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Office

Vol. 1138 Number 1

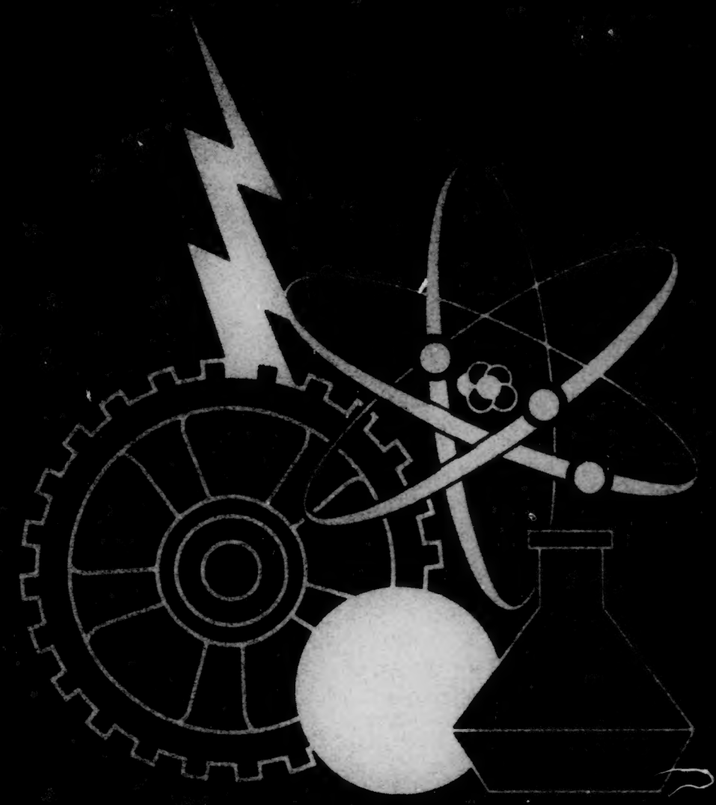
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

May 5, 1992



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
May 5, 1992 Volume 1138 Number 1

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1138 OG 2
Notice of Maintenance Fees Payable	1138 OG 2
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1138 OG 3
Reissue Applications Filed	1138 OG 6
Requests for Reexaminations Filed	1138 OG 7
CD-ROM Patent Images by Technology	1138 OG 7
Adverse Decisions in Interference	1138 OG 8
Patents Certificates of Correction	1138 OG 9
Special Boxes for Mail	1138 OG 10
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1138 OG 11
Patent Examining Corps	1138 OG 13
Reexaminations	1
Statutory Invention Registrations	3
Reissue Patents Granted (33,908)	7
Plant Patents Granted (7,860)	11
Patents Granted	
General and Mechanical (5,109,546)	13
Chemical (5,110,317)	277
Electrical (5,110,998)	473
Design Patents Granted (325,804)	657
Index of Patentees	PI 1
Indices of Reissue, Reexaminations, Design, Statutory Invention Registrations and Plant Patents	PI 82
Classification of	
Patents (Including Reissues and Reexaminations)	PI 89
Designs, and Plants Applications	PI 93
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 95
Designs and Plant Applications	PI 97
Change of Address Form	PI 99
Subscription Order Form	PI 101

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1992
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	600.00
—Corresponding prior U.S. national application filed	400.00
—Supplemental search fee, per additional invention	160.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	440.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	650.00
—Additional examination fee, per additional invention	220.00
International fees	
Basic fee	525.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	127.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	161.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	310.00	620.00
USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA	460.00	920.00
Filing with an EPO or JPO search report	400.	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on May 2, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,825,469 through 4,827,533
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 30, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,513,449 through 4,514,860
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9f) $450.00
By other than a small entity $900.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9f) $905.00
By other than a small entity $1,810.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§1.9(f)) $1,365.00
By other than a small entity..... $2,730.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable $600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 1, 1992
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,433,441	06/335,846	2/28/84
4,433,443	06/320,599	2/28/84
4,433,447	06/374,024	2/28/84
4,433,452	06/334,625	2/28/84
4,433,457	06/374,650	2/28/84
4,433,463	06/417,714	2/28/84
4,433,473	06/283,463	2/28/84
4,433,476	06/364,347	2/28/84
4,433,481	06/359,219	2/28/84
4,433,485	06/423,947	2/28/84
4,433,497	06/336,847	2/28/84
4,433,498	06/376,045	2/28/84
4,433,502	06/283,504	2/28/84
4,433,504	06/381,364	2/28/84
4,433,508	06/364,324	2/28/84
4,433,511	06/264,297	2/28/84
4,433,513	06/408,023	2/28/84
4,433,514	06/379,628	2/28/84
4,433,515	06/318,039	2/28/84
4,433,516	06/298,723	2/28/84
4,433,517	06/338,423	2/28/84
4,433,518	06/284,481	2/28/84
4,433,530	06/422,152	2/28/84
4,433,542	06/401,018	2/28/84
4,433,544	06/379,602	2/28/84
4,433,553	06/427,705	2/28/84
4,433,554	06/399,158	2/28/84
4,433,559	06/402,586	2/28/84
4,433,560	06/406,120	2/28/84
4,433,561	06/288,942	2/28/84
4,433,565	06/262,660	2/28/84
4,433,567	06/320,842	2/28/84
4,433,572	06/396,814	2/28/84
4,433,575	06/265,339	2/28/84
4,433,577	06/270,226	2/28/84
4,433,582	06/267,109	2/28/84
4,433,596	06/243,411	2/28/84
4,433,613	06/325,867	2/28/84
4,433,616	06/280,395	2/28/84
4,433,620	06/436,069	2/28/84
4,433,621	06/327,284	2/28/84
4,433,626	06/310,999	2/28/84
4,433,627	06/287,884	2/28/84
4,433,632	06/316,017	2/28/84
4,433,642	06/364,488	2/28/84
4,433,643	06/386,802	2/28/84
4,433,647	06/293,623	2/28/84
4,433,653	06/395,510	2/28/84
4,433,656	06/400,753	2/28/84
4,433,662	06/405,232	2/28/84
4,433,670	06/374,254	2/28/84
4,433,671	06/375,354	2/28/84
4,433,672	06/284,286	2/28/84
4,433,673	06/411,549	2/28/84
4,433,674	06/334,018	2/28/84
4,433,682	06/353,318	2/28/84
4,433,688	06/455,495	2/28/84
4,433,693	06/259,590	2/28/84
4,433,698	06/275,965	2/28/84
4,433,699	06/319,151	2/28/84
4,433,704	06/310,715	2/28/84
4,433,707	06/305,696	2/28/84
4,433,710	06/315,966	2/28/84
4,433,713	06/399,634	2/28/84
4,433,714	06/314,110	2/28/84
4,433,716	06/345,542	2/28/84
4,433,724	06/250,379	2/28/84
4,433,728	06/295,962	2/28/84
4,433,730	06/248,739	2/28/84
4,433,733	06/329,183	2/28/84
4,433,735	06/349,266	2/28/84
4,433,737	06/361,713	2/28/84
4,433,738	06/334,259	2/28/84
4,433,746	06/245,205	2/28/84
4,433,749	06/350,183	2/28/84
4,433,751	06/329,008	2/28/84
4,433,752	06/311,304	2/28/84
4,433,763	06/365,521	2/28/84
4,433,764	06/299,454	2/28/84
4,433,767	06/254,750	2/28/84
4,433,768	06/233,399	2/28/84
4,433,769	06/286,627	2/28/84
4,433,776	06/280,579	2/28/84
4,433,779	06/457,159	2/28/84
4,433,780	06/321,390	2/28/84
4,433,787	06/270,967	2/28/84
4,433,794	06/285,620	2/28/84
4,433,799	06/363,835	2/28/84
4,433,801	06/364,877	2/28/84

Patent Number	Serial Number	Issue Date
4,433,812	06/429,153	2/28/84
4,433,834	06/330,617	2/28/84
4,433,836	06/309,868	2/28/84
4,433,841	06/377,004	2/28/84
4,433,850	06/356,362	2/28/84
4,433,851	06/408,286	2/28/84
4,433,858	06/349,620	2/28/84
4,433,885	06/266,381	2/28/84
4,433,888	06/395,503	2/28/84
4,433,889	06/334,866	2/28/84
4,433,894	06/320,331	2/28/84
4,433,899	06/306,084	2/28/84
4,433,902	06/320,803	2/28/84
4,433,907	06/349,775	2/28/84
4,433,910	06/349,772	2/28/84
4,433,924	06/303,433	2/28/84
4,433,942	06/299,680	2/28/84
4,433,944	06/349,457	2/28/84
4,433,953	06/512,694	2/28/84
4,433,956	06/374,440	2/28/84
4,433,957	06/351,313	2/28/84
4,433,961	06/366,474	2/28/84
4,433,962	06/415,397	2/28/84
4,433,967	06/378,636	2/28/84
4,433,969	06/399,770	2/28/84
4,433,972	06/269,392	2/28/84
4,433,976	06/391,858	2/28/84
4,433,985	06/332,521	2/28/84
4,433,986	06/339,629	2/28/84
4,433,988	06/403,320	2/28/84
4,433,994	06/274,512	2/28/84
4,433,999	06/462,656	2/28/84
4,434,002	06/294,538	2/28/84
4,434,003	06/216,643	2/28/84
4,434,011	06/358,382	2/28/84
4,434,015	06/425,662	2/28/84
4,434,019	06/263,963	2/28/84
4,434,020	06/438,177	2/28/84
4,434,027	06/396,852	2/28/84
4,434,036	06/374,415	2/28/84
4,434,039	06/450,575	2/28/84
4,434,041	06/353,123	2/28/84
4,434,046	06/259,292	2/28/84
4,434,056	06/255,423	2/28/84
4,434,070	06/263,028	2/28/84
4,434,073	06/447,822	2/28/84
4,434,085	06/371,930	2/28/84
4,434,099	06/301,883	2/28/84
4,434,101	06/301,614	2/28/84
4,434,104	06/387,605	2/28/84
4,434,108	06/280,388	2/28/84
4,434,112	06/437,409	2/28/84
4,434,114	06/345,858	2/28/84
4,434,116	06/277,884	2/28/84
4,434,118	06/400,827	2/28/84
4,434,120	06/309,980	2/28/84
4,434,129	06/363,280	2/28/84
4,434,131	06/253,641	2/28/84
4,434,133	06/266,671	2/28/84
4,434,143	06/406,802	2/28/84
4,434,152	06/372,049	2/28/84
4,434,161	06/427,606	2/28/84
4,434,162	06/366,415	2/28/84
4,434,175	06/373,692	2/28/84
4,434,182	06/438,108	2/28/84
4,434,183	06/424,120	2/28/84
4,434,189	06/358,398	2/28/84
4,434,190	06/404,861	2/28/84
4,434,193	06/304,699	2/28/84
4,434,196	06/359,099	2/28/84
4,434,204	06/416,700	2/28/84
4,434,208	06/412,476	2/28/84
4,434,210	06/279,726	2/28/84
4,434,221	06/395,305	2/28/84
4,434,222	06/263,953	2/28/84
4,434,223	06/452,919	2/28/84
4,434,230	06/292,277	2/28/84
4,434,232		
4,434,233	06/239,920	2/28/84
4,434,234	06/386,505	2/28/84
4,434,237	06/363,839	2/28/84
4,434,248	06/426,317	2/28/84
4,434,250	06/335,393	2/28/84
4,434,255	06/370,654	2/28/84
4,434,256	06/406,859	2/28/84
4,434,268	06/355,618	2/28/84
4,434,286	06/440,456	2/28/84
4,434,288	06/366,883	2/28/84
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4,434,292	06/300,329	2/28/84
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4,434,329	06/348,339	2/28/84
4,434,331	06/230,286	2/28/84
4,434,336	06/292,208	2/28/84
4,434,345	06/403,063	2/28/84
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4,434,397	06/334,084	2/28/84
4,434,400	06/257,915	2/28/84
4,434,407	06/251,554	2/28/84
4,434,414	06/249,383	2/28/84
4,434,420	06/390,588	2/28/84
4,434,423	06/355,514	2/28/84
4,434,427	06/337,117	2/28/84
4,434,428	06/384,133	2/28/84
4,434,440	06/324,585	2/28/84
4,434,442	06/294,265	2/28/84
4,434,453	06/384,651	2/28/84
4,434,455	06/259,404	2/28/84
4,434,476	06/408,849	2/28/84
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4,434,494	06/231,605	2/28/84
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4,434,504	06/387,234	2/28/84
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4,727,606	06/839,631	3/01/88
4,727,607	06/943,934	3/01/88
4,727,609	06/839,905	3/01/88
4,727,610	06/895,100	3/01/88
4,727,611	06/886,430	3/01/88
4,727,613	06/943,646	3/01/88
4,727,617	06/806,598	3/01/88
4,727,619	06/881,036	3/01/88
4,727,628	07/074,489	3/01/88
4,727,636	06/890,356	3/01/88
4,727,639	06/799,335	3/01/88
4,727,643	06/850,228	3/01/88
4,727,644	06/898,675	3/01/88
4,727,647	06/897,272	3/01/88
4,727,652	06/865,854	3/01/88
4,727,660	06/872,734	3/01/88
4,727,662	07/005,027	3/01/88
4,727,664	06/883,643	3/01/88
4,727,669	06/658,116	3/01/88
4,727,670	06/912,787	3/01/88
4,727,671	07/033,653	3/01/88

Patent Number	Serial Number	Issue Date
4,727,673	06/899,067	3/01/88
4,727,674	06/910,310	3/01/88
4,727,677	07/067,980	3/01/88
4,727,686	06/905,199	3/01/88
4,727,687	06/681,903	3/01/88
4,727,690	06/937,308	3/01/88
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4,727,783	06/875,156	3/01/88
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4,727,876	06/704,335	3/01/88
4,727,895	06/859,367	3/01/88
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4,727,921	06/829,286	3/01/88
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4,727,928	06/883,496	3/01/88
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4,727,965	06/757,835	3/01/88
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4,727,996	06/887,289	3/01/88
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4,728,304	06/718,973	3/01/88
4,728,308	06/565,526	3/01/88
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4,728,349	06/715,113	3/01/88
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4,729,059	06/896,333	3/01/88
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4,729,120	06/782,716	3/01/88
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NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,403,040	06/350,801	9/06/83	2/25/82	1/02/92
4,674,297	06/329,429	6/23/87	2/13/86	12/30/91
4,694,874	06/301,061	9/22/87	11/22/85	10/18/91
4,695,640	06/789,950	9/22/87	10/21/85	9/24/91

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,237,584, Re. S.N. 07/857,956, Filed Mar. 26, 1992, Cl. 24/023, CLAMP STRUCTURE ESPECIALLY AXLE SLEEVE CLAMP, Hans Oetiker, Owner of Record: *Hans Oetiker , A.G., Horgen, Switzerland*, Attorney or Agent: Paul M. Craig, Jr., Ex. Gp.: 3501

4,899,069, Re. S.N. 07/832,010, Filed Feb. 6, 1992, Cl. 307/520, INTEGRATED ACTIVE LOW-PASS FILTER OF THE FIRST ORDER, Germane Nicollini, Owner of Record: *SGS-Thomson Microelectronics, Carrollton, Tex.*, Attorney or Agent: Richard A. Bachand, Ex. Gp.: 2504

4,903,580, Re. S.N. 07/841,635, Filed Feb. 27, 1992, Cl. 73/304B, PISTON FOR ALTERNATIVE ENDOTHERMIC CREATING OIL CUSHION LUBRICATION, Ludvico Bruni, Owner of Record: *A E Borgo S. P. A., Turin, Italy*, Attorney or Agent: Michael J. Keenan, Ex. Gp.: 2406

4,911,559, Re. S.N. 07/856,718, Filed Mar. 25, 1992, Cl. 374/158, DISPOSABLE PROBE COVER ASSEMBLY FOR MEDICAL THERMOMETER, Richard P. Meyst, et. al., Owner of Record: *Diatek, Inc., San Diego, Calif.*, Attorney or Agent: James R. Brueggeman, Ex. Gp.: 2406

4,911,869, Re. S.N. 07/857,054, Filed Mar. 24, 1992, Cl. 264/050, REIMPREGNATION OF PLASTIC FOAM PARTICLES WITH CO_2, Bernard H. Meyer, et. al., Owner of Record: *Arco Chemical Technology, L.P., Wilmington, Del.*, Attorney or Agent: John C. Martin, Jr., Ex. Gp.: 1307

4,912,206, Re. S.N. 07/858,959, Filed Mar. 27, 1992, Cl. 536/027, CDNA CLONE ENCODING BRAIN AMYLOID OF ALZEHEIMER'S DESEASE, Dimitry Y. Goldgaber, et. al., Owner of Record: *United States of America, as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.*, Attorney or Agent: Stephen A. Bent, Ex. Gp.: 1803

4,976,008, Re. S.N. 07/849,514, Filed Mar. 11, 1992, Cl. 16/354, MULTI-PIECE THRUST BEARING ASSEMBLY FOR A HINGE STRUCTURE, Austin R. Baer, Owner of Record: *Roton Barrier, Inc., St. Louis, Mo.*, Attorney or Agent: Lawrence G. Kurland, Ex. Gp.: 3205

4,981,303, Re. S.N. 07/855,058, Filed Mar. 19, 1992, Cl. 277/37, SEALING DEVICE, Noboru Matsushima, et. al., Owner of Record: *NOK Corp., Tokyo, Japan*, Attorney or Agent: Ken-Ichi Ha Hori, Ex. Gp.: 2406

4,986,273, Re. S.N. 07/843,512, Filed Feb. 28, 1992, Cl. 128/653, METHOD OF RADIOLOGICALLY SCANNING THE SPINE FOR MEASURING BONE DENSITY, William O'Neill, et. al., Owner of Record: *Medical & Scientific Enterprises, Inc., Sudbury, Mass.*, Attorney or Agent: Thomas O. Hoover, Ex. Gp.: 3305

4,995,706, Re. S.N. 07/859,168, Filed Mar. 27, 1992, Cl. 359/56, LIQUID CRYSTAL DEVICE WITH A FERROELECTRIC THIN FILM, Takashi Inujima, et. al., Owner of Record: *Inventors*, Attorney or Agent: Donald R. Studebaker, Ex. Gp.: 2504

5,055,334, Re. S.N. 07/859,060, Filed Mar. 27, 1992, Cl. 428/99, HEAT PROTECTIVE COVER FOR HOT WATER PIPES, Gabriel Lechuga, Owner of Record: *Inventor*, Attorney or Agent: Robert J. Schaap, Ex. Gp.: 1508

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 33,452, Reexam. No. 90/002,664, Requested Mar. 9, 1992, Cl. 384/486, METHOD FOR MAKING ALKYLHALOSILANES, William J. Ward, et. al., Owner of Record: *General Electric Co., Schenectady, N.Y.*, Attorney or Agent: James Magee & James C. Davis, Jr., Schenectady, N.Y., Ex. Gp.: 2405, Requester: Dow Corning Corp., Auburn, Mich.

Re. 33,851, Reexam. No. 90/002,676, Requested Mar. 18, 1992, Cl. 452/150, METHOD AND APPARATUS FOR AUTOMATICALLY CUTTING FOOD PRODUCTS OF PREDETERMINED WEIGHT OR SHAPE, Norman A. Rudy, et. al., Owner of Record: *Frigoscandia Food Processing Systems, A.B., Helsingborg, Sweden*, Attorney or Agent: Oliver D. Olson, Olson & Olson, Portland, Oreg., Ex. Gp.: 3203, Requester: Dinesh Agarwal, Shlesinger, Arkwright & Garvey, Arlington, Va.

4,328,802, Reexam. No. 90/002,673, Requested Mar. 13, 1992, Cl. 604/028, OPTHALMOLOGICAL PROCEDURES, Lawrence G. Pape, Owner of Record: *Opthalmic Systems, Inc., Long Island, N.Y.*, Attorney or Agent: Joseph Patrick Burke, Kettering, Ohio, Ex. Gp.: 3303, Requester: Barry L. Copeland, Alcon Labs, Inc., Ft. Worth, Tex.

4,740,775, Reexam. No. 90/002,671, Requested Mar. 20, 1992, Cl. 340/065, AUTOMOBILE BURGLAR ALARM, Reese Price, Jr., Owner of Record: *Inventor, Lake Station, Ind.*, Attorney or Agent: None, Ex. Gp.: 2604, Requester: Code Alarm, Inc., Madison Heights, Mich.

4,749,992, Reexam. No. 90/002,674, Requested Mar. 13, 1992, Cl. 340/870.02, UTILITY MONITORING AND CONTROL SYSTEM, Edward L. Fitzmeyer, et. al., Owner of Record: *Total Energy Management Consultants Corp., Melrose, Mass.*, Attorney or Agent: Michael I. Falkoff, Lahive & Cockfield, Boston, Mass., Ex. Gp.: 2604, Requester: Owner

4,797,413, Reexam. No. 90/002,682, Requested Mar. 23, 1992, Cl. 514/432, THIENO THIOPYRAN SULFONAMIDE DERIVATIVES, PHARMECEUTICAL COMPOSITIONS AND USE, John J. Baldwin, et. al., Owner of Record: *Merck & Co., Inc., Rahway, N.J.*, Attorney or Agent: William H. Nicholson, Merck & Co., Rahway, N.J., Ex. Gp.: 1201, Requester: Owner

4,840,815, Reexam. No. 90/002,670, Requested Mar. 11, 1992, Cl. 426/611, LOW CALORIC ALKYL GLYCOSIDE POLYESTER FAT SUBSTITUTES, Richard S. Meyer, et. al., Owner of Record: *Curtice-Burns, Inc., Rochester, N.Y.*, Attorney or Agent: Lee E. Johnson & Marcia S. Kelbon, Christensen, O'Conner, Johnson & Kindness, Seattle, Wash., Ex. Gp.: 1302, Requester: Owner

4,922,464, Reexam. No. 90/002,680, Requested Mar. 4, 1992, Cl. 366/349, PORTABLE MIXER FOR PROCESSING FOOD, Karl-Heinz Kamprath, Owner of Record: *Braun Aktiengesellaschaft, Kronberg, Germany*, Attorney or Agent: Willis M. Ertman, Fish & Richardson, Boston, Mass., Ex. Gp.: 2402, Requester: Owner

4,953,995, Reexam. No. 90/002,677, Requested Mar. 18, 1992, Cl. 400/121, DOT MATRIX PRINTER AND METHOD FOR PRINTING MULTIPLE LINES AT DIFFERENT LINE SPACINGS, Louis Sims, et. al., Owner of Record: *Output Technology, Inc., Spokane, Wash.*, Attorney or Agent: David L. Roberts, Wells, St. John & Roberts, Spokane, Wash., Ex. Gp.: 3307, Requester: Dataproducts Corp., Woodland Hills, Calif.

4,977,455, Reexam. No. 90/002,678, Requested Mar. 20, 1992, Cl. 358/142, SYSTEM AND PROCESS FOR VCR SCHEDULING, Patrick Young, Owner of Record: *Insight Telecast, Inc., San Mateo, Calif.*, Attorney or Agent: Flehr, Hohbach, Test, Albritton & Herbert, San Francisco, Calif., Ex. Gp.: 2602, Requester: TV Answer, Inc., Reston, Va.

5,080,712, Reexam. No. 90/002,675, Requested Mar. 16, 1992, Cl. 075/229, OPTIMIZED DOUBLE PRESS-DOUBLE SINTER POWDER METALLURGY METHOD, William B. James, et. al., Owner of Record: *Hoeganaes Corp., Riverton, N.J.*, Attorney or Agent: Peter J. Cronk, Woodcock, Washburn, Kurtz, et. al., Philadelphia, Pa., Ex. Gp.: 2204, Requester: Quebec Metal Powders, Ltd., Tracy, Quebec, Canada

CD-ROM Patent Images by Technology

The U.S. Patent and Trademark Office announces the implementation of a demonstration project to provide classified sets of

patent images in CD-ROM format. The classified sets are collections of U.S. patents which, by virtue of their placement in the U.S. Patent Classification System, represent meaningful technological groupings.

The two classified sets selected for this project are: Genetic Engineering, as defined by Class 935 and Class 435, subclass 172.3; and Acid Rain, as defined by Class 55, subclass 73 and Class 423, subclasses 220-234 and 242-244.

The sets will contain:

1) current classification information
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3) full text for those patents in the set where the text is available in electronic format, i.e., since 1971

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Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,548,689, Takeshi Sakashita, Takayuki Nakano, PHOTOCURABLE RESIN COMPOSITION, Interference No. 102,632, decided Mar. 23, 1992, claims 1, 2 and 7-13.

Patent No. 4,586,595, Franz Hartig, Dagwin Tomm, CLUTCH DISC UNDER-TOAD AND IDLING DAMPING MEANS, Interference No. 102,389, decided Mar. 10, 1992, claim 1.

Patent No. 4,600,625, Michiharu Abe, Hideaki Oba, OPTICAL INFORMATION RECORDING MEDIUM, Interference No. 102,633, decided Feb. 28, 1992, claims 1-60.

Patent No. 4,648,892, Carter Kittrell, Gary B. Hayes, Michael S. Feld, METHOD FOR MAKING OPTICAL SHIELD FOR A LASER CATHETER, Interference No. 102,358, decided Mar. 17, 1992, claims 1, 4 and 5.

Patent No. 4,806,541, Synese Jolidon, Rita Locher, Ivan Kompis, Ekkehard Weiss, Pierre-Charles Wyss, QUINOLINE DERIVATIVES, Interference No. 102,663, decided Mar. 24, 1992, claims 1-11.

Patent No. 4,880,782, Fritz Eckstein, Gerhard Hunsmann, Heinz Hartman, METHOD OF TREATING VIRAL INFECTIONS IN HUMANS AND COMPOSITIONS THEREFOR, Interference No. 102,682, decided Feb. 24, 1992, claims 4, 5 and 7-11.

Patent No. 4,891,355, Noriki Hayashi, Satoshi Takano, Kenji Miyazaki, Noriyuki Yoshida, METHOD FOR PRODUCING SUPERCONDUCTING CIRCUIT, Interference No. 102,514, decided Mar. 3, 1992, claims 1-9.

Patent No. 4,924,327, John K. Seamons, Kevin P. Grundy, SYSTEM AND METHOD FOR IMPROVING THE PERFORMANCE OF HIGH-DENSITY DATA STORAGE MEDIA, Interference No. 102,566, decided Mar. 3, 1992, claims 1, 2, 4-7, 9-12, 14-17, 19-22 and 24-29.

Patent No. 4,924,330, John K. Seamons, Kevin P. Grundy, SYSTEM AND METHOD FOR IMPROVING THE PERFORMANCE OF HIGH-DENSITY DATA STORAGE MEDIA, Interference No. 102,590, decided Mar. 3, 1992, claims 1-3, 5-9, 11-14, 16-19 and 21-30.

Patent No. 4,939,356, Joseph F. Rando, H. Nick Roberts, John F. O'Brien, BAR CODE SCANNER WITH ASTERISK SCAN PATTERN, Interference No. 102,577, decided Feb. 19, 1992, claims 39-42 and 44.

Patent No. 4,966,828, Reinhard Doenges, Hans Ruckert, Ulrich Geissler, Hartmut Steppan, CARBONYLMETHYLENE-HETEROCYCLIC COMPOUNDS CONTAINING TRIHALOGENOMETHYL GROUPS, PROCESS FOR THIER PREPARATION, AND LIGHT-SENSITIVE MIXTURE CONTAINING THE COMPOUNDS, Interference No. 102,608, decided Feb. 24, 1992, claims 1-13.

Patent No. 4,985,117, Hideyuki Kurosawa, Toshio Hirai, Hisanori Yamane, Tsutomu Yamashita, METHOD OF MANUFACTURING JOSEPHSON JUNCTIONS, Interference No. 102,314, decided Jan. 8, 1992, claims 1, 4 and 6-13.

NANNIE B. HENRY, *Deputy Clerk*
Board of Patent Appeals and Interferences
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PATENT NOTICES

Certificates of Correction For Week of May 5, 1992

D. 311,439	4,909,643	4,946,089	4,966,601
D. 311,975	4,909,646	4,946,380	4,966,727
D. 313,109	4,910,493	4,947,144	4,966,729
D. 313,557	4,911,056	4,947,302	4,966,978
D. 313,994	4,911,904	4,948,031	4,967,101
4,677,219	4,914,400	4,948,366	4,967,945
4,726,337	4,914,972	4,948,371	4,968,225
4,741,764	4,914,974	4,948,390	4,968,717
4,749,704	4,915,465	4,948,685	4,968,822
4,757,060	4,915,673	4,949,214	4,968,849
4,760,698	4,915,915	4,949,441	4,969,766
4,778,748	4,916,083	4,950,602	4,969,789
4,781,852	4,918,006	4,950,743	4,969,989
4,784,084	4,918,048	4,952,382	4,970,102
4,784,161	4,918,069	4,953,082	4,970,351
4,786,572	4,918,207	4,953,109	4,970,493
4,789,288	4,920,007	4,953,553	4,970,942
4,816,426	4,920,049	4,953,676	4,970,993
4,817,261	4,920,712	4,954,380	4,971,064
4,818,652	4,921,174	4,954,430	4,971,731
4,827,163	4,924,462	4,954,526	4,972,079
4,831,100	4,925,130	4,954,791	4,972,684
4,832,437	4,925,703	4,954,973	4,972,732
4,832,860	4,927,732	4,955,039	4,973,040
4,842,666	4,928,030	4,955,754	4,973,045
4,844,360	4,928,714	4,955,780	4,973,441
4,844,451	4,929,598	4,955,796	4,973,931
4,844,847	4,929,671	4,955,911	4,973,964
4,847,698	4,930,763	4,955,917	4,974,479
4,854,882	4,930,883	4,955,969	4,974,496
4,856,639	4,932,391	4,955,990	4,974,577
4,859,065	4,932,954	4,956,017	4,974,694
4,860,720	4,933,577	4,956,172	4,974,770
4,862,445	4,933,673	4,956,853	4,975,495
4,862,450	4,934,226	4,957,181	4,976,282
4,863,964	4,934,258	4,957,238	4,976,351
4,866,435	4,934,674	4,957,568	4,977,272
4,866,570	4,935,043	4,957,774	4,979,252
4,870,037	4,936,071	4,957,955	4,979,406
4,870,039	4,936,329	4,958,559	4,979,448
4,872,326	4,936,533	4,959,002	4,979,998
4,874,421	4,936,927	4,959,157	4,980,374
4,874,480	4,936,948	4,959,409	4,980,403
4,875,116	4,937,316	4,959,661	4,980,438
4,876,730	4,937,756	4,959,720	4,982,551
4,877,444	4,938,513	4,960,169	4,982,840
4,879,010	4,938,790	4,960,180	4,982,893
4,879,846	4,939,951	4,960,454	4,983,363
4,880,029	4,940,652	4,960,778	4,984,064
4,883,996	4,940,698	4,960,815	4,984,478
4,884,059	4,940,798	4,960,858	4,984,523
4,887,102	4,940,820	4,961,482	4,985,873
4,887,311	4,940,832	4,961,780	4,989,316
4,888,808	4,941,519	4,962,122	4,996,350
4,889,239	4,941,657	4,962,192	4,997,270
4,890,181	4,941,900	4,962,674	5,002,964
4,891,249	4,941,912	4,963,185	5,003,050
4,893,831	4,942,061	4,963,209	5,008,723
4,894,011	4,942,127	4,963,651	5,013,824
4,894,342	4,942,489	4,963,702	5,031,806
4,897,106	4,942,600	4,964,240	5,033,962
4,898,249	4,942,650	4,964,251	5,038,983
4,898,800	4,942,872	4,964,670	5,039,845
4,898,970	4,943,180	4,964,720	5,049,781
4,901,795	4,943,181	4,964,900	5,053,896
4,902,924	4,943,299	4,964,939	5,058,612
4,906,878	4,943,478	4,965,032	5,059,415
4,907,019	4,943,971	4,965,036	5,065,540
4,908,109	4,944,798	4,965,128	5,075,400
4,908,571	4,945,128	4,965,266	5,076,912
4,908,890	4,945,271	4,965,608	
4,909,210	4,945,708	4,966,163	

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PATENT EXAMINING CORPS

VACANT, Assistant Commissioner
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PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110 — D. E. TALBERT, Director	308-0661	1/11/91
ORGANIC CHEMISTRY, GROUP 120 — JOHN F. TERAPANE, JR., Director	308-1235	6/02/91
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130 — DONALD CZAJA, Acting Director	308-0651	3/13/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150 — J. O. THOMAS, Director	308-2351	10/24/90
BIOTECHNOLOGY, GROUP 180 — BARRY S. RICHMAN, Acting Director	308-0196	10/15/90
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210 — D. G. KELLY, Director	308-1782	9/13/90
SPECIAL LAWS ADMINISTRATION, GROUP 220 — ROBERT E. GARRETT, Director	308-0511	9/13/90
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230 — GERALD GOLDBERG, Director	308-0754	12/23/89
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 240 — CARLTON CROYLE, Director	308-0771	3/05/91
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250 — JOSEPH J. ROLLA, Director	308-0956	4/01/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 — BOBBY R. GRAY, Director	308-0962	9/14/90
DESIGN, GROUP 290 — ROBERT E. GARRETT, Director	308-0511	10/09/89
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MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320 — N. GODICI, Director	308-1148	4/23/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330 — J. J. LOVE, Director	308-0858	1/09/91
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340 — JOHN KITTLE, Director	308-0861	4/13/91
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 350 — A.L. SMITH, Director	308-0651	1/20/91

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during April 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,873,996 to 3,881,195 inclusive
Plant Patents ..... P. 3,697 to 3,712

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REEXAMINATIONS

MAY 5, 1992

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,410,917 (1691st)

METHOD OF AND APPARATUS FOR RECORDING INFORMATION FROM A MASTER MEDIUM ONTO A SLAVE MEDIUM EMPLOYING DIGITAL TECHNIQUES

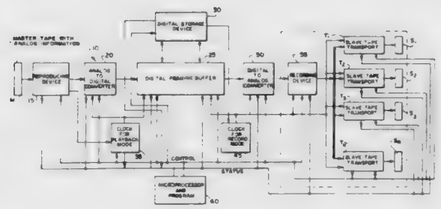
Ronald M. Newdoll, Woodside, and John E. Phillips, Cupertino, both of Calif., assignors to Accurate Sound Corporation, Redwood City, Calif.

Reexamination Request No. 90/002,283, Feb. 20, 1991.

Reexamination Certificate for Patent No. 4,410,917, issued Oct. 18, 1983, Ser. No. 302,159, Sep. 14, 1981.

Int. Cl.[5] G11B *5/86*

U.S. Cl. 360—15



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **19–21** and **25–34** are cancelled.

Claims **1, 6–8, 10, 13–18** and **22–24** are determined to be patentable as amended.

Claims **2–5, 9, 11** and **12**, dependent on an amended claim, are determined to be patentable.

New claims **35–62** are added and determined to be patentable.

1. A method of recording *audio* information on a recording medium that is reproduced from a master medium comprising the steps of:

(a) reproducing information from a master medium at one rate;

(*b*) *blocking information reproduced from the master medium into frames;*

(*c*) *adding error detection coding to said frames;*

[(b)] (*d*) storing the *frames of reproduced* information as digital information *in a solid state memory device;*

[(c)] (*e*) *repeatedly* retrieving the stored digital information *from said solid state memory device;*

[(d)] (*f*) converting the retrieved digital information into analog information; and

[(e)] (*g*) recording the analog information at a rate faster than said one rate onto a recording medium.

B1 4,849,032 (1692nd)

Patent Not Issued For This Number

B1 4,951,986 (1693rd)

PLASTIC BUMPER

Kunio Hanafusa; Naoshige Fukuhara, and Takaaki Tachibana, all of Okayama, Japan, assignors to Minoru Industrial Co., Ltd., Okayama, Japan

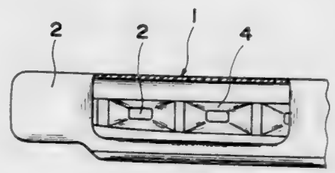
Reexamination Request No. 90/002,314, Apr. 5, 1991.

Reexamination Certificate for Patent No. 4,951,986, issued Aug. 28, 1990, Ser. No. 453,942, Dec. 20, 1989.

Claims priority, application Japan, Dec. 24, 1988, 63-327488; Dec. 24, 1988, 63-327489; May 15, 1989, 1-122290

Int. Cl.[5] B60R *19/00*

U.S. Cl. 293—120



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–3, 4**, and **8** are cancelled.

Claims **5–7** are determined to be patentable as amended.

New claims **9–13** are added and determined to be patentable.

5. [A] *An elongated one-piece* plastic bumper for use in an automobile comprising:

a closed hollow tubular body;

a front wall [member] *of said tubular body* generally having a U-shape cross-section; and

a rear wall [member] *of said tubular body* [having a plurality of supporting tubes extending from a surface of said rear wall member and plate ribs extending between neighboring supporting tubes];

at least two rows of supporting tubes aligned along said elongated one-piece plastic bumper and each extending between said front and rear walls of said tubular body; and

a plurality of plate ribs extending between neighboring supporting tubes and between said front and rear walls of said tubular body, at least one plate rib also extending between said front and rear walls.

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STATUTORY INVENTION REGISTRATIONS

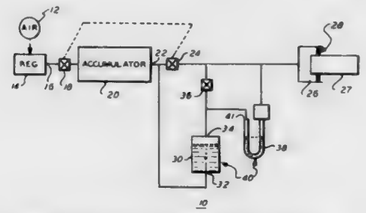
PUBLISHED MAY 5, 1992

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H1045
AIR BUBBLE LEAK DETECTION TEST DEVICE

Arthur D. Wilson, Mesa, Ariz., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 19, 1990, Ser. No. 615,182
Int. Cl.[5] G01M *3/02, 3/38*
U.S. Cl. 73—40 **7 Claims**

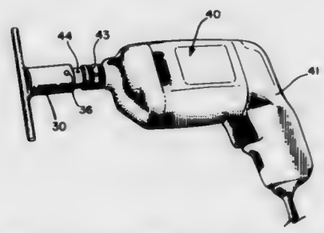


1. A leakage detection test device, comprising:
test fixture means for supporting a unit to be tested and applying air pressure to it, having an input;
air supply means having an output;
air bubble detection means for detecting the passage of air, having an input connected to the air supply means, an internal chamber partially filled with a liquid, input orifice means positioned in the internal chamber in the liquid and connected to the input, and output means positioned in the chamber above the liquid and connected to the input of the test fixture means.

H1046
DRILL CHUCK REMOVER

Ronnie C. Tinney, Noble, and Gordon R. Stout, Choctaw, both of Okla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 10, 1989, Ser. No. 309,583
Int. Cl.[5] B25B *13/04*
U.S. Cl. 81—120 **4 Claims**

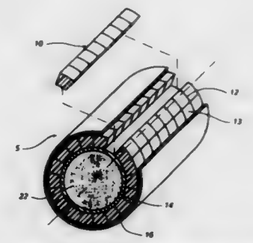


1. A tool for removing a drill chuck from the threaded shaft of a motor of a drill supporting said chuck, said chuck including a key hole therein, said tool comprising:
(a) a tubular segment sized for snugly receiving said drill chuck of said drill;
(b) a threaded hole defined through the wall of said tubular segment;
(c) a set screw received by said threaded hole and sized for engaging the key hole of said drill chuck and thereby securing said tubular segment to said drill chuck;
(d) means defined on the outer surface of said tubular segment for impacting said segment in a rotary direction for threadably removing said chuck from said threaded shaft.

H1047
FRAGMENTING NOTCHED WARHEAD ROD

William M. Henderson, Ninde; Leonard T. Wilson, Fredericksburg, and Charles R. Garnett, Dahlgren, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1991, Ser. No. 740,524
Int. Cl.[5] F42B *12/32*
U.S. Cl. 102—496 **6 Claims**

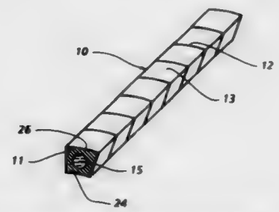


1. A fragmenting rod for use in a discrete fragment warhead comprising; a scored rod of preselected material adapted to reside in a fragmenting warhead case.

H1048
COMPOSITE FRAGMENTING ROD FOR A WARHEAD CASE

Leonard T. Wilson, Fredericksburg; Charles R. Garnett, Dahlgren, and William M. Henderson, Ninde, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1991, Ser. No. 740,528
Int. Cl.[5] F42B *12/32*
U.S. Cl. 102—496 **7 Claims**

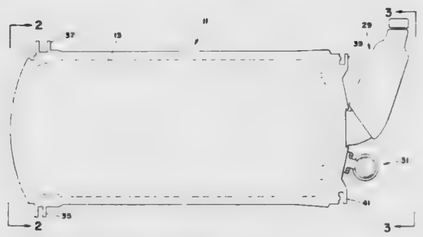


1. A composite fragmenting rod for use in a discrete fragment warhead comprising:
a scored rod comprising a plurality of preselected materials for disposing about an outside surface of an explosive material of the discrete fragment warhead.

H1049
GAS GENERATION FOR A MISSILE POST-BOOST CONTROL SYSTEM

Farid M. Khadduri, 5526 Westbard Ave., Bethesda, Md. 20816, and Stanley J. Kurzeja, 12813 Middleton La., Fairfax, Va. 22033

Filed Nov. 30, 1990, Ser. No. 621,105
Int. Cl.[5] C06D *5/00*
U.S. Cl. 102—530 **2 Claims**

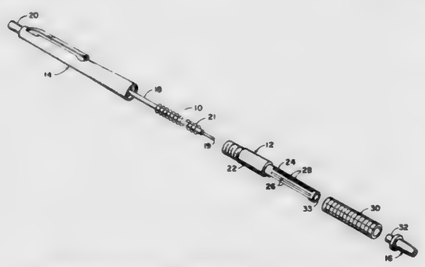


1. A gas generator comprising:
a cylindrical chamber, said chamber having a domed forward section, a domed aft section, said aft section having a centrally located aft round oriface;
a cylindrical propellant grain having one end abutting said forward section and the opposite end spaced from said aft section;
an outlet assembly connected to said aft section and communicating with said aft opening; and
said cylindrical chamber including a cylindrical case, said aft section being integral with said case, said case and aft section being formed of titanium.

H1050
WRITING INSTRUMENT

Richard J. Petrillo, Norwell, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Nov. 2, 1990, Ser. No. 608,214
Int. Cl.[5] A46B *5/02*
U.S. Cl. 401—6 **15 Claims**

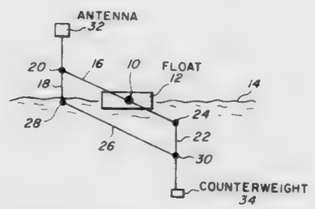


1. A writing instrument comprising:
a cylindrical barrel assembly having means for retaining a writing medium disposed at one end thereof;
a resilient portion of said barrel assembly disposed adjacent said barrel one end and terminating at said retaining means; and
a unitary tubular sleeve enveloping said barrel resilient portion;
said resilient portion comprising a thin wall elongated tube formed of a pair of bands having a continuous circumferential surface disposed one at each end thereof and a plurality of elongated slots formed thereon extending axially with respect to said cylindrical barrel assembly between said bands, whereby said tubular sleeve and said barrel resilient portion combine to provide a compressible finger grip to the user of the writing instrument during operation.

H1051
ANTENNA STABILIZING BUOY

Emanuel Briguglio, Bethesda, Md., assignor to Government of the United States, Washington, D.C.

Filed May 10, 1991, Ser. No. 698,418
Int. Cl.[5] B63B *22/20*
U.S. Cl. 441—28 **20 Claims**



1. A sensor stabilizing deployable mast system comprising:
a flotation element;
a pivot support connected to said flotation element;
a linkage system comprising a plurality of elongated rigid elements, wherein said rigid elements are attached to said pivot support, and wherein said linkage system pivots about said flotation element;
a sensor means mounted on a first one of said elongated rigid elements; and
a counterweight attached to a second one of said elongated rigid elements such that upon deployment of said mast system in water said sensor means is maintained at the desired vertical position by pantographic action.

H1052
METHOD FOR STABILIZATION OF PAN-BASED CARBON FIBERS

Leighton H. Peebles, Jr., 8204 Mockingbird Dr., Annandale, Va. 22003; A. S. Abhiraman, and Gajanan S. Bhat, both of 1233 Teakwood Trail, Stone Mountain, Ga. 30083

Filed Jun. 30, 1989, Ser. No. 373,980
Int. Cl.[5] D01F *9/12*
U.S. Cl. 423—447.7 **6 Claims**

1. A process for the stabilization of polyacrylonitrile-based fibers comprising heating said fibers in a furnace to a temperature ranging from about 150° to about 350° C. in an atmosphere comprising from about 5 to 30 volume percent of oxygen, from about 2 to about 95 percent of ammonia, and from about 5 to about 77 volume percent of a diluent gas.

H1053
COMPOSITION AND METHOD OF FORMING EXTRUDABLE FOOD ITEMS

Donald G. Coffey, Midland, Mich.; Donald A. Rebstock, Saint Simons Island, Ga., and Wilfred C. Meyer, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 274,888, Nov. 22, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 485,817
Int. Cl.[5] A23L *1/05, 1/06;* **A01J** *1/00;* **A23P** *1/00*
U.S. Cl. 426—573 **24 Claims**

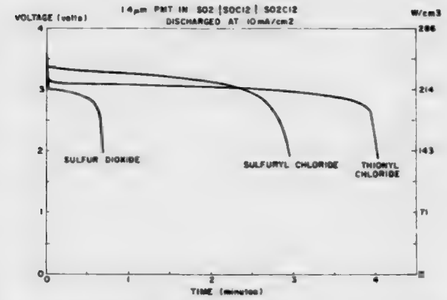
1. A manufactured food product comprising an extruded, shaped food product, having a matrix that contains an effective amount of carboxymethylcellulose, food particles, and a gelling binder, where the extruded, shaped food product has been contacted with an aluminum solution thereby gelling the food product so that the food particles are stable throughout the matrix and the shaped food product does not contain a gel-like skin.

18. A method of preparing an extruded, shaped food product comprising:
(a) blending a composition that comprises carboxymethylcellulose, a gelling binder and food particles to form a food mash composition;
(b) extruding the food mash into a desired shape; and
(c) exposing the extruded food product to an aluminum solution thereby gelling the food product such that the food particles are stable throughout the food product and the shaped food product does not contain a gel-like skin.

H1054
ELECTROCHEMICAL CELL THAT DELIVERS HIGH POWER PULSES

Charles W. Walker, Jr., Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 14, 1991, Ser. No. 715,265
Int. Cl.[5] H01M *6/14*
U.S. Cl. 429—194 **6 Claims**

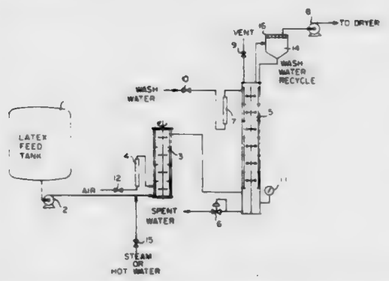


1. An electrochemical cell capable of delivering high power pulses, said electrochemical cell including poly 3-methylthiophene as the cathode, a member of the group consisting of $Li(SO_2)_3AlCl_4$, 1.0 M $LiAlCl_4$—$SOCl_2$ and 1.0 M $LiAlCl_4$ SO_2Cl_2 as the electrolyte and lithium as the anode.

H1055
THERMAL ENERGY COAGULATION AND WASHING OF LATEX PARTICLES

Nicholas Kydonieus, King of Prussia, Pa.; Jeffrey A. Hall; James D. Phillips, Jr., both of Benton, Ky., and John A. Sturm, Paducah, Ky., assignors to Atochem North America, Inc., Philadelphia, Pa.

Filed May 29, 1990, Ser. No. 530,146
Int. Cl.[5] C08F *6/16*
U.S. Cl. 528—499 **11 Claims**



1. A method for coagulating and washing an aqueous polymer latex for removing water-soluble contaminants therefrom comprising:
agitating and heating the latex to impart a combination of mechanical and thermal energy thereto sufficient to result in coagulation of the latex, wherein up to about 85% of the imparted energy comprises thermal energy, and
washing the coagulated latex by passing it in counter-current relationship with wash water.

H1056
TRIPEPTIDE, ITS PREPARATION AND USE

Jean-Marie Bernard, Route du Large - Saint Laurent d'Agny, 69440 - Mornant, France

Filed May 24, 1990, Ser. No. 527,928
Claims priority, application France, May 24, 1989, 89 06777
Int. Cl.[5] C07K *5/00*
U.S. Cl. 530—333 **10 Claims**

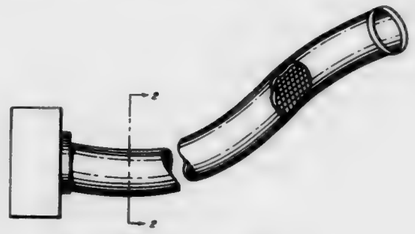
1. A compound of the formula:

L Leucyl - L Arginyl - L Proline.

H1057
CONDUCTIVE HOSE

Floyd W. Regalia, 4701 Kenmore Ave., #205, Alex, Va. 22304, and Earl H. Bonafede, 3537 Pepper Ridge Dr., Mobile, Ala. 36693

Filed May 31, 1990, Ser. No. 532,905
Int. Cl.[5] F16L *11/12;* **H01B** *7/00, 17/00*
U.S. Cl. 174—47 **9 Claims**



1. A conductive firehose comprising:
a tube of a certain length with two ends;
a conductive means for conducting electricity throughout the length of said tube;
a coupling attached to each end of said tube and electrically connected to said conductive means; and conductive means having a resistance of no more than one ohm per 150 foot length of said firehose and being comprised of a flexible conductive material having a weight of less than 15 pounds per 150 foot length of said firehose.

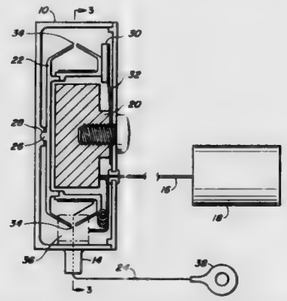
H1058
TRANSDUCER FOR MEASURING THE SEPARATOR OF ROCKET STAGES

Roger A. Herrick, deceased, Santa Clara, and Charlene Herrick, executrix, 825 Henrietta Ave., Sunnyvale, Calif. 94086

Filed Mar. 28, 1990, Ser. No. 501,069
Int. Cl.[5] G01B *7/04*
U.S. Cl. 324—206 **3 Claims**

1. A transducer for measuring the displacement of a departing body in a rocket system comprising;
a coil of wire having magnetic pulses recorded on said wire, means of attaching a free end of said wire to the departing body,

a means for rotatably mounting said coil on a second body, and



a magnetic detector on said second body through which said wire passes as the body departs.

H1059

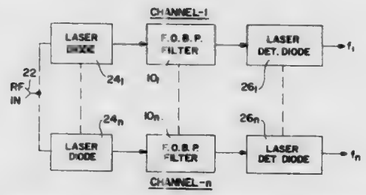
FIBER OPTIC RF SIGNAL CHANNELIZER

Charles E. Konig, Staten Island, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 19, 1991, Ser. No. 656,916

Int. Cl.[5] H04J *1/02, 14/02*

U.S. Cl. 359—124 **11 Claims**



1. A frequency channelizer for determining the frequency of a plurality of received radio frequency signals over a predetermined bandwidth, comprising:

a plurality of predetermined bandwidth frequency detection channels coupled to an RF signal input, each channel including a fiber optic bandpass filter having a predetermined different center frequency selectively chosen within said bandwidth for channeling signals for detection within a plurality of frequency bins.

H1060

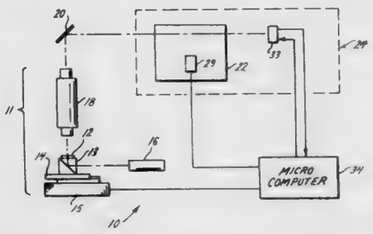
MICROSTRUCTURE CORRELATION COUNTER

Michael Lazich, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1990, Ser. No. 547,280

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—6 **5 Claims**



1. An apparatus for counting microstructures in a sample by optical correlation of an image of said microstructure with a pre-existing image of said microstructure producing indicia of said correlation, said apparatus comprising:

(a) a microscope for imaging said sample having an optical axis;

(b) a programmable stage being translatable in X-Y dimensions relative to said optical axis of said microscope and being capable of holding and positioning in said X-Y dimensions all or portions of said sample in the optical field of view of said microscope, said stage being operationally disposed in juxtaposition with said microscope;

(c) a laser aligned with said optical axis of said microscope and capable of coherently illuminating said sample and being operationally disposed in juxtaposition with said microscope to produce an image of the microstructure in said sample;

(d) a Vander Lugt correlator disposed coaxially with said optical axis of said microscope, said correlator having a spherical Fourier transform lens disposed to receive from said microscope the sample image produced by said laser, a matched filter spatial light modulator disposed coaxially a focal length behind said Fourier lens for providing a pre-existing image of a particular microstructure, a cross-correlation lens disposed coaxially behind said matched filter spatial light modulator, and an image plane disposed a focal length behind said cross-correlation lens, said correlator being operable for optically correlating said image of the microstructure in said sample with said pre-existing image and producing indicia of said correlation which is received at said image plane thereof;

(e) means disposed in optical juxtaposition with said correlator for detecting the indicia of correlation at said image plane; and

(f) a computer operationally disposed for programmable X-Y dimension translating of said translatable stage holding said sample at said microscope, rotating said matched filter spatial light modulator of said correlator, programmable scanning said detecting means across said image plane, and counting the detected indicia of correlation received at said image plane.

REISSUES

MAY 5, 1992

Matter enclosed in heavy brackets **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,908

MIXTURES OF BLUE MONO-AZO DISPERSE DYESTUFFS AND THEIR USE FOR DYEING POLYESTER

Horst Tappe, Dietzenbach; Hubert Kruse, Kelkheim; Reinhard Kühn, Frankfurt; Albert Bode, Schwalbach, and Margareta Boos, Hattersheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Original No. 4,678,476, dated Jul. 7, 1987, Ser. No. 911,746, Sep. 26, 1986. Application for reissue Feb. 19, 1991, Ser. No. 658,720

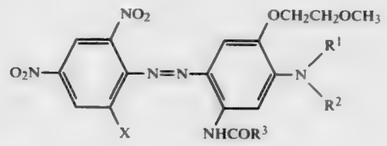
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1985, 3539771

Int. Cl.[5] C09B *29/08, 67/22;* **D06P** *1/04*

U.S. Cl. 8—639 **10 Claims**

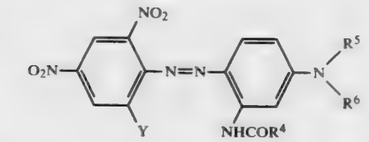
1. Dyestuff mixture containing at least two separate dyestuffs (I) and (II) in a weight ratio of (I):(II) of from (20 to 99):(80:1) wherein:

(I) is at least one dyestuff of the formula



and

(II) is at least one dyestuff of the formula



in which

X and Y are the same or different and each is independently chloro or bromo:

R^1 and R^2 are the same or different and each independently denotes hydrogen, alkoxy having 1 to 4 carbon atoms, alkenyl having 3 to 4 carbon atoms, cyclohexyl, benzyl, chlorobenzyl, bromobenzyl, nitrobenzyl, cyanobenzyl, alkylbenzyl having 1 to 4 carbon atoms in the alkyl moiety, alkoxybenzyl having 1 to 4 alkoxy carbon atoms, alkyl having 1 to 11 carbon atoms, alkyl having 1 to 11 carbon atoms interrupted by 1 to 3 oxygen atoms or substituted alkyl having 1 to 11 carbon atoms wherein the substituent is one selected from the group consisting of chloro, bromo, cyano, phenyl, phenoxy, hydroxy, (C_1-to-C_4-alkyl)-carbonyloxy; (C_1-to-C_4-alkoxy)carbonyl, phenylcarbonyloxy, (C_3-to-C_5-alkenyloxy)-carbonyloxy, (C_1-to-C_4-alkoxy)carbonyloxy, phenoxycarbonyloxy, tetrahydrofurfuryl, (C_1-to-C_4-alkyl)-tetrahydrofurfuryl, tetrahydropyronyl and (C_1-to-C_4-alkyl)-tetrahydropyronyl;

[R^3 and R^4 are the same or different and each is independently methyl, ethyl, n-propyl or i-propyl;**]**

R^3 denotes ethyl, n- or i-propyl,

R^4 denotes methyl, ethyl, n- or i-propyl:

R^5 and R^6 are the same or different and each is independently one of the definitions of R^1 and R^2 excepting hydrogen.

Re. 33,909

STEAM QUALITY METER

Raul Brenner, Villa Park, and John M. DiMartino, Chicago, both of Ill., assignors to Kay-Ray/Sensall, Inc., Mt. Prospect, Ill.

Original No. 4,753,106, dated Jun. 28, 1988, Ser. No. 928,806, Nov. 7, 1986. Application for reissue Jun. 27, 1990, Ser. No. 544,420

Int. Cl.[5] G01N *25/60;* **B01F** *5/06;* **B28C** *7/04*

U.S. Cl. 73—29.03 **15 Claims**



12. An apparatus for mixing fluid flowing in a conduit having a transverse dimension, the fluid comprising a liquid phase and a vapor phase, the apparatus comprising:

restriction means disposed in the conduit for receiving the fluid and having an orifice therethrough for accelerating the fluid to a selected velocity for mixing the liquid phase and the vapor phase;

diffuser means disposed in the conduit and extending from the orifice to a diffuser opening spaced away from the orifice a distance substantially greater than the transverse dimension of the conduit for diffusing the mixed fluid, the diffuser having a wall diverging from the orifice to the diffuser opening and the wall of the diffuser terminating closely adjacent an inner surface of the conduit to avoid turbulence; and

sensing means disposed on the conduit for sensing a parameter of the mixture, the sensing means sensing such parameter of the fluid in a selected region in the conduit spaced downstream from the diffuser opening such that the liquid and vapor phases are substantially mixed in the selected region over a range of flow.

Re. 33,910

CNC TURNING MACHINE

Ronald E. Compton, Southfield, Mich., assignor to The Cross Company, Fraser, Mich.

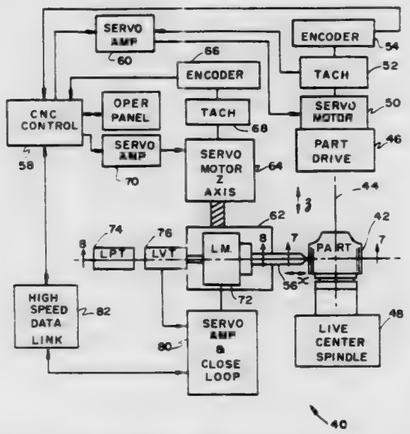
Original No. 4,653,360, dated Mar. 31, 1987, Ser. No. 731,419, May 7, 1985. Continuation of Ser. No. 329,885, Mar. 28, 1989, abandoned. Application for reissue Jan. 23, 1991, Ser. No. 645,346

Int. Cl.[5] B23B *5/24*

U.S. Cl. 82—18 **45 Claims**

1. In a turning machine (**40**) comprising means for rotating (**48**) a part (**42**) about an axis (**44**) and for causing a cutting tool (**56**) to make an axial pass along the part while the radial position of the tool relative to the part is selectively controlled in correlation with the angular position of the part about the axis of rotation as the part is being rotated, the improvement which comprises a main CNC control (**58**), angular position sensing means (**54**) operatively coupled with said means for rotating the part to provide to the CNC control information representative of instantaneous angular position of the part about the axis for rotation as the part is being rotated, radial position sensing means (**74**) for sensing the radial position of the cutting tool relative to the part, radial velocity sensing means (**76**) for sensing the radial velocity of the tool relative to the part, and a closed loop control system (**80**) for closed loop controlling the radial position of the cutting tool relative to the part as a

function of the radial position of the cutting tool and the radial velocity of the cutting tool said closed loop control system comprising an electric linear motor (72) as the prime mover for radially positioning the cutting tool, said CNC comprising means for issuing commands to the closed loop control system correlated with the information with said position sensing means and information about the part, and said closed loop control system comprising means for converting the CNC commands into a corresponding control current for the linear motor *wherein one end of an elongated carriage is adapted to be coupled to the cutting tool, the other end of the carriage being coupled to the motor for transmitting linear motion and wherein said linear motor and carriage are mounted on the head of the machine, and in which said carriage is guided for reciprocable linear motion on the machine head by guide means (138,178) disposed in cooperative relation with the carriage and the machine head for facilitating sliding movement of the carriage, and spring means (148) for spring-loading the guide means with a spring force sufficient to resist displacement in any direction transverse to the radial direction and thereby minimize deflection of the carriage in any such direction.*



75. In a turning machine having a head on which a tool is selectively positionable toward and away from a workpiece by a prime mover and a carriage, an improved prime mover and carriage combination for selectively positioning the tool on the head characterized by low friction, low inertia, and rapid response to input commands and comprising an electric linear motor forming the prime mover wherein one end of the carriage is adapted to be coupled to the cutting tool, the other end of the carriage is coupled to the motor for transmitting linear motion and wherein said linear motor and carriage are mounted on the head of the machine, and in which said carriage is guided for reciprocable linear motion on the machine head by guide means (138,178) disposed in cooperative relation with the carriage and the machine head for facilitating sliding movement of the carriage, and spring means (148) for spring-loading the guide means with a spring force sufficient to resist displacement in any direction transverse to the radial direction and thereby minimize deflection of the carriage in any such direction. 90

* * * * *

The questions raised in reexamination request No. 90/001,657, filed Dec. 1, 1988, have been considered and the results thereof are reflected in this reissue patent which constitutes the reexamination certificate required by 35 U.S.C. 307 as provided in 37 CFR 1.570(e).

Re. 33,911

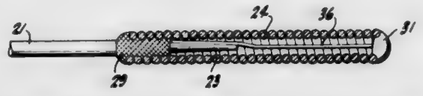
CATHETER GUIDE WIRE WITH SHORT SPRING TIP AND METHOD OF USING THE SAME

Wilfred J. Samson, Saratoga, and Ronald J. Solar, San Diego, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Original No. 4,554,929, dated Nov. 26, 1985, Ser. No. 513,222, Jul. 13, 1983. Application for reissue Mar. 27, 1986, Ser. No. 847,297

Int. Cl.[5] **A61B** *5/02*

U.S. Cl. 128—772 **17 Claims**



17. A guide wire for use in the placement of a catheter having an inner lumen extending therein into a patient's cardiovascular system comprising:

a) an elongated shaft of relatively rigid material having proximal and distal ends and a diameter substantially smaller than the diameter of the inner lumen;

b) a relatively flexible helical coil having proximal and distal ends and an outer diameter slightly smaller than 0.02 inch and substantially larger than the diameter of the shaft and a length substantially less than the length of the shaft, the distal end portion of the shaft being tapered to provide a gradual transition in flexibility of the shaft and the tapered portion and extending into the coil but terminating short of the distal end of the coil;

c) means for bonding the proximal end of the coil to the shaft; and

d) a flexible safety wire disposed interiorly of the coil and having one end bonded to the distal extremity of the shaft and having the other end bonded to the distal extremity of the coil.

Re. 33,912

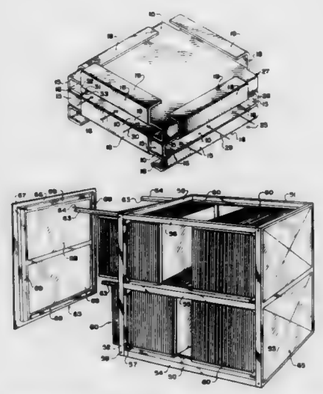
HEAT EXCHANGER

Andrew Lapkowski, Winnipeg, Canada, assignor to Jones Environics Ltd., Winnipeg, Canada

Original No. 4,848,450, dated Jul. 18, 1989, Ser. No. 154,105, Feb. 9, 1988. Application for reissue Mar. 26, 1991, Ser. No. 675,251

Int. Cl.[5] **F28F** *3/12*

U.S. Cl. 165—166 **23 Claims**



21. A heat exchanger core for forming a first fluid path and a second fluid path which is fluid imperviously separated from the first fluid path and in heat exchanging relation therewith, said core comprising a plurality of first plate members and a plurality of second plate members, each of said first and second plate members being formed from a substantially rigid sheet metal material and shaped to define a planar plate with the first and second plate members being assembled alternately so that the plates lie in parallel stacked spaced relationship, the space between the plate of each first plate member and the plate of a next adjacent second plate member on one side defining a part of the first fluid path and the space between the plate of said each first plate member and the plate of the next adjacent second plate member on an opposed side defining a part of the second fluid path, and a plurality of first and second connecting means each first connecting means coupling one of said first plate members to the next adjacent second plate members on a respective side of said one of said first plate members and defining between said one of said first plate members and said next adjacent second plate member a first and a second guiding wall each bridging the space between said one of the first plate members and said next adjacent second plate member at a respective one of two parallel edges of said one of the first plate member and said next adjacent second plate member and forming side edges of said part of the first fluid path, each second connecting means defining between one of said first plate members and the other of said next adjacent second plate members a third and a fourth guiding wall each bridging the space between said one of said first plate members and said other of said next adjacent second plate members at a respective one of two parallel edges of said one of the first plate members which parallel edges are at right angles to the parallel edges of the first and second guiding walls, said third and fourth guiding walls forming side edges of said part of the second fluid path, each said first and second connecting means consisting solely of integral portions of at least one of said one of said first plate members and said next adjacent second plate member and including portions bent at right angles to said plates to define said guiding walls and portions parallel to said plates defining a pair of slots, each slot defined by a pair of spaced parallel side surfaces, and a base connecting said side surfaces along adjacent edges of said side surfaces leaving an open mouth along said side surfaces opposite said base, the side surfaces lying parallel to said plates and the base lying generally at right angles to the plates with the base of one slot of the pair being parallel to the base of the other slot of the pair and spaced across the width of the plates, such that each first plate member is connected to the next adjacent second plate member by sliding movement in a direction parallel to the plates with portions of one of said first plate member and said next adjacent second plate member entered into engagement with said side surfaces of said slot thus holding said plates against any movement in a direction at right angles to said plates.

Re. 33,913

DISPENSING RACK

Rudy Kral, Clifton, N.J., and Paul Belokin, Denton, Tex., assignors to M & M Mars, a division of Mars Incorporated, Hackettstown, N.J.

Original No. 4,782,959, dated Nov. 8, 1988, Ser. No. 33,760, Apr. 3, 1987. Application for reissue Oct. 18, 1990, Ser. No. 599,687

Int. Cl.[5] **A47F** *7/00*

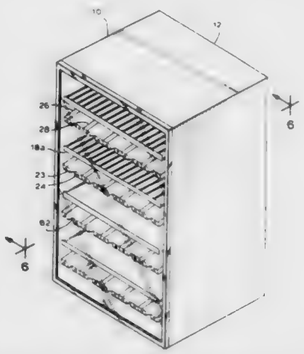
U.S. Cl. 211—59.2 **18 Claims**

10. A dispensing rack adaptable in a refrigeration unit for dispensing a leading item from a stack of items comprising:

a housing adapted to receive a plurality of items to be dispensed and having a plurality of horizontal retention members;

at least one individual ramp releasably secured within the housing and retaining the items wherein on a base and having a front flange extending upwardly from the base and means to constrain the items therein; and

a plurality of horizontal connecting rods each having first and second ends, the ends each being cooperatively retained to a horizontal retention member by clip retention means which insertably receives and retains the horizontal retention member and cooperatively retains the ends of the rods supporting the ramp within the housing, one of the connecting rods engaging the ramp at a horizontal plane above the horizontal plane of the other rod engaging the ramp to secure the ramp in a generally horizontal inclined position wherein the leading



item in the ramp is restrained from advancing therein by the front flange and when the leading item is withdrawn, the next leading item is placed into a convenient position to be withdrawn as a result of the positive gravity feed of the ramp.

Re. 33,914

INFRARED IMAGING SYSTEM AND METHOD

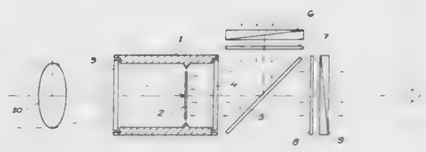
Jean J. A. Robillard, El Paso, Tex., assignor to Richard L. Scully, Charlottesville, Va.

Original No. 4,751,387, dated Jun. 14, 1988, Ser. No. 815,810, Jan. 2, 1986. Application for reissue Jun. 5, 1990, Ser. No. 533,445

Claims priority, application Ireland, Jan. 7, 1985, 34/85

Int. Cl.[5] **G02F** *1/13*

U.S. Cl. 250—331 **20 Claims**



1. An infrared imaging system comprising a film of dichroic [liquid crystal] *material* coated on a membrane, first means for forming an infrared image on the membrane, second means for illuminating the membrane with visible light, and third means for detecting variations in elliptical polarization of the light after reflection from or transmission through the membrane to provide a visible image.

Re. 33,915

DISPOSABLE HAZARDOUS AND RADIOACTIVE LIQUID HYDROCARBON WASTE COMPOSITION AND METHOD

Darryl J. Doan, Laurel, Mont., assignor to James William Ayres and Farrell D. Rowsell, both of Las Vegas, Nev.

Original No. 4,778,627, dated Oct. 18, 1988, Ser. No. 54,141, May 11, 1987. Continuation of Ser. No. 818,323, Jan. 13, 1986, abandoned. Application for reissue Oct. 16, 1990, Ser. No. 598,907

Int. Cl.[5] **G21F** *9/08, 9/16*

U.S. Cl. 252—631 **11 Claims**

9. A method of treating a radioactive or hazardous waste mate-

rial consisting essentially of liquid hydrocarbon composition comprising mixing therewith an organic ammonium montmorillonite, said liquid hydrocarbon:organic ammonium montmorillonite ratio being between about 1:2 and 3:1, by volume, respectively, said organic ammonium montmorillonite having at least 10 carbon atoms therein, and between about 1 and about 10% by volume of said liquid hydrocarbon composition a low molecular weight aliphatic alcohol having from 1 to 8 carbon atoms until the composition comprises a free standing solid.

Re. 33,916

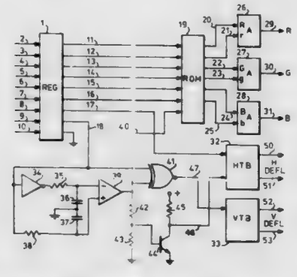
DIGITAL DISPLAY SYSTEM

Jesus A. Saenz, Greenwich, Conn.; Paul S. Yosim, and Darwin P. Rackley, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Original No. 4,727,362, dated Feb. 23, 1988, Ser. No. 631,043, Jul. 16, 1984. Application for reissue Nov. 30, 1989, Ser. No. 443,187

Int. Cl.[5] G09G *1/16*

U.S. Cl. 340—703 **17 Claims**



9. A digital display system comprising:

a digital data processor operable to develop data sets of more than one video display format for display, said digital data processor further operable to generate horizontal and vertical synchronizing signals, at least one of said horizontal and vertical synchronizing signals having positive-going pulses and negative-going pulses wherein the positive-going pulses correspond to a first video display format and the negative-going pulses correspond to a second video display format, and;

a monitor, said monitor including a raster scanned cathode ray tube, said monitor further including a circuit responsive to the positive-going and the negative-going pulses to display a video display format corresponding to the positive-going pulses and the negative-going pulses.

Re. 33,917

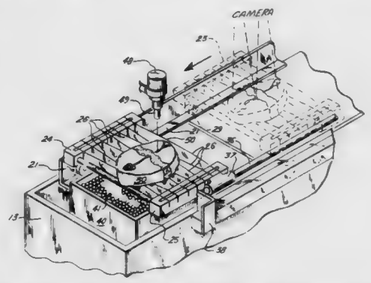
SUPPORT APPARATUS FOR USE IN VIDEO IMAGING AND PROCESSING OF TRANSVERSE FISH SECTIONS

James M. Lapeyre, deceased, late of New Orleans, La. by Noreen B. Lapeyre, administratrix ; John P. Farrell, South Jordan, Utah; Ronald H. Burch, Harahan, La.; Mark E. Sutton, Kenner, La., and Joseph F. Scamardo, Jr., Metairie, La., assignors to The Laitram Corporation, Harahan, La.

Original No. 4,847,954, dated Jul. 18, 1989, Ser. No. 202,696, Jun. 3, 1988. Continuation of Ser. No. 49,730, May 12, 1987, Pat. No. 4,748,724. Application for reissue Jun. 12, 1991, Ser. No. 714,209

Int. Cl.[5] A22C *25/06, 25/14*

U.S. Cl. 452—158 **20 Claims**



1. Processing apparatus for separating selected portions of a transverse fish body section comprising:

a visual station having a known location and further having a photo-imaging means for providing a visual image of said transverse fish body section when viewed along a preselected line of sight, said [imaging] *photo-imaging* means defining the selected portions of said fish body section;

a cutting station using a pressurized fluid stream for separating selected portions of said fish body section as defined by said photo-imaging means;

a plurality of means for supporting said transverse fish section substantially over its area, each of said [(means for supporting)] plurality being substantially invisible to said photo-imaging means and being suitable for receiving said pressurized fluid stream such that the fluid stream can [transverse] *traverse* the fish body section and said plurality of means for supporting without substantially altering the position of said fish section with respect to said means for [support] *supporting*, and further for moving from said known location of said visual station to a cutting station having another known location; and

means for controlling the relative movement of the pressurized fluid stream with respect to the transverse fish body section.

PLANT PATENTS

GRANTED MAY 5, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,860

GRAPEVINE, 'CHARDONEL'

Bruce I. Reisch; Robert M. Pool, both of Geneva, and John Einset, deceased, late of Geneva, all of N.Y. by Hjördis Einset, executrix , assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sep. 19, 1990, Ser. No. 585,836

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—47 **1 Claim**

1. The new and distinct variety of grape vine herein discribed and illustrated and identified by the characteristics enumerated above.

7,861

STRAWBERRY PLANT NAMED MILCIN

José M. A. Lopez, Tudela Navarra, Spain, assignor to Plantas de Navarra S.A., Navarra, Spain

Filed Aug. 8, 1990, Ser. No. 564,445

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—48 **1 Claim**

1. A new and distinct cultivar of strawberry plant named Milcin, as illustrated and described.

7,862

CARNATION PLANT NAMED 'CFPC CHANÓN'

Walter H. Jessel, Jr., Salinas, Calif., assignor to California Florida Plant Co., L.P., Salinas, Calif.

Filed Sep. 10, 1990, Ser. No. 580,255

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—71 **1 Claim**

1. A new and distinct variety of carnation plant, substantially as shown and described, characterized particularly by flowers of attractive pink coloration.

7,863

CARNATION PLANT NAMED CFPC CONCERTO

Walter H. Jessel, Jr., Salinas, Calif., assignor to California Florida Plant Co., L.P., Salinas, Calif.

Filed Sep. 10, 1990, Ser. No. 580,258

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—71 **1 Claim**

1. A new and distinct variety of carnation plant, substantially as shown and described, characterized particularly by flowers of attractive pink coloration.

VOL
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PATENTS

GRANTED May 5, 1992

ERRATA

483-004	5,109,592
454-160	5,109,755
454-284	5,109,756
606-241	5,109,835
482-054	5,110,117
482-073	5,110,118
482-093	5,110,119
482-137	5,110,121
482-134	5,110,122
385-016	5,110,194
359-224	5,110,195
359-974	5,110,196
435-005	5,110,319
205-157	5,110,420
205-131	5,110,421
205-159	5,110,422
205-254	5,110,423
507-110	5,110,484
514-362	5,110,493
554-170	5,110,508
554-184	5,110,509
548-200	5,110,936
546-302	5,110,943
211-091	5,110,989
219-549	5,111,032
359-336	5,111,153
357-025	5,111,221
395-575	5,111,384
395-425	5,111,385
095-425	5,111,386
395-425	5,111,087
395-800	5,111,038
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392-390	5,111,477

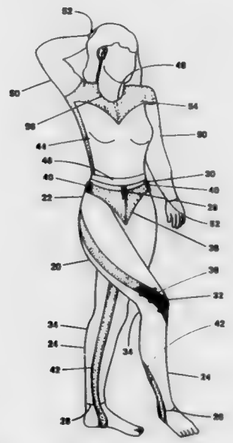
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PATENTS

GRANTED MAY 5, 1992

GENERAL AND MECHANICAL

5,109,546
EXERCISE SUIT WITH RESILIENT REINFORCING
Timothy P. Dicker, 11359 Dornfield Ter., Lakeview Terrace, Calif. 92353
Filed Jun. 10, 1991, Ser. No. 712,459
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—70 **22 Claims**



1. An exercise suit with resilient reinforcement for increasing resistance to a wearer's muscles comprising:

a) a pair of stretchable form fitting pants having an open waist and a pair of legs each containing an ankle opening therein,

b) a pair of resilient lower body reinforcing segments having a front segment and a back segment both in a triangular shape with angular corners and juxtapositioned on the pants on each side of the waist and each fastened to the pants on a center most portion parallel with a wearer's backbone, said segments having adustable fastening means on two corners permitting the wearer to increase or decrease tension created by the resiliency of the segment,

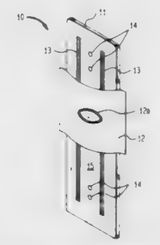
c) an elongatable resistive leg band spirally encircling each pant leg and affixed thereunto, said band attached jointly at both ends to the back lower body reinforcing segment crossing the wearer's knee and looped over each wearer's foot beyond the ankle opening forming a resistive constraint upon the wearer's lower body and leg movement for muscular toning and exercise,

d) a stretchable form fitting pull-over top having an open waist, a neck opening, sides and a pair of sleeves each containing a wrist opening on an end thereof,

e) a resilient upper body reinforcing collar in a diamond shape with truncated ends having a circular opening in the center for the user's head, juxtapositioned on the pull-over top around the neck opening and attachably fastened on the center most portion parallel with a wearer's backbone, and

f) an elongatable resistive side band having a first end and a second end and affixed on each side, each band attached on the first end to the collar, along the side terminating and on the second end at the waist opening forming a resistive constraint upon the wearer's upper body movement for muscular toning and exercise.

5,109,547
EXTENDED NECKWEAR SHIRT ATTACHMENT DEVICE
Iman 'al-Amin Abdallah, 1186 Broadway #711, New York, N.Y. 10001
Filed Feb. 16, 1990, Ser. No. 480,842
Int. Cl.[5] A41D *25/04*
U.S. Cl. 2—145 **30 Claims**



1. A device for attaching tied extended neckwear to a button of a shirt of a wearer, said extended neckwear including a wide forepart and a narrow rearpart, said device comprising

an elongated base member;

button attachment means attached in slidable and threaded engagement to said base member to form a unitary structure permitting slidable movement of said button attachment means along substantially the entire length of said base member; and

means to fixedly attach the unitary structure comprising said base member and the attached button attachment means to the wide forepart of the extended neckwear having the length of said base member extending vertically,

said device being selectively attachable to a button of the shirt of the wearer by engagement of said button attachment means with said button.

5,109,548
WEATHER-ADAPTABLE SKI HAT
Jeffrey B. Balaban, Camarillo; James B. Olmes, Agoura, and Jerris E. Greenblat, Sunset Beach, all of Calif., assignors to Ski Tote U.S.A., Camarillo, Calif.
Filed Jan. 25, 1991, Ser. No. 646,061
Int. Cl.[5] A42B *1/00*
U.S. Cl. 2—175 **7 Claims**



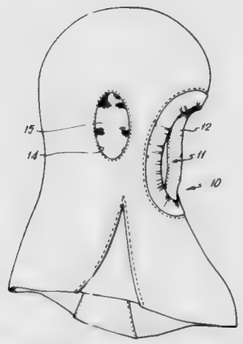
1. A ski hat comprising:

(a) a substantially tubular shell of flexible laminated fabric having top and bottom apertures, the flexible laminated fabric being substantially impermeable to liquid water while being permeable to water vapor;

(b) a flexible outer band surrounding the top aperture;

(c) drawstring means for reversibly tightening the flexible outer band surrounding the top aperture;
(d) protrusions integral with the substantially tubular shell and adjacent to the bottom aperture of the substantially tubular shell for covering the ears, the protrusions being lined with a layer of insulating fabric; and
(e) a head covering for covering the top of the head inserted between the substantially tubular shell and the layer of insulating fabric lining the protrusions for covering the ears and made of the same insulating fabric as the layer of insulating fabric lining the protrusions, the head covering having a top side and a bottom side when placed on the head.

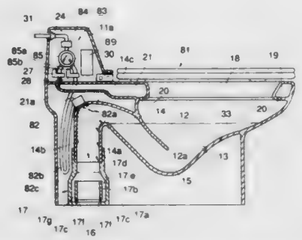
5,109,549
ANTI-FLASH HOOD
Beverley I. Mattinson, 6 Flash Lane, Bollington, Nr. Macclesfield SK10 5AQ, England
Filed May 22, 1990, Ser. No. 526,660
Claims priority, application United Kingdom, May 24, 1989, 8911929
Int. Cl.[5] A42B *1/04*
U.S. Cl. 2—202 **7 Claims**



1. An anti-flash hood of the kind referred to comprising a cover of heat resistant material having at least one area therein adapted to overlie a predetermined area of skin of the wearer and being heat resistant and being of relatively lighter weight than a remainder of the cover of heat resistant material to enable a wearer to have more rapid awareness of temperature changes in the environment than without such area.

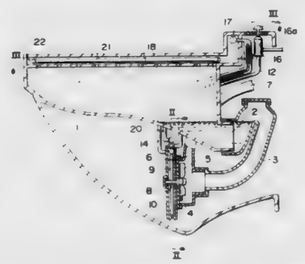
5,109,550
FLUSH WATER SUPPLY SYSTEM FOR TOILET STOOL
Atsuo Makita; Hirofumi Takeuchi; Shinji Shibata, and Noboru Shimbara, all of Kanagawa, Japan, assignors to Toto Ltd., Fukuoka, Japan
Division of Ser. No. 502,063, Mar. 29, 1990, Pat. No. 5,052,060. This application Jun. 10, 1991, Ser. No. 713,120
Claims priority, application Japan, Mar. 30, 1989, 1-79358
Int. Cl.[5] E30D *1/00, 1/24*
U.S. Cl. 4—300 **25 Claims**

1. A flush water supply system for a toilet, comprising:
(a) a toilet stool having a plurality of supply ports;
(b) a pipeline means for supplying flush water to said toilet stool, said pipeline means including a passageway change-over means having a plurality of discharge ports, and a plurality of pipelines each communicating between a respective one of said dis-charge ports of said passageway change-over means and a corresponding one of said supply ports of said toilet stool;
(c) a constant flow valve mounted in said pipeline means for obtaining a predetermined amount of dis-charge flow, the constant flow valve including a water passage and means for adjusting the cross-sectional area of the water passage after the water supply pressure reaches a predetermined value;
(d) at least one electrically operable valve mounted in said pipeline means;



(e) a starting-of-flush input means for accepting an input for starting the supply of flush water; and
(f) a control means for driving said passageway change-over means and said electrically operable valve in response to an input for starting the supply of flush water.

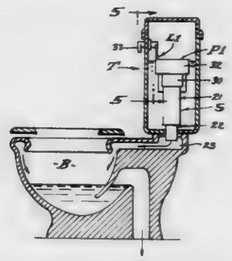
5,109,551
TOILET BOWLS WITH THE AIM OF ECONOMIZING WATER AND ELECTRIC ENERGY
Roger J. Lecat, Paris, France, assignor to Societe Civile Particuliere Fact-Anal, Savigny en Sancerre, France
Filed Dec. 20, 1989, Ser. No. 453,911
Claims priority, application France, Jan. 11, 1989, 89 00254
Int. Cl.[5] E03D *11/02*
U.S. Cl. 4—431 **10 Claims**



1. A toilet bowl which utilizes water comprising:
a bowl;
suction-extractor including a hydraulic turbine;
means for rinsing said bowl including a ramp and a tube open at its two ends positioned in the ramp, with the tube having an orifice for aeration;
means forming a water distribution system for providing water to said means for rinsing said bowl and to said hydraulic turbine of said suction-extractor; and
said means forming a water distribution system providing for flow of water from said hydraulic turbine to said means for rinsing.

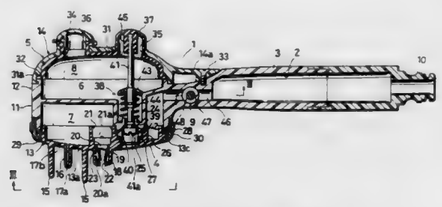
5,109,552
PRIMER TANK TOILET FLUSHING APPARATUS
John S. Osmond, 731 Cedar St., Santa Monica, Calif. 90405
Filed Sep. 21, 1990, Ser. No. 585,948
Int. Cl.[5] E03D *1/10*
U.S. Cl. 4—368 **15 Claims**

1. A flushing apparatus for toilets having a flush tank and a flush tube opening therefrom and into a toilet bowl, and having a water level control means responsive to depletion of water in said tank to refill said tank to a predetermined water level, said apparatus including;
a syphon within the flush tank and comprised of a suction leg opening within the bottom of said tank and extending upward to a bridge at the aforesaid predetermined water level, and a discharge leg continuing from the suction leg and extending downward from the bridge and discharging into the aforesaid flush tube of the toilet,
a header extending horizontally from the suction leg and spaced above the bridge to define a transfer opening into the discharge leg and having a seat opening therethrough and into the discharge leg,



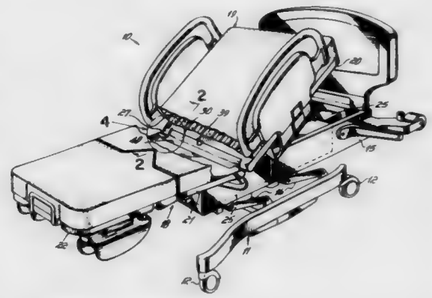
a flush valve passively closing the seat opening,
a raised primer tank for dumping a charge of water through the seat opening and over the transfer opening for inducing a suction effect from the suction leg and into the discharge leg, whereby water from the suction leg is drawn over the bridge and syphoning initiated to flush the toilet,
and means opening the passively closed flush valve and then closing the same when the primer tank water is depleted, thereby isolating both the suction and discharge legs from external atmosphere for continued syphoning effect until the flush tank water level is depleted.

5,109,553
SHOWER UTENSIL HAVING BRUSH
Shunichi Kishimoto, Osaka, Japan, assignor to Azz International Co., Ltd., Osaka, Japan
Filed Dec. 20, 1990, Ser. No. 631,147
Claims priority, application Japan, Dec. 28, 1989, 1-344650
Int. Cl.[5] A45D *19/02*; A46B *11/06*
U.S. Cl. 4—518 **19 Claims**



1. A brush-type shower utensil comprising:
a main body container having a water spray wall;
a water guide space formed within said main body container to adjoin said spray wall, said water guide space being connectable to a water supply source;
bristles projecting outward from said spray wall; and
hollow projections extending outward from said spray wall and communicating with said water guide space, each projection being capable of spraying water therethrough;
wherein said main body container is internally provided with a liquid containing space partitioned from said water guide space;
said main body container being further provided with a liquid dispenser means which comprises a delivery passage extending from said liquid containing space to said water spray wall, the liquid dispenser means further comprising a dispensing valve means which is always urged in one direction under an elastic biasing force;
said valve means including a first portion for closing said delivery passage when said valve means is moved in said one direction under said elastic biasing force, and a second portion for closing said delivery passage when said valve means is moved in the opposite direction against said elastic biasing force beyond a predetermined position,
wherein said first portion of said valve means is a valve body which is cooperative with a valve seat located in said delivery passage, and
wherein said valve means includes a valve shaft extending into said delivery passage, said valve body being provided at one end of said valve shaft, said second portion of said valve means being in the form of a flange provided at an intermediate portion of said valve shaft, said flange being normally urged under said elastic biasing force out of said delivery passage but movable into said delivery passage against said elastic biasing force.

5,109,554
SHIELD FOR BIRTHING BED
Richard L. Borders, Cincinnati; David C. Newkirk, Fairfield, both of Ohio, and Daniel G. Stafford, Batesville, Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.
Filed Apr. 15, 1991, Ser. No. 684,991
Int. Cl.[5] A61G *7/00*
U.S. Cl. 5—602 **2 Claims**



1. A hospital bed comprising:
a base,
a bed frame and linkage mounting the bed frame on the base,
patient support panels mounted on the bed frame including a seat panel and a head panel that is pivotally mounted to create a joint therebetween adjacent the seat panel, each panel having at adjacent edges a transverse notch extending beyond said frame on each side of said frame,
mechanism in said bed frame for raising and lowering said frame with respect to said base and for pivoting said head panel,
and a flexible, moisture-impervious sheet bridging the joint between said head and seat panel, said sheet having end edges fastened within the respective notches and extending across the entire notch.

5,109,555

SCOOP LITTER TO TRANSPORT AN INJURED PERSON

Hans Fickler, Weidstrasse 18, CH-8542 Wiesendangen, Switzerland

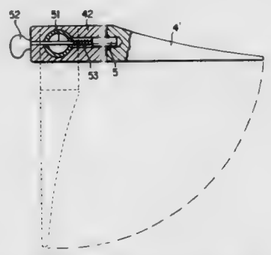
PCT No. PCT/CH89/00095, § 371 Date Jan. 18, 1990, § 102(e) Date Jan. 18, 1990, PCT Pub. No. WO89/11263, PCT Pub. Date Nov. 30, 1989

PCT Filed May 24, 1989, Ser. No. 455,389

Claims priority, application Switzerland, May 27, 1988, 2009/88

Int. Cl.[5] A61G *1/013*

U.S. Cl. 5—81.1 **11 Claims**



1. A litter for transporting an injured person, the litter comprising: a frame having a plurality of longitudinal braces (**1**), a plurality of support elements (**4**) pivotally attached with respect to said longitudinal braces (**1**) along a length of each said longitudinal brace (**1**), said support elements (**4**) and said longitudinal braces (**1**) consisting of non-metallic material thereby permitting passage of X-rays, a retaining block (**42**) secured to a corresponding said longitudinal brace (**1**), two side supports (**44**) of said support element (**4**) forming a recess (**43**) within which said retaining block (**42**) is positioned, said support element (**4**) having a bore, and a removably spring-loaded peg (**5**) normally urged within said bore into a locked position between said support element (**4**) and said retaining block (**42**) for fixing said support element (**4**) with respect to said retaining block (**42**).

5,109,556

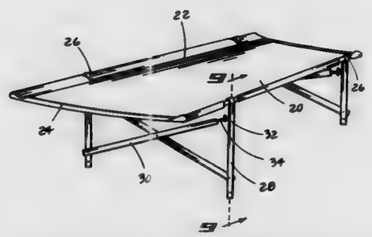
CAMP COT WITH ADJUSTABLE TO TENSIONING

David G. Cook, S. 4120 Sullivan Rd., Veradale, Wash. 99037

Filed Mar. 5, 1991, Ser. No. 665,417

Int. Cl.[5] A47C *17/00*

U.S. Cl. 5—110 **1 Claim**



1. A lightweight, collapsible cot comprising a body-support sheet, side rails to which said body-support sheet is attached and a plurality of transverse leg assemblies to support and position said side rails, means to adjust in infinitely-fine increments a cross-tension on said body-support sheet from loose to taut by moving apart said side rails, said means comprised of a four member leg assembly consisting of two vertical legs and two adjustable-length diagonal braces in which the lower ends of said adjustable-length diagonal braces are pivoted to the lower ends of said vertical legs, both said adjustable-length diagonal braces are pivoted to each other near their midpoints, and both said adjustable-length diagonal braces are connected at their top ends to the top of said vertical legs through adjustable joints, such that, as said adjustable-length diagonal braces are gradually lengthened, the tops of said vertical legs are gradually spread apart, moving said vertical legs out of parallel with each other thereby increasing tension on said body-support sheet.

5,109,557

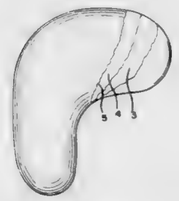
NURSING PILLOW

Alison M. Koy, 8855 N. Lamon Ave., Skokie, Ill. 60077; Tracy K. Johnson, 1662 Crestridge Dr., Littleton, Colo. 80121, and Julie Mumaugh, 8047 W. Harvard Dr., Lakewood, Colo. 80227

Continuation of Ser. No. 279,494, Dec. 5, 1988, abandoned. This application Apr. 23, 1990, Ser. No. 545,449

Int. Cl.[5] A47C *20/00*

U.S. Cl. 5—655 **5 Claims**



1. A process of using a pillow to help support a persons arm during the feeding of an infant wherein said pillow has the same firmness throughout and comprises: a firm core encompassed in a squash wrap and surrounded tightly by a fabric which forms the exterior of the pillow and retains it in a boot shape including a foot portion and a narrow leg portion, said pillow having flat top and flat bottom surfaces which are parallel and connected by curved edges, said narrow leg portion is about ½ as wide as said foot portion and said foot portion is about ¾ the length of said narrow leg portion; the steps comprising:

placing the pillow on an individuals lap while the individual is seated;

wrapping the foot portion around the abdomen of the individual;

placing an arm of the individual on the pillow in such a manner that the individuals elbow would rest on the narrow leg portion of said pillow and resulting in the individuals wrist nesting on the foot of the pillow; and

cradling an infant in the arm that is placed on said pillow.

5,109,558

BED WITH ITS RESTING SURFACE AT LEAST PARTLY OF KEYBOARD FORM

Rosario Di Blasi, Via Messina 6, 96015 Francofonte, Siracusa, Italy

Continuation of Ser. No. 448,759, Dec. 11, 1989, abandoned. This application Jul. 15, 1991, Ser. No. 731,124

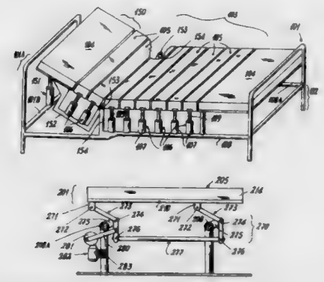
Claims priority, application Italy, Dec. 23, 1988, 23086 A/88

Int. Cl.[5] A47C *20/02*

U.S. Cl. 5—611 **12 Claims**

1. A bed, in particular for a person obliged to spend long periods in a lying position, comprising a frame a plurality of mutually independent adjacent elements which, when each element is in a corresponding upper position to said adjacent elements, form a keyboard-shaped substantially planar resting surface for said person, and which elements are vertically mobile independently of each other and downwardly from the resting surface whereby each of said plurality of mobile elements can by downward movement totally detach itself from contact with said person lying on said resting surface, said bed

comprising respective means for moving each of said mobile elements, each of said respective means for moving each of said mobile elements comprising an articulated parallelogram structure connected to a movement generating means for moving said articulated parallelogram structure, said move-



ment generating means being immovable with respect to the bed frame said bed frame including cross-members, each of said articulated parallelogram structures being connected to and supported by said cross-members via projections hinged to two sides of each of said articulated parallelogram structures.

5,109,559

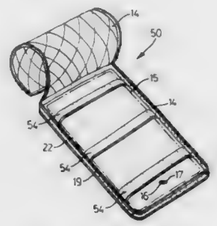
FLOTATION MATTRESS PAD HAVING A COVER WITH PAD RETAINING STRAPS

Gordon W. West, 35 Peel Village Parkway, Brampton, Ontario, L6W 1G1, Canada

Filed Jan. 18, 1991, Ser. No. 643,531

Int. Cl.[5] A47C *27/10, 31/00*

U.S. Cl. 5—451 **13 Claims**



1. A flotation mattress pad for a bed comprising:

a rectangular inner bladder constructed from an impervious plastic material having a top side and a bottom side with coterminous peripheral edges, the top side having a valve, the inner bladder having a thickness between 2.5 and 10 centimeters;

a rectangular outer bladder constructed from a fluid impervious plastic material having a top side and a bottom side with coterminous peripheral edges, the outer bladder enclosing the inner bladder, the top side of the outer bladder having a circular opening positioned to surround the valve on the inner bladder and allow access thereto.

5,109,560

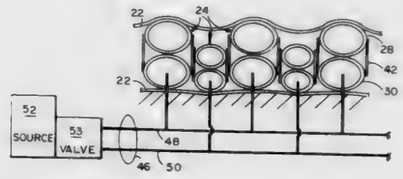
VENTILATED AIR MATTRESS WITH ALTERNATELY INFLATABLE AIR CELLS HAVING COMMUNICATING UPPER AND LOWER AIR CHAMBERS

Tsuyoshi Uetake, Tokyo, Japan, assignor to Keisei Medical Industrial Co., Ltd., Tokyo, Japan

Filed Sep. 18, 1991, Ser. No. 762,867

Int. Cl.[5] A61G *7/057*; A47C *27/10, 21/04*

U.S. Cl. 5—453 **10 Claims**



1. A mattress comprising:

a plurality of elongate, fluid-filled cells adjacent to each other, having lateral surfaces, upper and lower surfaces, said upper surfaces collectively forming a support surface, each of said plurality of fluid-filled cells having upper and lower chambers in fluid communication with each other;

means attached to said lateral surfaces of said cells interconnecting said upper and lower chambers to provide lateral support thereto;

said means for providing lateral support comprising chamber straddling upright members connecting the sidewalls of said upper and lower chambers;

means for inflating and deflating every other of said plurality of fluid-filled cells alternately as a function of time to define said support surface; and

means adjacent said plurality of fluid-filled cells for ventilating said surface.

5,109,561

ALTERNATING PRESSURE PAD

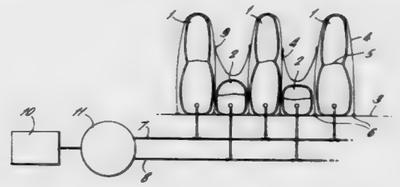
Rolf Schild, London, England, assignor to Huntleigh Technology, Plc, United Kingdom

PCT No. PCT/GB89/00233, § 371 Date Aug. 23, 1990, § 102(e) Date Aug. 23, 1990, PCT Pub. No. WO89/08439, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 8, 1989, Ser. No. 543,752

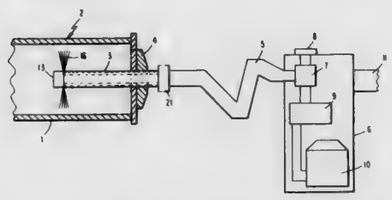
Int. Cl.[5] A47C *27/08*

U.S. Cl. 5—453 **14 Claims**



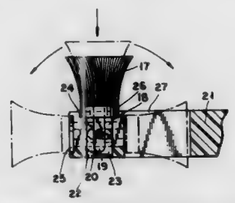
1. Alternating pressure pad comprising at least two sets of alternately inflatable cells, each cell of height greater than width and comprising at least one internal membrane arranged to restrict the shape of said cell and divide the cell into two communicating regions, wherein the maximum width of the lower of the two regions is greater than the maximum width of the upper of the two regions when fully inflated.

5,109,562
CHEMICAL VAPOR DEPOSITION SYSTEM CLEANER
John W. Albrecht, Bozeman, Mont., assignor to C.V.D. System Cleaners Corporation, Bozeman, Mont.
Continuation-in-part of Ser. No. 400,920, Aug. 30, 1989, abandoned. This application Aug. 29, 1990, Ser. No. 574,155
Int. Cl.[5] B08B *9/08*
U.S. Cl. 15—56 **11 Claims**



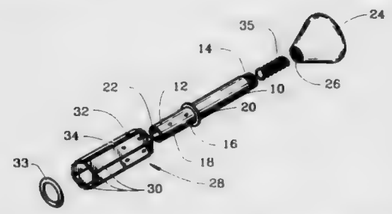
1. An apparatus for cleaning the interior surfaces of a vessel which comprises:
a cleaning head comprising an inflowing fluid distributor, an outflowing fluid exhaust port and means for dislodging particulates from the inner surface of a vessel into which the cleaning head is inserted;
an air shaft connected to said cleaning head for supplying fluid to and from said cleaning head, said air shaft comprising a rigid concentric tubular structure comprising inner and outer tube members;
a flexible heat exchanger hose assembly connected to said air shaft for heating fluid supplied to said air shaft, said flexible heat exchanger hose assembly comprising an outer fluid inlet hose and at least one inner fluid outlet hose positioned within said outer fluid inlet hose; and
means for supplying fluid to said flexible heat exchanger hose assembly, said air shaft and said cleaning head.

5,109,563
SOFT BRUSH GUM STIMULATOR
J. Robert Lemon, Charlotte; William T. Evans, and Robert E. Christian, both of Batesville, all of Ark., assignors to Professional Dental Technologies, Inc., Batesville, Ark.
Filed Sep. 19, 1990, Ser. No. 585,479
Int. Cl.[5] A46B *9/04;* **A61C** *15/00*
U.S. Cl. 15—167.1 **10 Claims**



1. A gum stimulator comprising a handle, a removable brush disposed on the handle, the brush having a thin flat bottom plate and having a high density of soft fibers extending upwardly therefrom, and means for attaching the brush to the handle comprising a mounting block having opposed slots, a pivot rod disposed in the handle and passing through the opposed slots, an end of the mounting block being moveable into a locking receptacle formed in the handle, the brush being axially displaceable in correspondence with the slots such that the brush may be locked into a perpendicular position by pressing an end of the mounting block into the locking receptacle, the brush and mounting block being rotatable about the pivot rod into at least three positions.

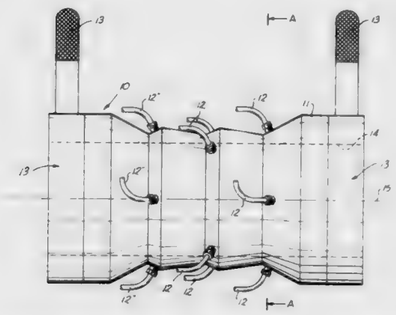
5,109,564
MANUAL VALVE CLEANER FOR REMOVING DEPOSITS FROM INTAKE AND OUTTAKE VALVES OF INTERNAL COMBUSTION ENGINES
Robert J. Horvath, 310 Homewood Dr., Libertyville, Ill. 60048
Filed Nov. 28, 1990, Ser. No. 618,976
Int. Cl.[5] A47L *25/00*
U.S. Cl. 15—236.06 **4 Claims**



1. A cleaning apparatus for removing deposits from intake and outtake valves internal combustion engines, comprising:
a handle;
a cylinder forming an aperture having a first end and a second end, the first end of said cylinder coupled to said handle, the second end of said cylinder employing a plurality of upper and lower axially spaced apart mounting pins extending obliquely from and attached permanently to said cylinder;
a plurality of flexible rectilinear cutting blades each having four free edge and a first and second surface face, each blade having a length and a width, one of the edges being a cutting edge projecting beneath said second end of said cylinder, each cutting blade having at least one upper coupling hole and at least one lower coupling hole conforming to said mounting pins for placement over said mounting pins;
a band removably attached for securing said blades to said cylinder; and
a spring releasably secured within the aperture;
whereby said upper and lower coupling holes on the first surface face of said blades are placed over said upper and lower mounting pins respectfully of said cylinder, said blades secured by placement of said band over the second surface face between the upper and lower pins extending through the upper and lower coupling holes, whereby the aperture of said cylinder is placed over a valve stem having a size less than the aperture and upon a force being applied to said handle said spring is compressed and said cutting edges of said blades uniformly contact the angular neck portion of the valve thereby removing deposits adhering to the valve and upon removal of the force from said handle said spring removes said blades from the valve.

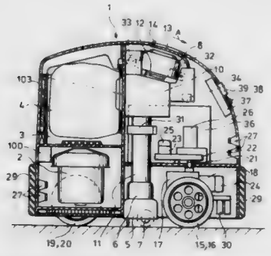
5,109,565
VACUWIPE
Mickey E. Akin, Bremen, Ga., and James O. Lowery, Ranburne, Ala., assignors to Southwire Company, Carrollton, Ga.
Filed Feb. 20, 1991, Ser. No. 657,791
Int. Cl.[5] A47L *5/38;* **B08B** *1/02, 5/04*
U.S. Cl. 15—309.1 **7 Claims**

1. An apparatus for removing liquids from the surface of a continuously advancing strand, comprising:
an outer body member having a first end and a second end and said body having an axial bore through which passes said advancing strand;
a plurality of vacuum suction tubes positioned such that one end of each such tube cooperates with, and removes liquid residue from, a portion of the surface of said strand passing thereby; and



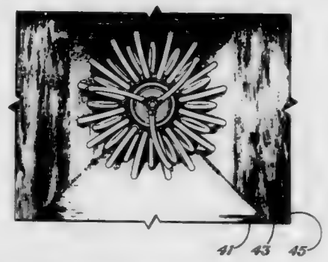
a sealing means positioned on said first end and said second end of said outer body member, said sealing means comprising an iris leaf assembly adjustable orifice.

5,109,566
SELF-RUNNING CLEANING APPARATUS
Yasumichi Kobayashi, Toyonaka; Hidetaka Yabuuchi, Takarazuka; Osamu Eguchi, Katano; Shinji Kondoh, Kawanishi, and Haruo Terai, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jun. 28, 1990, Ser. No. 544,957
Int. Cl.[5] A47L *9/28*
U.S. Cl. 15—319 **9 Claims**



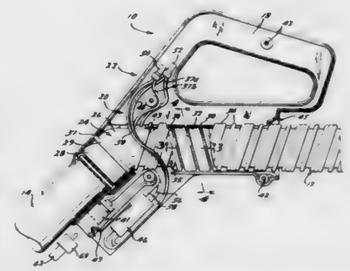
1. A self-running cleaning apparatus comprising:
a cleaning unit comprising:
a cleaner,
means for moving said cleaning unit,
means for steering said moving means,
obstacle detection means for detecting obstacles preventing movement of said cleaning unit and outputting obstacle signals indicative thereof,
direction detection means for detecting direction of movement of said cleaning unit and outputting direction signals indicative thereof,
means for determining a distance of movement of said cleaning unit from a starting position and outputting distance signals indicative thereof,
memory means for storing data relating to dimensional features of a predetermined area,
means for, in accordance with said data, said obstacle signals, said detection signals and said distance signals, controlling said moving means and said steering means to enable said cleaning unit to evade said obstacles and to return to said starting position, and
a power source for supplying electric power to said cleaning unit; and
charging means, disposed separate from said cleaning unit, for charging said power source when said cleaning unit is in said starting position.

5,109,567
DUCT AIR SWEEPER
Richard R. Harrison, Houston, Tex., assignor to Steamatic, Inc., Grand Prairie, Tex.
Filed Apr. 29, 1991, Ser. No. 692,568
Int. Cl.[5] A47L *5/38;* **B08B** *1/04*
U.S. Cl. 15—345 **8 Claims**



1. A cleaning apparatus comprising:
a flexible hose having an end adapted to be located in a duct or the like for cleaning the inside wall of the duct,
air injection means located at said end of said hose for injecting air under pressure onto the wall of the duct to be cleaned, and
inlet means located near said end of said hose through which loosened material can be withdrawn into said hose, by reduced pressure in said hose.

5,109,568
HANDLE ASSEMBLY FOR A VACUUM SYSTEM CLEANING TOOL
Dean R. Rohn; Steven R. Selewski; Stephen J. Wood, and Craig R. Cummins, all of Cadillac, Mich., assignors to Rexair, Inc., Troy, Mich.
Filed Jun. 15, 1990, Ser. No. 538,846
Int. Cl.[5] A47L *5/36*
U.S. Cl. 15—410 **13 Claims**



1. A handle assembly for a vacuum cleaner system, comprising:
handle means for articulating a cleaning tool, said handle means having an inner surface, said inner surface having at least one protruding ridge portion and a grooved portion;
hose means for intaking dust and dirt debris, said hose means having an outer ribbed portion for lockably engaging with said ridge portion when said hose means is secured to said handle means;
elbow section means having first and second ends for cou-

pling said vacuum hose means with a nozzle of a cleaning tool, said elbow section means being housed within said handle means and having a shoulder portion operable to lockably engage with said grooved portion of said handle means to thereby hold said elbow section means in said handle means, said second end being operable to couple with said nozzle of said cleaning tool, said elbow section means further being operable to slidably couple at its first end to a relatively smooth interior end portion of said hose means when said hose means is rotatably urged in a first direction into mating engagement with said elbow section means, and said first end of said elbow section means operating to frictionally grip onto said interior end portion of said hose means when said hose means is pulled linearly outwardly of said elbow section means and when said hose means is rotated in a second direction opposite to said first direction, said frictional gripping action provided by said elbow section means and said locking engagement of said hose means and said ridge portion resisting removal of said hose means from said handle means; and

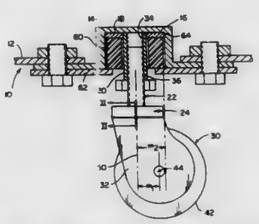
whereby said frictional engagement between said hose means and said elbow section means and said engagement of said ridge portion and said ribbed portion of said hose means operate cooperatively to secure said hose means to said handle means of said handle assembly.

5,109,569

NON-OSCILLATING CASTER

James D. Shaw, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 26, 1991, Ser. No. 736,367
Int. Cl.[5] B60B *33/00*
U.S. Cl. 16—44 **4 Claims**



1. A caster for a heavy instrument, said caster comprising a frame, means for pivotably connecting said frame to a resilient damper held by said instrument, and journal means for journalling a wheel on said frame off-center from said connecting means, said connecting means comprising a load-bearing plate and a stud fixed to said plate and having a rotational axis, said plate bearing directly over one of its surfaces onto a surface of said instrument, and said damper being disposed to surround said stud with said plate bearing on said damper, and said frame being fixedly secured to said stud in the vertical direction so as to deliver vertical forces directly onto said load-bearing plate with no vertical displacement of said frame relative to said instrument;

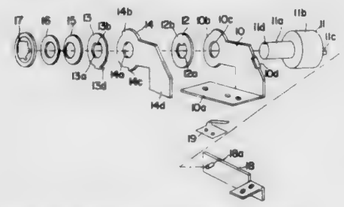
one surface of said plate extending horizontally to create a moment arm from said axis that is no longer than any horizontal moment arm created by said journal means from said axis, so that said stud can bend against said damper out of a vertical alignment and said plate can depress a portion of said damper when said wheel encounters only a horizontally-directed force.

5,109,570

OPENING/CLOSING MECHANISM

Shigeru Okada, and Masami Fujita, both of Tokyo, Japan, assignors to Tofuji E.M.I. Co., Ltd., Tokyo and Matsushita Electric Industrial Co., Ltd., Osaka, both of, Japan

Filed Mar. 6, 1991, Ser. No. 665,420
Int. Cl.[5] E05F *1/08*
U.S. Cl. 16—289 **6 Claims**



1. An opening/closing mechanism comprising:

a base attached to a main body of an apparatus;

an arm attached to an opening/closing portion of said apparatus and axially supported on said base so as to turn freely;

a rotary plate which turnes together with said arm and which has a projection;

a pop-up plate having an engaging portion, wherein when said opening/closing portion is closed up to a prescribed position, the engaging portion engages with the projection of said rotary plate so that said pop-up plate turns together with the rotary plate; and

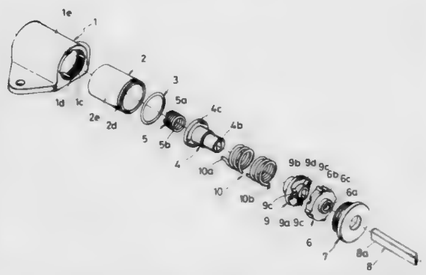
a resilient member provided between said pop-up plate and said base and compressed by turning of said pop-up plate, wherein when said opening/closing portion is released, said rotary plate is turned together with said pop-up plate by a compressive reaction force, thereby turning said opening/closing portion up to a prescribed position.

5,109,571

DOOR HINGE WITH MOVABLE AND FIXED CAMS

Kazuyoshi Ohshima, and Yojiro Nakayama, both of Tokyo, Japan, assignors to Sugatsune Industrial Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1990, Ser. No. 595,371
Claims priority, application Japan, Oct. 11, 1989, 1-164716; Oct. 31, 1989, 1-284550; Oct. 31, 1989, 1-284551
Int. Cl.[5] E05F *1/08*
U.S. Cl. 16—307 **2 Claims**



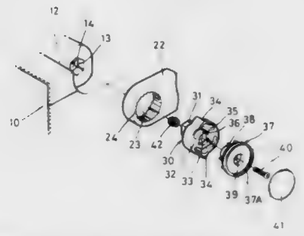
1. A hinge comprising a pair of movable members arranged within a casing for being rotated with a rotary shaft to be rigidly fitted to a swing door, a space between said movable members being filled with a viscous fluid, said hinge further comprising a spring carrier so arranged between said rotary shaft and said movable members that it can be engaged with and disengaged from said movable members by means of a spring one-way clutch for being rotated with said movable members only in one direction, said hinge further comprising a movable cam so arranged as to be rotatable with and axially slidable relative to said rotary shaft and a fixed cam so arranged as to be capable of being engaged with said movable cam, a spring being disposed between said spring carrier and said movable cam within said housing, an end of said spring being held by said spring carrier and the other end being axially slidably hooked to said casing, said movable and fixed cams being so configured that a torque is generated within the hinge to rotate the rotary shaft in one direction within a given range of rotation of the rotary shaft.

5,109,572

LOCKING HINGE DEVICE FOR THE LCD SCREEN OF A WORD PROCESSOR

Kyung Park, Kyeongki-do, Rep. of Korea, assignor to Hyundai Electronics Ind. Co., Ltd., Kyeongki-do, Rep. of Korea

Filed Sep. 21, 1990, Ser. No. 586,225
Claims priority, application Rep. of Korea, Sep. 23, 1989, 13934 UM 89[U]
Int. Cl.[5] E05D *11/10;* **H05K** *7/16*
U.S. Cl. 16—334 **5 Claims**



1. A locking hinge device for adjusting the screen viewing angle of a word processor having a base and a keyboard cover hinged to the base, the base having a key board fixedly mounted to the front upper face thereof, the keyboard cover having a liquid crystal display (LCD) screen fixedly mounted to the front face thereof, said locking hinge device comprising:

a horizontal pivot pin attachable to the mid-portion of the upper face of said base rearwardly to said keyboard and extending substantially between the opposing ends of said base;

a pair of elongated hinge members attachable to the opposing ends of said keyboard cover, each of said elongated hinge members having an axial bore at the front end thereof, said axial bore having circumferentially arranged detent receiving recesses on the inner circumference thereof for providing different positions of tilt-angle;

a pair of resilient restraint members fixed to the opposite ends of said pivot pin, each restraint member including a substantially wheel shaped portion received and retained in said axial bore, said substantially wheel shaped portion including a plurality of circumferentially arranged detents on the outer circumference thereof for being positioned in the corresponding ones of said circumferentially arranged recesses, a central bore receiving adjusting screws, slots provided between said central bore and said detents, and slits in communication with said slots and said central bore; and

constraint-force adjusting means having eccentrically located axially elongated interlocking pins received in said slits in said restraint members.

5,109,573

BRAKE MECHANISM FOR A PIVOTABLE CHARACTER DISPLAY

Howard F. Sherman, McGraw, N.Y., assignor to Smith Corona Corporation

Filed Sep. 27, 1990, Ser. No. 589,140
Int. Cl.[5] E05C *17/64;* **E05D** *11/08*
U.S. Cl. 16—341 **24 Claims**



1. A brake mechanism for a continuously adjustable pivotable character display on an electronic typewriter or portable computer, said brake mechanism comprising:

a) a brake pad mounted on said typewriter or computer; and

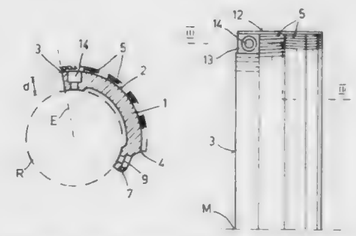
b) a cam located on said pivotable character display such that said character display is continuously pivotable between a down position and an upright position and said cam decreases a compression force on said brake pad as said character display is brought towards an upright position and a frictional force between said cam and said brake pad is sufficient to hold said character display in a desired position between said down position and said upright position.

5,109,574

COMB SEGMENT FOR FIXING ON A COMB ROLLER OF A COMBING MACHINE

Hansulrich Eichenberger, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 22, 1989, Ser. No. 354,929
Claims priority, application Switzerland, May 20, 1988, 01941/88
Int. Cl.[5] D01G *19/04*
U.S. Cl. 19—234 **15 Claims**



1. A circular comb segment for fixing on a circular comb roller of a combing machine, said segment including a base having an outer cylindrical peripheral surface extending from a front edge to a rear edge and having either combing needles or clothing points extending from said front edge, said base having a front face and a free space in a peripheral direction in front of a plane passing through the axis of said peripheral surface, coplanar with said front face and through the foremost needles or clothing points, said free space extending radially from said front edge over the entire thickness of said base and

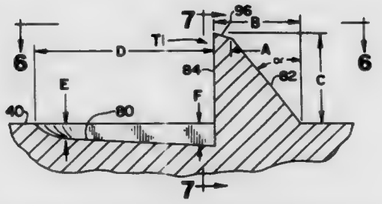
extending in the direction of the width of said base from the middle of said front edge to both sides over at least the major part of the width of said base.

5,109,575

TOOTHED SEAL FOR HARD THERMOPLASTIC STRAP

Barry R. Angarola, Schaumburg, and William F. Duenser, Mount Prospect, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Jun. 10, 1991, Ser. No. 714,001
Int. Cl.[5] B65D *63/14*
U.S. Cl. 24—16 PB **17 Claims**



1. A seal for joining a pair of overlapping plastic strap portions comprising:

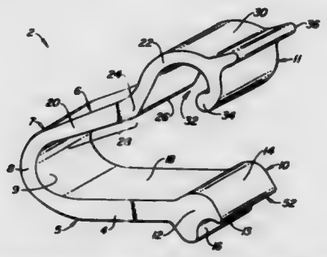
a body of sheet material having a strap-engaging surface on one side; at least a portion of said body thickness on said one side having a hardness which exceeds the hardness of said plastic strap; said body being sufficiently ductile at least along a bend region to accommodate deformation of said body at said bend region to permit closure of said seal about said strap portions with said strap-engaging surface in engagement therewith; said body having a plurality of teeth upset from said strap-engaging surface; each said tooth being formed of material displaced outwardly from said strap-engaging surface to define a recess therein; each said tooth having a solid configuration defined by converging side surfaces and truncated along a flat top surface substantially parallel to the portion of said strap-engaging surface that is immediately adjacent to said tooth; and the ratio of the length of each said tooth recess to the height of said tooth above said strap-engaging surface being within the range of about 1 to 1 to about 3 to 1.

5,109,576

CLOSURE DEVICE

Gordon E. Teekell, 8809 Skyline Blvd., Oakland, Calif. 94611, and Siegfried Liebthal, 1013 Holly St., Alameda, Calif. 94501

Filed Apr. 24, 1991, Ser. No. 690,753
Int. Cl.[5] B65D *77/10*
U.S. Cl. 24—30.5 R **10 Claims**



1. A one piece closure device for sealing rubber tubes, plastic bags, inflated balloons, or other flexible objects, comprising:

a first arm and a second arm, said first arm and said second arm each having a hinged end and a free end, said first arm and said second arm connected together at said hinged end by a resilient curved portion having a substantially smooth inner surface forming a hinge and having a natural, unbiased position wherein said free end of said first arm and free end of said second arm are separated forming an open position, said free end of said second arm formed having a curved flange portion terminating at a lip, said curved flange portion having an outer surface and an inner surface, said free end of said first arm formed having a bulged region, wherein when said first arm and said second arm are biased together and said bulged region is forced toward the inner surface of said flanged region, said first arm and said second arm secure together in a closed position with said bulge region clipped and retained within said flange region by said lip and the first arm and the second arm defining a clamping region therebetween; and

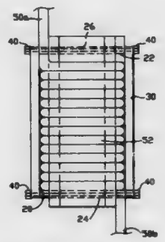
a lever formed on said outside surface of said flange region and providing a means for deforming said flange region to pivot said lip away from said bulge region thereby allowing said hinge to return to its natural, unbiased position.

5,109,577

CABLE-LINE SHORTENING DEVICE

Michael B. Young, Mililani, Hi., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 19, 1990, Ser. No. 557,450
Int. Cl.[5] B65H *75/00*
U.S. Cl. 24—71.2 **6 Claims**



1. A cable/line shortening device comprising:

a longitudinal winding member having a first end, a second end and a longitudinal axis extending between said first and second ends to be oriented generally parallel with a cable or line to be shortened, said winding member further including an exterior winding surface disposed around said longitudinal axis; and

cable redirecting means disposed on said exterior winding surface adjacent said winding member first and second ends for receiving a cable or line to be shortened and redirecting the cable or line from a longitudinal orientation to a transverse orientation generally across said winding member longitudinal axis for winding the cable or line about said winding surface in one or more transverse windings; and

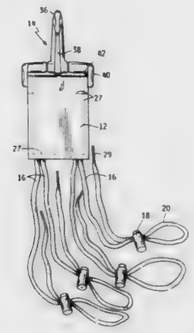
means for preventing said one or more transverse windings from overlapping comprising a pair of keeper members mounted to said cable redirecting means and extending generally parallel to said winding member longitudinal axis.

5,109,578

GOLF CLUB COVER RETENTION APPARATUS

Carolee M. Cox, 7032 Montrose Rd., Woodbury, Minn. 55125

Continuation of Ser. No. 602,404, Oct. 22, 1990, abandoned. This application Oct. 28, 1991, Ser. No. 783,556
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—298 **11 Claims**



1. An easily detachable connector for securing golf club head protectors to a golf bag comprising:

a golf bag attachment means;

a connector body, said connector body connected to said golf bag attachment means,

a first flexible cord having a first portion and an unsecured distal end, said first flexible cord having a second portion for forming into a loop with itself, said first portion of said first flexible cord secured to said connector body to hold said first flexible cord thereto;

a first cord lock, said first cord lock secureable to said first flexible cord said second portion of said first flexible cord forming a first loop with said first flexible cord, said first loop operable for attaching said first flexible cord to a first golf club protector, said first cord lock movable and secureable along said first flexible cord to enable securing of said first loop to a first golf club protector by compressing the first flexible cord in said first cord lock, the size of said first loop and the position of said first loop along said first flexible cord being adjustable along said first flexible cord by positioning said first cord lock along said first flexible cord;

a second flexible cord having a first portion and an unsecured distal end, said second flexible cord having a second portion for forming into a loop with itself, said first portion of said second flexible cord secured to said connector body to hold said second flexible cord thereto, said second flexible cord secured to said connector body independent of said first flexible cord; and

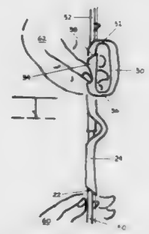
a second cord lock, said second cord lock secureable to said second flexible cord, said second portion of said second flexible cord forming a second loop with itself for attaching said second flexible cord to a second golf club protector, said second cord lock movable and secureable along said second flexible cord to enable securing of said second loop to the second golf club protector by compressing the second flexible cord in said second cord lock, the size of said second loop and the position of said second loop along said second flexible cord being adjustable independent to the position and size of said first loop, said first flexible cord coacting with the first golf club protector and said second flexible cord coacting with the second golf club protector so that said connector prevents either the first golf club protector or the second golf club protector from being accidently lost.

5,109,579

FISHING ROD CLAMPING DEVICE

Laurence G. Engel, 329 Greenwich St., New York, N.Y. 10013

Filed Jun. 27, 1991, Ser. No. 722,513
Int. Cl.[5] A44B *21/00*; A01K *87/00*
U.S. Cl. 24—339 **11 Claims**



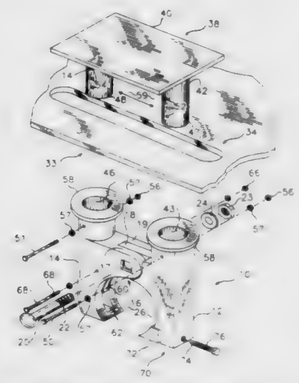
1. A fishing rod clamping device for holding a two-section fishing rod with the sections disassembled but ready for reassembly with each other, said device comprising a one-piece modified tube of resilient material having first, second, third and fourth portions joined by first, second and third webs and said tube having opposite ends, said first, second and third portions being cylindrical, and said tube further having a slit running lengthwise of said first, second and third portions and interrupted by said webs, said slit enabling releasable engagement of one of said cylindrical portions or with a said rod section.

5,109,580

MOUNTING CLAMP FOR HELICOPTER SKID

Mark Camus, 9301 SW. 92nd Ave., B104, Miami, Fla. 33176

Filed Apr. 20, 1990, Ser. No. 512,270
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—458 **16 Claims**



1. A clamping assembly for mounting a load supporting structure to a skid assembly of a helicopter, said clamp assembly comprising:

a. a clamp body having a first segment and a second segment movably connected to one another and positionable between a clamped position and an open position,

b. said clamped position defined by first and second segments disposed in spaced relation to one another to define a receiving space therebetween dimensioned and configured to receive a portion of the skid assembly therein in engaging relation to said first and second segments,

c. a keeper assembly including two elongated prongs fixedly connected in spaced relation to one another by a keeper

member and each prong removably connected to a different one of said first and second segments when in said clamped position,

d. said keeper assembly adapted to removably secure the load supporting structure to said clamp body and the skid when in said clamped position, and

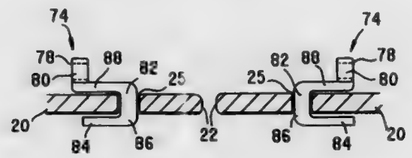
e. locking means mounted on said clamp body and disposed and structured for locking said clamp body in said clamped position, said locking means being removably received in interconnecting, locking engagement with each of said first and second segments and respective ones of said prongs connected thereto.

5,109,581

DEVICE AND METHOD FOR SECURING A SHOE

Murray J. Gould, 11712 Silent Valley La., Gaithersburg, Md. 20878

Filed Jan. 18, 1991, Ser. No. 642,869
Int. Cl.[5] A43C *5/00*
U.S. Cl. 24—714.6 **20 Claims**



1. A device of securing a shoe onto a foot of a wearer, the shoe comprising an upper part having a pair of opposed edges to be drawn together by said device, said upper part having a plurality of openings therein adjacent each of said edges, said device comprising:

a longitudinally extending band having an elongate cross sectional shape wherein the width dimension of the band significantly exceeds the height dimension of the band;

a plurality of fastening members each for attachment to said band and each for engagement with a respective opening in said upper part of said shoe, so that said band extends across said upper part back and forth between said edges, to removably attach said band to said upper part at each of said openings without being threaded through said openings; wherein,

each of said fastening members includes a passageway for accommodating and sliding along the length of said band along an axis of said passageway, said passageway shape corresponding to the elongate cross sectional shape of said band along a section of said passageway transverse to said axis.

5,109,582

THREAD TENSIONING APPARATUS

Tetsuo Okuda, Gifu, Japan, assignor to CKD Corporation, Aichi, Japan

Filed Oct. 25, 1990, Ser. No. 601,661
Claims priority, application Japan, Oct. 25, 1989, 1-278824
Int. Cl.[5] B65H *1/00, 75/38*; D02H *13/38*
U.S. Cl. 28—208 **27 Claims**

1. A thread tensioning apparatus comprising:

supports fixed in the apparatus;

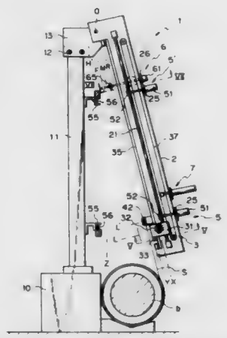
a pair of spaced arms that are attached to said supports so as to be simultaneously rotatable relative to said supports;

drawing-out means for catching threads, said drawing-out means being attached to said arms so as to be movable longitudinally of said arms to draw out threads caught thereon, and said drawing-out means extending substantially perpendicularly to said arms;

a first movable member that is attached to each of said arms so as to be movable in the longitudinal direction of said arms;

a comb that is attached to said movable member and extends substantially parallel to said drawing-out means;

thread arranging means, rotatably attached to said movable member and extending substantially parallel to said comb, for arranging threads disposed thereon;



a pair of spaced clamp bars that are attached to said arms and extend substantially parallel to said drawing-out means; and

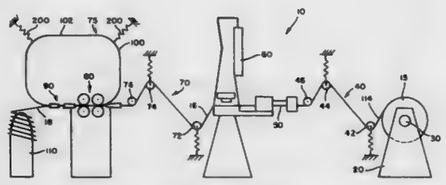
a pair of clamp members that are attached to said supports to cooperate with said clamp bars.

5,109,583

METHOD OF MANUFACTURING BARBED TAPE

Michael V. Pavlov, R.D. #4, Box A27A, Kingston, N.Y. 12401

Continuation of Ser. No. 814,782, Dec. 30, 1985, abandoned.
This application Nov. 9, 1989, Ser. No. 434,007
Int. Cl.[5] B21F *25/00*
U.S. Cl. 29—7.1 **15 Claims**



1. The method of forming a strengthened strip of barbed tape and bending the strengthened tape into a helical coil; comprising:

(a) providing a predetermined length of metal material in strip form having a predetermined width and a predetermined thickness permitting the material to be formed into a desired configuration;

(b) providing a forming means in position to receive said strip of material;

(c) feeding said strip of material to and through said forming means for forming an open strengthening groove longitudinally along the length of the strip in a predetermined location with respect to the width thereof;

(d) feeding a flexible wire mandrel to and through said forming means conjointly with said strip of material, said wire mandrel and said forming means co-acting with said strip of material, as it passes through said forming means, to form said strengthening groove in said strip of material;

(e) providing a radial bending means in position to receive both said strip of material and said wire mandrel as they exit said forming means;

(f) feeding said strip of material and wire mandrel to and through said radial bending means wherein said bending means bends said strip about an edge of said strip;

(g) said radial bending means co-acting with said strip of material and said wire mandrel to form said strip of material into a predetermined helical coil configuration;

(h) separating said strip of material and wire mandrel; and

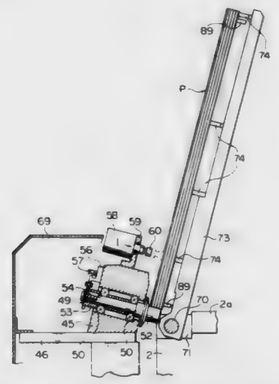
(i) collecting said helical coil of strip material in a collecting means.

5,109,584

PRINTED CIRCUIT BOARD ADAPTER SUPPLYING APPARATUS AND METHOD FOR USE IN PRINTED CIRCUIT BOARD DRILLING APPARATUS

Akira Irie, Kanagawa; Yasuhiko Kanaya, Machida, and Tamio Ohtani, Hadano, all of Japan, assignors to Hitachi Seiko Ltd., Tokyo, Japan

Division of Ser. No. 317,285, Feb. 28, 1989, Pat. No. 4,982,831.
This application Jul. 17, 1990, Ser. No. 553,460
Int. Cl.[5] B65G *47/00*
U.S. Cl. 29—33 P **4 Claims**



1. A printed circuit board supply apparatus for use in a printed circuit board drilling machine comprising:

a stocker provided on one lateral side of said printed circuit board drilling apparatus and including a magazine capable of storing a plurality of printed circuit boards at a predetermined spacing and in a tilted state, shifting means for intermittently shifting said magazine by a distance corresponding to said spacing, a plurality of rotatable rollers arranged to oppose said printed circuit board and providing a path of convey for said printed circuit boards, and delivery means capable of moving said rollers in the direction parallel to the tilt of said printed circuit boards so as to lift said printed circuit boards within said magazine thereby allowing said printed circuit boards to be moved into and out of said magazine;

a conveyor device arranged on the front side of said printed circuit board drilling machine and including a plurality of rollers providing a path of convey for said printed circuit boards which is connected to said path of convey, detection means arranged along said path of convey and capable of detecting a printed circuit board conveyed along said path, braking means arranged along said path of convey and capable of reducing the speed of convey of said printed circuit board in response to a signal produced by said detection means, and a stopper for stopping said printed circuit board at a predetermined position; and

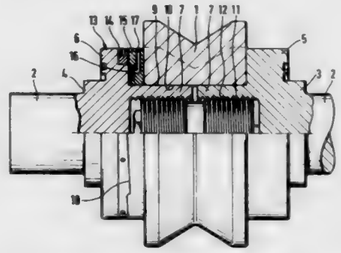
a delivery device provided on a table of said printed circuit board drilling machine and including reclining arms which are swingable between a delivery position where they support the printed circuit board which is being conveyed and a supply position where they deliver said printed circuit board onto said table.

5,109,585

ROLL FOR A ROLL STAND HAVING AN EXCHANGEABLE ROLL RING AND A DIVIDED ROLL BODY

Uwe Kark, Cuxhavener Strasse 60a, 2104 Hamburg 92, Fed. Rep. of Germany

Filed Mar. 25, 1991, Ser. No. 674,777
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1990, 9014728
Int. Cl.[5] B21B *27/02, 31/08*; B60B *7/04*
U.S. Cl. 29—123 **7 Claims**



1. A roll arrangement, comprising:

a roll ring having longitudinal first and second ends, and a longitudinal bore hole,

a divided roll body having first and second ends, a length, a central portion between the first and second ends, and an external circumference, the roll body including first and second parts which form first and second tensioning flanges, respectively, each of which axially supports an end of the roll ring,

a threaded connecting device situated entirely in the central portion of the roll body and interconnecting the first and second parts, the threaded connecting device transmitting forces acting between the first and second parts of the roll body,

a hydraulic tensioning device for tensioning the roll arrangement, and

a mechanical fixing device for fixing the amount of hydraulically produced tension maintained by the roll body, the hydraulic tensioning device and the mechanical fixing device being arranged on the external circumference of the roll body.

5,109,586

CRYSTALLINE ALUMINA ORTHODONTIC BRACKET

Robin M. F. Jones, Pennington; Carl Panzera, Bellemead, and Robert D. DeLuca, Pennington, all of N.J., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.

Division of Ser. No. 932,745, Nov. 19, 1986, Pat. No. 5,066,225, which is a continuation-in-part of Ser. No. 743,851, Jun. 12, 1985, Pat. No. 4,639,218, which is a continuation-in-part of Ser. No. 602,876, Apr. 23, 1984, abandoned, and Ser. No. 707,281, Mar. 6, 1985, abandoned. This application Aug. 27, 1991, Ser. No. 750,335
Int. Cl.[5] B23P *13/00*
U.S. Cl. 29—160.6 **2 Claims**

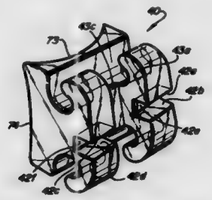
1. Process for producing a crystalline alumina orthodontic bracket which comprises the steps of:

(a) producing an elongated crystalline alumina rod having a longitudinal axis by drawing said rod from a melt of alumina, said rod having a predetermined cross-sectional configuration, said configuration being approximately the configuration of the cross-section of said bracket taken in a plane that is perpendicular to the top and bottom faces of

the bracket and is approximately parallel to the two side faces of the bracket, said configuration including a pair of tie wings on one side and a bracket base including a tooth contacting surface on the opposite side:

(b) annealing said rod in an inert atmospere at a temperature of said from about 1950° to about 2000° C.;

(c) machining the annealed rod to produce a longitudinal groove on the surface of the rod opposite to the base, said



longitudinal groove being oriented in a direction parallel to said longitudinal axis;

(d) subjecting the annealed rod to a stepped machining process whereby a series of double radiused contours are machined in the tooth contacting surface of the rod;

(e) cutting individual orthodontic brackets from the product of step (d); and

(f) annealing said brackets in an inert atmosphere at a temperature of from about 1950° to about 2000° C.

5,109,587

RUBBER COVERED ROLLER IN WHICH THE PHYSICAL STATE OF THE RUBBER AT THE END FACES THEREOF IS BETWEEN A RUBBER ELASTIC PHYSICAL STATE AND A GLASSLIKE PHYSICAL STATE

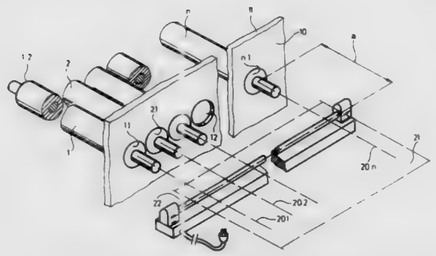
Hans-Jürgen Kusch, Neckargemünd, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jun. 12, 1989, Ser. No. 365,255

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1988, 3819802

Int. Cl.[5] B21B *31/08*

U.S. Cl. 29—132 **2 Claims**



1. A rubber-covered roller comprising a rod-like core, and a cylindrical covering on said core formed of rubber predominately in a rubber elastic state, said cylindrical covering having respective end faces at which the rubber is in a physical state formed by ultraviolet irradiation which is between the rubber-elastic physical state and a glasslike physical state.

5,109,588

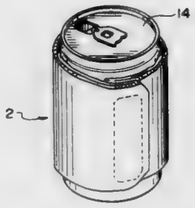
COOLING WRAP METHOD OF MANUFACTURE

Kenneth M. Hewlett, 702 - 17½ St. SE., and Gary A. Nordine, 1003 - 1st Ave. SE., both of Rochester, Minn. 55904

Filed Jun. 29, 1990, Ser. No. 546,534

Int. Cl.[5] B23P *11/02*

U.S. Cl. 29—525.1 **14 Claims**



1. An improved method of manufacturing a flexible, multi-layer wrap suited for being wrapped around a beverage container for helping keep the beverage cool, which comprises:

(a) providing a jacket assembly having pockets formed on opposed inner and outer faces thereof, each pocket having an entrance opening thereto;

(b) providing a first blanket made of a heat absorbing material which when cooled is capable of absorbing heat from the beverage, wherein the first blanket is insertable into the inner pocket of the jacket assembly;

(c) leaving the entrance opening to the inner pocket open so that the first blanket is removably insertable into the inner pocket during use of the wrap after the first blanket has been cooled;

(d) providing a second blanket made of an insulating material for slowing the transmission of ambient heat to the first blanket, wherein the second blanket is insertable into the outer pocket of the jacket assembly;

(e) inserting the second blanket into the outer pocket through the entrance opening to the outer pocket;

(f) closing the entrance opening to the outer pocket to completely enclose the second blanket within the outer pocket; and

(g) attaching fastening means to opposite ends of the jacket assembly so that the ends of the jacket assembly may be secured together after the jacket assembly has been wrapped around a beverage container with the inner pocket adjacent the beverage container and the outer pocket surrounding the inner pocket.

5,109,589

PROCESSES FOR MAKING METAL PROTOTYPE PARTS

Paul S. Cramer, Naugatuck; Gary M. Lomasney, New Britain, and Joseph J. Parkos, Jr., East Haddam, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 11, 1991, Ser. No. 667,782

Int. Cl.[5] B22D *19/06;* **C25D** *1/02*

U.S. Cl. 29—527.4 **31 Claims**

1. A process for making a metal part having internal and external surfaces, and a thickness, comprising:

(a) making a first mandrel having a surface upon which said part is made, by forming and joining together adjacent cross sections of the first mandrel;

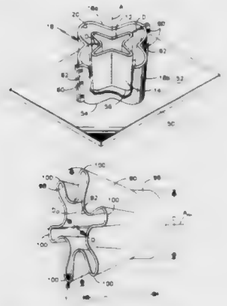
(b) making a second mandrel having a surface, upon which a metal anode is made, by forming and joining together adjacent cross sections of the second mandrel;

(c) depositing a layer of metal having a contacting surface which is in contacting relation with the surface of the second mandrel to form the metal anode;

(d) removing the metal layer from the surface of the second mandrel, and then assembling the first mandrel with respect to the metal layer such that the surface of the first mandrel and the contacting surface of the metal layer are

in opposing relation to each other, and wherein said making and depositing steps are carried out such that said surfaces of the first mandrel and the metal layer are spaced apart a uniform amount greater than the part thickness;

(e) placing the assembly in an electroplating solution, mak-



ing the first mandrel cathodic and the metal layer anodic, and plating a metal layer onto the surface of the first mandrel, wherein the thickness of the metal layer is greater than or equal to the part thickness; and

(f) removing the metal layer on the first mandrel from said mandrel.

5,109,590

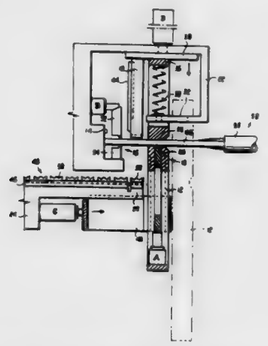
MULTI CORE CABLE STRIPPING

Karl H. Endres, Gallo Manor, South Africa, assignor to Molex Incorporated, Lisle, Ill.

Filed Dec. 21, 1989, Ser. No. 455,208

Int. Cl.[5] H01R *43/04*

U.S. Cl. 29—564.4 **7 Claims**



3. Apparatus for stripping and terminating the conductors of a multi core electrical cable which carries separately insulated electrical conductors which are exposed at one end of the cable including a holder for holding the insulated conductors with the free end of each conductor projecting from the holder, a gripper for gripping the insulation of the conductors in the holder, means for actuating the gripper, a stripper arrangement including blades for cutting the insulation on each conductor at a predetermined distance from its free end and for holding the insulation between the cuts and the free ends of the conductors, means for actuating the stripper arrangement, means for moving the holder in the axial direction of the conductors to a second position away from the stripper arrangement to strip the free ends of the conductors from the insulation when held by the stripper, a crimp anvil which is located directly below the stripped ends of the conductors in the second position of the holder, a crimp punch and means for activating the crimp punch to crimp lugs located on the anvil to the stripped ends of the conductors.

5,109,591

PLIERS FOR CUTTING AND PEELING TELCO CORD AND PRESS-FITTING SUCH CORD TO A TELCO PLUG

Ying-Teh Hung, No. 9 Ta-Tung St., Industrial District Tu-Cheng Hsiang, Taipei Hsien, Taiwan

Filed May 6, 1991, Ser. No. 696,361

Int. Cl.[5] H01R *43/04*

U.S. Cl. 29—566.4 **1 Claim**



1. Pliers for cutting, peeling telco cord, and press-fitting telco and cord to a plug comprising:

a main body, a sliding seat, an adjustable handle, a set of two pressing blocks, wherein said main body has a sliding passage for said sliding seat; three cavities for receiving telco plugs of three different sizes are disposed above and adjacent said sliding passage;

said sliding seat having two aligned openings for cord peeling; a pivot support for a pivot joining with said adjustable handle; an opening for cutting cord is between said main body and said adjustable handle; the end of said sliding seat has a long hole for receiving a pivot on said adjustable handle; said adjustable handle can thus have a lever motion to push up and down said sliding seat;

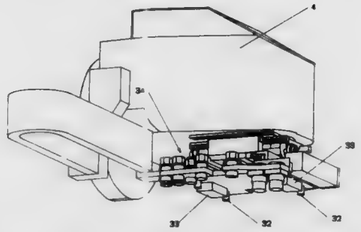
said set of two pressing blocks are parallelly mounted on shoulders of said sliding seat, screwed on the sliding seat, and always pushed and pulled simultaneously by it; each of said pressing blocks having three kinds; said three heads of each said two pressing blocks being different in length so that they can match said three cavities of different sizes;

the end of said sliding seat has a right edge with a post on it; said post is seized by a collar of a spring of which the other collar is fitted to the end of another handle on said main body so that said sliding seat and said adjustable handle may be pulled back to their original positions;

the center of said sliding seat has cavities, a passage, and an opening for chips of clad to be thrown away; a peeling blade screwed on said sliding seat and another blade screwed on said main body can peel clad in front of said cavities; said pivot on said adjustable handle is mounted in said long hole at the end of said sliding seat and a pivot support on said adjustable handle is joined to said main body;

a blade screwed on adjustable handle and a blade screwed on said another handle of said main body can cut telco cord at the both sides of said opening for cutting; these two blades can be performed as scissors and chips of telco cord may be dropped away from back of them directly.

5,109,592
MACHINE TOOL
Roberto Muselli, Piacenza, Italy, assignor to JOBS S.p.A., Piacenza, Italy
Division of Ser. No. 528,823, May 24, 1990, Pat. No. 5,044,064. This application Jun. 12, 1991, Ser. No. 714,210
Claims priority, application Italy, Sep. 11, 1989, 44815 A/89
Int. Cl.[5] B23Q *3/12*
U.S. Cl. 483—4 **3 Claims**

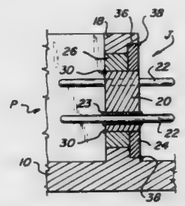


1. A method for performing multiple operations on a workpiece by utilizing a machine comprising: a support movable on three Cartesian axes (X, Y, Z); an operating head mounted on said support and movable around two orthogonal axes (A, C); an interface plate mounted on said head, and adapted for receiving a support plate of a series of end effectors, said support plate being movable, by numeric control, on two orthongonal axes (V, W), said method comprising the steps of:
(a) positioning the operating head at a location where the operations are to be performed;
(b) moving by numeric control, said support plate along a first one of the orthongonal axes (V) so as to bring a first end effector into a co-axial alignment with the location where the multiple operations are to be performed;
(c) advancing the end effector against a fixed stop means which is integral with said support plate;
(d) advancing, by numerical control, said support plate along a second one of the orthogonal axes (W) to perform a first operation;
(e) retracting said support plate and said end effector;
(f) moving by numerical control, said support plate along said first axis (V) so as to bring a second end effector into co-axial alignment with the location where the multiple operations are to be performed;
(g) repeating steps (c) to (f) until all the operations are performed; and
(h) exchanging the support plate with another support plate having a different series of end effectors, to repeat a cycle for performing a different series of operations.

5,109,593
METHOD OF MELT FORMING A SUPERCONDUCTING JOINT BETWEEN SUPERCONDUCTING TAPES
Mark G. Benz, Burnt Hills; Bruce A. Knudsen, Amsterdam; Lee E. Rumaner, and Robert J. Zabala, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Aug. 1, 1990, Ser. No. 561,438
Int. Cl.[5] H01L *39/24*
U.S. Cl. 29—599 **26 Claims**

1. A method for joining superconducting tapes having an inner laminate comprised of a parent-metal layer selected from the group niobium, tantalum, technetium, and vanadium, a superconductive intermetallic compound layer on the parent-metal layer, a reactive-metal layer that is capable of combining with the parent-metal and forming the superconductive intermetallic compound, and an outer laminate of a non-superconductive metal bonded to the inner laminate, the method comprising:
removing the outer laminate from a section of separate tapes to form exposed sections, and positioning the tapes so that the exposed sections are in contact;
melting the exposed sections in at least one melt zone where the exposed sections are in contact, and resolidifying the melt as a continuous precipitate of the superconductive intermetallic compound.

5,109,594
METHOD OF MAKING A SEALED TRANSITION JOINT
William F. Sharp, Louisville; Prem R. Hingorany, Broomfield, and Howard W. Mansell, Englewood, all of Colo., assignors to Explosive Fabricators, Inc., Louisville, Colo.
Division of Ser. No. 607,563, Nov. 1, 1990, Pat. No. 5,041,019. This application Mar. 18, 1991, Ser. No. 671,160
Int. Cl.[5] H01P *11/00*
U.S. Cl. 29—600 **2 Claims**

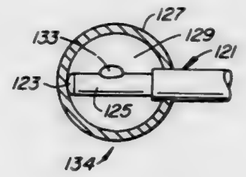


1. A method of manufacturing a hermetically sealed transition joint for use in a feed-through opening in the side wall of a receptacle for a microwave package, the receptacle being made of a first material, and a pin connector unit made of a second material being sealed in the transition joint in the feed-through opening, comprising the steps of:
forming a feed-through opening in the side wall of the receptacle;
explosively bonding a layer of the first material to a layer of the second material to form the transition joint;
forming a passageway through the transition joint which is configured to the shape and size of the pin connector unit;
machining the transition joint to a configuration corresponding to the shape and size of the feed-through opening;
positioning the pin connector unit in the passageway;
welding the pin connector unit about its periphery to the second layer to form a hermetic seal;
positioning the transition joint in the feed-through opening; and
welding the first layer of the transition joint about its periphery to the side wall to form a hermetic seal.

5,109,595
METHOD OF MAKING A FIBEROPTIC SENSOR OF A MICROWAVE FIELD
Kenneth A. Wickersheim, Menlo Park; Mei H. Sun, Los Altos, and James H. Kim, San Jose, all of Calif., assignors to Luxtron Corporation, Santa Clara, Calif.
Division of Ser. No. 472,351, Jan. 30, 1990, which is a continuation-in-part of Ser. No. 331,685, Mar. 30, 1989, abandoned. This application Apr. 1, 1991, Ser. No. 678,704
Int. Cl.[5] H01P *11/00*
U.S. Cl. 29—600 **7 Claims**

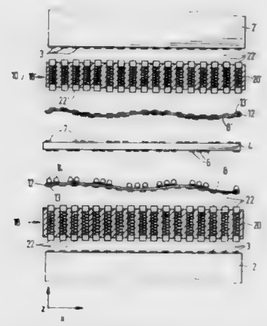
1. A method of making a microwave sensor, comprising the steps of:
providing a form of a meltable material that is characterized by being significantly reduced in volume when melted and resolidified,

coating an outside surface of said form with microwave absorbing material, and



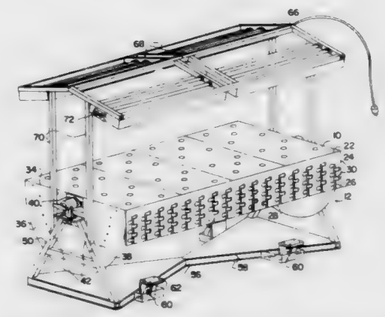
heating the coated form sufficiently to cause the form to melt, thereby to leave a substantially hollow shell of the microwave absorbing material.

5,109,596
ADAPTER ARRANGEMENT FOR ELECTRICALLY CONNECTING FLAT WIRE CARRIERS
Hubert Driller, and Paul Mang, both of Schmitten, Fed. Rep. of Germany, assignors to Mania Gmbh & Co., Weilrod, Fed. Rep. of Germany
Filed Nov. 13, 1989, Ser. No. 433,833
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1988, 3838413
Int. Cl.[5] B23P *21/00;* **G01R** *1/06*
U.S. Cl. 29—705 **2 Claims**



1. A device for electrically connecting electrical contact points of a flat wire carrier to respective electrical contact points of a test grid of an electronic testing device, where the electrical contact points of the flat wire carrier are arranged in a first pattern which is different than a second pattern of the contact points of the test grid, said device comprising:
an adapter board having first and second planar faces;
a plurality of first contacts disposed on said first planar face of said adapter board in the first pattern;
a plurality of second contacts disposed on said second planar face of said adapter board in the second pattern;
conductive means, extending through said adapter board, for electrically connecting each of said plurality of first contacts with one of said plurality of second contacts; and,
compensating means associated with said adapter board for compensating for varying heights of the contact points of at least one of the flat wire carrier and the test grid, said compensating means including at least one of an electrically conductive elastomer material and a flexible film-like material;
wherein said compensating means includes a first grid having first and second planar faces, for establishing electrical contact with at least one of said plurality of first contacts disposed on said first planar face of said adapter board, said first grid made from an electrically insulated resilient material and having a plurality of plugs made from an electrically conductive elastomer material extending therethrough from the first planar face to the second planar face in said first pattern.

5,109,597
BACKWIRED 3-D HARNESS TOOL ASSEMBLY
Cary S. Elder, Murray; Dennis K. Tolman, Brigham City, both of Utah, and Dale A. Gates, Irvine, Calif., assignors to Northrop Corporation, Hawthorne, Calif.
Filed Mar. 12, 1991, Ser. No. 668,281
Int. Cl.[5] B21F *27/12*
U.S. Cl. 29—721 **7 Claims**

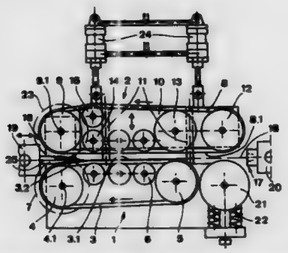


1. A backwired, three dimensional, electronic jig board assembly comprising:
a table top formed with a planar, rectangular surface having a plurality of apertures for the laying up of three dimensional wire harnesses thereupon;
a plug board extending downwardly at right angles from one long edge of the table top, the plug board having upwardly extending slots from the free edge thereof opposite the edge coupled to the table top, with apertures formed as extensions of each slot for the receipt of connectors;
a safety plate extending downwardly from each short edge of the table top and spanning the plug board, each safety plate having a central aperture and a pivot rod fixedly secured thereto;
support legs coupled to the pivot rods for the pivoting of the table top and plug board with respect thereto;
apertures formed in each safety plate for the receipt of a pin passing through the support legs to secure each safety plate as well as the table top and plug board in any one of a plurality of angular orientations;
wheels supported by the support frame for movement of the assembly; and
an electrical/light assembly secured over the table top and supported thereabove by posts coupled to the support legs.

5,109,598
METHOD AND APPARATUS FOR FEEDING CABLE TO A CABLE PROCESSOR
Max Koch, Meggen, Switzerland, assignor to TTC Technology Trading Company, Meggen, Switzerland
Filed Aug. 22, 1990, Ser. No. 571,325
Claims priority, application Switzerland, Oct. 18, 1989, 03786/89
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—825 **6 Claims**

1. A method for the feeding of a cable into an automatic cable-processing machine, wherein the cable processing machine comprises
a stationary belt drive including toothed belts of a stationary

belt drive and of a slidably disposed belt drive; a cable clamping and tightening device having spaced apart driving surfaces (3.1, 8.1) of toothed belts (3, 8) of a stationary belt drive (1);
a slidably disposed belt drive (2);
a driving roller (21) forming together with the slidably disposed belt drive a cable length-measuring apparatus (22);
a cable-clamping device (20), wherein a selected cable (18) is led through the cable clamping and tightening device (19);
comprising the steps placing a selected cable (18) between the spaced apart driving surfaces (3.1, 8.1) of toothed belts (3, 8) of the stationary belt drive (1) and of the slidably disposed belt drive (2) and over the driving roller (21) of the cable length-measuring apparatus (22); leading the selected cable (18) through the cable-clamping device (20);
clamping the selected cable (18) by the clamping and tightening device (19) and by the clamping device (20);
tightening the selected cable (18) by a displacement of the clamping and tightening device (19); 'tensioning the selected cable (18);



sliding the slidably disposed belt drive (2) onto the tensioned selected cable (18);
pressing the slidably disposed belt drive (2) onto the tensioned selected cable (18) by a force;
driving both of the belt drives (1, 2) in mutually opposite direction of rotation with simultaneous opening of the clamping and tightening device (19) and the clamping device (20);
moving the selected cable (18) forwards;
driving the driving roller (21) of the cable length-measuring apparatus (22);
interrupting the movement of the selected cable (18);
determining then an exact preset cable length;
cutting the selected cable (18) for resulting in a cable exhibiting two ends;
stripping the two ends of the selected cable (18) of insulation;
leading the cut-off cable (18) aqay; and
moving the remaining selected cable (18) forwards again by the preselected cable length.

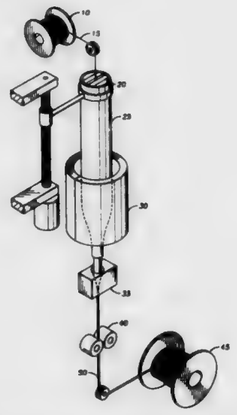
5,109,599

MINIATURE COAXIAL CABLE BY DRAWING

Ronald L. Ohlhaber, Geneva, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 555,882, Jul. 20, 1990, abandoned. This application Apr. 15, 1991, Ser. No. 686,711
Int. Cl.[5] H01B *13/20*
U.S. Cl. 29—828 **15 Claims**

1. A method of making miniature coaxial cable by drawing, which comprises the steps of:
feeding a pre-sized core into a tube-shaped outer cover containing supporting material;
heating said core, outer cover and supporting material to a given temperature to allow drawing of the outer cover and supporting material;
drawing said outer cover and said supporting material around said core until there is the desired amount of con-



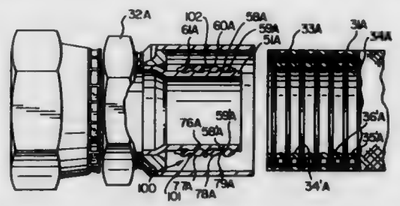
ductive air space between said central core and said outer cover; and
applying a conductive material to said outer cover.

5,109,600

METHOD OF MAKING A HOSE CONSTRUCTION

Homer N. Holden, Sylva, N.C.; James L. Lawrence, Ocala, Fla.; Jerry W. Rogers, and John D. Sanders, both of Springfield, Mo., assignors to Dayco Products, Inc., Dayton, Ohio

Filed Jul. 30, 1990, Ser. No. 559,461
Int. Cl.[5] B23P *19/04, 53/00*
U.S. Cl. 29—890.144 **12 Claims**



1. In a method of making a hose construction comprising the steps of forming a tubular hose to have an inner peripheral surface means and an outer peripheral surface means, forming said tubular hose to have opposed ends, forming said inner peripheral surface means of said tubular hose to comprise an inner corrugated hose made of polymeric material and having inwardly convex projections with recesses therbetween and extending from one end of said opposed ends of said tubular hose to the other end of said opposed ends thereof, forming a coupling to have an insert means disposed in said one end of said tubular hose and be radially outwardly expanded into sealing relation with said inner corrugated hose to secure said coupling to said one end of said hose, forming said inset means to have an outer peripheral surface means defined by a plurality of outwardly convex projections with recesses therebetween, and forming said projections of said insert means to be respectively received in said recesses of said inner hose and said projections of said inner hose to be respectively received in said recesses of said insert means whereby the interior of said tubular hose is substantially sealed to the interior of said coupling, the improvement comprising the step of treating said inner peripheral surface means of said inner hose at said one end of said tubular hose so that said projections and recesses

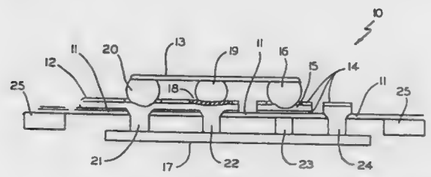
thereof more readily conform to said recesses and projections of said insert at the time said insert is being radially outwardly expanded, the step of treating said inner surface means of said inner hose comprising the step of adhesively bonding said projections and recesses of said inner hose to said recesses and projections of said insert, the step of adhesively bonding comprising the step of using a two part thermoset bonding means, the step of using a two part thermoset bonding means comprising the step of disposing one part of the parts of said two part bonding means in one recess of said insert and the other part of the parts of said two part bonding means in an adjacent recess of said insert thereby combining said two part thermoset bonding means when said insert is radially outwardly expanded against said inner surface means of said inner hose.

5,109,601

METHOD OF MARKING A THIN FILM PACKAGE

Donald G. McBride, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 408,959, Sep. 18, 1989, Pat. No. 4,965,700, which is a continuation of Ser. No. 199,228, May 26, 1988, abandoned. This application Feb. 12, 1990, Ser. No. 480,344
Int. Cl.[5] H05K *3/34*
U.S. Cl. 29—840 **7 Claims**



1. The method of manufacturing a thin flexible package assembly for utilizing different bonding techniques to affix electrical devices to be functionally operable with an electrical circuit, comprising the steps of:
casting a film of a predetermined electrically insulating material onto a predetermined sacrificial metal carrier material;
forming openings through said electrically insulating material at predetermined locations to identify bonding pad areas;
forming a predetermined electrical circuit on said electrically insulating material to be supported thereby and to use at least some of said openings for electrical connections to one device, or to a plurality of devices;
removing said sacrificial metal carrier material except in the areas of predetermined ones of said openings where metal material remaining is for use as bumps to affix at least one electrical device, by a predetermined bonding process, to be functionally operable with said electrical circuit; and
affixing a second electrical device to said electrical circuit on the side of said insulating material opposite said one electrical device, by a bonding process different from said predetermined bonding process.

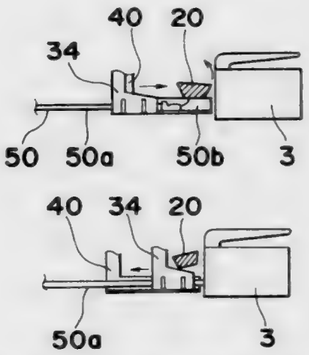
5,109,602

METHOD OF AND APPARATUS FOR INSERTING WIRED TERMINALS INTO CONNECTOR HOUSING

Michio Fukuda, Nishinomiya; Yoshinobu Ohta, Yokkaichi; Kenichi Taniguchi, Suzuka, and Katuyuki Sasaki, Yokkaichi, all of Japan, assignors to Sumitomo Wiring Systems Ltd., Mie, Japan

Filed Mar. 19, 1991, Ser. No. 671,335
Claims priority, application Japan, Mar. 23, 1990, 2-74300
Int. Cl.[5] B23P *19/00;* **H01R** *9/16*
U.S. Cl. 29—845 **2 Claims**

1. A method of inserting a terminal, connected to an electric wire, into a terminal cavity of a connector housing in said terminal inserting apparatus comprising:
a terminal grip means for gripping said terminal, which includes a pair of guide arms openable and closable in a horizontal plane and a terminal press arm pivotable in a vertical plane such that said guide arms and said terminal press arm are, respectively, pressed against opposite side faces and an upper face of said terminal; and
a wire grip means for gripping said electric wire, which includes a chuck retractably advanced along said guide arms between said guide arms;
the method comprising the steps of:
fitting said electric wire of said terminal between said guide arms in a state where said terminal is positioned at a predetermined location and said chuck is opened at a front end of said guide arms;
clamping a portion of said electric wire adjacent to said terminal by said chuck;
retracting said chuck along said guide arms so as to clamp said terminal between said guide arms and said terminal press arm;
displacing said terminal to a position located in front of said terminal cavity of said connector housing in a state where said terminal is clamped by said terminal grip means and said wire grip means; and



forwardly displacing said chuck along said guide arms so as to insert said terminal into said terminal cavity of said connector housing by guiding said terminal by said guide arms and said terminal press arm.

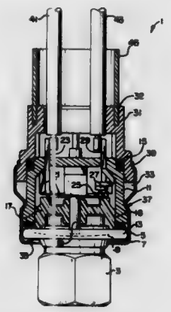
2. An apparatus for inserting a terminal, connected to an electric wire into a terminal cavity of a connector housing, comprising:
a terminal grip means for gripping said terminal, which includes a pair of guide arms openable and closable in a horizontal plane and a terminal press arm pivotable in a vertical plane such that said guide arms and said terminal press arm are, respectively, pressed against opposite side faces and an upper face of said terminal by elastic forces;
a wire grip means for gripping said electric wire, which includes a chuck retractably advanced along said guide arms between said guide arms, a first drive member for retractably advancing said chuck and a second drive member for opening and closing said chuck such that a state of grip of said terminal by said terminal grip means is cancelled and established by said chuck at a forward end and a rearward end of a stroke of said chuck, respectively; and
a robot flange for supporting said terminal grip means and said wire grip means.

5,109,603

METHOD OF WATERPROOF SEALING A LEAD FROM A PRESSURE OR TEMPERATURE RESPONSIVE SWITCH

Henry J. Boulanger, Nicholasville, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 640,328, Jan. 11, 1991, which is a division of Ser. No. 391,255, Aug. 9, 1989, Pat. No. 4,998,087.
This application Oct. 16, 1991, Ser. No. 777,853
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—859 **3 Claims**



1. A method of waterproofingly sealing an electrical connection to a member comprising the steps of:
(a) providing an electrical wire having thermoplastic insulation thereon leading from the member;
(b) providing a sleeve formed of an electrically insulating thermoplastic material having a first and a second end;
(c) forming a continuous groove in the member surrounding its electrical wire leading from the member;
(d) disposing said sleeve around said insulation and inserting a first end of said sleeve into said groove and adhesively securing said sleeve to said member within said groove;
(e) forcing said sleeve against said insulation; and
(f) causing said sleeve and said insulation to coalesce and form a waterproof seal therebetween.

5,109,604

METHOD OF ASSEMBLING A TORQUE CONVERTER IMPELLER

Ralph R. Koebele, Mt. Clemens, Mich., assignor to Borg-Warner Automotive Transmission & Engine Components Corporation, Sterling Heights, Mich.

Filed Apr. 20, 1989, Ser. No. 341,355
Int. Cl.[5] F16D *33/00*
U.S. Cl. 29—889.5 **21 Claims**

1. A method for assembling a torque converter impeller comprising:
positioning a plurality of vanes in a desired orientation, said vanes having a substantially uniform semicircular outer surface;
positioning a core ring in contact with said vanes;
securing said vanes to said core ring to maintain said vanes in said desired orientation;
positioning said vanes and said core ring in an outer shell, said outer shell having a substantially smooth inner surface, said outer surface of said vanes substantially conforming to said inner surface of said outer shell, said core ring being solely responsible for maintaining said vanes at the desired orientation with respect to said outer shell



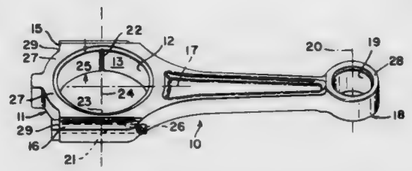
when said vanes and core ring are positioned in said outer shell; and,
securing said vanes and core ring to said outer shell.

5,109,605

MAKING A FRACTURED POWDER METAL CONNECTING ROD

Peter Y. Hoag, Milford, and David A. Yeager, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 194,750, May 17, 1988, Pat. No. 4,993,134.
This application Jan. 14, 1991, Ser. No. 640,739
Int. Cl.[5] B23P *15/10*
U.S. Cl. 29—888.09 **6 Claims**



1. In a method of completing the making of a connecting rod bifurcated by fracture, said rod having fractured portions with mating cracked surfaces carrying complementary peaks and valleys, said rod having an annular internal wall, the steps comprising:
(a) assembling said rod portions together to substantially remate the peaks and valleys of said cracked surfaces by guided application of compression forces;
(b) machining said annular wall to final finished dimensions in said remated condition; and
(c) providing notches at each diametrical side of said annular wall extending across said cracking plane, each notch having a curvilinear radial extremity throughout its length.

5,109,606

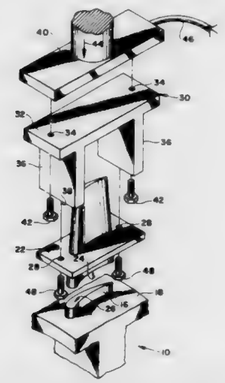
INTEGRALLY BLADED ROTOR FABRICATION OR REPAIR

Thomas DeMichael, Indiantown, and Philip G. Seeley, Jupiter, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 4, 1991, Ser. No. 664,148
Int. Cl.[5] B23P *15/02*
U.S. Cl. 29—889.1 **3 Claims**

2. A method for fabricating an integrally bladed rotor which

comprises a disk having a plurality of integral blades projecting from the rim of the disk including the steps of:
a) providing a disk having a plurality of projecting stubs;
b) providing a plurality of blade preforms, each preform having a proposed bond surface, a collar about the periphery of said blade adjacent said proposed bond surface and bolt holes through said collar;
c) securing to a bonding machine the base of a U-shaped blade holder having two legs and a base;
d) the securing of a blade to said U-shaped blade holder by bolting said blade through said bolt holes to the ends of the legs of said U-shaped bolt holder;



e) a positioning said replacement blade adjacent said stub;
f) applying a force between said stub and said blade preform with said force being applied through said legs and said collar;
g) locally heating said intended bond surface between said stub and said blade preform, to a temperature which causes softening, metal flow and bonding to cause bonding and then allowing the bond to cool;
h) removing said collar from said blade by machining; and
i) repeating steps d, e, f, and g until all stubs have blades attached thereto.

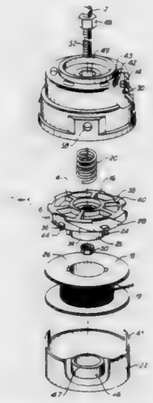
5,109,607

AUTOMATIC LINE TRIMMER HEAD

Robert G. Everts, Chandler, Ariz., assignor to Inertia Dynamics Corporation, Chandler, Ariz.

Filed Oct. 12, 1990, Ser. No. 597,818
Int. Cl.[5] B26B *7/00*
U.S. Cl. 30—276 **12 Claims**

1. A line trimmer head for attachment to a rotatable shaft driven by a motor, said line trimmer head comprising:
a generally cup-shaped housing having depending side walls defining an enclosure having a line outlet opening, said housing being rotated by said shaft;
a spool containing a supply of line disposed in said housing, said spool being normally rotatable with said housing in an interlocked position and selectively disengageable from said housing to freewheel an incremental amount in a disengaged position to allow an increment of line to be fed from said spool through said opening in said housing with a segment of said line extending outwardly from said housing;
indexer means disposed between said spool and said housing for disengaging said spool from said housing allowing relative rotational movement therebetween, said indexer means comprising an indexer cam journaled on said shaft, said indexer cam being axially and rotatably shiftable with respect to said shaft and being periodically axially shifted by said reduction in centrifugal force, said indexer cam including a circumferential side wall having means disposed between said side wall and an inner cylindrical surface of said housing for axially shifting said indexer cam between said interlocked position and a disengaged condition, said means for axially shifting comprising a cam track on said side wall and a follower on said inner surface of said housing;
spring means for biasing said indexer means away from said interlocked position; and



catch means for interlocking said spool and said housing in said interlocked position, said catch means being operatively engaged by said spring means provided that said length of line extending from said housing exerts a sufficient centrifugal force on the spool to maintain an interlock against the biasing force of said spring means, said interlock of said catch means being released by a reduction of the centrifugal force applied to said spool.

5,109,608

SCISSORS, IN PARTICULAR HAIRDRESSER'S SCISSORS

Gunther Pracht, Nettelbeckstr. 17, Solingen, Fed. Rep. of Germany D-5650

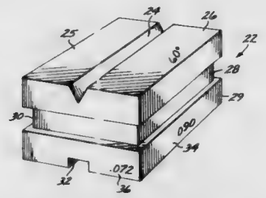
PCT No. PCT/EP89/00254, § 371 Date Oct. 15, 1990, § 102(e) Date Oct. 15, 1990, PCT Pub. No. WO89/10244, PCT Pub. Date Nov. 2, 1989
PCT Filed Mar. 11, 1989, Ser. No. 585,166
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1988, 3813273
Int. Cl.[5] B26B *13/12*
U.S. Cl. 30—341 **12 Claims**



1. Scissors, in particular hairdresser's scissors, comprising a long handle having a finger loop and a short handle having a pivotable finger loop, said pivotable finger loop being pivotably arranged about only one fixed oblique axis relative to a

centre line of the scissors, a handle ring (8) being mounted on the short handle (7), and the short handle ring (8) having two pins (9, 10) mounted inside said short handle ring (8) which are arranged on said only one fixed axis oblique relative to a centre line (M) of the scissors and which engage in bores in the pivotable finger loop (5) .

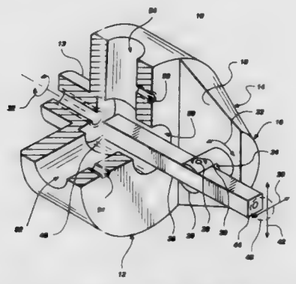
5,109,609
BALL-POINT SURFACE CHECKING DEVICE AND METHOD
Gunnar Anderson, 12750 Caravel, Cerritos, Calif. 90701
Filed Aug. 2, 1990, Ser. No. 561,923
Int. Cl.[5] G01C *25/00;* **G01B** *3/30*
U.S. Cl. 33—502 **7 Claims**



1. A device for checking the roundness of a ball-point type contact attachable to an instrument capable of measuring dimensional parameters associated with a threaded member wherein said ball-point type contact is employed to engage a predefined thread type on the surface of the threaded member, comprising:

a monolithic piece of hard, wear resistant, and geometrically stable material, having formed thereon at least one flat surface which has formed therein a reference groove of constant depth conforming in profile to the thread type of said threaded surface and additionally, having formed therein a comparison groove of constant depth, said comparison groove having a flat bottom surface, its width exceeding its depth and its depth selected such that a perfectly round ball-point type contact is insertable therein to a depth below the surface adjacent thereto exactly as far as such perfectly round ball-point type contact is insertable into said reference groove relative the surface adjacent thereto.

5,109,610
TRUE POSITION PROBE
James D. Johnson, 3141 W. 925 North, West Point, Utah 84105
Filed Apr. 23, 1991, Ser. No. 690,060
Int. Cl.[5] G01B *5/03, 7/03*
U.S. Cl. 33—559 **9 Claims**



1. A contact-type sensing probe comprising:

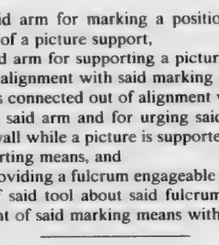
a probe body having an interior passageway along a longitudinal probe body axis and structured for mounting in a machine tool

a bearing mounted to said probe body having a bearing axis of rotation orthogonal to said longitudinal axis of said probe body;

swivel means having a first end structured to engage said bearing and rotate coaxially with said bearing axis of rotation and a second end having a slot and further having a swivel pin passageway defining a pivot axis of rotation orthogonal to said bearing axis of rotation and said longitudinal probe body axis; and

a probe shaft having a distal end, a proximal end extending into said interior passageway of said probe body and a probe shaft pin passageway structured to be coaxial with and a continuation of said swivel pin passageway in said swivel, said probe shaft being structured to fit into said slot in said swivel and receive a pin extending through said swivel and probe shaft pin passageways such that said probe shaft pivots around said pivot axis;

5,109,611
PICTURE POSITION MARKING TOOL
Ronald B. Houck, Marion, N.C., assignor to Avtech, Inc., Marion, N.C.
Filed May 29, 1991, Ser. No. 707,341
Int. Cl.[5] G01B *3/02*
U.S. Cl. 33—613 **16 Claims**



1. A tool for marking the position of a picture support on a wall comprising:

an arm,

means on said arm for marking a position on a wall for placement of a picture support,

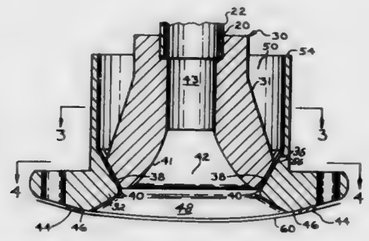
means on said arm for supporting a picture in substantially horizontal alignment with said marking means,

handle means connected out of alignment with said arm for supporting said arm and for urging said marking means against a wall while a picture is supported on said tool by said supporting means, and

means for providing a fulcrum engageable with the wall for rotation of said tool about said fulcrum means to cause engagement of said marking means with the wall.

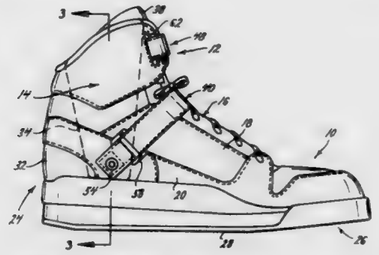
5,109,612
ASPIRATED SYPHON SHOE
Gerald L. Timm, Schoolcraft, Mich., assignor to The Johnson Corporation, Three Rivers, Mich.
Filed Dec. 6, 1990, Ser. No. 622,957
Int. Cl.[5] D06F *58/00*
U.S. Cl. 34—119 **8 Claims**

1. A low differential rotary syphon assembly for use with steam heated drying drums having an interior wall and condensate therein, comprising in combination, a shoe having a longitudinal axis, said shoe having a condensate flow surface and flow surface spacing means, said condensate flow surface having an opening receiving condensate, said spacing means adapted to maintain said condensate flow surface in opposed juxtaposition to the drying drum interior wall, said shoe including an open unobstructed central plenum in communication with said condensate flow surface opening receiving condensate and having an axis coaxial with said shoe longitudinal axis, at least one steam port defined in said shoe having a steam inlet spaced from said flow surface and an outlet discharging steam into said central plenum toward said condensate flow surface and the drying drum interior wall, whereby, steam



ejected from said port mixes with the condensate within said central plenum thereby forming a condensate mass of reduced density which enhances removal of said condensate, and condensate removal means attached to said shoe in communication with said central plenum.

5,109,613
SHOE WITH INTEGRAL ANKLE SUPPORT
Mark W. Van Dyke, Erie, Pa., assignor to Ronin, Inc., St. Louis, Mo.
Continuation of Ser. No. 369,267, Jun. 21, 1989, abandoned. This application Dec. 20, 1990, Ser. No. 630,450
Int. Cl.[5] A43B *7/20*
U.S. Cl. 36—89 **18 Claims**

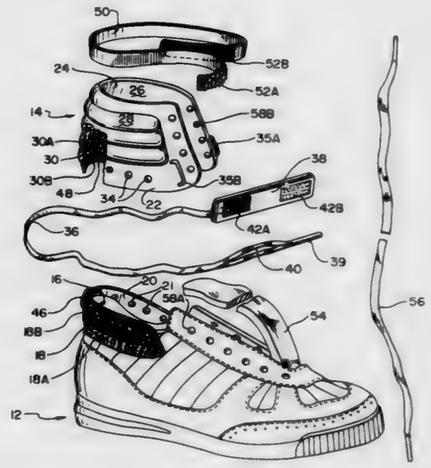


1. A shoe for providing ankle support, comprising:

means for inhibiting internal and external rotation of a rearward portion of a foot supported by the shoe, the inhibiting means comprising a plurality of generally opposed members, the inhibiting means attached to the shoe as a substantially integral part of the shoe, the inhibiting means attached to the shoe for movement generally independent of the shoe and for movement generally dependent upon motion of the foot, whereby the inhibiting means allows full-range dorsi and planter flexion of the foot; and

means for securing the inhibiting means in compressive coummunication with the ankle joint, the securing means securing the inhibiting means below an axis of rotation defined by the dorsi and the plantar flexion of the foot, the securing means limiting motion of a rearward portion of the foot.

5,109,614
CONVERTIBLE ATHLETIC SHOE HAVING LOW TOP AND HIGH TOP CONFIGURATIONS
Eddie G. Curry, 3515 S. Cottage Grove - Apt. 1013, Chicago, Ill. 60653
Filed Oct. 31, 1990, Ser. No. 606,531
Int. Cl.[5] A43B *3/24*
U.S. Cl. 36—100 **18 Claims**



17. A convertible shoe having low-top and high-top configurations, comprising:

a lower shoe portion including a foot opening;

an upper adapter portion having a leg opening and a lower shoe opening and a first series of holes;

means for securing the upper adapter portion to the lower shoe portion to place the convertible shoe in the high-top configuration including a first loop fastener portion and a first hook fastener portion both disposed on a foldable strip carried by and integral with the lower shoe portion at least partially surrounding the foot opening thereof and a second loop fastener portion and a second hook fastener portion both disposed on the upper adapter portion at least partially surrounding the lower shoe opening thereof;

the foldable strip having a second series of holes and capable of assuming folded and unfolded positions such that when said foldable strip is in said folded position and the upper adapter portion is separated from the lower shoe portion during use in the low-top configuration said first hook and loop fastener portions are concealed and such that when the foldable strip is in said unfolded position, said strip extends upwardly from said foot opening and said first hook and loop fastener portions are exposed;

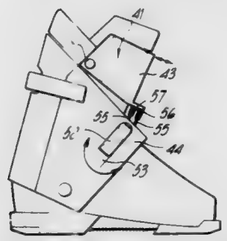
wherein when said convertible shoe is in said low-top configuration said first hook fastener portion engages with said first loop fastener portion to maintain said folded strip in said folded position and wherein when said convertible shoe is in said high-top configuration said first hook fastener portion engages said second loop fastener portion and said first loop fastener portion engages said second hook fastener portion to secure said upper adapter portion to said lower shoe portion and said second series of holes is aligned with said first series of holes of said upper adapter portion; and

means capable of passing through said aligned first and second series of holes for further securing said upper adapter portion to said lower shoe portion.

5,109,615
SUPPORT ADJUSTER DEVICE FOR THE QUARTERS OF SKI BOOTS

Mariano Sartor, Montebelluna, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Continuation of Ser. No. 412,038, Sep. 25, 1989, abandoned, which is a division of Ser. No. 785, Jan. 5, 1987, Pat. No. 4,888,889. This application May 21, 1991, Ser. No. 704,910
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—121 **1 Claim**



1. A ski boot with a shell defining a longitudinal direction thereof and comprising:

at least one quarter being connected to said shell and extending upwardly from said shell so as to define an upwardly extending extent thereof, said at least one quarter having a lower end and an upper end, said at least one quarter being connected to said shell at said lower end thereof, said at least one quarter having an extent in the upward direction from a lower edge of said lower end thereof to an upper edge of said upper end thereof, said extent of said at least one quarter extending upwardly from said shell past a user's ankle region up to a tibial portion, respectively a calf portion of the user's lower leg, thereby said upper end of said at least one quarter being arranged at said tibial portion, respectively said calf portion of the user's lower leg.

a support adjuster device for bearing against said tibial portion, respectively said calf portion of the user's lower leg, said support adjuster device comprising a concavely shaped body portion being pivotally mounted to said upper end of said at least one quarter, said concavely shaped body portion defining a concavity for at least partially embracing said tibial portion, respectively said calf portion of the user's lower leg facing said concavity of said concavely shaped body portion,

said concavely shaped body portion having upwardly extending spaced apart lateral side wall portions and an upwardly extending central portion bridging said side wall portions, said concavely shaped body portion having an overall height being smaller in size than said upwardly extending extent of said at least one quarter, said concavely shaped body portion having a lower end and an upper end, said concavely shaped body portion having an upwardly extending extent from a lower edge of said lower end thereof up to an upper edge of said upper end thereof, each one of said lateral side wall portions of said concavely shaped body portion being pivotally connected respectively to lateral side portions of said upper end of said at least one quarter,

means for pivotally mounting said each one of said lateral side wall portions of said concavely shaped body portion respectively to said lateral side portions of said upper end of said at least one quarter about a tranverse axis extending transversely to said longitudinal direction of said shell and transversely to said side wall portions of said concavely shaped body portion and transversely to said lateral side portions of said upper end of said at least one quarter, said concavely shaped body portion being pivotally rotatable about said transverse axis between a plurality of angular positions defined by a relative angular position of said extent of said concavely shaped body portion with respect to said extent of said at least one quarter, wherein

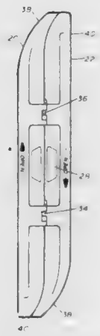
said concavely shaped body portion is releasably lockably positionable in at least one of said plurality of angular positions so as to define a releasable locked non-rotatable stable rigid connection relationship between said concavely shaped body portion and said at least one quarter which defines a fixed non-rotatable relative angular position of said extent of said concavely shaped body portion with respect to said extent of said at least one quarter, said ski boot further comprising:

releasable locking means for releasably locking said concavely shaped body portion in a selected one of said plurality of angular positions which defines a fixed non-rotatable relative angular position of said extent of said concavely shaped body portion with respect to said extent of said at least one quarter independently from the angular position of said at least one quarter with respect to said shell, thereby said concavely shaped body portion being adapted to exert on the tibial portion, respectively the calf portion of the user's lower leg a selected rigid supporting action independent from the closing action of said ski boot.

5,109,616
EMERGENCY SNOWSHOES CAPABLE OF BEING NESTED, HINGED AND LOCKED TOGETHER

Craig L. Lush, 8148 Cliffview Ave., Springfield, Va. 22153

Filed Oct. 24, 1990, Ser. No. 602,736
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—122 **1 Claim**



1. A pair of emergency snowshoes able to be nested together to form a back-pack with a cavity for carrying articles, each snowshoe comprising:

a top surface for receiving a foot,

a bottom surface for contact with snow,

a deck portion which consists of a front, mid and rear section, the deck portion being essentially flat except for the forward tip of the front section being curved upwardly, the deck portion being peripherally symmetric about a central longitudinal axis and a central transverse axis,

a toe hole within the mid-section of the deck,

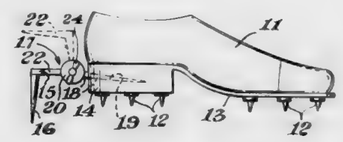
a vertical wall extending continuously around the periphery of the deck at varying heights, the wall containing hinge means and locking means, each on a respective longitudinal side,

the hinge means and the locking means arranged on each snowshoe such that when the top surface of a first snowshoe is facing the top surface of a second snowshoe, which is rotated 180 degrees from its mirror-image position, the first snowshoe can nest with the second snowshoe, allowing the respective hinge means and locking means of each snowshoe to mate thus forming a secure cavity between the decks.

5,109,617
SAND TRAP RAKE ACCESSORY FOR GOLF SHOES

William R. Nummy, 711 W. Meadowbrook, Midland, Mich. 48640

Filed May 9, 1991, Ser. No. 697,431
Int. Cl.[5] A43B *5/00*
U.S. Cl. 36—132 **7 Claims**



1. For attachment to a golf shoe having a heel, an accessory for smoothing out depressions in a golf course sand trap comprising

a tined rake about the width of the shoe heel,

a mounting for the rake adapted to secure it to the shoe in a transverse position rearward of the heel,

the mounting including pivot means allowing adjustment of the rake from a lowered position in raking contact with the ground to a raised position clear of the ground,

the pivot means comprising a mating pair of opposed disks, one disk being stationary and secured to the shoe mounting and the other disk being movable and secured to the rake,

the mating disks being compressed together by adjustable locking means comprising a pivot bolt extending axially through mating holes centered in the disks, and

compression means on the bolt manually tightenable to lock the disks together.

5,109,618
SNOW-PLOW

Walter Grübler, Brannenburg, Fed. Rep. of Germany, and Kurt Kopp, Kufstein, Austria, assignors to Martin Beilhack Maschinenfabrik und Hammerwerk GmbH, Rosenheim, Fed. Rep. of Germany

PCT No. PCT/EP88/01035, § 371 Date May 8, 1990, § 102(e) Date May 8, 1990, PCT Pub. No. WO89/04892, PCT Pub. Date Jun. 1, 1989
PCT Filed Nov. 13, 1988, Ser. No. 466,325
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1987, 3738734; Mar. 10, 1988, 3808002
Int. Cl.[5] E01H *5/04*
U.S. Cl. 37—232 **15 Claims**

1. A snow plow for a vehicle comprising:

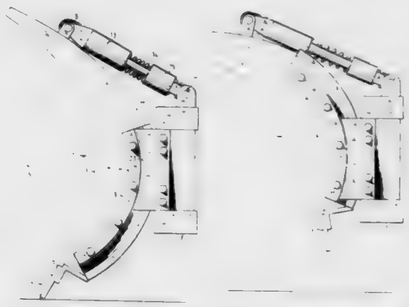
a snow plow blade;

a support frame for securement to the vehicle;

means for connecting said blade and said support frame one to the other enabling pivotal deflection of the blade in one direction relative to said support frame and about an axis upon the blade encountering a ground obstacle;

said connecting means including a pair of generally curved guides on said blade and said support frame defining generally curved, elongated contact surfaces, respectively, relatively slidable about said axis with substantially the entirety of one of said curved elongated contact surface lying in engagement with the other of said curved elongated contact surface throughout the full range of deflection of said blade relative to said support frame about said axis; and

a force limiter disposed between said blade and said support frame for preventing substantial deflection of the blade relative to the support frame in response to a force, up to and including a predetermined magnitude of force, applied to said blade by the ground obstacle, tending to deflect the blade in said one direction, said force limiter enabling deflection of said blade in said one direction in response to a force applied to said blade in excess of said

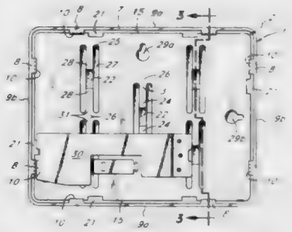


predetermined magnitude of force and including means enabling deflection of said blade in said one direction, after exceeding said predetermined magnitude of force, in response to an applied force less than said predetermined magnitude of force.

5,109,619
PICTURE FRAME RETAINER

Michael K. Noggle, Yorba Linda, Calif., assignor to Southern Plastic Mold, Inc., Anaheim, Calif.

Continuation of Ser. No. 443,271, Nov. 29, 1989, abandoned.
This application Jan. 31, 1991, Ser. No. 649,366
Int. Cl.[5] G09F *1//12*
U.S. Cl. 40—152.1 **27 Claims**



8. A picture frame unit comprised of a frame and a one-piece retainer with said retainer having one or more pads, each pad being formed on one or more flexible strips, such that when the retainer is engaged into the back of the frame, the pads are urged forward and cause pressure to be applied against a front panel of the frame thereby holding in place a picture between said pads and said front panel, and causing said strips to flex rearward so that said pads are displaced rearward toward the plane of the retainer.

5,109,620
FLOWING LIQUID ILLUSION

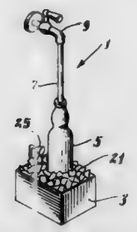
Arthur L. Torrence, Newtown, Conn., assignor to Mechtronics Corporation, Stamford, Conn.

Filed Aug. 19, 1991, Ser. No. 746,736
Int. Cl.[5] G09F *19/00*
U.S. Cl. 40—406 **14 Claims**

1. A display for creating the illusion of liquid streaming from an unattached source, said display including

a base supporting a receptacle, said base and said receptacle

being interconnected and capable of holding said liquid, a spigot positioned above said receptacle, a transparent outer tube leading from said spigot to said receptacle and supporting said spigot, a second tube within said outer tube, said second tube running from said base to said



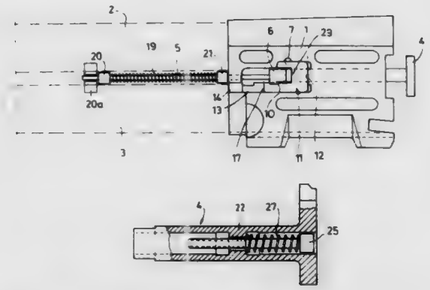
spigot, means for forcing said liquid from said base up said second tube, and means interconnecting the upper ends of said outer tube and said second tube,

whereby said liquid pass upwardly through said second tube and downwardly to said receptacle between said second and outer tube said outer tube.

5,109,621
CARTRIDGE EJECTION DEVICE

Horst Blaser, Isny im Allgäu, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jan. 14, 1991, Ser. No. 640,873
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1990, 4000816
Int. Cl.[5] F41A *15/06*
U.S. Cl. 42—46 **10 Claims**

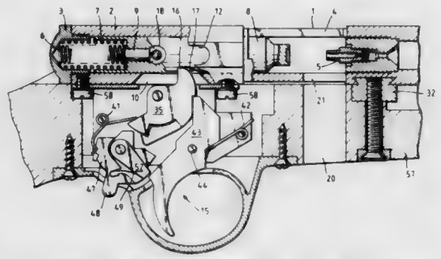


1. A break-open firearm having with at least one barrel and a cartridge ejection device in a monobloc unit, comprising per barrel a cartridge ejector movable in the barrel direction, said cartridge ejector, during tilting of the at least one barrel, being movable via a cam and by a corresponding guidance of the cam in a breech casing from a retracted position into a protruding position, and performing, during straightening of the at least one barrel, a reverse movement wherein, during straightening, an ejector spring can be tensioned at the same time, and, per barrel, a control bolt is provided extending through a barrel wall and effecting, after a shot has been fired, that the cartridge ejector during tilting remains in a tensioned position, and the tensioned position can be abolished only when the at least one barrel has been entirely tilted, characterized in that a control flap with a detent is provided which is mounted to the outside of the monobloc unit, that the control flap can be moved about an axis transversely to the barrel direction, the control bolt not being in engagement with the cartridge ejector but rather, after a shot has been fired, lifting the control flap so that, with the control bolt in the extended position, the detent on the control flap abuts against an edge on the cartridge ejector and thereby the cartridge ejector initially remains in the tensioned position during further tilting of the at least one barrel whereas, when the control flap is not extended, the movement of the cartridge ejector is not impeded.

5,109,622
RIFLE

Julian Echeberria, Eibar, Spain, assignor to Dikar, S. Coop, LTDA., Bergara, Spain

Filed Dec. 21, 1990, Ser. No. 629,640
Claims priority, application Spain, Dec. 26, 1989, 8904357
Int. Cl.[5] F41A *19/13, 17/30*
U.S. Cl. 42—69.02 **8 Claims**



1. A rifle comprised of a support area of the barrel and a retaining and safety mechanism connected with a striker which moves through the inside of the rear portion of the barrel, wherein, the barrel is a single piece in its whole length and is directly connected with a butt and front part thereof in which barrel, from its most recessed end is equipped with a threaded end opening recessed internally which receives a threaded plug in which concentric springs of the striker rest; a lower longitudinal opening for the passage of a tooth projecting from a sear piece of the retaining and safety mechanism in its connection with the striker; an internal horizontal blind perforation of circular section executed according to a medium plane of the barrel, which accedes through its diametrical end to the inside of the barrel through a longitudinal slot; a longitudinal opening toward the front of said longitudinal slot which occupies a section greater than 90 degrees made above a medium longitudinal plane of the barrel; a lower port below the front end of said longitudinal opening near the position of a primer.

5,109,623
LOADING DEVICE FOR MUZZLE-LOADING FIREARMS

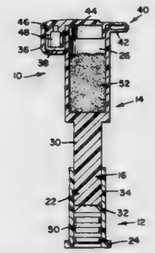
Kendrick L. French, Lebanon, Me., assignor to K. W. Thompson Tool Company, Inc., Rochester, N.H.

Filed Jan. 31, 1991, Ser. No. 648,570
Int. Cl.[5] F41C *27/00*
U.S. Cl. 42—90 **3 Claims**

1. A charge container for use with a muzzle-loading firearm, said container comprising:

(a) a first body having an elongated projectile chamber for containing a projectile, said first body having an inlet opening to the chamber at one end of the first body and an outlet opening to the chamber at the opposite end of the first body, said projectile chamber being substantially longer than said projectile said chamber being defined by an inner wall which has first detent means,

(b) a second body having a charge chamber for holding a powder charge, an opening to the charge chamber at one end of the second body, and an elongated plunger at the opposite end of the second body which is slidably mounted in said projectile chamber for movement from said inlet opening to said outlet opening, said plunger having a free end for engaging and for pushing a projectile which is located within said projectile chamber out of said projectile chamber through said outlet opening, whereby the projectile is pre-loaded into the muzzle opening of a firearm when the opposite end of the first body is positioned against said muzzle so that said outlet opening is aligned with said muzzle opening, said plunger having an outer surface which has a second detent means for cooperating with said first detent means for positioning and yieldably maintaining the free end of said plunger between said inlet opening and said projectile when said projectile is located in said projectile chamber adjacent said outlet opening, and



(c) closure means for sealing the opening to said charge chamber and for confining said powder charge within said charge chamber.

5,109,624
AUTOMATIC FISHING DEVICE

Byron D. Bryan, Rte. 1 Box 197, Taylor, Ark. 71861

Filed Mar. 18, 1991, Ser. No. 670,911
Int. Cl.[5] A01K *97/12*
U.S. Cl. 43—15 **13 Claims**

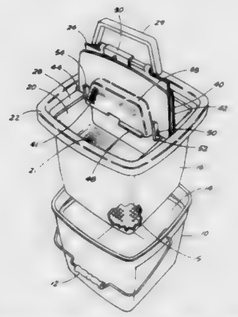


1. An automatic fishing device comprising frame means adapted for suspension over a water body; a curved passage provided in said frame means; an operating line slidably disposed in said curved passage, wherein a first segment of said operating line and a second segment of said operating line project downwardly from said curved passage and said frame means in spaced relationship; a hook carried by said first segment and a weight carried by said second segment; and a plate carried by said frame means adjacent to said first segment, at least one slot provided in said plate, whereby said hook is suspended at a selected depth in the water body and said weight is suspended over the water body responsive to engagement of said first segment of said operating line with said at least one slot and said hook is set in the mouth of a striking fish responsive to disengagement of said first segment from said at least one slot and dropping of said weight toward the water body.

5,109,625
BAIT BUCKET WITH LOCKING BAIT TRAY

Roger W. Skrede, Minneapolis, Minn., assignor to Future Design Corporation, Minneapolis, Minn.

Filed Oct. 5, 1990, Ser. No. 593,693
Int. Cl.[5] A01K *97/05*
U.S. Cl. 43—56 **9 Claims**



1. A live bait container providing easy access to live bait contained in water therein, the bait container comprising:

(a) an inner shell having an inside surface, outside surface, bottom and open top;

(b) a bait tray adapted to fit within said inner shell and also adapted to allow water to pass through said tray while retaining live bait within a space formed above said tray and within said inner shell, said tray having an upper position in which the live bait is held proximate said top of said inner shell and a lower position in which said tray is proximate the bottom of said inner shell;

(c) cover means for covering said inner shell when said tray is located in said lower position and said cover means is in its covered position, said cover means further having an open position to allow access to the live bait when said tray is located in said upper position;

(d) opening means attached to said tray for automatically opening said cover means when said tray is brought into said upper position;

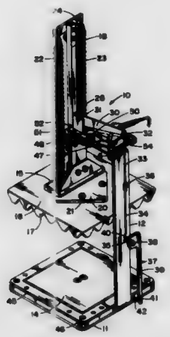
(e) retaining means attached to said cover means for automatically retaining said cover means in said open position and said tray in said upper position; and

(f) locking means for locking said cover means in said covered position and said tray in said lower position, said locking means having locked and unlocked positions;

wherein said bait tray is operatively connected to a handle for raising said tray to said upper position when said locking means is in said unlocked position, and for lifting said live bait container when said locking means is in said locked position and

wherein said bait tray separates said inner shell into two or more compartments to allow the storage of two or more types of live bait without mixing of the bait.

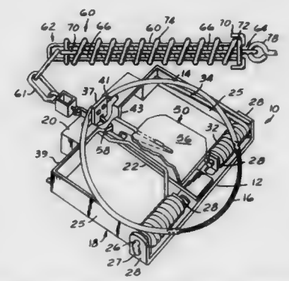
5,109,626
ANIMAL TRAP
Muu P. Ha, 5713 Cardinals Guard Ave., Orlando, Fla. 32809
Filed Feb. 4, 1991, Ser. No. 650,021
Int. Cl.[5] A01M *23/30*
U.S. Cl. 43—78 **6 Claims**



1. An animal trap comprising:
a frame having a base with an upright frame member extending generally perpendicular to said base and a top frame portion extending from said upright frame member over said base;
a movable floor attached to said frame base, said floor having a release pin protruding therefrom;
a slidable trap jaw slidably attached to said frame over said base and movable floor, said jaw having a shaft extending therefrom, said shaft being slidably mounted in said frame top frame portion;
spring means having at least one tension spring connected between said top frame portion and said jaw shaft whereby raising said jaw shaft and jaw will extend said spring means;
actuating means for releasing said cocked jaw to propel said jaw towards said frame base and to entrap an animal between said movable floor and said jaw, said actuating means having a linkage between said jaw shaft and said movable floor to release said jaw responsive to a predetermined pressure on said movable floor, whereby an animal is trapped by stepping on said movable floor, said actuating means having a cocking arm supported on said frame for holding said jaw in a raised position against the spring tension of said extended spring means; and
a safety lock mechanism having a rotatable safety arm pinned to said frame top portion and having a safety lock pin on one end thereof, said safety arm rotatably to place said safety lock pin in an aperture in said shaft to lock said shaft in position.

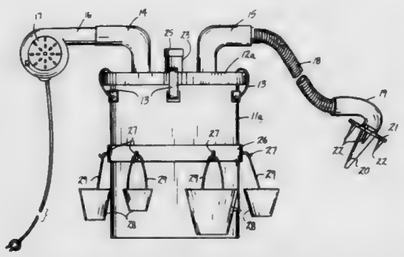
5,109,627
ANIMAL TRAP
Donald R. Lee, Box 588, Sundance, Wyo. 82729
Filed Jun. 27, 1991, Ser. No. 722,510
Int. Cl.[5] A01M *23/26, 23/34*
U.S. Cl. 43—88 **10 Claims**

1. An animal trap comprising a base, a pair of arms extending lengthwise of said base and each having front and rear ends, means pivotally connecting said rear ends of said arms to said base for swinging movement of said arms away from one another to an outer spread-apart position and toward one another to an inner closed position, a flexible linear element extending between and connecting the front ends of said arms, a clamping plate, means mounting said clamping plate on said base for movement between forward and rearward positions, said clamping plate having means engaging said arms and operative during movement of said clamping plate to its forward position to swing said arms toward one another to said inner closed position, spring means urging said clamping plate toward said forward position, a retainer for releasably holding said clamping plate in said rearward position against the force of said spring means, a release member for said retainer disposed in a space bounded by said flexible linear element and



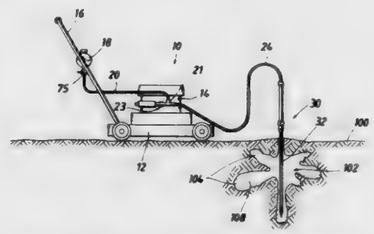
said arms when said arms are spread apart, said release member being operative to release said retainer when pressed upon by the extremity of an animal extended into said space permitting said clamping plate to be moved to its forward position by said spring means, said clamping plate when in said forward position cooperating with said flexible linear element in gripping the extremity of an animal extended into said space.

5,109,628
MOLE AND GOPHER CONTROL APPARATUS
Lee J. Ellefson, 1143 Newport, Coos Bay, Oreg. 97420
Filed May 29, 1990, Ser. No. 529,535
Int. Cl.[5] A01M *13/00*
U.S. Cl. 43—124 **1 Claim**



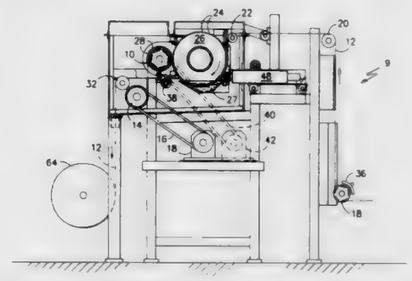
1. A portable volatile fluid discharging apparatus comprising, in combination,
a container arranged for receiving a predetermined quantity of said fluid, and
a lid securable to the container overlying an upper terminal end of the container to define a compartment therewithin, and
a first outlet duct directed through the lid and fixedly mounted to the lid into the compartment, and
an outlet duct fixedly mounted to the lid in pneumatic communication with the compartment, and
a blower means in operative association with the inlet duct to direct pressurized air into the compartment, and
a flexible delivery tube secured to a free terminal end of the outlet duct to receive a pressurized gas mixture from the compartment, and
a tapered conical venturi nozzle mounted to a forward terminal end of the delivery tube remote from the outlet duct to direct the gas mixture through the venturi tube at a predetermined velocity, and
wherein the container includes a plurality of clamps, each of the clamps pivotally mounted to the container at a lower terminal end of each clamp to permit pivotment of each clamp relative to the container permit overlying engagement of an upper surface of the lid to secure the lid to the container, and a clamp positioned at each quadrant of the lid and container to ensure a sealing relationship between the lid and the container, and
wherein the inlet duct is defined as an elbow, including an inlet vertical duct leg integrally secured to the lid, and a horizontal inlet duct leg arranged parallel to a top surface of the lid, and the outlet duct including an outlet duct vertical leg integrally secured to the lid and arranged parallel to the inlet duct vertical leg, and an outlet duct horizontal leg arranged orthogonally to the outlet duct vertical leg and arranged parallel to the inlet duct horizontal leg, and
wherein the blower means includes a blower nozzle received within the inlet duct horizontal leg, and the outlet duct horizontal leg including the delivery tube secured thereto, wherein the delivery tube is defined as an elongate flexible corrugated delivery tube to permit flexure of the tube and orientation of the tube relative to the outlet duct, and
wherein the venturi nozzle is defined by a venturi nozzle axis, and a positioning plate integrally mounted about the venturi nozzle and orthogonally aligned relative to the venturi nozzle axis, and the positioning plate including a matrix of spikes integrally and orthogonally mounted to the positioning plate, wherein the spikes are each arranged parallel to the venturi nozzle axis, and
wherein the container includes a circumferential belt fixedly mounted about an exterior surface of the container, and the belt including a predetermined number of outwardly directed hooks orthogonally mounted to the belt, and each hook including a truncated conical plug mounted thereto, and each plug defined by a varying conical configuration to accommodate variously sized rodent openings of a subterranean tunnel network.

5,109,629
METHOD AND APPARATUS FOR KILLING SUBTERRANEAN INSECTS
William G. King, Jr., 2017 Yorktown Ct. South, League City, Tex. 77573, and W. Edward Lawrence, 2323 W. Bay Area Blvd., #901, Webster, Tex. 77598
Filed Oct. 26, 1990, Ser. No. 603,792
Int. Cl.[5] A01M *13/00*
U.S. Cl. 43—132.1 **4 Claims**



1. A system (**10**) for applying vaporized insecticide to a subterranean ant colony (**102**) comprising,
a machine (**12**) including an internal combustion engine (**14**) having an exhaust port,
a tank (**18**) mounted on said machine (**12**) for holding liquid insecticide,
a T-pipe (**25**) having a base member (**22**) and a cross member (**40, 41**) in communication with said base member, said cross member having first (**40**) and second (**41**) arms in communication with said base member which is connected to said exhaust port,
a tube (**20**) connected from said tank (**18**) to a first arm (**40**) of said cross member of said T-pipe (**25**), said tube (**20**) adapted to conduct liquid insecticide from said tank (**18**) to the interior of said first arm (**40**),
a metallic tubular probe (**30**) having an insertion end (**34**) adapted for insertion into said subterranean ant colony (**102**) and having a plurality of holes (**36**) formed therein in a region near its insertion end, said probe having a connection end,
a flexible hose (**24**) connected at one end to said connection end of said tubular probe (**30**) and adapted for removable connection at its other end to said first arm (**40**) of said T-pipe (**25**),
a muffler (**26**) connected to said second arm (**41**) of said cross member of said T-pipe (**25**), and
means (**45**) for removably plugging said first arm (**40**) of said T-pipe (**25**) when said flexible hose is (**24**) not connected thereto and for removably plugging said muffler (**26**) when said flexible hose (**24**) is connected to said first arm of said T-pipe.

5,109,630
MACHINE AND METHOD TO ENHANCE FABRIC
Franklin S. Love, Columbus, N.C., and Joseph E. Rumler, Chesnee, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.
Filed Jan. 8, 1990, Ser. No. 461,687
Int. Cl.[5] B24B *7/00*
U.S. Cl. 51—74 R **4 Claims**

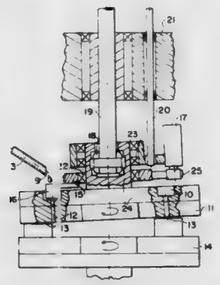


1. Apparatus to treat the surface of a fabric: a treating roll coated with tungsten carbide, a first means to supply a fabric into contact with the surface of said treating roll, means to drive said treating roll in a direction opposite to the direction of travel of said fabric and means to collect the treated fabric, said first means including a pair of slidably spaced collars on said treating roll and a pair of spaced tension discs connected to said collars on the inlet to said treating roll, said collars and said tension discs having pins on the surface thereof.

5,109,631
FINISH-MACHINING MACHINE COMPRISING MEANS FOR FEEDING AN ABRASIVE SLURRY AT A CONTROLLED RATE
Klaus Biebesheimer, Frankfurt am Main; Alexander Hofsess, Dreieich, and Dieter Simpfendörfer, Mühlheim/M., all of Fed. Rep. of Germany, assignors to Diskus Werke Frankfurt am Main Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany
Filed Jul. 16, 1990, Ser. No. 554,144
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1989, 3925274; May 21, 1990, 4016335
Int. Cl.[5] B24B *37/04, 57/02*
U.S. Cl. 51—111 R **13 Claims**

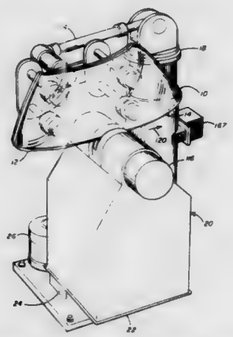
1. In a finish-machining machine comprising
an upper and a lower finishing disk, which are mounted to be rotatable on a vertical axis of rotation, said upper disk

having a top surface and a bottom surface, which faces and defines a working gap with said lower disk, and
feeding means for feeding an abrasive slurry to said working gap,
the improvement residing in that
said upper disk is formed in said top surface with annular groove means centered on said axis and is formed with a plurality of bores, which are spaced around said axis and open to said groove means and in said bottom surface of said upper disk, and



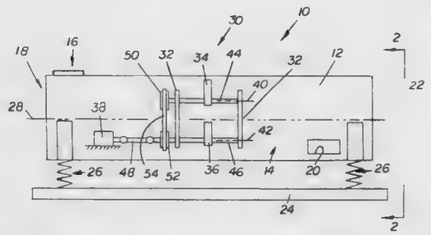
said feeding means comprise supplying means for supplying said abrasive slurry to said annular groove means and scraping means, which extend into said groove means and are mounted to be rotatable on said axis relative to said upper disk,
wherein means are provided for rotating said upper disk on said axis and said feeding means comprise
a speed sensor for indicating a rotation of said upper disk at a speed below a predetermined speed and
drive means for rotating said scraping means about said axis when said speed sensor indicates a rotation of said upper disk at a speed below said predetermined speed.

5,109,632
AUTOMATIC INTERLAYER TRIMMING
Jonathan E. Hostler, Verona, and Frank J. Byers, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Apr. 3, 1990, Ser. No. 503,588
Int. Cl.[5] B24B *21/00*
U.S. Cl. 51—135 R **25 Claims**



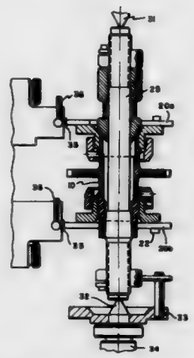
1. An apparatus for removing excess interlayer extending beyond the edges of a laminate, said laminate having an interlayer material between and bonded to a pair of glass sheets, said glass sheets having a predetermined peripheral shape and size and cross-sectional edge configuration, comprising:
an abrasive belt;
at least one roller to support said belt, said roller being capable of conforming to said cross-sectional edge configuration of said sheets;
means to provide relative movement between said laminate and said belt; and
means to urge said belt and said edge of said laminate toward one another to apply sufficient pressure to said edge of said laminate to remove said excess interlayer without substantially altering said predetermined peripheral shape and size and cross-sectional edge configuration of said glass sheets.

5,109,633
WORKPEICE TUMBLING AND CONVEYING APPARATUS
Michael W. Durnil, Louisville, Ky., assignor to Carrier Vibrating Equipment, Inc., Louisville, Ky.
Filed Aug. 9, 1990, Ser. No. 664,844
Int. Cl.[5] B24B *31/00*
U.S. Cl. 51—163.1 **29 Claims**



1. A workpiece tumbling and conveying apparatus for surface treating and conveying workpieces, comprising:
an elongated generally horizontal housing having an arcuate bottom wall concavely facing toward the interior of the housing, the housing having an inlet proximate one end and an outlet proximate the other end;
a base member;
resilient means for resiliently supporting the housing above the base member; and
vibratory generating means structurally associated with the elongated housing for generating a vibratory force and imparting the vibratory force to the housing, the vibratory force comprising a force couple component continuously varying in magnitude between a maximum value and a zero value, and a linear force component continously varying in magnitude between a zero value and a maximum value, the varying magnitude of the force couple component varying inversely to the varying magnitude of the linear force component such that at the instant the magnitude of the linear force component is at a maximum value the magnitude of the force couple component is zero, and at the instant the magnitude of the force couple component is at a maximum value the magnitude of the linear force component is zero, the vibratory force vibrating the housing such that the loci on the arcuate bottom wall of the housing moves in elliptical paths all having a common instant center of motion at any instant in time.

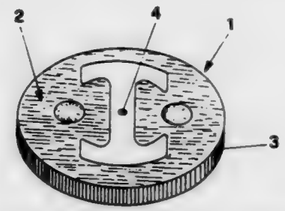
5,109,634
METHOD AND APPARATUS FOR MACHINING CENTERING CHAMFERS
Camille M. Cattelain, Franconville, and Francis Girard, Viroflay, both of France, assignors to Societe anonyme dite Hispano-Suiza, Saint-Cloud, France
Division of Ser. No. 352,986, May 17, 1989. This application Mar. 5, 1991, Ser. No. 664,803
Claims priority, application France, May 17, 1988, 88 06590
Int. Cl.[5] B24B *5/08*
U.S. Cl. 51—237 R **3 Claims**



1. Apparatus for establishing a reference rotational axis for a gear shaft comprising:
a) rolling path elements having centers;
b) attachment means to attach a rolling path element to each end of the gear shaft comprising:
i) support collars fixed attached to each end of the gear shaft;
ii) a slot defined by each rolling path element; and,
iv) a bolt extending through the slot and threadingly engaging a support collar to enable the position of each rolling path element to be adjusted with respect to the associated support collar;
c) means to rotate the gear shaft comprising:
i) a mandrel mounted in the gear shaft;
ii) a center device engaging each end of the mandrel;
iii) drive means to rotate the mandrel with respect to the center means about a reference axis; and
d) means to adjust the positions of the rolling path elements relative to the gear shaft such that their centers coincide with the reference axis and to compensate for any offset or warp of the gear shift.

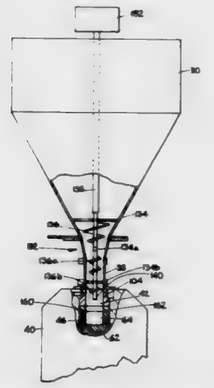
5,109,635
METHOD FOR MANUFACTURING WATCH DIALS OF MURRINO GLASS AND DIALS OBTAINED WITH THIS METHOD
Giuseppe Inzerillo, S. Polo, 1949/A, and Franco Nordio, Cannaregio, 2656, both of Venezia, Italy
Filed Jun. 7, 1990, Ser. No. 536,151
Claims priority, application Italy, Jun. 12, 1989, 85607 A/89
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—283 R **7 Claims**

1. A method for the production of watch dials made of "murrina" glass having a considerable thickness and obtained by melting a plurality of small glass cylinders placed next to each other so as to form a pattern, said method comprising the steps of
axially drilling a "murrina" disc with a hole having a diameter to allow the passage of a watch-hand supporting shaft therethrough;
conducting one or more honing phases in order to obtain two surfaces of the disc which are parallel to each and having a thickness for use as a dial for a watch;
the outer edge of the "murrina" disc to obtain a desired outer perimeter; and



further polishing at least one of the two visible surfaces of the "murrina".

5,109,636
PARTICLE BLAST CLEANING APPARATUS AND METHOD
Daniel L. Lloyd, Mason; Newell D. Crane, Cincinnati, and David E. Moore, Milford, all of Ohio, assignors to Cold Jet, Inc., Milford, Ohio
Continuation of Ser. No. 227,090, Aug. 1, 1988, Pat. No. 4,947,592. This application Aug. 13, 1990, Ser. No. 566,741
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—320 **20 Claims**



19. An improved method for radially transporting sublimable pellets in a particulate blast cleaning apparatus comprising the steps of:
(a) providing a source of sublimable pellets to a receiving station;
(b) rotating a radial transport rotor having at least one pellet transport cavity disposed in the circumferential surface of said radial transport rotor, with said transport cavity being alternately aligned with said receiving station and a radially spaced discharge station;
(c) providing a mechanical feed of said pellets into said transport cavity of said radial transport rotor when the respective transport cavity is indexed with said receiving station;
(d) rotating said radial transport rotor such that said transport cavity is moved radially from said receiving station to said discharge station;
(e) supplying a pressurized transport gas adjacent said discharge station for discharging said pellets from said transport cavity; and

(f) conveying said pellets to a discharge nozzle.

5,109,637
ABRADING IMPLEMENT
Edward J. Calafut, 2590 Glenwood Rd., Vestal, N.Y. 13850
Filed Nov. 29, 1990, Ser. No. 619,743
Int. Cl.[5] B24D *15/04*
U.S. Cl. 51—391 **4 Claims**



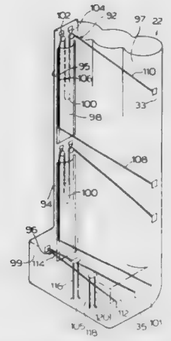
1. An abrading implement comprising:
core means of a first material of substantially solid composition that is a flexible and resilient polymer with a pair of major opposite, planar surfaces;
a layer of a second material secured on each said major surface having a foam composition that is a flexible and resilient polymer; and
a compressible mat of unwoven polymeric fibers affixed to each said layer with said fibers having adhered thereto abrading particles.

5,109,638
ABRASIVE SHEET MATERIAL WITH NON-SLIP BACKING
Byron L. Kime, Jr., Bettendorf, Iowa, assignor to Microsurface Finishing Products, Inc., Wilton, Iowa
Filed Mar. 13, 1989, Ser. No. 322,574
Int. Cl.[5] B24D *11/00*
U.S. Cl. 51—401 **23 Claims**



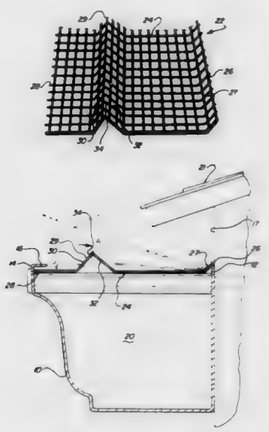
22. An improved indexable multi-layer coated abrasive material comprising:
at least one first base layer of a non-compressible, non-stretchable material provided with an upper surface and a lower surface;
at least one binder layer of a resiliently compressible material provided with a first surface and a second surface, the first surface of the binder layer in permanent, confirming engagement with the lower surface of the base layer;
at least one adhesive layer of a substantially insoluble resinous material coating and conforming to the second surface of the binder layer;
at least one layer of finely divided abrasive particles partially and substantially permanently embedded in the adhesive layer; and
at least one second backing layer of a resilient, non-tacky gripper material provided with an inner face in permanent, conforming engagement with the upper surface of the base layer and an outer face having resilient textured pattern formed thereon; said outer face presenting an outwardly exposed, readily releasable griping surface for frictionally and releasably engaging holding means when said holding means are pressed against said exposed surface and for ready release from said holding means for slidable selective movement of said abrasive material when the engagement pressure therebetween is released.

5,109,639
DOCK SEAL
David W. Moore, Ajax, Canada, assignor to Super Seal Mfg. Ltd., Ontario, Canada
Continuation of Ser. No. 307,510, Feb. 8, 1989, Pat. No. 4,916,870. This application Mar. 15, 1990, Ser. No. 494,123
Int. Cl.[5] E04B *1/34*
U.S. Cl. 52—2.12 **13 Claims**



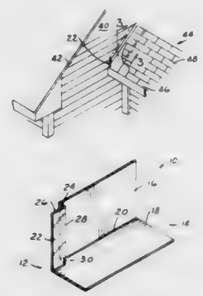
1. For use with a dock seal device for positioning about an opening in a wall face, which opening has a phantom axis of entry extending through the opening generally perpendicularly of the wall face, and a support structure having a rear end adapted to be positioned on the wall face about the opening such that said support structure projects forwardly of the wall face to a front end spaced apart from the wall face, the improvement being an inflatable seal supported by said support structure, said inflatable seal comprising:
an upper, hollow inflatable member, inflatable by air under pressure, for location in opposed spaced apart relationship with the rear end of the support structure, and a pair of vertical, hollow inflatable members, inflatable by air under pressure, for location in opposed spaced apart relationship with the rear end of the support structure,
said vertical inflatable members being in facing spaced apart relationship and being inflatable directly towards each other, laterally of the opening along a phantom axial line of inflation generally perpendicular to the phantom axis of entry,
said facing spaced apart relationship of said vertical inflatable members being maintained throughout inflation along said phantom axial line of inflation, and said opposed spaced apart relationship of said inflatable seal and the rear end of the support structure being maintainable throughout inflation of the inflatable seal, wherein said upper inflatable member comprises a horizontal inflatable drop curtain, said inflatable drop curtain and said vertical inflatable members being separately formed and including air ducts connecting the interior of said inflatable drop curtain with the interiors of the vertical inflatable members, and wherein each of said vertical inflatable members has opposed first and second side walls in facing relationship, said facing relationship of said first and second side walls being maintained throughout inflation of said inflatable vertical members, and
at least one retraction system housed in each inflatable vertical member comprising a counterweight disposed adjacent said first side wall, first and second adjacent pulleys supported on said first side wall, vertically above said counterweight; a first elastic cord extending elastically from said counterweight over said first pulley to said second side wall, and a second elastic cord extending elastically from said counterweight over said second pulley and being guided along said first wall to a position below said counterweight and thence to said second side wall.

5,109,640
SCREEN FOR A RAIN GUTTER
Ronald Creson, 11490 Maxfield Blvd., Hartland, Mich. 48353
Filed Mar. 18, 1991, Ser. No. 670,894
Int. Cl.[5] E04D *13/00*
U.S. Cl. 52—12 **4 Claims**



1. For use in conjunction with an elongated rain gutter of the type having two spaced apart and generally parallel upper edges which form an open top of the rain gutter, and a lip extending along an upper outer edge and an inner edge attached to a building facia board, a device to prevent the entry of debris into the rain gutter comprising:
an elongated screen having spaced apart and parallel inner and outer edges, said screen being dimensioned so that, with said outer screen edge in engagement with said upper outer edge under said lip and said inner edge having a turned-up portion in engagement with the building facia board, said screen covers the open top of the rain gutter and is compressively retained between the rain gutter outer lip and the building facia board,
means for facilitating attachment and detachment of said screen with the rain gutter comprising two facing wall sections formed in said screen, said wall sections having a common edge which is substantially parallel to and positioned in between said edges,
a first plannar screen portion extending on a generally horizontal plane between said outer screen edge and said means for attachment, a second planar screen portion extending on said generally horizontal plane between said turned-up portion of said inner edge and said means for attachment, said horizontal plane extending below said lip
wherein said facing wall sections each lie in a plane oblique to said horizontal plane of said first and second planar screen portions
wherein compression of said wall sections toward each other retracts and disengages at least one of said screen edges from its associated lip or building facia board to thereby allow attachment and detachment of said screen with respect to said rain gutter.

5,109,641
ROOF TRANSITION FLASHING
Peter Halan, 49669 Shelby Rd., Utica, Mich. 48087
Filed Feb. 19, 1991, Ser. No. 657,082
Int. Cl.[5] E04D *1/36, 3/38, 13/14*
U.S. Cl. 52—62 **18 Claims**



1. A roof transition flashing for installation to a building at a juncture between a vertical wall and an edge of a sloped roof, to prevent water flowing along the flashing from seeping behind siding located on the vertical wall and shingles located on the sloped roof, the roof transition flashing comprising:
an L-shaped member having a vertical planar section and a transverse planar section joined thereto by a first imperforate seam, said vertical planar section being positioned under the siding and flush with the vertical wall, said transverse planar section extending generally laterally from said vertical planar section and being positioned under the shingles and flush with the sloped roof, said L-shaped member having an upper end and a relatively lower end for installation adjacent the edge of the sloped roof; and
deflector means sealingly cooperating with the lower end of the L-shaped member for diverting the water away from said vertical planar section and away from the siding, so that when the roof transition flashing is positioned with said lower end adjacent the edge of the sloped roof, the water flowing along the roof flashing toward the edge of the sloped roof will be deflected away from said vertical planar section and away from the siding, to prevent the water from seeping behind the siding.

5,109,642
MULTI-STORY CAR PARK
Francisco Ayala, El Prat De Llobregat, and Jose M. Estradera, Barcelona, both of Spain, assignors to Camunsa Manutencion S.A., Barcelona, Spain
Filed Aug. 21, 1990, Ser. No. 571,256
Claims priority, application Spain, Aug. 21, 1989, 8902903
Int. Cl.[5] E04H *11/04*
U.S. Cl. 52—79.1 **8 Claims**

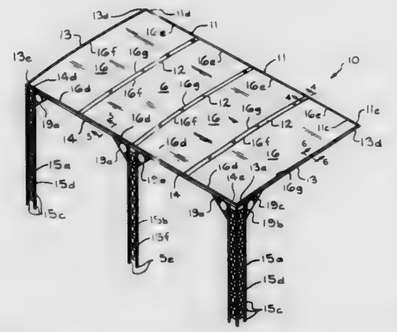
1. Multi-story car park, which includes at least one vehicle reception/delivery floor, with direct access from a public road, and at least one parking floor which is reached by at least one elevator from the reception/delivery floor, the parking floors being divided into consecutive parallel lanes, all of which have a width approximately equal to the length of a vehicle to be parked in the car park and a length which is a multiple of the width of the vehicle, the lanes being subdivided into elevator lanes having elevators, the elevators moving the vehicles vertically from and to the at least one reception/delivery floor; fixed space lanes for parking the vehicles, situated on either side of the elevator lanes; and flexible space lanes situated between the elevator lanes and the fixed space lanes, for moving the vehicles horizontally, perpendicular and parallel, to the elevator and fixed lanes; each fixed

space defined along each fixed space lane having means for moving the vehicles longitudinally in both directions, perpendicular to the lane; at least some flexible spaces defined along each flexible space lane having means for longitudinal and



transverse movement of the vehicles, perpendicular and parallel to the lane; at least one elevator defined in each said elevator lane having means for moving the vehicles through access doors, perpendicular to the elevator lane.

5,109,643
OVERHANGING STRUCTURE
George A. Speers, 9478 Francis Rd., DeWitt, Mich. 48820
Filed Aug. 8, 1990, Ser. No. 564,088
Int. Cl.[5] E04B *7/04*
U.S. Cl. 52—90 **11 Claims**

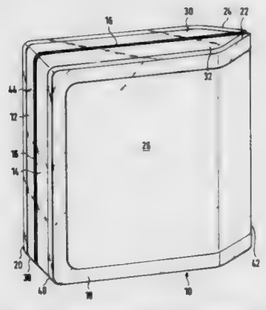


1. An overhang structure which mounts on an outside of a building including a roof panel support provided by multiple spaced apart parallel roof channel members having opposed ends and which roof channel members extend away from the building, F-channel side members at opposed sides of the roof panel support and parallel to the roof channel members, a first F-channel cross member which mounts on an outside wall of the building at one of the ends of the roof channel members and connecting the F-channel side members, and a second F-channel cross member which is parallel to the first F-channel cross member and mounted at the other of the ends of the roof channel members and connecting the F-channel side members and including support members which support the roof support, the improvement which comprises:

(a) each roof channel member having two spaced apart plates and a securing member between and connecting the plates defining at least one channel along a length of the roof channel member, wherein one of the plates of the roof channel member is separable from the securing member to expose two parallel slots inside and along the length of the securing member with a center post along the length of the securing member between the slots, wherein the slots can support separate wires in each slot; and

(b) securing means for holding the one of the plates of the roof channel member to the securing member to close the slots, wherein each of the roof channel members supports at least one roof panel along the length of the roof channel member.

5,109,644
GLASS BLOCK FOR USE AS A CORNERSTONE OR AN END BLOCK
Hans-Herbert Poremba, Dernbach, Fed. Rep. of Germany, assignor to Westerwald AG fur Silikatindustrie, Wirges, Fed. Rep. of Germany
Filed Feb. 7, 1991, Ser. No. 651,591
Claims priority, application European Pat. Off., Feb. 23, 1990, 90103593.1
Int. Cl.[5] E04C *1/42*
U.S. Cl. 52—306 **4 Claims**

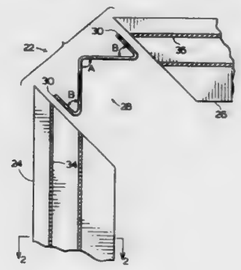


1. A glass block consisting of two halves fused together along a vertical center plane of the block and having planar converging inclined surfaces at a vertically extending end face, the inclined surfaces including an angle of 45° with said vertical center plane, the opposite vertical end face of the glass block being substantially flat, wherein said planar converging inclined surfaces extend substantially to said center plane of the glass block.

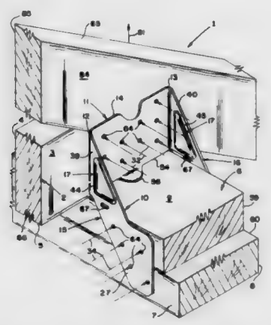
5,109,645
FRAME CONSTRUCTION SYSTEM
Carlo G. Bucci, Ontario, Canada, assignor to Repla Limited, Oakville, Canada
Continuation of Ser. No. 320,337, Mar. 8, 1989, Pat. No. 4,987,769. This application May 29, 1990, Ser. No. 530,056
Int. Cl.[5] A47G *1/10*
U.S. Cl. 52—656 **4 Claims**

1. In an aperture-closing frame construction, a corner joint having a first frame member and a second frame member, each member being of hollowed closed section terminating in mutually bevelled planar relation, with complementary angles of bevel, to form a tight, abutting joint having a predetermined included angle of variable size therebetween; the extruded sections forming mutually inclined closed channels having wall portions of the respective channels in mutually inclined substantially adjoining relation to provide substantially continuous inner peripheral and outer peripheral surfaces; a first joining member for insertion within said channels in oriented relation therebetween, comprising solely a planar strip having four adjoining, mutually inclined leg portions to provide a resilient open W-form, the two centre leg portions of the W-form, being mutually inclined substantially at said included angle, being mutually angularly adjustable for abutting a said section peripheral surface, in corner maintaining relation therewith; the other leg portions of said resilient W-form each extending from the respective adjoining centre leg portion at

an acute included angle, in inclined pressing relation against a respective other said peripheral surface and having a sharp, transversely extending edge portion to contact said other peripheral surface in effective cutting contact therewith, to jam said W-form in nonwithdrawable, corner maintaining relation therewith, so as to retain said frame members in secured, joined relation.



5,109,646
BEARING CONNECTION
Karen W. Colonias, Lafayette, and Michael W. Bugbee, Hayward, both of Calif., assignors to Simpson Strong-Tie Company, Inc., San Leandro, Calif.
Filed May 14, 1991, Ser. No. 699,671
Int. Cl.[5] E04B *7/04, 1/38*
U.S. Cl. 52—712 **7 Claims**



1. A bearing connection in a building structure including a load carrying wood structural member having first and second opposed sides and a lower edge, and a generally horizontally disposed wood plate member having first and second sides and mounted below said load carrying wood structural member and having an upper surface for supporting a portion of said lower edge of said load carrying wood structural member; the improvement comprising:

a. a first metal connector including:

1. a generally upright member having a pair of side edges and a face, disposed in juxtaposition with said first side of said load carrying wood structural member,

2. first and second leg members respectively and integrally connected to said side edges of said generally upright member and extending angularly therefrom a selected distance wherein a lower portion of said first leg member registers with said first side of said wood plate member and a lower portion of said second leg member registers with said second side of said wood plate member, and

3. stiffening means formed in an upper portion of each of said first and second leg members for increasing the column strength of said first and second leg members;

b. a second metal connector including:

1. a generally upright member having a pair of side edges and a face, disposed in juxtaposition with said second side of said load carrying wood structural member,

2. first and second leg members respectively and integrally connected to said side edges of said generally upright member and extending angularly therefrom a selected distance wherein a lower portion of said first leg member registers with said second side of said wood plate member and a lower portion of said second leg member registers with said first side of said wood plate member, and

3. stiffening means formed in an upper portion of each of said first and second leg members for increasing the column strength of said first and second leg members;

c. a first plurality of fasteners inserted through said face of said generally upright member of said first metal connector in a generally horizontal orientation into said load carrying wood structural member;

d. a second plurality of fasteners inserted through said face of said generally upright member of said second metal connector in a generally horizontal orientation into said load carrying wood structural member;

e. a third plurality of fasteners inserted through said lower portion of said first leg member of said first metal connector and said first side of said wood plate member and into said wood plate member in a generally horizontal orientation;

f. a fourth plurality of fasteners inserted through said lower portion of said second leg member of said first metal connector and said second side of said wood plate member and into said wood plate member in a generally horizontal orientation;

g. a fifth plurality of fasteners inserted through said lower portion of said first leg member of said second metal connector and said second side of said wood plate member and into said wood plate member in a generally horizontal orientation; and

h. a sixth plurality of fasteners inserted through said lower portion of said second leg member of said second metal connector and said first side of said wood plate member and into said wood plate member in a generally horizontal orientation.

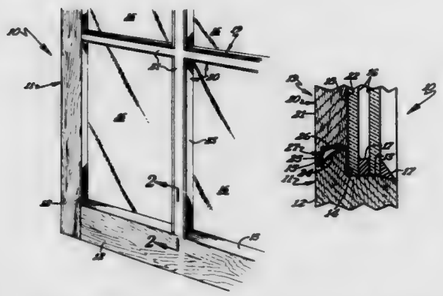
5,109,647
GRILL CLIP
Jack C. La See, 308 W. Cedar, Abbotsford, Wis. 54405
Filed Jul. 20, 1990, Ser. No. 555,982
The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.
Int. Cl.[5] E04B *1/61*
U.S. Cl. 52—773 **7 Claims**

1. In combination with a window including a generally rectangular-shaped frame having a generally convex inner frame surface portion, a glass pane mounted in the frame and having inner and outer surfaces,

a grill comprised of a plurality of grill bars interconnected with each other in right angular relation, each grill bar having an outer surface and an inner surface, said outer surface engaging the inner surface of the glass pane, each grill bar having concave end surfaces contoured to mate with the convex inner frame surface portion of the frame, each concave end surface of each grill bar having an arcuate recess therein spaced from the inner surface of the grill bar,

a plurality of identical one-piece grill engaging clips formed of spring metal, each clip including a substantially flat frame-engaging leg having one end thereof pointed and

being inserted between the frame and the glass pane, each clip including a coupling leg integral with the frame-engaging leg and presenting an outwardly convex angular outer surface, said coupling leg including a substantially flat first portion integral with the frame-engaging leg and extending angularly therefrom, a substantially flat second



portion integral with said first portion and extending angularly therefrom, a transverse fold line between said first and second portions defining the apex of said outwardly convex outer surface, said coupling leg engaging in the angular recess of the grill bar with snap coupling spring effect to thereby secure the grill to the frame and against the inner surface of said pane.

5,109,648

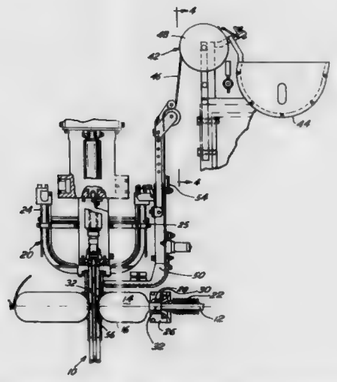
PACKAGING DEVICE WITH LOOP ATTACHMENT MECHANISM AND SKIN BRAKE

Alfred J. Evans, Raleigh, N.C., assignor to Delaware Capital Formation, Inc., Apex, N.C.

Continuation of Ser. No. 354,300, May 19, 1989, abandoned. This application Apr. 10, 1990, Ser. No. 507,381

Int. Cl.[5] B65B *9/12, 61/14*

U.S. Cl. 53—134.1 **2 Claims**



1. An improved stuffing machine for stuffing comminuted material in casing comprising:

a frame;

a product discharge horn mounted to the frame, for maintaining casing on the outside of the horn for withdrawal therefrom, the horn defining an axis, the comminuted material flowing through the horn along the axis, the direction of flow defining a downstream direction, an upstream direction being opposite thereto,;

brake means supported on the frame to selectively increase and decrease casing tension to control casing withdrawal from the horn,;

clip attachment means including dual, upstream and downstream clippers supported by the frame for fastening dual clips about the casing withdrawn from the horn, the clippers being upstream and downstream relative to each other;

the dual clips including upstream and downstream clips; and

a looper assembly means supported on the frame upstream of the clip attachment means for feeding hanging loops to the upstream clipper attachment for attachment to the casing withdrawn from the horn while the casing tension is being reduced by the brake means with the upstream clip.

5,109,649

COMPACT AUTOMATIC MACHINE FOR EMPTYING AND RELOADING FILM FROM AND INTO X-RAY CASSETTES

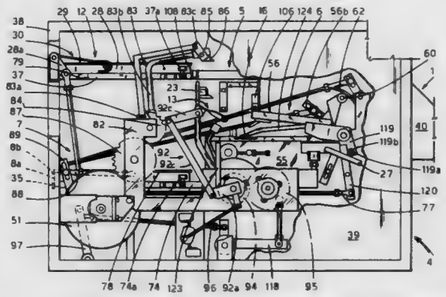
Cesare Azzaroni, Bologna, Italy, assignor to C.M.A. S.r.l., Bologna, Italy

Filed Feb. 28, 1989, Ser. No. 317,283

Claims priority, application Italy, Mar. 9, 1988, 3363 A/88

Int. Cl.[5] B65B *1/00*

U.S. Cl. 53—284.4 **13 Claims**



1. A compact automatic machine for emptying and reloading film from and into X-ray cassettes, comprising:

a first cassette station, incorporating devices by means of which cassettes are admitted singly in succession, and ejected once reloaded, by means of devices mounted to and encompassed by a light-excluding main frame;

a second cassette station located adjacent to said first station, having a stop located internally in the machine for locating a cassette received from said first station in said second station, incorporating a device serving to open and shut the cassette occupying the machine, a device serving to open and shut a magazine from which sheets of new film are dispensed, a device serving to pick up and transfer an exposed sheet of film from each open cassette to a collection point, and a device serving to pick up and transfer new film from the magazine to the empty open cassette, all of which interconnected by direct mechanical linkages, and mounted to and encompassed by a light excluding main frame,

wherein the device serving to pick up and transfer new film from the magazine comprises at least one flanged nozzle with radial orifices, connected to a source of compressed air and carried by an arm that is linked mechanically to one of the interconnected devices of the second station and rotatable between an at-rest position, in which the nozzle is distance from the magazine, and a working position, in which the nozzle gains the inside of the magazine and is held motionless with its flange offered to the leading edge of the new film during the initial movement made by the device in picking up at least the leading edge.

5,109,650

METHOD FOR DISTRIBUTING PIECES OF CANDY TO PACKAGING MACHINES

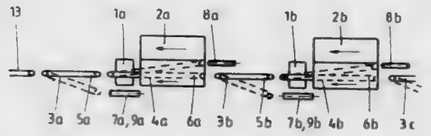
Wilhelm Hogenkamp, Hanover, Fed. Rep. of Germany, assignor to Otto Hänsel GmbH, Hanover, Fed. Rep. of Germany

Filed Jul. 30, 1990, Ser. No. 560,123

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1989, 3925272

Int. Cl.[5] B65G *47/12*

U.S. Cl. 53—443 **11 Claims**



1. A method for distributing pieces of candy arriving constantly in transverse rows on a continuous conveyor to a plurality of packaging machines, comprising the steps: arraying said pieces of candy on a belt upstream of said packaging machines; transferring said pieces of candy one row at a time selectively through a first shunt to either an upstream or a downstream packaging machine or selectively supplying said pieces of candy to buffers at predetermined times and storing temporarily the supplied pieces of candy in said buffers one row at a time adjacent at least one packaging machine through a second shunt independent of said first shunt; unloading said buffers in sequence by supplying contents of said buffers to predetermined packaging machines; and packaging said pieces of candy in said packaging machines.

5,109,651

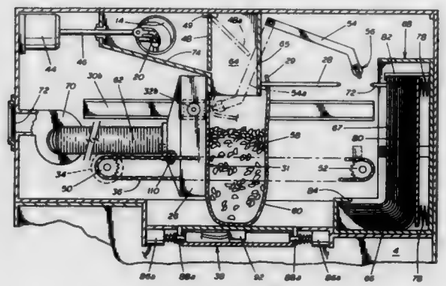
ICE BAGGER

James F. Stuart, Houston, Tex., assignor to Packaged Ice, Inc., Houston, Tex.

Filed Oct. 5, 1990, Ser. No. 593,046

Int. Cl.[5] B65B *5/06, 63/08*

U.S. Cl. 53—502 **32 Claims**



1. An ice bagging apparatus comprising:

(a) an ice collecting zone comprising a funnel shaped structure;

(b) an upwardly directional ice transport means operably positioned at substantially the lowest portion of said ice collecting zone and

(c) an ice bagging zone comprising a weight sensing closure and positioned below an upper terminal end of said ice transport means and a tractor movably positioned in said bagging zone between an upper terminal end of said ice transport means and said weight sensing closure, said tractor having a suction surface, alignable with a supply of bags for grasping and deploying a bag on said closure and below said upper terminal end.

5,109,652

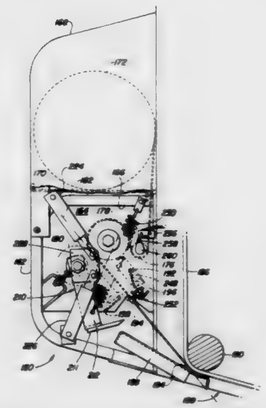
INDICATOR SYSTEM FOR ALERTING AN OPERATOR TO THE CONDITION OF A LARGE CYLINDRICAL BALE WRAPPING MECHANISM

Jean Viaud, Sarreguemines, France; William A. Ardueser, and Henry D. Anstey, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Division of Ser. No. 457,445, Dec. 27, 1989, abandoned. This application Jun. 26, 1991, Ser. No. 721,729

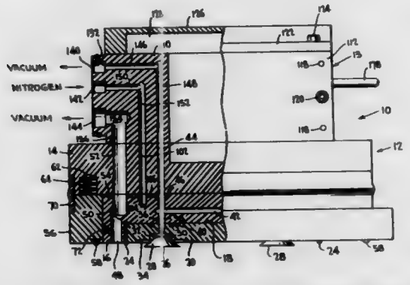
Int. Cl.[5] B65B *57/02, 13/18;* **A01F** *15/00*

U.S. Cl. 53—508 **9 Claims**



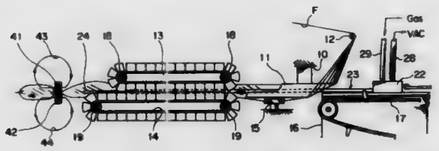
1. In a bale wrapping mechanism for a round baler including a feed mechanism for introducing a wrapping material, of a type supplied in rolls and carried on the baler, into a bale chamber for wrapping a bale formed therein, an indicator system for indicating the presence, or absence, of a supply of wrap material, comprising: a rotatably mounted, non-driven member positioned between a storage location for a roll of said material and the bale chamber and being adapted for having a length of said material in frictional engagement therewith for causing rotation thereof when material is being fed into the bale chamber for wrapping a bale; a wrap material feed switch being mounted adjacent said non-driven member and including a switch element movable between normal and actuated positions for respectively establishing first and second switched conditions in the switch; a cam being mounted for rotation with said non-driven member and being located and shaped for becoming engaged with and disengaged from the switch element during each rotation of the non-driven member whereby the switch is switched back and forth between its first and second switched conditions during each rotation of the non-driven member; an indicator circuit embodying said wrap material feed switch and including a source of electrical current; power and ground leads being connected across said source and an indicator device; a capacitor having a first terminal connected to the power lead in parallel with the indicator device; and said feed switch being connected in the ground lead and having a common terminal connected to a second terminal of the capacitor such that when the switch is in its first switched condition it connects the indicator device in circuit with the capacitor and when the switch is in its second switched condition it connects the capacitor in circuit with the source, whereby, when the cam is being rotated as a result of wrap material causing the non-driven member to rotate, the capacitor is alternately charged by the source and discharged through the indicator device thereby effecting an intermittent signal for apprising an operator that wrap material is being fed into the bale chamber and therefore the material supply is not depleted.

5,109,653
SEALING HEAD INCLUDING AN INDUCTION HEATING COIL
Charles S. Kubis, Palos Heights; John Walter, Evergreen Park, both of Ill.; Donald J. Roth, Westport, Conn., and Glenn R. Mohr, Linthicum, Md., assignors to Continental Holdings Inc., Omaha, Nebr.
Filed Jun. 16, 1988, Ser. No. 207,654
Int. Cl.[5] B29C *65/46*
U.S. Cl. 53—510 **19 Claims**



1. A sealing head for heat sealing a heat bondable lid to a heat bondable carton, said sealing head comprising a base, having a bottom wall, an induction heating coil projecting downwardly from said bottom wall for engaging a lid in clamping relation, a seal member carried by said base surrounding said bottom wall forming means for direct sealing engagement with a nest for a carton to be closed by a lid, and a vacuum port opening through said bottom wall forming means for drawing a vacuum in a carton prior to the application of a lid.

5,109,654
GAS FEED ARRANGEMENT FOR SUPPLY OF GAS INTO BAGS IN A PACKAGING MACHINE
Tadoru Suga, Ibaraki, Japan, assignor to Ibaraki Precision Machinery Co., Ltd., Japan
Continuation-in-part of Ser. No. 585,596, Sep. 20, 1990, abandoned. This application Oct. 22, 1991, Ser. No. 780,449
Claims priority, application Japan, Oct. 9, 1989, 1-263574
Int. Cl.[5] B65B *31/04*
U.S. Cl. 53—511 **6 Claims**



1. A gas feed arrangement for supplying gas into bags in a packaging machine wherein the packaging machine is of the type having inlet and outlet ports for a belt-like film transported in a longitudinal direction, a tube former for deforming the film into a tube form, means for welding opposite side edges of the film as the film is deformed by the tube former into tube form, conveyor means for feeding individual articles in a predetermined cycle into an elongated tube of film so as to allow a space to be left between every two adjacent articles, and seal means disposed downstream of the tension belts for sealing the tubulated film in a direction crossing the direction of film transport to form the film into bags, the improvement comprising:

upper and lower endless belts longitudinally aligned with and disposed between said tube former and said seal means with the entubed articles adapted to be disposed between said upper and lower endless belts;

said upper and lower endless belts including a plurality of outwardly disposed cushion blocks such that a plurality of entubed articles are adapted to be held between said cushion blocks carried by said upper endless belt and said cushion blocks carried by said lower endless belt, said cushion blocks having a thickness such that said elongated tube of film is adapted to be pressed flat by said cushion blocks in said space between two adjacent articles;

double pipe means received into said tube former through the entry port thereof and including an outer evacuation pipe and an inner gas jet pipe, said evacuation pipe having an area provided with a plurality of suction holes;

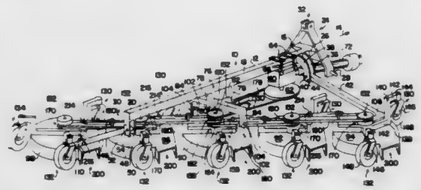
means for connecting, at the entry port of said tube former, one end of said gas jet pipe to a gas supply source through a gas line and one end of said evacuation pipe to a vacuum source through a vacuum line;

said gas jet pipe having another end;

means to mount said double pipe means such that the distance between said another end of said gas jet pipe and said area of said evacuation pipe provided with said suction holes is longer than a distance between the leading edges of two adjacent articles; and

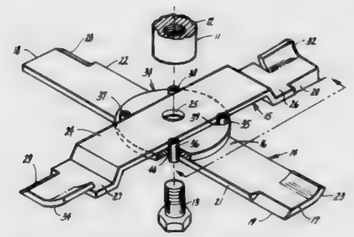
said area of said evacuation pipe provided with said suction holes being disposed between said cushion blocks carried by said upper endless belt and said cushion blocks carried by said lower endless belt.

5,109,655
ARTICULATING ROTARY MOWER
Daniel R. Tekulve, 2056 Shrine Rd., Batesville, Ind. 47006
Filed Feb. 12, 1991, Ser. No. 654,254
Int. Cl.[5] A01D *75/30*
U.S. Cl. 56—6 **29 Claims**



14. A gang mower assembly comprising a plurality of rotary mower decks connected together as a gang mower with adjacent decks staggered to provide overlapping cuts when the mower is moved in the forward direction, each mower deck comprising a rotary blade assembly defining a centrally located, upwardly extending rotary axis and pulley means mounted on said axis to provide an input drive for said blade assembly, means for positioning each mower deck relative to its adjacent deck, each said positioning means comprising rigid link means having first and second opposite link ends, means for attaching said first link end to one of said decks and means for movably attaching said second link end to an adjacent deck for swivel movement, said rigid link means lying generally in a straight line generally intersecting the rotary axes of said mower decks such that said decks are spaced along said straight line, and ground-engaging wheel means for individually supporting each of said decks for independent terrain following movement.

5,109,656
ROTARY CUTTING MECHANISM
Richard T. Zimmer, 16350 Haggerty, Belleville, Mich. 48111
Filed Feb. 11, 1991, Ser. No. 654,289
Int. Cl.[5] A01D *55/18*
U.S. Cl. 56—17.5 **15 Claims**



1. A rotary cutting mechanism comprising:

(a) rotary driving means having an axis of rotation;

(b) a first elongated blade attached to the rotary driving means to rotate with the driving means, the blade being rotationally symmetrical about the axis of rotation and having:

(i) a central mounting portion with upper and lower surfaces through which the axis passes,

(ii) first and second arms extending in opposite directions from the central portion, and

(iii) first and second cutting edges adjacent end portions of the first and second arms, respectively, and facing generally in the direction of rotation of the blade about the axis and lying in a first cutting edge plane perpendicular to the axis of rotation and axially displaced by a predetermined distance from the upper surface of the central portion;

(c) a second elongated blade attached to the rotary driving means to rotate with the first blade, the second blade also being rotationally symmetrical about the axis and having:

(i) a second central mounting portion through which the axis passes, the second central portion comprising a lower surface defining a second plane perpendicular to the axis,

(ii) third and fourth arms extending in opposite directions from the second central portion, each of the third and fourth arms having a respective end portion, and

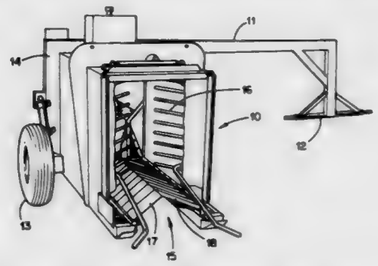
(iii) third and fourth cutting edges along the end portions of the third and fourth arms, respectively, and facing generally in the direction of rotation of the second blade about the axis, the third and fourth cutting edges being in a second cutting edge plane perpendicular to the axis and at an axial offset distance from the second plane; and

(d) holding means engaging the central portions of both blades to hold the blades so that the first and second cutting edge planes are substantially coplanar and the third and fourth cutting edges are angularly spaced substantially midway between the first and second cutting edges.

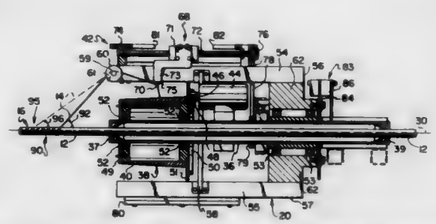
5,109,657
RECEIVING SYSTEM FOR A BERRY HARVESTER
Jeffrey S. DeVries, 13530 Tyler St., Holland, Mich. 49424
Filed May 10, 1991, Ser. No. 698,279
Int. Cl.[5] A01D *46/26*
U.S. Cl. 56—330 **6 Claims**

1. In combination with a berry-harvesting machine having an inverted U-shaped frame and a beating mechanism mounted within said frame, a fruit-receiving system having similar opposite sections mounted at the lower extremities of said frame, respectively, said sections each including a beam extending in a front-rear direction and secured to said frame, and also including a plurality of overlapped plate assemblies pivotally mounted on said beam and biased toward a position extending laterally from said beam, said sections providing inclined receiving surfaces having a central peak at a position where said plates of one of said sections approach said plates of the other of said sections, wherein the improvement comprises:

a construction of said plate assemblies including a flat body portion providing one of said receiving surfaces and having a uniform thickness, and also including a journal member having a plate forming an extended flange secured to the underside of said body portion, and a journal shaft secured to said flange plate, said beam having bearing means adapted to receive said journal shafts, said bearing means being disposed at an angle to said beam causing said body portions to overlap in a relationship at least approaching parallel contact between the underside of one of said body portions and the top of the next following body portion.



5,109,658
METHOD AND APPARATUS FOR REMOVING BINDER FROM AROUND TELECOMMUNICATIONS CABLE CORE
John N. Garner, Kingston, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Apr. 26, 1990, Ser. No. 515,144
Int. Cl.[5] D01H *1/00*
U.S. Cl. 57—2.5 **11 Claims**



1. An apparatus for removing spirally wrapped binder from around a telecommunication cable core comprising:

drive means disposed at a location along a passline for cable core, the drive means for continuously rotating around the passline a take-up reel for binder when the take-up reel is disposed in a take-up reel station;

binder unwinding and guide means which is freely rotatable about the passline and is operable for guiding binder to the take-up reel station from a cable core moving along the passline whereby during operation of the drive means with a take-up reel in the take-up reel station, binder is guided from the cable core and taken up around the take-up reel thereby tensioning the binder, the binder tension causing rotation of the unwinding and guide means about the cable core so as to cause unwinding of the binder from the core; and

means to control the speeds of rotation of the take-up reel

and the unwinding and guide means relative to the cable core speed along the passline so that the binder is in tension during take-up of binder and is controllably unwound from the core,

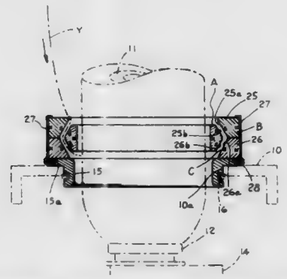
the binder unwinding and guide means comprising a guide element freely pivotally mounted about an axis so as to be pivoted dependent on the angle of the binder as it leaves the cable core, the control means providing an inductive proximity sensor switch and a trigger for operating the switch, the trigger movable by pivoting movement of the guide element towards and away from a switch operating position to cause operation of the control means at a certain pivotal position of the guide element corresponding to a limiting position of the binder upstream as it leaves the cable core.

5,109,659

MAGNETIC RING FOR THE SPINNING OF TEXTILE YARN AND METHOD

Kiyohiro Tsuzuki, Greenville, S.C., assignor to TNS Mills, Inc., Blacksburg, S.C.

Filed Jun. 1, 1990, Ser. No. 531,524
Int. Cl.[5] D01H *7/56*
U.S. Cl. 57—66 **14 Claims**



1. A textile yarn spinning apparatus having a driven bobbin and a traversing ring rail for distributing yarn thereon comprising:

a floating permanent magnetic ring centrally positioned about said bobbin beneath which yarn is fed to said bobbin;

a fixed ring on said ring rail carrying said floating ring centrally therein;

said fixed ring encompassing said floating ring, having a portion extending above and below said floating ring;

said fixed ring having a lower extension projecting inwardly beneath a surface of said floating ring; and

means on said fixed ring supplying a repulsive magnetic force with respect to said floating ring, maintaining said floating ring centrally above said lower extension;

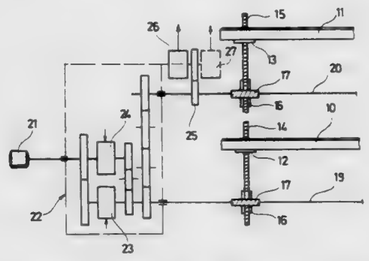
whereby twist is supplied to the yarn passing between said floating ring and said fixed ring and then beneath a bottom surface of said floating ring for distribution upon said bobbin.

5,109,660

APPARATUS AND METHOD FOR INCREMENTALLY SHIFTING A YARN-CARRYING MEMBER ALONG A SPINNING TUBE IN A TEXTILE SPINNING OR TWISTING OPERATION

Herbert Reyer, Ebersbach/Fils, and Thomas Peter, Esslingen, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

Filed Apr. 12, 1990, Ser. No. 508,353
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1989, 3912592
Int. Cl.[5] D01H *13/00;* **B65H** *54/28*
U.S. Cl. 57—95 **10 Claims**



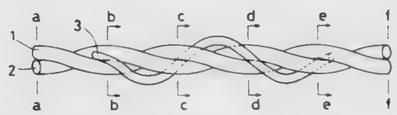
1. In a spinning or twisting method wherein yarn is wound in a cop-type winding manner on a spinning tube by the steps of rotating the spinning tube while applying the yarn to the spinning tube by reciprocating a yarn-carrying member along the spinning tube, incrementally shifting the extent of the reciprocating motion of the yarn carrying member along the spinning tube over the course of the winding operation, and varying the rotational speed of the spinning tube to be relatively lower during beginning and ending stages of the winding operation and relatively greater during the intervening stages of the winding operation, the improvement comprising performing the shifting of the yarn-carrying member in relatively shorter increments during the intervening stage of the winding operation than during the beginning and ending stages of the winding operation.

5,109,661

STEEL CORD FOR REINFORCING RUBBER

Kenichi Okamoto, and Hidekazu Nakata, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 12, 1990, Ser. No. 491,904
Claims priority, application Japan, Mar. 15, 1989, 1-64835
Int. Cl.[5] D02G *3/36;* **B60C** *9/00*
U.S. Cl. 57—212 **4 Claims**



1. A steel cord for reinforcing rubber comprising three brass-plated steel filaments twisted together, characterized in that two of said steel filaments have the same diameter and are twisted in contact with each other, the remaining one of said steel filaments has a smaller diameter than said two filaments and is twisted with said two filaments at least partially in contact with said two filaments and with the same twist pitch as said two filaments, said smaller diameter filament, when said filaments are so twisted. having a residual twist strain opposite to the direction of twist larger than the twist strain in said two filaments having the same diameter so that when said steel cord is cut at both ends thereof, the cut ends of said one steel filament having a smaller diameter retracts inwardly from the cut ends of said two steel filaments having the same diameter, so that the diameter of the steel cord will be expressed as follows:

$$Ds \leqq Dc_1 \leqq 1.45\ Ds$$

wherein

Ds = Diameter of the strand formed by said two steel filaments, and

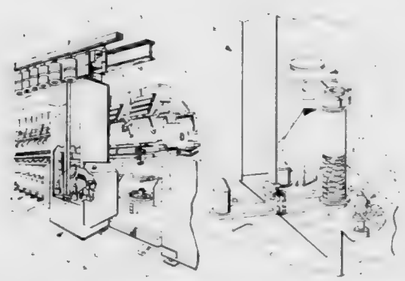
Dc_1 = Diameter of the steel cord after cut at both ends thereof.

5,109,662

OPERATING METHOD AND APPARATUS FOR THE AUTOMATED REMOVAL OF YARN REMNANTS FROM WINDING TUBES BY AN AUTOMATED MAINTENANCE AND SERVICING DEVICE TRAVELING ALONG A TEXTILE YARN PROCESSING MACHINE

Siegfried Inger, Tönisvorst, Fed. Rep. of Germany, assignor to Palitex Project Company GmbH, Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 550,119, Jul. 9, 1990, abandoned. This application Oct. 30, 1991, Ser. No. 784,146
Claims priority, application European Pat. Off., Jul. 24, 1989, 89113546.9
Int. Cl.[5] D01H *9/10, 11/00*
U.S. Cl. 57—305 **6 Claims**



1. In a textile yarn processing machine having a plurality of spindle assemblies mounted in side-by-side relationship longitudinally of said machine and each including an adapter carrying at least one tube and supply package of yarn wound thereon; the improvement of:

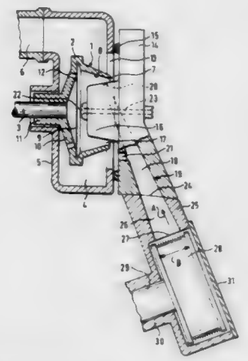
a maintenance device including a housing mounted for movement longitudinally along said machine to each of said spindle assemblies and having gripper means mounted in said housing for upward, downward and pivoting horizontal movement to move out of said housing and grip said adapter when the yarn is substantially used therefrom and move said adapter into said housing, mandrel means mounted in said housing for receiving and supporting said adapter moved into said housing by said gripper means, driven cutting means mounted in said housing for upward, downward and pivoting horizontal movement to move into engagement with and along the yarn supply package tube on said adapter on said mandrel means to cut any residual yarn winding thereon, and suction means mounted in said housing adjacent said mandrel means for pivoting horizontal movement to be positioned to remove the cut yarn windings.

5,109,663

ARRANGEMENT FOR OPEN END ROTOR SPINNING

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed May 30, 1990, Ser. No. 530,315
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1989, 3917991
The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.
Int. Cl.[5] D01H *4/00*
U.S. Cl. 57—407 **8 Claims**



1. An arrangement for open-end rotor spinning including an opening roller, a spinning rotor, and a fiber feeding duct connecting the opening roller and the spinning rotor, the fiber feeding duct starting at the circumference of the opening roller with a cross-section adapted to a working width of the opening roller and tapering to its mouth which is disposed opposite a sliding surface of the spinning rotor which expands conically toward a fiber collecting groove which is followed by a rotor bottom by means of which the rotor is fastened on a shaft, the mouth of the fiber feeding duct being disposed in a projection projecting into the rotor, this projection, together with the open edge of the rotor, forming an overflow gap for the transport air and being part of a cover which covers a rotor housing receiving the rotor and connected to a vacuum source, wherein the fiber collecting groove of the rotor has a diameter of maximally 33 mm, wherein the mouth of the fiber feeding duct has a cross-section of maximally 20 mm^2, wherein the fiber feeding duct is provided with a bypass opening connected to a vacuum source in an area located outside the rotor for facilitating an increase in the flow of transport air flow in the fiber feeding duct upstream of the rotor, and wherein the rotor bottom is provided with ventilating bores.

5,109,664

METHOD OF OPERATING A COMBUSTION CHAMBER FOR A GAS TURBINE ENGINE

Jervis D. Kester, Farmington, and Clarence P. Redington, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

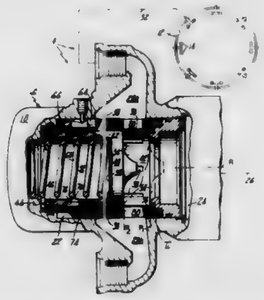
Division of Ser. No. 257,490, Oct. 13, 1988, Pat. No. 5,003,771. This application Feb. 8, 1991, Ser. No. 597,936
Int. Cl.[5] F02C *7/26*
U.S. Cl. 60—39.06 **3 Claims**

1. A method of operating a gas turbine engine in an aircraft, the engine having a plurality of fuel nozzles disposed in regions of a combustion chamber which regions are in flow communication with each other, the engine being operative at an idle power condition and a cruise power condition, which comprises:

flowing fuel from all the nozzles of the plurality of fuel

nozzles at said idle power condition and said cruise power condition;

operating the combustion chamber with a local fuel/air ratio in a first region of the combustion chamber which is richer than the local fuel/air ratios in other regions of the combustion chamber at the idle power condition by flowing fuel from all of the fuel nozzles of the plurality of fuel nozzles with flow through at least one of the nozzles in communication with the first region being greater than the flow through the remainder of said nozzles to flow more



fuel to the first region than to other regions of the combustion chamber;

operating the combustion chamber with the same local fuel/air ratio in the first region of the combustion chamber and remaining regions of the combustion chamber at the cruise power condition by flowing the same amount of fuel to all regions of the combustion chamber by flowing fuel from all of the fuel nozzles of the plurality of fuel nozzles at the cruise power condition such that the flow through all of said fuel nozzles is the same.

5,109,665

WASTE HEAT RECOVERY BOILER SYSTEM

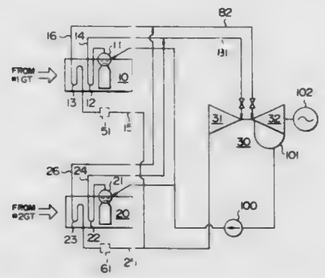
Shinichi Hoizumi, and Tsugutomo Teranishi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 11, 1989, Ser. No. 419,962

Claims priority, application Japan, Oct. 14, 1988, 63-257182

Int. Cl.[5] F01K *23/10*

U.S. Cl. 60—39.182 **5 Claims**



1. A reheating multiple combined plant comprising a plurality of gas turbines, a plurality of waste heat recovery boilers associated with the respective gas turbines, said waste heat recovery boilers each having a main steam generator and a reheater capable of generating main steam and reheat steam by the heat derived from the waste gas from the associated gas turbine, said main steam generator being disposed downstream of said reheater as viewed in the direction of a flow of said waste gas through each boiler, a steam turbine having at least one high-pressure turbine and at least one low-pressure turbine, a main steam pipe through which a single flow of the main steam formed by flows of the main steam from said main steam generators is introduced to said high pressure turbine of said steam turbine, a high-temperature reheat steam common pipe into which the flows of reheat steams from said reheaters of said waste heat recovery boilers are introduced through respective high-temperature reheat steam branch pipes extending from said reheaters, said high-temperature reheat steams being supplied through said high-temperature reheat steam common pipe into said low-pressure turbine of said steam turbine, a low-temperature reheat steam common pipe through which steam from said high-pressure steam turbine is distributed to low-temperature reheat steam branch pipes leading to said reheaters, and at least one flow rate control means provided in at least one of the branch pipes connected to at least one of said reheaters.

5,109,666

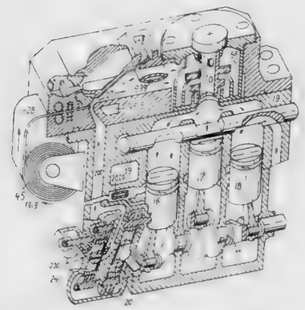
SOLID FUEL COMBUSTION DEVICE AND A COMPRESSOR

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 87,845, Aug. 19, 1987, Pat. No. 4,809,503, which is a continuation-in-part of Ser. No. 799,663, Nov. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 531,512, Sep. 12, 1983, abandoned, and a continuation-in-part of Ser. No. 64,248, Aug. 6, 1979, abandoned. This application Feb. 22, 1989, Ser. No. 313,673

Int. Cl.[5] F02C *3/26*

U.S. Cl. 60—39.464 **1 Claim**



1. A combustion chamber, comprising, in combination, a housing portion which forms said chamber, separate supply passages for the supply of hot air and fuel to a burning place in said chamber and a delivery passage for the transfer of the burned gas(es) out of said combustion chamber,

wherein said fuel supply passage is a thin, but wide, nozzle with said width exceeding the hight at least three times, and,

wherein said supply passage for said hot air is also a thin, and relative to its thin-ness, wide nozzle, located close to, parallel to and at least partially adjacent and before said fuel supply passage with the width of said air supply passage being substantially equal to the width of said fuel supply passage, and,

wherein said fuel is a thin, but wide tape, made from cleaned and powdered coal.

5,109,667

Patent Not Issued For This Number

5,109,668

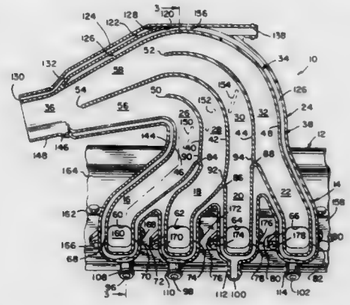
MARINE EXHAUST MANIFOLD AND ELBOW

Dennis H. Lindstedt, Winneconne, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Mar. 7, 1991, Ser. No. 665,994

Int. Cl.[5] F21N *3/02*

U.S. Cl. 60—310 **26 Claims**



13. In a marine propulsion system having an internal combustion engine exhausted through a water jacketed exhaust assembly, an improved exhaust assembly comprising:

a manifold portion having a plurality of intake exhaust passages receiving engine exhaust;

an elbow portion extending upwardly from said manifold portion and having a plurality of transfer exhaust passages extending from said intake exhaust passages and communicating through a bend with a discharge exhaust passage, wherein exhaust flows upwardly from said manifold portion into said elbow portion and around said bend to said discharge exhaust passage;

water jacket means around said intake exhaust passages and said transfer exhaust passages and directing water along the exterior of said intake exhaust passages and said transfer exhaust passages, wherein water flows upwardly along said manifold portion to said elbow portion and then upwardly and around said bend and then to the end of said discharge exhaust passage to mix with exhaust thereat;

a plurality of wall supports between said water jacket means and said elbow portion, said wall supports being angled to deflect and direct water flow upwardly to the top of said elbow portion.

5,109,669

PASSIVE SELF-CONTAINED AUTO IGNITION SYSTEM

Donald H. Morris, Agoura, and Gary L. Briley, Chatsworth, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 413,899, Sep. 28, 1989, abandoned. This application Nov. 19, 1990, Ser. No. 647,521

Int. Cl.[5] F02K *9/95*

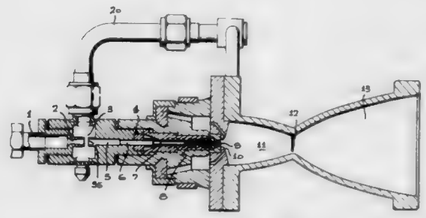
U.S. Cl. 60—39.821 **3 Claims**

1. A resonance tube ignition system for a rocket engine comprising,

a supersonic nozzle, a resonance cavity, and a resonance tube having a mouth and a bleed orifice,

wherein the supersonic nozzle is spaced across the resonance cavity from the mouth of the resonance tube and directs a gas flow of hydrogen into the resonance tube,

the hydrogen is heated in the resonance tube, exits the bleed orifice and enters the combustion chamber as a central jet of hot hydrogen,



a plurality of radial jets of oxygen are focused on the hydrogen entering the combustion chamber,

the hot hydrogen ignites the hydrogen-oxygen mixture to form a pilot flame for igniting fuel in the combustition chamber of the rocket engine,

the resonance cavity has an exit port and a tube connecting the exit port to the combustion chamber so that the increase in pressure in the combustion chamber when the engine is on will shut off the resonance ignition.

5,109,670

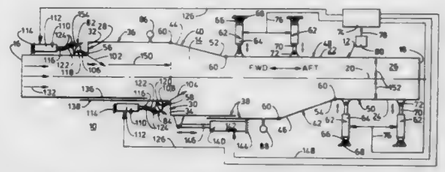
SCRAMJET COMBUSTOR

Daniel L. Harshman, Forest Park, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 327,831, Sep. 26, 1988. This application Oct. 15, 1990, Ser. No. 597,129

Int. Cl.[5] F02K *7/10*

U.S. Cl. 60—204 **1 Claim**



1. A method for operating a scramjet combustor, said combustor including a housing having a forward air-inlet orifice and an aft air-outlet orifice each with a center point together defining a longitudinal axis, said housing also having two spaced-apart, generally opposing, and generally longitudinally extending walls, wherein at least one of said walls includes: an aft-facing step with a transversely outward end; a generally longitudinally extending front portion having a forward end attached to said transversely outward end of said step, and having an aft end; a transition portion having a transversely outward terminus attached to said aft end of said portion and having a transversely inward terminus extending towards said longitudinal axis; and a generally longitudinally extending back portion having a front end attached to said transversely inward terminus of said transition portion; said back portion disposed

a transverse distance from said longitudinal axis, said method comprising:

(a) making measurements of input conditions of inlet Mach number, fuel-air ratio, and inlet pressure level during supersonic flight; and

(b) varying said transverse distance during supersonic flight as a function of said measurements to generally maintain a predetermined axial distribution of static pressure and temperature within said combustor.

5,109,671

COMBUSTION APPARATUS AND METHOD FOR A TURBINE ENGINE

John M. Haasis, Carlsbad, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 5, 1989, Ser. No. 446,233

Int. Cl.[5] F02C *3/05*

U.S. Cl. 60—39.36 **17 Claims**



1. A combustor structure for a turbine engine, said combustor structure comprising:

a pair of axially extending radially spaced annular walls which are radially congruent to cooperatively define at one end thereof an annular combustor exit;

a radially extending annular dome wall interconnecting said pair of walls at the other end thereof to cooperatively bound thereabout an annular pressurized air space and to bound there within an annular combustion cavity;

said walls cooperatively defining plural annular louvers opening therethrough for providing adjacent said combustion cavity respective annular film-like wall cooling interior air flows successively directed axially along said outer wall toward said dome wall, radially inwardly along said dome wall, and axially along said inner wall away from said dome wall;

said inner wall defining a circumferential plurality of radially disposed ports opening therethrough and spaced from said dome wall to admit a respective plurality of radially outwardly directed air jets extending radially outwardly toward impingement upon said outer wall and forming a toroid of primary combustion air adjacent said dome wall, said toroid rotating in agreement with said wall cooling film-like air flows;

means for energizing said rotating toroid of combustion air to swirl about said combustion cavity; and

fuel delivery means for circumferentially distributing a flow of fuel into said rotating swirling toroid of primary combustion air for combustion therewith.

5,109,672

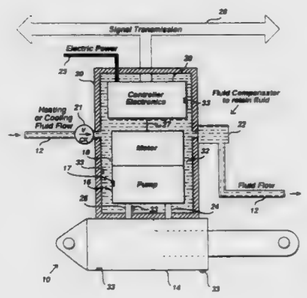
METHOD AND APPARATUS FOR COOLING AND REPLENISHING AIRCRAFT HYDRAULIC ACTUATORS

Charles C. Chenoweth, and Jan-son Shen, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 16, 1990, Ser. No. 464,974

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—456 **20 Claims**



9. A method of cooling a plurality of actuator assemblies, each of said actuator assemblies being coupled to a control effector, including a flight control surface of an aircraft and each including an actuator having hydraulic fluid therein, a high-pressure pump positioned adjacent said actuator for providing the hydraulic fluid in said actuator under high pressure, and a motor for driving said pump positioned adjacent said pump comprising:

pumping hydraulic fluid under high pressure into said actuator from said pump to vary the position of said control effector; and

circulating hydraulic fluid under low-pressure from a central low-pressure pump to said plurality of actuator assemblies and back to said central low-pressure pump through a fluid transmission tubing which extends in series from said central low-pressure pump to a first actuator assembly and from said first actuator assembly to a second actuator assembly and from said second actuator assembly to a third actuator assembly, and so on for each actuator within said plurality, said hydraulic fluid under low pressure being circulated in series between said actuator assemblies.

5,109,673

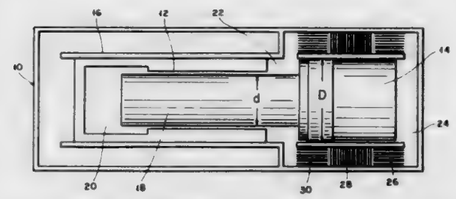
RELATIVE GAS SPRING CONFIGURATION FREE-PISTON STIRLING CYCLE SYSTEM

Nicholas G. Vitale, Watervliet, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed May 1, 1991, Ser. No. 694,370

Int. Cl.[5] F02G *1/043*

U.S. Cl. 60—520 **12 Claims**



1. In a Free Piston Stirling cycle system of the type including a power piston, a displacer having a diameter, an expansion space, a compression space, a gas spring space, and means coupling said displacer with said gas spring space, the improvement comprising:

a relative gas spring means arranged and constructed for generating a force to impart movement to said displacer by the relative motion between the displacer and the power piston, said gas spring means including a gas spring piston for coupling the displacer with the gas spring space, said gas spring piston having a diameter and being arranged and constructed so that the ratio of the diameter of said gas spring piston to the diameter of said displacer is at least 0.50.

5,109,674

PISTON INTERNAL-COMBUSTION ENGINE HAVING A SUPERCHARGING OPERATION USING A GROUP OF SWITCHABLE EXHAUST GAS TURBOCHARGERS

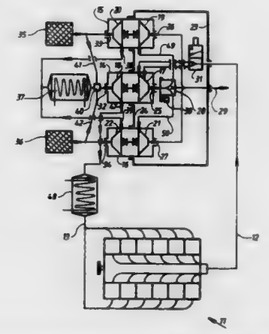
Hans Sudmanns, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Motoren-Und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Mar. 6, 1991, Ser. No. 665,090

Claims priority, application Fed. Rep. of Germany, May 19, 1990, 4016214

Int. Cl.[5] F02B *37/00*

U.S. Cl. 60—612 **8 Claims**



1. A piston internal-combustion engine, with an exhaust gas collector and a charge air collector, having a supercharging operation, comprising:

at least one group of switchable exhaust gas turbochargers, each exhaust gas turbocharger in said at least one group including:

a turbine housing;

an exhaust gas turbine operatively arranged in said turbine housing;

a charge air compressor housing; and

a charge air compressor operatively arranged in said compressor housing;

a gas-tight box having a side wall for fastening together said at least one group of exhaust gas turbochargers to the piston internal-combustion engine wherein said turbine housing for each exhaust gas turbocharger is disposed inside said gas-tight box and said compressor housing for each exhaust gas turbocharger is disposed outside the gas-tight box;

at least a first exhaust gas turbine of a first exhaust gas turbocharger having a first exhaust gas outlet being connected with second exhaust gas inlets of second exhaust gas turbines having second exhaust gas outlets;

an exhaust pipe coupled to jointly connected second exhaust gas outlets;

wherein said at least one group comprises three exhaust gas turbochargers fastened next to one another to the side wall of said gas-tight box, the exhaust gas collector being connected with a first exhaust gas inlet of the first exhaust gas turbine of the first exhaust gas turbocharger;

wherein said first exhaust gas turbocharger is centrally located in said at least one group of exhaust turbochargers; and

an exhaust gas flow divider rotatably arranged on the first exhaust gas outlet such that, in a first position, said exhaust gas flow divider connects the first exhaust gas outlet of the central exhaust gas turbocharger with the second exhaust gas inlets of the two adjacent exhaust gas turbochargers and, in a second position, said exhaust gas flow divider connects the first exhaust gas outlet of the central exhaust gas turbocharger directly to said exhaust pipe.

5,109,675

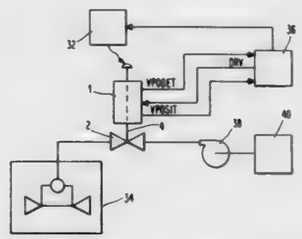
VALVE POSITION SENSING CIRCUIT

Edward Y. C. Hwang, Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 10, 1990, Ser. No. 597,949

Int. Cl.[5] F01K *13/02*

U.S. Cl. 60—660 **18 Claims**



1. An apparatus for sensing the position of a valve and providing a first signal indicative of the valve's position and a second signal indicative of a fault in the apparatus, the apparatus comprising:

a) position sensing means, operatively coupled to said valve, for providing first and second substantially linear signals, said linear signals each having an amplitude dependent upon the position of the valve, and wherein a sum of said linear signals remains within a predefined range of values in the absence of a fault, but deviates from said predefined

range of values when a fault is present, said sum defining a fault detection signal;

b) processing means coupled to said position sensing means (a) for receiving said substantially linear signals, summing said signals and determining whether a fault exists based upon a comparison of the sum (VPODET) with said predefined range, and providing a fault signal when a fault exists; and

c) control means, coupled between the processing means (b) and the valve, and responsive to said fault signal, for automatically controlling the position of said valve;

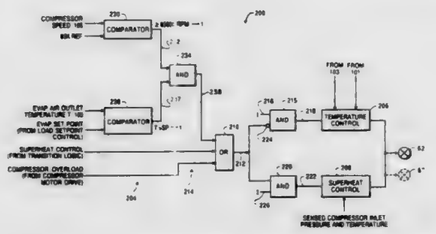
wherein, in the event of a fault, the valve position is controlled in accordance with a predefined plan.

5,109,676

VAPOR CYCLE SYSTEM EVAPORATOR CONTROL

Peter D. Waters, San Diego, Calif.; John F. Defenbaugh; Eric A. Henderson, both of Rockford, Ill., and Robert G. Glass, Loves Park, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 10, 1990, Ser. No. 550,631
Int. Cl.[5] F25B *5/00*
U.S. Cl. 62—117 **38 Claims**



1. A refrigeration system which may be operated to control superheat at an inlet to a compressor to produce a controlled superheat or to control a temperature of a fluid cooled by at least one evaporator to provide the cooled fluid at a set temperature by controlling an opening of at least one expansion valve comprising:

a temperature control which is activable to control the at least one expansion valve to cool the fluid to a set temperature in response to an enabling signal;

a superheat control which is activable to control the at least one expansion valve to control the superheat at the inlet of the compressor in response to an enabling signal; and

a controller, responsive to at least one logic operational state of the refrigeration system including a logic operational state of the compressor, for generating one of the enabling signals to activate one of the temperature control or the superheat control to control the at least one expansion valve to control superheat or provide cooled fluid at the set temperature.

5,109,677

SUPPLEMENTAL HEAT EXCHANGER SYSTEM FOR HEAT PUMP

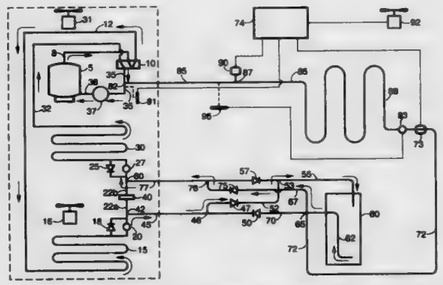
Gary Phillippe, 7263 Larchmont Dr., North Highlands, Calif. 95660

Filed Feb. 21, 1991, Ser. No. 660,141
Int. Cl.[5] F25B *13/00*
U.S. Cl. 62—160 **14 Claims**

1. In association with a refrigerant recirculating heat pump having a compressor, an indoor heat exchanger, an outdoor heat exchanger, and a flow line connecting said indoor and said outdoor heat exchangers, means for enhancing the indoor heating cycle capabilities of said heat pump, comprising:

a) means for generating additional expanded refrigerant and transferring said additional expanded refrigerant to said compressor and

b) means for monitoring said refrigerant's pressure and temperature at a location just prior to said refrigerant entering said compressor, wherein said monitoring means automatically connects said means for generating additional expanded refrigerant to said heat pump when selected refrigerant temperature and pressure ranges are satisfied, to enhance said heating cycle capabilities, and automatically disconnects said means for generating additional expanded refrigerant to said heat pump when said selected refrigerant temperature and pressure ranges are not satisfied.

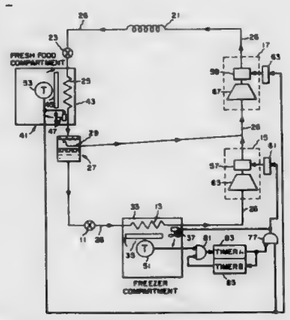


5,109,678

APPARATUS FOR CONTROLLING A DUAL EVAPORATOR, DUAL FAN REFRIGERATOR WITH INDEPENDENT TEMPERATURE CONTROLS

Heinz Jaster, and Warren F. Bessler, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 561,044, Aug. 1, 1990, Pat. No. 5,056,328, which is a division of Ser. No. 293,034, Jan. 3, 1989, Pat. No. 4,966,010. This application Aug. 2, 1991, Ser. No. 739,364
Int. Cl.[5] F25B *7/00*
U.S. Cl. 62—175 **3 Claims**



1. A refrigerator apparatus comprising:

a freezer compartment;

a fresh food compartment;

a refrigerator system including, a first expansion valve, a first evaporator situated in said freezer compartment, a first and second compressor, a condenser, a second expansion valve, a second evaporator situated in said fresh food compartment, all the above elements of the refrigerator system connected together in series, in that order, in a refrigerant flow relationship and a phase separator connecting said second evaporator to said first expansion valve in a refrigerant flow relationship, said phase separator providing intercooling between said first and second compressors;

a first fan situated in said freezer compartment for providing air flow over said first expansion;

a second fan situated in said fresh food compartment for providing air flow over said second evaporator;

a first thermostatic controller situated in said fresh food compartment for maintaining fresh food temperature by causing said first and second compressors to operate and said first and second fan to operate;

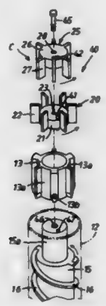
a second thermostatic controller situated in said freezer compartment for maintaining freezer temperature by interrupting the first compressor operation and the first fan when the fresh food compartment has been sufficiently cooled.

5,109,679

AUGER TYPE ICE MAKING MACHINE

Junichi Hida, Nagoya, Japan, assignor to Hoshizaki Denki Kabushiki Kaisha, Aichi, Japan

Filed May 31, 1991, Ser. No. 706,926
Claims priority, application Japan, Jun. 1, 1990, 2-58494
Int. Cl.[5] F25C *5/12*
U.S. Cl. 62—320 **2 Claims**



1. An auger type ice making machine including an evaporator housing having an internal cylindrical freezing surface on which ice crystals are formed, an auger rotatably mounted within said evaporator housing and being formed with a helical blade for scraping the ice crystals off said internal freezing surface and advancing the ice crystals toward an upper end of said evaporator housing, an extrusion head formed with a plurality of ice extruding passages and being positioned in place within the upper end portion of said evaporator housing to rotatably support an upper shaft portion of said auger, and an ice breaker mounted on the upper shaft portion of said auger for rotation therewith and being positioned above said extrusion head for breaking the rods of ice extruded upwardly from said ice extruding passages into pieces of relatively hard flake ice,

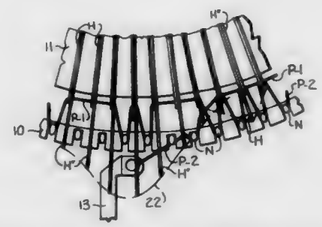
wherein said ice breaker comprises a plurality of ice breaker elements adapted to be coaxially coupled as a unit, said breaker elements each having a circular body portion formed with a plurality of circumferentially equally spaced blades which extend radially outwardly at a predetermined angle, said blades of said respective breaker elements being formed to be aligned at their lower edges in a condition where said breaker elements have been coaxially coupled at their body portions, and means for connecting said body portions of said breaker elements to each other in such a manner that said blades of said breaker elements are circumferentially equally spaced at a selected angle.

5,109,680

METHOD AND MACHINE FOR KNITTING JACQUARD PILE FABRIC

Bruce M. Pernick, Glendale, N.Y., assignor to Monarch Knitting Machinery Corporation, Glendale, N.Y.

Filed Oct. 24, 1990, Ser. No. 602,800
Int. Cl.[5] D04B *35/02*
U.S. Cl. 66—93 **13 Claims**



1. A method of knitting a pile jacquard fabric on a circular knitting machine including needles supported for longitudinal movement to form stitch loops of ground yarn fed thereto, first and second pile yarn loop forming elements supported between adjacent certain needles for longitudinal movement at substantially right angles of a longitudinal movement of said needles, the longitudinal movement of said pile yarn loop forming elements and of said needles crossing each other along a verge line defined by the verge of the needle cylinder, and a plurality of groups of successive spaced-apart pile yarn feeding stations, said pile jacquard fabric including successive courses of stitch wales knot of ground yarn, and each successive course also including pile loop yarn incorporated with the ground yarn in selected needle wales, said method including the steps of

moving selected of said first and second pile yarn loop forming elements beyond said verge line at successive of said yarn feeding stations and feeding pile yarn thereto,

moving selected needles beyond said verge line at successive of said yarn feeding stations,

moving said selected pile yarn loop forming elements inside of said verge line at successive of said yarn feeding stations to draw loops of the pile yarn between the selected needles and transferring previously drawn loops and floats thereby capturing and controlling the drawn pile yarn loops and floats, while allowing the other of said first and second pile yarn loop forming elements to be free to permit the same to capture another pile yarn at the next yarn feeding station, and

forming a course of ground yarn stitch loops with the first and second pile loop yarns incorporated with the ground yarn in selected needle wales.

5,109,681

DEVICE FOR THE SELECTIVELY CONTROLLED MUTUAL DISPLACEMENT OF YARN GUIDES OF FLAT-BED KNITTING MACHINES

Franz Schmid, Bodelshausen, and Jurgen Ploppa, Pfullingen, both of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Reutlingen, Fed. Rep. of Germany

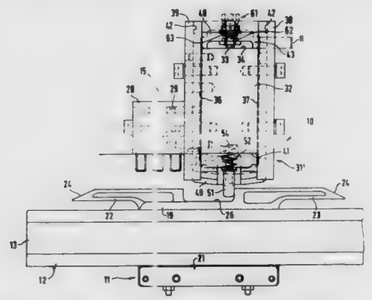
Filed Jul. 6, 1990, Ser. No. 548,822
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1989, 3922513
Int. Cl.[5] D04B *15/38, 15/56*
U.S. Cl. 66—126 R **12 Claims**

1. A device for the selectively controllable mutual displacement of yarn guides of flat-bed knitting machines, comprising:

a plurality of electromagnets fixed on a carriage unit against motion relative thereto, each electromagnet including an armature rod;

a plurality of yarn guide rails;

a yarn guide box mounted to and displaceable along
a yarn guide rail, said yarn guide box being movable in parallel to a needle bed unit;
a mutual displacement finger which is brought into and out of contact with at least one associated yarn guide box; and



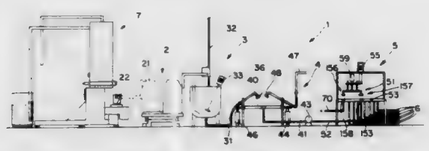
a frame element surrounding each electromagnet from the center of one end of which said mutual displacement finger protrudes in the direction of movement of the associated armature rod, the other end of said frame element being acted upon by said armature rod, said frame element having two side legs by which said frame element is supported in a longitudinally movable manner.

5,109,682

APPARATUS FOR THE PREPARATION AND DISTRIBUTION OF DYE SOLUTIONS IN DYEING PLANTS

Fabrizio Toschi, Breganze, and Massimo Meneghini, Vicenza, both of Italy, assignors to Color Service SRL, Vincentina, Italy

Filed Aug. 8, 1990, Ser. No. 564,193
Claims priority, application Italy, Aug. 29, 1989, 85639 A/89
Int. Cl.[5] D06B *23/14*
U.S. Cl. 68—13 R **8 Claims**



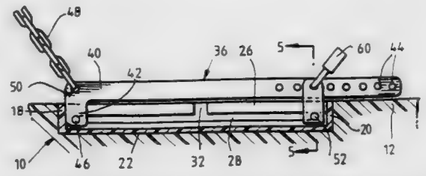
1. An apparatus for preparing and distributing dye solutions to one of a dyeing equipment or to a color kitchen in dyeing plants, said apparatus comprising:
a unit for loading powder dye into dissolution vats;
a water-network for supplying flushing water to said apparatus;
a collector unit for collecting prepared dye solution flowing out of the dissolution vats and for receiving water from said water-network, said collector unit including
a selection plate having a taper-shaped inlet and an outlet,
at least two collector pipes, each of said at least two collector pipes having a taper-shaped fitting for selective mating with the taper-shaped inlet of said selection plate, and
driving means for selectively connecting the taper-shaped fitting of each of said at least two collector pipes with the taper-shaped inlet of said selection plate,
wherein one of said at least two collector pipes supplies dye solution to said selection plate from the dissolution vats and the other of said at least two collector pipes supplies the flushing water to said selection plate from the water-network;
a distributor unit including at least one outlet for distributing the dye solution to the dyeing equipment or to the color kitchen; and
means for fluidly connecting the outlet of said selection plate with said distributor unit.

5,109,683

WIND SURFER LOCK

Gavin L. Cartwright, Unit 10, 27 Darling Street, South Yarra, Victoria, 3141, Australia

Filed Jan. 29, 1990, Ser. No. 471,499
Claims priority, application Australia, Feb. 1, 1989, PJ2491
Int. Cl.[5] E05B *73/00*
U.S. Cl. 70—14 **7 Claims**



1. A security device for use in a longitudinally extending channel having at least one undercut and an access channel communicating with said longitudinally extending channel and said undercut, comprising:
a rigid member including a longitudinal portion and an extension positionable in said longitudinally extending channel; at least one pin element extending from said extension, said at least one pin element being insertable into said access channel, said at least one pin element being movable in said undercut as said extension is moved in said longitudinally extending channel to position said longitudinal portion of said rigid member in a position substantially parallel with said longitudinally extending channel; an independent member; a pin attached to said independent member, said pin being positionable in said access channel, said pin being movable along said undercut as said independent member is moved along said longitudinally extending channel with an end of said independent member extending above said longitudinally extending channel; and means to connect and disconnect said rigid member and said end of said independent member above said longitudinally extending channel.

5,109,684

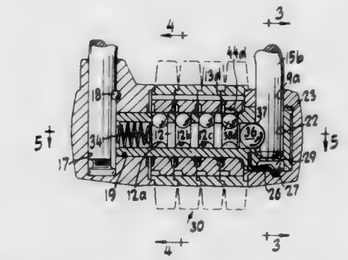
CHANGEABLE ROTARY COMBINATION SHACKLE LOCK

Kenneth N. Grandy, Sr., South Milwaukee, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Continuation of Ser. No. 472,693, Jan. 31, 1990, abandoned. This application Apr. 18, 1991, Ser. No. 687,265
Int. Cl.[5] E05B *37/06*
U.S. Cl. 70—25 **2 Claims**

1. A changeable combination U-shaped shackle lock in which the shackle has two legs and further has clutches and combination wheels comprising
a) a fixed body having a shaft means for receiving and holding a first shackle leg in the fixed body for limited movement therein and said fixed body including a head means sized and proportioned to permit the combination wheels to be placed around and removed from the shaft means and said fixed body having a recess sleeve receiving a second shackle leg;
b) the shaft means having a hollow shaft recess extending therethrough;

c) a reciprocal shaft positioned in the hollow shaft recess, which shaft is normally urged toward the second leg located in the head means;
d) a ball between the reciprocal shaft and second leg to lock the second leg;
e) a removable spring-loaded cap positionable on the head means which cap is sized and proportioned to prevent removal of the combination wheels from the shaft means and includes a recess opening substantially perpendicular to the path of reciprocation of the shaft means, such opening for receiving the second leg which recess opening is aligned with the recess sleeve; such cap upon removal allowing removal of the combination wheels; and



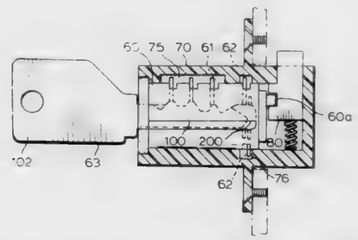
f) spring-loaded detent means for holding the cap on the head means after the lock is in its unlock position with the second leg removed from the head means and the cap;
whereby the head means, cap and second leg engage when the lock is locked and second leg and cap do not engage when the lock is unlocked permitting cap removal only upon activation of the detent means following shackle unlocking.

5,109,685

CONTROL KEY FOR EXTENSION ADAPTER

Florian G. Westwinkel, Toronto, Canada, assignor to Pundra Industries Limited

Continuation-in-part of Ser. No. 493,809, Mar. 15, 1990, abandoned. This application Apr. 15, 1991, Ser. No. 686,413
Int. Cl.[5] E05B *19/08, 29/04*
U.S. Cl. 70—368 **22 Claims**



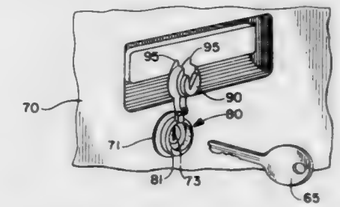
1. A kit comprising a control key extension, an operating key and a locking core including locking tumblers and at least one control tumbler, the operating key comprising:
an elongate flattened bitted shaft having bits extending therefrom in a major plane of the shaft, proximal end and a distal end, and an operating lever provided at the proximal end, the extension comprising;
a bitted shaft extending portion having one end adapted to engage the distal end of the operating key to locate a major plane of the extending portion in the major plane of the operating key to extend it at the distal end of the key, and having at least one bit projecting therefrom to lie in the major plane of the key when said one end of the extending portion engages the distal end of the key;
a lever end having engagement means for engaging the key operating lever; and
an elongate thin web connecting the extending portion and the lever end, the web having a first surface adapted to fit face to face with the flattened bitted shaft of the key and a second surface parallel to the first surface and its plane parallel with the major plane of the extending portion, the web having a longitudinally extending rib upstanding from the first surface, the rib being contoured for registration with a corresponding longitudinal groove of the key shaft.

5,109,686

KEYHOLE GUIDE FOR LOCKS AND METHOD OF USING THE SAME

Eugene Toussant, 7407 Oakhill Ave., Maximo, Ohio 44650

Filed Sep. 4, 1990, Ser. No. 577,504
Int. Cl.[5] E05B *15/08*
U.S. Cl. 70—454 **14 Claims**



1. A keyhole guide for mounting onto a key receiving member over a keyhole in said member comprising:
a base member having an essentially ring like structure having an open center, said open center in registry with said keyhole and having a diameter sufficient to fully expose said keyhole,
a cover having an outer diameter at least equal to the diameter of said open center of said base member, said cover removably attached to said base member and having a slot cut therein, said slot having at least two sides converging to an apex and fully exposing said keyhole in said slot;
a means for attaching said base member to a key receiving member so as to circumferentially surround a substantial portion of the keyhole of said key receiving member.

5,109,687

DEVICE FOR ADJUSTMENT OF BARREL WIDTH OF ROLL TYPE STRAIGHTENER

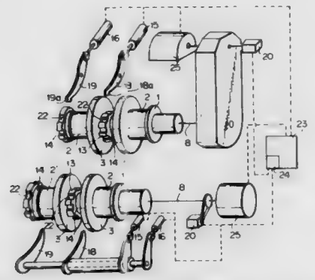
Yasushi Ooba, and Hiroshi Gotoh, both of Kitakyusyu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 8, 1991, Ser. No. 726,570
Int. Cl.[5] B21B *31/08*
U.S. Cl. 72—21 **7 Claims**

1. A device for adjusting a barrel width of a barrel assembly in a straightener for a rolled section steel, comprising
a main shaft rotatable by a driving means;
a pair of rolls forming a barrel fixedly mounted on the main shaft for rotation therewith, one of the rolls (fixed roll) being in a fixed position on the main shaft, while the other (adjustable roll) being adjustable in position along the main shaft so that a distance between the pair of rolls is variable;
means arranged between the pair of rolls on the main shaft, for adjusting the position of the adjustable roll along the main shaft, comprising a pair of displacement male and female screws, the former being axially moveable but rotation-inhibitedly mounted on the main shaft and the latter being engaged with an outer thread of the former by an inner thread thereof and having a plurality of notches on the periphery thereof, the displacement male screw

imparting an axial pressure onto the adjustable roll and the displacement female screw imparting an axial pressure onto the fixed roll;

means for fastening the pair of rolls in position, comprising a pair of tightening male and female screws, the former being axially moveable but rotation-inhibitedly mounted on the main shaft and the latter being secured at a fixed position on the main shaft and engaged with an outer thread of the former by an inner thread thereof and having



a plurality of notches on the periphery thereof, the tightening male screw imparting an axial pressure onto the adjustable roll to press it to the displacement male screw;

means engageable with the notches of the displacement female screw for preventing a rotation thereof with the main shaft;

means engageable with the notches of the tightening female screw for preventing a rotation thereof with the main shaft; and

means for detecting the rotation of the main shaft.

5,109,688

ROLLING MILL

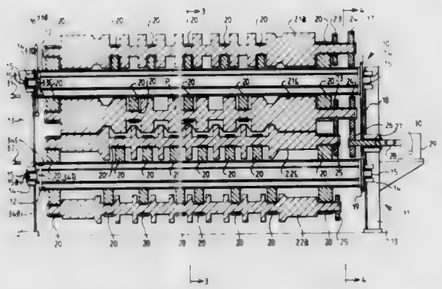
Timothy E. King, Telford, United Kingdom, assignor to Rollsec Limited, West Midlands, United Kingdom

Filed May 14, 1991, Ser. No. 699,881

Claims priority, application United Kingdom, May 18, 1990, 9011225

Int. Cl.[5] B21B *31/14*

U.S. Cl. 72—180 **17 Claims**



1. A rolling mill comprising:

a plurality of roll passes for progressively forming a workpiece to a desired final cross-sectional shape wherein each roll pass comprises a pair of rotatable mountings, the mountings being disposed on opposite sides of a pass line of the mill;

each rotatable mounting carrying at least two rolling means of different configuration to form the workpiece to a different final shape and rotation of the mountings permitting a selected rolling means of each mounting to be disposed, at a rolling position, on opposite sides of said pass line to engage and form the workpiece;

the mill having a drive means to rotate at least one rolling means of at least one of said roll passes when disposed in said rolling position;

the drive means comprising, at said at least one roll pass, a drive shaft and coupling means to couple the drive shaft to a first rolling means carried by one of said mountings when at its rolling position;

the coupling means coupling the drive shaft to the first rolling means when the rolling means is at its rolling position and un-coupling the drive shaft from the first rolling means when the rolling means is spaced from its rolling position;

the coupling means comprising a pair of gears, one driven from the drive shaft and the other driving said first rolling means and which are brought into meshing engagement as the first rolling means is brought to its rolling position;

at said at least one roll pass, each rolling means carried by one of said mountings having a driven gear connected thereto, the driven gear of each rolling means of said one mounting being moved into mesh with the driving gear connected to said drive shaft when said rolling means are moved into their respective rolling positions; and

transmission means to transmit rotation from said first rolling means to a second rolling means carried by the other of said mountings when at its rolling position.

5,109,689

HOT-ROLLING PROCESS FOR SEAMLESS TUBES WITH PRELIMINARY DIAMETER REDUCTION OF THE SEMIFINISHED PRODUCTS

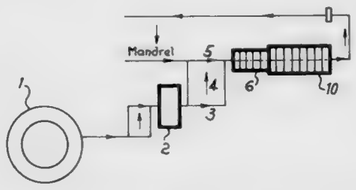
Raimondo D'Avanzo, Bergamo, Italy, assignor to Dalmine S.p.A., Milan, Italy

Filed Nov. 27, 1990, Ser. No. 619,188

Claims priority, application Italy, Nov. 30, 1989, 22559 A/89

Int. Cl.[5] B21B *17/04, 19/04*

U.S. Cl. 72—97 **7 Claims**



1. An improved process for hot-rolling of seamless tubes of medium-small diameter comprising coreless reduction without touching a mandrel in which a pierced blank is reduced and then continuously hot-rolled to a desired diameter size and wall thickness by continuous rolling on a mandrel, wherein said coreless reduction is carried out at a reducing mill immediately upstream of a continuous rolling step which uses a mandrel, whereby the coreless reduction and continuous rolling are performed in close and quick sequence on the same line, with said mandrel being introduced into said pierced blank without touching it, at the location of said reducing mill.

5,109,690

TENSION APPARATUS

Toshihisa Taniguchi, Kariya; Mituyuki Hayashi, Nishio, and Masahiko Sakai, Takahama, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 29, 1990, Ser. No. 528,888

Claims priority, application Japan, May 30, 1989, 1-136859

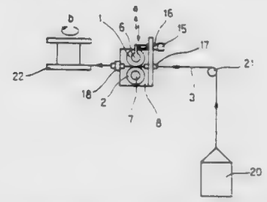
Int. Cl.[5] B21B *15/00;* **B65H** *59/22, 20/00*

U.S. Cl. 72—206 **5 Claims**

1. A tension apparatus for imparting a predetermined tension

to a wire-like member coated by an insulating member, comprising:

a pair of shaping rollers facing toward each other for forming a passing space therebetween which is smaller than a diameter of said wire-like member, each of said rollers having an arch-shaped groove on outer perimeter surfaces thereof which deforms an outer surface of said wire-like member passing therethrough to a same shape as a shape



of said arch-shaped groove, said groove having a curvature in a range of 0.5 to 1.3 times a diameter of the wire-like member; and

supporting means for rotatably supporting said shaping rollers;

wherein said predetermined tension is imparted on said wire-like member by passing said wire-like member through said space between said rollers and by deforming said outer surface of said wire-like member.

5,109,691

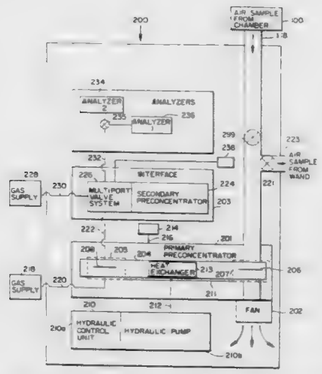
EXPLOSIVE DETECTION SCREENING SYSTEM

Colin D. Corrigan, and Lawrence V. Haley, both of Nepean, Canada, assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Continuation of Ser. No. 447,724, Dec. 8, 1989, Pat. No. 4,987,767, which is a continuation-in-part of Ser. No. 364,663, Jun. 9, 1989, abandoned. This application Nov. 2, 1990, Ser. No. 608,496

Int. Cl. G01N *30/00*

U.S. Cl. 73—23.36 **54 Claims**



1. A portable explosive detection screening system for the detection of concealed explosives, chemical agents and other controlled substances such as drugs or narcotics by detecting their vapor or particulate emissions, said system comprising:

(a) a portable sampling means for gathering a sample volume of air from a specific area on a person or object to collect any vapor or particulate emissions therefrom;

(b) a sample collection means to collect vapor or particulate emissions in said sample volume of air, said sample collection means including a particulate collection means for collecting and vaporizing particulate emissions collected by said portable sampling means;

(c) means for concentrating said vapor or vapor subsequently emitted by said particulate emissions, said means for concentrating having a first means for adsorption and a second means for desorption of said concentrated vapor;

(d) a detecting means including a first detector responsive to said vapor desorbed from said second means for desorption to generate a first signal and an alarm.

5,109,692

DIAGNOSTIC APPARATUS AND METHOD FOR FLUID CONTROL VALVES

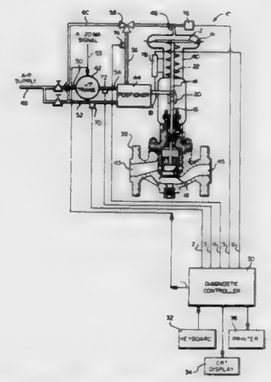
William V. Fitzgerald, McKinney, Tex., assignor to Fisher Controls International Inc., Clayton, Mo.

Division of Ser. No. 512,095, Apr. 10, 1990, Pat. No. 4,976,144, which is a continuation of Ser. No. 236,602, Aug. 25, 1988, abandoned. This application Oct. 24, 1990, Ser. No. 605,130

The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.

Int. Cl.[5] G01M *19/00;* **F16K** *37/00;* **G01L** *5/00*

U.S. Cl. 73—168 **6 Claims**



1. A method for diagnostically dynamic testing and determining the dynamic operating condition of a pneumatically operated fluid control valve assembly having a current to pressure transducer, a valve actuator connected to a valve flow control member for movement between respective closed and open valve positions, and a valve positioner pneumatically coupled between said current to pressure transducer and said valve actuator, said method comparing a dynamic output of said valve assembly in response to a dynamic input to said valve assembly and comprising the steps of:

providing a variable control current signal input to said channel to pressure transducer and a corresponding controlled variable pneumatic pressure to the input of the valve positioner forming a dynamic input to said valve assembly to operate the valve in a dynamic test operation cycle defined by moving the flow control member between said respective closed and open valve positions;

providing a position sensor to sense movement of the flow control member;

obtaining an output signal from the position sensor corresponding to movement of the flow control member in response to said dynamic input to said valve assembly during the dynamic test operation cycle;

processing said variable control current signal and said output signal to derive valve diagnostic data representing the movement of the flow control member during the dynamic test operation cycle as a function of the variation of said variable control current signal input to said current to pressure transducer; and

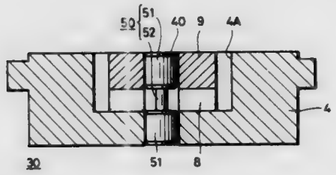
displaying said valve diagnostic data for enabling determination of the dynamic performance of said valve assembly under test.

5,109,693

THERMALLY STABILIZED ACCELEROMETER

Takeshi Hojo, Kuroiso; Michio Fukano, Ohtawara, and Mitsuru Kato, Kuroiso, all of Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed May 18, 1990, Ser. No. 525,972
Claims priority, application Japan, May 29, 1989, 1-135524
Int. Cl.[5] G01P *15/13*
U.S. Cl. 73—497 **5 Claims**



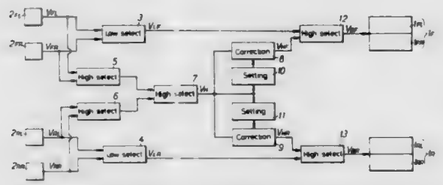
1. A thermally stabilized accelerometer having an acceleration sensing element and at least one torquer magnet to rebalance said sensing element, said torquer magnet comprising a pot-like yoke, a disk-like permanent magnet and a pole piece, said permanent magnet and said pole piece being attached to said yoke at the pot-like center; a central through-hole provided through said torquer magnet; and an elongated spool member of magnetic compensating alloy fixedly inserted within said through-hole, said spool member having a flux leading portion at each end thereof and a flux compensating portion between said flux leading portions, said flux compensating portion having a diameter less than that of each of said flux leading portions; whereby the scale factor of the accelerometer is not influenced by temperature change at all.

5,109,694

METHOD FOR ESTIMATING A REFERENCE VEHICLE SPEED OF A FOUR-WHEEL MOTOR VEHICLE

Toshio Yahagi; Yoshihiro Iwagawa; Yoichi Sugimoto, and Tsuyoshi Satoh, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Corp., Tokyo, Japan

Continuation-in-part of Ser. No. 381,422, Jul. 18, 1989, abandoned. This application Jan. 30, 1991, Ser. No. 648,330
Claims priority, application Japan, Jul. 18, 1988, 63-178368
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—9 **5 Claims**



1. A method of estimating vehicle speeds independently on front wheels and rear wheels of a four-wheel motor vehicle for determining slip rates of the front and rear wheels for use in anti-lock brake control, comprising the steps of:

(a) determining the speed of each of the front wheels;

(b) selecting the lowest of the front wheel speeds as a reference vehicle speed for the front wheels;

(c) determining a vehicle speed on the front wheel side based on the reference vehicle speed for the front wheels wherein the vehicle speed on the front wheel side is used for determining the slip rate of the front wheels;

(d) determining the speed of each of the rear wheels;

(e) selecting the lowest of the rear wheel speeds as a reference vehicle speed for the rear wheels; and

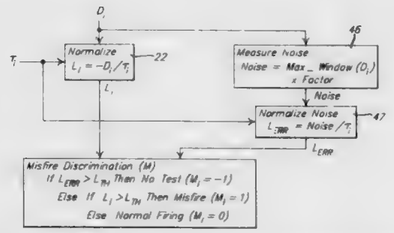
(f) determining a vehicle speed on the rear wheel side based on the reference vehicle speed for the rear wheels wherein the vehicle speed on the rear wheel side is used for determining the slip rate of the rear wheels.

5,109,695

MISFIRE DETECTION IN AN INTERNAL COMBUSTION ENGINE

John V. James, Walled Lake; James M. Dosdall, Grosse Ile, and Kenneth A. Marko, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 572,650, Aug. 24, 1990, Pat. No. 5,044,195. This application Jun. 5, 1991, Ser. No. 710,841
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—117.3 **14 Claims**



1. A method of detecting misfires of individual cylinder firings in a combustion engine wherein each individual cylinder firing is classified as a misfire, a normal firing, or as occurring during a no-test condition, said method comprising the steps of:

measuring engine acceleration corresponding to each of a plurality of cylinder firings during operation of said engine;

selecting one of said cylinder firings for detection;

determining an average acceleration over a series of said cylinder firings substantially centered on said selected cylinder firing;

determining deviation of said measured acceleration from said average acceleration for each of a group of said cylinder firings including said selected cylinder firing;

determining a noise parameter according to a maximum magnitude of said deviations of acceleration; and

comparing said noise parameter to a threshold to detect said no-test condition.

5,109,696

POWERTRAIN PERFORMANCE ASSESSMENT SYSTEM

Irving Bright; Ronald C. Erickson, both of Peoria, Ill.; Dennis K. Greene, Walnut Creek, Calif.; Gerald D. Hardy, Metamora, Ill.; Robert E. Hefner, Creve Couer, Ill.; Lowell E. Johnson, East Peoria, Ill.; Donald J. Schwingel, Peoria, Ill., and Richard E. Spring, Washington, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 6, 1990, Ser. No. 578,990
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.1 **43 Claims**

1. An apparatus for assessing the performance of a powertrain, said powertrain having a prime mover for rotating an output shaft, a torque converter unit driven by the output shaft, and a transmission having at least one directional clutch, one speed clutch, and a transmission input shaft driven by the torque converter unit, comprising:

means for sensing the rotational velocity of said output shaft and responsively producing an output shaft velocity signal;

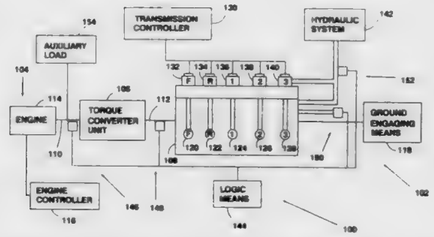
means for sensing the rotational velocity of said transmission input shaft and responsively producing a transmission input shaft velocity signal;

means for sensing the pressure of said directional clutch and responsively producing a directional clutch pressure signal;

means for sensing the pressure of said speed clutch and responsively producing a speed clutch pressure signal; and

logic means for receiving said speed clutch pressure signal, said directional clutch pressure signal, said output shaft velocity signal, and said transmission input shaft velocity signal, calculating a set of powertrain parameters as a function of the received signals and time, and producing an error signal in response to predetermined conditions of said powertrain parameters.

12. An apparatus for assessing the performance of a powertrain of a vehicle, said vehicle having a ground engaging means, said powertrain having a prime mover for rotating an output shaft, a torque converter unit driven by the output shaft and a transmission having at least one directional clutch and one speed clutch for delivering power to said ground engaging means, and a transmission input shaft driven by said torque converter unit, comprising:



means for sensing the rotational velocity of said output shaft and responsively producing an output shaft velocity signal;

means for sensing the rotational velocity of said transmission input shaft and responsively producing a transmission input shaft velocity signal;

means for sensing the pressure of said directional clutch and responsively producing a directional clutch pressure signal;

means for sensing the pressure of said speed clutch and responsively producing a speed clutch pressure signal; and

logic means including:

means for receiving said speed clutch pressure signal, directional clutch pressure signal, output shaft velocity signal, and said transmission input shaft velocity signal, calculating a set of powertrain parameters based on the received signals;

means for producing an engine power error signal in response to predetermined conditions of said powertrain parameters;

means for producing a torque converter input power demand error signal in response to predetermined conditions of said powertrain parameters; and,

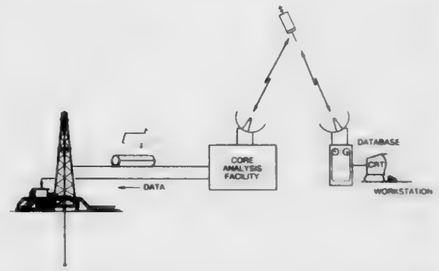
means for producing a torque converter output power error signal in response to predetermined conditions of said powertrain parameters.

5,109,697

METHOD OF EXPLORATION FOR HYDROCARBONS

Keith K. Millheim, 1406-B E. 38th St., Tulsa, Okla. 74105; Houston B. Mount, II, 4350 S. Braden Pl., Tulsa, Okla. 74135; Chandra S. Rai, 8904 E. 76th St., Tulsa, Okla. 74133, and Carl H. Sondergeld, 2618 W. Toledo, Broken Arrow, Okla. 74012

Continuation of Ser. No. 265,073, Oct. 31, 1988, Pat. No. 5,012,674. This application Jan. 22, 1991, Ser. No. 644,171
Int. Cl.[5] E21B *49/02*
U.S. Cl. 73—153 **14 Claims**



1. A method of producing a depth correlated record of the earth's subsurface using core cut as a well is being drilled, comprising:

(a) within a core analysis facility adjacent the well, analyzing substantially all lithologies represented within the core and obtaining a measurement of at least one physical property thereof, the physical property being a time-dependent physical property affected by passage of time between core removal from the well and making of the measurement, the measurement being obtained promptly after the core is removed from the well and under conditions including time effective for the at least one physical property being substantially equivalent to the physical property existing in the wellbore at time of removing the core; and

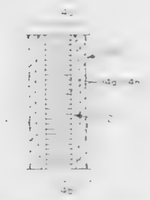
(b) producing a depth correlated record of the at least one physical property.

5,109,698

MONOPOLE, DIPOLE, AND QUADRUPOLE BOREHOLE SEISMIC TRANSDUCERS

Thomas F. Owen, Trail Hebtes, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Division of Ser. No. 395,788, Aug. 18, 1989, Pat. No. 5,030,873. This application Jan. 9, 1991, Ser. No. 639,016
Int. Cl.[5] E21B *43/25*
U.S. Cl. 73—632 **3 Claims**

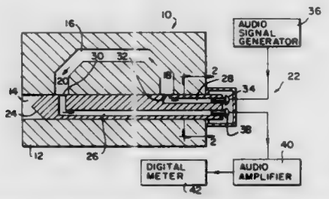


1. A method for analyzing wave motion in a solid medium, comprising:

placing a cylindrical shell in a liquid-filled borehole in said solid, said cylindrical shell having a wall that is relatively thin compared to the radius of said cylindrical shell, and having a top and a bottom end.

orienting said cylindrical shell inside said borehole,
applying an axial force at an end of said cylindrical shell, thereby causing said cylindrical shell wall to alternately flex inwardly and outwardly, to cause pressure gradients in said borehole liquid to produce elastic wave stresses in a wall of said borehole which radiate into said solid medium,
detecting said wave motion at a remote receiver, and
analyzing said wave motion for characteristics associated with compressional waves in solids.

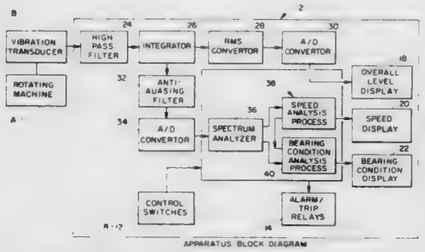
5,109,699
SONIC CASTING TESTER
James T. Voruz, Oconomowoc, Wis., assignor to Husco International, Waukesha, Wis.
Filed Jun. 10, 1991, Ser. No. 713,140
Int. Cl.[5] G01H *15/00*
U.S. Cl. 73—632 **3 Claims**



1. An apparatus for detecting a blockage in a cored passage of a hydraulic valve casting of the type having a valve body with a spool bore disposed therein and at least one fluid passageway in the valve body communicating with and intersecting the spool bore at a plurality of points, said apparatus comprising:
an elongated probe for insertion into the spool bore with said probe having a pair of passageways
with one of said probe passageways having a first end terminating in an opening in said probe which aligns with one of the intersection points and having a second end communicating with sound generating means which introduces a sound wave into said probe passageway and
with the other of said probe passageways having a first end terminating in an opening in said probe and having a second end communicating with sound detecting means which generates a signal in response to the detection of a sound wave,
so that a sound wave may be transmitted from said sound generating means, through said one probe passageway, out said first end opening, through the fluid passageway, into said other passageway opening, through said other probe passageway and to said sound detecting means,
powered signal generating means operatively connected to said sound generating means whereby a generated signal is transformed into a sound wave by said sound generating means, and
level indicating means operatively connected to said sound detecting means so that the level of said sound detection signal may be displayed.

5,109,700
METHOD AND APPARATUS FOR ANALYZING ROTATING MACHINES
Michael D. Hicho, Broadview Heights, Ohio, assignor to Life Systems, Inc., Cleveland, Ohio
Division of Ser. No. 552,421, Jul. 13, 1990. This application May 30, 1991, Ser. No. 707,441
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—660 **13 Claims**

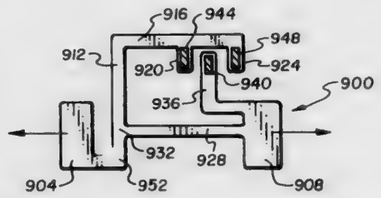
5. An apparatus for determining an indicator of a condition of a rolling element bearing enclosed in a housing of a rotating machine, the apparatus comprising:
a vibration transducer means in contact with said housing means for sensing mechanical vibrations of the rotating machine and converting the sensed vibrations into an analog signal proportional to the sensed vibrations;
an analog-to-digital convertor means for converting the analog signal into a digital signal;
a means for converting the digital signal into a frequency spectrum;



APPARATUS BLOCK DIAGRAM

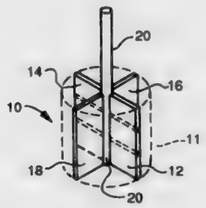
an analyzing means for analyzing the frequency spectrum to identify frequency components characteristic of problems other than bearing defects;
a means for eliminating the frequency components related to problems other than bearing defects;
a means for selecting a remaining frequency component having a highest amplitude as the indicator of the rolling element bearing condition.

5,109,701
FIELD-BASED MOVEMENT SENSOR
Stephen C. Jacobsen, and John E. Wood, both of Salt Lake City, Utah, assignors to Sarcos Group, Salt Lake City, Utah
Division of Ser. No. 580,779, Sep. 11, 1990, Pat. No. 5,016,481. This application Apr. 17, 1991, Ser. No. 686,608
Int. Cl.[5] G01B *7/16*
U.S. Cl. 73—782 **1 Claim**



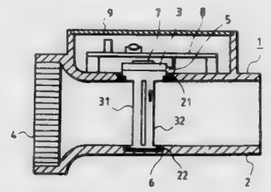
1. A lever-action transducer for measuring strain in an object on which the transducer is disposed, said transducer comprising
a flexible generally planar frame member having a working surface, said frame member including first and second spaced-apart bonding pads for attachment to the object, a lever arm disposed between the bonding pads to extend from a first end to a second end generally perpendicular to an imaginary line extending between the pads, an arm joining the first end of the lever arm to the first bonding pad, a base arm extending between the second bonding pad and the lever arm and joined to the lever arm at a location between the first and second ends and closer to the first end, a support arm extending laterally from the second end of the lever arm and including at least one projection extending toward the base arm, and a pull arm extending from the second bonding pad to a free end positioned beside, but spaced from the projection,
means disposed on the working surface of the free end of the null arm for producing a force field which emanates therefrom and which diminishes in strength the greater the distance from the force field producing means, and
detection means disposed on the working surface of the projection for detecting the presence of a force field and for producing signals representing force field strength and thus the distance of the detection means from the force field producing means.

5,109,702
METHOD FOR DETERMINING LIQUEFACTION POTENTIAL OF COHESIONLESS SOILS
Wayne A. Charlie, Fort Collins, Colo., and Leo W. Butler, Green Bay, Wis., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jun. 27, 1990, Ser. No. 549,888
Int. Cl.[5] G01N *3/00*
U.S. Cl. 73—84 **18 Claims**



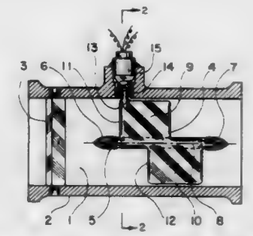
12. A rotational vane assembly for determining liquefaction potential of cohesionless soils comprising:
a rotatable shaft,
a plurality of radially disposed blades mounted to said shaft,
a pore pressure sensor mounted to said assembly and communicating by a duct to an outer edge of at least one blade,
means for inserting said blades into said soils and means for rotating said shaft to revolve said blades to shear said soils and obtain porewater pressure response measurements from said soils.

5,109,703
VORTEX FLOW METER
Yoshihiko Tanimura, Kyoto; Yasuo Tada, and Katsuaki Yasui, both of Hyogo, all of Japan, assignors to Mitsubishi Denki K.K. and Mitsubishi Jidosha Kogyo K.K., both of Tokyo, Japan
Filed Aug. 21, 1990, Ser. No. 570,496
Claims priority, application Japan, Aug. 21, 1989, 1-215305
Int. Cl.[5] G01F *1/38*
U.S. Cl. 73—861.22 **3 Claims**



1. A karman vortex flow meter, comprising:
a vortex generating member disposed in a fluid conduit;
a sensor portion including a pressure sensor integrally and fixedly secured to said vortex generating member for producing an output corresponding to a deformation of said pressure sensor caused by vortex pressure of Karman vortices produced by said vortex generating member, said sensor portion having a cross sectional area larger than that of said vortex generating member;
a pair of elastic holding members for elastically supporting opposite ends of said integral assembly of said vortex generating member and said sensor portion, respectively, with respect to a wall of said conduit to thereby minimize the deformation force applied to said sensor portion from said conduit; and
means for resiliently pressing said integral assembly against said elastic holding members to relatively rigidly support said assembly with said wall of said conduct.

5,109,704
VORTEX FLOWMETER WITH BALANCED VORTEX SENSOR
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005
Continuation-in-part of Ser. No. 412,793, Sep. 26, 1989, Pat. No. 4,986,134. This application Sep. 19, 1990, Ser. No. 584,105
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.[5] G01F *1/32*
U.S. Cl. 73—861.24 **20 Claims**

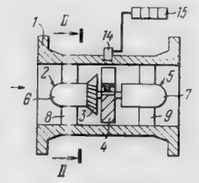


1. An apparatus for measuring flow rate of fluid comprising in combination:
a) a body including a flow passage extending therethrough;
b) a vortex generating bluff body of an elongated cylindrical shape disposed across a first cross section of the flow passage;
c) a vortex sensing planar member disposed across a second cross section of the flow passage generally parallel to the vortex shedding bluff body on a plane generally parallel to the central axis of the flow passage and supported by at least one supporting member anchored to the body and extending at least partially across the flow passage in a pivotable arrangement allowing a pivoting movement over at least a minute angle about a pivot axis generally parallel to the central axis of the flow passage and disposed at a midsection of the vortex sensing planar member, wherein leading edge of two halves of the vortex sensing planar member respectively located on the two opposite sides of the pivot axis are offset from one another by a distance generally equal to a noninteger times the wave length of sinuating streamlines created by vortices shed from the vortex generating bluff body; and
d) at least one transducer means connected to a deflective portion of the vortex sensing planar member for converting an alternating torque about the pivot axis produced by vortices shed from the vortex generating bluff body and experienced by the vortex sensing planar member to an alternating electrical signal.

5,109,705
TURBINE RATE-OF-FLOW TRANSDUCER

Robert G. Masyagutov, ulitsa Mendeleeva, 203/1, kv. 21, Ufa; Viktor T. Drobakh, ulitsa Paustovskogo, 8, korpus 3, kv. 160, Moscow, and Alexandr S. Aprakin, ulitsa Sofii Perovskoi, 13/1, kv. 54, Ufa, all of U.S.S.R.

PCT No. PCT/SU89/00061, § 371 Date Nov. 6, 1990, § 102(e) Date Nov. 6, 1990, PCT Pub. No. WO90/10847, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 13, 1989, Ser. No. 601,822
Int. Cl.[5] G01F *1/12*
U.S. Cl. 73—861.83 **2 Claims**



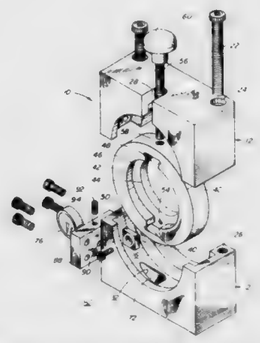
1. A turbine rate-of-flow transducer comprising a cylindrical body in which there are consecutively located in a cocurrent direction a first flow straightener including a fairing facing an oncoming flow stream in a coaxial position relative to said cylindrical body and having radial fins attached to said body; a means of balancing an axial force of said flow stream including a truncated cone, the small base of said truncated cone interacting with an end face of said fairing of said first flow straightener, and passages being made in a side surface of said truncated cone and being spaced equidistantly apart all the way along the circumference of said truncated cone; a rotor having vanes and fitted for revolving in said cylindrical body and in a coaxial position with said cylindrical body; a second flow straightener including a fairing located in a coaxial position relative too said body and having radial fins attached to said body, said fairings of said first and second straightener being located symmetrically with respect to an axis extending at right angles to an axis of revolution of said rotor, each of said passages of said truncated cone being directed so that a projection of a longitudinal axis of each said passages makes with a plane of an axis of revolution of said rotor an angle between 7° and 20° and a vertex of said angle being pointed towards a vertex of an angle at which said vanes of said rotor are inclined, and an aggregate cross sectional area of said passages of said truncated cone in the area of a large base of said truncating cone being between 2 and 6% of the area of flow section at an inlet into said rotor; and a pickup fitted to said cylindrical body in the zone of said rotor and generating a pulse each time a vanes of said rotor passes.

5,109,706
TIGHTENING FIXTURE WITH BUILT-IN TORQUE READOUT DEVICE

Victor D. Mogilnicki, Raleigh, N.C., assignor to Kennametal Inc., Latrobe, Pa.

Filed Jul. 6, 1990, Ser. No. 549,348
Int. Cl.[5] G01L *5/24*
U.S. Cl. 73—862.21 **15 Claims**

1. A tightening fixture for holding a chuck and indicating the torque applied to tighten a lock nut on the chuck, comprising:
(a) a stationary block;
(b) a torque transmitting collar rotatably mounted in the stationary block for receiving and holding the chuck;
(c) locking means for holding the chuck nonrotatable with respect to the collar so that when torque is applied to tighten the locking nut, the chuck and collar rotate as a unit;
(d) a torque indicator assembly responsive to the rotation of the collar for indicating the tightening torque being applied to the lock nut of the chuck; and

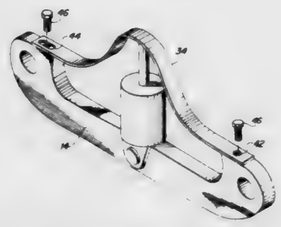


(e) said stationary block indicating an annular recess and the torque transmitting collar is rotatably mounted in the annular recess.

5,109,707
C-BEAM FORCE SENSOR

Harlan W. VanGerpen, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 13, 1990, Ser. No. 611,629
Int. Cl.[5] G01L *1/04, 5/13*
U.S. Cl. 73—862.62 **2 Claims**

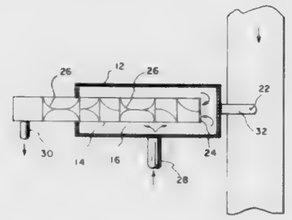


1. A force sensor for sensing forces tending to move one part towards and away from a second part, the force sensor comprising:
a beam;
a pair of lugs, each extending from a corresponding end of the beam, the lugs having coupler means for coupling each lug to one of the first and second parts, the coupler means beign spaced apart from and positioned on one side of the beam, the beam and the lugs forming a generally C-shaped member;
a curved flexible strap, the strap being concave in a direction facing the beam and a line connecting the coupler means of the lugs being located between the strap and the beam;
a first attachment means for attaching a first end of the strap to one of the lugs and a second attachment means for attaching a second end of the strap to the other of the lugs, the strap beign substantially more flexible than the C-shaped member and having a central portion which moves towards and away from the beam as the C-shaped member bends; and
a displacement transducer for sensing changes in separation between the beam and the central portion of the strap.

5,109,708
SAMPLING SYSTEM AND METHOD FOR SAMPLING CONCENTRATED AEROSOLS

Philip A. Lawless, Durham, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 323,819, Mar. 15, 1989, abandoned. This application Nov. 28, 1989, Ser. No. 445,955
Int. Cl.[5] G01N *31/00*
U.S. Cl. 73—863.11 **4 Claims**



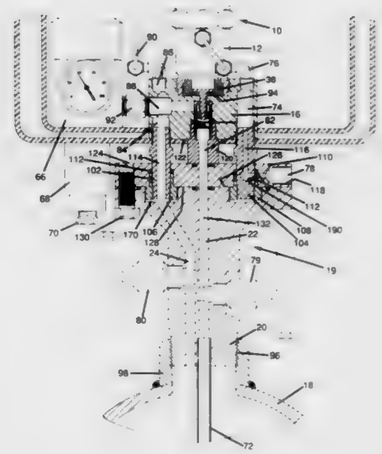
1. An improved system for obtaining representative samples of particles from an aerosol in which the particulate concentration of the aerosol is greater than 10^6 particles/cm^3 which comprises a sampling probe arranged to operate in cooperation with a dilution system, said sampling probe comprising:
(a) an outer tube having one end which terminates in a generally smooth tip for placement within a particle-laden aerosol stream and having at least one orifice in the sidewall near said tip for drawing a sample of aerosol from the stream;
(b) an inner tube located within said outer tube to form an annular space therebetween and a quenching zone between the inner tube end and said tip; and
(c) a mixing zone located within said inner tube;
said dilution system comprising:
(a) a loop which communicates with the annular space of the sampling probe via an inlet nozzle for supplying dilution gas to the probe and with the inner tube of the probe via an exit nozzle for removing an amount of diluted and quenched aerosol from the probe for measurement;
(b) means within said loop for measuring the flow of dilution gas to the probe and for setting the circulation rate;
(c) at least one filter within said loop for removing impurities from the dilution gas prior to its reaching the quenching zone of the probe;
(d) pumping means within said loop for supplying dilution gas to the probe while simultaneously removing diluted and quenched gas from the probe; and
(e) a make-up flow of dilution gas and an extraction flow of quenched gas to be measured which communicate with said loop and cooperate to balance the pressure in the sampling system in relation to the pressure within the aerosol stream being sampled.

4. A method for continuously obtaining representative samples of particles from an aerosol stream in which the concentration of particles is greater than about 10^6 particles/cm^3 which comprises:
(a) providing an enclosed quenching zone within said aerosol stream with an outer tube having at least one sampling orifice therein and communicating therebetween;
(b) introducing samples of said aerosol into said zone through said outer tube having the orifice therein by varying the pressure therein in relation to the pressure of said stream while simultaneously diluting the samples at a dilution ratio of at least about 500:1 by passing a stream of dilution gas into said zone; and
(c) immediately passing the diluted sample through a mixing zone adjacent said quenching zone to dilute and cool the sample to a concentration and temperature, respectively, suitable for measurement.

5,109,709
DIRECT MOUNT SYSTEM FOR A FLUID SAMPLING PUMP AND METHOD

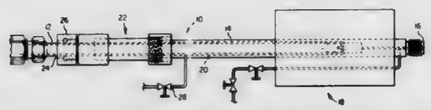
Spencer M. Nimberger, 13711 Chelwood Pl., Houston, Tex. 77069

Continuation-in-part of Ser. No. 496,368, Mar. 19, 1990. This application Sep. 21, 1990, Ser. No. 586,499
Int. Cl.[5] G01N *1/14*
U.S. Cl. 73—863.84 **18 Claims**



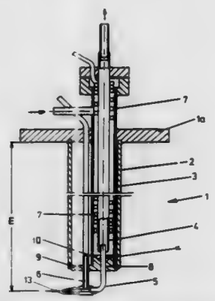
1. An interface for mounting a sampling pump to a flow line having a sampling nipple secured thereto, the sampling pump including a pump manifold having a hot loop passageway with a first hot loop entry port, a second hot loop exit port, and a third port spaced opposite the second port with respect to the first port, each of the first, second, and third ports passing through a lower face of the pump manifold, and the pump having an inlet along the hot loop passageway in the pump manifold, the interface comprising:
an interface body having (a) a hot loop entry passageway through the interface body for maintaining fluid communication between the flow line and the first hot loop entry port, (b) a hot loop return passage through the interface body for maintaining fluid communication between the second hot loop exit port and the flow line, and (c) tapered external threads on an end of the interface body for sealing engagement with mating threads on the sampling nipple;
first and second fittings;
first and second nipples each having an upper end for sealing engagement with the second hot loop exit port and the third port in the pump manifold, respectively, and a lower end for engagement with a corresponding one of the first and second fitting;
a spacer nipple having an upper end for sealing engagement with the first hot loop entry port and a through passageway
an interface plate having first and second passageways for receiving portions of the first and second nipples, respectively, and a flow passageway spaced between the first and second passageway for transmitting fluid from the hot loop entry passageway in the interface body to the first hot loop entry port; and
connection means for fixedly securing the interface plate to the interface body, such that the pump is directly supported by the interface to the flow line.

5,109,710
DIRECT FILTER INJECTION SYSTEM FOR GAS CHROMATOGRAPHS
Matthew S. Newkirk, and David M. Human, both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.
Filed Jun. 21, 1990, Ser. No. 541,816
Int. Cl.[5] G01N *30/20*
U.S. Cl. 73—863.11 **2 Claims**



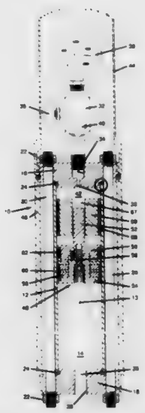
1. An injector port assembly for direct injection of a solid filter test sample for gas chromatography analysis comprising:
a) an elongated thermally conductive injector tube having a perforated sample holding portion; and
b) an injection port having a sealable entry opening into which said elongated injector tube is moveably inserted, comprising a hot zone, a cold zone removably attached to and thermally insulated from said hot zone, a purge valve means and means for connecting said injection port in fluid communication with a gas chromatography column.

5,109,711
PROBE FOR SAMPLING PARTICULATES IN GASES FROM FLUES
Horst Wendt, Erlangen, Fed. Rep. of Germany, assignor to Fag Kugelfischer Georg Schafer, Fed. Rep. of Germany
Filed Apr. 2, 1990, Ser. No. 503,523
Claims priority, application European Pat. Off., Apr. 1, 1989, 89105779
Int. Cl.[5] G01N *1/22*
U.S. Cl. 73—863.11 **16 Claims**



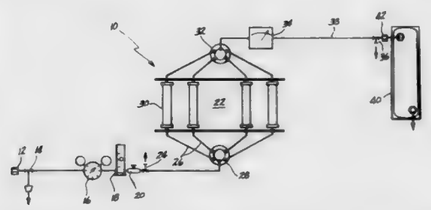
1. A probe for the removal of flue gases from a flue, comprising
a flue gas removal tube, an inlet suction nozzle on the flue gas removal tube, an outlet from the flue gas removal tube;
a mixed gas feed tube having an inlet, the outlet from the flue gas removal tube extending into the inlet of the mixed gas feed tube, the inlet of the mixed gas feed tube being larger than the outlet of the flue gas removal tube which outlet is in the inlet of the mixed gas feed tube, leaving a remaining entrance area into the mixed gas feed tube;
a fresh air tube extending along the mixed gas feed tube, the fresh air tube having an outlet therefrom for fresh air, and the fresh air tube outlet being located near to so as to communicate with the inlet to the mixed gas feed tube, such that fresh air from the fresh air tube outlet enters the mixed gas feed tube inlet along with flue gas from the flue gas removal tube;
heating means arranged in the fresh air tube, and the fresh air tube being along the mixed gas feed tube so that the heating means heats both the fresh air in the fresh air tube and the mixed gas in the mixed gas feed tube, the heating means being adapted to heat the gas in both tubes to a temperature above the respective prevailing dew points of those gases.

5,109,712
PORTABLE SAMPLE CYLINDER WITH REDUCED SEAL PERMEABILITY
Spencer M. Nimberger, Houston, and Robert L. Ward, Missouri City, both of Tex., assignors to Precision General, Inc., Houston, Tex.
Filed Sep. 21, 1990, Ser. No. 586,544
Int. Cl.[5] G01N *1/12*
U.S. Cl. 73—864.62 **20 Claims**



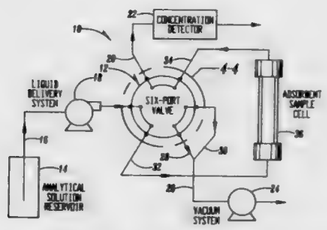
1. A portable sample cylinder for transporting a fluid sample, the sample cylinder including a cylindrical tube housing a sample chamber and defining a sample cylinder axis, an end cap at one end of the tube, and a piston slidabley movable within the sample chamber in sealing relationship with the sample cylinder, the portable sample cylinder further comprising:
the end cap including a planar stop surface an annular grove and a corner positioned between the stop surface and the annular grove;
an elastomeric seal positioned within the annular groove for static sealing between the end cap and the cylindrical tube;
the end of the cylindrical tube including (a) a planar end surface for engagement with the stop surface to limit axial movement of the cylindrical tube with respect to the end cap, and (b) a frustoconical compressional surface for applying a compressional force to the elastomeric seal in response to axial movement of the end surface toward the stop surface; and
connector means for moving the end cap axially to secure the cylindrical tube to the end cap and thereby compress the elastomeric seal to reduce the permeability of the elastomeric seal.

5,109,713
METHOD AND APPARATUS FOR TREATING AND STORING SULFUR CONTAINING GAS SO AS TO PROHIBIT THE DEGRADATION OF SAME
Irene Romero, and Rui Rodrigues, both of Los Teques, Venezuela, assignors to Intevep, S.A., Caracas, Venezuela
Continuation-in-part of Ser. No. 621,601, Dec. 3, 1990, abandoned. This application Mar. 14, 1991, Ser. No. 669,616
Int. Cl.[5] G01N *1/00*
U.S. Cl. 73—864.83 **28 Claims**



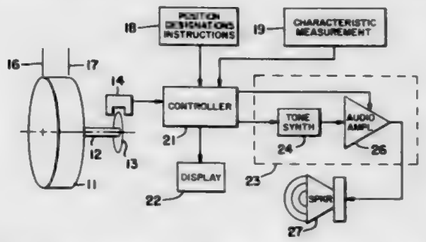
1. A method for treating a sulfur gas containing gas sample to be later analyzed so as to prohibit the degradation of the sulfur gas content of the gas sample over time comprising the steps of:
a) providing a sulfur gas containing gas sample;
b) dehydrating said gas sample so as to obtain a water content in said gas sample of less than 100 ppm to produce a dried gas sample;
c) storing said dried gas sample in a container which is non reactive with the sulfur gas in the dried gas sample; and
d) thereafter removing and analyzing said dried gas sample for sulfur gas content.

5,109,714
METHOD AND MEANS FOR DYNAMIC MEASUREMENT OF RATES OF ADSORPTION FROM SOLUTIONS
Bogdan J. Slomka, and William H. Buttermore, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa
Filed Sep. 21, 1989, Ser. No. 410,473
Int. Cl.[5] G01N *15/08*
U.S. Cl. 73—865.5 **7 Claims**



1. A method for dynamic measurement of rates of adsorption on solids from analytical solutions comprising:
(a) placing a solid adsorbent in an enclosed cell;
(b) pre-evacuating the solid adsorbent to remove contaminating fluids;
(c) rapidly contacting the adsorbent in the cell with an analytical solution without prior exposure of adsorbent to pure solvent; and
(d) detecting the amount of analytical solution adsorbed.

5,109,715
LOCATION DESIGNATOR FOR WHEEL SERVICE MACHINES
Donald J. Christian, Fremont, Calif., and Steven W. Rogers, Conway, Ark., assignors to FMC Corporation, Chicago, Ill.
Continuation of Ser. No. 656,929, Feb. 19, 1991, abandoned. This application Oct. 7, 1991, Ser. No. 772,294
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—865.9 **31 Claims**

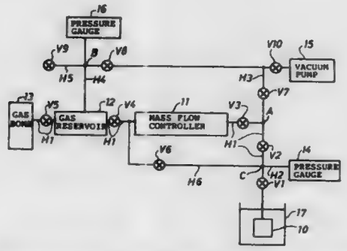


1. In a wheel service machine wherein a vehicle wheel assembly is disposed for rotation on a shaft having a shaft encoder for providing shaft angular position data relative to the machine, a controller coupled to receive the shaft angular position data, means for measuring a predetermined characteristic of the wheel assembly and for providing output indicative of the measurement connected to the controller, and means for indicating the results of the predetermined characteristic measurement to a wheel service machine operator, the improvement comprising
means for entering wheel assembly position designation instructions relating to the predetermined characteristic, the controller being connected to receive said wheel assembly position designation instructions and providing position designation control signal responsive to said instructions, shaft angular position data and output indicative of the characteristic measurement,
audio frequency synthesizer means connected to receive said position designation control signal for providing audio frequency output signals of predetermined duration in response thereto, and
audio means for receiving said audio frequency output signals and for producing an audio output position signal responsive thereto and indicative of a position of substantial alignment of the wheel assembly measured characteristic relative to a service machine reference position.

5,109,716
APPARATUS AND METHOD FOR MEASURING ADSORPTION/DESORPTION
Mutsuhiro Ito; Toshiyasu Abe, both of Miyazaki, Japan; Ryuji Orii, Corvallis, Oreg., and Tomio Yamakoshi, Miyazaki, Japan, assignors to Fuji-Davison Chemical Ltd., Kasugai, Japan
Filed Oct. 30, 1990, Ser. No. 605,958
Claims priority, application Japan, Feb. 27, 1990, 2-46577
Int. Cl.[5] G01N *15/08*
U.S. Cl. 73—865.5 **17 Claims**

1. An apparatus for measuring adsorption and desorption of a gas by a solid sample, comprising:
sample containing means having a predetermined volume Vol_2 for containing the solid sample and gas;
gas containing means having a predetermined volume Vo for containing gas;
exhaust means for selectively exhausting gas from either the sample containing means or the gas containing means;
gas feeding means for selectively continuously feeding gas at a flow rate either from the gas containing means to the sample containing means or form the sample containing means to the gas containing means;

first pressure measuring means for measuring the pressure of the gas in the gas controlling means; and
second pressure measuring means for measuring the pressure of the gas in the sample containing means;
the absorption and desorption being calculated based on the flow rate of gas between the gas containing means and the

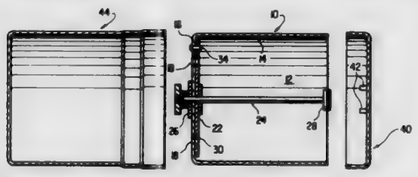


sample containing means, the pressure measured by the second pressure measuring means and the volume Vol_2 of the sample containing means, the adsorption of the solid sample being calculated while the gas feeding means feeds gas from the gas containing means to the sample containing means based on the flow rate of gas from the gas containing means into the sample containing means.

5,109,717
METHOD AND APPARATUS FOR MEASURING FLOWABILITY OF POWDERS

William G. Galetto, Baldwin, Md., and Laura K. Kent-Riggs, Coppell, Tex., assignors to McCormick & Company, Inc., Sparks, Md.

Division of Ser. No. 482,844, Feb. 22, 1990, abandoned. This application Apr. 9, 1991, Ser. No. 680,738
Int. Cl.[5] G01N *33/00*
U.S. Cl. 73—866 **10 Claims**

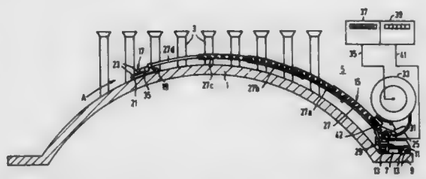


1. A method of measuring the flowability of a material comprising:
providing a material container having side walls, a transverse wall having a plurality of apertures defined therethrough, an open upper end, and a rotatable disc closure assembly mounted within said container, said rotatable disc assembly including a disc mounted immediately adjacent to said transverse wall and having a plurality of apertures defined therethrough so that when said disc is in a first position at least some of the apertures of said disc are coincident with at least some of the apertures of said transverse wall and so that when said disc is rotated to a second position, angularly displaced from said first position, the apertures of said disc are offset from the apertures of said transverse wall so that said disc closes the apertures of said transverse wall;
rotating said rotatable disc assembly so as to close the apertures of said transverse wall;
placing a material to be measured in said material container;
rotating said rotatable disc assembly so as to align at least some of the apertures of said disc with at least some of the apertures of said transverse wall;
rotating said container for a predetermined number of revolutions;
rotating said rotatable disc assembly so as to close the apertures of said material container; and
measuring the amount of material disposed which passed through said transverse wall so as to determine the flowability of the material placed within said material container.

5,109,718
APPARATUS AND METHOD FOR TESTING A VESSEL WALL

Georg Gugel, Kalchreuth; Martin Haefner, Erlangen; Rainer Bauer, Herzogenaurach, and Peter Krauss, Spardorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 17, 1990, Ser. No. 525,191
Claims priority, application Fed. Rep. of Germany, May 17, 1989, 3916061
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—866.5 **17 Claims**

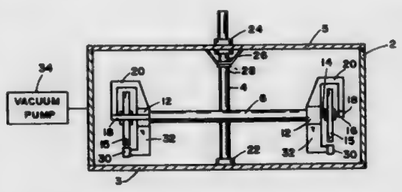


1. Apparatus for testing a vessel wall, comprising a rail, a carriage running on said rail, an inclining and swiveling telescoping arm having an end being pivotably connected to said carriage and a free end, said telescoping arm having curved members with U-shaped cross sections, a drive mechanism for extending and retracting said telescoping arm including a pusher tube having tensile strength and resistance to compression for driving said members in common and a motor for driving said pusher tube, a test unit carried by said free end of said telescoping arm, an evaluation unit, and a data line connected between said test unit and said evaluation unit.

5,109,719
GYROPOWER UNIT

Oscar W. Piokins, Jr., 1416 Mimosa La. NW., Lenoir, N.C. 28645

Filed Feb. 11, 1991, Ser. No. 653,507
Int. Cl.[5] G01C *19/02*
U.S. Cl. 74—5.37 **7 Claims**

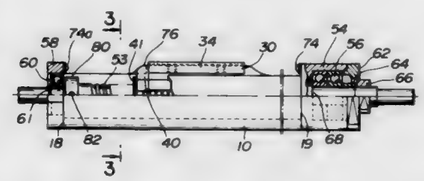


1. A device for generating rotational force about an axis of rotation comprising:
a beam having a longitudinal axis supported in a housing and rotatable about an axis of rotation perpendicular to said longitudinal axis of said beam;
disk means mounted on the longitudinal axis of said beam rotatable about said longitudinal axis of said beam;
motor means for rotating said disk means; and
means disposed proximate said disk means for inducing precession of said disk means in a direction of rotation of said beam when said disk means is rotated and causing said beam to rotate about said axis of rotation.

5,109,720
FEED UNIT APPARATUS

Shinichi Kasuga, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1990, Ser. No. 486,079
Claims priority, application Japan, Mar. 3, 1989, 1-24391[U]
Int. Cl.[5] F16H *27/02;* **F16J** *9/00;* **F16B** *7/10*
U.S. Cl. 74—89.15 **2 Claims**

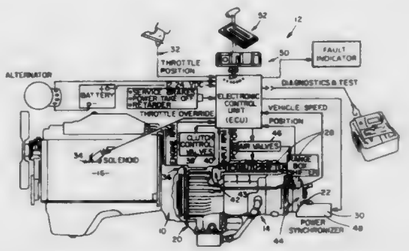


1. A feed unit apparatus comprising:
a guide rail of a continuous length having an upwardly opening U-shaped cross section and axial ball rolling grooves opposing each other formed in inner surfaces of side walls thereof;
a nut block having ball rolling grooves formed in both lateral sides respectively corresponding to the ball rolling grooves of the guide rail and having through bores serving as ball return paths respectively corresponding to the ball rolling grooves of the nut block, the nut block including an axial through bore having a ball thread groove formed in a center portion thereof, the nut block being loosely fitted into an inside of the guide rail with a minute clearance between an outer peripheral surface of the nut block and an inner peripheral surface of the guide rail, a portion of the nut block including the axial through bore having the ball thread groove formed therein constituting a nut portion, and another portion of the nut block including the ball rolling grooves formed in both lateral sides and the through bores serving as the ball return paths and constituting a linear movement ball bearing portion formed integrally with each other;
end caps respectively fixed to opposite axial ends of the nut block, each of the end caps having ball circulating paths respectively communicating corresponding ones of the ball rolling grooves and the ball return paths of the nut block with each other;
a plurality of balls rollably fitted between the ball rolling grooves of the guide rail and the ball rolling grooves of the nut block;
a feed screw shaft inserted into and engaged through the balls with the through bore in the nut block having the ball thread groove formed therein;
a support unit fixed to one end of the guide rail for rollably and axially unmovably supporting the feed screw shaft;
the nut block being provided with axially extending portions extending laterally outward from both upper side portions thereof beyond both outer surfaces having the ball rolling grooves formed therein so that the extending portions are respectively positioned close to the upper ends of both of the side walls of the guide rail to cover the upper ends of the side walls;
the nut block being formed with an axially extending recess in an upper surface between the extending portions, with the recess opening upwardly between the extending portions;
axially extending guide grooves respectively formed in the extending portions and opening to the recess;
the nut block having axially extending grooves respectively formed in both outer side surfaces thereof below the extending portions to form a reduced width portion in the nut block, the width of the recess being greater than the width of the reduced width portion of the nut block;
the guide rail being provided with a pair of axially extending magnets respectively mounted on the upper ends of the side walls so that inner edge portions of the magnets protrude inwardly into the axially extending grooves in the nut block forming the reduced width portion of the nut block;
each of the end caps being formed with a slant surface on an upper end portion thereof, the slant surface having curved portions respectively contiguous with an upper surface of the nut block and contiguous with upper surfaces of the magnets on the side walls of the guide rail; and
a flexible seal plate formed of a magnetic sheet material having opposed ends respectively secured to opposed end portions of the guide rail, the flexible seal plate being received within and slidably engaging the recess formed in the upper surface of the nut block between the extending portions of the nut block and slidably guided by the guide grooves in the inner side walls of the extending portions and slidably guided by the slant surface on the upper end portion of each of the end caps so that an expanded portion expanding upwardly is formed in the seal plate at a portion corresponding to the nut block to allow axial movement of the nut block while maintaining sealing of the minute clearance between the nut block and the guide rail, the flexible seal plate being attracted at the lateral side portions thereof by the magnets mounted on the side walls of the guide rail to thereby seal the minute clearance between the nut block and the guide rail before and behind the nut block.

5,109,721
RANGE SHIFTING ONLY FAULT TOLERANCE METHOD/SYSTEM

Mark D. Boardman, Portage, and James M. Irwin, Rochester Hills, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

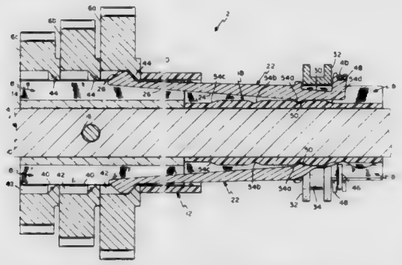
Filed May 9, 1991, Ser. No. 698,745
Int. Cl.[5] B60K *20/02*
U.S. Cl. 74—336 R **16 Claims**



1. A method for controlling shifting of an automated mechanical transmission system (12) of the type comprising a compound mechanical transmission (14) comprising a multiple ratio main section (94) connected in series with a multiple ratio auxiliary section (96), a fuel controlled engine (16), a nonpositive coupling (10) drivingly interposed the engine and the transmission, and a central control unit (50) effective to receive input signals from a plurality of system sensors (36, 42, 44, 28) indicative of the status of the transmission system and to process same in accordance with logic rules to issue command output signals to a plurality of system actuators (40, 28, 48), said method characterized by:
sensing for the presence of conditions indicative of a system

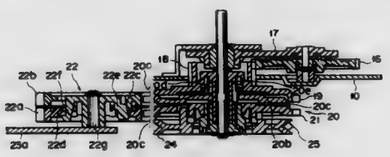
fault rendering continuing transmission main section shifting but not auxiliary section shifting undesirable;
responding to sensing the presence of said conditions by causing said main section to be engaged in a selected ratio thereof; and
thereafter, retaining said main section engaged in said selected ratio while issuing command output signals for causing shifting of only said auxiliary section.

5,109,722
SELF-DETENTING TRANSMISSION SHIFT KEY
Donald L. Hufnagle, Apple Valley, and Steven J. Svoboda, Bloomington, both of Minn., assignors to The Toro Company, Minneapolis, Minn.
Filed Jan. 12, 1990, Ser. No. 465,308
Int. Cl.[5] F16H *3/08*
U.S. Cl. 74—371 **9 Claims**



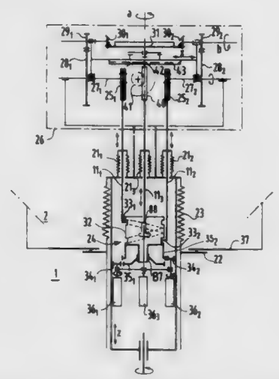
1. An improved variable speed transmission of the type having speed change gears rotatably journalled on a shaft, a key slidably carried on the shaft for moving between the gears, means for coupling the key to the gears for rotating one gear at a time with the shaft, wherein the key has a bottom surface in sliding engagement with the shaft, the bottom surface of the key formed with a fulcrum point intermediate its ends about which the key pivots to engage and disengage the gears, shift means for moving the key relative to the shaft between the different gears to change the output speed of the transmission, and detent means for indicating different detent positions of the key in which the key is coupled to the various gears, wherein the improvement comprises detent means having a first detent portion carried on the bottom surface of the key and a second detent portion contained on the shaft, wherein the detent portions cooperate together to define the detent position, wherein the first detent portion is located at the fulcrum point of the key so as to engage the second detent portion on the shaft regardless of the pivotal orientation of the key.

5,109,723
ROTATION TRANSMISSION MECHANISM
Masao Kato, Kumagaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 25, 1990, Ser. No. 470,345
Claims priority, application Japan, Jan. 31, 1989, 1-21001
Int. Cl.[5] F16H *57/00, 37/06*
U.S. Cl. 74—411 **5 Claims**



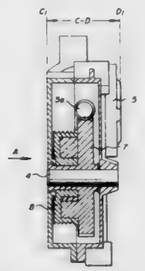
1. A rotation transmission mechanism, comprising:
a first driving gear to which a driving force is transmitted from a driving source;
a second driving gear, arranged coaxial with the first driving gear with a friction mechanism interposed, for receiving the driving force transmitted from the first driving gear through the friction mechanism and for outputting the driving force;
first and second directly-coupling gears engageable with the first and second driving gears and arranged coaxial with each other in such a manner as to provide gaps of a predetermined size in a circumferential direction thereof, said gaps serving to absorb torsion generated between the first and second driving gears, said first and second directly-coupling gears transmitting the driving force from the first driving gear directly to the second driving gear when the first directly-coupling gear is engaged with the first driving gears and the second directly-coupling gear is engaged with the second driving gear; and
engagement-switching means for selectively moving the first and second directly-coupling gears between a first position at which the first and second directly-coupling gears are engaged with the first and second driving gears and a second position at which the first and second directly-coupling gears are disengaged from the first and second driving means.

5,109,724
MICROMANIPULATOR
François Delarue, Champigny-sur-Marne; Michel Girand, Villiers-sur-Marne, and Manuel Montero, Le Perreux, all of France, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 12, 1990, Ser. No. 492,681
Claims priority, application France, Mar. 10, 1989, 89 03164
Int. Cl.[5] B25J *7/00;* **G05G** *11/00*
U.S. Cl. 74—479 **22 Claims**



1. A micromanipulator for displacing a sample carrier, said micromanipulator having elastic bellow, mounting and displacement means for mounting said carrier for rotation and linear translation of said carrier, and linkage members extending through corresponding bellows in a sealed manner and cooperating with said mounting and displacement means such that movement of each linkage member affects a corresponding translation of rotation of said carrier, the improvement comprising:
a first of said linkage members being a first transmission pin moveable in axial translation, substantially without rotation with respect to its corresponding bellows, and coupled to said mounting and displacement means; and said mounting and displacement means being arranged for rotating said sample carrier about a first axis of rotation substantially parallel to said first transmission pin in response to axial translation of said first transmission pin.

5,109,725
MOTOR DRIVE UNIT FOR CABLE WINDOW REGULATOR
Wolfgang Roth, Asslar-Oberlemp, and Thomas Medebach, Wetzlar, both of Fed. Rep. of Germany, assignors to Kuester & Co. GmbH, Ehringshausen, Fed. Rep. of Germany
Filed Feb. 23, 1990, Ser. No. 486,011
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1989, 3905589
Int. Cl.[5] G05G *1/08;* **F16H** *27/02*
U.S. Cl. 74—505 **1 Claim**



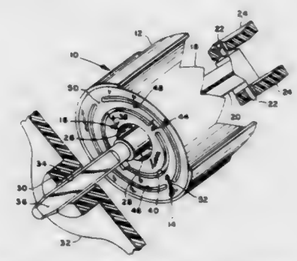
1. A motor drive unit for a cable drive system, comprising in combination:
a first subassembly including a first housing, a worm gear, and a bearing pin extending therefrom; and
a second subassembly, for connecting to said first subassembly, including a second housing, a worm wheel supported by said bearing pin and driven by said worm gear when said first and second subassemblies are connected, said worm wheel having a sheath portion extending therefrom, and a cable drum, said cable drum being mounted on said extended sheath and being driven thereby;
said housing of said second subassembly further including an opening through which a free end of said extended sheath portion of said worm wheel extends; and,
said free end including at least one hook element which positively engages edge portions of said opening so as to retain said worm wheel and cable drum against removal from said second subassembly.

5,109,726
CAMSHAFT WITH BARREL-SHAPED SHANK
Rolf Ohlendorf, Weinstadt; Gerhard Haussmann, Leinfelden, and Karl Krejci, Ostfildern, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany
Filed Apr. 2, 1990, Ser. No. 502,704
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 3913104
Int. Cl.[5] F16H *53/00;* **F01L** *1/04*
U.S. Cl. 74—567 **2 Claims**



1. A camshaft, adapted for high-power internal combustion engines, comprising bearing points, cams having a base circle and a cam face, and non-cylindrical first shank portions connecting the bearing points and cams and also connecting the cams, and a second shank portion between two adjacent cams having a convexly curved outer surface and a maximum diameter of the surface in a middle region of the shank portion, as viewed along the length of the camshaft being no greater than a diameter of the base circles of the cams wherein a shank portion of the first shank portions between each cam and bearing point has a frustoconical shape, with a wider diameter towards the cam.

5,109,727
ROTARY ADJUSTMENT CAM
Ronald S. Joyce, Elk Grove Village, Ill., assignor to Eaton Corporation, Cleveland, Ohio
Filed Feb. 28, 1991, Ser. No. 661,952
Int. Cl.[5] F16H *53/08;* **H01H** *19/00*
U.S. Cl. 74—568 R **3 Claims**

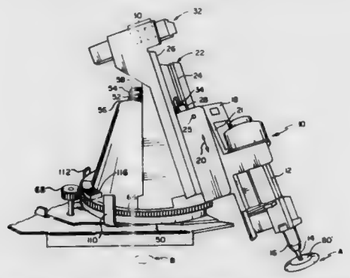


1. A rotary adjustment cam means comprising:
(a) an outer wall having a generally cylindrical shape with cam surfaces disposed generally peripherally thereabout and adapted for contacting a cam follower;
(b) torque web means extending radially inwardly from said outer wall;
(c) a centrally disposed hub defining journal surfaces thereon and extending axially from said web means, said outer wall, web means, and hub formed integrally as a one piece member, said web means operable to transmit torque from said hub to said outer wall about the axis of said hub; and,
(d) said web means including a first pair of oppositely disposed circumferentially spaced arcuately shaped slots formed therein, said slots forming in the region circumferentially therebetween a first pair of oppositely disposed radial spokes torsionally resilient about a first radial axis, said first pair of spokes connected to an annular intermediate region radially outwardly of said first pair of slots, said web means further including a second pair of oppositely disposed circumferentially disposed arcuate slots disposed outwardly of said annular region and defining in the circumferential regions therebetween a second pair of outwardly extending radial spokes connecting said annular intermediate region with said outer wall, said second pair of spokes torsionally resilient about a second radial axis in quadrature with said first radial axis, said first and second pairs of spokes operative to permit lateral deflection of said hub with respect to said wall yet transmit driving torque therebetween.

5,109,728
LOCKING MEANS FOR A ROTATIONAL WORK STATION IN AN ANALYZER
Martin F. Muszak, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 25, 1991, Ser. No. 736,277
Int. Cl.[5] F16H *25/00*
U.S. Cl. 74—820 **7 Claims**

1. In a camming apparatus for raising and lowering a work

station in response to a rotational drive, said apparatus comprising a cam, means for mounting said cam for rotation, drive means for rotating said cam and including a drive gear and a gear segment on said cam, a carrier for mounting a cam follower on said cam, said carrier being frictionally mounted on said cam sufficient to cause said follower to rotate with said



cam, unless said carrier is held from rotation, and locking means to lock said carrier into a known position to permit adjustments,

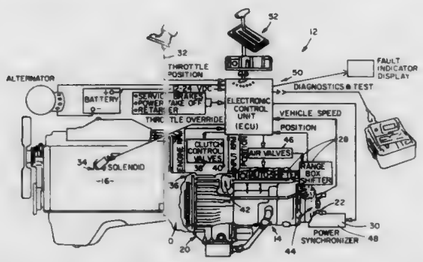
the improvement wherein said locking means comprise a gear segment having two ends on said carrier positioned to engage said drive gear during a portion of the engagement by said drive gear of said gear segment on said cam.

5,109,729

THROTTLE CONTROL FAULT DETECTION AND TOLERANCE METHOD/SYSTEM

Mark D. Boardman, Portage, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 9, 1991, Ser. No. 697,813
Int. Cl.[5] F16H *61/00*
U.S. Cl. 74—858 **25 Claims**



1. A method for controlling shifting an automated mechanical transmission system (12) of the type comprising a mechanical transmission (14), a fuel controlled engine (16), a nonpositive coupling (10) drivingly interposed the engine and the transmission, an operator set throttle control device (32), a throttle override device (34) effective to limit the maximum amount of the fuel supplied to the engine to a predetermined amount regardless of the setting of the throttle control device, and a central control unit (50) effective to receive input signals indicative of the status of the transmission system including signals indicative of (i) engine speed, and to process same in accordance with logic rules to issue command output signals to a plurality of system actuators, said method characterized by:

sensing for a required shift of said transmission;

responding to sensing a required shift of said transmission by initiating actuation of said throttle override device and sensing and memorizing the initial value of engine speed (ES_o) at the time of initiating actuation of said throttle override device;

allowing a period of time (T_{REF}) to pass and then sensing the then current engine speed (ES_c); and

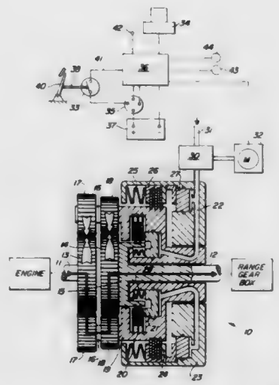
comparing the initial value of engine speed to the current value of engine speed and determining a throttle override device actuation fault if said initial value does not exceed said current value by at least a reference value ($ES_o - ES_c \geq REF$).

5,109,730

CONTROL SYSTEM FOR SHIFTING A GEARBOX

Klaus Zahn, Oestringen, and Werner Schmidt, Mannheim, both of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Jan. 17, 1990, Ser. No. 466,540
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1989, 3901421
Int. Cl.[5] B60K *41/10*
U.S. Cl. 74—866 **8 Claims**



1. A control system controlling a power shift stage connected between an internal combustion engine and a range gear box, the power shift stage comprising downshift means for reducing the transmission ratio and upshift means for increasing the transmission ratio, the engine having a fuel adjusting element for controlling a rate of fuel feed thereto, the control system having means for controlling the transmission ratio of the power shift stage depending upon engine load, a switch connected to the fuel adjusting element, an engine speed sensor for sensing the speed of the engine, and a control unit coupled to the switch, to the engine speed sensor and to the power shift stage, the control unit automatically shifting the power shift stage if the status of the switch and the sensor indicate that the fuel feed rate and the sensed engine speed fall outside of a certain range, the control unit comprising:

means for downshifting the power shift stage to reduce the transmission ratio when the switch indicates that the fuel adjusting element attains a full throttle position and the engine speed sensor indicates that the engine speed falls below a predetermined value corresponding to an upper power level and a second

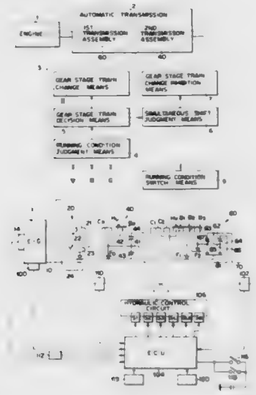
means for upshifting the power shift stage to increase the transmission ratio if the engine speed sensor indicates that the sensed engine speed exceeds a predetermined upper rated engine speed.

5,109,731

SHIFT CONTROL SYSTEM AND METHOD FOR AUTOMATIC TRANSMISSION

Kunihiro Iwatsuki; Hiromichi Kimura, and Hideaki Otsubo, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 4, 1991, Ser. No. 664,138
Claims priority, application Japan, Mar. 7, 1990, 2-55992
Int. Cl.[5] B60K *41/18, 41/04*
U.S. Cl. 74—866 **10 Claims**



1. A shift control system for an automatic transmission including first and second transmission assemblies arranged in tandem and individually controlled for selecting at least a first and a second gear stage train, each of said gear stage trains being composed of a plurality of gear stages set by combining said first and second transmission assemblies, comprising:

running condition judgment means for judging the present running conditions including the currently selected gear stage;

gear stage train decision means for deciding such one of said gear stage trains as is suited for said running conditions;

gear stage train change means for changing a currently selected gear stage train to another gear stage train decided by said gear stage train decision means;

simultaneous shift judgment means for judging if a change from said currently selected gear stage train to said decided gear stage train produces a simultaneous shift of both said first transmission assembly and said second transmission assembly; and

gear stage train change inhibition means for controlling said gear stage train changing means to inhibit a change to said decided gear stage train if the simultaneous shifts are judged.

5,109,732

ADAPTIVE CONTROL OF SERVO ACTIVATING PRESSURE FOR MOTOR VEHICLE AUTOMATIC TRANSMISSION

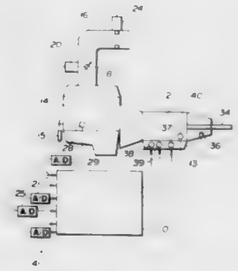
Satoshi Takizawa, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 7, 1990, Ser. No. 624,236
Claims priority, application Japan, Dec. 15, 1989, 1-324083
Int. Cl.[5] B60K *41/18*
U.S. Cl. 74—866 **8 Claims**

1. A system for controlling servo activating hydraulic fluid pressure of an automatic transmission of a motor vehicle power train including an engine, the automatic transmission having an output shaft and being shiftable between a plurality of gear positions, the system comprising:

means for detecting an airflow rate of intake air admitted to the engine and generating an airflow rate indicative of said airflow rate detected;

means for detecting a revolution speed of the output shaft of the automatic transmission and generating an output shaft revolution speed indicative signal indicative of said revolution speed detected; and



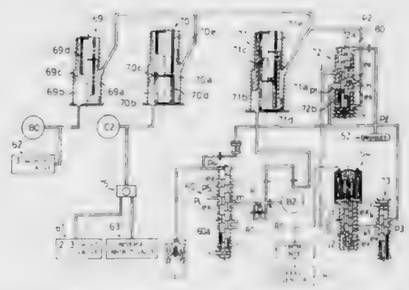
means responsive to said air flow rate indicative signal and said output shaft revolution speed indicative signal for determining a parameter as a predetermined function of said airflow rate and said revolution speed and determining the servo activating hydraulic fluid pressure in response to said parameter.

5,109,733

HYDRAULIC CONTROL DEVICE FOR AN AUTOMATIC TRANSMISSION

Kazunori Ishikawa; Kazumasa Tsukamoto, both of Toyota; Takuji Taniguchi, Okazaki, and Yutaka Taga, Aichi, all of Japan, assignors to Aisin Aw Co., Ltd. and Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 21, 1989, Ser. No. 313,233
Claims priority, application Japan, Feb. 20, 1988, 63-37882
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—868 **11 Claims**



1. In an automatic transmission having a transmission gear mechanism including rotational elements driven at various respective rotational speeds in different speed stage of the transmission, and at least one frictional engaging element operatively connected to one of the rotational elements and engageable for restraining the rotation of said one of the rotational elements, a hydraulic control device comprising:

a source of hydraulic fluid pressure;

a hydraulic servo operatively connected to said at least one frictional engaging element for selectively engaging and disengaging said at least one frictional engaging element;

a shift valve operatively hydraulically connected in the control device between said source of hydraulic fluid pressure and said hydraulic servo for selectively supplying hydraulic fluid from said source to said servo and draining

hydraulic fluid from said servo during respective shifting operations in which said at least one frictional engaging element is being put into engagement or is being disengaged; and

shift-shock inhibiting means for inhibiting shock crated at said at least one frictional engaging element during one of said respective shifting operations said shift-shock inhibiting means including

an accumulator having a back pressure chamber in operative hydraulic communication with said hydraulic servo for regulating the pressure of hydraulic fluid issuing to said hydraulic servo,

accumulator control means operatively hydraulically connected in the control device between said source of hydraulic pressure and the back pressure chamber of said accumulator for regulation the pressure of hydraulic fluid generated in said back pressure chamber during said one of said respective shifting operations,

sensor means for detecting the rotational speed of said one of the rotational elements and for issuing signals indicative of the rotational speed, and

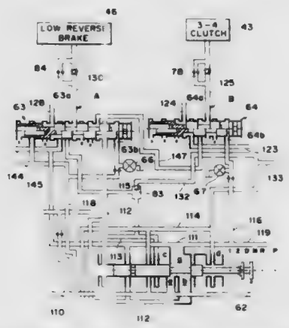
an electronic control unit operatively connected to said sensor means and to said accumulator control means for receiving the signals issued by said sensor, and for controlling said accumulator control means based on said signals to regulate the pressure of hydraulic fluid generated in said back pressure chamber during said one of said respective shifting operations to a pressure which causes said at least one fictional engaging element to restrain the rotation of said one of the rotational elements in a manner in which the rotational speed of said one of the rotational elements during said one of said respective shifting operations corresponds to a predetermined rotational speed.

5,109,734

HYDRAULIC CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION

Takuji Fujiwara, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 28, 1991, Ser. No. 751,067
Claims priority, application Japan, Aug. 28, 1990, 2-227810
Int. Cl.[5] F16H *61/18*
U.S. Cl. 74—869 **7 Claims**



1. A hydraulic control system for an automatic transmission comprising

a shift gear mechanism having a plurality of frictional, elements to be selectively actuated for switching a power transmitting path to establish a desired shift stage,

a manual valve for manually selecting a shift range among a plurality of shift ranges providing predetermined shift stages of the shift gear mechanism,

a 1-2 shift valve for making a shift operation between a first stage and a second stage of the shift gear mechanism,

a 2-3 shift valve for making a shift operation between the second stage and a third stage of the shift gear mechanism,

a low stage frictional element for establishing a lower shift stage of the shift gear mechanism,

a low stage hydraulic circuit for controlling the low stage frictional element by introducing a hydraulic pressure through the manual valve and the 1-2 shift valve,

a high stage frictional element for establishing a higher shift stage of the shift gear mechanism,

a high stage hydraulic circuit for controlling the high stage frictional element by introducing a hydraulic pressure through the manual valve, the 1-2 shift valve and the 2-3 shift valve,

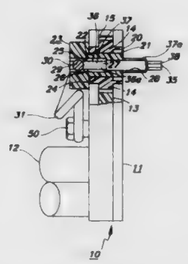
the 1-2 shift valve interrupting the introduction of the hydraulic pressure for the low stage hydraulic circuit when the hydraulic pressure is introduced into the high stage hydraulic circuit and introducing the hydraulic pressure to the low stage hydraulic circuit when the introduction of the hydraulic pressure to the high stage hydraulic circuit is interrupted.

5,109,735

HIGH STRENGTH QUICK CHANGE KEY TYPE INSTALLATION TOOL

Dale Hart, Seal Beach, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Jul. 25, 1989, Ser. No. 385,489
Int. Cl.[5] B25B *17/00*
U.S. Cl. 81—56 **4 Claims**



1. A tool for setting a threaded fastener with torque exerted at only one end, said tool comprising:

a body; a gear train said body adapted to receive and transmit torque from a power source; a socket in gear driving engagement with said gear train and mounted to said body for rotation around an axis, said socket having an internal non-circular array of fastener engaging surfaces and a central circular axial passage therethrough; a key holder having a circular external bearing surface fitted in said axial passage in the socket permitting free relative rotation between the key holder and the socket, said key holder having an internal key passage including a non-circular key-engaging portion and a shoulder; a key fitted in said passage, said key having an exterior non-circular portion to engage in said non-circular key passage portion, said key having a retained end and a free end, and an array of fastener engaging surfaces at the free end of said key; and

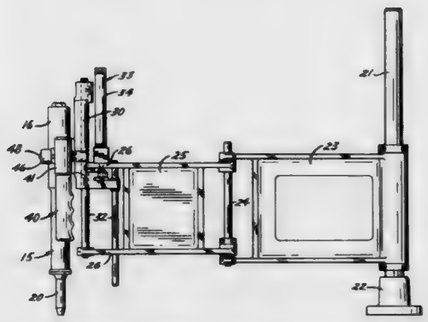
a spring mounted to said body and exerting a bias on said key to bias the free end of the key away from said body, said spring having a free end engaged to said holder to restrain the key holder against rotation, and at least partially occluding the non-circular key passage to prevent removal of the key while the spring is in place, said free end being removable to enable removal or placement of the key from or into said key passage at the end of said passage respective to the retained end of said key.

5,109,736

AUTOMATIC ASSEMBLY MACHINE WITH STEERING/UP-DOWN CONTROL HANDLE

Paul H. Dixon, Belvidere, Ill., assignor to Dixon Automatic Tool, Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 560,854, Jul. 27, 1990, abandoned. This application Feb. 27, 1991, Ser. No. 661,185
Int. Cl.[5] B25B *29/00*
U.S. Cl. 81—57.4 **11 Claims**



1. An automatic assembly machine comprising a support having a first section and having a second section adapted to shift horizontally relative to said first section, an automatic fastener driver, means mounting said fastener driver on said second section of said support for up and down movement between a raised retracted position and a lowered driving position, said mounting means anchoring said fastener driver against rotation relative to said second section of said support, a power-operated actuator connected between said fastener driver and said second section of said support and selectively operable to move said driver upwardly and downwardly between said positions, and manually operable means for use in shifting said fastener driver and said second section of said support horizontally relative to said first section of said support and for controlling said actuator means thereby to control up and down movement of said fastener driver, said manually operable means comprising a downwardly extending handle movable with said second section of said support, said handle defining a grip which may be manually grabbed and manually pushed or pulled horizontally to effect horizontal shifting of said fastener driver and said second section of said support relative to said first section of said support, means mounting said handle for up and down movement relative to said fastener driver between a raised normal position and a lowered actuated position, means urging said handle upwardly to said normal position, and means responsive to downward movement of said handle to said actuated position to cause said actuator to move said fastener driver downwardly to said driving position and responsive to upward movement of said handle to said normal position to cause said actuator to move said driver upwardly to said retracted position.

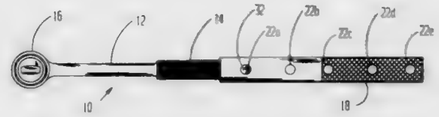
5,109,737

EXTENDED TOOL

Scott M. Raber, 426 Old Bridge Rd., Northport, N.Y. 11768

Filed Jun. 17, 1991, Ser. No. 716,209
Int. Cl.[5] B25B *23/16*
U.S. Cl. 81—177.2 **7 Claims**

1. A wrench comprising a shank, an extended handle means attached at one end to said shank to provide leverage, tool engaging means projected at right angles to the length of said handle means also attached to said shank, the improvement in which said extended handle means comprises a hollow cylinder of circular cross section open at the other end of said handle means, the open end of said cylinder having internal threads, a threaded male member for engagement with said internal threads for closing said open end, a hole in said cylinder adjacent the open end thereof, detent means within said cylinder extending out through said hole, a spring within said cylinder for biasing said detent means outwardly, said detent means and said spring being readily installed and replaced through said open end when said threaded male member is removed, an extended sleeve member of cylindrical shape and circular in cross section for sliding over and enclosing said handle means and being removable by merely sliding out from said handle means, said sleeve member being both slidable along the length of said handle means to increase or decrease leverage applied to said tool engaging means and rotatable on



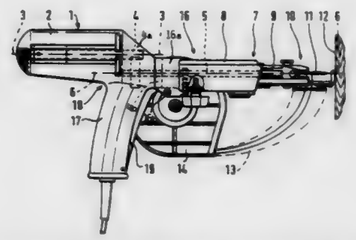
said handle means to permit said sleeve member to be positioned continuously variable both along the length of said handle means and rotationally as well, a plurality of spaced holes in said sleeve member aligned in a row, each of said holes being sufficiently large to accomodate said detent means to lock said sleeve member in any one of several fixed positions as determined by the hole in which said detent means penetrates, said detent means being pressed inwardly out of the aforesaid hole to permit said sleeve to be moved, said sleeve member thereby being adjustable between fixed positions without stopping at intermediate fixed positions by rotating said sleeve member.

5,109,738

HANDHELD SCREW DRIVING GUN

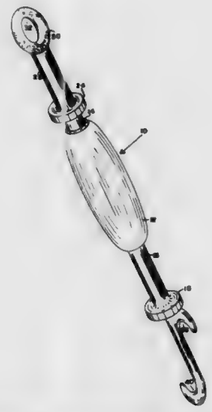
Gerhard Farian, Grossbettlingen, and Guenter Haas, Wolfschlugen, both of Fed. Rep. of Germany, assignors to Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Jul. 12, 1991, Ser. No. 728,990
Int. Cl.[5] B25B *23/04*
U.S. Cl. 81—434 **9 Claims**



1. A handheld screw driving gun, comprising a drive unit having a drive axis (3—3), a screwing bit extending essentially parallel to, but off-set from said axis (3—3), a housing enclosing said drive unit, a handle attached to said housing and extending essentially perpendicularly relative to said drive axis, a screwing unit, means connecting said screwing unit to said housing, said screwing unit comprising a guide head for said screwing bit, a screw feed mechanism, and a screw storage magazine, said drive unit extending away from said handle in a direction opposite to a screwing pressure applying direction, said screwing unit extending away from said handle in said screwing pressure applying direction, whereby said handle is connected approximately at a center of gravity of said screw gun so that said drive unit and said screwing unit balance each other.

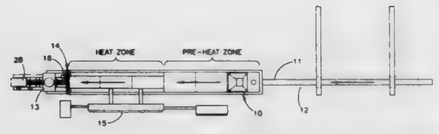
5,109,739
SLIDE HAMMER TOOL
Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434, and Brian D. Hale, 5961 Old School Rd., Pleasanton, Calif. 94566
Filed Mar. 22, 1991, Ser. No. 673,463
Int. Cl.[5] B25B *19/00*
U.S. Cl. 81—463 **4 Claims**



1. A slide hammer tool comprising; a first elongated shaft having first and second ends, a first abutment stationarily mounted on said first end, said abutment having internal threads, said second end having external threads, a second elongated shaft having first and second ends, a second abutment stationarily mounted on said first end, said second abutment having internal threads cooperating with said external threads on said second end of said first shaft, a ring stationarily mounted on said second end of said second shaft, said ring having it's internal diameter of a size cooperating with a handle of a braking bar, a weight slidably mounted on said first shaft, and an attachment threadably engaging said internal threads of said first abutment of said first shaft, whereby, when said ring is placed over the handle of said braking bar with said attachment being used as a handle, said weight may be forcibly struck against said first or second abutment to apply a shock to said braking bar handle,
wherein said attachment is a breaking bar, said breaking bar having a shank on one of its ends, said shank for use with a socket set, said breaking bar having a pivotable connection on its distal end, said pivotable connection cooperating with a second bar, said second bar having threads on its distal end, said threads cooperating with said internal threads of said first abutment of said first shaft.

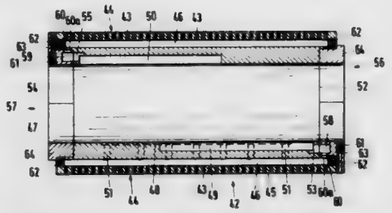
5,109,740
BILLET CUT-OFF CONTROL
Michael T. Kohn, Belding, and John F. Pearson, Grand Rapids, both of Mich., assignors to Belco Industries, Inc., Belding, Mich.
Filed Nov. 21, 1990, Ser. No. 616,341
Int. Cl.[5] B23D *33/02*
U.S. Cl. 83—15 **1 Claim**

1. A method of controlling a cutting system adapted to cut from a metal log, emerging from a furnace having an outlet end, billets of one or more segments having a predetermined total length, each of said segments having a predetermined minimum length, said method comprising:
presenting an end-for-end sequence of metal logs to said cutting system at a position spaced from said furnace end on a conveyor establishing a path of log movement, each of said logs having a leading and a trailing end;
detecting at a position interposed between said furnace end and said cutting system, the discontinuity represented by a trailing end of one of said logs and a leading end of the next following log, said one and next logs remaining in end-to-end contact;
detecting a leading end of a log isolated from any preceding log; and



controlling said cutting system and advancing said logs as a function of the positions of said discontinuity and leading end, said leading end detection being disposed at a distance from said discontinuity detection less than one log diameter.

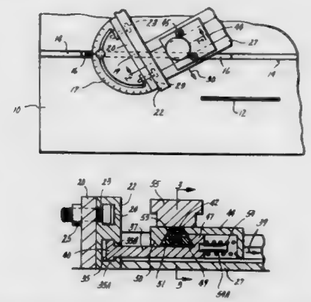
5,109,741
KNIFE ROLLER
Siegfried Fuchs, Neuwied, Fed. Rep. of Germany, assignor to Winkler & Duennebier Maschinenfabrik und Eisengiesserei KG, Neuwied, Fed. Rep. of Germany
Filed Dec. 17, 1990, Ser. No. 628,213
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1990, 4000078
Int. Cl.[5] B26D *7/18;* **B26F** *1/38;* **B31B** *19/14*
U.S. Cl. 83—100 **9 Claims**



1. A knife roller for cutting out several openings in flat material and for disposing of cut-out portions, comprising a roller cylinder body having a longitudinal roller axis, a shell section (**42**) surrounding at leastn a portion of said roller cylinder body, cutting knives secured to said shell section, a plurality of suction holes (**43**) passing through said shell section, said suction holes (**43**) being arranged in rows (**44**) extending in parallel to said longitudinal roller axis, said rows (**44**) being circumferentially spaced from one another around said shell (**42**), a plurality of suction channels (**46**) arranged so that one suction channel (**46**) is provided in common for all suction holes (**43**) of one suction hole row (**44**), whereby each suction hole row (**44**) has its own suction channel (**46**), said suction channels (**46**) extending in parallel to said longitudinal roller axis, a first suction air control duct (**48**) exclusively communicating with a first suction channel (**44***a*) of said plurality of suction channels (**46**), second and third suction air control ducts (**49, 50**), a first valving disk (**6**) arranged for communicating said second suction air control duct (**49**) with any one of said plurality of suction channels (**46**) except said first suction channel (**44***a*), a second valving disk (**57**) arranged for communicating said third suction air control duct (**50**) with anyone of said plurality of suction channels (**46**) except said first suction channel (**44***a*), flow conduit means for providing communication from a source of suction to said suction holes (**43**) through said suction channels (**46**), and through said suction air control ducts (**48, 49, 50**) of which said second and third ducts

are selectively controlled by said first and second valving disks (**56, 57**), whereby substantially any surface portion of said shell section is selectable for an application of suction through the suction holes in said surface portion.

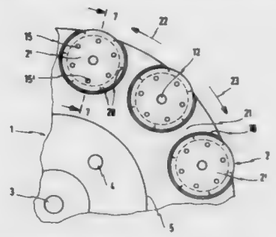
5,109,742
ATTACHMENT FOR MITER GAGE
Donald Strong, Rte. 1110, Whick, Ky. 41390
Filed Feb. 22, 1991, Ser. No. 660,146
Int. Cl.[5] B27B *25/10, 27/08*
U.S. Cl. 83—421 **6 Claims**



1. An attachment for a miter gage that is arcuately adjustable on a table saw table; comprising a first elongated linear fence positionable on the table with a first longitudinal side surface thereof abutting against the miter gage; means for connecting said first fence in a selected longitudinal position along the miter gage; a second elongated linear fence positionable on the table, with one end of said second fence abutting against a second longitudinal side surface of the first fence; and means for locking said second fence in selected positions of adjustment along the length of the first fence; said second fence consisting of a single channel member extending right angularly from said first fence; said channel member having a flat bottom wall seatable on the table, two side walls extending upwardly from said bottom wall, and two inturned flanges extending from said side walls, each toward the other; said fence locking means comprising a T-slot having an internal wall and extending longitudinally within and along said first fence, a slide element movably positioned within the channel member, and a manually-actuable means for drawing said slide element along the channel member away from the first fence; said slide element having an upper surface thereof slidably engaged with the inturned flanges, and a lower surface thereof slidably engaged with the bottom wall of the channel member, whereby the slide element is restricted to horizontal motion within the channel member; said slide element having a T cross-sectioned tongue extending into said T-slot to exert a clamp action on the slot internal wall when the manually actuable means is operated.

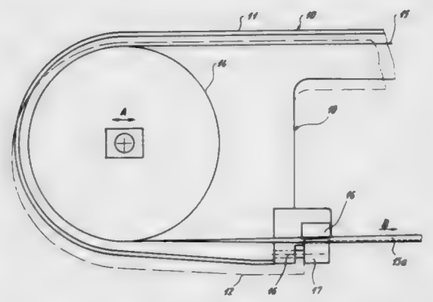
5,109,743
CUTTING KNIFE FOR ROTARY CUTTING APPARATUSES FOR PAPER
Gunter Gämmerler, Sudetenstrasse 31, D-8190 Wolfratshausen, Fed. Rep. of Germany
Continuation of Ser. No. 510,954, Apr. 19, 1990, abandoned. This application Oct. 17, 1991, Ser. No. 777,464
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1989, 3914207
Int. Cl.[5] B26D *1/14*
U.S. Cl. 83—676 **6 Claims**

1. A cutting knife for rotary cutting apparatuses for paper, in particular multilayer separated paper products, comprising a circular base body having a central region of uniform thickness with one surface of said central region forming a flat surface extending to a peripheral edge, and the other surface of said central region merging into a conically-tapered peripheral region terminating at said peripheral edge; a plurality of cutouts arranged about said conically-tapered peripheral region, said cutouts respectively opening into said peripheral edge;



and a blade affixed in each of said cutouts, each blade having a sharpened further peripheral edge with a first blade surface in alignment with said base body flat surface; a portion of said further peripheral edge extending beyond said base body peripheral edge.

5,109,744
BAND SAW FOR CUTTING ANIMAL CARCASSES
Manfred Syré, and Reinhard Freund, both of Paderborn, Fed. Rep. of Germany, assignors to Reinhard Freund Maschinenbau, Fed. Rep. of Germany
Filed Jul. 19, 1990, Ser. No. 554,350
Int. Cl.[5] B23D *55/10*
U.S. Cl. 83—818 **11 Claims**



1. A band saw for cutting animal carcasses and the like, comprising
(a) a housing including a fixed rotatable pulley and a displaceable rotatable pulley for supporting the band;
(b) a lid pivotally connected with said housing for movement between open and closed positions;
(c) means connected with said housing for displacing said displaceable pulley for tensioning the band when said lid is pivoted to the closed position; and
(d) guide means arranged adjacent to said pulleys for twisting the band, each of said guide means including:
(1) a first guide member connected with said housing; and
(2) a second guide member adjustably connected with said lid via an adjustable plate, said second guide member being arranged adjacent and space from said first guide member when said lid is in the closed position to define a gap for receiving the band, the thickness of the gap being adjusted by operation of said adjustable plate, said first guide member of said guide means arranged adjacent to said displaceable pulley being connected with a bearing block thereof for displacing said displaceable pulley and tensioning the band when said lid is pivoted

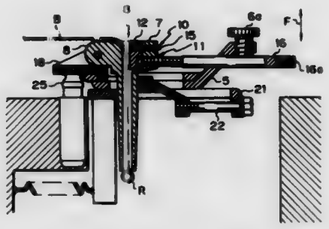
to the closed position, whereby when the lid is in the open position, the band is detensioned and the second guide members are remotely positioned from the first guide members to allow the band to be replaced.

5,109,745

TREMOLO UNIT FOR AN ELECTRONIC GUITAR

Junji Tomita, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Sep. 14, 1990, Ser. No. 583,181
Claims priority, application Japan, Sep. 14, 1989, 1-108242[U]
Int. Cl.[5] G10D *3/00*
U.S. Cl. 84—313 **4 Claims**



1. A tremolo unit for an electric guitar in combination with a guitar string, the combination comprising

a bridge base mounted in a vertically swingable arrangement to a main body of said electric guitar,

a bridge mounted to said bridge base in an arrangement movable substantially in a string direction, provided with a string hole formed there through, and made of a metal selected from the group consisting of iron and stainless steel,

a presser piece received in said string hole of said bridge in an arrangement contactable with a string inserted into said string hole and made of a metal selected from the group consisting of iron and stainless steel at least in a section for contact with said string, said string being provided with an end bead to be locked to a lower end of said string hole when stretched,

means for connecting said presser piece to said bridge in a movable arrangement, and

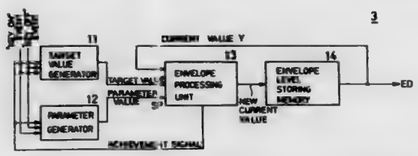
a lock bolt screwed into said bridge to urge said presser piece to press said string against a wall of said string hole.

5,109,746

ENVELOPE GENERATOR FOR USE IN AN ELECTRONIC MUSICAL INSTRUMENT

Kiyomi Takauji, and Yutaka Washiyama, both of Hamamatsu, Japan, assignors to Kawai Musical Inst. Mfg. Co., Ltd., Sizuoka, Japan

Filed Mar. 27, 1990, Ser. No. 499,816
Claims priority, application Japan, Mar. 27, 1989, 1-74601
Int. Cl.[5] G10H *1/06, 3/00*
U.S. Cl. 84—607 **8 Claims**



1. An envelope generator for use in an electronic musical instrument, comprising:

musical tone data processing means for evaluating a current value of musical tone envelope data with respect to a target value based on a parameter;

a target value generator for generating the target value and sending the target value to said musical tone data processing means;

a parameter generator for generating the parameter and sending the parameter to said musical tone data processing means;

changing rate control means for decrementing a change in the current value of the musical tone envelope data such that the current value becomes closer to the target value;

detection means for detecting whether or not the change is equal to 0 ; and

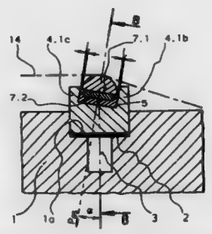
processing control means for controlling said musical tone data processing means by stopping the evaluation of the current value of musical tone envelope data with respect to the target value in response to a result of a detection by said detection means.

5,109,747

PIEZOELECTRIC BRIDGE SOUND PICK-UP FOR STRING INSTRUMENTS

Rolf Spuler, Sennhofweg 35, 8405 Winterthur, Switzerland

Filed Sep. 25, 1990, Ser. No. 587,732
Claims priority, application Switzerland, Jan. 3, 1990, 00001/90
Int. Cl.[5] G01H *3/18*
U.S. Cl. 84—731 **12 Claims**



1. A piezoelectric bridge sound pickup for a single strip of a string instrument comprising the combination of

a metal base body supported on a surface of the instrument, said base body having a bottom wall of at least 2 mm thickness, said bottom wall having an upper support surface;

an electrically insulating holder supported by said support surface;

a piezoelectric element supported on said holder and insulated from said base body by said holder;

a pressure piece resting on said piezoelectric element between said piexoelectric element and said string so that said string passes over and contacts said pressure piece and exerts alternating forces along a line through said pressure piece as said string vibrates; and

means between said pressure piece and said base body for elastically holding said pressure piece in position and for partially damping vibrations caused by said string,

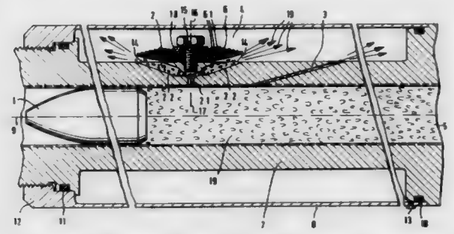
said upper support surface of said bottom wall being inclined relative to the surface of the instrument so as to lie in a plane substantially perpendicular to said line along which said string vibrates.

5,109,748

SMOKE EXHAUST DEVICE FOR GUN BARRELS

Roland Bertiller, Schramberg; Hubert Schneider, Dietingen, and Gerd Dieterle, Dornhan, all of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Oberndorf, Fed. Rep. of Germany

Filed May 15, 1991, Ser. No. 701,460
Claims priority, application Fed. Rep. of Germany, May 17, 1990, 4015822
Int. Cl.[5] F41A *13/08*
U.S. Cl. 89—1.2 **10 Claims**



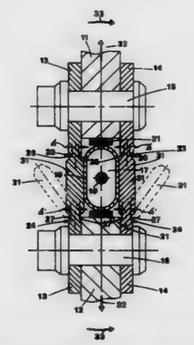
1. An smoke exhaust device for gun barrels, comprising a hollow cylinder arranged around the gun barrel and connected to the gun barrel in a gas-tight manner; at least one blow-off bore extending obliquely to the muzzle of the gun barrel connecting a caliber bore of the gun barrel to the hollow cylinder; a valve bore arranged between the caliber bore of the gun barrel and the smoke exhaust device, said valve bore starting at said caliber bore of the gun barrel and including two oblique inlet openings extending in opposite directions in the shape of a Y, said inlet openings extending at a low angle with respect to a longitudinal axis of the gun barrel; and, check valve means for admitting gas under pressure to the valve bore, said check valve comprising an assembly of layered leaf springs closing off said inlet openings.

5,109,749

EXPLOSIVELY ACTUATED SEPARABLE STRUCTURE

Nuri Y. Olcer, Englewood, Colo., assignor to Oea, Inc., Denver, Colo.

Filed Oct. 25, 1988, Ser. No. 262,511
Int. Cl.[5] F42B *1/00, 15/00*
U.S. Cl. 89—1.14 **18 Claims**



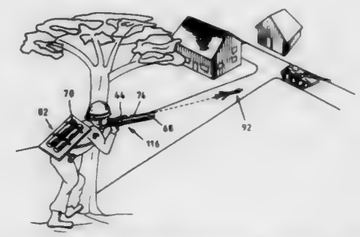
13. In an explosively actuated separable structure: first and second spaced apart plate members, a pair of aligned notches formed in each of the plate members and opening through opposite sides thereof to define areas of weakness between first and second portions of each of said members, and explosively actuated means positioned between the plate members for applying a laterally directed force to the plate members to effect separation of the first and second portions of said members in the areas of weakness.

5,109,750

CLOSED-BREECH MISSILE AND WEAPON SYSTEM

George Kayaian, 129 Cambridge Dr., Hicksville, N.Y. 11801, assignor to George Kayaian

Filed Jun. 13, 1990, Ser. No. 538,539
Int. Cl.[5] F41F *3/042, 3/052*
U.S. Cl. 89—1.818 **3 Claims**



1. A closed breech missile and weapon system, particularly lightweight, for anti-armor/anti-personnel use, comprising:

(a) a preloaded launch tube, a launcher assembly, recoil reducing means, connecting means for attaching and detaching weapon components, wherein the entire physical structure of the assembled weapon system is positioned against and to the front of the operators shoulder when in firing mode;

(b) a missile fired from a shoulder backed hand held launcher and launch tube;

(c) a first stage ignition system, that propels the missile a safe predetermined distance from the launch tube;

(d) a second stage fusing means that ignites second stage propellant when said missile has traveled the predetermined distance from the launch tube; and

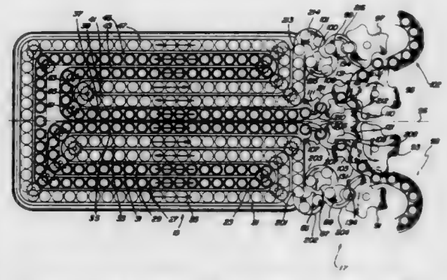
(e) a locking means to secure the missile in the launch tube, formed through the combined utilization of a missile lock, annular shoulder and press interference fit, permitting said launch tube to be aimed in any desired trajectory.

5,109,751

PARALLEL PATH SINGLE BAY AMMUNITION FEED SYSTEM

Richard L. Hagen, Villa Park, and William W. Thompson, Fountain Valley, both of Calif., assignors to North American Dynamics, Tustin, Calif.

Filed Jun. 6, 1990, Ser. No. 534,678
Int. Cl.[5] F41H *9/02*
U.S. Cl. 89—33.16 **10 Claims**



7. Ammunition storage and feed apparatus comprising:

a magazine means for providing first and second series of

rounds on first and second continuous serpentine paths, wherein both paths are disposed in parallel to form a single layer of rounds; and

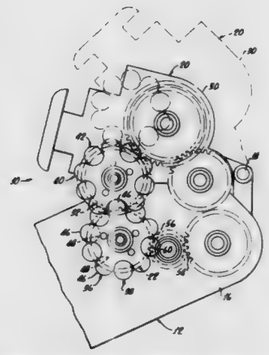
path integrator means for receiving the first and second series of rounds from the single layer magazine means and for integrating said first and second series of rounds into a third series of rounds.

5,109,752

UNIVERSAL SELF-TIMING AMMUNITION LOADER

Dino Yu, Corona, Calif., assignor to Western Design Corp., Irvine, Calif.

Filed Dec. 24, 1990, Ser. No. 632,531
Int. Cl.[5] F41A *9/30*
U.S. Cl. 89—33.17 **14 Claims**



1. A self-timing ammunition interface system comprising:

exit unit means for accepting and delivering ammunition rounds at spaced apart intervals, said exit unit means comprising a housing adapted for coupling with linker/-delinker means and exit unit interface drive gear means for timing the accepting and delivering of said ammunition rounds;

said linker/delinker means for inserting said ammunition rounds, delivered by said exit unit means, into interconnected ammunition links and for removing said ammunition rounds from the ammunition links and delivering said ammunition rounds at spaced apart intervals to the exit unit means, said linker/delinker means comprising a housing adapted for coupling with said exit unit means and loader interface drive gear means for timing the insertion and removal of said ammunition rounds from said ammunition links, said loader interface drive gear means and exit unit interface drive gear means being configured and disposed for engagement with one another when said exit unit means and linker/delinker means are coupled to one another; and

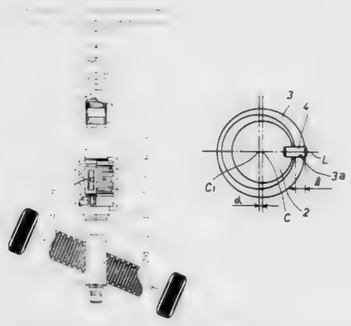
cooperating means, having portions disposed in each of the exit unit means and linker/delinker means, for automatically aligning the engagement of the exit unit interface drive gear means and the loader interface drive gear means to one of several rotational orientations as the exit unit interface drive gear means and loader interface drive gear means are pushed into engagement driving coupling of the exit unit means and linker/delinker means, each of said several rotational orientations enabling timed acceptance and delivery of ammunition to and from the exit unit means and linker/delinker means, said cooperating means comprising a set of lobed rotors, two each disposed in said exit unit means and linker/delinker means, respectively, with two lobed rotors of said set of lobed rotors coaxially mounted for rotation with the exit unit interface drive gear means and two lobed rotors of said set of lobed rotors coaxially mounted for rotation with the linker/delinker interface drive gear means, the two lobed rotors coaxially mounted with the exit unit interface drive gear means being oriented with one another to that projecting portions of one of said last mentioned lobed rotors are generally aligned with recessed portions of another of said last mentioned lobed rotors, and the two lobed rotors coaxially mounted with the linker/delinker interface drive gear means being oriented with one another so that projecting portions of one of said last mentioned lobed rotors are generally aligned with recessed portions of another of said last mentioned lobed rotors.

5,109,753

POWER STEERING VALVE ASSEMBLY MECHANISM WITH OFFSET VALVE SLEEVE BORE

Shigeki Kobayashi, Aichi, Japan, assignor to TRW Steering & Industrial Products (Japan) Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1991, Ser. No. 650,073
Claims priority, application Japan, Mar. 20, 1990, 2-28987[U]
Int. Cl.[5] F15B *9/10*
U.S. Cl. 91—375 A **5 Claims**



1. A power steering device including a valve assembly mechanism defining an assembly center line and comprising:

an input shaft for connection to a steering shaft;

a pinion shaft relatively rotatably connected to the input shaft and having a pinion engagable with a rack for turning vehicle steering wheels;

a valve sleeve surrounding an outer periphery of the input shaft; and

a torsion bar connecting the input shaft and the pinion shaft; wherein,

the pinion shaft is connected to the valve sleeve by a drive pin engaging a pin hole extending from a cylindrical bore of the valve sleeve along a radius of the valve sleeve, the drive pin being engaged with and projecting in a radial direction from the outer periphery of the pinion shaft, and

the bore of the valve sleeve defines a center line which intersects a center line defined by the pin hole while being displaced from the center line defined by the valve assembly away from the pin hole.

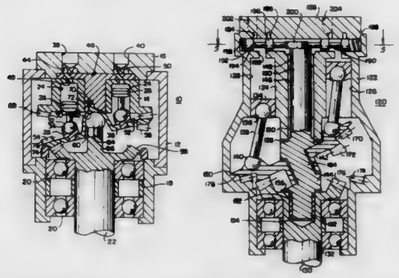
5,109,754

HIGH TORQUE LOW SPEED MOTOR

Edwin L. Shaw, P.O. Box 745, Captain Cook, Hi. 96704

Division of Ser. No. 538,073, Jun. 13, 1990, Pat. No. 5,094,147.
This application Nov. 27, 1991, Ser. No. 799,324
Int. Cl.[5] F01B *3/00;* **F04B** *1/12*
U.S. Cl. 91—499 **8 Claims**

1. A high torque fluid motor which comprises: a housing; a plurality of cylinder bores formed in said housing; an angle shaft having an offset portion rotatably mounted within said housing; a nutator assembly rotatably mounted on said offset portion of said angle shaft; a reaction surface formed on said nutator assembly; a plurality of pistons mounted in said cylinder bores and pivotally affixed to said reaction surface; a first bevel gear affixed to said housing; a second bevel gear mounted on said nutator assembly which meshes with said first bevel gear; an angle gear affixed to said nutator assembly; an



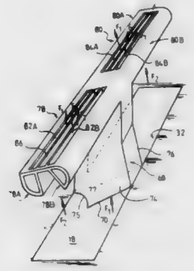
output shaft rotatably mounted in said housing having a shaft gear which meshes with said angle gear; a fluid inlet port; a fluid exhaust port; valve means for directing fluid from said inlet port to said cylinders and from said cylinders to said outlet port to cause said pistons to be biased sequentially against said reaction surface to force said nutator assembly to nutate and cause said shaft gear and output shaft to rotate.

5,109,755

HEATING AND VENTILATING APPARATUS FOR THE CABIN OF AN AUTOMOTIVE VEHICLE

Jean Guillemin, Elancourt-Maurepas, France, assignor to Valeo, Paris, France

Filed Jul. 23, 1990, Ser. No. 555,616
Claims priority, application France, Jul. 28, 1989, 89 10252
Int. Cl.[5] B60H *1/03*
U.S. Cl. 454—160 **5 Claims**



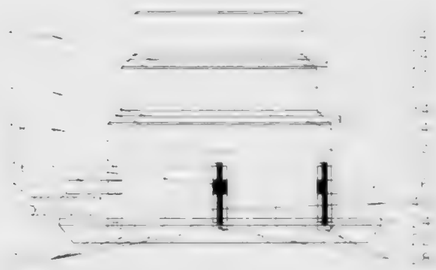
1. Heating and ventilating apparatus for the cabin of an automotive vehicle. comprising: a housing having a cold air inlet duct, a cold air transmission branch leading from the said inlet duct, an air heating branch leading from the said inlet duct and having an outlet, a mixing zone at the junction of the said branches, outlet port means comprising de-icing port means, aerator means and lower outlet port means, the housing defining means whereby each of the said outlet port means can communicate with the mixing zone; valve means in the housing for selectively directing air from the mixing zone to the various said outlet port means; a mixing valve at the junction of the said branches and the said inlet duct, for varying distribution of air from the inlet duct as between the said branches whereby to vary air temperature in the mixing zone; a heat exchanger in the air heating branch; a guide duct having an inlet partly covering the outlet of the air heating branch and an outlet opening close to the de-icing port means; and at least one air distributor leading from and on each side of the outlet of the guide duct to define a generally T-shaped configuration therewith, whereby warm air heated by the heat exchanger can be distributed and homogeneously mixed with air already mixed in the mixing zone.

5,109,756

ADJUSTABLE AIR DIFFUSER WITH QUICK MOUNTING MEANS

Scott M. Barboza, 1319 Sharps Lot Rd., and Michael A. Moore, 401 Stevens Rd., both of, Swansea, Mass. 02777

Filed Jan. 28, 1991, Ser. No. 646,211
Int. Cl.[5] F24F *13/062*
U.S. Cl. 454—284 **7 Claims**



1. An air diffuser assembly comprising:

(a) a plurality of collars, having sufficient size and length to accommodate connection of standard size air ducts, connected end to end by frustum shaped members and,

(b) each said frustum shaped member containing a tear away band of material located between two grooves of reduced wall thickness, along its perimeter and,

(c) a tab located at one point along said tear away band to initiate removal of said band hereby removing unneeded said collars and,

(d) a flange, mounted transversely adjacent to the lower end perimeter of the largest of said collars to receive diffuser grille.

5,109,757

APPARATUS FOR THE TEMPORARY RETENTION OF A PLURALITY OF SKEWERS, SUCH AS A LOADING APPARATUS OF A SKEWERING MACHINE

Jacques Dolle, Chemin de Bel Air, Impasse d'Eden, 30650 Rochefort du Gard, France

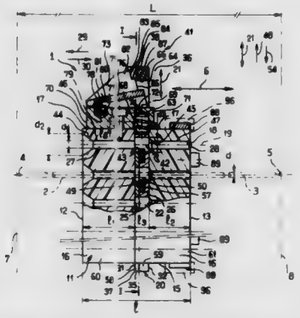
Filed Apr. 9, 1991, Ser. No. 682,905
Claims priority, application France, Apr. 10, 1990, 90 04579
Int. Cl.[5] A22C *17/00, 17/02*
U.S. Cl. 99—419 **10 Claims**

1. An apparatus for the temporary retention of a plurality of skewers, such as a loading apparatus of a skewering machine, the said apparatus comprising:

a body having a plurality of bores passing right through it along respective mutually parallel longitudinal axes and occupying specific relative positions, each of the said bores being capable of receiving a respective skewer with a possibility of relative longitudinal sliding, this skewer being maintained in a longitudinal orientation,

a transverse slide mounted slideably relative to the body in a specific transverse direction and having as many holes as there are bores of the body, the said holes passing right through it along respective mutually parallel longitudinal axes and occupying relative positions identical to the said specific relative positions, each of the said holes being capable of receiving a respective skewer with a possibility

of relative longitudinal sliding, in such a way that, as a result of the sliding of the slide relative to the body in the said transverse direction, the slide can be placed, as desired, in a first position, in which the axes of the holes of the slide coincide with the axes of the bores of the body to allow a free longitudinal passage of the skewers, or in a second position, in which the axes of the holes of the slide are offset transversely a specific way of the said transverse direction in relation to the axes of the bores of the body in order to immobilize the skewers against longitudinal passage, wherein the slide passes through the body at a longitudinally intermediate level of the bores of the latter, in such a way that a substantial portion of each bore of the body is located respectively on either side of the slide and can receive a respective portion of a skewer engaged in



this bore, while another portion of this skewer is engaged in a corresponding hole of the slide when the slide occupies its first position, wherein each hole of the slide is partially in register with the corresponding bore of the body when the slide occupies its second position, in such a way that the slide can occupy its second position when a skewer has a respective portion in this hole of the slide and in each portion of the corresponding bore of the body, and wherein the slide possesses, at the edge of each hole, at least in a localized manner on the upstream side of this hole with reference to the said specific way, a means for bearing transversely the said specific way against a skewer having a respective portion in this hole of the slide and in each portion of the corresponding bore of the body when the slide occupies its second position, in order to immobilize this skewer frictionally against longitudinal passage.

5,109,758

BAKERY OVEN WITH CONTINUOUS BAKING PROCESS

René Voegtlin, 2, rue de la Colline, Oberhausbergen, 67200 Strasbourg, France

Filed Oct. 4, 1990, Ser. No. 592,990

Claims priority, application France, Oct. 9, 1989, 89 13316

Int. Cl.[5] A21B *1/46*; A21D *8/00*

U.S. Cl. 99—443 C **29 Claims**

1. Bakery oven for performing a continuous baking process, comprising:

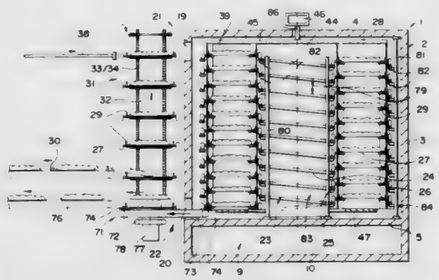
a baking chamber, said baking chamber including a charging opening and a discharging opening;

a plurality of containers for holding products to be baked;

a spiral conveying device for individually conveying said plurality of containers along a helicoidal path from said charging opening to said discharging opening;

a plurality of frames insertable on and removable from said spiral conveying device each frame associated with an individual container for ensuring individual picking up of an individual container of said plurality of containers from outside said baking chamber by the associate frame;

means for inserting and removing individual frames of said plurality of frames from said spiral conveying device; and



said spiral conveying device including means for individually conveying and guiding each of said plurality of frames with an associate container along the helicoidal path from said charging opening to said discharging opening.

5,109,759

TOFU MAKING MACHINE

Toshio Asahara, 18-3 Shigino. nishi, 2-chome Jyoto-ku, Osaka-shi Osaka 536, Japan

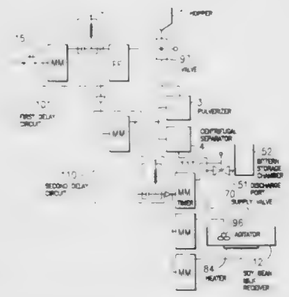
PCT No. PCT/JP88/00763, § 371 Date Aug. 9, 1989, § 102(e) Date Aug. 9, 1989, PCT Pub. No. WO89/00818, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 28, 1988, Ser. No. 345,544

Claims priority, application Japan, Jul. 30, 1987, 62-117056[U]; Jul. 30, 1987, 62-117057[U]

Int. Cl.[5] A23L *1/20*; A47J *19/00*

U.S. Cl. 99—483 **4 Claims**



1. A tofu-making machine, comprising:

a hopper into which is charged a predetermined quantity of soybeans and water;

said hopper being funnel-shaped and having a downspout;

a pulverizer for pulverizing soybeans, said pulverizer changing said soybeans into a juice including soybean milk and soybean refuse;

said pulverizer positioned below said downspout;

a flow passage disposed in communicating relation between said downspout and said pulverizer;

a first valve positioned in said flow passage so that soybeans are gravity fed from said hopper into said pulverizer only when said first valve is open;

a switch means that generates a first signal when said switch means is activated;

a first time delay circuit in electrical communication with said switch means and said first valve, said first time delay circuit being activated by said first signal and said first time delay circuit generating a second signal to open said first valve upon the elapse of a first predetermined period of time that begins when said machine is activated, soybeans charged into said hopper soaking in said water until said first valve is opened;

said first time delay circuit further being in electrical communication with said pulverizer and said pulverizer being started upon receipt of said second signal;

a centrifugal separator having a basket-like configuration, said separator being rotatably mounted for rotation about a vertical axis;

said pulverizer being positioned within said centrifugal separator to save space;

said first time delay circuit further being in electrical communication with said centrifugal separator and said centrifugal separator being started upon receipt of said second signal;

said separator, when activated, separating said soybean milk and soybean refuse from one another;

a housing that houses said separator;

said housing having a downspout;

a soybean milk receiver positioned below said housing in open communication with said housing downspout so that soybean milk that overflows said separator and that therefore enters said housing is directed into said soybean milk receiver by said housing downspout under the influence of gravity;

a bittern storage chamber positioned above said soybean milk receiver, said storage chamber having a discharge spout disposed in open communication with said soybean milk receiver;

a second valve disposed in said storage chamber discharge spout;

a second time delay circuit in electrical communication with said first time delay circuit;

said second time delay circuit operative to measure a second predetermined period of time and to generate a third signal upon elapse of said second period of time, said pulverizer and said separator operating during said second period of time;

a timer in electrical communication with said second time delay circuit, said timer, when activated by said third signal, generating a fourth signal that opens said second valve for a third predetermined period of time and said timer generating a fifth signal that closes said second valve upon the elapse of said third predetermined period of time so that a predetermined quantity of bittern is charged into the soybean milk in said soybean milk receiver;

an agitator disposed in said soybean milk receiver for stirring said soybean milk;

a heater disposed in heat transfer relation to said soybean milk receiver;

said fourth signal activating said agitator and said heater for a fourth predetermined period of time and said timer generating a sixth signal that terminates operation of said agitator and heater upon the elapse of said fourth period of time.

5,109,761

RAPID BREAD COOLING APPARATUS

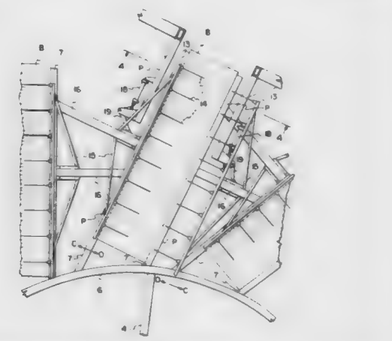
John B. Gray, 410 Thames St., Morrinsville, New Zealand

Filed May 23, 1989, Ser. No. 355,764

Claims priority, application New Zealand, May 23, 1988, 224759

Int. Cl.[5] A21D *6/00*; F25B *19/00*

U.S. Cl. 99—517 **13 Claims**

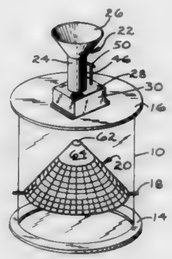


1. A bread cooling machine comprising:

at least one carousel mounted for rotation about a central axis and comprising a number of stations about the periphery of the carousel each arranged to support one or more batches of loaves under ambient atmospheric conditions at the exterior of the loaves, wherein the loaves are subject to cooling operations during rotation of the carousel,

means for carrying out cooling operations on the loaves at each carousel station comprising hollow needle means for penetrating the interior of the loaves and for supplying air under pressure thereto, wherein the hollow needle means for penetrating and supplying causes a flow of cooling air from the interior of the loaves to the ambient atmospheric conditions at the exterior of the loaves,

batching means for delivering batches of a fixed number of and confine positions maintaining the food particles within said hopper confinement portion when in said confine position and permitting the food particles to fall from said confinement portion in a mass having a configuration substantially corresponding to the cross section of said confinement portion transverse to said screen axis when moved to said release



position, the food particles defining said mass separating and being substantially evenly distributed below said screen over the surface upon said mass engaging said screen and the food particles falling therethrough, said screen being of a conical configuration converging in the direction of said food particle release means.

5,109,760

CHEESE DISTRIBUTOR

Khalid S. Ansari, Ann Arbor, Mich., assignor to Domino's Pizza, Inc., Ann Arbor, Mich.

Filed Jan. 16, 1990, Ser. No. 466,065

Int. Cl.[5] A21C *9/04*; B05C *5/00*; A23C *19/00*

U.S. Cl. 99—494 **11 Claims**

1. Apparatus for evenly distributing predetermined portions of food particles over a surface comprising, in combination, a frame adapted to be superimposed over the surface to receive the food particles, a screen mounted on said frame having an axis and a plurality of openings defined therein through which the food particles may fall, a hopper mounted on said frame in spaced relationship above said screen having a food particle confinement portion substantially aligned with said screen axis, and instantaneous food particle release means in alignment with said screen axis instantaneously movable between release

loaves to be cooled from a continuous stream of loaves for transfer to the carousel stations, and

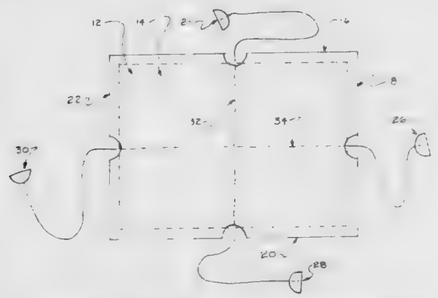
conveyor means for sequentially delivering each of the batches of a fixed number of loaves to be cooled from the batching means to the carousel stations and for sequentially receiving from the carousel stations the batches of a fixed number of loaves after the cooling operations take place.

5,109,762

METHOD AND APPARATUS FOR SECURING A PILE OF NEWSPAPERS OR MAGAZINES OR OTHER MATERIALS

Gregory J. Tetrault, 2925 W. 40th St., Minneapolis, Minn. 55410

Filed Aug. 6, 1990, Ser. No. 563,082
Int. Cl.[5] B65B *27/08, 13/02*
U.S. Cl. 100—2 **5 Claims**



1. A recycling apparatus for securing a pile of newspapers or magazines comprising:

a. a first rectangular planar sheet of paper material with four integral perforated tabs substantially at a mid-point of each side;

b. a first length of securing material positioned on said sheet of material, each end of said securing material secured to each of said integral perforated tabs which oppose each other;

c. a second length of said securing material positioned on said sheet of paper material, each end of said securing material secured to said integral perforated tabs which oppose each other; and,

d. a second planar sheet of paper material positioned over said first sheet of paper and over said first and second lengths of said securing material and said sheets of materials secured about the edges whereby said integral perforated tabs with said securing material are pulled to detach said tabs from said first planar sheet to stretch out said securing material for securing about a pile of materials.

5,109,763

OIL FILTER CRUSHER UNIT

Glenn A. Morris, and Leland M. Perkins, both of Thousand Oaks, Calif., assignors to G. A. Morris Enterprises, Inc., Newbury Park, Calif.

Filed Dec. 17, 1990, Ser. No. 629,223
Int. Cl.[5] B30B *15/16, 9/02, 9/32*
U.S. Cl. 100—48 **17 Claims**

11. An oil filter crusher unit comprising:

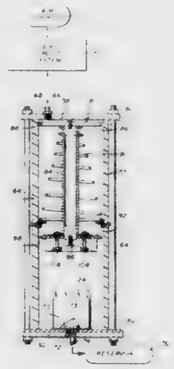
an upstanding housing defining an internal chamber having an access opening formed therein to permit an oil filter to be placed into said chamber;

a safety access door;

means for mounting the safety access door to permit up and down sliding movement relative to said housing to open and close said opening, said mounting means including vertical guide rails mounted at both sides of the opening in parallel relation to each other;

a spring-loaded locking cam;

a control lever on the outside of the housing and operatively connected to said spring-loaded locking cam to prevent operation of the crusher unit when the safety access door is open and to prevent opening of the safety access door during operation of the crusher unit;



a piston assembly contained in the internal chamber, said piston assembly including a piston and a crushing head;

control means for providing compressed air to a portion of the chamber to displace the piston assembly in a direction to move the crushing head to crush the oil filter, said control means including a timer for controlling the length of time compressed air is provided to the chamber;

a drain at a lower end of said housing; and

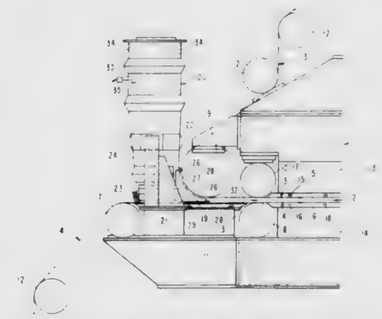
a reservoir for collecting oil flowing through said drain.

5,109,764

DOUBLE SCREEN BELT PRESS WITH A WEDGE COMPRESSION ZONE FOR DEWATERING MIXTURES OF FIBROUS MATERIAL SUSPENSIONS

Johannes Kappel; Gunther Stock; Karl Eickhoff, all of Graz, and Franz Petschauer, Lannach, all of Austria, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

Filed Sep. 25, 1990, Ser. No. 587,695
Claims priority, application Austria, Sep. 25, 1989, 2229/89
Int. Cl.[5] B30B *9/24*
U.S. Cl. 100—99 **19 Claims**



1. A double screen belt press for dewatering mixtures of fibrous material suspensions having a high dry solid content, comprising:

an upper perforated screen belt;

a lower perforated screen belt;

a wedge compression zone having supporting means for supporting said upper and lower belts in a generally facing relationship to each other to form a substantially horizontal initial portion of said compression zone, said supporting means for supporting said upper belt including a front roll with an outer circumferential surface engaging a portion of said upper belt, wherein said upper and lower belts extend through said compression zone; and

an independent high pressure material feed coupled in a fluid-tight manner to the beginning of said compression zone for feeding said fibrous material suspensions under high pressure to said compression zone, said material feed having

an outlet port with a pair of opposed sidewalls positioned above said lower belt and in front of said front roll such that said outlet port opens directly towards a portion of said upper belt supported on the circumferential surface of said front roll to force said fibrous material suspensions into said compression zone, and

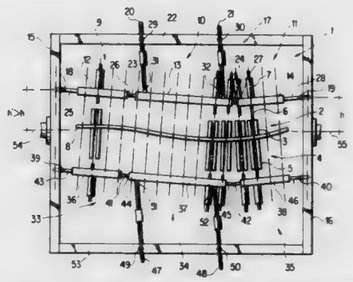
sealing means, coupled to said outlet port, for engaging said upper belt along said front roll in a fluid-tight manner, for engaging said lower belt in a fluid-tight manner between a portion of said material feed remote from said compression zone and said lower belt, and for engaging said side walls in a fluid-tight manner to laterally seal said upper and lower belts along said compression zone.

5,109,765

DEVICE FOR ASSEMBLING LAMINATED GLAZINGS

Francis Triffaux, Thourotte, and Michel Moncheaux, Compiegne, both of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 377,952, Jul. 11, 1989, abandoned. This application May 30, 1991, Ser. No. 708,840
Claims priority, application France, Jul. 12, 1988, 88 09498
Int. Cl.[5] B30B *3/04*
U.S. Cl. 100—155 G **6 Claims**



1. A device for assembling a laminate glazing by pressing, said device including a mobile unit comprising:

upper and lower horizontal crossbars, and first and second vertical uprights, which together comprise a pivotal frame;

at least one beam mounted between said vertical uprights, said at least one beam comprising at least two beam portions mounted such that each of said beam portions can be oriented with respect to the vertical independently of an other beam portion of said at least one beam;

means for separately adjusting the vertical orientation of each of said beam portions;

an elastic adjustment assembly mounted to each of said beam portions;

at least one pressing roller mounted to each of said beam portions via a respective one of said elastic adjustment assemblies; and

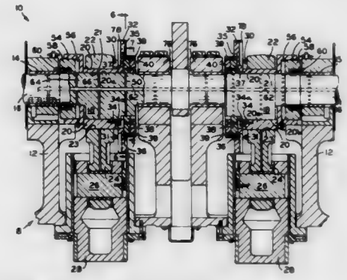
means for opposing each of said at least one pressing rollers such that a laminate glazing may be pressed between said pressing rollers and said means for opposing.

5,109,766

ADJUSTABLE STROKE PUNCH PRESS

Patrick H. Ontrop; Robert L. Schockman, both of St. Henry, and Frederick C. Bergman, Coldwater, all of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Filed Oct. 31, 1990, Ser. No. 606,489
Int. Cl.[5] B30B *5/00, 1/06*
U.S. Cl. 100—257 **14 Claims**



1. An adjustable stroke press comprising:

a crankshaft rotatably supported on a frame, said crankshaft including an eccentric portion;

an eccentric sleeve radially disposed on said eccentric portion and rotatable relative to said eccentric portion during stroke length adjustment, said eccentric sleeve always fixed to said crankshaft during normal press operation;

a connection arm connected to a slide, said arm radially and rotatably disposed on said eccentric sleeve during normal press operation; and

means for locking said eccentric sleeve to said crankshaft during normal press operation and for selectively unlocking said eccentric sleeve from said crankshaft and locking said sleeve to said connection arm during stroke length adjustment, whereby the stroke length can be changed by rotating said crankshaft relative to said eccentric sleeve, said eccentric sleeve capable of being locked to said crankshaft in a plurality of discrete different rotational positions relative to said crankshaft.

5,109,767

DEVICE FOR THE EMBOSSING OF FINE STRUCTURES

Alex Nyfeler, Baar; Gregor Antes, Hirzel, and Hansjörg Schmidlin, Luzern, all of Switzerland, assignors to Landis & Gyr Betriebs AG, Zug, Switzerland

Filed Aug. 31, 1990, Ser. No. 576,269
Claims priority, application Switzerland, Sep. 29, 1989, 535/89
Int. Cl.[5] B41F *17/00*
U.S. Cl. 101—23 **8 Claims**

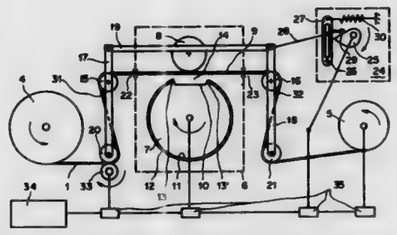
1. A device for embossing a set of motifs having a predetermined motif interval onto a length of thermoplastic film, said device comprising:

a rotating embossing cylinder which is provided on its outer circumference with a recess and an embossing matrix attached thereto for embossing said motifs onto said film, said motifs comprising fine relief-like structures, said embossing matrix having a usable length which is less than the entire circumference of the embossing cylinder but more than 50% of the circumference of the embossing cylinder,

a rotating counterpressure cylinder positioned adjacent said embossing cylinder, said length of film advancing between said counterpressure cylinder and said embossing cylinder for embossing said motifs from said embossing matrix and

for defining a free phase during each rotation of said embossing cylinder when said recess is positioned adjacent said film,

movement means for causing an additional relative movement between the length of film and the embossing matrix during each free phase of the embossing cylinder, and



control means in communication with the movement means for determining the amplitude of the additional relative movement, said control means including means to determine said amplitude in accordance with the motif interval.

5,109,768

DEVICE FOR MOVING THE IMPRESSION CYLINDER OF A PRINTING PRESS INTO AND OUT OF PRINTING ENGAGEMENT WITH AN IMAGE CARRIER CYLINDER

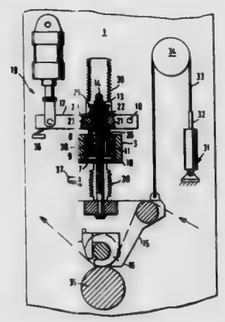
Herbert Lübke; Wolfgang Knapheide, both of Lienen, and Volker Schroder, Lengerich, all of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich/Westf., Fed. Rep. of Germany

Filed May 7, 1990, Ser. No. 519,228

Claims priority, application Fed. Rep. of Germany, May 11, 1989, 3915481

Int. Cl.[5] B31F *9/00*

U.S. Cl. 101—153 **5 Claims**



1. In a printing press having an impression cylinder with a bearing at each end, an image carrier cylinder and a frame in which both cylinders are positioned, a device for moving the impression cylinder between an engaged printing position cooperating with the image carrier cylinder and a disengaged position and also for producing a larger motion of the impression cylinder for the purpose of replacing the image carrier cylinder, the device comprising:

a lead screw for each bearing for lifting and lowering the bearing of the impression cylinder,

a thrust piston and cylinder unit for acting on each bearing for urging the impression cylinder towards said image carrier cylinder,

a nut engaging each lead screw, each nut having a tubular section with a constant external diameter,

a pinion mounted on each tubular section, and having a hub supported for pinion rotation in a fixed position relative to the frame, and

means to rotatively lock the pinion to the tubular section for rotation therewith and for sliding therealong to a limited extent for maintaining the pinion in mesh with gear means for rotatively driving the pinion during the large motion, the device further comprising, for each bearing, compensating means to balance the weight of the bearing, of parts connected with the bearing and of the impression cylinder.

5,109,769

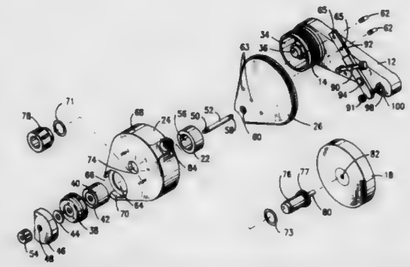
INKING APPARATUS FOR PRINTING ON NON POROUS SURFACES

Donald C. Wright, Jr., St. Petersburg, Fla., assignor to Universal Fountain Brush Co., St. Petersburg, Fla.

Filed Apr. 12, 1991, Ser. No. 684,669

Int. Cl.[5] B41F *5/00*

U.S. Cl. 101—329 **22 Claims**



1. A cartridge assembly for an ink filled roll and an abutting transfer roll comprising

a first housing member tightly fitted to a second housing member to form an enclosure for the ink filled roll and the transfer roll,

corresponding portions of the first and second housing members having a generally annular configuration enclosing the ink filled roll with a first bore axially located within the annular configuration of either the first or second housing member to accommodate a shaft around which the ink filled roll rotates within the first and second housing member enclosure,

corresponding portions of the first and second housing members having a lateral outwardly projecting portion with respect to the axis of the first bore in the first or second housing members, the projecting portion of the first housing member having an inner wall enclosing and closely spaced from an outer circumference of the transfer roll rotatably located within the projecting portion of the first housing member,

a drive roll rotatably located exterior to the projecting portion of the first housing member and axially aligned with the transfer roll, the transfer roll rotating in response to the rotation of the drive roll,

a discontinuity in an exterior side wall of the projecting portion of the first housing member adjacent to the transfer roll and distal from the ink roll to permit exposure of less than 90 degrees of the transfer roll circumference,

a discontinuity in an interior side wall of the first housing member distal from the discontinuity in the exterior side wall to permit abutment of the transfer roll and ink filled roll within the housing enclosure, and

the drive roll turning in response to contact with a moving print roll drum.

5,109,770

PRINTING CYLINDER CLEANING SYSTEM

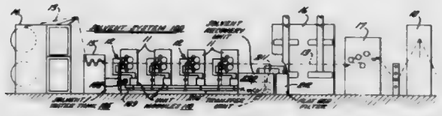
Diego Uribe, Barrington; Paul Driskill, Elgin, and Rolf Hantscho, Lake Zurich, all of Ill., assignors to Oxy-Dry Corporation, Itasca, Ill.

Continuation-in-part of Ser. No. 411,104, Sep. 22, 1989, Pat. No. 5,010,819. This application Sep. 18, 1990, Ser. No. 584,093

The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.

Int. Cl.[5] B41F *35/06*

U.S. Cl. 101—425 **45 Claims**



1. A printing cylinder cleaning system for a printing line having a plurality of printing units each having first and second printing cylinders comprising

a separate cleaning device associated with each printing cylinder, said cleaning devices each including a rotatably driven brush roller mounted for selected engagement with the associated printing cylinder for removing inks and foreign matter thereon and means for selectively directing cleaning fluid onto said printing cylinder for facilitating cleaning thereof,

a cleaning fluid supply,

a separate control module associated with each printing unit, said control modules each including at least one cyclicly operated positive displacement pump for directing a predetermined quantity of cleaning fluid during each cycle of operation, means connecting said control module to said cleaning fluid supply and means connecting said control module to the cleaning devices of the associated printing unit, and said positive displacement pump being selectively operable for directing a controlled predetermined flow of cleaning fluid to the fluid directing means of at least one of said cleaning devices and upon termination of operation of said positive displacement pump the flow of cleaning fluid to said fluid directing means is simultaneously interrupted.

5,109,771

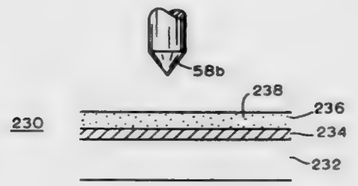
SPARK-DISCHARGE LITHOGRAPHY PLATES CONTAINING IMAGE-SUPPORT PIGMENTS

Thomas E. Lewis, E. Hampstead, N.H., and Michael T. Nowak, Gardner, Mass., assignors to Presstek, Inc., Hudson, N.H.

Continuation-in-part of Ser. No. 234,475, Aug. 19, 1988, Pat. No. 4,911,075. This application Nov. 28, 1989, Ser. No. 442,317

Int. Cl.[5] B41C *1/05, 1/10;* **B41N** *1/00*

U.S. Cl. 101—453 **51 Claims**



1. A lithographic plate that is transformable so as to change the affinity of said plate for ink, said plate being a layered structure including an ink-receptive substrate, a conductive layer and an ink-repellent coating, said coating containing a dispersion of particles consisting essentially of at least one crystalline metal oxide compound.

5,109,772

FLASH IGNITION SYSTEM

Donald J. Cunningham, North Ogden, and Bradley W. Smith, Ogden, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Jan. 22, 1991, Ser. No. 643,626

Int. Cl.[5] B60R *21/28;* **C06C** *5/06;* **F42B** *3/10*

U.S. Cl. 102—275.11 **10 Claims**



10. A flash igniter tube for use in a gas generator that employs solid fuel gas generant material to effect the inflation of a protective bag to cushion a passenger from impact with the structure of a vehicle in the event of a crash, which gas generator includes a tubular housing having an elongated chamber therein containing the solid fuel gas generant material with the tubular portion of the housing having an aperture therein for directing generated gases to the protective bag, comprising,

an elongated perforated igniter tube positioned in the elongated chamber in the tubular housing with the solid fuel gas generator material therein distributed throughout the length of the chamber in surrounding relation to said igniter tube, said igniter tube having a first end and a second end and being composed of carbon steel with the surface thereof suitably primed to cause a coating of $BKNO_3$ to adhere thereto, which surface is provided with a further coating of $BKNO_3$ deposited thereon, and

means including explosive $BKNO_3$ powder positioned in the tubular housing adjacent the first end of said igniter tube.

5,109,773

PUSH-TYPE CRACKER

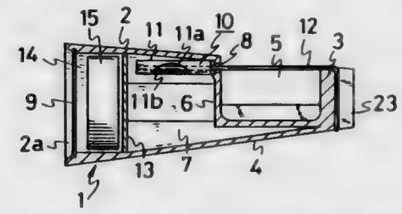
Nobusato Kaneko, Ehime, Japan, assignor to Fujika Co., Ltd., Ehime and Kaneko Fire Works Co. Ltd., Saitama, both of, Japan

Filed Oct. 31, 1990, Ser. No. 607,315

Claims priority, application Japan, Dec. 26, 1989, 1-337526

Int. Cl.[5] F42B *4/04*

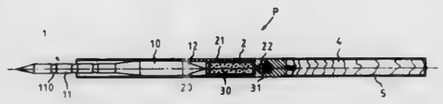
U.S. Cl. 102—357 **4 Claims**



1. A push-type cracker comprising a cracker body having a cylindrical front portion, a string setting rear portion, and a connecting wall portion and a finger-push recessed portion provided between the cylindrical front portion and the string setting rear portion, the recessed portion being cut deep inward from the peripheral surface of the cracker body, and a string passage hole bored in a partition wall portion which serves as the forward end face of the recessed portion, the

string passage hole communicating to an explosive loading chamber in the cylindrical front portion; an explosive release cover for closing a front end opening of the cylindrical front portion; and an explosive unit set in the cracker body comprising a powder explosive housed in the explosive loading chamber of the cracker body and supported in position by the partition wall portion, and a trigger string for causing the powder explosive to be exploded through sliding friction thereof, the trigger string being passed through the string passage hole and fastened to the string setting rear portion in such a manner that it extends taut overlying the recessed portion of the cracker body, whereby the powder explosive can be exploded when the trigger string overlying the recessed portion of the cracker body is finger-pushed from a direction perpendicular to the longitudinal direction of the string.

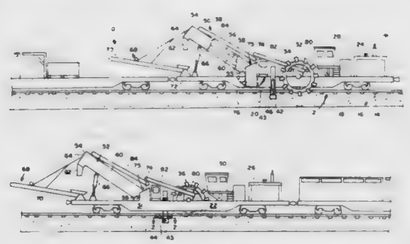
5,109,774
PENETRATIVE PROJECTILES
Jean Deffayet, Olivet, France, assignor to Thomson-Brandt Armements, Boulogne Billancourt, France
Filed May 14, 1991, Ser. No. 699,601
Claims priority, application France, May 18, 1990, 90 06246
Int. Cl.[5] F42B *12/06, 25/00, 10/56*
U.S. Cl. 102—382 **6 Claims**



1. A penetrating projectile, comprising:
a front penetrating element;
a tube fixedly joined to said front element contained therein, said tube having a first open end for receiving said front element and a second closed end, said closed end containing a propellant charge for the propulsion of said front element, and said tube further containing an igniter means for controlling the firing of the charge upon impact of the front element on a target, said projectile further including a parachute attached to said closed end of the tube, for reducing the velocity of said projectile and to make its longitudinal axis approach the vertical, said igniter means including a delay means for firing said propellant charge when the velocity of the projectile becomes substantially null.

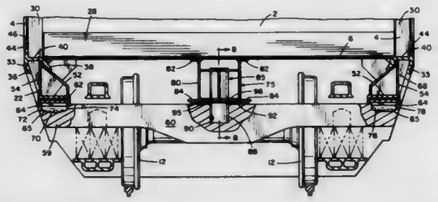
5,109,775
BALLAST RECONDITIONING APPARATUS WITH MULTIPLE EXCAVATING WHEELS AND INDEPENDENT CLEANING STATIONS FOR INCREASED OPERATING SPEED
John K. Kershaw, and Philip C. McCray, both of Montgomery, Ala., assignors to Knox Kershaw, Inc., Montgomery, Ala.
Filed Sep. 28, 1990, Ser. No. 590,030
Int. Cl.[5] E01B *27/06*
U.S. Cl. 104—2 **14 Claims**

1. Apparatus for excavating ballast from a railroad bed having cross ties for support of a railroad track thereon and for cleaning the excavated ballast, said apparatus comprising:
vehicular support means disposed for movement along the rails of said railroad track, said vehicular support means having a frame means provided with first and second sides;
a first excavating wheel assembly including a plurality of annularly arranged bucket members supported on said first side of said frame means for excavating ballast adjacent to a first end of said cross ties;
a second excavating wheel assembly including a second plurality of annularly arranged bucket members supported on said second side of said frame means for excavating ballast adjacent to a second end of said cross ties; and
a pair of discrete cleaning stations, each cleaning station carried on said frame means between said first and second sides and in spaced relation with said first and second excavating wheel assemblies and associated with a respective one of said excavating wheel assemblies for independently cleaning said ballast excavated by said associated excavating wheel assemblies, said pair of discrete cleaning stations comprising a vibratory enclosure having reticular



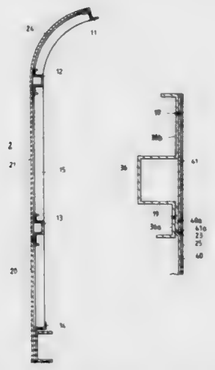
elements mounted therein and disposed for vibratory movement to vibrate contaminants from said ballast, said vibratory container having a receiving end portion for receiving said ballast from said associated excavating wheel assembly and a discharge end portion for discharging said ballast from said vibratory enclosure, said receiving end portion of said enclosure being positionable at a predetermined elevation relative to said discharge end portion of said enclosure whereby the rate of discharge of said ballast from said enclosure is controllable.

5,109,776
GONDOLA TYPE RAILWAY CAR WITH SNUG FITTING CENTER PLATE ARRANGEMENT
Bradford Johnstone, Flossmoor, Ill., and Robert W. Lyons, Michigan City, Ind., assignors to Trinity Industries Inc., Dallas, Tex.
Filed Jun. 29, 1990, Ser. No. 547,021
Int. Cl.[5] B61F *5/14*
U.S. Cl. 105—199.3 **10 Claims**



4. In a railway car having a car body with a transverse bolster and center filler structure, a railway truck having a spring supported truck bolster positioned beneath said body bolster, said body bolster having a center pin depending therefrom, and said truck bolster having a snugly fitting socket recessed therein holding said pin whereby said body and said truck bolster are in close coupled relation with each other and whereby motions of the body correspond with the motions of the truck bolster.

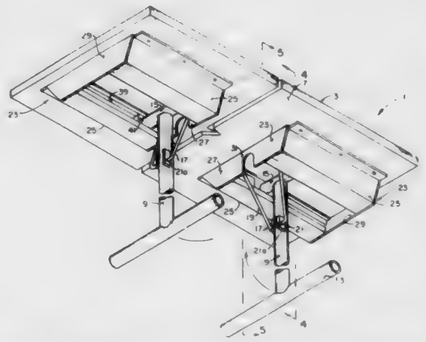
5,109,777
CAR BODY FOR RAILWAY ROLLING STOCK WITH JOGGLED ADJACENT SIDE SHEET END CONSTRUCTION FOR SMOOTH EXTERIOR
Keiji Ohmura; Sumio Okuno; Michifumi Takeichi; Kentarou Masai; Seiichi Okamoto, and Masatake Nakamura, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 9, 1990, Ser. No. 564,620
Claims priority, application Japan, Aug. 9, 1989, 1-204671
Int. Cl.[5] B61D *17/08*
U.S. Cl. 105—401 **1 Claim**



1. A car body for railway rolling stock including two end constructions, two side constructions, a roof construction and an underframe, said side constructions comprising a plurality of outside plates and a plurality of frame members joined to each other, said plurality of outside plates being made of a ferrous material and sized to fit on an outer surface of said framing, two of said plurality of said outside plates being disposed adjacent to each other, a joggled section formed in one end of one of said two outside plates so as to enable adjacent ends of said two outside plates to be disposed in an overlapping condition, said jogged section having a depth corresponding to a thickness of the other of said two outside plates, said frame members include two outside plate joining surfaces, one of said joining surfaces being located inwardly of the car body and the other joining surface being located outwardly of said car body by a distance corresponding to the depth of said joggled section, the adjacent ends of said outside plates in the overlapped condition being fitted into one of said outside plate joining surfaces, wherein said plurality of outside plates are joined to said framing by spot welding at a periphery thereof and at the adjacent ends of the outside plates in the overlapped condition, and wherein a coating is provided on an outer surface of each of said outside plates.

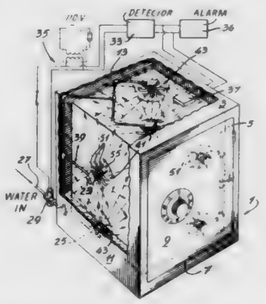
5,109,778
FOLDING TABLE
Alan Berkowitz; Elliott W. Baum, both of St. Louis, Mo., and Curt Angel, St. Clair, Ill., assignors to Berco Industries, St. Louis, Mo.
Filed Apr. 29, 1991, Ser. No. 677,501
Int. Cl.[5] A47B *3/08*
U.S. Cl. 108—127 **22 Claims**

1. A stable folding table comprising a table surface having a top surface and a bottom surface, at least one housing secured to the table surface bottom, said housing slidably and rotatably receiving a pair of table legs, said housing including means for moving said legs between a folded position and a supporting position, means for locking said legs in said supporting position, means for releasing said legs from said locking means, said legs each include a floor contacting member fixed to the bottom thereof, a release sleeve fixed to the top thereof, and a



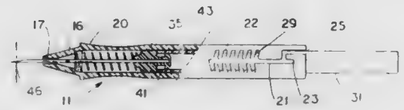
support pivotally fixed at one end to said leg intermediate said member and said sleeve and at another end to said housing.

5,109,779
FIRE INSULATED PARTITION
Jules Maroist, 2530 Richelieu, Beloeil, Canada J3G 2C9
Filed Sep. 12, 1991, Ser. No. 758,561
Int. Cl.[5] E05G *1/00;* **G08B** *15/02*
U.S. Cl. 109—33 **4 Claims**



1. In a fire insulated partition including inner and outer walls to define an inner space therebetween, water pipes disposed in said inner spaces and having a plurality of water outlets distributed throughout said inner space to deliver water therein, a water inlet outside said partition and connected to said water pipes to introduce water therein, said water inlet also connected to a source of water, valve means to initiate water circulation in said pipes and into said inner space upon activation by a detector, and means to continuously drain water from said inner space after said inner space has been filled therewith, the improvement which comprises a fire detector separate from said valve means enabling to open said valve means in case a fire erupts in the vicinity of said partition, blade propellers at said water outlets to distribute entering water substantially against entire interior surface of said inner and outer walls, and means operating said blade propellers when said detector senses a fire.

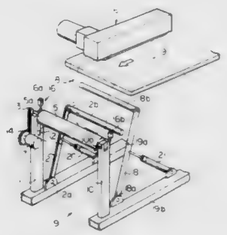
5,109,780
EMBROIDERY TOOL
James W. Slouf, and Elizabeth J. Slouf, both of 186 Tropicana Dr., Punta Gorda, Fla. 33950
Filed Jul. 15, 1991, Ser. No. 729,574
Int. Cl.[5] D05C *15/06*
U.S. Cl. 112—80.03 **4 Claims**



1. An embroidery tool comprising:
elongated body means having;
a forward end, a midpoint and a rearward end,
a smooth wall bore extending axially therethrough,
a longitudinally oriented first slot opening into said bore, said first slot starting aft of said midpoint of said body and running towards said rearward end and ending in a retracted notch,
a plurality of aligned parallel notches on each side of said slot,
a second slot having an opening starting at said first slot rearward of said notches, and opening into said bore starting forward of said retracted notch and perpendicular to said first slot, and having a back end,
a third slot opening into said bore starting at said back end of said second slot and longitudinally oriented parallel to said first slot and ending at said rearward end,
a shaft, having a forward end a midpoint, a rearward end, and an outer surface slideably engaged within said bore in said elongated body, and having;
a bore extending axially therethrough,
guide means on said outer surface of said shaft forward of said midpoint of said shaft for guiding said shaft in said slots and notches, and
cam means formed in said bore at said forward end,
an interchangeable assembly having;
a needle, and
a tip having a pair of tabs for engaging said cam means when mated within said shaft bore, and
compression means assembled over said needle for yieldingly urging said needle assembly and shaft in a rearwardly direction for maintaining said guide means in each selected position.

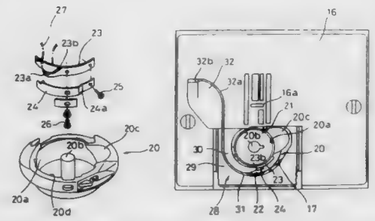
5,109,781
STACKING APPARATUS FOR SEWING MACHINE
Hideho Sasamoto, Chofu, Japan, assignor to Juki Corporation, Tokyo, Japan
Filed Dec. 27, 1990, Ser. No. 634,429
Claims priority, application Japan, Dec. 28, 1989, 1-150164[U]; May 17, 1990, 2-50762[U]
Int. Cl.[5] D05B *33/00*
U.S. Cl. 112—121.29 **7 Claims**

1. A stacking apparatus for stacking a sewn workpiece, comprising:
a workpiece draper;
a workpiece carrier for holding the sewn workpiece against said workpiece draper;
a throw-over member for folding the sewn workpiece to stack the workpiece on said workpiece draper; and
means for inclining said workpiece draper according to the amount of workpieces stacked on said workpiece draper, wherein said inclining means comprises:
means for rotatably supporting one end of said workpiece draper so that said workpiece draper can rotate in vertical and horizontal directions;
means for suspending a second end of said workpiece draper via a spring; and



means for guiding said second end of said workpiece draper so that said second end of said workpiece draper can obliquely move downward.

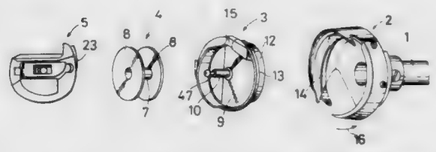
5,109,782
COVER PLATE AND BOBBIN HOLDER THREAD TENSIONING GUIDES
Yoshiyuki Uyama, Nagoya, Japan, assignor to Brother Koygo Kabushiki Kaisha, Nagoya, Japan
Filed Sep. 17, 1990, Ser. No. 583,328
Claims priority, application Japan, Oct. 23, 1989, 1-275374
Int. Cl.[5] D05B *57/14*
U.S. Cl. 112—184 **17 Claims**



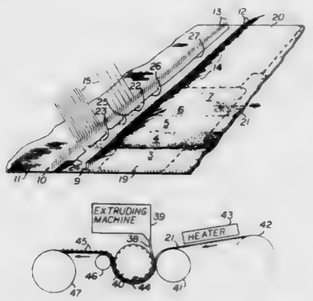
1. A bobbin thread supply device for a sewing machine, comprising:
a bobbin holder in an arm bed of the sewing machine;
a bobbin removably inserted into the bobbin holder;
tensioning means attached to a side wall of the bobbin holder for applying tension to a bobbin thread;
cover means for covering the bobbin holder; and
guide means formed on the cover and along the side wall of the bobbin holder for guiding a bobbin thread extending from the bobbin into the tensioning means.

5,109,783
FULL ROTARY HOOK WITH AN INCREASED AMOUNT OF BOBBIN THREAD WOUND AROUND THE BOBBIN
Hiromitsu Shimizu, Osaka, Japan, assignor to Hirose Manufacturing Co., Ltd., Osaka, Japan
Filed Mar. 6, 1991, Ser. No. 665,232
Claims priority, application Japan, May 15, 1990, 2-126364; May 15, 1990, 2-126365; May 15, 1990, 2-126366
Int. Cl.[5] D05B *57/14*
U.S. Cl. 112—231 **4 Claims**

1. In a full rotary hook including a bobbin case holder to be mounted in a rotatable hook body and a bobbin case to receive a bobbin removably mounted in said bobbin case holder such that said bobbin case and the bobbin together are mountable on and removable from said bobbin case holder, the improvement comprising a construction of said bobbin case holder and said bobbin case to enable an increase size bobbin having wound thereon an increased amount of thread to be employed without increasing a given size of the hook body and without substantially decreasing the strength of said bobbin case holder, said construction comprising:
said bobbin case having a cylindrical portion of an increased outer diameter and an increased inner diameter when compared to a given bobbin case; and
said bobbin case holder having a cylindrical portion having on the outer periphery thereof a thread hooking portion and a thread releasing portion, said cylindrical portion of said bobbin case holder having a uniform increased inner diameter to accommodate said increased outer diameter of said cylindrical portion of said bobbin case, said cylindrical portion of said bobbin case holder having a stepped outer periphery including a first circumferential portion extending from said thread releasing portion to said thread hooking portion relative to a direction of rotation of the hook body and a second remainder circumferential portion, said first circumferential portion having a reduced radial thickness, and said second remainder circumferential portion having an increased outer diameter greater than an outer diameter of said first circumferential portion and a radial thickness greater than said radial thickness of said first circumferential portion.

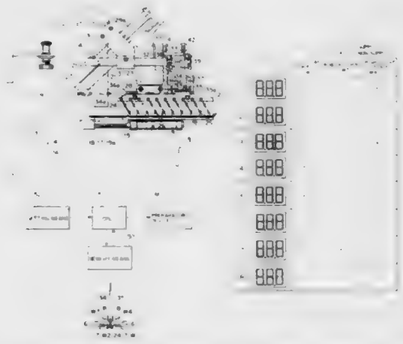


5,109,784
FLOOR MAT WITH VARIOUS TUFTING DENSITY ZONES
Marco A. Lepe-Cisneros, Calle 7th - #2209 Interior, Zona Central, Tijuana, B.C., Mexico
Filed Dec. 24, 1990, Ser. No. 633,072
Claims priority, application Mexico, Dec. 28, 1989, 18959/122600
Int. Cl.[5] D05C *15/00*
U.S. Cl. 112—266.2 **15 Claims**



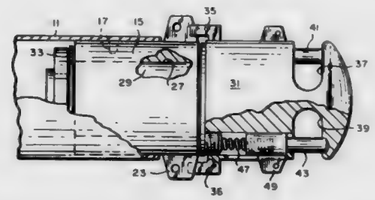
1. A method for manufacturing a roll of carpet having a transversally varied tufting density using a tufting machine having parallel, front and back transversal rows of symmetrically space-apart needles said rows of needles being alternately reciprocated through a carpet backing web, said method comprising:
threading yarns through all the needles of a first one of said rows and continuously feeding said yarns to said needles; and
omitting to thread yarn through selected numbers of needles of a second of said rows.

5,109,785
WORKPIECE FABRIC FEEDING DEVICE FOR BINDER STRIP SEWING MACHINE
Kazushi Inoue, Aichi; Shigeru Abe, Kakamigahara; Yuji Tagawa, Nagoya; Takashi Kondo, Oobu; Yasuhiko Watanabe, Ibi, and Jun Shibata, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Sep. 18, 1990, Ser. No. 584,165
Claims priority, application Japan, Sep. 25, 1989, 1-249482
Int. Cl.[5] D05B *35/06*
U.S. Cl. 112—303 **4 Claims**



1. A workpiece fabric feeding device for use in a binder strip sewing machine, the sewing machine including a table (**2**) on which a garment (**W1**) is held, and a stitching mechanism for stitching at least one of a binder strip (**W2**) and flap strips (**W3**, **W4**) selectively fed by the workpiece fabric feeding device to the garment (**W1**), the workpiece fabric feeding device comprising;
a preparatory device (**M**) for independently positioning at least one of the binder strip (**W2**) and the flap strips (**W3**, **W4**) onto a predetermined position of the garment (**W1**) and for integrally feeding the garment (**W1**) and the at least one of the binder strip (**W2**) and the flap strips (**W3**, **W4**) to the stitching mechanism;
setting means (**52**) for setting a plurality of feeding fashions defined by combinations of the binder strip and flap strips; and
control means (**51**, **53**) for controlling the preparatory device (**M**) in order to execute sewing programs in accordance with the feeding fashions set in the setting means.

5,109,786
SPINNAKER POLE
David R. Hall, Rte. 101 A - Box 909, Amherst, N.H. 03031
Filed Dec. 21, 1990, Ser. No. 633,241
Int. Cl.[5] B63H *9/10*
U.S. Cl. 114—89 **6 Claims**

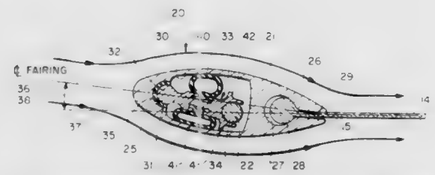


1. Spinnaker pole apparatus comprising:
a spinnaker pole one end of which is adapted for pivotal attachment to a mast of a sailboat;

at the other end of said pole, bearing means for receiving a pole end fitting and permitting the end fitting to rotate freely around the pole's longitudinal axis;

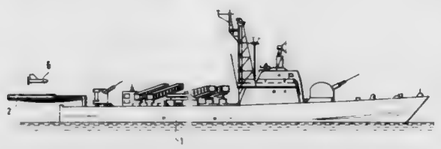
journaled in said receiving means, an end fitting which provides on opposite sides of said axis first and second fairleads for passing guys to the clews of a spinnaker, the free rotation of the fitting allowing a tensioned guy to align the respective fairlead thereby to avoid twisting of that guy and to orient the other fairlead facing downwardly to facilitate free running of a slacked guy.

5,109,787
CAMBERED FORESTAY FAIRING
Carleton G. Peterson, P.O. Box 673, Tarzana, Calif. 91356
Continuation of Ser. No. 7,264,530, Oct. 31, 1988, Pat. No. 4,947,776. This application Aug. 10, 1990, Ser. No. 565,132
The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.
Int. Cl.[5] B63H *9/06*
U.S. Cl. 114—102 **4 Claims**



2. A streamline fairing surrounding the forestay of a sailboat having a means of securing the luff of a sailboat's foresail to its aft end, and having a sufficiently wide forward enclosed cavity surrounding the forestay to allow the forestay to be held off a major centerline of the fairing by a member rotatably connected to the forestay at the aft end of said member and rotatably connected to the fairing's center-line at the forward end of said member whose angular travel with respect to said fairing is restrained by stops at both ends of said angular travel, thereby allowing the fairing to be held at a desired angle of attack with respect to the headsail while the sailboat is sailed on both port and starboard tacks by the resulting action caused by the aft loads of the sails on the aft end of the fairing and the forward reaction load of the forestay on the aft end of said member.

5,109,788
APPARATUS FOR RECOVERY OF UNMANNED, REUSABLE AIRCRAFT
Werner Heinzmann, Bremen, Fed. Rep. of Germany, assignor to MSG Marine-und Sondertechnik GmbH, Bremen, Fed. Rep. of Germany
Continuation of Ser. No. 500,473, Mar. 28, 1990, abandoned. This application Feb. 21, 1991, Ser. No. 660,157
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1989, 3910621
Int. Cl.[5] B63B *35/00*
U.S. Cl. 114—261 **1 Claim**



1. An apparatus for recovering an unmanned reusable aircraft during a return phase in which landing occurs by remote control and the use of auxiliary means such as a parachute retrieval system, comprising: a flexible surface element (**4**) which is at least one of gatherable and foldable; and actuatable retaining and guidance means (**2**, **3**) including two opposing L-shaped elements, the L-shaped elements each having a first leg that is extendable in a telescoping manner and a second leg that is pivotably mounted to a stern region of a ship so that the L-shaped elements are extendable in a longitudinal direction and outwardly pivotable for arranging the surface element horizontally beyond the stern region of the ship to form a trampoline-like retrieval surface (**5**) for the aircraft, and so that the L-shaped elements are longitudinally retractable and inwardly pivotable to form a stored stowage unit together with the surface element.

5,109,789
PERSONAL COMPATIBILITY INDICATING DEVICE
Oded Berman, 8/28 Hashalom Street, Kfar Saba, Israel
Filed Dec. 31, 1990, Ser. No. 636,221
Int. Cl.[5] G08B *5/00*; **G09F** *9/40*
U.S. Cl. 116—325 **12 Claims**



2. A matchmaking or person compatibility indicating device comprising:

a base member;

a first plurality of visually sensible indicator means on the base member for indication of characteristics of a user; and

a second plurality of visually sensible indicator means formed on the base member for indication of characteristics desired in a potential partner by the user; and

engagement means associated with the base member for selectively joining the base member of the user and a similar base member of a potential partner in a mutually overlapping arrangement wherein the first plurality of visually sensible indicator means on the user's base member is positioned in registration with a second plurality of visually sensible indicator means on the potential partner's base member such that a coincidence between characteristics indicated thereby may be visually sensed.

5,109,790
FLOOR COATING AGENT APPLYING MACHINE
Yasuhiko Matsumoto; Katsuaki Nanba, and Isao Morita, all of Osaka, Japan, assignors to Penguin Wax Co., Ltd., Osaka, Japan
Filed Jul. 5, 1990, Ser. No. 548,298
Claims priority, application Japan, Apr. 4, 1990, 2-90777
Int. Cl.[5] B05C *11/06*
U.S. Cl. 118—63 **9 Claims**

1. A floor coating agent applying machine comprising:

machine propelling wheels attached to a propelling machine body;

an applying member for applying a floor coating agent;

an applying device for applying said floor coating agent onto a floor surface by means of said applying member;

an air blower; and

at least one air guide member having one end connected to said air blower and a discharge opening defined in a position rearwardly of the machine body compared with the applying member and attached to said machine body to supply the air from said air blower for drying said coating agent applied onto said floor surface.

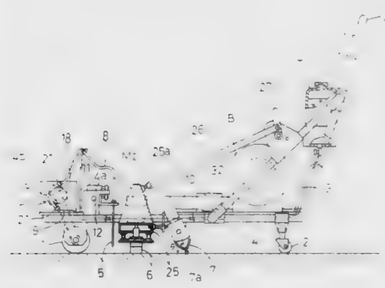
wherein said applying device is vertically movably mounted on the machine body between a free-lift state where the device is lowered, by a dead weight thereof, relative to



the machine body to place the applying member into pressure contact with the floor surface and a lift-up state where the applying member is lifted up away from the floor surface and a control member is provided for selectively bringing the applying device into the free-lift state or the lift-up state

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5,109,791
FLOOR COATING LIQUID APPLYING MACHINE
Yasuhiko Matsumoto; Katsuaki Nanba, and Isao Morita, all of Osaka, Japan, assignors to Penguin Wax Co., Ltd., Osaka, Japan
Filed Jun. 26, 1990, Ser. No. 544,755
Claims priority, application Japan, May 16, 1990, 2-127356; May 16, 1990, 2-127357
Int. Cl.[5] B05C *11/06*
U.S. Cl. 118—63 **11 Claims**



4. A floor coating liquid applying machine comprising:

a liquid feed device for feeding floor coating liquid to a floor surface, said liquid feed device having means for reciprocating said liquid feed device in a direction transverse with respect to a propelling direction of said machine;

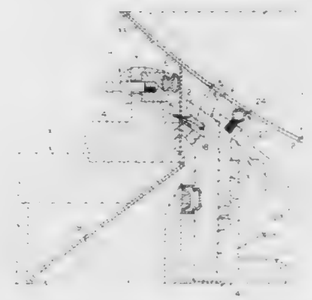
a liquid applying member for applying the floor coating liquid from said liquid feed device onto the floor surface;

a propelling vehicle body having means for propelling said body in said propelling direction, said vehicle body having said liquid feed device and said liquid applying member mounted thereon;

a feed pump attached to said liquid feed device for feeding the floor coating liquid from a liquid tank;

a blower having a blower opening and attached to said machine body feeds hot air rearwardly of said liquid applying member with respect to the propelling direction of said vehicle body.

5,109,792
COATING HEAD FOR APPLYING A COATING SUSPENSION LAYER ON A PAPER SHEET
Giorgio Baldini, San Pietro Val Lemina, Italy, assignor to Beloit Corporation, Beloit, Wis.
Filed Feb. 19, 1991, Ser. No. 657,573
Claims priority, application Italy, Feb. 16, 1990, 67115 A/90
Int. Cl.[5] B05C *5/02*
U.S. Cl. 118—410 **1 Claim**



1. A short dwell coater apparatus for applying coating material onto a web supported and guided by a rotatable backing roll, said apparatus comprising:

a housing disposed adjacent to the backing roll such that the web is disposed between the backing roll and said housing, said housing defining a chamber, said chamber being connected to a pressurized source of the coating material;

a flexible blade disposed downstream relative to said chamber and extending from said housing to the web for metering the coating material applied to the web moving past said chamber;

a deflector plate having a distal end for defining a variable exhaust port, said plate being disposed upstream relative to said chamber, and adjustably secured to said housing such that movement of said plate relative to the web is permitted;

guide means defined by said housing for slidably guiding said plate such that said movement of said plate is in a direction which defines a constant angle relative to a direction of movement of the web; and

said distal end including:

a flexible seal of ring-shaped cross-sectional configuration such that when said plate moves relative to said guide means, said flexible seal and the web defined therebetween said variable exhaust port.

5,109,793
PAINTING SHIELD APPARATUS FOR WINDOWS
Paul J. Ballejos, 1132 W. Heather, Mesa, Ariz. 85201
Filed Mar. 26, 1990, Ser. No. 500,531
Int. Cl.[5] B05C *21/00*
U.S. Cl. 118—505 **1 Claim**

1. A painting shield apparatus, comprising in combination,

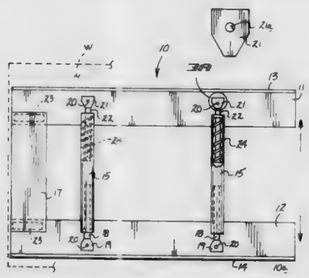
a first elongate longitudinally aligned plate spaced from and parallel to a second elongate longitudinally aligned plate, wherein the first and second plates are arranged to lie in a common plane,

and

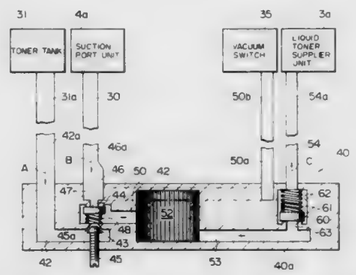
the first plate includes a first outer edge and the second plate includes a second outer edge, wherein the first and second outer edges are arranged at an exterior portion of each plate and are parallel to one another,

and

the first and second plates include biasing means to bias the first and second plates away from one another,
and
a positioning means to secure the first and second plates in a fixed position relative to one another and located at the opposite ends of the first and second plates,
and
wherein the biasing means includes a first and second biasing cylinder, the first and second biasing cylinder arranged parallel to one another and each cylinder orthogonally mounted to the first and second plate,
and
wherein each biasing cylinder includes a lower rod coaxially arranged within the biasing cylinder mounted to the second plate and an upper rod telescopingly received within the biasing cylinder mounted at its upper end to the first plate, and the upper rod including a spring mounted within the cylinder in association with the upper rod to bias the upper rod exteriorly of the biasing cylinder,
and
wherein the lower rod is telescopingly received within the biasing cylinder and includes a biasing means to bias the lower rod exteriorly of the biasing cylinder,
and
wherein the first and second edge each are defined as an elongate polymeric edge, each edge includes an elliptical cross-sectional configuration to accommodate compression and enhance sealing against an associated window frame,
and
wherein the first plate includes a first member telescopingly receivable within a second member, and the second plate includes a third member telescopingly receivable within a fourth member, the first and second plates adjustable to accommodate various widths of window frames,
and
wherein the positioning member includes a first magnet and a second magnet, the first magnet arranged parallel to and adjacent an upper edge of the positioning member and the second magnet arranged adjacent to a lower end of positioning member, the first and second magnet is positioned to overlie opposed upper surfaces of the first and second plates to secure the positioning to the first and second plates,
and
wherein the positioning member includes an elongate member defined by a predetermined cross-sectional configuration, and further including a first sleeve orthogonally arranged relative to the first plate and a second sleeve orthogonally mounted overlying the second plate, wherein the first and second sleeve are coaxially aligned relative to one another and each sleeve is defined by a cross-sectional configuration equal to the predetermined cross-sectional configuration.



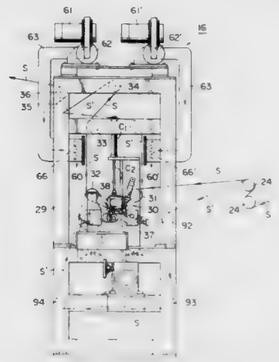
5,109,794
PUMP DEVICE FOR ELECTROSTATIC PLOTTER
Fumito Komatsu, and Tositatsu Kawatsu, both of Ina, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Sep. 25, 1991, Ser. No. 765,423
Claims priority, application Japan, Sep. 27, 1990, 2-257981
Int. Cl.[5] G03G *15/10*
U.S. Cl. 118—660 **5 Claims**



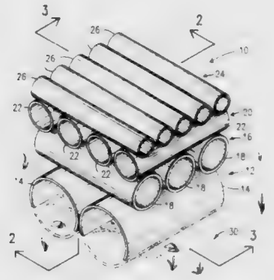
1. A pump device for an electrostatic plotter, comprising:
a housing;
a pump accommodated by said housing;
a first suction passage provided in said housing to connect said pump to a liquid toner source;
adjusting means for adjusting the flow of said liquid toner through said first suction passage;
a second suction passage provided in said housing and having a downstream end connected to said first suction passage downstream of said adjusting means and an upstream end adapted to be connected to a suction port unit of the electrostatic plotter; and
a discharge passage connected to a downstream side of said pump inside said housing to discharge the liquid toner drawn from said first and second suction passage towards a liquid toner supplier of the electrostatic plotter.

5,109,795
APPARATUS FOR MAKING THERMAL TRANSFER RECORDING SHEET
Shigeki Umise, Kawaguchi, and Hirokatsu Imamura, Nerima, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan
Division of Ser. No. 265,679, Oct. 19, 1988, Pat. No. 4,985,292. This application Nov. 15, 1990, Ser. No. 614,212
Int. Cl.[5] B05C *1/08, 11/00*
U.S. Cl. 118—669 **7 Claims**

1. An apparatus for the manufacture of strips of thermal transfer-type recording sheets, comprising:
web supply means for supplying a continuous web of base film having a hot-melt ink layer formed on one side thereof;
feed means for continuously feeding said continuous web along a predefined path from said web supply means;
gravure printing means for forming a group of end marks by gravure printing on either side of said continuous web being fed along said predefined path, the end marks of said group being spaced from each other in a direction perpendicular to a direction in which said continuous web is fed along said predefined path;
actuating means for actuating said gravure printing means to print said group of end marks only in preassigned regions of said continuous web in a longitudinal direction of said continuous web;
slitting means for longitudinally slitting and separating said continuous web into a plurality of narrower strips of recording sheets each having a said end mark printed respectively thereon; and
drying means disposed downstream of said gravure printing means with respect to the feeding direction of said continuous web, said drying means applying drying action only to said end marks printed on said continuous web during passage of said end marks past said drying means, said drying means comprising outlet slots for applying streams of heated air to respective end marks printed on said continuous web.

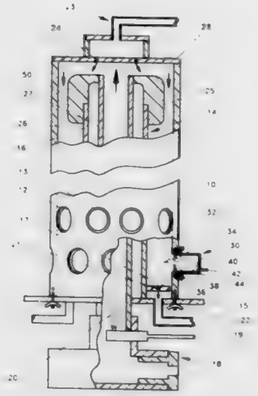


5,109,796
FISH HABITAT STRUCTURE
Donald T. Monus, Largo, Fla., assignor to Alfred R. Priest, Belleair, Fla.
Filed Jul. 17, 1991, Ser. No. 731,544
Int. Cl.[5] A01K *61/00*
U.S. Cl. 119—3 **8 Claims**



1. A fish habitat structure for use in estuaries and lake bottoms comprising
multiple layers of plastic pipes attached together, with each layer positioned at a right angle to an adjacent layer, each layer of pipes containing multiple parallel pipes spaced apart from adjacent pipes,
a first bottom layer of pipes having an interior diameter larger than the interior diameter of the pipes of a next upper layer, and succeeding upper layers of pipes, with the pipes of each succeeding upper layer having an interior diameter less than the pipe diameter in a layer below, and the bottom layer of pipes adapted to be embedded in the estuary or lake bottom.

5,109,797
AVIAN INHALATION EXPOSURE CHAMBER
James K. Briant, and Crystal J. Driver, both of P.O. Box 999, Richland, Wash. 99352
Filed Aug. 29, 1990, Ser. No. 574,707
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—15 **5 Claims**



1. An exposure system for delivering gaseous material uniformly to the heads of experimental animals, comprising;
(a) a vertical outer cylinder having a top and bottom, further having a closure disk defining air inlet holes at the top of said vertical outer cylinder, and a plurality of exposure ports near the bottom;
(b) a cylindrical central chimney interconnected with a gaseous material nebulizer,
(c) a closure ring in removable sealing engagement with the bottom of said vertical outer cylinder and to which said central chimney is sealed such that a vertical annulus is formed between said vertical outer cylinder and said central chimney,
(d) exhaust means for removing spent gaseous from said vertical annulus,
(e) a plurality of animal holding bottles mounted to said exposure ports;
(f) sealing means to effect an airtight seal between said animal holding bottles and said exposure ports, said sealing means also defining an aperture to sealably engage an animal's neck;
whereby the animal's head is positioned in said vertical annulus between said outer cylinder said central chimney, such that gaseous material will flow to the head of each animal, and whereby the exposure system can be disassembled by removing animal holding bottles, and disconnecting the vertical outer cylinder from the closure ring.

5,109,798
FOOD SUPPLEMENT DISPENSING SYSTEM FOR ANIMALS
Frank Impastato, and Debbie Grass, both of 204A Trefny Ave., Metairie, La. 70003
Filed Nov. 23, 1990, Ser. No. 617,135
Int. Cl.[5] A01K *5/00*
U.S. Cl. 119—51.03 **11 Claims**

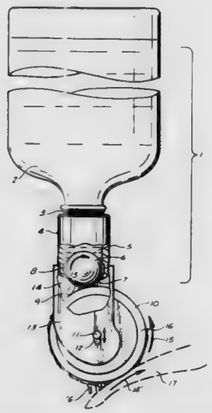
1. An animal feeder for dispensing viscous food supplements, comprising:
a container;
a dispenser, said dispenser further comprising:
an engagement portion having a lateral passage therethrough having cylindrical inner side walls and upper

and lower ends, said upper end engaged to said container, said engagement portion further comprising:

a dispenser bearing situated in said lateral passage of said engagement portion, said dispenser bearing configured to communicate with said cylindrical inner side walls in a sliding or rolling fashion;

a tapered seal situated on said lower end of said engagement portion, said tapered seal configured to seat said dispenser bearing;

lower engagement means situated at said lower end of said engagement portion;



a dispenser wheel having an axle and contact surface; and

bracket means for supporting said axle of said dispenser wheel, said bracket means having first and second side walls, said first and second side walls having a laterally configured slot for receiving said axle, said bracket means being engaged with said lower engagement means of said engagement portion;

said laterally configured slot configured so as to allow limited movement of said dispenser wheel in a lateral fashion via said axle.

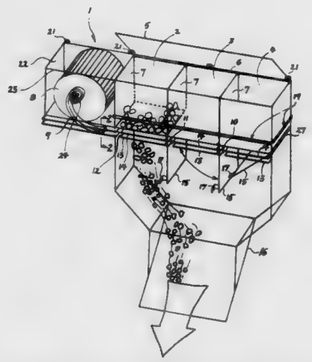
5,109,799

AUTOMATIC DRY PET FOOD DISPENSER

Ernest A. Lader, 63 Teresa Drive, Whitby, Ontario, Canada L1N 6H9

Filed Aug. 23, 1991, Ser. No. 752,274
Claims priority, application Canada, Apr. 23, 1991, 2040966
Int. Cl.[5] A01K *5/02*
U.S. Cl. 119—51.13 **5 Claims**

1. An apparatus for dispensing dry pet food in measured amounts at predetermined intervals over a several day period, comprising; a mechanical or electrical drive mechanism which, when activated, will rotate to recoil and uncoil a draw bar which will, in its extended position, support a trap door, said trap door being rotatably mounted at a bottom of a feed compartment, said trap door having an L-shaped tab as an integral part of said trap door, and the apparatus further including a channel shrouding any extended length of said draw bar and receiving said tab to allow said draw bar unobstructed recoiling and uncoiling movement therethrough, wherein recoiling



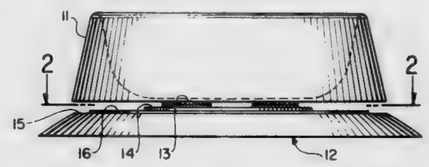
said draw bar at a predetermined distance will release said trap door for dispensing measured amounts of food.

5,109,800

INSECT BARRIER STAND

Willard J. Williams, Yacht Haven Marina, Berth 202, Wilmington, Calif. 90744

Filed Jul. 12, 1991, Ser. No. 729,321
Int. Cl.[5] A01K *5/00*
U.S. Cl. 119—61 **6 Claims**



1. A stand for supporting a bowl or can comprising:

a bowl-like container having a downwardly sloping sidewall spaced above a bottom;

a base having a central portion and an edge marginal region integrally joined with said central portion by a surrounding flat planar platform;

said base central portion including a raised hub above said surrounding platform so as to define a gap between said container sidewall and said edge marginal region;

said edge marginal region is a continuous downwardly sloping sidewall extending beyond said container bottom and positioned below said surrounding platform;

an insect barrier disposed on said platform in spaced-apart relationship with respect to said raised hub and said edge marginal region; and

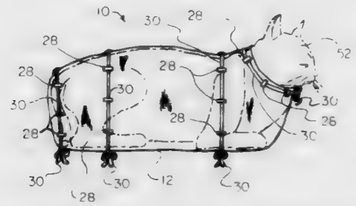
detachable fastener means cooperatively carried on said container bottom and said raised hub for detachable connection of said container with said base raised hub.

5,109,801

ANIMAL RESTRAINT

Vicki S. Gahagan, 10439 Desmoines Memorial Dr., S., Seattle, Wash. 98168

Filed Sep. 24, 1990, Ser. No. 586,955
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—96 **20 Claims**



1. An animal restraint for restraining an animal; wherein said animal comprises a body, a head, a neck, shoulders, front legs, hips, and rear legs; and wherein said animal restraint comprises a tapered, cone shaped, tubular sleeve of flexible material having a large end and a small end; wherein said sleeve is effectively continuous around its circumference and along its length; wherein said large end defines a large opening; wherein said small end defines a small, head opening; wherein said large opening is sized substantially larger than said animal's body to permit the easy entry and exit of said animal from said animal restraint; wherein said sleeve is sized larger than said animal's body to permit said animal's body to fit within said sleeve; and wherein said head opening is sized at least as large as said animal's head and neck to permit said animal's head and neck to pass therethrough; head opening closure means, located adjacent said head opening, for selectively adjusting the size of said head opening, and for releasably securing said animal restraint about said animal's neck; large opening closure means, located adjacent said large opening, for selectively adjusting the size of said large opening to be smaller than said animal's body, and for releasably keeping said animal within said animal restraint; shoulder closure means, located adjacent said animal's shoulders, for releasably holding said animal, when said animal is inside of said animal restraint, in a position wherein said animal's front legs are folded up, to help prevent said animal from using its said front legs to escape from said animal restraint; and hip closure means, located adjacent said animal's hips, for releasably holding said animal, when said animal is inside of said animal restraint, in a position wherein said animal's rear legs are folded up, to help prevent said animal from using its said rear legs to escape from said animal restraint; wherein said sleeve comprises mesh material means for permitting access to all of said animal's body through said mesh material means, wherein said access is sufficient to allow said animal to be bathed, powdered and injected through said mesh material means while said animal is inside of said animal restraint.

5,109,802

ANIMAL HEADGATE WITH AN AUTOMATIC LOCKING MECHANISM

William D. Priefert, P.O. Box 1540, Mt. Pleasant, Tex. 75455

Filed Mar. 18, 1991, Ser. No. 670,886
Int. Cl.[5] A61D *3/00*
U.S. Cl. 119—98 **8 Claims**

1. A headgate for restraining animals, comprising:

(a) a pair of generally upright frame members spaced apart by at least the width of said animal;

(b) top and bottom frame members extended between said upright frame members at the top and bottom thereof, respectively;

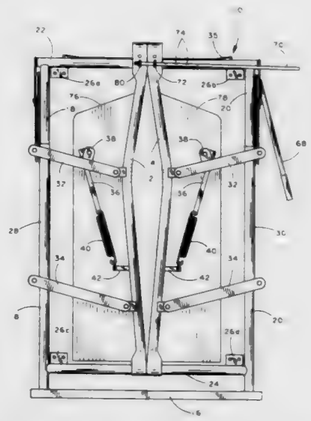
(c) a pair of animal neck-engaging yokes mounted for sliding movement on said top and bottom frame members between a fully open position and a fully closed position;

(d) a pair of sleeves, one each of which is associated with each of said upright frame members, for sliding movement thereon between an upper position and a lower position;

(e) linkage means interconnecting each of said yokes with an associated one of said sleeves such that as said sleeve is moved between said upper position and said lower position, the associated one of said yokes is moved between said fully open position and said fully closed position, respectively;

(f) spring biasing means for urging said yokes toward said fully closed position;

(g) locking means for preventing unassisted opening of said yokes; and (h) manually operable means for releasing said locking means and to raise said sleeves thereby opening said yokes.

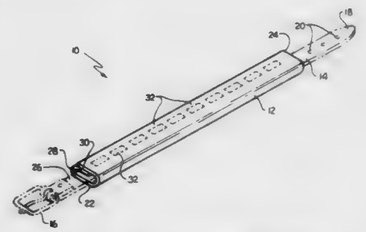


5,109,803

PADDED SLEEVE FOR PET COLLAR

Jeffrey W. Dunham, 11086 N. Six Lakes Rd., Six Lakes, Mich. 48886; Richard A. Carson, 7743 W. Lincoln Rd., Elwell, Mich. 48832, and Bernard J. Grosskopf, 10931 Edgar Rd., Vestaburg, Mich. 48891

Filed Jan. 28, 1991, Ser. No. 646,213
Int. Cl.[5] A01K *27/00*
U.S. Cl. 119—106 **10 Claims**



1. A padded sleeve and pet collar, comprising:

a substantially rectangular area of a pliable non-porous material, said material having at least one surface thereof adapted to be non-chafing when in contact with the skin or fur of a wearing pet; said rectangular area having a length dimension substantially equivalet to a length of a pet collar to which said sleeve is to be applied, less that

portion of the pet collar used for fastening said collar around a neck of a pet; said rectangular area having a width dimension adapted, when said rectangular area is appropriately folded along its length, to pass across an upper width surface of said collar from a first width edge thereof, downward past a second width edge of said collar opposed to said first width edge thereof, across a lower width surface of said collar from said second width edge to said first width edge, upwardly past said first width edge of said collar, and across that portion of said rectangular area folded over said upper width surface of said collar from said first width edge to said second width edge; and

a plurality of releasable fastening devices coupling between a surface of said rectangular area, opposed to a surface thereof proximate to said collar, first passing across said upper width surface of said collar and a surface of said rectangular area, proximate to said upper width surface of said collar, passing across said portion of said rectangular area folded over said upper width surface of said collar, said plurality being distributed substantially uniformly along the length dimension of said rectangular area.

5,109,804

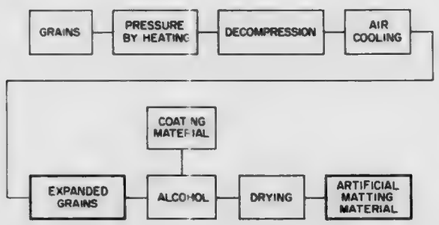
COATED ANIMAL LITTER

Osamu Chikazawa, 1-5-13, Nipponbashi, Chuo-Ku, Osaka-Shi, Japan 540

Continuation-in-part of Ser. No. 453,686, Dec. 20, 1989, abandoned. This application Oct. 15, 1990, Ser. No. 598,354

Int. Cl.[5] A01K *29/00*

U.S. Cl. 119—171 **5 Claims**



1. A litter material for pet animals, comprising the steps of expanding grains by subjecting the grains to a heat-pressurized state and decompression, and coating the grains thus treated with an inorganic powder material of zeolite in a range of 3–50 parts thereof for 100 parts of the grains, wherein the grains are pretreated by the steps of:

(a) drying and reducing in size;

(b) adding water to the dried and size-reduced grains to obtain a paste; and

(c) passing the paste through a fine sieve and heating the sieved paste at a temperature in the range of 120°–150° C. to transform the paste into a plurality of lumps having a diameter in the range of 1–2 millimeters.

5,109,805

ABSORBENT MATERIAL

Michael G. C. Baldry, and David A. Cummerson, both of Warrington, United Kingdom, assignors to Laporte Industries Limited, London, England

PCT No. PCT/GB89/01525, § 371 Date Jun. 12, 1991, § 102(e) Date Jun. 12, 1991, PCT Pub. No. WO90/07273, PCT Pub. Date Jul. 12, 1990

PCT Filed Dec. 21, 1989, Ser. No. 689,891

Claims priority, application United Kingdom, Dec. 24, 1988, 8830266

Int. Cl.[5] A01K *67/00*

U.S. Cl. 119—173 **7 Claims**

1. Litter comprising an absorbent material containing a bactericidal additive the litter being characterised in that the additive comprises one or more aliphatic bromo- nitro-bactericides in which the bromo- and nitro- groups are carried on the same carbon atom.

5,109,806

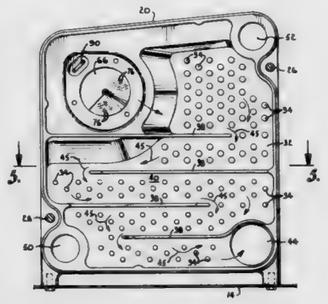
PREMIX BOILER CONSTRUCTION

Robert B. Duggan; James V. Goins, both of Michigan City; Donald E. Holloway, LaPorte, all of Ind., and Ronald Moulder, Newark, Ohio, assignors to The Marley Company, Mission Woods, Kans.

Filed Oct. 15, 1990, Ser. No. 597,065

Int. Cl.[5] F22B *7/18, 37/40*

U.S. Cl. 122—13.1 **6 Claims**



1. In a boiler, the combination of:

means for providing a plurality of separate water-ways each bounded by a heat transfer surface and each having an inlet and an outlet;

a combustion chamber;

a burner in said chamber;

means for supplying air and fuel to said burner;

ignition means for igniting the air-fuel mixture in the combustion chamber;

a plurality of baffles cooperating to present a serpentine flue passage extending adjacent said heat transfer surfaces from said combustion chamber to a flue outlet through which combustion gases are vented, said flue passage having a plurality of successive passes defining a serpentine path;

means for providing a bypass opening in at least one baffle to permit flue gases to flow in restricted amounts through said bypass opening from one pass to the next successive pass to short cut the serpentine path followed by the rest of the flue gases from said one pass to the next successive pass, thereby inhibiting standing waves in the combustion gas pathway; and

said means for providing said bypass opening comprising a notch in at least one preselected baffle and an elongated slit in all baffles except said one preselected baffle, said slits extending for substantial portions of the lengths of the baffles.

5,109,807

HIGH OUTPUT MINI HYDRONIC HEATER

Paul Sarkisian, Watertown, and Fred Becker, Reading, both of Mass., assignors to Gas Research Institute, Chicago, Ill.

Filed May 15, 1990, Ser. No. 523,853

Int. Cl.[5] F22B *9/00*

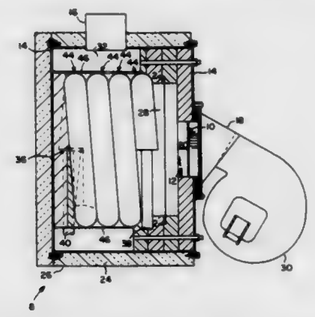
U.S. Cl. 122—20 B **3 Claims**

1. A hydronic heater comprising:

a housing, said housing defining in part a heat exchange chamber,

a wound heat transfer tube within said heat exchange chamber, said tube having an inlet and an outlet for conducting fluid through said heat exchange chamber, said wound heat transfer tube comprising a single tube having fins integral with the external surface thereof and extending therefrom,

a baffle having therein gas-metering orifice means, said baffle being wrapped around said heat transfer tube and defining in part said heat exchange chamber, said baffle



and said housing further defining an outer housing chamber concentrically therebetween,

said gas-metering orifice means comprising a plurality of rows of slots, each of said rows being positioned adjacent the closest point of approach of said fins to said baffle, and

means for producing combustion gases and for directing said combustion gases through said heat exchange chamber into contact with said tube and out through said gas metering orifice means to said outer housing chamber.

5,109,808

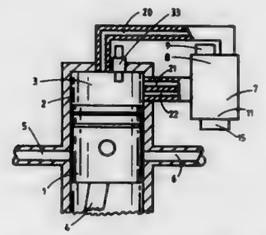
CROSS FLOW PRIMARY REACTORS FOR CYCLIC CHAR BURNING ENGINES AND GASIFIERS

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115-0514

Filed Jul. 3, 1991, Ser. No. 725,823

Int. Cl.[5] F02B *45/02*

U.S. Cl. 123—23 **31 Claims**



1. In a cyclic char burning power reactor comprising: at least one combined means for compressing and expanding gases, each said combined means comprising; an internal combustion engine mechanism comprising a variable volume chamber for compressing and expanding gases, and drive means for driving said internal combustion engine mechanism and for varying the volume of said chamber through repeated cycles, each cycle comprising a compression time interval followed by an expansion time interval, each said combined means for compressing and expanding further comprising, intake means for admitting reactant gases into said variable volume chamber prior to each said compression time interval, exhaust means for removing reacted gases from said variable volume chamber after each said expansion time interval; each said combined means for compressing and expanding being connected to a separate primary reaction chamber, within a pressure vessel container, each said primary reaction chamber comprising; a refuel end with a refuel mechanism means for supplying fresh char fuel particles into said refuel end, an ash collection end, a char fuel direction of motion from said refuel end toward said ash removal end, a peripheral dimension around the outer surface of said primary reaction chamber at right angles to said char fuel motion direction, each said primary reaction chamber further comprising, a volatile matter distillation and fuel preheat zone positioned toward said refuel end of said primary reaction chamber, an ash collection zone positioned toward said ash collection end of said primary reaction chamber, and a rapid reaction zone positioned between said volatile matter distillation and fuel preheat zone and said ash collection zone, each said primary reaction chamber further comprising at least one means for removing ashes; said char burning power reactor further comprising a source of supply of reactant gas containing appreciable oxygen gas to each said intake means for admitting reactant gases into said variable volume chamber; said char burning power reactor further comprising: means for preheating said char fuel within said primary reaction chamber to that temperature at which said char fuel reacts rapidly with oxygen in adjacent compressed reactant gases when said char burning power reactor is being started; means for cranking said internal combustion engine mechanism when said char burning power reactor is being started:

an improvement comprising:

dividing said peripheral dimension of said primary reaction chamber into a separate inlet portion, a separate outlet portion, and a separate sealed portion;

and adding to each said primary reaction chamber:

a reactant gas manifold comprising an inlet and an outlet, said outlet connecting to reactant gas inlet ports into said primary reaction chamber, and these ports positioned along at least that portion of the length of said primary reaction chamber in said direction of char fuel motion, which is adjacent to said rapid reaction zone, and these ports also positioned around only said inlet portion of the periphery of said primary reaction chamber;

a producer gas reservoir comprising an inlet, said inlet connecting to producer gas outlet ports out of said primary reaction chamber, and these ports positioned along that portion of said length of said primary reaction chamber along said direction of char fuel motion which is adjacent to said rapid reaction zone,

wherein all of said reactant gas inlet ports and also all of said outlet ports are smaller in at least one area cross section dimension than the char fuel particles being refueled into said primary reaction chamber;

a reactant fixed open gas flow connection from said variable volume chamber of said internal combustion engine mechanism to said inlet of said reactant gas manifold.

5,109,809

TEMPERATURE CONTROL SYSTEM FOR A WATER-COOLED INTERNAL COMBUSTION ENGINE

Hiroaki Fujimoto, Hamamatsu, Japan, assignor to Sanshin Industries Co., Ltd., Hamamatse, Japan

Filed Feb. 28, 1991, Ser. No. 662,258

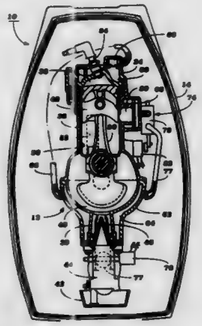
Claims priority, application Japan, Feb. 28, 1990, 2-45640

Int. Cl.[5] F01P *1/06*

U.S. Cl. 123—41.31 **19 Claims**

1. A temperature control system for a liquid cooled internal combustion engine comprising: a water pathway extending along two water-jacketed engine portions, and a water supply control means for selectively directing water into one of two possible flow paths within said water pathway, wherein a first flow path leads initially to a first water jacket located around a first engine portion and subsequently to a second water jacket

located around a second engine portion, and a second flow path leads initially to said second water jacket around said



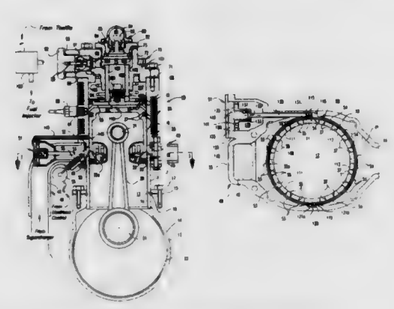
second engine portion and subsequently to said first water jacket around said first engine portion.

5,109,810

TWO CYCLE INTERNAL COMBUSTION HYDROCYCLE ENGINE

Howard W. Christenson, 128 W. 73rd St., Indianapolis, Ind. 46260

Filed Sep. 24, 1990, Ser. No. 587,233
Int. Cl.[5] F02B *25/08*
U.S. Cl. 123—51 R **20 Claims**



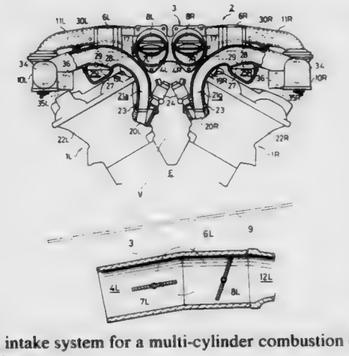
1. An internal combustion engine comprising:
a hollow cylinder;
a compression piston reciprocatably disposed within said cylinder;
means, including a rotatable flywheel connected to said compression piston, for storing energy from reciprocation of said compression piston;
a power piston reciprocatably disposed within said cylinder and opposing said compression piston;
a pump having;
a housing defining a fluid chamber for containing a fluid;
a fluid inlet to said fluid chamber;
a fluid outlet opening outside the engine for discharging a fluid from the engine through said fluid chamber;
a pumping member movably disposed within said fluid chamber to displace a fluid contained therein through said fluid outlet, said pumping member being attached to said power piston;
means for injecting a combustible mixture between said compression piston and said power piston;
means for igniting said combustible mixture, whereby ignition of said combustible mixture causes said power piston to move away from said compression piston within said cylinder and said pumping member to move with said power piston to displace fluid from said fluid chamber through said fluid outlet; and
means for controlling the injection and ignition of said combustible mixture for self-sustaining reciprocation of said compression piston.

5,109,811

INTAKE SYSTEM FOR MULTI-CYLINDER ENGINE

Fusatoshi Tanaka; Toshikazu Kurokawa; Kouji Matsuura, and Motoi Aoki, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed May 9, 1991, Ser. No. 697,376
Claims priority, application Japan, May 9, 1990, 2-117680
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 MB **31 Claims**



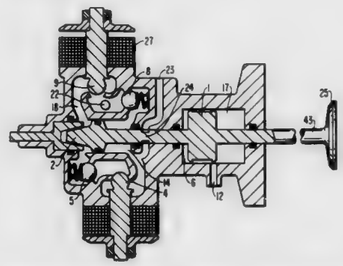
1. An intake system for a multi-cylinder combustion engine, comprising:
a surge tank disposed over a cylinder head of the combustion engine;
an independent intake passage connecting the surge tank to an intake port for each of cylinders of the combustion engine; and
a volume portion constituting a volume chamber disposed within a space formed among and surrounded by the independent intake passage, the surge tank and the cylinder head so as to gain dynamic effect of intake air.

5,109,812

PNEUMATIC PRELOADED ACTUATOR

Frederick L. Erickson, and William E. Richeson, both of Fort Wayne, Ind., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 4, 1991, Ser. No. 680,721
Int. Cl.[5] F01L *19/04*
U.S. Cl. 123—90.12 **11 Claims**



1. A bistable pneumatically powered hydraulically latched actuator mechanism comprising:

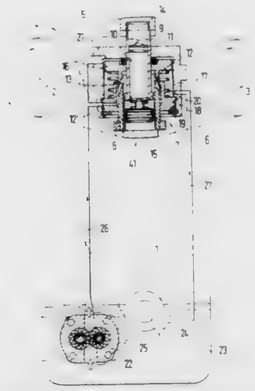
a reciprocable portion including a power piston and a latching piston having a pair of opposed working surfaces, the power piston and latching piston being movable together back and forth between stable initial and second positions;
symmetric first and second damping chambers in which air is compressed by the power piston alternately during translation of the mechanism portion back and forth between the initial and second positions, compression of the air in either damping chamber slowing the reciprocable portion movement and storing energy for subsequent propulsion of the power piston in an opposite direction;
hydraulic means including the latching piston for temporarily preventing reversal of the direction of movement of the reciprocable portion when the motion of that portion slows to a stop;
means operable on command to disable the hydraulic means and allow the compressed air in a damping chamber to propel the reciprocable portion from one toward the other of its stable positions;
supplemental hydraulic means operable only when the reciprocable portion is near the initial position for supplying additional hydraulic fluid under pressure to apply additional force to one latching piston working surface and assure that the reciprocable portion remains in the initial position until the hydraulic means is disabled.

5,109,813

CHAIN DRIVE TENSIONING AND ADJUSTING ARRANGEMENT

Alfred Trzmiel, Grafenberg; Olaf Fiedler, Pforzheim, and Johannes Weyandt, Illingen, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany and Hydraulik-Ring GmbH, Fed. Rep. of Germany

Filed Mar. 4, 1991, Ser. No. 663,603
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1990, 4023727
Int. Cl.[5] F01L *1/34, 1/04*
U.S. Cl. 123—90.15 **6 Claims**



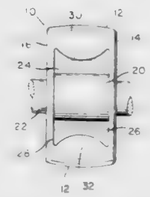
3. An arrangement for hydraulic tensioning and adjusting of a wind-around drive through which a first camshaft of a piston internal-combustion engine drives a second camshaft, comprising a hydraulic piston for changing the relative rotational position of the camshafts with respect to one another by adjustment of the drive by shifting a chain tensioning device transversely to the drive, while one of a loose end and a load end of the drive is lengthened and the other of the loose end and load end is shortened, wherein engine oil is used as hydraulic fluid for the hydraulic piston, and pressure of the fluid rises with rotational engine speed, and the engine oil pressure acts upon a control member which is under spring tension and which is shifted continuously corresponding to the rotational engine speed, and starting from a determinable rotational engine speed, exposes a duct communicating with the hydraulic piston so that the engine oil pressure can act upon the hydraulic piston.

5,109,814

SPHERICAL ROTARY VALVE

George J. Coates, 2500 Belmar Blvd., Wall Township, Belmar County, N.J. 07719

Filed May 10, 1991, Ser. No. 697,981
Int. Cl.[5] F01L *7/06*
U.S. Cl. 123—190.14 **7 Claims**



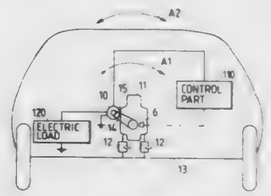
1. An improved rotary intake valve for use in a rotary valved internal combustion engine for cooperation with the inlet port of the cylinder of said internal combustion engine for the introduction of a fuel/air mixture into said cylinder, said improved rotary valve comprising
a drum body of spherical section formed by two parallel planer sidewalls of a sphere disposed about a center thereof, thereby defining a spherically-shaped end wall and formed with a shaft receiving aperture, said drum body formed with a circular-shaped cavity in a sidewall thereof and a channel extending between said circularly-shaped cavity and at least one aperture formed in said spherically-shaped end wall, said aperture formed in said spherically-shaped end wall having longitudinally-disposed sidewalls substantially parallel to said planer sidewalls of said drum body, said end walls of said aperture formed in said spherically-shaped end wall comprised of opposing curvalinear, semicircular shapes, the radius thereof equaling the radius of said inlet port of said cylinder.

5,109,815

METHOD OF AND APPARATUS FOR REDUCING VIBRATIONS OF CAR BODY

Yuuji Maeda, Katsuta; Yozo Nakamura, Shimoinayoshi; Kenichi Nakamura; Masahide Sakamoto, both of Katsuta; Yüzo Kadomukai, Shimoinayoshi; Masao Fukushima, Machida, and Kei Murakami, Zama, all of Japan, assignors to Hitachi, Ltd., Chiyoda and Nissan Motor Co., Ltd., Kanagawa, both of, Japan

Filed Jan. 28, 1991, Ser. No. 646,389
Claims priority, application Japan, Jan. 27, 1990, 2-146348
Int. Cl.[5] F02B *75/06*
U.S. Cl. 123—192.1 **20 Claims**



1. A method of reducing vibrations of a car body of an

automobile provided with an internal combustion engine, said method comprising the steps of:

detecting occurrence of roughness caused by irregular combustion in the engine; and

exerting, temporarily, for only a predetermined period of time after the detection of occurrence of roughness, such external force as will cancel engine vibrations caused by the roughness, on an engine block of the engine.

5,109,816

DIRECT FUEL INJECTION TYPE SPARK IGNITION INTERNAL COMBUSTION ENGINE

Shizuo Sasaki, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 24, 1991, Ser. No. 690,588

Claims priority, application Japan, Apr. 27, 1990, 2-44648[U]; Aug. 10, 1990, 2-210460

Int. Cl.[5] F02R *31/00*

U.S. Cl. 123—263 **13 Claims**



1. A direct fuel injection type spark ignition internal combustion engine comprising:

a piston/cylinder structure including a cylinder, a piston reciprocally movable in the cylinder, and a cylinder head located above the cylinder, the cylinder, the piston and the cylinder head defining a combustion chamber having an axis coincident with a longitudinal axis of the cylinder and a radially outer portion, the piston including a deep dish portion, a peripheral portion at least partially surrounding the deep dish portion, a shallow dish portion at least partially surrounding the peripheral portion, and a plug pocket, all formed in a top portion of the piston, the peripheral portion having a depth smaller than the deep dish portion and greater than the shallow dish portion and a diameter larger than the deep dish portion and smaller than the shallow dish portion, the deep dish portion having a side surface where the plug pocket opens to the deep dish portion, the deep dish portion including a fuel evaporation groove formed in the side surface upstream of the plug pocket in a direction of a swirl generated in the deep dish portion and an edge portion located at a top of the fuel evaporation groove so that the fuel evaporation groove is connected to the peripheral portion via the edge portion;

a spark plug located in the cylinder head close to the axis of the combustion chamber, the spark plug having an ignition portion protruding into the combustion chamber, the plug pocket of the piston receiving the ignition portion of the spark plug therein when the piston comes to its highest position; and

a fuel injection nozzle located at the radially outer portion of the combustion chamber, a fuel injection timing of the fuel injection nozzle being predetermined so that the fuel injection nozzle injects fuel toward the edge portion above the fuel evaporation groove at medium engine loads.

5,109,817

CATALYTIC-COMPRESSION TIMED IGNITION

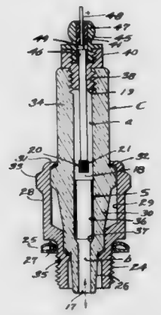
Mark A. Cherry, San Diego, Calif., assignor to Altronic, Inc., Girard, Ohio

Filed Nov. 13, 1990, Ser. No. 611,916

The portion of the term of this patent subsequent to Dec. 18, 2007, has been disclaimed.

Int. Cl.[5] F02B *19/12, 19/16*

U.S. Cl. 123—272 **35 Claims**



1. A method of catalytically enhanced ignition in internal combustion engines having a compression cycle and ignition of a combustible fuel-air mixture in a combustion chamber followed by a power cycle, and including;

the first step of providing a closed timing prechamber with a catalyst therein and in open communication with the combustion chamber for penetration therein of a stratified pressure front of the combustible fuel-air mixture,

the second step of positioning an igniter means at a depth of the stratified pressure front penetraton of said combustible fuel-air mixture into the closed timing prechamber for contact therewith at a determined compression of said combustible fuel-air mixture in the combustion chamber,

the third step of transferring the stratified pressure front of combustible fuel-air mixture from the combustion chamber and into contact with the catalyst in the timing prechamber during the compression cycle and preactivating the same,

the fourth step of capturing a volume of previously burnt noncombustible gasses in the closed chamber for occlusion of the igniter means and for depression as a spring,

and the fifth step of depressing said captured previously burnt non combustible gasses with the penetrating stratified pressure front of activated combustible fuel-air mixture until contact thereof with the igniter means, whereby an ignition phase occurs in the form of a flame emanating into the combustion chamber for continued burning to effect the power cycle and leaving burnt noncombustible gasses in the closed timing prechamber.

5,109,818

ENGINE SPEED LIMITING APPARATUS

Toshiyasu Yoshida, Shizuoka, Japan, assignor to JATCTO Corporation, Japan

Filed Jun. 21, 1991, Ser. No. 718,643

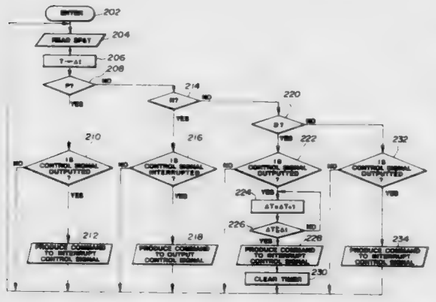
Int. Cl.[5] F02D *39/02*

U.S. Cl. 123—319 **3 Claims**

1. An apparatus for use with an automotive vehicle including an internal combustion engine operable at variable speeds and an automatic transmission operable in a selected one of positions including "park", "neutral" and "drive" positions, the apparatus comprising:

first means for detecting the selected position of the transmission;

second means for producing a control signal when the transmission is in the "neutral" position and for interrupting the control signal when the transmission is in the "park" position; and



third means responsive to the control signal for limiting the speed of the engine below a predetermined value.

5,109,819

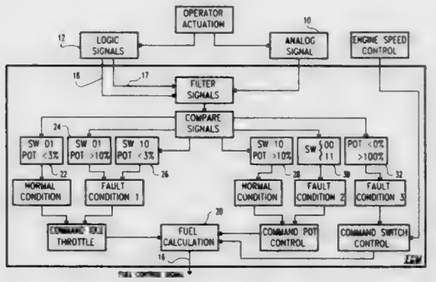
ACCELERATOR CONTROL SYSTEM FOR A MOTOR VEHICLE

Robert J. Custer, and Mark R. Stepper, both of Columbus, Ind., assignors to Cummins Electronics Company, Inc., Columbus, Ind.

Filed Mar. 29, 1991, Ser. No. 677,141

Int. Cl.[5] F02D *11/10, 41/22*

U.S. Cl. 123—399 **16 Claims**



1. An accelerator control system for a motor vehicle having an accelerator pedal, comprising:

primary input means for receiving a primary signal indicative of accelerator pedal position;

auxiliary input means for receiving a complementary pair of auxiliary signals indicative of accelerator pedal position; and

control circuit means for generating a throttle control signal in accordance with said primary signal and said complementary pair of auxiliary signals, said control circuit means including means for generating a throttle control signal corresponding to a throttle idle position when said primary signal or said complementary pair of auxiliary signals indicate an idle state.

5,109,820

APPARATUS AND METHOD FOR CONTROLLING KNOCKING IN AN INTERNAL COMBUSTION ENGINE

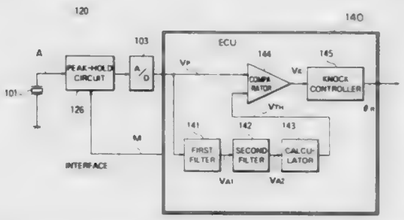
Toshio Iwata; Atsuko Matsuoka, and Atsuko Hashimoto, all of Himeji, Japan, assignors to Mitsubishi Denki K.K. and Mitsubishi Jidosha Kogyo K.K., both of Tokyo, Japan

Filed Apr. 24, 1991, Ser. No. 690,245

Claims priority, application Japan, Apr. 26, 1990, 2-108637

Int. Cl.[5] F02P *5/14*

U.S. Cl. 123—425 **14 Claims**



1. A knock control apparatus for an internal combustion engine having at least one cylinder, comprising:

a knock sensor for sensing knocking in said at least one cylinder;

a signal processor for generating, based on the output signal of said knock sensor, a vibration level for a predetermined crank angle range from a reference crank position of said at least one cylinder;

filter means for generating an average value of the vibration level;

a calculator for calculating a knock determination threshold based on the average value of the vibration level;

a comparator for comparing the vibration level with the knock determination threshold and generating a knock determination signal when the vibration level exceeds the knock determination threshold; and

a knock controller for controlling, based on the knock determination signal, engine control parameters to suppress knocking in said at least one cylinder.

5,109,821

ENGINE CONTROL SYSTEM

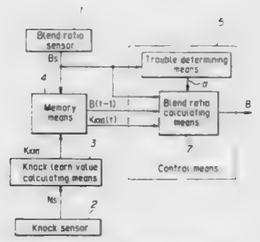
Masato Yoshida, Kyoto; Takanao Yokoyama, Nagaokakyo; Muneyoshi Nanba, Kyoto; Yoshihiko Kato, Kyoto; Kazumasa Iida, Kyoto, and Katsuhiko Miyamoto, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1991, Ser. No. 642,511

Claims priority, application Japan, Jan. 19, 1990, 2-11519; Feb. 2, 1990, 2-23759

Int. Cl.[5] F02D *5/14*

U.S. Cl. 123—425 **9 Claims**

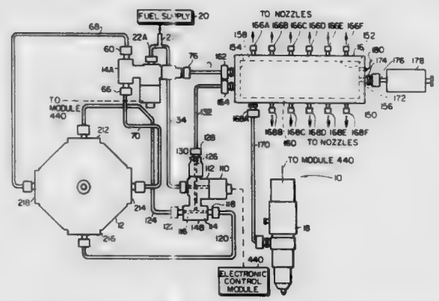


1. An engine control system comprising:

a blend ratio sensor, arranged in a fuel supply pipe to supply fuel to an engine, for detecting a blend ratio of methanol;

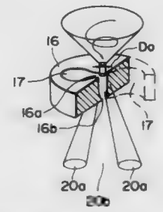
a knock sensor for outputting knock information of said engine;
a calculating means for computing fuel blended ratio based on said knock information;
compensation means for compensating a signal from said blend ratio sensor with an output signal from said calculating means, and for acquiring a control blend ratio;
trouble detecting means for detecting failure of said blend ratio sensor;
memory means for memorizing a blend ratio right before failure of said blended ratio sensor, as an assumed blend ratio when said blend ratio sensor fails; and
control means for controlling said engine in accordance with said assumed blend ratio and a signal from said compensation means.

5,109,822
HIGH PRESSURE ELECTRONIC COMMON-RAIL FUEL INJECTION SYSTEM FOR DIESEL ENGINES
Tiby M. Martin, 3836 Holly La., Waterloo, Iowa 50702
Division of Ser. No. 508,068, Apr. 11, 1990, Pat. No. 5,035,221, which is a division of Ser. No. 295,588, Jan. 11, 1989, abandoned. This application Nov. 30, 1990, Ser. No. 621,372
Int. Cl.[5] F02M *37/00*
U.S. Cl. 123—456 **1 Claim**



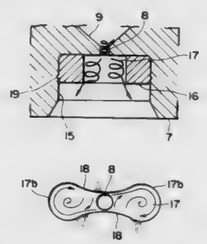
1. A high pressure common rail for use in a diesel fuel injection system comprising:
a body formed of a unitary structure having a plurality of parallel first elongated bores formed from one end thereof and a plurality of second bores intersecting the first bores at right angles to the longitudinal axis thereof to form a plurality of communicating internal chambers, inlet fittings being mounted in the first bores adapted to receive fuel under pressure into the first bores and outlet fittings being mounted in the second bores for discharging fuel from the second bores, under the influence of the inlet fuel pressure; and
relief valve means connected to the internal chambers to prevent the fluid pressure in the internal chambers from exceeding a predetermined level whereby the fuel pressure being discharged from the internal chambers is generally at said predetermined pressure.

5,109,823
FUEL INJECTOR DEVICE AND METHOD OF PRODUCING THE SAME
Mizuho Yokoyama; Hisanobu Kanamaru, both of Katsuta; Yoshio Okamoto; Tunemitu Kuroha, both of Ibaraki; Atsushi Koshizaka, Nakaminato, and Hironori Shinozaki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of, Japan
Filed Feb. 13, 1991, Ser. No. 654,677
Claims priority, application Japan, Feb. 23, 1990, 2-041036
Int. Cl.[5] F02M *51/08;* **B21K** *21/08*
U.S. Cl. 123—472 **11 Claims**



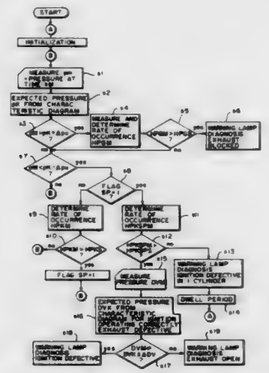
1. A fuel injector device comprising: a valve seat; a fuel swirling element disposed upstream of said valve seat and capable of imparting a swirling force to a fuel supplied thereto; a fuel injection nozzle orifice disposed downstream of said valve seat; and distributing means disposed downstream of said fuel injection nozzle orifice and capable of distributing the flow of the fuel injected through said fuel injection nozzle orifice, said distributing means having an axial central fuel passage bore having an inlet end adjacent said fuel injection nozzle orifice and an outlet end remote from said fuel injection nozzle orifice, said outlet end being substantially "8"-shaped and having a minimum diameter smaller than that of said inlet end.

5,109,824
ELECTROMAGNETIC FUEL INJECTION VALVE
Yoshio Okamoto; Yozo Nakamura, both of Ibaraki; Mineo Kashiwaya, Katsuta, and Eigi Hamashima, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Chiyoda and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of, Japan
Filed Jul. 10, 1989, Ser. No. 377,250
Claims priority, application Japan, Jul. 13, 1988, 63-172739
Int. Cl.[5] F02M *51/08*
U.S. Cl. 123—472 **8 Claims**



1. An electromagnetic fuel injection valve including a fuel swirl element disposed in series flow relationship with a valve seat for providing a swirl force to fuel, and fuel injection orifice means disposed downstream of said valve seat, said electromagnetic fuel injection valve comprising:
dividing means disposed downstream of said fuel injection orifice means for dividing an injected fuel flow by an undivided fuel passage.

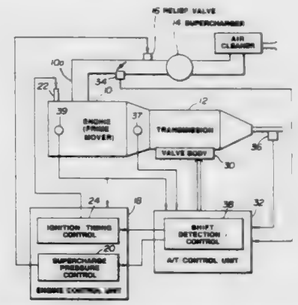
5,109,825
METHOD AND ARRANGEMENT FOR RECOGNIZING MISFIRES
Heinz-Günter Joos, Markgröningen; Karl-Heinz Kugler, Vaihingen, and Hans Köhnle, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE89/00628, § 371 Date Apr. 15, 1991, § 102(e) Date Apr. 15, 1991, PCT Pub. No. WO90/04093, PCT Pub. Date Apr. 19, 1990
PCT Filed Oct. 4, 1989, Ser. No. 671,878
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835285
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—479 **11 Claims**



1. A method for recognizing misfires in an internal combustion engine, the method comprising the steps of:
determining the maximum exhaust-gas pressure for each exhaust stroke;
determining an exhaust-gas pressure expected value for each exhaust stroke from values of operating parameters of the engine;
comparing the maximum exhaust-gas pressure to the corresponding exhaust-gas pressure expected value and emitting an occurrence signal whenever the two values deviate from one another by more than a specified difference;
determining the rate of occurrence of the occurrence signals; and,
whenever the rate of occurrence exceeds a threshold value, either directly emitting a fault signal or determining further rates of occurrence which then lead to the emission of a specified fault signal.

5,109,826
SHIFT SHOCK ATTENUATION SYSTEM FOR AUTOMOTIVE POWER TRAIN INCLUDING AUTOMATIC TRANSMISSION AND TURBOCHARGED INTERNAL COMBUSTION ENGINE
Yuji Kato, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Japan
Filed Jul. 25, 1990, Ser. No. 556,714
Claims priority, application Japan, Jul. 28, 1989, 1-195602
Int. Cl.[5] F02D *23/00;* **F02P** *5/00*
U.S. Cl. 123—564 **6 Claims**

6. In a vehicular power train
an engine, said engine having an induction passage;
a throttle valve operatively disposed in the induction passage;
an engine load sensor operatively connected with the throttle valve for sensing the position of said throttle valve and issuing a signal indicative of the load on the engine;
a supercharger device disposed in the induction conduit upstream of said throttle valve;
a vent valve disposed in said induction conduit at a location downstream of said supercharger for venting pressure developed by said supercharger device;
an engine control unit;
ignition control circuitry included in said engine control unit for determining the timing with which the engine ignition is induced;
supercharge pressure control circuitry included in said engine control unit for controlling the operation of said vent valve;
a transmission;
an engine speed sensor;
a vehicle speed sensor operatively connected with an output shaft rotational speed sensor;



a transmission control unit operatively connected with said output shaft rotational speed sensor and said engine speed sensor, said transmission control unit including:
a shift control means which is responsive to the outputs of said engine load sensor and the vehicle speed sensor for determining if a shift is necessary and if engine torque reduction is necessary during said shift, said shift control means further including circuitry for outputting a signal to said supercharge pressure control circuitry and said ignition control circuitry which signal indicates that at least one of a reduction in the supercharge pressure and a retardation in the ignition timing is necessary, in the event that a shift wherein a torque reduction is indicated as being necessary is determined.

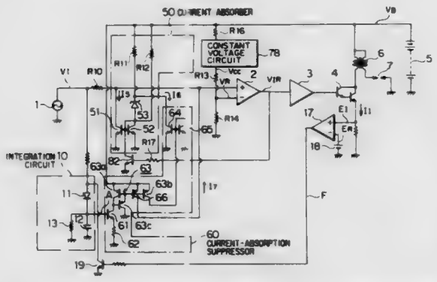
5,109,827
IGNITION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE
Hisanori Nobe, and Mitsuru Koiwa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 8, 1991, Ser. No. 681,829
Claims priority, application Japan, Apr. 19, 1990, 2-101703
Int. Cl.[5] F02P *3/04*
U.S. Cl. 123—618 **10 Claims**

1. An ignition apparatus for an internal combustion engine comprising:
a signal generator for generating an ignition signal having a magnitude proportional to the number of revolutions per minute of the engine in synchrony with the rotation thereof;
an ignition coil having a primary winding and a secondary winding;
a spark plug connected to the secondary winding of said ignition coil for firing a cylinder;
a waveform shaper for shaping the ignition signal from said signal generator into a signal containing a pulse having a rising edge and a falling edge;
a power supply connected to said ignition coil;

a first switch connected between said power supply and said ignition coil for switching on and off the conduction between said power supply and said the primary winding of said ignition coil based on the ignition signal shaped by said waveform shaper.

an integrator for integrating the ignition signal from said signal generator to provide a rpm voltage representative of the number of revolutions per minute of the engine;

a signal level controller for controlling the voltage level of the ignition signal based on the rpm voltage generated by said integrator;



a resistor interposed between said signal generator and said waveform shaper;

a current absorber for absorbing from the ignition signal a current in accordance with the voltage of said power supply;

a second switch operable to turn off said current absorber when the shaped signal generated by said waveform shaper rises; and

a current-absorption suppressor for suppressing a current to be absorbed by said current absorber in accordance with the rpm voltage generated by said integrator.

5,109,828

APPARATUS FOR SUPPLYING HIGH VOLTAGE TO SPARK PLUG OF INTERNAL COMBUSTION ENGINE

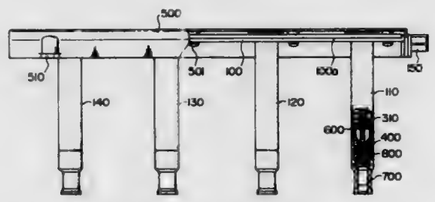
Hitoshi Tagami, Kariya; Masayasu Ushida, Chiryu, and Taro Tabata, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 26. 1991, Ser. No. 674,854

Claims priority, application Japan, Mar. 27, 1990, 2-079118; Jan. 17, 1991, 3-003812

Int. Cl.[5] F02P *3/02*

U.S. Cl. 123—635 **18 Claims**



13. An apparatus for supplying a high voltage to each spark plug associated with a cylinder of a multi-cylinder internal combustion engine, said apparatus comprising:

a distributor plate made of an electrically insulative material having a base portion and a connector; said distributor plate, base portion, and connector being of unitary construction; said connector being adapted for connection to a voltage source;

coil towers associated with each spark plug projecting from said base portion;

at least one spark coil winding mounted within each coil tower for being electrically connected to an associated spark plug; and

a plurality of connecting lines having first and second ends and a substantial portion of each connecting line being embedded in said base portion, said first ends being electrically connected to an associated spark coil winding and projecting up from said base portion adjacent to said associated spark coil winding, said second ends projecting into said connector.

5,109,829

HIGH VOLTAGE SWITCH

Werner Herden, Gerlingen; Johann Konrad, Tamm; Helmut Sautter, Ditzingen, and Wadym Suchowerskyj, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

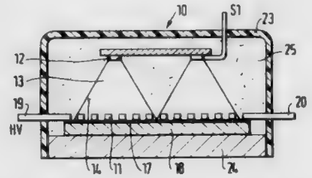
PCT No. PCT/DE88/00371, § 371 Date Dec. 20, 1989, § 102(e) Date Dec. 20, 1989, PCT Pub. No. WO89/00645, PCT Pub. Date Jan. 26, 1989

PCT Filed Jun. 22, 1988, Ser. No. 457,759

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722666

Int. Cl.[5] F02P *7/02*

U.S. Cl. 123—643 **11 Claims**



1. High-voltage switch, particularly for use as ignition voltage distributor for applying the ignition voltage to spark plugs of an internal combustion engine, comprising a plurality of optoelectronic semiconductor elements connected to a high voltage; at least one light-emitting element provided per each of said spark plugs, every light-emitting element being in a working connection with a plurality of said semiconductor elements; and at least one biconvex cylinder lens arranged between at least one of said light-emitting elements and said semiconductor elements.

5,109,830

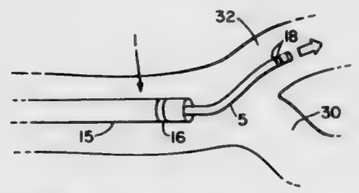
APPARATUS FOR NAVIGATION OF BODY CAVITIES

George Cho, Sudbury, Mass., assignor to Candela Laser Corporation, Wayland, Mass.

Filed Apr. 10, 1990, Ser. No. 507,388

Int. Cl.[5] A61B *1/06*

U.S. Cl. 128—4 **23 Claims**



1. A catheter apparatus comprising:

an outer catheter; and

an inner expansion having a preformed substantially "S" shape and comprising an optical fiber capable of carrying laser energy, wherein the inner extension memorizes the preformed shape so that it returns to the preformed shape absent application of sufficient force, the inner extension being slidable within the outer catheter such that within the outer catheter the inner extension follows the shape of the outer catheter while portions of the inner extension outside the outer catheter assume the preformed shape, an extending of the inner extension from the outer catheter allowing a variable bend at a distal end of the apparatus for guiding the apparatus through body lumens.

5,109,831

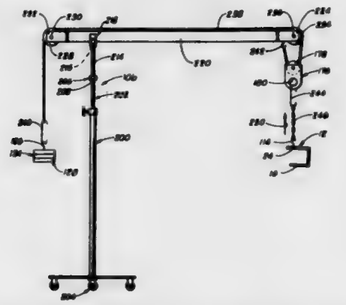
RETRACTOR SUPPORT ASSEMBLY

William J. Forrest, 3400 NW. Expressway, Oklahoma City, Okla. 73112, and Lewis C. Taylor, 1605 Norwood Pl., Oklahoma City, Okla. 73120

Continuation of Ser. No. 398,169, Aug. 24, 1989, Pat. No. 5,065,739. This application Jun. 7, 1991, Ser. No. 712,271

Int. Cl.[5] A61B *17/02*

U.S. Cl. 128—20 **4 Claims**



1. A retractor support assembly for assisting a surgeon by supporting a portion of a breast of a patient during reconstructive surgery, comprising:

a retractor having a blade which is insertable through a would near the breast, the blade being insertable through the wound and under a portion of the breast; and

a retractor support means connected to the blade of the retractor for exerting a predetermined force on the retractor tending to pull the retractor a predetermined distance in a generally upwardly direction for lifting the portion of the breast supported on the blade of the retractor and moving the blade and the portion of the breast supported on the blade in the generally upwardly direction the predetermined distance toward a breast lifted position, the retractor support means cooperating to maintain traction on the retractor for supporting the retractor and the portion of the breast supported on the blade of the retractor in the breast lifted position, comprising:

a first bar having a first end and a second end;

a first pulley rollingly mounted on the bar generally near the first end of the bar;

a second pulley rollingly supported on the bar generally near the second end of the bar;

a cable having opposite ends, the cable extending generally over the first and the second pulleys;

a weight support for holding predetermined weights connected to the end of the cable extending generally over and downwardly from the first pulley;

a block having a third pulley rollingly supported in a portion thereof, the cable extending generally over the second pulley and over the third pulley in the block and extending upwardly from the third pulley terminating with the opposite end connected to the bar; and

means for connecting the block to the retractor; and means for supporting the bar generally above the patient.

5,109,832

METHOD OF AND APPARATUS FOR PRODUCING ALTERNATING PRESSURE IN A THERAPEUTIC DEVICE

Richard D. J. Proctor, 5 Rocky Hill Dr., Litchfield, N.H. 03051, and Robert B. Scheuhing, 16 Spaulding Dr., Merrimack, N.H. 03054

Filed Dec. 7, 1990, Ser. No. 623,369

Int. Cl.[5] A61H *1/00;* **F15C** *1/08*

U.S. Cl. 128—24 R **20 Claims**



1. A therapeutic device for producing alternating pressure to portions of the human body comprising:

a source of pressurized fluid;

first and second sets of inflatable chambers, each set comprising at least two chambers; and

fluid control means comprising only one fluidic flip-flop connected between said pressurized fluid source and said first and second sets of inflatable chambers for supplying pressurized fluid alternately to said first and second sets of inflatable chambers and for exhausting pressurized fluid alternately from said first and second sets of inflatable chambers whereby alternating chamber pumping is produced by the therapeutic device.

5,109,833

HEART MASSAGE AND ARTIFICIAL RESPIRATION DEVICE

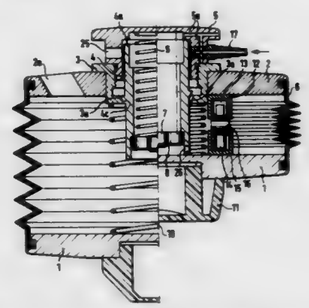
Eckart Frimberger, Tristanstrasse 21, D-8000 München, Fed. Rep. of Germany

Filed Jun. 19, 1990, Ser. No. 540,154

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1989, 3919956

Int. Cl.[5] A61H *31/00*

U.S. Cl. 128—28 **20 Claims**



1. A heart massage and artificial respiration device comprising a patient adapter, a compressible, elastically re-expanding bellows adapted to be placed on the thorax of the patient, an air intake valve coupled to the bellows, a patient valve coupled between the bellows and the patient adapter, and a normally closed pressure relief valve which, after completion of compression of the bellows, is mechanically opened, characterized in that said air intake valve and said pressure relief valve com-

prising a common unitary cylindrical sleeve having a central through-flow.

5,109,834

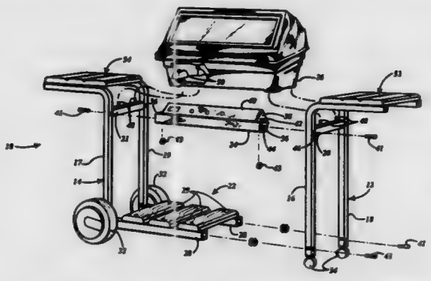
CART ASSEMBLY FOR BARBEQUE GRILLS

Floyd A. Collins, Fortson; Andrew W. Kahler, Columbus, and Marvin R. Windham, Cataula, all of Ga., assignors to W. C. Bradley Company, Ga.

Continuation-in-part of Ser. No. 554,661, Jul. 17, 1990. This application Aug. 9, 1991, Ser. No. 743,080

Int. Cl.[5] F24C *3/00*

U.S. Cl. 126—41 R **4 Claims**



1. A barbecue grill cart assembly for receiving a barbecue grill comprising a pair of generally vertical leg member assemblies each having a front leg and a rear leg with spaced, opposing, generally horizontal strut means connected to said front and rear leg members, said strut means having an upper surface for receiving a barbecue grill, and integral stud means projecting generally vertically therefrom and extending into the barbecue grill for securing the grill thereto, a front panel member having outwardly extending flange means for engaging said leg members adjacent the point of connection of said strut means to said front leg members for providing a plurality of contact points to prevent twisting and swaying of said leg member, and securing means disposed through said flange means and said leg members for fastening said assembly together.

5,109,835

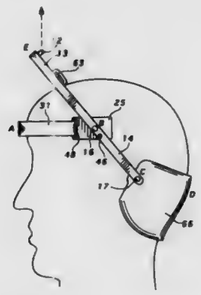
HEADGEAR FOR CERVICAL TRACTION SYSTEM

Philip McDonald, 3326 Elgin Dr., and Newel Kimball, 204 Browning Ave. #5, both of, Salt Lake City, Utah 84109

Continuation of Ser. No. 435,272, Nov. 9, 1989, abandoned. This application Oct. 8, 1991, Ser. No. 773,978

Int. Cl.[5] A61F *5/08*

U.S. Cl. 606—241 **12 Claims**



1. Headgear comprising

integrated first linkage means and lever arm means comprising a U-shaped bail having a central, generally semi-circularly shaped arch portion adapted to fit about the head of a user and terminal arm members extending from either end of said arch portion, each of said arm members having a proximal end at the juncture of said arm member with said end of said arch portion and an opposing distal end, said arm members forming said first linkage means,

second linkage means comprising two swivel plates, each of which rotatably interconnects said first linkage means at the proximal end portion of one of said arm members, and a strap attached to said swivel plates and extending therebetween, said strap being adapted to engage the forehead of a wearer,

third linkage means adapted to engage the occiput of a wearer, interconnecting said first linkage means at the distal end portion on each of said arm members,

whereby, said headgear cooperates with the head of a user to form a four bar linkage with the portion of said arm members between the point of attachment of said second linkage means and said third linkage means being the first link of the four bar linkage and whereby forces applied to said lever arm means are transferred to said four bar linkage.

5,109,836

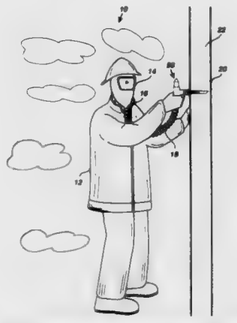
BREATHING APPARATUS FOR PROVIDING A SOURCE OF BREATHABLE AIR IN A BURNING STRUCTURE

Paul D. Burgess, 1085 N. W. 3rd Ave., Boca Raton, Fla. 33432

Filed Apr. 3, 1991, Ser. No. 679,741

Int. Cl.[5] A62B *18/02, 17/04, 23/02;* **A61M** *15/00*

U.S. Cl. 128—200.24 **22 Claims**



21. An improved method for providing a source of breathable air in a burning building, said method comprising the steps of:

puncturing an aperture only partially through a wall having an internal cavity containing breathable air;

inserting an apparatus into said aperture, said apparatus including means for conducting air from the internal cavity of said wall into said apparatus; and

breathing the air from an outlet of said apparatus.

5,109,837

HYPERBARIC CHAMBER

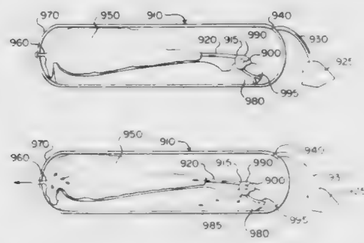
Rustem I. Gamow, Boulder, Colo., assignor to Hyperbaric Mountain Technologies, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 10,046, Feb. 2, 1987, Pat. No. 4,974,829, which is a continuation-in-part of Ser. No. 743,011, Jun. 10, 1985, abandoned. This application Apr. 21, 1989, Ser. No. 341,645

Int. Cl.[5] A61G *10/02*

U.S. Cl. 128—202.12 **8 Claims**

1. A hyperbaric rebreather comprising a chamber large enough to contain a whole normally proportional adult human body made of nonbreathable material capable of maintaining air pressures inside said chamber in the range from about 0.2 to about 10 psi greater than ambient comprising air input means for achieving said air pressure inside the rebreather chamber; an internal bladder for collection of exhaled air; said bladder being formed of material capable of substantially conforming to the available space in said chamber pressure-responsive



exhaust means connecting said bladder to the environment outside said rebreather allowing air in said bladder to exhaust therethrough at a preselected internal chamber pressure achieved by said air input means; and exhalate capture means for conducting said exhaled air into said bladder and preventing escape of said exhaled air into said rebreather.

5,109,838

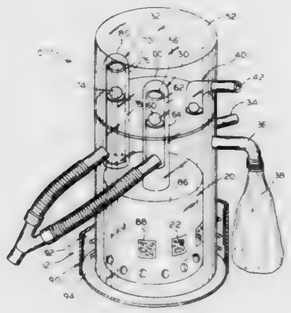
VISUALLY MONITORED ANESTHESIA BREATHING CIRCUIT

James O. Elam, 450 N. 325 East, Valparaiso, Ind. 46383

Filed Jul. 19, 1990, Ser. No. 554,381

Int. Cl.[5] A61M *15/00*

U.S. Cl. 128—203.12 **15 Claims**



1. A visually monitored anesthesia breathing circuit, comprising:

an absorber having a pair of spaced apart end walls joined by a side wall, said spaced apart end walls of said absorber including a top wall and a bottom wall and said side wall being formed of a transparent material and being generally cylindrically shaped, and a disposable single use cartridge having a particulate carbon dioxide absorbent material therein;

said disposable single use cartridge being defined by a pair of spaced apart, perforated end walls joined by a generally cylindrical side wall, at least said side wall being formed of a transparent material, said disposable single use cartridge being removably positioned within said absorber in spaced relation to said side wall and one of said end walls thereof;

means internally adjacent said transparent side wall of said disposable single use cartridge for visually indicating the extent of depletion of carbon dioxide absorption potential of said carbon dioxide absorbent material in said disposable single use cartridge, said visual indicating means substantially entirely surrounding said carbon dioxide absorbent material within said disposable single use cartridge and being visibly perceptible externally of said absorber through said transparent side wall thereof;

one of said end walls of said absorber including an expiratory valve in communication with said disposable single use cartridge and including an inspiratory valve in communication with said absorber;

said expiratory valve being adapted to direct expired gas from a patient directly to one of said perforated end walls of said disposable single use cartridge for removal of carbon dioxide as said expired gas flows through said carbon dioxide absorbent material in said disposable single use cartridge to the other of said perforated end walls;

said expiratory valve including an inlet leading from a patient into a vertically extending valve tube, said valve tube having a valve seat for a valve ball to define a one-way expiration monitoring valve, said expiratory valve also including a vertically extending flow passage surrounding said valve tube in radially spaced relation, said flow passage having a dome at the upper end thereof, said dome being disposed in vertically spaced relation to said valve tube to receive said valve ball to permit expired gas to pass from said valve tube onto said flow passage, said flow passage communicating with an upper one of said perforated end walls of said disposable single use cartridges for passage of expired gas first vertically upward through said valve tube and then vertically downward through said flow passage, said expiratory valve including said valve tube and said flow passage being transparent to accommodate visual monitoring of expiration by viewing vertical movement of said valve ball between said valve seat and said dome;

said inspiratory valve being adapted to receive anesthetic gases and oxygen for a patient from the other of said perforated end walls of said disposable single use cartridge following removal of carbon dioxide after said expired gas flows through said carbon dioxide absorbent material in said disposable single use cartridge and the other of said perforated end walls;

said inspiratory valve including an outlet leading to a patient from a vertically extending valve tube, said valve tube having a valve seat for a valve ball to define a one-way inspiration monitoring valve, said inspiratory valve also including a vertically extending flow passage surrounding said valve tube in radially spaced relation, said flow passage having a dome at the upper end thereof, said dome being disposed in vertically spaced relation to said valve tube to receive said valve ball to permit inspired gas to pass from said valve tube into said flow passage, said flow passage communicating with a lower one of said perforated end walls of said disposable single use cartridge for passage of inspired gas first vertically upward through said valve tube and then vertically downward through said flow passage, said inspiratory valve including said valve tube and said flow passage being transparent to accommodate visual monitoring of inspiration by viewing vertical movement of said valve ball between said valve seat and said dome;

external means for delivering an anesthetic to a patient in a metered flow, said external anesthetic delivering means being in communication with said absorber upstream of said inspiratory valve and downstream of said disposable single use cartridge, said inspiratory valve being adapted to provide anesthetic with oxygen from said absorber;

external means for delivering oxygen to a patient in a metered flow, said external oxygen delivering means being in selectively operable communication with said absorber upstream of said inspiratory valve and downstream of said disposable single use cartridge, said inspiratory valve being adapted to provide a fresh oxygen supply from said absorber; and

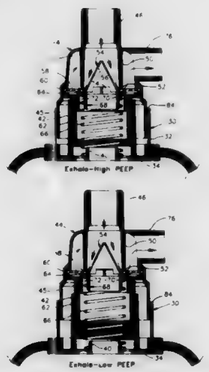
an overflow valve in communication with said absorber for connection to an operating room scavenger system.

5,109,839
INHALATION APPARATUS
Richard J. Blasdell, 4233 E. Mountain View Rd., Phoenix, Ariz. 85028, and Raymond L. Blasdell, 691 E. Fairway Dr., Litchfield Park, both of Ariz. 85340
Filed Nov. 14, 1988, Ser. No. 270,003
Int. Cl.[5] A61M *15/00*
U.S. Cl. 128—203.12 **5 Claims**



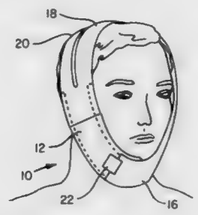
1. In an inhalation mask for administering a respiratory gas to an individual, the improvement for appealing to the senses and for alleviating the anxiety of the individual prior to placement of the mask over an external respiratory organ of the individual, wherein said mask is molded from a mixture comprising:
a) non-porous thermoplastic base material; and
b) odorizing and colorizing means combined with said base material before molding, said odorizing and colorizing means emitting a selected scent and imparting to said mask a selected color commonly associated with said scent.

5,109,840
RESUSCITATOR HAVING DIRECTIONAL CONTROL VALVE WITH INTERNAL "PEEP" ADJUSTMENT VALVE
John P. Daleiden, El Paso, Tex., assignor to Specialty Packaging Licensing Company, Wilmington, Del.
Filed Feb. 14, 1991, Ser. No. 655,642
Int. Cl.[5] A62B *7/04, 9/02;* **A61M** *16/00*
U.S. Cl. 128—205.13 **5 Claims**



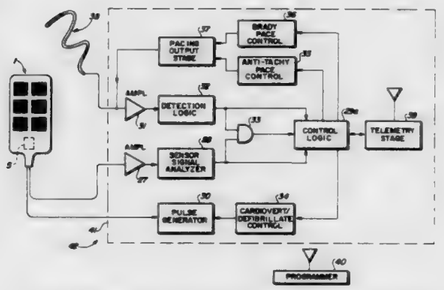
1. A resuscitator having an internal PEEP adjustment and comprising:
(a) flexible squeeze bag means having a hollow interior and first and second connections thereinto,
(b) a one-way gas inlet valve fastened to said second connection, said inlet valve permitting gas flow into said hollow interior through said second connection,
(c) a directional control valve assembly communicating with the said first connection and comprising
1) a valve housing comprising a first cylindrical part secured to said first connection and having a partial floor thereacross, the floor being formed with a perpendicular threaded sleeve concentric with the first cylindrical part, and a second domed part telescopingly related to the first part, the second domed part having associated therewith a second threaded sleeve disposed axially thereof, the first and second threaded sleeves being threadedly engaged,
2) a tubular patient port joined to said domed second part of said valve housing and adapted to be coupled in gas flow communication to a patient, said patient port extending into said valve housing and including a tubular extension formed concentric with said valve housing and having a circular end seat and a unitary flexible duck-billed diaphragm valve, an exit passage being formed between said second domed part and said extension and having an outlet port; said duck-billed diaphragm valve including a flexible outer normally flat peripheral portion, and an inner duck-bill portion, said peripheral portion being secured to said second domed part and being adjacent to and engageable with said circular end seat of said tubular extension, said duck-bill portion extending into said tubular extension; and
3) a spring means disposed compressively between the floor of the first cylindrical part of the housing and an annular portion of the duck-billed diaphragm valve opposite the seat, and urging the duck-billed diaphragm valve to seat against the circular end seat,
4) said first and second threaded sleeves comprising PEEP setting means for adjusting the PEEP exhaled against, said sleeves permitting relative rotation of the first and second parts of the housing of said control valve assembly,
whereby relatively rotating the parts of the valve housing to move the floor toward or away from the seat puts more or less compression on the spring to adjust the PEEP exhaled against.

5,109,841
FACIAL ICE PACK
Vance M. Hubbard, and Welton K. Brunson, both of Bedford, Tex., assignors to Tecnol, Inc., N. Richland Hills, Tex.
Filed Jul. 11, 1990, Ser. No. 551,911
Int. Cl.[5] A61F *7/10*
U.S. Cl. 128—380 **22 Claims**



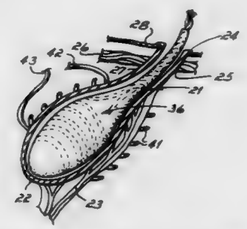
1. An ice pack, comprising:
a waterproof envelope having a first and second side, and having an open end and a closed end, said open end being sealable;
a strap having a centrally disposed longitudinal slit, said strap having a free end and a second end attached to said waterproof envelope proximate said open end, and extending longitudinally therefrom;
fastening means for connecting said strap to said waterproof envelope; and
wherein said first side of said waterproof envelope is constructed of an inner waterproof material layer, an intermediate absorbent material layer, and an outer pressure responsive fastening material layer.

5,109,842
IMPLANTABLE TACHYARRHYTHMIA CONTROL SYSTEM HAVING A PATCH ELECTRODE WITH AN INTEGRATED CARDIAC ACTIVITY SYSTEM
David W. Adinolfi, Santa Clarita, Calif., assignor to Siemens Pacesetter, Inc., Sylmar, Calif.
Filed Sep. 24, 1990, Ser. No. 587,282
Int. Cl.[5] A61N *1/39*
U.S. Cl. 128—419 D **37 Claims**



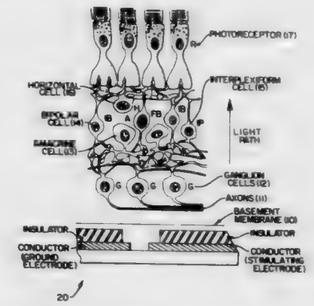
1. An implantable tachyarrhythmia control system comprising:
a flexible patch electrode adapted to be attached in vivo to cardiac tissue of a patient, said patch electrode including means for stimulating said cardiac tissue and having a motion sensor means embedded therein for generating an electrical signal corresponding to cardiac wall movement;
means adapted for in vivo electrical connection to said motion sensor means for analyzing said electrical signals to identify the presence of tachycardia;
means adapted for in vivo electrical connection to said means for stimulating, and electrically connected to said means for analyzing, for initiating therapeutic electrical treatment via said means for stimulating cardiac tissue upon the identification of tachyarrhythmia by said means for analyzing; and
a housing containing said means for analyzing and said means for initiating therapeutic electrical treatment adapted for implantation in said patient.

5,109,843
EXTRA TO-INTRACORPOREAL POWER SUPPLY
David B. Melvin, and David M. Brooks, both of Cincinnati, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio
Filed Nov. 30, 1990, Ser. No. 621,054
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—419 R **7 Claims**



7. A primary coil adapted for use as an extra to-intracorporeal energy transfer device comprising a cylindrical core having a rounded first end and a tapered second end separated by a cylindrical central section;
a wire having first and second ends said wire wrapped around said cylindrical central section;
said first and second ends passing from said cylindrical central section through said tapered second end.

5,109,844
RETINAL MICROSTIMULATION
Eugene de Juan, Jr.; Mark S. Humayun, and D. Howard Phillips, all of Durham, N.C., assignors to Duke University, Durham, N.C.
Filed Oct. 11, 1990, Ser. No. 595,442
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—419 R **20 Claims**

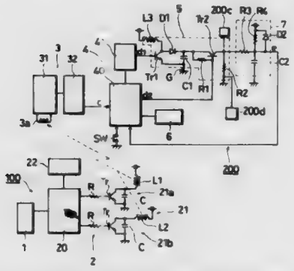


1. A method for stimulating a retinal ganglion cell in a retina without penetrating the retinal basement membrane at the surface of the retina, comprising:
(a) positioning a ganglion cell stimulating electrode on or above the retinal basement membrane;
(b) providing a ground electrode in operative association with the ganglion cell stimulating electrode, with the ground electrode positioned on or above the retinal basement membrane and positioned for capturing electric current produced by the stimulating electrode; and
(c) applying an electrical signal to said stimulating electrode sufficient to produce an electric current which penetrates the retina and produces an action potential in a retinal ganglion cell.

5,109,845
WIRELESS LOW-FREQUENCY MEDICAL TREATMENT DEVICE
Takahiro Yuuchi; Yasuyuki Tsuchida, and Masakatsu Fujiwara, all of Hyogo, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Nov. 14, 1990, Ser. No. 612,732
Claims priority, application Japan, Nov. 17, 1989, 1-299984
Int. Cl.[5] H61N *1/36*
U.S. Cl. 128—421 **3 Claims**

1. A wireless low-frequency medical treatment device having a sending section for sending data for low-frequency medical treatment and a pulse applying section for receiving the above data and applying a low-frequency pulse corresponding to the data on a living body, the device comprising:
a sending section comprising a plurality of sending coils, whose axes cross each other in a space, and sending coil driving means for supplying the sending coils with resonating currents having different phases, respectively, the currents indicating a signal corresponding to the data; and
a pulse applying section comprising a receiving coil for receiving the signal sent from the sending coils through electromagnetic induction, means for providing the signal

to a microcomputer to control low frequency medical treatment applied to a living body by said pulse applying



section, and pulse applying bodies for applying the medical treatment.

5,109,846

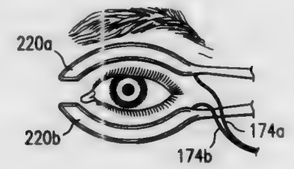
APPARATUS AND METHOD FOR ELECTROTHERAPEUTIC TREATMENT OF STRUCTURES ASSOCIATED WITH THE EYE

Gary E. Thomas, Littleton, Colo., assignor to PhysioDynamics, Inc., Littleton, Colo.

Continuation-in-part of Ser. No. 355,422, May 22, 1989. This application Nov. 5, 1990, Ser. No. 609,480

Int. Cl.[5] A61N *1/18*

U.S. Cl. 128—421 **17 Claims**



1. An apparatus for use in non-invasively applying an electrical signal to a structure associated with the eye of a patient, comprising:

means for conducting the electrical signal that includes a first electrode which is separated from a second electrode by a distance, wherein said first electrode and said second electrode are each adapted for application to the exterior surface of the patient; and

means for use in positioning said first electrode and said second electrode on the exterior of the patient so that both said first electrode and said second electrode are at locations substantially interior to the same bone structure that defines one of the patient's eye sockets and includes means for adjusting said distance between said first electrode and said second electrode, wherein a substantial portion of the electrical signal is applied to a structure associated with the eye of the patient.

5,109,847

NON-INTRUSIVE ANALGESIC NEUROAUGMENTIVE APPARATUS AND MANAGEMENT SYSTEM

Saul Liss; Bernard Liss, and Ben Manor, all of Glen Rock, N.J., assignors to E.P. Inc., Glen Rock, N.J.

Filed May 21, 1991, Ser. No. 703,610

Int. Cl.[5] A61N *1/18*

U.S. Cl. 128—421 **10 Claims**

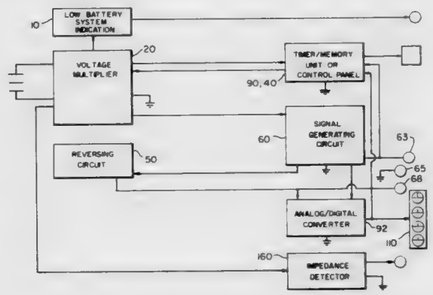
1. In combination, in a system for the treatment of certain neural responsive conditions, said system comprising:

a. means for generating a substantially constant current pulsed DC output voltage;

b. means for converting said output voltage into a double modulated output adjustable constant current waveform;

c. means for directing said double modulated output waveform across at least two contacts;

wherein said double modulated output waveform comprises



a first waveform component ranging between 1 and 100,000 KHz, a second waveform component ranging between 10 and 199,000 Hz, and a third waveform component ranging between 100 and 100,000 Hz and each waveform component is substantially time invariant and distinct from said other waveform components.

5,109,848

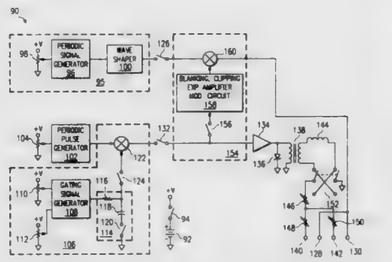
ELECTROTHERAPEUTIC APPARATUS

Gary E. Thomas, Littleton, and Michael W. Fellinger, Boulder, both of Colo., assignors to PhysioDynamics, Inc., Littleton, Colo.

Filed May 22, 1989, Ser. No. 355,167

Int. Cl.[5] A61N *1/32*

U.S. Cl. 128—422 **32 Claims**



4. An apparatus for providing electrical stimulation to a patient, comprising:

means for use in providing a periodic-exponential signal;

wherein said means for use in providing a periodic-exponential signal includes means for use in providing a first periodic-exponential signal and means for use in providing a second periodic-exponential signal having a frequency between about 1000 Hz and 100,000 Hz; and

means for applying said periodic-exponential signal to the patient.

5,109,849

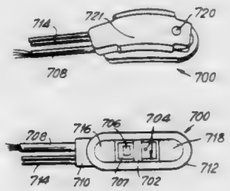
PERINATAL PULSE OXIMETRY SENSOR

David E. Goodman, San Francisco; Jessica A. Warring, Millbrae, and Paul D. Mannheimer, San Mateo, all of Calif., assignors to Nellcor, Inc., Hayward, Calif.

Division of Ser. No. 264,196, Oct. 28, 1988, Pat. No. 4,938,218, which is a continuation-in-part of Ser. No. 217,080, Jul. 7, 1988, and a continuation-in-part of Ser. No. 206,918, Jun. 13, 1988, said Ser. No. 217,080, is a continuation of Ser. No. 935,060, Nov. 21, 1986, abandoned, which is a continuation of Ser. No. 644,051, Aug. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,726, Aug. 30, 1983, abandoned, said Ser. No. 206,918, is a continuation of Ser. No. 105,509, Oct. 5, 1987, which is a continuation of Ser. No. 941,540, Dec. 11, 1986, abandoned, which is a continuation of Ser. No. 789,580, Oct. 21, 1985, abandoned, which is a division of Ser. No. 644,051,. This application Feb. 21, 1990, Ser. No. 482,827

Int. Cl.[5] A61B *5/0444*

U.S. Cl. 128—633 **18 Claims**



1. An intrauterine sensor system, comprising:

a probe adapted for insertion into a uterus, the probe having a deformable outer body;

means for connecting the probe to a vacuum source to positively attach the probe to the fetal tissue surface;

means for forming a deformable seal, the deformable seal means being mounted to a surface of the outer body that contacts the fetal tissue surface having a compliancy greater than the compliancy of the fetal tissue;

a light source and a light detector mounted in the probe and adapted to generate a signal for use in measuring at least one fetal blood flow characteristic by pulse oximetry;

first electrode means for detecting a fetal body function and for generating a signal responsive to the detected body function, the first electrode means being mounted in the probe and adapted to contact the fetal tissue surface when the probe is in place; and

means for connecting the light source to an external source of power, and for connecting the light detector and the first electrode means to external components adapted to receive and monitor the signals generated by the light detector and the first electrode means.

5,109,850

AUTOMATIC BLOOD MONITORING FOR MEDICATION DELIVERY METHOD AND APPARATUS

Ernesto E. Blanco, Belmont, and Rosina Samadani, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 477,679, Feb. 9, 1990, abandoned. This application Aug. 12, 1991, Ser. No. 746,070

Int. Cl.[5] A61B *5/00*

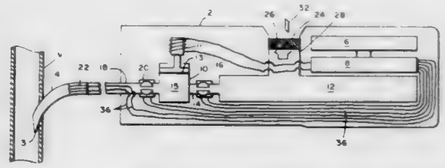
U.S. Cl. 128—635 **20 Claims**

1. An implantable blood monitoring and medication administering system, comprising,

an infusion device implantable beneath the skin of a human or animal and containing medication,

a single channel catheter implantable in a vessel and connected to the infusion device,

an information transmitting sensor located within the single channel catheter and communicating with the infusion device for transmitting information about blood chemistry to the infusion device, and



wherein said infusion device comprises means for causing medication to flow through the catheter, into engagement with the sensor, and thence into the vessel automatically in response to the information transmitted from the sensor.

5,109,851

MULTIPLE ELECTRODE AFFIXABLE SHEET

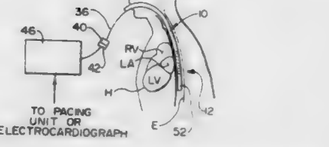
Hossein Jadvar, Chicago, and William T. Metzger, Libertyville, both of Ill., assignors to Arzco Medical Systems, Inc., Vernon Hills, Ill.

Continuation of Ser. No. 306,997, Feb. 6, 1989, Pat. No. 5,069,215. This application Feb. 5, 1991, Ser. No. 650,961

The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.

Int. Cl.[5] A61B *5/0402, 8/12;* **A61N** *1/05*

U.S. Cl. 128—642 **33 Claims**



1. A multi-element electrode structure affixable to an essentially cylindrical esophageal probe which can then be inserted into the esophagus of a patient, the electrode structure comprising:

a rectangular insulative sheet member having a selected length dimension, a width dimension and wrappable on the esophageal probe;

means, carried by said sheet member, for removably affixing said member to the probe;

a plurality of spaced, conducting electrode members carried by said sheet member; and

a plurality of elongated conducting members with each said conducting member having an end in electrical contact with a respective one of said electrode members.

5,109,852

METHOD FOR SENSING PRESSURE IN AN OBJECT

David B. Kaye, 2469 W. Roberts, Fresno, Calif. 93711, and Charles D. Melville, 10559 N. Armstrong Ave., Fresno, Calif. 93612

Filed Jun. 8, 1990, Ser. No. 535,410

Int. Cl.[5] A61B *3/16*

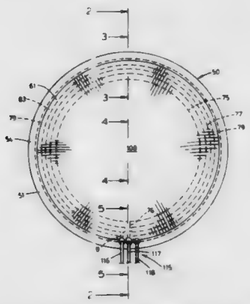
U.S. Cl. 128—645 **9 Claims**

1. A method for sensing pressure within a work object comprising:

A. placing an electrically deformable member on the work object so as to cover a portion of the surface area thereof;

B. applying electrical energy to said member to cause the

member to deform thereby applying pressure to said portion of the surface area of the work object; and

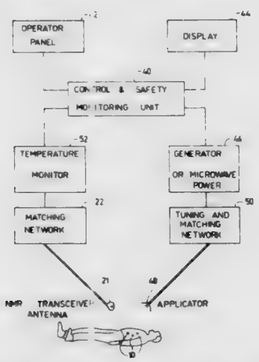


C. sensing the tension in said member dependent upon the amount of resistance to deformation imparted by the pressure within said work object.

5,109,853
REMOTE TEMPERATURE MONITORING APPARATUS AND TECHNIQUE

Zvi Taicher, 25 Ben Yehuda Street, and Mordechai Shporer, both of Rehovot, Israel, assignors to Zvi Taicher, Rehovot, Israel

Continuation of Ser. No. 299,966, Jan. 19, 1989, abandoned. This application Dec. 20, 1990, Ser. No. 631,746
Claims priority, application Israel, May 23, 1988, 86470
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653.2 **9 Claims**



1. A technique for in vivo temperature measurement of tissue comprising the steps of:

locating in living tissue at least one element having a temperature dependent internal magnetic field;

applying an RF field to the at least one element;

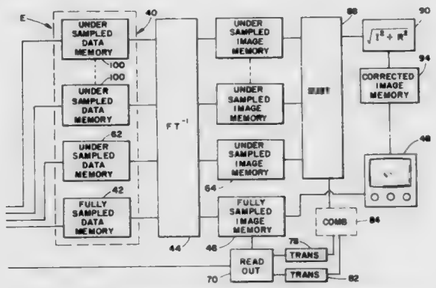
sensing the temperature dependent internal magnetic field of said at least one element by sensing the nuclear magnetic resonance frequency thereof in response to the application of said RF field thereto; and

providing an output indication of temperature of at least one element as a function of the sensed nuclear magnetic resonance frequency

5,109,854
ROLL-OVER ALIASING SUPPRESSION IN UNDERSAMPLED IMAGES

Terence J. Provost, Cleveland Hts., Ohio, assignor to Picker International, Inc., Highland Hts., Ohio

Filed Feb. 23, 1990, Ser. No. 484,690
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653.2 **17 Claims**



1. A method of magnetic resonance imaging comprising:

positioning a subject in a strong magnetic field;

applying radio frequency and gradient magnetic field pulses to at least a portion of the subject in the magnetic field to generate a fully sampled data set including a plurality of phase encoded magnetic resonance views which span a field of view;

collecting the fully sampled data set and an undersampled data set, the undersampled data corresponding to a selected portion of the field of view spanned by the fully sampled data set;

transforming the undersampled data set into an undersampled image representation, which undersampled image representation includes a roll-over aliasing contribution from a substance located within the field of view outside the selected portion;

transforming the fully sampled data set into a fully sampled image representation;

subtractively combining the undersampled image representation and at least one portion of the fully sampled image representation representing the substance located within the field of view outside of the selected portion to produce a corrected undersampled image representation;

converting the corrected undersampled image representation into a human-readable image display.

5,109,855
APPARATUS FOR DETECTING PROPERTIES, DIFFERENCES AND CHANGES OF HUMAN ANIMAL BODIES

Kirchhoff Günter, Dachau, Fed. Rep. of Germany, assignor to Handelsgesellschaft fur Medizin und Technik mit beschrankter Haftung, Dachau, Fed. Rep. of Germany

Filed Jul. 5, 1988, Ser. No. 215,398
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1986, 3623711; Jul. 6, 1987, 3046713; European Pat. Off., Jul. 14, 1987, 87/00378
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—653.1 **5 Claims**

1. An apparatus for detecting properties, differences and changes of bodies, comprising

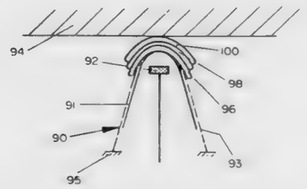
an a.c. source having two terminals, one terminal being adapted to be connected to a body to be examined,

a sensing electrode,

an electric measuring device coupled between the other terminal of the a.c. source and said sensing electrode,

a plurality of spacers arranged one over the other being

provided on the sensing electrode and being selectively replaceable for varying a measured effect by the electric measuring device and for varying a distance the sensing electrode is spaced from a surface of the body,

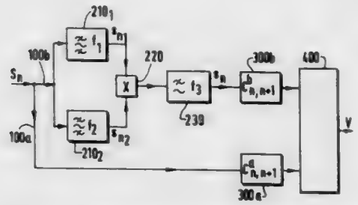


at least one grounded layer surrounding said sensing electrode consisting of a conductive material serving to shield the sensing electrode and having a forward edge adapted to contact the body to be examined and to effect a grounding of the a.c. source.

5,109,856
DEVICE FOR MEASURING THE SPEED OF MOVING ORGANS AND BLOOD FLOWS BY ULTRASONIC ECHOGRAPHY

Odile Bonnefous, Nogent sur Marne, and Frédéric Mangotte, Creteil, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 11, 1991, Ser. No. 653,821
Claims priority, application France, Feb. 9, 1990, 90 01530
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.01 **10 Claims**



1. A device for measuring the speed of moving organs and blood flows by ultrasonic echography, using an acoustic wave having a central frequency f_o, said device comprising a first processing channel means for the echographic signal received, which channel means comprises first intercorrelation means which supplies $2I+1$ samples values of the correlation function of two received successive echographic signals $S_n(t)$ and $S_{n+1}(t)$, referred to as the first correlation function of different values, the maximum value of which is at a set of coordinates, second processing channel means for the echographic signal received, comprising:

two parallel symmetrical bandpass filter means which act on the signal $S_n(T)$ applied thereto to supply signals $S_{n1}(t)$ and $S_{n2}(t)$, respectively, which are centered around a frequency f_1, being at the most equal to f_o, and around a frequency f_2, being at least equal to f_o, respectively, the difference f_2-f_1 being smaller than f_o,

multiplier means which form the product of the signals $S_{n1}(t)$ and $S_{n2}(t)$,

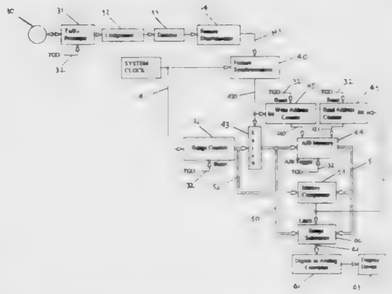
symmetrical bandpass filter means which selects the component $S_n(t)$ having the frequency f_2-f_1 of the product $S_{n1}(t)\times S_{n2}(t)$,

second intercorrelation means for supplying $2I+1$ sampled values of the correlation function of two successive signals $S_n(t)$ and $S_{n+1}(t)$, referred to as the second correlation function, and multiplexing/interpolation means for supplying an estimate of the speed by searching the coordinates of the maximum value of the correlation function around the sample offering the highest value of the second correlation function.

5,109,857
ULTRASOUND TIME DOMAIN VELOCITY DETECTION METHOD AND APPARATUS

David N. Roundhill, Durham, and Olaf T. von Ramm, Efland, both of N.C., assignors to Duke University, Durham, N.C.

Filed Mar. 4, 1991, Ser. No. 664,021
Int. Cl.[5] A61B *8/02*
U.S. Cl. 128—661.08 **30 Claims**



1. An ultrasonic method of measuring the movement of a particle in a test region comprised of biological tissue, the method comprising;

processing a first occurrence of a modulated waveform signal returned from said test region and detecting a first range of feature data; and then

processing a second occurrence of said modulated waveform signal returned from said test region and detecting a second range of feature data; then

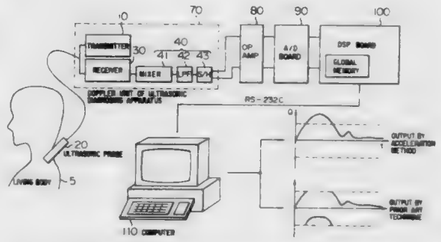
comparing said second range of feature data to said first range of feature data and determining the positional displacement between at least one feature in said second range of feature data and the closest adjacent feature in said first range of feature data;

said positional displacement indicating the movement of a particle in the test region.

5,109,858
PULSE DOPPLER MEASURING APPARATUS

Hisashi Nishiyama, Tokyo; Yasuhiro Hashimoto, Yokohama; Hiroshi Kanda, Tokorozawa, and Kageyoshi Katakura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 4, 1991, Ser. No. 650,421
Claims priority, application Japan, Feb. 5, 1990, 2-24550
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—661.09 **33 Claims**



1. A pulse Doppler measuring apparatus comprising:

transmitting/receiving means, which transmits burst-like ultrasonic waves to an object with a constant interval in

time one after another and receives waves reflected by said object to generate received signals;

means for forming a first phase vector of at least one of said reflected waves by mixing a reflection signal obtained from said reflected wave with a reference signal;

an MTI filter, which decomposes said first Phase vector into a real part and an imaginary part, obtains a first regression line, and extracts a second phase vector corresponding only to the high frequency component of said reflected wave, using differences of the real part and the imaginary part from said first regression line;

means for obtaining a current first phase difference vector representing a phase difference between the phase of a current one of said second phase vector and the phase of a preceding one of said second Phase vector;

means for forming a difference vector indicating a difference between current phase differences, using the current one of said first phase difference vector and a preceding one of said first phase difference vector; and

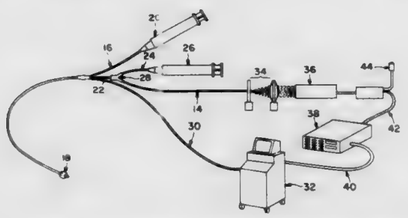
means for obtaining a current second phase difference vector, using the preceding one of said first phase difference vector and said difference vector indicating a difference between current phase differences, and further calculating the velocity of said object, using said second phase difference vector.

5,109,859

ULTRASOUND GUIDED LASER ANGIOPLASTY

Ronald D. Jenkins, Salt Lake City, Utah, assignor to Beth Israel Hospital Association, Boston, Mass.

Filed Oct. 4, 1989, Ser. No. 416,920
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—662.03 **22 Claims**



1. A method for removing atherosclerotic plaque from artery walls comprising:

(a) providing a source of laser energy;

(b) inserting a laser angioplasty catheter into an artery which contains atherosclerotic plaque, said laser angioplasty catheter having a fiberoptic waveguide along a long axis of said catheter and an ultrasonic transducer, said fiberoptic waveguide having a proximal end and a distal end with said fiberoptic waveguide having a bend at a right angle to the length of the catheter just before said distal end so that said fiberoptic waveguide can be rotated such that said distal end can trace out a circular path in a plane perpendicular to the length of the catheter, said fiberoptic waveguide being for receiving the laser energy at the proximal end and conducting the laser energy to the distal end, said ultrasonic transducer being capable of providing an intraluminal image to an ultrasound monitor;

(c) providing a circumferential groove in said laser angioplasty catheter for the containment of said right angle bend in said fiberoptic waveguide,

(d) covering said right angle bend of said fiberoptic waveguide with a track sleeve that serves as an Ultrasonic reference for said ultrasonic transducer;

(e) inflating an occlusion balloon proximal to said ultrasonic transducer for stabilizing said transducer and the image produced thereby and for temporary occlusion of blood flow;

(f) flushing the area in the artery containing the atherosclerotic plaque with a warm physiologic saline through an opening in said laser angioplasty catheter;

(g) taking an intraluminal image of the artery by use of said ultrasound transducer to determine the position and thickness of the atherosclerotic plaque within the artery in relation to said ultrasonic reference;

(h) using said data regarding position and thickness of the atherosclerotic plaque within the artery to rotate said distal end of said fiberoptic waveguide so that said distal end is adjacent to vessel wall atherosclerotic plaque; and

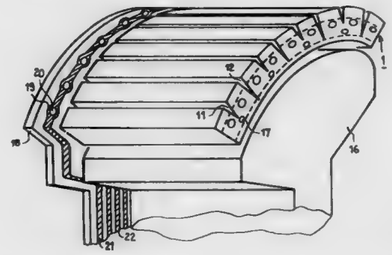
(i) initiating a pluse of laser energy.

5,109,860

PROBE WITH CURVED BAR FOR AN ECHOGRAPH

Jean-François Gelly, Valbonne; Patrick Dubut, Tourrettes S/Loup; René Reynier, Cagnes S/Mer, and Charles Maerfeld, Antibes, all of France, assignors to General Electric CGR SA, Issy Les Moulineaux, France

PCT No. PCT/FR87/00463, § 371 Date Jul. 17, 1989, § 102(e) Date Jul. 17, 1989, PCT Pub. No. WO88/04088, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 24, 1987, Ser. No. 368,338
Claims priority, application France, Nov. 28, 1986, 86 16661
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—662.03 **10 Claims**



1. Method for the fabrication of a bar probe, comprising the steps of:

bonding a piezoelectric bar to a thermodeformable supporting blade (2),

making cuts (11, 12) enabling the making of independent piezoelectric transducers and/or the dividing of the piezoelectric transducers,

heating and deforming the bar to give it the desired shape, by placing said supporting blade in contact with a curved mold so as to maintain the uniform thickness of said supporting blade.

5,109,861

INTRAVASCULAR, ULTRASONIC IMAGING CATHETERS AND METHODS FOR MAKING SAME

Paul Walinsky, Philadelphia; Peter A. Lewin, Wyndmoor, and John M. Reid, Strafford, all of Pa., assignors to Thomas Jefferson University and Drexel University, both of Philadelphia, Pa.

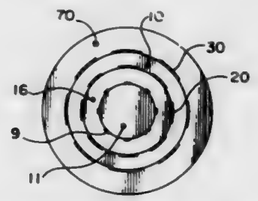
Filed Apr. 28, 1989, Ser. No. 344,919
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—662.06 **15 Claims**

1. An intravascular ultrasonic imaging catheter for imaging the cross section of a vessel, comprising:

(a) a flexible plastic tube polarized in distinct regions to become piezoelectric in those regions;

(b) a plurality of discrete driving electrodes disposed on a first surface of said tube to define active regions of said tube; and,

(c) at least one ground electrode defined on the second surface of said tube at least in the regions opposite from said driving electrodes;



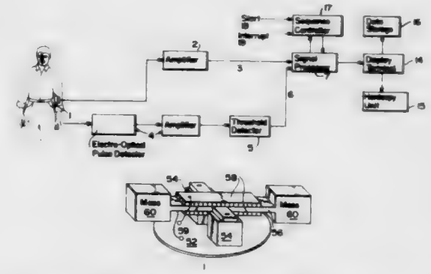
said tube being selectively polarized to be piezoelectrically active in said active regions while remaining substantially inactive in the areas between said regions.

5,109,863

NONINVASIVE DIAGNOSTIC SYSTEM FOR CORONARY ARTERY DISEASE

John L. Semmlow, New Brunswick; Walter Welkowitz, Metuchen; John B. Kostis, Warren, and Vasant Padmanabhan, Piscataway, all of N.J., assignors to Rutgers, The State University of New Jersey, New Brunswick and University of Medicine and Dentistry of New Jersey, Newark, both of N.J.

Division of Ser. No. 426,770, Oct. 26, 1989, Pat. No. 5,036,857.
This application May 6, 1991, Ser. No. 696,185
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—715 **4 Claims**



1. A low mass accelerometer transducer apparatus having increased sensitivity at high frequencies for detecting low level heart sounds in a noninvasive diagnostic system for coronary artery disease, said apparatus comprising:

a double cantilever beam configuration, the unsupported end of each beam having an equal mass attached thereto;

a bending moment sensor affixed to one side of said beam which produces an electrical output signal in relation to its bending moment;

support means for supporting said beam;

a contact plate affixed to said support means, for mounting against a patient's chest such that chest vibrations couple through said contact plate and support means causing said beam to bend in accordance with such vibrations; and

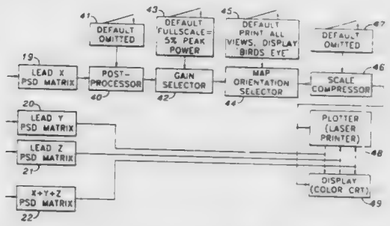
the transducer having a resonant frequency at slightly above 1200 Hz and increased sensitivity in the frequency band of 300 to 1200 Hz.

5,109,862

METHOD AND APPARATUS FOR SPECTRAL ANALYSIS OF ELECTROCARDIOGRAPHIC SIGNALS

George J. Kelen, Staten Island, N.Y., and Raphael Henkin, Monarch Beach, Calif., assignors to Del Mar Avionics, Irvine, Calif.

Continuation of Ser. No. 496,976, Mar. 19, 1990, abandoned.
This application Feb. 21, 1991, Ser. No. 658,505
Int. Cl.[5] A61B *5/048*
U.S. Cl. 128—702 **59 Claims**



1. A method for detecting abnormalities in physiological functions of an organism by performing a frequency analysis of a single cycle of a time varying bioelectric signal, said method comprising:

(a) partitioning said single cycle of said time varying signal into a sequence of time-displaced, overlapping segments or slices,

(b) performing a frequency analysis of each of said slices, thereby resolving each of said slices into a sequence of discrete spectral components of varying amplitude,

(c) storing a number proportional to the magnitude of each of said spectral components in a table in which frequency is plotted along a first axis, and time is plotted along a second axis,

(d) assessing the degree of difference between the spectra of different slices of said table, and (e) comparing said spectral differences with corresponding differences obtained from representative samples of normal and abnormal test organisms.

5,109,864

NIPPLE ASSEMBLY WITH ALARM BUZZER AND BODY TEMPERATURE INDICATOR (IV)

Jieh-Shan Lu, 56, Alley 115, Shing Her Lane, Jang Her Li, Nan Tour City, Nan Tour County, Taiwan

Filed Dec. 21, 1990, Ser. No. 633,611
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—736 **1 Claim**

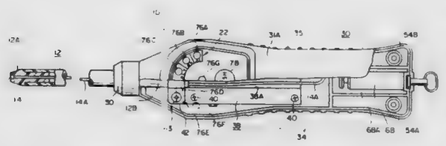


1. A nipple assembly comprising:

a) a nipple base;

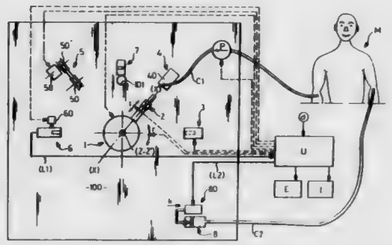
b) a main case receivable within the nipple base, the main case including an open end, a closed end, a central hole formed in the closed end and defined by a hollow cylindrical member extending towards the open end and terminating in a circular flange, a plurality of glue pits circumferentially spaced around the periphery of the main case for receiving waterproof glue to secure the main case to the nipple base;
c) a protection housing secured within the hollow cylindrical member;
d) a heat sensitive resistor disposed within the protection housing, and a rubber sheet secured to the protection housing and the circular flange;
e) an LCD, an IC boards and an alarm buzzer disposed within the main case;
f) a decorative plate secured to the open end of the main case, the decorative plate being sufficiently acoustically transparent for permitting sound from the alarm buzzer to pass therethrough, and including a viewing window through which the LCD may be observed;
g) a transparent convex housing secured to the decorative plate and including means for permitting the alarm sound to be transmitted therethrough;
h) a handle provided with a battery therein for energizing the alarm buzzer;
i) a heat conductive liquid within the main case; and
j) wherein the temperature of a baby's mouth on the nipple base is transferred through the heat conductive liquid to the heat sensitive resistor for transmitting a signal from the resistor to the IC board for operating the LCD to provide a display corresponding to the temperature of the baby's body, and when the conductive liquid reaches a predetermined temperature, a signal from the heat sensitive resistor is transmitted through the IC board to energize the alarm buzzer and attract the attention of a person caring for the baby.

5,109,865
METHOD AND APPARATUS FOR EXAMINING OVARY AND DIAGNOSING THE PRESENCE OF PREGNANCY IN MAMMALS
Masayuki Matsuura, Hamamatsu, Japan, assignor to Kabushiki Kaisha Semex Japan, Shizuoka, Japan
PCT No. PCT/JP89/00749, § 371 Date Mar. 28, 1990, § 102(e) Date Mar. 28, 1990, PCT Pub. No. WO90/01304, PCT Pub. Date Feb. 22, 1990
PCT Filed Jul. 27, 1989, Ser. No. 474,783
Claims priority, application Japan, Jul. 29, 1988, 63-189922; Jul. 29, 1988, 63-189923; Feb. 10, 1989, 1-32344
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—738 **6 Claims**



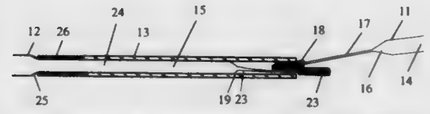
1. A method for diagnosing ovarian follicular insufficiency in a mammal comprising:
measuring the level of sodium ion concentration of the vaginal mucosa of said mammal; and
comparing the level thus measured with known sodium ion concentration ranges, said ranges being a top range substantially equal to the sodium ion concentration of mammalian blood having a high top end and low top end, a bottom range substantially equal to the sodium ion concentration of mammalian saliva having a high bottom end and a low bottom end, and a range intermediate between said top range and said bottom range having a high intermediate end and a low intermediate end; and
diagnosing a degree of ovarian follicular insufficiency in an estrous cycle which changes decreasing from the high top end of the top range over time, a sodium ion concentration level corresponding to the low end of the top range being indicative of severe follicular insufficiency, a sodium ion concentration level corresponding to the high end of the range intermediate between the top range and the bottom range being indicative of moderate follicular insufficiency, and a sodium ion concentration level corresponding to the low end of the range intermediate between the top range and the bottom range being indicative of mild follicular insufficiency.

5,109,866
ARTIFICIAL PANCREAS
Alain Guegan, Lorient; Jules Gy, Pace; Jean-Pierre Hespel, Rennes, and Philippe Rouyer, Pace, all of France, assignors to Societe d'Applications des Techniques Photoniques, France
PCT No. PCT/FR89/00380, § 371 Date Mar. 21, 1990, § 102(e) Date Mar. 21, 1990, PCT Pub. No. WO90/00909, PCT Pub. Date Feb. 8, 1990
PCT Filed Jul. 22, 1989, Ser. No. 490,610
Int. Cl.[5] A61B *17/3*
U.S. Cl. 128—771 **11 Claims**



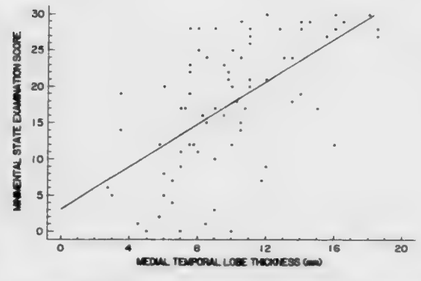
1. Artificial pancreas of the type comprising a means for automatically and periodically withdrawing blood samples from the body of a patient (M), means for measuring a level of glucose present in the blood sample (glycemia), means (8) for injecting a dose of insulin or glucose into the body of a patient, and means (u) for calculating and data processing which determines an amount of insulin or glucose to be administered to the patient as a function of the glucose level measured by the measuring means and for controlling the injecting means (8) in a manner corresponding to the amount of insulin or glucose to be administered, characterized in that measurement of glycemia is carried out by reading a color of a reactive zone (z) of a strip (b) reactive to glycemia, the measuring means comprising to this effect:
a) means (3) for distributing strips (b);
b) means (4) for depositing a blood droplet supplied by said withdrawing means on the reactive zone (z) of a strip (b);
c) means (5) for wiping the zone (z);
d) means (6) for optical reading of the color taken by the zone (z);
e) means (7) for removing the strip; and
f) means (1, 2) for automatically conveying the strips (b) individually from means to means (3, 4, 5, 6, 7), wherein said measuring means is mounted on a common deck (100).

5,109,867
EXTENDABLE GUIDEWIRE ASSEMBLY
Robert H. Twyford, Jr., Palo Alto, Calif., assignor to Target Therapeutics, Santa Clara, Calif.
Filed Apr. 19, 1991, Ser. No. 688,915
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—772 **9 Claims**



1. An extendable guidewire assembly for use within a patient's vasculature comprising in combination:
(a) a guidewire having a distal end that is adapted to be fed into said vasculature and a proximal end that has a first longitudinal interlocking member;
(b) an extension wire having a proximal end and a distal end that has a second longitudinal interlocking member that is adapted to longitudinally overlap and interlock with the first interlocking member; and
(c) a retractable sleeve carried concentrically about one of either the proximal end of the guidewire or the distal end of the extension wire, the sleeve being longitudinally movable from a retracted position in which it does not enclose an interlocking member to an extended position in which it encloses the overlapped, interlocked members to prevent said members from substantial radial movement relative to each other.

5,109,868
METHOD FOR DIAGNOSING SENILE DEMENTIA OF THE ALZHEIMER'S TYPE
Anthony D. Smith, Iffley, and Kim A. Jobst, Oxford, both of England, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.
Filed Mar. 18, 1991, Ser. No. 670,627
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—774 **13 Claims**



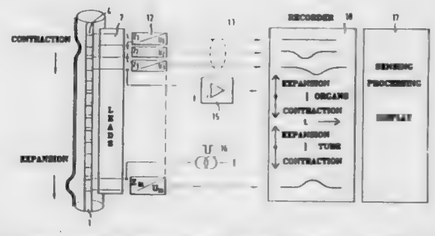
1. A method for detecting senile dementia of the Alzheimer's type (SDAT), which comprises measuring the thickness of one or both medial temporal lobes of the brain of a patient, and determining if the thickness of one or both medial temporal lobes is at least about 25% below the average thickness of the medial temporal lobe of a significant number of normal non-demented controls, thereby signifying presence of SDAT in such patient, or determining if the thickness of both medial temporal lobes of the patient is not more than about 25% below the average thickness of the medial temporal lobe of a significant number of normal non-demented controls, thereby signifying absence of SDAT in said patient.

5,109,869
DISPOSABLE UTERINE SOUND DEVICE
Mary E. Buckley, Sherman Oaks, Calif., assignor to Baxter International Inc., Deerfield, Ill.
Filed Jan. 22, 1991, Ser. No. 643,970
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—778 **14 Claims**



1. A disposable uterine sound device for measuring the depth and course of a uterine cavity, comprising:
a handle;
a shaft permanently attached to said handle, said shaft having a solid inner flexible metallic core; and
an outer plastic coating covering all of said inner core and a portion of said handle.

5,109,870
APPARATUS FOR AND METHOD OF MOTILITY AND PERISTALSIS MONITORING
Jiri Silny, and Günter Rau, both of Aachen, Fed. Rep. of Germany, assignors to Forschungsgesellschaft fur Biomedizinische Technik e.V., Aachen, Fed. Rep. of Germany
Continuation of Ser. No. 427,575, Oct. 23, 1989, abandoned. This application Oct. 26, 1990, Ser. No. 604,355
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1988, 3836349
Int. Cl.[5] A61B *5/05*
U.S. Cl. 128—780 **8 Claims**

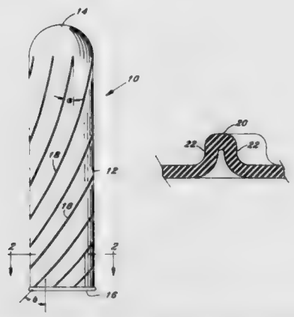


1. Apparatus for monitoring motility and/or peristalsis in a tubular organ which transports its contents, comprising:
a catheter sized to fit within the tubular organ,
a plurality of electrodes positioned along the outside of the catheter in electrical contact with the organ at longitudinally displaced points there along,
first channel means for measuring the impedance of the organ between a pair of said electrodes;
a plurality of additional channel means for making multiple, substantially simultaneous impedance measurements be-

tween electrode pairs representing the impedance of the organ at longitudinally displaced positions along the organ; and

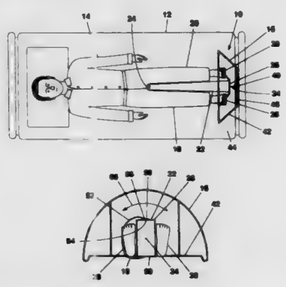
means for indicating the longitudinal displacement along the organ of impedance measurements made by the plurality of channel means which are characteristic of peristaltic content transport.

5,109,871
HEALTH PRODUCT
Thomas F. Thornton, 43 Contentment Island Rd., Darien, Conn. 06820
Filed Apr. 1, 1991, Ser. No. 678,142
Int. Cl.[5] A61F *6/00*
U.S. Cl. 128—844 **6 Claims**



1. A condom having a tubular wall and a plurality of generally parallel curving longitudinal ribs spaced about the surface thereof, the ribs being the same in direction and curvature, each commencing adjacent the distal end of the condom at a first angle in the range of 0° to 20° to an imaginary longitudinal line along the surface of the condom and curving away from said line and terminating adjacent the proximate end at a second angle in the range of 35° to 44° to another imaginary longitudinal line along the surface of the condom each rib being a unitary part of said tubular wall of said condom.

5,109,872
PATIENT LEG SUPPORT
David P. Conn, 416 N. Poppy, Lompoc, Calif. 93436
Filed Jan. 31, 1991, Ser. No. 648,635
Int. Cl.[5] A61G *15/00;* **A47C** *20/02*
U.S. Cl. 128—845 **10 Claims**



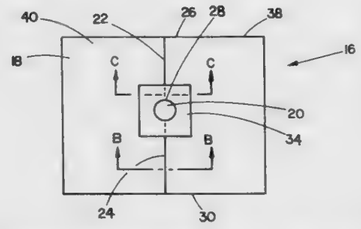
9. A leg support device comprising:

a frame mountable on a patient's bed to prevent bedding from interfering with movement of the patient's legs, said frame comprising a pair of horizontal members defining a space therebetween,

a leg support member releasably attachable to said frame and freely rotatable with respect to said frame, said leg support member being positionable between the patient's legs to assure maintenance of proper orientation of an injured leg while the patient is turning, and

a shaft projecting from a rigid plate embedded within the rear end of said leg support member and dimensioned to pass freely through said space.

5,109,873
SURGICAL DRAPE
Lyman R. Marshall, Asheville, N.C., assignor to Scherer Healthcare Ltd., Asheville, N.C.
Filed Jul. 19, 1991, Ser. No. 733,083
Int. Cl.[5] A61B *19/00, 19/08*
U.S. Cl. 128—849 **14 Claims**

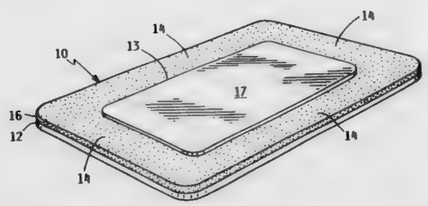


1. A surgical drape comprising:

a sheet of material which is substantially impervious to microorganisms; said sheet having a predetermined thickness; said sheet having an opening therein; said sheet adapted to be placed over a portion of the patient for providing a substantially sterile field during a surgical procedure; said opening adapted to be adjacent to the site of the surgical procedure;

at least one score line located between one edge of said sheet and said opening; said score line penetrating said sheet to a depth less than the entire thickness of said sheet thereby maintaining the sterile field along said score line, whereby said sheet may be readily severed along said score line, whereby said sheet may be readily severed along said score line after the completion of the surgical procedure.

5,109,874
WOUND PATCH
Godfrey Bellingham, Lake Elmo, and Julia A. Lord, Eagan, both of Minn., assignors to Bellingham Medical Inc., Lake Elmo, Minn.
Filed Jul. 18, 1991, Ser. No. 732,172
Int. Cl.[5] A61F *13/00*
U.S. Cl. 128—888 **9 Claims**



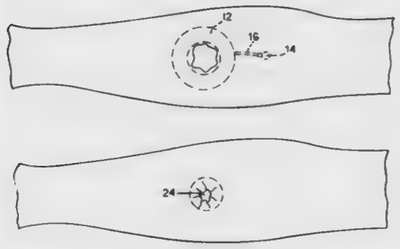
1. A dynamic non-bandage, wound patch to permit a user with a broken skin wound to engage in physical activities in the proximity of contaminates without contaminating of the wound covered by the wound patch or without having excretions from the wound migrate through the wound patch for a period not to exceed a few hours comprising:

a flexible and resilient layer of material, said flexible and resilient layer of material having sufficient flexibility to dynamically conform to the movement of the skin underlying the wound patch, said flexible and resilient layer of material having an interior region and a peripheral region, said flexible and resilient layer of material comprising a liquid impermeable and gas impermeable material to prevent ingress or egress of gases or liquids through said flexible and resilient layer of material;

a nonabsorbent and non-stick island located in said interior region to permit a user to place said nonabsorbent and non-stick island directly over a bandage on a person; and

a layer of liquid and gas impermeable adhesive extending completely across said flexible and resilient layer of material, said layer of liquid and gas impermeable adhesive material coacting with said flexible and resilient layer of material to secure said flexible and resilient layer of material to the skin of a user to temporarily form a liquid and gas impermeable barrier over a wound so that the user can participate in physical activities in the presence of contaminates without contaminating the wound.

5,109,875
RING TISSUE EXPANDERS AND THEIR METHOD OF USE
Marc E. Gottlieb, West Covina, Calif., assignor to City of Hope, Duarte, Calif.
Continuation of Ser. No. 262,063, Oct. 24, 1988, abandoned, which is a continuation of Ser. No. 920,616, Oct. 20, 1986, abandoned. This application May 2, 1990, Ser. No. 517,841
Int. Cl.[5] A61B *19/00*
U.S. Cl. 128—899 **2 Claims**



1. A procedure for reducing the size of a first epidermal scar which comprises:

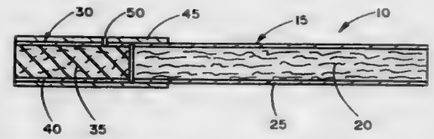
(i) surrounding said first scar with the expansion chamber of a surgically implanted device to induce the growth of new skin overlaying the surface of said expansion chamber and extending around the perimeter of said scar;

(ii) removing the implanted device and permitting the new skin to contract inwardly, thus producing a smaller, second epidermal scar; and

(iii) reducing said smaller scar by at least one repetition of steps (i) and (ii) with a smaller surgically implanted device having an expansion chamber.

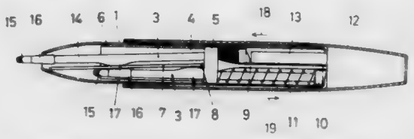
5,109,876
CIGARETTE PAPER AND CIGARETTE INCORPORATING SAME
Rhonda F. Hayden, Winston-Salem, and Elbert C. Jones, Jr., Sherrill's Ford, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Apr. 19, 1990, Ser. No. 511,144
Int. Cl.[5] A24B *1/02*
U.S. Cl. 131—365 **28 Claims**

1. A cigarette including smokable filler material; contained in a circumscribing wrapping material; the wrapping material comprising (i) a cellulosic base web, and (ii) inorganic filler



material including particles of an agglomerated matrix of particulate inorganic material.

5,109,877
MAKE-UP BRUSH DEVICE
Shiro Takeda, Kumano-Cho 3538-3, Aki-gun, Hiroshima, Japan
Filed Feb. 20, 1991, Ser. No. 657,816
Claims priority, application Japan, Feb. 20, 1990, 2-39494; Feb. 23, 1990, 2-17844
Int. Cl.[5] A45D *40/26*
U.S. Cl. 132—218 **11 Claims**



1. A make-up brush device for use in beautifying the face, comprising:

a cylindrical casing having a head end and a rear end;

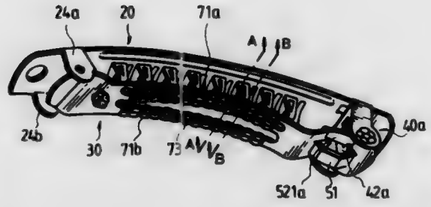
a guide means positioned within said cylindrical casing and extending axially for defining a plurality of separate spaces extending longitudinally in said cylindrical casing, said guide means including a ring at the middle thereof, a separator extending longitudinally from said ring toward the head end of said cylindrical casing for separating the space within the casing into said separate spaces, said separator having the end toward said head end shiftable laterally of said cylindrical casing, and a partition extending axially toward the rear end of said casing for defining a number of individual spaces extending axially and corresponding to said separate spaces defined by said separator;

a plurality of individual brush sticks each mounted within a corresponding one of said plurality of separate spaces for axial sliding movement therein, each of said brush sticks having an enlarged portion at a rear end thereof extending into the corresponding individual space, and each having a protruded portion on the body thereof which presses against said separator when the brush stick is moved axially toward the head end for shifting said separator laterally of said cylindrical casing;

spring means between said ring and said enlarged portion of each brush stick for biasing the brush sticks toward a retracted position within said casing; and

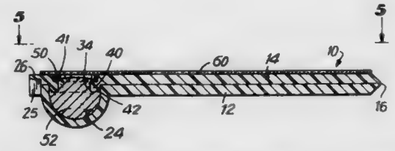
cap means normally demountably mounted on the head end of said cylindrical casing and remountable on the rear end thereof, said cap means including a pushing means extending inwardly from said cap means eccentrically with regard to a center axis through said cylindrical casing and selectively acting on the enlarged portions of the respective brush sticks so that any selected brush stick can be pushed axially forward to a projected position at the head end of said cylindrical casing.

5,109,878
HAIRCLIP
Chou Kuo-Hua, No. 15, Alley 10, Lane 118, Szu Wei Road, Wu Ku Hsiang, Taipei County, Taiwan
Filed Jun. 11, 1991, Ser. No. 713,294
Int. Cl.[5] A45D *8/28*
U.S. Cl. 132—279 **4 Claims**



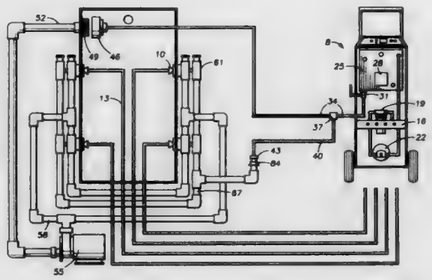
1. An improved structure hair-clip comprising an, elongate and arcuate, upper piece and lower piece, wherein:
two pivot holes are formed near one end of said upper piece;
two pivots, formed on one end of said lower piece, are disposed within respective said pivot holes to rotatably secure said upper piece to said lower piece;
a locking means includes at least one locking protrusion and more than one locking catches, said locking catches being disposed near an end of said upper piece opposite from said pivot holes, and said locking protrusion is disposed near an end of said lower piece opposite from said pivots;
a plurality of protruding pins are formed on the lower surface of said upper piece, arranged in two rows disposed near a respective upper edge and lower edge of said upper piece, extending between said pivot holes and said locking catches, said protruding pins extend downwards from the lower surface of said upper piece and have a rounded termination formed on the lower ends thereof;
a plurality of concave, avoid dimples, of equal number with said protruding pins, are formed on the upper surface of said lower piece, arranged in two rows disposed on two respective holder bars, formed on the respective upper edge and lower edge of said lower piece, extending between said pivots and said locking protrusion;
a central bar is disposed above the upper surface of said lower piece, over the space between the two said holder bars, adjoining with the main body of said lower piece through a pair of arcuate, sloping connecting bars to the respective left end and right end of said central bar;
whereby, said upper piece and said lower piece can clamp a hair bundle with a selected locking catch on said upper piece engaging said locking protrusion on said lower piece to releasably lock said upper piece in relative position to said lower piece, different selected said locking catches providing different spacings between said upper piece and said lower piece to accomodate varying thicknesses of hair bundles;
each said protruding pin of the two said rows on said upper piece approaches a corresponding said concave dimple on respective holder bars of said lower piece, tightly clamping a small percentage of the hair strands of the hair bundle between said rounded terminations of said protruding pins and the avoid surfaces of said concave dimples, increasing the resistance of the hairclip to sliding while preventing damage to tightly gripped hair strands, due to the curved surfaces of said terminations of said pins and said dimples on said holders.

5,109,879
SELF-MOLDING COSMETIC SAMPLER APPLICATOR
David Seidler, 69-10 108th St., Forest Hills, N.Y. 11375
Filed Mar. 5, 1991, Ser. No. 664,738
Int. Cl.[5] A45D *40/26*
U.S. Cl. 132—320 **19 Claims**



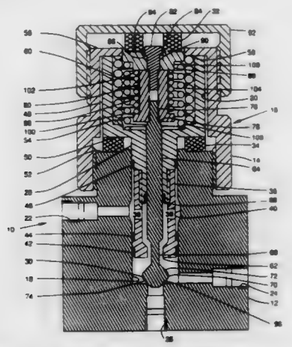
1. A sampler applicator package forming and holding a predetermined amount of a product to be applied which permits direct application of said product comprising a cover member having a recessed portion defining a well, a second member releasably coupled to said cover member about said recessed portion and having an aperture in registration with said well when said cover member is coupled to said second member, said aperture being located about an axis, said second member being elongated in a direction essentially perpendicular to said axis to form a handle means for holding said second member, said product being poured through said aperture into said well, said product forming the shape of said well, and anchoring means for anchoring said product to said second member, said poured product remaining anchored to said second member and exposed for application when said cover member is removed from said second member, said cover member being replaceable over said second member to protect said product during storage.

5,109,880
PORTABLE WHIRLPOOL BATHTUB CLEANER
John W. Booth, Irving, Tex., assignor to Hydravac Corporation, Irving, Tex.
Filed Feb. 18, 1991, Ser. No. 663,981
Int. Cl.[5] B08B *9/06*
U.S. Cl. 134—108 **8 Claims**



1. An apparatus for cleaning the circulation system of a whirlpool bathtub comprising:
a container for holding cleaning fluid;
a pump attached to said container for circulating cleaning fluid through the whirlpool circulation system;
a manifold attached to said pump;
a plurality of suction hoses, one end of each suction hose attached to the manifold and the other end of each hose adapted to attach to a whirlpool jet;
a flow line means connecting the container to an air intake and a suction fitting of the whirlpool bathtub, wherein said container, pump, manifold, suction hoses and flow line means are packaged together to form a portable unit; and
wherein a closed recirculating system is formed when the suction hoses are attached to the jets of the bathtub and the flow line means is attached to the air intake and the suction fitting.

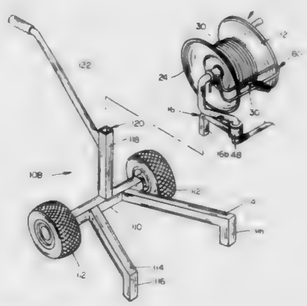
5,109,881
TEMPERATURE SENSITIVE CONTROL VALVE
Gerald S. Baker, Houston, Tex., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Aug. 23, 1990, Ser. No. 571,741
Int. Cl.[5] F16K *17/38*
U.S. Cl. 137—72 **6 Claims**



5. A valve for controlling the pressure maintained to the operator of a subsurface safety valve comprising
a body having a valve chamber, a supply passage, a control passage and a bleed passage communicating with the valve chamber,
valve means controlling flow from the supply passage to the control passage and from said control passage to said bleed passage.
a first temperature sensitive means for supporting said valve means in a position with flow between said supply and control passages are open and flow between said control and bleed passages are closed and when reaching its preselected release temperature the valve means moves to close flow between the supply and control passages and to open flow between said control and bleed passages,
a second temperature sensitive means for supporting said valve means in a position with the flow between said control and bleed passages is open following the release of said first temperature sensitive means and having a release temperature higher than the release temperature of said first temperature sensitive means to allow the valve means to move to a position closing flow between all three passages.

5,109,882
HOSE REEL
John H. Eley, Box B, Orchard, Nebr. 68764
Filed Feb. 21, 1991, Ser. No. 659,516
Int. Cl.[5] B65H *75/34*
U.S. Cl. 137—355.21 **17 Claims**

5. A hose reel, comprising:
a reel member rotatably mounted on a horizontal tube;
said reel member including a generally cylindrical hub portion coaxial with said horizontal tube, and a pair of opposing flanges projecting radially outwardly from said hub to form an annular channel for receiving a hose;
an upstanding tube depending from one end of said horizontal tube and bent so as to have a lower vertical portion aligned generally vertically under the center of said reel member;
the lower end of said upstanding tube being rotatably mounted to a first end of a generally horizontal support arm, with the rotational axis of said upstanding tube oriented vertically under the reel member;
said support arm having a short depending arm at a second end thereof adapted for receipt within a tubular support;
said support arm having a length between the first and second ends to permit full rotation of said reel member and upstanding tube on said axis;



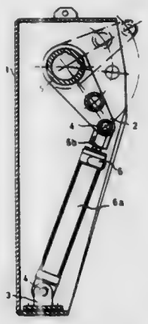
a hose guide, including:
a generally U-shaped rod member having a pair of legs connected at a base;
said U-shaped member legs having their free ends bent around one annular flange of said reel and connected to a sleeve rotatably mounted on said horizontal tube, such that said U-shaped rod is rotatable about an axis coaxial with the rotational axis of the reel member; and
means on said horizontal tube for stopping the rotation of the hose guide sleeve beyond a predetermined position in each rotational direction of the sleeve.

5,109,883
ISOLATOR WITH A HYDRAULIC ACTUATOR AND WITH A ROTATION-TRUEING COUPLING FOR THE ISOLATOR SHAFT
Anton F. Squirrell, Mellingen, Switzerland, assignor to Grovak Grossventiltechnik AG, Baar, Switzerland
PCT No. PCT/GB89/00593, § 371 Date Jan. 14, 1991, § 102(e) Date Jan. 14, 1991, PCT Pub. No. WO89/11612, PCT Pub. Date Nov. 30, 1989
PCT Filed May 26, 1989, Ser. No. 613,535
Claims priority, application United Kingdom, May 26, 1988, 8812480
Int. Cl.[5] F16K *35/00*
U.S. Cl. 137—385 **2 Claims**

1. An isolator, comprising: an isolator shaft; an isolator closure member carried by said isolator shaft; a hydraulic actuator for said isolator shaft; an auxiliary shaft for driving at least one extraneous device in response to operation of said isolator shaft; and a coupling interconnecting said isolator shaft and said auxiliary shaft for converting any possibly uneven motion of the former to a true rotary motion of the latter;
(a) said hydraulic actuator comprising a casing having first and second end regions and accommodating a part of said isolator shaft intermediate said end regions, said casing at said first end region thereof having an exterior mounting flange connecting the casing to the isolator and at said second end region thereof remote from said mounting flange having an interior mounting bracket, a lever arm assembly located within said casing and drivingly connected to said isolator shaft, and a hydraulic ram located within said casing and having a base end and a rod end,

said base end of said ram being pin jointed to said mounting bracket and said rod end of said ram being pin jointed to said lever arm assembly, whereby said hydraulic actuator is protected from the effects of temperature differences existing between the normally hot isolator and the normally cold hydraulic actuator;

(b) said auxiliary shaft comprising a rotatable tubular body equipped on its exterior with at least one operating element for driving said at least one extraneous device; and



(c) said coupling comprising a tube member fixed onto the isolator, a plurality of bearings fitted onto the exterior of said tube member, said tube member extending axially into said tubular body of said auxiliary shaft and rotatably supporting the same by means of said bearings, and a universal joint located interiorly of said tube member and drivingly interconnecting said isolator shaft with said auxiliary shaft.

5,109,884

SAFETY VALVE ARRANGEMENT

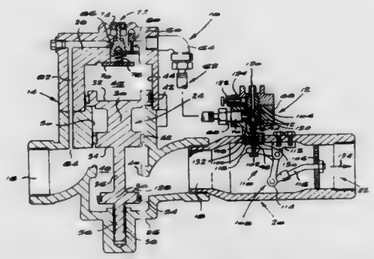
Jacobus N. du Plessis, Krugersdorp, South Africa, assignor to Stanley Gordon, Transvaal, South Africa

Filed Oct. 5, 1990, Ser. No. 593,221

Claims priority, application South Africa, Oct. 5, 1989, 89/7589

Int. Cl.[5] **F16K** *17/32*

U.S. Cl. 137—460 **5 Claims**



1. A self-actuating safety valve arrangement comprising:

a) a main valve housing having an inlet and an outlet for connection in a high pressure fluid line;

b) a main valve member carried slidably within the main valve housing, and being movable between an open position in which it allows the passage of fluid through the fluid line, and a closed position in which it prevents the passage of fluid through the fluid line;

c) a first chamber being defined between one side of the main valve member and the main valve housing;

d) a second chamber being defined between an opposite side of the main valve member, the inlet and the outlet of the main valve housing;

e) a feedback line communicating in use between the first chamber and a location in the fluid line downstream of the main valve member, the main valve member being arranged to be held open by fluid pressure via the feedback line, and to move to the closed position in response to a drop in pressure in the first chamber via the feedback line,

f) mechanical pressure sensing means being arranged to sense a drop in pressure in the fluid line downstream of the main valve member and to cause a drop in pressure in the feedback line in response thereto;

g) reset means for holding the main valve member open prior to it being held upon by fluid pressure via the feedback line, the reset means including a passage communicating in use between the first chamber and a location in the fluid line upstream of the main valve member, and a reset valve for selectively opening the passage.

5,109,885

SOLENOID VALVE, IN PARTICULAR FOR FUEL-INJECTION PUMPS

Joachim Tauscher, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

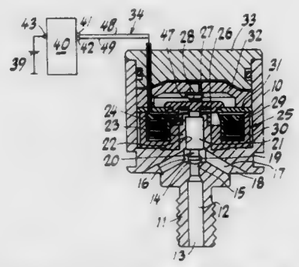
PCT No. PCT/DE89/00697, § 371 Date May 14, 1991, § 102(e) Date May 14, 1991, PCT Pub. No. WO90/05845, PCT Pub. Date May 31, 1990

PCT Filed Nov. 3, 1989, Ser. No. 700,150

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1988, 3838599

Int. Cl.[5] **F16K** *31/06*; **F02M** *51/00*

U.S. Cl. 137—554 **6 Claims**



1. A solenoid valve for a fuel injection pump comprising:

a housing defining a valve opening surrounded by a valve seat and coupled in fluid communication with a valve inlet and a valve outlet;

a valve needle moveable relative to the valve seat into a closed position into contact with the valve seat to close the valve opening and into an open position away from the valve seat to open the valve opening;

a stop member located adjacent to the valve needle to stop the valve needle upon reaching the open position;

an electromagnet including a winding for driving the valve needle into the closed position upon electrical excitation of the winding;

a spring member coupled to the valve needle for driving the valve needle into the open position;

a cable including a supply line coupled to one terminal of the winding and a feedback line coupled to another terminal of the winding for directing current through the winding;

a piezoelectric member coupled to the stop member for contacting the valve needle upon reaching the open position and generating a signal indicative thereof, wherein the output of the piezoelectric member conducting the higher potential is coupled between the winding and the feedback line and the other output of the piezoelectric member is coupled either between the supply line and winding or to ground or zero potential; and

a control unit including a first output coupled between the supply line and a voltage source for directing current from the voltage source to the winding, and a second output coupled between the feedback line and ground or zero potential by means of a switch element, wherein the open-position signal of the piezoelectric member is transmitted by the feedback line to the second output for tapping the signal.

5,109,886

FLUID PRESSURE CONTROLLER

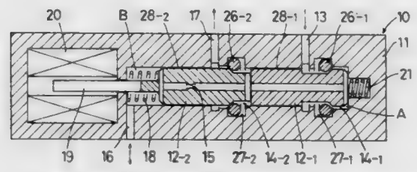
Koji Takata, and Koichi Hashida, both of Itami, Japan, assignors to Sumitomo Electric Industries, Osaka, Japan

Filed Feb. 8, 1991, Ser. No. 653,223

Claims priority, application Japan, Feb. 9, 1990, 2-29827

Int. Cl.[5] **F15B** *13/044*

U.S. Cl. 137—596.17 **12 Claims**



1. A fluid pressure controller comprising:

a housing having an input port, a discharge port and an output port;

a spool axially slidably mounted in said housing and including a pair of shoulders;

first and second chambers defined at opposing ends of said spool, respectively, between said spool and said housing;

an electricity/power converter means for imparting to said spool an axial driving force corresponding to the magnitude of an electric command;

a spring means for holding said spool in an initial position when no axial driving force is imparted to said spool by said electricity/power converter means;

a pressure increase valve ring member mounted about said spool and defining, with one of said shoulders of said spool, a pressure increase variable-size orifice;

a pressure reduction valve ring member mounted about said spool and defining, with the other of said shoulders of said spool, a pressure reduction variable-size orifice which is oriented in a direction opposite to a direction in which said pressure increase variable-size orifice is oriented, said pressure increase and pressure reduction variable-size orifices being adapted to separately control communication between said first chamber and said input port and communication between said first chamber and said discharge port depending upon the axial position of said spool;

two guide portions for guiding said spool, one of said guide portions being located on a side of said input part opposite said pressure increase ring valve member the other of said guide portions being located on a side of said discharge port opposite said pressure reduction ring valve member;

a first passage means for normally maintaining said second chamber in communication with said output port;

a second passage means for normally maintaining said first chamber and said second chamber in communication with one another; and

a fixed-size orifice formed in said second passage means;

whereby a pressure differential between said first and second chambers and across said pressure increase and pressure reduction variable-size orifices can be generated, the pressure differential corresponding to the axial force applied to said spool by said electricity/power converter means.

5,109,887

MULTIWAY VALVE

Shiro Saito; Shigeru Takagi, and Mineji Kondo, all of Tokoname, Japan, assignors to Inax Corporation, Aichi, Japan

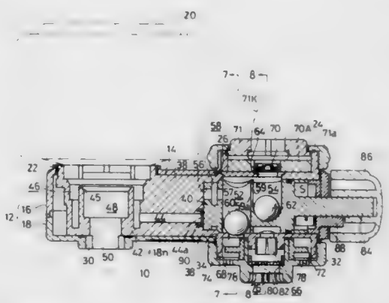
PCT No. PCT/JP90/00688, § 371 Date Dec. 21, 1990, § 102(e) Date Dec. 21, 1990, PCT Pub. No. WO90/15274, PCT Pub. Date Dec. 13, 1990

PCT Filed May 29, 1990, Ser. No. 635,584

Claims priority, application Japan, May 30, 1989, 1-62920[U]; May 31, 1989, 1-63618[U]; Jun. 2, 1989, 1-64809[U]; Jun. 2, 1989, 1-64810[U]; Mar. 22, 1990, 2-29334[U]

Int. Cl.[5] **F16K** *11/056*

U.S. Cl. 137—625.46 **8 Claims**



1. A multiway valve comprising:

a valve casing provided with an entrance port, plural exit ports and an outer surface, one exit port being formed at one end surface of the valve casing and the other exit ports being formed in the outer surface of the valve casing;

a valve member rotatably inserted in the valve casing for opening and closing the exit ports and having an end surface;

balls mounted in the valve casing so as to be capable of plugging up the exit ports in the outer surface of the casing;

arms formed integrally with the valve member and acting to move the balls; and

a seal which surrounds the exit port at the end surface and makes sliding contact with the end surface of the valve member.

5,109,888

HIGH-PRESSURE METALLIC PIPE PROVIDED WITH CONNECTING HEAD PART AND METHOD FOR FORMATION THEREOF

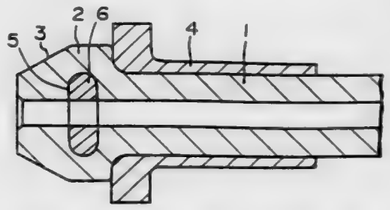
Masayoshi Usui, Numazu, Japan

Filed Aug. 14, 1989, Ser. No. 393,574

Claims priority, application Japan, Aug. 19, 1988, 63-206027

Int. Cl.[5] **F16L** *9/00*

U.S. Cl. 138—109 **10 Claims**



1. A high-pressure metallic pipe, comprising a steel pipe of relatively small outer diameter and a large wall thickness defining an inner diameter and a substantially smooth inner

peripheral surface, a connecting head part formed at an end of said steel pipe, said connecting head part comprising a radially outwardly formed rear wall facing portions of the steel pipe adjacent the connecting head and a seat surface extending unitarily inwardly from the rear wall at the end of the pipe such that an annular groove extends outwardly from the inner peripheral surface of the head part intermediate the rear wall and the seat surface, and a metallic ring member buried in the annular groove inside said head part, said metallic ring member having an inner diameter equal to the inner diameter of the steel pipe and serving to convert said annularly grooved part into a substantially flat and smooth inner peripheral surface to avoid cavitation erosion due to fluid flowing inside the pipe.

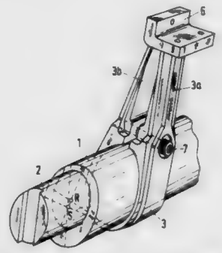
5,109,889
PRESSURE-RESISTANT HELICAL CORRUGATED PIPE
Shiro Kanao, No. 9-18, Nanpeidai 4-chome, Takatsuki-shi, Osaka, Japan
Filed Nov. 22, 1989, Ser. No. 440,174
Claims priority, application Japan, Dec. 27, 1988, 63-333132
Int. Cl.[5] F16L *11/11*
U.S. Cl. 138—173 **6 Claims**



1. A pressure-resistant helical corrugated pipe, comprising:
a helical corrugated pipe wall having a top, crest portion, opposite side wall portions extending from said top, crest portion and a bottom, trough portion disposed close to an axis of the pipe so as to be situated between adjacent top, crest portions;
a continuous thin metal belt plate of a generally inverted U-shaped transverse cross-section, said metal belt plate being disposed in said top, crest portion and also in substantially all of said opposite side wall portions that extend from said top, crest portion, said metal belt plate serving as a constituent element for said pipe wall;
another metal belt plate of a flat configuration being disposed in said bottom, trough portion so as to be situated between adjacent top, crest portions of said helical corrugated pipe wall and disposed out of contact with said thin metal belt plate; said flat metal belt plate having a width substantially equal to a width of said bottom, trough portion in a direction of the axis of the pipe, such that said flat metal belt plate is disposed in substantially the entire width of said bottom, trough portion; and
connective belt regions provided between said two metal belt plates in which said metal belt plates are absent, said connective belt regions being provided near connecting corner portions between said opposite side wall portions and said bottom, trough portion, said connective belt regions being made of a synthetic resin or rubber to interconnect said two metal belt plates.

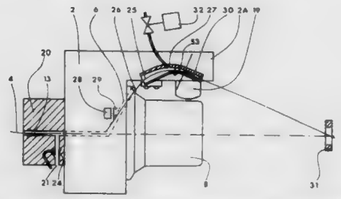
5,109,890
LOOM SLEY DRIVE
Angelo Stacher, Arbon, and Heribert Weber, Diepoldsau, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Mar. 12, 1991, Ser. No. 667,958
Claims priority, application Switzerland, Mar. 15, 1990, 01016/90
Int. Cl.[5] D03D *49/62*
U.S. Cl. 139—190 **15 Claims**

1. A loom sley drive comprising
a reed
a sley shaft having a center of gravity disposed eccentrically of a pivot axis thereof and on a side remote from said reed;
a sley lever having a pair of legs disposed in clip-shaped fashion about said shaft; and;



at least one screw securing said legs together in clamping manner to said shaft, said screw being disposed on a reed side of said sley shaft.

5,109,891
WEFT FEEDER FOR FLUID JET LOOMS WITH PNEUMATIC RETHREADING APPARATUS
Bruno Maina, Valdengo, Italy, assignor to ROJ Electrotex S.p.A., Biella, Italy
Filed Sep. 27, 1990, Ser. No. 588,925
Claims priority, application Italy, Sep. 27, 1989, 21846 A/89
Int. Cl.[5] D03D *47/34*
U.S. Cl. 139—450 **12 Claims**

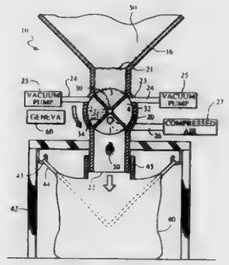


1. In a fluid jet loom having a weft feeder comprising a main nozzle and secondary nozzles for weft insertion, of the type also measuring the weft yarn lengths being fed and comprising a drum held stationary, onto which a winding arm winds up a weft yarn reserve, and means to automatically restore the continuity of the yarn from a feed spool to a main nozzle of the loom; the improvement in which said means consist of at least two compressed air devices acting on the weft yarn, the first device being positioned at an inlet of the weft feeder, to withdraw therefrom broken yarn and introduce therein new yarn fed by the spool and comprising a first duct connected to the inlet of the weft feeder, along which duct there are positioned clamping means, nozzle means and cutting means, and a second duct branching off from the first, close to an outlet of said first duct into the weft feeder, which second duct also has nozzle means; the second device being positioned adjacent to the weft feeder drum, to receive new yarn fed by the first device and by the winding arm and send it to a fixed point for feeding the main nozzle of the loom, and comprising a curved profiled duct, which is either open or includes means for opening longitudinally towards the drum and has aerodynamic guide means for the yarn.

5,109,892
PROCESS FOR PACKAGING AMORPHOUS POLYOLEFINS
Marc S. Somers, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 27, 1990, Ser. No. 634,985
Int. Cl.[5] B65B *3/04*
U.S. Cl. 141—11 **16 Claims**

1. A process for packaging amorphous polyolefins comprising:
(a) supplying an amorphous polyolefin at a flowable temperature,
(b) flowing said amorphous polyolefin into a molded polyolefin container having a wall thickness of at least 10 mils wherein the material of said container has a melting point below the temperature at which said amorphous polyolefin is flowed into the container, and
(c) slowly cooling the filled container.

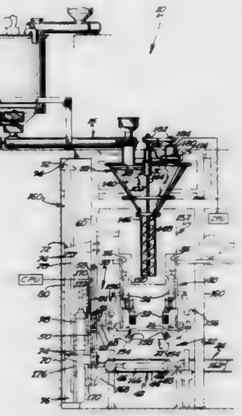
5,109,893
VACUUM FILL SYSTEM
Norwin C. Derby, Sherman, Tex., assignor to B.A.G. Corporation, Dallas, Tex.
Continuation-in-part of Ser. No. 558,678, Jul. 27, 1990, which is a continuation-in-part of Ser. No. 407,901, Sep. 15, 1989, abandoned. This application Nov. 19, 1990, Ser. No. 615,293
Int. Cl.[5] B65B *1/26*
U.S. Cl. 141—67 **12 Claims**



1. A vacuum fill system for deaerating flowable material comprising:
means defining a plurality of chambers;
enclosed, airtight housing means surrounding chamber-defining means and defining a plurality of zones equal in number to the plurality of chambers;
means for sequentially aligning each of the chambers with each of the zones of the housing means;
means for filling each chamber with flowable material when the chamber is aligned with one of the zones;
means for creating a vacuum in each chamber when the chamber is aligned with the next adjacent zone for deaerating the flowable material; and
means for thereafter returning the pressure in each chamber to atmospheric pressure substantially instantaneously for compacting the deaerated flowable material.

5,109,894
VERTICAL BOTTOM-FILL AUGER ASSEMBLY
Harold R. McGregor, 216 S. Grove, Owatonna, Minn. 55060
Division of Ser. No. 559,629, Jul. 30, 1990, Pat. No. 5,042,539, which is a continuation-in-part of Ser. No. 270,845, Nov. 14, 1988, Pat. No. 4,944,334. This application May 23, 1991, Ser. No. 704,887
Int. Cl.[5] B65B *1/14*
U.S. Cl. 141—83 **7 Claims**

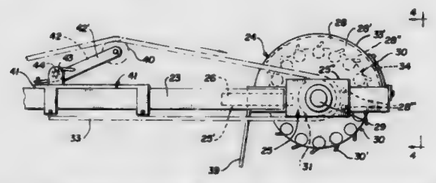
1. A vertical bottom-fill auger assembly for use in de-aerating a product and filling a target weight of said product into a bag, said vertical bottom-fill auger assembly comprising:
a frame assembly;
a bottom-fill auger assembly, said bottom-fill auger assembly being connected to and supported by said frame assembly, said bottom-fill auger assembly including an auger hopper having an open bottom and a fill tube depending from and connected to said auger hopper and communicating with said open bottom, said fill tube having a length and a bottom end, said fill tube having a spout assembly connected thereto adjacent said bottom end, said bottom-fill auger assembly further including an auger shaft having a section of flighting, said auger shaft having an axis of rotation oriented in a generally vertical direction, said auger shaft extending downwardly within said auger hopper and being received within said fill tube such that said section of flighting extends substantially through said length of said fill tube and terminating proximate to said bottom end, said section of flighting compressing and de-aerating the product within said fill tube to maintain a generally uniform product density as the product is discharged from said bottom end of said fill tube;
an auger shaft drive means, said auger shaft drive means being connected to said auger shaft and capable of controllably rotating said auger shaft and said section of flighting in a predetermined direction at a selected rate of revolution about said axis of rotation;



means for determining an approximate weight of the product which has been filled into the bag at a selected time concurrent with or prior to a selected interval during which said approximate weight of the product is being filled into the bag;
means for counting a number of revolutions of said auger shaft during said selected interval;
means for determining an approximate flow density of the product within said fill tube, said approximate flow density being expressible in units of weight of the product per auger revolution;
means for determining a weight difference constituting the difference between the target weight and said approximate weight of the product which has been filled into the bag at said selected time; and
means for responsively adjusting said rate of revolution of said auger shaft,
whereby the approximate weight of the product which has been filled into the bag at the selected time is compared to the target weight, the approximate weight being less than the target weight by the weight difference, and whereby the approximate flow density of the product within the fill tube is determined by comparing the approximate weight

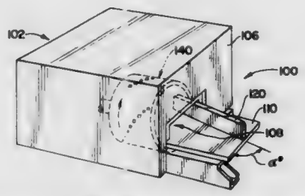
to the number of auger revolutions during the selected interval, and whereby a number of auger revolutions necessary to fill the weight difference of the product into the bag is determined, the auger shaft being rotated said number of auger revolutions necessary to fill the weight difference of the product into the bag such that the bag contains the target weight of the product.

5,109,895
CUTTING ATTACHMENT FOR TRENCHER
Wallace J. Rassier, P.O. Box 245, Williston, N. Dak. 58801
Filed Feb. 28, 1991, Ser. No. 662,777
Int. Cl.[5] **A01G** *23/06*
U.S. Cl. 144—2 N **3 Claims**



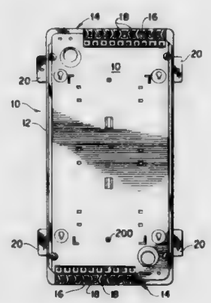
2. A cutting attachment for a trencher wherein the trencher has a trencher arm pivotally mounted at its one end to the trencher and having a sprocket gear at the one end of the arm and a socket at its other end of the arm with an endless chain on the arm, said attachment comprising a yoke having a base leg adapted to be detachably mounted in said socket of the arm and a pair of legs opposite the base leg with a sprocket rotatably mounted between the pair of legs and the endless chain connecting the sprocket at the one end of the arm with the sprocket mounted in the yoke at the other end of the arm with the sprocket mounted in the arm may drive the sprocket at the yoke at the other end of the arm, a radial blade fixed coaxially with the sprocket mounted in the yoke to rotate with said sprocket, said blade having a cutting edge at a substantially larger outer radius than said yoke sprocket whereby the arm may be lowered about its pivotal mounting to engage the radial blade against stumps and the like to cut into the stumps a substantial distance without stump surfaces adjacent the blade engaging the yoke sprocket, a housing enclosing the upper half of the radial blade.

5,109,896
MACHINE FOR SHARPENING WOODEN STAKE
Christopher B. Tomes, Arlington Heights, and Edward M. R. Tomes, Wheeling, both of Ill., assignors to Foxcroft Capital Corp., Hamilton, Canada
Filed Jul. 18, 1991, Ser. No. 732,074
Int. Cl.[5] **B27M** *3/00*; **B27C** *1/00*; **E04H** *15/62*
U.S. Cl. 144—30 **5 Claims**



1. A machine for sharpening a wooden stake having four substantially planar faces defining a substantially rectangular shape in cross-section, the machine comprising
(a) an enclosure having a portal defining a plane, a table mounted to the enclosure, and a fence mounted to the table at an acute angle relative to the plane defined by the portal, wherein the table and the fence constitute means for guiding a wooden stake into the enclosure, through the portal, in such manner that one substantially planar face of the wooden stake bears against the table and that another substantially rectangular face of the wooden stake bears against the fence,
(b) a sharpening drum mounted rotatably within the enclosure and arranged to be rotatably driven in a given rotational direction about an axis, the sharpening drum having a tubular wall with an interior surface and carrying multiple cutting blades arrayed along the interior surface, the cutting blades being arranged collectively to sweep a closed path conforming substantially to a right circular cylinder when the sharpening drum thus is driven and constituting means for cutting into a wooden stake guided into the enclosure, through the portal, in said manner so as to provide an end of the wooden stake with a bevelled surface, which intersects one of the substantially planar faces, and which conforms substantially to a portion of a right circular cylinder, and
(c) means comprising a motor for driving the sharpening drum in the given rotational direction about the axis.

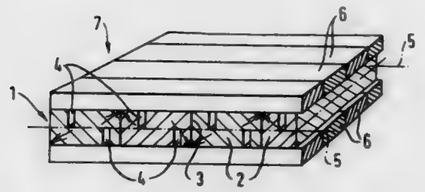
5,109,897
WIRE PROTECTION SYSTEM FOR ELECTRICAL ENCLOSURES
Terry A. Cassity, Paris, and Jeffrey O. Sharp, Lexington, both of Ky., assignors to Square D Company, Palantine, Ill.
Filed Dec. 10, 1990, Ser. No. 624,835
Int. Cl.[5] **B27M** *3/00*
U.S. Cl. 144—144.5 GT **4 Claims**



4. A wire protection system comprising:
an electrical enclosure box having end walls defining a plurality of open wire-receiving channels for receiving external wires entering said enclosure box;
an open frame having an elongated ridge for shielding the portions of said external wires immediately adjacent said enclosure box and a plurality of ribs adapted to fit within corresponding ones of said open channels for securing said wires therein; and
means securing said frame to said enclosure box.

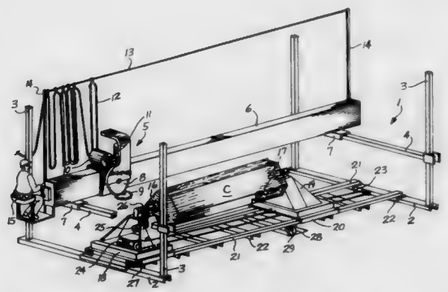
5,109,898
PROCESS FOR THE MANUFACTURE OF MULTI-PLY PANEL BOARDS PREFERABLY FOR FLOORS
Peter Schacht, Miesenbacher Str. 69, 8222 Ruhpolding, Fed. Rep. of Germany
Filed Mar. 14, 1990, Ser. No. 493,258
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1989, 3908851
Int. Cl.[5] **B27G** *11/00*
U.S. Cl. 144—350 **12 Claims**

6. A process for the manufacture of multi-ply panel boards comprising the steps of:
gluing a first tread ply with a first crossband ply, said first tread ply consists of a plurality of adjacently lying wooden boards with respectively longitudinally running fibers, said first tread ply forms a visible or tread surface, said first cross band ply consists of adjacently lying wooden boards or slats, fibers of said first crossband ply are disposed parallel to the first tread surface and perpendicular to fibers in the first tread ply;
gluing a middle ply, matching the first tread ply in material and fiber grain onto the first crossband ply;
forming a second crossband ply by matching the first crossband ply in material and fiber grain;



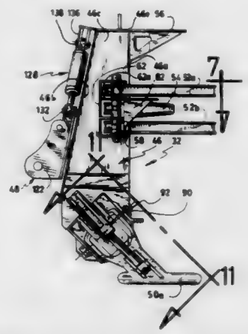
gluing the second crossband ply onto a free surface of the middle ply;
gluing a second tread ply matching the first tread ply in material and fiber grain onto a free surface of said second crossband ply to form a composite sheet;
sawing the composite sheet into double board blanks, a size of which in respective tread surface corresponds approximately to that of panel boards; and
halving the double board blanks to form the panel boards, by a parting cut guided in a middle plane between the two tread surfaces.

5,109,899
CANT-MAKING APPARATUS AND PROCESS
Ken Henderickson, P.O. Box 4026, Port Angeles, Wash. 98362
Filed Jan. 31, 1991, Ser. No. 648,478
Int. Cl.[5] **B27B** *1/00*
U.S. Cl. 144—378 **11 Claims**



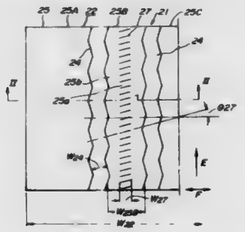
6. A process for making a cant from a log sector which is tapered lengthwise, which comprises supporting the log sector by centers engageable with its opposite ends in proximity to sawing means mounted to travel lengthwise of the log sector, tilting the centers conjointly and the line of travel of the saw means relatively so as to cut a slab from a round portion of the log sector which is of substantially uniform central radial thickness throughout its length, and moving the sawing means lengthwise of the log sector and thereby cutting such slab from the log sector.

5,109,900
TREE-FELLING HEAD
Sylvain Gilbert, 1641, St-Dominique, Roberval, Quebec, Canada G8H 2P1
Filed Mar. 20, 1991, Ser. No. 672,406
Int. Cl.[5] **A01G** *23/08*
U.S. Cl. 144—339 **10 Claims**



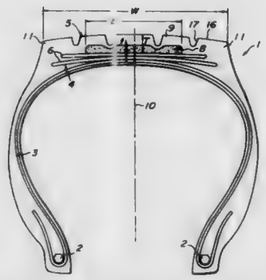
2. A feller buncher unit for use with an automotive vehicle in a forest, said vehicle of the type having an elongated boom, said feller buncher comprising:
(a) a main rigid frame;
(b) coupler means for connecting said feller buncher main frame to said boom;
(c) ground skimming knife means, carried by said main frame for cutting an upstanding tree about a horizontal plane proximate ground level;
(d) grabber means, for capturing and retaining in substantially upright position the tree section cut by said knife means, within a loading area;
(e) a retaining member, for retaining said cut tree section captured by said grabber means within said loading area; said retaining member consisting of two pivoted inner and outer lever members, the inner lever member pivoted to said main frame by a first pivot means, the outer lever member pivoted to the inner lever member by a second pivot means, for pivotal motion of said inner and outer lever members about a horizontal plane; stop means, to prevent pivotal motion of said outer lever member relative to said inner lever member beyond a right angle limit position directed towards said tree loading area; power means, to power operate said inner lever member in its pivotal motion; whereby at least a second upstanding tree can be thereafter captured by said grabber arms, and cut by said knife means, before release of both cut trees from said loading area is required; said unit main frame including two transversely spaced, vertical axles, said grabber means including two vertically spaced apart grabber arms, pivotally carried by respective said vertical axles, said inner lever member pivotally carried by one of said vertical axles and vertically offset relative to said grabber arms; additional power means, to power operate said grabber arms in their pivotal motions; wherein said additional power means includes a pair of ram members, each ram member pivoted about second pivot axles to an inner end extension of a corresponding grabber arm and extending freely through a transverse passage in said unit main frame whereby, upon pivotal action of said grabber arms from an open, spread-apart condition, clearing said tree loading area, to a closed condition, superimposed over one another within said loading area, the first mentioned pair of grabber pivot axles shift from closer positions from one another within the area between said pair of second pivot axles to farther positions from one another beyond this area.

5,109,901
PNEUMATIC RADIAL TIRES HAVING A TREAD INCLUDING ISOLATED SIPES
Kenji Miyamoto, Kodaira; Makoto Tanaka, Higashimurayama, and Norihiro Shimada, Kodaira, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Continuation of Ser. No. 186,404, Apr. 26, 1988, abandoned. This application Oct. 18, 1989, Ser. No. 423,679
Claims priority, application Japan, May 11, 1987, 62-115448
Int. Cl.[5] B60C *11/06, 11/12*
U.S. Cl. 152—209 R **14 Claims**



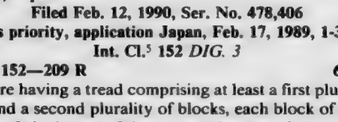
1. A pneumatic radial tire comprising; a tread divided into 5 ribs by 4 main wide grooves each extending circumferentially of the tire, wherein at least one row of sipes isolated from said main grooves and extending at an inclination angle of 0°–30° to the axial direction of the tire are arranged at an approximately equal interval in the circumferential direction of the tire on each side of the tire divided by a circumferential mid-line in only a second rib viewed inward from the outside edge in the axial direction of the tire and no other ribs have a pattern of sipes.

5,109,902
PNEUMATIC TIRES INCLUDING A FOAMED TREAD BASE RUBBER
Kazuomi Kobayashi, Kodaira City, Japan, assignor to Bridgestone Corporation, Tokyo, Japan
Filed Nov. 22, 1989, Ser. No. 440,543
Claims priority, application Japan, Nov. 22, 1988, 63-295473; May 2, 1989, 1-112994
Int. Cl.[5] B60C *11/00*
U.S. Cl. 152—209 R **1 Claim**



1. A pneumatic tire comprising; a toroidal carcass, a belt composed of at least two rubberized cord layers arranged radially outside the carcass, a tread surrounding the periphery of the belt having a tread rubber comprising a base rubber made of a foamed rubber, and a cap rubber made of a non-foam rubber,
said foamed rubber having numerous closed cells, an expansion ratio in a range from 10 to 50%, and a 10% compression modulus in the range of 0.22 to 0.61 kgf/mm^2, said cap rubber being arranged radially outside the base rubber; wherein a widthwise center of the base rubber is in substantial conformity with an equatorial plane of the tire, a width of the base rubber is smaller than that of the belt, and the cap rubber is also arranged on opposite lateral sides of the base rubber, a ratio of b/W is in a range from 0.15 to 0.65, in which b and W are a width of the base rubber and a ground contact width of the tread when a normal internal pressure is applied to the tire fitted to a normal rim under application of a normal load, respectively, and a ratio of t/T is in a range from 0.05 to 0.50, in which t and T are maximum gauges of the base rubber and the tread rubber, respectively.

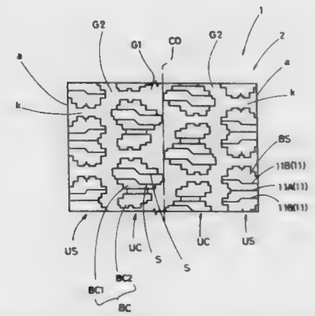
5,109,903
PNEUMATIC TIRE HAVING CHAMFERED TREAD BLOCKS
Susumu Watanabe, and Kiyoshi Tomioka, both of Hiratsuka, Japan, assignors to Yokohama Rubber Co. Ltd., Japan
Filed Apr. 3, 1990, Ser. No. 503,594
Claims priority, application Japan, Apr. 13, 1989, 1-91872
Int. Cl.[5] B60C *11/11*
U.S. Cl. 152—209 R **3 Claims**



1. A pneumatic tire having a tread pattern consisting of blocks which are defined by main grooves disposed on a tire tread surface in a tire circumferential direction and by sub-grooves dispose don the tire tread surface in a tire transverse direction, wherein the improvement comprises: each edge of each of said blocks defined by said main grooves and said sub-grooves crossing one another at an acute angle is chamfered and a curved surface at an upper end of said chamfer connects said chamfer to a block tread surface in a curve form as viewed in a vertical cross-section of each respective block, wherein the radius of curvature of said curved surface is at least 1 mm.

5,109,904
SNOW TIRE
Kazuki Numata, Nishinomiya, and Kiyoshi Ochiai, Kobe, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Feb. 12, 1990, Ser. No. 478,406
Claims priority, application Japan, Feb. 17, 1989, 1-38922
Int. Cl.[5] 152 *DIG. 3*
U.S. Cl. 152—209 R **6 Claims**

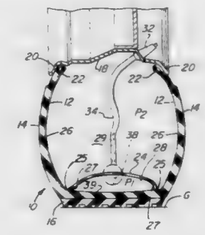
1. A tire having a tread comprising at least a first plurality of blocks and a second plurality of blocks, each block of the first plurality of blocks and of the second plurality of blocks having a side wall formed in a stepped configuration so as to provide a projection portion on the side edge thereof,
each block of the first plurality of blocks having at least one slit having a width of more than 0.2 and less than 0.8 mm,
the slit extending between the side edges of the block, and comprising a first part, a second part and a third part,
the first part extending axially of the tire from one side edge toward the other side edge of the block,
the second part extending axially of the tires from the said other side edge toward said one side edge of the block,
the third part extending obliquely with respect to the tire axial direction to connect the first part with the second part,
the depth of the slit varied in the tire axial direction to form a shallow portion and a deep portion,
the axial length of the first part being more than 0.25 times and less than 0.48 times the total axial length of the slit,
the axial length of the second part being more than 0.25 times and less than 0.48 times the total axial length of the slit,
the ratio between the axial length of the first part to the axial length of the second part being more than 0.8 and less than 1.2,
the axial length of the third part being more than 0.04 times and less than 0.5 times the total axial length of the slit,
the circumferential length of the third part being more than 0.04 times and less than 0.5 times the total axial length of the slit,



the ratio of the depth of the deep portion of the slit to the depth of a circumferential groove which extends circumferentially of the tire to define the blocks of the first plurality of blocks, being not less than 0.6 and not more than 0.8,
the ratio of the depth of the shallow portion of the slit to said depth of the circumferential groove being not less than 0.3 and not more than 0.55,
the ratio of the axial length of the shallow portion of the slit to the total axial length of the slit being not less that 0.25 and not more than 0.4, and
each block of the first plurality of blocks having an axially extending straight wide groove which is shallower than the circumferential groove to subdivide each block into a major part and a minor part.

5,109,905
DUAL CHAMBER PNEUMATIC TIRE WITH THE CHAMBERS SEPARATED BY A COLLAPSIBLE PARTITION WALL
Donald M. Lambe, 5015 Ponvalley, Bloomfield Hills, Mich. 48013
Continuation-in-part of Ser. No. 380,860, Jul. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 154,453, Feb. 8, 1988, abandoned, which is a continuation of Ser. No. 798,839, Jan. 21, 1986, abandoned, which is a continuation of Ser. No. 284,773, Jul. 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 79,315, Sep. 27, 1979, Pat. No. 4,293,017, which is a continuation-in-part of Ser. No. 856,294, Dec. 1, 1977, abandoned. This application Nov. 8, 1990, Ser. No. 610,743
Int. Cl.[5] B60C *5/22, 17/01*
U.S. Cl. 152—342.1 **8 Claims**

1. A pneumatic tire mounted on a conventional rim, said pneumatic tire comprising:
a casing having a pair of sidewalls and a tread extending therebetween, said pair of sidewalls mounted to said conventional rim, each of said pair of sidewalls having a first predetermined thickness, said tread having a substantially flat inner surface and a second predetermined thickness;
a flexible collapsible partition wall attached to the inner surface of the tread at positions spaced immediately axially inward from outer edges of the inner surface of said tread so as to define an outer chamber and a concentric inner chamber, said partition wall having a third predetermined thickness substantially thinner than said first predetermined thickness of said pair of sidewalls and substantially thinner than said second predetermined thickness of said tread and having a width and surface area greater than the width and surface area of the tread, with said partition wall being unsupported between its edge portions so as to collapse when there is no air pressure difference between said inner and outer chambers and being elastically deformable when a pressure difference exists between said chambers;
said outer chamber having pressurized air at a first predetermined pressure and said inner chamber having pressurized air at a second predetermined pressure, said first predetermined pressure in said outer chamber being greater than said second predetermined pressure in said inner chamber so as to keep all surface areas of the sidewalls under the lower pressure of the inner chamber, and so as to arcuately and outwardly deform and hold said partition wall in a position with respect to said inner tread surface by air pressure alone, defining a toroidal shape with a first predetermined volume for said outer chamber and defining said inner chamber with a second predetermined volume substantially greater than said first predetermined volume;

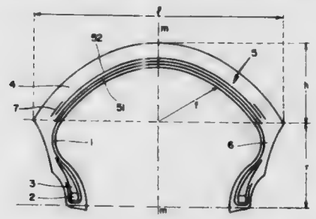


said flexible partition wall being elastically deformed to bulge further toward said inner chamber to absorb shocks transmitted through the air at the greater first predetermined air pressure in said outer chamber by an increase in surface area of said bulged partition wall subjected to the lower second predetermined air pressure in said inner chamber; and
means for inflating said outer air chamber to said higher first predetermined pressure and inflating said inner air chamber to said lower second predetermined pressure.

5,109,906
MOTOR-CYCLE TIRE HAVING BELT LAYERS WITH DIFFERENT MODULUS OF ELASTICITIES
Guido Giancola, Milan, Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Milan, Italy
Filed Apr. 14, 1989, Ser. No. 337,835
Claims priority, application Japan, Apr. 22, 1988, 63-20291
Int. Cl.[5] B60C *9/00, 9/18*
U.S. Cl. 152—536 **9 Claims**

1. A motor-cycle tire comprising:
a pair of beads at the sides of the tire for anchoring said tire to a corresponding wheel rim;
a textile carcass extending between the beads and secured thereto;
a tread-band radially outward of said carcass and having an arcuate cross-section whose height to width ratio has a value ranging between 0.20 and 0.35;

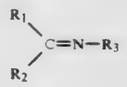
a pair of sidewalls defined substantially between the radially outer ends of the beads and the ends of the tread-band;
an annular reinforcing structure positioned between said carcass and said tread-band, and having a first strip of rubberized fabric reinforced with cords parallelly arranged with respect to each other and having a density in the range of 70–80 cords/dm and inclined at an angle ranging between 22° and 35° to the equatorial tire plane,
a second strip of rubberized fabric laid upon the first strip in a radially outer position with respect to the first strip and reinforced with cords parallelly arranged with respect to



each other and having a density of less than the density of the cords of said first strip, the cords of the second strip having an elasticity modulus lower than the elasticity modulus of the cords of said first strip and being inclined in the opposite direction with respect to the cords of the first strip and at an angle ranging between 18° and 30° with respect to the equatorial plane, said angle being smaller than the inclination angle of the cords of said first strip, an inclination difference between the cords of said first and second strips, with respect to said equatorial tire plane, ranging between 3° and 15°.

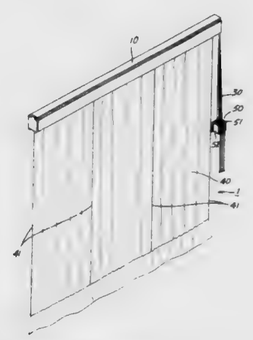
5,109,907
DIENE POLYMERS AND COPOLYMERS TERMINATED BY REACTION WITH N-ALKYL AND N-ARYL IMINES
Mark L. Stayer, Jr., Suffield; Thomas A. Antkowiak, Wadsworth; David F. Lawson, Uniontown, and Russell W. Koch, Hartville, all of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio
Division of Ser. No. 506,306. Apr. 9, 1990, Pat. No. 5,066,729.
This application Jul. 19, 1991, Ser. No. 732,851
Int. Cl.[5] B60C *9/02*
U.S. Cl. 152—564 **9 Claims**

1. A tire having reduced rolling resistance in which the tread portion of the tire is formed from an elastomer composition which comprises a terminally functionalized elastomeric polymer and rubber additives, wherein said terminally functionalized elastomeric polymer is prepared by reacting a living polymer obtained by anionic polymerization of a diene monomer or mixture of a diene monomer and a vinyl aromatic hydrocarbon monomer with a compound having the formula:



wherein R_1 and R_2 are selected from the group consisting of H, alkyl, cycloalkyl, aryl, dialkylaminoaryl, aralkyl, and aprotic O, N, and S—containing alkyl, cycloalkyl, aryl, and aralkyl groups; wherein R_3 is selected from the group consisting of alkyl, cycloalkyl, aryl, dialkylaminoaryl, aralkyl and aprotic O, N, and S—containing alkyl, cycloalkyl, aryl, and aralkyl groups; wherein R_3 is selected from the group consisting of alkyl, cycloalkyl, aryl, dialkylaminoaryl, aralkyl and aprotic O, N, and S—containing alkyl, cycloalkyl, aryl, and aralkyl groups; With the proviso that at least one of the R_1, R_2, and R_3 groups must be a dialkylaminoaryl group and that not all of the R_1, R_2 and R_3 groups can be aryl groups.

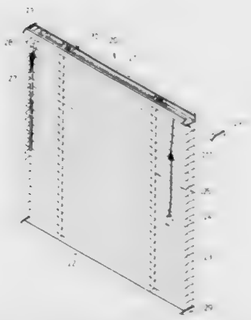
5,109,908
CURTAIN ASSEMBLY
Cheng-Hsiang Chen, No. 228, Sec. 2, Chung-Te Rd., Pei-Tun Dist., Taichung City, Taiwan
Filed Oct. 26, 1990, Ser. No. 604,975
Int. Cl.[5] E06B *9/06*
U.S. Cl. 160—84.1 **2 Claims**



1. A curtain assembly, comprising:
an elongated support member having first and second ends, a top wall, a bottom wall, two opposed side walls, and a guide path defined by said top wall, said bottom wall and said two opposed side walls, said bottom wall having a slit longitudinally formed therealong wherein said elongated support member is a rectangular frame having a pair of longitudinal protrusions, one on each side of said two opposed side walls, said pair of longitudinal protrusions being aligned with each other, said pair of longitudinal protrusions and said bottom wall defining a first guide path between them;
a pair of extension plates extending inclinedly from the underside of said bottom wall so as to form a second guide path;
a plurality of first rollers mounted in said guide path and fixed to said bottom wall;
a second roller mounted in said guide path, adjacent one end of said elongated support member;
a curtain having a top end and a bottom end, said curtain being divided into plural vertical sections and hanging from said bottom wall of said elongated support member;
a plurality of first strings attached to said curtain, extending from said bottom end toward said top end of said curtain, each of said first strings defining a boundary of at least one corresponding vertical section of the curtain;
a plurality of second strings, each having a first end and a second end, said first end of each of said plurality of second strings being respectively connected to a corresponding one of said plurality of first strings at said top end of said curtain;
a string control member comprising a plurality of control units, each control unit being operatively connected to a corresponding one of said plurality of second strings and comprising means for holding and releasing the corresponding second string;
a plurality of U-shaped frames, inserted into said first guide path, each U-shaped frame having two arms and a base portion connecting said two arms, said base portion having a semicircular opening for allowing each of said first ends of said plurality of second strings to pass through;
a plurality of plate members inserted into said second guide

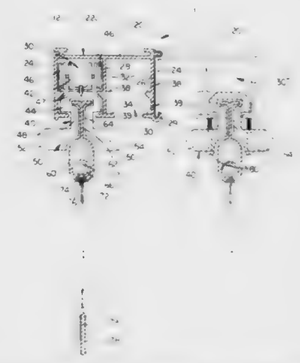
path, each cooperating to fasten a corresponding one of said U-shaped frames to said bottom wall; and
a substantially U-shaped frame in which said control units are held;
wherein each of said control units is generally square-shaped with a recess therein, a row of inclined teeth is formed in said recess of each control unit, each control unit has a third roller rotatably mounted in said recess of said control unit, and a fourth roller is provided between said third roller and said row of teeth and meshed with them, and wherein each of said second strings is releasably held between said third and said fourth rollers in the corresponding control unit; and
wherein a vertical position of a selected vertical section of the curtain may be individually adjusted by operating corresponding first and second strings.

5,109,909
VENETIAN BLIND
Amy Hong, No. 9, Jenn-Shing Lane, Fu-Nan Village, Fu-Shing Hsiang, Changhua Shiann, Taiwan
Filed May 13, 1991, Ser. No. 699,026
Int. Cl.[5] E06B *9/30*
U.S. Cl. 160—168.1 **3 Claims**



1. An improved venetian blind comprising a top rail, a bottom rail, a predetermined number of ladder tapes fastened to said top rail and said bottom rail at both ends thereof, a predetermined number of slats held on to said ladder tapes, a draw cord pulley lock set, a draw cord set, an adjusting member with a connection head attached thereto, a tilt rod, and four end caps,
said top rail and said bottom rail each respectively formed as a tube having a top, bottom, rear and front side and open ends,
said front side of said top rail and said bottom rail respectively having an upper face and a lower face integrally connected at an angle,
a width of said predetermined number of slats substantially equal to a width of said bottom side of said top rail and said top side of said bottom rail,
said draw cord pulley lock set and said connection head mounted on said lowerface of said front side of said top rail with the respective axis of said draw cord pulley lock set and said connection head located at an angle to said lower face,
wherein, when said venetian blind is drawn closed said draw cord pulley lock set and said connection head are positively spaced away from said slats.

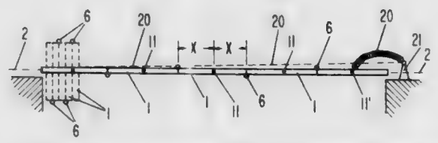
5,109,910
VERTICAL CURTAIN PANEL ASSEMBLY
Osmar Tortorella, and Yolanda Tortorella, both of 10521 SW. 157th Pl., Apt. No. 108, Miami, Fla. 33196
Filed Sep. 16, 1991, Ser. No. 760,682
Int. Cl.[5] E05D *15/06*
U.S. Cl. 160—197 **7 Claims**



1. A vertical curtain panel assembly for providing a decorative privacy barrier comprising:
an elongate frame structure including at least one frame unit having a top plate, two opposite longitudinal side walls and a longitudinal center wall equally spaced between said opposite side walls in parallel relation thereto,
said frame unit further including a pair of channels each defined between a respective of said side walls and said center wall,
each of said channels including an upper track and a lower track,
means on said side walls for attachment of an adjacent frame unit so as to add adjacent channels to the assembly,
a plurality of carriers each structured and disposed for receipt within one of said channels and including one pair of fixed carriers secured within a respective one of said channels and a plurality of movable pairs of carriers, each pair of movable carriers being movably fitted within a respective one of the remaining adjacent channels,
roller means on said movable carriers to allow movement thereof along a length of said upper and lower tracks in said channels,
each of said plurality of carriers including a lower portion fitted within said lower track and extending outwardly from an opening along said channels,
said carriers each including a wing structure including a pair of oppositely disposed transverse wings extending outwardly from said lower portion of each of said carriers exteriorly of said channels, said wings being structured and disposed to engage corresponding wings on adjacently positioned carriers in the adjacent channels,
a plurality of elongate panel holders each connected near opposite ends and extending between one of said respective pairs of said carriers within a respective one of said channels, such that said panel holder is supported in substantially parallel, spaced relation below the channel along a portion of a length thereof,
a plurality of vertical panels each attached along a top edge to a respective one of said panel holders and extending downwardly therefrom, and
means for pulling a first pair of said movable carriers along the respective channel wherein continued advancement results in engagement of said wing structure on a trailing one of said first pair of movable carriers with the wing structure on a next adjacent leading carrier in a second pair of carriers in the adjacent channel, continued ad-

vancement of said carriers terminating upon engagement of the wing structure on said fixed pair of carriers with the wing structure on an adjacent pair of movable carriers.

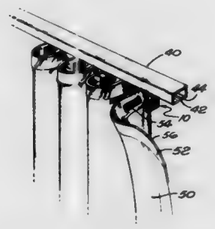
5,109,911
ACCORDION DOOR
Karlheinz Bockisch, Engelbosteler Damm 116-126, 3000 Hannover 1, Fed. Rep. of Germany
Filed Jul. 24, 1991, Ser. No. 734,894
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1990, 4023440; May 13, 1991, 9105891[U]
Int. Cl.[5] E05D *15/26*
U.S. Cl. 160—199 **12 Claims**



1. An accordion door that is suspended from a horizontal rail, comprising:

individual sections that are each pivotable about a respective vertical axis that is centrally disposed relative to a width dimension of said section, with each of said vertical pivot axes being in the form of a pin that is mounted on said section and is also mounted on a horizontal support member that on a side thereon remote from said pin has three guide rollers, two on one side of said rail and the third on the other side of said rail, with each of said guide rollers having a vertical axis of rotation, wherein said vertical axes of rotation of said guide rollers are disposed in the corners of an imaginary triangle, with said rail being a guide rail having longitudinal sides that are tapered and engage with complimentarily shaped outer peripheries of said guide rollers, and with each of said sections essentially comprising an expanded plastic core that is provided with panels on opposite sides.

5,109,912
DRAPERY SYSTEM
Leonard Gary, 219 Avenue H, Redondo Beach, Calif. 90277
Filed Oct. 24, 1988, Ser. No. 261,591
Int. Cl.[5] A47H *1/00*
U.S. Cl. 160—330 **15 Claims**

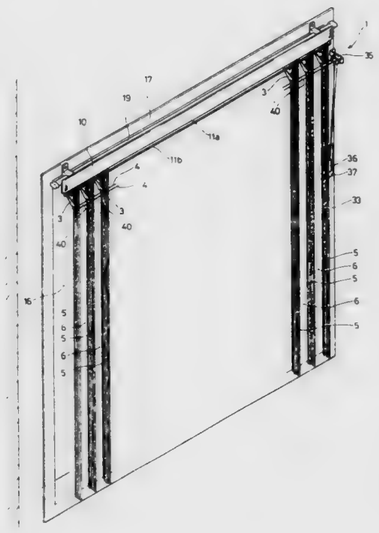


1. A drapery carrier member comprising:

a plate, said plate having two principal surfaces, a respective strip of Velcro fastening tape secured to each of said principle surfaces; and

a spool shaped head, said head having a central rod connected to a flange at each of its opposite ends, said head being connected to an edge of said plate at one of said flanges.

5,109,913
METHOD OF OPENING AND CLOSING STRIP CURTAIN AND APPARATUS THEREFOR
Kuniharu Kazuma, 32-banchi, Dai 95-go, Ayukawa-cho, Fukuishi, Fukui-ken, Japan
Filed Aug. 20, 1990, Ser. No. 570,086
Claims priority, application Japan, Aug. 18, 1989, 1-213166; Jul. 5, 1990, 2-71591[U]
Int. Cl.[5] A47H *1/00*
U.S. Cl. 160—332 **10 Claims**



1. An opening and closing apparatus for a strip curtain comprising:

a plurality of parallel, elongated hanging strips (**7**) arranged vertically, each of said strips having a flexible portion at least at an upper portion of said hanging strips,

a connecting member (**10**) for connecting the hanging strips (**7**) at the upper portion of said hanging strips to form a strip curtain having a front side and a reverse side,

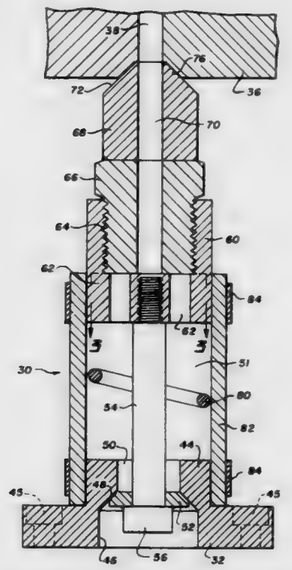
a plurality of rigid operating members (**3**, **3'**) arranged at an upper end portion of the strip curtain (**2**) and interposed among the hanging strips (**7**) having an interval of a predetermined distance with a predetermined number of strips therebetween, each said operating member (**3**, **3'**) being provided with a hanging portion (**23**, **23'**) with a lower end of each said operating member including front projections (**25**, **25'**) and reverse projections (**26**, **26'**) which project from said front side and said reverse side of the strip curtain (**2**),

said connecting member (**10**) including a holding means (**11***b*),

each said operating member (**3**, **3'**) being attached at their upper end portion to said holding means in such a manner that the operating member (**3**, **3'**) is swingable or tiltable in a direction of alignment of the hanging strips (**7**), and

operating connection means (**4**, **4'**) for connecting tip ends of the front projections (**25**, **25'**) of the operating members (**3**, **3'**) to one another and also tip ends of the reverse projections (**26**, **26'**) of the operating members (**3**, **3'**) to one another.

5,109,914
INJECTION NOZZLE FOR CASTING METAL ALLOYS WITH LOW MELTING TEMPERATURES
Thomas F. Kidd, Toledo, Ohio; Stephen A. Thompson, St. Bruno, and Guiseppe Paduano, Montreal, both of Canada, assignors to Electrovert Ltd., Laprairie, Canada
Filed Sep. 4, 1990, Ser. No. 578,835
Int. Cl.[5] B22D *37/00*
U.S. Cl. 164—113 **21 Claims**



1. In an apparatus for casting metal alloys with low melting temperatures, the improvement of a nozzle in a transfer line for joining to a die, comprising:

a base for connection to the transfer line;

valve means in the base to open and close the nozzle;

a nozzle body associated with the valve means, adapted to move relative to the base, and having spring means to retain the valve means closed;

sleeve means joining the base and the nozzle body to provide a passage for liquid metal alloy therethrough;

a connector positioned on the nozzle body to provide an interface connection between the transfer line and the die, and adapted to open the valve means when the connector interfaces with the die;

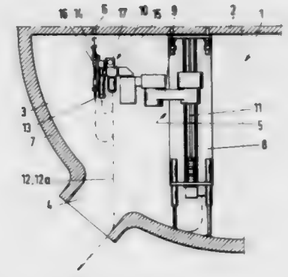
the sleeve means being formed of a flexible material capable of withstanding the temperature and the pressure of the liquid metal alloy to permit misalignment in the interface connection for the die.

19. In a method of casting metal alloys with low melting temperatures, wherein liquid metal alloy flows through a transfer line into a movable die, the improvement comprising the steps of:

providing a nozzle having valve means therein and sleeve means formed of flexible component that permits lateral and direct misalignment when the nozzle interfaces with the die; and

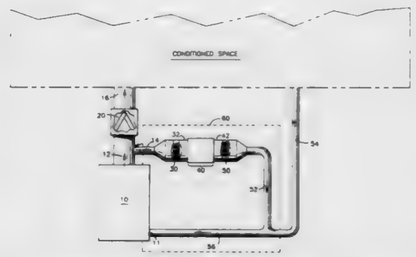
feeding liquid metal alloy to the nozzle, the valve means in the nozzle being closed when the nozzle does not interface with the die, and open when the nozzle interfaces with the die.

5,109,915
TOOL AND INSPECTION-INSTRUMENT CARRIER FOR AN APPARATUS FOR EXAMINING OR REPAIRING A STEAM GENERATOR
Boris Osusko, Bad Schönborn, Fed. Rep. of Germany, assignor to ABB Reaktor GmbH, Mannheim, Fed. Rep. of Germany
Filed Oct. 17, 1989, Ser. No. 422,655
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1988, 8813215[U]
Int. Cl.[5] F22B *37/10*; **F16L** *55/18*; **B25J** *11/00*
U.S. Cl. 165—11.2 **3 Claims**



1. In an apparatus disposed below a tube plate in a chamber of a steam generator accessible through a manhole for examining and/or repairing steam-generator tubes in the tube plate, a tool or inspection-instrument carrier, comprising a pneumatic swivel cylinder detachably connected to the apparatus, said swivel cylinder having a housing and an output shaft, a feed unit supported on said output shaft, a flexible shaft being axially movable by said feed unit, and a compressed-air motor associated with said housing for driving said flexible shaft.

5,109,916
AIR CONDITIONING FILTER SYSTEM
Joseph L. Thompson, Knoxville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Oct. 31, 1990, Ser. No. 607,008
Int. Cl.[5] F24F *3/14*, *7/00*
U.S. Cl. 165—59 **6 Claims**



1. An improved air circulation system of the type have a return air duct for fluidly interconnecting a conditioned space with a blower for circulating the air, and a discharge duct for conducting the flow air from the blower to the space, wherein the improvement comprises;

a by-pass duct interconnecting the discharge duct to the return air duct such that a portion of the air flowing through the discharge duct can be returned to the blower;

a filter disposed in said by-pass duct for removing contaminants from the air flowing from said by-pass duct 9, wherein said filter is a chemical type filter whose performance is degraded by the existence of moisture in the air flowing therethrough; and

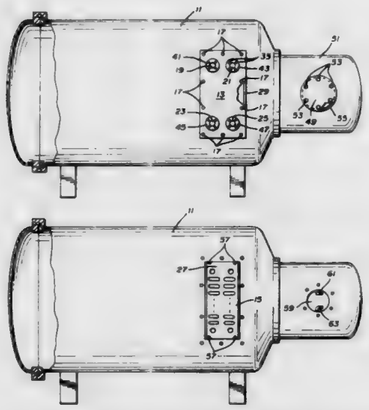
a heat exchanger coil placed in the discharge duct at a point downstream from the point at which said by-pass duct interconnects with said discharge duct.

5,109,917

MAINTENANCE ARRANGEMENT FOR A FURNACE

Fred W. Ripley, Perkasie, Pa., assignor to Vacuum Furnace Systems Corporation, Souderton, Pa.

Filed Mar. 11, 1991, Ser. No. 667,269
Int. Cl.[5] F28D *1/06*
U.S. Cl. 165—75 **4 Claims**



1. A vacuum furnace arrangement comprising in combination:

vacuum furnace chamber means having sidewall means and having aperture means formed in said sidewall means;

movable heat exchanger means disposed in said vacuum furnace chamber means in close proximity to said aperture means; guide means disposed in close proximity to said aperture means and formed to enable said movable heat exchanger means to be moved into and out of said vacuum chamber means through said aperture means;

cover plate means formed to fit over said aperture means;

sealing means formed to fit with said cover plate means and disposed to form sealed edges in response to said cover plate means being secured to said vacuum furnace chamber means; and means to secure said cover plate means to said vacuum furnace chamber means.

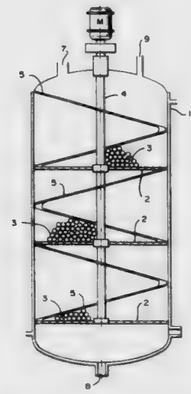
5,109,918

DEVICE FOR THE THERMAL TREATMENT OR ORGANIC AND INORGANIC SUBSTANCES

Hans Huschka, Hanau; Joerg Demmich, Wuerzburg, and Paul-Gerhard Maurer, Neuberg, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Alzenau, Fed. Rep. of Germany

Filed Jun. 8, 1990, Ser. No. 534,498
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1989, 3918718
Int. Cl.[5] F28D *15/00*
U.S. Cl. 165—104.18 **4 Claims**

1. A device for the thermal treatment of solid and sludge-like organic substances and of inorganic substances contaminated with organic substances, comprising an upright cylindrical reactor which is filled with ceramic or metal balls and is provided with an agitator for moving the balls in a radial and an axial direction, characterized in that the balls are distributed over several plates (2) arranged at intervals above each other



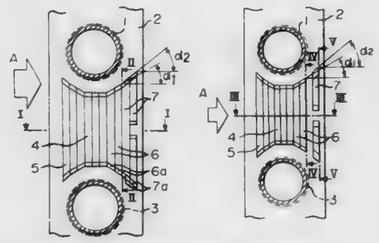
which contains at least one perforation permeable to gases and fine solid particles.

5,109,919

HEAT EXCHANGER

Kiyoshi Sakuma; Takayuki Yoshida; Tomohumi Tezuka; Katsuyuki Aoki; Makoto, all of Yamada, Shizuoka; Masao Hujii, and Ken Morinushi, both of Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 373,284, Jun. 29, 1989, abandoned.
This application Mar. 20, 1991, Ser. No. 671,645
Claims priority, application Japan, Jun. 29, 1988, 63-161298
Int. Cl.[5] F28D *1/04*; F28F *1/32*
U.S. Cl. 165—151 **6 Claims**



1. A fin-and-tube heat exchanger comprising:

at least one fin plate;

heat exchanger tubes having portion extending through the fin plate;

a plurality of fin collars formed in the plate, having the tube portions extended therethrough for thermally connecting the tube to the plate; and

a plurality of louvers provided at both surfaces of the plate between adjacent collars and extending from the plate in a direction transverse to an initial flow direction of a fluid so as to project from the surfaces, said initial flow direction being substantially parallel to the plate and transverse to the length of said louvers;

wherein the louvers are provided so as to surround the tube portions such that at least three adjacent louvers immediately border one another without any intervening unlouvered portions, except in areas nearest to the collars, the louvers are in parallel with one another and project alternately from both surfaces of the plate such that each of said louvers projects from a surface of said plate opposite to a surface from which project the louvers adjacent thereto, at least one first louver which is located at a trailing edge side in the fluid flow direction and at a position near to a line of the tube bank connecting centers of said fin collars is longitudinally extended so as to be positioned along the collars and has opposite rising ends extending from the plate slanted toward the corresponding tube portions at a first angle of substantially 35 deg to the initial flow direction of the fluid, and at least two further louvers projecting from opposite surfaces of said plate, which louvers are parallel to said at least one first louver and are located at a position nearest to the trailing edge are also longitudinally extended and have opposite rising ends extending from the plate slanted toward the corresponding tube portions at a second angle of greater than 35 deg to the initial flow direction of the fluid, wherein a difference between the first angle and the second angle is 35 deg or below.

5,109,920

METHOD OF MANUFACTURING HEAT EXCHANGERS

Albert E. Merryfull, St. Ives, Australia, assignor to Ice-Cel Pty. Limited, Australia

PCT No. PCT/AU88/00159, § 371 Date Jan. 2, 1990, § 102(e) Date Jan. 2, 1990, PCT Pub. No. WO88/09261, PCT Pub. Date Dec. 1, 1988
PCT Filed May 25, 1988, Ser. No. 439,384
Claims priority, application Australia, May 25, 1987, PI 2096
Int. Cl.[5] F28D *1/04*
U.S. Cl. 165—163 **20 Claims**

1. A method of manufacturing a heat exchanger element comprising the steps of:

a) extruding a tube of deformable plastic material.

b) winding the tube prior to curing to form a continuous spiral of tubing lying substantially in a plane;

c) engaging the spiral of tubing along the length of at least one spacer bar in order to maintain the spacing of the spiral of tubing within said plane;

d) disposing a plurality of spirals of tubing one above the other; and

e) arranging one end of each spiral of tubing in communication with an inlet manifold and the other end in communication with an outlet manifold.

12. A heat exchanger element of the type which exchanges heat between a fluid circulating in the element and a phase-change medium in a reservoir, the element comprising:

a) a plurality of spirals of flexible tubing disposed one above the other, one end of each spiral being in communication with an inlet manifold and the other end in communication with on outlet manifold; and

b) at least one spacer bar being notched along its length with notches of a size commensurate with the outer diameter of the tubes of said spirals such that each tube is engaged along the length of said spacer bar in order to maintain the tube in planar space relation.

19. A heat exchanger comprising a reservoir into which is secured a heat exchange element according to claim **12**.

5,109,921

CONTROLLED WEAK POINT FOR WIRELINE CABLE

Luis Aracena, Maturin, Venezuela, assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 29, 1991, Ser. No. 693,986
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—65.1 **16 Claims**

1. A controllable break device for use in interconnection with wireline cable and cable head comprising:

an upper sleeve section that is secured to said cable while leading a length of cable axially therethrough;

a lower sleeve section slidingly engaged with a portion of said upper sleeve section and receiving the length of cable axially therethrough for being secured to the cable head;

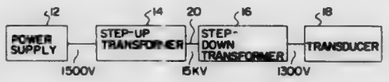
an inner tube having upper and lower ends extending axially within said upper and lower sleeve sections, said inner tube carrying the cable therethrough;

mandrel means receiving the inner tube therethrough and having upper and lower ends extending between said upper and lower sleeve sections; first shear pin means securing the mandrel means lower end to the lower sleeve section;

second shear pin means securing the inner tube upper end to said upper sleeve section; and

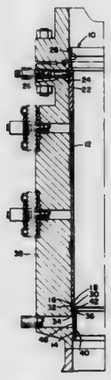
limit sleeve means disposed coaxial to said mandrel means and extending between the upper and lower sleeve sections, said limit sleeve means coacting selectively with said mandrel means to allow parting of said first shear pin means upon a predetermined amount of cable tension, and subsequent parting of said second shear pin means upon release of cable tension to allow separation of the upper and lower sleeve sections.

5,109,922
ULTRASONIC ENERGY PRODUCING DEVICE FOR AN OIL WELL
Ady A. Joseph, 100 N. Harper Ave., Los Angeles, Calif. 90048
Filed Mar. 9, 1990, Ser. No. 490,876
Int. Cl.[5] E21B *43/25*
U.S. Cl. 166—65.1 **7 Claims**



1. An ultrasonic energy producing device for reducing the viscosity of oil in an oil well, comprising:
an electroacoustic ultrasonic energy transducer for converting an alternating electrical power signal at a selected voltage into ultrasound energy, said transducer being arranged to be disposed in acoustic communication with oil present in the well;
a power supply for producing alternating electrical power at a voltage substantially higher than the selected voltage, said power supply being arranged to be disposed at ground level adjacent the well;
electrical conductor means of a length sufficient to extend from ground level to at least the level of oil in the well for conducting alternating electrical power from said power supply to said transducer;
a step-up transformer connected between said power supply and an input end of said conductor means for stepping up the voltage of the power produced by said supply; and
a step-down transformer arranged to be disposed in physical proximity to said transducer and to be connected in series between an output end of said conductor means and said transducer.

5,109,923
WELLHEAD BOWL PROTECTOR
Bashir M. Koleilat, 17826 Mahogany Forest, Spring, Tex. 77379
Filed Apr. 11, 1991, Ser. No. 683,937
Int. Cl.[5] E21B *17/10*
U.S. Cl. 166—117 **7 Claims**



1. A well tool for protecting the bore of a wellhead and for providing a seat in the wellhead to support a pipe hanger therein, said tool comprising an assembly of:
a) an elongated, sleeve-like bowl protector having means for connection to a pipe string for running said protector into and retrieving it from a wellhead;
b) an annular false bowl having support means on its outer surface for cooperation with an annular seat in a wellhead bore to support said false bowl in said bore, and seat means on the inner surface of said false bowl for supporting a pipe hanger thereon; and
c) means releasably connecting the bowl protector to the false bowl and being releasable upon exertion of a predetermined axial force on the bowl protector while the false bowl is held stationary.

5,109,924
ONE TRIP WINDOW CUTTING TOOL METHOD AND APPARATUS
Rainer Jürgens, and Dietmar Krehl, both of Celle, Fed. Rep. of Germany, assignors to Baker Hughes Incorporated, Houston, Tex.
Filed Dec. 17, 1990, Ser. No. 628,235
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1989, 3942438
Int. Cl.[5] E21B *7/08, 29/06*
U.S. Cl. 166—117.5 **9 Claims**

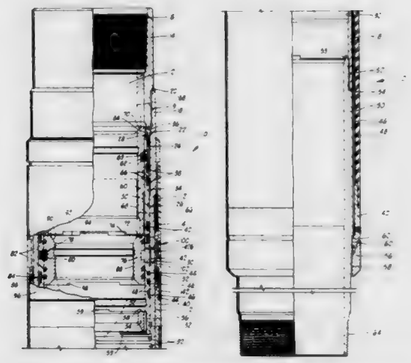


1. A device for drilling a deflection hole or window from a drill hole in underground rock or geologic formations, said device comprising a deflection wedge unit mountable via a packer in the drill hole, and a pilot cutting tool mounted to the lower end of a drill string, said drill string including a conically shaped deflection guide along said drill string behind said tool, said guide cooperating with a deflection ramp formed proximate the upper end of the deflection wedge unit which deflects the guide and thereby the tool in order to initiate the window cutting process, said deflection wedge unit eventually guiding said tool and said drill string including one or more later cutting tools.

5,109,925
MULTIPLE STAGE INFLATION PACKER WITH SECONDARY OPENING RUPTURE DISC
Lee W. Stepp, Comanche; Richard L. Giroux; Joseph B. Crump, both of Duncan, all of Okla., and Jerome F. Borges, Chesterfield, Mo., assignors to Halliburton Company, Duncan, Okla.
Filed Jan. 17, 1991, Ser. No. 642,491
Int. Cl.[5] E21B *33/126, 33/14*
U.S. Cl. 166—184 **20 Claims**

1. An inflatable packer apparatus for use in a well bore, said packer comprising:
case means for connecting to a casing string and defining a port therethrough;
inflatable packing means, connected to said case means and in communication with said port, for sealingly engaging the well bore when inflated; and

rupture means upstream of said inflatable packing means for rupturing in response to a predetermined pressure after



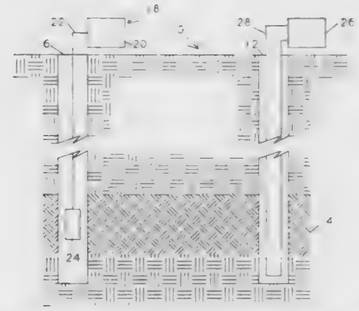
inflation of said packing means and thereby placing said port in communication with a well annulus.

5,109,926
WELLBORE PACKER WITH SHEARABLE ANTI-ROTATION LOCKING MEMBER
Rustom K. Mody; Vel Berzin, both of Houston; Randle E. Ford, Kingwood, and James C. Burtner, III, Spring, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.
Filed Nov. 12, 1990, Ser. No. 612,604
Int. Cl.[5] E21B *33/127*
U.S. Cl. 166—187 **28 Claims**



1. An inflatable packing tool for use in a subterranean wellbore when coupled to a wellbore conduit with a central bore for directing pressurized fluid in said wellbore, comprising, in combination:
a central tubular body for directing fluid in said wellbore, defining a central longitudinal axis;
upper and lower stationary collar members secured to said central tubular body for coupling said central tubular body to said wellbore conduit;
an annular inflatable packing element surrounding said central tubular body, including a flexible fluid-tight sleeve covered by a plurality of overlapping and axially extending reinforcing ribs;
a slidable sleeve assembly coupled to one end of said annular inflatable packing element;
a locking means for fixing the position of said slidable sleeve assembly during a deflated running mode to prevent:
a) axial movement of said slidable sleeve assembly relative to said central tubular body;
b) rotational movement of said slidable sleeve assembly relative to said central tubular body; and
c) twisting of said plurality of overlapping and axially extending reinforcing ribs out of axial alignment with said central longitudinal axis of said central tubular body;
a valve means for inflating said annular inflatable packing element with pressurized fluid from said wellbore conduit during an inflation mode; and
whereby said annular inflatable packing element is prevented from inadvertent inflation during said running mode as said inflatable packing tool is lowered in said wellbore, and said plurality of overlapping and axially extending reinforcing ribs are prevented from twisting out of axial alignment in response to rotational forces and damaging said annular inflatable packing element, and especially from damaging said flexible fluid-tight sleeve of said annular inflatable packing element.

5,109,927
RF IN SITU HEATING OF HEAVY OIL IN COMBINATION WITH STEAM FLOODING
Irwin R. Supernaw, P.O. Box 430, Bellaire, Tex. 77402-0430, and Kerry D. Savage, 9130 Olathe, Houston, Tex. 77055
Filed Jan. 31, 1991, Ser. No. 648,691
Int. Cl.[5] E21B *43/24*
U.S. Cl. 166—248 **7 Claims**



1. A method for producing hydrocarbons from a subterranean formation comprising the steps of:
penetrating the formation with a plurality of bore holes in a patterned array;
lowering into at least one of said bore holes RF generating means capable of penetrating the formation with RF energy in a narrow vertical but wide horizontal bend and preheating only the lower portion of the adjacent formation by application thereto of said RF energy independent of any other RF source; and
flooding the preheated area of the formation with steam.

5,109,928
METHOD FOR PRODUCTION OF HYDROCARBON DILUENT FROM HEAVY CRUDE OIL
Malcolm T. McCants, 2400 Augusta, Suite 260, Houston, Tex. 77057
Filed Aug. 17, 1990, Ser. No. 569,020
Int. Cl.[5] E21B *43/40*
U.S. Cl. 166—266 **32 Claims**

1. A method of producing a hydrocarbon diluent from a

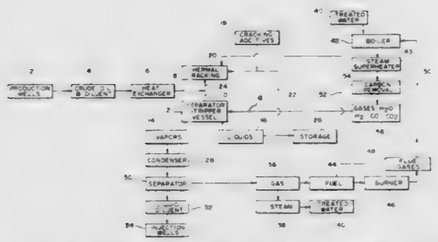
heavy crude oil extracted from an underground petroleum formation via a production well comprising the steps of:

a) preheating a quantity of heavy crude oil extracted from the production well to yield a heated crude oil;

b) separating in a separator vessel by flashing the heated crude oil to produce a first vapor fraction and a first liquid fraction;

c) thermally cracking in a cracking unit at least a portion of the first liquid fraction to produce a first liquid effluent;

d) quenching the first liquid effluent;



e) introducing at least a portion of the quenched fist liquid effluent into a separator;

f) condensing the first vapor fraction;

g) separating in a separator vessel the condensed vapor fraction to produce a liquid hydrocarbon diluent middle fraction characterized in having a boiling range between about 400°–700° F. and a gas; and,

h) directing the liquid hydrocarbon diluent into the formation via an injection well for enhancing production of petroleum from the formation via the production well.

5,109,929

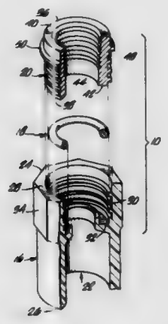
SPRINKLER HEAD ADAPTER

Robert W. Spears, Agua Dulce, Calif., assignor to Spears Manufacturing Corp., Sylmar, Calif.

Filed Sep. 7, 1990, Ser. No. 579,306

Int. Cl.[5] A62C *35/00*

U.S. Cl. 169—16 **13 Claims**



1. An adapter comprising:

(a) a plastic fitting having a bore extending from a first end to a second end of the fitting, a first part of the bore proximate to the first end being threaded and a second part of the bore proximate to the second end being unthreaded, the diameter of the threaded bore being substantially constant, the second end of the fitting being sized for receiving a plastic pipe, the fitting comprising means disposed in the bore of the fitting between the threaded and unthreaded parts of the bore for preventing intrusion of the plastic pipe into the threaded part of the bore;

(b) a metal insert having,

(i) a passageway extending from a first opening to a second opening of the insert, at least part of the passageway being threaded, the threaded passageway tapering inwardly in a direction from the first to the second opening,

(ii) at least part of the external surface of the insert being threaded with threads corresponding to the threads of the fitting, the diameter of the externally threaded insert being substantially constant, and

(iii) a stop flange adjacent the external threads of the insert; and

(c) a gasket disposed in the bore of the fitting between an end wall of the second opening of the insert and the fitting,

wherein the threaded bore of the fitting and the external threads of the insert are engaged by screwing the second opening of the insert into the first end of the fitting until the stop flange prevents further insertion of the insert.

5,109,930

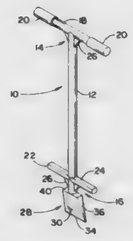
EARTH SPLITTER

Dennis K. Napier, 6057 Dayburst Way, Sacramento, Calif. 95823

Filed Aug. 10, 1990, Ser. No. 565,955

Int. Cl.[5] A01B *1/00*; **A01G** *3/06*

U.S. Cl. 172—13 **6 Claims**



2. A hand and foot-powered earth splitting tool, comprising:

a. an elongate, rigid central shaft having upper and lower ends;

b. a handle bar integral with and perpendicular to said central shaft at said central shaft's upper end, said central shaft bisecting the length of said handle bar;

c. a foot pressure bar integral with and perpendicular to said central shaft near said central shaft's lower end, said central shaft bisecting the length of said foot pressure bar, said foot pressure bar, further, resisting in the same plane as said handle bar; and,

d. a blade disposed at said central shaft's lower end, said blade being shaped as a wedge having first and second quadrangular primary faces, third and fourth triangular side faces, and a fifth quadrangular butt face integrally mated with said central shaft's lower end and having at width substantially the same as the thickness of said central shaft, wherein one of said primary faces of said blade is disposed at a right angle to said butt face, and wherein the other of said primary faces is disposed at an acute angle to said butt face, said primary faces having common lower peripheries defining a cutting edge.

5,109,931

TRACTOR DRAWBAR HITCH

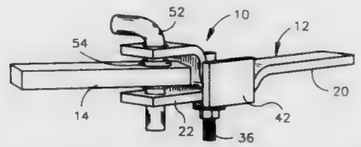
Charles J. Goll, RFD 2, Box 167, Marthasville, Mo. 63357

Filed Apr. 24, 1991, Ser. No. 690,636

Int. Cl.[5] B60D *1/00*

U.S. Cl. 172—248 **11 Claims**

1. A tractor drawbar and hitch for receiving a tongue of an implement, said implement being adapted to be connected to an implement connecting pin receiving hole in said drawbar, said hitch comprising a hitch member having means for pivotally connecting it to said hole in said drawbar for rotary movement about a vertical axis between an engaged hitch position in which an implement connecting pin receiving hole in the hitch member is in registry with the pin receiving hole in said drawbar and a disengaged position to clear said hitch member hole from registry with said drawbar hole and a lock member pivotally connected to said hitch member for rotary movement about a horizontal axis, said lock member being moveable between a locked position in engagement with the drawbar to lock said hitch member and an unlocked position in disengagement with the drawbar to free the hitch member for said rotary movement between said engaged and disengaged positions.



5,109,932

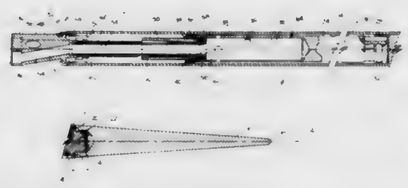
IMPACT BORER, CONNECTOR FOR EMBEDDING LINES, ANCHORING CABLES, AND SINKING WELLS

John C. Bueter, Fort Wayne; Randall T. Fields, Monroeville; Martin D. Chandler; Frederick W. Neuls, both of Roanoke, and Harry P. Laffkas, Fort Wayne, all of Ind., assignors to Industrial Engineering, Inc., Fort Wayne, Ind.

Filed Dec. 10, 1990, Ser. No. 625,080

Int. Cl.[5] E21B *7/06*

U.S. Cl. 173—17 **10 Claims**



1. An impact borer comprising an elongated shell with a longitudinal bore extending therethrough, said shell and said bore having opposite ends, an anvil secured to one of said shell ends and closing one of said bore ends, a ram positioned within said bore and being reciprocally slideable therein against and away from said anvil, a director secured to said shell at said other of said shell ends closing said bore at said other bore end, said ram and director dividing said bore into front, rear and ram chambers, said director isolating said front and rear chambers in alternation upon reciprocation of said ram, said director defining an inlet passage communicating with said ram chamber and an outlet passage communicating with said rear chamber, said ram having a tubular bore therein, said ram bore having opposite ends and being closed at one of said opposite ends adjacent said anvil, said director includes a manifold, an inlet tube and a guide, said guide being positioned within said ram bore, said inlet tube extending from said manifold into said ram bore through an opening at said other ram end, said guide being stationary with respect to said shell, said ram being reciprocally slideable in relation to both said guide and said shell, said inlet tube having a distal end, said inlet tube being pivotally attached to said guide adjacent to said distal end to allow said guide to align itself with said ram upon reciprocation and to accommodate misalignment of said inlet tube and guide.

5,109,933

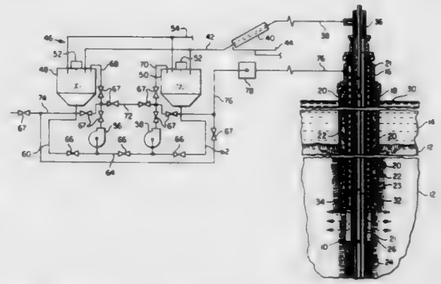
DRILL CUTTINGS DISPOSAL METHOD AND SYSTEM

James E. Jackson, Pearland, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 17, 1990, Ser. No. 569,351

Int. Cl.[5] E21B *21/06*; **B09B** *5/00*

U.S. Cl. 175—66 **14 Claims**



12. A system for producing a slurry of finely ground drill cuttings and a carrier liquid suitable for injection into an earth formation and the like and wherein said drill cuttings are produced during drilling operations from a drill cuttings/drilling fluids separation means, said system comprising:

receiving means for receiving a quantity of said drill cuttings;

means for conducting said drill cuttings to said receiving means;

means for conducting said carrier liquid to said receiving means;

conduit means in communication with said receiving means for discharging a mixture of said drill cuttings and said carrier liquid from said receiving means; and

a centrifugal pump connected to said receiving means for reducing the particle size of said drill cuttings so that a slurry of said drill cuttings and said carrier liquid may be prepared for injection into said space.

14. A method for disposing of solids particles including earth particles into an earth formation comprising the steps of;

providing a wellbore penetrating said earth formation and forming with said earth formation a space for receiving a slurry of said solids particles and a carrier liquid;

providing a system for generating a slurry formed of said solids particles and said carrier liquid, said system including means for reducing the particle size of said solids particles and means for conducting said slurry to an injection pump for injecting said slurry into said space;

mixing said solids particles with said carrier liquid;

reducing the particle size of said solids particles by shearing action on said solids particles to form a viscous fluid comprising said slurry; and

conducting said slurry to said injection pump and injecting said slurry into said space.

5,109,934

MOBILE DRILLING RIG FOR CLOSELY SPACED WELL CENTERS

David A. Mochizuki, Anchorage, Ala., assignor to Nabors Industries, Inc., Houston, Tex.

Filed Feb. 13, 1991, Ser. No. 654,754

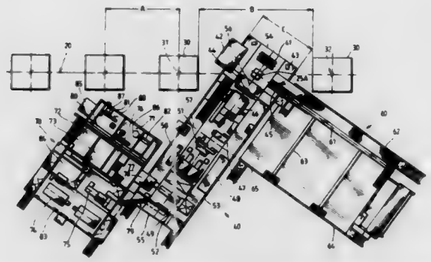
Int. Cl.[5] E21B *7/02*

U.S. Cl. 175—170 **10 Claims**

1. An enclosed modular drilling apparatus comprising:

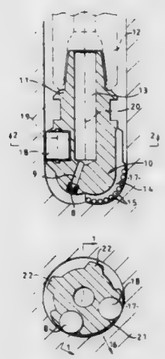
(a) a first self-propelled carrier having a first end, second end, major axis and minor axis, the first end positionable over a well, the carrier supporting a mast, drill pipe,

power supply, and power delivery means for delivering torque from the powe supply to the drill pipe;
(b) a second trailer-mounted carrier adapted to store pipe and having pipe conveyor means interconnectable with the first carrier for delivering pipe to the first carrier; and



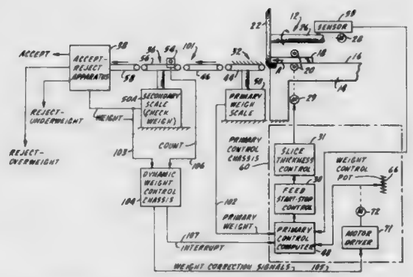
(c) a third trailer-mounted carrier having drilling mud delivery means interconnectable with the first carrier for delivering drilling mud to the first carrier, the third carrier positionable adjacent the second end of the first carrier rearwardly of the minor axis of the first carrier.

5,109,935
ROTARY DRILL BITS
Leslie R. Hawke, Stroud, England, assignor to Reed Tool Company Limited, Stonehouse, England
Filed Nov. 21, 1990, Ser. No. 616,636
Claims priority, application United Kingdom, Nov. 25, 1989, 8926689
Int. Cl.[5] E21B *10/46*
U.S. Cl. 175—434 **4 Claims**



1. A rotary drill bit comprising a bit body having a shank for connection to a drill string and a passage for supplying drilling fluid to the face of the bit, which carries a plurality of preform cutting elements each formed, at least in part, from polycrystalline diamond, the bit including means to apply a resultant lateral force to the bit as it rotates in use, and the gauge of the bit body including at least one low friction bearing means so located as to transmit said resultant lateral force to the part of the formation which the bearing means is for the time being engaging, the low friction bearing means including at least two rollers each mounted on the bit body for rotation about an axis lying in a plane containing the central axis of rotation of the bit and disposed so that a portion of the periphery of each roller engages the formation as the bit rotates and transmits a part of the resultant lateral force to the formation, wherein the axes of rotation of the two rollers are angularly spaced apart on the forward and rearward sides, respectively, with respect to the normal direction of forward rotation of the drill bit while drilling, of the direction of said resultant lateral imbalance force, in a plane transverse to the longitudinal axis of the drill bit, and wherein the axis of rotation of the roller on the forward side of the lateral imbalance force is angularly spaced from said direction by a lesser angle than is the axis of rotation of the roller on the rearward side of said direction.

5,109,936
DYNAMIC WEIGHT CONTROL SYSTEM
Robert F. Ruppel, Glen Cove, N.Y., assignor to Cahin Systems Corporation, Mokena, Ill.
Continuation-in-part of Ser. No. 373,091, Jun. 28, 1989, abandoned. This application Oct. 30, 1990, Ser. No. 605,736
Int. Cl.[5] G01G *19/40, 19/52*
U.S. Cl. 177—25.19 **30 Claims**

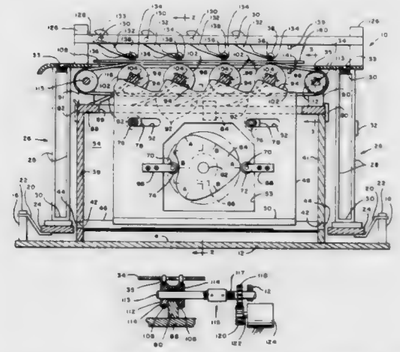


1. A method of controlling the slicing of a food product comprising the following steps:
A. recording a target weight and a related control weight for a multi-slice draft of the product;
B. advancing a food product into a slicing station at a predetermined feed rate;
C. slicing the food product, in the slicing station, to produce a series of multi-slice product drafts;
D. adjusting the feed rate of step B, when necessary, during slicing of each draft, to maintain the total weight of most of the drafts within a preselected permissible weight range above and below the control weight;
E. weighing each draft after its completion;
F. counting the number N of acceptable drafts, in a predetermined sample number of S drafts, that are within an acceptable weight range above and below the target weight;
G. computing an actual pass ratio N/S;
H. adjusting the target weight downwardly by a target weight reduction increment when the actual pass ratio of step G exceeds a pre-recorded desired pass ratio;
I. determining the average weight of the actual acceptable drafts in the sample of step F;
J. comparing the adjusted target weight of step H with the average weight of step I to determine the difference therebetween; and
K. adjusting the control weight in accordance with the difference from step J.

5,109,937
TRANSPORT MECHANISM FOR A WEIGHING SCALE
Frederick M. Kipp, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.
Filed Dec. 21, 1990, Ser. No. 631,548
Int. Cl.[5] G01G *19/00, 3/14, 21/00;* **B65G** *15/00*
U.S. Cl. 177—145 **13 Claims**

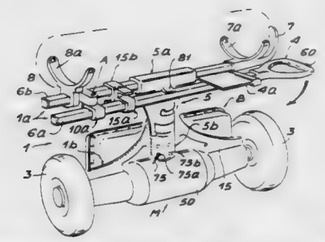
1. A transport mechanism for use in transporting flat articles across a weighing scale, comprising:
a) a longitudinally extending floor,

b) a pair of posts secured to said floor each of said posts being located on opposite longitudinal ends of said floor and in longitudinal alignment with one another,
c) two pairs of pulleys, each pair of said pulleys being rotatably supported by one of said posts, each post being located intermediate a pair of pulleys,
d) a pair of belts, each belt being trained about the pulleys of



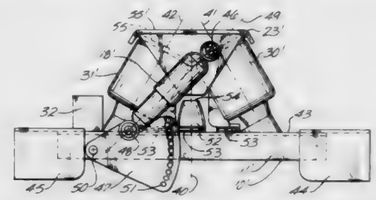
each of said pairs of pulleys located on a lateral side of their respective posts,
e) a pair of plurality of resilient arms supported by said floor, one of said pair of plurality of arms being located on each lateral side of said floor,
f) a roller rotatably supported on each of said arms in alignment with said pulleys and received within and in contact with said belts.

5,109,938
MOTORIZED GOLF CART
Francis Vautelin, and Robert Perrier, both of Beaune, France, assignors to Groupement d'Interet Economique Golf Inov, Beaune, France
Filed Oct. 17, 1990, Ser. No. 600,186
Claims priority, application France, Oct. 23, 1989, 89 13821
Int. Cl.[5] B62D *51/04*
U.S. Cl. 180—19.3 **18 Claims**



1. A motorized golf cart of the trolley type comprising a chassis made up of at least two supports assembled to each other by means of a swivel type connection device constituted by interfitting male and female portions fixed to respective ones of the two chassis supports, the two supports being capable of being moved apart from each other along the axis of rotation of the connection device in order to release them for rotation and in order to enable them to take up an in-use position or a storage position, one of the supports carrying two drive wheels, an electric motor, and a battery, the other support being essentially constituted by a tiller bar terminated at one end by a grip having a manual control member which is connected to the motor by an electrical connection including an intermediate connector, wherein the male and female halves of the intermediate connector are respectively supported by the male portion and by the female portion of the connection device and lie on the swivel axis of the two supports of the chassis.

5,109,939
VIBRATION DAMPENING SUSPENSION DEVICE FOR THE CAB OF A TRUCK VEHICLE
Richard Conaway, 2808 Miller Rd., Rte. 1, Shelby, Ohio 44875, and Thomas A. McKenzie, 18564 Zuni, Spring Lake, Mich. 49456
Continuation-in-part of Ser. No. 385,281, Jul. 25, 1989, Pat. No. 4,989,684. This application Oct. 31, 1990, Ser. No. 607,559
The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.
Int. Cl.[5] B62D *33/06;* **A47C** *7/62*
U.S. Cl. 180—89.15 **10 Claims**

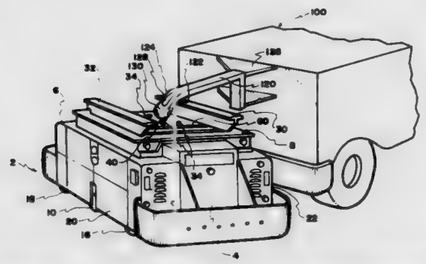


7. An improved vibration dampening suspension device for isolating a suspended body from the forced vibrations of a support body comprising:
a) a base member having a vertical axis and adapted for mounting to said support body;
b) a linking member having a first pivot axis and so constructed and adapted for pivotal mounting at said first pivot axis to said base member where said first pivot axis is in fixed and established relationship to said base member, said linking member having a second pivot axis laterally spaced from said first pivot axis;
c) an impact plate adapted for attachment to said suspended body pivotally mounted to said linking member at said second pivot axis;
d) a shock absorber having a central axis and a first and second end, where said first end is pivotally mounted to said impact plate;
e) adjustment means connected to said second end of said shock absorber and carried by said base member for selectively changing the angle of inclination of said central axis with said vertical axis;
f) an air spring having a displacement axis mounted to said base member and to said linking member where said displacement axis is substantially parallel to said vertical axis and said displacement axis is located intermediate said first and second pivot axes of said linking member;
g) a height control valve associated with said air spring for maintaining said air spring at a constant pre-selected height.

5,109,940
AUTOMATED GUIDED VEHICLE TOP DISPOSED TOWING APPARATUS
James V. Yardley, Centerville, Utah, assignor to Eaton-Kenway, Inc., Salt Lake City, Utah
Filed Mar. 5, 1991, Ser. No. 664,702
Int. Cl.[5] B62D *1/24*
U.S. Cl. 180—168 **2 Claims**

1. In combination, a trailer and an unmanned automated guided vehicle:
the vehicle comprising a main body having a front portion, a rear portion, opposed side portions, and a top surface,

remotely controlled steering means, a pair of front floor engaging wheels disposed along respective sides of the vehicle, a pair of rear floor engaging wheels disposed along respective sides of the vehicle, individual means for bidirectionally driving each of said floor-engaging wheels, a mounting plate attached to said top surface, and hitch means attached to said plate in a centrally disposed location between said side portions and said front and rear pairs of wheels;



the trailer comprising two bar means which comprise means for releasibly coupling to said centrally disposed hitch means;

the centrally disposed hitch means being rotatably connected to said releasible coupling means for movement about a vertical axis extending through said hitch means;

whereby, responsive to the remotely controlled steering means, rotational movement of 360 degrees of the vehicle about said vertical axis without displacement of said trailer is possible as a result of selective directional driving of each of said wheels.

5,109,941

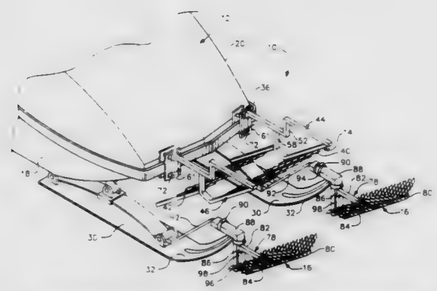
TRACTION ENHANCEMENT SYSTEM

Herb Thompson, 127 N. Devon, East Wenatchee, Wash. 98801

Filed Aug. 23, 1990, Ser. No. 572,169

Int. Cl.[5] B62M *27/02*

U.S. Cl. 180—182 **5 Claims**



1. A traction enhancement system for a snowmobile, the snowmobile having a pair of spaced-apart forwardly-mounted skis, each ski having an upwardly-curving tip, and a rearwardly mounted track, the system comprising:

a first mesh plate member mounted between the pair of skis and forward of the snowmobile track for compressing snow, said first mesh plate member including a first mesh plate and a second mesh plate, said first mesh plate being positioned above and forward of said second mesh plate; and

a pair of second mesh plate members, each of said second plate members being mounted on and above the tip of a single ski for deflecting snow, each of said second mesh plate members are mounted on the ski tip to be positioned forward of the ski, said second mesh plate members are bent along a longitudinal axis such that when mounted on the ski, snow will be deflected laterally to either side of the ski.

5,109,942

MOTORCYCLE BODY COVER

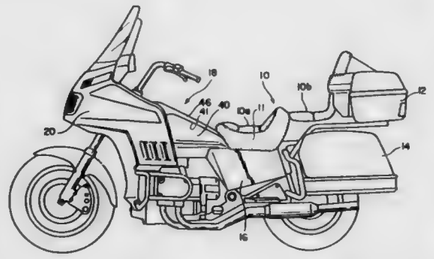
Giichiro Akimori, and Hideaki Nebu, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 97,782, Sep. 16, 1987, abandoned. This application Nov. 13, 1989, Ser. No. 434,350

Claims priority, application Japan, Sep. 18, 1986, 61-217983; Sep. 18, 1986, 61-217984; Sep. 18, 1986, 61-217985; Sep. 19, 1986, 61-219116

Int. Cl.[5] B62J *17/00*

U.S. Cl. 180—219 **23 Claims**



1. A body cover for a motorcycle, comprising:

an outer fairing having a rear edge and upright lateral edges including mounting bosses;

an inner fairing having a forward fairing edge and a pair of spaced apart extension plates each terminating in a planar rear ledge, said forward fairing edge being engaged to said rear edge of said outer fairing;

an instrument panel mounted on said inner fairing intermediate said extension plates;

first and second side panels oppositely disposed on the left and right sides of the motorcycle, each side panel having an inner wall positionable alongside the motorcycle, and a flange extending substantially perpendicularly outwardly from said inner wall, said inner wall of each said side panel having an upper rim, each said flange having a lateral flange mounting tab and a top flange mounting tab, said first and second side panels being attached to said outer fairing by said mounting bosses on said upright lateral edges of said outer fairing engaging said lateral flange mounting tab on each flange of each said side panel, with said top flange mounting tab of each flange engaged to said planar rear ledge of each said extension plate of said inner fairing; and

a top cover having two spaced apart arms and a top cover lip, each of said arms having a mounting ledge engaged to an inner edge of each extension plate of said inner fairing, and said top cover lip engaging said upper rim of said side panel inner walls.

5,109,943

MOTORCYCLE ENGINE STABILIZER

Rodney D. Crenshaw, 4103 Sapling La.; Bobby E. Goffe, 2227 Killebrey Ave., and John V. Masters, 315 Berckman Rd., all of Augusta, Ga. 30906

Filed Jul. 13, 1990, Ser. No. 552,189

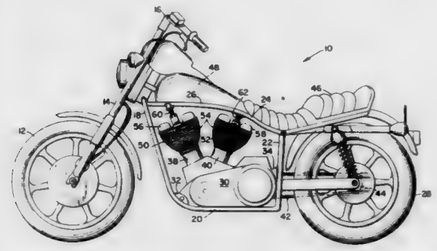
Int. Cl.[5] B62M *7/06*

U.S. Cl. 180—228 **11 Claims**

1. A motorcycle engine stabilizer mounted between the cylinder head of a motorcycle engine and a motorcycle frame for reducing engine vibrations, said stabilizer comprising:

a. a base member positioned on the engine cylinder head at a point on the cylinder head that is opposed to and that faces a portion of the frame, the base member including a first threaded portion;

b. an adjustable extension member having a second threaded portion threadedly engagable with the first threaded portion and threadedly carried by the base member for movement in a direction toward and away from the engine cylinder head, the extension member having a free end facing the frame;



c. an adapter carried at the free end of the extension member, the adapter including an inwardly dished contact surface for surface engagement with only one side of a tubular member of the motorcycle frame so that rotation of the extension member relative to the base member moves the contact surface of the adapter into surface-to-surface engagement with the frame to provide a force against the engine cylinder head to restrain vibration of the engine; and

d. a locking member for locking the extension member in a desired extended position relative to the base member.

5,109,944

FOUR WHEEL-DRIVE SYSTEM WITH VISCOUS COUPLING

Shuji Torii, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 235,625, Aug. 24, 1988, abandoned. This application Apr. 23, 1990, Ser. No. 513,036

Claims priority, application Japan, Sep. 7, 1987, 62-136619[U]

Int. Cl.[5] B60K *17/34*

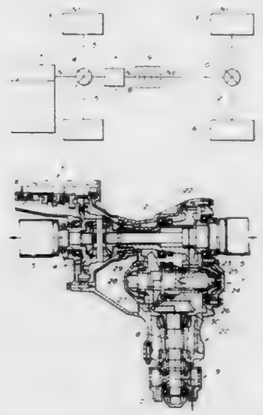
U.S. Cl. 180—248 **4 Claims**

1. A four-wheel drive system comprising:

a power unit; and

means for transmitting power from said power unit to a set of front wheels through a drive line having mechanically engaged drive elements and to a set of rear wheels though a drive line having a viscous coupling and mechanically engaged drive elements;

wherein said mechanically engaged drive elements of said drive line for the front wheels and said mechanically engaged drive elements of said drive line for the rear wheels have a set relationship that the ratio of rotating speed of said input shaft of said viscous coupling to the rotating speed of the front wheels is larger than the ratio



of rotating speed of said output shaft of said viscous coupling to the rotating speed of the rear wheels.

5,109,945

SAFETY DEVICE FOR USE WHEN DRIVER LEAVES A SEAT OF AN INDUSTRIAL VEHICLE

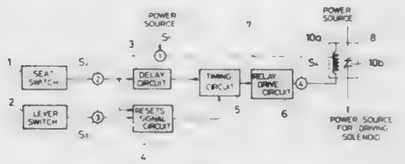
Toshiharu Koga, Aichi, Japan, assignor to Sumitomo Yale Co., Ltd., Japan

Continuation of Ser. No. 417,153, Oct. 4, 1989, abandoned. This application Feb. 4, 1991, Ser. No. 649,199

Claims priority, application Japan, Oct. 7, 1988, 63-130948[U]

Int. Cl.[5] B60K *28/04*

U.S. Cl. 180—273 **5 Claims**



1. A safety device for an industrial vehicle comprising:

a shift lever;

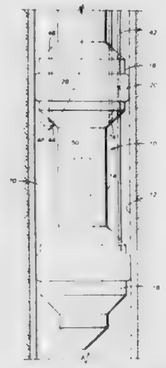
a seat switch for detecting seating or non-seating of a driver;

a lever switch for detecting forward, neutral or reverse position of the shift lever;

a solenoid valve used for switching flow of a hydraulic medium for forward and reverse movement of the industrial vehicle; and

a controlling means for de-energizing a power source of the solenoid valve when the seat switch detects non-seating of the driver and for re-inputting the power source of the solenoid valve only when a) the lever switch detects a neutral position of the shift lever and b) the seat switch detects the driver is seated while an engine of the industrial vehicle is running.

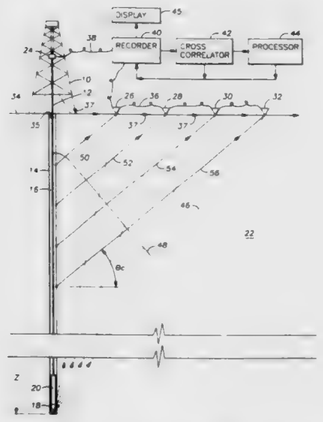
5,109,946
APPARATUS FOR PACK-OFF LOCKING OF SEISMIC ENERGY SOURCE
Martin Sorrells, Buffalo, Tex., assignor to OmniTech Services Inc., Houston, Tex.
Filed Apr. 11, 1991, Ser. No. 684,528
Int. Cl.[5] G01V *1/40*
U.S. Cl. 181—106 **8 Claims**



1. In a geophysical survey system using a seismic energy source placed in a well borehole, and a pack-off locking means to enclose the seismic energy source within a sealed chamber formed by the borehole sidewalls and said pack-off locking means, said locking means comprising:
first and second endcaps each having inner and outer faces;
a rigid member having first and second ends fixedly attached perpendicular to said first and second endcap inner faces respectively;
first and second sealing means attached to said first and second endcaps respectively;
means adapted for holding the seismic energy source between said endcap inner faces; and
means for expanding said sealing means tightly against the sidewalls of the inner surface of the well borehole, wherein said endcaps and the inner surface of the borehole sidewalls form an isolating chamber containing the seismic energy source which transmits acoustical energy waves mostly in a plane parallel with said endcap faces.

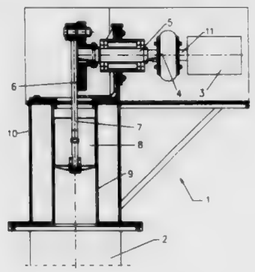
5,109,947
DISTRIBUTED SEISMIC ENERGY SOURCE
James W. Rector, III, Los Altos Hills, Calif., assignor to Western Atlas International, Inc., Houston, Tex.
Filed Jun. 21, 1991, Ser. No. 718,961
Int. Cl.[5] G01V *1/40*
U.S. Cl. 181—106 **19 Claims**

1. A system for seismic exploration from a fluid-filled borehole that penetrates a plurality of earth formations to a plurality of different borehole depths, comprising:
an elongated waveguide inserted into said borehole, said waveguide having an extensional-wave phase velocity greater than the acoustic-wave propagation velocity through said earth formations;
means for exciting extensional waves distributed along the length of said wave guide for radiating an extended acoustic wavefield therefrom into said earth formations to generate head waves therein;
means, disposed at a plurality of discrete locations, offset from said borehole, for detecting the generated head waves;
means for detecting the extensional waves traveling up said elongated waveguide;
means for contemporaneously sampling and recording the detected head waves and the detected extensional waves;



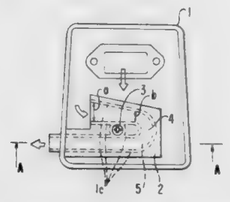
means for cross-correlating the sampled head waves with the contemporaneously sampled extensional waves to generate a plurality of cross-correlograms; and
means for displaying said cross-correlograms.

5,109,948
FREQUENCY CONTROLLED MOTOR DRIVEN LOW FREQUENCY SOUND GENERATOR
Roland Sandstrom, Stockholm, Sweden, assignor to Infrasonik AB, Stockholm, Sweden
PCT No. PCT/SE89/00366, § 371 Date Feb. 6, 1991, § 102(e) Date Feb. 6, 1991, PCT Pub. No. WO90/00095, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 27, 1989, Ser. No. 634,142
Claims priority, application Sweden, Jun. 29, 1988, 8802452
Int. Cl.[5] G10K *5/00*
U.S. Cl. 181—142 **10 Claims**



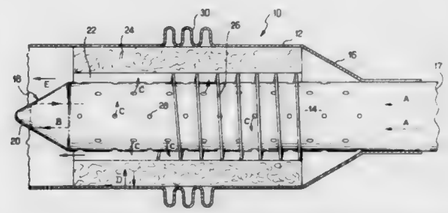
1. Low frequency sound generator comprising a resonator; a feeder unit with a movable member for supplying of gas pulses to the resonator inside which said gas pulses generate a standing gas-borne sound wave; a variable speed motor drivingly connected to said feeder unit to achieve a gas pulse generating movement of said movable member, wherein a phase displacement occurs between the movement of said movable member and the sound pressure of the standing gas-borne sound wave; and control unit means for the registration of said phase displacement, said control unit means including a speed regulation device operatively connected to the motor to guide the phase displacement towards an adjustable set point value.

5,109,949
MUFFLER OF INDUSTRIAL ENGINE
Toru Sato; Yoshio Kobayashi, and Tomiya Kato, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 28, 1990, Ser. No. 574,289
Claims priority, application Japan, Aug. 30, 1989, 1-100431[U]; Mar. 16, 1990, 2-26190[U]
Int. Cl.[5] F01N *7/10, 1/08*
U.S. Cl. 181—240 **6 Claims**



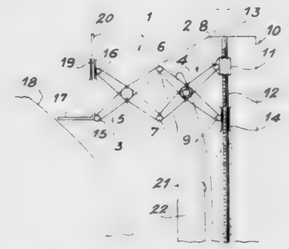
1. A muffler of an industrial engine comprising:
a muffler main body made of an aluminum casting, said main body having outer walls defining an inner chamber of the main body, a gas outlet extending through said outer walls and open to the exterior of the main body, and exhaust channel walls extending in said chamber and integral with said outer walls, said exhaust channel walls defining a channel open to said gas outlet; and a lid mounted to said main body over said channel so as to form an exhaust gas passageway with said channel walls, the exhaust gas passageway having an inlet end located in said chamber and extending to said gas outlet so as to serve as a tail pipe, and said exhaust gas passageway having a cross-sectional area that only decreases gradually or in a stepwise manner from said inlet end thereof to said gas outlet.

5,109,950
SILENCER FOR EXHAUST GASES AND PART OF AN EXHAUST LINE HAVING SUCH A SILENCER
Henri Lescher, Saint Germain en Laye, France, assignor to Glaenzer Spicer, Poissy, France
Filed Jan. 29, 1990, Ser. No. 471,611
Claims priority, application France, Jan. 27, 1989, 89 01064
Int. Cl.[5] F01N *1/10*
U.S. Cl. 181—256 **13 Claims**



1. A silencer for exhaust gases from an internal combustion engine, comprising:
an outer cylinder cover;
a single inner cylinder tube mounted coaxially within said outer cylinder cover to form an annular chamber between said inner cylinder tube and said outer cylindrical cover, said inner cylindrical tube being formed with a plurality of perforations therein and having a first open end for admission of the exhaust gases therethrough and a second closed end opposite said first open end, said second closed end comprising means for reflecting the exhaust gases as the exhaust gases impinge thereagainst;
a layer of absorbent material mounted about said inner cylindrical tube longitudinally along a substantial portion thereof;
wherein said annular chamber defines a means to allow the exhaust gases to flow substantially unhindered from said perforations formed in said inner tube to said layer of absorbent material; and
wherein said layer of absorbent material defines a means for absorbing noise from the exhaust gases as the exhaust gases pass therethrough.

5,109,951
DEVICE FOR THE CURVED DISPLACEMENT OF AN OBJECT IN CONTACT WITH A SURFACE
Yves Lecorre, St. Nazaire, France, assignor to Polytec, Saint Nazaire, France
Filed Dec. 27, 1990, Ser. No. 634,736
Int. Cl.[5] E04G *21/00*
U.S. Cl. 182—62.5 **5 Claims**

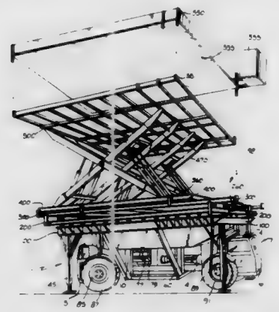


1. An apparatus for following the curvature of a surface, and comprising:
a threaded support;
a pantograph having at least two adjacent scissor sections pivotally connected;
a first end of the pantograph being threadably mounted to the support for translation therealong;
a second end of the pantograph being adjacent the first end;
means for movably mounting the second pantograph end to the threaded support for linking translation of the first and second ends along the threaded support;
a third end of the pantograph being pivotally mounted to an object which follows the surface curvature;
a fourth end of the pantograph movably mounted to the object, the third and fourth ends defining a line parallel to the threaded support;
a curved groove located in the plane of the pantograph;
a central hinge pin of one of said scissor sections located in the groove for following a profile of the groove; and
means for rotating the threaded support thereby adjusting the length of the pantograph and swinging the object along an arc coaxial with the surface curvature.

5,109,952
MOBILE AND ADJUSTABLE SCAFFOLD SYSTEM FOR TUNNEL ROOFING AND OTHER APPLICATIONS
John W. Starks, and E. Wayne Kyle, both of Starks Construction Company, Inc., 401 Main St., P.O. Box 5, Silt, Colo. 81652
Filed Nov. 6, 1990, Ser. No. 609,928
Int. Cl.[5] E06C *5/00*
U.S. Cl. 182—63 **34 Claims**

1. A mobile and adjustable system for positioning an overhead workpiece by a system operator, comprising:
(a) transportation means for transporting the system and the operator;
(b) adjustable positioning means attached to the transportation means for positioning the workpiece, including a set

of substantially parallel adjacently stacked tables, each said table being movably and adjustably attached to an adjacent said table, the table set being located above and mounted to the transportation means, the positioning means allowing adjustment in at least four of the following



five positions: levelness (including pitch or yaw); rotational; lateral; longitudinal; and vertical; and

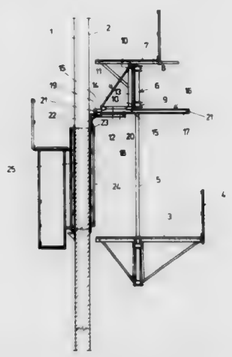
(c) operation means operatively connected to said system for operating the transportation means and the adjustable positioning means.

5,109,953

FORMWORK ARRANGEMENT FOR ERECTING A STRUCTURAL WALL

Hugo Mathis, Bregenz, Austria, assignor to Rund-Stahl-Bau Gesellschaft m.b.H., Fussbach, Austria

Filed May 10, 1991, Ser. No. 698,132
Claims priority, application Austria, May 17, 1990, 1103/90
Int. Cl.[5] E04B *1/16*; E04G *11/28*
U.S. Cl. 182—129 **9 Claims**



1. In a formwork arrangement for erecting a structural wall of castable materials, the formwork arrangement including at least one work platform and formwork plates which have a large surface area, each formwork plate having a height, and means for progressively vertically raising the formwork plates and the work platform by the height of the formwork plates, the improvement comprising a support frame mounted above the formwork plates of a formwork section, the support frame extending parallel to the platform, horizontally extending rails which are horizontally spaced from each other being mounted on the support frame, the rails being swivelable about a vertical axis, a carriage being slidably mounted on each of the rails, each carriage having a suspended anchor member on a side facing the formwork plate, and means for connecting the anchor member to an upper edge of a formwork plate.

5,109,954

WEIGHT BEARING APPARATUS FOR HANGING ON UPRIGHT STRUCTURES

Helmut K. Skyba, Route 2, Box 330, Wild Rose, Wis. 54984

Filed Nov. 29, 1990, Ser. No. 619,940
Int. Cl.[5] E06C *7/48, 1/34*
U.S. Cl. 182—189 **26 Claims**



1. An apparatus for supporting weight on an upright structure having opposite, generally vertical side edges, the apparatus comprising

a frame having a weight bearing surface,

first and second gripping arms carried on the frame, each having an outer end portion that extends beyond the frame, each outer end portion including a gripping edge,

first linkage means joining the gripping arms for moving the outer end portions away from and toward each other to thereby open and close the distance between the gripping edges, and

second linkage means that joins the first linkage means to the frame and serves to open and close the gripping arms in response to forces applied to the frame relative to the structure,

the second linkage means being operative for attaching the frame to the structure when the gripping arms are opened a sufficient distance to receive the structure and in contact with at least one side edge of the received structure, by serving, in response to a subsequent force that moves the frame into contact with the structure, to close the gripping arms a sufficient distance to bring both gripping edges into contact with the side edges of the structure,

the second linkage means also being operative for supporting weight on the frame when attached to the structure, by serving, in response to the downward force of the weight applied to the weight bearing surface of the frame, to urge the gripping arms continuously toward each other to thereby continuously secure an engagement of both the gripping edges on the structure as weight is applied, and

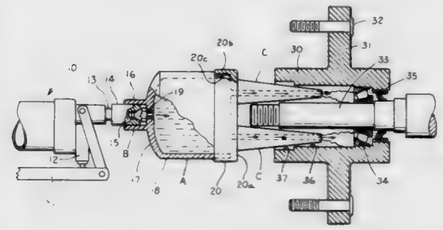
the second linkage means being further operative for detaching the frame from the structure when weight ceases to be applied to the weight bearing surface of the frame, by serving, in response to a force that moves the frame in a direction away from the ground, to open the gripping arms a sufficient distance to bring both gripping edges out of contact with structure.

5,109,955

APPARATUS FOR GREASING A WHEEL BEARING HUB

Jimmy E. Clark, 109 Farrs Bridge Rd., Greenville, S.C. 29611

Filed Jul. 20, 1990, Ser. No. 555,179
Int. Cl.[5] F16N *21/04*
U.S. Cl. 184—105.2 **4 Claims**



1. Apparatus for dispensing grease from a grease gun to a wheel bearing hub for containing a wheel bearing carried by a spindle comprising:

a reservoir for containing grease under pressure;

a coupling on said reservoir connecting said reservoir to a grease gun for dispensing grease under pressure into said reservoir;

at least three spaced nozzles carried by said reservoir extending outwardly of said reservoir for dispensing grease into said housing;

said nozzles being insertable between said hub and said spindle; and

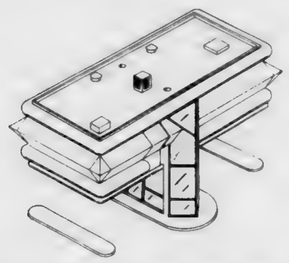
said spaced nozzles dispensing grease into said hub uniformly thereabout.

5,109,956

FOOD PREPARATION AND DELIVERY APPARATUS AND METHOD

Frank R. Casale; Nicola D. Casale; Antonio A. Casale; Richard P. Bennett, and Gilbert F. Padilla, all of Albuquerque, N. Mex., assignors to Nunzio's Pizza, Inc., Beverly Hills, Calif.

Filed May 26, 1989, Ser. No. 358,418
Int. Cl.[5] B65G *17/12, 47/34*; E04H *3/02*
U.S. Cl. 186—41 **13 Claims**



1. A remotely locatable, protectable menu and order display unit, comprising an outer housing and an inner housing, said inner housing comprising menu means and communication means for communicating with a remote location and said inner housing cooperably and telescopically slidable within said outer housing, and means for selectively and alternatively extending and retracting said inner housing with respect to said outer housing, wherein said means for selectively and alternatively retracting and extending said inner housing comprises an AC motor coupled to said inner housing through a drive screw and worm drive.

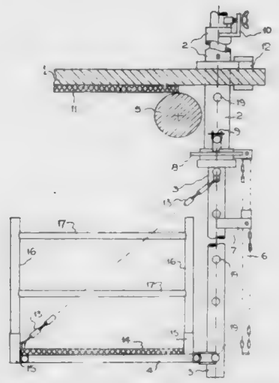
9. A food conveyor for conveying food from an upper story to a lower story of a multi-story food and beverage dispensing facility, said conveyor comprising an upright frame means for supporting a sprocket and chain assembly said sprocket and chain assembly including an upper sprocket assembly and a lower sprocket assembly, each of said sprocket assemblies including a pair of spaced sprockets on a sprocket shaft, and a pair of parallel chains being engaged with said sprockets, said chains supporting a plurality of conveyor trays swingably affixed to said chains, each of said conveyor trays being foldable downwardly when being conveyed upwardly on said chains and extending outwardly substantially horizontally when being conveyed downwardly on said chains, each of said trays having a plurality of outwardly extending fingers extending from a base member of said tray, and an off-loading ramp disposed to receive food conveyed downwardly on said trays and transport the food away from said conveyor.

5,109,957

OFFSHORE ACCESS SYSTEMS

Christopher N. Do, Selangor Darul Ehsan, Malaysia, assignor to IEV International Pty. Limited, Malaysia

Division of Ser. No. 444,124, Nov. 30, 1989. This application Mar. 29, 1991, Ser. No. 677,448
Claims priority, application Australia, Jun. 3, 1987, PI2278
Int. Cl.[5] B66B *9/00*
U.S. Cl. 187—1 R **6 Claims**



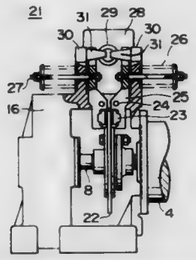
1. An offshore access system comprising a spaced-apart pair of davit-like, semi-circular support arms, each upper end of which carries a bracket adapted to be ridigly clamped onto a horizontal driving cable disposed above a horizontal structural member of an offshore structure on which member, or in connection with which, a task is to be performed; a mounting bar connecting the said upper ends; a support sleeve provided on each lower end of each said support arm; a mobile work platform or landing disposed beneath said horizontal structural member and having, at each lateral side thereof, a post vertically slidable within a respective said support sleeve; and means for raising and lowering said vertically slidable posts and associated mobile work platform or landing, and for moving the latter horizontally, with respect to the said horizontal structural member, so as to enable access to be gained thereto over the length thereof; the said mounting bar carrying a first spaced-apart, angled pair of rollers adapted to engage an upper part of said horizontal structural member, and a second spaced-apart angled pair of rollers mounted on an adjacent semi-circular support arm and adapted to engage a lower part of the horizontal structural member.

5,109,958

BRAKE UNIT FOR AN ELEVATOR HOIST APPARATUS

Kunio Kato; Yasumasa Iida; Takenobu Honda; Kazuhiko Sugita, and Shinji Yamasaki, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 11, 1990, Ser. No. 596,709
Claims priority, application Japan, Oct. 13, 1989, 1-265137
Int. Cl.[5] B66B *11/04*
U.S. Cl. 187—20 **3 Claims**



1. A brake unit for an elevator hoist apparatus for use with an electric motor output shaft, comprising:
- a brake disc having two braking surfaces and mounted on the motor output shaft for rotation therewith;
- a pair of brake arm assemblies each having a movable brake arm having a first end and a second end and a brake shoe mounted on the first end of the brake arm, each of the brake arm assemblies being movably disposed in the vicinity of the brake disc for selective braking engagement of the brake shoes with the braking surfaces of the brake disc;
- a pair of brake springs for biasing the brake shoes on the brake arms toward the braking surfaces;
- a pair of levers, each of which is pivotally supported on an axis perpendicular to the axis of the output shaft, each of the levers having a first end and a second end engageable with the second end of one of the brake arms; and
- actuator means for engaging with the first ends of the levers and pivoting the levers about their respective axis, thereby separating the brake shoes from the brake disc against the force of the brake springs.

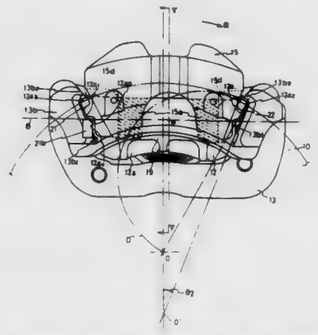
5,109,959

DISC BRAKE PAD ASSEMBLY WHICH RESISTS RADIAL OUTWARD DISPLACEMENT

Toshio Kondo, Okazaki; Kenji Urata, Anjo; Masayoshi Katagiri, and Kenichi Nakamura, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 277,806, Nov. 30, 1988, Pat. No. 4,940,119. This application Mar. 15, 1990, Ser. No. 493,740
Claims priority, application Japan, Nov. 11, 1987, 62-303016; Mar. 31, 1988, 63-79926
Int. Cl.[5] F16D *55/02, 65/02*
U.S. Cl. 188—73.31 **2 Claims**

1. A disc brake assembly for use with a disc rotor, comprising:
- a mounting member including a pair of arms,
- a pair of brake pad means being mounted on respective ones of the arms so as to be disposed on opposite sides of the rotor, the brake pad means being movable toward and away from the rotor, each brake pad means including a backing plate having first and second circumferential ends which converge generally radially inwardly,
- guide means fixed to the mounting member and extending in an axial direction generally parallel to an axis of rotation of the rotor,
- a caliper member slidably supported on the guide means for movement in the axial direction, the caliper member having a piston portion and a reaction portion disposed on opposite sides of the rotor and arranged to press respective brake pad means against opposite surfaces of the rotor,
- the mounting member having first and second circumferentially spaced torque-resisting surface means arranged opposite the first and second circumferential ends of the backing plates and arranged to be contacted thereby during a braking operation to resist circumferential movement of the pair of brake pad means, said first and second torque resisting surface means being radially outwardly divergent such that the pair of brake pad means are guided for radial outward displacement during a braking operation,
- generally circumferentially extending stop projections formed on the mounting member adjacent radially outer portions of the first and second circumferential ends of the backing plates for resisting the radial outward displacement of the associated brake pad means during a braking operation,



- regulating means for locating a press center of each brake pad within a domain defined by a half circle whose arc extends from a center of rotation of the disc to a respective one of the stop projections, the regulating means comprising a shim disposed between a backing plate and the caliper member to form a gap between a radially outer portion of the caliper member and the backing plate,
- fingers formed on the circumferential ends of the backing plates so as to project toward the associated torsion-resisting surfaces, external surfaces of the fingers extending generally radially and defining supporting surfaces, and
- springs mounted in the mounting member and engageable with the supporting surfaces for biasing the backing plates away from the torsion-resisting surfaces.

5,109,960

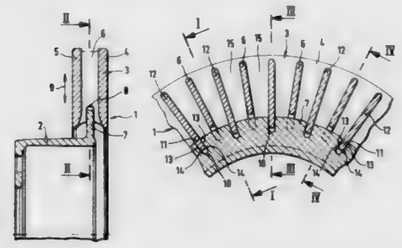
BRAKE DISK FOR DISK BRAKES

Schwarz Günther, Tuttlingen, Fed. Rep. of Germany, assignor to Schwäbische Hüttenwerke Gesellschaft mit beschränkter Haftung (GmbH), Aalen-Wasseralfingen, Fed. Rep. of Germany

Filed Jun. 19, 1990, Ser. No. 539,938
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1989, 3920418
Int. Cl.[5] F16D *65/12*
U.S. Cl. 188—218 XL **14 Claims**

1. A rotatable brake disk for disk brakes, in particular for motor vehicles, comprising
- a) a disk rim having two parallel friction rings which are connected by webs which, with respect to the axis of rotation of the brake disk, extend axially between the two friction rings and run radially in the direction of the outer edge of the brake disk, said webs having radially inner end sections;

- b) a nave having a supporting ring formed with radial grooves into which the radially inner end sections of said webs engage such that said webs and grooves establish a positive connection between the nave and the disk rim in the direction of rotation of the brake disk;



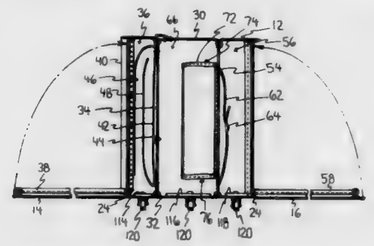
the radially inner end section of said webs having inner end surfaces which are radially spaced via gaps from the bottoms of said grooves, whereby said webs are displaceable in said grooves in both radial directions in order to compensate for relative thermal expansions of said disk rim and nave.

5,109,961

SUITCASE HAVING WHEELS AND FLEXIBLE BODY CONSTRUCTION

Mady I. Bergman, 216 Pacific Ave., Venice, Calif. 90291

Continuation-in-part of Ser. No. 152,147, Feb. 4, 1988, Pat. No. 4,966,259. This application Sep. 4, 1990, Ser. No. 577,300
Int. Cl.[5] A45C *5/14, 7/00, 13/04, 13/26*
U.S. Cl. 190—18 A **15 Claims**



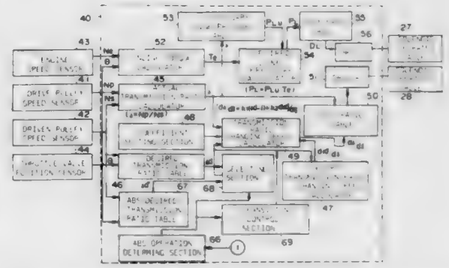
1. A flexible suitcase comprising:
- a body including an upper wall, a lower wall, a pair of opposing side walls joined to said upper and lower walls, a pair of opposing end walls joined to said upper wall, said lower wall and said side walls, a first interior partition joined to said upper wall, said lower wall and said end walls and a second interior partition joined to said upper wall, said lower wall and said end walls, said body being made from a flexible material in its entirety;
- a first compartment defined in said body between one of said side walls and said first partition;
- a second compartment defined in said body between the other of said side walls and said second partition;
- an intermediate compartment defined in said body between said first and second partitions;
- means for selectively releasing said one side wall from said upper wall and said end walls to allow said first compartment to be selectively opened and closed;
- means for selectively releasing said other side wall from said upper wall and said end walls to allow said second compartment to be selectively opened and closed;
- means for selectively releasing one of said partitions from said upper wall and said end walls to allow said intermediate compartment to be selectively opened and closed;
- a first stiffening panel independently secured on said lower wall in said first compartment;
- a second stiffening panel independently secured on said lower wall in said first compartment;
- a third stiffening panel independently secured on said lower wall in said intermediate compartment;
- wheel means mounted on said stiffening panels for supporting said body on the ground; and
- handle means on said body for pulling said body along the ground.

5,109,962

TRANSMISSION RATIO CONTROL SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Keiji Sato, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1990, Ser. No. 633,000
Claims priority, application Japan, Dec. 28, 1989, 1-343306; Dec. 28, 1989, 1-343307
Int. Cl.[5] B60K *41/26*
U.S. Cl. 192—4 A **4 Claims**



1. A system for controlling transmission ratio of a continuously variable belt-drive transmission connected to an engine mounted on a motor vehicle, having a drive pulley with a hydraulically shiftable disc and a primary hydraulic cylinder for shifting said disc, a driven pulley including a hydraulically shiftable disc and a secondary hydraulic cylinder for shifting said disc thereof, a belt engaged with both pulleys, a hydraulic circuit for supplying oil from a pump to said cylinders, a transmission ratio control valve for controlling a primary pressure applied to said primary cylinder, a line pressure control valve for controlling a secondary pressure applied to said secondary cylinder, a throttle position sensor for producing a throttle opening degree signal, speed sensors for detecting speeds of said drive pulley and driven pulley and said engine respectively and for producing respective speed signals, actual transmission ratio calculating means responsive to said drive pulley speed signal and driven pulley speed signal for calculating an actual transmission ratio and for producing an actual transmission ratio signal, desired transmission ratio calculating means responsive to said driven pulley speed signal and said throttle opening degree signal for calculating a desired transmission ratio and for producing a desired transmission ratio signal, valve operating means responsive to said actual transmission ratio signal and said desired transmission ratio signal for operating said transmission ratio control valve so as to control the transmission ratio to the desired transmission ratio, and an antilock brake system, the system comprising:
- ABS operation detector means for detecting an output signal of said antilock brake system and for producing an ABS signal;
- storing means for storing a plurality of ABS desired transmission ratios during an operation of said antilock brake system;
- selecting means responsive to said ABS signal for obtaining

an ABS desired transmission ratio from said storing means in place of said desired transmission ratio and for applying said ABS desired transmission ratio to said valve operating means; and

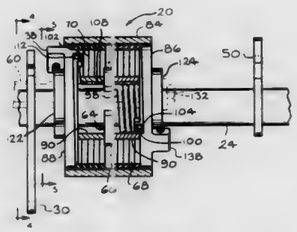
said ABS desired transmission ratios being arranged to slowly control said actual transmission ratio to the ABS desired transmission ratio.

5,109,963

FOUR WAY MANUAL SEAT ADJUSTER CLUTCH ASSEMBLY

David M. Husted, Ann Arbor; William H. Jones, Rochester, and William R. Tighe, Dearborn, all of Mich., assignors to Hoover Universal, Inc., Plymouth, Mich.

Filed Mar. 21, 1991, Ser. No. 672,896
Int. Cl.[5] F16D *51/00*; B60N *2/00*
U.S. Cl. 192—8 C **21 Claims**



1. A clutch assembly, comprising:

a stationary housing having an axis;

a pair of coil clutch springs disposed within said housing, said springs, when unstressed being freely rotatable within said housing about the axis of said housing;

means for biasing said coil clutch springs into frictional engagement with said housing such that rotation of said clutch springs relative to said housing is prevented;

an elongated torque transmitting member extending through said housing;

means for selectively coupling said torque transmitting member to said clutch springs whereby, when said clutch springs are in frictional engagement with said housing, rotation of said torque transmitting member is prevented; and

means for selectively releasing said clutch springs from frictional engagement with said housing to enable rotation of said clutch springs and said torque transmitting member.

5,109,964

CONICAL ROLLER TYPE CLUTCH APPARATUS

Tetsu Fukui; Yoshimi Oota, and Shigekazu Hasegawa, all of Osaka, Japan, assignors to Kubota Corporation, Osaka, Japan

Filed Feb. 26, 1991, Ser. No. 661,414
Claims priority, application Japan, Mar. 8, 1990, 2-57791; Sep. 18, 1990, 2-249835
Int. Cl.[5] F16D *41/06*
U.S. Cl. 192—48.92 **9 Claims**

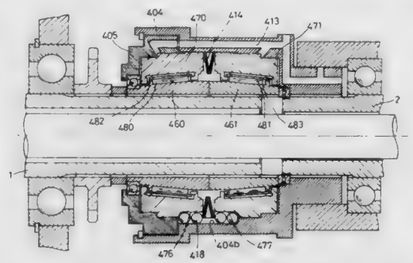
1. A rolling clutch apparatus with two one-way clutch mechanisms each having an inner ring defining a conical outside surface, an outer ring disposed coaxially with the inner ring and defining a conical inside surface, and conical rollers arranged between the conical surface of the inner ring and the conical surface of the outer ring, said clutch apparatus comprising:

first transmission means including one of said clutch mechanisms for allowing transmission only in a forward rotating direction,

second transmission means including the other of said clutch mechanisms for allowing transmission only in a backward rotating direction,

first shift means for shifting one of the inner ring and the outer ring of said first transmission means relative to the conical rollers of said first transmission means for engagement and disengagement therebetween,

second shift means for shifting one of the inner ring and the outer ring of said second transmission means relative to



the conical rollers of said second transmission means for engagement and disengagement therebetween, and

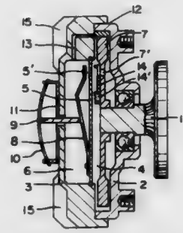
control means for simultaneously controlling said first shift means and said second shift means to disengage the conical rollers of said first transmission means using said first shift means and simultaneously disengage the conical rollers of said second transmission means using said second shift means.

5,109,965

TEMPERATURE SENSITIVE HYDRAULIC FAN COUPLING

Hiroshi Inoue, Shizuoka, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Japan

Filed Nov. 30, 1990, Ser. No. 621,293
Claims priority, application Japan, Dec. 1, 1989, 1-139826[U]
Int. Cl.[5] F16D *31/00*
U.S. Cl. 192—58 B **8 Claims**



1. A temperature sensitive hydraulic fan coupling comprising: a rotary drive shaft; a solid drive disk having opposed driving sides, a radially outer periphery and at least one communication hole extending between the driving sides, said solid drive disk being fixed to an end of said rotary drive shaft; a sealed box supported on said rotary drive shaft and defining an inner wall surface therein, a partition plate disposed within the sealed box and dividing the sealed box into an oil chamber and a torque transmission chamber, said partition plate having at least one oil flow adjusting hole extending between the oil chamber and the torque transmission chamber, said solid drive disk being received within said torque transmission chamber such that torque transmission gaps are defined between the inner wall surface of the sealed box and the opposed driving sides of the solid drive disk, said oil chamber being provided with an oil circulation passage and said torque transmission chamber being provided with a dam on the inner wall surface

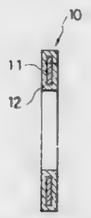
in opposite relationship with the radially outer periphery of said solid drive disk and in communication with said oil circulation passage; a temperature sensitive member attached to the sealed box; a valve member having one end fixed to said partition plate and an opposed end lying adjacent to the oil flow adjusting hole of said partition plate, a connecting rod arranged between said valve member and said temperature sensitive member so that when ambient temperature exceeds a set value, the valve member opens said oil flow adjusting hole, while when the ambient temperature is below the set value, the valve member closes said oil flow adjusting hole in response to a deformation of said temperature sensitive member, torque from said rotary drive shaft being transmitted to said sealed box by oil in the torque transmission gaps formed between said solid drive disk and the opposing inner wall surface of sealed box, said torque varying in accordance with contact area of the oil with the driving sides of the solid drive disk, said fan coupling being further characterized in that said solid drive disk is attached with at least one centrifugal valve operative to close said communication hole in said solid drive disk as said drive shaft rotates at high speed for preventing flow of oil from the oil chamber to one of said torque transmission gaps and thereby reducing the contact area of the oil with the solid drive disk and correspondingly reducing the torque transmitted during high speed rotation of the drive shaft.

5,109,966

MATING PLATE IN FRICTION ENGAGEMENT DEVICE

Kazuhito Mukai, and Takao Shibuya, both of Chitose, Japan, assignors to Dynax Corporation, Chitoshe, Japan

Continuation of Ser. No. 526,225, May 21, 1990, abandoned. This application Sep. 6, 1991, Ser. No. 759,111
Int. Cl.[5] F16D *13/64, 65/02, 69/00*
U.S. Cl. 192—70.12 **6 Claims**



1. In a friction engagement device including a friction plate comprising a core plate to which a friction material is bonded, and a metallic mating plate, said friction plate and said mating plate having faces arranged to engage each other and said faces being in contact with an oil, the improvement wherein the mating plate comprises a steel core having a plating consisting of at least 50% chromium.

5,109,967

ELECTRONICALLY CONTROLLED CLUTCH ENGAGEMENT SPEED CORRECTING FOR AN AUTOMATIC TRANSMISSION SYSTEM

Yoshitami Saitou; Nobuyuki Isono, and Nobuyasu Suzumura, all of Aichi, Japan, assignors to Aisin Seiki K.K., Aichi, Japan

Filed Mar. 26, 1990, Ser. No. 498,673
Claims priority, application Japan, Mar. 28, 1989, 1-077685
Int. Cl.[5] F16D *23/00*
U.S. Cl. 192—0.076 **8 Claims**

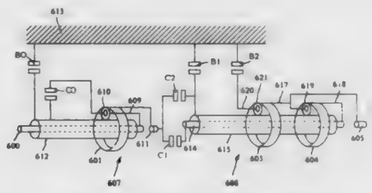
1. An electrically controlled automatic transmission system for a vehicle, comprising:

an automatic transmission having an output shaft, and a plurality of clutches and brakes activated by application of a fluid pressure to change a gear ratio by engagement and disengagement of said clutches and brakes,

a plurality of control valves for the clutches and brakes, respectively, each of said control valves individually controlling one of said clutches and brakes;

means for detecting a running condition of the vehicle; and

electronic control means for determining the engagement and disengagement of said clutches and brakes in accordance with the detected running condition of the vehicle, and for controlling said control valves in accordance with the determined engagement and disengagement, said electronic control means also individually determining a speed of engagement for those clutches and brakes which are to



be engaged, and for controlling said control valves to change the fluid pressure in accordance with the determined speed of engagement, thereby individually controlling the speed of engagement of said clutches and brakes;

said electronic control means including:

torque detecting means for detecting a torque of the output shaft of said automatic transmission; and

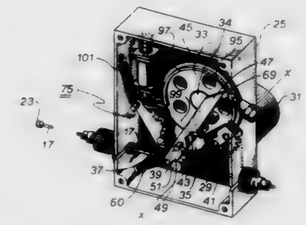
engagement speed correcting means for correcting the determined speed of engagement according to the detected torque.

5,109,968

CLUTCH OSCILLATOR ASSEMBLY

Gary M. Pollitt, 45050 Cameron St., Temecula, Calif. 92390, and Anthony R. Orosco, 3320 N. Millbrook, Fresno, Calif. 93726

Continuation-in-part of Ser. No. 663,724, Mar. 4, 1991, abandoned. This application Oct. 4, 1991, Ser. No. 771,209
Int. Cl.[5] F16D *19/00*
U.S. Cl. 192—83 **22 Claims**



1. In an engine-powered wheeled vehicle, having an engine, at least one drive wheel, and a clutch interposed therebetween, said clutch actuated through a clutch cable operated by a moveable engaging/disengaging clutch handle, a clutch oscillator assembly comprising:

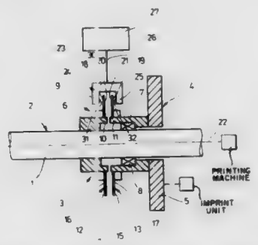
a) a chassis for mounting on the vehicle intermediate the clutch and the clutch handle;

b) a shaft supported on said chassis for powered rotation about a fixed axis;

c) switch means for interrupting the power to said shaft to cause controlled rotation thereof; and,

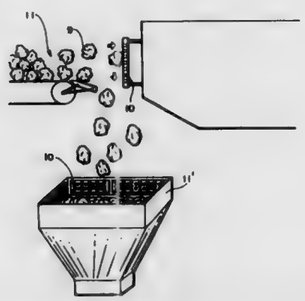
d) cyclic means in association with said shaft for alternately pulling and releasing said clutch cable as a function of rotation of said shaft.

5,109,969
JAW CLUTCH
Peter T. Blaser, Dielheim, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany
Filed Oct. 25, 1990, Ser. No. 605,178
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1989, 3935450
Int. Cl.[5] F16D *27/00*
U.S. Cl. 192—84 R **22 Claims**



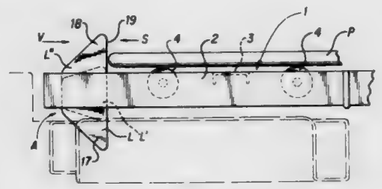
1. Clutch device for phase-synchronous coupling of rotating machine elements, comprising two coding elements, respectively, co-rotatable with two driven machine elements, a sensor fixed in position adjacent said coding elements, said coding elements having codings thereon which are variable in angular position with respect to said sensor, said sensor having means for registering information composed from respective codings of said two coding elements, a clutch control unit connected to said sensor for receiving said information therefrom, and means controlled by said clutch control unit for coupling the rotating machine elements at one specific predetermined position relative to one another.

5,109,970
AGGREGATE PARTICLE SHIELD
Tony Zaborszki, Kings Mountain, N.C., assignor to W.S. Tyler, Inc., Gastonia, N.C.
Filed Jul. 17, 1991, Ser. No. 731,806
Int. Cl.[5] B65G *11/16*
U.S. Cl. 193—2 R **19 Claims**



10. An aggregate particle shield for use as a wearliner or the like, in aggregate material transport devices, such as line vibrating feeders, discharge chutes, feeder hoppers or the like, said particle shield comprising a multiplicity of impact plugs upstanding in a hardened, molded polyurethane bed, said plugs having a body including an upper surface, a lower surface and wall means for joining said upper surface and said lower surface, said impact plugs being formed of a distinct shape that is generally cylindrical and has a reduced traverse cross-sectional area creating an annular cavity in said wall means of said impact plugs for receiving said polyurethane, said cavity providing an increased purchase in said impact plugs by said filler means whereby said impact plugs are held securely in place, said impact plugs being arranged in a predetermined pattern, and oriented so that all of said upper surfaces of said impact plugs are substantially co-planar with each said upper surface of each said impact plug being presented for contact with the aggregate particles.

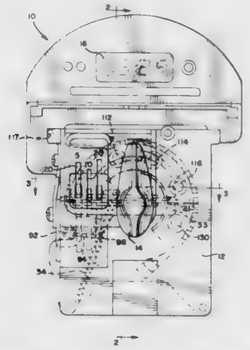
5,109,971
PALLET TRANSPORT DEVICE
Felix Riner, Frick, Switzerland, assignor to Gebruder Frech AG, Switzerland
Filed Apr. 16, 1991, Ser. No. 686,199
Claims priority, application Switzerland, Apr. 20, 1990, 01350/90
Int. Cl.[5] B65G *13/00*
U.S. Cl. 193—35 A **8 Claims**



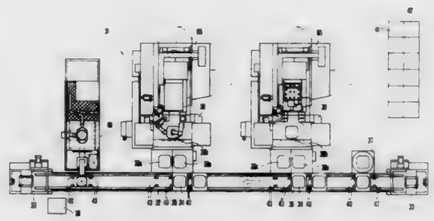
1. In a non-driven pallet transport device for receiving pallets, the device including a plurality of projections **(1)** which are received in a plurality of correspondingly designed docking receptacles of a driven pallet transport device, the projections **(1)** forming extensions of a plurality of roller conveyors on which the pallets are displaceable, the improvement comprising: the pallet transport device having at least one securing element **(5)** positioned at a front end of each projection **(1)**, each said securing element **(5)** comprising a shaped body **(9)** pivotally seated about a pivot axle **(8)** extending in a displacement direction of each pallet and having at least one first activation surface **(18)** and a securing surface **(19)** extending vertically to the displacement direction, the shaped body **(9)** positioned in a section of the front end of at least one of the projections **(1)** and the shaped body **(9)** having a second activation surface **(17)** which in an undocked condition of the pallet transport device extends below the roller conveyor in a support area of each said projection **(1)**, while the first activation surface **(18)** and the securing surface **(19)** of the shaped body **(9)** are maintained above the roller conveyor and are pivoted into a movement area of the pallets by a spring force.

5,109,972
COIN OPERATED TIMING MECHANISM
John W. Van Horn, Harrison, Ark., and Ralph H. Carmen, Lebanon, N.J., assignors to Duncan Industries Parking Control Systems Corp., Harrison, Ark.
Filed Jul. 24, 1989, Ser. No. 384,781
Int. Cl.[5] G07F *17/24*
U.S. Cl. 194—217 **46 Claims**

1. In a coin-operated timing mechanism including a coin carrier, said carrier including engaging means for operation of at least one switch engageable upon movement of the carrier with an inserted coin, and means responsive to switch operation for recording time purchased, the improvement wherein said switch includes a switch actuator positioned adjacent the path of movement of said carrier and its associated engaging means, and means for adjusting the position of said actuator relative to said path of movement whereby said engaging means is selectively engaged depending on the size of the coin inserted.

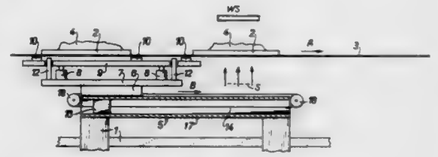


5,109,973
FREE FLOWING PRODUCTION SYSTEM
Takashi Hirano, and Hiroshi Yamaga, both of Abiko, Japan, assignors to Hitachi Seiki Co., Ltd., Abiko, Japan
Continuation of Ser. No. 238,146, Aug. 30, 1988, abandoned.
This application Jan. 2, 1990, Ser. No. 462,338
Claims priority, application Japan, Sep. 3, 1987, 62-221029
Int. Cl.[5] B65G *43/00*
U.S. Cl. 198—341 **7 Claims**



1. A free flowing production system comprising:
at least one pallet, adapted to hold a workpiece thereon;
an endless-running conveying apparatus adapted to hold a plurality of said pallets, to have workpieces in finished and unfinished conditions placed mixedly on a surface of said conveying apparatus;
at least one tray, adapted to hold said at least one pallet thereon, and directly placed on the surface of said conveying apparatus and formed such that pallets can be introduced and ejected from the tray for beginning and ending production of the workpiece;
at least one shifting device provided on each said pallet, having an adjustable position structure which has a position which can be moved between projecting or not projecting, by a manual or an automatic operation;
a variety of automatic production machines, disposed along said conveying apparatus, each said machine providing means for introducing and ejecting a pallet, each said automatic production machine including means for moving said position of said shifting device on a pallet which has passed therethrough, such that a position of said adjustable position structure is shifted when each machine finishes its production process;
an information apparatus, placed adjacent to one of said means for introducing and ejecting said pallet, for determining information indicative of a position of said shifting device and for allowing a pallet to proceed to a machine only when said position of said shifting device is not shifted;
an information card detachably attached to said pallet, and capable of repeated reading and writing operations, said information card including means for storing information indicative of an operation to be performed to said workpiece on said pallet on a particular machine;
a read/write apparatus, placed in a vicinity of said means for introducing and ejecting said pallet, for reading from and writing to said information card;
control means for transmitting said information read from said information card to said machine and for operating said machine based thereon, and writing information indicative of said operating to said information card;
wherein said information card on said pallet is written from a state indicative of an unfinished condition to a state indicative of a finished condition when an operation thereon is completed.

5,109,974
ASSEMBLY LINE SYSTEM
Christian Beer, Boniswil; Christoph Wassmer, and Alois Wyss, both of Brugg, all of Switzerland, assignors to Menziken Automation Mat AG, Menziken, Switzerland
Filed Mar. 27, 1991, Ser. No. 675,642
Claims priority, application Switzerland, May 11, 1990, 01609/90
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—346.1 **18 Claims**



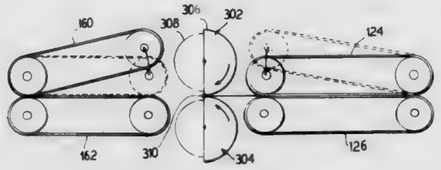
1. Assembly system having
a plurality of transport plates **(2)** for transporting workpieces **(4)** thereon;
a continuously moving transport belt arrangement **(3)** positioned below the transport plates and having a belt run in engagement with the transport plates for transporting said transport plates along a predetermined transport path **(A)** at a predetermined transport speed and spaced from each other;
work stations **(WS)** located along said path for permitting operation of said workpieces thereat,
and comprising, in accordance with the invention,
a rapid transport carriage **(6)** located below the transport plates **(2)**;
means **(14, 18)** for guiding said carriage **(6)** in a path **(B)** parallel to said transport path **(A)**;
linear motion drive means **(14, 16, 17)** coupled to said rapid transport carriage **(6)** for moving said carriage in a rapid transport direction **(B)** at a speed which is higher than the transport speed of the transport belt arrangement **(3)**;
lifting means **(8, 9)** projecting from the rapid transport carriage **(6)** towards said transport plates and selectively projectionable or retractable to engagement with, or release from, a selected transport plate **(2)**, positioned above said carriage, for rapid shifting of the selected transport plate along said predetermined transport path **(A)**, including at least one positioning projection **(10)** which, with respect to said rapid transport direction **(B)**, is located in advance of the engaged transport plate **(2)** to push away a

transport plate which was previously located at said work station (WS).

5,109,975
SEGMENTED TURNING DEVICE

John Prettie, Plymouth, Wis., assignor to H.G. Weber & Co., Inc, Kiel, Wis.

Continuation-in-part of Ser. No. 480,259, Feb. 15, 1990, Pat. No. 5,012,915, which is a continuation of Ser. No. 297,410, Jan. 13, 1989, abandoned. This application Jan. 11, 1991, Ser. No. 640,126
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—411 **23 Claims**

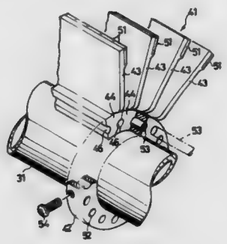


1. A device for rotating an item in a plane through an angle wherein said item is being conveyed in a linear longitudinal direction in said plane comprising:
- opposed rotating members for positively controlling said item as it is being conveyed in said linear longitudinal direction;
- a rotating roller means comprising at least one roller having an enlarged radius angular section and a reduced radius angular section;
- first rotating means comprising a first portion of said rotating roller means having said enlarged radius angular section for engaging a first portion of said item and for moving said portion at a first linear speed in said longitudinal direction;
- second rotating means comprising a second portion of said roller means having said enlarged radius angular section for simultaneously engaging a second, laterally spaced portion of said item and for moving said laterally spaced portion at a second, different linear speed in said longitudinal direction; and
- means for releasing said positive control of said opposed rotating members when said item is engaged by said first and second rotating means.

5,109,976
CLEANER

Toyoshige Mohri, Minoo, and Toshiyuki Makino, Tokyo, both of Japan, assignors to Horyo Corporation, Osaka, Japan

Filed Apr. 20, 1990, Ser. No. 511,689
Claims priority, application Japan, Nov. 21, 1989, 1-135894[U]
Int. Cl.[5] B65G *45/14*
U.S. Cl. 198—498 **8 Claims**

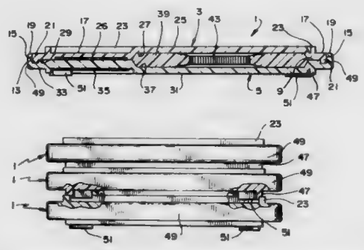


1. A cleaner comprising a rotary drum;
- radial rubber blades attached to the outer surface of the drum, each of the blades being formed with an enlarged portion at the base end portion thereof, the enlarged portions being formed separately from each other, and the separate enlarged portions of the blades when joined together forming a tubular boss portion surrounding the drum, wherein said separately formed enlarged portions include connecting means for connecting said enlarged portions together; and
- abrasion-resistant ceramic members each secured to the outer edge portion of each of the blades.

5,109,977
TAMPERPROOF COIN CASE

Stephen H. Mayer, El Toro, and David Hall, Newport Beach, both of Calif., assignors to Professional Coin Grading Service, Inc., Santa Ana, Calif.

Division of Ser. No. 506,091, Apr. 9, 1990, Pat. No. 5,042,650. This application Jun. 13, 1991, Ser. No. 714,833
The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.
Int. Cl.[5] B65D *85/58*
U.S. Cl. 206—0.8 **1 Claim**

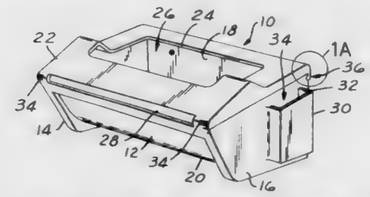


1. A stackable tamper proof coin case comprising first and second plate members permanently joined together along abutting joint areas to provide a coin containment case, said plate members having generally flat first and second outer surfaces, and other circumferential side walls;
- the outer surfaces of the first and second plate members including respective first and second engagement means to permit the stacking of plural assembled cases together with the flat outer surfaces spaced apart, said first engagement means comprising an outwardly extending continuous flange spaced inwardly of the outer circumferential side wall of the first plate member, and the second engagement means comprising an outwardly extending continuous flange spaced inwardly from the outer circumferential side wall of a second plate member said first and second flanges having substantially similar geometric configurations;
- stacking flanges disposed adjacent limited areas only of said first engagement means and protruding outwardly beyond the outer surface of the first engagement means, said stacking flanges spaced inwardly from the outer edge of said first engagement means a distance sufficient to enable the second engagement means to be stacked in abutting relationship with said first engagement means without interference with the stacking flanges on the first engagement means;
- whereby, when a pair of said cases identical to each other are stacked with the first engagement means of one case abutting the second engagement means of the other case, the stacking flanges of one case nest within the second engagement means of the other case.

5,109,978
DISPENSER FOR PLASTIC BAGS

Darrell R. Cawley, 16840 11 Mile, Apt. 109, Roseville, Mich. 48066

Filed Jul. 18, 1991, Ser. No. 732,394
Int. Cl.[5] B65D *85/671*
U.S. Cl. 206—225 **18 Claims**

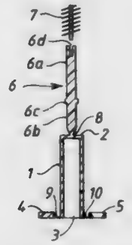


1. A dispenser for plastic bags, the plastic bags being mutually serially joined in a severable manner and rolled into a roll, said dispenser comprising:
- a front wall having an upper end, a lower end, a right side and a left side;
- a rear wall having an upper end, a lower end, a right side and a left side;
- a right side wall generally connected with said right side of said front and rear walls, said right side wall having an upper end and a lower end;
- a left side wall generally connected with said left side of said front and rear walls, said left side wall having an upper end and a lower end;
- a bottom generally connected with said lower end of each of said front, rear, right side and left side walls, said front wall being angled relative to said bottom at an interior angle therebetween of substantially larger than 90 degrees; and
- a top generally connected with said upper end of at least one of said front wall, said right side wall and said left side wall, said top and said front wall in combination forming a dispensing slot through which the plastic bags are passable, said top having an opening dimensioned so that the roll is passable therethrough.

5,109,979
CONTAINERS AND METHODS OF MANUFACTURING THEM

Rodney D. Cole, Guildford, United Kingdom, assignor to Innovation Services Limited, Great Britain

Filed Feb. 19, 1991, Ser. No. 657,639
Int. Cl.[5] B65D *69/00*; A45D *40/26*; A46B *11/00*; B65B *23/00*
U.S. Cl. 206—229 **58 Claims**

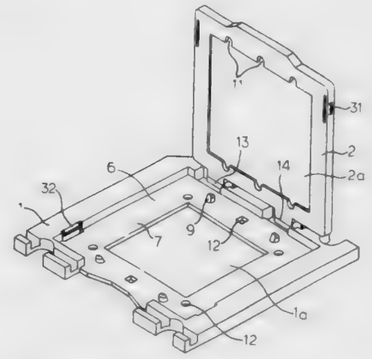


1. A method of manufacturing a moulded container having an associated applicator handle comprises moulding as a one-piece unit the container, the applicator handle, and a frangible moulded connection directly between the container and the applicator handle.

5,109,980
IC CARRIER WITH SHAFT COUPLING

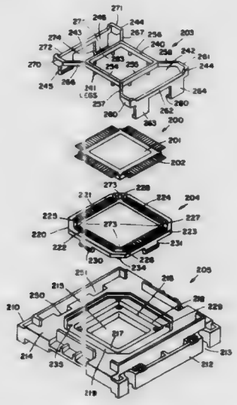
Noriyuki Matsuoka, and Kazumi Uratsuji, both of Tokyo, Japan, assignors to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1990, Ser. No. 631,676
Claims priority, application Japan, Dec. 22, 1989, 1-333999
Int. Cl.[5] B65D *73/02*, *51/04*; H05K *7/10*; H01R *13/62*
U.S. Cl. 206—328 **4 Claims**



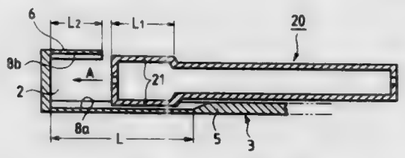
1. An IC carrier comprising:
- a base;
- a cover pivotally attached to said base for holding an IC in said carrier by closing said cover relative to said base; and
- a shaft coupling for pivotally attaching said cover to said base, said shaft coupling having two hinge portions on one end of said cover and spaced at an interval and each having a shaft projecting coaxially along a cover pivoting axis therefrom; and
- one end of said base corresponding to said one end of said cover having a short recess portion along an edge thereof with a length substantially equal to the length of said hinge portions in the pivoting axis direction and having a shaft receiving portion extending therefrom coaxially with said pivoting axis in the same direction as the shafts project from a corresponding hinge portion and a distance sufficient to accommodate one of the projecting shafts, and said one end of said base further having a longer recess portion along said edge thereof spaced from said short recess portion at the same interval as the spacing of said hinge portions and with a length longer than the length of said hinge portions in the pivoting axis direction and having a shaft receiving portion extending therefrom coaxially with the pivoting axis in the same direction as the shafts project from a corresponding hinge portion and a distance sufficient to accommodate one of the projecting shafts;
- said cover being bendable in the thickness direction thereof from an unbent condition for inclining said shafts relative to the pivoting axis for, when the cover is to be pivotally attached to said base, permitting the one of said hinge portions in the position corresponding to the longer recess portion to be inserted into the longer recess portion and the projecting shaft thereon to be inserted into the shaft receiving portion extending therefrom and permitting the projecting shaft on the other of said hinge portions in the position corresponding to the short recess portion to be inserted into the shaft receiving portion of the short recess portion and, upon restoring of the cover to the unbent condition, permitting the other of the hinge portions to be inserted into the short recess portion.

5,109,981
CARRIER AND CARRIER SYSTEM FOR FLATPACK INTEGRATED CIRCUITS
Roy E. Maston, III, Milford, and Robert H. Murphy, Merrimack, both of N.H., assignors to R. H. Murphy Company, Inc., Amherst, N.H.
Continuation-in-part of Ser. No. 495,860, Mar. 19, 1990, Pat. No. 5,012,924. This application Aug. 6, 1990, Ser. No. 563,402
Int. Cl.[5] B65D *73/02;* **H05F** *3/00;* **H01H** *47/00*
U.S. Cl. 206—331 **20 Claims**



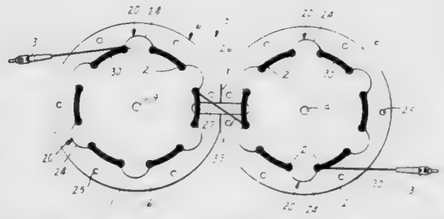
1. Apparatus for supporting an electronic component having a housing and a plurality of terminals emanating from the housing, said apparatus comprising:
A. carrier frame means having component support means for supporting the housing and terminals in a central area thereof and having first engagement means located beyond the support area, and
B. retention cover means for securing the component to said component support means including central, open frame means for engaging the component housing, second engagement means for securing said retention cover means to said first engagement means, and diagonal beam means emanating from said open frame means for spacing said second engagement means from said open frame means to align with said first engagement means whereby said retention cover means provides free access to the electronic housing and terminals.

5,109,982
CASSETTE CONTAINER CASE WITH RECESSED WALLS
Kiyoo Morita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jul. 23, 1990, Ser. No. 556,152
Int. Cl.[5] B65D *85/672*
U.S. Cl. 206—387 **2 Claims**



1. A cassette container case comprising: a lid having a pocket for receiving a front open portion of a cassette, and a casing having rotation-preventing projections formed thereon, said lid and said casing being pivotally connected for movement between open and closed positions, a pair of recessed portions for receiving a thick portion of a cassette at said front open portion of said cassette, said recessed portions being formed in an inner surface of said pocket, said recessed portions having a width in a direction of insertion of said cassette enabling insertion and removal of said cassette, one of said recessed portions being formed in a rear wall of said lid and the other of said recessed portions being formed in a front wall of said lid defining said pocket, said other of said recessed portions extending the entire height of said front wall, the height of said recessed portion formed in said rear wall being slightly greater than the sum of the height of said front wall and the length of said thick portion of said cassette in the front-to-rear direction of said cassette.

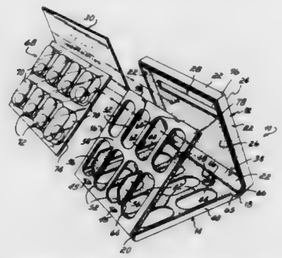
5,109,983
PACKAGE FOR AN OPTICAL FIBER JUMPER
James P. Malone, Middleton; Warren J. Biskupek, Aberdeen Township, Monmouth County, and Edward B. Lurie, Matawan, all of N.J., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 28, 1991, Ser. No. 646,686
Int. Cl.[5] B65D *85/671;* **B65H** *55/00*
U.S. Cl. 206—408 **9 Claims**



1. An optical fiber shipping and handling package for use with optical fiber jumpers, said package comprising
a sheet of material formed to have two allochiral halves which are joined along a fold line,
each of said halves having mushroom shaped cut-outs arranged in a circular array with said array having a diameter exceeding twice the bend radius for optical fibers, said cut-outs affording the wrapping of a length of optical fiber spirally on both halves with a connector at each end, and
said halves each having a recess communicating with the recess in the other half and extending across said fold line to permit a said length of optical fiber to extend across the fold line and to be readily cut to separate a said optical fiber wound thereon into two pigtails.

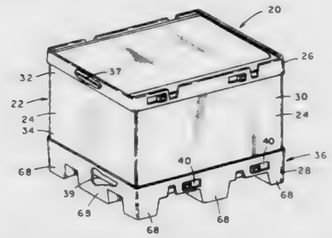
5,109,984
UNIT-DOSE MEDICATION HANDLING AND DISPENSING SYSTEM
Jerome M. Romick, 170 N. Drexel Ave., Columbus, Ohio 43209
Filed Jun. 22, 1990, Ser. No. 542,269
Int. Cl.[5] B65D *83/04*
U.S. Cl. 206—531 **5 Claims**

1. A reusable, plastic medication dispensing container, comprising:
a top, bottom, and unit-dose medication retaining frame, being molded as a one piece structure, with said top and frame being hingeably attached to said bottom;
reuseable means for affixing a label with patient medication information to said top, with said label affixing means being molded as an integral part of said top;
a hole through said top for viewing a portion of a label so affixed;
reuseable means, integrally molded to said top, bottom and frame, for interlocking said frame to said bottom and said top to said frame by positive mechanical locking action; and
a plurality of matching apertures through said bottom and frame,



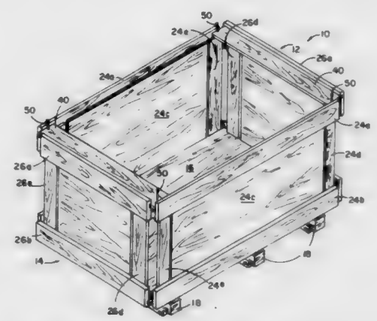
whereby a blister pack can be sandwiched and locked between said bottom and frame, and unit-dose medication from such a sandwiched blister pack can be passed through the apertures in said bottom, and said top can be interlocked directly above said frame.

5,109,985
END CAP LOCKING MEANS FOR A PALLETIZED CONTAINER
Henry H. Rose, Knoxville, Tenn., assignor to Formall/Blackwood Corporation, Knoxville, Tenn.
Filed Jun. 7, 1991, Ser. No. 712,089
Int. Cl.[5] B65D *19/06*
U.S. Cl. 206—600 **20 Claims**



1. In a palletized container including means defining sidewalls for the container and an end cap for attachment to the sidewall-defining means, said sidewall-defining means having two opposite ends and a planar portion adjacent one end of said opposite ends, and said end cap is adapted to accept said one end of the sidewall-defining means when placed in position for attachment thereto, the improvement comprising:
locking means for locking the sidewall-defining means to the end cap including
a) a slide member;
b) retaining means for slidably mounting the slide member on said one end of said sidewall-defining means so that the slide member can be moved in a direction generally parallel to the plane of said planar portion between a retracted position and an advanced position; and
c) means associated with the end cap defining an opening for receiving a part of the slide member when the slide member is moved from its retracted position toward its advanced position to thereby lock the sidewall-defining means to the end cap.

5,109,986
PALLET BOX CONTAINER
John F. Pruitt, Jr., 2140 Audobon, S.W., Wyoming, Mich. 49509
Filed May 6, 1991, Ser. No. 696,198
Int. Cl.[5] B65D *19/16*
U.S. Cl. 206—600 **16 Claims**

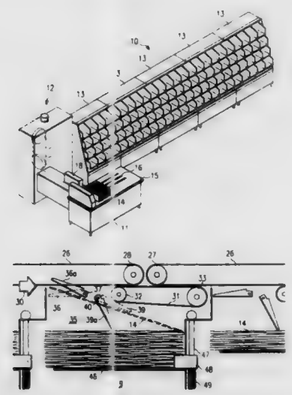


1. A collapsible pallet container comprising:
a support pallet having a horizontal platform with four edges and undergirders secured beneath said platform;
a plurality of two opposite, upright side panels and two opposite, upright end panels, arranged in a polygon;
said panels having vertical end edges;
said side panel vertical end edges being adjacent said end panel vertical end edges;
said vertical end edges having upper portions and lower portions;
flexible belting mounted to said panels at said upper portions and said lower portions, and extending between said side panels and said end panels in a manner to secure said panels together in a continuum capable of extension into a rectangular polygon or collapsing into a flattened parallelogram;
said platform having horizontal tongues protruding from at least two of its opposite edges;
said panels having upper and lower portions;
said lower portions of at least two opposite ones of said panels having grooves of a size and location to receive said tongues of said platform, whereby the lower portion of said polygon can be mounted to said platform; and
removable wedging compression members between two opposite ones of said upright panels, to rigidify said polygon, thereby forming a stable pallet container capable of purposeful collapsing.

5,109,987
MULTI-LEVEL SORT MACHINE
Henry A. Daboub, De Soto; Gary E. Bowland, and Paul Gray, both of Wylie, all of Tex., assignors to National Presort, Inc., Dallas, Tex.
Filed Dec. 4, 1989, Ser. No. 445,482
Int. Cl.[5] B07C *3/02*
U.S. Cl. 209—657 **15 Claims**

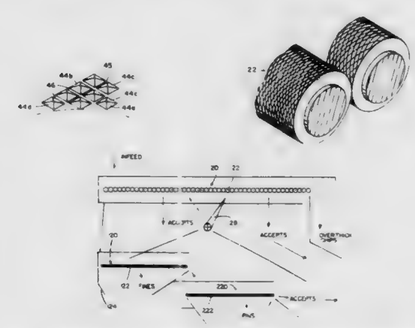
1. A stacker section for a document sorting machine, said stacker section comprising:
a) a plurality of vertically-space horizontally-extending tiers, each of said tiers comprising:
1) a transport tract extending horizontally along the length of said tier and adapted to receive a document;
2) means for maintaining said document in constant pinch while in said tract to move said document along said tract in an upright position;
3) a plurality of sort pockets having their entries spaced horizontally along said transport tract; each of said sort pockets comprising:

i. a deck positioned adjacent said tract and extending outward therefrom;
ii. a diverter means positioned adjacent said pocket for allowing said document to continue along said transport tract and by said pocket when in a first position and for intersecting said transport tract when in a



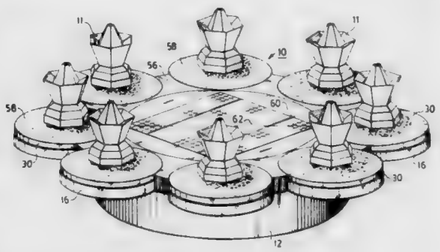
second position to thereby divert said document from said transport onto said deck of said pocket where said document is stacked in a substantially upright position; and
iii. means for moving said diverter to said first and second positions.

5,109,988
MACHINE AND METHOD FOR SORTING OUT FINES, PINS, AND OVER-THICK WOOD CHIPS
Adrian Artiano, Oregon City, Oreg., assignor to Acrowood Corporation, Everett, Wash.
Continuation-in-part of Ser. No. 155,270, Feb. 12, 1988, Pat. No. 4,903,845, and a continuation-in-part of Ser. No. 296,756, Jan. 1, 1989, Pat. No. 5,012,933. This application Feb. 26, 1990, Ser. No. 485,310
The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.
Int. Cl.[5] B07B *13/04*
U.S. Cl. 209—673 **15 Claims**



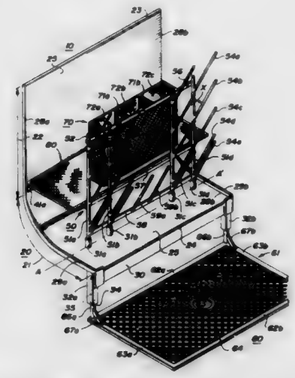
1. A method of separating fines, pins, and over-thick chips from wood chip material to obtain acceptable wood chips, said method comprising:
feeding the chip material at an infeed end of a first roller screen having agitating and conveying rollers spaced apart to pass chips of acceptable thickness between such rollers and to discharge over-thick chips at a discharge end, said first roller screen having a leading length segment commencing at said infeed end along which most of the fines and pins pass therethrough together with acceptable chips;
delivering the pins, fines, and acceptable chips passing through said leading length segment of said first roller screen onto an infeed end of a second roller screen having agitating and conveying rollers adapted to pass the fines between such rollers and to discharge the pins and said acceptable chips at a discharge end;
delivering the pins and acceptable chips discharging from said second roller screen onto an infeed end of a third roller screen having chip agitating and conveying rollers adapted to pass the pins between such rollers and to discharge the acceptable chips at a discharge end;
collecting the pins; and
combining the acceptable chips passing through the remainder of the length of said first roller screen following said leading length segment with the acceptable chips discharging from the discharge end of said third roller screen.

5,109,989
ROTARY DISPLAY
Klaus Kremmin, Churchville, and Thomas R. F. Kremmin, Spencerport, both of N.Y., assignors to K-2 Industries, Inc., Pavilion, N.Y.
Filed Dec. 11, 1990, Ser. No. 625,882
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—1.55 **28 Claims**



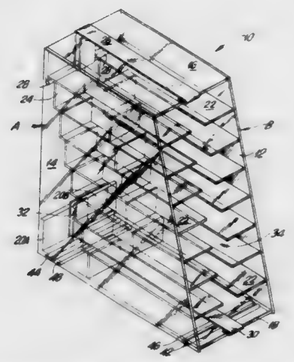
1. A rotary display comprising:
a base having an upper support surface;
a rotary table mounted for rotation on said base about a main axis of rotation;
means for rotating said rotary table including a drive mechanism that projects through said support surface of the base into engagement with an annular portion of said rotary table;
a plurality of display disks mounted for rotation about respective planetary axes of rotation carried by said rotary table;
a plurality of drive wheels mounted for rotation about respective drive axes of rotation carried by said rotary table; each of said drive axes extends substantially perpendicular to said main and planetary axes and substantially intersects said main axis and one of said planetary axes; and
each of said drive wheels includes an annular rim journaled about one of said drive axes; one diametral end of said annular rim is frictionally engaged with said upper support surface of the base, and the other diametral end of said annular rim is frictionally engaged with a bottom surface of said display disks whereby each of said display disks is rotated in response to rotation of said rotary table.

5,109,990
KITCHENWARE DRYING RACK
John D. Murphy, 4417 Irving St., Boise, Id. 83706, and Leo I. Kurtz, 1305 Richard Ave., Bethlehem, Pa. 18018
Filed Mar. 5, 1991, Ser. No. 664,943
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—41 **12 Claims**



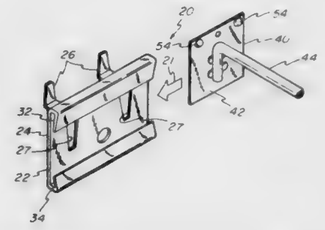
1. A rack for drying kitchenware for use on a countertop adjacent a sink basin comprising:
(A) a frame having a plurality of arms for holding kitchenware;
(B) a base supporting said frame and having a mounting portion of the underside thereof for resting adjacent said sink basin; and
(C) platform means connecting with said base and extending downwardly therefrom into said sink basin for stabilizing said rack to prevent tilting thereof.

5,109,991
WALLCOVERING SAMPLE STORAGE CONTAINER
Cheryl McPherson, Hackensack, N.J.; Gary Stanko, Barrington, Ill., and Richard Urso, Sparta, N.J., assignors to J. Josephson, Inc., South Hackensack, N.J.
Filed Jun. 6, 1990, Ser. No. 533,988
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—45 **10 Claims**



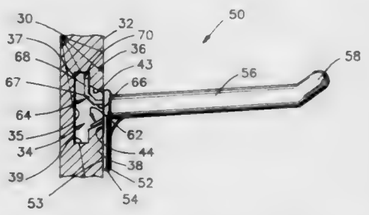
1. A multi-shelf storage container comprising a top, bottom rear, and a pair of side walls spaced from one another, the front of said container between said side walls being open, the side walls being canted rearwardly from bottom to top, and a plurality of essentially horizontal shelves extending between said side walls and from said open front toward said rear, the top, bottom, rear and each shelf being comprised of two halves, the halves of each shelf being laterally spaced from one another to define a path therebetween, each set of shelf halves on one side of such path being connected with one of the side walls, the container including means for joining the one another the halves of at least one of the top, bottom or rear.

5,109,992
ADJUSTABLE PEG HOOK
Byron R. Miller, Springboro, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed May 3, 1991, Ser. No. 695,611
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—59.1 **11 Claims**



1. An adjustable peg hook comprising:
a suspension bracket comprising a backing plate, a pair of pegs secured to said backing plate for engagement with spaced peg openings in a pegboard and upper and lower channel portions secured to said backing plate and defining horizontally extending and vertically spaced upper and lower plate passages,
an insert comprising a support plate for slidable reception in said upper and lower plate passages and a hook mounted on said support plate, and
locking means for selectively locking said support plate at any desired location along the horizontal extent of said passages.

5,109,993
MERCHANDISE DISPLAY SYSTEM AND MERCHANDISE HOLDER THEREFOR
V. James Hutchison, 1949 S. Robb Way, Lakewood, Colo. 80228
Filed Oct. 31, 1989, Ser. No. 429,697
Int. Cl.[5] A47F *1/00*
U.S. Cl. 211—87 **20 Claims**



1. A merchandise holder adapted for use in a merchandise display system including a front display surface provided with a horizontal channel for said mounting merchandise support holder, the channel having an enlarged interior region bounded by a back wall, an upper side support wall and a lower side support wall each extending forwardly from said back wall, and having upper and lower retention walls extending in opposition to one another from the respective upper and

lower support walls and terminating respectively in to an upper distal edge and a lower distal edge whereby a horizontal slot is formed between the upper and lower distal edges, said slot communicating from the front display surface to the interior of the channel, said merchandise holder comprising:

a base member having a front and a back;

a merchandise retention member including merchandise retention means for releasably retaining merchandise thereon, said retention member having a base end attached to the front of said base member;

channel engagement means on the back of said base member for engaging said upper and lower retention walls and supporting the weight of the merchandise holder and merchandise retained thereon; and

biasing means associated with said channel engagement means for resiliently biasing said base member in a direction away from the upper retention wall and toward said lower retention wall such that disengagement of said channel engagement means from said lower retention wall by upward forces exerted upon said merchandise holder is resisted, said channel engagement means sized such that both of said upper and lower retention walls are engaged thereby when said channel engagement means is biased toward the lower retention wall.

5,109,994

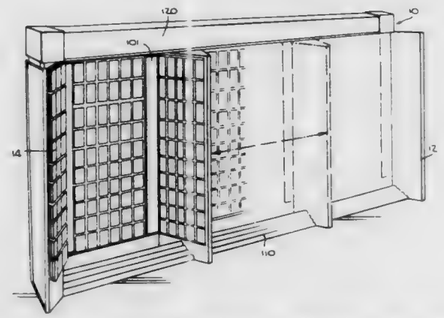
DISPLAY SYSTEM

R. Christopher Kidd, and Lester W. Morrow, both of New York, N.Y., assignors to Marlboro Marketing, Inc., New York, N.Y.

Filed Mar. 2, 1990, Ser. No. 487,731

Int. Cl.[5] A47F *5/00*

U.S. Cl. 211—162 **16 Claims**



1. A display unit for merchandise comprising upper and lower tracks, each of said tracks having a channel formed therein;

a pylon having two angularly arranged panels disposed between said upper and lower tracks; and

upper and lower wheels secured to said pylon and slidingly received in said respective upper and lower channels to provide for sliding said pylon along said channels,

locking means secured to one of either of said upper or lower wheels for locking said pylon in a selected position along said channel.

5,109,995

BEVERAGE DRINKING SET WITH STRAW HOLDER

Kwong L. Lou, 6402 N. San Gabriel Blvd., San Gabriel, Calif. 91775

Filed Oct. 18, 1990, Ser. No. 601,119

Int. Cl.[5] A47G *19/22, 21/18*

U.S. Cl. 215—1 A **21 Claims**

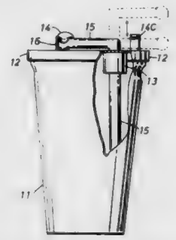
1. A beverage serving set comprising:

a beverage container for holding beverages to be consumed;

a lid covering the container;

a drinking straw permanently in L-shape having a short part and a long part, the long part being of a length to be extended into the container through the lid and adjacent the container bottom; and

sleeve means for freely slidably and rotatably supporting the long part of the straw through the lid, and maintaining the



long part perpendicular to the lid and the short part parallel to the lid during consumption of the beverage, whereby the short part of the straw can be positioned at various heights above the lid for a desired drinking position.

5,109,996

NURSING BOTTLE ASSEMBLY WITH MEANS TO REMOVE AIR

Charles J. Sullivan, 1500 Wagonwheel Dr., Henderson, Nev. 89015

Filed May 15, 1991, Ser. No. 701,469

Int. Cl.[5] A61J *9/00*

U.S. Cl. 215—11.6 **2 Claims**



1. An improved nursing bottle assembly of the type in which a collapsible sack for holding liquid has an open nipple end and a closed opposite end and is inserted into a protective tube that is open on both its first end and its second end, and in which a nipple is secured to a nipple mounting cap that is threaded on the first end of the protective tube to support the collapsible sack in the protective tube and to close the open nipple end of the collapsible sack, wherein the improvement comprises:

a hollow plunger sized to be slidably inserted into the second end of the protective tube,

the plunger having a closed end and an open end, the open end providing access to a cavity in the plunger, the closed end of the plunger having smaller diameter than the internal diameter of the second end of the protective tube,

the plunger being slidable within the protective tube from a first position at which the closed end of the plunger initially abuts the closed end of the protective sack to a second position in which the plunger causes the closed end of the protective sack to abut the nipple mounting cap,

the plunger having an external cylindrical shoulder portion adjacent its open end and extending toward its closed end, the external cylindrical shoulder portion being sized to loosely fit into the open end of the protective tube, and

the plunger further having a tapered body portion of decreasing diameter extending between its shoulder portion and its closed end to minimize interference between the plunger, the collapsible sack and the protective tube as the plunger is shifted in a direction to maintain contact between its closed end and the closed end of the sack and the sack collapses toward the nipple mounting cap upon withdrawal of the liquid,

whereby, as liquid is withdrawn from the protective sack through the nipple, the plunger can be shifted by manual pressure toward the first end of the protective tube to compress the fluid containing portion of the sack between the nipple and the closed end of the collapsing sack to prevent air accumulation in the sack space vacated by the removed liquid.

5,109,997

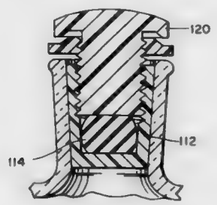
EXPANDABLE STOPPER

Edwin D. Phillips, 700 Cedar Ave., Middlesex, N.J. 08846

Filed Jun. 21, 1991, Ser. No. 718,657

Int. Cl.[5] B65D *39/12*

U.S. Cl. 215—360 **4 Claims**



1. A stopper for a bottle mouth comprising

a hollow body having an inner surface defining a generally cylindrical cavity with a closed lower end,

an interior helical thread formed on said inner surface,

a plug of relatively soft material, placed within the cavity against said closed lower end,

a cap having a core portion sized to fit within the cavity, at least a portion of the core having external helical threads engageable with the internal threads on the interior surface of the body, and a top with a radially protruding rim, whereby the cap can be turned with respect to the hollow body, once the body has been placed in a bottle mouth, the threads thereupon causing the core to advance against and compress the plug, which in turn expands the hollow body outward against the mouth, and further comprising

an internally threaded jacking ring mounted on the external helical threads of the cap between the cap's top and the bottle mouth, so that in case the stopper becomes frozen in the bottle mouth, the jacking ring can be screwed down against the mouth to withdraw the stopper.

5,109,998

FREIGHT CONTAINER FOR AIR TRANSPORT

Gerd Bretschneider, Hilzingen, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

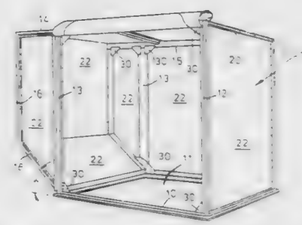
PCT No. PCT/CH88/00088, § 371 Date Dec. 30, 1988, § 102(e) Date Dec. 30, 1988, PCT Pub. No. WO88/08821, PCT Pub. Date Nov. 17, 1988

PCT Filed May 13, 1988, Ser. No. 302,236

Claims priority, application Fed. Rep. of Germany, May 13, 1987, 3715895

Int. Cl.[5] B65D *85/14*

U.S. Cl. 220—1.5 **7 Claims**



1. Freight container for air transportation purposes which comprises: a bottom panel; a support frame arranged on said bottom panel, said support frame including first and second pair of hollow sections projecting from the bottom panel and transverse hollow sections connecting said projecting sections, said first and second pair of hollow sections are rectangular having section walls; planking at least partly filling in said support frame and fitted to said sections; flat gusset plates interconnecting the sections of the support frame; wherein one of said first and second pair of hollow sections include two flanges extending outwards beyond the hollow sections and in line with a section wall and the other pair of said first and second hollow sections include two flanges extending at right angles to each other; and wherein the gusset plates are secured to said flanges, whereby deformation of the gusset plates is not necessary to join sections therewith.

5,109,999

TRANSPORT CONTAINERS

Jeremy Instone, and Giles Instone, both of London, England, assignors to Solindo Equipment Leasing Limited, Crawley, England

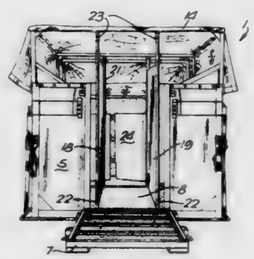
PCT No. PCT/GB90/00196, § 371 Date Oct. 5, 1990, § 102(e) Date Oct. 5, 1990, PCT Pub. No. WO90/09098, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 7, 1990, Ser. No. 576,523

Claims priority, application United Kingdom, Feb. 7, 1989, 8902632

Int. Cl.[5] B65G *1/20*

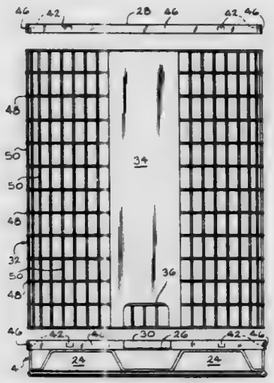
U.S. Cl. 220—1.5 **9 Claims**



1. A transport container comprising a lower part having a

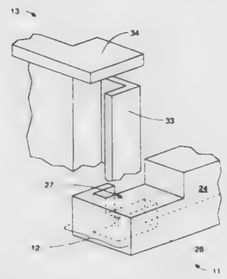
base and outer walls and an upper part defined by a collapsible structure which comprises a plurality of supporting members adjustably mounted to upper portions of said outer walls to be selectively raised and lowered relative to said outer walls, and a canopy extending over said supporting members and having edge portions which are adapted to be secured to said upper portions of at least some of said outer walls, said upper portions of at least some of said outer walls being hingedly provided with rigid supporting flaps which are arranged to be releasably engageable with said supporting members to provide stability to the collapsible structure when raised.

5,110,000
COMPOSITE SHIPPING CONTAINER WITH SEPARABLE TOP AND BOTTOM STRUCTURES
Dwight E. Nichols, Beatrice, Nebr., assignor to Hoover Group, Inc., Alpharetta, Ga.
Filed Feb. 11, 1991, Ser. No. 653,359
Int. Cl.[5] B65D *19/00*
U.S. Cl. 220—4.16 **23 Claims**



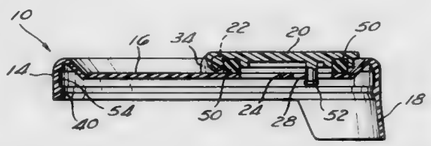
1. A composite shipping container comprising a removable poly tank, a housing and a pallet, said tank having a top wall, a bottom wall and substantially upright side walls, said top wall being integrally connected to said bottom wall by said tank side walls and also having a fill port positioned in said top wall and a discharge port located adjacent to said bottom wall, said tank being generally enclosed within said housing and supported thereby, said housing including upright side walls in side-by-side contact with said tank side walls and further including a top structure and a bottom structure, said bottom structure being attached to said pallet and being in supportive contact with said tank bottom wall, securing means on said top structure and said bottom structure for releasably retaining said top structure in securement with an upper periphery of said housing side walls and for releasably retaining said bottom structure in securement with a lower periphery of said housing side walls, said securing means being operable to secure said top structure to said upper periphery of said side walls and said bottom structure to said lower periphery of said side walls in response too relative telescoping movement of said top structure in relation to said upper periphery of said side walls and of said bottom structure in relation to said lower periphery.

5,110,001
HANDLE FOR WAFER CARRIER
L. Brian Dunn, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Mar. 4, 1991, Ser. No. 665,198
Int. Cl.[5] B65D *25/28*
U.S. Cl. 220—94 R **5 Claims**



1. An attachable and detachable handle for an automated-usage wafer carrier, comprising:
two elongated bases for spacing and rigidly supporting a pair of lock-pieces on each base,
two legs attached to said bases,
two transverse members attached to said legs for spanning the wafer carrier and expanding said legs by compressing together said transverse members, and
means for slidably attaching said handle to automated-usage fixtures at two ends of the wafer carrier by locating said lock-pieces at opposite ends of said elongated bases, each lock-piece including a generally U-shaped flange, each flange opening inward and toward the center of the base and forming a vertical slot slightly wider than the thickness of a SEMI (Semiconductor Equipment and Materials International) standard automated-usage pickup flange and said vertical slots at each end of said base being slightly farther apart than said SEMI pickup flanges.

5,110,002
PROTECTIVE CAP WITH SEAL FOR BEVERAGE CONTAINER
Terence Tucker, 33811 Shannon La., San Juan Capistrano, Calif. 92675
Continuation-in-part of Ser. No. 598,175, Oct. 15, 1990, Pat. No. 5,054,640. This application Jan. 22, 1991, Ser. No. 620,836
Int. Cl.[5] B65D *51/18*
U.S. Cl. 220—254 **5 Claims**



1. A protective cap for preventing insects, airborne debris, and the like from entering a beverage container, for preventing spillage, and for sealing carbonation within the container, the cap comprising:
(a) a generally planar surface having a peripheral portion formed thereabout, said generally planar surface having an opening formed therein, said peripheral portion having a detent formed thereabout for engaging the rim of a beverage can such that said protective cap is removably attachable to a beverage can such that a gas-tight seal is provided at the periphery of said cap between said cap and said can;

(b) a cover hingeably attached to said cap such that said cover can be rotated between an opened position and a closed position of said opening;
(c) a compressible seal disposed in a groove formed in the lower surface of said cover; and
(d) a detent means formed upon one of said planar surface and said cover for engaging said cover in a closed position such that said seal is sufficiently compressed to provide a gas-tight closure.

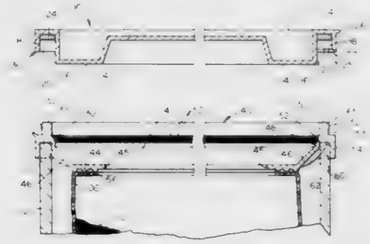
5,110,003
TORQUE-OVERRIDE CAP
Robert MacWilliams, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.
Filed Jun. 28, 1990, Ser. No. 545,060
Int. Cl.[5] B65D *53/00*
U.S. Cl. 220—304 **29 Claims**



1. A cap for use in a filler neck of a tank, the cap comprising
a housing including means for engaging the filler neck,
shell means for providing a hand grip, the shell means including a plurality of drive teeth,
a ratchet wheel disposed between the housing and the shell means and connected to the housing for rotation therewith, the ratchet wheel including a plurality of driven teeth configured to engage the drive teeth to provide a torque-limited connection in the cap-advancing direction and a positive connection in the cap-removal direction, and
spring means for yieldably biasing the driven teeth of the ratchet wheel into engagement with the drive teeth of the shell means to establish said torque-limited and positive connections, the spring means being separate from the ratchet wheel.

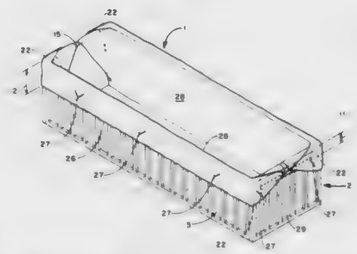
5,110,004
LID ASSEMBLY
Mario Albanesi, Rome, Italy; Willy A. M. Hertogs, Sint Katelijne Waver, Belgium; Adil M. Khan, and Lucio Pieroni, both of Rome, Italy, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 22, 1990, Ser. No. 497,476
Claims priority, application Italy, Mar. 23, 1989, 19878 A/89
Int. Cl.[5] B65D *43/06*
U.S. Cl. 220—355 **4 Claims**

1. An airtight, reclosable coffee package comprising:
(A) a rectangular lid assembly wherein a lid and a frame are formed as a single molded piece, the lid and frame being joined together by a weakened section which acts as a hinge and permits the lid to be placed in superposed relationship with the frame, the lid having along its entire periphery a rectangular channel-shaped cavity, the frame having a flat, inwardly-extending flange with a central opening which delimits an access opening, said flat inwardly extending flange being connected to a rectangular peripheral relief by a steeply inclined section, said rectangular peripheral relief designed to be received in said channel-shaped cavity and having a peripheral channel underlying it, at least one of the flanks of the rectangular peripheral relief having flexible corrugations thereon which cooperate with a wall of the channel-shaped cavity of the lid so that when the two are brought into pressure-



contact with each other the corrugations press against the wall of the channel-shaped cavity, providing an airtight seal between the two elements of the lid assembly;
(B) a flexible bag fixed underneath the flat, inwardly-extending flange of the frame in an airtight relationship therewith, said flat inwardly-extending flange having a number of ribs underneath to ensure said airtight relationship, said flexible bag containing coffee in its interior and having provision for an opening to permit access to its interior through the access opening of the flange; and
(C) a rigid container enveloping said coffee-containing flexible bag and fixed within the peripheral channel of the frame.

5,110,005
WASTE CONTAINER LINER
Michael R. Schilling, Clinton, La., assignor to Pactec, Inc., Clinton, La.
Filed Mar. 26, 1990, Ser. No. 500,020
Int. Cl.[5] B65D *5/60*
U.S. Cl. 220—404 **2 Claims**



1. In combination with a waste container having an interior and edges, a liner, comprising a flexible envelope having a lengthwise centerline, said envelope including:
a. a top side;
b. a bottom side;
c. first and second ends;
d. a lengthwise slit in said top side between said first and second ends substantially along said centerline of said envelope, said slit having opposing edges;

wherein said top side and said bottom side are sealed together at said first and second ends; and wherein said bottom is positioned in said interior of said container and said opposing edges of said slit and said first and second ends extend over said edges of said container.

5,110,006

HEAT INSULATION SYSTEM FOR SURFACES ALONG WHICH A HOT GAS STREAM IS CONDUCTED

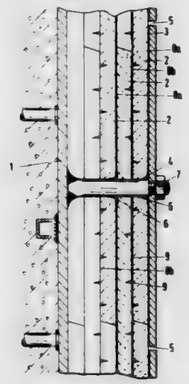
Gerhard Becker, Mannheim; Hans-Gunter Gross, Heidelberg; Johannes Henssen, Geilenkirchen, and Josef Schöning, Hambrucken, all of Fed. Rep. of Germany, assignors to Hochtemperatur Reaktorbau GmbH, Ortmund, Fed. Rep. of Germany

Filed Aug. 21, 1990, Ser. No. 570,627

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1989, 3927624

Int. Cl.[5] B65D *7/42*

U.S. Cl. 220—442 **16 Claims**



1. A hot gas conduction path heat insulation system comprising:

a plurality of holding bolts mounted on a support structure;

a plurality of layers of slightly compressed ceramic fiber mats mounted against said support structure, wherein said holding bolts extend through said layers;

rectangular cover plates mounted against said mats wherein said holding bolts extend through cover plate mounting holes;

intermediate sheets arranged between said layers of slightly compressed ceramic fiber mats exhibiting a plurality of force transfer elements, wherein said force transfer elements are lug-shaped points stamped out on opposing sides of said intermediate plates, and wherein said holding bolts pass through holes defined in said intermediate plates; and

sealing sleeves arranged on said holding bolts.

5,110,007

DISPENSER

Brian R. Law, Leicester, and Christopher Harris, Oakham, both of England, assignors to Imperial Chemical Industries plc, England

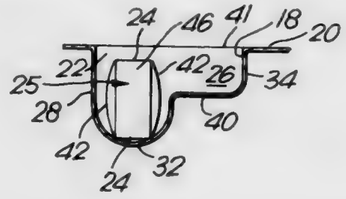
Filed Sep. 5, 1989, Ser. No. 402,776

Claims priority, application United Kingdom, Sep. 12, 1988, 8821287.3

Int. Cl.[5] G07F *11/66*

U.S. Cl. 221—25 **14 Claims**

1. A blister pack comprising a support member provided with a plurality of pockets each of which contains a composition in unit dosage form having a minor and a major axis symmetry, and a cover member of sheet material having a frangible portion closing each pocket and rendering each unit dosage form captive within its respective pocket until the respective frangible portion of the cover member is broken by pressure on the pocket and unit dosage for, said pockets being provided with a support portion to retain the unit dosage form in position and a guide portion which guides the dosage form into the



support portion of the pocket whereby the guide portion provides a means which guides the unit dosage form into the support portion of the pocket and orients the unit dosage form into the support portion such that the minor axis of symmetry of the unit dosage form is generally parallel to the plane of the cover member.

5,110,008

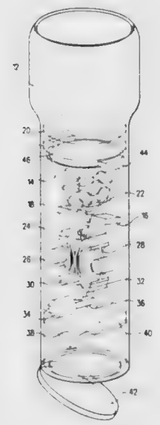
DISPENSER ADAPTED TO ISOLATE THE DISPENSED OBJECTS BY COMPRESSION BETWEEN TWO MOVEABLE STRUCTURES

Thomas S. Moulding, Jr., 214 Via La Soledad, Redondo Beach, Calif. 90277, and Donald G. Ellis, Geneva Park, Boulder, Colo. 80302

Filed Sep. 29, 1989, Ser. No. 414,454

Int. Cl.[5] B65G *59/00*

U.S. Cl. 221—259 **100 Claims**



1. A dispenser for dispensing substantially non-compressible solid objects one at a time comprising:

a receptacle having a substantially hollow interior for storing a plurality of objects to be dispensed, said receptacle having an opening through a first wall thereof;

a passageway extending from said opening to the exterior of said dispenser;

a pair of cooperating structures disposed in said passageway, at least one of said cooperating structures moveable relative to the other cooperating structure whereby movement of said moveable structure carries said objects through said passageway and between said structures substantially one at a time;

said at least one movable structure at least partially formed from a compressible material, said compressible material having dimensions sufficiently larger than dimensions of one of said objects such that a discrete indentation is formed in said compressible material by said object, said indentation possessing a surface disposed behind said object relative to the direction of movement of said object through said passageway thereby facilitating movement of said object through said passageway;

moving means for moving said movable structure; and

detecting means for detecting the passage of each said object past a predefined point in said passageway.

5,110,009

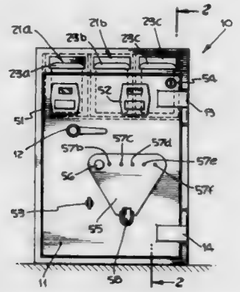
COIN ROLL DISPENSING MECHANISM

Klaus W. Gartner, Palos Verdes Estates, Calif., and Alan K. Uyeda, 8939 Gallatin Rd., #25, Pico Rivera, Calif. 90660, assignors to Alan K. Uyeda, Pico Rivera, Calif.

Continuation of Ser. No. 547,486, Jul. 3, 1990, abandoned. This application Oct. 23, 1991, Ser. No. 781,841

Int. Cl.[5] G07F *11/24*

U.S. Cl. 221—266 **16 Claims**



1. A coin roll dispensing machine for use in dispensing coin rolls through a safe door, comprising:

a dispensing means for selectively distributing individual ones of said coin rolls, said dispensing means having a coin magazine, a pair of guide ramps and associated delivery chute below said magazine, said magazine comprising a plurality of coin reservoirs, a plurality of rotatable cylinders, a plurality of selection apertures, and a plurality of shafts axially linked to said cylinders and accessible via said selection apertures, said coin rolls being stored in each of said reservoirs, each of said cylinders positioned at the bottom of each of said reservoirs respectively and having a cavity sized to accept the lowermost of said coin rolls;

a securing means for preventing operation of said dispensing means, said securing means having a plurality of electrically operated solenoids to normally restrict rotation of each of said plurality of cylinders; and

a first electrically operated means for producing a first code responsive signal to disengage said securing means and enable a selected cylinder to be manually rotated, said first electrically operated means comprising a first electronic combination entry device for manual entry of a first coded sequence and a first circuit board associated with said first entry device electrically connected to said solenoids;

wherein, upon disengagement of said securing means, direct manual rotation of a selected one of said shafts causes corresponding rotation of the cylinder associated with said selected shaft, allowing a lowermost one of coin rolls in said cylinder to be removed from said reservoir and guided to said delivery chute by said guide ramps.

5,110,010

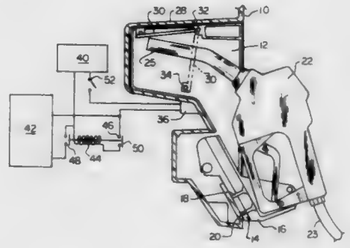
AUTOMATIC FUEL DISPENSER ACTUATOR

Leon B. Smith, Greensboro, N.C., assignor to Gilbarco, Inc., Greensboro, N.C.

Filed Sep. 21, 1990, Ser. No. 586,750

Int. Cl.[5] B67D *5/12*

U.S. Cl. 222—75 **15 Claims**



1. A fuel dispenser of the type provided with a hose connecting a dispenser housing and a nozzle comprising:

a. a metering apparatus for metering fuel through the hose,

b. a power supply for supplying power to the metering apparatus,

c. a nozzle supporting said housing for supporting the nozzle when not in use, said nozzle support provided with a flap positioned to have a first orientation when said nozzle is removed from said nozzle support and a second orientation when said nozzle is supported by said nozzle support because of dislodgement of said flap from said first orientation to said second orientation by said nozzle's placement in said nozzle support,

d. a magnetically actuable switch on said nozzle support operatively associated with said power supply and said metering apparatus, and

e. a magnet mounted on said flap to cause said switch to have a first state when said flap is in said first orientation and to cause said switch to have a second state when said flap is in said second orientation, whereby when said switch is in said first state, said metering apparatus is operatively associated with said power supply to permit the dispensing of fuel through said hose and when said switch is in said second state, said power supply is isolated from said metering apparatus to prevent the dispensing of fuel through said hose.

5,110,011

NON-RELEASABLE SPRAY HEAD AND DIP TUBE ASSEMBLY

Douglas J. Laska; W. Randolph Merton, and Alan G. McKown, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 29, 1990, Ser. No. 546,109

Int. Cl.[5] B67D *5/00*

U.S. Cl. 222—82 **15 Claims**

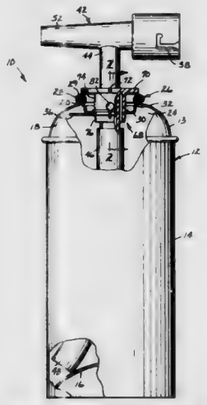
9. A spray dispensing assembly for liquid materials comprising:

a container having a hole, a cover for initially closing said hole, and means for selectively opening said hole;

a spray head having an inlet with a connection for detachable joining with a source of pressurized air, and an outlet for discharging a spray of liquid materials; and

a non-releasable coupling for selectively securing said spray head to said container and over said hole in captive fashion after said hole is opened, thereby substantially hindering refilling of said container, wherein said coupling includes a leg for extension into said hole when said spray

head is secured to said container, wherein said coupling includes an outwardly extending wall adjacent said leg for



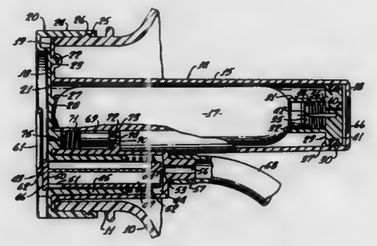
hindering excessive tilting of said spray head when said spray head is secured to said container.

5,110,012

BEVERAGE CONTAINER WITH REGULATED PRESSURE

William R. Scholle, Corona Del Mar; William T. Lloyd-Davies, Irvine, and Chester Savage, both of Irvine, all of Calif., assignors to Scholle Corporation, Irvine, Calif.

Filed Jan. 11, 1991, Ser. No. 640,202
Int. Cl.[5] B65D *83/14*
U.S. Cl. 222—83.5 **18 Claims**



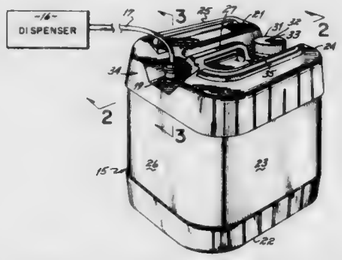
1. A liquid dispensing device comprising
a container having an outlet,
means for controlling the flow of liquid from said outlet,
at least one cartridge of pressurized gas,
said cartridge having a neck at one end thereof,
an outlet through said neck, and a membrane over said outlet acting as a closure therefor,
means for supporting said cartridge in said container, a pressure responsive member in said container, means for providing communication between a portion of said pressure responsive member and the exterior of said container so that said portion is subjected to the ambient pressure around the exterior of said container, and for providing communication between another portion of said pressure responsive member and the interior of said container so that said other portion is subject to the pressure within said container,
said pressure responsive member being movable in response to differences between said ambient pressure and the pressure within said container,
a valve member,
means for arranging said valve member relative to said pressure responsive member so that said valve member is movable by said pressure responsive member,
said valve member including means for forming an aperture in said membrane for discharging gas from said cartridge through said aperture into said container, and for controlling the discharge of gas through said aperture in response to movement thereof by said pressure responsive member,
a resilient means engaging said cartridge and said pressure responsive member for providing a seal between said pressure responsive member and said neck and for biasing said pressure responsive member away from said neck,
said resilient means having an opening therethrough for receiving and transmitting gas so discharged from said cartridge,
said pressure responsive member having an opening therethrough for permitting discharge of said gas from said resilient member into said container.

5,110,013

SYSTEM FOR DISPENSING LIQUID CLEANING COMPOUNDS

Russel W. Clark, and James E. Donovan, both of Cincinnati, Ohio, assignors to Diversey Corporation, Mississauga, Canada

Continuation of Ser. No. 500,400, Mar. 28, 1990, abandoned. This application Jul. 8, 1991, Ser. No. 726,574
Int. Cl.[5] B67D *5/04, 5/60*
U.S. Cl. 222—382 **5 Claims**



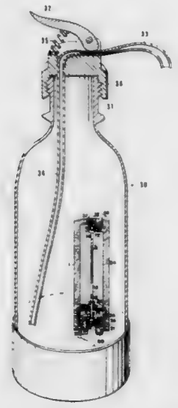
1. A container for a liquid cleaning compound comprising:
a container body having a top, bottom and side wall, a large filling opening and a small dispensing outlet:
said filling opening comprising a screw on cap having a central liquid impervious vapor pervious vent opening into said container whereby said cap can be unscrewed and removed to permit filling and rinsing of said container;
said dispensing outlet including a fitting, said fitting comprising a tubular member having a first end molded to said container and a second end extending from the top wall of said container, said fitting having an inner annular surface having a smooth tubular configuration of uniform diameter from said first end to said second end and an outer annular surface having a contoured configuration adapted to connect to a snap on coupling and a tube compression fitted within said inner annular surface, said tube extending to the bottom of said container wherein liquid cleaning compound can be removed from said dispensing outlet without removing the cap on said large filling opening.

5,110,014

BI-STABLE PRESSURE MAINTAINING GAS CONTAINERS

George J. Doundoulakis, 2498 Kayron La., North Bellmore, N.Y. 11710

Filed Nov. 7, 1990, Ser. No. 610,820
Int. Cl.[5] B65D *83/00*
U.S. Cl. 222—396 **18 Claims**



1. A vessel for storing and releasing a gas for maintaining a pre-determined pressure in a container carrying a liquid and being disposed in close proximity to said vessel; said vessel comprising:
a particular gas to be stored and be released to said container by said vessel;
a high pressure chamber inside said vessel for containing said gas at relatively high pressure, compared to atmospheric pressure;
pressure sensing means for detecting a pressure external to said vessel, relatively to atmospheric pressure;
gas flow control means for allowing flow of said gas from said high pressure chamber to said container;
automatic control means connecting said sensing means with said gas flow control means;
said flow control means comprising:
dual valve housing means and bi-directional valve means, the latter operable in said dual valve housing means, for allowing flow of said gas while said sensing means detects a pressure within a predetermined pressure range and for shutting off gas flow when said sensing means detects a pressure either lower or higher than the predetermined pressure range;
whereby, said vessel provides high pressure storage of a gas, the releasing of which being automatically monitored for maintaining in a container holding a liquid, a predetermined pressure level.

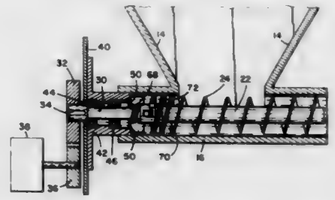
5,110,015

SEALING ARRANGEMENT FOR DRY GOOD FEEDER

Harold J. Kilts, Minneapolis, Minn., assignor to Tecnetics Industries, Inc., St. Paul, Minn.

Filed Dec. 12, 1989, Ser. No. 449,548
Int. Cl.[5] G01F *11/20*
U.S. Cl. 222—413 **16 Claims**

1. A dry good material feeding apparatus having an improved drive seal arrangement, comprising:
a feed hopper having an outer wall defining a storage portion for holding dry material and an auger housing portion, said auger housing portion having a first cylindrical space defined therein on a first side, and a second cylindrical space defined therein on a second side, said first and second cylindrical spaces being substantially aligned and extending through said outer wall so as to communicate said storage portion with an exterior space;
an auger member having a shaft and at least one helical flight connected thereto, said auger member being positioned so as to extend into both of said first and second cylindrical spaces;
means positioned in said first cylindrical space for supplying mechanical energy to turn said auger member; and
means for sealing said supplying means with respect to said feed hopper, said sealing means comprising a rigid tubular member having a spaced defined therein, an outer surface



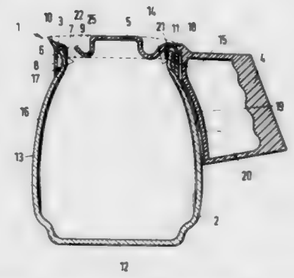
of said tubular member tightly engaging a surface of said housing portion which defines said first space, a seal member having a first section sealingly engaged with said supplying means and a second section sewingly engaged with an inner surface of said tubular member whereby dry material is prevented from escaping said hopper via said first cylindrical space and said sealing means can be relatively inserted or withdrawn from said feed hopper as a unit, said helical flight extending in said first cylindrical space to an area which is proximate said sealing means, whereby dry material is urged away from said sealing means during operation of the apparatus.

5,110,016

CARAFE AND THE METHOD OF MAKING

Gisbert Heimann, and Walter Kramer, both of Mainz, Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Aug. 13, 1990, Ser. No. 565,846
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1989, 3926760
Int. Cl.[5] A47G *19/14*
U.S. Cl. 222—475.1 **12 Claims**



1. A carafe of non-metallic components comprising:
a unitary glass body portion having a side wall of a first diameter, a bottom and an opening of a diameter less than that of the sidewall defined by a rim having inner and outer surfaces to form a neck;
a plastic edge having a pouring lip at one location and handle attaching means positioned in opposed relation to the pouring lip; the plastic edge further including an inner flange which is positioned over the inner surface of the

rim and an outer flange positioned over the outer surface of the rim with an annular space between at least the outer flange and outer surface,

wherein the outer flange terminates in contact with the body portion at a location below the neck and the inner flange terminates within the neck, the inner flange being bevelled to provide a non-abrupt transition between the inner surface of the rim and plastic edge;

a layer of adhesive disposed in the annular space and bonding the plastic edge member to the rim, and

a handle, the handle extending along and bonded to the side wall of the carafe at a location opposite the pouring lip of the plastic edge, the handle having means for positively cooperating with the handle attaching means of the plastic edge.

5,110,017

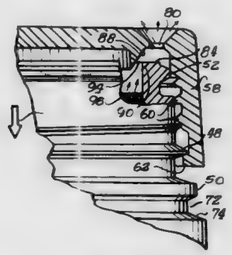
CONTAINER WITH CAPTIVE CAP AND INTERNALLY VALVED CLOSURE AND POSITIVE CLOSURE SEALS

Morris Braun, Chicago, Ill., assignor to W. Braun Company, Chicago, Ill.

Division of Ser. No. 396,934, Aug. 22, 1989, Pat. No. 5,038,967. This application Aug. 13, 1991, Ser. No. 744,254

Int. Cl.[5] B65D *47/00*

U.S. Cl. 222—520 **15 Claims**



1. An open-top container and a captive closure cap surmounting said container, said container having a container body and a neck integral therewith, and said neck being formed with an upwardly open top defining a filling and discharge opening for said container;

an upstanding annular wall of said neck being formed with continuous external thread means for engaging cooperating intercoupling means carried by said closure cap;

said closure cap bridging said neck of said container and including a top wall and an annular skirt depending from said top wall;

annular wiping bead means integrally formed on said neck of said container adjacent an upper limit of said neck, said wiping bead means including a vertically-extending, bounding perimetric end face in contiguous abutment with an opposingly-presented vertical inner wall of said cap for establishing a sustained, wall-wiping sliding contact seal between said end face of said wiping bead means and said wall of said cap in an annular sector above said threads of said neck as said cap is threadedly advanced downwardly toward, and retracted upwardly from, said body of said container;

said bead means projecting radially outwardly of said neck and biased to abut and stressingly to bear against an inside surface of said skirt of said cap for preventing entry of product onto to contaminate said threads upon discharge of product from said container;

sealing ring means for establishing a fluid-tight, line-contact seal of said closure cap with said container at said filling and discharge opening of said container;

said sealing ring means comprising annular flange means integrally formed with and depending from an underside of said top wall of said cap for stressingly engaging and positively sealing against a cooperating annular circumscribing upper interior edge of said container upon threadedly advancing said cap downwardly onto said neck of said container to close said container;

said flange means defining a downwardly projecting annular rib formed with an upwardly and outwardly flared circumscribing outer annular wall for penetrating entry of said flange means into said neck of said container for stressingly engaging said neck about said upper interior edge thereof for establishing a definitive line-contact seal of said cap with said container along a locus circumscribing said annular wall of said flange means of said cap;

and stop means for mechanically deterring separation of said closure cap physically from said container when said cap is threadedly elevated to expose said open top of said container to facilitate discharge of container-stored product therefrom.

5,110,018

CLOSING APPARATUS FOR THE BOTTOM POURING HOLE OF A CASTING LADLE

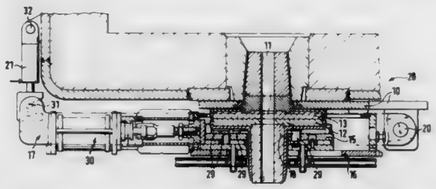
Josef Lothmann, Langerwehe; Jürgen Osborg-Schmitz, Hürtgenwald-Gey, and Wolfgang Schönbrenner, Kreuzau, all of Fed. Rep. of Germany, assignors to Zimmermann & Jansen, Duren, Fed. Rep. of Germany

Filed Feb. 26, 1991, Ser. No. 661,421

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1990, 4006064

Int. Cl.[5] B22D *41/34*

U.S. Cl. 222—600 **14 Claims**



1. A closing apparatus for a bottom pouring hole of a casting ladle, comprising a mounting plate mounted on the bottom of the ladle with a head plate resting against the mounting plate, in which head plate a port is formed to pour out melt, and further comprising a slide plate supported for pivoting movement about two axes and adapted to be pressed resiliently against the head plate, wherein the slide plate is supported for reciprocating movement inside a housing and the housing is supported by a housing carrier means, for pivoting movement about a first pivot axis, while the housing carrier means is supported by the mounting plate for pivoting about a second pivot axis, with the first and second pivot axes extending parallel to each other and to the sealing face between the head and slide plates,

wherein said housing support means comprises a U-shaped carrier bracket, said slide plate between the two legs of the carrier bracket, a frame which the slide plate rest against, and said housing for pivotal movement, defining said first pivot axis, with said carrier bracket being adapted to be moved into an operating position by a closing means engaging a web at said bracket, on one hand, and said mounting plate, on the other hand, in which position said bracket is then retained by a retainer hook or similar mechanical holding means.

5,110,019

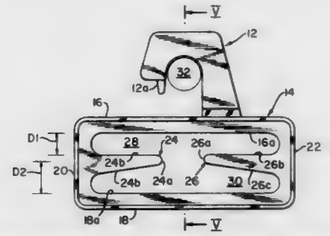
GARMENT ACCESSORY HANGER FOR TIES OR SCARFS WITH PLURAL OPENINGS AND SPECIAL HOOK

Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to B&G Plastics, Inc., New York, N.Y.

Filed Nov. 28, 1990, Ser. No. 619,028

Int. Cl.[5] A47G *25/74*

U.S. Cl. 223—87 **5 Claims**



1. A garment accessory hanger comprising an integral frame having a hook portion and a body portion, said body portion defining an upper transverse marginal course, a lower transverse marginal course and opposed first and second side marginal courses interconnecting said upper and lower transverse marginal courses, and first and second deflectable arms extending respectively from said first and second side marginal courses, ends of said arms being mutually spaced, said upper transverse marginal course and said first and second arms bounding a first opening in said body portion, said lower transverse marginal course and said first and second arms bounding a second opening in said body portion, said first opening being of lesser area than said second opening, said first and second arms having respective surfaces bounding said first opening which are parallel with an undersurface of said upper transverse marginal course bounding said first pening, said first and second arms having respective surfaces bounding said second opening which extend at an acute angle with respect to an upper surface of said lower transverse marginal course bounding said second opening, the parallelism of said undersurface of said upper transverse marginal course and said surfaces of said first and second arms bounding said first opening, and the acute angularity of said surfaces of said first and second arms bounding said second opening and the diversity in area as between said first and second openings giving rise to enhanced frictional relation between said hanger and a garment inserted loopwise onto said first and second arms and disposed in said first and second openings.

5,110,020

TOTE BAG

Michael Uhl, 829 Myrna Dr., West Hempstead, N.Y. 11551

Filed Dec. 28, 1990, Ser. No. 635,276

Int. Cl.[5] B62J *7/00*

U.S. Cl. 224—32 R **13 Claims**

1. A tote bag for carrying sundries and a liquid refreshment bottle comprising a base sheet having a longitudinal axis, a transverse axis, a forward portion and a rear portion, the forward portion of said base sheet defining a bottom panel for a pouch having a top panel and side walls and having an access opening for introduction of sundries therein, the rear portion of said base sheet has an elongated flap extending in a direction away from said pouch and of sufficient size to be rolled with the liquid refreshment bottle about an axis transverse to the longitudinal axis of said base sheet, a second flap integrally formed with said top panel along a line transverse to the length of said base sheet, and extending therefrom to overlay at least in part the rolled elongated flap and cooperating to hold said bottle within the rolled elongated flap, fastening means disposed on said integrally formed second flap on the surface facing said elongated flap, and on said elongated flap disposed in alignment therewith on the surface thereof which forms the exterior surface of said elongated flap when said elongated flap



is wrapped around said bottle, said fastening means cooperating to hold said second flap and rolled elongated flap securely to each other.

5,110,021

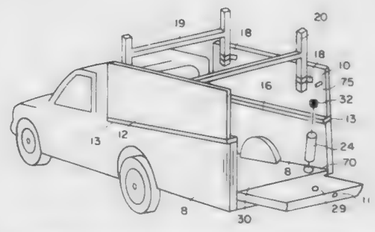
COMBINATION PIPE RACK AND TOOL LOCKER FOR A TRUCK BED

Fredric O. Dawson, Jr., 1588 McKendrie, San Jose, Calif. 95126

Continuation-in-part of Ser. No. 406,441, Sep. 13, 1989, abandoned. This application Feb. 19, 1991, Ser. No. 657,173

Int. Cl.[5] B60P *3/00, 7/00*

U.S. Cl. 224—42.01 **17 Claims**



1. A combination pipe rack and tool locker to be mounted on a truckbed of a truck having a floor with a length and breadth, parallel first and second sidewalls having said length, a frontwall and a rearwall wherein said walls have a common height defined by top edges of each wall and wherein said rack and locker combination comprises:

a first door and a second door, each having a length equal to said length of said truckbed and a width that is substantially equal to one half said width of said truck bed and each having an inside and an outside bounded by a hinging edge parallel to a meeting edge;

a first and second means for hingably attaching respectively said first and second hinging edges of said doors to said first and second top edges of said sidewalls permitting said doors turning on said door hinging means to be oriented vertically to an open position as parallel extensions of said sidewalls and oriented horizontally over said truckbed to form an enclosure with said truckbed;

a first means for racking said pipe located close to said frontwall and having a hinged end and a supported end;

a second means for racking said pipe located close to said rear wall and having a hinged end and a supported end;

a first and second means for hingably attaching, respectively, said hinging ends of said first and second racking means to said insides of said first and second doors providing for said racking means to be oriented against said inside of said first and second door when said doors are

oriented horizontally to form said enclosure and providing for said racking means to be oriented across said truckbed to support pipe when said doors are oriented vertically;

a first and second means for detachably securing said supported ends of said first and second racking means to said second and first door respectively to carry pipe and provide rigid support to maintain said doors in said vertical position and permit folding said first and second racking means against said inside of said first and second door respectively when said doors are oriented to said horizontal position.

5,110,022

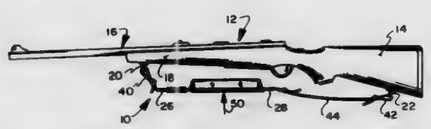
RIFLE SLING WITH RIFLE REST

Donald S. Dvoroznak, Harrisburg, Pa. Holtzclaw; , and James O. Holtzclaw, Jr., Broomfield, Colo., assignors to The Hunter Company, Westminster, Colo.

Continuation of Ser. No. 402,077, Aug. 31, 1989, Pat. No. 5,018,652. This application Nov. 14, 1990, Ser. No. 613,244

Int. Cl.[5] **F41C** *23/02;* **A45C** *15/00*

U.S. Cl. 224—150 **5 Claims**



1. A rifle sling for a rifle having an elongated barrel having a longitudinal axis, comprising:

a body portion with a base having first and second end portions and a pair of spaced, generally coextensive protrusions of substantially homogenous resilient material intermediate said end portions extending above said base, said protrusions defining therebetween a recess for receiving at least a portion of said rifle barrel so as to steady said barrel to aid in aiming said rifle, each said protrusion having an upper surface and a pair of opposed sides extending from the base to the upper surface of the protrusion in the direction of the longitudinal axis of the barrel, each protrusion further having a pair of opposed ends;

first and second coupling means for coupling the first and second ends of said body portion to said rifle barrel; and

said first and second coupling means being spaced apart for connection to spaced apart portions of said rifle so that said body portion provides suspension for said rifle sling; and

each of said protrusions having in cross section a height greater than its width and being substantially stiff to prevent flexing of the body portion along the length of the barrel of the rifle when rested in said recess, said protrusions further including a flexible outer covering extending along the upper surface and the opposed ends of the protrusions and being joined to the base portion to hold taut the flexible covering at the upper surface and ends of the protrusions to thereby prevent length-wise bending of said protrusions, the flexible outer covering being folded to form a generally trapezoidal pleat overlying the ends of the protrusions.

5,110,023

CARRIER FOR POOL VACUUM HOSES

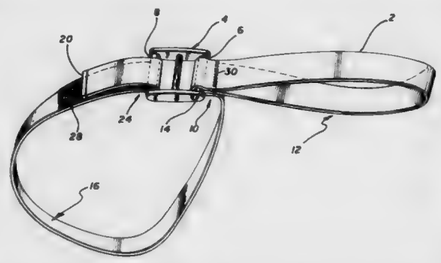
George M. Colin, Dana Point, Calif., assignor to Odyssey Systems Ltd., San Clemente, Calif.

Filed Apr. 18, 1991, Ser. No. 699,307

Int. Cl.[5] **A45C** *13/30;* **A45F** *3/14*

U.S. Cl. 224—205 **5 Claims**

1. A hose carrier comprising an elongated continuous flexible strap having first and second ends and a rigid connector having a pair of spaced parallel bars, said strap being configured to form a shoulder loop, a hose carrying loop and a reverse cinching loop, said strap having a first bight extending around a first of said parallel bars of said connector between said hose loop and said shoulder loop, said shoulder loop having a first of said ends positioned adjacent said first bight, said bight having two adjacent strap portions attached together



with said first end in a common fastening, whereby said shoulder loop is of a fixed size, and said hose loop having a second bight extending around the second of said parallel bars of said connector, and said second end of said strap having means thereon for connecting said second end to said hose loop at a selected position to form said cinching loop ad determine the size of said hose carrying loop.

5,110,024

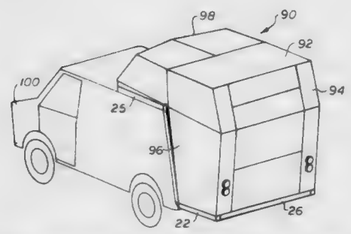
LOAD CARRIER AND METHOD OF USE

Miroslav Rodic, 905 Bayou River Dr., Houston, Tex. 77079

Filed Jul. 19, 1990, Ser. No. 554,353

Int. Cl.[5] **B60R** *9/00, 7/00*

U.S. Cl. 224—328 **24 Claims**



17. The combination with a vehicle having a frame and a rear door or gate of a load carrier removably mounted thereon, said carrier comprising:

a load-supporting frame comprising an upper horizontal frame portion with a front and portion and a back end portion and a main transverse bracing member and supported on the top of said vehicle;

a lower horizontal frame portion comprising a lower horizontal frame portion with a front and portion and a back end portion and a main transverse bracing member;

vertical means rigidly connecting said upper horizontal frame portion and said lower horizontal frame portion to support said lower horizontal frame portion below said rear door or gate when said upper horizontal frame portion is supported on the top of said vehicle;

a restraining brace system connected to said upper frame portion and said lower frame portion,

said restraining brace system connected to said upper frame portion and said lower frame portion,

said restraining brace system including:

upper restraining members connecting the front end portion of the frame and the main transverse bracing member of said upper frame portion;

diagonal transverse members extendedly connecting the main transverse bracing member of said upper frame portion and the back end portion of said lower frame portion;

restraining members having top ends fixedly attached to the back end portion of the frame, said members extend from said back end portion of the frame downward and inward to the front transverse bracing member of said lower frame portion;

attachment bracing members fixedly attached to the lower edge of the lower front transverse bracing member of said lower frame portion removably mounting the load carrier to the carrier vehicle,

means on said upper horizontal frame portion for securing said upper horizontal frame portion to the top of said vehicle, and

means on said lower frame portion operatively engagable with the frame of said vehicle for mounting said carrier to said vehicle.

5,110,025

PAPER FEEDER HAVING A PAPER EXHAUSTION DETECTOR

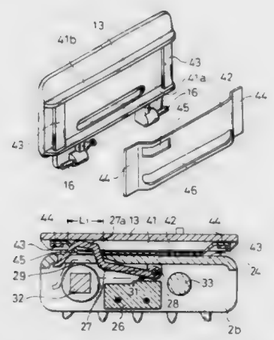
Sadao Unuma, Aichi, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 7, 1990, Ser. No. 490,701

Claims priority, application Japan, Mar. 20, 1989, 1-69019; Apr. 14, 1989, 1-94974

Int. Cl.[5] **B65H** *20/20*

U.S. Cl. 226—74 **5 Claims**



1. A cover for a paper feed tractor having a first side frame, a second side frame, a paper receiving plate extending substantially perpendicularly from the second side frame and having a hole formed therein, a paper feed belt rotatably mounted between the first and second side frames and having outwardly projecting feed pins for engaging perforated paper, and a paper exhaustion detector mounted to the second side frame and including a microswitch which has an upwardly biased plunger, and an actuator pivotable between a first position in which it is pressed upwardly by the plunger such that a contact portion thereof extends through the hole in the paper receiving plate at least a predetermined distance above the paper receiving plate when no paper is present along an upper surface of the paper receiving plate and a second position in which it is pressed downwardly by paper present along the upper surface of the paper receiving plate against the bias of the plunger such that the contact portion extends through the hole in the paper receiving plate a distance less than the predetermined distance above the paper receiving plate, said cover comprising:

a plate;

means for mounting said plate to the first side frame;

a first elongated rib projecting downwardly from a bottom surface of said plate and extending parallel to a direction in which the paper is adapted to be fed;

an elongated slot formed through said plate and extending along one side of said first rib in parallel with said first rib;

a second elongated rib projecting downwardly from said bottom surface of said plate and extending parallel to said first rib on a side of said slot opposite said first rib;

an elongated holding member having an elongated slot formed therethrough along a substantial portion of the length of said paper holding member, and a hole formed therethrough on one side of and spaced apart from said slot of said paper holding member; and

means for mounting said paper holding member to said bottom surface of said plate between said first and second ribs such that said slot in said paper holding member is parallel to and located directly below said slot in said plate, said hole formed through said paper holding member being positioned such that when said paper holding member is mounted to said bottom surface of said plate by said mounting means, said hole formed through said paper holding member is adapted to be located directly above the hole in the paper receiving plate.

5,110,026

APPARATUS FOR A STEPWISE ADVANCING OF A WEB-SHAPED WORKPIECE

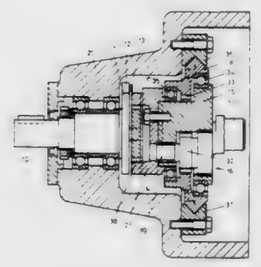
Helmut Messner, Arbon, Switzerland, assignor to Bruderer AG, Frasnacht, Switzerland

Filed Aug. 24, 1990, Ser. No. 573,715

Claims priority, application Switzerland, Dec. 11, 1989, 4440/89

Int. Cl.[5] **B65H** *20/04;* **F16H** *21/00*

U.S. Cl. 226—152 **3 Claims**



1. An apparatus for a stepwise advancing of a web-shaped workpiece, which apparatus includes two workpiece advancing units operative to clampingly receive a workpiece therebetween, of which two workpiece advancing units the first workpiece advancing unit is periodically movable towards the second workpiece advancing unit such to periodically clamp a workpiece therebetween and being periodically movable away from the second workpiece advancing unit such to release the workpiece, and which apparatus includes further a drive shaft and a first intermediate drive transmitting assembly driven by said drive shaft and drivingly connected to said first workpiece advancing unit, and a second intermediate drive transmitting assembly driven by said same drive shaft and drivingly connected to said second workpiece advancing unit,

said first intermediate drive transmitting assembly comprising a cam drive driven by said drive shaft and drivingly connected via a transmission rod assembly to said first workpiece advancing unit and operative to control the sequence of the movement of said first workpiece advancing unit against said second workpiece advancing unit and away therefrom, and which second intermediate drive

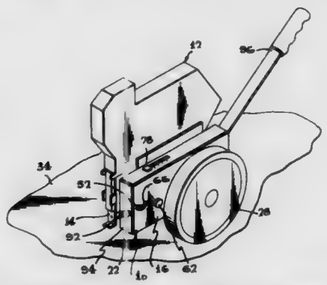
transmitting unit comprises a crank assembly having a driving pivot and supported such in an intermediate shaft, which is drivingly connected to said drive shaft to be driven therefrom, that the driving pivot which is operative to drive said second workpiece advancing unit executes in operation an oscillating movement, which intermediate shaft is supported in a slide which is oscillatory opposite to the oscillating movement of said driving pivot.

5,110,027

ATTACHMENT FOR HAND-HELD NAIL GUN

Allen C. Burlingame, 7622 Fountain Ave., #5, West Hollywood, Calif. 90046

Filed Oct. 30, 1990, Ser. No. 607,300
Int. Cl.[5] B27F *7/02*
U.S. Cl. 227—8 **5 Claims**



1. An attachment for a hand-held nail gun comprising:
a housing, said housing having attachment means for attaching said housing to a hand-held nail gun having a safety slide thereon;
a slide wheel rotatably mounted on said housing, said wheel being for engagement with a surface along which the housing is moved;
a drive train within said housing, said drive train being connected to said wheel to be driven by said wheel as said attachment moves along a surface;
a connector connected to said drive train and to the safety slide on the nail gun so that said connector and the safety slide are actuated when the attachment is moved a predetermined distance along the surface, said drive train being variable so that said predetermined distance is preselectable; and
said drive train including a cluster of a plurality of different sized gears and a pickoff gear which can be positioned to selectively engage one of said gears in said gear cluster so as to select the drive train ratio to select said predetermined distance the attachment moves along the surface between connector actuations.

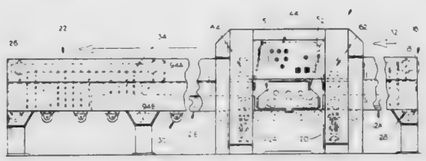
5,110,028

SWITCH TIE END PLATING MACHINE

Gordon E. Matlock, 554 Sappington Bridge Rd., Sullivan, Mo. 63080

Filed Jan. 30, 1991, Ser. No. 647,843
Int. Cl.[5] B25C *7/00*
U.S. Cl. 227—39 **6 Claims**

1. A switch tie end plating machine capable of handling ties having various lengths, comprising,
a first elongated staging chamber having an input end and a discharge end,
a second elongated staging chamber longitudinally aligned with said first staging chamber and having an input end spaced from the discharge end of said first staging chamber, said second staging chamber having a discharge end spaced from its input end,
an end plating frame means positioned between the discharge end of said first staging chamber and the input end of said second staging chamber,
means for supplying ties to the input end of said first staging chamber,
a first conveyor means in said first staging chamber for conveying a tie therethrough,
a second conveyor means in said second staging chamber for conveying a tie therethrough,
a third conveyor means for conveying a tie through said end plating frame means,
means for compressing the ends of the ties which are to be end plated,
an end plating mechanism movably mounted on said end plating frame means,
said end plating mechanism including a pair of oppositely extending rams for driving end plates into the end of ties positioned in said first and second staging chambers,
means for moving said end plating mechanism between a first position wherein said rams are positioned between the ends of the ties in said staging chambers to a second



position wherein said rams are not positioned between the discharge end of said first staging chamber and the input end of said second staging chamber to permit a tie to be conveyed through said end plating mechanism,
tie stop means in each of said staging chambers for engaging the ends of the ties in said chambers to limit the longitudinal movement thereof when said rams seat the end plates on the ends of the ties,
said tie stop means including means for automatically compensating for ties of various lengths, wherein each of said tie stop means comprises an elongated, horizontally disposed, rotatable shaft means positioned above the tie in the associated chamber means for rotating said shaft, a plurality of flexible, connector members secured to said shaft and extending downwardly therefrom, a gate means secured to the lower end of said flexible connector members, said chamber having a plurality of horizontally spaced apart guide means, each of which are adapted to receive one of said gate means when the length of the tie permits the same.

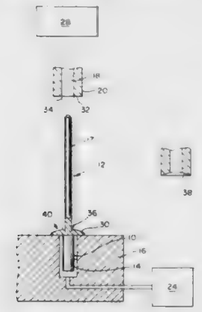
5,110,029

BLIND RIVET SETTING TOOL WITH RIVET LOADER

Jeffrey T. Blake, New Haven, Conn., assignor to Emhart Inc., Newark, Del.

Filed Apr. 30, 1991, Ser. No. 693,583
Int. Cl.[5] B21J *15/10*
U.S. Cl. 227—112 **1 Claim**

1. An automatic blind rivet setting system comprising
a blind rivet setting tool for setting a blind rivet having a body portion with a convexly flanged end and a mandrel portion extending into the body portion, said blind rivet setting tool including
a nose portion having an end surface, and
a bore in said nose communicating with said end surface for receiving the mandrel of a blind rivet,
vacuum means for establishing a vacuum in said bore for holding the mandrel portion of a blind rivet located therein,
said end surface being selectively concavely contoured to correspond to the convex flange surface with the inner diameter of said concave surface substantially corresponding to the inner diameter of the convex flange surface to guide the convexly flanged end into the nose portion during rivet transfer.
a loading device including a blind bore for receiving the body portion of a blind rivet to be transferred to said nose when said loading device is located so as to present the



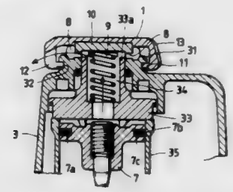
mandrel in coaxial relation with the axis of said nose bore, and
means for blowing a blind rivet received in said loading device blind bore towards said nose bore so that the mandrel will enter into said nose bore and be held therein by said vacuum means.

5,110,030

PNEUMATIC FASTENER DRIVING TOOL HAVING AN AIR EXHAUST ARRANGEMENT

Isamu Tanji, Katsuta, Japan, assignor to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1991, Ser. No. 734,663
Claims priority, application Japan, Aug. 10, 1990, 2-84939[U]; Aug. 24, 1990, 2-89120[U]
Int. Cl.[5] B25C *1/04*
U.S. Cl. 227—130 **9 Claims**



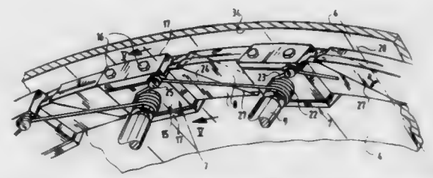
1. A pneumatic fastener driving tool comprising:
a main body portion in which a drive piston is reciprocally movable for driving or ramming a driven member in one direction, a compressed air being applied to the drive piston for its movement in the one direction;
a casing positioned above the main body portion, a compressed air exhaust passage being defined within the casing for exhausting the compressed air to an atmosphere for allowing the drive piston to be movable in a second direction opposite the first direction, the casing having an outer peripheral portion being formed with an annular groove; and
a cap means formed of an elastic material, the cap means having a cylindrical shape comprising a top wall portion and a cylindrical side wall portion and an annular projection radially inwardly extending from the side wall portion, the annular projection being elastically engageable with the annular groove, the cap means being formed with an exhaust port in communication with the exhaust passage, the cap means being rotatable about its axis overcoming a frictional force given by the elastic engagement between the annular projection and the annular groove for changing an angular position of the exhaust port.

5,110,031

WELD SUPORTING RING FOR PIPES

Fernando Rinaldi, Milan, Italy, assignor to Atlantic Point Inc., Panama

Filed Jan. 10, 1991, Ser. No. 639,902
Claims priority, application Netherlands, Nov. 2, 1990, 9002397
Int. Cl.[5] B23K *37/04*
U.S. Cl. 228—50 **12 Claims**



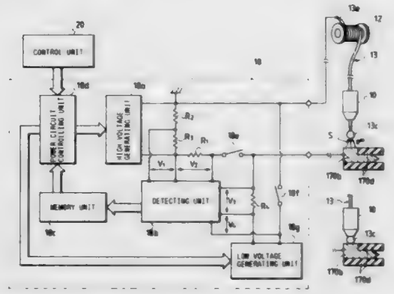
1. A weld supporting ring for internally supporting an annular weld during welding together of two pipe ends of two pipes extending mutually in line, including a plurality of ring pieces, each ring piece comprising at least one supporting body bounding the outer periphery of the weld supporting ring, wherein each ring piece has a spring support connected thereto and a spring wound around the spring support, wherein an end of the spring grips onto the ring piece and the other end of the spring grips onto an adjoining ring piece.

5,110,032

METHOD AND APPARATUS FOR WIRE BONDING

Yukiharu Akiyama, Koganei, and Yoshio Oshima, Tokorozawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 442,149, Nov. 28, 1989, Pat. No. 5,037,023.
This application Apr. 29, 1991, Ser. No. 692,913
Claims priority, application Japan, Nov. 28, 1988, 63-299936; Feb. 13, 1989, 1-33426
Int. Cl.[5] B23K *31/00;* **H05K** *3/32*
U.S. Cl. 228—102 **4 Claims**



1. An insulation film coated wire bonding method for repeating steps of producing a discharge through a predetermined discharge gap between a front end of a first portion of an insulation film coated wire wound on a wire spool and drawn out through a bonding capillary and a discharge electrode by an output voltage of a discharge voltage generator for producing a ball on the front end of the wire, and then pressing the ball against a predetermined bonding position by the bonding capillary to ball bond the first portion of the wire to a first position on a semiconductor device chip, and subsequently wedge bonding a second portion of the wire to a second position outside the semiconductor device chip by the bonding capillary comprising:
(a) prior to a discharge for the ball formation of the ball bonding electrically determining a voltage drop variation or an electrical parameter corresponding to the voltages

drop variation due to a decrease in length of the insulation film coated wire wound on the spool at a discharge for a preceding ball formation; and then

(b) controlling the output voltage of the discharge voltage generator in accordance with the predetermined voltage drop variation or electrical parameter to maintain an applied voltage across the discharge gap between the discharge electrode and the front end of the wire substantially at a predetermined value at the discharge for the ball formation of the ball bonding.

5,110,033

SEGMENTED BRUSH SEAL

Lawrence E. Noone, Lyman, and Leo J. Lagasse, Welles, both of Me., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 21, 1991, Ser. No. 658,943
Int. Cl.[5] F16J *15/447;* **F01D** *11/02;* **B23K** *31/02*
U.S. Cl. 228—160 **6 Claims**



1. A method of manufacturing a segmented brush seal having an annular backing plate with inner and outer diameters and an axial centerline therethrough, an annular side plate having an inner diameter greater than the inner diameter of the backing plate and a plurality of radially inwardly extending tabs extending therefrom, the side plate further having an outer diameter and an axial centerline therethrough, the coaxial plates sandwiching a plurality of circumferentially arrayed bristles extending radially inwardly at a constant circumferential skew angle with respect to the side plate, comprising the steps of:

(a) welding together the sandwiched plates, bristles, and tab at a circumferential location of the seal, wherein the welded zone lengthwisely extends from a radially inner end of a tab to an outermost diameter of the seal, the welded zone being substantially parallel to the bristle skew angle, and

(b) lengthwisely bifurcating the seal through the welded zone, wherein the bifurcation is substantially parallel with a local bristle skew angle and wherein a portion of the weld zone is lengthwisely retained by each resulting edge.

5,110,034

SUPERCONDUCTING BONDS FOR THIN FILM DEVICES

Michael B. Simmonds, Del Mar, Calif., assignor to Quantum Magnetics, Inc., San Diego, Calif.

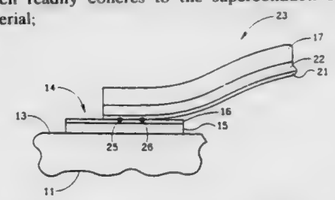
Filed Aug. 30, 1990, Ser. No. 575,164
Int. Cl.[5] H01L *21/607, 39/00;* **B23K** *20/10*
U.S. Cl. 228—179 **26 Claims**

1. A method of bonding a superconductive electrical lead to a superconductive thin film pad on a substrate, said method comprising the steps of:

forming a thin film bonding pad of superconductive material on the substrate, the pad having a contact surface;

forming a thin ribbon of similar superconductive material, the ribbon having a facing surface;

coating at least one of the pad contact surface and the ribbon facing surface with a very thin layer of a different material which readily coheres to the superconductive surface material;



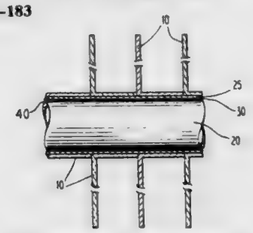
placing the different-material coated surface in contact with the c her superconductive material surface; and then bonding the thin ribbon to the bonding pad.

5,110,035

METHOD FOR IMPROVING THE SOLDERABILITY OF CORROSION RESISTANT HEAT EXCHANGE TUBING

Samuel D. Reynolds, Jr., Oviedo, and Homer G. Hargrove, Maitland, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 1, 1990, Ser. No. 473,556
Int. Cl.[5] B23K *1/20*
U.S. Cl. 228—183 **22 Claims**



1. A method of fabricating or repairing heat exchange tubing of the type employed in connection with electrical generators in power plants, comprising:

(a) providing a tubular member comprising a surface oxide;

(b) depositing an integral solderable coating onto said surface oxide; and,

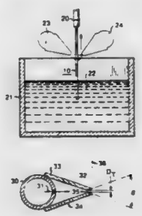
(c) soldering a plurality of spaced fins onto said integral solderable coating of said tubular member.

5,110,036

METHOD AND APPARATUS FOR SOLDER LEVELING OF PRINTED CIRCUIT BOARDS

John L. Parker, Jr., Sandston, Va., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 17, 1990, Ser. No. 628,789
Int. Cl.[5] B08B *3/02*
U.S. Cl. 228—256 **7 Claims**



1. A method of fabricating a printed circuit board having two major surfaces comprising the steps of:

inserting the board into a bath of solder; and

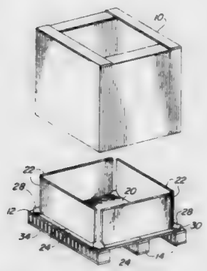
as the board is removed from said bath, directing toward at least one surface a fluid flow through a nozzle so as to create a shock wave within the nozzle and a Mach number of the fluid at the exit of the nozzle of less than 0.8.

5,110,037

CONTAINER AND METHOD OF MAKING SAME

John R. Pieritz, Sr., Milan, Ill., assignor to Rock Island Packaging Corp., Milan, Ill.

Filed Jun. 20, 1991, Ser. No. 718,049
Int. Cl.[5] B65D *5/42*
U.S. Cl. 229—23 A **10 Claims**



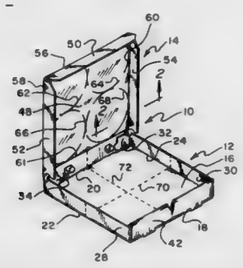
1. The method of making a container from a single rectangular sheet of fiber board, comprising cutting the sheet inwardly at each of sides of said sheet via two cuts per side with each cut terminating substantially at a corner of an imaginary similar smaller rectangle centered within the sheet whereby to provide a pair of end panels, a pair of side panels and four corner panels all connected to the smaller rectangle, bending the side and end panels upwardly relative to the smaller rectangle at 90° to the smaller rectangle so as to form a structure of which the smaller rectangle provides a horizontal bottom, and folding the corner panels beneath and lying flatwise against the bottom so as to give the bottom a double thickness.

5,110,038

PLATE FORMING AND BREAK DOWN PIZZA BOX

Frank Pantisano, 411 Linda Ave., and Scott M. Devine, B7 Fairways Apartments, both of Blackwood, N.J. 08012

Filed Apr. 16, 1991, Ser. No. 685,926
Int. Cl.[5] B65D *5/54*
U.S. Cl. 229—103 **18 Claims**



1. A device of a pizza box that incorporates plates comprising:

(A) a pizza box comprising:

(i) a bottom section comprising:

(a) a bottom panel having a front edge, two opposite side edges, and a rear edge, and

(b) side panels integral with and extending upwardly from each edge of the bottom panel and attached together to form an open box shape,

(ii) a cover section comprising:

(a) a top panel having a front edge, two opposite side edges, and a rear edge,

(b) flap panels integral with and depending downwardly from the front edge and each side edge of the top panel, and

(c) hinge means hingeably attaching the rear edge of the top panel to a top edge of the side panel extending upwardly from the rear edge of the bottom panel,

(B) a plurality of continuous first line slit cuts through panel material, the panel through which the first cuts are provided being chosen from the group consisting of the bottom panel alone and the top panel alone, the choice defined as the first panel and the remaining top or bottom panel being defined as the second panel,

wherein the first line slit cuts are

(i) shaped to be the periphery of a plurality of individual shapes each of sufficient size and shape to hold at least one slice of pizza, the shapes being removalbe from the panel, and

(ii) interrupted by uncut panel material of sufficient length to hold the shapes in the box when it is being used to carry the pizza, but allow ready removal of the shapes from the box panel, and

(C) a plurality of second line slit cuts through the second panel material,

wherein the second line slit cuts

(i) are of sufficient length and are positioned to bisect the second panel and to divide the second panel into at least four proximately equal parts, and

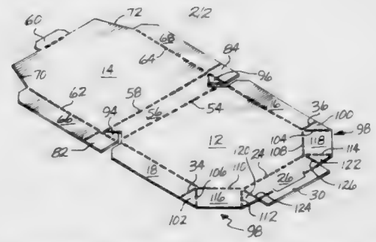
(ii) are interrupted by uncut panel material of sufficient length to hold the parts to the box shape when it is being used to carry the pizza, but allow ready separation of the second panel into the parts for disposal.

5,110,039

SINGLE PIECE FOOD PACKAGE

Nicholas A. Philips, West Chicago, Ill., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Nov. 14, 1990, Ser. No. 613,173
Int. Cl.[5] B65D *5/24*
U.S. Cl. 229—110 **2 Claims**



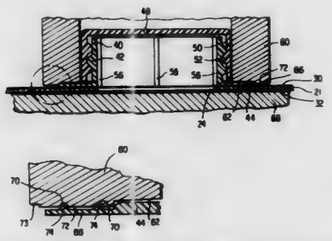
1. A single piece paperboard container for holding relatively flat circular food products has top and bottom panels with at least four side panels connected to respective edges of the top and bottom panels through hinge lines, having the improvement comprising:

a pair of slots positioned within a back one of said side panels originating at a position adjacent a respective corner of the bottom panel and extending inwardly along an angle of approximately 45° and terminating at a point approximately one-half the height dimension of the back side panel,

a pair of triangular support panels extending outwardly from score lines which extend between ends of the slots and adjacent corners of the top panel, and

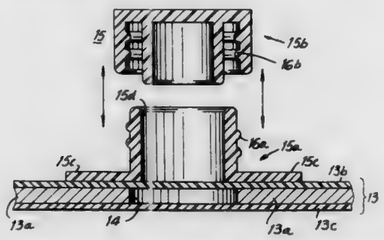
a pair of generally rectangular panels extending outwardly from a pair of hinge lines which form third legs of the triangular supports panels.

5,110,040
POUR SPOUT CONSTRUCTION AND METHOD
Roderick W. Kalberer, 163 Lake Rd., Salisbury Mills, N.Y. 12577; Frederick J. Henkel, 1291 Barsanlaw Dr., Raleigh, N.C. 27613, and Arnold L. Berzins, 415 Fera St., P.O. Westwood, N.J. 07675
Filed Apr. 30, 1991, Ser. No. 693,197
Int. Cl.[5] B65D *5/74*
U.S. Cl. 229—125.14 **9 Claims**



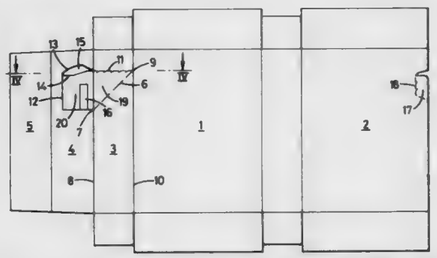
1. A pour spout and carton construction adapted for packaging of liquids or powders, including a closed paperboard carton having an exterior and an interior surface, one portion of said carton having an opening therethrough to thereby define a dispensing opening, an annular pour spout having an integral flange, said flange rigidly mounted exteriorly on said carton, said pour spout having a spout passageway at least partially aligned with said dispensing opening, the carton exterior, at least in the area of said pour spout flange, having a layer of plastic, an annular weld zone on said flange for bonding said spout to said carton through said carton exterior plastic layer, said zone having a knurled surface on the top surface of the flange, said weld zone located at the radially outermost portion of said spout flange, the knurled portion of the spout flange being of lesser thickness than the remainder of the spout flange.

5,110,041
IN-LINE FITMENT SEALING APPARATUS AND METHOD
Donald E. Keeler, Sussex, N.J., assignor to International Paper Company, Purchase, N.Y.
Filed Aug. 24, 1990, Ser. No. 572,068
Int. Cl.[5] B65D *5/74*
U.S. Cl. 229—125.15 **1 Claim**



1. A carton with a pour spout for a fluid contained therein, comprising:
a carton blank having walls seamed on one side to form a rectangular tube configuration having a top end thereof, said carton blank including a substrate layer defining an external side and an internal side of the carton which is provided with a spout opening die-cut through said substrate layer at said top end of said carton blank, and a thermoplastic extrusion layer applied on the external side of said substrate layer and covering said spout opening of said substrate layer;
a spout fitment made of thermoplastic material having an annular flange portion defining a planar rear surface area and a pour hole therethrough which is positioned in registration with said spout opening in said substrate of said carton blank; and
an adhesive layer made of hot-melt adhesive applied over the rear surface area of said flange portion of said spout fitment,
wherein said thermoplastic material of said flange portion of said spout fitment and said adhesive layer of hot-melt adhesive applied over the rear surface area of said flange portion are heat-sealed to said thermoplastic extrusion layer on the external side of said substrate layer, so as to form a secure fitment seal through heat-sealing only on the external side of said substrate layer.

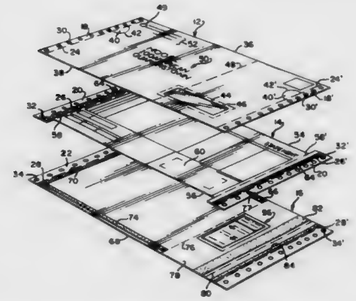
5,110,042
CARTONS WITH POURING SPOUTS
Derek Hurden, St. Neots, England, assignor to Trenton Box Company Limited, England
Filed Jun. 25, 1991, Ser. No. 720,632
Claims priority, application United Kingdom, Jun. 28, 1990, 9014422
Int. Cl.[5] B65D *5/70, 5/74*
U.S. Cl. 229—215 **9 Claims**



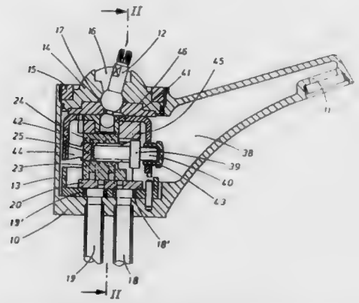
1. A carton having a pouring spout, said pouring spout being defined by a diagonal hinge line extending upwardly across a first panel of the carton between a first hinge point on a first vertical edge line and a second hinge point on said first panel, said first vertical edge line being disposed between a second panel and said first panel, wherein said pouring spout comprises two hinged spout panels disposed substantially perpendicular to each other, the first of said spout panels being cut out from said first panel and the second of said spout panels being cut out from said second panel, said second spout panel being disposed so as to slide between two supporting panels during opening and closing of said pouring spout, one of said supporting panels being an extension flap connected to said second panel.

5,110,043
RETURN MAILER WITHOUT FLY SHEET
Robert E. Ashby, Quakertown, Pa., assignor to Moore Business Forms, Inc., Grand Island, N.Y.
Filed May 16, 1991, Ser. No. 701,070
Int. Cl.[5] B65D *27/06, 27/34*
U.S. Cl. 229—304 **24 Claims**

1. A return mailer construction comprising a first outer part; an intermediate part; and a second outer part; said first outer part having a pair of side edges, an upper edge and a lower edge, and an address window formed therein, said window covered by a substantially transparent patch; a first perforation line extending between the upper and lower edges across the window and the patch to define a first separable portion of said first outer part, removable upon opening of the mailer construction.

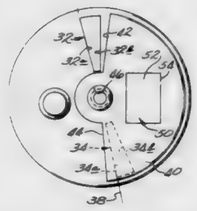


5,110,044
SANITARY MIXING VALVE
Konrad Bergmann, Wittlich, Fed. Rep. of Germany, assignor to Ideal Standard GmbH, Bonn, Fed. Rep. of Germany
PCT No. PCT/EP89/00548, § 371 Date Nov. 16, 1990, § 102(e) Date Nov. 16, 1990, PCT Pub. No. WO89/11690, PCT Pub. Date Nov. 30, 1989
PCT Filed May 19, 1989, Ser. No. 623,383
Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817277
Int. Cl.[5] G05D *23/13*
U.S. Cl. 236—12.16 **21 Claims**



1. A sanitary mixing valve for controlling the flow and mix of hot and cold water supplied respectively from a hot water inlet and a cold water inlet, comprising a valve body coupleable to said hot and cold water inlets and having a water outlet, a stationary valve seat disk supported on said valve body, disk packet means supported on said valve seat disk for controlling the flow and temperature of water emerging from said water outlet, said disk packet means including a lower guide disk, an upper guide disk and a control said lower guide disk having at least first and second passages in communication with said hot and cold water inlets through said stationary valve seat disk, said control disk having corresponding third and fourth passages selectively displaceable to communicate with the first and second passages in said lower guide disk, said upper guide disk having a corresponding first set of pressure compensation chambers in communication with said third and fourth passages in said control disk, said control disk including a first mixing chamber in communication with at least one of said third and fourth passages and said pressure compensation chambers for receiving a portion of the hot and cold water therein, and a temperature-dependent control means supported on said disk packet means and coupled to said control disk for directly receiving said mixture of water from said mixing chamber, for determining the temperature of the mixture of water in said mixing chamber upon receipt thereof and for selectively adjusting the position of said control disk to regulate the temperature of mixed water emerging from said water outlet at a predetermined temperature, said temperature-dependent control means being positioned in said first mixing chamber.

5,110,045
DUAL EXHAUST FLUID FLOW CONTROL DISTRIBUTION APPARATUS
Eric J. Glasson, Somerset; Henry Ty, Attleboro, both of Mass.; Alfred J. White, No. Providence, and Joseph H. Gondusky, Warwick, both of R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 20, 1990, Ser. No. 630,676
Int. Cl.[5] G05D *23/08*
U.S. Cl. 236—93 R **6 Claims**

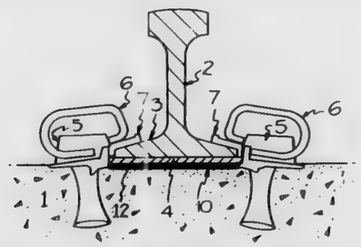


1. An automotive transmission fluid distribution system for directing fluid to selected paths dependent upon sensed temperature comprising a valve body having an inlet passage and first and second outlet passages, a plate member disposed on the body having a generally flat top surface with first and second orifices, a gate element slidable on the top surface of the plate between a first position in which the first orifice is covered and the second orifice is uncovered and a second position in which the first orifice is uncovered and the second orifice is covered and intermediate positions where one of the first and second orifices becomes uncovered at the other of the first and second orifices becomes covered with the total uncovered orifice area remaining essentially constant and temperature responsive means coupled between the plate member and the gate element to move the element between the first and second positions dependent upon sensed temperature.

5,110,046
RAIL FASTENING SYSTEM
Hartley F. Young, Melton, Australia, assignor to McKay Australia Limited, Maidstone, Australia
Filed Mar. 7, 1990, Ser. No. 489,498
Claims priority, application Australia, Mar. 9, 1989, PJ3138
Int. Cl.[5] E01B *9/38*
U.S. Cl. 238—283 **3 Claims**

1. An abrasion resistant rail seat for securing a rail to a concrete rail tie of the type in which the rail has a flange and is secured to a concrete rail tie by elastic rail clamps and an elastomeric rail pad insulates the rail from the rail tie, the improvement comprising interposing an abrasion resistant plate between said rail pad and said rail tie, said abrasion resistant plate forming a water tight seal with said rail tie, said abrasion resistant plate being wider than said rail and extending beyond the flange of said rail, and a layer of adhering material

between said abrasion resistant rail plate and said rail tie for adhering said plate to said tie, said material being the sole



means for adhering said plate to said tie so that replacement of said abrasion resistant rail plate is facilitated.

5,110,047

VANE-TYPE NOZZLE(S) FOR VARYING THE MAGNITUDE AND DIRECTION OF A THRUST VECTOR, AND METHODS OF OPERATING SAME

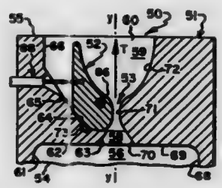
Hans G. Toews, East Aurora, N.Y., assignor to Moog Inc., East Aurora, N.Y.

PCT No. PCT/US89/03602, § 371 Date Mar. 20, 1990, § 102(e) Date Mar. 20, 1990, PCT Pub. No. WO89/12741, PCT Pub. Date Dec. 28, 1989

PCT Filed Aug. 21, 1989, Ser. No. 474,744

Int. Cl.[5] B64C *15/02*

U.S. Cl. 239—11 **12 Claims**



1. An adjustable nozzle, comprising:

a body having a flow passageway therethrough, said passageway being configured to define a converging entrance section, a narrowed throat section and a diverging exit section, said body having a surface forming a stationary wall portion of said throat section;

a vane member pivotally mounted on said body, said vane member having a first surface facing into said passageway to form a movable wall portion of said throat section, said first surface being eccentric to the pivotal access of the associated vane member, said vane member being rotatable about its pivotal axis to an angular position at which said first surface engages said stationary wall portion of said throat section to close said passageway; and

an actuator mounted on said body and operable to selectively vary the angular position of said vane member relative to said body;

whereby said actuator may be selectively operated to controllably vary the orifice area of said throat section.

5,110,048

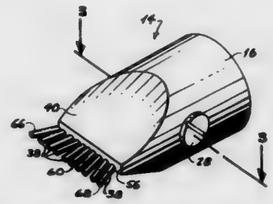
SPRAY NOZZLES

John E. Waldrum, Ambler, Pa., assignor to DowElanco, Indianapolis, Ind.

Filed Dec. 3, 1990, Ser. No. 621,355

Int. Cl.[5] B64D *1/18*

U.S. Cl. 239—171 **19 Claims**



1. A spray nozzle for liquids, comprising:

a body having a forward end and a rearward end portion leading to a rearward end, the body being provided with a transverse cavity intermediate said forward and rearward ends, the forward end being substantially circular in transverse section and the rearward end being substantially wedge shaped;

a liquid inlet at the forward end of the body, the inlet opening into a short borehole and the borehole being in fluid communication with the cavity, permitting filling the cavity with liquid under pressure;

a plurality of transversely spaced capillary tubes within the body in substantially a side-by-side array, the capillary tubes each having an inlet end and an outlet end, the inlet ends of the capillary tubes being in fluid communication with the transverse cavity to receive simultaneously discrete portions of liquid from the cavity, and the outlet ends of the capillary tubes extending rearwardly at least to the wedge shaped rearward end of the body to discharge discrete portions of liquid rearwardly of the body in the plurality of transversely spaced droplets; and,

the body being small in width so as to minimize differential gravity pressure across the array of capillary tubes when the spray nozzle is loaded with liquid and the array is angularly oriented such that some said capillary tubes are elevated above other said capillary tubes, said width being sufficiently small to prevent dribbling of liquid from the other said capillary tubes when the array is angularly oriented.

5,110,049

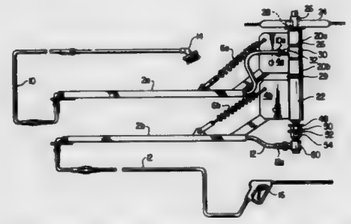
ROTATABLE BOOM SYSTEM FOR DISPENSING FLUIDS

A. Joe Harris, Garland, and Wallace L. Grace, Terrell, both of Tex., assignors to Dilling-Harris and Ginsan, Inc., Dallas, Tex.

Filed Nov. 27, 1990, Ser. No. 618,751

Int. Cl.[5] B05B *15/06*

U.S. Cl. 239—209 **30 Claims**



11. A rotatable boom system comprising a fixed tubular member; first boom means mounted to said tubular member for rotation relative to said tubular member; second boom means mounted to said tubular member for rotation relative to said tubular member; means for introducing a first fluid into said tubular member; means for introducing a second fluid into said tubular member independently of said first fluid; and means for directing said first and second fluids to said first and second boom means, respectively, said directing means comprising first outlet means associated with said tubular member for receiving and discharging said first fluid, and second outlet means associated with said tubular member and in a spaced relation to said first outlet means for receiving and discharging said second fluid, said second outlet means comprising an opening extending through the wall of said tubular member, additional sleeve means mounted on said tubular member for rotation relative thereto, an outlet fitting on said additional sleeve means, and means connecting said outlet fitting with said opening during rotation of said additional sleeve means.

5,110,050

GAS TURBINE ENGINE NOZZLE

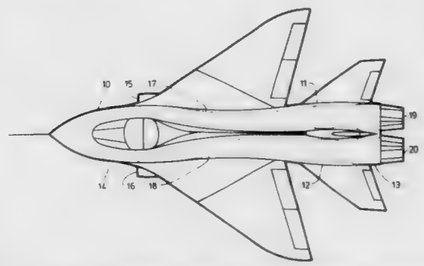
Douglas J. Nightingale, Bristol, England, assignor to Rolls-Royce (1971) Limited, London, England

Continuation of Ser. No. 833,221, Sep. 14, 1977, abandoned, which is a continuation of Ser. No. 610,189, Sep. 3, 1975, abandoned. This application Feb. 15, 1979, Ser. No. 22,273

Claims priority, application United Kingdom, Sep. 7, 1974, 39182

Int. Cl.[5] F02K *1/12*

U.S. Cl. 239—265.39 **15 Claims**



1. A gas turbine engine having a nozzle wherein a plurality of flaps are pivotable about their upstream ends and cooperate to vary the geometry of the nozzle the flaps comprising at least three relatively flexible flaps forming the greater part of the nozzle circumference and interdigitated with relatively rigid flaps, the axially extending free side edges of respective adjacent relatively flexible flaps being connected together by means for producing relatively circumferential movement between said free side edges of the flexible flaps and the relatively rigid flaps whereby all of the flaps pivot about their upstream ends and the flexible flaps are caused to change their curvature so that the geometry of the nozzle is varied, said means for producing relative circumferential movement being capable of taking the hoop tension in said flexible flaps.

5,110,051

SQUEEZE SPRAYER DEVICE

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06612

Filed Mar. 1, 1991, Ser. No. 663,173

Int. Cl.[5] B65D *1/32*

U.S. Cl. 239—327 **28 Claims**

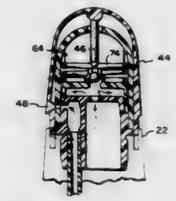
24. A squeeze sprayer, comprising:

a flexible container of liquid product;

closure means connectable to said container, said closure means having a discharge orifice through which liquid from the container is sprayed;

dip tube means connected to said closure means for conveying liquid from said container to said orifice upon squeezing the container;

means for atomizing the sprayed liquid, comprising a closed end hollow cylinder fixedly connected to said closure means and having a first discharge opening in fixed alignment with said orifice;



said atomizing means further comprising air valve means covering said orifice in a discharge closed position and being axially moveable against the bias of a return spring within said cylinder in response to an increase in air pressure within said container upon the squeezing for uncovering said orifice in a discharge open position and for conveying pressurized air to the liquid spray to create a fine mist spray.

5,110,052

MANUALLY OPERABLE DISCHARGING APPARATUS FOR MEDIA

Lothar Graf, Rielasingen-Worblingen; Karl-Heinz Fuchs, Radolfzell, and Leo Maerte, Sipplingen, all of Fed. Rep. of Germany, assignors to Ing. Erich Pfeiffer GmbH & Co. KG, Fed. Rep. of Germany

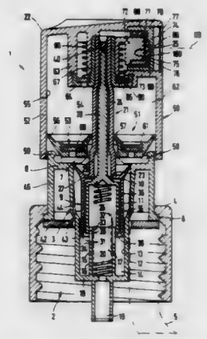
PCT No. PCT/EP88/00597, § 371 Date Feb. 7, 1990, § 102(e) Date Feb. 7, 1990, PCT Pub. No. WO89/00085, PCT Pub. Date Jan. 12, 1989

PCT Filed Jul. 5, 1988, Ser. No. 455,361

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1987, 3722469

Int. Cl.[5] B05B *9/043*

U.S. Cl. 239—333 **23 Claims**



1. A manually operable dispenser for media, comprising:

A medium pump operable by a handle and including a basic support body and which has a pump chamber, connected to a media outlet channel leading to a discharge nozzle; and

at least one manually operable compressed air pump, having at least one compressed air chamber which is connected by at least one compressed air channel at least indirectly to the discharge nozzle , and said air pump having a pump piston separable from said support body and traversed by an operating shaft of said medium pump, said piston being

axially supported against air pressure in said air chamber by axial contact against said basic support body.

5,110,053

FUEL INJECTION NOZZLE

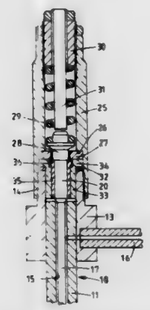
John W. Stevens, Kent, England, assignor to Lucas Industries Public Limited Company, Solihull, England

Filed Dec. 4, 1990, Ser. No. 624,322

Claims priority, application United Kingdom, Apr. 12, 1990, 9008403

Int. Cl.[5] F02M *61/12*

U.S. Cl. 239—533.9 **8 Claims**



1. A fuel injection nozzle for supplying fuel to a compression ignition engine comprising an elongated nozzle body defining a blind bore, an annular seating defined at the blind end of the bore, a hollow boss defined at the end of the body remote from the seating, a valve member movable axially within the bore and defining a space with the wall of the bore, the valve member being shaped at one end for engagement with the seating and having its other end projecting from the bore and extending within said boss, a fuel inlet communicating with said space, resilient means biasing the valve member into engagement with the seating, the valve member being movable by fuel pressure away from the seating to allow fuel flow through an outlet orifice extending from the bore downstream of the seating, an inner guide bush surrounding the portion of the valve member within said boss, said inner guide bush serving to guide the movement of the valve member, an outer guide bush in which the inner guide bush is axially slidable, an outwardly extending flange formed on the outer guide bush, said flange overlying an annular end surface of said boss, a washer interposed between said end surface and said flange, means engagable with said boss to clamp the washer and flange to said surface to achieve a fuel tight seal, a clearance defined between an inner surface of said boss and another surface of said outer guide bush, whereby prior to clamping the washer and flange to said surface the outer guide bush can be positioned laterally to achieve alignment of the valve member, cooperating surfaces defined by the valve member and the wall of the bore respectively, said cooperating surfaces forming a restrictor which acts to restrict the flow of fuel between the fuel inlet and the outlet orifice during the initial movement of the valve member away from the seating, said cooperating surfaces separating as the valve member moves to the fully open position to allow substantially unrestricted flow of fuel and a stop to determine the fully open position of the valve member.

5,110,054

FUEL INJECTOR

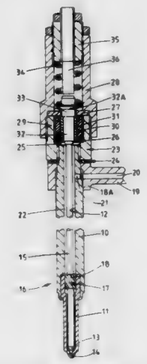
John W. Stevens, Kent, England, assignor to Lucas Industries, Solihull, England

Filed Nov. 5, 1990, Ser. No. 610,839

Claims priority, application United Kingdom, Nov. 23, 1989, 8926478

Int. Cl.[5] F02M *61/12*

U.S. Cl. 239—533.11 **19 Claims**



1. A fuel injector for supplying fuel to an internal combustion engine, comprising an elongated body in which is defined a bore, a seating forming at one end of the bore, an elongated valve member extending within the bore and forming a clearance therewith, the valve member being shaped at one end for co-operation with said seating to control flow of fuel through an outlet from a fuel inlet which communicates with said clearance, a guide bush carried by the body and located adjacent the other end of the valve member thus allowing said valve member to align with said seating, and allowing limited axial movement under the action of fuel pressure in said clearance, and, allowing the formation of a seal to prevent escape of fuel from said clearance, the valve member being guided for axial movement by the guide bush and resilient means acting on the valve member to urge the valve member into contact with the seating, the valve member defining a surface against which fuel under pressure in the clearance can act to lift the valve member from the seating said valve member and the wall of the bore being constructed to form a guide means for the valve member, the guide means being located intermediate the guide bush and the seating passage means being provided to allow flow of fuel past the guide means, and said guide bush being allowed limited radial movement within the body.

5,110,055

METHOD AND APPARATUS FOR CLEANING THERMOPLASTIC MATERIAL FOR REUSE

Parry Teeny, Portland, Oreg., assignor to Partek Corporation, Vancouver, Wash.

Continuation of Ser. No. 333,368, Apr. 3, 1989, abandoned. This application Sep. 20, 1990, Ser. No. 587,618

Int. Cl.[5] B02C *23/18, 23/20*

U.S. Cl. 241—15 **9 Claims**

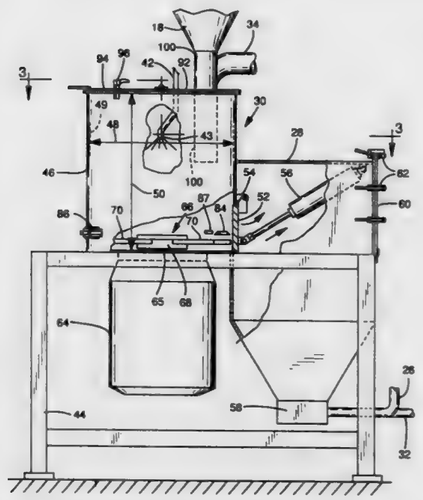
1. A method for decontaminating thermoplastic materials, comprising the steps of:

(a) placing into a container a quantity of contaminated material consisting essentially of pieces of thermoplastic material from molded plastic containers and contaminants adhered thereto and mixed therewith, said contaminants including as their primary constituents label materials of paper and film plastic, together with adhesives used for fastening such label materials to such pieces of thermoplastic material, said adhesives including water soluble adhesives;

(b) mechanically agitating said contaminated material in said container until, by said agitation action, some of said contaminants are dislodged from adhesion to said pieces of thermoplastic material and the temperature of said contaminated material is elevated to a first predetermined temperature;

(c) thereupon spraying a predetermined amount of liquid solvent at a temperature lower than that of said contaminated material into said container with said contaminated material, and absorbing a portion of said solvent in said label materials and water soluble adhesives, said predetermined amount of said solvent being no greater than about ten per cent by weight of the quantity of contaminated material;

(d) thereafter continuing to agitate said contaminated material together with said solvent and, by said agitation action, separating more of said contaminants from adhesion to said pieces of thermoplastic material and further elevating the temperature thereof until a second predetermined



temperature, higher than said first predetermined temperature, is reached and at least a majority of said contaminants are released from adherence to individual ones of said pieces of thermoplastic material without raising the temperature of said pieces of thermoplastic material high enough to cause said pieces to begin to melt;

(e) substantially continuously withdrawing a stream of gas from said container while performing each of said steps (a), (b), (c) and (d), and carrying a majority of said released contaminants and a majority of said solvent away from said container in said stream of gas, while leaving said pieces of thermoplastic material in said container;

(f) ceasing agitation of said pieces of thermoplastic material after said second predetermined temperature has been reached, but before the temperature of said thermoplastic pieces rises sufficiently high above said second predetermined temperature to cause said pieces to begin to melt; and

(g) thereafter removing said pieces of thermoplastic material, which are in a relatively dry state, from said container.

5,110,056

METHOD AND APPARATUS FOR REDUCING BRITTLE MATERIAL FOR SUBSEQUENT GRINDING

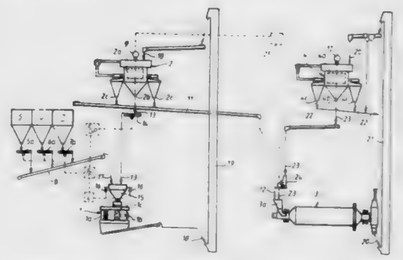
Gotthardt Blasczyk, and Norbert Patzelt, both of Beckum, Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Feb. 8, 1991, Ser. No. 652,604

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1990, 4005323

Int. Cl.[5] B02C *23/12*

U.S. Cl. 241—19 **10 Claims**



1. A method for two-stage grinding of brittle material comprising:

a) subjecting fresh brittle material to primary reduction in a first mill;

b) separating reduced fresh material into a quantity of first oversize material and a quantity of first fines;

c) recycling the quantity of first oversize material to the first mill;

d) delivering the quantity of first fines to a second mill for further reduction;

e) separating material which has been reduced in the second mill into a quantity of second oversize material and a quantity of second fines;

f) recycling the quantity of second oversize material to the second mill;

g) removing the quantity of second fines as a finished product;

h) varying the quantity of first fines corresponding to an alteration of the quantity of second oversize material by adjusting the fineness of separation of the first separator to maintain constant the total quantity of first fines and second oversize material delivered to the second mill; and

i) varying the quantity of fresh material corresponding to an alteration of the quantity of first oversize material to maintain constant the total quantity of first oversize material and fresh material delivered to the first mill.

5,110,057

METHOD OF HIGH PERFORMANCE JAW CRUSHING

Vijia K. Karra, Franklin; Anthony J. Magerowski, Milwaukee, and Scot E. Szalanski, Oak Creek, all of Wis., assignors to Nordberg Inc., Milwaukee, Wis.

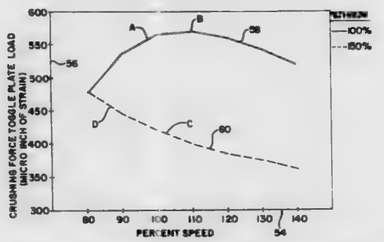
Filed Dec. 6, 1990, Ser. No. 623,017

Int. Cl.[5] B02C *1/02*

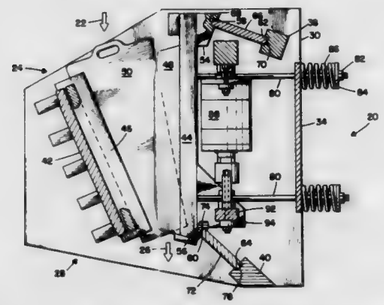
U.S. Cl. 241—30 **4 Claims**

1. A method of operating a jaw crusher having a specified speed, a specified throw, and a specified horsepower draw to achieve a specified maximum operational crushing force and a resulting crusher throughput capacity, comprising increasing said throw over said specified level and decreasing said speed

below said specified level so that said capacity is increased without exceeding said crushing force, thus enabling an increase in crusher production without increasing the physical size of the jaw crusher.



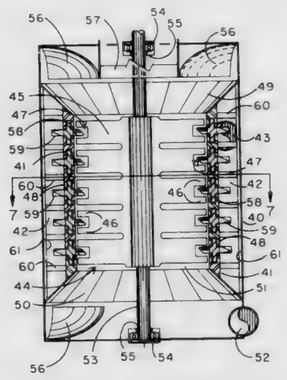
5,110,058
ROCK CRUSHER
James W. Rawson, 169 Munyan Rd., Putnam, Conn. 06260
Filed May 2, 1991, Ser. No. 694,812
Int. Cl.[5] B02C *17/14*
U.S. Cl. 241—264 **18 Claims**



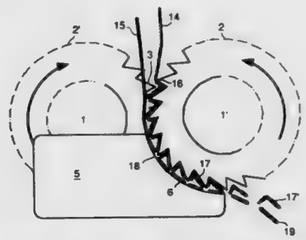
1. Apparatus for crushing rock into aggregate comprising:
a stationary frame;
a stationary jaw fixed to said frame;
a movable jaw lying generally in an upright plane and, together with said stationary jaw, defining an upper region for receiving rock to be crushed and a lower region from which crushed aggregate is discharged;
support means mounting said movable jaw on said frame for movement relative to said stationary jaw such that displacement of said upper region of said movable jaw is substantially restricted to said upright plane and such that displacement of said lower region of said movable jaw is substantially restricted to a generally horizontal plane transverse of said upright plane; and
operating means for reciprocably moving said movable jaw relative to said stationary jaw.

5,110,059
SOLID WASTE SHREDDER
James A. Titmas, 347 Crain Ave., Kent, Ohio 44240, and Phillip J. Flauto, 2205 E. Streetsboro Rd., Hudson, Ohio 44326
Division of Ser. No. 443,506, Nov. 30, 1989, Pat. No. 4,985,976.
This application Dec. 14, 1990, Ser. No. 627,776
Int. Cl.[5] B02C *13/282*
U.S. Cl. 241—47 **19 Claims**

1. Apparatus for shredding material comprising an annular drum having vertically spaced circular tracks, vertically spaced blade means including segmented blade members, a plurality of said blade members carried by each said circular track, rotatable paddle means within said annular drum having a radially outer end adjacent to said blade means, means to introduce the material at one axial end of said paddle means so that the material is forced against said blade means, and means to remove shredded material at the other axial end of said paddle means.

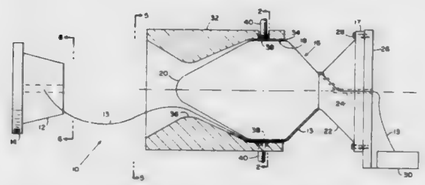


5,110,060
CUTTER ENHANCEMENT FOR PLASTIC SIZE REDUCTION EQUIPMENT
Lynn C. Lundquist, 10833 NE. Russell, Portland, Oreg. 97220
Filed Oct. 9, 1990, Ser. No. 595,258
Int. Cl.[5] B02C *18/18*
U.S. Cl. 241—158 **10 Claims**



1. A material size reduction mechanism for cutting a workpiece, having a nominal thickness, to a predetermined, uniform finished size, comprising:
a cutter assembly for cutting, longitudinally and transversely, a workpiece, including a set of first cutter discs carried on a first shaft and a set of second cutter discs carried on a second shaft, said first cutter discs being axially and rotatably fixed on said first shaft, said second cutter discs being axially shiftable on said second shaft, wherein said first and second cutter discs are constructed and arranged to mesh, thereby defining a cutting chamber wherein a primary cutting action occurs, wherein said shafts include a shoulder against which a series of cutters and spacers may be located;
a stationary surface located adjacent each cutter disc and spaced apart therefrom by a predetermined distance to provide a secondary cutting action with its associated cutter, wherein said predetermined distance is less that the nominal thickness of the workpiece; and
mounting means which includes a spacer mounted between adjacent cutters, a compression spacer located at the end of a shaft bearing against the final cutter in a series, an anti-friction bearing mounted on a shaft such that it may be slidably positioned to put a series of spacers and cutters under a compressive load on a shaft, and a compression plate, mountable from the exposed end of the shaft, which will exert a compressive force on said series of cutters, spacers and on said anti-friction bearing.

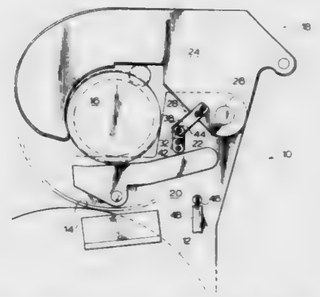
5,110,061
PNEUMATIC REEL FIBER PAY OUT SYSTEM
Roger P. Berry, 1000 Wood Cir., Madison, Ala. 35758
Filed Dec. 3, 1990, Ser. No. 623,315
Int. Cl.[5] B65H *54/00*
U.S. Cl. 242—47 **10 Claims**



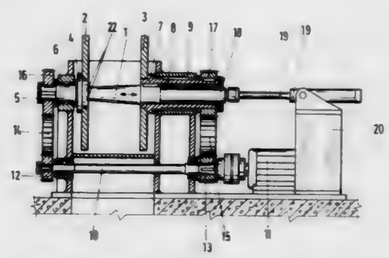
1. Apparatus for testing wound optical filament bobbins under conditions simulating operational conditions, comprising:
(a) a stationary support for supporting a filament bobbin against rotation in a fixed position;
(b) a non-rotating cylindrical spool for receiving said filament from a filament bobbin supported on said stationary support;
(c) stationary means disposed about the circumference of said spool for creating a supersonic stream of fluid between said stationary means and the surface of said non-rotating spool and for guiding said optical filament between said stationary means and said surface of said spool, and through an opening in said spool;
(d) a stationary signal transmitting means connected to an end of said filament for transmitting signals through said filament during the testing of said optical filament; and
(e) control means for controlling said supersonic stream of fluid between said spool surface and said stationary means to pull said filament from said bobbin and for winding said filament about said spool.

5,110,062
DETECTION APPARATUS FOR PAPER BUILD UP ON REEL BAR
Djuro Kremar, Quebec, Canada, assignor to Valmet-Dominion Inc., Lachine, Canada
Filed Jul. 12, 1990, Ser. No. 551,832
Claims priority, application Canada, May 31, 1990, 2016013
Int. Cl.[5] B65H *75/00*
U.S. Cl. 242—57 **12 Claims**

1. A paper machine for winding a web onto a reel bar including:
loading means for moving the reel bar into a first winding position to engage a drive drum and to initiate winding of a web onto the reel bar;
securing means engaging the reel bar for holding the reel bar in engagement with the drive drum in the first winding position until a predetermined amount of web has been wound onto the reel bar, and thereafter the securing means being moveable remotely of the reel bar to permit the reel bar to be transferred into a second winding position;
detection apparatus for detecting successful turn-up of the web onto a reel bar comprising:
a first bracket mounted to a stationary portion of the machine and having a bracket end portion that carries an optical sensor for detecting a change in state of an optical signal which is indicative of a change in the presence and absence of the optical signal,
a second bracket mounted to the securing means including an optical signalling means in the form of an orifice normally axially aligned juxtaposed to the optical sensor for changing the state of the optical signal when said securing means moves a predetermined distance causing the orifice to move out of alignment with the optical sensor due to build up of paper on the reel bar; and,
control means connected to the output of the optical signal detector for generating a signal indicating successful turn-up of winding of the web onto the reel bar upon the change of state continuing for a predetermined period of time exceeds the disturbance cycle time of a bouncing reel bar.



5,110,063
COILING MACHINE FOR STRIP-SHAPED MATERIAL, MORE PARTICULARLY FOR AN EDGE STRIP FORMED IN THE TRIMMING OF STEEL STRIPS
Wilfried Koepe, Wiehagen 104, D-4712 Werne, Fed. Rep. of Germany, assignor to Wilfried Koepe, Werne, Fed. Rep. of Germany
Filed Oct. 17, 1990, Ser. No. 599,339
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1989, 3937992
Int. Cl.[5] B21C *47/02*; **B65H** *18/10*
U.S. Cl. 242—78.1 **3 Claims**



1. A coiling machine for strip-shaped material, comprising: lateral bearing blocks, axially fixed side discs rotatably mounted on the bearing blocks; a coiling shaft; an axially fixed hollow shaft mounted in one of the bearing blocks for rotation and connected to one of the side discs for rotation therewith; means mounting the coiling shaft for axial displacement in the hollow shaft between an operative position wherein the coiling shaft is disposed between the two side discs and a second position wherein the coiling shaft is within the hollow shaft and removed from between the two side discs; means for directly driving the hollow shaft; means directly driving the

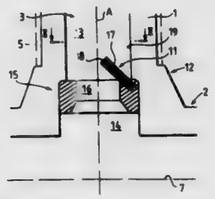
other of the side discs; and means for positively coupling the coiling shaft to the hollow shaft.

5,110,064

BOBBIN CARRYING TRAY

Hidetoshi Kimura, Kyoto, and Shotaro Okugawa, Ohtsu, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed May 1, 1991, Ser. No. 694,253
Claims priority, application Japan, May 8, 1990, 2-47894[U]
Int. Cl.[5] B65A *49/06*
U.S. Cl. 242—129.5 **11 Claims**



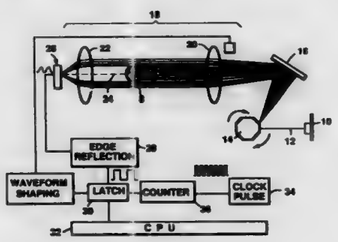
1. A bobbin carrying tray comprising:
a peg for supporting a bobbin, the peg including a base portion,
an air passage having a central longitudinal axis extending through the peg and the base portion, the air passage being defined by an inner wall portion of at least one of the peg and the base portion,
at least one linear member extending in a sloped fashion relative to the central longitudinal axis from a location adjacent the inner wall portion of at least one of the peg and the base portion.

5,110,065

BOBBIN WINDING CONTROL

Donald G. Cawelti; Bryan F. Berlin, both of Tucson, Ariz., and John T. Kenna, Thousand Oaks, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 14, 1991, Ser. No. 669,251
Int. Cl.[5] B65H *54/28*
U.S. Cl. 242—158 R **4 Claims**



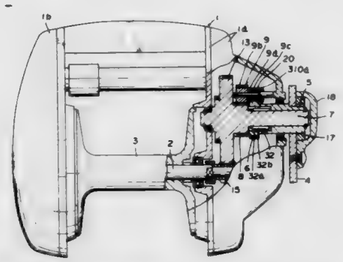
1. A method of determining winding errors including gapping and climb-back as well as improper attack angle of a filament being wound onto a bobbin, comprising the steps of:
periodically sweeping a laser beam across a region within which the filament approaching the bobbin is located;
detecting the interruption of the laser beam by the filament and continuously generating a signal corresponding thereto;
establishing a reference signal corresponding to a predetermined filament angle of attack;
comparing the predetermined angle of attack reference signal with the continuously generated signal to provide an error signal representative of the difference between said compared signal;
establishing a further reference signal corresponding to an acceptably positioned filament approaching the bobbin;
comparing the continuously generated signal with the further reference signal to provide an error differential signal;
reversing bobbin rotation responsive to the error differential signal; and
resuming bobbin winding rotation responsive to cessation of the error differential signal.

5,110,066

SPEED CHANGE APPARATUS FOR A FISHING REEL

Junichi Toda, Sakai, Japan, assignor to Shimano Inc., Osaka, Japan

Filed Apr. 1, 1991, Ser. No. 678,219
Claims priority, application Japan, Apr. 6, 1990, 2-92858
Int. Cl.[5] A01K *89/015;* **F16H** *3/08*
U.S. Cl. 242—255 **8 Claims**



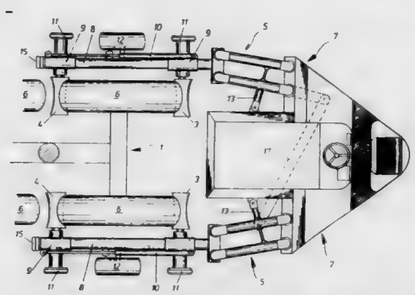
1. A fishing reel comprising:
a reel body, a fishing line winding member supported to said reel body to be rotatable with respect thereto, and a drive mechanism for driving said fishing line winding member, said drive mechanism comprising a rotatable handle and a speed change apparatus for changing a speed of said fishing line winding member driven by said drive mechanism upon rotation of said handle, said speed change apparatus comprising:
(a) an input shaft supported to said reel body and adapted to be rotated by rotation of said handle;
(b) an output shaft rotatably supported to said reel body, adapted to be rotated by rotation of said handle and coupled with said fishing line winding member;
(c) a first sun gear provided on said input shaft and having a predetermined number of teeth;
(d) a second sun gear provided on said output shaft and having a different number of teeth from that of said first sun gear;
(e) a differential gear comprising a smaller diameter toothed portion having a predetermined number of teeth and engageable with one of said first and second sun gears and a larger diameter toothed portion having a larger number of teeth than that of said smaller diameter toothed portion, said differential gear being rotatably supported to said reel body, one of said smaller diameter toothed portion and larger diameter toothed portion being freely supported with respect to the other; and
(f) a transmission changeover mechanism including clutch means for connecting or disconnecting said smaller diameter toothed portion and larger diameter toothed portion and for choosing between a first transmission system in which said smaller diameter toothed portion and larger diameter toothed portion are connected to transmit said driving force from said input shaft to said output shaft and a second transmission system in which said smaller diameter toothed portion and said larger diameter toothed portion are disconnected to connect said input shaft and output shaft directly.

5,110,067

TRANSFER DEVICE TO GRIP A DOUBLE WHEEL

Matti Sinkkonen, Vaajakoski, Finland, assignor to Tana-Jyra Ky, Vaajakoski, Finland

PCT No. PCT/FI89/00040, § 371 Date Sep. 7, 1990, § 102(e) Date Sep. 7, 1990, PCT Pub. No. WO89/08583, PCT Pub. Date Sep. 21, 1989
PCT Filed Mar. 8, 1989, Ser. No. 572,933
Claims priority, application Finland, Mar. 8, 1988, 881057
Int. Cl.[5] B64C *25/50*
U.S. Cl. 244—50 **14 Claims**



1. A transfer device that grips a double wheel which is intended to move an aircraft (**1**) or any other double wheeled device equipped with a base, which transfer device consists of a fork-shaped frame and a pair of front and rear rollers (**3, 4**) attached to each of a pair of forks (**2**), means for compressing and moving the forks and means for revolving the rollers, and in which both pairs of rollers (**3, 4**) can be placed in front of and behind a wheel (**6**) of the double wheeled device (**1**) to be moved, and in which by rotating the rollers (**3, 4**) pressed against the wheels (**6**) of the double wheeled device to be moved the double wheels too are made to rotate and the entire double wheeled device is made to move, characterized in that the forks (**2**) are attached to a connecting rear frame (**7**) by means of parallelogram arms (**5**), which are adapted to provide at least a portion of the lateral movement required when placing the rollers (**3, 4**) around the double wheels (**6**) and which transfer device also includes means (**13, 18, 19, 20**) for swinging the parallelogram arms.

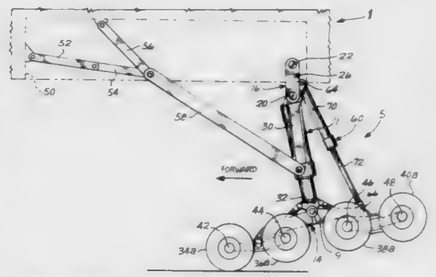
5,110,068

MULTI-AXLED PROPPED LANDING GEAR

Donald L. Grande, Des Moines, and Harry C. Ralph, Kirkland, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 20, 1990, Ser. No. 631,627
Int. Cl.[5] B64C *25/26, 25/34*
U.S. Cl. 244—102 SL **11 Claims**

7. A landing gear for an aircraft, comprising:
a wheel truck having a plurality of wheels;
a main prop member for mounting said wheel truck to a landing gear support structure on said aircraft, said main prop member having an upper end portion pivotably mounted to said support structure, and a lower end portion pivotably mounted to a generally central region of said wheel truck, said main prop member being operable to swing said wheel truck between a certain stowed position during aircraft flight and a lowered position during aircraft landings; and
at least one other prop member having an end pivotably connected adjacent said upper end portion of said main prop member, and a second end pivotably connected to a region of said wheel truck that is offset from said central region, said other prop member normally being telescopically extendable and retractable, and further, said other prop member being releasably lockable to hold a certain fixed length when said aircraft is on the ground, in a manner so as to prevent pivoting movement of said main prop member relative to said wheel truck.

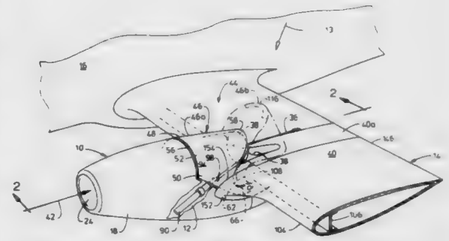


5,110,069

SINGLE PIVOT OVERWING THRUST REVERSER

George Webb, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Nov. 30, 1990, Ser. No. 620,597
Int. Cl.[5] B64D *33/04*
U.S. Cl. 244—110 B **37 Claims**



1. A thrust reverser for a gas turbine engine supported by a pylon to a wing, the engine being effective for discharging exhaust gases from an outlet of an exhaust nozzle thereof over a surface of the wing, comprising:
a generally U-shaped deflector having first and second spaced apart sides joined together by a base, and spaced apart open forward and aft ends, said first and second sides including first and second support portions, respectively, disposed between said forward and aft ends, said deflector first and second support portions including first and second proximal ends, respectively, and said deflector being positionable in a stowed position around said exhaust nozzle so that said deflector aft end is disposed forward of said nozzle outlet for allowing substantially unobstructed discharge of said exhaust gases from said nozzle outlet, and in a deployed position for changing direction of said exhaust gases for thrust reversal;
a torque bar fixedly joined to said first and second proximal ends and having a longitudinal centerline axis;
means for rotatably joining said torque bar to said wing;
means for rotating said deflector about said torque bar centerline axis for positioning said deflector in said deployed and stowed positions.

5,110,070

RIGID AIRSHIP HAVING RIBS AND LONG BEAMS FORMING A CARRIER FRAME

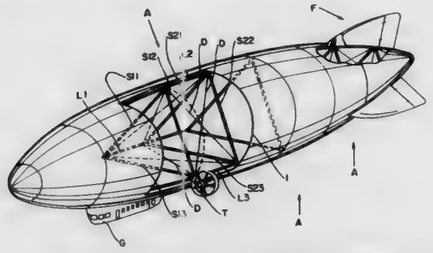
Klaus Hagenlocher, Friedrichshafen, and Florian Windischbauer, Lindau, both of Fed. Rep. of Germany, assignors to Luftschiffbau Zeppelin GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jun. 7, 1991, Ser. No. 712,269

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1990, 4018749

Int. Cl.[5] B64B *1/06*

U.S. Cl. 244—125 **20 Claims**



1. A rigid airship comprising a carrier frame including longitudinal beams and a plurality of triangular cross-ribs each having a base arranged horizontally in a lower option of said carrier frame, means forming junctions between said triangular cross-ribs and said longitudinal beams at corners of said cross-ribs to form quadrangular frame components each comprising two cross-ribs and two longitudinal beams interconnecting said two cross-ribs, thereby enclosing quadrangular surfaces, diagonally extending tension elements in said quadrangular frame components, whereby three of said quadrangular frame components form a longitudinal frame section lift gas cell means arranged in said longitudinal frame sections between triangular cross-ribs, each lift gas cell means bearing with an outer portion against an inner surface of the respective longitudinal beams to which said lift gas cell means is secured, each lift gas cell means having a cell skin projecting laterally from the cross-ribs and from the longitudinal carrier beams so that said lift gas cell means form with their cell skin an outer skin of said rigid airship over the length of the respective longitudinal frame section, said lift gas cell means having a lower portion loosely resting on said tension elements diagonally crossing said quadrangular surface formed by two lower base longitudinal beams and two triangular bases, whereby a lower portion of the respective lift gas cell mean forms a separation wall between gas in said lift gas cell means and at least one air chamber formed in a lower belly portion of said airship, and a separate envelope portion arranged between said base longitudinal beams to downwardly close said at least one air chamber, whereby said envelope portion completely encloses the surface of said lower belly portion of said airship while said cell skin of said lift gas cell means encloses the remaining surface of said airship.

5,110,071

PERSONNEL CAPSULE EXTRACTION APPARATUS

Henry J. Hunter, Lancaster; Clifton W. Marshall, Campo; Kenneth Cunningham, and Marvin A. Tingdahl, both of Lancaster, all of Calif., assignors to The United States of America as Represented by the Secretary of the Air Force, Washington, D.C.

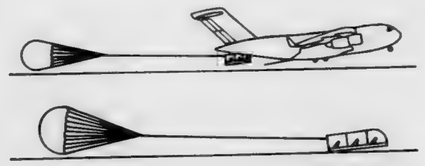
Filed Apr. 18, 1990, Ser. No. 510,657

Int. Cl.[5] B64D *01/12, 01/14*

U.S. Cl. 244—137.3 **8 Claims**

1. A personnel capsule extraction apparatus comprising in combination

means for containing and enclosing personnel, said personnel containing and enclosing means includes a base platform with a plurality of seats arranged thereon and operatively attached to said base platform, said base platform having a first and second end, a plurality of roll bars operatively attached to said base platform and substantially equally-spaced along the length of said base platform, said roll bar being reinforced with a plurality of connecting members which are orthogonal to said plurality of roll bars and equally-spaced thereon, a windshield operatively attached to said base platform and one of said roll bars, said windshield located at said first end of said base platform, and an altitude control bar operatively attached to one of said roll bars at said second end of said base platform, said altitude control bar is positioned parallel to said base platform,



an airdrop platform to support said personnel containing and enclosing means, said personnel containing and enclosing means operatively attached to said airdrop platform,

means for absorbing shock, said shock absorbing means uniformly spaced between said personnel containing and enclosing means and said airdrop platform, said shock absorbing means absorbing any shock which is transmitted to said personnel containing and enclosing means when said airdrop platform impacts the ground, and,

means for extracting, said extracting means operatively attached to said personnel containing and enclosing means, said extracting means extracting said personnel containing and enclosing means from a low flying aircraft, said extracting means being activated by an aircraft crew member to extract said personnel containing and enclosing means at a predetermined height above the ground.

5,110,072

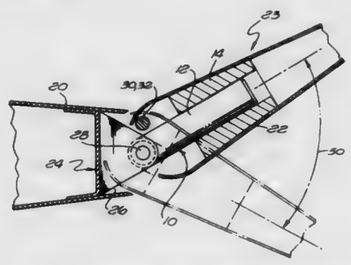
CONTROL SURFACE STABILIZER HINGE

George A. Owl, deceased, late of Gardena, Calif., by David A. Owl, legal representative, San Angelo, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 13, 1990, Ser. No. 611,372

Int. Cl.[5] B64C *3/50, 9/02, 9/08*

U.S. Cl. 244—213 **5 Claims**



1. A multiple point suspension system for attaching a control surface to an edge of a flexible wing, comprising:

a plurality of active hinges, each said active hinge including means for urging said control surface into various angular relationships relative to said wing, and a plurality of passive hinges for pivotally coupling said control surface to said flexible wing at locations between said active hinges,

each said passive hinge including a shaft rotatably coupled, by axle means, to said flexible wing, and a cylinder fixedly housed within said movable control surface, each said shaft being slidably received within a respective one of said cylinders,

whereby, when said wing is flexing and as said control surface is being moved through actuation of said urging means to one of said angular relationships relative to said flexible wing, said passive hinges allow said control surface to move in out-of-plane correspondence with said flexed wing.

5,110,073

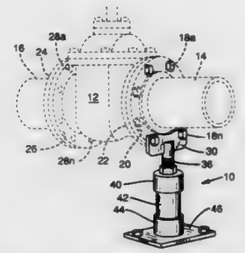
FLANGED PIPE SUPPORT

John H. Schoenky, 22700 NW. Quatama St., Hillsboro, Oreg. 97124

Filed Mar. 12, 1991, Ser. No. 667,827

Int. Cl.[5] F16L *3/00*

U.S. Cl. 248—49 **2 Claims**



1. A pipe support for piping having flanges, said flanges having spaced holes for affixing sections of said piping together, comprising:

1. a base having an upper surface thereon;
2. a first cup fixedly attached to said upper surface;
3. a separator, having a first end loosely fitting within said first cup;
4. an inverted second cup loosely fitting over a second end of said separator, and having a threaded portion thereon;
5. a plate having:
   a. a concave arcuately shaped upper edge;
   b. a lower edge having a threaded extension affixed thereto;
      i. said threaded extension engaging said threaded portion so that the separation between said upper edge and said base is adjustable; and
6. said plate having therein spaced holes for bolting said plate to said flanges.

5,110,074

BRACKET FOR USE WITH BOLT AND BRACKET POSITION-ADJUSTABLY ATTACHED TO ELONGATE ELEMENT

Takeshi Deguchi, Toyonaka, Japan, assignor to Inaba Denki Sangyo Co., Ltd., Osaka, Japan

Filed Mar. 8, 1991, Ser. No. 666,795

Claims priority, application Japan, Mar. 12, 1990, 2-61609

Int. Cl.[5] F16L *3/00*

U.S. Cl. 248—340 **22 Claims**

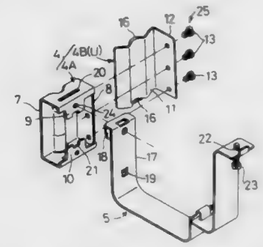
1. A bracket for use with a bolt comprising:

a pair of holder members having holding portions for securely holding a bolt therebetween;

a securing portion provided to at least one of the holding portions for restricting movement of the bracket along a longitudinal direction of the bolt as being secured onto threads of the bolt;

an integrating portion disposed at one lateral side of said holding portions for integrating said holder members with each other;

an inlet portion disposed at the other lateral side of said



holding portions for allowing insertion of said bolt by relatively and radially moving said bolt; and

urging means for urging said holder members in a direction for holding said bolt.

5,110,075

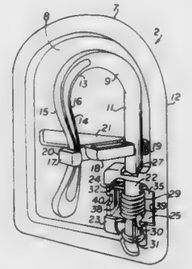
POOL SWEEPER HOSE CLAMP

Douglas B. Reid, 1017 Folsom Ranch Dr., #301, Folsom, Calif. 95630; Bruce A. Christie, and Beth A. Christie, both of 7051 Newton Pl., Rancho Cucamonga, Calif. 91730

Filed Apr. 29, 1991, Ser. No. 692,948

Int. Cl.[5] E04H *4/16*

U.S. Cl. 248—79 **9 Claims**



1. In combination with a swimming pool, a clamp assembly for mooring a sweeper hose or other floating objects to a wall of the pool at water level which comprises:

a baseplate comprising a peripheral frame and a backplane, said baseplate having a shallow frontal housing cavity;

means for mounting said baseplate against said wall;

a hook having a substantially linear shank and an open loop shaped and dimensioned to form a bay for capturing a part of said floating objects; and

means for holding the shank of the hook in a position parallel to said backplane and inside the housing cavity;

wherein said means for holding comprise means for rotatively mounting the shank about its own axis.

5,110,076

ADJUSTABLE MULTIPOLE SUPPORT STAND FOR MEDICAL FLUIDS

Stephen J. Snyder, Van Nuys, and John L. Wilson, Bishop, both of Calif., assignors to Cal-Surgical, Inc., Bishop, Calif.

Filed Jan. 14, 1991, Ser. No. 640,823

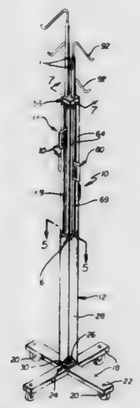
Int. Cl.[5] A47G *29/00*

U.S. Cl. 248—125 **20 Claims**

1. A multipole support stand for medical fluids and the like, comprising:

a plurality of elongated and generally vertically oriented support poles each including support means disposed generally at an upper end thereof for supporting a medical fluid container;

a frame structure including an upright center post and having means for supporting said poles in a generally verti-



cally oriented parallel array for sliding movement of said poles along parallel axes between raised and lowered positions; and

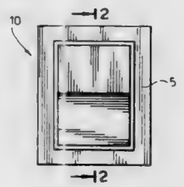
lock means for releasably and individually locking each of said poles in a selected vertical position of adjustment relative to said frame structure, each of said lock means engageable with said center post.

5,110,077

MEMBERS FOR SUPPORTING ARTICLES ON SMOOTH WALLS

Romano Mossini, Via Arzaga, 4, 20146 Milano, Italy

PCT No. PCT/IT88/00062, § 371 Date Feb. 28, 1990, § 102(e) Date Feb. 28, 1990, PCT Pub. No. WO89/02360, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 16, 1988, Ser. No. 490,574
Claims priority, application Italy, Sep. 18, 1987, 21954 A/87
Int. Cl.[5] A47G *1/17*
U.S. Cl. 248—205.3 **7 Claims**



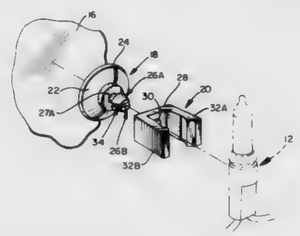
1. A member for supporting articles on smooth walls, the member comprising a single plastic sheet that has a single three-dimensional rigid central part that acts as an article support and a flexible peripheral flange, the rear surface of said flange being covered with adhesive and serving to anchor the member to a smooth wall, said rigid central part being hollow and having a front side, a top side, a bottom side, and two lateral sides, said top side integrally interconnecting the front and both lateral sides from above, said bottom side integrally interconnecting the front and both lateral sides from below.

5,110,078

DECORATIVE LIGHT SUPPORT ASSEMBLY

Lonnie F. Gary, Lubbock, Tex., assignor to Gary Products Group, Inc., Lubbock, Tex.

Continuation of Ser. No. 478,623, Feb. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 257,392, Oct. 13, 1988, Pat. No. 4,901,960, and a continuation-in-part of Ser. No. 294,266, Jan. 6, 1989, Pat. No. 4,962,907. This application May 28, 1991, Ser. No. 706,562
Int. Cl.[5] F16B *47/00*
U.S. Cl. 248—206.2 **8 Claims**



1. A decorative light support assembly adapted to support a decorative bulb and socket assembly on a substantially planar support surface, said decorative light support assembly comprising a suction cup member and a socket support member,

said suction cup member having a suction side adapted to releasably engage said substantially planar support surface and a second side opposite said suction side comprising means adapted to releasably engage said socket support member, and

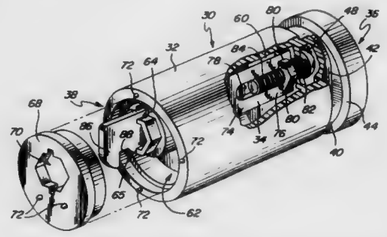
said socket support member further comprising means for releasably engaging and supporting a decorative bulb and socket assembly in substantially parallel alignment to the substantially planar support surface.

5,110,079

DETACHABLE PERSONAL ACCESSORY APPARATUS FOR USE WITH PANEL SYSTEMS

Mel Evenson, San Pedro, and John Melzian, Rancho Palos Verdes, both of Calif., assignors to Rubbermaid Office Products Group, Inc., Inglewood, Calif.

Filed May 31, 1991, Ser. No. 708,743
Int. Cl.[5] A47B *96/06*
U.S. Cl. 248—222.1 **10 Claims**



1. A demountable apparatus for use with panel systems comprising:

a body member having a channel; and

an adjustable fastener member located in said channel, said fastener member including a first end comprising a length adjusting mechanism and a second end comprising a hook member, said body member comprising an elongated cylinder having a first end including an opening for receiving a threaded bolt, said channel including a pair of diametrically opposed grooves, said channel terminating

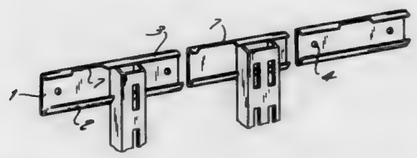
in the opening in said first end of said body, and wherein said fastener member comprises a flat elongated fastener plate slidably retained in the grooves of said channel, said fastener plate including a first end located proximal the first end of said body, said first end including means for holding a nut, and having a second end located proximal a second end of said body comprising a hook member made integral with said fastener plate, said fastener plate receiving the threaded bolt disposed through the opening of the first end of said body, said bolt adjustably retained in the nut of said fastener plate.

5,110,080

HOLDING STRIP FOR SUSPENSION BARS

Martin Rieman, Eslov, Sweden, assignor to Sparring Elfa Aktiebolag, Vastervik, Sweden

PCT No. PCT/SE89/00058, § 371 Date Aug. 2, 1990, § 102(e) Date Aug. 2, 1990, PCT Pub. No. WO89/07409, PCT Pub. Date Aug. 24, 1989
PCT Filed Feb. 10, 1989, Ser. No. 543,731
Claims priority, application Sweden, Feb. 10, 1988, 8800441
Int. Cl.[5] E04G *3/00*
U.S. Cl. 248—225.1 **7 Claims**



1. A horizontal holding strip for mounting on a wall or corresponding surface vertical suspension bars (**8**), said vertical suspension bars used to suspend brackets and shelf units received by said brackets, said horizontal holding strip comprising:

a rear face (**1**) provided with means (**4**) for fastening said horizontal holding strip to said wall;

a lower holding edge (**2**) bent obliquely upward from the lower edge of said rear face and outward from said wall and designed to cooperate with a corresponding mounting slot (**10**) of said vertical suspension bar (**8**);

an upper stop edge (**3**) bent obliquely downward from the upper edge of said rear face and outward from said wall with the lower end (**6**) of the stop edge bent outwardly and placed at such a distance above the upper end of said lower holding edge (**2**) and adapted in such a way that a vertical suspension bar received on said lower holding edge (**2**) is prevented from being removed from said lower holding edge (**2**), since the upper side of said suspension bar (**8**) abuts and is stopped by the lower end of said stop edge (**3**); and

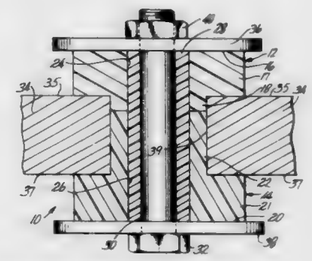
said stop edge (**3**) of said holding strip has at least one recess (**7**) up to said rear face (**1**), the length of which substantially corresponds to the width of said suspension bar and into which a suspension bar can be introduced and lowered such that said mounting slot (**10**) of said vertical suspension bar (**8**) surrounds said holding edge (**2**), and so that said vertical suspension bar can be lifted up and removed from said holding edge (**2**) of said holding strip, respectively.

5,110,081

VIBRATION-ISOLATING MOUNT

William O. Lang, Jr., 19149 Manila Ave., Bloomington, Calif. 92316

Filed Sep. 26, 1990, Ser. No. 588,760
Int. Cl.[5] F16F *3/08*
U.S. Cl. 248—635 **10 Claims**



1. A vibration-isolating mount comprising:

a first soft urethane body having an annular shoulder which rests on one surface of a frame and a cylindrical neck which has an axial length that extends into a hole in the frame;

a second soft urethane body having an annular shoulder which rests on an opposite surface of the frame and a cylindrical neck which has an axial length that extends into the same hole from the opposite surface of the frame;

the first soft urethane body and the second soft urethane body having a urethane hardness in the range of about 40 to about 95 Durometer A;

the axial length of the neck of the first body being substantially less than the axial length of the neck of the second body with the total length of the first neck and the second neck being equal to the axial length of the hole in the frame;

a cylindrical sleeve for adding rigidity to the first body and the second body;

the first body and the second body having aligned axial bores for receiving the cylindrical sleeve; and

the cylindrical sleeve having an axial bore for receiving a bolt for securing the mount to the frame.

5,110,082

ADJUSTABLE APPARATUS FOR SUPPORTING MACHINERY OR OTHER LOAD

Robert L. Rowan, Jr., 3239 Ella Lee La., Houston, Tex. 77019

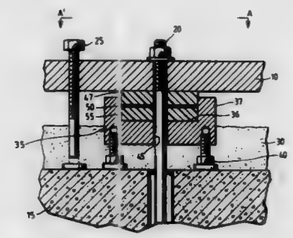
Continuation-in-part of Ser. No. 326,393, Mar. 20, 1989, Pat. No. 5,016,338, which is a continuation-in-part of Ser. No. 248,272, Sep. 21, 1988, abandoned, which is a continuation of Ser. No. 77,614, Jul. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 50,484, May 18, 1987, abandoned. This application Feb. 16, 1990, Ser. No. 480,880
Int. Cl.[5] G01L *5/00*
U.S. Cl. 248—678 **14 Claims**

1. Apparatus for supporting a frame or other weight on a foundation comprising:

a base chock having a floor and an open slot for receiving an anchor bolt;

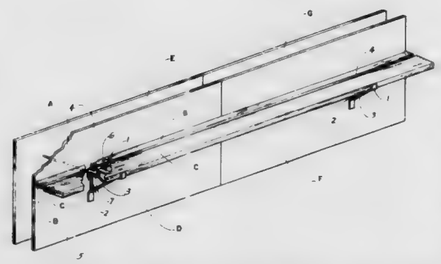
a poured-in-place frame chock whose width permits it to rest on the floor of said base chock and having an open slot for receiving said anchor bolt; and

a retractable engine chock shaped to be insertable between said frame chock and the floor of the base chock, said



engine chock having an open slot for receiving said anchor bolt.

5,110,083
ROSS STAGING BRACKET
Ross C. Page, HCR 30 Box 14, East Peacham, Vt. 05862
Filed Jan. 11, 1991, Ser. No. 640,106
Int. Cl.[5] E04G *17/06*
U.S. Cl. 249—46 **1 Claim**



1. A Ross Staging Bracket to hold parallel sections of foundation forming walling eight and one-half feet or less in height together in place apart from one another in parallel rows and to support one end of a walkway made of metallic or wooden planking for concrete foundation workmen to walk on while pouring and working on fresh concrete held between such parallel sections of foundation forming walling, comprising:

a. A first bar having an outer upwardly extending flange;

b. A second bar;

c. A third angulated bar or strut;

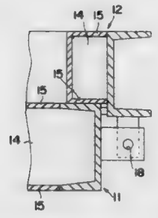
d. A first horizontal waler support plate;

e. A second vertical form engaging plate extending downwardly from one end of said first horizontal waler support plate;

f. A third vertical waler engaging plate extending upwardly from an opposite end of said first horizontal waler support plate;

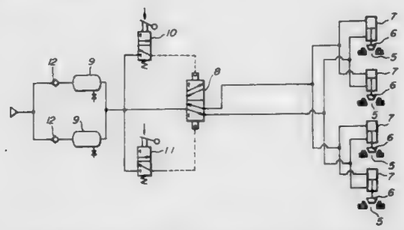
g. a rotatable cam lock means for engaging with a form tie, said means being pivotally mounted to and beneath said first horizontal waler support plate such that said first bar having an outer upwardly extending flange is welded to said first horizontal waler support plate and extends outwardly therefrom, and such that said second bar is welded to said second vertical form engaging plate and extends downwardly therefrom and such that said third angulated bar or strut is welded at one end thereof adjacent to an outer end of said first bar and is welded at an opposite end thereof adjacent to a lower end of said second bar.

5,110,084
FORM DEVICE FOR CELLULAR CONCRETE AND METHOD OF MAKING SUCH CONCRETE
Mikio Hihara, and Nobuhisa Suzuki, both of Fuji, Japan, assignors to Nissei Plan, Inc., Sizuoka, Japan
Filed Aug. 22, 1988, Ser. No. 234,945
Claims priority, application Japan, Jun. 10, 1988, 63-143075; Jun. 10, 1988, 63-143076
Int. Cl.[5] B28B *1/50, 7/26*
U.S. Cl. 249—111 **2 Claims**



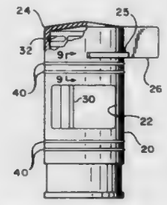
1. A form device for cellular concrete, consisting of a plurality of piled-up form units each having a heat-insulating bottom and shell, a heat-insulating top board, and a bottom-to-shell joint, the heat insulating members having a structure such that they are composed of a foam plastic board covered with a metal lagging material.

5,110,085
GAS VENTING DEVICE FOR FOAM MOLD
Toshio Iwasawa, Kanagawa, Japan, assignor to Bridgestone Corporation, Tokyo, Japan
Filed Nov. 16, 1989, Ser. No. 437,135
Claims priority, application Japan, Nov. 16, 1988, 63-287516; Sep. 19, 1989, 1-240616
Int. Cl.[5] F16K *31/124*
U.S. Cl. 251—29 **5 Claims**



1. A gas venting device for a foam mold defining therein a mold cavity and having an upper mold half formed with at least one vent hole therein, comprising: a valve for closing and opening said at least one vent hole of said foam mold; a valve driving cylinder for driving said at least one valve for closing and opening said at least one vent hole; a main change-over valve for controlling the valve driving cylinder; pressure accumulating means connected through the main change-over valve to the valve driving cylinder; change-over means connected to the main change-over valve for changing-over said main change-over valve by external inputs; timer means for actuating the main change-over valve with a variable delay time; and said gas venting device together with said foam mold being mounted on a trolley, said trolley movable through an oven, whereby said gas venting device is actuated as said trolley is moved by activating said change-over valve.

5,110,086
IRRIGATION VALVE WITH BAFFLE AND SEALS
Guy A. Meuleman, Rupert, Id., assignor to Aqua Control, Inc., Rupert, Id.
Filed Apr. 30, 1991, Ser. No. 693,541
Int. Cl.[5] F16K *5/04*
U.S. Cl. 251—118 **7 Claims**



1. An improved irrigation valve comprising the combination of

a valve housing having means defining a tubular passage therein;

means defining an inlet opening in a side of said tubular passage;

means for attaching the valve housing to an opening in a pipe so that water from the pipe can flow into the housing and through the inlet opening; and

a tubular valve member slidably and rotatably received in the tubular passage, said valve member having a cylindrical wall, a central axis and an open outlet end, said valve member including

means defining a flow opening in said cylindrical wall, said valve member being rotatable in said passage to align with varying degrees said flow opening in said valve member with said inlet opening in said housing to thereby control the flow of water through said valve from said pipe to said outlet end, a baffle extending generally axially within said valve member adjacent an inner surface of said cylindrical wall to interfere with flow of water within said valve member in a circular direction relative to said central axis

a closed end opposite said open outlet end, said flow opening being located intermediate said open and closed ends, and

a baffle support comprising a generally circular body insertable into said valve member to a location between said closed end and said flow opening, said baffle being carried by said baffle support.

5,110,087
VARIABLE FORCE SOLENOID HYDRAULIC CONTROL VALVE
George H. Studtmann, Mount Prospect; James R. Ward, DeKalb, and Terry L. Forbes, Dixon, all of Ill., assignors to Borg-Warner Automotive Electronic & Mechanical Systems Corporation, Sterling Heights, Mich.
Continuation-in-part of Ser. No. 543,162, Jun. 25, 1990, abandoned. This application Jun. 21, 1991, Ser. No. 718,944
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.16 **10 Claims**

1. An electromechanical device, comprising:

a housing;

a magnetic coil arranged within said housing, said coil including an electrical winding;

a pole piece having an axial length partially disposed within said coil in said housing, said pole piece having a first end extending beyond said electrical winding of said coil;

a magnetic armature disposed within said housing, said armature having a center portion, an intermediate portion, and an outside portion,

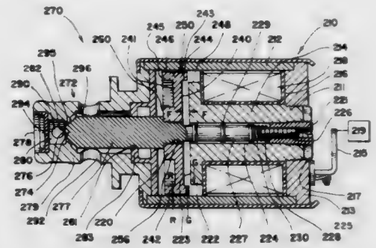
said armature outside portion being connected to said armature center portion by said armature intermediate portion,

said armature outside portion having an axial length and being positioned radially outside said first end of said pole piece to define a first radial variable working air gap between said armature outside portion and said pole piece,

said armature intermediate portion defining a substantially circular planar surface, said armature intermediate portion being axially displaceable from said first end of said pole piece to define an axial variable working air gap;

said armature outside portion having an outer circumferential surface positioned radially inside and spaced from said housing to define a second radial working air gap;

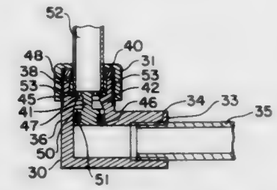
a seat member disposed within said pole piece;



spring means positioned between said seat member and said armature center portion, said spring means adapted to urge said armature away from said seat member; and

said housing, armature and pole piece forming a magnetic flux circuit such that energization of said magnetic coil being effective to cause translation of said armature toward said first end of said pole piece, axial movement of said armature outside portion during translation of said armature being effective to vary the portion of the axial length of said outside portion within the flux path and thereby vary the axial length of said first radial variable working air gap.

5,110,088
WATER-CONTROL STOPPER
Sen-Tien Shih, No. 18, Lane 70, I Ya Alley, I Hsing Tsun, Hsiu Shui Hsiang, Changhua Hsien, Taiwan
Filed Mar. 13, 1991, Ser. No. 668,765
Int. Cl.[5] F16L *29/02*
U.S. Cl. 251—149.1 **4 Claims**



1. A water control stopper comprising:

a) a stopper body of L-shaped configuration defined by a longitudinal section having an outer screw thread and a horizontal section having an inner screw thread, the longitudinal section including a stepped hole defined by an inner lateral hole communicating with a larger hole through an inclined plane;

b) an I-shaped valve disposed in the stepped hole, the valve including an upper face plate having a larger diameter than the diameter of the inner lateral hole, a water stopping piece provided with a plurality of indentations therein, and a center rod connecting the upper face plate to the water stopping piece;

c) a threaded nut secured on the outer screw thread of the

longitudinal section, the nut including a washer and a hole positioned at the center of the nut; and

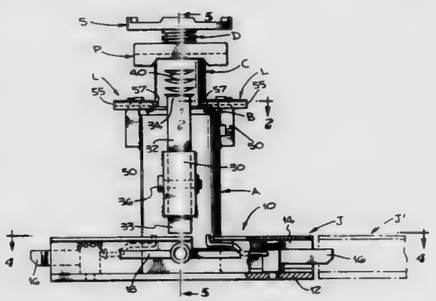
d) an actuator tube disposable through the hole in the nut for urging the valve away from the inclined plane and permitting water flow through the indentations of the valve and out the tube.

5,110,089

EXTENDIBLE JACK STAND

Clyde E. Slay, Santa Ana, Calif., assignor to Safe-T-Jack, Inc., Huntington Beach, Calif.

Filed Apr. 2, 1990, Ser. No. 503,297
Int. Cl.[5] B66F *5/04*
U.S. Cl. 254—8 B **11 Claims**



11. An extendible jack stand comprising:

(a) a horizontally disposed base;

(b) a first vertical frame fixedly attached to said base and extending upwardly therefrom;

(c) a second vertical frame positioned in telescoping relationship relative to said first frame and having thereon a vertical series of ratchet teeth;

(d) a third vertical frame positioned in telescoping relationship relative to said second frame and having thereon a vertical series of ratchet teeth;

(e) a load-bearing seat carried by the upper end of said thrid frame;

(f) a ratchet arm extending vertically upward along said first frame, being pivotally mounted at its mid-portion to said first frame and having a dog on its upper end which extends above said first frame;

(g) locking means operable for locking said second frame in fixed relation to said first frame while said third frame is being raised, or for locking said third frame in fully extended relation to said second frame while said second frame is being raised; and

(h) said dog of said ratchet arm being oriented inward toward the central axes of the three frames to selectively engage successive ratchet teeth, said ratchet teeth being arranged longitudinally, of whichever frame is then being raised for locking that frame in step-wise fashion.

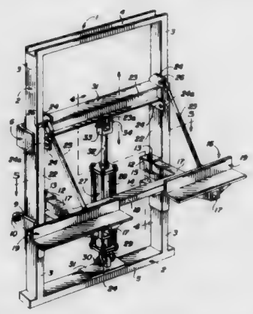
5,110,090

HYDRAULIC LIFTING DEVICE

William L. McDuffie, P.O. Box 201, Oak Ridge, La. 71264

Filed Feb. 25, 1991, Ser. No. 660,041
Int. Cl.[5] E21B *19/00*
U.S. Cl. 254—124 **3 Claims**

1. A lifting device for mounting on a vehicle and engaging and lifting an object, comprising a generally rectangularly-shaped support frame having the largest dimension located substantially in a vertical plane and stiffener means carried by said support frame in substantially horizontal relationship between the top and bottom of said support frame, said support frame adapted for attachment to the vehicle; a carriage characterized by a pair of carriage channels slidably disposed in said support frame in vertical orientation, at least one pair of sleeves carried by said carriage channels in spaced, transverse relationship and a carriage cross member connecting said carriage channels for maintaining said carriage channels in said support frame; a pair of lifting arms adapted for engaging said sleeves, respectively, in spaced, substantially horizontal relationship; a lifting arm spacer carried by said lifting arms in fixed relationship; a pair of spacer plates attached to said lifting arms, respectively, for engaging the object responsive to operation of the tractor; and a hydraulic cylinder having a bottom end attached to the bottom of said support frame and a piston carried by said cylinder in extensible and retractable relationship, said piston attached to said carriage-cross member for raising and lowering said carriage and said lifting arms, said lifting arm spacer, said spacer plates and the object in concert, responsive to operation of said hydraulic cylinder.

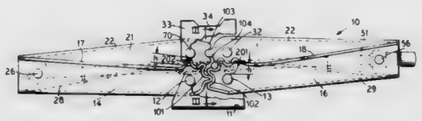


5,110,091

SCISSORS JACK WHICH HAS IMPROVED FORMED GEAR TEETH

Darryl L. Engel, LaOtto, and John R. Scoville, Butler, both of Ind., assignors to Universal Tool & Stamping Co., Butler, Ind.

Filed Jul. 29, 1991, Ser. No. 737,210
Int. Cl.[5] B66F *3/12*
U.S. Cl. 254—126 **6 Claims**



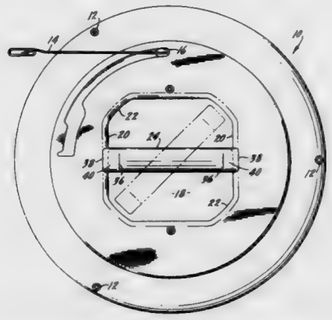
1. A scissors type jack comprising, a base, a pair of lower links which have first ends pivotally attached to said base, a support member, a pair of upper links which have first ends pivotally attached to said support member, a threaded collar with opposite ends pivotally attached to second ends of first ones of said pair of upper and lower links, a block member formed with a central opening and with opposite ends pivotally attached to second ends of second ones of said pair of upper and lower links, a threaded shaft which extends through said central opening of said block member and threadedly received in said threaded collar, flanges formed on said pair of lower links and meshing gear teeth formed on said first ends on said flanges, flanges formed on said pair of upper links and meshing gear teeth formed on said first ends on said flanges, and the flanges and meshing teeth of said lower links extending in a direction which is opposite to the direction of the flanges and teeth of said upper links.

5,110,092

COMBINATION PULLER AND FISH TAPE REEL

William E. Blaha, St. Charles, and Richard R. Hyde, DeKalb, both of Ill., assignors to Ideal Industries, Sycamore, Ill.

Continuation-in-part of Ser. No. 475,754, Feb. 6, 1990, abandoned. This application Sep. 24, 1990, Ser. No. 587,779
Int. Cl.[5] B65H *59/00*
U.S. Cl. 254—134.3 FT **6 Claims**



1. In a puller structure for gripping and pulling an elongated object, such as a fish tape or the like to aid in pulling the elongated object through a conduit and the like, a somewhat elongated body structure divided into opposed otherwise solid side formations separated by a longitudinal channel opening on a top surface of the body structure, the distance between the bottom of the channel and a bottom surface of the body structure being such that a hinge is provided between the two side formations, a reception cavity in the longitudinal channel for an elongated object, such as a fish tape to be gripped and pulled, the body being made primarily of a stiffly flexible plastic of sufficient flexibility to allow the hinge to be flexed and the side surfaces to approach each other closing the channel somewhat under compression on the outside of the puller structure by the human hand, the size and dimensioning being such that an elongated object may be easily inserted or withdrawn from the bottom of the reception cavity when the puller structure is in its free state, and a mounting formation on each end of the body structure enabling the puller structure to be releasably mounted in the central opening of an electrician's fish tape reel, the mounting formation of each end including a pair of laterally spaced longitudinally disposed projections defining a recessed flat between them, the flats on each end being separated from each other by a distance on the order of the distance between the opposed surfaces forming the inner openings in a fish tape reel.

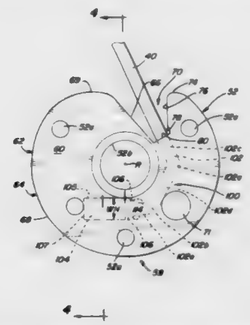
5,110,093

SHEAVE PLATE AND CABLE ASSEMBLY FOR A TIRE LIFT/CARRIER WINCH

Donald R. Rempinski, Grand Haven, and Donald R. Britt, Grand Rapids, both of Mich., assignors to Sparton Corporation, Jackson, Mich.

Continuation of Ser. No. 170,281, Mar. 18, 1988, abandoned. This application Dec. 20, 1989, Ser. No. 453,009
Int. Cl.[5] B66D *1/00*
U.S. Cl. 254—266 **40 Claims**

7. A sheave plate and cable assembly for a winch comprising (a) a sheave plate having spaced apart side faces defining a plate thickness and having an outer peripheral edge interconnecting the side faces and including an arcuate, cable-wrapping track thereon, and (b) a cable having a cable end extending into the sheave plate between the side faces and captured in the sheave plate by a portion of said sheave plate molded thereabout, the cable end having a thickness equal to or less than the plate thickness whereby the cable end does not protrude beyond the side faces of said sheave plate.

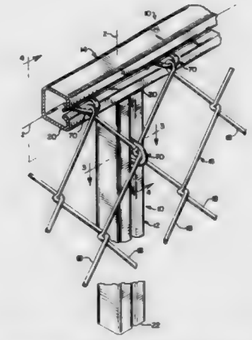


5,110,094

B-SHAPED STRUCTURAL MEMBER AND FASTENING SYSTEM

George D. Kruse, Dallas, Tex., assignor to PPA Industries, Inc., Dallas, Tex.

Filed Sep. 7, 1990, Ser. No. 578,954
Int. Cl.[5] E04B *1/38;* **E04H** *17/02, 17/14*
U.S. Cl. 256—47 **5 Claims**

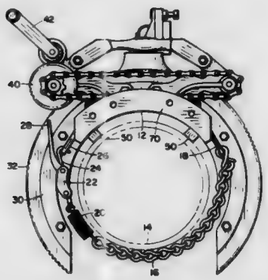


1. A fence fastening and support system including:

a generally horizontally disposed top rail including a linearly extending back-wall section extending substantially the entire length of said rail; a first sidewall section and a second sidewall section, each said sidewall section integrally formed with and extending from a respective side of said back-wall section, said sidewall sections being generally perpendicular to said back-wall section; a first front-wall section integrally formed with and extending generally perpendicular from said first sidewall section and spaced from said back-wall section; a second front-wall section integrally formed with and extending generally perpendicular from said second sidewall section and spaced from said back-wall section; a first inwardly turned flange section integrally formed with and extending from said first front-wall section; a second inwardly turned flange section integrally formed with and extending from said second front-wall section, each said flange being inclined toward and spaced from each other; and a linearly and generally horizontally extending slot defined intermediate said inwardly turned flanges, said flanges

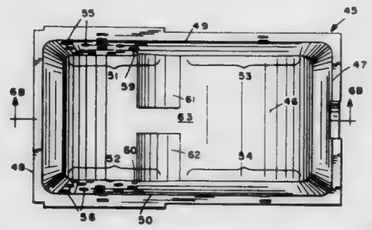
each providing an engagement surface to grippingly receive fastener means therebetween; a plurality of generally vertically disposed posts, each said post including a linearly extending back-wall section extending substantially the entire length of said post; a first sidewall section and a second sidewall section, each said sidewall section integrally formed with and extending from a respective side of said back-wall section, said sidewall sections being generally perpendicular to said back-wall section; a first front-wall section integrally formed with and extending generally perpendicular from said first sidewall section and spaced from said back-wall section; a second front-wall section integrally formed with and extending generally perpendicular from said second sidewall section and spaced from said back-wall section; a first inwardly turned flange section integrally formed with and extending from said first front-wall section; a second inwardly turned flange section integrally formed with and extending from said second front-wall section, each said flange being inclined toward and spaced from each other; and a linearly and generally vertically extending slot defined intermediate said inwardly turned flanges, said flanges each providing an engagement surface to grippingly receive fastener means therebetween; means for connecting said rail to said posts; and a plurality of fasteners adapted to be inserted at spaced intervals along the length of said vertical slot and of said horizontal slot, each said fastener adapted to secure a portion of fence fabric to said post or rail, each fastener defining a serrated surface on its exterior, said engagement surfaces interlocking with said serrated surfaces of each said fastener to lock each said fastener to said post or rail such that removal of each said fastener is highly resisted while insertion of each said fastener requires a relatively small insertion force.

5,110,095
SPACER BLOCKS FOR PIPE BEVELING AND/OR WELDING MACHINE
Patrick R. Dougal, Tulsa, Okla., assignor to H & M Pipe Beveling Machine Company, Inc., Tulsa, Okla.
Filed Jan. 17, 1991, Ser. No. 642,459
Int. Cl.[5] B23K *7/00*
U.S. Cl. 266—55 **7 Claims**



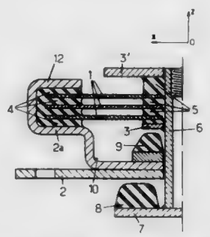
1. Spacers for supporting an arcuate saddleof a pipe beveling or welding machine in concentric relation, with respect to each of three specifically different sizes of pipe wherein a plurality of such spacers are connected to the saddle and are disposed radially between the saddle and one of the pipes, each spacer having a width, length and height corresponding exactly to the three incremental spaces which are to be provided between the saddle and the three specifically different sizes of pipe, respectively, in order to achieve concentricity, all of the spacers being connectible to the saddle in a first orientation where the width dimension of the spacers is disposed radially between the saddle and a first size of pipe, all of the spacers being connectible to the saddle in a second orientation where the length dimension of the spacers is disposed radially between the saddle and a second size of pipe, all of the spacers being connectible to the saddle in a third orientation where the height dimension of the spacers is disposed radially between the saddle and a third size of pipe.

5,110,096
ONE-PIECE TUNDISH LINING
Donald R. Zacharias, Parma Heights, Ohio, assignor to Foseco International Limited, Birmingham, England
Filed Feb. 15, 1991, Ser. No. 655,507
Int. Cl.[5] C21B *7/14*
U.S. Cl. 266—227 **23 Claims**



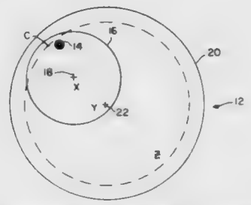
1. A discrete preformed expendable refractory lining for disposition in a metallurgical vessel, the discrete preformed lining being integrally-formed, prior to disposition in the vessel, in one-piece to have a floor portion, wall portions and at least one integrally-formed flow control device, the lining having a refractory composition throughout.

5,110,097
ELASTIC MOUNTING, PARTICULARLY FOR A VEHICLE ENGINE
Jean-Michel Simon, Clamart, France, assignor to Hutchinson S.A., France
Filed Sep. 13, 1990, Ser. No. 581,930
Claims priority, application France, Sep. 13, 1989, 89 11969
Int. Cl.[5] F16F *7/00*
U.S. Cl. 267—136 **9 Claims**



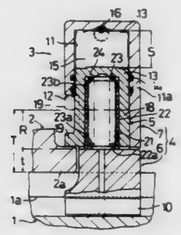
1. An elastic mounting apparatus for a vehicle engine comprising:
a first armature for fixing to a structure of a vehicle;
a second armature for fixing to and supporting an engine;
an elastic system located between said two armatures, said elastic system having relatively weak rigidity in a vertical direction z and having higher rigidities in two transverse directions x and y, said x, y and z directions comprising an orthonormal system, said elastic system comprising a set of thin parallel and spaced plates of flexible material extending substantially transversely to said vertical direction z, said plates being uninterrupted and comprising a composite material, each of said plates including two ends and first superposed blocks of elastic material intercalated as a sandwich between corresponding ends of said plates whereby said ends are fastened to one of said armatures, said first blocks flexibly fastening both ends of each of said plates to said one armature, said plates including middle parts and second superposed blocks of elastic material intercalated as a sandwich between said plates whereby said middle parts are fastened to the other of said armatures.

5,110,098
UNIVERSAL PLATEN HOLDDOWN APPARATUS
John-Michael Merjanian, Burlington, Mass., assignor to W. R. Grace & Co.-Conn., New York, N.Y.
Continuation of Ser. No. 397,355, Aug. 21, 1989, abandoned, which is a continuation of Ser. No. 250,029, Sep. 27, 1988, abandoned. This application Jul. 26, 1990, Ser. No. 559,441
Int. Cl.[5] B25B *11/00*
U.S. Cl. 269—21 **9 Claims**



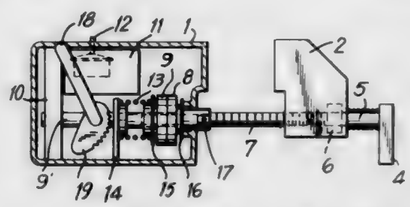
1. An apparatus for securely holding a workpiece on a table through the application of a vacuum source through the table, said apparatus comprising:
a first plate rotatable about its central axis;
a second plate mounted on said table and rotatable about its central axis, said second plate being larger than said first plate and entirely encircling said first plate which is mounted on said second plate;
means for applying a vacuum source to a workpiece through an opening in said first plate located at or near the outer perimeter of said first plate; wherein the rotation of said first and second plates about their central axes can be used to position said means for applying a vacuum at any point within a circumferential area on said second plate covering a majority of the total area of said second plate.

5,110,099
HYDRAULIC CLAMP WITH DIRECT OPERATED CLAMPING-MEMBER
Tsutomu Shirakawa, Kobe, Japan, assignor to Kabushiki Kaisha Kosmek, Hyogo, Japan
Filed May 21, 1991, Ser. No. 703,834
Claims priority, application Japan, Jun. 5, 1990, 2-147560
Int. Cl.[5] B23Q *3/08*
U.S. Cl. 269—25 **9 Claims**



1. A hydraulic clamp with a direct operated clamping member comprising:
a housing having a first end portion and a second end portion;
a cylinder bore formed in the first end portion of said housing extending towards said second end portion;
means for rigidly connecting said first and second end portions of said housing;
a piston slidably located within and in oil tight relationship with said cylinder bore and moveable between clamping and unclamping positions;
a clamping actuation oil chamber located within said cylinder bore between said first end portion of said housing and said piston;
a moveable clamping member secured to said piston for movement therewith and extending toward the second end portion of said housing, said clamping member including a clamping portion facing a clamping area;
a spring receiving bore formed in said clamping member and extending parallel to the direction of motion of said clamping member; and
an unclamping spring means located within said spring receiving bore for biasing said piston and clamping member in an unclamping direction;
said housing including an extension of the peripheral wall of said cylinder bore between said first and second end portions;
said clamping member comprising an extension of said piston and being slidably disposed in said extension of the peripheral wall of said bore, said extension of the peripheral wall of said cylinder bore including an opening facing said clamping area;
said clamping portion extending through said opening at least when in a clamping position.

5,110,100
ELECTRIC VISE
Lawrence M. Cotton, New Bern, N.C., assignor to Robert Bosch Power Tool Corporation, New Bern, N.C.
Filed Nov. 28, 1990, Ser. No. 619,308
Int. Cl.[5] B25B *1/10*
U.S. Cl. 269—244 **11 Claims**



1. A vise, comprising two jaws formed so that at least one of said jaws is movable relative to the other of said jaws; a rotary drive pivotally connected with at least said one movable jaw so as to move said one relative to said other jaw; and a one-way slip clutch having two clutch halves provided with ramp-like projections inclined in one circumferential direction, said clutch being located between said drive and said movable jaw so that a drive force is positively transmitted to said one jaw so as to positively move said one jaw away of said other jaw, and at the same time during movement of said one jaw toward said other jaw said clutch slips over so as to prevent excessive application of clamping force by said movable jaw on an object to be clamped.

5,110,101

APPARATUS FOR SUBDIVIDING A RUNNING WEB OF COHERENT PANELS IN ZIG-ZAG FORMATION

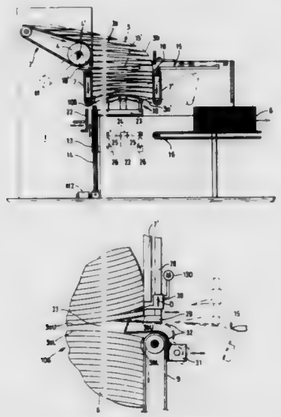
Oscar Roth, Waltenschwil, Switzerland, assignor to Involvo AG, Bünzen, Switzerland

Filed Apr. 18, 1991, Ser. No. 687,449

Claims priority, application Switzerland, Apr. 19, 1990, 1327/90

Int. Cl.[5] B41L *39/02*

U.S. Cl. 270—39 **12 Claims**



1. Apparatus for subdividing a continuous web of mutually inclined panels in zig-zag formation wherein neighboring panels are connected to each other along fold lines, comprising a substantially upright duct having an inlet and including spaced-apart first and second sidewalls and a bottom wall; means for advancing the web longitudinally toward and into said duct by way of said inlet so that the duct accumulates a growing pile of overlapping panels with the foremost panel of the pile resting on said bottom wall and the fold lines between successive panels alternatingly adjacent said first and second sidewalls; means for repeatedly severing the web along spaced-apart predetermined fold lines which are located at a predetermined level above said bottom wall to separate from the pile a succession of stacks of coherent overlapping panels, including a substantially flat severing tool disposed at said level and having a leader, and means for reciprocating said tool between a retracted position outwardly adjacent said first sidewall and an extended position in which the leader is outwardly adjacent said second sidewall whereby the leader severs the web along a predetermined fold line which is adjacent said second sidewall; means for spreading apart two superimposed fold lines which are adjacent said first sidewall, one of which is located above and the other of which is located below said level so as to provide a clearance for penetration of said leader between the spread-apart superimposed fold lines and toward severing engagement with the web along the predetermined fold line at said level, said spreading means being movable between an inoperative position outwardly adjacent said first sidewall and an operative position between said sidewalls and comprising a first spreading element which engages from below the upper fold line and a second spreading element which engages from above the lower fold line of the superimposed fold lines at said level during movement of said spreading means to said operative position; means for moving said spreading means to operative position prior to advancement of said leader beyond said first sidewall toward said second sidewall; and means for clamping at least two panels above the upper fold line against said first spreading element in the operative position of said spreading means.

5,110,102

ARTICLE PRESSING DEVICE AND SORTER WITH THE SAME

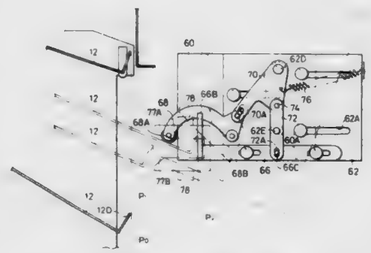
Akihiro Suzuki, Ibaraki; Hiroshi Yamamoto, Mito, and Hiroshi Tobita, Ohmiya, all of Japan, assignors to Ikegami Tsushinki Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1991, Ser. No. 661,329

Claims priority, application Japan, Jul. 10, 1990, 2-180501; Jul. 10, 1990, 1-180505

Int. Cl.[5] B42B *1/02*

U.S. Cl. 270—53 **11 Claims**



1. An article pressing device which comprises:

a base arranged in the vicinity of an operation position to which a receptacle carrying articles to be treated is transported in a receptacle transporting direction;

a first moving member arranged on said base for reciprocal movement in the receptacle transporting direction;

a second moving member arranged on said first moving member for reciprocal movement in said receptacle transporting direction, the second moving member being adapted to contact the receptacle transported to the operation position;

first biasing means for biasing the first moving member in a direction opposite to the receptacle transporting direction;

second biasing means for biasing the second moving member in a direction opposite to the receptacle transporting direction by a biasing force smaller than a biasing force of the first biasing means;

pressing arm rotatably mounted on the first moving member for movement toward and away from the articles to be treated on each receptacle at the operation position; and

link means, arranged between said pressing arm and said second moving member, for moving the pressing arm when the first and second moving members are relatively moved.

5,110,103

IMAGE FORMING APPARATUS WITH IMPROVED DOCUMENT FEEDER

Jun Miyoshi, Higashiosaka, and Hiroyuki Nagai, Toyonaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 11, 1989, Ser. No. 378,124

Claims priority, application Japan, Jul. 12, 1988, 63-92348; Jul. 12, 1988, 63-172955; Jul. 12, 1988, 63-172956; Nov. 25, 1988, 63-299213; Nov. 25, 1988, 63-299214; Nov. 30, 1988, 63-302651

Int. Cl.[5] B65H *5/22*

U.S. Cl. 271—3 **19 Claims**

1. An image forming apparatus provided with an automatic original feeder for conveying an original, comprising,

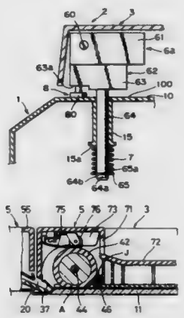
a main body,

a transparent platen for supporting an original on the main body,

a frame which is movably to a position where it covers an original which is on the transparent platen,

an original conveying means on said frame for moving an original which is on the transparent platen,

at least one supporting member attached movably up and down to the main body of the image forming apparatus, said supporting member rotatably supporting said frame, and,



urging means for elastically moving said supporting member downward, said frame having an original cover plate opposable to the transparent platen, said original conveying means and the original cover plate having a clearance therebetween which is covered with at least one clearance covering member having almost the same color tone as those of the original conveying means and the original cover plate, said clearance covering member comprising a body which includes a plurality of fine flexible elements extending across the clearance.

5,110,104

SHEET TRANSPORTING DEVICE WITH CARRIAGE UNIT

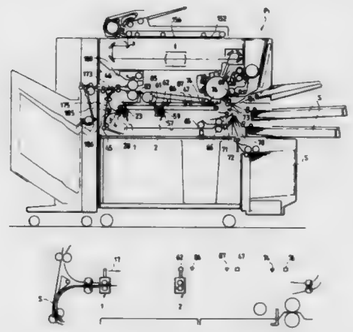
Naho Wakao, Machida; Masakazu Hiroi, Yokohama; Makoto Kitahara, and Yuji Takahashi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1990, Ser. No. 524,928

Claims priority, application Japan, May 19, 1989, 1-126507; May 19, 1989, 1-126508; May 19, 1989, 1-126510; May 19, 1989, 1-126511

Int. Cl.[5] B65H *5/22*

U.S. Cl. 271—3.1 **16 Claims**



5. An image forming apparatus provided with a sheet transporting device, comprising:

sheet storage means provided in the middle of a sheet transport path for storing sheets thereon;

a carriage unit comprising sheet discharge means for transporting a sheet to said sheet storage means and capable of reciprocating motion substantially above said sheet storage means;

a first path for guiding the sheet from said sheet storage means to a sheet re-feeding path at a downstream side in the sheet feeding direction of said carriage unit;

a second path for guiding the sheet to said sheet re-feeding path without passing through said sheet storage means; and

control means for selecting a mounting mode for controlling said carriage unit to feed out the sheet to said sheet storage means or a passage mode for controlling said carriage unit to feed out the sheet to said second path.

5,110,105

SHEET HANDLING APPARATUS

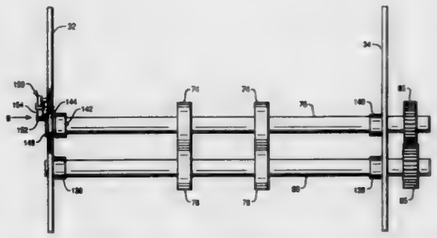
Kenneth A. Nicoll, and Adam J. L. Johnston, both of Dundee, Scotland, assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 25, 1991, Ser. No. 659,770

Claims priority, application United Kingdom, Aug. 17, 1990, 9018078

Int. Cl.[5] B65H *5/22*

U.S. Cl. 271—5 **3 Claims**



1. Sheet handling apparatus for removing sheet one by one from a stack of sheets held in a container and for feeding said sheets toward an output station, comprising:

sheet engaging means arranged to withdraw part of an end sheet from said stack away from the remainder of said stack to position said part for further comprising;

transport means including first and second shafts, first and second roll means mounted on said first and second shafts and arranged to grip therebetween the end sheet from said stack of sheets positioned by said sheet engaging means for the purpose of removing said sheet from said container, an electric motor for driving said roll means, and switch means operatively associated with one end of said first shaft and deenergizing said motor when operated, said first shaft being mounted so that said one end is movable spatially relative to said second shaft, whereby movement of said one end away from said second shaft by more than a predetermined amount brings about operation of said switch means; and

a supporting framework having a wall with a rectangular aperture therein, and a movable bearing slidably mounted for vertical movement in said aperture and having an end portion corresponding to said one end of said first shaft mounted therein;

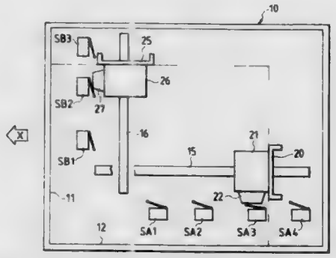
the sheet handling apparatus also including a fixed bearing secured to the supporting framework and receiving a portion of said first shaft spaced from said end portion of said first shaft, said first shaft being pivotable about said fixed bearing.

5,110,106

SHEET SIZE DETECTOR FOR SHEET CONTAINER

Takuo Matsumura, and Yutaka Nogami, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 10 1990, Ser. No. 595,215
Int. Cl.[5] B65H *3/44*
U.S. Cl. 271—9 **10 Claims**



1. An image recording apparatus, comprising:

a plurality of containers for storing sheets to be fed therefrom, the sheets stored in the containers of a given recording apparatus being in one of a plurality of sheet size groups,

a plurality of sheet guides in each of said containers for biasing sheets toward a predetermined location, the positions of said sheet guides corresponding to the sheet size in each of said containers, respectively;

means for determining positions of said sheet guides and outputting position data corresponding to size range increments including the size of sheets disposed in each of said plurality of containers;

memory means for storing sheet size data for a plurality of sheet size groups including at least a first sheet size group and a second sheet size group, at least said first and second sheet size groups including sheet sizes within a single size range increment;

first means for comparing outputted position data from any one of said containers with sheet size data stored in said memory means to determine if sheets in a selected one of said containers are included in either of said first group or said second group or are included in said single size range increment common to said first and second groups;

second means for comparing position data of another container in said given recording apparatus with sheet size data stored in said memory means to determine if sheets in said other container are included in either of said first or second groups and excluded from said single size range increment when said outputted position data from said one container corresponds to a sheet size included in said single size range increment; and

means for determining the sheet size of sheets in said one container based upon outputted position data from said sheet guide position determining means and the size group of sheets stored in said given recording apparatus as determined by said first means or said second means.

5,110,107

SHEET MATERIAL FEEDER

Thomas E. Bieber, Coplay, Pa., assignor to Bell & Howell Phillipsburg Co., Allentown, Pa.

Continuation of Ser. No. 524,563, May 17, 1990. This application Apr. 3, 1991, Ser. No. 680,081
Int. Cl.[5] B65H *3/04*
U.S. Cl. 271—35 **23 Claims**

1. A sheet material feeder for seriatim feeding of lowermost sheets from a sheet stack, said sheet material feeder comprising:

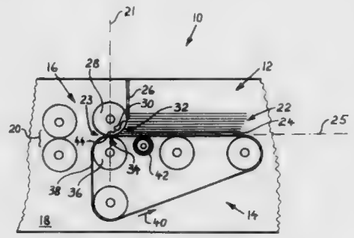
a sheet hopper for holding a stack of sheets, said sheet hopper having a singulating exit region, and means for urging sheets toward said singulating exit region;

a sheet feeding plane in which said lowermost sheet of the sheet stack is substantially disposed while being fed from the sheet stack in said sheet hopper;

a singulating plane through said singulating exit region and oriented substantially orthogonally to the direction in which said lowermost sheet is fed from the sheet stack;

means for feeding said lowermost sheets from said sheet hopper through said singulating plane;

at least one restraining set including first and second means for restraining mutually cooperatively all but the lowermost sheet of the sheet stack from feeding through said singulating plane, said first means for restraining including a restrainer having a stationary guide member, said guide member including an urging surface having an urging edge region on one side thereof, said urging surface including a first and a second portion, said first portion generally facing toward leading edges of lower sheets in the sheet stack, said second means for restraining including a support member and a resilient member supported thereon, said support member including a support surface



having a supporting edge region on one side thereof, said support surface supporting said resilient member, said resilient member having an outer and an inner surface and a thickness therebetween, said inner surface including a contact surface region substantially contacting said support surface, said resilient member including a lateral overhang extending laterally beyond said supporting edge region, wherein said second portion of said urging surface faces said outer surface in the region of said lateral overhang;

a first plane substantially parallel to said sheet feeding plane and tangent to said urging surface at least in said urging edge region in the region of said singulating plane; and

a second plane parallel to said first plane and tangent to said support surface at least in said supporting edge region in the region of said singulating plane;

wherein said first and second planes are spaced apart by a distance that is less than the sum of said thickness of said resilient member plus the smallest thickness of sheet material operatively handled by said sheet material feeder, and wherein said lowermost sheets are fed through said singulating plane between said urging edge region and said outer surface.

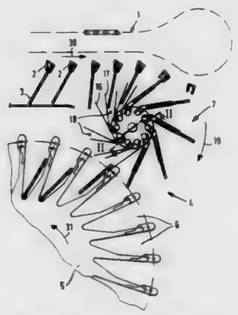
5,110,108

SHEET TRANSPORTING APPARATUS

Hans Müller, Zofingen, Switzerland, assignor to GRAPHA-Holding AG, Hergiswil, Switzerland

Filed Dec. 28, 1989, Ser. No. 458,078
Claims priority, application Switzerland, Feb. 3, 1989, 389/89
Int. Cl.[5] B65H *29/68*
U.S. Cl. 271—69 **16 Claims**

1. Apparatus for manipulating sheets, particularly printed sheets, comprising a first conveyor having a plurality of discrete neighboring means for individually advancing the sheets of a series of sheets in a first direction at a predetermined frequency along a first path; a second conveyor having a plurality of discrete neighboring means for advancing the sheets of said series of sheets in a second direction at said frequency along a second path, the neighboring advancing means of said first conveyor being spaced apart from each other a first distance and the neighboring advancing means of said second conveyor being spaced apart from each other a second distance; and a third conveyor having means for transferring successive sheets of said series from the discrete advancing means of said first conveyor to the discrete advancing means of said second conveyor, said transferring means comprising a carrier rotatable about a first axis, a plurality of discrete neighboring sheet clamping units mounted on said carrier for orbital movement about said axis in response to rotation of said carrier, each of said units comprising a pair of clamping members defining a sheet receiving pocket, at least one clamping member of each pair being pivotable relative to the other clamping member of the respective pair about a discrete second axis which is at least substantially parallel to said first axis, and means for pivoting the at least one clamping member of each of said units relative to the other clamping member of the respective unit during at least one predetermined portion of each revolution of said carrier about said first axis to thereby vary the spacing of said units during said orbital movement so that said spacing corresponds to said first distance during reception of sheets from said first conveyor and that said spacing corresponds to said second distance during transfer of sheets to said second conveyor.



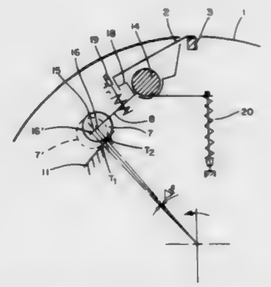
5,110,109

ADJUSTABLE GRIPPER DEVICE FOR SHEET-FED ROTARY PRESSES

Christoph Stanco, Offenbach am Main; Heinrich Ochs, Sinntal, and Kurt Difflipp, Dietzenbach, all of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed Apr. 26, 1991, Ser. No. 692,286
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1990, 4013261
Int. Cl.[5] B65H *29/06*
U.S. Cl. 271—82 **3 Claims**

1. An adjustable gripper device for use in a sheet-guiding cylinder having two gripper rows located diametrically opposite one another on the periphery of the cylinder which is rotatable relative to a stationary cam defining a predetermined camming pattern, each of said gripper rows including a cam driven gripper shaft for holding gripper fingers rockably mounted on the cylinder, a cam follower lever having one end rigidly connected to the gripper shaft, a cam follower roller rotatably attached to the other end of the cam follower lever, means for maintaining contact between the cam follower roller and the stationary cam so that the camming pattern can be transmitted to the fingers, and said adjustable gripper device comprising means for adjusting the center line of the cam follower roller on at least one side of the cylinder relative to the axis of the gripper shaft so that the peripheral position of the one cam follower roller relative to the other cam follower



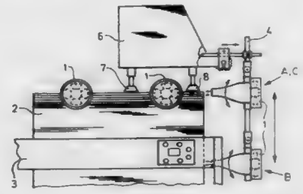
roller on the opposite side of the cylinder is at a work and turn angle γ of exactly 180°.

5,110,110

LOOSENING BLOWERS FOR SHEET FEEDERS OF SHEET-FED ROTARY PRINTING PRESSES

Arno Wirz, Bammental, and Dieter Bergmeier, Heidelberg, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Oct. 6, 1989, Ser. No. 418,396
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1988, 3834400
Int. Cl.[5] B65H *3/14*
U.S. Cl. 271—98 **8 Claims**



1. In a sheet feeder of a sheet-fed rotary printing press, loosening blowers having controllable blowing power and being disposed so as to be adjustable in height on a frame of the sheet feeder behind and at the sides of a pile of sheets, comprising a plurality of fans respectively having means individually adjustable for directing an air flow of varying blowing power against a side face of the pile of sheets at a varying angle to the side face.

5,110,111

APPARATUS INCLUDING A U-SHAPED BIN HAVING A BAR GRID NETWORK FOR UNIFORMLY STACKING CUT SHEETS OF PRINTED MEDIA

Ronald S. Gompertz, and Victor Escobedo, both of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 28, 1990, Ser. No. 486,332
Int. Cl.[5] B65H *29/00*
U.S. Cl. 271—186 **9 Claims**

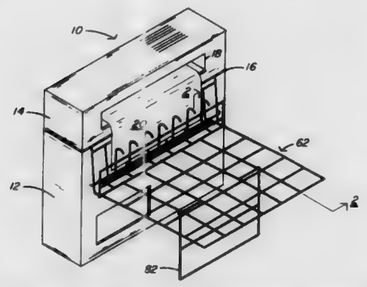
1. Sheet receiving and stacking apparatus for accumulating cut sheets fed from the output of a sheet feeding apparatus which comprises:

a. a generally U-shaped sheet receiving bin connected to receive sheets fed from an adjacent sheet feeding mechanism,

b. an output tray connected to said bin for accumulating and

stacking sheets passing over one surface of said bin and moving away from said sheet feeding mechanism, and

c. said bin having a first upstanding member positioned adjacent to said sheet feeding mechanism and a second upstanding member positioned away from said first upstanding member and a floor member extending between said first and second upstanding members and adjacent to



said output tray, said second upstanding member being defined in part by a bar grid network including a plurality of hook-shaped rib members which partially define the generally U-shaped contour of said bin, said rib members having aligned convex upwardly facing surfaces operative to come into direct contact with a stack of cut sheets moving away from said bin.

5,110,112

DEVICE FOR CATCHING A TRAILING EDGE OF A SHEET FOR A SHEET DELIVERY

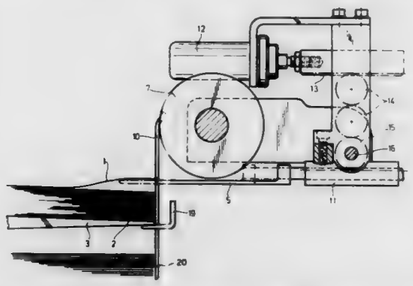
Manfred Henn, Heidelberg, and Carsten Kelm, Mannheim, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Nov. 15, 1990, Ser. No. 613,383

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1989, 3937945

Int. Cl.[5] B65H *31/32*

U.S. Cl. 271—189 **4 Claims**



1. In a sheet delivery of a sheet-fed rotary printing machine having a non-stop auxiliary piling device including an auxiliary pile support having a length at least equal to the length of the sheets being delivered, a device for collecting a trailing edge of the sheets, comprising a plurality of collecting fingers having a length which is a minor fraction of the length of the auxiliary pile support and being all disposed at an even level above the auxiliary pile support at distances mutually spaced from one another, motorized drive means for moving said collecting fingers forwards and backwards, parallel to sheet travel, in a guide channel, a suction roller in operative proximity with said collecting fingers, and sheet pile stops for the trailing edges of the sheets, said sheet pile stops extending upwardly beyond the level of said sheet pile to said suction roller, said collecting fingers being disposed beneath said suction roller and between said pile stops, said motorized drive means comprising a common drive member with mechanical transmission members coupled with said collecting fingers.

5,110,113

DEVICE FOR CONTROLLING SHEET POSITIONING ON AN INTERMEDIATE TRAY

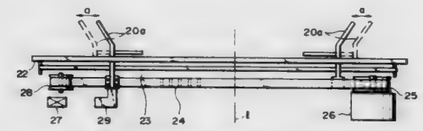
Koichi Kanaya, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 1, 1990, Ser. No. 561,609

Claims priority, application Japan, Aug. 1, 1990, 1-197940

Int. Cl.[5] B65H *9/12*

U.S. Cl. 271—241 **6 Claims**



1. A device for controlling positioning of a sheet carrying an image on one side thereof in a predetermined position on an intermediate tray of a copier which is operable in a two-sided copy mode, said device comprising:

sheet position regulating means movably provided on the intermediate tray for positioning the sheet, which has been transported to and stacked on the intermediate tray and will be refed, in the predetermined position;

drive means for moving and stopping said sheet position regulating means at a desired position;

control means for controlling said sheet position regulating means and said drive means such that an amount of displacement of said sheet position regulating means driven by said drive means is set in response to a given command which is entered on an operation board of the copier; and

an adjustment means for adjusting the amount of displacement of said sheet position regulating means set by said control means in response to said given command entered on said operation board.

5,110,114

METHOD AND APPARATUS FOR MULTIPLE SHEET DETECTION

Makoto Yamauchi; Yoshiaki Kurata, and Tadashi Ichinose, all of Ibaraki, Japan, assignors to Komori Corporation, Tokyo, Japan

Filed Mar. 6, 1991, Ser. No. 665,600

Claims priority, application Japan, Mar. 8, 1990, 54992

Int. Cl.[5] B65H *7/12*

U.S. Cl. 271—262 **9 Claims**

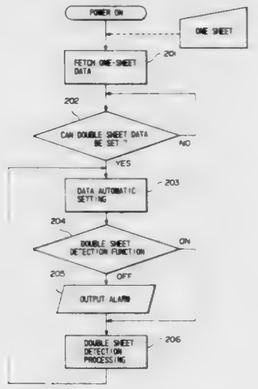
1. A method of multiple sheet detection for performing ON/OFF control of a multiple sheet detection means for detecting the presence of multiple sheets on the basis of a use/non-use state set by a setting means, said use/non-use state indicating whether said multiple sheet detections means is in operation or not, said method comprising:

the step of fetching sheet data from one sheet fed for the first time;

the step of determining on the basis of the fetched sheet data whether multiple sheet feeding of the sheets can be discriminated by the multiple sheet detection means;

the step of checking the use/non-use state of said multiple sheet detection means by said setting means when multiple sheet feeding can be discriminated by the multiple sheet detection means; and

the step of generating an alarm on the basis of a check result of the checking step, wherein the step of generating the alarm comprises the step of immediately generating the



alarm when the check result represents a non-use state of said multiple sheet detection means.

5,110,115

DOCUMENT TRANSPORT AND DETECTION APPARATUS

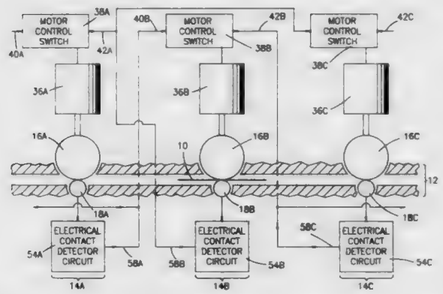
John Couper, Mid Calder, Scotland, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Mar. 16, 1990, Ser. No. 495,594

Claims priority, application United Kingdom, Apr. 5, 1989, 8907756

Int. Cl.[5] B65H *7/02*

U.S. Cl. 271—265 **3 Claims**



1. An apparatus for transporting a document along a track, said apparatus comprising:

a drive set, said drive set comprising a driven member for urging a document along the track;

an idler member, opposed to said driven member, said driven member and said idler member being cooperative to engage a document there-between;

said drive set selectably operable to energize a motor to apply drive to said driven member;

said drive set selectably operable to cut power to said motor to remove drive from said driven member;

a first detector for detecting a document on the track about to reach said drive set, said drive set being responsive to said first detector detecting a document to energize said motor to apply drive to said driven member;

detection means responsive to a change in electrical impedance between said driven member and said idler member to indicate the presence of a document between said driven member and said idler member; and

a second detector for detecting a document on the track having left said drive set, said drive set being responsive to said second detector detecting a document to cut power to said motor to remove drive from said driven member.

5,110,116

APPARATUS TO REMOVE FOLDED PRODUCTS, PARTICULARLY FOLDED NEWSPAPER PRODUCTS OR NEWSPAPER SECTIONS, FROM A CARRIER STRUCTURE, AND METHOD OF SUCH REMOVAL

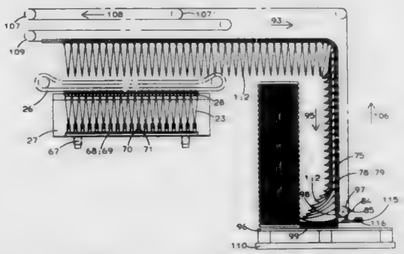
Ingo Kobler, Anhausen, and Godber Petersen, Augsburg, both of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed May 4, 1990, Ser. No. 519,119

Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915228

Int. Cl.[5] B65H *5/02*

U.S. Cl. 271—277 **21 Claims**



1. The combination of individual folded products (**1**, **2**), wherein the folded products define a back or fold line (**5**, **6**) and two sheet portions (**1***a*, **1***b*; **2***a*, **2***b*) joined at said back or fold line, said folded products being interdigited with the fold lines of successively alternate products facing in opposite first and second directions, whereby the fold line of any product will be between sheet portions of adjacent products at either side of said product having the respective fold line with

apparatus to remove the individual interdigited folded products, particularly folded interdigited newspaper products, from a carrier structure (**23**) where the products are retained next to each other, and for stacking the products in an interdigited vertical stack, wherein said apparatus comprises

transport means (**75**) located adjacent said carrier structure (**23**);

gripper means (**84**, **85**) secured to the transport means and engageable about the fold lines facing in a first direction which is directed toward the gripper means, said fold lines defining first fold lines,

said gripper means being further engageable against an adjacent part of the sheet portions joined at said first fold lines, to grip said first respective fold lines and adjacent partial sheet portions of the respective products;

said gripper means being further engageable with the sheet portions of alternate products positioned adjacent the partially gripped portions;

means (**33**, **34**; **61**, **74**) for relatively moving said carrier structure and said transport means in a removal direction, which removes the gripped products, retained on the gripper means of the transport means, from the carrier structure (**23**);

means (**78**, **79**) for guiding the transport means (**75**) in a vertical path (**95**);

means (**96**, **101**, **101'**) for orienting the products in a horizontal direction to form an interdigited vertical stack of said individual products; and

control means (**88**) operatively engageable with said gripper

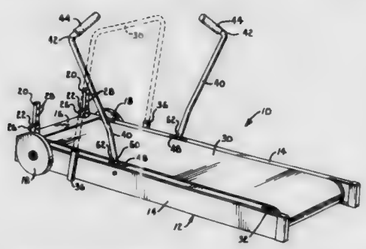
means (84, 85) for releasing the printed products from the gripper means as said products form said interdigited vertical stack.

5,110,117

TREADMILL WITH PIVOTING HANDLES

Milton W. Fisher, Lexington, Mo., and Glen E. Henson, 8793 Blue Ridge Blvd., Kansas City, Mo. 64138, assignors to Glen Henson, Kansas City, Mo.

Filed Feb. 27, 1990, Ser. No. 485,620
Int. Cl.[5] A63B *23/66*
U.S. Cl. 482—54 **13 Claims**



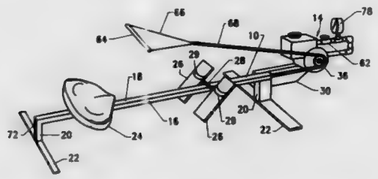
1. A treadmill comprising:
a rigid frame having opposite sides;
a treadmill surface on the frame providing a movable walking surface for a user of the treadmill;
a pair of elongated bars;
means for mounting said bars on the opposite sides of the frame in generally upright positions and in a manner allowing each bar to be reciprocated pivotally about a generally horizontal pivot axis;
a rod mounted on each side of the frame for axial sliding movement and coupled with the bar on said side in a manner to slide in opposite axial directions when the bar is pivoted from the neutral position in opposite pivotal directions;
a pair of springs on said rod each arranged to be deformed when the rod is moved axially in opposite directions, said springs resisting deformation to urge said rod to slide in a direction to return the bar to the neutral position thereof; and
a handle on each bar located to be grasped by a user standing on said treadmill surface to permit the user to reciprocate each bar in opposite directions about the pivot axis thereof.

5,110,118

RESISTANCE MECHANISM FOR EXERCISE EQUIPMENT

Timothy Winey, 2514 Fair Oaks Blvd. #200, Sacramento, Calif. 95825

Filed Jun. 18, 1990, Ser. No. 539,350
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—73 **7 Claims**



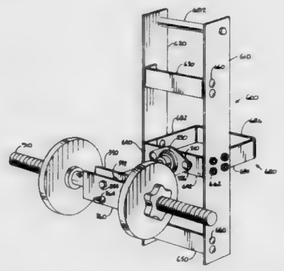
1. A resistance mechanism for exercising equipment comprising:
an elongated frame structure having a first end and a second end;
a positive displacement fluid pump mounted at the first end of the frame structure, the pump having a rotor shaft a fluid passage from the reservoir to the inlet of the pumping chamber, a fluid passage from the outlet of the pumping chamber to the reservoir and indicator means for gauging the level of resistance of the resistance mechanism;
actuator means for actuating the pump and forcing fluid through the fluid passage from the pumping chamber to the reservoir, said actuator means including a manual input means for an exerciser to exert a dynamic input force on the actuator means displacing the actuator means to operate the pump; and,
regulating means for regulating the flow of fluid through the fluid passage from the pumping chamber to the reservoir, wherein the resistance mechanism is constructed and arranged to increase the level of resistance to a physical input according to the rate of displacement of the actuator means, wherein the frame structure includes a horizontal central member with a seat positioned thereon facing the pump and displaceable in part between the first end and the second end of the frame structure, wherein the pump rotor shaft includes a sprocket and the actuator means comprises a hand grip tow bar connected to an elongated chain that engages the sprocket, the chain being wrapped around the sprocket at the first end of the frame structure and connected to an elongated tension spring anchored at the second end of the frame structure.

5,110,119

EXERCISE DEVICES

Gene W. Arnold, P.O. Box 128, Greenwood, Mo. 64034

Division of Ser. No. 580,168, Sep. 10, 1990. This application Apr. 1, 1991, Ser. No. 678,227
Int. Cl.[5] A63B *21/06*
U.S. Cl. 482—93 **9 Claims**



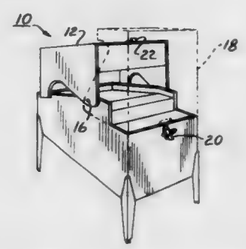
1. An exercise device comprising:
support means for a lower arm of a user comprising:
first and second spaced-apart struts;
at least one rest plate extending between said struts for supporting a portion of the lower arm thereon;
a handle for grasping by the user at one end of said struts;
means for connecting said handle to said support means;
clamping means for releasably receiving a weight therein comprising:
an elongated bolt having a first end and a second free end;
a lower clamping plate attached at said second free end of said bolt;
an upper clamping plate attached at said second free end of said bolt and displaceable from said first plate;
means for connecting said lower clamping plate to said upper clamping plate with a portion of the weight being fixable therebetween;
means for associating said clamping means with said support means in movement therewith, said associating means including structure for joining said first end of said bolt to said support means with said elongated bolt extending said clamping plates away from said support means, the weight resisting movement of the device by the user.

5,110,120

BACK BOX LATCH FOR PINBALL GAMES

Walter Smolucha, Chicago, Ill., assignor to Williams Electronics Games, Inc., Chicago, Ill.

Filed Jun. 10, 1991, Ser. No. 712,730
Int. Cl.[5] A63D *3/02;* **A47B** *88/00*
U.S. Cl. 273—121 R **4 Claims**



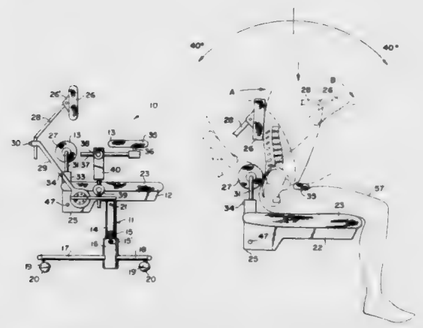
1. A playfield cabinet with a latch mechanism for securing a back box to the playfield cabinet comprising:
a) a playfield cabinet;
b) a back box hingedly secured to said cabinet for movement between horizontal and vertical positions;
c) a locking tab secured to one of said back box and said playfield cabinet;
d) a latch body secured to the other of said back box and said playfield cabinet, said body including:
i) a secondary tab attached to said body;
ii) linkage means for engaging:
(a) said locking tab to secure said back box in a vertical position;
(b) said secondary tab serving to protect said linkage means from damage when said back box is not secured in the vertical position.

5,110,121

EXERCISE CHAIR FOR THE LOWER BACK

Daniel N. Foster, 135 Cricket Ave., Ardmore, Pa. 19003

Filed Sep. 28, 1990, Ser. No. 589,420
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—137 **23 Claims**



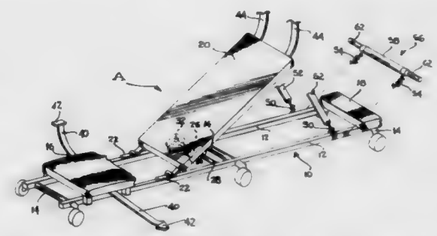
1. A chair for general use and for exercising the lower back comprising a base adapted to be disposed firmly on a floor and having a front thighsupporting portion and a rear portion, back positioning means movably mounted to said base, and a first and second spaced, substantially rigid pelvic restraint means adjustably mounted to said base for engaging the pelvis at the posterior and anterior thereof respectively to inhibit rotational movement of the pelvis of the user during an exercise movement, and selective resistance means mounted between said back positioning means and said base to bias during and exercise movement said back positioning means against rearward movement of said back body positioning means in response to user force applied by the back of the user, said first pelvic restraint means including a lumbar support means positioned against the posterior pelvis of a user.

5,110,122

EXERCISING APPARATUS AND METHOD

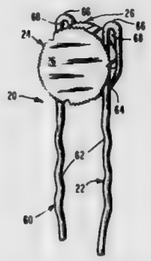
Christopher Moore, and John C. Phillips, Jr., both of Pacoima, Calif., assignors to Czeu Gathright, Los Angeles, Calif., a part interest

Filed Sep. 14, 1990, Ser. No. 581,979
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—134 **18 Claims**



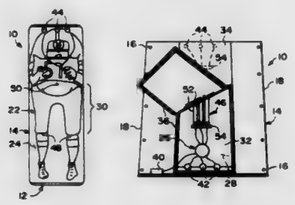
1. An exercising apparatus which is light in weight and portable and which enables a large number of exercises to be performed thereon, said exercising apparatus comprising:
a) a frame comprised of a pair of spaced apart frame bars lying in substantially the same horizontal plane;
b) a seat supporting section on said frame in proximity to an end thereof for supporting the buttocks of a user;
c) a back supporting section on said frame adjacent said seat supporting section and capable of lying in substantially the same horizontal plane as the seat supporting section;
d) a head supporting section on said frame adjacent said back supporting section and also lying in substantially the same horizontal plane as the seat supporting section;
e) bi-directional resistance means which has no positive driving force to permit a raising of the back supporting section out of the same horizontal plane so that it can assume a somewhat vertical orientation for providing certain support to the lower back in the performance of certain exercises, said bi-directional resistance means also enabling the back supporting section to be re-positioned in the same horizontal plane as the seat supporting section and head supporting section to enable a user to perform other exercises when in a prone position,
f) means associated with said bi-directional resistance means to provide a resistive force against said back supporting section which operates in opposition to a pushing force applied to an opposite side of the back supporting section by a user leaning against the back supporting section and which pushing force tends to push the back supporting section into the same horizontal plane as the seat supporting section, said bi-directional resistance means also providing a resistive force operating against and in opposition to a pulling force applied to the back supporting section when a user attempts to pull the back supporting section out of the plane of the seat supporting section, and
g) means for removably coupling the back of the user to the back supporting section to cause the back supporting section to move only with the back of the user.

5,110,123
COMBINED DIVOT REPAIRER AND BALL MARKER/SPOTTER
George G. Larson, 11916 W. Washington Blvd., Los Angeles, Calif. 90066
Filed Jun. 24, 1991, Ser. No. 720,013
Int. Cl.[5] A63B *57/00*
U.S. Cl. 273—32 A **10 Claims**



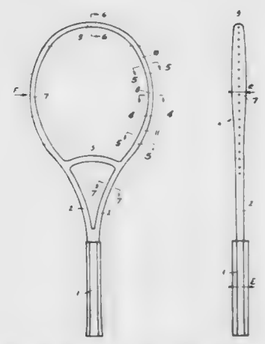
2. A golf tool combination comprising
a divot repairer and a pair of ball markers, each of which includes integral
means for enabling said markers to be joined together as an independent unit, to be separated from one another and to be rejoined as an independent unit, and for defining a space therebetween, and
said divot repairer being releasably held by said markers in the space therebetween, thereby enabling said divot repairer to be alternately separated from and held by said markers.

5,110,124
BLANKET FOR PEEWEE FOOTBALL BLOCKING AND TACKLING DUMMY
James Micco, 2 Hanson Pl., Huntington, N.Y. 11743
Filed May 31, 1991, Ser. No. 710,746
Int. Cl.[5] A63B *67/00*
U.S. Cl. 273—55 A **4 Claims**



1. A peewee blanket assembly for a football blocking and tackling dummy comprising:
a) a substantially rectangular blanket member having front and rear surfaces and a plurality of spaced apart eyelets along the long side edges thereof;
b) a lacing cord, which passes through the eyelets and extends between the eyelets on opposite said long side edges so that said blanket member can be wrapped around an existing tackling dummy;
c) a full length standing picture of a football player indicia in the middle on said front surface of said blanket member; and
d) means attached to and centrally of said rear surface of said blanket member, for indicating the magnitude of force applied to said blanket when a user tackles said blanket member when on a blocking and tackling dummy and to indicate when said dummy is properly tackled
i) said means attached to and centrally of said rear surface comprising, a piece of flat foam rubber padding
ii) a panel sized to fit over said piece of; and
iii) hook and loop fabric fastener strips permanently secured to said blanket member and said panel to removably attach said panel over said piece of flat foam rubber padding.

5,110,125
SPORT RACKET
Annie Blanc, Villeurbanne, France, assignor to Skis Rossignol S. A., Voiron, France
Continuation of Ser. No. 341,875, Apr. 24, 1989, abandoned. This application Feb. 20, 1991, Ser. No. 658,440
Claims priority, application France, Apr. 26, 1988, 88 06066
Int. Cl.[5] A63B *49/02*
U.S. Cl. 273—73 C **7 Claims**

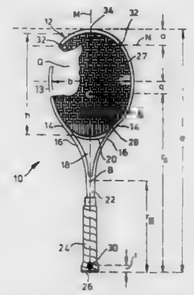


1. A sport racket made of composite material having as a base a fibrous reinforcement and a matrix composed of organic material, said racket comprising:
a frame having two shafts connected to a head which holds strings to form a striking surface;
wherein the cross-section of the frame varies along the shafts and head such that said cross-section has a maximum width (L_1) and a minimum thickness (e_1) along said shafts, a minimum width (L_2) and a maximum thickness (e_2) along median portions, and a width (L_3) and a thickness (e_3) at a crown portion of said head which are intermediate the cross-sections of said shafts and said median portions, the thickness (e_1) of said shafts being smaller than the thickness of a handle of the racket; and
wherein the cross-section maintains a constant perimeter along the shafts and the head.

5,110,126
TENNIS RACKET
Siegfried Kuebler, Ueberlingen, Fed. Rep. of Germany, assignor to Head Sportgeraete Gesellschaft m.b.H. & Co. OHG., Austria
Continuation of Ser. No. 496,058, Mar. 16, 1990, abandoned, which is a continuation of Ser. No. 143,940, Jan. 14, 1988, abandoned. This application Jun. 26, 1991, Ser. No. 722,381
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1987, 3701022; Jan. 26, 1987, 3702197
Int. Cl.[5] A63B *49/04*
U.S. Cl. 273—73 R **4 Claims**

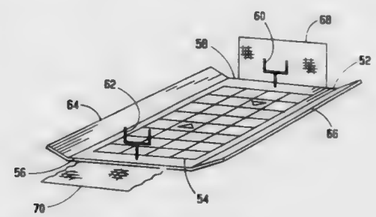
1. A tennis racket having a weight of 320 to 410 grams, a length of 650 to 720 m and a balance point located 310 to 335 mm from the handle end, the racket comprising:
a racket head formed from a rod for serving as a tensioning frame;

a string arrangement located within a plane in the racket head;
an open frog zone adjoining the racket head and being laterally delimited on both sides by the rod;
a handle connected to the rod, said handle having a handle end, the racket center of oscillation being located 470–500 mm from the handle end, said racket head including an apex at an end furthest from the handle end;
a first weight disposed on or within said handle at a distance of from 0–100 mm from said handle end; and



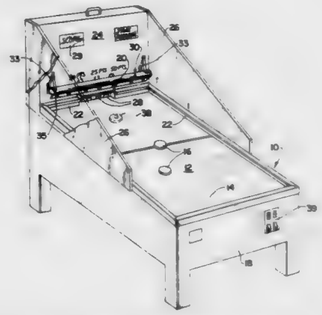
second and third weights of equivalent mass disposed on or within the racket head, said second and third weights being located on each side of an axis passing longitudinally through the racket and being disposed at an axial distance of 0–100 mm from a line extending through the apex in a direction perpendicular to the longitudinal axis of the racket;
wherein the total amount of said first, second and third weights is in the range of 50–150 grams; said first, second and third weights for reducing the rebound moment and increasing the slam force of the racket.

5,110,127
MULTIPLE GAMING BOARDS
James Potter, 314 E. El Rio Grande, Garland, Tex. 75041, assignor to James Potter, Garland, Tex.
Filed Jan. 22, 1991, Ser. No. 643,856
Int. Cl.[5] A63F *7/06*
U.S. Cl. 273—85 R **4 Claims**



1. A gaming board system comprising:
a plurality of gaming boards;
a box for containing said gaming boards;
a plurality of playing tokens;
at least one playing piece, said game piece including:
a triangular member having three sides with one side being longer than the other two remaining sides, said playing piece operable to be supported on one corner thereof in an upright position on a supporting surface with the one longer side facing a player and allowing the player to impart a force to a lower end thereto relative to the supported corner to propel the playing piece forward and away from the supporting surface; at least one of the gaming boards including:
a flat surface including said supporting surface,
a playing pattern disposed on said flat surface and having goal lines at opposite ends of said pattern to designate a playing area,
a goal disposed proximate to each of said goal lines;
said goals including uprights disposed above the flat surface of said playing area and disposed apart a pre-determined distance and having a horizontal bar disposed between said uprights at a lower end thereof and above said flat surface,
a selectively collapsible net disposed on either end of the playing surface and operable to be disposed in a relaxed and lowered position at or below the flat surface of at least one of said plurality of gaming boards or in an upright position to extend from the flat surface of the at least on of said plurality of gaming boards and substantially above and behind said associated goal, said net further operable to be manipulated by a player and pulled upward behind the respective one of said goals when said playing piece is propelled thereat, and
inclined sides disposed along said flat surface at an angle such that they extend upward from the playing surface to contain said playing piece in the playing area.

5,110,128
AIR CUSHION TABLE GAME
Mark J. Robbins, P.O. Box 185515, Ft. Worth, Tex. 76181
Filed Feb. 21, 1991, Ser. No. 658,519
Int. Cl.[5] A63F *7/07, 7/30*
U.S. Cl. 273—126 A **11 Claims**



1. An air cushion table game which comprises a playfield; means for providing an air cushion for pucks sliding on said playfield; a goal for receiving said pucks at one end of the playfield; and movable barrier means comprising a horizontal bar for lowering onto said playfield in front of said goal in response to predetermined condition to prevent the return of pucks from the area of said goal to the user, said horizontal bar being also raisable above said playfield to permit free passage of pucks thereunder.

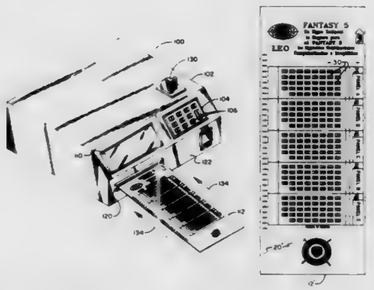
5,110,129
NUMBER SELECTING DEVICE AND PRINTING DEVICE AND PAMPHLET FOR PLAYING A LOTTERY
Miguel G. Alvarez, 7441 Northwest 8th St., Miami, Fla. 33126
Filed Oct. 9, 1990, Ser. No. 593,952
Int. Cl.[5] A63F *3/06*
U.S. Cl. 273—138 A **20 Claims**

1. A device for darkening boxes on a computer lottery game card for use in purchasing lottery tickets; the device comprising:
a housing including an outer casing.

a slot formed in said housing structured and configured for entry of the lottery game card therein,

memory means within said housing adapted to store a plurality of groups of numbers, wherein an individual group of numbers corresponds with a corresponding particular subject,

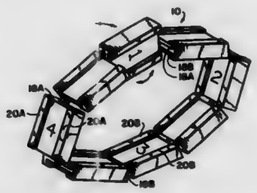
means on the exterior of said outer casing for selecting and entering said subject,



number selecting means adapted to select a selection of numbers from said group of numbers corresponding with the entered subject, and

printing means adapted to darken in those boxes on the computer lottery game card having said selection of numbers printed therein.

5,110,130
PUZZLE HAVING TILES TRANSFERABLE BETWEEN CASEMENTS CONNECTED IN A LOOP
Daniel Aulicino, Bedford, N.Y.
Filed Jan. 31, 1991, Ser. No. 648,863
Int. Cl.[5] A63F *9/08*
U.S. Cl. 273—153 S **7 Claims**



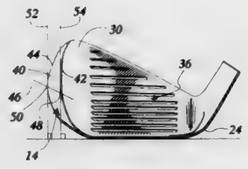
1. A puzzle comprising:

(a) a plurality of closely spaced casements and means for joining the casements to form a closed loop; said casements each having a longitudinal axis of symmetry; each of said casements being rotatable around its axis and each including pairs of opposite edges for defining respective portions of at least two spaced tracks;

(b) selected casements each retaining a first indicia-bearing tile and a second indicia-bearing tile in spaced relationship in the respective track portions such that the plurality of casements in said closed loop presents in the defined tracks a respective series of tiles in a given order;

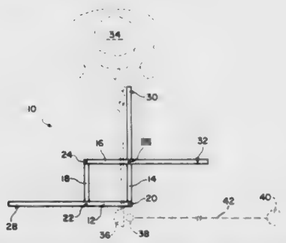
(c) said tiles being loosely held in said tracks so as to be slidable in said respective tracks around said closed loop, whereby selective slicing movement and rotation of casements produces another order, different from the given order, for each of said series of tiles.

5,110,131
POSITIVE DRAFT GOLF IRON
D. Clayton Long, 3707 Gateway, Albany, Ga. 31707
Filed Jan. 25, 1991, Ser. No. 646,161
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—167 H **3 Claims**



1. A golf iron head comprising of a heel, a toe, a sole, a planar striking face, a backside, a top, a center of mass, and a hosel for connecting with a shaft, wherein said toe tapers back from said striking face outward away from said heel to a back edge defined by said toe and said back side, wherein said back edge is the outermost portion of said toe from the center of mass.

5,110,132
ALIGNMENT APPARATUS FOR GOLFERS
Tracy Weston, and Joe H. Juren, both of 11 Sugar Creek Dr., Austin, Tex. 78746
Filed Jun. 4, 1991, Ser. No. 709,896
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—187 R **2 Claims**



1. An alignment apparatus for golfers comprising:

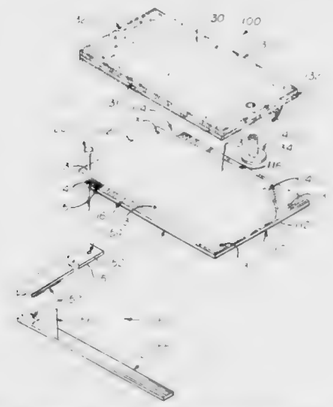
(a) three long sections and one short section rotatably and collapsibly joined and defining a reference square positioned adjacent a golf ball showing a user that said sections are in proper relation to each other and said golf ball;

(b) a first long section for pointing at a target which provides alignment feedback to said user for taking a golf club back along a line away from said target and for aligning said club in the direction of said target when swinging said club;

a second long section extending perpendicular to said first long section and having one and thereof pointing toward said user, stopping short of said user's feet, and the second end thereof pointing at said golf ball which provides alignment feedback for the user's body and hands as being ahead of or behind said ball;

(d) a third long section parallel to said first long section and perpendicular to said second long section for providing alignment feedback for said user's feet as being open or closed to said target, and said one short section joining said first and third long sections to complete said reference square.

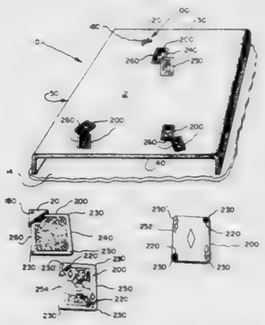
5,110,133
GOLF SWING TRAINING SYSTEM
Joseph M. Durso, 2224B Springwood Dr., Reston, Va. 22081
Continuation-in-part of Ser. No. 642,160, Jan. 17, 1991, abandoned, which is a continuation-in-part of Ser. No. 542,774, Jun. 25, 1990, abandoned. This application Jul. 2, 1991, Ser. No. 726,162
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—187 R **21 Claims**



1. A golf swing training device comprising a flat elongated, at least generally rectangular base having two forwardly directable edges spaced a predetermined distance apart, means for securing the base to a practice surface, an elongated, at least generally rectangular, flexible, turf-like hitting surface having two forwardly directable edges spaced apart a predetermined distance more than, the same as, or less than the predetermined distance between the two forwardly directable edges of the base, means for aligning the face of a club head relative a target located along the forwardly directable edges of the base and extending beyond the forwardly directable edges of the hitting surface when positioned thereon, means for adjustably attaching the hitting surface to the base and lowering same thereto such that alignment and shiftability of the hitting surface in relation to the base is permitted readily and repeatedly by lifting the hitting surface from the base prior to executing a swing of the golf club in conjunction with the device yet such that said hitting surface and base remain attached when the hitting surface is struck by the golf club in executing the golf swing.

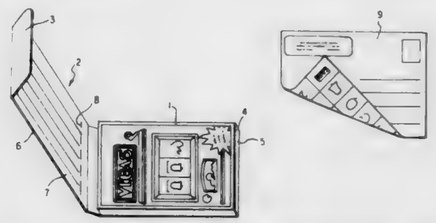
5,110,134
CARD MARK SENSOR AND METHODS FOR BLACKJACK
Donald J. Laughlin, and Lawrence F. Wagoner, both of Laughlin, Nev., assignors to No Peek 21, Laughlin, Nev.
Filed Mar. 1, 1991, Ser. No. 662,690
Int. Cl.[5] A63F *1/02, 1/06*
U.S. Cl. 273—293 **25 Claims**

8. A plurality of blackjack playing cards within the range of 4–20 cards each having a blackjack value within the range of ten to eleven, each card of the plurality comprising additional face indicia representative in machine detectable form of only



the blackjack numerical value of the card without regard to its suit.

5,110,135
CARD GAME
Fred Weber, Schaffhausen, Switzerland, assignor to AGM Aktiengesellchaft Müller, Neuhausen, Fed. Rep. of Germany
Filed Feb. 22, 1991, Ser. No. 659,265
Int. Cl.[5] A63F *1/06;* **B42D** *15/02*
U.S. Cl. 273—296 **7 Claims**



1. A card game having at least one playing card and a folding box for holding the at least one playing card, the folding box having at least one foldable lateral insert flap attached thereto at one end and at least one slot, wherein:

a printed form for address information is provided on a surface of said at least one lateral insert flap;

said at least one lateral insert flap extends more than the length of said folding box thereby overlapping one lengthwise surface of said folding box when said at least one lateral insert flap is in a folded-over state, a free end of said at least one lateral insert flap being insertable into the at least one slot at an opposite end of the folding box from where said at least one lateral insert flap is attached; and

said printed form for address information is provided on said at least one lateral insert flap on an outside surface thereof when in a folded-over state.

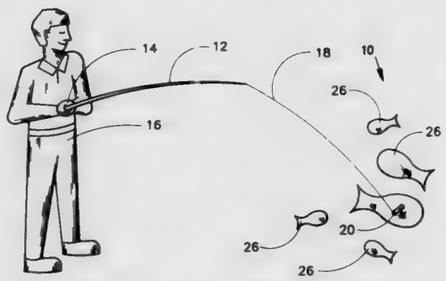
5,110,136
FISHING CASTING PRACTICE DEVICE
David Land, 10907 E. 68th St., Tulsa, Okla. 74133
Filed Mar. 11, 1991, Ser. No. 667,003
Int. Cl.[5] A63B *69/00*
U.S. Cl. 273—346 **2 Claims**

1. A fishing casting practice device for use with a fishing rod having extending fishing line, which device comprises:

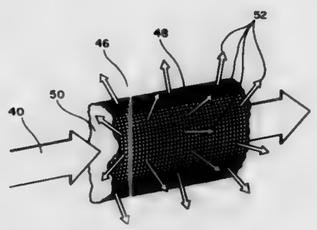
at least one casting target having contact engaging material on substantially the entire exterior thereof and containing

buoyant material encased within said contact engaging material so that each said target may float on water; and

a lure replacement projectile having line connection means to secure an end of said fishing line to said lure replacement projectile, at least a portion of said lure replacement projectile covered by hook engaging material capable of engaging said contact engaging material on said target when brought into contact with any part of said target.



5,110,137
INFRARED TARGET USING GAS PERMEABLE MATERIAL
Lawrence J. Watkins, and Roland Fuentes, Jr., both of Huntsville, Ala., assignors to Teledyne Industries Incorporated, Los Angeles, Calif.
Filed Mar. 11, 1991, Ser. No. 667,210
Int. Cl.[5] F41J *1/00*
U.S. Cl. 273—348.1 **15 Claims**



1. A device for generating a specific infrared signature of an intended target object, comprising:

a thermal system for the transport of heated gases, having a plurality of walls, at least one of said walls being comprised of a gas impermeable material, there being at least one of said walls whose surfaces are desired to present an infrared signature of an intended target object and is comprised of a gas permeable material.

5,110,138
TOY SHOOTING GALLERY
Benjamin Vandermeide, 3904 Hallmark Dr., West Valley City, Utah 84119
Filed Dec. 20, 1990, Ser. No. 633,227
Int. Cl.[5] F41J *7/04*
U.S. Cl. 273—391 **20 Claims**

1. A shooting gallery, comprising:

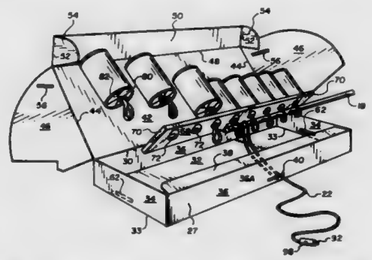
a frame, defining a horizontally oriented support surface, said horizontally oriented support surface defining at least one aperture therethrough;

a target, positioned upright atop said horizontally oriented support surface of said frame, proximate said aperture, said target being displaceable off of said horizontally oriented support surface by a force application thereto;

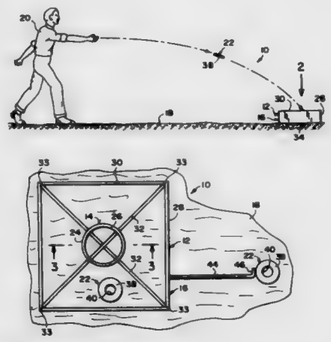
a cable, having a first end and a second end, said first end being secured to said target, said cable being inserted through said aperture;

a rod positioned below said horizontally oriented support surface, said second end of said cable being secured to said rod, said cable being dimensioned to be displaced through said aperture and to permit said target to be knocked down from its upright position on said support surface by a force application thereto;

wherein a displacement of said rod outwardly away from said frame displaces said cable through said aperture and effects a return of a knocked down target to an upright position atop said horizontally oriented support surface of said frame.



5,110,139
DISK TOSS GAME
William A. Baumgartner, 2398 York St., E. Meadow, N.Y. 11554
Filed Jul. 29, 1991, Ser. No. 737,154
Int. Cl.[5] A63B *67/06*
U.S. Cl. 273—400 **7 Claims**

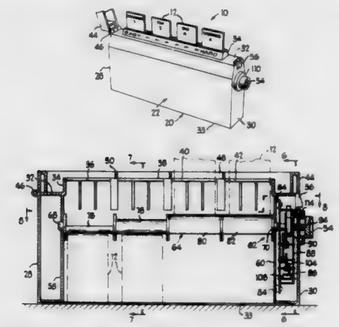


1. A disk toss game comprising:

a) a receptacle having a first central target area and a second larger target area about the first area whereby said receptacle is placed onto a playing surface at a predetermined distance away from a player, wherein the first central target area of said receptacle is a hollow cylindrical member having an open top end to receive said game pieces tossed thereto, wherein the second larger area of said receptacle is a box member having an open top end to receive said game pieces tossed thereto, wherein said receptacle further including a pair of bars affixed to the corners of the open bottom end of said box member in an X-shaped configuration so that the open bottom end of said hollow cylindrical member can be secured thereto; and

b) a plurality of game pieces that are tossed at said receptacle by the player so that said game pieces may land into the first central target area, into the second larger target area and outside but proximate said receptacle to indicate different points the player will receive during the play of said game.

5,110,140
GAME INCLUDING CARD DISPLAY TIMER
Jeffrey D. Breslow, Highland Park, and Howard J. Morrison, Riverwoods, both of Ill., assignors to Breslow, Morrison, Terzian et al., Chicago, Ill.
Filed Feb. 7, 1991, Ser. No. 651,760
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—459 **8 Claims**

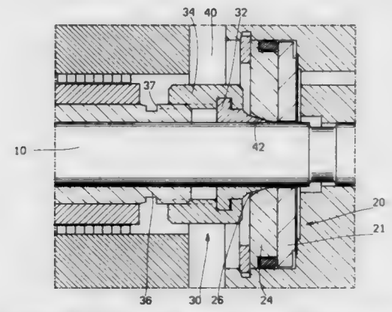


1. A game comprising in combination:

a plurality of cards; and

means for displaying a number less than the plurality of the cards with each of the number being displayed for a different limited period of time.

5,110,141
SPINDLE ASSEMBLY
Ami Dayan, Ra'anana, Israel, assignor to MSB Technologies Ltd., Kibutz Givat Brenner, Israel
Filed Jul. 1, 1991, Ser. No. 724,581
Claims priority, application Israel, Jul. 3, 1990, 94955
Int. Cl.[5] H02K *7/09;* **F16C** *33/74;* **F16J** *15/40;* **F16K** *41/00*
U.S. Cl. 277—9 **13 Claims**

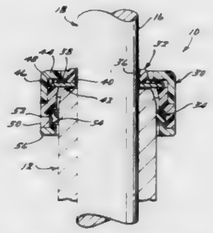


1. Apparatus for restricting magnetic oil to a desired location within a FFFB comprising:

selectably locatable stopper means having a first location near said FFFB for enabling a vacuum to be produced and for restricting said magnetic oil within said FFFB during filling of said FFFB with said magnetic oil and a second location away from said FFFB when filling is not occurring; and

means for moving said selectably locatable stopper means between said first location and said second location.

5,110,142
VALVE STEM OIL SEAL
Michael J. Szott, Bartlett, Ill., assignor to Macrotech Fluid Sealing, Inc., Salt Lake City, Utah
Filed Nov. 30, 1990, Ser. No. 619,916
Int. Cl.[5] F16J *15/32;* **F01L** *3/08*
U.S. Cl. 277—33 **1 Claim**



1. A fixed valve stem oil seal comprising:

a three-piece cup-shaped case having a central longitudinal axis and defined by three longitudinally spaced outer wall portions telescoped within one another;

an upper portion of said case comprising a generally cylindrical portion having a radially inwardly extending flange with a central aperture for the acceptance of a valve stem;

a generally cylindrical intermediate portion of said case nested with the upper portion thereof and having a first radially extending surface disposed radially inwardly of the cylindrical portion of said upper case portion in axially spaced relation to the radial flange on said upper case portion, a second radially outwardly extending surface axially spaced from said first surface and engageable with a complementary lower end face of said upper case portion, a third radially inwardly extending surface defining an upper surface of an "O" ring groove, and an annular lower end face;

a seal support washer seated on the first radial surface of the intermediate portion of said case and having a central aperture for the acceptance of the valve stem;

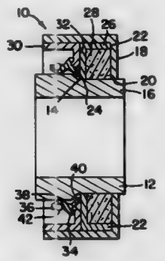
a seal element having a radially extending portion disposed between the radial flange on the upper case portion and said seal support washer and radially movable relative thereto, said seal element having an annular sealing surface engageable with the valve stem;

a generally cylindrical lower case portion nested with said intermediate case portion and having a first radially outwardly extending surface engageable with the lower end face of said intermediate case portion, a second radially inwardly extending surface defining a lower wall portion of said "O" ring groove, and a third axially extending surface defining a longitudinal wall of said "O" ring groove; and

an annular elastomeric "O" ring disposed between the third radial surface on said intermediate case portion and the second radial surface on said lower case portion for retaining said valve stem oil seal on a valve guide,

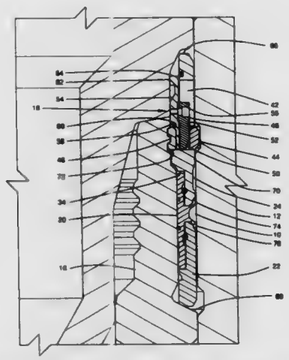
whereby said upper, intermediate, and lower case portions are assembled with one another solely by relative longitudinal movement.

5,110,143
SEAL CARTRIDGE FOR USE IN IDLER ROLLERS
Bryon T. Hibbetts, Tupelo, Miss., assignor to FMC Corporation, Chicago, Ill.
Filed Nov. 30, 1990, Ser. No. 621,175
Int. Cl.[5] F16J *15/32*
U.S. Cl. 277—47 **4 Claims**



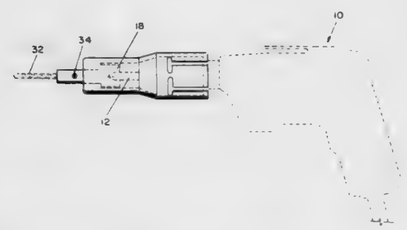
1. A rotary seal for use in a conveyor roller having an axle and a roll surface and a bearing supporting said roll surface for rotary motion on said axle, said rotary seal comprising:
a seal housing having an aperture therein;
a spacer carried inside said seal housing;
a seal locator having an upturned flange carried inside said seal housing inboard from and adjacent to said spacer;
a contact seal carried in said seal housing, said contact seal in contact with an inner surface of said seal housing and said spacer;
an inner seal carried by said seal locator, said inner seal having a lip portion in contact with said spacer and an inwardly and downwardly projecting lip projecting beyond the end of said upturned flange;
a bushing having a first diameter and a second diameter greater than said first diameter relatively inboard from said first diameter, said first diameter separated from said second diameter by an inclined step inboard of said spacer when said bushing is located in said aperture of said seal housing, said inclined step and said spacer forming a cavity to accommodate said inwardly and downwardly projecting lip.

5,110,144
CASING HANGER SEAL ASSEMBLY
James A. Burton, and Rickey D. Book, both of Houston, Tex., assignors to Cooper Industries, Inc., Houston, Tex.
Filed Aug. 24, 1990, Ser. No. 573,630
Int. Cl.[5] E21B *33/04, 33/128*
U.S. Cl. 277—116.2 **12 Claims**



1. A sealing assembly for sealing between an interior sealing surface of a well housing and an exterior sealing surface of a hanger landed within the well housing comprising
an annular seal body having an outer seal lip, and a plurality of inner ridges,
an energizer for engaging the outer seal lip and urging it outwardly into sealing engagement with the interior sealing surface of the housing,
said energizer including means for storing the energy of moving radial sealing lip into its sealing position so that the force is maintained on the lip.

5,110,145
POWER TOOL ADAPTOR
Patrick A. Stewart, 3429 Gibson SE., Apt. A, Albuquerque, N. Mex. 87106
Filed Jun. 24, 1991, Ser. No. 719,824
Int. Cl.[5] B23B *51/12*
U.S. Cl. 279—24 **14 Claims**

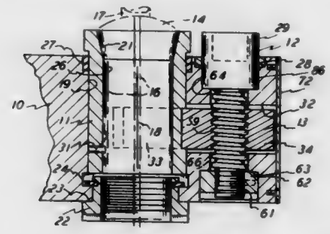


1. An adaptor for a high speed power tool, or the like, mounting tool bit means of polygonal shank configuration in chuck means, said adaptor comprising:
torque transmitting sleeve means comprising a polygonal cavity means at one end for engaging said polygonal shank of the tool bit means;
cylindrical cavity means at the other end of said torque transmitting sleeve means for releasably engaging a tool bit means of cylindrical shank configuration;
securing means for releasably attaching said tool bit means of cylindrical shank configuration;
grip sleeve means mounted on said torque transmitting sleeve means in relatively rotational relationship thereto; and
said grip sleeve means enclosing a portion of said cylindrical cavity means and enclosing and abutting said chuck means of said power tool.

5,110,146
COLLET CLAMPING AND RELEASING YOKE APPARATUS
Richard F. Beere, Waterford, Wis., assignor to Beere Tool Company, Inc., Racine, Wis.
Filed Jun. 26, 1990, Ser. No. 543,556
Int. Cl.[5] B23B *31/20*
U.S. Cl. 279—43 **16 Claims**

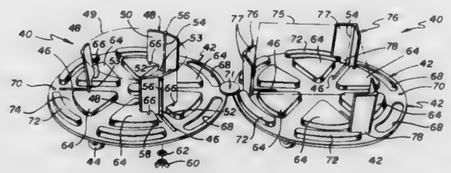
1. A collet having a clamping and releasing yoke apparatus comprising a support block having a cylindrical hole therein, a hollow cylindrical sleeve disposed aligned with and snugly in said hole and being slidable therein along the cylindrical axis of said sleeve, a workpiece clamping collet disposed snugly in said sleeve and being of the type for radial inward clamping movement and being affixed to said support block for preventing movement of said collet relative to said support block along said cylindrical axis, said sleeve and said collet having matching surfaces in sliding contact for effecting radially inwardly clamping movement of said collet onto a workpiece disposed in said collet and upon axial sliding of said sleeve in said hole, a yoke slidably mounted on said support block for movement parallel to said cylindrical axis and including two

spaced-apart and rigidly extending fingers having planar surfaces faces toward each other and extending along the lengths of said fingers which are disposed on and respectively engaged with diametrically opposite sides of said sleeve, said sleeve having grooves therein on said diametrically opposite sides and with said grooves being defined by planar surfaces disposed parallel to said planar surfaces of said fingers and at the base of



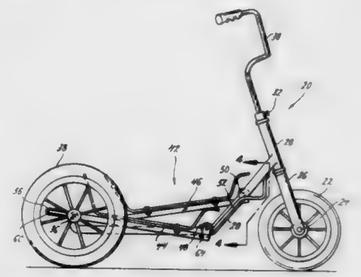
said grooves and with said planar surfaces of said fingers being in snug contact with the base of said grooves which are snugly receiving said fingers for non-rotatably securing said sleeve, and an actuator operatively connected to said yoke for displacing said fingers in the two axial directions along said cylindrical axis for sliding said sleeve along said cylindrical axis to thereby actuate said collet for alternate clamping and releasing of a workpiece.

5,110,147
HIGHLY STABLE, CONTINUOUSLY ADJUSTABLE TRASH CAN TRANSPORTER
Leonard B. Gershman, 10853 Rose Ave., #55, Los Angeles, Calif. 90034
Continuation-in-part of Ser. No. 269,421, Nov. 10, 1988, abandoned. This application Jul. 27, 1990, Ser. No. 558,666
Int. Cl.[5] B62B *11/00*
U.S. Cl. 280—79.5 **6 Claims**



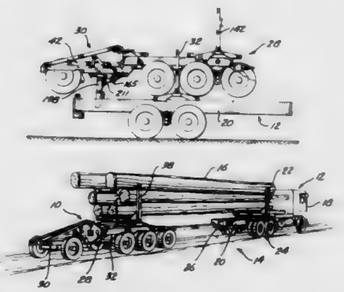
1. A trash can transporter train assembly comprising:
a plurality of substantially flat circular platforms supported on wheels, with each platform having a center and a minimum diametral platform extension;
means for coupling said platforms together including coupling holes formed in a front and in a rear portion of each platform and a connector including a substantially U-shaped single strand connecting element with ends fitting into the rear coupling hole of a lead platform and into the forward coupling hole of a following platform;
a plurality of guide members adjustably positionable on each said platform to permit trash cans of a variety of sizes to be removably positioned on said platform, each of said guide members being continuously adjustable over a radial distance at least equal to one-fifth of the radius of said platforms;
continuously adjustable attachment means for securing the guide members of each platform in corresponding ones of the slots of the corresponding platform; and
the height or vertical extent of said guide members above the surface of said platforms being at least equal to one-fourth the minimum diametral platform extension;
whereby said guide members may be adjusted to fit trash cans of different sizes, and the accurate fit and substantial height of the guide members precludes spilling, even when a plurality of said platforms is pulled over an uneven surface.

5,110,148
THREE-WHEELED SCOOTER WITH RECIPROCATING TREADLE DRIVE
LeRoy Stienbarger, Licking, and Frank Gray, St. Louis, both of Mo., assignors to Champion Toy Company, St. Louis, Mo.
Filed Dec. 14, 1990, Ser. No. 628,405
Int. Cl.[5] B62M *1/00*
U.S. Cl. 280—221 **11 Claims**



1. A vehicle having a pair of treadles, a drive axle, means for securing a rearward end of each treadle to said drive axle in a driving relationship, a track and roller supporting the forward end of each treadle from the vehicle, the forward end of each of said treadles having a roller mounted thereon, said rollers riding on their associated track as the treadles are oscillated, said track and roller having means for vertically supporting said associated end of each of said treadles through at least a portion of said treadle movement as a rider oscillates said treadles to thereby drive said drive axle and propel said vehicle.

5,110,149
TRAILER SYSTEM DESIGN FOR ENHANCED LOAD-CARRYING CAPACITY AND MANEUVERABILITY
Gale E. Dahlstrom, P.O. Box 57, Hoquiam, Wash. 98550
Filed Nov. 30, 1987, Ser. No. 126,363
Int. Cl.[5] B60P *3/40*
U.S. Cl. 280—401 **14 Claims**



1. A system for supporting a load and allowing the load to be transported over a roadway, said system comprising:
a bed assembly having first and second ends, said bed assembly being vertically pivotable about a point adjacent its

first end and being for contacting and movably supporting the load; and

an auxiliary trailer for additionally movably supporting the load,

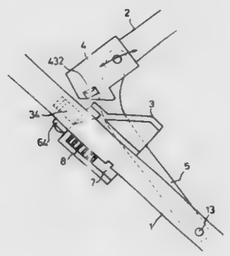
said auxiliary trailer being pivotably connectable to said bed assembly adjacent said second end of said bed assembly for substantially lateral movement with respect to said bed assembly.

5,110,150

COLLAPSIBLE MECHANISM FOR A STROLLER

Shun-Min Chen, P.O. Box 82-144, Taipei, Taiwan

Filed Apr. 23, 1991, Ser. No. 689,542
Int. Cl.[5] B62B *7/06*
U.S. Cl. 280—642 **1 Claim**



1. The collapsible mechanism for a stroller with a handle support and a rear wheel support on each side of said stroller, comprising:

an engaging seat member formed with a longitudinal passage extending therethrough for slidably receiving said rear wheel support two opposite lugs extending from a top of seat member, said longitudinal passage having a semi-seat member **93**, said longitudinal passage having a semi-cylindrical chamber at one side thereof;

a coupling block having one end connected said handle support and an opposite end having a slot adapted to receive said rear wheel support, said opposite end including an angular portion adapted to be received within the recess of said engaging seat member, said angular portion of said coupling block having outer sidewalls with a protuberance provided on each of said outer sidewalls;

a spring disposed within the semi-cylindrical chamber of said engaging seat;

a stop member engaged with said rear wheel support and received within said semi-cylindrical chamber, said stop member having a top end in contact with a bottom end of said spring; and

a crank arm having one end pivotally connected to said rear wheel support and an opposite end pivotally connected to said handle support.

5,110,151

SHIM AND COMPUTERIZED CHART FOR SIMULTANEOUSLY ADJUSTING CAMBER AND TOE-IN

James L. Blechschmidt, Tempe; Robert D. Johnson, and Robert F. Powell, both of Mesa, all of Ariz., assignors to Shimco, Inc., Mesa, Ariz.

Continuation-in-part of Ser. No. 494,963, Mar. 16, 1990, Pat. No. 5,007,658. This application Feb. 11, 1991, Ser. No. 653,884
Int. Cl.[5] B62D *17/00*
U.S. Cl. 280—661 **12 Claims**

1. Orientation apparatus for

selecting from a plurality of different sized tapered shims at least one selected shim to be positioned in the wheel assembly of a vehicle to alter the alignment of the assembly by adjusting the camber and toe-in of the wheel assembly by selected amounts, and,

determining the orientation of the selected shim necessary to alter the alignment of said wheel assembly by the selected amounts of camber and toe-in,

the wheel assembly including

an axle member,

spindle means attached to the axle member for rotatably receiving and carrying a wheel, and

bolts for removably, fixedly securing the spindle means to the axle member, the bolts each having an imaginary longitudinal centerline,

each of the tapered shims having a taper different from the taper of the other of the tapered shims and including

a first contact surface lying in a first imaginary plane;

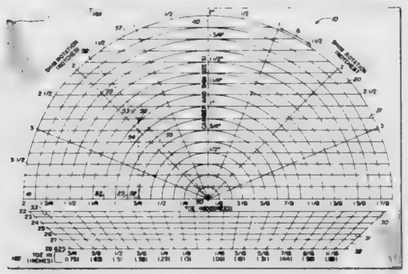
a second contact surface lying in a second imaginary plane, the second imaginary plane being at an acute angle with respect to the first plane, the first and second imaginary planes intersecting along a line and each being perpendicular to a third common imaginary plane;

at least one opening formed through the tapered shim;

each of the shims being interposed between the spindle means and the axle member in at least one of three operative positions to adjust the alignment of the wheel,

a first operative position which adjusts only the camber of the wheel;

a second operative position which adjusts only the toe-in of the wheel; and,



a third operative position which simultaneously adjusts both the toe-in and camber of the wheel;

the opening being shaped, contoured and dimensioned such that the bolts pass through the opening when the shim is interposed between the spindle means and the axle member and the bolts are utilized to fixedly secure the spindle means to the axle member;

said orientation apparatus including

(a) chart means correlating camber and toe-in adjustment values with the orientation of each of the shims and including

(i) a first graduated axis indicating toe-in values,

(ii) a second graduated axis perpendicular to and intersecting said first graduated axis and indicating camber values, each of said values on said first and second axis representing a size of shim and representing the maximum amount by which said represented size of shim can adjust the toe-in and camber of the wheel assembly, said toe-in and camber values increasing by selected increments as the distance along said axes from the intersection of the axes increases,

(iii) alignment lines interconnecting equivalent values on said first and second axes, each of said alignment lines indicating the amount by which the toe-in and camber of the wheel assembly is altered when a shim of the size represented by the equivalent values interconnected by the alignment line is interposed between the spindle and the axle of said wheel assembly

in a selected position with respect to said bolts, said selected position being obtained by rotating the shim about said axis generally parallel to the longitudinal centerline of one of said bolts;

(b) dial means including

(i) an outer peripheral edge,

(ii) a point of rotation on said dial means within said outer peripheral edge,

(iii) a first rule line passing through said point of rotation, and,

(iv) a second rule line passing through said point of rotation and perpendicular to said first rule line;

(c) mounting means for mounting said dial means on said chart means for

(i) movement in a first direction parallel to said first graduated axis,

(ii) movement in a second direction parallel to said second graduated axis, and,

(iii) rotation about said point of rotation,

said orientation apparatus permitting a shim size to be selected by

determining the desired toe-in and camber change of the wheel assembly of a vehicle,

moving said point of rotation of said dial means along said first graduated axis to the value on said first graduated axis corresponding to said desired toe-in value,

moving said dial means to a first reference position by moving said point of rotation away from said first graduated axis and parallel to said second graduated axis a distance equal to the distance from said first graduated axis of the value on said second graduated axis corresponding to said desired camber change, and

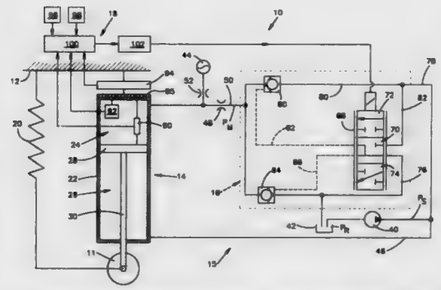
selecting the one of said alignment lines closest to said first reference position, said selected line interconnecting equivalent values on the first and second graduated axes representing the size of the shim selected.

5,110,152

ACTIVE SUSPENSION SYSTEM

Neil Jones, Palm City, Fla., assignor to TRW Inc., Lyndhurst, Ohio

Filed Apr. 26, 1991, Ser. No. 691,714
Int. Cl.[5] B60G *11/26*
U.S. Cl. 280—707 **13 Claims**



1. A suspension control system for a vehicle having a sprung mass and an unsprung mass, said suspension control system comprising:

hydraulic actuator connectable between the sprung mass and the unsprung mass, said actuator comprising a piston movable in at least one direction in a hydraulic ram in response to hydraulic fluid pressure acting on said piston in said ram;

a hydraulic circuit communicating said ram with a source of pressurized hydraulic fluid, said hydraulic circuit comprising an on-off valve assembly between said ram and said source of pressurized hydraulic fluid, operation of said on-off valve assembly varying the pressure and quantity of hydraulic fluid in said ram and thereby co-trolling movement of said piston in said ram;

means for sensing dynamic inputs to the vehicle;

means for providing a demand signal in response to said inputs, said demand signal being indicative of a desired motion of said piston in said ram to achieve a desired motion of the sprung mass relative to the unsprung mass; and

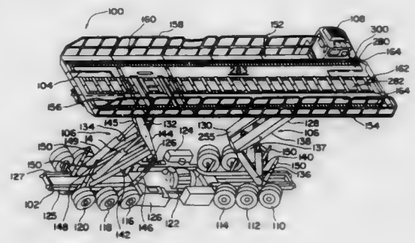
means for providing a control signal for operating said on-off valve assembly in response to said demand signal, said control signal being a pulse width modulated signal having a duty cycle which is a function of said demand signal.

5,110,153

VEHICLE FOR TRANSPORTING LOADS

David K. Kallansrude, Huntsville; William C. Aiken, Toney; Dan P. Deitz, Hillsboro, and William D. Powelson, Madison, all of Ala., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Sep. 6, 1990, Ser. No. 578,507
Int. Cl.[5] B60G *17/00*
U.S. Cl. 283—707 **35 Claims**



1. A vehicle, comprising:

a base;

suspension means connected to said base;

ground engaging means connected to said suspension means;

sensor means for monitoring the clearance between a surface and said vehicle positioned away from the surface, said sensor means including signalling means for outputting a detection signal when said sensor means is positioned a predetermined distance away from the surface;

control means in communication with said sensor means for analyzing signals received from said sensor means, said control means including means for outputting adjustment signals;

adjustment means for adjusting said suspension means in accordance with adjustment signals outputted to said adjustment means by said control means so as to provide sufficient clearance between said vehicle and the detected surface such that said vehicle avoids contact with the detected surface, and said suspension system including a plurality of individual suspension devices and means for individually or collectively raising or lowering said suspension devices upon receipt of a signal from said means for outputting adjustment signals.

5,110,154

COMBINATION SKI POLE AND GLOVE

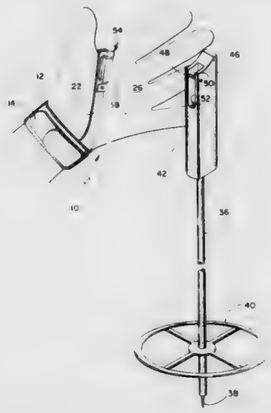
Glenn M. Street, 1806 Danielle Dr., St. Cloud, Minn. 56301

Continuation-in-part of Ser. No. 566,080, Aug. 13, 1990, abandoned. This application Jun. 24, 1991, Ser. No. 719,358
Int. Cl.[5] A63C *11/00, 11/22*
U.S. Cl. 280—822 **13 Claims**

1. In combination,

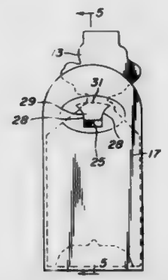
(a) a ski pole having a ground-engaging member at one end and a hand grip adjacent the other end, said hand grip including a forward surface area;

(b) a rigid pin disposed in a recess in said hand grip at a rear surface area at a location generally 180° opposite said forward surface area;
(c) a ski glove having a wrist band and a strap fastened at one end to said wrist band on a palm side of said glove, said strap traversing the palm of said glove at a predetermined angle to pass between a thumb-receiving pocket of said



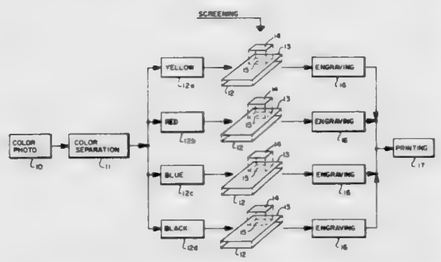
glove and an index finger-receiving pocket of said glove to fasten at the other end on a back side of said glove; and
(d) a hook attached to said strap and insertable into the recess for engaging said pin and facing outward from the palm side of said strap proximate the juncture of said thumb-receiving pocket and said index finger-receiving pocket for releasably engaging said pin on said hand grip.

5,110,155
GREETING CARD WITH INTERLOCKING PULLOUT
Edward Piechocki, Strocks Grove Rd., R.D. 1, Upper Black Eddy, Pa. 18972, and Eric Liddell, Lititz, Pa., assignors to Edward Piechocki, Upper Black Eddy, Pa.
Filed Apr. 24, 1991, Ser. No. 690,354
Int. Cl.[5] **B42D** *15/00*
U.S. Cl. 283—117 **8 Claims**



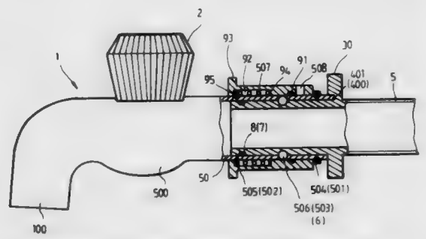
1. A movable card construction, comprising:
(a) an envelope in the form of a pocket having a front face, a rear face, and an opening at the top;
(b) a pullout card located slideably within said envelope and movable so that it projects at the top from said opening;
(c) a tab extending from the bottom of said pullout card formed by a reverse fold at the bottom of said pullout card; and
(d) a window in the rear face of said envelope, said window engaging said tab and stopping the movement of said pullout card only as the pullout card is moved upward.

5,110,156
LITHOGRAPHIC PRINT AND METHOD
Herbert R. Axelrod, 6 Marine Pl., Deal, N.J. 07753
Filed Feb. 23, 1990, Ser. No. 483,918
Int. Cl.[5] **B42D** *15/00*; **B41M** *1/14*
U.S. Cl. 283—117 **2 Claims**



1. A lithographic print of a color photograph including:
(a) a first area of said print in which the color of said photograph are optically simulated by a pattern of printed dots of primary colors to accurately reproduce the hues and color intensity in said first area of said photograph,
(i) the proportion of dots of each primary color varying across the surface of said first area to reproduce variations in the color hues of said first area of said photograph, and
(ii) the density of dots of each color varying across the surface of said first area to reproduce variations in the color intensity of said first area of the said photograph;
(b) a second area of said print, in which the density of said dots is reduced to accurately reproduce the hues of said photographs but to reduce the color intensity thereof; and
(c) printed lettering in said second area.

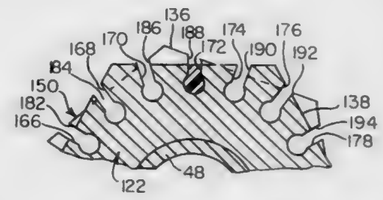
5,110,157
STRUCTURE OF A WATER FAUCET JOINT
Kun-yang Chen, 293, Cheng Tu Road, Taichung, Taiwan
Filed Nov. 19, 1990, Ser. No. 615,259
Int. Cl.[5] **F16L** *37/00*
U.S. Cl. 285—8 **1 Claim**



1. A structure of a water faucet joint comprising:
a) a faucet head including an outlet on one end thereof and a generally cylindrical fastener sleeve on the other end thereof;
a first annular recess formed near the terminal end of said fastener sleeve, and a second annular recess formed a predetermined distance inwards from said first annular recess;

a first and second elastic retaining rings disposed in said first and second annular recesses, respectively;
a plurality of positioning holes formed at predetermined radial positions on said fastener sleeve between said first and second annular recesses, each having a tapered cross section that is smaller on the interior side of said fastener sleeve than on the exterior side thereof;
an axial projection provided on the periphery of the terminal end of said fastener sleeve at a predetermined position thereon;
b) a generally cylindrical conduit connector with an outer diameter substantially equal with the inner diameter of said fastener sleeve, so that said fastener sleeve can be inserted over said conduit connector;
a flange provided on said conduit connector in a medial position thereon, having a recessed notch formed at a predetermined position thereon for receiving said projection on said fastener sleeve when said fastener sleeve is mounted thereon;
at least on annular recess formed around said conduit connector near the terminal end thereof which is received within said fastener sleeve when mounted thereon, each said annular recess carrying a sealing ring therein;
an annular positioning groove formed around the outer periphery of said conduit connector at a predetermined position thereon, between said annular recess thereon and said flange, said positioning groove registering with said positioning holes on said fastener sleeve when mounted thereon;
c) a plurality of generally ball shaped retaining elements, each disposed within a respective said positioning hole and having a diameter greater than the cross section of said positioning holes on the interior side of said fastener sleeve so as to prevent said retaining elements from passing therethrough, said retaining elements engaging said annular positioning groove on said conduit assembly when said fastener sleeve is mounted thereon;
d) a generally cylindrical stoppage sleeve slidingly secured over said fastener sleeve;
an annular cavity formed around the inner periphery of said stoppage sleeve at a predetermined position thereon, said annular cavity containing and abutting said second retaining ring;
a coil compression spring disposed within said annular cavity, having one end thereof abutting said second retaining ring and the other end thereof abutting a side of said annular cavity to bias said stoppage sleeve towards a forward position near the terminal end of said fastener sleeve, where said stoppage sleeve abuts said first retaining ring;
an installing hole formed on the periphery of said stoppage sleeve near the end thereof which abuts said first retaining ring, through which said retaining elements can be inserted into or retracted from said positioning holes when said stoppage sleeve is drawn back to a rearward position;
an annular holding groove formed around the inner periphery of said stoppage sleeve between said installing hole and said annular cavity;
wherein, when said fastener sleeve is mounted over said conduit connector, said stoppage sleeve prevents the outward radial displacement of said retaining elements from said positioning groove on said conduit connector to secure said faucet head with said conduit connector when said conduit connector is in said forward position abutting said first retaining ring;
said faucet head can be retracted from said conduit connector by drawing back said stoppage sleeve until said holding groove thereon registers with said retaining elements to allow the outward radial displacement thereof and disengagement from said positioning groove.

5,110,158
CONNECTOR FITTING LOCKING AND SEALING ARRANGEMENTS
Frank J. Sabo, 1230 Meadow View La., Amherst, Ohio 44001-1205, and Doonan D. McGaw, 245 Saint James Way, Naples, Fla. 33942-6715
Continuation-in-part of Ser. No. 346,473, May 2, 1989, Pat. No. 4,893,846. This application Jan. 11, 1990, Ser. No. 463,434
Int. Cl.[5] **F16L** *55/00*
U.S. Cl. 285—92 **15 Claims**



1. In a fitting having a first threaded member and a second threaded member joined in axially aligned threaded relation with said first member to a desired arcuate position relative to said first member, said members each having an axially extending part thereof which is diametrically greater than the mating threads of either of said members, said diametrically greater axially extending parts being axially juxtaposed when said members are in said desired arcuate position; the improvement including locking arrangement means for removably locking said first and second members against relative arcuate threading movements at a relative arcuate position of said members which is within a predetermined arcuate degree range of said desired arcuate position, said locking arrangement means comprising:
at least one longitudinally extending first recess formed in said outer surface of said first threaded member and a plurality of circumferentially spaced second recesses formed in said outer surface of said second threaded member, said recesses being defined by radially extending wall surfaces, at least portions of said radially extending wall surfaces being laterally spaced from other portions thereof, said first and second recesses having in cross section at least portions thereof by which said at least one first recess is selectively longitudinally alignable with at least one of said second recesses in increments of relative arcuate movements of said first and second members to define at least one alignment set of recesses formed by one of said at least one first recesses and one of said second recesses so that at least one such selected longitudinal alignment set is attained within said predetermined arcuate degree range of said desired arcuate position;
and insert means inserted into said at least one such selected longitudinal alignment set of recesses and having at least one wall surface engaging at least one of said radially extending recess wall surfaces between said laterally spaced portions thereof, said insert means and said first and second recesses of said at least one such selected longitudinal alignment set of recesses having means including said engaged wall surfaces cooperating to secure said insert means in said at least one such selected longitudinal alignment set of recesses, locking said insert means against radial removal from said at least one such selected longitudinal alignment set of recesses and resisting longitudinal removal of said insert means from said at least one such selected longitudinal alignment set of recesses, said insert means preventing relative arcuate movements of said first member and said second member, said insert means being removable from said at least one such selected longitudinal alignment set of recesses so that said first and second members may be arcuately moved in cooperative threaded relation relative to each other.

5,110,159

ROTATING UNION FOR SUPPLYING COMPRESSED AIR TO A ROTATING PART OF A PRINTING PRESS

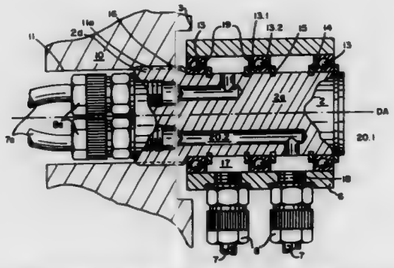
Manfred Herold, Kahl/Main, and Herbert Rebel, Rodgau, both of Fed. Rep. of Germany, assignors to Man Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed Dec. 27, 1990, Ser. No. 634,761

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1989, 3943119

Int. Cl.[1] **F16L** *39/04*

U.S. Cl. 285—131 **15 Claims**



1. A rotating union for supplying compressed air to the end of a journal of a rotating part of a printing press comprising a rotor disposed on the rotational axis of the journal, a fixed tubular housing disposed in surrounding relation about the rotor, a plurality of roller bearings each having inner and outer bearing races disposed between said rotor and tubular housing member for defining a plurality of axially spaced annular air chambers, compressed air supply lines corresponding in number to said annular air chambers and being coupled to said tubular housing member each for communicating pressurized air to a respective one of said annular air chambers, compressed air discharge lines connected to said rotor and each communicating with a respective one of said annular air chambers, and sealing discs each being affixed adjacent an axial end of one of said races of each said bearing and which in response to communication of pressurized air to said annular air chambers sealingly engage the axial end of the other race of the respective bearing to effect sealing of the annular air chambers and which upon the interruption of communication of pressurized air to said air chambers permit relative movement of the disc without substantial frictional contact with the other race.

5,110,160

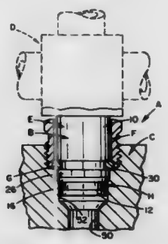
HIGH PRESSURE PORT FITTING SYSTEM

Darko Brozovic, Richmond Heights, Ohio, assignor to Fluid Line Products, Inc., Willoughby, Ohio

Filed Aug. 23, 1990, Ser. No. 572,124

Int. Cl.[5] **F16L** *41/14*

U.S. Cl. 285—211 **19 Claims**



1. A high pressure fitting assembly comprising:

a body having a fluid passage extending therethrough from a first end to a second end, the body including a first peripheral groove adjacent the second end for receiving a seal member therein, and a frusto-conical portion axially interposed between the groove and first end;

a fastening sleeve received over the body and being operatively associated therewith, the sleeve being externally threaded along a portion thereof; and

a port having a bore adapted to communicate with the fluid passage of the body, a smooth walled first counterbore for closely receiving the body second end and seal member therein, a threaded second counterbore for receiving the fastening sleeve in threaded engagement and securing the body in the port, and a frusto-conical region interconnecting the first and second counterbores being dimensioned for sealing engagement with the frusto-conical portion of the body.

5,110,161

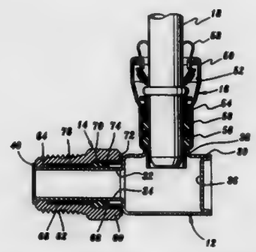
MEANS OF IMPROVING PERFORMANCE OF SWIVELLING PRESSURE SEALING DEVICES

Donald D. Bartholomew, Mt. Clemens, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Filed Nov. 13, 1990, Ser. No. 612,258

Int. Cl.[5] **F16L** *27/08*

U.S. Cl. 285—281 **6 Claims**



1. A swivellable fitting assembly comprising:

a housing including an extending stem, and means for receiving a conduit, said stem including an axial bore such that fluid may pass through said housing;

a rotatable nipple having an axial bore therethrough, means for securing said nipple with said stem, said axial bore having at least one increased diameter portion and an end portion of the axial bore closely surrounding said stem;

sealing means for sealing said stem portion with said rotatable nipple, said sealing means positioned about said stem and in sealing contact with said rotatable nipple in said at least one said increased diameter portion of said axial bore; and

spacer means for spacing said rotatable nipple with said stem portion, said spacer means including a cylindrical spacer extending from said end portion of said axial bore to said sealing means, said cylindrical spacer positioned in a first enlarged diameter portion of said axial bore, a second spacer extending from said sealing means and extending out the other end of said nipple and positioned in a second enlarged diameter portion of said axial bore such that said sealing means is limited in compression to provide sealing between said rotatable nipple and said stem portion of said housing.

5,110,162

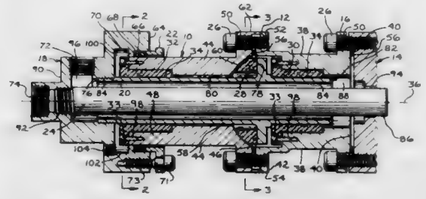
ANTI-CORROSIVE ROTARY JOINT

John H. Peter, Three Rivers, and Gerald L. Timm, Schoolcraft, both of Mich., assignors to The Johnson Corporation, Three Rivers, Mich.

Filed Feb. 28, 1991, Ser. No. 661,598

Int. Cl.[5] **F16L** *27/08*

U.S. Cl. 285—281 **13 Claims**



1. A rotary joint for use with apparatus rotating about an axis particularly characterized by its ability to accommodate high temperature corrosive fluid flow comprising, in combination:

A. an elongated tubular housing having an axis, inner and outer ends, a longitudinal bore intersecting said ends and a radially extending seal surface intersecting said bore,

B. housing mounting means defined on said housing inner end for mounting said housing upon the apparatus concentric to the axis thereof for rotation with the apparatus, a passage defined in said mounting means communicating with said housing bore in communication with the apparatus upon said mounting means being mounted upon the apparatus,

C. an elongated tubular nipple within said housing bore having an axis, an outer surface, inner and outer ends, and a radially extending seal surface extending from said outer surface in axially spaced opposed relation to said housing seal surface, said nipple bore being in communication with said housing bore at said nipple inner end,

D. an axially spaced bearing means interposed between said housing bore and said nipple outer surface maintaining said nipple axis coaxial with said housing axis,

E. An annular seal circumscribing said nipple interposed between and engaging said housing and nipple seal surfaces sealing said nipple with respect to said housing,

F. a head mounted upon and enclosing said housing outer end, said head having an inner end and an outer end, an inlet port defined in said head and a nipple support defined in said head concentric to said nipple axis, said nipple outer end being fixed within said nipple support, said nipple bore being in communication with said inlet port at said nipple outer end, and

G. a head seal interposed between said head and said housing outer end permitting said housing relative rotational and axial movement with respect to said head, said nipple bore, housing bore and housing mounting means passage establishing communication between the apparatus and said head port.

5,110,163

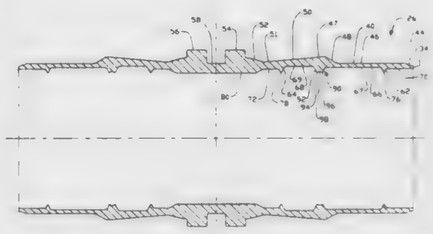
PIPE FITTING WITH IMPROVED COUPLING BODY

Robert W. Benson, San Carlos; Christopher G. Dietemann, San Francisco; Mark J. Beiley, Daly City, and Sohel A. Sareshwala, San Leandro, all of Calif., assignors to Lokring Corporation, Forster City, Calif.

Filed Mar. 22, 1990, Ser. No. 497,505

Int. Cl.[5] **F16L** *13/14*

U.S. Cl. 285—382.2 **35 Claims**



1. An apparatus for making pipe connections comprising:

a coupling body with a first surface adapted for receiving a pipe, which pipe has an initial shape;

a swage ring means which is adapted for being urgeable relative to the pipe in order to cause at least part of the first surface to engage the pipe to create a seal;

said first surface of the coupling body describing a first tooth means for substantial biting into the pipe as said swage ring means is urged relative to the pipe;

said first surface describing a second tooth means for making at least a minimal bite into the pipe as said swage ring means is urged relative to the pipe;

a groove defined between the first tooth means and the second tooth means;

said groove defining a length between the first tooth means and the second tooth means;

said groove having a bottom and defining a depth which represents a distance that the first tooth means extend from the bottom;

wherein the length and depth of the groove are selected so that a portion of the pipe located between the first tooth means and the second tooth means substantially retains an initial shape after the swage ring means has caused the first tooth means and the second tooth means to bite into the pipe;

said first surface describing a third tooth means for making at least a minimal bite into the pipe as said swage ring means is urged relative to the pipe, said third tooth means located on the opposite side of the first tooth means from the second tooth means;

a second groove defined between the first tooth means and the third tooth means;

said second groove defining a second length between the first tooth means and the third tooth means;

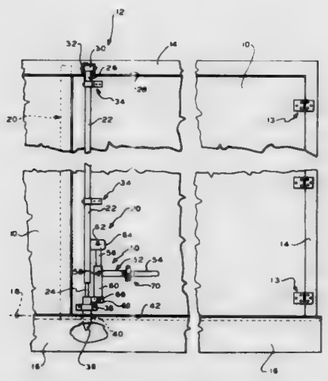
said second groove having a second bottom and defining a second depth which represents a second distance that the first tooth means extend from the second bottom;

wherein the second length and the second depth of the second grooves are selected so that a second portion of the pipe located between the first tooth means and the third tooth means substantially retain an initial shape after the swage ring means has caused the first tooth means and the third tooth means to bite into the pipe;

wherein the coupling body defines a pipe receiving end and wherein said third tooth means is located more distantly from the pipe receiving end than the first tooth means;

said first surface is an inner surface and said coupling body having an outer surface defining a reverse taper means for assisting the swage ring in urging the first tooth means to bite into the pipe, which reverse taper means protrudes a greater distance from the outer surface substantially adjacent to the first tooth means and slopes downwardly to a position substantially adjacent to the third tooth means.

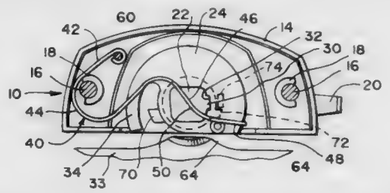
5,110,164
LATCHING APPARATUS FOR A PANEL DOOR
Paul L. Whiteman, Morgantown, and William Hurst, New Holland, both of Pa., assignors to Morgan Trailer Mfg. Co., Morgantown, Pa.
Filed Sep. 27, 1991, Ser. No. 766,772
Int. Cl.[5] F05C *9/00*
U.S. Cl. 292—4 **13 Claims**



1. Apparatus for latching a door closed, the door having upper and lower edges, the apparatus comprising:
(a) first and second elongated rods telescoped together for relative sliding movement;
(b) first means for mounting the first rod to the door with its free end proximate the upper door edge so that the first rod is free to rotate about its longitudinal axis but is prevented from moving longitudinally;
(c) second means for mounting the second rod to the door with its free end proximate the lower door edge so that the second rod is free to rotate about its longitudinal axis and to move longitudinally;
(d) a manipulable operating handle;
(e) linkage means interconnecting the rods and the handle for
(i) longitudinally moving the free end of the second rod toward or away from the lower door edge in response to rotation of the handle about an axis which is generally perpendicular to the longitudinal axes of the rods; and
(ii) rotating the free ends of the rods in a first or a second direction in response to rotation of the handle in the first or the second direction about an axis which is coincident with the longitudinal axes of the rods;
(f) third means for latching or unlatching the lower edge of the closed door in response to movement of the free end of the second rod toward or away from the lower edge; and
(g) fourth means for latching or unlatching the upper edge of the closed door in response to rotation of the free end of the first rod in the first or the second direction.

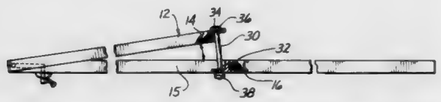
5,110,165
BIASED CHECK RAIL LOCK
Stephen M. Piltingsrud, Owatonna, Minn., assignor to Truth Division of SPX Corporation, Owatonna, Minn.
Filed Feb. 12, 1991, Ser. No. 653,969
Int. Cl.[5] E05C *3/04*
U.S. Cl. 292—242 **14 Claims**

1. In a window lock having a cam pivotable relative to a housing between a first position extending from said housing to engage a keeper to lock said window and a second position with substantially all of said cam located within said housing, the improvement comprising means for biasing said cam toward said second position when said cam is not in said first position and up to at least 60° from said second position, where said biasing means does not bias said cam toward said second



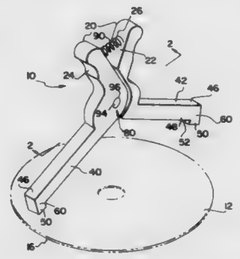
position when said cam is within at least 50° of said first position.

5,110,166
SAFETY LOCK FOR A CRANKED WINDOW
Wilbur N. Brown, 652 Devonshire Dr., Oxnard, Calif. 93030
Filed Feb. 25, 1991, Ser. No. 659,891
Int. Cl.[5] E05C *17/12*
U.S. Cl. 292—262 **20 Claims**



1. A security lock for a cranked window having a movable frame and stationary frame with flange portions comprising:
a first bore defined through said flange portion of said movable frame;
a second bore defined through said flange portion of said stationary frame; and
a substantially rigid nonextensible means disposed through said first and second bore for limiting movement of said movable frame relative to said stationary frame,
whereby said cranked window may be opened to provide ventilation while prohibiting forced entry through said window.

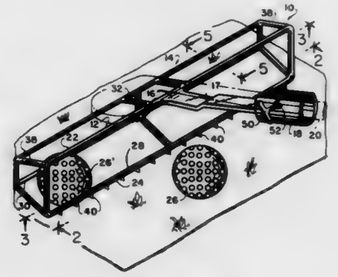
5,110,167
DISC HANDLING DEVICE, METHOD OF USE AND PACKAGE
Robert N. Friend, 1308 Willow Ave., Melrose Park, Pa. 19026
Filed Jun. 7, 1990, Ser. No. 534,803
Int. Cl.[5] B25J *15/08*; **B25B** *9/00*
U.S. Cl. 294—16 **5 Claims**



1. A device for handling and moving relatively fragile, flexible discs, of substantial diameter, wherein said discs have an upper edge and a lower edge, said device comprising: (a) handle means for actuating the device, (b) a first and second

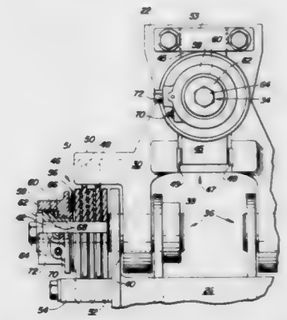
substantially straight arm connected to said handle means at a juncture and generally extending away from each other, each of said first and second arms comprising a distal end, a proximal end and a gripper means for gripping the upper and lower edges of the disc, said gripper means being attached to each of the distal ends, the first and second arms being movably attached to each other at their proximal ends, said gripper means including a first inner surface on each of the first and second arms which meet in an obtuse angle whereby discs of substantial diameter can be handled by said device, and said gripper means also including a second inner surface extending from each of said distal ends, each said second inner surface being at an angle of approximately 90° to a respective first inner surface, the first and second inner surfaces of said gripper means making point contact with a portion of said upper and lower edges of said disc to confine said disc edge portion between said first and second inner surfaces, (c) pivot means for pivoting said first and second arms in response to actuation of said handle means, said pivot means being located at the juncture of said handle means and said first and second arms, and spring means normally urging said first and second arms toward each other whereby said relatively fragile, flexible discs of substantial diameter are handled and moved from a first location to a second location.

5,110,168
GOLF BALL RETRIEVER
John Petrillo, Sherwood Hill Rd., Brewster, N.Y. 10509
Filed Jun. 21, 1990, Ser. No. 541,849
Int. Cl.[5] A63B *47/02*
U.S. Cl. 294—19.2 **15 Claims**



1. A golf ball retriever, comprising;
an elongate head part for retrieving golf balls on land or from a body of water, said head part comprising:
a forward open frame part defining a generally rectangular mouth opening with parallel upper and lower leading members spaced apart enough so that a stationary golf ball can enter the mouth opening when the lower leading member of the forward frame part is swept beneath the golf ball, and
a rear open frame part for preventing golf balls entering said mouth opening from escaping from the head part in the direction in which the golf balls enter said mouth opening, said rear frame part having parallel upper and lower trailing members spaced apart less than the diameter of a golf ball, said lower trailing member defining a rear seat edge parallel to the lower leading member of the forward frame part and spaced from the lower leading member a distance slightly less than the diameter of a golf ball so that the golf ball can be seated between the rear seat edge and the lower leading member after entering said mouth opening;
means for connecting said forward frame part to said rear frame part, in open spaced relation relative to one another, including rigid rod like members extending between the upper leading and trailing members, and between the lower leading and trailing members, respectively; and
means for fixing one end of a handle to the head part; and
wherein
said forward frame part has a number of forwardly directed, downwardly inclined projections spaced from one another along the length of the lower leading member, for applying a dislodging the force on golf balls embedded in a ground or water bottom surface; and
said fixing means is arranged so that an attached handle will apply a pulling force to said head part and enable the projections along the length of the lower leading member to be urged against and underneath a golf ball embedded in the ground or water bottom surface for dislodging the ball and causing the ball to be directed into the mouth opening of the forward frame part.

5,110,169
GREASE LOADED GRAPPLE DAMPENER
Leonard L. Shepherd, and Cyril W. VonFumetti, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Oct. 3, 1990, Ser. No. 592,714
Int. Cl.[5] B66C *1/00, 13/06*; **F16F** *11/00*
U.S. Cl. 294—119.4 **2 Claims**



1. A grapple suspension assembly comprising:
a swivel link having a first pivot connection for pivotally coupling the swivel link to a boom and a second pivot connection which is generally orthogonally arranged respective of the first pivot connection for pivotally coupling the swivel link to a grapple;
a first pivot pin located in the first pivot connection;
a second pivot pin located in the second pivot connection;
a first set of friction plates mounted to the first pivot pin and operatively coupled to the swivel link, the first set of friction plates also being adapted to be mounted to a boom for providing a braking force between the swivel link and a boom to which the swivel link is mounted;
a first grease dampener mounted to the first pivot pin and in contact with the first set of friction plates for compressing the first set of friction plates when pressurized grease is applied to the dampener, the first dampener comprises a grease zerk for injecting grease into the first dampener, a first pressure relief valve for releasing pressurized grease from the first dampener when the grease pressure in the first dampener exceeds a preset level whereby the first pressure relief valve prevents the first grease dampener from over-compressing the first set of friction plates, a first bushing mounted to the first pin and a first annular piston slidably mounted to the first bushing and in contact with the first set of friction plates, and a first cylinder is formed between the first bushing and the first annular piston, whereby when pressurized grease is applied to the first cylinder, the first annular piston is driven towards the first set of friction plates increasing the braking force between the swivel link and a boom to which the swivel link is mounted, the first pivot pin is a stepped pin having

an enlarged portion located in the first pivot connection and a smaller portion located in the first set of friction plates and the first bushing;

a second set of friction plates mounted to the second pivot pin and operatively coupled to the swivel link, the second set of friction plates also being adapted to be mounted to a grapple for providing a braking force between the swivel link and a grapple to which the swivel link is mounted; and

a second grease dampener mounted to the second pivot pin and in contact with the second set of friction plates for compressing the second set of friction plates when pressurized grease is applied to the second dampener, the second dampener comprises a grease zerk for injecting grease into the second dampener, a second pressure relief valve for releasing pressurized grease from the second dampener when the grease pressure inside the second dampener exceeds a preset level whereby the second pressure relief valve prevents the second grease dampener from over-compressing the second set of friction plates, a second bushing mounted to the second pin and a second annular piston slidably mounted to the second bushing and in contact with the second set of friction plates, and a second cylinder is formed between the second bushing and the second annular piston, whereby when pressurized grease is applied to the second cylinder, the second annular piston is driven toward the second set of friction plates increasing the braking force between the swivel link and a grapple to which the swivel link is mounted, the second pivot pin is a stepped pin having an enlarged portion located in the second pivot connection and a smaller portion located in the second set of friction plates and the second bushing

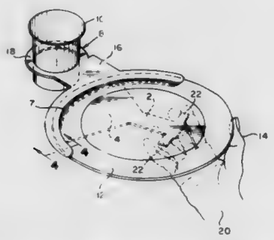
wherein the smaller portion of the first pivot pin is provided with a bolt and a retaining washer against which abuts the first bushing, and the smaller portion of the second pivot pin is provided with a bolt and a retaining washer against which abuts the second bushing.

5,110,170

COMBINATION PLATE AND CUP HOLDING APPARATUS

John c. Boatwright, 7310 Tavenner La., Alexandria, Va. 22306, assignor to John C. Boatwright, Alexandria, Va.

Filed Sep. 19, 1990, Ser. No. 584,630
Int. Cl.[5] A47G *19/08;* **B65D** *6/04*
U.S. Cl. 294—146 **11 Claims**



1. A combination plate and cup holding apparatus, comprising:

(a) plate support means for supporting a plate thereon, said plate support means having a platform member defining a plane for directly supporting a portion of the bottom of a plate thereon;

(b) an arcuate retaining member secured to said plate support means and adapted to receive therein and support the edge of a plate, said retaining member being of sufficient length to retain the plate on said plate support means;

(c) cup support means secured to said retaining member for supporting a cup adjacent the edge of said retaining member; and

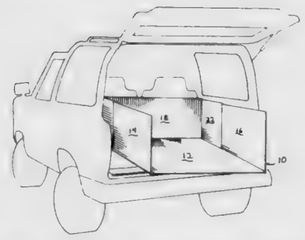
(d) said platform member having an inner portion and extending inwardly from said retaining member, and handle means secured to the inner portion of said platform member and extending substantially in said plane defined by said platform member to enable said apparatus to be held with a single hand by finger-gripping said handle means while the thumb of the hand rests on the adjacent edge of the plate to retain the plate in said retaining member.

5,110,171

PROTECTIVE LINER FOR CARGO AREA OF VEHICLE

Colleen P. Anthony, 2606 East Bay Dr. N.W., Gig Harbor, Wash. 98335

Filed May 29, 1990, Ser. No. 529,557
Int. Cl.[5] B60R *13/01*
U.S. Cl. 296—39.2 **19 Claims**



1. A unitary protective liner for the cargo area of vehicles comprising: a rectangular blank of flexible, semi-rigid material, having forward and rearward first parallel edges and two second parailel side edges orthogonal to said first parallel edges, multiple fold lines substantially parallel to said first parallel edges and multiple fold lines substantially parallel to said second parallel edges, a single pair of cut slits of equal length extending inwardly from said second parallel edges, said pair of cut slits are located opposite each other and extend inwardly from said first parallel edges to a point defined by said fold lines, said pair of cut slits are the only cuts in said blank, and said blank, when assembled by folding into a protective liner for insertion into a vehicle between the wheel wells thereof, has two side panels supported by said wheel wells and a single end panel interlocked with said side panel, said protective liner having an open end opposite side end panel to facilitate loading and unloading of cargo into and out of said protective liner.

5,110,172

VERTICALLY RETRACTABLE SOFT OR FLEXIBLE TAILGATE FOR A PICKUP TRUCK

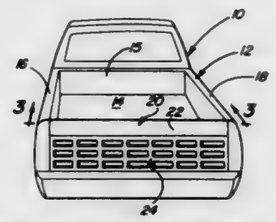
Clyde W. Ney, Waterford, Mich., and Genaro Prats, Mission Viejo, Calif., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 14, 1990, Ser. No. 627,684
Int. Cl.[5] B62D *25/00*
U.S. Cl. 296—50 **14 Claims**

1. A movable tailgate for a pickup truck with side walls comprising:

a tailgate formed from a windable material includes a rigid cross member to be connected to an upper edge of said windable material;

track means for providing movement of said tailgate between a raised position and a lowered position, said tailgate coupled with said track means for movement between said raised and lowered positions and said track means adapted to be coupled with the pickup truck side walls; and



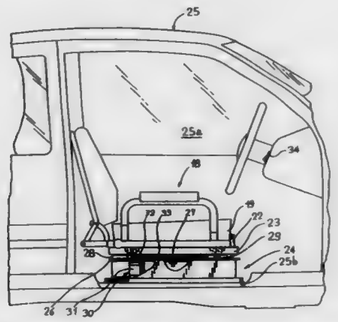
reel means for enabling said tailgate to wind around said reel means when said tailgate is moving between said raised and lowered positions.

5,110,173

WHEELCHAIR FOR INVALIDS

Carmine Megna, Via A. Poliziano 11, Monza 20052, Milan, Italy

Filed Jun. 3, 1991, Ser. No. 709,336
Int. Cl.[5] B60N *1/12*
U.S. Cl. 296—65.1 **6 Claims**



1. A wheelchair for invalids, for selective movement to second guides on an auxiliary support structure, comprising:

(a) a support frame;

(b) a pair of principal wheels mounted on the front part of said support frame;

(c) a pair of directional wheels mounted on the rear part of said frame;

(d) a small chair mounted on the top part of said frame, and being removably connected to the frame; and first guides supported by the frame and for connecting said small chair to said frame, said small chair being disengaged by sliding on the first guides to be transferred to said second guides mounted on said auxiliary support structure,

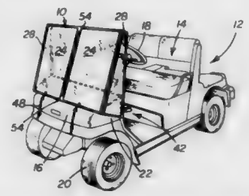
wherein said auxiliary support structure is provided and comprised of a fixed base, a rotating platform engaged on the fixed base, second guides carried by said platform, and means for rotating said platform.

5,110,174

PORTABLE WINDSHIELD ASSEMBLY FOR A RECREATIONAL VEHICLE

David A. Andree, Lexington, Ky., assignor to Vista Enterprises, Inc., Lexington, Ky.

Filed Nov. 16, 1990, Ser. No. 614,397
Int. Cl.[5] B60J *1/06*
U.S. Cl. 296—77.1 **18 Claims**



1. A portable windshield assembly for a recreational vehicle having a cowling and a passenger area, comprising:

at least one windshield panel;

an upright assembly attached to said windshield panel and supporting said windshield panel in an upright position directly on said cowling;

means for collapsing said windshield assembly into a compact configuration for ease of portability; and

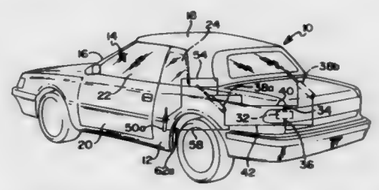
means for mounting said portable windshield assembly directly to said cowling, said upright assembly and mounting means functioning together so as to fully independently support said windshield assembly in an upright position.

5,110,175

CONVERTIBLE WITH AUTOMATIC WINDOW OPERATION

Roderick C. Fischbach, Ann Arbor, Mich., assignor to Wickes Manufacturing Company, Southfield, Mich.

Filed Jul. 26, 1991, Ser. No. 736,607
Int. Cl.[5] B60J *7/00*
U.S. Cl. 296—117 **17 Claims**



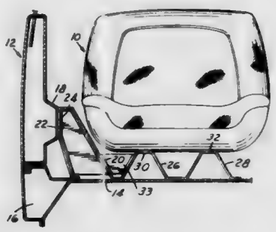
1. In a convertible vehicle having a body with a passenger compartment, a top mounted on the body for movement between a raised position covering the passenger compartment and a lowered position opening the passenger compartment, and a window mounted on the body for movement between raised and lowered positions,

a hydraulic system including a hydraulic pressure fluid source and a first hydraulic actuator for raising and lowering the top, characterized by

a second hydraulic actuator operatively connected to the window and operable to raise and lower the window with less hydraulic pressure than required to raise and lower the top, and

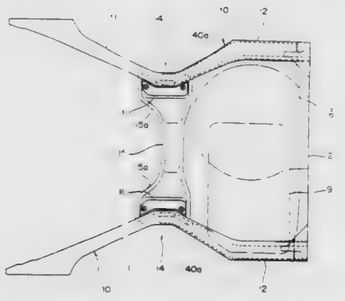
a hydraulic circuit connecting said actuators in parallel so that the hydraulic system is operable to sequentially raise the window and then the top, and to sequentially lower the window and then the top.

5,110,176
AUTOMOTIVE SIDE IMPACT PROTECTION APPARATUS
Cass V. Curtis, Dover, N.H., assignor to Davidson Textron Inc., Dover, N.H.
Filed Jun. 24, 1991, Ser. No. 719,923
Int. Cl.[5] B62D *25/05*
U.S. Cl. 296—188 **4 Claims**



1. A side impact protection apparatus for use with an automotive door and a seat mounted on seat reinforcement trusses on an underbody, said apparatus comprising a face plate formed on the lower inner portion of the door and having a vertical inner face, and reinforcement means having a vertical outboard face for interfacing with said vertical inner face of said face plate when said door is closed and secured to said seat reinforcement trusses.

5,110,177
AUTOMOBILE REAR BODY STRUCTURE
Shibata Akio, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Sep. 18, 1990, Ser. No. 584,577
Claims priority, application Japan, Sep. 30, 1989, 1-115259[U]
Int. Cl.[5] B60R *27/00*
U.S. Cl. 296—189 **26 Claims**



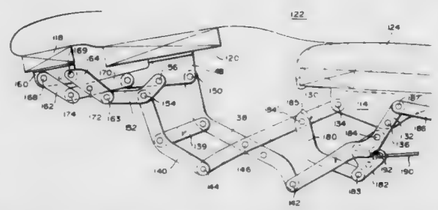
1. An automobile rear body structure comprising:
a pair of rear side frames extending in directions to be longitudinal of a vehicle body;
a cross member extending transversely between said pair of rear side frames and having opposite ends connected rigidly thereto at joints in respective rear wheel zones thereof, each said rear side frame including a rear portion extending rearwardly from the respective said joint with said cross member; a rear suspension cross member extending below and along and being secured to a lower surface of said cross member; and
each said rear side frame including means for, in the event of a rear-end collision with said structure, causing said rear side frame to bend at a location immediately rearwardly of the respective said joint, such that each said rear portion bends as a unit and such that a fuel tank to be positioned between said rear portions is protected from damage.

5,110,178
T-TOP ROOF COVER
Natalie R. Love, 3604 Telmar Rd., Baltimore, Md. 21207
Filed Dec. 14, 1990, Ser. No. 627,321
Int. Cl.[5] B60J *7/10*
U.S. Cl. 296—218 **15 Claims**



1. A removable cover for automobiles with a T-top roof comprising:
(a) a cover made of flexible, waterproof material which is large enough to cover the roof area of an automobile having a T-top roof, front, rear and side windows, which cover has a front edge, a rear edge, two side edges, and four areas between the front and side edges and rear and side edges;
(b) means of attachment by which the cover may be attached to and removed from the frame of the automobile;
(c) means adjacent the side edges of the cover engageable with the side windows to establish a seal along the side windows, and means adjacent the front edge of the cover to establish a seal along the frame adjacent the front window; and
(d) wherein said means of attachment includes a fastener means at each of said four areas of said cover for securing the cover to an exterior surface of the automobile at a level below an upper edge of the side windows.

5,110,179
RECLINER CHAIR
Walter C. Rogers, P.O. Box 685, Denton, N.C. 27239
Division of Ser. No. 463,461, Jan. 11, 1990, which is a continuation-in-part of Ser. No. 361,309, Jun. 5, 1989, Pat. No. 4,915,444. This application May 6, 1991, Ser. No. 696,005
Int. Cl.[5] A47C *1/02*
U.S. Cl. 297—68 **3 Claims**



1. A recliner chair comprising in combination a basic support, a seat and backrest, a linkage system mounting the seat and backrest on the basic support, a footrest linkage mounted at the front of the chair for movement between retracted and extended positions, a footrest frame connected to the footrest linkage to move between a retracted position below the seat and inwardly of the front end of the seat and an extended position projecting forwardly from the front end of the seat, a second footrest frame connected to the footrest linkage between the first frame and the seat, a layer of upholstery overlying and connected to the seat and extending over the second frame and to the first footrest frame while being connected to the first frame, said upholstery layer extending from the seat to the first footrest frame when the footrest is in extended position to provide a leg and foot support surface, and extending about the front end of the seat and below the seat when the footrest is in retracted position, said upholstery layer being exposed to view at the front of the chair below the seat when the footrest is in retracted position.

5,110,180
CONVERTIBLE CHAIR-BED FOR INDOOR AND OUTDOOR USE
Rudolf T. Schneider, von Galen-Strasse 8, DE-6400 Fulda, Fed. Rep. of Germany
PCT No. PCT/EP88/00324, § 371 Date Oct. 11, 1989, § 102(e) Date Oct. 11, 1989, PCT Pub. No. WO88/07827, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 15, 1988, Ser. No. 432,738
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1987, 3713117; Oct. 20, 1987, 3735498
Int. Cl.[5] A47C *1/02*
U.S. Cl. 297—78 **20 Claims**



1. A convertible chair-bed comprising:
first and second supports pivotally connected one to the other at adjoining ends to form a first joint;
a sitting and reclining surface including a backrest, a seat and a leg rest each having opposite end edges, said seat being pivotally coupled to an adjoining end edge of said backrest to form a second joint and to an adjoining end edge of said leg rest to form a third joint spaced from said second joint;
means for pivotally coupling said seat and said first support to define a fourth joint at a location along said seat intermediate said second and third joints and spaced along said first support from said first joint;
means for pivotally coupling said backrest and said second support to define a fifth joint at a location along said backrest spaced from said second joint and along said second support spaced from said first joint;
said first, second, fourth and fifth joints forming the end joints of a first quadrangle meeting the condition

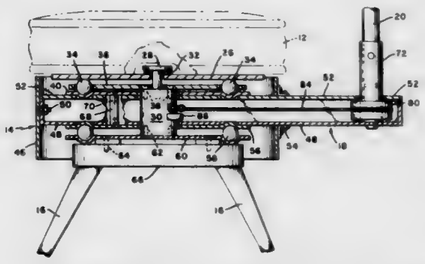
$$a+b>c+d$$

wherein a is the distance between said first and fourth joints, b is the distance between said first and fifth joints, c is the distance between said fifth and second joints, and d is the distance between said second and fourth joints;
a foot support connected to said leg rest to define a sixth joint at a location along said leg rest spaced from said third joint and to said first support to define a seventh joint at a location spaced from said fourth joint and along the opposite side thereof from said first joint;
said third, fourth, sixth and seventh joints forming the end points of a second quadrangle meeting the condition

$$e+f>g+h$$

wherein e is the distance between said sixth and seventh joints, f is the distance between said fourth and seventh joints, g is the distance between said third and fourth joints and h is the distance between said third and sixth joints;
seat and back support members coupled to said seat and backrest, respectively, for changing said chair-bed from a sitting position to a reclining position and vice versa in response to movement of either member.

5,110,181
CHAIR WITH MOVING SEAT AND MOVING MIRROR
Luther G. Simjian, Fort Lauderdale, Fla., assignor to Command Automation, Inc., Fort Lauderdale, Fla.
Continuation of Ser. No. 550,449, Jul. 10, 1990, abandoned. This application Jun. 17, 1991, Ser. No. 716,267
Int. Cl.[5] A47C *7/62*
U.S. Cl. 297—185 **5 Claims**



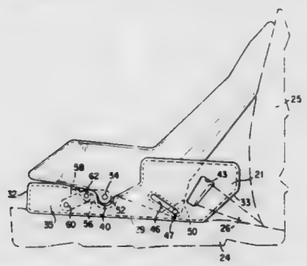
1. A chair with moving seat and moving mirror comprising
a stationary center post having an upper end and a lower end
a seat mounting plate fastened for rotation about its center to the upper end of said center post;
a first set of bearing balls disposed for frictionally engaging the underside of said seat mounting plate;
a stationary ball retaining plate fastened to the upper end of said center post for retaining the balls of said first set in spaced relationship to one another and for providing rotation of the respective balls in place;
a stationary leg support disposed underneath said center post;
a ball race plate supporting a second set of bearing balls disposed between the lower end of said center post and said leg support and fastened respectively to said center post and to said leg support;
a horizontally disposed beam having one end extending toward the rear of the chair and being coupled between said first set of bearing balls and said second set of bearing balls,
whereby responsive to the rotation of said seat mounting plate the balls of said first set are caused to rotate in place, thereby causing said beam to be driven in coordinated counterrotation with said seat mounting plate, and said second set of bearing balls provide relief for such rotation relative to said stationary center post and said leg support;
a substantially vertically disposed mirror support arm rotatably mounted at its lower end to said beam end extending toward the rear of said seat mounting plate, and said arm supporting at its upper end a mirror having a reflecting face plate for reflecting an image toward a stationary mirror disposed in front of said chair;
linkage means connected between said lower end of said mirror support arm and said stationary center post for causing said arm with mirror mounted thereto to rotate about its substantially vertical axis in the same direction as said seat mounting plate while said beam undergoes counterrotation relative to said seat mounting plate.

whereby said mirror face plate, responsive to the rotation of said seat mounting plate and the coordinated counterrotation of said beam, is caused to assume a position substantially tangential along a circle having its center located forward of the axis of rotation of said seat mounting plate for presenting in the stationary mirror a substantially stationary image from the rear of a person sitting on the chair.

5,110,182
PORTABLE SEAT

Randall Beauvais, Fenton, Mo., assignor to Life Force Associates, L.P., Fenton, Mo.

Filed Oct. 21, 1988, Ser. No. 260,598
Int. Cl.[5] B60R *21/00*
U.S. Cl. 297—216 **19 Claims**

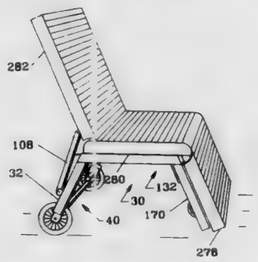


1. A portable seat that can be installed on a seat of a vehicle that is subject to sudden deceleration, the portable seat comprising a base section having means for releasably mounting the base section onto a vehicle seat, a seat section, and means connected between the seat section and the base section for providing relative movement between the seat section and the base section, to absorb energy of inertia upon sudden deceleration of the vehicle, wherein the means for providing movement between the seat section and the base section includes means for raising both forward and rearward parts of the seat section as the seat section is moved forward by inertia relative to the base section.

5,110,183
CUSTOMIZED HOME CHAIR AND METHOD OF MANUFACTURE

Isaac W. Jeanes III, 119 Spruce St., Pulaski, Va. 24301, assignor to Comfy Care, Inc. and Isaac W. Jeanes III, Pulaski, Va., a part interest

Filed Dec. 10, 1987, Ser. No. 131,648
Int. Cl.[5] A47C *1/032*
U.S. Cl. 297—343 **23 Claims**

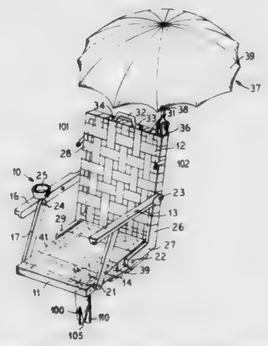


1. A reclining chair device comprising:
a frame including a plurality of legs providing support for the front and rear of said frame;
a seat movably connected to the frame;
means secured to said frame for applying substantially linear movement to the seat wherein said means is defined by the frame and constrains seat movement in a substantially linear direction therealong such that the seat is guided longitudinally along the frame thereby permitting the seat to be guided at generally the same height as it is moved forwardly and as it is moved rearwardly;
a backrest pivotally connected at a first pivot point to the seat such that the angular position of said backrest with respect o the seat is adjustable and such that the backrest moves longitudinally with the seat;
a legrest pivotally connected at a second pivot point to the seat wherein the angular position of said legrest with respect to said seat is adjustable wherein the legrest is movable longitudinally therewith and wherein the legrest is devoid of direct supporting linking means to the frame to adjust the angular position of the legrest with respect to the seat;
a platform comprising the seat, the legrest, and the backrest, wherein said platform is supported by the frame and wherein structural members of the frame supporting said platform are substantially on the underside of the uppermost portions of the platform in all backrest positions from a fully reclined backrest position to a fully raised backrest position thereby facilitating ingress and egress;
means secured to at least one of said legrest and said backrest to orient the legrest, the seat, and the backrest into a substantially coplanar relationship such that the reclining chair device may be used as a bed;
means connected to one of said frame and said seat for altering the angel of the seat with respect to the horizontal thereby allowing the occupant to be more comfortable; and
means for raising and lowering the backrest wherein said means for raising and lowering the backrest support the backrest in all backrest positions are substantially located beneath the uppermost portions of the backrest in all backrest positions, wherein the angular position of the backrest with respect to the seat is infinitely adjustable between backrest positions, wherein as the seat moves rearwardly the backrest raises, wherein said means for raising and lowering the backrest is secured to at least one of said seat and said frame, wherein as the seat moves forwardly the backrest reclines thereby moving an occupant of said chair forwardly as the backrest reclines, and wherein the center of gravity is moved forwardly as the backrest reclines.

5,110,184
ROTATABLE BEACH CHAIR

Scott C. Stein; Craig B. Stein, and Sean T. Stein, all of 415 Coral Way, Ft. Lauderdale, Fla. 33301

Filed Aug. 29, 1991, Ser. No. 751,560
Int. Cl.[5] A47C *1/02*
U.S. Cl. 297—349 **6 Claims**



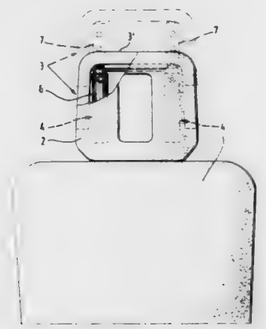
1. An improved beach chair having a seat portion and a back portion pivotally connected together, a pair of arm rests and arm rest supports pivotally connected to said seat portion and

back portion, a ground engaging spike connected to said seat portion and said spike rotatably mounted to said seat portion so that said beach chair can be rotated relative to said spike, wherein said spike has a first pointed ground engaging portion and a second portion which is attached to said seat portion and which is rotatably connected to said first pointed ground engaging portion of said spike, wherein a bearing is mounted between said first pointed ground engaging portion and said second portion which is attached to said seat portion, and wherein said second portion which is attached to said seat portion is formed with a cylindrical-shaped opening and said first pointed portion has an extension which is received within said cylindrical-shaped opening and said bearing is mounted in said cylindrical-shaped opening between said first and second portions of said spike.

5,110,185
VEHICLE SEAT

Christian Schmutz, Kaiserslautern, and Günther Franzmann, Rockenhausen, both of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed Sep. 5, 1990, Ser. No. 577,548
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1989, 3930171
Int. Cl.[5] B60R *22/28, 21/13;* **B60N** *2/46*
U.S. Cl. 297—410 **9 Claims**

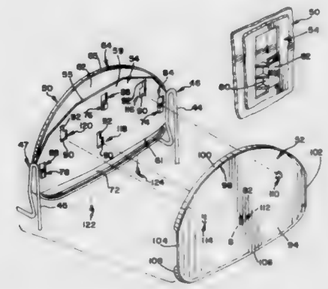


1. A vehicle seat, said seat adapted especially for motor vehicles of convertible or coupe construction, said vehicles each having a removable roof, comprising:
a back rest having a support structure associated therewith, said back rest having an upper end,
a rollover protection member located on said back rest,
an adjustment device including at least one drive means adapted for fast activation,
said rollover protection member being rapidly movable by said adjustment means in a displacement direction from a rest position to an operating position in which said member protrudes upwards over said back rest upper end,
a pre-tensioned coil spring extendable when the rollover protection member is released in the displacement direction, where that end of the coil spring which is provided to move the rollover protection member into an operating position is held in a pre-tensioned position by positive interlock means which is adapted to be moved into a release position by means of an electromagnet activation element,
at least one sensor capable of sensing a vehicle rollover condition for signaling activation of said activation element,
an interlock means comprising two movable catches, said catches being oppositely pivotable and further comprising a toggle lever means adapted to be electrically activated for operating said catches, and
an electromagnet for activating said toggle means, a dead response provided in the connection between the electromagnet and said toggle lever means, thereby enabling the armature of the electromagnet to move prior to the toggle lever moving from a position which holds the interlock means in the interlock position, where the interlock means preferably occupies a position above a dead point into a kink position, which corresponds to a release position.

5,110,186
BACK ASSEMBLY FOR WIRE ROD OFFICE FURNITURE STACKING CHAIR

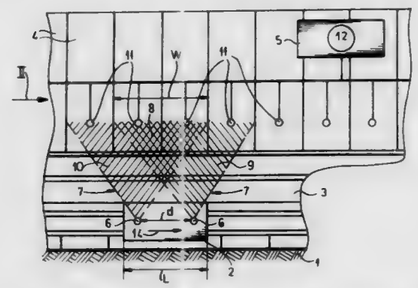
Craig A. Clark, Montgomery, Ill., and Robert J. Poortvliet, Jenison, Mich., assignors to Allsteel Inc., Aurora, Ill.

Division of Ser. No. 528,317, May 23, 1990, Pat. No. 5,064,247.
This application Mar. 28, 1991, Ser. No. 676,326
Int. Cl.[5] A47C *7/00*
U.S. Cl. 297—444 **5 Claims**



1. A back for an office furniture chair;
said chair back comprising an assembly including:
a back pan comprising a metallic plate of predetermined thickness and marginal configuration,
an inner imperforate opaque back member,
an outer imperforate opaque back member,
said back members being formed from a plastic material, being of similar sizing and marginal configuration, and being disposed in interfitting relation on either side of said back pan in encapsulation relation thereto to define oppositely facing, outer, smoothly contoured and imperforate back surfaces for said chair back on either side thereof,
said back members and said back pan including interfitting means masked by said back members for securing said back members to said back pan,
said interfitting means comprising:
a first set of similarly located hook and keyhole slot means defined by said inner back member and said back pan for mounting said inner back member on one side of said back pan by limited movement of said inner back member relative to said back pan, and
a second and separately positioned set of similarly located hook and keyhole slot means defined by said outer back member and said back pan for mounting said outer back member on the other side of said back pan by limited movement of said outer back member relative to said back pan,
and including self-tapping means for securing said back members against said movement thereof relative to said back pan, when said interfitting means sets are respectively in their respective interfitting relations.

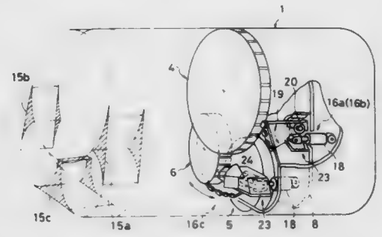
5,110,187
APPARATUS FOR THE MINING OF MINERAL MATTER, ESPECIALLY COAL
Peter Heintzmann, Bochum; Karl-Heinz Berger, Herten, and Peter Walbrodt, Hünxe, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhutte Heintzmann GmbH & Co. KG, Bochum, Fed. Rep. of Germany
Filed Mar. 7, 1991, Ser. No. 666,399
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1991, 4103545
Int. Cl.[5] E21D *23/14*
U.S. Cl. 299—1.4 **18 Claims**



1. A mining apparatus for the mining of a mineral face, comprising:
a mining machine displaceable back and forth along said face for mining mineral matter therefrom, thereby advancing said face;
a conveyor device positioned to receive mined mineral matter dislodged from said face by said mining machine for removing said mineral matter;
an array of walking props extending along said face and advanceable as said face is advanced, said mining machine being provided with two signal emitters trained toward said array and each emitting a diverging beam of electromagnetic radiation with at least one characteristic different from that of the other of said beams so that with respect to travel of said mining machine, one of said beams exclusively forms a leading zone, the other of said beams exclusively forms a trailing zone and said beams are superimposed in an overlapping region;
at least one signal receiver responsive to said electromagnetic radiation from both of said signal emitters on each of said walking props; and
control means connected to the signal receivers of said walking props and responsive to the different characteristics of said beams for controlling advance of said walking props to enable said walking props to follow advance of said face.

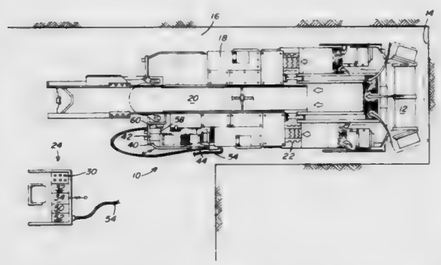
5,110,188
DEFORMED SHIELD TUNNELING METHOD AND TUNNELING MACHINE
Kazunari Kawai, and Norio Mitani, both of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
PCT No. PCT/JP90/00093, § 371 Date Jul. 30, 1991, § 102(e) Date Jul. 30, 1991, PCT Pub. No. WO90/09509, PCT Pub. Date Aug. 23, 1990
PCT Filed Jan. 26, 1990, Ser. No. 730,909
Claims priority, application Japan, Feb. 7, 1989, 1-27813
Int. Cl.[5] E21D *9/08*
U.S. Cl. 299—10 **2 Claims**

1. A deformed shield tunneling method for constructing a predetermined deformed section, comprising the steps of:
excavating a tunnel surface by rotating a plurality of circular cutters arranged in the front of a front casing of a tunneling machine;
cutting soil in a tangent portion of circles formed between said circular cutters by rocking a rocking cutter against said tangent portion;



letting a residual soil portion between the cuts of said circular cutters and the cut of said rocking cutter naturally fall; and
employing a protective cover attached to said rocking cutter to prevent intrusion of soil into the drive mechanism for said rocking cutter during excavation and to prevent soil collapse from the tunnel surface after excavation.

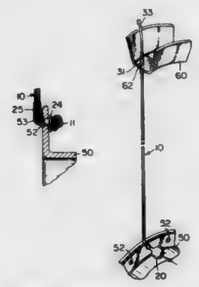
5,110,189
REDUNDANT REMOTE CONTROL SYSTEM USED ON A CONTINUOUS MINER AND METHOD OF USING SAME
Marvin L. Haines, Bridgeport, W. Va., assignor to Tamrock World Corporation, Netherlands Antilles
Filed Nov. 16, 1990, Ser. No. 614,703
Int. Cl.[5] E21C *35/24*
U.S. Cl. 299—30 **10 Claims**



1. A method of remote control for use on a continuous miner comprising the steps of,
providing for the remote control of a continuous miner a first system having at least one switch, a first multiplexer, a first transmitter, a first receiver, a first demultiplexer and a first continuous miner interface,
positioning said switch, said first multiplexer, and said first transmitter in an operator station located remote from said continuous miner,
connecting said first receiver and said first demultiplexer to said first continuous miner interface on said continuous mining machine,
translating a signal from said first demultiplexer by said continuous miner interface into miner functions,
providing for the remote control of said continuous mining machine a second system having a second multiplexer, a second transmitter, a second receiver and a second demultiplexer,
arranging said second multiplexer and said second transmitter in said operator station,

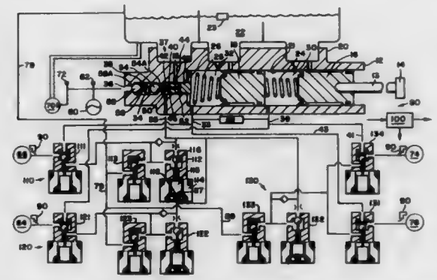
connecting said second receiver and said second demultiplexer to said continuous miner, and
interconnecting said second demultiplexer with said continuous miner interface to receive a signal from said second system to initiate miner functions in the event of failure of said first system.

5,110,190
HIGH MODULUS MULTIFILAMENT SPOKES AND METHOD
Harold M. Johnson, 2903 Legion Ave. N., Lake Elmo, Minn. 55042
Filed Mar. 16, 1990, Ser. No. 495,281
Int. Cl.[5] B60B *1/00*
U.S. Cl. 301—55 **43 Claims**



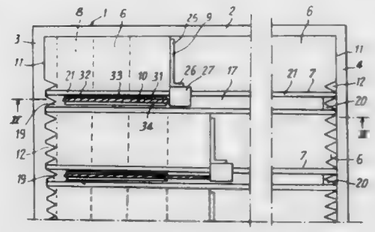
1. A non-rigid spoke comprising:
(a) a flexible mid-portion extending between first and second ends said flexible mid-portion comprising a non-rigid spoke material;
(b) a first attachment means affixed adjacent said spoke first end; and
(c) a second attachment means affixed adjacent said spoke second end wherein said spoke has a tensile strength of at least about 0.2×10^6 psi, said non-rigid spoke material flexes without mechanical failure and is load supporting only in tension.

5,110,191
MASTER CYLINDER WITH INTEGRATED SUPPLY REGULATOR
G. Emerson Brown, Niles, Mich., assignor to Allied-Signal Inc., Morristown, N.J.
Filed Aug. 17, 1990, Ser. No. 570,931
Int. Cl.[5] B60T *8/32*
U.S. Cl. 303—113 R **14 Claims**



1. A master cylinder with an integrated fluid supply regulator utilized with an adaptive braking system, comprising a master cylinder for operating a braking system of a vehicle, reservoir means connected with said master cylinder in order to provide fluid for utilization by the master cylinder, one end of the master cylinder including a bore having therein a fluid supply regulator for operating a regulator valve disposed adjacent valving means connected with a fluid pressure supply, the bore having connections with the reservoir and with an adaptive braking system line connection, the adaptive braking system connected with the adaptive braking system line connection and vehicle brakes, and control means for operating said adaptive braking system, the regulator displacable solely by fluid pressure effected by a piston of the master cylinder such that the regulator opens the regulator valve and fluid pressure received from the fluid pressure supply communicates through said bore to said line connection and to said adaptive braking system and for communication to wheel brakes only during adaptive braking, and said regulator also being engagable by said piston when the piston is substantially displaced so that the regulator effects the opening of the regulator valve and permits pressurized fluid to communicate with said adaptive braking system.

5,110,192
APPARATUS FOR STORING AND DISPENSING OBJECTS, SUCH AS IN PARTICULAR PACKETS OF CIGARETTES, BOXES AND OTHER LIKE ARTICLES, OF PARALLELEPIPEDIC OR CYLINDRICAL SHAPE
Jacques Lauterbach, Paquier du Charmois - Talmay, 21270 - Pontailler-sur-Saone, France
Filed Apr. 16, 1990, Ser. No. 509,948
Int. Cl.[5] B65G *1/16*
U.S. Cl. 312—71 **20 Claims**



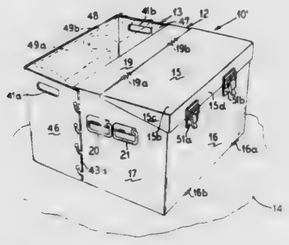
1. In an apparatus for storing and dispensing objects, such as boxes and packets, of a solid shape, comprising:
a principal body in the form of a box means, including two longitudinal lateral sides, a front side and a rear side both perpendicular to the preceding ones, and a bottom, said principal body being divided into a certain number of elongated passages in the direction of the lateral sides, with the aid of an appropriate number of partitions, parallel to one another and between which the objects are placed in line, one behind the other;
a pusher mounted for longitudinal slide allocated to each of said elongated passages so that it is applied against the last object of the line;
elastic means cooperating with each of said pushers to urge said pushers, on a front side of the principal body, with the result that the first object of the line comes into abutment against the same front side;
each said pusher being rigidly associated with an auxiliary or slide block means mounted or longitudinal slide with the aid of appropriate members to ensure continuous guiding of said pusher over the whole length of its displacement;
said pusher being constituted by a blade extending across the passage between two successive partitions defining the same passage;
each said partition comprising on its four upper, lower, front and rear edges, respectively, an upper, lower, front and rear groove;
each of said grooves being laterally defined by a wall, on one

of which slides the auxiliary body means which has the general shape of a rectangular plate disposed vertically lengthwise and comprises, at the location of each of its top and bottom horizontal sides, a U-shaped channel constituted by two plates mounted square so as to form a horizontal slideway overlapping respectively the upper and lower edge of said wall of the partition, to constitute the members for guiding the pusher;

said front groove being much deeper than the other three grooves in order to constitute a chamber in which is mounted a wheel rotating freely on a shaft borne by the walls; and

said elastic means including a taut, elongated, elastic body connected with and extending between a first catch means borne by the partition in the lower groove, passing along this lower groove, then in a notch in the wheel and being fastened to a second catch means borne by the upper channel of the auxiliary body.

5,110,193
PORTABLE TRAVEL PANTRY
Roy McClenning, P.O. Box 396, Tonica, Ill. 61370
Filed Mar. 8, 1991, Ser. No. 666,623
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—282 **14 Claims**



1. A portable travel pantry, comprising:

a rectangular main module means for carrying and for arranging and segregating food items and items related to serving of food;

said main module means having first compartment means for separately storing eating utensils, second compartment means for storing food boxes, third compartment means for storing canned goods, and fourth compartment means for storing plates used for serving food;

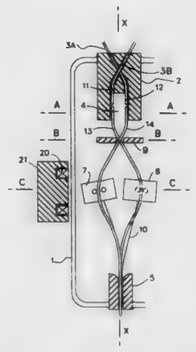
said main module means having a swingable front wall, a swingable top wall, and a back wall opposite the front wall, the top wall and front wall each being swingable between a transport configuration and a serving configuration;

a catch-all module means having a front wall and an open top for receiving relatively bulky food items at an inside thereof;

handle means at sides of the main module means for carrying the main module means; and

means for selectively attaching and detaching the catch-all module means to the main module means such that said back wall of the main module means is parallel and directly adjacent to said front wall of the catch-all module means when the catch-all module means is attached to the main module means, and such that when the handle means on the main module means is employed to lift the main module means, the catch-all module means is also carried along with the main module means when it has been selectively attached thereto.

5,110,194
CONTROLLED FIBER-OPTIC SWITCH
Erwin A. Zurfluh, Feldmeilen, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 6, 1990, Ser. No. 534,088
Claims priority, application European Pat. Off., Jul. 31, 1989, 89810584
Int. Cl.[5] G02B *6/36*
U.S. Cl. 385—16 **15 Claims**



2. Controlled fiber-optic switch for selectably connecting or disconnecting the ends of first (**13**) and second (**11**) optical fibers by lateral displacement of the first fiber's end between a connect position which is opposite the second fiber's end, and a disconnect position in which both fibers (**11**, **13**) are disconnected, comprising

said first fiber (**13**) having a length greater than is required to establish the connection between a fixation point and its free fiber end whereat contact is made with the free fiber end of the second fiber; guiding and holding elements (**2**) for holding said fibers' ends in opposite position and for defining two alternative switching positions for said first fiber's end, and further comprising means for applying lateral moving forces to said first fiber, characterized by:

a guiding aperture (**9**) for lateral guidance of said first fiber (**13**), with its free fiber end being located on one side of said aperture, and a bendable portion of the fiber being located and fixed on the other side of said aperture;

motion activating means (**8**, **20**) for applying lateral bending forces to said first fiber (**13**), and switching said first fiber's free end by altering the first fiber's effective length between its fixation (**5**) and said guiding and holding elements (**2**) and holding, in the connect position, said first fiber against said opposite end of said second fiber (**11**) under residual axial stress caused by excess length of the first fiber (**13**).

5,110,195
HIGH BANDWIDTH STEERING MIRROR
Gregory C. Loney, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation of Ser. No. 493,220, Mar. 14, 1990, abandoned. This application Mar. 15, 1991, Ser. No. 670,500
Int. Cl.[5] G02B *7/18*
U.S. Cl. 359—224 **17 Claims**

1. A steering mirror assembly, comprising:

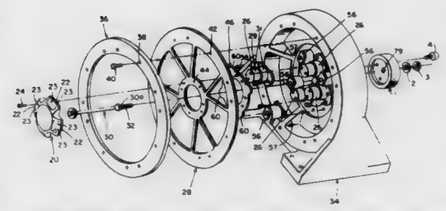
a) a base;

b) a mirror for directing signals that strike the mirror;

c) a deformable support post, having an axis that extends along an entire length of the post, to support and hold the mirror captively to the base and to limit linear motion of the mirror along the axis of the post, said post being positioned behind the mirror;

d) a set of actuators on the base positioned behind the mirror to adjust an angular orientation of the mirror; and

e) a flexure ring for limiting rotational and linear motion of the mirror and for minimizing the coupling of secondary resonances in motion of the assembly, comprising:

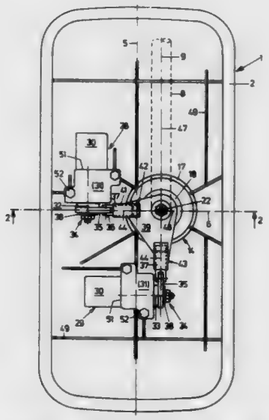


an outer ring to provide coupling of the flexure ring to the base;

an inner ring for coupling the flexure ring to the mirror; and

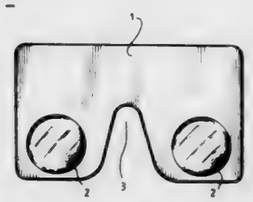
a set of arms of thin material that connect the inner ring to the outer ring.

5,110,196
MOTOR-POWERED ADJUSTABLE REAR VIEW MIRROR
Heinrich Lang, Ergersheim, and Wolfgang Seiboth, Bad Windsheim, both of Fed. Rep. of Germany, assignors to Mekra Rangau Plastics GmbH & Co. KG, Fed. Rep. of Germany
Filed May 15, 1989, Ser. No. 351,808
Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817288
Int. Cl.[5] G02B *7/18;* **B60R** *1/06*
U.S. Cl. 359—874 **11 Claims**



1. A motor-powered adjustable rear view mirror for motor vehicles, comprising a housing (**1**, **1'**, **1''**) accommodating and supporting a mirror glass (**3**, **3'**) a fixing device (**7**, **7'**, **7''**) having means to be rigidly connected to a motor vehicle, a base plate connected in a stationary manner to the fixing means (**7**, **7'** **7''**), a universal joint (**14**, **14'** **14''**) which is connected to the fixing device (**7**, **7'** **7''**) and which bears the housing (**1**, **1'**, **1''**) pivotally about a central point (**22**) of the universal joint (**14**, **14'**, **14''**) and, at least one positioning drive (**28**, **29**) connected in a stationary manner to the housing (**1**, **1'**, **1''**) and is coupled to the base plate (**39**, **39'**, **62**) via a slider-crank transmission (**34**, **67**, **75**), by means of which the housing (**1**, **1'**, **1''**) is adjusted by pivoting about at least one pivot axis (**47**, **48**) passing through said central point (**22**), wherein the slider-crank transmission (**34**, **67**, **75**) comprises a crank (**35**, **68**, **76**) coupled to the base plate (**39**, **39**, **62**) via a sliding bearing (**42**, **43**, **74**,**83**) and wherein there is articulated on the crank (**35**) by means of a crank joint (**36**) a push rod (**37**) which is displaceably guided in a bearing sleeve (**41**) which is connected to the base plate (**39**, **39'**) and wherein the slider-crank (**35**, **67**, **75**) is in itself pivotable about a longitudinal axis (**44**) of the sliding bearing (**42**, **43**, **74**, **83**).

5,110,197
EMERGENCY EYE GLASS
Chaim Arad, 32 Mikve Israel Street, Holon, Israel
Continuation of Ser. No. 499,051, Mar. 26, 1990. This application Jan. 10, 1991, Ser. No. 639,683
Claims priority, application Israel, Mar. 24, 1989, 89732
The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.
Int. Cl.[5] G02C *1/00, 7/08*
U.S. Cl. 351—41 **2 Claims**

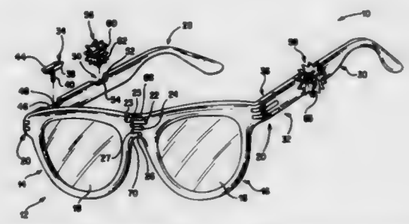


1. Eye glasses for temporary use during an emergency comprising:

a flat, plate-shaped body having size dimensions which are substantially the same as a credit card, said plate-shaped body having a noes area cut-out, said nose area cut-out having no projections; and,

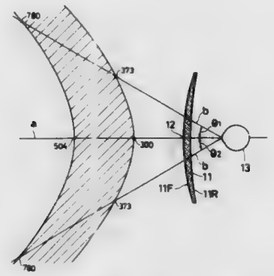
two optical lenses having diopter power, said optical lenses being made from a plastic material and held within the plane of said flat, plate-shaped body.

5,110,198
EYE WEAR WITH INTERLOCKING FRAME SECTIONS
Beth R. Travis, and Darin P. Travis, both of 21213B Hawthorne Blvd., #5416, Torrance, Calif. 90509
Filed May 23, 1990, Ser. No. 527,428
Int. Cl.[5] G02C *5/02, 5/14*
U.S. Cl. 351—124 **13 Claims**



1. An article of eye wear comprising a lens frame formed of a pair of eyepiece sections each of which defines a plurality of mutually engageable interlockable arms each arm having a uniform horizontal thickness throughout formed with ends enlarged in the vertical direction and wherein said ends are interlockable such that said arms are releasably coupled together in interleaved fashion above the bridge of the nose of a wearer.

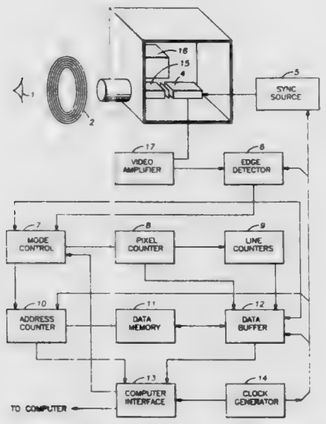
5,110,199
DISTORTION FREE OPHTHALMIC LENS FOR PRESBYOPIA HAVING WIDE RANGE DISTINCT VIEWS
Takeshi Ishida, 289 Bessho-cho, Matsubara-shi, Osaka, Japan
Filed Feb. 1, 1991, Ser. No. 649,420
Int. Cl.[5] G02C *7/06*
U.S. Cl. 351—169 **1 Claim**



1. In a lens for presbyopia comprising a front surface and a near surface, said front surface having a radius of curvature which is smaller than the radius of curvature of said rear surface, the improvement comprising

one of said front and rear surfaces having a radius of curvature which is successively increased as the lens surface extends radially outwardly away from the geometric center of the lens in such a manner that lateral magnifications for principal rays transmitted through the lens in a non-paraxial range are substantially the same as the lateral magnification for a principal ray transmitted through the lens in a paraxial range, whereby aberrational distortion of the lens is substantially eliminated and the range of distinct vision through the lens is substantially extended.

5,110,200
VIDEO KERATOMETER
Richard Snook, Houston, Tex., assignor to Technitex, Inc., Houston, Tex.
Filed Jun. 30, 1989, Ser. No. 374,425
Int. Cl.[5] A61B *3/10*
U.S. Cl. 351—212 **9 Claims**



1. A video keratometer for ascertaining the shape of the corneal surface of the eye, comprising:

imaging means for providing an image on the corneal surface of the eye;

video means for receiving a reflection of the image from the corneal surface and for transmitting a video signal representative of the reflected image;

an edge detector for detecting brightness discontinuities in the video signal received from said video means representing edge of the image;

means for defining data points based upon the brightness discontinuities detected by said edge detector;

means responsive to said defining means for determining corneal radius;

means for centering said imaging means for the eye; locating means responsive to said data points for locating the optical center of said data points;

means for setting a mask, wherein said mask defines preferred data points in the central area of the eye;

means for comparing said preferred data points with said optical center; and

display means responsive to said comparing means for displaying an error signal when said optical center lies outside said preferred data points.

5,110,201
FILM TRANSPORT DEVICE
Josef Haas, Vienna, Austria, assignor to Arnold & Richter Cine Technik GmbH & Co. Betriebs KG, Munich, Fed. Rep. of Germany
Filed Nov. 19, 1990, Ser. No. 615,073
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1989, 3938983
Int. Cl.[5] G03B *21/48*
U.S. Cl. 352—180 **13 Claims**



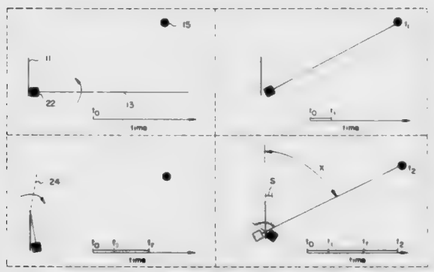
1. Film transport device comprising film gate structure, a toothed film transport sprocket, a drive motor for driving said sprocket, the teeth of said sprocket engaging the holes in a motion picture film with play for transporting said film stepwise one frame at a time and final-positioning it at a film gate, with each film step being divided into a transport phase and a position adjusted phase acting on the film, and a drive motor regulator coupled to said drive motor for controlling said drive motor such that each film step of said sprocket as driven by said drive motor is divided into a transport phase and a position adjusted phase acting on the film, said transport phase (t_T) being composed of a short acceleration phase (t_1, t_2) with a steep acceleration slope (t_1) and large torque set value (M_{S1}) and a long continuous drive phase (t_3) and braking phase (t_4), whose time duration is a multiple of the acceleration phase (t_1, t_2), said drive motor regulator being subjected to torque set values (M_{S1}, M_{S2}) over the entire duration of said transport phase (t_T),

said higher torque set value (M_{S1}) in said acceleration phase (t_1, t_2), being kept essentially constant over a short time interval (t_2), said second torque set value (M_{S2}) in the drive and braking phases (t_3, T_4) being reduced approximately linearly, without said set value (M_{S2}) jumping to a negative torque set value (delay torque) and making a continuous transition to a position adjusted phase (t_R),

said torque values (M_{S1}, M_{S2}) being stored pointwise in said acceleration phase (t_1, t_2), said drive phase (t_3), and said braking phase (t_4),

the teeth (**10** to **14**) of said film transport sprocket (**1**), which engage film holes (**60**), abutting the edges of perforation holes (**63**) which are forward in the direction of motion, during said acceleration phase (t_1, t_2), said sprocket teeth which engage said film holes (**60**) being either carried along with play in holes (**60**) or having their leading edges in the direction of motion abutting the leading edges (**63**) of holes in the direction of motion in said driving and braking phases (t_3, t_4), and said sprocket teeth having their forward edges in the direction of movement abutting the forward edges (**63**) of holes during said position-regulating phase (t_R), so that film (**6**) is pulled aperiodically into the exact final position.

5,110,202
SPATIAL POSITIONING AND MEASUREMENT SYSTEM
Andrew W. Dornbusch; Yvan J. Beliveau; Eric J. Lundberg, and Timothy Pratt, all of Blacksburg, Va., assignors to Spatial Positioning Systems, Inc., Blacksburg, Va.
Continuation-in-part of Ser. No. 07/570,268, Aug. 17, 1990. This application Dec. 31, 1990, Ser. No. 636,459
Int. Cl.[5] G01C *1/03, 3/00, 5/00*
U.S. Cl. 356—1 **14 Claims**



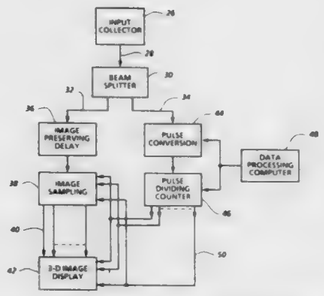
1. A spatial positioning and measurement system for determining the instantaneous x-y-z position of an object in a three-dimensional Cartesian coordinate system, comprising:

at least one fixed reference station, each said station emitting a primary laser beam having an angle of divergence ϕ and being about an axis at an angle of inclination β, each said station including at least one reflective surface for generating a secondary laser beam having said angle of divergence ϕ and being rotated in an opposite direction from said primary beam about said axis at said angle of inclination β;

a portable position sensor located at said object, said sensor including detector means for detecting said primary and reflected laser beams, said detector means emitting a signal indicating detection of a laser beam, said sensor also including at least one axicon for directing incoming light to said detector means; and

a determination means for determining the position of the object based on the signals emitted from said detector means.

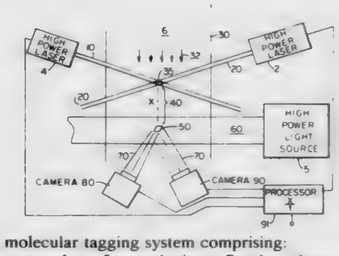
5,110,203
THREE DIMENSIONAL RANGE IMAGING SYSTEM
Bruce S. MacCabee, Sabillasville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 28, 1991, Ser. No. 751,371
Int. Cl.[5] G01C *3/08*
U.S. Cl. 356—5 **14 Claims**



1. In a target observation system having means generating pulses of luminant energy for illuminating a target and receiver means at a receiving location for reception of echo pulses of the luminant energy reflected from the target, the improvement residing in said receiver means including means for sampling the luminant energy from each of the echo pulses, means for extracting target data from the sampled luminant energy of each of the echo pulses, and data processing control means responsive to said reception of each of the echo pulses for establishing said target data exclusively as a function of distance traveled by the luminant energy in each of the pulses between the target and said receiving location,

beam splitting means for establishing separate paths along which the luminant energy of each of the echo pulses is conducted to the sampling means and the data processing control means, respectively.

5,110,204
VELOCITY MEASUREMENT BY THE VIBRATIONAL TAGGING OF DIATOMIC MOLECULES
Richard B. Miles, Princeton, and Walter R. Lempert, Mercerville, both of N.J., assignors to Trustees of Princeton University, Princeton, N.J.
Filed Nov. 6, 1990, Ser. No. 609,929
Int. Cl.[5] G01P *3/36*
U.S. Cl. 356—28 **26 Claims**



1. A molecular tagging system comprising:

a first pump laser for producing a first laser beam;

a stimulated Raman cell positioned for receiving as an input said first laser beam, said stimulated Raman cell being pumped by a portion of said first laser beam for producing a second laser beam differing in frequency from said first laser beam by the vibrational frequency of a molecular

species to be tagged, said stimulated Raman cell outputting said first and second laser beams; and

first focusing means for focusing said first and second laser beams to form an overlapping region within a volume, whereby a fraction of the molecular species to be tagged are driven into their first vibrational state by stimulated Raman pumping, thereby tagging the molecules of a well defined region within the volume.

5,110,205

APPARATUS FOR DETECTING ALCOHOL CONCENTRATION

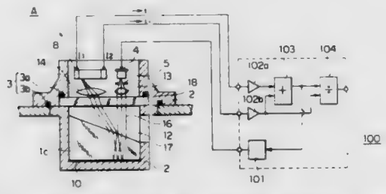
Hiroyoshi Suzuki; Kenji Ogawa, and Toru Yamamoto, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1991, Ser. No. 651,080

Claims priority, application Japan, Feb. 8, 1990, 2-30258; Feb. 8, 1990, 2-30259

Int. Cl.[5] G01N *21/41*

U.S. Cl. 356—135 **7 Claims**



1. An alcohol concentration detecting apparatus, comprising:

a transparent body (**1***c*,**1***d*) transparent to light and having a refraction surface (**9**) disposed, when in use, in contact with liquid fuel to define a refraction interface between said transparent body and the fuel, said transparent body defining a light path for allowing said light to pass through said refraction surface for refracting said light;

a light-emitting element (**4**) disposed at one end of said light path and emitting a light beam along said light path;

an optical position detector element (**8**) disposed at the other end of said light path for receiving a refracted light beam refracted at said refraction surface and generating an output (**i1**,**i2**) indicative of the amount of alcohol contained in said fuel;

an optical lens (**13**, **13***b*, **14**, **14***b*) disposed in said light path between said light-emitting element and said light-receiving optical position detector element for directing and focusing a light beam emitted from said light-emitting element onto said optical position detector element; and

a transparent partition (**18**, **18***a*, **18***c*) disposed between said transparent body and said light-emitting element and between said transparent body and said optical position detector element, said transparent partition defining a substantially wedge-shaped fuel cavity (**17**) for receiving the fuel therein between said transparent partition and said refraction surface of said transparent body.

5,110,206

DEVICE FOR FORMING A COMPOSITE IMAGE OF A PERSON'S FACE

Todd E. Mischke, 95-1195 Leolani St., Mililani, Hi. 96789

Filed May 2, 1991, Ser. No. 694,486

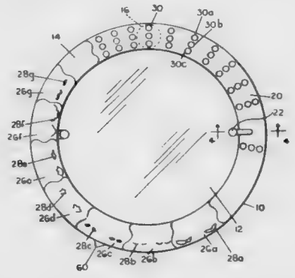
Int. Cl.[5] G03B *21/14*

U.S. Cl. 353—30 **11 Claims**

9. A device for forming a composite image of a person's face comprising:

a transparent viewing sheet having a plurality of facial features outlined thereon used to form an image by comparing the facial features through said viewing sheet,

a plurality of rotatably concentric transparent facial feature rings in overlaid relation with each other and each having a different facial feature outlined thereon but in different sizes, locations, and shapes,



and means to rotatably position said rings relative to each other to align a plurality of facial features taken from comparison at a common point in their overlaid position, whereby the selected facial features combine to form the image as it appeared in said viewing sheet.

5,110,207

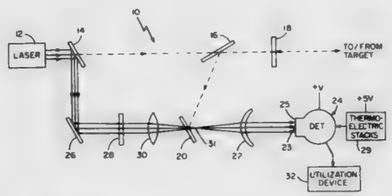
OPTICAL SYSTEM INCLUDING INTERFEROMETER FOR ENHANCING THE PERFORMANCE OF A PHOTOCONDUCTIVE NON-SHOT NOISE LIMITED DETECTOR

Clarke E. Harris, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 388,733, Jul. 31, 1989, abandoned, which is a continuation of Ser. No. 033,1958, Apr. 3, 1987, abandoned. This application May 6, 1991, Ser. No. 698,254

Int. Cl.[5] G01C *3/08*

U.S. Cl. 356—4.5 **31 Claims**



1. In combination:

means for transmitting a beam of electromagnetic energy toward a target;

a photoconductive detector element having a surface, wherein a primary source of noise in said detector element is due to fluctuations in current produced by said detector element in the absence of illumination of said surface;

means for directing portions of the transmitted beam reflected by the target onto said detector element surface; and

means for providing a local oscillator beam of electromagnetic energy, said local oscillator beam providing means and said directing means comprising means for coupling the local oscillator beam to said detector element with a substantially uniform intensity distribution on the surface thereof.

5,110,208

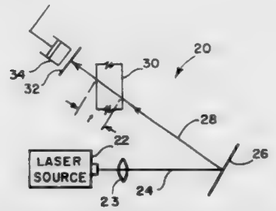
MEASUREMENT OF AVERAGE DENSITY AND RELATIVE VOLUMES IN A DISPERSED TWO-PHASE FLUID

Sastry R. Sreepada, Clifton Park, and Robert R. Rippel, late of Scotia, both of N.Y. by Linda S. Rippel, executrix , assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 285,689, Dec. 16, 1988, abandoned. This application Dec. 19, 1990, Ser. No. 629,961

Int. Cl.[5] G01N *21/45*

U.S. Cl. 356—128 **9 Claims**



1. An apparatus for measuring the average density of an essentially transparent, dispersed two-phase fluid having a dispersed phase made up of essentially transparent bubbles, droplets, or particles that have smooth, rounded surfaces, comprising:

a source which produces a collimated beam that has a diameter no larger than 1% of the diameter of the bubbles, droplets, or particles of the dispersed phase;

a diffraction grating, to which the collimated beam is directed;

means for isolating a single-order component of the diffracted beam and directing it through the dispersed two-phase fluid;

containing means for the dispersed two-phase fluid that allows the single-order component of the diffracted beam to pass through, and

measuring means for determining the refraction of the beam by the dispersed two-phase fluid.

5,110,209

METHOD AND APPARATUS FOR ADJUSTING THE ALIGNMENT OF A SIGHTING DEVICE AND A PIVOTABLE MEMBER

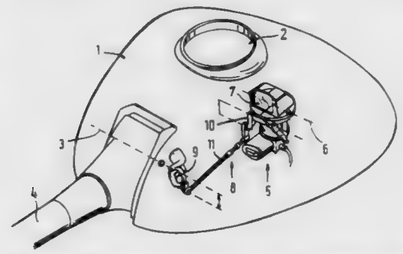
Nicolaas P. Elshoud, Delft, and Frits J. Versteeg, Rotterdam, both of Netherlands, assignors to B. V. Optische Industrie "De Oude Delft", Delft, Netherlands

Continuation of Ser. No. 769,576, Aug. 26, 1985, abandoned. This application Dec. 1, 1987, Ser. No. 127,233

Claims priority, application Netherlands, Aug. 31, 1984, 8402659

Int. Cl.[5] G01B *11/27*

U.S. Cl. 356—138 **26 Claims**



1. A method of adjusting the alignment of a sighting device and a member having a longitudinal axis coupled therewith, said member being pivotable in at least one plane, about a first pivot axis, and at least part of said sighting device being pivotable about a second pivot axis, comprising the steps of:

(a) mounting on said member a source means for generating a beam of radiation shining on said pivotable part of said sighting device, said beam of radiation being productive of a point image on a viewing end of said sighting device;

(b) moving said pivotable member into a different position and, if said point image is displaced during said movement, changing coupling between said pivotable part of said sighting device and said member; and

(c) repeating step (b) for a predetermined number of angular positions until, as said member is traversing on entire swing, said point image is displaced within a predetermined tolerance range.

5,110,210

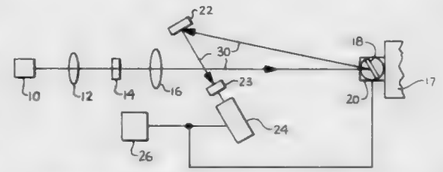
PRECISION ANGLE SENSOR

Theodore D. Fay, Mission Viejo; William F. Morgan, Long Beach, and Stanley Schneider, Rancho Palos Verdes, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jul. 23, 1990, Ser. No. 557,421

Int. Cl.[5] G01B *11/00*

U.S. Cl. 356—150 **11 Claims**



1. A precision angle sensor system to measure angular deflection of an object relative to a system fiducial comprising:

photon source means;

photon dispersion means mounted on the object;

spectrometer means comprising spectrometer slit means, spectrometer dispersion means and a multipixel detector to sense patterns of photons falling thereupon; and

system control means to calculate the angular deflection of the object based upon a comparison of the shift in position of a known pattern of photons on the detector from a first position produced by a known orientation of the object to a second position produced by the deflection of the object, the comparison being made between said second position of the known pattern and a plurality of positions of simulations of the known pattern produced by model generation means for a plurality of different simulated known deflections of the object, said system control means being connected to the output of the multiplexed detector.

5,110,211

OPTICAL INTERFERENCE SIGNAL EXTRACTOR WITH DEVICE FOR REDUCED NOISE FROM OPTICAL LIGHT POWER VARIATION

Shoji Niki, 2-171-1, Fukiagemachi Shinjuku, Kitaadachi-gun, Saitama, Japan, and Jonathan R. Pawlik, 600 Mountain Ave., Murray Hill, N.J. 07974

Filed Jan. 4, 1990, Ser. No. 461,048

Int. Cl.[5] G01B *9/02*

U.S. Cl. 326—346 **10 Claims**

1. An optical interference signal extractor comprising:

an optical interferometer which receives light to be measured and in which an optical path difference for outputting interference light of said light to be measured is sweepable;

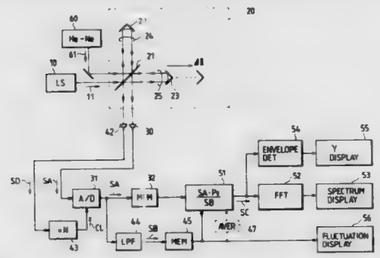
optical interference signal generating means for receiving

the interference light incident from said optical interferometer and outputting a first optical interference signal that is an electric signal corresponding to the interference light;

optical power signal extracting means for generating an optical power signal corresponding to the power of the light to be measured; and

arithmetic means for dividing the first optical interference signal from said optical interference signal generating means by the optical power signal from said optical power signal extracting means and for outputting the result of the division as a second optical interference signal,

wherein said optical interference signal generating means includes a first photodetector which receives and converts the interference light to an electric signal; an A-D converter which converts the output of said first photodetector to a digital signal and outputs the digital signal as the first optical interference signal; a reference light source for emitting reference light of a narrow spectrum which is applied to said optical interferometer, together with the light to be measured a second photodetector for converting reference interference light emitted from said optical interferometer into an electric signal in accordance with the reference light; and a multiplier which multiplies the frequency of the output signal of said second photodetector to a desired frequency and applies the multiplied output as a sampling clock to said A-D converter; and wherein said optical power signal extracting means includes a digital low-pass filter which is supplied with the output of said A-D converter and has a predetermined cut-off frequency for extracting the optical power signal in digital form.



5,110,212

SMOOTHNESS SENSOR

Andrew J. Gabura, Ontario, Canada, assignor to Sentrol Systems, Ltd., Canada

Filed Oct. 2, 1986, Ser. No. 914,673
Int. Cl.[5] G01N *21/47*
U.S. Cl. 356—429 **11 Claims**

1. Apparatus for obtaining a precision measurement of the smoothness of a moving web of paper or the like including in combination

a source of light,

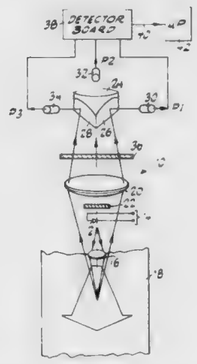
means for focusing light from said source onto a spot on said web along a path having an optical axis generally perpendicular to said web.

means for collecting light reflected from said spot around substantially 360° with reference to said optical axis,

first and second and third detectors,

means for dividing light collected by said collecting means from respective 120° sectors around the optical axis into three discrete beams and for directing said beams respectively and individually to said first and second and third detectors to produce first and second and third output signals,

means responsive to said output signals for producing three difference signals respectively representing the difference between the first and second output signals and the difference between the first and third output signals and the difference between the second and third output signals,



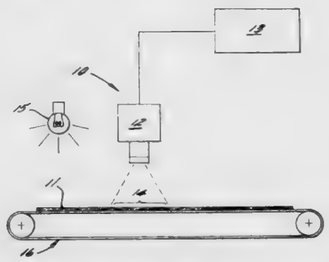
and means responsive to said difference signals for producing said precision measurement of the smoothness of said web.

5,110,213

METHOD AND APPARATUS FOR MEASURING CONCENTRATION OF A MATERIAL IN A SAMPLE

Sydney K. Seymour, Clemmons, N.C., assignor to R. J. Reynolds Tobacca Company, Winston-Salem, N.C.

Filed Dec. 21, 1989, Ser. No. 454,493
Int. Cl.[5] G01N *21/55*
U.S. Cl. 356—445 **44 Claims**



1. A method for measuring carbon concentration in a carbon-containing sample, comprising the steps of:

optically sensing a two-dimensional portion of the carbon-containing sample;

converting the optically sensed two-dimensional portion of the carbon-containing sample into a first two-dimensional digital image having a first two dimensional array of points, each having a digital value related to the sensed optical intensity thereat;

obtaining a first average digital value for the first two-dimensional array of points;

optically sensing a two-dimensional portion of a sample which is free of carbon;

converting the optically sensed two-dimensional portion of the carbon-free sample into a second two-dimensional digital image having a second two-dimensional array of points, each having a digital value related to the sensed optical intensity thereat;

obtaining a second average digital value for the second two-dimensional array of points; and

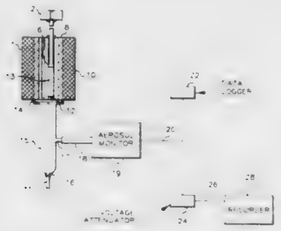
comparing the first and second average digital values to nondestructively and accurately measure carbon concentration in said carbon-containing sample.

5,110,214

APPARATUS AND METHOD FOR EVALUATING THE PROPENSITY OF POLYMERS FOR SMOKING DURING PROCESSING

David R. Battiste; Kenneth W. Willcox, both of Bartlesville, and Tommy J. Morgan, Ramona, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 9, 1990, Ser. No. 549,881
Int. Cl.[5] G01N *25/00*
U.S. Cl. 374—45 **15 Claims**



1. An apparatus for determining the propensity of polymers to emit smoke comprising:

(a) a means to heat said polymer to a molten state;

(b) connected therewith a means to extrude said polymer after said polymer has reached said molten state;

(c) a means for receiving the thus extruded polymer having an inlet end connected to said means to extrude so that said polymer enters said means for receiving through said inlet end after extrusion; and

(d) a means to monitor gases from said means for receiving said extruded polymer and to determine the propensity of said extruded polymer to emit smoke by determining the presence and amount of smoke in said monitored gases, said means to monitor gases being in fluid communication with said means for receiving.

10. A method for determining the propensity of a polymer to emit smoke during processing comprising:

(a) heating said polymer to a molten state;

(b) extruding said polymer after said polymer has reached said molten state into an enclosed space;

(c) sampling gases from said enclosed space when said polymer is extruded into said enclosed space;

(d) monitoring said thus sampled gases for presence and amount of smoke in a monitoring device; and

(e) determining the propensity of said polymer to emit smoke.

5,110,215

CONTAINER FOR LIQUID CRYSTAL CUMULATIVE DOSIMETER

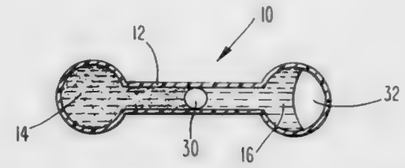
Mortimer M. Labes, Philadelphia, Pa., assignor to Temple University, Philadelphia, Pa.

Filed Dec. 21, 1990, Ser. No. 633,269
Int. Cl.[5] G01K *11/16, 3/00*
U.S. Cl. 374—106 **18 Claims**

1. A container for a liquid crystal cumulative dosimeter used to sense the cumulative temperature exposure of a product, said dosimeter including a first liquid crystal composition constituent and a second liquid crystal composition constituent adapted when mixed to react chemically and to change color in response to said reaction and in proportion to the cumulative time and temperature exposure of said constituents, said container comprising:

a resilient outer body sealed to confine said first composition constituent and said second composition constituent and having at least one transparent section to permit observation of the color of the confined composition formed when said two constituents are allowed to mix; and

barrier means contained completely within and physically unattached to said outer body for separating said first constituent from said second constituent, said barrier means including an air bubble disposed between said first and said second constituents and a ballast air bubble disposed behind one of said first or said second constituents, whereby disruption of said barrier means allows said first constituent to mix with said second constituent.

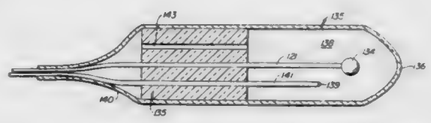


5,110,216

FIBEROPTIC TECHNIQUES FOR MEASURING THE MAGNITUDE OF LOCAL MICROWAVE FIELDS AND POWER

Kenneth A. Wickersheim, Menlo Park; Mei H. Sun, Los Altos, and James H. Kim, San Jose, all of Calif., assignors to Luxtron Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 331,685, Mar. 30, 1989, abandoned. This application Jan. 30, 1990, Ser. No. 472,351
Int. Cl.[5] G01J *5/18;* **G01K** *11/20;* **H05B** *6/80*
U.S. Cl. 374—122 **53 Claims**



1. A microwave power or field strength sensor, comprising:

a three-dimensional symmetrically shaped microwave absorbing element characterized by being heated by a microwave field,

a substantially non-microwave absorbing temperature transducer positioned in thermal communication with said element and adapted to generate a signal proportional to the temperature of the element, and

a signal transmitting path connecting said temperature signal from said transducer to a location remote from of said element, whereby the microwave power or field strength is measurable from said signal.

5,110,217

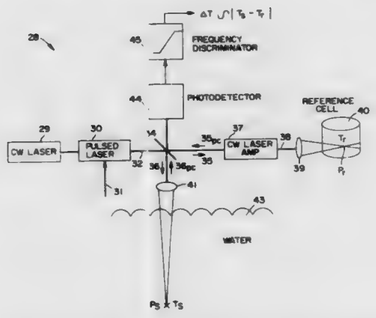
METHOD FOR OPTICALLY AND REMOTELY SENSING SUBSURFACE WATER TEMPERATURE

Harold E. Sweeney, Menlo Park, Calif., assignor to GTE Government Systems Corporation, Mountain View, Calif.

Division of Ser. No. 387,734, Aug. 1, 1989, Pat. No. 4,984,903. This application Oct. 31, 1990, Ser. No. 607,386
The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.
Int. Cl.[5] G01J *5/54;* **G01K** *11/00;* **G01B** *9/00*
U.S. Cl. 374—123 **2 Claims**

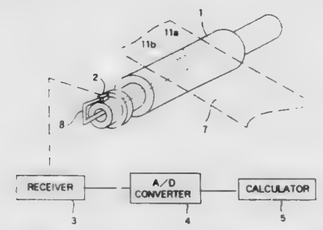
1. A method of remotely measuring an unknown temperature T_x of a transparent medium by comparison with the known temperature T_r of a transparent reference material, consisting of the steps of:

combining the outputs of a continuous-wave (cw) laser and a high intensity pulsed laser to form a combined laser output beam, said high intensity exceeding the intensity required to produce stimulated Brillouin scattering (SBS) in said transparent medium;
splitting said combined laser output beam into first and second sub-beams;
amplifying the cw component of said first sub-beam to an intensity exceeding the intensity required to produce SBS in said reference material, while simultaneously suppressing the pulse components in said first sub-beam;



directing said first sub-beam with the amplified cw component into said reference material and thereby generating a cw phase-conjugate beam;
directing said second sub-beam into said transparent medium and generating a pulsed phase-conjugate beam;
mixing said cw and pulsed phase-conjugate beams in a photodetector and producing a difference frequency proportional to $T_s - T_r$; and
converting said difference frequency into a value of T_s.

5,110,218
PREDICTION METHOD FOR FORMATION OF HEAT STREAK AND THERMAL SENSOR ROLL THEREFOR
Atsushi Aizawa; Yoshinori Matsumoto; Kenji Hara, and Toshiro Yamada, all of Osaka, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan
Filed Mar. 8, 1991, Ser. No. 666,812
Claims priority, application Japan, Mar. 27, 1990, 2-78217
Int. Cl.[5] G01B *13/08*
U.S. Cl. 374—153 **4 Claims**



1. A method of predicting formation of heat streaks, comprising the steps of:
attaching at least one temperature detecting block to a thermal sensor roller, said temperature detecting block including a plurality of thermocouples embedded close to each other with individually different depth from a surface of said thermal sensor roll;
disposing said thermal sensor roll at a position in contact with a metal strip to be rolled and downstream from a work roll;
detecting temperatures of inner parts of said thermal sensor roll with said thermocouples;
transmitting detected temperatures from said thermocouples as electromagnetic waves;
receiving the electromagnetic waves;
calculating a temperature of the metal strip being rolled based on the received electromagnetic waves; and
comparing the calculated temperature with a predetermined temperature of heat streak formation which is based on a reduction ratio and a rolling speed at a time of detecting the temperature.

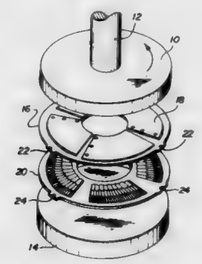
5,110,219
COMBINATION BEACH MAT/TOTE BAG
Rui P. Lopes, 253 Bear Paw Rd., Bridgeport, Conn. 06606
Filed May 9, 1991, Ser. No. 697,795
Int. Cl.[5] B65D *30/10*; A47G *9/06*
U.S. Cl. 383—4 **16 Claims**



1. A combination mat/tote bag comprising:
a sheet made of flexible, foldable material having a pair of opposed side edges and a pair of opposed end edges;
a flexible strap attached to said sheet adjacent each of said side and end edges, each strap having a disc shaped anchor pod secured on a distal end thereof;
a handle at each of said end edges; and
fasteners along each of said side edges,
said sheet adapted to be folded along a line between said side edges such that said side and end edges are superimposed and said side edges fastened to form an open top tote bag which may be carried by said handles, said sheet further adapted to be unfastened, unfolded and spread on the ground and said anchors buried below the ground surface to secure said sheet.

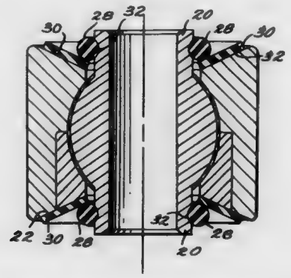
5,110,220
THRUST BEARING UNDERSPRING
Alston L. Gu, Rancho Palos Verdes Estates, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Mar. 8, 1991, Ser. No. 667,689
Int. Cl.[5] F16C *32/06*
U.S. Cl. 384—105 **19 Claims**

1. A fluid thrust bearing comprising:
a thrust runner;
a thrust plate to rotatably support said thrust runner; and
a complaint foil bearing operably disposed between said thrust runner and said thrust plate, said compliant foil bearing including a bearing disk having a plurality of compliant foils disposed towards said thrust runner and a foil underspring disposed between said thrust plate and said bearing disk, said underspring including means for



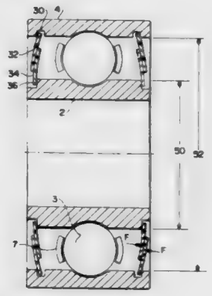
providing radially outwardly increasing spring force support of said overlying compliant foils.

5,110,221
SELF-ALIGNING TRACK ROLLER
Glennwood H. Narkon, Rockville, and Stanley S. Orkin, Vernon, both of Conn., assignors to Kamatics Corporation, Bloomfield, Conn.
Continuation-in-part of Ser. No. 77,395, Jul. 24, 1987, Pat. No. 4,842,424. This application Dec. 16, 1988, Ser. No. 285,601
The portion of the term of this patent subsequent to Jun. 27, 1989, has been disclaimed.
Int. Cl.[5] F16C *23/04*
U.S. Cl. 384—203 **22 Claims**



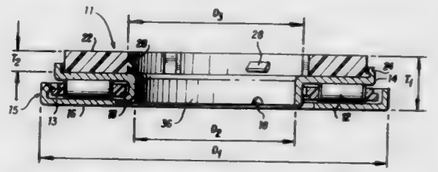
1. A track-roller bearing assembly comprising:
an inner ball race member having a central axis and an outwardly facing arcuate peripheral bearing surface;
an outer race member coaxial with said central axis of said inner race member and including a bearing portion having an annular arcuate surface, said outer race member being rotatable about said central axis of said inner race member and angularly displacable relative to said axis; and
means for realigning said central axis of said outer race member with said central axis of said inner race member when said race members have rotated angularly relative to each other, said realigning means being mounted between and immediately adjacent the respective end portions of said inner and outer race members.

5,110,222
POSITIVE CONTACT, SELF RETAINING BEARING SEALS
Bruce H. Johnson; Lawrence E. Larsen, and Edmund F. Welch, all of Kansas City, Mo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Feb. 2, 1990, Ser. No. 473,800
Int. Cl.[5] F16C *33/78*
U.S. Cl. 384—482 **16 Claims**



1. A bearing comprising:
an inner race;
an outer race;
bearing means engaged between the inner and outer races;
means for sealing a space between the inner and outer races, said means for sealing including first and second sealing washers, said first washer having an outer diameter greater than an inner diameter of the outer race, said second washer having an inner diameter less than the outer diameter of the inner race, said first and second washers overlapping one another and being biased against one another an amount sufficient to prevent lubricant and lubricant contaminating particles from passing therethrough; and
a groove in one of said inner and outer races wherein one of said first and second sealing washers is snap-fitted into said groove such that it is self-retaining and further holds the other of said first and second washers in place between the inner and outer races.

5,110,223
SHIM THRUST BEARING APPARATUS
Hans W. Koch, and Bobby L. Hodge, both of Charlotte, N.C., assignors to INA Bearing Company, Inc., Fort Mill, S.C.
Filed Mar. 27, 1990, Ser. No. 500,193
Int. Cl.[5] F16C *33/46, 43/00*
U.S. Cl. 384—620 **34 Claims**



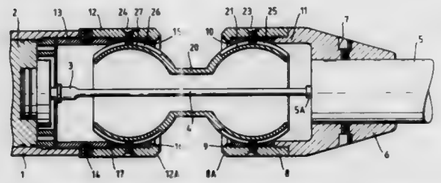
1. A thrust bearing, comprising:
a) a plurality of bearing elements;
b) a thrust cage assembly for retaining said bearing elements;
c) washer means for restraining said thrust cage assembly; and
d) a spacer having engagement surfaces adjoining said washer means,

wherein each of said spacer and said washer means further include radially extending means for locking said spacer and said washer means together.

5,110,224
FLEXIBLE CABLE TERMINATION WITH SWIVEL COUPLINGS

Kenneth Taylor, Great Dunmow, and Roy Allen, London, both of England, assignors to STC PLC, London, England

Filed Nov. 15, 1990, Ser. No. 614,226
Claims priority, application United Kingdom, Nov. 15, 1989, 8925819
Int. Cl.[5] G02B *6/36*
U.S. Cl. 385—25 **8 Claims**

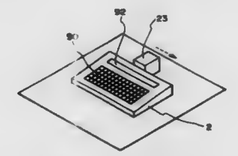


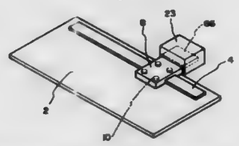
1. A flexible cable termination for connecting a submarine cable to a rigid repeater housing comprises first and second swivel couplings, the first coupling having housing connection means for connection to the repeater housing, the second coupling having cable connection means for connection to the cable, the couplings being joined by a rigid hollow link bar which can accommodate flexible transmission elements extending between the cable and the repeater housing and which is smaller in diameter than either coupling so that the termination can bend through an angle of more than 58°, there being means to prevent rotation of the cable connection means relative to the housing connection means.

5,110,225
MANUAL PRINTER

Yasuyuki Uchiyama, Tokyo, Japan, assignor to Mutoh Industries Ltd., Tokyo, Japan

Filed Jun. 1, 1990, Ser. No. 531,685
Claims priority, application Japan, Jul. 27, 1989, 1-88249[U]
Int. Cl.[5] B41J *3/28*
U.S. Cl. 400—29 **4 Claims**



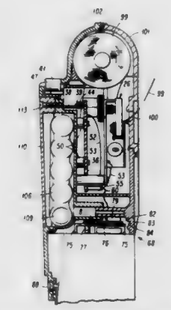


1. A manual printer for use in printing on paper set on a mounting face, comprising:
a casing adapted to be mounted on the mounting face;
an elongated guide rail mounted in said casing;
a guide member;
means for mounting said guide member to said guide rail such that said guide member is movable longitudinally along said guide rail;
a base secured to said guide member and located outwardly of said casing, said base comprising a base frame secured to said guide member and a head base pivotably mounted to said base frame for movement between raised and lowered positions;
printing means, mounted to said base, for printing on the paper;
control means for controlling the printing by said printing means as said guide member is moved along said guide rail; and
input means for inputting data into said control means.

5,110,226
BATTERY OPERATED DATA ENTRY TERMINAL DEVICE AND PRINTER ATTACHMENT

Richard A. Sherman, Toddville, and Darald R. Schultz, Cedar Rapids, both of Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Filed Oct. 19, 1990, Ser. No. 600,552
Int. Cl.[5] B41J *3/36*
U.S. Cl. 400—88 **22 Claims**

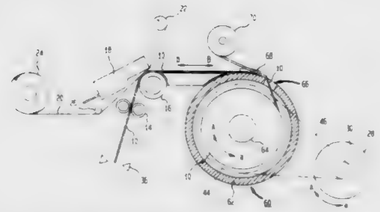


1. A portable, printing data entry terminal device comprising:
a data entry terminal unit including an elongate housing having upper and lower faces, a keyboard and a data display disposed in the upper face, a control and data processing unit disposed within said housing and coupled to said keyboard and data display, a self-contained power source disposed within the housing and coupled to the control and data processing unit, and an electrical and data interface disposed within and at one end of the housing, the electrical and data interface coupled to the control and data processing unit, the housing having an opening adjacent said interface and including means for attaching an end cap and connector assembly to the housing for sealing the opening and coupling said connector assembly to said interface;
an adapter bracket attached to the end cap attaching means, the adapter bracket including a support frame, and electrical connector means supported on the frame and electrically coupled to said electrical and data interface for electrical and data signal communication with the control and data processing unit; and
a printer unit including a printer housing having upper and lower housing shells, a printer circuit means disposed within the printer housing and adjacent the lower shell, a printer mechanism disposed in the housing adjacent and coupled to the printer circuit means, the printer circuit means including connector means, disposed adjacent an end of said lower housing shell and including at least one connector protruding from said lower housing shell and coupled to said printer circuit means, for providing an external connector termination for said printer circuit means, and means for coupling the printer circuit means to the electrical connector means of the adapter bracket.

5,110,227
COLOR PRINTER

Atsushi Hatakeyama, Tokyo; Tsutomu Miura, Kanagawa; Wayne F. Niskala, Tokyo; Tomonori Sato, and Masamichi Yumino, both of Kanagawa, all of Japan, assignors to Eastman Kodak Co., Rochester, N.Y.

Filed Jan. 30, 1991, Ser. No. 648,455
Claims priority, application Japan, Apr. 2, 1990, 2-88582
Int. Cl.[5] B41J *11/48*
U.S. Cl. 400—120 **21 Claims**



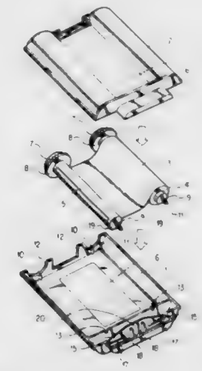
1. A color printer comprising:
a print medium holder means which is freely movable in a prescribed printing direction while supporting a print medium;
a print transfer medium comprising a multiplicity of colored inks which are selectively brought into contact with, and separated from, the print medium supported on the print medium holder means; and
printing means which is moved in unison with the movement of the print medium holder means while the print transfer medium is maintained in close contact with the print medium for effecting printing by selectively transferring the colored ink of the transfer medium to the print medium, the printing means comprising:
disengaging means for disengaging a driving force used to move the print medium holder means;
an urging member for urging the paper holder means in a direction opposite to the prescribed printing direction; and
a positional alignment mechanism for mechanically determining the position at which printing is to start on the print medium using abutment contact of the print medium holder means when the holder means is disengaged from the driving force and is urged by the urging member in the direction opposite to the prescribed printing direction.

5,110,228
CASSETTE WITH A LOOSENING PREVENTION MECHANISM

Yuji Yokomizo, Kurashiki, Japan, assignor to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Dec. 20, 1990, Ser. No. 631,241
Claims priority, application Japan, Dec. 20, 1989, 1-146630[U]
Int. Cl.[5] B41J *35/28*
U.S. Cl. 400—208 **20 Claims**

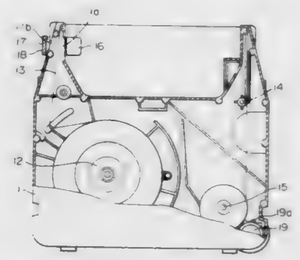
1. A cassette with a loosening prevention mechanism, comprising:
a cassette case having a resilient member integrally formed therewith; and
a plurality of reels rotatably supported within said cassette case and having a strip of medium wound therearound, each of said reels comprising:
a) an outer end having an outer shaft portion to which an external force may be applied,
b) an inner end engaged by said resilient member such that said resilient member presses said reel towards said outer end and onto a bearing portion of said cassette case, and
c) rotation prevention means for preventing rotation of said reel when said resilient member presses said reel toward said outer end and for permitting rotation of said reel when an external force moves said reel toward said inner end in opposition to said resilient member.



5,110,229
PRINTING DEVICE HAVING A RIBBON CASSETTE WITH A END OF RIBBON SENSOR

Takehiko Ide, Tosu, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 375,419, Jul. 5, 1989, abandoned. This application Feb. 6, 1991, Ser. No. 652,353
Claims priority, application Japan, Jul. 12, 1988, 63-173349
Int. Cl.[5] B41J *35/36*
U.S. Cl. 400—249 **4 Claims**



1. A printing device comprising:
a ribbon cassette comprising a cassette case having an inside and an outside, a ribbon disposed in said cassette case and having a transparent portion at its terminal end, said cassette case being integrally incorporated with a supply side hollow arm portion and a take-up side hollow arm portion one of which has side surfaces respectively including openings which face each other and which are spaced apart to provide a space therebetween, said inside of said cassette case being open to the outside through one of said openings, said ribbon extending through said space between said openings and through said hollow arm portions;
a mounting base on which said ribbon cassette is removably mounted;
a detecting means for detecting said transparent portion and including a light emitting means and a light receiving means, said detecting means being mounted on said mounting base;
a reflecting plate mounted on said mounting base and facing

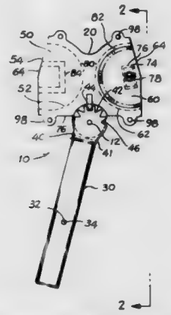
said detecting means, said reflecting plate and said detecting means being spaced apart to include said space therebetween, said openings being disposed opposite said detecting means and said reflecting plate, respectively, such that said ribbon extends between said detecting means and said reflecting plate when said ribbon cassette is mounted on said mounting plate.

5,110,230

ADJUSTABLE SWIMMING-POOL CLEANING TOOL

Mark F. Cole, Jr., 3520 N. Fieta Del Sol West, Tucson, Ariz. 85715, and Clyde S. Woods, Jr., 9301 E. 8th St., Tucson, Ariz. 85710

Filed Feb. 22, 1991, Ser. No. 658,890
Int. Cl.[5] A46B *11/00*
U.S. Cl. 401—52 **4 Claims**



1. An adjustable double-purpose cleaning tool for alternative utilization between two functional sides, comprising:

(a) a head for housing two cleaning attachments on opposite sides, said head comprising two concave semicircular surfaces enclosed by two exterior plates to form two approximately semicircular housings facing opposite directions for receiving the two cleaning attachments, and further comprising a neck portion in fixed rigid relationship to said housings;

(b) a handle, adjustably pivotally joined to said neck portion, for attaching to one end of an extension pole;

(c) spring-loaded locking means for adjusting the relative pivotal position of said neck portion and said handle to produce a desired angle of attack for said cleaning attachments with respect to their working surfaces;

(d) a screwably adjustable clamp located approximately at the center of each of said two semicircular housings for exerting lateral retaining pressure against the cleaning attachments housed therewithin; and

(e) a set of small ridges incorporated into the interior of each of said semicircular housings and on the face of said screwably adjustable clamp for increasing its clamping effectiveness by producing a firmer grip on the cleaning attachments.

5,110,231

FLUID SPRAY CLEANING SYSTEM

Robert D. Monteith, Villa Park, and Keith Johnson, So. Laguna, both of Calif., assignors to George M. Stephenson, Bethel, Conn.

Filed May 9, 1991, Ser. No. 697,699
Int. Cl.[5] A46B *5/02, 11/02;* **B65D** *83/20*
U.S. Cl. 401—190 **6 Claims**

1. A hand-operated cleaning wand system including ON/-OFF control means adapted to be detachably mounted on a pressurized fluid container having an upstanding closure valve stem for dispensing pressurized fluid from the container when this valve stem is actuated by depressing movement thereof, said system comprising:

said ON/OFF control means having an outer cap with gripping means on a lower end thereof adapted to engage and to mount said control means on a pressurized container which can dispense a pressurized fluid through the valve stem of such a container upon depressing movement of the valve stem thereof;

an inner cap mounted for helical ON/OFF movement in said outer cap;

an ON movement of said inner cap turning said inner cap helically downwardly relative to said outer cap for providing downward depressing movement of said inner cap suitable for depressing actuation of a valve stem of such a container;

an OFF movement of said inner cap turning said inner cap helically upward relative to said outer cap for providing upward movement of said inner cap suitable for stopping dispensing of pressurized fluid upon upward movement of such a valve stem;

said ON/OFF control means having a first fluid passageway therein for conducting pressurized fluid from such a valve stem when such a valve stem is actuated;



said inner cap having a thumb tab for hand-operated turning of said inner cap relative to said outer cap in said ON and OFF movement;

said outer cap having ON and OFF stops thereon respectively engaged by said inner cap for limiting ON and OFF turning movement of said inner cap relative to said outer cap;

a length of flexible tubing having first and second ends;

said first end of said tubing being coupled to said ON/OFF control means in communication with said first fluid passageway;

a hand-operated wand having a second fluid passageway extending therein;

said second end of said tubing being coupled to said wand in communication with said second fluid passageway;

said wand having a nozzle with a bore communicating with said second fluid passageway;

valve means positioned in said second fluid passageway in said wand for opening and closing a path through said second fluid passageway from said tubing to said nozzle bore; and

a button actuator mounted in said wand for operating said valve means to open and close said valve means for dispensing fluid from said nozzle bore.

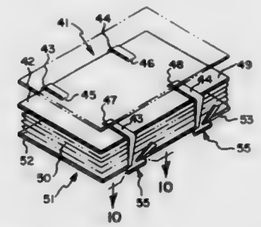
5,110,232

BINDER

Peter D. Jermann, 117 S. 14th St., Olean, N.Y. 14760

Filed May 1, 1991, Ser. No. 694,391
Int. Cl.[5] B42F *3/00*
U.S. Cl. 402—8 **19 Claims**

1. A binder comprising first and second opposing panels, each panel having a hinging end and an opening end; said first panel comprising gripping means for engaging a flexible strap at an edge of an opening end of said panel; said second panel comprising slot means for slidably engaging a flexible strap; flexible strap means extending from said hinging end of said first panel; said flexible strap means being arranged to pass



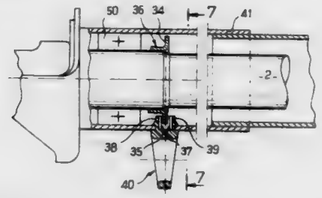
through said slot means of said second panel to retain said second panel in adjustable, opposing juxtaposition to said first panel, by engaging said strap means with said gripping means.

5,110,233

DEVICE FOR TEMPORARILY AXIALLY IMMOBILIZING A SHAFT IN A BODY SUCH AS A STEERING COLUMN CASING TUBE

André Hoblingre, Valentigney; Patrick Courvoisier, Vieux Charmont, and Gérard Bari, Valentigney, all of France, assignors to ECIA, France

Filed May 2, 1991, Ser. No. 694,714
Claims priority, application France, May 3, 1990, 9005589
Int. Cl.[5] B65D *59/00*
U.S. Cl. 403—12 **13 Claims**



1. Device for temporarily axially immobilizing an inner shaft in an outer body containing an aperture in a wall thereof, said device comprising: a collar fixed to said shaft; and a locking element detachably fixed in said aperture and to the wall of said body; said collar and said locking element together defining, inside said body, a radial flange sandwiched between two radial abutment surfaces which prevent relative axial displacement between said shaft and said body, said flange and said abutment surfaces being mounted on respectively different ones of said shaft and said body.

5,110,234

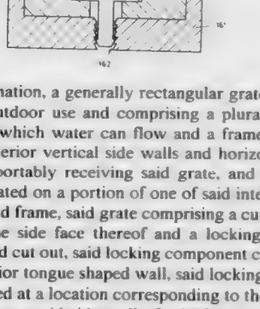
ANGLE JOINT PIECE

Mauri Mäkinen, Kokinkyläntie 6 C2, 02180 Espoo, Finland

Continuation of Ser. No. 405,341, Sep. 11, 1989, abandoned. This application Jul. 8, 1991, Ser. No. 726,774
Claims priority, application Finland, Sep. 21, 1988, 884322
Int. Cl.[5] B25G *3/36*
U.S. Cl. 403—403 **15 Claims**

1. A frame structure for a slide door carried by wheels, which frame structure comprises frame battens (**10**) joined to each other at an angle of 90° by means of one of a plurality of angle joint pieces (**1**), so that each angle joint piece (**1**) is fitted against a face of frame battens that is parallel to a plane of the door, and a face (**12**) of each said plurality of angle joint pieces which is fitted against said frame battens is provided with two projections (**6**, **6'**), said projections being perpendicular to one another and parallel to said plane of the door, said projections being fitted into longitudinal grooves (**11**) provided in said frame battens (**10**), the longitudinal grooves in the battens being open toward said plane of the door, characterized in that:

the distance of a first of said projections (**6**) from an extension of a second of said projections (**6'**) is at least equal to



the distance of a first of said longitudinal grooves (**11**) in said frame battens from an inner edge (**10***a*) of said frame battens (**10**), and that

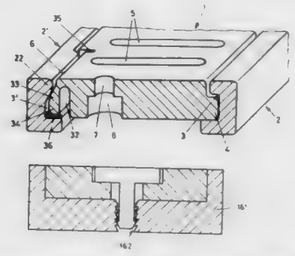
said frame battens are cut off at an angle of 90°.

5,110,235

LOCKING COMPONENT FOR SECURING A COVER ON A FRAME

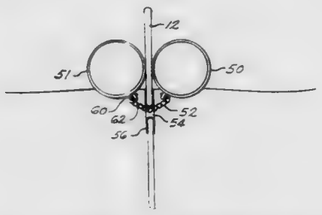
Roland Thomann, Langnau, and Heinz Witschi, Adlingenswil, both of Switzerland, assignors to ABT, Inc., Troutman, N.C.

Filed May 22, 1990, Ser. No. 527,068
Claims priority, application Switzerland, May 25, 1989, 1972/89
Int. Cl.[5] E01C *11/22;* **E05C** *21/02*
U.S. Cl. 404—4 **10 Claims**



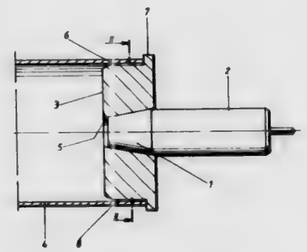
1. In combination, a generally rectangular grate of the type suitable for outdoor use and comprising a plurality of inlets slots through which water can flow and a frame, said frame comprising interior vertical side walls and horizontal bottom walls for supportably receiving said grate, and at least one projection located on a portion of one of said interior vertical side wall of said frame, said grate comprising a cut out portion on at least one side face thereof and a locking component mounted in said cut out, said locking component comprising at least one exterior tongue shaped wall, said locking component being positioned at a location corresponding to the location of said projection on said side wall of said frame whereby said grate can be locked into said frame by the cooperating action of said locking component and said projection on said side wall of said frame.

5,110,236
SELF-RIGHTING OIL CONTAINMENT BOOM
Joseph P. Santamaria, Alexandria, N.H., assignor to JPS/Oiltrol, Inc., Bristol, N.H.
Filed Jun. 11, 1990, Ser. No. 536,301
Int. Cl.[5] E02B *15/04*
U.S. Cl. 405—63 **16 Claims**



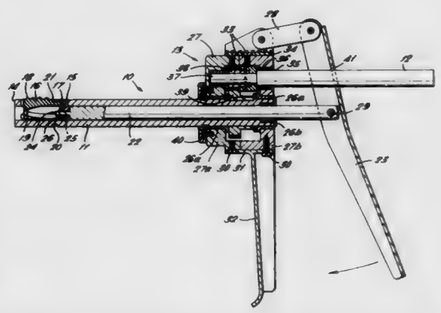
1. A boom for containing a contaminant in a body of water comprising:
- means for forming a longitudinal barrier at the surface of the water; and
- float means on opposite sides of the barrier for maintaining the barrier forming means afloat in a substantially vertical orientation in the water; and
- means attached to the float means and freely reciprocatable through an opening in the interior of the barrier forming means for allowing the float means to assume different levels in the water to enable the barrier forming means to maintain a substantially vertical orientation in the water.

5,110,237
RAMMING DEVICE
Alfons Hesse, Lennestadt, Fed. Rep. of Germany, assignor to Paul Schmidt, Lennestadt, Fed. Rep. of Germany
Filed Sep. 16, 1988, Ser. No. 245,825
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3734998
Int. Cl.[5] E02F *5/18*
U.S. Cl. 405—184 **9 Claims**



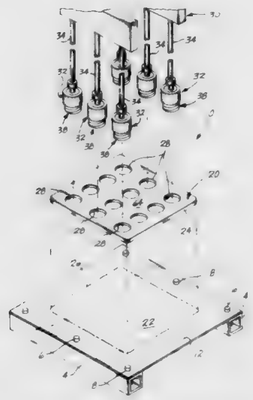
1. A device for driving in a pipe, comprising:
- a connecting piece engageable into a rearward end of the pipe and having at least one earth outlet opening; and
- a ram having a conical striking tip **1** engageable into the connecting piece, the connecting piece being comprised of an expansion ring **3** having an outer face which forms a relatively flat surface, and an inside cone arranged on the conical striking tip **1** of the ram, the expansion ring **3** widening radially outwards across its entire length so as to press with its cylindrical outer circumference **6** against an inner wall of the pipe **4** to be driven in, the expansion ring **3** further having a collar **7** arranged at its rear end so as to act as a stop for the pipe.

5,110,238
DRILLS
David P. Payne, 30 Park Road, Berrylands, Surbiton, Surrey KT5 8RD, United Kingdom
Filed Jul. 12, 1991, Ser. No. 729,214
Claims priority, application United Kingdom, Jul. 16, 1990, 9015577
Int. Cl.[5] B23B *51/00*
U.S. Cl. 408—159 **8 Claims**



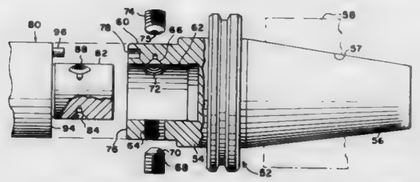
1. An expansible drill for undercutting holes comprising a rotatably tubular drill body having an axial bore, at least one radially extending arm attached by hinge means at one end to the drill body such that the arm is pivotal radially outwards, cutting means formed in the arm, guide means for moving the arm radially outwards, wherein said guide means comprise a non-rotating shaft, a sleeve rotatably mounted on a first end of the non-rotation shaft, the arms being held in contact with the rotating sleeve, and means for moving the shaft axially relative to the drill body towards said one end, so as to cause the arm to pivot radially outwards.

5,110,239
VACUUM CLAMPING SYSTEM
A. Douglass Riley, and Hugh W. Hanson, both of Winnipeg, Canada, assignors to The Boeing Company, Seattle, Wash.
Filed Apr. 26, 1991, Ser. No. 691,998
Int. Cl.[5] B23D *1/30*; B27C *5/00*; B25B *11/00*
U.S. Cl. 409—125 **12 Claims**



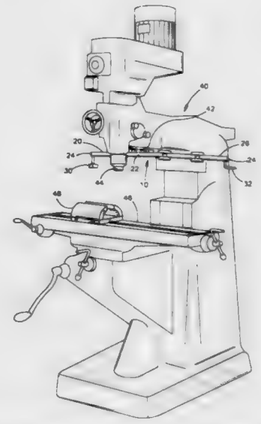
1. A vacuum clamping system for trimming a workpiece, comprising:
- a template adapted to be laid across one side surface of said workpiece, said template being shaped to outline at least a portion of said workpiece to be trimmed, and having a plurality of openings through its thickness;
- a plurality of hold-down pods, each pod including an expandable and contractible bellows, said bellows having an open suction end that is sized and shaped to pass through any one of said template openings, for coming into closing contact with said one side surface of said workpiece, said bellows being connected to a vacuum source, for drawing air from inside said bellows and thereby causing said bellows to contract when said suction end is closed, with each hold-down pod further including a clamping housing, connected to said bellows, and adapted to thrust against said template in response to contraction of said bellows, whereby in operation,
- at least some of said hold-down pods are placed adjacent said template while said bellows of each one of said pods is in an expanded condition, in a manner so that the suction end of said bellows extends through a separate one of said template openings and into closing contact with said workpiece, and upon evacuation of said bellows, the resultant contraction of said bellows causing said clamping housing of each one of said pods to be pulled into thrusting contact with said template, thereby sandwiching said template between said workpiece and said hold-down pods, in a manner so as to hold said template in a fixed position relative to said workpiece.

5,110,240
APPARATUS FOR COUPLING TOOL HOLDERS
James G. Zeilinger, and Leon O. Kern, both of Frankenmuth, Mich., assignors to DeVlieg-Bullard, Inc., Frankenmuth, Mich.
Filed May 9, 1991, Ser. No. 697,583
Int. Cl.[5] B23B *29/02*; B23C *5/26*
U.S. Cl. 409—234 **13 Claims**



1. A coupling for connecting to a machine tool spindle a selected one of a number of tool holders each of which has coupling means different from the remainder of said tool holders, said coupling comprising:
- a. a body having opposite ends;
- b. means at one end of said body for connection to said spindle;
- c. an annular wall at the opposite end of said body forming a socket having a bore open at least at one end thereof;
- d. a first opening extending radially through said wall;
- e. a concave, radial recess in said bore diametrally opposed to said first opening and in communication only with said bore;
- f. a second opening extending radially through said wall and interposed between said first opening and said recess; and
- g. a pair of fastening members, one of which is accommodated in said first opening and the other of which is accommodated in said second opening, and
- h. at least one of said fastening members being of such length as to enable one end thereof to project into said bore.

5,110,241
MILLING MACHINE VISE LIFTER AND STORAGE APPARATUS
Robert E. Shook, P.O. Box 0857, Painesville, Ohio 44077
Filed Jun. 11, 1991, Ser. No. 713,268
Int. Cl.[5] B23Q *3/00*
U.S. Cl. 409—235 **6 Claims**



1. For use in combination with a vertical turret milling machine, which milling machine comprises a motorized milling tool movably suspended on a way that extends horizontally above a substantially flat bed upon which a workpiece clamping means rests, said bed being controllably movable in three orthogonal linear directions; an apparatus adapted for attachment to said horizontal way, which apparatus comprises:
- (a) an attachment means including a clamping means that is adapted to fixedly engage said way; and
- (b) a substantially horizontally disposed support arm having a proximal end pivotably connected to said attachment means and having a distal end adapted to be received in clamping jaws of said workpiece clamping means;

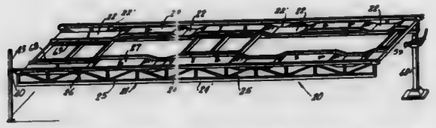
thereby, said apparatus provides the capability to support said clamping means as said bed is lowered for the purpose of first disengaging said clamping means from support by said bed, thereby transferring support from said bed to said support arm, and then moving said clamping means supported by said support arm to a storage location where it remains supported by said support arm while remaining clear of said bed, thereby freeing said bed for the installing of other workpiece clamping means.

5,110,242
APPARATUS FOR STORING AUTOMOBILES INSIDE MARITIME CONTAINERS
Martin D. Chance, P.O. Box 28, Ramsey, Isle of Man
PCT No. PCT/US89/01380, § 371 Date Jan. 22, 1991, § 102(e) Date Jan. 22, 1991
PCT Filed Apr. 4, 1989, Ser. No. 613,849
Int. Cl.[5] B60P *3/08*
U.S. Cl. 410—26 **21 Claims**

15. An apparatus for double stacking wheeled vehicles in upper and lower levels inside a maritime container with a substantially rectangular floor plan having a floor, four top frame members, four bottom frame members and four corner posts, and said apparatus further including a removable ramp assembly, comprising:
- A. a continuous and rigid platform member having four corners extending substantially the entire length and width of said container and housed therein, said platform member having two long lateral sides and two short end

sides and said platform member further including two parallel ramp ways that are kept in a spaced apart relationship that cooperatively receive said wheeled vehicles;

B. locking means for keeping said platform member suspended in a substantially horizontal plane above said floor and in cooperation with said ramp assembly for loading the vehicles on said upper level and said locking means



including means for adjusting the separation of said platform member from said roof and said locking means being positioned at said short end sides of said platform member; and

C. a mechanical crank jack member removably mounted to said platform member so that said platform member can be vertically raised and lowered.

5,110,243

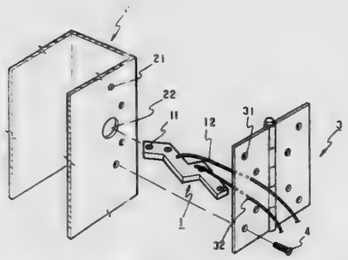
APPARATUS FOR ATTACHING OBJECTS TO A PANEL

Jung H. Oh, 91-265, Shinsu-dong, Mapo-ku, Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 160,304, Feb. 25, 1988, Pat. No. 5,044,854. This application Jul. 19, 1990, Ser. No. 555,243

Int. Cl.[5] F16B *37/08*

U.S. Cl. 411—344 **4 Claims**



2. A fastening device for securely attaching objects, which objects can be large in size, to a front side of a panel having the other side not approachable or hidden, which panel can be thin in thickness, by the use of an auxiliary member, which auxiliary member has an elongate form so as to be insertable lengthwise through an insertion hole in the panel and which auxiliary member is positionable on the back side of the panel to extend along a linear distance on said back side of the panel, and by the use of a plurality of fasteners, each of which fasteners extends through aligned openings formed in the object, the panel and the auxiliary member and each of which openings is separate and spaced from the insertion hole to thereby provide a plurality of attachment forces, each of which forces is separate and spaced from the location of the insertion hole, and wherein the object has a rear surface directly engagable with a front surface of the panel and wherein the object itself can be large and/or heavy or the object can be a device such as a hinge which supports a large and/or heavy part such as a door, said fastening device comprising,

an auxiliary member having an elongate form so as to be insertable lengthwise through an insertion hole in the panel.

said auxiliary member having a surface complementary to and engagable with the back surface of the panel,

said auxiliary member being sufficiently elongated in form to extend along a linear distance on said back side of the panel and being constructed to permit a plurality of fastening holes to be formed through the auxiliary member at locations spaced away from the insertion hole,

fastening holes formed in the auxiliary member and the object and alignable with respective fastening holes formed in the panel,

guide string means connected to the auxiliary member for pulling the auxiliary member forward after the auxiliary member has been inserted through the insertion hole to hold the front surface of the auxiliary member in place against the back surface of the panel member with the fastening holes of the auxiliary member in alignment with the fastening holes in the panel,

fastener means insertable in the aligned fastening holes in the object, panel and auxiliary member for securely attaching the object to the panel when the fastening means are fastened to the auxiliary member, and

wherein each of said fastening holes is separate and spaced from the insertion hole so that the fastener means provide a plurality of attachment forces each of which is separate and spaced from the location of the insertion hole, and

whereby large and/or heavy objects can be securely attached to a panel which can be thin in thickness by a plurality of points of attachment which are separate and spaced from the insertion hole.

5,110,244

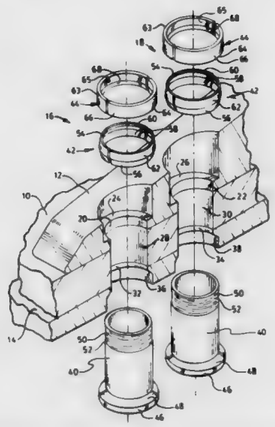
FASTENER ASSEMBLY

James A. Garman, Eureka, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Aug. 27, 1991, Ser. No. 750,340

Int. Cl.[5] F16B *19/00*; **B21D** *39/00*

U.S. Cl. 411—361 **14 Claims**



1. A fastener assembly adapted to secure an adapter to a base edge of a bucket, the fastener assembly, comprising:

a hollow cylindrical pin having an enlarged portion at one end and a plurality of circumferential ridges and grooves at the other end thereof each being longitudinally adjacent each other, the hollow cylindrical pin, when assembled, being disposed through respective holes in the base edge and the adapter;

a hollow cylindrical shear ring operative, when assembled, to fit around the circumferential ridges and grooves adjacent the other end of the hollow cylindrical pin; and

a hollow cylindrical compression ring operative, during assembly, in response to an external axial force applied to the hollow cylindrical compression ring to radially compress the hollow cylindrical shear ring so that a portion of the material of the hollow cylindrical shear ring is forced to flow around the plurality of circumferential ridges and into the plurality of circumferential grooves.

5,110,245

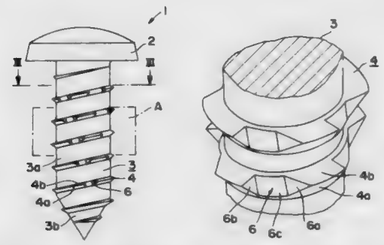
THREAD FORMING SCREW

Sakamoto Hiroyuki, Fukuchiyama, Japan, assignor to Nitto Seiko Co., Ltd., Kyoto, Japan

Filed Sep. 12, 1990, Ser. No. 581,541

Int. Cl.[5] F16B *35/04*

U.S. Cl. 411—421 **1 Claim**



1. In a forming fastener comprising a driven head with a recess or a convex surface to be engaged with a driving tool and a shank portion with a rolled type thread having a first angle of a progressive flank and a second angle of a following flank, wherein the second angle is smaller than said first angle, the thread is interrupted by plural slot recesses being formed as helical slot recesses with a lead angle reverse to an inclination of the thread, the thread has parts of a continuous thread without any slot recess at its tapered end, each of the recesses is formed by a dully inclined leading edge of the interrupted thread, a nearly perpendicular rearward edge of its leading interrupted thread prevents said fastener from rotating in a direction that it can loosen, the thread is formed having a partially cut-away screw thread between two adjacent interrupted threads, and a depth of said slot recesses is selected as a percentage of a height of said screw to thread to that of a female thread formed thereby.

5,110,246

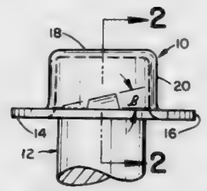
TWIST-OFF PUSHNUT FASTENER

Charles K. Fisher, Belford, and Willem J. Steyn, Jackson, both of N.J., assignors to TRW Inc., Cleveland, Ohio

Filed Apr. 23, 1991, Ser. No. 690,088

Int. Cl.[5] F16B *37/14, 37/16*

U.S. Cl. 411—429 **1 Claim**



1. A hat-shaped push-on fastener for telescopic application to a male member comprising: a single piece of springy sheet metal having: an annular flange defining a washer-like base; an inverted cup with the bottom of the cup constituting the top of the hat formation and the mouth of the cup merging with the washer-like base at the inner circumference thereof, the side wall of the cup being a cylindrical sleeve perpendicular to the washer-like base and adapted to closely surround the male member to which the fastener is telescopically applied; and a pair of relatively rigid and inflexible teeth having tips extending radially inward and axially upward, the teeth being located on diametrically opposite sides of the sleeve and being struck inwardly from the metal of the sleeve and being severed therefrom across the end of the tips and along their longitudinal edges from the ends of the tips to the washer-like base, the roots of the teeth being at the level of the washer-like base and the ends of the tips being spaced a relatively substantial distance from the top of the hat formation, each tooth being inclined at a slight angle top the axis of the sleeve and arranged such that the end of each tip is tilted to engage the surface of the male member to which it is telescopically applied along an imaginary helical path, with the end of each tip engaging along a helical path having the same hand and substantially the same helix angle; and an elongated slot for receiving a screw driver for manually rotating said fastener, said slot extending through the bottom of the cup along a diametrical line generally transverse to an imaginary line extending generally diametrically between said pair of teeth, the ends of said slot being spaced radially inwardly from the side wall of the cup.

5,110,247

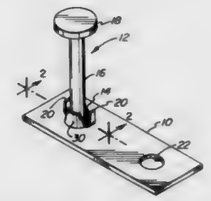
FASTENER ASSEMBLY WITH RETAINING FINGERS FOR USE WITH A POWER ACTUATED GUN

Al Losada, 204 Folino Dr., Bridgeport, Conn.

Filed May 2, 1991, Ser. No. 694,934

Int. Cl.[5] F16B *15/00*; **B25C** *1/08, 5/02, 5/06*

U.S. Cl. 411—441 **11 Claims**



1. An improved fastener assembly of a type which is driven into a support structure by a power actuated gun comprising:

a bracket plate, said bracket plate having an aperture formed therein;

at least two fingers formed within said bracket plate adjacent said aperture spaced to frictionally fit within a bore of the power actuated gun;

a stud having a head end portion, a shank portion, and a pointed end portion, said stud having a shank diameter sized so as to be frictionally retained in said aperture; and

said stud having a head end portion having a diameter sized so as to fit within the bore of the power actuated gun;

whereby the fastener is held within the bore of the power actuated gun by the frictional engagement of said fingers with the bore of a gun.

5,110,248

VERTICAL HEAT-TREATMENT APPARATUS HAVING A WAFER TRANSFER MECHANISM

Takanobu Asano, Yokohama; Hirofumi Kitayama, Aikawa; Hiroyuki Iwai, and Yuuji Ono, both of Sagamihara, all of Japan, assignors to Tokyo Electron Sagami Limited, Kanagawa, Japan

Filed Jul. 11, 1990, Ser. No. 550,981

Claims priority, application Japan, Jul. 17, 1989, 1-183927; Jul. 17, 1989, 1-183929; Mar. 9, 1990, 2-59155

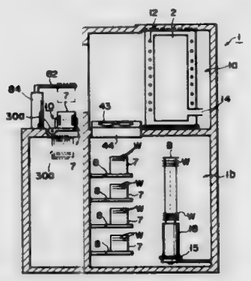
Int. Cl.[5] B23K *9/00*

U.S. Cl. 414—172 **12 Claims**

1. A vertical heat-treatment apparatus having a wafer transfer mechanism for transferring a plurality of semiconductor wafers from a plurality of carriers to a vertical boat, said apparatus comprising:

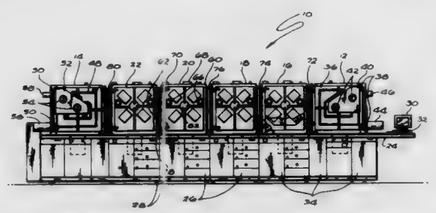
a port having a substantially horizontal surface for receiving

said carriers, said wafers being arranged in parallel substantially in a vertical state in said carriers;
posture change means provided at said port for rotating said carriers to change the posture of said wafers from said vertical state to a horizontal state;
a station for keeping said carriers in a standby state, with said wafers arranged in parallel substantially in said horizontal state;
carrier loading/unloading means for receiving said carriers from said posture change means and transferring said carriers to and loading the same on said station; and



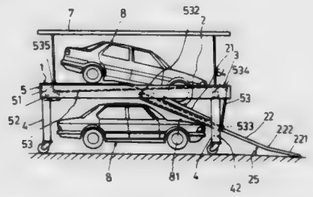
wafer loading/unloading means for taking out said wafers in succession from said carriers on said station and transferring said wafers to said vertical boat and loading said wafers on said vertical boat;
a frame on which said carrier loading/unloading means and said wafer loading/unloading means are commonly mounted, and
motive means for moving said frame between a first position and a second position, wherein said carrier loading/unloading means is presented toward said station when said movable frame is in said first position, and wherein said wafer loading/unloading means is presented toward said station when said movable frame is in said second position.

5,110,249
TRANSPORT SYSTEM FOR INLINE VACUUM PROCESSING
Arthur E. Norman, Northridge, Calif., assignor to Innotec Group, Inc., Simi Valley, Calif.
Continuation of Ser. No. 922,172, Oct. 23, 1986, abandoned. This application Aug. 14, 1989, Ser. No. 393,673
Int. Cl.[5] C23C *14/34*
U.S. Cl. 414—217 **40 Claims**



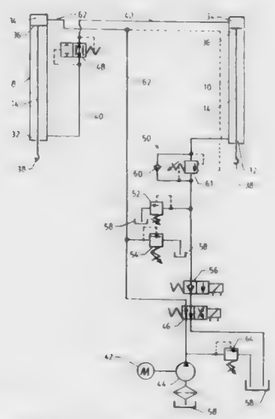
1. An inline processing system for a plurality of pallets each supporting a plurality of substrates for, including,
a magazine for supporting the pallets in stacked relationship for processing,
a load chamber disposed in adjacent relationship to the magazine for receiving and supporting the magazine and including indexing means coupled to the magazine structure for indexing the magazine to provide for the transfer of successive ones of the pallets in the stacked relationship from the magazine to the load chamber,
a process chamber located inline with the load chamber and in adjacent relationship to the load chamber on the opposite side of the load chamber from the magazine and including a passageway between the load chamber and the process chamber to provide for the passage of individual ones of the pallets between the load chamber and the process chamber,
valve means coupled to the passageway for opening and closing the passageway to provide for the passage of individual ones of the pallets between the load chamber and the process chamber when the passageway is open and for sealing the load chamber from the process chamber to prevent passage of pallets between the load chamber and the process chamber and to provide for independence in the atmospheres in the load and process chambers when the passageway is closed to facilitate the processing of the substrates in the process chamber,
carrier means movable between the load and process chambers for receiving the individual ones of the pallets indexed from the magazine and for supporting the individual ones of the pallets for transport from the load chamber to the process chamber to a position for processing of the substrates in the process chamber,
first drive and support means located within the load chamber for coupling to the carrier means to support the carrier means and for driving the carrier means from the load chamber to the process chamber to transfer each pallet from the load chamber to the process chamber for processing of the substrates on such pallet in the process chamber and for returning the carrier means from the process chamber to the load chamber after the transfer of such pallet from the load chamber to the process chamber, and
second drive and support means located within the process chamber for coupling to the carrier means to support the carrier means and for driving the carrier means to the process chamber from the load chamber to transfer each pallet from the load chamber to the process chamber for processing of the substrate on such pallet in the process chamber and for returning the carrier means from the process chamber to the load chamber after the transfer of such pallet from the load chamber to the process chamber, and
means for receiving the pallets after the substrates in the pallets have been processed in the process chamber.

5,110,250
DOUBLE-STORY PARKING APPARATUS HAVING TELESCOPIC ACCESS
Zeal-Sain Kuo, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei, Hsien Taiwan
Filed Dec. 18, 1990, Ser. No. 630,287
Int. Cl.[5] B65G *11/18*
U.S. Cl. 414—229 **1 Claim**



1. A parking apparatus comprising:
a fixed elevated horizontal platform mounted on at least two horizontal longitudinal beams mounted on a plurality of supporting columns standing on a ground floor below said platform;
a telescopic access including an upper guide plate pivotally secured to a front edge portion of said platform by a hinge, and a lower entry plate telescopically mounted in two U-shaped grooves formed on two opposite side portions on said guide plate, said telescopic access being operatively lowered and extended to form a sloping surface on the ground floor adapted for driving a car thereon to be parked on said elevated platform, and operatively raised to level said access to form a horizontal plane coplanar to said platform also for levelling the car parked on said platform;
a driving means including at least a reel driven by a motor, and at least a wire having an inner end of said wire wound on said reel and an outer end of said wire connected to a rear portion of said entry plate through a plurality of rollers for operatively lowering and raising said access about said platform; and an electric controller for controlling said driving means for lowering and raising said access, the improvement which comprises:
said entry plate formed with a slight-slope plate on a front edge of said entry plate having a bending portion formed between said slight-slope plate and said entry plate;
each said wire wound on said reel guided through a first roller rotatably mounted on a rear portion of said guide plate, a second roller rotatably mounted on a front portion of said guide plate, and a third roller rotatably mounted on a front portion of said beam; and
each said supporting column formed with a wheel on its lower portion for movable purpose.

5,110,251
HYDRAULIC PLATFORM LIFT FOR TRUCK TRAILERS
Ralph E. Gray, 561 Fallingbrook Drive, Waterloo, Ontario, Canada N2L 4N2
Continuation-in-part of Ser. No. 297,930, Jan. 17, 1989, abandoned. This application Jun. 12, 1990, Ser. No. 536,770
Int. Cl.[5] B60P *1/44*
U.S. Cl. 414—545 **14 Claims**

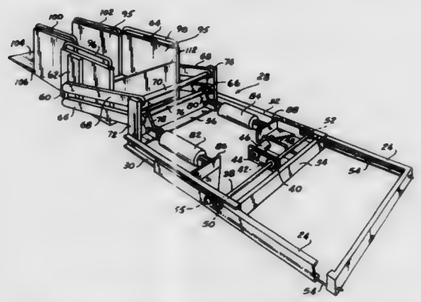


1. A platform lift for use with a cargo door of a truck or truck trailer, said door having a lower edge and two sides, said truck or trailer resting on a supporting surface, said lift comprising:
(a) a platform having an upper surface and two ends;
(b) two vertically mounted hydraulic cylinders, a first cylinder being mounted at one side of said door and a second cylinder being mounted at the other side of said door, each cylinder containing a rod and a piston, and each cylinder having a rod end and a cap end with the platform being connected to the rod of each cylinder;
(c) the first cylinder having a larger cross-sectional size than the second cylinder such that a cross-sectional area of the first cylinder at the rod end minus a cross-sectional area of the rod of the first cylinder is substantially equal to a cross-sectional area of the second cylinder at the cap end;
(d) the cylinders being interconnected by a connecting line so that hydraulic fluid can flow between the rod end of the first cylinder and the cap end of the second cylinder as the cylinders are activated, said cylinders and said connecting line being a cylinder portion, said cylinder portion having an entrance where hydraulic fluid enters the cylinder portion and an exit where hydraulic fluid exits the cylinder portion;
(e) control means, reservoir means and pumping means for hydraulic fluid connected with said cylinder portion to form a closed hydraulic circuit, to activate the cylinders of said cylinder portion, said control means including a counterbalance valve so that, when hydraulic fluid is forced into the entrance of said cylinder portion:
(i) said counterbalance valve is mounted to control, during lowering of the platform, flow of hydraulic fluid from said exit from said cylinder portion;
(ii) said counterbalance valve sensing pressure, during the downward movement of the platform, of the hydraulic fluid being forced into the entrance of said cylinder portion from said pumping means to ensure that said pressure does not fall below a predetermined minimum by decreasing the flow of hydraulic fluid from said exit from said cylinder portion;
(iii) said counterbalance valve permitting said platform to be lowered while preventing hydraulic fluid from flowing out of said exit from said cylinder portion at a rate that is faster than the pumping means can pump fluid into the entrance of said cylinder portion;
(f) each rod of the cylinders having a free end opposite to an end that is connected to the piston, the free ends of the rods and the platform being connected so that the platform can be moved upward or downward hydraulically between a lower edge of said door and said supporting surface with a positive force by appropriately activating the cylinders so that the pistons move upward or downward;
(g) the platform being pivotally connected so that its upper surface can be moved from a vertical position to a horizontal position and vice-versa, as desired, the platform being capable of being located in a vertical position entirely below the door of the truck or trailer by forcing the cylinders downward.

5,110,252
WHEELCHAIR LIFT FOR TRANSIT VEHICLES HAVING ELEVATED PASSENGER COMPARTMENT FLOOR
Lawrence S. Aoki, Modesto, Calif., assignor to Hogan Mfg., Inc., Escalon, Calif.
Filed May 24, 1990, Ser. No. 528,744
Int. Cl.[5] B60P *1/44*
U.S. Cl. 414—549 **15 Claims**

1. A wheelchair lift, for use on a transit vehicle having an enclosed compartment under the passenger seating area, the lift comprising:
support means to be secured to the compartment;
a movable carriage slidably mounted on said support means;
means coupled with said carriage for causing said carriage to move along said support means between an extended position and a retracted position;
a platform mounted on said carriage, said platform comprising a fixed portion having a horizontal first surface and an outer edge and a movable portion having a second surface, said movable portion being pivotally mounted to said fixed portion at said outer edge so as to be movable (a) downwardly and outwardly from (1) a first position wherein said second surface extends substantially vertically to (2) a second position wherein said first surface

extends substantially parallel to said second surface, and (b) upwardly and inwardly from (1) said second position to (2) said first position, further wherein said fixed portion includes a first pair of handrails extending upwardly from said first surface on opposite sides of said fixed portion, and said movable portion includes a second pair of handrails extending upwardly from said second surface on opposite sides of said movable portion, said first and second pairs of handrails being affixed, respectively, to said fixed and movable portions so as to remain in said upwardly extending relation therewith when said movable portion is in said first position, said second position, or is being moved between said first and second positions, said



fixed and movable portions of said platform and said first and second handrails being sized and configured so as to permit said platform to be received entirely within the compartment of the transit vehicle when said carriage is in said retracted position and said movable portion is in said first position;

means coupled with said movable portion for causing said movable portion to move between said first and second positions when said carriage is in said extended position; and

means coupled to said platform for lowering said platform to the ground and raising it to a level of the passenger seating area.

5,110,253
TWO-LEVER THREE FUNCTION CONTROL MECHANISM

Paul J. Ernst, Dubuque, and Rex A. Hanson, Peosta, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 21, 1990, Ser. No. 632,309
Int. Cl.[5] G05G *1/24*; E02F *9/20*
U.S. Cl. 414—694 **17 Claims**

10. A three-function control mechanism comprising:

a first control lever that can be moved in a first plane and a second plane perpendicular to the first plane for controlling a first function and a second function, respectively;

a second control lever that can be moved in the first plane and a third plane that is parallel to the second plane for controlling a first function and a third function, respectively;

a stationary control lever mounting bracket is provided with a guide slot and a control linkage mounting point;

the first control lever is provided with a control yoke having a first connection point, a second connection point, and a yoke mounting point, the first and second connection points are provided with suitable linkages for manipulating the first and second functions when the first control lever is moved through the first and second planes, respectively;

a main ball joint is mounted to the control linkage mounting point, a stub shaft is coupled to the main ball joint and the yoke mounting point, the stub shaft is also provided with an extending portion that extends into the guide slot of the control lever mounting bracket for restricting the movement of the stub shaft in the second plane;

the second control lever is provided with a link that is provided with an aperture through which the stub shaft projects, the link projects on the other side of the aperture from the control lever and provides a third connection

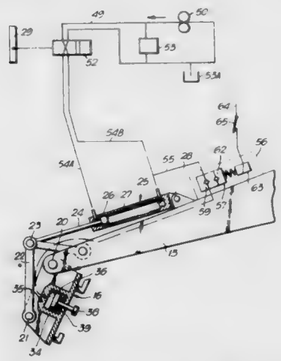


point having suitable linkages for manipulating the third function, the second control lever follows the first control lever as it moves through the first plane but is independent of the first lever as it moves through the second plane, the first control lever follows the second control lever as it moves through the first plane but is independent of the second control lever as it moves through the third plane.

5,110,254
QUICK-RELEASE COUPLING FOR EARTHWORKING MACHINES

Martin J. Aubrey, Westbourne, Kington, Herefordshire HR5 3NL, England

Filed May 7, 1990, Ser. No. 519,908
Claims priority, application United Kingdom, Mar. 7, 1990, 9005741
Int. Cl.[5] E02F *3/70*
U.S. Cl. 414—723 **11 Claims**



8. A quick-release coupling for connecting a tool in an earthworking machine, the coupling comprising:

a coupling member adapted for engaging the tool;

support structure on which the coupling member is support for movement between operational positions;

a first hydraulic motor adapted for moving said coupling member between said operational positions, said first hydraulic motor including a cylinder containing a piston movable therein between terminal positions;

a locking member provided on the first coupling member and movable between a lock position and a release position for respectively locking the tool to the coupling member and releasing it therefrom;

a spring arranged between the first coupling member and the locking member for urging the locking member into one of the lock and release positions; and

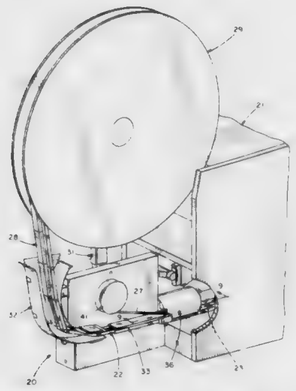
a second hydraulic motor arranged for moving the locking member into the other one of the lock and release positions in opposition to the force of said spring;

said second hydraulic motor being arranged for moving said locking member into said other one of the lock and release positions responsive to fluid pressure in the first hydraulic motor reaching a predetermined value, said predetermined value being reached when said piston attains one of said terminal positions.

5,110,255
CONNECTOR FEEDING APPARATUS FOR A CONNECTOR TERMINATION PRESS

Joseph F. LeBan, Warrenville, and Robert F. Levin, Braceville, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Jul. 19, 1991, Ser. No. 733,050
Int. Cl.[5] B25J *11/00*
U.S. Cl. 414—754 **5 Claims**



1. A connector feeding apparatus, comprising:

connector supply means for providing a plurality of connectors in a first orientation;

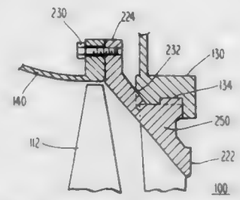
a drum for sequentially reorienting each connector from the first orientation where the connector is not properly oriented for termination within a connector terminator press to a second orientation where the connector is properly oriented for termination within a connector termination press, the drum including at least one connector positioning slot for receipt of the connector; and

means for rotating the drum to reorient each connector from the first to the second orientation.

5,110,256
METHODS AND APPARATUS FOR ATTACHING A FLOW GUIDE TO A STEAM TURBINE FOR RETROFIT OF LONGER ROTATIONAL BLADES

John C. Groenendaal, Jr., Winter Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 11, 1991, Ser. No. 653,573
Int. Cl.[5] F01D *9/04, 3/02*
U.S. Cl. 415—190 **9 Claims**



1. A steam turbine having two ends adapted to exhaust steam through a flow guide, the steam turbine comprising at least an inner housing enclosing one or more sets of circularly disposed rotatable blades affixed to a central shaft, and one or more sets of circularly disposed stationary blade assemblies affixed to an outer blade ring residing in a circumferential groove in the inner housing, the steam turbine further comprising:

at least one retrofit set of rotatable blades disposed at each of the ends of the turbine and having a relatively greater length than the said rotatable blades; and

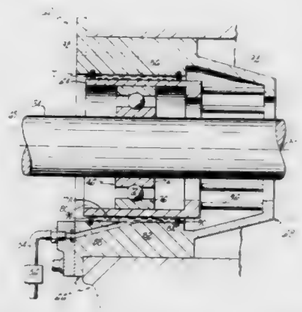
a modified stationary blade assembly comprising an outer ring extension section integral with an outer ring and connecting means for attaching the flow guide to the outer ring extension,

wherein said inner housing is modified to comprise at least one surface sloped relative to a horizontal axis of the turbine to provide clearance for said outer ring extension section, and whereby the flow guide is in close proximity to the tips of the retrofit rotatable blades.

5,110,257
APPARTUS FOR SUPPORTING A ROTATING SHAFT IN A ROTARY MACHINE

David H. Hibner, Colchester; Dennis F. Buono, Manchester; Kurt M. Dembeck, Vernon, and Roy D. Franceschet, North Haven, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 507,950, Apr. 11, 1990, which is a division of Ser. No. 193,449, May 12, 1988, Pat. No. 4,947,639. This application Sep. 17, 1990, Ser. No. 583,930
Int. Cl.[5] F16C *27/00*; F01D *5/00*
U.S. Cl. 415—119 **5 Claims**



1. A rotary machine which includes a rotor shaft and sup-

port structure for the shaft, the rotor shaft being rotatable at a first speed and a second speed, which comprises:

an adjacent support structure which is spaced radially from the shaft;

a member disposed about the shaft which is adapted to rotatably support the rotor shaft and which is spaced from the adjacent support structure leaving a damping chamber that is circumferentially continuous and that is disposed circumferentially about the member for damping vibrations in the shaft therebetween;

means for flexibly supporting the member from the adjacent support structure which permits vibrational movement of the shaft in response to rotation of shaft;

means for disposing damping medium in said damping chamber at said first rotational speed of the rotor shaft to provide a viscous damper for damping vibrational movement of the rotor shaft, and for removing damping medium from said damping chamber at said second rotational speed of the shaft to remove the viscous damper from the rotary machine at said second speed.

5,110,258

BLOWER HAVING A SOUND-DAMPING STRUCTURE

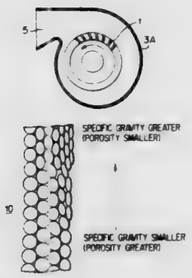
Ken Morinushi; Hidehara Tanaka, both of Amagasaki; Yoshihiro Noguchi, Hanazono; Toshihisa Imai, Hanazono, and Yutaka Takahashi, Hanazono, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Mitsubishi Electric Home Appliance Co., Ltd., Saitama, both of, Japan

Filed Aug. 2, 1990, Ser. No. 561,685

Claims priority, application Japan, Aug. 9, 1989, 1-204881

Int. Cl.[5] F01D *5/10*

U.S. Cl. 415—119 **7 Claims**



1. A blower comprising:

an impeller for raising the pressure of fluid and delivering said fluid;

means for driving the impeller; and

a fan casing which includes a fluid path to inspire the fluid from the outside and deliver it to the outside through the impeller;

wherein the fan casing is at least partly formed by a hard porous structural unit whose specific gravity is continuously changed in at least one of a thickness direction and a surface direction of said porous structural unit, the blower is a centrifugal type blower, the porous structural unit is substantially in the form of a plate and forms a side surface of the fan casing, and the porous structural unit has such a radial distribution in specific gravity that its specific gravity becomes greater and its porosity becomes smaller in a direction toward a periphery of the fan casing in an area which is located outside a location corresponding to a periphery of the impeller.

5,110,259

PITCH CHANGE BEARING SYSTEM

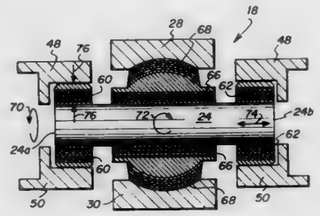
Madison K. Robinson, Bedford, Tex., assignor to Bell Helicopter Textron Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 421,166, Oct. 13, 1989, Pat. No. 4,986,735. This application Sep. 10, 1990, Ser. No. 579,821

The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.

Int. Cl.[5] B64C *27/35*

U.S. Cl. 416—134 A **6 Claims**



1. A pitch change bearing assembly for a helicopter having a yoke and a grip comprising:

a shaft having first and second ends;

a first radial elastomeric bearing element disposed on said first end of said shaft;

a second radial elastomeric bearing element disposed on said second end of said shaft;

a third radial elastomeric bearing element disposed on said shaft between and spaced apart from said first and second radial elastomeric bearing elements;

means for attaching said third radial elastomeric bearing element to a grip; and

means for attaching said first and second radial elastomeric bearing elements to a yoke, such that said third radial elastomeric bearing element and said first and second radial elastomeric bearing elements share torsional motions imparted by the grip, thereby allowing a reduced radial envelope of the pitch change bearing assembly in which torsional motions can be accommodated.

5,110,260

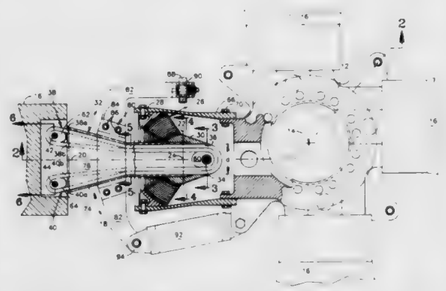
ARTICULATED HELICOPTER ROTRO WITH AN IMPROVED BLADE-TO-HUB CONNECTION

Francis E. Byrnes, White Plains, N.Y.; Edward S. Hibyan, and William L. Noehren, both of Trumbull, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 17, 1990, Ser. No. 628,270

Int. Cl.[5] B64C *11/12*

U.S. Cl. 416—134 A **12 Claims**



1. An articulated helicopter rotor comprising:

a) a rotor hub mounted for rotation about an axis of rotation;

b) a plurality of blades extending radially from said hub;

c) means connecting each of said blades to said hub so as to permit said blade to move freely in flapping, lead-lag, and pitch change motion with respect to the hub about intersecting flapping, lead-lag and pitch change axes, and to react loads associated with such motions and to transfer said loads together with centrifugal loads generated by the blade during rotation into said hub comprising:

1) a spherical elastomeric bearing laminate comprising alternate layers of rigid material and elastomer positioned between a bearing inner race and a bearing outer race and being concentric about an intersection of the blade pitch change, lead-lag and flapping axes. said inner race having a central aperture extending therethrough and enveloping the blade pitch change axis, said inner race also having aligned apertures in the walls thereof on opposite sides of the central aperture and positioned radially inboard of the spherical bearing laminate;

2) means connecting the bearing outer race to the hub;

3) a first connecting pin extending through said aligned apertures in the blade inner race and connected thereto;

4) second and third connecting pins positioned laterally on opposite sides of the blade pitch change axis, extending substantially parallel to the first connecting pin, and connected to the blade root;

5) a composite yoke comprising a plurality of unidirectional high tensile strength fibers bonded together in a resin matrix to form a continuous loop shaped to wrap around said first connecting pin and extend therefrom in bifurcated fashion through said elastomeric bearing inner race central aperture and with first and second legs of the bifurcated yoke respectively wrapping around said second and third connecting pins to thereby connect said blade to said hub so that all blade pitch change, lead-lag and flapping motions are accommodated by said yoke and spherical bearing, and all of the pitch change, lead-lag and flapping loads and the blade centrifugal load generated during rotation are carried by said composite yoke through said elastomeric bearing to said hub.

5,110,261

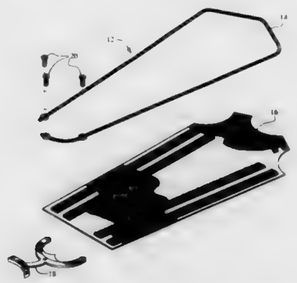
FAN BLADE

Leigh A. Junkin, Somerville, Tenn., assignor to Hunter Fan Company, Memphis, Tenn.

Filed Jul. 5, 1990, Ser. No. 548,079

Int. Cl.[5] F01D *5/30*

U.S. Cl. 416—204 R **11 Claims**



1. A rotary fan blade, configured for attachment to a conventional mounting structure having three points of attachment to said blade, comprising:

a generally rigid frame, comprising a single formed member defining the outer configuration of said blade, having first and second legs,

said first leg having a distal end with dual attachment means associated therewith for attaching said frame to two of said three points of attachment on said mounting structure,

said second leg having a distal end with a single attachment means associated therewith for attaching said frame to the third said point of attachment on said mounting structure; and

a cover securable to said frame.

5,110,262

ATTACHMENT OF A GAS TURBINE ENGINE BLADE TO A TURBINE ROTOR DISC

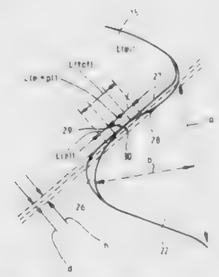
Neil M. Evans, Bristol, England, assignor to Rolls-Royce plc, London, England

Filed Nov. 19, 1990, Ser. No. 615,406

Claims priority, application United Kingdom, Nov. 30, 1989, 8927096

Int. Cl.[5] F01D *5/30*

U.S. Cl. 416—219 R **5 Claims**



1. In a gas turbine engine having a plurality of airfoil blades attached to a rotor disc, a root attachment for one blade, comprising a firtree root on the blade which has at least one tooth adapted to engage with a notch within a shaped slot formed in the disc to which the blade is attached, said at least one tooth having a tip and there being a trough adjacent the tooth, such that an undercut surface of the notch adjacent a flank of said at least one tooth is substantially planar and the flank has a convex curvature having a maximum elevation relative to a straight line drawn between the tip of the tooth and the base of the adjacent trough, whereby initial contact between the undercut surface and the flank under zero loading is solely at a location of said maximum elevation and under increased loading the flank crushes at said location to provide an area of load-spreading contact around said location.

5,110,263

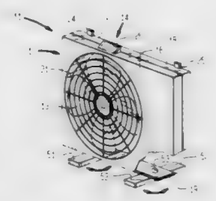
CONVERTIBLE FLOOR AND WINDOW FAN

Bernard Chiu, Ashland, Mass., assignor to Duracraft Corporation, Sudbury, Mass.

Filed Sep. 24, 1990, Ser. No. 587,291

Int. Cl.[5] F04D *29/64*

U.S. Cl. 416—244 R **30 Claims**

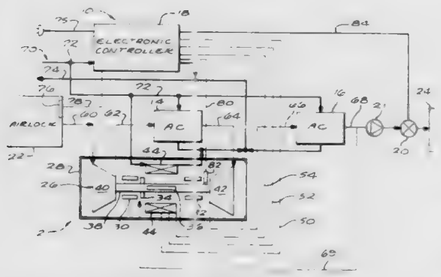


1. A portable electric fan comprising:

housing means having a front wall defining a front opening

for transmitting air, a rear wall defining a rear opening for transmitting air, a top surface, and a bottom surface;
fan blade means rotatably mounted in said housing means and adapted to move air in a given direction through said front and rear openings;
retainer means projecting upwardly from said top surface and adapted to engage one side of the sash of a vertically movable window; and
first and second elongated legs movably mounted in spaced apart positions on said bottom surface and adapted for movement between floor and window positions, each of said legs projecting in said given direction beyond said front and rear walls when in said floor position and extending in longitudinally aligned directions substantially perpendicular to said direction when in said window position.

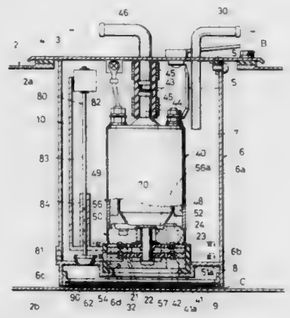
5,110,264
VARIABLE SPEED TURBO VACUUM PUMP
Roger P. Murry, San Pedro, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
PCT No. PCT/US89/05734, § 371 Date Feb. 13, 1990, § 102(e) Date Feb. 13, 1990, PCT Pub. No. WO91/09230, PCT Pub. Date Jun. 27, 1991
PCT Filed Dec. 20, 1989, Ser. No. 487,999
Int. Cl.[5] F04D *27/00*
U.S. Cl. 417—45 **20 Claims**



1. A vacuum pump system (10), comprising:
motor driven compressor means (12) including a drive motor having a characteristic proportionality of drive torque to current at all speeds, and a dynamic compressor for compressing a gaseous medium from a first inlet pressure and density to a second exhaust pressure and density; and
electronic controller means (18) for monitoring the rotational speed of said compressor means (12), and for providing a constant current commutated power supply to said compressor means (12), said controller means (18) thereby causing the rotational speed of said compressor means (12) to increase in inverse proportion to the inlet density of said gaseous medium.

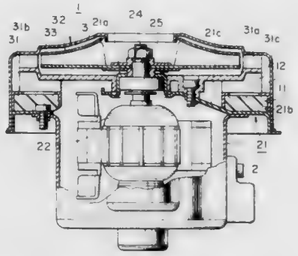
5,110,265
FUEL PUMP
Kiyoshi Kato; Isamu Suzuki, and Seiji Toshima, all of Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Jan. 16, 1991, Ser. No. 641,857
Int. Cl.[5] F04B *49/00, 17/00, 35/00, 41/06*
U.S. Cl. 417—279 **16 Claims**

1. A fuel pump having a first pumping mechanism for pumping a fuel in a main tank to a subtank and having a second pumping mechanism for pumping the fuel in said subtank to an outside of said main tank, said fuel pump comprising:
a first rotatable impeller having a plurality of outer peripheral vanes; and
a wall member means surrounding the vanes of said first rotatable impeller to define a first fuel flow passage;
said wall member means having:
two partition walls for partitioning said first fuel flow passage into a first pumping passage and a second pumping passage;
and spacer means including a first suction opening for communicating an upstream end of said first pumping passage to said main tank;



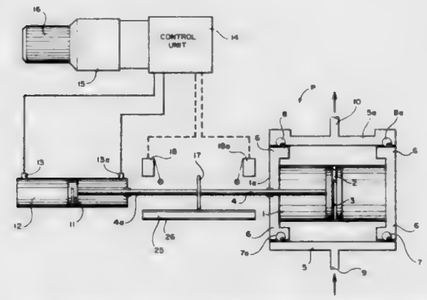
a first discharge opening for communicating a downstream end of said first pumping passage to said subtank;
a second suction opening for communicating an upstream end of said second pumping passage to said subtank;
a second discharge opening for communicating a downstream end of said second pumping passage out of said main tank.

5,110,266
ELECTRIC BLOWER HAVING IMPROVED RETURN PASSAGE FOR DISCHARGED AIR FLOW
Hisanori Toyoshima; Fumio Jyoraku; Yoshitaro Ishii, all of Hitachi; Yukiji Iwase, Ushiku, and Shigenori Sato, Niihari, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 26, 1990, Ser. No. 485,056
Claims priority, application Japan, Mar. 1, 1989, 1-046553
Int. Cl.[5] F04B *21/00, 17/00, 35/04*
U.S. Cl. 417—312 **8 Claims**



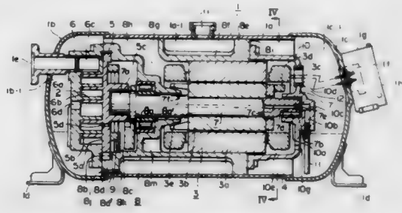
1. An electric blower comprising:
an electric motor;
a centrifugal impeller connected to a rotary shaft of said electric motor for rotation therewith;
end bracket means for separating said electric motor from said centrifugal impeller;
a diffuser including a flat plate portion extending between said centrifugal impeller and said end bracket means and a plurality of diffuser vanes formed on said flat plate portion near an outer periphery of said centrifugal impeller, said flat plate portion having a plurality of guide vanes formed on a surface of said flat plate portion opposite said diffuser vanes;
a discharge air flow return passage defined by said end bracket means, said flat plate portion and said guide vanes for returning a discharging air flow from said centrifugal impeller inwardly of said blower;
said end bracket means has a substantially convex shape so as to extend gradually away from said flat plate portion of said diffuser as said end bracket means extends from a central area thereof toward an outer periphery thereof and terminate in an annular flat plate portion disposed substantially parallel to said flat plate portion of said diffuser, thereby defining an opening area of said discharge air flow return passage; and
a sound absorbing material arranged in said discharge air flow return passage and disposed on said annular flat plate portion of said end bracket means.

5,110,267
POSITIVE-DISPLACEMENT PUMP FOR PUMPING ALIMENTARY LIQUIDS
Alberto Giordani, Via IV Novembre, 13 Montebello Vic.No (Vicenza), Italy 36054
Filed Dec. 6, 1989, Ser. No. 446,768
Claims priority, application Italy, Dec. 6, 1988, 22869 A/88
Int. Cl.[5] F04B *17/00*
U.S. Cl. 417—404 **8 Claims**



1. An apparatus for use in pumping alimentary liquids, comprising:
a first cylinder adapted to be connected in a liquid network for the alimentary liquids;
a first piston mounted for reciprocable movement in said first cylinder;
a first piston stem fixed to said first piston;
drive means, coupled to said first piston stem, for forcing said first piston to reciprocate in said first cylinder;
rotation means, coupled to said first piston stem, for rotating said first piston stem and said first piston relative to said first cylinder;
valve means operatively connected to said first cylinder for controlling flow of the alimentary liquids to and from said first cylinder;
wherein said valve means comprises at least one ball valve, said at least one ball valve comprising a ball formed of rubber surrounding a hard inner core, and a ball seat formed of rubber surrounding a hard inner core;
wherein said drive means comprises a second cylinder, a second piston mounted for reciprocable movement in said second cylinder, and a second piston stem fixed to said second piston and to said first piston stem, and hydraulic control means for alternatingly feeding hydraulic fluid into said second cylinder on opposite sides of said second piston so as to force said second piston to reciprocate in said second cylinder;
wherein first and second position sensors are provided and are operatively connected to said hydraulic control means;
wherein means are provided for actuating said first position sensor when said first piston reaches a first position in said first cylinder, and for actuating said second position sensor when said first piston reaches a second position in said first cylinder;
wherein said first and second position sensors comprise first and second limit switches, respectively;
wherein said actuating means comprises an element fixedly mounted to at least one of said first and second piston stems such that when said first piston reaches said first position, said element contacts said first limit switch and, when said first piston reaches said second position, said element contacts said second limit switch; and
wherein said rotation means comprises a rotatable shaft mounted in contact with said element and adapted to rotate said element.

5,110,268
LUBRICANT SUPPLY SYSTEM OF A SCROLL FLUID MACHINE
Kazuo Sakurai, Shizuoka, and Takahiro Tamura, Shimizu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 3, 1990, Ser. No. 620,613
Claims priority, application Japan, Dec. 4, 1989, 1-313347
Int. Cl.[5] F04B *17/00, 35/04*
U.S. Cl. 417—410 **6 Claims**



1. A scroll fluid machine comprising:
a compression mechanism for compressing a gaseous fluid disposed in a closed space and including a stationary scroll member and an orbiting scroll member cooperating with said stationary scroll member to define therebetween a scroll space;
an electric motor disposed in said closed space;
a drive shaft including a first portion axially extending through a rotor of said electric motor and fixed to said rotor and a second portion comprising a crank section drivingly connected to said orbiting scroll member; and
bearing means including a first bearing comprising a sliding bearing for supporting a free end of said first portion of said drive shaft and a second bearing supporting a portion of said drive shaft between said first and second portions, said first portion of said drive shaft having a peripheral surface which slidingly contacts with said sliding bearing;
a lubricant supply groove formed in said peripheral surface and opening at one end in an end surface of said free end of said first portion of said drive shaft and terminating at an opposite within said peripheral surface;
an axial lubricant supply hole and a radial lubricant hole provided in said drive shaft for providing a communication between said lubricant supply groove and said axial lubricant supply hole;
lubricant supply means for supplying a pressurized lubricant through said lubricant supply groove to said sliding bearing and to said second bearing and through said radial lubricant hole and said axial lubricant supply hole;
wherein said axial lubricant supply hole is closed at one end adjacent said end surface of said drive shaft and opened in an end surface of said crank section;

a bottom of said closed space forms a lubricant reservoir for the lubricant, an upper portion of said closed space communicates with a discharge port of said pressure mechanism so that pressure of the pressurized fluid discharged through said discharge port of said compression mechanism acts on he lubricant in said lubricant reservoir; and

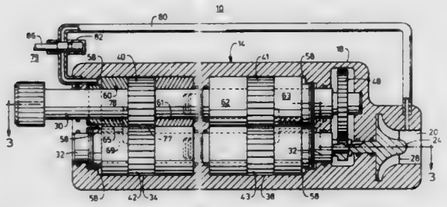
wherein a passage means is provided for communicating said lubricant reservoir and said lubricant supply groove, whereby the pressure of said pressurized fluid forces the lubricant in said lubricant reservoir into said lubricant supply groove through said passage means.

5,110,269

GAS TURBINE FUEL PUMPING APPARATUS

James A. Fallon, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Oct. 24, 1990, Ser. No. 602,821
Int. Cl.[5] F04B *23/04*
U.S. Cl. 417—428 **12 Claims**



1. An engine fuel pump apparatus comprising:

a positive displacement fuel pump having at least first and second pumping elements,

a means for unloading one of said elements so that it substantially stops pumping.

said unloading means comprising;

a set of end bearings supporting said unloadable element,

a pressurizing chamber which receives said bearings and which is used to urge said bearings into contact with said elements during their operation thereby enabling said elements to pump,

a duct axially disposed through said bearing and in fluid pressure communication with a high pressure discharge side of said unloadable element on one side of said duct and said pressurizing chamber on the other side of said duct,

a bypass line leading from said pressurizing chamber to a position upstream of said unloadable element,

a controllable bypass valve inserted in said bypass line, and

a control means to control said unloading means.

5,110,270

PERISTALTIC PUMP WITH SPRING MEANS TO URGE SLIDE MEMBERS AND ATTACHED ROLLERS RADIALLY OUTWARD ON A ROTOR

Joseph Q. Morrick, 1634 West County Rd. B, Roseville, Minn. 55113

Continuation of Ser. No. 579,590, Sep. 10, 1990, abandoned, which is a continuation of Ser. No. 471,952, Jan. 29, 1990, abandoned. This application Jun. 21, 1991, Ser. No. 719,643
Int. Cl.[5] F04B *43/12*
U.S. Cl. 417—477 **20 Claims**

2. A peristaltic pump, comprising:

a base;

a rotor rotatably mounted on said base;

an axial shaft on said rotor for rotatably driving said rotor;

parallel spaced-apart upper and lower rotor plate members attached to said rotor drive shaft;

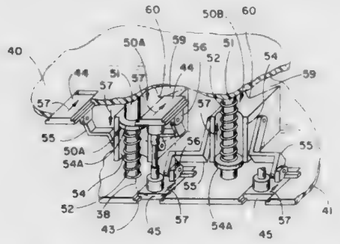
a housing attached to said base generally surrounding said rotor;

a length of occludable hollow tubing;

a passageway between said housing and said rotor for holding said tubing;

slide member radially slidably mounted on said rotor plate members;

multiple roller means equally angularly spaced around said rotor, said roller means attached to said slide members for



moving radially on said rotor to occlude said tubing in said passageway as said rotor is rotated;

spring means mounted on said rotor; and

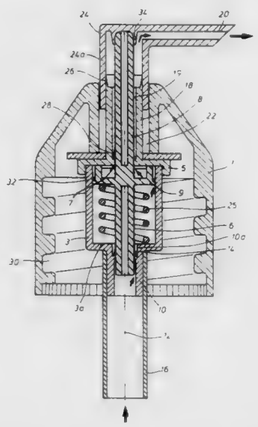
means linking said spring means to said slide members for urging said slide members and their attached roller means radially outward on said rotor for occluding said tubing in said passageway.

5,110,271

HAND-OPERABLE DOUBLE-ACTION METERING AND/OR ATOMIZING PUMP

Jörg Hofmann, Kreuzstrasse 11, Kreuzwertheim, Fed. Rep. of Germany D-6983

Filed Nov. 30, 1990, Ser. No. 620,246
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1989, 3940101
Int. Cl.[5] F04B *21/02*
U.S. Cl. 417—555.1 **9 Claims**



1. Hand-operable reciprocating metering and/or atomizing pump for the withdrawal of a liquid from a container, comprising a pump body having a pump cylinder and a pump plunger mounted therein,

the pump cylinder being provided with a tubular extension forming a transition for connection to a suction tube,

the pump plunger having an extension which is formed in the axial direction of the pump and extending into the

tubular extension, said tubular extension including a first sealing lip which encircles the tubular extension and is directed towards the pump cylinder,

the first sealing lip sealingly bearing on the pump plunger extension and defining a one-way valve that permits liquid to flow along the tubular extension only towards the pump cylinder, and

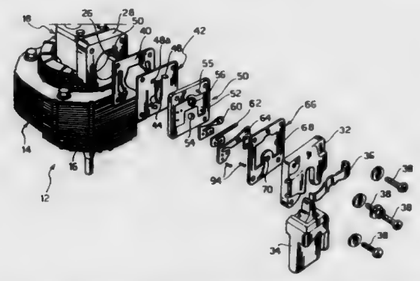
the sealing lip being integrally formed with the tubular extension and being disposed along a line which is spaced from a proximate end of the pump cylinder.

5,110,272

VALVE UNIT FOR A RECIPROCATING COMPRESSOR FOR REFRIGERATORS AND THE LIKE

Federigo Peruzzi, and Norbert Andrione, both of Turin, Italy, assignors to Aspera S.r.l., Turin, Italy

Filed Feb. 7, 1991, Ser. No. 651,395
Claims priority, application Italy, Jun. 7, 1989, 67453 A/89
Int. Cl.[5] F04B *21/02*
U.S. Cl. 417—571 **8 Claims**



1. A valve unit for a reciprocating compressor with a cylinder and a piston for refrigerators and the like, comprising a valve plate (50) fitted to a head end (28) of the cylinder (26) of the compressor and having an intake port (54) with a valve and an exhaust port (56) surrounded by an annular seat (58) formed in an opposite face of the plate (50) from that which faces the cylinder (26), an exhaust valve reed (60) associated with the exhaust seat (58) and travel-limiting means (64) fixed to the valve plate (50) for limiting the travel of the exhaust valve reed (60), in which the exhaust valve reed (60) comprises a base portion (66) which is restrained on the plate (50), an obturator head portion (72) which is spaced from the base portion (66) and cooperates with the seat (58), and an elongate portion (68, 70) which connects the base portion (66) and the head portion (72), characterised in that the connecting portion (68, 70) is "L"-shaped in plan with the head portion (72) situated at the end of the leg (70) of the "L" and the base portion (66) situated at the end of the foot (68) of the "L", the foot (68) of the "L" being free to bend with the leg (70) of the "L".

5,110,273

SCROLL-TYPE FLUID MACHINE WITH AN IMPROVED JOURNAL BEARING

Mitsuhiro Nishida, and Masumi Arita, both of Fukuoka, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Mar. 16, 1990, Ser. No. 494,347
Claims priority, application Japan, Aug. 2, 1989, 1-200666
Int. Cl.[5] F01C *1/04, 21/04*; F16C *33/66*
U.S. Cl. 418—55.6 **4 Claims**

1. An arrangement for a scroll-type fluid machine comprising:

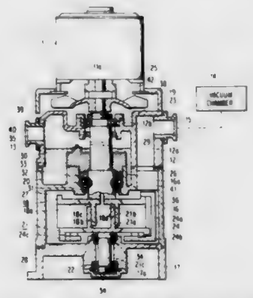
a first scroll having a base plate, a shaft which extends from one surface of the base plate, and a spiral wrap which extends from another surface of the base plate;

a second scroll having a base plate and a spiral wrap which extends from a surface of the base plate and interfits with the spiral wrap of the first scroll to define a compression chamber;

a first casing which houses the first and second scrolls;

a second casing which adjoins the first casing, the shaft of the first scroll extending into the second casing; and

a shaft bearing arrangement which rotatably supports the



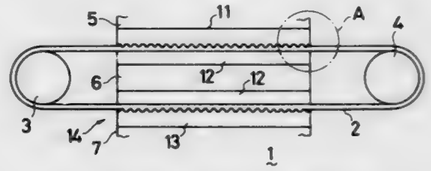
shaft of the first scroll and which comprises a bearing housing which is detachably mounted on the second casing, a journal bearing which is secured to the bearing housing and rotatably supports the shaft of the first scroll, an oil seal which is mounted on the second casing and surrounds the shaft of the first scroll, and grease which is disposed between the journal bearing and the oil seal.

5,110,274

METALLIC MOLD FOR COGGED V-BELT

Hirotaka Hatai, and Akira Mayahara, both of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan

Filed Dec. 5, 1990, Ser. No. 621,426
Claims priority, application Japan, Dec. 7, 1989, 1-141836
Int. Cl.[5] B29C *35/02*
U.S. Cl. 425—28.100 **14 Claims**



1. A mold for molding a cogged belt, comprising:

a substantially flat lower mold having a gentle curve in a lengthwise direction thereof; and

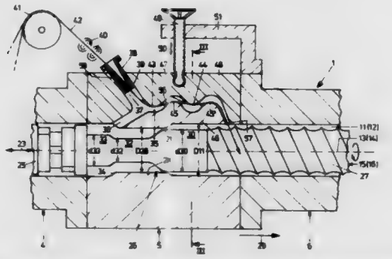
an upper mold having a cogged surface with cog peaks and cog troughs alternating with each other, said cogged surface comprising a pair of end portions and a central portion therebetween, wherein said cog peaks of said end portions are narrower than said cog peaks of said central portion but have the same height as said cog peak of said central portion.

5,110,275

EXTRUDER FOR THE PREPARATION OF PLASTIC MATERIAL WITH THE INTRODUCTION OF AT LEAST ONE FIBRE STRAND

Bernhard Scheuring, Stuttgart, Fed. Rep. of Germany, assignor to Werner & Pfleiderer GmbH, Fed. Rep. of Germany

Filed May 20, 1991, Ser. No. 702,917
Claims priority, application Fed. Rep. of Germany, May 25, 1990, 4016784
Int. Cl.[5] B29C *47/00*
U.S. Cl. 425—113 **10 Claims**



1. An extruder for forming reinforced plastic material comprising:
- a housing (1) having at least one housing bore (11, 12) with an axis (13, 14);
- a rotatably drivable extruder shaft (15, 16) arranged in each of said at least one housing bore (11, 12);
- a feed orifice (54) for the plastic material provided at a first end of said at least one housing bore (11, 12);
- a discharge orifice (7) provided at a second end of said at least one housing bore (11, 12) and downstream of said feed orifice (54);
- a melting zone (4) arranged downstream of said feed orifice (54);
- a mixing zone (6) arranged downstream of said melting zone (4);
- fibre feeding means comprising an orifice provided in the housing (1) for introducing a fibre strand (42), and leading into said at least one housing bore (11, 12) downstream of said melting zone (4) and upstream of a downstream end of said mixing zone (6);
- wherein the orifice for introducing the fibre strand (42) opens into an impregnating channel (35), which is provided in the housing (1) and has a beginning (36) leading radially outward from said at least one housing bore (11, 12) downstream of said melting zone (4) and which impregnating channel (35) has an end (57) downstream of said beginning (36), said end (57) opening into said at least one housing bore (11, 12) at said mixing zone (6).

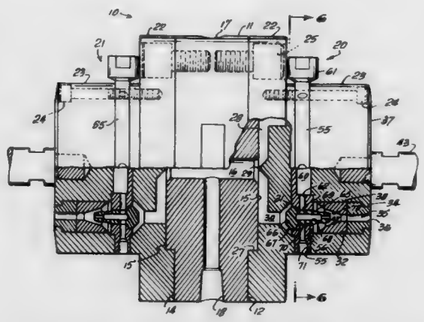
5,110,276

EXTRUSION DIE ASSEMBLY

John T. Farnsworth, 1943 Stoneman St., Simi Valley, Calif. 93065; Roger D. Johnson, 16911 Shinedale Dr., Canyon Country, Calif. 91351; Gary W. Obrecht, 9625 Sylmar Ave., Apt. 43, Panorama City, Calif. 91412, and Linda A. Young, 28025 N. Sarabande Ln., Apt. 1216, Canyon Country, Calif. 91351

Filed Dec. 28, 1989, Ser. No. 458,213
Int. Cl.[5] B29C *47/12, 47/30*
U.S. Cl. 425—133.1 **8 Claims**

1. A free-standing extrusion die assembly in communication with but mounted apart from the discharge end of an extruder, said die assembly comprising:
- a flat center plate having a pair of opposed planar side faces, channel means extending between said planar side faces for carrying extrudate material to said opposed planar side faces, and at least one inlet passage communicating with said channel means and extending perpendicular to said channel means for introducing extrudate material from an extruder into said channel means, and
- a pair of die units, with one of said die units being mounted on each of the planar side faces of the center plate, each of



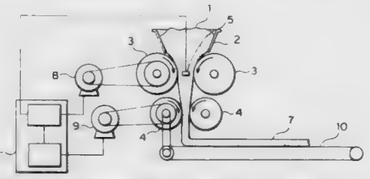
said die units having at least one axial conduit means extending therethrough for carrying extrudate material, with each of said conduit means being in communication with the channel means of said center plate and forming a shaped die orifice in a downstream face of each die unit.

5,110,277

DOUGH-STRETCHING ROLLER APPARATUS

Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Filed Jan. 22, 1991, Ser. No. 643,976
Claims priority, application Japan, Feb. 16, 1990, 2-36725
Int. Cl.[5] B29C *55/18*
U.S. Cl. 425—141 **6 Claims**



1. A dough-stretching roller apparatus comprising a pair of upper rollers that are disposed to define a first gap between them, a hopper located above the upper rollers to supply dough to the first gap between the upper rollers, a pair of lower rollers that are located under the upper rollers and that are disposed to define a second gap between them in line with the first gap between the upper rollers, motors for separately driving the upper and lower rollers, a sensor means that detects a width of the dough in a direction to the axis of rotation of the upper rollers at the first gap between the upper rollers, and a controller that controls the motor driving the upper rollers in response to a signal from the sensor means.

5,110,278

INJECTION MOLDING APPARATUS FOR PRODUCING A TORIC LENS CASTING MOLD ARBOR

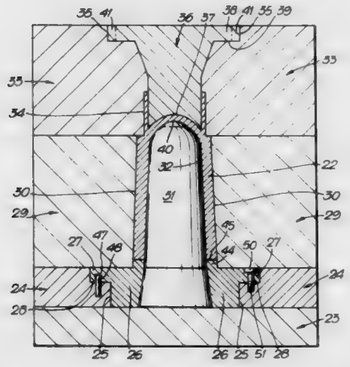
John S. Tait, and Izi Bruker, both of San Diego, Calif., assignors to Pilkington Visioncare, Inc., Menlo Park, Calif.

Filed Nov. 30, 1990, Ser. No. 621,449
Int. Cl.[5] B29C *45/33*
U.S. Cl. 425—175 **6 Claims**

1. Injection molding apparatus for producing a lens casting mold arbor, said arbor having

i. hollow top and bottom portions separated by a finished element;
ii. exterior and interior lateral surfaces; and
iii. a bottom end surface carrying at least one alignment means for aligning said arbor on a lathe;

said injection molding apparatus comprising:
- a. an injection molding body having an interior opening with a surface corresponding to said exterior lateral surface of said arbor;
- b. a first core pin inserted in a bottom portion of said interior opening in said molding body, said first core pin having an external lateral surface corresponding to said interior lateral surface of said bottom portion of said arbor, said first core pin being spaced apart from said surface of said interior opening in said molding body to provide a cavity having the shape of said bottom portion of said arbor;
- c. a toric core pin inserted in the upper portion of said interior opening of said molding body, said toric core pin having a bottom end shaped in the form of a toric lens curve having a predetermined toric axis, said toric core pin having an exterior lateral surface corresponding to said interior lateral surface said top portion of said arbor, said toric core pin being spaced apart from said surface of said interior opening of said molding body to provide a cavity having the shape of said top portion of said arbor,



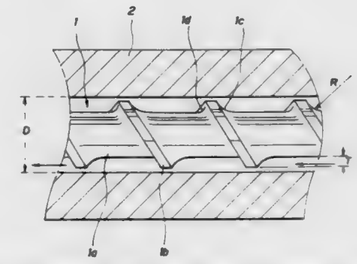
and being spaced apart from the upper end of said first core pin to provide a cavity having the shape of said finished element separating said top and bottom portions of said arbor;
- d. alignment means formed in said toric core pin for mating with corresponding alignment means in the upper portion of said molding body, whereby said toric axis of said toric core pin is maintained in a stationary position;
- e. a rotatable ring plate inserted in said molding body for forming said bottom end surface of said arbor, said rotatable ring plate having an upper surface corresponding to said bottom end surface of said arbor and having at least one alignment means in its said upper surface for forming said at least one alignment means in said bottom end surface of said arbor;
- f. means for rotating and locking said rotatable ring plate at a point where said at least one alignment means in said ring plate is offset a predetermined number of degrees from said toric axis of said toric pin, whereby said at least one alignment means in said bottom end surface of said arbor will be offset a corresponding number of degrees from said toric axis; and
- g. means for introducing resinous molding material into said cavities and applying heat and pressure to said molding material to produce said lens casting arbor.

5,110,279

INJECTION MOLDING APPARATUS

Hideo Amemiya, Yokohama; Minoru Kuroda, Urawa, and Tomio Nitta, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed May 2, 1990, Ser. No. 517,721
Claims priority, application Japan, May 12, 1989, 1-117287
Int. Cl.[5] B29B *7/42*; B29C *45/60*
U.S. Cl. 425—208 **3 Claims**



1. An injection molding apparatus for injection-molding a high-nitryl resin, comprising an injection screw disposed within a cylinder, said injection screw having a material feed section, a metering section and a compression section positioned between the material feed section and the metering section, said injection screw including a screw shaft, a flight extending helically around the screw shaft and forming a groove, and a rear side corner portion defining an arc surface, said rear side corner portion being formed between the screw shaft and the flight, said injection screw being configured such that:
- (1) the injection screw possesses a compression ratio of 1.8 to 2.5;
- (2) the ratio of the length of the material feed section to the length of the metering section is from 1 to 1.5, and the ratio of the length of the compression section to the length of the metering section is from 1.8 to 2.8;
- (3) the depth T of said groove formed in the metering section in relation to an inner diameter D of the cylinder is

$$T \geqq 0.057D - 0.2 \text{ mm},$$

wherein the units of measurement of T and D are millimeters; and
- (4) the radius of curvature R of the arc surface of the rear side corner portion in relation to the inner diameter D of the cylinder is

$$R \geqq 0.36D + 2.0 \text{ mm},$$

wherein the units of measurement of R and D are millimeters.

5,110,280

APPARATUS FOR FEEDING AND CUTTING SYNTHETIC RESIN

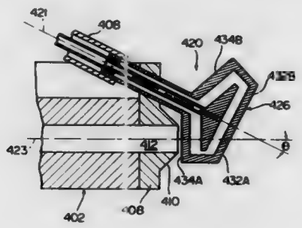
Kiyoshi Kawaguchi, and Hideki Yagishi, both of Yokohama, Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 266,230, Oct. 31, 1989, Pat. No. 4,913,871, which is a continuation of Ser. No. 874,948, Jun. 16, 1986, abandoned. This application Dec. 1, 1989, Ser. No. 444,693
Claims priority, application Japan, Jun. 21, 1985, 60-133952; Aug. 30, 1985, 60-189362
Int. Cl.[5] B29C *47/12*
U.S. Cl. 425—311 **10 Claims**

1. A synthetic resin feeding apparatus comprising:
- an extruder having an extrusion plate with a front surface and internal walls which form an extrusion opening that extends through the extrusion plate, and
- a cutting tool disposed for cutting molten synthetic resin extruded from the extrusion opening,

the extrusion plate having a tapered portion formed by

external walls which taper in a direction outwardly from the front surface of the plate

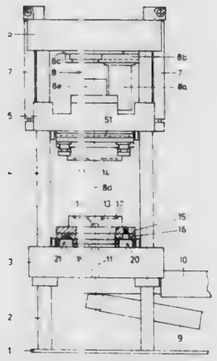


to a foremost edge of the tapered portion where the external walls intersect with the internal walls to form the foremost edge as a knife edge.

5,110,281
RUBBER INJECTION PRESS

Günther Bausch, Vaihingen-Enz, and Fritz Wächter, Kirchheim/Teck-Naber, both of Fed. Rep. of Germany, assignors to Werner & Pfleiderer, GmbH, Fed. Rep. of Germany

Filed Sep. 6, 1990, Ser. No. 578,891
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1989, 3932039
Int. Cl.[5] B29C *33/08*
U.S. Cl. 425—406 **19 Claims**

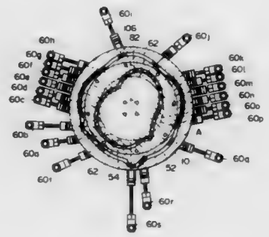


1. A rubber injection press comprising:
a stationary clamping plate;
a first mould element supported by said stationary clamping plate;
a heater in the form of a heating panel arranged between the stationary clamping plate and the first mould element;
heating elements arranged in the heating panel;
a carriage movable in a direction towards and away from the stationary clamping plate;
a second mould element supported by said carriage; and
a mould formed by said first and said second mould element, which is closed by moving said carriage towards said stationary clamping plate, and which is opened by moving said carriage away from said stationary clamping plate;
wherein the heating elements are flexible heating coils which are cast in the heating panel,
the heating panel consists substantially of aluminum, and wherein the first mould element is connected with another clamping plate by means of clamping devices, and said another clamping plate is connected with the heating panel.

5,110,282
PREFORM CARRYING APPARATUS

Hermann Voss, Löhrsweg, Fed. Rep. of Germany, assignor to Nissei ASB Machine Co., Ltd., Nagano, Japan

Filed Apr. 23, 1990, Ser. No. 512,832
Int. Cl.[5] B29C *49/42*
U.S. Cl. 425—534 **17 Claims**



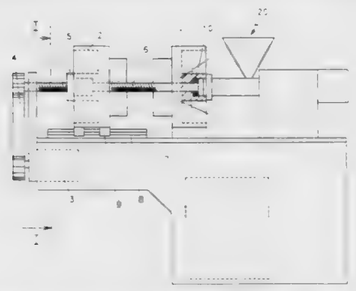
1. A preform carrying apparatus for carrying a preform along a passage on which working stations are provided, said apparatus comprising:
a rotary disk;
a fixed plate disposed opposite to said rotary disk;
first and second cams provided on said fixed plate;
a support arm which can freely expand and contract in the radial direction from said rotary disk, the base end of which is rockably supported by said rotary disk, and which is provided with a first cam follower which is guided by said first cam and a second cam follower which is guided by said second cam; and
a coupling disposed at the forward end of said support arm so as to removably support the neck portion of said preform;
said support arm being expanded and contracted in the longitudinal direction in accordance with the trailing position of said first cam follower and rocked around said base end as the fulcrum in accordance with the trailing position of said second cam follower, thereby enabling the acceleration, deceleration and stopping of the feeding of said preform.

5,110,283
INJECTION MOLDING MACHINE HAVING A PRECISION CLAMPING UNIT

Hans Blüml, Burgthann; Peter Klein, Schwaig, and Ernst Würl, Höttingen, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 27, 1989, Ser. No. 441,379
Continuation-in-part of PCT/DE88/00304, May 19, 1988.
Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3718106
Int. Cl.[5] B29C *45/66*
U.S. Cl. 425—589 **12 Claims**

1. An injection molding machine having bed means on which is disposed an apparatus for moving together and separating first and second injection mold pieces, said first and second injection mold pieces having a mutually central axis along which said moving together and separating first and second injection mold pieces occurs, said central axis passing substantially through a central portion of said first and second injection mold pieces, said apparatus comprising:
first and second guide rail means, disposed on said bed means, said first and second guide rail means movably supporting at least one of said first and second injection mold pieces, each said guide rail means defining its longitudinal axis;
said longitudinal axis of said first guide rail means being disposed generally parallel to said longitudinal axis of said second guide rail means;
first and second ball spindle drives mechanically connected to said at least one of said first and second injection mold pieces for moving said at least one of said first and second injection mold pieces toward and away form the other of said first and second injection mold pieces;
said at least movable one of said first and second injection mold pieces being supported by said first and second guide rail means;
said first and second guide rail means being firmly attached to said bed means a substantial distance form one anther to provide linear guidance and torsion resistance for said at least movable one of said first and second injection mold pieces;
said first and said second ball spindle drives for being disposed a distance from one another, one on either side and symmetrically with respect to said central axis of said fist and second injection mold pieces, said first and second ball



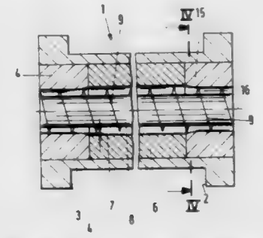
spindle drives being substantially parallel to said central axis, said first and second ball spindle drives defining a horizontal plane;
means for operating said first and second ball spindle drives synchronously with one other;
cradle means for movably supporting said first injection mold piece on said first and second guide rail means, said cradle means comprising a generally U-shaped cradle element having an interior cavity, the interior cavity for being disposed about said guide rail means; and
said first ball spindle drive being positioned generally vertically above said first guide rail means and said second ball spindle drive being positioned generally vertically above said second guide rail means so that the distance form said first guide rail means to said second guide rail means is substantially equal to the distance from said first ball spindle drive to said second ball spindle drive.

5,110,284
WEAR-RESISTANT HOUSING FOR AN EXTRUSION DEVICE

Manfred Dienst, Burgdorf, and Arnold Aschemann, Harsum, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 17, 1990, Ser. No. 628,004
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942350
Int. Cl.[5] B29C *47/66*
U.S. Cl. 425—183 **18 Claims**

1. A wear-resistant housing for a screw extruder comprising a barrel having a longitudinal axis and an internal surface spaced from said longitudinal axis to define at least one bore extending longitudinally through said barrel, said barrel further including opposed first and second end regions, a sleeve member disposed in each of said first and second end regions, each said sleeve member having a longitudinal axis which coincides with the longitudinal axis of said barrel and having an internal surface which defines at least one bore through said sleeve member, said bore in said barrel member and said bores in said sleeve members having predetermined diameters and jointly defining a continuous bore through said housing, an extruder screw mounted to rotate in said continuous bore and having an external diameter less than the diameter of said bores in said barrel member and said sleeve members, and wherein said bores defined in said sleeve members each have a diameter

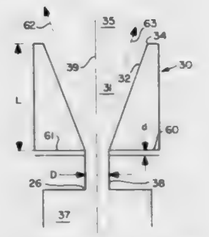


smaller than the diameter of said bore defined in said barrel, whereby greater friction and consequently greater wear occurs in the regions of said sleeve members compared to wear on the bore of said barrel.

5,110,285
FLUIDIC BURNER

William J. Snyder, Ossining, and John E. Anderson, Somers, both of N.Y., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Dec. 17, 1990, Ser. No. 627,834
Int. Cl.[5] F23M *3/02;* **B05B** *1/14*
U.S. Cl. 431—8 **17 Claims**



1. Apparatus for changing the flow direction of a high velocity fluid stream injected into a combustion zone comprising:
(A) a fluidic cavity having a restricted flow area communicating downstream thereof with an expanded flow area, said restricted flow area having a diameter D at said point of communication sufficient to enable fluid passing therethrough to have a supersonic velocity, said expanded flow area having a length of from 3 D to 9 D, so as to establish a reduced pressure zone adjacent a portion of the surface of the fluidic cavity; and
(B) means for providing biasing fluid into the fluidic cavity in a direction substantially perpendicular to the axial centerline of the fluidic cavity, said means having a diameter d such that d/D is within the range of from 0.18 to 0.75, said biasing fluid provision means communicating with the fluidic cavity at a point within the range of from 3*d*/4 upstream to d/4 downstream of the point of communication between the restricted flow area and the expanded flow area, where D and d are measured in the same units.

11. Method for changing the flow direction of a high velocity main fluid stream injected into a combustion zone comprising:
(A) providing a flow of main fluid through a fluidic cavity having a restricted flow area of diameter D communicating downstream thereof with an expanded flow area wherein the main fluid flows through the restricted flow area at a supersonic velocity and through the expanded

flow area for a length of from 3 D to 9 D to establish a reduced pressure zone adjacent a portion of the surface of the fluidic cavity;

(B) injecting a biasing fluid stream having a diameter d into the fluidic cavity at the reduced pressure zone in a direction substantially perpendicular to the flow direction of the main fluid passing through the restricted flow area at a point within the range of from 3*d*/4 upstream to d/4 downstream of the point of communication between the restricted flow area and the expanded flow area, where D and d are measured in the same units; and

(C) changing the flow direction of the main fluid.

5,110,286

DEVICE FOR PREHEATING FUEL FOR AN ULTRASONIC ATOMIZER FOR HEATERS

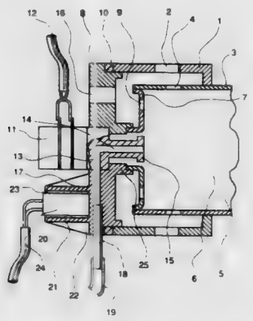
Herr G. Gaysert, Esslingen, and Herr D. Götz, Kirchheim, both of Fed. Rep. of Germany, assignors to J. Eberspächer, Esslingen, Fed. Rep. of Germany

Filed Jun. 7, 1990, Ser. No. 534,288

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1989, 3918663

Int. Cl.[5] F23D *11/44*

U.S. Cl. 431—208 **14 Claims**



1. A heater for vehicles operating independently of a vehicle engine, comprising:

a burner housing, including burner housing walls and an open forward end;

an ultrasonic atomizer flange connected to said burner housing at said open forward end, said atomizer flange including a longitudinal through-bore and a radially extending canal connected to said through-bore;

a combustion chamber positioned within said burner housing, said combustion chamber including a combustion chamber sidewall positioned spaced from a sidewall of aid burner housing and a combustion chamber front-end wall;

an ultrasonic atomizer arranged in said atomizer flange in said longitudinal through-bore, said atomizer including an axial bore communicating with a combustion space within said combustion chamber, and a radial bore, connected to said axial bore, said radial bore being positioned communicating with said radial canal of said atomizer flange;

a fuel supply line connected to said radial canal of said atomizer flange for supplying fuel to said radial canal, said fuel passing through said radial canal, passing through said atomizer radial bore and passing through said atomizer axial bore for delivery of fuel to said combustion chamber space;

and, a heating element connected to said atomizer flange positioned outside said fuel feedline adjacent said atomizer, said heating element having a heated surface in contact with said atomizer flange, adjacent said radial canal, for heating said atomizer flange for direct heat transfer between said atomizer flange and fuel in said radial canal.

5,110,287

INFRA-RED BURNER SYSTEM FOR FURNACES

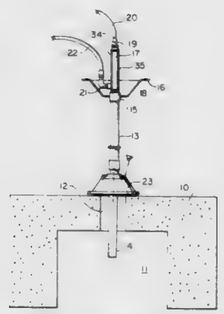
Collin B. P. MacPherson, Morpeth, and Graham N. Jefferson, Edgeworth, both of Australia, assignors to Alcan International Limited, Montreal, Canada

Division of Ser. No. 413,831, Sep. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 163,271, Mar. 2, 1988, abandoned. This application May 9, 1991, Ser. No. 698,376

Claims priority, application Australia, Mar. 3, 1987, PI 0645

Int. Cl.[5] F27D *7/00*

U.S. Cl. 432—24 **5 Claims**



1. A method for controlling the temperature of a fuel-fired furnace, said furnace having walls with internal refractory linings defining a combustion chamber; a burner tube having an open outer end and an open inner end, said inner end extending through said furnace wall into the combustion chamber; conduit means for connecting the burner tube to a fuel supply; an infra-red pyrometer mounted at the outer end of the burner tube and in axial alignment therewith such that the pyrometer is sighted axially through the burner tube and onto an internal furnace wall opposite the burner; fuel supply control means; and a data processor;

said method comprising feeding fuel through said conduit means into the burner tube and burning the fuel to produce a flame extending into the combustion chamber, periodically stopping the fuel flow to the burner for a time sufficient to eliminate any flame in the combustion chamber, activating the pyrometer when no flame is present and obtaining a signal indicative of the temperature of the refractory lining, feeding said signal to the data processor, comparing the signal with a preset target value and adjusting the fuel supply controller means when a discrepancy occurs between the measured signal and the preset target value.

5. A method according to claim **1** wherein said data processor stops fuel flow through said control means for at least 10 seconds at regular intervals every 4 to 10 minutes and also receives temperature signals from the pyrometer when fuel flow is stopped.

5,110,288

GRAVITY FLOW THERMAL PROCESS FOR RECLAIMING FOUNDRY SAND

John J. Rothschild, 2883 Aspen La., Bloomfield Hills, Mich. 48013, and James L. Donahue, 2294 Paulette, Walled Lake, Mich. 48088

Filed Feb. 8, 1990, Ser. No. 476,813

Int. Cl.[5] F27D *1/08*; F23K *3/00*

U.S. Cl. 432—96 **20 Claims**

1. A thermal sand reclamation apparatus for removing a coating from used sand particles, comprising:

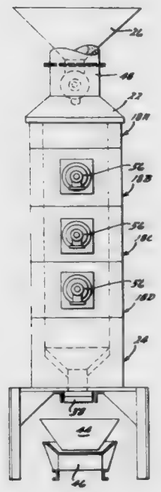
a furnace defining an elongated combustion chamber therein;

sand feeding means associated with a first end of said furnace for feeding said used sand particles through said combustion chamber, said sand feeding means forming an air-tight seal between said combustion chamber and the ambient atmosphere;

dispersion means disposed in said combustion chamber for dispersing said used sand particles passing therethrough and defining a plurality of open zones intermediate thereof;

heating means for producing a turbulent combustion supporting atmosphere in each of said open zones for thermally treating said used sand particles so as to generate substantially instantaneous vaporization and combustion of said coating;

accumulating means disposed adjacent a second end of said furnace for receiving said thermally treated sand particles exiting said combustion chamber, said accumulating means having a lower discharge opening adapted to be filed with said treated sand particles;



means for maintaining a combustion supporting atmosphere within said accumulating means such that heated air is introduced into said accumulating means for further exposing said thermally treated sand particles to a combustion supporting atmosphere, said heated air acting to maintain said treated sand particles at a desired temperature to provide dwell time for purging trapped residual vapors for combustion in said combustion chamber and for combusting residual coatings remaining on said thermally treated sand particles;

discharge means operable associated with said lower discharge opening for selectively discharging a predetermined quantity of reclaimed sand therefrom, said discharge means and said reclaimed sand particles confined in said lower discharge opening being coactive to form an air-tight seal between said ambient atmosphere and said accumulating means; and

sensing means for enabling accumulation of said predetermined quantity of treated sand in said accumulating means and for actuating said discharge means.

5,110,289

APPARATUS FOR HEAT TREATMENT OF LIME MUD

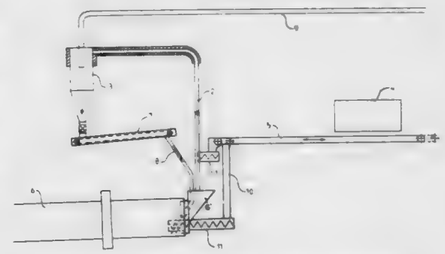
Esko I. Mattelmäki, Varkaus, Finland, assignor to A. Ahlstrom Corp., Karhula, Finland

Division of Ser. No. 467,398, Jan. 22, 1990. This application Feb. 5, 1991, Ser. No. 650,864

Claims priority, application Finland, Jan. 26, 1989, 890376

Int. Cl.[5] F27B *7/02*

U.S. Cl. 432—106 **8 Claims**



1. Apparatus for heat treating lime mud, comprising:

a lime filter for thickening lime mud;

a lime reburning kiln including a flue gas discharge;

a cyclone separator for separating dried lime mud from flue gases;

drying conduit means for simultaneously conveying thickened lime mud from the lime filter and flue gases from the kiln flue gas discharge to the cyclone, and including at least one vertical portion;

a first feed screw for dosing lime mud from the lime filter into the vertical portion of the drying conduit means; and

first conveying means for conveying dried lime mud from the cyclone to the lime reburning kiln.

5,110,290

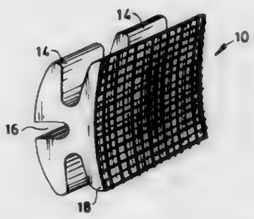
ORTHODONTIC BRACKET/MESH SCREEN

Raymond F. Wong, Chino, Calif., assignor to Ormco Corporation, Glendora, Calif.

Filed Nov. 19, 1990, Ser. No. 615,491

Int. Cl.[5] A61C *3/00*

U.S. Cl. 433—9 **13 Claims**



1. An orthodontic appliance for attachment to a tooth, said appliance comprising:

(a) a base portion made of a ceramic material, said base portion having an engagement surface for placement against said tooth; and

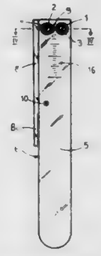
(b) a single barrier layer of a compliant material placed adjacent said engagement surface, said single layer having a plurality of independent passages for allowing an adhesive to pass therethrough for securing said base portion to said tooth, said barrier does not form a part of the bond structure between the appliance and tooth and is made of a material which is sufficiently flexible so as to not transmit any substantial forces therethrough and is substantially chemically inert so as to not form any substantial adhesive

chemical bond with said adhesive, said layer providing a fracture plane for assisting in debonding said appliance from said tooth.

5,110,291
APPARATUS FOR BENDING DENTAL ROOT CANAL INSTRUMENTS

Jean-Claude Randin, Ballaigues, Switzerland, assignor to Les fils d'Auguste Maillefer, Societe anonyme a Ballaigues, Switzerland

Filed Jun. 7, 1991, Ser. No. 712,914
Claims priority, application Switzerland, Jun. 8, 1990, 1931/90
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—156 **7 Claims**



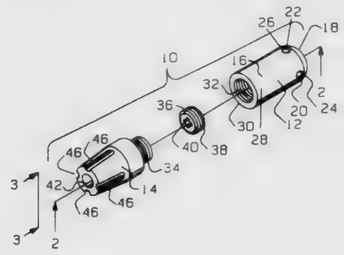
1. Apparatus for bending dental instruments for use in root canals comprising, a stationary elongated supporting element, an elongated member pivotally mounted on said elongated supporting element about a pivot axis, resilient return means urging said elongated supporting element and elongated member to be separated from each other about said pivot axis, a first stem having an axis and mounted at one end of the elongated supporting element, a second stem having an axis and mounted at one end of the elongated member, the stems being juxtaposed and mounted with their respective axis oriented parallel to each other, said pivot axis being parallel to the axis of said stems, the stems being movable toward each other when the elongated member is pivoted toward said elongated supporting element, whereby a dental instrument may be pinched between said stems and withdrawn therefrom to impart a curved shape to said instrument.

5,110,292
ENDOSSEOUS IMPLANT SYSTEM WITH INTERNAL JAM NUT

Alan R. Balfour, Oceanside, and Donald E. Hendricks, San Diego, both of Calif., assignors to Calcitek, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 575,315, Aug. 30, 1990, abandoned. This application Jan. 16, 1991, Ser. No. 641,887
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—173 **5 Claims**

1. A prosthetic dental implant attachment system for mounting a prosthetic device in fixed relationship to a jaw of patient comprising:
- a root member for securing the implant system to the jaw, said root member having an axial threaded bore opening at an exposed end of said root member;
- a coronal member, said coronal member having a threaded shaft for engaging said axial threaded bore for mounting said coronal member on said root member in fixed relationship thereto and a central bore passing though said coronal member and said threaded shaft;
- said threaded shaft having a bottom end distal from said coronal member; and
- a jam nut threadedly received within said threaded bore between said root member and said coronal member, said jam nut having a wrench engaging means accessible through said central bore;

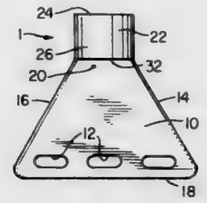


whereby said jam nut can be tightened against said bottom end of said coronal member after said coronal member has been mounted on said root member.

5,110,293
NECKLESS BLADE IMPLANT

Leonard I. Linkow, 1530 Palisade Ave., Fort Lee, N.J. 07024

Filed Sep. 30, 1988, Ser. No. 252,290
The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—176 **29 Claims**

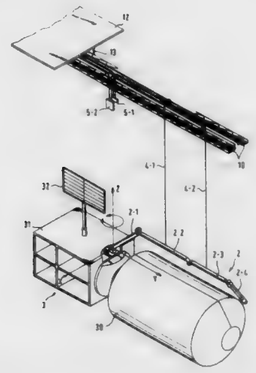


1. A submergible oral implant for supporting an artificial tooth structure, comprising:
- an implant portion having an upper surface, a bottom surface, side surfaces extending between the upper and bottom surfaces, and a connection part at an area of the upper surface, the connection part having sides and generally orthogonal ends, the distance between the sides of the connection part being as wide as the lateral dimension of the rest of the implant portion, the implant portion being adapted to be fitted with an opening in a bone in the vicinity of the occlusal plane of a patient in such a manner that said connection part remains just below the rim of the opening in the bone, and
- at least one post portion having first and second ends, the first end being adapted to receive at least a part of said artificial tooth structure and the second end being adapted for a direct connection to the connection part of the implant portion, the post portion having lateral dimensions such that a part of the second end extends outwardly at least to the sides of the connection part and defines shoulders for supporting the artificial tooth structure, the post portion having longitudinal dimensions such that another part of the second end extends outwardly at least to the ends of said connection part,
- the side surfaces of the implant portion in the mesio-distal plane being connected to the upper surface along a connection edge that slopes toward the bottom surface in the direction away from the connection part, whereby, upon insertion of the implant in the opening in the bone, the bone may grow over the implant portion to the connection part and no narrow neck portion is provided between the implant portion and the post portion.

5,110,294
DEVICE FOR GROUND-BASED SIMULATION OF OPERATIONS OF A MANIPULATOR USABLE IN SPACE BY MEANS OF A MODEL OF A SPACE VEHICLE

Bernd Brand; Ernst-Ludwig Klingelhofer, both of Gilching, and Kristiane Hoch, Hamburg, all of Fed. Rep. of Germany, assignors to Deutsche Forschungsanstalt fur Luft -und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Sep. 24, 1990, Ser. No. 587,129
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1989, 3931753
Int. Cl.[5] B64G *7/00*
U.S. Cl. 434—34 **19 Claims**

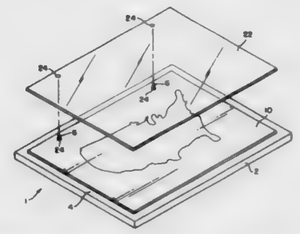


1. A device for the ground-based simulation of operations of a manipulator usable as a mock-up of a space vehicle movable in the direction of or around the three axes, x, y, and z, of an orthogonal coordination system comprising
- a horizontally disposed support frame including
  - first and second rails extending in the y direction;
  - first and second movable carriages movable respectively on said first and second rails;
  - first and second deflection rollers mounted respectively on said first and second movable carriages;
  - first and second ropes guided respectively over said first and second deflection rollers;
- a manipulator as a mock-up of a space vehicle having a base and at least first and second segments attached thereto;
- said first and second ropes each having one end respectively connected to said first and second segments at a position laterally offset with respect to the respective longitudinal axis and the respective center of gravity of each of said segments and directly under said deflection roller supporting said first and second ropes respectively;
- additional deflection rollers supporting each of said ropes;
- a counterweight connected to each of said first and second ropes at a position on said rope after it has been guided over at least one of said additional deflection rollers supporting that said rope;
- said counterweight having a weight approximately twice the weight of said segment to which said rope connects said counterweight;
- a module having a means for connection to said manipulator;
- said base of said manipulator connectable to said module;
- said means for connection of said module to said manipulator including
  - a drive system for movement of said manipulator about said module in a rotation about the z axis extending through said base of said manipulator.

5,110,295
EDUCATIONAL TRACING DEVICE

Christina T. Concra, 14 Huckleberry La., Ballston Lake, N.Y. 12019

Filed Nov. 13, 1990, Ser. No. 612,409
Int. Cl.[5] G09B *11/04*
U.S. Cl. 434—88 **10 Claims**

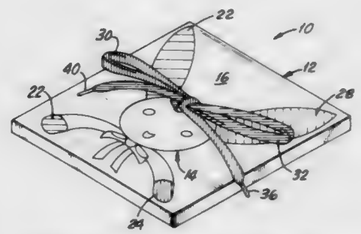


1. An educational device comprising:
- a frame means having a substantially rigid, flat top surface;
- a plurality of opaque base sheets wherein each base sheet has indicia on a top surface thereof and wherein at least two of said base sheets have indicia on their top surfaces that provide related information;
- a plurality of transparent sheets wherein each sheet has a surface capable of being marked upon; and
- a registration means operatively connected to said frame means for removably securing to said frame means in a stacked manner and in a fixed registry at least one base sheet and at least two transparent sheets wherein said at least one base sheet is located atop the top surface of said frame means and wherein at least two transparent sheets are located atop the base sheet.

5,110,296
EDUCATIONAL DEVICE FOR TEACHING A CHILD TO TIE A BOW

Martha G. Cohen, 18 West Valley Brook Rd., Long Valley, N.J. 07853

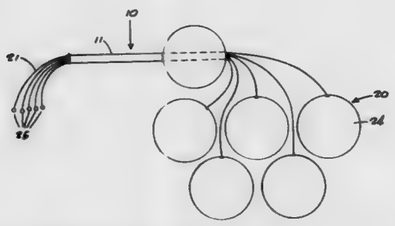
Filed Mar. 12, 1991, Ser. No. 667,824
Int. Cl.[5] G09B *19/24*
U.S. Cl. 434—260 **5 Claims**



1. An educational device for teaching a child to tie a bow comprising:
- a substrate having a predetermined image thereon, said image being divided into left and right portions;
- left and right laces attached to said substrate and extending forward from said image;
- said left lace being attached to the left portion of said image and said right lace being attached to the right portion of said image;

said left lace having a first color indicia and said right lace having a second color indicia;
the left portion of said image having a positioning indicia of a color matching the color of said right lace and the right portion of said image having a positioning indicia of a color matching the color of said left lace;
the left portion of said image having a loop defining indicia of a color matching the color of said right lace and the right portion of said image having a loop defining indicia of a color matching the color of said left lace;
whereby said positioning indicia and said loop defining indicia are employed as an aid in teaching a child to tie a bow with said laces.

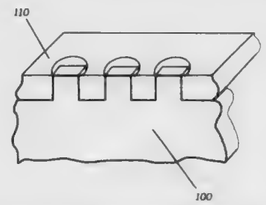
5,110,297
ASSEMBLY SYSTEM FOR DEMONSTRATING CHEMICAL STRUCTURES
Harold J. Teague, 109 Elmhurst Dr., Lumberton, N.C. 28358
Filed Jan. 17, 1989, Ser. No. 297,674
Int. Cl.[5] G09B *29/26*
U.S. Cl. 434—278 **21 Claims**



1. A model for demonstrating chemical structures comprising:
(a) a base component portion comprising a ball-like base body having a bore; and
(b) a plurality of assembly component portions, each assembly component portion comprising a ball-like assembly component body attached to a strap at one end thereof;
wherein the straps of the plurality of assembly component portions are slidably received in the bore of the ball-like base body with all of the assembly component ball-like bodies being on the same side of the base body bore; and
wherein selective manipulation of the straps provides for selective assembly of a plurality of chemical structure-representative cluster bodies comprising the ball-like base body and selected ones of the ball-like assembly component bodies.

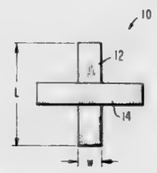
5,110,298
SOLDERLESS INTERCONNECT
Dale W. Dorinski, Coral Springs, and Mac W. Branan, Ft. Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 558,282, Jul. 26, 1990, abandoned. This application Sep. 12, 1991, Ser. No. 759,737
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—65 **5 Claims**

1. A solderless electrical interconnection system, comprising:
a deformable first circuit carrying substrate at least partially covered with conductive material, constructed and arranged to have at least one protruding member disposed on at least one peripheral edge of the first circuit carrying substrate, said protruding member being an integral part of, and formed from the same material as, the deformable circuit carrying substrate; and
a deformable second circuit carrying substrate at least partially covered with conductive material constructed and arranged to have at least one aperture disposed on at least one peripheral edge of the second circuit carrying substrate, so as to co-operatively interconnect with the protruding member of the first circuit carrying substrate to form a solderless electrical interconnection both circuit



carrying substrates comprising a material which deforms during interconnection to provide an interference fit between the protruding member of the first circuit carrying substrate and the aperture of the second circuit carrying substrate.

5,110,299
HIGH DENSITY INTERCONNECT
James L. Gates, Vista, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Feb. 28, 1990, Ser. No. 486,669
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—68 **12 Claims**

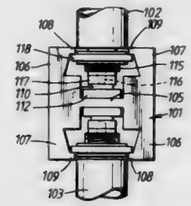


1. A bump interconnect for use in a high density hybrid semiconductor array, said interconnect comprising:
a first elongated, generally rectangular bump disposed on a first surface; and
a second elongated, generally rectangular bump disposed on a second surface;
the second bump being aligned substantially orthogonal to the first bump, the first and second bumps being merged under hybridization pressure to form the interconnect, the thickness of the interconnect being approximately equal to the thickness of one of the bumps prior to merging.

5,110,300
ELECTRIC CURRENT DISTRIBUTION APPARATUS
Terence A. Woodgate, London, England, assignor to GTE Rotaflex Limited, London, England
Division of Ser. No. 623,413, filed as PCT/GB89/00665, Jun. 15, 1989, Pat. No. 5,067,906.
Claims priority, application United Kingdom, Jun. 20, 1988, 8814581; Mar. 23, 1989, 8906739; Mar. 23, 1989, 8906740
Int. Cl.[5] H01R *25/14*
U.S. Cl. 439—121 **17 Claims**

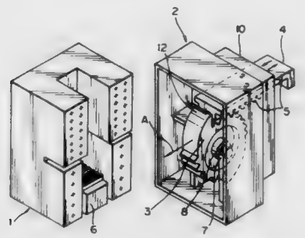
1. A coupling for a low voltage electric distribution system, comprising an elongate track member defining a channel with inner wall means and opposed side walls having means defining inwardly facing abutment surfaces, a conductor extending along and insulated from the channel and supported by the inner wall means, a connector including a screw-threaded part and a contact insulated therefrom and projecting therethrough for contacting the track conductor, and a clamping element

received in the channel and in screw-threaded engagement with said connector part, the clamping element abutting said



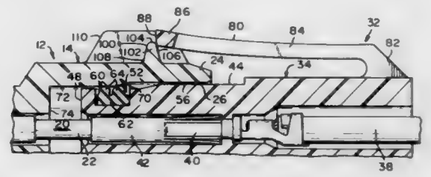
abutment surfaces and the reaction force acting thereon causing the contact to be pressed into engagement with the conductor.

5,110,301
MULTI-WAY CONNECTOR REQUIRING LESS INSERTING FORCE
Nori Inoue, and Masamitsu Chishima, both of Yokkaichi, Japan, assignors to Sumitomo Wiring System Ltd.
Filed Dec. 18, 1990, Ser. No. 629,592
Claims priority, application Japan, Dec. 22, 1989, 1-333238; Feb. 9, 1990, 2-12397[U]; Mar. 7, 1990, 2-23078[U]
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—310 **6 Claims**



1. A multi-way connector requiring less inserting force in which the front portions of a pair of female and male connector housings each accommodating groups of terminals are fitted in each other so as to be coupled together for connection, wherein:
a rotatable cam rotatably supported and having a driver point projection and a follower point pawl that are formed on the outer circumference thereof is provided in one of said pair of connector housings, while a driver slide is mounted on the upper side of said rotatable cam, said driver slide being slidable in a coupling direction of said one of said pair of connector housings, a leading end of said driver slide being brought into abutment with the rear of said driver point projection, and a rear end thereof being allowed to project from said one of said pair of connector housings; and that
a follower engagement portion designed to be brought into engagement with said follower point pawl is provided in the other connector housing of said pair of connector housings, while a radius ratio relationship between the rotative radius of said driver point projection and said follower point pawl is set such that the former becomes equal to or greater than the latter, whereby said pair of connector housings are coupled together for connection by the action of said rotatable cam resulting when said driver slide is pushed in.

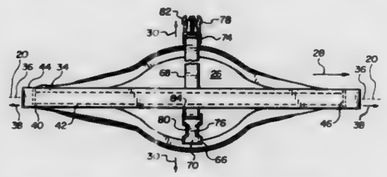
5,110,302
LATCHING MEANS FOR ELECTRICAL CONNECTORS
Robert J. Kobler, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 171,200, Mar. 15, 1988, abandoned, which is a continuation of Ser. No. 896,307, Aug. 12, 1986, abandoned, which is a continuation of Ser. No. 735,417, May 17, 1985, abandoned. This application Mar. 16, 1989, Ser. No. 325,077
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—357 **11 Claims**



1. An improved electrical connector assembly comprising a first connector and a second connector axially matable therewith, wherein the first and second connectors have first and second housings respectively adapted to matably engage and having first and second terminals disposed in the first and second housings respectively and matable at first and second mating faces, the first and second connectors defining an inherent level of resistance to mating, and the first housing includes at least one latching projection extending outwardly from a respective side thereof at an axial location with respect to the first mating face thereof and the second housing has a resilient cantilever latching arm associated with each latching prejection and having a latching section on a free end thereof, each latching arm being secured to the second housing at a respective location along the side thereof and extending axially forwardly therefrom, each latching projection and latching section being adapted for the latching arm to be deflected outwardly against a selected latching arm spring strength during connector mating by riding over an associated latching projection and the latching section to latch therebehind when the first and second connectors are in fully mated relationship, and each latching section has forwardly and rearwardly facing projection-engaging surfaces, and each latching projection comprises a body section having an arm-engaging forward surface, a rearward surface and a radiused outer tip portion therebetween and tangential with the forward and rearward surfaces, the improvement comprising:
each said latching projection forward surface extending at an angle of between about 70° and 90° from axial and being steep and abrupt, and each said latching section forward surface extending at an angle of between 70° and 90°, with at least one thereof being less than 90°;
with the construction of each latching arm resulting in a spring strength such as to generate a substantial resistance to latching upon engagement with the associated latching prejection similar in amount to the inherent resistance to mating,
whereby during initial mating movement the latching section of the latching arm initially engages and is stopped by the abrupt, steep latching projection whereafter no further axially together movement of the connectors can occur until the instantaneous application of increased axial mating force needed to overcome the resistance to latching suddenly encountered, and
each said latching section having a short axial dimension between said forward and rearward surfaces thereof and said rearward surface thereof being steep, and each said latching projection rearward surface having a slope of between 70° and 90° engageable by a said steep rearward surface of a said latching section, to minimize resistance to

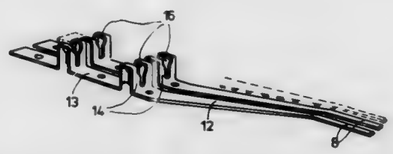
resiling of a deflected said latching arm and latching of a said latching section therebehind,
whereupon the latching section immediately rides over and latches behind the abrupt, steep latching projection.

5,110,303
ELECTRICAL CORD CONNECTION RETAINER
James L. Hardy, 962 Lands End Rd., Farmington, Utah 84025
Filed Jul. 30. 1991, Ser. No. 737,770
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—367 **19 Claims**



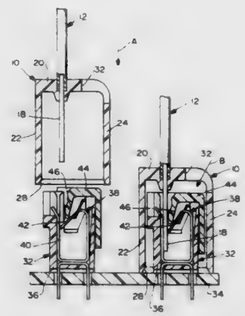
1. An electrical connection retainer comprising:
a housing having an elongate central region and laterally extending ears symmetrically arranged about said central region, said housing having a pair of spaced opposing edges;
an elongate reinforcement strip fabricated of a material which precludes a longitudinal stretching of said reinforcement strip, said reinforcement strip being secured to said housing elongate central region to extend longitudinally along said housing;
two zipper tracks, each said zipper track being secured to a respective edge of said housing;
a zipper pull mounted on said zipper tracks adapted for engaging and disengaging said zipper tracks;
wherein an engagement of said zipper tracks forms said housing into a tubular housing adapted to receive and retain a pair of intercooperated electrical connectors therein.

5,110,304
ELECTRIC CONNECTOR TERMINAL, PRIMARILY A SO-CALLED ISDN JACK, AND A METHOD OF MANUFACTURING CONTACT STRIPS THEREFOR
Poul Kjeldahl, Johs. Ewaldsvej 8, DK-8660 Skanderborg, Denmark
PCT No. PCT/DK89/00243, § 371 Date Apr. 17, 1991, § 102(e) Date Apr. 17, 1991, PCT Pub. No. WO90/04863, PCT Pub. Date May 3, 1990
PCT Filed Oct. 17, 1989, Ser. No. 678,948
Claims priority, application Denmark, Oct. 17, 1988, 5769/88
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—398 **9 Claims**



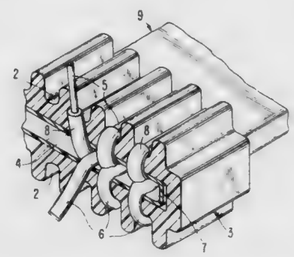
1. An electric connector terminal comprising a plurality of contact strips extending side by side between a contactor area adapted for engagement with a complementary terminal and a connector area, each of said contact strips including at least two bent out U-shaped or V-shaped loop portions adapted to receive respective connector wires in a recess in said loop portions, and wherein said at least two loop portions are arranged mutually spaced in a longitudinal direction of the contact strips.

5,110,305
SHROUD DEVICE FOR ELECTRICAL CONDUCTORS
Richard R. Edgley, Elmhurst; Daniel M. Palmieri, Bloomingdale, and Timothy R. Ponn, Aurora, all of Ill., assignors to Molex Incorporated, Lisle, Ill.
Filed Mar. 11, 1991, Ser. No. 667,727
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—441 **6 Claims**



1. A system for facilitating insertion of an electrical cable into an electrical connector, the cable having at least one conductive wire surrounded by an insulating jacket, and an end of the wire being stripped of the jacket for termination with a terminal in the connector, comprising in combination:
an electrical connector having a terminal for trapping the stripped end of the wire, with actuating means movably mounted on the connector for engaging the terminal to release the trapped wire; and
a shroud of insulating material secured to the insulating jacket of the cable and substantially surrounding the stripped end of the wire and configured to allow the wire to be inserted into the connector in termination with the terminal, the shroud having a window providing access through the shroud to the actuating means of the connector.

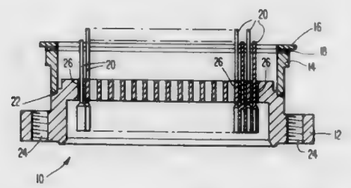
5,110,306
COMPACT CONNECTOR ASSEMBLY AND TERMINATION GUIDE THEREFOR
Steven K. Buck, Buda, and Wendall D. Willey, Austin, both of Tex., assignors to W. L. Gore & Associates, Inc., Newark, Del.
Filed Jul. 24, 1991, Ser. No. 735,216
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—497 **20 Claims**



1. An electrical connector assembly comprising:

(a) a connector body, including one or more closely spaced rows of closely spaced connector pins attached to lead frames affixed therein, said lead frames extending from the back face of said body;
(b) a termination guide, having a slot therethrough for housing electrical signal cables, a series of alternating spaced apart grooves and spacers being formed into one or both the upper and lower surfaces of said guide paralleling said slot for housing bared end portions of conductors and shielding of;
(c) one or more electrical signal cables passing through said guide, folding over the end of said guide, opposite that of the entrance of said cable, into said grooves between said spacers and being terminated to said pins;
(d) a connector backshell fitting over said lead frames and said guide against said connector body to complete said connector assembly; and
(e) a quantity of hardenable, curable liquid insulative resin filling said backshell, surrounding said guide, said terminated conductor and shielding ends, and said lead frames.

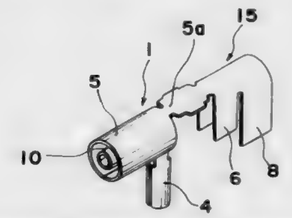
5,110,307
LASER WELDABLE HERMETIC CONNECTOR
Edward J. Rapoza, West Milford, N.J., assignor to Balo Precision Parts Inc., Butler, N.J.
Filed Jul. 9, 1991, Ser. No. 727,668
Int. Cl.[5] H01R *13/74*
U.S. Cl. 439—566 **27 Claims**



1. An electrical connector suitable for providing electrical access through a sidewall of a microelectronic package housing while maintaining hermeticity, said housing having a first coefficient of thermal expansion, comprising:
a connector body having an aperture therethrough and a second coefficient of thermal expansion,
a connector pin disposed through said aperture and hermetically sealed to said connector body with an insulating composition,
flange means for joining said hermetic electrical connector to said microelectronic package housing, said flange means comprising upper and lower flanges metallurgically bonded together and comprising first and second metallic compositions respectively, said first composition being hermetically bonded to said connector body with a fusion weld having a heat-affected-zone which does not significantly affect the hermeticity provided by said insulating composition and said second composition being weldable to said microelectronic package housing.

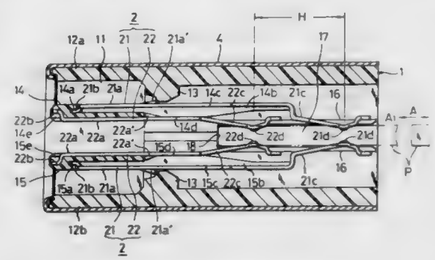
5,110,308
CONNECTOR
Toshio Nishikawa; Yuichi Maruyama; Hiromi Ogura, and Kenshi Michishita, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan
Filed Aug. 13, 1990, Ser. No. 567,011
Claims priority, application Japan, Aug. 11, 1989, 1-95024[U]; Aug. 11, 1989, 1-95025[U]; Feb. 28, 1990, 2-20659[U]; Feb. 28, 1990, 2-20660[U]
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—582 **34 Claims**

1. A connector adapted to be mounted to a coaxial cable having a cable internal conductor, an internal insulator surrounding the internal conductor, a shield conductor surrounding the internal insulator, and a cable outer insulator surrounding the shield conductor, said connector comprising:
a housing comprising, an outer conductor having a main portion with a front end and a rear end, and an inner contact mounted within said main portion of said outer conductor and being adapted to be connected to the internal conductor of the coaxial cable;
an outer conductor adapter which is one piece with, in electrical contact with, and extending away from said



main portion of said outer conductor of said housing, said outer conductor adapter being adapted for insertion between the cable internal insulator and the shield conductor of the coaxial cable; and
a sleeve portion formed as one piece with, in electrical contact with, and extending away from said outer conductor of said housing, at least part of said sleeve portion being adapted to wrap around the coaxial cable so as to cause the shield conductor of the coaxial cable to adhere under pressure to said outer conductor adaptor.

5,110,309
MULTI-POLE ELECTRICAL CONNECTOR
Norio Ichitsubo, Osaka, Japan, assignor to Hosiden Corporation, Osaka, Japan
Filed Dec. 4, 1990, Ser. No. 621,976
Claims priority, application Japan, Dec. 14, 1989, 1-144849[U]
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—630 **6 Claims**



1. A multi-pole electrical connector, comprising:
a main body having a connector insertion hole into and from which another multi-pole electrical connector is inserted and removed, and a board insertion hole into and from which a printed circuit board is inserted and removed;
upper and lower contact piece holding portions formed integrally with said main body and projecting, in two stages, into said connector insertion hole of said main body each contact piece holding portion having a top surface side and a bottom surface side;
a plurality of upper pairs of contact pieces juxtaposed relative to each other, each upper pair of contact pieces including two contact pieces separated from each other, at

the top surface side and the bottom surface side of said upper contact piece holding portion;

an upper contact formed on each of said two contact pieces forming each of said upper pairs of contact pieces, said upper contacts corresponding to contacts of the other multi-pole electrical connector;

an upper extending portion which extends from each of said two contact pieces forming each of said upper pairs of contact pieces and which extend into said board insertion hole;

an upper contact formed on each of said upper extending portions of said two contact pieces forming each of said upper pairs of contact pieces, said upper contacts being positionally shifted, in the insertion/removal direction of the printed circuit board, so as to correspond to external contacts formed on the top surface side of the printed circuit board;

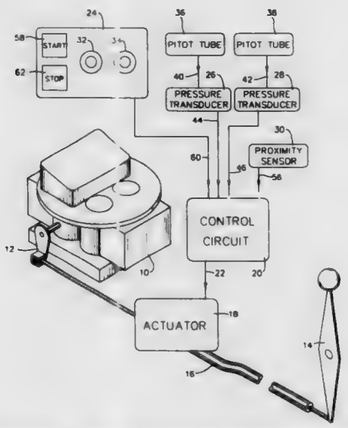
a plurality of lower pairs of contact pieces juxtaposed relative to each other, each lower pair of contact pieces including two contact pieces separated from each other, at the top surface side and the bottom surface side of said lower contact piece holding portion;

a lower contact formed on each of said two contact pieces forming each of said lower pairs of contact pieces, said lower contacts corresponding to contacts of the other multi-pole electrical connector;

a lower extending portion which extends from each of said two contact pieces forming each of said lower pairs of contact pieces and which extend into said board insertion hole; and

a lower contact formed on each of said lower extending portions of said two contact pieces forming each of said lower pairs of contact pieces, said lower contacts being positionally shifted, in the insertion/removal direction of the printed circuit board, so as to correspond to external contacts formed on the bottom surface side of the printed circuit board.

5,110,310
AUTOMATIC SPEED CONTROL SYSTEM FOR BOATS
James V. Hobbs, Bethesda, Md., assignor to Lakeland Engineering Corporation, Bethesda, Md.
Filed Apr. 25, 1991, Ser. No. 691,122
Int. Cl.[5] B63H *19/00*
U.S. Cl. 440—1 **7 Claims**



1. A device for controlling the speed of a motorized watercraft, comprising:

(a) means for measuring the speed of said craft relative to the water over which it travels, consisting of more than one speed measuring device;

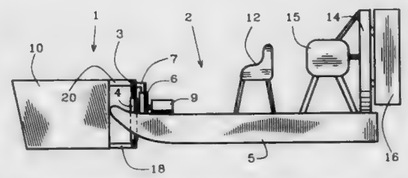
(b) control circuit means for comparing the outputs of said speed measuring devices at least frequently, and for using only the highest output of said speed measuring devices as the measured speed;

(c) control means for regulating the speed of the engine of said craft whereby a desired speed of said craft relative to the water may be set and maintained under uniform conditions;

(d) said control circuit means further comparing said measured speed said with said desired speed;

(e) means for actuating said control means to alter the speed of said engine to correct the speed of said craft relative to said water whenever said measured speed varies from said desired speed.

5,110,311
AIR BOAT SLIME PLOW AND METHODS OF USE
William F. Wilkerson, 100 SW. 4th St., Mulberry, Fla. 33860
Filed Nov. 7, 1990, Ser. No. 610,420
Int. Cl.[5] B63B *35/32*
U.S. Cl. 440—37 **21 Claims**



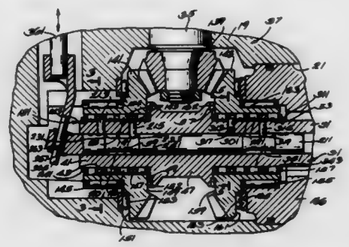
1. An air-boat plow extensible selectively from a hull of an air-boat in laterally-plowing relationship to forward travel of the air-boat comprising:

a hollow suspension member extended from each side of a front section of the air-boat and having sufficient length and rigidity in relationship to the air-boat to absorb transverse pressures from plowing action of a plow attached to plow-attachment members inside the hollow suspension members;

plow-attachment members extendible through the hollow suspension members; and

plow-share members attachable to the plow-attachment members at a bottom section of the air-boat.

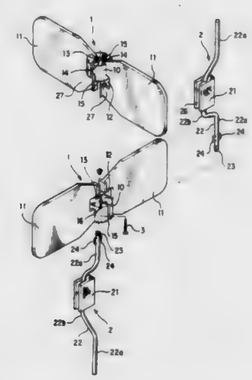
5,110,312
RELEASABLE ROLLER CLUTCH REVERSING TRANSMISSION
Jeffrey P. Higby, Wildwood, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed May 14, 1990, Ser. No. 523,045
Int. Cl.[5] B63H *21/28*
U.S. Cl. 440—75 **12 Claims**



11. A propeller shaft including a forwardly open axial bore,

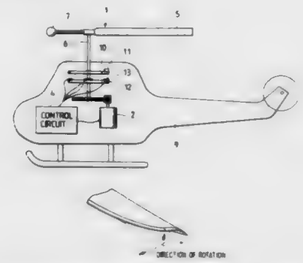
a portion having an outer surface with an axially extending flat, a first radially extending hole communicating with said bore and with said outer surface of said portion, and a second radially extending hole communicating with said bore and with said outer surface of said portion and located in axially spaced relation to said first hole.

5,110,313
SEPARABLE BLADE ASSEMBLY FOR RUBBER RAFT
Tsai J. Po, 191, Minchuan Rd., Tamshui Taipei, Taiwan
Filed Sep. 25, 1989, Ser. No. 411,657
Int. Cl.[5] B63H *1/04*
U.S. Cl. 440—90 **2 Claims**



1. A separable crankshaft blade assembly for use as a propulsion device on a rubber raft, said assembly comprising two interfitting blade components and two interfitting crankshaft components; each blade component comprising a central hub having a rotational axis, and two blade elements radiating outwardly from said hub in diametrically opposite directions; each said blade element having an axial length that is appreciably greater than the axial length of the associated hub to form a central free space in line with the hub, each said blade element having a free inner edge area thereof extending toward the hub central axis to a point within the central free space in line with said hub; each said hub having two axially extending grooves (**15**) extending in a plane normal to the plane of the associated blade elements; said hubs being axially engaged so that inner edge areas of the blade elements on one blade component fit within the axially extending grooves in the hub of the other blade component, thereby forming a four blade assembly wherein the blades are equidistantly spaced; each said hub having an axial hole (**13**) extending therethrough on the hub axis; one of said hubs having a transverse diametrical hole (**16**) extending therethrough in intersecting relation to the associated axial hole; each crankshaft component comprising a rod having two aligned end portions and an offset intermediate crank portion adapted to receive a pedal thereon; one end portion of each rod having a transverse opening (**23**) extending therethrough, and a key (**24**) extending from the rod surface near the transverse opening; each hub having an axial slot (**14**) radiating from the associated axial hole, each slot extending only part way along the axial dimension of the hub to interlockably receive one of said keys; said rods having end portions thereof insertable into the axial holes in the hubs so that the transverse openings (**23**) register with each other and with the transverse hole in said one hub; and a fastener (**3**) extending through said transverse hole and the registering openings to rigidly interconnect the two blade components and the two crankshaft components; said keys fitting into said axial slots so that the offset portion of one rod is ninety degrees out of phase with respect to the offset portion of the other rod.

5,110,314
DEVICE FOR INCLINING THE TIP PATH PLANE OF A PROPELLER OF TOY HELICOPTER
Yuji Fujihara, and Masaru Ando, both of Osaka, Japan, assignors to Keyence Corporation, Osaka, Japan
Filed Nov. 8, 1990, Ser. No. 610,652
Claims priority, application Japan, Nov. 14, 1989, 1-296866
Int. Cl.[5] A63H *17/00*
U.S. Cl. 446—34 **6 Claims**



1. A propeller blade tip path plane-inclining device for use in a toy helicopter, comprising:

a fuselage;

a propeller which is asymmetrical with respect to a rotating shaft connected to said propeller and which imparts a vertical upward propulsive force to said fuselage;

a motor fixedly connected to said fuselage and operatively connected to said rotation shaft for driving said propeller for rotation in a propeller rotation plane;

position detector means for detecting the position of said propeller in said propeller rotation plane; and

a control circuit operatively coupled to said position detector means and said motor for generating a pulse signal for driving said motor, said control circuit increasing and decreasing the width of said pulse signal at predetermined regions with respect to said propeller rotation so as to incline said tip path plane in accordance with at least one detection signal from said position detector means.

5,110,315
ANNULAR SUPPORT DEVICE WITH PIVOTAL SEGMENTS
Richard Zawitz, 365 Moncada Way, San Francisco, Calif. 94127
Filed Apr. 1, 1991, Ser. No. 678,717
Int. Cl.[5] A63H *33/12*
U.S. Cl. 446—102 **11 Claims**

1. A continuous device which may be twisted into an infinite variety of configurations, comprising:

a plurality of serially connected rigid segments having a first end pivotally secured to one of two adjacent segments, and a second end pivotally secured to the other one of the two adjacent segments, permitting each segment to be twisted relative to the two adjacent segments causing the annular device to assume any one of an infinite number of configurations, each configuration having a continuous center line therearound;

a first end face on the first end of each segment, which end face is normal to the center line of the annular device defining a first interface plane for each segment, the first end of each segment forming a first interface with the cooperating end of the one of the two adjacent segments along the first interface plane with a pivot axis therethrough normal to the first interface plane;

a second end face on the second end of each segment, which end face is normal to the center line of the annular device

defining a second interface plane for each segment, the second end of each segment forming a second interface with the cooperating end of the other one of the two adjacent segments along the first interface plane with a pivot axis therethrough normal to the first interface plane;

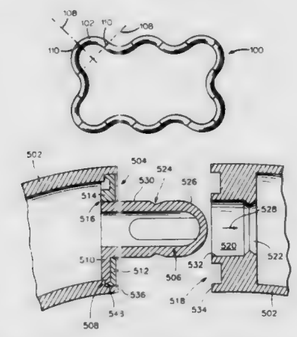
a first engagement means on the first end face of each segment; and

a second engagement means on the second end face of each segment for engaging the first engagement means on the other one of the two adjacent segments for securing the plurality of segments together;

the first engagement means is a cylindrical central extension means extending from the first end face;

the second engagement means is a cylindrical central channel means extending into the second end face for pivotally engaging the extension means on the other one of the two adjacent segments,

the extension means has a recess separating a cylindrical portion and an at least partially divided bulb portion for engaging the channel means to pivotally secure the adjacent segments together, said at least partially divided bulb



portion including two opposed grooves interconnected by a bridge portion at a terminal portion of said extension means;

the channel means has a radially inwardly extending rib separating a cylindrical portion from a terminal portion of said channel means for engaging the recess on the extension means after compression of the bulb portion in said cylindrical portion of said channel means during insertion of the extension means into the channel means, said rib tapering radially inwardly from said cylindrical portion of said channel means to a radially innermost point and tapering radially outwardly from said radially innermost point to said terminal portion of said channel means;

the center axis of the cylindrical extension means is coincident with the center axis of the cooperating cylindrical channel means on the one adjacent segment forming a common pivot axis;

the continuous center line through the annular device is a line of radial symmetry around the annular device;

the coincident center axes are also coincident with the center line of radial symmetry at the interface plane between adjacent segments.

5,110,316

PRACTICAL JOKE DEVICE

David Shaw, 28 Moorfield Drive, Halesowen, West Midlands B63 3TG, and Christopher L. Birch, London, both of England, assignors to David Shaw, United Kingdom

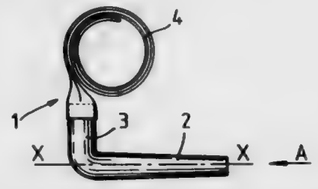
PCT No. PCT/GB89/00674, § 371 Date Feb. 20, 1990, § 102(e) Date Feb. 20, 1990, PCT Pub. No. WO89/12489, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 16, 1989, Ser. No. 482,016

Claims priority, application United Kingdom, Jun. 18, 1988, 8814555

Int. Cl.[5] A63H *33/40, 37/00*

U.S. Cl. 446—202 **1 Claim**



1. A hand-held practical joke and display device comprising:

a) a mouthpiece having a width and a longitudinal axis and being attached to a rolled-up display portion which can be unrolled and thereby extended upon delivering air through the mouthpiece from the mouth of a person using the device, said display portion being disposed at a angle with respect to the mouthpiece to display information carried on said display portion,

b) said display portion including an air-inflatable chamber and a non-inflatable panel display element adapted for carrying and displaying information,

c) said air-inflatable chamber being in flow communication with said mouthpiece and said non-inflatable panel display element being carried by said air-inflatable chamber whereby the display element unrolls when air is delivered to the mouthpiece and rolls up with the air-inflatable chamber when air is not delivered to the mouthpiece,

d) the panel display element having a display area substantially greater than the area occupied by the air-inflatable chamber,

e) said inflatable chamber being unrolled whenever air is blown into said mouthpiece to cause said non-inflatable panel element to be unrolled with said chamber to an extended dimension,

f) in the unrolled condition, the extension direction of the panel display element and chamber is displaced at an angle with respect to the longitudinal axis of the mouthpiece, and

g) resilient biassing means extend along the length of the air inflatable chamber for causing the unrolled display portion to roll up when air is not delivered through the mouthpiece from the mouth of the person using the device.

5,110,317

METHODS AND COMPOSITIONS TO ENHANCE STAIN RESISTANCE OF DYED NYLON CARPET FIBERS: THIOCYANATE TO REDUCE YELLOWING

Dale A. Hangey, Midlothian, Va.; Michael P. Friedberger, Millville, N.J.; William A. Archie, Petersburg, Va., and Roger N. Spitz, New York, N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 361,671, Jun. 1, 1989, abandoned, which is a continuation of Ser. No. 101,652, Sep. 28, 1987, abandoned. This application Jun. 3, 1991, Ser. No. 709,041

Int. Cl.[5] D06M *15/00;* **B32B** *3/02, 27/34*

U.S. Cl. 8—115.6 **22 Claims**

1. A method to continuously treat dyed nylon carpet fabric to impart improve resistance to staining comprising:

preheating said dyed carpet fabric with water at a temperature between about 140° and 212° F. (60° and 100° C.) to a wet pick-up of above about 75% by weight, and a carpet temperature of between about 130 and 120° F. (54.4° and 99° C.), then

extracting said water from said carpet fabric to a wet pick-up of between about 30 to 190% by weight, then applying an aqueous solution of an effective amount of a sulfonated aromatic condensate to said carpet fabric at a pH of between about 1.5 to 5.5, at a concentration of between about 0.25 and 40 grams of solids of said condensate per liter of aqueous solution, at a wet pick-up of between 200 and 650% by weight, at an aqueous solution liquor temperature of between about 140° and 212° F. (60° and 100° C.), to achieve a carpet fabric temperature between about 130° and 210° F. (54.4° and 99° C.), then

holding said carpet in said aqueous solution for between about 0.5 to 90 seconds at a temperature above 130° F. (54.4° C.) wherein said aqueous solution also contains an effective amount to reduce yellowing of sulfonated aromatic condensate treated carpet of a thiocyanate wherein the thiocyanate cation is ammonium, sodium, potassium or zinc.

5,110,318

COMPOSITION AND METHOD FOR COLORING AND CONDITIONING HAIR

Rocco F. Altobelli, 1300 Deerwood Dr., Eagan, Minn. 55123; Wallace R. Hlavic, 3401 E. Calhoun Pkwy., Minneapolis, Minn. 55408, and Annette Angell-Schram, 5108-192nd St., Farmington, Minn. 55024

Continuation-in-part of Ser. No. 408,604, Sep. 18, 1989, Pat. No. 5,002,076, which is a division of Ser. No. 178,320, Apr. 6, 1988, Pat. No. 4,913,898. This application Mar. 14, 1990, Ser. No. 493,303

Int. Cl.[5] A61K *7/13*

U.S. Cl. 8—405 **34 Claims**

1. A composition for coloring hair comprising: about 20–70% water;

about 5–25% clay;

0.00001–5.0% of a coloring component, wherein said coloring component is selected from the group consisting of a non-permanent coloring agent and a semi-permanent coloring agent;

about 0.1–5.0% moisturizer component;

about 2–20% reconstruction component; and

about 0.5–20% shine imparting component or any combination thereof.

5,110,319

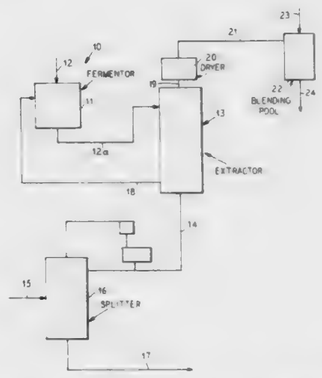
PROCESS FOR EXTRACTING ETHANOL FROM FERMENTATION BROTHS FOR DIRECT BLENDING INTO GASOLINE WHILE PRESERVING THE BROTH FOR RECYCLING

Jim L. Turpin, Fayetteville, Ark.; Robert B. Eldridge, Bartlesville, Okla., and Sharon Booth-McGee, Baton Rouge, La., assignors to The Board of Trustees of the University of Little Rock Arkansas, Little Rock, Ark.

Filed Jun. 13, 1990, Ser. No. 537,131

Int. Cl.[5] C10L *1/02*

U.S. Cl. 44—451 **11 Claims**



1. A method of producing gasohol which comprises fermenting ethanol-producing source material in a fermentor, releasing fermentation broth from the fermentor into an extractor, releasing a light alkylate having a boiling range of 50°–150° C. into the extractor for countercurrent flow relative to the fermentation broth, flowing the extract from the extractor, blending gasoline with the extract to provide a desired ethanol content in the gasoline, and recycling the extract freed fermentation broth back to the fermentor.

5,110,320

ABRASIVE PRODUCTS BONDED WITH COLOR STABILIZED BASE CATALYZED PHENOLIC RESIN

David E. Broberg, and Carl A. Jackson, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 13, 1990, Ser. No. 480,018

Int. Cl.[5] B24D *11/00*

U.S. Cl. 51—295 **40 Claims**

1. A coated abrasive article comprising

(a) a support member having a front surface and a back surface, said support member optionally being saturated with a saturant and said back surface of said support member optionally having a backsize layer;

(b) abrasive granules;

(c) a first layer of a bond system which serves to bond said abrasive granules to said front surface of said support member;

(d) optionally at least one size layer overlying said first layer; and

(e) optionally at least one supersize layer overlying said size layer;

wherein at least one of said saturant, said backsize layer, said first layer, said size layer, and said supersize layer comprises

(a) a cured alkali metal hydroxide catalyzed phenolic resin; and

(b) reaction residue with said alkali metal hydroxide catalyzed phenolic resin of an amount of at least one ammoni-

um-based salt sufficient to color stabilize said cured resin, wherein said salt is selected from the group consisting of:
(i) an ammonium-based salt having the formula

NH_4AlF_4

and being present in an amount less than 10 weight percent based on said cured resin;
(ii) ammonium-based salts represented by the general formula

$(NH_4M.M')AlF_6$,

wherein M and M are cations which may be the same or different and are selected from the group consisting of NH_4^+, Li^+, Na^+, and K^+, and being present in an amount less than 10 weight percent based on said cured resin; and
(iii) ammonium-based salts selected from the group consisting of ammonium chloride, ammonium bifluoride, dibasic ammonium citrate, tribasic ammonium citrate, ammonium dihydrogen phosphate, and diammonium hydrogen phosphate.

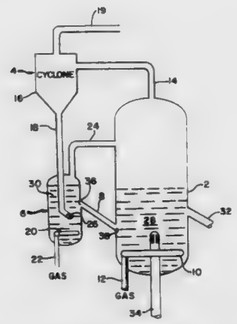
5,110,321
ABRASIVES CONTAINING AMMONIUM FLUORIDE-BASED GRINDING AID
David E. Broberg, and Carl A. Jackson, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 13, 1990, Ser. No. 479,116
The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.
Int. Cl.[5] B24D *3/28*
U.S. Cl. 51—295 **16 Claims**

1. A coated abrasive article comprising
(a) a support member;
(b) abrasive granules;
(c) a first layer of a cured bond system which serves to bond said abrasive granules to said support member;
(d) optionally at least one cured size layer overlying said first layer; and
(e) optionally at least one cured supersize layer overlying said size layer;
wherein at least one of said cured bond system, said cured size layer, and said cured supersize layer contains a grinding aid in an amount sufficient to increase the abrading performance of said coated abrasive article, wherein said grinding air is an ammonium aluminum fluoride-based salt selected from the group consisting of NH_4, M, M')AlF_6, wherein M and M' are cations which may be the same or different and are selected from the group consisting of NH_4^+, LI^+, Na^+ and K^+, with the proviso that at least one of
(i) said cured bond system comprises at least 10 weight percent of said ammonium aluminum fluoride-based salt, based on the weight of said cured bond system;
(ii) said cured size layer comprises at least 10 weight percent of said ammonium aluminum fluoride-based salt, based on the weight of said cured size layer; and
(iii) said cured supersize layer comprises at least 10 weight percent of said ammonium aluminum fluoride-based salt, based on the weight of said cured supersize layer.

5,110,322
ABRASIVE ARTICLE
Kesh S. Narayanan, Holden, and Muni S. Ramakrishnan, Northborough, both of Mass., assignors to Norton Company, Worcester, Mass.
Continuation-in-part of Ser. No. 406,487, Sep. 13, 1989, abandoned. This application Apr. 9, 1990, Ser. No. 506,059
Int. Cl.[5] B24D *3/02*
U.S. Cl. 51—309 **16 Claims**

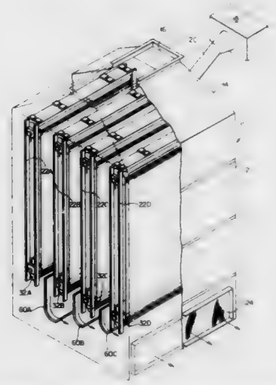
1. An abrasive article comprising particulate material held in a resinous bond wherein:
a. The particulate material comprises from about 30% to about 95% by volume of abrasive particles and correspondingly from about 5 to about 70% by volume of friable filler particles selected from hollow bubbles of a metal oxide, an organic polymer or a glass, friable particles of a silicate or an aluminosilicate, and foamed or solid glass or organic polymer particles; and
b. the abrasive particles comprise particles of a sintered sol-gel alumina and particles of at least one further abrasive material.

5,110,323
PROCESS FOR THE RETURN OF RECOVERED PARTICULATE SOLIDS BY A CYCLONE SEPARATOR TO A VESSEL
Dalip S. Soni, Houston, Tex., assignor to Stone & Webster Engineering Corp., Boston, Mass.
Division of Ser. No. 461,065, Jan. 4, 1990, Pat. No. 5,037,617. This application May 9, 1991, Ser. No. 697,702
Int. Cl.[5] B01D *24/36, 45/12*
U.S. Cl. 55—1 **4 Claims**



1. A process for separating particulate solids from a mixed phase particulate solids-gas suspension and returning the solids to a vessel in which the mixed phase particulate-solids gas suspension is generated comprising the steps of:
delivering a mixed phase particulate solids-gas suspension from a main vessel containing a bed of particulate solids wherein the mixed phase particulate solids-gas suspension is generated to a particulate solids-gas separation device;
delivering the particulate solids from the separation device to a fluidized bed of solids in an auxiliary vessel;
fluidizing the bed of solids in the auxiliary vessel;
returning particulate solids from the auxiliary vessel to the main vessel; and
returning gas from the auxiliary vessel to the main vessel.

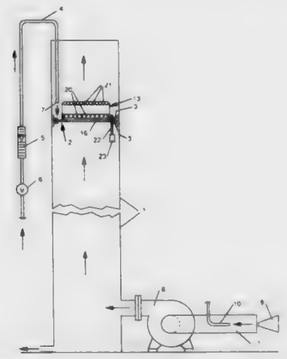
5,110,324
ELECTROSTATIC SEPARATION METHOD AND APPARATUS
Anthony Q. Testone, Schwenksville, Pa., and Waldyn J. Benbenek, Conroe, Tex., assignors to Louisiana Pacific Corporation, Conroe, Tex.
Filed Dec. 27, 1989, Ser. No. 456,148
Int. Cl.[5] B03C *3/00*
U.S. Cl. 55—11 **20 Claims**



1. A method for removing liquid contaminant particles from a gaseous stream comprising:
passing said stream through a housing having an inlet and an outlet,
generating an electrostatic field in said housing extending transversely of said gaseous stream between an array of points in aid stream connected to a source of voltage and a conductive plate spaced from said array of points, with said field having lines of force extending from said array of points to said conductive plate,
collecting liquid contaminant particles impelled by said lines of force on a collection surface adjacent said stream and located between said array of points and said conductive plate,
causing said collection surface to be moved by a driving apparatus, and
removing liquid contaminant collected on said moving collection surface from said moving collection surface.

5,110,325
RECYCLE SPRAY GAS-LIQUID CONTACTOR
Bernard J. Lerner, 727 Orchard Hill Dr., Pittsburgh, Pa. 15238
Continuation-in-part of Ser. No. 512,214, Apr. 20, 1990, Pat. No. 5,024,686. This application Apr. 22, 1991, Ser. No. 688,439
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—90 **5 Claims**

5. A method of mass transfer of substances between a liquid and a gas comprising the steps of: introducing liquid at a predetermined rate to a tray containing liquid-conducting tubes so spaced apart to induce gas venturi flow, passing a gas upward between the tubes, aspirating liquid from orifices in the tubes by gas venturi aspiration at a rate that is many time greater than the initial rate of introduction of liquid to the tray, effecting thereby a cocurrent spray of liquid in the gas; passing the gas and contained spray through a first flow-restrictive element which partially coalesces and regenerates the spray; passing the gas and regenerated spray into a relatively high-voidage volume between the first flow-restrictive element and a secondary flow-restrictive element, thereby causing the gas and spray to flow laterally through the high voidage volume between the elements; collecting spray and gas discharged from the high voidage volume and separating the spray by impingement on a plane surface and causing the liquid therefrom to recycle into cocurrent spray contact with a further quantity of the gas at a liquid rate that is many times higher

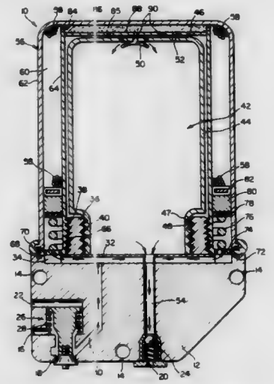


than the initial pre-determined rate of liquid introduction to the tray; withdrawing so-treated liquid from ultimate contact with inflowing gas and so-treated gas from contact with inflowing liquid.

5,110,326
IMMOBILIZED LIQUID MEMBRANE
K. K. Sirkar, Scotch Plains; R. R. Bhave, Hoboken; H. T. Taskier, Fanwood, all of N.J., and M. I. Ostler, Libertyville, Ill., assignors to Celanese Corporation, New York, N.Y.
Continuation of Ser. No. 458,551, Dec. 28, 1989, abandoned, which is a division of Ser. No. 761,133, Jul. 31, 1985, abandoned. This application Mar. 12, 1991, Ser. No. 668,356
Int. Cl.[5] B01D *53/22, 69/00*
U.S. Cl. 55—158 **11 Claims**

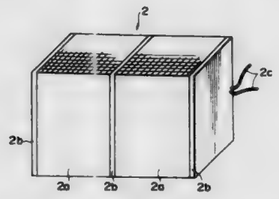
1. A single-ply, ultrathin immobilized liquid membrane having high positive pressure difference stability comprising a single ply hydrophobic microporous support, and an aqueous liquid membrane immobilized within said support, said immobilized liquid membrane constituting the means which permit a specie of a gaseous feed mixture on one side of said support to preferentially permeate through said support to a gas on the other side of said support said immobilized liquid membrane being produced by a method comprising the steps of:
(a) contacting said single-ply hydrophobic microporous support with an aqueous solution containing from about 40 to about 95 percent by volume of an exchange component until steady state is achieved;
(b) removing said support from said aqueous solution;
(c) contacting said support with water until steady state is achieved;
(d) removing said support from said water;
(e) repeating steps (a)–(d) until a water membrane is immobilized within substantially the entire thickness of said support; and
(f) partially reducing the thickness of said membrane immobilized within said support by (i) establishing a moisture partial pressure gradient between at least one side of said support and a gas in contact with said one side, and (ii) maintaining said moisture partial pressure gradient for a time sufficient to cause a portion of said liquid membrane to evaporate thereby partially reducing its thickness.

5,110,327
COMPRESSED AIR DRYER
Gregory C. Smith, Elyria, Ohio, assignor to Allied-Signal Inc., Morristown, N.J.
Filed Sep. 20, 1991, Ser. No. 763,095
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—163 **14 Claims**



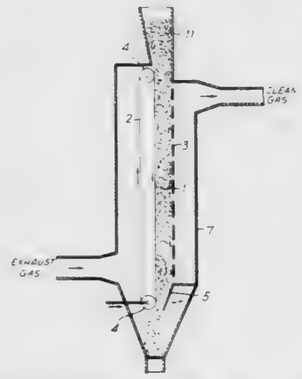
1. Compressed air dryer comprising a base having an inlet communicated to a compressed air source, an outlet communicated to a storage reservoir, and exhaust, and valve means responsive to a control signal for opening and closing said exhaust; means for securing a desiccant canister to said base; said desiccant canister including circumferentially extending inner and outer walls defining an annular chamber therebetween; a desiccant in said annular chamber, a transversely extending end wall closing one end of annular chamber; means for securing the other end of said annular chamber to said base; said inner wall, said transversely extending wall, and said base defining a purge compartment within said desiccant canister for storing purge air for periodic backflowing through the desiccant for regeneration of the latter whereby said purge volume is defined within said desiccant canister; said base extending across the other end of said desiccant canister and purge compartment; and a flowpath defined by said base, said desiccant canister, and said purge compartment for communicating compressed air from said inlet to said outlet.

5,110,328
SOLVENT ADSORBER AND SOLVENT RECOVERY SYSTEM
Hisaaki Yokota, Chigasaki; Tadashi Yoshiguchi, and Hitoshi Kamimatsuse, both of Kamakura, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Filed Jun. 5, 1990, Ser. No. 533,413
Claims priority, application Japan, Jun. 7, 1989, 1-144987; Dec. 20, 1989, 1-146718; Mar. 20, 1990, 2-70050
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—180 **14 Claims**



1. A solvent adsorber, comprising:
an adsorbent material containing activated carbon as a major component and molded into a monolithic structure having gas passages for passing a solvent-containing gas therethrough for adsorption of the solvent from said gas; and
a heat supply member held in contact with said adsorbent material for transmitting heat to said monolithic adsorbent material mainly through heat conduction.
wherein said monolithic adsorbent material comprises a plural number of honeycomb structure units, and said heat supply member is interposed between said honeycomb structure units.

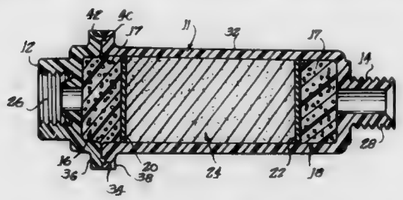
5,110,329
FILTERING DEVICE FOR DUST AND EXHAUST GASES OF GLASS MELTING FURNACES CONTAINING SULFUROUS COMPOUNDS
Helmut Pieper, Lohr/Main, Fed. Rep. of Germany, assignor to Beteiligungen Sorg GmbH & Co. KG, Lohr/Main, Fed. Rep. of Germany
Filed Jun. 20, 1990, Ser. No. 540,936
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1989, 3921720
Int. Cl.[5] B01D *46/32*
U.S. Cl. 55—269 **10 Claims**



1. An apparatus suitable for filtering dust and exhaust gases containing sulfur compounds emanating from a glass melting furnace comprising a housing having:
a first and second end;
a first belt within said housing extending from said first end to said second end;
perforated means within said housing extending from said first end to said second end and positioned substantially parallel to said belt; and
filter means located between said first belt and perforated means,
said filter means moving between said first and second end substantially independently of said first belt.

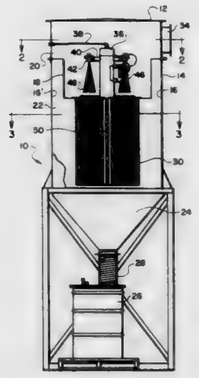
5,110,330
FILTER DRYER
James F. Loughran, Hanover Park, Ill., assignor to Arrow Pneumatics, Inc., Lake Zurich, Ill.
Continuation of Ser. No. 477,241, Feb. 8, 1990, abandoned. This application Mar. 27, 1991, Ser. No. 677,594
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—275 **5 Claims**

1. An in-line filter dryer for filtering contaminants from and drying a flow of compressed air, comprising: a housing having an entrance and an exit, each defining a first cross-sectional area and an interior volume defining a second cross-sectional area much greater than said first cross-sectional area; a sintered bronze dispersion filter element mounted within said housing intermediate said entrance and said interior volume for collecting liquid material and dirt in an entering air flow and for dispersing air form said entrance evenly across said interior volume; a cotton oil removal filter element mounted within said housing for receiving air from said dispersion filter and removing oil contaminants from the air; a quantity of desiccant



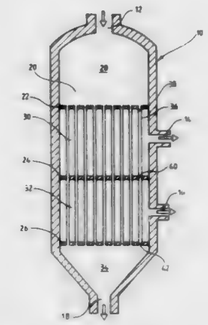
contained within said interior volume of said housing for receiving air from said oil removal filter for adsorbing the moisture and lowering the dewpoint of the air; a second cotton oil removal filter element and a second sintered bronze dispersion filter element, arranged in the housing in a substantially symmetrical manner with the first oil removal and dispersion filters, for filtering out desiccant dust and other particles form the air exiting said housing and for allowing the filter dryer to be used in either direction of air flow.

5,110,331
DUST COLLECTOR WITH RE-ENTRAINMENT PREVENTION WALLS
Roger D. Williams, Dallas, N.C., assignor to Pneumafil Corporation, Charlotte, N.C.
Filed Apr. 25, 1991, Ser. No. 691,347
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—302 **18 Claims**



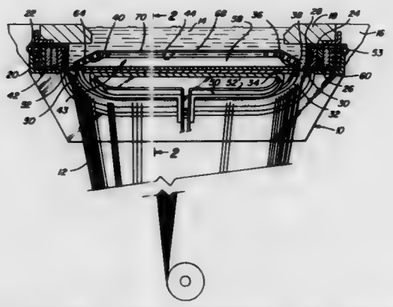
1. A dust collector for removing particles entrained and transported in a flow of a transport fluid, said dust collector comprising:
(a) a housing having a generally cylindrical chamber, inlet means for introducing said transport fluid into said chamber in a generally helical flow path along the interior surfaces of said chamber and in a direction toward a portion of said housing at which removed dust particles are collected or discharged from the housing and outlet means through which said transport fluid exits said housing;
(b) filter means mounted in said housing and extending within said chamber and formed with a filter material to permit said transport fluid to flow inwardly through the exterior surface of said filter means and cause said particles to be removed from said transport fluid and collected on said exterior surface;
(c) filter cleaning means mounted in said housing for periodically causing a reverse flow of cleaning fluid to flow back through said filter means in a direction opposite to the normal flow of said transport fluid for causing at least some of the collected particles on said filter means to be moved away from said exterior surface thereof; and
(d) wall means disposed within said chamber and partially surrounding said filter means to define a flow channel between said wall means and said exterior surface of said filter means that will cause at least some of said reverse flow of cleaning fluid and said particles removed from said filter means thereby to flow in a direction toward and directly into said generally helical flow path of said transport fluid and to cause said particles to be reintroduced into said helical flow path of said transport fluid and carried toward said discharge collection portion of said housing by said flow path.

5,110,332
FILTER FOR FILTRATION OF PARTICLES FROM A HOT GAS FLOW
Juhani Isaksson, Karhula, Finland, assignor to A. Ahlstrom Corporation, Karhula, Finland
Filed Apr. 3, 1991, Ser. No. 680,194
Claims priority, application Finland, Apr. 6, 1990, 901747
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—378 **20 Claims**



1. A filter for high temperature gases, comprising:
a vessel having a dirty gas inlet, a separated particles outlet, and a clean gas outlet;
a plurality of elongated rigid tubular filter elements having pores therein which allow the passage of high temperature gas therethrough, but filter out the majority of particles contained in the gas, the dirty gas inlet being provided on one side of the filter elements and the clean gas outlet being provided on the other side of the filter elements;
at least one support plate mounted in said vessel having edge wall means defining therein for receipt of said rigid tubular filter elements, and separating said dirty gas inlet from said clean gas outlet;
each said rigid tubular filter element and an associated edge wall means defining a slot therebetween; and
means for sealing each said slot, said means comprising at least two distinct seal elements disposed in said slot and spaced a short distance from each other in the dimension of elongation of said rigid filter element, each seal operatively engaging both said rigid filter element and said edge wall means.

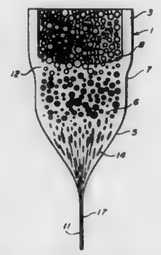
5,110,333
GLASS FIBERIZING BUSHING
Ronald O. McCormick, 191 Mainsail Dr., Westerville, Ohio 43081
Continuation of Ser. No. 572,465, Aug. 23, 1990, abandoned. This application Sep. 9, 1991, Ser. No. 758,547
Int. Cl.[5] C03B *37/09*
U.S. Cl. 65—1 **31 Claims**



1. A fiberizing bushing assembly for making fiberglass wherein molten glass is heated in a forehearth and supplied through an opening to the fiberizing bushing assembly comprising:
a frame;
a bushing retained by said frame on the opening of the forehearth, said bushing having an outside wall extending downwardly and away from the opening in a continuous loop having a lower edge spaced from the opening, an extrusion face spaced from the opening and extending inwardly from the outside wall at the lower edge of the outside wall to an inner edge and a base wall extending between and interconnecting the inner edge of the extrusion face;
heater block means adjacent to the bushing for radiantly and conductively heating the outside wall and the base wall to maintain the temperature of molten glass within the bushing at the desired temperature for fiberizing, said heater block means comprising ceramic members having resistance heating elements disposed therein, said heater block means further comprising an inner module for heating said base wall and an outer module for heating said outside wall;
a plurality of tips formed in the extrusion face of the bushing through which molten glass is drawn to form glass filaments, said tips each defining a hole through said extrusion face and extending slightly below said extrusion face; and
cooling means for cooling the glass filaments upon exiting said tips.

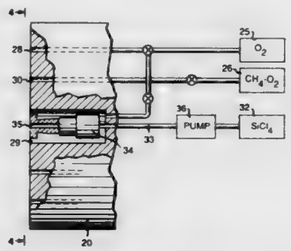
5,110,334
METHOD OF PRODUCING GLASS FIBER WITH CORES OF A DIFFERENT MATERIAL
Jack D. Ayers, Oakton, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jul. 31, 1990, Ser. No. 560,703
Int. Cl.[5] C03B *37/025, 37/075*
U.S. Cl. 65—2 **24 Claims**

1. A process of forming a glass fiber with one or more metal filaments, elemental semiconductor filaments, nonceramic semiconducting compound filaments or ceramic filaments in its core, the process comprising:
heating a closed end of a first glass tube including a metal, elemental semiconductor, nonceramic semiconducting compound or ceramic powder in its core to the working temperature of the first glass tube, which is above the melting point of the metal, elemental semiconductor, nonceramic semiconducting compound or ceramic powder;
evacuating the first glass tube to create a pressure gradient between the inside and outside of the first glass tube sufficient to collapse the heated first glass tube into contact with the metal powder, elemental semiconductor powder, nonceramic semiconducting compound powder, or ceramic powder, respectively, thereby preventing the formation of a gap between the first glass tube and the metal, elemental semiconductor, nonceramic semiconducting compound or ceramic powder;
drawing a first glass fiber from the heated closed end of the first glass tube;



inserting said drawn first glass fiber into a second glass tube made of a glass with a lower working temperature than that of the initial fiber, said second tube having one sealed end to make a tube assembly;
evacuating said tube assembly; then
drawing a second glass fiber from said tube assembly at a temperature above the working temperature of said second glass tube and below the working temperature of said first glass tube but sufficiently high for said drawing of said tube assembly that said first glass fiber is caused, by force exerted upon it by said second glass tube, to collapse and be drawn out into a continuous sheath surrounding said core.

5,110,335
METHOD OF GLASS SOOT DEPOSITION USING ULTRASONIC NOZZLE
Thomas J. Miller, Alpharetta, Ga., and Douglas W. Monroe, Newtown, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jun. 25, 1990, Ser. No. 543,286
Int. Cl.[5] C03C *25/02*
U.S. Cl. 65—3.12 **12 Claims**

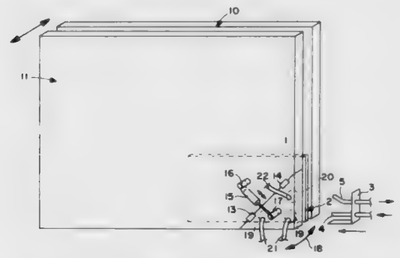


6. A method for making glass comprising the steps of: depositing glass soot comprising the steps of (a) projecting from a torch a fuel gas and an oxygen-containing gas, the fuel gas being ignited to form a flame, (b) projecting from the torch a reactant of appropriate composition and having appropriate properties so as to react at the temperatures produced in the flame to form a stream of glass soot and (c) collecting the soot to form a soot structure; and consolidating the soot structure to form a glass structure wherein the improvement comprises:
providing in the torch an ultrasonic nozzle;
delivering the reactant in liquid form and without a carrier gas to the ultrasonic nozzle;
and using the ultrasonic nozzle, without a gas, to apply high frequency acoustic energy to the reactant so as to break the liquid reactant into a mist and to project the mist from the torch at a velocity of less than about 0.8 meters per second.

5,110,336
METHOD OF USING AMORPHOUS PRECIPITATED SILICA PARTING MATERIAL FOR SHAPING GLASS SHEET DOUBLETS
Randy R. Kadunce, New Kensington; Paul W. Bush, Delmont, and Pamela L. Martino, New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 28, 1990, Ser. No. 635,018
Int. Cl.[5] C03B *40/00, 23/023*
U.S. Cl. 65—24 **18 Claims**

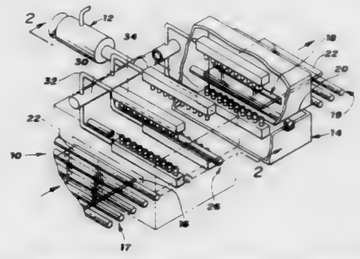
1. In a method of simultaneously bending a pair of glass sheets wherein said sheets are supported in overlaying relation, heated to a temperature at which said sheets are capable of being deformed and simultaneously shaping said sheets, the improvement comprising:
interposing a parting material consisting essentially of amorphous precipitated silica particles between said glass sheets prior to said simultaneous bending.

5,110,337
METHOD AND APPARATUS FOR FILLING THE INNER SPACE OF SEMIFINISHED INSULATING GLASS PANELS WITH GAS
Peter Lisec, Bahnhofstrasse 34, A-3363 Amstetten-Hausmening, Austria
Filed Oct. 15, 1990, Ser. No. 597,765
Claims priority, application Austria, Feb. 28, 1990, 473/90
Int. Cl.[5] C03B *23/24;* **B65B** *31/04*
U.S. Cl. 65—58 **11 Claims**



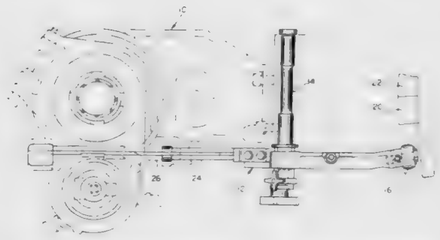
1. In a method for filling the inner space of semifinished insulating glass panels, comprising at least two glass panes and an interposed spacer frame, with a gas other than air, wherein a slot-like opening is formed for feeding gas and withdrawing air and/or air-gas mixture, by holding one of the glass panes of the semifinished insulating glass panel at a spacing from the spacer frame when the semifinished insulating glass panel, after composing the pane package, is pressed while standing substantially vertically in a press between press plates, gas being blown into and air and/or air-gas mixture being withdrawn from the interior of the semifinished insulating glass panel through the thus-formed, slot-like opening, the improvement comprising: holding one of the glass panes of the semifinished insulating glass panel at a spacing from the spacer frame in the zone of only one lower corner of the semifinished insulating glass panel while retaining the remaining portion of this glass pane by the press plates in contact with the spacer frame; injecting gas into the interior of the semifinished insulating glass panel with a flow direction oriented essentially in parallel to the lower horizontal leg of the spacer frame; and withdrawing air and/or air-gas mixture form the interior of the semifinished insulating glass panel through a region of the slot-like opening lying above the region of the slot-like opening through which gas is injected into the interior of the semifinished insulating glass panel.

5,110,338
METHOD AND APPARATUS FOR HEATING A GLASS SHEET
Harold A. McMaster, Perrysburg, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio
Filed Apr. 17, 1991, Ser. No. 686,498
Int. Cl.[5] C03B *23/02, 35/22*
U.S. Cl. 65—182.2 **15 Claims**



1. An apparatus for treating a glass sheet, comprising:
a substantially enclosed chamber containing an atmosphere in which the glass sheet may be treated;
means for supporting the glass sheet in the chamber atmosphere; and
a gas turbine engine having the characteristic of generating heated pressurized exhaust gases in the normal operation thereof, the engine connected to the chamber to provide the exhaust gases to the chamber to treat the glass sheet.

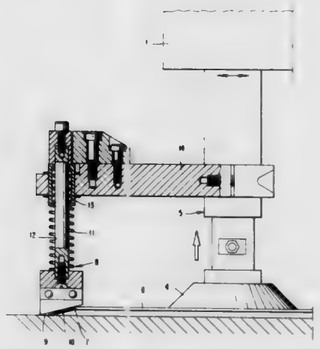
5,110,339
H-28 MACHINE HAVING AN ADJUSTABLE NECK RING LEVER
Michael P. Ciriello, Prospect, and Richard A. Gorski, Suffield, both of Conn., assignors to Emhart Glass Machinery Inc., Towson, Md.
Filed Apr. 23, 1991, Ser. No. 690,078
Int. Cl.[5] C03B *9/195*
U.S. Cl. 65—238 **3 Claims**



1. An H-28 machine having a neck ring lever comprising
a lever for operating a neck ring mechanism,
cam roller means at one end of said lever,
means for supporting said lever for selected rotation about a horizontal axis including,

shaft means, and
sleeve means secured to said shaft means,
said lever having a through bore for slidably receiving said sleeve means, and
means for axially displacing said lever relative to said sleeve means so that the location of said cam roller cam be advanced or retarded, comprising
an adjuster plate secured to said shaft means having a through bore therein and
control means including,
a threaded shaft having a knob at one end,
a pair of nuts pinned to said threaded shaft on either side of said adjuster plate, and
a threaded through bore in said lever for receiving the free end of said threaded shaft.

5,110,340
APPARATUS FOR REMOVING A MARGINAL ZONE EXTERNAL OF AN OUTLINE CUT IN A GLASS SHEET
Kimmo J. Ikola, Kangasala, and Kimmo E. Stenman, Tampere, both of Finland, assignors to Tamglass Oy, Finland
Filed May 29, 1990, Ser. No. 529,664
Claims priority, application Finland, Jun. 9, 1989, 892858
Int. Cl.[5] C03B *33/09*
U.S. Cl. 65—269 **3 Claims**



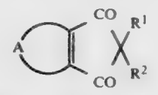
1. An apparatus for removing a marginal zone from a glass sheet, wherein the marginal zone is located outside an outline cut in the glass sheet, comprising:
a conveyor carriage;
a plurality of suction pad rods mounted on said conveyor carriage for movement therewith;
a plurality of suction pads mounted to said suction pad rods for attachment to and carrying of the glass sheet;
a plurality of mechanical removing means mounted on respective ones of said suction pad rods, said removing means and its respective suction pad rod being capable of relative movement upwardly and downwardly;
means for heating the marginal zone for at least partially removing the marginal zone from the glass sheet, said heating means including flame burners; and
means for moving said suction pad rods and suction pads upwardly relative to said mechanical removing means whereby upward movement of the marginal zone is restrained by said mechanical removing means to cause the marginal zone to be removed from the glass sheet;
said suction pad rods being horizontally movable relative to said conveyor carriage so that said suction pads and said mechanical removing means can be horizontally adjusted relative to the glass sheet.

5,110,341
PLANT AND FRUIT TREATMENT WITH LYSOPHOSPHATIDYLETHANOLAMINE
Jiwan P. Palta, and Karim M. Farag, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.
Filed Apr. 18, 1990, Ser. No. 510,650
Int. Cl.[5] A01N *57/12, 33/08, 59/06*
U.S. Cl. 71—86 **8 Claims**

1. A method of enhancing the ripening and stability of fruit comprising spraying on the fruit prior to harvest a treating spray comprising a carrier and an amount of agent effective to enhance fruit ripening and stability, the agent selected from the group consisting of a lysophospholipid and a phospholipid containing ethanolamine.

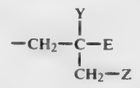
5,110,342
INDAN-1,3-DIONE DERIVATIVE AND HERBICIDAL COMPOSITION CONTAINING THE SAME AS ACTIVE INGREDIENT
Tetsuo Jikihara, Komae; Toyohiko Shike, Yokohama; Manabu Katsurada, Machida; Hisao Watanabe, Yokohama, and Osamu Ikeda, Machida, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan
Division of Ser. No. 523,748, May 15, 1990, Pat. No. 5,076,830. This application Sep. 6, 1991, Ser. No. 755,826
Claims priority, application Japan, May 16, 1989, 1-122624
Int. Cl.[5] A01N *43/00*; C07C *49/215*
U.S. Cl. 71—88 **7 Claims**

1. An indan-1,3-dione derivative represented by the following formula (I):



(I)

wherein R^1 represents a hydrogen atom or a lower alkyl group; R^2 represents a group represented by

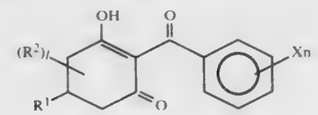


wherein E represents a phenyl group or a pyridyl group each of which may be substituted by 1 to 3 substituents selected from the group consisting of a halogen atom, a C_1–C_4 alkyl group, a C_1–C_3 haloalkyl group having 1 to 5 halogen atoms, a C_1–C_2 alkoxy group, a C_1–C_2 haloalkoxy group having 1 to 5 halogen atoms, a nitro group and a cyano group; Y represents a hydroxyl group; and Z represents an alkylsulfonyloxy group which may be substituted by a halogen atom or a phenyl group, or a phenylsulfonyloxy group which may be substituted by a substituent selected from the group consisting of halogen atoms, a C_1–C_3 alkyl group, a C_1–C_3 haloalkyl group having 1 to 5 halogen atoms, a C_1–C_2 alkoxy group, a C_1–C_2 haloalkoxy group having 1 to 5 halogen atoms, a tetramethylene group, a nitro group and a cyano group; and

A represents a 1,3-butadienylene group which may be substituted by 1 to 4 substituents selected from the group consisting of a halogen atom, a C_1–C_3 alkyl group, a C_1–C_3 haloalkyl group having 1 to 5 halogen atoms, a C_1–C_2 alkoxy group, a C_1–C_2 haloalkoxy group having 1 to 4 halogen atoms, a nitro group and a cyano group; or a 1,3-azabutadienylene group which may be substituted by 1 to 3 substituents selected from the group consisting of a halogen atom, a C_1–C_3 alkyl group, a C_1–C_3 haloalkyl group having 1 to 5 halogen atoms, a C_1–C_2 alkoxy group, a C_1–C_2 haloalkoxy group having 1 to 4 halogen atoms, a nitro group and a cyano group.

5,110,343
CYCLOHEXENONE DERIVATIVES
Akiyoshi Ueda; Haruhito Ohishi; Toshio Aihara; Hisao Ishikawa; Kazuyuki Tomida, and Hideo Hosaka, all of Tokyo, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 274,306, Nov. 21, 1988, abandoned. This application May 24, 1990, Ser. No. 527,885
Claims priority, application Japan, Nov. 28, 1987, 62-301304
Int. Cl.[5] A01N *31/06*; C07C *49/453*
U.S. Cl. 71—88 **2 Claims**

1. A compound having the formula



wherein
X is same or different substituent selected from the group consisting of halogen, nitro, C_{1-6} alkyl, halo C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio and C_{1-6} alkylsulfonyl;
n is 1, 2, 3 or 4
R^1 is C_{1-6}alkyl which is substituted by cyano, halogen, hydroxy, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{1-6} alkylsulfonyl or tetrahydropyranyloxy; C_{1-6} alkylthio or phenylthio;
R^2 is C_{1-6} alkyl;
l is 0, 1 or 2.

5,110,344
PROCESS FOR THE HYBRIDIZATION OF COTTON
James M. Olvey, Tucson, Ariz., assignor to University Patents, Inc., Westport, Conn.
Division of Ser. No. 710,521, Mar. 12, 1985, abandoned, which is a continuation of Ser. No. 337,153, Jan. 5, 1982, abandoned. This application Jan. 12, 1987, Ser. No. 2,139
Int. Cl.[5] A01N *43/80*
U.S. Cl. 71—90 **13 Claims**

1. A method of hybridizing a first cotton variety with a second cotton variety comprising the steps of:
periodically applying to plants of said first cotton variety an isothiazole plant growth regulator;
monitoring the presence or absence and degree of burning of the bracts of said plants;
adjusting the amount and/or periodicity of application of said regulator in response to said monitoring; and
exposing said first cotton variety to pollen from said second cotton variety.

5,110,345
PROCESS FOR THE HYBRIDIZATION OF COTTON
James M. Olvey, Tucson, Ariz., assignor to University Patents, Inc., Westport, Conn.
Continuation of Ser. No. 710,521, Mar. 12, 1985, abandoned, which is a continuation of Ser. No. 337,153, Jan. 5, 1982, abandoned. This application Jan. 12, 1987, Ser. No. 2,192
Int. Cl.[5] A01N *43/80*
U.S. Cl. 71—90 **22 Claims**

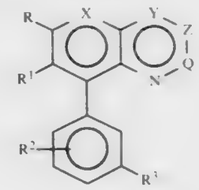
1. A method of rendering cotton plants male sterile while retaining substantial female fertility comprising
providing isothiazole plant growth regulator to the plants in an amount effective to render the cotton plants male sterile while retaining substantial female fertility, including the steps of:
contacting said plants with a preselected amount of the isothiazole plant growth regulator;
monitoring the presence or absence and degree of burning of the bracts of the plants; and adjusting the amount of regulator in response to said monitoring.

5,110,346
HERBICIDAL COMPOSITION AND METHOD FOR KILLING WEEDS USING THE SAME
Takeshige Miyazawa, Shizuoka, and Kazuhiko Kawano, Niiza, both of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan
Filed Apr. 17, 1991, Ser. No. 686,472
Claims priority, application Japan, May 12, 1990, 2-122210
Int. Cl.[5] A01N *43/72, 43/40*
U.S. Cl. 71—90 **8 Claims**

1. A herbicidal composition comprising (a) 9-(4-chloro-5-methoxycarbonylmethylthio-2-fluorophenyl) -8-thia-1,6diazabicyclo[4.3.0]nonan-7-on and (b) 2-[4,5-dihydro-4-methyl-4-((1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3quinolinecarboxylic acid, or 2-[4,5-dihydro 4-methyl-4-(1-methylethyl)-5-oxo-l H-imidazol-2-yl]-5-ethyl-3-pyridinecarboxylic acid, its ester or its salt, as active ingredients.

5,110,347
SUBSTITUTED FUSED HETEROCYCLIC HERBICIDES
Thomas Selby, Wilmington, Del., assignor to E. I Du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 26, 1990, Ser. No. 617,707
Int. Cl.[5] A01N *43/60*; C07D *241/42, 241/44, 253/10*
U.S. Cl. 71—92 **21 Claims**

1. A compound of the formula



wherein
X is CH;
Y is N;
Z, CR^4 or CR^5;
Q, CR^4 or CR^5;
R is C_1–C_4 alkyl, C_2–C_4 alkoxyalkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_3 alkylamino or $N(C_1$–C_3 alkyl)$(C_1$–C_3 alkyl);
R^1 is H, F, Cl or CH_3;
R^2 is H, halogen, C_1–C_3 alkyl, C_1–C_3 haloalkyl, C_1–C_3 alkoxy or C_1–C_3 haloalkoxy;
R^3 is H, halogen, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_4 haloalkyl, C_3–C_4 halocycloalkyl, C_2–C_4 haloalkenyl, C_2–C_4 haloalkynyl, OR^6, $S(O)_nR_7$ or CN;
R^4 is H, CN, C_1–C_3 alkyl, C_1–C_3 alkoxy or halogen;
R^5 is C_1–C_4 haloalkyl, C_3–C_5 halocycloalkyl, C_2–C_4 haloalkenyl, C_2–C_4 haloalkynyl, OR^6, $S(O)_nR^7$ or halogen;
R^6 is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_1–C_4 haloalkyl, C_2–C_4 haloalkenyl or C_2–C_4 haloalkynyl;
R^7 is C_1–C_2 alkyl or C_1–C_2 haloalkyl;
R^8 is H, CN, C_1–C_3 alkyl, C_1–C_3 alkoxy or halogen; and
n is 0; 1 or 2;
or their mono N-oxides or their agriculturally suitable salts, provided that:
(a) when Z is CR^4, then Q is CR^5; and
(b) when Q is CR^4, then Z is CR^5.

5,110,348

GLYCINE COMPOUNDS AND HERBICIDAL COMPOSITIONS THEREOF

William J. Hopwood, Sittingbourne, England, assignor to Shell Internationale Research Maatschappij B.V., Netherlands

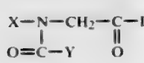
Continuation of Ser. No. 150,989, Feb. 1, 1988, abandoned. This application Jul. 5, 1990, Ser. No. 548,190

Claims priority, application United Kingdom, Feb. 27, 1987, 8704671

Int. Cl.[5] **A01N** *37/18;* **C07C** *255/50*

U.S. Cl. 71—100 **12 Claims**

1. Compound of the formula



(I)

in which

X represents a phenyl group substituted in the 2-position with a cyano group and optionally substituted in one or more of the 3-, 4-, 5-, or 6-positions, the optional substituents in the other positions being halogen, nitro, cyano, amino, mono- or di-(C_{1-4} alkyl) amino, C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} haloalkyl and a group of the formula MR^4 wherein M represents an oxygen or sulfur atom and R^4 represents a hydrogen atom, a C_{1-8} alkyl group, a C_{1-4} haloalkyl group or a phenyl group;

Y represents a phenyl group, optionally substituted with up to 3 moieties selected from the group consisting of halogen, nitro, cyano, amino, mono- or di-(C_{1-4} alkyl) amino, C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} haloalkyl, and a group of the formula MR^4 wherein M represents an oxygen or sulfur atom and R^4 represents a hydrogen atom, a C_{1-8} alkyl group, a C_{1-4} haloalkyl group or a phenyl group;

L represents an oxygen or sulfur atom; and

Z represents a hydrogen atom or a C_{1-6} alkyl group optionally substituted with halogen, cyano, amino, mono- or di(C_{1-4} alkyl) amino, C_{1-4} haloalkyl, or a group selected from the formulae MR^4 and $(CO)GR^4$ wherein G represents an oxygen or sulfur atom and M and R^4 are as defined above, or Z is additionally C_{3-8} cycloalkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, phenyl or phenyl-C_{1-4} alkyl group; and

or an amine or alkali metal salt thereof.

5,110,349

CUTTING INSERT OF SINTERED HARD ALLOY

Kenneth Westergren, Hägersten; Gerold Weinl, Alvsjö, and Rolf Oskarsson, Rönninge, all of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed Nov. 14, 1990, Ser. No. 612,852

Claims priority, application Sweden, Nov. 15, 1989, 8903835

Int. Cl.[5] **C22C** *29/12, 29/16;* **B22F** *3/12*

U.S. Cl. 75—233 **12 Claims**



1. A sintered cutting insert of a material comprising at least 50% by volume of at least one hard phase selected from the group consisting of carbides, nitrides, oxides and mixtures thereof of at least one metal selected from the group consisting of the group IVb, Vb and VIb elements of the periodic table, and a binder phase comprising at least one element selected from the group consisting of Co, Ni and Fe, wherein a pressbody of said material is produced by nonuniformly compacting a mixture of the metal hard phase and the binder phase so that the working edges of the cutting insert after compacting the material but prior to sintering the material have a higher relative density than surrounding material and sintering the pressbody.

5,110,350

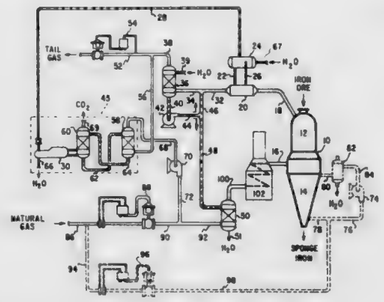
METHOD OF REDUCING IRON ORE

Juan A. Villarreal-Trevino, San Nicolás de los Garza; Eugenio Zendejas-Martinez, and Enrique R. Martinez-Vera, both of Monterrey, all of Mexico, assignors to Hylsa S.A. de C.V., Monterrey, Mexico

Continuation-in-part of Ser. No. 191,702, May 9, 1988, Pat. No. 4,880,458, which is a continuation-in-part of Ser. No. 54,420, May 26, 1987, abandoned, which is a continuation of Ser. No. 752,974, Jul. 8, 1985, Pat. No. 4,668,284, which is a continuation of Ser. No. 494,629, May 16, 1983, Pat. No. 4,528,030. This application Nov. 14, 1989, Ser. No. 436,307

Int. Cl.[5] **C21B** *13/02*

U.S. Cl. 75—495 **21 Claims**



1. A method for the gaseous reduction of particulate iron ore to sponge iron, comprising:

providing a vertical shaft moving bed reactor having at least a reduction zone;

feeding to said reduction zone a hot stream of reducing gas largely composed of hydrogen, carbon monoxide, and including hydrocarbon(s) and water;

causing said hot reducing gas stream to flow through at least a portion of said bed to reduce the ore in said reactor to sponge iron while also giving water and CO_2 as reduction reaction products and yet also to produce H_2 and CO from at least said hydrocarbon(s), and resulting in a partially spent reducing gas as a hot off-gas stream;

withdrawing said off-gas stream from said reactor and causing at least a major portion of such off-gas stream to circulate at least a major portion of such off-gas stream to circulate in a recycle loop returning to said reduction zone, which recycle loop comprises said reduction zone, a cooler/dewaterer & a CO_2 absorber, and a humidifier & a heater;

cooling said off-gas stream circulating in said recycle loop sufficiently to condense the water present as water vapor in said hot off-gas stream and removing from said recycle loop at least condensed water to form a hot liquid-water stream thereby dewatering and removing both the latent heat of the condensed watering addition to the sensible heat from such off-gas stream;

also removing CO_2 from such off-gas stream to give an upgraded reducing gas stream in said recycle loop;

feeding to said upgraded reducing gas stream in said recycle loop added hydrocarbon(s) and added water in at least one stream which serve as make-up source(s) for the reducing gas;

heating at least the upgraded reducing gas stream in said recycle loop and feeding such upgraded reducing gas stream mixed with said added hydrocarbon(s) and said added water to said reduction zone via said recycle loop as said hot reducing gas stream;

said added water being fed hot in liquid or vapor form into the upgraded reducing gas stream, most of the elevated temperature of such added water being derived from both the sensible heat of the hot off-gas stream and the latent heat of the water condensed from the off-gas stream; and

the H_2 and CO present in said reactor and said recycle loop being generated therein essentially from said hydrocarbon(s) catalyzed by the sponge iron internally within the reactor without using any external catalytic reformer.

5,110,351

METHOD OF PROMOTING THE DECARBURIZATION REACTION IN A VACUUM REFINING FURNACE

Phillip B. Hunter, Westmoreland County, Pa.; Chang-Long Chou, Tainan, and Muh-Shuh Wang, Taichung, both of Taiwan, assignors to USX Corporation, Pittsburgh, Pa.

Filed Jan. 10, 1991, Ser. No. 639,619

Int. Cl.[5] **B22D** *27/20;* **C22C** *7/10*

U.S. Cl. 75—508 **12 Claims**

1. A method of decarburizing a molten steel bath to an ultra low level of less than 0.005% carbon, the molten steel bath containing a relatively low level of dissolved oxygen of less than about 500 ppm, said decarburization taking place in a vessel under vacuum, and method comprising:

determining the dissolved oxygen increment required for addition to the bath to achieve an aim final carbon content based on the initial carbon content and the initial oxygen content of the bath;

calculating an amount of manganese ore to be added to the bath, said manganese ore having as a major constituent manganese dioxide (MnO_2) and having a predetermined oxygen recovery ratio, said amount being calculated based on the oxygen recovery ratio to provide at least the required dissolved oxygen increment;

adding said calculated amount of manganese ore to said bath; and

placing said ore and said bath under a vacuum condition for a predetermined period of time, said predetermined period of time being sufficient for supply of the required oxygen increment to the bath by decomposition of the manganese ore and for the reaction of the oxygen from the ore with the carbon in the bath to lower the carbon content of the bath.

5,110,352

METHOD OF PRODUCING ALUMINUM MATERIAL FOR USE AS ELECTRONIC MATERIAL

Kazuo Toyoda, and Masao Maeda, both of Osaka, Japan, assignors to Showa Aluminum Corporation, Osaka, Japan

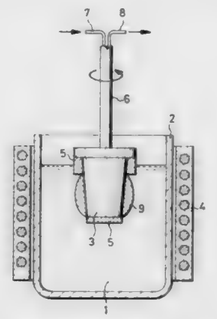
Filed May 24, 1991, Ser. No. 705,422

Claims priority, application Japan, May 28, 1990, 2-137977

Int. Cl.[5] **C22B** *21/06*

U.S. Cl. 75—679 **2 Claims**

1. A method of producing an aluminum material for use as an electronic material comprising the steps of melting aluminum inevitably containing U and Th to obtain molten aluminum, holding the molten aluminum heated at a temperature above the solidification temperature thereof, and immersing a hollow rotary cooling member in the molten aluminum and rotating the cooling member in the molten aluminum while maintaining the surface of the cooling member at a temperature lower than the solidification temperature by supplying a cooling fluid to the interior of the cooling member to cause aluminum to crystallize out on the surface of the cooling member with reduced U and Th contents.



5,110,353

PROCESS FOR THE RECOVERY AND SEPARATION OF ARSENIC FROM ANTIMONY

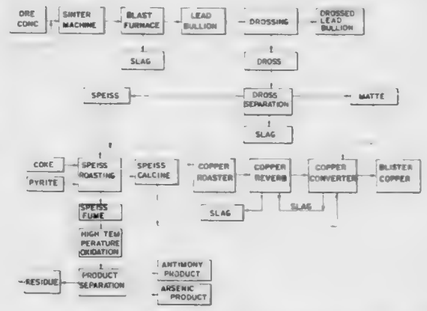
Taie Li, Salt Lake City, Utah; Thomas P. Clement, II, Perrysburg, Ohio, and John P. Hager, Golden, Colo., assignors to ASARCO Incorporated, New York, N.Y.

Continuation of Ser. No. 437,317, Nov. 17, 1989, abandoned, which is a continuation of Ser. No. 253,468, Oct. 5, 1988, abandoned, which is a continuation of Ser. No. 089,112, Aug. 25, 1987, Pat. No. 4,808,221. This application Jan. 29, 1991, Ser. No. 648,322

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[5] **C22B** *30/02*

U.S. Cl. 75—703 **5 Claims**



1. A process for enhancing the volatilization and separation of antimony from an antimony bearing material which does not contain arsenic comprising heating the antimony bearing material at an elevated temperature in an atmosphere containing arsenic to form a fume.

5,110,354

CLOSED LOOP COPPER CELL EXTRACTION PROCESS

Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434, and Robert R. Swinney, 1255 Jones St., Reno, Nev. 89503

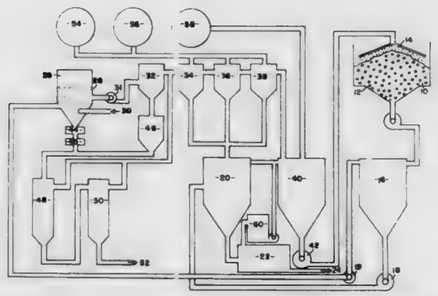
Filed Apr. 19, 1991, Ser. No. 687,494

Int. Cl.[5] **B01D** *11/00;* **C22B** *15/08*

U.S. Cl. 75—726 **4 Claims**

1. A process for obtaining copper precipitate from copper bearing ores comprising; a leach pad, a lixivial solution, means

to deliver and distribute said lixivial solution to said leach pad, a solid-solution separator, said separator separating the pregnant solution resulting from said leach pad into at least first and second parts, said first part being a pregnant solution, a scrubber, means to deliver said second part from said solid-solution separator to said scrubber, a decanter centrifuge, means to deliver said second part from said scrubber to said decanter centrifuge, said decanter centrifuge producing at least first and second parts, said first part being a pregnant solution, a sludge pond, means to deliver said second part from said decanter centrifuge to said sludge pond, a copper precipitator, means to deliver said first part from said solid-solution separator to said copper precipitator, said copper precipitator containing iron, said copper precipitator having a source of compressed air, said copper precipitator producing at least first and second parts, said first part being a barren solution, said second part being a mixture of at least copper and iron, a collector, means to deliver said last named second part to said collector, a magnetic separator, means to deliver last named second part to said magnetic separator, said magnetic separator producing at least first and second parts, said last named first part being magnetic, said last named second part being non-magnetic, means to remove said last named first part from said magnetic separator, a first hydro-cyclone, means to deliver said last named second part to said first hydro-cyclone, a second hydro-cyclone, said first and second hydro-cyclones producing at least first and second parts, said last named first part being a barren solution, means to deliver said last named second part



from said first hydro-cyclone to said second hydro-cyclone, an inert dryer, means to deliver said last named second part from said second hydro-cyclone to said inert dryer, a micro copper collector, means to deliver said first part from said copper precipitator to said micro copper collector, said micro copper collector producing at least first and second parts, said last named first part being a barren solution, a micro copper holding tank, means to deliver said last named second part from said micro copper collector to said micro copper holding tank, means to deliver last named second part from said micro copper holding tank to said first hydro-cyclone, a first iron salt precipitator, means to deliver said last named first part from said micro copper collector to said first iron salt precipitator, means to deliver said first parts from said first and second hydro-cyclones to said first iron salt precipitator, said first iron salt precipitator producing at least first and second parts, said last named first part being a barren solution, a second iron salt precipitator, means to deliver said last named first part from said first iron salt precipitator to said second iron salt precipitator, said second iron salt precipitator producing at least first and second parts, said last named first part being a barren solution, a third iron salt precipitator, means to deliver said last named first part from said second iron salt precipitator to said third iron salt precipitator, said third iron salt precipitator producing at least first and second parts, said last named first part being a barren solution, an acid make-up tank, means to deliver said last named first part from said third iron salt precipitator to said acid make-up tank, means to deliver output from said acid make-up tank to said means to deliver and distribute said lixivial solution, means to deliver said second parts from said first, second and third iron salt precipitators to said scrubber, a first and second chemical solution, a first and second chemical solution storage tank, means to deliver said chemical solutions from said storage tanks to said first, second and third iron salt precipitators, an acid, an acid storage tank, means to deliver said acid from said acid storage tank to said acid make-up tank, make-up water, means to deliver said make-up water into said process, a holding tank, means to deliver said first part from said decanter centrifuge to said holding tank, and means to deliver said last named first part from said holding tank to said acid make-up tank.

5,110,355

PROCESS FOR PREPARING NONCONDUCTIVE SUBSTRATES

Phillip Pendleton, Cheshire, Conn., assignor to Olin Hunt Sub III Corp., Cheshire, Conn.

Division of Ser. No. 499,229, Mar. 26, 1990. This application Mar. 4, 1991, Ser. No. 663,344
Int. Cl.[5] C23C *18/24, 18/28*
U.S. Cl. 106—1.11 **6 Claims**

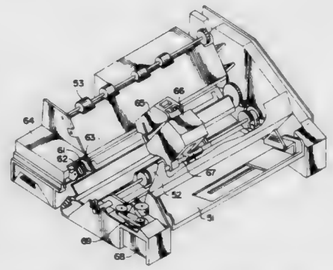
1. A neutralizer/conditions solution comprising water, at least one neutral or acidic reducing agent and at least one polyelectrolyte polymer conditioner; said reducing agent constituting 1.0% to 2.5% by weight of said solution and said polyelectrolyte polymer conditioner constituting 0.01% to 0.2% by weight of said solution.

5,110,356

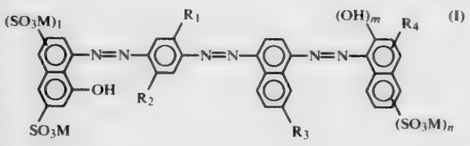
INK, AND RECORDING PROCESS USING THE SAME

Katsuhiro Shirota, Kawasaki; Tsuyoshi Eida, Yokohama; Megumi Saito, Kawasaki, and Takao Yamamoto, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 473,060, Jan. 31, 1990, abandoned. This application Aug. 21, 1991, Ser. No. 752,206
Claims priority, application Japan, Feb. 2, 1989, 1-22485
Int. Cl.[5] C09D *11/00*
U.S. Cl. 106—22 **3 Claims**

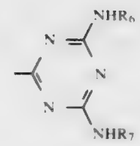


1. An ink comprising a dye and a liquid medium, wherein said dye is a dye of Formula (I):



(I)

wherein R_1 and R_2 represent independently an alkyl group, an alkoxy group or an acetylamino group; R_3 represents $-SO_3M$ or a hydrogen atom; R_4 represents a hydrogen atom, $-SO_3M$ or $-NHR_5$, where R_5 represents a hydrogen atom, a phenyl group that may have a substituent, or a group of the formula



where R_6 and R_7 represent independently a hydrogen atom or $-C_2H_4OH$; M represents an alkali metal, an ammonium group or an organic ammonium group; and l, m and n represent independently an integer of 0 or 1, wherein said dye is contained in an amount ranging from 0.1 to 15% by weight based on the total weight of the ink, and wherein said liquid medium comprises a water-soluble organic solvent and water.

5,110,357

NONSILICA MOLD MATERIAL FOR DENTAL TITANIUM CAST

Akira Kuwano, Tokyo, and Yoshimasa Kidowaki, Osaka, both of Japan, assignors to Iwatani Sangyo Kabushiki Kaisha (Iwatani International Corp.), Osaka, Japan

Filed Aug. 3, 1990, Ser. No. 562,662
Claims priority, application Japan, Dec. 19, 1989, 1-329207
Int. Cl.[5] C09K *3/00*; **C04B** *35/00*; **C03C** *10/00, 10/16*
U.S. Cl. 106—35 **8 Claims**

1. A nonsilica mold material for a dental titanium case consisting essentially of:

a major amount of alumina and zirconia and a minor amount of magnesia and phosphate sufficient to act as a binder for the alumina and zirconia up to 5% boron trioxide as an optional binder ingredient.

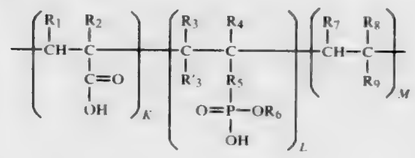
5,110,358

COMPATIBILITY AGENT FOR AQUEOUS POLYPIGMENTARY SUSPENSIONS CONTAINING HYDRATED CALCIUM SULFATE

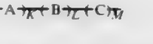
Jacques Mongoin, Champagne Au Mont D'OR; Georges Ravet, Saint Genis les Ollieres, and Jean-Marc Suau, La Duchere Plateau, all of France, assignors to Coatex S.A., Caluire, France

Division of Ser. No. 418,869, Oct. 10, 1989. This application Nov. 29, 1990, Ser. No. 619,435
Claims priority, application France, Oct. 10, 1990, 88 13511
Int. Cl.[5] C09C *3/10, 1/02*
U.S. Cl. 106—462 **5 Claims**

1. An aqueous pigmentary suspension, comprising hydrated calcium sulfate and a copolymer having the formula (I):



symbolized by the formula:



wherein (B) is an ethylene unit having a phosphate or phosphonate group, (A) is an ethylene unit having a carboxylic acid group, and (C) is an ethylene unit which may have an ester group, and wherein L is a value such that the amount of (B) is between 5 and 95 parts by weight, based on the total amount of (A), (B), and (C), one of K and M may be 0 and the sum of K, L, and M equals 100 parts by weight;

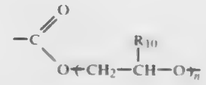
wherein R_1 is one member selected from the group consisting of hydrogen and a carboxylic acid group which may be esterified with a C_1 to C_{12} alkyl group;

R_2 is one member selected from the group consisting of hydrogen and C_1–C_{12} alkyl;

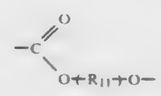
R_3 and R'_3 are each, independently, one member selected from the group consisting of hydrogen, a carboxylic acid group, halogen, C_1–C_{12} alkyl, and substituted or unsubstituted aryl;

R_4 is one member selected from the group consisting of hydrogen, C_1–C_{12} alkyl, substituted or unsubstituted aryl, and a carboxylic acid group which may be esterified with a C_1–C_{12} alkyl group;

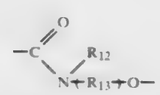
R_5 is one member selected from the group consisting of an ester group, a substituted amide, oxygen, C_1–C_{12} alkylene, substituted or unsubstituted arylene, substituted or unsubstituted cycloalkylene, substituted or unsubstituted cycloalkenylene and substituted or unsubstituted aralkylene, an ethylene or propylene oxide carboxylic ester of the formula:



in which R_{10} is hydrogen or methyl and n has a value of between 1 and 50, an alkyl, aryl, or aralkyl carboxylic ester of the formula:



wherein R_{11} contains 1 to 12 carbon atoms, and a substituted amide of the formula:



wherein R_{12} is hydrogen, C_1–C_{12} alkyl, substituted or unsubstituted aryl, or aralkyl, and R_{13} is C_1–C_{12} alkylene, substituted or unsubstituted arylene, substituted or unsubstituted cycloalkylene, substituted or unsubstituted cycloalkenylene, or substituted or unsubstituted aralkylene;

R_6 is one member selected from the group consisting of hydrogen, a cation, an amine, C_1–C_3 alkyl, substituted or unsubstituted aryl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted cycloalkenyl, substituted or unsubstituted aralkyl, a C_1–C_{12} ester, and a substituted amide;

R_7 is one member selected from the group consisting of hydrogen, a carboxylic acid group, a C_1–C_{12} ester, C_1–C_{12} alkyl, aryl, cycloalkyl, cycloalkenyl, and aralkyl;

R_8 is one member selected from the group consisting of hydrogen, a carboxylic acid group, C_1–C_3 alkyl, and halogen; and

R_9 is one member selected from the group consisting of a C_1–C_{12} ester, substituted or unsubstituted amide, C_1–C_{12} alkyl, cycloalkyl, cycloalkenyl, aryl, aralkyl, halogen, $-CO_2H$, and a sulfonated or sulfated alkyl or aryl group.

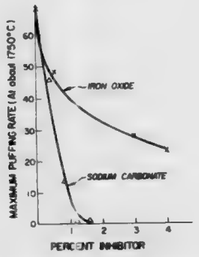
5,110,359
TREATMENT OF PETROLEUM COKES TO INHIBIT COKE PUFFING

Thomas H. Orac, Strongsville; Herbert C. Quandt, Lakewood, and David R. Ball, Bay Village, all of Ohio, assignors to Ucar Carbon Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 379,272, Jul. 13, 1989, abandoned, which is a division of Ser. No. 164,749, Mar. 7, 1988, Pat. No. 4,875,979. This application Dec. 10, 1990, Ser. No. 624,475

Int. Cl.[5] C09C *1/44*

U.S. Cl. 106—473 4 Claims



1. A carbonaceous filler for use in the production of electrodes consisting essentially of discrete particles of petroleum coke excluding a binder, said particles having a sulfur content in excess of 0.3% by weight and having a puffing inhibiting agent distributed throughout the mass of said particles, said puffing inhibiting agent comprising a sodium-containing or potassium-containing deposit distributed throughout the mass of said particles and wherein the average amount of sodium or potassium in said petroleum coke particles being greater than about 0.15 percent by weight and said puffing inhibiting agent having been reacted with the particles of petroleum coke at a temperature below the temperature at which said particles of petroleum coke would begin to puff in the absence of said puffing inhibiting agent.

5,110,360
PRODUCT CAPABLE OF INHIBITING THE CORROSION OF THE REINFORCEMENTS PRESENT IN CONCRETE OR CEMENT MORTAR AND RELATED PROCESS

Giuseppe Bruzzone, Varazze; Diego Perrone, Cogoleto, and Alessandro Sperati, Cernusco sul Naviglio, all of Italy, assignors to Luigi Stoppani S.p.A., Milan, Italy

PCT No. PCT/IT89/00019, § 371 Date Jan. 4, 1991, § 102(e) Date Jan. 4, 1991, PCT Pub. No. WO90/00635, PCT Pub. Date Jan. 25, 1990

PCT Filed Mar. 16, 1989, Ser. No. 613,821

Claims priority, application Italy, Jul. 5, 1988, 21230 A/88

Int. Cl.[5] C04B *22/08;* E04C *5/01;* C23F *11/00*

U.S. Cl. 106—638 8 Claims

1. A process to reduce the corrosion of the reinforcements contained in concrete or cement mortar, comprising the step of:

adding exhausted chromite earths derived from the production of chromates to said mortar in quantities from 1 to 10 parts by weight for 100 parts of cement.

5,110,361
MAGNESIUM OXYCHLORIDE CEMENT COMPOSITIONS AND METHODS FOR MANUFACTURE AND USE

Russell I. Alley, and George E. Caine, both of Salt Lake City, Utah, assignors to CAC, Inc., Salt Lake City, Utah

Continuation of Ser. No. 267,443, Nov. 4, 1988, Pat. No. 5,004,505. This application Apr. 1, 1991, Ser. No. 678,602

Int. Cl.[5] C04B *9/02*

U.S. Cl. 106—685 29 Claims

1. A method for repairing damaged concrete surfaces comprising the steps of:

(a) mixing magnesium oxide with a magnesium chloride solution having a specific gravity in the range from about 20° Baumé to about 30° Baumé such that the resulting mixture has a ratio by weight of magnesium oxide to magnesium chloride solution in the range from about 1:2 to about 2:1;

(b) adding acid to the mixture of step (a) such that the weight percentage of acid in the resulting cement composition is in the range from about 1% to about 10% of the magnesium chloride solution by weight;

(c) combining the cement composition of step (b) with a combination of differently sized aggregate particles selected to minimize voids and interstitial spaces between said aggregate particles, thereby forming a dense material product, wherein the ratio of magnesium oxide to aggregate particles is in the range from about 1:2 to about 1:5; and

(d) applying the product of step (c) to a damaged concrete surface in a manner such that the concrete surface is repaired.

5,110,362
CEMENT COMPOSITIONS

John T. Hoarty, 1 Barn Lane, Golborne, nr Warrington WA3 3NR; Leslie Hodgkinson, 10 Lindi Avenue, Grappenhall, Warrington WA4 2SJ, and Michael J. Waddicor, Beechcroft, St. Matthews Close, Appleton, Warrington WA4 5DE, all of England

Filed Mar. 12, 1990, Ser. No. 491,704

Continuation of PCT/GB89/00496, May 10, 1989.

Claims priority, application United Kingdom, May 11, 1988, 8811171

Int. Cl.[5] C04B *7/13*

U.S. Cl. 106—708 2 Claims

1. In a cement composition comprising cement and greater than 0 and up to 65% by weight of pulverised fuel ash having a range of loss on ignition of about 1.5% to about [6%] 12% by weight, the improvement which comprises adding an air entraining effective amount of an air entrainment agent selected from the group consisting of water soluble C9/C10 fatty acids salts, abietic acid salts, ether sulphates, alkyl sulphonates, alkyl aryl sulphonates and amine oxide salts together with an effective amount of sodium or potassium octanoate, the octanoate being present in an amount sufficient to stabilize entrained air and lower the rate of air loss.

5,110,363
COMPOSITION, AND METHOD FOR THE CLARIFICATION OF SUGAR-BEARING JUICES, AND RELATED PRODUCTS

Stephen J. Clarke, Baton Rouge, and Joy Bourgeois, Napoleonville, both of La., assignors to The Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Filed Jan. 17, 1991, Ser. No. 642,438

Int. Cl.[5] C13D *3/02, 3/12*

U.S. Cl. 127—46.1 10 Claims

1. An analytical method for the clarification of raw sugar cane juice, and related products, for determination of the sugar content thereof, which comprises

mixing with said raw sugar cane juice, or related product, a dry, stable, powdered admixture of

A) aluminum chloride hydride,

B) lime, and

C) activated bentonite, and bentonite containing calcium aluminum silicate

in amount to form a precipitate, without dilution of said raw sugar cane juice, or related product, and

separating from the precipitate a clarified juice suitable for the direct analysis of its original sugar content.

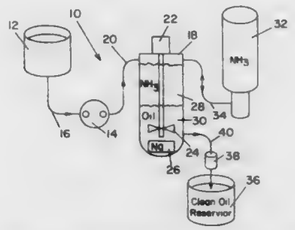
5,110,364
PROCESSES FOR DECONTAMINATING POLLUTED SUBSTRATES

Duane J. Mazur, Amherst; Norman L. Weinberg, E. Amherst, both of N.Y., and Albert E. Abel, Columbus, Ohio, assignors to A.L. Sandpiper Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 31,701, Mar. 30, 1987, Pat. No. 4,853,040. This application Jul. 27, 1989, Ser. No. 385,799

Int. Cl.[5] C07C *7/48;* C02F *1/70*

U.S. Cl. 134—2 33 Claims



1. A process for decontaminating a substrate polluted with a toxic substance, which comprises the steps of providing a solution comprising solvated electrons, and applying to said polluted substrate the solution in an amount sufficient to substantially decontaminate the substrate, said decontamination process being conducted in the presence of at least one substrate capable of competing with the selectivity of the reaction between the toxic substance and solvated electrons or stability of the solvated electrons.

5,110,365
CONTROL OF FURNACE CLEANING FOR REFLECTIVE ASH USING INFRARED IMAGING

Hudson R. Carter, Granville, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 3, 1990, Ser. No. 621,417

The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.

Int. Cl.[5] B08B *7/04, 9/00;* C21B *7/24;* G01J *1/14*

U.S. Cl. 134—18 15 Claims

1. A method for controlling periodic furnace wall cleaning by distinguishing between a clean condition for a furnace wall from an unclean condition for high reflectivity ash deposited on the furnace wall which has at least one area to be cleaned and a remaining uncleaned reference area, comprising the steps of:

taking a near infrared image of the furnace wall including the area to be cleaned and the uncleaned reference area;

measurings image intensity at a location on the area to be cleaned and establishing a signal indicative thereof;

measuring image intensity at a location on the uncleaned reference area and establishing a signal indicative thereof;

supplying the image intensity signals to a signal processor for determining a ratio between the image intensities of the area to be cleaned and reference area;

comparing the ratio of the image intensities with a selected value for distinguishing an unclean condition for the furnace wall from a clean condition; and

initiating furnace wall cleaning when the ratio reaches the selected value indicating the unclean condition of the furnace wall.

5,110,366
SPARGER SYSTEM FOR DISCHARGE OF BULK MATERIAL FROM HOPPER CARS

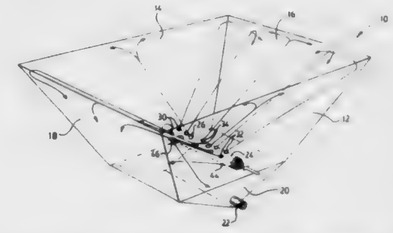
Colin R. McGregor, Oakville, Canada, assignor to Tenneco Canada Inc., Islington, Canada

Continuation-in-part of Ser. No. 205,726, Jun. 13, 1988, Pat. No. 5,002,615. This application Mar. 19, 1991, Ser. No. 671,474

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.

Int. Cl.[5] B01D *1/04;* B08B *3/02, 3/04, 9/00, 9/093*

U.S. Cl. 134—22.11 3 Claims



1. A method of removal of sodium chlorite from an enclosure having side walls upwardly and outwardly extending from lower sump means, end walls upwardly and outwardly extending from said lower sump means and joined to said side walls, and a top wall, which comprises: spraying water as fan-shaped jets from a plurality of orifices in a sparger pipe extending between said side walls, in the form of a corresponding plurality of sprays, each directed towards an extremity of said side walls adjacent to but not into the joint to said end walls, so that each said spray, after penetrating sodium chlorite in the enclosure, impacts the respective said wall, and flushes through the joint with the respective end wall partially across said respective end wall, and further including orifices from which fan-shaped jets of water are sprayed towards said walls adjacent the mid-portion of the width thereof adjacent an upper portion thereof and from which water is sprayed towards said side walls adjacent the mid-portion of the width thereof adjacent an upper portion thereof, and further including orifices from which water is sprayed towards said top wall adjacent the joint with said end walls, and further includes a pair of orifices from which water is sprayed into said sump, and discharging a fluid mixture of sodium chlorite formed in said sump as a result of said spraying step from said sump.

5,110,367
METHOD FOR PRECISION CLEANING OF MEDICAL DEVICES

E. Wayne Ahlstrom, Manchester, Mo., assignor to Mallinckrodt Specialty Chemicals Company, St. Louis, Mo.

Continuation of Ser. No. 507,810, Apr. 12, 1990, abandoned. This application May 15, 1991, Ser. No. 701,642

Int. Cl.[5] B08B *3/08*

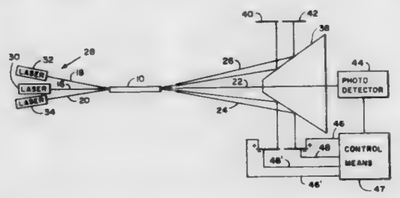
U.S. Cl. 134—42 27 Claims

1. A method for precision cleaning of medical devices comprising contacting a medical device which comes into contact with life supporting fluids with a cleansing agent comprising choline, so as to depyrogenate said medical device.

5,110,368
DEVICE FOR SPATIALLY TRANSMITTING A PLURALITY OF SIGNALS OVER A FIBEROPTIC MONOFILAMENT

William F. Otto, Huntsville; Miles E. Holloman, Decatur, and Debbee J. Jordan, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 10, 1990, Ser. No. 580,011
Int. Cl.[5] H01I *31/052;* **G02B** *27/00*
U.S. Cl. 136—246 **10 Claims**



1. A device for transmitting a plurality of spatially separate laser beams over a single fiberoptic monofilament and, for conveying said plurality of signals, comprising:

(a) laser means for generating a plurality of spatially separate laser beams;

(b) means for inputting a signal into at least one of said laser beams;

(c) a fiberoptic glass monofilament having a glass core with a predetermined refractive index and a cladding layer having a different refractive index, having a receiving end and exiting end for receiving and conveying a plurality of laser beams;

(d) means for directing each of said spatially separate laser beams into said receiving end of said monofilament, at an angle to the longitudinal axis of said monofilament, each of which differs from the angle of each of the other laser beams whereby each of said laser beams exits from exiting end of said monofilament in a conical annulus having the same angle as the angle said laser beam was directed into the receiving end of said monofilament; and

(e) means spaced from each other for intersecting each of said annuli for extracting energy contained therein.

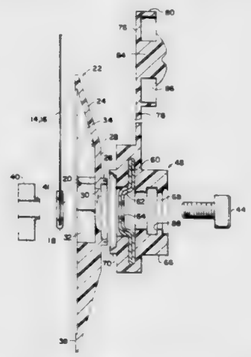
9. A transmitting device as set forth in claim **1**, wherein said spaced means for intersecting said annuli comprises two rows of a plurality of photovoltaic cells.

5,110,369
CABLE INTERCONNECTIONS FOR SOLAR CELL MODULES

Eric Tornstrom, Acton, Mass., and Anthony J. Norbedo, Gaithersberg, Md., assignors to Mobil Solar Energy Corporation, Billerica, Mass.

Filed Oct. 24, 1990, Ser. No. 603,886
Int. Cl.[5] H01L *31/05*
U.S. Cl. 136—251 **20 Claims**

1. In combination with a photovoltaic solar cell device having a rear wall and a conductive terminal strip protruding from said rear wall and having a hole therein, a member made of an insulating material secured to said rear wall, said member having an aperture and being positioned so that said hole in said terminal strip extends across said aperture, and a nut capturing said strip to said member so as to provide an electrical connection with said strip, said nut having a threaded hole accessible through said aperture to receive a threaded hole

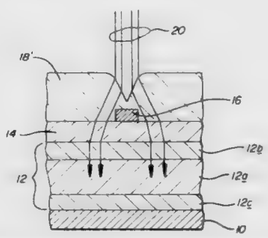


accessible through said aperture to receive a threaded fastener for securing said strip to an electrical cable.

5,110,370
PHOTOVOLTAIC DEVICE WITH DECREASED GRIDLINE SHADING AND METHOD FOR ITS MANUFACTURE

Craig Vogeli, New Baltimore, and Prem Nath, Rochester Hills, both of Mich., assignors to United Solar Systems Corporation, Troy, Mich.

Filed Sep. 20, 1990, Ser. No. 585,661
Int. Cl.[5] H01L *31/052, 31/18*
U.S. Cl. 136—256 **18 Claims**



16. A photovoltaic cell having decreased shading, said cell comprising:

a layer of bottom electrode material;

a photovoltaic body disposed upon said layer of bottom electrode material;

a layer of top electrode material disposed upon said photovoltaic body in a spaced apart relationship with said layer of bottom electrode material so that the photovoltaic body is sandwiched therebetween;

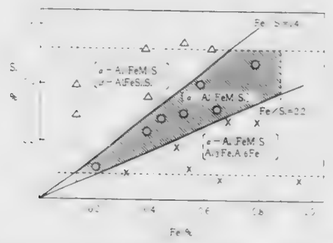
at least one electrically-conductive, current-collecting grid line associated in electrical communication with said top electrode; and

a layer of transparent, electrically insulating synthetic organic polymeric material disposed directly upon said top electrode material and said at least one grid line so as to cover the top electrode and the at least one gridline, said encapsulating layer having a groove formed integrally therein generally coextensive with the length of said current-collecting gridline, said groove operative to diffract incident light away from the underlying grid line so that said light illuminates adjacent portions of said photovoltaic cell, whereby shading effects caused by said grid line are minimized.

5,110,371
ALUMINUM ALLOYS FOR FORMING COLORED ANODIC OXIDE FILMS THEREON AND METHOD FOR PRODUCING A SHEET MATERIAL OF THE ALLOY

Takeshi Moriyama; Katsuji Ogawa; Fumio Ohtake, and Akito Nishizawa, all of Aichi, Japan, assignors to Nippon Light Metal Company, Ltd., Tokyo, Japan

Filed Jul. 9, 1991, Ser. No. 727,210
Claims priority, application Japan, Mar. 18, 1991, 3-077159
Int. Cl.[5] C22F *1/04;* **C22C** *21/02*
U.S. Cl. 148—691 **5 Claims**



5. A method for producing a sheet material of aluminum alloy consisting essentially of, by weight, from 0.08 to 0.50 percent silicon, from 0.15 to 0.90 percent iron, the weight ratio of iron to silicon being from 1.4 to 2.2, and the remainder aluminum, intermetallic compounds of α-type Al-Fe-Si system being uniformly contained in the alloy, comprising the steps of:

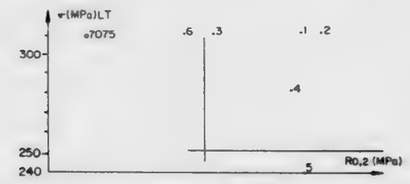
heating an ingot of the aluminum alloy to a temperature about 450° to 590° C. and maintaining it over one hour at a heated temperature; and

flattening the ingot by hot rolling and cold rolling.

5,110,372
METHOD OF OBTAINING AN ALUMINUM BASED ALLOY WITH HIGH YOUNG'S MODULUS AND HIGH MECHANICAL STRENGTH

Jean-François Faure, Voiron, France, assignor to Pechiney Recherche, Courbevoie, France

Division of Ser. No. 503,903, Apr. 4, 1990, Pat. No. 5,047,092.
This application Mar. 26, 1991, Ser. No. 674,922
Claims priority, application France, Apr. 5, 1989, 89 04700
Int. Cl.[5] C22F *1/00*
U.S. Cl. 148—552 **5 Claims**



1. A method of obtaining an aluminum based alloy composition, comprising the steps of:

a) forming by spray deposition, a solid body having a composition consisting essentially of, by weight, 5.5 to 8.45% Zn, 2 to 3.5% Mg, 0.5 to 2.5% Cu, 0.1 to 0.5% Zr, 0.3 to 0.6% Cr, 0.3 to 1.1% Mn, up to 0.5% Fe, up to 0.5% Si, other elements ≦0.05% each, up to 0.15% total, and balance Al;

b) converting said body to a worked product at 300° to 450° C.;

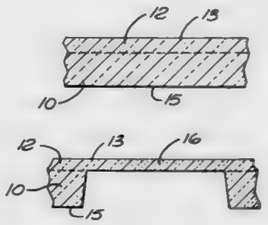
c) optionally, converting said worked product cold; and

d) heat treating said worked product comprising dissolution, quenching and annealing in a T6 or T7 state.

5,110,373
SILICON MEMBRANE WITH CONTROLLED STRESS

Philip E. Mauger, Santa Clara, Calif., assignor to Nanostructures, Inc., Mountain View, Calif.

Division of Ser. No. 243,816, Sep. 13, 1988, Pat. No. 4,966,663.
This application Aug. 9, 1990, Ser. No. 565,253
Int. Cl.[5] H01L *29/84*
U.S. Cl. 148—33.2 **3 Claims**



1. A stress-controlled silicon structure having a membrane comprising:

a silicon substrate with a first electrical conductivity type said substrate having first and second opposite surfaces;

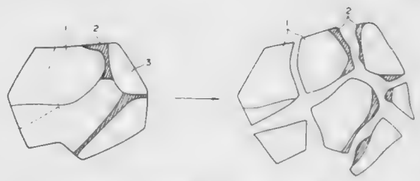
a doped layer adjacent to said first surface of said substrate having a dopant with a second electrical conductivity type, said doped layer having a non-uniform dopant concentration profile that varies as a function of lateral position on said first surface; and

an electrochemically etched portion of said second surface of said substrate etched to a boundary of said doped layer, thereby forming said membrane with a thickness approximately equal to the thickness of said doped layer, said membrane having a pattern of internal stress that varies in accordance with the dopant concentration profile.

5,110,374
RARE EARTH-IRON-BORON MAGNET POWDER AND PROCESS OF PRODUCING SAME

Takuo Takeshita; Ryoji Nakayama, and Tamotsu Ogawa, all of Omiya, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Division of Ser. No. 234,405, Aug. 19, 1988, Pat. No. 4,891,532.
This application Jun. 6, 1990, Ser. No. 534,185
Claims priority, application Japan, Aug. 19, 1987, 62-205944; Sep. 22, 1987, 62-238341; Feb. 29, 1988, 63-46309; Mar. 23, 1988, 63-68954; Jun. 28, 1988, 63-159758
Int. Cl.[5] H01F *1/02*
U.S. Cl. 148—101 **12 Claims**



1. A process of producing a rare earth-iron-boron alloy magnet powder comprising the steps of:

(a) preparing a rare earth-iron-boron alloy material,

(b) subsequently occluding hydrogen into said alloy material by holding said material at a temperature of 500° C. to 1000° C. in an atmosphere of a gas selected from the group consisting of hydrogen gas and a mixture of hydrogen and inert gases wherein the pressure of hydrogen in said atmosphere is no less than 10 torr;

(c) subsequently subjecting said alloy material to dehydrogenation at a temperature of 500° C. to 1000° C. until the

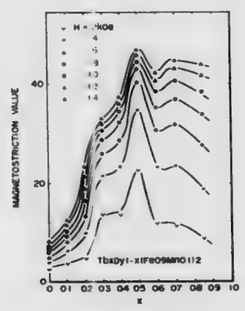
pressure of hydrogen in said atmosphere is decreased to no greater than 1×10^{-1} torr; and
(d) subsequently cooling said alloy material.

5,110,375
BATON METHOD OF HEAT TREATING EXPANDABLE
Kevin L. Parsons, 16 Wagon Wheel Dr., Appleton, Wis. 54915
Division of Ser. No. 587,488, Sep. 20, 1990, abandoned, which is a continuation of Ser. No. 255,078, Oct. 7, 1988, abandoned. This application Aug. 22, 1991, Ser. No. 748,669
Int. Cl.[5] C21D *1/00*
U.S. Cl. 148—534 **5 Claims**



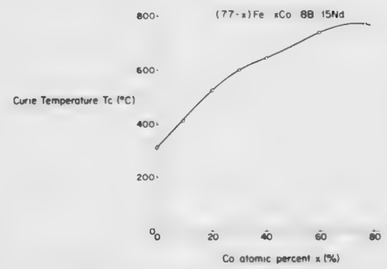
1. A method for manufacturing a expandable baton comprising steps of:
(a) forming heat treatable alloy steel into a main section and a telescoping section;
(b) annealing the main section and the telescoping section formed in step (a) by heat treating;
(c) after annealing the main section and the telescoping section in step (b), forming a portion of a joint on both the main and telescoping sections such that the joint portions on the main and telescoping sections form a complete joint when the baton is in an extended position;
(d) after forming the joint portions in step (c), hardening the main and telescoping sections by heat treating.

5,110,376
SUPER-MAGNETOSTRICTIVE ALLOY
Tadahiko Kobayashi; Yoichi Tokai, and Masashi Sahashi, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 412,291, Sep. 27, 1989. This application Mar. 18, 1991, Ser. No. 671,074
Claims priority, application Japan, Sep. 29, 1988, 63-242317; Aug. 18, 1989, 1-211423; Aug. 18, 1989, 1-211424
Int. Cl.[5] H01F *1/147*
U.S. Cl. 148—301 **7 Claims**



1. A super-magnetostrictive alloy having a structure intermetallic compound as the main phase, and having a composition whose atomic ratio is expressed by $(Tb_xDy_{1-x})(Fe_{1-y}M-n_y)_z$,
where $0.35\leqq x\leqq0.9$, $0.001\leqq y\leqq0.3$ and $1.4\leqq z\leqq2.1$.

5,110,377
PROCESS FOR PRODUCING PERMANENT MAGNETS AND PRODUCTS THEREOF
Hitoshi Yamamoto, Osaka; Masato Sagawa, Nagaokakyo; Setsuo Fujimura, Kyoto, and Yutaka Matsuura, Ibaraki, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan
Continuation of Ser. No. 239,381, Sep. 1, 1988, abandoned, which is a division of Ser. No. 85,226, Aug. 13, 1987, Pat. No. 4,826,546, which is a continuation of Ser. No. 706,399, Feb. 27, 1985, abandoned. This application May 14, 1990, Ser. No. 523,338
Claims priority, application Japan, Feb. 28, 1984, 59-36923; Feb. 28, 1984, 59-36924; Feb. 28, 1984, 59-36925; Feb. 28, 1984, 59-36926
Int. Cl.[5] H01F *1/053*
U.S. Cl. 148—302 **30 Claims**



1. A sintered magnetically anisotropic body having an energy product of at least 30 MGOe and a coercive force of more than 13 kOe that is the product of a process which comprises the steps of:
providing an anisotropic sintered body composed of, in atomic percentage, 13–18% R (provided that R is at least one rare earth element including Y and at least 50% of the entire R is Nd and/or Pr), 5–11% B, and the balance being at least 71% Fe,
subjecting the sintered body to a primary heat treatment at a temperature of 750°–1000° C. and below the sintering temperature at which the density of the body has been increased by sintering,
then cooling the resultant body to a temperature of no higher than 680° C. at a cooling rate of 3°–2000° C./min, and
further subjecting the thus cooled body to a secondary heat treatment of 480°–700° C. wherein the body has a coercive force greater than the anisotropic sintered body with the same composition which is in an as-sintered state or which has been subjected to a one-stage aging treatment.

5,110,378
METALLIC GLASSES HAVING A COMBINATION OF HIGH PERMEABILITY, LOW COERCIVITY, LOW AC CORE LOSS, LOW EXCITING POWER AND HIGH THERMAL STABILITY
Ryusuke Hasegawa, Morristown, and Gordon Fish, Lake Hiawatha, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Continuation of Ser. No. 235,725, Aug. 17, 1988, abandoned, which is a continuation of Ser. No. 65,099, Jun. 19, 1987, abandoned, which is a continuation of Ser. No. 825,963, Feb. 5, 1986, abandoned, which is a continuation of Ser. No. 594,507, Mar. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 497,391, May 23, 1983, Pat. No.
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—304 **9 Claims**

1. A metallic alloy having a dc coercivity ranging from about 0.6 to about 4.1 A/m and an ac core loss ranging from about 1.4 to about 5.9 mW/kg, at 60 Hz and 0.1 T, said alloy being substantially completely glassy and consisting of about 76 and about 78 atom percent iron, about 2 to about 5 atom percent of at least one of chromium and moiybdenum, about 14 to about 19 atom percent boron, about 3 to about 6 atom percent silicon, and 0 to about 1 atom percent carbon, plus impurities, the total of boron, silicon and carbon present ranging from about 18 to about 22 atom percent.

5,110,379
HIGH TEMPERATURE FINE-GRAINED STEEL PRODUCT
Charles W. Finkl, Evanston, Ill., assignor to A. Finkl & Sons Co., Chicago, Ill.
Filed Apr. 18, 1991, Ser. No. 687,260
Int. Cl.[5] C22C *38/00*
U.S. Cl. 148—333 **5 Claims**

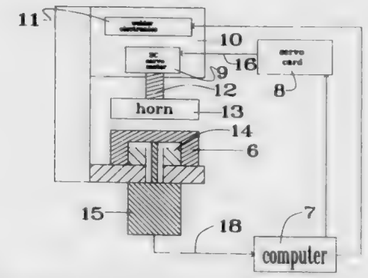
3. A hot work implement characterized by maintenance of a fine grain structure at elevated working temperatures, said implement consisting essentially of:
C from about 0.40 to about 0.45
Mn from about 0.65 to about 0.85
Si from about 0.30 to about 0.60
Ni from about 0.70 to about 0.90
Cr from about 2.35 to about 2.65
Mo from about 0.90 to about 1.10
V from about 0.02 to about 0.04
Al from about 0.015 to about 0.025
Cb from about 0.01 to about 0.1
N from about 75 ppm to about 150 ppm
balance Fe and usual impurities and residual elements in amounts insufficient to adversely affect the use properties of the implement.

5,110,380
DETONATING AN INSENSITIVE EXPLOSIVE
Kien-yin Lee, Los Alamos, and Carlyle B. Storm, Santa Fe, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Sep. 30, 1991, Ser. No. 767,603
Int. Cl.[5] C06G *25/34*
U.S. Cl. 149—92 **2 Claims**

2. A method for providing chemical energy comprised of detonating a composition comprised of 3-amino-5-nitro-1,2,4-triazole.

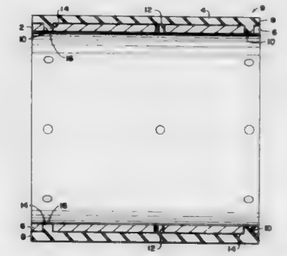
5,110,381
ULTRASONIC WELDING WITH CONTROLLED SEAL COMPRESSION
David P. Heckard, 61566 County Rd. 133, Elkhart, Ind. 46526, and Cameron B. Erekson, 23724 Cortland Dr., Elkhart, Ind. 46514
Filed Jun. 21, 1990, Ser. No. 541,551
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—64 **9 Claims**

1. A method for ultrasonic bonding comprising the steps of:
supporting a component to be bonded in a nest;
applying a first force to said component along a first axis relative to said component at a first time;
measuring a first displacement of a first portion of said component along said first axis at said first time;
releasing said force;
heating a second portion of said component by application of ultrasonic energy;
measuring a second displacement of said first portion of said component along said first axis during said application of said ultrasonic energy; and



discontinuing said heating so as to produce a substantially permanent displacement of said first portion of said component substantially equal to said first displacement.

5,110,382
METHOD FOR MAKING A ROLLER ASSEMBLY FOR GRAIN SHELLERS
Jimmy C. Terry, Spring, and John A. Mrosko, Katy, both of Tex., assignors to F. H. Maloney, Houston, Tex.
Division of Ser. No. 517,576, May 1, 1990. This application Oct. 23, 1990, Ser. No. 602,117
Int. Cl.[5] B32B *5/18*
U.S. Cl. 156—77 **9 Claims**



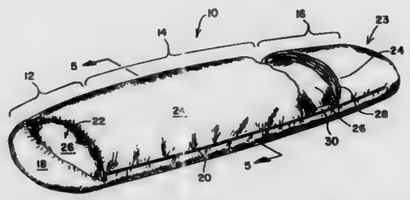
1. A method for making a roller assembly, the method comprising providing a round, tubular, rigid metal first sleeve, forming first and second apertures extending radially through said first sleeve, bonding a second sleeve to the entire exterior surface of said first sleeve with material of said second sleeve entering and filling said first apertures during said bonding, shielding said second apertures such that said material does not enter said second apertures during said bonding, and removing said shielding after said bonding, to provide a laminate sleeve assembly with parts of said second sleeve extending through said first sleeve to the interior surface of said first sleeve, and providing a mounting hub assembly comprising a circular wall having ribs extending from said wall and substantially normal thereto, sliding said sleeve assembly onto said ribs, providing locking plates adapted for connection to said wall and having recess means therein alignable with said sleeve assembly second apertures, locating pins in said locking plate recess means, disposing said locking plates such that said pins enter said sleeve assembly second apertures, and fixing said locking plates to said wall, whereby to connect said sleeve assembly to said mounting hub to form said roller assembly.

5,110,383

METHOD OF SLEEPING BAG CONSTRUCTION AND ARTICLES MADE THEREBY

Paul F. Kramer, Berkeley, Calif., assignor to Sierra Design, Inc., Berkeley, Calif.

Filed Nov. 3, 1989, Ser. No. 431,442
Int. Cl.[5] D60C *25/00*
U.S. Cl. 156—88 **15 Claims**



1. A method of manufacture of an insulated item having a shell at least partially surrounding a central volume, said shell being hollow and having opposing flexible inner and outer layers and including a fibrous insulating material in the interior volume formed between said inner and outer shell layers, in steps comprising:

a. forming a last member approximately in the shape of said central volume;

b. arraying a plurality of continuous fibers which form said fibrous insulating material into a swath and wrapping said swath about said last member so as to fully enclose said last member to a desired depth at each area of the surface of said last member so as to form an enclosing cocoon thereabout;

c. separating and edge stabilizing said continuous fibers along preselected separation lines on said cocoon;

d. removing said cocoon from said last member and inserting into a preformed shell member; and

e. attaching said preformed shell member to said cocoon along said separation lines and attaching at least some corresponding opposing points on said inner and outer shell layers to one another.

5,110,384

PROCESS FOR MAKING ELECTRICALLY CONDUCTIVE PATTERNS

Dietmar Dudek, Oberursel, Fed. Rep. of Germany, and Thomas Pfeiffer, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 17, 1990, Ser. No. 510,316
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 3913115
Int. Cl.[5] B05D *5/12*; C03B *29/00*
U.S. Cl. 156—89 **9 Claims**

1. A process for making an electrically conductive pattern on a substrate comprising:

(a) forming on the substrate a patterned adhesive layer that is at least temporarily tacky;

(b) applying a powder comprising metal to the patterned adhesive layer;

(c) applying to the metal-containing powder pattern a second powder comprising a supplementary element or a mixture of supplementary elements wherein the supplementary elements are selected from the group consisting of bismuth, cadmium, lead, copper, boron, rhodium, nickel, indium, aluminum, and silicon; and

(d) firing the patterned substrate at a temperature and time sufficient to remove the adhesive layer and sinter the powders.

5,110,385

METHOD FOR FORMING POLYMER COMPOSITE FILMS USING A REMOVABLE SUBSTRATE

Jeffrey D. Birdwell, Lake Jackson, and William P. Carl, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 739,936, May 31, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 143,209
The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.
Int. Cl.[5] B32B *31/00*; B29C *47/60*
U.S. Cl. 156—155 **16 Claims**

1. A method for forming polymer composite films using a removable substrate comprising:

(a) forming a first dispersion of a first perfluorinatedpolymer containing sites convertible to ion exchange groups and a dispersant having: a boiling point less than about 110° C.; a density of from about 1.55 to about 2.97 grams per cubic centimeter; and a solubility parameter of from greater than about 7.1 to about 8.2 hildebrands, wherein the perfluorinated polymer in the dispersion has a particle size of from about 0.01 micron to about 840 microns;

(b) depositing the first dispersion onto a first removable substrate;

(c) heating the first dispersion at a temperature sufficient to form an fuse a first polymer film;

(d) forming a second dispersion of a second perfluorinated polymer containing sits convertible to ion exchange groups and a second dispersant having: a boiling point less than about 110° C.; a density of from about 1.55 to about 2.97 grams per cubic centimeter; and a solubility parameter of from greater than about 7.1 to about 8.2 hildebrands, wherein the perfluorinated polymer in the dispersion has a particle size of from about 0.01 micron to about 840 micron;

(e) depositing the second dispersion onto the first film;

(f) heating the second dispersion for a time and at a temperature sufficient to form and fuse a second polymer film;

(g) bonding the first film to the second film; thereby forming a composite film; and

(h) removing the first substrate wherein the first and the second dispersants are independently represented by the general formula:

XCF_2-CYZX'

where:

X is selected from the group consisting of F, Cl, Br, and I;

X' is selected from the group consisting of Cl, Br, and I;

Y and Z are independently selected from the group consisting of H, F, Cl, Br, I and R';

R' is selected from the group of perfluoralkyl radicals and chloroperfluoralkyl radicals having from 1 to 6 carbon atoms.

5,110,386

METHOD OF FORMING PARTS OF PRODUCTS TO BE WORN

Mitsuzo Ochi, Ehime; Shoji Nakano, Kanonji, and Masashi Hosokawa, Kagawa, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan

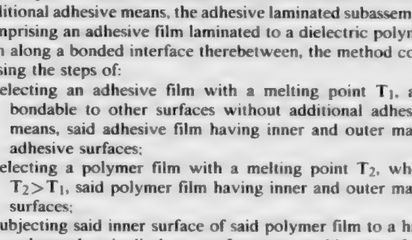
Filed Apr. 27, 1990, Ser. No. 515,126
Claims priority, application Japan, Apr. 29, 1989, 1-111698
Int. Cl.[5] B32B *31/08*; A61F *13/15*
U.S. Cl. 156—204 **4 Claims**

1. The method which comprises the sequence of

(a) subjecting an elongated continuous first web (**30**) having side edges (**31***a*, **31***b*) to cutting in a longitudinal direction along an alternating concave convex cutting line between said side edges to thereby form a first partial web (**30***a*) and second partial web (**30***b*) that each have a series of alternating convex edge portions (**33***b*) and a series of alternating concave edge portions (**33***a*),

(b) longitudinally offsetting said first and second partial webs (**30***a*, **30***b*) with respect to each other so said convex edge portions (**33***b*) at least partially overlay each other and said concave edge portions (**33***a*) are at least partially spaced apart from each other,

(c) providing a second web (**40**) having a main flat central section and two C-shaped side sections (**41**, **43**) that face each other,



(d) bonding the upper portions of said two C-shaped side sections (**41**, **43**) to said side edges (**31***a*, **31***b*) of said first web (**30**) while said convex edge portions (**33***b*) remain overlapped to thereby form a composite web, and then

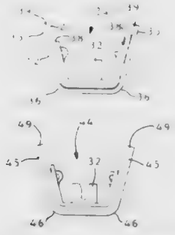
(e) spreading apart said first and second partial webs (**30***a*, **30***b*) through an arc of 180° so that the side edges (**31***a*, **31***b*) of said first web (**30**) are disposed inwardly of said concave and convex edge portions (**33***a*, **33***b*).

5,110,387

METHOD FOR LAMINATING POLYMER FILMS

John F. Jasinski, New Freedom; Robert P. McCormick; Ricky C. Mellinger, both of Seven Valleys, all of Pa.; James K. Draper, and Navin N. Vyas, both of Winston Salem, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 401,578, Aug. 24, 1989, abandoned, which is a continuation of Ser. No. 226,179, Jul. 29, 1988, abandoned. This application Feb. 19, 1991, Ser. No. 657,295
Int. Cl.[5] B32B *31/00*; B65C *9/25*
U.S. Cl. 156—222 **12 Claims**



1. A method for making a laminated assembly suitable for being substantially shaped and formed into an insulated electrical terminal having a U-shaped channel portion, the laminated assembly comprising an adhesive laminated subassembly having a major surface thereof bonded to a metal substrate without additional adhesive means, the adhesive laminated subassembly comprising an adhesive film laminated to a dielectric polymer film along a bonded interface therebetween, the method comprising the steps of:

selecting an adhesive film with a melting point T_1, and bondable to other surfaces without additional adhesive means, said adhesive film having inner and outer major adhesive surfaces;

selecting a polymer film with a melting point T_2, where $T_2 > T_1$, said polymer film having inner and outer major surfaces;

subjecting said inner surface of said polymer film to a high voltage electric discharge to form a treated inner surface;

heating said polymer film having said treated inner surface to a temperature greater than T_2,

aligning said adhesive surface and said inner treated polymer surface in opposed facing relationship, and

applying pressure to urge said films relatively together; and then

heating said pressed together films to a temperature greater than T_1, said adhesive film thereby adhering to said polymer film along a bonded interface to form said adhesive laminated subassembly, said adhesive film remaining adhesive along its outer major surface for bonding to a metal substrate without additional adhesive means and the bonded interface between said adhesive and said polymer films having enhanced bond strength; and

bonding a metal substrate along said outer major surface of said adhesive film to define a subsequent bonded interface thereby forming said laminated assembly, whereby

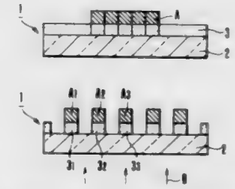
said laminated assembly is formable into said electrical terminal wherein sidewalls of said U-shaped channel portion extend outwardly at sharp bends from the plane of the laminated assembly, thus stressing both the bonded and subsequent bonded interfaces, the polymer film of the article so shaped and formed from the laminated assembly has enhanced resistance to delamination from said adhesive film, and the polymer film remains assuredly secured to the outer surfaces of the formed electrical terminal.

5,110,388

METHOD OF DICING AND BONDING SEMICONDUCTOR CHIPS USING A PHOTOCURABLE AND HEAT CURABLE ADHESIVE TAPE

Mikio Komiyama, Yokohama; Yasunao Miyazawa, Urawa; Kazuyoshi Ebe, Saitama, and Takanori Saito, Ohmiya, all of Japan, assignors to Lintec Corporation, Tokyo, Japan

Division of Ser. No. 380,548, Jul. 14, 1989. This application Feb. 8, 1991, Ser. No. 653,232
Claims priority, application Japan, Jul. 21, 1988, 63-183158
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—229 **8 Claims**



1. A method of using an adhesive tape comprising an energy beam transmittable base sheet having a surface tension of not more than 40 dyne/cm and an adhesive layer formed on one surface of said base sheet, said adhesive layer comprising:

(a) an acrylate or methacrylate polymer substantially free from C—C double bonds and having at least 50 mol % of units derived from at least one acrylate or methacrylate and a molecular weight of from about 40,000 to 1,500,000,

(b) an epoxy resin having an average of at lease 1.8 vicinal epoxy groups per molecule and an average molecular weight of from 100 to 10,000,

(c) a photopolymerizable low molecular weight compound having at least one C—C double bond and having a molecular weight of from 100 to 30,000,

(d) a heat activatable potential curing agent for said epoxy resin, and

(e) a photopolymerization initiator for said photopolymerizable low molecular weight compound,

wherein, based on 100 parts by weight of said acrylate or methacrylate polymer, from 100 to 2000 parts by weight of said epoxy resin is present in said adhesive layer,

said method comprising the steps of adhering a semiconduc-

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tor wafer to said adhesive tape, dicing said wafer into chips together with the adhesive layer of said adhesive tape, irradiating the adhesive layer of said tape with an energy beam, picking up the chips together with pieces of the diced adhesive layer adhered thereto from said base sheet, placing the chips on a lead frame so that the respective pieces of the adhesive layer may come in contact with said lead frame, and causing the pieces of the diced adhesive layer to again develop tackiness by heating, thereby securely mounting the chips on said lead frame.

7. A method of using an adhesive tape comprising an adhesive layer which comprises

(a) an acrylate or methacrylate polymer substantially free from C—C double bonds and having at least 50 mol % of units derived from at least one acrylate or methacrylate and a molecular weight of from about 40,000 to 1,500,000,

(b) an epoxy resin having an average of at least 1.8 vicinal epoxy groups per molecule and an average molecular weight of from 100 to 10,000,

(c) a photopolymerizable low molecular weight compound having at least one C--C double bond and having a molecular weight of from 100 to 30,000,

(d) a heat activatable potential curing agent for said epoxy resin, and

(e) a photopolymerization initiator for said photopolymerizable low molecular weight compound,

wherein, based on 100 parts by weight of said acrylate or methacrylate polymer, from 100 to 2000 parts by weight of said epoxy resin is present in said adhesive layer,

said method comprising the steps of adhering a semiconductor wafer to said adhesive tape formed on a release sheet, irradiating the adhesive layer with an energy beam, dicing said wafer into chips together with the adhesive layer, picking up the chips together with pieces of the diced adhesive layer adhered thereto from said release sheet, placing the chips together with pieces of the diced adhesive layer adhered thereto on a lead frame so that the respective pieces of the adhesive layer may come in contact with said lead frame, and causing the pieces of the diced adhesive layer to again develop tackiness by heating, thereby securely mounting the chips on said lead frame.

5,110,389

THERMOSENSITIVE IMAGE TRANSFER RECORDING MEDIUM

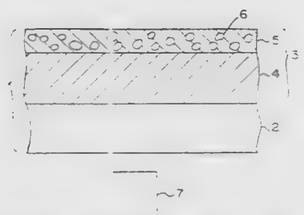
Yoshihiko Hiyoshi, Numazu; Youji Ide, Mishima; Masanaka Nagamoto, Susono, and Tetsuji Kunitake, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 334,572, Apr. 7, 1989, abandoned. This application May 28, 1991, Ser. No. 707,939

Claims priority, application Japan, Apr. 8, 1988, 63-86400

Int. Cl.[5] B41M *5/26*

U.S. Cl. 156—234 **12 Claims**



12. A multicolor thermosensitive image transfer recording method of obtaining multicolored images using a plurality of thermosensitive image transfer recording media comprising (a) a support, (b) a release layer, formed on said support, comprising a thermofusible material and (c) a thermofusible ink layer, formed on said release layer, comprising a thermofusible material, a coloring agent and a filler, with the difference between the refractive index of said filler and the refractive index of the thermofusible material of the ink layer being 0.15 or less, each recording medium having different colors, said method comprising the steps of:

successively bringing said thermofusible ink layer of each recording medium into contact with a receiving sheet; and

imagewise transferring said thermofusible ink layer successively with application of heat thereto to said receiving sheet.

5,110,390

METHOD OF MAKING A LAMINATE

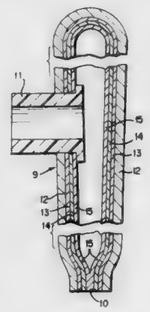
Francesco Martini, Rho, and Luigi Perazzo, Cuneo, both of Italy, assignors to W.R. Grace & Co.-Conn., Duncan, S.C.

Division of Ser. No. 342,595, Apr. 21, 1989, Pat. No. 4,906,495, which is a continuation of Ser. No. 136,679, Dec. 21, 1987, abandoned. This application Oct. 12, 1989, Ser. No. 420,449

Claims priority, application United Kingdom, Dec. 24, 1986, 8630963

Int. Cl.[5] B29B *47/06*

U.S. Cl. 156—244.11 **5 Claims**



1. A method of making a laminate comprising:

a) coextruding a film having

i) a first layer comprising an oxygen impermeable material, and

ii) a second layer comprising a melt-bondable ethylene copolymer;

b) adhering to the first layer of the coextruded film a water-disintegratable film; and

c) adhering a water insoluble layer on the side of the water-disintegratable film distant from the coextruded film.

5,110,391

METHOD AND APPARATUS FOR AUTOMATICALLY BONDING FILM TO A SUBSTRATE AND CUTTING THE FILM TO DESIRED SIZE

Hiroshi Taguchi, Tokyo, and Youji Washizaki, Saitama, both of Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Jul. 25, 1990, Ser. No. 557,036

Claims priority, application Japan, Dec. 31, 1989, 1-341300

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—250 **6 Claims**

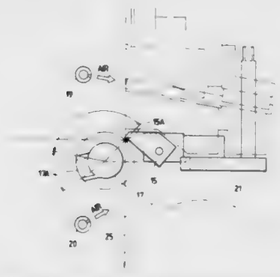
1. A method in which a continuous film is cut to a length which corresponds to that of a substrate, having a leading plate edge and being conveyed to a bonding position, said film being bonded to a film bonding surface of said substrate by a pressure bonding roller, said method comprising the steps of:

cutting a portion of the continuous film to have a leading edge that is substantially perpendicular to the direction of the feed of said film by a rotary cutter while keeping said film stationary and orienting said cutter with its cutting line perpendicular to said film feed direction in preparation for an initial bonding of the film onto the substrate;

bonding the leading edge of said continuous film to said bonding surface at the leading plate edge of said substrate;

bonding said continuous film further, under pressure, to said film bonding surface gradually from the leading edge of said film by said pressure bonding roller while additional amounts of said continuous film are fed in said film feed direction;

cutting said continuous film by said rotary cutter while said film is moving and orienting said cutter with its cutting



line oriented obliquely across said film feed direction at a prescribed angle thereto depending on the speed of the feed of said film and the circumferential velocity of a rotary knife of said cutter, so that said cut-off film has a trailing edge and the length of said cut-off film corresponds to that of said substrate; and

bonding said trailing edge of said cut-off film to that remaining portion of said film bonding surface of said substrate by said pressure bonding roller.

5,110,392

PRIMER COMPOSITION CONTAINING AN ORGANOMETALLIC COMPOUND FOR BINDING SUBSTRATES WITH A CYANOCRYLATE ADHESIVE

Kenji Ito, and Kaoru Kimura, both of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 219,815, Jul. 14, 1988, abandoned, which is a continuation of Ser. No. 899,800, Aug. 25, 1986, abandoned, which is a continuation of Ser. No. 611,691, May 18, 1984, abandoned. This application May 3, 1990, Ser. No. 518,657

Claims priority, application Japan, May 20, 1983, 58-87761; Dec. 5, 1983, 58-228323; Mar. 29, 1984, 59-59367

Int. Cl.[5] C09J *5/04*

U.S. Cl. 156—314 **12 Claims**

1. A process for bonding a polyolefin, polyfluoroolefin, polyethylene terephthalate, polyacetal, nylon or plasticizer-rich soft polyvinyl chloride substrate to a like substance or for bonding a polyolefin, polyfluoroolefin, polyethylene terephthalate, polyacetal, nylon or plasticizer-rich soft, polyvinyl chloride substrate to another substrate which comprises applying to the surface of at least one of the substrates to be bonded together an adhesion promoter composition consisting essentially of 90–99.999 wt. % organic solvent and 0.001–10 wt. % of at least one organometallic compound containing a metal selected from the group consisting of typical metals, applying a cyanoacrylate-based adhesive comprising an alpha-cyanoacrylate and bringing together the thus-treated surfaces of the substrates to be bonded.

5,110,393

METHOD OF PEELING A BONDED FILM FROM A CIRCUIT BOARD

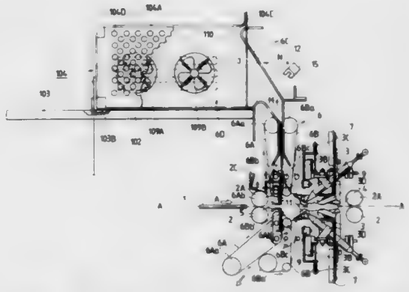
Shigeo Sumi, Saitama, and Ichio Fukuda, Tokyo, both of Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Jun. 4, 1990, Ser. No. 532,408

Claims priority, application Japan, Jun. 4, 1989, 1-141969

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—344 **10 Claims**



1. A film peeling method wherein a film adhered to a surface of a board is initially peeled therefrom and subsequently conveyed, comprising:

separating part of said film from said board at an edge of said board;

holding said separated part of the film and applying a peeling force thereto;

simultaneously separating the remaining part of the film and initially transferring away said film from said surface of the board while holding the film;

introducing the peeled and initially transferred film into a duct wherein a static electricity eliminating fluid is substantially constantly flowing along a transfer path of the peeled film; and

initially injecting a first pressurized fluid into said duct so as to generate fluid flow along an upper wall and a bottom wall of said duct, respectively, and after a predetermined time period injecting a second additional pressurized fluid onto the peeled and initially transferred film in synchronism with the peeling action so as to secondarily transfer the peeled film to a peeled film receiving station, said first and second fluids being injected onto the film in an injection direction substantially perpendicular to a path of travel of the board and in a plane parallel to the surface of the board so as to cause said film to travel in a direction parallel to said injection direction along a horizontal transfer path.

5,110,394

APPARATUS FOR FORMING INTERCONNECTION PATTERN

Toshiaki Ogawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1991, Ser. No. 683,648

Claims priority, application Japan, Jul. 4, 1990, 2-178288

Int. Cl.[5] B44C *1/22;* **C23F** *1/02*

U.S. Cl. 156—345 **1 Claim**

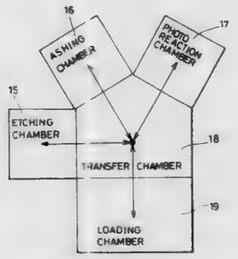
1. An apparatus for forming an interconnection pattern on a semiconductor substrate, comprising:

an etching chamber for selectively etching an interconnection layer formed on said semiconductor substrate by a reactive ion etching employing a resist, so as to form said interconnection pattern;

an ashing chamber for removing said resist by ashing;

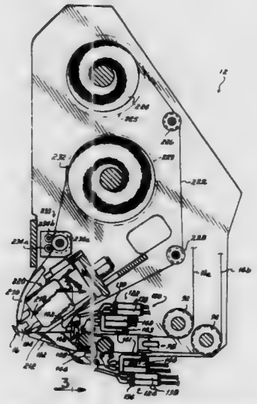
a photoreaction chamber for performing a surface treatment of said interconnection pattern with light;

a first airtight pathway for in-situ transportation of said semiconductor substrate from said etching chamber to said ashing chamber; and



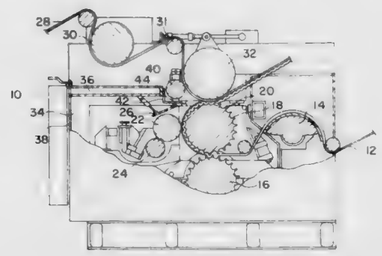
a second airtight pathway for in-situ transportation of said semiconductor substrate from said ashing chamber to said photoreaction chamber.

5,110,395
FIBER PLACEMENT HEAD
Milo M. Vaniglia, Southgate, Ky., assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Dec. 4, 1989, Ser. No. 445,201
Int. Cl.[5] B26D *5/20*
U.S. Cl. 156—353 **14 Claims**



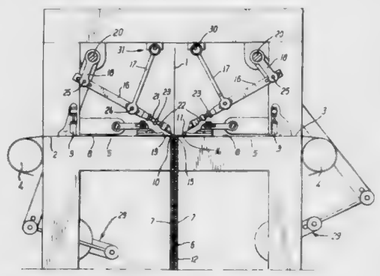
1. A fiber placement head for applying composite fiber tows onto a surface, comprising:
a fiber compaction device;
guide means for guiding a number of individual fiber tows supplied at independent rates from a fiber tow source to a location beneath said fiber compaction device, said guide means being effective to orient the individual fiber tows side-by-side to form a fiber band which is pressed against the surface by said fiber compaction device;
cutting means associated with each of the individual fiber tows for selectively and independently cutting the fiber tows to form a cut end;
clamping means associated with each of the fiber tows and operative in response to actuation of said cutting means for individually and independently clamping the cut end of one of the fiber tows in a fixed position relative to said fiber compaction device after each of the fiber tows is cut by one of said cutting means.

5,110,396
FLOATING AIR SEAL FOR AN APPARATUS FOR MANUFACTURING SINGLE FACED CORRUGATED BOARD
William W. Harris, Turnersville, N.J., assignor to The Langston Corporation, N.J.
Filed Jun. 14, 1990, Ser. No. 538,292
Int. Cl.[5] B31F *1/28;* **B32B** *31/08*
U.S. Cl. 156—382 **9 Claims**



5. An apparatus for manufacturing single faced corrugated board comprising a first corrugating roller; a second corrugating roller adjacent to the first corrugating roller for corrugating a first web in cooperation with the first corrugating roller, the second corrugating roller being hollow and having vented slots on its outer surface; applicator means adjacent to the second corrugating roller for applying an adhesive to the peaks of the corrugations formed in the first web; a pressure roller adjacent to the second corrugating roller for receiving a second web of liner material and for applying it to the corrugated first web; a seal roller adjacent to the pressure roller for guiding the said liner material along the pressure roller; a pressure chamber partially defined by the first and second corrugating rollers, the pressure roller and the seal roller, said chamber applying a positive air pressure to maintain the first web on the second corrugating roller; and an air seal adjacent to the seal roller and comprising an elongated sealing member parallel to the axis of rotation of the seal roller and having a sealing surface substantially tangential to the seal roller and slightly spaced form the seal roller, and including resilient means for urging the sealing member towards the seal roller.

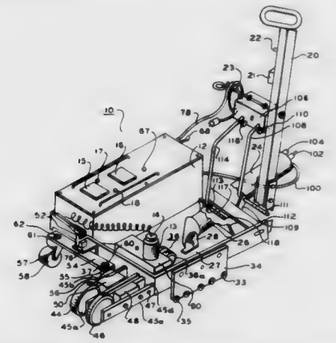
5,110,397
APPARATUS FOR MAKING PILE FABRICS
Neil S. Fraser, Elderslie, Great Britain, assignor to Stoddard Sekers International plc, Elderslie, Scotland
Filed Sep. 19, 1989, Ser. No. 409,128
Claims priority, application United Kingdom, Sep. 20, 1988, 8822050
Int. Cl.[5] D04H *11/08*
U.S. Cl. 156—435 **7 Claims**



1. Apparatus for manufacturing fabrics with non-woven pile,

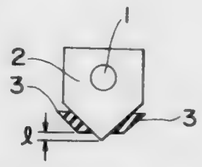
including means for moving a pair of continuous support bands along a passage with the bands disposed substantially parallel to a longitudinal axis of the passage and to each other and at a predetermined distance from each other, means for folding a warp at the entrance of the said passage comprising two folder blades arranged to move the said warp continuously and alternately in opposite directions to form a series of bellows folds between the support bands in the passage, supporting means for each folder blade, suspension means for each supporting means, and operating means for oscillatory driving of the supporting means; the suspension means for each folder blade comprising a plurality of paris of cranks, each crank being pivotally connected at one end to a fixed part of the apparatus and pivotally connected at the other end to its respective supporting means; and in which at least one crank of each pair has said one end mounted to said fixed part via an eccentric mounting whereby the effective arc length of the crank can be varied in a stepless manner.

5,110,398
MACHINE FOR APPLYING HEAT WELDS OR SOLVENT WELDS TO ROOF MEMBRANES
Colin R. R. Murphy, Morristown, N.J., assignor to Engineered Construction Components (America), Inc., Panama City, Panama
Filed Apr. 5, 1990, Ser. No. 505,142
The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—499 **5 Claims**



1. A device for welding overlapping roof membranes, wherein a fastening means is located between the overlapping roof membranes, comprising:
a chassis;
means for movably supporting said chassis;
heat welding means capable of heat welding two overlapping roof membranes to each other, said heat welding means capable of applying a heat weld to said roof membranes on at least one side adjacent to the fastening means, said heat welding means including at least one heat directing means for directing heat to form a heat weld on at least one side of and adjacent to the fastening means;
fluid application means capable of applying a solvent and/or a primer between said overlapping roof membranes on at least one side of and adjacent to the fastening means, said fluid application means including at least one solvent directing means for directing said solvent or primer between said overlapping roof membranes to form a solvent weld on at least one side of and adjacent to a fastening means, and/or to aid in preparing said membranes for application of a heat weld on at least one side of and adjacent to the fastening means, said solvent welding means positioned forward of said heat welding means relative to the direction of movement of said device; and
means for applying pressure to welded overlapping roof membrane portions on opposite sides of and adjacent to the fastening means between the overlapping roof membrane portions, said means for applying pressure positioned rearward of said heat welding means relative to the direction of movement of said device to provide thereby pressure to said welded roof membrane portions, said means for applying pressure to welded overlapping roof membranes comprising a pair of weighted wheels, each of said weighted wheels capable of being positioned on opposite sides of said fastening means, and a weld wheel located behind said heat welding means and in front of said weighted wheels relative to the direction of movement of said device, said weld wheel capable of being positioned over an upper membrane of said overlapping roof membranes, said weld wheel including a groove dividing said weld wheel into first and second portions, whereby said first and second portions are capable of being positoned on opposite sides of said fastening means.

5,110,399
HEAT-CUTTING/BONDING BLADE AND HEAT-BONDING APPARATUS
Yoshinori Yoshida, and Makoto Hagihara, both of Yamaguchi, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Filed Nov. 22, 1989, Ser. No. 440,192
Claims priority, application Japan, Nov. 22, 1988, 63-152009; Dec. 16, 1988, 63-163088; Dec. 16, 1988, 63-163089; Jan. 23, 1989, 1-6250; Jan. 30, 1989, 1-9633
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—515 **18 Claims**



1. A heat-bonding blade having an edge for heat-bonding two or more thermoplastic resin sheets superposed on one another without heat-cutting them, the edge of said blade being provided with a contact surface contactable with the uppermost one of said thermoplastic resin sheets, said contact surface being embossed so as to have a multiplicity of emboss projections wherein the bonding area ratio given by the following formula ranges between 20 and 90%

{(total area of emboss projections)/(total area of contact surface)}×100

and wherein said blade comprises a pressing member having a lower end and which is provided on at least one side of said blade, the distance between the lower end of said at least one pressing member and the edge of said blade being so determined that said at least one pressing member lightly presses said thermoplastic resin sheets sufficiently to cause heat-bonding when said edge of said blade is pressed into said sheets, so that said sheets are pressed at a predetermined pressure by said at least one pressing member during heat-bonding.

5,110,400

APPARATUS FOR BONDING CONTINUOUS THIN FILM TO DISCRETE BASE PLATES AND CUTTING THEREOF

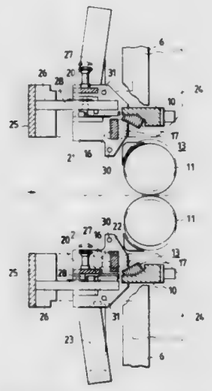
Yasuhiro Nagafuchi, Chiba; Mitsuhiro Seki, Tokyo; Shigeo Sumi, Saitama, and Fumio Hamamura, Kanagawa, all of Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 500,984

Claims priority, application Japan, Mar. 29, 1989, 1-77886; Apr. 29, 1989, 1-109831

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—521 **4 Claims**



1. A film bonding apparatus for bonding a continuous supply of film to a board, comprising:

a body for providing structural support to the apparatus;

means for conveying the boards to a film bonding position and for retracting boards from said film bonding position;

a film feed member being capable of temporarily securing a leading end of said continuous film thereto and capable of feeding said leading end of the continuous film to said film bonding position;

means for holding said leading end of the film comprising a holding surface disposed proximate said film bonding position and being adapted for contact with said leading end of the film fed by said film feed member to said film bonding position, said holding surface having apertures formed thereon for holding said leading end of the film by suction;

rotary cutter means comprising a fixed blade provided in the vicinity of said holding member and a rotary blade mounted on said body, said rotary cutter means being movable toward and away from a first side of said film;

moving means, for moving said holding means toward and away from a second side of said film, mounted on said body; and

a compression bonding roller for bonding said film held by said film feed member in said film bonding position to said film bonding surface, said compression bonding roller is movable in a direction toward said leading end of film held by said film feed member is said film bonding position, said film is automatically advanced by virtue of rotation of said compression bonding roller so as to bond film to said film bonding surface over a predetermined distance, said compression bonding roller being moved in concert with said board a first predetermined distance in a direction of feed of said board while the film is being bonded to said board, said compression bonding roller subsequently being capable of moving a second predetermined distance in a direction opposite to a feed of said board so as to loosen said film.

5,110,401

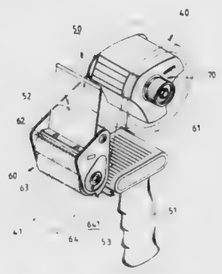
ADHESIVE TAPE CUTTER

Harrison Huang, No. 23, Lin T'so Rd., Taiwan, Taiwan

Filed Aug. 15, 1990, Ser. No. 567,759

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—527 **7 Claims**



1. An adhesive tape cutter comprising:

a handle;

a base piece secured to said handle;

a cutting device fixed to said base piece;

a tape mounting fixed to said base piece; and

means for mounting an adhesive tape roll on said tape mounting, said tape mounting including:

a shaft having a first end fixed to said base piece and a second free end;

a carrier rotatably mounted to said shaft and having means for carrying thereon said tape roll;

a pressing piece being limitedly slidable but not rotatably mounted on said free end;

a positioner adjustably coaxially fixed into said free end;

a stopper sleeved on said positioner;

an elastic member mounted between said stopper and said pressing piece for biassing said pressing piece against said carrier;

two protecting metal pieces respectively mounted between said base piece and said carrier as well as said carrier and said pressing piece; and

two abrasive pieces respectively mounted between said base piece and a respective one of said metal pieces as well as the other said metal piece and said pressing piece.

5,110,402

LABELLING MACHINE FOR LABELLING CONTAINERS SUCH AS BOTTLES HAVING A LABELLING BOX FOR A STACK OF LABELS IN A LABELLING STATION

Rudolf Zodrow, and Rainer Buchholz, both of Düsseldorf, Fed. Rep. of Germany, assignors to Holstein und Kappert AG, Dortmund, Fed. Rep. of Germany

Filed Mar. 28, 1991, Ser. No. 676,708

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1990, 4010974; Sep. 5, 1990, 4109335

Int. Cl.[5] B65C *9/00*

U.S. Cl. 156—573 **20 Claims**

1. A label box in a labelling station of a labelling machine, wherein said label box is for holding a plurality of labels and said labelling machine comprises means for extracting the labels from said label box, said label box comprising:

means for guiding the labels towards the extracting means;

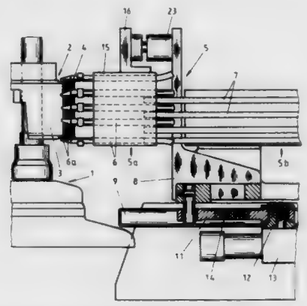
means for retaining a portion of the labels in the vicinity of the extracting means;

said label box comprising a forward portion and a rear portion, said forward portion being disposed towards said extracting means and said rear portion being disposed generally away from said extracting means and adjacent to said forward portion;

said retaining means being disposed in said forward portion of said label box;

said retaining means being slidingly displaceable with respect to said rear portion of said label box; and

means for displacing said retaining means between:



a first position, wherein the labels are positioned to permit the extraction of the labels from said label box by the extracting means; and

a second position, wherein the labels are positioned to prevent the extraction of the labels from said label box by the extracting means.

5,110,403

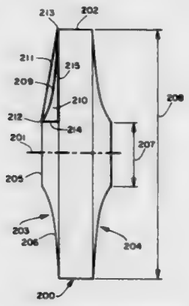
HIGH EFFICIENCY ULTRASONIC ROTARY HORN

Thomas D. Ehlert, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 18, 1990, Ser. No. 526,073

Int. Cl.[5] B29C *65/08*

U.S. Cl. 156—580.1 **12 Claims**



1. In an ultrasonic rotary horn intended to be excited at a frequency of from about 18 to about 60 kHz, which horn comprises a shaped, solid metal object having a radial surface terminated by a first end and a second end, and a rotational axis, in which each of said ends is defined by a surface and said object is radially symmetrical, the improvement which comprises:

(A) the diameter of said horn is in the range of from about 4 cm to about 19 cm;

(B) the width of said horn at said radial surface is from about 0.6 cm to about 13 cm;

(C) the thickness of said horn at the rotational axis thereof is from about 0.6 cm to about 15 cm and is independent of the width of said horn at said radial surface;

(D) the thickness of said horn at the rotational axis is greater than the width of said horn at said radial surface;

(E) said horn has a mass in the range of from about 0.06 kg to about 30 kg;

(F) said diameter, width, and thickness are selected for a desired frequency so that said horn, upon being excited by ultrasonic energy at such frequency which is input at the rotational axis at, and substantially perpendicular to, one or both of said ends, is adapted to resonate in a manner such that:

(1) the first end is excited and moves substantially in phase with the movement of the source of excitation;

(2) the second end, whether or not it is actively excited, moves substantially out of phase with the movement of the excited first end;

(3) said radial surface also moves substantially out of phase with the movement of the excited first end; and

(4) said horn exhibits a single nodal point at its geometric center;

(G) said horn operates at an efficiency of greater than 0.2 microns per watt; and

(H) said first end and said second end have a substantially convex configuration which comprises a central, circular, flat portion which is concentric with said rotational axis and a generally concave portion from said flat portion to said radial surface, in which:

(1) the diameter of said flat portion is at least about 20 percent of the diameter of the horn;

(2) said generally concave portion is a curved surface having radial symmetry and a curvilinear profile in cross-section through said rotational axis which lies in the triangular area defined by (i) a straight line leading from the outer boundary of said flat portion to the edge of said radial surface; (ii) a straight line which is parallel with the rotational axis and which begins at the outer boundary of said flat portion and extends toward the interior of said horn; and (iii) a straight line which is perpendicular to the rotational axis and which extends from the edge of said radial surface to said straight line parallel with the rotational axis.

5,110,404

METHOD FOR HEAT PROCESSING OF SILICON

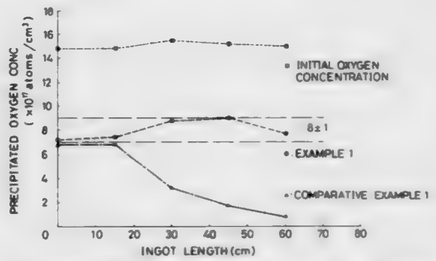
Izumi Fusegawa; Hirotoshi Yamagishi, and Takao Abe, all of Annaka, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1990, Ser. No. 496,750

Claims priority, application Japan, Mar. 31, 1989, 1-82841

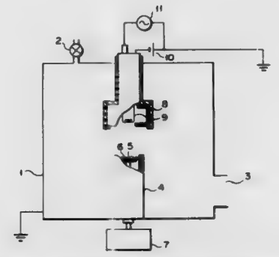
Int. Cl.[5] H01L *21/306*

U.S. Cl. 156—603 **11 Claims**



5. A method for heating treating a single crystal of silicon comprising thermally treating such at a high temperature ranging from 1200° to 1350° C. under conditions sufficient to initialize the heat history of said crystal during growing thereof; then heat treating said initialized single crystal at a low temperature ranging from 400° C. to 550° C., sufficient to introduce oxygen precipitation nuclei into said single crystal, in the furnace of a Czochralski crystal puller, as an after-heating step, after completion of pulling-up of the said single crystal silicon and then subjecting said heat treated crystal to a higher temperature sufficient to precipitate oxygen at said nuclei.

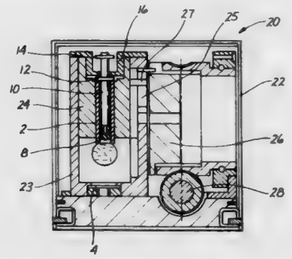
5,110,405
METHOD OF MANUFACTURING SINGLE-CRYSTAL DIAMOND PARTICLES
Atsuhito Sawabe, and Tadao Inuzuka, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 9, 1989, Ser. No. 363,788
Claims priority, application Japan, Jun. 9, 1988, 63-142052
Int. Cl.[5] C30B *29/04*
U.S. Cl. 156—610 **18 Claims**



1. A method of manufacturing single-crystal diamond particles, comprising the steps of:
introducing a reaction gas containing at least one organic compound into a reaction vessel having an anode and a cathode;
producing a plasma by direct current discharge caused between the anode and the cathode; and
vibrating inorganic single-crystal particles in the plasma, and depositing single-crystal diamond on the surface of the single-crystal particles, the substantially single-crystal diamond comprising at least one of a pseudosingle crystal including twins, a pseudo-single crystal having secondary nuclei on a surface of a particle thereof, and a pseudo-single crystal in which a growth nuclei and deposited diamond have a relationship of orientation and a number of stacking faults;
wherein said cathode is provided with a filament for starting discharge, and/or for maintaining the discharge; and
wherein discharge from an abnormal glow discharge region to a glow-arc transition region is caused between said anode and said cathode.

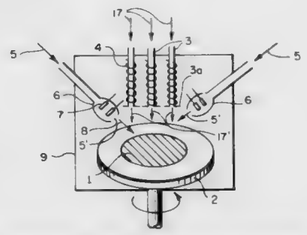
5,110,406
MANIPULATING LIQUID UNDER CONDITION OF WEIGHTLESSNESS
Karl-Hermann Sill, Salem, and Harald Lenski, Ueberlingen, both of Fed. Rep. of Germany, assignors to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany
Filed Dec. 13, 1990, Ser. No. 627,650
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1989, 3941099
The portion of the term of this patent subsequent to Apr. 21, 2009, has been disclaimed.
Int. Cl.[5] C30B *7/00*
U.S. Cl. 156—621 **5 Claims**

1. Apparatus for handling liquid under particular conditions of weightlessness or near weightlessness comprising:
a small tube being open at one tube end and closed at the other end except for a passage;
a seal of elastic property made of a low wetting material with a flat surface larger than the inner diameter of the tube so as to be incapable of entering the tube and modifying its volume;
means for moving the tube towards and away from said seal;
a plunger moveably disposed within said tube there being a liquid in a space between the plunger and said open end of the tube;
a rod connected to the plunger for moving the same and traversing said passage at said other end of the tube and being outside thereof provided with two adjustably spaced apart stops; and
stationary means for limiting abutment of the rod and of the plunger to the range given by spacing between the stops



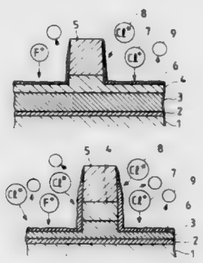
such that the plunger moves inside the tube on account of the means for moving the tube and whenever one of the stops abuts the stationary means, while the means for moving continues to move the tube.

5,110,407
SURFACE FABRICATING DEVICE
Tetsuo Ono; Susumu Hiraoka, both of Kokubunji, and Keizo Suzuki, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 20, 1991, Ser. No. 658,399
Claims priority, application Japan, Mar. 7, 1990, 2-53646
Int. Cl.[5] H01L *21/306;* **B44C** *1/22;* **C23F** *1/02*
U.S. Cl. 156—643 **51 Claims**



1. In an electronic device manufacturing process, including a hot reactive gas etching method for a substrate of the electronic device, the etching method comprising the steps of:
providing an etching mask on the substrate;
maintaining at least one portion of the substrate surface exposed through the mask in a vacuum chamber for the remaining steps of the method;
etching by directly impinging a hot reactive gas beam produced from a first material through the mask onto the exposed surface of the substrate for a time sufficient to etch the substrate surrface thereby producing an etched area having at least one side and bottom surfaces; and
introducing a second material different from the first material used in producing the hot reactive gas beam so that the second material contacts at least a side surface of the etched hole to an extent sufficient that the ratio of bottom surface etching to side surface etching is substantially increased, to reduce the etching on the side surface.

5,110,408
PROCESS FOR ETCHING
Takashi Fujii; Hironobu Kawahara; Kazuo Takata; Masaharu Nishiumi, and Noriaki Yamamoto, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 20, 1991, Ser. No. 658,254
Int. Cl.[5] H01L *21/306;* **B44C** *1/22;* **C23F** *1/02;* **C03C** *15/00*
U.S. Cl. 156—643 **27 Claims**



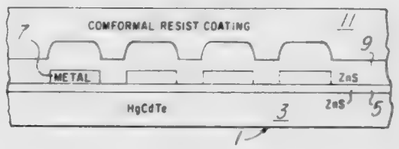
1. A process for etching which comprises etching at least one material selected from the group consisting of a polycrystal silicon film, a tungsten alloy film, a tungsten film and a silicon substrate by using, as an etching gas, a mixture comprising a reductive fluoride gas, a hydrocarbon gas and a halogen gas having a larger atomic diameter than that of the material to be etched.

5,110,409
ENHANCED PLASMA ETCHING
Frank D. Egitto, Binghamton, and Walter E. Mlynko, Vestal, both of N.Y., assignors to IBM, Armonk, N.Y.
Continuation of Ser. No. 12,696, Feb. 9, 1987, Pat. No. 4,985,112. This application Dec. 21, 1990, Ser. No. 631,866
The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—643 **13 Claims**



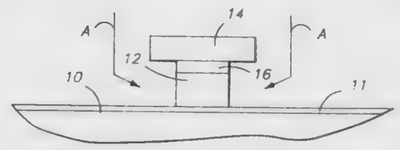
1. A method for etching an article by plasma etching wherein said article includes a substrate and a surface of organic material selected from the group of polyimides, polyamides, epoxy resins, phenolic-aldehyde polymers, and polyolefins thereon which comprises:
positioning the article to be etched on a cathode;
enclosing in a container the cathode and the article to be etched;
introducing an etchant gas into said container; and
applying power to the cathode in an oscillating mode whereby the power is cycled between a lower wattage value and a higher wattage value to thereby enhance the etching rate.

5,110,410
ZINC SULFIDE PLANARIZATION
Jerry L. Elkind, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Aug. 13, 1990, Ser. No. 566,746
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—643 **22 Claims**



1. A method of planarizing a group II–VI insulating layer comprising the steps of:
(a) providing a device having a non-planar group II–VI insulating layer as an outer surface thereof;
(b) forming a layer of etchable material over said insulating layer having a planar outer surface; and
(c) etching said etchable layer to expose said insulating layer and then etching both said etchable layer and said insulating layer at substantially the same etch rate until said etchable material is substantially all etched away to provide a planar group II–VI insulating layer.

5,110,411
METHOD OF ISOTROPICALLY DRY ETCHING A POLY/WSI, SANDWICH STRUCTURE
Paul Long, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Apr. 27, 1990, Ser. No. 516,053
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—656 **13 Claims**



1. A method of isotropically dry etching a WSi_x/polysilicon sandwich structure atop a silicon substrate wafer containing integrated semiconductor circuits, the sandwich structure having an overlying photoresist masking portion, the method being conducted within a parallel plate reactor which in operation provides a continuous power density over the parallel plates, the method comprising:
spacing the reactor parallel plates a preselected separation distance from one another and applying a preselected amount of electrical power to the parallel plates;
injecting gases to within the reactor to provide a reactive gas mixture at a preselected pressure within the reactor, the reactive gas mixture comprising SF_6, Cl_2, and O_2 in approximate respective volume ratios of $7.0\pm5\%$:$5.0\pm5\%$:$4.0\pm5\%$; and
subjecting the wafer to the reactive gas mixture at the preselected pressure for a preselected amount of time to isotropically etch the WSi_x and polysilicon beneath the photoresist masking portion at substantially the same rate and provide a WSi_x/polysilicon runner having substantially vertical sides and having resist overhang projecting laterally from the vertical sides of the WSi_x/polysilicon runner.

5,110,412
METHOD OF MANUFACTURE OF PAPER OR CARDBOARD USING RECYCLED FIBERS TREATED WITH ENZYMES
Jean-Luc M. Fuentes, Villenave D'Ornon, and Michel M. Robert, Lacanau, both of France, assignors to La Cellulose Du Pin, Aubervilliers Cedex, France
Continuation of Ser. No. 326,637, Mar. 21, 1989, abandoned. This application Feb. 11, 1991, Ser. No. 653,975
Claims priority, application France, Mar. 22, 1988, 88-03687
The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.
Int. Cl.[5] D21C *5/02*
U.S. Cl. 162—5 **9 Claims**

1. A method for the manufacture of paper or cardboard from an aqueous suspension of fibers containing a majority of recycled cellulose fibers, said method comprising depositing the aqueous suspension of said fibers onto a forming fabric, wherein, prior to the deposit of the suspension onto the forming fabric, the fibers are treated with an amount of an enzyme sufficient to increase drainability of said suspension, said enzyme being selected from the group consisting of cellulases, hemicellulases, and other enzymes having C_1, C_x or xylanase activity and acting on all or part of the constituents of the cellulose fibers, and mixtures thereof, at a temperature of between 15° and 80° C. and at a pH of between 3 and 8, for a period of greater than 5 minutes, thereby causing an improvement in the drainability of said suspension.

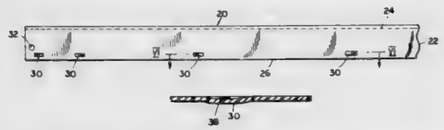
5,110,413
INTUMESCENT SHEET MATERIAL
Adrian M. Steer, Halifax, United Kingdom, assignor to T & N Technology Limited, Warwickshire, England
Filed Aug. 6, 1990, Ser. No. 562,844
Int. Cl.[5] D21H *17/67*
U.S. Cl. 162—145 **9 Claims**

1. A method of making intumescent sheet material having a matrix whose predominant ingredient is an unfired kaolinitic clay comprising ball clay reinforced by inorganic vitreous fibre, said material including up to 10 per cent by weight of an organic binder, by dewatering an aqueous suspension of the aforesaid ingredients in the form of a layer which includes cellulose fibre as web-forming agent, said suspension containing an amount of heat-expandable graphite sufficient to swell the sheet in a fire.

5,110,414
PROCEDURE FOR MANUFACTURING LIGNOCELLULOSIC MATERIAL PRODUCTS
Kaj G. Forss; Agneta G. M. Fuhrmann, and Martti Toroi, all of Espoo, Finland, assignors to Oy Keskuslaboratorio - Centrallaboratorium AB, Finland
PCT No. PCT/FI88/00033, § 371 Date Sep. 8, 1989, § 102(e) Date Sep. 8, 1989, PCT Pub. No. WO88/07104, PCT Pub. Date Sep. 22, 1988
Continuation of Ser. No. 399,506, Sep. 8, 1989, abandoned. This PCT application Mar. 7, 1988, Ser. No. 660,165
Claims priority, application Finland, Mar. 9, 1987, 871010
Int. Cl.[5] D21H *17/23*
U.S. Cl. 162—163 **15 Claims**

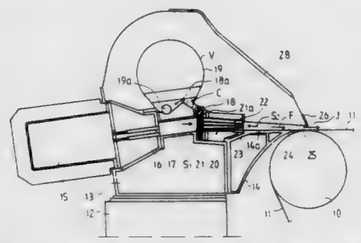
1. A method for manufacturing products from lignocellulosic material and for improving their strength and water resistance characteristics, comprising the steps of adding to an aqueous slurry of lignocellulosic fiber material, high molecular weight lignin derivatives of which at least 35% by weight of said lignin derivatives have a molecular weight over 5000 to provide a lignocellulosic/lignin mixture, said lignin derivatives being unpolymerized with added resin, adjusting the acidity of the lignocellulosic/lignin mixture to a value in the range of pH 2 to pH 7 to effect precipitation of said lignin derivatives on said cellulosic fibers.

5,110,415
COMPOSITE DOCTOR BLADE ASSEMBLY FOR PULP OR PAPERMAKING MACHINE DOCTORS
Normand Boucher, Laval, Canada, and Giancesare Bonetti, Milan, Italy, assignors to Albany International Corp., Menands, N.Y.
Filed Apr. 23, 1990, Ser. No. 512,851
Int. Cl.[5] D21G *3/00, 3/02, 3/04*
U.S. Cl. 162—281 **17 Claims**



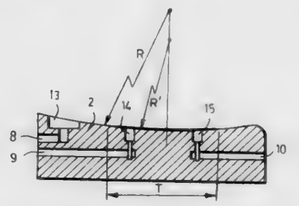
1. A doctor blade comprising:
an elongated strip having a first side, a second side, and a surface extending therebetween; and
a plurality of tabs deformed elastically on said strip; said tabs and said strip having irregularities formed in said material when said material is sheared along a plane generally normal to said surface to generate said tabs, said irregularities forming an interference between said tabs and said strip to maintain said tabs at least partially above said surface.

5,110,416
TURBULENCE GENERATOR IN THE HEADBOX OF A PAPERMAKING MACHINE
Ari Linsuri, and Michael H. Odell, both of Jyväskylä, Finland, assignors to Valmet Paper Machinery Inc., Finland
Filed Jun. 1, 1990, Ser. No. 532,394
Claims priority, application Finland, Jun. 2, 1989, 892709
Int. Cl.[5] D21F *1/06*
U.S. Cl. 162—343 **13 Claims**



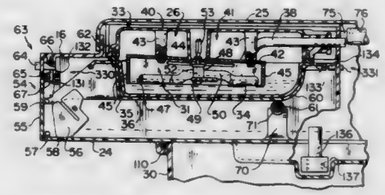
1. A turbulence generator in the headbox of a paper machine, said turbulence generator producing microturbulence in a paper pulp suspension flowing therethrough such that homogeneity of said paper pulp flow is improved, said a plurality or said turbulence tubes spaced apart from each other at substantially the same vertical level; said plurality of turbulence tubes each extending from an inlet side of said turbulence generator to an outlet of said turbulence generator and each said turbulence tube having a substantially circular cross-sectional area at said inlet side and each said tube having a smoothly and gradually changing cross-sectional area such that, at said outlet side of said turbulence generator, each tube comprises a plurality of planar sides such that said outlet side forms a cell structure comprising individual ones of said tubes abutting each other so as to form an overlapping cell system wherein there are two or more middle cell rows, each said middle cell row comprising a plurality of cells each having sides inclined from both the vertical and horizontal planes, said cells of each said middle cell row being substantially horizontal with each other and having a rectangular cross-sectional area with shorter planar sides and longer planar sides, and a cell structure comprising a plurality of peripheral cell rows placed respectively above and below said middle cells rows, each said peripheral cell row comprising a plurality of peripheral cells each being defined by vertical sides which terminate at a corner of adjacent cells in one of said middle cell rows, and by said shorter planar sides of adjoining cells of said middle cell rows, said plurality of peripheral cells having a substantially pentagonal shape or having a two-ridged structure defined by the shorter planar sides and the longer planar sides of three adjoining middle cells and having vertical sides; and
said cell structure comprising upper and lower horizontal walls which further define said cells of said peripheral cell row;
further comprising said turbulence generator having one or more lateral ducts;
wherein said cell structure substantially fully occupies said outlet side of said turbulence generator; and
wherein said shorter planar sides and said longer planar sides of said cells within said middle cell rows are each at an angle of about 45 degrees relative to the horizontal and vertical planes.

5,110,417
EXTENDED PRESS ZONE WITH SHALLOW HYDRODYNAMIC POCKET
Jarmo Lehtonen, and Jukka Kinnunen, both of Tampere, Finland, assignors to OY Tampella AB, Tampere, Finland
Filed Dec. 17, 1990, Ser. No. 628,014
Claims priority, application Finland, Dec. 21, 1989, 896163
Int. Cl.[5] D21F *3/06*
U.S. Cl. 162—358 **19 Claims**



1. A press with extended press zone in a paper machine for dewatering a wet fibre web, comprising
a rotating press roll and at least one press shoe extending in the axial direction of the press roll, said press shoe bearing on the press roll;
a liquid-impermeable slide band having a direction of travel and sliding along the surface of the press shoe between the press shoe and the press roll in the direction of travel of the fibre web;
first lubricating means for introducing lubricant between the slide band and the press shoe at an entry edge of the press;
at least one press felt for passing the fibre web through the press between the press roll and the slide band and for receiving water from the fibre web;
a hydrodynamic pocket area in an upper surface of the press shoe facing the slide band having at least substantially the same width as the fibre web and being narrower than the extended press zone in the direction of travel of the band, said hydrodynamic pocket area comprising at least one pocket formed in the surface of the press shoe as a recess;
second lubricating means including at least one lubrication conduit for introducing pressurized lubricant to the hydrodynamic pocket area;
pocket means for increasing the pressure of the pressurized lubricant in the hydrodynamic pocket area between the press shoe and the slide band in the direction of travel of the fibre web, said pocket means comprising said at least one pocket having a depth such that the press operates substantially hydrodynamically; and
said at least one pocket having a lubrication introduction area communicating with said at least one lubrication conduit, the lubrication introduction area formed by at least one lubrication introduction groove having a depth greater than the depth of said at least one pocket and extending in the axial direction of the roll.

5,110,418
WATER DISTILLER HAVING A HEATING ELEMENT WITH TEMPERATURE SENSING AND CONTROL ELEMENTS
Dale L. Garrison, Antioch, Ill., and William F. Strutz, Racine, Wis., assignors to Emerson Electric Company, Racine, Wis.
Filed Jan. 18, 1991, Ser. No. 643,030
Int. Cl.[5] C02F *1/04*
U.S. Cl. 202—81 **11 Claims**



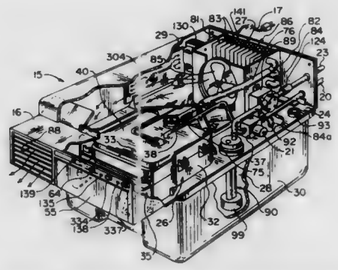
1. A water distiller comprising
a steam chamber including a tray for containing water to be distilled,
conduit means for conveying water to be distilled from a source to the tray including valve means operable in an open position to convey water to the tray and a closed position to block the passage of water to the tray,
heating element means extending in the stream chamber for submersion in the water carried by the tray, the heating element means being operable within a range of temperatures including temperatures below and above a predetermined temperature to heat the water in the tray, the heating element means including a main body portion having an axis that extends in a plane generally parallel to the water in the tray and a section having an axis that is deflected above the axis of the main body portion,
a heat sink that surrounds the deflected section of the heating element means,
heat sensing means for sensing the temperature of the heat sink, and
control means connected to the valve means and the heat sensing means and operative in a mode for closing the valve means when the sensed temperature of the heat sink is equal to or less than said predetermined temperature and for opening the valve means when the sensed temperature of the heat sink is greater than said predetermined temperature.

5,110,419
LOW PROFILE WATER DISTILLER
Thomas J. Weber, Oak Creek; Richard E. Forrest, Racine, both of Wis., and Dale L. Garrison, Antioch, Ill., assignors to Emerson Electric Co., Racine, Wis.
Filed Jan. 18, 1991, Ser. No. 642,790
Int. Cl.[5] B01D *3/02;* **C02F** *1/04*
U.S. Cl. 202—185.3 **6 Claims**

1. A water distiller comprising
a housing having horizontal length and width greater than its height,
a steam chamber within the housing having a horizontal dimension greater than its vertical height,
a condenser within the housing having a horizontal dimension greater than its vertical height, the vertical height of the condenser being generally the same as the vertical height of the steam chamber,

raw water conduit means within the housing for delivering water to be distilled into the steam chamber, the raw water conduit means extending in a generally horizontal plane,

steam conduit means within the housing for delivering steam from the steam chamber to the condenser, the steam conduit means extending in a generally horizontal plane parallel to the generally horizontal plane of the raw water conduit means,



air circulation means within the housing for drawing cooling air through the condenser in a generally horizontal path parallel to the generally horizontal planes of the raw water conduit means and the steam conduit means, and

said steam chamber, condenser, raw water conduit means, steam conduit means and air circulation means are arranged generally spaced apart horizontally relative to each other within said height of the housing.

5,110,420

ELECTROCHEMICAL PROCESS

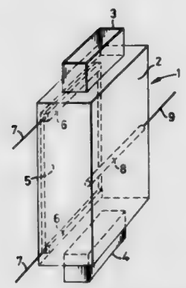
Rodney J. Marshall, Southampton, and John M. Sherborne, Woking, both of England, assignors to The British Petroleum Company p.l.c., Finsbury, England

Filed Oct. 15, 1991, Ser. No. 777,831

Claims priority, application United Kingdom, Oct. 19, 1990, 9022828

Int. Cl.[5] C25D *5/00, 9/04*

U.S. Cl. 205—157 **11 Claims**



1. The process for cathodically depositing a compound containing at least one element of Group IIB and at least one element of Group VIB by electrodeposition from a bath solution containing ionic species of these elements containing an anode, a cathode on which deposition takes place, the cathode comprising a layer of relatively high sheet resistance on an insulating substrate is characterised in that the anode is positioned relative to the cathode such that the distance from the anode to a point on the cathode increases as the distance between that point and the nearest electrical connection to the cathode decreases.

5,110,421

METHOD FOR SELECTIVELY COATING SURFACES OF COMPONENTS

Alan L. Gabrielson, Bristol, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed May 24, 1991, Ser. No. 705,590

Int. Cl.[5] C25D *5/02*

U.S. Cl. 205—131 **5 Claims**

1. A process for selectively plating separate surfaces of a component, the process comprising the steps of:

electroplating a first material onto a first surface;

applying a masking means to the component;

tumbling a plurality of components thereby removing the masking means from a second surface and leaving the masking means on the first surface;

electroplating a second material onto the second surface, the masking means preventing electroplating on the first surface; and

removing the masking means from the first surface.

5,110,422

METHOD FOR PRODUCING AN ADHERENT METAL DEPOSIT ON CARBON, AND MIRROR OBTAINED BY THIS METHOD

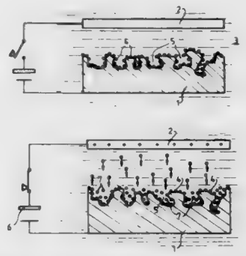
Serge Alperine, Paris, and Pierre Josso, Issy Les Moulineaux, both of France, assignors to Office National D'Etudes et de Recherches Aerospatiales, Bagneux, France

Filed Dec. 12, 1990, Ser. No. 626,593

Claims priority, application France, Dec. 13, 1989, 89 16486

Int. Cl.[5] C25D *7/08*

U.S. Cl. 205—159 **15 Claims**



1. A method for producing an adherent deposit on an outer surface of a solid carbon-based substrate, which comprises:

(1) forming a porous layer having a strong adhesion to the substrate, a high specific surface area and a columnar structure with open pores of a depth of at least 1 nm by depositing on the substrate a material comprising at least one member selected from the group consisting of carbon and a carbide; and

(2) depositing on the porous layer a material having a strong affinity for carbon so as to substantially fill said pores, wherein said material having a strong affinity for carbon comprises at least one element selected from the group consisting of cerium, cobalt, chromium, iron, hafnium, iridium, osmium, palladium, platinum, rhodium, ruthenium, lanthanum, manganese, molybdenum, nickel, silicon tantalum, thorium, titanium, uranium and tungsten.

5,110,423

BATH FOR ELECTROPLATING BRIGHT TIN OR TIN-LEAD ALLOYS AND METHOD THEREOF

John L. Little, Cranston, R.I.; Philip W. Schultz, East Lansing, Mich., and Harry Kroll, East Greenwich, R.I., assignors to Technic Inc., Cranston, R.I.

Filed May 25, 1990, Ser. No. 529,351

Int. Cl.[5] C25D *3/56, 3/60, 3/30*

U.S. Cl. 205—254 **48 Claims**

6. A tin or tin-lead alloy plating bath for the electrodeposition of bright plate which consists essentially of:

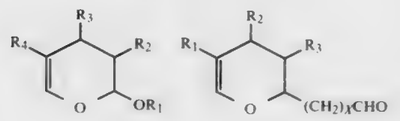
A. a plating bath containing a bath soluble alkane or alkanol sulfonic acid;

B. tin alkane or alkanol sulfonate or both tin and lead alkane or alkanol sulfonate;

C. a first low volatility brightening agent selected from the group consisting of

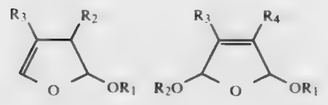
(a) a dialdehyde precursor capable of undergoing acid hydrolysis selected from the group consisting of

i. a substituted dihydropyran represented by the following two formulas:



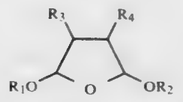
wherein R_1, R_2, R_3, and R_4 represent hydrogen or a $C_{1\text{-}5}$ alkyl group; x is an integer from 0 to 5; and/or

ii a substituted dihydrofuran represented by the formulas



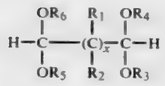
wherein R_1, R_2, R_3 and R_4 represent hydrogen or a $C_{1\text{-}5}$ alkyl group; and/or

iii. a substituted tetrahydrofuran represented by the formula



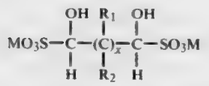
wherein R_1, R_2, R_3 and R_4 represent hydrogen or a $C_{1\text{-}5}$ alkyl group; and/or

iv. an acetal of dialdehyde represented by the formula



wherein R_1, R_2, R_3, R_4, R_5 and R_6 represent hydrogen or a $C_{1\text{-}5}$ alkyl group; x is an integer from 1 to 10; and/or

v. a hydroxysulfonate represented by the formula



wherein R_1 and R_2 represent hydrogen, hydroxy-, or a $C_{1\text{-}5}$ alkyl group; M is an alkali metal, x is an integer from 0 to 10;

D. a second low volatility brightening agent selected from the group consisting of

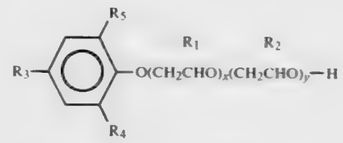
(a) aromatic aldehydes and substituted aromatic aldehydes, excluding benzaldehyde; and/or

(b) aromatic ketones or substituted aromatic ketones; and/or

(c) carboxaldehydes of heterocyclic rings or substituted heterocyclic rings; and

E. a surfactant selected from the group consisting of:

(a) a nonionic surfactant selected from the group represented by the formula



wherein R_1 and R_2 represent hydrogen or $-CH_3$; R_3, R_4 and R_5 represent H, a $C_{1\text{-}20}$ alkyl, benzyl, and/or a styryl group; x and y are integers from 1–30; and/or

(b) a nonionic surfactant that is a block copolymer of ethylene and propylene oxide selected from the group represented by the formula



wherein A represents a halogen, —OH, or —OR, where R is a $C_{1\text{-}15}$ group; x, y, and z are integers from 1 to 100; and/or

(c) a nonionic surfactant that is a block copolymer of ethylene and propylene oxide selected from the group represented by the formula



wherein A represents a halogen, —OH, or —OR, where R is a $C_{1\text{-}15}$ group; x, y, and z are integers from 1 to 100;

F. a non-silicon defoaming agent selected from the group consisting of:

(a) a polypropylene oxide or nonionic surfactant from the group represented by the formula



wherein A represents a halogen, —OH, or —OR, where R is a $C_{1\text{-}15}$ alkyl group; x, y, z are integers from 1 to 100; with the condition that no more than 10% of the compound is polyethylene oxide; and/or

(b) a polypropylene oxide or nonionic surfactant from the group represented by the formula



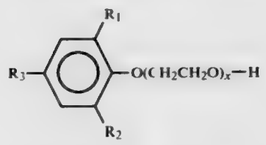
wherein A represents a halogen, —OH, or —OR, where R is a $C_{1\text{-}15}$ alkyl group; x, y, z are integers from 1 to 100 with the condition that no more than 10% of the compound is polyethylene oxide; and/or

(c) an aliphatic alcohol, represented by the formula

R—OH

wherein R is a C_{5-30} alkyl group; and/or

(d) an ethoxylated alkyl phenol from the group represented by the formula



wherein R_1, R_2 and R_3 represent hydrogen or C_{1-16} alkyl groups with the condition that there is at least one alkyl group; x is an integer from 1-5 and

G. antioxidants selected from the group consisting of 1-phenyl-3-pyrazolidinone, resorcinol, catechol, and hydroquinone sulfonate.

5,110,424

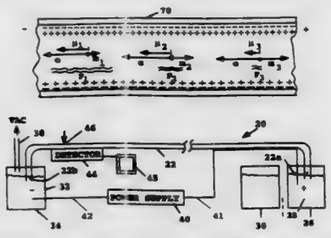
NUCLEIC ACID FRACTIONATION BY COUNTER-MIGRATION CAPILLARY ELECTROPHORESIS

Allan M. Chin, Palo Alto, Calif., assignor to Applied Biosystems, Inc., Foster City, Calif.

Continuation-in-part of Ser. No. 390,631, Aug. 7, 1989. This application Aug. 6, 1990, Ser. No. 562,790

Int. Cl.[5] **G01N** *27/26;* **B01D** *57/02*

U.S. Cl. 204—180.1 **19 Claims**



1. A method of fractionating a mixture of different molecular weight nucleic acid fragments, comprising

loading a liquid sample containing the nucleic acid fragments into one end of a microcapillary tube filled with a fluid electrolyte solution, where the inner wall surface of the tube contains negatively charged groups, one end of the tube is placed in fluid communication with an anodic reservoir containing a polymer solution of an uncharged polymer having a molecular weight of at least about 50,000 daltons, and the other tube end is placed in communication with an cathodic reservoir, and

applying a voltage between the anodic and cathodic reservoirs which is effective to draw said polymer solution into and through the tube by electroosmotic flow, at a fluid flow rate in the tube which is greater, in the direction of the cathodic reservoir, than the molecular-weight dependent rates of migration of such nucleic acid fragments, in the direction of the anodic reservoir, such that larger molecular weight nucleic acid fragments move more rapidly toward the cathodic reservoir.

5,110,425

TERMINAL CHLORINATION OF NORMAL ALKANE HYDROCARBONS

Nicholas J. Turro, Tenafly, N.J., and James R. Fehlner, Moscow, Pa., assignors to Inrad, Inc., Northvale, N.J.

Continuation of Ser. No. 218,215, Jul. 13, 1988, Pat. No. 4,971,664. This application Oct. 10, 1990, Ser. No. 596,728

The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.

Int. Cl.[5] **C07C** *17/00*

U.S. Cl. 204—158.12 **22 Claims**

1. A method of producing a terminally chlorinated normal alkane, at high terminal selectivity, comprising adsorbing a normal alkane into a zeolite of a type which has internal channels of diameter slightly larger than that of the alkane and which is substantially devoid of internal chambers, and chlorinating the adsorbed alkane in the zeolite.

5,110,426

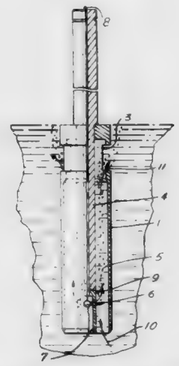
METHOD OF AND AN APPARATUS FOR INTRODUCING AT LEAST ONE HALIDE IN THE LIQUID OR GASEOUS STATE INTO THE BATH OF A CELL FOR DRY ELECTROLYSIS

Jean Boutin, Argenteuil; Pierre Brun; Airy-Pierre Lamaze, both of Grenoble; Patrick Paillere, Ugine, and Pascale Salles, Avrille, all of France, assignors to Compagnie Europeenne Du Zirconium Cezus, Courbevoie, France

Filed Sep. 14, 1990, Ser. No. 582,089

Int. Cl.[5] **C25C** *3/02*

U.S. Cl. 204—64 R **12 Claims**



1. A method of introducing an inert gas and at least one liquid or gaseous halide into a bath contained within an electrolysis cell in which there are at least partially immersed an anodic assembly and a cathode between which a continuous electrical voltage is established and into which the halide is introduced at the same time as an inert gas, comprising the steps of:

(a) providing a means for confining a portion of the bath in an annular elongate space on an axis which is substantially vertical and which space at its upper and lower ends is in communication with the bath; and

(b) imparting motion to the bath in the annular space by introduction of the liquid or gaseous halide and the inert gas to effect an ascending motion of the bath in the annular space and a descending motion of the bath on the outside of the annular space,

whereby a continuous circulation of the bath in contact with the gas and or the halide is achieved.

5,110,427

PROCESS FOR THE PREPARATION BY CRUSHING OF SCRAP COMPRISING METAL PARTS PROVIDED WITH A SURFACE COATING

Klaus Meyer, Schaffhausen, Switzerland, assignor to Alusuisse-Longz Services, Ltd., Zurich, Switzerland

Filed Jan. 24, 1991, Ser. No. 645,047

Claims priority, application Switzerland, Feb. 8, 1990, 407/90

Int. Cl.[5] **C25C** *3/08, 3/12;* **H05B** *7/094*

U.S. Cl. 204—67 **15 Claims**

1. Process which comprises providing scrap comprising metal parts provided with a surface coating, crushing said parts, adding the crushed parts to a carbon-containing mass used in the electrochemical industry to form a carbon-crushed part composite, and including the step of using said composite in the electrochemical industry.

9. Process according to claim 1 wherein the crushed parts are added to a carbon-containing mass used in the electrochemical industry for the production of aluminum, and including the step of using said composite in the electrochemical industry to produce aluminum by a process selected from the group consisting of the Soderberg process and the Hall-Heroult process.

5,110,428

PROCESS AND APPARATUS FOR DOUBLE-SIDED CHEMOMECHANICAL POLISHING OF SEMICONDUCTOR WAFERS AND SEMICONDUCTOR WAFERS OBTAINABLE THEREBY

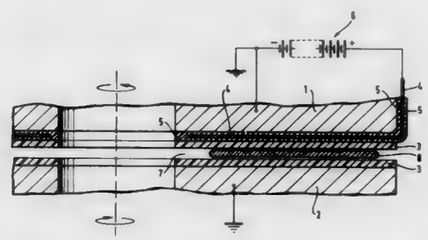
Helene Prigge, Chatswood, Australia, and Josef Lang, Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Sep. 4, 1990, Ser. No. 577,678

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1989, 3929484

Int. Cl.[5] **C25F** *3/30, 7/00*

U.S. Cl. 204—129.3 **9 Claims**



1. A process for the double-sided chemo-mechanical polishing of semiconductor wafers, comprising the steps of:

simultaneously polishing the front and rear side of said wafers via upper and lower polishing surfaces, to which an alkaline polishing agent is applied;

differently polarizing said front and rear surfaces of said wafers, at least temporarily, during said polishing step; and

wherein said different polarizing step comprises establishing, at least temporarily, an electric field between said upper and lower polishing surfaces generated by a direct current source.

5,110,429

METHOD AND ARRANGEMENT FOR DIAGNOSTICS OF FRICTION SYSTEMS OF MOTORS

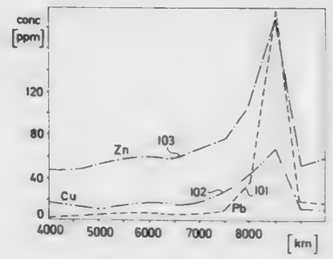
Ladislav Novotny; Robert Kalvoda, both of Prague; Vladimír Novak, and Karel Uher, both of Doksy, all of Czechoslovakia, assignors to JZD Valassko Se Sidlem Ve Vlachovicich, Gottwaldov, Czechoslovakia

Filed Dec. 29, 1989, Ser. No. 458,918

Claims priority, application Czechoslovakia, Dec. 30, 1988, 9111-88; Dec. 30, 1988, 9113-88

Int. Cl.[5] **C25F** *7/00*

U.S. Cl. 204—153.1 **6 Claims**



1. A method for diagnosing friction systems by analyzing lubricant used in said systems, comprising the steps of

taking a sample of used lubricant and transferring metallic microparticles dispersed in the sample into a solution to be analyzed;

turning the solution alkaline;

introducing a pair of electrodes into the solution;

applying a series of voltages across the electrodes in steps;

for each voltage applied across the electrodes, measuring the current passing through the electrodes;

recording voltage and current coordinates;

adding a predetermined amount of triethanolamine to the solution;

repeating the steps of applying voltage and recording current-voltage coordinates;

comparing the recorded coordinates to estimate the concentration of metallic microparticles in the solution.

5,110,430

HIGH MASS ISOTOPE SEPARATION ARRANGEMENT

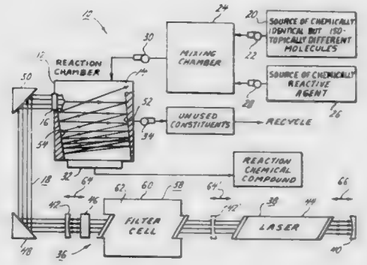
Jozef W. Eerkens, Pacific Palisades, Calif., assignor to Cameco Corporation (Trustee), Saskatoon, Canada

Continuation of Ser. No. 262,661, Jun. 14, 1972, Pat. No. 5,015,348. This application Nov. 28, 1988, Ser. No. 276,848

The portion of the term of this patent subsequent to Jun. 4, 2005, has been disclaimed.

Int. Cl.[5] **B01D** *5/00;* **B01J** *19/08*

U.S. Cl. 204—157.20 **29 Claims**



1. In a process for separating predetermined isotopic mole-

VOL
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cules from a mixture of chemically identical but isotopically different molecules to obtain a concentration of the predetermined isotope wherein the molecules comprising the mixture having a preselected lower rovibrational energy state and a higher rovibrational energy state with photon-inducible transitions between the lower rovibrational energy state and the higher rovibrational energy state and the photon frequency for the photon-inducible transitions between the lower and higher rovibrational energy states of the predetermined isotopic molecules is different from the photon frequency for the photon-inducible transitions between the lower and higher rovibrational energy states of the other chemically identical but isotopically different molecules in the mixture, the improvement comprising the steps of:

supplying the mixture of chemically identical but isotopically different molecules into a reaction chamber at the lower rovibrational energy state, and in a first preselected physicochemical state; and

maintaining the temperature and pressure of the chemically identical but isotopically different molecules at a first preselected temperature and first preselected pressure in the reaction chamber and the value of the first preselected pressure is selected so that the rotational line width of at least one rotational line does not exceed the rotational line spacing in the frequency range of the at least one rotational line in the vibrational absorption band;

supplying a chemically reactive agent into the reaction chamber and the chemically reactive agent chemically combinable with the molecules at the higher rovibrational energy state to produce a chemical compound having atoms of the predetermined isotope in a second physicochemical state different from the first physicochemical state, and the chemically reactive agent unreactive with the molecules at the lower rovibrational energy state;

selectively photon inducing the transitions of the predetermined isotopic molecules from the lower rovibrational energy state to the higher rovibrational energy state to cause a chemical combination with the chemically reactive agent to provide a chemical compound produced having atoms of the predetermined isotope; and

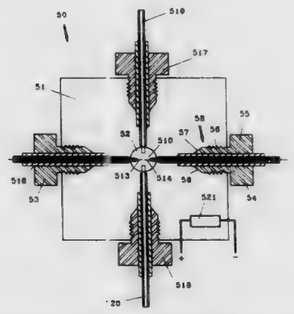
removing the chemical compound from the reaction chamber.

5,110,431

ON-CAPILLARY GAP JUNCTION FOR FLUORESCENCE DETECTION IN CAPILLARY ELECTROPHORESIS

Stephen E. Moring, Sunnyvale, Calif., assignor to Applied Biosystems, Inc., Foster City, Calif.

Filed Feb. 28, 1990, Ser. No. 486,893
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—180.1 **27 Claims**



1. A method of coupling sample liquid from an exit end of a first capillary into an inlet end of a second capillary, said method comprising the steps of:

(a) inserting an exit end of said first capillary into a first end of a first channel extending through a gap junction reactor and attaching this capillary to said gap junction reactor utilizing a first fitting;

(b) inserting the inlet end of said second capillary into a second end of said first channel and attaching this capillary to said gap junction reactor utilizing a second fitting, said first and second fittings each being located such that these fibers are aligned substantially collinearly at the exit end of the first capillary and the inlet end of the second capillary, each of these capillaries being inserted into the reactor to a depth such that an exit end of the first capillary is separated from the inlet end of the second capillary by said gap and these capillaries are nonoverlapping;

(c) producing a flow of sample liquid through the first capillary, across the gap into the second capillary; and

(d) producing a nonzero voltage difference between liquid in an exit end of the first capillary and liquid in an inlet end of the second capillary to produce electric field lines that cross from the exit end of the first capillary to the inlet end of the second capillary, whereby sample component zone broadening during passage across the gap is less than if this voltage difference were zero.

5,110,432

METHOD FOR SEPARATING DISSOLVED SPECIES BY ELECTRODIALYSIS

Daniel A. D. Boateng, Montrose, Canada, assignor to Cominco Ltd., Trail, Canada

Continuation of Ser. No. 338,825, Apr. 17, 1989, abandoned.
This application Oct. 25, 1990, Ser. No. 602,903
Int. Cl.[5] B01D *13/02*
U.S. Cl. 204—182.3 **9 Claims**

1. A method for the separation by electrodialysis of dissolved species in a water-containing solution derived from metallurgical and chemical processing comprising the steps of forming a feed solution, said feed solution comprising:

a) a concentration of at least one species selected from a first group consisting of the elements of groups IA except fracium, IB, IIA, IIB, IIIA except boron, IIIB, IVB VIIB, and VIII except osmium of the periodic table of the elements; the elements vanadium, chromium, tin, lead, and bismuth; and acids of nitrogen, sulfur, fluorine, chlorine, bromine and iodine; and

b) a concentration of at least one species selected from a second group consisting of acids containing an element chosen from the group consisting of boron, carbon, germanium, phosphorus, arsenic, antimony, selenium, tellurium and fluorine; said feed solution having a value of the pH, and species of said second group in said solution having a value of the oxidation state such that said at least one species of said first group is present in said solution substantially in ionized form and said at least one species of said second group is present in said solution substantially in nonionized form; feeding said feed solution to the diluate cells of an electrodialysis unit comprising a multiplicity of alternating suitable cation permselective exchange membranes and suitable anion permselective exchange membranes, said membranes defining alternating diluate and concentrate cells, an anode compartment and a cathode compartment, an anode positioned in the anode compartment and a cathode positioned in the cathode compartment; applying an electrical current between the anode and the cathode providing a current density at a value sufficient to effect said separation while substantially preventing water splitting; passing a flow of diluate through said diluate cells and passing a flow of concentrate through said concentrate cells; passing said flow of diluate through said diluate cells and passing said flow of concentrate through said concentrate cells at a linear velocity sufficient to maintain turbulent flow in said diluate and concentrate cells; passing said ionized species from said diluate in said diluate cells to said concentrate in said concentrate cells through said cation exchange membranes and said anion exchange membranes; substantially leaving said nonionized species in said diluate; withdrawing a diluate from said diluate cells, said diluate containing substantially said at least one species of said second group as present in said feed solution; and withdrawing a concentrate from said concentrate cells, said concentrate containing an increased concentration of said at least one species of said first group.

5,110,433

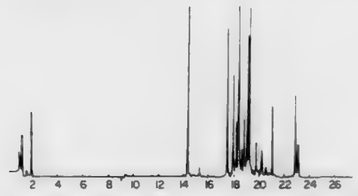
Patent Not Issued For This Number

5,110,434

USE OF ZWITTERIONS TO MOBILIZE ISOELECTRICALLY FOCUSED AMPHOLYTE ZONES

Minge-De Zhu, Berkeley; Roberto Rodriguez, Richmond, and C. Timothy Wehr, Albany, all of Calif., assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed Dec. 20, 1990, Ser. No. 633,646
Int. Cl.[5] C25B *1/00*; **B01D** *57/02*
U.S. Cl. 204—183.2 **11 Claims**



1. A method for the mobilization of zones of ampholyte substances isoelectrically focused in an ampholytic separation medium between an anolyte at a first pH and a catholyte at a second pH higher than said first pH, said method comprising:

(a) introducing into either said anolyte or said catholyte an ampholyte having an isoelectric point between said first and second pH's and defined as a mobilization ampholyte; and

(b) applying a voltage between said anolyte and said catholyte to cause migration of said mobilization ampholyte into said ampholytic separation medium, and maintaining said voltage to form a continuously expanding zone of said mobilization ampholyte in said ampholytic separation medium, thereby displacing each of said isoelectrically focused zones by said expanding zone past a locus of detection.

5,110,435

APPARATUS AND PROCESS FOR PRODUCING A THIN LAYER ON A SUBSTRATE

Helmut Haberland, Laireweg 17a, D-7805 Botzingen, Fed. Rep. of Germany

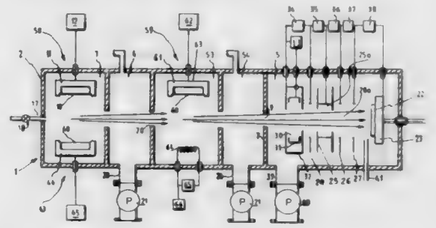
PCT No. PCT/DE89/00179, § 371 Date Sep. 21, 1990, § 102(e) Date Sep. 21, 1990, PCT Pub. No. WO89/09293, PCT Pub. Date Oct. 5, 1989
PCT Filed Mar. 22, 1989, Ser. No. 585,083
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 3809734
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.31 **17 Claims**

1. An apparatus for producing a thin layer of coating material on a substrate, comprising:

a vacuum chamber containing means for holding a substrate, cluster formation means for generating clusters of a coating material, ionization means for ionizing the clusters and acceleration means having at least one electrode for accelerating cluster ions with an electric field along an acceleration path in a direction to the substrate,

wherein the cluster formation means comprises a sputter unit having a sputter target composed of the coating material in solid form for transferring the coating material into a gas phase and means forming an aggregation chamber having means for supplying a gas,

wherein the acceleration means comprises means forming an acceleration chamber separated from the aggregation chamber and in communication with the aggregation chamber via an aperture for receiving he clusters travelling along the acceleration path,



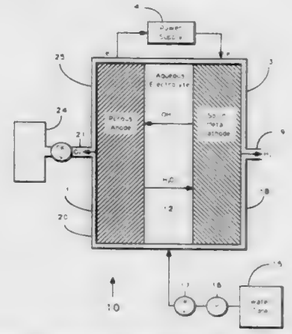
a vacuum pump connected to the acceleration chamber and means for controlling the vacuum pump and the means for supplying gas to set a gas atmosphere in the aggregation chamber to a pressure of at leas 1 Pa to effect formation of the clusters of the coating material based on collisions of the sputtering generated particles with gas atoms.

5,110,436

WATER ELECTROLYSIS

Franz H. Schubert, Chardon, and David J. Grigger, Mayfield Heights, both of Ohio, assignors to The United States of America as represented by the Adminstrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 1, 1991, Ser. No. 648,933
Int. Cl.[5] C25B *1/04*, *1/12*
U.S. Cl. 204—129 **6 Claims**



1. A method of generating elemental oxygen from an aqueous electrolyte cell wherein the method comprises:

(a) forming an electrolysis cell charged with water in the cell wherein the cell has spaced and separated anode and cathode terminals;

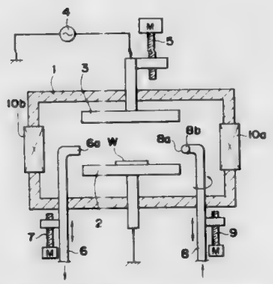
(b) flowing an electric current in the cell between the anode and cathode so that the current flow initiates dissociation of the water into elemental oxygen liberated at the anode thereof;

(c) collecting the oxygen from the cell by delivery of the oxygen through a flow line extending from the anode of the cell;

(d) operating the cell at an elevated pressure wherein the cathode is a solid member capable of withstanding the operating pressure imposed on the cell and further so that elemental hydrogen formed at the cathode is permeably

transmitted across the cathode for removal from the cell; and wherein said cathode is positioned with an external face exposed for hydrogen gas collection in operation.

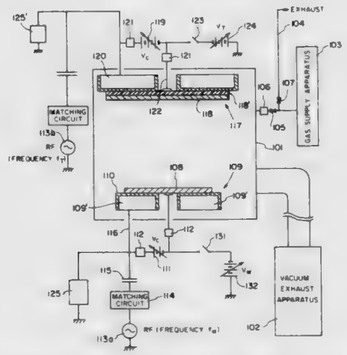
5,110,437
PLASMA PROCESSING APPARATUS
Yuichiro Yamada; Yosinari Matusita, and Yuji Tutui, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 27, 1990, Ser. No. 634,732
Claims priority, application Japan, Dec. 29, 1989, 1-341532
Int. Cl.[5] H05H *1/46*; B01J *19/12*
U.S. Cl. 204—298.33 **5 Claims**



1. A plasma processing apparatus, comprising:
(a) a chamber;
(b) means for evacuating said chamber, said evacuation means comprising a gas evacuation pipe having a gas inlet located within said chamber;
(c) a pair of spaced apart electrodes confronting each other within said chamber;
(d) first lifting means for selectively moving one of said pair of spaced apart electrodes in opposite first and second directions respectively extending toward and away from the other of said pair of spaced apart electrodes;
(e) a high frequency electric power source means, connected to said pair of spaced apart electrodes, for supplying a high frequency electric voltage between said pair of spaced apart electrodes;
(f) means for introducing gas into said chamber, said gas introduction means comprising a gas feed pipe having a gas outlet located within said chamber; and
(g) second lifting means for selectively moving said gas outlet of said gas feed pipe of the gas introduction means in the opposite first and second directions.

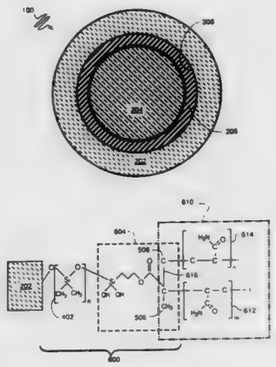
5,110,438
REDUCED PRESSURE SURFACE TREATMENT APPARATUS
Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Aoba-ku, Sendai-shi, Miyagi-ken 980, Japan; Tadashi Shibata, Sendai, and Masaru Umeda, Tokyo, both of Japan, assignors to Tadahiro Ohmi, Miyagi, Japan
PCT No. PCT/JP89/00026, § 371 Date Jul. 10, 1990, § 102(e) Date Jul. 10, 1990
PCT Filed Jan. 12, 1989, Ser. No. 536,548
Claims priority, application Japan, Jan. 13, 1988, 63-5388
Int. Cl.[5] H05H *1/46*; C23F *4/00*
U.S. Cl. 204—298.34 **3 Claims**

1. An apparatus for surface treatment by ions, comprising:
at least one vacuum chamber, an exhaust unit and a gas supply unit connected to said vacuum chamber, a specimen holder for holding a specimen inside said vacuum chamber, a target holder for holding a target inside said vacuum chamber, means for supplying a first electric power of high frequency (f_t) of 150 MHz or greater to said target;



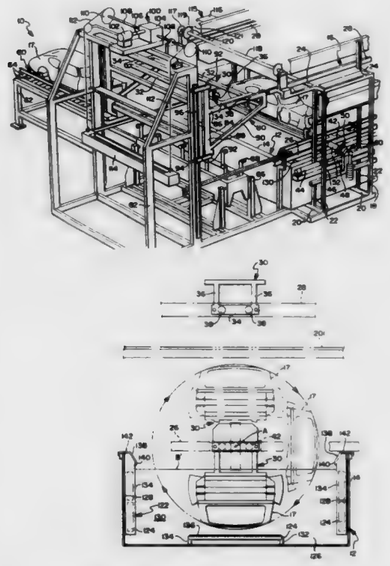
and means for supplying a second electric power of high frequency (f_w) lower than said first electric power of high frequency (f_t) to said specimen holder.

5,110,439
CAPILLARY GEL COLUMN WITH POLYORGANOSILOXANE COUPLING LAYER
Robert R. Holloway, Montara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Aug. 30, 1991, Ser. No. 752,709
Int. Cl.[5] G01N *27/26*; B01D *57/02*
U.S. Cl. 204—299 R **8 Claims**



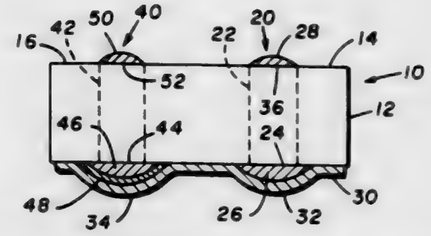
1. A capillary column for polyacrylamide gel electrophoresis, said column comprising:
a glass capillary tube having an inner wall;
a polyacrylamide gel matrix within said tube; and
a polyorganosiloxane layer radially between said inner wall and said matrix, said polyorganosiloxane layer being covalently bound to said inner wall and to said gel matrix so that said gel matrix is attached to said tube via unbroken series of covalent bonds, each of said series including in excess of 1000 Si—O bonds.

5,110,440
ROLL IMMERSION SYSTEM
Leo L. Case, Troy, Mich., assignor to Elcoat Systems, Inc., Warren, Mich.
Filed Feb. 16, 1988, Ser. No. 156,204
Int. Cl.[5] C25D *17/00*; B65G *49/02*; B05C *3/02*
U.S. Cl. 204—300 EC **27 Claims**



1. In a processing apparatus for surface treatment of vehicle bodies or the like, support means, a process tank assembly inside the support means comprising a plurality of process tanks adapted to have treatment liquids for said surface treatment therein, means on the support means defining a first level for treatment of bodies processed by the apparatus, means on the support means defining a second level located vertically above and parallel to the first level, carrier means on the support means movable on the first level above said process tanks for supporting a body to be processed above said tanks and movable with the body along said tanks to carry said body along said first level from one tank to the next, indexing means on the support means and operatively connected to the carrier means for moving the carrier means on said first level along said tanks, rotating means on the support means at each tank and operatively connected to the carrier means for selectively rotating the carrier means and a body on the carrier means between an upright position above the liquid level of the tank and an inverted position wherein the body is completely below the liquid level of such tank, said carrier means being positioned substantially entirely above said liquid level when said body is completely below such liquid level, said carrier means having an axis of rotation above the liquid level of said tank, said support means having a first end for the loading of bodies into the apparatus and a second end opposite to the first for the discharge of bodies treated in the apparatus, said apparatus including loading means at said first end for loading the body into the apparatus and upon said carrier means, said apparatus including a carrier return means on said support means located on said second level, and elevator means on said support means at the first and second end thereof for moving the carrier means vertically between said first and second levels.

5,110,441
SOLID STATE PH SENSOR
Patrick J. Kinlen, Fenton, and Hilliard L. Williams, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.
Filed Dec. 14, 1989, Ser. No. 450,783
Int. Cl.[5] G01N *27/30*
U.S. Cl. 204—418 **8 Claims**



1. A solid state pH sensor for pH sensing equipment, said pH sensor comprising:
(a) an indicator electrode, said indicator electrode comprising
(1) a first electrically conductive conductor imbedded in a first electrically non-conductive substrate, said first electrically conductive conductor having a first electrically conductive conductor exposed portion,
(2) a metal/metal oxide coating on said first electrically conductive conductor exposed portion, such that said metal/metal oxide coating entirely covers said first electrically conductive conductor exposed portion,
(3) a first annealed perfluorocarbon copolymer coating on said metal/metal oxide coating, such that said first annealed perfluorocarbon copolymer coating entirely covers said metal/metal oxide coating, and
(4) an indicator contact zone electrically connected to said first electrically conductive conductor, wherein said indicator contact zone is utilized in making electrical contact between said first electrically conductive conductor and said pH sensing equipment; and
(b) a reference electrode, said reference electrode comprising
(1) a second electrically conductive conductor imbedded in a second electrically non-conductive substrate, said second electrically conductive conductor having a second electrically conductive conductor exposed portion,
(2) a metal/metal salt coating on said second electrically conductive conductor exposed portion, such that said metal/metal salt coating entirely covers said second electrically conductive conductor exposed portion,
(3) an immobilized electrolyte coating on said metal/metal salt coating, such that said immobilized electrolyte coating entirely covers said metal/metal salt coating,
(4) a second annealed perfluorocarbon copolymer coating on said immobilized electrolyte coating, such that said second annealed perfluorocarbon copolymer coating entirely covers said immobilized electrolyte coating, and
(5) a reference contact zone electrically connected to said second electrically conductive conductor, wherein said reference contact zone is utilized in making electrical contact between said second electrically conductive conductor and said pH sensing equipment;
(c) wherein said indicator and reference electrodes are electrically insulated from each other.

VOL 1138 ISS 1 MY 5 1992 UMI

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REINFORCED ELECTROLYTE FUNCTION ELEMENTS

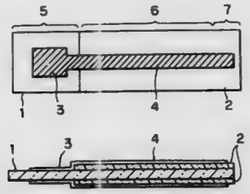
Takao Kojima; Hiroyuki Ishiguro; Yoshiki Kawachi, and Tetsusyo Yamada, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 947,821, Dec. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 749,467, Jun. 27, 1985, abandoned, and a continuation-in-part of Ser. No. 749,457, Jun. 27, 1985, abandoned. This application Mar. 6, 1989, Ser. No. 319,043

Claims priority, application Japan, Jun. 27, 1984, 59-130937; Jun. 27, 1984, 59-130938; Aug. 21, 1984, 59-172352

Int. Cl.[5] G01N *27/409*

U.S. Cl. 204—426 14 Claims



1. A zirconia-base solid electrolyte function element comprising a zirconia-base solid electrolyte substrate, the substrate including at its free end an electrochemically operable portion provided with an electrode on each side of the substrate, another portion to be retained, and an arm portion defined by an intermediate portion between the free end and said another portion, wherein a reinforcing layer is formed directly on each side of said zirconia-base solid electrolyte substrate, the reinforcing layers extending at least from said arm portion to said another portion to be retained, the ratio of the shrinkage modulus of the zirconia-base electrolyte substrate to the reinforcing layers being 1.02 to 1.08, the thickness ratio of each of said reinforcing layers to said zirconia-base solid electrolyte substrate is 1/100 to 25/100, and the substrate and reinforcing layers having been sintered simultaneously.

5,110,443

CONVERTING HEAVY HYDROCARBONS INTO LIGHTER HYDROCARBONS USING ULTRASONIC REACTOR

Armand A. Gregoli, Tulsa, Okla.; Andrew M. Olah, Spencer, Ohio; John A. Hamshar, Owasso, and Daniel P. Rimmer, Broken Arrow, both of Okla., assignors to Canadian Occidental Petroleum Ltd., Calgary, Canada

Continuation of Ser. No. 311,133, Feb. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 218,840, Jul. 14, 1988, Pat. No. 5,000,872, which is a continuation-in-part of Ser. No. 114,204, Oct. 27, 1987, Pat. No. 4,978,365, which is a continuation-in-part of Ser. No. 934,683, Nov. 24, 1986, Pat. No. 4,725,287. This application Apr. 18, 1989, Ser. No. 340,169

Int. Cl.[5] C10G *15/08*

U.S. Cl. 208—46 18 Claims

1. A process for converting hydrocarbons and crudes into lighter hydrocarbon products comprising the steps of:

(a) providing a hydrocarbon;

(b) preparing an oil-in-aqueous phase emulsion containing the hydrocarbon; said preparing comprises:

(i) admixing water droplets with a catalyst;

(ii) surrounding the water droplets containing the catalyst with droplets of the hydrocarbon;

(iii) forming the oil-in-aqueous phase emulsion containing a multilamellar vesicle with the hydrocarbon droplets of step (ii) surrounded by the water droplets; and

(c) feeding the oil-in-aqueous phase emulsion into an ultrasonic reactor for converting the hydrocarbon in the oil-in-aqueous phase emulsion into a lighter hydrocarbon product and to form residual oil-in-aqueous phase emulsion containing the lighter hydrocarbon product, the hydrocarbon, and gaseous reaction products.

5,110,444

MULTI-STAGE HYDRODESULFURIZATION AND HYDROGENATION PROCESS FOR DISTILLATE HYDROCARBONS

Edward C. Haun, Glendale Heights; Gregory J. Thompson, Waukegan, and Jayant K. Gorawara, Mundelein, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Aug. 3, 1990, Ser. No. 562,365

Int. Cl.[5] C10G *45/00*

U.S. Cl. 208—89 17 Claims

1. A hydrotreating process which comprises the steps:

a) passing a stream of middle distillate charge stock serially through at least three reaction zones, the three reaction zones comprising a first catalytic reaction zone containing a fixed bed of solid desulfurization catalyst comprising a non-noble metal active component chosen from the group comprising cobalt, molybdenum, nickel and tungsten, and a second and third catalytic reaction zone each containing a fixed bed of hydrogenation catalyst comprising a platinum group active component;

b) separating the effluent of the first and second reaction zones into liquid and vapor fractions, and stripping the liquid fraction with hydrogen in respective first and second stripping zones to produce first and second stripping zone gas streams;

c) removing hydrogen sulfide from the first stripping zone net gas stream;

d) passing the first stripping zone net gas stream into the third reaction zone, passing the second stripping zone net gas stream into the first reaction zone, and passing hydrogen recovered from the effluent of the third reaction zone into the second reaction zone; and,

e) recovering a low aromatic hydrocarbon content product stream from the effluent of the third reaction zone.

5,110,445

LUBRICANT PRODUCTION PROCESS

Nai Y. Chen, Titusville, and Randall D. Partridge, West Trenton, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jun. 28, 1990, Ser. No. 545,162

Int. Cl.[5] C10G *55/06*

U.S. Cl. 208—96 14 Claims

1. A process for producing a hydrocarbon lubricant, which comprises:

(i) hydroisomerizing a waxy lube feed by contact in the presence of hydrogen with a zeolite beta hydroisomerization catalyst,

(ii) extracting aromatics from the hydroisomerized feed with a solvent which is selective for aromatics,

(iii) dewaxing the extracted, hydroisomerized feed to lower its pour point and form a dewaxed lube product,

(iv) hydrofinishing the dewaxed product.

5,110,446

INTEGRATED PRODUCTS SEPARATION FROM FLUID CATALYTIC CRACKING AND AROMATIZATION PROCESSES

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 310,487, Feb. 14, 1989, abandoned, which is a continuation of Ser. No. 122,726, Nov. 18, 1987, abandoned. This application Sep. 7, 1990, Ser. No. 579,417

Int. Cl.[5] C10G *57/00*

U.S. Cl. 208—100 12 Claims

1. A method for improving the gasoline product yield in a catalytic cracking process comprising the steps of:

(a) catalytically cracking a hydrocarbon feedstock containing gas oil or heavier fractions to a cracked product stream containing distillate, gasoline, lighter boiling range hydrocarbon fractions, and H_2S, CO_2, or both H_2S and CO_2;

(b) providing a product fractionation section for separating and recovering gasoline and lighter components from said product stream, said product fractionation section including a primary cracked product separation zone, a multistage compressor, and a central debutanizer separator;

(c) flowing a stream containing cracked gasoline and lighter boiling hydrocarbons withdrawn from an upper section of said primary cracked product separation zone to a first accumulation zone to provide a vapor stream enriched in C_4-cracked hydrocarbons containing H_2S, CO_2, or both H_2S and CO_2, and a liquid stream enriched in C_5+hydrocarbons;

(d) compressing said vapor stream of step (c) in a first stage of said multistage compressor of step (b) to evolve a deacidification charge stream;

(e) deacidifying said deacidification charge stream of step (d) by countercurrently contacting said vapor deacidification charge stream in a first sorption zone with an acid sorbent whereby said acid sorbent becomes enriched in H_2S, CO_2, or both H_2S and CO_2;

(f) withdrawing a deacidified stream enriched in C_4-cracked hydrocarbons from said first sorption zone and flowing said deacidified stream to a second accumulation zone;

(g) contacting a deacidified vapor stream withdrawn from said second accumulation zone of step (f) with a catalyst comprising a zeolite under conversion conditions to convert C_4-cracked hydrocarbon products to a reactor effluent stream containing gasoline boiling range constituents including aromatics;

(h) cooling and at least partially condensing said reactor effluent stream and flowing said cooled reactor effluent stream to a third accumulation zone;

(i) compressing a vapor stream withdrawn from said third accumulation zone in a second stage of said multistage compressor of step (b);

(j) cooling said second stage compressor effluent of step (i) to at least partially condense said second stage compressor effluent;

(k) flowing said at least partially condensed second stage compressor effluent to a fourth accumulation zone to separate said at least partially condensed second stage compressor effluent into a vapor stream enriched in C_3-components and a liquid stream containing C_4+components;

(l) charging liquid product streams from said first accumulation zone, said second accumulation zone, said third accumulation zone, and said fourth accumulation zone to said central debutanizer separator to separate said liquid product streams into a central debutanizer overhead stream enriched in C_4-components and a bottom stream enriched in C_5+gasoline boiling range components; and

(m) flowing a portion of said central debutanizer bottom stream to a second sorption zone to countercurrently sorb and remove C_3+components from said fourth accumulation zone overhead stream of step (l) and recycling said sorbed C_3+components to said fourth accumulation zone.

5,110,447

PROCESS AND APPARATUS FOR PARTIAL UPGRADING OF A HEAVY OIL FEEDSTOCK

William A. MacWilliams, and William Eadie, both of Edmonton, Canada, assignors to Kasten, Eadie Technology Ltd., Edmonton, Canada

Filed Sep. 12, 1988, Ser. No. 242,535

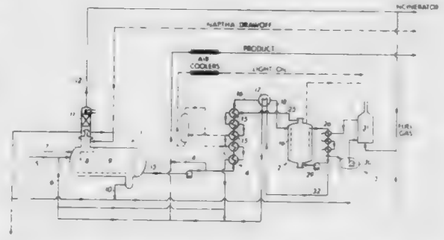
Int. Cl.[5] C10G *9/00*

U.S. Cl. 208—106 11 Claims

1. A process for visbreaking heavy oil, which is substantially free of water and solids, in a closed upstanding flash separator, said separator having an upstanding tubular member mounted therein and extending longitudinally thereof, said tubular member being spaced inwardly from the separator's side wall and terminating short of the separator's top and bottom ends, whereby the separator provides a central open-ended soak chamber, an outer open-ended annular chamber that is coextensive with the soak chamber and encircles it, and flash and quench chambers at the upper and lower ends respectively of the soak and annular chambers, said flash and quench chambers each communicating with both the soak and annular chambers, said process comprising:

(a) feeding a stream of heavy oil into the top end of the annular chamber, said heavy oil having an elevated temperature that is in the range of about 220° F. to about 600° F.;

(b) feeding a recycle stream, comprising a mixture of visbroken residuum and heavy oil and having a temperature in the range of about 750° F. to about 800° F., into the top end of the soak chamber;



(c) removing light hydrocarbons flashed from the heavy oil and the recycled mixture streams in the form of an overhead vapour stream;

(d) passing the heavy oil and the recycled mixture streams separately and co-currently down through the annular and soak chambers respectively, so that the liquid in the soak chamber immediately adjacent the tubular member wall surface is cooled by heat exchange, through the wall of the tubular member, with the liquid moving through the annular chamber;

(e) commingling the liquids, issuing from the bottom ends of the annular and soak chambers, in the quench chamber, to quench the visbreaking reaction;

(f) withdrawing a product mixture of visbroken residuum and heavy oil at a controlled rate from the quench chamber; and

(g) recycling part of the product mixture and heating it to 750°–800° F., to provide the recycle stream of step (b).

5,110,448

COKING PROCESS

Stephen P. Adams, 4272 Holly Hill Ct., Lake Charles, La. 70605, and William R. Morrison, 11000 Gatesden, Apt. 207, Tomball, Tex. 77375

Filed Mar. 12, 1991, Ser. No. 668,006

Int. Cl.[5] C10G *9/14*

U.S. Cl. 208—131 14 Claims

1. In a delayed coking process in which a hydrocarbon feedstock is converted to coke in a coker drum and coke is thereafter removed from the coking drum using an aqueous stream the steps comprising:

removing a coker water stream comprising water and hydrocarbon from coking drum;

introducing into the coker water stream a composition effective for separating the water and hydrocarbon of the coker water stream and producing a hydrocarbon enriched phase substantially free of said composition and an aqueous phase substantially free of hydrocarbon and containing substantially all of said composition, the composi-

tion being introduced into the coker water stream at an effective non-composition decomposing temperature;
returning a stream of the hydrocarbon enriched phase to the delayed coking process in hydrocarbon feedstock thereto; and
removing a stream of the aqueous phase and returning it to coking drum.

5,110,449

OXYGEN ADDITION TO A COKING ZONE AND SLUDGE ADDITION WITH OXYGEN ADDITION

Dean G. Venardos, Batavia, and Shri K. Goyal, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 285,110, Dec. 15, 1988, Pat. No. 5,041,207, which is a continuation-in-part of Ser. No. 937,990, Dec. 4, 1986, abandoned. This application Jun. 18, 1991, Ser. No. 716,790

Int. Cl.[5] C10G *9/14, 11/00*

U.S. Cl. 208—131 **43 Claims**

1. A coking process wherein a sludge material is passed into a coking zone and a heavy hydrocarbon feed comprising residual oil is also passed into a coking zone at coking conditions, to effect production of solid coke and lighter hydrocarbon products derived from the feed which comprises: (1) contacting feed, liquid derived from the feed, or vapor derived from the feed with oxygen at oxidation conditions to effect oxidation of a portion of the feed, liquid derived from the feed, or vapor derived from the feed, (2) contacting the sludge with oxygen to form a mixture, and (3) passing the mixture into the coking zone during the coke production cycle at thermal treatment conditions to contact at least a portion of the feed, liquid derived from the feed, or vapor derived from the feed.

5,110,450

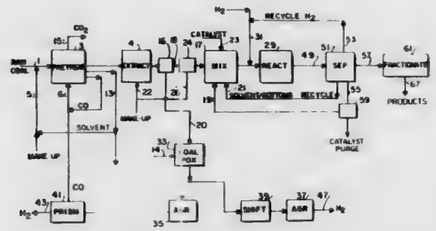
COAL EXTRACT HYDROCONVERSION PROCESS COMPRISING SOLVENT ENHANCED CARBON MONOXIDE PRETREATMENT

Claude C. Culross, and Steve D. Reynolds, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 21, 1989, Ser. No. 455,653

Int. Cl.[5] C10G *1/02*

U.S. Cl. 208—413 **17 Claims**



1. A process for hydroconverting coal to produce a hydrocarbonaceous liquid, which comprises:
(a) in a pretreatment zone, forming a slurry of water-containing coal in an organic solvent, wherein the ratio of water-to-dry coal at conditions is below 0.5:1 and the ratio of organic solvent-to-dry coal is 4:1 to 1:1, and subjecting the slurry to an effective amount of carbon monoxide at a temperature in the range of 550°–700° F. and an elevated pressure to cause depolymerization and hydrogenation of the coal thereby increasing the coal's solubility in the solvent and to extract a portion of the coal into the organic solvent;
(b) separating the pretreated coal slurry into two phases, an organic solvent phase comprising a substantial amount of soluble hydrocarbonaceous materials extracted from the coal, and a second solid residue phase comprising substantially all of the inorganic ash from the coal;
(c) forming an essentially ashless mixture comprising said extract and a catalyst, wherein the catalyst is comprised of dispersed particles of a sulfided metal containing compound, said metal being selected from the group consisting of Groups VA, VIA, VIIA and VIIIA of the Periodic Table of the Elements and mixtures thereof;
(d) reacting the essentially ashless mixture of coal extract and catalyst with a hydrogen-containing gas under coal hydroconversion conditions, in a hydroconversion zone to obtain a hydrocarbonaceous liquid; and
(e) hydrotreating at least an portion of the hydrocarbonaceous liquid from step (d) to produce an upgraded product.

5,110,451

COAL EXTRACTION PROCESS

Michael A. Jones, Gloucester, England, assignor to Coal Industry (Patents) Limited, United Kingdom

Continuation of Ser. No. 344,499, Apr. 27, 1989, abandoned, which is a continuation of Ser. No. 75,730, Jul. 20, 1987, abandoned. This application Jan. 16, 1991, Ser. No. 641,791

Claims priority, application Japan, Aug. 22, 1986, 8620460

Int. Cl.[5] C10G *1/06*

U.S. Cl. 208—421 **6 Claims**

1. A coal liquefaction process in an ebullating bed reactor, comprising extracting a coal with a liquid hydrogen donor solvent at elevated temperature and pressure, catalytically hydrocracking at least a portion of the extract and partially hydrogenating the solvent at the same time and in the same reactor by employing a hydrocracking/hydrogenation catalyst, and recycling as solvent a fraction of the reactor product, using as the hydrocracking/hydrogenation catalyst a mixture comprising from 5 to 20% by volume of a first component which is composed of tungsten or molybdenum sulphide in combination with a nickel or cobalt, said first component being on a support, said nickel or cobalt promoting said first component's activity and a second component which consists of tungsten or molybdenum sulphide on a support, said second component being present in an amount of from 95% to 80% by volume based on the total volume of the catalyst mixture, whereby there are obtained increased product yields combined with reduced formation of naphthenes, said reduced formation of naphthenes being dependent on the volume ratio of the components in the catalyst mixture which is adjusted to give a specified ratio of hydrocracking the coal extract to hydrogenation of the solvent.

5,110,452

METHOD OF REFINING COAL BY CATALYZED SHORT RESIDENCE TIME HYDRODISPROPORTIONATION TO FORM A NOVEL COAL-DERIVED FUEL SYSTEM

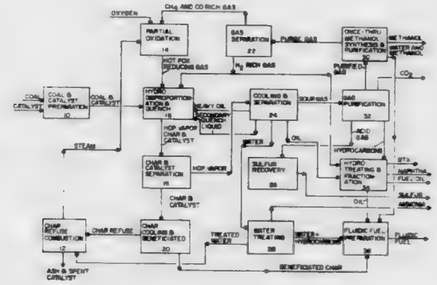
Lee G. Meyer, and Gerald F. Cavaliere, both of Englewood, Colo., assignors to Carbon Fuels Corporation, Englewood, Colo.

Continuation-in-part of Ser. No. 355,528, May 23, 1989, Pat. No. 5,021,148, and a continuation-in-part of Ser. No. 277,603, Nov. 28, 1988, Pat. No. 4,938,782, and a continuation-in-part of Ser. No. 84,270, Aug. 11, 1987, Pat. No. 4,787,915, and a continuation-in-part of Ser. No. 59,288, Jun. 8, 1987, Pat. No. 4,832,831. This application May 14, 1990, Ser. No. 522,933

Int. Cl.[5] C10G *1/00*

U.S. Cl. 208—423 **24 Claims**

1. An improved catalytic method for refining a volatile containing carbonaceous material, which method comprises the steps of:
(a) heating a particulate, volatile containing carbonaceous material in the presence of a catalyst selected from the group consisting of iron-based, zinc-based, potassium-based, sodium-based, and calcium-based catalysts at a heat rate sufficient to maximize decomposition and minimize formation of char and condensation products to a volatilization temperature effective to produce a substantially decomposed volatilization product: and
(b) contacting said substantially decomposed volatilization



product with a hydrogen donor-rich gaseous atmosphere at a hydrogenation temperature effective to minimize formation of condensation products and reduce thermal cracking for a hydrogenation residence time effective to produce a hydrogenated volatilization product.

5,110,453

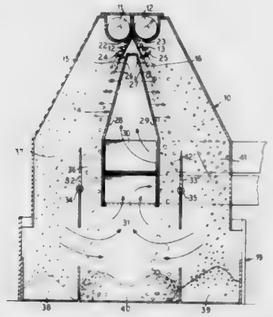
SPLIT FEED REJECT CLAIMER

James R. Montgomery, Portland, Oreg., assignor to Beloit Corporation, Beloit, Wis.

Filed Aug. 22, 1990, Ser. No. 571,048

Int. Cl.[5] B07B *4/04, 11/06*

U.S. Cl. 209—135 **11 Claims**



1. A mechanism for separating rejected material from acceptable fibers for papermaking comprising in combination:
means for delivering a flow of fibers with mixed reject material and releasing the flow to descend gravitationally downward in at least two separate descending streams;
adjustment means for controlling the downward angle of release of said streams,
and lateral air flow delivery means directing flows of air laterally across each of said streams so that heavier reject material falls through the air flow and fibers are carried laterally outwardly of each stream to deposit downwardly in flows of acceptable fibers, said lateral air flow delivery means including a central plenum chamber between separate descending streams, with a plurality of air flow nozzles laterally of the chamber to direct a plurality of streams of air laterally across the streams of fibers.

5,110,454

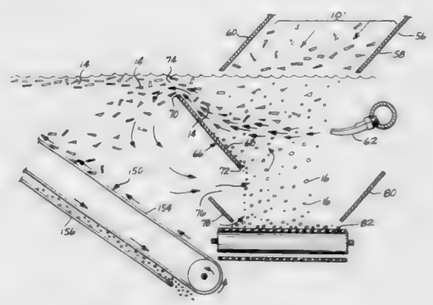
APPARATUS FOR RECLAIMING GRAVEL, SOIL PARTICLES AND WOOD PIECES FROM A MIXTURE OF THE SAME

Jim L. Parker, Bothell, and Dave Forman, Seattle, both of Wash., assignors to Recovery Systems Technology, Inc., Bothell, Wash.

Filed Jan. 19, 1988, Ser. No. 145,230

Int. Cl.[5] B03B *5/28, 5/66*

U.S. Cl. 209—155 **31 Claims**



1. A material separator for separating a mixture of buoyant and nonbuoyant wood pieces, rocks and soil particles into its component parts, comprising:
a water tank having a bottom, sidewalls and an open top, said tank when in use containing a body of water having a water surface;
a rock conveyor having a rock receiving portion in said tank spaced above the bottom and below the surface of the body of water, said rock conveyor extending from the rock receiving portion upwardly and outwardly from said tank to a discharge end located outside of the tank;
delivery means for delivering into said tank, at a location generally above the rock receiving portion of the rock conveyor, a mixture of rock, soil particles and wood pieces;
a wood-piece conveyor having a wood-piece receiving portion in said tank located laterally adjacent the rock receiving portion of the rock conveyor, said wood-piece conveyor extending from said wood-piece receiving portion upwardly and outwardly from the tank to a discharge end located outside of the tank;
means in said tank, below the water surface, for causing a flow pattern in the water for moving both buoyant and nonbuoyant wood-pieces out from said mixture and influencing them towards and onto the wood-piece receiving portion of the wood-piece conveyor, while allowing rocks to drop downwardly through said water onto the rock receiving portion of the rock conveyor, said means in said tank comprising water jet means directed to discharge water streams towards said wood piece conveyor and a baffle in said water spaced horizontally from the water jet means in a direction towards which the water streams extend, said baffle sloping downwardly towards said water jet means, and said delivery means being positioned to deliver the mixture into the water at a location which is horizontally between the water jet means and said baffle, and the vertical position of the baffle is such that the wood pieces in the water move over the baffle on their way to the wood-piece conveyor, said baffle including a lower boundary spaced above the rock receiving portion of the rock conveyor, so that a water passage exists between the baffle and the rock receiving portion;
means for influencing soil particles from the mixture to settle at a bottom location in said tank; and
a mud conveyor extending from said bottom location up-

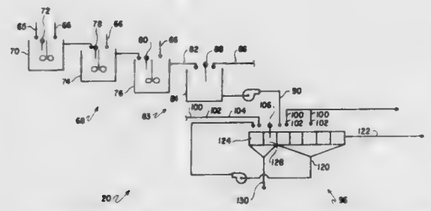
wardly and outwardly from the tank to a discharge end located outside of the tank.

5,110,455

METHOD FOR ACHIEVING ENHANCED COPPER FLOTATION CONCENTRATE GRADE BY OXIDATION AND FLOTATION

Richard O. Huch, Tucson, Ariz., assignor to Cyprus Minerals Company, Englewood, Colo.

Filed Dec. 13, 1990, Ser. No. 626,825
Int. Cl.[5] B03D *1/002, 1/018, 1/02, 1/06*
U.S. Cl. 209—167 **20 Claims**



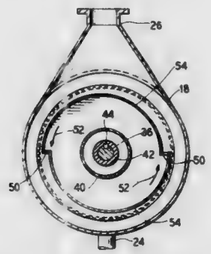
1. A method for recovering copper sulfide from a slurry containing copper sulfide and copper rimmed iron sulfide, comprising:
(a) conditioning said slurry with an effective amount of oxidizing agent to render the copper rimmed iron sulfide separable from the copper sulfide;
(b) conditioning the oxidizing agent conditioned slurry with a base to obtain a pH above about pH 9; and
(c) subjecting the slurry having a pH above about pH 9 to a flotation process to recover a copper sulfide concentrate.

5,110,456

HIGH CONSISTENCY PRESSURE SCREEN AND METHOD OF SEPARATING ACCEPTS AND REJECTS

Peter E. LeBlanc, Worthington, Mass., assignor to Beloit Corporation, Beloit, Wis.

Division of Ser. No. 363,668, Jun. 8, 1989, Pat. No. 4,981,583, which is a division of Ser. No. 746,734, Jun. 20, 1985, Pat. No. 4,855,038. This application Oct. 22, 1990, Ser. No. 602,436
The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.
Int. Cl.[5] B01D *29/38*
U.S. Cl. 209—273 **2 Claims**



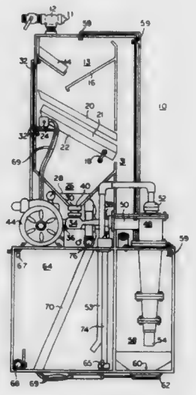
1. In a pressure screen apparatus of the type having:
a generally cylindrical hollow housing including sidewall means, an end wall having an opening therein, an inlet for receiving a flow of paper stock slurry located adjacent one end of said housing, an accepts outlet centrally located in said sidewall means, and a rejects outlet adjacent the other end of said housing;
drive means including a rotatable drive shaft extending through said opening and sealed to said housing;
a pair of spaced rings connected to the inner surface of said housing on each side of said accepts outlet between said inlet and said rejects outlet;
a cylindrical profile screen connected to said rings to isolate said accepts outlet from said inlet; and
a rotor connected to said drive shaft and located within said screen, the improvement comprising:
said rotor comprising a profiled surface including means for generating substantial turbulence, fluidization and high velocity of slurry moving along the screen and means for creating a stock and screen-cleaning substantially continuous pulsation cycle wherein approximately equal periods of positive and negative pulses are created in the accepts direction of flow while substantially eliminating any periods wherein stock near said screen experiences no pulse.

5,110,457

ORE SAMPLE AND WATER RECOVERY APPARATUS AND METHOD THEREFOR

Randy Krawl, 2813 N. 29th St., Boise, Id. 83703, and Matt Stramel, 965 Highland, Elko, Nev. 89801

Filed Nov. 1, 1989, Ser. No. 430,720
Int. Cl.[5] B01D *21/26*
U.S. Cl. 210—787 **14 Claims**



1. A method for preparing an ore sample and recovering water from a drilling rig which comprises the steps of:
separating large ore particles from wet ore by sieving and directing the large particles directly into a sample tank;
infusing the sieved wet ore into a hydraulic carrier medium of water;
extracting the water from the wet ore using a cyclone separator;
directing the extracted water into a storage tank;
directing the ore from the cyclone separator to the sample tank;
removing all of the ore from the sample tank; and
cleaning any remaining residue from the sample tank.

5,110,458

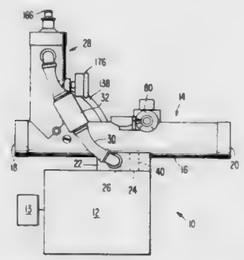
MIXER AND FLUID FILTERING UNIT

Valentine Hechler, IV, 26 Meadowview Dr., Northfield, Ill. 60093, and Edward A. Schwall, 1632 Oakwood Rd., Northbrook, Ill. 60093

Filed Mar. 29, 1991, Ser. No. 679,686
Int. Cl.[5] B01D *35/027*
U.S. Cl. 210—90 **20 Claims**

1. A mixer and fluid filtering unit connectable to a source of a first fluid under pressure and a source of a second fluid and

operative to filter a small proportion of the first fluid received thereby while mixing the remainder of said first fluid with said second fluid in a predetermined ratio and maintaining said predetermined ratio regardless of pressure changes in said first fluid comprising:
body means having a first fluid inlet means to receive said first fluid under pressure, a second fluid inlet means to receive said second fluid and a mixed fluid outlet means spaced from said first fluid inlet means, said body means operating to conduct fluid flowing from said first fluid inlet means to said mixed fluid outlet means, motive fluid



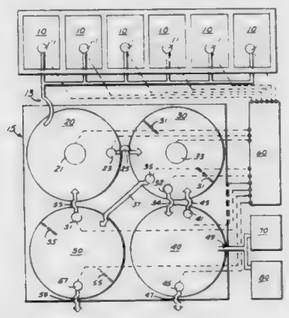
filtering means provided adjacent to said first fluid inlet means, and operating to separate a portion of the first fluid, said motive fluid filtering means including a filter means for filtering the separate portion of said first fluid and sensing means to sense the condition of said filter means,
and ratio valve means mounted within said body means between said first fluid inlet means and said mixed fluid outlet means, said ratio valve means being connected to receive said second fluid from said second fluid inlet means and operating in response to the fluid pressure of said first fluid to mix said second fluid with said first fluid.

5,110,459

SEPTAGE ANAEROBIC TREATMENT BATCH PROCESSING

Richard C. Baxter, Moline, Mich., assignor to B & B W/W, Inc., Moline, Mich.

Filed Aug. 3, 1990, Ser. No. 562,593
Int. Cl.[5] B01D *21/30;* **C02F** *3/30*
U.S. Cl. 210—143 **21 Claims**



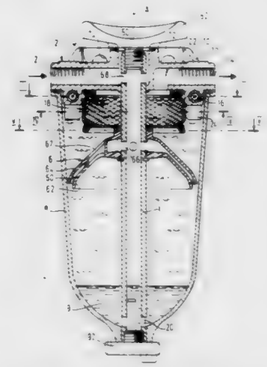
1. A waste treatment facility comprising:
a waste pretreatment cell for receiving waste into said facility and for pretreating said waste by blending solid and liquid components of the waste together and by dilution with treated liquid effluent;
a waste treatment cell for receiving pretreated waste from said waste pretreatment cell and for aerobic treatment of the waste after pretreatment in said waste pretreatment cell;
a sludge digester cell for receiving sludge from said treatment cell for anaerobic treatment of said sludge and for collecting gaseous by-products;
a plurality of transfer means in fluid communication with said cells for transferring the contents of said cells; and
control means for controlling the operation of said facility.

5,110,460

CENTRIFUGAL SEPARATOR FOR A LIQUID CAPABLE OF WAXING, IN PARTICULAR FOR DIESEL OIL

François Gilas, La Chapelle Rablais, France, assignor to GEC Alsthom SA, Paris, France

Filed Jun. 21, 1990, Ser. No. 541,643
Claims priority, application France, Jun. 21, 1989, 89 08283
Int. Cl.[5] B01D *21/30, 35/18*
U.S. Cl. 210—149 **8 Claims**



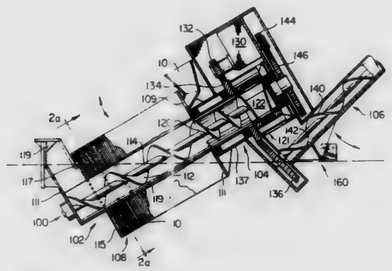
1. A separator for a liquid capable of waxing under the effect of low temperature, in particular for diesel fuel, the separator comprising:
a vertically upright separation bowl (**8**) having a vertical axis (A) and a bowl opening around said axis;
a lid (**12**) closing said bowl opening, said lid being constituted at least in part by a heat-conducting material and having an inside face adjacent to said separation bowl and an opposite outside face;
an annular filtering wall (**19**) extending around the said axis inside said separation bowl, said wall being carried by said lid from said inside face thereof;
a separator inlet (**2**) for receiving said liquid, said inlet conveying said liquid in the direction of an upstream face of said filtering wall;
a separator outlet (**14**) for receiving said liquid after it has passed through said filtering wall to face a downstream face thereof; and
a heater element (**16**) in thermal contact with said lid for heating said liquid;
the improvement wherein said lid (**12**) includes a heat-conveying extension of said lid (**12**), projecting from said inside face thereof, facing and in the proximity of said upstream face of said filtering wall (**18**) to prevent said wall from being blocked by said elements of said liquid capable of waxing said heat-conveying extension comprises a plurality of fins (**24**) extending radially and axially and being angularly spaced around said axis (A).

5,110,461

APPARATUS FOR SEPARATING LIQUIDS AND SOLIDS

Gunther Abel, 210-11673-7th Ave., Richmond, British Columbia, Canada V7E 4X3

Filed Sep. 5, 1990, Ser. No. 577,556
Int. Cl.[5] B01D *33/06, 33/76*
U.S. Cl. 210—158 **17 Claims**



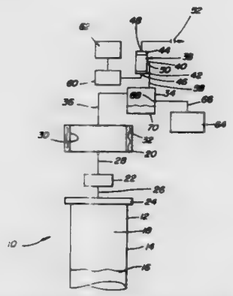
1. Apparatus for separating solids and liquids, comprising:
separator screen means for receiving and separating the solids and liquids;
said separator means comprising a curved screen;
first conveyor means for feeding the separated solids upwardly from said separator screen means extending at a first inclination through said separator screen means;
compactor means for receiving the solids from said conveyor means and compacting the solids;
cutter means for cutting the compacted solids into pieces;
and wherein a second conveyor means for receiving and conveying the cut pieces from said compactor means extends further upwardly and at a greater inclination than said first conveyor means.

5,110,462

CONDENSER/MEMBRANE PERMEATER

John A. Taylor, Pinckney, Mich., assignor to Separation Dynamics, Inc., Southfield, Mich.

Division of Ser. No. 443,335, Nov. 30, 1989. This application Jul. 25, 1991, Ser. No. 735,865
Int. Cl.[5] B01D *53/22*
U.S. Cl. 210—180 **12 Claims**



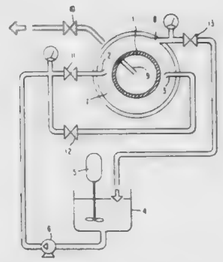
1. An apparatus (10,10') for removing volatiles from a liquid (16), said apparatus (10,10') comprising: container means for containing the liquid (16) including volatiles therein, said container means (12) defining a gaseous atmospheric space (18) adjacent to the liquid (16); vaporizing means for vaporizing the volatiles from the liquid (16) in the container (14) into said gaseous atmospheric space (18); conducting means in fluid communication with said vaporizing means (20,20',22) for conducting the gaseous atmosphere containing the volatiles from said space (18); separating means (40) including a membrane (49) having one side in fluid communication with said conducting means for separating a volatile free atmospheric permeate from a volatile retentate to a second side of said membrane (49); collecting means for removing the volatile retentate from the membrane (49) and containing the collected volatile retentate, said separating means including a fluid outlet for releasing the volatile free atmospheric permeate therefrom.

5,110,463

SLURRY FILTER APPARATUS WITH MEANS TO DIRECT SLURRY TO FILTER FACE AT AN ANGLE

Takahashi Yuichi, Tochigi, and Azuma Katsuji, Tokyo, both of Japan, assignors to Fuji Filter Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP89/00280, § 371 Date Feb. 1, 1990, § 102(e) Date Feb. 1, 1990, PCT Pub. No. WO89/11902, PCT Pub. Date Dec. 14, 1989
PCT Filed Mar. 15, 1989, Ser. No. 460,068
Claims priority, application Japan, Jun. 3, 1988, 135701
Int. Cl.[5] B01D *33/72, 36/00*
U.S. Cl. 210—194 **12 Claims**



1. A slurry filter apparatus, comprising:
a first chamber having a slurry inlet and a recirculation outlet respectively arranged so as to direct a flow of slurry into and out of said first chamber;
a second chamber having a filtrate outlet;
a rotatably mounted filter separating said first and second chambers,
means for flowing slurry to said slurry inlet from a slurry tank;
means for ejecting the flow of slurry under pressure from said slurry inlet so as to strike a face of said filter at a predetermined angle so as to be non-tangential to the face of said filter; and
means for returning unfiltered slurry from said first chamber through said recirculation outlet to said slurry tank.

5,110,464

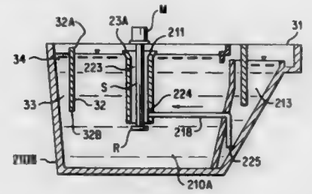
APPARATUS FOR RECIRCULATION OF LIQUIDS

Vladimir Etlin, 7403 Lisle Ave., Falls Church, Va. 22043

Continuation-in-part of Ser. No. 252,495, Sep. 30, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 484,975
Int. Cl.[5] C02F *3/22*
U.S. Cl. 210—195.3 **6 Claims**

1. Apparatus for treating liquids comprising:
a first chamber for receiving liquid-to-be-treated, said first chamber being filled to a first-chamber liquid-level line;
a second chamber filled to a second-chamber liquid-level line different from said first-chamber liquid-level line;
first delivery means for delivering liquid from said first chamber to said second chamber whereby liquid is introduced into said second chamber;
air communication means communicating with ambient air, said air communication means forming a sub-chamber within said first chamber;

mixing means provided in said first chamber for mixing and aerating liquids;
an air pocket in said sub-chamber wherein at least a portion of said air pocket is beneath said second-chamber liquid-level line; and,



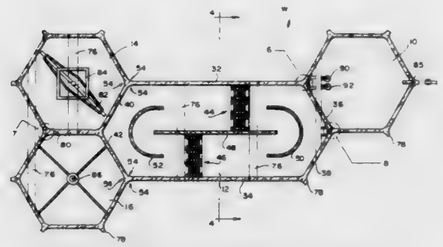
second delivery means for delivering liquid from said second chamber to said first chamber, said second delivery means having an outlet which empties into said air pocket at an elevation below said second-chamber liquid-level line.

5,110,465

COMPACT WASTE WATER TREATMENT FACILITY

Willie B. McNeill, Jr., P.O. Drawer 5618, Tallahassee, Fla. 32314

Filed Oct. 5, 1990, Ser. No. 593,434
Int. Cl.[5] B01L *20/00*
U.S. Cl. 210—199 **30 Claims**



1. A compact waste treatment facility, comprising:
a) an aeration basin, a settling basin, and a digester basin, said basins being interconnected in the order named for therewith providing a sequentially arranged waste treatment facility;
b) each of said basins comprised of six integral walls which are substantially equiangularly disposed one to the other so that each basin is hexagonally shaped in plan, and each basin has a wall common with the basin interconnected therewith; and,
c) means operably associated with said aeration basin for causing fluid flow thereabout.

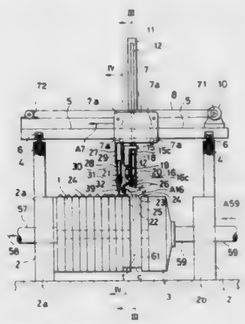
5,110,466

FILTER PRESS

Kiyoshi Tanii, 1349, Arao, Arao-shi, Kumamoto-ken, Japan

Filed Dec. 18, 1990, Ser. No. 629,559
Claims priority, application Japan, Jan. 8, 1990, 2-754[U]; Feb. 24, 1990, 2-44191
Int. Cl.[5] B01D *25/32*
U.S. Cl. 210—225 **9 Claims**

5. A press comprising:
a plurality of filer plates having two spaced faces separated by an edge;
a frame for supporting said plurality of filter plates, said faces being oriented vertically and facing each other;
a stationary plate at one end of said frame;
a pressure plate slidably arranged at the other end of said frame;
a horizontal track above said frame;
a carriage movable along said horizontal track;
a vertical operation cylinder supported on said carriage and having an operating rod;
a reverse-washing operation cylinder supported on said carriage and having a link rod;
a photosensor supported on said carriage;
brake means for stopping said carriage at selected positions along said horizontal track;
guide rods supported for vertical movement with respect to said carriage;
a driving rod rigidly connected to said guide rods and the operating rod of said vertical operation cylinder;
a water-flow pipe having an axis and nozzles for washing said filter plates from the outside, said water-flow pipe being supported for rotation relative to said driving rod;
a separating operation cylinder having a generally vertically



oriented link rod, said separating operation cylinder being supported on said driving rod;
a separating rod connected to the lower end of the link rod of said separating operation cylinder and supported for pivoting around the axis of said water-flow pipe in response to movement of the link rod of the separation operation cylinder;
a reverse-washing water-supply pipe connected to the lower end of the link rod of said reverse-washing operational cylinder;
connection pipes protruding from said reverse-washing water-supply pipe to respectively face corresponding connectors on the edges of a selected one of said filter plates;
means for selectively supplying said reverse-washing water-supply pipe with air under pressure or water under pressure; and
guide rods connected to said reverse-washing water-supply pipe and supported for vertical movement with respect to said carriage.

5,110,467

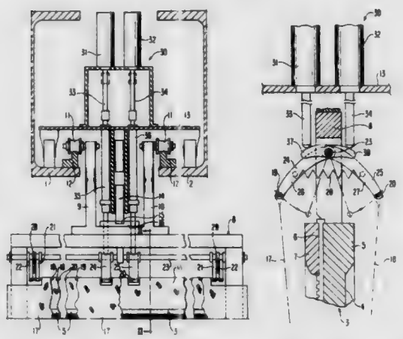
FILTER PRESS

Max Oelbermann, Wilhelm-Engels-Str. 1, 5630 Remscheid, Fed. Rep. of Germany

Filed Oct. 5, 1990, Ser. No. 593,807
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1989, 3933740
Int. Cl.[5] B01D *25/34*
U.S. Cl. 210—225 **7 Claims**

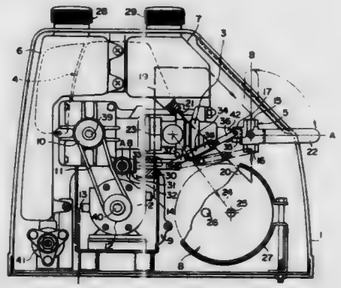
2. A filter press comprising:
a pair of top guide rails;
a plurality of filter plates movably suspended on said top guide rails;
filter cloths provided on opposite sides of each respective

said filter plate, said filter cloths being respectively attached, at top portions thereof, on filter cloth rods;
each said filter plate including a filter plate suspension means for suspending the filter plate in the filter press;
an axle mounted on each said suspension means at a position above a top rim of the respective filter plates:
a pair of pivoting levers pivotally mounted on said axle and having the lower ends attached to a respective filter cloth rod;
spring means interposed between the pair of pivoting levers in such a manner that for cake ejection, the respective filter cloths can be swung against a spring force of said



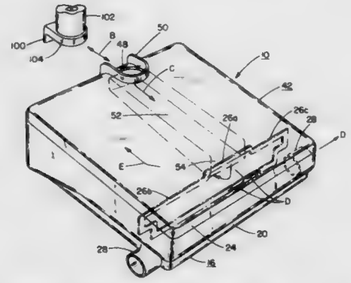
spring means away from the filter plate into an inclined position;
a pair of double levers pivotally supported on said axle, each of said double levers including a first end and a second end, the pivot point of said double levers being located between said first and second ends, said second end of each of said double levers having a respective said filter cloth rod mounted thereon; and
means for vibrating said double levers including a pair of adjusting cylinder-piston means arranged in such a manner that a piston of the respective cylinder-piston means engages the first end of a respective said double lever.

5,110,468
FRESH WATER GENERATOR
Susumu Miyashita, Kodaira; Tadashi Ishimura, Nishitama, and Yoshiaki Hironaka, Sayama, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan
Filed Jan. 15, 1991, Ser. No. 641,411
Claims priority, application Japan, Jan. 16, 1990, 2-006762
Int. Cl.[5] C02F *1/44*
U.S. Cl. 210—321.69 **2 Claims**



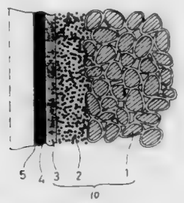
1. A fresh water generator comprising:
an internal combustion engine;
a primary pump, driven by transmission devices of said internal combustion engine, for pumping water to be treated;
a secondary pump, always driven by said internal combustion engine, for pressurizing said water;
a three-way valve connected: (A) to said primary pump at a first inlet thereof; (B) to a chemical tank at a second inlet thereof; and (C) to said secondary pump at an outlet thereof, said three-way valve having an operation lever that is rotatable between a first position in which a first path between the first inlet and said outlet is connected, and in which a second path between said second inlet and said outlet is blocked, and a second position in which the first path between said first inlet and said outlet is blocked, and in which the second path between said second inlet and said outlet is connected;
a filtering device for purifying water to be treated connected to said secondary pump which is sent by pressure; and
interlocking means for clutch means of said transmission devices and said operation lever of said three-way valve which is switchable to a first position in which said clutch means are actuated to transmit drive power from said internal combustion engine to said primary pump, and from a second position in which said clutch means are relaxed to block transmission of the drive power.

5,110,469
COFFEE GROUNDS DISPOSAL UNIT
Edward A. Kozloski, Babylon; Eric Seger, Wantagh; Walter E. Howard, Brewster, and James R. Weldon, New York, all of N.Y., assignors to Kraft General Foods, Inc., Glenview, Ill.
Filed Jun. 29, 1990, Ser. No. 546,357
Int. Cl.[5] B01D *35/02*
U.S. Cl. 210—455 **28 Claims**



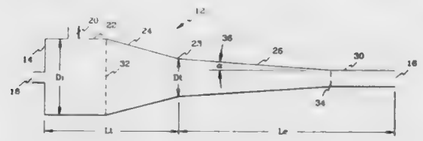
1. A coffee grounds disposal arrangement comprising a receptacle having a bottom wall and encompassing sidewalls extending upwardly from said bottom wall; strainer means in said receptacle to separate said receptacle into first and second compartments; a lid member mounted on said receptacle, said lid member including an inlet portion located in a region above said first compartment for conveying a flow thereto of a hot liquid having spent coffee grounds entrained therein from a discharge orifice of a coffee brewing apparatus, venting means in said lid member for venting steam from said hot liquid in said receptacle, said strainer means facilitating flow of said hot liquid therethrough from said first compartment into said second compartment while inhibiting through-passage of said coffee grounds so as to cause said coffee grounds to collect in said first compartment; and outlet means in said second compartment for discharging said hot liquid from said receptacle.

5,110,470
CERAMIC FILTER AND PROCESS FOR MAKING IT
Kiyoshi Yokosawa, and Naohito Wajima, both of Kanagawa, Japan, assignors to Toto Ltd., Japan
Filed Oct. 25, 1990, Ser. No. 603,019
Claims priority, application Japan, Oct. 26, 1989, 1-279105
Int. Cl.[5] B01D *33/21*
U.S. Cl. 210—500.23 **11 Claims**



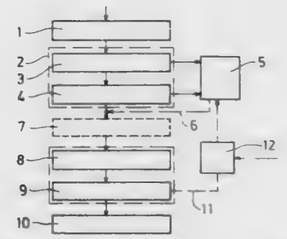
1. A ceramic filter comprising;
a porous support obtained by sintering starting material consisting of i) alumina coarse particles used as aggregates and ii) alumina-zirconia mixed fine particles used as a sintering aid and containing not less than 90 wt. % of alumina, which are so blended that the alumina is in an amount of from 80 to 90 wt. % based on the total weight of the starting materials, said material being shaped before sintering;
a fine intermediate layer formed on one surface of said support and comprised of at least one kind of particles selected from particles of SnO_2, TiO_2 or CeO_2 and having a particle diameter of not more than 500 Å; said fine intermediate layer being obtained by baking a gel at a temperature ranging from 400° C. to 900° C.; and
a thin film formed on the surface of sid fine intermediate layer and comprised of at least one particle selected from particles of SnO_2, TiO_2, ZrO_2 or CeO_2 and having a particle diameter of not more than 300 Å and smaller than the particle diameter of the particles that constitute said fine intermediate layer, said thin film being obtained by baking a gel at a temperature ranging from 300° C. to 800° C.

5,110,471
HIGH EFFICIENCY LIQUID/LIQUID HYDROCYCLONE
Charles M. Kalnins, Woodlands, Tex., assignor to Conoco Specialty Products Inc., Houston, Tex.
Filed Aug. 30, 1990, Ser. No. 574,875
Int. Cl.[5] B04C *5/081*
U.S. Cl. 210—512.2 **24 Claims**



1. A high efficiency hydrocyclone apparatus for separating liquid constituents of differing densities from a fluid mixture wherein one of the constituents is a disperse phase of liquid droplets within a liquid continuous phase, wherein the high efficiency hydrocyclone comprises;
a separation chamber having an inlet portion at one end thereof;
inlet means at the one end thereof for inletting the fluid mixture into an inlet portion of said separation chamber to generate a swirling motion of the fluid mixture;
an overflow outlet axially positioned at said one end of the separation chamber for outletting a less dense constituent of the fluid mixture;
an underflow outlet at the opposite end of the separation chamber from said inlet means; said separation chamber further comprising a first relatively steeply tapered or curved portion and a second elongated less steeply tapered, curved or substantially cylindrical portion, said first tapered or curved portion connecting the inlet portion with the second tapered, curved or substantially cylindrical portion to provide a section for accelerating the swirling motion of the fluid mixture, with the transition between said first and second portions being represented by a throat portion occurring at or near the transition between said first and second portions and having a diameter D_T, which throat diameter D_T is sufficiently small to bring the accelerated swirling fluid mixture into a sufficiently confined residence portion of the separation chamber represented partially by said second portion,
said inlet portion having a diameter D_i in the plane of the inlet means opening into said inlet portion, and wherein an elongated chamber portion beginning at the throat diameter D_T and extending therefrom includes any tapered, curved or substantially cylindrical portion which make up the elongated chamber portion of said separation chamber from the throat D_T up to the underflow outlet therefrom, such elongated chamber portion being describe herein as having an effective length L_e which constitutes the effective confined residence portion of the hydrocyclone;
wherein the are to volume ratio of the elongated chamber portion $(A/V)_{L_e}$ beginning at throat D_T and extending the distance L_e is defined as the sum of internal surface areas A of all the portions making up L_e of said separation chamber, divided by the sum of the internal volumes V of all the portions making up L_e of said separation chamber;
wherein D_T is located at a place in the separation chamber where the diameter is 0.5 times the diameter D_i and
where $(A/V)_{L_e}$ is greater than 0.21 mm^{-1} so that the residence time in the residence portion of the accelerated swirling liquid mixture is prolonged in a sufficiently confined cross-sectional area and within as small a volume as practical to thereby enhance the efficiency of separation of the disperse phase droplets from the liquid continuous phase.

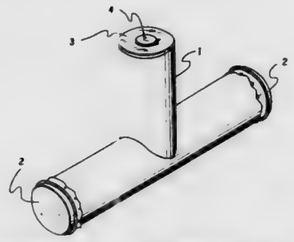
5,110,472
PROCESS FOR TREATMENT OF FRUITS AND VEGETABLES, ESPECIALLY FOR JUICE EXTRACTION, AND UNIT FOR CARRYING OUT THE PROCESS
Walter Gresch, Niederweningen, Switzerland, assignor to Bucher-Guyer AG Maschinenfabrik, Niederweningen, Switzerland
Continuation of Ser. No. 186,481, Jun. 15, 1988, abandoned. This application Nov. 8, 1990, Ser. No. 610,768
Claims priority, application Switzerland, Aug. 19, 1986, 3306/86
Int. Cl.[5] B01D *61/18*
U.S. Cl. 210—632 **33 Claims**



1. Process for the preparation of fruits and vegetables as raw materials for the extraction of juice therefrom comprising the steps of crushing the raw material and separating out solid components from the crushed raw material, subjecting the crushed raw material from which solid components have been

separated to mechanical or electrical treatment, so as to apply mechanical shearing forces to result in a breakdown of the cells thereof to produce an at least partially liquefied raw juice, and subjecting the raw juice to filtration to clarify the raw juice to form a permeate.

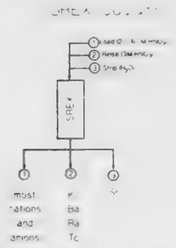
5,110,473
METHOD AND APPARATUS FOR SAMPLING ORGANIC COMPOUNDS IN WATER
John P. Hassett, Cortland, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.
Filed Sep. 17, 1990, Ser. No. 583,525
Int. Cl.[5] B01D *11/00, 61/00*
U.S. Cl. 210—634 **17 Claims**



17. A method of determining the amount of organic compounds in water in situ which comprises the steps of:
a) placing an apparatus for removing organic compounds from water in water in situ, the apparatus comprising a housing having an opening therein, a nonporous membrane covering the opening, and a means for reducing pressure in the housing, the apparatus containing an organic solvent and the membrane being capable of allowing organic compounds from the water to diffuse therethrough;
b) allowing any organic compounds in the water to diffuse through the membrane into the organic solvent contained within the housing;
c) reducing any pressure within the housing;
d) removing the apparatus from the water, thus removing any organic compounds in the organic solvent from the water; and
e) determining the amount of any organic compounds in the organic solvent thus removed.

5,110,474
METHOD FOR LIQUID CHROMATOGRAPHIC EXTRACTION OF STRONTIUM FROM ACID SOLUTIONS
E. Philip Horwitz, Naperville, and Mark L. Dietz, Evanston, both of Ill., assignors to Arch Development Corporation, Chicago, Ill.
Filed Apr. 9, 1990, Ser. No. 507,419
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—635 **7 Claims**

1. A method for separating strontium and/or technetium values from a waste sample using a chromatographic separation column, comprising the steps of:
preparing a nitric acid sample solution of at least about 0.01 Molarity comprising a dissolved form of said strontium and/or technetium values in said waste sample;
passing said nitric sample solution through said separation column comprising a solution of a Crown ether in a diluent insoluble in water and capable of dissolving a substantial quantity of water with said Crown ether soluble therein, said Crown ether and diluent solution dispersed onto an inert resin substrate material in said separation column whereby said strontium and/or technetium values are extracted from said sample solution; and

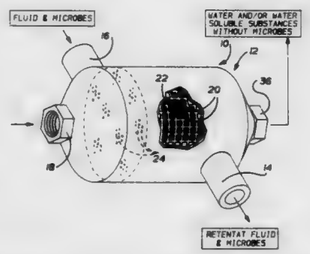


selectively eluting said strontium and/or technetium values by passing water through said separation column.

5,110,475
PROCESS FOR THE PREPARATION OF AQUEOUS DISPERSIONS
Georg Rössling, and Andreas Sachse, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany
Filed Oct. 15, 1990, Ser. No. 596,920
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1989, 3934656
Int. Cl.[5] B01D *15/00*
U.S. Cl. 210—640 **15 Claims**

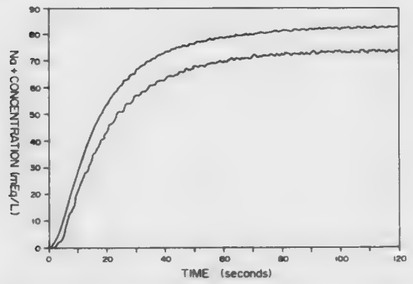
1. A process for the preparation of an aqueous dispersion comprising removing a liquid from a liquid mixture by means of membrane distillation, wherein said dispersion is (1) an aqueous phase containing liposomes or (2) an aqueous phase containing micelles.

5,110,476
HOLLOW FIBER MEMBRANE SYSTEM FOR REMOVAL OF VIRUSES AND BACTERIA
John A. Taylor, Pinckney, Mich., assignor to Separation Dynamics, Inc., Southfield, Mich.
Filed Apr. 10, 1990, Ser. No. 506,902
Int. Cl.[5] C02F *1/44*
U.S. Cl. 210—640 **6 Claims**



1. A method of water, said method including the steps of: passing a flow of fluid containing water and/or water soluble substances and microbes therein in contact with a nonporous water and water soluble substance permeating membrane, and imbibing and disinfecting the water and/or water soluble substances through the membrane independent of size of the molecule in the fluid and convective pressure while preventing passage of microbes and water insoluble hydrocarbons and halogenated hydrocarbons through the membranes.

5,110,477
DIALYZER CLEARANCE CHECK SYSTEM
David B. Howard, 4620 Timberlane Rd., Crystal Lake, Ill. 68675; Rodney Kenley, 816 Fairway, Libertyville, Ill. 60048; Dennis Berry, 209 S. Shannon Dr., Woodstock, Ill. 60098; Prakash Keshaviah, 10840 41st Ave., N. Plymouth, Minn. 55441, and Rohit Vishnoi, 4235 Bloomington Ave., Arlington Hts., Ill. 60004
Filed Feb. 13, 1990, Ser. No. 479,504
Int. Cl.[5] B01D *61/28, 61/32*
U.S. Cl. 210—647 **11 Claims**

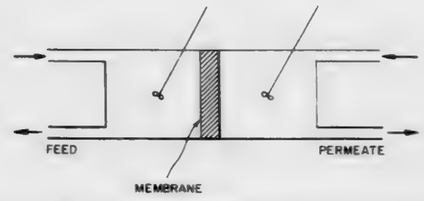


1. A method comprising determining clearance competency of hemodialyzers comprising:
a) contacting the blood side of a dialyzer membrane with a priming fluid;
b) simultaneously contacting the dialysate side of a dialyzer membrane with a diffusion fluid;
c) measuring the changes in solute level on either side of the said membrane with means for measuring; and
d) correlating the changes in solute level to a corresponding standard reference substance clearance value with means for correlating.

10. Apparatus for use during hemodialysis treatment with a dialyzer having a blood circulation pathway on one side of a semipermeable membrane and a dialysate chamber on the other side of said membrane, said apparatus comprising means for determining clearance competency of hemodialyzers including:
a) measuring means for measuring the composition of a dialyzing solution;
b) control means for activating a blood displacing pump to circulate blood through the dialyzer;
c) a detecting means connected to said control means for distinguishing between a priming solution and blood; and
d) interfacing means connecting the control means to the blood displacing pump for disabling the blood displacing pump when dialyzing solution is not present in the dialysate chamber.

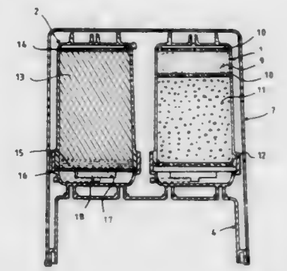
5,110,478
CATALYTIC CONVERSION OVER MEMBRANE COMPOSED OF A PURE MOLECULAR SIEVE
Werner O. Haag, Lawrenceville, and John G. Tsikoyiannis, Princeton, both of N.J., assignors to Mobil Oil Corp., Fairfax, Va.
Continuation-in-part of Ser. No. 533,328, Jun. 5, 1990, Pat. No. 5,019,263. This application Mar. 25, 1991, Ser. No. 674,634
Int. Cl.[5] B01D *61/00*
U.S. Cl. 210—650 **25 Claims**

1. A process for converting feedstock organic compounds to conversion product which comprises contacting said feedstock with catalyst under catalytic conversion conditions in a reaction zone containing catalyst, the reaction zone having walls at least partially comprised of a non-composited microporous membrane comprising a continuous array of crystalline molecular sieve material, with passage of conversion reactants through an inner side of the membrane so that an effluent



emerging from an outer side of the membrane contains at least one conversion product.

5,110,479
WATER PURIFICATION SYSTEMS
Moshe A. Frommer, 2a Eisenberg Street, Rehovot, and Israel Dalven, 28/8 Chatam Sofer Street, Emanuel, both of Israel
Continuation of Ser. No. 457,243, Dec. 27, 1989. This application Sep. 16, 1991, Ser. No. 759,849
Claims priority, application Israel, Dec. 30, 1988, 88844; Apr. 25, 1989, 90084
Int. Cl.[5] B01D *15/04, 35/143*
U.S. Cl. 210—662 **8 Claims**



5. A method for visually indicating an exhaustion of the desalination capacity of a water purification apparatus, comprising the step of:
passing water from which excess salts are to be removed through a bed, said bed being a mixture of a strong base ion exchange resin and a strong acid ion exchange resin wherein said strong base ion exchange resin is in a stoichiometric excess of about 5–15% over said acid ion exchange resin; and,
passing the water, after passage through said bed, through an adjacent layer of a neutral or weakly basic substrate supporting an artificial dye, said layer being located adjacent the exit port of said apparatus so that when said bed of said ion exchange resins becomes exhausted, thereby resulting in an increase of salt content and of pH, the water rapidly release said artificial dye providing a visible color indication of the exhaustion of the water purification apparatus having said ion exchange resins.

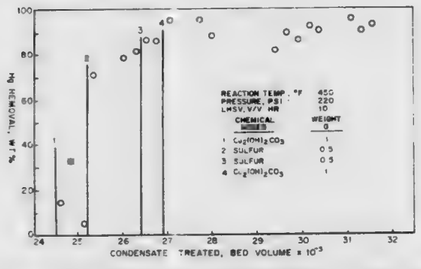
5,110,480
ON-LINE REJUVENATION OF SPENT ABSORBENTS
Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.
Filed Jul. 5, 1990, Ser. No. 548,324
Int. Cl.[5] B01D *15/00*
U.S. Cl. 210—670 **20 Claims**

1. A process for removing Hg from a Hg contaminated feed

selected from the group consisting of petroleum refinery feed stock, waste waters and gases, with an adsorbent which, on being spent, can be rejuvenated on-line comprising:

contacting the Hg contaminated feed with an adsorbent which comprises an amount of CuS or Ag and a support which has a surface area ranging from 50 to 1000 m^2/gm. and is inert to the presence of Hg in the Hg containing feed,

wherein the amount of CuS or Ag ranges from 1 to 30 weight percent of the said absorbent, wherein contacting is undertaken at a temperature of at least ambient and at a pressure ranging from subatmospheric to superatmospheric;



removing Hg from said contaminated feed; continuously contacting said Hg contaminated feed with said adsorbent and thereby causing the adsorbent to be spent;

rejuvenating said adsorbent, after the Hg adsorption capacity of said adsorbent has decreased by depositing additional CuS or Ag on said spent adsorbent by the steps of:

contacting the spent adsorbent with a source of copper or silver;

providing a precipitating reagent selected from the group consisting of a source of sulfur or a reducing agent;

contacting the source of copper or silver with said precipitating reagent to precipitate CuS or Ag on the spent absorbent; and

passing additional Hg contaminated feed to contact it with the precipitated CuS or Ag on said spent absorbent.

5,110,481

METHOD FOR SEPARATION OF POLYVINYL ALCOHOL FROM AQUEOUS SOLUTIONS THEREOF USING PEROXODISULFATES

Yoshiteru Sando; Eiichi Nakano, and Hiroshi Ishidoshiro, all of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

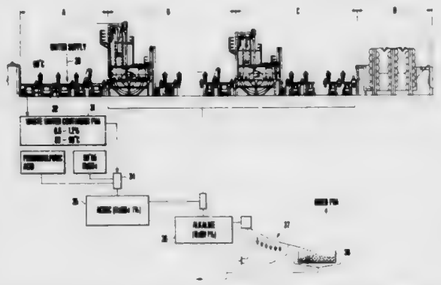
Filed May 10, 1991, Ser. No. 698,670

Claims priority, application Japan, May 17, 1990, 2-127720; Jul. 5, 1990, 2-177874

Int. Cl.[5] **C02F** *1/72*

U.S. Cl. 210—721 **3 Claims**

1. A method for the precipitation of polyvinyl alcohol from an aqueous solution thereof comprising adding peroxodisulfate to an aqueous polyvinyl alcohol solution, and heating the resultant solution to a temperature above 70° C. to precipitate polyvinyl alcohol therefrom, wherein the precipitation of



polyvinyl alcohol is done in an acidic condition by addition of the sulfuric acid.

5,110,482

WATER REPURIFICATION METHOD OF CITY WATER AND ITS EQUIPMENT

Kyong S. Shin, Seoul, Rep. of Korea, assignor to Goldstar, Co., Ltd., Seoul, Rep. of Korea

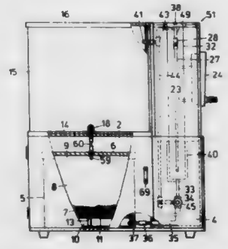
Continuation of Ser. No. 239,177, Aug. 31, 1988. This application Apr. 10, 1990, Ser. No. 507,039

Claims priority, application Rep. of Korea, Sep. 12, 1987, 1987/10141

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

Int. Cl.[5] **B01D** *24/16*

U.S. Cl. 210—758 **19 Claims**



1. A method for purifying water from a public supply which has been treated with chlorine to kill bacteria, said water containing oxidizing agents and solid impurities, comprising the steps of:

taking the water to be purified in a continuous flow from the public supply by selectively monitoring and adjusting intake;

leading the water through piping to a vertical tube into which the water flows so that the water in said tube has a free water surface subject to air pressure;

leading the water from the bottom of said vertical tube to a settling zone of a filter basin;

filtering the water in said filter basin by using water pressure from water in said vertical tube to slowly force the water from said settling zone upwards through a particulate filter material, wherein said chlorine and said solid impurities are removed from the water by said particulate material;

leading the filtered water from said filter basin up to a separate water storage basin located above said filter basin by an outflow pipe; and

temporarily storing the filtered water in said water storage basin;

removing the filtered water from said water storage basin;

wherein all of the previous steps are automatically performed in a total retention time which is less than the time required for bacterial regrowth to begin.

5,110,483

SEPARATION OF PARTICLES ADSORBED ON CARRIER MATERIAL

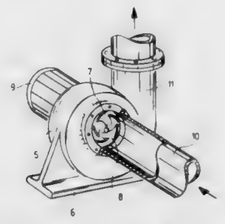
Rintje Boersma, Bemmel, Netherlands, assignor to Smit Transformatoren B.V., Nijmegen, Netherlands

Filed Dec. 12, 1990, Ser. No. 628,643

Claims priority, application Netherlands, Jan. 2, 1990, 9000004

Int. Cl.[5] **B01D** *21/26*

U.S. Cl. 210—787 **7 Claims**



1. A method of separating composite particles made up of carrier particles and flakes adsorbed thereon into individual elements including separate carrier particles and flakes within a liquid suspension, comprising the steps of:

introducing the liquid and composite particle suspension into an intake of a centrifugal pump having a rotatable vane within a housing and a tangential discharge leading outwardly of the housing;

rotating the vane to create a turbulence within the housing;

producing a velocity gradient within the tangential discharge; and

exposing the composite particles within suspension to the velocity gradient within the tangential discharge to separate the composite particles into individual carrier particles and flakes within the liquid.

5,110,484

DRILLING FLUID WITH STABILIZED BROWNING REACTION ANIONIC CARBOHYDRATE

Jim J. Sheu, and Ronald G. Bland, both of Houston, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

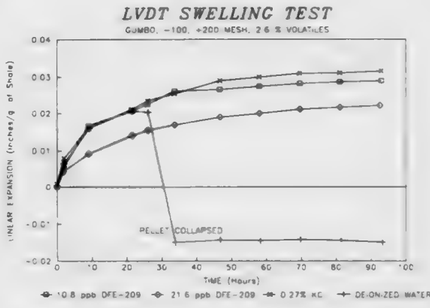
Continuation-in-part of Ser. No. 529,622, May 29, 1990. This application Jun. 28, 1990, Ser. No. 544,924

Int. Cl.[5] **E21B** *21/04*

U.S. Cl. 507—110 **56 Claims**

1. A combination fluid for the drilling, workover or completion of a subterranean well, comprising:

an aqueous medium; a prepared browning reaction product inclusive of cations produced by heating a reducing sugar in an aqueous alkaline solution at a temperature not exceeding about 105° C. effective to promote said reaction;



and a stabilizing sulfite ion present in an amount effective to inhibit continuing browning reaction of said product.

5,110,485

LIQUID ALUMINUM PHOSPHATE SALT GELLING AGENT

David A. Huddleston, Sugar Land, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Jul. 16, 1990, Ser. No. 552,974

The portion of the term of this patent subsequent to Oct. 15, 2008, has been disclaimed.

Int. Cl.[5] **E21B** *43/26*

U.S. Cl. 252—8.551 **14 Claims**

1. A liquid aluminum phosphate salt gelling agent comprising the reaction product of:

a dialkyl phosphate formed from the reaction product of (1) a polyphosphate intermediate produced by reacting triethyl phosphate and phosphorous pentoxide and (2) a mixture of C_6 to C_{10} aliphatic alcohols;

an aluminum sulfate; and

a solvent.

6. A method for treating a liquid hydrocarbon which comprises adding to said liquid hydrocarbon:

a liquid aluminum phosphate salt gelling agent comprising the reaction product of (a) dialkyl phosphate formed from the reaction product of (1) a polyphosphate intermediate produced by reacting triethyl phosphate and phosphorous pentoxide and (2) a mixture of C_6 to C_{10} aliphatic alcohols, (b) an aluminum sulfate, and (c) a solvent; and

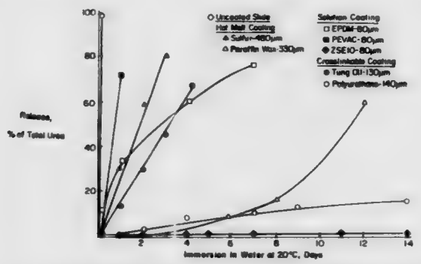
an activator.

5,110,486

BREAKER CHEMICAL ENCAPSULATED WITH A CROSSLINKED ELASTOMER COATING

Pacifico V. Manalastas, Edison; Evelyn N. Drake, Bernardsville; Edward N. Kresge, Watchung; Warren A. Thaler, Flemington, all of N.J.; Lee A. McDougall, Houston; John C. Newlove, Kingwood, both of Tex.; Vijay Swarup, Clinton, N.J., and Albert J. Geiger, Fort Saskatchewan, Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 637,391, Jan. 4, 1991, and a continuation-in-part of Ser. No. 637,401, Jan. 4, 1991, each is a continuation-in-part of Ser. No. 446,572, Dec. 4, 1989, abandoned, Ser. No. 446,573, Dec. 4, 1989, abandoned, Ser. No. 446,736, Dec. 6, 1989, abandoned, Ser. No. 446,831, Dec. 6, 1989, abandoned, and Ser. No. 446,958, Dec. 6, 1989, abandoned.
This application Mar. 28, 1991, Ser. No. 676,662
The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.
Int. Cl.[5] E21B *43/26*
U.S. Cl. 252—8.551 **24 Claims**



1. An encapsulated breaker chemical composition used in an oil or gas operation which comprises:
(a) a solid particulate breaker chemical; and
(b) a coating substantially free of pinholes comprising an ionically and covalently crosslinked neutralized sulfonated elastomeric polymer having a thickness of at least about 1 micron deposited onto the surface of particles of said breaker chemical, wherein said crosslinked neutralized sulfonated polymer encapsulates said breaker chemical, wherein said crosslinked neutralized sulfonated polymer is essentially impermeable to said breaker chemical under conditions of use and said crosslinked neutralized sulfonated polymer is non-reactive to said breaker chemical.

5,110,487

ENHANCED OIL RECOVERY METHOD USING SURFACTANT COMPOSITIONS FOR IMPROVED OIL MOBILITY

Steven P. Current, Novato, Calif., assignor to Chevron Corporation, San Francisco, Calif.

Continuation of Ser. No. 333,715, Apr. 3, 1989, abandoned, which is a continuation of Ser. No. 8,348, Jan. 29, 1987, abandoned. This application Dec. 5, 1990, Ser. No. 622,197
Int. Cl.[5] E21B *43/25, 43/24*
U.S. Cl. 252—8.554 **22 Claims**

1. A surfactant composition useful for coacting with an emulsion in a petroleum reservoir which includes at least two surfactant components, one of said components being an anionic surfactant and the other of said components being a nonionic polyether surfactant which is selected from among polyol ethers, polyol esters and phenolic resins, wherein the anionic surfactant comprises an alpha olefin sulfonate dimer having from 15 to 45 carbon atoms, wherein the ratio of said components is selected to reduce the viscosity of an emulsion in a petroleum reservoir to near, or less than, the viscosity of the oil phase alone and wherein the anionic surfactant component is from 30 to 70 weight percent of the total surfactant composition.

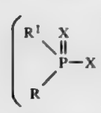
5,110,488

LUBRICATING COMPOSITIONS CONTAINING REDUCED LEVELS OF PHOSPHORUS

Craig D. Tipton, Perry, and Thomas A. Tagliamonte, Mentor, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

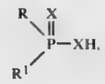
Continuation of Ser. No. 933,830, Nov. 24, 1986, abandoned.
This application Nov. 17, 1989, Ser. No. 437,331
Int. Cl.[5] C10M *137/06*
U.S. Cl. 252—32.7 E **25 Claims**

1. A power transmission fluid containing up to about 0.015% by weight phosphorus which comprises
(A) a major amount of an oil of lubricating viscosity,
(B) at least one metal salt selected from the group consisting of
(I) metal salts of the formula



M^{a+}, and

(II) metal salts $M_b^{a+}Y^-_a$ of a mixture of
(1) at least one acid of the formula



and

(2) at least one carboxylic acid having the formula R^2COOH wherein R^2 contains from about 2 to about 40 carbon atoms and is an aliphatic or alicyclic hydrocarbon-based radical, each Y^- is independently an anion of acids (1) or (2), M is a metal, a is the valence of the metal M, b is a number between 0.5 and 2, P is phosphorus, each X is independently oxygen or sulfur, and R and R^1 are the same or different hydrocarbon groups of at least 3 carbon atoms bonded to the phosphorus, at least one bond being at a secondary carbon atom of R or R^1, through an oxygen or sulfur atom, and
(C) from about 0.005% to about 0.02% by weight boron as at least one acylated, nitrogen-containing compound made by reacting an aliphatic hydrocarbon substituted carboxylic acylating agent having at least about 10 carbon atoms in the aliphatic hydrocarbon substituent, simultaneously or sequentially, in any order, with at least one amino compound containing at least one



group and a boron-containing reagent,
provided further (B) the metal salt is the major source of phosphorous in the lubricating composition.

5,110,489

WATER RESISTANT GREASE COMPOSITION

James F. Stadler, Bethel Park; David L. Kufen, West Mifflin, and James L. Purvis, Natrona Heights, all of Pa., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 27, 1989, Ser. No. 371,951
Int. Cl.[5] C01M *157/04*
U.S. Cl. 252—35 **38 Claims**

1. A grease composition which comprises
(a) from about 50 to about 90 wt. % of a lubricating oil,
(b) from about 1 to about 15 wt. % of a water insoluble thickener, and
(c) from about 0.01 to about 4 wt. % of a copolymer of ethylene and at least one other alphaolefin monomer, wherein the copolymer comprises intramolecularly heterogeneous copolymer chains containing at least one crystallizable segment of the methylene units and at least one low crystallinity ethylene-alphaolefin copolymer segment, wherein said at least one crystallizable segment comprises at least about 10 wt. % of said copolymer chain and contains an average ethylene content of at least about 57 wt. %, wherein said low crystallinity segment contains an average ethylene content not greater than about 53 wt. %, and wherein aid copolymer has a molecular weight distribution characterized by at least one of a ratio of $\overline{M}_w/\overline{M}_n$ of less than 2 and a ratio of $\overline{M}_z/\overline{M}_w$ of less than 1.8, and wherein at least two portions of an individual intramolecularly heterogeneous chain, each portion comprising at least 5 wt. % of said chain, differ in composition from one another by at least 7 wt. % ethylene, and
(d) from about 0.01 to about 4 wt. % of a copolymer that comprises the reaction product of
(i) an ethylene copolymer comprising from about 15 to about 90 wt. % ethylene and from about 10 to about 85 wt. % of one or more C_3 to C_{28} alpha-olefin wherein the copolymer has a number average molecular weight ranging from about 5,000 to about 500,000 and is grafted with an ethylenically unsaturated carboxylic acid material containing at least one ethylenic bond and at least one carboxylic acid groups or anhydride groups;
(ii) an alkylene or oxyalkylene amine having at least two primary amine groups selected from the group consisting of alkylene polyamines having alkylene groups of about 2 to 7 carbon atoms and 2 to 11 nitrogens, and polyoxyalkylene polyamines, wherein the alkylene groups contain 2 to 7 carbon atoms and the number of oxyalkylene groups will be about 3 to 70; and,
(iii) a long chain hydrocarbyl substituted succinic anhydride or acid having 50 to 400 carbon atoms.

5,110,490

WATER RESISTANT GREASE COMPOSITION

Harry S. Pink, Whitehouse Station, N.J.; Timothy Hutchings, Grove, England, and James F. Stadler, Bethel Park, Pa., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 27, 1989, Ser. No. 372,409
Int. Cl.[5] C10M *149/06*
U.S. Cl. 252—35 **31 Claims**

1. A grease composition which comprises
(a) from about 50 to about 90 wt.% of a lubricating oil,
(b) from about 1 to about 15 wt.% of a water insoluble thickener, and
(c) from about 0.01 to about 4 wt.% of a copolymer that comprises the reaction product of
(i) an ethylene copolymer comprising from about 15 to about 90 wt.% ethylene and from about 10 to about 85 wt.% of one or more C_3 to C_{28} alpha-olefin wherein the copolymer has a number average molecular weight ranging from about 5,000 to about 500,000 and is grafted with an ethylenically unsaturated carboxylic acid material containing at least one ethylenic bond and at least one carboxylic acid groups or anhydride groups;
(ii) an alkylene or oxyalkylene amine having at least two primary amine groups selected from the group consisting of alkylene polyamines having alkylene groups of about 2 to 7 carbon atoms and 2 to 11 nitrogens, and polyoxyalkylene polyamines, wherein the alkylene groups contain 2 to 7 carbon atoms and the number of oxyalkylene groups will be about 3 to 70; and,
(iii) a long chain hydrocarbyl substituted succinic anhydride or acid having 50 to 400 carbon atoms.

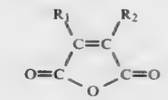
5,110,491

OLIGOMERIC LUBRICANT ADDITIVE DESIGNED TO ENHANCE ANTIOXIDANCY AND CORROSION RESISTANCE IN RAILWAY DIESEL CRANKCASE LUBRICANTS

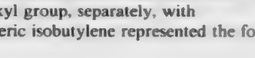
Thomas F. Derosa, Passaic, N.J.; Rodney L. Sung, Fishkill, N.Y.; Benjamin J. Kaufman, Hopewell, N.Y., and Ronald L. O'Rourke, Hyde Park, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 22, 1991, Ser. No. 688,801
Int. Cl.[5] C10M *141/06, 141/08*; C07D *285/14*
U.S. Cl. 252—47.5 **5 Claims**

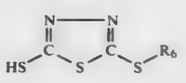
1. A railway diesel crankcase lubricant composition comprising a major portion of a diesel lubricating oil and a minor amount of, as an oxidation and corrosion inhibiting agent, a condensate product prepared by the process comprising:
(a) reacting a dibasic acid anhydride of the formula:



where R_1 and R_2 is hydrogen or a (C_1–C_{10}) linear or branched alkyl or cyclic alkyl group, separately, with
(i) an oligomeric isobutylene represented the formula:



where the sum of the repeat units, b and c, are limited to the range of 10 to 500 so that the material has a corresponding molecular weight range from about 500 amu to 15,000 amu to produce oligomeric (isobutylene -g- succinic anhydride) and
(ii) 2,5-dimercapto-1,3,4,- thiadiazole represented by the formula



where R_6 is hydrogen or a (C_1–C_{10}) linear or branched aliphatic hydrocarbon, to produce 2-thio-(5-mercapto-1,3,4-thiadiazole) succinic anhydride;
(b) reacting said oligomeric (isobutylene-g-succinic anhydride) and said thiadiazole succinic anhydride with pentamethylenehexaamine to produce the [2-thio-(5-mercapto-1,3,4-thiadiazole)] -[oligomeric (isobutylene-g-succinic)] - pentamethylenetetramine-bis-succinimide; and
(c) recovering said bis-succinimide product.

5,110,492
CLEANER AND DISINFECTANT WITH DYE
Irene Casey, P.O. Box 690566, Houston, Tex. 77269-0566
Division of Ser. No. 227,178, Aug. 2, 1988, Pat. No. 4,965,063, which is a continuation-in-part of Ser. No. 936,171, Dec. 1, 1986, Pat. No. 4,793,988. This application Aug. 13, 1990, Ser. No. 566,549
The portion of the term of this patent subsequent to Jul. 7, 2007, has been disclaimed.
Int. Cl.[5] C11D *3/40, 3/43, 3/48, 17/00*
U.S. Cl. 252—90 5 Claims

1. A composition for cleaning surfaces comprising: at least one surfactant;
a pH sensitive dye which changes color upon exposure to air;
an alkali means for adjusting the pH of the composition to an alkali pH to produce a color in the composition so that upon neutralization in the air the dye loses color;
said composition being a visually colored composition with the disappearing pH sensitive dye effectively indicating the delivery of the composition and giving a visual check as to the area contacted when the visually colored composition is applied; and
said composition packaged in a sealed air tight container adapted to maintain the alkali pH after the pH of the composition is adjusted to produce a color from the pH sensitive dye in the composition.

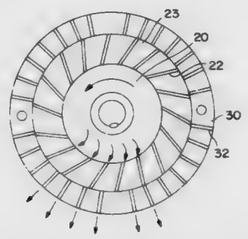
5,110,493
OPHTHALMIC NSAID FORMULATIONS CONTAINING A QUATERNARY AMMONIUM PRESERVATIVE AND A NONIONIC SURFACTANT
Roger F. Cherng-Chyi, and Deborah M. Lidgate, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Continuation of Ser. No. 96,173, Sep. 11, 1987, abandoned. This application Dec. 7, 1990, Ser. No. 624,027
Int. Cl.[5] A61K *31/40*
U.S. Cl. 514—413 16 Claims

1. An ophthalmologically acceptable non-steroidal anti-inflammatory drug formulation, comprising:
an ophthalmologically acceptable non-steroidal anti-inflammatory carboxyl group-containing drug in an effective amount for ophthalmic treatment between 0.001% and 10.0% wt/vol;
a quaternary ammonium preservative in an antimicrobially effective amount between 0.001% and 1.0% wt/vol;
an ethoxylated alkyl phenol that conforms generally to the formula: $C_8H_{17}C_6H_4(OCH_2CH_2)_nOH$ where n has an average value of 40 in a stabilizing amount between 0.001% and 1.0% wt/vol; and an aqueous vehicle q.s. to 100%.

5,110,494
ALKALINE CLEANER AND PROCESS FOR REDUCING STAIN ON ALUMINUM SURFACES
Leslie M. Beck, Perkasie, Pa., assignor to Man-Gill Chemical Company, Cleveland, Ohio
Filed Aug. 24, 1990, Ser. No. 573,650
Int. Cl.[5] C11D *7/06, 17/00;* C04B *9/02;* C23D *17/00*
U.S. Cl. 252—156 29 Claims

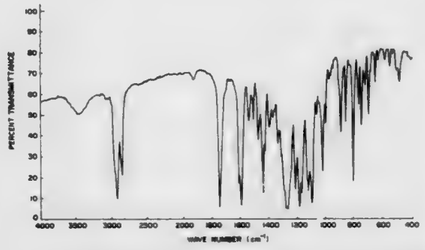
1. A process for reducing the discoloration of aluminum surfaces treated with an aqueous alkaline cleaner composition comprising treating said aluminum surface by contacting it with an aqueous cleaner composition comprised of from about 100 to about 5000 ppm of a nitrogen-containing heterocyclic compound, wherein said heterocyclic compound is a pyrrole, imidazole, pyrazole, thiazole or triazole compound.

5,110,495
ORGANIC PEROXIDE DISPERSIONS
James M. Self, Taylors, S.C., assignor to ABCO Industries, Ltd., Roebuck, S.C.
Continuation-in-part of Ser. No. 567,664, Jan. 3, 1984, Pat. No. 4,917,816. This application Apr. 10, 1990, Ser. No. 508,063
The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[5] C01B *15/055*
U.S. Cl. 252—186.26 16 Claims

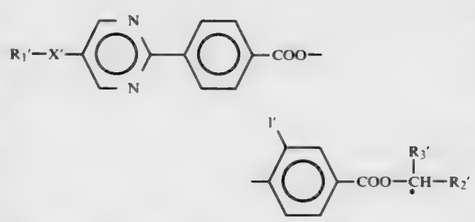


1. An improved organic peroxide dispersion comprising:
a) from about 35 to about 70 weight percent of solid organic peroxide having a particle size of 10 microns or less;
b) from about 65 to 30 weight percent water;
c) a dispersant, said dispersant being inert as to said peroxide and at least water dispersible and producing a dispersion having a predetermined viscosity of at least 100 centipoises when measured with a Brookfield RVT viscometer using a No. 3 spindle at 50 revolutions per minute; and
d) a defoamer.

5,110,496
LIQUID CRYSTAL COMPOUND
Hiroyuki Mogamiya; Noriko Yamakawa; Yoshiichi Suzuki, all of Tokyo; Hitoshi Suenaga, and Yasuhiro Hasegawa, both of Hyogo, all of Japan, assignors to Showa Shell Sekiyu Kabushiki Kaisha, Tokyo and Teikoku Chemical Industry Co., Ltd., Hyogo, both of, Japan
Filed Mar. 1, 1991, Ser. No. 663,313
Claims priority, application Japan, Mar. 1, 1990, 2-50125; Jul. 10, 1990, 2-182267
Int. Cl.[5] C09K *19/34, 19/20, 19/22;* C07D *239/00*
U.S. Cl. 252—299.61 10 Claims

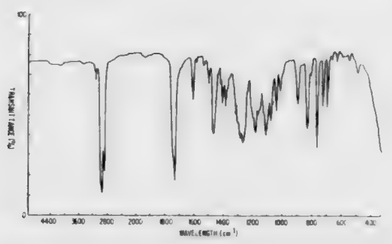


1. An optically active liquid crystal compound which exhibits tristable states when the optically active liquid crystal compound is in the S*(3) phase and which is represented by the formula

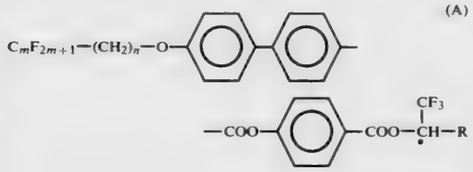


wherein R_1' and R_2' each represents an alkyl group of 4–18 carbon atoms, R_3' represents CF_3 or C_2F_5, X' represents O or a single bond, and l' shows substitution by a fluorine atom.

5,110,497
COMPONENT FOR LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL COMPOSITION CONTAINING THE SAME
Yoshiichi Suzuki; Shigenori Sakuma, and Noriko Yamakawa, all of Tokyo, Japan, assignors to Showa Shell Sekiyu K.K., Tokyo, Japan
Filed Jan. 28, 1991, Ser. No. 646,115
Claims priority, application Japan, Jan. 26, 1990, 2-17459
Int. Cl.[5] C09K *19/12, 19/52;* C07C *69/76*
U.S. Cl. 252—299.65 4 Claims



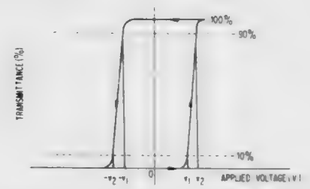
1. A liquid crystal compound represented by formula (A):



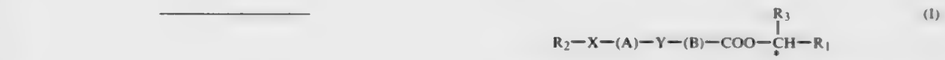
(A)

wherein R represents an alkyl group having from 1 to 6 carbon atoms; m represents an integer from 1 to 17; n represents an integer from 1 to 3; M+n≦18; and * indicates an optically active center.

5,110,498
LIQUID CRYSTAL COMPOUND
Yoshiichi Suzuki; Shigenori Sakuma, and Noriko Yamakawa, all of Tokyo, Japan, assignors to Showa Shell Sekiyu K.K., Tokyo, Japan
Filed Dec. 27, 1990, Ser. No. 634,631
Claims priority, application Japan, Dec. 27, 1989, 1-339481
Int. Cl.[5] C09K *19/12, 19/34, 19/20*
U.S. Cl. 252—299.66 8 Claims



1. A liquid crystal compound represented by formula (I):



(I)

wherein R_1 represents an alkyl group having from 3 to 18 carbon atoms or an aralkyl group having from 7 to 18 carbon atoms; R_2 represents an alkenyl group having from 2 to 18 carbon atoms and containing a double bond at the terminal; R_3 represent CF_3 or C_2F_5; X represents a single bond, —O—, —COO—, or —OCO—; Y represents —COO—, —OCO—, —CH_2O—, or —OCH_2—; A and B each represent cyclic groups having 1 to 2 six-membered rings cyclic group or naphthalene; and * indicates an optically active center.

5,110,499
METHOD FOR INCREASING THE BRIGHTNESS AND HALFLIFE OF ELECTROLUMINESCENT PHOSPHORS
Kenneth T. Reilly, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.
Filed Apr. 1, 1991, Ser. No. 678,515
Int. Cl.[5] C09K *11/56*
U.S. Cl. 252—301.6 S 4 Claims

1. A method for increasing the average particle size and improving the brightness and halflife of an electroluminescent copper-activated zinc sulfide or copper- and manganese-activated zinc sulfide phosphor, comprising the steps of:
a) blending particles of said phosphor having an average particle size of less than 25 micrometers in diameter with a chloride flux to form a uniform mixture;
b) heating said mixture at a temperature of from about 1000° C. to about 1300° C. for about 2 to about 4 hours to effect production of a crystalline material;
c) washing said crystalline material with sufficient water to remove at least a major portion of the water-soluble material therefrom;
d) drying the washed material to produce a relatively moisture-free material;
e) subjecting said relatively moisture-free material to low-intensity milling for a sufficient time to change the crystallographic structure of at least a portion of the moisture-free material from a hexagonal structure to a cubic structure; and
f) adding to the milled material copper sulfate and zinc sulfate where the phosphor is copper-activated zinc sulfide and additionally manganese carbonate where the phosphor is copper- and manganese-activated zinc sulfide to form a mixture and heating the resulting mixture at a temperature of from about 650° C. to about 750° C. for about 1.5 to about 3 hours to form said electroluminescent

phosphor having an increased average particle size of greater than 25 microns and improved brightness and halflife.

5,110,500

POLYSILOXANE SCINTILLATOR COMPOSITION

James K. Walker, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 239,793, Sep. 2, 1988, abandoned. This application Mar. 13, 1990, Ser. No. 492,452

Int. Cl.[5] C09K *11/06*

U.S. Cl. 252—301.16 **17 Claims**

1. A plastic scintillator useful for the detection or measurement of ionizing radiation consisting essentially of at least one substantially optically transparent polysiloxane matrix having incorporated therein at least one primary fluor;

a) said at least one polysiloxane having a structure and being composed such that, upon absorption of ionizing radiation, converts at least a portion thereof to electromagnetic energy having a wavelength of 330 nm or less in about one nanosecond;

b) said at least one fluor being capable of absorbing at least a portion of said electromagnetic energy and converting it to detectable or measurable light; and

c) said at least one polysiloxane being capable of maintaining said substantial optical transparency and said at least one fluor being stable to exposures of said ionizing radiation at doses of at least 10^7 rads.

5,110,501

PROCESS FOR MANUFACTURING ORGANOCLAYS HAVING ENHANCED GELLING PROPERTIES

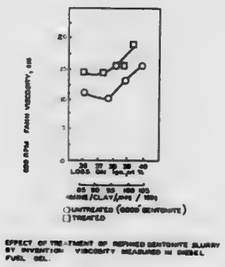
Milburn I. Knudson, Jr., Gonzales, Tex., and Thomas R. Jones, Cornwall, England, assignors to Southern Clay Products, Inc., Gonzales, Tex.

Continuation of Ser. No. 828,044, Feb. 10, 1986, abandoned, which is a continuation-in-part of Ser. No. 771,477, Sep. 3, 1985, Pat. No. 4,664,842, which is a continuation-in-part of Ser. No. 551,957, Nov. 15, 1983, Pat. No. 4,569,923, which is a continuation-in-part of Ser. No. 561,052, Dec. 13, 1983, abandoned, which is a continuation-in-part of Ser. No. 193,636, Oct. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 393,600, Jun. 30, 1982, abandoned, which is a continuation of Ser. No. 193,635, Oct. 3, 1980, abandoned. This application Jul. 7, 1988, Ser. No. 219,831

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.[5] B01J *13/00*; **C07F** *5/06*

U.S. Cl. 252—315.2 **3 Claims**



EFFECT OF TREATMENT OF REFINED BENTONITE SLURRY BY INVENTION VISCOSITY MEASURED IN DIESEL FUEL OIL.

1. A process for preparing an organophilic clay gellant comprising:

(a) subjecting a slurry of smectite-type clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of clay to high shear conditions achieved by passing the slurry at least one time through a Manton-Gaulin homogenizer whereby clay agglomerates are separated, said smectite-type clay having been previously treated to remove non-clay impurities;

(b) reacting the smectite-type clay with organic cation whereby at least some of the cation exchange sites of the smectite-type clay are substituted with organic cation thereby forming an organophilic clay gellant;

(c) separating the organophilic clay gellant; and

(d) drying the organophilic clay gellant.

5,110,502

METHOD OF SUPPRESSING FORMATION OF CONTRAILS AND SOLUTION THEREFOR

Surjit Singh, Williamsville, N.Y., assignor to SCIPAR, Inc., Williamsville, N.Y.

Division of Ser. No. 813,098, Dec. 24, 1985, Pat. No. 4,766,725. This application Aug. 22, 1988, Ser. No. 234,911

Int. Cl.[5] B01D *17/02*; **C09K** *3/18*

U.S. Cl. 252—319 **26 Claims**

1. A hypernucleating solution for condensing water vapor in hot engine exhaust gases passing into a cold environment to particles having a size below the humanly visible range comprising in relatively sufficient proportions to effect said hypernucleation of said exhaust gases a non-corrosive surfactant in a combined carrier and nucleating agent selected from the group of water soluble monohydric, dihydric, trihydric and polyhydric alcohols, and an inorganic nucleating agent, said non-corrosive surfactant being present in an amount of between about 0.01% and 7% by weight, and said combined carrier and nucleating agent being present in an amount of between about 79% and 98% by weight, and said inorganic nucleating agent being present in an amount of between about 1% and 20% by weight.

5,110,503

DEMULSIFYING METHOD

Elliot Cohen, 6531 Ivy Glen Dr., Dallas, Tex. 75240

Filed May 15, 1990, Ser. No. 523,728

Int. Cl.[5] B01D *19/04*

U.S. Cl. 252—325 **16 Claims**

1. A method for demulsifying oil from water including the steps of contacting a mixture of oil and water with a mixture comprising:

(A) the reaction product of an alpha-beta unsaturated acid and a short chain amine or salt thereof; and

(B) at least one member selected from the group consisting of:

(i) an alkoxylated alcohol of the formula:

$$R(EO)_a(PO)_b(EO)_c(PO)_dH$$

where R contains from 6 to 14 carbon atoms: a, b, c and d all have values of one or greater; and EO and PO are ethylene and propylene oxide residues respectively;

(ii) a short chain alkyl sulfate;

(iii) a short chain alkyl sulfonate; and,

(iv) a phosphate ester having as the anion thereof

$$R'O(AO)xPO_4$$

wherein AO is an alkylene oxide residue, x has a value of from 1 to 10, and R' is a hydrocarbyl residue having from 12 to 24 carbon atoms, for a sufficient time to effect substantial separation of the oil from the water.

5,110,504

LOW FREQUENCY NONLINEAR ELECTRIC MATERIAL AND METHOD FOR GENERATION OF HIGHER HARMONIC WAVE

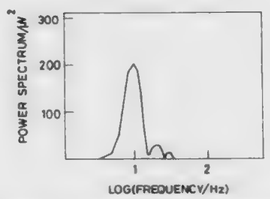
Kohzo Ito, Tsukuba; Yoshikazu Tanabe, Toride; Masa-aki Sato, Tsukuba, and Kyoji Kaeriyama, Tsuchiura, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 28, 1989, Ser. No. 329,874

Claims priority, application Japan, May 16, 1988, 63-118881

Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—500 **6 Claims**



1. A low frequency nonlinear electric material, consisting essentially of:

an electroconductive polymer having nonlinear conductivity and selected from the group consisting of a polythiophene possessing a polymerization degree in the range of 1,000 to 50, a poly(3-substituted thiophene) selected from the group consisting of poly(3-methylthiophene), poly(3-ethylthiophene) and poly(3-phenylthiophene) possessing a polymerization degree in the range of 1,000 to 50 and polyfuran possessing a polymerization degree in the range of 1,000 to 50, said electroconductive polymer being obtained by doping the polymer with at least one electrolytic ion selected from the group consisting of hexafluorophosphate ion, tetrafluoroborate ion, perchlorate ion, and paratoluenesulfonate ion in an amount in the range of 0.01 to 0.5 based on the units of corresponding monomer, and removing said at least one electrolytic ion from the doped polymer.

5,110,505

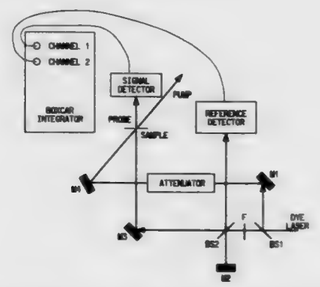
SMALL-PARTICLE SEMICONDUCTORS IN RIGID MATRICES

Norman Herron, and Ying Wang, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 24, 1989, Ser. No. 315,626

Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—518 **9 Claims**



1. An article of manufacture consisting essentially of porous glass, the pores of which contain a polymer and a semiconductor material comprising at least one cation selected from the group consisting of Cd^{+2}, Zn^{+2}, Pb^{+2}, Cu^{+2}, Ga^{+3}, In^{+3}, and Ti^{+4}, and at least one anion selected from the group consisting of S^{-2}, Se^{-2}, O^{-2}, I^-, p^{-3}, Sb^{-3}, and As^{-3} provided when the cation is In^{+3} or Ga^{+3} the anion is other than P^{-3}, Sb^{-3}, or As^{-3}.

5,110,506

SOIL RELEASE PROMOTING LIQUID DETERGENT COMPOSITION CONTAINING A PET-POET COPOLYMER AND A NARROW RANGE ALCOHOL ETHOXYLATE

Loretta K. Ciallella, Hopelawn, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 113,798, Oct. 27, 1987, Pat. No. 4,883,610. This application Nov. 1, 1989, Ser. No. 430,218

The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.

Int. Cl.[5] C11D *1/72, 3/37*; **D06M** *15/507*

U.S. Cl. 252—559 **6 Claims**

1. A soil release promoting liquid detergent composition which comprises 10 to 30% of a narrow range ethoxylate (NRE) nonionic detergent which is a higher fatty alcohol ethoxylate condensation product of a higher fatty alcohol and ethylene oxide, with the ethylene oxide being in polyethoxy ethanol groups averaging 4 to 10 ethoxy groups per mole, with at least 80% of the narrow range ethoxylate being higher fatty alcohol ethoxylates of ethoxy contents in the range of 4 to 10 ethoxy groups per mole, 0.2 to 3% of a copolymer of polyethylene terephthalate and polyoxyethylene terephthalate (PET-POET copolymer) which is of a weight average molecular weight in the range of 15,000 to 50,000 and 50 to 85% of water.

5,110,507

METHOD OF SEPARATING AND PURIFYING SPENT SOLVENT GENERATED IN NUCLEAR FUEL CYCLE

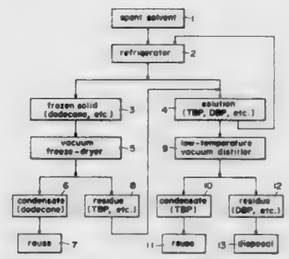
Katsuyuki Ohtsuka, Mito; Isao Kondo, Ibaraki, and Takashi Okada, Katsuta, all of Japan, assignors to Doryokuro Kakunenryo Kithatsu Jigyodan, Tokyo, Japan

Filed Mar. 22, 1991, Ser. No. 673,064

Claims priority, application Japan, Apr. 11, 1990, 2-95351

Int. Cl.[5] G21F *9/00*

U.S. Cl. 252—626 **4 Claims**



1. A method of separating and purifying a spent solvent generated in a nuclear fuel cycle and containing a phosphate and a hydrocarbon selected from the group consisting of n-dodecane and kerosene, said method comprising

exposing the spent solvent to a temperature not greater than the freezing point of the hydrocarbon but not less than the freezing point of the phosphate to selectively freeze the hydrocarbon,

separating a resulting frozen solid mainly composed of the hydrocarbon from a remaining solution containing the phosphate in a higher concentration, and

subjecting the resulting frozen solid to vacuum freeze-drying to thereby recover the hydrocarbon.

5,110,508
PROCESS AND APPARATUS FOR MAKING A HEAT-SENSITIVE MATERIAL

Karl-Heinz Buettgen, Karpen-Sindorf; Bernhard Gutsche, Hilden; Friedrich Hommers, Duesseldorf; Wilhelm Johannisbauer, Erkrath; Eberhard Peukert, Hilden, and Reinhold Sedelies, Ratingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Apr. 20, 1989, Ser. No. 340,977
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1988, 3813612; Aug. 3, 1988, 3826320
Int. Cl.[5] C09F *5/08*
U.S. Cl. 554—170 **11 Claims**

1. In an esterification process in which an alcohol having 6 to 24 carbon atoms is reacted with a carboxylic acid having at least 6 carbon atoms and in which at least one of a reactant or a product is heat sensitive, the improvement wherein the process comprises the steps of:
(1) forming a reaction mixture in a reaction zone,
(2) continuously circulating the reaction mixture over a falling film evaporator under conditions in which at least one product of the reaction is the form of a gas phase,
(3) continuously removing the gas phase from contact with the reaction mixture and
(4) returning at least a portion of the reaction mixture to the reaction zone in step (1).

5,110,509
PROCESS FOR THE RECOVERY OF MONOGLYCERIDES AND DIGLYCERIDES FROM A MIXTURE CONTAINING MONOGLYCERIDES, DIGLYCERIDES, AND TRIGLYCERIDES

Siegfried K. Peter, Lindenweg 3, Uttenreuth, Fed. Rep. of Germany D-8525 ; Eckhard O. Weidner, Erlangen, Fed. Rep. of Germany; Ulrich M. Ender, Erlangen, Fed. Rep. of Germany, and Bernd A. Czech, Erlangen, Fed. Rep. of Germany, assignors to Peter K. Siegfried, Uttenreuth-Weiher, Fed. Rep. of Germany

Filed Jul. 24, 1989, Ser. No. 385,313
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1988, 3825248
Int. Cl.[5] C11C *3/02*
U.S. Cl. 554—184 **23 Claims**

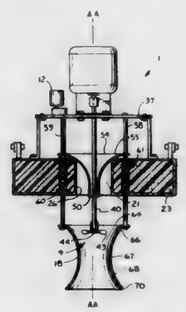
1. A process for the recovery of monoglycerides and diglycerides from a mixture containing monoglycerides, diglycerides, triglycerides, and obtained by esterification of glycerol with fatty acids, transesterification of triglycerides with glycerol, or enzymatic cleavage of triglycerides, comprising extracting a mixture containing monoglycerides, diglycerides, and triglycerides in a countercurrent system with a supercritical extractant, wherein the supercritical extractant containing a hydrocarbon in an amount of 30 to 90 weight-percent and wherein the hydrocarbon acts as a cosolvent; and
maintaining the extractant in a supercritical state during the extraction process;
wherein the supercritical extractant is furnished by a member selected from the group consisting of carbon dioxide, nitrogen monoxide N_2O, sulfurhexafluoride, trifluoromethane, tetrafluoromethane, and mixtures thereof;
wherein hydrocarbons employed contain from about 2 to 6 carbon atoms.

5,110,510
AERATION AND MIXING APPARATUS

Kenneth L. Norcross, Kansas City, Mo., assignor to JMO Holding, Inc., Industrial Airport, Kans.

Filed Feb. 21, 1991, Ser. No. 658,997
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—91 **7 Claims**

1. In a surface aerator for reacting oxygen with treated wastewater in a wastewater treatment facility having a float, a diffuser member and an axial-flow mixer with radially-extending blades for propelling wastewater upwardly through a flow channel in the float and onto the diffuser member; the improvement comprising:
(a) a diffuser cone slidingly mounted with respect to said mixer; and
(b) a diffuser hood connected to said cone and in spaced relation thereto; said hood surrounding the blades of the

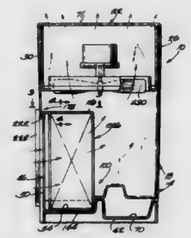


mixer; said cone and said hood being simultaneously slidable between a mixing position with said cone adapted to block flow of wastewater through said channel and said hood spaced below the float and an aeration position wherein said cone is spaced from said channel and said hood has an upper end thereof abutting said float such that said hood and channel combine to form a common wastewater flow pathway therethrough.

5,110,511
HUMIDIFIER

Joseph M. Hand, Sheboygan Falls, Wis., assignor to Bemis Manufacturing Company, Sheboygan Falls, Wis.

Continuation of Ser. No. 644,939, Jan. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 546,584, Jun. 29, 1990, abandoned. This application Sep. 24, 1991, Ser. No. 764,944
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—104 **25 Claims**

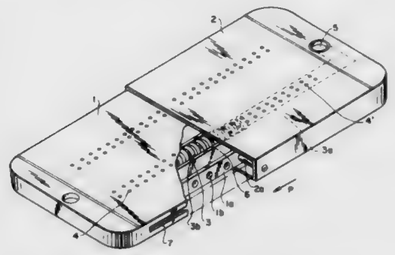


1. A humidifier comprising a trough adapted to contain water, a wicking assembly having a lower end located in said trough and including a plurality of wick portions each having an end, and frame means for supporting said wick portions in generally parallel, side-by-side relation, said frame means including a first frame member extending generally perpendicular to said wick portions and adjacent said ends of said wick portions, and first means which is adhesively secured to said ends of said wick portions and which is non-adhesively mechanically interlocked with said frame member regardless of whether said first means adheres to said frame member, and means for causing air flow through said wicking assembly.

5,110,512
ADJUSTABLE BUBBLE GENERATOR

In-Gyu Kwon, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Japan

Filed Apr. 16, 1991, Ser. No. 685,662
Claims priority, application Rep. of Korea, Apr. 17, 1990, 90-4709
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—122 **4 Claims**

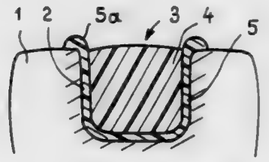


1. An adjustable bubble generator which comprises in combination:
a stationary casing including top and bottom walls spaced apart by a pair of side walls, said top wall having an air introduction aperture and a plurality of bubble discharge holes arranged in a longitudinal direction of the bubble generator, said stationary casing being opened at its open end;
a movable casing telescopically coupled to the open end of said stationary casing in a slidable manner, said movable casing including top and bottom walls spaced apart by a pair of parallel side walls, said top wall having a plurality of bubble discharge holes arranged in line with the discharge holes of said stationary casing, said movable casing being opened at its coupled end; and
at least one extensible distributor conduit contained within said stationary and movable casings and extending beneath and along said bubble discharge holes formed in the stationary and movable casings, said conduit having a plurality of distribution holes perforated along the length thereof whereby said conduit can be extended or retracted in response to the sliding movement of said movable casing with respect to said stationary casing.

5,110,513
PROCESS FOR PRODUCING AN ARTICLE MADE OF RESIN BY PHOTOPOLYMERIZATION AND APPLICATIONS OF THIS PROCESS

Gabriel Puvilland, Le Chesnay, France, assignor to Framatome, Courbevoie, France

PCT No. PCT/FR88/00445, § 371 Date May 11, 1989, § 102(e) Date May 11, 1989, PCT Pub. No. WO89/02358, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 9, 1988, Ser. No. 368,394
Claims priority, application France, Sep. 11, 1987, 87 12645
Int. Cl.[5] A61C *13/087;* **B29C** *35/08, 39/40*
U.S. Cl. 264—19 **21 Claims**

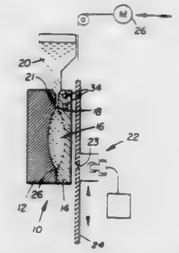


1. Process for producing an article made of resin based, photopolymerizable materials by photopolymerization with a low degree of shrinkage, comprising the steps of:
(a) juxtaposing and maintaining in contact a main volume, equal to at least 80% of a total volume of said article, of a resin based, unpolymerized, first photopolymerizable material which is photpolymerizable to radiation at a first wavelength and a complementary volume of a resin based, unpolymerized, second photopolymerizable material which is photopolymerizable to radiation at a second wavelength, but which is insensitive to, and not photopolymerizable at, radiation at said first wavelength;
(b) photopolymerizing said first photopolymerizable material of said main volume by applying radiation at said first wavelength to polymerize said first photopolymerizable material in said main volume, while said second photopolymerizable material in said complementary volume is unpolymerized and compensates for any shrinkage of said first photopolymerizable material, said main volume and said complementary volume being maintained in contact; and then
(c) photopolymerizing said second photopolymerizable material of said complementary volume by applying radiation at said second wavelength to polymerize said second photopolymerizable material in said complementary volume to join said main and complementary volumes and produce said article.

5,110,514
CONTROLLED CASTING OF A SHRINKABLE MATERIAL

David S. Soane, Piedmont, Calif., assignor to Soane Technologies, Inc., Livermore, Calif.

Filed May 1, 1989, Ser. No. 345,718
Int. Cl.[5] B29C *35/10, 39/02;* **B29D** *11/00*
U.S. Cl. 264—22 **7 Claims**



1. A method of forming an article of precise dimensions by solidification in a precisely dimensioned mold of a liquefied material comprising at least one monomer, prepolymer or polymer, that, upon exposure to a solidifying source of electromagnetic radiation, shrinks; the method comprising the steps of:
a. providing a mold body having a first part and a second part, said first and second parts defining an internal cavity therebetween, the cavity corresponding to the precise dimensions of the finished article and having a closed end and an open end, at least one of said first or the second parts formed to permit exposure of the liquefied material to the electromagnetic source in the internal cavity in a differential and sequential manner;
b. providing the electromagnetic source for imposition through a focusing gate upon the surface of the liquefied material to the electromagnetic source in the internal cavity in a differential and sequential manner;
c. providing a source of the liquefied material at said open end of said mold body;
d. filling the internal cavity with the liquefied material;
e. differentially exposing said liquefied material to said electromagnetic source through the focusing gate by moving

the source relative to the mold body starting at said closed end and proceeding to the open end while continuously supplying liquefied material to said open end so that polymerization takes place at a controlled rate from the closed end to the open end; and

f. removing the resultant solidified article from the cavity.

5,110,515

METHOD OF ENCAPSULATING SEMICONDUCTOR CHIPS

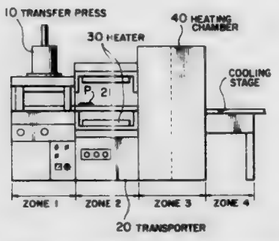
Shozo Nakamura, both of Yokohama; Aizo Kaneda; Shigeharu Tsunoda, Fujisawa; Akio Hasebe, and Masao Mitani, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 16, 1989, Ser. No. 353,256

Claims priority, application Japan, May 25, 1988, 63-128077

Int. Cl.[5] B29C *45/14, 35/08*

U.S. Cl. 264—25 **6 Claims**



1. A method for encapsulating semiconductor chips within a plastic package, said method including the following steps:

positioning a semiconductor chip within a cavity of a mold;

filling said mold with resin and molding said resin into a molded product which contains therein said semiconductor chip, said molding effective to elevate the temperature of said resin to temperature T1, said temperature T1 being sufficient to cause said resin to be moldable within said mold;

heating said molded product to a temperature T2 to post-cure it immediately after said molding, said temperature T2 being higher than a raised glass transition temperature T_g of said resin;

bringing said molded product to a temperature T3 to secondary-cure it said temperature T3 being equal to said raised glass transition temperature T_g of said resin and substantially less than T2; and,

removing said molded product from said mold and naturally cooling said molded product.

5,110,516

PROCESS OF MAKING A LEAD WIRE OF HARD CARBON

Mitsuru Yoshida, Fujioka, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 347,258, May 4, 1989, abandoned. This application Aug. 6, 1990, Ser. No. 563,955

Int. Cl.[5] B29C *47/00;* **C01B** *31/02*

U.S. Cl. 264—29.6 **5 Claims**

1. A process for producing a lead wire of hard carbon for supplying power to a fuel battery, comprising the steps of:

uniformly mixing and dispersing a mixture composition comprising

a monomer or a precondensate of furan resin,

binder containing as a main ingredient chlorine-containing vinyl resin, said chlorine-containing vinyl resin being the only ingredient that is carbonized after calcining, and

carbon powder;

applying high shearing force to the mixture composition;

molding the composition to obtain a preliminary molding;

extrusion molding the preliminary molding in a rod shape;

insolubilizing and infusibilizing the rod-shaped molding; and

calcining the rod-shaped molding in an inert gas atmosphere.

5,110,517

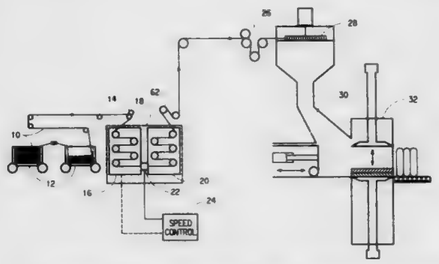
METHOD FOR DEREGISTERING CRIMPED MULTIFILAMENT TOW

Craig R. Lukhard, Newark; Jerry F. Potter, Seaford, both of Del., and Maurice C. Todd, Chadds Ford, Pa., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Jun. 1, 1990, Ser. No. 531,654

Int. Cl.[5] D02J *1/12*

U.S. Cl. 264—40.1 **4 Claims**



1. A method for deregistering a drawn crimped polyamide multifilament tow having variations of physical properties along the length of the tow comprising stretching said tow under a predetermined tension between feed and draw rolls and maintaining said tension substantially constant by controlling the speed of said feed rolls to maintain said tension constant while stretching sections of tow with differing physical properties.

5,110,518

FOIL-BLOWING APPARATUS AND METHOD

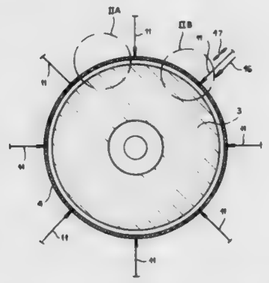
Hartmut Halter, Troisdorf, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Oct. 16, 1990, Ser. No. 598,392

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1989, 3935701; Apr. 27, 1990, 4013610

Int. Cl.[5] B29C *47/16, 47/92*

U.S. Cl. 264—40.1 **15 Claims**



1. A method of blowing a foil of a thermoplastic material, comprising the steps of:

(a) extruding a tube of said thermoplastic material continuously from an annular nozzle orifice;

(b) forming at least one annular wall of said orifice as an elastically deformable annular nozzle lip;

(c) blowing the thermoplastic tube extruded from said orifice to expand said tube into a foil balloon;

(d) flattening the foil balloon;

(e) winding at least one layer of foil formed by flattening said foil balloon into a roll of said at least one layer;

(f) measuring a thickness of said foil;

(g) prestressing said lip in a radial direction; and

(h) superimposing upon the radial prestress of said lip in step (g) a radial deformation of said lip in response to the measurement of thickness of said foil in step (f) at a multiplicity of locations around a periphery of said lip to correct a thickness of said tube and correct for thickness deviations of said foil.

5,110,519

PROCESS FOR MINIMIZING DISTURBANCE OF MULTI-LAYER LAMINATE MATERIAL IN EXTRUSION OF MULTI-LAYER PREFORMS FOR BLOW MOLDING OF HOLLOW BODIES

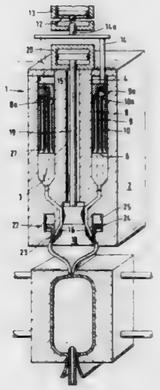
Werner Daubenbüchel, Bergisch-Gladbach; Otto Eiselen, Königswinter; Karsten Friedrichs, Bad Honnef; Dieter Hess, Swisttal; Erich Kiefer, and Peter Klüsener, both of Bonn, all of Fed. Rep. of Germany, assignors to Krupp Kautex Maschinenbau GmbH, Bonn, Fed. Rep. of Germany

Filed Jul. 9, 1990, Ser. No. 549,794

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1989, 3922883

Int. Cl.[5] B29C *49/04, 49/78*

U.S. Cl. 264—40.2 **20 Claims**



1. A batch process for the production of multi-layer hollow bodies by blow molding of tubular preforms, each preform being extruded in one working cycle through an outlet opening by an extrusion unit including a single extrusion head with the outlet opening and a plurality of extruders coupled with the extrusion head, each preform having a tubular wall of laminate material including at least one layer of each of at least two different thermoplastic materials, said extruders collectively containing all component materials of the laminate material, the unit including at least one laminate formation region, at least one storage chamber in communication with the at least one laminate-formation region and a communicating duct between said at least one storage chamber and the outlet opening, the communicating duct including a closure element, separate flows of component materials coming together in the laminate-formation region to form a laminate of the component materials, the at least one storage chamber being defined by at least one emptying means, the at least one emptying means reciprocating in a filling stroke movement for accumulating material in the at least one storage chamber and in an emptying stroke movement for advancing material from the at least one storage chamber towards the outlet opening during each working cycle, the process comprising the steps of:

continuously feeding the component materials from the plurality of extruders towards the outlet opening throughout each working cycle;

blocking the flow of the laminate to the outlet opening from the at least one laminate formation region and the at least one storage chamber by closing off the communication duct using the closure element;

filling the at least one storage chamber with material, with an accompanying filling movement of the at least one emptying means while closing off the communication duct;

opening the communication duct to the flow of the laminate through the outlet opening from the at least one laminate formation region and the at least one storage area;

emptying the at least one storage chamber of the material the chamber was filled with during the step of filling with an accompanying emptying stroke movement of the at least one emptying means whereby the emptying results in an accompanying ejection of one of the preforms from the outlet opening;

blow molding the ejected preform to form one of the hollow multi-layer bodies;

again blocking the flow of the laminate to the outlet opening from the at least one laminate formation region and the at least one storage chamber after the ejection of the preform;

again filling the at least one storage chamber with material, with an accompanying filling movement of the at least one emptying means after again blocking the flow of the laminate; and

regulating movement of the at least one emptying means during transitions from filling to emptying and from emptying to again filling of the at least one storage chamber to maintain pressure on the material in the least one laminate formation region during the transitions such that pressure changes which disturb the structure of the laminate layers being formed during any of the transitions are sufficiently avoided and the continuity of the laminate layers formed, during any of the transitions, as a wall of one of the hollow bodies is maintained.

5,110,520

METHOD FOR MANUFACTURING A POROUS STATIC PRESSURE GAS BEARING

Takatomi Miyazaki, Tsuchiura, and Satoshi Ohsaki, Ushiku, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1990, Ser. No. 594,933

Claims priority, application Japan, Oct. 13, 1989, 1-265221; Mar. 9, 1990, 2-056676; Apr. 19, 1990, 2-101713; Apr. 19, 1990, 2-101714

Int. Cl.[5] B29C *67/00;* **B05D** *5/00*

U.S. Cl. 264—40.3 **22 Claims**

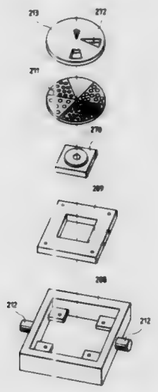
1. A method of manufacturing a porous static pressure gas bearing, including the steps of:

providing a porous material impregnated with resin;

selecting a pattern having a plurality of openings suited for providing a predetermined flow rate of gas through the gas bearing;

placing said pattern having said plurality of openings so as to face a bearing surface of the porous material; and

spraying a solvent for dissolving the resin through the pattern and onto the bearing surface of the porous material to



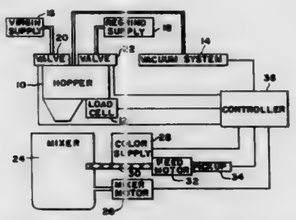
dissolve the resin and provide said predetermined flow rate of gas passing through the bearing surface.

5,110,521

HYBRID APPARATUS AND METHOD FOR BLENDING MATERIALS

Richard W. Moller, Fenton, Mich., assignor to Hydreclaim Corporation, Fenton, Mich.

Filed Aug. 17, 1990, Ser. No. 568,784
Int. Cl.[5] B29B *7/28;* **B29C** *47/92*
U.S. Cl. 264—40.4 **13 Claims**



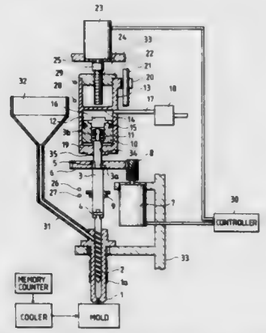
1. A method of blending a plurality of materials comprising:
(a) introducing a quantity of a first material from a source thereof to a container;
(b) weighing said first material in said container;
(c) introducing a quantity of a second material to said container;
(d) calculating a quantity of a third material that is required to be combined with said first material to produce a selected weight ratio of said first and third materials only;
(e) dispensing to a mixing chamber a quantity of said third material corresponding to the quantity calculated in step (d);
(f) discharging said first and second materials from said container to said mixing chamber; and
(g) mixing said first, second, and third materials in said mixing chamber.

5,110,522

ELECTRICALLY DRIVEN TYPE INJECTION MOLDING METHOD

Ryohei Inaba, Kawasaki; Masaaki Kumamura, Yokohama; Shojiro Danmoto, Ushiku; Mitsuo Arai, Chichibu; Yozo Tobo, Sagamihara; Hirofumi Sugawara, Yokohama, and Tadanobu Miyazaki, Ushiku, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 514,751
Claims priority, application Japan, Apr. 26, 1989, 1-104515; Jun. 2, 1989, 1-139258; Jun. 2, 1989, 1-139259; Jun. 2, 1989, 1-139260; Jun. 2, 1989, 1-139261; Mar. 20, 1990, 2-72934
Int. Cl.[5] B29C *45/23, 45/77, 45/80*
U.S. Cl. 264—40.4 **2 Claims**



1. A back pressure regulating method in an injection molding apparatus which includes an injection screw housed in a heating cylinder, a first motor for imparting rotational movement to the injection screw, a second motor for imparting rectilinear movement to the injection screw, ana a rectilinearly moving mechanism for converting rotation of the second motor into rectilinear movement of the injection screw, comprising the steps of:
measuring an amount of resin material charted in the heated cylinder by actuating the first motor to rotate the injection screw, the resin material accumulating in the cylinder and causing the injection screw to retract to a first predetermined position, wherein the resin material is mixed by the injection screw as it is being retracted to the first position;
applying a back pressure to the injection screw as the amount of resin material is measured;
actuating the second motor, whereby the rectilinearly moving mechanism causes the injection screw to retract to a second position further retracted from the first position, thereby
applying a suction force on the resin material as the injection screw is retracted to the second position; and
actuating the second motor, whereby the rectilinearly moving mechanism advances the injection screw toward an injection opening in the heated cylinder to inject the resin material into a mold.

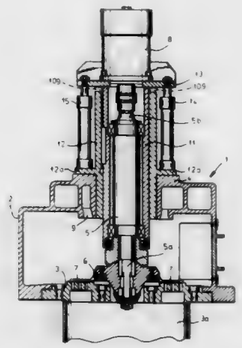
5,110,523

METHOD AND APPARATUS FOR MAINTAINING A CONSTANT CONTACT PRESSURE ON ELEMENTS FOR CUTTING UNDER WATER IN GRANULATOR MACHINES

Andrea Guggiari, Como, Italy, assignor to Pomini Farrel S.p.A., Castellanza, Italy

Filed Aug. 21, 1990, Ser. No. 570,222
Claims priority, application Italy, Sep. 19, 1989, 21759 A/89
Int. Cl.[5] B28B *11/16*
U.S. Cl. 264—40.5 **10 Claims**

1. A method for maintaining a constant position of cutter blades against a die for cutting a granular material under water, said method comprising the steps of:
(a) applying a predetermined thrust to the cutter blades of a cutter for urging same toward a die in a water chamber thereby advancing the cutter blades toward the die;
(b) bringing the blades into contact with the die with the predetermined thrust;
(c) rotating the cutter blades thereby generating a hydrodynamic force having a hydrodynamic thrust component directed towards the die;



(d) at least periodically detecting the hydrodynamic thrust component in response to the rotating of the blades; and
(e) applying a compensating force to the cutter blades equal to and directed opposite the hydrodynamic thrust component thereby maintaining the predetermined thrust force providing continuous contact between the cutter blades and the die.

5,110,524

PROCESS FOR MAKING MOLDED POLYMERIC PRODUCT WITH MULTIPASS EXPANSION OF POLYMER BEAD WITH LOW BLOWING AGENT CONTENT

William H. Harclerode, Ewing; William E. Volz, Marlboro; John V. Wiman, Morristown; John C. Voss, Trenton; Barry J. Pekich, Bridgeton, and John C. Knutsen, Highland Park, all of N.J., assignors to BASF Corporation

Division of Ser. No. 618,359, Nov. 26, 1990. This application Oct. 15, 1991, Ser. No. 776,956
Int. Cl.[5] C08J *9/22, 9/232, 9/24*
U.S. Cl. 264—53 **38 Claims**

1. A process for making a closed-cell foamed thermoplastic resinous molded object, the process comprising the steps of:
A. preexpanding unexpanded beads in from 2 to 4 preexpansion steps, the beads being comprised of:
i. a blowing agent which is at least one member selected from the group consisting of:
pentane, cyclopentane, methylcyclopentane, neopentane, isopentane, pentane petroleum distillate fractions, 2-methyl pentane, 3-methyl pentane, 2,2-dimethylbutane, 2,3-dimethylbutane, 2-methyl pentane, 3-methyl pentane, propane, butane, isobutane, hexane, isomers of hexane, cyclohexane, methylcyclohexane, heptane, propylene, butylene, isobutylene, mixtures of one or more aliphatic hydrocarbons having a molecular weight of at least 42 and a boiling point not higher than 95. C at 760 millimeters absolute pressure, water, carbon dioxide, ammonium carbonate, and azo compounds that are decomposable to form a gas at a heat-plastifying temperature to which the polymer is brought,
the blowing agent being present in the beads in an amount of from about 2 weight percent to about 4.4 weight percent based on the weight of the beads; and
ii. a polymer produced from at least one monomer, wherein the monomer is at least one member selected from the group consisting of:
styrene, derivatives of styrene, vinyltoluene, mono- and polyhalogenated vinyltoluenes which form linear polymers, acrylonitrile, methyl methacrylate, and vinyl toluene, the polymer being present in the beads in an amount of from about 93 weight percent to about 98 weight percent based on the weight of the beads, the polymer exhibiting:
(a) a polydispersity of from about 1 to less than 2.5,
(b) a weight average molecular weight of greater than about 180,000 to about 300,000, and
(c) an M_z:M_n of from about 2 to about 4.5, wherein the polystyrene polymer is branched to from 0 to less than 5 weight percent, and
wherein the preexpansion steps are carried out in an expander and at substantially atmospheric pressure, and wherein the preexpansion steps are carried out so that finally-preexpanded beads are produced, and
B. molding the finally-preexpanded beads in order to both fuse and further expand the finally-preexpanded beads, so that a molded foamed object having a density of from about 0.8 pounds per cubic foot to about 1.1 pounds per cubic foot is formed.

5,110,525

METHOD FOR MANUFACTURING A SUBSTANTIALLY RIGID WATER-DISPERSIBLE ARTICLE

Rodger E. Kolsky, Schenectady, N.Y., and William H. Hale, Sutton Ely, England, assignors to NET/TECH International, Inc., Baldwin, N.Y.

Filed Apr. 30, 1990, Ser. No. 516,148
Int. Cl.[5] B29C *39/02*
U.S. Cl. 264—122 **10 Claims**

1. A method for manufacturing a substantially rigid water-dispersible article, comprising the steps of:
mixing together in a dry state the following materials:
a water-soluble film-forming polymer,
chemically purified finely divided highly bleached cellulose, and
glass fiber wool;
adding water to the dry mixture to form a dough;
adding to said dough a hydrophobic composition in the form of a water-immiscible hydrophobic liquid substance dispersed in water;
forming the dough into a predetermined shape; and
drying the dough while the dough is maintained in said predetermined shape said water-immiscible hydrophobic liquid substance migrating to the surface of the article to form a moisture resistant or water-repellant coating or film layer.

5,110,526

PROCESS FOR PRODUCING MOLDED ARTICLES OF POLYTETRAFLUOROETHYLENE RESIN

Taira Hayashi, Atsugi; Hiroyuki Watanabe, Kanagawa; Akira Tuchiya, Hachiouzi; Kazuo Hagiwara, Isehara, and Iwao Hishiyama, Atsugi, all of Japan, assignors to Nippon Valqua Industries, Ltd., Tokyo, Japan

Filed Sep. 21, 1989, Ser. No. 410,339
Claims priority, application Japan, Sep. 22, 1988, 238426
Int. Cl.[5] B29C *47/90*
U.S. Cl. 264—127 **16 Claims**

1. A process for producing polytetrafluoroethylene resin molded articles, which comprises the steps of:
extruding from an extrusion machine an unsintered polytetrafluoroethylene resin paste extrusion molded article having an outer peripheral surface;
inserting said unsintered molded article into a sintering mold

comprising a cylindrical member having an inner peripheral surface, in such a manner that a clearance is produced between the outer peripheral surface of said unsintered molded article and the inner peripheral surface of said sintering mold;

sintering said unsintered molded article in a state of being inserted in said sintering mold at a temperature higher than a melting point of the polytetrafluoroethylene resin by means of an oven to produce a sintered molded article,



so that said sintered molded article expands outwardly in its radial direction and in its longitudinal direction, said expansion causing said clearance to disappear and causing the outer peripheral surface of the sintered molded article to be pressed against the inner peripheral surface of said sintering mold;

cooling said sintered molded article to cause it to contract to form a contracted molded article; and

removing said contracted molded article from said sintering mold.

5,110,527

POLYTETRAFLUOROETHYLENE POROUS MATERIAL AND PROCESS FOR PRODUCING THE SAME

Akira Harada, and Hiroshi Mano, both of Osaka, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed Jun. 15, 1990, Ser. No. 538,443

Claims priority, application Japan, Jun. 15, 1989, 1-150379

Int. Cl.[5] B27J *5/00*; B29C *47/40*

U.S. Cl. 264—127 **8 Claims**

1. A process for producing a polytetrafluoro-ethylene porous material which comprises the steps of: forming a mixture comprising a polytetrafluoroethylene fine powder having a number-average molecular weight of 2,000,000 or more, a polytetrafluoroethylene fine powder having a number-average molecular weight of 1,000,000 or less, and a liquid lubricant into a predetermined shape; subsequently stretching the formed mixture at least uniaxially in an unsintered state; and then heat-treating the stretched mixture at a temperature not lower than the melting point of polytetrafluoroethylene.

5,110,528

PROCESS FOR MAKING SCULPTURED INTERFITTING PIECES

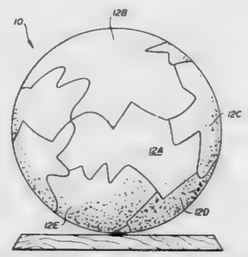
Nancy C. Greenfield, 10740 Strathern St., Sun Valley, Calif. 91352, and James S. Greenfield, 93 Wyckoff St., Brooklyn, N.Y. 11201

Filed Jan. 22, 1988, Ser. No. 147,293

Int. Cl.[5] B29C *39/02*

U.S. Cl. 264—138 **2 Claims**

1. A process for forming a take-apart article composed of a plurality of interfitting irregularly shaped pieces having curved complementary interfitting surfaces, which process comprises: (a) carving a selected moldable material into a desired configuration to form a first irregularly shaped piece of the article; (b) surrounding a portion of the surface of the first piece with a set-up to provide a mold adjacent to said first portion; (c) pouring a liquid moldable material into the mold; (d) allowing the moldable material to set to form a second piece of the article having a first portion of its surface complementing the irregular shape of the corresponding portion of



the first piece and having a second portion of its surface conforming with the inner surface of the mold; (e) carving the second portion of the surface of the second piece into a desired irregular configuration; (f) fitting the second piece against the first piece, and repeating steps (b), and (c), with respect to the first and second pieces; and (g) repeating steps (b)–(f) with respect to additional pieces until a desired number of individual pieces have been formed to constitute the take-apart article.

5,110,529

PROCESS FOR PRODUCING HOLLOW MOLDINGS

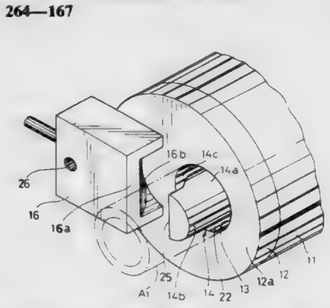
Hidetoshi Arima, Obu, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Obu, Japan

Filed Feb. 26, 1991, Ser. No. 660,865

Claims priority, application Japan, Feb. 28, 1990, 2-48583

Int. Cl.[5] B29C *47/22*

U.S. Cl. 264—167 **6 Claims**



1. A process for producing a hollow molding including a first portion and a second portion, said portions having different cross-sectional configuration and being integrally formed as a unit, comprising the steps of:

providing a molding die having an opening which is configured to conform with the outer circumferential configuration of said first portion;

providing a core member including a first portion which has an outer circumferential configuration corresponding to the inner circumferential configuration of said first portion of said hollow molding and a second portion which has an outer circumferential configuration of said second portion of said hollow molding;

arranging said molding die so that said first portion of said core member is positioned in said opening of said molding die for forming a molding opening which is configured to conform with the cross-sectional configuration of said first portion of said hollow molding;

extruding a molding material from said molding opening of said molding die to form said first portion of said hollow molding over a desired length;

providing a complemental holding die having a molding surface which is configured to conform with a part of the outer circumferential configuration of said second portion;

arranging said complemental molding die so that said second portion of said core member is faced to said molding surface of said complemental molding die for forming a molding clearance which is configured to conform with a part of the cross-sectional configuration of said second portion of said hollow molding;

continuously passing the molding material extruded from said molding opening through said molding clearance of said complemental molding die to form said second portion of said hollow molding, and

discharging an excessive molding material, said discharging step being included in said forming step for forming one of said first and second portions having a reduced cross-sectional area.

5,110,530

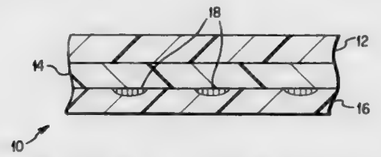
STRIPED FILM METHOD

Marvin R. Havens, Greer, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Sep. 7, 1990, Ser. No. 579,009

Int. Cl.[5] B29C *47/06*

U.S. Cl. 264—171 **6 Claims**



1. A method of making a pigmented film comprising coextruding at least three melt streams, one of the melt streams including a pigment, in a multiple layer die wherein the flow of the melt stream containing the pigment is restricted so that the resulting film has a striped appearance, and the pigmented melt stream forms an internal layer in the resulting film.

5,110,531

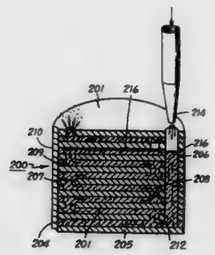
PROCESS AND APPARATUS FOR CASTING MULTIPLE SILICON WAFER ARTICLES

Leonard Nanis, Palo Alto, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Dec. 27, 1982, Ser. No. 453,718

Int. Cl.[5] B29C *45/00*

U.S. Cl. 264—219 **2 Claims**

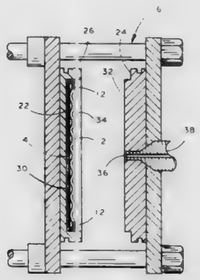


1. A non-pressing, non-squeezing, non-flattening, and non-Si spherical pool forming method for casting silicon articles of preselected shape suitable for fabricating into solar cells by reaction of gaseous silicon tetrafluoride with sodium in substantially stoichiometric quantities to produce a reaction product from which molten silicon and molten NaF are recovered and wherein said silicon tetrafluoride gas used in the reaction is obtained by thermal decomposition of sodium fluosilicate which is precipitated from aqueous fluosilicic acid generated from phosphate rock conversion to fertilizer, said process comprising:

a) assembling a plurality of modular segments into a mold having a preselected number of interconnected cavities capable of receiving molten NaF and molten silicon, said mold including at least one of a first separator plate segment, at least one of a first cavity plate segment, at least one of a second separator plate segment, at least one of a second cavity plate segment, and a bottom plate segment, said mold being formed by assembling said modular segments in a selected stacking order of said first separator plate segment, said first cavity plate segment, and said second separator plate segment one upon another so as to form a series of connected mold cavities separated alternately by said first separator plate segment and said second separator plate segment, said second separator plate segment below a last said first cavity plate segment being followed by said second cavity plate segment and said bottom plate segment with the proviso that if the first segment of said mold is a second separator plate segment, then the last separator stacked below the last said first cavity plate segment forming said mold is a first separator plate segment; each of said modular segments forming said mold having a substantially identical outer periphery, said outer periphery having an alignment notch thereon and said modular segments with said alignment notch when assembled in said selected stacking order define a continuous notch having a length coextensive with the height of said modular segments forming said mold, said first separator having at least one of a cavity neck passage and at least one of a sprue port forming passage therethrough and oppositely disposed, each proximate said outer periphery in spaced apart relation, said first cavity plate segment having at least one of a central cavity and at least one of a sprue port forming passage therethrough and oppositely disposed, proximate on opposite sides of said outer periphery in side-by-side spaced apart relation, said second separator plate segment having at least one of a cavity neck passage and at least one of a sprue port forming passage therethrough disposed in side-by-side spaced apart abutting relation, both positioned substantially proximate on one side of said outer periphery, said second cavity plate segment having at least one of a central cavity and at least one of a sprue port forming passage therethrough and oppositely disposed in side-by-side relation connected by a common connecting passage, and said bottom plate segment having a non-interrupted planar surface; said modular segments with said sprue port forming passage when assembled in said selected stacking order define a sprue port within said mold and having a continuous depth essentially coextensive with the height of said mold capable of receiving said molten NaF and said molten silicon into said central cavity formed by at least one said second cavity plate segment lying coplanar between selected said modular segments of said mold; one or more of said first cavity plate segments with said central cavity when assembled in said selected stacking order define one or more said central cavities within said mold capable of containing said molten silicon and NaF; said first separator plate segment and said second separator plate segment with respective said cavity neck passages when assembled in said selected stacking order are capable of providing liquid flow of said molten silicon and NaF between one or more said central cavities formed by said selected stacking order of said first cavity plate segment and said second cavity segment;

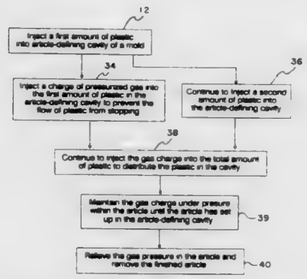
b) maintaining said mold in stacked configuration;
c) heating said mold to about the melting point of said molten silicon;
d) injecting said molten NaF downwardly into said sprue port through said sprue port forming passage of said mold, filling said bottom cavity first with said molten NaF and further filling one cavity after another above said bottom cavity in an ascending order through said interconnecting ports thereby displacing gases residing within said mold and completely filling said mold with said NaF;
e) injecting said molten silicon downwardly into said sprue port through said sprue port forming passage of said mold filled with NaF, filling said bottom cavity first with said molten silicon and continuing filling one cavity after another above said bottom cavity in an ascending order through said interconnecting ports thereby substantially displacing said molten NaF residing within said molten and substantially filling said mold with said molten silicon;
f) cooling said mold containing essentially said molten silicon at a selected temperature rate to below about the solidification temperature of said silicon; and
g) removing said silicon after solidification by disassembling said mold.

5,110,532
METHOD FOR MOLDING A LAMINATE
Siebolt Hettinga, 2123 NW. 111th St., Des Moines, Iowa 50322
Filed Mar. 4, 1991, Ser. No. 665,571
Int. Cl.[5] B29C *45/14, 45/16*
U.S. Cl. 264—257 **4 Claims**



1. A process of injection molding for forming a laminate having a deformable surface layer and a thermoplastic substrate, as the bonding agent, said process comprising the steps of:
(a) providing a male mold member and a female mold member;
(b) folding under an edge portion along at least a partial perimeter of said deformable surface layer;
(c) releasably securing said folded edge portion of said deformable surface layer to the undersurface of said deformable surface layer;
(d) placing said deformable surface layer between said male mold member and said female mold member, said undersurface of said deformable surface layer directed toward said male mold member;
(e) clamping said male mold member and said female mold member together to form a mold cavity;
(f) allowing time for said securement between said folded edge portion and said undersurface of said deformable surface to release;
(g) injecting a plastic material into the mold cavity and between said folded perimeter edge portion of said deformable surface layer and said undersurface of said deformable surface layer;
(h) allowing said plastic material to at least partially cool and harden; and then
(i) removing the resultant laminate from the mold cavity.

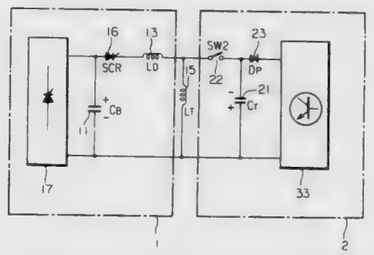
5,110,533
METHOD FOR THE USE OF GAS ASSISTANCE IN THE MOLDING OF PLASTIC ARTICLES TO ENHANCE SURFACE QUALITY
James W. Hendry, Brooksville, Fla., assignor to Milad Limited Partnership, Naples, Fla.
Filed Nov. 7, 1990, Ser. No. 610,386
Int. Cl.[5] B29C *45.00, 45.34;* **B29D** *22/00*
U.S. Cl. 264—572 **6 Claims**



1. A method for the use of gas-assistance in molding a hollow plastic article for improving surface quality of the plastic article in an injection molding system including a mold having an article-defining cavity, the method comprising the steps of:
injecting a first amount of molten plastic resin less than a total amount of molten plastic resin sufficient for the preparation of the plastic article into the cavity, so that the first amount of molten plastic resin flows in the cavity;
injecting a charge of pressurized gas into the mold after the step of injecting the first amount of plastic into the cavity, said gas charge being of pressure and quantity sufficient to enter but not exit the first amount of molten plastic resin in the cavity and sufficient to prevent the flow of first amount of molten plastic resin in the cavity from stopping;
continuing to inject a second amount of molten plastic resin into the cavity simultaneously with the step of injecting the charge of pressurized gas, the first and second amounts of molten plastic resin providing the total amount sufficient for the preparation of the plastic article;
continuing to inject the charge of pressurized gas into the mold to distribute the total amount of molten plastic resin in the cavity after completion of the step of injecting the second amount of molten plastic resin whereby imperfections on an exterior surface of the plastic article are prevented;
maintaining the gas charge under pressure within the article until the article has set up in the cavity to form the article;
relieving the gas pressure within the article; and
removing the article form the mold wherein a ratio of the first amount of molten plastic resin to the total amount of molten plastic resin is in a range of 0.2 to 0.7; and wherein the pressurized gas has a pressure between approximately 1000 psi and 5000 psi.

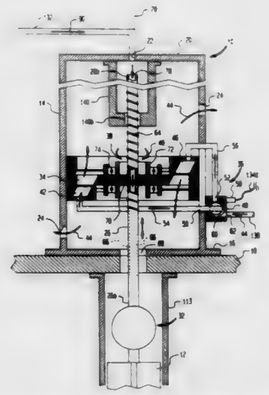
5,110,534
POWER SOURCE FOR NUCLEAR FUSION REACTOR
Satarou Yamaguchi, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Continuation of Ser. No. 828,879, Feb. 13, 1986, abandoned. This application Oct. 11, 1989, Ser. No. 420,729
Claims priority, application Japan, Feb. 19, 1985, 60-29301
Int. Cl.[5] G21B *1/00*
U.S. Cl. 376—143 **4 Claims**

1. In a nuclear fusion reactor having a load coil, a power source for supplying a current to the load coil, the power source comprising:
a biased power supply means, coupled to the load coil, for supplying a current in a first direction to the load coil and a reverse magnetic field power supply means coupled to the load coil, for supplying a reverse current of a second direction opposite to the first direction to the load coil and having a circuit for holding the reverse current for a predetermined period of time, wherein said biased power supply means includes means for maintaining a constant reverse current without a ripple through the load coil, said constant current maintaining means including a series circuit of a first capacitor, a unidirectional element having



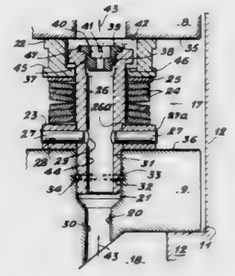
a switching function, and an inductor and connected in parallel with load coil, said biased power supply means further including a thyristor power supply connected in parallel with said capacitor, and wherein said reversed magnetic field power supply means includes a series circuit of a switch and a second capacitor connected in parallel with the load coil and a series circuit of a diode and a transistor power supply connected in parallel with said second capacitor.

5,110,535
TURBINE-DRIVEN CONTROL ROD DRIVE
Charles W. Dillmann, Morgan Hill, Calif., assignor to General Electric Company, San Jose, Calif.
Continuation-in-part of Ser. No. 553,073, Jul. 10, 1990. This application Mar. 11, 1991, Ser. No. 667,798
Int. Cl.[5] G21C *7/16*
U.S. Cl. 376—230 **13 Claims**



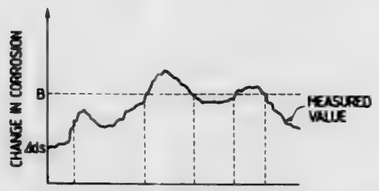
1. A drive for moving a control rod along a longitudinal axis in a reactor core disposed in a pressure vessel containing a pressurized fluid comprising:
a housing extending from said core;
a spindle disposed within said housing and mounted thereto for translation;
a turbine rotor operatively joined to said spindle within said housing for translating said spindle upon rotation of said rotor;
means for selectively rotating said turbine rotor in first and second opposite directions; and
coupling means joined to an end of said spindle for selectively gripping said control rod for translation movement with said spindle for inserting and withdrawing said control rod into and from said core, and for ungripping said control rod.

5,110,536
DEVICE FOR WEDGING THE UPPER SUPPORT PLATE OF CLUSTER GUIDES IN RELATION TO THE VESSEL OF A NUCLEAR REACTOR
Gérard Chevereau, Le Raincy, France, assignor to Framatome, Paris, France
Filed Nov. 15, 1990, Ser. No. 613,073
Claims priority, application France, Nov. 15, 1989, 89 14988
Int. Cl.[5] G21C *13/02*
U.S. Cl. 376—285 **10 Claims**



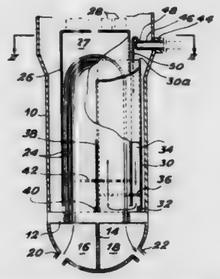
1. A device for wedging and positioning an upper support plate for guides of control clusters in relation to a bearing surface linked to a vessel of a pressurized-water nuclear reactor, said device comprising
(a) an upper ring (**22**) and a lower ring (**23**) which are respectively laid onto said support plate (**8**) and onto said bearing surface (**9**) and between which is seated a stack of preloaded elastic washers (**24**);
(b) a hollow connecting shank (**26**) provided with an axial channel (**44**) and passing through said upper and lower rings, said shank comprising a part engaging in a bore (**20**, **21**) in said support plate or bearing surface;
(c) said lower ring (**23**) having means (**27**) of connection to said shank, while said upper ring is mounted slidably in relation to said lower ring (**23**) under the effect of a load exerted on said elastic washers;
(d) said shank comprising means (**33**) for fixing said shank to said support plate or to said bearing surface inside said bore receiving said shank;
(e) said means of connection between said lower ring (**23**) and said shank (**26**) consisting of radial pins (**27**) passing through passages (**28**) formed transversely in said lower ring (**23**) and being fixed to said lower ring and penetrating into receptacles (**29**) provided in a lateral surface of said shank.

5,110,537
WATER QUALITY INSPECTION METHOD AND APPARATUS THEREFOR
Hideo Miura, Ibaraki; Asao Nishimura, Ushiku; Shinji Sakata, Katsuta; Tasuku Shimizu, Hitachi, and Shigeo Hattori, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 26, 1990, Ser. No. 484,914
Claims priority, application Japan, Feb. 27, 1989, 1-42986
Int. Cl.[5] G21C *9/00*
U.S. Cl. 376—305 **23 Claims**



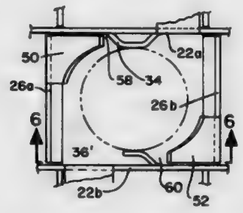
1. A method of inspecting the quality of water by measuring a variation in the water quality in terms of a difference in time variation of a distance between respective pairs of opposed electrodes of two or more pairs of opposed electrodes due to the corrosion rate of the electrode surface, the respective pairs of opposed electrodes being of the same material, and at least one of the pairs of opposed electrodes being of material different from material of another of the pairs of opposed electrodes.

5,110,538
PREHEATING STEAM GENERATOR
Yves Pascal, Nanterre, and Gilles Dague, Paris, both of France, assignors to Framatome, Courbevoie, France
Filed Mar. 22, 1990, Ser. No. 497,583
Claims priority, application France, Mar. 22, 1989, 89 03750
Int. Cl.[5] G21C *15/14*
U.S. Cl. 376—402 **11 Claims**



1. Steam generator for a pressurized water reactor having an external envelope with a vertical axis of revolution, said envelope defining an internal space subdivided into a primary lower zone and a secondary upper zone by a plate having horizontal tubes, a vertical partition subdividing the primary lower zone into a primary fluid supply collector and a discharge collector, a group of inverted U-tubes located in the secondary upper zone and connected to the tube plate in such a way that ends of the U-tubes issue respectively into the supply and discharge collectors, an inner envelope covering the group of tubes and having a lower edge remote from the tube plate, a skirt surrounding part of the inner envelope positioned vertically of the discharge collector in such a way as to define with the inner envelope a secondary water supply space which is open to the top and communicates at its bottom with a space within the inner envelope, said inner space communicating with an upper part of the secondary upper zone by water-steam separators traversing an upper wall of the inner envelope, a secondary water feed device having feed tubes issuing at the top of the feed space and a secondary steam discharge device traversing an upper wall of the inner envelope, wherein said steam generator comprises return-preventing means preventing secondary water issuing from the feed tubes from passing out of the feed space above the skirt, said return-preventing means comprising a plate mounted substantially level with an upper edge of said skirt so as to reduce at this level a cross-section of a passage for the secondary water supply space.

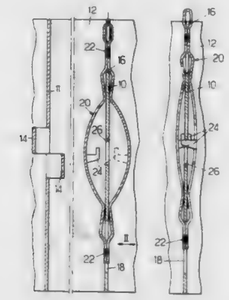
5,110,539
SPACER GRID ASSEMBLY FIXTURE
Patrick A. Perrotti, Newington, and Zeses E. Karoutas, Simsbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.
Filed Dec. 7, 1990, Ser. No. 624,338
Int. Cl.[5] G21C *3/34*
U.S. Cl. 376—439 **11 Claims**



1. A method for assembling an egg-crate type grid by orthogonally interengaging slots cut transversely into one longitudinal edge of each of a plurality of metal strips, comprising:
supporting a first plurality of strips on their lower unslotted edges in north-south orientation so that the strips are uniformly spaced apart in parallel in the east-west direction with all the slots oriented upwardly on the upper edge;
pre-positioning selected portions of the slotted upper edges of adjacent north-south strips farther apart in the east west direction while maintaining the lower edges at said uniform spacing;
interengaging the lower, slotted edges of a second plurality of east-west oriented strips with the north-south strips while the selected portions of the upper edges of the north-south strips are spread; and
returning the upper edges of the first plurality of strips to the unspread orientation.

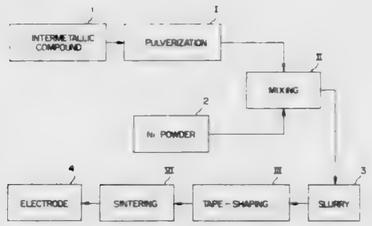
5,110,540
GRID FOR A NUCLEAR ASSEMBLY
Michel Verdier, Villeurbanne, France, assignor to Frametome & Compagnie Generale Des Matieres Nucleaires, France
Filed Feb. 21, 1990, Ser. No. 482,804
Claims priority, application France, Feb. 21, 1989, 8902242
Int. Cl.[5] G21C *3/34*
U.S. Cl. 376—441 **8 Claims**

3. A spacer grid for a nuclear fuel assembly, comprising a plurality of sets of plates which are interleaved and mutually interconnected to define cells each for receiving a fuel rod and further comprising a plurality of hairpin springs each carried by and retained on a respective one of said plates and each projecting into at least a respective one of said cells by a predetermined amount when in released condition for exerting a transverse holding force on one said fuel rod placed in the respective cell, wherein each of said springs is provided with retention means arranged for retaining it temporarily in a retracted condition with respect to the respective plate, said spring when in retracted condition projecting into the respective cell or cells by an extent less than said predetermined amount and said retention means being releasable by a force of predetermined direction applied on the spring, wherein said



retention means comprise at least one spur formed on a leg of said hairpin spring, shaped for engaging a respective plate.

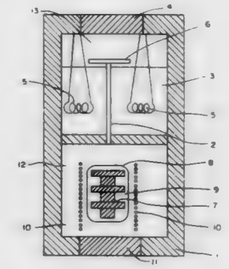
5,110,541
METHOD OF MANUFACTURING ELECTRODES OF MOLTEN CARBONATE FUEL CELL
Yoshikazu Yamamasu, Yokohama; Tetsuyuki Morita, Tokyo; Sadao Nakaniwa, Yokohama, and Masami Ichihara, Yachiyo, all of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan
Filed May 22, 1991, Ser. No. 703,929
Claims priority, application Japan, May 28, 1990, 2-135360
Int. Cl.[5] G22F *1/00*
U.S. Cl. 419—2 **14 Claims**



1. A method of manufacturing a porous electrode for a molten carbonate fuel cell, comprising the steps of:
(A) pulverizing an Al-base intermetallic compound;
(B) mixing Ni powders with the pulverized Al-base intermetallic compound to form a slurry which contains Ni powders and the pulverized intermetallic compound in a manner such that the pulverized intermetallic compound serves as a reinforcement;
(C) shaping the slurry like a sheet or a tape; and
(D) sintering the sheet or tape-like slurry to form the porous electrode.

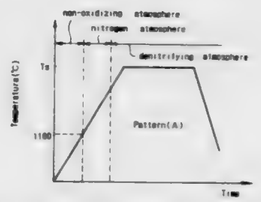
5,110,542
RAPID DENSIFICATION OF MATERIALS
Robert M. Conaway, Columbus, Ohio, assignor to Vital Force, Inc., Columbus, Ohio
Filed Mar. 4, 1991, Ser. No. 663,625
Int. Cl.[5] B22F *1/00*
U.S. Cl. 419—25 **6 Claims**

1. A method for the processing of a workpiece with high temperature and high pressure comprising the steps:
a) placing said workpiece into a pressure-containment vessel, and,
b) applying pressure to said workpiece of at least 10,000 pounds per square inch, and,
c) applying heat to said workpiece by a heating means, raising thereby the temperature of said workpiece such that every region of said workpiece requiring processing reaches a temperature in the range from a minimum of 60% to a maximum of the melting temperature of said material comprising said workpiece, wherein said heating is performed as rapidly as practicable consistent with the capabilities of said heating means, and,



d) applying pressure to said workpiece, said pressure reaching a maximum value at least four times the flow stress of the material comprising said workpiece, wherein said flow stress is determined for the material of said workpiece at the maximum processing temperature attained in step (c), and,
e) lowering the temperature of said workpiece to a value causing further processing of said workpiece to cease, and,
f) releasing said pressure and removing said workpiece from said pressure-containment vessel.

5,110,543
CEMENT BLADE MEMBER FOR CUTTING-TOOLS AND PROCESS FOR PRODUCING SAME
Niro Odani; Kazuyoshi Yoshioka, and Sinichi Sekiya, all of Tokyo, Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan
Division of Ser. No. 435,200, Nov. 9, 1989, Pat. No. 5,059,491. This application Jul. 19, 1991, Ser. No. 733,081
Claims priority, application Japan, Nov. 11, 1988, 63-285215
Int. Cl.[5] B22F *3/16;* **C22C** *19/00*
U.S. Cl. 419—29 **2 Claims**



1. A process for producing a blade member for cutting-tools, comprising the steps of:
(a) mixing powders of said binder phase for forming the binder and said hard dispersed phases to provide a powder mixture of a binder phase of 5% to 30% by weight of at least one element selected from the group consisting of cobalt and nickel; and
a hard dispersed phase of a balance composite carbo-nitride of titanium and at least one element selected from the group consisting of tungsten, molybdenum, tantalum, niobium, hafnium and zirconium, said composite carbo-

nitride satisfying the relationship of $0.2 \leqq b/(a+b) \leqq 0.7$, where a and b denote atomic ratios of carbon and nitrogen, respectively;

(b) compacting said powder mixture into a green compact; and

(c) sintering said green compact to provide the cermet substrate, said sintering including effecting initial temperature elevation to 1,100° C. in a non-oxidizing atmosphere; subsequent temperature elevation from 1,100° C. to a temperature range between 1,400° C. and 1,500° C. in a nitrogen atmosphere; and a subsequent sintering operation in a denitrifying atmospohere to obtain a hard surface layer in which the region having the maximum hardness is present at a depth from 5 μm and 50 μm from a substrate surface thereof said substrate surface having a hardness of 20% to 90% of said maximum hardness.

5,110,544

STAINLESS STEEL EXHIBITING EXCELLENT ANTICORROSION PROPERTY FOR USE IN ENGINE EXHAUST SYSTEMS

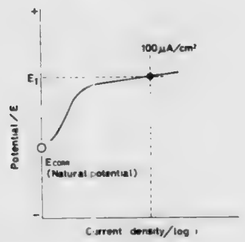
Eiji Sato; Ryo Matsubashi; Satoshi Ito, all of Kanagawaken; Kazuhiro Tano, and Kenichi Asakawa, both of Kitakyusyushi, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 27, 1990, Ser. No. 618,948

Claims priority, application Japan, Nov. 29, 1989, 1-309476

Int. Cl.[5] C22C *38/22, 38/26*

U.S. Cl. 420—69 **9 Claims**



1. A stainless steel exhibiting excellent anticorrosion property for use in engine exhaust systems comprising, as expressed in wt %,

not more than 0.010% C,

not more than 0.2% Si,

not less than 0.05% and not more than 1.5% Mn,

not less than 12% and not more than 20.0% Cr,

not less than 0.2% and not more than 3.0% Mo,

not less than 0.005% and not more than 0.1% Al,

not more than 0.015% N,

not more than 0.025% P,

not more than 0.010% S, either

not less than $10\times(C\%+N\%)$ and not more than 0.5% Ti, or said amount of Ti and

not less than $5\times(C\%+N\%)$ and not more than 0.5% Nb, and the balance of Fe and unavoidable impurities.

5,110,545

ALUMINUM ALLOY COMPOSITION

Donald C. McAuliffe, Golden, and Ivan M. Marsh, Denver, both of Colo., assignors to Golden Aluminum Company, Lakewood, Colo.

Continuation-in-part of Ser. No. 315,408, Mar. 24, 1989, Pat. No. 4,976,790. This application Sep. 5, 1990, Ser. No. 578,019

The portion of the term of this patent subsequent to Apr. 14, 2009, has been disclaimed.

Int. Cl.[5] C22C *21/08*

U.S. Cl. 420—534 **17 Claims**

1. An aluminum alloy composition, comprising:

a) from about 2 to about 2.8 weight percent magnesium;

b) from about 0.9 to about 1.6 weight percent manganese;

c) from about 0.13 to about 0.20 weight percent silicon;

d) from about 0.25 to about 0.35 weight percent iron; and

e) from about 0.20 to about 0.25 weight percent copper;

wherein the balance comprises aluminum.

5,110,546

METHOD FOR LOCATING METALLIC NITRIDE INCLUSIONS IN METALLIC ALLOY INGOTS

Jack C. White, Albany; Davis E. Traut, Corvallis; Laurance L. Oden, Albany, and Roman A. Schmitt, Corvallis, all of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 7, 1991, Ser. No. 696,805

Int. Cl.[5] C22C *1/00*

U.S. Cl. 420—590 **12 Claims**

1. A method of quantitatively determining the dissolution history of metallic nitride inclusions in metallic melts, comprising the steps of:

preparing a mixture of the halide of a metal and hafnium halide;

coreducing the mixture to form a metallic-hafnium alloy sponge;

nitriding or reacting in air the metallic-hafnium alloy sponge to form hafnium-labeled nitride or oxynitride inclusions;

seeding the metallic sponge to be melted with the hafnium-labeled nitride pieces to form ingots;

neutron activating the ingots; and

determining the hafnium location in the ingots by radiometric means.

5,110,547

PROCESS AND APPARATUS FOR THE PRODUCTION OF SEMI-SOLIDIFIED METAL COMPOSITION

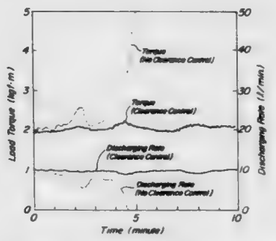
Manabu Kiuchi, Zushi; Masazumi Hirai, Chiba; Yasuo Fujikawa, Chiba; Ryuji Yamaguchi, Chiba; Akihiko Nanba, Chiba, and Masato Noda, Chiba, all of Japan, assignors to Rheo-Technology, Ltd., Japan

Filed Apr. 25, 1991, Ser. No. 692,444

Claims priority, application Japan, Oct. 29, 1990, 2-288383; Dec. 28, 1990, 2-418096; Feb. 28, 1991, 3-055584; Feb. 28, 1991, 3-055585

Int. Cl.[5] B22D *11/00*

U.S. Cl. 420—590 **14 Claims**



1. A process for continuously producing semi-solidified metal compositions in which non-dendritic primary solid particles are dispersed into remaining liquid matrix by conducting vigorous agitation in a molten metal cooling and solidification step, which comprises continuously charging molten metal into a clearance defined between a rotating agitator composed of a cylindrical drum having a horizontally rotational axis and a wall member having a concave face along an outer periphery of the drum, where dendrites produced by solidification based on forced cooling are broken through shearing force based on rotation of said rotating agitator to form a semi-solidified metal composition suspending fine non-dendritic primary solid particles, and then continuously discharging out the resulting semi-solidified metal composition from a lower part of said clearance.

5,110,548

APPARATUS FOR CONCURRENTLY OXGENATING AND PUMPING BLOOD CIRCULATED EXTRA-CORPOREALLY IN CARDIOVASCULAR SYSTEMS

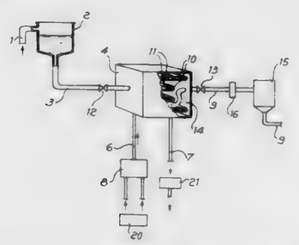
Franco M. Montevecchi, 11, Via Malaspina, Pioltello (MI), Italy 20096

Filed Mar. 10, 1988, Ser. No. 166,116

Claims priority, application Italy, Mar. 25, 1987, 19834 A/87

Int. Cl.[5] A61M *1/14*

U.S. Cl. 422—48 **10 Claims**



1. An apparatus for concurrently oxygenating and pumping blood circulated extra-corporeally in cardiovascular assistance, said apparatus comprising a container, at least one-blood oxygenating fluid interface permeable to gas and impermeable to blood within said container, said at least one interface defining an exchange area between a first circulation space for blood and a second circulation space for an oxygenating fluid, said container having a blood inlet and a blood outlet in fluid communication with said first circulation space, said container having an oxygenating fluid inlet and an oxygenating fluid outlet in fluid communication with said second circulation space, and pump means for pumping blood through said first circulation space, wherein said pump means for pumping blood comprises means for periodically varying the pressure of an oxygenating fluid acting on said at least one interface within said second circulation space, wherein the pressure variations cause a pulsed outflow of blood from the first circulation space whereby blood is oxygenated within said first circulation space as it is pumped therethrough.

5,110,549

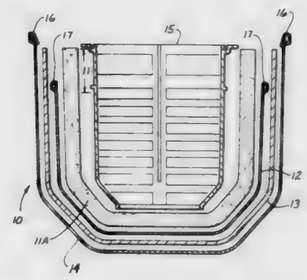
LIQUID AND GAS SEPARATION SYSTEM

Lucas S. Gordon, Laguna Beach, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 489,760, Feb. 27, 1990, abandoned, which is a continuation of Ser. No. 59,064, Jun. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 88,5963, Jul. 14, 1986, abandoned. This application Feb. 28, 1991, Ser. No. 664,449

Int. Cl.[5] A61M *1/14*

U.S. Cl. 422—46 **33 Claims**



1. A blood oxygenator comprising:

a housing defining a blood reservoir therewithin;

a filter element disposed within the blood reservoir, the filter element comprising, a) an inner blood receiving chamber formed therewithin, b) an upper region having a defoaming agent incorporated therein and c) a lower region also having a defoaming agent incorporated therein;

a blood inlet for providing a flow of blood into the inner blood receiving chamber of the filter element;

a blood outlet for allowing blood to flow out of the reservoir at a location outside of the filter element; and

a microscreen element disposed about the lower region of the filter element but not about the upper region of the filter element such that blood passing outwardly through the lower region of the filter element will subsequently flow outwardly through the microscreen element but blood passing outwardly through the upper region of the filter element will bypass the microscreen element;

said filter element being sized, constructed and positioned such that, if flow through the microscreen element becomes blocked, blood will divert through the upper region of the filter element and will subsequently bypass the microscreen element.

5,110,550

TEST CARRIER FOR THE ANALYTICAL DETERMINATION OF A COMPONENT OF A LIQUID SAMPLE

Reiner Schlipfenbacher, Lampertheim, and Joachim Steinbiss, Lorsch, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 25, 1989, Ser. No. 384,726

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1988, 3826057

Int. Cl.[5] G01N *21/00*

U.S. Cl. 422—56 **11 Claims**

1. Test carrier useful in determining a component of a liquid sample, comprising:

(a) a base layer having positioned thereon,

(i) a sample application region;

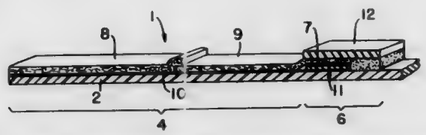
(ii) an evaluation region;

(b) a liquid transport path which extends from the sample application region into said evaluation region,

(c) a plurality of test layers, comprising a color forming layer positioned in the evaluation region of said liquid transport path, said color forming layer having a surface facing

away from said base layer and containing at least one color forming reagent. and

(d) an absorbent covering layer positioned above said surface of the color forming layer facing away from said base layer, wherein said absorbent covering layer is in fluid



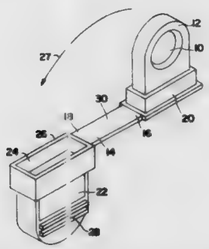
contact with said liquid transport path, and said absorbent covering layer when wet permits visualization of color in said color forming layer but is non-transparent to, wherein the color forming layer and the absorbent covering layer are arraigned as the last section of the liquid transport path said color when dry.

5,110,551

ZERO DIFFUSION PATH GAS DOSIMETER SYSTEM AND METHOD

Jan Michal, Prague, Czechoslovakia, assignor to ORE Research Institute, Prague, Czechoslovakia

Filed Jan. 3, 1991, Ser. No. 637,115
Int. Cl.[5] G01N *21/00, 31/22*
U.S. Cl. 422—58 **7 Claims**



1. A personal gas diffusion dosimeter, comprising:

(a) a gas permeable wafer formed of a material that is inert to polyamine, said wafer formed of a polymeric web having an axial gas diffusion length of substantially zero;

(b) a circumferential frame securably holding said wafer;

(c) a flexible elongate member having first and second ends, integrally formed at said first end thereof with a surface of said frame; and

(d) a rigid gas impermeable housing proportioned for enclosure about said frame, said housing having a mouth proportioned for securable receipt of said frame, said mouth, at a side thereof, integrally connected with said second end of said flexible member,

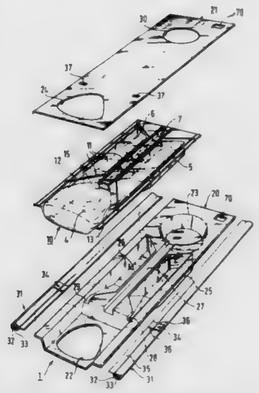
whereby said wafer-holding frame may be selectably inserted into said housing, after soakage of the wafer within an absorptive medium, and may be selectably released from said housing when a user wishes to expose the soaked wafer to an ambient atmosphere for an interval of time, and may be re-inserted into said housing after said interval has elapsed.

5,110,552

APPARATUS FOR PERFORMING BIOLOGICAL ANALYSES BY CHEMICAL REACTION ON A SERUM

Jean Guigan, 5, rue des Ursulines, 75005 Paris, France

Filed Jul. 18, 1989, Ser. No. 381,430
Claims priority, application France, Jul. 28, 1988, 88 10212
Int. Cl.[5] G01N *21/00, 35/00*
U.S. Cl. 422—64 **8 Claims**



1. An apparatus for processing a plurality of cartridges by performing biological analyses by chemical reaction on a serum, said apparatus comprising:

a hub mounted for rotation about the axis of the hub, connected to a motor and having an angle encoder controlling rotation cycles of said hub and imparting both centrifuging motion to the hub and also step-by-step motion thereto;

a plurality of circumferentially spaced cartridge-carrying lifts fixed radially to the hub and supporting said cartridges, respectively, means for causing each lift to pass from a cartridge-loading position to a working position, said cartridge-loading position being higher than said working position, each of the lifts having an open peripheral face, and aligned open top and bottom faces, and each lift including declutchable means for locking a cartridge radially in position during centrifuging;

a plurality of optical reading gauges at said circumferentially spaced positions of said lifts, fixed to said hub and level with the peripheral faces of said lifts, respectively, and rotatable therewith;

each cartridge being of generally rectangular shape and comprising:

a flexible sachet of flexible plastic material having three compartments each intended to contain a reagent or a diluant, with at least one of the compartments being a flexible analysis compartment optically aligned with said optical reading gauge, being connected firstly to a free end of the sachet via a channel closed by a fragile capsule, and secondly to the other two reagent storage compartments via respective ducts, each including a fragile weld;

a rectangular bottom preformed in plastic material receiving said sachet, having an opening aligned with said sachet analysis compartment and being also provided with a cuvette for storing serum, said channel of said sachet terminating in said cuvette;

a lid closing said bottom, said lid having an opening aligned with said opening within said bottom leaving a major portion of said analysis compartment visible for facilitating optical measurement of reagent condition in said analysis compartment;

said apparatus further comprising at least one peripheral optical read situated on the path of rotation of said optical

reading gauges for selective alignment with said optical reading gauges and performing an optical measurement of the condition of reagent mixture within an analysis compartment upon effecting such alignment means and a cartridge fragile capsule and weld breaking module situated above the path of movement of said analysis compartment and reagent storage compartments, provided with means for selectively breaking said fragile capsule and said fragile duct welds.

5,110,553

AUTOMATIC SAMPLE PREPARATION FOR ANALYSIS OF SAMPLE PARTICLES

Michael L. Ruschak, Sewickley Township, Allegheny County; William D. McAninch, Allegheny Township, Allegheny County, and Dan A. Anderson, Greensburg, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 2, 1988, Ser. No. 279,014
Int. Cl.[5] G01N *1/10, 21/62*
U.S. Cl. 422—68.1 **10 Claims**



1. Apparatus for analyzing the composition of metal particles produced by means for making the particles, comprising:

means for forming a gas stream to transport the metal particles from the means for making the particles to a cyclone device for separating the particles from said stream before they are supplied to a cup,

a cup located to receive metal particles from the means for producing said particles, which cup when filled to maximum capacity will hold substantially the same amount of metal particles from said means each time it is filled, said cup having an upper bevelled edge that is effective to divert particles not collected in the cup from the cup,

means for directing excess particles from the cup to a scrap location,

a dissolution vessel located to receive said amount of particles, said dissolution vessel provided with a ball valve that opens the vessel to receive the particles from the cup, and to close the vessel after the particles are received,

means for receiving said amount of particles from the cup before said amount is received in the dissolution vessel, and for directing said amount to the dissolution vessel,

means connected in fluid communication with the dissolution vessel for supplying a known amount of solvent to said vessel to dissolve said amount of metal particles received in the dissolution vessel and provide a dissolved sample of metal for analysis, and

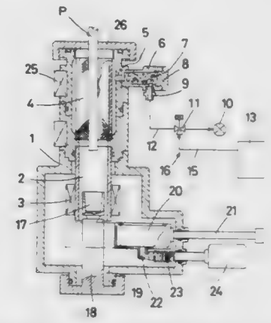
an optical emission spectrometer connected to receive the dissolved sample from the dissolution vessel for producing emission spectra from the dissolved sample, and for comparing said emission spectra with emission spectra produced by a known amount of a known alloy of the same metal as the sample metal to determine the composition of the sample metal.

5,110,554

COMBUSTION FURNACE FOR BURNING SAMPLE TO BE ANALYZED

Masahiro Tanimoto, Kyoto, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed Jan. 2, 1990, Ser. No. 460,210
Claims priority, application Japan, Jan. 14, 1989, 1-2976[U]
Int. Cl.[5] G01N *31/12*
U.S. Cl. 422—78 **4 Claims**



1. A combustion furnace system for burning a sample to be analyzed, consisting of:

a furnace body;

a combustion cylinder within the furnace body;

a filter located inside said furnace body to pass gaseous substances from the combustion cylinder;

a cleaning gas port on the furnace body at the outer circumference of the filter;

a cleaning gas supply line attached to the cleaning gas port to send pressurized cleaning gas to the interior of the furnace body for the purpose of removing dust stuck to the interior of the furnace body and the filter;

a three-way changeover valve on the outside of the furnace body, the three-way valve being repeatedly switched on and switched off while the cleaning gas is being sent to the interior of the furnace body to vary the pressure of the cleaning gas disbursed into the filter and interior of the furnace body; and

an analyzer attached to the three-way valve so that the gas port may be used as an output port with gaseous residue from burned samples output to the analyzer through the gas port.

5,110,555

CAPILLARY FLOW APPARATUS FOR INOCULATION OF A TEST SUBSTRATE

Craig E. Moore, Elkhart, and Kerry Wilson, South Bend, both of Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Sep. 18, 1989, Ser. No. 408,915
Int. Cl.[5] B65B *3/04;* **G01N** *1/18*
U.S. Cl. 422—100 **5 Claims**

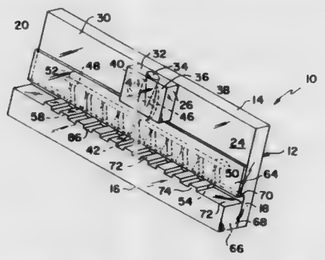
1. Apparatus for the simultaneous inoculation of multiple test means with liquid, said apparatus comprising:

a main body having a block member with a single liquid inlet located in the top of said block member and a capillary flow system interconnecting said single liquid inlet with multiple nozzle outlets positioned at the bottom of said block member,

wherein the capillary flow system consists of means defining a common capillary flow conduit for the flow of liquid from said single liquid inlet into multiple capillary

tubes and wherein each of said multiple capillary tubes is connected to a respective nozzle outlet;

support means positioned below said multiple nozzle outlets for holding multiple test means which are to be inoculated with liquid introduced into said single liquid inlet; and



a plurality of protuberances positioned in series along the length of said support means, said protuberances being aligned such that there is a protuberance directly below each nozzle outlet.

5,110,556

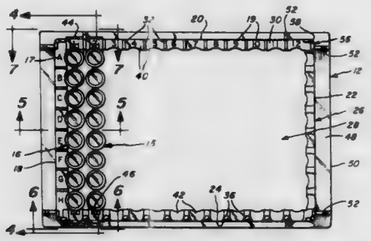
MULTI-WELL TEST PLATE

George Lyman, Cape Porpoise, Me., and Anthony Labriola, Woburn, Mass., assignors to Costar Corporation, Cambridge, Mass.

Continuation of Ser. No. 923,906, Oct. 28, 1986. This application Aug. 22, 1991, Ser. No. 749,166

Int. Cl.[5] G01N *21/03*

U.S. Cl. 422—101 **3 Claims**



1. A multi-well strip constructed and arranged to be removably mounted in a test plate comprising:

a multi-well strip comprising a plurality of spaced-apart wells arranged in a linear array and molded together as a strip of wells, each of said plurality of wells having side and bottom walls, wherein the bottom wall of each well is a microporous membrane,

frangible connecting means joining pairs of adjacent wells and enabling each well to be readily separated from the other wells in the strip, and

flanges attached to end wells of the strip and extending in opposite directions to permit releasable mounting of the strip on a test plate.

5,110,557

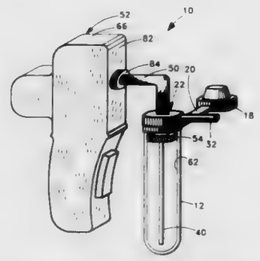
BLOOD SAMPLE COLLECTION APPARATUS

Bradley V. Brown, 11573 Monrovia St., Overland Park, Kans. 66210, and Rodney Laible, R.R. 1, Box 37, Bennington, Nebr. 68007

Filed Jul. 9, 1990, Ser. No. 549,953

Int. Cl.[5] B01L *11/00*

U.S. Cl. 422—101 **9 Claims**



1. A blood collection apparatus, comprising a blood collection tube having open and closed ends,

a plug adapted to fit within and seal the open end of the blood collection tube,

a vacuum tube extended through said plug for evacuating air from the blood collection tube, said vacuum tube having a lower end,

a pickup tube protruding outwardly from said plug for drawing blood from a puncture site,

a drop tube extending downwardly from said plug and having a lower end positioned within the blood collection tube and spaced substantially below the lower end of the vacuum tube,

conduit means within said plug for connecting said pickup tube and drop tube so that blood drawn into said pickup tube is deposited into the blood collection tube through the lower end of the drop tube,

a first filter on said plug and operatively interposed between the lower end of the vacuum tube and the air within said blood collection tube, said first filter being operative to allow gas flow therethrough but to block liquid flow therethrough, thus filtering the air drawn through said vacuum tube,

a portable hand-held vacuum source including an inlet port and means for connecting said inlet port to said vacuum tube;

said first filter comprising a ring having an exterior surface engaging the interior periphery of the blood collection tube of the same diameter, said exterior surface having a plurality of grooves formed therein and extending from an upper edge to a lower edge thereof for filtering air directed through those grooves between said ring and interior periphery,

the material of said ring being impervious to fluid flow therethrough but for through said exterior grooves, and

the exterior diameter of said ring corresponding to the interior diameter of said blood collection tube such that air passing between said ring and blood collection tube is confined to said grooves.

5,110,558

APPARATUS FOR ADSORPTION DETECTION

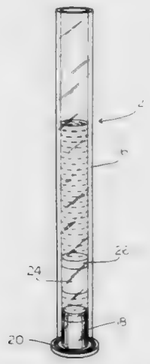
Thomas R. Romer, Washington, Mo., assignor to Romer Labs, Inc., Washington, Mo.

Division of Ser. No. 224,159, Jul. 26, 1988, Pat. No. 4,895,808. This application Dec. 13, 1989, Ser. No. 450,293

Int. Cl.[5] B01D *15/00, 33/01*

U.S. Cl. 422—101 **17 Claims**

1. An adsorption column for absorbing dissolved components consisting essentially of at least one of interferences and analytes from a solution, said column comprising a tubular member containing an absorbent packing mateial therein, said tubular member having a restricted bottom opening and a peripheral resilient seal member, said column being insertable within a test tube with said seal in close contact with an inner wall of said test tube, said column being insertable within said



test tube to forcefully exert pressure upon a solution in said tube to force said solution through said opening and past said adsorbent material for adsorption of said dissolved components onto said adsorbent material, said adsorbent material being packed within said tubular member in a layer and a separate filter for filtering solid mateial being provided in said tubular member between said opening and said adsorbent material.

5,110,559

HYDROGEN GENERATING APPARATUS

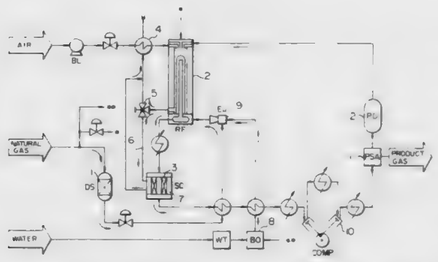
Yumihito Kondo, Ibaraki; Yoshiaki Amamo, Tsuchiura; Shinjiro Kimura, Ushiku, and Susumu Horiuchi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 544,381

Claims priority, application Japan, Jun. 29, 1989, 1-165211

Int. Cl.[5] G05D *23/00;* **B01J** *7/00, 12/00*

U.S. Cl. 422—109 **18 Claims**



1. A hydrogen generating apparatus comprising a reforming system including a reformer and a shift converter connected in series, each incorporating a catalyst, a material gas supply system for supplying a reactant gas to said reforming system, means for supplying a combustible gas to a combustion zone of said reformer, steam generating mean for supplying steam to said reforming system; an air supply system for supplying air to effect combustion of the combustible gas in the combusting zone to heat the catalyst in said reformer; a product hydrogen transporting system operatively associated with the reforming system for discharging product hydrogen from the apparatus and a reformer combustion gas exhaust system for discharging combustion gas from the reformer; said apparatus further comprising:

a shift converter jacket surrounding the catalyst within said shift converter;

a branch pipe branching from said reformer combustion gas exhaust system and leading to said shift converter jacket; and

a change-over valve provided at a portion of said reformer combustion gas exhaust system where said branch pipe branches off from said reformer combustion gas exhaust system; said change-over valve comprising valve means for alternately changing over flow of reformer combustion exhaust gas between a flow in the direction of said reformer combustion gas exhaust system and a flow in the direction of said shift converter jacket so that said reformer combustion exhaust gas flows through said jacket.

5,110,560

CONVOLUTED DIFFUSER

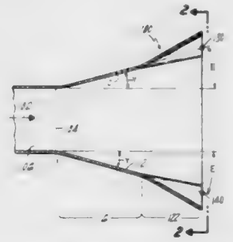
Walter M. Presz, Jr., Wilbraham, Mass.; Robert W. Paterson, Simsbury, Conn.; Michael J. Werle, West Hartford, Conn., and Robert H. Ealba, Grosse Pointe Farms, Mich., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 124,325, Nov. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 857,910, Apr. 30, 1986, abandoned, and a continuation-in-part of Ser. No. 947,164, Dec. 29, 1986, Pat. No. 4,789,117. This application Jul. 25, 1989, Ser. No. 384,620

The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.

Int. Cl.[5] F01N *3/10, 7/08;* **B01D** *53/36*

U.S. Cl. 422—176 **45 Claims**



1. A device for carrying a fluid in a downstream, principal flow direction, comprising wall means defining a diffusing section for decreasing the velocity in the principal flow direction and increasing pressure, said diffusing section having means defining an inlet and an outlet, the inlet cross-sectional flow area being less than the outlet cross-sectional flow area, said diffusing section wall means having a fluid passage defining surface extending from said inlet to at fluid passage defining surface extending from said inlet to at least said outlet, said surface having formed therein, between said inlet and outlet, a plurality of downstream extending, adjoining alternating troughs and ridges, both being U-shaped in cross-section taken perpendicular to the principal flow direction, including at least one pair of adjacent ridges defining one of said troughs therebetween, said plurality of troughs each having a downstream end the depth and height of said plurality of troughs and ridges both increasing in the downstream direction from an initial depth and height, respectively, of zero, said plurality of troughs and ridges having their maximum depth and height, respectively, at said downstream ends of said plurality of troughs, wherein adjoining troughs and ridges blend smoothly with each other along the length thereof forming a smoothly undulating surface, wherein said plurality of troughs and ridges are sized and contoured such that each trough generates

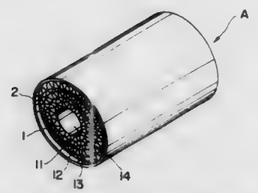
a pair of large-scale, counterrotating vortices, each vortex rotating about axes extending substantially in the downstream direction, said fluid passage defining surface immediately upstream of and adjacent said plurality of troughs and ridges being configured to avoid streamwise, two-dimensional boundary layer separation from said passage defining surface during operation of said device, and wherein said fluid passage defining surface extends downstream beyond and is joined to said downstream ends of said plurality of troughs.

5,110,561

EXHAUST GAS CLEANING DEVICE

Yuzo Hitachi, and Haruo Serizawa, both of Shizuoka, Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Japan

Filed May 2. 1990, Ser. No. 517,794
Claims priority, application Japan, May 8, 1989, 1-52419
Int. Cl.[5] B01J *35/04;* **F01N** *3/28*
U.S. Cl. 422—180 **12 Claims**



1. An improved exhaust gas cleaning device comprising:

a honeycomb core body, said honeycomb core body formed by superposing a planar band made of a metal sheet and a corrugated band made from another metal sheet one over the other in a contiguous relationship and then rolling the thus-superposed planar band and corrugated band together into a multilayered spiral form to define a number of network-patterned axial gas flow passages and carrying an exhaust gas cleaning catalyst thereon, the improvement comprising

means defining an open cylindrical hollow space within the honeycomb core body, along the central axis of rolling thereof, wherein the open cylindrical hollow space has a diameter satisfying the following relationship

$$\frac{20}{100} \cdot \phi_1 \leqq \phi_2 \leqq \frac{95}{100} \cdot \phi_1$$

wherein

ϕ_1 is the outer diameter of the honeycomb core body, and

ϕ_2 is the diameter of the cylindrical hollow space; and

outer casing means having an inner diameter ϕ_1 closely fitting around the honeycomb core body while the presence of the open cylindrical hollow space of diameter ϕ_2 is maintained therein.

5,110,562

LASER ISOTOPE SEPARATION APPARATUS

Nobuyuki Sasao, and Hiromi Yamaguchi, both of Tokai, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Feb. 28, 1990, Ser. No. 486,495
Claims priority, application Japan, Aug. 4, 1989, 1-202653
Int. Cl.[5] B01J *19/08*
U.S. Cl. 422—186 **5 Claims**

1. A laser isotope separation apparatus used for isotopes having an isotope shift which is not greater than a line width of laser light, comprising:

gasification means for gasifying a substance containing isotopes,

first excitation means providing irradiated laser light of a first wavelength, for exciting the isotopes to a first excited level,

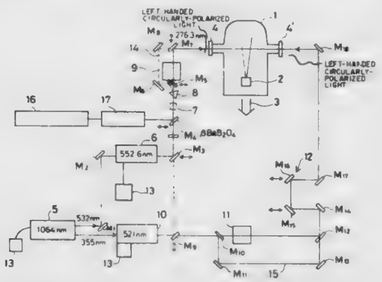
second excitation means providing irradiated laser light of a second wavelength, for exciting isotopes excited by the laser light of the first wavelength to a second excited level,

ionization means providing irradiated laser light of a third wavelength to ionize the isotopes at the second excited level,

separation means for separating ionized isotopes from neutral isotopes, said separation means including electrodes applied with an electromagnetic field,

light pumping means for pumping at least two different leasers,

wave conversion means for producing a non-linear optical



effect for converting wavelength of light from at least one of said lasers, said wave conversion means including first and second circular polarization converters, wherein the laser light of said first wavelength is converted to circularly polarized light having a first optical path by said first circular polarization converter, and said laser light of said second wavelength having a second optical path is converted to circularly light by said second circular polarization converter,

optical circuit means for delaying said circularly polarized laser light in at least one of said first and second optical paths such that said first and second wavelengths are made to be the same length,

wherein said first circularly polarized laser light and said second circularly polarized laser light are irradiated on said gasified substance from opposite directions.

5,110,563

CATALYTIC COMBUSTION

Kim P. A. Noakes, Norton, and Peter J. Davidson, Hurworth-on-Tees, both of England, assignors to Imperial Chemical Industries, PLC, London, England

Division of Ser. No. 181,031, Apr. 13, 1988, Pat. No. 4,938,685, which is a continuation-in-part of Ser. No. 52,004, May 20, 1987, Pat. No. 4,788,004. This application May 30, 1990, Ser. No. 530,309
Claims priority, application United Kingdom, May 27, 1986, 8612777; Apr. 13, 1987, 8708776
Int. Cl.[5] B01J *8/04*
U.S. Cl. 422—191 **5 Claims**

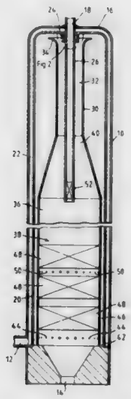
1. Catalytic combustion apparatus comprising:

a) an cylindrical shell provided with first and second inlet ports and an outlet port;

b) a hollow member, having an interior and inlet and outlet ends, disposed within the shell, and extending along a major proportion of the length thereof, said hollow member defining an annular space between said shell and said hollow member, the interior of said hollow member communicating with said annular space at the inlet end of said hollow member and with said outlet port at the outlet end of said hollow member;

c) first supply means connected to the first inlet port for supplying a first gas stream from said first inlet port to the interior of the hollow member, said first supply means having a discharge end terminating adjacent the inlet end of said hollow member;

d) second supply means connected to the second inlet port for supplying a second gas stream from said second inlet port to the interior of the hollow member, said second supply means including a conduit extending into the interior of said hollow member and having a discharge end terminating between the discharge end of the first supply means and the outlet end of said hollow member;



e) a combustion catalyst bed disposed within the hollow member between the discharge end of the second supply means and the outlet end of said hollow member;

f) communication means disposed between the combustion catalyst bed and the outlet port, providing communication between the interior of the hollow member and the annular space; and

g) constriction means provided at the discharge end of the first supply means forming an ejector for inducing recycle of gas from the interior of the hollow member via the communication means and the annular space to the inlet end of said hollow member.

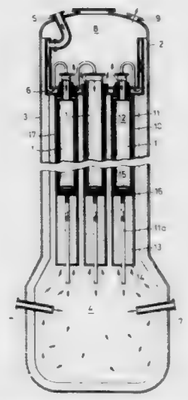
5,110,564

DEVICE FOR ACCOMMODATING CATALYST ESPECIALLY IN THE PRODUCTION OF SYNTHESIS GAS

Hans-Joachim Herbort, Froendenberg, Fed. Rep. of Germany, assignor to Uhde GmbH, Dortmund, Fed. Rep. of Germany

Filed Apr. 24, 1989, Ser. No. 342,983
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813863
Int. Cl.[5] B01J *8/06*
U.S. Cl. 422—197 **15 Claims**

1. In a device for accommodating a primary catalyst and a secondary catalyst in the production of synthesis gas in an auto thermal reformer comprising an upright pressure vessel (2) having an upper end and a lower end, a plurality of laterally spaced upright primary catalyst tubes (11) containing the primary catalyst and secondary catalyst containing means located within said pressure vessel, wherein the improvement comprises means for containing and supporting the secondary catalyst from each said primary catalyst tube, and a narrow feed tube (11*a*) having a diameter smaller than said primary catalyst tubes (11) extending downwardly from and in open flow communication with a lower end of each said primary catalyst tube (11), and each of said narrow feed tubes (11*a*)



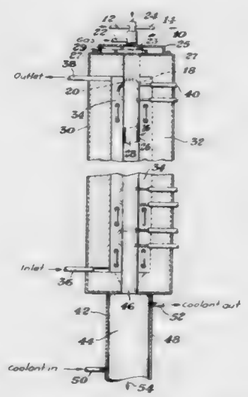
extending through said means for supporting the secondary catalyst.

5,110,565

APPARATUS FOR PRODUCING UNIFORM, FINE CERAMIC POWDER

Alan W. Weimer; William G. Moore, and Raymond P. Roach, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 5, 1938, Ser. No. 152,613
Int. Cl.[5] F28D *7/10, 15/00*
U.S. Cl. 422—198 **6 Claims**



1. An apparatus for producing uniform, fine ceramic powder comprising:

(a) a reactant transport member;

(b) a reactor chamber;

(c) a heating means; and

(d) a cooling camber;

the reactant transport member comprising a conduit in fluid communication with the reactor chamber, said reactant transport member further comprising a cooling apparatus, said cooling apparatus constructed so as to support and enclose at least a portion of said conduit, said apparatus further comprising a support sleeve, said support sleeve constructed so as to support said transport member, said

support sleeve further constructed so as to be spaced apart from said transport member, said apparatus further comprising a plug, wherein said plug is in operative contact with at least a portion of said support sleeve, said plug having an aperture defined therein, said aperture having a surface constructed so as to be spaced apart from the reactant transport member, the support sleeve and the plug positioned so as to define an annular gas-flow space around an exterior surface of said conduit of said reactant transport member, said gas-flow space in flow communication with the reactor chamber;

the reactor chamber comprising a wall defining a reaction zone, the wall comprising a refractory material;

the heating means constructed so as to heat reactants in the reaction zone to a temperature sufficient to react reactants present in said reactor chamber, said heating means positioned so as to maintain an area of the reaction zone, positioned adjacent to said reactant transport member, at a desired reaction temperature; and,

the cooling chamber, of said apparatus, comprising a wall defining a cooling zone, said cooling zone further comprising a cooling inlet, said reactor chamber in flow communication with said cooling zone via said cooling inlet, wherein said cooling zone and said cooling inlet have diameters and wherein said cooling zone diameter is larger than said cooling inlet diameter;

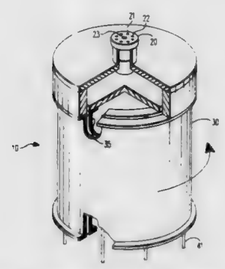
said apparatus further constructed so as to maintain the reactant transport member, and the cooling chamber at temperatures below that of the reaction zone, wherein reactants are fed through the reactant transport member into the reaction zone of said reactor chamber so as to react to form products, and subsequently feeding the products into the cooling zone so as to produce uniform, fine ceramic powders.

5,110,566

CHROMATOGRAPHIC SEPARATION OF ZIRCONIUM ISOTOPES WITH REDUCED WASTE LIQUOR

Thomas S. Snyder, Oakmont, Pa., and Ernest D. Lee, Ogden, Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 19, 1990, Ser. No. 555,342
Int. Cl.[5] C22B *34/10*
U.S. Cl. 423—70 **15 Claims**



1. A continuous chromatographic process for the simultaneous separation of each of the isotopes of zirconium in a sample containing a mixture of zirconium isotopes to produce substantially pure fractions of each of said separated isotopes, wherein said process includes the steps of:

(a) loading a substantially vertical chromatographic separation column having an effective column height sufficient to resolve each said zirconium isotope into a distinct product fraction having a purity greater than 90% with a cation exchange resin including pentavalent phosphorus-derived active groups having a strong affinity for zirconium cations and complexes thereof;

(b) preparing an aqueous feed solution of ionic zirconium from said sample having a pH of between about 3 and 4 and a solubility limit of about 90 g/l;

(c) preparing an eluant capable of displacing zirconium ions from said exchange resin, wherein said eluant is an aqueous solution of a strong mineral acid having a normality greater than one;

(d) feeding said aqueous zirconium feed solution to the top of said located chromatographic separation column so that said feed solution begins to travel down said column;

(e) feeding said mineral acid eluant through said column to cause each of the zirconium isotopes in said feed solution to pass through said column at a different speed;

(f) collecting a separate zirconium isotope containing product fraction at the bottom of said column for each of the isotopes present in said sample; and

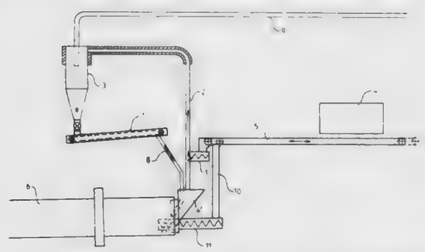
(g) containing to feed said eluant through said column until each of said zirconium isotopes present in said sample has been separated and collected.

5,110,567

METHOD AND APPARATUS FOR HEAT TREATMENT OF LIME MUD

Esko I. Mattelmäki, Varkaus, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Jan. 22, 1990, Ser. No. 467,398
Claims priority, application Finland, Jan. 26, 1989, 890376
Int. Cl.[5] C01F *11/06*
U.S. Cl. 423—175 **12 Claims**



1. A method for heat treating lime mud utilizing a pneumatic drier and a reburning kiln, comprising the steps of:

(a) thickening lime mud to a dry solids content of over about 75%;

(b) drying and preheating the thickened lime mud in the pneumatic drier utilizing flue gases exhausted from the kiln;

(c) separating the thickened, dried, lime mud from the flue gases; and

(d) feeding the thickened, dried, lime mud to the kiln.

5,110,568

STANNOSILICATES AND PREPARATION THEREOF

Edward W. Corcoran, Jr., Easton, Pa.; David E. W. Vaughan, Flemington, N.J., and Paul E. Eberly, Jr., Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 486,471, Feb. 28, 1990, which is a continuation-in-part of Ser. No. 91,657, Sep. 1, 1987, abandoned. This application Sep. 14, 1990, Ser. No. 582,301
Int. Cl.[5] C01B *17/16*
U.S. Cl. 423—230 **12 Claims**

1. A process for removing H_2S from a feed stream containing H_2S and hydrocarbons or hydrogen, or both comprising contacting the stream with a crystalline stannosilicate of the general formula:

$$xM_2O.SiO_2.4\pm0.5Sn_nO_2.yH_2O.ZR$$

M is a Group IA metal, a Group IIA metal whereupon M_2O becomes MO, or a quaternary amine

x is 1.5 to 4;

y is 4 to 15;

R is an amine; and

Z is 0 to 4,

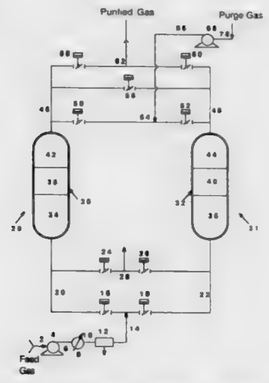
wherein the framework comprises tin, silicon, and oxygen, the tin is octahedrally coordinated and silicon is tetrahedrally coordinated, absorbing H_2S on the crystalline stannoxilicate, and recovering a stream depleted in H_2S.

5,110,569

LOW TEMPERATURE PURIFICATION OF GASES

Ravi Jain, Piscataway, N.J., assignor to The BOC Group, Inc., New Providence, N.J.

Filed Jan. 19, 1990, Ser. No. 467,673
Int. Cl.[5] C01B *31/18, 31/20, 3/58*
U.S. Cl. 423—230 **31 Claims**



17. Process for producing a gaseous product substantially purified from impurities consisting of water vapor, carbon monoxide and carbon dioxide comprising:

(a) removing water vapor from a gaseous feed stream containing said impurities and sufficient oxygen to convert all carbon monoxide present in said gaseous feed stream to carbon dioxide;

(b) contacting the feed stream from step (a) with one or more oxidation catalysts to thereby convert carbon monoxide to carbon dioxide; and

(c) removing carbon dioxide and any remaining water vapor from the gaseous product obtained in step (b) to obtain said substantially purified gaseous product.

5,110,570

PREPARATION OF CRYSTALLINE POROUS BORO-SILICATES

Giuseppe Bellussi, Piacenza; Angela Carati, San Giuliano Milanese, and Fabrizio Cavani, Modena, all of Italy, assignors to Eniricerche S.p.A, Milan; Enichem Synthesis S.p.A., Palermo and Snamprogetti S.p.A., Milan, all of, Italy

Filed Dec. 14, 1990, Ser. No. 627,635
Claims priority, application Italy, Dec. 21, 1989, 22795 A/89
Int. Cl.[5] C01B *35/12*
U.S. Cl. 423—277 **11 Claims**

1. Process for preparing crystalline, porous borosilicates or boron-metal-silicates isostructural with beta zeolites characterized by the following general formula:

$$a(TEA^-)_2O.b\ Me_{2/n}O.(1-c)B_2O_3.c\ L_2O_3.d\ SiO_2$$

wherein:

TEA^+ = tetraethylammonium

$ME = H^+$, NH_4^+ or a metal cation having "n" valency

L is selected from the group consisting of aluminum, gallium, iron, chromium, vanadium, molybdenum and manganese

a = 0.1–1

b = 0.1–1

c = 0–0.9

d = 4–1000

consisting of:

(a) preparing an "A" mixture containing a silica source, a boron source, the hydroxide of an alkali metal (MeOH), a tetra-alkylammonium (R^+) salt, distilled water and, in the particular case of boron-metal-silicates, a source of metal (L), such that the molar composition of the mixture, expressed as oxides, is the following:

$SiO_2/B_2O_3 > 1$,

$R^+/SiO_3 = 0.1$–1.0,

$Me/SiO_2 = 0.1$–1.0,

$H_2O/SiO_2 = 5$–80,

and, in the case of boron-metal-silicates, $SiO_2/L_2O_3 > 10$ and heating such a mixture in an autoclave under hydrothermal conditions and under its autogenous pressure, at a temperature within the range of from about 90° C. to about 160° C. for a time of not less than 1 day,

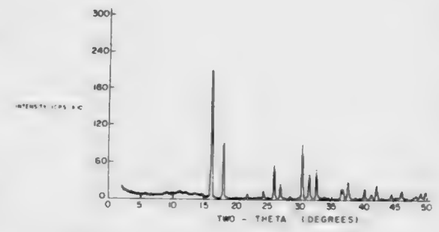
(b) adding the mixture obtained from the above (a) step, in an amount within the range of from about 1 to about 60% by weight, to a fresh mixture "B" having the same, or substantially the same, composition as of the "A" mixture and heating the resulting "C" mixture in an autoclave, under hydrothermal conditions and under the mixture's autogenous pressure, at a temperature within the range of from about 90° C. to about 160° C., under static conditions, or with stirring.

5,110,571

STANNOSILICATES AND PREPARATION THEREOF (C-2417)

Edward W. Corcoran, Jr., Easton, Pa.; David E. W. Vaughan, Flemington, N.J., and Paul E. Eberly, Jr., Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 91,657, Sep. 1, 1987, abandoned. This application Feb. 28, 1990, Ser. No. 486,471
Int. Cl.[5] C01B *33/20*
U.S. Cl. 423—326 **17 Claims**



1. Crystalline stannosilicate of the formula

$$xM_2O.SnO_2.4\pm0.5SiO_2.yH_2O.zR$$

wherein M is Group IA metal, a Group IIA metal, whereupon M_2O becomes MO, or a quaternary amine;

x is 1.5 to 4;

y is 4 to 15;

R is an amine; and

z is 0 to 4

wherein the framework species comprises tin in octahedral coordination, silicon in tetrahedral coordination, and oxygen.

5,110,572

SYNTHESIS OF MESOPOROUS CRYSTALLINE MATERIAL USING ORGANOMETALLIC REACTANTS

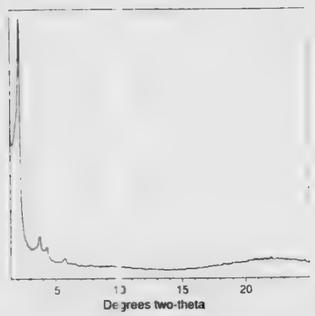
David C. Calabro, Somerset; Kirk D. Schmitt, Pennington, both of N.J., and James C. Vartuli, West Chester, Pa., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 625,238, Dec. 10, 1990, which is a continuation-in-part of Ser. No. 470,008, Jan. 25, 1990. This application Jun. 24, 1991, Ser. No. 720,105

The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.

Int. Cl.[5] **C01B** *33/34*

U.S. Cl. 423—328 **27 Claims**



1. A method for synthesizing a composition of matter comprising an inorganic, porous, non-layered crystalline phase material exhibiting, after calcination, an X-ray diffraction pattern with at least one peak at a d-spacing greater than about 18 Angstrom Units and having a benzene adsorption capacity of greater than 15 grams benzene per 100 grams of said material at 50 torr and 25° C. which comprises (i) preparing a reaction mixture capable of forming said composition, said mixture comprising one or a combination of oxides selected from a group consisting of divalent element, trivalent element, tetravalent element and pentavalent element, organic directing agent and solvent or solvent mixture, said organic directing agent comprising an ion of the formula $R_1R_2R_3R_4Q^+$, wherein Q is nitrogen or phosphorus and wherein at least one of R_1, R_2, R_3 and R_4 is aryl or alkyl of from 7 to about 36 carbon atoms or combinations thereof, the remainder of R_1, R_2, R_3 and R_4 being selected from the group consisting of hydrogen, alkyl of from 1 to 5 carbon atoms and combinations thereof, (ii) maintaining said mixture under sufficient conditions of pH, temperature and time for formation of said composition of matter, and (iii) recovering said composition of matter, wherein a dialkoxyaluminoxytrialkoxysilane is in the reaction mixture in step (i).

5,110,573

SILICA-ALUMINA-ORGANIC AMINE PRODUCT, ITS SYNTHESIS AND USE IN ZEOLITE PRODUCTION

Ivy D. Johnson, Medford, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 16, 1990, Ser. No. 568,295

Int. Cl.[5] **C01B** *33/34*

U.S. Cl. 423—328 **14 Claims**

1. A process for producing a zeolite in the presence of an organic compound which is selective to the production of said zeolite, under zeolite crystallization conditions, wherein the process comprises

providing a particulate, amorphous silicate-aluminate derivative of said organic compound effective to cause the crystallization of said zeolite under the conditions [B] below:

(A) wherein said silicate-aluminate derivative is formed by a method which comprises:

forming at least two aqueous solution streams, the first of said two streams containing a soluble source of silicon and a second stream containing a soluble source of aluminum,

contacting the two streams continuously, in the presence of said organic compound, at a pH of less than 7, to form a product stream which has a pH of greater than 7 which contains an insoluble precipitate,

wherein conditions of said contacting include a temperature of ambient to 300° C.,

whereby said insoluble precipitate is said silicate-aluminate derivative, and

wherein said derivative is stable to water washing; and

(B) introducing said particulate, amorphous silicate-aluminate derivative to water to provide a system containing greater than 8 weight percent solids loading,

wherein solids loading percent is defined by the formula

$$\frac{\text{weight of said silicate aluminate}}{\text{weight of water plus silicate-aluminate}} \cdot 100\%$$

subjecting said system to elevated temperatures of 80° C. to 300° C., at pressures effective to produce said zeolite.

5,110,574

PRECIPITATED SILICAS AND PROCESS FOR THEIR PRODUCTION AND USE

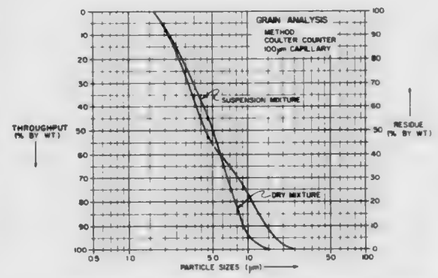
Helmut Reinhardt, Cologne; Adam Becker, Bornheim-Hersel; Robert Kuhlmann, Erftstadt, and Peter Nauroth, Wesseling, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 123,006, Nov. 19, 1987, abandoned. This application Dec. 7, 1988, Ser. No. 281,917

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639845

Int. Cl.[5] **C01B** *33/12*; **C09K** *3/14*; **A61K** *7/16*

U.S. Cl. 423—335 **10 Claims**



1. A precipitated silica having, the following physical-chemical features:

drying loss (DIN 53198)	%	3–7
Conductivity at 25° C. (4% slurry)	µS	400–800
pH level (5% accd. to DIN 53200)		6–7
BET* surface area (DIN 66131)	m^2/g	130–150
tamping density (DIN 53194)	g/l	100–150
macropore volume D > 30 nm (by Hg-injection method)	ml/g	3.2–4/0
Gardner oil absorption	ml/100 g	180–200
water retention capacity	%	76–79
Cu abrasion	mg	5–14
RDA** abrasion		35–100

-continued

REA*** abrasion		40–90
scratch		little–very little
viscosity (in 16% glycerin-water dispersion (1:1); aerometer D w/ heliopath)	mPas	5000–10000
Fe content	ppm	240–280

3. A precipitated silica having the following physical-chemical features:

drying loss (DIN 53198)	%	3–7
conductivity at 25° C. (4% slurry)	µS	250–400
pH level (5% accd. to DIN 53200)		6–7
BET surface area (DIN 66131)	m2/g	220–250
tamping density (DIN 53194)	g/l	80–120
macropore volumes D > 30 nm (by Hg injection method)	ml/g	3.2–4.0
Gardner oil absorption	ml/100 g	200–220
water retention capacity	%	77–78
Cu abrasion	mg	8–12
RDA abrasion		60–80
REA abrasion		60–90
scratch		little
viscosity (in 16% glycerin-water-dispersion (1:1); aerometer D w/ heliopath)	mPas	14000–18000
Fe content	ppm	70–90

5,110,575

PROCESS FOR PRODUCING SINTERABLE CRYSTALLINE ALUMINUM NITRIDE POWDER

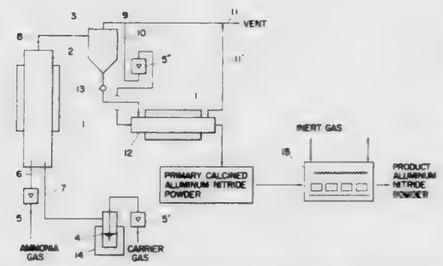
Kazuo Wakimura, Sennan; Masao Tanaka, Sakai, and Atsuhiko Hiai, Takaishi, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 470,458, Jan. 29, 1990, abandoned. This application May 31, 1991, Ser. No. 708,807

Claims priority, application Japan, Jan. 27, 1989, 1-16244; Feb. 16, 1989, 1-48998; Mar. 9, 1989, 1-55070; Jun. 21, 1989, 1-156705

Int. Cl.[5] **C01B** *21/072*

U.S. Cl. 423—412 **12 Claims**



1. A process for producing sinterable crystalline aluminum nitride powder by reacting an alkyl aluminum with ammonia in a gas phase at 600°–1300° C. to produce an amorphous aluminum nitride precursor powder followed by calcining the thus-produced precursor powder at 1400° C. or higher to crystallize the precursor powder, wherein

(A) the precursor powder is produced by a process which comprises:

(i) employing an empty vertical-column tubular reactor into which the reactants are fed continuously and the reaction product is removed continuously; and

(ii) feeding into the reactor separate continuous streams of the alkyl aluminum in admixture with an inert gas and of the ammonia to the lower part of the reactor at a molar ratio of the alkyl aluminum to ammonia of from 1/1 to 1/100, and a volume ratio of the alkyl aluminum to the whole gas phase of 0.01–0.2, where they are mixed at about the reaction temperature and where they react, whereby an amorphous aluminum nitride precursor powder is formed within the reactor beyond the point of the introduction of the reactants into the reactor; whereby the likelihood of clogging the reactor with reaction product is reduced; and

(B) the precursor powder is converted to a sinterable powder by a process which comprises:

(i) removing a continuous stream of the produced amorphous aluminum nitride precursor powder from the reactor;

(ii) introducing a continuous stream of the thus-obtained amorphous aluminum nitride precursor powder directly into a first calcining furnace comprising a rotary kiln;

(iii) calcining continuously the stream of powder in the first calcining furnace at 600°–1300° C. in an atmosphere of a reducing gas containing at least 20% by volume of ammonia;

(iv) transferring the thus-calcined powder from the first calcining furnace to a second calcining furnace; and

(v) further calcining the calcined powder in the second calcining furnace at 1400°–1750° C. in a non-reactive atmosphere;

whereby high purity, high density aluminum nitride powder of uniform particle size distribution and low agglomerate content is produced.

5,110,576

CARBON BLACK HAVING A HIGH SPECIFIC SURFACE AREA

Mizuo Soeda, Tokyo, and Kazuyoshi Watanabe, Shimonoseki, both of Japan, assignors to Cabot Corporation, Boston, Mass.

Filed May 22, 1990, Ser. No. 526,725

Claims priority, application Japan, May 23, 1989, 1-129643

Int. Cl.[5] **C09C** *1/48*

U.S. Cl. 423—445 **2 Claims**

1. Carbon blacks characterized by having an I_2 No. of from at least about 135 mg/g to about 200 mg/g, a DBP of from at least about 105 cc/100 g to about 150 cc/100 g, a CTAB/I_2 No. ratio of 0.95 to 1.05, a N_2SA/CTAB ratio of not greater than 1.05, a $Dmode_C/Dmode_U$ ratio of at least 0.96 to about 1.0.

5,110,577

PROCESS OF DEPOSITING A CARBON FILM HAVING METALLIC PROPERTIES

Michael A. Tamor, Toledo, Ohio, and Kenneth C. Hass, Plymouth, Mich., assignors to Ford Motor Company, Dearborn, Mich.

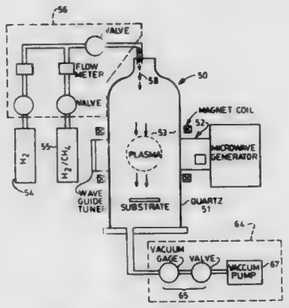
Division of Ser. No. 464,067, Jan. 12, 1990. This application Jan. 28, 1991, Ser. No. 620,599

Int. Cl.[5] **C01B** *31/02*; **C23C** *16/00*

U.S. Cl. 423—445 **4 Claims**

1. A method of making a carbon material comprised of the following steps: depositing said material onto a temperature-

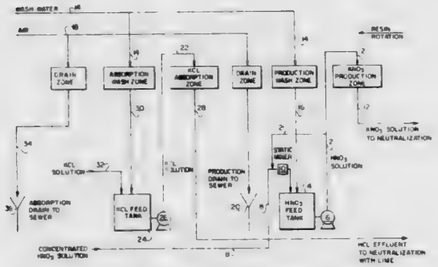
resistant substrate by excitation of a gas mixture comprised of 5–50% methane in hydrogen, said gas mixture being maintained in the pressure range of 0.1–1.0 Torr, said substrate being maintained in the temperature range of 300°–400° C.



5,110,578
CONTINUOUS PRODUCTION OF POTASSIUM NITRATE VIA ION EXCHANGE

Alvaro Abidaud, Barranquilla, Colombia, assignor to Monomeros Colombo Venezolanos, S.A. (E.M.A.), Barranquilla, Colombia

Filed Oct. 3, 1990, Ser. No. 592,030
Claims priority, application 10051989, Oct. 5, 1989, 311079
Int. Cl.[5] C01D *9/00*
U.S. Cl. 423—202 **14 Claims**



1. A process for the continuous production of KNO_3 via ion exchange, comprising the steps of:

a) continuously passing a first solution comprising HNO_3 through a first group of at least one potassium loaded strong cationic exchange resin bed to continuously produce a second solution comprising KNO_3 and converting at least a portion of said resin to the hydrogen loaded form;

b) continuously passing a third solution comprising water through a second group of at least one resin bed having at least a portion of said resin in the hydrogen loaded form, said at least one bed also containing HNO_3 and KNO_3 formed in step a), to continuously form a fourth solution comprising HNO_3 and KNO_3;

c) continuously passing a fifth solution comprising KCl through a third group of at least one resin bed having at least a portion of said resin in the hydrogenated form to continuously produce a sixth solution comprising HCl and converting at least a portion of said resin to the potassium loaded form;

d) continuously passing a seventh solution comprising water through a fourth group of at least one resin bed having at least a portion of said resin in the potassium loaded form, said at least one bed also containing HCl and KCl formed in step c), to continuously form an eighth solution comprising HCl and KCl; wherein

said steps a, b, c, and d are performed simultaneously;

said first, third, fifth and seventh solutions are continuously fed to said beds through feed ports in fluid communication with said beds;

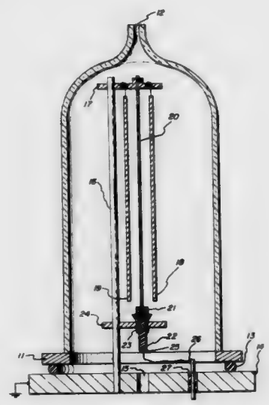
said second, fourth, sixth and eighth solutions are continuously drained from drain ports in fluid communication with said beds;

said process further comprising simultaneously effecting relative movement between said beds and said ports so that said each of said first group of beds sequentially becomes a member of said second, third, fourth and first group of beds, each of said second group of beds sequentially becomes a member of said third, fourth, first and second group of beds, each of said third group of beds sequentially becomes a member of said fourth, first, second, and third group of beds, and each of said fourth group of beds sequentially becomes a member of said first, second, third, and fourth group of beds.

5,110,579
TRANSPARENT DIAMOND FILMS AND METHOD FOR MAKING

Thomas R. Anthony, Schenectady, and James F. Fleischer, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 14, 1989, Ser. No. 407,179
Int. Cl.[5] C01B *31/06*
U.S. Cl. 423—446 **5 Claims**

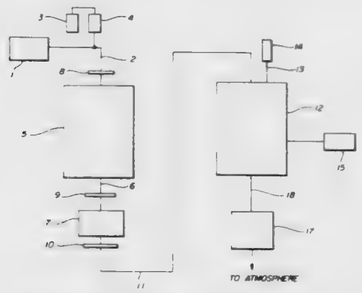


4. A method of growing a continuous free standing, non-adherent transparent polycrystalline film on the surface of a substrate, which diamond film has a thickness of at least 50 microns, comprising, passing a hydrogen-methane mixture at a pressure of about 3 to about 24 torr through a heated filament reaction zone which is sufficient to generate active carbon-hydrogen species and provide a temperature of about 600° C. to 1000° C. on the surface of the substrate which is maintained at a distance of from about 0.3 to about 1 centimeter from the heated filament, where the hydrogen-methane mixture introduced into the heated filament reaction zone has from about 1.5 to about 2 volume % of methane based on the total volume of hydrogen and methane.

5,110,580
METHOD AND APPARATUS FOR CHLORINE DIOXIDE MANUFACTURE

Aaron Rosenblatt, New York, N.Y.; David H. Rosenblatt, Baltimore, Md.; David Feldman, New York, N.Y.; Joseph E. Knapp, Pittsburgh, Pa.; Diane Battisti, Greensburg, Pa., and Badie Morsi, Pittsburgh, Pa., assignors to Iolab Corporation, Claremont, Calif.

Filed Sep. 14, 1989, Ser. No. 408,153
Int. Cl.[5] C01B *11/02, 11/10*
U.S. Cl. 423—472 **22 Claims**



1. A method for preparing a composition for generating chlorine dioxide gas comprising contacting a composition comprised of at least about 70 percent sodium chlorite by weight and impurities, wherein at least one of said impurities is sodium hydroxide, with an agent which consumes essentially all of the sodium hydroxide to provide a composition which when contacted with chlorine gas in an inert gas stream efficiently and promptly produces chlorine dioxide gas.

5,110,581
CHLORINE DIOXIDE GENERATION

Russell I. Derrah, Oakville, Canada, assignor to Marsulex Inc., Ontario, Canada

Filed Oct. 1, 1990, Ser. No. 591,095
Claims priority, application Canada, Sep. 29, 1989, 614843
Int. Cl.[5] C01B *11/02*
U.S. Cl. 423—479 **8 Claims**

1. A process for the generation of chlorine dioxide from an alkali or alkaline earth metal chlorate, said process comprising treating said chlorate in an aqueous reaction medium comprising sulphuric acid wherein said sulphuric acid in said reaction medium is alkylation waste sulphuric acid comprising oxidizable cyclic or acyclic alkyl or alkenyl compounds.

5,110,582
HAIR-SETTING PREPARATION

Walter Hungerbühler, and Hubert Meindl, both of Riehen, Switzerland, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 693,216, Jan. 18, 1985, abandoned, which is a continuation of Ser. No. 594,955, Apr. 2, 1984, abandoned, which is a continuation of Ser. No. 360,030, Mar. 19, 1982, abandoned. This application Aug. 3, 1987, Ser. No. 81,636
Claims priority, application Switzerland, Mar. 25, 1981, 2019/81
Int. Cl.[5] A61K *7/06, 9/12*
U.S. Cl. 424—47 **5 Claims**

1. A hair-setting preparation, which comprises:

(1) a solution of 0.25 to 6% by weight of a terpolymer prepared from a mixture of 45 to 55% by weight of N-t-butylacrylamide, 35 to 45% by weight of ethyl acrylate and 5 to 8% by weight of acrylic acid and 6 to 85% by weight of a solvent selected from the group consisting of ethanol isopropanol and mixtures thereof, with 55% to 100% of the carboxyl groups in the terpolymer having been neutralized by a primary or tertiary alkanolamine having a total of 2 to 9 carbon atoms, the longest chain having at most 3 carbon atoms; and

(2) from 10 to 80% by weight of a propellant which consists essentially of a halogen-free hydrocarbon, dimethyl ether, or mixtures thereof.

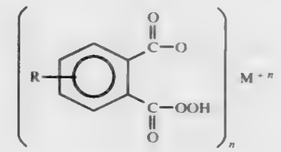
5,110,583
PEROXY ACIDS COMPOSITION FOR ORAL TREATMENT

Padmini Sampathkumar, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 266,316, Nov. 3, 1988, Pat. No. 4,990,329, Continuation of Ser. No. 942,471, Dec. 15, 1986, abandoned, which is a division of Ser. No. 738,103, May 24, 1985, Pat. No. 4,670,252. This application Dec. 10, 1990, Ser. No. 625,286
Int. Cl.[5] A61K *9/68*
U.S. Cl. 424—48 **12 Claims**

1. A chewing gum composition comprising:

(a) from about 1×10^{-4} mole to about 2.5×10^{-3} mole per piece of gum of a monoperphthalate compound having the general structure:



or its pharmaceutically-acceptable salts or esters, wherein M^{+n} is a cation selected from the group consisting of an alkali metal, an alkaline earth metal, a non-toxic heavy metal, trimethylammonium and triethylammonium, and R is 1 or more substituents compatible with the peroxy acid functionality of the aromatic ring; and

(b) a chewing gum carrier comprising a gum base, flavoring and sweetening agents.

5,110,584
SCENTED NAIL ENAMELS CONTAINING ESSENTIAL OILS

Mario W. Medri, and Nelly Medri, both of Millburn, N.J., assignors to Consumer Products Corporation, N.Y.

Filed Oct. 22, 1990, Ser. No. 601,296
Int. Cl.[5] A61K *7/043, 35/78, 47/38;* **C11B** *9/00*
U.S. Cl. 424—61 **4 Claims**

1. A fingernail cosmetic composition comprising a fingernail cosmetic composition suitable for application to human fingernail and toenails for protection and beautification thereof containing from about 5% to about 40% by weight of at least one resin and from about 30% to about 85% by weight of at least one organic solvent having incorporated therein an essential oil or blends thereof in an amount of at least 6% to about 20% by weight relative to the total weight of the composition sufficient to emit an enhanced fragrance scent for at least 24 hours after a nail enamel film is formed by application of said fingernail cosmetic composition to the surface of nails or any substrate.

5,110,585

QUATERNIZED NITROGEN CONTAINING POLYCYCLIC COMPOUNDS

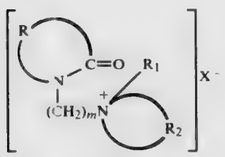
Ratan K. Chaudhuri, Butler; David J. Tracy, Lincoln Park; Robert B. Login, Oakland, and Michael W. Helioff, Westfield, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 922,923, Oct. 24, 1986, Pat. No. 4,732,990, and a continuation-in-part of Ser. No. 91,010, Aug. 28, 1987, Pat. No. 4,883,655. This application Mar. 1, 1989, Ser. No. 317,481

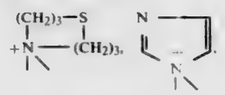
Int. Cl.[5] **A61K** *7/075;* **C07D** *401/06, 417/06, 419/06*

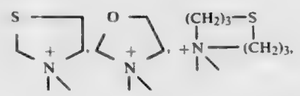
U.S. Cl. 424—70 **19 Claims**

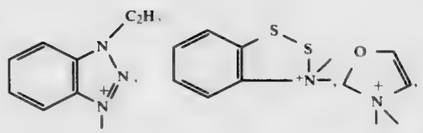
1. A quaternized polycyclic compound having the formula:

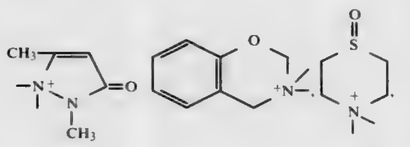


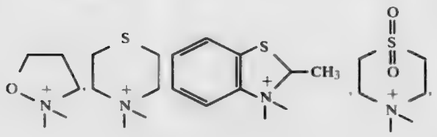
wherein X^- is an anion: m is an integer having a value of from 1 to 4; R is linear alkylene having from 3 to 8 carbon atoms and is optionally substituted with C_1 to C_4 alkyl; R_1 forms a double bond in the heterocyclic ring with the quaternized nitrogen or is alkyl, alkyleneoxyalkyl, alkoxy, alkylhydroxy, aryl, aralkyl, aralkenyl, alkaryl or alkyleneamidoalkyl, said groups containing up to 30 carbon atoms; and R_2 together with the quaternary nitrogen atom forms a heterocyclic ring selected from the group consisting of



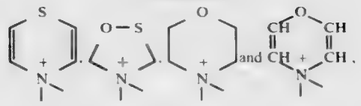








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said heterocyclic rings being optionally substituted with alkyl.

5,110,586

WHITE COLORED DEODORIZER AND PROCESS FOR PRODUCING THE SAME

Tokumitsu Kurihara; Tatsuo Saito, and Hidefumi Harada, all of Yamaguchi, Japan, assignors to Titan Kogyo Kabushiki Kaisha, Ube, Japan

Continuation of Ser. No. 238,459, Aug. 30, 1988, abandoned. This application Jun. 21, 1990, Ser. No. 541,074

Int. Cl.[5] **A41B** *13/02*

U.S. Cl. 424—76.1 **2 Claims**

1. A process for producing a white colored deodorizer consisting essentially of the steps of:

combining an aqueous alkaline solution or an aqueous acidic solution with a mixed aqueous solution containing a water-soluble zinc compound and at least one compound selected from the group consisting of water-soluble aluminum compounds, water-soluble silicon compounds and mixtures thereof, said combining step being performed by simultaneous addition of the two solutions in such a way that the combined solution will keep its pH in the range of 6 to 12 and said combining step is performed at a temperature of 20° C. to 80° C. to form a precipitate;

separating the precipitate from the combined solution; and

drying the separated precipitate at 120° C. to 350° C. to form a white fine powder consisting essentially of zinc oxide and at least one oxide selected from the group consisting of aluminum oxide, silicon dioxide and mixtures thereof, wherein the molar ratio of zinc oxide to oxide is in the range of from 5:95 to 95:5.

5,110,587

IMMUNOGENIC COMPOSITION COMPRISING SYNTHETICALLY MODIFIED VACCINIA VIRUS

Enzo Paoletti, Delmar, and Dennis Panicali, Averill Park, both of N.Y., assignors to Health Research, Incorporated, Albany, N.Y.

Continuation of Ser. No. 90,209, Aug. 27, 1987, abandoned, which is a division of Ser. No. 622,135, Jun. 19, 1984, Pat. No. 4,722,848, which is a continuation-in-part of Ser. No. 446,824, Dec. 8, 1982, Pat. No. 4,603,112, which is a continuation-in-part of Ser. No. 334,456, Dec. 24, 1981, Pat. No. 4,769,330. This application Jun. 14, 1990, Ser. No. 537,882

Int. Cl.[5] **A61K** *39/12;* **C12P** *21/02, 19/34;* **C12N** *15/00, 7/00, 5/00, 15/06*

U.S. Cl. 424—89 **4 Claims**

1. An immunogenic composition comprising a recombinant vaccinia virus sythetically modified by recombination to have, within a non-essential region of the vaccinia genome, a heterologous DNA sequence which encodes an antigenic protein derived from a pathogen where said composition when administered to a susceptible host is capable of inducing an immunological response specific to the protein encoded by said pathogen.

5,110,588

COMPOSITE SALMONELLA *E. COLI, VIBRIO CHOLERAE* VACCINE STRAINS

Renato Morona, Aberfoyle Park, and Stephen R. Attridge, Salisbury Park, both of Australia, assignors to Enterovax Limited, Salisbury South, Australia

Continuation-in-part of Ser. No. 86,354, Aug. 17, 1987, abandoned. This application Sep. 1, 1989, Ser. No. 401,403

Claims priority, application Australia, Aug. 19, 1986, PH7545; Sep. 1, 1988, PJ0186; Nov. 2, 1988, PJ1273

Int. Cl.[5] **A61K** *39/116, 39/106, 39/108, 39/112*

U.S. Cl. 424—92 **16 Claims**

1. A vaccine composition comprising an avirulent Salmonella - *Escherichia coli* hybrid strain, wherein said hybrid strain is made by modifying an avirulent strain of Salmonella so that the lipopolysaccharide core region produced by the hybrid is the *E. coli* lipopolysaccharide core region and the hybrid further produces a *Vibrio cholerae* O-antigen.

5,110,589

SWINE DYSENTERY SUBUNIT VACCINE AND METHOD

Lynn A. Joens; James D. Cramer, and Mary E. Mapother, all of Tuscon, Ariz., assignors to Arizona Technology Development Corporation, Tucson, Ariz.

Filed Sep. 14, 1988, Ser. No. 244,725

Int. Cl.[5] **A61K** *39/02, 35/14*

U.S. Cl. 424—92 **12 Claims**

1. A process for preparing a swine dysentery subunit vaccine comprising the steps of: growing *Treponema hyodysenteriae* by fermentation in tryptcase soy broth supplemented with bovine serum and porcine facel extract under an anaerobic atmosphere; harvesting the *Treponema hyodysenteriae* bacterial cells; separating an outer envelope portion of said *Treponema hyodysenteriae* bacterial cells from a cytoplasmic portion of said *Treponema hyodysenteriae* bacterial cells; and mixing said outer envelope portion with an injectable adjuvant.

5,110,590

USE OF A SOLUTION OF ALPHA-CHYMOTRYPSIN

Jorg H. Krumeich, Propst-Hellmich-Promenade 28, D4630 Bochum 6, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 930,769, Nov. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 826,337, Feb. 5, 1986, Pat. No. 4,695,458. This application Feb. 6, 1990, Ser. No. 475,883

The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.

Int. Cl.[5] **A61K** *37/547, 37/553*

U.S. Cl. 424—94.64 **31 Claims**

1. A method of performing an extracapsular operation for treatment of grey cataract comprising treating a posterior side of the capsule of the lens with a composition of matter consisting essentially of alpha-chymotrypsin in an physiologically suitable medium, the concentration of said alpha-chymotrypsin in the composition being effective to clean the posterior lens capsule left behind in said extracapsular cataract operation and without dissolving the zonule fibers which hold said lens in tension, said composition containing an amount of a physiologically suitable substance effective for combatting further unwanted dilution of the alpha-chymotrypsin during treating the posterior side of the capsule of the lens.

5,110,591

NEEM OIL EMULSIFIER

William A. Williams, Latrobe, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 1, 1990, Ser. No. 488,209

Int. Cl.[5] **A61K** *35/78, 31/74, 31/35;* **A01N** *43/16*

U.S. Cl. 424—195.1 **16 Claims**

1. A concentrated water-in-oil microemulsion which, when diluted with water, forms a storage stable oil-in-water macroemulsion, said concentrated emulsion containing from about 50 to about 90 percent by weight of neem oil containing a pesticidally effective amount of azadirachtin and from about 50 to about 10 percent by weight of an emulsifier composition containing from about 40 to about 60 weight percent of nonionic emulsifying agent selected from the group consisting of sorbitan esters, ethoxylated and propoxylated mono- or diglycerides, lactated mono- or diglycerides, acetylated mono- or diglycerides, sugar-esters polyoxyethylene sorbitan esters containing from 4 to 20 polyoxyethylene groups, polyglycerol esters, or mixtures thereof, from about 20 to about 40 weight percent of polyhydric alcohol containing from 2 to 6 carbon atoms, and from about 10 to about 25 weight percent of water.

5,110,592

METHOD OF INCREASING LIVE BIRTHS TO FEMALE ANIMALS AND ANIMAL FEED BLEND SUITABLE FOR SAME

Paul A. Stitt, 123 Cleveland Ave., Manitowoc, Wis.

Continuation-in-part of Ser. No. 629,906, Dec. 19, 1990, abandoned, which is a continuation of Ser. No. 133,967, Dec. 16, 1987, abandoned. This application May 3, 1991, Ser. No. 695,071

Int. Cl.[5] **A61K** *35/78*

U.S. Cl. 424—195.100 **61 Claims**

1. A method for increasing the number of live births to a female animal, comprising administering orally to said female animal beginning at least one week before the expected time of birth of said female animal's offspring and continuing at least until the birth of said offspring, a biologically effective amount of an edible composition comprising ground flaxseed.

5,110,593

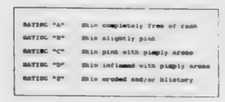
IRRADICATION AND TREATMENT OF DIAPER DERMATITIS AND RELATED SKIN DISORDERS

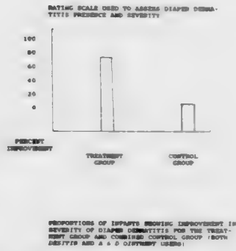
M. Sue Benford, 6065 Frantz Rd., Ste. 205, Dublin, Ohio 43017-4020

Filed Nov. 13, 1990, Ser. No. 612,567

Int. Cl.[5] **A61K** *7/00*

U.S. Cl. 424—401 **3 Claims**





PROPORTIONS OF IMPART SHOWING IMPROVEMENT IN SEVERITY OF DIAPER DERMATITIS FOR THE TREATMENT GROUP AND COMBINED CONTROL GROUP (BOTH ARITYS AND A & D OINTMENT USERS)

1. A method of treatment of human skin affected by diaper dermatitis and related skin disorders by topically applying to said affected areas an ointment consisting essentially of:

a) about 49 percent by weight of petrolatum;

b) about 15 percent by weight of lanolin;

c) an effective amount of oxyquinoline to provide sufficient inhibition and inactivation of microbes present in said affected area to promote healing thereof; and

d) an effective amount of one or more pharmaceutical carrier vehicles to promote topical application of said oint-

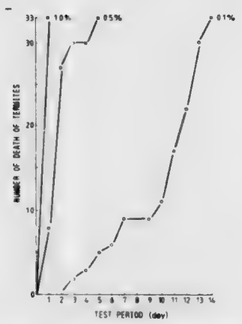
ment without interfering with the effectiveness of the active agents which promotes healing of the affected areas, said carrier vehicles being taken from a group consisting of water, Beeswax, Sodium Borate, Methyl Salicylate, Sorbitan Sesquioleate, and Trisodium HESTA or mixtures thereof.

5,110,594

INSECTICIDES AND BACTERICIDE MADE OF SELL FLOWER ESSENTIAL OIL

Dai Morita, 96-1,2-chome, Ishimine-cho, Shuri, Naha-shi, Okinawa-ken, Japan

Filed Dec. 4, 1990, Ser. No. 622,050
Int. Cl.[5] A01N *25/00*
U.S. Cl. 424—405 **9 Claims**



1. An insecticidal and bactericidal composition comprising essential oil distilled from sell flow (Alpinia Speciosa K. schum) in combination with a carrier for said essential oil selected from the group consisting of granules, paper, sheets, pellets and a liquid containing a dispersant for the essential oil.

5,110,595

IMPLANT PREPARATIONS CONTAINING BIOACTIVE MACROMOLECUI E FOR SUSTAINED DELIVERY

Paul Y. Wang, 47 Marblemount Crescent, Agincourt, Ontario, M1T 2H5, Canada

Continuation-in-part of Ser. No. 16,845, Feb. 20, 1987, abandoned. This application Jun. 19, 1987, Ser. No. 63,968
Claims priority, application Canada, Feb. 18, 1987, 509526
Int. Cl.[5] A61F *2/02, 9/14;* **A61K** *37/02, 37/26*
U.S. Cl. 424—422 **18 Claims**

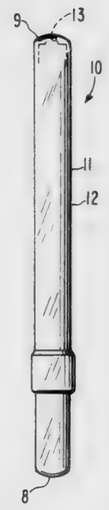
1. A process of making a bioerodible preparation with sustained action implantation comprising admixing an effective amount of solid bioactive polypeptide with lipid powder, and compressing the resulting admixture under pressure, with the said lipid powder being selected from the group consisting of glycerides, waxes, long-chain fatty acids or salt, amide of anhydride derivatives thereof, phospholipids, sphingolipids, cerebrosides, terpenes, non-hormonal steroids or a combination thereof.

5,110,596

DELIVERY SYSTEM COMPRISING MEANS FOR DELIVERING AGENT TO LIVESTOCK

Judy A. Magruder, Mt. View; James B. Eckenhoff, Los Altos; Richard Cortese, Los Gatos; Jeremy C. Wright, Los Altos, and John R. Peery, Palo Alto, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 283,359, Dec. 13, 1988, Pat. No. 5,034,229.
This application Apr. 20, 1990, Ser. No. 513,330
The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.
Int. Cl.[5] A23K *1/18*
U.S. Cl. 424—438 **1 Claim**



1. An improvement in a method for delivering a beneficial agent to an animal, wherein the method comprises:

(a) admitting into the animal a dispenser comprising:

(1) a wall that surrounds an internal lumen, which wall comprises a pair of ends with one end inside the other end, said wall comprising a section that limits the passage of fluid through the wall and a section that permits the passage of fluid through the wall;

(2) 5 ng to 20 g a beneficial agent in the lumen, said beneficial agent comprising a member selected from the group consisting of drug, protein, peptide and hormone;

(3) an expandable hydrogel in the lumen comprising the section that permits the passage of fluid through the wall;

(4) a fluid impermeable partition between the beneficial agent and the hydrogel;

(5) at least one exit passageway in the wall for delivering the beneficial agent from the dispenser; and,

(b) delivering the beneficial agent from the dispenser by the hydrogel increasing the volume and occupying space in the lumen, thereby pushing the beneficial agent through the passageway to the animal, and wherein the improvement comprises:

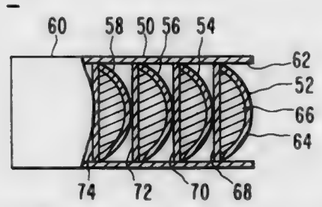
(c) maximizing the delivery of the beneficial agent by protecting the beneficial agent from the fluid of the animal and by maintaining the beneficial agent in the section of the wall that limits the passage of fluid through the wall for delivering the beneficial agent in an effective dose to the animal over a prolonged period of time.

5,110,597

MULTI-UNIT DELIVERY SYSTEM

Patrick S. L. Wong, Palo Alto; Felix Theeuwes; James B. Eckenhoff, both of Los Altos; Steven D. Larsen, Dublin, and Hoa T. Huynh, Fremont, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed May 17, 1991, Ser. No. 701,927
Continuation of 495,825, Mar. 19, 1990, U.S. Pat. No. 5,023,088. This application May 17, 1991, Ser. No. 701,927
Claims priority, application United Kingdom, Jun. 15, 1988, 8814220
The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.
Int. Cl.[5] A61K *9/24*
U.S. Cl. 424—438 **12 Claims**



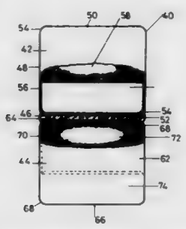
1. A controlled release device comprising water-permeable receptacle means containing at least one active material, said receptacle means being formed from at least two separable pieces, said receptacle means containing a quantity of at least one water-sensitive material which when wet will cause a positive pressure to be exerted on the interior wall of said receptacle means and result in the separation of said two pieces.

5,110,598

INTERMITTENT RELEASE DOSAGE FORM

Lilian Kwan, Saint Davids, Pa., and William Steber, Ledgewood, N.J., assignors to SmithKline Beecham Corp., Philadelphia, Pa.

Continuation of Ser. No. 374,499, Jun. 30, 1989, abandoned. This application Nov. 20, 1990, Ser. No. 617,476
Int. Cl.[5] A23K *1/18*
U.S. Cl. 424—438 **13 Claims**



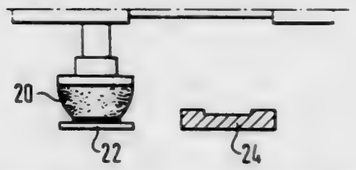
1. A delayed release dosage form for ruminants which delivers doses of a medicament intermittently in the rumen comprising a plurality of discrete boluses joined together each of which contains a layer containing a medicament dispersed in a filler and a second weighted layer containing a dense filler matrix which permits the bolus to lodge in the rumen, said boluses having a hydrophobic polymeric coating which provides a different break time for each bolus.

5,110,599

PROCESS FOR PRODUCING AN ADMINISTRATION AND/OR DOSAGE FORM FOR MEDICINAL ACTIVE SUBSTANCES BY MEANS OF A PRINTING PROCESS

Dieter Anhäuser, Melsbach, and Robert-Peter Klein, Neuwied, both of Fed. Rep. of Germany, assignors to LTS Lohmann Therapie-Systeme GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Continuation of Ser. No. 544,011, Jun. 26, 1990, abandoned, which is a continuation of Ser. No. 348,588, filed as PCT/DE88/00366, Jun. 16, 1988, abandoned. This application abandoned. This application Aug. 13, 1991, Ser. No. 746,296
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727232
Int. Cl.[5] A61F *13/00*
U.S. Cl. 424—449 **9 Claims**



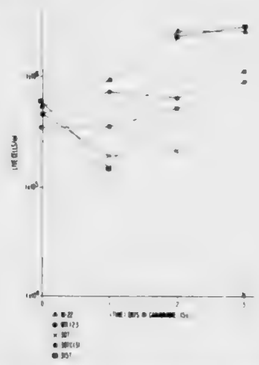
1. Process for producing a medicament active substance dosage on a substrate, comprising the steps, in sequence, of (a) applying a quantity of the active substance as a printing medium to a cavity of a printing pad block, (b) pressing a deformable printing pad onto the block cavity to absorb the active substance printing medium, and (c) pressing the pad with the absorbed active substance printing medium to a substrate to leave on the substrate a precisely controlled printed dosage coating of the medicament active substance wherein the printing medium is for administration in a trandermal therapeutic system has been inserted.

5,110,600

METHOD OF TREATING VIRAL INFECTIONS WITH AMINO ACID ANALOGS

Melvin H. Green, San Digeo, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Jan. 25, 1988, Ser. No. 148,069
Int. Cl.[5] A61K *9/127*
U.S. Cl. 424—45 D **15 Claims**

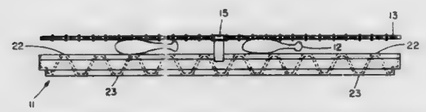


1. A method for treating viral infection in a mammal in need of such treatment comprising administering to said mammal an effective dose of a pharmaceutical preparation containing L-canavanine in an amount sufficient to provide a molar ratio of said L-canavanine to arginine of from 1:1 to 10:1 to selectively kill cells infected with virus.

5,110,601
METHOD FOR SIMULATING OPEN FLAME BROILED MEAT PRODUCTS

Mohan Rao; Michael E. Harlamert; Dennis Ash; Sylvia L. Schonauer; Gregory D MacGeorge; Keith D. Barkhau; John D. Beltz, all of Louisville, and Donald R. Kupski, LaGrange, all of Ky., assignors to PepsiCo. Inc., Purchase, N.Y.

Division of Ser. No. 547,627, Jul. 2, 1990, which is a continuation-in-part of Ser. No. 377,177, Jul. 10, 1989, Pat. No. 4,991,497. This application Mar. 8, 1991, Ser. No. 666,879
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—523 **8 Claims**

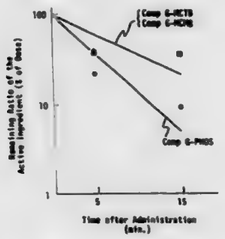


1. A method for rapidly cooking poultry meat products to simulate open flame broiling, said method comprising:
(a) coating a grill means with a carmelizing layer;
(b) clamping a poultry meat product between said coated grill means and a pan having an alternating series of crowns and reservoirs to provide a uniform meat thickness between the upper portion of said crowns and the coated side of said grill;
(c) cooking said poultry product in an oven having rapidly moving air by simultaneously:
(i) heating said rapidly moving air to 400° F. to 550° F.;
(ii) impacting said poultry product with rapidly moving heated air at a velocity of 800 to 3000 fpm;
(iii) heating said crowns to transfer heat to said poultry product by conduction.
(d) collecting expressed juices and fat in a plurality of reservoirs formed in said pan.

5,110,602
PHARMACEUTICAL COMPOSITIONS COMPRISING ESTERS OR AMIDES AS ACTIVE INGREDIENTS

Soonih Kim; Kazuhisa Takeda, and Seiei Sasatani, all of Osaka, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 417,537, Oct. 5, 1989, Pat. No. 5,004,612, which is a division of Ser. No. 180,933, Apr. 13, 1988, Pat. No. 4,889,723. This application Jan. 15, 1991, Ser. No. 641,404
Claims priority, application Japan, Apr. 13, 1987, 62-88785
Int. Cl.[5] A61K *37/22*
U.S. Cl. 424—451 **9 Claims**



1. A pharmaceutical composition consisting essentially of an amide of a prostaglandin analogue suspended or dissolved in a middle chain glyceride of a fatty acid of 4 to 10 carbon atoms or a mixture thereof.

5,110,603
BATHING PREPARATION FOR COLLOIDAL MATERIAL

Allen H. Rau, Cincinnati, Ohio, assignor to Kao Corporation, Tokyo, Japan and The Andrew Jergens Company, Cincinnati, Ohio

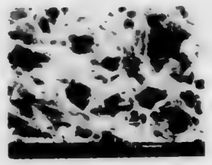
Filed Jan. 31, 1991, Ser. No. 648,871
Int. Cl.[5] A61K *9/20*
U.S. Cl. 424—466 **14 Claims**

1. A bath preparation comprising:
aggregated particles comprised of (1) a composition which will dissolve in warm and hot water to release carbon dioxide said composition comprising a carbonate salt and an acid, said composition (1) being intimately mixed with 0.1–50%, by weight, of a colloidal material suitable for treatment of skin, said colloidal material being selected from the group consisting of colloidal oatmeal, flour derived from corn, wheat, soy, rice or barley, meals obtained from corn or almond, hydrophobic starch obtained from corn, wheat, rice, potato, water-insoluble gums, cellulose and mixtures thereof.

5,110,604
PROCESSES FOR PRODUCING COLLAGEN MATRIXES AND METHODS OF USING SAME

George H. Chu, Sunnyvale; Yasushi Ogawa, Pacifica, both of Calif.; John M. McPherson, Framingham, Mass.; George Ksander, Redwood City, Calif.; Bruce Pratt, Union City, Calif.; Diana Hendricks, Brea, Calif., and Hugh McMullin, San Bruno, Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Division of Ser. No. 213,726, Jun. 30, 1988, Pat. No. 5,024,841. This application Dec. 19, 1990, Ser. No. 630,299
Int. Cl.[5] A61K *9/14, 37/66, 37/12, 37/24*
U.S. Cl. 424—484 **4 Claims**



1. A method for promoting wound healing in a mammal having a wound, which method comprises:
applying to said wound a matrix having a density of about 0.01 to about 0.3 g/cm^3, a thickness of about 1–20 mm, and having pores at least 80% of which are at least 35 um in diameter, wherein said matrix comprises
fibrillar atelopeptide collagen, wherein said fibrils are about 50–200 nm in diameter, and are not chemically cross-linked.

5,110,605
CALCIUM POLYCARBOPHIL-ALGINATE CONTROLLED RELEASE COMPOSITION AND METHOD

Ramesh N. Acharya, Lake Forest, Ill., assignor to Oramed, Inc., Mundelein, Ill.

Filed Aug. 21, 1990, Ser. No. 570,340
Int. Cl.[5] A61K *47/32, 47/36, 9/10, 9/16*
U.S. Cl. 424—487 **13 Claims**

1. A polymeric complex composition comprising a reaction complex formed by the interaction of (1) about 0.1% to about 90% calcium polycarbophil component which is a water-swellable, but water-insoluble, fibrous, cross-linked carboxy-functional polymer, said polymer containing (a) a plurality of repeating units of which at least about 80 percent contain at least one carboxyl functionality, and (b) about 0.05 to about 1.5 percent cross-linking agent substantially free from polyalkenyl polyether, said percentages being based upon the weights of unpolymerized repeating unit and cross-linking agent, respectively with (2) from about 0.1 to about 99. percent of alginic acid or a salt thereof, said interaction being performed in the presence of an active agent selected from the group consisting of medicinal agents and cosmetic agents, said interaction being at a pH from about 3 to about 10, the calcium polycarbophil being originally present, prior to said interaction, in the form of the calcium salt, having a calcium, and wherein the ratio of said reaction complex to said active agent is about 200,000:1 to about 1:100'.

5,110,606
NON-AQUEOUS MICROEMULSIONS FOR DRUG DELIVERY

Robert P. Geyer, Brookline, Mass., and Vinod Tuliani, Media, Pa., assignors to Affinity Biotech, Inc., Boothwyn, Pa.

Filed Nov. 13, 1990, Ser. No. 612,592
Int. Cl.[5] A61K *9/10, 9/101*
U.S. Cl. 424—489 **7 Claims**

1. An emulsion composition comprising as internal phase, a drug contained in a polar, nonaqueous oxygen-containing, pharmaceutically acceptable liquid selected from the group consisting of glycerin, propylene glycol, polyethylene glycol 200, 400, 600, 1500, 4000 and 6000, ethylene glycol dimethyl ether, tetraethylene glycol dimethyl ether, triacetin, medium chain (C_8–C_{10}) triglycerides and propylene glycol C_8 diester, said internal phase being dispersed in a lower alkyl ester of a C_8–C_{22} fatty acid external phase, and lecithin as emulsifying agent, the amounts of the components being polar liquid, 1–20%; fatty ester, 33–70%; and lecithin 20–60%.

5,110,607
CHEWING GUM COMPOSITION AND METHOD OF MAKING SAME

Robert K. Yang, Randolph, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 865,509, May 20, 1986, Pat. No. 4,876,095. This application Oct. 23, 1989, Ser. No. 424,984
Int. Cl.[5] A23G *3/30*
U.S. Cl. 426—3 **23 Claims**

1. A chewing gum base composition being substantially devoid of rosin esters and terpene components comprising:
(a) an elastomer component selected from the group consisting of synthetic and natural rubber polymers; and mixtures thereof
(b) a high melting point wax compatibilization component; and
(c) a high molecular weight polymeric resin component.

5,110,608
CHEWING GUMS HAVING LONGER LASTING SWEETNESS

Subraman R. Cherukuri, Towaco; Steven M. Faust, Stanhope, both of N.J., and Gul Mansukhani, Staten Island, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 291,704, Dec. 29, 1988. This application Mar. 9, 1990, Ser. No. 490,871
The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.
Int. Cl.[5] A23G *3/30*
U.S. Cl. 426—3 **30 Claims**

1. A chewing gum composition having longer lasting sweetness which comprises in percentages by weight of the total composition:
(a) a soft polyvinyl acetate gum base in an amount from about 60% to about 70%;
(b) a flavoring agent;
(c) an intense sweetening agent in an amount up to about 0.3%; and
(d) a bulk sweetening agent in an amount from about 10% to about 40%.

5,110,609
INTERMEDIATE MOISTURE VEGETABLES

Victor M. Lewis, and David A. Lewis, both of New South Wales, Australia, assignors to Byron Agricultural Company Pty. Ltd., Sydney, Australia

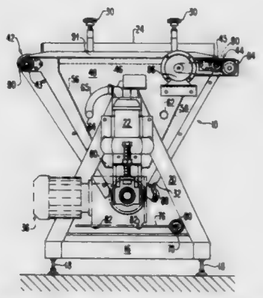
Continuation of Ser. No. 30,577, Mar. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 862,216, Apr. 23, 1986, abandoned. This application Mar. 12, 1991, Ser. No. 668,012
Claims priority, application Australia, Sep. 17, 1984, PG 7174
Int. Cl.[5] A23B *7/00*
U.S. Cl. 426—402 **17 Claims**

1. A process for producing an intermediate moisture vegetable or fruit product which is microbiologically stable at water activity levels within the range of 0.5 to 0.95 and is free from additives used to prevent microbial spoilage which consists essentially of the steps of partially dehydrating a vegetable or fruit to a moisture content of from 26% to 60% and thereafter holding the resultant product in an oxygen free or substantially oxygen free environment.

5,110,610
DOUGH PIECE ROUNDER AND METHOD

Donald L. Cummins, Mechanicsville, Va., assignor to AMF Machinery Systems, Inc., Richmond, Va.

Filed Mar. 21, 1991, Ser. No. 672,934
Int. Cl.[5] A21D *6/00;* **A21C** *9/00*
U.S. Cl. 426—496 **16 Claims**



14. The method of shaping a dough piece comprising the following steps:
making a mass of dough into uniform pieces of equal weight;
depositing said dough pieces onto an endless air impervious flexible belt;
conveying by said belt said pieces to a dough shaping apparatus;
shaping said dough pieces into a desired shape;
supporting and cooling said belt by a perforated plate deck lying just underneath at least a portion of said belt; and
discharging air from said perforated plate deck to provide a film of air between said plate deck and said belt to reduce the friction therebetween and to carry away heat from any friction heat generated.

5,110,611
PROCESS FOR EXTRUDING A WET MATERIAL
Werner Stahl, Stalbühlweg 8, D-6740 Landau, and Hans Buggisch, Malsch-Waldprechtsweiher, both of Fed. Rep. of Germany, assignors to Werner Stahl, Landau, Fed. Rep. of Germany
Filed Apr. 2, 1990, Ser. No. 502,277
Int. Cl.[5] A23P *1/00*
U.S. Cl. 426—512 **6 Claims**

1. A process for pressing out and extruding a wet filter cake, paste or feedstuff material, said process comprising the steps of pressing the material through at least one opening of a perforated plate with a predetermined force by means of a first movement of a displacement body acting on said material, and exerting a shear force on the material by means of a second movement of the displacement body generated independently from the first movement causing the material to undergo liquefaction prior to the pressing step.

5,110,612
HYDROXYPROPYL STARCH HYDROLYZATE PRODUCT
James M. Quarles, and Richard J. Alexander, both of Cedar Rapids, Iowa, assignors to Penford Products Company, Cedar Rapids, Iowa
Filed Sep. 4, 1990, Ser. No. 577,591
Int. Cl.[5] A23L *1/236, 1/187, 1/06;* **A21D** *8/00*
U.S. Cl. 426—548 **45 Claims**

1. A hydrolyzate product of hydroxypropyl starch comprising greater than about 15% by weight DP 2–6 hydrolyzate polymers and characterized by a DE value of from about 20 to about 45.

11. A reduced calorie sweetener composition comprising the hydroxypropyl starch hydrolyzate product of claim 1 and a high potency sweetener.

30. In a food product comprising sucrose or other starch hydrolyzate products, the improvement comprising replacing all or a portion of said sucrose or starch hydrolyzate product with the hydroxypropyl starch hydrolyzate product of claim 1.

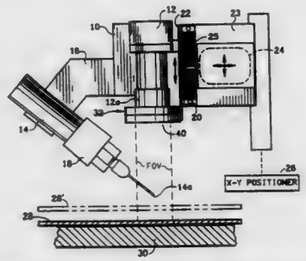
5,110,613
PROCESS OF MAKING MULTI-TEXTURED SNACK CHIPS
Robert A. Brown, Mason; Yen-Ping C. Hsieh, and James L. Court, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Dec. 28, 1990, Ser. No. 635,089
Int. Cl.[5] A21D *15/04*
U.S. Cl. 426—549 **15 Claims**

1. A process for preparing snack chips comprising the steps of:
(a) mixing a starch material with water to form moist starch agglomerates comprising from about 25% to about 55% water by weight; then
(b) mixing the moist starch agglomerates with a dry starch material containing not more than about 20% water by weight to form an agglomerate/starch composite comprising from about 50% to about 95% moist starch agglomerates by weight and from about 5% to about 50% dry starch material by weight; wherein the mixing is conducted so that the agglomerate/starch composite comprises agglomerates of moist starch and discrete regions of dry starch material uniformly dispersed throughout the agglomerates, and so that the dry starch material after mixing contains not more than about 30% water by weight, and the moisture content of the dry starch material after mixing is at least about 5 percentage points less than the moisture content of the moist starch agglomerates after mixing; then
(c) forming the agglomerate/starch composite into chip-like pieces; and then
(d) cooking the pieces until they are crisp, wherein the cooking process is selected from the group consisting of baking, frying, and combinations thereof.

5,110,614
PROCESS OF MAKING A MICROWAVEABLE BAKERY PRODUCT
Dennis Corbin, and Scott Corbin, both of Oklahoma City, Okla., assignors to MicroGold, Oklahoma City, Okla.
Filed Dec. 14, 1989, Ser. No. 451,115
Int. Cl.[5] A23D *10/02*
U.S. Cl. 426—555 **1 Claim**

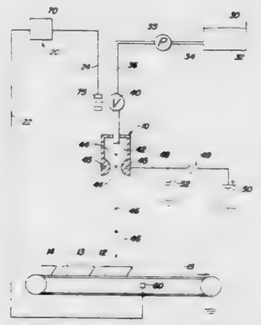
1. A method for preparing microwave oven reheated yeast leavened bread products comprising:
preparing a premix, said premix comprising by weight from 25 to 40 parts flour, 25 to 50 parts of shortening, 4.5 to 25.0 parts protein material selected from the group consisting of egg protein, milk protein and soy protein 25 to 40 parts high gluten flour and 15 to 20 parts dextrose, said premix preparation having a first step consisting of combining the protein material and shortening to absorb said shortening into said protein material and then adding yeast and said flour to said combination;
mixing the premix into a dough;
baking said dough to form a bread product;
cooling said bread product; and
microwaving said bread product.

5,110,615
METHOD FOR DISPENSING VISCOUS MATERIALS A CONSTANT HEIGHT ABOVE A WORKPIECE SURFACE
Philip P. Maiorca, Poway; Ronald N. Abernathy, Vista, and George H. Wadley, Carlsbad, all of Calif., assignors to Asymptotic Technologies, Inc., Carlsbad, Calif.
Division of Ser. No. 549,379, Jul. 5, 1990, Pat. No. 5,052,338, which is a continuation-in-part of Ser. No. 472,742, Jan. 31, 1990, abandoned. This application Sep. 9, 1991, Ser. No. 756,447
Int. Cl.[5] B05C *11/00, 5/00*
U.S. Cl. 427—8 **7 Claims**



1. A method for dispensing viscous materials, comprising the steps of:
providing a dispensing device for holding a quantity of a viscous material to be dispensed through a tip thereof;
coupling the dispensing device to a dispensing control so that a metered amount of the viscous material will be dispensed in response to a dispensing control signal;
moving the dispensing device along an axis to selectively position the tip a predetermined distance away from the surface of a workpiece positioned adjacent thereto in response to an applied height control signal, said height control signal being generated by processing the output signals from a camera moved along with the dispensing device to determine when an image of the workpiece surface is maximally in focus; and
causing the dispensing control to apply the dispensing control signal to cause a metered amount of the viscous material to be dispensed from the tip of the dispensing device onto the workpiece surface.

5,110,616
METHOD OF APPLYING LIQUID TO A PAN SURFACE IN A CONTROLLED SEQUENCE
James H. Lair, and John E. Fagan, both of Norman, Okla., assignors to Burford Corp., Maysville, Okla.
Continuation-in-part of Ser. No. 231,588, Aug. 8, 1988, Pat. No. 4,925,699, which is a continuation of Ser. No. 937,961, Dec. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 796,083, Nov. 7, 1985, abandoned. This application Sep. 15, 1989, Ser. No. 407,531
Int. Cl.[5] B05D *5/08, 1/04*
U.S. Cl. 427—9 **8 Claims**

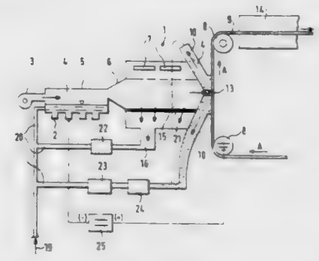


8. A method of forming a film of oil on surfaces in pans carried by a conveyor comprising the steps of: initiating a cycle for spraying atomized oil toward a first partial area on the surface in a pan for a predetermined time interval; initiating a second cycle for spraying atomized oil toward a second partial area on a surface in the pan; and controlling said first and second time intervals such that oil sprayed on the first and second partial areas forms a substantially continuous film of oil over surfaces in the pan.

5,110,617
METHOD OF APPLYING MULTICOLOR FINISH TO ELONGATED CHANNEL MEMBER
Ray D. Gundling, Schaumburg; Joseph E. Kaminkow, Arlington Heights, and Jay A. Hoffman, Jr., Forest Park, all of Ill., assignors to Data East Pinball, Inc., Melrose Park, Ill.
Filed Jan. 2, 1991, Ser. No. 636,618
Int. Cl.[5] B05D *5/00, 1/06*
U.S. Cl. 427—14.1 **9 Claims**

9. A method of applying in a multicolor finish to an elongated channel member, which comprises:
applying a first fusible color coating to a first portion of said channel member; applying a second fusible color coating to a second portion of said channel member, and also applying said second color coating to a part of said first portion, said color coatings being applied as powder coatings under electrostatic charge conditions, said part being adjacent to said second portion and said first and second color coatings being of different colors, fusing said color coatings, whereby said part assumes a third color that is a blend of the first and second colors.

5,110,618
PROCESS FOR ELECTROSTATICALLY COATING A SUBSTRATE USING AN AEROSOL
Horst Faust, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt/Main, Fed. Rep. of Germany
Filed Aug. 2, 1990, Ser. No. 561,881
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1989, 3925539
Int. Cl.[5] B05D *1/04*
U.S. Cl. 427—32 **15 Claims**

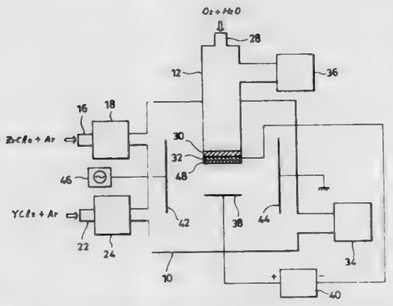


1. A process for coating a substrate with a film which includes at least one vaporize solvent component and at least one solid component using an electrostatic discharge means, comprising the steps of:
(a) introducing a coating solution which includes at least one vaporizable solvent component and at least one solid component into an atomizing zone;
(b) atomizing the coating solution introduced into the atomizing zone to produce drops;
(c) mixing the coating solution drops with an air or gas stream to form an aerosol;
(d) electrically charging the aerosol using the electrostatic discharge means;
(e) blowing the aerosol out of the atomizing zone into a vaporizing zone;
(f) vaporizing a large portion of the solvent component so that the individual drop size of the aerosol is about 50 to 90 percent by volume smaller than the volume of the drop size of the aerosol formed in step (c);
(g) spraying the aerosol onto a charged substrate in an application zone; and
(h) drying the aerosol so as to fuse the solid components and form a film on the surface of the substrate.

5,110,619
METHOD FOR PRODUCTION OF FILMS
Zempachi Ogumi, 89-3, Matsunoki-cho, Shimogamo, Sakyo-ku, Kyoto-shi, Kyoto 606, and Zenichiro Takehara, 10-14, Nishishimbayashi-cho 6-chome, Oe, Nishikyo-ku, Kyoto-shi, Kyoto 610-11, both of Japan
PCT No. PCT/JP90/00281, § 371 Date Oct. 1, 1990, § 102(e) Date Oct. 1, 1990, PCT Pub. No. WO90/10728, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 5, 1990, Ser. No. 582,228
Claims priority, application Japan, Mar. 6, 1989, 1-53991
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—38 **1 Claim**

1. A method of producing a film comprising steps of transporting ions in a thickness direction of the film in the course of formation thereof and reacting the ions thus transported to one surface of said film with a gas within a reaction chamber to give a desired film, wherein said formation of the film is done on a substrate which is a porous electrode, an electric field is applied in said reaction chamber between said porous electrode and a counter electrode and in the thickness direction of the film in the course of formation thereof so as to accelerate

transport of ions, and a plasma generated by another pair of electrodes is established in front of said surface to thereby



eliminate via said plasma the electric charges accumulating on said surface.

5,110,620

METHOD FOR THE PRODUCTION OF AN ELECTRET SHEET

Yatsuhiro Tani, and Satoshi Takase, both of Ohtsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 276,617, Nov. 28, 1988. This application Oct. 3, 1991, Ser. No. 770,564

Claims priority, application Japan, Nov. 28, 1987, 62-301302; Apr. 6, 1988, 63-85985

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—40 **8 Claims**



1. A method of manufacturing an electret sheet comprising the steps of providing a surface of a porous sheet with at least one solid material in particulate form spaced at various intervals on said surface, said material being selected from the group consisting of (1) organic materials that are solid at room temperature and consist of organic carboxylic acids, metal salts of carboxylic acids, polyethylene, polypropylene, polyethyleneterephthalate, polyamide, polyvinylidene fluoride, polytetrafluoroethylene, polystyrene, polyvinyl chloride, polyvinylidene chloride, cellulose, or polyvinyl alcohol; (2) inorganic materials that are ceramics, metal nitrides, or carbon black; and (3) metallic materials that are comprised of aluminum, silver, tin, nickel, or copper, and subsequently electrifying the porous sheet that has said solid material on its surface.

5,110,621

PROCESS FOR THE PRODUCTION OF MODIFIED POLYSILOXANE-COATED SANITARY RUBBER ARTICLE

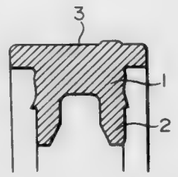
Morihiro Sudo, Tokyo; Tomoyasu Muraki, Abiko; Eiji Kawachi, Kiryu, and Yasushi Kawachi, Ashikaga, all of Japan, assignors to Daikyo Gomu Seiko Ltd., Tokyo, Japan

Division of Ser. No. 209,639, Jun. 21, 1988. This application Sep. 5, 1990, Ser. No. 577,698

Claims priority, application Japan, Jun. 23, 1987, 62-154272; Sep. 2, 1987, 62-218026

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—44 **8 Claims**



1. A process for the production of a modified polysiloxane-coated sanitary rubber article, which comprises applying to a rubber surface a modified polysiloxane composition comprising a modified polysiloxane having at least one group selected from the group consisting of alkenyl, acryloyl, vinyloxy, maleimide and phenylketone groups in the molecule, and bridging the modified polysiloxane by irradiation of an electron beam, a laser beam or ultraviolet rays to form a coating strongly bonded to the rubber surface.

5,110,622

PROCESS FOR PREPARING A METAL SULFIDE THIN FILM

Yo Hasegawa, Nara; Kazuyuki Okano, Ikoma; Yasuhito Isozaki, Neyagawa; Munehiro Tabata, Ibaragi; Chiharu Hayashi, and Akira Nakanishi, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP89/00419, § 371 Date Dec. 4, 1989, § 102(e) Date Dec. 4, 1989, PCT Pub. No. WO89/10326, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 19, 1989, Ser. No. 445,663

Claims priority, application Japan, Apr. 21, 1988, 63-98664

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—126.1 **1 Claim**

1. A process for preparing a metal sulfide thin film, wherein an organic compound alone or dissolved in a solvent is made into a fine mist and sprayed on a heated substrate, said organic compound being at least one selected from the group consisting of metal mercaptide, metal thiocarboxylate, metal dithiocarboxylate, metal thioglycolate and metal salt of thioglycolate ester.

5,110,623

METHOD OF ORIENTING A LIQUID CRYSTAL MATERIAL, APPARATUS THEREFOR, AND LIQUID CRYSTAL DEVICE ORIENTED THEREBY.

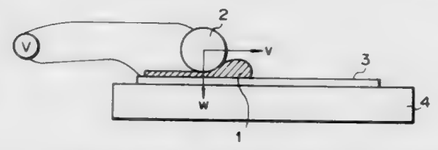
Kimihiro Yuasa, and Kenji Hashimoto, both of Chiba, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed May 31, 1990, Ser. No. 531,170

Claims priority, application Japan, Jun. 2, 1989, 1-139134; Jul. 10, 1989, 1-175662; Nov. 22, 1989, 1-302196

Int. Cl.[5] B05D *5/06*

U.S. Cl. 427—162 **14 Claims**



1. A method of orienting a liquid crystal material, comprising; orienting the liquid crystal material by applying a shearing force to the liquid crystal material while an electric field is being applied to the liquid crystal material.

5,110,624

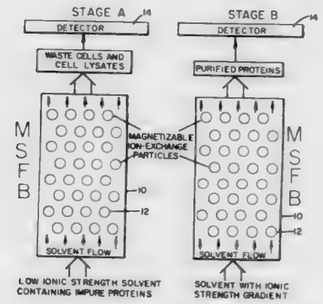
METHOD FOR PREPARING MAGNETIZABLE POROUS PARTICLES

Richard D. Noble, Boulder; Carl A. Koval, Lafayette; Lori Nixon, and Geoffrey F. Slaff, both of Boulder, all of Colo., assignors to The University of Colorado Foundation, Inc., Denver, Colo.

Division of Ser. No. 409,616, Sep. 19, 1989. This application Mar. 26, 1991, Ser. No. 675,554

Int. Cl.[5] B05D *7/24*

U.S. Cl. 427—212 **4 Claims**



1. A method for preparing a magnetizable, porous particle comprising:

contacting an untreated first portion of porous particles with a suspension comprised of magnetite particles coated with a dispersing agent and water;

removing and discarding said first portion of porous particles;

contacting said suspension with an untreated second portion of porous particles; and

separating said suspension from said second portion of porous particles.

5,110,625

PROCESS FOR SURFACE MODIFICATION OF POLYMER ARTICLES

Michael T. Burchill, Cranbury; Maryam Rafiei, Bayonne, and Joseph Silbermann, Old Bridge, all of N.J., assignors to Atochem North America, Philadelphia, Pa.

Continuation of Ser. No. 322,286, Mar. 13, 1989, abandoned, which is a continuation of Ser. No. 209,619, Jun. 21, 1988, Pat. No. 4,868,011, which is a continuation-in-part of Ser. No. 945,595, Dec. 23, 1986, Pat. No. 4,770,905. This application Nov. 13, 1990, Ser. No. 613,946

The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.

Int. Cl.[5] B05D *5/00*

U.S. Cl. 427—160 **17 Claims**

1. A method modifying the surface characteristics of a resinous article, comprising:

a. immersing an article in water,

b. contacting the immersed article with a solvent solution of methylene chloride having a modifier ingredient therein, and

c. concurrently subjecting said liquid to a deaeration process.

5,110,626

U.V. STABILIZED ARTICLE

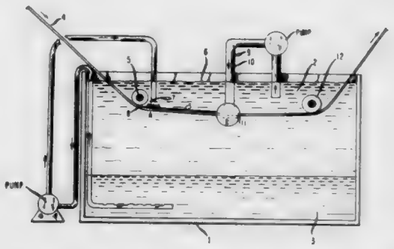
Michael T. Burchill, Cranbury, and Joseph Silbermann, Old Bridge, both of N.J., assignors to Atochem North America, Inc., Somerville, N.J.

Division of Ser. No. 945,757, Dec. 23, 1986, abandoned. This application Jun. 29, 1989, Ser. No. 373,656

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.

Int. Cl.[5] B05D *5/00*

U.S. Cl. 427—160 **10 Claims**



1. A process for producing a surface modified resin article which comprises immersing a resin-body in a suitable liquid media, said liquid media being nonagressive towards said resin;

applying a solution of modifier material comprising an ultraviolet light stabilizer in a solvent to a surface of said resin body; and

displacing residual modifier and solvent from the thustreated surface in situ;

both steps being carried out in an environment which is non-evaporative of said solvent.

5,110,627

PROCESS FOR MAKING REINFORCEMENTS FOR ASPHALTIC PAVING

Roy Shoesmith, and Mark O. Kittson, both of Ontario, Canada, assignors to Bay Mills Limited, Ontario, Canada

Continuation of Ser. No. 558,153, Jul. 26, 1990, abandoned, which is a division of Ser. No. 116,351, Nov. 4, 1987, Pat. No. 4,957,390. This application Aug. 12, 1991, Ser. No. 745,970

Int. Cl.[5] B05D *5/10*

U.S. Cl. 427—208.4 **26 Claims**

1. A process for making a reinforcement for asphaltic paving comprising:

selecting an open grid comprising two sets of parallel strands of continuous filament fibers, the grid having openings between adjacent strands and the two sets of strands being substantially perpendicular to each other;

impregnating the strands of the grid with a resin; and

applying to one side of the resin-impregnated grid a coating of stable, activatable adhesive without closing the openings between the strands, the adhesive being compatible with asphaltic paving.

5,110,628

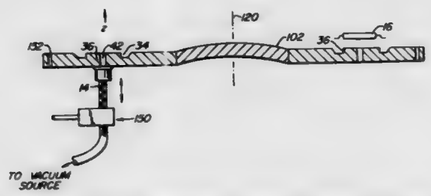
METHOD AND APPARATUS FOR MARKING OR ERASING A MARKING ON A SEMICONDUCTOR CHIP PACKAGE

David L. Ganapol, Scotts Valley, and Gary L. Small, San Jose, both of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Mar. 15, 1990, Ser. No. 494,246

Int. Cl.[5] B05D *5/00;* **B05C** *13/02;* **B08B** *11/02*

U.S. Cl. 427—256 **17 Claims**



1. An apparatus for marking or erasing a marking on a semiconductor chip package having leads, said apparatus comprising:

support structure for supporting the package, said support structure defining a conduit means therein, said support structure having a main surface and a depression therein at an elevation below the main surface, said support structure having a portion protruding upwards from the depression forming a pedestal, said depression defining space surrounding the pedestal for housing the leads when the pedestal is supporting the package so that the leads do not contact said support structure;

means connected to said conduit means for evacuating the conduit means; and

means for marking or erasing a marking on the package when the package is supported by said structure and when the conduit means is evacuated by said evacuating means, so that the package is held to said support structure by sufficient force for the marking or erasing, and so that the leads of the package are not disturbed during the marking or erasing.

13. A method for marking or erasing a marking on a semiconductor chip package having leads and employing a support structure for supporting the package, the structure defining a conduit means therein and having a depression therein for holding the leads so that the leads do not contact the structure when positioned thereon, said method comprising:

placing a semiconductor chip package with leads onto the support structure, such that the leads are situated in the depression and do not contact the support structure;

evacuating the conduit means; and

marking or erasing a marking on the package when the conduit means is being evacuated, so that the package is held to the support structure by sufficient force for the marking or erasing, and so that the leads of the package are not disturbed during the marking or erasing.

5,110,629

METHOD FOR PREPARING RUBBER SURFACE FOR ADHESION TO POLYMERIC FORMULATION

Edward N. Gomberg, Las Vegas, Nev., and Ahmed A. Zurkiya, Hixson, Tenn., assignors to Synair Corporation, Chattanooga, Tenn.

Filed Oct. 5, 1990, Ser. No. 593,199

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—322 **18 Claims**

1. A method of preparing a surface of a rubber substrate for forming a temperature stable bond to polymeric formulations including the sequential steps of:

applying a coat of a polyamine, Solution A, to a rubber substrate;

applying a coat of a peroxide solution, Solution B;

applying a coat of a polyisocyanate, Solution C, wherein the surface becomes isocyanate-rich; and

applying a polymeric formulation whereafter the polymeric formulation is allowed to cure, thereby chemically bonding to the isocyanate-rich surface.

5,110,630

METAL GASKET AND METHOD OF PRODUCING THE SAME

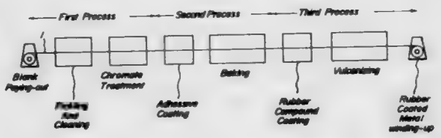
Tunehiko Abe; Hiroyuki Nakano, both of Kawaguchi; Kazuaki Shiotani, Urawa, and Yoshiharu Takada, Chiba, all of Japan, assignors to Nippon Leakless Industry Co., Ltd. and Sanshin Kogyo Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 386,219, Jul. 28, 1989. This application Feb. 19, 1991, Ser. No. 656,512

Claims priority, application Japan, Jul. 28, 1988, 63-186786; Oct. 3, 1988, 63-128750

Int. Cl.[5] B05A *3/02*

U.S. Cl. 427—327 **7 Claims**



1. A method of producing a metal gasket comprising steps of coating a non-rinse chemical for chromate conversion on at least one surface of a metal plate and drying it in a first process, coating an adhesive thereon in a second process, and providing a rubber compound layer thereon and vulcanizing it in a third process, wherein said metal plate is a steel plate selected from a stainless steel sheet and a carbon steel sheet.

5,110,631

PRODUCTION OF METAL SPRAY DEPOSITS

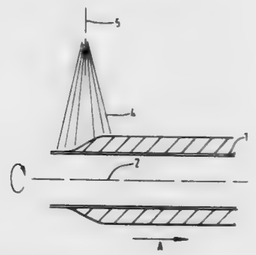
Alan Leatham, Swansea, and Jeffrey Coombs, West Glamorgan, both of Wales, assignors to Osprey Metals Limited, Neath, Wales

Continuation of Ser. No. 323,158, Mar. 15, 1989, abandoned, which is a continuation of Ser. No. 83,788, filed as PCT/GB86/00698, Nov. 12, 1986, abandoned. This application Sep. 20, 1990, Ser. No. 612,512

Claims priority, application United Kingdom, Nov. 12, 1985, 8527853; Nov. 12, 1985, 8527854

Int. Cl.[5] B05D *1/02*

U.S. Cl. 427—422 **19 Claims**



1. A method of forming a deposit on the surface of a substrate comprising the steps of:

teeming a stream of molten metal, metal alloy or molten ceramic through an atomizing device;

generating a spray of gas atomized molten metal, metal alloy or molten ceramic particles by the application of an atomizing gas at a temperature less than that of said molten metal, metal alloy or molten ceramic, said spray having a mean axis directed at the substrate,

rotating the substrate about an axis of the substrate, and

extracting heat in flight and/or on deposition from the atomized particles by said cooler atomizing gas to produce a coherent deposit,

the improvement comprising:

(i) oscillating the spray in the direction of the axis of the substrate whereby:

(a) the angle of the mean axis of the spray to the substrate and to the molten stream is varied, and

(b) the deposition profile of the spray is modified by elongation along the length of the substrate;

(ii) oscillating the spray at a speed of oscillation sufficiently rapid that a thin layer of semi-solid/semi-liquid metal or ceramic is substantially maintained at the surface of the deposit over the amplitude of oscillation into which further particles are deposited to maintain a substantially uniform microstructure through the thickness of the deposit; and

(iii) moving the substrate in axial direction during deposition of the atomized particles onto the substrate by an amount greater than the amplitude of oscillation whereby a deposit of continuous or semi-continuous length is formed.

5,110,632

RECIPROCATING PAINTING METHOD

Shin Kawaguchi; Yutaka Ohhashi, and Kenji Fukuta, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jul. 3, 1991, Ser. No. 725,524

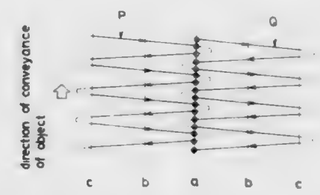
Claims priority, application Japan, Aug. 15, 1990, 2-215290

Int. Cl.[5] B05D *1/02*

U.S. Cl. 427—424 **3 Claims**

1. A method of painting an object in conveying a plurality of painting machines arranged perpendicularly to the direction in which the object is conveyed and to be reciprocated in the direction of the arrangement of the machines, turning points of the orbits of the adjacent painting machines drawn above the object of which are overlapped in the conveying direction, comprising the step of:

cutting off the delivery of the paint at the area of overlapping of the orbits in such a way that the starting points and the ending points of the cutoff for the adjacent painting machines are located on one straight line along the conveying direction.



5,110,633

PROCESS FOR COATING PLASTICS ARTICLES

Robert Cassat, Ternay, and Jean-Pierre Logel, Mulhouse, both of France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 21, 1990, Ser. No. 570,499

Claims priority, application Switzerland, Sep. 1, 1989, 3172/89

Int. Cl.[5] B05D *1/18*

U.S. Cl. 427—430.1 **13 Claims**

1. A one-step process for coating a plastics article selected from the group consisting of thermoplastics, heat curable resins and elastomers with a thin layer of a noble metal, wherein said plastics article contains finely particulate, homogenized filler selected from the group consisting of MnO, NiO, Cu_2O, SnO, and Bi_2O_3 which process comprises contacting said plastics article with an acid aqueous solution of a noble metal salt having a pH in the range of 0.5 to 3.5.

5,110,634

PROCESS FOR MAKING A SURFACE MODIFIED POLYMER ARTICLE

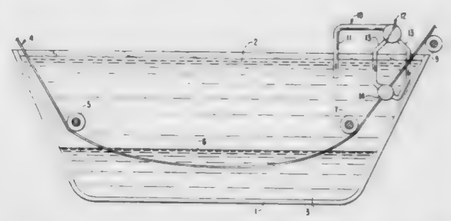
Joseph Silbermann, Old Bridge, and Michael T. Burchill, Cranbury, both of N.J., assignors to Atochem North America, Philadelphia, Pa.

Division of Ser. No. 76,630, Jul. 23, 1987, Pat. No. 4,925,739. This application May 1, 1989, Ser. No. 345,190

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] B05D *1/18*

U.S. Cl. 427—430.1 **27 Claims**



26. A continuous process for incorporating at least one ultraviolet light stabilizer into at least one of the surface regions of a polyvinyl chloride sheet, wherein said surface regions extend to a depth of up to about 200 microns, the amount of stabilizer incorporated into each of said surface regions is at least 0.3 g/m^2 of said sheet and at least 70% of said amount is present in the upper 100 microns of said surface regions, comprising the steps of:

(a) continuously transporting said sheet through a methylene

chloride solution containing 1 to 60 wt./vol. % of said at least one ultraviolet light stabilizer, which is disposed as a lower layer beneath an upper layer of water, wherein the rate of transport of said sheet through said solution is such that said sheet is in contact with said solution for a period of time ranging from about two seconds to about two minutes; and

(b) continuously withdrawing said sheet from said lower layer through said upper layer, wherein any residual solution on the surfaces of said article is displaced by directing jets of water onto said surfaces of said sheet while within said upper water layer.

5,110,635
REUSABLE WREATH

Rosemarie A. Creegan, 1660 East Dr., Merrick, N.Y. 11566

Filed Apr. 26, 1991, Ser. No. 692,234
Int. Cl.[5] A41G *1/00*
U.S. Cl. 428—10 **6 Claims**

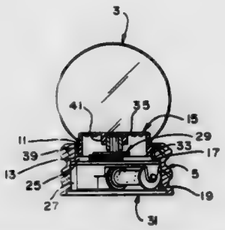


1. A reusable wreath for year-round use comprising:
a decorative wreath base which is generally ring shaped;
means for removably connecting a plurality of accessories to said wreath base, including a hook element, and a loop element of a hook and loop fastener, one of said elements being formed as a narrow strip and spirally wound about said wreath base to maintain said wreath base in said ring shape, and the other said element being attached to said accessories; and
a plurality of seasonably interchangeable accessories formed as sets, each set containing a coordinated group of accessories which together with said decorative wreath base depict a particular season.

5,110,636
DECORATIVE DISPLAY DEVICE

Jack Hou, Taipei, Taiwan, assignor to Giftec, Ltd., Alexandria, Va.

Filed Feb. 5, 1991, Ser. No. 650,877
Int. Cl.[5] G09F *19/00*
U.S. Cl. 428—11 **9 Claims**

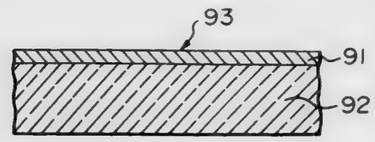


1. A decorative display device comprising:
a) a transparent housing provided with a bottom opening for filling the housing with a liquid;
b) a cup-shaped sealer snugly fitted within the bottom opening to form a liquidtight seal therewith;
c) a hollow base having a top opening within which a portion of the housing and sealer are received to permit rotation of the housing relative to the base;
d) a wind-up drive mechanism contained within the base and including a power output shaft; and
e) a transmission assembly drivingly connecting the sealer to the power output shaft so that rotation of the housing relative to the base and drive mechanism in a first direction causes the drive mechanism to be wound up and unwinding of the drive mechanism causes rotation of the housing relative to the base and drive mechanism in a second opposite direction.

5,110,637
AMORPHOUS OXIDE FILM AND ARTICLE HAVING SUCH FILM THEREON

Eiichi Ando; Koichi Suzuki, both of Yokohama; Junichi Ebisawa, Tokyo, and Susumu Suzuki, Kawasaki, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,330
Claims priority, application Japan, Mar. 3, 1988, 63-48765; Mar. 31, 1988, 63-76202; Jun. 14, 1988, 63-144827; Oct. 21, 1988, 63-264163
Int. Cl.[5] E06B *3/24*; B05D *1/36*; C03C *3/14*
U.S. Cl. 428—34 **15 Claims**



1. An amorphous oxide film composed essentially of an oxide containing B and at least one member selected from the group consisting of Zr, Ti, Hf, Sn, Ta and In.

4. An article with high durability which comprises a substrate and one or more thin film layers formed thereon, wherein the outermost layer is made of an amorphous oxide film composed essentially of an oxide containing B and at least one member selected from the group consisting of Zr, Ti, Hf, Sn, Ta and In.

11. A double-glazed windowpane comprising:
(1) a substrate having
(i) a total of 2n+1 coating layers (n≧1) formed on said substrate including a transparent oxide layer as the 2n+1 layer (n≧0) and a silver layer as the 2N layer (n≧1) and
(ii) an amorphous oxide layer composed essentially of an oxide containing B and at least one member selected from the group consisting of Zr, Ti, Hf, Sn, Ta, and In formed on the outermost layer of said 2n+1 coating layers, and
(2) one or more substrates, double- or multi-glazed with an inner space between said substrates, and with said 2n+1 coating layers and said amorphous oxide layer facing the inner space.

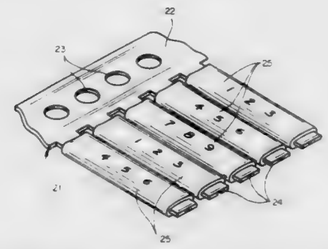
13. A building or transportation means having windows provided with a windowpane which comprises a transparent substrate and one or more thin film layers formed thereon, wherein the outermost layer exposed to air is made of an amorphous oxide film composed essentially of an oxide containing B and at least one member selected from the group consisting of Zr, Ti, Hf, Sn, Ta and In.

14. An amorphous oxide film composed essentially of an oxide containing B, Si and at least one member selected from the group consisting of Zr, Ti, Hf, Sn, Ta and In.

5,110,638
MARKER DEVICE WITH PERMANENT INDICIA

Christine E. Vogdes, Mountain View, and Kris B. Hanson, Newark, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Mar. 20, 1990, Ser. No. 496,398
Int. Cl.[5] B65D *85/20*
U.S. Cl. 428—35.1 **19 Claims**

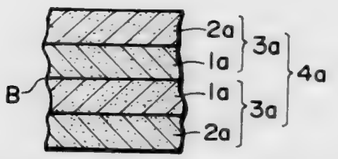


1. A marker device comprising: an article having on at least a portion of a surface thereof a permanent mark, said marker device comprising an article formed by extruding a composition comprising:
a. about 35 to about 75% of a polymeric component having dispersed therein about 25 to about 65% of a filler component comprising:
i. about 2 to about 65% of an insoluble, infusible, particular, active filler having a mean particle size less than about 2.5 micron and a surface area greater than about 10 m^2/g; and
ii. up to about 63% of an insoluble, infusible, particulate, inert filler;
with the proviso that if the polymer of the polymeric component is nonpolar, said polymeric component contains about 0.1 to about 10% of low molecular weight polar compound, all percentages being by weight based on the weight of the composition.

5,110,639
PACKAGING MATERIAL FOR PHOTOSENSITIVE MATERIALS

Mutsuo Akao, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 10, 1990, Ser. No. 550,558
Claims priority, application Japan, Jul. 13, 1989, 1-179040
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—35.2 **9 Claims**



1. A packaging material for photosensitive materials which is a multilayer film comprising two identical coextruded multilayer inflation films each of said coextruded multilayer films being symmetrically disposed and being composed of thermoplastic resin and having an inner and an outer layer and containing a bleedable antistatic agent wherein the antistatic agent content of the outer layer is in the range of about 0.01 to about 0.3% by weight and is more than 1.2 times by weight the antistatic agent content of the inner layer.

5,110,640
DETERGENT POUCH CONSTRUCTION

Robert J. Mack, Flemington, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Filed May 18, 1990, Ser. No. 525,786
Int. Cl.[5] B05D *1/14, 1/16*; B32B *33/00, 3/02*
U.S. Cl. 428—35.2 **9 Claims**

1. A laundry detergent pouch comprising a pair of layers of a non-woven web material having laundry detergent particles therebetween and sealed along the periphery of the pouch by a seal that is not affected by water, said web being formed of fibers of crimped water sensitive material bonded together to retain the smaller detergent particles when said pouch is dry and when said pouch is wetted, said fibers lose their crimp and elongate, to form interstices therebetween of a size so that the largest detergent particles can pass therethrough.

5,110,641
MELT-DISPERSIBLE PACKAGE FOR MELT-PROCESSIBLE POLYMERS

Norman B. Kean, Limavady, Northern Ireland, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 14, 1990, Ser. No. 629,659
Int. Cl.[5] B65D *33/26*
U.S. Cl. 428—35.5 **10 Claims**

1. An article comprising a package containing a heat seal sensitive polymer wherein the package comprises a thermoplastic bag sealed at both ends, at least one seal being with a thermoplastic polymeric thread, both the thermoplastic bag material and the thermoplastic thread material having a melt temperature at or below the processing temperature of the heat seal sensitive polymer.

5,110,642
FILMS USING BLENDS OF POLYPROPYLENE AND POLYISOBUTYLENE

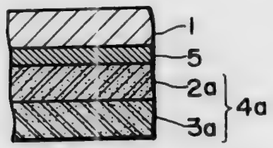
Roger P. Genske, Neepah, assignor to American National Can Company, Chicago, Ill.

Division of Ser. No. 207,369, Jun. 13, 1988, Pat. No. 5,006,384, which is a division of Ser. No. 144,652, Jan. 11, 1988, Pat. No. 4,892,911, which is a continuation of Ser. No. 803,029, Nov. 29, 1985, abandoned. This application Apr. 8, 1991, Ser. No. 681,752
The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.
Int. Cl.[5] B29D *22/00*
U.S. Cl. 428—35.8 **28 Claims**



1. A multiple layer sheet material, comprising:
(a) a first polypropylene-based layer having two opposing surfaces, said first layer being a blend of 35% to 90% by weight polypropylene copolymer and conversely 65% to 10% by weight polyisobutylene, said polypropylene copolymer comprising 70 to 98 mole percent propylene moieties and conversely 30 to 2 mole percent ethylene moieties, the overall composition of said blend comprising at least about 1.8 mole percent ethylene; and
(b) a second layer of a metal foil affixed on one said surface of said first layer.

5,110,643
PACKAGING MATERIAL FOR PHOTOSENSITIVE MATERIALS
Mutsuo Akao, and Takuichi Komatsu, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Dec. 4, 1989, Ser. No. 444,945
Int. Cl.[5] B29D *22/00*
U.S. Cl. 428—35.9 **13 Claims**



1. A packaging material for photosensitive materials comprising a coextruded multilayer film layer having a Young's modulus in longitudinal direction of more than 40 kg/mm^2 comprising a polyolefin resin film layer having a density of 0.941 to 0.970 g/cm^3, a melt index of 0.1 to 5 g/10 minutes and a Young's modulus in longitudinal direction of more than 50 kg/mm^2 and a ethylene copolymer resin film layer having a density of 0.870 to 0.939 g/cm^3 and a melt index of 0.1 to 15 g/10 minutes, a metallized flexible sheet layer laminated on said coextruded multilayer film layer, and a flexible sheet layer laminated on said metallized flexible sheet layer,and said polyolefin resin film layer is located on the side of a packaged product.

5,110,644
COMPOSITION MATERIAL TUBE SUBSTANTIALLY INSENSITIVE TO THE VARIATIONS OF LENGTH UNDER THE EFFECT OF THE INTERNAL PRESSURE
Charles Sparks, Le Vesinet; Pierre Odru, Fontenay Sous Bois; Marcel Auberon, Le Maillan, and Jean-François Fuchs, Castelnau Medoc, all of France, assignors to Institut Francais Du Petrole et Aerospatiale, Malmaison, France
Continuation of Ser. No. 316,787, Feb. 28, 1989, abandoned. This application Jun. 4, 1990, Ser. No. 532,361
Claims priority, application France, Feb. 28, 1988, 88 02500
Int. Cl.[5] B32B *5/28*
U.S. Cl. 428—36.3 **21 Claims**



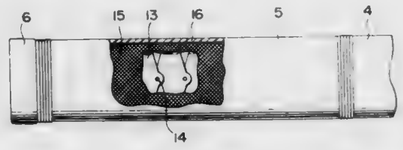
1. A composite material tube having substantially no variations of length under an effect of an internal pressure of a fluid conveyed through said tube, the composite material tube comprising a plurality of stable layers of reinforcement fibers, the reinforcement fibers of each layer being placed at the same winding angle θ in absolute value with respect to a longitudinal axis of the tube with an equal proportion of fibers wound at said angle θ in one direction as fibers wound in the opposite direction, the fibers of each layer being embedded in a resin matrix adhering to the fibers, the fibers of the same layer and the associated matrix having a volume Y, and parallel fibers of the same layer and the associated matrix having an overall modulus of elasticity in a natural direction E of the fibers, wherein said layers of fibers have the following relationship:

$$0.35 < A < 0.60,$$

where:
A is determined in accordance with the following equation:

$$A = \frac{\sum_{i=i}^{i=n} [E_i Y_i (\sin^2|\theta_i|) \cdot (\cos^2|\theta_i|)]}{\sum_{i=1}^{i=n} [E_i Y_i \sin^4|\theta_i|]}.$$

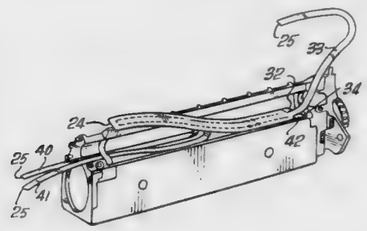
5,110,645
SHEATH OF ARTICULATED TUBE FOR ENDOSCOPE
Jun Matsumoto, and Ryouchi Tanaka, both of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Japan
Continuation of Ser. No. 102,049, Sep. 29, 1987, abandoned. This application Sep. 2, 1991, Ser. No. 764,043
Claims priority, application Japan, Oct. 3, 1986, 61-235747
Int. Cl.[5] F16L *11/18;* **C08L** *27/18*
U.S. Cl. 428—36.9 **6 Claims**



1. A sheath of an articulated tube for use in an endoscope, comprising:
a terpolymer of vinylidene fluoride-hexafluoropropylene-tetrafluoroethylene as a main component;
a copolymer of vinylidene fluoride-hexafluoropropylene as a heat-proof plasticizer;
medium thermal furnace black as a filler; and
a peroxide vulcanizing agent and a peroxide vulcanizing assistant.

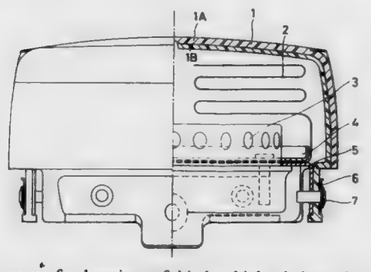
5,110,646
PROCESS AND MATERIALS FOR RECONDITIONING A TONER CARTRIDGE
James D. Prestel, 26478 Calle San Francisco, San Juan Capistrano, Calif. 92675; Mitchel S. Hose, Garden Grove, and Paul J. Barbour, Santa Anna, both of Calif., assignors to James D. Prestel, San Juan Capistrano, Calif.
Filed Jan. 25, 1991, Ser. No. 645,809
Int. Cl.[5] B65D *65/28;* **G03G** *15/06*
U.S. Cl. 428—43 **5 Claims**

2. A toner cartridge slot cover strip with a tear-away center section for facilitating the regeneration of used toner cartridges of the type having a cartridge body with a toner slot adjacent a magnetic roller and cleaner strip, said toner cartridge slot cover strip comprising:
a elongated, three layer laminated sheet having an upper thin polymeric layer, a delayed tack middle layer and a release paper bottom layer, said elongated, three layer laminated sheet having a first end, a second end, a left-longitudinal edge and a right-longitudinal edge, said sheet having first and second cuts parallel to the left and right longitudinal edges dividing the sheet into three approximately equal portions;
the beginning portions of said first and second cuts beginning at the second end and extending through all three layers of said elongated, three layer laminated sheet and extending parallel to the right and left edges toward the first end a distance greater than half the length between the first end and the second end, said beginning portions of the first and second cuts being the full cut portions which terminate near the middle of the sheet at a full cut termination;
the perforated portions of the first and second cuts begin at



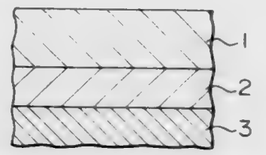
the full cut termination and continue parallel to the right and left longitudinal edges to a point near the first end called the perforation terminations, said perforated portions being spaced cuts with uncut portions therebetween to provide a tear off ability and said perforated portions being joined at the perforation terminations near the first end and said spaced cuts extending through all three layers of said sheet;
a first and second transverse cut through only the upper thin polymeric layer extending from each of the full cut near the full cut terminations to the nearest longitudinal edge; and
a transverse cut only through the backing layer between the perforation terminations.

5,110,647
COVER FOR A VEHICLE AIR BAG
Masami Sawada; Yuichi Nanbu, both of Shiga, and Mitsuo Yoshiyasu, Chiba, all of Japan, assignors to Takata Corporation, Tokyo, Japan
Filed Dec. 20, 1989, Ser. No. 453,685
Claims priority, application Japan, Dec. 26, 1988, 63-328323; Feb. 22, 1989, 1-42733
Int. Cl.[5] B60R *21/16*
U.S. Cl. 428—43 **8 Claims**



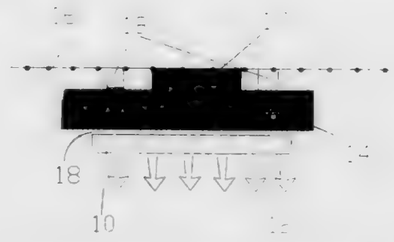
1. A cover for housing a folded vehicle air bag, the cover being made solely of polymeric materials, being adapted to be fastened to a retainer base in a position generally between the air bag and the vehicle occupant and having weakened zones that enable it to break easily when the air bag inflates, characterized in that it has an external surface layer formed of a thermoplastic polymeric material having a Type A hardness of from about 20 to about 90 as determined by Japanese Industrial Standard K6301-1975 and a core layer formed of a thermoplastic polymeric material having a modulus in elasticity in flexure of not less than about 1000 kg/cm^2 as determined in accordance with Japanese Industrial Standard K7203-1982 and a hardness greater than that of the surface layer, and in that the weakened zones are formed in the core layer.

5,110,648
OPTICAL STORAGE MEDIUM
Masa-aki Suzuki, Neyagawa, and Eiji Ando, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 26, 1989, Ser. No. 456,371
Claims priority, application Japan, Jan. 10, 1989, 1-003101
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—64 **4 Claims**



1. An optical storage medium comprising a recording layer containing organic dye molecules which allows recording due to change in the molecular structure or molecular aggregate structure induced by irradiation with light, and a controlling layer stable against change in molecular structure or aggregate structure of molecule induced by recording light or reading light provided on said recording layer for controlling the recording sensitivity of said recording layer, wherein the controlling layer is made of a material selected from the group consisting of fatty acids, fatty acid esters, fatty acid metal salts, aliphatic amides, aliphatic alcohols and acrylic polymers.

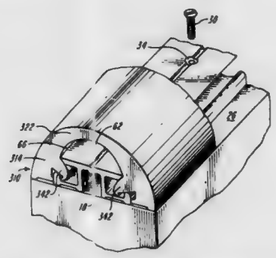
5,110,649
SEPARABLE FASTENERS FOR ATTACHMENT TO OTHER OBJECTS
Andrew P. Morse, Manchester, and George A. Provost, Litchfield, both of N.H., assignors to Velcro Industries, B.V., Netherlands
Filed Jul. 3, 1990, Ser. No. 548,385
Int. Cl.[5] A44B *21/00*
U.S. Cl. 428—100 **10 Claims**



1. An improved fastener assembly for attachment to other objects, and adapted to be embodied in a foamed cushion by being held in a trough in a mold wall during foaming of the cushion, said trough having a predetermined width, said fastener assembly comprising
a fastener strip having an outer surface comprising one-half

of a touch fastening system, said strip having a predetermined width less than the width of the trough;
a thin foam layer having a front surface attached to the inner surface of said fastener strip, said foam layer having a width substantially greater than the predetermined width of said fastening strip so as to extend a substantial distance beyond each edge of said fastening strip and overlap the edges of the trough;
an open-mesh fabric layer attached to a back surface of said thin foam layer; and
a metal shim held on to said thin foam layer, said metal shim being adapted to be held in the foam mold by mold-mounted magnets in the bottom of the trough.

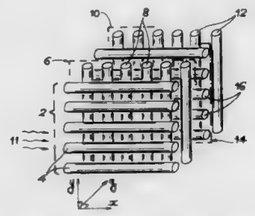
5,110,650
RESILIENT STRIP AND MOUNTING MEMBER FOR FLUSH FITTING PROTECTIVE STRIP ASSEMBLY
Gerald Kessler, Youngstown, Ohio, assignor to Boston Metal Products Corp., Medford, Mass.
Continuation of Ser. No. 383,905, Jul. 21, 1989, Pat. No. 5,013,596. This application Apr. 19, 1991, Ser. No. 688,646
The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.
Int. Cl.[5] E04F *19/02;* **B60J** *11/00*
U.S. Cl. 428—100 **10 Claims**



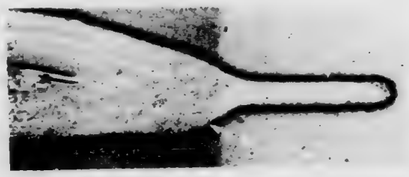
1. An elongated protective strip of resilient material to be secured in and partially surrounding a mounting member, said resilient strip comprising:
(a) a body partially surrounding the mounting member and having a pair of edge portions; and
(b) a pair of oppositely disposed, inwardly extending solid latch members, each terminating in a hook having an opening on the side of the latch member facing away from the mid-line of the body and each latch member located between a point 45 degrees away from the mid-line of the body and another point 90 degrees away from the mid-line, in the same direction.

5,110,651
DIELECTRIC OR MAGNETIC ANISOTROPY LAYERS, LAMINATED COMPOSITE MATERIAL INCORPORATING SAID LAYERS AND THEIR PRODUCTION PROCESS
Thierry Massard, Paris; Claude Barbalat, les Ulis, and Jean-Jacques Lefevre, Guipeville, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Oct. 12, 1990, Ser. No. 596,869
Claims priority, application France, Oct. 23, 1989, 89 13840
Int. Cl.[5] B32B *5/12*
U.S. Cl. 428—105 **8 Claims**

1. Thin continuous dielectric or magnetic anisotropy layer consisting essentially of hot compacted contiguous fibers (4,6) parallel to a pre-determined direction (x,y) and consisting essentially of a thermoplastic polymer sheath containing a magnetic or dielectric pulverulent charge core having homogeneous grains with a size of 10 to 50 μm and optionally reinforcing means (22), the cohesion of the fibers of the layer resulting from the melting of the polymer.

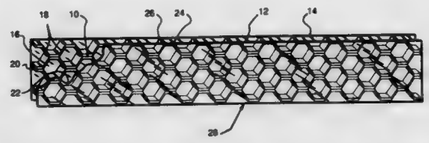


5,110,652
SHAPED FIBER-REINFORCED CERAMIC COMPOSITE ARTICLE
Roger A. Allaire, Big Flats, and G. Daniel Lipp, Painted Post, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.
Filed Dec. 4, 1989, Ser. No. 445,398
Int. Cl.[5] B32B *5/12, 5/08;* **F01D** *5/28*
U.S. Cl. 428—114 **3 Claims**



1. A multi-layer ceramic matrix composite article having at least one curved exterior surface and a varying thickness along axes perpendicular to the surface, wherein the varying thickness is produced at least in part by a variation in the number of layers of composite material traversed by the axes, and wherein the curved surface is formed of a facing layer of composite material comprising a ceramic matrix reinforced with long, substantially unbroken inorganic fibers disposed in directions parallel to the curved surface, said facing layer (i) being sufficiently large to cover the layers of composite material therebeneath and (ii) comprising edge portions which are substantially free of fiber- or matrix-depleted composite material.

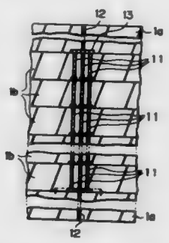
5,110,653
SHOCK ABSORBING WRAP FOR SPORTING EQUIPMENT
Curtis L. Landi, Mountain View, Calif., assignor to Supracor Systems, Inc., Sunnyvale, Calif.
Filed Dec. 11, 1990, Ser. No. 625,504
Int. Cl.[5] B32B *3/12*
U.S. Cl. 428—116 **7 Claims**



1. An improved wrap used to form a hand gripping surface for a generally cylindrically shaped handle, comprising:

a generally rectangularly shaped anisotropic three-dimensional structured body of wrapping material including
a core made from strips of flexible thermoplastic elastomeric material bonded together to form the walls of a honeycomb network of generally hexagonally shaped cells, the walls of said cells each having upper edges and lower edges;
a first sheet of resilient slip resistant facing material, thermal compression bonded to one surface of said core formed by either said upper edges or said lower edges; and
said body of material being wrappable about a handle and securable thereto such that the outer surface thereof forms said hand gripping surface.

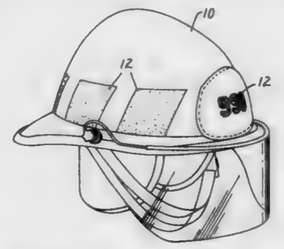
5,110,654
CERAMIC MULTILAYER WIRING SUBSTRATE
Sakae Yokokawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jul. 16, 1990, Ser. No. 552,535
Claims priority, application Japan, Jul. 17, 1989, 1-182553
Int. Cl.[5] B32B *3/10*
U.S. Cl. 428—137 **3 Claims**



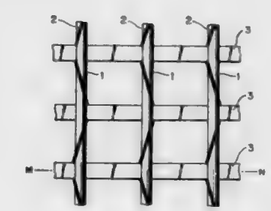
1. A ceramic multilayer wiring substrate having a stack of a plurality of ceramic sheets each being formed with through holes, which are connected to one another by conductive paste buried in said through holes, comprising:
a plurality of parallel first through holes formed in each of the ceramic sheets which constitute an intermediate layer portion, and spaced apart in a direction perpendicular to a direction of thickness of said ceramic sheet;
a single second through hole formed in each of the ceramic sheets which constitute surface layer portions between which the intermediate layer portion is interposed; and
a relaying land for connecting said single second through hole to said plurality of parallel first through holes.

5,110,655
REMOVABLE, HIGH TEMPERATURE RESISTANT RETROREFLECTIVE MARKING MATERIAL
David A. Engler, and Britton G. Billingsley, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 17, 1990, Ser. No. 599,073
Int. Cl.[5] G02B *5/128;* **B32B** *7/06*
U.S. Cl. 428—143 **18 Claims**

1. A marking material which comprises:
a) a flexible retroreflective sheeting comprising a retroreflective layer of closely packed retroreflective elements protruding from the front of surface of a binder layer and a fire resistant fabric disposed behind the binder layer; and
b) a mounting adhesive layer covering the rear of the fire resistant fabric, which mounting adhesive adheres strongly to polycarbonate and yet can be stripped cleanly from the polycarbonate after being held in a forced air oven at 260° C. for 5 minutes.



5,110,656
IMPREGNATED LENO FABRIC AND REINFORCED INORGANIC MATRIX ARTICLE
Shin-ichi Inaba; Yasuyuki Shindo; Shirou Tsubouchi, all of Gunma; Hiroki Naganuma, Urawa; Yoshio Nakazawa, Musashino; Ryusuke Hayashi, Yokohama, and Kanji Yamada, Tokyo, all of Japan, assignors to Kanebo Ltd. and Nippon Steel Corporation, both of Tokyo, Japan
Filed Mar. 8, 1990, Ser. No. 490,400
Claims priority, application Japan, Mar. 15, 1989, 1-60738; Mar. 15, 1989, 1-60739; Mar. 15, 1989, 1-60740; Mar. 15, 1989, 1-60741
Int. Cl.[5] B32B *5/00, 18/00*
U.S. Cl. 428—257 **11 Claims**



1. A network article comprising a leno cloth fixed with a resin, characterized in that a weft bending index, C_f, as defined below is less than 0.03:

$$C_f = D_f / L_f$$

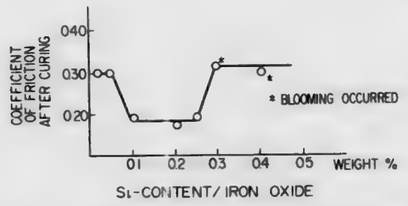
where in L_f is an average distance between two mutually-adjacent warp yarns, and
D_f is an average distance between one peak of a wavy central line of a weft yarn and a straight line connecting two peaks adjacent to said peak in a cross section along the weft of the network article.

5,110,657
ANTI-SKID COATING COMPOSITION
Winston C. Ainslie, Coquitlam, Canada, assignor to Reichhold Chemicals, Inc., Durham, N.C.
Filed May 22, 1990, Ser. No. 526,976
Int. Cl.[5] C08L *61/00;* **B32B** *5/22;* **B05D** *1/36*
U.S. Cl. 428—141 **13 Claims**

1. A weather-resistant temporary anti-skid coating consisting essentially of:

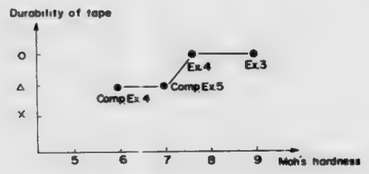
(a) a binder composition having a viscosity of about 300 to 1200 centipoises comprising:
(i) about 85 to 95 weight % of an aqueous resin selected from the group consisting of urea-formaldehyde resin, melamine formaldehyde resin, and mixtures thereof;
(ii) about 3 to 20 weight % of an aqueous emulsion selected from the group consisting of polyvinyl acetate, ethylene-vinyl acetate copolymer and mixtures thereof;
(iii) a catalyst comprising a salt selected from the group consisting of ammonium chloride, ammonium sulfate and mixtures thereof;
(iv) a dispersant for said catalyst; and
(b) an aggregate that does not dull cutting blades having a particle size of about 20 to 60 mesh; wherein the coating is sufficiently viscous to substantially prevent its penetration into a wooden substrate and wherein said coating has a cure time of about ½ to 1½ minutes at about 350° F.

5,110,658
MAGNETIC RECORDING MEDIUM
Yasushi Nakano; Tohru Miyake; Shigeru Akutsu, and Yuji Shimizu, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Oct. 17, 1988, Ser. No. 258,386
Claims priority, application Japan, Oct. 19, 1987, 62-263205; Oct. 20, 1987, 62-264240
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—141 **9 Claims**



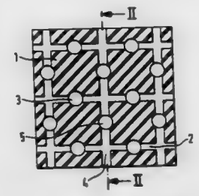
1. A magnetic recording medium comprising a non-magnetic support and provided thereon a magnetic layer containing a ferromagnetic iron oxide and a binder, said ferromagnetic iron oxide containing Si at a proportion of 0.10 to 0.25 % by weight based on the total weight of the iron oxide powder.

5,110,659
LAPPING TAPE
Yoshisuke Yamakawa; Kiyoto Fukushima, and Koji Matsuno, all of Saku, Japan, assignors to TDK Corporation, Japan
Continuation of Ser. No. 331,637, Mar. 30, 1989, abandoned. This application May 10, 1990, Ser. No. 522,079
Claims priority, application Japan, Apr. 1, 1988, 63-77998
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—141 **4 Claims**



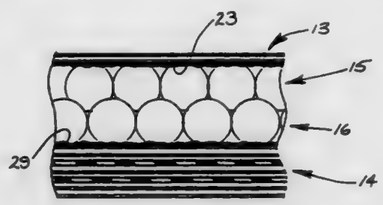
1. A lapping tape comprising a base and a coat having abrasive particles formed thereon, said abrasive particles consisting of:
an acicular iron oxide powder having a surface area of at least 30 m^2/g as determined by BET method and selected from the group of magnetite, γ-iron, and cobalt-containing γ-iron oxide; and
a granular inorganic powder having a Moh's hardness of more than 7 and contained in an amount of 2.0 to 30 percent by weight on the basis of the weight of the oxide powder, said coating having a centerline mean roughness of 0.015 to 0.025 μm.

5,110,660
RUBBER SPRING ELEMENT
Franz J. Wolf, and Hubert Pletsch, both of Bad Soden-Salmünster, Fed. Rep. of Germany, assignors to WOCO Franz-Josef Wolf & Co., Bad Soden-Salmunster, Fed. Rep. of Germany
Filed Dec. 21, 1989, Ser. No. 454,483
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1989, 3901897
Int. Cl.[5] B32B *1/00*; F16F *7/00*
U.S. Cl. 428—178 **11 Claims**



1. A rubber spring element consisting of a rubber matrix traversed by hollow channels and cavities in such a manner that each of the cavities formed in the rubber matrix is traversed by at least one of the hollow channels, wherein the area of the inside cross-section of the hollow channels, given the same alignment of the planes of section at right angles to the longitudinal direction of the hollow channels, amounts in each case to at least 25% of the area of the largest inside cross-section of the nearest cavity traversed by this hollow channel, and wherein the hollow channels in the rubber matrix intersect communicatingly either directly or in the cavities.

5,110,661
ARMOR COMPONENT
Trevor K. Groves, Calgary, Canada, assignor to Dorothy Groves, Calgary, Canada
Continuation-in-part of Ser. No. 861,812, May 12, 1986, abandoned. This application Dec. 17, 1987, Ser. No. 136,443
Claims priority, application Canada, Jul. 2, 1985, 486220
Int. Cl.[5] F41H *1/02, 5/04, 5/06*
U.S. Cl. 428—178 **8 Claims**



2. An armour component for use against a bullet, said component comprising:
at least two pairs of layers of flexible material,
at least two layers of hard beads tightly confined one each between one of said pair of layers of flexible material,
the beads in each layer of hard beads being thereby contained in a separate flat envelope formed by said one pair of layers of flexible material,

the layers of beads in the envelopes being void of any inter-bead matrix and being held in like close packed lattice patterns by means drawing together said pair of layers of flexible material forming each envelope,
said hard beads on impact of a bullet being free to rotate and vibrate so as to encounter repeated impacts with each other and said bullet to thereby provide an action causing dissipation of bullet energy,
said envelopes being fastened together with juxtaposed layers of flexible material of the separate envelopes held in face-to-face engaging relationship and the beads of the two layers internesting in the inter-bead spaces of each other.

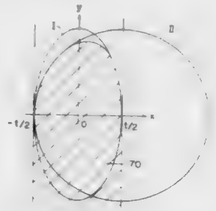
5,110,662
COATED GLAZING MATERIAL
Jean-Michel Depauw, Brussels, and Jean-Claude Hoyois, Hamsur-Heure, both of Belgium, assignors to Glaverbel, Brussels, Belgium
Filed Dec. 28, 1989, Ser. No. 458,386
Claims priority, application United Kingdom, Jan. 5, 1989, 8900166
Int. Cl.[5] B32B *15/04, 7/12*
U.S. Cl. 428—192 **15 Claims**

1. An article, comprising:
a glazing material coated with a multi-layer coating comprised of a reflective layer of silver sandwiched between a transparent undercoat and a transparent overcoat,
wherein said transparent undercoat is provided on said glazing material and comprises at least one layer of at least one metal oxide selected from the group consisting of tin oxide, titanium dioxide, aluminium oxide, bismuth oxide, and mixtures thereof, over which is deposited a layer of zinc oxide having a thickness not greater than 15 nm, said layer of zinc oxide being in direct contact with said reflective layer of silver, and
wherein said transparent overcoat comprises a layer of an oxide of at least one sacrificial metal selected from the group consisting of titanium, aluminium, stainless steal, bismuth, tin, and mixtures thereof, formed by initial deposition of said at least one sacrificial metal and conversion of said initial deposition of said at least one sacrificial metal to said oxide.

4. The article recited in claim 1, wherein the article has one face including a peripheral margin and a remainder area, and wherein a strip of adhesive is positioned around the peripheral margin of said one face and said multi-layer coating is provided on said remainder area of said one face.

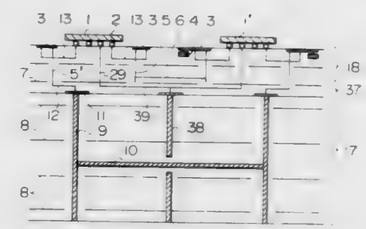
5,110,663
ULTRA-HIGH-MOLECULAR-WEIGHT POLYETHYLENE AND METHOD FOR ITS MANUFACTURE
Masashi Nishiyama; Hideaki Fujii, and Tatsumi Takahashi, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan
Filed Jul. 31, 1990, Ser. No. 548,934
Claims priority, application Japan, Dec. 29, 1988, 63-333919; Mar. 25, 1989, 1-72789; Apr. 18, 1989, 1-99675
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 **17 Claims**

1. A non-porous ultra-high-molecular-weight polyethylene sheet comprising a non-porous sheet having a thickness of 100 to 300 microns formed by extruding in the absence of plasticizer a feed polyethylene comprising a mixture of at least two polyethylenes selected from a polyethylene having a viscosity-average molecular weight of 300,000 to 1,000,000 and a polyethylene having a viscosity-average molecular weight of



1,000,000 to 6,000,000, the mixture having a viscosity-average molecular weight of 300,000 to 2,000,000.

5,110,664
THICK FILM AND THIN FILM COMPOSITE SUBSTRATE AND ELECTRONIC CIRCUIT APPARATUS USING IT
Keiichirou Nakanishi, Kokubunji; Masakazu Yamamoto, Hadano, and Minoru Yamada, Hanno, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 10, 1990, Ser. No. 550,553
Claims priority, application Japan, Jul. 10, 1989, 1-175464
Int. Cl.[5] B32B *3/00, 27/14*
U.S. Cl. 428—195 **32 Claims**

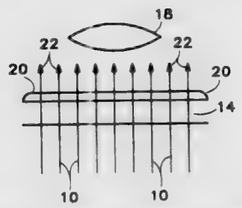


1. A thick film and thin film composite wiring substrate for mounting integrated circuit chips thereon, comprising:
a thin film substrate including a first signal wiring layer therein, said first signal wiring layer including a signal wiring for electrically interconnecting signal terminals of said integrated circuit chips; and
a thick film substrate laminated together with said thin film substrate and including a second signal wiring layer therein, said second signal wiring layer including a signal wiring for electrically interconnecting signal terminals of said integrated circuit chips.

5,110,665
LIGHT-TRANSMISSIVE SUBSTRATES COATED TO PROMOTE ADHESION OF PHASE-CHANGE INKS
Donald R. Titterington, Tualatin, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Division of Ser. No. 457,645, Dec. 27, 1989, Pat. No. 4,992,304. This application Jan. 17, 1991, Ser. No. 642,732
Int. Cl.[5] B32B *7/12, 33/00, 35/00*
U.S. Cl. 428—195 **8 Claims**

1. A light-transmissive phase change ink printed substrate, which comprises
a base substrate;
an adhesion promoter applied to at least one surface of said substrate, said adhesion promoter being applied as an optically clear uniform layer; and
a layer of solidified light-transmissive phase change ink

arranged in a predetermined pattern and having a substantially uniform thickness, which transmits light in a rectilinear path and is compatible with said adhesion promoter,



printed onto at least one surface of said substrate and adheringly bonded thereto by said adhesion promoter layer.

5,110,666

COATED FABRIC STRUCTURE FOR AIR BAG APPLICATIONS

Jill R. Menzel; John R. Damewood, both of Spartanburg, S.C.; Bert A. Ross, Conyngham, Pa., and Richard C. Kerr, Rutherfordton, N.C., assignors to Reeves Brothers, Inc., Spartanburg, S.C.

Continuation-in-part of Ser. No. 326,183, Mar. 20, 1989, Pat. No. 5,013,811. This application May 6, 1991, Ser. No. 695,852

Int. Cl.[5] **B32B** *25/10, 27/12, 27/40;* **B60R** *21/16*

U.S. Cl. 428—196 **20 Claims**

1. A coated, fabric comprising a fabric substrate and a coating at least partially covering said substrate, said coating comprising a polyurethane formed from a polyol mixture of a polycarbonate polyol and a polyether polyol, a diisocyanate compound and first and second extender components, wherein the diisocyanate compound is initially reacted with the first extender component in a molar ratio of above 2:1 to form a modified diisocyanate component having a functionality of about 2 prior to reaction with the polyol mixture and the second extender component.

5,110,667

POLYMER COMPOSITION IMPARTING LOW SURFACE ENERGY

Stephen J. Galick, and James E. Sax, both of Oakdale, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 26, 1990, Ser. No. 498,984

Int. Cl.[5] **B32B** *7/06, 7/12;* **B44C** *1/65*

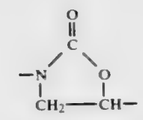
U.S. Cl. 428—202 **11 Claims**

1. The combination of a graphic sheet having adhesive on the back side and, covering the adhesive back side, a liner sheet comprising a polymer blend composition useful in making release liners comprising:

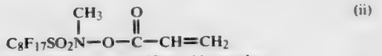
A. a matrix polymer selected from the group consisting of polyolefins, polystyrene, polyamides, and polymethylmethacrylate;

B. a filler selected from the group consisting of metal oxides; metal hydroxides; metal silicates; metal carbonates; silicas; barytes; zeolites; clays; metal fibers, powders and flakes; cellulosic fibers; glass fibers, powder, hollow spheroids or beads; and polymeric materials having a softening point or melting point above the melt temperature of the matrix polymer; said filler being in a concentration of about 1–80 weight percent;

C. a fluorocarbon selected from the group consisting of: (i) 2-oxazolidinone compounds comprising one or more 2-oxazolidinone moieties having the formula:

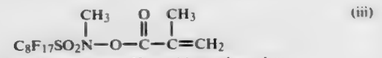


at least one of which has a monovalent fluoroaliphatic radical R_1 bonded to the 5-position carbon atom thereof by an organic linking group;



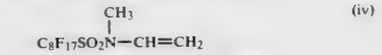
(ii)

N-methyl perfluorooctanesulfonamido acrylate;



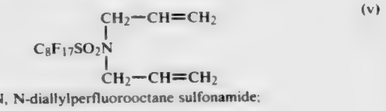
(iii)

N-methyl perfluorooctanesulfonamido methacrylate;



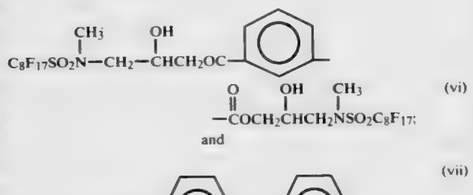
(iv)

N-vinyl, N-methyl perfluorooctanesulfonamide;



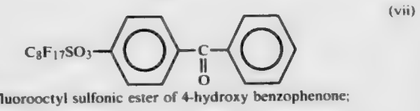
(v)

N, N-diallylperfluorooctane sulfonamide;



(vi)

and



(vii)

perfluorooctyl sulfonic ester of 4-hydroxy benzophenone;

which fluorocarbon is present in a concentration of 0.1 to 20 weight percent.

5,110,668

FLEXIBLE LAMINATE HAVING COPOLYETHERESTER ADHESIVE

Michael G. Minnick, Coshocton, Ohio, assignor to General Electric Company, Worthington, Ohio

Filed Dec. 21, 1990, Ser. No. 632,310

Int. Cl.[5] **B32B** *7/00*

U.S. Cl. 428—215 **28 Claims**



1. A flexible laminate comprising, in sequence, metal, a copolyetherester resin film and fabric.

17. The use of copolyetherester resin as an adhesive in a laminate of metal and fabric comprising a copolyetherester resin in the form of a film between a surface of the metal and a surface of the fabric.

5,110,669

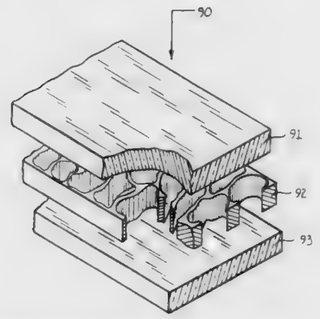
CONDUCTIVE POLYMER LAMINATES

Thomas M. Knobel, Hackensack, N.J.; Christian Dubouchet, Langnau Am Albis, Switzerland, and Lance L. Black, Richwood, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 28, 1989, Ser. No. 414,043

Int. Cl.[5] **B32B** *27/32, 15/18*

U.S. Cl. 428—215 **14 Claims**



1. A polymeric laminate comprising:

(a) at least one conductive layer; and

(b) at least one static dissipative layer comprising an organic polymer having dispersed therein 0.003 to 20 percent by weight of a non-volatile ionizable metal salt in an amount sufficient to increase the conductivity of the polymer, the static dissipative layer being in electrical contact with the conductive layer;

wherein the static dissipative layer is less conductive than the conductive layer, the surface resistivity of the laminate is lower than the surface resistivity of the static dissipative layer alone, the conductive layer has a resistivity of less than about 10^5 ohm-cm, the static dissipative layer is capable of dissipating 99 percent of a static charge of 5000V within 30 seconds and the static dissipative layer has a thickness between that of the percolation distance of electrons in the static dissipative layer and the maximum portage thickness of electrons in the static dissipative layer.

5,110,670

FILM FOR TRANSFER METALLIZING

Siegfried Janocha, Wiesbaden; Gunter Schloegl, Kelkheim; Lothar Bothe, Mainz-Gonsenheim, and Guenther Crass, Taunusstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 14, 1989, Ser. No. 365,711

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1988, 3821582

Int. Cl.[5] **B32B** *27/08, 27/32*

U.S. Cl. 428—216 **27 Claims**

1. A biaxially stretch-oriented film suitable for the process of transfer metallizing which comprises

(a) a base layer comprising a polyolefin containing an additive and an inert admixture in the form of finely divided particles, and

(b) a covering layer on either side of said base layer and coextruded therewith comprising a polyolefin,

wherein said additive migrates from said base layer into said covering layers, and wherein said particles partially protrude from said base layer and are completely enveloped by said covering layers, such that at least a part of the outer surface area of one of the two covering layers is rough.

5,110,671

ONE SIDE HEAT SEALABLE POLYPROPYLENE FILM

Riccardo Balloni, Fairport, and Jay K. Keung, Macedon, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 389,440, Aug. 4, 1989, abandoned. This application Jun. 7, 1991, Ser. No. 711,718

Int. Cl.[5] **B32B** *27/02, 27/08*

U.S. Cl. 428—218 **15 Claims**

1. A polymer film laminate comprising:

(a) A first outer layer of isotactic polypropylene, coextensively adherent to one surface of a core layer (b), said polypropylene having been compounded with an effective amount of an anti-blocking agent but being devoid of silicone oil, said polypropylene first outer layer having been flame treated, the exposed surface of said first outer layer being coated with a coefficient of friction-reducing amount of silicone oil transferred to said surface through contact with a silicone oil coating present upon the exposed surface of a second outer heat sealable surface layer (c);

(b) a core layer derived from an isotactic polypropylene; and

(c) a second heat sealable outer surface layer coextensively adherent to the other surface of said core layer (b), said second outer layer being formed from a polymer selected from the group consisting of an ethylene-propylene-butene-1 terpolymer, an ethylene-propylene-random copolymer, a propylene-butene-1 copolymer, an ethylene-butene-1 copolymer, and blends thereof, said polymer being compounded with an effective amount of an anti-blocking agent and a quantity of silicone oil such that a coefficient of friction-reducing amount thereof will be present on the exposed surface of said second outer surface as well as the exposed surface of layer (a) following mutual contact of said surfaces.

5,110,672

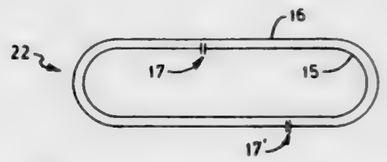
PAPERMAKERS' PRESS FELT WITH BASE FABRIC THAT DOES NOT REQUIRE SEAMING

Wilhelm Zehle, and Hippolit Gstrein, both of Gloggnitz, Austria, assignors to Huyck Corporation, Wake Forest, N.C.

Filed Jun. 19, 1991, Ser. No. 717,629

Int. Cl.[5] **B32B** *5/02*

U.S. Cl. 428—234 **25 Claims**



1. An endless press felt for use in papermaking, cellulose and similar machines comprising:

a continuous loop of base fabric comprising at least two layers of base fabric material; and

at least one layer of batt material needled to said continuous loop base fabric to provide a paper contact surface;

the ends of the fabric of the base fabric material being joined together solely by the needled batt material.

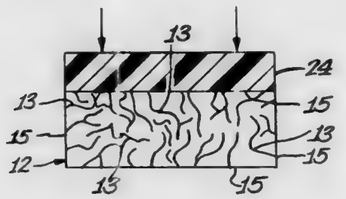
5,110,673
FUSIBLE ADHESIVES FOR TEXTILE FASTENING INSERTS
Ulrich Simon, Herne, and Heinz Scholten, Haltern, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany
Filed Mar. 6, 1990, Ser. No. 489,095
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1989, 3938880
Int. Cl.[5] **B32B** *5/02, 5/06*
U.S. Cl. 428—236 **10 Claims**

1. A textile fastening insert, comprising a fabric coated with a fusible adhesive, comprising:
(i) 90 to 99 wt. % of a copolyamide having a melting point in the range of 80° to 150° C. and a solution viscosity, η_{rel}, in the range of 1.3 to 1.7; and
(ii) 1 to 10 wt. % of an isocyanatoisocyanurate obtained by trimerization of isophorone diisocyanate.

5,110,674
FLAME RETARDANT BITUMEN
Louis L. Grube, Bound Brook, and Stanley P. Frankoski, West Milford, both of N.J., assignors to GAF Building Materials Corporation, Wayne, N.J.
Division of Ser. No. 632,219, Dec. 21, 1990, Pat. No. 5,055,135, which is a continuation-in-part of Ser. No. 394,892, Aug. 17, 1989, abandoned. This application Jun. 24, 1991, Ser. No. 720,055
Int. Cl.[5] **B32B** *11/02, 27/20*
U.S. Cl. 428—283 **1 Claim**

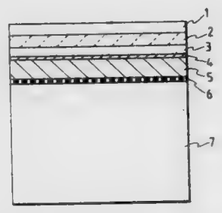
1. A polyester roofing felt installation containing between about 40 and about 50 wt. % of the composition which comprises:
(a) between about 35 and 60 wt. % of a petroleum asphalt or asphaltic blend having a Brookfield viscosity of from about 500 to 4,000 cps, a penetration of from about 20 to 350 dmm and a softening point of from about 80° to 200° F.;
(b) between about 2 and about 30 wt. % of a thermoplastic copolymeric styrene modifier and
(c) between 35 and about 50 wt. % of colemanite, combined to provide 100% composition.

5,110,675
CERAMIC ARTICLES WITH A POLYMER COMPONENT AND METHODS OF MAKING SAME
Marc S. Newkirk, Newark, Del., assignor to Lanxide Technology Company, LP, Newark, Del.
Division of Ser. No. 67,522, Jun. 26, 1987, Pat. No. 4,892,786, which is a continuation-in-part of Ser. No. 908,054, Sep. 16, 1986, abandoned. This application Sep. 29, 1989, Ser. No. 415,181
The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.
Int. Cl.[5] **C22K** *1/02;* **C25C** *3/08*
U.S. Cl. 428—312.2 **3 Claims**



1. A self-supporting ceramic body which comprises:
(1) a polycrystalline oxidation reaction product comprising (a) interconnected reaction product crystallites, and (b) interconnected porosity distributed through at least a portion of said reaction product crystallites and at least partially accessible from at least one surface of said ceramic body;
(2) a metallic component which is at least partially interconnected distributed throughout at least a portion of said polycrystalline oxidation reaction product; and
(3) a curable polymer disposed in at least a portion of said porosity in said polycrystalline oxidation reaction product.

5,110,676
MAGNETIC RECORDING MEDIUM INCORPORATING METALLIC MAGNETIC THIN FILM
Mikio Murai; Kiyoshi Takahashi, both of Osaka, and Masaru Odagiri, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Jul. 9, 1990, Ser. No. 549,561
Claims priority, application Japan, Jul. 7, 1989, 1-175862
Int. Cl.[5] **G11B** *23/00*
U.S. Cl. 428—336 **6 Claims**

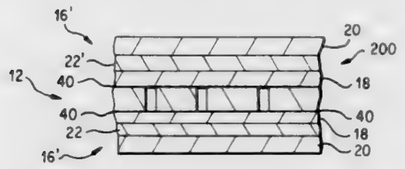


3. A magnetic recording medium comprising:
a base layer formed of a non-magnetic material:
particles distributed over a surface of the base layer, with a particle diameter which is within a range of 100 Å to 500 Å, and with a distribution density which is within a range of 10^4 to 10^8 particles/mm^2;
a magnetic metallic thin film formed over said surface and said particles;
a plasma polymerization layer formed over said metallic thin film, said plasma layer having a thickness from 5 Å to 20 Å;
a thin film of diamond-state carbon formed over said plasma polymerization layer, said diamond-state carbon film having a thickness from 80 Å to 160 Å;
a protective layer of carbon formed over said diamond-state carbon film, said protective carbon layer having a thickness from 20 Å to 50 Å; and
a layer of fluorine-containing lubricative material formed over said protective layer of carbon.

5,110,677
LETTUCE PACKAGING FILM
Charles R. Barmore, Moore, and Henry G. Schirmer, Spartanburg, both of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.
Filed Oct. 1, 1990, Ser. No. 591,333
The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.
Int. Cl.[5] **B32B** *7/12*
U.S. Cl. 428—349 **25 Claims**

1. A multilayer laminate comprising:
a) an inner component film having perforations defined therein;
b) a first outer component film, bonded to one side of the inner component film, the first outer component film including a bonding layer of ethylene copolymers, and an outer heat sealable layer; and

c) a second outer component film, bonded to the opposite side of the inner component film, the second outer component film including a bonding layer of ethylene copolymers, and an outer heat sealable layer.



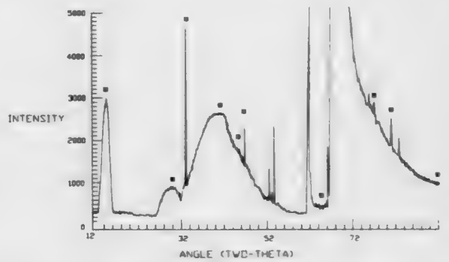
5,110,678
SYNTHETIC POLYVINYL ALCOHOL FIBER AND PROCESS FOR ITS PRODUCTION
Hiroshi Narukawa, Soja; Akio Mizobe, Okayama; Fumio Nakahara, Kurashiki; Akira Kubotsu, Soja; Akitsugu Akiyama, Soji; Masakazu Nishiyama, Okayama; Kenji Nagamatu, and Hirotoshi Miyazaki, both of Kurashiki, all of Japan, assignors to Kuraray Company Limited, Kurashiki, Japan
Filed Apr. 20, 1990, Ser. No. 512,104
Claims priority, application Japan, Apr. 27, 1989, 1-109998; Aug. 4, 1989, 1-203141; Oct. 30, 1989, 1-283636
Int. Cl.[5] **D02G** *3/00*
U.S. Cl. 428—364 **3 Claims**



1. A synthetic polyvinyl fiber comprising a polyvinyl alcohol having a polymerization degree of at least 1,500, said fiber having a structure of an aggregate of innumerable fibrils, showing in the transmission microphotograph an interference pattern having innumerable slit-like disorder, having a pulpification ratio of at least 20% after being wet-beaten in a disk refiner and having a tensile strength of at least 15/g denier.

5,110,679
HARD CARBON NITRIDE AND METHOD FOR PREPARING SAME
Eugene E. Haller; Marvin L. Cohen, both of Berkeley, and William L. Hansen, Walnut Creek, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.
Filed Apr. 24, 1990, Ser. No. 513,245
Int. Cl.[5] **B32B** *9/00, 9/04;* **C23C** *14/06*
U.S. Cl. 428—408 **36 Claims**

1. A method of preparing at least partially sp^3-bonded crystalline carbon nitride comprising the step of depositing carbon and nitrogen radicals upon a crystalline substrate having appropriate lattice parameters and orientation for formation thereon of said sp^3-bonded crystalline carbon nitride.
14. Crystalline sp^3-bonded carbon nitride.



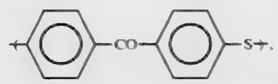
15. Crystalline β-phase carbon nitride.
20. Crystalline α-phase carbon nitride.

5,110,680
MAGNETIC RECORDING MEDIUM
Yoshinori Yamamoto, and Kenji Sumiya, both of Osaka, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan
Filed Sep. 7, 1988, Ser. No. 241,254
Int. Cl.[5] **G11B** *23/00*
U.S. Cl. 428—413 **2 Claims**

1. A magnetic recording medium comprising a substrate and a magnetic layer formed thereon containing a magnetic powder and a binder resin component which comprises a blend of a glycidyl group-containing vinyl-chloride resin and a phosphated vinyl-chloride resin said binder resin component having a weight ratio of said glycidyl group-containing vinyl-chloride resin to said phosphated vinyl-chloride resin of from 2:8 to 8:2.

5,110,681
MELT-STABLE POLY(ARYLENE THIOETHER-KETONE) PREPREGS AND MOLDED OR FORMED PRODUCTS THEREOF
Yoshikatsu Satake; Ken Kashiwadate; Yasuo Sakaguchi; Takayuki Katto, and Zenya Shiiki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K. K., Tokyo, Japan
Filed Oct. 21, 1988, Ser. No. 261,073
Claims priority, application Japan, Oct. 30, 1987, 62-273524; Sep. 17, 1988, 63-231467
Int. Cl.[5] **D03D** *3/00, 15/00, 17/00, 25/00*
U.S. Cl. 428—419 **23 Claims**

1. A melt-stable poly(arylene thioether-ketone) prepreg comprising in integral combination:
(A) 20wt. %–90wt. % of a fibrous reinforcing material selected from the group consisting of long fibers, at least one shaped long fiber body and a combination thereof, said fibers and body being formed of a material selected from the group consisting of inorganic fibers, organic fibers and a combination thereof;
(B) 10wt. %–80% wt. % of a thermoplastic matrix material composed principally of a melt-stable poly(arylene thioether-ketone) having predominant recurring units of the formula



wherein the —CO— and —S— are in the para position to each other, and having the following physical properties (a)–(c):
(a) melting point, Tm being 310° C.–380° C.;
(b) melt crystallization temperature, Tmc (420° C./10

min) being at least 210° C. and residual melt crystallization enthalpy, ΔHmc (420° C./10 min) being at least 10 J/g, wherein Tmc (420° C./10 min) and ΔHmc (420° C./10 min) are determined by a differential scanning calorimeter at a cooling rate of 10° C./min after the poly(arylene thioether-ketone) is held at 50° C. for 5 minutes in an inert gas atmosphere, heated to 420° C. at a range of 75° C./min and then held for 10 minutes at 420° C.; and

(c) reduced viscosity being 0.2–2 dl/g as determined by viscosity measurement at 25° C. and a polymer concentration of 0.5 g/dl in 98 percent by weight sulfuric acid.

5,110,682

BONDING OF COMPOSITES

Benedict R. Bonazza, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 20, 1990, Ser. No. 570,188

Int. Cl.[5] B32B *27/06; C09J 5/02*

U.S. Cl. 428—419 **28 Claims**

1. A method for the bonding of two amorphous thermoplastic articles comprising the steps of:

(a) treating a surface of at least one of said articles with (i) at least one bonding agent selected from the group consisting of N-alkylpyrrolidones, aromatic sulfones, cyclic alkylsulfones, alkyl amides, lactams, and lactones, or (ii) with a solution of an amorphous thermoplastic of the type making up said article dissolved in at least one bonding agent selected from the group consisting of N-alkylpyrrolidones, aromatic sulfones, cyclic alkylsulfones, alkyl amides, lactams, and lactones to produce a treated surface;

(b) contacting and pressing said treated surface with a surface of the other of said articles to produce contacted surfaces;

(c) heating said contacted surfaces under conditions of temperature, pressure, and for a period of time sufficient to evaporate said bonding agent.

5,110,683

FILMS HAVING IN THEIR THICKNESS AT LEAST TWO SUPERIMPOSED ZONES, INCLUDING AN INSULATING ZONE AND A CONDUCTIVE ZONE, AND THE PRODUCTION THEREOF BY IRRADIATING A POLYMER FILM BY MEANS OF A BEAM OF HIGH ENERGY IONS

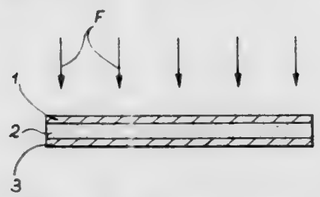
Emmanuel Balanzat, Caen; C. Boiziau, Massy; Charles Darnez, Cauderan; Jean-Paul Durand, Ivry /Seine, and Alain LeMoël, Chaville, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 218,287, filed as PCT/FR87/00380, Oct. 6, 1987, Pat. No. 4,983,460. This application Dec. 14, 1990, Ser. No. 627,418

Claims priority, application France, Oct. 10, 1986, 86 14111

Int. Cl.[5] B32B *27/00*

U.S. Cl. 428—421 **5 Claims**



1. A film, having in its thickness, a structure constituted successively of an electrically insulating layer, a second semi-metallic layer, and a third electrically insulating layer, said electrically insulating layers being constituted of an organic polymer and the semi-metallic layer being constituted of a derivative of said organic polymer and the structure of said film being formed by subjecting said film in a confined atmosphere in a tight enclosure to ion radiation which has sufficient energy to allow the ions to pass completely through the polymer film.

5,110,684

MASONRY WATER REPELLENT

Ian V. Cooper, Georgetown, Canada, assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 7, 1990, Ser. No. 609,861

Int. Cl.[5] B32B *13/00, 9/04*

U.S. Cl. 428—447 **41 Claims**

16. A water repellent masonry architectural building material comprising an inorganic porous mineral substrate for forming the masonry architectural building material, and an additive incorporated into the inorganic porous mineral substrate for rendering the masonry architectural building material water repellent, the additive being a mixture of (i) a water soluble silane coupling agent and (ii) an emulsion which includes water, at least one surfactant, and a siloxane fluid, the siloxane fluid being selected from the group consisting of linear methylhydrogen siloxane polymers, linear methylhydrogen-methylalkyl siloxane copolymers, methylhydrogen cyclosiloxane polymers, and methylhydrogen-methylalkyl cyclosiloxane copolymers.

5,110,685

LOW FRICTION, ABRASION RESISTANT POLYMER COATING

Virginia R. Cross, Houston, Tex., and Cindy B. Shulman, Cliff Side Park, N.J., assignors to Exxon Chemical Patents, Inc., Linden, N.J.

Filed May 18, 1990, Ser. No. 526,216

Int. Cl.[5] B32B *25/08*

U.S. Cl. 428—494 **33 Claims**

1. A low friction, abrasion resistant polymer coating composition comprising:

(a) a high density polyethylene component comprising a blend of

(i) high molecular weight, high density polyethylene;

(ii) low molecular weight, high density polyethylene; and

(iii) medium molecular weight, high density polyethylene; and

(b) an elastomer component comprising a blend of ethylene/propylene rubber and high density polyethylene.

5,110,686

LOW TEMPERATURE HEAT SHRINKABLE FILM AND PROCESS FOR PRODUCING THE SAME

Toshio Taka, Fujisawa; Kihachi Shishido, and Takuo Ohkubo, both of Yokohama, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Division of Ser. No. 306,228, Feb. 3, 1989, Pat. No. 4,913,977, which is a division of Ser. No. 897,691, Aug. 11, 1986, abandoned. This application Dec. 8, 1989, Ser. No. 447,939

Claims priority, application PCT Int'l Appl., Dec. 13, 1984, PCT/JP84/00588

Int. Cl.[5] B32B *27/08*

U.S. Cl. 428—516 **5 Claims**

1. An inflation film having a multilayer structure which is prepared by laminating a plurality of films consisting of a linear low density polyethylene resin having a short branched chain and a density of 0.935 g/cm^3 or less by inflation molding followed by drawing.

5,110,687

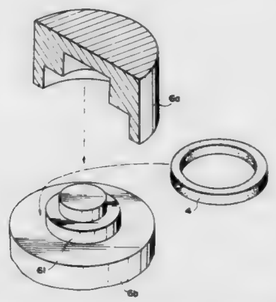
COMPOSITE MEMBER AND METHOD FOR MAKING THE SAME

Mutsumi Abe, Kobe; Takashi Motoda, Hyogo, and Keni-ichi Aota, Ichikawa, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 31, 1990, Ser. No. 606,182

Int. Cl.[5] B22F *7/06;* **B32B** *31/20*

U.S. Cl. 428—551 **8 Claims**



1. A composite member comprising a plurality of molding members of different compositions, each molding member comprising a non-liquid resin material and a substantial amount of powder, wherein said powder is selected from the group consisting of metallic material and ceramic material, and wherein the molding members are integrated through bonding of the resin materials in the respective members and wherein said resin material is selected from the group consisting of epoxy resins, phenolic resins, unsaturated polyester resins, polyethylene, polypropylene, 6-nylon, 6,6-nylon, polyvinyl chloride and polyesters.

5,110,688

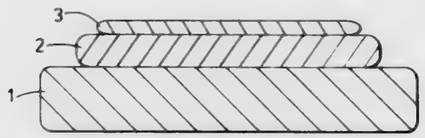
DIELESS MICRO-PYRETIC MANUFACTURING TECHNIQUE FOR FABRICATING BEARING MATERIALS AND THE BEARING MATERIALS PRODUCED THEREBY

Jainagesh A. Sekhar; A. K. Bhattacharya, and Hung P. Li, all of Cincinnati, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio

Filed Dec. 3, 1990, Ser. No. 621,300

Int. Cl.[5] G22F *3/00*

U.S. Cl. 428—552 **50 Claims**



1. A method of preparing a bearing material for use in a self-lubricating bearing, said method comprising:

(1) preparing a combustible powder mixture capable of undergoing micro-pyretic synthesis, said mixture comprising:

(a) at least one bearing component powder;

(b) at least one low friction coefficient material powder; and

(c) at least one combustible material powder;

(2) compressing said combustible powder mixture into a shape; and

(3) igniting said combustible powder mixture and allowing said combustible powder mixture to undergo micropyretic synthesis for sufficient time so as to form said bearing material.

5,110,689

MULTI-LAYERED STEEL SHEETS

Tsutomu Watanabe; Masaaki Yamashita; Takahiro Kubota, all of Tokyo; Yoshiaki Miyosawa, and Tadashi Nishimoto, both of Amagasaki, all of Japan, assignors to NKK Corporation, Tokyo and Kansai Paint Co., Ltd., Amagasaki, both of, Japan

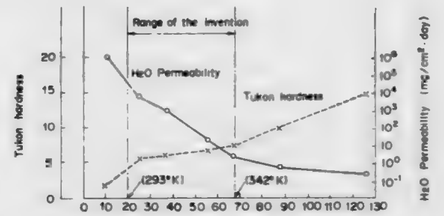
Continuation of Ser. No. 384,652, Jul. 25, 1989, abandoned. This application Feb. 19, 1991, Ser. No. 657,281

Claims priority, application Japan, Jul. 29, 1988, 63-190951

The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.

Int. Cl.[5] B32B *15/04*

U.S. Cl. 428—623 **23 Claims**



22. Multi-layered steel sheets, formed with a chromate film in coating amount of 30 to 80 mg/m^2 calculated as metallic chromium on the surface of a zinc or a zinc alloy plated steel sheet, and a resin composition film at a coating amount of 0.05 to 3.0 g/m^2 on said chromate cilm, said resin composition film, said resin composition film comprising an organic solvent soluble epoxy resin having glass transition temperature of 293° to 342° K and hydrophobic silica having a particle size of 5 to 100 mμ and sparingly water soluble Cr compound in a ratio of 70:30 to 55:45 by weight of epoxy resin:and in a ratio of 37:3 to 20:20 by weight of hydrophobic silica:sparingly water soluble Cr compound, and 0.05 to 15 parts by weight of silane compound per 100 parts by weight in total of solid epoxy resin and hydrophobic silica.

5,110,690

SUBSTANTIALLY FLAT AND THIN STEEL BAND

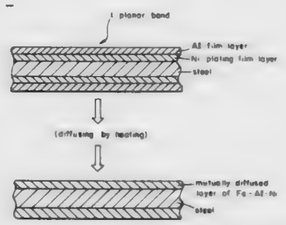
Masayoshi Usui, and Haruo Serizawa, both of Shizuoka, Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 390,041, Aug. 7, 1989, abandoned. This application Feb. 7, 1991, Ser. No. 652,368

Claims priority, application Japan, Aug. 13, 1988, 63-201032

Int. Cl.[5] B32B *15/00*

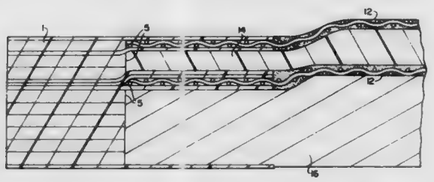
U.S. Cl. 428—678 **14 Claims**



1. A corrosion and heat resistant article which consists essentially of a substantially flat, thin steel substrate and a mutually diffused layer formed on a surface of said substrate, said mutu-

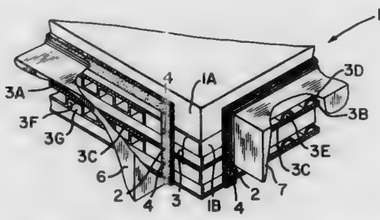
ally diffused layer consisting essentially of iron, nickel and aluminum, and being formed by providing a nickel coating on said steel substrate to form a coated steel substrate and then dipping said coated steel substrate in molten aluminum so as to cause mutual diffusion of iron from said steel substrate, nickel from said nickel coating and aluminum from said molten aluminum.

5,110,691
FUEL CELL COMPONENT SEALANT
Myron Krasij, Avon, and Paul R. Watson, Marlborough, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.
Filed Jan. 16, 1991, Ser. No. 642,260
Int. Cl.[5] H01M *2/08*
U.S. Cl. 429—35 **12 Claims**



1. A fuel cell, said fuel cell having framed components including a cathode electrode, an anode electrode, and an electrolyte therebetween, a cathode chamber on the nonelectrolyte side of said cathode electrode, an anode chamber on the nonelectrolyte side of said anode electrode, wherein the improvement comprises the use of a sealant to prevent leakage of fuel, oxidant, reaction products, and electrolyte, said sealant located on the frame portion of said framed components, wherein when the framed components are stacked, the sealant forms a seal between adjacent frames; whereby the sealant comprises a mixture of between about 50 wt% to about 90 wt% butyl rubber and about 10 wt% to about 50 wt% ethylene propylene latices.

5,110,692
GASKET FOR MOLTEN CARBONATE FUEL CELL
Mohammad Farooque, Huntington, and Jeff Allen, Woodbury, both of Conn., assignors to Energy Research Corporation, Danbury, Conn.
Filed Aug. 20, 1990, Ser. No. 570,034
Int. Cl.[5] H01M *8/04*
U.S. Cl. 429—36 **29 Claims**

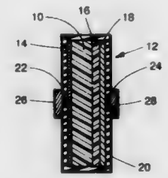


1. A gasket for use in a stack of fuel cells, the gasket being disposable along the length of the face of the stack of cells and being accessible to the cell electrolyte, the gasket comprising:
an elongated porous member able to support electrolyte flow;
and one or more barrier means within said member for retarding said electrolyte flow.

5,110,693
ELECTROCHEMICAL CELL
Stephen O. Friend, Boxford; Jaspard H. Atkins, Westwood, both of Mass.; Howard G. Tennent, Kennett Square, Pa., and Robert Hausslein, Lexington, Mass., assignors to Hyperion Catalysis International, Lexington, Mass.
Continuation of Ser. No. 413,838, Sep. 28, 1989, abandoned. This application Oct. 23, 1990, Ser. No. 602,446
Int. Cl.[5] H01M *4/96*
U.S. Cl. 429—40 **10 Claims**

1. In an electrochemical cell comprising a catalytic electrode on which an electrochemical reaction occurs,
the improvement wherein carbon microfibers in the form of microfiber aggregates in which individual microfibers have diameters less than or equal to 0.1 micron are incorporated in said electrode in an amount sufficient to enhance the electrical conductivity of said electrode.

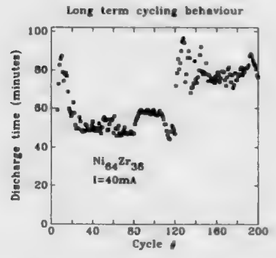
5,110,694
SECONDARY LI BATTERY INCORPORATING 12-CROWN-4 ETHER
Ganesan Nagasubramanian, La Crescenta, and Salvador DiStefano, Alhambra, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Oct. 11, 1990, Ser. No. 596,139
Int. Cl.[5] H01M *10/40*
U.S. Cl. 429—192 **12 Claims**



1. A solid electrolyte comprising in combination:
a solid polyethylene oxide matrix;
a dispersion of a lithium salt in the matrix, the ratio of oxygen to lithium in the polyethylene oxide matrix being from 1 to 1 to 10 to 1; and
further including 12 Crown-4-ether in an amount effective to increase conductivity.

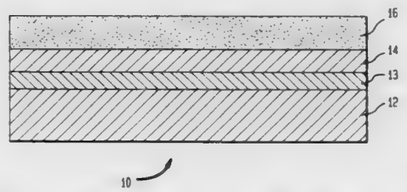
5,110,695
RECHARGEABLE ELECTROLYTIC CELL WITH AMORPHOUS ALLOY ELECTRODE
Dominic H. Ryan, Baie D'Urfe; John O. Strom-Olsen, Montreal, both of Canada; Jan Kycia, St. James, N.Y.; Bipin Patel, LaSalle, and Francois Dumais, Montreal, both of Canada, assignors to The Royal Institution for the Advancement of Lerning (McGill University), Montreal, Canada
Filed Jun. 19, 1990, Ser. No. 540,104
Int. Cl.[5] H01M *10/24*
U.S. Cl. 429—206 **7 Claims**

1. A rechargeable electrolytic cell comprising:
a first electrode and a second electrode in spaced apart relationship and an electrolyte electrically connecting the first and second electrodes internally of the cell,
said first electrode having an active component of nickel hydroxide in an electrical connection with said electrolyte,
said second electrode having an active component of an amorphous alloy in electrical connection with said electrolyte, said amorphous alloy comprising: at least one element selected from the group consisting of Ti, V, Zr, Nb, Hf, Ta and rare earth elements; and at least one metal selected from Fe, Co, Ni, Cu, Ru, Rh, Pd and Ag,



said first and second electrodes each having a connecting means for electrically connecting the electrodes with an external electrical circuit.

5,110,696
RECHARGEABLE LITHIATED THIN FILM INTERCALATION ELECTRODE BATTERY
Frough K. Shokoohi, Bedminster, and Jean-Marie Tarascon, Martinsville, both of N.J., assignors to Bell Communications Research, Livingston, N.J.
Continuation-in-part of Ser. No. 612,086, Nov. 9, 1990, abandoned. This application Jul. 22, 1991, Ser. No. 733,224
Int. Cl.[5] H01M *4/48;* **C01D** *15/00*
U.S. Cl. 429—218 **17 Claims**



12. A rechargeable lithium battery comprising an electrode providing a source of lithium ions, an electrolyte, and a counter-electrode consisting essentially of a lithiated transition metal oxide intercalation compound selected from the class consisting of $LiMn_2O_4$, $LiCoO_2$, and $LiNiO_2$
characterized in that said counter-electrode consists essentially of a thin film of said intercalation compound prepared by
a) situating a suitable coating substrate in an air-tight enclosure with a supply of said lithiated metal oxide;
b) establishing within said enclosure a low pressure, carbon-free atmosphere;
c) vaporizing at least a portion of said metal oxide;
d) condensing said metal oxide vapor on a surface of said substrate in a coating having a thickness in the range of about 1 to 5 micrometers; and
e) heating said coating within said atmosphere at a temperature and for a time sufficient to convert said coating to crystallites of said metal oxide having a grain size in the range of about 0.05 to 0.1 micrometer.

5,110,697
MULTIFUNCTIONAL PHOTOLITHOGRAPHIC COMPOSITIONS
James E. Lamb, III; Terry Brewer, and J. Michael Mori, all of Rolla, Mo., assignors to Brewer Science Inc., Rolla, Mo.
Division of Ser. No. 250,375, Sep. 28, 1988. This application Dec. 13, 1990, Ser. No. 626,967
Int. Cl.[5] G03F *7/30, 7/11*
U.S. Cl. 430—14 **1 Claim**

1. An imaged article of manufacture compromising:
a) A top layer of photoresist material,
b) A multifunctional sublayer consisting essentially of poly(-vinylpyridine), a base-insoluble, non-photosensitive light attenuating material, inertly compatible to poly(vinylpyridine), and
c) A micro-electronic substrate, and
d) made by
i. selective dissolution of the poly(vinylpyridine) and an effective amount of the inertly compatible, base-insoluble, non-photosensitive light attenuating material, said selective dissolution being in a polar organic solvent having a molecular weight from about 84 to about 91, and having a flash point of from 28° C. to about 35° C.;
ii. Spin-coating the composition of step i onto the micro-electronic substrate;
iii. Immediately subsequent thereto spin-coating the photoresist onto the composition of step i;
iv. Exposing the photoresist to light and developing an image in the photoresist by using a basic developer solution; and
v. Dry-etching the image through the composition of step i and onto the micro-electronic substrate.

5,110,698
METHOD OF RECORDING
Hajime Hara, Fujisawa; Shingo Orii, Kawasaki; Tetsuo Satoh, Yokohama; Tomohiro Toya, Yokohama, and Shigeki Iida, Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan
Division of Ser. No. 233,852, Aug. 15, 1988, Pat. No. 4,933,243, which is a continuation of Ser. No. 909,484, Sep. 19, 1986, abandoned. This application Apr. 9, 1990, Ser. No. 495,499
Claims priority, application Japan, Sep. 20, 1985, 60-206563
Int. Cl.[5] G03C *5/16*
U.S. Cl. 430—20 **4 Claims**

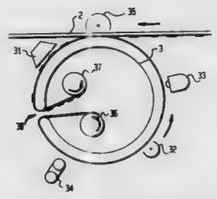
1. A recording method comprising forming a film of thermotropic cholesteric liquid crystal polyester as a recording medium on a base, heating said recording medium to transform an opaque polydomain state into a transparent monodomain state and then cooling the heated recording medium rapidly to approximately room temperature to fix information thereto.
2. The method of claim 1 wherein local overheating on said recording medium is applied by a laser beam.

5,110,699
METHOD AND APPARATUS FOR FORMING MASTERS AND IMAGES THEREFROM
John W. May; William Mey, and Susan E. Riblett, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 2, 1990, Ser. No. 459,850
Int. Cl.[5] G03G *13/00, 13/28*
U.S. Cl. 430—54 **12 Claims**

6. A method of creating a multicolor toner image, said method comprising:
creating a plurality of electrostatic images,
toning said electrostatic images to create a plurality of primary toner images with a toner opaque to radiation of a given wavelength and intensity,
transferring each primary toner image to a separate master, each of said masters having a layer of material which

persistently changes its conductivity in response to radiation of said given wavelength and intensity,

without fixing said toner images, exposing said masters having said toner images thereon to radiation of said wavelength and intensity to create a persistent conductivity image in each of said masters defined by said respective toner image,



cleaning said toner images off said master surfaces to create planographic xeroprinting masters,

charging each of said masters to create secondary electrostatic images defined by said conductivity images,

toning said secondary electrostatic images with toners of different colors to create color toner images, and

transferring said color toner images to a substrate in registration to create a multicolor toner image.

5,110,700

ELECTROPHOTOGRAPHIC IMAGING MEMBER

Leon A. Teuscher; Satchidanand Mishra, both of Webster, N.Y., and Andrea G. Holland, Charlotte, N.C., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 28, 1990, Ser. No. 635,310

Int. Cl.[5] G03G *05/14, 05/04*

U.S. Cl. 430—64 **27 Claims**



1. An electrophotographic imaging member, comprising at least one photoconductive layer and a blocking layer comprised of an alkali metal salt of a maleic acid half ester copolymer, wherein at least a portion of free acid groups in said copolymer is neutralized by an alkali metal.

5,110,701

BINDER FOR ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING RECURRING ESTER UNITS

Eiichi Kato, and Kazuo Ishii, both of Haibara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

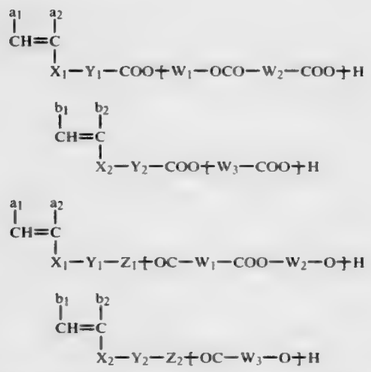
Filed May 11, 1990, Ser. No. 521,956

Claims priority, application Japan, May 12, 1989, 1-117536; May 19, 1989, 1-124550

Int. Cl.[5] G03G *5/08*

U.S. Cl. 430—96 **8 Claims**

1. An electrophotographic light-sensitive material comprising a support having thereon a photoconductive layer containing at least inorganic photoconductive particles and a binder resin, wherein the binder resin contains (A) at least one resin comprising a graft copolymer having a weight average molecular weight of from 1.0×10^3 to 2.0×10^4 and containing, as a copolymer component, at least one of polyester type macromonomers having a weight average molecular weight of from 1.0×10^3 to 1.5×10^4 and represented by following formulae (I), (II), (II), and (IV):



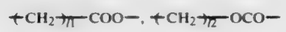
(I)

(II)

(III)

(IV)

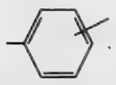
wherein the brackets [ ] represents a recurring unit; a_1 and a_2, which may be the same or different, each represents hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group having from 1 to 8 carbon atoms, —COO—Z, or —COO—Z bonded through a hydrocarbon group having from 1 to 8 carbon atoms (wherein Z represents a hydrocarbon group having from 1 to 18 carbon atoms); X_1 represents a bond, —COO—, —OCO—,



(wherein l1 and l2 each represents an integer, of from 1 to 3),



(wherein P_1 represents a hydrogen atom or a hydrocarbon group having from 1 to 12 carbon atoms), —CONHCONH—, —CONHCOO—, —O—,



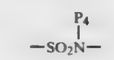
or $—SO_2—$; Y_1 represents a bond or a group linking X_1 and —COO— or a group linking X_1 and Z_1; Z_1 represents a bond, or $—CH_2—$, —O—, or —NH—; W_1 and W_2, which may be the same or different, each represents a divalent aliphatic group, a divalent aromatic group (each of the aforesaid groups may have in the bond of the divalent organic residue at least one bond group selected from —O—, —S—,



(wherein P_2 represents a hydrogen atom or a hydrocarbon group having from 1 to 12 carbon atoms), $—SO_2—$, —COO—, —OCO—, —CONHCO—, —NHCONH—,



(wherein P_3 has the same meaning as P_2),

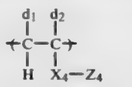


(wherein P_4 has the same meaning as P_2), and



or an organic residue composed of a combination of these residues; W_3 represents a divalent aliphatic group; b_1 and b_2 have the same meaning as a_1 and a_2; X_2 has the same meaning as X_1; Y_2 has the same meaning as Y_1; and Z_2 has the same meaning as Z_1,

and (B) at least one resin having a weight average molecular weight of 5×10^4 or more, containing a recurring unit represented by the following formula (VI) as a copolymer component, and having a crosslinked structure:



(VI)

wherein X_4 represents —COO—, —OCO—, —CH_2OCO—, —CH_2COO—, —O—, or $—SO_2—$; Z_4 represents a hydrocarbon group having from 1 to 22 carbon atoms; and d_1 and d_2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group having from 1 to 8 carbon atoms, —COO—Z′, or —COO—Z′ bonded through a hydrocarbon group having from 1 to 8 carbon atoms, wherein Z′ represents a hydrocarbon group having from 1 to 18 carbon atoms.

5,110,702

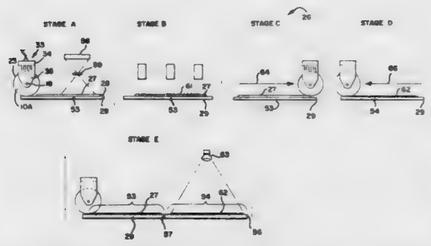
PROCESS FOR TONED IMAGE TRANSFER USING A ROLLER

Yee S. Ng, Fairport, and Donald S. Rimai, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 448,487, Dec. 11, 1989, abandoned. This application Nov. 13, 1990, Ser. No. 612,948

Int. Cl.[5] G03G *13/16*

U.S. Cl. 430—99 **10 Claims**



1. A process for transferring at least one toned image from a photoconductor element surface to a receiver comprising rolling a heated intermediate transfer roller over the element while the temperature of the circumferential surface portions of the roller is sufficient to sinter the toner particles comprising said toned image to each other; and rolling the heated, toned image bearing roller over the receiver to transfer the tone image to said receiver wherein the temperature of said receiver is at least about equal to the temperature of the roller.

5,110,703

CARRIER FOR DEVELOPER

Ikutaroh Nagatsuka; Chiaki Suzuki; Masayuki Takeda; Yasuo Matsumura, and Takayoshi Aoki, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 148,345, Jan. 25, 1988, abandoned. This application Mar. 19, 1990, Ser. No. 496,138

Claims priority, application Japan, Jan. 26, 1987, 62-014078; Jan. 26, 1987, 62-014079; Jan. 26, 1987, 62-014080

Int. Cl.[5] G03G *9/10*

U.S. Cl. 430—108 **14 Claims**

1. A carrier for a developer for use in developing an electrostatic or magnetic latent image, comprising

particles obtained by atomizing a molten mixture comprising:

a magnetic powder and

a binder resin containing

a first polyolefin and

a second polyolefin having a functional group, wherein said polyolefin having a functional group is present in an amount of about 50% by weight or less based on the total weight of the binder resin.

5,110,704

TONER FOR DEVELOPING STATICALLY CHARGED IMAGES AND PROCESS FOR PREPARATION THEREOF

Masahide Inoue, Nara; Tetsuya Nakano, Nabari; Naruo Yabe; Koichi Tsuyama, both of Kobe; Yoshitake Shimizu, Kyoto, and Mitsushi Kuroki, Kumamoto, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jun. 27, 1990, Ser. No. 544,632

Claims priority, application Japan, Jun. 29, 1989, 1-165346

Int. Cl.[5] G03G *9/087, 9/097*

U.S. Cl. 430—110 **10 Claims**

1. A toner for developing a statically charged image, which comprises particles containing a fixing resin and, dispersed therein, a colorant and a charge-controlling dye, wherein the composition has such rheological characteristics that the tangent (tan δ) of the loss angle is 0.95 to 1.25 when the storage modulus of elasticity (G′) is 10^4 dyne/cm^2 and wherein the ratio of concentration of dye on the surface of the particles to total dye concentration of the toner is in the range of from 0.30 to 0.50.

3. The toner as set forth in any of claims **1** through **2**, wherein the fixing resin is a styrene/acrylic copolymer in which the styrene component/acrylic component molar ratio is from 60/40 to 98/2.

5,110,705

CONTACT TYPE DEVELOPING METHOD AND DEVELOPING UNIT

Masahiro Hosoya, Okegawa; Mitsunaga Saito, Tokyo; Mitsuharu Endo, Susono; Yoshimitsu Ohtaka, Mishima, and Yukio Futamata, Shizuoka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa and Tokyo Electric Co., Ltd., Tokyo, both of, Japan

Filed Mar. 30, 1990, Ser. No. 502,171

Claims priority, application Japan, Mar. 31, 1989, 1-81919; Mar. 31, 1989, 1-81920; Mar. 31, 1989, 1-81922; Mar. 31, 1989, 1-81923; Jun. 30, 1989, 1-168605

Int. Cl.[5] G03G *15/08*

U.S. Cl. 430—120 **20 Claims**

1. In a contact type developing method in which a thin layer of toner is formed on the surface of a toner carrier to which a developing bias voltage is applied and said thin layer of toner is supplied to an electrostatic latent image to thereby render said electrostatic latent image visible, the improvement wherein:

when let it be supposed that:

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a quantity of electrification of toner that adheres to a latent image holding body by development is q [C/kg];
a quantity of electrification of toner due to its triboelectrification with said latent image holding body is q_p [C/kg];
an electric resistance of said toner carrier is R [$\Omega \cdot m^2$];
an effective length of said toner carrier is l[m];
an effective surface area of said toner carrier is S_r, [m^2];
a quantity of toner that adheres to said latent image holding body by development is m_p [kg/m^2];
a speed of movement of the surface of said latent image holding body is V_p [m/sec];
a quantity of toner that adheres to the surface of said toner carrier is m [kg/m^2]; and
a speed ratio of the surface of said toner carrier to that of said latent image holding body is k,
these values are so adjusted as to satisfy the following conditional expression:

$$-100<\{-(q-q_p)m_pV_p|+q_p(km-m_p)V_p|\}\cdot R/-S_r<100$$

5,110,706

I-LINE RADIATION-SENSITIVE ALKALI-SOLUBLE RESIN COMPOSITION UTILIZING 1,2-QUINONE DIAZIDE COMPOUND AND HYDROXY-CHALCONE ADDITIVE

Yoshiji Yumoto; Tsutomu Shimokawa, and Takao Miura, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 611,762
Claims priority, application Japan, Nov. 14, 1989, 1-295416
Int. Cl.[5] G03F *7/023;* G03C *1/61*
U.S. Cl. 430—191 **4 Claims**

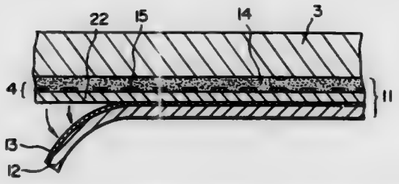
1. An i-line of ultraviolet radiation sensitive resin composition comprising an admixture of:
(a) 100 parts by weight of an alkali-soluble resin;
(b) 5 to 100 parts by weight of a 1,2-quinone diazide compound, which may have reacted with the alkali-soluble resin to form a condensate; and
(c) 0.1 to 10 parts by weight of a compound which is at least one compound selected from the group consisting of 4-hydroxy-4'-methylchalcone, 4-hydroxy-3', 4'-dimethoxychalcone, 4-hydroxy-3',4',5'-trimethoxychalcone, 4-hydroxy-3',4'-dioxylenylchalcone and 4-hydroxy-3',4'-dimethylchalcone.

5,110,707

METHOD OF PRODUCING AN OPTICAL OR MAGNETO-OPTICAL RECORDING CARD AND TRANSFER TYPE OPTICAL OR MAGNETO-OPTICAL RECORDING MEDIUM

Minoru Fujita; Yoichi Fukushima, and Toshio Haga, all of Tokyo, Japan, assignors to Kyodo Printing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 63,174, Jun. 15, 1987, abandoned. This application Jan. 26, 1990, Ser. No. 471,037
Claims priority, application Japan, Jun. 17, 1986, 61-141009
Int. Cl.[5] G03C *1/72;* G11B *23/0*
U.S. Cl. 430—256 **16 Claims**



1. A transfer type recording medium for producing an optical or magneto-optical recording card comprising a base film, peeling layer, an optical or magneto-optical recording layer and a light permeable adhesive layer which are successively superimposed one above another to constitute a layered structure; and wherein
said optical or magneto-optical recording layer includes a pattern support layer and an optical or magneto-optical recording material layer superimposed on the pattern support layer, said pattern support layer being formed of acryl-based resin, vinyl-based resin, cellulose-based resin, polyester-based resin, or polyurethane-based resin and having a thickness in the range of 0.5 to 100 microns, preferably in the range of 1 to 50 microns; and wherein
said optical or magneto-optical recording material layer has a thickness in the range of 50 to 2000 angstroms and is formed of metallic material selected from the class consisting of Te, Bi, In, Pb, Sn, Sb, Zn, Se, Cd, Ga, Ag, Au, Cu, Cr and Al or their alloy, or has a thickness in the range of 100 angstroms to 10 microns and is formed of compound material of organic and/or inorganic material selected from the class consisting of Te - C, Te - CS_2, Bi - CS_2, Te - teflon, Ag -gelatine, or multilayer film selected from a class of film consisting of Te - dyestuff, Te - nitrocellulose, metallic material film - dielectric material film, or has a thickness in the range of 100 angstroms to 10 microns and is formed of dyestuff film selected from the class of film consisting of cyanine dye, phthalocyanine, naphthoquinone dye, or has a thickness in the range of 100 angstroms to 10 microns and is formed of compound material of organic material selected from the class of material consisting of nitrocellulose styrene, acetic acid vinyl or gelatine and dyestuff, sub-oxide selected from the class of material consisting of TeOx, GeOx, SbOx or MoOx, or layered material of metallic material and organic material selected from the class of material consisting of AuPt - (polystyrene, polymethylmethacrylate, polyvinylacetate) or Al - teflon or inorganic film material selected from the class of material consisting of MnCuBi, CdCo, TbCo, TbFe, GdTbFe, or TbFeCo.

5,110,708

RADIATION-SENSITIVE MIXTURE AND PRODUCTION OF RELIEF IMAGES

Son N. Kim, Hemsbach, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 3, 1990, Ser. No. 592,296
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1989, 3935875
Int. Cl.[5] G03C *1/72*
U.S. Cl. 430—270 **9 Claims**

1. A radiation-sensitive mixture, consisting essentially of
(a) a binder or binder mixture which is insoluble in water but soluble in aqueous alkaline solutions and
(b) a compound which forms a strong acid on exposure to radiation,
wherein the mixture additionally contains an organic compound (c) which has an acid-cleavable carbamate unit



or component (a) contains an acid-cleavable carbamate unit



5,110,709

LIGHT-SENSITIVE POSITIVE WORKING COMPOSITION CONTAINING A PISOLFONE COMPOUND

Toshiaki Aoai, and Tadayoshi Kokubo, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Apr. 5, 1991, Ser. No. 680,733
Claims priority, application Japan, Apr. 6, 1990, 1-91832
Int. Cl.[5] G03C *1/76*
U.S. Cl. 430—271 **15 Claims**

1. A positive working light-sensitive composition which comprises:
(a) 10 to 95% by weight of a compound which has at least one acid-decomposable group and whose solubility in an alkaline developer increases by the action of an acid,
(b) 0.01 to 20% by weight of a disulfone compound represented by the formula (I):

$$R^1-SO_2-SO_2-R^2 \quad (I)$$

wherein R^1 and R^2 may be same or different and represent substituted or unsubstituted alkyl groups, substituted or unsubstituted alkenyl groups or substituted or unsubstituted aryl groups, and
(c) 3 to 85% by weight of a water-insoluble but alkaline watersoluble resin,
wherein the optical density at 248 nm of 1 μm thick coating of the composition is not more than 1.4 and the optical density at 248 nm of the coating exposed to light of 248 nm is less than the optical density of the coating before exposed to light.

5,110,710

LIGHT-SENSITIVE LITHOGRAPHIC PRINTING PLATE WHEREIN THE SUPPORT IS TREATED WITH AN AQUEOUS SOLUTION CONTAINING NITRITES

Yasuji Tomita; Hideyuki Nakai, and Kiyoshi Goto, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 446,197, Dec. 5, 1989, abandoned. This application May 15, 1991, Ser. No. 702,104
Claims priority, application Japan, Dec. 13, 1988, 63-312980; Feb. 14, 1989, 1-35540; Apr. 10, 1989, 1-90946
Int. Cl.[5] G03C *1/77;* G03F *7/021, 7/027;* C25D *5/44*
U.S. Cl. 430—278 **10 Claims**

1. A light-sensitive lithographic printing plate which comprises an aluminum or aluminum alloy support having been pretreated and a light-sensitive layer provided thereon, wherein the surface of the support adjacent to the light-sensitive layer is anodized, following by being treated with an aqueous solution containing 0.001 to 10% by weight based on the aqueous solution, of a nitrile selected from the group consisting of $NaNO_2$ and KNO_2.

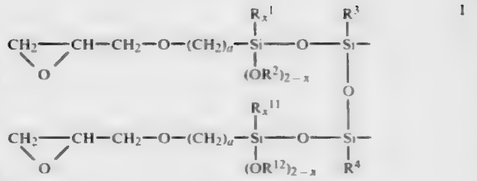
5,110,711

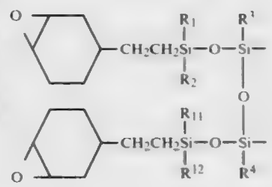
METHOD FOR FORMING A PATTERN

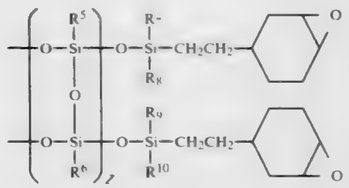
Edward D. Babich, Chappaqua, N.Y.; Jeffrey D. Gelorme, Plainville, Conn.; Michael Hatzakis, Chappaqua, N.Y.; Jane M. Shaw, Ridgefield, Conn.; Kevin J. Stewart, Lake Peekskill, and David F. Witman, Pleasantville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 419,047, Oct. 10, 1989. This application Apr. 11, 1991, Ser. No. 683,729
Int. Cl.[5] G03F *7/075, 7/26*
U.S. Cl. 430—296 **8 Claims**

1. A method for forming a pattern of a photoresist which comprises:
A) providing on a substrate an uncured film containing an epoxy functional organosilicon polymer having a structural formula selected from the group:







wherein each R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11} and R^{12} radical is individually selected from the group consisting of hydrogen, monovalent hydrocarbon radicals, epoxy groups, mercapto radical, and cyanoalkyl radicals, and each a is an integer from 0 to 12, z is an integer from 1 to 10^2 and each x is an integer from 0 to 2;
B) imagewise exposing said uncured film to radiation in a pattern to thereby cause polymerization of the film in said pattern; and
C) developing said photoresist.
2. The method of claim 1 wherein said radiation is electron-beam radiation.

5,110,712

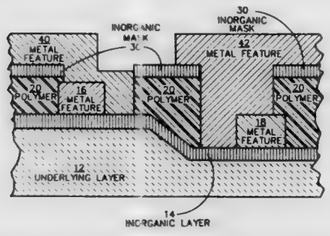
INCORPORATION OF DIELECTRIC LAYERS IN A SEMICONDUCTOR

Daniel D. Kessler; Robert W. Wu; Christopher C. Beatty, and Mark D. Crook, all of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 341,293, Apr. 19, 1989, abandoned, which is a continuation of Ser. No. 61,850, Jun. 12, 1987, abandoned. This application Apr. 25, 1990, Ser. No. 547,093
Int. Cl.[5] G03C *5/00*
U.S. Cl. 430—312 **9 Claims**

1. A process for forming a composite dielectric sandwich in an integrated circuit through the use of inorganic dielectric layers comprising the steps of:

(a) forming a first inorganic dielectric layer over at least one underlying layer of said integrated circuit that has sufficient strength to protect said underlying layer by distributing stress from subsequently formed metal features that are deposited on said first inorganic dielectric layer;
(b) forming first metal features on said first inorganic dielectric layer;
(c) forming a polymer layer over said first inorganic dielectric layer and said first metal features of said integrated circuit, said polymer layer being substantially uniformly distributed to provide a substantially planarized surface;
(d) depositing a second inorganic dielectric layer in said integrated circuit over said polymer layer that provides sufficient strength to protect said polymer layer by distributing stress from subsequently formed second metal features that are deposited on said second inorganic dielectric layer;
(e) forming a mask on said second inorganic dielectric layer;
(f) etching said second inorganic dielectric layer using said mask as a masking pattern to form an inorganic dielectric mask and to provide a protective layer for etching of any subsequently deposited polymer layers;



(g) etching said polymer layer using said inorganic dielectric mask as a masking pattern to essentially remove all polymer unmasked by said inorganic dielectric mask between said inorganic dielectric mask and said first inorganic dielectric layer such that said first inorganic dielectric layer functions as a protective layer and etch stop for said underlying layers wherever said etching of said polymer layer continues after all of said unmasked polymer has been removed to fully expose any existing external contact surfaces of said first metal features;
(h) maintaining said second inorganic dielectric layer as an insulating layer that, together with said polymer layer, forms said composite dielectric sandwich that has sufficient strength to distribute stress from subsequently formed second metal features and that remains in said integrated circuit as an etch stop layer for subsequently formed layers in a multilayer integrated circuit;
(i) forming said second metal features on said second inorganic dielectric layer an in vias formed by etching said polymer layer.

5,110,713
METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL
Kazuaki Yoshida, and Takatoshi Ishikawa, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 264,245, Oct. 28, 1988, abandoned. This application Mar. 27, 1991, Ser. No. 676,475
Claims priority, application Japan, Oct. 30, 1987, 62-274845
The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.
Int. Cl.[5] G03C *7/30*
U.S. Cl. 430—372 **16 Claims**

1. A method of continuously processing a silver halide color photographic material with a color developer containing at least one aromatic primary amine color-developing agent, which comprises developing, after exposure to light, a silver halide color photographic material having a total coating amount of silver halide in terms of silver of from 0.40 to 0.70 g/m^2 and at least one of the layers of which contains a silver halide emulsion containing at least 80 mol % silver chloride in the presence of a compound represented by the following formula (I):

$$Z—S—M \quad (I)$$

wherein M represents a hydrogen atom, a cation, or —S—Z, in which Z represents a heterocyclic residue containing one or more nitrogen atoms,
with a color developer that is substantially free from sulfite ion and benzyl alcohol and whose replenishing amount is 20 ml to 120 ml per m^2 of the silver halide photographic material.

5,110,714
METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL
Genichi Furusawa; Yasuhiro Yoshioka, and Yasufumi Nakai, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 3, 1989, Ser. No. 416,801
Claims priority, application Japan, Oct. 3, 1988, 63-249243
The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.
Int. Cl.[5] G03C *7/46, 7/30*
U.S. Cl. 430—376 **12 Claims**

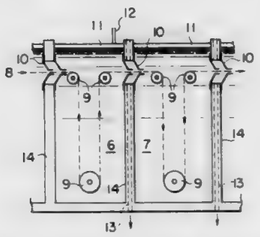
1. A method for processing an image-wise exposed silver halide color photographic material with a color developer containing at least one aromatic primary amine colordeveloping agent, comprising processing said image-wise exposed silver halide color photographic material having at least one layer comprising a high-silver-chloride silver halide emulsion containing 80 mol % or more of silver chloride, and containing at least one coupler whose relative coupling rate is at least 0.05 in each of a red-sensitive layer, a green-sensitive layer, and a blue-sensitive layer, with a color developer containing 3.5×10^{-2} to 1.5×10^{-1} mol chloride ions/l and 5.0×10^{-5} to 5.0×10^{-4} mol bromide ions/l.

5,110,715
PHOTOGRAPHIC REVERSAL PROCESS
Ubbo Wernicke, Cologne; Werner Berthold, Leverkusen; Helmut Häseler, Leverkusen, and Gustav Tappe, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa Gavaert Aktiengesellschaft, Leerkusen, Fed. Rep. of Germany
Filed Oct. 10, 1989, Ser. No. 419,584
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1988, 3835661; Dec. 22, 1988, 3843264
Int. Cl.[5] G03C *7/46, 5/50*
U.S. Cl. 430—379 **10 Claims**

1. A photographic reversal process for the production of positive photographic images by imagewise exposure of the photosensitive material containing at least one blue-sensitive silver halide layer containing a yellow coupler, at least one green-sensitive silver halide layer containing a magenta coupler and at least one red-sensitive silver halide layer containing a cyan coupler, black-and-white first development of the material, chemical fogging or diffuse second exposure and subsequent color development, characterized in that
a) at least one N,N-dialkyl-p-phenylenediamine derivative is used as sole developer in the first development,
b) the first development bath contains at least one compound which prevents the developer oxidation product formed during the first development from reacting with the color couplers present in the color photographic reversal material to form image dyes,
c) the pH value in the first development bath is in the range of from 6.5 to 7.5

d) the silver halide emulsion layers of the photographic material have a chloride content of at least 80 mol-%.

5,110,716
STABILIZER FOR SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL USE AND THE METHOD OF PROCESSING THE LIGHT-SENSITIVE MATERIAL WITH THE STABILIZER
Satoru Kuse, Hino; Shigeharu Koboshi, Sagamihara, and Moeko Hagiwara, Kokubunji, all of Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Apr. 23, 1990, Ser. No. 513,221
Claims priority, application Japan, Apr. 28, 1989, 1-109956; May 26, 1989, 1-134357
Int. Cl.[5] G03C *5/39*
U.S. Cl. 430—429 **6 Claims**

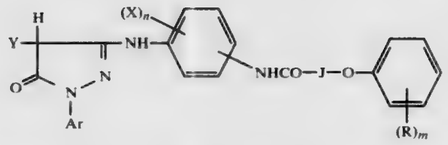


1. A stabilizing solution for processing a silver halide photographic light-sensitive material comprising
a compound selected from the group consisting of water-soluble siloxane compounds each having a polyoxyalkylene group, said compound represented by the following formulas I or II, in an amount of 0.05 g to 40 g per liter; and,
a triazine type compound represented by the following formula III in an amount of from 0.1 g to 20 g per liter;

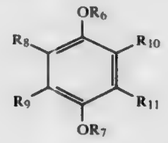
$$A_2—O—(A)l—(B)m—(C)n—X_1 \quad (I)$$

wherein A_2 is a monovalent organic group; A, B and C are each an ethyleneoxy group, propyleneoxy group or a

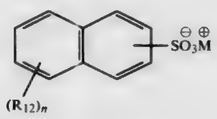
$$—(CH_2)n_1—(CH)m_1—(CH_2)l_1—O— \text{ group,}$$
$$\quad\quad\quad



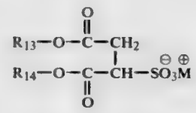
wherein Ar represents an aryl group; Y represents a hydrogen atom or a group capable of releasing by reaction with an oxidation product of a color developing agent; X represents a halogen atom, an alkyl group or an alkoxy group; J represents a divalent bonding group; R represents a halogen atom, a hydroxy group, an alkyl group, an aralkyl group or an alkoxy group; m represents an integer of 0 to 5; n represents an integer of 0 to 4;



wherein R_6 and R_7 represent an alkyl group having 2 to 7 carbon atoms or an aralkyl group; R_8, R_9, R_{10} and R_{11} represent a hydrogen atom, an alkyl group having 4 to 8 carbon atoms or an aralkyl group, wherein three or more of R_8, R_9, R_{10} and R_{11} are not hydrogen atoms at the same time;



wherein R_{12} represents an alkyl group having 1 to 16 carbon atoms or an aralkyl group; M represents a hydrogen atom or a cation; n represents an integer of 1 to 7;



wherein R_{13} and R_{14} represent an alkyl group having 4 to 20 carbon atoms; M represents a hydrogen atom or a cation.

5,110,719

PROCESS FOR PREPARING A DIRECT POSITIVE PHOTOGRAPHIC MATERIAL

Sadanobu Shuto; Hatsumi Tanemura, and Shigeo Hirano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 403,509, Sep. 6, 1989, abandoned. This application Nov. 13, 1990, Ser. No. 611,373

Claims priority, application Japan, Sep. 6, 1988, 63-221483

The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.

Int. Cl.[5] **G03C** *1/485, 1/005*

U.S. Cl. 430—569 **17 Claims**

1. A process for preparing a direct positive photosensitive material comprising providing on a support at least one silver halide light-sensitive emulsion layer comprising the combination of (a) non-prefogged internal latent image silver halide core/shell grains; (b) a binder; (c) at least one compound represented by Formula (I), (II) or (III); and at least one compound represented by formula (IV):

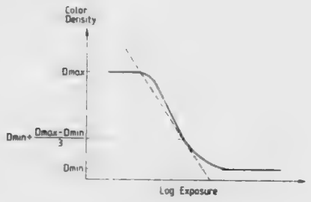
$$R—SO_2S—M \quad (I)$$

$$R—SO_2S—R^1 \quad (II)$$

$$R—SO_2S—L_m—SO_2S—R^2 \quad (III)$$

wherein R, R^1 and R^2 each represents a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aromatic group, or a substituted or unsubstituted heterocyclic group; M represents a cation; L represents a divalent linking group; and m is 0 or 1; and

$$R^3—SO_2M^1 \quad (IV)$$



wherein R^3 represents a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aromatic group, or a substituted or unsubstituted heterocyclic group; and M^1 represents a cation,

wherein said silver halide light-sensitive emulsion layer comprises said compound represented by formula (I), (II) or (III) in an amount of from 10^{-5} to 10^{-2} mol per mol of said internal latent image silver halide,

wherein said silver halide light-sensitive emulsion layer comprises said compound represented by formula (IV) in an amount of from 10^{-7} to 10^{-3} mol per mol of said internal latent image silver halide,

by adding said at least one compound represented by formulae (I), (II) and (III) and said at least one compound represented by formula (IV) during formation of the silver halide core grains or during chemical sensitization of the silver halide core grains.

5,110,720

DENTAL COMPOSITION AND A PROCESS FOR THE PREPARATION THEREOF

Endre Csányi; Gábor Csányi; Tibor Balogh, and László Nagy, all of Budapest, Hungary, assignors to Reanal Einomvegyszergyar, Budapest, Hungary

PCT No. PCT/HU88/00003, § 371 Date Jun. 28, 1989, § 102(e) Date Jun. 28, 1989, PCT Pub. No. WO88/05650, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 29, 1988, Ser. No. 381,722

Int. Cl.[5] **A61C** *5/00*

U.S. Cl. 433—215 **8 Claims**

1. A dental composition which comprises an anti-osteoporotic agent, an antiphlogistic agent, one or more known auxiliary agent(s), optionally, a natural or synthetic chemotherapeutic agent and, optionally, a local anaesthetic.

5,110,721

METHOD FOR HYPOTHERMIC ORGAN PROTECTION DURING ORGAN RETRIEVAL

David Anaise, Dix Hills, and Marc Yland, Stony Brook, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Feb. 10, 1989, Ser. No. 309,288

Int. Cl.[5] **A01N** *1/02*

U.S. Cl. 435—1 **1 Claim**

1. A method for maintaining, in situ, the viability of an organ of a non-heart beating cadaver, which comprises the steps of:

providing cooled solution to a cavity of a cadaver through an inflow catheter inserted at least partially into the cavity of the cadaver, the solution being contained in a container and being provided to the cavity of the cadaver by a pump in fluid communication with the container and a first conduit communicating with the pump and the inflow catheter; and

removing solution at a predetermined rate from the cavity of the cadaver for recirculation and recooling, the solution being removed from the cavity by a return catheter inserted at least partially into the cavity, and a second conduit communicating with the container and the return catheter, whereby the container, pump, inflow catheter, first conduit, return catheter and second conduit define, with the cavity of the cadaver, a closed fluid circuit for continually providing cooled solution to the cavity and for removing solution therefrom.

5,110,722

CELL, TISSUE OR ORGAN STORAGE SOLUTION

Kelvin G. M. Brockbank, Marietta, Ga., and Katherine A. Anderegg, Pittsburgh, Pa., assignors to CryoLife, Inc., Marietta, Ga.

Filed Nov. 9, 1989, Ser. No. 433,952

Int. Cl.[5] **A01N** *1/02;* **C12N** *5/06*

U.S. Cl. 435—1 **14 Claims**

1. A method of maintaining viability of a cell, tissue or organ comprising:

(i) contacting said cell, tissue or organ with a solution comprising transferrin and selenium; and

(ii) maintaining said cell, tissue or organ in contact with said solution at a temperature of about 4° C. or less in a non-frozen state.

12. A cell, tissue or organ storage solution comprising insulin, transferrin, hydrocortisone, selenium and 4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid.

5,110,723

METHOD FOR PROVIDING CHEMICALLY OR BIOLOGICALLY USEFUL MOIETY FROM WATER-COMPATIBLE REDUCIBLE COMPOUND

Albert J. Mura, Rochester; Robert T. Belly, Webster, and Vanessa R. Lum, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 344,869, Apr. 28, 1989, Pat. No. 5,037,762, which is a division of Ser. No. 868,855, May 30, 1986, Pat. No. 4,853,186. This application Feb. 25, 1991, Ser. No. 660,369

Int. Cl.[5] **C12Q** *1/00*

U.S. Cl. 435—4 **10 Claims**

1. A method for providing a chemically or biologically useful moiety comprising, at a pH of 9 or less, reducing a water-compatible reducible compound of the structure CAR—$(—R^1)_n$ wherein CAR— is a substituted or unsubstituted aromatic or quinone nucleus, R^1 is a moiety which comprises a shiftable detectable species, and n is 1 or 2,

provided said reducible compound is constructed such that it is capable of being reduced at said pH to release said shiftable detectable species, and said reducible compound comprises at least one water-compatibilizing moiety which has a hydrophobic parameter less than about −2.0 and which is selected from the group consisting of carboxy, sulfo, ammonium, sulfonamido, hydroxy, iodoxy and glucosyl, and

further provided that when R^1 is replaced with H, CAR—$(—H)_n$ is constructed such that it has an $E_{\frac{1}{2}}$ of at least about +100 mV when measured in water.

5,110,724

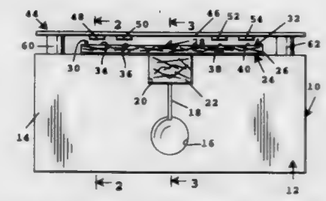
MULTI-ANALYTE ASSAY DEVICE

Gary E. Hewett, Atherton, Calif., assignor to Cholestech Corporation, Hayward, Calif.

Filed Apr. 2, 1990, Ser. No. 503,371

Int. Cl.[5] **C12Q** *1/60;* **G01N** *21/11*

U.S. Cl. 435—11 **16 Claims**



1. An assay device for use in assaying multiple analytes in a blood sample whose volume is no more than about 50 μl, comprising

a sample dispenser having (i) a support, (ii) a well defined in the support for receiving such sample, (iii) a sieving matrix on said support effective to selectively retard blood cells when a blood sample is applied to one end of the matrix as the sample migrates by capillarity toward the opposite matrix end, (iv) capillary means for drawing sample fluid from said well into the matrix, and (v) an absorbent strip on said support having a central region in fluid contact with said opposite matrix end for distributing sample fluid from the sieving matrix by capillary flow to sample-transfer sites in opposite end regions of the strip,

a test plate carrying a plurality of wettable, absorbent pads, each having an exposed outer surface region and a defined expanse, said plurality of pads containing reagent means effective to produce a detectable analyte-dependent reaction product for detection of a selected analyte, when sample fluid is transferred from said associated sample-transfer sites to said plurality of pads, and

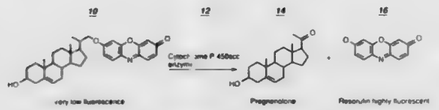
means mounting said plate on said dispenser, said mounting means being adjacent to and spaced from said plurality of pads, for movement toward and away from a sample-transfer position at which substantially the entire outer exposed surface regions of said plurality of pads are in contact with the sample-transfer sites, for simultaneous transfer of substantially the same volume of sample fluid from each of said transfer sites to each of said plurality of pads in the support with fluid movement at a substantially uniform flow rate in a direction normal to the pad outer surface regions throughout the entire expanse of each pad, whereby said plurality of pads are filled uniformly to a selected volume when said plurality of pads are held in contact with said sample-transfer sites for a selected period of time.

5,110,725

OPTICAL PROBE FOR THE CYTOCHROME P-450 CHOLESTEROL SIDE CHAIN CLEAVAGE ENZYME

Babetta L. Marrone; Daniel J. Simpson; Clifford J. Unkefer, all of Los Alamos, and Thomas W. Whaley, Santa Fe, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 5, 1991, Ser. No. 680,978
Int. Cl.[5] C12Q *1/60*; C12N *9/02*
U.S. Cl. 435—11 **6 Claims**



1. A method for quantifying the activity of the P-450$_{scc}$ enzyme in the conversion of cholesterol to pregnenolone in steroidogenesis, comprising the steps of:

forming a fluorogenic probe having a cholesterol-based steroid connected through a linking group at the C-22 position with a chromophore effective to have a low optical response when attached to said steroid and a high optical response as an anion, said chromophore having a molecular size effective to not interfere with an enzymatic reaction that cleaves said chromophore from said steroid;

incorporating said probe in a process for said conversion of cholesterol to pregnenolone;

reacting said probe with the P-450$_{scc}$ enzyme to cleave said side-chain from the probe and form said anion having said high optical response from said chromophore; and

exciting said anion to obtain said high optical response; and

optically detecting said response as a measure of said P-450$_{scc}$ enzyme activity.

5,110,726

IMMUNOASSAY FOR ANTIBODIES BINDING PLATELETS

Daryl M. Ogden, Harris, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 89,884, Aug. 27, 1987, Pat. No. 4,959,308. This application Feb. 17, 1988, Ser. No. 156,786
Int. Cl.[5] G01N *33/546*
U.S. Cl. 435—7.21 **17 Claims**

1. A method for detecting human antibodies in a biological sample directed against platelets, the method comprising the steps of:

treating platelets with an aqueous solution comprising a dialyzable nonionic detergent to solubilize platelet antigens comprising HLA and platelet specific antigens and to produce a detergent lysate;

separating insoluble material and excess detergent from the detergent lysate so as to minimize interference with subsequent binding of antibodies directed against platelet antigens to platelet antigens and to produce a detergent-free lysate;

removing from the detergent-free lysate substances nonimmunospecifically binding to human IgG by passing the lysate over a column of matrix-bound human IgG to produce partially purified platelet antigens;

affixing the partially purified platelet antigens to a particulate solid matrix to produce an antigen-coated particulate latex matrix wherein the platelet antigens are passively coated onto the latex particles to achieve a ratio (weight/weight) of unaffixed antigen to affixed antigen of from about 1.6 to about 6.0;

contacting said antigen-coated particulate latex matrix with a solution comprising a human biological sample possibly containing antibodies directed against platelets under conditions appropriate for formation of immunocomplexes; and

detecting agglutination of antigen-coated particulate latex matrix; said agglutination resulting from formation of immunocomplexes between the matrix-bound antigen and antibodies of the biological sample directed against platelets.

5,110,727

METHOD FOR PERFORMING COAGULATION ASSAYS ACCURATELY, RAPIDLY AND SIMPLY, USING DRY CHEMICAL REAGENTS AND PARAMAGNETIC PARTICLES

Bruce J. Oberhardt, Raleigh, N.C., assignor to Cardiovascular Diagnostics, Inc., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 33,817, Apr. 3, 1987, Pat. No. 4,849,340. This application May 10, 1988, Ser. No. 192,672
The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.
Int. Cl.[5] G01N *1/12*; B01L *3/00*; C12M *1/14*
U.S. Cl. 435—13 **58 Claims**

1. In a coagulation assay comprising combining a coagulation assay reagent and a whole blood sample or plasma sample and obtaining a coagulation assay measurement, the improvement comprising adding to a dry coagulation assay reagent containing magnetic particles distributed substantially homogeneously therethrough, arranged in a substantially flattened format, and under the influence of an oscillating magnetic field or moving permanent magnetic field, or both, a whole blood sample or a plasma sample thereby substantially simultaneously initiating movement of said magnetic particles and the coagulation assay measurement and monitoring movement of said magnetic particles to obtain said assay measurement.

5,110,728

ACYL CARRIER PROTEIN - DNA SEQUENCE AND SYNTHESIS

Jean C. Kridl, and Vic C. Knauf, both of Davis, Calif., assignors to Calgene, Inc., Davis, Calif.

Continuation of Ser. No. 78,924, Jul. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 891,529, Jul. 31, 1986, abandoned. This application Nov. 15, 1989, Ser. No. 437,764
Int. Cl.[5] C12P *21/00, 21/04*; C12N *15/00, 5/00*; C07H *15/12*
U.S. Cl. 435—69.1 **29 Claims**

17. A method for producing a peptide product in a plant cell by recombinant techniques, where a plant cell is transformed with an expression cassette to provide a transgenic cell comprising a gene encoding said peptide product and said transgenic cell is grown whereby said gene is expressed and said peptide product is produced, the improvement which comprises:

obtaining said peptide product in a chloroplast or leucoplast by employing as said gene an open reading frame encoding a spinach or Brassica acyl carrier protein, said open reading frame encoding said peptide product and an amino acid sequence capable of functioning as a transit peptide, whereby said peptide product is produced as a precursor peptide and is translocated to said chloroplast or leucoplast.

5,110,729

METHOD OF PRODUCING PEPTIDES USING BACULOVIRUS VECTORS IN CULTURED CELLS

Susumu Maeda, Tottori; Mitsuru Furusawa, Tokyo; Yasumasa Marumoto, Tokyo; Tadashi Horiuchi, Tokyo; Yoshinari Sato, Tokyo, and Yoshiyuki Saeki, Tokyo, all of Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 930,489, Nov. 14, 1986, abandoned. This application Jan. 16, 1991, Ser. No. 641,795
Claims priority, application Japan, Nov. 14, 1985, 60-255607
The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.
Int. Cl.[5] C12P *21/00*; C12N *15/00, 15/20, 15/34*
U.S. Cl. 435—69.1 **28 Claims**

1. A method for producing a peptide which comprises:

(a) constructing a recombinant *Bombyx mori* nuclear polyhedrosis virus comprising the following elements, operatively linked in order 5' to 3';

(i) A *Bombyx mori* nuclear polyhedrosis virus DNA (BmNPV DNA) polyhedrin promoter;

(ii) BmNPV DNA encoding all or part of a polyhedral protein-encoding structural gene, with or without a linker base sequence coding for a linking peptide or amino acid;

(iii) DNA encoding a structural gene for a desired protein positioned in a proper reading frame for all or part of said polyhedral protein-encoding structural gene; and

(iv) a transcription terminator of said BmNPV DNA;

(b) introducing said recombinant nuclear polyhedrosis virus into cells of a *Bombyx mori* cell line;

(c) propagating said recombinant nuclear polyhedrosis virus; and

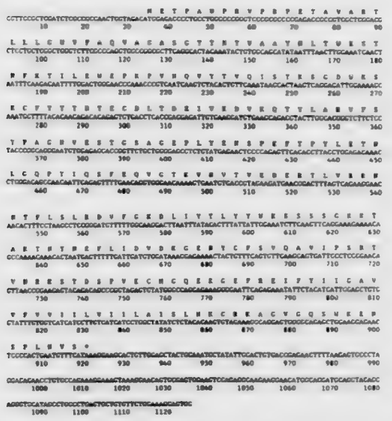
(d) harvesting said desired protein and all or part of said polyhedral protein with or without said linking amino acid or peptide.

5,110,730

HUMAN TISSUE FACTOR RELATED DNA SEGMENTS

Thomas S. Edgington, La Jolla, and James H. Morrissey, San Diego, both of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Continuation-in-part of Ser. No. 33,047, Mar. 31, 1987, abandoned. This application Jun. 25, 1987, Ser. No. 67,103
Int. Cl.[5] C12N *15/09, 15/12, 15/86*
U.S. Cl. 435—69.6 **7 Claims**



6. A method of preparing a mature human tissue factor heavy chain (huTFh) protein comprising the steps of:

a) initiating a culture, in a nutrient medium, of mammalian cells transformed with a recombinant DNA molecule comprising an expression vector operatively linked to a first DNA segment coding for said mature huTFh and a second DNA segment operatively linked to said first DNA segment and coding for an amino acid residue leader sequence, so that said recombinant DNA molecule codes for a huTFh precursor;

b) maintaining said culture for a time period sufficient for said transformed cells to express said mature huTFh protein; and

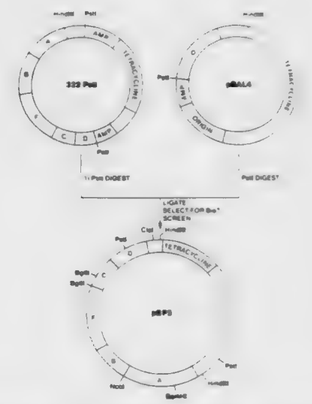
c) recovering said mature huTFh protein from said culture.

5,110,731

SYSTEM FOR BIOTIN SYNTHESIS

Eric F. Fisher, Boulder, Colo., assignor to Amgen, Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 983,042, Aug. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 769,849, Aug. 26, 1985, abandoned. This application Jun. 13, 1990, Ser. No. 537,017
Int. Cl.[5] C12P *17/18*; C12N *15/00, 15/70*
U.S. Cl. 435—119 **15 Claims**



1. A system for the production of biotin comprising:

an *Escherichia coli* cell having a biotin retention-deficient mutant genotype: and

nonlytic extrachromosomal DNA, within said cell, encoding at least one gene product of the biotin operon of *Escherichia coli* or a functional homolog thereof and having a uvrB$^-$ genotype.

5,110,732

SELECTIVE GENE EXPRESSION IN PLANTS

Philip N. Benfey, New York, and Nam-Hai Chua, Scarsdale, both of N.Y., assignors to The Rockefeller University, New York, N.Y.

Filed Mar. 14, 1989, Ser. No. 323,525
Int. Cl.[5] C21N *15/79*; C07H *15/12*; A01H *5/00*
U.S. Cl. 435—172.3 **5 Claims**

1. In a method for the expression of a chimeric plant gene, the improvement which comprises the use of a tissue-specific promoter fragment which causes tissue-specific expression in leaves, stems, cotyledons, and vascular tissue of the hypocotyl while causing detectable levels of expression in root vascular tissue when operably coupled directly to a DNA segment corresponding to the −72 to +8 promoter fragment of the Cauliflower Mosaic Virus 35S gene, said tissue-specific promoter fragment having the sequence:

5'-TGAGACTTTT CAACAAAGGG TAATATCCGG
AAACCTCCTC GGATTCCATT GCCCAGCTAT
CTGTCACTTT ATTGTGAAGA TAGTGGAAAA
GGAAGGTGGC TCCTACAAAT GCCATCATTG
CGATAAAGGA AAGGCCATCG TTGAAGATGC
CTCTGCCGAC AGTGGTCCCA AAGATGGACC
CCCACCCCAC GAGGAGCATC GTGGAAAAAG
AAGACGTTCC AACCACGTCT TCAAAGCAAG
TGGATTGATG TGATA-3'

5,110,733

LIQUID-LIQUID EXTRACTION WITH PARTICULATE POLYMERIC ADSORBENT

Chan W. Kim; Elizabeth M. Robinson, both of Cambridge, and Chokyun Rha, Boston, all of Mass., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 34,655, Apr. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 854,985, Apr. 28, 1986, abandoned. This application Dec. 21, 1989, Ser. No. 453,354

Int. Cl.[5] C12N *9/00;* **B01D** *11/04, 15/04*

U.S. Cl. 435—183 **17 Claims**

1. A liquid-liquid extraction method of separating or purifying a product, said method comprising:

(A) agitating an aqueous solution or dispersion of (1) the product mixed with other material, (2) a plurality of water soluble, mutually immiscible substances in amounts effective to maintain separation of multiple aqueous liquids phases, and (3) a water-insoluble particulate polymeric absorbent having particle diameters in the range of from about 0.01 to about 10 micrometers and capable of adsorbing either the product or the other material to form a reversible complex, whereby the adsorbent reversibly binds the adsorbable material to form a complex;

(B) causing the system resulting from step (A) to separate into the said multiple liquid aqueous phases, whereby a predominant portion of the complex partitions into one of the phases or to an interface thereof; and

(C) recovering the product from the complex, or from the aqueous phase or interface in which it has concentrated.

5,110,734

PURIFIED CYCLODEXTRINASE

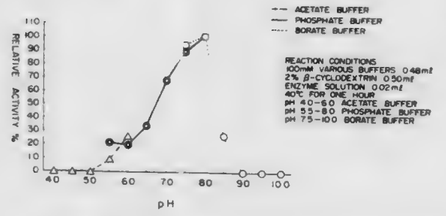
Tetsuya Oguma; Mamoru Kikuchi; Kiyoshi Mizusawa; Shoichi Tokutake, and Nobuyuki Yamaji, all of Noda, Japan, assignors to Kikkoman Corporation, Noda, Japan

Filed Jun. 6, 1990, Ser. No. 533,856

Claims priority, application Japan, Jun. 12, 1989, 1-146891; Jun. 16, 1989, 1-152257

Int. Cl.[5] C12N *9/26;* **C12P** *19/14*

U.S. Cl. 435—201 **3 Claims**



1. A purified cyclodextrinase having the physicochemical characteristics of cyclodextrinase produced by the bacteria deposited under FERM BP-2458, wherein

said enzyme cleaves cyclodextrins to produce maltooligosaccharides corresponding to the polymerization degree of glucose of the cyclodextrins;

the K_m of said enzyme for cyclodextrins is no higher than the K_m of said enzyme for linear maltooligosaccharides with the same polymerization degree of glucose as cyclodextrins;

when β-cyclodextrin is used as substrate, the optimum pH is about 8.0 and the stable pH range is 5.5–9.5;

the optimum working temperature for the present enzyme is 40° C.;

said enzyme is inactivated by a treatment at a temperature of 55° C. and pH=7.5 for a period of 15 minutes;

said enzyme is inhibited 90% by Hg^{2+}, Cu^{2+}, Zn^{2+}, Ni^{2+} and activated 10–30% by Ca^{2+}, Mg^{2+};

the molecular weight of said enzyme is 144,000 when measured by gel filtration method and 72,000 when measured by SDS PAGE method.

5,110,735

THERMOSTABLE PURIFIED ENDOGLUCANASE FROM THERMOPHILIC BACTERIUM ACIDOTHERMUS CELLULOLYTICUS

Melvin P. Tucker, Lakewood; Karel Grohmann; Michael E. Himmel, both of Littleton, and Ali Mohagheghi, Golden, all of Colo., assignors to Midwest Research Institute, Kansas City, Mo.

Filed Sep. 26, 1989, Ser. No. 412,434

Int. Cl.[5] C12N *9/42, 1/00*

U.S. Cl. 435—209 **4 Claims**

1. A substantially purified high molecular weight cellulase enzyme having a molecular weight of between about 156,600 to about 203,400 daltons from the bacterium *Acidothermus cellulolyticus* (ATCC 43068), said enzyme is water soluble, possesses both C_I and C_X types of enzyme activity, a high degree of stability toward heat, and exhibits optimum temperature for activity at about 65° C. at pH's from about 2 to about 9 and an inactivation temperature of about 90° C. at pH's from about 2 to about 9.

5,110,736

PURIFICAITON PROCEDURE OF TPA FROM CRUDE PREPARATIONS

Mitsuyoshi Morii; Masaharu Ohoka, both of Yokohama; Nobuhiro Kawashima, Sagamihara; Noriko Morii, Yokohama, and Toshihiko Suzuki, Tokyo, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 287,655, Dec. 21, 1988, abandoned, which is a continuation of Ser. No. 887,514, Jul. 21, 1986, abandoned. This application Oct. 24, 1990, Ser. No. 602,387

Claims priority, application Japan, Aug. 1, 1985, 60-168601

Int. Cl.[5] C12N *9/64*

U.S. Cl. 435—226 **10 Claims**

1. A method of purifying crude human tissue plasminogen activator (tPA) containing, as an impurity, a protein which is reactive with an anti-human tPA antibody and has a molecular weight of 110,000 ± 20,000 daltons, existing in a culture medium containing serum, which method consists essentially of the steps of:

(a) passing the crude tPA to be purified through a column of an affinity reagent containing an immobilized Kunitz inhibitor which is produced in seeds of *Erythrina latissima* and other *Erythrina* plants and acts as an inhibitor to trypsin, plasmin and tPA but not to urokinase, to thereby bind the tPA to the affinity reagent and separate unbound material

(b) washing the column with a saline buffer solution containing salts at neutral or alkaline pH containing 0.5 to 3.0M NaCl; and thereafter

(c) eluting the tPA-bound affinity reagent with a buffer of acidic pH.

5,110,737

METHOD FOR THE ISOLATION OF HYBRIDOMAS USING CHOLESTEROL AUXOTROPHY OF MYELOMA CELLS

Yoshinari Myoken, Lake Placid, N.Y.; Tetsuji Okamoto, Hiroshima, Japan, and J. Denry Sato, Lake Placid, N.Y., assignors to W. Alton Jones Cell Science Center Incorporated, Lake Placid, N.Y.

Filed Jul. 31, 1989, Ser. No. 388,048

Int. Cl.[5] C12N *5/00*

U.S. Cl. 435—240.27 **11 Claims**

1. A method for selecting mammalian derived hybridoma cells, which are the fusion product of a myeloma cell, which is a cholesterol auxotroph due to the deficiency of an essential enzyme in the metabolic pathway of cholesterol production, and a cell which is capable of synthesizing cholesterol and which maintains this characteristic after fusion with the myeloma cell, from unfused parent myeloma cells, comprising the step of culturing a mixture of said hybridoma cells and said unfused parent myeloma cells in a nutrient medium suitable for the growth of said hybridomas, said medium lacking cholesterol and cholesterol precursors downstream from the deficient essential enzyme of the myeloma cells in amounts sufficient to support significant growth of said myeloma cells, whereby said hybridoma cells grow and said unfused parent myeloma cells die.

5,110,738

MONOCLONAL ANTIBODY CAPABLE OF RECOGNIZING ARTERIOSCLEROTIC LESIONS AND AGENTS FOR DETECTING AND TREATING ARTERIOSCLEROSIS

Tatsuya Takano; Ryoichi Hashida, both of Tokyo; Keiji Nakagami, Kanagawa, and Junji Kimura, Tokyo, all of Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

Continuation-in-part of Ser. No. 801,712, Nov. 26, 1985, abandoned. This application Dec. 14, 1987, Ser. No. 132,687

Claims priority, application Japan, Nov. 30, 1984, 59-252013

Int. Cl.[5] C12N *15/00, 5/00;* **G01N** *33/577;* **C07K** *15/14*

U.S. Cl. 435—240.27 **8 Claims**

1. Hybridoma 212D accession No. C.N.C.M. I-512.

5,110,739

PROCESS FOR SELECTIVE FERMENTATION WITH MUTANTS OF *PEDIOCOCCUS HALOPHILUS*

Keietsu Abe, Noda, and Kinji Uchida, Nagareyama, both of Japan, assignors to Kikkoman Corporation, Noda, Japan

Continuation of Ser. No. 163,627, Mar. 3, 1988, abandoned. This application Jul. 17, 1991, Ser. No. 733,065

Claims priority, application Japan, Mar. 7, 1987, 62-51210

Int. Cl.[5] C12N *1/00, 1/20;* **C12P** *1/00*

U.S. Cl. 435—252.9 **8 Claims**

1. A process for selective fermentation, comprising:

(a) providing a medium containing at least one metabolite which induces catabolite repression, selected from the group consisting of glucose and mannose, and at least two metabolites whose catabolism is inhibited by catabolite repression, selected from the group consisting of arabinose, xylose, galactose, sucrose, maltose, trehalose, lactose, and glycerin;

(b) inoculating said medium with an inoculum containing an organism selected from the group consisting of *Pediococcus halophilis* I-2, having an accession number FERM BP-1304, and *Pediococcus halophilis* I-1, having an accession number FERM BP-1303,

(c) fermenting said inoculated medium for a fermentation period such that the concentration in said inoculated medium of each of said at least two metabolites whose catabolism is inhibited by catabolite repression is reduced, but such that said medium still contains said metabolite which induces catabolite repression.

5,110,740

PRETREATMENT OF PHENOLIC RESIN SUSPENSION TO REMOVE RESIDUAL PHENOL

Alexander R. Pokora, Pickerington, Ohio, and John J. Stolfo, Lenox, Mass., assignors to The Mead Corporation, Dayton, Ohio

Filed Sep. 6, 1989, Ser. No. 403,530

Int. Cl.[5] C07B *63/00;* **B41M** *5/20;* **B32B** *7/04;* **C12P** *7/00*

U.S. Cl. 435—262 **3 Claims**

1. A method for treating a suspension of a phenolic resin to render said suspension essentially free of unpolymerized phenolic monomer, said method comprising the steps of:

adding a perioxidase enzyme and a perioxide to a suspension of a phenolic resin containing residual phenolic monomer to thereby polymerize said residual phenolic monomer and render said monomer insoluble in water, said polymerized monomer being retained in said suspension.

5,110,741

AERATION APPARATUS FOR THE CULTURE OF MAMMALIAN CELLS

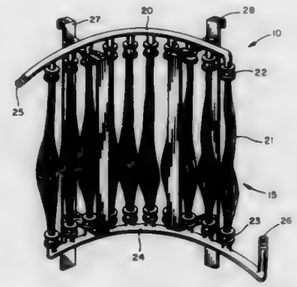
Kiyomoto Ohi, Nara, and Shin Shimizu, Kyoto, both of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 167,340, Mar. 14, 1988, abandoned. This application May 9, 1990, Ser. No. 520,973

Claims priority, application Japan, Mar. 18, 1987, 62-65362

Int. Cl.[5] C12M *3/02, 1/06*

U.S. Cl. 435—284 **2 Claims**

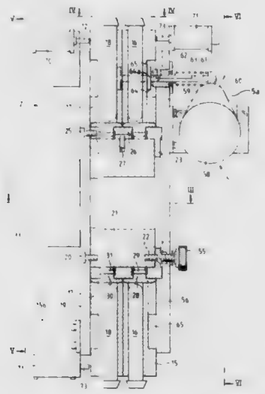


1. An aeration apparatus for culturing mammalian cells in a large-scale culture vessel comprising a plurality of aeration means, each of said aeration means comprising a bundle of thin-walled narrow tubes made of a gas permeable material, first head means for introducing a gas, first connector means providing flow communication between said first head means and said bundle of tubes at a first end of each of said aeration means, second head means for removing a gas and second connector means providing flow communication between said second head means and said bundle of tubes at a second end of each of said aeration means, said first head means and said second head means including fixing means for positioning said aeration apparatus to the inside of the culture vessel such that said thin-walled narrow tubes of said aeration means are positioned between said first head means and said second head means along the inside surface of the vessel so as to be slackened, so that said thin-walled narrow tubes are capable of waving in the vessel when gas or air is supplied to said aeration means.

5,110,742
INDIRECT POTENTIOMETRIC METHOD AND DILUENT FOR ANALYSIS OF LITHIUM
Frank R. Shu, La Habra Heights, Calif.; Chen-Yie Chien, Ashland, Mass., and Julie S. Kim, Placentia, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.
Filed Oct. 19, 1990, Ser. No. 600,453
Int. Cl.[5] G01N *27/327, 27/333*
U.S. Cl. 436—18 **37 Claims**

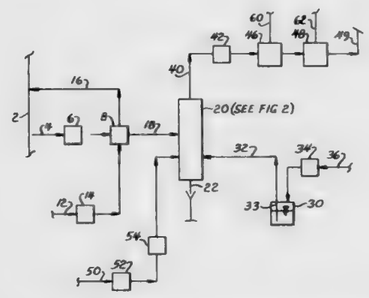
1. A diluent useful for the indirect potentiometric determination of lithium in a clinical sample comprising, in effective amounts:
(i) a pH buffer;
(ii) at least one lithium salt; and
(iii) a non-cationic surfactant, said surfactant containing at least one hydrophobic group and at least one hydrophillic group, and being substantially free of polyoxyethylene groups;
the pH of said diluent being within the range of about 5.5 to about 9.5.

5,110,743
METHOD AND APPARATUS FOR STORING AND MIXING BLOOD SAMPLES
Arthur Windisch, Bachenbülach, and Heinz Pfenninger, Volketswil, both of Switzerland, assignors to Oerlikon-Contraves AG, Zurich, Switzerland
Filed Nov. 10, 1988, Ser. No. 269,596
Claims priority, application Switzerland, Nov. 12, 1987, 04423/87
Int. Cl.[5] G01N *35/06*
U.S. Cl. 436—48 **39 Claims**



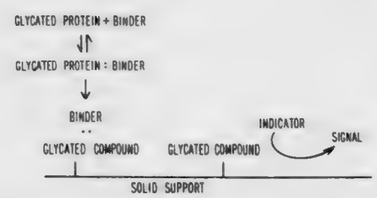
1. An apparatus for storing and mixing blood samples housed in containers for automatic analysis of the blood samples, comprising:
at least one drivable storage disc for the storage of the blood samples;
at least one mixing disc for preparing the blood samples;
means for driving the at least one mixing disc independently of the at least one storage disc;
said at least one storage disc and said at least one mixing disc being arranged adjacent one another in parallel planes;
each of said discs being provided with groove means for receiving containers housing the blood samples; and
a transfer device cooperating with said at least one storage disc and said at least one mixing disc for transfer of the containers housing the blood samples from the at least one storage disc to the at least one mixing disc.

5,110,744
METHOD FOR PROCESS CONTROL
Ernest H. Baughman, Naperville, Ill., and Barbara R. Coughlin, Seattle, Wash., assignors to Amoco Corporation, Chicago, Ill.
Filed Nov. 16, 1989, Ser. No. 438,338
The portion of the term of this patent subsequent to Apr. 2, 2009, has been disclaimed.
Int. Cl.[5] G01N *35/08, 21/00;* **C02F** *3/00*
U.S. Cl. 436—53 **11 Claims**



1. A method for controlling the energy input into an amine regenerator affected by weak acid or weak base components of one or more liquid streams comprising:
volatilizing substantially all of the acid or base components of each of a plurality of individual, repetitive samples taken from said liquid stream or streams, the samples being of essentially constant size;
separating said volatilized components from said individual sample by means of an analyte carrier stream which flows at substantially constant rate;
determining the concentration of said volatilized component of individual samples using one or more detectors and generating a control signal proportional thereto; and
controlling the energy input into said amine regenerator based on said control signal.

5,110,745
METHODS OF DETECTING GLYCATED PROTEINS
Larry J. Kricka, Berwyn, and Peter Wilding, Paoli, both of Pa., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.
Filed Jun. 1, 1989, Ser. No. 359,953
Int. Cl.[5] G01N *33/52*
U.S. Cl. 436—87 **33 Claims**

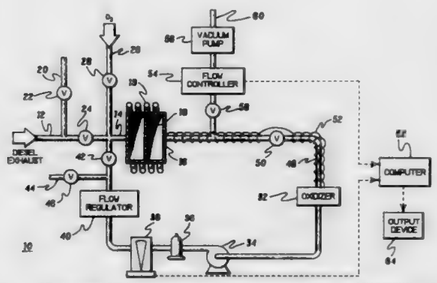


1. A method of detecting glycated protein in a body fluid suspected of containing said glycated protein, comprising the steps of:
a) contacting a test sample of said body fluid with an excess of a binder composition under conditions which allow binding of glycated protein in said test sample to a portion of said binder composition thereby leaving a portion of said binder composition unbound with glycated protein;
b) exposing the unbound portion of said binder composition from step a to an excess of glycated compound affixed to a solid support under conditions which allow reaction of said unbound portion of said binder composition to a portion of said glycated compound affixed to a solid support thereby leaving a portion of said glycated compound affixed to a solid support unreacted with said unbound portion of said binder composition;
c) reacting the unreacted portion of said glycated compound affixed to a solid support from step b with a detecting agent; and
d) detecting said detecting agent.

5,110,746
METHOD FOR THE DETERMINATION OF ALBUMIN IN BIOLOGICAL FLUIDS
Howard Grey, Geneva; Ciaran Mangan, Onex, both of Switzerland; Jean Brochot, St. Julien En Genevois, France, and Iqbal Siddiqi, Villette, Switzerland, assignors to Pharmacia Diagnostics Inc., Fairfield, N.J.
PCT No. PCT/US88/01328, § 371 Date Dec. 22, 1988, § 102(e) Date Dec. 22, 1988, PCT Pub. No. WO88/08533, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 22, 1988, Ser. No. 299,939
Claims priority, application European Pat. Off., Apr. 22, 1987, 87810253.2
Int. Cl.[5] G01N *33/50*
U.S. Cl. 436—88 **15 Claims**

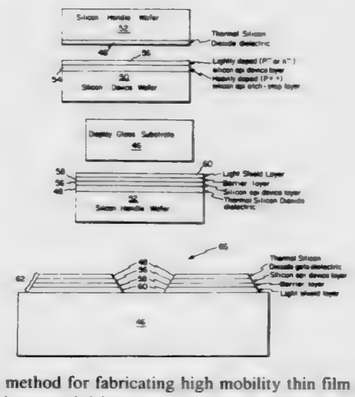
1. A method for the quantitative determination of serum albumin in biological fluids even in the presence of globulins, comprising a first step of reacting a sample of serum with an excess of a halogeno-aromatic reagent in which at least one halogen atom is displaceable by the protein and the reaction leads to the formation of a protein/reagent complex; a second step of measuring the rate of halide ion liberation by an ion selective electrode; and a third step of computing the measured rate data with other similar data from the same reaction performed with calibrating amounts of albumin, such computation providing results on said determination.

5,110,747
DIESEL PARTICULATE MONITOR
Harvey Pataschnick, and Georg Rupprecht, both of Voorheesville, N.Y., assignors to Rupprecht & Patashnick Company, Inc., Albany, N.Y.
Filed Nov. 13, 1990, Ser. No. 612,562
Int. Cl.[5] G01N *15/00, 21/76, 33/22*
U.S. Cl. 436—133 **32 Claims**



1. A method of determining particulate concentration of diesel exhaust comprising the steps of:
filter diesel exhaust to separate and collect particulate on a high efficiency filter;
measuring the amount of exhaust filtered;
exposing the filtered particulate to oxygen;
heating the filtered particulate to oxidize carbon within the particulate to carbon dioxide;
circulating resultant carbon dioxide through a closed measurement loop;
measuring the level of the resultant carbon dioxide within the closed measurement loop to arrive at a resultant level of carbon; and
calculating the particulate concentration by comparing the level of carbon with the amount of exhaust measured.

5,110,748
METHOD FOR FABRICATING HIGH MOBILITY THIN FILM TRANSISTORS AS INTEGRATED DRIVERS FOR ACTIVE MATRIX DISPLAY
Kalluri R. Sarma, Mesa, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.
Division of Ser. No. 676,998, Mar. 28, 1991. This application Jul. 22, 1991, Ser. No. 733,922
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—51 **3 Claims**



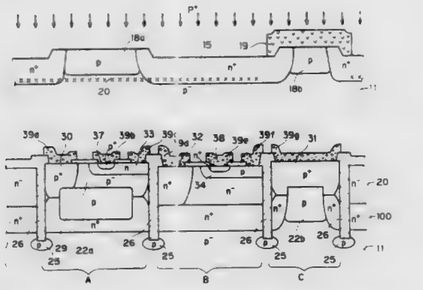
1. A method for fabricating high mobility thin film transistors as integrated drivers on a substrate, comprising:
growing a silicon dioxide layer on a first silicon wafer;
growing a doped silicon etch-stop layer on a second silicon wafer;
growing a silicon epitaxy layer on the silicon etch-stop layer;
bonding the first and second silicon wafers together at the silicon dioxide layer and the silicon epitaxy layer;
etching away the second silicon wafer;
etching away the silicon etch-stop layer;
depositing a barrier layer on the silicon epitaxy layer;
depositing a first light shield layer on the barrier layer;
bonding a glass substrate to the first light shield layer of the first silicon wafer;
etching away the first silicon wafer; and
etching regions of the silicon dioxide layer, the silicon epitaxy layer, the barrier layer and the first light shield layer to form a plurability of islands, situated on the glass substrate.

5,110,749
METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE
Tatsuhiko Ikeda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 13, 1991, Ser. No. 714,723
Claims priority, application Japan, Jun. 22, 1990, 2-164604
Int. Cl.[5] H01L *21/265, 29/70*
U.S. Cl. 437—26 **17 Claims**

1. A method for manufacturing a semiconductor device, comprising the steps of:
(a) preparing a first conductivity type semiconductor substrate with relatively low impurity concentration;
(b) forming second conductivity type first and second semiconductor regions with relatively high impurity concentration on the surface of said semiconductor substrate and

a first conductivity type third semiconductor region with relatively high impurity concentration on the surface of said semiconductor substrate sandwiched between said first and second semiconductor regions;

(c) implanting second conductivity type impurities at a range of reaching an interface of said third semiconductor region and said semiconductor substrate so as to extend over said first and second semiconductor regions;



(d) diffusing said impurities to form a second conductivity type fourth semiconductor region connected to said first and second semiconductor regions between said third semiconductor region and said semiconductor substrate; and

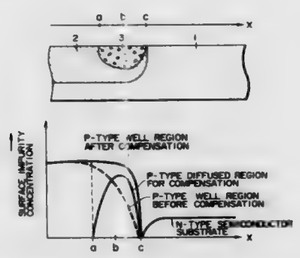
(e) forming a first conductivity type buried layer by depositing a second conductivity type semiconductor layer with relatively low impurity concentration on an entire top surface to bury said third semiconductor region.

5,110,750

SEMICONDUCTOR DEVICE AND METHOD OF MAKING THE SAME

Munehiro Yoshida, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Aug. 2, 1990, Ser. No. 561,608
Claims priority, application Japan, Aug. 8, 1989, 1-203771
Int. Cl.[5] H01L *21/266*
U.S. Cl. 437—27 **12 Claims**



1. A method of increasing a concentration of an impurity at the periphery of a well region in a semiconductor device comprising the steps of:

preparing a semiconductor substrate of a first conductivity type;

selectively introducing an impurity of a second conductivity type into said semiconductor substrate to provide at least one first well region of the second conductivity type therein, the second conductivity type being opposite from the first conductivity type; and

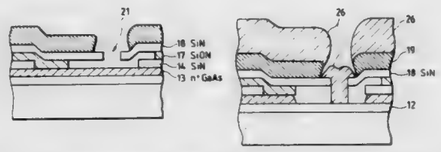
selectively introducing an impurity of the second conductivity type into a peripheral portion of said at least one first well region where the impurity concentration is less than the impurity concentration at the center of the at least one first well region, thereby increasing the impurity concentration of the second conductivity type at said peripheral portion of the at least one first well region to obtain a uniform surface impurity concentration between the peripheral portion and the center of said at least one first well region.

5,110,751

METHOD OF MANUFACTURING A COMPOUND SEMICONDUCTOR DEVICE

Yoshikazu Nakagawa, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Feb. 20, 1991, Ser. No. 658,218
Claims priority, application Japan, Feb. 26, 1990, 2-45225
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—40 **7 Claims**



1. A manufacturing process of a compound semiconductor device, comprising:

the first step of forming successively a first compound semiconductor layer, a second compound semiconductor layer for a source and a drain region, and a first structural layer on a semiconductor substrate;

the second step of forming a first resist pattern having a first opening on the first structural layer;

the third step of etching an area of the first structural layer that is exposed through the first opening with the first resist pattern being used as a mask to thereby expose the second semiconductor layer, and thereafter removing the first resist pattern;

the fourth step of forming successively a second structural layer and a third structural layer on the exposed area of the second semiconductor layer and the entire first structural layer, the second structural layer being dissoluble by a particular etchant and the third structural layer being less dissoluble by the particular etchant than the second structural layer;

the fifth step of forming on the third structural layer a second resist pattern having a second opening that is located over the etched area of the first structural layer and closer to the source region than to the drain region;

the sixth step of etching the second and third structural layers with the second resist pattern being used as a mask to thereby expose the second semiconductor layer through a third opening of the third structural layer, and thereafter removing the second resist pattern;

the seventh step of side-etching the second structural layer with the particular etchant through the third opening of the third structural layer to produce a fourth opening in the second structural layer;

the eighth step of etching the exposed area of the second semiconductor layer through the fourth opening of the second structural layer to thereby expose the first semiconductor layer and to form the source and drain regions in the second semiconductor layer; and

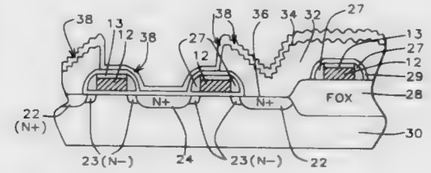
the ninth step of vapor-depositing a gate metal vertically on the exposed area of the first semiconductor layer.

5,110,752

ROUGHENED POLYSILICON SURFACE CAPACITOR ELECTRODE PLATE FOR HIGH DENSITY DRAM

Chih-Yuan Lu, Taipei, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jul. 10, 1991, Ser. No. 727,873
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—47 **17 Claims**



1. A method to produce a roughened surface capacitor fabricated on a monocrystalline semiconductor substrate comprising:

depositing a thin first polycrystalline silicon layer to form a first capacitor plate on a particularly completed DRAM over a base insulating layer and a contact opening exposing said substrate;

doping said first polycrystalline silicon layer with an impurity for semiconductors;

depositing a thin layer of a metal capable of forming a slicide over the surface of said first layer;

heating the resultant composite layer at a temperature to cause silicidation for a time sufficient to preferentially react with grains versus grain boundaries and to grow silicon grain crystals on the surfaces to thereby producing a roughened surface;

removing the metal silicide from the resultant roughened composite layer with a suitable etchant;

depositing a thin insulating layer to form a capacitor dielectric layer over the surface of the roughened layer; and

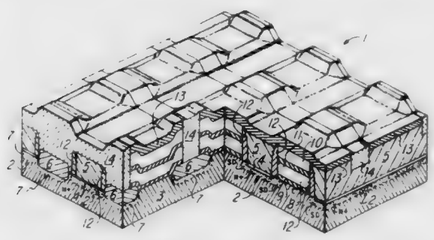
depositing a second thin polycrystalline silicon layer over said thin insulating layer to form the second capacitor plate.

5,110,753

CROSS-POINT CONTACT-FREE FLOATING-GATE MEMORY ARRAY WITH SILICIDED BURIED BITLINES

Manzur Gill, Rosharon, and David J. McElroy, Rosenberg, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 269,838, Nov. 10, 1988, Pat. No. 5,025,494.
This application Sep. 4, 1990, Ser. No. 576,887
Int. Cl.[5] H01L *21/70, 27/00*
U.S. Cl. 437—52 **20 Claims**



1. A method for making a non-volatile memory cell array including bitlines and wordlines in a face of a semiconductor substrate of first conductivity type, comprising the steps of:

forming thick field oxide regions with underling channel stop regions in said face;

growing a gate oxide layer on said face;

applying a first conductive layer on said face;

applying a second conductive layer on said face overlying and insulated from said first conductive layer by an interlevel dielectric layer;

forming a protective layer over said second conductive layer;

patterning said protective layer and forming control- and floating-gate strips such that said strips are substantially centered on said field oxide regions and such that said strips extend over said field oxide regions;

implanting an impurity material of second conductivity type to form conductors parallel to and adjacent to said strips;

siliciding said conductors;

forming a first insulating oxide in the space between said control- and floating-gate strips and over said conductors;

removing a part of said first insulating oxide and substantially all of said protective layer to form a surface substantially planar including the upper surface of said second conductive layer;

applying a third conductive layer to said substantially planar surface; and

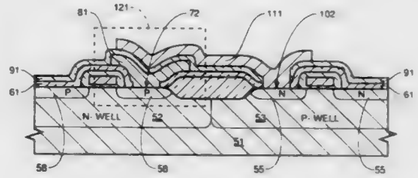
patterning said third conductive layer and etching through said third conductive layer and said strips to form wordlines, control gates and floating gates from said strips while leaving said conductors protected by said first insulating oxide, wherein said wordlines, control gates and floating gates are substantially centered between said thick field oxide regions and extend over a part of adjacent said thick field oxide regions.

5,110,754

METHOD OF MAKING A DRAM CAPACITOR FOR USE AS AN PROGRAMMABLE ANTIFUSE FOR REDUNDANCY REPAIR/OPTIONS ON A DRAM

Tyler A. Lowrey; Kevin G. Duesman, and Eugene H. Cloud, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Oct. 4, 1991, Ser. No. 771,688
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **12 Claims**



1. A process to form a programmable 3-dimensional antifuse element in a dynamic random access memory fabricated on a starting substrate, said process comprising:

(a) forming a isolative dielectric layer over an existing surface of said starting substrate, said starting substrate surface having first and second conductors therein;

(b) masking and etching a first buried contact opening thereby exposing a portion of said first conductor;

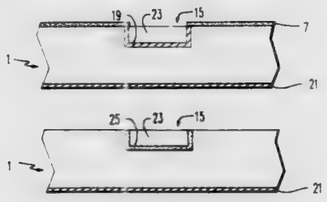
(c) placing a first conductive material superjacent said isolative dielectric layer and said first conductor's xposed portion thereby forming a first buried contact between said first conductive material and said first conductor's exposed portion;

(d) patterning said first conductive material thereby leaving a patterened portion of said first conductive material aligned about said first buried contact;

(e) forming a dielectric layer superjacent said patterened first conductive material and said isolative dielectric layer;

(f) masking and etching a second buried contact opening thereby exposing a portion of said second conductor;
(g) placing a second conductive material superjacent said dielectric layer and said second conductor's exposed portion thereby forming a second buried contact between said second conductive material and said second conductor's exposed portion; and
(h) patterning said second conductive material thereby leaving a patterned portion of said second conductive material aligned about said contact and extending to and overlying said first conductive material, said patterned first conductive material, the portion of said patterned second conductive material overlying said first patterned conductive material and the portion of said dielectric residing therebetween forming said programmable 3-dimensional antifuse structure.

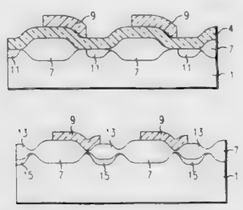
5,110,755
PROCESS FOR FORMING A COMPONENT INSULATOR ON A SILICON SUBSTRATE
Li-Shu Chen, Ellicott City; Rathindra N. Ghoshtagore, Columbia; Alfred P. Turley, Ellicott City, and Louis A. Yannone, Pasadena, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jan. 4, 1990, Ser. No. 460,703
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—62 **23 Claims**



1. A process for forming an insulating layer of material in a semiconductive substrate around the site of a semiconductor device in the substrate, wherein said substrate is formed from an oxidizable semiconductor material, comprising the sequence of steps of:
forming a recess on a top surface of said substrate that encompasses said site;
depositing dopant atoms on the surface of the recess while heating said substrate to form a doped layer on said recess surface;
filling said recess with the same type of semiconductive material that forms said substrate to form a device island;
anodizing said site so that said doped layer is formed into a porous layer, and
oxidizing said porous layer into an insulating layer.

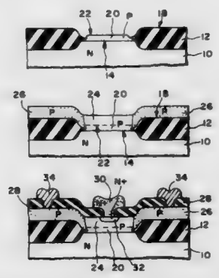
5,110,756
METHOD OF SEMICONDUCTOR INTEGRATED CIRCUIT MANUFACTURING WHICH INCLUDES PROCESSING FOR REDUCING DEFECT DENSITY
Richard W. Gregor, and Chung W. Leung, both of Allentown, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jul. 3, 1991, Ser. No. 725,706
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—70 **4 Claims**

1. A method of fabricating a semiconductor integrated circuit comprising:
oxidizing selected portions of a substrate to form first oxide regions;
forming silicon nitride regions which cover a substantial portion of the first oxide regions and expose a substantial portion of said substrate, said substrate having an oxide surface, said silicon nitride regions having a thickness approximately equal to the thickness of said oxide surface;
ion implanting into the substrate between said silicon nitride regions;



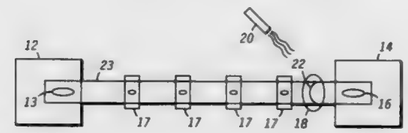
annealing; and
oxidizing said exposed substrate regions to form second oxide regions.

5,110,757
FORMATION OF COMPOSITE MONOSILICON/POLYSILICON LAYER USING REDUCED-TEMPERATURE TWO-STEP SILICON DEPOSITION
Margareth C. Arst, Palo Alto; Teh-Yi J. Chen, Cupertino; Kenneth N. Ritz, Santa Clara, and Shailesh S. Redkar, Mountain View, all of Calif., assignors to North American Philips Corp., New York, N.Y.
Filed Dec. 19, 1990, Ser. No. 630,140
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—89 **25 Claims**



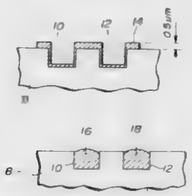
1. A method of forming a semiconductor structure from a body comprising a monocrystalline silicon region and an adjoining dielectric region, the method comprising the steps of:
performing a silicon deposition at an average body temperature less than or equal to 950° C. using a first silicon source to form a first monocrystalline silicon layer on an exposed major surface of the monocrystalline silicon region without simultaneously depositing substantially any silicon on an adjacent exposed major surface of the dielectric region; and
performing a silicon deposition at an average body temperature less than or equal to 950° C. using a second silicon source of different chemical composition than the first silicon source to form a second monocrystalline silicon layer on an exposed surface of the first monocrystalline silicon layer and to simultaneously form a polycrystalline silicon layer on the exposed major surface of the dielectric region.

5,110,758
METHOD OF HEAT AUGMENTED RESISTOR TRIMMING
Ira E. Baskett, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 3, 1991, Ser. No. 709,060
Int. Cl.[5] H01L *21/14, 21/306, 21/326*
U.S. Cl. 437—171 **16 Claims**



1. A method of heat augmented resistor trimming, comprising:
providing a resistor having a first end and a second end as a component of an integrated circuit;
contacting the first end by means of a first metallic contact means located proximate to the first end;
contacting the second end by means of a second metallic contact means located proximate to the second end;
selectively heating the resistor to reduce the level of electrical current required to cause metal to migrate from the first end toward the second end;
migrating metal from the first metallic contact means toward the second metallic contact means by application of an electric current in a predetermined direction between the first contact means and the second contact means thereby increasing the conductivity between the first metallic contact means and the second metallic contact means; and
stopping the flow of electrical current when a desired conductivity between the first metallic contact means and the second metallic contact means is obtained.

5,110,759
CONDUCTIVE PLUG FORMING METHOD USING LASER PLANARIZATION
Ryoichi Mukai, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 452,495, Dec. 19, 1989, abandoned.
This application Jul. 26, 1991, Ser. No. 737,910
Claims priority, application Japan, Dec. 20, 1988, 63-325059
Int. Cl.[5] H01L *21/268*
U.S. Cl. 437—173 **28 Claims**



1. A conductive plug forming method for forming conductive plugs in via holes of an insulating layer having a main surface, comprising the steps of:
providing an insulator layer having a plurality of via holes extending thereinto from said main surface, each via hole being separated relatively to another via hole of the plurality thereof by a respective, intervening portion of said main surface;
forming a conductor layer on the main surface of the insulator layer, only in the vicinity of said plurality of via holes including each said intervening portion, the periphery of said conductor layer defining a boundary encompassing therewithin said plurality of via holes and the total volume of conductor material of the conductor layer being determined in accordance with the total of the respective, individual volumes of the plurality of via holes encompassed within the boundary; and
melting the conductor layer by irradiating said conductor layer with an energy beam, the conductor layer having a predetermined volume of conductor material within said boundary relative to the total volume of said plurality of adjacent via holes such that, when melted, the volume of conductor material within said boundary thereof and in the vicinity of said plurality of adjacent via holes flows in its entirety from said main surface of said insulator layer, toward and into said plurality of via holes within said boundary, and forms respective plugs in said plurality of via holes and none of said conductor material of said conductor layer remains on said main surface.

5,110,760
METHOD OF NANOMETER LITHOGRAPHY
David S. Y. Hsu, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 28, 1990, Ser. No. 589,758
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—180 **21 Claims**



1. A method for fabricating a vertical metallic structure having nanometer linewidths on a substrate, comprising the steps of:
providing a substrate having at least one buttress on a first horizontal surface, said buttress having horizontal and vertical surfaces;
depositing a metallic layer formed by thermal decomposition of a volatile metal-containing precursor gas, selected from the group consisting of metal carbonyls and molecules including a metal coordination compound including PF_3 ligands and a metal, in a gaseous mixture consisting essentially of said precursor gas and a carrier gas on said horizontal and vertical surfaces of said buttress and on said substrate horizontal first surface, said precursor gas having a partial pressure of less than 10^{-5} Torr and said carrier gas having a partial pressure of less than 10^{-4} Torr, said substrate being at a temperature of about 230° C. to about 350° C. during said deposition;
removing said metallic layer from said horizontal surface of said buttress and said substrate horizontal first surface; and
etching said substrate so as to remove said buttress and leave said metallic layer deposited on said vertical surface of said buttress.

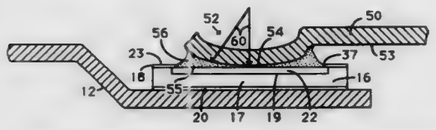
5,110,761
FORMED TOP CONTACT FOR NON-FLAT SEMICONDUCTOR DEVICES
Martin Kalfus, and Eugene L. Foutz, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Division of Ser. No. 243,363, Sep. 9, 1988, Pat. No. 5,001,545.
This application Feb. 12, 1990, Ser. No. 478,852
Int. Cl.[5] H01L *23/50*
U.S. Cl. 437—182 **5 Claims**

1. A method of forming a semiconductor device comprising:
providing a semiconductor die having opposed first and second faces, wherein the second face has thereon at least one bonding location at least partially enclosed by another

region having an upper surface whose height above the second face exceeds the height of the bonding location;

providing lead means having a first mounting portion for mounting the die and a second bonding portion for bonding to the bonding location, wherein the bonding portion of the lead means is curved in at least one direction;

assembling the lead means and the semiconductor die so that the curved bonding portion of the lead means faces the bonding location on the die with the curve of the bonding



portion oriented so that a central part of the curved bonding portion is closer to the bonding location than a peripheral part of the curved bonding portion and so that no part of the bonding portion touches the another region; and then

bonding the curved bonding portion to the bonding location by means of liquefiable electrically conductive attachment material which contacts the bonding location without extending substantially on the upper surface of the another region.

5,110,762

MANUFACTURING A WIRING FORMED INSIDE A SEMICONDUCTOR DEVICE

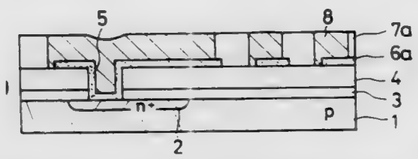
Moriya Nakahara; Yasuyuki Saito; Kenichi Shirai, all of Yokohama; Yasushi Itabashi, Tokyo, and Takashi Turugai, Kitagami, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 7, 1989, Ser. No. 376,655

Claims priority, application Japan, Jul. 7, 1988, 63-169654; Dec. 19, 1988, 63-318636

Int. Cl.[5] H01L *21/44*

U.S. Cl. 437—189 **4 Claims**



1. A method of manufacturing semiconductor devices, comprising the steps of:

preparing a semiconductor substrate, on the surface of which is formed a first insulating layer having a contact hole;

forming an electroconductive base layer in a desired wiring pattern on the first insulating layer and on the semiconductor substrate in the contact hole;

forming a second insulating layer on the first insulating layer except on an area of the desired wiring pattern defined by the base layer; and

growing a wiring layer selectively only on the base layer up to practically the same level as the surface of the second insulating layer, whereby the wiring layer is formed in the desired wiring pattern.

5,110,763

PROCESS OF FABRICATING MULTI-LEVEL WIRING STRUCTURE, INCORPORATED IN SEMICONDUCTOR DEVICE

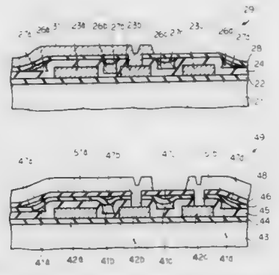
Yasuhiko Matsumoto, Shizuoka, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jan. 22, 1991, Ser. No. 643,891

Claims priority, application Japan, Jan. 29, 1990, 2-18447

Int. Cl.[5] H01L *21/44, 21/48*

U.S. Cl. 437—195 **16 Claims**



1. A process of fabricating a multi-level wiring structure on a semiconductor substrate covered with a lower insulating film, comprising the steps of:

a) forming lower-level wiring strips on said lower insulating film;

b) covering said lower-level wiring strips and exposed portions of said lower insulating film with a first intermediate insulating film, valleys being formed between said lower-level wiring strips;

c) coating the entire surface with an organic glass film, said valleys being filled with said organic glass film;

d) removing said organic glass film except for pieces of said organic glass film in said valleys;

e) coating the entire surface with an inorganic glass film;

f) removing said inorganic glass film except for pieces of said inorganic glass film on said pieces of said organic glass film;

g) covering the entire surface with a second intermediate insulating film; and

h) forming upper-level wiring strips on said second intermediate insulating film.

5,110,764

METHOD OF MAKING A BEVELED SEMICONDUCTOR SILICON WAFER

Nobuyoshi Ogino, Musashino, Japan, assignor to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Division of Ser. No. 505,475, Apr. 6, 1990, Pat. No. 5,021,862. This application Jan. 16, 1991, Ser. No. 641,780

Claims priority, application Japan, Apr. 17, 1989, 1-97749

Int. Cl.[5] H01L *21/463*

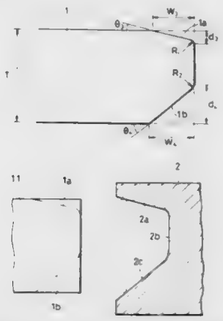
U.S. Cl. 437—224 **3 Claims**

1. A method of manufacturing a semiconductor silicon wafer usable for integrated circuits, comprising the steps of:

providing an unbeveled semiconductor silicon wafer; and

grinding a circumference of said wafer by means of a grindstone having a grinding surface configuration which conforms with a predetermined unsymmetrical circumferential edge beveling configuration of a semiconductor silicon wafer product to simultaneously form unsymmetrical beveled portions on front and back sides of said wafer

product, wherein said grinding step comprises grinding said front and back sides to an equal grinding width,



thereby applying all grinding force simultaneously on both said front and back sides of said wafer product.

5,110,765

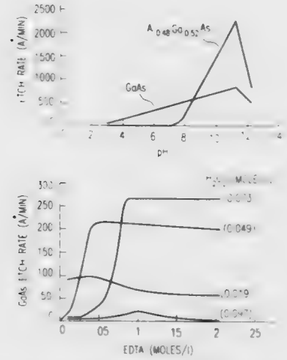
SELECTIVE ETCH FOR GAAS-CONTAINING GROUP III-V COMPOUNDS

Jaya Bilakanti, Mahwah, and Edward J. Laskowski, Scotch Plains, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 30, 1990, Ser. No. 621,700

Int. Cl.[5] H01L *21/302*

U.S. Cl. 437—225 **10 Claims**



1. A method of making a semiconductor device comprising fabricating a structure which includes a pair of Group III-V compound regions having different compositions,

at least one of said regions comprising GaAs, characterized in that

said structure is subjected to an etchant comprising a solution of an anion of EDTA and H_2O_2 with a pH in the range of approximately 4 to 6 so that said one region is selectively etched, wherein the concentration of EDTA in said solution is above a value in the range of 0.02–0.075 moles/liter when the concentration H_2O_2 in said solution is in the range of 0.049–0.073 moles/liter.

5,110,766

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE INCLUDING FORMING A FLATTENING LAYER OVER HOLLOWS IN A CONTACT HOLE

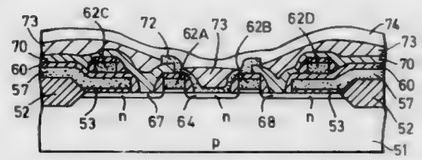
Satoshi Maeda; Shizuo Sawada, and Satoshi Shinozaki, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kangawa, Japan

Continuation of Ser. No. 225,494, Jul. 28, 1988, abandoned. This application Jul. 6, 1990, Ser. No. 549,632

Claims priority, application Japan, Jul. 28, 1987, 62-188241; Feb. 19, 1988, 63-36767

Int. Cl.[5] H01L *21/465*

U.S. Cl. 437—228 **1 Claim**



1. A method of manufacturing a semiconductor memory device which includes a conductive member, comprising the steps of:

forming an insulating layer over the conductive member;

forming a contact hole through the insulating layer by etching a predetermined part of the insulating layer;

forming a first conductive layer on the insulating layer and in the contact hole, said first conductive layer being formed with hollows therein;

forming a flattening layer on the first conductive layer;

reducing the surface level variation of the flattening layer by annealing the flattening layer to permit the flattening layer to remain only in the hollows of the first conductive layer;

exposing a part of the first conductive layer by etching the flattening layer; and

forming a second conductive layer on the flattening layer and the exposed part of the first conductive layer.

5,110,767

METHOD OF DEPOSITING A SUPERCONDUCTING FILM BY ELECTROPHORESIS

Arthur Tauber, Elberon; Robert D. Finnegan, West Long Branch; Michelle A. Dornath Mohr, Freehold, and Frank A. McBride, Browns Mills, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1991, Ser. No. 749,816

Int. Cl.[5] H01B *12/00;* **H01L** *39/12;* **B01D** *57/02*

U.S. Cl. 505—1 **1 Claim**

1. Method of depositing a superconducting film of $HoBa_2Cu_3O_{7-x}$ on a substrate of $YBa_2Cu_3O_{7-x}$ from a mixture containing stoichiometric amounts of Ho_2O_3, $BaCO_3$ and CuO powders including the steps of

(A) processing the powder mixture using milling and sintering techniques to an average particle size of about 2 to 3 μm,

(B) adding about three grams of the powder to about 25 cc of acetone,

(B) depositing the powder in the acetone by electrophoresis in electric fields of about 100 to about 1000 volta/cm for about 3 to about 15 minutes to obtain superconducting films having a thickness of 5 to 25 μm; and

(D) sintering and annealing in oxygen.

5,110,768
RAPID SOLID-STATE SYNTHESIS OF REFRACTORY MATERIALS

Richard B. Kaner, 1806 Benedict Canyon Dr., Beverly Hills, Calif. 90210; Philippe R. Bonneau, 10941 Strathmore Dr., #47, Los Angeles, Calif. 90024; Edward G. Gillan, 11565 Ohio Ave., #3, Los Angeles, Calif. 90025; John B. Wiley, 21260 E. Washington St., Walnut, Calif. 91789; Robert F. Jarvis, Jr., 6200 Edinger Ave., #622 Los Angeles, Calif. 92647, and Rande Treece, 11811 Venice Blvd., #228, Los Angeles, Calif. 90025

Filed Jan. 28, 1991, Ser. No. 647,380
Int. Cl.[5] C04B *35/52, 35/58*
U.S. Cl. 501—1 **1 Claim**

1. A process for producing a refractory material having the form TB_o comprising the steps of:

a. mixing a first salt having the form TX_n and a second salt having the form A_mB with the stoichiometric ratio of said second salt to said first salt being n/m in a container where T is selected from the group consisting of transition metals carbon, silicon, germanium, tin and lead, X is selected from the halide group consisting of fluorine, chlorine, bromine and iodine, A is selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, beryllium, magnesium, calcium, strontium and barium, B is a base selected from the group consisting of nitrogen, phosphorus, arsenic, antimony, bismuth, carbon, silicon, germanium, tin and lead, subscript m and subscript n are integers and subscript o is a fraction;

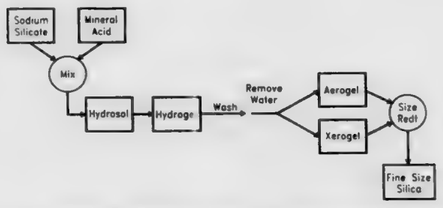
b. igniting said mixture of said first and second salts whereby said refractory material is produced along with byproducts having forms nAX and (n/m-o)B; and

c. separating said refractory material from said byproducts.

5,110,769
INORGANIC HYDROGEL FLATTING AGENTS

William A. Welsh, Highland, and Stephen R. Schmidt, Silver Spring, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 310,125, Feb. 15, 1989, abandoned. This application Oct. 26, 1990, Ser. No. 604,389
Int. Cl.[5] C03C *3/076*
U.S. Cl. 501—12 **4 Claims**



1. A process for the production of a flatting agent comprising milling a hydrous inorganic oxide hydrogel while maintaining a volatiles content of at least 40 weight percent, and recovering an inorganic hydrogel flatting agent having a pore volume of at least 1.0 ml/g, an average particle size in the range 1 to 10 microns and a particle size distribution such that when the inorganic hydrogel flatting agent is dispersed in a coating, the fineness of grind is at least 4.75 on a Hegman scale.

5,110,770
CERAMIC CUTTING TOOL MATERIAL WITH IMPROVED TOUGHNESS

Nils G. L. Brandt, Solna, and Anders G. Thelin, Vällingby, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

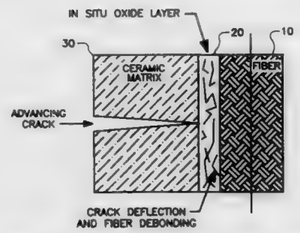
Continuation of Ser. No. 201,737, Jun. 3, 1988, abandoned. This application Jun. 28, 1991, Ser. No. 723,241
Claims priority, application Sweden, Jun. 9, 1987, 8702390
Int. Cl.[5] C04B *35/56*
U.S. Cl. 501—89 **4 Claims**

1. A single crystal disc reinforced ceramic cutting tool material characterized by increased toughness behavior in metal cutting applications consisting essentially of a composite defined by a matrix of alumina, 0–20 weight-% zirconia in a monoclinic or a tetragonal phase, 0–20 weight-% Cr_2O_3, and having 5–35 weight-% single crystal discs having a diameter of 5–50μm and a thickness of 0.5–8μm.

5,110,771
METHOD OF FORMING A PRECRACKED FIBER COATING FOR TOUGHENING CERAMIC FIBER-MATRIX COMPOSITES

Harry W. Carpenter, Northridge, and James W. Bohlen, Fountain Valley, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Mar. 13, 1991, Ser. No. 669,132
Int. Cl.[5] C04B *35/76*
U.S. Cl. 501—95 **14 Claims**



1. A method of producing a ceramic fiber/ceramic matrix composite having a precracked fiber coating, comprising:

depositing a precursor oxidizable coating on ceramic fibers;

infiltrating said fibers with a ceramic matrix to form a ceramic fiber/ceramic matrix composite;

after the formation of said composite, oxidizing said coating, whereby to form plural microcracks in the oxidized coating.

5,110,772
FABRICATION OF DENSE Si_3N_4 CERAMICSS USING CAO-TiO_2-SiO_2 ADDITIVES

Frederick J. Parker, Columbia, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Aug. 30, 1990, Ser. No. 575,102
Int. Cl.[5] C04B *35/48*
U.S. Cl. 501—97 **12 Claims**

1. A sintered silicon nitride composition comprising silicon nitride and intergranular material consisting essentially of CaO, TiO_2, and SiO_2in relative proportions falling in a region defined by composition points

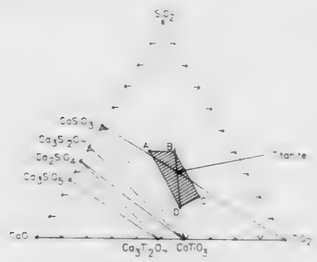
A. 35 CaO—25 TiO_2—40 SiO_2,

B. 25 CaO—35 TiO_2—40 SiO_2,

C. 25 CaO—55 TiO_2—20 SiO_2, and

D. 35 CaO—50 TiO_2—15 SiO_2

on a ternary CaO—TiO_2—SiO_2 composition diagram having proportions as wt. %, said region including points ABCD and



the lines connecting said points, said intergranular material forming about 2–15 wt. % of said composition.

5,110,773
METHOD FOR THE PRODUCTION OF BETA-SIALON BASED CERAMIC POWDERS

José S. M. Corral; Salvador De Aza, both of Madrid; Francisco M. Poyato, Alcala De Henares; Francisco J. Valle Fuentes, Madrid; Isabel O. Miranda, Madrid; Rafael M. Caseres, Madrid, and Paz C. Martinez, Madrid, all of Spain, assignors to Union Explosivos Rio Tinto, S.A., Madrid, Spain

Continuation of Ser. No. 185,907, Apr. 25, 1988, abandoned. This application Nov. 22, 1989, Ser. No. 440,781
Claims priority, application Spain, Apr. 28, 1987, 8701257
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—98 **5 Claims**

1. A process for producing β′-sialon ceramic compounds having a formula $Si_{6-z}Al_zO_zN_{8-z}$, where z=2.7 to 4, comprising the steps of:

(a) providing a starting a material consisting of a premullitic material having the formula

$$\tfrac{1}{3}(3Al_2O_3.2SiO_2)+(4/3-n)SiO_2,$$

said premullitic material being formed by treating a premullite having a formula of $\frac{1}{3}(3Al_2O_3.2SiO_2)+4/3SiO_2$ with a strong alkali to remove some of the SiO_2, where n equals the number of moles eliminated by the strong alkali, where the molar ratio of Al_2O_3 to SiO_2 in the premullitic material ranges between 0.5 and 1.5, and where the premullitic material has a specific surface ranging from greater than 50 m^2/g to 400 m^2/g and has a high degree of porosity;

(b) finely grinding said premullitic material to a size of 10 μm or smaller;

(c) homogenizing said finely ground premullitic material with finely ground carbon and without the addition of any pore inducing agents;

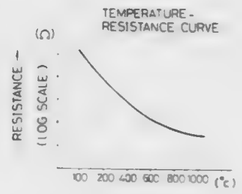
(d) forming said mixture of finely ground premullitic material and said finely ground carbon into a shape; and

(e) heating said shaped mixture in the presence of nitrogen.

5,110,774
HOMOGENEOUS SOLID SOLUTION MATERIAL AND METHOD OF MANUFACTURING THE SAME

Atsushi Ogura, Kanagawa, Japan, assignor to Atsushi Ogura, Kanagawa, Japan

Continuation-in-part of Ser. No. 259,400, Oct. 18, 1988, Pat. No. 4,998,648, which is a continuation of Ser. No. 930,333, Nov. 12, 1986, abandoned. This application Aug. 9, 1990, Ser. No. 565,373
Claims priority, application Japan, Nov. 29, 1985, 60-267199; Jun. 13, 1986, 61-136162
The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.
Int. Cl.[5] C04B *35/26*
U.S. Cl. 501—126 **8 Claims**

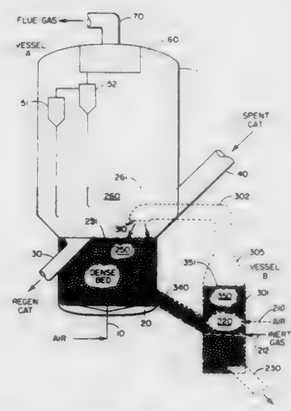


1. A metal oxide-ceramic material consisting essentially of a homogeneous solid solution of a precipitated metal oxide and a ceramic prepared by melting and cooling metal oxide-ceramic composite particles having a ceramic particle with a surface film formed of a precipitated crystalline metal oxide reacted and precipitated in a reduction reaction of complex metal ions.

5,110,775
TWO STAGE COMBUSTION PROCESS FOR CRACKING CATALYST REGENERATION

Hartley Owen, Belle Mead, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 28, 1990, Ser. No. 635,437
Int. Cl.[5] B01J *38/34, 38/36, 29/38;* **C10G** *11/18*
U.S. Cl. 502—43 **8 Claims**



1. A process for the two stage regeneration of a stream of coke containing particulates including coked fluidized catalytic cracking (FCC) catalyst from a cracking reactor comprising:

charging said stream of fluidized solids comprising coked

FCC catalyst to a primary regenerator vessel having a bubbling dense bed of fluidized solids and:
an inlet for said coked FCC catalyst;
an inlet for oxygen-containing regeneration gas in a lower portion of said bubbling dense bed,
an inlet within said bubbling dense bed for a flue gas and entrained catalyst stream from a secondary vessel;
an outlet in an upper portion of said primary vessel above said bubbling dense bed for flue gas removal from said primary vessel,
a regenerated catalyst outlet within said bubbling dense bed for removal of regenerated FCC catalyst, and
a lower outlet in a lower portion of said bubbling dense bed connective with a secondary regenerator vessel;
at least partially regenerating said coked FCC catalyst in said primary regenerator at FCC catalyst regeneration conditions including a temperature of 1100 to 1500 F. and a superficial vapor velocity of less than 5 fps and sufficient to maintain said coked FCC catalyst as a dense phase, bubbling fluidized bed of solids, to produce at least partially regenerated FCC catalyst;
removing regenerated FCC catalyst from said primary vessel regenerated catalyst outlet and recycling it to an FCC cracking reactor;
withdrawing from said primary vessel lower outlet a fluidized solids stream containing partially regenerated FCC catalyst and charging same to a secondary catalyst regenerator vessel having:
a fluidized solids inlet connective with the lower outlet of the primary regenerator,
an inlet for oxygen-containing regeneration gas in a lower portion of said secondary vessel,
a flue gas outlet in an upper portion of said secondary vessel connective with an immersed within said bubbling fluidized bed in said primary vessel, and
a fluidized solids outlet in a lower portion of said secondary vessel connective with said FCC cracking reactor;
regenerating in said secondary vessel said partially regenerated FCC catalyst at catalyst regeneration conditions including a higher temperature than said primary vessel, and a superficial vapor velocity at least 25% higher than the superficial vapor velocity in said primary vessel and sufficiently high to maintain a bed of fluidized solids in said secondary vessel and to entrain from said bed of fluidized solids at least a portion of the FCC catalyst charged to said secondary vessel, to produce a secondary vessel flue gas stream containing entrained, regenerated FCC catalyst;
recycling said flue gas and entrained regenerated FCC catalyst from said second vessel back to said bubbling fluidized bed in said primary vessel; and
removing fluidized solids withdrawn from said fluidized solids outlet of said secondary vessel and recycling same to said FCC reactor.

5,110,776

CRACKING CATALYSTS CONTAINING PHOSPHATE TREATED ZEOLITES, AND METHOD OF PREPARING THE SAME

Girish K. Chitnis, Chadds Ford, Pa., and Joseph A. Herbst, Turnersville, N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Filed Mar. 12, 1991, Ser. No. 667,853
Int. Cl.[5] B01J *29/08;* **C10G** *11/05*
U.S. Cl. 502—64 **36 Claims**

1. A process for preparing a zeolite containing catalyst for use in catalytic cracking, comprising:
(a) modifying a zeolite by treating the zeolite with a phosphate containing aqueous solution to form an aqueous mixture;
(b) directly combining said aqueous mixture containing phosphate modified zeolite with a matrix precursor to form a slurry; and
(c) spray drying said slurry to form a catalyst.

5,110,777

COPPER-CONTAINING ZEOLITES AND THEIR PREPARATION

Katsumi Kamiyama, Tokuyama, and Kazushige Igawa, Shinnanyo, both of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Division of Ser. No. 255,018, Oct. 7, 1988, Pat. No. 4,999,173. This application Jun. 14, 1990, Ser. No. 537,824
Claims priority, application Japan, Oct. 7, 1987, 62-251614; Oct. 7, 1987, 62-251615; Oct. 7, 1987, 62-251616
Int. Cl.[5] B01J *29/34*
U.S. Cl. 502—68 **11 Claims**

1. A copper-containing zeolite, produced by a process which consisting essentially of:
subjecting a zeolite having lattice spacings (d values) as indicated in the following Table as determined by powder X-ray diffraction to ion exchange with copper ions in an aqueous solution containing a water-soluble copper salt and ammonia:

Lattice spacing (d value)	Relative strength	Lattice spacing (d value)	Relative strength
11.1 ± 0.3	strong	4.60 ± 0.08	weak
10.0 ± 0.3	strong	4.25 ± 0.08	weak
7.4 ± 0.2	weak	3.85 ± 0.07	very strong
7.1 ± 0.2	weak	3.71 ± 0.05	strong
6.3 ± 0.2	weak	3.04 ± 0.03	weak
6.04 ± 0.2	weak	2.99 ± 0.02	weak
5.56 ± 0.1	weak	2.94 ± 0.02	weak
5.01 ± 0.1	weak		

4. The copper-containing zeolite according to claim **1**, wherein said ammonia is added in the form of ammonia water, hydrous ammonia compounds and aqueous solutions containing dissolved ammonia, and in an amount such that the mixture of the zeolite, water-soluble copper compound and ammonia has a pH of about 4 to 12.

11. The copper-containing zeolite according to claim **1**, which is in the form of a molding which further comprises a clay binder in the amount of 5 to 30 parts of binder per 100 parts of zeolite.

5,110,778

BORON ALUMINUM AND GALLIUM PERFLUORO ALKANESULFONATE AND RESINSULFONATE CATALYSTS

George A. Olah, 2252 Gloaming Way, Beverly Hills, Calif. 90210

Division of Ser. No. 920,329, Oct. 17, 1986, Pat. No. 4,721,559. This application Oct. 23, 1987, Ser. No. 111,546
Int. Cl.[5] B01J *31/02*
U.S. Cl. 502—168 **5 Claims**

1. A Friedel-Crafts catalyst comprising a Group III-B metal salt of one of a perfluorinated polymeric resinsulfonic acid, a polytrifluoroethylene-sulfonic acid, or a tetrafluoroethylene-trifluoroethylene-sulfonic acid copolymer.

5,110,779

POLYMER HYDROGENATION CATALYSTS

Dennis A. Hucul, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 294,452, Jan. 9, 1989, Pat. No. 5,028,665. This application May 7, 1991, Ser. No. 696,676
Int. Cl.[5] B01J *21/04, 21/12, 21/18, 23/40, 23/74*
U.S. Cl. 502—185 **5 Claims**

1. A catalyst comprising at least one Group VIII metal deposited on a porous support material, characterized in that said carrier has a pore size distribution such that at least 90% of the pore volume is defined by pores having diameters greater than 1000 angstroms and the ratio of metal surface area to carrier surface area is in the range from 0.07 to 0.75:1.

5,110,780

CARBON MONOXIDE OXIDATION CATALYST

Alan W. Peters, Rockville, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed May 31, 1990, Ser. No. 531,197
Continuation of Ser. No. 231,327, Aug. 12, 1988, abandoned.
Int. Cl.[5] B01J *21/04, 23/10*
U.S. Cl. 502—303 **7 Claims**

1. A carbon monoxide catalyst composition for use in fluid catalytic cracking processes comprising about 4 to 30 weight percent lanthana and about 50 to 1000 ppm platinum on an alumina substrate having a surface area of about 45 to 450 m^2/g, said catalyst being cerium free and having an average particle size of about 20 to 200 microns.

5,110,781

CATALYSTS

David C. Griffiths, Addlestone, and Brian Kneale, Knaphill, both of England, assignors to The British Petroleum Company p.l.c., London, England

Continuation of Ser. No. 203,010, Jun. 6, 1988, abandoned. This application Apr. 25, 1991, Ser. No. 691,678
Claims priority, application United Kingdom, Jun. 23, 1987, 8714661
Int. Cl.[5] B01J *21/04, 33/74*
U.S. Cl. 502—335 **5 Claims**

1. A process for the preparation of an alumina-based catalyst which comprises:
(a) selecting a gamma alumina catalyst having a bulk density of at least 0.6 g/m and a pore volume of less than 0.6 ml/g;
(b) heating the gamma alumina of (a) to a temperature of at least 1200° C. in the presence of a nickel-containing sintering agent in an amount to give at least 8% by weight of nickel and
(c) recovering a sintered alumina-based catalyst having a bulk greater than of the alumina of (a) and an attrition resistance as measured by attrition loss of less than 0.01% wt/hour.

5,110,782

PROCESS FOR PRODUCING PEROVSKITE-TYPE OXIDE CATALYST

Hatsuo Hirono, Nyuzen; Koichi Moriyama, Uozu; Hideo Fukui, Kurobe, and Ikuya Matsuura, Toyama, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Apr. 10, 1990, Ser. No. 507,601
Claims priority, application Japan, Apr. 25, 1989, 1-103354
Int. Cl.[5] B01J *23/10, 23/76, 37/03, 37/14*
U.S. Cl. 502—303 **9 Claims**

1. A process for producing a perovskite oxide catalyst consisting essentially of the steps of: providing a first aqueous solution containing a plurality of metal salts; providing a second aqueous solution containing a neutralizing compound for said plurality of metal salts; reacting said first aqueous solution with said second aqueous solution to cause coprecipitation of neutral salts; recovering said neutral salts; adding one or more organic substances selected from the group consisting of cellulose, polyvinyl acetate, polyethylene, polystyrene, polypropylene, polyvinyl alcohol, starch, gelatin and a saccharide to the coprecipitated salts to form a mixture of said organic substance(s) with coprecipitate salts; and firing said mixture to produce a perovskite oxide catalyst.

5,110,783

HYDROTREATING CATALYST AND METHOD FOR PREPARATION THEREOF

Hidefumi Yamaguchi; Hiroyuki Kiyofuji; Katsuhiro Shirono; Rinpei Tokuou, and Jun Fuchigami, all of Kitakyushu, Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan

Filed May 16, 1991, Ser. No. 701,266
Claims priority, application Japan, May 22, 1990, 2-132389
Int. Cl.[5] B01J *23/84, 37/03, 23/04*
U.S. Cl. 502—314 **4 Claims**

1. A hydrotreating catalyst comprising an alumina carrier support with a catalyst component thereon selected from Group VIB and Group VIII metals of the Periodic Table characterized in that the alumina carrier consists of aggregates of fibrous alumina particles having an average particle length (L) of 10–20 nm and at least a 35% portion of the fibrous alumina particles has a length in the range of said average particle length (L)±5 nm.

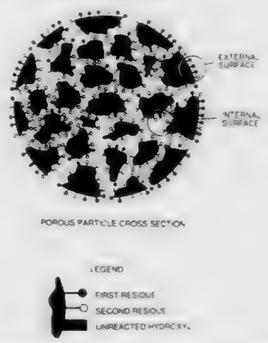
5,110,784

DUAL SURFACE POROUS MATERIAL

Dwight E. Williams; Thomas J. Tangney, both of Midland County, and Anthony Revis, Saginaw County, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 154,754, Feb. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 901,349, Aug. 28, 1986, abandoned, which is a continuation of Ser. No. 736,030, May 20, 1985, abandoned, which is a continuation of Ser. No. 598,091, Apr. 9, 1984, abandoned. This application Feb. 12, 1990, Ser. No. 479,133
Int. Cl.[5] B01J *20/32, 20/22;* **B01D** *15/08;* **B32B** *5/14*
U.S. Cl. 502—401 **90 Claims**

Dual Surface Material

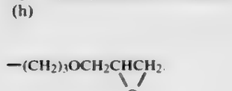


15. A composition of matter consisting of silylated porous material having an external zone which comprises the external surfaces of the porous material and having an internal zone which comprises the internal surfaces of the porous material which has been prepared by a method comprising
(I) contacting a hydroxyl-bearing porous material with less than or equal to two-thirds of the amount representing saturation coverage of a residue from silanes having rapidly reacting leaving groups, based on the hydroxyl content of the porous material, of a silane having rapidly leaving groups, said silane selected from a group consisting of
(i) disubstituted amidosilanes wherein the amidosilanes are selected from a group cosisting of:
(a) N,N-disubstituted amidosilanes having the general formula

$$(R)(R'')_aSi\{N(R''')CR'\}_b$$

and

(b) N,O-disubstituted aminosilanes having the general formula

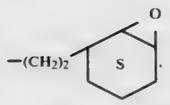


wherein in said formulae, R is selected from hydrogen, allyl, vinyl and Q wherein Q is selected from a group consisting of

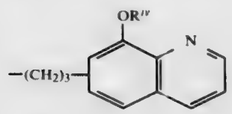
(a) alkyl groups having less than twenty carbon atoms,
(b) aryl groups having less than twenty carbon atoms,
(c) $-(CH_2)_2CF_3$,
(d) $-(CH_2)_3Cl$,
(e) $-(CH_2)_3SR^{iv}$,
(f) $-(CH_2)_3NR_2^{iv}$,
(g) $-(CH_2)_3N(R^{iv})(CH_2)_2N(R^{iv})_2$,
(h)



(i)



(j) $-(CH_2)_3OC(O)C(CH_3)=CH_2$,
(k)



and

(l) $-C_2H_4C_nF_{2n+1}$,

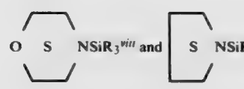
wherein n is at least 2; R'' is independently selected from methyl, ethyl and phenyl groups; R''' is selected from methyl, ethyl and phenyl groups; R' is a substituted or unsubstituted alkyl group of from 1 to 6 carbon atoms or hydrogen; R^{iv} is selected from methyl, ethyl and phenyl groups; a+b has a value of 3 and b does not have a value of zero;

(ii) substituted aminosilanes wherein the aminosilanes are selected from a group consisting of

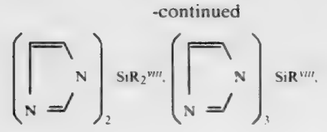
(a) N,N,N-trisubstituted aminosilanes having the formula $(R^{v})(R^{vi})_cSi(NR^{vii}_2)_d$ and

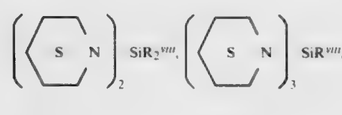
(b) heterocyclic aminosilanes, wherein the heterocyclic aminosilanes are selected from the group consisting of

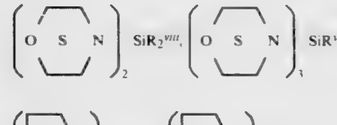


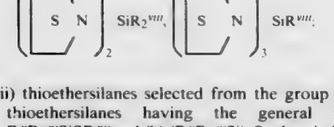


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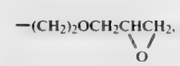




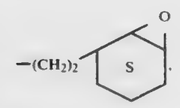


(iii) thioethersilanes selected from the group consisting of thioethersilanes having the general formula (a) $R^xR_2^{xi}SiSR^{xii}$ and (b) $(R^xR_2^{xi}Si)_2S$ wherein in said formulae, R^x is selected from a group consisting of hydrogen, allyl, vinyl and Q'' wherein Q'' is selected from a group consisting of

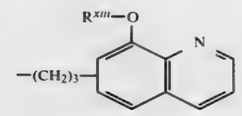
(a) alkyl groups having less than twenty carbon atoms,
(b) aryl groups having less than twenty carbon atoms,
(c) $-(CH_2)_2CF_3$,
(d) $-(CH_3)_3SR^{xiii}$,
(e) $-(CH_2)_3NR_2^{xiii}$,
(f) $-(CH_2)_3N(R^{xiii})(CH_2)_2NR^{xiii})_2$,
(g)



(h)



(i) $-(CH_2)_3OC(O)C(CH_3)=CH_2$,
(j)



and

(k) $-C_2H_4C_nF_{2n+1}$,

wherein n is at least 2; R^{xi} is independently selected from methyl, ethyl and phenyl groups; R^{xii} is independently selected from methyl, ethyl and phenyl groups, R^{xiii} is independently selected from alkyl groups having 1 to 6 carbon atoms and phenyl;

(II) allowing the mixture from (I) to react and form covalent bonds by reaction with the surface hydroxyl groups thereby predominantly treating the porous exterior surface;

(III) thereafter, contacting and mixing the treated porous material from (II) with a second silane, different than the silane of steps (I) and (II), for a period of time to allow the silane, or its silanol-bearing hydrolysis product, to diffuse into the interior of the porous material and covalently bond by reaction with hydroxyl groups on the interior surface of the porous material;

(IV) subsequently isolating the silulated porous material from the mixture of (III), wherein silulated porous material character exists when certain conditions exist, said conditions being selected from the group consisting of

$$\frac{\Gamma_1(E)}{\Gamma_1(A)} \geq 1.5,\ \Gamma_1 \geq 0.3 \text{ molecules/nM}^2 \text{ and } \Gamma_2(A) \geq 0.1 \text{ molecules/nM}^2 \quad (a)$$

$$\frac{\Gamma_1(E)}{\Gamma_1(A)} \geq 1.5 \text{ and } \Gamma_1(E) \geq 15\% \text{ of saturation of the surface of the porous material; and } \Gamma_2(A) \geq 5\% \text{ of saturation of the surface of the porous material} \quad (b)$$

wherein Γ_1 (E) is the external surface density in Molecules/nM^2 as inferred by a method which selectively analyzes the external surface such as Electron Spectroscopy for Chemical Analysis, and wherein Γ_1 (A) and Γ_2 (A) are like measurements of average surface density as measured by bulk analysis, and wherein subscripts 1 and 2 refer to the treated material of steps II and III, respectively.

5,110,785

COMPOSITION OF MATTER AND METHOD OF MAKING

Thomas B. Reed, 1810 Smith Rd., Golden, Colo. 80401, and William L. Mobeck, 3331 S. Monaco Pkwy., #B, Denver, Colo. 80222

Filed May 1, 1991, Ser. No. 694,355
Int. Cl.[5] B01J *20/24*
U.S. Cl. 502—404 **15 Claims**

1. A composition of matter comprising at least one woodlike particle having a cellular structure of a plurality of adjacent interconnected elongated tubular cell walls composed in part of hemicellulose that have been heated to a controlled selected temperature and for a time sufficient to convert at least a portion of the hemicellulose to an oil-like oleophilic, hydrophobic substance that forms on the internal and external surfaces of the cell walls to substantially reduce the weight of the cell walls and render the particle oleophilic and hydrophobic.

5,110,786

HEAT-SENSITIVE RECORDING MATERIAL

Naoto Arai, Ikeda; Nobuo Kanda, Neyagawa, and Masaharu Nojima, Amagasaki, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1990, Ser. No. 508,898
Claims priority, application Japan, Apr. 28, 1989, 1-109769
Int. Cl.[5] B41M *5/30*
U.S. Cl. 503—204 **6 Claims**

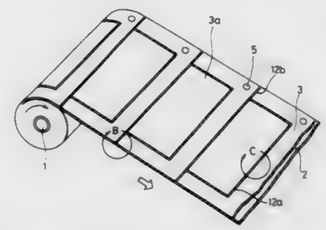
1. A heat-sensitive recording material comprising a recording layer formed on a substrate where said recording layer comprises a colorless or pale colored basic chromogenic material, a color developing material which develops a color by contacting with said chromogenic material, and a stabilizer, characterized in that said recording layer comprises at least one selected from the group consisting of 3-(N-methyl-N-cyclohexyl)amino-6-methyl-7-phenylaminofluoran, 3-diethylamino-6-methyl-7-phenylaminofluoran and 3-(N-ethyl-N-tetrahydrofurfuryl)amino-6-methyl-7-phenylaminofluoran together with 3-di(n-butyl)amino-6-methyl-7-phenylaminofluoran as said chromogenic material, and at least one selected from the group consisting of 1,1,3-tris(3-cyclohexyl-4-hydroxy-6-methylphenyl)butane, 1,1,3-tris(2-methyl-4-hydroxy-5-tert-butylphenyl)butane and 4,4'-cyclohexylidenedip henol as said stabilizer.

5,110,787

ROLL PAPER FOR THERMAL PRINTER

Yasuo Yukita; Masakazu Sone, both of Tokyo, and Hidehiko Funayama, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 611,503
Claims priority, application Japan, Nov. 16, 1989, 1-133167[U]
Int. Cl.[5] B41M *5/30*
U.S. Cl. 503—206 **5 Claims**



1. A roll paper for a thermal print in which a coloring paper having a synthetic paper, a heat-sensitive dye containing layer, and a peeling paper are wound as a roll shape, said peeling paper being affixed to the synthetic sheet by an adhesive material, comprising:

first cuts for defining a picture forming region of one frame on said coloring paper In order for said picture forming region to be peeled off from said peeling paper, said picture being formed on said synthetic paper when in the heat-sensitive dye is heated by the thermal head of said thermal printer; and

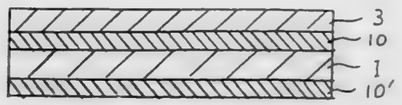
second cuts made completely across the entire width of said roll paper, in which said first and second cuts are repeatedly made at every said picture forming region in the length direction of said roll paper.

5,110,788

THERMAL TRANSFER IMAGE RECPETION PAPER

Shigeru Katayama; Hiroshi Matsumoto, and Tatuo Wada, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 411,284, Sep. 22, 1989, abandoned. This application Aug. 9, 1990, Ser. No. 564,943
Claims priority, application Japan, Sep. 22, 1988, 63-238115
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 **8 Claims**



1. Thermal transfer image reception paper comprising:

an image reception paper base material constituted by a core material and two sheets of synthetic paper provided on both sides of said core material, respectively;

a dyeable resin layer provided on at least one surface of said

image reception paper base material directly or through an intermediate layer; and wherein

each sheet of said synthetic paper has a single layer structure composed of a paper-like layer having fine pores.

5,110,789

SUPERCONDUCTIVE CERAMIC WIRE AND METHOD FOR MAKING SAME

Tetsuro Yamaguchi, Urawa; Takuo Takeshita, Omiya, and Sadaaki Hagino, Urawa, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

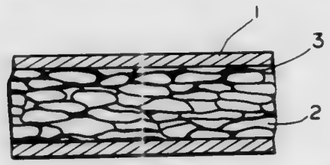
Filed Jul. 25, 1990, Ser. No. 559,379

Continuation of Ser. No. 237,580, Aug. 29, 1988, abandoned.

Claims priority, application Japan, Aug. 27, 1987, 62-213775

Int. Cl.[5] H01B *12/00*

U.S. Cl. 505—1 **8 Claims**



2. A superconducting ceramic wire which is obtained by:

(a) mixing powdery yttrium oxide, powdery barium carbonate, powdery copper monoxide at a molecular proportion of 1:4:6;

(b) making a compound having a composition of YBa2-Cu307 and a perovskite structure by heat-treating the powdery mixture;

(c) pulverizing the compound;

(d) mixing the pulverized compound with a binding material;

(e) heat-treating the mixture to obtain an elongated superconducting porous member consisting essentially of superconducting ceramic particles;

(f) making a layer of copper on the elongated member by chemical plating;

(g) soaking the copper-clad elongated member in molten lead so that between 5% and 40% by volume of lead is deposited between the superconducting porous ceramic particles;

(h) covering the lead-deposited elongated member with a copper sheath; and

(i) extending the lead-deposited elongated member covered with the copper sheath at a diametric reduction rate higher than 80%.

3. A superconducting ceramic wire comprising:

(a) a core including superconducting ceramic particles and lead filling the pores between the superconducting ceramic particles; and

(b) a metal sheath covering the core.

5,110,790

SUPERCONDUCTING THIN FILMS ON POTASSIUM TANTALATE SUBSTRATES

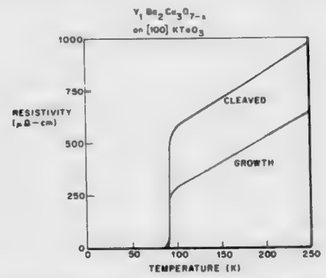
Roeland Feenstra, and Lynn A. Boatner, both of Oak Ridge, Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Nov. 10, 1988, Ser. No. 269,410

Int. Cl.[5] B32B *9/00*

U.S. Cl. 505—1 **13 Claims**

1. A composition for the lossless transmission of electrical current comprising a superconducting thin film epitaxially deposited on a oriented surface of a single crystal $KTa_{1-z}Nb_zO_3$ substrate, where z is 0 to 1, wherein said superconducting thin film is selected from the group consisting of $YBa_2Cu_3O_7$, $Y_2Ba_4Cu_8O_{20}$, a compound wherein a trivalent rare earth element replaces yttrium in compound $YBa_2Cu_3O_7$, and



a compound wherein scandium replaces yttrium in the compound $YBa_2Cu_3O_7$.

5,110,791

METHOD FOR PRODUCING OXIDE SUPERCONDUCTOR

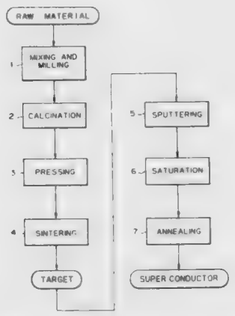
Seigen Ri, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 18, 1990, Ser. No. 584,345

Claims priority, application Japan, Sep. 18, 1989, 1-241573; Jan. 29, 1990, 2-016212

Int. Cl.[5] H01L *39/24*

U.S. Cl. 505—1 **19 Claims**



1. A method for producing an oxide superconductor including a first element, said method comprising the steps of:

(a) forming a layer on a substrate, said layer consists essentially of an A-Cu-O type compound, wherein A is a lanthanide element or a rare earth element, and said layer is deficient in at least the first element; and

(b) immersing said layer formed in step (a) into a solution containing a supplementary element which is the first element.

4. A method according to claim **1**, wherein said layer is formed by a sputtering method.

5,110,792

METHOD AND APPARATUS OF OPTICAL MODULATION USING SUPERCONDUCTIVE OXIDE MATERIAL

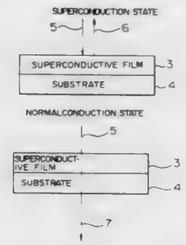
Takahiro Nakayama, Hitachi; Kunihiro Tamahashi, Mito; Moriaki Fuyama, Hitachi; Hiroyuki Minemura, Hitachi; Yoshio Sato, Hitachi; Nobuyoshi Tsuboi, Ibaraki, and Hiroaki Koyanagi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 197,965, May 24, 1988, abandoned. This application Nov. 3, 1989, Ser. No. 431,231

Claims priority, application Japan, May 25, 1987, 62-125868; May 25, 1987, 62-125869; Jun. 24, 1987, 62-155462; Jun. 24, 1987, 62-155463

Int. Cl.[5] H01B *12/00*; G02F *1/01*; G01K *7/00*; H01P *1/11*

U.S. Cl. 505—1 **34 Claims**



23. An optical modulation apparatus for producing modulated light, said apparatus comprising:

a superconductive oxide material having a T_c of at least 30° K., the superconductive oxide material having different optical properties depending upon whether the superconductive oxide material is in a superconductive state or not;

an external input device which generates a signal to be applied to said superconductive oxide material so that a superconduction-normalconduction transition is induced in said superconductive oxide material; and

a light source for generating an incident light to be applied to said superconductive oxide material.

5,110,793

ULTRA HIGH ENERGY CAPACITORS USING INTENSE MAGNETIC FIELD INSULATION PRODUCED BY HIGH-T_c SUPERCONDUCTING ELEMENTS FOR ELECTRICAL ENERGY STORAGE AND PULSED POWER APPLICATIONS

Dilip K. De, Winston-Salem, N.C., assignor to International Superconductor Corp., Riverdale, N.Y.

Filed Feb. 22, 1989, Ser. No. 314,432

Int. Cl.[5] H01F *36/00*; G11C *11/44*

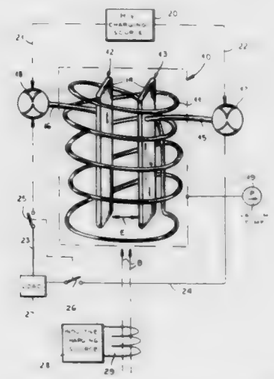
U.S. Cl. 505—869 **20 Claims**

1. A method of storing electrical energy for a prolonged period of time, comprising the steps of:

(a) electrically charging a pair of spaced-apart electrically conductive capacitor plates;

(b) positioning a high-critical-temperature superconductor so that upon energization thereof with an electric current a magnetic field is generated between said capacitor plates; and

(c) circulating an electric current in said high-critical-temperature superconductor to generate a magnetic field



between said capacitor plates of a field strength sufficient to prevent substantial loss of charge therefrom.

5,110,794

METHOD OF IMMUNIZATION WITH PARTIALLY CATIONIZED SUBSTANCES AND SAID PARTIALLY CATIONIZED SUBSTANCES

Jacob G. Michael, Cincinnati, Ohio, assignor to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 147,063, Jan. 22, 1988, which is a continuation-in-part of Ser. No. 9.234, Jan. 30, 1987. This application Mar. 16, 1990, Ser. No. 494,678

Int. Cl.[5] A61K *39/12*; C07K *3/00, 13/00*

U.S. Cl. 514—2 **24 Claims**

1. In a method of immunization of an animal against a protein-containing substance comprising administration of said protein-containing substance to the animal in an amount effective to induce an immune response to said protein-containing substance, the improvement consisting essentially of: modifying the protein containing substance through the covalent attachment of at least one agent selected from the group consisting of primary amines, secondary amines, tertiary amines, and ammonium groups, where

a) said modified protein-containing substance has an isoelectric point, as measured by isoelectric focusing in a polyacrylamide gel, of at least 0.5 units greater than the isoelectric point of the native, unmodified protein-containing substance, but not in excess of a value of about 9.3;

b) said modified protein-containing substance is essentially non-reactive at physiological pH; and

c) the immunological response of the animal to the modified protein-containing substance is greater than to the unmodified, native protein-containing substance.

5,110,795

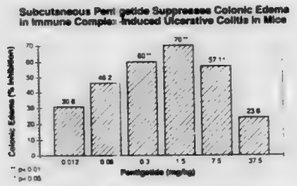
METHODS AND COMPOSITIONS FOR THE TREATMENT OF INFLAMMATORY BOWEL DISEASES AND CONDITIONS

Gary S. Hahn, Cardiff by the Sea, Calif., assignor to Immunetech Pharmaceuticals, San Diego, Calif.

Continuation-in-part of PCT/US87/03222, Dec. 9, 1987, and a continuation-in-part of PCT/US87/03223, Dec. 9, 1987, and a continuation-in-part of Ser. No. 939,927, Dec. 9, 1986, Pat. No. 4,816,449, which is a continuation-in-part of Ser. No. 899,891, Aug. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 824,945, Feb. 3, 1986, Pat. No. 4,628,045, which is a continuation-in-part of Ser. No. 746,175, Jun. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 522,601, Aug. 12, 1983, abandoned. This application Jan. 26, 1990, Ser. No. 471,147

Int. Cl.[5] C07K *7/06;* **A61K** *37/02*

U.S. Cl. 514—17 **21 Claims**



1. A method for the treatment of an inflammatory bowel disease comprising administering to a mammalian subject a therapeutically effective amount of a peptide, or a pharmaceutically acceptable salt thereof said peptide, having the amino acid sequence Asp-Ser-Asp-Pro-Arg.

5,110,796

PROPHYLACTIC AND THERAPEUTIC AGENTS FOR CATARACTS

Motokazu Itoi; Shizuko Kobayashi, both of Tokyo; Yasuo Ishii, Saitama, and Minako Kasuya, Kanagawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

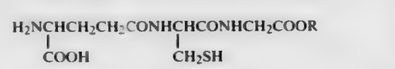
Filed Dec. 7, 1989, Ser. No. 447,173

Claims priority, application Japan, Dec. 9, 1988, 63-311717

Int. Cl.[5] A61K *37/02;* **C07K** *5/08*

U.S. Cl. 514—18 **3 Claims**

1. A method for the treatment of cataracts in a host which comprises administering to said host a cataract-inhibiting effective amount of a compound of the formula:



$$H_2NCHCH_2CH_2CONHCHCONHCH_2COOR$$
$$\quad\quad\quad

cleoside methylphosphonate sequence complementary to the first splice acceptor site of the TAT III gene of the HIV with which said H-9 human lymphoid cells are infected.

5,110,803
PLANT POLYSACCHARIDE FRACTIONS INDUCING PROLACTIN IN MAMMALS

Tan H. Nguyen, Saint Avé, France, assignor to Guyomarc'h Nutrition Animale, Saint-Nolff, France

Division of Ser. No. 216,806, Jul. 8, 1988, Pat. No. 4,948,785. This application Aug. 7, 1990, Ser. No. 551,492
Claims priority, application France, Jul. 10, 1987, 87 09857
Int. Cl.[5] A61K *31/715;* **C08B** *37/00*
U.S. Cl. 514—54 **3 Claims**

1. A polysaccharide derived from a species of Gossypium containing monomeric units of rhamnose, arabinose, xylose, mannose, galatose, and glucose, having a molecular mass between 10,000 and 1,000,000 daltons; having 1 to 8% nitrogen and 0.8 to 2% sulfur; being substantially insoluble in ethanol; wherein said polysaccharide is selected from the group consisting of gossypine A, which has a molecular mass between 20,000 and 50,000 daltons and contains about 3.40% ±0.3 by weight of nitrogen and 1.32% ±0.3 by weight of sulfur, and gossypine B, which has a molecular mass of between 54,000 and 100,000 daltons and contains about 6.7% ±0.3 by weight of nitrogen and 1.32% ±0.3 weight of sulfur.

5,110,804
NON-TOXIC INSECTICIDE COMPOSITION AND METHOD FOR KILLING SPECIFIC INSECTS

Merlin Lee, Orcutt, Calif., assignor to Agrisystemen Limited, Hong Kong, Hong Kong

Filed Oct. 10, 1989, Ser. No. 420,120
Int. Cl.[5] A61K *31/715, 35/78;* **A01N** *25/00*
U.S. Cl. 514—60 **12 Claims**

1. A method of killing insects, and the eggs of said insects which are protected by a waxy secretion which method comprises applying to a plant infested with said insects an aqueous solution of film-forming corn starch to form a film over said insects to entrap and asphyxiate them in said film.

5,110,805
METHOD FOR PROTECTING PLANTS AGAINST SOIL-BORNE FUNGI USING GLYPHOSATE AND IMAZAQUIN COMPOSITIONS

Dana K. Berner; Gerard T. Berggren, and Johnnie P. Snow, all of Baton Rouge, La., assignors to The Board of Supervisors of Louisiana State University, Baton Rouge, La.

Filed Sep. 28, 1990, Ser. No. 590,478
Int. Cl.[5] A01N *57/20*
U.S. Cl. 514—76 **3 Claims**

1. A method for protecting plants against soil-borne fungi, which method comprises: treating soil, which contains soil-borne fungi which are pathogenic to plants, with a fungicidally effective amount of a composition selected from the group consisting of: (a) 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-xy]-3-quinoline carboxylic acid mixed with agriculturally acceptable carriers: and (b) a mixture of isopropylamine salt of N-phosphonomethyl glycine, 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1 -H-imidazol-2-yl]-2-quinoline carboxylic acid and agriculturally acceptable carriers.

5,110,806
LUNG SURFACTANT COMPOSITIONS

John A. Clements, Tiburon, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 927,340, Nov. 5, 1986, Pat. No. 4,826,821, which is a continuation of Ser. No. 749,122, Jun. 26, 1985, abandoned, which is a continuation of Ser. No. 542,453, Oct. 17, 1983, abandoned. This application Apr. 7, 1989, Ser. No. 335,101
The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.
Int. Cl.[5] A61K *31/685*
U.S. Cl. 514—78 **17 Claims**

1. Synthetic lung surfactant compositions consisting essentially of

dipalmitoyl phosphatidyl choline,

a fatty alcohol having 14 to 18 carbon atoms, and

a non-ionic physiologically non-toxic surface active agent,

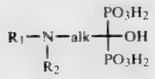
wherein the dipalmitoyl phosphatidyl choline is the major component by weight, present in at least 80% by weight of the sum of the weight of the dipalmitoyl phosphatidyl choline and fatty alcohol in the composition, and the fatty alcohol and surface active agent are each minor components by weight, and the fatty alcohol is hexadecanol.

5,110,807
ARALIPHATYLAMINOALKANEDIPHOSPHONIC ACIDS

Knut A. Jaeggi, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.J.

Continuation-in-part of Ser. No. 278,394, Dec. 1, 1988, abandoned. This application Mar. 28, 1990, Ser. No. 500,441
Int. Cl.[5] A61K *31/66;* **C07F** *9/38*
U.S. Cl. 514—89 **21 Claims**

1. An aromatically substituted alkylaminoalkanediphosphonic acid of the formula



(I)

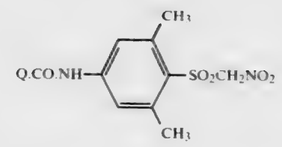
wherein R_1 is a lower alkyl or lower alkenyl radical that is mono- or di-substituted by at least one ring selected from phenyl and naphthyl, which ring is unsubstituted or substituted by at least one substituent selected from lower alkyl, lower alkoxy, lower alkylthio, and halogen; R_2 is hydrogen, lower alkyl, or lower alkenyl; and alk is lower alkylene; or a salt thereof.

5,110,808
AMIDE DERIVATIVES, COMPOSITIONS AND USE

David R. Brittain, Rochdale; Steven P. Brown; Anthony L. Cooper, both of Bude; Jethro L. Longridge, Macclesfield; Jeffrey J. Morris, Sandbach; John Preston, Knutsford, and Linda Slater, Macclesfield, all of England, assignors to Imperial Chemical Industries, PLC, London, England

Filed Jul. 31, 1991, Ser. No. 738,436
Claims priority, application United Kingdom, Aug. 2, 1990, 9016984
Int. Cl.[5] A61K *31/16, 31/535;* **C07D** *245/192;* **C07C** *317/28*
U.S. Cl. 514—155 **10 Claims**

1. A derivative of the compound (4-amino-2,6-dimethylphenylsulphonyl)nitromethane having the formula I:



(I)

wherein Q is a carbamoyl group of the formula $R^3R^4N.CO$—, in which R^3 and R^4 are independently (1–4C)alkyl, allyl or benzyl, the latter optionally bearing 1 or 2 halogeno substituents; or R^3 and R^4 together with the adjacent nitrogen atom constitute a pyrrolidine, piperidine or morpholine ring, which ring may optionally bear one or two independently selected (1–4C)alkyl substituents; or a pharmaceutically acceptable salt thereof.

5,110,809
ANTIFUNGAL GEL FORMULATIONS

Jonas Wang, Robbinsville, N.J.; Bhiku Patel, Amherst, N.Y.; Stacley Au, Tonawanda, N.Y., and Hemanshu Shah, Williamsville, N.Y., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Division of Ser. No. 323,727, Mar. 15, 1989, Pat. No. 5,002,938, which is a continuation-in-part of Ser. No. 381,059, Mar. 7, 1989, abandoned, which is a continuation of Ser. No. 171,350, Mar. 21, 1988, abandoned. This application Oct. 23, 1990, Ser. No. 601,958
Int. Cl.[5] A61K *9/06, 31/415, 31/57*
U.S. Cl. 514—171 **8 Claims**

1. A stable anhydrous gel formulation for topical administration comprising (a) a therapeutically effective amount of a mixture of an imidazole antifungal agent and a 17-ester steroid antiinflammatory agent, (b) a solvent system consisting essentially of a lower alkanol in combination with a dihydroxy alcohol or a trihydroxy alcohol or a mixture thereof and (c) an effective amount to cause gelling of hydroxypropyl cellulose or hydroxyethyl cellulose.

5,110,810
METHOD OF USING DEHYDROEPIANDROSTERONE AND DEHYDROEPIANDROSTERONE-SULFATE AS INHIBITORS OF PLATELET AGGREGATION

David M. Eich, Suffolk; Robert Jesse, and John Nestler, both of Richmond, all of Va., assignors to Virginia Commonwealth University, Richmond, Va.

Filed Feb. 8, 1991, Ser. No. 652,518
Int. Cl.[5] A61K *31/56*
U.S. Cl. 514—178 **11 Claims**

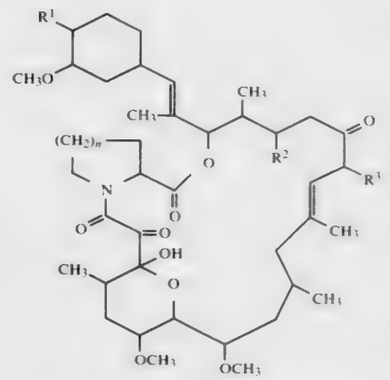
1. A method of reducing the rate of platelet aggregation in a patient's blood plasma, comprising the step of administering a therapeutic dose of dehydroepiandrosterone to a patient in need of reduced platelet aggregation.

5,110,811
TRICYCLO COMPOUNDS, A PROCESS FOR THEIR PRODUCTION AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Masakuni Okuhara; Hirokazu Tanaka; Toshio Goto, all of Sakuramura; Tohru Kino, Tsuchiura, and Hiroshi Hatanaka, Sakuramura, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Continuation of Ser. No. 868,749, May 30, 1986, Pat. No. 4,929,611, which is a continuation-in-part of Ser. No. 799,855, Nov. 20, 1985, Pat. No. 4,894,366. This application Mar. 9, 1990, Ser. No. 491,205
Claims priority, application United Kingdom, Dec. 3, 1984, 8430455; Feb. 5, 1985, 8502869; Apr. 1, 1985, 8508420
The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.
Int. Cl.[5] A61K *31/395*
U.S. Cl. 514—183 **6 Claims**

1. A method of inhibiting IL-2 production by the external application of an effective amount of a compound of the formula:



R^3 is methyl, ethyl, propyl or allyl,

n is an integer of 1 or 2, and

the symbol of a line and dotted line is a single or a double bond, or a pharmaceutically acceptable salt thereof

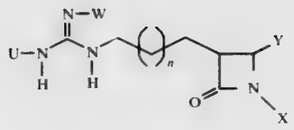
in which R^1 is hydroxy or pharmaceutically acceptable protected hydroxy selected from 1-(loweralkylthio)(lower) alkyloxy, tri(lower)alkylsilyloxy, lower alkyldiphenylsilyloxy, pharmaceutically acceptable organic carboxylic acyloxy, pharmaceutically acceptable organic sulfonic acyloxy, and pharmaceutically acceptable organic carbamic acyloxy, and R^2 is hydrogen or the same meanings as R^1.

5,110,812
AZETIDIN-2-ONE DERIVATIVES AS SERINE PROTEASE INHIBITORS

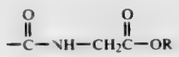
William T.-W. Han, Cheshire, Conn., assignor to Bristol-Myers Squibb Co., New York, N.Y.

Division of Ser. No. 533,270, Jun. 4, 1990, Pat. No. 5,037,819. This application May 7, 1991, Ser. No. 696,641
Int. Cl.[5] C07D *205/09, 205/08;* **C07F** *7/10;* **A61K** *31/395*
U.S. Cl. 514—210 **21 Claims**

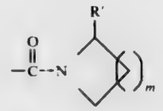
1. 3-Guanidinoalkyl-2-azetidinones of the formula



wherein
U and W can be the same or different and are selected from the group consisting of phenylmethoxycarbonyl and t-butyloxycarbonyl;
n is 1 to 3;
X is a member selected from the group consisting of arylsulfonyl, amino substituted arylsulfonyl, and alkylsulfonyl; and
Y is a member selected from the group consisting of hydrogen, arylalkenyl, aryalkyl, formyl, carboxy, alkoxycarbonyl, acyloxy, arylthio, arylsulfonyl, alkylthio, alkylsulfonyl, arylaminocarbonyl, the radical



in which R is hydrogen, alkyl or arylalkyl, and the radical

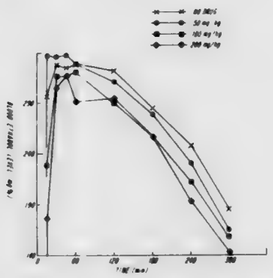


in which m is 1 to 3 and R′ is hydrogen or $-CO_2R''$ wherein R″ is hydrogen, alkyl or arylalkyl.

5,110,813
REDUCTION OF VOLUNTARY ALCOHOL CONSUMPTION BY TREATMENT WITH ANGIOTENSIN CONVERTING ENZYME INHIBITORS

Larry A. Grupp, Downsview; Edward Perlanski, Bear River, both of Canada, and Robert B. Stewart, Indianapolis, Ind., assignors to Alcoholism and Drug Addiction Research Foundation, Ontario, Canada

Continuation-in-part of Ser. No. 96,951, Sep. 15, 1987. This application Sep. 29, 1989, Ser. No. 414,952
Int. Cl.[5] A61K *31/55, 31/40*
U.S. Cl. 514—212 **11 Claims**



1. A method of treating warm-blooded animals in need thereof so as to reduce their voluntary alcohol consumption which comprises administering a therapeutically effective amount of an angiotensin converting enzyme inhibitor to said animals.

5. A method for treatment of alcoholism, comprising administering to a warm-blooded animal in need thereof a therapeutically effective amount of an angiotensin converting enzyme inhibitor selected from the group consisting of abutapril and benzapril.

5,110,814
AZELASTINE AND ITS SALTS USED TO COMBAT PSORIASIS

Jürgen Engel, Alzenau, Fed. Rep. of Germany; Michael Molliere, Rutherford, N.J., and Istvan Szelenyi, Schwaig, Fed. Rep. of Germany, assignors to Asta Pharma AG, Fed. Rep. of Germany

Filed Dec. 28, 1989, Ser. No. 458,350
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1989, 3900607
Int. Cl.[5] A61K *31/55*
U.S. Cl. 514—212 **6 Claims**

1. A method for treating a psoriasis disorder which comprises topically or orally administering a pharmaceutically effective dose of a member of the group consisting of azelastine and its pharmaceutically acceptable salts.

5,110,815
5-AMINO-5,6,7,8-TETRAHYDROQUINOLINES AND RELATED COMPOUNDS AND PHARMACEUTICAL USE

Richard C. Effland, Bridgewater, N.J., and David Fink, Doylestown, Pa., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Dec. 3, 1990, Ser. No. 620,811
Int. Cl.[5] A61K *31/47;* **C07D** *215/227*
U.S. Cl. 514—228.2 **46 Claims**

1. A compound of the formula

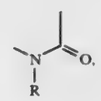
wherein X–Y is a group of the formula

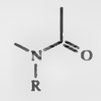
wherein R is hydrogen, loweralkyl, loweralkenyl, loweralkynl, or arylloweralkyl, or a group of the formula

wherein R^1 is hydrogen, loweralkyl or arylloweralkyl; R^2 and R^3 are independently hydrogen, loweralkyl, arylloweralkyl, diarylloweralkyl, lowercycloalkenylloweralkyl, loweralkoxy, arylloweralkoxy, or loweralkanoyl; R^2 and R^3 taken together with the nitrogen atom to which they are attached form a group of the formula

wherein p is 0 or 1, a group of the formula

wherein Z is O, S, or a group of the formula NR^6 wherein R^6 is hydrogen, loweralkyl, or arylloweralkyl; R^4 is hydrogen, loweralkyl, or arylloweralkyl; R^5 is hydrogen, loweralkyl, or arylloweralkyl; m is 0, 1, or 2; and n is 1 or 2; with the proviso that when R^2 and R^3 are hydrogen, or either R^2 or R^3 is loweralkyl, and X–Y is a group of the formula





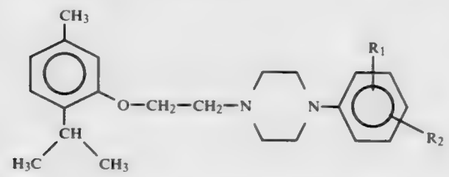
R^4 is not hydrogen or loweralkyl; the geometric and optical isomers thereof, or a pharmaceutically acceptable salt thereof.

5,110,816
3-[2-(4-ARYLPIPERAZIN-1-YL)ETHOXY]-P-CYMENE, THE DERIVATIVES OF SAID PRODUCT WHICH ARE ORTHO-, META- AND PARA-MONOSUBSTITUTED OR -DISUBSTITUTED ON THE PHENYL RING, THE METHOD OF PREPARING SAID DERIVATIVES AND THE DRUGS IN WHICH SAID COMPOUNDS ARE PRESENT AS THE ACTIVE PRINCIPLE

Patrick Houziaux, Maule; Jean-Pierre Riffaud, Versailles; Jean-Yves Lacolle, Saint Nom La Breteche, and Bernard Danree, Poissy, all of France, assignors to Institut de Recherches Chimiques et Biologiques Appliquees (I.R.C.E.B.A.), Vicq, France

PCT No. PCT/FR89/00298, § 371 Date Dec. 12, 1990, § 102(e) Date Dec. 12, 1990, PCT Pub. No. WO89/12634, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 13, 1989, Ser. No. 623,718
Claims priority, application France, Jun. 13, 1988, 88 07864
Int. Cl.[5] A61K *31/495;* **C07D** *295/00*
U.S. Cl. 514—255 **3 Claims**

1. A product of the formula:



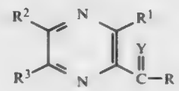
in which R_1 is selected from a hydrogen atom, a halogen atom, a hydroxyl radical, an alkyl radical having from 1 to 4 carbon atoms, an alkoxy radical having from 1 to 5 carbon atoms or a phenoxy, benzyloxy, trifluoromethyl or acetyl radical and R_2 is selected from a hydrogen atom, a halogen atom, a hydroxyl radical, an alkyl radical having from 1 to 4 carbon atoms, an alkoxy radical having from 1 to 5 carbon atoms or a phenoxy, benzyloxy, trifluoromethyl or acetyl radical.

5,110,817
METHOD FOR CONTROLLING AND/OR LOWERING SERUM TRIGLYCERIDE AND/OR CHOLESTEROL LEVELS IN MAMMALS

Karl H. Beyer, Jr., P.O. Box 387, 1001 Gypsy Hill Rd., Penllyn, Pa. 19422

Continuation of Ser. No. 260,947, Oct. 21, 1988, Pat. No. 4,920,123. This application Jan. 31, 1990, Ser. No. 472,878
The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.
Int. Cl.[5] A61K *31/495*
U.S. Cl. 514—255 **5 Claims**

1. A method for treating hypertriglyceridemia in a patient, comprising administering to said patient an effective amount of at least one compound of formula (I):



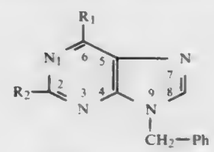
wherein
Y is O or NH,
R is OH, $NHCONR^4R^5$; or $N{=}C(NR^4R^5)_2$; where R^4 and R^5 are each independently selected from the group consisting of hydrogen; $C_{1\text{-}10}$ alkyl, straight or branched chain; aryl $C_{1\text{-}4}$ alkyl; mono- or disubstituted aryl $C_{1\text{-}4}$ alkyl where the substituents are fluoro, chloro, bromo, iodo, or $C_{1\text{-}10}$ alkyl, straight or branched chain;
R^1 and R^2 are each independent selected from the group consisting of hydrogen, amino, and mono- or di-substituted amino where the substituents are $C_{1\text{-}10}$ alkyl, straight or branched chain, $C_{3\text{-}8}$ cycloalkyl; provided that R^1 and R^2 may not both be amino or substituted amino; and
R^3 is hydrogen, trifluoromethyl; fluoro; chloro; bromo; or iodo; or a pharmaceutically acceptable salt thereof.

5,110,818
ANTICONVULSIVE SUBSTITUTED-9-BENZYL-9H-PURINES

Hans Allgeier, Lörrach-Haagen, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 416,086, Oct. 2, 1989, abandoned. This application Dec. 19, 1990, Ser. No. 630,401
Claims priority, application Switzerland, Oct. 6, 1988, 3731/88
Int. Cl.[5] A61K *31/52;* **C07D** *473/16*
U.S. Cl. 514—261 **12 Claims**

1. A 9H-purine derivative of the formula


(I)

in which Ph is 2-halophenyl or 2,6-dihalophenyl, wherein halo in each case is halogen having an atomic number of up to and including 35;
R_1 is amino, N-C_1–C_4alkylamino or N,N-di-C_1–C_4alkylamino; and
R_2 is amino, N-C_1–C_4alkylamino or N,N-di-C_1–C_4alkylamino;
in free form or in form of a pharmaceutically acceptable salt thereof.

5,110,819

SUBSTITUTED QUINOLINES AND MEDICINAL USE THEREOF

Ian Ahnfelt-Ronne; Erik T. Hansen, both of Fredensborg; Dorte Kirstein, Lyngby; Ole Bent I. Nielsen, and Schneur Rachlin, both of Vaerlose, all of Denmark, assignors to Leo Pharmaceutical Products Ltd., Hallerup, Denmark

PCT No. PCT/DK88/00188, § 371 Date Jun. 1, 1990, § 102(e) Date Jun. 1, 1990, PCT Pub. No. WO89/05294, PCT Pub. Date Jun. 15, 1989

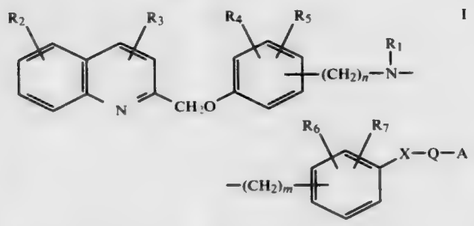
PCT Filed Nov. 17, 1988, Ser. No. 476,403

Claims priority, application United Kingdom, Dec. 1, 1987, 8728051

Int. Cl.[5] **C07D** *403/10, 413/10;* **A61K** *31/47*

U.S. Cl. 514—311 **6 Claims**

1. A compound of the formula I



I

in which formula I R_1 stands for hydrogen, straight or branched saturated or unsaturated C_1–C_8-alkyl, aryl or for ar-C_1–C_4-alkyl wherein aryl and ar are phenyl, the said alkyl and phenyl being unsubstituted or substituted by halogen, trifluoro methyl, cyano, nitro, amino, carboxy, carbalkoxy, carbamyl, hydroxy, alkyl or alkoxy; R_2, R_3, R_4, R_5, R_6 and R_7 are the same or different and stand for hydrogen, halogen, pseudo halogen, cyano, nitro, amino, carboxy, carbalkoxy, carbamyl, hydroxy, alkyl or alkoxy; n and m are the same or different and stand for an integer from 0–6; provided that n cannot be zero when A stands for carboxy and X and Q both stand for a bond; X stands for a bond or for O, S, S(O), $S(O)_2$ or for NR_8 where R_8 is defined as R_1 above; Q stands for a bond or for straight or branched, C_1–C_6-alkylene; A stands for carboxy, 1H-tetrazolyl, a sulphonic acid group, a sulfamyl group, a sulphinic acid group or a hydroxamic acid group, and pharmaceutically acceptable, non-toxic salts thereof.

5,110,820

DIHYDROPYRIDINE COMPOUNDS WHICH PROCESS BOTH CALCIUM (2 +)-ANTAGONISTIC AND BETA RECEPTOR BLOCKING ACTIVITIES

Takashi Fujikura; Noriki Ito, both of Saitama; Yuzo Matsumoto, Tokyo; Masaharu Asano, and Toichi Takenaka, both of Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 440,441, Nov. 21, 1989, abandoned, which is a continuation of Ser. No. 185,299, Apr. 19, 1988, abandoned, which is a continuation of Ser. No. 913,780, Sep. 30, 1986, abandoned, which is a division of Ser. No. 904,778, Sep. 5, 1986, abandoned, which is a continuation of Ser. No. 692,384, Jan. 17, 1985, abandoned. This application Nov. 13, 1990, Ser. No. 611,340

Claims priority, application Japan, Jan. 25, 1984, 59-11434

Int. Cl.[5] **A61K** *31/455*

U.S. Cl. 514—356 **2 Claims**

1. A method for the treatment of ischemic heart diseases and hypertension in a host which comprises administering to said host a composition comprised of, in single dose form, from 0.0001 mg/kg to 3 mg/kg of body weight, of 4-(2-Hydroxy-3-phenoxypropylamino)butyl methyl 2,6-dimethyl-4-(m-nitrophenyl)-1,4-dihydropyridine-3,5-dicarboxylate or its pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier.

5,110,821

1,3,4-OXADIAZOLYL-PHENOXYALKYLISOXAZOLES AND THEIR USE AS ANTIVIRAL AGENTS

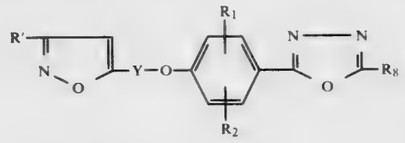
Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 396,419, Aug. 18, 1989, Pat. No. 4,945,164. This application Jun. 7, 1990, Ser. No. 534,917

Int. Cl.[5] **C07D** *413/10;* **A61K** *31/42*

U.S. Cl. 514—364 **8 Claims**

1. A compound of the formula:



wherein:

Y is an alkylene bridge of 3–9 carbon atoms;

R′ is lower-alkyl or hydroxy-lower-alkyl of 1–5 carbon atoms;

R_1 and R_2 are halogen, lower-alkyl of 1–5 carbon atoms, lower-alkoxy of 1–5 carbon atoms, nitro, lower-alkoxycarbonyl having from 2–4 carbon atoms or trifluoromethyl; and

R_8 is hydrogen or lower-alkyl of 1–5 carbon atoms, with the proviso that when R_8 is hydrogen, R′ is hydroxy-lower-alkyl;

or pharmaceutically acceptable acid-addition salts thereof.

5,110,822

SYNERGISTIC COMBINATIONS OF 4,5-DICHLORO-2-N-OCTYL-3-ISOTHIAZOLONE OR 2-METHYL-3-ISOTHIAZOLONE WITH FERRIC DIMETHYL DITHIOCARBAMATE FUNGICIDE

Samuel E. Sherba, Willingboro, N.J.; Raj J. Mehta, Gujarat, India, and Barry C. Lange, Lansdale, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 3, 1991, Ser. No. 637,086

Int. Cl.[5] **A01N** *43/80, 47/10*

U.S. Cl. 514—372 **14 Claims**

1. A microbicidal composition comprising a synergistic mixture a first component of which is selected from the group consisting of 4,5-dichloro-2-n-octyl-3-isothiazolone and 2-methyl-3-isothiazolone and a second component of which is ferric dimethyldithiocarbamate, wherein the ratio of the first component to the second component is in a range of from about 0.1/100 to about 100/0.1.

5,110,823

PYRROLIDINE DERIVATIVES AS NOOTROPIC AGENTS

Fumiko Hamaguchi, Tokyo; Tatsuo Nagasaka, Hachioji; Rie Hakamada, Kawasaki, and Einosuke Sakurai, Saitama, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

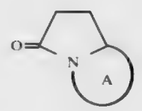
Filed Feb. 26, 1991, Ser. No. 660,950

Claims priority, application Japan, Aug. 24, 1990, 2-221208

Int. Cl.[5] **A61K** *31/42, 31/40;* **C07D** *263/54, 209/00*

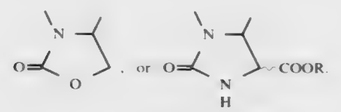
U.S. Cl. 514—375 **6 Claims**

1. A compound of formula (I)



(I)

wherein the ring A represents the following heterocyclic ring



(R is C_1–C_6 alkyl)

5,110,824

METHOD OF TREATING DISORDERS OF COGNITIVE FUNCTION WITH SUBSTITUTED BENZAMIDES

Jacques Acher, Itteville; Jean-Claude Monier, Lardy; Jean-Paul Schmitt, Arpajon; Renee Gardaix-Luthereau, Cachan, all of France; Brenda Costall, and Robert Naylor, both of Ilkey, United Kingdom, assignors to Societe D'Etudes Scientifiques et Industrielles de L'Ile-de-France, Paris, France

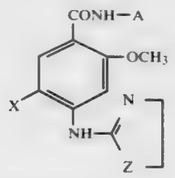
Filed Apr. 12, 1990, Ser. No. 507,753

Claims priority, application France, Apr. 12, 1989, 89 04792

Int. Cl.[5] **A01N** *43/76, 43/50*

U.S. Cl. 514—377 **9 Claims**

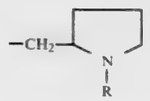
1. A method of treating disorders of cognitive function which comprises administering to one in need of said treatment a daily dosage of 50 to 750 mg of a compound of the formula I:



(I)

in which

A is diethylaminoethyl group or a group of the general formula II:



(II)

where R is a C_1–C_3 alkyl, allyl, cyclopropylmethyl or cyclohexenylmethyl group,

X is a chlorine or bromine atom, and

Z is —NH— or —O— with the following condition: when Z is —O—, A is a diethylaminoethyl group, and their pharmacologically acceptable salts.

5,110,825

BENZOFURAN DERIVATIVE

Masaru Ogata, Hyogo; Hiroshi Matsumoto, Osaka; Sumio Shimizu, Hyogo, and Shiro Kida, Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

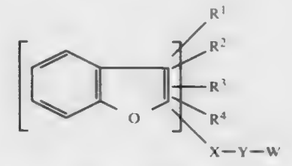
Filed Dec. 7, 1990, Ser. No. 623,614

Claims priority, application Japan, Dec. 28, 1989, 1-342757

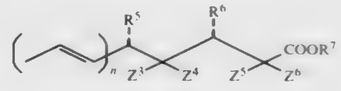
Int. Cl.[5] **A01N** *43/64;* **C07D** *307/78*

U.S. Cl. 514—381 **4 Claims**

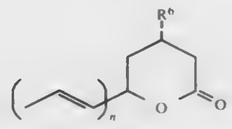
1. A compound represented by the formula:



wherein R^1 and R^2 each is hydrogen, halogen or optionally substituted amino; R^3 and R^4 each is optionally substituted lower alkyl or optionally substituted phenyl; X-Y is $—CZ^7=CZ^1—$ or $—CHZ^7—CHZ^2—$; W is



or



wherein R^5 and R^6 each is hydroxy or oxo; R^7 is hydrogen, lower alkyl, quaternary ammonium, alkali metal or alkaline earth metal; Z^1, Z^2 and Z^7 each is hydrogen, optionally substituted phenyl, or optionally substituted tetrazole; Z^3, Z^4, Z^5 and Z^6 each is hydrogen or halogen; the dotted line represents the presence or absence of a double bond; and n is an integer of 0 or 1.

5,110,826

AZOLE DERIVATIVES AND ANTIFUNGAL DRUGS CONTAININH THE SAME AS AN ACTIVE COMPONENT

Kimihiko Hori; Akira Sakaguchi, both of Utsunomiya; Koichi Ishida, Tochigi; Tomoko Nomura, Utsunomiya; Keiko Suzuki, Utsunomiya, and Shuichi Tsuchiya, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

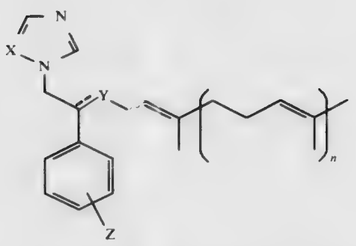
Filed Nov. 7, 1990, Ser. No. 609,777

Claims priority, application Japan, Nov. 9, 1989, 1-290031; Feb. 6, 1990, 2-25115

Int. Cl.[5] **A61K** *31/415;* **C07D** *233/60*

U.S. Cl. 514—39 **2 Claims**

1. An azole derivative represented by the following formula (I):



(I)

wherein X is CH, Y is an oxygen atom, a sulfur atom, an imino group, a methylimino group or a group represented by =N~O—, Z is one or two halogen atoms, n is 1 or 2, the wavy line denotes either an E or Z stereochemistry of the double bond; or an acid adduct thereof.

5,110,827

IMIDAZOLE COMPOUNDS HAVING FUNGICIDAL ACTIVITY

Hisao Sugiura; Takashi Nishimura, and Toshinobu Tanaka, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

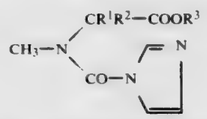
Filed Oct. 26, 1990, Ser. No. 603,996

Claims priority, application Japan, Nov. 21, 1989, 1-300858; Nov. 21, 1989, 1-300859

Int. Cl.[5] A01N *43/50;* **C00D** *233/60*

U.S. Cl. 514—399 **10 Claims**

1. An imidazole compound of the formula:



(I)

wherein R^1 and R^2 each represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, provided that both of R^1 and R^2 do not represent an alkyl group at the same time, or together form a group $=CHR^4$, where R^4 represents an alkyl group having 1 to 4 carbon atoms; when R^1 and R^2 each represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, R^3 represents an alkyl group having 1 to 12 carbon atoms, an alkenyl group having 1 to 12 carbon atoms, a phenyl-C_{1-12}-alkyl group, a phenyl-C_{3-12}-alkenyl group, a phenoxy-C_{2-12}-alkyl group or a phenoxy-C_{3-12}-alkenyl group, and the phenyl rings of the phenyl-C_{1-12}-alkyl, phenyl-C_{3-12}-alkenyl, phenoxy-C_{2-12}-alkyl and phenoxy-C_{3-12}-alkenyl groups are optionally substituted with at least one substituent selected from a halogen atom, a C_{1-12}-alkyl group, a C_{1-12}-alkoxy group, a C_{3-12}-alkenyloxy group and a phenoxy group; and when R^1 and R^2 together form the group $=CHR^4$, R^3 represents an alkyl group having 4 to 10 carbon atoms, an alkenyl group having 4 to 10 carbon atoms or a phenyl-C_{1-12}-alkyl group having a phenyl ring optionally substituted with at least one substituent selected from a halogen atom, a C_{1-12}-alkyl group, a C_{1-12}-alkoxy group, a C_{3-12}-alkenyloxy group and a phenoxy group.

5,110,828

AZABICYCLO OXIME DERIVATIVES

Steven M. Bromidge; Michael S. Hadley, and Barry S. Orlek, all of Harlow, England, assignors to Beecham Group p.l.c., Brentford, England

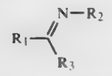
Filed Apr. 13, 1989, Ser. No. 337,281

Claims priority, application United Kingdom, Apr. 15, 1988, 8808925; May 27, 1988, 8812602; Oct. 13, 1988, 8824076

Int. Cl.[5] C07D *453/02;* **A61K** *31/435*

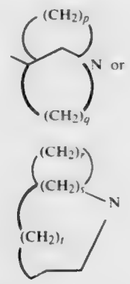
U.S. Cl. 514—413 **9 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein R_1 represents



in which

each of p and q independently represents an integer of 2 to 4, r represents an integer of 2 to 4, s represents 1 or 2 and t represents 0 or 1;

R_2 is a group OR_4, where R_4 is C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, a group $OCOR_5$ where R_5 is hydrogen or R_4, or a group NHR_6 or NR_7R_8 where R_6, R_7 and R_8 are independently C_{1-2} alkyl; and

R_3 is hydrogen or C_{1-4} alkyl, subject to the proviso that when R_2 is a group $OCOR_5$ or a group NHR_6, R_3 is C_{1-4} alkyl.

5,110,829

2,2'-THIENYLBENZOTHIOPHENES, THEIR PREPARATION AND THEIR USE FOR CONTROLLING PESTS

Reiner Kober, Fussgoenheim; Hans Theobald, Limburgerhof; Uwe Kardorff, Mannheim; Christoph Kuenast, Otterstadt; Peter Hofmeister, Neustadt; Rainer Seele, Fussgoenheim, and Gerhard Wagenblast, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

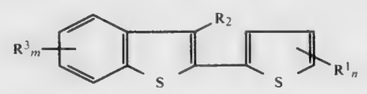
Filed Jul. 30, 1991, Ser. No. 737,738

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1990, 4024206

Int. Cl.[5] A61K *31/38;* **C07D** *333/64*

U.S. Cl. 514—443 **5 Claims**

1. A 2,2'-thienylbenzothiophene of the formula I



I

where R^1 and R^3 independently of one another are each halo-

gen, C_1–C_8–alkyl, C_1–C_6–haloalkyl, C_1–C_6–alkoxy or C_1–C_6–haloalkoxy, R^2 is hydrogen, halogen, C_1–C_8–alkyl, C_1–C_6–haloalkyl, C_1–C_6–alkoxy or C_1–C_6–haloalkoxy, n is 0, 1 or 2, and the radicals may be different when n is 2, m is 0, 1, 2, 3 or 4, and the radicals may be different when m is 2, 3 or 4, and n and m are not simultaneously 0 when R^2 is hydrogen.

5,110,830

BENZENESULFONAMIDES TREATMENT OF TUMORS SUSCEPTIBLE TO

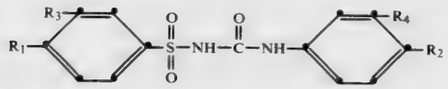
Richard W. Harper, Indianapolis; Gerald A. Poore, Martinsville, and Brent J. Rieder, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 336,404, Apr. 11, 1989, abandoned, which is a division of Ser. No. 729,581, May 2, 1985, Pat. No. 4,845,128, which is a continuation-in-part of Ser. No. 625,280, Jun. 27, 1984, abandoned. This application Sep. 13, 1990, Ser. No. 581,840

Int. Cl.[5] A01N *47/34, 41/06, 41/12*

U.S. Cl. 514—592 **8 Claims**

1. A method of treating susceptible neoplasms in mammals which comprises administering to a mammal in need of said treatment an effective amount of a compound of the formula



wherein:

R_1 and R_3 are independently hydrogen, C_1–C_3 alkyl, halo, trifluoromethyl, or C_1–C_3 alkoxy;

R_2 is halo, methyl, or trifluoromethyl; and

R_4 is hydrogen, halo, methyl, or trifluoromethyl.

5,110,831

VINYLOGOUS HYDROXAMIC ACIDS AND DERIVATIVES THEREOF AS 5-LIPOXYGENASE INHIBITORS

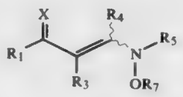
Ronald L. Magolda, Wallingford, Pa., and Stephen W. Wright, Wilmington, Del., assignors to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Filed Nov. 30, 1990, Ser. No. 621,152

Int. Cl.[5] A61K *31/135*

U.S. Cl. 514—645 **30 Claims**

1. A compound having the formula:



I

the sterioisomers and pharmaceutically acceptable salts thereof, wherein:

X is O;

R_1 is phenyl; phenyl optionally substituted with a total of 1 to 3 substituents each of which is independently selected from Br, Cl, F, I, CF_3, C_1 to C_{14} alkyl, NO_2, phenyl naphthyl, C_1 to C_{14} alkyl; or cycloalkyl of 3 to 6 carbon atoms;

R_3 and R_4 independently represent H, C_1 to C_4 alkyl; phenyl; phenyl optionally substituted with 1 to 3 substituents each of which is independently selected from Br, Cl, F, I, CF_3, C_1 to C_{14} alkyl, NO_2, phenyl, naphthyl, C_1 to C_{14} alkyl, cycloalkyl of 3 to 6 carbon atoms;

R_5 is H, phenyl, benzyl, (C_1 to C_6 alkyl)phenyl, naphthyl, C_1 to C_{12} alkyl, or C_3 to C_8 cycloalkyl;

R_7 is H, or a pharmaceutically acceptable cation.

5,110,832

USING PERILLYL ALCOHOL TO KILL BACTERIA AND YEASTS

Doyle E. Chastain, 137 Birch St., Titusville, Fla. 32780; W. Eugene Sanders, Jr., and Christine C. Sanders, both of Omaha, Nebr., assignors to Doyle E. Chastain, Titusville, Fla.

Filed Oct. 9, 1990, Ser. No. 597,488

Int. Cl.[5] A01N *31/00;* **A61K** *31/045*

U.S. Cl. 514—729 **3 Claims**

1. A method of killing bacteria comprising: treating bacteria in its habitat with bactericidal concentrations of perillyl alcohol.

5,110,833

PREPARATION OF SYNTHETIC ENZYMES AND SYNTHETIC ANTIBODIES AND USE OF THE THUS PREPARED ENZYMES AND ANTIBODIES

Klaus Mosbach, Lackalänga 31-18, S-240 20 Furulund, Sweden

Filed Mar. 29, 1990, Ser. No. 500,892

Int. Cl.[5] C08J *9/26, 9/28*

U.S. Cl. 521—50 **5 Claims**

1. A method of producing synthetic enzymes or synthetic antibodies, comprising the orientation of monomers around a print molecule, addition of crosslinkers, polymerizing to a polymer and subsequent removal of the print molecule, thereby creating a cavity in the polymer corresponding to said print molecule.

5,110,834

PRODUCTION OF CHLOROFLUOROCARBON-FREE URETHANE-CONTAINING SOFT-ELASTIC MOLDINGS HAVING A CELLULAR CORE AND A COMPACTED PERIPHERAL ZONE

Peter Horn, Heidelberg; Wolfgang Hoelderich, Frankenthal; Rudolf Taddey, Damme, and Dieter Tintelpot, Diepholz, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 3, 1991, Ser. No. 770,382

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1990, 4034082

Int. Cl.[5] C08J *9/35, 9/38*

U.S. Cl. 521—52 **19 Claims**

1. A process for the production of chlorofluoro-carbon-free urethane-containing soft-elastic moldings having a cellular core and a compacted peripheral zone, by reacting

a) an organic and/or modified organic polyisocyanate with

b) at least one relatively high-molecular-weight compound containing at least two reactive hydrogen atoms and, optionally,

c) a low-molecular-weight chain extender and/or crosslinking agent,

in the presence of

d) a blowing agent,

e) a catalyst,

f) additives and, optionally,

g) assistants,

in a closed mold with compaction, wherein the additive (f) used is a crystalline, microporous molecular sieve having a cavity and cavity mouth diameter of less than 1.3 nm and comprising metal oxides or metal phosphates.

5,110,835

ANTISTATIC EXPANDABLE STYRENE POLYMERS IN BEAD FORM

Manfred Walter, Speyer; Karl-Heinz Wassmer, Limburgerhof, and Maria Lorenz, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 5, 1991, Ser. No. 740,351

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1990, 4024871

Int. Cl.[5] C08J *9/224*

U.S. Cl. 521—57 **1 Claim**

1. An antistatic expandable styrene polymer in bead form, containing

a) a styrene polymer,

b) from 0.5 to 3% by weight, based on a), of a coating containing

b1) from 10 to 70% by weight of finely divided silica,

b2) from 20 to 80% by weight of a hydroxyl-containing quaternary ammonium salt

and, optionally,

b3) from 0.05 to 20% by weight of a conventional coupling agent and/or

b4) from 10 to 30% by weight of a conventional agent for shortening the cooling time,

c) from 1 to 8% by weight, based on a), of a C_3- to C_6-hydrocarbon as blowing agent.

5,110,836

TIME-EFFICIENT PROCESS FOR MAKING EXPANDED POLYMERIC PRODUCTS WITH MULTIPASS EXPANSION OF POLYSTYRENE BEAD

William H. Harclerode, Ewing; John C. Knutsen, Highland Park; Barry J. Pekich, Bridgeton; John V. Wiman, Morristown, and John C. Voss, Trenton, all of N.J., assignors to BASF Corporation, Parsippany, N.J.

Filed Nov. 26, 1990, Ser. No. 618,340

Int. Cl.[5] C08V *9/22, 9/232, 9/24*

U.S. Cl. 521—58 **38 Claims**

1. A process for making an expanded polymeric product, the process comprising:

A. expanding unexpanded beads in a first expansion step, the beads being comprised of:

i. a blowing agent which is at least one member selected from the group consisting of:

pentane, cyclopentane, methylcyclopentane, neopentane, isopentane, pentane petroleum distillate fractions, propane, butane, isobutane, hexane, isomers of hexane, methylcyclopentane, cyclohexane, heptane, propylene, 1-butylene, 2-butylene, isobutylene, mixtures of one or more aliphatic hydrocarbons having a molecular weight of at least 42 and a boiling point not higher than 95° C. at 760 millimeters absolute pressure, water, carbon dioxide, ammonium carbonate, and azo compounds that are decomposable to form a gas at a heat-plastifying temperature to which the polymer is brought,

the blowing agent being present in the beads in an amount of from about 2 weight percent to about 4.4 weight percent based on the weight of the beads; and

ii. a polymer produced from at least one monomer, wherein the monomer is at least one member selected from the group consisting of:

styrene and derivatives of styrene, vinyltoluene, mono- and polyhalogenated vinyltoluenes which form linear polymers, phenyl ether, acrylonitrile, and methyl methacrylate,

the polymer being present in the beads in an amount of from about 93 weight percent to about 98 weight percent based on the weight of the beads, the polymer exhibiting:

(a) a polydispersity of from about 1 to less than 2.5,

(b) a weight average molecular weight of greater than about 180,000 to about 300,000, and

(c) an Mz:Mn of from aboout 2 to aboout 4.5; and

wherein the polymer is branched to from 0 to less than 5 weight percent, and

B. aging the expanded beads for a time period of from about 1 hour to about 80 hours after the first expansion step;

C. carrying out from 1 to 3 additional expansion steps with an aging period of from about 1 hour to about 80 hours between each of the additional expansion steps, whereby finally-expanded beads are produced upon completion of the expansion steps, the expansion steps being carried out so that the finally-expanded beads have a density of from about 0.8 pounds per cubic foot to about 1.1 pounds per cubic foot.

5,110,837

PROCESS FOR MAKING MOLDED POLYMERIC PRODUCT WITH MULTIPASS EXPANSION OF POLYMER BEAD WITH LOW BLOWING AGENT CONTENT

William H. Harclerode, Ewing; William E. Volz, Marlboro; John V. Wiman, Morristown; John C. Voss, Trenton; Barry J. Pekich, Bridgeton, and John C. Knutsen, Highland Park, all of N.J., assignors to BASF Corporation, Parsippany, N.J.

Filed Nov. 26, 1990, Ser. No. 618,359

Int. Cl.[5] C08J *9/22, 9/232, 9/24*

U.S. Cl. 521—58 **35 Claims**

1. A process for making a closed-cell, foamed thermoplastic resinous object, the process comprising expanding unexpanded beads in from 2 to 5 expansion steps, the beads being comprised of:

A. a blowing agent which is at least one member selected from the group consisting of: pentane, cyclopentane, neopentane, isopentane, pentane petroleum distillate fractions, propane, butane, isobutane, hexane, isomers of hexane, 2-methyl pentane, 3-methyl pentane, 2,2-dimethylbutane, 2,3-dimethylbutane, 2-methyl pentane, 3-methyl pentane, methylcyclopentane, cyclohexane, heptane, propylene, butylene, isobutylene, mixtures of one or more aliphatic hydrocarbons having a molecular weight of at least 42 and a boiling point not higher than 95° C. at 760 millimeters absolute pressure, water, carbon dioxide, ammonium carbonate, and azo compounds that are decomposable to form a gas at a heat-plastifying temperature to which the polymer is brought, the blowing agent being present in the unexpanded beads in an amount of from about 2 weight percent to about 4.4 weight percent based on the weight of the beads; and

B. a polymer produced from at least one monomer, wherein the monomer is at least one member selected from the group consisting of: styrene, derivatives of styrene, vinyltoluene, mono- and polyhalogenated vinyltoluenes which form linear polymers, acrylonitrile, and methyl methacrylate, the polymer being present in the beads in an amount of from about 93 weight percent to about 98 weight percent based on the weight of the beads, the polymer exhibiting:

(a) a polydispersity of from about 1 to less than 2.5,

(b) a weight average molecular weight of greater than about 180,000 to about 300,000, and

(c) an M_z:M_n of from about 2 to about 4.5, wherein the polymer is branched to from 0 to less than 5 weight percent, and

wherein the expansion steps are carried out in an expander and at substantially atmospheric pressure, and wherein the expansion steps are carried out so that finally-expanded beads are produced, the expansion steps being carried out so that the finally-expanded beads have a density of from about 0.8 pounds per cubic foot to about 1.1 pounds per cubic foot.

5,110,838

BIODISINTEGRABLE THERMOPLASTIC RESIN FOAM AND A PROCESS FOR PRODUCING SAME

Yutaka Tokiwa, Tsuchiura, and Akira Iwamoto, Tsukuba, both of Japan, assignors to Director-General of Agency of Industrial Science and Technology and JSP Corporation, both of, Japan

Filed Dec. 19, 1990, Ser. No. 630,165

Claims priority, application Japan, Dec. 27, 1989, 1-339196

Int. Cl.[5] C08J *9/10, 9/14*

U.S. Cl. 521—81 **2 Claims**

1. A process for producing a biodisintegrable thermoplastic resin foam, which comprises melt-kneading a mixed resin of 5–40 weight % of a thermoplastic resin decomposable by microorganisms and 95–60 % weight % of a thermoplastic resin not decomposable by microorganisms and a foaming agent, which is gaseous or liquid in normal state, at a high temperature above the melting point of the mixed resin under high pressure and thereafter bringing the kneaded mixture to a low pressure zone whereby a foam having an apparent density of less than 0.5 g/cm^3 is obtained wherein the individual aerial cells constituting the foam have an average cell wall thickness of 1–100 μm.

5,110,839

FOAMED CEMENTITIOUS COMPOSITIONS COMPRISING LOW WATER AND POLY(CARBOXYLIC)ACID STABILIZER

Yen-Yau H. Chao, Harleysville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 441,029, Mar. 22, 1989. This application Sep. 23, 1991, Ser. No. 764,045

Int. Cl.[5] C08J *9/06*

U.S. Cl. 521—83 **7 Claims**

1. A foamed composition consisting essentially of from about 25 to less than about 70 parts by weight water, about 100 parts by weight hydraulic substance and about 0.01 to about 10 parts by weight of a polymeric foam stabilizer having a weight average molecular weight from about 1,000 to about 20,000 and comprising a homopolymer or copolymer of C1–C12 ethylenically unsaturated carboxylic acid monomers and salts thereof; wherein said composition is prepared by uniformly mixing: a) a homogeneously foamed mixture comprising about 25 to less than about 70 parts by weight water and from about 0.01 to about 5 parts by weight of said polymeric stabilizer, and b) a homogeneous slurry comprising about 25 to less than about 70 parts by weight water, about 100 parts by weight of said hydraulic substance, and from about 0.01 to about 5 parts by weight of said polymeric foam stabilizer.

5,110,840

FLAME-RETARDANT POLYURETHANE FOAM UTILIZING A PHOSPHORUS ACID

David H. Blount, 6728 Del Cerro Blvd., San Diego, Calif. 92120

Filed Jan. 2, 1990, Ser. No. 459,474

Int. Cl.[5] C08J *9/04;* **C08G** *18/24;* **C09K** *21/04*

U.S. Cl. 521—85 **23 Claims**

1. The process for the production of flame-retardant polyurethane foam which process consist of mixing and reacting the following components:

A. phosphorus acid compounds selected from the group consisting of phosphoric acid, phosphinic acid, phosphenous acid, hypophosphorus acid, orthophosphoric acid, pyrophosphoric acid, triphosphoric acid, metaphosphoric acid and mixtures thereof, in the amount of 1 to 25 parts by weight;

B. organic polyhydroxyl compound, 20 to 200 parts by weight;

C. organic polyisocyanate, 25 to 100 parts by weight;

D. organic compound which will react with phosphorus acid compounds, up to 25 parts by weight and selected from the group consisting of alcohols, epoxy compounds, polyepoxy compounds, organic acids, aldehydes, organic esters, ketones, organic anhydrides, thioalcohols, phenols, nitriles, halomethyl compounds, thiophenols, organic isocyanates, sulphonic acids, thioisocyanates, thioethers, organic ethers, sulphonic acid halides, carboxylic acid halides, and mixtures thereof.

5,110,841

ANTISTATIC POLYOLEFIN FOAMS AND FILMS AND METHOD OF MAKING THE FOAM AND ANTISTATIC COMPOSITION

Bruce A. Malone, Granville, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 542,848, Jun. 25, 1990. This application Sep. 16, 1991, Ser. No. 735,135

Int. Cl.[5] C08J *9/00*

U.S. Cl. 521—94 **7 Claims**

1. A polyolefin foam comprising:

(a) a polyolefin resin;

(b) a blowing agent; and

(c) an antistatic composition having two components (1) at least one quaternary ammonium salt and (2) at least one partial ester of a long chain fatty acid with a polyol;

which polyolefin foam has a static decay time which is faster than a polyolefin foam containing no antistatic composition or a polyolefin foam containing only one of the two components.

5,110,842

ELECTRON-BEAM CURED SHEET-TYPE FOAM

Nario Uejikkoku, and Masashi Takeda, both of Shiga, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP90/00612, § 371 Date Oct. 22, 1990, § 102(e) Date Oct. 22, 1990, PCT Pub. No. WO90/14385, PCT Pub. Date Nov. 29, 1990

PCT Filed May 14, 1990, Ser. No. 598,646

Claims priority, application Japan, May 16, 1989, 1-123773

Int. Cl.[5] C08J *9/14*

U.S. Cl. 521—134 **10 Claims**

1. An electron-beam cured sheet-type foam comprising 100 parts by weight of a polypropylene type resin (A) the main component of which is propylene; 5 to 40 parts by weight of a copolymer resin (B) which is made up of ethylene and at least one comonomer selected from the group consisting of acrylic acid, ethylacrylate, maleic acid anhydride and vinylacetate; and a copolymer resin (C) made up of ethylene and an alpha olefin containing 4 to 8 carbon atoms, having a melting point of 117° C. to 123° C. and a density of 0.890 g/cmg/cm^3 to 0.910 g/cm^3; which foam sheet has a gel content of 20 to 60 percent, an expansion ratio of 5 to 40 a toughness at 150° C. of 50 kg/cm^2 % or more, a size-change ratio at 120° C. of 5 percent or less, a 25%-compressive hardness at ordinary temperature of 0.1 to 1.0 kg/cm^2 and a 5%-expansion stress at ordinary temperature of 10 to 100 kg/cm^2.

5,110,843

ABSORBENT, NON-SKINNED FOAM AND THE METHOD OF PREPARATION

James L. Bries, Cottage Grove, and Vickie A. Johnston, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 1, 1991, Ser. No. 694,111

Int. Cl.[5] C08G *18/14*

U.S. Cl. 521—159 **18 Claims**

1. A polyurethane foam comprising a convolution of connected passages and three-dimensional vesicular, porous surface structure, and substantially without an outer layer skin.

5,110,844

LEATHER-LIKE THERMOPLASTIC POLYESTER SERIES RESIN SHEET AND PROCESS FOR PRODUCTION OF THE SAME

Motoshige Hayashi; Norio Amano; Tekeshi Taki, and Takaaki Hirai, all of Nara, Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed May 13, 1991, Ser. No. 699,072
Int. Cl.[5] C08G *63/00;* **C08J** *9/08*
U.S. Cl. 521—182 **8 Claims**

1. A leather-like thermoplastic polyester series resin sheet comprising a uniformly and finely foamed sheet comprising a thermoplastic polyester series resin, wherein said foamed sheet has cells having a diameter of substantially not longer than 1 mm, the cell walls thereof have a thickness of substantially not thicker than 100 μm, and the cell wall constructing each cell extends with irregular bending so as to make a flexibility of not more than 20,000 mg in the Gurley flexibility test.

5,110,845

EXTRUDABLE CURABLE ORGANOSILOXANE COMPOSITIONS

Thomas E. Gray, and Jary D. Jensen, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 3, 1990, Ser. No. 622,700
Int. Cl.[5] C08K *9/10*
U.S. Cl. 523—211 **11 Claims**

1. In a curable organosiloxane composition comprising the product obtained by mixing to homogeneity

A. from 96 to 99.5 weight percent, based on the total weight of (A) and (B), of a first diorganoalkenylsiloxy terminated polydiorganosiloxane exhibiting a viscosity of from 5 to 20 Pa.s at 25 degrees C. and containing essentially no alkenyl radicals bonded to non-terminal silicon atoms;

B. a second diorganoalkenylsiloxy terminated polydiorganosiloxane that is miscible with said first polydiorganosiloxane and exhibits a viscosity of from 0.1 to 20 Pa.s at 25 degrees C., where from 1 to 5 percent of the non-terminal repeating units of said second diorganoalkenylsiloxy-terminated polydiorganosiloxane contain an alkenyl radical;

C. an amount sufficient to cure said composition of an organohydrogensiloxane that is miscible with (A) and (B), and contains an average of more than two silicon bonded hydrogen atoms per molecule,

D. a hydrosilation catalyst comprising a metal from the platinum group of the periodic table or a compound of said metal, the amount of said catalyst being sufficient to promote curing of said composition at a temperature of from ambient to 250 degrees C., and

E. from 10 to 60 weight percent, based on the weight of said composition, of a reinforcing silica filler that is treated with at least one organosilicon compound, where the organic radicals bonded to the silicon atoms of (A), (B) and (C) are monovalent hydrocarbon or halogenated hydrocarbon radicals,

the improvement comprising the presence in said composition of from 0.5 to 4 weight percent, based on the combined weights of (A) and (B), of said second diorganoalkenylsiloxy terminated polydiorganosiloxane, whereby the tear strength of cured elastomers prepared from said composition is from 35–45 kilonewtons per meter and the compression set values of said elastomers is less than 35%.

5,110,846

PROCESS FOR CONTINUOUS PRODUCTION OF MATT OR SATIN POWDER PAINTS

Silvestro Farronato, and Sergio Gazzea, both of Romano d'Ezzelino, Italy, assignors to Hoechst Sara S.p.A., Romano D'Ezzelino, Italy

PCT No. PCT/EP89/00432, § 371 Date Dec. 15, 1989, § 102(e) Date Dec. 15, 1989, PCT Pub. No. WO89/10949, PCT Pub. Date Nov. 16, 1989
PCT Filed Apr. 21, 1989, Ser. No. 449,904
Claims priority, application Italy, May 2, 1988, 20421 A/88
Int. Cl.[5] C08K *13/00;* **C08J** *3/20;* **B29C** *47/60;* **A01J** *21/02*
U.S. Cl. 523—346 **5 Claims**

1. A method of continuous production of a matt or satin powder paint comprising a physical mixture of a plurality of powder paints wherein said powder paints are different from each other in at least one of their respective viscosities, reactivities, and systems of binders, said method comprising the steps of extruding separately each of the plurality of paints and physically combining the extruded paints in their molten state in a single stream before cooling in a predetermined variable ratio to produce desired matt or satin powder paint.

5,110,847

EMULSION WATER PAINT AND PROCESS FOR ITS PRODUCTION USING EPOXY ACRYLIC-RESOLVE RESIN BLENDS

Shunji Kojima, Yokosuka; Yoshiki Watanabe, Yokohama; Hiroaki Goto, Tokyo, and Toshinori Moriga, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Division of Ser. No. 426,351, Oct. 25, 1989, Pat. No. 5,068,266, which is a continuation-in-part of Ser. No. 272,838, Sep. 27, 1988. This application Dec. 24, 1990, Ser. No. 632,681
Claims priority, application Japan, Jan. 27, 1987, 62-15146; Jan. 27, 1987, 62-15147; Mar. 25, 1987, 62-69176; May 7, 1987, 62-109727; Jan. 27, 1988, PCT/JP88/00064
The portion of the term of this patent subsequent to Feb. 11, 2009, has been disclaimed.
Int. Cl.[5] C09D *3/56, 3/58, 5/02, 11/10*
U.S. Cl. 523—412 **6 Claims**

1. An emulsion water paint, which comprises, as coating film-forming components, (i) a carboxyl group-containing acrylic resin component, (ii) an epoxy resin component and (iii) a resol phenolic resin component containing methylol groups, wherein the carboxyl group of the acrylic resin component is present in the form of an ammonium salt or amine salt, the coating film-forming components are present in the form of oil-in-water emulsion particles, and the resol phenolic resin is an alkyl-etherified resol phenolic resin in which at least 30 mol% of all of the methylol groups of the resol phenolic resin component are etherified by the reaction of the methylol groups with an alcohol.

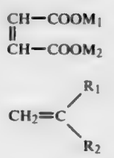
5,110,848

WET DISPERSION PROCESS AND PROCESS OF PRODUCING HEAT-SENSITIVE RECORDING MATERIAL

Akira Igarashi, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 1, 1989, Ser. No. 304,453
Claims priority, application Japan, Feb. 1, 1988, 63-021812; Apr. 4, 1988, 63-082545
Int. Cl.[5] C08L *3/00, 5/00;* **B41M** *3/12, 5/20*
U.S. Cl. 524—30 **12 Claims**

1. A process for dispersing particles of an organic compound in water, which comprises dispersing the organic compound in water using (1) a water-soluble high molecular weight compound having a molecular weight of at least 10,000 and (2) a copolymer formed from a monomer represented by the following formula (I) and a monomer represented by the following formula (ii), said copolymer having a molecular weight of not more than 10,000:



(I)

(II)

wherein M_1 and M_2 each represents an alkali metal atom or an ammonium group; R_1 represents a methyl group; and R_2 represents an alkyl group having from 3 to 5 carbon atoms.

5,110,849

POLYESTER COMPOSITION

Hiroo Karasawa; Kiichi Kometani, and Kiyokazu Nakamura, all of Aichi, Japan, assignors to Toray Industries, Inc., Japan

Filed Aug. 10, 1990, Ser. No. 565,650
Int. Cl.[5] C08K *5/3495, 5/3432, 5/32, 5/16, 5/20, 5/13, 5/15, 5/04*
U.S. Cl. 524—87 **8 Claims**

1. A polyester composition comprising 100 parts by weight of a thermoplastic polyester which essentially comprises an acid having a cyclic group selected from the group consisting of aromatic and heterocyclic dicarboxylic acids, said acid having 8 to 20 carbon atoms, and at least one diol selected from the group consisting of the aliphatic diols and cycloaliphatic diols having 2 to 10 carbon atoms, and 0.005 to 10 parts by weight of a metal alcoholate salt of a substituted aromatic alcohol having at least one aromatic ring, at least one hydroxyl group directly bonded to said aromatic ring and at least one non-ionic group directly bonded to said aromatic ring, the said non-ionic group being at least one group selected from the group consisting of cyano group, nitro group, formyl group, acyl group, alkoxycarbonyl group, carboamide group and triazole group, in which said hydroxyl group is in the form of a metal salt, and wherein the said metal of said hydroxyl group metal salt is at least one metal selected from the group consisting of alkali metal, alkaline earth metal, aluminum and zinc.

5,110,850

HALOGEN-FREE, FLAME-RETARDANT THERMOPLASTIC POLYURETHANE CONTAINING MELAMINE

Julius Farkas, West Lake, Ohio, assignor to B. F. Goodrich Company, Akron, Ohio

Filed Apr. 10, 1991, Ser. No. 683,393
Int. Cl.[5] C08K *5/3492*
U.S. Cl. 524—100 **29 Claims**

1. A halogen-free flame retardant urethane composition comprising;

a thermoplastic polyurethane (TPU); and a sole flame retardant, wherein said sole flame retardant is melamine that is derivative free.

5,110,851

METHOD FOR PRODUCING FREE-FLOWING, WATER-SOLUBLE POLYMER GELS

Wood E. Hunter, Pittsburgh, Pa., and Gary P. Craun, Wickliffe, Ohio, assignors to Calgon Corporation, Pittsburgh, Pa.

Division of Ser. No. 231,113, Aug. 11, 1988, Pat. No. 4,904,715, which is a continuation of Ser. No. 11,578, Feb. 6, 1987, abandoned, which is a division of Ser. No. 722,050, Apr. 11, 1985, Pat. No. 4,666,964, which is a division of Ser. No. 562,303, Dec. 16, 1983, Pat. No. 4,525,509. This application Jan. 8, 1990, Ser. No. 461,897
Int. Cl.[5] C08K *5/34*
U.S. Cl. 524—106 **8 Claims**

1. A method for preparing free-flowing, water soluble particles of amphoteric polymers comprising:

(a) reducing the size of a water-soluble amphoteric polymer gel by a size reduction means, so as to produce polymer gel particles which are less than ¼ inch in their largest dimension; and

(b) adding to the size-reduced polymer gel particles of Step (a) 0.001 to 20 percent, by weight, of an amphipathic compound, thereby reducing the adhesion of said gel particles to themselves and other substances; wherein said amphoteric polymer is made by polymerizing an anionic monomer with a cationic monomer.

5,110,852

FILAMENT MATERIAL POLYLACTIDE MIXTURES

Sylwester Gogolewski, Renens, Switzerland, and Albert J. Pennings, Norg, Netherlands, assignors to Rijksuniversiteit te Groningen, Groningen, Netherlands

Division of Ser. No. 597,159, Mar. 13, 1984, Pat. No. 4,915,893. This application Oct. 27, 1988, Ser. No. 263,552
Int. Cl.[5] C08K *5/15, 5/07;* **C08L** *67/04*
U.S. Cl. 524—108 **10 Claims**



1. Filament material produced by the process involving dry or wet-spinning a mixture comprising a polyester material and an additive selected from the group consisting of non-reactive polyurethane, glycolide, lactide, camphor, benzoic acid-2-hydroxyacetate, hexamethylbenzene, 1,2-cyclohexandione, and other low molecular weight organic compounds having melting temperatures in the range of 40° to 180° C. and which are soluble in trichloromethane, dichloromethane, ethanol and mixtures thereof, and mixtures of the foregoing members of the group.

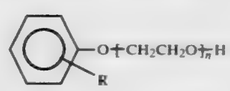
5,110,853

FREEZE-THAW STABLE POLYACRYLAMIDE EMULSIONS

Nguyen Van-Det, Midland, Ga., and Peter M. Robinson, High Point, N.C., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Aug. 27, 1990, Ser. No. 573,484
Int. Cl.[5] C08F *2/32;* **C08J** *3/00;* **C08K** *5/06*
U.S. Cl. 524—375 **23 Claims**

1. A freeze-thaw stabilized water-in-oil emulsion of a water-soluble acrylamide polymer having less than about 40 percent by weight of the water-soluble polymer, an inverting breaker surfactant, and a freeze-thaw stabilizing amount of an ethoxylated alkylphenol surfactant of the formula:



wherein R is a straight chain or branched alkyl group having 8–9 carbon atoms and n is an integer having an average value of more than 1 and up to about 2.

5,110,854

WATER-BASED SHIELDING COMPOSITIONS FOR LOCALLY PROTECTING METAL SURFACES DURING HEAT TREATMENT THEREOF

Glenn O. Ratliff, Watergate Apartments, #1802, 26241 Lake Shore Blvd., Euclid, Ohio 44132

Continuation of Ser. No. 199,310, May 26, 1988, abandoned. This application Mar. 8, 1990, Ser. No. 492,346

Int. Cl.[5] C08K *3/08*

U.S. Cl. 524—439 **6 Claims**

1. A paintable water-based anti-nitriding composition for a selected surface of a steel article, the composition being suitable for depositing a shield of wipeably removable residue on said surface to prevent its being case hardened in a gas nitriding operation, the composition comprising in weight percent with respect to the herein named ingredients:

about 36–45% by weight of water reducible alkyd resin;

about 38–43% by weight of tin powder;

about 9–13% by weight of powdered titanium dioxide;

about 1–2% by weight alkanolamine titanate thixotropic agent;

about 1–3% by weight ethylene glycol monobutyl ether;

about 1–2% by weight ethylene glycol; and

about 1–5% octylphenoxypolyethoxy-ethanol surfactant,

the composition being substantially nonreactive in storage.

5,110,855

BARRIER BLENDS BASED ON AMORPHOUS POLYAMIDE AND ETHYLENE/VINYL ALCOHOL, UNAFFECTED BY HUMIDITY

Philip S. Blatz, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 206,025, Jun. 17, 1988, Pat. No. 4,952,628, which is a continuation-in-part of Ser. No. 88,260, Aug. 24, 1987, abandoned. This application Apr. 17, 1990, Ser. No. 511,177

Int. Cl.[5] C08K *3/00*; **B32B** *5/22, 27/08*; **C08L** *77/00*

U.S. Cl. 524—441 **6 Claims**

1. A blend consisting essentially of about 50 to about 95 weight percent of an amorphous polyamide having a glass transition temperature of about 90° C. to about 200° C. and about 5 to about 50 weight percent of a vinyl alcohol polymer having a copolymerized ethylene content of 0 to about 50 mol percent and a degree of saponification of at least about 90%, the percentages of the polyamide and the vinyl alcohol polymers being based on the total weight of polymers in the blend, wherein a laminar filler is present and is present in an amount of up to about 23 weight percent which has particles at least about 95% of which are less than 74 micrometers in diameter, and which have a platelet-like shape with an aspect ratio of about 10 to about 150.

5,110,856

VINYL ACETATE-ETHYLENE COPOLYMER EMULSION AND PROCESS FOR PRODUCING THE SAME

Takeo Oyamada; Yoshito Taira; Masayoshi Nitta; Yasuo Kaneshima; Tateshi Kurino, and Shizuo Narisawa, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Division of Ser. No. 486,453, Feb. 28, 1990, Pat. No. 5,070,134. This application Sep. 17, 1991, Ser. No. 761,137

Claims priority, application Japan, Feb. 28, 1989, 1-49565; Dec. 13, 1989, 1-324797

Int. Cl.[5] C08F *2/16*

U.S. Cl. 524—459 **3 Claims**

1. A process for producing a vinyl acetate-ethylene copolymer emulsion comprising: a vinyl acetate-ethylene copolymer composed of from 10 to 40% by weight of an ethylene unit and from 90 to 60% by weight of a vinyl acetate unit, said emulsion having a mean particle size of not larger than 0.9 μm and a solids content of from 55 to 75% by weight; an emulsifying dispersant in an amount of from 2.5 to 5.0 parts by weight per 100 parts by weight of the vinyl acetate unit, wherein the emulsifying dispersant contains from 1.0 to 1.9 parts by weight of partially saponified polyvinyl alcohol prepared so as to have an average polymerization degree of from 300 to 1,000; and, from 1.0 to 3.0 parts by weight of a polyoxyethylene nonionic surface active agent having an HLB of from 16.5 to 17.5 per 100 parts by weight of the vinyl acetate unit, said process comprising:

mixing with stirring from 1.0 to 1.9 parts by weight of partially saponified polyvinyl alcohol prepared so as to have an average polymerization degree of from 300 to 1,000 and from 1.0 to 3.0 parts by weight of a polyoxyethylene nonionic surface active agent having an HLB of from 16.5 to 17.5 per 100 parts by weight of the whole of vinyl acetate to be polymerized together with a reducing agent of a redox catalyst, water, and optionally, a pH buffer to provide an aqueous solution containing from 2.5 parts by weight or more but less than 5.0 parts by weight of the emulsifying dispersant per 100 parts by weight of the vinyl acetate;

adding from 40 to 90% by weight of vinyl acetate to be polymerized to the aqueous solution of the emulsifying dispersant under stirring to provide a stable vinyl acetate emulsified dispersion; and

carrying out a polymerization reaction at a polymerization temperature of from 30° to 80° C. and an ethylene pressure of from 10 to 100 kg/cm^2 by using the vinyl acetate emulsified dispersion, while successively adding from 10 to 60% of vinyl acetate which is the residue of vinyl acetate to be polymerized to the polymerization system during the polymerization and further adding thereto at least 0.004 mole of an oxidizing agent of redox catalyst per kilogram of the whole of vinyl acetate supplied within 3 hours after the initiation of the polymerization.

5,110,857

ULTRAVIOLETSETTING RESIN COMPOSITION

Akio Inagaki, Okazaki; Kiyotaka Nakai, Chita, and Hitoshi Tauchi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 810,265, Dec. 18, 1985, abandoned. This application Mar. 23, 1990, Ser. No. 501,303

Claims priority, application Japan, Dec. 18, 1984, 59-268188

Int. Cl.[5] C08K *3/40*; **C08J** *3/28*

U.S. Cl. 524—494 **4 Claims**

1. An ultraviolet-setting resin composition containing 50 to 200 parts, based on 100 parts of said resin composition, of a fragmentary amorphous quartz glass powder of 1 to 50 μm in particle size, and of a specific surface area of 0.2 to 2.5 m^2/g, said fragments being of a length of about 1 to 10 times the width thereof.

5,110,858

TETRAFLUOROETHYLENE POLYMER COMPOSITIONS CONTAINING PARTICULATE CARBON

Young H. Kim, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 23, 1990, Ser. No. 500,048

The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.

Int. Cl.[5] C08L *67/04*

U.S. Cl. 524—496 **30 Claims**

1. A composition comprising about 5% to about 50% by weight of a first polymer consisting essentially of repeat units of the formula —(—CH_2—CR^1R^2—C(O)O—)—, about 95% to about 50% by weight of a tetrafluoroethylene polymer, and about 1% to about 233% by weight of said tetrafluoroethylene polymer of particulate carbon, wherein R^1 and R^2 are independently chosen alkyl groups, and provided that the total number of carbon atoms in R^1 and R^2 is about 20 or less.

5,110,859

POLYMERS, THEIR PRODUCTION AND USES

Peter Flesher, "Littlebeck", Beck Lane, Bingley, West Yorkshire, and David Farrar, 13 Greenfield Lane, Idle, Bradford, West Yorkshire, both of Great Britain

Continuation of Ser. No. 125,960, Nov. 27, 1987, abandoned. This application Oct. 19, 1990, Ser. No. 602,920

Int. Cl.[5] C08L *29/04*

U.S. Cl. 524—503 **5 Claims**

1. An aqueous polyvinyl alcohol composition consisting essentially of water and a polyvinyl alcohol composition in which the polyvinyl alcohol is a polymer formed of

(a) 10 to 99% by weight recurring vinyl units in the polymer backbone and selected from vinyl alcohol and vinyl acylate units, above 50 mole percent being vinyl alcohol units,

(b) 0 to 50% by weight recurring vinyl units in the polymer backbone and derived from other ethylenically unsaturated copolymerisable monomer, characterized in that the polymer is also formed of

(c) 1 to 99% by weight recurring vinyl units in the polymer backbone and derived from an allyl ether monomer that carries a pendant groups—$A_mB_nA_pR$ wherein B is ethyleneoxy, n is an integer of at least 2, A is propyleneoxy or butyleneoxy, m and p are each an integer less than n, and R is a hydrophobic group containing at least 8 carbon atoms.

5,110,860

AGRICULTURAL FILM

Kozo Kotani, Toyonaka; Hideo Negawa, Shiga, and Taiichi Sakaya, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 26, 1990, Ser. No. 587,782

Claims priority, application Japan, Oct. 6, 1989, 1-262715

Int. Cl.[5] C08L *31/02*

U.S. Cl. 524—563 **3 Claims**

1. An agricultural film of a polyolefin composition comprising from 0.02 to 0.5 part by weight of an ω-hydroperfluoroalkyl group-containing fluorine compound surfactant and from 0.5 to 5 parts by weight of a nonionic dripping agent per 100 parts by weight of a polyolefin resin.

5,110,861

SEALING RESIN COMPOSITION FOR ELECTRONIC COMPONENT AND ELECTRONIC COMPONENT

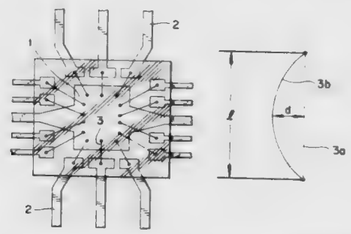
Masato Togami, Shizuoka, and Toshio Kanoe, Osaka, both of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Jul. 28, 1989, Ser. No. 386,275

Claims priority, application Japan, Aug. 4, 1988, 63-194746

Int. Cl.[5] C08L *31/00, 77/12, 33/18*; **C08J** *31/36*

U.S. Cl. 524—601 **23 Claims**



1. A sealing composition for an electronic component comprising a melt-processable polyester which has a weight-average molecular weight of 1000 to 3900 and forms an optically anisotropic molten phase, and an effective concentration not to exceed 80 percent by weight based upon the total weight of the composition of an inorganic powder capable of mean particle size diameter 1–1000 uM necessary to increase the thermal conductivity to at least 10 W/m·K at 300° K. of said composition, said inorganic powder having been surface-treated with 0.1–10% mercaptosilane coupling agent based on said inorganic powder, wherein said composition is capable of well protecting an electronic component encapsulated therein when immersed for 30 seconds in a bath of molten solder provided at 260° C., as evidenced by the absence of visible surface change.

5,110,862

AQUEOUS DISPERSIONS OF POLYESTER AND POLYESTER-AMIDES CROSS-LINKED WITH METALLIC IONS AND CASTS MADE THEREFROM

Mohan Vishnupad, Monroe, and Jose Ramirez, Trumbull, both of Conn., assignors to Imaginative Research Associates, Inc., Bridgeport, Conn.

Continuation of Ser. No. 578,018, Sep. 5, 1990, abandoned, which is a division of Ser. No. 367,183, Jun. 16, 1989, Pat. No. 4,992,508. This application Feb. 5, 1991, Ser. No. 652,233

Int. Cl.[5] C08L *5/49*

U.S. Cl. 524—601 **3 Claims**

1. A cross-linked emulsion comprising:

a water dissipatable polymer in an amount from 18 to 30 percent by weight based on the total weight of the composition;

water in an amount from 67 to 80 percent by weight based on the total weight of the composition;

emollient oils in an mount from 0.1 to 25 percent by weight based on the total weight of the composition;

a source of multivalent metallic ions in an mount from 0.1 to 5 percent by weight based on the total weight of the composition;

humectants in an amount from 0.1 to 40 percent by weight based on the total weight of the composition; and

emulsifier in an amount from 0.01 to 5 percent by weight based on the total weight of the composition.

5,110,863

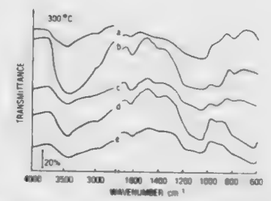
SOLID-GEL PRECURSOR SOLUTIONS AND METHODS FOR THE FABRICATION OF POLYMETALLICSILOXANE COATING FILMS

Toshifumi Sugama, Mastic Beach, N.Y., assignor to Associated Universities, Inc., Washington, D.C.

Filed Oct. 1, 1990, Ser. No. 590,770

Int. Cl.[5] C08K *3/20, 5/05*

U.S. Cl. 524—767 **27 Claims**



1. A coating solution which comprises a monomeric organoalkoxysilane containing an imidazole group, a metal alkoxide and a chlorine containing acid in an alcohol/water medium.

VOL 1138 ISS 1 MY 5 1992 UMI

5,110,864

CATIONIC MONOMER DELAYED ADDITION PROCESS

Peter M. Robinson, Columbus, and Nguyen Van-Det, Midland, both of Ga., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 488,312, Mar. 5, 1990, Pat. No. 5,081,182, which is a continuation-in-part of Ser. No. 864,365, May 19, 1986, abandoned. This application Aug. 19, 1991, Ser. No. 747,302

Int. Cl.[5] C08F *2/32*

U.S. Cl. 524—801 **3 Claims**

1. An improved retention aid for paper being a water-soluble cationic copolymer in the aqueous phase of a water-in-oil emulsion wherein the copolymer comprises (a) at least 30 mole % of repeating units derived from a water-soluble nonionic monomer and (b) repeating units derived from a cationic monomer, wherein the copolymer is prepared by (i) preparing an aqueous solution of the nonionic monomer and about 15 to about 85 weight percent of the cationic monomer, (ii) emulsifying the aqueous solution in a sufficient quantity of hydrocarbon oil to form a water-in-oil emulsion, (iii) adding the balance of the cationic monomer to the emulsion in the substantial absence of polymerization during the addition, and (iv) polymerizing the monomers.

5,110,865

ORGANOPOLYSILOXANE EMULSION AND METHOD FOR THE PREPARATION THEREOF

Isao Ona, and Masaru Ozaki, both of Chiba Prefecture, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 171,317

Claims priority, application Japan, Mar. 31, 1987, 62-79194; Apr. 23, 1987, 62-100274

Int. Cl.[5] C08L *83/06*

U.S. Cl. 524—838 **20 Claims**

1. A method for the preparation of an organopolysiloxane emulsion, said method comprising preparing an emulsion of components comprising

(A) an organopolysiloxane having the general formula $HO(R_2SiO)_mH$ wherein R is a monovalent organic group selected from the group consisting of alkyl groups, 2-phenylethyl, 2-phenylpropyl, 3,3,3-trifluoropropyl, alkenyl groups,phenyl, tolyl, and gamma-aminopropyl, gamma-(N-ethylamino)propyl, gamma-(N-butylamino)propyl, 4-(N-cyclohexylamino)butyl, 4-(N-phenylamino)butyl, N-aminoethylaminopropyl, beta-(N,N-dimethylamino)ethyl, gamma-glycidoxypropyl, 3,4-epoxycyclohexylpropyl, gamma-mercaptopropyl, and gamma-methacryloxypropyl, and m has an average value of ten or more and

(B) 0.1 to 100 weight parts, per 100 weight parts component (A), of an aminoxy group-containing organosilicon compound having the general formula $R^1R^2NO(R^3_2SiO)_nR^3_2SiONR^1R^2$ wherein R^1, R^2, and R^3 are monovalent hydrocarbon groups selected from the group consisting of alkyl groups, 2-phenylethyl, 2-phenylpropyl, 3,3,3-trifluoropropyl, alkenyl groups, phenyl and tolyl and n is zero or more; in the presence of

(C) 1 to 50 weight parts, per 100 weight parts of the total quantity of components (A) plus (B) of a surfactant and

(D) an emulsion-forming amount of water; and stirring the emulsion or allowing the emulsion to stand for 30 minutes to 12 hours at 5 to 70 degrees Centigrade.

5,110,866

THERMOPLASTIC POLYESTER RESIN COMPOSITION HAVING IMPROVED IMPACT RESISTANCE

Masafumi Hongo, and Hideyuki Shigemitsu, both of Hiroshima, Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Mar. 5, 1990, Ser. No. 493,599

Claims priority, application Japan, Mar. 6, 1989, 1-53129

Int. Cl.[5] C08L *67/02*

U.S. Cl. 525—67 **10 Claims**

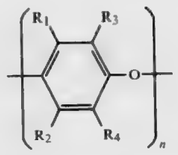
1. A thermoplastic polyester resin composition having an improved impact resistance, which comprises

(A) 30 to 70 parts by weight of a polyester resin mainly composed of units derived from an aromatic dicarboxylic acid having 8 to 22 carbon atoms or a functional derivative thereof and units derived from an alkylene glycol, cylcloalkylene glycol, or aralkylene glycol, having 2 to 22 carbons;

(B) 5 to 28 parts by weight of a polycarbonate resin; wherein said polycarbonate resin is prepared by reacting a dihydroxyl compound and an optional polyhydroxyl compound with phosgene or a diester of carbonic acid; said dihydroxyl compound being a dihydroxydiarylalkane selected from the group consisting of 4,4'-dihydroxy-2,2-diphenylpropane (bisphenol A), tetramethylbisphenol A and bis-(4-hydroxyphenyl)-p-diisopropylbenzene; and said optional polyhydroxyl compound is selected from the group consisting of phloroglucinol, 4,6-dimethyl-2,4,6-tri-(4-hydroxyphenyl)-heptene, 4,6-dimethyl-2,4,6-tri-(4-hydroxyphenyl)-heptane and 1,3,5-tri-(4-hydroxyphenyl)-benzene;

(C) 5 to 35 parts by weight of a graft copolymer obtained by graft-polymerizing at least one monomer selected from the group consisting of aromatic vinyl monomers in the presence of a rubbery polymer selected from the group consisting of polybutadiene rubbers, copolymers comprising at least 50% by weight of butadiene units and a minor amount of styrene units or acrylonitrile units, polyacrylic acid ester rubbers, polyorganosiloxane rubbers, and composite rubbers comprising at least two of these rubbers; and

(D) 10 to 45 parts by weight of a polyphenylene ether resin, wherein said polyphenylene ether resin is a homopolymer or copolymer having recurring units represented by the following formula:



wherein R_1, R_2, R_3, and R_4 are independently selected from the group consisting of a hydrogen atom, alkyl groups, halogen atoms, a nitro group and an amino group and n is a number of at least 30;

which further comprises

(E) 2 to 20 parts by weight, per 100 parts by weight of the resin composition comprising components (A) through (D), of a copolymer having a main chain of a polyolefin copolymerized with glycidyl methacrylate and a side chain of a styrene polymer, in which the content of glycidyl methacrylate in the polyolefin copolymerized with glycidyl methacrylate is 5 to 30% by weight;

wherein the styrene polymer constituting the side chain of the copolymer (E) is polystyrene or a copolymer comprising at least 80% by weight of styrene and not more than 20% by weight of maleic anhydride or methyl methacrylate; and,

wherein the content of the styrene polymer in the copolymer (E) is from 10 to 90% based on the copolymer (E); and,

wherein the amount of polyester resin (A) is larger than the amount of the polyphenylene ether resin (D).

5,110,867

INTERPENETRATING POLYMER NETWORK OF EPOXY RESIN, POLYALLYL POLYMER AND ANHYDRIDE

Jan A. J. Schutyser, Dieren; Antonius J. W. Buser, Wehl; Pieter H. Zuuring, Nijmegen, and Hendrik J. Slots, Rijssen, all of Netherlands, assignors to Akzo NV, Arnhem, Netherlands

Filed Sep. 12, 1990, Ser. No. 581,483

Claims priority, application Netherlands, Sep. 15, 1989, 8902310

Int. Cl.[5] C08L *39/04, 63/02, 63/04*

U.S. Cl. 525—114 **7 Claims**

1. An interpenetrating polymer network comprising a polymer built up from at least one polyallyl compound which is cross-linked under the influence of a radical initiator, an epoxy resin, and a cross-linking agent for the epoxy resin which is a cyclic carboxylic anhydride containing a radical-polymerizable functional group.

5,110,868

BIODEGRADABLE COMPOSITIONS FOR CONTROLLED RELEASE OF CHEMICAL AGENTS

Harold E. Bellis, Wilmington, Del., and Virginia M. Osterman, Glen Mills, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 14, 1991, Ser. No. 640,562

Int. Cl.[5] C11D *17/00, 3/48*

U.S. Cl. 252—174.23 **12 Claims**

1. A solid, water-degradable composition in the form of a molded object which is amorphous and comprises at least 50 percent by weight of or amorphous condensation polymer of hydroxyacetic acid and lactic acid, said polymer having a molecular weight of between about 800 and 4000 and composed of 40 to 60 mole percent of hydroxyacetic acid, the balance being lactic acid, from about 5 up to about 10 weight percent of a nonionic surfactant which is a condensation product of a long chain ethylene oxide moiety with an aliphatic alcohol, wherein the aliphatic alcohol contains 8 to 20 carbon atoms, and the balance comprising at least one water soluble inert salt.

5,110,869

β-(KETO OR SULFONYL)ESTERS FROM REACTION OF SILYKETENE ACETAL AND ACYL OR SULFONYL COMPOUND

Gordon M. Cohen, Wynnewood, Pa., and Hans J. Reich, Madison, Wis., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 336,120, Apr. 11, 1989, Pat. No. 4,983,679, which is a continuation-in-part of Ser. No. 48,958, May 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 8,960, Jan. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 868,083, May 29, 1986, abandoned. This application Aug. 21, 1990, Ser. No. 570,458

Int. Cl.[5] C08F *8/10, 8/36*

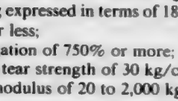
U.S. Cl. 525—194 **4 Claims**

1. Process for preparing beta-ketoesters of beta-sulfonylesters comprising contacting and reacting a silylketene acetal with an acyl or sulfonyl compound in the presence of a catalyst with is a source of

(1) an anion selected from the group consisting of fluoride, difluorotrimethylsilicate, bifluoride, cyanide and azide ions; or

(2) an oxyanion which forms a conjugate acid having a pKa measured in dimethylsulfoxide at 25° C.;

the silylketene acetal being of the formula



wherein

Q is R^1;

each R^1, independently, is a hydrocarbyl or substituted hydrocarbyl radical;

R^2 is C_1–C_8 hydrocarbyl,

R^3 is H or methyl,

R^4 is a polymeric radical comprised of acrylic units;

the acyl or sulfonyl compound being selected from the group consisting of $[XC(O)]_nR^5$ and $[YS(O)_2]_nR^5$ wherein:

X is —F, —OAr or —OC(O)R^6;

Y is —F or —OAr;

Ar is aryl or substituted aryl;

R^5 is a hydrocarbyl., substituted hydrocarbyl or polymeric radical valence n, wherein the carbon adjacent to the C(O) or $S(O)_2$ is not part of a carbon-carbon double or triple bond;

R^6 is a hydrocarbyl or substituted hydrocarbyl radical; and wherein

n is an integer of at least 2, and —C(O)X or —$S(O_2)$Y groups in the product are finished with a mono-or difunctional finishing agent.

5,110,870

EXTENSIBLE FILM OR SHEET AND PROCESS FOR PRODUCING THE SAME

Toshio Fujii, Kurashiki; Yoshinao Shinohara, Nagareyama, and Keishin Handa, Kurashiki, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Dec. 29, 1989, Ser. No. 459,328

Claims priority, application Japan, Jan. 6, 1989, 1-999

Int. Cl.[5] C08L *23/26, 23/04, 23/16*

U.S. Cl. 525—194 **10 Claims**

1. An extensible film or sheet obtained by converting into a film or sheet a starting resin composition comprising: 100 to 60 parts by weight of an ethylene copolymer having a density of less than 0.910 g/cm^3, a flow ratio of 30 or less and a melt index of 10 g/10 min or less; and a positive amount up to 40 parts by weight of a linear polyethylene having a density of 0.910 to 0.945 g/cm^3 while reacting or after reacting said starting resin composition with a radical forming agent in an amount of 0.001 to 0.1 part by weight to 100 parts by weight of said starting resin composition, said film or sheet having

1) a film blocking expressed in terms of 180 ° peel strength of 60 g/25 mm or less;

2) a tensile elongation of 750% or more;

3) an Elmendorf tear strength of 30 kg/cm^2 or more; and

4) a 1% secant modulus of 20 to 2,000 kg/cm^2.

5,110,871

RUBBER COMPOSITIONS

Hitoshi Kondo, Tokyo; Makoto Sasaki, Yokohama, and Yukio Kobayashi, Tokyo, all of Japan, assignors to Bridgestone Corporation and Nippon Oil Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 223,045, Jul. 22, 1988, Pat. No. 4,972,022. This application Aug. 2, 1990, Ser. No. 561,763

Claims priority, application Japan, Aug. 6, 1987, 62-195159; Aug. 6, 1987, 62-195160

Int. Cl.[5] C08L *33/06, 35/02*

U.S. Cl. 525—207 **4 Claims**

1. A rubber composition comprising:

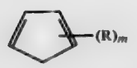
(A) 1 to 30 parts by weight of a resin (R2), based on

(B) 100 parts by weight of at least one rubber selected from the group consisting of natural and synthetic rubbers,

wherein resin (R2) is obtained by reacting:

(1) a hydroxyl group-containing cyclopentadiene resin (R1), which is obtained by heat copolymerizing:

(i) 100 parts by weight of a component A being at least one compound selected from the group consisting of a cyclopentadiene ring containing compound represented by the following general formula:



(I)

wherein R is an alkyl group having a carbon number of 1–3 and m is an integer of 0–6, and its Diels-Alder reaction adduct,

(ii) with 2 to 120 parts by weight of a component B being a compound having a polymerizable double bond and hydroxyl group in its molecule, and

(iii) a component C being at least one compound selected from the group consisting polybasic acids, anhydrides and esters thereof,

in such a manner that an equivalent ratio of a carboxyl group, acid anhydride (having one bivalent acid anhydride), ester group or mixtures thereof in said component C to hydroxyl group in said resin (R1) is within a range of 0.05–1.5.

5,110,872

RUBBER COMPOSITION

Makoto Sasaki, Yokohama; Yukio Kobayashi, and Shozo Tsuchiya, both of Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Japan

PCT No. PCT/JP87/01020, § 371 Date Aug. 26, 1988, § 102(e) Date Aug. 26, 1988, PCT Pub. No. WO88/05063, PCT Pub. Date Jul. 14, 1988

PCT Filed Dec. 23, 1987, Ser. No. 254,939

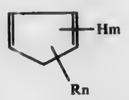
Claims priority, application Japan, Dec. 26, 1986, 61-311797; Dec. 26, 1986, 61-311798; Dec. 26, 1986, 61-311799

Int. Cl.[5] C08C *45/00*; C08L *9/00*

U.S. Cl. 525—216 **5 Claims**

1. A rubber composition comprising 100 parts by weight of a rubber made up of ethylene and an α-olefin and/or an unconjugated diene, and 0.5–30 parts by weight of at least one of the following polycyclopentadienes;

(a) a cyclopentadiene resin derived by copolymerizing 100 parts by weight of a first component with 5–200 parts by weight of a second component, said first component being either one or both of a 5-membered, conjugated double bond-containing compound and a Diels-Alder adduct thereof, and represented by the formula



wherein H is a hydrogen atom, R is a C_{1-3} alkyl group, m and n each are 0–6, and the sum of m and n is 6, and said second component being an unsaturated aromatic hydrocarbon component having in the molecule a carbon double bond and a benzene nucleus; and

(b) a polar group-containing cyclopentadiene resin formed by copolymerizing 100 parts by weight of said first component with 1–200 parts by weight of a third component which is a compound having a polar group and a carbon double bond, said polar group being an ester, nitrile or amide group, wherein said ester is vinyl acetate, vinyl propionate, methyl acrylate, methyl methacrylate, ethyl acrylate, butyl acrylate, linseed oil or tung oil.

5,110,873

THERMOSETTING RESIN COMPOSITION

Yoshimi Kono, Amagasaki, and Sabee Maeda, Osaka, both of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

Continuation of Ser. No. 259,913, Oct. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 65,421, Jun. 23, 1987, abandoned. This application Mar. 21, 1991, Ser. No. 673,267

Int. Cl.[5] C08F *4/34, 265/06*

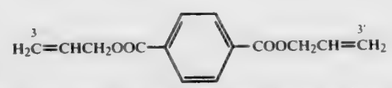
U.S. Cl. 525—305 **5 Claims**

1. A thermosetting resin composition for obtaining a shaped article consisting essentially of, as resin components:

(A) 60 to 95% by weight of a prepolymer or precopolymer selected from the group consisting of (A-1), (A-2) and (A-3) below,

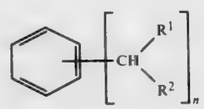
(A-1) a prepolymer of diallyl phthalate,

(A-2) a prepolymer of diallyl terephthalate derived from diallyl terephthalate of the following formula (1)



(1)

and an aromatic benzyl hydrocarbon having at least one hydrogen atom at the benzyl position and represented by the following formula (2)

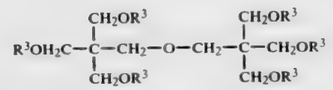


(2)

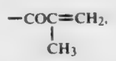
wherein each R^1 and R^2 represents a member selected from the class consisting of a hydrogen atom and lower alkyl groups, and n is an integer of 1 to 3, and

(A-3) a mixture of (A-1) and (A-2), and

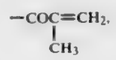
(B) 40 to 5% by weight of a polyacrylate or polymethacrylate of dipentaerythritol having at least 4 acryloyl or methacryloyl groups in the molecule and represented by the following formula



wherein each R^3 represents a hydrogen atom, $-COCH=CH_2$ or



and at least four R^3 groups represent $-COCH=CH_2$ or



and

(C) about 1 to about 10 parts by weight of an organic peroxide as a curing agent per 100 parts by weight of the prepolymer or precopolymer (A).

5,110,874

METHODS AND COMPOSITIONS FOR REDUCTION OF DRAG IN HYDROCARBON FLUIDS

Michael I. Naiman, St. Louis, and James C. Chang, Manchester, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 381,232, Jul. 18, 1989, Pat. No. 4,983,186. This application Apr. 19, 1990, Ser. No. 510,929

Int. Cl.[5] C08F *8/32*

U.S. Cl. 525—329.9 **14 Claims**

1. A salt useful for reducing friction loss in flowing hydrocarbon fluids, said salt being formed by the ionic reaction between an oil-soluble polyamine and a terpolymer of styrene, alkyl acrylate and a carboxylic acid selected from the group consisting of acrylic acid and methacrylic acid.

5,110,875

POLYSTYRENE ANION EXCHANGE POLYMERS

Albert A. Jaxa-Chamiec, Rickmansworth, and Deirdre M. B. Hickey, Welwyn, both of England, assignors to Smith Kline & Franch Laboratories Limited, Welwyn Garden City, England

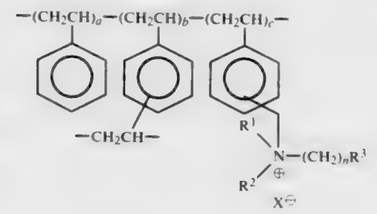
Filed Jun. 12, 1990, Ser. No. 536,837

Claims priority, application United Kingdom, Jun. 14, 1989, 8913699

Int. Cl.[5] C08F *8/32*

U.S. Cl. 525—332.2 **11 Claims**

1. A pharmaceutical composition comprising a polymer of structure



(1)

in which,

R1 and R^2 are each C_{1-4}alkyl, or one is C_{1-4}alkyl and the other is $-(CH_2)_nR^3$;

n is 2 to 12;

R^3 is NR^4R^5 or $N^{\oplus}R^6R^7R^8\ X^{\ominus}$;

R^4 and R^5 are the same or different and are each hydrogen, C_{1-4}alkyl, $C(=NH)NH_2$, or together with the nitrogen atom to which they are attached form a saturated or unsaturated ring optionally containing one or more further heteroatoms.

R^6, R^7 and R^8 are the same or different and are each hydrogen, C_{1-4}alkyl or one of R^6, R^7 and R^8 is C_{1-4}alkyl and the other two together with the nitrogen atom to which they are attached form a saturated or unsaturated ring optionally containing one or more further heteroatoms;

a, b and c are numbers which indicate the relative molar percentages of the units present in said polymer, (b) being from 1 to 10 molar percent, and (c) being from 30 to 98 molar percent; and

$X^{\ominus}$ is a counter ion.

5,110,876

TRI-BLOCK THERMOPLASTIC ELASTOMERS WITH IMPROVED HIGH TEMPERATURE PROPERTIES

H. James Harwood, Stow; Allan S. Jones, Cuyahuga Falls, both of Ohio, and Malcoln A. Smook, Wilmington, Del., assignors to The West Company, Incoprorated, Phoenixville, Pa.

Filed Aug. 3, 1990, Ser. No. 562,468

Int. Cl.[5] C08F *8/10*

U.S. Cl. 525—332.3 **3 Claims**

1. A thermoplastic elastomeric block copolymer having terminal polystyrene units and elastomeric polyolefin mid block units, said copolymer having an amount of naphthoylated substitution on said polystyrene units, wherein the amount of said substitution is from 15% to 95% of said polystyrene units.

5,110,877

METHOD FOR IMIDIZING AN ALKYL METHACRYLATE POLYMER

Werner Hoess, Griesheim; Heinz Vetter, Rossdorf; Manfred Brehm, Aschaffenburg; Guenter Schroeder, Ober-Ramstadt, and Roland Reiner, Darmstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Feb. 1, 1991, Ser. No. 650,399

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1990, 4002904

Int. Cl.[5] C08F *8/32*

U.S. Cl. 525—378 **13 Claims**

1. A method for imidizing an alkyl methacrylate polymer which comprises reacting said polymer with an imidizing agent containing nitrogen by reacting a portion of said imidizing agent with said polymer and then adding further imidizing agent only after the previously added imidizing agent has been reacted completely or at least partially.

5,110,878

DRY POLYAMIDE-EPICHLOROHYDRIN RESIN POWER FOR STRENGTHENING WET PAPER

Ronald L. Amey, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 14, 1991, Ser. No. 698,993

Int. Cl.[5] C08G *69/48*

U.S. Cl. 525—430 **4 Claims**

1. A dry, solid, water soluble, amorphous, cationic polyamide-epichlorohydrin resin powder, the polyamide portion of said resin being the long chain reaction product of a polyalkylene polyamine having two primary amine groups and at least one secondary amine group with a member selected from the group consisting of C_3 to C_8 saturated aliphatic dicarboxylic acids and lower alkyl esters of C_3 to C_8 saturated aliphatic dicarboxylic acids, said resin having been made by the reaction of said polyamide with epichlorohydrin in an aqueous solution in which the mole ratio of epichlorohydrin to secondary amine groups of the polyamide is about 0.5 to 1 to about 1.8 to 1.

5,110,879

MISCIBLE BLENDS OF POLYIMIDE POLYMERS AND PROCESS FOR FORMING THE SAME

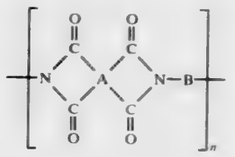
Tai-Shung Chung, Randolph, and Rohitkumar H. Vora, Westfield, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Apr. 24, 1990, Ser. No. 513,645

Int. Cl.[5] C08L *79/08*

U.S. Cl. 525—432 **21 Claims**

1. A miscible blend of at least two polyimide polymers having different molecular structures, each of said polyimide polymers having recurring groups of the structure:



wherein;

(i) the moiety A is a tetravalent aromatic radical containing at least one benzene, naphthalene or polyphenyl nucleus,

the moiety B is a divalent aromatic group, and n is an integer ranging from about 15 to 300, and wherein

(ii) said A moieties for each of said at least two polyimide polymers are structurally identical to one another, and said B moieties for each of said at least two polyimide polymers are structurally different from one another.

5,110,880

BLENDS OF POLY(ARYL KETONE) AND A POLYETHERIMIDE

James E. Harris, Piscataway; Lloyd M. Robeson, Whitehouse Station, and John P. Gavula, Lebanon, all of N.J., assignors to Amoco Corporation, Chicago, Ill.

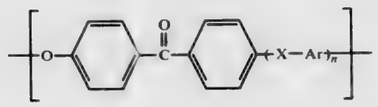
Continuation of Ser. No. 803,979, Dec. 3, 1985, abandoned, which is a continuation-in-part of Ser. No. 537,042, Sep. 29, 1983, abandoned. This application Jan. 30, 1987, Ser. No. 8,696

Int. Cl.[5] C08L *79/08*

U.S. Cl. 525—436 **5 Claims**

1. A molding composition comprising a miscible blend of:

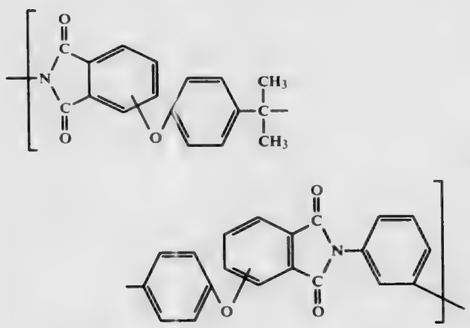
(a) a poly(aryl ketone) having repeating units of the formula:



wherein Ar is independently a divalent aromatic radical selected from phenylene, biphenylene, or naphthylene, X is independently O,

or a direct bond and n is an integer of from 1to 3, and

(b) a polyetherimide having repeating units of the formula:



said composition having a single glass transition temperature.

5,110,881

POLYMERIZABLE ORGANIC RESIN COMPOSITION

Douglas S. McBain, Norton, and John C. Crano, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 339,850, Apr. 18, 1989, Pat. No. 4,994,208. This application Jan. 10, 1991, Ser. No. 639,462

Int. Cl.[5] C08F *283/02, 26/02*

U.S. Cl. 525—455 **19 Claims**

1. A polymerizable organic resin composition comprising a homogeneous copolymerizable blend of:

(a) from about 55 to about 90 weight percent of polyol(allyl carbonate),

(b) from about 10 to about 40 weight percent of aliphatic polyurethane having ethylenic unsaturation at its terminal ends, and

(c) from about 1 to about 4 weight percent of a difunctional monomer selected from the group consisting of allyl methacrylate and allyl acrylate.

5,110,882

SILICONE PRESSURE-SENSITIVE ADHESIVE COMPOSITION

Yuji Hamada; Ichiro Murakami, and Shosaku Sasaki, all of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Company, Ltd., Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,292

Claims priority, application Japan, Nov. 28, 1986, 61-283343

Int. Cl.[5] C08F *283/00*

U.S. Cl. 525—478 **9 Claims**

1. A silicone pressure-sensitive adhesive composition comprising

(A) 30 to 70 weight parts of a polydiorganosiloxane having the general formula $R^1R_2SiO(R_2SiO)_nSiR_2R^1$ wherein each R is a monovalent hydrocarbon group, each R^1 is a lower alkenyl group and n is an integer.

(B) 70 to 30 weight parts of an organopolysiloxane which is constituted of $R^2{}_3SiO_{\frac{1}{2}}$ units and SiO_2 units in a molar ratio in the range of 0.6:1 to 0.9:1, wherein R^2 is selected from the group consisting of alkyl groups, alkenyl groups, and the hydroxyl group, and the methyl group comprises at least 95 mol percent of all R^2 groups and which has a silicon-bonded hydroxyl content of no more than 1 weight percent,

(C) an organohydrogenpolysiloxane having an average of at least 2 silicon-bonded hydrogen atoms in each molecule, in a quantity sufficient to provide from 1 to 40 silicon-bonded hydrogen atoms per alkenyl group in component (A), and

(D) a platinum-containing catalyst in a quantity sufficient to provide 0.1 to 1,000 weight parts platinum for each one million weight parts of the combined quantity of components (A) through (C).

5,110,883

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT COPOLYMERS OF DIALLYLAMMONIUM MONOMERS AND ACRYLAMIDE MONOMERS IN SOLUTION

Herbert A. Gartner, Baden-Baden, Fed. Rep. of Germany, assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 11, 1991, Ser. No. 667,707

Int. Cl.[5] C08F *226/04*

U.S. Cl. 526—84 **12 Claims**

1. A process for the preparation of a water-soluble, linear copolymer of diallyl ammonium monomer and acrylamide monomer having a uniform diallyl ammonium monomer to acrylamide monomer ratio comprising the steps of:

a) initiating the copolymerization of a stirred mixture of diallyl ammonium monomer with a portion of the total amount of acrylamide monomer required in a solvent solution at a temperature at which copolymerization proceeds;

b) adding to said stirred monomer solution the remaining acrylamide monomer by continuous addition to form a homogeneous gel solution, while maintaining the reaction temperature;

c) after completion of the addition of acrylamide, maintaining the reaction mixture at the polymerization temperature for a period of about 30 minutes to about 1 hour to complete polymerization;

d) after the polymerization is completed homogeneously mixing a chain transfer agent in said gel solution to form a gel mixture;

e) heating said gel mixture to a temperature at which residual monomer undergoes copolymerization; and

f) drying said gel mixture.

5,110,884

OLEFIN POLYMERIZATION

Ted M. Pettijohn, and Henry L. Hsieh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 536,383, Jun. 11, 1990, Pat. No. 5,028,673. This application Mar. 4, 1991, Ser. No. 664,239

Int. Cl.[5] C08F *4/643, 4/646*

U.S. Cl. 526—114 **8 Claims**

1. A process for the polymerization of monomers selected from olefins comprising contacting said olefins under suitable reaction conditions with a catalyst prepared by contacting reactants consisting essentially of a rare earth metal halide, an organolithium compound, and a transition metal compound selected from dicyclopentadienyl zirconium dichloride and titanium compounds of the formula TiX4 wherein each X is individually selected from the group consisting of halogen, alkyl, alkoxy and aryl radicals.

5,110,885

METHOD FOR POLYMERIZING ACYCLIC DIENES

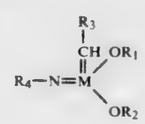
Kenneth B. Wagener; James M. Boncella, both of Gainesville, Fla.; Robert P. Duttweiler, Somerville, N.J.; Marc A. Hillmyer, Pasadena, Calif., and Jan G. Nel, Sanderland, Mass., assignors to University of Florida, Gainesville, Fla.

Filed Jan. 3, 1990, Ser. No. 462,532

Int. Cl.[5] C02F *4/78*

U.S. Cl. 526—170 **10 Claims**

1. A method for the step propagation, condensation type polymerization of an acyclic diene which comprises contacting said diene with a catalyst having the formula



[I]

wherein: R_1, R_2 and R_4 may be the same or different and are alkyl, aryl, aralkyl, haloalkyl, haloaryl, haloaralkyl or a siliconcontaining analog thereof, R_3 is alkyl, aryl, aralkyl or a substituent resulting from the reaction of the M=CH—R_3 moiety of said catalyst with an acyclic diene being polymerized, and

M is W or Mo,

at a temperature and for a time sufficient to effect said polymerization of said diene and recovering said polymerized diene.

5,110,886

COMPATIBILIZING AGENT AND POLYMER BLEND COMPOSITION USING THE SAME

Shizuo Kitahara, and Tetuya Toyoshima, both of Kawasaki, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1991, Ser. No. 650,588

Claims priority, application Japan, Feb. 5, 1990, 2-25623; Jul. 20, 1990, 2-192657

Int. Cl.[5] G08F *26/06, 34/02*

U.S. Cl. 526—260 **9 Claims**

1. A compatibilizing agent for improving the compatibility between different polymers which are poorly compatible with each other, comprising a polymer having at least one heterocyclic ring structure containing a >C=N⊕< bond in the molecule.

5,110,887

SUPERABSORBENT CROSSLINKED AMPHOLYTIC ION PAIR COPOLYMERS

Henry L. Hsieh, and Iqbal Ahmed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 607,005, Oct. 31, 1990. This application Sep. 18, 1991, Ser. No. 761,572

Int. Cl.[5] C08F *12/30*

U.S. Cl. 526—287 **33 Claims**

1. An article of manufacture selected from the group consisting of a paper towel and a disposable diaper containing therein a polymer formed by the copolymerization of an effective amount of each of the following components to produce a polymer which is highly absorbent to aqueous electrolyte solutions:

(a) an ampholytic ion pair monomer comprising

(i) an ammonium cation 3-methacrylamidopropyldimethylammonium and

(ii) a sulfonate anion selected from the group consisting of 2-acrylamido-2-methylpropane sulfonate, 2-methacryloyloxyethane sulfonate, vinyl sulfonate, styrene sulfonate and combinations of two or more thereof;

(b) at least one comonomer selected from the group consisting of acrylamide, methacrylamide, acrylonitrile, acrylic acid, methacrylic acid, alkali salts of acrylic acid, alkali salts of methacrylic acid, N-vinyl-2-pyrrolidone and combinations of two or more thereof; and

(c) at least one crosslinking agent which has at least two polymerizable olefinic functionalities wherein each of the olefinic functionalities is suitable for crosslinking.

5,110,888

RESIN COMPOSITION

Hisao Furukawa; Yasushi Kato, both of Kobe, and Jo Kawamura, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

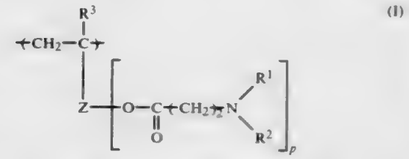
Filed Oct. 18, 1989, Ser. No. 423,327

Claims priority, application Japan, Oct. 21, 1988, 63-266828

Int. Cl.[5] C08L *33/14*

U.S. Cl. 526—312 **6 Claims**

1. A resin composition comprising 5 to 100% by weight of a vinyl copolymer comprising 0.1 to 99% by weight of units having the formula (I):



(I)

wherein R^1 is an alkyl, aryl or aralkyl group with 1 to 30 carbon atoms, R^2 is a hydrogen atom or an alkyl, aryl or aralkyl group with 1 to 30 carbon atoms, R^3 is a hydrogen atom or a methyl group, Z is an organic group with a valence of 2 to 4, and p is an integer of 1 to 3.

5,110,889

RADIATION HARDENABLE COMPOSITIONS CONTAINING LOW VISCOSITY DILUENTS

Francis A. Higbie, Bound Brook, N.J.; Robert A. LieBerman, Naperville, Ill., and Ira M. Rose, Millburn, N.J., assignors to Diamond Shamrock Chemical Co., Dallas, Tex.

Continuation of Ser. No. 74,991, Jul. 17, 1987, abandoned, which is a division of Ser. No. 849,301, Apr. 8, 1986, Pat. No. 4,989,275, which is a continuation-in-part of Ser. No. 725,801, Apr. 22, 1985, abandoned, and a continuation-in-part of Ser. No. 797,483, Nov. 13, 1985, abandoned. This application Nov. 29, 1990, Ser. No. 619,818

Int. Cl.[5] C08F *18/00*

U.S. Cl. 526—320 **15 Claims**

1. A radiation hardenable composition comprising:

(I) at least one radiation hardenable oligomer selected from the group consisting of:

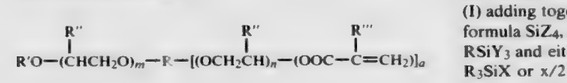
(A) reaction products of acrylic or methacrylic acid or mixtures thereof and at least one polyepoxide containing more than one 1,2-epoxide group per molecule, about 0.6 to 1 mole of carboxyl groups having been used to one epoxide group; said polyepoxide optionally having been prereacted with from 0.01 to 0.5 NH or SH or COOH equivalents per epoxide equivalent of reagents selected from the group consisting of (i) ammonia, (ii) aliphatic and cycloaliphatic primary and secondary amines, (iii) hydrogen sulfide, (iv) aliphatic, cycloaliphatic, and aromatic dithiols and polythiols, and (v) dicarboxylic and polycarboxylic acids;

(B) products of reaction of the materials of part (A) with isocyanates;

(C) urethanes containing acrylic and methacrylic acid units; and

(D) oligomers of the diacrylate of the diglycidyl ether of bisphenol-A: and

(II) at least one radiation hardenable diluent selected from the group consisting of



where:

R=saturated linear or branched C_2–C_6 hydrocarbon fragment

R′=at least one saturated linear or branched C_1–C_6 alkyl

R″=H—, CH_3—, CH_3CH_2—, or mixtures

R‴=H—, CH_3—, or mixtures

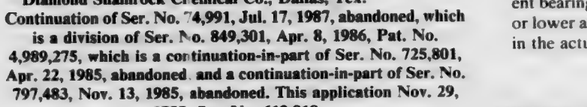
a=1, 2, or 3

m=0 to about 6

n=0 to about 6 and with the proviso that

m+n does not exceed about 6,

mono-lower alkoxy trans 1,4-cyclohexane dimethylol monoacrylate, mono-lower alkoxy trans-1,4-cyclohexane dimethylol monomethacrylate, monomethacrylate, mono-lower alkoxy 2,2,4-trimethyl-1,3-pentanediol monoacrylate, mono-lower alkoxy 2,2,4-trimethyl-1,3-pentanediol monomethacrylate. and



where:

R′=at least one saturated linear or branched C_1–C_6 alkyl

R″=H—, CH_3—, CH_3CH_2—, or mixture

R‴=H— or CH_3—

R⁗=H—, CH_3—, or mixtures

a=1

m=0 to about 6

n=0 to about 6

m+n=0 to about 6,

said radiation hardenable composition containing an amount of diluent component (II) that is from 10 to 70 percent by weight of the total composition and having a viscosity that is lower than the viscosity of a reference composition which is identical to the actual composition, except for the substitution of a radiation hardenable diluent bearing an acrylate group in lieu of each of the R′—O or lower alkoxy groups in the radiation hardenable diluent in the actual composition.

5,110,890

METHOD OF MAKING ORGANISILOXANE RESINS

Derek W. Butler, South Glamorgan, United Kingdom, assignor to Dow Corning Limited, Barry, Wales

Filed Feb. 22, 1990, Ser. No. 483,524

Claims priority, application United Kingdom, Mar. 22, 1989, 8906626

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—12 **10 Claims**

1. A method of making organosiloxane resins which are liquid at 50° C. at a pressure of 10^5 Pa and have the general formula $[M_xT_yQ_z]_n$, wherein M denotes a monofunctional siloxane unit of the formula $R_3SiO_{\frac{1}{2}}$, T denotes a trifunctional siloxane unit of the general formula $RSiO_{3/2}$ and Q denotes a tetrafunctional unit of the general formula $SiO_{4/2}$, wherein R is selected from the group consisting of aliphatic and aromatic hydrocarbon substituents, a hydrogen atom, chloropropyl, trifluoropropyl, organic groups linked to silicon via a carbon atom and having oxygen present, organic groups linked to silicon via a carbon atom and having oxygen and phosphorous present, organic groups linked to silicon via a carbon atom and having oxygen and sulphur present and organic groups linked to silicon via a carbon atom and having sulphur present, n has an average value of from 4 to 14 and x, y and z have values such that x+y is not less than z and not more than 2z and that the ratio of x to y has a value of from 2 to 9, which comprises (I) adding together z molar parts of (A) a silane of the general formula SiZ_4, molar parts of (B) a silane of the general formula $RSiY_3$ and either x molar parts of (C) a silane of the formula R_3SiX or x/2 molar parts of (C′) a disiloxane of the formula $(R_3Si)_2O$ in an aqueous medium, wherein X is selected from the group consisting of halogen atoms and alkoxy groups, Y is selected from the group consisting of halogen atoms, alkoxy groups and groups of the general formula —$OSiR'_3$, wherein R′ is selected from the group consisting of alkyl and aryl groups and Z denotes an alkoxy group provided that Component (A) is not added to the aqueous medium prior to Components (B) and (C) or (C′), and (II) allowing Components (A), (B) and (C) or (C′) to react together in said aqueous medium, the medium having a pH below 7.

5,110,891

AMINE FUNCTIONAL SILOXANES

Martin E. Cifuentes, and David B. Selley, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 11, 1991, Ser. No. 683,898

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—34 **7 Claims**

1. An aminofunctional organosilicon compound of the formula

$$R_3SiO[R_2SiO]_x[RQ^1SiO]_y[RQSiO]_zSiR_3$$

wherein R denotes an alkyl group of one to four carbons, OH, an alkoxy group or a phenyl group with the proviso that at least fifty percent of the total R groups are methyl; Q denotes an amine functional substituent of the formula —R^2Z, wherein R^2 is a divalent alkylene radical of three to six carbon atoms and Z is a monovalent radical selected from from the group consisting of

$$-NR_2^3,\ -NR^3(CH_2)_nNR_2^3 \text{ and } -NR^3(CH_2)_nN(R^3)\overset{O}{\overset{\|}{C}}R^4$$

wherein R^3 denotes hydrogen or an alkyl group of one to four carbons, R^4 denotes an alkyl group of one to four carbons and n is an integer from two to six; x, y and z are integers the sum of which is within the range of about twenty-five to about eight hundred; 4 is at least one; and Q^1 denotes an amine functional substituent as defined above additionally including a carbon bonded silicon atom having at least one silicon-bonded hydrolyzable group.

5,110,892

SINGLE PACK POLYURETHANE ADHESIVE

Malcolm Graham, Herts, United Kingdom, assignor to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Dec. 18, 1990, Ser. No. 629,761

Int. Cl.[5] C08G *18/10*

U.S. Cl. 528—48 **14 Claims**

1. In a single pack stirrable reactive polyurethane adhesive composition comprising an isocyanate terminated prepolymer lower layer and an upper layer comprising a curing agent therefor, the upper layer and the base layer are separated by a disposable barrier layer, the improvement which comprises dispersing 0.1 to 5% by weight of a wax into the base layer at a temperature above the melting point of wax.

5,110,893

PREPARATION AND POLYMERIZATION OF CYCLIC AROMATIC KETONES

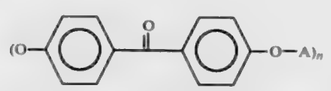
James M. Fukuyama, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 146,154, Jan. 20, 1988, Pat. No. 4,980,453. This application Jul. 30, 1990, Ser. No. 559,920

Int. Cl.[5] C08G *8/02, 14/00, 63/00, 75/00*

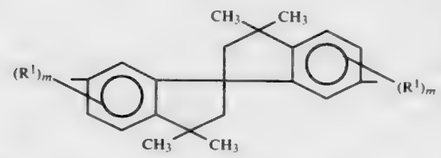
U.S. Cl. 528—125 **19 Claims**

1. A composition comprising macrocyclic aryl ether ketones having the formula



wherein n is an integer from about 2 to about 20 and A is a bridged biphenyl group selected from the group consisting of formulas

$$-A^1-Y-A^2-, \text{ and} \qquad (I)$$



wherein each A^1 and A^2 is a single ring divalent aromatic radical, Y is a bridging radical in which one or two atoms separate A^1 from A^2, R^1 is independently C_{1-4} primary or secondary alkyl or halo, and m is 0 to about 3.

5,110,894

COPOLYMERS CONTAINING POLYBENZAZOLE MER UNITS AND POLY(AROMATIC KETONE) OR POLY(AROMATIC SULFONE) MER UNITS

William J. Harris, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 327,925, Mar. 23, 1989, Pat. No. 5,030,706, which is a continuation-in-part of Ser. No. 256,338, Oct. 12, 1988. This application Jul. 7, 1989, Ser. No. 378,360

Int. Cl.[5] C08G *75/32, 73/22, 73/18*

U.S. Cl. 528—128 **55 Claims**

1. A process for synthesizing a copolymer having benzazole moieties and aromatic ketone or sulfone moieties, said process comprising the step of contacting a plurality of difunctional primary monomers in a non-oxidizing, dehydrating solvent acid under conditions such that functional moieties of the monomers react simultaneously or sequentially to form azole rings and aromatic ketone or sulfone moieties which link the monomers, whereby a copolymer is formed, wherein each difunctional monomer contains at least two functional moieties chosen from the group consisting of azole-forming moieties and acylation reactive groups and chosen such that:

(a) at least two monomers contain azole-forming moieties capable of reaction to form an azole ring,

(b) at least two monomers contain acylation reactive groups capable of reacting together to form an aromatic ketone or sulfone moiety, and

(c) at least one monomer contains a functional moiety capable of reacting as an acylation group and a functional moiety capable of reacting as an azole-forming moiety.

49. A copolymer having a plurality of mer units which each independently comprise:

(1) a benzazole moiety;

(2) a decoupling group bonded to the 2-carbon of an azole ring in the benzazole moiety;

(3) an aromatic sulfone group bonded to the decoupling group consisting essentially of an aromatic group bonded to a sulfonyl group; and

(4) a bond or a decoupling group linking the aromatic sulfone group to the benzazole moiety of an adjacent mer unit.

5,110,895

POLYESTER AND POLYESTER CARBONATE FROM TEREPHTHALIC OR ISOPHTHALIC ACID, PHOSGENE AND PHENOLS WITH HEAT RESISTANCE AND LIGHT STABILITY

Richard Weider, Leverkusen; Dieter Arlt, Cologne; Christian Leuschke, Dormagen, and Thomas Scholl, Meerbusch, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

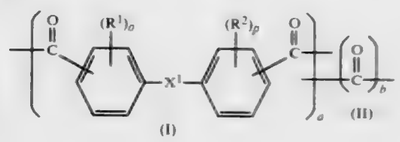
Filed Aug. 13, 1990, Ser. No. 566,172

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1989, 3927771

Int. Cl.[5] C08G *63/00, 63/02, 64/00*

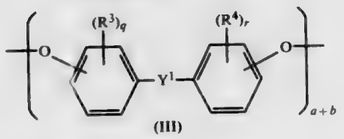
U.S. Cl. 528—176 **9 Claims**

1. Polyester or polyester carbonate having repeating units of the formulae (I), (II) and (III)



(I) (II)

-continued



(III)

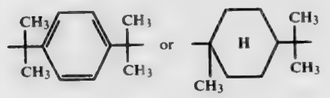
in which

R^1, R^2, R^3 and R^4 independently of one another represent linear or branched C_{1-4} alkyl, linear or branched C_{1-4} alkoxy or chlorine,

o, p, q and r independently of one another represent zero, one, two, three or four,

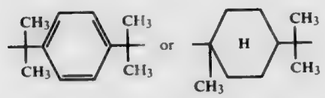
a and b indicate the numbers of mols of the dicarboxylate component or the carbonate component and a+b indicates the number of mols of the bisphenolate component and the term 100·a/(a+b) has a value of 5 to 100,

X^1 represents linear or branched C_{1-12} alkylene, linear or branched C_{2-12} alkylidene, C_{5-15} (alkyl) cycloalkylene, C_{5-15} (alkyl) cycloalkylidene or one of the groups



and

Y^1 is a single bond or Y^1 is linear or branched C_{1-12} alkylene, linear or branched C_{2-12} alkylidene, C_{5-15} (alkyl) cycloalkylene C_{5-15} (alkyl) cycloalkylidene, —O—, —S—, —SO_2—, —CO— or one of the groups



at least one of the indices o, p, q and r being different from zero or the term 100·a/(a+b) is from 5 to 99.9 where X^1 represents methylene, linear C_{2-7} alkylidene or 1,1-dimethyl-2,2-propylidene,

and wherein the degree of polymerization is from 2 to 100 repeating units of (I), (II) and (III).

5,110,896

THERMOTROPIC LIQUID CRYSTALLINE POLYESTER COMPOSITIONS

Marion G. Waggoner, Hockessin, and Michael R. Samuels, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

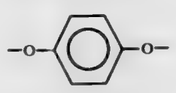
Filed Dec. 10, 1990, Ser. No. 625,132

Int. Cl.[5] C08G *63/189*

U.S. Cl. 528—190 **11 Claims**

1. A thermotropic liquid crystalline polyester composition consisting essentially of recurring units of

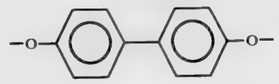
(a) structure (I),



(I)

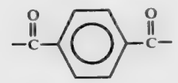
(b) structure (II),

-continued



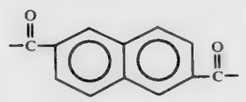
(II)

(c) structure (III),



(III)

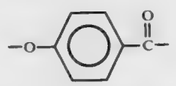
(d) structure (IV),



(IV)

and

(e) structure (V),



(V)

wherein the molar ratio of (I):(II) ranges from 65:35 to 40:60, wherein the molar ratio of (III):(IV) ranges from 85:15 to 50:50, wherein the molar ratio of the total of (I) and (II) to the total of (III) and (IV) is substantially 1:1, and further wherein there are 200 to 600 moles of (V) per 100 moles of (I) plus (II).

5,110,897

THERMOPLASTIC POLYCARBONATE COMPOSITION HAVING IMPROVED OXYGEN BARRIER PROPERTIES FROM DIESTER DIOL

John C. Schmidhauser, Schenectady, and Kathryn L. Longley, Saratoga Springs, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

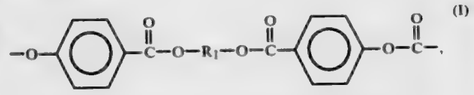
Division of Ser. No. 375,111, Jul. 3, 1989, abandoned. This application May 9, 1990, Ser. No. 520,905

Int. Cl.[5] C08G *63/64*

U.S. Cl. 528—196 **16 Claims**

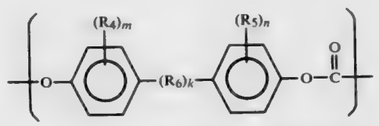
1. A high molecular weight thermoplastic aromatic polycarbonate resin exhibiting improved oxygen barrier properties, comprising

(A) about 50–100 mole percent of structural units of the formula



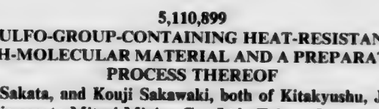
(I)

(B) any balance being structural units of the formula



(II)

wherein R_1 is a divalent aliphatic hydrocarbon radical, divalent aromatic radical or divalent aliphatic ether radical; R_4 and R_5 are independently monovalent hydrocarbon radicals or halogen radicals; R_6 is a divalent hydrocarbon radical or a



radical; m and n are independently numbers in the range of 0 to about 4; and k is 0 or 1.

5,110,898

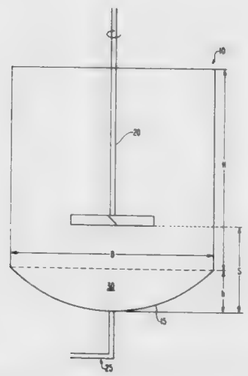
METHOD FOR MANUFACTURING AMINO-ALDEHYDE COMPOSITIONS

Richard E. Formaini, Stone Mountain, Ga., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 276,750, Nov. 28, 1990, Pat. No. 4,960,856. This application Oct. 1, 1990, Ser. No. 592,442

Int. Cl.[5] C08G *12/40*

U.S. Cl. 528—256 **16 Claims**



1. In a method for manufacturing insoluble amino-aldehyde particles wherein a solid condensation product precursor liquid is introduced into a reactor containing an acidified diluent liquid having a temperature between about 38° and 46° C. and said precursor liquid is mixed with said acidified liquid by agitation to form an intimate mixture; and said mixture is then reacted at a temperature between about 45° and 80° for a time sufficient to convert the precursor liquid to insoluble amino-aldehyde particles, the improvement comprising

introducing said precursor liquid into said diluent in a zone of said reactor having a level of agitation lower than that necessary to form said intimate mixture.

5,110,899

SULFO-GROUP-CONTAINING HEAT-RESISTANT HIGH-MOLECULAR MATERIAL AND A PREPARATION PROCESS THEREOF

Koji Sakata, and Kouji Sakawaki, both of Kitakyushu, Japan, assignors to Mitsui Mining Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/00644, § 371 Date Jan. 22, 1991, § 102(e) Date Jan. 22, 1991, PCT Pub. No. WO90/14382, PCT Pub. Date Nov. 29, 1990

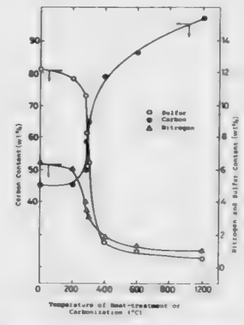
PCT Filed May 21, 1990, Ser. No. 640,354

Claims priority, application Japan, May 22, 1989, 1-126804

Int. Cl.[5] C08G *16/02*

U.S. Cl. 528—265 **11 Claims**

1. A sulfo-group-containing heat-resistant high-molecular material containing sulfo groups in an amount of not less than 1 wt. % in terms of sulfur content and having an ammonia adsorptivity of not less than 10 mg/g, formed by heat-treating at a temperature of 250°–500° C. a starting composition composed mainly of a sulfo-group-containing aromatic high-molecular compound which comprises unit constituents of an aromatic sulfonic acid compound or a salt thereof and is soluble in aqueous solvents.



5,110,900

COPOLYADIPAMIDE CONTAINING ETHYLTETRAMETHYLENEADIPAMIDE UNITS

James A. Hammond, Jr., Chattanooga, Tenn., and David N. Marks, Wilmington, Del., assignors to E. I Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 21, 1991, Ser. No. 718,939

Int. Cl.[5] C08G *69/26*

U.S. Cl. 528—340 **8 Claims**

1. A copolyadipamide consisting essentially of between about 60 and about 99.5 mole percent hexamethyleneadipamide units and between about 0.5 and 40 mole percent ethyltetramethyleneadipamide units, said copolyamide having an RV greater than about 5, and a melting point of greater than about 220° C.

5,110,901

HIGHER MOLECULAR WEIGHT ARYLENE SULFIDE RESIN AND PROCESS FOR ITS PREPARATION

Kenneth C. Hoover, Tulsa; Earl Clark, Jr., Bartlesville; Roy E. Reger; Lacey E. Scoggins, both of Bartlesville, all of Okla., and Afif M. Nesheiwat, Madison, N.J., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 284,170, Dec. 13, 1988, abandoned. This application Sep. 11, 1990, Ser. No. 580,720

Int. Cl.[5] C08G *75/14*

U.S. Cl. 528—387 **58 Claims**

1. An arylene sulfide resin prepared by contacting, in a polymerization mixture, during a polymerization process, reactants comprising:

(a) an alkali metal sulfide,

(b) an organic amide,

(c) an alkali metal carboxylate,

(d) water, and

(e) a monomer source comprising at least one dihaloaromatic compound, wherein the amount of said alkali metal carboxylate present during said polymerization process ranges from about 0.01 to about 0.03 mole for each mole of sulfur present in resulting said arylene sulfide resin, and wherein the amount of said water present during said polymerization process ranges from about 1.02 to about 2.1 moles for each mole of sulfur present in resulting said arylene sulfide resin.

5,110,902

AROMATIC SULFIDE/SULFONE POLYMER PRODUCTION WITH COMPLEX OF ALKALI METAL HYDROSULFIDE AND ALKALI METAL AMINO ALKANOATE

Lacey E. Scoggins, Bartlesville, and Kenneth C. Hoover, Tulsa, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 401,595, Aug. 31, 1989, Pat. No. 5,015,725, which is a division of Ser. No. 102,462, Sep. 29, 1987, abandoned. This application Mar. 22, 1991, Ser. No. 673,616

Int. Cl.[5] C08G *75/16*

U.S. Cl. 528—388 **7 Claims**

1. A process for the production of aromatic sulfide/sulfone polymer which comprises contacting:

(a) at least one organic diluent selected from the group consisting of amides, hydrocarbyl sulfones, and heterocyclic amines,

(b) water,

(c) at least one complex comprising at least one alkali metal hydrosulfide and at least one alkali metal aminoalkanoate, and

(d) at least one dihaloaromatic sulfone,

under polymerization conditions for a period of time sufficient to form an aromatic sulfide/sulfone polymer.

5,110,903

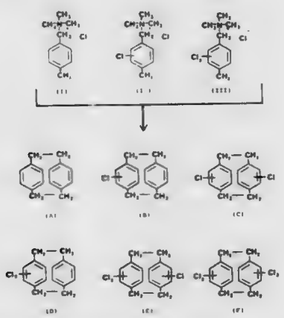
PROCESS FOR THE PREPARATION OF MIXED PARYLENE DIMERS FREE OF ALPHA-HALOGENS

Chinsoo Lee, and David R. Bassett, both of Charleston, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 20, 1990, Ser. No. 630,548

Int. Cl.[5] C07C *17/00*

U.S. Cl. 528—397 **21 Claims**



1. An environmentally improved process for the preparation of a mixture of halogenated and non-halogenated 2,2-paracyclophanes used in the preparation of parylene, and wherein said mixture has a predetermined distribution of halogenated isomers which are free of alpha-isomers, which process comprises the steps of:

a) forming a starting mixture of at least two of:

i) p-methylbenzyltrimethylammonium halide,

ii) p-methyl-monohalobenzyltrimethylammonium halide, and

iii) p-methyl-dihalobenzyltrimethylammonium halide, wherein the ratio of (i), (ii) and (iii) in the starting mixture is selected to provide a predetermined distribution of halogenated isomers;

b) contacting said mixture with an alkaline hydroxide, and

c) thereafter recovering said mixture.

5,110,904

LHRH ANALOGS

Fortuna Haviv, Deerfield, and Jonathan Greer, Chicago, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 390,572, Aug. 7, 1989, which is a continuation-in-part of PCT/US89/00528, Feb. 9, 1989, which is a continuation-in-part of Ser. No. 154,681, Feb. 10, 1988, abandoned. This application Jul. 10, 1990, Ser. No. 548,512

Int. Cl.[5] C07K *7/20;* **A61K** *37/24*

U.S. Cl. 530—313 **10 Claims**

1. A peptide of the formula:

A—B—C—D—E—F—G—H—I—J
1 2 3 4 5 6 7 8 9 10

wherein

A is an amino acyl residue selected from the group consisting of
N-acetyl-D-3-(2-naphthyl)alanine,
N-acetyl-sarcosyl,
N-acetyl-D-phenylalanyl,
N-acetyl-D-(4-chlorophenyl)alanyl, and

B is an amino acyl residue selected from the group consisting of
D-3-(4-chlorophenyl)alanyl,
D-3-(4-fluorophenyl)alanyl,
D-phenylalanyl, and
D-3-(2-naphthyl)alanyl;

C is an amino acyl residue selected from the group consisting of
D-3-(3-pyridyl)alanyl,
D-3-(1-naphthyl)alanyl,
D-3-(2-thiazolyl)alanyl, and
D-3-(2-benzo[b]thienyl)alanyl,

D is an amino acyl residue selected from the group consisting of
L-seryl,
N-(R^0)-L-seryl,

E is an amino acyl residue selected from the group consisting of
N-(R^0)-L-tyrosyl,
N-(R^0)-L-tyrosyl(O-methyl),
N-(R^0)-L-phenylalanyl,
N-(R^0)-L-3-cyclohexylalanyl,

F is an amino acyl residue selected from the group consisting of
D-trypyl,
D-3-(3-pyridyl)alanyl,
D-seryl,
D-[epsilon-N-(N'-morpholinylcarbonyl)]lysyl,
D-[epsilon-N-(2-pyrazinyl)carbonyl]lysyl,
D-[epsilon-N-(N'-piperidinyl-N'-methyl)carbonyl]lysyl,
D-[epsilon-N-(3-quinolinyl)carbonyl]lysyl, and
D-(epsilon-N-nicotinoyl)lysyl;

G is an amino acyl residue selected from the group consisting of
L-leucyl,
L-valyl,
L-cyclohexylalanyl,
N-(R^0)-L-cyclohexylalanyl,
N-(R^0)-L-leucyl;

H is an amino acyl residue selected from the group consisting of
L-(epsilon-N-isopropyl)lysyl,
N-(R^0)-L-arginyl, and
L-arginyl;

I is an amino acyl residue selected from the group consisting of
L-prolyl,
N-(R^0)-L-alanyl; and

J is —$NH(CH_2CH_3)$ or is an amino acyl residue selected from the group consisting of
D-alaninamide,
N-(R^0)-D-alaninamide,
N-(R^0)-L-alaninamide,
sarcosamide,
alpha-aza-glycinamide,
D-serinamide, and

wherein R^0 is alkyl of from one to four carbon atoms; provided that when J is —$NH(CH_2CH_3)$, I is L-prolyl.

5,110,905

ACTIVATED *BACILLUS THURINGIENSES* DELTA-ENDOTOXIN PRODUCED BY AN ENGINEERED HYBRID GENE

Daniel P. Witt, South Hamilton; Donald A. Colbert, Scituate, and Algis Anilionis, Arlington, all of Mass., assignors to Repligen Corporation, Cambridge, Mass.

Continuation of Ser. No. 745,354, Jun. 14, 1985, abandoned. This application Jul. 27, 1990, Ser. No. 559,223

Int. Cl.[5] C07K *3/00;* **C12P** *21/06, 21/04*

U.S. Cl. 530—350 **4 Claims**

1. A protein characterized by being a gene expression product insecticidally active against tobacco budworm larvae and by an amino acid sequence consisting of a total of 608 to 610 amino acids, in which sequence the amino acids from amino acid position number 1 extending through amino acid position number 608 are sequentially:

MET ASP ASN ASN PRO ASN ILE ASN GLU CYS ILE PRO TYR ASN CYS LEU SER ASN PRO GLU VAL GLU VAL LEU GLY GLY GLU ARG ILE GLU THR GLY TYR THR PRO ILE ASP ILE SER LEU SER LEU THR GLN PHE LEU LEU SER GLU PHE VAL PRO GLY ALA GLY PHE VAL LEU GLY LEU VAL ASP ILE ILE TRP GLY ILE PHE GLY PRO SER GLN TRP ASP ALA PHE LEU VAL GLN ILE GLU GLN LEU ILE ASN GLN ARG ILE GLU GLU PHE ALA ARG ASN GLN ALA ILE SER ARG LEU GLU GLY LEU SER ASN LEU TYR GLN ILE TYR ALA GLU SER PHE ARG GLU TRP GLU ALA ASP PRO THR ASN PRO ALA LEU ARG GLU GLU MET ARG ILE GLN PHE ASN ASP MET ASN SER ALA LEU THR THR ALA ILE PRO LEU PHE ALA VAL GLN ASN TYR GLN VAL PRO LEU LEU SER VAL TYR VAL GLN ALA ALA ASN LEU HIS LEU SER VAL LEU ARG ASP VAL SER VAL PHE GLY GLN ARG TRP GLY PHE ASP ALA ALA THR ILE ASN SER ARG TYR ASN ASP LEU THR ARG LEU ILE GLY ASN TYR THR ASP HIS ALA VAL ARG TRP TYR ASN THR GLY LEU GLU ARG VAL TRP GLY PRO ASP SER ARG ASP TRP ILE ARG TYR ASN GLN PHE ARG ARG GLU LEU THR LEU THR VAL LEU ASP ILE VAL SER LEU PHE PRO ASN TYR ASP SER ARG THR TYR PRO ILE ARG THR VAL SER GLN LEU THR ARG GLU ILE TYR THR ASN PRO VAL LEU GLU ASN PHE ASP GLY SER PHE ARG GLY SER ALA GLN GLY ILE GLU GLY SER ILE ARG SER PRO HIS LEU MET ASP ILE LEU ASN SER ILE THR ILE TYR THR ASP ALA HIS ARG GLY GLU TYR TYR TRP SER GLY HIS GLN ILE MET ALA SER PRO VAL GLY PHE SER GLY PRO GLU PHE THR PHE PRO LEU TYR GLY THR MET GLY ASN ALA ALA PRO GLN GLN ARG ILE VAL ALA GLN LEU GLY GLN GLY VAL TYR ARG THR LEU SER SER THR LEU TYR ARG ARG PRO PHE ASN ILE GLY ILE ASN ASN GLN GLN LEU SER VAL LEU ASP GLY THR GLU PHE ALA TYR GLY THR SER SER ASN LEU PRO SER ALA VAL TYR ARG LYS SER GLY THR VAL ASP SER LEU ASP GLU ILE PRO PRO GLN ASN ASN ASN VAL PRO PRO ARG GLN GLY PHE SER HIS ARG LEU SER HIS VAL SER MET PHE ARG SER GLY PHE SER ASN SER SER VAL SER ILE ILE ARG ALA PRO MET PHE SER TRP ILE HIS ARG SER ALA GLU PHE ASN ASN ILE ILE PRO SER SER GLN ILE THR GLN ILE PRO LEU THR LYS SER THR ASN LEU GLY SER GLY THR SER VAL VAL LYS GLY PRO GLY PHE THR GLY GLY ASP ILE LEU ARG ARG THR SER PRO GLY GLN ILE SER THR LEU ARG VAL ASN ILE THR ALA PRO LEU SER GLN ARG TYR ARG VAL ARG ILE ARG TYR ALA SER THR THR ASN LEU GLN PHE HIS THR SER ILE ASP GLY ARG PRO ILE ASN GLN GLY ASN PHE SER ALA THR MET SER SER GLY SER ASN LEU GLN SER GLY SER PHE ARG THR VAL GLY PHE THR THR PRO PHE ASN PHE SER ASN GLY SER SER VAL PHE THR LEU SER ALA HIS VAL PHE ASN SER GLY ASN GLU VAL TYR ILE ASP ARG ILE GLU PHE VAL PRO ALA GLU.

5,110,906

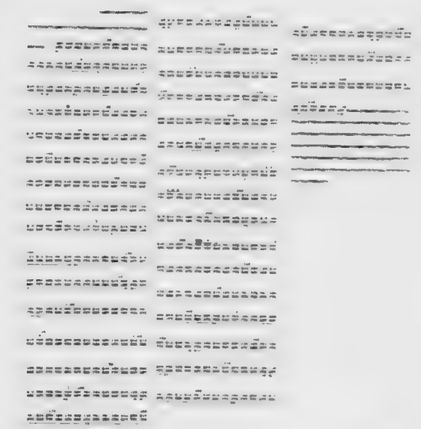
DERIVATIVES OF SOLUBLE T-4

Paul J. Maddon; Richard Axel, both of New York, N.Y.; Raymond W. Sweet, Bala Cynwyd, Pa., and James Arthos, Ann Arbor, Mich., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y. and Smithkline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 114,244, Oct. 23, 1987, which is a continuation-in-part of Ser. No. 898,587, Aug. 21, 1986, abandoned. This application Feb. 24, 1988, Ser. No. 160,348

Int. Cl.[5] C07K *13/00*

U.S. Cl. 530—350 **3 Claims**



1. A polypeptide, the amino acid sequence of which consists essentially of the amino acid sequence shown in FIG. 6 from +1 to +183 directly fused to the amino acid sequence from +353 to +271.

5,110,907

FACTOR VIII COMPLEX PURIFICATION USING HEPARIN AFFINITY CHROMATOGRAPHY

David P. Kosow, Monrovia; Prabir Bhattacharya, Walnut, and Charles F. Sternburg, Norco, all of Calif., assignors to Alpha Therapeutic Corporation, Los Angeles, Calif.

Filed Aug. 1, 1989, Ser. No. 388,254

Int. Cl.[5] A61K *35/14;* **C07K** *5/20, 13/00*

U.S. Cl. 530—383 **15 Claims**

1. A process for separating Factor VIII complex from an impure protein fraction containing Factor VIII complex, comprising the steps of:

providing an aqueous solution of the impure protein fraction containing Factor VIII complex;

applying the impure protein fraction solution to a heparin coupled chromatographic medium;

binding Factor VIII complex to the heparin; and

eluting the Factor VIII complex from the chromatographic medium using an aqueous solution containing $CaCl_2$ as the

eluting agent, and recovering Factor VIII complex from the eluate.

5,110,908

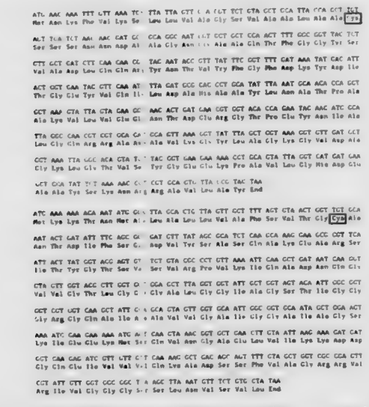
HAEMOPHILUS INFLUENZAE PEPTIDES AND PROTEINS

Robert A. Deich, Rochester; Gary Zlotnick, Penfield, and Bruce Green, Pittsford, all of N.Y., assignors to Praxis Biologics, Inc., Rochester, N.Y.

Continuation of Ser. No. 20,849, Mar. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 948,364, Dec. 31, 1986, abandoned. This application Nov. 9, 1989, Ser. No. 436,092

Int. Cl.[5] C07K *13/00*

U.S. Cl. 530—403 **13 Claims**



1. A substantially pure antigenic peptide or protein of approximately 16000 dalton molecular weight which is PBOMP-1, an Haemophilus influenzae outer membrane protein, said peptide or protein having an amino acid sequence substantially as depicted in FIG. **11** from amino acid residue 20 to 153, in which the peptide or protein is obtained without the use of denaturing detergents.

2. A substantially pure antigenic peptide or protein of approximately 16000 dalton molecular weight which is PBOMP-2, an Haemophilus influenzae outer membrane protein, said peptide or protein having an amino acid sequence substantially as depicted in FIG. **15** from amino acid residue 19 to 154.

5,110,909

MACROMOLECULAR CONJUGATES OF HEMOGLOBIN, A PROCEDURE FOR THEIR PREPARATION AND THEIR USES

Edith Dellacherie, Malzeville; Michèle Leonard, Neuves-Maisons; Daniel Sacco, and Claude Vigneron, both of Nancy, all of France, assignors to Institut Merieux, Charbonnieres/Baines, France

Filed Apr. 20, 1989, Ser. No. 340,826

Claims priority, application France, Apr. 20, 1988, 88 05240

Int. Cl.[5] A61K *35/14;* **C07K** *13/00*

U.S. Cl. 530—385 **23 Claims**

1. A process for making a conjugate comprising the steps of:

a) providing a hemoglobin which can undergo a reversible transition between the oxygenated state and a deoxygenated state and a water-soluble hemocompatible polymer which can covalently and ionically bond to the hemoglobin, wherein the polymer has a mean molecular weight of about 1,000 to 500,000 daltons and has a chemically bonded ligand with i) at least one negative charge borne by an anionic group comprising a sulfate, phosphate or carboxylate moiety which forms an ionic bond with an amino group at an allosteric site on the hemoglobin and ii) at least one polar group selected from the group comprising a hydroxyl, carboxyl or aldehyde moiety which forms a covalent bond between the polymer and the hemoglobin; and wherein the conjugate has a mean molecular weight of about 70,000 to 1,000,000 daltons and salt bridges between internal NH_3^+ and COO^- groups of the hemoglobin being intact when the hemoglobin is in the deoxygenated state; and

b) reacting the polymer with the hemoglobin in the oxygenated state in a non-deoxygenated aqueous medium at a pH of about 5 to 9 to form simultaneously the ionic bond and the covalent bond between the hemoglobin and the ligand on the polymer without denaturing the hemoglobin.

5,110,910

VIRUCIDAL EUGLOBULIN PRECIPITATION

Grace C. Tsav, Walnut Creek, Calif., assignor to Miles Inc., Elkhart, Ind.

Filed Mar. 25, 1991, Ser. No. 673,991

Int. Cl.[5] A61K *39/395;* **C07K** *3/24*

U.S. Cl. 530—390.1 **7 Claims**

1. A method of preparing an antibody preparation comprising both IgM and IgG antibodies, the method comprising the steps of

(a) mixing a source for the IgM and IgG antibodies in an aqueous solution in the presence of tri-n-butyl phosphate, the solution having a conductivity ranging from about 0.03 to 0.20 M MHO/CM, a pH ranging from about 4.75 to 4.85 and a protein concentration when measured at A280 ranging from about 5 to 40, to assure inactivation of substantially all viruses present; and

(b) subjecting the solution to conditions sufficient to precipitate substantially all of the antibodies from the solution while maintaining substantially all of the tri-n-butyl phosphate in the supernate by simultaneously assuring a solution conductivity ranging from about 0.05 to 0.70 M MHO/CM, a pH ranging from about 6.0 to 7.5 and an amount of IgM antibody proportion in the precipitate ranging from about 20 to 80% by weight total protein precipitate.

5,110,911

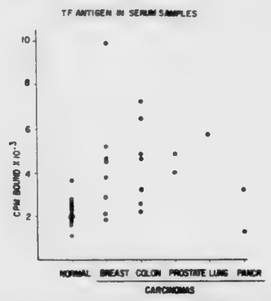
HUMAN TUMOR-ASSOCIATED THOMSEN-FRIEDENREICH ANTIGEN

John Samuel, and B. Michael Longenecker, both of Edmonton, Canada, assignors to Biomira, Inc., Alberta, Canada

Filed Nov. 2, 1989, Ser. No. 430,357

Int. Cl.[5] C07K *15/02, 15/14;* **G01N** *33/48, 33/543*

U.S. Cl. 530—395 **6 Claims**



6. A human, tumor-associated glycoprotein antigen characterized by a non-cryptic Gal beta (1→3) GalNAc epitope, a molecular weight in excess of 1,000,000 daltons, and extractability with perchloric acid, the epitope being sensitive to alkali and periodate but resistant to acid, in at least partially purified form, said antigen being isolated by affinity chromatography of antigenic material derived from adenocarcinoma conditioned media, adenocarcinoma cell detergent extracts or pleural effusion fluid with an insolubilized TF-specific monoclonal antibody having the binding characteristics of MAb 49H.8.

5,110,912

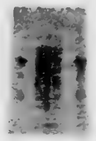
PURIFICATION OF IL-2-CONTAINING HYBRID COMPOUNDS

Leonard F. Estis, Upton, Mass., assignor to Seragen, Inc., Hopkinton, Mass.

Filed Mar. 2, 1990, Ser. No. 487,604

Int. Cl.[5] C07K *3/20*

U.S. Cl. 530—413 **9 Claims**



1. A method for purifying, from a mixture, a hydbrid compound which comprises a portion of IL-2 covalently attached to a cell physiology affecting molecule, said portion of IL-2 comprising at least a region of the IL-2R binding domain of IL-2 effective to cause said hybrid compound to bind to cells bearing an IL-2R, said method comprising:

passing said mixture containing said hybrid compound over a column having attached thereto molecules comprising an M5 or M6 high mannose carbohydrate with affinity for the hybrid compound to bind said hybrid compound to said molecules while permitting the remainder of said mixture to pass through said column without binding to said molecules; and then

eluting said hybrid compound from said column.

5,110,913

ANTIBODY PURIFICATION METHOD

Michael Coan, El Cerrito, and Vivian W. Lee, Richmond, both of Calif., assignors to Miles Inc., Elkhart, Ind.

Filed May 25, 1990, Ser. No. 528,523

Int. Cl.[5] C07K *3/12, 3/22*

U.S. Cl. 530—388.23 **6 Claims**

1. A method of purifying a murine antibody in an aqueous solution comprising the steps of

(a) binding the antibody to an ion exchange resin at a first pH for the aqueous solution which facilitates antibody binding;

(b) washing the bound antibody at a second different pH for the wash solution which does not elute the antibody; and

(c) eluting the antibody at a third pH for the elution solution which facilitates elution, the above purification being done without changes in ionic strength among the solutions of steps (a), (b) and (c).

5,110,914

METHOD OF SEPARATING PROTEINS

William M. Awad, Jr., Miami, Fla., assignor to University of Miami, Miami, Fla.

Continuation-in-part of Ser. No. 276,924, Nov. 28, 1988. This application Oct. 3, 1989, Ser. No. 416,299

Int. Cl.[5] C07K *3/22*

U.S. Cl. 530—416 **17 Claims**

1. A method of separating protein comprising:

contacting said proteins to be separated with a ligand that is cationic, which ligand is attached to a matrix, under conditions that permit pi-electron and electrostatic charge interaction of said ligand with specific amino acid residues of said proteins to be separated; and effecting said separation based on said interaction.

5,110,915

PROCESS FOR PREPARATION OF LIGNOCELLULOSE PHENOLIC COMPOUND COMPOSITE PRODUCT

Naohiko Tsujimoto; Masaru Yamakoshi; Toshimitsu Kudo; Yukiko Horiuchi, and Jiro Shimizu, all of Tokyo, Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1990, Ser. No. 588,241

Claims priority, application Japan, Sep. 27, 1989, 1-249174; Jul. 18, 1990, 2-187976

Int. Cl.[5] C08G *5/18, 37/16, 37/18*

U.S. Cl. 530—502 **19 Claims**

1. A lignocellulose-phenolic compound composite product comprising a lignocellulose material reacted with and homogeneously dissolved in at least one phenolic compound at a weight ratio of the lignocellulose material to the phenolic compound of from 0.4/1.0 to 5.0/1.0.

5,110,916

BIS (OCTAALKYLPHTHALOCYANINATE) LANTHANIDES

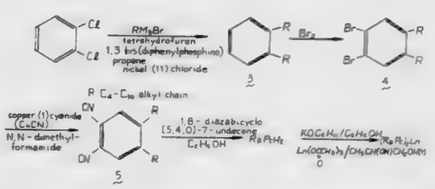
Iwao Yamamoto, No. 16-25,2-chome, Fumiiri, Ueda City, Nagano Pref.; Kazuchika Ohta, Ueda, and Tsuyoshi Komatsu, Okaya, all of Japan, assignors to Eastern Co., Ltd., Chino and Iwawo Yamamoto, Ueda, both of, Japan, a part interest

Filed Dec. 21, 1990, Ser. No. 633,248

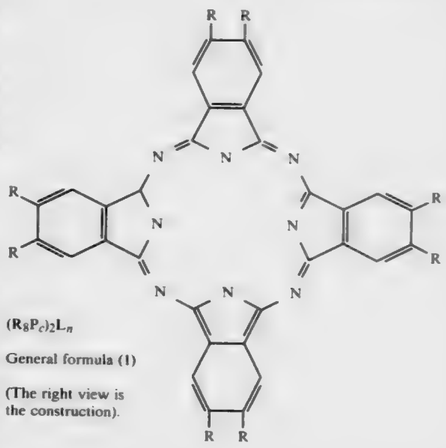
Claims priority, application Japan, Dec. 30, 1989, 1-340867

Int. Cl.[5] C07F *5/00*

U.S. Cl. 534—15 **21 Claims**



1. A metal complex compound of the following formula:

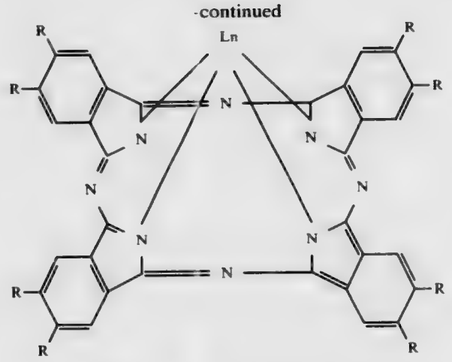


$(R_8P_c)_2L_n$

General formula (1)

(The right view is the construction).

-continued



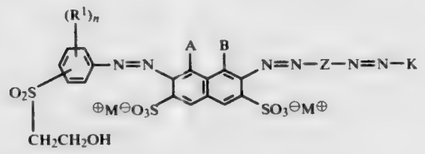
wherein R is an alkyl group of 4–30 carbon atoms and Ln represents one of the lanthanide series La–Lu or Y.

5,110,917
WATER-SOLUBLE TRISAZO DYES

Wolfgang Bauer, Maintal; Willi Steckelberg, Hofheim, and Josef Ritter, Schwalbach, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 5, 1991, Ser. No. 740,126
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1990, 4025611
Int. Cl.[5] C07C *245/00*
U.S. Cl. 534—815 **6 Claims**

1. Water-soluble trisazo dyes of the formula I



(I)

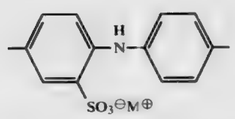
wherein

R^1 is hydrogen, alkyl of 1–2 carbon atoms, alkoxy of 1–2 carbon atoms, hydroxyl, halogen or carboxyl,

n is 1 or 2,

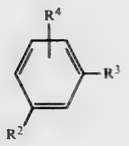
A and B are each hydroxyl or amino but are not identical to each other,

Z is the radical of an aromatic diamine of the formula II



(II)

and K is the radical of a coupling component of the formula III



(III)

wherein

R^2 is hydroxyl or unsubstituted or $HOOCCH_2$— or $HOCH_2CH_2$-substituted amino,

R^3 is hydrogen, hydroxyl or unsubstituted or $HOOCCH_2$—, $HOCH_2CH_2$—, H_2NCO— or phenyl-substituted amino,

R^4 is hydrogen, alkyl or 1–2 carbon atoms, unsubstituted or methoxy- or ethoxy-substituted alkoxy of 1–2 carbon atoms or SO_3H, and

$M^{\oplus}$ is a cation or a mixture of different cations selected from the group consisting of lithium, sodium and potassium, or an unsubstituted or $HOCH_2CH_2$-monosubstituted or -polysubstituted ammonium cation.

5,110,918
PROCESS FOR PREPARING EDTA-FREE HEPARINS, HEPARIN FRACTIONS AND FRAGMENTS

Benito Casu; Annamaria Naggi; Pasqua Oreste; Giangiacomo Torri; Giorgio Zoppetti; Giancarlo Sportoletti, and Francesco De Santis, all of Milan, Italy, assignors to Sanofi S.A., Paris, France

Continuation of Ser. No. 364,576, Jun. 8, 1989, abandoned, which is a continuation of Ser. No. 50,287, May 14, 1987, abandoned. This application Sep. 24, 1990, Ser. No. 587,605
Claims priority, application Italy, May 16, 1986, 20462 A/86; Oct. 3, 1986, 21901 A/86
Int. Cl.[5] A61K *31/725;* **C08B** *37/10*
U.S. Cl. 536—21 **2 Claims**

1. A process for the preparation of a composition comprising heparin, heparin fractions, heparin fragments or mixtures thereof, said composition being substantially free of EDTA, comprising:

subjecting an aqueous solution of heparin, heparin fragments, heparin fractions or mixtures thereof to a series of purification steps comprising dialysis, diafiltrations on membranes having a cut-off valve of from 500–10,000 D, or combinations thereof,

assaying the resulting preparation so treated for the presence of EDTA, and if EDTA is detected in said preparation, further purifying said preparation by repeating the above steps until said EDTA is removed,

wherein said assay comprises obtaining the ^1H—NMR spectrum of the purified preparation of heparin, heparin fractions, heparin fragments, or mixtures thereof and checking said spectrum for the absence of the signals at 2.61, 3.16 and 3.18 ppm and at 3.25 3.64, 3.71 and 3.99 ppm.

5,110,919
PROCESS FOR THE PREPARATION OF 2-AMINO-9-(2,3,5-TRI-O-BENZYL-BETA-D-ARABINOFURANOSYL) ADENINE AND NOVEL INTERMEDIATES

Peter Blumbergs, Royal Oak; Mohammed S. Khan, Detroit, and Richard L. Kalamas, Wyandotte, all of Mich., assignors to Ash Stevens, Inc., Detroit, Mich.

Filed Dec. 4, 1989, Ser. No. 445,446
Int. Cl.[5] C07H *19/16, 19/19;* **C07D** *473/00, 473/02*
U.S. Cl. 536—24 **18 Claims**

1. A process for the preparation of the compound 2,6-diamino-9-(2,3,5-tri-O-benzyl-beta-D-arabinofuranosyl) purine (V) which comprises:

(a) reacting 2,6-di(alkoxyacetamido)purine (II) with: 2,3,5-tri-O-benzyl-1-chloro-alpha-D-arabinofuranose (III)

wherein alk is a lower alkyl group containing 1 to 6 carbon atoms which can be straight chain or branched in a non-polar organic solvent selected from the group consisting of dichloroethane and acetonitrile in the presence of a hydrochloric acid acceptor selected from the group consisting of an amine, Lewis base and molecular sieve at a temperature between about 75°–100° C. to produce 2,6-di(alkoxyacetamido)-9-(2,35-tri-O-benzyl-beta-D-arabinofuranosyl) purine (IV) in a first reaction mixture; and

(b) separating (IV) from the first reaction mixture by removing the non-polar organic solvent; and

(c) removing 2,6-dialkoxyacet- groups from intermediate (IV) by reaction with sodium methoxide in a lower alkanol selected from the group consisting of ethanol and methanol at a temperature which produces the compound (V).

5,110,920
HLA TYPING METHOD AND DNA PROBES USED THEREIN

Henry A. Erlich, Oakland, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Division of Ser. No. 678,255, Dec. 5, 1984, which is a continuation-in-part of Ser. No. 456,373, Jan. 7, 1983, Pat. No. 4,582,788, which is a continuation-in-part of Ser. No. 341,902, Jan. 22, 1982, abandoned. This application Aug. 30, 1988, Ser. No. 238,619
Int. Cl.[5] C12Q *1/68;* **C07H** *15/12;* **C12N** *15/00*
U.S. Cl. 536—27 **9 Claims**

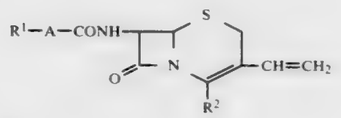
1. A DNA probe that is specific to a single Class II HLA locus comprising a labeled DNA sequence that is substantially complementary to the DNA sequence at said locus.

5,110,921
7-ACYLAMINO-3-VINYLCEPHALOSPORANIC ACID DERIVATIVES

Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Takashi Masugi, Ikeda; Hideaki Yamanaka, Hirakata, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 462,347, Jan. 3, 1990, Pat. No. 4,960,809, and a continuation of Ser. No. 127,929, Dec. 2, 1987, abandoned, which is a division of Ser. No. 889,189, Jul. 24, 1986, Pat. No. 4,731,443, which is a division of Ser. No. 653,041, Sep. 21, 1984, abandoned, which is a division of Ser. No. 341,621, Jan. 22, 1982, Pat. No. 4,487,927, which is a continuation-in-part of Ser. No. 261,618, May 7, 1981, Pat. No. 4,423,213, which is a continuation-in-part of Ser. No. 205,334, Nov. 10, 1980, Pat. No. 4,409,214. This application Sep. 17, 1990, Ser. No. 583,304
Claims priority, application United Kingdom, Nov. 19, 1979, 7939985; Feb. 8, 1980, 8004335; Apr. 21, 1980, 8012991; Jul. 14, 1980, 8022920
Int. Cl.[5] C07D *501/34;* **A61K** *31/545*
U.S. Cl. 540—222 **3 Claims**

1. A compound of the formula:



in which

R^1 is aminothiazolyl which may have halogen, aminothiadiazolyl, aminooxadiazolyl, aminopyridyl, aminopyrimidinyl, acyl aminothiazolyl which may having halogen, di(lower)alkylaminomethyleneaminothiadiazolyl, di(lower)alkylaminomethyleneaminooxadiazolyl, or acylaminopyridyl,

A is methylene which may have amino, a protected amino group, hydroxy or oxo, and

R^2 is carboxy or a protected carboxy group, or

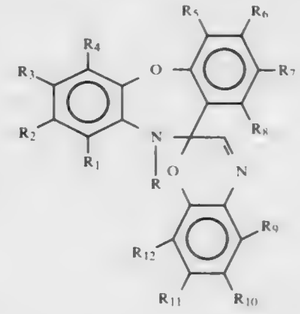
a pharmaceutically acceptable salt thereof.

5,110,922
PHOTOCHROMATIC AND THERMOCHROMATIC SPIRO-OXAZEPIN-OXAZINE COMPOUNDS AND THE PROCESS FOR THEIR PREPARATION

Graziano Castaldi, Briona, and Pietro Allegrini, Milan, both of Italy, assignors to Enichem Synthesis S.p.A., Palermo, Italy

Division of Ser. No. 622,710, Dec. 6, 1990, Pat. No. 5,055,576. This application Jul. 31, 1991, Ser. No. 738,335
Claims priority, application Italy, Dec. 12, 1989, 22659 A/89
Int. Cl.[5] C07D *223/14;* **F21V** *9/04;* **G02F** *1/00;* **G02B** *5/23*
U.S. Cl. 540—523 **7 Claims**

1. A process for the preparation of photochromatic and thermochromatic compounds having an oxazepin-oxazine group of the formula I

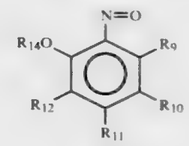


(I)

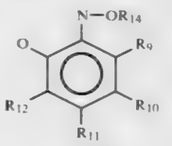
wherein:

R is selected from the group consisting of a hydrogen atom; a linear or branched C_1–C_5 alkyl group which may be substituted with 1 to 5 atoms of halogen chosen from fluorine, chlorine, bromine and iodine; a C_1–C_5 alkoxy group; a C_1–C_5 carboxyalkyl group; a cyano group; a C_2–C_5 alkenyl group; a phenyl group; and a benzyl group;

R_1 to R_{12}, which can be identical or different, are each independently selected from the group consisting of a hydrogen atom; a linear or branched C_1–C_5 alkyl group; a C_2–C_5 alkenyl group; a benzyl group; a halogen atom chosen from fluorine, chlorine, bromine and iodine; a hydroxy group; a C_1–C_5 alkoxy group; an amino group; a C_1–C_5 monoalkyl amino group; a C_1–C_5 dialkyl amino group; a C_3–C_7 cycloalkyl amino group; a carboxyl group; a C_1–C_5 carboxyalkyl group; a carboxyamide group; a C_1–C_5 N-alkyl substituted or C_1–C_5 N, N-dialkyl substituted carboxyamide group; a cyano or nitro group; or any adjacent two taken from R_9, R_{10}, R_{11} and R_{12} jointly are selected from the group consisting of a condensed benzene nucleus without substituents or carrying from 1 to 3 substituents chosen from those described for R_1–R_{12}, comprising reacting a nitroso derivative having the formula (IIA) or a tautomer thereof having the formula (IIB)

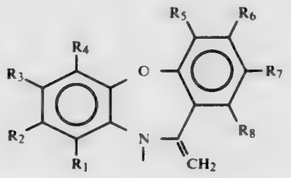


(IIA)



(IIB)

with a compound of the formula (III):



(III)

wherein R_{14} is selected from the group consisting of a hydrogen atom, a C_1–C_5 carbonylalkyl group, a C_1–C_5 sulphonyloxyalkyl group and a sulpharyl group.

5,110,923

METHOD FOR PREPARING 5-CHLOROCARBONYL-5H-DIBENZ(B,F)AZEPINE

Peter Palitsch, Dresden; Klaus Czernotzky, Radebeul; Erhard Richter, Radebeul; Berndt Kreher, Radebeul; Wilifried Klump, deceased, late of Bad Suderode by Dagmar Klump, heir , and Rainer Müller, Dresden, all of Fed. Rep. of Germany, assignors to Arzneimittelwerk Dresden GmbH, Radebeul, Fed. Rep. of Germany

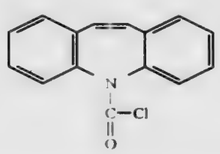
Filed Apr. 18, 1991, Ser. No. 687,398

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1990, 4023204

Int. Cl.[5] **C07D** *223/26*

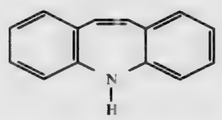
U.S. Cl. 540—589 **11 Claims**

1. A process for preparing 5-chlorocarbonyl-5H-dibenz[b,f]-azepine of formula (I)



(I)

which comprises reacting in a solvent iminostilbene of formula (III)



(III)

with phosgene in an anhydrous aromatic solvent, the reaction being carried out at a temperature of from about 20° C. to about 60° C., adding an aqueous base to the reaction to release from the iminostilbene hydrochloride iminostilbene which is formed in addition to the 5-chlorocarbonyl-5H-dibenz[b,f]azepine, and phosgenating the iminostilbene completely while retaining acidic reaction conditions.

5,110,924

ADDUCT-ALDEHYDE AND ITS USE FOR THE PREPARATION OF VITAMIN-D COMPOUNDS

Sebastianus J. Halkes, and Wilhelmus R. M. Overbeek, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

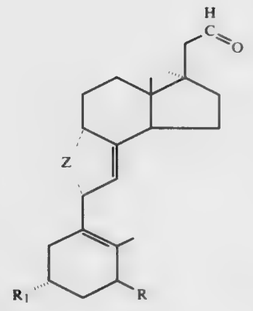
Filed Jun. 12, 1990, Ser. No. 536,761

Claims priority, application Netherlands, Jun. 15, 1989, 8901513

Int. Cl.[5] **C07D** *237/26, 487/04, 333/50*

U.S. Cl. 544—233 **1 Claim**

1. An adduct-aldehyde of the formula



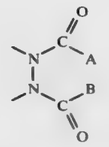
(I)

wherein

R is hydrogen or hydroxy which is optionally etherified by an etherification agent or esterified by an estherification agent,

R_1 is hydroxy which is optionally etherified by an etherification agent or esterified by an esterification agent, and

Z is sulphonyl or a group of the formula



wherein A and B are equal or different and represent C_1–C_4 alkoxy, or wherein A and B together constitute phenylimino or o-phenylene,

the etherification agent being selected from the group consisting of triphenylmethylhalides, 2,3-dihydropyran, trialkylsilylhalides having 1 to 6 carbon atoms in the alkyl group and trialkylsilylethoxymethylhalides having 1 to 6 carbon atoms in the alkyl groups, and

the esterification agent being selected from the group consisting of alkylchlorocarbonates having 2 to 5 carbon atoms, saturated aliphatic carboxylic acids having 1 to 4 carbon atoms, p-toluenesulphonic acid, methanesulphonic acid, trifluoroacetic acid and derivatives of said acids suitable for the esterification reaction.

5,110,925

PYRIDAZINONE DERIVATIVES

You Kusase; Masatoshi Murakata; Nobuo Mochizuki, and Michinori Takebayashi, all of Odawara, Japan, assignors to Nippon Soda Co., Ltd., Japan

PCT No. PCT/JP89/00127, § 371 Date Oct. 4, 1989, § 102(e) Date Oct. 4, 1989, PCT Pub. No. WO89/07594, PCT Pub. Date Aug. 24, 1989

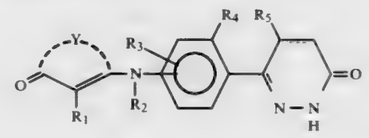
PCT Filed Feb. 9, 1989, Ser. No. 427,123

Claims priority, application Japan, Feb. 13, 1988, 63-31618; Mar. 31, 1988, 63-75910

Int. Cl.[5] **C07D** *237/26*

U.S. Cl. 544—234 **1 Claim**

1. A compound of the formula



wherein

Y represents C_{2-3} alkylene which may be substituted by one gemdimethyl and/or one C_{1-10} alkyl, C_{1-2} alkoxy, benzyl, methylthio C_{1-3} alkyl or C_{1-2} alkoxycarbonyl;

R_1 represents hydrogen, C_{1-4} alkyl, acetyl or allyl;

R_2 represents hydrogen or methyl;

R_3 represents hydrogen, methyl, methoxy, halogen or hydroxy;

R_4 represents hydrogen;

R_5 represents hydrogen or C_{1-2} alkyl which may be substituted by hydroxy;

R_4 and R_5 may form $—OCH_2—$, $—CH_2CH_2—$ or $—CH_2—$ by joining each other; and

represents single or double bond; or a pharmaceutically acceptable salt thereof.

5,110,926

PROCESS FOR THE PREPARATION OF A CARBOCYCLIC NUCLEOSIDE ANALOGUE

Richard Storer, Pinner; Chi L. Mo, and John P. Turnbull, both of Greenford, all of England, assignors to Glaxo Group Limited, London, England

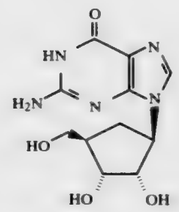
Filed Jul. 18, 1990, Ser. No. 553,631

Claims priority, application United Kingdom, Jul. 19, 1989, 8916480

Int. Cl.[5] **C07D** *473/18, 473/32*

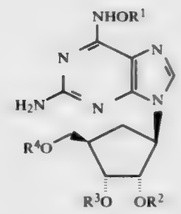
U.S. Cl. 544—276 **8 Claims**

1. Process for the preparation of a compound of formula (I)



(I)

which comprises hydrolysing a compound of formula (II)



(II)

wherein R^1 represents a C_{1-6}alkyl group or an arylC_{1-4}alkyl group and R^2, R^3 and R^4 each independently represent a hydrogen atom or a hydroxyl protecting group, followed, where necessary, by removal of any protecting groups present, and wherein the hydrolysis is effected at a temperature in the range of −10° C. to +120° C. in the presence of inorganic acid.

5,110,927

PRAZOSIN ANALOG WITH INCREASED SELECTIVITY AND DURATION OF ACTION

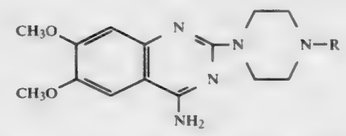
Josef Pitha, Baltimore, and John W. Kusiak, Lanham/Seabrook, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Dec. 31, 1987, Ser. No. 140,744

Int. Cl.[5] **C07D** *403/04*

U.S. Cl. 544—291 **3 Claims**

1. A compound having the formula:



(I)

wherein R is —CO-bicyclo[2.2.2]octa-2,5-diene-2-yl or —CO— bicyclo[2.2.2.]oct-2-ene-2-yl.

5,110,928

PREPARATION OF N-ARYL-SUBSTITUTED 2-AMINOALKYL-2-HYDROXYALKYLAMINES AND N-ARYL-SUBSTITUTED PIPERAZINES

Wolfgang Schroeder, Bad Durkheim, and Guenther Ruider, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

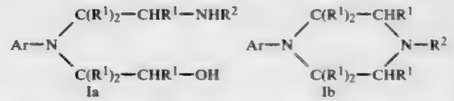
Filed Mar. 15, 1991, Ser. No. 670,042

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1990, 4008322

Int. Cl.[5] **C07D** *295/02, 295/08*

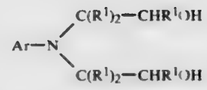
U.S. Cl. 544—395 **8 Claims**

1. A process for preparing N-aryl-substituted 2-aminoalkyl-2-hydroxyalkylamines and N-aryl-substituted piperazines of the formulae Ia and Ib respectively



Ia Ib

where Ar is aryl, the R^1 radicals can be identical or different and are hydrogen or methyl, and R^2 is hydrogen or alkyl, by reacting an N,N-di(2-hydroxyalkyl)-N-arylamine of the formula II



II

with ammonia or a primary amine of the formula III

$$H_2N-R^2 \qquad \text{III}$$

at elevated temperature and under elevated pressure in the presence of hydrogen and of a catalyst, which comprises using for this a supported catalyst whose active mass contains predominant amounts of copper and/or nickel and/or cobalt in the form of the metal or an oxide.

5,110,929

PROCESS FOR THE PREPARATION OF N-ALKYLATED QUATERNARY NITROGEN CONTAINING AROMATIC HETEROCYCLES

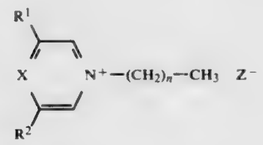
Henrich H. Paradies, Iserlohn, Fed. Rep. of Germany, assignor to Medice Cham.-Pharm. Fabrik Putter GmbH & Co. KG, Iserlohn, Fed. Rep. of Germany

Division of Ser. No. 446,015, Dec. 4, 1989, which is a division of Ser. No. 82,773, Aug. 6, 1987, Pat. No. 4,894,454. This application Jun. 14, 1990, Ser. No. 538,350

Int. Cl.[5] **C07D** *241/02*

U.S. Cl. 544—406 **7 Claims**

1. A process for the preparation of a product having the formula



in which:

X is a member selected from the group consisting of N and $N-{}^{+}(CH_2)_n-CH_3$;

R^1 is a member selected from the group consisting of H, $C(O)-O-(CH_2)_n-CH_3$, and OH;

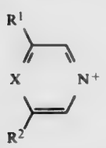
R^2 is a member selected from the group consisting of H, $C(O)-O-(CH_2)_n-CH_3$, $C(O)-NH_2$, and OH;

Z^- is a member selected from the group consisting of chloride, bromide, iodide, maleate, formate, acetate, propionate, hydrogen sulfate, malate, fumarate, salicylate, alginate, gluconate, glucoronate, galactoronate, ethyl sulfate and $H_2PO_4^-$; and

n is 8 to 20;

said process comprising:

(a) dissolving a compound having the formula



in a solvent selected from the group consisting of 1,2-dimethoxyethane, n-heptane, acetone, diisobutylketone, and isobutylethylketone, and mixtures of 1,2-dimethoxyethane and n-heptane;

(b) adding with constant stirring a stoichiometric amount of an n-alkyl halide having the formula $Y-(CH_2)_n-CH_3$ in which Y is halogen; and

(c) heating the resulting mixture to reflux with constant stirring until said product which precipitates upon cooling is formed.

5,110,930

PROCESS FOR THE PREPERATION OF 2-(2-IMIDAZOLIN-2-YL) PYRIDINES AND QUINOLINES

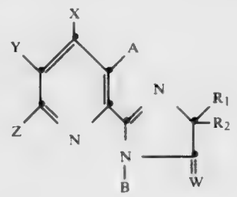
Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 484,754, Feb. 26, 1990, Pat. No. 5,021,078, which is a division of Ser. No. 280,906, Dec. 9, 1988, Pat. No. 4,923,504, which is a division of Ser. No. 850,192, Apr. 10, 1986, Pat. No. 4,798,619, which is a division of Ser. No. 382,041, May 25, 1982, Pat. No. 4,638,668, which is a continuation-in-part of Ser. No. 252,704, Apr. 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 155,909, Jun. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 155,910, Jun. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 155,867, Jun. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 155,908, Jun. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 155,865, Jun. 2, 1980, abandoned. This application Apr. 17, 1991, Ser. No. 686,633

Int. Cl.[5] **C07D** *401/04*

U.S. Cl. 546—15 **2 Claims**

1. A process for the preparation of a compound having the structure:



wherein

R_1 is C_1–C_4alkyl;

R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together with the carbon to which they are attached they may represent C_3–C_6 cycloalkyl optionally substituted with methyl;

A is $COOR_3$ or $CONHR_6$;

R_3 is

C_1–C_{12} alkyl optionally substituted with one of the following groups: C_1–C_3 alkoxy, halogen, hydroxyl, C_3–C_6 cycloalkyl, benzyloxy, furyl, phenyl, halophenyl, loweralkylphenyl, loweralkoxyphenyl, nitrophenyl, carboxyl, loweralkoxycarbonyl, cyano or triloweralkylammonium;

C_3–C_{12} alkenyl optionally substituted with one of the following groups: C_1–C_3 alkoxy, phenyl, halogen or loweralkoxycarbonyl or with two C_1–C_3 alkoxy groups or two halogen groups;

C_3–C_6 cycloalkyl optionally substituted with one or two C_1–C_3 alkyl groups;

C_3–C_{10} alkynyl optionally substituted with one or two C_1–C_3 alkyl groups; or,

A cation of alkali metals, alkaline earth metals, manganese, copper, iron, zinc, cobalt, lead, silver, nickel, ammonium or organic ammonium;

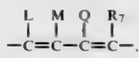
R_6 is hydrogen, hydroxyl, C_3-alkenyl, C_3-alkynyl or C_1–C_4 alkyl optionally substituted with one hydroxyl or one chlorine group;

B is H;

W is O;

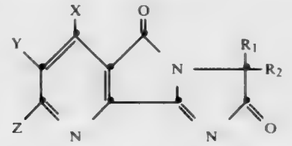
X is hydrogen, halogen, hydroxyl or methyl, with the proviso that when Y and Z are taken together to form a ring and YZ is represented by the structure; $-(CH_2)_n-$, where n is 3 or 4, is X is hydrogen;

Y and Z are each hydrogen, halogen, C_1–C_6 alkyl, hydroxyloweralkyl, C_1–C_6 alkoxy, C_1–C_4 alkylthio, phenoxy, C_1–C_4 haloalkyl, nitro, cyano, C_1–C_4 alkylamino, diloweralkylamino or C_1–C_4 alkylsulfonyl group, or phenyl optionally substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; and, when taken together, Y and Z may form a ring in which YZ are represented by the structure: $-(CH_2)_n-$, where n is an integer of 3 or 4, provided that X is hydrogen; or



where L, M, Q and R_7 are each hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, C_1–C_4 haloalkyl, NO_2, CN, phenyl, phenoxy, amino, C_1–C_4 alkylamino, diloweralkylamino, chlorophenyl, methylphenyl, or phenoxy substituted with one Cl, CF_3, NO_2 or CH_3 group, with the proviso that only one of L, M, Q or R_7 may represent a substituent other than hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy;

comprising; reacting a compound having the structure:



wherein R_1, R_2, X, Y and Z are as described above; with (a) at least one equivalent of an alcohol represented by the structure R_3OH and an alkali metal alkoxide $R_3O^-M^+$, where R_3 is a described above and $M^+$is an alkali metal, at a temperature between about 20° C. and 50° C., alone or in the presence of an aprotic solvent; whereby the desired product, in which A is $COOR_3$ and R_3, R_1, R_2, X, Y and Z are as described above, is formed; or with (b) at least one equivalent of an amine represented by the structure R_6NH_2, where R_6 is as described above, alone or in the presence of an aprotic solvent, at a temperature between about 80° C. and 125° C., whereby the desired product, in which A is $CONHR_6$ and R_6, R_1, R_2, X, Y and Z are as described above, is formed.

5,110,931

PROCESS FOR THE PREPARATION OF N,N'-DIMETHYLPERYLENE-3,4,9,10-TETRACARBOXYLIC DIIMIDE IN HIGH-HIDING PIGMENT FORM

Erwin Dietz, Kelkheim, and Manfred Urban, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 275,777, Nov. 23, 1988, abandoned. This application Nov. 8, 1989, Ser. No. 434,093

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740280

Int. Cl.[5] **C07D** *471/06;* **C09B** *67/20*

U.S. Cl. 546—37 **11 Claims**

1. A process for the preparation of N,N'-dimethylperylene-3,4,9,10-tetracarboxylic diimide in high-hiding pigment form comprising the step of:

a) reacting perylene-3,4,9,10-tetracarboxylic dianhydride with at least 3 mol of methylamine in the at least 5-fold amount by weight of water, based on the weight of the dianhydride, per mol of perylene-3,4,9,10-tetracarboxylic dianhydride at a temperature of 40° to 200° C., the resultant highly crystalline crude pigment in aqueous suspension having a mean particle size $D_{50\%}$ (mass distribution) of 0.15 μm to 0.4 μm and a mean length-to-width ratio $q_{50\%}$ (mass distribution) of the pigment particles of 10:1 to 3:1

b) the said crude pigment is subsequently ground in aqueous suspension after intermediate isolation or without intermediate isolation, until the mean particle size is 0.1 μm to 0.2 μm and the mean length-to-width ratio of the pigment particles is less than 5:1 (pre-pigment), and,

c) the pre-pigment is heat-treated at a temperature of 50° C. to 200° C., in aqueous suspension or, after the addition of an organic solvent, in an aqueous-organic medium, until the resultant pigment has a mean particle size of 0.125 μm to 0.4 μm and a mean length-to-width ratio of the pigment particles of 4:1 or less.

5,110,932

POLYSUBSTITUTED ARYL ACRIDINIUM ESTERS

Say-Jong Law, Westwood; Steve C. S. Chang, Franklin; Stephen A. Palmacci, Walpole, and Roger S. Cubicciotti, Needham, all of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

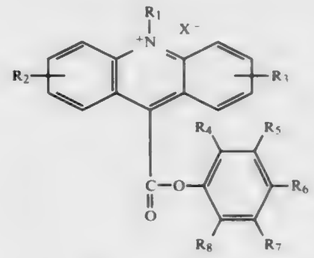
Continuation of Ser. No. 133,792, Dec. 14, 1987, Pat. No. 4,918,192, which is a division of Ser. No. 915,527, Oct. 6, 1986, Pat. No. 4,745,181. This application Mar. 1, 1990, Ser. No. 478,819

The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.

Int. Cl.[5] **C07D** *219/04*

U.S. Cl. 546—102 **6 Claims**

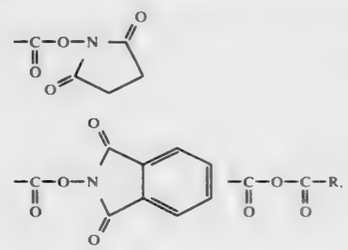
1. A luminescent polysubstituted aryl acridinium ester selected from the group having the following structure:



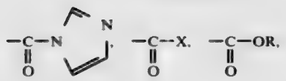
where R_1 is an alkyl, alkenyl, alkynyl, or aryl group; R_2, R_3, R_5, or R_7 are a hydrogen, amino, carboxyl, hydroxyl, alkoxyl, nitro, or halide group; R_4 or R_8 are an, alkoxyl, group; R_6 represents hydrogen or the following substituent:

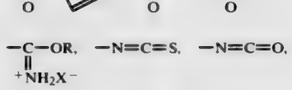
$$R_6 = -R_9-R_{10}$$

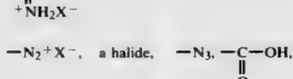
where R_9 is not required but if present is an alkyl, aryl, or aralkyl group, and R_{10} is selected from the following:

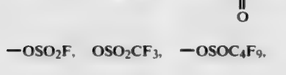


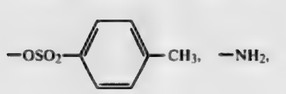
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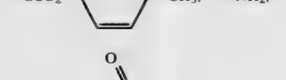


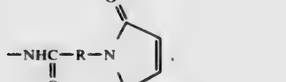




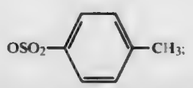






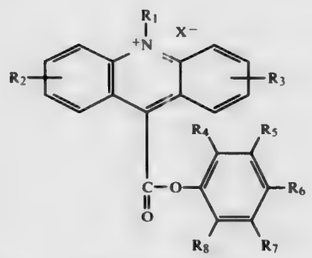


;X is CH_3SO4^-, OSO_2F^-, a halide, $OSO_2CF_3^-$, $OSO_2C_4F_9^-$,

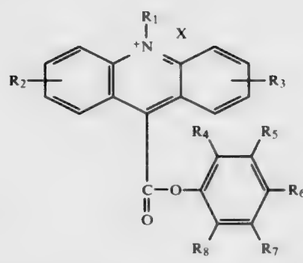


R is alkyl, aryl, aralkyl; and finally R_5, R_6, and R_7 substituent positions on the phenoxy ring are interchangeable.

3. A luminescent polysubstituted aryl acridinium ester selected from the group having the following structure:



where R_1 is an alkyl, alkenyl, alkynyl, or aryl group; R_2, R_3, R_5, or R_7 are a hydrogen, amino, carboxyl, hydroxyl, alkoxyl, nitro, or halide group; R_4 or R_8 are an alkyl group; R_6 represents hydrogen; X is $CH_3SO_4^-$, $^-OSO_2F$, a halide, $^-OSO_2CF_3$, $^-OSO_2C_4F_9$, or



and the R_5, R_6 and R_7 substituent positions on the phenoxy ring are interchangeable.

5,110,933

SALTS OF 3-AZABICYCLO(3.3.1) NONANES AS ANTIARRHYTHMIC AGENTS, AND PRECURSORS THEREOF

Kenneth D. Berlin, Stillwater; Benjamin J. Scherlag, Oklahoma City; Cyril R. Clarke, Stillwater; Surendra R. Otiv, Stillwater; Stan A. Zisman, Stillwater; Subbiah Sangiah, Stillwater, and Satish V. Mulekar, Stillwater, all of Okla., assignors to Board of Regents of Oklahoma State University, Stillwater, Okla.

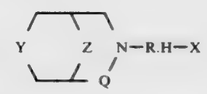
Continuation-in-part of Ser. No. 435,976, Nov. 13, 1989, Pat. No. 5,084,572. This application Nov. 7, 1990, Ser. No. 610,428

The portion of the term of this patent subsequent to Jan. 28, 2009, has been disclaimed.

Int. Cl.[5] **C07D** *495/08, 495/10*

U.S. Cl. 546—114 **4 Claims**

1. A 3-azabicyclo [3.3.1]nonane compound having the following formula:



wherein

H-X represents a pharmacologically acceptable acid,

Q represents CH_2, or CO,

Z represents CH_2, CO, $C(OCH_3)_2$, or



R represents hydrogen, lower alkyl, or a benzyl- or benzoyl group wherein the phenyl ring is unsubstituted or is substituted by halogen or by 1 to 3 methoxy groups, a benzene sulfonyl group, or



and

Y represents S→O.

5,110,934

BISPHENOLS AND POLY(IMIDOARYLETHER KETONE)S AND POLY(IMIDOARYLETHER SULFONE)S PRODUCED THEREFROM

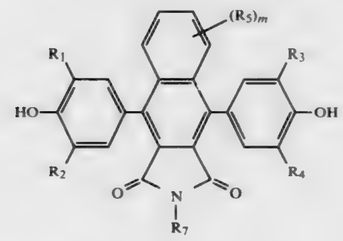
Allan S. Hay, 5015 Glencairn Avenue, Montreal, Quebec, Canada H3W 2B3 , and Marko Strukelj, 495 Prince Arthur Street West, Apt. 33, Montreal, Quebec, Canada H2X 1T4

Filed May 23, 1991, Ser. No. 704,930

Int. Cl.[5] **C07D** *401/04, 209/60*

U.S. Cl. 546—159 **6 Claims**

1. A bisphenol of formula (I):



(I)

in which

R_1, R_2, R_3 and R_4, which may be the same or different, are selected from hydrogen, fluorine, chlorine, bromine, alkyl of 1 to 6 carbon atoms, aryl of 6 to 10 carbon atoms, alkoxy of 1 to 6 carbon atoms and aryloxy of 6 to 10 carbon atoms;

R_5 is selected from fluorine, chlorine, bromine and alkyl of 1 to 6 carbon atoms,

m is 0, 1, 2, 3 or 4, and

R_7 is alkyl of 1 to 18 carbon atoms; aryl of 6 to 10 carbon atoms, unsubstituted or substituted one or more times by a substituent selected from fluorine, chlorine, trifluoromethyl alkyl of 1 to 6 carbon atoms and phenyl; or heteroaryl.

5,110,935

COMPOUNDS WHICH ARE ACTIVE AGAINST THE TISSUE FORMS OF MALARIA AND METHOD OF PREPARATION

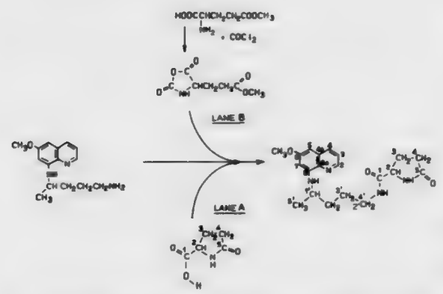
Philippe Pirson, Wezembeek-Oppem; Jean-Bernard Falmagne, Wavre, and André Trouet, Winksele-Herent, all of Belgium, assignors to Ire-Celltarg, S.A., Fleurus, Belgium

Filed Sep. 22, 1989, Ser. No. 410,885

Claims priority, application France, Sep. 23, 1988, 88 12441

Int. Cl.[5] **A61K** *31/47;* **C07D** *215/38, 215/40;* **C07K** *5/02*

U.S. Cl. 546—171 **4 Claims**



1. A quinoline derivative containing a free amine group and having antimalarial properties, or its addition salts with acids, wherein the quinoline derivative is represented schematically by the formula:

PQ-X

in which

PQ denotes quinolines containing a free amine group and having antimalarial properties, and

X is selected from the group consisting of gamma-L-glutamic acid, L-pyroglutamic acid and beta-L-aspartic acid,

wherein the PQ-X bond is a convalent peptide bond between the free amine group of PQ and a carboxyl group of the selected amino acid and wherein further the bond is stable in serum and resistant to lysosomal hydrolases.

5,110,936

PROCESS FOR THE PREPARATION OF 3-(LPYROGLUTAMYL)-L-THIAZOLIDINE-4-CARBOXYLIC ACID DERIVATIVES

Stefano Poli, and Lucio Del Corona, both of Milan, Italy, assignors to Poli Industria Chimica S.P.A., Milan, Italy

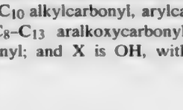
Filed Oct. 9, 1990, Ser. No. 594,313

Claims priority, application Italy, Oct. 12, 1989, 22003 A/89

Int. Cl.[5] **C07D** *277/04, 277/18, 207/00*

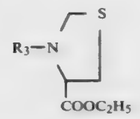
U.S. Cl. 548—200 **5 Claims**

1. A process for the preparation of 3-(L-pyroglutamyl)-L-thiazolidine-4- carboxylic acid and its derivatives which process comprises reacting a compound of formula (I)



wherein:

R_1 is hydrogen, C_1–C_6 alkyl, C_3–C_7 cycloalkyl, C_4–C_{10} cycloalkylalkyl, aryl and substituted aryl, C_2–C_5 alkoxycarbonyl, C_2–C_{10} alkylcarbonyl, arylcarbonyl and aralkylcarbonyl, C_8–C_{13} aralkoxycarbonyl and substituted aralkoxycarbonyl; and X is OH, with a compound of formula (II)



(II)

wherein R_3 is hydrogen or C_3–C_9 trialkylsilyl in the presence of a condensing agent.

5,110,937

PREPARATION OF DI-CATION ETHERS

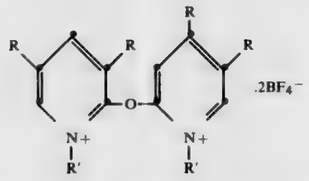
Derek D. Chapman, and Ronald R. Valente, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1989, Ser. No. 400,844

Int. Cl.[5] **C07D** *401/12*

U.S. Cl. 546—261 **11 Claims**

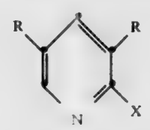
1. Process for the preparation of a salt of a di-cation ether having the formula:



(I)

wherein each substituent designated by R is independently selected from the class consisting of hydrogen, halogen, and lower alkyl radicals, such that not more than one halogen is bonded to either ring, and said each radical designated by R' is lower alkyl radicals, said process comprising the stepwise reaction sequence of:

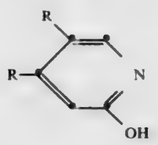
(A) reacting (i) a halopyridine having the formula



(II)

wherein R has the same significance as above and X is halogen having an atomic number of at least 17, with (ii) an alkylating agent selected from the class consisting of dimethylsulfate, diethylsulfate, alkyltoluene sulfonates, and compounds having the formula $R'OSO_2CF_3$, thereby N-alkylating said halopyridine,

(B) reacting in the presence of a tertiary alkyl amine, the N-alkylated intermediate product of step (A) with a hydroxypyridine having the formula:



(III)

wherein R has the same significance as above, and not more than one R is halogen;

(C) reacting the monc N-alkylated ether intermediate thereby produced with an alkylating agent selected from the class of alkylating agents set forth above; and

(D) reacting the di-N-alkylated ether intermediate thereby produced with a water soluble metal fluoborate whereby said di-cation ether salt of Formula (I) is produced; said process being further characterized by having a yield of a di-cation ether salt in substantial excess of any yield of a pyridone co-product.

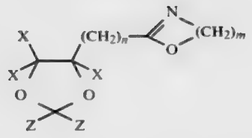
5,110,938

HALODIOXOLANE-CONTAINING OXAZINES AND OXAZOLINES, AND THEIR POLYMERS

Ming-Hong Hung, and Mureo Kaku, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 30, 1990, Ser. No. 621,680
Int. Cl.[5] **C07D** *263/14*
U.S. Cl. 548—237 **13 Claims**

1. A compound of the formula



wherein:

each X is independently hydrogen, chlorine or fluorine;

each Z is independently $—CY_3$, $—C_2Y_5$, normal $—C_3Y_7$, fluorine, or chlorine;

m is 2 or 3;

n is zero or an integer of 1 to 10;

each Y is independently chlorine or fluorine; and provided that at least one of Y is fluorine.

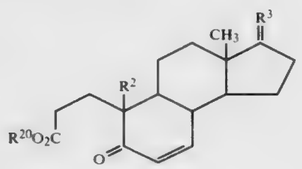
5,110,939

INTERMEDIATES IN THE PREPARATION OF STERIOD 5-ALPHA-REDUCTASE INHIBITORS

Dennis A. Holt, Downingtown; Mark A. Levy, St. Davids, and Brian W. Metcalf, Radnor, all of Pa., assignors to Smithkline Beecham Corporation, Philadelphia, Pa.

Division of Ser. No. 7,539, Jan. 28, 1987, Pat. No. 4,888,336.
This application Oct. 10, 1989, Ser. No. 419,563
Int. Cl.[5] **C07D** *307/94, 257/04;* **C07C** *69/608*
U.S. Cl. 548—250 **3 Claims**

1. A compound of the formula

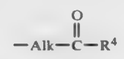


in which:

R_2 is H or C_{1-8} alkyl;

R_3 is

(1) alpha-hydrogen, alpha-hydroxyl, or alpha-acetoxy and (a)



where Alk is absent or present as a straight or branched hydrocarbon chain of 1 to 12 carbons, and R^4 is

(i) hydrogen,

(ii) hydroxyl,

(iii) C_{1-8} alkyl,

(iv) hydroxy C_{1-8} alkyl,

(v) NR^5R^6, where R^5 and R^6 are each independently selected from hydrogen, C_{1-8} straight or branched chain alkyl, C_{3-6} cycloalkyl, phenyl; or R^5 and R^6 taken together with the nitrogen to which they are attached represent a 5–6 membered saturated ring comprising up to one other heteroatom selected from oxygen and nitrogen, or

(vi) OR^7, where R^7 is alkali metal, C_{1-18} straight or branched chain alkyl, benzyl, or

(b) —Alk—OR^8, where Alk is always present and has the same meaning as above, and R^8 is

(i) phenyl C_{1-6} alkylcarbonyl,

(ii) C_{5-10} cycloalkylcarbonyl,

(iii) benzoyl

(iv) C_{1-8} alkoxycarbonyl,

(v) amino, or C_{1-8} alkyl substituted amino, carbonyl, or

(vi) hydrogen, provided that Alk is a branched C_3-C_8 chain,

(2) =CH—Alk—CO—R^4 or =CH—Alk—OR^8, where Alk is present or absent and has the same meaning as above, and R^4 and R^8 have the same meaning as above and R^8 also is hydrogen or C_{1-20} alkylcarbonyl;

(3)



where the dashed bond replaces the 17-alpha-hydrogen,

(4) alpha-hydrogen and NHCOR^9 where R^9 is C_{1-12} alkyl or NR^5R^6

where R^5 and R^6 have the same meaning as above,

(5) alpha-hydrogen and cyano,

(6) alpha-hydrogen and tetrazolyl; or

(7) keto; and

R^{20} is C_{1-18} alkyl.

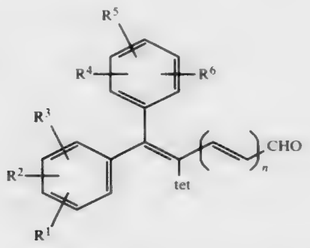
5,110,940

ANTIHYPERCHOLESTEROLEMIC TETRAZOLE COMPOUNDS

Sing-Yuen Sit, Meriden, and John J. Wright, Middletown, both of Conn., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 437,942, Nov. 17, 1989, which is a division of Ser. No. 151,513, Feb. 18, 1988, Pat. No. 4,897,490, which is a continuation-in-part of Ser. No. 18,542, Feb. 25, 1987, abandoned. This application May 6, 1991, Ser. No. 695,827
Int. Cl.[5] **C07D** *257/02*
U.S. Cl. 548—252 **26 Claims**

1. A compound of the formula

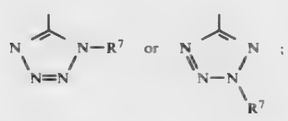


wherein

R^1 and R^4 each are independently hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, or trifluoromethyl;

R^2, R^3, R^5 and R^6 each are independently hydrogen, halogen, C_{1-4} alkyl or C_{1-4} alkoxy;

tet is



n is an integer of from 0 to 2, inclusive; and

R^7 is C_{1-4} alkyl, C_{1-4} alkoxy(lower)alkyl or (2-methoxyethoxy)methyl or triphenylmethyl.

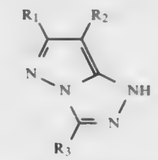
5,110,941

METHODS OF PRODUCING 1H-PYRAOLO(5,1-C)-1,2,4-TRIAZOLES AND PYRAZOLE DERIVATIVES

Masato Taniguchi, and Tadahisa Sato, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1989, Ser. No. 423,891
Claims priority, application Japan, Oct. 21, 1988, 63-265681
Int. Cl.[5] **C07D** *487/04, 417/14, 417/04, 409/14*
U.S. Cl. 548—262.4 **7 Claims**

1. A method of producing 1H-pyrazolo[5,1-c]-1,2,4-triazoles represented by formula (II):



(II)

wherein R_1, R_2, and R_3 each represents:

a hydrogen atom,

a halogen atom,

an alkyl or aralkyl group,

an alkyl or aralkyl group substituted with a hydroxyl group, a nitro group, a carboxyl group, a cyano group, halogen atom, a phenyl group or a phenoxy group,

a phenyl group, a 4-t-butylphenyl group, a 2,4-di-t-amylphenyl group, a 4-tetradecanamidophenyl group or a 3-nitrophenyl group,

a 2-furyl group, a 2-thienyl group, a 2-pyrimidinyl group, a 2-benzothiazolyl group, a 1-phenyltetrazole-5-oxy group, a 2-tetrahydropyranyloxy group, a 2-benzothiazolylthio group, a 2,4-diphenoxy-1,3,5-triazole-6-thio group, a 2-pyridylthio group, a triazolyl group, a tetrazolyl group, an imidazolyl group, or a pyrazolyl group,

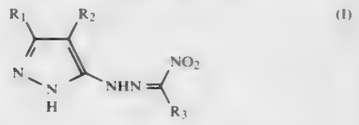
a cyano group,

a phenoxy group, a 2-methylphenoxy group, a 4-t-butylphenoxy group, a 3-nitrophenoxy group, a 3-t-butyloxycarbamoylphenoxy group, a 3-methoxycarbamoylphenoxy group, a 2,4-dimethylphenoxy group, a 4-methylphenoxy group, a 2-methoxy-5-nitrophenoxy group or a 2-methoxy-4-nitrophenoxy group,

an alkylthio group,

a phenylthio group, or

an azo group, which comprises making a compound represented by formula (I) undergo a ring closure reaction:



(I)

wherein R_1, R_2, and R_3 are defined above.

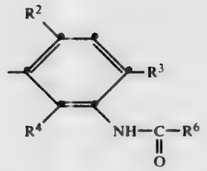
5,110,942

DYE DERIVED FROM A PYRAZOLOTRIAZOLE

John W. Harder, and Paul A. Burns, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

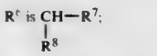
Division of Ser. No. 452,907, Dec. 19, 1989, Pat. No. 4,990,430.
This application Aug. 31, 1990, Ser. No. 576,031
Int. Cl.[5] **C07D** *487/04*
U.S. Cl. 548—262.4 **4 Claims**

1. A dye that is formed upon oxidative coupling of a 6-t-alkyl-1H-pyrazolo-1, 2, 4-triazole photographic coupler having a group in the 3-position represented by the formula:



wherein

R^2, R^3 and R^4 individually are hydrogen, unsubstituted or substituted alkoxy or unsubstituted or substituted alkyl containing 1 to 5 carbon atoms;



R^7 and R^8 individually are hydrogen, unsubstituted or substituted alkyl, aryl, carbonamido, phenoxy, sulfonamido, sulfanyl, carbamoyl, hydroxy, phosphoramido, sulfonyl, sulfinyl, or unsubstituted or substituted polyether groups, that enable the coupler to have a Log P that is within the range of 4 to 8; at least one of R^7 and R^8 is other than hydrogen; and,

a primary amine photographic color developing agent.

5,110,943

CERTAIN PHENOXY (OR 5-TRIFLUOROMETHYL-PYRIDYL-OXY)-PHENOXY-2-YL-PROPANE DERIVATIVES

Kenneth H. Clifford; Gareth T. Phillips, both of Kent, England, and Arthur F. Marx, Ma Delft, Netherlands, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

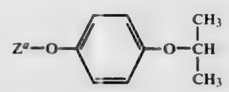
Division of Ser. No. 277,929, Nov. 30, 1988, Pat. No. 5,037,759. This application May 24, 1991, Ser. No. 705,539

Claims priority, application United Kingdom, Dec. 1, 1987, 8728064

Int. Cl.[5] C07D *213/643, 43/275*

U.S. Cl. 546—302 **1 Claim**

1. A compound of formula IIa



IIa

in which Z^a represents a phenyl group or a 5-trifluoromethyl-2-pyridyl group optionally substituted at the 3-position by a halogen atom.

5,110,944

PROCESS FOR PREPARING 5-HYDROXYHYDANTOIN

Masahiko Yamada, and Satomi Takahashi, both of Kobe, Japan, assignors to Kenegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 20, 1991, Ser. No. 657,800

Claims priority, application Japan, Feb. 23, 1990, 2-43218

Int. Cl.[5] C07D *233/78*

U.S. Cl. 548—311 **4 Claims**

1. A process for preparing 5-hydroxyhydantoin which comprises oxidizing 4,5-dihydroxyimidazolin-2-one with hydrogen peroxide in an aqueous medium in the presence of a metal ion selected from the group consisting of divalent iron ion and monovalent copper ion.

5,110,945

1-AZONIABICYCLO[3.3.0]OCT-1(5)-ENE SALT DERIVATIVES AND PROCESS FOR THE PREPARATION OF THE SAME

Masayasu Kurono; Yasuaki Kondo; Yukiharu Matsumoto; Mitsuru Oka, and Kiichi Sawai, all of Nagoya, Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Aichi, Japan

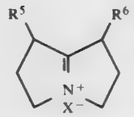
Filed Oct. 15, 1991, Ser. No. 776,039

Claims priority, application Japan, Oct. 16, 1990, 2-275216

Int. Cl.[5] C07D *487/04*

U.S. Cl. 548—453 **3 Claims**

1. 1-Azonia-4,6-disubstituted-bicyclo-[3.3.0]oct-1(5)-ene salt derivatives shown by the formula of

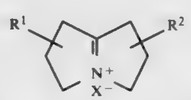


(I)

wherein X is a halogen atom, ClO_4, NO_3, BF_4, R^3SO_3, $(SO_4)_{0.5}$ or CW_3CO_2, and R^5 and R^6 are same or different hydrocarbon group with 1–10 carbon atoms, or one of R^5 and R^6 represents hydrogen atom and the other is the hydrocarbon group with 2–10 carbon atoms.

2. 1-Azonia-4,6-disubstituted-bicyclo[3.3.0]oct-1(5)-ene salt derivative as claimed in claim **1**, wherein the derivative is 1-azonia-4,6-dimethylbicyclo[3.3.0]oct-1(5)-ene perchlorate.

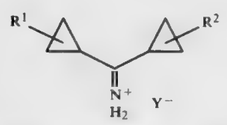
3. A process for the preparation of 1-azoniabicyclo[3.3.-0]oct-1(5)-ene salt derivatives of the formula



(IV)

wherein X is a halogen atom, ClO_4, NO_3, BF_4, R^3SO_3, $(SO_4)_{0.5}$ or CW_3CO_2, and R^1 and R^2 are same or different and each being hydrogen atom or hydrocarbon group with 1–10 carbon atoms,

which comprises the step of heating in a solvent a dicyclopropylmethanimine salt derivative of the formula



(II)

wherein R^1 and R^2 have the meanings referred to above, and Y is a halogen atom, ClO_4, NO_3, BF_4, R^3SO_3, $(SO_4)_{0.5}$ or CW_3CO_2,

solely or with an ammonium salt of the formula

$NR^4{}_4Z$ (III)

wherein Z is a halogen atom, ClO_4, NO_3, BF_4, R^3SO_3, $(SO_4)_{0.5}$ or CW_3CO_2 and R^4 is a hydrocarbon group with 1–10 carbon atoms,

in case of that the symbol Y represents the halogen atom, R^3SO_3 or $(SO_4)_{0.5}$; or with the ammonium salt of Formula (III), wherein Z is the halogen atom, R^3SO_3 or $(SO_4)_{0.5}$, in case of that Y represents the radical other than the halogen atom, R^3SO_3 or $(SO_4)_{0.5}$.

5,110,946

PREPARATION OF 4-CHLORO-3-SULPHAMOYL-N-(2,3-DIHYDRO-2-METHYL-1H-INDOL-1-YL)-BENZAMIDE FROM 2,3-DIHYDRO-2-METHYL-1H-INDOLE AND HYDROXYLAMINE-O-SULPHONIC ACID

Roger Thevignot, Bolbec, France, assignor to Adir et Compagnie, Courbevoie, France

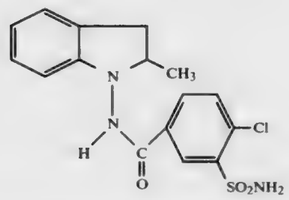
Filed May 22, 1991, Ser. No. 704,309

Claims priority, application France, Jun. 14, 1990, 90 07387

Int. Cl.[5] C07D *209/08*

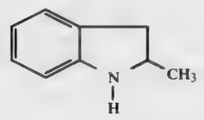
U.S. Cl. 548—483 **5 Claims**

1. Process for the preparation of 4-chloro-3-sulphamoyl-N-(2,3-dihydro-2-methyl-1H-indol-1-yl)benzamide, the compound of the formula I:



(I)

characterised in that 2,3-dihydro-2-methyl-1H-indole, the compound of the formula II:

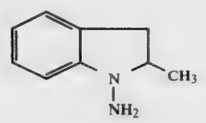


(II)

is subjected to the action of hydroxylamine-O-sulphonic acid, the compound of the formula III:

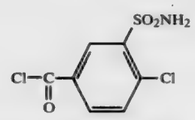
H_2NOSO_3H (III)

is suspended in a polyhalogenated alkane, in the presence of triethylamine and at a temperature of from 20° C. to 60° C., then 1-amino-2,3-dihydro-2-methyl-1H-indole, the compound of the formula IV:



(IV)

is separated from the reaction medium by selective extraction and is reacted in the form of a base or salt, in solution in tetrahydrofuran or in an alcoholic medium and in the presence of an acid-acceptor with 4-chloro-3-sulphamoylbenzoyl chloride, the compound of the formula V:



(V)

at a temperature of from 20° to 30° C. in order to form the compound of the formula I.

5,110,947

PROCESS FOR THE PREPARATION OF 3-CARBOALKOXYPYRROLIDONES

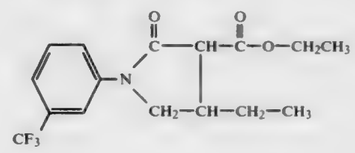
Frank X. Woolard, Richmond, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 291,083, Dec. 27, 1988, abandoned. This application Jul. 3, 1990, Ser. No. 547,706

Int. Cl.[5] C07D *207/08*

U.S. Cl. 548—531 **1 Claim**

1. The compound having the formula



5,110,948

ORGANOSAMARIUM CATALYSTS FOR THE HYDROAMINATION OF OLEFINS

Tobin J. Marks; Steven P. Nolan, both of Evanston, and Michel R. Gagne, Chicago, all of Ill., assignors to Northwestern University, Evanston, Ill.

Continuation-in-part of Ser. No. 291,186, Dec. 28, 1988, abandoned. This application Mar. 13, 1990, Ser. No. 492,823

Int. Cl.[5] C07D *207/06, 295/023, 24/02, 209/04*

U.S. Cl. 548—579 **21 Claims**

1. A method for hydroaminating an amino-olefin,, comprising contacting said amino-olefin with a catalyst under an inert atmosphere, said catalyst being selected from the group consisting of $Cp'_2Sm(THF)_2$ and Cp'_2Sm, where $Cp' = \eta_5R_5C_5$, and R is selected from the group consisting of H, alkyl or aryl.

5,110,949

METHOD OF SYNTHESIZING LEUKOTRIENE B_4 AND DERIVATIVES THEREOF

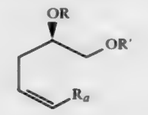
Yoshihiro Abe, Tokyo, Japan, and Kyriacos C. Nicolaou, Havertown, Pa., assignors to University of Pennsylvania, Philadelphia, Pa.

Division of Ser. No. 165,521, Mar. 8, 1988, Pat. No. 4,873,024. This application Sep. 13, 1989, Ser. No. 388,990

Int. Cl.[5] C07D *309/12*

U.S. Cl. 549—214 **1 Claim**

1. The compound of the formula



where R is Si(t-Bu)(phenyl)$_2$, R′ is tetrahydropyran, and R_a is $-(CH_2)_4-CF_3$.

5,110,950

METHOD OF PREPARING 2-PHOSPHORYLATED COMPOUNDS OF ASCORBIC ACID

Paul A. Seib, and Xiao Y. Wang, both of Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Filed Jun. 12, 1991, Ser. No. 713,791

Int. Cl.[5] C07F *9/08*

U.S. Cl. 549—222 **15 Claims**

1. In a method of synthesizing L-ascorbate 2-phosphorylated compounds including the steps of forming a reaction mixture having respective quantities of an ascorbic acid reactant and a

metaphosphate phosphorylating agent in a noninterfering aqueous solvent, and allowing the mixture to react to phosphorylate said reactant, the improvement which comprises the steps of carrying out said phosphorylation reaction in the presence of a phosphorylation reaction-accelerating amount of an ion selected from the group consisting of calcium, strontium and barium ion and mixtures thereof, while maintaining the pH of said reaction mixture at a level of from about 3–12.

5,110,951
METHOD FOR PRODUCING L-ASCORBIC ACID 2-PHOSPHATES

Yoshimasa Ishimura, and Yohei Kurata, both of Kawasaki, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Jun. 25, 1990, Ser. No. 542,550
Int. Cl.[5] C07F 9/06
U.S. Cl. 549—222 **7 Claims**

1. A method for producing L-ascorbic acid 2-phosphate comprising:

(a) phosphorylating L-ascorbic acid having hydroxyl groups at the 5- and 6-positions which are unprotected or protected with a protective group, or a salt thereof using a phosphorus oxyhalide at a temperature not higher than about 40° C. to form a reaction mixture containing L-ascorbic acid 2-phosphates,

(b) heating the reaction mixture resulting from step (a) to convert by-products derived from phosphorylating L-ascorbic acid in step (a) at a temperature of about 50° to about 105° C. into L-ascorbic acid, and

(c) phosphorylating the reaction mixture containing said L-ascorbic acid from step (b) using a phosphorus oxyhalide at a temperature not higher than about 40° C.

5,110,952
METHOD OF PRODUCING 3-DIBUTYLAMINO 6-METHYL-7-ANILINOFLUORAN

Hiroaki Harada, and Yasuhisa Iwasaki, both of Yao, Japan, assignors to Yamamoto Chemicals, Inc., Osaka, Japan

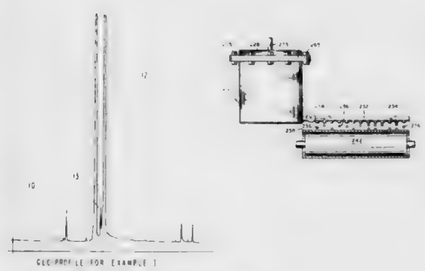
Filed Dec. 20, 1990, Ser. No. 631,677
Claims priority, application Japan, Dec. 25, 1989, 1-337994
Int. Cl.[5] C07D 311/82
U.S. Cl. 549—226 **5 Claims**

1. A method of producing a high melting point 3-dibutylamino-6-methyl-7-anilinofluoran characterized by peaks at diffraction angle (2θ) of 6.9°, 11.0°, 18.5° and 18.9° in X-ray diffractiometry using Cu-K α ray and having a melting point in the range of 179°–186° C., which comprises: condensing (A) 2-(4-dibutylamino-2-hydroxy-benzoyl)benzoic acid with (B) 4-methoxy-2-methyldiphenylamine in an amount of 0.8 to 1.2 mols (A) per mol (B), in the presence of concentrated sulfuric acid to provide a phthalide at a temperature in the range of 0°–50° C., neutralizing the phthalide, and then subjecting the phthalide to ring closure reaction using an alkali in an amount of 0.5–15 mols per mol of (A) or (B), the selection of (A) or (B) being determined by the one used in the smallest amount at a temperature of not less than 50° C. up to the reflux temperature in the presence or absence of a water immiscible organic solvent.

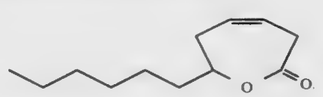
5,110,953
PROCESS FOR PREPARING COMPOSITIONS CONTAINING UNSATURATED LACTONES, PRODUCTS PRODUCED THEREBY AND ORGANOLEPTIC USES OF SAID PRODUCTS

Mohamad I. Farbood, Holmdel; James A. Morris, Wall; Mark A. Sprecker, Sea Bright; Lynda J. Bienkowski, Perth Amboy; Kevin P. Miller, Middletown; Manfred H. Vock, Locust, and Myrna L. Hagedorn, Edison, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

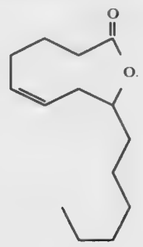
Division of Ser. No. 545,610, Jun. 29, 1990, Pat. No. 5,023,347, which is a division of Ser. No. 279,065, Dec. 2, 1988, Pat. No. 4,960,597, which is a continuation-in-part of Ser. No. 228,512, Aug. 5, 1988, Pat. No. 4,946,782. This application Dec. 7, 1990, Ser. No. 623,522
Int. Cl.[5] C07D 313/04
U.S. Cl. 549—263 **2 Claims**



1. A compound having the structure:



2. The compound having the structure:



5,110,954
DEHYDROGENATION OF DIOLS

Harold E. Bellis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 11, 1990, Ser. No. 551,124
Int. Cl.[5] C07D 313/04, 309/10, 307/20
U.S. Cl. 549—266 **10 Claims**

1. A process for producing high purity lactone comprising catalytically dehydrogenating an aliphatic diol, wherein the aliphatic diol contains from 3–7 carbon atoms in the main chain and is optionally substituted by C_{1-4} alkyl, in a liquid slurry in the presence of a copper chromite catalyst wherein the catalyst is present in the slurry in particulate form having a size range

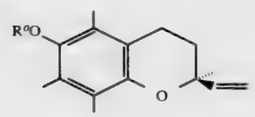
of from 1–20 microns and in the substantial absence of added hydrogen.

5,110,955
TOCOPHEROL SYNTHESIS: CHROMANE CYCLIZATION AND CATALYSIS

Andreas Knierzinger, and Michelangelo Scalone, both of Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

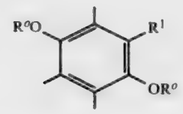
Filed Apr. 5, 1990, Ser. No. 505,873
Claims priority, application Switzerland, Apr. 14, 1989, 1411/89; Jan. 30, 1990, 288/90
Int. Cl.[5] C07D 311/72
U.S. Cl. 549—411 **19 Claims**

1. A process for the manufacture of vinylchromanes having the formula



I

wherein R^o represents hydrogen or a cleavable protecting group,
which process comprises cyclizing a compound of the formula



II

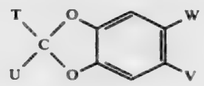
wherein R^o is defined above and R^1 is the residue $—CH_2C-H_2—C(W)(CH_3)—CH=CH_2$ or $—CH_2—CH-_2—C(CH_3)=CH—CH_2W$ where W is a leaving group, by means of a chiral rhodium- or palladium-diphosphine complex.

5,110,956
BENZODIOXALE DERIVATIVES

Yoshitake Ogata; Makoto Ikeda, both of Tsukuba; Seiichiro Nomoto, Ushiku; Makoto Okita, Tsukuba; Naoyuki Shimomura, Tsukuba; Toshihiko Kaneko, Tsukuba; Takashi Yamanaka, Tsukuba; Ieharu Hishinuma, Kitasouma; Junichi Nagakawa, Tsukuba; Kazuo Hirota, Tsukuba; Kaname Miyamoto, Tsukuba; Toru Horie, Tsukuba, and Tsuneo Wakabayashi, Mito, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

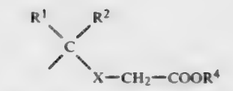
Continuation of Ser. No. 160,333, Feb. 25, 1988, abandoned. This application Apr. 23, 1990, Ser. No. 517,444
Claims priority, application Japan, Mar. 4, 1987, 62-49141; Apr. 3, 1987, 62-82258; Apr. 27, 1987, 62-103724; Apr. 28, 1987, 62-105508; Apr. 28, 1987, 62-105509; Sep. 28, 1987, 62-243492
Int. Cl.[5] C07D 317/54, 277/30
U.S. Cl. 549—447 **4 Claims**

1. A benzodioxole derivative having the formula (I) or a pharmaceutically acceptable salt thereof:

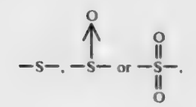


(I)

wherein T is hydrogen, U is hydrogen, V is R^3 and W is



wherein R^1 and R^2 may be the same or different and each represents a hydrogen atom, an alkyl, benzyl, phenethyl or a heteroarylalkyl group wherein the heteroaryl group is a five or six membered ring containing nitrogen, R^3 represents a hydrogen atom or a lower alkyl, benzyl orphenethyl, or heteroarylalkyl group wherein the heteroaryl group is a five or six membered ring containing nitrogen, R^4 represents a hydrogen atom or a lower alkyl group, or R^2 and R^3 may join together to form a 4 to 6-membered ring and X represents a group of the formula:



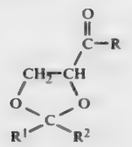
with the proviso that R^1 is an alkyl, benzyl, phenethyl, or heteroarylalkyl group having at least 3 carbon atoms when X is —S— group and R^3 and R^2 are each a hydrogen atom.

5,110,957
PROCESS FOR PREPARING 1,3-DIOXOLANE KETONES

Robert J. Pryce, Faversham; John E. Hawes, Sittingbourne, and Sheetal Handa, Milton Regis, all of England, assignors to Shell Research Limited, England

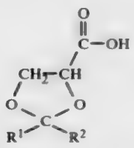
Filed Aug. 17, 1990, Ser. No. 568,851
Claims priority, application United Kingdom, Aug. 17, 1989, 8918806
Int. Cl.[5] C07D 317/26
U.S. Cl. 549—450 **8 Claims**

1. A process for preparing a ketone of the formula:



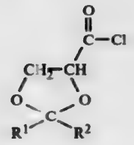
in which R^1 and R^2 each independently represent a C_{1-6} alkyl or C_{6-12} aryl group, and R represents alkyl, aryl, cyclohexyl, or aralkyl, which process comprises the steps of:

reacting a carboxylic acid having the following formula in which R^1 and R_2 are as hereinbefore defined:

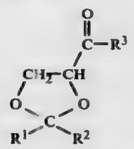


with a lithium compound selected from the group consisting of lithium hydride and lithium hydroxide to form the corresponding lithium salt of the carboxylic acid;

reacting the lithium salt so-obtained with thionyl chloride to yield an acyl chloride having the following formula in which R^1 and R_2 are as hereinbefore defined:



reacting the acyl chloride so-obtained with a secondary amine to yield an amide having the following formula in which R^3 represents a secondary amino group, and R^1 and R^2 are as hereinbefore defined:



and, reacting the amide so-obtained with an organometallic reagent selected from the group consisting of Grignard and lithium reagents to yield the ketone having formula I.

5,110,958

COMPOUNDS, PROCESS AND INTERMEDIATES

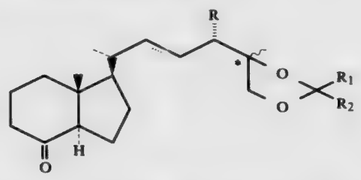
Enrico G. Baggiolini; Andrew D. Batcho, both of North Caldwell; Gary A. Truitt, Passaic; Milan R. Uskokovic, Upper Montclair, and Peter M. Wovkulich, Nutley, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 495,518, Mar. 19, 1990, abandoned, which is a continuation of Ser. No. 110,299, Oct. 19, 1987, abandoned, which is a continuation of Ser. No. 682,125, Dec. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 578,160, Feb. 8, 1984, abandoned. This application May 6, 1991, Ser. No. 698,176

Int. Cl.[5] C07D *317/26*

U.S. Cl. 549—454 **4 Claims**

1. A compound of the formula



wherein R is hydrogen or methyl, R_1 and R_2 each, independently, is hydrogen, lower alkyl or aryl, or taken together are lower alkylene of from 3 to 6 carbon atoms, and the dotted (. . .) line is an optional bond.

5,110,959

PROCESS FOR PREPARATION OF EPOXY ESTERS AND INTERMEDIATES PREPARED THEREBY

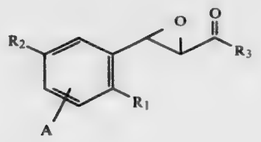
Joseph R. Flisak, Audubon, Pa.; Paul G. Gassman, St. Paul, Minn.; Ivan Lantos, Wayne, and Wilford L. Mendelson, King of Prussia, both of Pa., assignors to Smithkline Beckman Corp., Philadelphia, Pa.

Filed Jun. 14, 1989, Ser. No. 366,059

Int. Cl.[5] C07D *303/38, 303/00*

U.S. Cl. 549—513 **37 Claims**

1. An improved process for preparing a chiral α-epoxy ketone of the formula:



(III)

wherein

R_1 is $(L)_a$—$(CH_2)_b$—$(T)_c$—Q;

a is 0 or 1;

b is 3 to 14;

c is 0 or 1;

L and T are independently oxygen or CH_2;

Q is C_{1-4}alkyl, trifluoromethyl, furanyl, thienyl, cyclohexyl or phenyl, optionally monosubstituted with Br, Cl, CF_3, C_{1-4}alkoxy, or C_{1-4}alkyl;

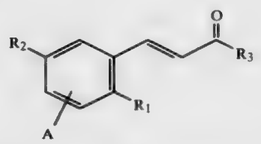
R_2 and A are independently selected from H, CF_3, C_{1-4}alkyl, halogen or NO_2;

or R_1 is H and R_2 is $(L)_a$—$(CH_2)_b$—$(T)_c$—Q

wherein a, b, c, L, T and B are as defined above; and

R_3 is phenyl or naphthyl unsubstituted or substituted by one or two halogen, C_{1-4}alkyl, C_{1-4}alkoxy or trifluoromethyl groups;

comprising reacting an α,β-unsaturated ketone of the formula:



(II)

wherein R_1, R_2, A and R_3 are defined above, with a polyamino acid, an oxidant and a base in a mixture of water and an organic solvent wherein the improvement is the use of a nonaromatic and non-chlorinated hydrocarbon solvent.

5,110,960

ANTIFUNGAL ANTIBIOTICS

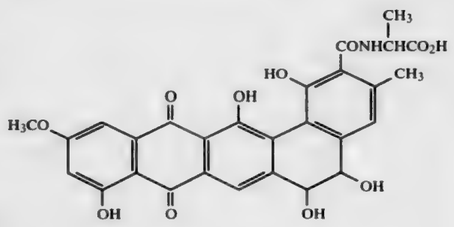
Toshikazu Oki, Yokohama; Kyoichiro Saitoh, Zushi; Kozo Tomatsu; Koji Tomita, both of Tokyo; Masataka Konishi, Kawasaki; Takeo Miyaki, Yokohama; Mitsuaki Tsunakawa, and Maki Nishio, both of Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 366,573, Jun. 15, 1989, Pat. No. 4,990,497, which is a division of Ser. No. 115,273, Nov. 2, 1987, Pat. No. 4,870,165, which is a continuation-in-part of Ser. No. 10,058, Feb. 2, 1987, abandoned. This application Oct. 1, 1990, Ser. No. 590,721

Int. Cl.[5] E07O *50/22*

U.S. Cl. 552—220 **1 Claim**

1. An intermediate having the formula



or a salt thereof, or an ester thereof.

5,110,961

CATALYTIC PROCESS FOR THE SYNTHESIS OF AN ALCOHOL, NEW METAL COMPLEXES AND PROCESS FOR THE SYNTHESIS OF THESE COMPLEXES

Serge Lecolier, Janville sur Juine; André Mortreux, Hem; Francis Petit, Villeneuve d'Asq, and Henri Samain, Bievres, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris Cedex, France

Filed Dec. 14, 1990, Ser. No. 628,389

Claims priority, application France, Dec. 21, 1989, 89 16951

Int. Cl.[5] C07F *7/22, 7/24, 3/08, 15/06*

U.S. Cl. 556—31 **16 Claims**

1. Process for the synthesis of an alcohol by reaction of an epoxide with a nucleophilic compound containing a labile hydrogen in the presence of a metal catalyst, characterised in that the catalyst is a metal complex of general formula (I) $[M[Co(CO)_4]_2]_x$ in which x is equal to 1 or 2 and M denotes a metal chosen from the group consisting of tin, lead and cadmium, preferably tin.

5,110,962

PREPARATION AND APPLICATION OF BROMINATED COMPOUNDS OF MANGANESE

Gérard Cahiez; Blandine Laboue, both of Paris, and Pierre Tozzolino, Morlaas, all of France, assignors to Societe Nationale Elf Aquitaine, France

PCT No. PCT/FR88/00619, § 371 Date Aug. 15, 1990, § 102(e) Date Aug. 15, 1990

PCT Filed Dec. 16, 1988, Ser. No. 566,331

Int. Cl.[5] C07F *13/00;* **C07C** *45/00*

U.S. Cl. 556—46 **16 Claims**

1. Process for the preparation of a brominated organomanganese compound RMnBr wherein R is an organic group, by reacting an organometallic compound RM or RM'X, wherein M and M' are metals that are more electropositive than Mn and X is halogen, with $MnBr_2$ characterized in that the manganese bromide is in the form of a solution in acyclic ether of a lithium-containing complex having the composition $MnBr_2.nLiBr$, n being 1 to 4.

5,110,963

METHOD FOR MAKING $MO_4S_4L_6$ (C-2386)

Catherine L. Coyle, Mendham, N.J.; Scott A. Farina, Unionville, Pa.; Edward I. Stiefel, Bridgewater, N.J., and Mark A. Greaney, Upper Black Eddy, Pa., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed May 24, 1991, Ser. No. 708,020

Int. Cl.[5] C07F *11/00*

U.S. Cl. 556—61 **11 Claims**

10. A method for preparing a compound of the formula $Mo_4S_4L_6$ wherein L is a 1,1-dithioacid, comprising:

contacting a Mo(III) halide and a salt of a 1,1-dithioacid in an organic solvent at temperatures in the range of from about 25° C. to 250° C. for a time sufficient to form the $Mo_4S_4L_6$ compound, the salt of the 1,1-dithioacid being selected from alkali, alkaline earth, ammonium and organoammonium salts of 1,1-dithioacids, the 1,1-dithioacid being selected from the group consisting of dithiocarbamates, thioxanthates, xanthates, dithiophosphates, dithiophosphinates and mixtures thereof; and the organic solvent selected from the group consisting of alcohols, nitriles, toluene, CH_2Cl_2 and mixtures thereof.

5,110,964

PROCESS FOR PRODUCING FERROCENOYL DERIVATIVES

Yoshio Hiroi, and Seiichiro Yokoyama, both of Chiba, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/00595, § 371 Date Dec. 12, 1990, § 102(e) Date Dec. 12, 1990, PCT Pub. No. WO90/13554, PCT Pub. Date Nov. 15, 1990

PCT Filed May 10, 1990, Ser. No. 623,642

Claims priority, application Japan, May 12, 1989, 1-117482; Jul. 7, 1989, 1-174047

Int. Cl.[5] C07F *17/02*

U.S. Cl. 556—143 **6 Claims**

1. A process for producing ferrocenoyl derivative carboxylic acid, which comprises reacting a ferrocene derivative with a monocarboxylic acid or dicarboxylic acid in the presence of a catalyst.

5,110,965

PROCESS FOR THE PREPARATION OF SALTS OF IRON AMINO AND HYDROXY CARBOXYLIC ACID COMPLEXES

Jon C. Thunberg, Milford; Steven P. VanKouwenberg, Raymond, both of N.H., and Walter B. Begonis, Reading, Mass., assignors to W.R. Grace & Co.-Conn., New York, N.Y.

Filed Aug. 16, 1990, Ser. No. 568,001

Int. Cl.[5] C07F *15/02*

U.S. Cl. 556—148 **32 Claims**

1. A process for the preparation of iron organic acid complexes comprising reacting an organic acid or its salt or partial salt that is capable of chelating iron with an oxide of iron and a base in the presence of a trace amount of a separately added a catalyst selected from the group consisting of ferrous ion, metallic iron, and the salt of the ferrous complex of the acid being produced, and neutralizing the resulting reaction product with the further addition of said base.

5,110,966

NEW ORGANOBORON REAGENTS FOR THE PREPARATION OF UNSUBSTITUTED PROPARGYLIC ALCOHOLS

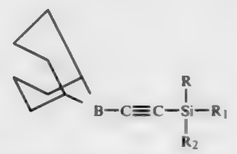
Jonathan C. Evans, and Christian T. Goralski, both of Midland, Mich., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jun. 20, 1991, Ser. No. 717,970

Int. Cl.[5] C07F *5/02*

U.S. Cl. 556—403 **2 Claims**

1. A compound of the formula



wherein R, $R_1$and R_2 are each independently selected from a group represented by C_1–C_6 alkyl or phenyl.

5,110,967

CROSSLINKERS AND CHAIN EXTENDERS FOR ROOM TEMPERATURE VULCANIZATION OR CROSSLINKING OF POLYMERS

Russell K. King, and Chi-long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 15, 1991, Ser. No. 657,018

Int. Cl.[5] C07F *7/08*

U.S. Cl. 556—407 **19 Claims**

1. A silicon compound comprising at least one silicon atom

to which is bonded at least two heterocyclic Si—N groups having one heterocyclic silicon atom, at least one nitrogen atom, and three to five ring carbon atoms wherein at least one nitrogen atom is bonded to the heterocyclic silicon atom and either a nitrogen atom or the heterocyclic silicon atom is bonded to the silicon atom through a divalent saturated aliphatic hydrocarbon radical.

5,110,968

NAPHTHALOCYANINE DERIVATIVES, PRODUCTION THEREOF, OPTICAL RECORDING MEDIUM USING THE SAME, AND PRODUCTION THEREOF

Seiji Tai, Palo Alto, Calif.; Nobuyuki Hayashi, Hitachi, Japan; Koichi Kamijima, Hitachi, Japan; Takayuki Akimoto, Hitachi, Japan; Mitsuo Katayose, Hitachi, Japan, and Hideo Hagiwara, Hitachi, Japan, assignors to Hitachi, Chemical Company Ltd., Tokyo, Japan

Division of Ser. No. 460,934, Jan. 4, 1990, Pat. No. 5,039,600. This application May 30, 1991, Ser. No. 709,037
Claims priority, application Japan, Jan. 11, 1989, 1-3984
Int. Cl.[5] C07F *7/04, 7/10*
U.S. Cl. 556—415 **2 Claims**

1. A compound of the formula:



wherein R^1 is a substituent of the formula: $—(CR^2R^3)_x-SiR^4R^5R^6$, in which R^2, R^3, R^4, R^5 and R^6 are independently a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an aryl group or an aryloxy group; and n is an integer of 1to 4.

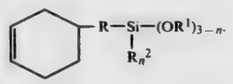
5,110,969

METHOD OF MANUFACTURING OF OLIGO(4-(2-ORGANO-ORGANOOXYSILYLALKYL)CYCLOHEXANE-1,2-DIYL)BIS-OLIGOSULFIDES

Uwe Dittrich; Sigrid Dathe, both of Dresden; Hartmut Raabe; Rolf Sourisseau, both of Gotha, and Klaus Ruehlmann, Dresden, all of Fed. Rep. of Germany, assignors to Chemiewerk Nuenchritz GmbH, Nuenchritz, Fed. Rep. of Germany

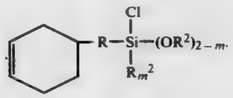
Filed Jul. 15, 1991, Ser. No. 729,544
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1990, 342751
Int. Cl.[5] C07F *7/08, 7/18*
U.S. Cl. 556—427 **6 Claims**

1. A method of manufacturing oligo(4-(2-organooxysilylalkyl)cyclohexane-1,2-diyl)bis-oligosulfides from products of industrial-scalesynthesis of 4-(2-organoorganooxysilylalkyl)-1-cyclohexene, without the use of catalysts and at ambient pressure; comprising reacting an organosilane of formula I



I

and an organochlorosilane of formula II



II

wherein R and R^2 each independently represent an C_{1-6} alkyl group;

R^1 represents an alkyl, cycloalkyl, or aryl group;

n=1 to 3; and

m=1 or 2;

wherein the molar ratio of I to II is in the range of from 1000:1 to 10:1,

directly with sulfur or a mixture of hydrogen sulfide and sulfur, in a molar ratio of R: sulfur (and/or hydrogen sulfide) of 1:1 to 1:5, at a temperature>150° C. and ambient pressure; and wherein said reaction is conducted in the absence of a sulfidization catalyst.

5,110,970

PROCESS FOR THE MANUFACTURE OF CERTAIN NEW SILICONE POLYETHER COPOLYMERS FOR POLYURETHAN FOAM MANUFACTURE

Charles H. Blevins, II, San Jose, Calif.; Paul L. Matlock, Ossining, and Gerald J. Murphy, Hopewell Junction, both of N.Y., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Mar. 29, 1991, Ser. No. 677,148
Int. Cl.[5] C07F *7/08, 7/18*
U.S. Cl. 556—445 **6 Claims**

1. A method for preparing a polyether-siloxane copolymer having a polyether backbone, comprising the following steps:

a) providing a polyether possessing olefinically-unsaturated pendant groups;

b) reacting said polyether with a silane having an Si-H group and at least one hydrolyzable functional group, to form an intermediate polyether-silane; and

c) reacting said intermediate polyether-silane under hydrolytic conditions with a silane possessing at least one hydrolyzable functional group, or with a siloxane possessing 1–3 hydrolyzable groups, to form a polyether-siloxane copolymer.

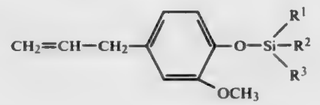
5,110,971

SILYL DERIVATIVES OF EUGENOL

Mary K. Haus, Monroeville Boro, Allegheny County, and Andrew J. Sivak, Edgewood Boro, Allegheny County, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 438,560, Nov. 20, 1989, abandoned, which is a continuation of Ser. No. 375,648, Jul. 5, 1989, abandoned. This application Sep. 5, 1990, Ser. No. 577,713
Int. Cl.[5] C07F *7/08, 7/18*
U.S. Cl. 556—446 **5 Claims**

1. A compound of the formula



in which R^1, R^2 and R^3 are independently selected from linear, branched, and cyclic hydrocarbon groups having a total of from eight to twenty-four carbon atoms, except that, where one of R^1, R^2 or R^3 is a phenyl group, the total carbon atoms must be at least nine.

5,110,972

PROCESS FOR RECYCLING SILICONE SCRAP AND PRODUCTS RELATING THERETO

Thomas W. Greenlee, Shaker Heights, Ohio, assignor to Tremco Incorporated, Cleveland, Ohio

Filed Jul. 18, 1991, Ser. No. 732,279
Int. Cl.[5] C07F *7/08*
U.S. Cl. 556—460 **5 Claims**

1. A process of cracking high molecular weight silicone polymer, said process comprising the steps of:

dissolving the silicone polymer in an organic solution comprising an acid and heating the resulting mixture until the silicone polymer is substantially dissolved;

adding a base; and

distilling out silicone cyclics from the solution.

5,110,973

CHEMICALLY INERT FLUORINATED ORGANOSILICON COMPOUNDS

Gerardo Caporiccio, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 373,393, Jun. 30, 1989, abandoned. This application Oct. 1, 1990, Ser. No. 590,850
Int. Cl.[5] C07F *7/04, 7/08*
U.S. Cl. 556—488 **8 Claims**

1. A flurorinated organosilicon compound corresponding to the formulae:

$R^1{}_4Si$

or

$R^2{}_3Si(R^3SiR^4{}_2)_2R^3SiR^2{}_3$

where at least three of the R^1 radicals, at least two of the R^2 radicals on each silicon atom and at least one of the R^4 radicals on each silicon atom is selected from the group consisting of alkylene-terminated monovalent homotelomers of chlorotrifluoroethylene, vinylidene fluoride and trifluoroethylene, and cotelomers selected from the group consisting of:

cotelomers of chlorotrifluoroethylene and hexafluoropropene;

cotelomers of tetrafluoroethylene with one member selected from the group consisting of hexafluoropropene, 1-H-pentafluoropropene and 2-H-pentafluoropropene;

cotelomers of vinylidene fluoride and one of said hexa- and pentafluoropropenes;

cotelomers of tetrafluoroethylene and a perfluoroalkyl vinyl ether; and cotelomers of tetrafluoroethylene, chlorotrifluoroethylene, and a perfluoroalkyl vinyl ether; and

cotelomers of tetrafluoroethylene, chlorotrifluoroethylene and hexafluoropropene,

and where said telomers and cotelomers are bonded to said silicon atom by a divalent alkylene radical $—C_mH_{2m}—$, where m is 2, 3 or 4;

any remaining R^1, R^2 and R^4 radicals are selected from the group consisting of alkyl radicals containing from 1 to 4 carbon atoms, fluoroalkyl radicals of the general formula $R^5(CH_2)_y—$, phenyl and perfluoroalkyl-substituted phenyl, where R^5 represents a perfluoroalkyl radical containing from 1 to 4 carbon atoms and y is 2, 3 or 4 and the value of z is from 1 to 4, inclusive;

R^3 represents an alkylene-terminated telechelic divalent fluorotelomer or fluorocotelomer represented by the formula

$$—C_mH_{2m}—(R^6)CFCF_2—(C_pF_{2p})_q(C_2ClF_3)_r—R_f—(C_2ClF_3)_r—(C_pF_{2p})_q—CF_2CF(R^6)—C_mH_{2m}—$$

where the repeating units of said monovalent and divalent fluorocotelomers are distributed randomly or sequentially;

R_f represents a perfluoroalkylene radical containing from 2 to 6 carbon atoms;

R^6 is fluorine or trifluoromethyl;

the value of m is 2, 3 or 4 with the proviso that $—C_mH_{2m}—$ represents a linear radical, inclusive, the value of p is 2 or 3, r is at least 1, q is 0 or a positive integer up to and including 10, the value of r+q is from 2 to 20, inclusive, and when q represents a positive integer the value of r/q is from 2 to 10, inclusive.

5,110,974

THERMAL DISPROPORTIONATION OF ARYLHALOSILANES

Howard M. Bank, Freeland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 24, 1991, Ser. No. 782,178
Int. Cl.[5] C07F *7/08*
U.S. Cl. 556—469 **12 Claims**

1. A process for thermal disproportionation of arylhalosilanes, the process comprising: heating arylhalosilanes of formula

$$R_cR^1{}_dH_eSiX_{4-c-d-f}$$

in liquid phase at a temperature within a range of about 250° C. to 450° C. for a reaction time of 0.1 to 18 hours, to effect disproportionation to product arylhalosilanes of formula

$$R_cR^1{}_dH_eSiX_{4-c-d-f}$$

where each R is independently selected from a group consisting of alkyl radicals of 1 to 12 carbon atoms. each R^1 is independently selected from a group consisting of aryl radicals and substituted aryl radicals. X is a halogen atom selected from a group consisting of bromide. chloride, and iodide, a=1 or 2, b=1 or 2, c=0 or 1, a+b+c=2 or 3, d=a+1, and f=b−1.

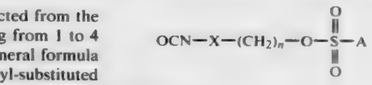
5,110,975

ISOCYANATOALKYL SULPHONATES AND A PROCESS FOR THEIR PREPARATION

Georg Schroëder, Burscheid-Hilgen; Dieter Arlt, Cologne, and Manfred Jautelat, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 12, 1990, Ser. No. 626,493
Claims priority, application Fed. Rep. at Germany, Dec. 22, 1989, 3942465
Int. Cl.[5] C07C *303/00, 307/00, 309/00, 311/00*
U.S. Cl. 558—44 **2 Claims**

1. 1. Sulfonate isocyanates of the formula



I

wherein

X represents a branched or unbranched alkylene group having 1–18 C atoms, a cycloalkylene group having 5–14 C atoms or an arylene radical having 6–20 C atoms, each of which can optionally be substituted by C_1–C_4-alkyl, $COOR^1$ or OR^2, wherein R^1 and R^2 independently of one another represent a C_1–C_4-alkyl radical,

n represents an integer from 1 to 3 and

A represents an alkyl group having 1–18 C atoms, a cycloalkyl group having 5–14 C atoms, an aryl radical having 6–20 C atoms or an aralkyl group having 7–16 C atoms, each of which can optionally be substituted by a carboxamido, alkoxy, cyano or carboxylic acid ester group.

5,110,976

INSECTICIDAL COMPOSITION COMPRISING MORE THAN ONE ACTIVE INGREDIENT

Gyorgy Hidasi, Budapest; Istvan Szekely, Dunakeszi; Bela Bertok; Sandor Zoltan, both of Budapest; Lajos Nagy, Szentendre; Antal Gajari, Budapest; Eva Somfai, Budapest; Agnes Hegedüs, Budapest; Laszlo Pap, Budapest; Rudolf Soos, Budapest; Erzsebet Radvany, Budapest; Sandor Botar, Budapest, and Tamas Szabolcsi, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 367,546, Jun. 16, 1989, Pat. No. 5,013,754, which is a division of Ser. No. 916,546, Oct. 15, 1986, Pat. No. 4,845,126. This application May 7, 1991, Ser. No. 696,580

Claims priority, application Hungary, Jan. 16, 1985, 158/85; Jan. 8, 1986, 74/86

Int. Cl.[5] **C07C** *253/34, 255/39*

U.S. Cl. 558—407 **6 Claims**

1. A process for preparing a synergistic, crystalline product consisting of solely enantiomer pair 1RCisS and 1SCisR and enantiomer pair 1RTransS and 1STransR cypermethrin in a 3:7 to 5:5 crystalline mixture, which comprises the steps of:

(a) epimerizing an oily melt or a saturated solution of enantiomer pair 1RCisS and 1SCisR and enantiomer pair 1RTransS and 1STransR in a ratio other than 3:7 to 5:5, or a mixture of enantiomer pair 1RCisS and 1SCisR, enantiomer pair 1RTransS and 1STransR together with enantiomer pair 1RCisR and 1SCisS and enantiomer pair 1RTransR and 1STransS, said saturated solution including a protic or apolar, aprotic inert organic solvent by treating said oily melt or saturated solution with an organic or inorganic base at a temperature of −15° C. to 30° C. to precipitate crystals consisting solely of the 1RCisS and 1SCisR and the 1RTransS and 1STransR enantiomer pairs in a 3:7 to 5:5 weight ratio;

(b) isolating the precipitated crystals consisting solely of the enantiomer pairs 1RCisS and 1SCisR and 1RTransS and 1STransR at −10° to 30° C., optionally after inoculating the reaction mixture with a seeding crystal consisting of a mixture of the enantiomer pairs 1RCisS and 1SCisR and 1RTransS and 1STransR at a weight ratio of 3:7 to 5:5 before crystallization; and

(c) repeating any of the above steps, if necessary.

5,110,977

ESTER-CONTAINING QUATERNARY AMMONIUM SALTS AS ADHESION IMPROVING TONER CHARGE AGENTS

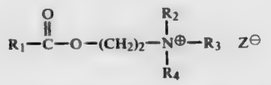
John C. Wilson; Lawrence P. DeMejo, both of Rochester, and Alexandra Bermel, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 14, 1990, Ser. No. 479,774

Int. Cl.[5] **C07C** *69/75, 69/76;* **G03G** *9/06, 9/08*

U.S. Cl. 560—1 **1 Claim**

1. A quaternary ammonium salt of the formula:



wherein R_1 is cyclohexyl or phenyl, R_2 and R_3 are methyl, R_4 is benzyl and $Z^{\ominus}$ is m-nitrobenzenesulfonate.

5,110,978

PROCESS FOR THE PREPARATION OF PHENOLIC THIOCARBOXYLIC ACID ESTERS

Werner Stegmann, Liestal, and Reto Luisoli, Hölstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 554,953, Jul. 17, 1990, abandoned, which is a continuation of Ser. No. 283,102, Dec. 12, 1988, abandoned. This application Dec. 21, 1990, Ser. No. 632,585

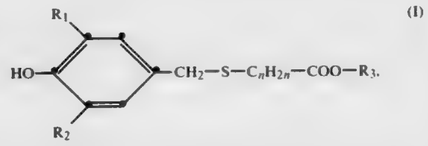
Claims priority, application Switzerland, Dec. 22, 1987, 4987/87

The portion of the term of this patent subsequent to Nov. 19, 2003, has been disclaimed.

Int. Cl.[5] **C07C** *319/12*

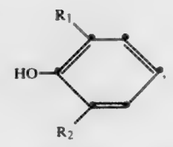
U.S. Cl. 560—15 **10 Claims**

1. A process for the preparation of a compound of formula I



(I)

wherein R_1 and R_2 are each independently of the other C_1–C_4alkyl, R_3 is C_1–C_{20}alkyl or C_2–C_{20}alkyl which is interrupted by —O— or —S—, and n is 1 or 2, by reacting a phenol of formula II



(II)

with formaldehyde or a compound that releases formaldehyde under the reaction conditions, and with a thiol of formula III

$$HS-C_nH_{2n}-COO-R_3 \quad \text{(III)}$$

wherein R_1, R_2, R_3 and n are as defined above, in the presence of a base, which process comprises carrying out the reaction under excess pressure and in the presence of mono- or dimethylamine or mono- or diethylamine as base.

5,110,979

TRISUBSTITUTED BENZOIC ACID INTERMEDIATES

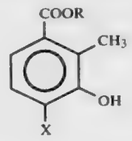
Nhan H. Nguyen, Hercules, Calif., assignor to Imperial Chemical Industries PLC, London, United Kingdom

Filed Jan. 15, 1991, Ser. No. 641,206

Int. Cl.[5] **C07C** *69/78*

U.S. Cl. 560—61 **4 Claims**

1. A compound having the structural formula



wherein R is C_1–C_4 alkyl and X is halogen.

5,110,980

SEPARATION OF POLY-β-HYDROXYALKANOIC ACID FROM MICROBIAL BIOMASS

Bruce A. Ramsay; Juliana Ramsay, both of Dollard des Ormeaux, Canada; Eric Berger, Auberives S/Varéze, France; Claude Chavarie, Montreal, Canada, and Gerhart Braunegg, Graz, Austria, assignors to Ecole Polytechnique, Montreal, Canada

Filed Sep. 20, 1989, Ser. No. 409,758

Claims priority, application Canada, Apr. 6, 1989, 595881

Int. Cl.[5] **C07L** *69/66*

U.S. Cl. 560—185 **16 Claims**

1. In a process for the separation of poly-β-hydroxyalkanoic acid (PHA) of high molecular weight from a bacterial, PHA-producing biomass, with said high molecular weight being equal to or at least 50% of the original molecular weight of said PHA produced in said biomass, said process comprising the steps of adding a given amount of said biomass to a hypochlorite solution at a pH of 9 to 13.5, allowing said hypochlorite solution to digest said biomass for a given period of time, and recovering the non-digested PHA that remains in suspension from said hypochlorite solution, the improvement consisting of:

a) fixing a predetermined actual percentage of purity for the PHA to be recovered; and

b) then carrying out a sequence of steps selected from the group consisting of

(i) determining the actual percentage of purity as a function of time while said biomass is subject to digestion, and separating the non-digested biomass as soon as said predetermined percentage of desired purity is achieved, and

(ii) selecting the ratio of the initial hypochlorite concentration in said solution to the concentration of biomass added to said solution such that the dissolving capacity of said hypochlorite solution is exhausted when said predetermined percentage of desired purity is achieved

whereby, in both (i) and (ii), little further degration of said PHA molecular weight occurs.

5,110,981

PROCESS FOR MAKING ALKYL NAPHTHALENE SULFONATE SURFACTANTS

Norman Milstein, Montgomery, Ohio, assignor to Henkel Corporation, Ambler, Pa.

Filed Jun. 18, 1991, Ser. No. 717,131

Int. Cl.[5] **C07C** *61/00*

U.S. Cl. 562—90 **20 Claims**

1. A process for making surfactant material, said process comprising steps of:

(A) mixing a specified mass of liquid naphthalene with a first incremental mass of liquid acid selected from the group consisting of sulfuric acid and oleum, said first incremental mass being not more than a specified first proper fraction of the amount sufficient to sulfonate the specified mass of naphthalene with one sulfonate group per naphthalene molecule;

(B) mixing with the mixture formed in step (A) a second incremental mass of alkylating alcohols, said second incremental mass being not more than a specified second proper fraction of the amount sufficient to alkylate the specified mass of naphthalene with one alkyl group per naphthalene molecule and also being small enough that the concentration of gaseous hydrocarbon formed by dehydration of the alkylating alcohols to olefin during mixing does not exceed about 100 ppm in the gas phase above the reaction mixture;

(C) mixing with the mixture formed in the previous step a third incremental mass of liquid acid selected from the group consisting of sulfuric acid and oleum, said third incremental mass being not more than a specified third proper fraction of the amount sufficient to sulfonate the specified mass of naphthalene with one sulfonate group per naphthalene molecule;

(D) mixing with the mixture formed in the previous step a fourth incremental mass of alkylating alcohols, said fourth incremental mass being not more than a specified fourth proper fraction of the amount sufficient to alkylate the specified mass of naphthalene with one alkyl group per naphthalene molecule and also being small enough that the concentration of gaseous hydrocarbon formed by dehydration of the alkylating alcohols to olefin during the mixing does not exceed about 100 ppm in the gas phase over the reaction mixture;

(E) repeating steps (C) and (D) sufficiently many times that when mixing is discontinued after the last repetition of step (D), the resulting liquid mixture spontaneously separates into two liquid phases, the second, denser, aqueous one of said phases being more concentrated in sulfuric acid than the other phase and the other, first, organic one of said phases being more concentrated in total organic materials than the aqueous second phase; the total amount of liquid acid used in all of steps (A)–(D) and all repetitions of steps (C) and (D) being less than the amount required to sulfonate the specified mass of naphthalene with at least one sulfonate group per naphthalene molecule;

(F) separating the organic phase recited in part (E) from the aqueous phase recited therein;

(G) mixing with the organic phase separated in part (E) a fifth incremental mass of liquid acid selected from the group consisting of sulfuric acid and oleum, said fifth incremental mass being not more than a specified fifth proper fraction of the amount sufficient to sulfonate the specified mass of naphthalene with at least one sulfonate group per naphthalene molecule;

(H) if the total amount of alkylating alcohols mixed with the specified mass of naphthalene by the completion of the previous step is not sufficient to alkylate all the specified mass of naphthalene with at least one alkyl group per molecule of naphthalene, mixing with the mixture formed in the previous step a sixth incremental mass of alkylating alcohols, said sixth incremental mass being not more than a specified sixth proper fraction of the amount sufficient to alkylate the specified mass of naphthalene with one alkyl group per naphthalene molecule and also being small enough that the concentration of gaseous hydrocarbon formed by dehydration of the alkylating alcohols to olefin during the mixing does not exceed about 100 ppm in the gas phase over the reaction mixture;

(I) discontinuing agitation of the reaction mixture, so that the mixture can separate into two or more liquid phases if its contents would exist in the form of two or more liquid phases at equilibrium, and separating the resulting liquid phase that is most concentrated in organic material from the other liquid phases present if any; and

(J) dissolving the liquid phase that is most concentrated in organic material from step (I) in water and neutralizing the resulting solution with a strong alkali.

5,110,982

PROCESS FOR PRODUCING 2,6-NAPTHALENE DICARBOXYLIC ACID

Toru Tanaka, and Masato Inari, both of Okayama, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jan. 25, 1991, Ser. No. 645,798

Claims priority, application Japan, Jan. 26, 1990, 2-17110; Feb. 6, 1990, 2-25074; Feb. 15, 1990, 2-32416

Int. Cl.[5] **C07C** *51/265*

U.S. Cl. 562—414 **6 Claims**

1. A process for producing 2,6-naphthalene dicarboxylic acid which comprises oxidizing a 2-alkyl-6-acyl naphthalene with molecular oxygen-containing gas in the presence of a catalyst containing cobalt, manganese and bromine in an acetic

acid solvent, characterized in that the oxygen concentration in the exhaust gas is controlled so as to satisfy the following equation:

$$15/(X+7.5)+0.1 \leqq Y \leqq 90/(X+8)+0.4 \quad (I)$$

wherein Y is oxygen concentration, volume %, in the exhaust gas and X, cm, is a distance between the inlet for an oxygen gas and the surface of the reaction solution in a static state.

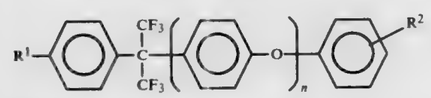
5,110,983

HEXAFLUOROISOPROPYL-CONTAINING MONOMERS, PROCESS FOR THEIR PREPARATION AND THEIR USE

Jürgen Lau; Günter Siegemund, both of Hofheim am Taunus, and Freimund Röhrscheid, Kelkheim/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1990, Ser. No. 497,553
Int. Cl.[5] C07C *205/59*
U.S. Cl. 562—435 **1 Claim**

1. A compound of the formula I



(I)

in which n is zero or 1, and, if
n=zero, then
R^1 is $-CH_3$ and
R^2 is —OH in the para-position, and if
n=1, then
R^1 is $-CH_3$, —COOH, —COCl, $-CONH_2$ or $-NH_2$ and
R^2 is $-CH_3$, —COOH, —COCl, $-CONH_2$, $-NH_2$ or $-NO_2$ in the meta- or para-position.

5,110,984

PROCESS FOR INCREASING THE YIELD OF PURIFIED ISOPHTHALIC ACID AND REDUCING WASTE-WATER TREATMENT A

Rose M. Janulis, Downers Grove, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Nov. 6, 1990, Ser. No. 610,147
Int. Cl.[5] C07C *51/487, 51/43*
U.S. Cl. 562—487 **9 Claims**

5. An improved method of purification of isophthalic acid comprising:
(a) dissolving crude isophthalic acid in a feed solution comprising a polar solvent at a temperature of from about 100° C. to about 300° C.;
(b) passing the hot feed solution containing isophthalic acid at a pressure sufficient to maintain the solution substantially in the liquid phase, through a particulate catalyst bed in the presence of hydrogen, the catalyst bed comprising at least one Group VIII noble metal-containing component selected from the group consisting of palladium-, platinum-, rhodium-, ruthenium-, osmium-, iridium-containing components and mixtures thereof supported on active carbon carrier particles;
(c) cooling the solution to a temperature of from about 35° C. to about 120° C. to effect separation of the resulting purified isophthalic acid from the solution by crystallization;
(d) recovering and drying the crystallized, purified isophthalic acid; and
(e) recycling about 20 percent to about 60 percent of the solution remaining after the recovery of the isophthalic acid crystals back to the feed solution.

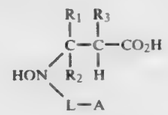
5,110,985

PROCESS FOR PREPARING CARBOXYALKYL-SUBSTITUTED HYDROXYLAMINE

Hiroshi Hayakawa, and Kiyoshi Morimoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

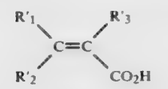
Filed Nov. 9, 1990, Ser. No. 612,022
Claims priority, application Japan, Nov. 13, 1989, 1-294342
Int. Cl.[5] C07C *229/00*
U.S. Cl. 562—571 **9 Claims**

1. A process for preparing a carboxyalkyl-substituted hydroxylamine represented by formula (I):



(I)

where L represents an alkylene group; A represents a hydrogen atom, a sulfo group, a carboxy group, a phosphono group, a trialkylammonio group, a hydroxy group, an amino group, an acyl group, a carbamoyl group, a sulfamoyl group, an alkoxycarbonyl group, or a cyano group; and R_1, R_2, and R_3, which may be the same or different, each represent a hydrogen atom, an alkyl group, or an aryl group; said process comprising the step of, reacting an α,β-unsaturated carboxylic acid represented by formula (II) as an alkylating agent:



(II)

where R'_1, R'_2, and R'_3, which may be the same or different, each represent the same group as defined for R_1, R_2, and R_3, with a hydroxylamine of the formula HO—NH—R″, where R″ represents a hydrogen atom or an alkyl group which may be substituted with a sulfo group, a carboxy group, a phosphono group, a trialkylammonio group, a hydroxy group, an amino group, an acyl group, a carbamoyl group, a sulfamoyl group, an alkoxycarbonyl group, or a cyano group, in the presence of a solvent comprising:
(a): (i) an organic polar solvent alone or
(ii) a solvent mixture of water and an organic polar solvent
when A is a sulfo group, a phosphono group, a carboxy group, or a trialkylammonio group; or
(b): (i) water alone,
(ii) an organic polar solvent alone, or
(iii) a solvent mixture of water with an organic polar solvent
when A is a hydrogen atom, a hydroxy group, an amino group, an acyl group, a carbamoyl group, a sulfamoyl group, an alkoxycarbonyl group, or a cyano group, wherein the α,β-unsaturated carboxylic acid has been neutralized by a base in the amount 0.3 to 1 mole per mole of the α,β-unsaturated carboxylic acid.

5,110,986

SYNTHESIS OF N-T-ALKYL-1,2-DIACYLHYDRAZINES

Martha J. Kelly, Norristown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 26, 1988, Ser. No. 186,328
Int. Cl.[5] C07C *241/02*; C07D *409/12, 407/12, 405/12*
U.S. Cl. 564—149 **23 Claims**

1. A process for preparing a N-t-alkyl-1,2-diacylhydrazine comprising reacting a 1,3,4-oxadiazole with a tertiary alkyl cation precursor in the presence of a strong acid catalyst;said acid catalyst being substantially free of the corresponding acid anhydride.

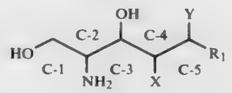
5,110,987

METHOD OF PREPARING SPHINGOSINE DERIVATIVES

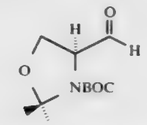
Dennis Liotta, and Alfred H. Merrill, both of Stone Mountain, Ga., assignors to Emory University, Atlanta, Ga.

Filed Jun. 17, 1988, Ser. No. 208,390
Int. Cl.[5] C07C *209/54*
U.S. Cl. 564—303 **46 Claims**

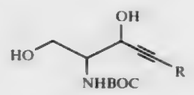
1. A method of preparing a threo-isomer of a derivative of sphingosine, wherein said derivative of sphingosine comprises the formula:



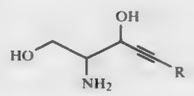
wherein X and Y are selected from the group consisting essentially of hydrogen, hydroxyl, alkoxy, amino, alkylamino and dialkylamino and wherein R_1 is selected from the group consisting essentially of hydrogen, alkyl and aryl, comprising the steps of:
a) adding acetylide anions to an aldehyde or a derivative of said aldehyde that is capable of forming said derivative of sphingosine in substantially the same manner as said aldehyde to form an erythro-isomer of propargyl alcohol, said aldehyde having the formula:



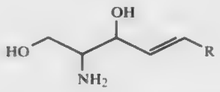
b) inverting said propargyl alcohol by S_N2 inversion to form a threo-isomer of propargyl alcohol;
c) acidifying said threo-isomer to form a diol having the formula:



wherein R is selected from the group consisting essentially of hydrogen, alkyl and aryl;
d) cleaving said diol to form an amine having the formula:



e) reducing said amine to form an alkene having the formula:



and
f) adding a functional group selected from the group consisting of hydrogen, hydroxyl, alkoxy, amino, alkylamino, and dialkylamino to the 4 and 5 position of said alkene to form said threo-isomer of a derivative of sphingosine.

5,110,988

NONLINEAR OPTICAL MATERIAL

Seizo Miyata, 18-26, Shimohoya-3-chome, Hoya-shi; Takeshi Hosomi, Yokohama; Toshio Suzuki, Chigasaki; Toshiyuki Watanabe, Higashikurume; Hironobu Yamamoto, and Akio Hayashi, both of Koganei, all of Japan, assignors to Sumitomo Bakelite Company Limited; Seizo Miyata; Naoya Miyata and Research Development Corporation of Japan, all of Tokyo, Japan

Filed Jun. 29, 1989, Ser. No. 373,131
Claims priority, application Japan, Aug. 23, 1988, 63-208589; Sep. 2, 1988, 63-219669; Nov. 30, 1988, 63-303712; Nov. 30, 1988, 63-303713; Mar. 20, 1989, 1-68721
Int. Cl.[5] C07C *211/48*
U.S. Cl. 564—441 **2 Claims**

1. A noncentrosymmetric molecular crystal of N-methoxymethyl-4-nitroniline forming a hexa- to tetradecahedron, which belongs to orthorhombic space group $p2_12_12_1$, and having plane (110) or plane (120) or a combination thereof, and which has a side of at least 0.25 mm.

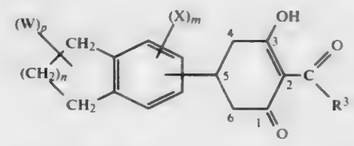
5,110,989

HERBICIDAL COMPOUNDS AND COMPOSITIONS

Alexander Serban, Doncaster; Keith G. Watson, Box Hill North; Graham J. Bird, North Melbourne; Graeme J. Farquharson, Reservoir, and Linsay E. Cross, Maribyrnong, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Division of Ser. No. 461,003, Jan. 26, 1983, Pat. No. 4,952,722.
This application Jul. 17, 1990, Ser. No. 553,413
Claims priority, application Australia, Feb. 12, 1982, PF2693; Jul. 2, 1982, PF4686
Int. Cl.[5] C07C *49/115*
U.S. Cl. 568—327 **2 Claims**

1. A compound of formula XIII



wherein
W, which may be the same or different, are selected from the group consisting of C_1 to C_6 alkyl, C_2 to C_6 alkenyl and C_2 to C_6 alkynyl;
X, which may be the same or different, are selected from the group consisting of: halogen; nitro; cyano; C_1 alkyl; C_1 to C_6 alkyl substituted with a substituent selected from the group consisting of halogen, nitro, hydroxy, C_1 to C_6 alkoxy and C_1 to C_6 alkylthio; C_2 to C_6 alkenyl; C_2 to C_6 alkynyl; hydroxy; C_1 to C_6 alkoxy; C_1 to C_6 alkoxy substituted with a substituent selected from halogen and C_1 to C_6 alkoxy; C_2 to C_6 alkenyloxy; C_2 to C_6 alkynyloxy; C_2 to C_6 alkanoyloxy; (C_1 to C_6 alkoxy)-carbonyl; C_1 to C_6 alkylthio; C_1 to C_6 alkylsulfinyl; C_1 to C_6 alkylsulfonyl; sulfamoyl; N-(C_1 to C_6 alkyl)-sulfamoyl; N,N-di(C_1 to C_6 alkyl)sulfamoyl; benzyloxy; substituted benzyloxy wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, nitro, C_1 to C_6 alkyl, C_1 to C_6 alkoxy and C_1 to C_6 haloalkyl; the group NR^8R^9 wherein R^8 and R^9 are independently selected from the group consisting of hydrogen; C_1 to C_6 alkyl, C_2 to C_6 alkanoyl, benzoyl and benzyl; the groups formyl and C_2 to C_6 alkanoyl and the oxime, imine and Schiff base derivatives thereof; and the group $-(CH_2)_g-$ which bridges two adjacent carbon atoms of the benzene ring and wherein q is an integer selected from 2 to 5;
R^3 is selected from the group consisting of: C_1 to C_6 alkyl;

C_1 to C_6 fluoroalkyl; C_2 to C_6 alkenyl; C_2 to C_6 alkynyl; and phenyl;
p is zero or an integer selected from 1 to 4;
n is zero or an integer selected from 1 to 3;
m is zero or an integer selected from 1 to 3.

5,110,990
PROCESS FOR RECOVERY OF PHOSPHORUS LIGAND FROM VAPORIZED ALDEHYDE

Michael A. Blessing, Sissonville, W. Va.; Gregory J. Dembowski, League City, Tex., and Gregory K. Finnell, Charleston, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 595,408, Mar. 30, 1984, abandoned. This application Jun. 22, 1989, Ser. No. 370,126
Int. Cl.[5] C07C *45/00*
U.S. Cl. 568—492 **13 Claims**

1. In a liquid recycle rhodium catalyzed hydroformylation process for producing aldehydes, wherein an olefinic compound, carbon monoxide and hydrogen are reacted in the presence of a solubilized rhodium-phosphorus complex catalyst, free phosphorus ligand and higher boiling aldehyde condensation by-products to produce an aldehyde product and wherein said aldehyde is separated and recovered from a liquid reaction aldehyde product solution containing aldehyde product, solubilized rhodium-phosphorus complex catalyst, free phosphorus ligand and higher boiling aldehyde condensation by-products that has been removed from the hydroformylation reactor, by vaporizing the aldehyde product contained in said solution to obtain a vaporized aldehyde product stream consisting essentially of aldehyde product, vaporized phosphorus ligand and vaporized higher boiling aldehyde condensation by-products which is disengaged in a separator from the remaining non-volatilized catalyst containing liquid reaction product solution that is recovered from the bottom of the separator and recycled back to the reaction system, the improvement which comprises (a) selectively separating the phosphorus ligand contained in said vaporized aldehyde product stream by thoroughly contacting said stream with a spray of dispersed liquid having a lower boiling point than said higher boiling aldehyde condensation by-products so as to condense the vaporized phosphorus ligand and vaporized higher boiling aldehyde condensation by-products contained in said volatilized aldehyde product stream, and (b) recovering the condensed phosphorus ligand and condensed higher boiling aldehyde condensation by-products so obtained from said volatilized aldehyde product stream, said dispersed liquid being employed in the form of droplets and in an amount such that the percent of phosphorus ligand so separated and recovered is at least 1.2 times higher than the percent of higher boiling aldehyde condensation by-products also so separated and recovered and wherein the amount ratio of dispersed liquid employed per flow rate of volatilized aldehyde product stream is about 5 to 60 pounds per hour of dispersed liquid per 1000 pounds per hour of volatilized aldehyde product stream.

5,110,991
HETEROGENEOUS CATALYST FOR ALKOXYLATION OF ALCOHOLS

Donald H. Champion, Pflugerville, and George P. Speranza, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Apr. 1, 1991, Ser. No. 677,934
Int. Cl.[5] C07C *43/18*
U.S. Cl. 568—618 **14 Claims**

1. A method for producing polyether alcohols which comprises reacting an alcohol of the formula ROH where R is C_1–C_{22} alkyl and an epoxide over a heterogeneous catalyst which consists of a fluoride of Group I of the Periodic Table supported on alumina at a temperature of about 70–150° and a pressure of atmospheric to 1500 psig.

5,110,992
PROCESS FOR THE PREPARATION OF GLYCOL ETHERS

Martin P. Atkins, Sunbury-on-Thames; William Jones, Cambridge, and Malama Chibwe, Romford, all of England, assignors to The British Petroleum Co., p.l.c., London, England

Filed Sep. 24, 1990, Ser. No. 586,826
Claims priority, application United Kingdom, Oct. 4, 1989, 8922358.0
Int. Cl.[5] C07C *43/03, 43/10*
U.S. Cl. 568—618 **9 Claims**

1. A process for the preparation of a glycol ether by reacting an olefin oxide with an excess of an alcohol over a catalyst; characterized in that the catalyst comprises a material which has been prepared by calcination of an anionic double hydroxide clay having a structure comprising magnesium and aluminum in combination, following by rehydration and subsequent recalcination.

5,110,993
9,9-BIS(3,5-DIPHENYL-4-HYDROXYPHENYL)FLUORENE AND POLY(ARYLENE ETHERS) THEREFROM

Allan S. Hay, 5015 Glencairn Avenue, Montreal, Quebec H3W 2B3, and Zhi Y. Wang, 3600 Parc Ave., Apt. A 1803, Montreal, Quebec H2X 3R2, both of Canada

Filed Feb. 8, 1991, Ser. No. 653,079
Int. Cl.[5] C07C *39/17*
U.S. Cl. 568—721 **1 Claim**

1. 9,9-Bis(3,5-diphenyl-4-hydroxyphenyl)fluorene.

5,110,994
PROCESS FOR SYNTHESIZING 9,9-BIS-(HYDROXYPHENYL)FLUORENE

Peter Fialla, Maria Enzersdorf, Austria, assignor to ISONOVA Technische Innovationen Ges.m.b.H., Austria

PCT No. PCT/AT90/00031, § 371 Date Dec. 10, 1990, § 102(e) Date Dec. 10, 1990, PCT Pub. No. WO90/12776, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 17, 1990, Ser. No. 613,668
Claims priority, application Austria, Apr. 17, 1989, 901/89
Int. Cl.[5] C07C *39/12, 37/20*
U.S. Cl. 568—727 **6 Claims**

1. A process for preparing 9,9-bis(4-hydroxyphenyl)fluorene by reacting fluorenone with excess phenol in a condensation reaction using hydrochloric acid gas as the condensing agent and aluminum trichloride as the catalyst, comprising preparing a liquid catalyst by dissolving aluminum trichloride in an anhydrous organic solvent or mixture of solvents which are substantially inert relative to the condensation reaction, the solvent or at least one component of the mixture of solvents being an electron donor, while simultaneously introducing hydrochloric acid gas and introducing this liquid catalyst by dripping into the reaction mixture under agitation.

5,110,995
PREPARATION OF PHENOL OR PHENOL DERIVATIVES

Alexandr S. Kharitonov; Gennadii I. Panov; Kazimira G. Ione; Vyacheslav N. Romannikov; Galina A. Sheveleva; Lidia A. Vostrikova, and Vladimir I. Sobolev, all of Novosibirsk, U.S.S.R., assignors to Institute of Catalysis, Novosibirsk, U.S.S.R.

Filed Mar. 12, 1991, Ser. No. 668,085
Int. Cl.[5] C07C *37/60, 46/06, 50/04, 39/26*
U.S. Cl. 568—800 **11 Claims**

1. A process for preparing phenol or derivatives thereof comprising oxidation of the aromatic nucleus of benzene or derivatives thereof with nitrous oxide at a temperature within the range of 275° C. to 450° C., in the presence of a zeolite catalyst of the composition: $y.El_2O_n.x.Fe_2O_3.SiO_2$, wherein $y=0-6.5.\ 10^{-2}$, $x=1.5.10^{-5}-2.10^{-2}$, El at least one element of Periods 2, 3, 4 and 5 of the periodic system; n is valence of the element El and at a time of contact of the reaction mixture with the catalyst of not more than 8 seconds.

5,110,996
PRODUCTION OF VINYLIDENE FLUORIDE

Derek W. Edwards, Runcorn, Great Britain, assignor to Imperial Chemical Industries PLC, London, England

Filed Oct. 17, 1988, Ser. No. 259,360
Claims priority, application United Kingdom, Oct. 20, 1987, 8724561
Int. Cl.[5] C07C *17/02*
U.S. Cl. 570—159 **16 Claims**

1. Process for preparing vinylidene fluoride from the reaction of dichlorodifluoromethane with methane which process comprises passing a gaseous flow of methane and dichlorodifluoromethane through a heated reaction zone containing a non-metallic packing material which is stable at the operating temperatures of the process and which subjects the gaseous reactants to a temperature with the range 500° C. to 1200° C. and maintaining the gaseous flow so that the calculated residence time for the gaseous reactants in the reaction zone is within the range of from 0.1 to 10.0 seconds.

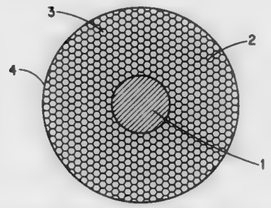
5,110,997
PROCESS FOR PREVENTING FOULING IN THE PRODUCTION OF ETHYLENE DICHLORIDE

Ghazi B. Dickakian, Kingwood, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Apr. 19, 1991, Ser. No. 688,053
Int. Cl.[5] C07C *17/38, 17/15*
U.S. Cl. 570—222 **15 Claims**

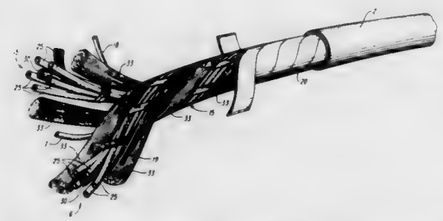
1. In a method for recovering ethylene dichloride wherein crude ethylene dichloride (EDC) feed stream from a chlorination or oxychlorination unit is distillation separated into an overhead stream of purified ethylene dichloride and a bottoms stream of crude EDC containing fouling amounts of chlorinated and/or oxygenated polymeric materials, the improvement for inhibiting fouling in the bottoms stream comprising introducing into the crude ethylene dichloride feed stream an inhibiting amount of antifoulant selected from the group consisting of
(A) the reaction product of (i) an olefin polymer of C2 to C10 mono-olefin having a molecular weight of about 300 to 5000 reacted with a C4 to C10 mono-unsaturated dicarboxylic acid or anhydride material; and (ii) a basic reactant amine;
(B) an oil-soluble magnesium alkyl aromatic sulfonate; and
(C) a blend of 10 to 90 wt % (A) and 90 to 10 wt % of (B).

5,110,998
HIGH SPEED INSULATED CONDUCTORS
Lawrence C. Muschiatti, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 476,333, Feb. 7, 1990, abandoned. This application Jan. 30, 1991, Ser. No. 647,889
Int. Cl.[5] H01B *7/02*
U.S. Cl. 174—24 **12 Claims**



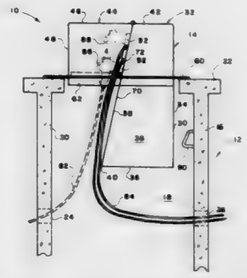
1. An electrically insulated conductor comprising an electrically conductive element surrounded by ultramicrocellular foamed polymer insulation having a void volume greater than about 75%, wherein the velocity of propagation of the insulated conductor is greater than 90% of the speed of light.

5,110,999
AUDIOPHILE CABLE TRANSFERRING POWER SUBSTANTIALLY FREE FROM PHASE DELAYS
Todd Barbera, 116 Front St., Marblehead, Mass. 01945
Filed Dec. 4, 1990, Ser. No. 622,003
Int. Cl.[5] H01B *7/34*
U.S. Cl. 174—36 **13 Claims**



12. A twin-axial power cable for transfer of current having uniform density free from phase delays, comprising:
first and second bundles each having a nonconductive element and at least one insulated wire strand of a predetermined gauge disposed around said nonconductive element;
said at least one insulated wire strand of each of said first and second bundles being equal to the other in total cross-sectional area, each at least one strand of said first and second bundles having a radius no greater than one half the skin depth of current travelling through the cable at 60 Hz;
a ground wire of predetermined gauge located along each of said at least one insulated wire strand of said first and second bundles;
said first and second bundles of said at least one insulated wire strand and said ground wires twisted spirally about each other along the cable length to present a generally round cross-sectional shape and to minimize electromagnetic interference and inductance;
a filler of nonconductive material located around said first and second bundles and said ground wires, said filler for pliably packing said bundles and said ground wires;
a foil shield wrapped around said twin-axial bundles, ground wires, and filler;
a non-insulated drain wire located within said surrounding foil shield and between said filler and said foil shield, said drain wire being in electrical contact with said foil shield; and
a nonconductive flexible cable jacket tightly surrounding said foil shield.

5,111,000
ENCLOSURE FOR SEMI-BURIED ELECTRICAL DISTRIBUTION APPARATUS
Claude A. Maraldo, 6254 Louis XIV St., New Orleans, La. 70043
Filed Sep. 21, 1990, Ser. No. 585,934
Int. Cl.[5] H02G *9/00;* **H02B** *5/00*
U.S. Cl. 174—38 **12 Claims**

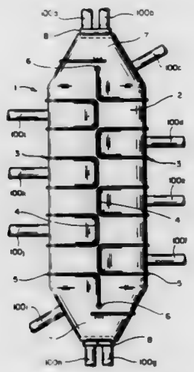


1. An enclosure for an electrical apparatus, comprising:
a subway vault having an open top and an open bottom;
a vertically oriented housing means for housing the electrical apparatus and having a lower portion extending a distance into said vault and an upper portion integrally formed with the lower portion and extending upwardly therefrom, said upper portion being positioned substantially above ground;
means for suspending said housing means on a top edge of the subway vault; and
a cover means hingedly attached to a top front edge of said upper portion and substantially enclosing that part of an upper portion front wall extending above ground.

5,111,001
SPLICE CASE
James E. Jervis, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Filed Apr. 13, 1990, Ser. No. 509,041
The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.
Int. Cl.[5] H02G *15/113*
U.S. Cl. 174—92 **18 Claims**

1. A splice case for encapsulating a plurality of cables, which comprises:
a first hollow part;
a second part that can be positioned adjacent the first part such that the first and second parts together define an enclosed space, said first and second parts having access ports for cables in the sides perpendicular to a major surface;
a sealing material having a cone penetration value from 100 to 350 (10^{-1} mm) and an ultimate elongation of at least 200%, the sealing material being within the first hollow part; and
a spring for forcing the first and second parts together thereby putting the sealing material under compression, when the spring engages the first and second parts, said spring permitting cables to be placed within the enclosure between the portions of the spring shape bearing against the sides of the case substantially perpendicular to the major surface;

the first part and/or the second part having a deformable major surface, and the spring being so shaped as to cause said major surface to be deformed towards the sealing



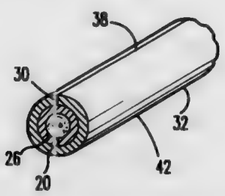
material thereby putting the sealing material under compression when the spring engages the first and second parts.

5,111,002

METHOD OF FABRICATING THERMOCOUPLE CABLE AND THE CABLE RESULTING THEREFROM

Milton B. Hollander, Stamford, Conn., assignor to Omega Engineering, Inc., Stamford, Conn.

Filed Jan. 28, 1991, Ser. No. 646,283
Int. Cl.[5] H01B *7/18*; H01C *1/03*
U.S. Cl. 174—102 P **5 Claims**



1. An improved double clad thermocouple cable comprising: two thermocouple wires; insulating material surrounding said thermocouple wires; a first outer sheath of ribbon material encasing said insulating material and said wires and having a first welded seam running longitudinally therealong; and a continuous and seamless second outer sheath encasing said first outer sheath and formed of material selected from the group comprising polytetrafluoroethylene, nylon and epoxy resins.

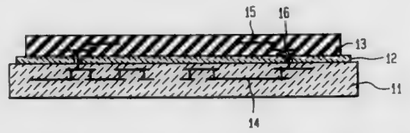
5,111,003

MULTILAYER WIRING SUBSTRATE

Kohji Kimbara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 401,115, Sep. 1, 1989, abandoned. This application Mar. 6, 1991, Ser. No. 665,938
Claims priority, application Japan, Sep. 2, 1988, 63-220869
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—255 **13 Claims**

1. A multilayer wiring substrate comprising:
a glass ceramic section;
a wiring layer section having a plurality of wiring layers electrically insulated from each other by a polymide material; and
an intermediate layer made of an inorganic material which ensures a strong adhesion between said ceramic section and said wiring layer section wherein the width and length of the intermediate layer is different from the width and length of said ceramic section and the width and



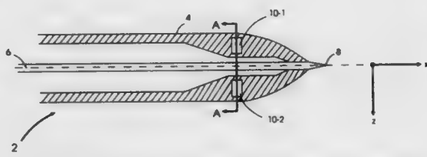
length of said wiring layer section so that no peripheral edges of said intermediate layer come into contact with any peripheral edges of said ceramic section and said wiring layer section.

5,111,004

STYLUS FOR HANDWRITING IDENTIFICATION

Larry S. Gullman, La Honda, Calif., assignor to Kumahira Safe Co., Inc., Hiroshima, Japan

Filed May 23, 1991, Ser. No. 704,761
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—18 **8 Claims**



1. A stylus for generating signals in response to tactile pressure comprising:
a shaft having a tip;
at least a first pressure-sensitive sensor embedded in said shaft at a first location at a first displacement from said tip;
at least a second pressure-sensitive sensor embedded in said shaft at a second location at said first displacement from said tip; and
at least a third pressure-sensitive sensor embedded in said shaft at a third location at said first displacement from said tip.

5,111,005

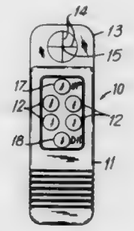
GRAPHICS TABLET WITH N-DIMENSIONAL CAPABILITY

Paul D. Smith, New Canaan; Michael J. Padula, Sandy Hook, and Robert M. McDermott, Weston, all of Conn., assignors to Summagraphics Corporation, Seymour, Conn.

Filed Oct. 4, 1990, Ser. No. 592,796
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—19 **25 Claims**

1. A graphics digitizer tablet comprising:
(a) a working surface in an X-Y plane for supporting a work diagram,
(b) means and a puck for generating when activated X-Y coordinate data representing the location of the puck relative to the working surface,

(c) first control means mounted on the puck for manipulation by a user,



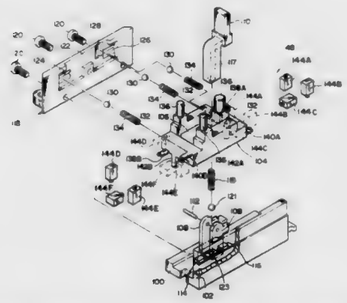
(d) means connected to the puck first control means for generating a multi-valued signal in response to manipulation by the user of the control means.

5,111,006

SWITCH DEVICE FOR POWER DRIVEN SEAT

Harumi Doke; Syozi Ishida; Hiroki Iwasa; Chikao Nagasaka; Masuyuki Ueda; Shigeru Kato; Hisashi Aoki; Makoto Shibahara, and Satoshi Mori, all of Aichi, Japan, assignors to Kabushiki Kaisha Toka-Rika-Denki-Seisakusho, Aichi, Japan

Filed May 9, 1990, Ser. No. 520,757
Claims priority, application Japan, May 16, 1989, 1-56025[U]; Nov. 30, 1989, 1-139179[U]
Int. Cl.[5] H01H *9/00*
U.S. Cl. 200—5 R **22 Claims**



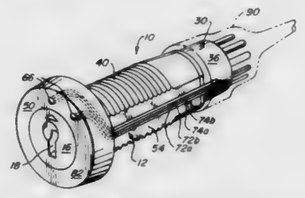
1. A switch device for power driven seat of a vehicle having a seat cushion, a seat back and power sources for moving said seat cushion and said seat back, said switch device comprising:
(a) a first control knob for controlling said seat cushion, having a three-dimensional shape which generally corresponds to and represents the shape of said seat cushion so as to enable an occupant to easily locate and correctly operate said first control knob with a hand;
(b) a second control knob for controlling said seat back, having a three-dimensional shape which generally corresponds to and represents the shape of said seat back and is capable of relatively moving with respect to said first control knob so as to enable said occupant to easily locate and correctly operate said second control knob by hand;
(c) a contact unit for supporting each of said first and second control knobs and allowing said first and second control knobs to be movable an operation of said occupant in the same directions as said occupant intends to move said seat cushion and said seat back;
(d) a connections member for supporting said second knob on said contact unit which penetrates said first control knobs;
(e) a plurality of switches accommodated in said contact unit for independently detecting the movement of each of said first and second control knobs by the operation of said occupant and actuating power sources for moving said seat cushion and said seat back in accordance with the detected movement of each of said first and second control knobs; and
(f) a slider accommodated in said contact unit supporting said first control knob to transmit the movement of said first control knob in the forward and rearward directions due to the operation of said occupant in order to enable the detection of the movement of said first control knob by at least one of said plurality of switches by detecting the movement of said slider.

5,111,007

SWITCH LOCK WITH LIGHTED POSITION INDICATOR

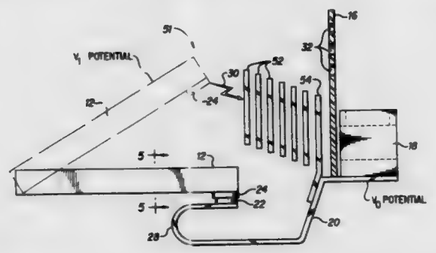
Charles D. Miller, Waukegan; Thomas J. DeCicco, Mt. Prospect, and Timothy P. Laabs, Des Plaines, all of Ill., assignors to The Eastern Company, Naugatuck, Conn.

Filed Aug. 1, 1988, Ser. No. 226,745
Int. Cl.[5] H01H *27/06, 9/16*
U.S. Cl. 200—43.08 **15 Claims**



1. In a switch lock having a forward end and a rearward end and mounted in a barrier opening, said switch lock having a lock plug rotatable between two positions and a switch rotated by the lock plug between two positions to place a primary switch pole in a selected one of two positions, a visual switch position indicator, comprising:
a secondary switch pole having two positions, said secondary switch pole being connected to a power source;
a first light indicating a first position of said switch lock, said first light having leads, one of said leads being connected to ground;
a second light indicating a second position of the switch lock, said second light having leads, one of said leads being connected to ground;
a bezel at the lock forward end, said bezel having a front surface and a rear surface and mounting the lights in openings therethrough and having its rear surface supported against the barrier;
a groove in the bezel rear surface between the light openings, wherein said light leads are secured in said groove; and
three switch terminals,
one of said terminals being connected to ground,
the second of said terminals being connected to the other lead of the first light and selectively connected to the secondary switch pole in response to rotation of the switch to complete a power circuit to illuminate the light to indicate the first position of the lock plug, and
the third of said terminals being connected to the other lead of the second light and selectively connected to the secondary switch pole in response to rotation of the switch to complete a power circuit to illuminate the light to indicate the second position of the lock plug.

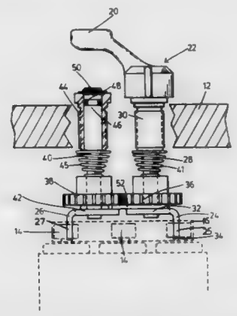
5,111,008
EFFECTIVE ARC STACK/EFFICIENT CONTACT CARRIER
Clark L. Oster, Cedar Rapids, Iowa, assignor to Square D Company, Palatine, Ill.
Filed Sep. 13, 1990, Ser. No. 581,853
Int. Cl.[5] H01H *33/10, 33/18*
U.S. Cl. 200—144 R **11 Claims**



1. An electric circuit breaker, comprising,
a housing having an interior and an exterior, said housing having a means to allow gas to pass from said interior to said exterior;
a stationary contact and a moveable contact, each of which is positioned within said interior of said housing, said moveable contact being capable of moving along a path into and out of electrical connection with said stationary contact;
a lug positioned at said exterior of said housing said lug being electrically connected to said stationary contact by a conductive path; and
an arc stack comprised of a plurality of parallel, spaced apart, metal plates, said arc stack being positioned within said interior of said housing between said stationary contact and said lug, each of said plurality of parallel, spaced apart, metal plates having length, width and thickness dimensions wherein said length and width dimensions are each larger than said thickness dimension, each of said plurality of spaced apart, metal plates being positioned with its length and width dimensions in a plane generally parallel to said path travelled by said movable contact and with its thickness dimension generally perpendicular to said path travelled by said movable contact.

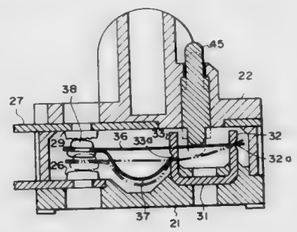
5,111,009
OPERATING MECHANISM FOR THROWING TOGGLE SWITCHES
Anthony W. P. Chan, Willowdale, and Richard M. Phillips, Whitby, both of Canada, assignors to Cooper Industries, Inc., Houston, Tex.
Filed Nov. 14, 1990, Ser. No. 612,467
Int. Cl.[5] H01H *9/20*
U.S. Cl. 200—330 **25 Claims**

1. An electrical switch comprising:
at least two toggle circuit breakers at spaced apart locations and united by a common tie bar; and
a mechanism for operating the toggle circuit breakers, and wherein the mechanism comprises:
first and second forks each adapted to engage the tie bar, the forks being cooperatively movable between at least first and second respective fork positions to move the tie bar laterally between corresponding at least first and second tie bar positions, whereby the at least two toggle circuit breakers are toggled by lateral movement of the tie bar between its at least first and second positions;
manually operable means to move the first fork; and



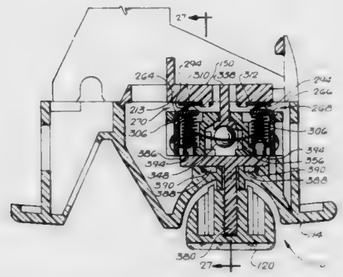
gear means associated with said first fork to gear the second fork to move synchronously with said first fork.

5,111,010
SWITCH DEVICE
Sadao Kokubu; Minoru Nishio, and Yoshitaka Hattori, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan
Filed Mar. 28, 1990, Ser. No. 500,562
Claims priority, application Japan, Mar. 31, 1989, 1-38425[U]
Int. Cl.[5] H01H *5/18*
U.S. Cl. 200—461 **23 Claims**



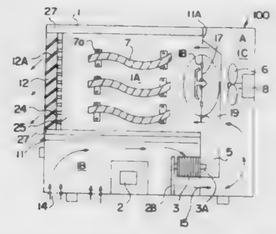
1. A switch device whose state is changed over upon a snap action, comprising:
a) a first movable member made of a leaf spring and having a slot formed in a middle portion thereof,
b) a supporting means for swingably supporting a base portion of the first movable member, having a first movable member supporting portion inserted in the slot,
c) a second movable member made of a leaf spring and fabricated separately from said first movable member, having a middle portion which has a width greater than the width of said slot, a base portion which is narrower than the slot, and a free end portion which is superposed on a free end portion of the first movable member, the base portion being swingably supported by the supporting means so that upon application of an operating force to the first movable member the second movable member flexes resiliently to cause a snap action to thereby quickly change its urging direction,
d) a movable contact secured proximate to the free end portions of the first and second movable members, respectively,
e) fixed contacts facing each other and disposed in opposite relation with the movable contact disposed between them, with which the movable contact selectively comes in contact upon the snap action of the second movable member, and
f) a coupling means which is provided in the superposed free end portions of the first and second movable members for coupling the first and second movable members together so as to prevent rotational shifting of the first and second movable members, said coupling means being located on opposite sides of said movable contact.

5,111,011
MIRROR CONTROL SLIDE SWITCH FOR AUTOMOTIVE VEHICLES
Wesley D. Roswold, Elgin, Ill., assignor to Indak Manufacturing Corp., Northbrook, Ill.
Division of Ser. No. 557,976, Jul. 26, 1990, Pat. No. 5,041,703.
This application Apr. 29, 1991, Ser. No. 692,708
Int. Cl.[5] H01H *15/24*
U.S. Cl. 200—550 **4 Claims**



1. An electrical selector switch, comprising
a casing,
an electrically insulating plate in said casing,
said plate having one side formed with an elongated guide flange projecting therefrom and extending in a longitudinal dimension along said side,
said side being generally flat,
said flange being generally T-shaped in cross section and being substantially perpendicular to said side of said plate;
first and second sets of electrically conductive fixed contacts mounted along said generally flat side of said plate on opposite sides of said flange,
an electrically insulating carriage having a longitudinal channel therein receiving and interlocking with said flange and having a cross section corresponding with the generally T-shaped cross section of said flange,
first and second electrically conductive contactors mounted on said carriage and slidably engageable with said first and second sets of fixed contacts,
and first and second spring means for biasing said first and second contactors toward and against said first and second sets of fixed contacts while biasing said carriage away from said plate,
said carriage being slidable along said flange while said contactors are selectively engageable with said first and second sets of fixed contacts.

5,111,012
ELECTRONIC MICROWAVE HEATING APPARATUS
Whoang J. Hyun, and Mun H. Jo, both of Kyungki, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed May 15, 1990, Ser. No. 523,521
Claims priority, application Rep. of Korea, May 16, 1989, 89-6342[U]; Nov. 14, 1989, 89-16768[U]
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 R **12 Claims**

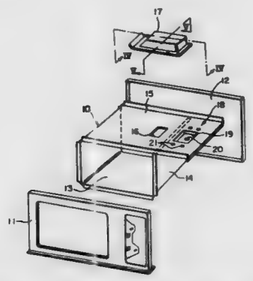


1. An electronic wave heating apparatus, comprising:
a case provided with an inner portion divided into a heat exchanging chamber, an electric and mechanical chamber and an auxiliary chamber;
high voltage means and means for generating microwaves, electrically connected to each other and mounted in said electric and mechanical chamber;
means for guiding the microwaves, mounted in said auxiliary chamber, into which an antenna of said microwave generating means is received;
means mounted at the rear of said guiding means in said auxiliary chamber, for forcedly drawing air from outside said case to cool the inner portion of said electric and mechanical chamber;
means for absorbing the microwaves and performing calorification, said absorbing means including a plurality of curved surfaces integrally connected to each other in order to widen the contacting surface with microwaves, said absorbing means being at a predetermined position; and
means mounted at the front of said heat exchanging chamber for discharging heat exchanged air from said heat exchanging chamber.

5,111,013
MICROWAVE COOKING APPARATUS HAVING A LOW WAVEGUIDE
Akira Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 21, 1990, Ser. No. 616,950
Claims priority, application Japan, Nov. 24, 1989, 1-306237
Int. Cl.[5] H05B *6/72*
U.S. Cl. 219—10.55 F **9 Claims**

1. A microwave cooking apparatus, comprising:
a magnetron device, including an antenna portion, for generating microwave energy;
an oven frame defining:
a cooking chamber including a plate for accommodating food to be cooked and a ceiling plate for covering the upper portion of said cooking chamber;
a machine chamber located adjacent to said cooking chamber, wherein a planar recessed portion drawn out of a plane of said ceiling plate and having an opening projects into said machine chamber to form a magnetron mounting part for mounting said magnetron device;
a waveguide for delivering microwave energy from said magnetron device into said cooking chamber, said waveguide being secured at the position of said ceiling plate

substantially to cover the antenna portion of said magnetron device;

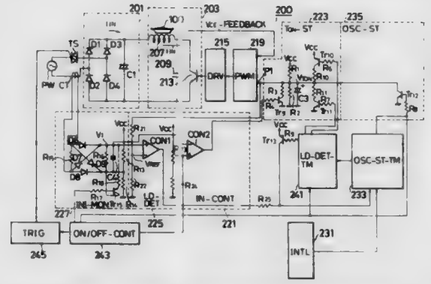


a front panel mounted on said oven frame; and
a back panel mounted on said oven frame.

5,111,014
ELECTROMAGNETIC COOKER INCLUDING LOAD CONTROL

Teruya Tanaka, and Yoshiyuki Noguchi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 9, 1989, Ser. No. 363,963
Claims priority, application Japan, Jun. 14, 1988, 63-144779; Jun. 14, 1988, 63-146530
Int. Cl.[5] H05B *6/08*
U.S. Cl. 219—10.77 **33 Claims**

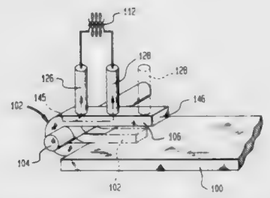


1. An electromagnetic cooking apparatus comprising:
DC (direct current) power supply means for producing DC power from low-frequency AC (alternating current) power;
DC-to-AC inverting means coupled to the DC power supply means and including a switching element and a heating coil, for inverting the DC power inputted from the DC power supply means into high-frequency AC power so as to heat an article by energizing the heating coil with the high-frequency AC power, thereby electromagnetically inducing eddy currents within the article;
monitoring means for monitoring the DC power inputted into the DC/AC inverting means so as to produce a DC input power signal;
setting means coupled to the DC/AC inverting means, for setting an ON-time duration of the switching element; and,
judging means for judging whether or not the article to be heated corresponds to a heatable load electromagnetically loaded on the heating coil in response to the DC input power signal produced from the monitoring means after a predetermined time duration has passed from a beginning of the ON-time duration, thereby controlling the inverting operation of the DC/AC inverting means.

5,111,015
APPARATUS AND METHOD FOR FUSING WIRE

Edward D. Riordan, South Somerville, N.J., assignor to Joyal Products, Inc., Linden, N.J.

Filed Mar. 14, 1991, Ser. No. 669,048
Int. Cl.[5] B23K *11/16*
U.S. Cl. 219—56.22 **16 Claims**



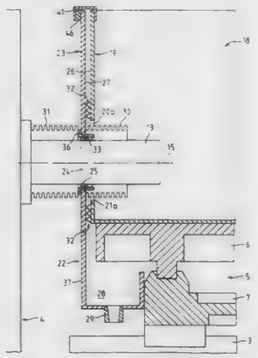
1. A fusing method of forming a fused joint between an armature wire having electrical insulation thereon and a terminal extending from a commutator bar, said method comprising positioning an armature wire against one surface of said terminal, moving a pair of spaced apart heating electrodes against another surface of said terminal to form a current path between said electrodes through a portion of said terminal extending therebetween, one of said electrodes constructed from a material having a high electrical resistance which is substantially the same or greater than the electrical resistance of another of said electrodes, said electrode constructed from a material having a high electrical resistance positioned at least proximately overlying a portion of said armature wire and, supplying electrical current between said electrodes and through said portion of said terminal extending therebetween to heat said terminal sufficient to remove said electrical insulation from said armature wire in contact with said terminal and to fuse said armature wire thereto.

5,111,016
MACHINE FOR SPARK EROSION CUTTING WITH A GUIDE-ARM CROSSING THE BACK WALL OF THE WORKING LIQUID CONTAINER

Attilio Lodetti, Losone, and Brenno Medici, Peccia, both of Switzerland, assignors to Agie AG fur industrielle Elektronik, Losone, Switzerland

Filed Jun. 3, 1991, Ser. No. 710,029
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1990, 4019662
Int. Cl.[5] B23H *7/02*
U.S. Cl. 219—69.12 **10 Claims**

1. A machine for spark erosion cutting of a workpiece (1) clamped onto a compound rest table (5) of the machine in a working zone (9) thereof, by means of a wire-shaped or ribbon-shaped tool electrode (2) running tensioned between an upper and a lower electrode guide (10, 11),
the machine being provided with a container (18) for a working liquid that surrounds at least the working zone (9) of the workpiece (1),
the lower electrode guide (11) being supported on a stand (4) of the machine by means of an elongated guide-arm (13) with a horizontal longitudinal axis (15),
the compound rest table (5) being provided with two slides (6, 7) lying crosswise on top of one another for sliding the workpiece (1) in relation to the stand (4) as desired parallel to the longitudinal axis (15) of the guide-arm (13) and in the horizontal direction orthogonal thereto,
the container (18) having an essentially flat, vertical back wall (19) facing the stand (4) and having an opening (20*a*, 20*b*) confined by a rim (21*a*, 21*b*), the guide-arm (13) crossing this back wall (19) of the container (18) at the location of the opening (20*a*, 20*b*) in the direction of its longitudinal axis (15) at a right angle,
the rim (21*a*, 21*b*) of the opening (20*a*, 20*b*) of the back wall (19) enclosing the guide-arm (13) and being spaced therefrom,
the container (18) being provided with an essentially plate-shaped closing piece (22) that is parallel to the back wall (19), slidable on it and permanently covering the opening (20*a*, 20*b*) of the back wall (19),
the closing piece (22) having another opening (24) confined by another rim (25),
this other rim (25) of the other opening (24) provided in the closing piece (22) enclosing the guide-arm (13) in such manner that it can be slid in the direction of the longitudinal axis (15) of the guide-arm (13),
first sealing means (32) being provided for establishing a slidable sealing between the closing piece (22) and the back wall (19),



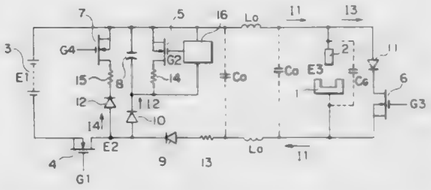
second sealing means (30, 31; 33) being provided for establishing a slidable sealing between the guide-arm (13) and the closing piece (22), and
the uppermost of the two slides (6) being rigidly con nected with a chucking fixture (8) for the workpiece (1) and with the back wall (19) of the container (18),
characterized in that
the closing piece (22) is arranged outside of the container (18) on a side (26) of the back wall (19) facing the stand (4),
the lower of the two slides (7) is connected rigidly with the closing piece (22) and in relation to the stand (4) can only be moved parallel to the longitudinal axis (15) of the guide-arm (13), and
in relation to the lower slide (7) the upper slide (6) can only be moved at a right angle to the longitudinal axis (15) of the guide-arm (13).

5,111,017
POWER SUPPLY CIRCUIT FOR DISCHARGE MACHINING

Shoji Futamura, Kawasaki, and Masaki Kurihara, Yokohama, both of Japan, assignors to Electrical Discharge Work's, Kanagawa, Japan

Filed Aug. 7, 1990, Ser. No. 564,053
Claims priority, application Japan, Aug. 16, 1989, 1-211076
Int. Cl.[5] B23H *1/02*
U.S. Cl. 219—69.18 **5 Claims**

1. A power supply circuit for discharge machining comprising a discharge machining electrode and a workpiece defining a discharge gap, a first switching means for supplying a d-c power voltage to the discharge gap between the discharge machining electrode and the workpiece, a first energy consumption circuit having a second switching means provided on an output side of said first switching means, and a second energy consumption circuit having a third switching means provided in parallel with said discharge gap, said second

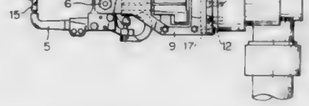


switching means of said first energy consumption circuit and said third switching means of said second energy consumption circuit are caused to conduct after said first switching means is turned off.

5,111,018
CONNECTION MEMBER IN A WELDING GUN FOR ROBOT

Toshihiro Nishiwaki; Shigeru Umeda, and Tsuyoshi Takatori, all of Tokyo, Japan, assignors to Obara Corporation, Tokyo, Japan

Filed Mar. 22, 1991, Ser. No. 674,553
Claims priority, application Japan, May 9, 1990, 2-47709[U]
Int. Cl.[5] B23K *11/10*
U.S. Cl. 219—86.25 **8 Claims**



1. A welding gun assembly, comprising:
a hollow frame means including a pair of generally opposed elongate side plates which extend between opposite ends of said hollow frame means in generally parallel spaced relationship, a pivotal mounting portion connected to said side plates adjacent one end of said hollow frame means, and an attaching portion connected to said side plates adjacent the other end of said hollow frame means, said hollow frame means defining therein an interior space which is generally bounded by said side plates, said pivotal mounting portion and said attaching portion;
a pair of welding gun arms pivotally mounted on said pivotal mounting portion for pivotal movement about a pivot axis, said welding gun arms projecting outwardly from said hollow frame means;
a robot having a wrist portion which is operable to articulate a tool;
attachment means for removably fastening said wrist portion of said robot in flush abutment against said attaching portion of said hollow frame means with said wrist portion disposed exteriorly of said hollow frame means; and
said attachment means including a plurality of through holes provided in said attaching portion, a plurality of holes provided in said robot wrist portion and generally coaxially aligned with the respective through holes of said attaching portion, a plurality of elongate fastening elements extending from inside said hollow frame means outwardly through the respective through holes and projecting outwardly from said hollow frame means into the associated coaxially aligned holes of said robot wrist por-

tion, said elongate fastening elements being removably positioned in said aligned holes of said attaching portion and said robot wrist portion, each said elongate fastening element having an end portion which projects inwardly into the interior space of said hollow frame means to permit access to and removal of said elongate fastening element, and each said elongate fastening element being otherwise inaccessible.

5,111,019

VARIABLE-PITCH SPOT WELDING GUN ASSEMBLY FOR A WELDING ROBOT

Nobutoshi Torii, Hachioji, Japan; Yasuo Naito, and Kunio Ueda, both of Yamanashi, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

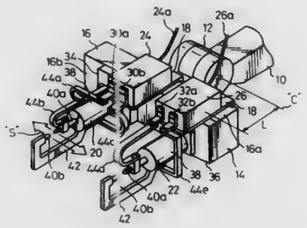
PCT No. PCT/JP90/00366, § 371 Date Nov. 19, 1990, § 102(e) Date Nov. 19, 1990, PCT Pub. No. WO90/11160, PCT Pub. Date Oct. 4, 1990

PCT Filed Mar. 19, 1990, Ser. No. 613,781

Claims priority, application Japan, Mar. 20, 1989, 1-65975

Int. Cl.[5] B23K *11/10*

U.S. Cl. 219—87 **5 Claims**



1. A variable-pitch spot welding gun assembly for a welding robot, comprising;

a base means directly fixed to a robot wrist of the robot;

an electrical transformer means, fixedly attached to said base means at a portion as near as possible to an axis of motion of said robot wrist, for transforming an electric primary voltage into an electric secondary voltage necessary to spot-welding, wherein said electric transformer means comprises first and second electric transformers fixedly disposed with a fixed space therebetween along a predetermined axis;

a fixed spot welding gun attached to said base means and separated from said electrical transformer means, said first electric transformer being connected to said fixed spot welding gun;

a movable spot welding gun movably mounted on said base means and movable relative to said fixed spot welding gun along said predetermined axis to adjust a pitch therebetween, said second electric transformer being connected to said movable spot welding gun; and

an electric secondary flexible conductor means electrically connecting said fixed and movable spot welding guns to said electrical transformer means.

5,111,020

METHOD AND APPARATUS FOR CONTROLLING ELECTRICAL RESISTANCE SPOT WELDING

Ariel Stiebel, 88 Marlborough, Bloomfield Hills, Mich. 48013

Filed May 2, 1991, Ser. No. 694,937

Int. Cl.[5] B23K *11/24*

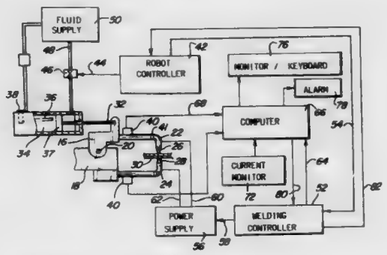
U.S. Cl. 219—110 **7 Claims**

1. An electrical resistance spot welding apparatus that includes a welding gun having a pair of electrode holders, each electrode holder supporting an electrode, and having means for moving said electrode holders to move said electrodes into and out of squeezing engagement with a work piece, said apparatus comprising:

a controllable source of electrical welding current coupled to said electrodes;

means for continuously detecting the mechanical deformation in a work piece, said means for detecting further comprising a piezoelectric transducer mounted to at least one of said electrode holders, said piezoelectric transducer producing a continuous electrical signal indicative of said deformation;

means for terminating said welding current, said means for



terminating continuously receiving and monitoring said electrical signal from said piezoelectric transducer to immediately terminate the welding current when said electrical signal indicates the occurrence of indentation of the weld nugget; and

means for unidirectionally locking said means for moving said electrode holders during thermal expansion and indentation of the work pieces at the weld sites during formation of the weld said means for locking mechanically connected to at lest one of said electrode holders to prevent said electrodes to move apart during said deformation.

5,111,021

LASER SURFACE TREATMENT NOZZLE WITH POWDER SUPPLY

Pascal Jolys, Meudon La Foret, and Philippe Lagain, Toulouse, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris Cedex, France

Filed Sep. 12, 1991, Ser. No. 758,695

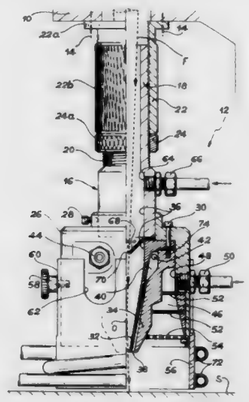
Claims priority, application France, Oct. 16, 1990, 90 12746

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.6 **10 Claims**

1. Nozzle for the surface treatment of a substrate by a laser and with a supply or addition of powder, comprising a body which can be fixed to a tubular support for the arrival of a focussed laser beam, a central passage for the laser beam, an internal, annular, convergent passage for supplying powder and an external, annular passage for supplying protective gas formed coaxially in the said body, wherein setting means are provided for displacing the nozzle body with respect to a member for fixing said body to the support, in accordance with

the axis of the laser beam, a protective skirt being fitted so as to slide on the nozzle body, parallel to the said axis, in order to



surround an area of regulatable length between a front end of the body and the substrate surface.

5,111,022

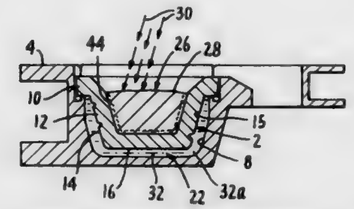
COOLING SYSTEM FOR ELECTRON BEAM GUN AND METHOD

James L. Harper, Fremont, and Charles H. Hill, Mountain Ranch, both of Calif., assignors to TFI Telemark, San Jose, Calif.

Filed Aug. 23, 1989, Ser. No. 397,521

Int. Cl.[5] B23K *15/00*

U.S. Cl. 219—121.33 **19 Claims**



1. In an electron beam gun having a main body, a crucible for holding evaporant, the crucible having a lipped rim section and a cup section, said cup section having an external surface, an electron beam gun for directing an electron beam onto material in the crucible and means for cooling the crucible, the improvement comprising:

said main body provided with a cavity for receiving said crucible, said main body being adapted to support the lipped rim section of the crucible creating a coolant chamber around substantially the entire external surface of the crucible's cup section; and means for circulating coolant throughout said coolant chamber, whereby a skull of solid evaporant is formed at the crucible/evaporant interface forming a protective barrier minimizing evaporant contamination from the crucible.

5,111,023

METHOD OF TREATING GOLD PLATING FILM

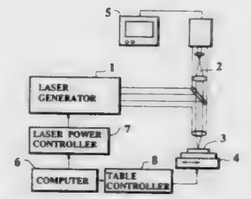
Kinya Horibe; Tomio Hirano; Minoru Ikeda, and Hideaki Murata, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Jul. 25, 1990, Ser. No. 557,105

Claims priority, application Japan, Jul. 31, 1989, 1-196933

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.85 **8 Claims**



1. A method of treating a gold plating film, comprising the steps of:

(a) exposing the gold plating film to a first irradiation energy to bring at least surface portions of the film into almost melted condition; and

(b) cooling the almost melted portions gradually in air.

5,111,024

HIGH-FREQUENCY HIGH-VOLTAGE POWER GENERATOR WITH A COAX RESONATOR

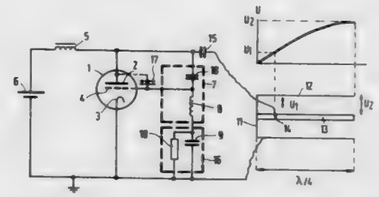
Christian S. A. E. Patron, and Theodorus H. J. Walters, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 6, 1990, Ser. No. 549,346

Claims priority, application Netherlands, Jul. 13, 1989, 8901806

Int. Cl.[5] B33K *9/00*

U.S. Cl. 219—121.54 **19 Claims**

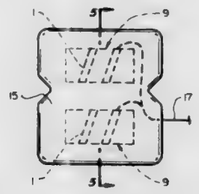


1. A power generator for supplying a high-frequency high-voltage comprising: an active element, a frequency-determining circuit connected in series to the AC main current path of the active element, and a control circuit connected to a control electrode of said active element, wherein the frequency-determining circuit comprises a coaxial waveguide having an electrical length of a quarter of the wavelength of the operating frequency of the power generator, one end of said waveguide being short-circuited and the other end being open, and wherein connection points of the waveguide to the AC main current path are situated in the vicinity of the short-circuited end and with at least one connection point located at an adjustable position.

5,111,025
SEAT HEATER

Pradeep Barma, Fremont, and Corey J. McMills, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 477,689, Feb. 9, 1990, abandoned. This application Dec. 27, 1990, Ser. No. 634,935
Int. Cl.[5] H05B *3/36*
U.S. Cl. 219—217 **14 Claims**



10. An upholstered seat which comprises a resilient seat member which is covered by a seat cover, a resilient back member which is covered by a back cover, and a flexible heater which lies between the resilient back member and the back cover, or between the resilient seat member and the seat cover, or both, the flexible heater comprising

(1) a support member which is in the form of a flat sheet; and

(2) a heating element which is in the form of a tape which has a ratio of external surface area to polymer volume of at least 20 inch^{-1}, which is wrapped around the support member, and which comprises

(a) a resistive element which is composed of

(i) particles of ultrahigh molecular weight polyethylene having a molecular weight of at least 3 million, which particles have been sintered without completely losing their identity, and

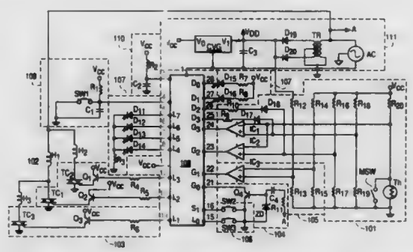
(ii) a particulate conductive filler which is present substantially only at or near the boundaries of the coalesced particles; and

(b) elongate electrodes which are secured to opposite margins of the resistive element and which can be connected to a source of electrical power to cause current to pass through the resistive element.

5,111,026
CONTROL DEVICE AND METHOD FOR AN ELECTRIC RICE COOKER

Chun-Ho Ma, 918-41 Daerim-dong, Yeongdeungpo-ku, Seoul, Rep. of Korea

Filed Feb. 6, 1990, Ser. No. 475,968
Claims priority, application Rep. of Korea, Apr. 1, 1989, 43161989
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—492 **10 Claims**



1. A control device for an electric rice cooker, comprising:

temperature detecting means for detecting the temperature of the inner pot of the electric rice cooker;

first heater switching means for connecting AC power to a first heater to soak rice in the pot at a first predetermined temperature;

second heater switching means for connecting AC power to a second heater to boil rice in the pot;

third heater switching means for connecting AC power to a third heater to keep the boiled rice warm at a second predetermined temperature;

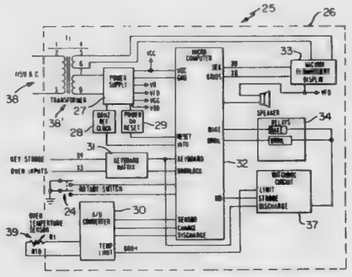
trigger signal generating means for generating a trigger signal by which said boiling heater switching means and said warming heater switching means are synchronously triggered at a zero cross point of the AC supply voltage; and

a microprocessor responsive to said temperature detecting means, said second heater switching means, said third heater switching means, and said trigger signal generating means, said microprocessor having a program stored to control said second heater switching means and said third heater switching means.

5,111,027
CONTROL SYSTEM AND METHODS OF MAKING AND OPERATING THE SAME

Daniel L. Fowler, Kentwood, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 376,388, Jul. 6, 1989, Pat. No. 5,029,244. This application Nov. 20, 1990, Ser. No. 616,224
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—506 **10 Claims**



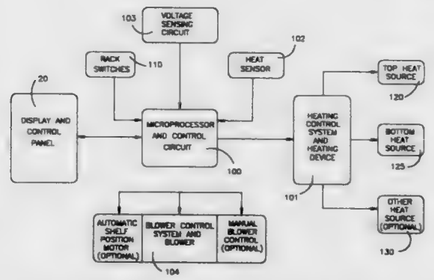
1. In a control system for an apparatus having a heating means and comprising a high energy control circuit means for operating said heating means and having an output relay driver transistor, manually operated means for initiating the operation of said high energy control circuit means, microcomputer means for operating the high energy control circuit means after said manually operated means has initiated the operation thereof, and supervisory circuit means for detecting dynamic failure of said microcomputer means and disabling said high energy control circuit means if said microcomputer means is not operating in a normal mode thereof, said supervisory circuit means having means requiring the manual operation of said manually operated means before permitting power to reach said high energy control circuit means whereby said high energy control circuit means is disabled unless said manual operation of said manually operated means has taken place and said microcomputer means is operating in said normal mode thereof, said supervisory circuit means having a supervisory transistor therein that is in series with said relay driver transistor and that must be switched on to enable said relay driver transistor, said supervisory circuit means having a capacitor therein for sustaining the on condition of said supervisory transistor, said manually operated means comprising momentary means for initially charging said capacitor and switching on said supervisory transistor when said manually operated means has been manually and momentarily operated

to initiate the operation of said high energy control circuit means, said microcomputer means having means for continuing the charging of said capacitor only after the initial manual and momentary operation of said manually operated means has initially charged said capacitor and if said microcomputer means is operating in a normal mode thereof, the improvement comprising temperature sensing means that is operatively interconnected to said capacitor independently of said microcomputer means and has means that by-passes said microcomputer means and permits the continuous charging of said capacitor only as long as said temperature sensing means is sensing an output temperature effect of said heating means that is below a predetermined high temperature limit for said system and that terminates the charging of said capacitor when said sensed temperature is above said predetermined high temperature limit.

5,111,028
METHOD AND CONTROL ARRANGEMENT FOR COOKING APPLIANCES

Duane A. Lee, Springfield, Tenn., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Sep. 11, 1989, Ser. No. 405,433
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—506 **18 Claims**



1. In a control system for a cooking appliance having an arrangement for positioning food to be cooked at a number of different positions within the appliance, said control system comprising means for controlling the energization of the appliance for the cooking of selected foods, means for selecting foods to be cooked under the control of said control means, and indicating means, the improvement wherein said control means responds to the selection of a given food by said selecting means by indicating on said indicating means a position for said given food within said appliance for cooking said given food.

5,111,029
COMPACT HEAT DISINFECTION UNIT FOR CONTACT LENSES

Douglas H. Grambush, Laguna Beach; Gregory R. Holland, Irvine, and Walter A. York, El Toro, all of Calif., assignors to Allergan, Irvine, Calif.

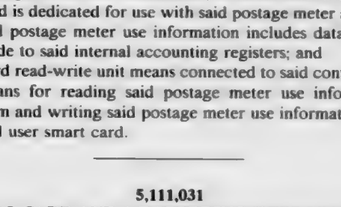
Filed Sep. 24, 1990, Ser. No. 587,662
Int. Cl.[5] A61L *2/00*; **H05B** *3/06*
U.S. Cl. 219—521 **22 Claims**

1. A compact heat disinfection unit for sterilizing contact lenses comprising:

a housing having an internal chamber adapted to receive a covered dual compartment lens case therein;

heating means disposed in said unit adjacent to said cavity for heating the same;

a retractable electric blade assembly coupled to said heating means for providing electricity to the same when said blade assembly is plugged into an electric socket, said blade assembly being swivably retractable from a first storage position contained within a slot in said housing to a second operative position extending in a direction away from said housing, moisture sealing means being provided between said blade assembly and said heating means for preventing moisture from the exterior of said unit from contacting said heating means past said blade assembly;

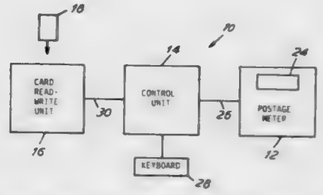


a button accessible from the exterior of the unit and selectively movable from an operative to an inoperative position for actuating said heating means.

5,111,030
POSTAL CHARGE ACCOUNTING SYSTEM

Glynn M. Brasington, and John L. Jones, both of Harlow, United Kingdom, assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 7,423,690, Oct. 18, 1989, abandoned, which is a continuation of Ser. No. 7,153,304, Feb. 8, 1988, abandoned. This application Jun. 12, 1991, Ser. No. 714,363
Int. Cl.[5] G06F *15/20*
U.S. Cl. 235—375 **29 Claims**



1. A postal charge accounting system comprising:

a) an electronic postage meter including internal accounting registers;

b) control unit means connected to said postage meter for controlling said meter;

c) at least one user smart card programmed for processing postage meter use information, wherein said user smart card is dedicated for use with said postage meter and said said postage meter use information includes data entries made to said internal accounting registers; and

d) card read-write unit means connected to said control unit means for reading said postage meter use information from and writing said postage meter use information into said user smart card.

5,111,031
OPTICAL CARD AND A RECORDING/REPRODUCTION APPARATUS FOR THE SAME

Shigeo Terashima, Tenri, and Hirotsugu Matoba, Sakurai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

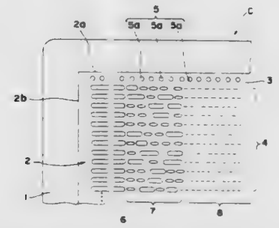
Filed May 3, 1989, Ser. No. 346,804
Claims priority, application Japan, May 7, 1988, 63-111289
Int. Cl.[5] G11B *7/00*
U.S. Cl. 235—456 **1 Claim**

1. An optical card provided with a rectangular memory region having a first edge and a second edge for storing information read by an optical reproducing apparatus during trans-

portation of the optical card in a predetermined direction inside said optical reproducing apparatus, comprising:

a first train of pits formed along said first edge of said memory region extending parallel to said predetermined transportation direction of said optical card, wherein each pit has a predetermined length;

a plurality of track control pits, respectively positioned parallel to and extending from said first train of pits,



wherein each of said track control pits being longer in length than said predetermined length of a pit from said first train of pits;

a plurality of address pits, each address pit extending from a corresponding track control pit, wherein said plurality of address pits includes pits of various lengths; and

a plurality of linear tracks, each said linear track extending from a corresponding address pit, for storing information.

5,111,032

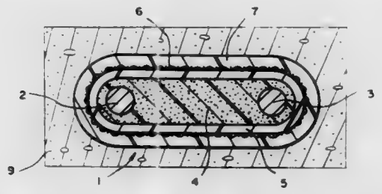
METHOD OF MAKING AN ELECTRICAL DEVICE COMPRISING A CONDUCTIVE POLYMER

Neville S. Batliwalla, Foster City; Amitkumar N. Dharia, Newark; Randall M. Feldman, Redwood City, and Ashok K. Mehan, Union City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Mar. 13. 1989, Ser. No. 322,969

Int. Cl.[5] H05B *3/34*

U.S. Cl. 219—549 **23 Claims**



15. A flexible elongate electrical heater which comprises

(1) an elongate resistive heating element which comprises first and second elongate wire electrodes which are embedded in a continuous strip of conductive polymer;

(2) a first elongate jacket which is composed of an insulating polymeric material, and which surrounds the heating element;

(3) a metallic braid which surrounds and contacts the first insulating jacket; and

(4) a second elongate jacket which is composed of a polymeric material, which surrounds and contacts the metallic braid, and a part of which passes through apertures in the metallic braid to fill at least 20% of the apertures and to contact.

5,111,033

OPTICAL CARD

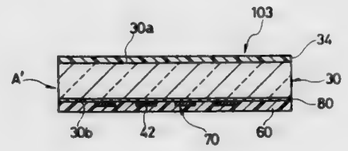
Minoru Fujita; Yuji Kakinuma, and Yoichi Fukushima, all of Tokyo, Japan, assignors to Kyodo Printing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 424,896, Oct. 20, 1989, abandoned. This application Sep. 6, 1991, Ser. No. 759,110

Claims priority, application Japan, Nov. 10, 1988, 63-284362; Mar. 27, 1989, 1-74448

Int. Cl.[5] G06K *14/02*

U.S. Cl. 235—488 **9 Claims**



1. An optical card comprising:

a card substrate having a first and a second side which are parallel to each other, said card substrate having its rigidity which is sufficient to handle said card substrate independently, said first side of said card substrate serving as a reading side upon which reading light is incident;

an optical-data recording section including a light-reflective pattern, said optical-data recording section being arranged on said second side of said card substrate, in which optical data incident upon said optical-data recording section toward said reading side of said card substrate is recorded by said optical-data recording section, the optical data recorded on he optical card being read by detecting the light reflected from the light-reflective pattern; and

a shielding layer is arranged on said fist side of said card substrate, for shielding said optical-data recording section from a viewer's field of view, said shielding layer being substantially black in color and having its transmission characteristic with respect to said reading light, which is sufficient to shield light within a visual range and to enable reading of said optical-data recording section whereby a sensor for reading the light reflective patterns adapted to be positioned at the reading side upon which reading light is incident for reading.

5,111,034

APPARATUS UTILIZING LIGHT EMITTING SEMICONDUCTOR DEVICE

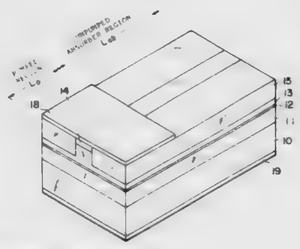
Takeshi Takagi, Ibaraki, Japan, assignor to Omron Corporation, Kyoto, Japan

Filed Jul. 19, 1990, Ser. No. 554,726

Claims priority, application Japan, Sep. 27, 1989, 1-249298; Sep. 27, 1989, 1-249299; Sep. 27, 1989, 1-249300

Int. Cl.[5] H01J *31/50*

U.S. Cl. 250—213 A **1 Claim**



1. A logic unit comprising:

at least two input means for respectively converting at least two logical electric signals into output signals having a predetermined pulse width depending on the logical values represented by the electric signals;

delay means for delaying an output signal of one of the input means by time corresponding to the pulse width applied to an output signal of the other input means;

a light emitting semiconductor device which has a pumped region and an unpumped absorber region and in which an active layer has a quantum well structure and driving current/light output characteristics have dependence on the pulse width of a driving current;

means for adding an output signal of said delay means and the output signal of said other input means to drive said light emitting semiconductor device by the added output therefrom;

a light receiving device for receiving light emitted from said light emitting semiconductor device to generate a light reception signal at a level corresponding to the amount of the received light; and

level determining means for determining the light reception signal outputted from said light receiving device at a threshold level corresponding to the type of a logic operation.

5,111,035

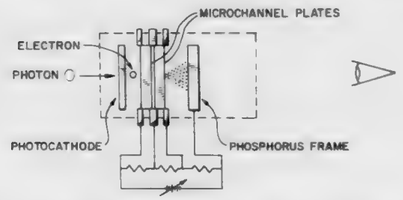
DIGITAL ANODE TO DETERMINE THE LOCATION OF ELECTRONS ON A GIVEN SURFACE

Adriano de Luca, Manzana, Mexico, assignor to Universidad Autonoma Metropolitana, Mexico

Filed Feb. 22, 1990, Ser. No. 483,915

Int. Cl.[5] H01V *31/50*

U.S. Cl. 250—213 VT **3 Claims**



1. A digital anode that enables the capture of electrons on a given surface and permits to know their precise location by digitalizing their position in a system of cartesian coordinates, said digital anode comprising a plurality of electronic transducers that have a given initial voltage and a different voltage value when they have captured electrons, said transducers being interconnected, in a system of cartesian coordinates, by horizontal and vertical lines, said lines being directly connected to decoding electronic circuits that furnish the position of said electrons substantially simultaneously upon said capturing of said electrons by said transducers.

5,111,036

SHUTTER APPARATUS

John G. Dibble, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 4, 1991, Ser. No. 664,897

Int. Cl.[5] H01J *31/50*

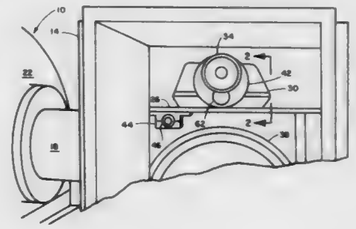
U.S. Cl. 250—214 AL **10 Claims**

1. An apparatus for interrupting the light path between a lens and a camera, said apparatus comprising:

a means for interrupting said light path mounted between said lens and said camera;

a means for sensing destructive illumination and generating a signal indicating detection, said means for sensing and generating mounted in juxtaposition with said interrupting means so that destructive illumination impinges upon said sensing and generating means before it impinges on said lens; and

a means connected between said sensing means and said



interrupting means for transferring said signal from said sensing and generating means to said interrupting means for making said interrupting means operative as long as said signal is provided.

5,111,037

DEVICE FOR MEASURING LIGHT SCATTERED BY AN INFORMATION SUPPORT

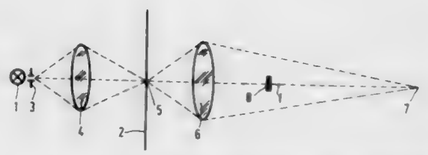
Emile E. M. Boderie, and Marinus J. M. Van Dam, both of Venlo, Netherlands, assignors to Oce Nederland B.V., Netherlands

Filed Jul. 5, 1990, Ser. No. 548,119

Claims priority, application Netherlands, Jul. 6, 1989, 8901722

Int. Cl.[5] H01J *3/16;* **G03B** *27/74*

U.S. Cl. 250—216 **5 Claims**



1. A device for measuring light scattered by an information support comprising:

(a) a light source directed to said information support;

(b) at least one objective lens to focus light from said information support; and

(c) at least one sensor having a light-sensitive surface for sensing light from said information support and positioned from said objective lens a distance wherein the light-sensitive surface lies within a beam of focussed light from said objective lens and senses a fraction of said focussed light whereby the quantity of light sensed remains substantially constant over a variation of ±20% in distance between said information support and objective lens.

5,111,038

ACOUSTO-OPTIC TUNABLE FILTER APPARATUS AND METHOD FOR DETECTING AND IDENTIFYING AN OPTICAL RADIATION SOURCE.

Lyle H. Taylor, Murrysville; Nathan T. Melamed, Pittsburgh, and Milton S. Gottlieb, Churchill, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 12, 1991, Ser. No. 654,170

Int. Cl.[5] G02F *1/11*

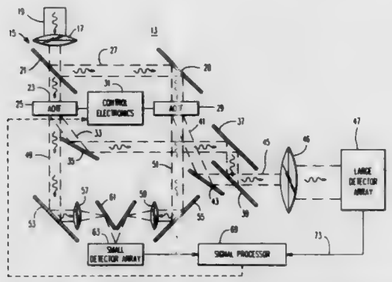
U.S. Cl. 250—225 **26 Claims**

1. Apparatus for detecting and identifying a source of optical radiation, said apparatus comprising:

optical input means generating from incident optical radiation emitted by said source a first input beam having a first polarization and a second input beam having a second polarization orthogonal to said first polarization;

a first acousto-optic tunable filter (AOTF) to which said first input beam is applied as an extraordinary wave and which separates said first input beam into a diffracted ordinary polarized beam of a predetermined narrow bandwidth centered around a center wave length selected by an applied first radio frequency signal of a first selected frequency, and a first broad-band undiffracted beam;

a second acousto-optic tunable filter (AOTF) to which said second input beam is applied as an ordinary wave and which separates said second beam into a diffracted extraordinary polarized beam of a predetermined narrow



bandwidth centered around a center wave length selected by an applied second radio frequency signal of a second selected frequency, and a second broad-band undiffracted beam;

first detector means responsive to said first and second broad-band undiffracted beams generating first detector signals;

second detector means responsive to said diffracted ordinary and extraordinary polarized beams generating second detector signals;

control means generating said first and second radio frequency signals; and

signal processor means processing said first detector signals to detect the presence of the source of optical radiation, and processing said second detector signals to identify the source of optical radiation.

5,111,039
PHOTOELECTRIC VERTICAL SENSOR WITH PRESSURE COMPENSATION MEANS

Edilbert Froning, Bodanstr. 23, 7772 Oberuhldingen, Fed. Rep. of Germany

Filed Sep. 10, 1990, Ser. No. 580,211
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1989, 3930228
Int. Cl.[5] G01D *5/34*
U.S. Cl. 250—231.10 **5 Claims**

1. A vertical sensor comprising:

a container including two opposite sides; and at least one flexible shell portion

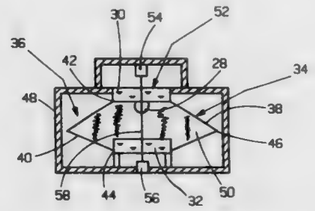
said container being filled by a light absorbing liquid enclosing an air bubble;

said container assuming a vertical indicating position in which said air bubble assumes a predetermined position within said container

said air bubble being subject to displacement from said predetermined position within said container upon deviation of said container from said vertical indicating position;

two rigid transparent end plates each of which is located at a respective one of said two opposite sides of said container;

light barrier means associated with said two rigid transparent end plates and responsive to said displacement of said air bubble upon said deviation of said container from said vertical indicating position;



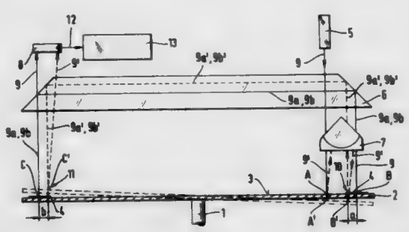
pressure compensating means compensating for pressure changes occurring inside said container relative to atmospheric pressure; and

said pressure compensating means is provided by said at least one flexible shell portion of said container.

5,111,040
PHOTOELECTRIC DEVICE FOR POSITION MEASURING

Harald Bernard, Waldkraiburg, and Alfons Spies, Seebruck, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Mar. 12, 1991, Ser. No. 667,885
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1990, 4007967
Int. Cl.[5] H01J *3/14;* **G01B** *11/02*
U.S. Cl. 250—237 G **9 Claims**



1. A photoelectric position measuring device for measuring the relative position of a first object and a second object comprising:

a light beam source emitting a beam of light;

a graduated scale having a graduation, said graduation having a first graduation area and a second graduation area wherein a beam from said source impinges on an area outside of said graduation, said beam being reflected from said scale;

means for directing said reflected beam onto said first graduation area such that said reflected beam and said impinging beam are parallel to one another wherein said impinging beam is diffracted into diffracted beams in said first graduation area;

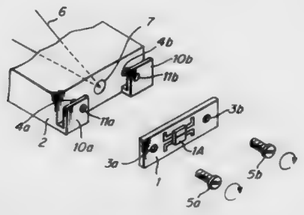
means for impinging said diffracted beams onto said second graduation area wherein said diffracted beams impinge on said second graduation area at angles equivalent to the diffraction angles of said beams in said first area, said beams interfering in said second graduation area; and

means for detecting said interference and generating signals representing measured values.

5,111,041
MEANS FOR SECURING A PHOTODETECTOR TO A BASE PLATE OR THE LIKE

Hitoshi Imai, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1991, Ser. No. 654,506
Claims priority, application Japan, Feb. 16, 1990, 2-15107[U]
Int. Cl.[5] H05K *7/12*
U.S. Cl. 250—239 **19 Claims**



1. A photodetector fixing mechanism for fixing a photodetector to a base plate by screws screwed in threaded bores at said base plate, comprising;

a mounting member for fixing the photodetector to said base plate, having bores provided at the position corresponding to said threaded bores, through which said screws perforate respectively; and

said base plate having at least two caul portions, arm portion means for securing each caul portion from said base plate at greater intervals than a thickness of said mounting member and having bores through which said screws perforate respectively,

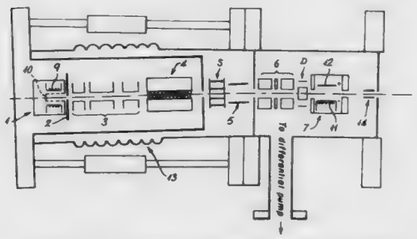
said arm portion means also for securing each caul portion in lateral relationship to one another to provide a space for accommodating the photodetector,

said caul portions being deformable toward said base plate by pressure applied to said caul portions from the exterior.

5,111,042
METHOD AND APPARATUS FOR GENERATING PARTICLE BEAMS

John L. Sullivan, Stourbridge, and Ning-Sheng Xu, Birmingham, both of England, assignors to National Research Development Corp., London, England

PCT No. PCT/GB88/00938, § 371 Date Apr. 11, 1990, § 102(e) Date Apr. 11, 1990, PCT Pub. No. WO89/04586, PCT Pub. Date May 18, 1989
PCT Filed Oct. 28, 1988, Ser. No. 469,481
Claims priority, application United Kingdom, Oct. 30, 1987, 8725459
Int. Cl.[5] H05H *3/00*
U.S. Cl. 250—251 **25 Claims**



1. A source of atomic or molecular particles comprising:

a source of ionized particles;

means for removing a beam of said ionized particles from said source;

focusing means for focusing said beam of particles to form a focused beam of particles;

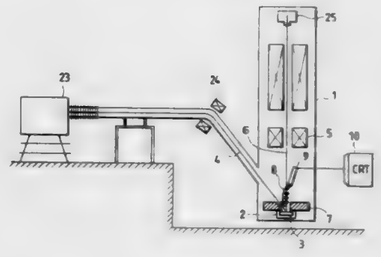
filter means for selecting particles in said focused beam having a predetermined velocity; and

charge exchange means for permitting neutralization of charge on said ionized particles, wherein said charge exchange means maintains a pressure at least two orders of magnitude higher than that of adjacent parts of the system.

5,111,043
APPARATUS FOR MATERIAL SURFACE OBSERVATION

Naoto Shigenaka; Tsuneyuki Hashimoto, both of Hitachi, and Motomasa Fuse, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 9, 1991, Ser. No. 639,129
Claims priority, application Japan, Jan. 10, 1990, 2-1543
Int. Cl.[5] G01N *23/04*
U.S. Cl. 250—306 **13 Claims**



1. An apparatus for observing a surface of a material comprising:

first irradiating means for irradiating a surface of a material with a first energy beam, the first energy beam causing the surface of the material to emit a first secondary energy beam;

second irradiating means for irradiating the surface of the material with a second energy beam, the second energy beam causing the surface of the material to emit a second secondary energy beam; and

image forming means for forming an image of the surface of the material in response to the first secondary energy beam, the image being substantially free of interference from the second secondary energy beam.

5,111,044
MEDICAL IMAGE REPRODUCING SYSTEM

Toshitaka Agano, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 9, 1991, Ser. No. 682,179
Claims priority, application Japan, Apr. 10, 1990, 2-94650
Int. Cl.[5] G01N *23/04;* **G06F** *15/42;* **H04N** *1/21*
U.S. Cl. 250—327.2 **9 Claims**

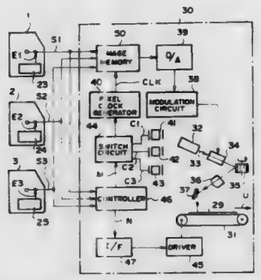
1. A medical image reproducing system, which comprises:

i) a plurality of medical image signal feeding apparatuses, which feed out image signals representing, medical images, and

ii) a single image reproducing and recording apparatus, which is connected to the plurality of said medical image signal feeding apparatuses, and which reproduces an image from each of the image signals fed out from the

plurality of said medical image signal feeding apparatuses and records the image,

wherein each of the plurality of said medical image signal feeding apparatuses is provided with means for generating an identification signal representing the resolution, with which the picture elements in an image represented by an image signal fed out from each said medical image signal feeding apparatus are arrayed, said identification signal



being fed into said image reproducing and recording apparatus together with the corresponding image signal, and

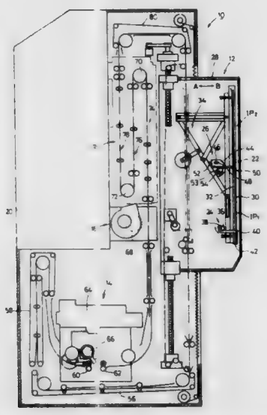
said image reproducing and recording apparatus is provided with a means for reading the identification signal and setting the resolution, with which the picture elements in a reproduced and recorded image are arrayed, to be equal to the resolution represented by the identification signal, which has thus been read.

5,111,045

APPARATUS FOR RECORDING AND READING RADIATION IMAGE INFORMATION

Masaaki Konno, and Yasuhiro Kawai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 2, 1991, Ser. No. 679,399
Claims priority, application Japan, Apr. 3, 1990, 2-88734
Int. Cl.[5] G01N *23/04*
U.S. Cl. 250—327.2 **7 Claims**



1. An apparatus for recording and reading radiation image information, comprising:

a image recording unit for applying radiation bearing radiation image information to a stimulable phosphor sheet to record the radiation image information on said phosphor sheet while said phosphor sheet is located at a recording position;

an image reading unit for applying stimulating light to said phosphor sheet on which the radiation image information has been recorded and for photoelectrically reading resulting light emitted from the stimulable phosphor sheet;

an erasing unit for discharging any residual radiation energy from said phosphor sheet before new radiation image information is recorded on said phosphor sheet and after previous radiation image information has been read by said image reading unit;

a conveyor for feeding a plurality of phosphor sheets circulatively through said image recording unit, said image reading unit, and said erasing unit; and

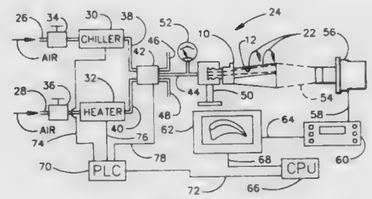
said image recording image having first an engaging portion for engaging one end of a first of said phosphor sheets so as to position said first of said phosphor sheets in said recording position, and a second engaging portion for engaging one end of a second of said phosphor sheets so as to position said second of said phosphor sheets in said recording position while holding a portion of said second stimulable phosphor sheet in superimposed relationship to a portion of said first stimulable phosphor sheet.

5,111,046

APPARATUS AND METHOD FOR INSPECTING COOLING HOLES

Thomas E. Bantel, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 18, 1991, Ser. No. 670,658
Int. Cl.[5] G01N *25/72*
U.S. Cl. 250—330 **19 Claims**



1. A method of inspecting a channel, comprising the steps of:

(a) forcing a heated gas of a selected temperature through the channel for a predetermined time period to cause a heat-up cycle;

(b) measuring selected parameters from an infrared signature of the channel during a transient of the heat-up cycle;

(c) switching from the heat-up cycle, after the predetermined time period, to a cool-down cycle by forcing a cooled gas of a chosen temperature through the channel;

(d) measuring selected parameters from an infrared signature of the channel during a transient of the cool-down cycle; and

(e) detecting defects in the channel and identifying a nature of the defect by analyzing the selected parameters from both the heat-up transient and the cool-down transient.

5,111,047

COLLISIONAL IONIZATION DETECTED ATOMIC RESONANCE FILTER

John C. Brock, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

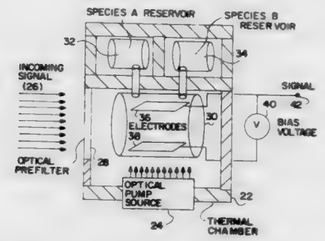
Filed Sep. 21, 1990, Ser. No. 587,828
Int. Cl.[5] H04B *10/06*
U.S. Cl. 250—336.1 **22 Claims**

1. A narrow-bandwidth optical filter and detector, comprising:

a chamber containing a selected atomic or molecular vapor;

means for admitting into the chamber signal photons of a particular wavelength to be detected, as well as photons of other wavelengths, wherein the atomic or molecular vapor is selected to absorb only the signal photons and to produce atoms or molecules in a metastable state, in numerical proportion to the number of signal photons of the particular wavelength admitted into the chamber;

means for admitting an inert buffer gas into the chamber, wherein collisions between the atomic particles of the



buffer gas and the atoms or molecules in the metastable state cause ionization of a significant proportion of the atoms or molecules in the metastable state, and these collisions constitute a primary ionization mechanism of the filter and detector; and

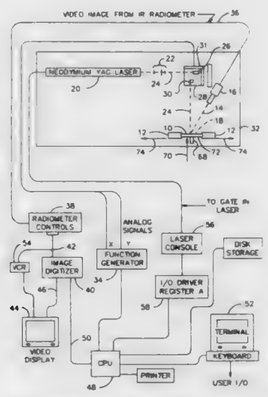
means for generating an electric field across the chamber and thereby collecting and detecting free electrons or ions as a measurable electric current proportional to the rate of admission of the signal photons.

5,111,048

APPARATUS AND METHOD FOR DETECTING FATIGUE CRACKS USING INFRARED THERMOGRAPHY

John W. Devitt, Loveland; Thomas E. Bantel, Cincinnati, both of Ohio; Joseph M. Sparks, Newport, Ky., and Janet S. Kania, Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Sep. 27, 1990, Ser. No. 588,909
Int. Cl.[5] G01N *21/71*
U.S. Cl. 250—342 **25 Claims**



1. A method for detecting a defect in a workpiece, comprising the steps of:

(a) positioning a surface of the workpiece to be inspected in an optical path of an infrared radiation detector;

(b) generating a graph of irradiance versus distance along a selected portion of the workpiece to establish an original irradiance intensity level;

(c) heating the selected portion of the workpiece by electromagnetic radiation for a selected duration to cause an increase in radiance from any defect present at the workpiece surface in the selected portion, the radiation detector operating in a different spectral band than the electromagnetic radiation wherein any defect has a substantially higher emissivity relative to the workpiece surface surrounding the defect to cause an enhanced signal-to-noise ratio so as to allow distinction of a flaw which may cause a failure of the workpiece from another minor surface anomaly;

(d) generating a series of graphs of irradiance versus distance along the selected portion as the irradiance decays from a peak intensity level back to the original intensity level after the heat is removed, the series of graphs representing a transient response of the irradiance from the selected portion; and

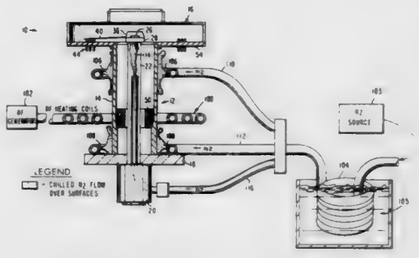
(e) detecting defects in the selected portion of the workpiece by comparing the graphs to one another to analyze the transient response of the radiance received from the selected portion by the infrared radiation detector and to distinguish any flaw which may cause a failure of the workpiece from another minor surface anomaly.

5,111,049

REMOTE FIRED RF GETTER FOR USE IN METAL INFRARED DETECTOR DEWAR

Timothy S. Romano; Leonard E. Peck, Jr., both of Goleta; Karl H. Neumann, Santa Barbara, and Robert E. Zahuta, Lompoc, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Dec. 21, 1990, Ser. No. 631,556
Int. Cl.[5] G12B *15/00*
U.S. Cl. 250—352 **16 Claims**



1. An infrared detector assembly comprising:

a metallic dewar housing providing an evacuated chamber;

an infrared detector supported within said evacuated chamber;

cooling means for cooling said infrared detector during operation of said detector assembly;

getter means provided in said evacuated chamber for gettering gas molecules therefrom, said getter means located remotely from said infrared detector;

means for fixedly securing said getter means within said dewar housing; and

wherein said getter means is adapted for activation via electromagnetic induction heating through said metallic dewar housing.

5,111,050

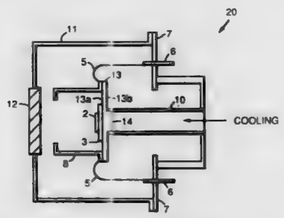
QUICK COOLDOWN/LOW DISTORTION HYBRID FOCAL PLANE ARRAY PLATFORM FOR USE IN INFRARED DETECTOR DEWAR PACKAGES

Nevil Q. Maassen; Timothy S. Romano, and Leonard E. Peck, all of Goleta, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Dec. 3, 1990, Ser. No. 621,419

Int. Cl.[5] G01J *5/06*

U.S. Cl. 250—352 **10 Claims**



1. A platform for use with a cryogenically cooled radiation detector means, the platform having a first major surface comprising means for supporting the radiation detector means thereon and an opposed second major surface having an upstanding portion extending therefrom, the upstanding portion being integrally formed and continuous with the second major surface and having a shape selected for coupling to a cryogenic cooling apparatus, wherein the platform is comprised of aluminum nitride.

5,111,051

MULTI-ANODE ARRAY PHOTOMULTIPLIER TUBE

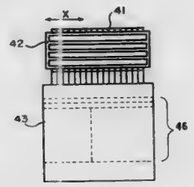
Mitsuo Watanabe, Shizuoka, Japan, assignor to Hamamatsu Photonics K. K., Shizuoka, Japan

Filed Sep. 10, 1990, Ser. No. 579,675

Claims priority, application Japan, Sep. 14, 1989, 1-239190

Int. Cl.[5] H01J *43/12;* **G01T** *1/28*

U.S. Cl. 250—363.02 **9 Claims**



7. A radiation detector comprising:

a scintillator array comprising a plurality of scintillator crystals, arranged in a first and a second direction perpendicular to each other, for emitting scintillation light in response to an incident radiation;

a photomultiplier tube comprising:

a photocathode for converting the scintillation light to photoelectrons;

a plurality of dynodes for multiplying the photoelectrons; and

an anode array for collecting the multiplied photoelectrons, the anode array comprising a first group of anodes, arranged in said first direction, for detecting a receiving position of the photoelectrons in said first direction, and a second group of anodes, electrically isolated from each other and arranged in said second direction in the form of a plurality of rows so as to be associated with the respective anodes of the first group, for detecting the receiving position of the photoelectrons said second direction, the anode array being arranged so that centers of the anodes substantially coincide with centers of the corresponding scintillator crystals; and

a computing circuit for determining a scintillation position in said first and second directions on the basis of detection data for said first and second directions provided from the photomultiplier tube, a computing operation for said second direction being performed in a parallel manner for sets of the detection data for said first direction which corresponds to the respective anodes of the first group.

5,111,052

RADIATION SENSOR AND A RADIATION DETECTING APPARATUS USING THE SAME

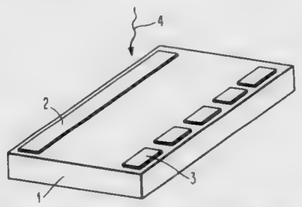
Tetsuro Ohtsuchi, Osaka; Hiroshi Tsutsui, Yawata; Koichi Ohmori, Toyonaka; Sueki Baba, Suita; Hiromasa Funakoshi, Hirakata; Toshiyuki Kawara, Kadoma, and Yoshiyuki Yoshizumi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 9, 1989, Ser. No. 435,219

Claims priority, application Japan, Nov. 10, 1988, 63-284514; Jan. 26, 1989, 1-17132

Int. Cl.[5] G01T *1/24*

U.S. Cl. 250—370.01 **41 Claims**



1. A radiation sensor for the measurement of photon energies of incident radiation, which comprises a semiconductor substrate sensitive to photons of said incident radiation, at least one common electrode and at least one split electrode, both of which are disposed on the same surface of said substrate, wherein said at least one common electrode and said at least one split electrode comprise means for receiving an applied voltage so as to detect a current produced by said incident radiation.

5,111,053

CONTROLLING A LIQUID METAL ION SOURCE BY ANALOG FEEDBACK AND DIGITAL CPU CONTROL

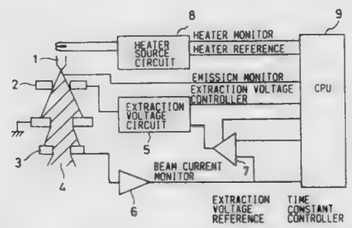
Katsumi Suzuki, Tokyo, Japan, assignor to Seiko Instruments, Inc., Tokyo, Japan

Filed Feb. 19, 1991, Ser. No. 656,848

Claims priority, application Japan, Feb. 19, 1990, 2-38076

Int. Cl.[5] H01J *37/08*

U.S. Cl. 250—424 **1 Claim**



1. A method of controlling a liquid metal ion source used in a focused ion beam apparatus, the source having a metallic needle emitter with a pointed and, a reservoir for supplying liquid metal to the surface of the needle emitter, means for heating the needle emitter and the reservoir, and a beam extraction electrode with a small opening formed therethrough at a position facing the metallic needle emitter to pass an ion beam, the beam extraction electrode being connected to receive a beam extraction voltage for controlling the value of the current in the ion beam, said method comprising the steps of:

performing an analog feedback control including detecting the ion beam by a monitor electrode which conducts a current representative of the ion beam current level and controlling the voltage applied to the beam extraction electrode in response to the monitor electrode current to keep the beam current at a constant value, and

performing a digital control including: supplying to a CPU information representative of the ion current emitted by the source, the monitor electrode current, the beam extraction voltage and the power being supplied to the means for heating; estimating the state of the liquid metal ion source from the changes over time of the values represented by the information supplied to the CPU; and controlling at least one of the beam extraction voltage, the heater power and the analog feedback time constant in order to stabilize the operation of the liquid metal ion source.

5,111,054

HEAT-ACTUATED VACUUM VALVE FOR A PARTICLE BEAM APPARATUS

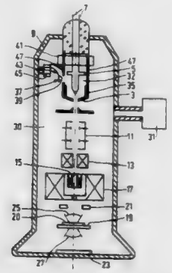
Hendrik N. Slingerland, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jan. 4, 1991, Ser. No. 638,226

Claims priority, application Netherlands, Jan. 10, 1990, 9000057

Int. Cl.[5] H01J *37/18*

U.S. Cl. 250—441.11 **4 Claims**



1. A particle beam apparatus comprising a vacuum chamber which is provided with an aperture that can be closed and which can be evacuated by heating, characterized in that said aperture is provided with a heat-actuated valve device having an activation temperature which corresponds substantially to the heating temperature for the evacuation of vacuum space.

5,111,055

METHOD AND SYSTEM FOR THE OPTICAL MEASUREMENT OF THE AIR PRESSURE BY LASER EXCITATION, PARTICULARLY IN FRONT OF AN AIRCRAFT

Henri Fima, Malissard, France, assignor to Sextant Avionique, Valence, France

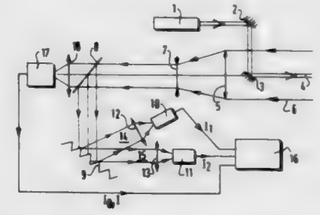
Filed Feb. 15, 1991, Ser. No. 655,915

Claims priority, application France, Feb. 22, 1990, 90 02181

Int. Cl.[5] G01L *11/00;* **G01N** *21/64*

U.S. Cl. 250—461.1 **14 Claims**

1. A method for optical remote measurement of the pressure of the air by laser excitation in which, having determined the air temperature, backscattered radiation is caused by means of a laser generator with very fine spectral line and by excitation of an absorption spectral line of molecular oxygen, the backscattered energies are measured at two different distances, the ratio of these energies is determined, a coefficient of absorption is derived therefrom depending on the temperature and the



molecular density of oxygen and the density and so the pressure is calculated, wherein an absorption spectral line is excited belonging to a Schumann-Runge band of molecular oxygen and the absorption spectral line is very wide with respect to the Rayleigh diffusion spectrum.

5,111,056

OPTICAL MEASUREMENT SYSTEM DETERMINATION OF AN OBJECT PROFILE

Kazunari Yoshimura, Hirakata, and Kuninori Nakamura, Neyagawa, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 12, 1991, Ser. No. 684,121

Claims priority, application Japan, Apr. 14, 1990, 2-98722; Dec. 25, 1990, 2-405527

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—560 **6 Claims**



1. In an optical measurement method for determination of an object profile comprising the steps of:

a) directing light beam to scan a surface of an object surface and to obtain a reflected light beam therefrom in a direction angled from that of said light beam incident to said object surface;

b) receiving said reflected light beam to obtain position data with respect to the individual scanned points on the object surface; and

c) analyzing said position data to measure a series of distances to the individual scanned points on the object surface, said measured distances representing height data of said individual scanned points being processed to determine an object profile along said scanned point;

an improvement is characterized that said step a) further comprising the sub-steps of:

deflecting said light beam toward said object surface by the use of a deflector and directing it through an optical center portion of a lens onto said object surface to providing a series of corresponding beam spots across said object surface for scanning said object surface thereby;

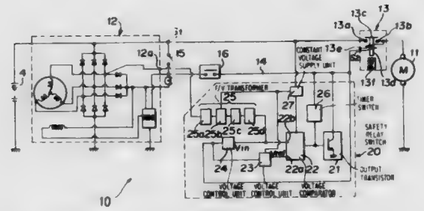
converging said reflected light beam from said object surface and deflecting it by the common deflector to direct a resulting deflected light beam for providing said position data.

5,111,057

STARTER OF AN ENGINE

Takeshi Sugiyama, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Mar. 21, 1991, Ser. No. 673,051
Claims priority, application Japan, Apr. 23, 1990, 2-107924
Int. Cl.[5] F02N *17/00*
U.S. Cl. 290—38 R **4 Claims**



1. A starter of an engine which comprises:

a starting motor which applies a driving force for starting an engine;

detecting means for generating a first voltage signal corresponding to a number of revolutions of the engine;

an electromagnet switch having a moving contact supported by a plunger which opens and closes two fixed contacts that are respectively connected to a power source and the starting motor, a coil having one end connected to a point between the starting motor and one of the fixed contacts for drawing said plunger so that the fixed contacts are shorted by the moving contact, and a magnet for retaining the plunger in a drawn position;

a main switch and a normally open touch switch for starting the engine installed in a start-up circuit by connecting said power source to a second end of the coil of the electromagnetic switch so that current is supplied to the coil of the electromagnetic switch for activating the starter motor in starting the engine;

a voltage comparator for comparing a second voltage signal produced by a weak inverse direction current flowing in the coil of the electromagnetic switch when the fixed contact are closed with the first voltage signal generated by said detecting means and for outputting a current when the first voltage signal is greater than said second voltage signal; and

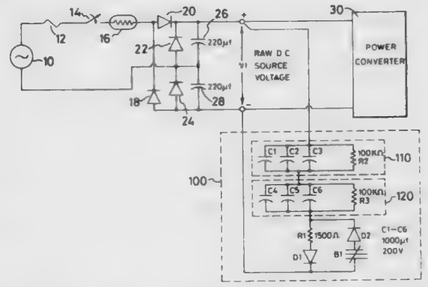
a switch device responsive to said current outputted by said voltage comparator for stopping the starting motor when in a conductive state by electrically connecting said second end of said coil to ground so that a strong inverse direction current flows through said coil generating an inverse drawing force.

5,111,058

CIRCUIT FOR SUSTAINING POWER SUPPLY OUTPUT FOLLOWING MOMENTARY INTERRUPTION OF COMMERCIAL A.C. POWER

Richard A. Martin, 14981 E. Elk Pl. 98-8, Denver, Colo. 80239

Filed May 23, 1990, Ser. No. 527,272
Int. Cl.[5] H02J *9/06;* **G11C** *14/00*
U.S. Cl. 307—66 **3 Claims**



1. A power supply circuit for powering a load comprising computers in which the output voltage of the power supply circuit is sustained during a momentary interruption of a commercial A.C. power source, the power supply circuit comprising:

full-wave voltage doubler rectifier/filter means coupled to the commercial A.C. power source for providing a raw D.C. source;

power converter means coupled to said raw D.C. voltage source for converting said raw D.C. voltage source to one or more D.C. voltages used by the computer equipment;

capacitor means, a charging resistor, and a charging diode connected in series, the series combination thereof being connected to said raw D.C. voltage source to provide a charging path for charging said capacitor means to a voltage corresponding to said raw D.C. voltage source during normal operation of the commercial A.C. power source; and

a break-over device and a discharge diode connected in series, the series combination thereof being connected across the series combination of said charging resistor and said charging diode to provide a path for discharging said capacitor means to sustain operation of said powr converter means during momentary interruption of the commercial A.C. power source and to disconnect said capacitor means from said raw D.C. voltage source when said capacitor means has been discharged to a minimum level required to insure proper operation of said power converter means.

5,111,059

POWER TRANSFER UNIT FOR TRANSFERRING POWER SUPPLIED TO A LOAD BETWEEN POWER SOURCES RESPONSIVE TO DETECTED SCR GATE-CATHODE VOLTAGE

George K. Woodworth, Gainsville, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1990, Ser. No. 566,928
Int. Cl.[5] H02J *3/00, 9/06;* **H03K** *17/30*
U.S. Cl. 307—87 **5 Claims**

1. A power transfer unit for transferring power from a first power source connected to a load to a second power source connected to said load, comprising;

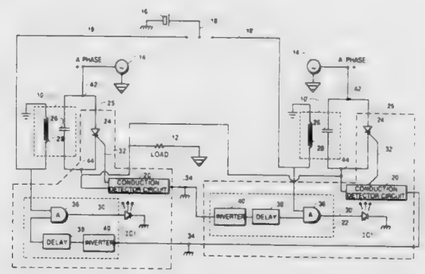
a first SCR device having its anode-cathode path connected between a first power source and the load and having a gate terminal, and a second SCR device having its anode-cathode path connected between a second power source and said load and having a gate terminal;

a first gate conduction detector coupled between said gate terminal and said cathode of said first SCR device, and having an output terminal;

a second gate conduction detector coupled between said gate terminal and said cathode of said second SCR device;

a logic control circuit having an input connected to the output of said gate conduction detector and having an output coupled to said gate of said second SCR device;

said first gate conduction detector outputting a signal to said logic control circuit when the voltage between said gate



and said cathode of said first SCR device is lower than a predetermined threshold voltage, corresponding to a minimal current flowing through said anode-cathode path of said first SCR device;

said logic control circuit, in response to receiving said signal from said first gate conduction detector, instituting a predetermined delay time interval followed by outputting a gate energizing signal which is coupled through said second gate conduction detector to said gate electrode of said second SCR device; and

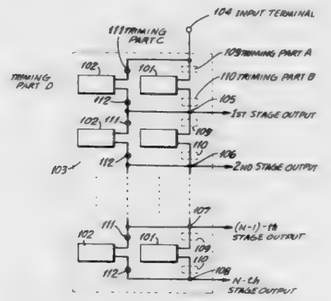
whereby a precise outage interval is realized between the conduction of said first SCR device and the conduction of said second SCR device.

5,111,060

ELECTRONIC CIRCUIT EQUIPPED WITH REDUNDANT OR SPARE CIRCUIT ELEMENTS FOR EVERY CIRCUIT ELEMENT

Hideki Asada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 13, 1990, Ser. No. 582,633
Claims priority, application Japan, Sep. 13, 1989, 1-238611
Int. Cl.[5] H03K *19/12, 17/16*
U.S. Cl. 307—219 **10 Claims**



1. An electronic circuit comprising:

a plurality of first signal processing means having an identical function;

a plurality of input signal terminals for supplying input signals to input terminals of said first signal processing means, respectively;

a plurality of output signal terminals for respectively outputting output signals from output terminals of said first signal processing means;

a plurality of second signal processing means having an identical function which is also identical to that of said first signal processing means;

said second signal processing means being arranged in the circuit in groups with said first signal processing means so that each group includes one of said first signal processing means and at least one of said second processing means positioned in the vicinity of a respective first processing means;

first input connecting lines each connecting an input terminal of a respective first signal processing means of each group to a respective input signal terminal;

first output connecting lines each connecting an output of a respective first signal processing means of each group to a respective output signal terminal;

at least one of said first input and output connecting lines including a first trimming element which breaks when irradiated by an energy beam so as to break an electrical connection between a respective first signal processing means and one of said respective input and output terminals;

second input connecting lines each provided between an input terminal of a respective second signal processing means of each group and a respective input signal terminal;

second output connecting lines each provided between an output terminal of a respective second signal processing means of each group and a respective output signal terminal;

at least one of said second input and output connecting lines including a second trimming element which becomes activated only when irradiated by an energy beam, so as to establish an electrical connection between a respective second processing means and one of said respective input and output terminals, whereby when a defect occurs in any of said first signal processing means, a defective first signal processing means is replaced by the second signal processing means in the same group by irradiating said first trimming part and thereby disconnecting said defective first signal processing means from the circuit and irradiating said second trimming part and thereby connecting the second signal processing means of the same group with the circuit.

5,111,061

DRIVING CIRCUIT FOR SEMICONDUCTOR ELEMENT

Hiroyuki Masuda, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1991, Ser. No. 704,593
Claims priority, application Japan, May 25, 1990, 2-136861
Int. Cl.[5] H03K *17/60, 17/72*
U.S. Cl. 307—254 **2 Claims**

1. A driving circuit for a semiconductor element to be controlled, comprising:

a first transistor and a second transistor being connected in series to selectively assume an ON-state responsive to application of forward or reverse bias;

a first power source for supplying D.C. current to said first transistor;

a second power source connected in series with said first power source for supplying D.C. current to said second transistor;

a semiconductor element to be controlled and to be driven, whose base is connected to a series node of said first transistor and said second transistor and is supplied with forward bias current, and whose emitter is connected with a series node of said first power source and said second

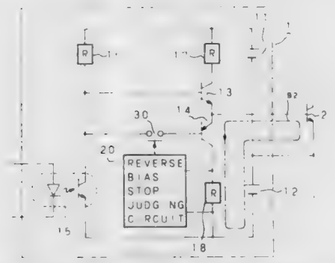
power source and is supplied with reverse bias current; and

a reverse bias stop judging circuit, connected between said second transistor and said second power source, having:

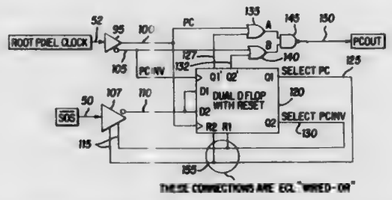
a detecting circuit, for detecting reverse bias current;

level detecting means for detecting when said reverse bias current continuously exceeds a set level for a predetermined time according to a detected output of said detecting circuit; and

means for temporarily stopping application of reverse bias to said semiconductor element to be controlled according to the detected output of said level detecting means and for restarting application of reverse bias to said semiconductor element after a predetermined time.



5,111,062
METHOD AND APPARATUS FOR REDUCING PIXEL CLOCK JITTER IN A LASER SCANNER
Timothy M. Hunter, Webster, N.Y.; Hung M. Pham, San Gabriel, Calif., and John L. Zanghi, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Aug. 23, 1991, Ser. No. 751,391
Int. Cl.[5] H03K *3/00*
U.S. Cl. 307—269 **6 Claims**



1. A method of reducing pixel clock jitter in a raster'scanner wherein a sensor generates a start of scan signal and a crystal oscillator generates a pixel clock signal, comprising the steps of:

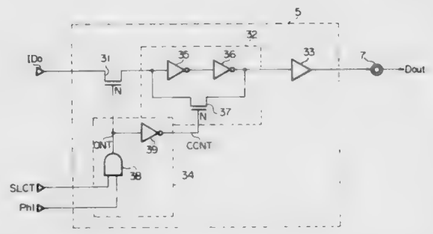
generating an inverted pixel clock signal from said pixel clock signal;

generating an inverted start of scan signal from said start of scan signal;

selecting one of said pixel clock signal and said inverted pixel clock signal based on which of said pixel clock signal and said inverted pixel clock signal has a rising edge closest to said start of scan signal, a selected one of said pixel clock signal and said inverted pixel clock signal being a select signal; and

replacing said pixel clock signal with the select signal.

5,111,063
INTEGRATED CLOCK DRIVER CIRCUIT
Toshiki Iwata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Feb. 5, 1990, Ser. No. 474,613
Claims priority, application Japan, Feb. 3, 1989, 1-24855
Int. Cl.[5] H03K *5/13, 19/00*
U.S. Cl. 307—269 **9 Claims**



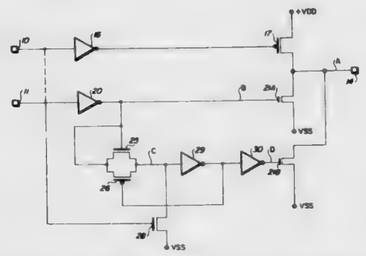
1. An integrated circuit comprising:

a) a clock signal producing circuit having a first clock driver responsive to a system clock signal and producing a first clock signal and a second clock driver responsive to the first clock signal, and producing a second clock signal delayed from the first clock signal,

b) an internal circuit responsive to said second clock signal and producing an output data signal; and

c) an output circuit coupled to a data output pin, said output circuit being responsive to said first clock signal for transferring said output data signal to the data output pin; wherein said output circuit comprises: a controlling circuit responsive to a selecting signal fed from the internal circuit and to said first clock signal fed from said first clock driver for producing a gate control signal and the complementary gate control signal, a latch circuit responsive to said complementary gate control signal for retaining said output data signal, a first gate transistor supplied with said output data signal fed from the internal circuit and responsive to said gate control signal for transferring the output data signal to the latch circuit, and an output buffer circuit coupled between the latch circuit and said data output pin.

5,111,064
SLOW RAMP HIGH DRIVE OUTPUT PAD
James Ward, Gilbert, Ariz., assignor to VLSI Technology, Inc., San Jose, Calif.
Filed Sep. 5, 1990, Ser. No. 577,980
Int. Cl.[5] H03K *17/60*
U.S. Cl. 307—270 **4 Claims**



1. A drive circuit for a CMOS output pad including in combination:

an output bonding pad;

a PMOS output transistor having a gate and having the drain-source path thereof connected between a relatively positive supply voltage VDD and said output bonding pad;

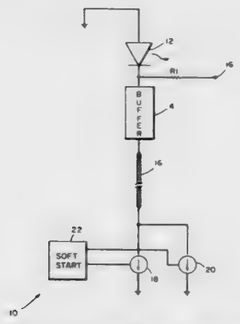
an NMOS output transistor means comprising first and second NMOS output transistors of approximately equal size, such that the physical geometry of each said first and second NMOS output transistors is substantially one-half that of a conventional NMOS transistor, said second NMOS output transistor having a high gate capacitance, and each of said first and second output transistors having a gate and having the drain source path thereof connected between said output bonding pad and a source of relatively negative supply potential VSS;

first supply means for supplying binary input drive signals to the gate of said PMOS output transistor;

display means;

second supply means providing a relatively low current for supplying said binary input drive signals to the gate of said first NMOS output transistor, said second supply means functioning as a current source to delay the turn-on of said first NMOS output transistor from a non-conductive condition to a fully conductive condition for a pre-determined time wherein said second supply means is connected to the gate of said second output NMOS transistor through said delay means for supplying said relatively low current thereto, causing delayed conductivity of said second NMOS output transistor from its non-conductive state to its fully conductive state, such that a relatively slow time ramp occurs to change the output voltage on said output bonding pad from a relatively high binary value to a relatively low binary value in response to corresponding changes of said binary input drive signals.

5,111,065
DIODE DRIVER CIRCUIT UTILIZING DISCRETE-VALUE DC CURRENT SOURCE
James K. Roberge, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Mar. 23, 1990, Ser. No. 497,993
Int. Cl.[5] H03K *3/01, 3/42, 3/26;* **H01S** *3/00*
U.S. Cl. 307—270 **27 Claims**

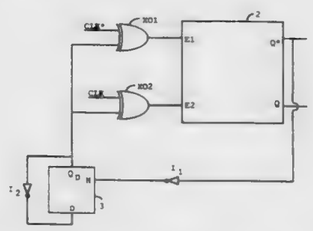


1. A driver circuit for a laser diode comprising:

a discrete-value DC current source for drawing a controlled current through the diode;

Darlington transistor pair buffer circuit electrically in series between the diode and the current source, the buffer circuit being physically located such that any substantial length of coupling between the diode and the current source is to the side of the buffer circuit away from the diode.

5,111,066
CLOCK FREQUENCY DOUBLER
Alain Artieri, Meylan, and Sylvain Kritter, Grenoble, both of France, assignors to SGS-Thompson Microelectronics S.A., Gentilly Cedex, France
Filed Feb. 12, 1991, Ser. No. 653,633
Claims priority, application France, Feb. 13, 1990, 90 02216
Int. Cl.[5] H03K *3/00*
U.S. Cl. 307—271 **8 Claims**



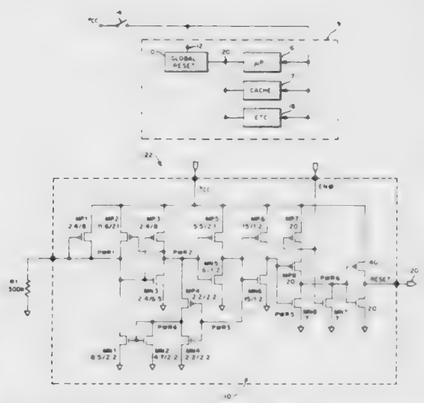
1. A circuit for generating non-overlapping complementary clock signals at a double frequency from an input clock signal, comprising:

an NAND flip-flop with NAND gates and complementary outputs on which said double frequency signals are available,

a D-type flip-flop having a data input, a clock input and an output receiving at its clock input one of the outputs of the NAND flip-flop, and the output of which is coupled to its data input through an invertor (I2), and

two Exclusive OR gates receiving on their first inputs the input clock signal and its complement, respectively, and on their second inputs the output of the D-type flip-flop, the outputs of said OR gates being connected to the inputs of said NAND flip-flop, respectively.

5,111,067
POWER UP RESET CIRCUIT
Keng L. Wong, and Joseph D. Schutz, both of Portland, Oreg., assignors to Intel Corporation, Santa Clara, Calif.
Filed Apr. 29, 1991, Ser. No. 692,487
Int. Cl.[5] H03K *17/20, 17/22, 17/24, 17/06*
U.S. Cl. 307—272.3 **9 Claims**



1. A reset circuit arrangement comprising:

(a) reset circuitry having an input for connection with a direct current power supply voltage which, when acti-

vated, rises from its minimum voltage level to its maximum voltage level over a period of time, and an output for connection with at least one circuit component to be reset, said circuitry providing a reset signal at said output upon initiation of said power supply voltage and until said power supply voltage reaches a predetermined level, at which time said reset signal is removed;

(b) a latching circuit which forms part of said reset circuitry and which operates in a first unlatched state in response to and until said power supply voltage reaches said predetermined voltage level for maintaining said reset signal, at which time said latching circuit operates in a second latched state for removing said reset signal, said latching circuit operating in its second, latched state so long as said power supply voltage remains above said predetermined level;

(c) means also forming part of said reset circuitry for grounding said latching circuit through a predetermined resistance; and

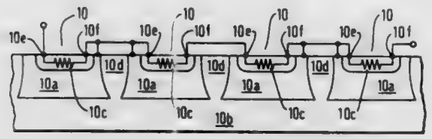
(d) said latching circuit including a plurality of transistors having a common gate which is grounded through said predetermined resistance so as to rapidly direct voltage away from said common gate of said latching circuit for causing said latching circuit to switch to its first state in the event said power supply voltage is interrupted and for preventing any coupling or leakage of current to said gate from causing said latching circuit to latch prematurely when it is in its unlatched state.

5,111,068

DIFFUSION RESISTOR CIRCUIT

Hiromi Kusakabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 30, 1988, Ser. No. 175,294
Claims priority, application Japan, Mar. 31, 1987, 62-78580
Int. Cl.[5] H01L *25/00, 27/02;* **H01C** *1/012*
U.S. Cl. 307—303.1 **3 Claims**



1. A diffusion resistor circuit comprising:

a plurality of diffusion resistors, each of said plurality of diffusion resistors including a substrate, an island area including an impurity of a first polarity diffused into the substrate, a resistor area including an impurity of a second polarity diffused into the island area and an input terminal and an output terminal;

means connecting the resistor areas of the plurality of diffusion resistors in series for supplying a current signal through the resistor areas so that the diffusion resistors are successively connected in adjacent pairs; and

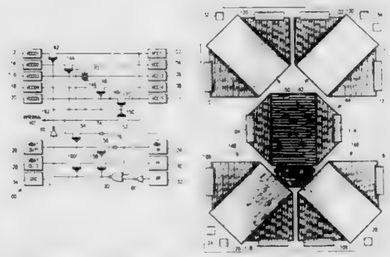
circuit means alternately connecting the island areas of each successive adjacent pair of diffusion resistors to the input terminal of one resistor area of the adjacent pair of diffusion resistors and the output terminal of the other resistor area of the adjacent pair of diffusion resistors for reducing distortion of the current signal.

5,111,069

LAYOUT OF INTEGRATED CIRCUIT WITH VERY LARGE TRANSISTORS

Kevin E. Deierling, and Gary V. Zanders, both of Dallas, Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 574,167, Aug. 27, 1990, abandoned. This application Mar. 27, 1991, Ser. No. 676,133
Int. Cl.[5] H03K *3/335, 3/353*
U.S. Cl. 307—303.2 **100 Claims**



1. An integrated circuit, comprising:

a plurality of n-channel field effect transistors, each having predominantly lateral current flow;

a plurality of p-channel field effect transistors, each having predominantly lateral current flow, including four or more externally-accessible p-channel field effect switching transistors, each comprising a gate and first and second source/drain regions, and

each respectively having an effective gate width of 30,000 microns or more, and

each having an effective active area of more than 5% of the total area of said integrated circuit; and

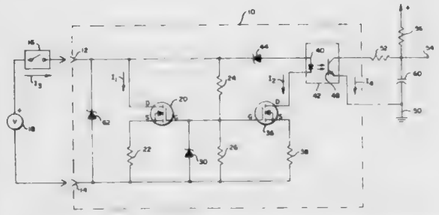
a plurality of wide metal leads, each operatively connected to link a respective source/drain terminal of one of said switching transistors to a corresponding external contact pad.

5,111,070

DC INPUT CIRCUIT WITH CONTROLLED LEAKAGE CURRENT

Timothy J. Murphy, Hudson, and Thaddeus A. Weber, Richmond Heights, both of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jan. 18, 1991, Ser. No. 643,251
Int. Cl.[5] H03K *3/42, 17/72*
U.S. Cl. 307—311 **5 Claims**



1. A DC input circuit receiving an input voltage spanning a low range and a high range and producing a digital output having a first state when the input voltage is in the high range and a second state when the input voltage is in the low range, and for allowing an input leakage current with the input voltage, the input circuit comprising:

a pair of input terminals for receiving the input voltages and input leakage control;

a first controllable current source means connected across first and second terminals for conducting a first current at a first input voltage value in the low range, and holding the first current flow constant at a first non-zero predetermined value for all input voltages about a second input voltage value no less than the first input voltage value;

a current responsive switch for generating the first state of the digital output only in response to current flow through the current responsive switch;

a second controllable current source means connected in series with the current responsive switch for holding the current through the current responsive switch a second non-zero predetermined value; and

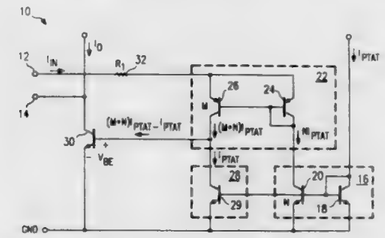
a voltage threshold device in series with the current responsive switch and the second controllable current source, the series combination being connected across the first and second terminal, for preventing the flow of current through the current responsive switch and the second controllable current source for input voltages not within the high range.

5,111,071

THRESHOLD DETECTION CIRCUIT

Stephen C. Kwan, Plano, and Steven C. Jones, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 423,824, Oct. 19, 1989, abandoned. This application Apr. 3, 1991, Ser. No. 681,439
Int. Cl.[5] H03K *5/153*
U.S. Cl. 307—350 **28 Claims**



1. A threshold detection circuit comprising:

an input node for receiving an input voltage;

a first circuit coupled to a reference current;

a second circuit coupled to said first circuit, said second circuit producing a first current proportional to said reference current, wherein said first current is larger than said reference current;

a current sink coupled to said first current for sinking a portion of said current;

a resistive element coupled between said node and said second circuit; and

an output circuit coupled to said current sink, said output circuit providing an output voltage in response to said input voltage exceeding a predetermined threshold.

5,111,072

SAMPLE-AND-HOLD SWITCH WITH LOW ON RESISTANCE AND REDUCED CHARGE INJECTION

Durbin L. Seidel, Fort Collins, Colo., assignor to NCR Corporation, Dayton, Ohio

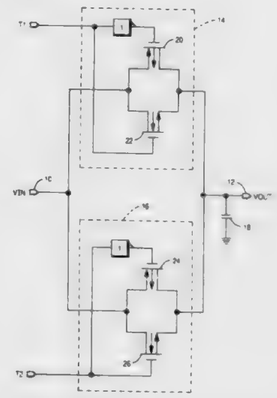
Filed Aug. 29, 1990, Ser. No. 574,176
Int. Cl.[5] C11C *27/02;* **H03K** *17/16, 17/687*
U.S. Cl. 307—353 **11 Claims**

1. A sample-and-hold circuit comprising:

an input terminal for receiving an analog voltage signal;

storage means for storing a charge representative of said analog voltage;

a first MOS switch connected between said input terminal and said storage means for selectively providing a current path between said input terminal and said storage means for a first predetermined period of time so as to supply charge to said storage means, said first switch having a low on- r resistance; and



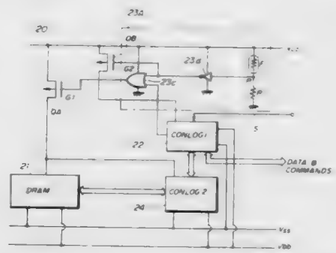
a second MOS switch connected between said input terminal and said storage means for selectively providing a current path between said input terminal and said storage means for a second predetermined period of time so as to supply charge to said storage means, said second switch having low charge injection characteristics.

5,111,073

WAFER-SCALE SEMICONDUCTOR DEVICE HAVING FAIL-SAFE CIRCUIT

Takaaki Suzuki, Kawasaki, and Takeo Tatematsu, Sagamihara, both of Japan, assignors to Fujitsu Limited, Japan

Filed Sep. 13, 1990, Ser. No. 581,951
Claims priority, application Japan, Sep. 19, 1989, 1-244078; Dec. 18, 1989, 1-327532
Int. Cl.[5] H01J *19/82;* **H03K** *3/01*
U.S. Cl. 307—442 **20 Claims**



1. A wafer-scale semiconductor device comprising:

a wafer; and

a plurality of functional blocks formed on said wafer, wherein said functional blocks include a functional block which includes

an internal circuit,

switching means for selectively connecting said internal circuit to a power supply line in response to a control signal,

control logic circuit means, coupled to said internal circuit, for supplying data to said internal circuit and reading out data from said internal circuit and for generating a logic signal used for controlling said switching means, said logic

signal based on whether or not said internal circuit is defective, and

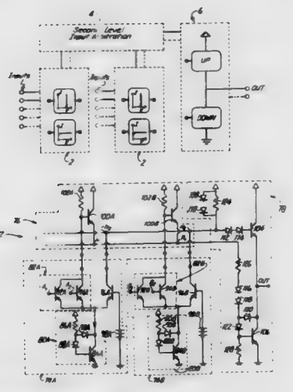
fail-safe means, coupled to said switching means and said control logic circuit means and including a circuit element having a status showing whether or not said control logic circuit means is malfunctioning, said fail-safe means for generating said control signal based upon 1) said logic signal and 2) the status of said circuit element, wherein when said circuit element has the status showing that said control logic circuit means is malfunctioning, said fail-safe means outputs said control signal which instructs said switching means to disconnect said internal circuit from said power supply line irrespective of said logic signal.

5,111,074

MULTI-INPUT COMPOUND FUNCTION COMPLEMENTARY NOISE-IMMUNE LOGIC

Roger J. Gravrok, Eau Claire, Wis., and Raymond M. Warner, Jr., Edina, Minn., assignors to Regents of the University of Minnesota, St. Paul, Minn.

Filed Jul. 26, 1990, Ser. No. 559,162
Int. Cl.[5] H03K *17/16, 19/086, 19/003, 17/30*
U.S. Cl. 307—443 **19 Claims**



1. A digital logic circuit comprising:

a first logical subfunction comprising:

a multi-input active circuit with a plurality of input nodes, the circuit having a non-conductive state when all of the plurality of input nodes are low and a conductive state when one of the input nodes is high;

a constant-voltage element connected to the multi-input active circuit, which has a non-conducting state and a conducting state and provides a generally constant voltage drop when in the conducting state, which determines a transition voltage at which an input of the multi-input active circuit causes the multi-input active circuit to change between the non-conductive and the conductive state;

a constant-current element connected to the multi-input active circuit to establish a constant current through the constant-voltage element when the constant-voltage element is in the conductive state, wherein a voltage at any of the plurality of inputs to the multi-input active circuit may be greater than the transition voltage;

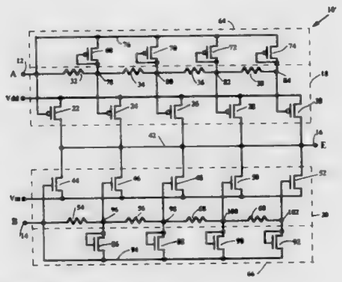
a second-level arbitration circuit connected to the first logical subfunction for producing mutually exclusive pull-up and pull-down control signals as a function of the multi-input active circuit; and an output stage connected to the second-level arbitration circuit having a pull-up driver responsive to the pull-up control signal and a pull-down driver responsive to the pull-down control signal.

5,111,075

REDUCED SWITCHING NOISE OUTPUT BUFFER USING DIODE FOR QUICK TURN-OFF

Thomas V. Ferry, San Jose; Jamil Kawa, Santa Clara; Kerry M. Pierce, Fremont; William G. Walker, Saratoga, and Michael A. Zampaglione, San Jose, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 316,894, Feb. 28, 1989, abandoned. This application Mar. 5, 1991, Ser. No. 665,385
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—443 **19 Claims**



1. A buffer comprising:

input terminal means and output terminal means;

a linear array of switch elements where each switch element has a control input for switching said switch element on and off, each switch element being coupled between said output terminal and a terminal of an electrical power source;

means coupling a control input of a first one of said switch elements to said input terminal means;

delay means coupling a control input of each switch element to the control input of a next switch element; and

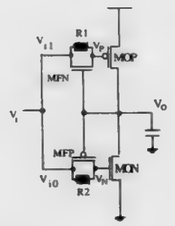
diode means coupled between said input terminal means and said delay means to provide a unidirectional current bypass of said delay means.

5,111,076

DIGITAL SUPERBUFFER

Min Ming Tarng, 1367 Glenmoor Way, San Jose, Calif. 95129

Filed Sep. 5, 1990, Ser. No. 577,791
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—446 **17 Claims**



1. A buffer comprising

a first and second supply voltages,

an output stage comprising an output terminal, a first transistor connected between said output terminal and said first supply voltage, a second transistor connected between said output terminal and said second supply voltage,

an input terminal,

a first control means connected between said input terminal and said first transistor,

a second control means connected between said input terminal and said second transistor,

said first control means comprising a third transistor having a gate connected to said output terminal and forming a current path between said input terminal and a gate of said first transistor,

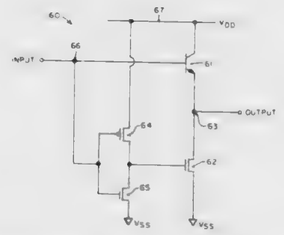
said second control means comprising a fourth transistor having a gate connected to said output terminal and forming a current path between said input terminal and a gate of said second transistor.

5,111,077

BICMOS NONINVERTING BUFFER AND LOGIC GATES

Ian A. Young, and Jeffrey K. Greason, both of Portland, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 540,342, Jun. 19, 1990, Pat. No. 5,049,765. This application Mar. 22, 1991, Ser. No. 673,648
Int. Cl.[5] H03K *19/02*
U.S. Cl. 307—446 **7 Claims**



1. A BiCMOS circuit providing non-inverting logic operation comprising:

a first bipolar transistor having its collector coupled to a first operating potential, its base connected to an input node and its emitter coupled to an output node;

a first field-effect device coupled between said output node and a second operating potential;

second and third field-effect devices coupled as a CMOS inverter connected between said first and second operating potentials, the output of said inverter being coupled to the gate of said first field-effect device;

the gates of said second and third field-effect devices being connected to said input node such that when a logical high signal is applied to said input node said output node is driven to a high logic gate and when a logical low signal is applied to said input node said output node is driven to a low logic state approximately equal to said second operating potential.

5,111,078

INPUT CIRCUIT FOR LOGIC CIRCUIT HAVING NODE AND OPERATING METHOD THEREFOR

Hiroshi Miyamoto, and Kazutoshi Hirayama, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

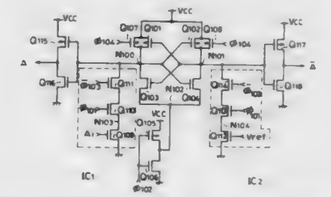
Continuation of Ser. No. 479,662, Feb. 13, 1990, abandoned. This application Sep. 9, 1991, Ser. No. 758,764
Claims priority, application Japan, Feb. 15, 1989, 1-35409
Int. Cl.[5] H03K *19/096, 17/16*
U.S. Cl. 307—451 **29 Claims**

1. A semiconductor device having an input circuit coupled to an input node of a logic circuit, comprising:

input means for providing an input signal in response to a signal externally applied to said semiconductor device, to be coupled to said logic circuit,

first and second transistors connected in series between a first terminal and a second terminal, said first terminal being connected to said input means and said second terminal being directly connected to said logic circuit input node,

first clock signal generator means for applying a first clock signal to a control electrode of said first transistor at a first time to render said first transistor conductive,



second clock signal generator means for applying a second clock signal to said second transistor at a second time, subsequent to said first time, to render said second transistor non-conductive,

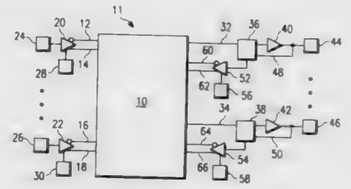
wherein said input signal is applied from said input means to said logic circuit input node through the first and second transistors during the time interval between said first time and said second time.

5,111,079

POWER REDUCTION CIRCUIT FOR PROGRAMMABLE LOGIC DEVICE

Randy C. Steele, Southlake, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jun. 29, 1990, Ser. No. 545,921
Int. Cl.[5] H03K *19/177*
U.S. Cl. 307—465 **17 Claims**



1. A programmable logic device comprising:

a plurality of inputs;

a logic array, connected to said inputs, to define a logic function thereof;

a storage element connected to each input for storing configuration information for selectively disabling its associated input;

a plurality of outputs connected to said array;

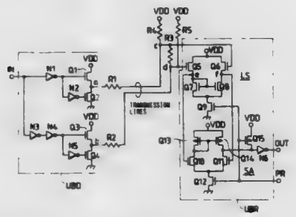
a programming buffer for holding programming data to program a portion of the device;

a plurality of memory elements connected to said programming buffer for storing a copy of data input previously thereto;

comparison circuitry connected to said programming buffer and said memory elements for generating a comparison signal indicative of a match between data in said buffer and data in said plurality of memory elements; and

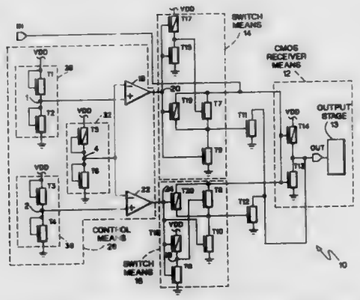
means for storing configuration information in said storage elements based upon the comparison signal.

5,111,080
COMPLEMENTARY SIGNAL TRANSMISSION CIRCUIT WITH IMPEDANCE MATCHING CIRCUITRY
Masao Mizukami, Yokohama, and Yoichi Sato, Iruma, both of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan
Filed Nov. 13, 1990, Ser. No. 614,071
Claims priority, application Japan, Nov. 21, 1989, 1-302515
Int. Cl.[5] H03K *19/0175*
U.S. Cl. 307—475 **24 Claims**



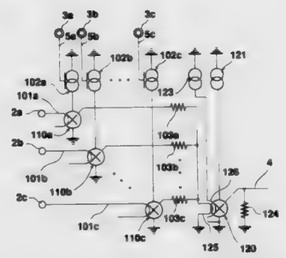
1. A signal transmission circuit comprising:
a transmission-side output circuit for outputting complementary output signals therefrom in response to signals to be transmitted;
resistor means connected in series to output terminals, respectively, of said output circuit;
terminating resistors whose resistances are adapted to be matched with the characteristic impedances of transmission lines for transmitting the complementary output signals; and
a receiving input circuit, having an input portion, a level shifting circuit connected to said input portion for level shifting an input signal, and a high-input impedance type differential amplifying circuit connected to said level shifting circuit, said receiving input circuit being used to receive the output signals transmitted from said output circuit.

5,111,081
PROCESS COMPENSATED INPUT SWITCHING THRESHOLD OF A CMOS RECEIVER
Francois I. Atallah, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 20, 1990, Ser. No. 630,576
Int. Cl.[5] H03K *19/017, 5/153, 19/092, 19/094*
U.S. Cl. 307—475 **13 Claims**



1. A circuit arrangement for interfacing the input of a CMOS receiver with other circuits comprising:
an inverter having two series connected FET devices, with each FET device having a gate electrode for receiving an input signal and one of its other electrodes coupled to an output node;
a plurality of FET devices coupled to the output node and in parallel with one of the series-connected FET devices;
a plurality of switching means, with each switching means having an output node connected to a gate electrode of one of the plurality of FET devices and an input node; and
a control means for generating a plurality of control signals with each signal coupled to the input of each switching means and representing a difference between a maximum switching threshold voltage level spread for the CMOS technology used to manufacture the CMOS receiver and selected switching threshold voltage level spreads within said maximum threshold voltage level spread.

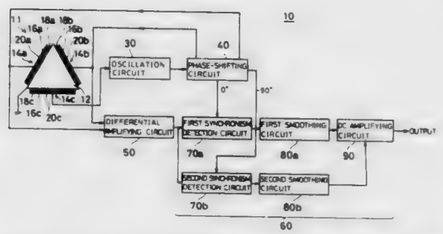
5,111,082
SUPERCONDUCTING THRESHOLD LOGIC CIRCUIT
Yutaka Harada, Nishitama, Japan, assignor to Research Development Corporation of Japan, Tokyo, Japan
Filed Jul. 12, 1990, Ser. No. 551,495
Claims priority, application Japan, Jul. 28, 1989, 1-196115
Int. Cl.[5] H03K *17/92*
U.S. Cl. 307—476 **6 Claims**



1. A superconducting threshold logic circuit comprising:
a plurality of first current switching circuits each having
a first Josephson device having at least one Josephson junction which causes transition between a superconduction state and a voltage state by applying an input signal,
a variable bias current supply means for supplying bias current to the Josephson device, and
a load resistor through which all or part of the bias current applied to the Josephson device flows during the voltage state; and a second current switching circuit having a second Josephson device for receiving a sum of currents flowing through the load resistors of the first current switching circuits, whereby the bias currents of said first current switching circuits are controlled independently to change weights for the input signals and said second current switching circuit determines whether the sum of currents is greater than a threshold value of the second Josephson device.

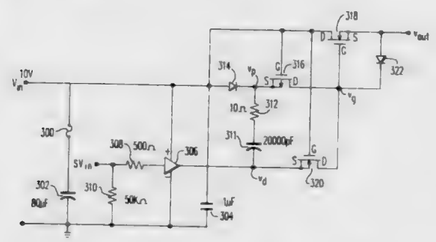
5,111,083
DETECTION CIRCUIT FOR DETECTING A PREDETERMINED SIGNAL FROM A COMPOSITE SIGNAL
Takeshi Nakamura, Uji, Japan, assignor to Murata Manufacturing Co., Ltd., Japan
Filed Nov. 29, 1990, Ser. No. 620,185
Claims priority, application Japan, Nov. 30, 1989, 1-312662
Int. Cl.[5] H03K *9/06;* **H03D** *13/00*
U.S. Cl. 307—527 **5 Claims**

1. A detection circuit comprising:
a first synchronism detection circuit for synchronous detection of an input signal;
a second synchronism detection circuit for synchronous detection of said input signal separately from said first synchronism detection circuit;
a phase-shifting circuit, connected to said first and second synchronous detection circuits, for outputting a signal having a first phase to said first synchronism detection circuit and having a second phase to said second synchronism detection circuit;
a first smoothing circuit, connected to said first synchronous detection circuit, for smoothing an output of said first synchronism detection circuit;



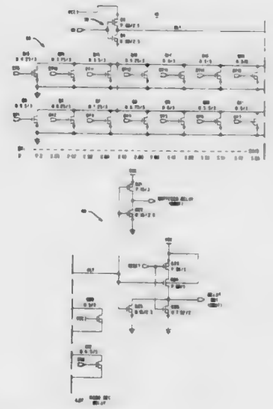
a second smoothing circuit, connected to said second synchronous detection circuit, for smoothing an output of said second synchronism detection circuit; and
a composite circuit, connected to said first and second smoothing circuits, for adding outputs of said first smoothing circuit and said second smoothing circuit and for outputting a composed signal.

5,111,084
LOW LOSS DRAIN PULSER CIRCUIT FOR SOLID STATE MICROWAVE POWER AMPLIFIERS
Scott K. Suko, Columbia, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 31, 1990, Ser. No. 531,065
Int. Cl.[5] H03K *19/086, 17/16*
U.S. Cl. 307—571 **20 Claims**



1. A control circuit for applying a power signal from a power source to a power output at a high switching frequency, comprising:
a. N-channel switching means connected to the power source, having a control gate, for selectively transmitting the power signal to the power output of the control circuit during an active state which is entered in response to a gate bias voltage applied to the gate;
b. control input means for receiving a power application signal indicating that power is to be applied to the power output and for providing a control signal in response thereto;
c. a charge pumping circuit connected to the control input means and the gate of the N-channel switching means comprising a capacitor for storing a stored charge and first and second complementary transistor switching means for applying the stored charge to the gate of the N-channel switching means upon receipt of the control signal provided by the control input means, so as to temporarily increase said gate bias voltage to the N-channel switching means, thus causing the N-channel switching means to enter its active state.

5,111,085
DIGITALLY CONTROLLED DELAY CIRCUIT
John W. Stewart, Wichita, Kans., assignor to NCR Corporation, Dayton, Ohio
Filed Apr. 29, 1987, Ser. No. 43,778
Int. Cl.[5] H03K *5/13;* **G11C** *11/34*
U.S. Cl. 307—603 **9 Claims**



1. A delay circuit comprising:
a first resistance;
an inverter circuit coupled between a first voltage source and a reference potential by said first resistance for receiving a signal to be delayed;
a plurality of different size resistances connectable in parallel to said first resistance;
a distributed capacitance circuit coupled to the output of said inverter circuit so that current flows between said inverter circuit and said distributed capacitance circuit and charges the capacitance of said distributed capacitance circuit, said distributed capacitance circuit inverting the signal on the output of said inverter circuit and providing a signal delay as a function of the charging of the capacitance of said distributed capacitance circuit; and
means for selecting one of said plurality of different size resistances to be actively connected in parallel with said first resistance, so that the amount of the current available to charge the capacitance of said distributed capacitance current may be increased.

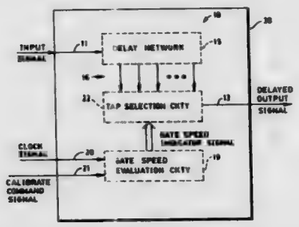
5,111,086
ADJUSTING DELAY CIRCUITRY
Paul R. Back, Groton, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.
Filed Nov. 19, 1990, Ser. No. 615,729
Int. Cl.[5] H03K *5/13, 5/159, 3/01*
U.S. Cl. 307—603 **3 Claims**

1. Delay circuitry for introducing a delay between INPUT SIGNALS and DELAYED OUTPUT SIGNALS derived from said INPUT SIGNAL, said delay circuitry having an input port to receive said INPUT SIGNALS and a delayed signal output port to emit said DELAYED OUTPUT SIGNALS, said delay circuitry including
a delay network having a plurality of gates connected to receive said INPUT SIGNALS and to pass a signal derived from a received INPUT SIGNAL through successive gates of said delay network, said delay network hav-

ing taps connected sequentially so that different taps emit signals that have passed through a different number of gates,

gate speed evaluation circuitry including gates and having means to receive CALIBRATE COMMAND SIGNALS,

said gate speed evaluating circuitry including means for generating in response to a received CALIBRATE COMMAND SIGNAL a GATE SPEED INDICATOR SIGNAL indicative of the operating speed of gates in the gate speed evaluating circuitry,



tap selection circuitry connected to receive GATE SPEED INDICATOR SIGNALS from said gate speed evaluating circuitry and including

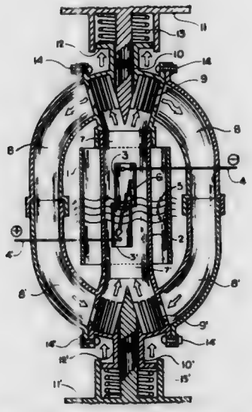
means for selecting and connecting to the delayed signal output port one of said taps, such selecting being controlled by a received GATE SPEED INDICATOR SIGNAL, the tap selected being such that there is a direct relationship between the operating speed of gates in the gate speed evaluation circuitry and the number of gates between the input port and the selected tap, said delay network and said delay evaluation circuitry being on one chip.

5,111,087

PROPULSION SYSTEM

Kemal Butka, 372 Central Park West, Apt. 20J, New York, N.Y. 10025

Filed Dec. 13, 1990, Ser. No. 626,955
Int. Cl.[5] H02K *44/02*
U.S. Cl. 310—11 **13 Claims**



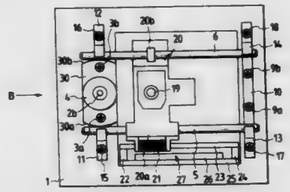
1. A propulsion system, comprising means generating electric current; means generating a magnetic field substantially perpendicular to the electric current; and means forming a duct arranged so that by interaction of the magnetic field and the electric current a force in a liquid accommodated in said duct is produced and the liquid is moved to apply a thrust, said means forming a duct being formed as a closed duct so that the liquid circulates in the duct and does not escape from it, said duct having an axis and including a core duct portion arranged in the region of said means for generating an electric current and means for generating a magnetic field, at least one side duct portion communicating with said core duct portion, and a transition duct portion communicating said side duct portion with said core duct portion, said transition duct portion being formed by a least one slot.

5,111,088

GUIDE RAIL MOUNTING STRUCTURE

Masahisa Fujino, Musashino, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1989, Ser. No. 424,191
Claims priority, application Japan, Oct. 28, 1988, 63-272286
Int. Cl.[5] H02K *41/00*
U.S. Cl. 310—12 **19 Claims**



1. A guide rail mounting structure using a motor, comprising:

a motor having a stator portion;

a chassis to which said motor is fixed; and

a guide rail positioned in contact with said stator portion of said motor, wherein

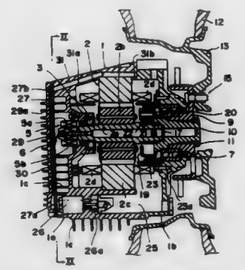
said stator portion of said motor is an outer peripheral surface of a motor base portion for fixing said motor to said chassis.

5,111,089

COOLING DEVICE FOR A VEHICLE MOTOR

Satoru Wakuta, Anjo, and Shinichi Otake, Aichi, both of Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Apr. 24, 1991, Ser. No. 690,159
Int. Cl.[5] H02K *5/18, 5/20, 9/19*
U.S. Cl. 310—54 **2 Claims**



1. A cooling device for a vehicle motor comprising:

a rotation shaft rotatably supported by a casing assembly;

a rotor fixed to said rotation shaft;

a stator disposed around said rotor and fixed to said casing assembly;

a coil wound around said stator;

an oil pump motor disposed at a lower portion of said casing assembly;

an oil passage facing said coil and formed in an upper portion of said casing assembly;

a cooling fin formed on a side wall of said casing assembly;

a separator plate being in contact with said cooling fin;

an oil passage cover combined with said separator plate to form an oil passage therebetween; and

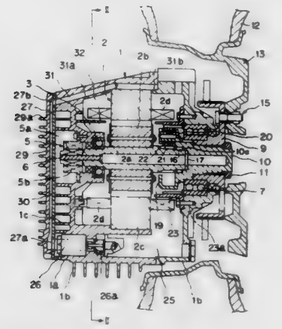
a cooling fin formed on said oil passage cover.

5,111,090

COOLING DEVICE OF A MOTOR FOR VEHICLE

Shin-ichi Otake, Aichi, and Satoru Wakuta, Anjo, both of Japan, assignors to Aisin Aw Co., Ltd., Japan

Filed Nov. 7, 1990, Ser. No. 611,803
Claims priority, application Japan, Nov. 7, 1989, 1-290828
Int. Cl.[5] H02K *9/00, 9/20*
U.S. Cl. 310—54 **14 Claims**



1. An oil-cooled electric motor for a vehicle comprising:

a casing;

a rotational shaft rotatably supported by the casing;

a wheel mounted on said rotational shaft;

a stator disposed around the circumference of said rotor;

a coil wound around the stator;

cooling means for supplying a flow of cooling oil onto the outer circumference of the coil; and

oil guide means, extending from one side of the casing and disposed adjacent the inner circumference of said coil, for preventing the cooling oil from running onto said rotor.

5,111,091

RELUCTANCE TYPE ELECTRIC MOTOR

Itsuki Bahn, Tokyo, Japan, assignor to Kabushikigaisha Sekogiken, Tokyo, Japan

PCT No. PCT/JP90/01128, § 371 Date May 1, 1991, § 102(e) Date May 1, 1991, PCT Pub. No. WO91/03868, PCT Pub. Date Mar. 21, 1991
PCT Filed Sep. 4, 1990, Ser. No. 689,051
Claims priority, application Japan, Sep. 8, 1989, 1-231433
Int. Cl.[5] H02K *11/00, 17/12;* **H02P** *3/08, 3/14*
U.S. Cl. 310—68 B **3 Claims**

1. A two-phase reluctance type electric motor capable of effecting regenerative braking including a DC power source having a positive side and a negative side, comprising:

a position detecting device for detecting positions of salient poles of a rotor by use of a plurality of position detection elements fixed on a fixed armature side with a preset separation angle and deriving an electrical signal having first, second, third and fourth position detection signals of a width of 90 electrical degrees which are cyclically generated to continue to one another without being superposed on one another;

a plurality of first and second exciting coils each having first and second ends;

first semiconductor switching elements series-connected to the first and second ends of said first and second exciting coils, said plurality of first exciting coils and said plurality of second exciting coils respectively forming first- and second-phase exciting coils;

first diodes connected in a reverse direction to the series-connected bodies of said first semiconductor switching elements and said exciting coils;

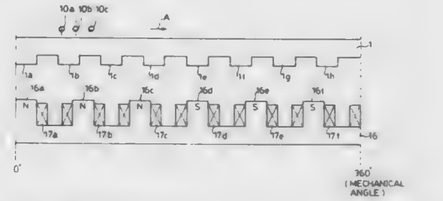
an energization control circuit for energizing said first semiconductor switching elements series-connected to both ends of said first and second exciting coils according to the first, second, third and fourth position detection signals to energize said exciting coils by means of a DC power source so as to rotate the motor in a forward direction or energizing said first semiconductor switching elements series-connected to said first and second exciting coils according to the position detection signals which cause reverse-rotation torque to energize said exciting coils by means of said DC power source so as to rotate the motor in a reverse direction;

a detection circuit for deriving detection signals proportional to exciting currents flowing in said exciting coils;

first and second chopper circuits for holding said exciting currents to preset values according to the detection signal outputs of said detection circuit;

a second diode for reverse current prevention connected to the DC power source;

a second semiconductor switching element for short-circuiting connected in parallel with said second diode, the



current conducting direction being set to an opposite direction;

an electric circuit for holding said second semiconductor switching element for short-circuiting in an OFF state for a first period of time corresponding to a short time length of an electrical signal obtained at an end of the first, second, third and fourth position detection signals and holding said second semiconductor switching element in an ON state during a second period of time in response to the electrical signal;

an electric circuit for preventing magnetic energy stored in one of said exciting coils when energization of a corresponding one of said exciting coils is interrupted at the end of a corresponding one of the position detection signals is fed back to the DC power source via said second diode of reverse current prevention connected switching element for short-circuiting, causing the stored magnetic energy to flow into the exciting coils to be energized by a next one of the position detection signals to rapidly extinguish the same and eliminating counter torque and reduced torque which are respectively generated by energization caused by discharge of the magnetic energy and energization caused from a starting portion of the position detection signal until the exciting current rises to a preset value;

an electric circuit for making the rise of current during the energization by said chopper circuit steeper by adding together the electromotive force caused by reduction in the amount of flux crossing the exciting coils and the DC power source voltage when a rotating operation is changed to a reverse rotation mode during the forward rotating direction and making the fall of the DC power

source voltage dull to effect electromagnetic braking by supplying current to the positive side of the DC power source via said second semiconductor switching element for short-circuiting by a voltage obtained by adding together the electromagnetic force caused by reduction in the amount of flux crossing the exciting coils in the falling portion of current and the electromagnetic force caused by discharge of magnetic energy stored in the exciting coils so as to regenerate electric power; and

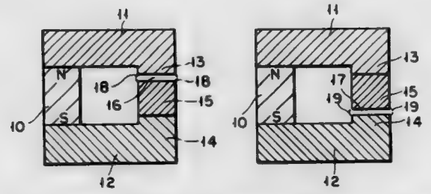
means for adjusting and fixing the positions of said position detection elements so that energization of said exciting coils can be effected to make the output torque of said exciting coils maximum.

5,111,092

DEVICE FOR SENSING RECIPROCATED ARMATURE POSITION

Robert H. Reinicke, Mission Viejo, Calif., assignor to Marotta Scientific Controls, Inc., Montville, N.J.

Filed Mar. 1, 1991, Ser. No. 664,595
Int. Cl.[5] H02K *33/00;* **H01L** *43/06;* **G01R** *33/06;* **F16K** *31/06*
U.S. Cl. 310—68 B **10 Claims**



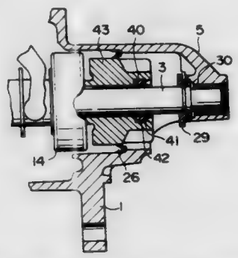
10. A position-sensing device, comprising a magnetic circuit including a core element defining a gap between two opposed pole faces, and an armature element movable between a first position of adjacency to one of said pole faces and a second position of adjacency to the other of said pole faces, there being a gap between said armature and said one pole face when said armature element is in said second position and a gap between said armature element and said other pole face when said armature element is in said first position, means for polarizing said circuit, and fringe-flux detection means local to and laterally adjacent said one pole face for detecting whether said armature element is in said first or said second position.

5,111,093

ENGINE STARTER WITH DUST SEAL ARRANGEMENT

Toshinori Tanaka, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Aug. 29, 1990, Ser. No. 574,181
Claims priority, application Japan, Aug. 31, 1989, 1-223077
Int. Cl.[5] H02K *7/118;* **F02N** *15/06;* **F16J** *15/32*
U.S. Cl. 310—88 **11 Claims**



1. An engine starter for use with an internal combustion engine having an engine ring gear, comprising:

a housing having an opening:

an electric motor having a rotary shaft rotatably disposed within said housing;

a pinion gear rotatably mounted on said rotary shaft, said pinion gear being axially slidable along said rotary shaft between an actuated position in which said pinion gear is moved forward and engages the engine ring gear through said opening in said housing and an inactuated position in which said pinion gear is moved rearward and disengages from the engine ring gear;

a unidirectional clutch disposed between said pinion gear and said rotary shaft for unidirectionally transmitting a rotation of said rotary shaft to said pinion gear;

electromagnetic drive means for electromagnetically driving said pinion gear between said actuated position and said inactuated position and controlling energization of said electric motor; and

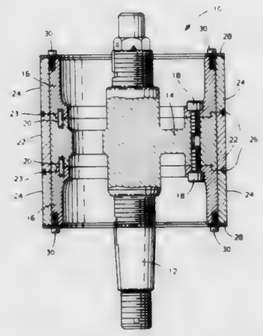
seal means disposed between said rotary shaft and said pinion gear for sealing therebetween against ingress of any foreign matter thereinto, said seal means comprising a seal ring having a lip extending substantially forwardly and inwardly such that an inner edge thereof contacts an outer surface of said rotary shaft.

5,111,094

PERMANENT MAGNET ROTOR HAVING MAGNET RETENTION APPARATUS

Balkrishna R. Patel, Troy, and Andrew L. Bartos, Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 3, 1991, Ser. No. 754,091
Int. Cl.[5] H02K *21/12, 15/14*
U.S. Cl. 310—156 **6 Claims**



1. A permanent magnet rotor for an electric motor comprising:

a rotor shaft;

segmented rotor core means including a primary core segment secured to said rotor shaft and at least one secondary core segment secured to said primary segment in coaxial abutting relationship therewith;

primary and secondary permanent magnets secured to outer circumferential surfaces of said primary and secondary segments to define juxtaposed magnet surfaces where said primary and secondary magnets abut, the juxtaposed surfaces being undercut to form a groove which encircles the primary and secondary magnets at said juxtaposed magnet surfaces;

a retaining ring seated into said groove, said ring retaining the magnets securely to the rotor, overcoming centrifugal force generated by rotation of the rotor; and

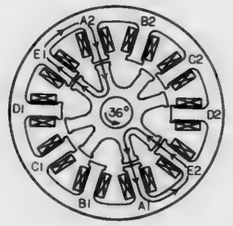
end rings attached to axial ends of the rotor, said end rings retaining the magnets securely to rotor, overcoming the centrifugal force generated by rotation of the rotor.

5,111,095

POLYPHASE SWITCHED RELUCTANCE MOTOR

James R. Hendershot, Hillsboro, Ohio, assignor to Magna Physics Corporation, Hillsboro, Ohio

Filed Nov. 28, 1990, Ser. No. 619,057
Int. Cl.[5] H02K *19/20*
U.S. Cl. 310—168 **11 Claims**



3. A switched reluctance motor driven by a polyphase source comprising:

a stator having a yoke and a plurality of evenly spaced salient poles distributed on the yoke such that adjacent poles are separated by an angle α_1; and

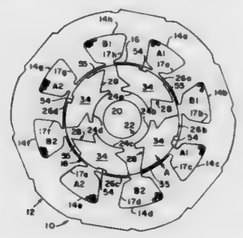
a rotor mounted for rotation relative to the stator and having a plurality of evenly spaced pairs of salient poles, where the spacing between adjacent poles of different pairs equals the angle α_2 and the spacing between poles of a pair equals the angle α_1 and the numbers of the plurality of stator and rotor poles are such that at least two pairs of rotor poles may be simultaneously radially aligned with selected ones of the poles of the stator.

5,111,096

ISOLATED SEGMENTAL SWITCH RELUCTANCE MOTOR

Gary E. Horst, Manchester, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 15, 1991, Ser. No. 670,313
Int. Cl.[5] H02K *15/02, 3/18*
U.S. Cl. 310—168 **16 Claims**



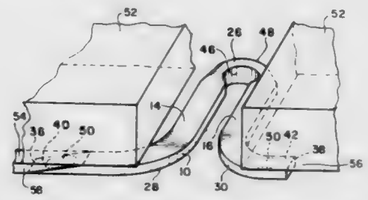
1. A two-phase, unidirectional switched reluctance motor having a rotor comprising a plurality of radially extending pairs of teeth, each tooth being formed of stacked laminations with each stack being magnetically isolated from every other stack of laminations; a stator having a central bore in which the rotor is disposed for rotation, the stator comprising an even and equal number of stator poles and salient teeth; and, magnetizing phase windings with which the stator is wound, the phase windings comprising coils mounted on the stator and spanning two adjacent stator teeth, the windings selectively generating magnetic fields extending from the stator poles into the central bore, the operation of the motor being such that when each phase is energized, all the rotor and stator teeth are producing positive torque for a specific angular span of rotor rotation.

5,111,097

ROTOR POLE CROSSOVER

Mark B. Londergan, Orlando; Albert C. Sismour, Jr., Casselberry, both of Fla., and John E. Richardson, Alexandria, Va., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1990, Ser. No. 621,119
Int. Cl.[5] H02K *56/00;* **H92K** *41/00*
U.S. Cl. 310—261 **11 Claims**



1. A rotor pole crossover for a generator having a shaft and a winding around said shaft, said crossover, comprising:

a body having first and second legs of a certain thickness and width joined by a substantially U-shaped portion,

wherein said substantially U-shaped portion includes a first open end, a second closed end, a top and a bottom, said bottom being arranged to face said shaft, and

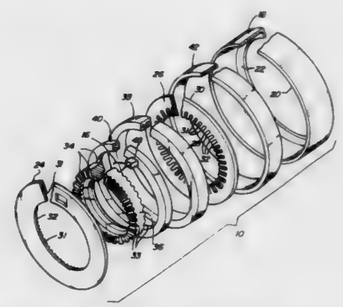
wherein the substantially U-shaped portion thins from the first end to the second end relative to the width of the legs, but thickens from top to bottom, relative to the thickness of the legs.

5,111,098

UNITARY ROTATIONAL SPEED SENSOR

David E. Peck; George E. Platzer, both of Rochester Hills; Dennis A. Kramer, and William D. Krusel, both of Troy, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 236,689, Aug. 24, 1988, abandoned. This application Jan. 12, 1990, Ser. No. 463,736
Int. Cl.[5] H02K *1/22, 11/00, 17/42;* **G01P** *3/48*
U.S. Cl. 310—268 **53 Claims**



1. A rotational speed sensor, comprising:

a stator including two coaxial, axially spaced elements;

said elements having first and second radially extending

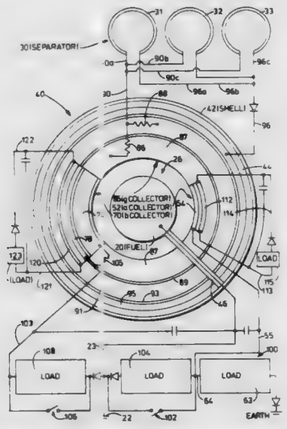
said first radial portions having alternating circumferentially spaced regions offering first and second magnitudes of magnetic permeability;

a rotor arranged for rotation about a rotational axis and having alternating circumferentially spaced regions offering first and second magnitudes of magnetic permeability;

said alternating cicumferentially spaced regions of first and second magnitudes of magnetic permeability of said rotor

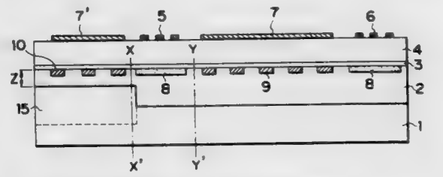
and said stator elements being arranged in axially opposed relationship and in close proximity;
magnet disposed between said stator elements;
said rotor, magnet and stator elements being arranged to form a flux path whereby a variation in a magnetic flux indicative of the rotational speed of said rotor relative to said stator is produced in said magnetic flux path upon rotation of said rotor;
means for sensing variations in flux in said flux path; and
said rotor compirses two coaxial halves, said magnet is disposed between said rotor halves and each said stator element is connected by retainer means which provides a flux path therebetween.

5,111,099
APPARATUS AND METHOD FOR CONVERTING RADIOACTIVE ENERGY INTO ELECTRICAL ENERGY
Robert J. Smith, Peebles, Ohio, assignor to Genesis Energy Systems, Inc., Peebles, Ohio
Filed Mar. 2, 1990, Ser. No. 487,603
Int. Cl.[5] G21D *7/00*; G21H *1/00*
U.S. Cl. 310—305 **27 Claims**



1. An apparatus for converting radioactive energy into electrical energy, said apparatus comprising:
an outer radiation protection shell;
a radioactive fuel source located within said shell;
magnetic means for separating alpha and beta particles emitted from said radioactive fuel source, and directing alpha particles to a first predetermined region of said shell while directing beta particles to a second predetermined region for collection and use;
means located adjacent said first region within said shell for collecting alpha particles directed to said first region;
means located adjacent said second region within said shell for collecting beta particles directed to said second region;
means for collecting gamma particles emitted from said radioactive fuel source, wherein electric current is derived from collected gamma particles via a load attached to said gamma collecting means for producing a magnetic field;
means for accommodating gaseous by-product formed within said shell; and
output means for utilizing said collected alpha and beta particles to create electric current.

5,111,100
SURFACE ACOUSTIC WAVE DEVICE AND METHOD FOR FABRICATING SAME
Osamu Noguchi, and Kazuyoshi Sugai, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan
Filed Jan. 3, 1991, Ser. No. 637,058
Claims priority, application Japan, Jan. 12, 1990, 2-5903
Int. Cl.[5] H01L *41/07*
U.S. Cl. 310—313 A **4 Claims**

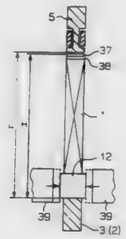


1. A surface acoustic wave device comprising:
a multi-layered structure including a first conductivity type high impurity concentration silicon substrate, a first conductivity type silicon epitaxial layer, an insulating layer and a piezo-electric layer;
a group of input transducers formed on said piezo-electric layer and classifying an input signal in frequency to generate a plurality of surface acoustic waves at respective frequencies and propagating along respective propagation paths which each correspond to a respective one of said input transducers;
a group of output transducers formed on said piezo-electric layer, each of the output transducers obtaining an output signal from a surface acoustic wave propagated along a respective one of the propagation paths;
a group of gate electrodes formed on said piezo-electric layer, each of them corresponding to a respective one of said propagation paths;
a group of first pn diode arrays formed on the surface side of said first conductivity type silicon epitaxial layer between the input and the output transducers, and each corresponding to a respective one of said propagation paths; and
a group of second pn diode arrays formed on the surface side of said first conductivity type silicon epitaxial layer on a side of said input transducers opposite from said group of first pn diode arrays;
wherein said first conductivity type silicon epitaxial layer is thinner in the region of the group of second pn diode arrays than in the region of the group of first pn diode arrays.

5,111,101
DEVICE FOR MAGNIFYING DISPLACEMENT OF PIEZOELECTRIC ELEMENT AND METHOD OF PRODUCING THE SAME
Yasuo Imoto, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Sep. 4, 1990, Ser. No. 576,843
Claims priority, application Japan, Sep. 5, 1989, 1-229948
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—328 **9 Claims**

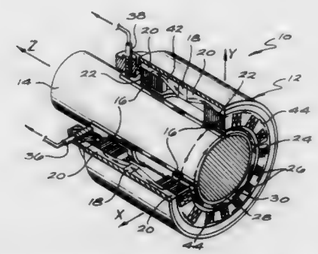
1. A method for producing a displacement magnifying device for a piezoelectric element wherein the displacement of the piezoelectric element, in a given direction caused by applied voltage is transmitted to a contact member and is magnified by the contact member and a displacement magnifying mechanism, the method comprising the steps of:
assembling a frame, the contact member, the piezoelectric element and a temperature compensating member having a temperature expansion characteristic reverse to that of the piezoelectric element;

plastically deforming the temperature compensating member in the direction of displacement of the piezoelectric element by pressing sides of the temperature compensating member in a direction perpendicular to the direction of displacement;
measuring a displacement amount caused by the plastic



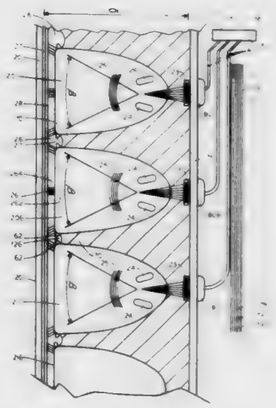
deformation of the temperature compensating member by measuring the amount of displacement of at least one of the contact member and the displacement magnifying mechanism; and
releasing the pressure against the temperature compensating member when the measured displacement amount reaches a predetermined value.

5,111,102
MAGNETIC BEARING STRUCTURE
Crawford R. Meeks, 5540 Mason Ave., Woodland Hills, Calif. 91367
Continuation-in-part of Ser. No. 356,413, May 25, 1989. This application May 11, 1990, Ser. No. 522,209
The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.
Int. Cl.[5] H02K *7/09*
U.S. Cl. 310—90.5 **27 Claims**



1. An electromagnetic bearing structure for supporting a rotatable member in a suspended position with respect to a stationary member, the bearing structure comprising:
first means associated with the stationary member for generating a radially polarized, controllable electromagnetic field surrounding a first portion of the rotatable member;
second means associated with the stationary member and axially spaced from the first electromagnetic field generating means, for generating a radially polarized, controllable electromagnetic field surrounding a second portion of the rotatable member;
means associated with the stationary member for generating an axially polarized magnetic field, wherein the axially polarized magnetic field generating means is situated between the first and second electromagnetic field generating means; and
means for directing substantially all magnetic flux from the first and second electromagnetic flux generating means and the axially polarized magnetic field generating means, radially through only a pair of air gaps between the rotatable member and the stationary member, to provide magnetic flux coupling of the rotatable member to the stationary member.

5,111,103
PLURAL UNIT MONITOR
Denyse DuBrucq, 812 Noridge Trail, Port Washington, Wis. 53074
Filed Dec. 29, 1989, Ser. No. 459,140
Int. Cl.[5] H01J *1/00*
U.S. Cl. 313—2.1 **7 Claims**

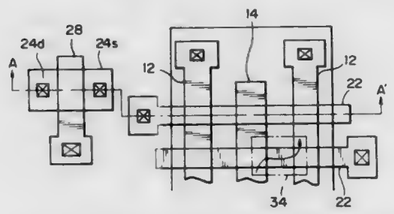


1. An apparatus for displaying a video image comprising:
an enclosure having an image screen and a coplanar faceplate;
a plurality of monitor units disposed within said enclosure and immediately adjacent each other in a planar array, said array being disposed adjacent the image screen;
means for applying a voltage across a portion of the surface of the faceplate comprising a first layer of strips of conductive material on the surface of the faceplate, a second layer of strips of conductive material overlaying the first layer and offset therefrom, each strip of the first and second layers being insulated from an adjacent strip, and each strip of the second layer being conductively connected to and adjacent strip of the first layer.

5,111,104
TRIPLE-ENVELOPED METAL-HALIDE ARC DISCHARGE LAMP HAVING LOWER COLOR TEMPERATURE
Scott R. Hunter, Rockport, Mass., assignor to GTE Products Corporation, Danvers, Mass.
Continuation of Ser. No. 448,494, Dec. 11, 1989, abandoned. This application Sep. 17, 1991, Ser. No. 762,155
Int. Cl.[5] H01J *17/16*
U.S. Cl. 313—25 **8 Claims**

1. A metal-halide arc-discharge lamp comprising:
means for providing a correlated color temperature of approximately 3,600 degrees Kelvin or less and a luminous efficacy of approximately 90 lumens per watt or higher, said means including in combination:
(a) a first light-transmissive envelope being a metal-halide arc tube;
(b) a second light-transmissive envelope hermetically enclosing said arc tube, the atmosphere within said second envelope and outside said arc tube being a vacuum;
(c) a third light-transmissive envelope being an outer

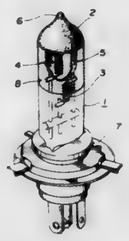
envelope, said third envelope hermetically enclosing said second envelope, the atmosphere within said third envelope and outside said second envelope being inert with respect to internal lamp parts, said third envelope



being light-transmissive through substantially all of the surface of said third envelope; and

(d) means for structurally and electrically completing said lamp.

5,111,105
VEHICULAR LIGHTING DEVICE
Teruaki Yamamoto, Tokyo, Japan, assignor to PIAA Corporation, Tokyo, Japan
Filed Dec. 17, 1990, Ser. No. 628,652
Int. Cl.[5] H01J *5/16*
U.S. Cl. 313—112 **20 Claims**



1. A lamp bulb, used in a motor vehicle, comprising:

a glass tube with a forward and a rearward portion;

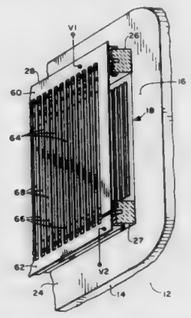
a sub-main filament positioned in the forward portion of the glass tube;

a main filament positioned in the rearward portion of the glass tube, and rearwardly of the sub-main filament; and

a luminous film extending to coat only the forward portion of the glass tube forwardly of the main-filament, which filters light emitted from the sub-main filament located in the forward portion of the glass tube.

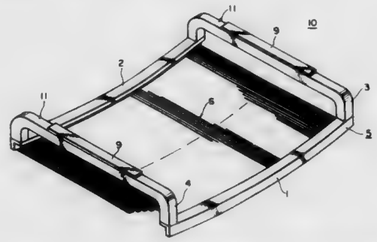
5,111,106
POST-MASK-DEFI ECTION TYPE TENSION MASK COLOR CATHODE RAY TUBE
Sam Kaplan, Chicago, and Robert Adler, Northfield, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.
Filed Apr. 12, 1989, Ser. No. 336,478
Int. Cl.[5] H01J *29/07*
U.S. Cl. 313—403 **20 Claims**

1. A post-mask-deflection color cathode ray tube having an electron gun and a sealed envelope characterized by having a strip-type tension foil shadow mask in the form of two intercalated combs providing mutually insulated first and second arrays of metal strips each adapted to receive a different electrical potential effective to cause electron beams passing therethrough to be deflected by the electrical fields created between



the strips, and wherein the metal strips of one of said arrays are narrower than the strips of the other array.

5,111,107
GRID APPARATUS FOR A COLOR CATHODE RAY TUBE WHICH ELIMINATES VIBRATION OF THE GRIDS
Hisao Kume; Shuichi Kuwajima, both of Aichi, and Takahide Sanma, Gifu, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Apr. 17, 1990, Ser. No. 509,751
Claims priority, application Japan, Apr. 18, 1989, 1-97853
Int. Cl.[5] H01J *29/80*
U.S. Cl. 313—405 **5 Claims**



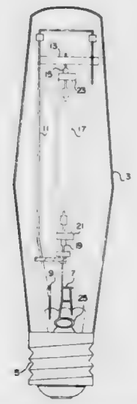
1. A grid apparatus for a color cathode ray tube comprising:

a frame comprising a pair of mutually opposed support bars and a pair of resilient support members attached between said support bars;

a plurality of parallel ribbon-shaped grid elements stretched under tension and attached to said frame; and

metallic members which have a larger thermal expansion coefficient than said resilient support members connected to reverse surfaces of said resilient support members on the sides which are opposite to the grid elements.

5,111,108
VAPOR DISCHARGE DEVICE WITH ELECTRON EMISSIVE MATERIAL
David A. Goodman, Amesbury; John L. Plumb, Danvers, both of Mass.; Rudy E. M. Geens, Leuven, Belgium; Richard A. Snellgrove, Danvers, and Elliot Wyner, Peabody, both of Mass., assignors to GTE Products Corporation, Danvers, Mass. and GTE Sylvania N.V., Belgium
Filed Dec. 14, 1990, Ser. No. 627,529
Int. Cl.[5] H01J *51/073*
U.S. Cl. 313—630 **14 Claims**



1. A vapor discharge device comprising:

a base;

a sealed outer envelope connected to said base;

a pair of lead-in conductors extending from said base into said sealed envelope;

at least one arc tube disposed within said sealed outer envelope, each arc tube comprising a discharge-substaining fill, a first electrode electrically connected to a first lead-in conductor of said pair of lead-in conductors, and a second electrode electrically connected to a second lead-in conductor of said pair of lead-in conductors, said first electrode and second electrode being adapted to have an elongated arc discharge maintained therebetween; and

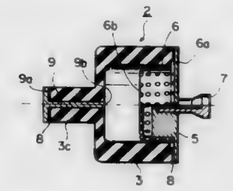
an electron emissive material disposed on said first electrode and said second electrode, said electron emissive material comprising reacted $Ba_xSr_{1-x}Y_2O_4$ wherein X is in a range of from 0.05 to 0.95.

5,111,109
DISCHARGE TUBE FOR SERIES GAP USE IN IGNITION APPARATUS
Kiyoshi Yagi, and Seiichi Wakabayashi, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 723,885
Claims priority, application Japan, Jul. 11, 1990, 2-72976
Int. Cl.[5] H01J *17/06, 17/10, 17/18*
U.S. Cl. 313—622 **2 Claims**

1. A discharge tube comprising:

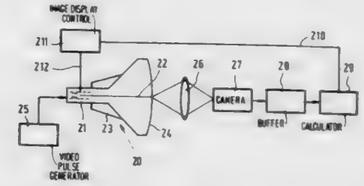
an insulating tube in which an inert gas is sealed, said insulating tube being formed as a cylinder with one end open and the other closed; and

a pair of electrodes, one acting as an anode electrode and the other as a cathode electrode, said anode electrode being formed as a flanged electrode, said cathode electrode being formed as a bar electrode, said flanged electrode being hermetically fitted to the open end of the insulating tube, said bar electrode being embedded in the closed end of the insulating tube so that the front end surface of the bar electrode faces the interior of the insulating tube, said anode and cathode electrodes being applied with a voltage



to cause a discharge between the pair of opposing electrodes.

5,111,110
METHOD OF DETERMINING A DISPLAY PARAMETER IN A PICTURE DISPLAY TUBE AND METHOD OF IMPROVING A PICTURE DISPLAY IN A PICTURE DISPLAY TUBE
Paulus A. Houben, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 527,993, May 22, 1990, abandoned.
This application Aug. 16, 1991, Ser. No. 749,614
Claims priority, application Netherlands, May 24, 1989, 8901295
Int. Cl.[5] H04N *17/02*
U.S. Cl. 315—10 **10 Claims**



1. A method of determining a display parameter of a picture tube which includes a display screen with a sequential array of triads of luminescent color elements thereon, the spacing of such triads corresponding to a first modulation frequency, means for producing a variable intensity electron beam, and means for deflecting the beam across the screen to cause the triads to produce a luminescent color image; characterized in that the method comprises the steps of:

(a) frequency modulating the intensity of the electron beam at a second modulation frequency lower than said first modulation frequency, thereby producing a luminescent image pattern on the screen;

(b) determining luminance values of the image pattern as a function of position on the screen;

(c) determining from the luminance values a fundamental wave of the image pattern, such fundamental wave having a frequency substantially equal to the second modulation frequency;

(d) analyzing the fundamental wave of the image pattern to determine a selected characteristic thereof; and

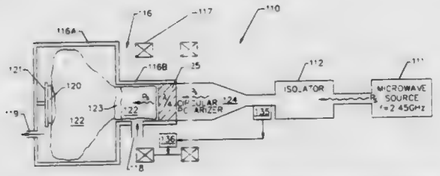
(e) determining said display parameter of the picture tube from the selected characteristic of the fundamental wave of the image pattern.

5,111,111

METHOD AND APPARATUS FOR COUPLING A MICROWAVE SOURCE IN AN ELECTRON CYCLOTRON RESONANCE SYSTEM

James E. Stevens, Princeton; Joseph L. Cecchi, Lawrenceville, both of N.J., and Patrick L. Colestock, St. Charles, Ill., assignors to Consortium for Surface Processing, Inc., Princeton, N.J.

Filed Sep. 27, 1990, Ser. No. 589,078
Int. Cl.[5] H05H *1/46*
U.S. Cl. 315—111.41 **15 Claims**



1. An electron cyclotron resonance apparatus comprising:
a processing chamber;
gas supplying means for supplying gas to said processing chamber;
microwave generating means for generating microwave energy;
circular polarizing means coupled to said microwave generating means, for circularly polarizing the microwave energy in a first angular direction and for suppressing circularly polarized microwave energy in a second angular direction opposite the first angular direction;
magnetic field generating means for generating a magnetic field in said processing chamber, the magnetic field causing electrons in said processing chamber to rotate in the first angular direction in electron cyclotron resonance to thereby generate a plasma of the gas in the processing chamber;
transforming means coupled between said circular polarizing means and said processing chamber, for matching the impedance of said circularly polarized microwave energy in the first angular direction, to the impedance of said plasma, to thereby couple the circularly polarized microwave energy in the first angular direction to the plasma; and
means for adjusting said magnetic field generating means to minimize remnants of microwave energy which are reflected from the plasma;
wherein said adjusting means comprises:
means, coupled to said processing chamber, for measuring said remnants of reflected microwave energy in said chamber; and
an electronic controller, responsive to said measuring means and operatively connected to said magnetic field generating means, for adjusting said magnetic field generating means to minimize the measured remnants of reflected microwave energy.

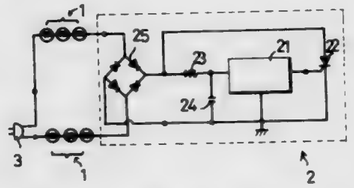
5,111,112

LIGHT STRING CONTROL APPARATUS

Yang-Wen Hsu, 1st Fl., No. 17, Kechiang Rd., Shihlin Dist., Taipei, Taiwan

Filed Mar. 29, 1991, Ser. No. 677,052
Int. Cl.[5] H05B *37/02*
U.S. Cl. 315—205 **1 Claim**

1. A light string controlling apparatus comprising a bridge rectifier, an RC filter, a control circuit, and a silicon controlled rectifier,
said bridge rectifier having two AC input terminals connected in series with a light string having a plurality of light bulbs in series, a DC positive output terminal connected in parallel with said RC filter, and a DC negative output terminal connected to a ground, said RC filter being connected in parallel with said control circuit which is connected to a gate of said silicon controlled rectifier, said silicon controlled rectifier having an anode terminal and a cathode terminal respectively connected to said positive and negative output terminals of said bridge rectifier;



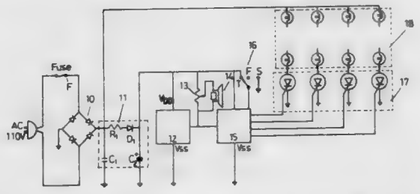
said control circuit comprising an oscillator, a function generator, and an output trigger connected in parallel with each other, said control circuit generating a train of pulses, a train of analog signals, or a combination of pulses and analog signals to trigger the gate of said silicon controlled rectifier to control the conducting angle of said silicon controlled rectifier, thereby controlling the timing for the flashing and illumination of said light string.

5,111,113

MUSIC INITIATED CHRISTMAS LIGHT SET CONTROLLER

Ching C. Chu, Taipei, Taiwan, assignor to Superlite Co., Ltd., Taipei, Taiwan

Filed Apr. 6, 1989, Ser. No. 334,167
Int. Cl.[5] H05B *37/02, 41/34, 41/30*
U.S. Cl. 315—210 **6 Claims**



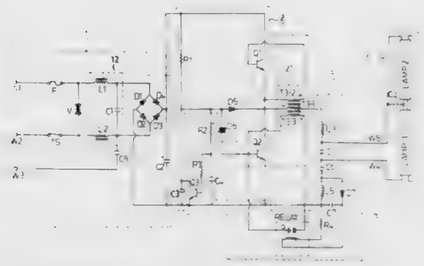
1. A music initiated Christmas light set controller electrically coupled to an alternating current power source for selectively energizing a plurality of Christmas light sets, comprising:
a housing formed by a casing having one open end portion and an open top portion, a cover plate for locking engagement with said casing to form a closure for said open top portion, and a front cover for releasable locking engagement with said casing to form a removable closure for said open end;
a circuit board disposed within said housing having at least a pair of input terminations for receiving an input voltage signal from said power source and a plurality of output terminatins for coupling output energization signals to said light sets;
a bridge rectifier circuit disposed on said circuit board and being electrically coupled to said input terminations for generating a pulsating direct current signal, said pulsating direct current signal being coupled to a first terminal of each of said plurality of light sets;
a voltage regulating circuit disposed on said circuit board having an input coupled to said bridge rectifier circuit for both filtering and reducing an amplitude value of said pulsating direct current signal;
a music generating circuit disposed on said circuit board and coupled to said voltage regulating circuit for generating (1) a musical output signal, and (2) a serial timed pulse output signal, said musical output signal being coupled to a transducer for converting said musical signal to an acoustic signal;
an alternative switching circuit disposed on said circuit board and having a first input coupled to said music generating circuit for receipt of said serial timed pulses, said alternative switching circuit having a second input coupled to a three position switch for selecting one of three energization schemes for said plurality of Christmas light sets; and
thyristor circuit means for energizing said light sets disposed on said circuit board, said thyristor circuit means having (1) a plurality of gate inputs coupled to respective outputs of said alternative switching circuit, (2) a plurality of anode terminals, each of said anode terminals being coupled to a respective one of said light sets, and (3) a plurality of cathode terminals commonly coupled to a return lead of said bridge rectifier circuit, whereby said light sets are periodically energized at one of two selected rates responsive to a rhythm of said musical output signal as provided by said serial timed pulse output signal, or selectively continuously energized.

5,111,114

FLUORESCENT LAMP LIGHT BALLAST SYSTEM

Chen-Chan Wang, Feng-Shan, Taiwan, assignor to L.P.S. Technology Co., Ltd., Taiwan

Filed Jun. 18, 1991, Ser. No. 716,896
Int. Cl.[5] H05B *41/29*
U.S. Cl. 315—225 **1 Claim**



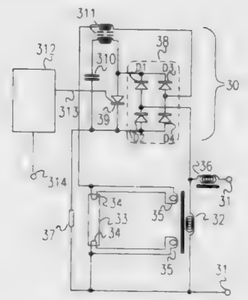
1. A gas discharge lamp light ballast system, comprising:
a power supply transforming means to transform a primary AC line voltage into a rectified DC voltage;
a frequency inverter means to convert said rectified DC voltage into a high frequency voltage signal, said frequency inverter means including a first charging circuit means of a first resistor and a first capacitor charged by said rectified DC voltage via said first resistor, a first transistor means triggered by said first capacitor into an ON state, means for stopping further charging of said first capacitor when said first transistor means is in the ON state, a second transistor means, and a transistor driving means to alternatingly turn said first and said second transistor means ON and OFF so as to generate said high frequency voltage signal;
a resonant circuit means to convert said high frequency voltage signal into a high amplitude, high frequency voltage signal;
a gas discharge lamp means excited to light by said high amplitude, high frequency voltage signal; and
a protective circuit means including a relay means having a normally open contact connected to said transistor driving means, a third transistor means having collector and emitter terminals connected across said first capacitor, and a second charging network of a second resistor and a second capacitor connected across said first capacitor and connected across base and emitter terminals of said third transistors means, said second resistor and said second capacitor having a time constant longer than that of said first resistor and said first capacitor, whereby, when said lamp means is in a burnout condition or said lamp means is being replaced, said normally open contact of said relay means closes, and said second charging network triggers said third transistor means into an ON state and causes said first capacitor to discharge via said third transistor means, thereby preventing said first capacitor to trigger said first transistor means into the ON state and automatically disabling the frequency inverter means to stop the generation of the high amplitude, high frequency voltage signal.

5,111,115

FLUORESCENT LAMP CONTROLLER

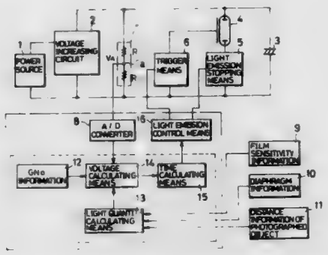
David P. Ball, Swanson, and Donald R. Ensor, Western Springs, both of New Zealand, assignors to Electronic & Transformer Engineering Limited and Vusion International Limited, both of Auckland, New Zealand

Filed Jan. 8, 1991, Ser. No. 638,528
Claims priority, application New Zealand, Feb. 5, 1990, 232367
Int. Cl.[5] H05B *41/14*
U.S. Cl. 315—239 **10 Claims**



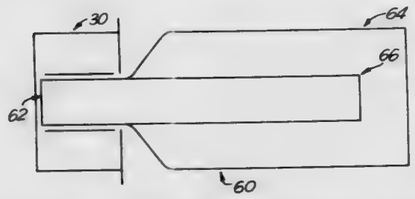
1. Apparatus for providing from a source of alternating electric power the igniting and operating voltages for a gas discharge lamp, or lamps in series, said apparatus comprising:
a step-up transformer; switching means; charge storage means; means for charging said charge storage means; and switch control means to cause said switching means to be in either an "on" state or an "off" state; said switching means and said charge storage means being connected in series with said step-up transformer to provide, when said switching means is closed, a series resonant circuit; said step-up transformer being connected in series between the gas discharge lamp and the switching means; said switching means being connected in series with said lamp or lamps whereby in use with said switching means and the gas discharge lamp connected to the source of alternating electric power, operation of the control means to switch "on" said switching means to cause it to conduct thereby allows said charge storage means to discharge transient current through said step-up transformer, causing an ignition pulse of high voltage to be created within said step-up transformer available to ignite said gas discharge lamp or lamps, and once ignited said lamp or lamps can continue to draw current from said power source via said step-up transformer and through said switching means, and operation of the switch control means in the "off" sense to act on said switching means will thereby switch "off" the lamp or lamps.

5,111,116
STROBOSCOPIC CONTROLLER
Hiroshi Takeda, Funabashi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Mar. 20, 1991, Ser. No. 672,316
Claims priority, application Japan, Mar. 28, 1990, 2-77003
Int. Cl.[5] H05B *41/32*
U.S. Cl. 315—241 P **8 Claims**



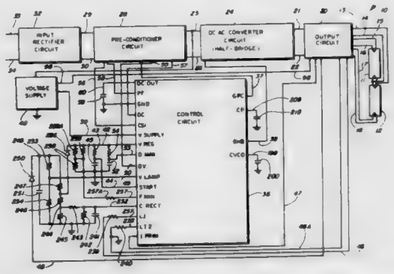
1. A stroboscopic controller for illuminating a photographed object by discharging a charge stored to a main capacitor through a light emitting tube, said stroboscopic controller comprising:
voltage measuring means for measuring a charging voltage of the main capacitor before light emission;
light quantity calculating means for calculating a quantity of light required to illuminate the photographed object, including means for receiving information indicative of film sensitivity, diaphragm and a distance from a camera to the photographed object;
voltage calculating means for calculating a voltage of the main capacitor at a stopping time of the light emission from the charging voltage measured by said voltage measuring means and the quantity of light calculated by the light quantity calculating means;
time calculating means for calculating a stroboscopic light emitting time for which the voltage of the main capacitor is changed by the stroboscopic light emission from said charging voltage before the light emission to said voltage at the stopping time of the light emission; and
light emission control means for controlling a light emitting operation and a stopping operation thereof with respect to the light emitting tube based on the stroboscopic light emitting time calculated by the time calculating means.

5,111,117
DISCHARGE TUBE ARRANGEMENT
Ulrich Greb, and Andrew T. Rowley, both of Leicester, England, assignors to Thorn Emi plc, London, England
Filed Sep. 4, 1990, Ser. No. 577,161
Claims priority, application United Kingdom, Sep. 5, 1989, 8920051
Int. Cl.[5] H05B *41/16*
U.S. Cl. 315—248 **8 Claims**



1. An electrodeless discharge tube comprising a first portion for insertion in a launcher, said first portion containing a fill for propagating a surface wave, a further portion containing an ionizable fill, and a partition wall affecting separation of said first portion from said further portion, wherein said surface wave set up within the first portion propagates through the partition wall to set up a discharge in the fill in said further portion.

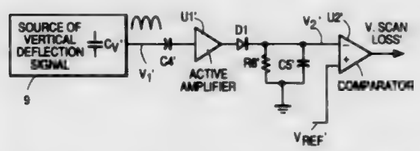
5,111,118
FLUORESCENT LAMP CONTROLLERS
Mark W. Fellows; John M. Wong, both of Buffalo Grove, Ill.; Edmond Toy, Sunnyvale, Calif.; Robert A. Erhardt, and James A. Thomsen, Jr., both of Chicago, Ill., assignors to North American Philips Corporation, New York, N.Y.
Continuation of Ser. No. 516,003, Apr. 27, 1990, which is a division of Ser. No. 219,923, Jul. 15, 1988, Pat. No. 4,952,849.
This application Aug. 12, 1991, Ser. No. 746,074
Int. Cl.[5] H05B *41/36*
U.S. Cl. 315—307 **20 Claims**



1. A controller for a load including a fluorescent lamp comprising: DC-AC converter means having an input and an output, DC supply means coupled to said input, output circuit means coupled to said output and arranged for coupling to said fluorescent lamp, and control means for controlling operation of said DC-AC converter and said DC supply means, said output circuit means including inductance means and resonant capacitor means forming a circuit which is resonant at no-load and load-condition resonant frequencies with loads equivalent to those respectively obtained prior to and after lamp ignition, said control means being arranged to operate in a lamp ignition phase to operate said converter at a frequency within a range offset from said no-load resonant frequency, and said control means being arranged to operate in an operating phase after lamp ignition to operate said converter in a frequency range offset in the same direction from said load-condition resonant frequency, said output circuit providing power to said fluorescent lamp to illuminate it, said output circuit providing power for a cycle of a pre-ignition heating state, for an ignition state and for a post-ignition operation state for said lamp, said output circuit being operable to attempt to ignite said lamp continuously should it fail to ignite, said controller operating in response to the voltage across said lamp during an ignition state exceeding a predetermined magnitude to cease that cycle of said ignition state and to start another cycle of an ignition state.

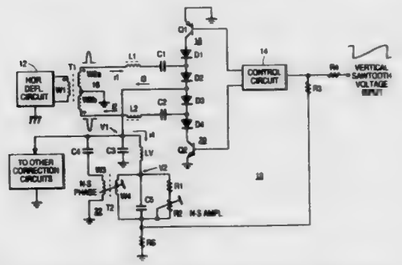
5,111,119
SCAN LOSS DETECTOR FOR CATHODE RAY TUBE
Walter Truskalo, Indianapolis, and Marvin N. Norman, Noblesville, both of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed May 17, 1991, Ser. No. 701,737
Int. Cl.[5] G09G *1/04*; H01J *29/70*
U.S. Cl. 315—386 **19 Claims**

1. A video display apparatus, comprising:
a cathode ray tube including an evacuated glass envelope, a display screen disposed at one end of said envelope and an electron gun assembly disposed at a second end of said envelope, said electron gun assembly producing an electron beam that forms a raster at electron beam landing locations on said screen;
means for generating a deflection current in a deflection winding that is disposed on said cathode ray tube for producing a deflection field in a beam path of said electron beam;
means coupled to said deflection current generating means for generating a parabolic deflection signal at an amplitude that is related to an amplitude of said deflection current;



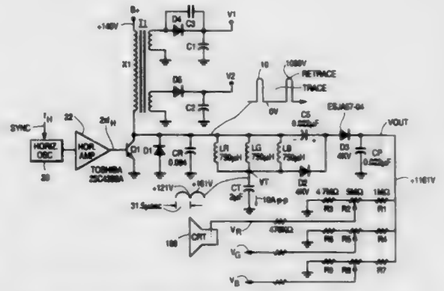
a comparator responsive to a second signal for generating an output signal that is coupled to an electrode of said cathode ray tube to provide beam current blanking when a scan loss condition occurs; and
an active amplifier having an input responsive to said parabolic deflection signal for generating said second signal by amplifying the signal that is developed at said input of said amplifier.

5,111,120
RASTER CORRECTED VERTICAL DEFLECTION CIRCUIT
Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Licensing Corporation, Princeton, N.J.
Filed Feb. 14, 1991, Ser. No. 655,526
Claims priority, application United Kingdom, Feb. 27, 1990, 9004392
Int. Cl.[5] G09G *1/04*; H01S *29/72*
U.S. Cl. 315—393 **30 Claims**



1. A switched vertical deflection system, comprising:
means energized by a source of horizontal rate pulses for generating respective charging and discharging currents;
means for modulating said currents, said modulated currents having zero values substantially coincident with the centers of horizontal retrace intervals;
a vertical deflection yoke; and,
energy storage means responsive to said modulated currents for developing a vertical deflection voltage for driving a vertical deflection current in said vertical yoke, said vertical deflection voltage having zero crossings substantially coincident with the centers of said horizontal retrace intervals and maxima substantially coincident with the centers of horizontal trace intervals, and a North-South pincushion correction current being generated in said vertical deflection yoke by integration of said vertical deflection voltage.

5,111,121
VOLTAGE BOOSTER FOR CRT ELECTRODE SUPPLY
Robert J. Gries, Indianapolis, and Marvin N. Norman, Noblesville, both of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed Jun. 12, 1991, Ser. No. 714,393
Int. Cl.[5] H01J *29/70*
U.S. Cl. 315—411 **13 Claims**

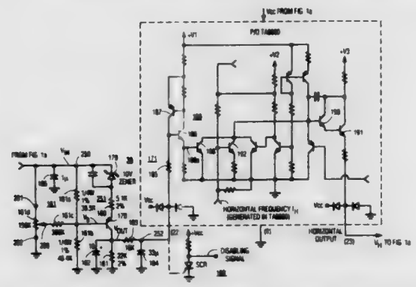


1. A television apparatus power supply, comprising:
a deflection circuit output stage including a deflection winding coupled to a retrace capacitance to form a retrace resonant circuit and first switching means responsive to a signal at a frequency that is related to a deflection frequency and coupled to said retrace resonant circuit for generating a deflection current in said deflection winding and a flyback pulse during a retrace interval of a deflection cycle, such that during a trace interval of said deflection cycle said switching means is conductive and conducts said deflection current;
a first capacitor;
a source of a supply voltage;
second switching means coupled to said source of said supply voltage and to a series arrangement formed by said capacitor and said first switching means for generating a current supplied from said source of said supply voltage that flows in said capacitor and in said first switching means to develop a capacitor voltage during said trace interval, and for decoupling said capacitor from said source of said supply voltage when said flyback pulse is generated to superimpose said capacitor voltage on said flyback pulse; and
a rectifier coupled to said capacitor and responsive to said superimposed voltage for generating an output supply voltage at an electrode of a cathode ray tube in accordance with said superimposed voltage.

5,111,122
VIDEO DISPLAY HIGH VOLTAGE PROTECTION CIRCUIT
James A. Wilber, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed May 3, 1991, Ser. No. 695,160
Int. Cl.[5] H01J *29/70*
U.S. Cl. 315—411 **10 Claims**

1. A high voltage generation circuit of a video display apparatus with high voltage protection, comprising:
a high voltage generator responsive to an alternating current voltage for developing an ultor accelerating potential at an output terminal of said generator;
means coupled to said high voltage generator for developing an ultor signal representative of said ultor accelerating potential;
an amplifier having an input responsive to said ultor signal for generating an output signal at an output of said amplifier;

a latch having an input that is responsive to said output signal and an output that is coupled to an input of said latch in a positive feedback path for generating a latched, disabling signal when said amplifier output signal is indicative of excessive ultor accelerating potential, such that a



signal path between said input and said output of said amplifier for the generation of said output signal is outside said positive feedback path; and

means responsive to said disabling signal for disabling the development of said ultor accelerating potential.

5,111,123

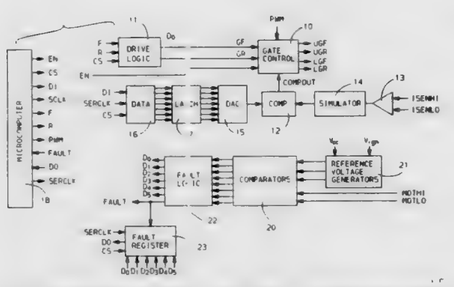
MOTOR DRIVER INTERFACE FAULT DETECTION APPARATUS USING INITIAL TURN-ON AND NOISE TIMERS

Larry R. Hach, and Gerard F. Kelley, both of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Nov. 16, 1990, Ser. No. 614,694

Int. Cl.[5] H02H *7/08*

U.S. Cl. 318—434 **7 Claims**



1. In an H-bridge electric motor drive apparatus comprising an electric power supply having supply and ground voltage terminals, a first pair of switching transistors connected in series with the power supply, a second pair of switching transistors connected in parallel with the first pair of switching transistors, and an electric motor having a first motor terminal connected to the junction of the first pair of switching transistors and a second terminal connected to the junction of the second pair of switching transistors, the switching transistors being activatable to a conducting condition in a predetermined combination in response to a first input control signal to connect the electric motor across the electric power supply for motor activation and further activatable to a non-conducting condition in response to a second input control signal to disconnect the electric motor from the electric power for motor deactivation, fault detection apparatus comprising, in combination:

means effective to compare the voltage at one of the first and second motor terminals with at least one reference voltage to determine a fault condition;

a first timer response to a continuous detection of the fault condition to define a first time period from the initiation of said continuous detection;

a second timer responsive to a continuous presence of the first input control signal to define a second time period from the initiation of said first output control signal;

means effective to store a fault signal in response to the detection of the fault condition at the end of the first or second time periods.

5,111,124

CONTINUOUS DEADBEAT CONTROL SYSTEM WITH FEEDBACK CONTROL

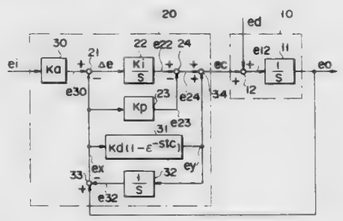
Ryoichi Kurosawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 13, 1990, Ser. No. 581,901

Claims priority, application Japan, Sep. 14, 1989, 1-237153

Int. Cl.[5] H02P *7/00*

U.S. Cl. 318—434 **16 Claims**



1. A continuous deadbeat system with feedback control which operates a controlled object according to a manipulation variable command, comprising:

means for detecting an amount of control for said controlled object to provide a controlled variable;

means for controlling the amount of control for said controlled object according to a control output representing a difference between the controlled variable and the manipulation variable command, such that the controlled variable approaches to the manipulation variable command, wherein said controlling means has a transfer function F(s) containing a complex parameter s as a variable, and a degree of the complex parameter s, which is a denominator of an expression of the transfer function F(s), is equal to or more than a degree of the complex parameter s, which is a numerator of said expression; and

means for combining the control output with a delay signal which is obtained by delaying the controlled variable by a predetermined time, wherein the predetermined time is a time necessary to achieve the control performed by said controlling means.

5,111,125

AUTOMATIC MIRROR REPOSITIONING

John A. Barrs, Clawson, Mich., assignor to United Technologies Automotive, Dearborn, Mich.

Filed Jun. 17, 1991, Ser. No. 716,045

Int. Cl.[5] G05B *19/19;* **G02B** *7/18*

U.S. Cl. 318—603 **1 Claim**

1. An automatic mirror repositioning system having at least one mirror mounted within mirror movement boundaries, there being an origin at the center of mirror movement, comprising:

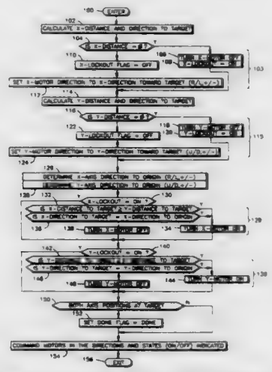
a first motor, connected to the mirror, controlling a first axis of mirror movement;

a second motor, connected to the mirror, controlling a second axis of mirror movement;

a first position means, responsive to the position of the mirror along said first axis, for providing a first feedback signal indicative of a current position of the mirror along said first axis;

a second position means, responsive to the position of the mirror along said second axis, for providing a second feedback signal indicative of a current position of the mirror along said second axis; and

signal processing means, for providing signals indicative of a predetermined target position of the mirror and responsive to said first and said second feedback signals, for causing said first motor to drive said mirror toward said predetermined target position when either the distance along said first axis from said current position to said



target position is not less than the distance along said second axis from said current position to said target position or the direction along said first axis from said current position toward said target position is also toward said origin, and for causing said second motor to drive said mirror toward said target position when either the distance along said second axis from said current position to said target position is not less than the distance along said first axis from said current position to said target position or the direction along said second axis from said current position toward said target position is also toward said origin.

5,111,126

STEREO OPTICAL GUIDANCE SYSTEM FOR CONTROL OF INDUSTRIAL ROBOTS

Bradley W. Powell, Athens, and Mike H. Rodgers, Huntsville, both of Ala., assignors to Applied Research, Inc., Huntsville, Ala.

Filed Aug. 27, 1990, Ser. No. 573,357

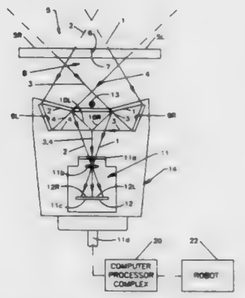
Int. Cl.[5] H01J *3/14;* **B23K** *9/12*

U.S. Cl. 318—568.16 **20 Claims**

1. A stereo optical system for locating indicia on a workpiece, said system comprising:

a camera means for receiving reflected images of said indicia, said camera means having a retina, and a lens spaced apart from said retina so as to focus said reflected images upon said retina;

a pair of center mirrors, each of said center mirrors being disposed to reflect an image through said lens and upon one half of said retina;



a pair of peripheral mirrors, each of said peripheral mirrors being disposed to reflect an angular image of said indicia upon one of said pair of center mirrors.

5,111,127

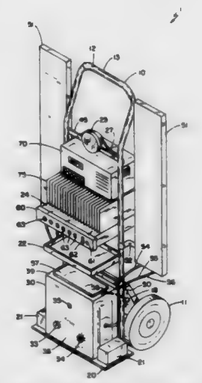
PORTABLE POWER SUPPLY

Woodward Johnson, 200 Bush Hill Rd., Ashburnham, Mass. 01430

Filed Jun. 25, 1990, Ser. No. 542,702

Int. Cl.[5] H01M *10/46;* **H02J** *7/00*

U.S. Cl. 320—2 **9 Claims**



1. A portable, rechargeable power supply, comprising:

a frame member;

a plurality of ground engaging wheels attached to said frame member for transporting said frame member over the ground;

a housing attached to said frame;

a rechargeable DC battery located within said housing and having a positive and a negative output terminal;

a voltage inverter, attached to said frame member and electrically hardwired to said battery output terminals, for converting DC output from said battery to an AC output and for converting AC power from an external source to a DC output for charging the DC battery;

an AC power block mounted on said frame and electrically connected to said inverter and having a plurality of AC input/output sockets;

a DC input/output female-type socket mounted on said housing and switchably connected electrically to said battery;

a plurality of photovoltaic panels attached to said frame for generating DC electrical output from solar energy; and

switching means mounted on said housing including a first switch for enabling the panels' DC output to be switched either to the battery for recharging or to a second switch, said second switch enabling the DC input/output socket to be electrically connected to either the battery or to said panels.

5,111,128

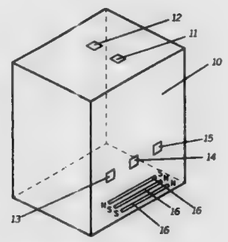
BATTERY IDENTIFICATION APPARATUS

Mac William Branan, Jr., Fort Lauderdale, and Michael Robinson, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 17, 1990, Ser. No. 628,959

Int. Cl.[5] H02J *7/00*

U.S. Cl. 320—2 **18 Claims**



1. A battery, comprising:

a housing;

at least one rechargeable cell within said housing, having a predetermined characteristic;

magnetized elements in a predetermined arrangement and number within said housing for providing information to a charger, whereby the arrangement and number of said magnetized elements is indicative of said predetermined characteristic.

5,111,129

WATERPROOF SWITCH AND CHARGING JACK ASSEMBLY

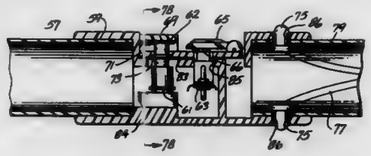
Michael L. Schuman, El Monte, Calif., assignor to Rainbow Lifegard Products, Inc., El Monte, Calif.

Division of Ser. No. 272,078, Nov. 16, 1988, Pat. No. 4,962,559.

This application May 7, 1990, Ser. No. 520,071

Int. Cl.[5] H01M *10/46*

U.S. Cl. 320—2 **5 Claims**



1. In a cordless electrically powered device which includes a rechargeable battery, a submersible switch and jack assembly comprising:

a housing defining therethrough a first hole and a second hole;

a switch mounted in the housing and having an actuator associated with the first hole;

a charger jack mounted in the housing in alignment with the second hole;

a flexible diaphragm sealed to the housing and disposed across the first hole;

a jack seal member movably mounted to the exterior of the housing; and

a jack seal loader member movable on the exterior of the housing into and out of loading relation to the jack seal member and urging the seal member into sealing relation with the second hole when in said loading relation.

5,111,130

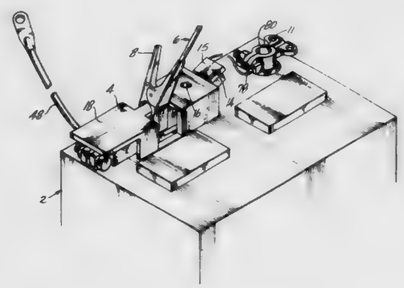
CLAMP ACTIVATED JUMPER CABLE SWITCH

Wesley V. Bates, 1409 Bonita Ave., La Verne, Calif. 91750

Filed Mar. 14, 1990, Ser. No. 494,152

Int. Cl.[5] H01M *2/00, 10/46;* **H01R** *11/00, 4/30*

U.S. Cl. 320—25 **30 Claims**



1. A safety device for a battery, comprising:

(a) a fixed contact electrically connected to one terminal of the battery;

(b) a movable contact adapted for attachment of an electrically conductive clamp of unknown polarity, and for being biased toward the fixed contact under the influence of the clamp;

(c) switch means biased into a safety position for electrically separating the movable and fixed contacts, and movable to an operative position for allowing the clamp to move the movable contact into electrical communication with the fixed contact; and

(d) indicating means electrically connected to a reference potential and to the movable contact for indicating whether the unknown polarity is the same as a polarity of the one terminal;

whereby a user can operate the switch to electrically connect the clamp to the one terminal when the indicating means indicates that the unknown polarity is the same as the polarity of the one terminal.

5,111,131

COMPACT LOW NOISE LOW POWER DUAL MODE BATTERY CHARGING CIRCUIT

Thomas A. Somerville, Tuscon, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Nov. 30, 1990, Ser. No. 621,014

Int. Cl.[5] H02J *7/00*

U.S. Cl. 320—32 **22 Claims**

1. A battery charger comprising in combination:

(a) a first rectifier receiving a line voltage and producing a rectified sinusoidal voltage;

(b) a transformer having a primary winding coupled to receive the rectified sinusoidal voltage and first and second secondary windings, a second rectifier being coupled between terminals of the first secondary winding and terminals of a battery;

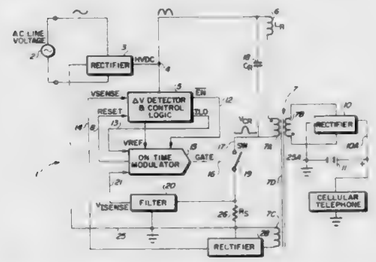
(c) a switch coupled between a terminal of the primary winding and means for producing a signal indicative of current flowing through the switch and primary winding;

(d) first means coupled to terminals of the second secondary

winding for producing a battery condition voltage representative of a voltage between the terminals of the battery;

(e) peak detect and hold means coupled to receive a voltage proportional to the battery condition voltage and detect and hold a peak value thereof;

(f) second means for comparing an output voltage of the peak detect and hold means with the voltage proportional to the battery condition voltage to produce a charging mode signal when the voltage proportional to the battery condition voltage falls a predetermined threshold voltage



below the output voltage of the peak detect and hold means; and

(g) third means coupled to receive the charging mode signal and the signal indicative of current flowing through the primary winding for producing a control signal applied to the switch to control flow of current through the primary winding in accordance with the battery condition voltage, the third means including means for producing a constant turn off time for the switch and means for varying turn on time for the switch in response to the signal indicative of current flowing through the primary winding.

5,111,132

BATTERY CHARGING SYSTEM FOR MARINE PROPULSION UNIT

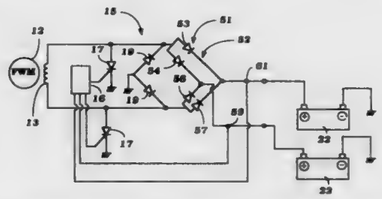
Hitoshi Motose, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 18, 1990, Ser. No. 510,516

Claims priority, application Japan, Apr. 18, 1989, 1-96484

Int. Cl.[5] H02J *7/14*

U.S. Cl. 322—90 **3 Claims**



1. A charging system for charging a plurality of batteries, a rotating permanent magnet generating coil subject to a reversing current flow said charging system comprising a rectifying diode circuit positioned between the ends of the generating coil and the batteries, said diode circuit comprising a plurality of parallel diode circuit paths, each of said parallel diode circuit paths connecting a respective end of said generating coil with a respective terminal of each battery, said parallel diode circuits being equal in number to the number of batteries, and regulating means for regulating the voltage applied from said coil to each of said parallel diode circuit paths.

5,111,133

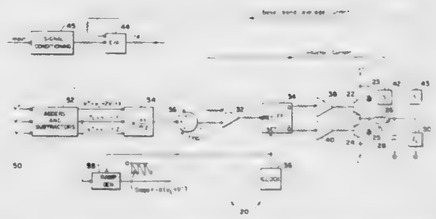
CONVERTER CIRCUIT FOR CURRENT MODE CONTROL

Louis R. Poulo, Andover, and James G. Staley, Stow, both of Mass., assignors to Analogic Corporation, Peabody, Mass.

Filed Sep. 27, 1990, Ser. No. 589,068

Int. Cl.[5] G05F *1/46*

U.S. Cl. 323—286 **11 Claims**



1. A converter circuit operable in a current control mode for controlling the current provided to a load, said circuit comprising:

inductance means, coupled to said load, for conducting a steady state waveform of inductor current having an increasing portion with a positive slope, a decreasing portion with a negative slope and an average value;

clocking means for generating a clocking signal at a predetermined frequency;

means for generating a threshold current at a predetermined slope and level;

means for generating a switching signal during each cycle of said clocking signal when the inductor current equals a threshold current level;

switching means, responsive to said clocking signal and said threshold current, for controlling the voltage at one end of said inductance means between two different levels of voltages respectively as a function of two supply voltages so that said inductance means conducts (1) increasing inductor current for one level of load voltage from the beginning of each cycle of said clocking signal until the inductor current equals said threshold current during each cycle, and (2) decreasing inductor current for the other level of voltage from the time in each cycle the current equals said threshold current until the end of each said cycle; and

wherein said means for generating said threshold current generates said threshold current as a function of said load and supply voltages so that said predetermined slope and level of the threshold current is a desired steady state solution of said decreasing inductor current so that any perturbations of said inductor current immediately converges to the steady state waveform at the time in each cycle the current equals the threshold current.

5,111,134

METHOD AND APPARATUS FOR DETERMINING THE FREQUENCY OF SHORT OSCILLATION BURSTS OF ELECTRICAL SIGNALS

Stephan Damp, Weil am Rhein, Fed. Rep. of Germany, assignor to Deutsch-Franzosisches Forschungs-Institut, St. Louis, France

Filed Nov. 22, 1989, Ser. No. 440,523

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1988, 3840109

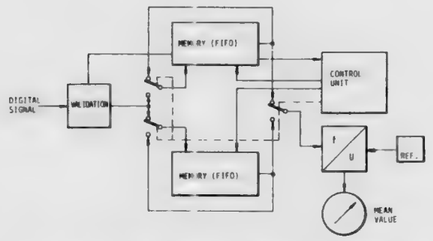
Int. Cl.[5] G01R *23/09;* **G01P** *5/00;* **G01S** *17/58*

U.S. Cl. 324—78 D **18 Claims**

1. A method for determining the frequency of short oscillation bursts of electrical signals comprising the steps of:

reading a desired number of oscillation bursts into a storage means;

reading the oscillation bursts out of the storage means in such a manner that the oscillation burst directly follow each other in the order of the reading into the storage means for generating an oscillation burst sequence;



cyclically repeating a reading out of the oscillation burst sequence, the oscillation burst sequences being directly adjoined to each other until a previously predetermined number of readout cycles is reached; and

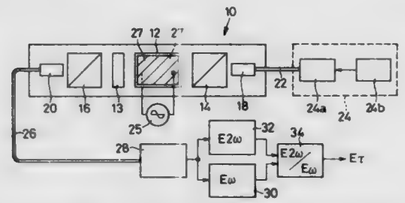
processing the frequency of the oscillation burst sequences adjoined to each other.

5,111,135

METHOD FOR OPTICALLY MEASURING ELECTRIC FIELD AND OPTICAL VOLTAGE/ELECTRIC-FIELD SENSOR

Yoshinari Kozuka, and Yuichi Kakizaki, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jul. 11, 1990, Ser. No. 550,978
Claims priority, application Japan, Jul. 12, 1989, 1-179855; Jul. 12, 1989, 1-179856
Int. Cl.[5] G01R *19/00*
U.S. Cl. 324—96 **4 Claims**



1. A method for optically measuring an AC electric field or an AC voltage, comprising the steps of:

emitting a light beam from a light-emitting portion;

transmitting said light beam emitted by said light-emitting portion through a sensing head comprising a Pockel's-effect element while applying an AC electric field to be measured to said Pockel's-effect element, so that the light beam is modulated by said AC electric field applied to said Pockel's-effect element, said sensing head further comprising a polarizer and an analyzer respectively disposed upstream and downstream of said Pockel's-effect element in the direction of transmission of said light beam;

directing said light beam transmitted through said sensing head, to be received by a light-detecting portion, so that said light-detecting portion produces an electric signal corresponding to the received light beam;

selecting a first component (E_ω) of said electric signal which has a same angular frequency as that of said AC electric field, and a second component ($E_{2\omega}$) which has an angular frequency which is two times that of said AC electric field;

calculating a ratio ($E_{2\omega}/E_\omega$) of said second component to said first component, to determine a strength of the AC electric field or a magnitude of the AC voltage which produces said AC electric field based on said ratio ($E_{2\omega}/E_\omega$); and

providing a retardation element which is disposed in series with said Pockel's-effect element, between said polarizer and said analyzer, said retardation element giving an optical bias ψ which satisfies the following equation:

$$V\pi_0 \cdot \frac{d(1/V\pi)}{dT} \cdot \sin 2\psi_0 - 2\frac{d\psi}{dT} \leqq 1 \times 10^{-4}$$

where,

$V\pi$: half-wave voltage of said Pockel's-effect element

$V\pi_0$: half-wave voltage of said Pockel's-effect element at the room temperature

$\frac{d(1/V\pi)}{dT}$: temperature coefficient of the half-wave voltage

ψ_0: optical bias given by said retardation element at the room temperature

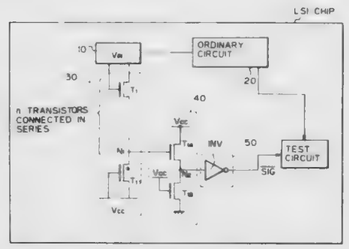
$\frac{d\psi}{dT}$: temperature coefficient of the optical bias.

5,111,136

SEMICONDUCTOR CIRCUIT

Hiromi Kawashima, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 14, 1991, Ser. No. 746,148
Claims priority, application Japan, Aug. 15, 1990, 2-215429
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 R **7 Claims**



1. A semiconductor circuit comprising:

a first circuit including a group of "n" transistors each having a threshold voltage of Vth to provide a collective threshold voltage of nVth, and a load element, the transistors and load element being connected in series between a power source and an input terminal, a node between the transistor group and the load element forming an output terminal of the first circuit;

a second circuit including a first transistor whose gate receives an output from the output terminal of the first circuit, and a second transistor whose gate receives a power source voltage, the first and second transistors being connected in series between the power source and a ground, a node between the first and second transistors forming an output terminal of the second circuit; and

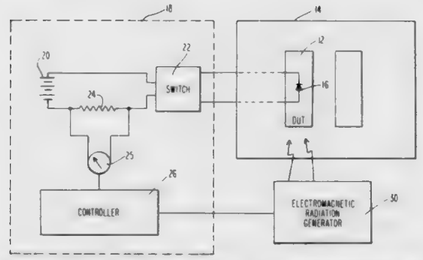
an inverter circuit for providing a test mode signal in response to an output of the second circuit.

5,111,137

METHOD AND APPARATUS FOR THE DETECTION OF LEAKAGE CURRENT

John M. Heumann, Loveland, Colo., and Vance R. Harwood, Amstelveen, Netherlands, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 29, 1990, Ser. No. 605,289
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—158 R **23 Claims**



1. Apparatus for determining the quality of the mounting of a semiconductor device on a circuit board, the circuit board comprising first and second conductive paths and the semiconductor device comprising first and second leads and a diode effectively formed between said leads, wherein said first lead is associated with said first path and said second lead is associated with said second path , said apparatus comprising:

a current monitor, connected to monitor the leakage current from said diode; and

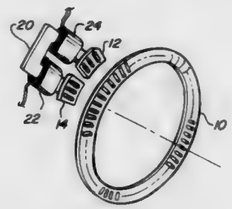
an electromagnetic radiation generator, positioned to provide electromagnetic radiation incident on said semiconductor device, wherein leakage current monitored during the provision of electromagnetic radiation is indicative of mounting quality.

5,111,138

SPEED SENSOR HAVING A CLOSED MAGNETIC FLUX PATH FOR SENSING SPEED FROM AN AXIAL FACE OF A ROTATING MEMBER

Dennis A. Kramer, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 523,694, May 15, 1990, abandoned.
This application Jul. 18, 1991, Ser. No. 732,252
Int. Cl.[5] G01P *3/488*
U.S. Cl. 324—174 **4 Claims**



1. A rotational speed sensor comprising:

a stator having two portions;

a first portion including two discrete elements which are circumferentially spaced along a circumference from one another and feature radially extending surfaces;

each said surface having alternating circumferentially spaced regions offering first and second magnitudes of magnetic permeability;

said stator having a second portion forming a high magnetic permeability structural interconnection between said surfaces of said discrete elements of said first portion;

a magnet disposed between at least one of said discrete elements and said second portion of said stator and providing structural interconnection therebetween;

a rotor arranged for rotation about a rotational axis and having alternating circumferentially spaced regions offering first and second magnitudes of magnetic permeability;

said alternating circumferentially spaced regions of first and second magnitudes of magnetic permeability of said rotor and stator being axially opposed and arranged in close proximity to one another;

said rotor, magnet and stator being arranged to form a magnetic flux path whereby a variation in magnetic flux indicative of the rotational speed of said rotor relative to said stator is produced in said magnetic flux path upon rotation of said rotor; and

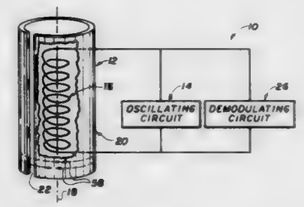
means for sensing variation in said flux disposed on said second portion of said stator.

5,111,139

INDUCTIVE DISPLACEMENT TRANSDUCER HAVING AN UNDULATORY MOVEABLE MEMBER

Mitchell Rose, 3718 Silsby Rd., University Heights, Ohio 44118

Filed Mar. 30, 1990, Ser. No. 502,847
The portion of the term of this patent subsequent to Apr. 21, 2009, has been disclaimed.
Int. Cl.[5] G01B *7/14*
U.S. Cl. 324—207.22 **1 Claim**





1. A transducer for measuring linear displacement of an object, comprising:

a uniformly wound substantially cylindrical coil for generating a magnetic field when an electrical current passes therethrough, said coil having a predetermined length and an inductance determined in part by said length, said coil defining a hollow interior portion and having a longitudinal axis;

an elongate steel probe for changing the inductance of said coil in response to the insertion of said probe within said hollow interior portion of said coil along said longitudinal axis, said steel probe having at least one surface coextensive with said predetermined length of said coil which is substantially undulatory in shape;

a protective shield surrounding a substantial portion of said probe and said coil, said protective shield having a slit aligned with said longitudinal axis of said coil and extending the entire length thereof;

an oscillating circuit connected electrically in parallel to said coil, said oscillating circuit being responsive to said change in the inductance of said coil to output an oscillating signal having a voltage amplitude varying as a function of the change in the inductance; and

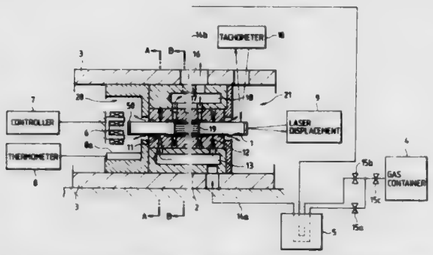
a demodulating circuit connected electrically in parallel to said oscillating circuit, said demodulating circuit being responsive to changes in said oscillating signal of said

oscillating circuit to output a sinusoidal voltage signal relating to the axial position of said probe within said hollow interior portion of said coil.

5,111,140
APPARATUS AND METHOD FOR MEASURING REPULSIVE DISPLACEMENT AND REPULSIVE FORCE CHARACTERISTICS OF A SUPERCONDUCTOR WITH RESPECT TO A MAGNET

Ryoichi Takahata, Osaka, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Mar. 7, 1990, Ser. No. 489,914
Claims priority, application Japan, Mar. 8, 1989, 1-57442; Dec. 27, 1989, 1-344767
Int. Cl.[5] G01N *27/72*; G01R *33/12*
U.S. Cl. 324—228 **16 Claims**

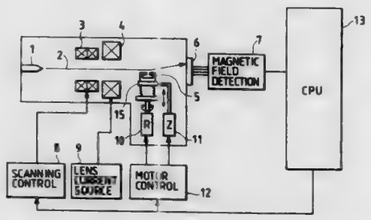


1. A method of measuring repulsive displacement of a superconductor, comprising the steps of:
supporting said superconductor in a predetermined position without contact inhibiting the repulsive displacement;
disposing a magnet at a position opposed to said superconductor along an axis of displacement;
increasing the magnetic forced of said magnet; and
measuring a repulsive displacement of said superconductor from said predetermined position to a stop position.

5,111,141
MAGNETIC FIELD MEASUREMENT OPTIMIZATION APPARATUS USING A CHARGED PARTICLE BEAM

Satoru Fukuhara, Katsuta; Hiroyuki Shinada, Chyofu, and Shigemitsu Seitoh, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 31, 1990, Ser. No. 607,351
Claims priority, application Japan, Nov. 1, 1989, 1-282956
Int. Cl.[5] G01R *33/02*
U.S. Cl. 324—250 **21 Claims**

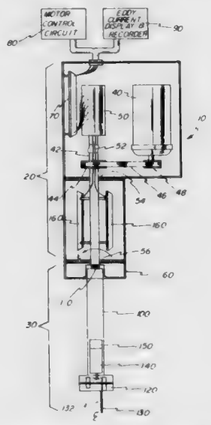


1. A magnetic field measurement optimization apparatus for optimizing the measurement of a magnetic field created by a sample, comprising:
charged particle beam emitting means for emitting a finely focussed charged particle beam so as to travel through and be deflected by a magnetic field created by a sample;
impingement detecting means for detecting the impingement of the charged particle beam on the surface of the sample; and
position adjusting means for adjusting the propagation path of the charged particle beam relative to the sample on the basis of an impingement detection signal provided by the impingement detecting means to maximize the deflection of the charged particle beam by the magnetic field.

5,111,142
EDDY CURRENT PROBLE WITH ADJUSTABLE POSITION ROTATING HEAD

Daniel P. Mazzone, Dayton; James D. Hoeffel, Centerville; James S. Nevitt, Bellbrook, and Richard E. Elliott, Dayton, all of Ohio, assignors to Systems Research Laboratories, Inc., Dayton, Ohio

Filed Aug. 8, 1990, Ser. No. 564,272
The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.
Int. Cl.[5] G01N *27/72*; G01R *33/12*
U.S. Cl. 324—262 **8 Claims**



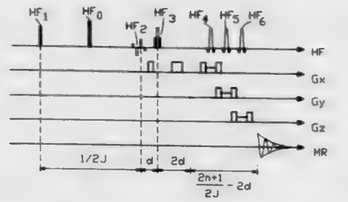
1. An articulated inspection probe including a body member,
means for attaching said body member to a rotating drive member for rotation about an axis,
a head member carried by said body member for rotation therewith, said head member containing an inspection device,
modifying means carried by said body member for modifying the physical position of said head member with respect to said body member while said body member is rotating, and
sensing means carried by said body member for sensing the position of said head member relative to said body member.

5,111,143
MAGNETIC RESONANCE SPECTROSCOPY METHOD AND APPARATUS FOR PERFORMING THE METHOD

Graeme McKinnon, Zürich, and Peter Bösiger, Ennetbaden, both of Switzerland, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 3, 1990, Ser. No. 562,521
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1989, 3925972
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—307 **20 Claims**

1. A magnetic resonance spectroscopy method where a plurality of sequences act on an examination zone in the presence of a uniform, steady magnetic field, each sequence comprising at least first, second and third RF pulses ($HF_1 \ldots HF_3$), the distance in time between the first and second RF pulses (HF_1, HF_2) being equal to the reciprocal value of twice a scalar coupling constant (J), after the second and the third RF pulses (HF_2, HF_3) there being applied magnetic gradient fields (Gx) having amplitude and duration so that spin resonance signals occurring after the third RF pulse are exclusively due

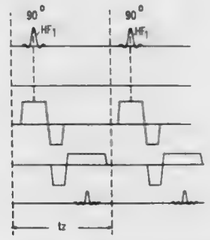


to double quantum coherence, characterized in that in order to reduce a first lipid spectral component (L_1) at the area of a first lactate component (M_1), the second and/or the third RF pulse (HF_2, HF_3) is frequency selective so that it acts as a 90° pulse for a second lactate spectral component (M_2) coupled to the first lactate spectral component (M_1) and as a 0° pulse or a 180° pulse for a second lipid spectral component (L_2) coupled to the first lipid spectral component (L_1).

5,111,144
MAGNETIC RESONANCE TOMOGRAPHY METHOD AND MAGNETIC RESONANCE TOMOGRAPHY APPARATUS FOR PERFORMING THE METHOD

Michael Kuhn, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed Nov. 13, 1990, Ser. No. 612,950
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1989, 3938370
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **4 Claims**

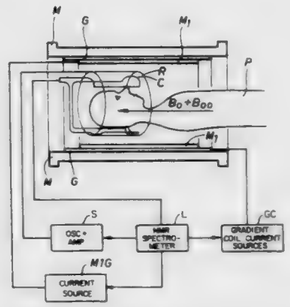


1. A magnetic resonance tomography method where a plurality of sequences act on an object to be examined (20) in the presence of a steady, uniform magnetic field, each of said sequences including the generating of a magnetic rf pulse (HF1) in conjunction with a first magnetic gradient field (Gz) and the reading of a spin resonance signal in the presence of a second magnetic gradient field which has a gradient (Gy) extending perpendicularly to the gradient of the first field, the object being displaced in the direction of the gradient (Gz) of the first magnetic gradient field and the image of the nuclear magnetization distribution being line-wise reconstructed by way of a one-dimensional Fourier transformation of the spin resonance signal each time obtained, characterized in that the excitation sequences are preceded by a saturation sequence which dephases the nuclear magnetization everywhere outside a slice (201, 202) extending parallel to the directions of the two gradients.

5,111,145
METHOD AND APPARATUS FOR STUDYING THE PROPERTIES OF A MATERIAL

Raimo E. Sepponen, Helsinki, Finland, assignor to Instrumentarium Corp., Finland

Continuation of Ser. No. 372,046, Jun. 27, 1989, abandoned.
This application Feb. 28, 1991, Ser. No. 663,076
Claims priority, application Finland, Jul. 1, 1988, 883153
Int. Cl.[5] G01R *33/62*
U.S. Cl. 324—316 **7 Claims**

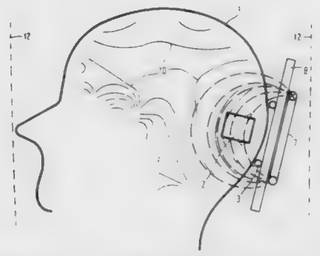


5. An apparatus for applying dynamic nuclear polarization and magnetic resonance imaging methods to studying an object, characterized in that said apparatus is provided with means for changing the intensity of a polarizing magnetic field in a manner that the intensity of a polarizing field over the object during the saturation of an electron spin system required by dynamic nuclear polarization is different from that of a polarizing field lying over the object during the detection of an NMR signal.

5,111,146
COIL SYSTEM FOR VOLUME-SELECTIVE MAGNETIC RESONANCE SPECTROSCOPY

Michael H. Kuhn, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 29, 1990, Ser. No. 529,987
Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917619
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—318 **10 Claims**



1. A coil system for a volume-selective magnetic resonance spectroscopy arrangement, said arrangement including means for generating a steady-state magnetic field which exhibits variations in an object zone due to local variations of magnetic susceptibility in the object zone, said system comprising:
a radio frequency RF coil adapted to be selectively connected to a selected one of an RF generator and an RF receiver to respectively generate magnetic RF fields or receive RF signals;

a steady-state magnetic field correction coil at a defined distance in space from the RF coil; and

a current source for supplying current at a frequency substantially lower than said radio frequency to the correction coil so that said correction coil generates a spatially varying magnetic field in the zone exposed to the RF coil generated fields.

5,111,147

GRADIENT COIL SYSTEM FOR NMR MACHINES

Guy Aubert, Grenoble, France, assignor to Centre National de la Recherche Scientifique, Paris, France

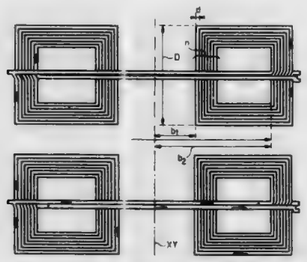
PCT No. PCT/FR88/00462, § 371 Date Mar. 26, 1990, § 102(e) Date Mar. 26, 1990, PCT Pub. No. WO89/03031, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 16, 1988, Ser. No. 490,603

Claims priority, application France, Sep. 28, 1987, 87 13350

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **10 Claims**



1. Method for the compensation of the magnetic effects of the eddy currents in predetermined zones of an NMR machine provided with a system of gradient coils said to be compensated because said gradient coils are designed to eliminate the magnetic effects of the eddy currents, characterized in that said method comprises a step for the adjusting of the current in these coils so that a magnetic vector potential (A) created by said system of gradient coils or one of the components is reduced to a minimum in said predetermined zones, said components of said magnetic vector potential being geometrical components.

5,111,148

BATTERY VOLTAGE DISCRIMINATOR CIRCUIT

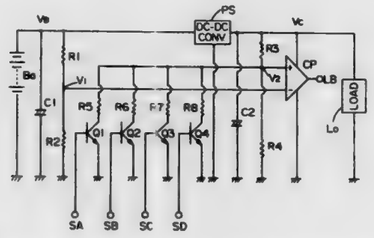
Seiiti Senoo, and Yoshio Watanabe, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed May 30, 1990, Ser. No. 530,561

Claims priority, application Japan, May 31, 1989, 1-137670

Int. Cl.[5] G01N *27/27*

U.S. Cl. 324—433 **10 Claims**



1. In a battery voltage discriminator circuit for an apparatus having battery means, a plurality of loads which are selectively driven by said battery means, and signal means for generating a signal indicative of the battery means voltage dropping below a reference voltage, said circuit further comprising:

reference voltage setting means for setting said reference voltage to one of plural predetermined values, said plural predetermined values each respectively corresponding to a different one of said loads, said one value corresponding to the load then being driven by said battery means; and

reference voltage change means for activating said reference voltage setting means for a period of time in response to a change in the load being driven by said battery means.

5,111,149

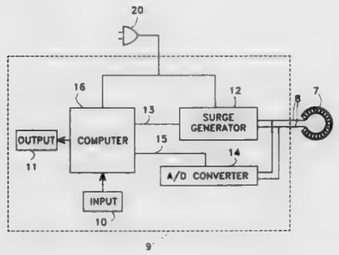
METHOD AND APPARATUS FOR AUTOMATICALLY CALCULATING THE INTEGRITY OF AN ELECTRICAL COIL

Jeffrey D. Lebesch, Fort Collins, Colo., assignor to Baker Electrical Instrument Company, Fort Collins, Colo.

Filed Feb. 28, 1989, Ser. No. 317,274

Int. Cl.[5] G01R *31/02, 31/06*

U.S. Cl. 324—546 **50 Claims**



1. A method for automatically calculating the integrity of an electrical coil comprising the steps of sequentially:

(a) connecting an electrical coil to test equipment;

(b) subjecting said coil to at least one electrical surge;

(b) subjecting said coil to at least one electrical surge;

(c) reading the reaction of said coil to the electrical surge through operation of said test equipment;

(d) automatically calculating the integrity of said coil; and

(e) automatically determining the acceptability of the integrity by comparing said calculation of integrity to a limit wherein said limit is set without faulting a representative coil and wherein said limit is a dimensionless error representing a deviation from a resonance established by an impedance in the tester and an impedance of the coil.

5,111,150

PRECISION PHASE SHIFT SYSTEM

David D. Casey, Overland Park, Kans., assignor to Garmin Corporation, Lenexa, Kans.

Filed Sep. 26, 1990, Ser. No. 588,288

Int. Cl.[5] H03B *3/04*

U.S. Cl. 328—155 **27 Claims**



1. An apparatus for producing selectively phase-shifted output signals comprising:

base signal means for producing periodic base signals and for selectively changing the frequency thereof between first and second frequencies;

output means operably coupled with said base signal means for producing output signals in response to said base signals, said output signals presenting a phase relationship with said base signals; and

phase shift means for producing phase shift signals representative of a plurality of successive phase shifting steps,

said output means including means responsive to said phase shift signals for shifting the phase of said output signals relative to said base signals in said plurality of successive phase shifting steps over a plurality of successive cycles,

said base signal means including means for maintaining said base signals at said first frequency during said phase shifting steps, for subsequently changing said base signals to said second frequency for at least one cycle in order for said output means to produce at least one corresponding output signal in response, and for subsequently changing said base signal to said first frequency.

5,111,151

DIGITAL PHASE LOCKED LOOP SYSTEM

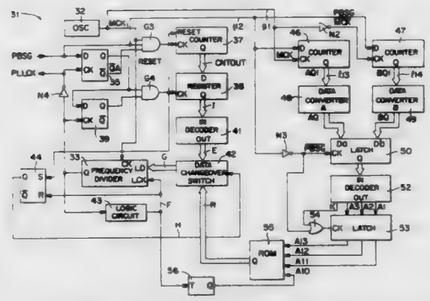
Hiroshi Ii, Higashi-Hiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1989, Ser. No. 424,697

Claims priority, application Japan, Oct. 21, 1988, 63-266676

Int. Cl.[5] H03K *5/13;* **H03L** *7/00;* **H03D** *3/24*

U.S. Cl. 328—155 **7 Claims**



1. A digital phase locked loop system for receiving an input signal and supplying a phase locked loop clock signal for synchronizing the input signal comprising:

an oscillator for generating a clock signal of a predetermined frequency;

a variable frequency divider, responsive to said clock signal from said oscillator, for producing a phase locked loop clock signal by dividing a frequency of said clock signal;

first means, responsive to the input signal and the phase locked loop clock signal, for detecting a phase difference between the input signal and the phase locked loop clock signal, thereby outputting a phase difference detecting signal according to the detected difference;

second means, operatively connected to said first means and responsive to said phase difference detecting signal, for providing said frequency divider with a first frequency dividing ratio corresponding to said phase difference when said phase difference detecting signal is received;

third means, operatively connected to said oscillator and responsive to the input signal and said phase locked loop clock signal, for detecting a frequency of the input signal and for providing said variable frequency divider with a second frequency dividing ratio corresponding to a phase of the input signal being coincidence with a phase of the phase locked loop clock signal; and

fourth means, operatively connected to said frequency divider and said third means, for initially establishing said first frequency dividing ratio of said variable frequency divider according to said second means and thereafter establishing said second frequency dividing ratio of said variable frequency divider according to said third means in response to said phase locked loop clock signal produced by said variable frequency divider in response to said first frequency dividing ratio.

5,111,152

APPARATUS AND METHOD FOR DEMODULATING A DIGITAL MODULATION SIGNAL

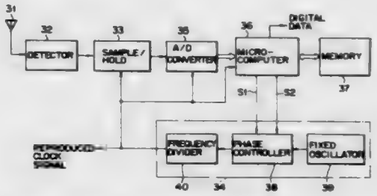
Masaaki Makino, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1991, Ser. No. 730,474

Claims priority, application Japan, Jul. 19, 1990, 2-191094; May 15, 1991, 3-110575

Int. Cl.[5] H03D *3/00*

U.S. Cl. 329—300 **20 Claims**



1. A demodulating apparatus comprising:

detector means for performing a frequency-detection on a digital modulation signal to acquire a detection signal;

clock generating means for generating a clock signal; and

discrimination means for sampling a voltage level of said detection signal from said detector means at a clock timing of said clock signal from said clock generating means, and converting the sampled voltage level into digital data, which is set to have one of first and second logic values on the basis of a reference voltage LDC;

wherein said discrimination means includes control means for comparing the voltage level En sampled at a clock timing, voltage level En−1 sampled at a timing one clock earlier than En and voltage level En−2 sampled at a timing two clock earlier than En, with first and second threshold voltages LA and LB respectively higher and lower than said reference voltage LDC, and controlling said clock generating means to synchronize the phase of said clock signal with said detection signal when it is detected from the comparison that anyone of first and second conditions is satisfied where the first condition is $En-2<LB$, $LB \leqq En-1 \leqq LA$ and $LA<En$, and the second condition is $LA<En-2$.

5,111,153

NON-LINEAR OPTICAL AMPLIFICATION

Michael J. O'Mahony, Felixstowe, and Ian W. Marshall, Woodbridge, both of England, assignors to British Telecommunications public limited company, England

Continuation of Ser. No. 341,323, Apr. 21, 1989, abandoned. This application Jun. 18, 1990, Ser. No. 540,444

Claims priority, application United Kingdom, Apr. 22, 1988, 8809603

Int. Cl.[5] H01S *3/103;* **G02F** *1/28*

U.S. Cl. 359—336 **34 Claims**

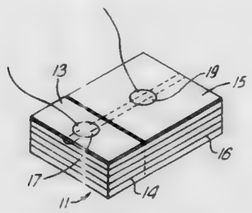
1. A method of amplifying an optical signal, comprising:

locating an optical amplifier device having an amplification region and a saturable absorption region, there being either only one amplification region or only one saturable absorption region, so that an input optical signal is receivable by the amplification region,

pumping the amplification region below the lasing threshold,

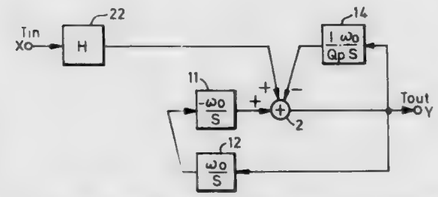
inputting said signal of selected wavelength λ and at a level

such that the amplification region remains below its lasing threshold,
controlling the device to operate in a non-linear manner, and



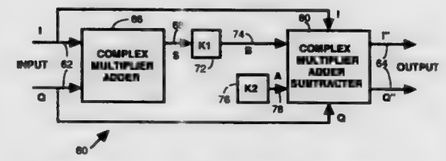
receiving an amplified output signal at the input wavelength λ.

5,111,154
ANALOG FILTER
Chikashi Nakagawara, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Dec. 24, 1990, Ser. No. 632,948
Claims priority, application Japan, Dec. 25, 1989, 1-337560
Int. Cl.[5] H03F *1/34*
U.S. Cl. 330—85 **6 Claims**



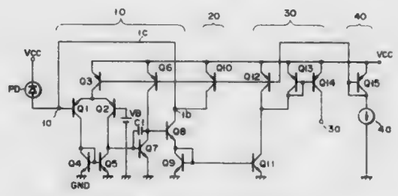
3. An analog high-pass filter for realizing the secondary transfer function by using an amplifier having a feedback loop, comprising:
first and second integrating means for integrating an output signal;
third integrating means for integrating a signal from the second integrating means; and
signal combining means for combining signals from the first and third integrating means with an input signal and deriving the output signal.

5,111,155
DISTORTION COMPENSATION MEANS AND METHOD
Christopher R. Keate; Sergio Aguirre, both of Chandler, and Brian L. Stockdell, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 4, 1991, Ser. No. 663,522
Int. Cl.[5] H03F *1/32*
U.S. Cl. 330—149 **11 Claims**



1. A phase compensation apparatus, comprising:
first signal processing means providing a first output signal (I') proportional to a first input signal (I) being provided thereto;
second signal processing means providing a second output signal (Q') proportional to a second input signal (Q) being provided thereto;
third signal processing means coupled to outputs of the first and second signal processing means for providing a third output signal (B) proportional to the sum of the first (I') and second (Q') output signals; and
fourth signal processing means receiving the first (I) and second (Q) input signals and the third output signal (B) and a fourth signal (A) and producing a fifth output signal (Q'') proportional to a difference of a product of the fourth signal (A) and the first input signal (I) and a product of the third output signal (B) and the second input signal (Q), and producing a sixth output signal (I'') proportional to a sum of a product of the fourth signal (A) and the second input signal (Q) and a product of the third output signal (B) and the first input signal (I).

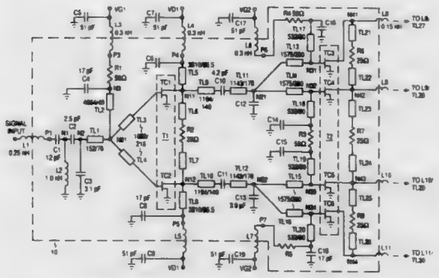
5,111,156
CURRENT AMPLIFIER CIRCUIT
Masayuki Hachiuma, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 29, 1990, Ser. No. 619,604
Claims priority, application Japan, Dec. 1, 1989, 1-312551
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—257 **17 Claims**



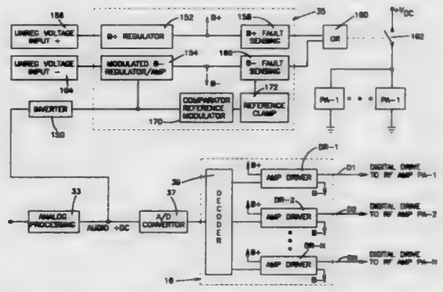
15. A current amplifier circuit comprising:
a reference bias generating circuit for generating a reference bias;
an operational amplifier for amplifying an input current, said operational amplifier including an input terminal for receiving the input current, an output terminal, a feedback loop between said input terminal and said output terminal, and a signal detector through which a signal current of said feedback loop flows;
a bias current circuit responsive to the reference bias for providing a bias current which flows through said signal detector, whereby a sum current equal to said bias current and said signal current flows through said signal detector; and
a bias current subtracting circuit having an input current equal to the current through said signal detector and subtracting a current equal to the bias current from the input current to output an output current signal equal to the signal current.

5,111,157
POWER AMPLIFIER FOR BROAD BAND OPERATION AT FREQUENCIES ABOVE ONE GHZ AND AT DECADE WATT POWER LEVELS
James J. Komiak, Lansing, N.Y., assignor to General Electric Company, Syracuse, N.Y.
Filed May 1, 1991, Ser. No. 694,410
Int. Cl.[5] H03F *3/60*
U.S. Cl. 330—286 **16 Claims**

1. A power amplifier for operation over a broad band of frequencies above 1 GHZ and at power levels in tens of watts, comprising,
A) an input terminal for connection to an RF signal source having a resistive 50 ohm impedance,
B) a monolithic microwave integrated circuit (MMIC) formed on a first monocrystalline semiconducting substrate **11** comprising
(1) a driver stage comprising
(i) a FET driver transistor (**T1**) subdivided into two parallel operated transistor cells (**TC1**, **TC2**), each cell having a rectangular configuration with interdigitated source, drain, and gate segments, a gate segment manifold being placed to one side of each cell, a drain segment manifold being placed to the other side, and a source segment manifold, formed of a linear air bridge spanning each cell and making ground contact at the to and bottom of each cell, the cellular configuration providing improved device efficiency and raising the input impedance above a minimum of a few (i.e. 4–10) ohms to facilitate an efficient match to said source over said broad band with reasonable signal gain, each cell having a high Q input impedance with significant shunt capacitance, resulting in a falling signal gain through said broad band and a low Q output impedance whose resistive component is several (i.e. 2–4) times greater than said input resistance,
(ii) an input network having an input connection to said signal input terminal and fanned out to provide separate output connections to said two gate manifolds,
each path through said input network comprising four serial sections, each contributing to an impedance reducing transformation to minimize return loss (**S11**) and each exhibiting resonance with staggered tuning to preemphasize the upper portion of s id broad band to offset decreasing transistor gain while sustaining reasonable stage signal gain (**S21**) over said broad band,
(2) an output power stage comprising
(i) a FET power transistor (**T2**) subdivided into four parallel operated transistor cells (**TC3**, **TC4**, **TC5**, **TC6**), each cell having a rectangular configuration with interdigitated source, drain and gate segments, a gate segment manifold being placed to one side of the cell, a drain manifold being placed on the other side, and a source segment manifold, formed of a linear air bridge spanning each cell and making ground contact at the top and bottom of each cell, the cellular configuration providing improved device efficiency and raising the input impedance above a minimum of several (i.e. 2–5) ohms to facilitate an efficient match to the driver stage over said broad band with reasonable signal gain, each cell having a high Q input impedance with significant shunt capacitance, resulting in a falling signal gain through said broad band and a low Q output impedance whose resistive component is several (i.e. 2–4) times greater than said input resistance,
(ii) an interstage network having two parallel input connections, one to each of the drain manifolds of said driver transmitter and fanned out to provide four separate output connections, one to each of the gate manifolds of said power transistors,
each path through said interstage network comprising four serial sections, each contributing to an impedance reducing transformation to improve the power match between driver transistor drain manifolds and power transistor gate manifolds and each exhibiting resonance with staggered tuning to preemphasize the upper portion of said broad band to offset decreasing transistor gain while sustaining reasonable stage signal gain (**S21**) over said broad band, and
C) an output terminal for connection to an RF load having a resistive 50 ohm impedance,
D) an output network formed upon a second substrate (**11**) adjacent to said first substrate (**10**), having an underlying ground plane, a central insulating layer of a material having a dielectric constant at least equal to that of said first substrate, and a patterned metallization on the upper surface thereof for formation of said network,
said output network having four input connections, one to each of the drain manifolds of said power transistor and fanning in to a single output path connected to said output terminal, each path through said output network comprising four serial sections, each contributing to an impedance increasing transformation and each exhibiting resonance with staggered tuning to achieve a b road b and impedance match for a reflectionless power transfer (**S22**) to said RF load.



5,111,158
MODULATED VOLTAGE SUPPLY AND FAULT MONITORING THEREOF ADAPTED FOR USE IN AN RF POWER AMPLIFIER SYSTEM
Jeffrey M. Malec, and Hilmer I. Swanson, both of Quincy, Ill., assignors to Harris Corporation, Melbourne, Fla.
Filed Jun. 27, 1991, Ser. No. 722,298
Int. Cl.[5] H03F *1/26, 3/24*
U.S. Cl. 330—297 **13 Claims**



1. A modulated voltage supply and fault monitoring thereof, comprising:
means for providing a modulating signal having a variable magnitude;
a modulated voltage supply for receiving an input voltage and said modulating signal for modulating said input voltage to provide a modulated output voltage which has been amplitude modulated in accordance with the amplitude variations of said modulating signal;
reference means for receiving said modulating signal and providing a variable reference signal having a magnitude that varies with that of said modulating signal; and

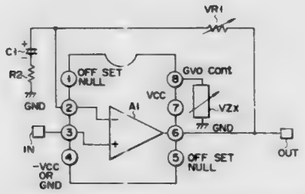
fault comparing means for comparing the magnitude of said modulated signal and that of said variable reference signal and providing a fault signal in dependence upon said comparison.

5,111,159

AMPLIFIER CIRCUIT WITH OPEN-LOOP GAIN THAT CAN BE VARIED WITH RESPECT TO CLOSED-LOOP GAIN

Hiroshi Arakawa, Yokohama, Japan, assignor to Kabushiki Kaishi Toshiba, Kawasaki, Japan

Filed Mar. 6, 1991, Ser. No. 665,471
Claims priority, application Japan, Mar. 9, 1990, 2-58443
Int. Cl.[5] H03G *3/10*
U.S. Cl. 330—254 **8 Claims**



1. An amplifier circuit, with an open-loop gain and a closed-loop gain, comprising:

an operational amplifier having an inverting input terminal, a noninverting input terminal, and an output terminal, said operational amplifier including a current source circuit with a current path providing a current;

a feedback circuit for feeding a signal output from said output terminal back to said inverting input terminal to set the closed-loop gain of said amplifier circuit; and

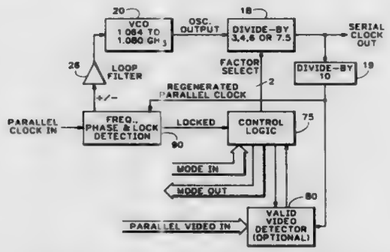
a replaceable load connected to a portion of the current path of said current source circuit for changing the current provided by said current source circuit to set the open-loop gain of said amplifier circuit.

5,111,160

CLOCK GENERATION CIRCUIT FOR MULTISTANDARD SERIAL DIGITAL VIDEO WITH AUTOMATIC FORMAT IDENTIFICATION

David L. Hershberger, Nevada City, Calif., assignor to The Grass Valley Group, Nevada City, Calif.

Filed Apr. 30, 1991, Ser. No. 693,829
Int. Cl.[5] H03L *7/18*
U.S. Cl. 331—1 A **20 Claims**



1. A multiple standard video frequency clock source for generating clock signals at a first frequency and a second frequency, where the first frequency corresponds to the digital data rate of a first video standard and the second frequency corresponds to the digital data rate of a second video standard, the clock source comprising:

a frequency source whose output is a first frequency source output frequency or a second frequency source output frequency depending on the status of a frequency source output frequency control signal;

frequency dividing means for dividing the frequency source output frequency by a first constant in response to a first control signal to produce a first frequency and by a second constant in response to a second control signal to produce a second frequency; and

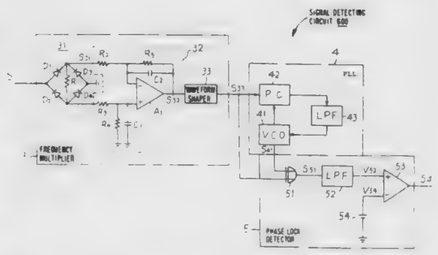
controlling means for producing the frequency source output frequency control signal, the first control signal and the second control signal according to which video standard is being used.

5,111,161

PLL WITH LOCK DETECTOR FOR DETECTING A SPECIFIED SIGNAL IN A PLURALITY OF INPUT SIGNALS

Toshiyuki Sato, Kanagawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 15, 1991, Ser. No. 669,981
Claims priority, application Japan, Mar. 20, 1990, 2-72304
Int. Cl.[5] H03L *7/06*
U.S. Cl. 331—25 **4 Claims**



4. A signal detecting method for detecting a designated signal specified in a designated frequency from an all-inclusive signal to be examined, specified in a plurality of frequencies; said method comprising the steps of:

multiplying a frequency of the all-inclusive signal by a multiplying factor, producing a multiplied signal specified in a multiplied frequency of the frequency of the all-inclusive signal by the multiplying factor;

comparing a phase (first phase) of the multiplied signal with a phase (second phase) of an oscillated signal specified in a multiplied frequency of the designated frequency by the multiplying factor, producing a comparison output signal;

shifting the second phase in response to the comparison output signal so that the first phase is locked with the second phase;

repeating said steps of phase comparison and phase shift until phase-lock between the first and second phases is established and producing a phase-lock output signal; and

comparing the phase-lock output signal with the multiplied signal for producing a detected output signal representing whether the designated signal is in the all-inclusive signal.

5,111,162

DIGITAL FREQUENCY SYNTHESIZER HAVING AFC AND MODULATION APPLIED TO FREQUENCY DIVIDER

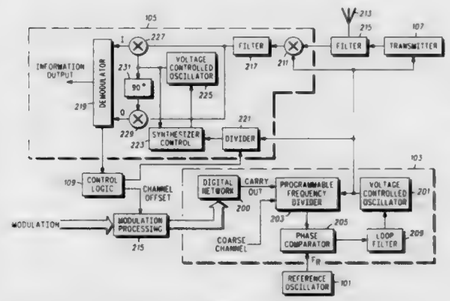
Alexander W. Hietala, Cary, and Patrick J. Marry, Huntley, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 3, 1991, Ser. No. 695,120
Int. Cl.[5] H03C *3/09;* **H03L** *7/18*
U.S. Cl. 332—127 **8 Claims**

1. A digital frequency synthesizer with automatic frequency control (AFC) and the capability of modulating an input signal on a carrier signal having a frequency, comprising:

means for dividing the carrier signal frequency by a selected divisor value;

means for converting the input signal to one of a predetermined plurality of representative numbers;



means for generating an offset number corresponding to a difference between the frequency of the carrier signal and a predetermined frequency; and

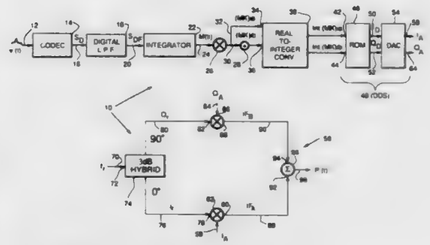
means for adding said offset number to said one of a predetermined plurality of representative numbers whereby said divisor value may be selected.

5,111,163

DIGITAL FM MODULATOR

Simha Erlich, Haifa, Israel, assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 6, 1991, Ser. No. 695,839
Int. Cl.[5] H03C *3/40*
U.S. Cl. 332—117 **20 Claims**



1. A digital FM modulator, comprising:

digital converter means for converting an AM analog input signal into a digital signal representative thereof;

digital signal processing means for processing said digital signal;

digital synthesizer means responsive to said processed digital signal for generating first and second variable frequency synthesizer output signals, I1 and Q1, respectively, disposed in phase quadrature relation with each other;

signal generating means for generating a fixed frequency reference signal;

I/Q hybrid circuit means, including:

signal splitter means for splitting said reference signal into first and second reference signal components I2 and Q2, respectively, disposed in phase quadrature relation with each other;

first mixer means for mixing said first reference signal component I2 with said first synthesizer output signal I1, to thereby produce a first intermediate frequency output signal IF1;

second mixer means for mixing said second reference signal component Q2 with said second synthesizer output signal Q1, to thereby produce a second intermediate frequency output signal IF2;

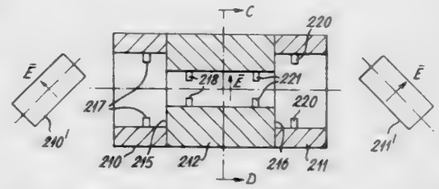
summer means for combining said first intermediate frequency output signal IF1 and said second intermediate frequency output signal IF2, to thereby produce an FM modulator output signal.

5,111,164

MATCHING ASYMMETRICAL DISCONTINUITIES IN A WAVEGUIDE TWIST

Frans C. De Ronde, Bath, England, assignor to National Research Development Corporation, London, United Kingdom

Filed Oct. 16, 1989, Ser. No. 422,020
Claims priority, application United Kingdom, May 29, 1986, 8613028; Apr. 8, 1987, 8708373; May 21, 1987, 8712030; Canada, Mar. 15, 1989, 593723
Int. Cl.[5] H01P *1/02, 1/165*
U.S. Cl. 333—21 A **24 Claims**



1. A twist for coupling first and second rectangular waveguides, the waveguides being oriented in a twisted relation to one another and each having corresponding transverse axes which are angularly oriented in relation to one another, the twist comprising:

conductive walls defining an opening which is positioned between first and second rectangular waveguides twisted in relation to one another, and which presents first and second interfaces to the first and second waveguides, respectively, and allows communication of electromagnetic fields between the waveguides through the opening, each said interface having a reference plane at which a reflection coefficient for waves transmitted in a first direction from the first waveguide to the second waveguide is equal and of opposite sign to a reflection coefficient for waves transmitted in a second direction from the second waveguide to the first waveguide,

the walls comprising a ridge having a first axis of symmetry in said first direction, the ridge also having a second axis of symmetry transverse to said first direction and angularly oriented in relation to directions of both of said corresponding transverse axes of the first and second waveguides.

5,111,165

MICROWAVE COUPLER AND METHOD OF OPERATING SAME UTILIZING FORWARD COUPLING

William W. Oldfield, Redwood City, Calif., assignor to Wiltron Company, Morgan Hill, Calif.

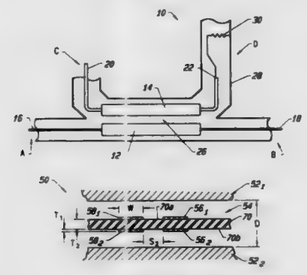
Filed Jul. 11, 1989, Ser. No. 378,012
Int. Cl.[5] H01P *5/18*
U.S. Cl. 333—116 **19 Claims**

1. An apparatus for forward coupling signals comprising:

a first and a second transmission line, said first transmission line having at opposite ends thereof a port A and a port B, respectively, said second transmission line having at opposite ends thereof a port C and a port D, respectively, said

ports A and C and said ports B and D being adjacent ports, respectively; and

first and second tightly coupled suspended substrate forward coupling means realized by said first and said second transmission lines being in a generally side-by-side relationship a predetermined distance S apart between said



ports A and B and between said ports C and D, respectively, such that a signal applied to said port A which has a frequency of at least 26GHz is forward coupled from said port A to said port D with a coupling factor of at least 8dB and substantially less coupling between said port A and port C.

5,111,166

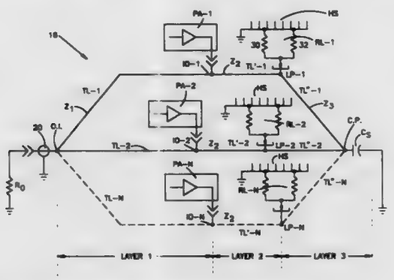
N-WAY POWER COMBINER HAVING N REJECT LOADS WITH A COMMON HEAT SINK

Robert J. Plonka; Dennis J. Milfs, and David L. Nickell, all of Quincy, Ill., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 11, 1991, Ser. No. 683,988

Int. Cl.[5] H01P *5/12*

U.S. Cl. 333—128 **12 Claims**



1. An N-way power combiner comprising:

a common output port;

N input ports, each adapted to be connected to one of N RF signal sources for receiving an RF input signal which is to be combined with other RF input signals to provide an output RF signal at said output port;

N load ports, each adapted to be connected to a reject load for dissipating power in the event that one or more of said RF input signal sources is deactivated;

N first transmission lines each connected at one end to said common output port and each connected at its opposite end to a respective one of said N input ports;

N second transmission lines respectively interconnecting each of said input ports with one of said load ports;

N third transmission lines each connecting a respective one of said load ports with a common point;

N reject loads, each connected to a different one of said N load ports for dissipating power in the event that one or more of said RF input signal sources is deactivated; and

a common heat sink coupled to all of said N reject loads with said heat sink being sized and configured to provide a total heat dissipation capability to dissipate more than the maximum amount of heat required to be dissipated by any one of said N reject loads and less than N times that amount.

5,111,167

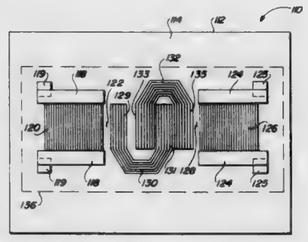
SURFACE ACOUSTIC WAVE DEVICE AND METHOD UTILIZING PLURAL MULTI-STRIP COUPLERS

Hunter W. Menning, Orlando, Fla., assignor to Sawtek, Inc., Orlando, Fla.

Filed Nov. 13, 1990, Ser. No. 612,105

Int. Cl.[5] H03H *9/42*

U.S. Cl. 333—151 **6 Claims**



1. A surface acoustic wave device comprising a substrate, overlap weighted input and output transducers disposed on a piezoelectric surface of the substrate in line each with the other; and multi-strip coupler means disposed on the surface between the input and output transducers for convolving energy from the input transducer to the output transducer, the multi-strip coupler means comprising two generally U-shaped multi-strip couplers disposed along the surface in overlapping relationship one with the other between the input and output transducers.

5,111,168

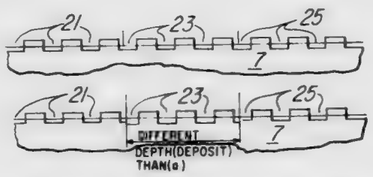
REAL-TIME, IN-SITU SAW FILTER DELAY ADJUSTMENT

Carl M. Panasik, Garland; Patrick J. Wilde, Decatur, and Betty L. James, Grapevine, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 15, 1990, Ser. No. 567,831

Int. Cl.[5] H03H *9/42, 9/68*

U.S. Cl. 333—152 **15 Claims**



1. A method of adjusting the delay of a SAW device comprising the steps of:

(a) providing a substrate capable of propagating a surface acoustic wave thereon having an input transducer portion on one end portion thereof, an output transducer portion on the opposite end portion thereof and a waveguide portion therebetween;

(b) masking said input and output transducer portions and providing a masked pattern over said waveguide portion exposing part of said waveguide portion;

(c) applying an RF input signal to said input transducer and providing an indication of the output obtained from said output transducer; and

(d) etching the exposed part of said waveguide portion with an etchant until said indication has reached a predetermined value.

5,111,169

LC NOISE FILTER

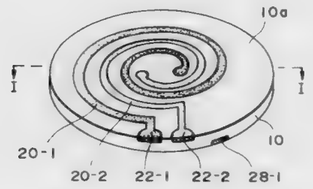
Takeshi Ikeda, 2-5-6-213, Sanno, Ohta-ku, Tokyo, Japan

Filed Mar. 22, 1990, Ser. No. 497,209

Claims priority, application Japan, Mar. 23, 1989, 1-71339; May 12, 1989, 1-119369

Int. Cl.[5] H03H *7/01, 7/09*

U.S. Cl. 333—181 **23 Claims**



1. An LC noise filter comprising:

a dielectric material;

a plurality of spiral grooves provided in at least one surface of said dielectric material in such a manner as to be concentrically adjacent to each other; and

a plurality of inductor conductors at least one of which is provided in each of said grooves;

each of said inductor conductors forming a capacitor with the inductor conductor adjacent thereto with a wall body of said dielectric material therebetween.

5,111,170

DIELECTRIC RESONATOR DEVICE

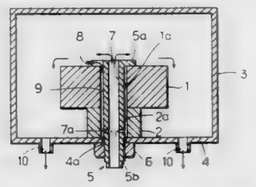
Kanji Ohya, Nagoya, Japan, assignor to NGK Spark Plug Co., Ltd., Japan

Filed Jun. 19, 1991, Ser. No. 717,624

Claims priority, application Japan, Jun. 22, 1990, 2-66367[U]

Int. Cl.[5] H01F *7/10*

U.S. Cl. 333—219.1 **5 Claims**



1. A dielectric resonator device comprising a dielectric resonator body of dielectric ceramics having an inner bore provided along the axis thereof, a pedestal having an inner bore provided along the axis thereof, a shield casing for containing the resonator body and the pedestal, and a fastening member inserted into the inner bores of the the resonator body and the pedestal for fastening and fixing them on the base wall of the shield casing, wherein the shield casing and the fastening member are provided with openings for circulating a cooling gas in the shield casing, respectively.

5,111,171

RELAY HAVING CONTACT VIEWING LENES IN THE COVER

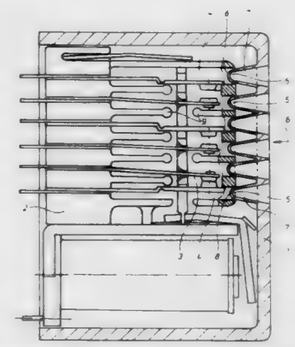
Jochen von Bonin, Gosheim, and Eberhard Kirsch, Wehingen, both of Fed. Rep. of Germany, assignors to Hengstler Bauelemente GmbH, Wehingen, Fed. Rep. of Germany

Filed Sep. 7, 1990, Ser. No. 579,012

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1989, 3929877

Int. Cl.[5] H01H *9/02*

U.S. Cl. 335—202 **3 Claims**



1. A relay with a removable cover and spring contact sets mounted on a single common spring carrier and arranged in chambers mutually separated from each other, wherein each chamber is provided with an opening coordinated with a projection attached to the cover such that when the cover is in place the opening is closed, and wherein the projections terminate in lenses.

5,111,172

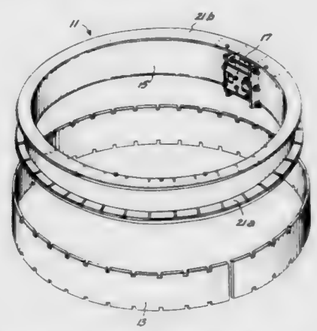
DEMOUNTABLE COIL FORM FOR EPOXY-IMPREGNATED COILS

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 17, 1989, Ser. No. 395,634

Int. Cl.[5] H01F *7/22*

U.S. Cl. 335—216 **6 Claims**



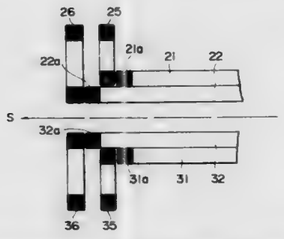
1. A demountable coil form for fabricating epoxy impregnated superconductive coils comprising:

a split ring having an axially extending opening being widest at its inner diameter and tapering towards the outer diameter of the ring;

a collar clamp secured to the ring on either side of the axially

extending opening for adjusting the size of the ring opening;
a wedge having a taper matching the taper of the opening;
means in contact with said wedge and connected to said ring for securing said wedge in said opening, the surface of said wedge positioned flush with the outer diameter of said ring; and
annular side plates secured to either axial side of said ring, said side plates extending radially outwardly from said ring, said side plates defining slots creating a passageway from the exterior of said side plates to the interior.

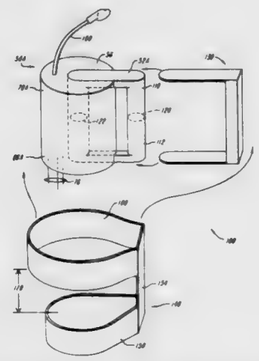
5,111,173
DEFLECTION ELECTROMAGNET FOR A CHARGED PARTICLE DEVICE
Tetsuya Matsuda; Shunji Yamamoto; Tadatoshi Yamada, and Toshie Ushijima, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Sep. 7, 1990, Ser. No. 578,790
Claims priority, application Japan, Mar. 27, 1990, 2-75582
Int. Cl.[5] H01F *1/00, 7/00;* **H01H** *5/00;* **H05H** *13/04*
U.S. Cl. 335—216 **10 Claims**



10. A deflection magnet for deflecting a charged particle beam along a semicircular orbit, said deflection magnet comprising:
upper and lower race-track shaped superconducting coils bent into semicircular form along the semicircular orbit and disposed symmetrically with respect to the plane of the orbit of the charged particle beam, said race-track shaped upper and lower coils each including radially inner and outer semicircular branches running parallel to the semicircular orbit and end portions bridging the radially inner and outer branches; wherein each one of the end portions of the upper and lower coils is divided into at least two layers disposed in a stepped configuration.

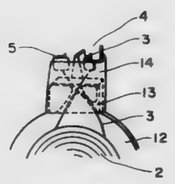
5,111,174
SHIELDED HIGH FREQUENCY POWER TRANSFORMER
J. Stanley Kriz, Fairfax, Va., assignor to AVP/Megascan, Littleton, Mass.
Filed Jul. 16, 1990, Ser. No. 555,041
Int. Cl.[5] H01F *15/04*
U.S. Cl. 336—73 **5 Claims**

1. A shielded inductor comprising:
a winding assembly having an aperture therethrough and an outer surface;
a magnetic circuit extending through said aperture;
a first magnetic shield substantially entirely surrounding the periphery of the portion of said magnetic circuit not extending through said winding assembly;
a second magnetic shield comprising
a first electrically continuous loop in close proximity and surrounding a portion of said winding assembly outer surface, and
a second electrically continuous loop laterally offset from said first electrically continuous loop and spaced apart from said winding assembly, wherein



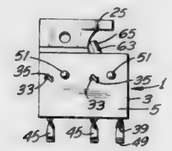
said first and second magnetic shields substantially inhibit free field electromagnetic radiation from said magnetic circuit.

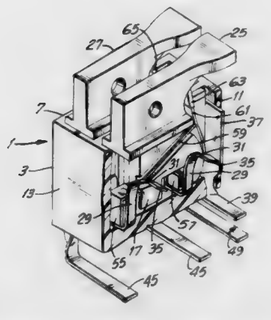
5,111,175
RESIN MOLDING WITH EMBEDDED COIL FOR ELECTROMAGNETIC VALVE WITH THERMAL SHOCK PROTECTION OF COIL LEADS
Masayuki Sugiura, Anjo; Nobuaki Miki, Kariya; Takeshi Nasu, Anjo; Kiyohiko Sugiura, Hekinan, and Masao Saito, Nishio, all of Japan, assignors to Aisin AW Co., Ltd., Japan
Filed Dec. 28, 1990, Ser. No. 633,619
Claims priority, application Japan, Dec. 28, 1989, 1-338191
Int. Cl.[5] H01H *3/00, 51/34*
U.S. Cl. 336—192 **7 Claims**



7. A resin molding and coil device for an electromagnetic valve for use in a vehicular hydraulic control circuit, said device comprising:
a coil bobbin;
an electromagnetic coil wound on said coil bobbin;
a lead extending from one end of said electromagnetic coil;
a connector terminal connected to said lead;
a groove formed in said coil bobbin and containing said lead therein;
a molding resin covering said bobbin, said coil, said lead and said terminal excepting a portion of said terminal;
and a flexible heat insulator covering said groove to separate said lead from said molding resin to reduce thermal shock to said lead and terminal.

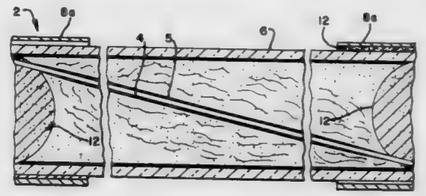
5,111,176
DUAL POSITION, FLAT MOUNT PIGGYBACK FUSE HOLDER
Carl E. Lindquist, Bridgewater, N.J., assignor to San-O Industrial Corporation, Holbrook, N.Y.
Filed Jun. 26, 1991, Ser. No. 722,608
Int. Cl.[5] H01H *85/02, 85/30*
U.S. Cl. 337—188 **4 Claims**





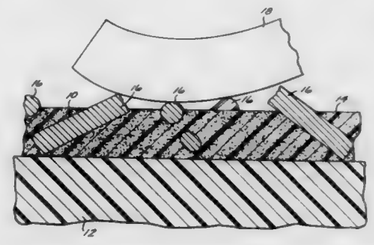
1. A dual position, piggyback fuse holder for flat mounting on an edge surface of a printed circuit board, said fuse holder comprising a fuse holder body portion made of an electrically insulative material and having three opposed, spaced apart parallel walls; a front side wall, a rear side wall and an intermediate partition wall; a pair of opposed spaced apart side edge walls extending from said front side wall to said rear side wall; and a bottom closure wall, said walls defining a first fuse holder compartment and a second fuse holder compartment, said first fuse holder compartment being adapted to receive a first fuse assembly having a fuse element and spaced contact terminals, and said second fuse holder compartment being adapted to receive a second fuse assembly having a fuse element and spaced contact terminals; a pair of generally U-shaped metallic members in said first fuse holder compartment, each of said generally U-shaped members having an integral, laterally extending arm portion which protrudes through a rectangular aperture in said front side wall and form a side contact pin which is twisted at said aperture from about 45 to about 90 degrees to lock said contact pin in position; a metallic alarm contact plate in said first fuse holder compartment abutting the inside surface of said edge wall and protruding through a rectangular aperture in said bottom closure wall forming an alarm contact pin which is twisted at said aperture from about 45 to about 90 degrees to lock said alarm contact pin in position; a pair of generally U-shaped members in said rear fuse holder compartment, each U-shaped member having an integral depending leg portion which protrudes through apertures in said bottom wall and twisted thereat from about 45 to 90 degrees and bent approximately 90 degrees to form additional contact pins, and a second alarm contact plate member abutting the inside surface of the edge wall in said second fuse holder compartment, said second alarm contact plate protruding from an aperture in said bottom closure wall, twisted thereat from about 45 to about 90 degrees and bent approximately 90 degrees to form a second alarm contact pin.

5,111,177
OVERLOAD CONDITION INDICATING FUSE
David J. Krueger, Arlington Heights; Siebang Oh, Elk Grove Village, and Lun K. Tjhie, Prospect Heights, all of Ill., assignors to Littlefuse, Inc., Des Plaines, Ill.
Continuation-in-part of Ser. No. 412,914, Sep. 26, 1989. This application Sep. 25, 1990, Ser. No. 587,809
Int. Cl.[5] H01H *85/30*
U.S. Cl. 337—243 **8 Claims**



1. A condition indicating fuse comprising: a housing having at least one transparent section; a pair of spaced terminals exposed on said housing for connection to an external circuit; a fuse element extending between said terminals in said housing, said fuse element melting to interrupt the circuit between said terminals immediately upon flow of short circuit currents or after various progressively decreasing periods of time upon the flow of progressively increasing levels of overload current; and fuse condition indicating means in said housing responsive to a current overload in the fuse element by depositing on the inner surface of said housing a material which fluoresces upon being subjected to external radiation to enable identification of said fuses that have been exposed to abnormally high current levels in their application, said fuse element indicating means including an overload condition indicating material which, upon the flow of said overload current, is blown against the inner surface of the housing.

5,111,178
ELECTRICALLY CONDUCTIVE POLYMER THICK FILM OF IMPROVED WEAR CHARACTERISTICS AND EXTENDED LIFE
Wayne P. Bosze, Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.
Filed Jun. 15, 1990, Ser. No. 538,801
Int. Cl.[5] H01C *10/30*
U.S. Cl. 338—160 **34 Claims**



1. An electrically conductive polymer film for incorporation in a potentiometer where the film is contacted by a movable wiper required to stay in contact with the film, the film comprising:
a cured polymeric resin;
an electrically conductive substance mixed in sufficient quantity with the polymeric resin to render the polymeric resin electrically conductive; and
means for reducing wiper-induced wear on the film, com-

prising particles selected from a group consisting of fibers and spheres, said particles being mixed with the polymeric resin, the particles being of sufficient quantity and size to protrude from the surface of the film to render the surface uneven on the micro scale whereby a wiper of a potentiometer which incorporates the film moves on the film substantially continuously in contact with the particles, thereby substantially reducing the amount of contact between the wiper and the surface of the film.

5,111,179

CHIP FORM OF SURFACE MOUNTED ELECTRICAL RESISTANCE AND ITS MANUFACTURING METHOD

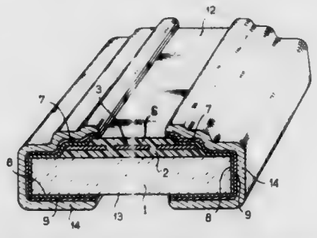
Claude Flassayer, St Laurent du Var, France, and Franklin Collins, Lewiston, N.Y., assignors to Sfernice Societe Francaise des l'Electro-Resistance, Paris, France

Filed Oct. 22, 1990, Ser. No. 600,819

Claims priority, application France, Oct. 20, 1989, 89 13759

Int. Cl.[5] H01C *1/012*

U.S. Cl. 338—313 **12 Claims**



1. In a chip form electrical resistance, designed to be soldered notably on a printed circuit card or on an hybrid circuit substratum, including an electrically insulating substratum **(1)** of the ceramic type on which is combined by an adhesive layer or organic resin **(2)**, a sheet **(3)** of metal or resistive alloy, this sheet being engraved in order to form filaments **(4)** connected together to constitute a sinuous resistive circuit, this resistive sheet **(3)**, being covered by another layer **(6)** of organic resin; the improvement in which said another layer of resin leaves free near the two opposite sides of the substratum **(1)**, two parts **(5, 5*a*)** at the extremity of the resistive sheet **(3)**, these two parts **(5, 5*a*)** of the resistive sheet being each covered by a thin layer **(8)** of a metal or alloy adhering shape-matingly to the resistive sheet **(3)**, said layer **(8)** of a metal or alloy being covered by a second thicker layer **(9)** of metal or conductive alloy, and said second layer **(9)** being covered by a third layer **(14)** also thicker of a solderable alloy, these three layers **(8, 9, 14)** being superimposed and extending equally and shapematingly over the two lateral and opposite sides of the substratum **(1)** and partially over the face **(13)** of the substratum opposite to the resistive sheet **(3)**.

5,111,180

APPARATUS FOR DETECTING RANGE SELECTED IN AUTOMATIC TRANSMISSION

Akihiro Suzuki, Shizuoka, Japan, assignor to Jatco Corporation, Fiji, Japan

Filed Feb. 22, 1991, Ser. No. 659,100

Claims priority, application Japan, Feb. 26, 1990, 2-45320

Int. Cl.[5] G08B *23/00*

U.S. Cl. 340—456 **6 Claims**

1. An apparatus for detecting in which one of a plurality of ranges an automatic transmission is placed, the apparatus comprising:

a contact support;

a cooperating moveable contact moveable relative to said contact support to assume a plurality of positions corresponding to the plurality of ranges, respectively;

a common stationary contact on said contact support cooperating with said moveable contact;

a plurality of individual stationary contacts cooperable with said common contact, said plurality of individual stationary contacts being arranged such that when said moveable contact assumes a first one of said plurality of positions, said moveable contact bridges a first portion of said plurality of individual stationary contacts with said common stationary contact, when said moveable contact assumes a second one of said plurality of positions, said moveable contact bridges a second portion of said plurality of individual contacts with said common stationary contact, and when said moveable contact assumes a third one of said plurality of positions, said moveable contact bridges a third portion of said plurality of individual contacts with said common contact;

signal lines connected to said first, second, and third portions of said plurality of individual stationary contacts in a predetermined overlapping manner; and

means for making a judgement based on information derived from said signal lines which one of said plurality of positions said moveable contact assumes and generating a range signal indicative of a range selected.

5,111,181

ARRANGEMENT FOR RECOGNIZING WHETHER OR NOT A VEHICLE IS SLOWING DOWN

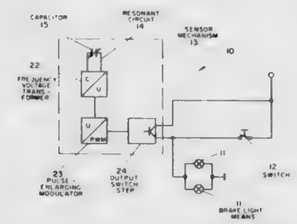
Wolfgang Priesemuth, Postkamp 13, 210 Breitenburg-Nordoe, Fed. Rep. of Germany

Filed Aug. 29, 1989, Ser. No. 400,164

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1989, 3903047

Int. Cl.[5] B60Q *1/50*

U.S. Cl. 340—467 **8 Claims**



1. An arrangement for recognizing, via brake light means provided on a vehicle, especially a motor vehicle, whether or not said vehicle is slowing down, whereby said brake light means can be turned on upon activation of a vehicle brake via a switch that is connected therewith, said arrangement further comprising:

a sensor mechanism for delivering to said brake light means signal means having a value that corresponds to the deceleration state and intensity of deceleration of said vehicle at any given time, whereby said brake light means is electrically activated in a manner that corresponds to said value of said signal means at least upon activation of said vehicle brake, whereby said sensor mechanism includes an element for detecting deceleration of said vehicle, with said element essentially including a capacitor as part of a resonant circuit, the capacitance of which varies as a function of the deceleration of said vehicle.

5,111,182

VEHICLE BRAKING ACTION ALARMING APPARATUS

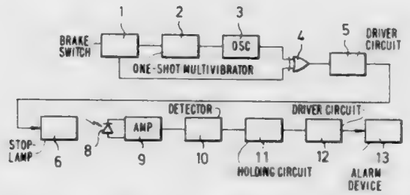
Kiyomitsu Ishikawa, and Toru Tanabe, both of Tokyo, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 393,519, Aug. 14, 1989, abandoned, and Ser. No. 406,682, Sep. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 311,531, Feb. 15, 1989, abandoned. This application Apr. 9, 1990, Ser. No. 507,357

Claims priority, application Japan, Feb. 19, 1988, 63-20682[U]

Int. Cl.[5] B60Q *1/44*

U.S. Cl. 340—479 **22 Claims**



1. A vehicle braking action alarming apparatus comprising:

stop-lamp means, mounted at the rear of the vehicle, for emitting light, said stop-lamp means having light emitting means which includes a light emitting diode;

oscillator means for generating a signal at a predetermined frequency;

driver means for driving and illuminating said stop-lamp means;

controller means for applying an output from aid oscillator means to said driver means when a brake switch of said vehicle is turned on, for causing said driver means to drive and illuminate said stop-lamp means to produce a light emission from said stop lamp means at said predetermined frequency;

photosensor means mounted at the front of said vehicle for receiving light from said stop-lamp means of another preceding vehicle; and

processor/driver means for processing a signal from said photosensor which received said light from said stop-lamp means of said another preceding vehicle, detecting said signal at said predetermined frequency and for driving a sound source for generating an audible alarm sound, warning an operator of a braking action of said another preceding vehicle when a light emission of said predetermined frequency is received and detected.

5,111,183

THIRD BRAKE LAMP EMPLOYING OPTICAL FIBERS

Frank Wang, No. 296, Section 2, Lu Shun Road, Pei Tun District, Tai Chung City, Taiwan

Filed Mar. 28, 1991, Ser. No. 676,426

Int. Cl.[5] G60Q *1/44*

U.S. Cl. 340—479 **2 Claims**

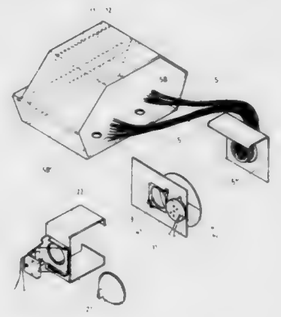
1. A third brake lamp comprising:

(a) a housing;

(b) a light source assembly received in said housing, said light source assembly including a lamp support having a lamp means mounted thereto;

(c) first bracket means mounted in said housing adjacent said light source assembly, said first bracket means having a first aperture therethrough, a focusing lens mounted in said first aperture, drive means mounted to a first surface of said first bracket means, said drive means having a shaft passing through said first bracket means, and a color board rotatably mounted on said shaft of said drive means adjacent a second surface of said first bracket means to cover said focusing lens;

(d) second bracket means mounted in said housing adjacent said first bracket, said second bracket means having a second aperture passing therethrough; and,



(e) a plurality of optical fibers, each having a first end mounted in said second aperture of said second bracket means and a second end removably mounted in an opening array of a display panel mounted in a first end of said housing, wherein said light emitted from said lamp means passes through said focusing lens and said color board to be focused on said first end of each of said optical fibers.

5,111,184

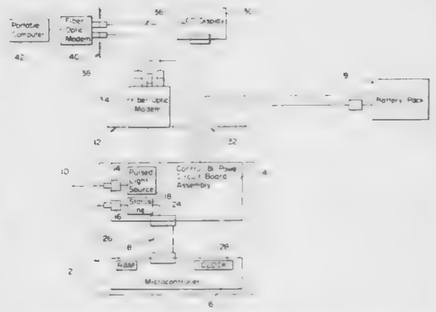
TAMPER-PROOF DEVICE FOR DETECTING OPENING AND CLOSING OF A SECURE CONTAINER

Harley L. Heaton, Manassas, Va.; Michael R. Arneson, Westminster, Md., and Guy P. LaRocca, Centreville, Va., assignors to Atlantic Research Corporation, Alexandria, Va.

Filed Feb. 25, 1991, Ser. No. 659,619

Int. Cl.[5] G08B *13/12*

U.S. Cl. 340—542 **12 Claims**



1. A tamper-proof device for detecting opening and closing events of a secure container, comprising

(a) a fiber optic cable having a first portion connected with a fixed member of the container and a second portion connected with a movable locking member of the container, whereby said cable is deflected when the container locking member is moved between open and closed positions;

(b) an optical source connected with one end of said cable for delivering a light signal to said cable; and

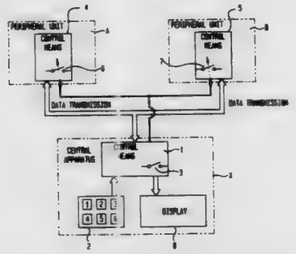
(c) optical detector means connected with the other end of said cable for sensing variations in the light signal transmitted through the cable as a result of microbend losses due to deflection of said cable, whereby each opening and closing event of the container is detected.

5,111,185

PASSWORD CONTROLLED ANTI-THEFT SYSTEM FOR DISCOURAGING THEFT OF A MULTIPLE-APPARATUS SYSTEM

Kengo Kozaki, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1990, Ser. No. 513,771
Claims priority, application Japan, May 8, 1989, 1-114861
Int. Cl.[5] G08B *13/22*
U.S. Cl. 340—568 **14 Claims**



1. A password controlled anti-theft system for discouraging theft of a mutiple-component system in which at least one password controlled peripheral apparatus is connectable to a central apparatus, and wherein, when each of the central apparatus and the at least one peripheral apparatus enters into a burglary mode, the central apparatus and the at least one peripheral apparatus is inhibited from normal operation until a correct password is entered, the password controlled system comprising:

entry means in the central apparatus for entering a password, the central apparatus having means responsive to a peculiar password;

each of the at least one password controlled peripheral apparatus having a means for storing a peculiar password and being connected to and controlled by the central apparatus;

control means in said central apparatus for concurrently releasing the burglary modes of the central apparatus and the at least one password controlled peripheral apparatus connected thereto, when the peculiar passwords of the connected password controlled peripheral apparatuses as well as the peculiar password of the central apparatus are correctly entered via said entry means; and

wherein, if no password controlled peripheral apparatus is connected to the central apparatus, entry of the peculiar password of the central apparatus causes said control means in said central apparatus to release the burglary mode of the central apparatus.

5,111,186

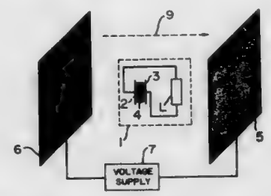
LC-TYPE ELECTRONIC ARTICLE SURVEILLANCE TAG WITH VOLTAGE DEPENDENT CAPACITOR

Doug Narlow, Coral Springs, and Hubert A. Patterson, Boca Raton, both of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Nov. 29, 1990, Ser. No. 620,462
Int. Cl.[5] G08B *13/18*
U.S. Cl. 340—572 **50 Claims**

1. A resonant tag adapted for use in an electronic article surveillance system, said resonant tag having at least a first resonant frequency, the resonant tag comprising:

an inductive means:



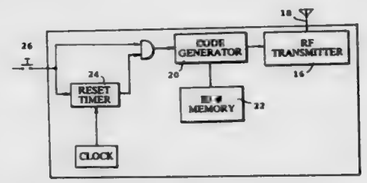
and a voltage dependent capacitance means whose capacitance can be varied with changes in voltage to selectively provide said first resonant frequency for said tag.

5,111,187

PERSONAL SECURITY SYSTEM NETWORK WITH FALSE ALARM PREVENTION

Todd E. Heckleman, Hamlin, and Daniel F. Pedtke, Palmyra, both of N.Y., assignors to Detection Systems, Inc., Fairport, N.Y.

Filed Jul. 5, 1991, Ser. No. 726,363
Int. Cl.[5] G08B *25/00*
U.S. Cl. 340—574 **8 Claims**



5. A combination comprising:

a central station for monitoring alarm signals;

a network of transceivers adapted to receive emergency signals, and to transmit alarm signals to said central station upon receipt of an emergency signal; and

at least one portable transmitter for transmitting an emergency signal, said portable transmitter including means for inhibiting multiple transmissions within a predetermined time period.

5,111,188

ELECTRONIC FLUID-LEVEL SENSOR WITH THREE STATE INDICATOR

Harry E. Turloff, 3378 Clyde Dr., Port Huron, Mich. 48060; Kirk G. Kitchen, and Igor Levin, both of Ann Arbor, Mich., assignors to Harry E. Turloff, Port Huron, Mich.

Filed Oct. 5, 1989, Ser. No. 417,266
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—623 **19 Claims**

10. An electronic indicating circuit that produces one of three humanly perceptible indicators depending on whether an electronic sensor for producing an indication of fluid level in a tube indicates the fluid level is above a reference by more than a small distance, within the small distance of the reference, or below the reference by more than the small distance, comprising:

a float supported by the fluid, said float retaining a core essentially consisting of material having a relative magnetic permeability significantly greater than one;

a source of alternating current;

a middle coil encircling the tube and connected to said source of alternating current;

a top coil encircling the tube above said middle coil, said magnetic permeability of said float and the alternating current in said middle coil producing an induced AC voltage in said top coil corresponding to the position of said float within the tube;

a first rectifier circuit connected to said top coil, said first rectifier circuit capable of outputing a first DC voltage proportional to imported AC voltage from said top coil;

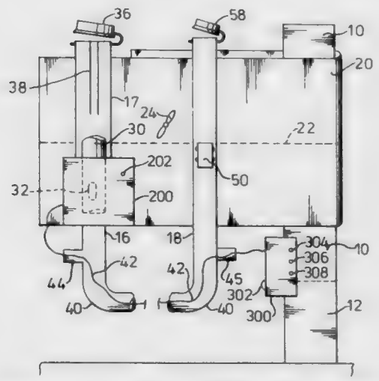
a bottom coil encircling the tube below said middle coil, said magnetic permeability of said float and the alternating current in said middle coil producing an induced AC voltage in said bottom coil corresponding to the position of said float within the tube;

a second rectifier circuit connected to said bottom coil, said second rectifier circuit capable of outputing a second DC voltage proportional to imported AC voltage from said bottom coil;

summing means for producing the indication of fluid level by summing said first DC voltage in a first polarity and said second DC voltage in a second opposite polarity;

a first fixed voltage;

a first voltage comparator having a first noninverting input, a first inverting input, and a first output, said first inverting input connected to the indication of fluid level, said first



noninverting input connected to said first fixed voltage, and said first output connected to a first one of the humanly perceptible indicators actuated by the generation of said first output when the voltage on said first inverting input exceeds the voltage on said first noninverting input, thereby indicating the fluid level is above the reference by more than the small distance;

a second fixed voltage that is smaller than said first fixed voltage;

a second voltage comparator having a second noninverting input, a second inverting input, and a second output, said second inverting input connected to said second fixed voltage, said second noninverting input connected to the indication of fluid level, and said second output connected to a second one of the humanly perceptible indicators actuated by the generation of said second output when the voltage on said second inverting input exceeds the voltage on said second noninverting input, thereby indicating the fluid level is below the reference by more than the small distance; and

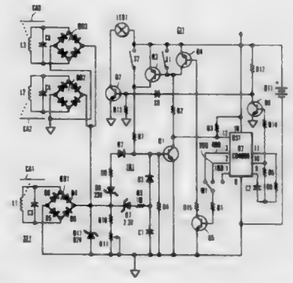
electronic inverting means connected to a third one of the humanly perceptible indicators, for actuating the third indicator when neither said first output nor said second output are generated, thereby indicating the fluid level is within the small distance of the reference.

5,111,189

FAULT INDICATOR WITH TIMING CONTROL

Thomas Yeh, South Weymouth, Mass., assignor to Sigma Instruments, Inc., Weymouth, Mass.

Filed Nov. 27, 1989, Ser. No. 441,461
Int. Cl.[5] H02H *7/00*; G08B *21/00*
U.S. Cl. 340—664 **7 Claims**



1. A power-line faulted circuit indicator, comprising:

sensing means for location in a magnetic field surrounding a conductor carrying current to a load for sensing a trip condition in the conductor;

electronic means responsive to said sensing means for assuming a first state in response to said sensing means sensing a trip condition representing excessive current flow and for remaining in the first state until set to a second state representing less than excessive current flow;

signaling means coupled to said electronic means for generating a signal only in response to said electronic means being in the first state;

timing means responsive to said electronic means assuming the first state for setting said electronic means to the second state after a predetermined period;

manual means for setting said electronic means to the second state before the predetermined period has expired so that said sensing means can resume sensing for a trip condition in the conductor;

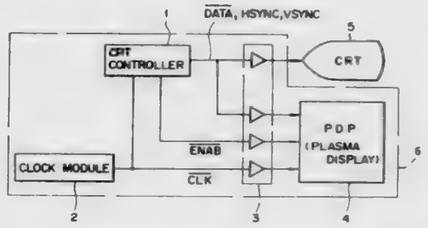
said sensing means including an inductive sensor for coupling to the conductor.

5,111,190

PLASMA DISPLAY CONTROL SYSTEM

Hiroki Zenda, Hamura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 23, 1989, Ser. No. 335,613
Claims priority, application Japan, May 28, 1988, 63-130925
Int. Cl.[5] G09G *3/00, 3/28, 3/00*; H04N *5/04*
U.S. Cl. 340—717 **4 Claims**



1. A plasma display control system which has a plasma display, allows a CRT display to be connected thereto as an option, and has a plurality of selectable display resolutions, comprising:

a CRT display controller for outputting vertical and hori-

zontal sync signals and data signals for data to be displayed by said CRT display and said plasma display;

display resolution discriminating means for discriminating the polarities of the vertical and horizontal sync signals output from said CRT controller, and determining a display resolution in accordance with the combination of polarities of the signals, said display resolution discriminating means including:

a first counter for counting a first number of horizontal sync pulses when the vertical sync signal is at a first level, and counting a second number of horizontal sync pluses when the vertical sync signal is at a second level;

a first comparator for receiving and comparing the first and second numbers, thereby discriminating the polarity of the vertical sync signals;

a second counter for counting a first number of clock pulses when the horizontal sync signal is at a first level and a second number of clock pulses when the horizontal sync signal is at a second level; and

a second comparator for receiving and comparing the first and second number of the clock pulses, thereby discriminating the polarities of the horizontal sync signal;

display timing generating means for generating a display timing signal in accordance with the display resolution determined by said display resolution discriminating means; and

drive means for driving said plasma display responsive to the display timing signal generated by said display timing generating means.

5,111,191

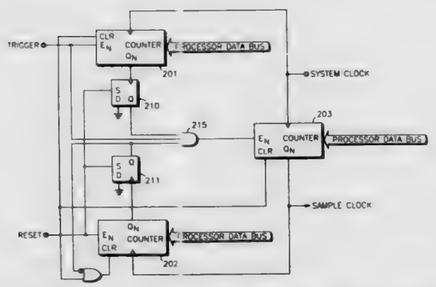
METHOD AND APPARATUS FOR WAVEFORM DIGITIZATION

Richard M. Povenmire, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 210,460, Jun. 23, 1988, Pat. No. 5,028,914. This application Apr. 2, 1990, Ser. No. 502,710

Int. Cl.[5] G09G *5/18*

U.S. Cl. 340—720 **5 Claims**



1. A circuit for producing a sample clock signal to stagger samples of a high frequency input waveform, said circuit comprising:

processor means for providing values;

clock means for producing periodic signals;

first counter means connected to said processor means and to said clock means and operating in response to said periodic signals to count from a predetermined first value of said processor means to zero;

first latching means connected to said first counter means and operating in response to said zero count of said first counter means to store an indication of said zero count;

second counter means coupled to said processor means and to said clock, said second counter means operating in response to said periodic signals to count from a predetermined second value to zero;

second latching means connected to said second counter means and operating to store an indication of said zero count of said second counter means; and

third counter means coupled to said first and second latching means, said third counter means operating in response to said zero indication of said first latching means to produce said sample clock signal and in response to said zero indication of said second latching means to inhibit production of said sample clock signal.

5,111,192

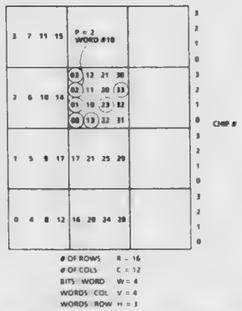
METHOD TO ROTATE A BITMAP IMAGE 90 DEGREES

Vinod K. Kadakia, Rancho Palos Verdes, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1989, Ser. No. 453,738

Int. Cl.[5] G09G *1/06*

U.S. Cl. 340—727 **6 Claims**



1. The method of rotating an original n column by n row image, each column comprising a word, comprising the steps of:

A. storing said image in a buffer, said storing step comprising the steps of:

a. first circular shifting each original word by a number of pixels equal to the column number, and

b. storing each shifted word in the location of said buffer equal to the column number, and

B. outputting an n column by n pixel image from said buffer, where the column number j and the pixel number i of the buffer varies from 0 to n−1, said outputting step for each word output comprising the steps of:

a. assembling the jth output n pixel word from n pixels of the buffer, where pixel number i of the assembled word comes from pixel number i of word number (i+j+1)-mod n of the buffer, and

b. second circular shifting the resultant word j+1 pixels.

5,111,193

ELECTRONIC DISPLAY ELEMENT FOR ELECTRONIC DISPLAY DEVICE

Terrence D. Huber; Duane B. Kutsch, both of Spokane; William J. Seaton, Greenacres, and Donald R. Skinfill, Veradale, all of Wash., assignors to American On-Premise Advertising Company, Spokane, Wash.

Filed Jun. 6, 1990, Ser. No. 533,742

Int. Cl.[5] G08B *5/00*

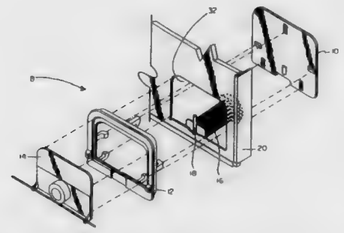
U.S. Cl. 340—783 **16 Claims**

1. A display element for use in an information display device having a plurality of holes provided therein for receiving a plurality of said display elements, said display element comprising:

a translucent member adapted to abut against a back side of said display device and cover one of said holes;

a mounting bracket adapted to abut against a front side of said display device, said bracket having fastening means extending through said one hole of said display device and connecting to said translucent member for securing said translucent member to said display device;

a flap pivotally secured to said bracket about a pivot axis, one side of said flap having a non-reflective surface and the other side of said flap having a reflective surface, said flap being pivotable from a first position where said non-reflective surface faces outwardly therefrom to a second position, approximately 180° from said first position, where said reflective surface faces outwardly therefrom;



a magnet disposed on said flap;

an electromagnet secured to back side of said display device, said electromagnet having a pole piece disposed axially therein and extending into said translucent member; and

means for supplying an electric current to said electromagnet so as to alternatively energize said pole piece to be a south pole piece or a north pole piece;

wherein when said pole piece is energized to be one of a north pole piece and a south pole piece said flap is pivoted to said first position and when said pole piece is energized to be the other of said north pole piece and south pole piece said flap is pivoted to said second position.

5,111,194

ARTIFICIAL HALFTONE PROCESSING APPARATUS

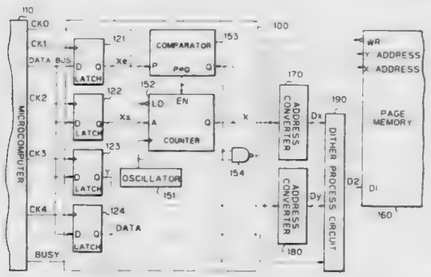
Shogo Oneda, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Feb. 12, 1990, Ser. No. 479,618

Claims priority, application Japan, Feb. 16, 1989, 1-37236; Jul. 28, 1989, 1-195619; Dec. 16, 1989, 1-326724

Int. Cl.[5] E09G *3/00*

U.S. Cl. 340—793 **18 Claims**



1. An artificial halftone processing apparatus for processing and rendering a halftone image artificially, comprising:

image outputting means having two-dimensional addresses being assigned to respective pixels which constitute a two-dimensional image;

pulse generating means for generating pulses having a predetermined period;

address generating means for generating the two-dimensional dimensional addresses of said image outputting means, said address generating means comprising at least one counter for counting the pulses generated by said pulse generating means;

halftone processing means for outputting to said image outputting means a signal derived from a tone level of an input multi-level signal, the halftone processing means including a halftone processing table in which a different threshold value is assigned to each pixel position in a set two-dimesional pixel matrix region;

address information converting means for converting two-dimensional address information generated by said address generating means into two-dimensional position information representative of a pixel position in said two-dimensional pixel matrix of said halftone processing means, and feeding said position information to said halftone processing means; and

matrix updating means for updating an arrangement or a size of said two-dimensional pixel matrix region and updating a content of conversion by said address information converting means.

5,111,195

DRIVING CIRCUIT FOR A MATRIX TYPE DISPLAY DEVICE

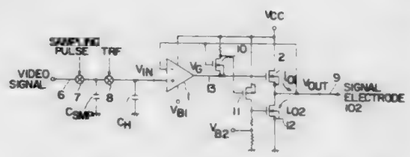
Hirofumi Fukuoka, Osaka, and Yoshiharu Kanatani, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 26, 1990, Ser. No. 470,623

Claims priority, application Japan, Jan. 31, 1989, 1-23485; Jul. 17, 1989, 1-183950; Jul. 17, 1989, 1-183951

Int. Cl.[5] G09G *3/00*

U.S. Cl. 340—811 **7 Claims**



1. In a driving circuit for a matrix type display device in which a plurality of picture elements are arranged in a matrix, comprising: a vertical scanning means for scanning each horizontal scanning line of said display device; and a video signal output means for supplying video signals through output portions to said display device at each horizontal scan, said output portions being respectively connected to vertical signal lines of said display device,

said video signal output means comprises for each of said output portions:

a comparison means for comparing the level of a video signal to be output, with the level of the respective vertical signal line which is caused by the video signal output at the previous horizontal scan; and

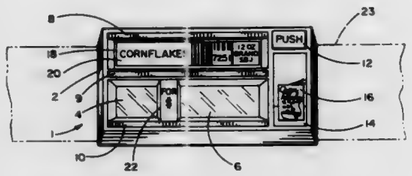
an output level control means for, when the level of said video signal to be output is higher than the level of said vertical signal line, raising the level of said vertical signal line to the level substantially identical with the level of said video signal to be output, and, when the level of said video signal to be output is lower than the level of said vertical signal line, lowering the level of said vertical signal line, lowering the level of said vertical signal line to the level substantially identical with the level of said video signal to be output.

5,111,196

ELECTRONIC INFORMATION DISPLAY MODULE AND CONNECTOR THEREFOR

Peter F. Hunt, Paramount, Calif., assignor to ESL, Inc., Olathe, Kans.

Filed Mar. 23, 1987, Ser. No. 28,737
Int. Cl.[5] G09G *3/20*
U.S. Cl. 340—825.35 **8 Claims**



1. In combination,

an information display device having

(a) a housing defining spaced edge surfaces on the exterior thereof,

(b) a memory connected to said housing for storing information,

(c) display means connected to said housing and interfaced with said memory for visually displaying the information stored therein, and

(d) first electrical contact means on the exterior of said housing and operatively connected to said memory; and

a portable data terminal for supplying information to said memory, said terminal including,

(e) a face for presentment to the housing,

(f) second electrical contact means on said face engageable in abutting relationship with said first contact means,

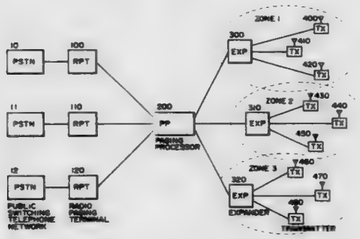
(g) guide means on said terminal adjacent said face and operable in cooperation with said edge surfaces as said face is presented to said housing to guide the position of said face so that said second electrical contacts come into abutting electrically conductive relationship with said first contacts.

5,111,197

APPARATUS FOR ALLOCATING SUBSCRIBER IDENTIFICATION NUMBERS TO PLURAL SERVICE ZONES IN A PAGING SYSTEM

Yoshio Ichikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 165,056, Mar. 7, 1988, abandoned. This application Feb. 21, 1990, Ser. No. 483,314
Claims priority, application Japan, Mar. 6, 1987, 62-50377
Int. Cl.[5] H04B *7/00*
U.S. Cl. 340—825.44 **5 Claims**



1. An apparatus for allocating subscriber identification numbers to plural service zones in a paging system, comprising:

plural ratio paging terminals each including a first control unit and a subscriber file for storing subscriber numbers, and pager identification numbers, service zones and signal frequencies corresponding to said subscriber numbers, and receiving subscriber numbers from a public switching telephone network, said control unit reading said pager identification number, said service zone and said signal frequency corresponding to said subscriber number received from said public switching telephone network out of said subscriber file;

a paging processor including a second control unit, plural queing means equal in number to said signal frequencies in each service zone, and plural paging signal encoders, and receiving information of said pager identification numbers, said service zones and said signal frequencies read out of said subscriber file from said plural radio paging terminals, said second control unit controlling each of said plural queing means to carry out queing operation exclusively for each of said service zones in accordance with said information, whereby each of said pager identification numbers is allocated to at least one service zone to have at least one of said signal frequencies, said second control unit controlling said each of said plural queing means to carry out time slot allocating operation exclusively for said each of said service zones in accordance with a predetermined order of said signal frequencies, whereby paging signals, among which the frequency collision is avoided in two adjacent service zones of said service zones, are produced and said second control unit controlling said plural paging signal encoders to encode said paging signals;

plural expanders each belonging to a corresponding one of said service zones, and receiving said encoded paging signals from said paging processor to divide a corresponding one of said paging signals into a predetermined number of paging signals; and

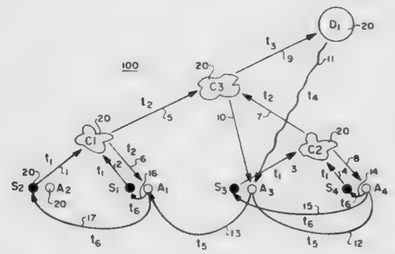
plural transmitters provided in said each of said service zones, each of said plural transmitters receiving one of said divided paging signals and radiating said one of said divided paging signals.

5,111,198

METHOD OF ROUTING A PLURALITY OF MESSAGES IN A MULTI-NODE COMPUTER NETWORK

Bradley C. Kuszmaul, Cambridge, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

Continuation of Ser. No. 172,625, Mar. 24, 1988, abandoned. This application Dec. 18, 1990, Ser. No. 629,026
Int. Cl.[5] H04B *3/00*
U.S. Cl. 340—825.52 **8 Claims**



1. In a data communication network in which messages are routed among a plurality of nodes, a method of routing messages from different source nodes to a common destination node comprising the steps of

a. generating a message at each of i source nodes, each said message comprising at least the information Di, Si, where Di is address information for the destination node for the message generated at the ith source node, and Si is address information for ith source node,

b. routing each message toward its destination node,

c. at a node where at least a first two messages meet that are addressed to the same destination node D1 and comprise at least the information D1, S1 and D1, S2, where D1 is address information for the destination of the two messages and S1 and S2 are address information for the source nodes of the two messages, generating a second two messages in place of the first two messages, the first said message comprising at least the information D1, A1 and the second message comprising at least the information A1, S1, S2, where A1 is address information for an auxiliary node that is neither a destination node nor a source node,

d. routing the first of said second messages toward the destination node, D1,

e. routing the second of said second messages toward the auxiliary node, A1, whose address is specified in said second message,

f. upon receipt of a message at a destination node, D1, generating a message in response thereto, said message comprising at least address information for an auxiliary node specified by the message received at the destination node,

g. routing said message from the destination node through the nodes of the communication network toward said auxiliary node identified by the address information A1, using address information for the auxiliary node specified by the first of said second messages, and

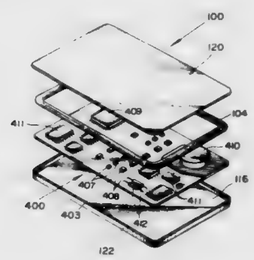
h. after receipt at node A1 of a message from the destination node and the second message comprising at least the information A1, S1, S2, generating two messages, one addressed to node S1 and the other to node S2.

5,111,199

POCKET-PORTABLE RADIO CODE SIGNAL TRANSMITTER FOR AUTOMOTIVE KEYLESS ENTRY SYSTEM

Takahisa Tomoda; Mikio Takeuchi; Kinichiro Nakano, and Motoki Hirano, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 895,372, Aug. 11, 1986, abandoned. This application Jun. 26, 1990, Ser. No. 542,786
Claims priority, application Japan, Aug. 12, 1985, 60-177288
Int. Cl.[5] H04Q *1/00*
U.S. Cl. 340—825.72 **6 Claims**



1. A pocket-portable transmitter for an automotive keyless entry system, said transmitter comprising:

a substantially box-shaped housing including first parallel edge portions having a given length and second parallel edge portions having a length less than the length of said first parallel edge portions;

a flexible substrate within said housing;

a first group of relatively large circuit components, said first group of relatively large circuit components including a microprocessor;

a second group of relatively small circuit components, said small circuit components located on central portions of said substrate, longitudinal axes of said small components being aligned perpendicular to a longitudinal axis of said substrate; and

an antenna mounted on a peripheral edge wall portion of said housing, said wall portion being perpendicular to said substrate; and wherein

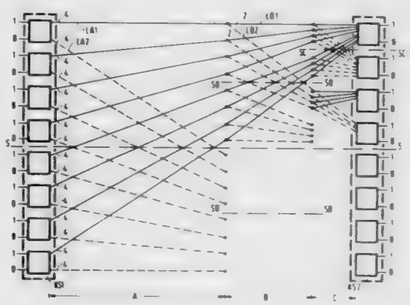
at least one of said relatively large circuit components is located on said substrate adjacent to one of said second parallel edge portions.

5,111,200

BROADBAND SPACE-DIVISION SWITCHING NETWORK WITH LINKAGE IN A PRINTED CIRCUIT BOARD HAVING MULTI-LAYER MICRO-STRIP LINES

Wolfgang E. Jasmer, Hamburg; Johann E. W. Krüger, Quickborn, and Ulrich R. P. Killat, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 126,395, Nov. 30, 1987, abandoned. This application Dec. 11, 1989, Ser. No. 453,033
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1986, 3641149
Int. Cl.[5] H04B *3/38*; H01R *9/00*
U.S. Cl. 340—826 **13 Claims**



1. A broadband space-division switching network comprising:

a board for arrangement of printed circuitry thereon,

a first plurality of switching matrices disposed on a first side of said board, forming a first switching stage,

a second plurality of switching matrices disposed on said first side of said board, forming a second switching stage, and

a plurality of groups of connection links, connection links of each group being connected to a respective switching matrix of said first stage, and each connection link connecting a respective one of the switching matrices of the first switching stage to a respective one of the switching matrices of the second stage,

characterized in that the connections links are arranged in a pattern of lines,

first and third groups of connection links comprise respective first and third groups of line portions extending respectively from a first and a third switching matrix of said first stage in respective directions along said first side of said board, and second and fourth groups of connection links comprise respective second and fourth groups of line portions extending respectively from a second and a fourth switching matrix of said first stage in respective directions along said second side of said board,

at least some of said line portions of said third group extend in respective directions which are inclined with respect to a direction of at least some of said line portions of said first group,

at least some of said line portions of said fourth group extend in respective directions which are inclined with respect to a direction of at least some of said line portions of said second group,

line portions on one side of the board are free from crossings over each other, and line portions on a side opposite said one side of the board are free from crossings over each other,

at least some of said line portions of said second group extend to respective positions opposite respective ones of said line portions of said first group and are electrically connected thereto at the respective positions, and

at least some of said line portions of said fourth group extend to respective positions opposite respective ones of said line portions of said first group and respective positions opposite respective ones of said line portions of said third group; and each of said at least some of said line portions of said fourth group is electrically connected to the respective one of said line portions of said first group and to the respective one of said line portions of said third group at the respective positions.

5,111,201

SYSTEM RADIO TRANSMISSION OF LIQUID LEVEL DATA AND BATTERY SAVING TECHNIQUE

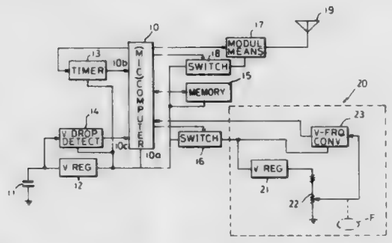
Hiroshi Matsumura; Norio Shimamura; Yasuto Ohta; Masaru Kawabe; Makoto Shimizu; Naoaki Natori, and Naohiko Suzuki, all of Kanagawa, Japan, assignors to Tokyo Tatsuno Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1989, Ser. No. 456,912

Claims priority, application Japan, Dec. 26, 1988, 63-329586; Mar. 13, 1989, 1-61314

Int. Cl.[5] **G01F** *3/24, 17/00;* **H04B** *1/16;* **G08C** *15/00*

U.S. Cl. 340—870.380 **9 Claims**



1. System for radio transmission of liquid level data and for converting the received data to liquid volume data to be indicated, comprising;

a transmitter comprising

a cell electric source,

first means intermittently supplied with electric power from the source to convert liquid level data to corresponding electric signals,

second means intermittently supplied with electric power from the source to convert said corresponding electric signals to corresponding frequency signals,

modulation means intermittently supplied with electric power from the source to transmit the received frequency signals on carrier waves through an antenna,

a computer normally maintained in a standby state,

timer means for intermittently providing activation signals to the computer to place it in an activated state at a predetermined interval, and

means for storing the last liquid level data to be inputted in the computer so that when the computer is activated said first means is actuated to give the electric signals representing the present level data to be inputted in the computer for comparison of the two data, wherein a transmitting period is selected to be longer in case where the last liquid level is higher than the present level and shorter in case where the last liquid level is lower than the present level, and after the transmission is over the last level data are cleared and the new level data are stored in said storing means; and

a receiver essentially comprising

first means for demodulation of the received frequency signals through an antenna,

second means for storing data necessary for conversion in advance so as to convert the received liquid level data to liquid volume data,

an indicator including the volume data, and wherein the storing means is adapted to set a counter number when detecting that the liquid level is not being raised up by comparison of said two level data so that the set number is decreased by one when the computer is activated to reach zero and then firstly the level signals are transmitted.

5,111,202

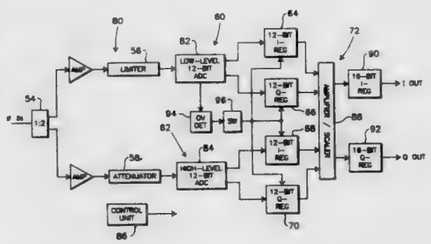
EXTENDED DYNAMIC RANGE QUADRATURE DETECTOR WITH PARALLEL CHANNEL ARRANGEMENT

Duveen J. Rivera, Northridge, Calif., and John J. Kotrba, Wichita, Kans., assignors to ITT Corporation, New York, N.Y.

Filed Mar. 28, 1991, Ser. No. 677,646

Int. Cl.[5] **H03M** *1/18, 1/20;* **H03D** *3/00*

U.S. Cl. 341—139 **11 Claims**



1. A quadrature detector for producing N-bit digital inphase and quadrature baseband output signals in response to an analog input signal, comprising:

low-level quadrature demodulator means responsive to the input signal, including low-level analog-to-digital converter means for quadrature sampling the input signal and producing M-bit digital inphase and quadrature baseband low-level output signals in response thereto, where M is less than N;

high-level quadrature demodulator means responsive to the input signal, including:

signal attenuating means for attenuating the input signal by a predetermined factor; and

high-level analog-to-digital converter means for quadrature sampling the attenuated input signal and producing M-bit digital inphase and quadrature baseband high-level output signals in response thereto; and

digital scaling and switching means including:

digital amplifier means for amplifying or scaling the high-level output signals by said predetermined factor;

digital bit extension means for extending the number of bits of the low-level digital output signals or the amplified high-level digital output signals to produce the N-bit output signals; and

switching means for detecting the amplitude of the input signal and applying the low-level digital output signals to the bit extension means when said amplitude is below a predetermined value that saturates the low-level analog-to-digital converter, and applying the amplified high-level digital output signals to the bit extension means when said amplitude is above said predetermined value.

5,111,203

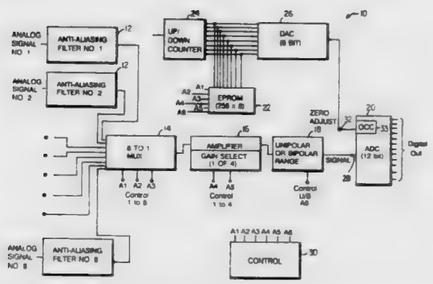
CIRCUITRY FOR CONDITIONING ANALOG SIGNALS AND CONVERTING TO DIGITAL FORM

Robert A. Calkins, Wrentham, Mass., assignor to Data Translation, Inc., Marlboro, Mass.

Filed Nov. 27, 1990, Ser. No. 618,722

Int. Cl.[5] **H03M** *1/06*

U.S. Cl. 341—141 **19 Claims**



1. A circuit for converting an input analog signal or signals into an output digital signal comprising

an analog-to-digital converting circuit having an analog input and a digital output that provides said output digital signal, said output digital signal representing the value of an analog signal at said analog input,

signal conditioning circuitry for receiving a said input analog signal and selectably providing it to said analog input via one of a plurality of different paths or under one of a plurality of different conditions, said different paths or different conditions resulting in different offsets being imposed upon said input analog signal, said signal conditioning circuitry being connected to select a said path or a said condition based upon a digital selection signal,

an offset correction memory storing offset correction characteristics for respective said paths or respective said conditions and providing an offset signal based on a said characteristic for a path or condition, said memory being connected to be addressed by said digital selection signal, and

an offset correction circuit that has an offset input that receives said offset signal from said offset correction memory and causes the value of said output digital signal to be adjusted by an amount related to the magnitude of said offset signal, to thereby correct said output digital signal for the offset related to the respective path or condition.

5,111,204

APPARATUS FOR CONVERTING DATA BETWEEN DIGITAL AND ANALOG VALUES

Henry S. Katzenstein, Pacific Palisades, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Continuation of Ser. No. 936,756, Dec. 2, 1986, abandoned, which is a continuation of Ser. No. 553,041, Nov. 18, 1983, abandoned. This application Jul. 16, 1990, Ser. No. 512,757

Int. Cl.[5] **H03M** *1/66*

U.S. Cl. 341—150 **32 Claims**

1. In combination for providing a conversion between a binary coded input word defined by a plurality of bits and an analog value,

means for providing a plurality of binary coded input signals each corresponding to a particular bit in the binary coded input word,

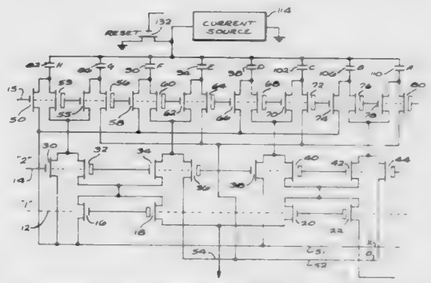
a plurality of switches each responsive, at the same time as the response of the other switches, only to a particular one of the binary coded input signals, the number of switches responsive to each particular binary coded input signal being dependent upon the binary value of such signal,

a plurality of storage means each having a low value and each constructed to store energy in a short period of time,

a line,

means for connecting the switches to one another in an array having a repetitive pattern of switch connections to obtain the operation of the switches in a pattern dependent upon the binary coded input signals,

means for connecting the switches, the storage means and the line to provide, for progressive increases in the binary coded input word, corresponding increases in the number



of the storage means charging energy to the line in accordance with the pattern of operation of the switches, such pattern causing a particular sequence for charging energy through the storage means to the line in response to progressive increases in the binary coded input word, that particular sequence being the charging of energy through an additional one of the storage means to the line with each increase in the value of the binary coded input word while the storage means previously charging energy to the line continue to charge energy to the line, and

means for providing for a discharge at particular times of energy from the storage means.

5,111,205

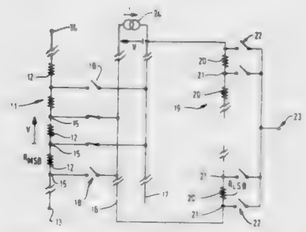
DIGITAL-TO-ANALOG AND ANALOG-TO-DIGITAL CONVERTERS

Patrice P. Morlon, Valbonne, France, assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Dec. 18, 1990, Ser. No. 629,530

Int. Cl.[5] **H03M** *1/68, 1/78, 1/06, 1/14*

U.S. Cl. 341—156 **8 Claims**



1. In a converter for converting signals between analog and digital form, a segmented voltage divider network comprising:

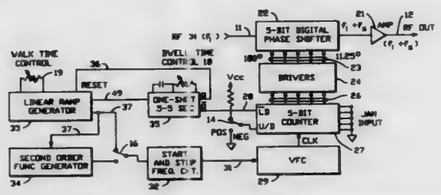
a first resistive voltage divider for providing a multiplicity of substantially equal voltage segments;

a second resistive voltage divider;

means for directly connecting one of said voltage segments to said second voltage divider so tat said second divider constitutes a load on the first divider; and

a controlled current source means coupled in parallel with said second divider for providing a compensatory current corresponding to that flowing through said second divider.

5,111,206
VELOCITY DECEPTION APPARATUS
Asad M. Madni, Los Angeles, and Joseph Fala, Pasadena, both of Calif., assignors to Systron Donner Corp., Concord, Calif.
Filed Sep. 22, 1983, Ser. No. 534,566
Int. Cl.[5] G01S *7/38;* **H03K** *5/159*
U.S. Cl. 342—15 **11 Claims**



1. Velocity deception apparatus for receiving radar signals and frequency translating them comprising:

a solid state variable phase shifter including a plurality of series coupled cells for inserting various different phase shifts into said received radar signals by binary inputs to selected cells;

multi-bit counter means connected to said phase shifter and having a number of binary outputs corresponding to said binary inputs of said plurality of cells each of said binary outputs being respectively connected to a binary input of a cell for enabling or disabling such cell, said counter also having a clock input;

a voltage-to-frequency converter (VFC) for driving said clock input having an output train of binary pulses with a repetition rate proportional to the instantaneous voltage magnitude of an analog input waveform; and

waveform generator means connected to said VFC for generating a said analog input waveform of a ramp type having a starting point which minimizes the amount of initial frequency translation of the received radar signal and a maximum for determining the maximum frequency translation whereby a said received radar signal is frequency translated from its initial value to such maximum in a period of time determined by the period of said ramp type waveform, said period of time being a walk time.

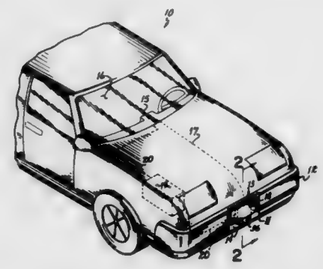
5,111,207
BRACKET AND ASSEMBLY FOR REMOTE MOUNTING OF POLICE RADAR WARNING RECEIVER
Paul M. Allen, Cincinnati, Ohio, assignor to Cincinnati Microwave, Inc., Ohio
Division of Ser. No. 434,426, Nov. 13, 1989, Pat. No. 4,952,937.
This application Jun. 28, 1990, Ser. No. 545,996
The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.
Int. Cl.[5] G01S *7/40*
U.S. Cl. 342—20 **11 Claims**

1. A bracket for mounting a license plate to a vehicle comprising:

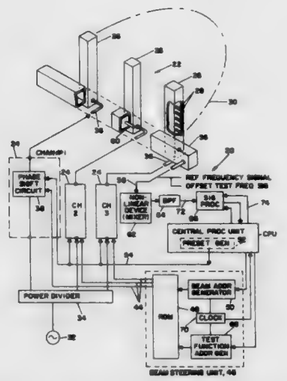
bracket means adapted to secure the license plate to a first end of the vehicle with a radar detector located therebetween;

a first edge portion of said bracket means including a first lip perpendicular to a plane to be occupied by the secured license plate; and

a second lip oriented parallel to said plane, at least a section of the second lip being transparent to radar signals to allow radar signals directed at said first end of the vehicle to pass therethrough and between said first lip and a license plate first edge when said license plate is secured thereto.



5,111,208
CALIBRATION OF PLURAL - CHANNEL SYSTEM
A. R. Lopez, Commack, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.
Filed Feb. 23, 1989, Ser. No. 314,336
Int. Cl.[5] G01S *7/40*
U.S. Cl. 342—174 **12 Claims**



1. A method for calibrating phase shifts in a system having multiple signal-carrying channels comprising steps of:

extracting from each channel a sample of a signal translated by the channel;

summing together the signal samples of the respective channels;

selecting a first channel to be calibrated, the first channel translating a first signal;

applying a phase-shift test pattern to the first signal by incrementing the phase of the first signal in a monotonically continuing pattern of phase variation at a predetermined rate, thereby offsetting the frequency of said first signal relative to the frequencies of the signals translated by the other channels, all of the translated signals of the other channels having the same frequency and the sum of the signals of the other channels serving as a reference signal;

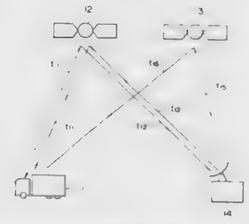
mixing the first signal with the reference signal to obtain a beat-frequency signal;

measuring a phase deviation between said beat-frequency signal and said test pattern;

replacing said test pattern at said first signal with a fixed amount of calibration phase of value commensurate with said phase deviation; and

repeating the foregoing steps with each of the signals translated by the other channels, thereby providing a calibration sequence in which each channel is calibrated once.

5,111,209
SATELLITE-BASED POSITION DETERMINING SYSTEM
Ichiro Toriyama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed May 20, 1991, Ser. No. 703,202
Claims priority, application Japan, May 23, 1990, 2-133231
Int. Cl.[5] H04B *7/185;* **G01S** *5/02*
U.S. Cl. 342—357 **3 Claims**



1. A system for determining a position of a mobile station, comprising:

means incorporated in said mobile station for transmitting a position determination signal from said mobile station through a first geostationary satellite to a fixed station;

means incorporated in said fixed station for receiving said position determination signal;

means incorporated in said fixed station for transmitting a first reference signal through said first geostationary satellite to said mobile station;

means incorporated in said fixed station for transmitting a second reference signal through a second geostationary satellite to said mobile station;

means incorporated in said mobile station for receiving said first reference signal;

means incorporated in said mobile station for receiving said second reference signal;

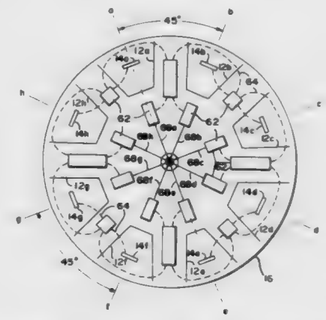
means incorporated in said mobile station for measuring a first period of time from a transmitting timing of said position determination signal to a receiving timing of said first reference signal and measuring a second period of time from the transmitting timing of said position determination signal to a receiving timing of said second reference signal;

said transmitting means incorporated in said mobile station transmitting information of said first and second periods of time measured above through said first geostationary satellite to said fixed station; and

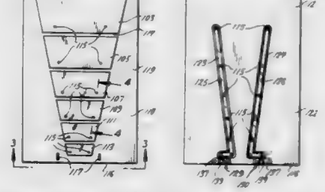
means incorporated in said fixed station for computing the position of said mobile station according to the information of said first and second periods of time transmitted above.

5,111,210
COLLISION AVOIDANCE RADAR DETECTOR SYSTEM
Robert L. Morse, Norfolk, Va., assignor to Survival Safety Engineering, Inc., Virginia Beach, Va.
Filed Jun. 22, 1990, Ser. No. 542,072
Int. Cl.[5] G01S *13/93*
U.S. Cl. 342—455 **18 Claims**

9. A collision avoidance microwave signal detector system for providing an indication of the relative bearing of a remote source of microwave energy comprising an antenna for receiving said microwave energy, said antenna including a plurality of microwave sensitive means arranged in a planar circular array for monitoring microwave energy sensing means including a horn element and a microwave energy responsive diode disposed within said horn element adapted to monitor energy received in a predetermined angular sector, each said diode being serially connected to a resistive element forming a voltage divider for developing a noise signal at an audio frequency corresponding to the microwave energy received at each sector, means for comparing each said developed noise signal to a predetermined threshold and providing an output control signal when the developed noise signal exceeds the value of the threshold.



5,111,211
BROADBAND PATCH ANTENNA
Scott E. Dahlberg, St. Peters, Mo., assignor to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Jul. 19, 1990, Ser. No. 554,360
Int. Cl.[5] H01Q *1/38, 11/10*
U.S. Cl. 343—700 MS **19 Claims**



1. A broad frequency band antenna comprising:

a dielectric planar support having a front side and a back side;

a layer of metallization adhered to said back side of said dielectric planar support;

a plurality of trapezoidally shaped antenna elements affixed to said front side of said dielectric planar support oriented parallel to each other;

a pair of microstrip feedlines on said back side of said dielectric planar support electrically insulated from said layer of metallization;

a plurality of pairs of connecting pins, each connecting pin of a pair of connecting pins electrically joining a microstrip feedline to one of said antenna elements such that each antenna element is electrically joined once to each of said microstrip feedlines;

a pair of transmission lines, each having a first end electrically connected to a different one of said microstrip feedlines, and a second end, said pair of transmission lines extending from said microstrip feedlines through said

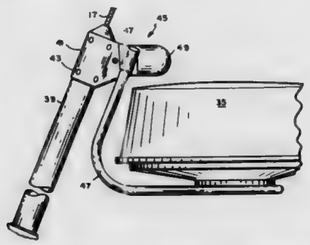
dielectric planar support to said front side and then extending back through said dielectric planar support to said back side; and

a pair of coaxial connectors, each connected to a second end of a different one of said transmission lines, and groundedly affixed to said layer of metallization.

5,111,212
RADAR ANTENNA MOUNT

Allen H. DeSatnick; Paul A. Torrie, and Thomas D. Egan, all of Marblehead, Mass., assignors to Questus Corporation, Marblehead, Mass.

Filed Jan. 30, 1990, Ser. No. 472,017
Int. Cl.[5] H01Q *1/34*
U.S. Cl. 343—709 **12 Claims**



1. A self leveling mount for mounting a radar antenna having a center of gravity on a sailing vessel subject to heeling, said mount comprising:

a shaft on a fore-and-aft horizontal axis relative to said vessel;

pivotally mounted on said shaft, a housing forming an annular chamber around at least a portion of said shaft;

a viscous fluid in said chamber;

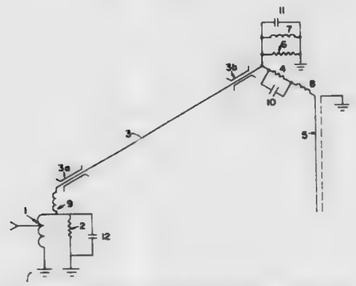
vane means on said shaft dividing said chamber into two regions, the relative sizes of said regions being variable as a function of the angular position of said housing relative to said shaft, there being restricted communication between said regions; and

means for mounting said antenna on one of said shaft and housing with the center of gravity of the antenna being below said axis and for fixedly attaching the other of said shaft and housing to said vessel.

5,111,213
BROADBAND ANTENNA

Joseph R. Jahoda, Clifton, and Steven D. Shergold, Bumpass, both of Va., assignors to Astron Corporation, Herndon, Va.

Filed Jan. 23, 1990, Ser. No. 468,666
Int. Cl.[5] H01Q *11/02*
U.S. Cl. 343—722 **29 Claims**



27. A wideband antenna system for continuous coverage of the 1.5 MHz to 30 MHz radio frequency spectrum which is coaxial cable fed and having low VSWR, comprising:

a coaxially fed wideband balun having a low impedance input and a high impedance output;

at least one wire radiating element, said element having a first and second end, said first end connected to said wideband balun high impedance output;

at least one passive switching means, said switching means having a first and second end, wherein said passive switching means first end is connected to the second end of said radiating element;

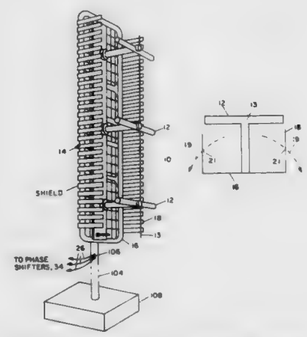
at least one insertion resistor, said insertion resistor having a first and second end, wherein said insertion resistor first end is connected to the second end of said passive switching means; and

at least one radio frequency damping element, said damping element connected to the second end of said insertion resistor.

5,111,214
LINEAR ARRAY ANTENNA WITH E-PLANE BACKLOBE SUPPRESSOR

Richard J. Kumpfbeck, Lloyd Harbor, and Peter W. Hannan, Smithtown, both of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.

Continuation of Ser. No. 917,743, Oct. 10, 1986, abandoned. This application Apr. 18, 1989, Ser. No. 339,883
Int. Cl.[5] H01Q *1/520, 21/060, 21/120*
U.S. Cl. 343—841 **13 Claims**



1. An antenna system with a radiation pattern primarily directed in a forward direction, the antenna system having a limited overall width in a transverse direction and a composite reflector for providing operation with reduced E-plane back radiation, comprising:

a plurality of radiating elements spaced in a longitudinal direction transverse to said forward and said transverse directions, each said element including a radiating segment extending in said transverse direction from a coupling point outward to a furthermost point, for providing a free space radiation pattern having a low field strength region outward form the furthermost points; and

a composite reflector including:

a backwall section positioned behind said radiating segments and having a backwall width in said transverse direction substantially equal to said limited overall width, said backwall width terminating in an edge extending in said longitudinal direction; and

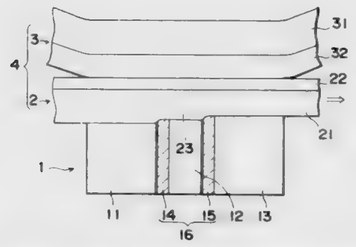
sidewall means, coupled along said edge of said backwall section and extending forward substantially perpendicularly to said radiating segments and terminating in a longitudinally extending composite reflector edge, for positioning said composite reflector edge behind, and outward in said transverse direction from, said furthermost points in said low field strength region;

whereby, said composite reflector is effective to reduce E-plane back radiation as compared to a back reflector of similar width, while having an overall width approximately that of said backwall section alone.

5,111,215
RESISTIVE SHEET TRANSFER PRINTING AND ELECTRODE HEADS

Nobuyoshi Taguchi, Ikoma; Fukui Yasuo, Kadoma, and Imai Akihiro, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 6, 1990, Ser. No. 623,364
Claims priority, application Japan, Dec. 7, 1989, 1-318064; Dec. 7, 1989, 1-318065
Int. Cl.[5] B41J *2/395;* **G01D** *15/06*
U.S. Cl. 346—76 PH **28 Claims**



1. An electrode head for use in color transfer recording on a running recording member having a resistive ink sheet and an image receiving member for contacting a surface of the resistive ink sheet, the recording member running over the electrode head from an insertion side to an exit side, said electrode head comprising:

a plurality of spaced opposed electrodes spaced in a direction of running of the recording member and arranged in an electrode train extending transversely of the running direction;

an intermediate insulating support member between said spaced opposed electrodes in said electrode train and against which said electrodes are supported said intermediate insulating support has an abrasive wear resistance; and

a first insulating support member having an abrasive wear resistance on the insertion side of said electrode head and a second insulating support member having an abrasive wear resistance on the exit side of said electrode head;

the abrasive wear resistance of said intermediate insulating support member being equal to or smaller than that of the first insulating support member and being equal to or greater than that of the second insulating support member.

5,111,216
TAPE SUPPLY CARTRIDGE FOR PORTABLE THERMAL PRINTER

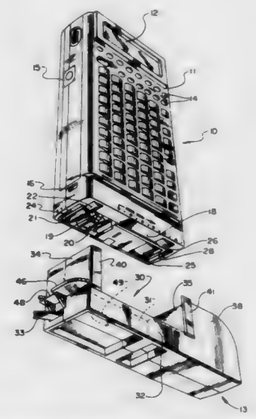
Michael M. Richardson, Scottsdale, and Edwin L. Swartout, Glendale, both of Ariz., assignors to Kroy Inc., Scottsdale, Ariz.

Filed Jul. 12, 1988, Ser. No. 217,962
Int. Cl.[5] G01D *15/10;* **B41J** *3/24, 3/20;* **B44C** *7/00*
U.S. Cl. 346—76 PH **30 Claims**

1. A portable, hand held printing device for printing images of selected characters on a strip of tape comprising:

a thermal device having data input and storage means, a housing including an external print edge, a thermal printhead disposed within said print edge, sensing means within said print edge for sensing movement of said tape and means operatively connected with said sensing means for controlling said printhead in response to movement of said tape; and

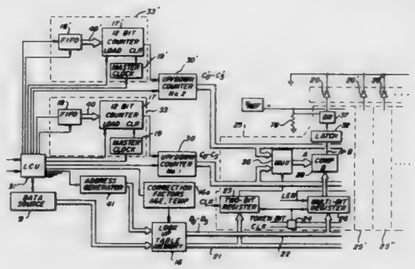
a separate tape supply cartridge having a supply of tape, a receiving pocket for receiving a portion of said thermal device embodying said print edge, a tape pathway defined by a portion of said receiving pocket for operatively aligning said tape with said printhead and sensing means and for insuring operative engagement between said tape and printhead and sensing means.



5,111,217
DOT PRINTER AND METHOD FOR GREY LEVEL RECORDING

Eric K. Zeise, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 18, 1989, Ser. No. 451,898
Int. Cl.[5] G01D *15/14;* **H04N** *1/036, 1/23*
U.S. Cl. 346—107 R **18 Claims**



1. A non-impact printer apparatus comprising:

a recording element;

driving means for driving the recording element for recording;

control means for controlling an enablement time of the driving means for driving the recording element during a picture element recording period, said control means including a multibit register means for storing a multibit data signal representing data to be recorded;

means for generating a first and a second concurrent series of digital pulse signals, each series of pulse signals including a multibit digital signal representing a time-changing count, a time-changing count of the first series changing at

a different rate than a time-changing count of the second series;

a comparator means for comparing a multibit data signal with one of said counts and enabling the driving means at a time controlled by said multibit data signal and said count of the first series of digital pulse signals and disenabling said driving means at a time controlled by a multibit data signal and the time-changing count of the second series of digital pulse signals.

5,111,218

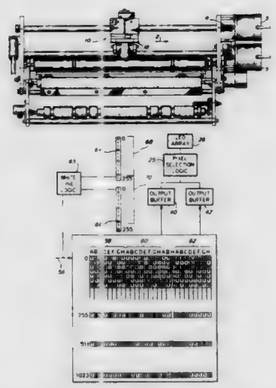
SYSTEM FOR ELECTRONICALLY CONTROLLING LED-ARRAY IMAGE PRINTER

Donald R. Lebeau, Greenville, and Paul J. Kalutkiewicz, Windham, both of N.H., assignors to A.B. Dick Company, Chicago, Ill.

Division of Ser. No. 252,628, Oct. 5, 1988, Pat. No. 4,963,894. This application Jun. 5, 1990, Ser. No. 533,506

Int. Cl.[5] H04N *1/21*

U.S. Cl. 346—107 R **17 Claims**



1. A method of controlling an image printer including an LED array printhead that is scanned perpendicular to the direction of travel of the photosensitive medium being exposed, comprising the steps of:

providing raster image data to an image printer control unit;

storing at least a portion of said raster image data in memory within said image printer control unit;

designating as exposure bands each set of exposure data within said stored raster image data corresponding to one complete scanning exposure of the LED array;

identifying from said exposure data for each exposure band any scan line for which no information is to be printed;

terminating the exposure scan of the LED array on a scan termination line where no information is to be printed; and

commencing the next exposure scan on a line subsequent to said exposure scan termination line.

5,111,219

FθLENS AND IMAGE APPARATUS USING THE SAME

Jun Makino, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1991, Ser. No. 712,184

Claims priority, application Japan, Jun. 15, 1990, 2-157013

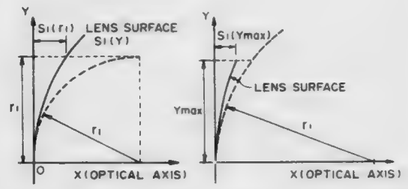
Int. Cl.[5] G01D *9/42*

U.S. Cl. 346—108 **24 Claims**

1. An fθ lens acting to effect uniform speed scanning while causing a light beam deflected at a uniform angular velocity by the deflecting surface of a deflector to be imaged on a plane to be scanned, wherein the shape of the curved surface of at least the lens surface of the lens which is adjacent to the deflection point side of the deflecting surface in the main scanning plane is an aspherical shape and particularly, near the optical axis, in at least the main scanning plane, this aspherical shape is convex toward said deflection point, and when the radius of curvature of this convex shape near the optical axis in the main scanning plane is r_1 and the focal length of the fθ lens near the optical axis in the main scanning plane is fm,

$$0 \geqq r_1 < |fm|$$

and yet, when with the point of intersection between the lens surface adjacent to the deflection point side and the optical axis as the origin and with the coordinates system of the x-axis



plotted in the direction of the optical axis and the coordinates system of the y-axis plotted in the main scanning plane perpendicularly thereto, the surface shape in the main scanning plane is expressed as a function $S_i(y)$ in which y is a variable, and when the maximum effective diameter of this surface in the main scanning plane is Ymax, $S_i(y)$ is defined between 0 and Ymax, and when $r_1 < Ymax$,

$$-1 < S_i(r_1)/r_1 < 0.5$$

and when $r_1 24$ Ymax,

$$+1 \times Ymax/r_1 < S_i(Ymax)/Ymax < 0.5/Ymax/r_1.$$

5,111,220

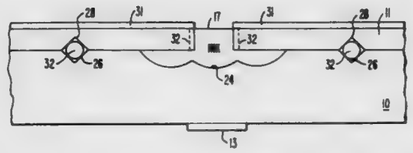
FABRICATION OF INTEGRATED ACOUSTIC INK PRINTHEAD WITH LIQUID LEVEL CONTROL AND DEVICE THEREOF

Babur B. Hadimioglu, Mountain View; Butrus T. Khuri-Yakub, Palo Alto, and David L. Steinmetz, Mountain View, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 14, 1991, Ser. No. 640,661

Int. Cl.[5] B41J *2/045*

U.S. Cl. 346—140 R **12 Claims**



1. An integrated acoustic ink printhead with liquid level control comprising

a substrate having an array of ejectors, each of said ejectors having a concave substrate surface area with a radius of curvature capable of radiating a free surface of ink with focused acoustic radiation to eject individual droplets of ink on demand, each of said ejectors having an acoustic focal length approximately equal to each other;

a spacer layer with a first surface in intimate contact with said substrate and a second surface opposite said first surface, said spacer layer having a predetermined thickness approximately equal to a difference between each of said ejectors acoustic focal length and each of said ejectors radius of curvature, said spacer layer also having

a set of apertures through said spacer layer, each aperture aligned with one of said ejectors substrate surface area;

a set of holes in said spacer layer first surface and a set of corresponding holes in said substrate, said spacer layer holes and said substrate holes forming cavities at the contact between said spacer layer and said substrate in locations other than said apertures in said spacer layer and said substrate; and

means in said cavities for engaging said spacer layer and said substrate;

whereby said set of apertures is aligned with each of said ejectors substrate surface area and said set of apertures in said spacer layer form a control for a level of said free ink surface above each of said ejectors substrate surface area.

5,111,221

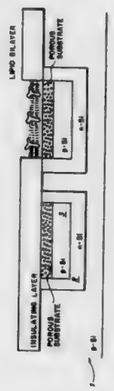
RECEPTOR-BASED SENSOR

Thomas L. Fare, Washington, D.C., and Frances S. Ligler, Potomac, Md., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 193,625, May 13, 1988, abandoned. This application Jun. 27, 1990, Ser. No. 544,442

Int. Cl.[5] H01L *29/66, 29/96*

U.S. Cl. 357—25 **27 Claims**



1. An amperometric sensor comprising:

a semiconductor substrate having a nonporous portion and a hydrophilic porous portion on said nonporous portion, and

a high impedance receptor film in intimate contact with and sealing at least the porous portion, said receptor film permitting a significant ionic current to enter said porous portion only in response to an interaction of said receptor film with a predetermined chemical.

5,111,222

PRESSURE ALARM IN WATER-SEALED CAMERA

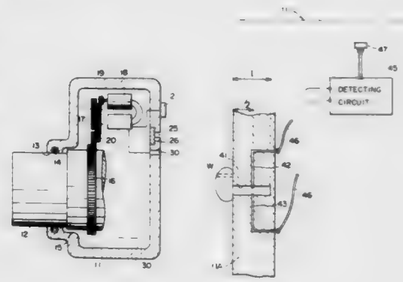
Masahiro Hayakawa, Yokohama, and Kousei Kosako, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1990, Ser. No. 561,719

Claims priority, application Japan, Aug. 3, 1989, 1-91610[U]; Feb. 16, 1990, 2-35677; Feb. 16, 1990, 2-35678

Int. Cl.[5] G03B *17/08*

U.S. Cl. 354—64 **19 Claims**



1. A camera adapted to be sealed against water, said camera comprising:

detecting means for detecting the presence of water having a hydraulic pressure greater than a predetermined value about said camera; and

means for generating an alarm signal when the presence of water at the predetermined hydraulic pressure is detected by said detecting means.

5,111,223

CAMERA SYSTEM

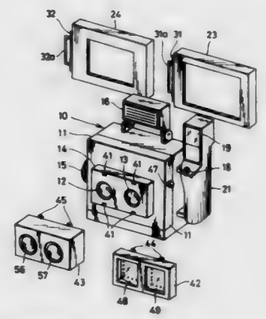
Hiroshi Omura, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 20, 1991, Ser. No. 718,474

Claims priority, application Japan, Jul. 2, 1990, 2-174996

Int. Cl.[5] G03B *41/00*

U.S. Cl. 354—111 **9 Claims**



1. A camera system comprising:

a camera body having at least two taking lenses on a front side thereof:

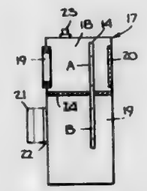
first means for holding at least a photographic film therein of a first film format, said first means being removably attachable to a rear side of said camera body in position to receive images passing through said taking lenses;

second means for holding at least a photographic film therein of a second film format, said second means being removably attachable to said rear side of said camera body in position to receive images passing through said taking lenses;

third means for deflecting optical axes of said taking lenses;

fourth means for changing magnification of said taking lenses as well as for deflecting optical axes of said taking lenses; and connecting means for attaching and detaching either of said third or fourth means to and from said camera body.

5,111,224
CAMERA FOR PRODUCING PICTURES OF INDIVIDUALS JOINTLY WITH CHARACTERS
Donald Spector, 380 Mountain Rd., Union City, N.J. 07087
Continuation-in-part of Ser. No. 459,642, Jan. 2, 1990, Pat. No. 4,994,832. This application Feb. 7, 1991, Ser. No. 652,003
Int. Cl.[5] G03B *1/00*
U.S. Cl. 354—125 **7 Claims**



2. A camera for producing pictures in each of which an individual whose picture is taken is seen jointly with a figurative character in such a way as to establish an apparent relationship therebetween, said camera being loaded with a dual-track film having a picture track whose series of light-sensitive picture frames are partially pre-exposed so that each picture frame contains a latent image of the character at a predetermined position, said film having a guide track whose series of viewfinder frames are each formed by a transparency having a printed image therein corresponding to the latent image of the adjacent picture frame in the picture track, said camera being provided with a viewfinder behind which said guide track is advanceable, said camera including a lens and shutter means behind which said picture track is advanceable whereby when the shutter means of the camera is actuated to take a picture on a particular picture frame of an individual then seen through the viewfinder, the picture frame is then exposed to sufficient light to complete the exposure thereof.

5,111,225
CAMERA
Shousuke Haraguchi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 1, 1991, Ser. No. 649,722
Claims priority, application Japan, Feb. 5, 1990, 2-025735; Feb. 9, 1990, 2-030031
Int. Cl.[5] G03B *15/05*
U.S. Cl. 354—149.11 **14 Claims**

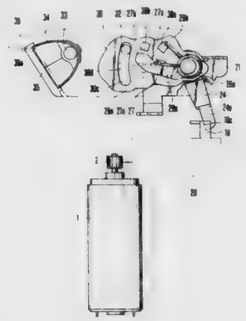
1. A camera comprising:

(a) a flash unit supported swingably between a down position and an up position, said flash unit including at least a flash light emitting portion;

(b) a first drive mechanism for supplying a drive force in a specific swinging direction to said flash unit;

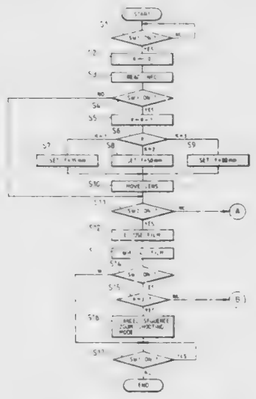
(c) a second drive mechanism for supplying a drive force in said specific swinging direction to said flash unit; and

(d) control means for controlling the drive force of said second drive mechanism so that the drive speed of said flash unit in said specific swinging direction is lower than the drive speed caused by the drive force of said first drive



mechanism for said flash unit in said specific swinging direction.

5,111,226
OPERATION CONTROL APPARATUS OF ELECTRIC ZOOM CAMERA
Toshiyuki Nakamura; Kazuyuki Kazami, both of Tokyo; Koichi Daitoku, Sagamihara, and Hidenori Miyamoto, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 307,741, Feb. 8, 1989, abandoned. This application Dec. 13, 1989, Ser. No. 449,355
Claims priority, application Japan, Feb. 12, 1988, 63-17246[U]; Feb. 12, 1988, 63-30505; Apr. 25, 1988, 63-103635; Apr. 26, 1988, 63-102984; Jul. 27, 1988, 63-187747
Int. Cl.[5] G03B *5/00*
U.S. Cl. 354—195.1 **32 Claims**



1. An electric zoom camera comprising:

a photographing lens system having a zoom lens system;

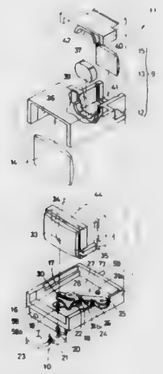
detecting means for detecting a focal length of said photographing lens system and generating a corresponding output;

driving means for driving said photographing lens system for zooming;

commanding means for generating a command for executing zooming to said driving means; and

control means for controlling said driving means in accordance with the output from said detecting means and the command to change a focal length of said photographing lens stepwise between focal lengths of a plurality of predetermined focal lengths arranged substantially in accordance with a geometric progression.

5,111,227
ZOOM CAMERA
Yuzi Ogawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 7, 1991, Ser. No. 712,929
Claims priority, application Japan, Jun. 13, 1990, 2-62315[U]
Int. Cl.[5] G03B *13/12*
U.S. Cl. 354—199 **15 Claims**



1. A zoom camera comprising:

a zoom photography optical system having a predetermined zoom range and being movable to a retracted position rearwardly and beyond the zoom range;

a zoom finder which varies the field of view of said finder in accordance with the focal length of said zoom photography optical system, and which is driven by a drive source which also drives said zoom photography optical system;

a movable variable power lens group which is provided with said zoom finder;

lens driving means which is driven by said drive source;

a lens moving mechanism which moves said movable variable power lens group to a predetermined position in association with the movement of said lens driving means, within the predetermined zoom range of said zoom photography optical system; and

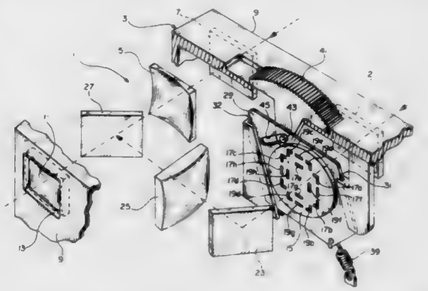
idling means for idling said lens driving means so as to not transmit the movement of said lens driving means to said lens moving mechanism when said zoom photography optical system is moved beyond the predetermined zoom range defined between a telephoto extremity and a wide angle extremity.

5,111,228
HORIZONTAL/VERTICAL FRAME VIEWFINDER
David E. Hansen, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 18, 1991, Ser. No. 670,635
Int. Cl.[5] G03B *13/10*
U.S. Cl. 354—222 **4 Claims**

1. A viewfinder for use in a camera to view a subject to be photographed with the camera oriented horizontally or vertically, is characterized in that:

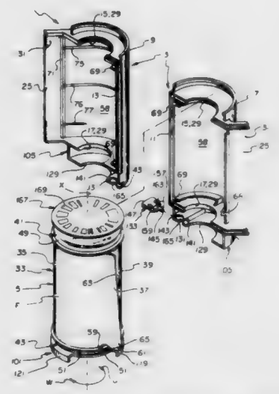
visual composition means is manually operable for changing from a horizontal frame view of a subject to be photographed to a vertical frame view of the subject without having to change the camera from a horizontal orientation to a vertical one;

said visual composition means includes reticle means having a first set of framing marks visible for defining said horizontal frame view of subject to be photographed and a second pair of framing marks visible for defining said



vertical frame view of the subject, and masking means manually adjustable for alternatively concealing said first and second sets of framing marks.

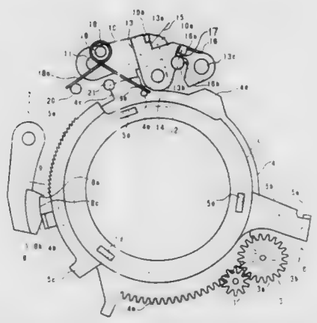
5,111,229
FILM CASSETTE WITH TRI-LOBE SPOOL
Daniel M. Pagano, Henrietta, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 14, 1991, Ser. No. 641,248
Int. Cl.[5] G03B *17/26*
U.S. Cl. 354—275 **5 Claims**



1. A film cassette comprising a film spool supported within a lighttight shell for rotation to thrust a filmstrip coiled about said spool to the exterior of said shell whether said filmstrip is unexposed or is only partly exposed, and a film exposure status indicator secured to said spool for rotation from an unexposed position for providing a visible indication said filmstrip is unexposed to respective partly exposed and fully exposed positions for providing visible indications the filmstrip is only partly exposed and is substantially exposed, is characterized in that:

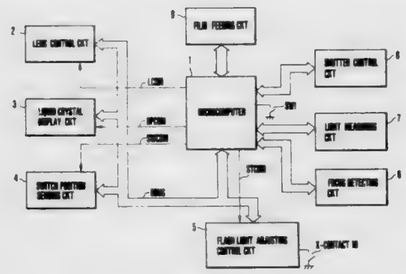
said spool includes a coaxial opening in which is located integral one-way access means having different rotational orientations when said status indicator is in its unexposed. partly exposed and fully exposed positions for allowing various only one-way access to said coaxial opening corresponding to the respective positions of the status indicator, in order to engage and rotate the spool

5,111,230
LENS SHUTTER DRIVING MECHANISM USING LENS DRIVING MECHANISM
Kouichi Kobayashi, Tokyo, Japan, assignor to COPAL Company Limited, Tokyo, Japan
Filed Aug. 28, 1990, Ser. No. 574,284
Claims priority, application Japan, Aug. 29, 1989, 1-222527; Sep. 29, 1989, 1-254427; Nov. 30, 1989, 1-139063[U]
Int. Cl.[5] G03B *9/08, 13/36*
U.S. Cl. 354—400 **6 Claims**



1. A lens shutter driving mechanism using a lens driving mechanism comprising:
a stepping motor for rotating in normal and reverse directions in accordance with a phase order of a sequentially supplied pulse train;
a main driving member coupled with said stepping motor to be driven in a forward direction and a return direction in accordance with the rotational direction of said stepping motor;
a blade driving member coupled with a shutter blade and disposed adjacent a moving line of said main driving member to open and close the shutter blade;
a blade driving member starting member formed in said main driving member so as to not operate said blade driving member in the forward movement of said main driving member from its initial position and to operate said blade driving member in the return movement of said main driving member to its initial position;
a lens driving member urged to move in the return direction of said main driving member and advanced to follow said main driving member after said blade driving member starting member formed in said main driving member has passed by said blade driving member in the forward movement of said main driving member to drive a focus adjusting lens group;
an arrangement member for engaging said lens driving member so as to not prevent the forward movement of said lens driving member and to restrict the return movement of said lens driving member;
an engagement release portion formed in said main driving member to release the engagement of said lens driving member by said engagement member after said blade driving member starting member has operated said blade driving member in the return movement of said main driving member;
a positional sensor for indentifying a first state in which said main driving member is in its initial position and a second state in which said main driving member is in a position advanced from the initial position; and
control means for controlling a normal pulse and a reverse pulse supplied to said stepping motor to control the normal rotation and the reverse rotation of said stepping motor and for confirming the initial position of said main driving member in accordance with an output of said positional sensor, wherein
said control means controls an amount of normal rotation of said stepping motor counted from a timing in which a logic of said positional sensor is inverted from the first state to the second state when said stepping motor is rotated in the normal direction and reads a state of said positional sensor at a timing in which reverse rotation pulses having a number necessary to return said main driving member to a position just before the logic of said positional sensor is inverted from the second state to the first state are supplied to said stepping motor in the reverse rotation of said stepping motor so that said control means determines an occurence of an abnormal operation when said positional sensor is in the first state in the reading.

5,111,231
CAMERA SYSTEM
Tatsuyuki Tokunaga, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 23, 1990, Ser. No. 557,172
Claims priority, application Japan, Jul. 27, 1989, 1-192546; Jul. 27, 1989, 1-192547; Jul. 27, 1989, 1-192548
Int. Cl.[5] G03B *7/08, 7/28, 15/05*
U.S. Cl. 354—402 **17 Claims**

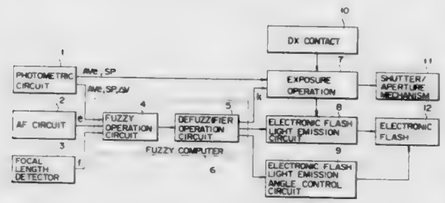


1. A flash photographing system for photographing with flash light of a flash device, comprising:
a) a light measuring circuit which individually measures light of a plurality of areas of an image field, said light measuring circuit being arranged to measure reflected light coming from a photographed object as a result of flashing in case of flash photography;
b) a focus detecting circuit which performs a focus detecting action on each of different areas of said image field;
c) a setting circuit which sets the flash light quantity condition on the basis of a focused state of each of said areas detected by said focus detecting circuit; and
d) a light quantity control circuit including an integrating circuit arranged to perform an integrating action on the light measurement output of said light measuring circuit for each of said areas and a stopping circuit arranged to stop the flash light from being emitted when an output of said integrating circuit reaches a predetermined value, said integrating action being performed in accordance with each flash light adjusting condition set by said setting circuit.

5,111,232
CAMERA HAVING FUZZY INFERENCE FUNCTION
Katsuhiko Tsunefuji, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jun. 4, 1990, Ser. No. 532,916
Claims priority, application Japan, Jun. 15, 1989, 1-152922
Int. Cl.[5] G03B *13/00*
U.S. Cl. 354—402 **26 Claims**

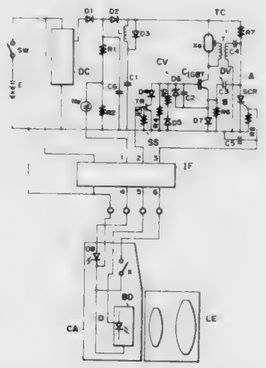
1. A camera comprising:

measuring means for outputting information associated with an object to be photographed;
a fuzzy computer for receiving an output from the measuring means as an input value, obtaining a fitting degree of the input value with respect to a then-part membership function in accordance with an if-part membership function and the then-part membership function, both of



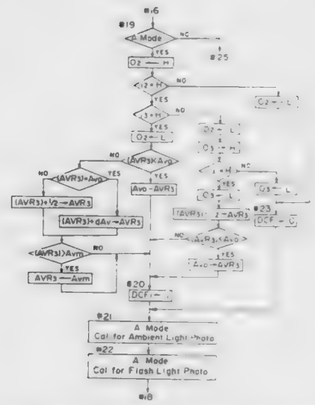
which correspond to a plurality of rules representing a degree of influence of the input value on an optimal exposure, obtaining a center of gravity value from a plurality of fitting degree corresponding to the rules, and obtaining a determination value as a result of inference; and
means for determining photographic conditions from the determination value from the fuzzy computer and the output from said measuring means.

5,111,233
ELECTRONIC FLASHING DEVICE
Norikazu Yokonuma, Tokyo; Nobuyoshi Hagiuda; Hideki Matsui, both of Yokohama, and Hiroshi Sakamoto, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Jun. 25, 1991, Ser. No. 720,624
Claims priority, application Japan, Jun. 28, 1990, 2-173997
Int. Cl.[5] G03B *7/00, 15/05*
U.S. Cl. 354—416 **4 Claims**



1. An electronic flashing device comprising:
a flashing discharge tube for emitting light by a charge stored in a main capacitor;
a voltage controlled switching device driven by a voltage applied to a control terminal thereof for controlling the light emission of said flashing discharge tube;
voltage application means for applying a voltage, higher than the charge voltage of said main capacitor, across said flashing discharge tube prior to the light emission of said flashing discharge tube; and
control voltage generation means for generating a voltage to be applied to the control terminal of said voltage controlled switching device in accordance with the voltage generated by said voltage application means.

5,111,234
CAMERA SYSTEM WITH MEANS FOR VARYING EXPOSURE CONTROL DATA
Nobuyuki Taniguchi, Tondabayashi; Masatake Niwa, Sakai; Akira Fujii, Sennan; Takeo Hodu, Sakai; Masaaki Nakai, Nara; Minoru Sekida, Sakai, and Masayoshi Sahara, Sennan, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 219,754, Jul. 15, 1988, Pat. No. 4,952,959, which is a division of Ser. No. 43,758, Apr. 29, 1987, Pat. No. 4,763,144, which is a division of Ser. No. 888,600, Jul. 23, 1986, Pat. No. 4,712,904, which is a division of Ser. No. 634,474, Jul. 25, 1984, Pat. No. 4,621,914. This application Apr. 11, 1990, Ser. No. 508,669
Claims priority, application Japan, Jul. 27, 1983, 58-138129; Jul. 29, 1983, 58-139600; Aug. 8, 1983, 58-144547; Aug. 8, 1983, 58-144549; Aug. 17, 1983, 58-150572; Jun. 22, 1984, 59-129572; Jun. 25, 1984, 59-131452; Jun. 25, 1984, 59-131453
Int. Cl.[5] G03B *7/20, 17/18*
U.S. Cl. 354—455 **3 Claims**



1. A camera system including a camera body and an interchangeable lens mountable on the camera body, comprising:
a manually operable member;
means for storing an aperture value;
means for altering the aperture value to be stored in said storing means at a predetermined step in response to a manual operation of said manually operable member;
means, provided in the camera body, for receiving a plurality of kinds of data from an interchangeable lens mounted on the camera body, said plurality kinds of data being transmitted serially from the interchangeable lens and including a minimum aperture value of the interchangeable lens;
means for producing, in accordance with the minimum aperture value received by said receiving means, a first minimum aperture value representing the minimum aperture value;
means for detecting whether or not the aperture value altered by said altering means is smaller than the first minimum aperture value;
means for setting the aperture value to be stored in said storing means to the first minimum aperture value when said detecting means detects that the aperture value altered by said altering means is smaller than the first minimum aperture value; and
means, operated when the first minimum aperture value is stored in said storing means for increasing, in response to

a manual operation of said manually operable member, the stored minimum aperture value by a value corresponding to a difference between the first minimum aperture value and a second minimum aperture value representing a minimum aperture value in a plurality of aperture values changeable at said predetermined step in a response to a manual operation of said manually operable member.

5,111,235

METHOD OF OPERATING ELECTROPHOTOGRAPHIC PRINTING APPARATUS

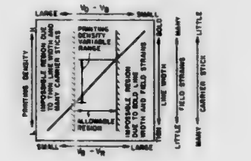
Hiroshi Ueno; Yasuo Kikuchi; Kunitomo Takahashi; Koji Doi; Tsukasa Onose, and Toshitaka Ogawa, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

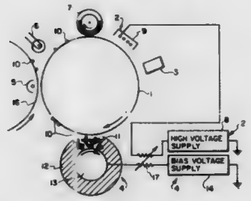
Continuation-in-part of Ser. No. 399,270, Aug. 28, 1989, abandoned. This application Feb. 26, 1991, Ser. No. 660,266

Claims priority, application Japan, Aug. 26, 1988, 63-212700

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—246 **2 Claims**





1. A method of operating an electrophotographic printing apparatus, comprising the steps of:

charging a photosensitive body by using a charging unit;

exposing a charged surface of said photosensitive body by using an exposing unit so as to form an electrostatic latent image on said surface of said photosensitive body; and

developing said electrostatic latent image on said photosensitive body through a bias development system by using a developing unit,

in which the relationship of a bias voltage V_B applied to a developing roll of said developing unit and a surface potential V_O of said photosensitive body satisfies the following conditions: $V_O = a.V_B + b$; $0 < a$; and $0 < b < V_O$.

5,111,236

MULTIPLE-PRINT 3-D PRINTER AND PROCESS

Allen K. W. Lo, 5022 Hidden Branches Dr., Dunwoody, Ga. 30338

Filed Mar. 27, 1990, Ser. No. 499,668

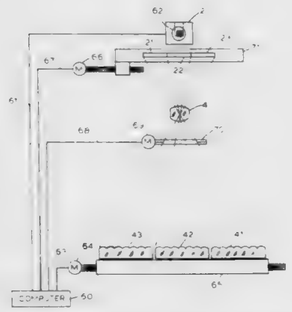
Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—22 **12 Claims**

1. A high speed three dimensional (3-D) printer for simultaneously projecting all of the 2-D negative views required to produce a 3-D photograph onto the number of 3-D prints corresponding to the number of 2-D negative views used in the process, said printer comprising:

means for holding a negative, light projecting means, and a lens with a field of coverage wide enough to simultaneously print all of the 2-D views required to produce a 3-D print onto the number of 3-D prints corresponding to the number of 2-D negative views used in the process;

means for holding the number of 3-D prints it is desired to print;



means for moving the 3-D prints between exposures to fill all the image bands in the 3-D prints.

5,111,237

IMAGE FORMING APPARATUS

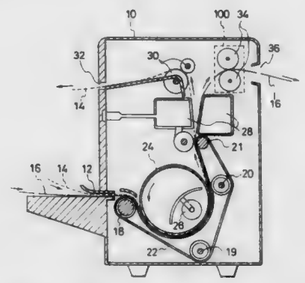
Takemi Yamamoto; Jun Sakai, both of Nagoya; Hiroshi Kawahara, Aichi; Shigeyuki Hayashi, Nagoya; Kenji Sakakibara, Ichinomiya; Michitoshi Akao, Nagoya; Ichiro Sasaki, Nagoya, and Ryohei Komiya, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 11, 1987, Ser. No. 24,432

Claims priority, application Japan, Mar. 11, 1986, 61-51408; Mar. 31, 1986, 61-73952

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—27 **4 Claims**



1. An image forming apparatus, comprising:

a light-and-pressure-sensitive recording medium including a sheetlike substrate, a number of microcapsules provided on the surface of the substrate each containing a chromogenic material and a radiation-curable resin, and a developer material, said radiation-curable resin reacting with radiation, thereby increasing the mechanical rupture strength of the microcapsules, said developer material reacting with the chromogenic material;

conveyer means for feeding the light-and-pressure-sensitive recording medium together with an original to an exposing position with the light-and-pressure-sensitive recording medium and the original overlapping each other;

exposure means for applying radiation at the exposing position through the original to the light- and pressure-sensitive recording medium, said exposure means including a light source placed at the opposite side of said recording medium with respect of the original;

separating means for separating the original from the light- and pressure-sensitive recording medium exposed by the exposure means; and

pressurizing means for pressuring the light- and pressure-sensitive recording medium separated from the original so that the microcapsules, hardened by the exposure to the exposure means, and ruptured selectively in accordance with the mechanical ruptured strength thereof, thereby allowing chromogenic material and developer material to react with each other and change the color of the surface of the light-and pressure-sensitive recording medium.

5,111,238

FILM PROCESSING UNIT

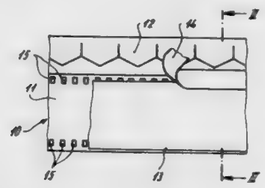
Johannes Honerkamp, Ebbendorfer Strasse 14, 4517 Hilter, Fed. Rep. of Germany

Filed Jun. 20, 1991, Ser. No. 718,285

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1990, 4020749

Int. Cl.[5] C03B *27/52, 27/62*

U.S. Cl. 355—40 **8 Claims**



1. A film processing unit, comprising:

(a) a developed film strip (**11**) including a base layer, and an emulsion layer on one side of said base layer;

(b) a reorder strip (**12**) coplanar with and arranged adjacent one side edge of said film strip;

(c) a cover layer (**13**) at least partially covering said emulsion layer on said film strip, one side edge of said cover layer adjacent said reorder strip being slightly spaced from the adjacent side edge of said film strip; and

(d) an adhesive strip (**14**) extending at least partially over, and in adhesive engagement with, the adjacent portions of said film strip, said cover layer and said reorder strip, thereby to connect together said film strip, said reorder strip, and said cover layer.

5,111,239

CARD TRANSPORTING DEVICE FOR USE IN A READER PRINTER OR THE LIKE

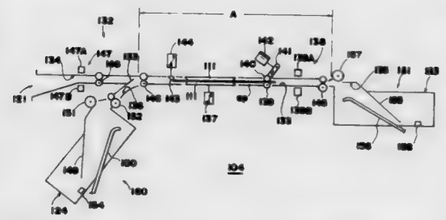
Kuniaki Kamimura, Ebina; Kenji Sawada, Machida, and Yasushi Yamade, Sagamihara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 30, 1991, Ser. No. 693,365

Claims priority, application Japan, May 1, 1990, 2-115993; May 1, 1990, 2-115994; May 1, 1990, 2-115995

Int. Cl.[5] G03B *13/28*

U.S. Cl. 355—45 **7 Claims**



1. A transport device provided in an apparatus which is capable of projecting on a screen an image of an original at a projecting position and printing the projected image on a recording medium if necessary, said transport device comprising:

an accommodating portion for accommodating a plurality of the originals;

an insertion portion through which one original is inserted in the transport device;

first transport means for transporting one after another to said projecting position the originals accommodated in said accommodating portion; and

second transport means for transporting to the projecting position the one original inserted through said insertion portion.

5,111,240

METHOD FOR FORMING A PHOTORESIST PATTERN AND APPARATUS APPLICABLE THEREWITH

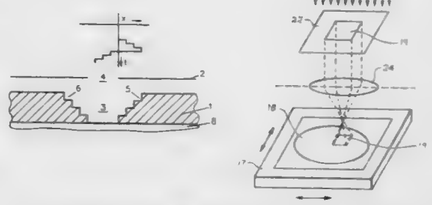
Ulrich C. Boettiger, Dettenhausen, and Bernhard Hafner, Jettingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 292,086, Dec. 30, 1988, Pat. No. 4,935,334. This application Feb. 8, 1990, Ser. No. 477,371

Claims priority, application European Pat. Off., Apr. 21, 1988, 88106389.5

Int. Cl.[5] G03B *27/42*

U.S. Cl. 355—53 **6 Claims**



1. An apparatus for shifting laterally a substrate relative to an irradiation mask or the projection of the mask on the substrate surface relative to the substrate, comprising means for shifting the substrate into the x- and/or the y-direction and relative to the mask or the projection of the mask on the substrate surface during exposure or means between the mask and the substrate for shifting the path of the beam relative to the substrate during exposure; means for controlling said shifting means during exposure; and means for adjusting the substrate relative to the mask, wherein said adjusting means are used for shifting and said controlling means are adapted to control and shifting in a predetermined manner during exposure.

5,111,241

BERNOULLI SCAN GATE

Christopher J. Kralles, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 27, 1991, Ser. No. 750,377

Int. Cl.[5] G03B *27/62*

U.S. Cl. 355—75 **3 Claims**

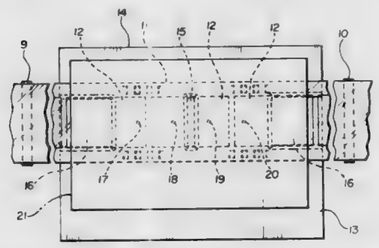
1. A web flattening system for a web having a top surface and a bottom surface, said system comprises:

a platen having at least two orifices;

a plate positioned above said platen in close proximity to cause the bottom surface of a web moved between said plate and said platen to be positioned in close proximity to said orifices; and

means for supplying a high velocity gas stream to said orifices to create lesser gas pressure along the bottom surface

of a web moved between said plate and said platen than the ambient gas pressure along the top surface of the web,



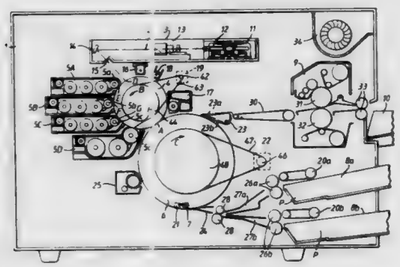
whereby the web will be shifted toward said platen at least in the vicinity of said orifices.

5,111,242

IMAGE FORMING APPARATUS HAVING A MORE SMOOTHLY CONTROLLED IMAGE FORMING ELEMENT

Koji Tanimoto; Kazuhisa Kimura, and Kazuo Sasama, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Aug. 27, 1990, Ser. No. 572,408
Claims priority, application Japan, Sep. 29, 1989, 1-253964
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—200 **21 Claims**



16. An apparatus comprising:

a drum;

means for rotating the drum, the rotating means including a stepping motor having a plurality of excitation windings;

means for detecting variations in the rotational speed of the rotating means;

means for storing at least one speed variation data sequence corresponding to detected variations in the rotational speed of the rotating means;

means for driving the rotating means; and

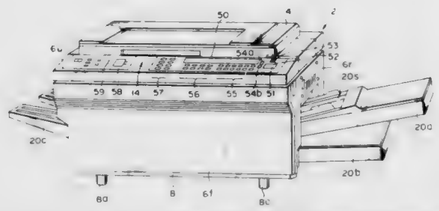
means for controlling the driving means, responsive to at least one speed variation data sequence, such that the plurality of excitation windings are switched and excited at switching time intervals which compensate for variations in the rotational speed of the rotating means.

5,111,243

APPARATUS AND METHOD FOR ADJUSTING IMAGE CONTRAST ON A DISPLAY DEVICE

Mitsuru Hatano, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 19, 1990, Ser. No. 554,336
Claims priority, application Japan, Jul. 19, 1989, 1-184822
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—209 **9 Claims**



1. An apparatus for adjusting the image contrast of a display device capable of displaying data of a first and second brightness ratio of the display to a background thereof, the display device including a first display section for displaying data, a second display section for displaying the first brightness ratio and a third display section for displaying the second brightness ratio, said apparatus comprising:

means for energizing the display device which displays information, including the data, in the first brightness ratio;

means for inputting new data indicating the second brightness ratio for altering the first brightness ratio, the inputting means including a mode-switching element for switching the apparatus from a normal mode to a data-inputting mode, and a plurality of numeral-entry elements for directing the entry of numerical data;

means for supplying a first data indicating the first brightness ratio and the new data indicating the second brightness ratio until further data for changing the second data is inputted and the displayed information is changed, the data displayed in the third display section being replaced with the new data in response to entry of this new data; and

means for changing a background brightness of the display based on the new data by controlling energizing means.

5,111,244

IMAGE-FORMING MACHINE WITH IMPROVED PROCESS AND OPTIONAL UNIT ASSEMBLIES

Shigeo Koyama, Ibaraki; Eiji Tsutsui, Amagasaki; Kazuhiro Kobayashi, Ikoma; Katsushi Horihata, Osaka, and Hiroyuki Tanaka, Yamato Koriyama, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 26, 1988, Ser. No. 262,873
Claims priority, application Japan, Oct. 30, 1987, 62-273663; Nov. 19, 1987, 62-290740; Nov. 30, 1987, 62-301775
Int. Cl.[5] G03G *15/00, 21/00*
U.S. Cl. 355—210 **29 Claims**

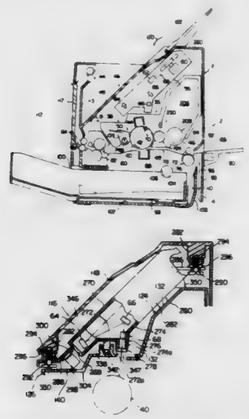
1. In an image-forming machine comprising a main body including an upper wall, an image-bearing means in the form of a rotating drum including a surface having a photosensitive material thereon, an optical means for projecting light having image information onto said photosensitive material on said surface, a developing device for developing a latent electrostatic image formed on said surface, a transfer means for transferring a toner image formed on said surface in a transfer zone to a sheet material, a conveying mechanism for conveying the sheet material through said transfer zone, and a receiving section for receiving the sheet material conveyed by said conveying mechanism, the improvement wherein:

said receiving section is disposed above said optical means and includes a receiving surface defined by an upper surface of said upper wall of said main body, said receiving surface being inclined upwardly at a predetermined angle to the horizontal;

said optical means is disposed in a box-like optical unit frame, and said optical unit frame is disposed within said main body at a location above said rotating drum and extending substantially parallel to said receiving surface of said receiving section and inclined upwardly from a lower first end on a first side of said rotating drum to an upper second end on a second side of said rotating drum, thereby defining an enlarged space below said optical unit frame on said second side of said rotating drum;

a main portion of a light path of said optical means is inclined to the horizontal substantially parallel to said receiving surface of said receiving section in a straight line from one end portion to another end portion of said optical unit frame; and

said developing device is positioned in said enlarged space below said optical unit frame at a location on said second side of said rotating drum.

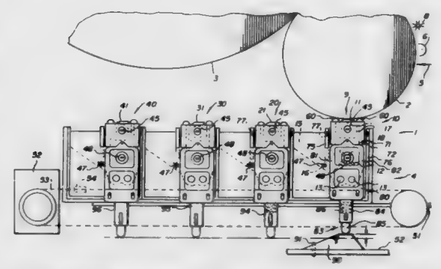


5,111,245

APPARATUS FOR POSITIONING A DEVELOPMENT UNIT WITH RESPECT TO AN IMAGE MEMBER

Michael L. DeCecca, Fairport; Arthur S. Kroll, and Arthur E. Dunn, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1990, Ser. No. 621,686
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—245 **17 Claims**



1. Positioning apparatus for positioning an applicator of a development unit with respect to a surface of an image member at a developing position, said surface having a generally cylindrical shape at least at said development position, said cylindrical shape having an axis of rotation and opposite ends, and said positioning apparatus positioning said applicator and surface with respect to three orthogonal axes, a z axis parallel to the axis of rotation of the image member, an x axis parallel to a line between the development position and the axis of rotation, and a y axis orthogonal to the x and z axes, said apparatus including:

two spaced pins, each oriented generally parallel to the x axis and fixed with respect to one of said surface and said applicator,

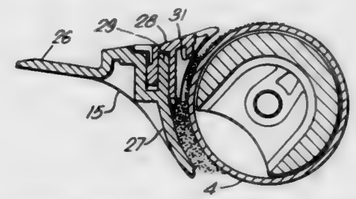
means defining two holes fixed with respect to the other of said surface and said applicator and positioned to receive said pins, one of said holes restricting relative movement of its pin parallel to both said y and z axes and the other hole restricting linear movement of its pin parallel only to said y axis, and means associated with one of said image member and applicator for engaging structure associated with the other of the image member and applicator for controlling the relative position of said surface and applicator parallel to the x axis.

5,111,246

ELECTROSTATOGRAPHIC MACHINE

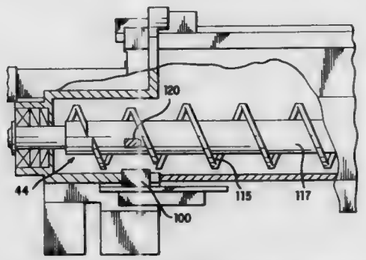
Ian Brailsford; Robert A. Carter, both of Stevenage, United Kingdom; Edward J. Gutman, Webster; Don B. Jugle, Renfield, both of N.Y., and Roger D. Masham, Ashwell, United Kingdom, assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1990, Ser. No. 621,683
Claims priority, application United Kingdom, Feb. 20, 1990, 9003747
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—245 **2 Claims**



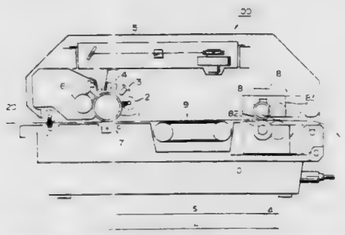
1. A process unit adapted to be removably mounted in a main assembly of an electrostatographic printing machine, the process unit comprising a housing of an electrically insulating plastics material, an imaging member mounted for movement within the housing, a development apparatus within the housing containing developer material for developing an electrostatic latent image on the imaging member, and a transfer device mounted on the housing which causes a developed image to be transferred from the moving imaging member to a copy sheet, the development apparatus including a conductive exit portion over which the imaging member passes as it moves towards the transfer device and which forms a seal for the developer material in the development apparatus, the conductive exit portion extending over the whole region from the development apparatus to the transfer device, thereby providing an electrical discharge path from the exit portion and preventing unwanted charge from building up on the exit portion.

5,111,247
TONER CONCENTRATION SENSING USING AUGER MOUNTED MAGNET
Stephen J. Nichols, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jul. 30, 1991, Ser. No. 738,028
Int. Cl.[5] G03G *15/06*; B01F *15/00*
U.S. Cl. 355—246 **20 Claims**



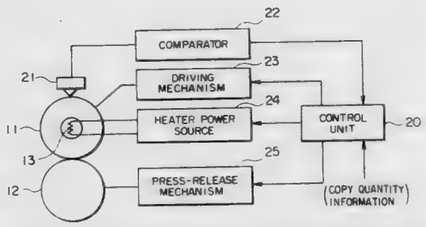
1. A developer mechanism for determining a concentration of toner particles within a printing machine in which developer material comprises toner particles in a reservoir, the toner particles being selectively attracted to a charged receptor surface, the developer mechanism comprising:
at least one auger rotatably mounted in the reservoir for mixing the developer material, the at least one auger having a blade and core;
a sensor mounted in the reservoir adjacent to the at least one auger for sensing an amount of said toner particles in the reservoir;
a magnet mounted on the at least one auger for rotation therewith to brush the surface of the sensor with a developer brush to remove agglomerated developer material on the sensor, the sensor being positioned within a magnetic field of the magnet when the magnet faces the sensor during said rotation;
a filtering means for filtering a signal detected by the sensor; and
wherein the sensor outputs an AC signal having a frequency due to the rotation of the at least one auger, the filtering means determining the peak of the AC signal due to the concentration of said toner particles.

5,111,248
PRINTING APPARATUS
Masahiro Kita, Itabashi, and Ikuo Negoro, Saitama, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 11, 1990, Ser. No. 535,667
Claims priority, application Japan, Jun. 9, 1989, 1-147072; May 9, 1990, 2-119179
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—282 **18 Claims**



1. A printing apparatus employing an electrophotographic system using a continuous recording medium, a toner image being transferred onto said continuous recording medium by transfer means, said printing apparatus comprising:
means for fixing an unfixed toner image on said continuous recording medium, said fixing means being movably disposed in said apparatus; and
means for securing said fixing means;
wherein said fixing means is capable of being moved in a direction along which said continuous recording medium is fed and said securing means secures said fixing means at one of a plurality of predetermined positions according to the type of the loaded continuous medium.

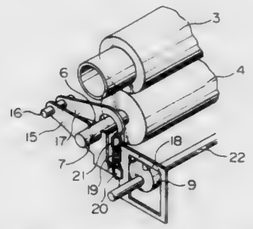
5,111,249
HEAT ROLLER FIXING DEVICE
Akihiro Owada, Tokyo, Japan, assignor to Konica Corporation, Tokyo, Japan
Filed Oct. 3, 1990, Ser. No. 592,311
Claims priority, application Japan, Oct. 6, 1989, 1-261739
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—285 **3 Claims**



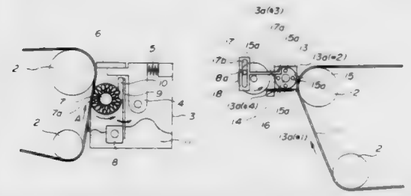
1. A thermal fixing device of a copying machine for fixing a toner image on the surface of a recording sheet, the device having a pair of rollers consisting of a heating roller and a pressure roller which convey the recording sheets therebetween, thereby heating and pressing the toner image to be fixed on the surface of the recording sheet, the device comprising:
means for driving at least one of the pair of rollers to rotate; and
means for controlling the driving means to stop the rotation of the rollers when a number of sheets in a batch of recording sheets less than a predetermined number have been fixed and conveyed, and controlling the driving means to continue the rotation of the rollers for a predetermined interval after a number of sheets in a batch of recording sheets greater than the predetermined number have been fixed and conveyed.

5,111,250
HEAT-FIXING DEVICE HAVING A ROLLER SELECTIVELY LOADED THROUGH AN ELASTIC ELEMENT
Hiromi Kashiwagi, Fukaya, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan
Filed May 9, 1991, Ser. No. 698,162
Claims priority, application Japan, May 10, 1990, 2-120391
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—285 **7 Claims**

1. A heat-fixing device for heating a toner image on a sheet-like member comprising a rotatable heating roller for heating the toner image and a rotatable pressing roller for pressing the sheet-like member against the heating roller,
wherein a longitudinal axis of one of the heating roller and the pressing roller is fixed and a longitudinal axis of another one thereof is not fixed, the heat-fixing device further comprises,
guide arm means swingable on a swing axis and supporting the another one of the heating roller and the pressing roller at a position distant from the swing axis to guide a movement of the another one of the pressing roller and the heating roller in relation to the fixed one thereof so that the longitudinal axes of the pressing roller and the heating roller are kept on a plane to form a longitudinal contact line between the pressing roller and the heating roller, and
driving means including moving means and elastic means arranged between the guide arm means and the moving means so that the moving means drive the guide arm means through the elastic mans to press the sheet-like member between the heating roller and the pressing roller, and wherein a pressing force between the heating roller and the pressing roller is adjusted in accordance with a movement of the moving means when the pressing roller and the heating roller are in contact with each other.

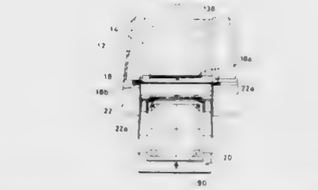


5,111,251
APPARATUS FOR CLEANING PHOTOCONDUCTIVE BELT
Mugijirou Uno, Isehara, and Kazuhiro Yuasa, Zama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Nov. 9, 1990, Ser. No. 610,937
Claims priority, application Japan, Nov. 15, 1989, 1-294863
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—297 **3 Claims**



1. A cleaning apparatus for cleaning a photoconductive belt of a seamless type which is used within a recording system for transferring a latent image of information to be recorded onto a recording paper, the photoconductive belt being rotated along a rotation path by a plurality of supporting rollers, said cleaning apparatus comprising:
blade means provided at a first position along the rotation path of the photoconductive belt for removing a residual toner from the photoconductive belt;
brush means provided at a second position upstream of the first position along the rotation path of the photoconductive belt, the brush means having a pile material coming in contact with a surface of the photoconductive belt;
scraper means for cleaning the brush means by removing a remaining toner from the pile material of the brush means;
said blade means including a rotary part on which a plurality of blade edges are supported, the rotary part being rotatable around a shaft extending in a direction parallel to the axial direction of the supporting rollers;
a stopper part for locating the rotary part at a third position along the rotation path where one of the plurality of blade edges comes in contact with a photoconductive belt surface; and
a drive part for rotating the rotary part around the shaft, responsive to a control signal which is supplied by said recording system to said drive part when a prescribed number of revolutions of the photoconductive belt is reached, so that one of the plurality of blade edges is selectively brought in contact with the photoconductive belt surface.

5,111,252
ELECTROPHOTOGRAPHIC COPYING MACHINE WITH PAPER FEEDING AND DISCHARGE TRAYS
Fumihiko Hamada, Ogaki; Kunio Tsuboi, Kanzaki; Mitihiko Hasegawa, Taka; Yasuji Ichizawa, Yoro; Toshiya Yabe, Ogaki; Kunitomo Yamasaki, Anpachi; Yasunobu Takahashi, Kanzaki, and Katsuji Mizuta, Hashimi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Aug. 22, 1990, Ser. No. 571,858
Claims priority, application Japan, Aug. 23, 1989, 1-98284[U]; Aug. 23, 1989, 1-98285[U]; Aug. 23, 1989, 1-98572[U]
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—308 **15 Claims**



1. An electrophotographic copying machine, comprising:
a body;
a paper feeding tray attached to one side surface of said body, said paper feeding tray having a first, a second and a third paper feeding tray plate, means connecting said plates to each other to permit collapsing of the second plate over the first and third plate over the second and also unfolding of the second plate relative to the first plate and third plate relative to the second plate, and said first paper feeding tray plate being contained in said body in a state where said second and said third paper feeding tray plates are collapsed over said first plate; and
a paper discharging tray attached to the other side surface of said body, said paper discharging tray having a first, a second and a third paper discharging tray plate, means connecting said plates to each other to permit collapsing of the second plate over the first and the third plate over the second and also unfolding of the second plate relative to the first plate and the third plate relative to the second plate, and said first paper discharging tray plate being contained in said body in a state where said second and said third paper discharging tray plates are collapsed over said first plate.

5,111,253

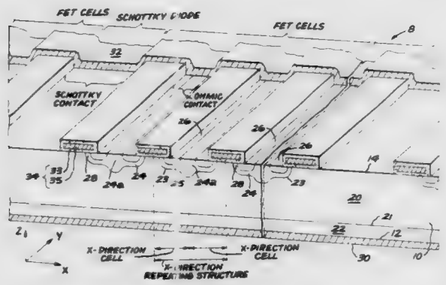
MULTICELLULAR FET HAVING A SCHOTTSKY DIODE MERGED THEREWITH

Charles S. Korman, Schenectady, N.Y.; Bantval J. Baliga, Raleigh, N.C., and Hsueh-Rong Chang, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 348,981, May 9, 1989, abandoned. This application Aug. 28, 1990, Ser. No. 576,125

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—15 **31 Claims**



1. A semiconductor device comprising:

first and second main electrodes;

a body of semiconductor material including:

a multicellular FET including a plurality of FET cells each connected between said first and second main electrodes; and

a Schottky diode connected between said first and second main electrodes;

said Schottky diode including a plurality of Schottky contacts interspersed with said FET cells;

a plurality of said FET cells not having Schottky contacts within the cells of said plurality; and

at least one of said FET cells being spaced from the plurality of Schottky contacts by an intervening FET cell.

5,111,254

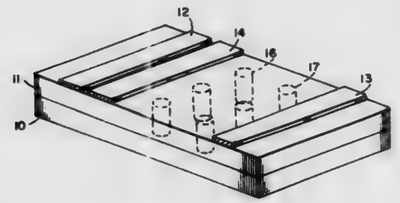
FLOATING GATE ARRAY TRANSISTORS

Mark Levinson, Sudbury; Brian M. Ditchek, Milford; Philip G. Rossoni, Belmont, and Frederick Rock, Marlboro, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 17, 1990, Ser. No. 569,355

Int. Cl.[5] H01L *29/80, 29/48*

U.S. Cl. 357—22 **10 Claims**



1. A junction field effect transistor comprising

a body including a layer of active semiconductor material and an underlying insulating or semi-insulating substrate, said layer having a surface;

a source electrode in ohmic contact with the semiconductor material;

a drain electrode in ohmic contact with the semiconductor material;

a control gate electrode in rectifying contact with the semiconductor material and having a control gate depletion zone associated therewith; said control gate electrode being located between the source electrode and the drain electrode for controlling the flow of current between the source electrode and the drain electrode;

said source, drain, and control gate electrodes comprising elongated strips positioned parallel to each other at said surface; and

a floating gate element in rectifying contact with the semiconductor material and electrically isolated from the control gate electrode; said floating gate element having a floating gate depletion zone associated therewith and being located between the control gate electrode and the drain electrode and between said surface and the interface of the layer of active semiconductor material and the substrate in the path of current flow between the source electrode and the drain electrode;

such that the control gate depletion zone associated with the control gate electrode expands with increasing drain potential until the control gate depletion zone reaches the floating gate element causing the maximum electric field at the control gate electrode to be clamped while said floating gate element increases in potential as the depletion zone associated therewith expands.

5,111,255

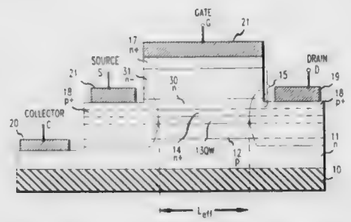
BURIED CHANNEL HETEROJUNCTION FIELD EFFECT TRANSISTOR

Philip A. Kiely, Tinton Falls, and Geoffrey W. Taylor, Holmdel, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 5, 1990, Ser. No. 533,636

Int. Cl.[5] H01L *29/80*

U.S. Cl. 357—22 **19 Claims**



1. A field effect transistor having a first semiconductor region laterally disposed between second and third semiconductor regions, said first semiconductor region comprising:

a first semiconductor layer having a first conductivity type, a first energy bandgap and a first doping concentration;

a second semiconductor layer forming a conducting channel between said second and third semiconductor regions, said second and third semiconductor regions each having a second conductivity type opposite to said first conductivity type, said second semiconductor layer having said second conductivity type and a second energy bandgap, said first energy bandgap greater than said second energy bandgap, and said first and second semiconductor layers having a first heterojunction interface such that said conducting channel is formed beneath said first heterojunction interface;

a charge sheet formed within said first semiconductor layer and substantially near said first heterojunction interface, said charge sheet having said first conductivity type and a second doping concentration substantially greater than said first doping concentration; and

a third semiconductor layer having said first conductivity type and a third energy bandgap substantially equal to said first energy bandgap, said second and third semiconductor layers having an interface.

5,111,256

HIGH SPEED SEMICONDUCTOR DEVICE AND AN OPTELECTRONIC DEVICE

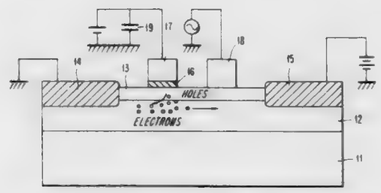
Keiichi Ohata, and Hikaru Hida, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,588

Claims priority, application Japan, Dec. 27, 1988, 63-334814; Mar. 28, 1989, 1-77193

Int. Cl.[5] H01L *29/80*

U.S. Cl. 357—22 **12 Claims**



1. A semiconductor device comprising;

(a) a substrate,

(b) a first layer of an undoped first semiconductor material formed on the substrate,

(c) a second layer of an undoped second semiconductor material formed on said first layer, said second semiconductor material having an electron affinity smaller than that of said first semiconductor material,

(d) a source electrode and a drain electrode respectively formed in contact with said first layer, and

(e) a hole injection electrode and a gate electrode respectively formed on said second layer between said source electrode and said drain electrode in this order,

said hole injection electrode being formed on said second layer with one of an interposed p^+ semiconductor layer and an interposed thin insulating film.

5,111,257

ELECTRONIC INTEGRATED CIRCUIT HAVING AN ELECTRODE LAYER FOR ELEMENT ISOLATION

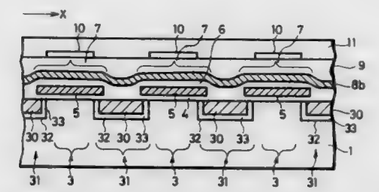
Nobuaki Andoh, and Osamu Ueda, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,768

Claims priority, application Japan, Dec. 21, 1988, 63-324244

Int. Cl.[5] H01L *29/10*

U.S. Cl. 357—23.4 **12 Claims**



1. An electronic integrated circuit having a plurality of electronic circuit elements integrated on a substrate in a plurality of element forming regions, and an isolation structure for electrically isolating respective ones of said element forming regions, said isolation structure and said element forming regions having adjacent upper surfaces facilitating formation of a low resistance interconnection layer thereover by avoiding surface irregularities in said upper surfaces, said integrated circuit comprising

recesses formed in said substrate in portions of areas between said element forming regions;

insulation means formed in said recesses and on the surface of said substrate;

a field shield electrode formed on the surface of said substrate and in said recesses that provides an isolation field when an activation voltage is applied thereto, an upper surface of said field shield electrode being substantially planar with upper surfaces of adjacent ones of said element forming regions whereby a relatively flat isolation structure is provided; and

an interconnection layer formed over said field shield electrode and said adjacent element forming regions.

5,111,258

SEMICONDUCTOR DEVICE WITH A MULTI-STEPPED SOURCE REGION AND METHOD FOR PRODUCING THE SAME

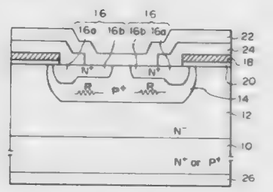
Mutsumi Sasaki, Machida; Koji Takahashi, Kamakura, and Shuichi Suzuki, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 493,013, Mar. 13, 1990, abandoned. This application Jul. 31, 1991, Ser. No. 742,081

Claims priority, application Japan, Mar. 14, 1989, 1-61543

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.4 **11 Claims**



1. A vertical MOS transistor comprising:

a first region;

a well-shaped second region formed in said first region, said well-shaped second region having a center portion and a channel formed in a periphery of the second region;

a third region formed in said well-shaped second region between said center portion and said channel, both said first region and said third region having a first conductive type, said well-shaped second region having a second conductive type opposite to said first conductivity type; and

a gate electrode being formed above said channel of said well-shaped second region through a gate insulating film, said channel sandwiched between said first region and said third region, said third region having a first portion formed near said channel and a second portion formed far from said channel, said first portion having a depth inside said second region which is very deep and said second portion having a depth which is very shallow, wherein a resistance of said well-shaped second region near said second portion of said third region is lower than said first portion.

5,111,259

TRENCH CAPACITOR MEMORY CELL WITH CURVED CAPACITORS

Clarence Teng, Plano, and Peter Ying, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 25, 1989, Ser. No. 385,340

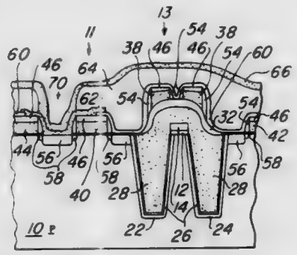
Int. Cl.[5] H01L *29/68, 21/44*

U.S. Cl. 357—23.6 **20 Claims**

1. A semiconductor memory device comprising:

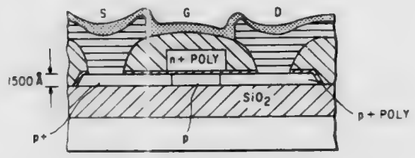
a semiconductor substrate, said substrate having a major surface;

a plurality of memory cells arranged in an array of rows and columns on said substrate, each cell including:
a trench formed in said substrate proximate a trench of an adjacent memory cell, said trench having first and second sidewalls;
a diffused region formed on said first and second sidewalls of said trench, said diffused region extending to and being substantially flush with the major surface of said substrate;
a dielectric layer formed on said diffused region;



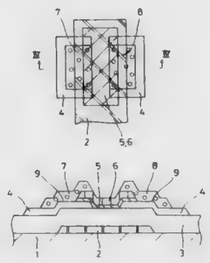
conductive material formed on said dielectric layer, said conductive material sloping below the major surface of said substrate adjacent said first sidewall and sloping above said second sidewall and said major surface and sloping back down to a trench of an adjacent memory cell; and
a transistor having a source/drain in conductive contact with said diffused region.

5,111,260
POLYSILICON FETS
Satwinder Malhi, Richardson, and Rajiv Shah, Plano, both of Tex., assignors to Texax Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 805,270, Dec. 6, 1985, abandoned, which is a continuation of Ser. No. 505,156, Jun. 17, 1983, abandoned. This application Jul. 5, 1990, Ser. No. 548,168
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.7 **5 Claims**



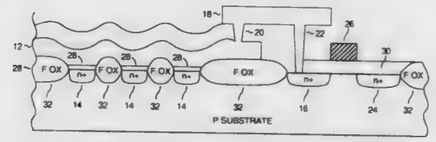
1. A polycrystalline-channel field effect transistor comprising:
a channel region consisting essentially of polycrystalline silicon doped to have an equilibrium carrier concentration of at least 5×10^{16} per cubic centimeter and also comprising a significant admixture of a grain-boundary-passivating species;
source and drain regions connected to said channel region and having the same conductivity type as said channel region;
said channel region being bounded at a first surface thereof by a gate which is capacitatively coupled through a dielectric to said channel region, and said channel region being bounded at a second surface thereof opposite to said first surface by a backside interface;
wherein said channel consists predominantly of polysilicon, and wherein said channel is bounded at said first and second surfaces thereof by a dielectric predominantly comprising silicon dioxides;
wherein said first surface has interface characteristics such as to deplete said channel to a first depth inward from said first surface,
and said second surface has interface characteristics such as to deplete said channel to a second depth inward from said second surface,
and the sum of said first and second depths is greater than the minimum thickness of said channel region,
whereby said transistor is not conductive under zero applied gate voltage.

5,111,261
SILICON THIN FILM TRANSISTOR WITH AN INTRINSIC SILICON ACTIVE LAYER FORMED WITHIN THE BOUNDARY DEFINED BY THE EDGES OF THE GATE ELECTRODE AND THE IMPURITY CONTAINING SILICON LAYER
Sakae Tanaka; Yoshiaki Watanabe, both of Tokyo; Katsuo Shirai, Tochigi, and Yoshihisa Ogiwara, Tochigi, all of Japan, assignors to Seikosha Co., Ltd. and Nippon Precision Circuits, Ltd., both of Tokyo, Japan
Division of Ser. No. 377,873, Jul. 10, 1989, Pat. No. 5,021,850. This application Aug. 8, 1990, Ser. No. 564,814
Claims priority, application Japan, Jul. 13, 1988, 63-174439; Aug. 12, 1988, 63-201445; Sep. 13, 1988, 63-229427
The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.7 **1 Claim**



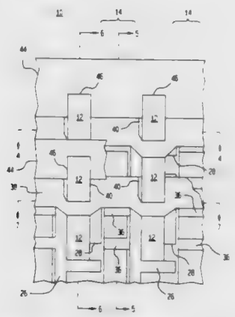
1. A silicon thin film transistor comprising:
an insulating substrate;
a gate electrode formed on the insulating substrate and having edges defining a first external boundary;
a gate insulating layer formed on said insulating substrate containing said gate electrode;
a pair of first impurity containing silicon layers formed on said gate insulating layer in such a manner as to transversely cross said first boundary of said gate electrode;
an intrinsic silicon layer formed on said pair of first impurity containing silicon layers and on said gate insulating layer between said pair of first impurity containing silicon layers in such a manner as to interconnect said pair of first impurity containing silicon layers, said impurity containing silicon layers having edges defining second external boundaries, whereby said first and second boundaries together define a third external boundary;
a protective insulation layer formed on said intrinsic silicon layers and having the same shape as that of said intrinsic silicon layer; and
a source electrode and a drain electrode formed at contact parts of said pair of first impurity containing silicon layers,
wherein all edges of said intrinsic silicon layer are positioned entirely within said third boundary defined by edges of said gate electrode and said first impurity containing silicon layers.

5,111,262
STRUCTURE FOR PROTECTING THIN DIELECTRICS DURING PROCESSING
Shih-Ou Chen, Fremont; John L. McCollum, and Steve S. Chiang, both of Saratoga, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.
Continuation of Ser. No. 230,463, Aug. 10, 1988, Pat. No. 4,941,028. This application Nov. 22, 1989, Ser. No. 440,306
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.13 **1 Claim**



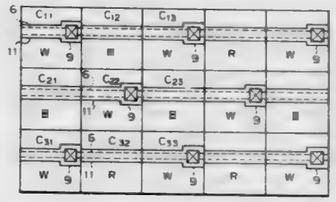
1. In an uncompleted integrated circuit having a dielectric located between a first diffusion region in a substrate and a conductor located immediately above and adjacent to said dielectric, a structure for protecting said dielectric from damage due to static charge buildup during processing and storage of said circuit, including:
detecting means for sensing a voltage buildup on said conductor with respect to said diffusion region,
discharge means completely contained within layers in said integrated circuit located including and below said conductor and responsive to said detection means, for creating an ohmic electrical connection between said conductor and said diffusion region.

5,111,263
CHARGE-COUPLED DEVICE (CCD) IMAGE SENSOR OPERABLE IN EITHER INTERLACE OR NON-INTERLACE MODE
Eric G. Stevens, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 8, 1991, Ser. No. 652,830
Int. Cl.[5] H01L *29/78;* **H04N** *3/14*
U.S. Cl. 357—24 **18 Claims**



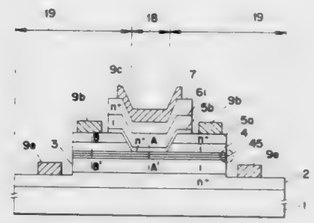
1. A CCD image sensor comprising:
a substrate of a semiconductor material having a surface;
a plurality of photodetectors in said substrate at said surface, said photodetectors being arranged in a column;
a CCD shift register in said substrate at said surface and extending along said column of photodetectors;
a separate transfer region in said substrate between only a portion of each of said photodetectors and the CCD shift register;
a set of first and second conductive gates extending across the CCD shift register at each of said photodetectors; and
each of the transfer regions of alternate photodetectors in the column extending under only the first gate of its respective set of gates, and each of the transfer regions of the other photodetectors in the column extending under only the second gate of its respective set of gates.

5,111,264
PHOTOELECTRIC CONVERSION DEVICE
Junichi Hoshi, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 563,857, Aug. 8, 1990, abandoned, which is a continuation of Ser. No. 213,919, Jun. 30, 1988, abandoned. This application Aug. 2, 1991, Ser. No. 740,661
Claims priority, application Japan, Jul. 3, 1987, 62-165522
Int. Cl.[5] H01L *27/14, 31/00, 27/10, 27/15*
U.S. Cl. 357—30 **10 Claims**



1. A photoelectric conversion device comprising:
a plurality of first photoelectric conversion cells corresponding to a plurality of filters of relatively high light transmittance;
a plurality of second photoelectric conversion cells corresponding to a plurality of filters of relatively low light transmittance; and
signal lines comprising a plurality of laminated layers connected for driving said first and second photoelectric conversion cells, wherein a contact for electrical connection between the plurality of layers is provided within a region of said first photoelectric conversion cells corresponding to the filter of relatively high light transmittance.

5,111,265
COLLECTOR-TOP TYPE TRANSISTOR CAUSING NO DETERIORATION IN CURRENT GAIN
Shin-Ichi Tanaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Dec. 5, 1989, Ser. No. 446,423
Claims priority, application Japan, Dec. 6, 1988, 63-309319
Int. Cl.[5] H01L *29/72, 29/161, 29/80, 29/06*
U.S. Cl. 357—34 **11 Claims**



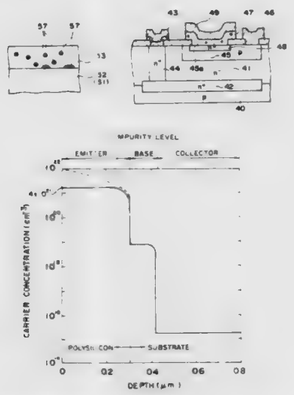
1. A semiconductor device comprising:
a substrate;
an emitter layer formed on said substrate;

a first barrier layer formed on said emitter layer with an area smaller than said emitter layer;
a second barrier layer formed on said emitter layer, said second barrier layer being in lateral contact with said first barrier layer, and having a film thickness greater than that of said first barrier layer through which electric carriers substantially do not permeate by tunneling effect;
a base layer formed on said first barrier layer, said first and second barrier layers having an electron affinity smaller than that of said emitter layer and said base layer, and said first barrier layer having a thickness through which electric carriers may permeate to said base layer by tunneling effect;
a base contact layer formed on said second barrier layer, said base contact layer being in contact with said base layer;
a collector layer formed on said base layer;
an emitter electrode formed electrically connected to said emitter layer;
a base electrode formed electrically connected to said base contact layer; and
a collector electrode formed electrically connected to said collector layer.

5,111,266
SEMICONDUCTOR DEVICE HAVING A REGION DOPED TO A LEVEL EXCEEDING THE SOLUBILITY LIMIT

Yuji Furumura; Fumitake Mieno, both of Kawasaki; Tsutomu Nakazawa, Yokohama; Takashi Eshita, Inagi; Mamoru Maeda, Tama, and Tsunenori Yamauchi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan

Continuation of Ser. No. 320,650, Mar. 8, 1989, abandoned. This application Jun. 12, 1991, Ser. No. 714,367
Claims priority, application Japan, Mar. 11, 1988, 63-56119; Apr. 5, 1988, 63-83834
Int. Cl.[5] H01L *29/167, 29/72*
U.S. Cl. 357—34 **9 Claims**

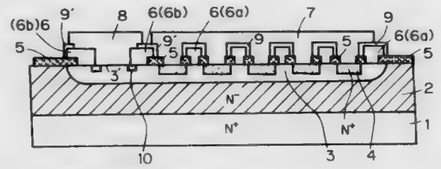


1. A bipolar transistor comprising:
a base region made of a single crystal silicon doped with a first impurity element of a first conductivity type to a first level;
an emitter region made of silicon doped with a second impurity element of a second conductivity type to a second level larger than the first level, said second impurity element comprising an element capable of forming a silicon compound having a band gap that is larger than that of silicon, said emitter region containing a precipitate of said silicon compound at an interface between the base region and the emitter region such that the precipitate of said silicon compound forms a heterojunction at said interface; and
a collector region made of silicon and doped with an impurity element of the second conductivity type.

5,111,267
SEMICONDUCTOR DEVICE HAVING A MULTILAYER ELECTRODE STRUCTURE AND METHOD FOR FABRICATING THE SAME

Ikunori Takata, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1990, Ser. No. 584,059
Claims priority, application Japan, Sep. 29, 1989, 1-255926; Sep. 11, 1990, 2-241418
Int. Cl.[5] H01L *29/72, 27/02, 29/34*
U.S. Cl. 357—36 **6 Claims**



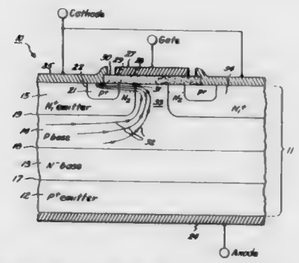
1. A semiconductor device, comprising:
a first conductivity type first semiconductor layer having first and second major surfaces;
a second conductivity type first semiconductor region selectively formed on said first major surface of said first semiconductor layer, said first semiconductor region having first and second portions, said first portion being much longer than said second portion;
a first conductivity type second semiconductor region selectively formed on a surface of said first semiconductor region;
a low-resistance region selectively formed on the surface of said first semiconductor region separately from said second semiconductor region;
a first electrode region formed on said first portion of said first semiconductor region and a part of said low-resistance region and having first and second portions;
an insulating film formed to cover said first portion of said first electrode region;
a second electrode region formed on said second semiconductor region and said insulating film; and
a third electrode region formed on said second portion of said first semiconductor region, on another part of said low-resistance region and on said second portion of said first electrode.

5,111,268
SEMICONDUCTOR DEVICE WITH IMPROVED TURN-OFF CAPABILITY

Victor A. K. Temple, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 707,309, Mar. 1, 1985, abandoned, which is a continuation of Ser. No. 391,620, Jun. 24, 1982, abandoned, which is a continuation-in-part of Ser. No. 331,049, Dec. 16, 1981, abandoned. This application Mar. 4, 1991, Ser. No. 663,780
Int. Cl.[5] H01L *29/74, 29/747, 29/10, 29/78*
U.S. Cl. 357—38 **4 Claims**

1. A multicellular thyristor comprising:
(a) a wafer of semiconductor material including:
(i) an upper emitter layer and a lower emitter layer that are separated from each other by an upper base layer and a lower base layer;
(ii) an upper turn-off region adjoining said upper emitter layer, separated from said upper base upper by said upper emitter layer, and being the same in conductivity type as said upper base layer;
(iii) said wafer being a first plurality of substantially identical cells therein, one cell of said first plurality including said upper emitter layer and said upper turn-off region and the remainder of said substantially identical cells each including a further, respective upper emitter layer and a further, respective upper turn-off region adjoining said respective upper emitter layer;
(iv) each of said cells including a field effect structure comprising an upper gate electrode layer extending across said upper emitter layer from said upper turn-off region to said upper base layer and spaced from said upper emitter layer, said upper base layer and said upper turn-off region by a first insulating layer, said first insulating layer having a thickness which enables application of an appropriate bias voltage to said gate electrode layer to control conduction through a first channel within said upper emitter layer of said each cell between said upper base layer and said upper turn-off region and thereby control conduction in a first distributed bypass carrier current path extending from the interior of said upper base layer through said first channel and into said upper turn-off region;
(b) a first electrode electrically connected to said lower emitter layer;
(c) a second electrode electrically connected to each of said upper emitter layers and to each of said upper turn-off regions; and

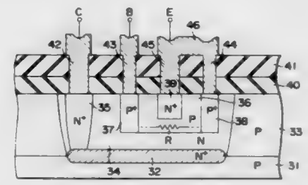


(d) an upper turn-off electrode comprising the upper gate electrode layers of all of said cells in said first plurality;
said thyristor having an ON-state current path extending from said first electrode through said lower emitter layer, said lower base layer, said upper base layer and said upper emitter layer to said second electrode;
each of said cells in said first plurality having a small enough size and said upper base layer and said first channel having low enough resistances during conduction through said first channels, that said first bypass current path has a low enough resistance during said conduction through said first channels to divert enough current from said ON-state current path into said first bypass current path to turn said each cell off whereby said thyristor turns off in response to application of said appropriate bias voltage to said upper turn-off electrode to render said first channels conductive;
(e) said wafer of semiconductor material further includes:
(i) a lower turn-off region adjoining said lower emitter layer, being separated from said lower base layer by said lower emitter layer, and being the same in conductivity type as said lower base layer;
(ii) said wafer having a second plurality of substantially identical cells therein, one cell of said second plurality including said lower emitter layer and said lower turn-off region and the remainder of said substantially identical cells of said second plurality each including a further, respective lower emitter layer and a further, respective lower turn-off region adjoining said respective lower emitter layer;
(iii) each of said cells of said second plurality including a field effect structure comprising a lower gate electrode layer extending across said lower emitter layer from said lower turn-off region to said lower base layer and spaced from said lower emitter layer, said lower base layer and said lower turn-off region by a second insulating layer, said second insulating layer having a thickness which enables application of a bias voltage to said lower gate electrode layer to control conduction through a second channel within said lower emitter layer between said lower base layer and said lower turn-off region and thereby control conduction in a second distributed bypass carrier current path extending from the interior of said lower base layer through said second channel and into said lower turn-off region;
(f) said first electrode is additionally electrically connected to each of said lower turn-off regions; and
(g) said thyristor further comprises a lower turn-off electrode comprising the lower gate electrode layers of all of said cells of said second plurality;
the resistance of said semiconductor material to the flow of majority carriers within said upper base region being greater than the resistance of said semiconductor material to the flow of majority carriers within said lower base region; and
the number of cells in said first plurality being greater than the number of cells in said second plurality.

5,111,269
BIPOLAR TRANSISTOR STRUCTURE CONTAINING A RESISTOR WHICH ASSURES REDUCTION IN LAYOUT AREA

Kazunori Tsugaru, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 3, 1991, Ser. No. 680,120
Claims priority, application Japan, Apr. 4, 1990, 2-88357
Int. Cl.[5] H01L *27/02, 29/72, 29/00*
U.S. Cl. 357—43 **5 Claims**



1. A semiconductor device containing bipolar transistors, comprising:
a semiconductor substrate of a first conductivity type;
a buried layer formed at the surface of said semiconductor substrate so as to correspond to a region in which a bipolar transistor is to be formed;
an epitaxial layer of the first conductivity type formed on said semiconductor substrate including said buried layer region;
a well of a second conductivity type formed in said epitaxial layer so as to correspond to said buried layer region, the impurity atom concentration of which is lower than that in said buried layer;
a first diffusion region of the second conductivity type formed so as to extend from the surface of said well to said buried layer, the impurity atom concentration of which is higher than that in said buried layer;
a second diffusion region of the first conductivity type formed at the surface of said well in the vicinity of said first diffusion region, the impurity atom concentration of

which is higher than that in said second conductivity type well;

third and fourth diffusion regions of the first conductivity type each formed separately on opposite sides of said second diffusion region, the impurity atom concentration of which is higher than that in said second diffusion region;

a fifth diffusion region of the second conductivity type located between said third and fourth diffusion regions in said second diffusion region, the impurity atom concentration of which is higher than that in said second diffusion region, and directly under which a resistor is formed so as to connect said third diffusion region with said fourth diffusion region; and

an interconnection electrically connecting said fourth diffusion region with said fifth diffusion region;

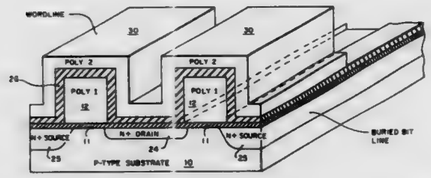
wherein said first diffusion region constitutes a collector, said third and fourth diffusion regions constitute bases, said fifth diffusion region constitutes an emitter, one of said bases and said emitter are connected with said interconnection, and said resistor is connected across said base and emitter.

5,111,270

THREE-DIMENSIONAL CONTACTLESS NON-VOLATILE MEMORY CELL

Jyh-Cherng J. Tzeng, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 22, 1990, Ser. No. 483,466
Int. Cl.[5] H01L *29/68, 29/78, 29/06, 27/10*
U.S. Cl. 357—23.5 **13 Claims**



1. A three dimensional non-volatile memory cell comprising:

a substrate of a first conductivity type having a planar upper surface;

spaced-apart regions of a second conductivity type disposed in said substrate along said upper surface, said spaced-apart regions defining a channel therebetween;

a first gate member substantially confined above and insulated from said channel, said first gate member storing a charge which affects the conductivity within said channel, said first gate member having a first thickness which obviates the need for isolation regions between adjacent cells;

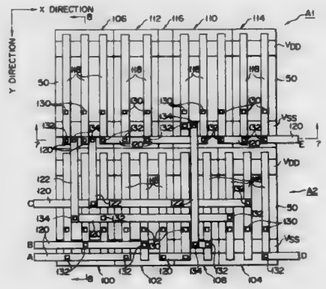
a second gate member disposed over and insulated from said first gate member, said second gate member controlling the programming and erasing of said cell and having a second thickness, said first thickness being greater than or equal to said second thickness to provide a vertical dimension which enhances the capacitive coupling between said first and second gate members while minimizing the overall area of said memory cell.

5,111,271

SEMICONDUCTOR DEVICE USING STANDARD CELL SYSTEM

Hiroshi Hatada, and Shojiro Mori, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 25, 1990, Ser. No. 543,128
Claims priority, application Japan, Jun. 26, 1989, 1-163197
Int. Cl.[5] H01L *27/10*
U.S. Cl. 357—45 **8 Claims**



1. A semiconductor device comprising:

a plurality of standard cells;

a first array, arranged in a first direction, having some of the plurality of standard cells on a common level;

a second array, arranged in the first direction adjacent to the first array, having others of the plurality of standard cells on the common level;

first and second power lines implemented by a first conductive layer on a second level above the standard cells and extending in the first direction, for operating the standard cells;

a first wiring implemented by a second conductive layer on a third level above the first conductive layer, extending in a second direction perpendicular to the first direction, the first wiring including

a plurality of wires having a common length, each wire corresponding to an input/output terminal of a standard cell;

a second wiring, entirely disposed over the first array, implemented by a third conductive layer above the second conductive layer, extending in the first direction, and connected to the first wiring;

a third wiring, entirely disposed over the second array, implemented by the third conductive layer, extending in the first direction, and connected to the first wiring; and

a fourth wiring implemented by a fourth conductive layer above the third conductive layer, extending in the second direction, and connected to the first wiring at connection portions entirely disposed over the first and second arrays.

5,111,272

SEMICONDUCTOR DEVICE HAVING ELEMENT REGIONS ELECTRICALLY ISOLATED FROM EACH OTHER

Naoto Miyashita, Yokohama; Koichi Takahashi, Kawasaki; Hironori Sonobe, and Mitsutoshi Koyama, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 7, 1991, Ser. No. 651,988
Claims priority, application Japan, Feb. 9, 1990, 2-30584
Int. Cl.[5] H01L *27/12*
U.S. Cl. 357—49 **6 Claims**

1. A semiconductor device comprising:

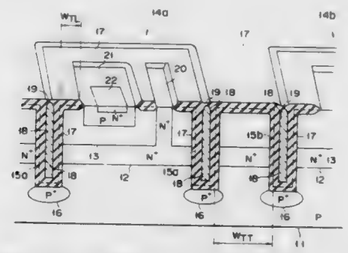
at least two element regions;

a first groove, formed to surround a first one of said at least two element regions, with a first inner surface;

a second groove, formed to surround a second one of said at least two element regions which is closest to said first one of said at least two element regions, with a second inner surface;

a field region between said first and second ones of said at least two element regions;

a first oxide film, formed on said first and second inner



surfaces of said first and second grooves, with a first thickness; and

a second oxide film, formed on said field region, with a second thickness,

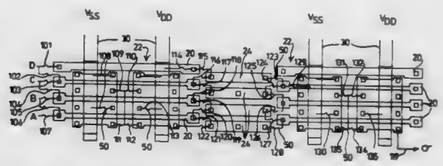
wherein said first thickness equals said second thickness, and a distance between said first groove and said second groove is set to be equal to or greater than 3 μm.

5,111,273

FABRICATION OF PERSONALIZABLE INTEGRATED CIRCUITS

Zvi Orbach, and Meir I. Janai, both of Haifa, Israel, assignors to Quick Technologies Ltd., Haifa, Israel

Continuation-in-part of Ser. No. 500,502, Mar. 28, 1990, which is a continuation of Ser. No. 311,397, Feb. 16, 1989, abandoned, which is a continuation of Ser. No. 273,706, Nov. 15, 1988, abandoned, which is a continuation of Ser. No. 819,707, Jan. 17, 1986, abandoned, and a continuation-in-part of Ser. No. 437,333, Nov. 20, 1989, which is a continuation of Ser. No. 117,943, Nov. 6, 1987, abandoned. This application Jun. 19, 1990, Ser. No. 540,343
The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.
Int. Cl.[5] H01L *27/02, 27/10*
U.S. Cl. 357—51 **11 Claims**



1. A gate array device comprising:

a collection of semiconductor elements; fusible links interconnecting the collection of semiconductor elements into an inoperably connected gate array device; and

an insulation layer disposed over said collection of semiconductor elements and having discrete apertures overlying said fusible links,

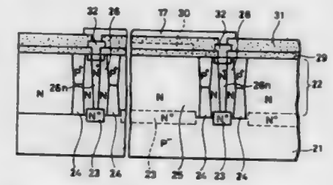
said collection of semiconductor elements being interconnected for converting the inoperable gate array device into a selected operable electronic function upon the fusing of predetermined ones of the fusible links.

5,111,274

SEMICONDUCTOR INTEGRATED CIRCUIT WITH CIRCUIT BLOCKS, DUMMY ISLANDS, AND BIAS AND SHIELD ELECTRODES

Kazuo Tomizuka; Sakae Sugayama; Takao Saeki, all of Gunma, and Fumio Sandoh, Tochigi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Division of Ser. No. 378,397, Jul. 11, 1989, Pat. No. 5,050,238. This application Oct. 23, 1990, Ser. No. 602,184
Claims priority, application Japan, Jul. 12, 1988, 63-173007; Aug. 12, 1988, 63-202197; Nov. 17, 1988, 63-291450
Int. Cl.[5] H01L *29/40, 27/04, 29/34, 25/04*
U.S. Cl. 357—53 **3 Claims**



1. A semiconductor integrated circuit comprising:

a p type semiconductor substrate,

an n type epitaxial layer formed on said substrate,

p^+ type isolation regions penetrating said epitaxial layer to form a plurality of island regions and at least one dummy island between said island regions,

semiconductor circuit elements formed in said island regions,

a plurality of circuit blocks which include said circuit elements,

at least a first circuit block of said circuit blocks being surrounded by said dummy island,

a reverse bias electrode for applying a predetermined reverse bias potential to said dummy island,

a shield electrode covering said first circuit block and connected to said reverse bias electrode,

said reverse bias electrode being connected to said dummy island through an opening of a first insulating layer,

said shield electrode being connected to said reverse bias electrode through an opening in a second insulating layer, and

a conductor led into and out of said first circuit block extends through a cut portion of said reverse bias electrode between said first and second insulating layers.

5,111,275

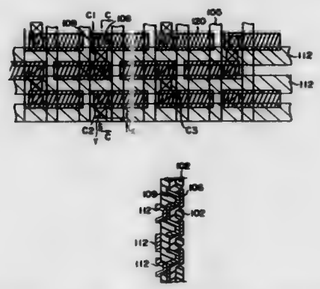
MULTICELL SEMICONDUCTOR MEMORY DEVICE

Shizuo Sawada, and Masaki Ogihara, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 19, 1988, Ser. No. 286,018
Claims priority, application Japan, Dec. 22, 1987, 62-324478
Int. Cl.[5] H01L *23/48, 29/46, 29/54*
U.S. Cl. 357—71 **14 Claims**

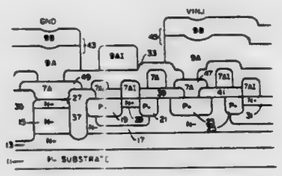
1. A semiconductor device comprising a semiconductor substrate; a plurality of memory cells constituting a memory cell array on a surface of the semiconductor substrate; a plural-

ity of first conductive layers on the semiconductor substrate, each first conductive layer in contact with two memory cells;



and a plurality of second conductive layers, each second conductive layer in contact with multiple first conductive layers.

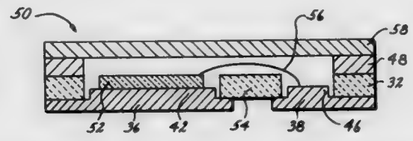
5,111,276
THICK BUS METALLIZATION INTERCONNECT STRUCTURE TO REDUCE BUS AREA
Hemraj Hingarh, Saratoga; Andres D. Asuncion, Sunnyvale; Michael Thomas, Cupertino, and Robert Brown, Palo Alto, all of Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.
Continuation of Ser. No. 336,598, Apr. 10, 1989, abandoned, which is a continuation of Ser. No. 65,659, Jun. 22, 1987, abandoned, which is a continuation of Ser. No. 714,132, Mar. 19, 1985, abandoned. This application Nov. 19, 1990, Ser. No. 617,426
Int. Cl.[5] H01L *23/48, 29/46, 29/54*
U.S. Cl. 357—71 **16 Claims**



DOUBLE 2nd METAL (D2M)

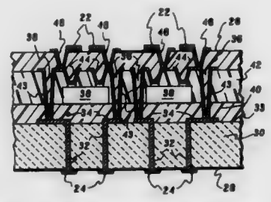
1. A metallization structure for a horizontally extending power bus region and horizontally extending interconnect lines in an integrated circuit comprising:
a semiconductor substrate having circuit elements formed therein;
a conductive bus region;
horizontally extending conductive interconnect lines coupled to said circuit elements and to said power bus region for transmitting power from said power bus region to said circuit elements;
said horizontally extending power bus region and said horizontally extending interconnect lines being formed of a first horizontally extending conductive layer of a first predetermined thickness and insulated from said substrate except for the connections with said elements;
said power bus region further being formed of a second horizontally extending conductive layer disposed upon and in physical contact with an upper surface of and in electrical contact with selected portions of said first horizontally extending conductive layer, said second horizontally extending conductive layer having a second predetermined thickness; and,
said metallization structure thereby defining a power bus region with a thickness greater than the thickness of said interconnect lines wherein said first horizontally extending conductive layer is integral both to said interconnect lines and to said power bus region.

5,111,277
SURFACE MOUNT DEVICE WITH HIGH THERMAL CONDUCTIVITY
Manuel Medeiros, III, Acushnet, and Jay S. Greenspan, South Dartmouth, both of Mass., assignors to Aegis, Inc., New Bedford, Mass.
Filed Mar. 29, 1991, Ser. No. 677,078
Int. Cl.[5] H01L *23/02*
U.S. Cl. 357—74 **29 Claims**



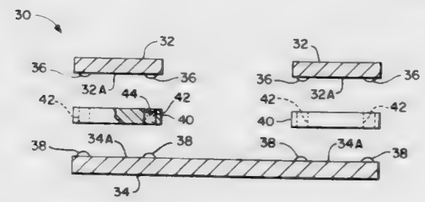
1. A surface mount package for use in encapsulating an electronic device, comprising:
a ceramic frame having first and second sides and a plurality of apertures; and
a plurality of metallic components bonded to said ceramic frame, with a separate metallic component extending across each of said apertures.

5,111,278
THREE-DIMENSIONAL MULTICHIP MODULE SYSTEMS
Charles W. Eichelberger, 1256 Waverly Pl., Schenectady, N.Y. 12308
Filed Mar. 27, 1991, Ser. No. 676,936
Int. Cl.[5] H01L *23/16, 23/02*
U.S. Cl. 357—75 **49 Claims**



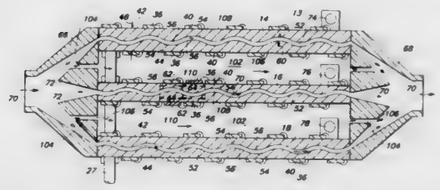
1. A multichip integrated circuit package having an upper surface and a lower surface, said package comprising:
a substrate;
a plurality of integrated circuit chips disposed on an upper surface of said substrate, said integrated circuit chips each having at least one interconnection pad on a top surface thereof;
encapsulant surrounding said integrated circuit chips, said encapsulant surrounding said integrated circuit chips, the integrated circuit chips and having a plurality of via openings therein, said openings being aligned with at least some of said interconnection pads;
a pattern of interconnection conductors disposed above the upper surface of said encapsulant so as to extend between at least some of the openings therein and so as to provide electrical connection to at least some of the interconnection pads through the said openings; and
conductive means disposed within said substrate and said encapsulant so as to provide electrical connection between the lower surface of said substrate and the interconnection conductors disposed above the upper surface of said encapsulant, said conductive means being disposed within said encapsulant so as to pass between said plurality of integrated circuit chips.

5,111,279
APPARATUS FOR ISOLATION OF FLUX MATERIALS IN "FLIP-CHIP" MANUFACTURING
Nicholas F. Pasch, Redwood City; Vahak K. Sahakian, Los Altos Hills, and Conrad J. Dell'Oca, Palo Alto, all of Calif., assignors to LSI Logic Corp., Milpitas, Calif.
Continuation of Ser. No. 400,572, Aug. 28, 1989, abandoned. This application Aug. 30, 1990, Ser. No. 576,182
Int. Cl.[5] H01L *23/02*
U.S. Cl. 357—81 **22 Claims**



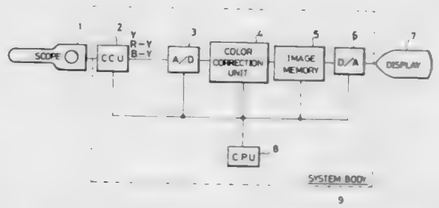
1. A flip-chip structure comprising:
a chip having first solder balls on a face thereof;
a substrate having corresponding second solder balls on a face thereof; and
a separate and distinct preformed planar structure disposed between the chip and the substrate, having two opposite faces, one face in contact with the chip and the opposite face in contact with the substrate;
through holes extending through the preformed planar structure from the one face to the opposite face; and
solder joints consisting essentially of the first solder balls and corresponding second solder balls fused to one another within the through holes.

5,111,280
THERMAL MANAGEMENT OF POWER CONDITIONING SYSTEMS
Arthur H. Iversen, 15315 Sobey Rd., Saratoga, Calif. 95070
Continuation-in-part of Ser. No. 269,882, Nov. 10, 1988, Pat. No. 4,989,070. This application May 1, 1990, Ser. No. 517,222
Int. Cl.[5] H01L *25/04, 39/02, 23/02*
U.S. Cl. 357—82 **14 Claims**



1. A semi-conductor assembly, comprising:
an elongated, electrically isolated metallic support structure of generally rectangular cross section, said structure containing therein an enclosed coolant conduit spanning the length of said support structure, said conduit being of generally rectangular cross-section, the width dimension of said conduit being greater than its height;
a semi-conductor device mounted on at least one exterior surface of said structure, said device being bonded in a thermally intimate manner to said surface of said structure opposing said width dimension of said conduit and being placed opposing a concave curved heat transfer segment of the surface of said conduit;
first circuit means extending along and spaced from said structure, for providing electrical control to said semi-conductor device;
second circuit means, expending along and spaced from said structure, for carrying current from said semi-conductor device; and
electrical interconnect means for connecting said semi-conductor device to said first and second circuit means.

5,111,281
COLOR CORRECTION DEVICE FOR AN ENDOSCOPE
Tadashi Sekiguchi, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 462,326, Dec. 28, 1989, abandoned, which is a continuation of Ser. No. 248,121, Sep. 23, 1989, abandoned. This application Oct. 3, 1990, Ser. No. 593,323
Claims priority, application Japan, Sep. 28, 1987, 62-240907
Int. Cl.[5] H04N *9/73*
U.S. Cl. 358—29 **15 Claims**

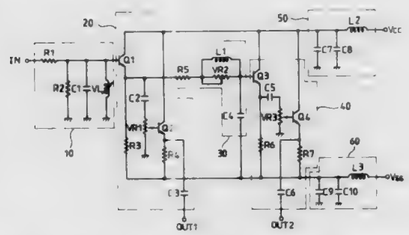


1. A color correction device for an endoscope, comprising:
means for specifying an appropriate color correction for image signals to be made in accordance with certain chromatic characteristics of said image signals; and
means for performing the color correction specified by the specifying means, including:
calculation means receiving said image signals for carrying out calculations for the color correction; and
memory means for storing sets of color correction factors to be used in the calculation of the color correction and for providing an appropriate set of the color correction factors to the calculation means, the appropriate set of the color correction factors being selected according to addresses of the memory means specified by the specifying means according to said certain chromatic characteristics of said image signals.

5,111,282
CHROMINANCE SUBCARRIER GENERATING CIRCUIT
Hae-yong Choi, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Mar. 14, 1990, Ser. No. 493,451
Claims priority, application Rep. of Korea, Mar. 30, 1989, 89-4111
Int. Cl.[5] H04N *9/64*
U.S. Cl. 358—40 **4 Claims**

1. A chrominance subcarrier generating circuit for generating chrominance subcarriers having different phases in response to reception of square-wave signals, comprising:
filtering means for extracting sinusoidal chrominance subcarriers after removing harmonic components from square signals;
first terminal means for providing first chrominance subcarriers after blocking the direct current components and after amplifying the amplitudes of the sinusoidal chrominance subcarriers from said filtering means;
phase shifting means for providing phase-shifted chrominance subcarriers by shifting the phase of the chrominance subcarriers amplified by said first terminal means;
second terminal means for providing second chrominance subcarriers after blocking direct current components and

amplifying the amplitudes of the phase-shifted chrominance subcarriers; and



first power source filter means and auxiliary power source filter means for attenuating noise components of the first and second chrominance subcarriers.

5,111,283

ELECTRONIC CAMERA WITH DIGITAL SIGNAL PROCESSING CIRCUIT

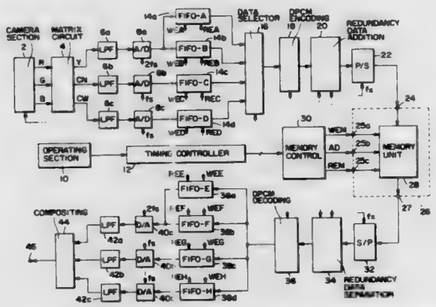
Kenichi Nagasawa, and Hideaki Kawamura, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1990, Ser. No. 481,180

Claims priority, application Japan, Feb. 20, 1989, 1-41358

Int. Cl.[5] H04N *9/04, 5/225*

U.S. Cl. 358—41 **14 Claims**



8. An image signal output device for reading out data stored in a storage medium which data includes a plurality of different categories of image data which are encoded, and for forming and outputting image signals corresponding to the encoded data read out, said image signal output device comprising:

(A) data decoding means for reading out the encoded data stored in the storage medium and for decoding the read-out encoded data to successively output the plurality of different categories of image data;

(B) output means for simultaneously outputting the decoded plurality of categories of image data successively output from said data decoding means; and

(C) image signal forming means for forming image signals by using the plurality of categories of image data simultaneously output from said plurality of memories, and for outputting the formed image signals.

5,111,284

DIGITAL CONVERGENCE UNIT FOR ADJUSTING THE CONVERGENCE IN A COLOR DISPLAY SYSTEM

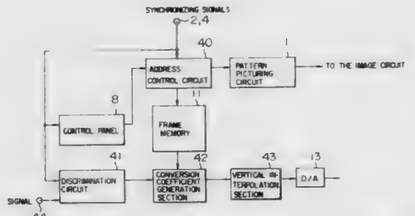
Susumu Tsujihara, Neyagawa, and Yasuaki Sakanishi, Ibaraki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 5, 1990, Ser. No. 622,639

Claims priority, application Japan, Dec. 8, 1989, 1-317443

Int. Cl.[5] H04N *9/31*

U.S. Cl. 358—60 **6 Claims**



1. A digital convergence unit for use with a display means for displaying images with three primary color components on a screen, said digital convergence unit comprising:

a frame memory means for storing correction data, each representative of a reference convergence correction quantity at a respective one of a plurality of adjusting points defined on said screen;

extraction means for extracting aspect ratio information from an input signal;

conversion coefficient generation means for generating a converstion coefficient based on said aspect ratio information;

conversion means for generating converted correction data from said conversion coefficient and correction data read out of said frame memory means; and

correction signal generation means, responsive to said converted correction data, for generating an adjustment signal used for position adjustment of said primary color components over the entire screen, said correction signal generation means including means for interpolating said converted correction data between adjusting points over the entire screen.

5,111,285

VIDEO PRINTER DEVICE

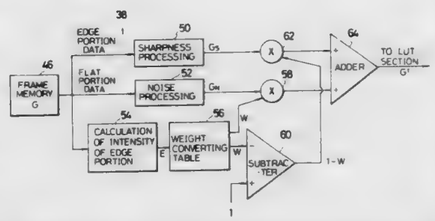
Shuji Fujita, Narashino; Masashi Narita, Chiba; Masanori Akada, and Yoshihiko Azuma, both of Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1990, Ser. No. 522,827

Claims priority, application Japan, May 15, 1989, 1-120994

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—75 **4 Claims**



1. A video printer device for printing as a still image a video signal corresponding to an arbitrary scene from a continuous video signal such as a television signal and organized in frames

of image data, the video printer device characterized in that said device comprises:

(a) image quality refinement means for performing noise processing and tone processing for image data obtained from said video signal; said image quality refinement means including a first noise processing section for performing noise processing on the basis of a weighted average of two consecutive frames of image data, a second noise processing section for performing noise processing according to one feature of an edge portion and another feature of a flat portion of a frame of the image data, and range processing means for eliminating unevenness of density distribution in the image data so as to flatten the density distribution by accumulating counts of pixels having like density in the image data to obtain an output, producing a density histogram of the output and adjusting a number of pixels within each density of the density histogram to be substantially equal to each other; said second noise processing section including a sharpness processing unit for performing sharpness processing with which sharpness is improved for the edge portion of the image data at which density of the image is steeply changed, a flat portion noise processing unit for performing noise processing to the flat portion of the image data at which density of the image data is slightly changed, an intensity calculating unit for calculating the intensity of the edge portion of the image data, a weight-converting unit for estimating a weight corresponding to the intensity calculated, and weighted summation means for weighting a first output from said sharpness processing unit and a second output from said flat portion noise processing unit and adding said weighted first and second outputs:

(b) image display means for displaying thereon the image data processed by said image quality refinement means; and

(c) printer means for performing color conversion processing for the image data processed by said image quality refinement means and producing a color hard copy on the basis of the image data processed by said image quality refinement means.

5,111,286

IMAGE PROCESSING

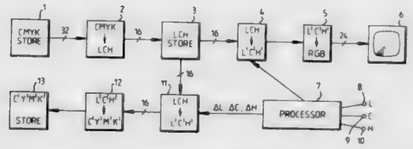
Lindsay W. MacDonald, Bedfordshire, and Richard A. Kirk, Hertfordshire, both of England, assignors to Crosfield Electronics Ltd., England

Filed Feb. 25, 1991, Ser. No. 660,085

Claims priority, application United Kingdom, Feb. 23, 1990, 9004121

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—75 **17 Claims**



1. A method of generating a control data array from an image represented by digital data defining the colour content of pixels of the image in terms of first colour components defining a first colour space the method comprising

a) transforming the image into a second colour space different from the first colour space wherein each pixel is defined by second colour components having a reduced resolution relative to those or the first colour space;

b) generating from the reduced resolution version of the image an array of control data having a value corresponding to each image pixel, the control values being generated from the reduced resolution image values in accordance with a predetermined algorithm.

5,111,287

TV SIGNAL TRANSMISSION SYSTEMS AND METHODS

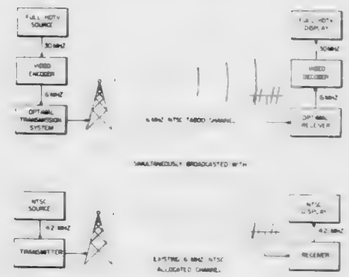
Richard W. Citta, Oak Park, and Ronald B. Lee, Chicago, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Division of Ser. No. 370,222, Jun. 22, 1989, Pat. No. 5,043,805, which is a continuation-in-part of Ser. No. 238,956, Aug. 31, 1988, which is a continuation-in-part of Ser. No. 176,893, Apr. 4, 1988, abandoned, and a continuation-in-part of Ser. No. 239,155, Aug. 31, 1988, abandoned. This application Mar. 22, 1991, Ser. No. 673,444

The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.

Int. Cl.[5] H04N *7/00*

U.S. Cl. 358—83 **4 Claims**



1. In an environment in which pre-existing NTSC or other standard television signals are transmitted and received in a source locale on standard allocated television channels mutually separated from one another by one or more empty taboo channels to prevent adjacent channel interference and staggered with respect to channel allocations in neighboring locales to prevent co-channel interference therebetween, a spectrum compatible method of transmitting and receiving high definition, wideband television signals simultaneously with said standard television signals, comprising:

deriving wide-band high definition television source signals and encoding said source signals to form encoded non-compatible high definition television signals with standard channel bandwidth;

transmitting in said source locale said encoded high definition television signals in at least a partially digital form on RF carriers for said taboo channels at relatively low power levels so as to minimize interference with adjacent channels in said source locale and co-channels in said neighboring locale; and

receiving in said source locale said transmitted high definition signals and reproducing a representation of said source signals in response thereto.

5,111,288

SURVEILLANCE CAMERA SYSTEM

David M. Blackshear, Molena, Ga., assignor to Diamond Electronics, Inc., Carroll, Ohio

Continuation of Ser. No. 556,903, Jul. 23, 1990, which is a division of Ser. No. 391,173, Aug. 9, 1989, Pat. No. 4,945,367, which is a continuation-in-part of Ser. No. 163,257, Mar. 2, 1988, Pat. No. 4,918,473. This application Oct. 8, 1991, Ser. No. 772,601

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—108 **9 Claims**

1. In a surveillance camera system of the type having a video camera mounted for orientational movement about pan and tilt axes and electrically connected to a video monitor, a method

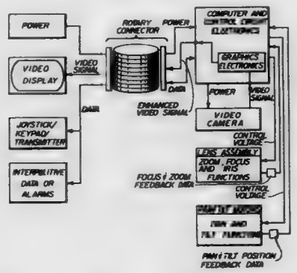
of controlling the orientation of the camera for automated surveillance with said method comprising the steps of:

(a) defining and storing at least two orientations of the camera within its surveillance area with each orientation comprising a pan position and a tilt position of the camera;

(b) defining and storing a descriptive word captain corresponding to each of the camera orientations defined in step (a);

(c) selecting one of the camera orientations defined in step (a);

(d) moving the camera about the pan axis in a direction toward the pan position of the selected camera orientation;



(e) moving the camera about the tilt axis in a direction toward the tilt position of the selected camera orientation;

(f) terminating camera movement when its pan and tilt position equals those of the selected camera orientation;

(g) enhancing the video signal from the camera with the descriptive word caption corresponding to the selected camera orientation and displaying the enhanced video image on the video monitor;

(h) dwelling a predetermined length of time; and

(i) go to step (c), and

wherein steps (c) through (i) are performed by a computerized control means mounted with the video camera.

5,111,289

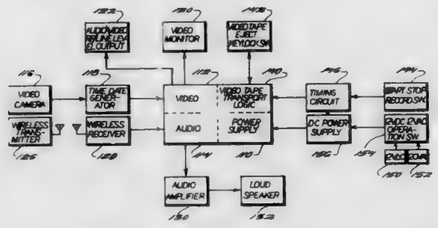
VEHICULAR MOUNTED SURVEILLANCE AND RECORDING SYSTEM

Gary L. Lucas, 3701 Overcreek Rd., Columbia, S.C. 29206, and Tracy E. Brewer, 685 Ayers Dr., Charleston, S.C. 29412

Filed Apr. 27, 1990, Ser. No. 515,104

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—108 **14 Claims**



1. In a vehicle having a passenger compartment and a standard radio antenna, said vehicle having a source of electrical power, a surveillance system comprising:

camera means for obtaining motion picture images, said camera means attached to said vehicle;

a bracket attached to said vehicle within said passenger compartment;

a housing releasably attached to said bracket;

means for recording said images onto removable information storage units within said housing;

means for monitoring said images as said images are being recorded or monitoring said information storage units, said monitoring means located within said housing; and

a switch carried by said housing and in electrical communication with said source of power, said switch activating said monitoring means, said camera means and said recording means, said switch activating said recording means after said switch activates monitoring and said camera means are activated.

5,111,290

SURVEILLANCE SYSTEM HAVING A MINIATURE TELEVISION CAMERA AND A RF VIDEO TRANSMITTER MOUNTED IN A MANNEQUIN

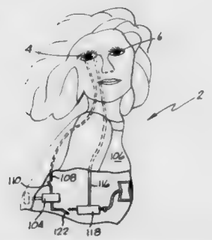
Frederic J. Gutierrez, 1601 S. Logan St., Denver, Colo. 80210

Continuation-in-part of Ser. No. 603,526, Oct. 25, 1990, which is a continuation-in-part of Ser. No. 329,599, Mar. 28, 1989, abandoned. This application Dec. 28, 1990, Ser. No. 635,283

The portion of the term of this patent subsequent to Jan. 31, 2008, has been disclaimed.

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—108 **7 Claims**



1. The combination of a surveillance camera, a video transmitter and a mannequin comprising:

a mannequin positioned in a display in an establishment;

a surveillance camera having a lens portion;

mounting means for invisibly mounting said surveillance camera in said mannequin so that said lens portion has a field of view of a selected area of said establishment; and

a video transmitter invisibly mounted in said mannequin to convert and transmit signals received from said surveillance camera.

5,111,291

AUTO FREEZE FRAME DISPLAY FOR INTRUSION MONITORING SYSTEM

Charles H. Erickson, Woodridge; Peter A. Erio, Morris, and James E. Kase, Tinley Park, all of Ill., assignors to Commonwealth Edison Company, Chicago, Ill.

Division of Ser. No. 548,847, Jul. 6, 1990. This application Sep. 25, 1991, Ser. No. 765,213

The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.

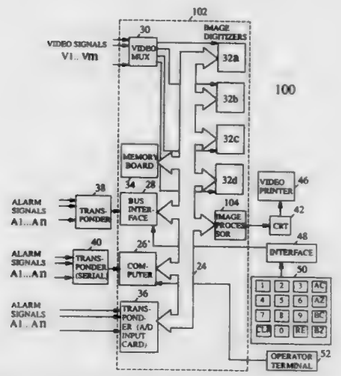
Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—108 **16 Claims**

1. In a video surveillance and intrusion alarm system of the type comprising means for generating a plurality of alarm signals, each associated with a respective zone; and means for generating a plurality of video signals, each associated with a respective zone; the improvement comprising:

at least one video image digitizer means for storing on an ongoing basis a plurality of sets of digitized still video images, each set associated with a respective one of the video signals, each stored digitized still video image corresponding to a respective image time;

controller means responsive to thee alarm signals for automatically selecting at least one of the stored digitized still video images for display, said at least one selected digitized still video image corresponding for each of the alarm signals to the zone associated with that alarm signal, and said at least one selected digitized still video image corresponding to an image time prior to the time the respective alarm signal was received by the controller means; and



display means coupled to the at least one video image digitizer means for displaying the at least one selected digitized still video image, thereby providing a view of the zone associated with an alarm signal as the zone appeared at a time prior to the time when the alarm signal was received by the controller means.

5,111,292

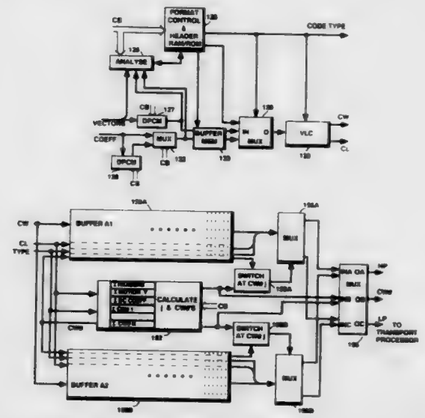
PRIORITY SELECTION APPARATUS AS FOR A VIDEO SIGNAL PROCESSOR

Joseph Kuriacose, Plainsboro, N.J.; Alfonse A. Acampora, Staten Island, N.Y., and Joel W. Zdepski, Lebanon, N.J., assignors to General Electric Company, Princeton, N.J.

Filed Feb. 27, 1991, Ser. No. 661,995

Int. Cl.[5] H04N *7/12, 7/00, 7/04, 5/2*

U.S. Cl. 358—133 **13 Claims**



1. In a video signal encoder, apparatus for separating digital codewords CW of compressed video signal data into two data streams of codewords CW, respective codewords CW representing different types of compressed video data and having varying codelengths of different numbers of bits, said apparatus comprising:

video signal compression means for providing codewords CW of compressed video data and codewords TYPE, associated with respective codewords CW, and indicating the respective type of the associated codeword CW;

a source of a parameter P representing the percent of data to be allocated between said two data streams;

memory means, coupled to said compression means, for storing at least predetermined amounts of codewords CW;

calculating means, responsive to said codewords TYPE and CW, and said parameter P for a) calculating the total number of bits of said predetermined amount of codewords CW; b) for generating numbers CW#i corresponding to said types of compressed video data and associating said codewords CW#i with corresponding codewords CW, where i represents an index of integral numbers, and wherein codewords CW of types having relatively greater importance for image reproduction are assigned indexes i of lower value and codewords CW of types having relatively lesser importance for image reproduction are assigned indexes i of higher value; c) for determining, from said parameter P and said total number of bits, the number of bits B to be allocated to one of said two data streams; d) for determining the largest codeword number CW#j associated with a codeword CW which when its bits are summed with bits of all codewords associated with codeword numbers having lesser valued indexes produces a sum which does not exceed said number B; and e) for forming a first data stream of codewords CW from said memory means for which associated codeword numbers CW#i are less than or equal to CW#j, and a second data stream of codewords CW for which associated codeword numbers CW#i are greater than CW#j.

5,111,293

PREDICTIVE CODING DEVICE HAVING A SAMPLING MEANS AND A PREDICTIVE CODING MEANS

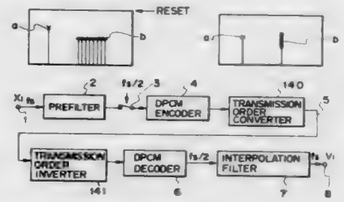
Shinichi Yamashita, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1990, Ser. No. 498,435

Claims priority, application Japan, Mar. 28, 1989, 1-073937; Mar. 28, 1989, 1-073938; Mar. 28, 1989, 1-073939

Int. Cl.[5] H04N *7/13*

U.S. Cl. 358—135 **17 Claims**



1. A predictive coding device comprising:

input means for inputting a video signal which includes sampled values in an order according to a raster scanning;

sub-sampling means for sub-sampling the video signal input by said input means, pixels sub-sampled by said sub-sampling means in adjacent horizontal lines of the same field being arrayed along lines of a vertical direction of a screen; and

predictive coding means for receiving a sub-sampling value from said sub-sampling means and outputting an encoded code,

said predictive coding means including an encoder for encoding a difference between the sub-sampling value and a predicted value corresponding to the sub-sampling value, and outputting the encoded code, and a predictor for generating the predicted value using only an array of

pixels in a vertical direction of a screen with respect to a sub-sampling value of a pixel to be encoded by said encoder.

5,111,294

MOTION COMPENSATED INTERFRAME ENCODING SYSTEM WITH ADAPTIVE QUANTIZATION

Kohtaro Asai; Tokumichi Murakami, and Kazuhiro Matsuzaki, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 466,549, Jan. 17, 1990, abandoned, which is a division of Ser. No. 416,984, Oct. 4, 1989, Pat. No. 4,954,892. This application Jan. 24, 1991, Ser. No. 645,322

Claims priority, application Japan, Feb. 14, 1989, 1-34344; Feb. 14, 1989, 1-34345

Int. Cl.[5] H04N *7/13*

U.S. Cl. 358—136 **4 Claims**

SEQUENCE OF A TRANSFORM COEFFICIENT	SIZE OF A DECREMENT SECTION	QUANTIZING STEP SIZE
LOW BAND	SMALL	SMALL
	MEDIUM	SMALL
	LARGE	MEDIUM
MEDIUM BAND	SMALL	SMALL
	MEDIUM	MEDIUM
	LARGE	LARGE
HIGH BAND	SMALL	MEDIUM
	MEDIUM	LARGE
	LARGE	LARGE

1. A picture signal encoding and decoding apparatus comprising an encoding section for conversion encoding with movement compensation and a decoding section, said encoding section having: a movement detecting section for detecting the movement quantity of a digital picture signal; a subtracter for obtaining the difference between said digital picture signal and a predictive signal; an orthogonal transformation section which performs orthogonal transformation to a differential signal obtained from said subtracter; a quantizing section for quantizing a transform coefficient; and means for selecting a predetermined quantization characteristic from a plurality of such characteristics as a function of both the movement quantity detected by said movement detecting section and the sequence of transform coefficients for performing adaptively selected quantization of the transform coefficients, said decoding section having: an inverse orthogonal transformation section for creating a decoded differential signal by inverse orthogonal transformation; an adder for creating a decoded picture signal by adding said decoded differential signal to said predictive signal for movement compensation; and a memory for storing said decoded picture signal and creating said predictive signal for movement compensation according to said movement quantity.

5,111,295

METHOD AND SYSTEM FOR HIGH DEFINITION COLOR TV COMPATIBLE WITH EXISTING TV SETS, EXISTING BROADCASTING CHANNELS AND EXISTING VCR EQUIPMENT

Lee M. Chao, 21 Barmore St., Stamford, Conn. 06905

Filed Apr. 20, 1990, Ser. No. 511,569

Int. Cl.[5] H04N *7/01, 7/04, 11/06, 11/20*

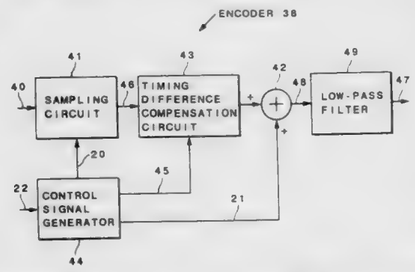
U.S. Cl. 358—140 **50 Claims**

1. The method of encoding a luminance signal portion of a color television motion picture signal for providing capability for substantially twice-standard resolution in at least the scanning direction in a TV picture produced from the encoded luminance signal while being compatible with the current NTSC color TV video format and being compatible with the current NTSC color TV broadcasting bandwidth requirements, and being compatible with existing TV receiver sets, said method comprising the steps of:

treating the successive picture frames of the color TV motion picture as alternate first and second frames in a sequence;

treating standard picture elements which are distinguishable in the scanning direction within the available video bandwidth under the current color TV video format as applied to TV broadcasts, VCR applications, video games, as each being divided into a group of two successive high resolution (HR) picture elements of equal size;

treating a first of the two successive HR picture elements in each group as a first HR picture element;



treating a second of the two successive HR picture elements in each group as a second HR picture element;

in generating the encoded video luminance signal for each first frame, sampling only the first HR picture elements;

using the resulting samples to provide luminance values for both the first and second HR picture elements in the respective groups of the first frame;

in generating the encoded video luminance signal for each second frame, sampling only the second HR picture elements, and

using the resulting samples to provide luminance values for both the first and second HR picture elements in the respective groups of the second frame.

5,111,296

DATA TRANSFER FROM A TELEVISION RECEIVER HAVING PICTURE-IN-PICTURE CAPABILITY TO AN EXTERNAL COMPUTER

David J. Duffield, Indianapolis; Michael S. Deiss, Zionsville; Billy W. Beyers, Jr., Greenfield, and Kevin E. Bridgewater, Indianapolis, all of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Apr. 19, 1990, Ser. No. 510,711

Int. Cl.[5] H04N *5/265*

U.S. Cl. 358—83 **2 Claims**

1. A picture-in-picture system for a television receiver, comprising:

data entry means for generating data signals in response to activation by a user;

a terminal for receiving digital control signals from an external unit;

memory means for storing data;

picture-in-picture processing means for receiving a video signal, for storing a predetermined amount of said video signal in said memory means in response to a first control signal, for reading video-representative data from said memory means in response to a second control signal, and for producing a display signal for display on a display screen;

control means for controlling said picture-in-picture processing means, said control means having a first input coupled to said data entry means for receiving said data signals, having a second input coupled to said terminal for receiving said digital control signals, and having an output for developing said first and second control signals in response to one of said data signals and said digital control signals, said control means applying said video-representative data read from said memory means to said terminal for transfer to said external unit.

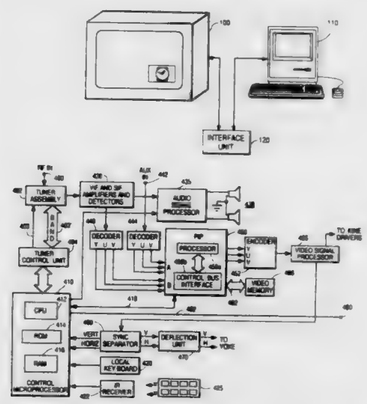
2. A picture-in-picture system for a television receiver, comprising:

a terminal for receiving control digital signals from an external computer;

a source of video signals;

memory means for storing data related to said video signals;

picture-in-picture processing means coupled to said source of video signals for receiving said video signals, and coupled to said memory means for storing a predetermined amount of said video signals in response to a first control signal, for reading said video-related data from said memory means in response to a second control signal, and for producing a display signal for display on a display screen;



control means for controlling said picture-in-picture processing means, said control means having a first input coupled to said terminal for receiving said digital control signals, and having an output for developing said first and second control signals;

said control means in response to said digital control signals generates said first control signal causing said picture-in-picture processing means to store said predetermined amount of said video signals, and generates said second control signal causing said picture-in-picture processing means to read said video-related data, said control means transmitting said video-related data to said external computer via said terminal.

5,111,297

PICTURE-IN-PICTURE DOUBLE-SCANNING TELEVISION RECEIVER

Toshiaki Tsuji; Kiyoshi Imai, both of Ibaraki, and Atsushi Ishizu, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 31, 1990, Ser. No. 560,847

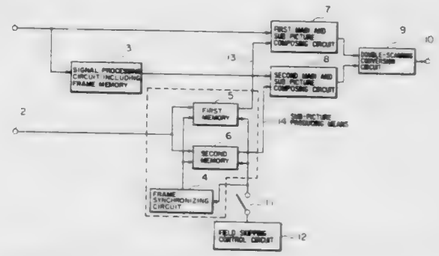
Claims priority, application Japan, Aug. 4, 1989, 1-203267

Int. Cl.[5] H04N *5/262, 5/44, 5/45, 5/265*

U.S. Cl. 358—183 **13 Claims**

1. A picture-in-picture double scanning television receiver comprising:

sub-picture producing means for receiving an interlace scanned sub-picture video signal and outputting, to perform non-interlaced scanning, a first sub-picture video signal to be inserted into a main scanning line and a second sub-picture video signal to be inserted into an interpolated scanning line so that the relative phase relationship between the first and second sub-picture video signals become identical with each other, wherein said sub-picture producing means comprises a first and a second memory means for storing the input interlace scanned sub-picture video signal for two fields, respectively, a sub-picture video signal for one of said two fields read out from the sub-picture video signal for said two fields stored in said first memory means being delivered as said first sub-picture video signal and a sub-picture video signal for the other of said two fields read out from the sub-picture video signal for said two fields stored in said second memory means being delivered as said second sub-picture video signal;



first main and sub-picture composing means for inserting the first sub-picture video signal into the interlace scanned main picture video signal;

second main and sub-picture composing means for inserting the second sub-picture video signal which is used to convert the interlace scanned sub-picture video signal into the non-interlaced scanning mode, thereby producing a resultant composite signal; and

double-scanning conversion means for receiving the output signal of said first and second main and sub-picture composing means and producing a non-interlace scanning video signal.

5,111,298

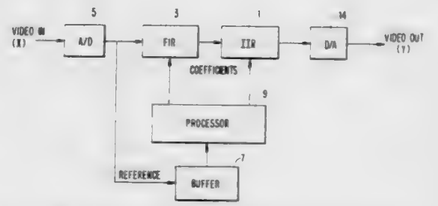
METHOD AND APPARATUS FOR COMMUNICATION CHANNEL IDENTIFICATION AND SIGNAL RESTORATION

David Koo, Briarcliff Manor, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 595,112, Oct. 9, 1990, Pat. No. 5,047,859. This application Apr. 30, 1991, Ser. No. 693,737

Int. Cl.[5] H04N *7/08*

U.S. Cl. 358—187 **5 Claims**



1. A method for removing channel induced distortion from signals, comprising the steps of:

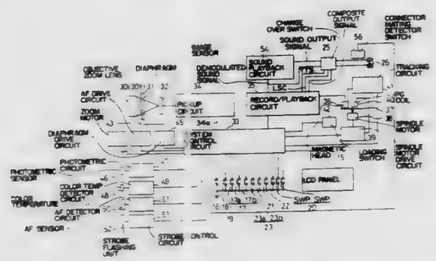
a) receiving a test signal after it has passed through and been distorted by a communication channel;

b) deriving from said received test signal a sequence of coefficients to be used with at least one filter;

c) subjecting said sequence of coefficients to a transformation process so as to transform it from its time domain state to its frequency domain state;

d) widening the bond width of said sequence of coefficients in said frequency domain state; and
e) subjecting said widened bandwidth frequency domain state to an inverse transform process so as to transform it into its time domain state.

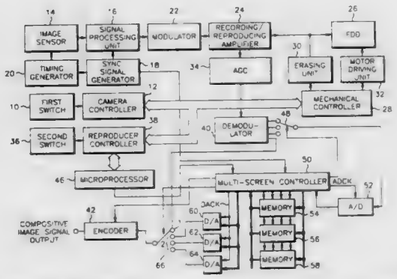
5,111,299
STILL VIDEO CAMERA
Harumi Aoki; Tahei Morisawa; Kiminki Ogawa, and Makoto Mogamiya, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 4, 1989, Ser. No. 417,055
Claims priority, application Japan, Oct. 4, 1988, 63-250266; Oct. 4, 1988, 63-250267; Oct. 4, 1988, 63-250268; Oct. 4, 1988, 63-250269; Oct. 4, 1988, 63-250270
Int. Cl.[5] H04N *5/30, 5/225*
U.S. Cl. 358—209 **38 Claims**



1. A mode changing device for a still video camera, comprising:
means for setting a mode from a plurality of function modes in which an operation of said camera is controlled and a plurality of modes associated with each of said function modes;
means for displaying said plurality of function modes;
mode changing means for selecting a function mode from said plurality of function modes displayed on said display means which has been selected for changing;
mode changing actuator means for actuating said mode changing means through an external operation; and
means for selecting a mode from said plurality of modes associated with each function selected for being changed by said mode changing means, wherein said display mode of said selected mode is selected by said mode changing actuator means.

5,111,300
STILL VIDEO CAMERA WITH A MULTI-SCREEN MEMORY
Seok-Hoon Nam, Seoul, Rep. of Korea, assignor to SamSung Electronic Co., Ltd., Kyung Ki-Do, Rep. of Korea
Filed Dec. 28, 1990, Ser. No. 635,871
Claims priority, application Rep. of Korea, Dec. 29, 1989, 1989-20142
Int. Cl.[5] H04N *5/30*
U.S. Cl. 358—209 **1 Claim**

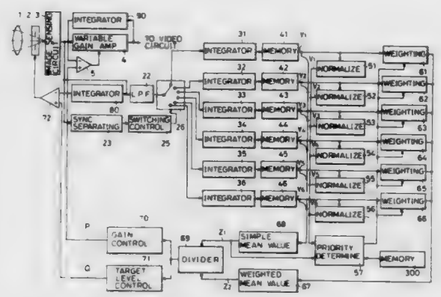
1. A still video camera for recording or reproducing a still picture, including modulating means for generating a frequency modulated synchronizing signal by receiving a signal which is generated by photographing an object, recording/reproducing means for recording/reproducing the signals output from said modulating means on or/and from a recording media, demodulating means for demodulating the signals generated from said recording media so as to produce a luminance signal and a first and second chrominance signals, camera controlling means for supplying recording control signals to said modulating means and the recording/reproducing means according to a recording switching signal, and reproducer controlling means for supplying a reproducing control signal and a reproducing mode control signal to said recording/reproducing means according to a reproducing switching signal, comprising:
a microprocessor for generating recording/reproducing commands by analyzing a mode control signal generated according to mode selections;
multi-screen controlling means for generating an A/D and D/A sampling clocks, a multi-screen recording/reproducing control signal, a first and second switching control signals according to the recording/reproducing commands of the microprocessor;
A/D converting means for converting analog signals into digital signals according to said A/D conversion sampling clock;
an analog switch for supplying said luminance signal, said first and second chrominance signals to said A/D converting means according to said first switching control signal;



multi-screen memory means having a plurality of memories for recording/reproducing multi-screen image signals in response to said multi-screen recording/reproducing control signal generated from said multi-screen controller;
D/A converting means having a plurality of D/A converters for generating a luminance signal, and a first and second chrominance signals by converting the signals generated from said recording media into analog signals according to said D/A conversion sampling clock of said multi-screen controller;
video switching means for selectively generating the image signals, and the luminance signal, and the first and second chrominance signals from the D/A converting means according to the second switching control signal; and
an encoder for encoding the signal generated from said video switching means and a synchronizing signal so as to generate composite image signals.

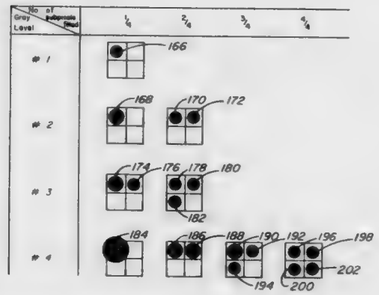
5,111,301
AUTOMATIC EXPOSURE ADJUSTING APPARATUS FOR AUTOMATICALLY ADJUSTING EXPOSURE BY FUZZY INFERENCE
Toshinobu Haruki, Shijonawate, and Kenichi Kikuchi, Osaka, both of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Jun. 26, 1990, Ser. No. 544,669
Claims priority, application Japan, Jun. 28, 1989, 1-166134; Sep. 12, 1989, 1-236242; Sep. 12, 1989, 1-236243; Sep. 12, 1989, 1-236245; Sep. 12, 1989, 1-236246
Int. Cl.[5] H04N *5/238*
U.S. Cl. 358—228 **30 Claims**

1. An automatic exposure adjusting apparatus for automatically adjusting exposure based on a video signal obtained from image sensing means (**1, 3**), comprising:
representative value computing means (**22, 31–36, 41–46, 68**) for detecting a luminance signal level of said video signal and computing a representative value temporarily representing a luminance level of an entire image sensed picture,
correction amount determining means (**51–57, 61–67**) for determining a correction amount of said temporary representative value in accordance with a luminance distribution in the image sensed picture, and
exposure controlling means (**2, 4, 5, 69–72**) for controlling exposure such that an amount of adjustment of exposure is



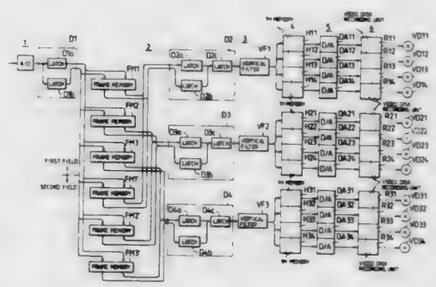
adjusted in accordance with said temporary representative value and said correction amount,
said determination of the correction amount by said correction amount determining means is carried out based on fuzzy inference.

5,111,302
METHOD AND SYSTEM FOR ENHANCING THE QUALITY OF BOTH COLOR AND BLACK AND WHITE IMAGES PRODUCED BY INK JET AND ELECTROPHOTOGRAPHIC PRINTERS
C. S. Chan; James G. Bearss, and Terry M. Nelson, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Continuation-in-part of Ser. No. 278,881, Dec. 2, 1988, Pat. No. 4,930,018. This application Apr. 27, 1990, Ser. No. 515,946
Int. Cl.[5] H04N *1/034, 1/29;* **B41J** *2/205, 2/21*
U.S. Cl. 358—298 **26 Claims**



20. A method for gray scale printing of one or more colors which comprises the steps of:
a. providing a plurality of different gray scale entry level numbers representative of different available printed dot loadings defined by printed dot area sizes per printed pixel, and corresponding to a plurality of different levels of a chosen gray table,
b. selecting an available gray scale entry level number within a selected level of said gray table which does not exceed a predetermined maximum allowable dot loading,
c. utilizing said entry level number to control a dot area size selection for each printed pixel within a super pixel,
d. limiting the number of dots printed in each super pixel to a number of individual or subdivided pixels therein, and
e. printing with dot-next-to-dot always (DNDA) formatting within said super pixels to ensure that there is never any dot-on-dot color mixing within said super pixels.

5,111,303
VIDEO SIGNAL RECORDING SYSTEM AND PICTURE DISPLAY SYSTEM IN A HIGH-DEFINITION TELEVISION SYSTEM
Hitoshi Senso; Yoshio Arai, and Masao Fukuda, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Nov. 22, 1989, Ser. No. 440,169
Claims priority, application Japan, Feb. 27, 1989, 1-43171; Feb. 27, 1989, 1-43173
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—335 **16 Claims**

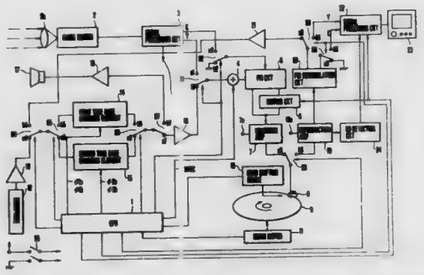


1. A video signal recording system in which the number of horizontal scanning lines of a high-definition television video signal is converted into a converted video signal having a predetermined number of scanning lines equal to M times the number of horizontal scanning lines of a conventional video signal corresponding to an ordinary television video system, and said converted video signal is divided into M sections in the vertical direction and N sections in the horizontal direction so as to permit separate recording of M×N sections of said divided video signal onto M×N recording media respectively.

5,111,304
RECORDING AND/OR REPRODUCING APPARATUS
Takao Kinoshita; Kazuhiko Ito, both of Tokyo, and Shigeo Yamagata, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 453,980, Dec. 20, 1989, abandoned, which is a division of Ser. No. 368,148, Jun. 15, 1989, Pat. No. 4,912,570, which is a continuation of Ser. No. 936,745, Dec. 2, 1986, abandoned. This application Apr. 29, 1991, Ser. No. 692,973
Claims priority, application Japan, Dec. 2, 1985, 60-269428; Dec. 23, 1985, 60-287852; Dec. 25, 1985, 60-290387; Dec. 25, 1985, 60-290388; Dec. 25, 1985, 60-290389
Int. Cl.[5] H04N *5/91, 5/76*
U.S. Cl. 358—341 **18 Claims**

1. An apparatus for recording an audio signal and a still image signal, comprising:
a) recording means for recording said audio and still image signals on a medium;

b) a view finder arranged to permit viewing a field to be recorded by said apparatus; and



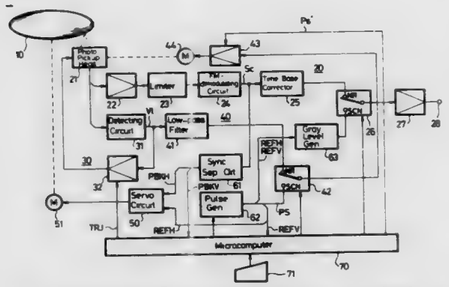
c) display means for displaying data representing a length of audio recording time at a position where said field is observable concurrently with said data.

5,111,305

VIDEO DISK PLAYER HAVING CLV FORMAT

Noriyuki Yamashita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 31, 1990, Ser. No. 472,748
Claims priority, application Japan, Jan. 31, 1989, 1-21171
Int. Cl.[5] H04N *5/76*; G11B *7/00*
U.S. Cl. 358—342 **10 Claims**



1. A video disk player for reproducing a video disk in scan mode, the video disk having tracks of information previously recorded according to a constant linear velocity (CLV) format, comprising:

(a) photo pickup means for reproducing a video signal from the video disk, the photo pickup means including an objective lens having an optical axis;

(b) tracking servo means supplied with the output of the photo pickup means for effecting a tracking servo of the photo pickup means;

(c) first means for selectively moving the optical axis of the objective lens in the radial direction relative to the video disk to produce a track jump;

(d) second means for generating a pseudo-video signal;

(e) third means for generating a reference vertical frequency signal;

(f) an output terminal;

(g) switching means connected to receive the output of the photo pickup means and the pseudo-video signal of the second means and for selectively supplying one of them to the output terminal; and

(h) programmed control means supplied with the output of the photo pickup means for

(i) causing the first means during a scan mode to carry out a first track jump of a relatively large number of tracks for the video disk while causing the switch means to supply the pseudo-video signal instead of the reproduced video signal to the output terminal,

(ii) extracting a vertical synchronizing signal from the reproduced information recorded on the disk and detecting a phase difference between a vertical synchronizing pulse of the reproduced video signal and the reference vertical frequency signal after the first track jump is carried out,

(iii) causing the switch means to supply the reproduced video signal instead of the pseudo-video signal to the output terminal when the detected phase difference is smaller than a predetermined value,

(iv) calculating, when the detected phase difference is larger than the predetermined value, the number of tracks which must be jumped for the phase difference to become smaller than the predetermined value,

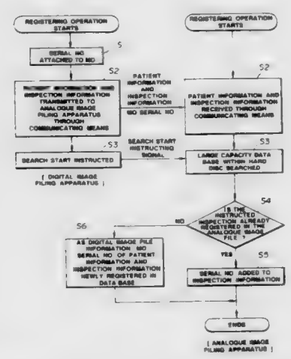
(v) determining, when the calculated number of tracks to be jumped is larger than a predetermined value, that the position of the photo pickup means lies in a dead zone track area relative to the position of the vertical synchronizing pulse of the recorded video signal, and causing the first means to carry out a second track jump of a medium number of tracks for the video disk when the dead zone track area is determined, thereby urging the photo pickup means to leave the dead zone track area.

5,111,306

ENDOSCOPE IMAGE FILING SYSTEM

Masahide Kanno, Hachioji; Shouichi Ieoka, Takahama; Keiichi Hiyama, Akishima; Kenji Matsunaka, and Tadao Eto, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1991, Ser. No. 685,793
Claims priority, application Japan, Apr. 18, 1990, 2-102386
Int. Cl.[5] H04N *7/18*; A61B *9/06*
U.S. Cl. 358—403 **24 Claims**



1. An endoscope image filing apparatus characterized by comprising:

a recording means for recording in the same medium endoscope image information and search information required to search the endoscope image information;

a medium discriminating information imparting means for imparting medium discriminating information to said medium;

a medium controlling means for memorizing said search information and the medium discriminating information of the medium in which this search information is recorded; and

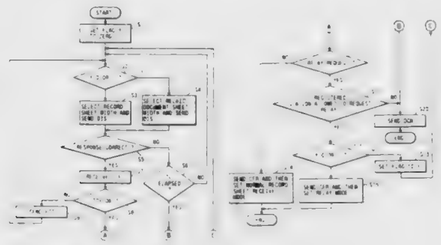
a searching means for searching the medium discriminating information by inputting said search information into said medium controlling means.

5,111,307

FACSIMILE MACHINE

Motoaki Yoshino, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1989, Ser. No. 451,185
Claims priority, application Japan, Dec. 19, 1988, 63-320201
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—407 **6 Claims**



1. A facsimile machine comprising:

means for declaring a processable image size to a calling station;

means for receiving image data from the calling station;

relay means for sending the received image data received by said receiving means to another station;

record means for recording the received image data received by said receiving means; and

control means connected to said declaring means for changing the declaration of the processable image size to the calling station between a size for a received image record mode and a size for a received image relay mode,

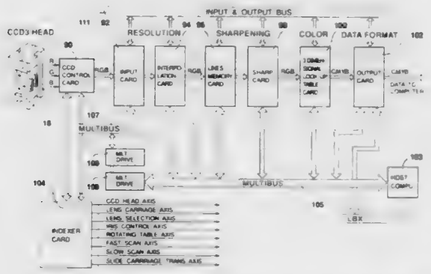
wherein said control means determines a presence or absence of information indicating a relay request from the calling station, and changes the declaration of the image size in accordance with the determination result.

5,111,308

METHOD OF INCORPORATING A SCANNED IMAGE INTO A PAGE LAYOUT

Abraham Bachar, Petach Tikva, Israel, assignor to Scitex Corporation Ltd., Herzlia B, Israel

Continuation of Ser. No. 431,071, Nov. 3, 1989, which is a division of Ser. No. 44,428, Apr. 30, 1987. This application Oct. 25, 1990, Ser. No. 603,330
Claims priority, application Israel, May 2, 1986, 78675
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—448 **8 Claims**



1. A method for fitting a picture into a page layout, so that the picture will fit precisely in a desired location in the layout, said method comprising the steps of:

preliminarily scanning a planar picture and displaying it to an operator on a TV screen;

displaying the page layout;

marking two points on the displayed picture and two corresponding points on the layout where the two picture points are to fit;

physically rotating the picture in a plane thereof and magnifying the picture so that the positional relationship of the two picture points of the thus rotated and magnified picture matches that of the corresponding layout points; and

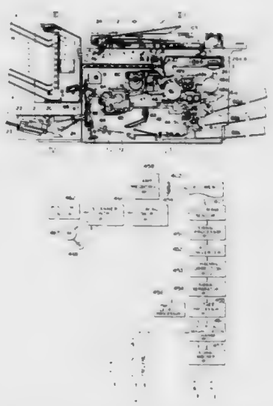
rescanning the picture as thus rotated and magnified.

5,111,309

DENSITY CONTROL SYSTEM FOR A DIGITAL COPIER

Seiji Sakata, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 191,327, May 9, 1988, abandoned. This application May 21, 1990, Ser. No. 527,696
Claims priority, application Japan, May 9, 1987, 62-113076; Mar. 23, 1988, 63-67294
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—455 **3 Claims**



1. A density control system for a digital copier comprising:

scanning means for optically scanning an original document;

photoelectric converting means for photoelectrically converting image data representative of the original document produced by said scanning means;

detecting means for detecting a peak voltage of the image data produced by said photoelectric converting means;

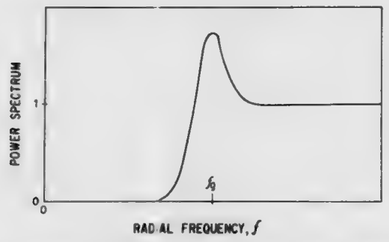
analog-to-digital (AD) converting means for digitizing the image data produced by said photoelectric converting means the image data produced by said photoelectric converting means and erasing the background density of the image data representative of a document, by using the peak voltage detected by said detecting means;

storing means for storing a plurality of density data each having a particular threshold level;

manual density adjusting means for selecting one of the plurality of density data stored in said storing means; and

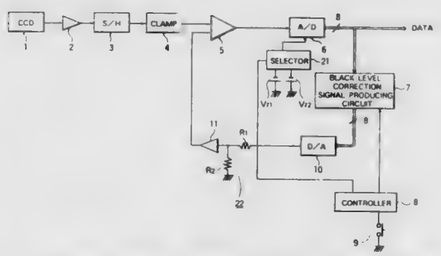
control means for controlling image density by comparing the digitized image data produced by said AD converting means and the selected density data.

5,111,310
METHOD AND APPARATUS FOR HALFTONE RENDERING OF A GRAY SCALE IMAGE USING A BLUE NOISE MASK
Kevin J. Parker, and Theophano Mitsa, both of Rochester, N.Y., assignors to Research Technologies Corporation, Inc., Tucson, Ariz.
Filed Dec. 4, 1990, Ser. No. 622,056
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—456 **15 Claims**



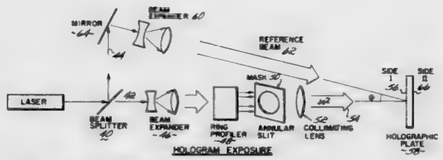
1. A method for the halftoning of gray scale images by utilizing a pixel-by-pixel comparison of the image against a blue noise mask in which the blue noise mask is comprised of a random non-deterministic, non-white noise single valued function which is designed to produce visually pleasing dot profiles when thresholded at any level of said gray scale images.

5,111,311
IMAGE READING APPARATUS WITH BLACK LEVEL CORRECTION
Hiroyuki Yamamoto, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan
Filed Jun. 29. 1990, Ser. No. 546,917
Claims priority, application Japan, Jul. 7, 1989, 1-176690
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—461 **7 Claims**



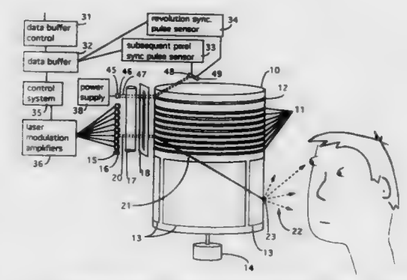
1. An image reading apparatus having a normal reading mode for outputting a digital image signal and a test mode for preparing a black correction signal, comprising:
image reading means for photoelectrically reading an image and outputting an analog image signal;
an A/D converter means for converting the analog image signal into a digital image signal, the a/D converter means being selectively provided with either a high or low reference potential to select either a wide or narrow conversion scale range, respectively;
producing means for producing a black level correction signal;
correction means for correcting an analog image signal based on the black level correction signal; and
control means for controlling the image reading apparatus to selectively operate in the test mode or the normal reading mode, wherein:
in the test mode, the image reading means reads a black image and outputs a black analog signal, the A/D converter means is provided with the low reference potential and converts the black analog signal into a black digital signal, and the producing means produces a black level correction signal on the basis of the black digital signal; and
in the normal reading mode, the correction means corrects an analog image signal on the basis of the black level correction signal, and the A/D converter means is provided with the high reference potential and converts the corrected analog image signal into a digital image signal.

5,111,312
COUPLING MECHANISM FOR EFFICIENT CONVERSION OF AXISYMMETRIC BEAM PROFILES INTO PROFILES SUITABLE FOR DIFFRACTION-FREE TRANSMISSION IN FREE SPACE
Bob W. Stewart, 5745 Pandora Ave., Cincinnati, Ohio 45213
Continuation-in-part of Ser. No. 380,890, Jul. 18, 1989, Pat. No. 4,992,750. This application Feb. 12, 1991, Ser. No. 654,216
Int. Cl.[5] G03H *1/04, 1/12*
U.S. Cl. 359—11 **7 Claims**



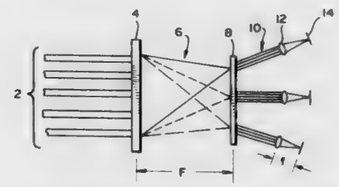
1. Apparatus comprising:
a laser for providing coherent light along a first optical path;
optics disposed along the first optical path for splitting said coherent light into a higher intensity segment directed along the first optical path and a lower intensity segment directed along a second optical path;
holographic recording means having a first side, a second side and a photosensitive layer, said plate positioned at an intersection of the first and second optical paths;
optics disposed along the first optical path for expanding the higher intensity segment;
optics disposed along the first optical path for converting the transverse intensity profile of the higher intensity segment into a ring profile;
mask containing an annular slit disposed along the first optical path, the inner radius of said slit being appropriately matched to the inner radius of the ring-profiled segment, said mask for receiving and filtering the ring-profiled segment;
optics disposed along the first optical path for receiving and collimating the filtered ring-profiled segment from said mask, thereby producing a J_0-profiled beam, said optics directing the J_0-profiled beam toward said first side of said holographic recording means to impinge on said photosensitive layer;
optics disposed along the second optical path for expanding the lower intensity segment, thereby producing a reference beam, said optics also for directing the reference beam toward said first side of said holographic recording means to impinge on said photosensitive layer;
said holographic recording means positioned such that the reference beam and the J_0-profiled beam substantially completely overlap at the location whereat they impinge on said photosensitive layer of said holographic recording means, thereby forming an interference pattern which is recorded by said holographic recording means.

5,111,313
REAL-TIME ELECTRONICALLY MODULATED CYLINDRICAL HOLOGRAPHIC AUTOSTEREOSCOPE
Mark R. Shires, 107 E. Fairmont Ave., Milwaukee, Wis. 53217
Continuation-in-part of Ser. No. 392,008, Aug. 10, 1989, abandoned. This application May 22, 1990, Ser. No. 526,981
Int. Cl.[5] G03H *1/26*
U.S. Cl. 359—17 **13 Claims**



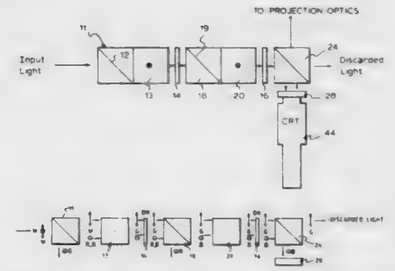
1. An electronically modulated autostereoscopic display comprising:
a cylindrical member having a plurality of holograms recorded on a surface thereof, each of said holograms when reconstructed in whole or in part producing a line image not parallel to the plane containing the base of said cylindrical member;
optical means, comprising a holographic raster scanner, for producing and directing at least one light beam to scan a two-dimensional raster on said cylindrical member, each said light beam being shaped to illuminate a small point of said holograms whereby a line image is reconstructed;
means for rotating said cylindrical member about its axis of symmetry at constant high speed whereby said line images can be reconstructed while said cylindrical member occupies a plurality of angular displacements;
electronic circuitry that modulates said light beam in response to received data and in correspondence with the rotational displacement of said cylindrical member.

5,111,314
OPTICAL CORRELATOR INTERCONNECT FOR OPTICAL COMPUTER
Kenneth G. Leib, Wantagh, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Aug. 9, 1990, Ser. No. 564,580
Int. Cl.[5] G03H *1/16*
U.S. Cl. 359—29 **8 Claims**



1. An optical correlator interconnect for an optical computer, comprising:
light beam source means including an array of light sources for forming a selected number of input beams in response to a binary input signal;
optical correlator means including holographic lens means for receiving, at a first plane, said input beams from said selected light sources and outputting a selected number of frequency correlated output beams having a predetermined size and shape, said optical correlator means further including a matched filter of fixed size and shape; and
inverse Fourier transform means for receiving said frequency-correlated output beams and focusing each of said correlated output beams on a respective second plane.

5,111,315
OPTICAL SYSTEM FOR ILLUMINATING A LIGHT VALVE
Arno G. Ledebuhr, Pleasanton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Feb. 14, 1991, Ser. No. 658,139
Int. Cl.[5] G02F *1/133;* **G03B** *21/14;* **G02B** *27/28*
U.S. Cl. 359—40 **9 Claims**



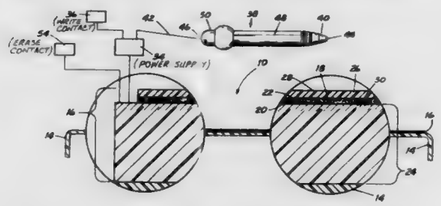
8. An optical system for illuminating a liquid crystal light valve in response to an optical input beam, comprising:
prepolarizer means for polarizing a green band of wavelengths within said input beam in a first state, and for polarizing red and blue bands of wavelengths within said input beam in a second state orthogonal to said first state;
first liquid crystal switch means, in optical alignment with said prepolarizer means, for selectively rotating the polarization of optical energy within said green wavelength band to said second state, and for selectively rotating the polarization of optical energy within said red and blue bands to said first state;
a red polarizer filter, in optical alignment with said first liquid crystal switch means, for filtering optical energy within said red wavelength band polarized in said second state;
a blue polarizer filter, in optical alignment with said first liquid crystal switch means, for filtering optical energy within said blue wavelength band polarized in said first state;
second liquid crystal switch means, in optical alignment with said polarizer filter means, for selectively rotating the polarization states of optical energy within said red, green and blue first, second and third wavelength bands;
broadband polarizer means, in optical alignment with said second liquid crystal switch means, for directing to said light valve optical energy polarized in a predetermined state; and
controller means for sequentially actuating said first and second liquid crystal switch means.

5,111,316
LIQUID CRYSTAL WRITING STATE
Frederick E. Nobile, DePere; John F. Harris, III, Franksville; Gary S. Silverman, Racine, and Richard A. Baumann, Franksville, all of Wis., assignors to Western Publishing Company, Racine, Wis.
Filed Aug. 9, 1990. Ser. No. 566,104
Int. Cl.[5] G02F *1/133;* **G09G** *3/02, 3/06;* **G08C** *21/00*
U.S. Cl. 359—52 **19 Claims**

1. In a display device of the type having a liquid crystal layer

providing two visual characteristics, the improvement comprising:

a laminate having an LC-layer with first and second surfaces and formed of polymeric material holding micro-volumes of liquid crystal material, and a conductive layer along the first surface, the second surface conductor-free on or along an image-accepting region of the laminate; and



movable means for selective transitory application of electrical potential through the LC-layer to the conductive layer,

whereby an externally-applied image is displayed on the image-accepting region upon application of such potential thereto.

5,111,317

METHOD OF DRIVING A FERROELECTRIC LIQUID CRYSTAL SHUTTER HAVING THE APPLICATION OF A PLURALITY OF CONTROLLING PULSES FOR COUNTERACTING RELAXATION

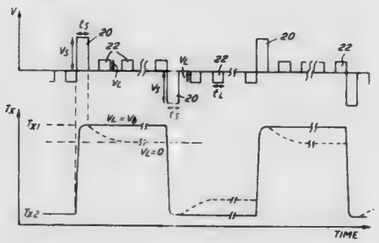
Ian Coulson, Maidenhead, England, assignor to Thorn Emi plc, London, England

Filed Dec. 1, 1989, Ser. No. 444,424

Claims priority, application United Kingdom, Dec. 14, 1988, 8829129; Jun. 28, 1989, 8914836

Int. Cl.[5] G02F *1/133*

U.S. Cl. 359—56 **9 Claims**



1. A method of controlling the transmission of electromagnetic radiation through a ferroelectric liquid crystal shutter comprising at least one liquid crystal cell having a first state of maximum transmission and a second state of minimum transmission, the cell being switchable between the first and second states by the application of a switching pulse having a value of voltage pulse width and voltage pulse height which, in combination, are sufficient to switch the cell, the method comprising applying a first switching pulse of one polarity to switch the cell to one of the first or second states and then applying a first plurality of consecutive controlling pulses of the same polarity as that of said first switching pulse for a time period greater than the pulse width of said first switching pulse, each controlling pulse having a pulse height and pulse width which, in combination, are insufficient to switch the cell between the two states, the controlling pulses serving to control the transmission of the cell in said one of the first and second states by counteracting any relaxation of the cell in said one of the first and second states.

5,111,318

FERROELECTRIC LIQUID CRYSTAL ELEMENT

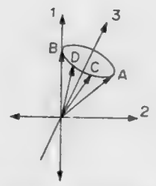
Noriaki Kohtoh; Toyohiko Abe, and Hiroyoshi Fukuro, all of Ichihara, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Nov. 3, 1989, Ser. No. 431,392

Claims priority, application Japan, Nov. 7, 1988, 63-280583

Int. Cl.[5] G02F *1/13;* **C09K** *19/56*

U.S. Cl. 359—76 **1 Claim**



1. A ferroelectric liquid crystal element comprising a pair of substrates each having a transparent electrode and an orientation controlling film formed on the electrode, and ferroelectric liquid crystal sandwiched between the substrates in contact with the film, wherein said orientation controlling film is a polyimide resin film having a thickness of from 100 to 5,000 Å treated by a rubbing treatment and capable of giving nematic liquid crystal and pretilt angle of from 15 to 30° to the substrate surface and said polyimide resin has a perfluoro group and a siloxane bond, and is prepared by reacting 1,1,1,3,3,3-hexafluoro-2,2-bis (4-(4-aminophenoxy)phenyl)propane; 1,3-bis (aminopropyl)-tetramethyldisiloxane; and cyclobutane tetracarboxylic acid dianhydride.

5,111,319

DRIVE CIRCUIT FOR PROVIDING AT LEAST ONE OF THE OUTPUT WAVEFORMS HAVING AT LEAST FOUR DIFFERENT VOLTAGE LEVELS

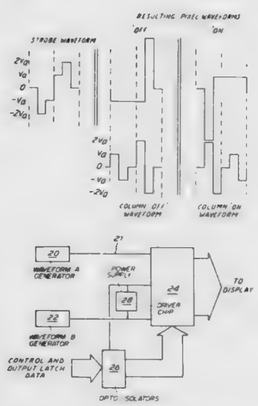
Christopher J. Morris, Middlesex, England, assignor to Thorn EMI plc, London, England

Continuation of Ser. No. 220,476, Jul. 18, 1988, abandoned. This application Feb. 11, 1991, Ser. No. 653,759

Claims priority, application United Kingdom, Jul. 21, 1987, 8717172; Aug. 3, 1987, 8718351

Int. Cl.[5] G02F *1/13;* **G09G** *3/00*

U.S. Cl. 359—85 **10 Claims**



1. A drive circuit for producing a plurality of output waveforms for driving a matrix addressed display, the drive circuit comprising; a first signal generating circuit for providing a first waveform having at least two voltage levels, a second signal generating circuit for providing a second waveform having at least two voltage levels; a display driver arranged to receive the first and second waveforms and having a plurality of output terminals, each terminal arranged for outputting at least one of the first and second waveforms to the display; a control circuit for controlling the output of the display driver, thereby to effect a plurality of output waveforms from the display driver for driving the display such that at least one of the output waveforms has at least four different voltage levels.

5,111,320

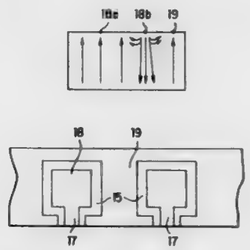
FERROLECTRIC LIQUID CRYSTAL DEVICES HAVING IMPROVED OPERATING PROPERTIES BY USING AN ELECTRONIC MASK

Joseph J. Wysocki, Webster, N.Y.; Sui K. Hark, Shatin, Hong Kong; Virgil J. Hull, Perinton, N.Y.; Joseph F. Stephany, Williamson, N.Y.; Andras I. Lakatos, Penfield, N.Y., and Ram S. Narang, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 29, 1990, Ser. No. 619,411

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—87 **42 Claims**



1. A liquid crystal device comprising:

a first transparent plate;

a second plate arranged substantially parallel to said first plate;

a ferroelectric material sealed between said first and second plate;

at least one pixel electrode located on said first plate;

a background electrode located on said first plate closely adjacent to and spaced from said at least one pixel electrode, said background electrode being non-overlapping with and laterally spaced from an outer periphery of said at least one pixel electrode; and

a backplane electrode located on said second plate opposing said at least one pixel electrode and said background electrode.

5,111,321

DUAL-POLARIZATION LIQUID-CRYSTAL ETALON FILTER

Jayantilal S. Patel, Red Bank, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Continuation-in-part of Ser. No. 598,476, Oct. 16, 1990, and a continuation-in-part of Ser. No. 577,220, Aug. 31, 1990, Pat. No. 5,068,749. This application Mar. 29, 1991, Ser. No. 677,769

Int. Cl.[5] G02F *1/1335, 1/137;* **G01B** *9/02*

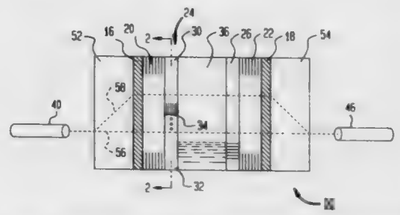
U.S. Cl. 359—92 **10 Claims**

1. A dual-polarization liquid-crystal etalon filter comprising:

a first substrate having formed thereon a first mirror, a first electrode, and a first alignment layer, said first alignment layer being comprised of a homogeneous aligning agent and being divided into first and second portions separated by an interface, said first portion aligning an adjacent liquid crystal in a first direction substantially parallel to a surface of said first portion, said second portion aligning an adjacent liquid crystal in a second direction substantially parallel to a surface of said second portion and substantially perpendicular to said first direction;

a second substrate having formed thereon a second mirror, a second electrode, and a second alignment layer for aligning an adjacent liquid crystal in one or more predetermined directions, said first and second substrates being assembled together with said first and second alignment layers facing each other and with a predetermined gap therebetween, wherein at least one of said substrates comprises a layer of a birefringent material; and

a liquid crystal filling said gap.



5,111,322

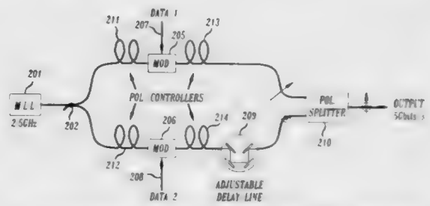
POLARIZATION MULTIPLEXING DEVICE WITH SOLITONS AND METHOD USING SAME

Neal S. Bergano, Lincroft; Stephen G. Evangelides, Jr., both of Middletown, and Linn F. Mollenauer, Colts Neck, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 4, 1991, Ser. No. 680,456

Int. Cl.[5] G02B *6/28;* **H04J** *11/00*

U.S. Cl. 359—122 **22 Claims**



1. Apparatus for multiplexing at least first and second information bearing signals on a fiber optic transmission medium, comprising

means for generating a stream of soliton pulses on said transmission medium at a first frequency,

means for splitting said stream of soliton pulses into at least first and second pulse streams having essentially orthogonal polarizations;

means for modulating said first and second pulse streams with said first and second signals, respectively, to produce first and second modulated signals;

means for time interleaving said first and second modulated signals; and

means for applying said interleaved signal to said transmission medium.

12. A method of multiplexing at least first and second information bearing signals on a fiber optic transmission medium, comprising the steps of

generating a stream of soliton pulses on said transmission medium at a first frequency,

splitting said stream of soliton pulses into at least first and second pulse streams having essentially orthogonal polarizations;

modulating said first and second pulse streams with said first and second signals, respectively, to produce first and second modulated signals;

time interleaving said first and second modulated signals; and

applying said interleaved signal to said transmission medium.

5,111,323

OPTICAL SWITCHING SYSTEM

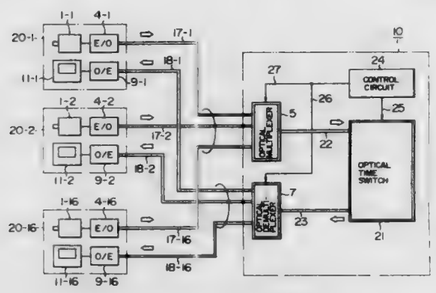
Toshiki Tanaka, Ome; Katsuyuki Imoto, Sayama; Hiroshi Kuwahara, and Taihei Suzuki, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 15,379, Feb. 17, 1987, abandoned. This application May 30, 1989, Ser. No. 358,514

Claims priority, application Japan, Mar. 7, 1986, 61-48254

Int. Cl.[5] ***H04J 14/08***

U.S. Cl. 359—139 **9 Claims**



1. An optical switching system comprising:

a plurality of first and second fiber optical cable lines for connecting subscriber terminals and the optical switching system and for transmitting optical signals therebetween;

an optical time division multiplexer having an optical sampling means for sampling separately one sample to every frame period for each of the optical signals which are transmitted in parallel from the plurality of first fiber optical cable lines to generate optical sample signals and a multiplexing means for multiplexing said optical sample signals obtained by said sampling means to obtain a time division multiplexed optical signal train in time slots;

an optical time switch including optical memory means to temporarily store said optical sample signals extracted from said time division multiplexed optical signal train and means for reading said optical sample signals stored in said memory means so as to interchange the order of the time slots in said time division multiplexed optical signal train and for outputting an interchanged multiplexed optical signal train having one sample for each of the optical signals;

an optical time division demultiplexer for demultiplexing said interchanged multiplexed optical signal train outputted from said optical time switch, for distributing the demultiplexed optical signals to the plurality of said second fiber optical cable lines, and for transmitting the distributed optical signals in parallel; and

means including an electronic control circuit for performing time slot conversion control of said optical time division multiplexer, said optical time division demultiplexer and said optical time switch.

5,111,324

OPTICAL RECEIVERS

Fazlollah R. Jahromi, Essex, England, assignor to STC PLC, London, England

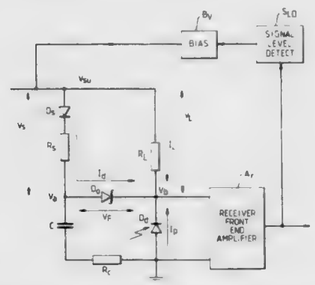
Filed Jun. 8, 1990, Ser. No. 535,744

Claims priority, application United Kingdom, Jun. 9, 1989, #913306

Int. Cl.[5] ***H04B 10/06***

U.S. Cl. 359—189 **1 Claim**

1. An optical receiver having a reverse biassed photodetector, a first diode connected in series with a capacitor and a first resistor to shunt current developed by the photodetector, a second diode connected in series with a second resistor and said first diode, a source of bias current connected to said



second diode and via a third resistor to said photodetector, and means for increasing for forward biassing of said first and second diodes respectively dependent in response to increasing optical signal level at said photodetector.

5,111,325

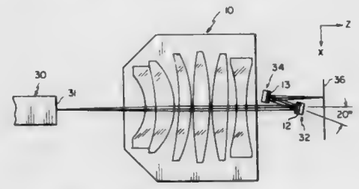
F-θ LENS

Donald DeJager, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 16, 1989, Ser. No. 422,350

Int. Cl.[5] **G02B** *26/08, 9/00*

U.S. Cl. 359—206 **7 Claims**



1. An f-θ lens, said lens being adapted to receive an input beam which comprises a combination of beams each of which is at a predetermined wavelength and has a predetermined vergence in a scan direction, said lens comprising:

means for correcting in a scan direction for lateral color aberrations of said beams at a receiving medium; and

means for correcting in a scan direction for axial color aberrations of said beams at the receiving medium when at least one of said beams has a non-zero vergence.

5,111,326

INTEGRATED KERR SHUTTER AND FIBER LASER OPTICAL MODULATION

Gary A. Ball, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 25, 1991, Ser. No. 691,264

Int. Cl.[5] **G02B** *6/26;* **H01S** *3/10*

U.S. Cl. 359—244 **9 Claims**

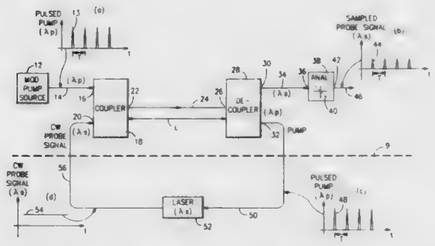
1. An integrated Kerr shutter and fiber laser modulated optical source, comprising:

pump means for providing a pulsed optical input pump signal having a first wavelength and a first polarization and having a time period between pulses and pump pulse width;

continuous wave means, responsive to an output pump signal, for providing an optical continuous-wave input probe signal having a second wavelength and a second polarization different from said first wavelength and said first polarization of said input pump signal, respectively;

coupling means for providing a combined optical signal by combining said input pump signal and said input probe signal;

polarization changing means, responsive to said combined optical signal, for providing a polarization alterable probe signal as part of said combined optical signal having a first polarization when said input pump signal is not present and having a second polarization when said input pump signal is present and providing an output pump signal as



part of said combined optical signal having traveled through said polarization changing means and having substantially the same timing and power as said input pump signal;

decoupling means, responsive to said combined optical signal from said polarization changing means, for separating said combined optical signal into said polarization alterable probe signal and said output pump signal; and

analyzer means, responsive to said polarization alterable probe signal, for providing an optical output probe signal indicative of a component of the polarization of said polarization alterable probe signal.

5,111,327

SUBSTITUTED 3,4-POLYMETHYLENEDIOXYTHIOPHENES, AND POLYMERS AND ELECTRO RESPONSIVE DEVICES MADE THEREFROM

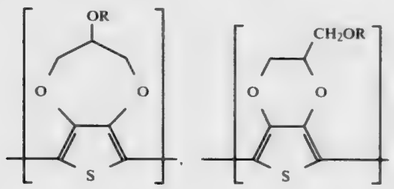
Margaret L. Blohm; James E. Pickett, both of Schenectady, and Paul C. VanDort, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 4, 1991, Ser. No. 663,524

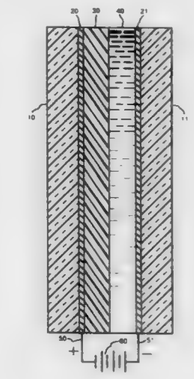
Int. Cl.[5] **G02F** *1/01;* **C08F** *28/06*

U.S. Cl. 526—256 **18 Claims**

1. An electro-responsive polymer comprising chemically combined repeat units selected from the class consisting of,



and a mixture thereof where R is a member selected from hydrogen or a $C_{(1-18)}$ organic radical.



5,111,328

ELECTROMAGNETIC RADIATION MODULATING DEVICE

Hulya Demiryont, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 12, 1990, Ser. No. 626,498

Int. Cl.[5] **G02F** *1/15, 1/153*

U.S. Cl. 359—265 **24 Claims**

1. An electromagnetic radiation modulating laminate, comprising:

A) a conductive substrate;

B) a persistent first metal layer adhered to the conductive substrate;

C) a fast ion conductor layer, containing fast ions of a second metal, adhered to the first metal layer;

D) a transition metal compound ion storage layer adhered to the fast ion conductor layer; and

E) an electrode adhered to the ion storage layer.

5,111,329

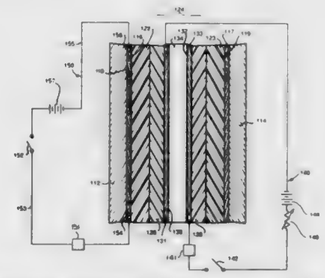
SOLAR LOAD REDUCTION PANEL WITH CONTROLLABLE LIGHT TRANSPARENCY

Kenneth J. Gajewski, Woodhaven, Mich.; Ronald R. Hymore, Oregon, Ohio, and Kenneth E. Nietering, Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 28, 1990, Ser. No. 618,868

Int. Cl.[5] **G02F** *1/01;* **G02B** *5/23*

U.S. Cl. 359—275 **24 Claims**



1. A laminated glazing unit which is substantially transparent to visible light in at least one selectable condition and less

transparent in a second selectable condition, the glazing unit comprising:

a first ply which is substantially transparent and substantially inextensible;

electro-active means for controlling transparency to visible light, the electro-active means comprising (i) first and second flexible, substantially inextensible polymer layers, each having an inward surface facing the other, (ii) first and second electrodes on the inward surface of the first and second polymer layers, respectively, and (iii) a layer of electro-active material sandwiched between the electrodes, the electro-active material being controllably switchable from the first condition to the second, less transparent condition by selected application of electrical potential across the electrodes;

a first laminating layer of flexible polymeric material mediate a surface of the first ply and an outward surface of the first polymer layer of the electro-active means; and

a Fabry-Perot interference filter for preferentially reducing infrared light energy transmitted through the glazing unit, the interference filter comprising a film stack sputter coated onto said surface of the first ply mediate the first ply and the first laminating layer, the film stack including, in order, at least a first zinc oxide film proximate to the first ply, a first silver metal film, a second zinc oxide film, a second silver metal film and a dielectric film adjacent the first laminating layer, the first laminating layer laminating the first polymer layer to the film stack on the surface of the first ply.

5,111,330

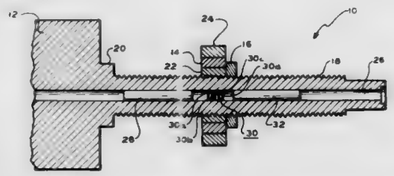
OPTICAL ISOLATORS EMPLOYING WAVELENGTH TUNING

Jay S. VanDelden, Montville, and Donald K. Wilson, W. Caldwell, both of N.J., assignors to Optics for Research, Caldwell, N.J.

Continuation-in-part of Ser. No. 393,143, Aug. 14, 1989, abandoned. This application Nov. 13, 1990, Ser. No. 611,774

Int. Cl.[5] G02F *1/09;* **G02B** *1/08*

U.S. Cl. 359—281 **14 Claims**



1. In a method of rotating the plane of polarization of polarized light in a Faraday rotator, said Faraday rotator including (i) an optical element having an optical axis, said optical element being formed from a composition including at least one ferromagnetic material, and said optical element being formed from at least one substrate in the form of a disc, and each of said at least one disc(s) is coated with an iron-and oxygen-containing film, and (ii) at least one permanent magnet for generating a magnetic field along the optical axis of the optical element, the improvement comprising:

varying the strength of magnetic fiels generated along the optical axis of the optical element by moving said at least one permanent magnet with respect to said optical element such that the strength of the magnetic field in said at least one ferromagnetic material is maintained at a level below the saturation point for said at least one ferromagnetic material in order to respond to changes in the wavelength of said polarized light.

5,111,331

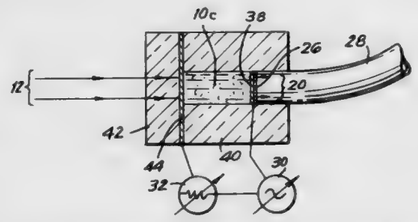
ELECTRO-OPTICAL LIGHT MODULATOR

Paul Rosenberg, Larchmont, N.Y., assignor to Research Frontiers Incorporated, Woodbury, N.Y.

Continuation-in-part of Ser. No. 68,655, Jul. 1, 1987, abandoned. This application Jul. 5, 1989, Ser. No. 375,730

Int. Cl.[5] G02F *1/00;* **G02B** *26/00*

U.S. Cl. 359—296 **11 Claims**



1. An electro-optical arrangement for modulating light to convey information along a communications system, comprising:

(a) a light valve including a pair of light-transmissive, electrically-conductive electrodes spaced apart of each other, and a fluid suspension of particles dispersed in the suspension between the electrodes and orientable to have variable light-transmissive characteristics;

(b) transmitter means for transmitting a carrier light beam through the electrodes and the particles in the suspension;

(c) modulator means for modulating the carrier light beam to generate an information-carrying, modulated light beam, said modulator means including a variable electrical modulator electrically connected to the electrodes applying a variable electrical field across the suspension and, in turn, for changing orientations and the light-transmissive characteristics of the particles; and

(d) receiver means including optical fiber means having a receiving end coated with a light-transmissive, electrically-conductive coating that constitutes one of said electrodes of the light valve, said receiving end being positioned in the path of the modulated light beam for receiving the modulated light beam through the coating, said optical fiber means being connected to and extending away from the light valve in a path along the communications system.

5,111,332

METHOD OF AND APPARATUS FOR CONTROLLING DEFLECTION OF OPTICAL BEAMS

Akira Kuwabara; Eiichi Tamaki, and Yasufumi Koyama, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jan. 18, 1991, Ser. No. 642,764

Claims priority, application Japan, Jan. 26, 1990, 2-17553

Int. Cl.[5] G02F *1/11, 1/33*

U.S. Cl. 359—307 **20 Claims**

1. A method of controlling an optical beam deflected by an acousto-optic deflector, said method comprising the steps of:

(a) generating a periodic sweep signal whose level varies with time;

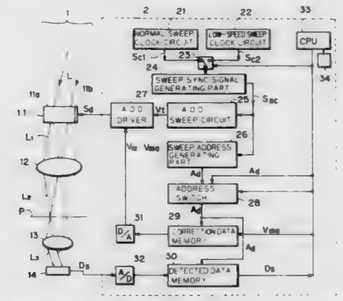
(b) generating an amplitude control signal synchronized with said sweep signal;

(c) generating a drive signal whose frequency and amplitude vary in response to said sweep signal and said amplitude control signal, respectively;

(d) providing said drive signal to said acousto-optic deflector to thereby drive said acousto-optic deflector and obtain a deflected optical beam;

(e) detecting light intensity of said deflected optical beam with a photo-sensor in synchronism with said sweep signal, to thereby obtain light intensity data representing dependence of said light intensity on said frequency;

(f) correcting said amplitude control signal as a function of a reference light intensity value to obtain a corrected amplitude control signal, said reference light intensity value retrieved within said light intensity data;



(g) generating said drive signal again while substituting said corrected amplitude control signal for said amplitude control signal; and

(h) providing said drive signal generated in the step (g) to said acousto-optic deflector to thereby obtain said deflected optical beam with intensity corrected.

5,111,333

OPTICAL MIXER

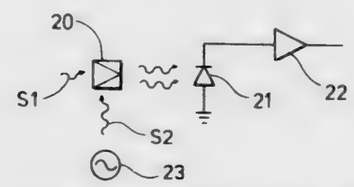
Alistair N. Coles, Bath, and David G. Cunningham, Wickwar, both of England, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 19, 1990, Ser. No. 585,685

Claims priority, application United Kingdom, Sep. 20, 1989, 8921244

Int. Cl.[5] H01S *3/10;* **H04B** *9/00*

U.S. Cl. 359—333 **6 Claims**



1. An optical mixer for up/down-converting a sub-carrier signal of a first frequency, that is intensity-modulated onto a first optical signal, said optical mixer comprising:

(a) an optical amplifier; and

(b) gain-modulating means, optically coupled to the optical amplifier, for modulating the gain of the optical amplifier, said gain-modulating means comprising means for generating a second optical signal intensity-modulated at a second frequency and launching said second optical signal into said optical amplifier at an intensity sufficient to cause the optical amplifier to operate at least partially within its saturated gain region, thereby causing the gain of the optical amplifier to be modulated at said second frequency resulting in up/down conversion of said sub-carrier signal.

5,111,334

MULTI-STAGE FIBER-OPTIC AMPLIFIER

Rolf Heidemann, Tamm, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Jan. 9, 1991, Ser. No. 638,509

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1990, 4002369

Int. Cl.[5] H01S *3/16, 3/09;* **G02B** *6/00*

U.S. Cl. 359—341 **8 Claims**



1. A fiber-optic amplifier having stages, said amplifier for use with a monomode fiber for 1536 nm light signals, each said amplifier stage comprising:

a fiber piece doped with at least one lanthanoid and having an input end and an output end;

a wavelength selective directional coupler including first and second inputs, and a first output, said coupler first input for receiving input light signals, said coupler first output connected to the fiber piece of said amplifier stage for outputting light signals to said fiber piece; and

a pump light source, connected to said second input of said directional coupler for inputting pump light to said directional coupler;

wherein two or more of said amplifier stages, each being composed of a fiber piece, a wavelength selective directional coupler and a pump light source, are provided connected in cascade so that the output end of the fiber piece of one amplifier stage is connected with the first input of the directional coupler of a next-following amplifier stage, and wherein the fiber pieces of the individual amplifier stages differ from one another with respect to at least one of length, doping and basic material, whereby maximum gain over a broad wavelength range is realized.

5,111,335

ULTRA-BLACK FILM AND METHOD OF MANUFACTURING THE SAME

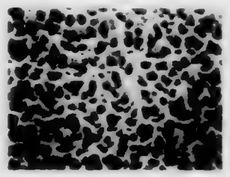
Masao Horiuti; Shunichi Kodama, both of Tokyo, and Kenji Kuroda, Hadano, all of Japan, assignors to Anritsu Corporation, Tokyo, Japan

Division of Ser. No. 268,509, Nov. 8, 1988, Pat. No. 4,984,855. This application Oct. 11, 1990, Ser. No. 595,606

Claims priority, application Japan, Nov. 10, 1987, 62-283878; Jan. 9, 1988, 63-2914; Feb. 27, 1988, 63-45569; Sep. 16, 1988, 63-231760; Sep. 16, 1988, 63-231761; Sep. 30, 1988, 63-127194[U]; Sep. 30, 1988, 63-127195[U]; Sep. 30, 1988, 63-244228

Int. Cl.[5] G02B *5/22*

U.S. Cl. 359—350 **13 Claims**



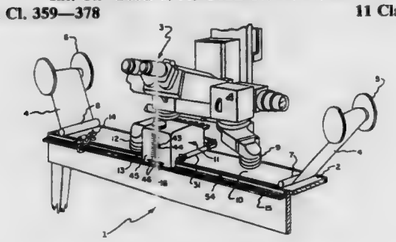
1. A LED module having an inner surface provided with an

ultra-black film comprising a base made of a material selected from the group consisting of electric conductors and non-conductors, a nickel-phosphorus alloy layer formed on said base and a phosphate layer formed on said nickel-phosphorus alloy layer, the spectral reflectance of said ultra-black film in a wavelength range of 380 to 1,800 nm being 0.04 to 0.4%, the surface of said ultra-black film having a plurality of conical holes with opening diameters of 1 to 6 μm and contiguous to one another, the surfaces of said conical holes being fluffy.

5,111,336
FILM ACCUMULATOR

Ronald J. Martino, Geneva, and Frederick J. Ramsey, deceased, late of Rochester by Helen F. Ramsey, Rochester, Administratrix, both of N.Y., assignors to Leica Inc., Buffalo, N.Y.

Filed Feb. 1. 1991, Ser. No. 649,557
Int. Cl.[5] G03B *1/18*; G02B *21/22, 27/02*
U.S. Cl. 359—378 **11 Claims**

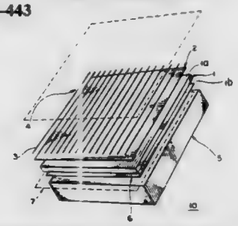


1. A photographic film accumulator which comprises:
a base, a first plurality of elongated, parallel rollers mounted to said base, said first plurality of rollers being spaced apart in a stationary plane, carriage means slidably mounted to said base for movement along a path perpendicular to said stationary plane, a second plurality of elongated, parallel rollers mounted to said carriage, said second plurality of rollers being spaced apart in a movable plane, positioning means for moving said carriage with said movable plane to a chosen location along said path, one location on said path positioning said movable plane on one side of said stationary plane for feeding a film end through said accumulator in a substantially straight line between said first and second plurality of rollers and a plurality of locations positioning said movable plane on the other side of said stationary plane for accumulating film along a serpentine path,
whereby moving said carriage with said movable plane to a chosen location along said path achieves a chosen distance between selected portions of two photographs on a strip of film.

5,111,337
ENHANCED CONTRAST, MAXIMUM GAIN FRONT AND REAR PROJECTION SCREENS

Eugene Martinez, Woodbine Rd., Irvington, N.Y. 10533

Filed Jan. 4, 1991, Ser. No. 638,363
Int. Cl. G03B *21/56*
U.S. Cl. 359—443 **54 Claims**

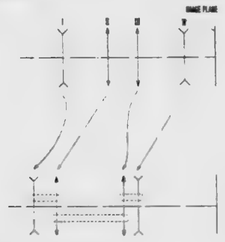


1. A method for making projection screens, comprising:
providing a thin plastic film;
printing onto said thin plastic film, a translucent coating; and
further printing dark patterns onto said film to enhance the contrast of an image projected thereon.

5,111,338
ZOOM LENS

Hiroki Nakayama, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1991, Ser. No. 654,191
Claims priority, application Japan, Feb. 17, 1990, 2-037066
Int. Cl.[5] G02B *15/16, 15/177*
U.S. Cl. 359—686 **17 Claims**

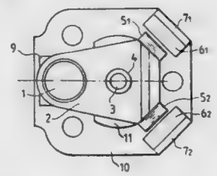


1. A zoom lens comprising:
from front to rear,
a first lens unit having a negative refractive power;
a second lens unit having a positive refractive power;
a third lens unit having a positive refractive power; and
a fourth lens unit having a negative refractive power;
wherein zooming from the wide-angle end to the telephoto end is performed by having at least said second and fourth lens unit toward the object side in such a way that a separation between said first lens unit and said second lens unit and a separation between said third lens unit and said fourth lens unit are shorter in the telephoto end than in the wide-angle end wherein, further, said second and fourth lens units also are moved in such a way that the magnifications of said second lens unit and said fourth lens unit increase, and the amount of variation of the magnification for said second lens unit is larger than that for said fourth lens unit.

5,111,339
LENS ACTUATOR

Hiroyuki Hagiwara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1990, Ser. No. 514,414
Claims priority, application Japan, Apr. 28, 1989, 1-107765; May 16, 1989, 1-120271
Int. Cl.[5] G02B *7/02*
U.S. Cl. 359—813 **7 Claims**

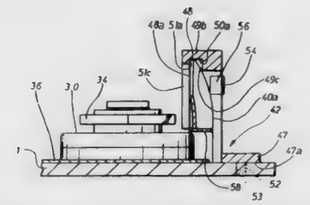


1. A lens actuator comprising:
a base having a supporting shaft;
a lens holder set so as to be rotatable about and slidable along said supporting shaft;
a lens retained by said lens holder in such a manner that an optical axis thereof is parallel to said supporting shaft, said lens being mounted on said lens holder at a position separate from said supporting shaft;
means for generating a force for rotating said holder in response to the flow of current therethrough, comprising first coil means mounted on said holder on the side opposite to said lens with said supporting shaft therebetween, the distance from the center of said supporting shaft to the center of said supporting shaft to the center of gravity of said first coil means;
means for generating a force for sliding said holder along said supporting shaft in response to the flow of a current therethrough, comprising second coil means mounted on said holder; and
a magnet mounted on said base for applying a magnetic field to both generating means.

5,111,340
LENS DEVICE

Hiroyuki Kashima, and Naohisa Kinoshita, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 27, 1990, Ser. No. 618,730
Claims priority, application Japan, Jan. 10, 1990, 2-3850
Int. Cl.[5] G02B *7/02*
U.S. Cl. 359—819 **15 Claims**



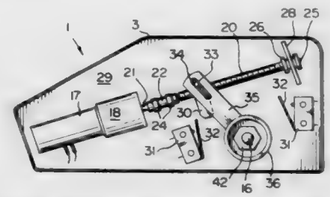
1. A lens device for a laser scanning apparatus in which a laser light is deflected in a predetermined direction by a rotary polygonal mirror, the lens device comprising:
a correction lens for correcting the focal point of said laser light deflected by said rotary polygonal mirror according to a deflection angle, said correction lens being formed by cutting a circular lens along a plane off an optical axis thereof and removing a segment of shorter arc therefrom;
a lens holder including a frame arranged to abut against an arcuate peripheral portion of said correction lens to hold the latter in position both in the radial direction of the lens and in the direction of the optical axis; and
pressing means for pressing said correction lens both in the radial direction and in the direction of the optical axis thereof to hold said lens in position relative to said lens holder.

5,111,341
DRIVE DEVICE FOR TRUCK MIRROR

Russell Keast, Box 605, Innisfail, Alberta, Canada T0M 1A0

Filed Aug. 14, 1990, Ser. No. 567,103
Claims priority, application Canada, Apr. 6, 1990, 2014116
Int. Cl.[5] G02B *7/18*
U.S. Cl. 359—841 **5 Claims**

1. Remote control drive means for providing axial rotation of a vehicle mirror comprising:
a) pivot means for rotatably supporting a first end of said mirror;
b) casing means for mounting on a second end of said mirror;
c) threaded shaft means provided with first and second ends, said threaded shaft means fixedly positioned in said casing at each of said shaft ends from longitudinal movement therein;
d) drive means for reversibly rotating said shaft means;
e) block means threadedly mounted on said shaft means and longitudinally movable thereon when said shaft means is rotated;
f) arm means provided with a lost motion slot means for pivotal engagement with a pin means extending outwardly from said movable block means and for fixed engagement to said second end of said mirror thereby

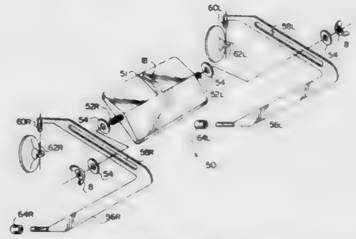


providing rotation of said mirror when rotation of said shaft means causes longitudinal movement of said block means and rotation of said arm means; and,
g) switch means in said casing for limiting movement of said lever means and consequently of said mirror connected thereto.

5,111,342
HITCH-VIEWING MIRROR ASSEMBLY EMPLYING SUCTION CUPS AND TIP RESTS FOR USE ON TOWING VEHICLE

David M. Quesada, 330 Ormonde Rd., Arroyo Grande, Calif. 93420

Division of Ser. No. 299,079, Jan. 23, 1989, Pat. No. 4,951,913, which is a continuation-in-part of Ser. No. 57,811, May 21, 1987, abandoned. This application Jul. 30, 1990, Ser. No. 560,085
Int. Cl.[5] G02B *5/08*; B60R *1/08*
U.S. Cl. 359—872 **4 Claims**



1. A trailer-hitch-viewing mirror assembly for use on a towing vehicle having a trailer hitch at its rear, said assembly enabling a person to view said hitch while driving said vehicle so as to be able to maneuver said vehicle into a position where said hitch is aligned with a mating hitch of a vehicle to be towed, comprising, in combination:
a mirror,
means for mounting said mirror on the rear of said towing vehicle, said means arranged to mount said mirror in a position spaced behind said towing vehicle and in a position facing forward and downward, such that said driver of said towing vehicle, while seated in a driver's seat in the front of said towing vehicle, can see said hitch in said mirror, so that said driver can accurately maneuver said towing vehicle while viewing said hitch in said mirror, without assistance from another person, until said hitch is aligned for connection with the mating hitch of a vehicle to be towed,
said means for mounting comprising a bracket assembly for attaching said mirror to said rear of said towing vehicle,
said bracket assembly comprising a pair of elongated, spaced, and generally parallel members and a respective pair of suction cups, said suction cups attached to said rear

of said towing vehicle for holding said mirror in a fixed position spaced behind said rear of said towing vehicle,

each of said members of said pair of elongated members comprising two substantially straight sections which are connected at an angle,

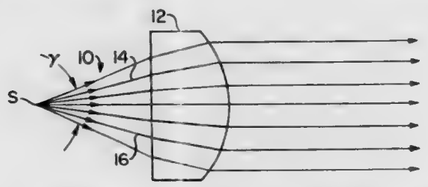
one end of each of said members connected to a respective suction cup,

the other end of each of said members being a free end for resting against a rear surface of said towing vehicle such that said pair of elongated members have four ends with two suction cups on two of said four ends for attachment to said rear of said towing vehicle and two free ends on the other two of said four ends for resting against said rear surface of said towing vehicle,

said mirror having a reflecting surface, said mirror being mounted in a frame having opposite sides, said reflecting surface being positioned between said opposite sides of said frame, and

a pair of pivot means connected to said opposite sides of said frame, respectively, so as to support said mirror, said pair of pivot means also being connected to said respective members at a location on each member between said ends of each member, such that said mirror is connected between said members and can pivot on said pair of pivot means with respect to said members.

5,111,343
GRADIENT FILTER
Michael E. Harrigan, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 29, 1990, Ser. No. 529,835
Int. Cl.[5] G02B *5/20, 5/22*
U.S. Cl. 359—888 **5 Claims**



4. A gradient filter for reducing width variations in a diode laser beam, said filter being formed by a plurality of concentric elements which form a discrete approximation of a transmission profile proportional to:

$$e^{-2(x/w_x)2-2(y/w_y)2}$$

where x and y are position coordinates from a center of the beam, w_x is the e^{-2} radius of the x section of the beam, and w_y is the e^{-2} radius of the y section of the beam.

5,111,344
CERAMIC-COATED MICROSCOPE SLIDE
E. H. Robinson, Jr., Harriman, Tenn., assignor to Chase Instruments Corp., Norcross, Ga.
Filed Jun. 16, 1989, Ser. No. 367,484
Int. Cl.[5] G02B *1/00, 21/26;* **B32B** *3/00*
U.S. Cl. 359—900 **10 Claims**

10. A method of making a microscope slide having at least one ceramic marking surface, comprising the steps of:

a. applying a ceramic coating to a marking area on a glass microscope slide,

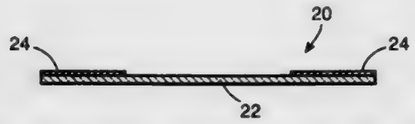
said ceramic coating having a firing temperature below the annealing temperature of the glass slide,

said glass slide having a surface softening temperature corresponding, substantially, to the firing temperature of the ceramic coating;

b. heating the glass slide together with its ceramic coating at the approximate firing temperature of the ceramic coating to fuse the ceramic coating to the surface of the glass slide,

the firing temperature of the ceramic coating ranging from about 875 degrees Fahrenheit to about 900 degrees Fahrenheit,

the annealing temperature of the glass slide being about 962 degrees Fahrenheit,

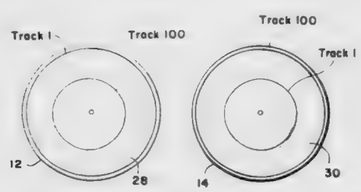


the surface softening temperature of the glass slide being within the range of about 875 degrees Fahrenheit to about 900 degrees Fahrenheit, and

the heating period for the glass slide together with its ceramic coating being approximately 12–15 minutes; and

c. slowly cooling the glass slide with its ceramic coating following fusion to prevent distortion of the glass.

5,111,345
DISK MEMORY DEVICE
Ronald M. Muller, Upper Marlboro, Md., assignor to The United States of America as represented by the Administrator, National Aeronautics & Space Administration, Washington, D.C.
Filed May 26, 1989, Ser. No. 357,928
Int. Cl.[5] G11B *5/09, 17/22, 3/74*
U.S. Cl. 360—48 **6 Claims**



1. A disk memory device for recording and/or reading data comprising:

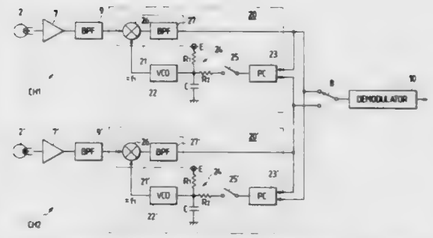
a first recording surface on at least one disk and a second recording surface on said at least one disk or a different disk, said first and second recording surfaces each divided into a number of multiple concentric track groups such that the outermost track of said first recording surface is track **1** and continuing in higher consecutive numbers until the innermost track of said first recording surface is track n while the innermost track of said second recording surface is track **1** and continuing in higher consecutive numbers until the outermost track of said second recording surface is track n such that the combined length of a track from said first recording surface plus the length of the same numbered track on said second recording surface is constant;

means for driving said at least one disk;

means for recording and reproducing said data on said first and second recording surfaces including a first read/write head for reading/writing data on said first recording surface, and a second read/write head for reading/writing data on said second recording surface, said first and second read/write heads reading/writing at the same time such that the combined capacity of said first and second read/write heads is a constant number of bits; and

means for reading the data recorded on said first and second recording surfaces.

5,111,346
FM AUDIO RECORD REPRODUCING APPARATUS HAVING CIRCUITRY FOR PREVENTING DISCONTINUITIES DURING CHANNEL SWITCHING OR SWITCHING OF READ HEADS
Hideo Matsuoka, Tokyo, Japan, assignor to Akai Electric Co., Ltd., Tokyo, Japan
Filed Jul. 18, 1989, Ser. No. 381,248
Claims priority, application Japan, Jul. 20, 1988, 63-180665
Int. Cl.[5] G11B *15/14, 5/02, 20/06*
U.S. Cl. 360—64 **17 Claims**



1. An FM audio signal reproducing apparatus in which an FM audio signal frequency-modulated with a frequency of a carrier signal as its center frequency and recorded on a recording medium by a helical scanning recording system having a plurality of recording heads is reproduced from said recording medium by a helical scanning reproducing system having a plurality of reproducing heads, and said FM signals reproduced by said reproducing heads are successively switched over in a period of overlap of said signals to form a continuous signal which is demodulated into an audio signal so as to be output, said apparatus comprising:

a first reproducing head for producing a first FM signal;

a second reproducing head for producing a second FM signal;

a phase locked loop circuit means for shifting a phase of one of said first and second FM signals to coincide with the other of said first and second FM signals during said overlap period, said phase locked loop circuit means outputting first and second outputs;

a switch means for alternately selecting said first and second outputs of said phase locked loop circuit means to produce said continuous FM signal; and

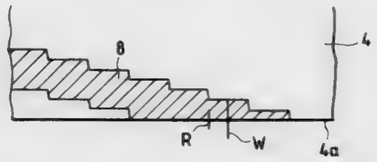
a demodulator for demodulating said continuous FM signals to obtain said audio signal,

wherein said phase locked loop circuit means comprises:

a first and a second frequency conversion means for converting a frequency of said FM signal reproduced by said respective reproducing heads, said first and second frequency conversion means outputting a first and a second output signal, respectively; and

first and second shifting means for shifting said phase of said first and second output signals of said first and second frequency conversion means, respectively, to coincide with each other on the basis of said first and second outputs of said frequency conversion means, said first and second shifting means outputting a frequency conversion signal to said first and second frequency conversion means for converting a frequency of successively reproduced first and second FM signals, respectively, during said overlap period.

5,111,347
METHOD OF DETECTING TAPE EDGE
Hitoshi Ono, and Fumito Komatsu, both of Nagano, Japan, assignors to K.K. Sankyo Seiki Seisakusho, Nagano, Japan
Filed Oct. 10, 1989, Ser. No. 419,249
Claims priority, application Japan, Oct. 11, 1988, 63-255327
Int. Cl.[5] G11B *5/56*
U.S. Cl. 360—75 **13 Claims**



1. A method of detecting an edge of a magnetic tape, using a magnetic head device comprising a magnetic head capable of reading after writing and having a read gap and a write gap, and means for selectively electrically connecting said write gap to a write circuit and a read circuit, said method comprising the steps of:

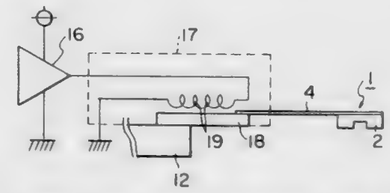
running said tape while moving said magnetic head from a predetermined initial position in the widthwise of said tape until said magnetic head reaches the edge of said tape to record a signal on said tape;

subsequently rewinding said tape to said predetermined initial position to return said magnetic head to a position of said tape where said signal has been recorded;

subsequently, under the condition of electrically connecting said write gap to said read circuit to cause said write gap to serve as a read gap, running said tape while causing said magnetic head to follow said signal recorded on the tape to read said signal; and

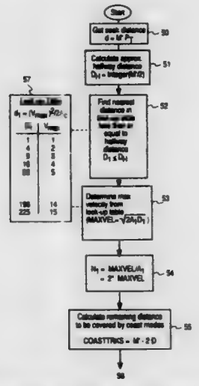
subsequently comparing said read signal with a reference value to detect the edge of said tape.

5,111,348
MAGNETIC HEAD INCLUDING THERMOELECTRIC POSITIONING MEANS
Hiroshi Baba, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 30, 1987, Ser. No. 44,433
Claims priority, application Japan, May 2, 1986, 61-67070[U]
Int. Cl.[5] G11B *5/596*
U.S. Cl. 360—77.06 **3 Claims**



1. A magnetic head with position correction and detection means for reading and writing information including a slider having a read/write core provided with position detection cores at both right and left sides thereof which overlap said read/write core, and including thermo electric means for heating and cooling a portion of said magnetic head to cause movement of said magnetic head over a magnetic disk.

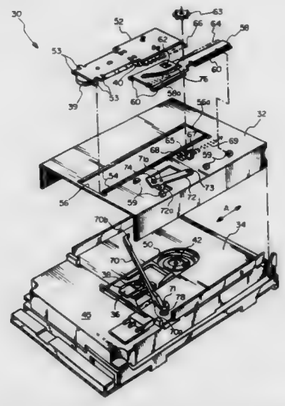
5,111,349
DIGITAL SERVO SYSTEM FOR MOVING BODY BY A DISTANCE EQUAL TO AN INTEGRAL MULTIPLE OF A PREDETERMINED PITCH
Ronald R. Moon, Los Gatos, Calif., assignor to Alps Electric (USA), Inc., San Jose, Calif.
Filed Feb. 7, 1989, Ser. No. 307,864
Int. Cl.[5] G11B *5/55, 21/08*
U.S. Cl. 360—78.07 **8 Claims**
MICROFICHE APPENDIX INCLUDED
(50 Microfiche, 1 Pages)



8. A method for moving a body by a total distance equal to an integral multiple of a predetermined pitch distance, comprising:
sampling the position of the body at periodic sample times;
calculating a distance that is equal to or less than half the total distance, where the distance is inversely proportional to an acceleration level equal to rational multiple of the pitch divided by the square of the sample time and the distance is proportional to the square of the maximum velocity of the body;
calculating the number of sample times required for accelerating the body at said acceleration level to reach the maximum velocity; and
accelerating the body at said acceleration level over one or more periods of time whose total duration equals the number of sample times.

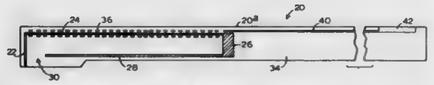
5,111,350
SHUTTER OPENING APPARATUS FOR AN INFORMATION STORAGE DISK DRIVE SYSTEM
James R. Carey, and David L. Rowden, both of Rochester, N.Y., assignors to Literal Corporation, Colorado Springs, Colo.
Continuation of Ser. No. 329,474, Mar. 28, 1989, abandoned. This application Dec. 4, 1990, Ser. No. 622,173
Int. Cl.[5] G11B *17/04*
U.S. Cl. 360—99.06 **12 Claims**

1. In an information storage disk drive system having a cartridge insertion guide means for receiving a disk cartridge including a disk along an insertion path and for holding said cartridge in its own plane of insertion when in a final operative position, the cartridge having a shutter movable laterally to uncover a disk access aperture in the cartridge which exposes a radial segement of recording tracks on said disk, the drive system including one or more of optical read/write head, electromagnetic bias coil and disk hub clamp components positioned between the guide means and below the cartridge insertion path and adapted to be nested in said access aperture when the cartridge is in its final operative position, shutter opening apparatus comprising:
a pivotable shutter opening lever positioned in the guide means, said lever having a shutter engaging member adapted to engage the shutter when the cartridge has been inserted to a point at which at least the disk recording tracks segment is substantially within said guide means and further adapted to pivot laterally and open said shutter sufficiently as said cartridge is inserted to a point along



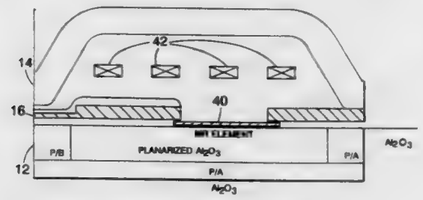
said insertion path at which said cartridge encounters any of said components whereby said shutter clears said components and allows said components to nest within said access aperture as the cartridge is continued to be inserted toward its final operative position.

5,111,351
INTEGRATED MAGNETIC READ/WRITE HEAD/FLEXURE/CONDUCTOR STRUCTURE
Harold J. Hamilton, Santa Clara, Calif., assignor to Censtor Corp., San Jose, Calif.
Continuation of Ser. No. 441,716, Nov. 27, 1989, Pat. No. 5,041,932. This application Jun. 5, 1991, Ser. No. 710,561
The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.
Int. Cl.[5] G11B *5/105, 5/127*
U.S. Cl. 360—104 **7 Claims**



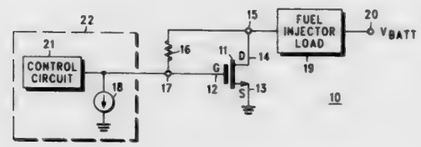
1. A magnetic recording system comprising
an integrated, unitary read/write head/flexure/conductor structure including an elongate dielectric flexure body having embedded therewithin a magnetic read/write head including pole means, and electrical coil and conductor means operatively associated with said pole means, with said structure having a mass less than about 1.5-milligrams, and
a magnetic recording medium moveable relative to said read/write head adjacent and in continuous sliding contact with said structure.

5,111,352
THREE-POLE MAGNETIC HEAD WITH REDUCED FLUX LEAKAGE
Shyam C. Das, Sudbury, and Michael L. Mallary, Berlin, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Continuation-in-part of Ser. No. 79,117, Jul. 29, 1987, Pat. No. 4,907,113, and a continuation-in-part of Ser. No. 253,390, Oct. 4, 1988, Pat. No. 4,885,649, which is a continuation of Ser. No. 33,446, Apr. 1, 1987, abandoned. This application Jun. 22, 1989, Ser. No. 369,833
The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.
Int. Cl.[5] G11B *5/127, 5/147*
U.S. Cl. 360—113 **14 Claims**



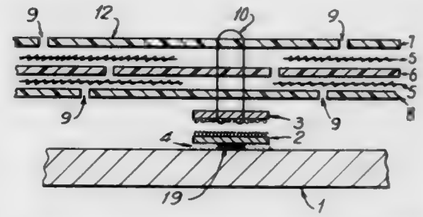
1. A magnetic recording head comprising
a pair of write poles which extend in spaced relationship from a yoke region to a corresponding pair of tips that are separated by a gap,
a read pole disposed in said gap,
a sensor spaced away from the gap toward said yoke region, the read pole being adapted to conduct flux to the sensor, and
at least one of said write poles being configured so that the spacing between said write poles at their tips is less than the spacing between said write poles nearer to said sensor to provide a narrow track definition.

5,111,353
OVERVOLTAGE PROTECTION CIRCUIT
Jeffrey P. Kotowski, Rolling Meadows, and Brian Chapman, Gurnee, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 7, 1990, Ser. No. 520,299
Int. Cl.[5] G05B *9/02;* **F02D** *41/30*
U.S. Cl. 361—91 **28 Claims**



1. An overvoltage protection circuit comprising:
switch means having a control electrode for receiving a control signal voltage and first and second output electrodes, said switch means being turned on and thereby permitting current conduction between said output electrodes in response to the control signal voltage at said control electrode exceeding a predetermined threshold voltage with respect to said first output electrode;
a terminal having a variable voltage signal provided thereat wherein said terminal is coupled to said second output electrode of said switch means;
a resistor coupled between said terminal and said control electrode of said switch means; and
a constant current source connected to said control electrode and providing a known current;
wherein for voltages at said terminal above a predetermined maximum voltage said resistor provides current to said control electrode in accordance with the magnitude of the voltage at said terminal which current will exceed the known current provided by said constant current source by a predetermined amount, and said switch means will, in response thereto, be turned on and permit current conduction between its output electrodes thereby tending to limit the magnitude of the voltage at said terminal and said second output electrode of said switch means.

5,111,354
PROCESS FOR THE PERFECTING OF THE GROUNDING OF MULTI-LAYER INSULATIONS (THERMAL BLANKETS) FOR SPACE APPLICATIONS
Danilo Marzi, L'Aquila, Italy, and Roger A. Stonier, Reno, Nev., assignors to Selenia Spazio, S.p.A., L'Aquila, Italy
Filed Mar. 30, 1990, Ser. No. 502,434
Claims priority, application Italy, Apr. 3, 1989, 47808 A/89
Int. Cl.[5] H05F *3/02*
U.S. Cl. 361—218 **2 Claims**



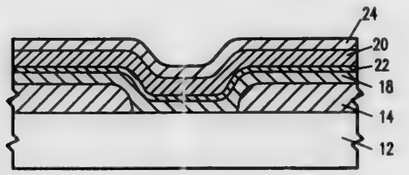
1. A multi-layer insulation for the passive thermal control of satellites or space structures comprising outer, intermediate and inner superposed layers, the outer layer of the multi-layer insulation (7) being electrically conductive on its two faces (13) (14), said two faces of said outer layer being electrically connected by the presence of holes (9) through said outer layer the walls of which are electrically conductive (11);
both faces of the other layers (6) (8) being electrically conductive, said both faces of each other layer being electrically connected by the presence of holes (9) the walls of which are conductive;
an underlying structure, means for attaching the multi-layer insulation (12) to the underlying structure (1) including a hook and pile fastener (2 and 3) of electrically conductive material;
one part of the hook and pile fastener being electrically conductively attached to the multi-layer insulation (12) and the other part being electrically conductively attached to the underlying structure (1).

5,111,355
HIGH VALUE TANTALUM OXIDE CAPACITOR
Kranti V. Anand, late of Sunnyvale, Calif. by Madhu Anand, sole heir , and Michael E. Thomas, Milpitas, Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.
Filed Sep. 13, 1990, Ser. No. 581,761
Int. Cl.[5] H01G *7/00, 9/00, 4/06*
U.S. Cl. 361—313 **20 Claims**

1. In an integrated circuit having a silicon substrate, a thin film capacitor comprising:
a) a first layer of dielectric material disposed on said silicon substrate;
b) a first layer of electrically conductive material disposed between said dielectric layer and said silicon substrate, said electrically conductive material comprising a material which can be reactively converted with a gas into an

electrically insulating dielectric material which, together with said layer of dielectric material, has a predetermined series dielectric constant;

c) a second layer of dielectric material disposed between said first dielectric layer and said first layer of electrically



conductive material, said second layer of dielectric material comprising said reactively converted electrically conductive material; and

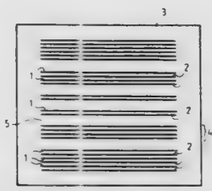
d) a second layer of electrically conductive material disposed on said first layer of dielectric material.

5,111,356

COMPOSITE STRUCTURE RESISTANT TO THERMAL SHOCKS AND APPLICATION THEREOF TO MULTIPLE-LAYER CERAMIC CAPACITORS

Patrick Hardy, Auxonne, France, assignor to Compagnie Europeenne de Composants Electroniques LCC, Courbevoie, France

Filed Oct. 5, 1990, Ser. No. 593,766
Claims priority, application France, Oct. 9, 1989, 89 13142
Int. Cl.[5] C23B *5/50;* **H01L** *41/08*
U.S. Cl. 361—321 **7 Claims**



1. A multilayer type composite structure that withstands shocks and is formed by an alternation of layers made of a first material and a second material, the first material having a higher coefficient of thermal diffusivity than the second material, wherein the distribution of the layers and their thickness are such that, in the thickness of the structure, there are a plurality of zones formed by an alternation of several layers of the first material and of layers with all the same thickness of the second material, these zones being separated from one another by a thicker layer made of said second material.

5,111,357

SOLID DIELECTRIC CAPACITOR AND METHOD OF MANUFACTURE

Hirokazu Chazono, Takasaki; Hiroshi Saito, Harunamachi; Mutsumi Honda; Hisamitsu Shizuno, both of Takasaki, and Hiroshi Kishi, Fujioka, all of Japan, assignors to Taiyo Yuden Company, Ltd., Tokyo, Japan

Filed Oct. 22, 1990, Ser. No. 601,315
Claims priority, application Japan, Nov. 16, 1989, 1-298137; Nov. 16, 1989, 1-298138
Int. Cl.[5] H01G *4/12, 7/00;* **C04B** *35/46*
U.S. Cl. 361—321 **8 Claims**

1. A solid dielectric capacitor comprising a dielectric ceramic body and at least two electrodes in contact therewith, the dielectric ceramic body consisting essentially of:

(a) 100 parts by weight of a major ingredient expressed by the formula,

$$(Ba_{k-x-y}M_xL_y)O_kTiO_2$$

where

M is at least either of magnesium and zinc;

L is at least either of calcium and strontium;

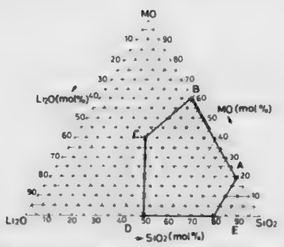
k is a numeral not less than 1.00 and not more than 1.05;

x is a numeral greater than 0 and less than 0.10;

y is a numeral greater than 0 and not greater than 0.05; and the sum of x and y is a numeral not less than 0.01 and not greater than 0.10;

(b) from 0.01 to 3.00 parts by weight of a first additive ingredient of at least either of dichromium trioxide and aluminum oxide; and

(c) from 0.2 to 5.0 parts by weight of a second additive ingredient comprising an additive mixture of lithium oxide, silicon dioxide and at least one metal oxide selected



from the group consisting of barium oxide, strontium oxide, calcium oxide, magnesium oxide and zinc oxide, the relative proportions of lithium oxide, silicon dioxide and at least one selected metal oxide constituting the additive mixture being in that region of the ternary diagram of FIG. 2 attached hereto which is bounded by lines sequentially connecting:

the point A where the additive mixture consists of one mole percent lithium oxide, 80 mole percent silicon dioxide, and 19 mole percent metal oxide;

the point B where the additive mixture consists of one mole percent lithium oxide, 39 mole percent silicon dioxide, and 60 mole percent metal oxide;

the point C where the additive mixture consists of 30 mole percent lithium oxide, 30 mole percent silicon dioxide, and 40 mole percent metal oxide;

the point D where the additive mixture consists of 50 mole percent lithium oxide, 50 mole percent silicon dioxide, and 0 mole percent metal oxide; and

the point E where the additive mixture consists of 20 mole percent boric oxide, 80 mole percent silicon dioxide, and 0 mole percent metal oxide.

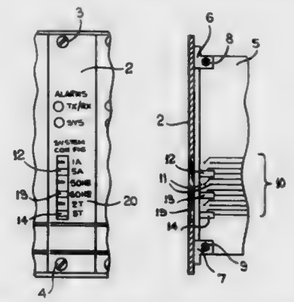
5,111,358

ELECTRICAL EQUIPMENT WITH MODE INDICATOR

Leonard Ernst, Boonton, N.J., assignor to Dowty RFL Industries Inc., Boonton, N.J.

Filed Mar. 20, 1991, Ser. No. 672,177
Int. Cl.[5] H02B *1/26*
U.S. Cl. 361—334 **6 Claims**

1. Electrical equipment configurable to operate in one of a number of possible modes, comprising: an enclosure; an optically transparent window in said enclosure; electrical circuitry located within the enclosure; connection means for electrically interconnecting the electrical circuitry to configure the equipment in a selected mode such that the connection means are visible but not accessible through the window to give an indication of said selected mode; the enclosure having markings on its outer surface indicative of said possible modes arranged in relation to said window so that the connection means, in each



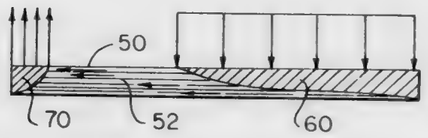
of the different possible mode selections, indicates a corresponding marking for that mode.

5,111,359

HEAT TRANSFER DEVICE AND METHOD

Mark J. Montesano, Fairfax, Va., assignor to E-Systems Inc., Dallas, Tex.

Filed Apr. 17, 1991, Ser. No. 686,604
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—388 **13 Claims**



1. A lightweight electronic component mounting board suitable for use in an airborne environment comprising:

(1) a generally flat core adapted to receive an electronic component in a heat transfer relationship to a mounting surface, said core (a) having a depth relatively small when compared to the length and width thereof and (b) being comprised of heat conducting fibers in a binder, said conducting fibers being disposed generally parallel to said mounting surface with their longitudinal axis generally parallel to the length of said core;

(2) a first wedge carried by said core and adapted to be in a heat transfer relationship to a heat generating electronic component when such component is mounted on said board, said first wedge extending into the depth of said core in a heat transfer relationship with said conducting fibers embedded therein; and

(3) a second wedge carried by said core adjacent one longitudinal end thereof, said second wedge (a) being adapted to transfer heat to a heat sink (b) extending cross the width of said core a distance substantially the same as the width of said first wedge, (c) extending into the depth of said core a distance substantially the same as the depth of said first wedge, and (d) being in a heat transfer relationship with said conducting fibers embedded therein,

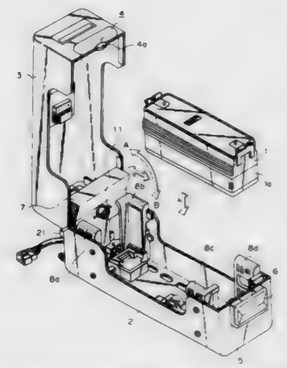
whereby heat generated by a component mounted on said board may be conducted by said first wedge into the depth of said core into contact with said conducting fibers therein and to said second wedge for transfer to a heat sink.

5,111,360

ONBOARD TELEPHONE PACKAGE FOR VEHICLE

Teruo Baba, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1991, Ser. No. 645,716
Claims priority, application Japan, Feb. 1, 1990, 2-020396
Int. Cl.[5] H05K *7/00;* **H04B** *1/08*
U.S. Cl. 361—391 **7 Claims**



1. An onboard package for a portable telephone unit, including

a lower tray to be fixed at a suitable position in a passenger compartment of a vehicle;

an upper cover engaged with said lower tray so that the upper cover is openable and closable;

guides for fixing a body of the telephone unit within said lower tray;

a connector to be connected to the telephone unit;

a slide section, supported by said lower tray so that the slide section is movable in a direction in which said connector is inserted and removed, for supporting said connector so that said connector faces the body of the telephone unit; and

arms fixed at one end to said upper cover and engaged at the other end with said slide section, for moving said slide section by a predetermined distance in association with opening and closing operations of said upper cover.

5,111,361

DEVICE HAVING A SLIDER PORTION AND A STAND PORTION FOR TITLING A COMPACT ELECTRONIC APPARATUS

Takaichi Kobayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 542,041, Jun. 22, 1990. This application Jun. 24, 1991, Ser. No. 719,983
Claims priority, application Japan, Jun. 23, 1989, 1-162216; Jun. 23, 1989, 1-162219; Jun. 23, 1989, 1-162221
Int. Cl.[5] H05K *5/02;* **H02B** *1/00;* **F16M** *11/00*
U.S. Cl. 361—394 **6 Claims**

1. A compact apparatus comprising:

a housing substantially in the form of a rectangular prism, having a bottom face constituting a mounting surface and a top face opposed to the bottom face;

information input means on the top face of the housing; and

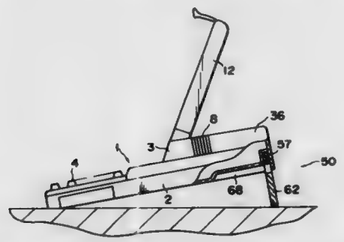
tilting means at the rear portion of the housing for tilting the bottom face, said tilting means including:

a guide passage formed in the housing, having an opening on the bottom face of the housing, and extending from the opening toward the top face of the housing;

a slider having a first connecting portion and arranged in the guide passage, movable along the extending direction of the guide passage, between an up position where the first

connecting portion is situated inside the guide passage and a down position where the first connecting portion is situated outside the guide passage;

a plate-shaped stand having a second connecting portion pivotally connected to the first connecting portion and rockable around the second connecting portion, between a raised position where the stand extends along the extending direction of the guide passage and a housed position where the stand extends substantially parallel to the bot-



tom face of the housing, when the slider is in the down position, said second connecting portion being adapted to be inserted into the guide passage, thereby keeping the stand in the raised position, when the slider is moved to the up position; and

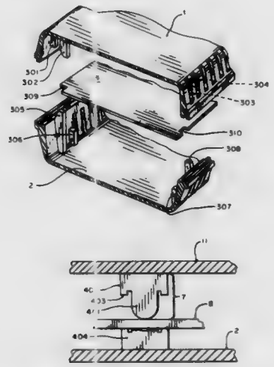
a receiving depression formed in the bottom face of the housing, communicating with the opening of the guide passage, and adapted to house the stand in the housed position.

5,111,362

ENCLOSURE ASSEMBLY WITH TWO IDENTICAL COVERS HAVING MODIFIABLE SUPPORTS FOR ASYMMETRICALLY HOUSING A PRINTED CIRCUIT BOARD OR THE LIKE

Ronald C. Flamm, Newberg; Leonard O. Turner, Beaverton, and James D. Plunkett, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 18 1990, Ser. No. 584,190
Int. Cl.[5] H05K *5/02;* **B65D** *6/00*
U.S. Cl. 361—395 **10 Claims**



6. An enclosure assembly comprised of:

a printed circuit board, said printed circuit board defining a plurality of alignment notches, said printed circuit boarding being asymmetrically positioned within said enclosure assembly;

a top cover coupled with a bottom cover of identical construction, each of said top cover and said bottom cover defining:

(a) a plurality of molded ribs coupling with said plurality of notches defined by said printed circuit board; and

(b) a modifiable support means, said modifiable support means including a breakaway portion, for supporting and positioning said printed circuit board in a first asymmetric position after modifying said modifiable support means by removing said breakaway portion on said first molded cover or in a second asymmetric position after modifying said modifiable support means by removing said breakaway portion on said second molded cover; and

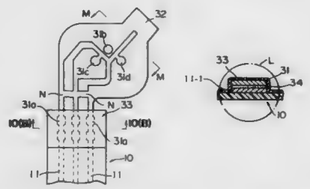
fastening means fastening said top cover with said bottom cover.

5,111,363

MOUNT FOR ELECTRONIC PARTS

Nobuyuki Yagi; Jiroh Inagaki; Kozo Morita, all of Tokyo; Yosutoshi Kaku; Shinji Mizuno, both of Kanagawa, and Akiko Yamanaka, Tokyo, all of Japan, assignors to Teikoku Tsushin Kogyo Co., Ltd., Kanagawa, Japan

Filed Jun. 12, 1989, Ser. No. 365,116
Claims priority, application Japan, Jun. 23, 1988, 63-155632; Jul. 21, 1988, 63-182575; Sep. 14, 1988, 63-231880
Int. Cl.[5] H05K *1/00*
U.S. Cl. 361—398 **19 Claims**



1. A mount for mounting electronic parts to an electronic device, comprising:

a flexible board consisting of a thermoplastic resin film and having a pattern of electrically conductive material thereon;

electronic parts having terminals overlying said pattern of electrically conductive material;

an electrically conductive bonding agent interposed between said terminals and said pattern of electrically conductive material and bonding the terminals of said electronic parts directly to said electrically conductive material to thereby define bonded portions at which the electronic parts are bonded to said flexible board; and

at least some of the electronic parts and said flexible board being integrated by resin molded around said at least some of the electronic parts and a portion of said flexible board.

5,111,364

IMPACT RESISTANT LAYER FOR A CIRCUIT BOARD

Satoshi Yoshimoto, Komaki; Shigeru Nakata, Nagoya; Noboru Takama, Nagoya, and Minoru Taniguchi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Aug. 30, 1990, Ser. No. 575,331
Claims priority, application Japan, Sep. 28, 1989, 1-115456[U]
Int. Cl.[5] H05K *5/00. 1/00*
U.S. Cl. 361—399 **7 Claims**

5. An electronic control element comprising:

an intermediate housing comprising a top cover and an intermediate base plate;

a circuit board within said intermediate housing, said circuit board comprising:

a base film;

a circuit pattern formed on the base film;

a layer of resist material on the base film overlying the circuit pattern; and

an exterior layer of thermosetting material on at least a portion of the resist layer for protecting the underlying layers from wear, the thermosetting layer having an interior surface contacting the resist layer and an exte-



rior surface exposed over the entire thermosetting layer;

means on the housing for engaging said circuit board; and said thermosetting material being disposed on portions of the resist layer where the engaging means engages said circuit board.

5,111,365

ELECTROLYTIC CAPACITOR PROVIDED WITH A LOW RESISTIVITY ELECTROLYTE

Roland F. Dapo, Columbia, S.C., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 20, 1991, Ser. No. 717,958
Int. Cl.[5] H01G *9/02*
U.S. Cl. 361—506 **10 Claims**

1. An electrolytic capacitor comprising aluminum anode and cathode members separated by an insulating spacer impregnated with an electrolyte consisting essentially of a solution containing from about 50%-70% by weight of N-methylformamide, up to about 30% by weight of a member selected from the group consisting of 2-methoxyethanol, 2-ethoxyethanol, ethylene glycol and 1,2-propylene glycol, about 12-20% by weight of an aromatic dicarboxylic acid selected from the group consisting of isophthalic acid and terephthalic acid, from 4% to 10% by weight of an amine selected from the group consisting of dimethylamine and monomethylamine, the mole ratio of the amine of the dicarboxylic acid being less than 2.00:1 and greater than 1.67:1, up to 0.5% by weight of pelargonic acid, up to 0.10% by weight of phosphoric acid and up to 8% by weight of water.

5,111,366

CAP HAVING ILLUMINATED INDICIA

Guerin D. Rife, and W. Preston Willingham, both of Winter Park, Fla., assignors to Gift Asylum, Inc., Winter Park, Fla.

Filed May 17, 1991, Ser. No. 702,270
Int. Cl.[5] A42B *1/24*
U.S. Cl. 362—31 **12 Claims**

1. A cap for displaying information on the front thereof, said cap comprising a crown portion adapted to be worn on the head of the user and having a front section, said front section having an opening therein, adjacent which are panel-supporting means, said panel-supporting means being configured to receive a panel of transparent material having a light-receiving edge and to support same adjacent said opening, and means for



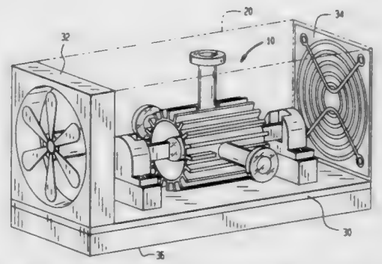
illuminating said transparent material, said illumination means illuminating the panel from the edge thereof.

5,111,367

FIBER OPTIC LIGHTING DEVICE

David L. Churchill, 2200 Rte. 301, Unit 5, Palmetto, Fla. 34221

Filed Oct. 16, 1991, Ser. No. 777,156
Int. Cl.[5] F21V *7/04*
U.S. Cl. 362—32 **15 Claims**



1. A fiber optic lighting device for providing a light source at an end of a fiber optic bundle, said lighting device comprising:

an arc lamp operably connected and positioned within a tubular open-ended heat sink;

a rigid transparent elongated member having ground and polished inner and outer ends and connected within a mating opening formed through a wall of said heat sink, said opening positioned facing said arc lamp;

said transparent member extending laterally from said heat sink with said inner end adjacent said arc lamp such that light emitting from said arc lamp strikes said inner end;

said inner end having a thin dielectric layer disposed thereon structured for reflecting at least a portion of the infrared wave lengths which emanate from said arc lamp back into said heat sink whereby light passing through and emitted from said end is absent said infrared wave lengths.

5,111,368

SHADE ARRANGEMENT FOR A DUAL FILAMENT BULB IN A VEHICLE HEADLAMP

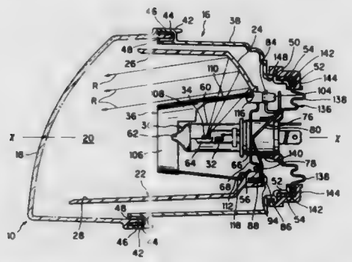
Takanori Suzuki, and Tatsuhiko Harada, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1991, Ser. No. 737,877
Claims priority, application Japan, Aug. 7, 1990, 2-208358
Int. Cl.[5] B60Q *1/04*
U.S. Cl. 362—61 **8 Claims**

1. A vehicle headlamp capable of emitting an upper beam and a lower beam, comprising:

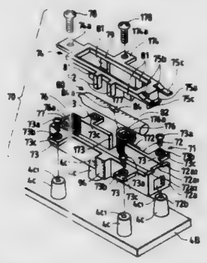
(a) a lamp body;

(b) a lens secured to the lamp body to define a lighting chamber therebetween;
(c) reflector means in the lighting chamber providing a paraboloidal reflective surface generally opposed to the lens, and a pair of substantially opposed flat reflective surfaces disposed between the lens and the paraboloidal reflective surface, the paraboloidal reflective surface having a focus in the lighting chamber and an optical axis extending through the lens;
(d) an electric lighting bulb disposed in the lighting chamber, the bulb having an envelope containing both a primary filament and an auxiliary filament, the primary filament being disposed at the focus of the paraboloidal reflective surface for emitting rays of light to be reflected by the



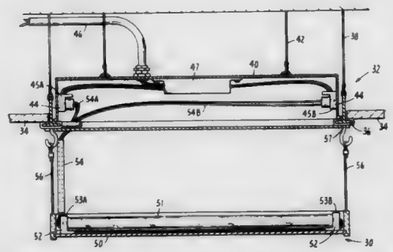
paraboloidal reflective surface in order to provide an upper beam, the auxiliary filament being displaced from the primary filament toward the lens for emitting rays of light to be reflected by part of the paraboloidal reflective surface in order to provide a lower beam; and
(e) a shade disposed between the bulb and at least one of the flat reflective surfaces in order to prevent the light rays emitted by the bulb from falling directly on said one flat reflective surface, the shade being inclined with respect to the optical axis so as to extend in a direction in which the light rays emitted by the auxiliary filament of the bulb travels after having been reflected by said part of the paraboloidal reflective surface;
(f) whereby a decrease in the intensity of the lower beam due to the shade is reduced to a minimum.

5,111,369
HEADLIGHT FOR MOTOR VEHICLE
Katutada Shirai, and Hideharu Mochizuki, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan
Division of Ser. No. 624,868, Dec. 10, 1990. This application Aug. 8, 1991, Ser. No. 741,902
Claims priority, application Japan, Dec. 27, 1989, 1-336265; Dec. 28, 1989, 1-338385; Dec. 28, 1989, 1-338386; Mar. 29, 1990, 2-78630
Int. Cl.[5] F21M *3/20*
U.S. Cl. 362—61 **8 Claims**



1. A headlight for a motor vehicle of a movable reflector type in which a reflector fitted with a bulb therein can be swung vertically and horizontally in a body of said headlight so as to adjust the angle of the direction of emission of light from said headlight, the improvement comprising a level for measuring the angle of the elevational direction of said emission attached in a prescribed position to said reflector, said level comprising a casing shaped as a rectangular container and open at the top of said casing, a holder positioned over said top of said casing, a rectilinear bubble vial suspended from a lid of said holder and housed in said casing, and a zero point adjustment mechanism provided in such a manner that one longitudinal end portion of said holder in the longitudinal direction of said vial is fitted in said casing by a hook and opening engagement means so as to vertically support said holder, one side portion of said holder being fitted to a vertical screw engaged in a tapped hole of said casing and vertically extending through said holder so as to be used for the zero point adjustment of said level, a compressed spring provided between said holder and said casing and urging said holder toward the head of said screw so as to elastically support said holder, said holder being swung about said means by turning said vertical screw.

5,111,370
DEVICE AND METHOD FOR CONVERTING A DOWN-LIGHT INTO AN UP-LIGHT
Walter B. Clark, 1910 Newell Rd., Palo Alto, Calif. 94303
Filed Feb. 21, 1991, Ser. No. 658,763
Int. Cl.[5] F21V *19/02*
U.S. Cl. 362—147 **21 Claims**

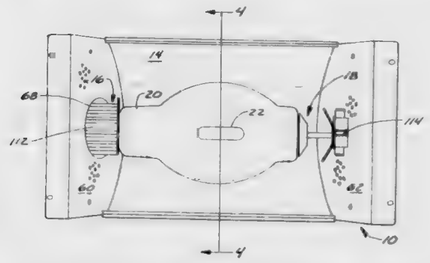


1. A device for converting a down-light mounted in a ceiling into an up-light, the down-light having at least one fluorescent lamp holder including two opposing female receptacles for receiving fluorescent lamp end pins, comprising:
a luminaire body having a reflective lower wall and at least one lamp holder mounted between the lower wall and the ceiling;
means for suspending the luminaire body from the ceiling; and
a ballast lead extender electrically connecting the down-light lamp holder to the luminaire body lamp holder.

5,111,371
ARC-STREAM CORRECTING LAMP HOLDER
Wayne G. Nielson, Hutchinson, Minn., assignor to Sterner Lighting Systems Incorporated, Winsted, Minn.
Filed Oct. 22, 1990, Ser. No. 601,941
Int. Cl.[5] F21V *19/02*
U.S. Cl. 362—261 **12 Claims**

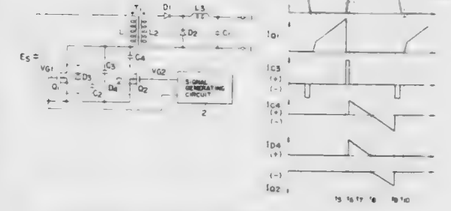
1. A holder comprising:
a support member;
a reflector coupled to the support member, the reflector reflecting a portion of a electromagnetic radiation in a preselected direction from an electromagnetic transmissive envelope placed adjacent to the reflector, the envelope comprising an elongated source of electromagnetic radiation extending between two points which displaces a

determinable amount within the envelope from a straight line between the points; and
means for mounting the envelope to the support member and adjacent to the reflector such that the determinable dis-



placement of the source of electromagnetic radiation is compensated and the source of electromagnetic radiation is positioned substantially on a desired axis relative to the reflector by displacing the envelope.

5,111,372
DC-DC CONVERTER
Shigeru Kameyama; Koji Arakawa, both of Tsurugashima; Kazushi Watanabe, Nagaoka; Hitoshi Yoshioka, Kawasaki, and Isami Norigoe, Inagi, all of Japan, assignors to Toko Kabushiki Kaisha; Nemic Lambda Kabushiki Kaisha, both of Tokyo; Yutaka Electric Mfg. Co., Ltd., Kanagawa and Densetsu Corporation, Tokyo, all of, Japan
Filed Oct. 9, 1990, Ser. No. 594,027
Claims priority, application Japan, Oct. 14, 1989, 1-266615
Int. Cl.[5] G05F *3/335*
U.S. Cl. 363—20 **4 Claims**



1. A DC—DC convertor comprising:
a transformer having a primary winding adapted to be connected in series with a DC power source and a secondary winding;
a rectifier and smoothing circuit;
a main switching means, adapted to be connected in series with said DC power source, for connecting said rectifier and smoothing circuit to said secondary winding of said transformer when said main switching means is in an on-state;
an auxiliary switching circuit connected in parallel with said main switching means, said auxiliary switching circuit comprising a first capacitor connected in parallel with a second capacitor that is connected in series with an auxiliary switching device; and
a signal generating circuit means for providing a first control signal to said main switching means and a second control signal to said auxiliary switching device to control on/off operation of said main switching means and said auxiliary switching device such that both said main switching means and said auxiliary switching device are in an off-state simultaneously in a manner wherein said main switching means turns on after a first rest period has elapsed after said auxiliary switching device turns off and said auxiliary switching device turns on after a second rest period has elapsed after said main switching means turns off, said first rest period being between $\frac{1}{4}$ and 1/6 of a resonance period determined by an inductance of said transformer and said first capacitor, and said second rest period being less than $\frac{1}{8}$ of a period during which said main switching means is in an off-state.

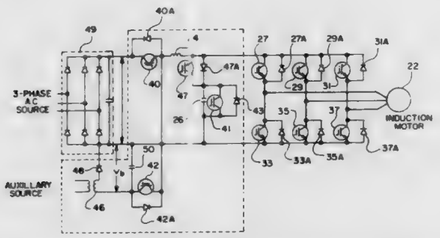
5,111,373
PWM-CONTROLLED POWER SUPPLY INCLUDING CHOKE COIL WITH 3-WINDINGS
Shigetoshi Higaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 29, 1991, Ser. No. 647,026
Claims priority, application Japan, Feb. 1, 1990, 2-20444
Int. Cl.[5] H02M *5/458*
U.S. Cl. 363—37 **4 Claims**



1. A power supply apparatus comprising:
AC-to-DC converting means coupled to an AC (alternating current) power source capable of supplying a first AC voltage having a source frequency from a pair of output terminals, for converting said first AC voltage to obtain a positive DC (direct current) voltage from a positive half cycle of said first AC voltage appearing at one output terminal of said output terminals and also a negative DC voltage from a negative half cycle of said first AC voltage appearing at said one output terminal with a common voltage appearing at another output terminal of said output terminals;
DC-to-AC inverter means including a pair of first and second switching elements and also a PWM (pulse width modulation) controller for controlling switching operations of said first and second switching elements in a PWM control mode so as to invert said positive and negative DC voltages into a second AC voltage having a modulation frequency higher than said source frequency, said second AC voltage being applied to a load; and,
choke coil means having a single core and first, second and third coil windings wound on said single core for magnetically coupling said coil windings with each other, said first and second coil windings being interposed between said AC power source and said AC-to-DC converting means, and also said third coil winding being interposed between said DC-to-AC inverter means and said load.

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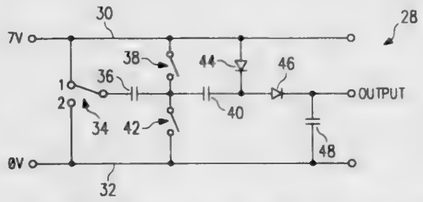
5,111,374
HIGH FREQUENCY QUASI-RESONANT DC VOLTAGE NOTCHING SCHEME OF A PWM VOLTAGE FED INVERTER FOR AC MOTOR DRIVES
Jih-Sheng Lai, and Bimal K. Bose, both of Knoxville, Tenn., assignors to The University of Tennessee Research Corp., Knoxville, Tenn.
Filed Jun. 22, 1990, Ser. No. 542,903
Int. Cl.[5] H02M *5/45*
U.S. Cl. 363—37 **4 Claims**



1. A circuit for converting a DC voltage produced by a first power supply to a pulsating DC voltage useful for operating an AC machine, said pulsating DC voltage being available at first and second output terminals of said circuit, said circuit comprising in combination: a quasi series resonant circuit including at least an inductor and a capacitor selectively coupled in series to form a terminal common with a first one of said output terminals, first, second, third and forth switching circuits, and a second power DC supply said first, third and fourth switches being selectively coupled and operable in response to first switching signals to couple said inductor between the terminals of said first DC power supply to establish an initial current of a selected first amplitude and polarity in said inductor; said second, third and fourth switches being selectively coupled and operable under second switching conditions to couple said inductor between the terminals of said second DC power supply to establish a second initial current of a second selected amplitude and polarity in said inductor; said first, third and forth switch means being selectively coupled and operable under third switching conditions to couple said inductor and capacitor in series to form said quasi series resonant circuit and to couple said quasi series resonant circuit between the terminals of said first DC power supply to establish a resonant current in said quasi resonant circuit; said third switch means being operable under forth switching conditions to selectively interrupt said resonant current by decoupling at least one terminal of said capacitor from said first one of said output terminals, thereby establishing a resonant current of a selected amplitude in said quasi series resonant circuit to control the selectively interrupt said resonant current to selectively change the duration of the pulses of said pulsating DC voltage.

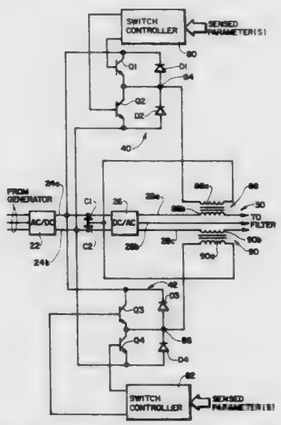
5,111,375
CHARGE PUMP
Andrew Marshall, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 20, 1990, Ser. No. 630,703
Int. Cl.[5] H02M *7/00*
U.S. Cl. 363—60 **20 Claims**

1. A charge pump comprising:
high voltage and low voltage supply rails having a predetermined voltage differential;
first and second capacitors coupled in series;
first switching circuitry coupled to said high voltage and low voltage supply rails and said first and second capacitors, said first switching circuitry operable to selectively charge said first and second capacitors to desired voltages; and
second switching circuitry coupled to said high voltage and low voltage supply rails and to said first capacitor, said second switching circuitry operable to selectively couple



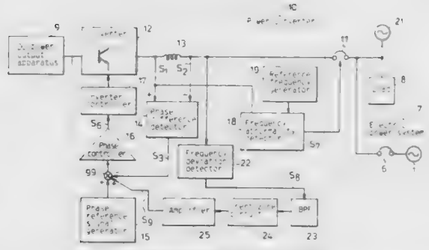
said first capacitor to said high and low voltage supply rails to said first capacitor so as to generate a desired output voltage.

5,111,376
VOLTAGE BALANCING CIRCUIT
Byron R. Mehl, Belvidere, Ill., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Nov. 1, 1990, Ser. No. 607,811
Int. Cl.[5] H02M *7/44*
U.S. Cl. 363—71 **7 Claims**



1. A voltage balancing circuit for balancing first through Nth phase voltages produced on first through Nth output lines where N is an integer greater than one, comprising:
first through Nth means coupled to the first through Nth output lines, respectively, for sensing the magnitude of the first through Nth phase voltages; and
N−1 voltage combining circuits responsive to the first through Nth sensing means and coupled to N−1 output lines for modifying the voltage magnitude on the N−1 output lines whereby the first through nth phase voltages are maintained within a range of voltage magnitudes.

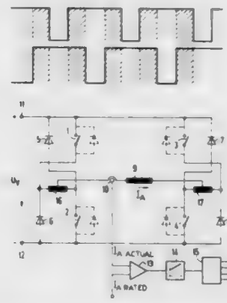
5,111,377
INTERCONNECTION FOR ELECTRIC POWER SYSTEM
Hiromasa Higasa; Fumihiko Ishikawa; Shigenori Matsumura, all of Takamatsu; Sueo Sakata, and Masayoshi Kumano, both of Amagasaki, all of Japan, assignors to Shikoku Research Institute Incorporated, Takamatsu and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan
Filed Mar. 1, 1991, Ser. No. 663,168
Claims priority, application Japan, Mar. 2, 1990, 2-52099
Int. Cl.[5] H92M *7/537*
U.S. Cl. 363—95 **2 Claims**



1. Interconnection system for electric power system for interconnection between an electric power system and a power converter which includes an inverter for converting a DC power into a converted AC power, thereby to supply AC power to a load or loads from said electric power system and said inverter, said interconnection system comprising:
a frequency deviation detector for detecting frequency deviation of said converted AC power outputted from said inverted and issuing a first signal,
a band-pass filter for passing a selected frequency band component from said first signal,
an inert zone circuit for passing output signal from said band-pass filter only for the component having levels above a predetermined threshold level, thereby outputting a third signal,
a control circuit for positively feeding back said third output signal, thereby to increase frequency deviation of said converted AC power from said inverter, and
an output abnormality detector for making a disconnection of said inverter from said interconnection with said electric power system, when frequency deviation of said inverter exceeds a predetermined reference value of frequency deviation, or when deviation of intensity of output current or output power of said inverter exceeds a predetermined reference level for deviation.

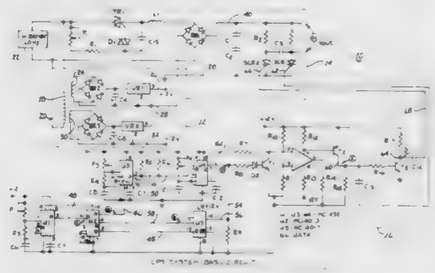
5,111,378
DC CHOPPER CONVERTER
Stefan Nowak, Erlangen, and Robert Bleisteiner, Dormitz, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jul. 30, 1990, Ser. No. 560,597
Claims priority, application European Pat. Off., Aug. 11, 1989, 89114937.0
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—98 **28 Claims**

1. A method for controlling a DC chopper converter with four switching elements operatively coupled between power supply terminals and a load to form an H-bridge configuration, comprising the steps of:
cyclically driving diagonally disposed switching elements so that said diagonally disposed switching elements experience one or more overlap periods of concurrent closure over any number of cycles;
cyclically driving non-diagonally disposed switching elements in offset phase so that no non-diagonally disposed switching element is closed concurrently with closure of a diagonally disposed switching element and;



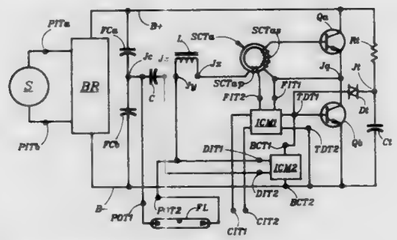
varying the amount of current through said load by varying the overlap period of concurrent closure.

5,111,379
ELECTROFISHING APPARATUS AND METHOD
Norman G. Sharber, and John P. Sharber, both of Flagstaff, Ariz., assignors to Coffelt Manufacturing, Inc., Flagstaff, Ariz.
Filed Dec. 6, 1989, Ser. No. 446,652
Int. Cl.[5] H02M *7/155;* **A01K** *79/00*
U.S. Cl. 363—128 **30 Claims**



1. Electrofishing apparatus for inducing electrotaxis and narcosis with minimal injury to the fish, said apparatus comprising in combination;
a) a source of electrical power for operating said apparatus;
b) means electrically connected to said power source for generating an output of high power direct current pulses, said generating means including means for developing a pulse train, said developing means including means for producing a packet of high frequency pulses and means for repeating the packet at a low frequency;
c) means for modulating the output of said generating means with the pulse train; and
d) means for transmitting underwater the generated and modulated direct current pulses.

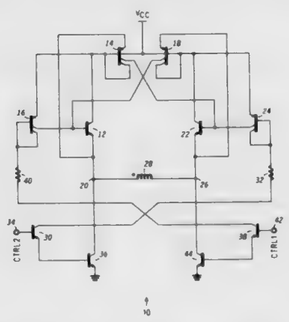
5,111,380
CONTROLLED SERIES-RESONANCE-LOADED INVERTER
Ole K. Nilssen, Caesar Dr , Rte. 5, Barrington, Ill. 60010
Continuation of Ser. No. 286,801, Dec. 20, 1988, abandoned, and a continuation-in-part of Ser. No. 346,321, May 1, 1989, which is a continuation of Ser. No. 686,275, Dec. 26, 1984, abandoned, said Ser. No. 286,801, is a continuation-in-part of Ser. No. 80,865, Aug. 3, 1987, Pat. No. 4,819,146. This application Mar. 23, 1990, Ser. No. 498,484
Int. Cl.[5] H02M *7/44*
U.S. Cl. 363—132 **36 Claims**



1. An arrangement comprising:
an energized LC circuit means oscillating at a natural resonance frequency, an alternating current flow in the LC circuit means;
a means for loading the LC circuit means being connected with the LC circuit means; the alternating current having a continuous sinusoidal waveshape irrespective of the degree of loading of the LC circuit means;
a source of DC voltage;
inverter means connected in a circuit with the DC voltage and the LC circuit means, the inverter means having control input means and being operative, each time in response to receiving a control input at the control input means, to provide an energy pulse to the LC circuit means, thereby increasing the magnitude of the alternating current; and
sensing means connected in circuit with the LC circuit means and the control input means, the sensing means being operative to provide said control input, but only whenever the magnitude of the alternating current falls below a pre-determined level.

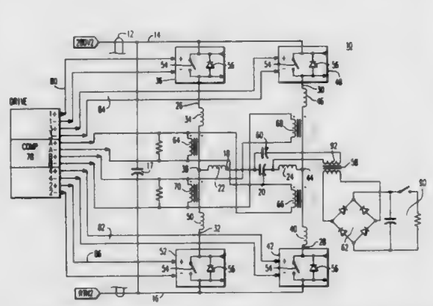
5,111,381
H-BRIDGE FLYBACK RECIRCULATOR
John M. Pigott, Phoenix, and Robert B. Jarrett, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 12, 1991, Ser. No. 743,955
Int. Cl.[5] H02M *7/5387*
U.S. Cl. 363—132 **8 Claims**

1. An H-Bridge circuit reponsive to first and second control signals and having first and second output terminals, and inductive load being coupled across the first and second terminals, the H-bridge circuit being formed by a first half which includes a first transistor pair and a second half which includes a second transistor pair, the first half of the H-bridge circuit being rendered conductive when the first control signal is in a first logic state, the second half of the H-bridge circuit being rendered conductive when the second control signal is in a first logic state, the H-bridge circuit comprising:
a first circuit coupled to the second output terminal for clamping the second output terminal to a predetermined voltage, said first circuit providing current drive to a transistor of the first transistor pair of the first half of the



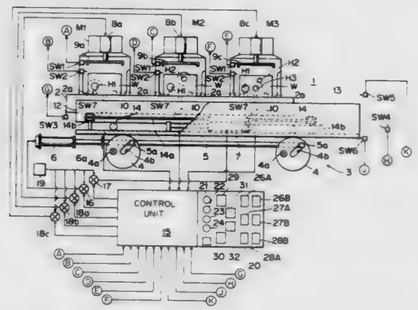
H-bridge circuit thereby creating a first recirculation path to discharge the inductive load.

5,111,382
HIGH POWER, HIGH FREQUENCY RESONANT INVERTER USING MOS CONTROLLED THYRISTORS
Franklin B. Jones, Catonsville, Md.; Ray S. Kemerer, Monroeville, Pa.; Charles E. Carter, Baltimore, and Charles S. Kerfoot, Pasadena, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Oct. 23, 1990, Ser. No. 601,556
Int. Cl.[5] H02M *7/523*
U.S. Cl. 363—132 **25 Claims**



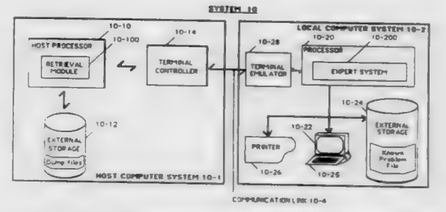
1. An inverter operable to power of 10 KW and 100 KHz from a two-sided DC source of about 270 volts comprising:
resonant circuit means operable when energized for producing a sinusoidal output voltage at twice the DC source voltage including; a common reactive output leg having opposite ends;
at least two pair of reactive input legs, each pair being switchably coupled in series diagonally through opposite ends of the output leg to opposite sides of the DC line;
switch means in series with each input leg for switchably connecting the diagonal pairs of input legs alternately to the DC source for energizing the resonant circuit means, said switch means including a MOS controlled thyristor (MCT) for each input leg having an anode, a cathode and a gate for serially connecting each input leg through the anode and cathode to the DC source when in a conducting state and for opening the leg when in a nonconducting state;
gating means coupled to the gate of each MCT for normally maintaining each MCT off to a nonconducting state and for alternately gating one diagonal pair of the MCTs momentarily on only during the positive half cycle of the sinusoidal output, said pair of MCTs being rendered nonconductive within about 1 microsecond of the onset of the negative half cycle thereof for preventing a short circuit during any period of overlap during which the MCTs in more than one pair of input legs are on.

5,111,383
APPARATUS FOR RECOVERING SEQUENTIALLY CONTROLLED APPARATUS
Katsunori Kimura; Shinichi Hata, and Yoshitaka Nishimura, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Sep. 27, 1989, Ser. No. 412,820
Claims priority, application Japan, Sep. 30, 1988, 63-248699
Int. Cl.[5] G06F *15/46;* **G05B** *23/02*
U.S. Cl. 364—184 **10 Claims**



1. An automatic normal operation recovery system used in cooperation with a sequentially controlled apparatus having a plurality of actuators which are operated in a predetermined sequence to perform a sequential operation of said sequentially controlled apparatus for automatically removing an operational failure caused in said sequentially controlled apparatus by actuating said actuators, thereby recovering said sequentially controlled apparatus to its normal operating condition, said recovery system comprising:
operational failure detecting means for detecting an occurrence and a type of an operational failure caused in said sequentially controlled apparatus;
actuator operating means for operating said actuators in a sequence suitable for a type of operational failure detected by said operational failure detecting means so as to remove said type of operational failure, thereby recovering said sequentially controlled apparatus to its normal operating condition;
memory means for accumulatively storing data of a type of operational failure detected by said operational failure detecting means and a sequence taken to remove said type of operational failure through said manual recovery means; and
automatic recovery means for, when an operational failure is detected by said operational failure detecting means, assigning an order of priority to all sequences available for removing the same type of operational failure as said operational failure detected by said operational failure detecting means accumulatively stored in said memory and automatically actuating said actuator operating means to operate said actuators in a sequence assigned the first order of priority.

5,111,384
SYSTEM FOR PERFORMING DUMP ANALYSIS
Edouard Aslanian, Somerville; Susan L. Pitts, Billerica, and Leon A. Sztucinski, Brookline, all of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.
Filed Feb. 16, 1990, Ser. No. 481,143
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—575 **24 Claims**



1. A system for automatically analyzing memory dumps, said system comprising:
retrieval means;
a number of memory dumps, each memory dump generated as a result of a problem occurring on a given computer system operated- under the control of an operating system, said each dump containing information pertaining to a number of operating system control structures containing information used by the operating system and user programs at the time the dump was generated; and
an expert system comprising:
control means including:
a memory for storing knowledge in the form of objects, said objects including information representative of a plurality of operating system control structures organized into frames and rulesets linked to said frames so as to create decisions using a premise-conclusion if-then form of reasoning; and,
an inference engine coupled to said memory for interpreting said rulesets using said if-then reasoning; and,
knowledge representation means coupled to said control means and to said retrieval module, said knowledge representation means for providing dump control structures in response to requests received from said control means, said control means being operative to diagnose said problem causing said memory dump by analyzing the contents of said control structures contained in said memory dump in a predetermined sequence, said knowledge representation means in response to each request causing said retrieval module to transfer only that portion of said memory dump necessary for generating an operating system control structure requested by said control means.

5,111,385
PARALLEL-MODE DATA TRANSFER APPARATUS USING SECTOR MEMORIES
Naoharu Hattori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Continuation of Ser. No. 423,639, Oct. 19, 1989, abandoned, which is a continuation of Ser. No. 113,510, Oct. 28, 1987, abandoned. This application Jun. 3, 1991, Ser. No. 709,788
Claims priority, application Japan, Oct. 30, 1986, 61-259152
Int. Cl.[5] G06F *3/00*
U.S. Cl. 395—425 **1 Claim**

1. An apparatus for controlling transfer of data between a sectored storage medium and a system bus of a data processor, said apparatus comprising:
first and second memories each being partitioned into a plurality of sectors corresponding to sectors of said storage medium, each sector of said first and second memories being further partitioned into a plurality of memory cells;

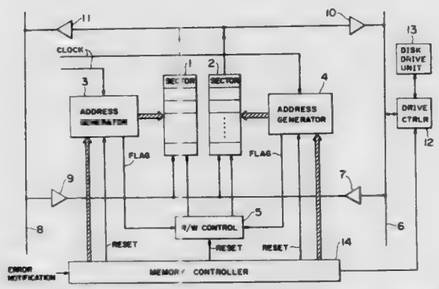
first programmable cell counter means for periodically incrementing a first cell address count which specifies memory cells in said first memory beginning with a programmable cell count value preset by said data processor and for generating a first carry output when said first cell address count reaches a prescribed count value which corresponds to a memory cell at an end of a sector of said first memory;

a first flag set in response to a first occurrence of said first carry output and reset in response to a second occurrence of said first carry output;

first programmable sector counter means, responsive to a first input pulse received by said first programmable sector counter means, for incrementing a first sector address count which specifies sectors of said first memory beginning with a programmable sector count value preset by said data processor;

first gate means, responsive to said first flag being set, for applying said second occurrence of said first carry output to said first programmable sector counter means as said first input pulse;

second programmable cell counter means for periodically incrementing a second cell address count which specifies memory cells in said second memory beginning with a programmable cell count value preset by said data processor and for generating a second carry output when said second cell address count reaches a prescribed count value which corresponds to a memory cell at an end of a sector of said second memory;



a second flag set in response to a first occurrence of said second carry output and reset in response to a second occurrence of said second carry output;

second programmable sector counter means, responsive to a second input pulse received by said second programmable sector counter means, for incrementing a second sector address count which specifies sectors of said second memory beginning with a programmable sector count value preset by said data processor;

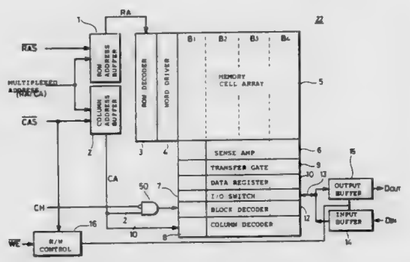
second gate means, responsive to said second flag being set, for applying said second occurrence of said second carry output to said second programmable sector counter means as said second input pulse; and

control means responsive to outputs of said first and second flags, for controlling said first and second memories to alternately operate in read and write modes to cause first data to be written either from said storage medium or from said system bus into a first specified sector of said first memory and to subsequently cause a copy of said first data to be read from said first specified sector of said first memory into either said system bus or said storage medium, and to further cause second data from either said storage medium or said system bus to be written into a second specified sector of said second memory simultaneously with said reading of said first data from said first memory and to subsequently cause a copy of said second data to be read from said second specified sector of said second memory into either said system bus or said storage medium simultaneously with writing of third data into said first memory, said control means responsive to a notification of occurrence of a data error for operating at least one of said first and second memories in a read mode to cause a copy of erroneous data to be selectively recalled from a specific portion of said first memory or said second memory into said system bus, said specific portion specified by said programmable cell count value and said programmable sector count value respectively preset by said data processor into said first programmable cell counter means and said first programmable sector counter means or respectively preset by said data processor into said second programmable cell counter means and said second programmable sector counter means.

5,111,386
CACHE CONTAINED TYPE SEMICONDUCTOR MEMORY DEVICE AND OPERATING METHOD THEREFOR

Kazuyasu Fujishima, Hyogo, Japan, and Charles A. Hart, San Jose, Calif., assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 266,060, Nov. 2, 1988, abandoned. This application Jun. 14, 1990, Ser. No. 538,605
Claims priority, application Japan, Dec. 2, 1987, 62-306101
Int. Cl.[5] G06F *12/00, 7/00;* **G11C** *8/00*
U.S. Cl. 395—425 **10 Claims**



1. A semiconductor memory device for use in a cache system including a generator for generating a cache hit/miss indicating signal, comprising:

a memory cell array comprising a plurality of memory cells arranged in a matrix of rows and columns, word lines corresponding to said rows, said memory cell array divided into a plurality of memory cell blocks each corresponding to a grouping of columns;

sense amplifier means for amplifying and latching data of a row of memory cells corresponding to a selected word line;

cache storage means, separate from said sense amplifier means, and provided for each said memory cell block for storing data of the corresponding cell block;

said generator generating a cache hit indicating signal when an externally applied address matches an address related to information in the cache storage means and generating a cache miss indicating signal when no such match occurs;

first means for accessing data, corresponding to an externally applied column address, from said cache storage means in response to said cache hit indicating signal;

second means for directly accessing data from said memory cell array in response to said cache miss indicating signal and externally applied row and column address, said second means including transfer means for transferring data from a block of said memory cell array to said cache storage means; and

third means responsive to said cache miss indicating signal, said third means including means for controlling the data transfer operation of said transfer means in response to a part of said externally applied column address, wherein only a part of data on said row corresponding to the selected word line in said memory cell array is transferred through said transfer means.

a plurality of bus drivers arranged to exchange the functional block identification code, the functional block operation designating code, and the input/output data between one of said plurality of bus groups and an external circuit, said plurality of bus drivers comprising a block code bus driver, a command bus driver, a communication driver, and a status bus driver.

5,111,387

Patent Not Issued For This Number

5,111,388
PROCESSING APPARATUS WITH FUNCTIONAL HIERARCHICAL STRUCTURE USING CORRESPONDING HIERARCHICAL MACHINE INSTRUCTION FIELDS

Hajime Shiraishi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 720,881, Apr. 8, 1985, Pat. No. 4,901,225. This application Nov. 13, 1989, Ser. No. 434,987
Claims priority, application Japan, Apr. 9, 1984, 59-70443; Apr. 9, 1984, 59-70444; Aug. 16, 1984, 59-169976; Dec. 28, 1984, 59-276130
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—800 **4 Claims**



1. A processing apparatus with a functional hierarchical structure, comprising:

machine instruction decoding means for decoding a machine instruction having an operation code field with a hierarchical structure corresponding to functional levels and an operation object field with a hierarchical structure corresponding to that of the operation code field;

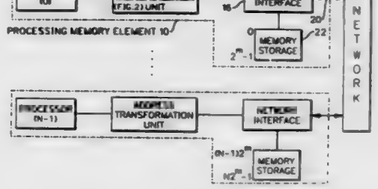
a plurality of functional block means, connected to the machine instruction decoding means, each for performing one of a plurality of functional block operations and having a hierarchical structure corresponding to the hierarchical structure of said operation code field of said machine instruction;

a plurality of bus groups arranged to interconnect said plurality of functional block means, each of said bus groups including a block code bus for transmitting a functional block identification code, a command bus for transmitting a functional block operation designating code, a communication bus for transmitting input/output data to the functional block means, and a status bus for transmitting current status data of a first functional block means to another functional block means and for transmitting instruction accept status data; and

5,111,389
APERIODIC MAPPING SYSTEM USING POWER-OF-TWO STRIDE ACCESS TO INTERLEAVED DEVICES

Keven P. McAuliffe, Yorktown Heights; Evelyn A. Melton, Poughkeepsie; Vern A. Norton, Croton-On-Hudson; Gregoty F. Pfister, Briarcliff Manor, and Scott P. Wakefield, Croton-On-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1987, Ser. No. 114,909
Int. Cl.[5] G06F *12/10*
U.S. Cl. 395—800 **8 Claims**



1. An aperiodic mapping system for the mapping of logical addresses to physical addresses in a multi-user, multi-server system wherein there are 2^d server devices and n logical address bits (where d is $<$n) for generating optimized stride accesses among said multiple server system;

said multiple-users and multiple servers being selectively connectable over an interconnection network wherein any user can communicate with any server in the system,

each user having its own address transformation unit including a multiplier means and a matrix storage means,

each said network having addressing means which examines any system address on the network to determine which server is being addressed, said mapping system comprising,

an address transformation means operating in each address transformation unit for

performing in the multiplier a bit-matrix multiplication of an n-bit first (logical) address (A) from its associated user with a predetermined matrix M′ stored in the matrix storage means, said matrix having d, n-bit rows to produce a second (d-bit)+(n−d bit) (physical) address A′, placing said second address A′, on the interconnection network, and

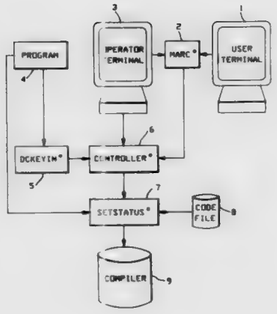
utilizing the d-bits of said second address A′ to determine if that server is being addressed.

5,111,390

SOFTWARE SECURITY SYSTEM FOR MAINTAINING INTEGRITY OF COMPILED OBJECT CODE BY RESTRICTING USERS ABILITY TO DEFINE COMPILERS

Larry R. Ketcham, Laguna Niguel, Calif., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 22, 1988, Ser. No. 234,772
Int. Cl.[5] G06G *12/14, 9/445, 9/45, 3/02*
U.S. Cl. 395—725 **7 Claims**



1. In a computer system having program files, the method of authorizing a code file as a compiler, comprising the steps of:

(a) establishing, via an operating system, a FILEKIND attribute value to differentiate files as to being a data file, a code file, or an authorized compiler;

(b) requesting, via a first program, the operating system to assign a FILEKIND value to a secondprogram, where said first program is prevented, by the operating system, from assigning a FILEKIND value that would indicate a code file or a compiler;

(c) establishing, via an operating system routine, the ability to assign a COMPILERCODEFILE value to a program's FILEKIND attribute where only a privileged user/-privileged program is permitted access to the operating system routine, designated SETSTATUS, wherein said COMPUTERCODE FILE value represents an integer created by the operating system which designates a code file as a compiler;

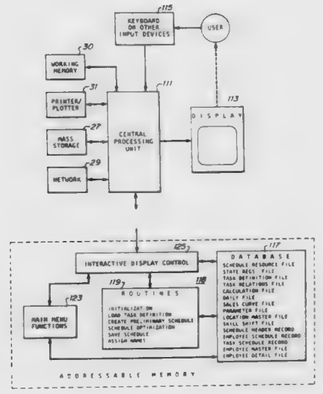
(d) permitting, via a supervisory program designated DCKEYIN, that only a privileged user or privileged program, will get access capability to request, via said operating system routine, said operating system to authorize a code file as a compiler.

5,111,391

SYSTEM AND METHOD FOR MAKING STAFF SCHEDULES AS A FUNCTION OF AVAILABLE RESOURCES AS WELL AS EMPLOYEE SKILL LEVEL, AVAILABILITY AND PRIORITY

Randall K. Fields, Woodland; Paul R. Quinn, and Todd Blackley, both of Park City, all of Utah, assignors to Mrs. Fields, Inc., Park City, Utah

Filed Oct. 5, 1989, Ser. No. 417,643
Int. Cl.[5] G06F *15/21*
U.S. Cl. 364—401 **12 Claims**



1. A system for processing a plurality of variables to create a staff schedule for a plurality of unique remote locations, said system including:

a memory divided into separate data files of information including tasks to be performed and scheduled, the sequence of the tasks, resources available, and employee skill levels, availability and priority;

means coupled to said memory for storing and retrieving information in said memory;

an input device for entering information indicative of projected daily business volume and for designating the tasks to be performed;

generating means coupled to said memory and said input device for generating from the separate data files in said memory and from the information from said input device, schedules of tasks to be performed and the employees selected by availability by day of the week, employee skill levels, and employee priority or seniority, and minimum and maximum hours available per employee for establishing therefrom the shifts of employees by time interval and skill level requirements to perform the designated tasks, said generating means having placement logic for scheduling tasks and optimization logic for dividing the schedule into shifts according to skill levels; and

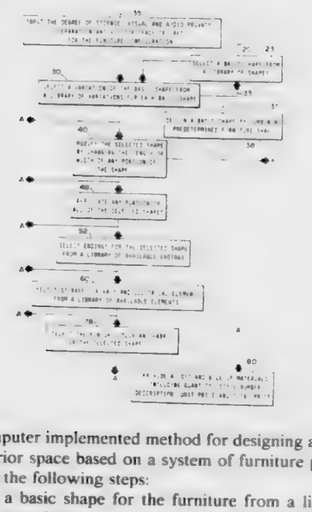
a display coupled to said generating means, for displaying the schedules including the indications of the employees and tasks and the start and stop times therefor.

5,111,392

DESIGN SYSTEM FOR CREATING FURNITURE LAYOUTS

Stuart B. Malin, Chicago, Ill., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Jun. 9, 1989, Ser. No. 363,676
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—401 **9 Claims**



1. A computer implemented method for designing and costing an interior space based on a system of furniture products comprising the following steps:

selecting a basic shape for the furniture from a library of implementable shapes;

selecting a furniture configuration for the selected shape;

modifying any portion of said selected furniture configuration to increase or decrease the width or length of said furniture configuration in implementable increments;

replicating any portion of said selected furniture configuration;

selecting the furniture components for any end of said selected furniture configuration from a collection of implementable endings;

selecting any storage, privacy and electrical elements to complete said selected furniture configuration from a library of implementable elements;

specifying the finish, color and fabrics for any portion of or the overall furniture configuration from a predetermined collection of finishes, colors, and fabrics: and

making available a bill of materials in the course of and at the end of the design process.

5,111,393

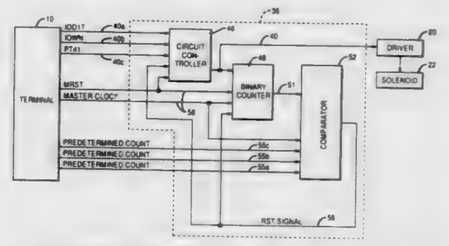
Patent Not Issued For This Number

5,111,394

CIRCUIT AND METHOD FOR ENERGIZING A SOLENOID IN AN ELECTRONIC DEVICE FOR A PREDETERMINED ENERGIZING PERIOD

Wilbur I. Hilles, New Concord, Ohio, and David A. Rieker, Lawrenceville, Ga., assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 22, 1989, Ser. No. 411,273
Int. Cl.[5] G06F *15/20;* **E05B** *64/5C*
U.S. Cl. 364—405 **19 Claims**



1. An electronic business machine having a cash drawer therein, said electronic business machine comprising:

a master controller including software for controlling the operation of the electronic business machine;

a keyboard coupled to said master controller, said keyboard having at least one key thereon;

first means controlled by said master controller of generating a first signal in response to said sat least one key being actuated;

opening means for opening the cash drawer; and

a timeout circuit operatively coupling said first means and said opening means; said timeout circuit being capable of generating a second signal in response to said first signal;

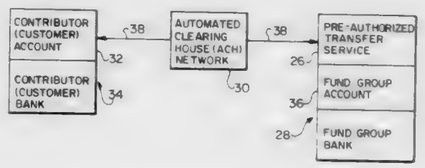
said software in said master controller initiating said first means to generate said first signal and said timeout circuit generating the second signal for a predetermined energizing period in response to said first signal when said at lest one key is actuated, said opening means becoming energized for said predetermined energizing period and causing the cash drawer to open in response to said second signal; said timeout circuit preventing said opening means from being energized beyond a predetermined energizing period.

5,111,395

AUTOMATED FUND COLLECTION SYSTEM INCLUDING MEANS TO ELIMINATE DUPLICATE ENTRIES FROM A MAILING LIST

Rodney A. Smith, 1404 Basil Rd., McLean, Va. 22101, and Paul Janigian, 8007 Carroll Ave., Takoma Park, Md. 20912

Filed Nov. 3, 1989, Ser. No. 431,184
Int. Cl.[5] G06F *15/21*
U.S. Cl. 364—408 **19 Claims**



1. An automated fund collection apparatus comprising:

means for creating a file, said file comprising a plurality of

records, each record including a name and address of an individual,

means for selecting portions of each record,

means for making a first comparison between a first predetermined portion of a first record and a first predetermined portion of at least one second record to determine if said first portions match,

means for identifying at least one duplicate record in said file when at least said first portions match,

means for making a second comparison between a second predetermined portion of said first record and a second predetermined portion of said at least one second record to determine if said second portions match,

means for identifying at least one duplicate record in said file when at least said second portions match and said first portions do not match,

means for eliminating identified duplicate records from said file and means for creating a second file of unique records, wherein no two records identify the same individual,

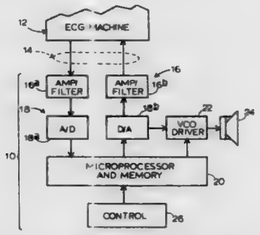
means for creating a list of individuals from said second file of unique records,

means for sending each individual on said list a proposal for an electronic funds transfer agreement in which each individual agrees to make automatic and periodic transfers of funds from each individual to a fund collection entity and, means for printing a plurality of checks and means for sending one of said plurality of checks to each said individual.

5,111,396
PORTABLE ECG DATA-STORAGE APPARATUS

Gary N. Mills, Gladstone; Habib Homayoun, Aloha, and Herbert J. Semler, Portland, all of Oreg., assignors to Instromedix, Inc., Hillsboro, Oreg.

Filed Nov. 9, 1989, Ser. No. 433,756
Int. Cl.[5] G06F *15/42*; **A61N** *1/36*
U.S. Cl. 364—413.06 **5 Claims**



1. Portable, two-way ECG data-storage apparatus for the selective window-capturing, in the successive records, of plural-lead ECG data comprising

a central digital processor and an associated semiconductor memory,

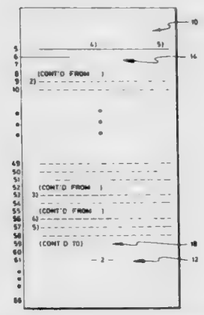
an input/output interface structure selectively coupleable to the input and output analog terminals in an external ECG machine, said structure including analog/digital conversion means, operatively connected to said processor and memory for transferring ECG data to and from said memory,

user-interface control means operatably connected to said processor, operable selectively, in a capture/storage mode, to effect, via processor operation, the capture and storage in said memory (for a limited preselected time window only) of converted analog ECG data arriving at said interface structure, and in a retrieve/broadcast mode to supply, for outputting via said interface structure, converted digital data then stored in said memory.

5,111,397
MANAGING LENGTHY FOOTNOTES IN A WORK PROCESSING DOCUMENT

David S. Chirokas, Arlington; Daniel G. Michaud, Methuen, both of Mass.; Arthur P. McDeed, III, Nashua, N.H.; Michael J. Shiel, Lunenburg; G. Michael Soper, Tyngsboro, both of Mass., and Dennis R. Mascio, Kingston, N.H., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Dec. 11, 1989, Ser. No. 449,693
Int. Cl.[5] G06F *9/00*
U.S. Cl. 364—419 **9 Claims**



1. In a word processing system for reviewing an original document containing lines of body and footnote texts and for preparing a final multipage output document with pages having (i) body text, (ii) footnote references within the body text, and (iii) for each footnote reference, footnote text corresponding to that footnote reference, apparatus which responds to footnote references each having corresponding footnote text that extends across plural pages in which at least one other footnote reference appears in the body text of one of said plural pages, said apparatus comprising:

driver means for assembling a page of the output document, for each page the driver means building that page with a combination of (i) body text including any desired footnote references and (ii) footnote text corresponding to the footnote references in the body text; and

a processor routine responsive to footnote text corresponding to each footnote reference and executed by the drive means to direct the driver means to assemble each page in accordance with first style requirements including (i) having at least one line of body text appear on the page, (ii) for each footnote reference having corresponding footnote text extending across the page, having at least two lines of the corresponding footnote text appear on the page, and (iii) for each footnote reference in the body text of the page, having at least a portion of corresponding footnote text appear on that page.

5,111,398
PROCESSING NATURAL LANGUAGE TEXT USING AUTONOMOUS PUNCTUATIONAL STRUCTURE

Geoffrey D. Nunberg, San Francisco; H. Tayloe Stansbury, Mountain View; Curtis Abbott, Menlo Park, and Brian C. Smith, La Honda, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1988, Ser. No. 274,158
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—419 **31 Claims**

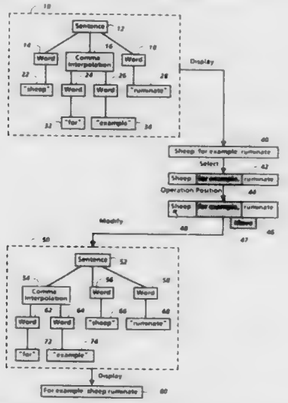
MICROFICHE APPENDIX INCLUDED
(113 Microfiche, 2 Pages)

19. A data structure produced for use in a system that includes:

memory for storing the data sturcture; and

a processor connected for accessing the data structure when stored in the memory;

the data structure comprising text data representing a natural language text that includes words and punctuational features with positions relative to the words; the text data comprising structure data indicating types of text units at

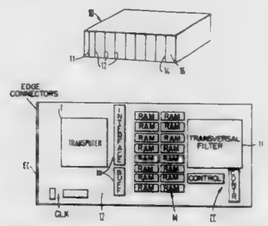


the boundaries of which the punctuational features are positioned, the structure data further indicating nesting relationships between the words and the text units such that the processor can access the text data and use the structure data to determine the punctuational features and their positions relative to the words when the data structure is stored in the memory.

5,111,399
SEISMIC APPARATUS AND METHOD INCLUDING USE OF TRANSPUTERS FOR REAL TIME PROCESSING OF DATA

Peter Robert Armitage, 82 Queen Street, Barry, South Glamorgan, United Kingdom

PCT No. PCT/GB87/00510, § 371 Date Jan. 19, 1989, § 102(e) Date Jan. 19, 1989, PCT Pub. No. WO88/00711, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 20, 1987, Ser. No. 303,666
Claims priority, application United Kingdom, Jul. 19, 1986, 8617674
Int. Cl.[5] G01V *1/36*
U.S. Cl. 364—421 **10 Claims**



1. A seismic processing apparatus which comprises a plurality of data processing modules (**12**), each module comprising a parallel processing device (T) and a transversal filter (TF), the parallel processing devices having respective links (L) for the input and output of data, and the parallel processing devices (T) of the plurality of modules (**12**) being connected by their links (L) into a linear array, each transversal filter (TF) being connected to the parallel processing device (T) of the same module and comprising an input register (**R1**), a plurality of active coefficient registers (**R3**), a plurality of parallel multipliers (MAA) for simultaneously multiplying together data words held in the input register and in respective active coefficient registers (**R3**), and a series of delay and adder devices (CDA) in which the outputs of the multipliers are accumulated.

5,111,400
AUTOMATIC INTEGRATED REAL-TIME FLIGHT CREW INFORMATION SYSTEM

Evan W. Yoder, 5351 W. Co. Rd. 300 South, R.R. 2, Russiaville, Ind. 46979

Continuation of Ser. No. 311,827, Mar. 16, 1987, abandoned. This application Nov. 13, 1990, Ser. No. 611,454
Int. Cl.[5] G06F *7/70, 15/48, 15/50*; **G01S** *13/00*
U.S. Cl. 364—424.01 **19 Claims**



1. An airborne information dissemination system for a subject aircraft within range of an air traffic control facility (ATC) providing a generalized broadcast of dynamic conditions data in computer readable format, such data including updated position data corresponding to the position of every one of a plurality of aircraft, said information dissemination system comprising:

a receiver in the subject aircraft to receive the dynamic conditions data including the position data;

a display screen in the subject aircraft;

an on-board computer having means for operating on said dynamic conditions data to generate a graphic display on said display screen from the dynamic condition data updated at subsequent receptions of the dynamic conditions data, including representations of the current positions of the plurality of aircraft derived from said position data, wherein said display is at least initially egocentric with respect to the ATC with the ATC oriented at the focus of said display;

transformation means in said on-board computer for transforming said dynamic conditions data such that said display is made egocentric with respect to the subject aircraft with the subject aircraft at said focus; and

means for selectably switching between said dynamic conditions data as received or said dynamic conditions data after transformation by said transformation means in generating said display.

5,111,401
NAVIGATIONAL CONTROL SYSTEM FOR AN AUTONOMOUS VEHICLE

Hobart R. Everett, Jr.; Gary A. Gilbreath, and Robin T. Laird, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

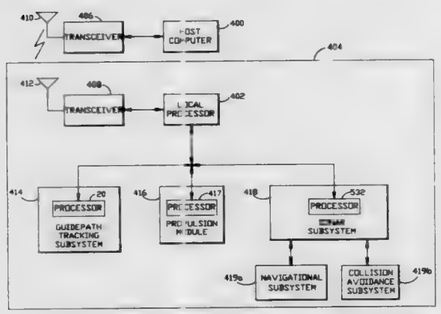
Filed May 19, 1990, Ser. No. 531,483
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—424.02 **23 Claims**

1. A navigational control system for directing an autonomous vehicle to travel along a generally planar surface, such as a floor, from a first location to a destination within an operating environment, comprising:

an autonomous vehicle including a self-propelled and steerable propulsion module providing position signals corresponding to a dead-reckoning determination of a position and bearing of said module with respect to a reference position;

at least one long, narrow guidepath stripe applied to said surface of said environment to define a desired pathway having predetermined coordinates along which said module may be selectively guided, said guidepath stripe encoded with a plurality of displacement markers positioned at predetermined intervals along the length of said guidepath stripe, said markers having predetermined coordinates;

stripe detecting means mounted to said module for detecting said guidepath stripe and said displacement markers, and for providing recognition signals when said stripe detecting means detects said guidepath stripe and for providing



recognition signals when said guidepath stripe detection means detects one of said displacement markers;

ranging means mounted to said module for measuring the range between said module and any object and for providing range signals corresponding to said measured range; and

processing means for determining an optimal path for said module to follow to said destination, said processing means: coupled to receive said position signals for monitoring said dead-reckoning determined position of said module along said path; coupled to receive said range signals for revising said path in order to avoid an obstacle blocking said path; and coupled to receive said recognition signals for revising said dead-reckoning position of said module into an updated position; said processing means for revising said optimal path in response to said updated position; and for providing navigational control signals to guide said module along said optimal path.

5,111,402
INTEGRATED AIRCRAFT TEST SYSTEM

David K. Brooks, Seattle; Cindy M. Waun, Kirkland, and Larry E. Gross, Issaquah, all of Wash., assignors to Boeing Company, Seattle, Wash.

Filed Jan. 19, 1990, Ser. No. 467,772
Int. Cl.[5] G06F *15/20;* **G01M** *19/00*
U.S. Cl. 364—424.04 **39 Claims**

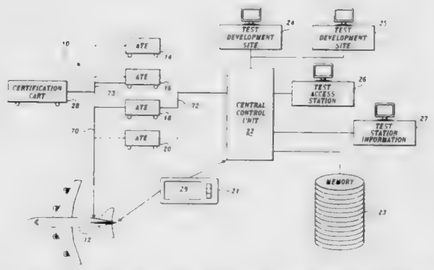
1. An integrated aircraft test system for functionally testing a plurality of aircraft components and subsystems, wherein at least one of the aircraft components and subsystems operates in response to data broadcast from another one of the aircraft components, and wherein during functional testing of said one of the aircraft components and subsystems, simulation data are broadcast thereto, said test system comprising:

(a) at least two automated test equipment carts for performing functional tests on different aircraft components and subsystems, at least one said cart having instruments for functionally testing the at least one aircraft component and subsystem that operates in response to data broadcast by another of the one of the aircraft components, each of said carts including:

a plurality of processor controllable instruments for performing functional tests on specific aircraft components and subsystems;

connection means for interconnecting said instruments to the components and subsystems that said instruments functionally test; and

a system controller connected to said instruments for controlling said instruments and having an input/output unit, said system controller controlling the functional test of said at least one aircraft component and subsystem by said instruments and including means for receiving and storing the results of the functional test from said instruments, said



system controller input/output unit of said automated test equipment cart having said instruments for performing functional testing on the at least one aircraft component and subsystem that operates in response to the simulation data broadcast from the another aircraft component further being connected to said connection means so that said system controller can control the broadcast of the simulation data to the at least one aircraft component and subsystem through data transmissions over said connection means; and

(b) a central control unit including a memory, said central control unit adapted for connection to said system controller input/output units for reading said stored test results therefrom and for storing said test results in said central control unit memory.

5,111,403
TERRAIN COMPENSATION METHOD AND APPARATUS FOR AIRCRAFT AUTOMATIC LANDING SYSTEMS

Munir Orgun, Woodinville; Venkata R. Pappu, Kirkland, and Alfredo A. Toledo, Jr., Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 26, 1990, Ser. No. 470,927
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—428 **4 Claims**

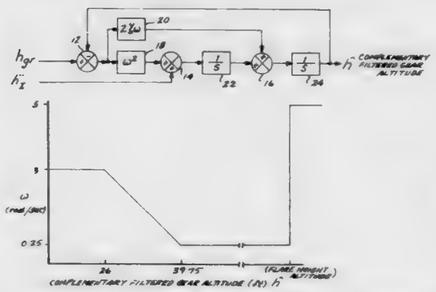
1. A method for supplying an aircraft landing gear altitude signal in an automatic landing system for use by said automatic landing system in controlling said aircraft during an automatic landing procedure, said method comprising:

estimating the position of said aircraft relative to the threshold of the runway at which said automatic landing procedure is being executed;

generating a complementary filtered signal representative of landing gear altitude by processing a radio altimeter based gear altitude signal and an inertial vertical acceleration signal; and

establishing the complementary filter frequency at a first

predetermined frequency when said estimated position of said aircraft is a first predetermined value and at a second

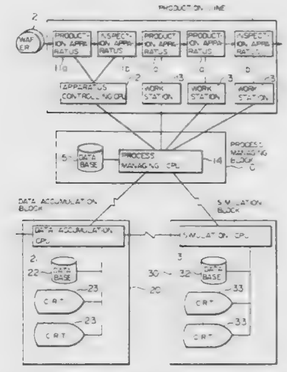


predetermined frequency when said estimated position of said aircraft is a second predetermined value.

5,111,404
METHOD FOR MANAGING PRODUCTION LINE PROCESSES

Norihiko Kotani, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 176,863, Apr. 1, 1988, Pat. No. 4,901,242. This application Dec. 7, 1989, Ser. No. 447,439
Claims priority, application Japan, Apr. 3, 1987, 62-83415
Int. Cl.[5] G06F *15/46;* **G05B** *13/04*
U.S. Cl. 364—468 **2 Claims**



1. A method for managing processes that are successively carried out by a plurality of individual apparatus in a production line to produce operational finished articles from unfinished articles comprising:

inputting a recipe to each of a plurality of individual production apparatus, each apparatus carrying out at least one process in a production line being supplied with unfinished articles at the beginning of the production line, producing partly finished articles in the production line and producing operational finished articles at the end of the production line;

monitoring data concerning at least one of the processes which has already been carried out on partially finished articles in accordance with at least one recipe;

simulating the operational characteristics of finished articles from the data concerning the partially finished articles and the recipes input to the production apparatus for producing finished articles from the partially finished articles;

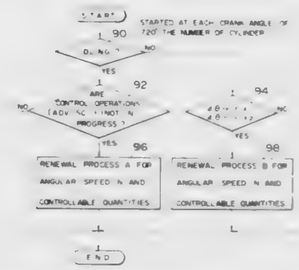
determining process conditions for the processes for production of finished articles from the partially finished articles in response to the simulation of operational characteristics to produce finished articles having desired operational characteristics; and

controlling the conditions in response to the determined process conditions of at least one process to be carried out to produce, from partially finished articles, finished articles having the desired operational characteristics.

5,111,405
ENGINE CONTROL SYSTEM

Yuji Maeda, Katsuta; Yozo Nakamura, Ibaraki; Kenichi Nakamura, and Masami Nagano, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1990, Ser. No. 534,948
Claims priority, application Japan, Jun. 13, 1989, 1-148411
Int. Cl.[5] G01M *15/00;* **F02D** *41/26*
U.S. Cl. 364—431.07 **12 Claims**



1. An engine control system of a type in which engine control data necessary for controlling at least one of ignition timing and fuel supply amount of an engine is calculated for each of a plurality of cylinders, said control system comprising:

rotation angular speed detection means for sequentially and independently detecting rotation angular speeds of the engine crankshaft during timing periods of substantially identical predetermined crankshaft rotation angle having a duration within 720/2N which straddle the point of highest crankshaft rotation speed for each cylinder (N indicating the number of cylinders of the engine); and

data calculation means for calculating rotation speed data for each cylinder in response to angular speeds detected by said rotation angular speed detection means during said timing periods which straddle only said point of highest crankshaft rotation speed, said engine control data being calculated by using the rotation speed-dependent data for each cylinder.

8. An engine control system according to claim **1**, wherein said timing periods of substantially identical predetermined crankshaft rotation angle are substantially centered at a mid position between the top and bottom dead centers of the combustion stroke.

5,111,406
METHOD FOR DETERMINING DRILL TARGET LOCATIONS IN A MULTILAYER BOARD PANEL

Julie C. Zachman; Robert A. Kuntz, both of Madison; Steven R. Smith, Verona, all of Wis., and James S. Hudzik, Billerica, Mass., assignors to Nicolet Instrument Corporation, Madison, Wis.

Filed Jan. 5, 1990, Ser. No. 462,393
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—474.02 **7 Claims**

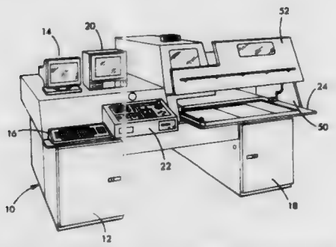
1. A method of determining locations for an x-y arrangement of holes to be drilled in a multilayer board panel in accordance with blueprint coordinates for solder pads and fiducial pads,

each of the holes being drilled through a z-axis stack of overlapping solder pads, the panel being constructed to have ideal drill coordinates located at the blueprint coordinates of the solder pads and having fiducial pads according to additional blueprint coordinates located at staggered locations in each layer of the panel so that there is no overlap of fiducial pads from one layer to another, the method comprising the steps of:

(a) preparing a fixture to have fixture holes that correspond with the blueprint coordinates of the fiducial pads of several layers of the multilayer board panel;

(b) storing the blueprint coordinates of the fiducial pads;

(c) mounting the panel upon the fixture in an absolute position relative to the fixture such that the fixture holes of the fixture and the fiducial pads of the panel are superimposed;



(d) examining the fixture holes of the fixture and the fiducial pads of the multilayer board panel with a radiation source and detector;

(e) computing an offset between the fixture holes and the fiducial pads by comparing the locations of the fixture holes and the correspondent fiducial pads of the panel that are superimposed on the fixture holes as seen by the detector;

(f) calculating a correction to be made on the ideal drill coordinates using the computed offsets to provide corrected drill coordinates; and

(g) drilling holes through the solder pads at the corrected drill coordinates.

5,111,407

SYSTEM FOR MEASURING AND RECORDING A UTILITY CONSUMPTION

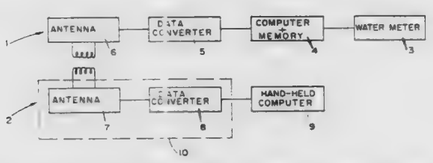
Natan Galpern, Hevel Megido, Israel, assignor to Arad Ltd., Kibbutz Daliah, Israel

Filed Aug. 21, 1990, Ser. No. 570,216

Claims priority, application Israel, Aug. 25, 1989, 91439

Int. Cl. G06F *15/56, 15/74*

U.S. Cl. 364—483 **11 Claims**



1. A system for measuring and recording a utility consumption, said system comprising a data-gathering system and an interrogation unit;

the data-gathering system including:

a meter having a unique identification code for measuring and displaying a metered utility consumption and producing successive electrical pulses representative of an increment thereof,

a sealed electronic module removably fixed to the meter and comprising:

a first computer electrically coupled to the meter and responsive to the electrical pulses produced thereby for computing a utility consumption,

a memory coupled to the first computer for storing data representative of said computed utility consumption and of said unique identification code,

a first bi-directional data converter coupled to the first computer for converting in one direction said data to a representative r.f. signal and for converting in the second direction an r.f. signal to representative digital data,

a first wideband coil antenna coupled to the data converter for transmitting and receiving an r.f. signal; and

a power source for providing electrical power to the sealed electronic module; and

the interrogation unit including:

a non-contact portable communications interface for coupling the data-gathering system to a second computer so as to permit the second computer to read data stored in the memory of the data gathering unit and to write data thereto thereby allowing the computed utility consumption to be conformed to the metered utility consumption; said non-contact portable communications interface comprising:

a second wideband coil antenna for communicating with the first coil antenna by mutual coupling,

a second bi-directional data converter coupled to the second antenna for converting in one direction a received r.f. signal to digital output data and for converting in a second direction digital input data to an r.f. output signal and being further provided with coupling means for coupling to the second computer, and

a power source for providing electrical power to the interrogation unit.

5,111,408

DIGITAL IMAGE DOCUMENTATION SYSTEM

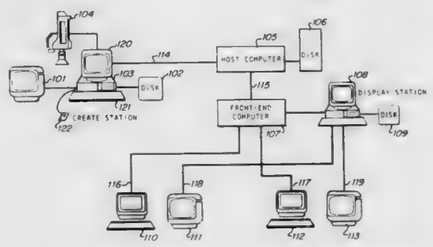
Kamran Amjadi, Citrus Heights, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 259,650, Oct. 19, 1988, abandoned.

This application Nov. 19, 1990, Ser. No. 617,298

Int. Cl. *G06F 15/46*

U.S. Cl. 364—514 **13 Claims**



1. A method for providing electronic documentation to a manufacturing technician about a manufacturing process, the method comprising the steps of:

(a) creating a high resolution color digital image of an article used in the manufacturing process;

(b) adding text to the high resolution color digital image;

(c) storing the high resolution color digital image with the added text; and,

(d) displaying the high resolution color digital image and the added text to the manufacturing technician during the manufacturing process.

5,111,409

AUTHORING AND USE SYSTEMS FOR SOUND SYNCHRONIZED ANIMATION

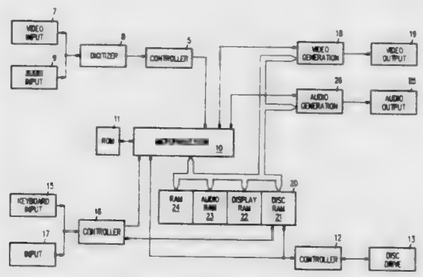
Elon Gasper, 12849 - 67th St., Bellevue, Wash. 98006, and Joseph H. Matthews, III., 16522 NE. 135th Pl., Redmond, Wash. 98052

Filed Jul. 21, 1989, Ser. No. 384,243

The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.

Int. Cl. *G09B 19/04*

U.S. Cl. 395—152 **13 Claims**



1. Apparatus for generating and displaying user created animated objects having synchronized visual and audio characteristics, said apparatus comprising:

a program-controlled microprocessor;

first means coupled to said microprocessor and responsive to user input signals for generation a first set of signals defining visual characteristics of a desired animated object;

second means coupled to said microprocessor and to said first means and responsive to user input signals for generating a second set of signals defining audio characteristics of said desired animated object; and

controller means coupled to said first and second means and to said microprocessor for generating a set of instructions collating and synchronizing said visual characteristics with said audio characteristics thereby defining said animated object having synchronized visual and audio characteristics.

5,111,410

MOTION ANALYZING/ADVISING SYSTEM

Mizuo Nakayama; Shigesumi Kuwajima, both of Tokyo; Takahito Suzuki, Kanagawa; Kazushi Miyake, Tokyo; Tsutomu Shibata, and Chikashi Seki, both of Kanagawa, all of Japan, assignors to Kabushiki Kaisha Oh-Yoh Keisoku Kenkyusho, Tokyo, Japan

Filed Jun. 25, 1990, Ser. No. 543,127

Claims priority, application Japan, Jun. 23, 1989, 1-161299; Mar. 22, 1990, 2-72841; Apr. 13, 1990, 2-98485

Int. Cl. *A61B 5/11;* **A63B** *69/36*

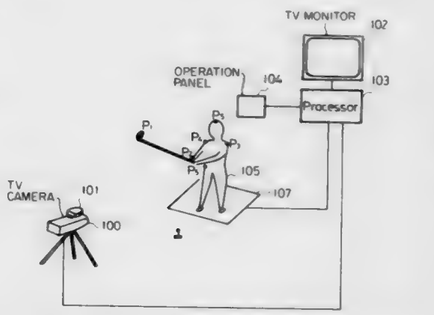
U.S. Cl. 364—551.01 **23 Claims**

16. A motion analyzing/advising system which monitors images of motions of a subject, comprising:

means to sample and convert the images of the motions of a subject into digital signals indicative thereof,

calculating means to extract coordinate data of one or more motion points from the converted digital signals,

trigger detector means to detect whether said motion points satisfy preset trigger conditions for starting, suspending or ending a measurement operation based on said coordinate data and to automatically provide an appropriate trigger signal when said preset trigger conditions are satisfied, and



means to start, suspend or end the measurement operation based on said trigger signal provided by said trigger detector means.

5,111,411

OBJECT SORTING SYSTEM

Arthur Browne, Horley, England, assignor to U.S. Philips Corporation, New York, N.Y.

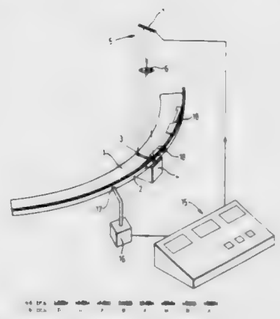
Continuation of Ser. No. 684,321, Dec. 20, 1984, abandoned.

This application Aug. 1, 1988, Ser. No. 226,565

Claims priority, application United Kingdom, Jan. 9, 1984, 8400436

Int. Cl. *G06K 9/38;* **G01N** *21/00*

U.S. Cl. 364—559 **17 Claims**



1. An object sorting device for solid objects that are presented in a limited plurality of allowed orientations in a plane with respect to a longitudinal axis in said plane, said device comprising:

means for moving said objects in a direction along said longitudinal axis;

means for scanning successive objects each in a raster format to derive a raster waveform of each object;

means for binarizing the waveform of an object into a two-dimensional array of binary pixels comprising rows along the direction of said longitudinal axis and columns transverse to said longitudinal axis;

feature extraction means for extracting selected features from the two-dimensional binary array to produce a one-dimensional array comprising a plurality of elements each representative of the information content of a corresponding said column of binary pixels, said feature extraction means comprising run counting means for counting runs of successive identical elements of said one-dimensional

array and for outputting only those runs having a predetermined minimum length at least equal to two to represent the selected features;

means fed by said feature extraction means for deriving a one-dimensional reference array from the scanning of a plurality of reference objects;

means for storing said reference array; and

comparison means receiving the output from said feature extraction means and said storage means for comparing within a predetermined tolerance the one-dimensional array of an unknown object with said one-dimensional reference array to produce a binary object sorting signal for sorting objects in an undesired orientation from said track.

5,111,412

COMPOSITE SENSING TRANSDUCER

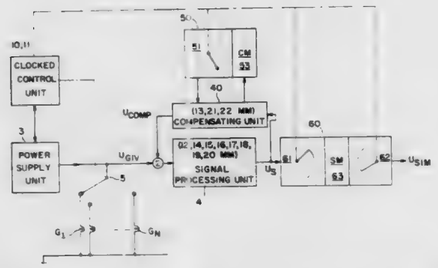
Bengt H. Törnblom, Västerås, Sweden, assignor to Tornbloms Kvalitetskontroll AB, Västerås, Sweden

Continuation of Ser. No. 152,545, Feb. 5, 1988, abandoned. This application Nov. 9, 1989, Ser. No. 434,504

Claims priority, application Sweden, Feb. 9, 1987, 8700472; Sep. 15, 1987, 8703555

Int. Cl.[5] G01N *27/90, 27/82*

U.S. Cl. 364—571.04 **20 Claims**



1. A device for monitoring a test object with respect to at least one detectable characteristic thereof, such as a crack, said device comprising:

a plurality of eddy current type transducers mounted so that each transducer monitors at least partially different adjacent regions of said test object to scan over a wider test object than covered by each region;

power supply means for energizing said plurality of transducers to generate respective output signals;

signal processsing means for processing and combining said output signals to provide a resultant output signal representing said at least one detectable characteristic from the monitoring of desired regions of said test object;

means for vector transformation of said resultant output signal to provide a vector transformed resultant output signal;

selector means for selectively sequentially feeding said respective output signals from each of said plurality of transducers to said signal processing means, to obtain said monitoring of desired regions of said test object;

a plurality of updatable memories for storing respective compensation data for each of said plurality of transducers;

means for compensating said respective output signals; and

memory selector means for selectively retrieving said respective compensation data from said plurality of updatable memories and selectively feeding said compensation data to said means for compensating.

5,111,413

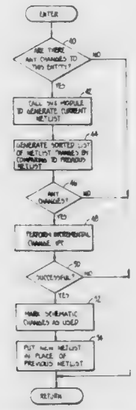
COMPUTER-AIDED ENGINEERING

Richard W. Lazansky, Pleasanton; Thomas R. Miller, Palo Alto; David R. Coelho, Fremont; Kenneth E. Scott, Fremont, and Alec G. Stanculescu, San Mateo, all of Calif., assignors to Vantage Analysis Systems, Inc., Fremont, Calif.

Filed Mar. 24, 1989, Ser. No. 328,427

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—578 **33 Claims**



1. In an appropriateiy programmed digital computer, a method of simulating electronic circuits comprising the steps of:

a) performing a simulation of a first circuit, said first circuit represented in a first netlist data structure, said first netlist data structure stored in storage in said computer, said simulation producing at least one response value at a first simulated time;

b) during said simulation of said first circuit:

i) inputting at least one change to said first circuit by entering said at least one change in a graphical schematic capture program executing on said computer, said graphical schematic capture program inputting user changes with a graphical user interface illustrating electrical components and their interconnections; and

ii) in response to said at least one change, modifying portions of said first netlist data structure affected by said change to produce a modified netlist data structure, said modified netlist data structure representing a second circuit; and

c) resuming said simulation at a next, later simulated time with said modified netlist data structure, said at least one response value at a first simulated time used in initiating said resumed simulation.

5,111,414

METHOD AND APPARATUS FOR TRUTH TABLE BASED NONCONTENDING OPTICAL CROSSBAR SWITCH

Raymond Arrathoon, 1409 Chestnut La., Rochester Hills, Mich. 48063

Continuation of Ser. No. 231,718, Aug. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 912,353, Sep. 26, 1986, Pat. No. 4,821,222. This application Oct. 15, 1990, Ser. No. 597,116

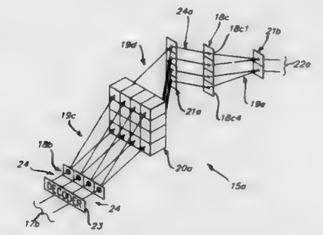
Int. Cl.[5] G06F *1/04*

U.S. Cl. 364—713 **21 Claims**

1. A truth table based hybrid optical/electronic noncontending N×M crossbar switch apparatus, comprising:

first means for converting N binary input electrical signals to N first optical outputs, where N is a positive integer having a value of at least 2;

a cross connection array having a plurality of spatially distinct locations generally arranged in M rows and N columns, where M is a positive integer having a value of at least 2, with each such location including an optical detector for transforming a first optical input received thereby into an electronic signal, internal electronic logic and an optical emitter for transforming an internal electronic signal into an optical output, with such internal electronic



logic selectably interconnecting the detector and the emitter of each such location;

first fiber optic coupling means for interconnecting the first means to the cross connection array such that at least one of the N optical outputs is fanned-out to each of the M rows of the cross connection array; and

second fiber optic coupling means for effecting a factor of N fan-in of optical signals from said cross connection array, including means for effecting M individual optical OR operations such that M output signals result.

5,111,415

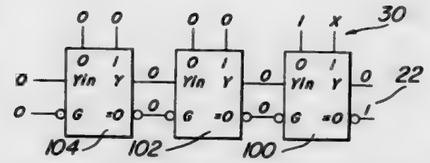
ASYNCHRONOUS LEADING ZERO COUNTER EMPLOYING ITERATIVE CELLULAR ARRAY

J. Barry Shackleford, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 6, 1989, Ser. No. 431,951

Int. Cl.[5] G06F *7/00*

U.S. Cl. 364—715.04 **35 Claims**



1. Leading zero detector comprising a cell including asynchronous logic circuitry having a pair of digital data inputs and a data output for providing an indication that a leading zero has been detected on the digital data inputs including a count of the number of leading zeros detected on the data inputs, the cell being cascadable with a selectable number of other like cells to incrementally increase a maximum count of the numbers of detected leading zeros.

5,111,416

PSEUDO RANDOM NOISE CODE GENERATOR FOR SELECTIVELY GENERATING A CODE OR ITS MIRROR IMAGE FROM COMMON DATA

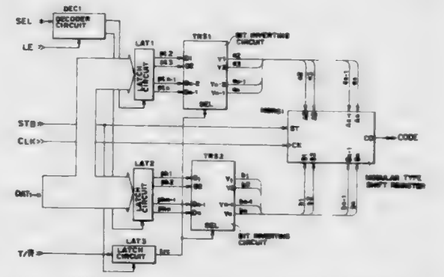
Masaaki Harada, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1990, Ser. No. 479,931

Claims priority, application Japan, Feb. 20, 1989, 1-38464; Feb. 20, 1989, 1-38465; Feb. 20, 1989, 1-38466

Int. Cl.[5] G06F *1/02*

U.S. Cl. 364—717 **11 Claims**



1. A pseudo random noise code generator comprising:

bit inverting means having an input to which is applied code data necessary for setting a predetermined code and having an output to which said bit inverting means selectively supplies one of said code data and mirror image code data for setting a mirror image code of said predetermined code; and

a shift register which is coupled to said output of said bit inverting means and which outputs a pseudo random noise code which is respectively said predetermined code and said mirror image of said predetermined code when said bit inverting means is respectively outputting said code data and said mirror image code data;

wherein said bit inverting means includes output selecting means which, when code data necessary for setting a code u is applied to said input of said bit inverting means, outputs the code data necessary for setting the code u when a control signal has a first state and inverts the bits of said code data and outputs mirror image code data for setting the mirror image code $\bar{u}$ of said code u when said control signal has a second state, so that it is possible to select to output one of the two codes which are mirror images of each other from common code data in response to said control signal.

5,111,417

DIGITAL FILTER SAMPLING RATE CONVERSION METHOD AND DEVICE

Jacques Belloc, Antibes; Claude Galand, Cagnes sur Mer; Emmanuel Lancon, Nice; Andre Milewski, Saint Paul, and Michel Quintin, La Gaude, all of France, assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 398,358, Aug. 24, 1989, abandoned. This application Jul. 19, 1990, Ser. No. 559,533

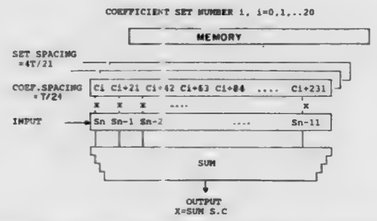
Claims priority, application European Pat. Off., Aug. 30, 1988, 88480021.0

Int. Cl.[5] G06F *15/31*

U.S. Cl. 364—724.1 **6 Claims**

1. A digital filter having a predefined impulse response h(t) for filtering an input signal sampled at a rate A into a filtered output signal sampled at a rate B, said filter including a shift register provided with taps, a set of multipliers, each multiplier having one input connected to one of said taps, adding means connected to said multipliers, and storage means for storing filter coefficients to be added to said multiplier inputs, said filter being characterized in that it includes:

means for sampling said filter having a predefined impulse response h(t), said sampling being conducted at a rate substantially equal to the lowest common multiple P of A and B, and deriving therefrom Np filter coefficients;
means for arranging a number N'p of said coefficients, N'p being substantially equal to Np, into sets of coefficients, Set(i);

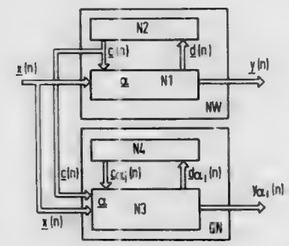


means for feeding said input signal samples into said shift register at said input rate; and
means for fetching sets of filter coefficients in a predetermined order and applying said coefficients to said multipliers at a rate B;
whereby the output samples are being generated at said B rate.

5,111,418
METHOD AND NETWORK CONFIGURATION FOR OBTAINING THE GRADIENT OF THE OUTPUT SIGNALS OF A GIVEN NETWORK FOR PROCESSING DISCRETE-TIME SIGNALS RELATING TO THE NETWORK PARAMETERS

Anton Kummert, Hattingen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 17, 1990, Ser. No. 525,163
Claims priority, application European Pat. Off., May 19, 1989, 89-109-086.2
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—724.19 **5 Claims**

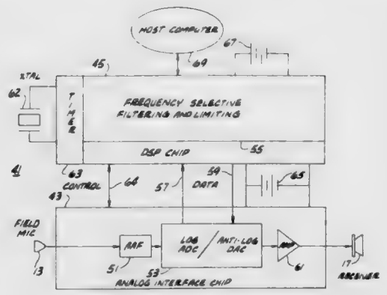


1. Method for obtaining a gradient of output signals of a network for processing discrete-time signals with respect to network parameters, the network including a first subnetwork having only delay-free elements, being acted upon by input signals and emitting output signals, and a second subnetwork having only time-lag elements, receiving signals from the first subnetwork and feeding back the signals with a delay to the first subnetwork, the method which comprises
forming further output signals each corresponding to the gradient of the output signals with respect to the network parameters, setting the further output signals equal to the sum of all of the signals produced by linking all of the input signals, all of the signals delayed by the second subnetwork and all of the network parameters through a first linking function, and of all of the signals being a result of the linkage of all of the input signals, all of the signals delayed by the second subnetwork, and all of the network parameters through a second linking function multiplied by internal signals being delayed in accordance with the second subnetwork;
setting the first linking function equal to the gradient of a transfer function of the first subnetwork with respect to the network parameters;
setting the second linking function equal to the gradient of the transfer function of the first subnetwork with respect to the signals delayed by the second subnetwork; and
setting the internal signals equal to the gradient of the signals supplied by the first subnetwork to the second subnetwork with respect to the network parameters.

5,111,419
ELECTRONIC FILTERS, SIGNAL CONVERSION APPARATUS, HEARING AIDS AND METHODS

Robert E. Morley, Jr., Richmond Heights; A. Maynard Engebretson, Ladue; George L. Engel, Crestwood, and Thomas J. Sullivan, Kirkwood, all of Mo., assignors to Central Institute for the Deaf, St. Louis, Mo.

Continuation-in-part of Ser. No. 172,266, Mar. 28, 1988, Pat. No. 5,016,280. This application Apr. 11, 1988, Ser. No. 180,170
Int. Cl.[5] G06F *15/31;* **H04R** *25/00*
U.S. Cl. 364—724.19 **46 Claims**

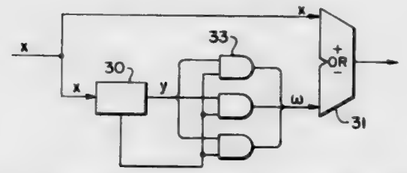


1. An electronic filter for filtering an electrical signal, comprising:
a filter having an input for receiving a signal to be filtered, having an output producing a filtered signal and having signal processing means including logarithmic filter means producing an intermediate output signal;
said filter having a plurality of filter stages having inputs and outputs coupled in cascade, each said filter stage filtering signals at its input according to electrical representations of filter parameters;
electronic control means coupled to said filter for altering the electrical representations to vary a value of each of said filter parameters in substantially constant percentage amounts of the value of that one of said filter parameters;
each said filter stage having means connected to it for storing its electrical representations of filter parameters;
each said filter stage including means for adding its electrical representations of the filter parameters to the signal at its input thereby producing a filter sum signal;
at least one of said filter stages including means for producing a filter signal in logarithmic form at its output by combining its filter sum signal with a signal from the output of one of the other filter stages; and
wherein said electronic filter further comprises means connected to said signal processing means for multiplexing its intermediate output signal with the electrical signal to be filtered and for providing the multiplexed signal to the input of said filter whereby said logarithmic filter means operates as both a logarithmic prefilter and a logarithmic postfilter.

5,111,420
ARITHMETIC UNIT USING A DIGITAL FILTER FORMING A DIGITAL SIGNAL PROCESSING SYSTEM WITH SIGNAL BYPASS

Tetsuro Kontani, Yokohama, Japan, assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Feb. 22, 1990, Ser. No. 483,585
Claims priority, application Japan, Feb. 23, 1989, 1-41893
Int. Cl.[5] G06F *7/38, 15/61*
U.S. Cl. 364—745 **8 Claims**

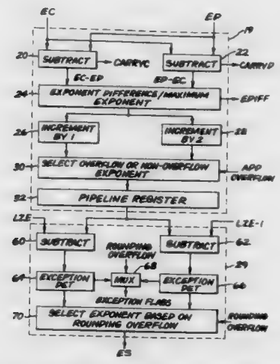


1. A digital signal processing system with signal bypass comprising:
an arithmetic unit having two inputs;
a digital filter having a signal input, a signal output and an overflow output;
means for providing an input signal to one input of the arithmetic unit and to the signal input of the digital filter;
means connected to the signal output and overflow output of the digital filter for connecting the signal output of the digital filter to the other input of the arithmetic unit unchanged, or changed to a zero level signal in response to the overflow output being active.

5,111,421
SYSTEM FOR PERFORMING ADDITION AND SUBTRACTION OF SIGNED MAGNITUDE FLOATING POINT BINARY NUMBERS

Karl J. Molnar, Clifton Park; Ho Chung-Yih, Schenectady; Daniel A. Staver, Scotia, and Barbara D. Molnar, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 26, 1990, Ser. No. 484,752
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—748 **11 Claims**

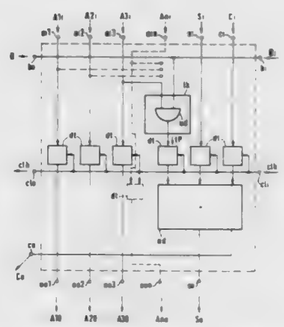


1. A system for adding or subtracting a pair of signed magnitude floating point binary numbers, each of said numbers including a sign field, a mantissa field, and an exponent field, said system comprising:
an exponent data path for selecting the larger of said exponent fields and for incrementing the larger of said exponent fields by one and by two;
a mantissa data path for determining the sum or difference of said mantissa fields and for determining an addition overflow and a rounding overflow to provide a result mantissa, said mantissa data path including means for determining the number of leading zeros LZE in the sum or difference of the mantissa fields;
first selecting means in said exponent data path for selecting the exponent field incremented by one if no addition overflow occurs and for selecting the exponent field incremented by two if an addition overflow occurs; and
second selecting means in said exponent data path for selecting the value of the incremented exponent field less the number of leading zeros LZE if no rounding overflow occurs and for selecting the value of the incremented exponent field less LZE-1 if a rounding overflow occurs, to provide a result exponent.

5,111,422
CIRCUIT ARRANGEMENT FOR CALCULATING PRODUCT SUMS

Manfred F. Ullrich, Denzlingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Sep. 4, 1990, Ser. No. 577,394
Claims priority, application European Pat. Off., Sep. 20, 1989, 89 117362
Int. Cl.[5] G06F *7/00, 7/52*
U.S. Cl. 364—750.5 **6 Claims**



1. Circuit arrangement for forming n products from two multidigit binary numbers Amn, Bkn and for adding said n products, where n is a positive integer greater than one, comprising:
an overall array of n parallel multipliers, each comprising a basic array of individual partial product rows formed by respective basic cells;
wherein the individual partial product rows of the n basic arrays are interleaved row by row so that the corresponding partial product rows of all n basic arrays are arranged one below the other in respective row groups of n partial product rows each, and
wherein the successive partial product rows of all of the successive row groups are interconnected in a pipeline configuration in which each basic cell of a partial product row has an input end connected to adjacent basic cells of the partial product row located thereabove, including a sum input, a carry input, and n A-coefficient inputs, a B-coefficient input connected to a preceeding adjacent basic cell of the same partial product row, an output end connected to adjacent basic cells of the partial product row located therebelow, including a sum output, a carry output, and n A-coefficient outputs, and a B-coefficient

output connected to a succeeding adjacent basic cell of the same partial product row, and

wherein each basic cell contains: a delay unit for each of n A-coefficients which are applied to the A-coefficient inputs, said delay units being controlled by a half clock signal; an undelayed through connection for a B-coefficient which is applied to the B-coefficient input; an adder fed via respective delay units with the sum signal applied to the sum input, the carry signal applied to the carry input, and a summation input; and a logic gate which combines the B-coefficient with the undelayed A-coefficients to form the partial product thereof and provides said partial product to the summation input of said adder.

5,111,423

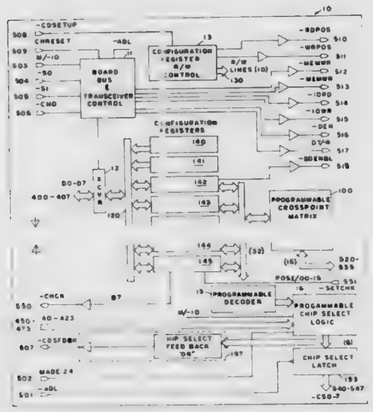
PROGRAMMABLE INTERFACE FOR COMPUTER SYSTEM PERIPHERAL CIRCUIT CARD

Stanley J. Kopec, Jr., San Jose; Yiu-Fai Chan, Saratoga, and Robert F. Hartmann, San Jose, all of Calif., assignors to Altera Corporation, San Jose, Calif.

Filed Jul. 21, 1988, Ser. No. 222,565

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—500 **19 Claims**



1. A programmable interface for use in a peripheral circuit card in a computer system for interfacing between said peripheral circuit card and a communications bus in said computer system, said peripheral circuit card having configuration registers for receiving from said computer system via said communications bus various characteristics of said peripheral circuit card, said peripheral circuit card further having at least one application circuit chip thereon, said characteristics including an address pointer for said at least one chip, said programmable interface being capable of being programmed by a user prior to assembling said interface into said peripheral circuit card, said programmable interface comprising:

address input means for supplying address signals to said interface from said communications bus;

data input means for supplying data signals to said interface from said communications bus;

mask means for storing a plurality of alternate user-definable address ranges for each of said at least one application circuit chip, said mask means having mask output means and being an erasable programmable read-only memory capable of being programmed by a user prior to assembling said interface into said peripheral circuit card;

activation means programmable by a user prior to assembling said interface into said peripheral circuit card, said user-programmable activation means being a programmable logic array, for reading said address pointer from said configuration registers for activating that one of said plurality of address ranges stored in said programmable mask means which corresponds to said address pointer from said configuration registers;

comparator means having first and second inputs and an output, said mask output means being coupled to said first input of said comparator means;

means for applying said address signals to said second input of said comparator means; and

means connected to said output of said comparator means for generating an enable signal to enable said at least one application circuit chip to act on said data signals when said output of said comparator means indicates that said address signals match said mask; whereby:

said programmable interface is capable of being programmed by programming said user-programmable mask means to store said at least one address range, thereby preparing said interface for assembling into said peripheral circuit card.

5,111,424

LOOKAHEAD BUS ARBITRATION SYSTEM WITH OVERRIDE OF CONDITIONAL ACCESS GRANTS BY BUS CYCLE EXTENSIONS FOR MULTICYCLE DATA TRANSFER

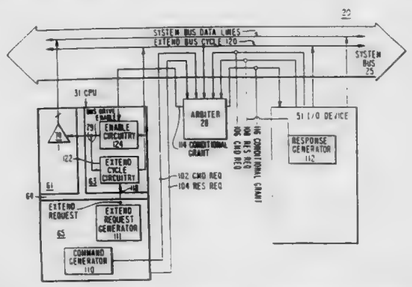
Darrel D. Donaldson, Lancaster, and Richard B. Gillett, Jr., Westford, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 44,490, May 1, 1987, Pat. No. 4,947,368. This application Feb. 23, 1990, Ser. No. 483,813

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

Int. Cl.[5] G06F *13/14, 13/36, 13/42, 15/16*

U.S. Cl. 395—725 **7 Claims**



1. A commander node coupled to a commander request line, a responder request line, and a grant line corresponding exclusively to the node, and coupled to each of a plurality of other nodes by a pended bus, wherein a node becomes a transmitter in order to transfer a message, including a command or including return data, on the pended bus during one or more cycles of the bus, wherein a commander node initiates a transaction on the pended bus by making a command transfer, wherein a responder node completes the transaction on the pended bus by making a return data transfer in response to the command transfer, and wherein a node can access the pended bus after the commander node initiates a transaction and before the responder node completes the transaction, the commander node comprising:

commander bus request means, coupled to the commander request line, for generating a commander bus request and transmitting the commander bus request on the commander request line at times when a command is to be transferred from the commander node onto the bus;

extend request means for generating an extend request for the commander node at times when the commander node requires more than one bus cycle to transfer a message;

extend cycle means, coupled to the extend request means, for activating an extend bus cycle signal when the commander node becomes a transmitter at times when the extend request for the commander node is present; and

bus access means, coupled to the grant line, for obtaining control of the pended bus to enable the commander node to become a transmitter during an initial access cycle, in response to receipt of a conditional bus grant on the grant line, at times when an extend bus cycle signal is not activated by any of the other nodes, and for maintaining control of the pended bus to enable the commander node to remain the transmitter during bus cycles succeeding the initial access cycle at times when the extend bus cycle signal is activated by the commander node.

5,111,425

SINGLE CHIP COMMUNICATION DATA PROCESSOR WITH DIRECT MEMORY ACCESS CONTROLLER HAVING A CHANNEL CONTROL CIRCUIT

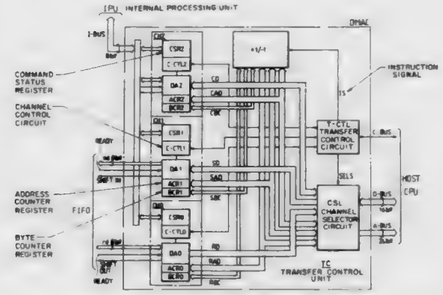
Yusuke Takeuchi, Ohme, and Sakae Miki, Komae, both of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Jan. 16, 1990, Ser. No. 465,028

Claims priority, application Japan, Jan. 23, 1989, 1-13511

Int. Cl.[5] G06F *13/28, 13/12*

U.S. Cl. 395—425 **6 Claims**



1. An integrated communication data processor for use with a host processor and a main memory device, said integrated communication data processor comprising:

an internal processing unit for executing communication processing in accordance with predetermined instructions;

a receiving means for receiving serial data inputted to the integrated communication data processor and for transforming the serial data into parallel data;

a receiving buffer means coupled to the receiving means for storing the parallel data and for providing the parallel data in units of bytes; and,

a direct memory access control means for transmitting the parallel data stored in the receiving buffer means to the main memory device, wherein the direct access memory control means transmits the parallel data independently of the internal processing unit, the direct memory access control means including:

an address register for storing address data transmitted by the host processor, said address data representing an address in the main memory device to which the parallel data will be transmitted;

an increment means for incrementing the address data when a parallel data byte is transmitted to the main memory device;

a byte count register for storing transfer byte count data transmitted by the host processor, said transfer byte count data representing the number of parallel data bytes to be transmitted to the main memory device;

a decrement means for decrementing the transfer byte count data when one parallel data byte is transmitted;

a control circuit means for overseeing the byte count data and for providing a status data based upon the transfer byte count data;

a data assembler for assembling the parallel data in units of two bytes before said parallel data is transferred to the main memory device and wherein the control circuit means controls the data assembler; and,

a status register means for storing the status data transmitted by the control circuit means, wherein said status data is polled by the internal processing unit.

5,111,426

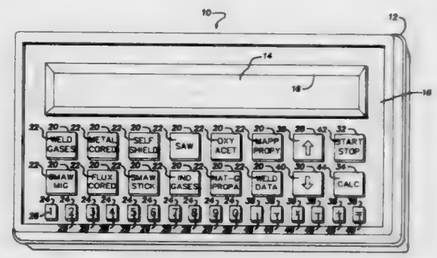
INSTRUCTIONAL DEVICE AND METHOD THEREOF

Arthur R. Bergstresser, Sr., 157 Edgewood Dr., Berea, Ohio 44017, and Edward Craig, 338 Siena Ct., Oshawa, Ontario, Canada L1J 6V5

Filed Mar. 23, 1989, Ser. No. 327,979

Int. Cl.[5] G06F *1/00;*

U.S. Cl. 395—600 **9 Claims**



1. In a portable electronic device for the display of reference information, said device having a digital data storage means containing said reference information, a keyboard having a plurality of keys, control means and display means, said keyboard, said digital data storage means and said display means being electrically connected to said control means, wherein said control means senses keys pushed and in response thereto retrieves a portion of said reference information from said digital data storage means and displays said portion of said reference information on said display means, said reference information being categorized into subsets and sub-areas of subsets, each subset having an index indicating the sub-areas of each subset, the improvement comprising:

at least one of said keys only operates to select display of the index of a particular subset of the reference information and has proximate indicia corresponding to the particular subset, said index further indicating by specific reference to specific indicia the keys to push to select the sub-areas;

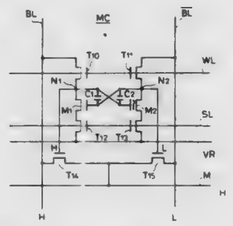
at least another one of said keys operates to select display of a desired sub-area of the particular subset as indicated by the index and having proximate specific indicia corresponding to said index; and

a start-and-stop key, wherein if said index or sub-area is larger than a page of the display means, said control means causes said display means to display a succession of page-sized parts of said index or sub-area, each part being displayed for a fixed delay time unless said start-and-stop key is pressed and said succession of parts continuing if said start-and-stop key is pressed again.

5,111,427
NONVOLATILE CONTENT-ADDRESSABLE MEMORY AND OPERATING METHOD THEREFOR

Kazuo Kobayashi; Yasushi Terada, and Takeshi Nakayama, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1989, Ser. No. 310,115
Claims priority, application Japan, Jun. 1, 1988, 63-136136
Int. Cl.[5] G11C *15/00, 11/00*
U.S. Cl. 365—49 **15 Claims**

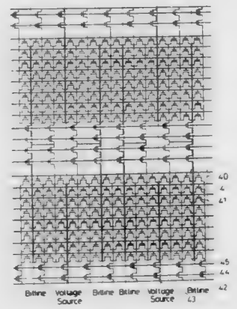


14. A nonvolatile CAM comprising:
a plurality of word lines,
a plurality of bit line pairs each comprising a first bit line and a second bit line and provided intersecting with said plurality of word lines,
a plurality of match lines provided corresponding to said plurality of word lines,
a plurality of memory cells each provided at an intersection of said plurality of word lines and said plurality of bit line pairs and having first and second storage nodes storing complementary information,
each of said plurality of memory cells comprising
capacitance means coupled between said first storage node and said second storage node,
first, information-writable and erasable nonvolatile memory means coupled to said first storage node,
second, information-writable and erasable nonvolatile memory means coupled to said second storage node,
first switching means responsive to a selecting signal applied to the corresponding word line for electrically connecting said first bit line with said first storage node,
second switching means responsive to a selecting signal applied to the corresponding word line for electrically connecting said second bit line with said second storage node, and
matching sense means for outputting a match signal to the corresponding match line when information applied to said first and second bit lines and information stored in said first and second storage nodes match with each other,
said nonvolatile CAM further comprising
first selecting means for selecting one of said plurality of word lines
second selecting means for selecting one of said plurality of bit line pairs,
writing means for writing information to said capacitance means in the memory cell provided at an intersection of the word line selected by said first selecting means and the bit line pair selected by said second selecting means,
reading means for reading out information from said capacitance means in the memory cell provided at an intersection of the word line selected by said first selecting means and the bit line pair selected by said second selecting means,
said writing means further comprising means for writing information to said first and second nonvolatile memory means in the memory cell provided at an intersection of the word line selected by said first selecting means and the bit line pair selected by said second selecting means,
said reading means further comprising means for reading out information from said first and second nonvolatile memory means in the memory cell provided at an intersection of the word line selected by said first selecting means and the bit line pair selected by said second selecting means,
searching means for applying search data to one or any of said plurality of bit line pairs and searching between the search data and data stored in said capacitance means in the memory cell connected to the bit line pair, and
said searching means further comprising means for applying search data to one or any of said plurality of bit line pairs and searching between the search data and data stored in said first and second nonvolatile memory means in the memory cell connected to the bit line pair.

5,111,428
HIGH DENSITY NOR TYPE READ ONLY MEMORY DATA CELL AND REFERENCE CELL NETWORK

Wei-Chen Liang, and I-Bin Lin, both of Hsin-Chu, Taiwan, assignors to Silicon Integrated Systems Corp., Taiwan

Filed Jul. 10, 1990, Ser. No. 550,578
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—104 **6 Claims**



1. A high density NOR type read only memory data cell and reference cell network comprising a data cell network coupled with a reference cell network, said data cell network being comprised of a plurality of groups of data cells each of which is comprised of a MOSFET which has a gate connected to a wordline, a source and a drain selectively connected to a bitline and a voltage source through a first buried conductor, said voltage source being a ground line or power line, wherein the sources of the MOSFETs of the same group are respectively connected together through a second buried conductor and the drains of which are respectively connected together through a third buried conductor to further couple with the connected sources through a NOR type connection to reduce space occupation, and wherein the data in the data cell network is identified by comparing the difference in electric current between the reference cell network and the data cell network.

5,111,429
SINGLE EVENT UPSET HARDENING CMOS MEMORY CIRCUIT

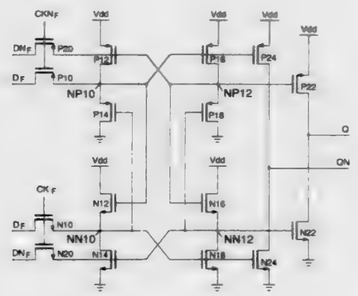
Sterling R. Whitaker, Moscow, Id., assignor to Idaho Research Foundation, Inc., Moscow, Id.

Filed Nov. 6, 1990, Ser. No. 609,583
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—156 **10 Claims**

1. A cross coupled storage cell for a single binary bit of information comprising:

a) first cross coupled means for storing the bit;

b) second cross coupled means for storing the bit; and

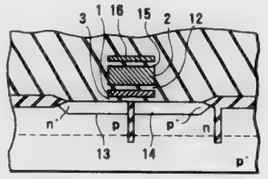


c) means for cross coupling the first cross coupled means to the second cross coupled means.

5,111,430
NON-VOLATILE MEMORY WITH HOT CARRIERS TRANSMITTED TO FLOATING GATE THROUGH CONTROL GATE

Takashi Morie, Kanagawa, Japan, assignor to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jun. 21, 1990, Ser. No. 541,911
Claims priority, application Japan, Jun. 22, 1989, 1-158381; Apr. 16, 1990, 2-97578
Int. Cl.[5] G11C *11/34*
U.S. Cl. 365—185 **15 Claims**

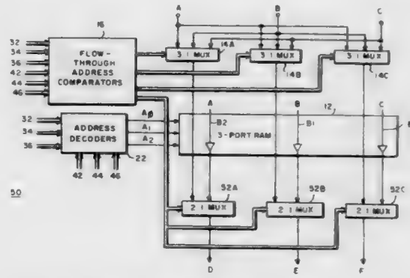


1. A non-volatile semiconductor memory device comprising:
means for injecting a first type of charges, said means for injecting a first type of charges comprising:
a first charge injecting electrode;
a first insulating film formed on said charge injecting electrode for passing a tunnel current;
a first control electrode formed on said first insulating film,
wherein said first charge injecting electrode, said first insulating film and said first control electrode are formed overlapping at least in a first overlap region;
a second insulating film formed on said first control electrode; and
a floating electrode formed on said second insulating film;
means for sensing an amount of total charges stored in said floating electrode,
wherein said second insulating film and said electrode are formed overlapping at least on said first overlap region, and
wherein said first charge injecting electrode is connected to a high potential and said first charge injecting electrode emits said first type of charges, and said first type of charges is stored in said floating electrode, said first type of charges is injected into and stored in said floating electrode through said first insulating film, said first control electrode and said second insulating film.

5,111,431
REGISTER FORWARDING MULTI-PORT REGISTER FILE

Douglas Garde, Dover, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Nov. 2, 1990, Ser. No. 608,294
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—129.02 **8 Claims**



1. A multi-port RAM register file comprising:
a. a read/write memory (RAM) having a plurality of bit storage cells and a plurality of bit buses over which data may be written to or read from said bit storage cells, and, for each bit bus, a corresponding RAM output port the number of RAM output ports being identified by the variable "n";
b. a plurality of input multiplexers, each having multiple inputs and an output, the number of such inputs corresponding to the number of input ports to be provided;
c. each input of said input multiplexers being connected to a register file input port, such that each input multiplexer has an input connected to each of the input ports;
d. n two input output multiplexers, each having one input connected to a different one of said bit buses and another input connected to the output of a different one of the input multiplexers;
e. a plurality of register file output ports, each output port being connected to the output of one of the output multiplexers; and
f. flow-through address comparator means for controlling the input and output multiplexers.

5,111,432
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH POWER CONSUMPTION REDUCING ARRANGEMENT

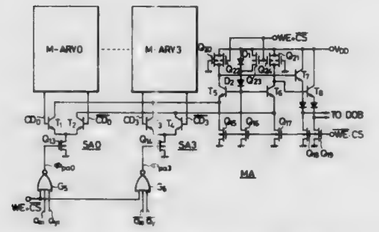
Shuichi Miyaoka, Fucyu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 259,459, Oct. 14, 1988, abandoned, which is a continuation of Ser. No. 686,600, Dec. 26, 1984, abandoned. This application Mar. 12, 1990, Ser. No. 492,329
Claims priority, application Japan, Dec. 26, 1983, 58-243807
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—190 **23 Claims**

1. A semiconductor integrated circuit device comprising bipolar transistors that generate output signals at their collectors only during a period of their operation and one or more first MOSFETs controlled by a control signal to be conductive to serve as current sources to supply operation currents to said bipolar transistors only during the periods of their operation so that said bipolar transistors generate said output signals only

when said first MOSFETs are rendered conductive by said control signal,

wherein said bipolar transistors are differential transistors which receive read signals from memory cells and wherein said first MOSFETs are coupled to common emitters of said differential transistors to form said operation currents for said bipolar transistors according to reach control signals applied to said first MOSFETs as said control signal, and



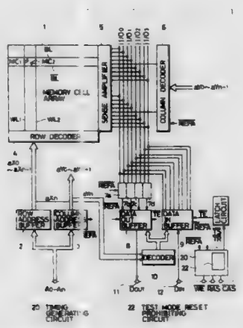
wherein said collector output signal of said differential transistors is amplified by an amplifier circuit which is comprised of a bipolar transistor that works as an amplifier element and a second MOSFET which is turned on only during an operation period thereof and which constitutes a current source for said amplifier circuit bipolar transistor.

5,111,433

SEMICONDUCTOR MEMORY DEVICE WITH INHIBITING TEST MODE CANCELLATION AND OPERATING METHOD THEREOF

Hiroshi Miyamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1990, Ser. No. 515,501
Claims priority, application Japan, May 8, 1989, 1-114529
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—201 **17 Claims**



1. A semiconductor memory device selectively controllable for read and write operations in a normal mode and a test mode, comprising:

control means responsive to at least one externally applied control signal for setting said semiconductor device in said test mode and for cancelling said test mode;

means for setting said semiconductor memory device in a refresh operation state during said normal mode or said test mode;

state hold means responsive to a read operation or write operation occurring before said refresh operation for being set in a predetermined state; and

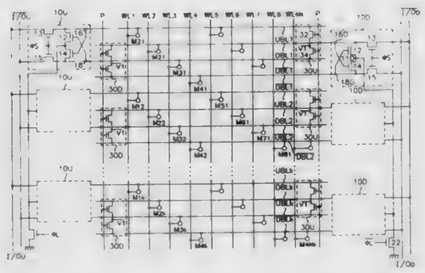
inhibiting means for inhibiting said control means from cancelling said test mode when said state hold means is in said predetermined state.

5,111,434

SEMICONDUCTOR MEMORY DEVICE

Soon-In Cho, Seoul, Rep. of Korea, assignor to Ltd. SamSung Electronics Co., Suwon, Rep. of Korea

Filed May 31, 1989, Ser. No. 359,128
Claims priority, application Rep. of Korea, Dec. 20, 1988, 1988-17050
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—207 **14 Claims**



1. A semiconductor dynamic random access memory, comprising:

a plurality of bit lines arranged in parallel to each other for providing a plurality of even numbered bit line pairs and a plurality of odd numbered bit line pairs;

a plurality of word lines intersecting said plurality of bit lines;

a plurality of upper sense amplifiers respectively connected to lowermost ends of each of even numbered bit line pairs;

a plurality of lower sense amplifiers respectively connected to lowermost ends of each of even numbered bit line pairs;

a memory cell array having a plurality of memory cells arranged sequentially in a diagonal line within selected locations of a plurality of spacings formed by intersection of said bit lines and word lines, said memory cell being disposed at every fourth spacing in a row and a column;

first latching means connected with said upper sense amplifiers, for activating said upper sense amplifiers; and

second latching means connected with said lower sense amplifiers, for activating said upper sense amplifiers, said first latching means and said second latching means being alternatively activated to each other.

5,111,435

BIPOLAR-CMOS SEMICONDUCTOR MEMORY DEVICE

Junichi Miyamoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 167,174, Mar. 11, 1988, abandoned. This application Feb. 8, 1991, Ser. No. 652,491
Claims priority, application Japan, Mar. 31, 1987, 62-79178
Int. Cl.[5] G11C *8/00*
U.S. Cl. 365—230.06 **9 Claims**

1. A semiconductor memory device comprising:

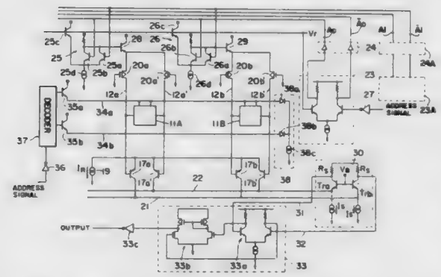
a memory cell array comprising MOS type memory cells arranged in a matrix manner;

a plurality of bit line pairs for connecting respective ones of said MOS type memory cells in a column direction;

a plurality of bipolar transistors connected to said bit line pairs, respectively, the bases thereof being connected to corresponding ones of said bit lines, the emitters thereof being commonly connected;

a constant current source being connected to the common

connection of said emitters of said plurality of bipolar transistors; and



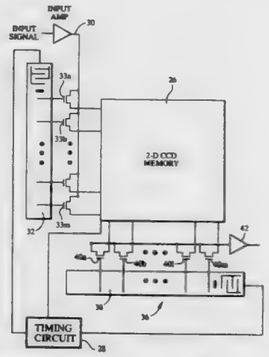
column select means for selecting one column of MOS type memory cells by raising or lowering potentials on the bit lines of a selected pair of said plural pairs of bit lines from those on the bit lines of non-selected pairs thereof.

5,111,436

2D CHARGE COUPLED DEVICE MEMORY WITH ACOUSTIC CHARGE TRANSPORT MULTIPLEXER

Nikola S. Subotic, 1760 Traver Rd., Ann Arbor, Mich. 48105, and Michael T. Eismann, 890 Lambkins, Saline, Mich. 48176

Filed Oct. 17, 1990, Ser. No. 598,967
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—238 **14 Claims**



13. A corner-turn memory, comprising:

a two dimensional CCD array having N rows and M columns of elements;

driver means for said array operative, in a first mode, to transfer charges between adjacent columns of the array and, in a second mode, to transfer charges between adjacent rows of the array;

an ACT input multiplexer having M equally spaced taps, each tap being connected to a cell in a border column of the ACT device;

a second ACT device having N equally spaced taps, each associated with one cell in a border row of said ACT device;

N electronic switches, each associated with one cell of said border row of said CCD array;

N electronic switches, each being associated with one cell of said border row of the CCD array and one tap of said second ACT device, the taps of said second ACT device being connected to the trigger elements of the associated switch and the cells of said row of said CCD array being connected to the one pole of each of said switches;

a summing unit having inputs from all of the second poles of said switching devices;

means for providing an input serial signal to said first ACT device;

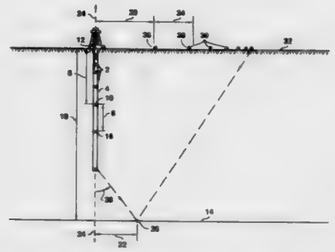
means for generating an impulse signal at the input of said second ACT device in time relation to the transfer of charges, by said driver, from row to row of said CCD array.

5,111,437

METHOD FOR POSITIONING SEISMIC SOURCES TO FLATTEN CDP FOLD IN VSP SURVEYS

James A. Rice, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Aug. 5, 1991, Ser. No. 739,951
Int. Cl.[5] G01J *1/36*
U.S. Cl. 367—57 **60 Claims**



1. A system for sending and receiving seismic signals, which comprises:

a. a plurality of seismic sources positioned along or near the surface of the earth; and

b. a plurality of seismic receivers positioned in a wellbore, said plurality of seismic receivers being positioned so that a first distance between a pair of adjacent seismic receivers increases exponentially as a second distance from the closer of the pair of adjacent seismic receivers to the intercept of the wellbore with the surface increases.

5,111,438

METHOD OF ACOUSTIC PROCESSING FOR ACOUSTIC IMAGE CLASSIFICATION

James G. Kelly, Newport, and Robert N. Carpenter, Portsmouth, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 28, 1991, Ser. No. 783,665
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—87 **5 Claims**

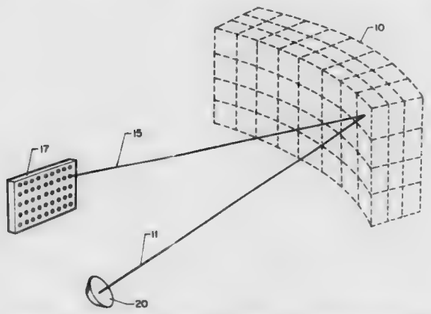
1. A method of using active sonar in an underwater environment to classify an i-th target from a set of I possible targets, comprising the steps of:

a) transmitting an acoustic waveform $f(t_1)$ having finite energy E, over a period of time $t_1=0$ to T, into a test volume of water, said test volume being divided into M test cells, each of said test cells occupying a location m, m=1 to M, in said test volume, each of said test cells at said location m further having exactly one scattering coefficient a_{im}, i=1 to I, wherein the i-th target has a scattering coefficient vector a_i such that

$$a_{im}=[a_i]_m;$$

b) providing a database of M×M covariance matrices K_{ai}, i=1 to I, for each of said I possible targets;

c) receiving an acoustic waveform vector $x(t_2)$, over a period of time $t_2=T_1$ to T_2 where $T_1>T$, with an acoustic receive array having N acoustic sensors, said received acoustic waveform vector $x(t_2)$ having a corresponding



signal component vector $s(t_2)$ and a corresponding noise component vector $n(t_2)$, wherein said signal component vector $s(t_2)$ at an n-th sensor of said N acoustic sensors for the i-th target is $s_{in}(t_2)$ and is represented by a signal model

$$\sum_{m=1}^{M} a_{im} f(\beta_{im}(t_2 - \tau_{nm}))$$

i=1 to I and n=1 to N,

wherein τ_{nm} is a time delay for said transmitted acoustic waveform to travel to an m-th test cell location and back to the n-th sensor, β_{im} is the Doppler effect of any relative motion temporal adjustment in the received waveform and $f(\beta_{im}(t_2-\tau_{nm}))$ is said transmitted acoustic waveform compensated by said relative motion temporal adjustment;

d) estimating a scattering coefficient vector $\hat{a}_i$, i=1 to I, for each of said I possible targets according to the equation

$$K_{ai}\left[ID + \left(\frac{2NE}{N_o}\phi K_{ai}\right]^{-1}\right]\left[\frac{2}{N_o}\int_{T_1}^{T_2} F \quad f(t_2) \times (t_2)\, dt_2\right]$$

wherein,

ID is an M×M identity matrix,

N_o is a noise spectrum level due to background acoustic or electronic noise,

ϕ is an M×M waveform correlation matrix described by the equation

$$\frac{1}{NE}\int_{T_1}^{T_2} F \quad f(t_2)\, F f(t_2)\, dt_2$$

wherein $F f(t_2)$ is a N×M matrix having an n-th and m-th element such that

$$[F f(t_2)]_{nm} = f(\beta_{im}(t_2 - \tau_{nm}))$$

and $F \quad i(t_2)$ is the complex conjugate-transpose of $F_i T_2$);

e) estimating a signal component vector $\quad i(t_2)$, i=1 to I, for each of said I possible targets from said estimated scattering coefficient vector $\hat{a}_i$ using said signal model; and

f) correlating said estimated signal component vector $s_i(t_2)$, i=1 to I, with said received acoustic waveform vector $x(t_2)$ for each of said I possible targets wherein said correlation is indicative of the target to be classified.

5,111,439

CHRONOMETER WITH TIDE INDICATING MEANS

Raoul-Henri Erard, 4,rue de Chalet, 2301 La Chaux-De-Fonds, France

Filed Jun. 4, 1990, Ser. No. 532,699
Int. Cl.[5] G04B *19/26*
U.S. Cl. 368—19 **13 Claims**



1. A chronometer having the tide grid comprising a contour line indicating at least one complete tide cycle and a superposed reading grid comprising at least one read-off reference mark, one of said grids being driven in rotation at a constant angular speed about an axis, said grids being concentric about said axis and said read-off reference mark being radially disposed relative to said axis, said contour line indicating tides on polar coordinates such that the distance of a point on said contour line from said axis indicates the height of the tide, said radial read-off reference mark intersecting said contour line at a point which indicates the height of the tide for the time shown by the chronometer for a specific geographical location.

5,111,440

AN APPARATUS FOR CONTROLLING THE ROTATION AND STABILIZING THE POSITION OF A MAGNET DEVICE

Gerardus L. Mathildus, Cascade; Matthew W. Hecht, Louisville, and Robert A. Briones, Colorado Springs, all of Colo., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 188,261, Apr. 29, 1988, Pat. No. 4,962,492. This application Oct. 5, 1990, Ser. No. 593,245
Int. Cl.[5] G11B *11/12, 13/04*
U.S. Cl. 369—13 **6 Claims**

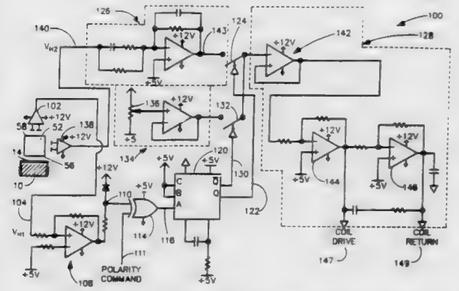
1. An apparatus for controlling the rotation and stabilizing the position of a magnet device positioned between first and second actuators in a magneto-optic recording system when said first and second actuators are activated by applying power thereto, comprising:

common drive circuitry means for supplying power to each of the first and second actuators;

first circuitry means for inputting a first signal to said common drive circuitry means to stabilize the position of the magnet device with respect to the surface of a magneto-optical recording medium in said recording system, said first signal being selectively applied to said common drive circuitry means;

second circuitry means for inputting a second signal to said common drive circuitry means to control the rotation of the magnet device with respect to the surface of said magneto-optical recording medium, said second signal being selectively applied to said common drive circuitry means; and

third means for selectively electrically coupling one of said first circuitry means and said second circuitry means to said common drive circuitry means, wherein only one of



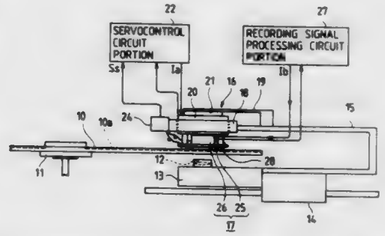
said first and second circuitry means is electrically connected to said common drive circuitry means at one time whereby only one of said first signal and said second signal is applied to said common drive circuitry means at any one time.

5,111,441

APPARATUS FOR GENERATING MAGNETIC FIELD VARYING IN RESPONSE TO AN INFORMATION SIGNAL

Hiroshi Eto, Tokyo; Nobuyuki Oka, Kanagawa, and Takehiro Nagaki, Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 5, 1991, Ser. No. 650,607
Claims priority, application Japan, Feb. 6, 1990, 2-26861
Int. Cl.[5] G11B *11/00, 13/00, 5/02, 15/04*
U.S. Cl. 369—13 **4 Claims**



1. An apparatus for generating a magnetic field varying in response to a varying information signal, the apparatus comprising:

a base plate made of electrical insulating material,

a magnetic core mounted on one surface of said base plate, said magnetic core having a central leg portion extending through a hole formed in said base plate so as to cause and end face of said central leg portion to be located substantially coplanar with a surface of said base plate opposite said one surface on which said magnetic core is mounted,

coil means wound on the central leg portion of said magnetic core and supplied with said varying information signal, and

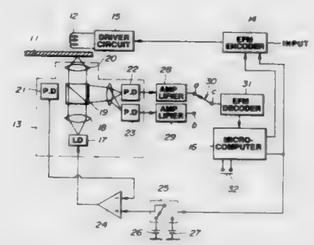
capacitance detecting electrode means formed as a thin conductive layer attached to the opposite surface of said base plate for opposition to a recording medium having a conductive layer, said thin conductive layer of said capacitance detecting electrode means surrounding and being spaced apart from said end face of said magnetic core, and said capacitance detecting electrode means being provided with means for restraining eddy current loss caused in said capacitance detecting electrode means.

5,111,442

RECORDABLE OPTICAL DISC STORAGE DEVICE WITH LIMITED STORAGE CAPACITY, AND RECORDING APPARATUS THEREFOR

Heitaro Nakajima, Tokyo; Masahiro Hotori; Hiroshi Ogawa, both of Kanagawa, and Kazuhiko Fujiie, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 15, 1989, Ser. No. 408,079
Claims priority, application Japan, Sep. 20, 1988, 63-235442; Sep. 24, 1988, 63-125000[U]
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—47 **12 Claims**



1. An apparatus for recording signals on an optical disc comprising

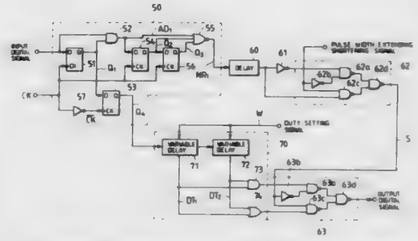
means for reproducing the number of times of possible recording or the cumulative possible recording time duration recorded on an unrewritable region of the disc and means for inhibiting the recording operation when the number of times of recording or the cumulative recording time duration exceeds the number of times of possible recording or the cumulative possible recording time duration.

5,111,443

OPTICAL RECORDING APPARATUS

Fumihiko Yokogawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 344,886, Apr. 28, 1989, abandoned. This application Aug. 12, 1991, Ser. No. 745,966
Claims priority, application Japan, Nov. 2, 1988, 63-278200
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—54 **8 Claims**



1. An optical recording apparatus for recording pulse signals on an optical recording medium, said pulse signals comprising pulses of several bit lengths representing information content, said apparatus comprising:

pulse signal time length detecting means for detecting a length of an input pulse and determining whether said input pulse is longer than a predetermined length, and for

outputting a control signal, said control signal having at least one of a first level and a second level based on a length of said input pulse, said first level indicating said input pulse is longer than said predetermined length and said second level indicating said input pulse is shorter than or equal to said predetermined length;

control signal receiving means for receiving said control signal from said pulse signal time length detecting means, and for determining a level of said control signal; and

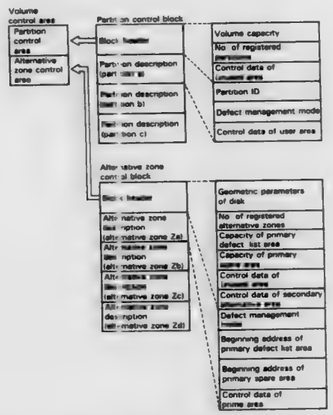
pulse length altering means, coupled to said control signal receiving means, for selectively extending the length of said input pulses when said control signal received by said control signal receiving means has said second level, and for shortening the length of said input pulses when said control signal outputted by said pulse signal time length detecting means and received by said control signal receiving means has said first level.

5,111,444

METHOD OF MANAGING DEFECTIVE SECTORS IN A DISK-SHAPED INFORMATION RECORDING MEDIUM AND AN APPARATUS FOR PERFORMING THE SAME

Yoshihisa Fukushima, Osaka, and Isao Satoh, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 13, 1989, Ser. No. 379,462
Claims priority, application Japan, Jul. 13, 1988, 63-174518
Int. Cl.[5] G11B *3/90*
U.S. Cl. 369—58 **22 Claims**



1. A method of managing defective sectors in a disk-shaped information recording medium in which the recording and reproducing of information are conducted in units of a sector, each sector being divided into one or more partitions, the file management being conducted in units of partition, comprising the steps of:

allocating at least one primary alternative zone in said information recording medium, said alternative zone comprising: a prime area for recording user data, said prime area having a variable capacity which corresponds to the occurrence rate of defective sectors and to a user capacity allocated to a partition; a primary spare area for recording alternative sectors which substitute for defective sectors; and a primary defect list area for recording a primary defect list of a fixed length, said primary defect list holding the relationship between defective sectors and alternative sectors,

managing defective sectors in units of an alternative zone by substituting the defective sectors detected in said prime area with alternative sectors in said primary spare area, and by registering the defective sectors in said primary defect list,

allocating a secondary alternative zone in said information recording medium, said secondary alternative zone comprising: a secondary spare area for recording alternative sectors for substituting for defective sectors which overflow from said at least one primary alternative zone; and a secondary defect list area for recording a secondary defect list which holds the relationship between defective sectors and alternative sectors in said secondary spare area,

managing hierarchically defective sectors by substituting defective sectors which overflow from said at least one primary alternative zone, with alternative sectors in said secondary alternative zone, and by registering the defective sectors in said secondary defect list, and

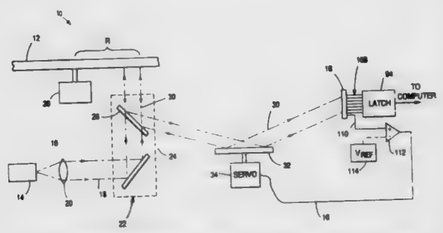
managing all area formed in the volume of said information recording medium by allocating a volume control area in said information recording medium, and by recording volume control data in said volume control area, said volume control data including control data of said at least one primary alternative zone, said partitions, said secondary alternative zone and an unused area.

5,111,445

HOLOGRAPHIC INFORMATION STORAGE SYSTEM

Demetri Psaltis; Alan Yamamura, both of Pasadena, Calif., and Seiji Kobayashi, Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 17, 1989, Ser. No. 438,576
Int. Cl.[5] G11B *7/18, 7/12*
U.S. Cl. 369—103 **28 Claims**



1. A holograhic, parallel read-out information storage system comprising:

an optical memory disk on which are previously recorded a plurality of coaxial tracks and a plurality of radially contiguous individual holograms, each hologram being representative of a predetermined data pattern and positioned along at least one of the tracks, wherein each of the radially contiguous holograms is recorded as a Fourier transform hologram with respect to the direction (y direction) tangential to the tracks and as a Fresnel hologram with respect to the radial direction (x direction), i.e. perpendicular to the tangential direction of the tracks;

means for rotating the optical memory disk about an axis;

an optical system for illuminating the optical memory disk with a read-out beam, the read-out beam being at least partially reflected from the optical memory disk;

detector means for detecting the reflected read-out beam, the detector means including an array of photosensitive detector pixels for generating corresponding electrical data signal; and

latch means for latching he data signals when the read-out beam illuminates one of he holograms, the latching occurring when the reflected read-out beam projects a complete image of he hologram under illumination onto the array of detector pixels.

5,111,446

DISK CARTRIDGE AND DISK DRIVE

Minoru Fujita, Toride, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Mar. 7, 1989, Ser. No. 319,669
Claims priority, application Japan, Mar. 8, 1988, 63-52557
Int. Cl.[5] G11B *7/26, 23/03, 23/00*
U.S. Cl. 369—291 **11 Claims**



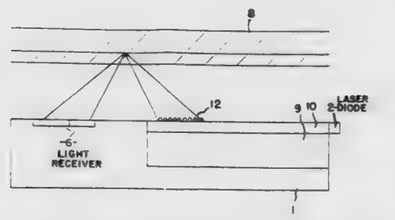
1. A disk cartridge including a case assembly rotatably accommodating therein a magnetic disk including a metallic center hub having a center hole therethrough, said case assembly comprising an upper case without a center opening and a lower case having a center opening therein, said upper case being provided with a projection protruding from a center portion of an inner surface of said upper case beyond a lower surface of said hub through said center hole thereof such that said projection abuts against a spindle member of a disk drive which projects through said center opening of said lower case so as to rotatably support said hub of said magnetic disk.

5,111,447

INTEGRAL PICK UP FOR AN OPTICAL DIGITAL DISC USING SAW DEFLECTION AND LENSE

Tsukasa Yamashita, Nara; Nobuhisa Inoue, Kyoto; Mori Kazuhiko, Osaka; Masaharu Matano, and Isao Taguchi, both of Nagaokakyo, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 397,635, Aug. 24, 1989, abandoned, which is a continuation of Ser. No. 168,249, Mar. 15, 1988, abandoned, which is a division of Ser. No. 559,060, Oct. 13, 1983, Pat. No. 4,747,090. This application Jul. 5, 1990, Ser. No. 548,203
Claims priority, application Japan, Oct. 14, 1982, 57-180257; Oct. 29, 1982, 57-190645
Int. Cl.[5] G11B *7/135, 7/09;* **G02B** *6/12*
U.S. Cl. 369—44.12 **11 Claims**



8. An optical pickup for a data storage medium, comprising:

a base plate, formed with a light transmission path thereon defining a first plane;

light emitting means for projecting a light beam into said light transmission path in said first plane;

grating means, located in said first plane, for projecting said light beam outside said first plane and toward the data storage medium disposed above said light emitting means at an oblique direction; and

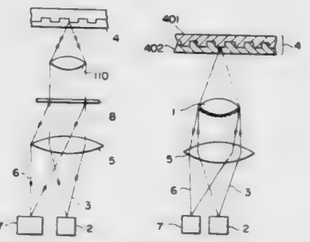
light receiving means, located in said first plane, for receiving a light beam reflected from said data storage medium at another oblique direction.

5,111,448

OPTICAL PICKUP HEAD HAVING A HOLOGRAM-ASSOCIATED OBJECTIVE LENS AND OPTICAL INFORMATION PROCESSING APPARATUS USING THE SAME

Yoshiaki Komma, Neyagawa; Shinichi Kadowaki, Hirakata; Makoto Kato, Nishinomiya, and Tetsuo Saimi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 6, 1989, Ser. No. 362,095
Claims priority, application Japan, Jun. 9, 1988, 63-142120
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.23 **8 Claims**



1. An optical pickup head, comprising:

a radiation light source for emitting a light beam;

a hologram-integrated lens means comprising a hologram formed directly on a conventional refraction-type lens to be integral therewith, for receiving said light beam emitted from said radiation light source and converging the light beam on an optical disc, said hologram comprising means for generating a diffraction light beam when light reflected from said optical disc is incident on said hologram-integrated lens means; and

a photodetector means, responsive to a first beam portion of said diffraction light beam, for producing an output signal comprising a focusing error component, for effecting focusing servo control of said optical disc, said first beam portion including two spherical wave fronts having focal points positioned respectively on front and rear sides of a light receiving plane of said photodetector means when said diffraction light beam is received by said photodetector means, said output signal being proportional to the intensity of the diffraction light beam, and

said radiation light source and said photodetector means being disposed adjacent to each other in a plane oriented generally normal to a propagation direction of said light beam emitted by said radiation source.

5,111,449

OPTICAL PICK-UP DEVICE USING DIFFRACTION GRATING ELEMENT HAVING TWO SUB-REGIONS

Yukio Kurata; Yoshio Yoshida, both of Tenri, and Toshiya Nagahama, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 340,442, Apr. 19, 1989, abandoned. This application May 11, 1990, Ser. No. 522,631
Claims priority, application Japan, Apr. 20, 1988, 63-97496
Int. Cl.[5] G11B *7/00, 7/013*
U.S. Cl. 369—44.37 **8 Claims**

1. An optical pick-up device comprising:

a light emitting element for emitting a light beam;

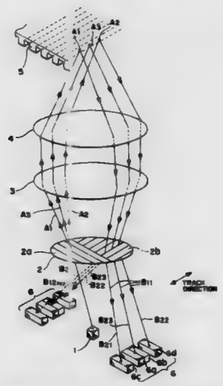
an optical system for focusing said light beam onto a recording medium and also for focusing said light beam reflected from said recording medium back through said optical system;

photo-detecting means for producing a tracking error signal and a focusing error signal from said reflected beam;

diffracting means for diffracting said light beam toward said

recording medium and for diffracting said reflected beam onto said photo-detecting means;

wherein said diffracting means, positioned before said light emitting element and said photo-detecting means, produces two sub-spots in two directions for applying the 3-spot method from said light beam projected by said light emitting element toward said recording medium, and including a first sub-region and a second sub-region



formed in the same plane and defined by a parting line aligned substantially perpendicular to the track direction of said recording medium;

said first sub-region having a diffraction grating for diffracting said light beam into three beams including a main beam refracted toward said recording medium; and

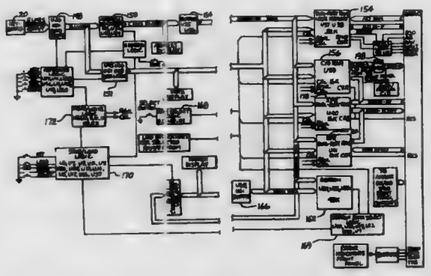
said second sub-region having a diffraction grating for diffracting the reflected beams of said three beams from said recording medium toward said photo-detecting means.

5,111,450

DATA BUS TESTER FOR AUTONOMOUS DATA COMMUNICATIONS SYSTEM

Joseph T. Cooledge, Bellevue, and Reza Sharif, Edmonds, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 1, 1989, Ser. No. 430,420
Int. Cl.[5] H04J *3/14*; H04B *3/46*
U.S. Cl. 370—13 **18 Claims**



1. A data bus tester for use in testing subsystem integration over a digital autonomous terminal access communication (DATAC) bus, said tester being characterized in that it receives the digital information transmitted on said bus by other terminals, and simulates the transmission of certain terminals, said tester comprising:

(a) a local memory operable to receive and store addressable digital information from said bus, and to store addressable digital information selected by the user of said tester for subsequent transmission on said DATAC bus;

(b) a receive personality memory, connected to at least said local memory, and operable to identify the label portion of the digital information transmitted by a given terminal on said DATAC bus, and to cause said digital information to be stored in said local memory at an addressable location selected by said user;

(c) a transmit personality memory, connected to at least said local memory, and operable to transmit a user-selected digital label on said bus, and to cause said local memory to provide certain prestored digital data for transmission along with said label to be transmitted; and

wherein said memories of paragraphs (a), (b) and (c) above are volatile memories; and further including

(d) a non-volatile memory, connected to all of said volatile memories, and operable to save user-selected ranges of digital label and data information from said volatile memories, and to load user-selected ranges of said saved information back into said volatile memories;

(e) user input means for editing the digital information in said volatile and non-volatile memories; and

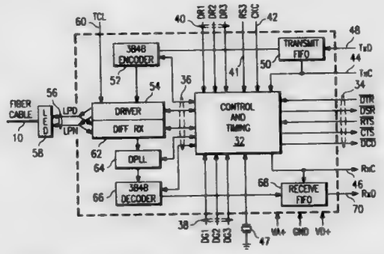
(f) output means for displaying to the user the digital information in said volatile and non-volatile memories.

5,111,451

METHOD AND APPARATUS FOR SYNCHRONIZING AN OPTICAL TRANSCEIVER OVER A FULL DUPLEX DATA COMMUNICATION CHANNEL

Douglas S. Piasecki, Austin; Eric J. Swanson, Buda, both of Tex., and Russell A. Hershbarger, Nevada City, Calif., assignors to Crystal Semiconductor, Austin, Tex.

Filed Oct. 27, 1989, Ser. No. 429,213
Int. Cl.[5] H04J *14/08*
U.S. Cl. 370—29 **3 Claims**



1. A duplex transmission system for transmitting packets of data between two remote points and having a data link for carrying data therebetween, a first modem at one end for interfacing with transmitted and received packets of data and a second modem at the other end of the data link for interfacing with transmitted and received packets of data, each of the modems comprising:

a transmitter for receiving and encoding data to be transmitted as packets of data, and for transmitting the encoded packets of data during a transmit frame;

a receiver for receiving from the data link received packets of data during a receive frame and decoding the received packets of data;

control circuitry for generating operating cycles within said modem, the operating cycles sequentially generated and comprised of said transmit and receive frames;

a control decoder for decoding master/slave status signals from the received data during the receive frame and generating a master status signal if a slave status signal has been received and decoded, and for generating a slave status signal if no status signal has been received or if a master status signal has been decoded from the received data during the receive frame;

status encoding circuitry for encoding the master and slave status signals onto the transmitted packets of data in the transmitter when the transmitted packets of data are generated; and

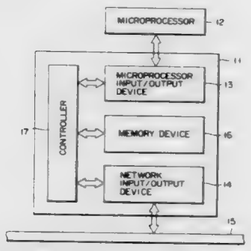
a phase lock loop for locking the transmitter operation and the receiver operation to the received packets of data when the slave status signal is not present in the received packets of data, said phase lock loop operable to lock the receiver only to the received packets of data when the slave status signal is present.

5,111,452

LAN CONTROLLER

Yuriko Kyuma, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 3, 1990, Ser. No. 592,313
Claims priority, application Japan, Oct. 6, 1989, 1-261564
Int. Cl.[5] H04J *3/14*
U.S. Cl. 370—85.1 **6 Claims**



1. A LAN controller, comprising:

a memory device for storing first data being received and transmitted by a microprocessor, second data relating to data identification of said first data, and third data allowing/prohibiting the communication of said first data, respectively; and

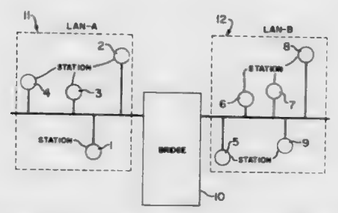
a controller for causing said memory device to automatically store third data allowing/prohibiting the communication of said first data only when said second data is stored into said memory device.

5,111,453

APPARATUS AND METHOD FOR RECOGNIZING ADDRESSES OF INFORMATION PACKETS

Joel I. Morrow, Merrick, N.Y., assignor to Nynex Corporation, New York, N.Y.

Filed May 18, 1990, Ser. No. 525,957
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—85.13 **34 Claims**



1. Apparatus for use with information packets, said information packets each including source and destination addresses each comprised of a sequence of address parts, said apparatus comprising:

means for receiving said information packets;

first means responsive to said receiving means for: segmenting the destination address of a received packet into first fragments each containing different address parts of said destination address; determining for each particular first fragment whether the particular first fragment corresponds to any one of first stored representations of associated fragments of source addresses; and making a first match determination when all the first segments are determined to correspond to respective first stored representations;

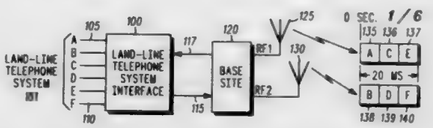
and second means responsive to said receiving means for: scrambling said destination address of said received packet and segmenting said scrambled destination address into second fragments each containing different address parts of said scrambled destination address and at least one of which is different from said first fragments due to said scrambling; determining for each particular second fragment whether the particular second fragment corresponds to any one of second stored representations of associated fragments of scrambled source addresses; and making a second match determination when all the second fragments are determined to correspond to respective second stored representations.

5,111,454

DIGITAL CELLULAR TDM SYSTEM EMPLOYING 6:1 PACKING OF TRANSCODED INFORMATION

Nelson C. Hung, Schaumburg, and John R. Welk, Addison, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 16, 1990, Ser. No. 567,994
Int. Cl.[5] H04J *3/16*
U.S. Cl. 370—95.3 **40 Claims**



1. A digital radio time-division multiple access (TDMA) system including a land-line telephone system interface and at least one base-site which generates at least one radio carrier frequency, the digital radio time-division multiple access (TDMA) system utilizing an equipment synchronization scheme to maintain equipment synchronization when required, the digital radio time-division multiple access (TDMA) system comprising:

means for compressing information input from at least two message channels from the land-line telephone system into one information block for transmission in one TDM timeslot;

means for inserting a block synchronization scheme into said one information block;

means for reserving a portion of said information block for the equipment synchronization scheme;

means for using a fraction of said reserved portion for said compressed information when equipment synchronization is not required;

means for conveying at least said one TDM timeslot from the land-line telephone system interface to a base-site; and

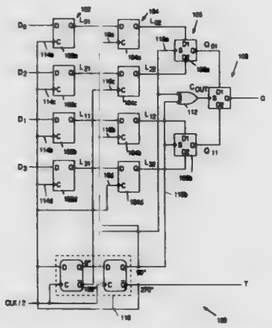
means, coupled to said means for conveying, for converting said compressed information of at least said one TDM timeslot to coded information for at least two information timeslots for radio transmission on a radio carrier frequency.

5,111,455

INTERLEAVED TIME-DIVISION MULTIPLEXOR WITH PHASE-COMPENSATED FREQUENCY DOUBLERS

Kevin J. Negus, San Jose, Calif., assignor to Avantek, Inc., Milpitas, Calif.

Filed Aug. 24, 1990, Ser. No. 572,854
Int. Cl.[5] H04J *3/04*; H03K *17/00*
U.S. Cl. 370—112 **38 Claims**



1. A synchronous, interleaved, time-division M:1 multiplexor for multiplexing M parallel input bits into a serial output bit stream having an output bit rate of B, wherein M is an integer power of two and equal to or greater than four, comprising:

first phase-controlled latching means for receiving and latching the M parallel bits in respective synchronization with a first plurality of selected phases of a multiphase clock signal having a frequency of B/M, wherein each of the first plurality of the multiphase clock signal phases is selected to cause the latching of a corresponding received bit to occur substantially at a time at least 2/B after the bit is first received;

first interleaver means for receiving and interleaving selected pairs of the M latched bits in respective synchronization with a second plurality of selected phases of the multiphase clock signal, wherein each of the second plurality of the multiphase clock signal phases is selected to cause the interleaving of each bit of a corresponding, selected pair of bits to occur substantially at a time at least 1/B after the bit is first received; and

second interleaver means for receiving and interleaving selected dyads of the interleaved pairs of bits in respective synchronization with an interleaver clock signal having a frequency of 2B/M.

5,111,456

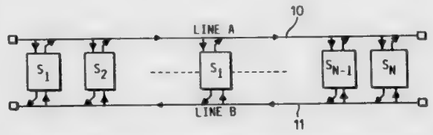
APPARATUS AND METHOD FOR COMMUNICATING DATA BETWEEN A PLURALITY OF STATIONS

John O. Limb, Los Gatos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 14, 1990, Ser. No. 567,285
Claims priority, application European Pat. Off., Aug. 16, 1989, 89308325
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—85.1 **21 Claims**

1. A communications system comprising a plurality of stations (S_1, $S_2 \ldots S_N$) and two communication paths which are unidirectional and oppositely directed with respect to each other, each communication path coupled to each of said stations such that said stations are sequentially interconnected; each of such plurality of stations (S_1, $S_2 \ldots S_N$) comprising:

means to write data packets to one of said paths for transmission to downstream stations with that writing being in cycles of up to a predetermined maximum number of packets per cycle, a predetermined station further comprising means for detecting when all the stations (S_1, $S_2 \ldots S_N$) have completed their writing cycle and thereafter transmitting a reset signal from said predetermined station onto the other of said paths, said reset signal indicating



that all of said stations have completed their writing cycle; and

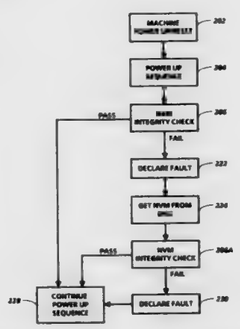
means to detect the reset signal and commence a further cycle of writing of packets on the basis of that reset signal.

5,111,457

DETECTION AND RECOVERY FROM AN NVM DATA INTEGRITY FAILURE

Douglas T. Rabjohns, Fairport; Robert M. VanDuyn, Rochester, and Dale T. Platteter, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 26, 1989, Ser. No. 427,076
Int. Cl.[5] G11C *29/00*; G11B *20/18*
U.S. Cl. 371—10.1 **1 Claim**



1. In an image processing apparatus having image processing means for forming an image, a controller for directing the operation of the image processing means, the controller including a mass memory device storing a backup NVM image and a non-volatile memory for dynamically storing critical machine data, the method of automatically maintaining the integrity of the non-volatile memory comprising the steps of:

providing a first non-volatile memory integrity check,

responding to a negative non-volatile memory integrity check to declare a non-volatile memory fault,

reading the backup NVM image from the mass memory device,

providing a second non-volatile memory integrity check, and

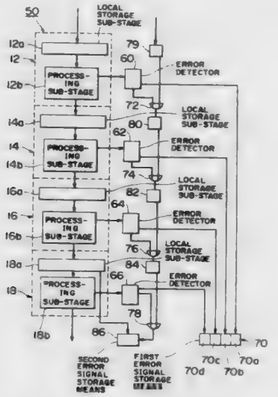
responding to the second non-volatile memory integrity check to declare a failure of the NVM image on the mass memory device.

5,111,458

HARDWARE ARRANGEMENT FOR STORING ERROR INFORMATION IN PIPELINED DATA PROCESSING SYSTEM AND METHOD THEREFOR

Tadashi Hara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 26, 1989, Ser. No. 385,192
Claims priority, application Japan, Jul. 27, 1988, 63-185417
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—16.5 **5 Claims**



1. A hardware arrangement for obtaining error information in a pipelined data processing system, said pipelined data processing system including a plurality of serially coupled pipeline stages, each of said stages including a local storage sub-state and a data processing sub-stage, said hardware arrangement comprising:

a plurality of error detectors, each of said error detectors being coupled to a respective one of said data processing sub-stages, each of said error detectors generating first and second error signals in response to detection of error in an associated data processing sub-stage;

first error signal storage means, said first error signal storage means being coupled to each of said plurality of error detectors and having a plurality of memory sections, each of said memory sections being assigned to a respective one of said error detectors, each of said memory sections being arranged to store said first error signal applied from an associated error detector;

second error signal storage means, said second error signal storage means being coupled to said local storage sub-stage included in a last pipeline stage of said serially coupled pipeline stages for storing error information therefrom in response to said second error signal;

a first OR gate which is coupled between said second error signal storage means and an error detector assigned to said last pipeline stage of said serially coupled pipeline stages, said second error signal storage means being responsive to a second signal applied through said first OR gate; and

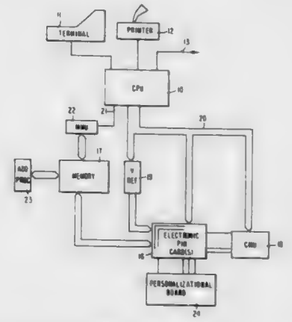
a plurality of series circuits each consisting of a second OR gate and a register, each of said series circuits being assigned to one of said error detectors except for an error detector provided for said last pipeline stage of said serially coupled pipeline stages, said second OR gate receiving said second signal at one input thereof and receiving an output of a register preceded thereby at the other input thereof, an output of said second OR gate being stored in a register of the same series circuit, and said register applying an output thereof to an OR gate of a following series circuit.

5,111,459

ELECTRONIC CIRCUIT TESTER

Yves DeVigne, Grenoble, France, assignor to DRAXY (s.a.r.l.), Saint Egreve, France

Filed Sep. 17, 1987, Ser. No. 98,033
Claims priority, application France, Sep. 19, 1986, 86 13304
Int. Cl.[5] G01R *31/26*
U.S. Cl. 371—27 **4 Claims**



1. Electronic circuit tester comprising:

a connection board (**24**) for connection with each of the terminals of a circuit to be tested;

n boards (**16**), called electronic pins, comprising signal shaping means each of which is connected to an input of the connection board;

a single test vector memory means for (**17**) containing all the test vectors for the circuit and from the circuit, including means for controlling application of said test vectors to the circuit to be tested through said electronic pins;

a central process unit (**10**) for managing the tester and external links;

wherein the management of the vector memory is made by at least one of a memory management unit (**22**) connected independently from other tester units to the central processing unit (**10**) and an address processor (**23**) operating asynchronously with respect to the central processing unit.

5,111,460

PROCESS FOR THE LOCALIZATION OF DEFECTIVE STATIONS IN LOCAL NETWORKS AND ASSOCIATED INTERFACE CONTROLLER

Wolfgang Botzenhardt, Göppingen; Siegfried Dais, Gerlingen; Uwe Kiencke, Regensburg; Martin Litschel, Vaihingen, and Jan Unruh, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 327,958, Feb. 10, 1989, abandoned. This application Apr. 19, 1991, Ser. No. 687,999
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719283
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—29.1 **8 Claims**

1. A method of localization of defective stations in local networks including a plurality of data receiving and transmitting station which communicate with one another via a serial bus and each station having predetermined station-internal states, an error detection stage and an error reporting stage, the method comprising the steps of

a continuous self-monitoring of individual stations as to their operability independent of remaining stations;

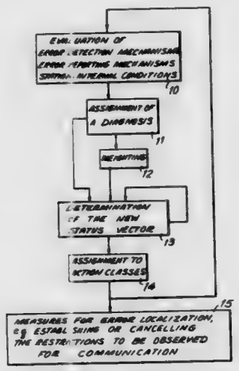
reporting an error when a malfunction is detected;

continuously monitoring in each station a bit stream arising on the bus from an interaction of all stations;

responding in each station to an error message contained in the bit stream;

setting the station-internal states in relation to information received from the bit stream;

statistically evaluating the reported errors in each station, to determine an error frequency;



comparing in respective stations the error frequency with a predetermined limit to initiate an action when the limit is reached.

5,111,461

COMMUNICATION CONTROL SYSTEM

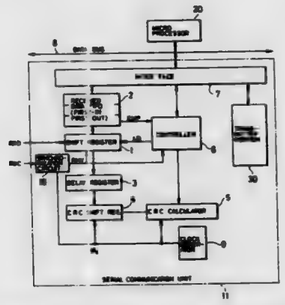
Takeshi Miyazaki, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 198,518, May 25, 1988, Pat. No. 4,939,741. This application Apr. 11, 1990, Ser. No. 508,391

Claims priority, application Japan, May 27, 1987, 62-128196

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—37.1 **9 Claims**



1. In a serial communication system including a data transmission device for providing at least one piece of serial data, along with a reception clock, and a data reception device coupled to receive the serial data containing error detection data and a signal from the reception clock, the data reception device comprising:

a reception circuit including a storing means coupled to receive the serial data and for storing the received serial date therein in response to the signal from the reception clock;

a calculator coupled to receive the error detection data from the reception circuit, the calculator being responsive to a predetermined clock signal and a control signal for starting a calculation of the received error detection data;

a clock generator coupled to the calculator for providing the predetermined clock signal;

a microprocessor for providing a command indicative of a start of the calculation in the calculator; and,

command decoder means coupled to receive the command for providing the control signal to the calculator, whereby the calculation continues even during the interruption of the signal from the reception clock, the signal being interrupted upon a completion of reception of the serial data.

5,111,462

DECODERS FOR HAMMING ENCODED DATA

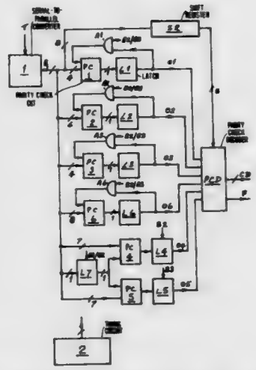
David R. Tarrant, Sutton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1989, Ser. No. 356,041

Claims priority, application United Kingdom, May 27, 1988, 8812592; May 5, 1989, 8910339

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—37.1 **11 Claims**



1. A decoder for Hamming encoded data in the form of a serial bit stream successive blocks of which are Hamming encoded, said decoder comprising: serial-to-parallel converter means for converting each of said blocks into a plurality of successive parallel bytes, a plurality of first parity check circuits for carrying out successive partial parity checks on each of the bytes of a block as each byte is received, and a plurality of second parity check circuits for carrying out parity checks on at least part of selected ones of said bytes as they are received, and means for combining the outputs of said parity check circuits to afford an output indicative of possible errors in a block.

5,111,463

ERROR CORRECTION METHOD AND APPARATUS

Christopher P. Zook, Lafayette, Colo., assignor to Exabyte Corporation, Boulder, Colo.

Continuation-in-part of Ser. No. 434,009, Dec. 9, 1989, abandoned. This application Feb. 5, 1990, Ser. No. 475,187

Int. Cl.[5] G06F *11/10*

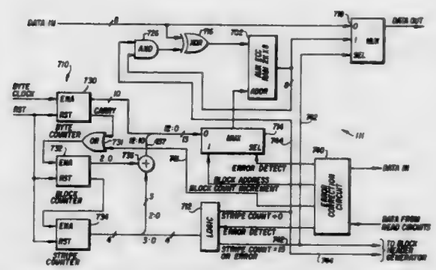
U.S. Cl. 371—39.1 **50 Claims**

39. Apparatus for encoding informational data for transmission to a magnetic tape, said apparatus comprising:

means for formatting informational data into at least some of a group of blocks $B_{r,c}$, with each block $B_{r,c}$ belonging to a row r and a column c, with r ranging from 0 to k-1 and with c ranging from 0 to n-1, and with each block $B_{r,c}$ including bit positions b_x wherein x ranges from an integer Y to an integer Z;

means for generating m number of error correction blocks E_i to be included in said group of blocks $B_{r,c}$, wherein i ranges from 0 to m-1, wherein $m=q\times k$ with q being an integer constant, each of said error correction blocks E_i also including bit positions b_x wherein x ranges from integer Y to integer Z, and wherein a value for each bit position b_x included in each block E_i is derived from a sum of the bits having bit position b_x in all blocks $B_{r,c}$ where

$$i=(r+k(c \bmod q)+INT(c/q))\bmod m$$



in which INT(c/q) is the largest integer not greater than c/q); and,

means for recording all blocks $B_{r,c}$ in k number of helical stripes on the magnetic tape, with all blocks $B_{r,c}$ in a same column c being recorded in a same helical stripe on the magnetic tape, and with error correction blocks E_i being recorded as the last m/q number of stripes of the n number of stripes.

5,111,464

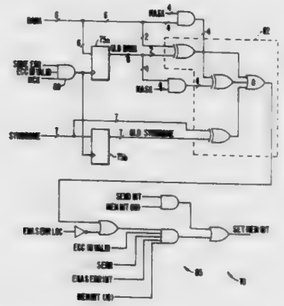
INTERRUPT REPORTING FOR SINGLE-BIT MEMORY ERRORS

Paul M. Farmwald, Berkeley, and Timothy S. Fu, Fremont, both of Calif., assignors to Mips Computer Systems, Inc., Sunnyvale, Calif.

Filed Dec. 1, 1989, Ser. No. 444,639

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—40.1 **12 Claims**



1. Apparatus for use in a computer system which operates to provide error information including an indication that a memory error has occurred and, at least for some memory errors, an identifier of the portion of memory where the error occurred, comprising:

register means for storing at least a portion of the error information for the most recent previous error;

comparison means, responsive to the stored error information and to incoming error information, for providing an indication whether they differ;

means, responsive to the occurrence of an error, for transferring the corresponding portion of the incoming error information into said register means; and

means for generating an interrupt signal, operable in at least one mode to generate an interrupt signal only if said comparison means indicates a difference and at least one type of error has occurred.

5,111,465

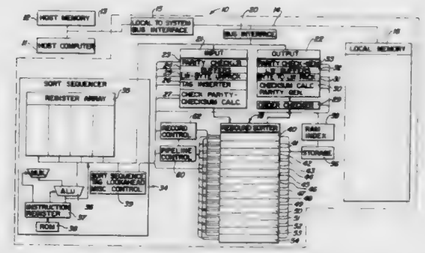
DATA INTEGRITY FEATURES FOR A SORT ACCELERATOR

Brian C. Edem, San Jose, Calif.; Richard P. Helliwell, Colorado Springs, Colo.; John T. Johnston, San Jose, Calif., and Richard F. Lary, Colorado Springs, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 30, 1989, Ser. No. 374,349

Int. Cl.[5] G06F *11/08*

U.S. Cl. 371—54 **8 Claims**



1. A data integrity system comprising a sorting means for receiving as input a group of unordered input records and for generating as output a corresponding group of output records in sorted order, said system comprising input and output byte value generating means for generating byte values for bytes of each input and output record according to a predetermined function, input byte value summing means for summing said byte values of each input record to generate input record checksum values, input record checksum adding means for adding said input record checksum values for a group of input records to develop a resulting input checksum, output byte value summing means for summing said byte values of each output record to generate output record checksum values, output record checksum adding means for adding said output record checksum values for a group of output records to develop a resulting output checksum, and comparison means for comparing said resulting output checksum with said resulting input checksum values of the corresponding input record checksum and for developing an error signal in response to a difference in said input and output checksums, said predetermined function having associative properties such that said resulting input and output checksums are independent of the order of summing of said input and output checksum values while being different in response to errors including swapping of bytes between records.

5,111,466

OPTICAL MULTILAYER STRUCTURES FOR HARMONIC LASER EMISSION

Richard J. F. Normandin, Ottawa; Sylvie Letourneau, Les Saules; Francoise Chatenoud, Fleury d'Aude, and Robin L. Williams, Orleans, all of Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Mar. 11, 1991, Ser. No. 667,494

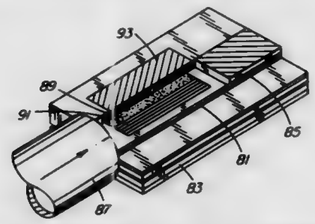
Claims priority, application Canada, Oct. 25, 1990, 2028506

Int. Cl.[5] H01S *3/10*; H03F *7/00*

U.S. Cl. 372—22 **9 Claims**

1. A broad bandwidth optical multilayer structure for harmonic laser emission, comprising:

an optical waveguide for propagating light in one dimension under a guiding condition,
the said waveguide being made of more than one layer of an optically non-linear semiconductor materials, all the said layers being parallel to the said dimension, and
light injection means for injecting into the said waveguide along the said dimension contra-propagating lights of



fundamental wavelengths to produce a harmonic light in a direction different from the said dimension and determined by the mutual relationship of the said contra-propagating lights in that
the locations and the thickness of the said layers and their refractive indices are chosen approximately according to the Fourier transform of the following equation:

$$S = \int_{-\infty}^{\infty} \frac{P^{NL}(y')}{n(y')} \exp\{-ik_0 n(y')y'\}dy'$$

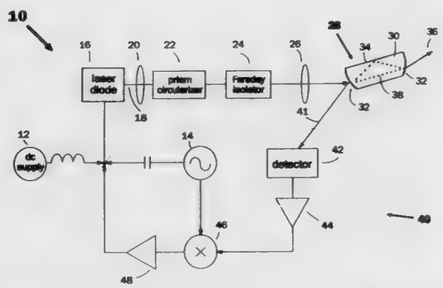
where
S is proportional to radiated harmonic field,
$P^{NL}(y')$ is nonlinear polarization field induced by the waveguided fundamentals,
n(y') is the refractive index at position y', and
k_0 is the wave vector of radiated field in air
so as to provide the said multilayer structure with a predetermined interaction bandwidth.

5,111,467
HYBRID RUGATE FILTER ASSEMBLY FOR TEMPERATURE STABILIZED EMISSION OF GRATING COUPLED SURFACE EMITTING LASERS
Eric M. Bradley, San Diego, Calif., assignor to Tacan Corporation, Carlsbad, Calif.
Filed Sep. 10, 1990, Ser. No. 579,602
The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—32 **9 Claims**



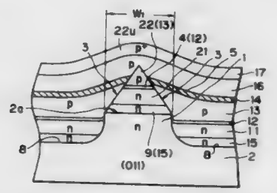
1. An apparatus including a filter for temperature stabilized emission at a desired wavelength by a surface emitting laser having an active region and at least one second order grating for vertical emission adjacent to said active region, said filter comprising:
a substrate which is transparent to light of said desired wavelength; and
a dielectric film having an average refractive index deposited on said substrate, said average refractive index having a periodic variation comprising an alternating higher and lower refractive index, said periodic variation having a period where said desired wavelength is a function of said period, said dielectric film having sufficient thickness to cover a plurality of periods whereby said filter assembled over said second order grating selectively reflects light of said desired wavelength back into said second order grating which deflects said reflected light into said active region causing said laser to emit light at said desired wavelength.

5,111,468
DIODE LASER FREQUENCY DOUBLING USING NONLINEAR CRYSTAL RESONATOR WITH ELECTRONIC RESONANCE LOCKING
William J. Kozlovsky, Mountain View, and Wilfried Lenth, Capitola, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 15, 1990, Ser. No. 597,964
Int. Cl.[5] H01S *3/133*
U.S. Cl. 372—32 **17 Claims**



1. A semiconductor laser apparatus comprising:
a DC power supply coupled with an RF source generating a low-amplitude RF current;
a diode laser source receiving an injection current from the DC power supply and the coupled RF current source emitting a laser beam with a central carrier frequency having low-amplitude frequency sidebands generated by the RF current;
an optical beam shaping system for processing and directing the laser beam emitted from the diode laser source;
a nonlinear resonator having a plurality of longitudinal resonator frequencies with a fundamental spatial mode receiving the optically-shaped laser beam, said optically-shaped beam substantially matching the fundamental spatial profile and the central carrier frequency substantially matching one of the longitudinal resonator frequencies;
said nonlinear resonator using a phase-matched, second harmonic generation (SHG) process for generating a second laser beam by frequency doubling the central carrier frequency of the diode laser source, and further reflecting a portion of the incident optically-shaped laser beam to an electronic resonance locking system;
said electronic resonance locking system having a photodetector receiving the reflected portion of the optically-shaped beam from the resonator and generating an RF signal arising from the difference in phase shifts or amplitudes between said RF sidebands caused by any frequency mismatch between the central laser frequency and said substantially matched longitudinal resonator frequency; and
said electronic frequency locking system further including an RF mixer electrically coupled to the diode laser source receiving the RF signal from the photodetector and an input from the RF source for generating an error signal as a feedback signal which is supplied to the diode laser source for tuning the laser injection current or the diode temperature,
whereby the diode laser central carrier frequency is controlled by the tuning of the injection current or diode temperature to track the substantially matched longitudinal resonator frequency.

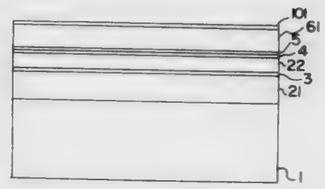
5,111,469
SEMICONDUCTOR LASER
Hironobu Narui; Hiroshi Yoshimatsu; Shoji Hirata; Masafumi Ozawa, all of Kanagawa, and Yoshifumi Mori, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Aug. 14, 1990, Ser. No. 566,824
Claims priority, application Japan, Aug. 15, 1989, 1-210382; Aug. 15, 1989, 1-212600
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—46 **5 Claims**



1. In a semiconductor laser comprising:
a semiconductor substrate provided in its major surface with a strip mesa of a desired width having an expanded portion; and
a laminated structure constructed on the major surface of the semiconductor substrate by sequentially forming by epitaxisis at least a first semiconductor layer serving as a first conduction type cladding layer, a second semiconductor layer serving as an active layer, a third semiconductor layer serving as a second conduction type cladding layer, and a fourth semiconductor layer serving as a light absorbing layer;
characterized in that;
faults are formed in the laminated structure along the direction of extension of the opposite longitudinal side surfaces of the strip mesa;
the second semiconductor layer is split by the faults so that a portion of the second semiconductor forms a strip active layer between the faults in a portion of the laminated structure extending on the strip mesa;
the fourth semiconductor layer of the laminated structure is split by the faults so that the fourth semiconductor layer 14 is not included in a portion of the laminated structure corresponding to a portion of the desired width of the strip mesa; and
a portion of the fourth semiconductor layer serving as a light absorbing layer is formed over the active layer in a portion of the laminated structure corresponding to the expanded portion of the strip mesa.

5,111,470
SEMICONDUCTOR LASER DEVICE AND A METHOD OF FABRICATING THE SAME
Hiroyuki Hosoba, Nara; Akinori Seki, Toyota; Toshio Hata, Nara; Masafumi Kondou, Nara; Takahiro Suyama, Yamatokoriyama, and Sadayoshi Matsui, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 12, 1991, Ser. No. 685,415
Claims priority, application Japan, Apr. 13, 1990, 2-99012
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—46 **5 Claims**

1. A semiconductor laser device comprising a semiconductor substrate and a multi-layered structure disposed on the substrate, said multi-layered structure containing an $Al_xGa_{1-x}As$ ($0<x<1$) first cladding layer formed on the substrate, an $Al_yGa_{1-y}As$ ($0<y<1, x>y$) active layer for laser oscillation formed on said first cladding layer, an $Al_xGa_{1-x}As$ ($0<x<1$)



second cladding layer formed on said active layer, and an $Al_zGa_{1-z}As$ ($0<z<1$) current blocking layer formed above the second cladding layer, said current blocking layer having a striped groove as a current injection path.

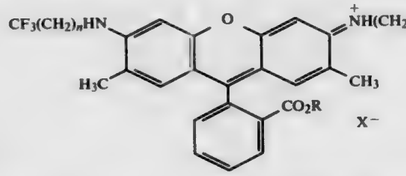
5,111,471
SEMICONDUCTOR LASER DEVICE
Ryo Hattori, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Jan. 7, 1991, Ser. No. 638,333
Claims priority, application Japan, Jul. 16, 1990, 2-189904
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—46 **4 Claims**



1. A semiconductor laser device comprising:
an InP substrate of a first conductivity type;
a first InP current blocking layer of a second conductivity type opposite said first conductivity type disposed on said substrate;
an InP buried layer of said first conductivity type disposed on said substrate, surrounded by said first current blocking layer, and having the same thickness as said first current blocking layer;
a ridge including a double heterojunction structure comprising a first InP cladding layer of said first conductivity type, an InGaAsP active layer, and a second InP cladding layer of said second conductivity type, said first cladding layer, said active layer, and said second cladding layer being substantially planar and stacked in the named order on said InP buried layer, said ridge and InP buried layer each having a width, said widths being substantially the same;
a second InP current blocking layer of said first conductivity type disposed on said first InP current blocking layer surrounding said ridge; and
a contact layer of said second conductivity type disposed opposite and in contact with said second InP current blocking layer and said second InP cladding layer.

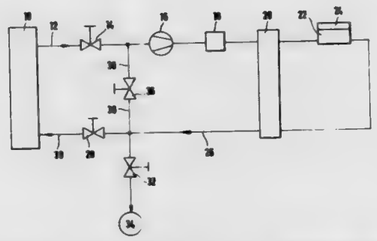
5,111,472
FLUORINATED LASER DYES
Peter R. Hammond, Livermore, Calif., and James F. Feeman, Wyomissing, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Division of Ser. No. 643,607, Jan. 22, 1991, Pat. No. 5,047,559. This application May 14, 1991, Ser. No. 699,538
Int. Cl.[5] H01S *3/20*; C07D *311/88*
U.S. Cl. 372—53 1 Claim

1. A method of producing an excited dye laser beam comprising a step of exposing a dye of the formula



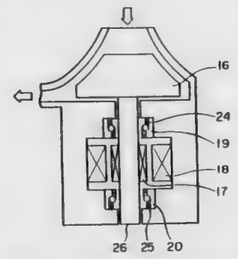
wherein R is hydrogen or linear or branched alkyl of 1 to 10 carbon atoms, n is an integer from 1 to 4 and X is an anion, to an exciter laser beam of a frequency and intensity sufficient to cause said dye to lase.

5,111,473
LASER GAS PURIFYING APPARATUS
Ulrich Rebhan, Göttingen; Gerd Steinführer, Bovenden; Frank Voss, and Peter Oesterlin, both of Göttingen, all of Fed. Rep. of Germany, assignors to Lambda Physik Forschungs- und Entwicklungsgesellschaft mbH, Göttingen, Fed. Rep. of Germany
Filed Jan. 22, 1991, Ser. No. 644,210
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1990, 4002185
Int. Cl.[5] H01S *3/22*
U.S. Cl. 372—59 1 Claim



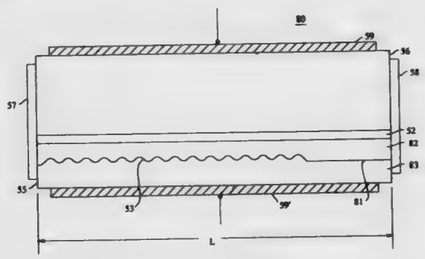
1. Apparatus for purifying gas of an excimer laser wherein laser gas is passed out of the resonant cavity through an outlet port, transferred to gas-cleaning means, and returned to the resonant cavity through an inlet port, said apparatus comprising:
a first closed cycle system comprising a first conduit system coupled between the outlet and inlet ports of said laser including in the order named first valve means, pump means for conveying gas through said conduit system, a cooling trap and second valve means, said first and second valve means when open connecting said laser in said first conduit system for circulating laser gas from said outlet port, through said cooling trap and back to said inlet port, and when closed disconnect said first conduit system from said laser, and
a second conduit system including third valve means connected to said first conduit system which when said third valve means is closed provides a second closed cycle system including said pump means and said cooling trap, but not said first and second valve means, for recirculating laser gas through said cooling trap independently of the laser.

5,111,474
LASER OSCILLATOR DEVICE
Tsutomu Funakubo, Fujiyoshida, and Norio Karube, Machida, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan
Continuation of Ser. No. 457,774, filed as PCT/JP89/00526, May 25, 1989, abandoned. This application Jul. 19, 1991, Ser. No. 733,011
Claims priority, application Japan, Jun. 16, 1988, 63-148918
Int. Cl.[5] H01S *3/03, 3/22*
U.S. Cl. 372—61 3 Claims



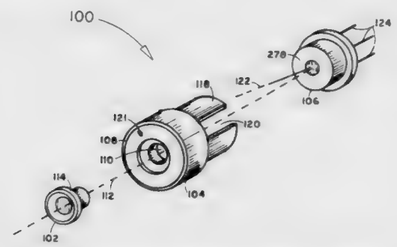
1. A laser oscillator device comprising an electric-discharge tube for producing an electric discharge in a laser gas contained in the electric-discharge tube for laser excitation, an optical resonator for effecting laser oscillation, and a gas circulating device having a gas blower and a cooling unit for forcibly cooling the laser gas,
said gas blower comprising a turbo blower having an impeller casing and two impellers that are rotatable in laser gas within the casing and which are mounted on a single shaft for applying thrust loads in opposite directions, said turbo blower having grease lubricated bearings which are operated without positive pressure fluid sealing means.

5,111,475
ANALOG OPTICAL FIBER COMMUNICATION SYSTEM, AND LASER ADAPTED FOR USE IN SUCH A SYSTEM
David A. Ackerman, Hopewell; Leonard J. Ketelsen, Fanwood, and Louis A. Koszi, Scotch Plains, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Continuation-in-part of Ser. No. 459,922, Jan. 2, 1990, Pat. No. 5,012,484. This application Mar. 20, 1991, Ser. No. 672,306
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—96 5 Claims



1. A semiconductor laser comprising
a) a semiconductor body forming a radiation cavity of length L defined by a front facet and a back facet, associated with each of said facets being a reflectivity, and associated with the cavity during operation of the laser being a photon density and a gain;
b) a diffraction grating associated with the radiation cavity; and
c) contact means facilitating flowing an electrical current through the semiconductor body;
CHARACTERIZED IN THAT
d) said diffraction grating has a length that is less than L, such that a portion of the radiation cavity does not have a diffraction grating associated therewith, said portion extending from the back facet for a distance δL towards the front facet, and the radiation cavity extends continuously, without off-set, between the front and back facets.

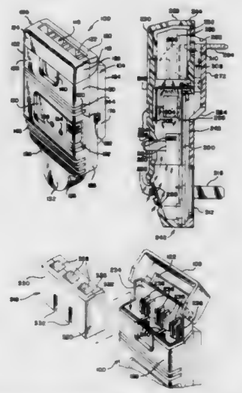
5,111,476
METHOD AND APPARATUS FOR ALIGNING A LASER DIODE, AND LASER DIODE SYSTEM PRODUCED THEREBY
William E. Hollenbeck; Timothy P. Foster, both of Grants Pass, and Adam J. Reed, Ashland, all of Oreg., assignors to Applied Laser Systems, Grants Pass, Oreg.
Filed Feb. 21, 1991, Ser. No. 659,494
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—107 19 Claims



1. An aligned laser optic system (ALOS) comprising:
a tubular diode housing;
a lens positioned on one side of said housing,
a coaxial tubular extension on the side of said housing opposite said lens, said extension including two or more longitudinal slots having a size and position that will permit entry therein of a laser diode gripping mechanism; and
a laser diode placed into said diode housing near the side opposite said lens, placement of said diode having been accomplished by passing said diode into said extension by means of said gripping mechanism.

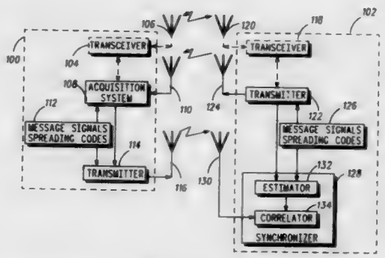
5,111,477
FRAGRANCE DIFFUSER
Ken Muderlak, Shorewood, Wis., assignor to Technical Concepts, L.P., Chicago, Ill.
Filed May 7, 1990, Ser. No. 521,981
Int. Cl.[5] H05B *3/06*; A61L *9/03*
U.S. Cl. 392—390 25 Claims

1. An aroma dispenser comprising:
solid cartridge means for emitting a fragrance into the air, said cartridge means having at least one external surface with a mating face, and further having first means for keying said cartridge means such that a particular cartridge means can be identified by its keying means, said first keying means including a plurality of separate apertures disposed in said mating face and directed inwardly from said external surface of said cartridge means to form a first predefined identification pattern; and
housing means for receiving and containing said solid cartridge means, said housing means having at least one internal surface with a mating face, and further having second means for keying said housing means such that a particular housing means can be identified by its keying means, said second keying means including a plurality of separate projections disposed on said mating face and directed inwardly from said internal surface of said housing means to form a second predefined identification pattern;
said first and second keying means including means for



mating said mating face of said cartridge means with said mating face of said housing means only when said first identification pattern corresponds to said second identification pattern, and for preventing the insertion into said housing means of any cartridge means lacking a first identification pattern which corresponds to said second identification pattern.

5,111,478
METHOD AND APPARATUS FOR PROVIDING SIGNAL SYNCHRONIZATION IN A SPREAD SPECTRUM COMMUNICATION SYSTEM
James A. McDonald, Buffalo Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 31, 1991, Ser. No. 648,472
Int. Cl.[5] H04L *27/30*
U.S. Cl. 375—1 32 Claims



9. A spread spectrum signal synchronizing system, comprising:
(a) first communication site, comprising:
(i) a transmitter comprising means for generating a first spread message signal as a function of a first message signal and a first spreading code, the transmitter further comprising means for transmitting the first spread messge signal over a radio communication channel;
(ii) receiving means for receiving a second spread message signal from over the radio communication channel; and
(iii) synchronizing means for synchronizing the received

second spread message signal with an estimate of the received second spread message signal, the synchronizing means comprising means for generating an estimated second spread message signal as a function of a second message signal and a second spreading code associated with the first spreading code, the synchronizing means further comprising means for synchronizing the received and the estimated second spread message signals by using a sliding correlator to incrementally increase the phase shift between the received and the estimated second spread message signal until the received and the estimated second spread message signals are synchronized; and

(b) second communication site, comprising:

(i) receiving means for receiving the first spread message signal from over the radio communication channel;

(ii) determining means for determining the first spreading code used to generate the received first spread message signal; and

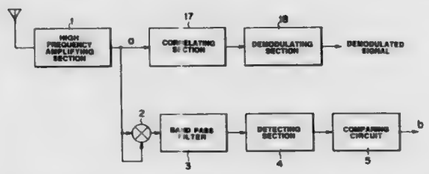
(iii) transmitting means for enabling synchronization of received spread message signals at the first communication site, the transmitting means comprising means for generating the second spread message signal as a function of the second message signal and the second spreading code associated with the determined first spreading code, the transmitting means further comprising means for transmitting the second spread message signal over the radio communication channel.

5,111,479

SPREAD SPECTRUM RECEIVER AND CARRIER SENSE CIRCUIT THEREFOR

Shigeo Akazawa, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1990, Ser. No. 605,258
Claims priority, application Japan, Nov. 2, 1989, 1-286879
Int. Cl.[5] H04L *27/30*
U.S. Cl. 375—1 **6 Claims**



4. A circuit for use in a spread spectrum receiver, said circuit comprising:

operating means for outputting a squared signal which is a received signal multiplied by itself;

a filter for extracting from said squared signal a carrier component of a spread spectrum signal included in said squared signal, said filter outputting said carrier component;

a detecting circuit for detecting the level of said carrier component and for outputting a carrier sense signal when the level of said carrier component is greater than a predetermined level; and

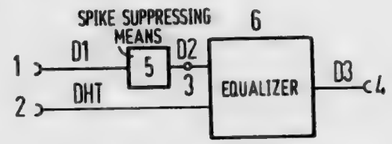
means for starting an initial synchronization circuit of a spread spectrum receiver in response to said carrier sense signal and a correlation pulse.

5,111,480

METHOD FOR EQUALIZATION OF THE PULSE WIDTHS OF A DIGITAL SIGNAL

Imre Sarkoezi, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,149
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732680
Int. Cl.[5] H04L *25/52, 25/08;* **H03K** *11/00*
U.S. Cl. 375—4 **9 Claims**



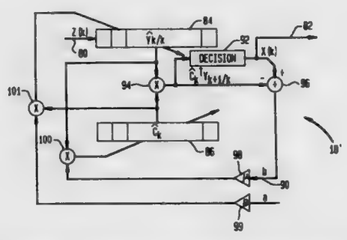
1. A method for equalizing pulse widths of a spike-free digital signal (D2) with an auxiliary data clock signal (DHT), comprising the steps of equalization of pulses to obtain an equalized digital signal (D3) by deriving the beginning of the pulses of said equalized digital signal (D3) from the detected leading edges of the pulses of the spike-free digital signal (D2) and deriving the end of the pulses of the equalized digital signal (D3) from the leading edges of the pulses of the auxiliary data clock signal (DHT) to thus obtain the equalized digital signal (D3).

5,111,481

DUAL MODE LMS CHANNEL EQUALIZER

Walter Y. Chen, Brookside, N.J., and Richard A. Haddad, Tuxedo, N.Y., assignors to Nynex Corporation, White Plains, N.Y.

Filed Nov. 17, 1989, Ser. No. 438,733
Int. Cl.[5] H04B *3/04, 3/14*
U.S. Cl. 375—14 **9 Claims**



1. A channel equalizer for reconstructing original signal values X(k) transmitted via a channel from received signal values Z(k) comprising

means utilizing an LMS algorithm for estimating smoothed received signal values Y(k) to compensate for the effect of additive noise V(k) of said channel in said received signal values Z(k),

means utilizing an LMS algorithm for estimating the inverse impulse response of said channel, and

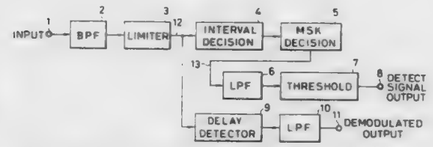
means for reconstructing the original transmitted signal values X(k) from the estimated smoothed received signal values Y(k) by utilizing the estimated inverse impulse response to compensate for the frequency response of the channel.

5,111,482

MSK SIGNAL DETECTOR

Hisao Ohtake, Tokyo, Japan, assignor to Oki Electric Industry Co. Ltd., Tokyo, Japan

Filed Mar. 13, 1990, Ser. No. 492,626
Claims priority, application Japan, Mar. 14, 1989, 1-59584
Int. Cl.[5] H04L *27/14*
U.S. Cl. 375—90 **21 Claims**



1. A minimum shift keying (MSK) signal detector comprising:

a limiter for limiting the amplitude of an input signal and generating a limiter output signal with high and low levels;

a transition interval decision and memorizing circuit for deciding whether intervals between high-to-low and low-to-high transitions of said limiter output signal fall into a first window centered at the half-period of an MSK space frequency, a third window centered at the half-period of an MSK mark frequency, or a second window disposed midway between said first and third windows, and storing decision results;

an MSK decision circuit for testing the pattern of said decision results and generating an MSK decision signal indicating whether the pattern of said decision results matches a pattern appearing when the input signal is an MSK signal;

a low-pass filter for averaging said MSK decision signal; and

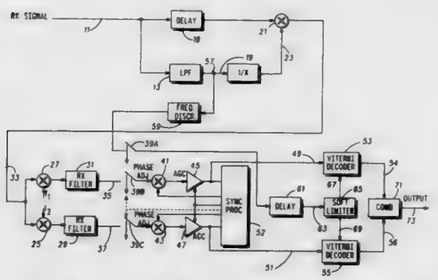
a thresholding circuit for generating an MSK detect signal indicating whether or not the output of said low-pass filter exceeds a threshold value.

5,111,483

TRELLIS DECODER

Salomon Serfaty, Kibutz Gaash, Israel, assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 390,564, Aug. 7, 1989, abandoned. This application Oct. 12, 1990, Ser. No. 596,450
Int. Cl.[5] H04L *27/06*
U.S. Cl. 375—94 **10 Claims**



1. A method for decoding a received signal comprising at least one trellis coded modulated signal and a center-band pilot signal containing a Rayleigh-faded component, comprising the steps of:

(a) filtering said received signal to extract said center-band pilot signal, thus providing an extracted center-band pilot signal;

(b) applying said extracted center-band pilot signal to a frequency discriminator to provide a frequency discriminator output;

(c) applying said frequency discriminator output to a soft limiter to provide a metric modifier ("s");

(d) decoding said at least one trellis coded modulated signal using at least one Viterbi decoder whose metric ("m") is modified responsive to the formula:

$$m=(1-s)d^2$$

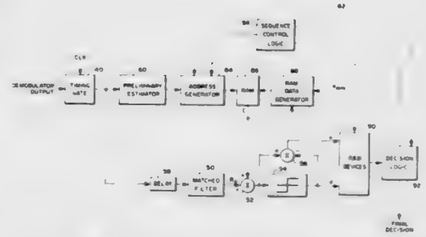
where $1>s\geqq 0$, and d is the Euclidian distance.

5,111,484

ADAPTIVE DISTORTION CANCELLER

Panagiotis D. Karabinis, Atkinson, N.H., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 16, 1991, Ser. No. 686,217
Int. Cl.[5] H04B *1/10*
U.S. Cl. 375—94 **10 Claims**



1. In a digital communications system having a channel susceptible to linear and nonlinear distortions, a method for identifying the state of an observed data element from among a set of states, said method comprising the steps of:

a. receiving a preliminary sequence of data elements, said preliminary sequence including said observed data element;

b. estimating the states of each of said data elements of said preliminary sequence;

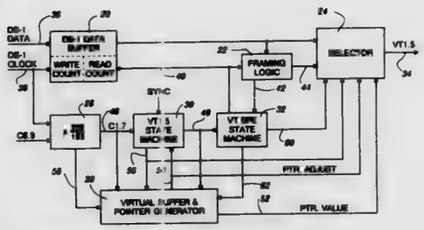
c. generating, for each of a plurality of cancellation coefficients corresponding to a plurality of data sequences having states which map closely adjacent to the states of said preliminary sequence, the value of said observed data element modified by said cancellation coefficient;

d. determining, for each value of said observed data element modified by said cancellation coefficient, a closest state from among a mapping of said set of states;

e. measuring, for each value of said observed data element modified by said cancellation coefficient, the error quantity resulting from the difference between said value of said observed data element modified by said cancellation coefficient and said closest state; and

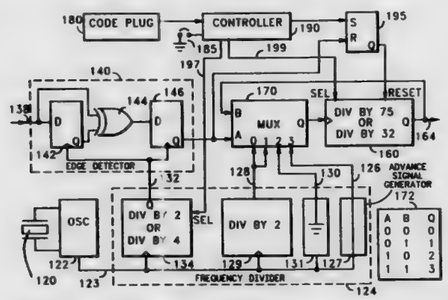
f. assigning to said observed data element the closest state of said determining step for which said error quantity of said measuring step results in a minimum value.

5,111,485
METHOD OF AND CIRCUIT FOR SYNCHRONIZING DATA
James A. Serack, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed May 18, 1990, Ser. No. 524,903
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—112 **13 Claims**



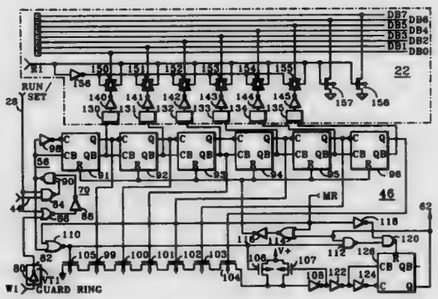
8. A synchronizing circuit comprising:
a data store;
means for storing asynchronous data in the store;
first gapping means for gapping a synchronous clock signal to produce a first gapped clock signal;
second gapping means for gapping the first gapped clock signal with a predetermined ratio to produce a second gapped clock signal;
means for reading data from the store in dependence upon the second gapped clock signal;
monitoring means for monitoring a frequency difference between the first gapped clock signal and the asynchronous data rate multiplied by the predetermined ratio; and
control means responsive to the monitoring means for controlling the first gapping means to compensate for the frequency difference.

5,111,486
BIT SYNCHRONIZER
Mark L. Oliboni, Boynton Beach; Stephen H. Woltz; George A. Drapac, both of Boca Raton, and Walter L. Davis, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 15, 1989, Ser. No. 324,277
Int. Cl.[5] H04L *7/10*
U.S. Cl. 375—120 **11 Claims**



10. A method of controlling a receiver having a digital phase locked loop capable of being programmed to lock onto either a first or second predetermined data rate, the digital phase locked loop further capable of being programmed to operate with either a first or second bandwidth, the receiver additionally having a memory means having a first and second state for determining the operation of the digital phase locked loop, the method comprising the steps of;
reading the memory means and determining the state thereof, the memory means comprising at least one bit within a programmable memory;
programming the digital phase locked loop to lock onto the first data rate and to operate at the first bandwidth if the memory means is in the first state; and
programming the digital phase locked loop to lock onto the second data rate and to operate at the second bandwidth if the memory means is in the second state.

5,111,487
ELECTRONIC TIMER APPARATUS
Kenneth R. Burch, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 24, 1989, Ser. No. 384,219
Int. Cl.[5] H03K *23/00*
U.S. Cl. 377—44 **18 Claims**

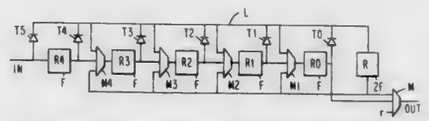


1. Modulo timer apparatus controllable by write signals generated by a central controller, said apparatus comprising:
means for generating a reference clock signal;
at least one counter stage of a predetermined first modulus value having an input for receiving a clock signal, and a plurality of outputs indicative of the digital count of said stage;
said central controller operative to generate a write signal to a selected counter stage to control the input of data into the selected counter stage, and for providing a digital control signal;
at least one selecting means coupled to the at least one counter stage and controlled by said digital control signal to couple one of said reference clock signal or corresponding write signal to the input of the at least one counter stage to alter the count thereof.

5,111,488
DOUBLING/DIVIDING DEVICE FOR A SERIES BIT FLOW
Philippe Chaisemartin, Brignoud, and Sylvain Kritter, Grenoble, both of France, assignors to SGS-Thomson Microelectronics S.A., Gentilly Cedex, France
Filed Jan. 7, 1991, Ser. No. 637,920
Claims priority, application France, Jan. 9, 1990, 90 00403
Int. Cl.[5] H04J *1/05;* **G11C** *7/00*
U.S. Cl. 377—47 **3 Claims**

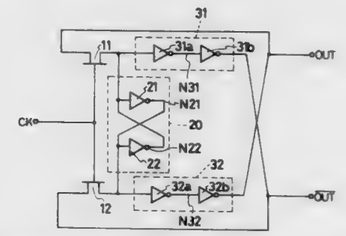
1. A device for doubling or dividing by 2 the rate of serial bits comprising:
a succession of first one-bit registers (**R4–R0**) actuated at a frequency F,
a second register (**R**) actuated at a frequency 2F,
an input terminal (**IN**) connected to the input of the first (**R4**) among said first registers and, through a first gate (**T5**), to an internal line (**L**) connected to the input of said second register,

first multiplexers (**M4–M1**) respectively connected to the input of each (**R3–R0**) of said first registers for selecting either the output of the preceding register, or said internal line, or the output of said second register,
a second multiplexer (**M**), the output of which corresponds



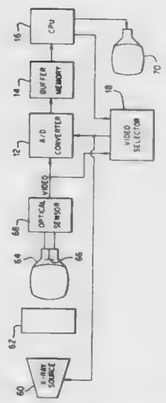
to the device output and which selects either the output of the last (**R0**) among said first registers, or the output of the second register, or filling bits,
second transfer gates (**T4–T0**) between the output of each first register and said internal line, and
means for controlling the various gates and multiplexers.

5,111,489
FREQUENCY-DIVIDING CIRCUIT
Koutarou Tanaka; Makoto Shikata, and Masahiro Akiyama, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 305,419, Feb. 1, 1989, abandoned. This application Sep. 21, 1990, Ser. No. 586,446
Claims priority, application Japan, Feb. 9, 1988, 63-28475
Int. Cl.[5] H03K *21/02, 3/356, 17/28*
U.S. Cl. 377—121 **19 Claims**



1. A frequency-dividing circuit comprising:
a latch circuit (**20**) having a first and second complementary terminals (**N21, N22**);
first and second amplify/delay circuits (**31, 32**) each having an input and an output, each of said first and second amplify/delay circuits comprising a cascade coupling of an amplifying inverter and a delay circuit, said amplifying inverter being arranged to drive said latched circuit; and
first and second switches (**11, 12**) each having a respective control electrode, said control electrodes being coupled to receive an input signal (**CK, N42**) alternately assuming a first state or a second state, each of said switches so connected as to be simultaneously conductive when said input signal is in said first state and simultaneously nonconductive when said input signal is in said second state, each said switch coupling an output from a respective one of said amplify/delay circuits to a respective one of said complementary terminals and to an input of said the amplify/-delay circuit.

5,111,490
METHOD AND APPARATUS FOR COLLECTING VIDEO FRAMES, LINES AND PIXELS
Bruce M. Drawert, Vernon Hills, Ill., assignor to Kaibushiki Kaisha Toshiba, Kanagawa, Japan
Filed Oct. 5, 1990, Ser. No. 593,861
Int. Cl.[5] H04N *5/32*
U.S. Cl. 378—4 **26 Claims**



10. An apparatus for collecting predetermined portions of a video signal, said video signal including a plurality of frames of video information, comprising:
means for variably selecting a predetermined total number of said plurality of frames of video information; and
means for collecting video information corresponding to said plurality of frames of video information until said predetermined total number of frames has been collected.

5,111,491
X-RAY LITHOGRAPHY MASK AND METHOD FOR PRODUCING SAME
Takahiro Imai, and Naoji Fujimori, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Aug. 21, 1991, Ser. No. 747,950
Claims priority, application Japan, Aug. 28, 1990, 2-226922
Int. Cl.[5] G21K *5/00*
U.S. Cl. 378—35 **7 Claims**



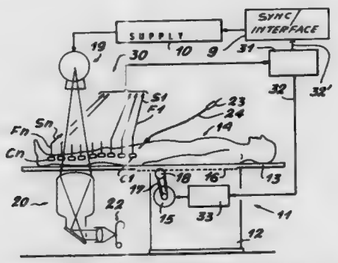
1. An X-ray lithography mask comprising an X-ray transparent film made from diamond, X-ray absorber patterns made of materials with high absorption for X-rays and deposited on the X-ray transparent film and diamond crosspieces deposited on the X-ray transparent film for reinforcing the X-ray transparent film.

5,111,492

X-RAY DIAGNOSIS SYSTEM FOR ANGIOGRAPHIC EXAMINATION WITH DEVICE FOR THE AUTOMATIC TRACKING OF A CONTRAST MEDIUM

Remy Klausz, Neuilly S/Seine, France, assignor to General Electric CGR S.A., Issy les Molineaux, France

Filed Jul. 1, 1991, Ser. No. 724,170
Claims priority, application France, Jul. 6, 1990, 90 08624
Int. Cl.[5] H05G *1/64*
U.S. Cl. 378—99 **13 Claims**



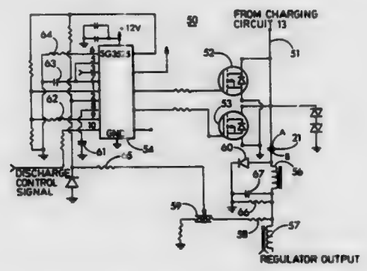
1. A system of X-ray diagnosis for the angiographic examination of a patient, comprising a stand supporting an X-radiation source and a radiological image receiver cooperating with the source, a radiology table of the type including a panel mounted on a base, means to obtain relative shifts of the stand and of the panel, a device for the injection of a contrast medium into the patient's circulatory system and a device for the acquisition of the images detected by the receiver so as to finally obtain a radiological image of a patient's body, wherein said system further comprises means for detecting the progress of the contrast medium in the patient's circulatory system and means responsive to said means for detecting for triggering, firstly, the relative shifting of the stand and of the panel in several positions and, secondly, the taking of the radiological image for these relative positions so that the radiological image obtained at each of these relative positions is recorded at an instant when the blood vessels of the zone, an image of which is recorded, show a significant concentration in contrast medium.

5,111,493

PORTABLE X-RAY SYSTEM WITH CERAMIC TUBE

Melvin P. Siedband, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 276,152, Nov. 25, 1988, abandoned. This application Oct. 31, 1990, Ser. No. 607,603
Int. Cl.[5] H05G *1/24*
U.S. Cl. 378—103 **18 Claims**



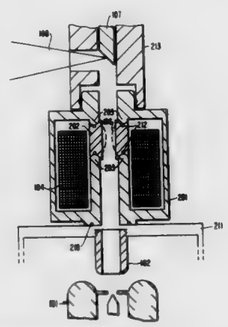
1. X-ray apparatus comprising:
(a) an energy source for providing a DC voltage;
(b) a storage capacitor;
(c) means for recharging the capacitor from the energy source;
(d) power supply means, connected to the capacitor, for providing a regulated output voltage, including an inductor connected between the storage capacitor and the output of the power supply means, a controllable switch connected between the storage capacitor and ground on the other side of the capacitor from the inductor, a pulse-width modulator providing output pulses to control the controllable switch with the width of the pulses from the modulator modulated in accordance with an input signal to provide negative output pulses from the capacitor to the inductor, and means for providing an input to the pulse-width modulator to maintain the output voltage of the power supply means substantially constant as the capacitor voltage changes during an X-ray exposure;
(e) an X-ray tube having at least an anode and a cathode;
(f) means, receiving the output of the power supply means, for selectively providing a high voltage between the anode and cathode of the X-ray tube to drive the same.

5,111,494

MAGNET FOR USE IN A DRIFT TUBE OF AN X-RAY TUBE

Loyce A. Turner, SE. Smyrna, and Phillip K. Ausburn, Lawrenceville, both of Ga., assignors to North American Philips Corporation, New York, N.Y.

Filed Aug. 28, 1990, Ser. No. 574,623
Int. Cl.[5] H01J *35/30*
U.S. Cl. 378—138 **9 Claims**



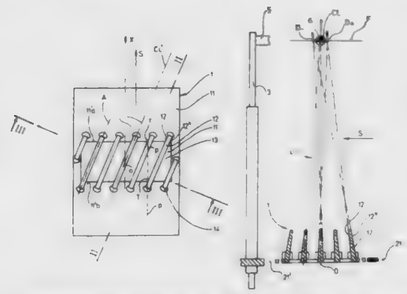
1. An x-ray tube comprising:
a) a cathode;
b) an accelerating anode for accelerating electrons from the cathode;
c) a magnet for focussing electrons leaving the accelerating anode, the magnet including a cylindrical magnetic core; and
d) a target assembly;
wherein the improvement comprises:
e) non-magnetic material sealed between poles of the core;
f) a direct seal between the core and the accelerating anode; and
g) a direct seal between the core and the target assembly; whereby a vacuum is maintained in the magnet along only the electron path without need of a separate drift tube.

5,111,495

APPARATUS FOR REDUCTION OF SCATTER IN DIAGNOSTIC RADIOLOGY

Lucijan Miklavcic, Hrvatini 216a, Ankaran, Yugoslavia YU-66280

Filed May 22, 1990, Ser. No. 526,632
Claims priority, application Yugoslavia, May 26, 1989, 1095/89; Jun. 1, 1989, 1133/89
Int. Cl.[5] G21K *5/10, 1/00*
U.S. Cl. 378—146 **4 Claims**



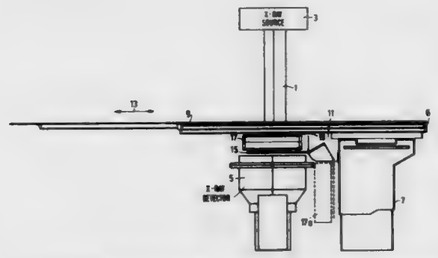
1. A scanning slit radiography apparatus with a radiographic grid, of radiopaque strips a radiopaque frame of the grid being mounted on a carriage, which is sweepable along guide bars of a sweeping guide frame so that the grid in each instant is moved along its longitudinal axis, and a rectangular aperture made in the radiopaque frame and having a downward border and an upward border, with regard to the direction of the sweep being performed in the radiopaque frame, whereby the borders are normal to the longitudinal axis, characterized in that downward lateral faces of each two next radiopaque strips, which are fastened to the radiopaque frame and traverse the aperture with mutually parallel long axes, cut opposite borders at points which are equidistant from the longitudinal axis, and that the strips, whose long medial planes intersect each other in a convergent line, are shaped in such manner that planes of the downward lateral faces intersect each other in an upward decentrated line and planes of upward lateral faces intersect each other in a downward decentrated line.

5,111,496

X-RAY EXAMINATION TABLE WITH PIVOTALLY CONNECTED FILM HOLDER

Ludovicus P. C. Van Es, and Robert Van Der Ploeg, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1990, Ser. No. 518,881
Claims priority, application Netherlands, May 10, 1989, 8901169
Int. Cl.[5] G03B *42/02*
U.S. Cl. 378—177 **7 Claims**



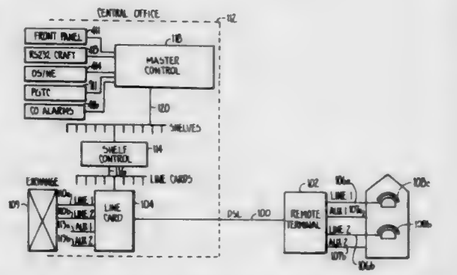
1. An X-ray examination apparatus comprising an X-ray source, an X-ray detector, said source and detector being mounted on a carrier so that they face one another, and a patient table with a table frame and a table top supported by the table frame, the combination therewith comprising a film holder having an image plane and pivotally connected to the table frame for pivoting to first and second positions relative to the frame and means securing the film holder such that the image plane of the film holder extends parallel to the table top in the first position and transversely of the table top in the second position, said frame including means for permitting the table top to displace in a given direction with respect to the table frame.

5,111,497

ALARM AND TEST SYSTEM FOR A DIGITAL ADDED MAIN LINE

David C. Bliven, San Jose; Anthony Vranicar, Santa Clara; Philip B. Vail, San Leandro; Gerald L. Shimirak, Danville, all of Calif., and Julian S. Mullaney, Raleigh, N.C., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 17, 1990, Ser. No. 584,325
Int. Cl.[5] H04B *3/46*; H04M *1/24, 9/00*; H01R *13/44*
U.S. Cl. 379—27 **71 Claims**
MICROFICHE APPENDIX INCLUDED
(10 Microfiche, 819 Pages)



1. A test system for a digital main line system, said digital main line system including a line card for conversion of analog signals to digital signals and a remote terminal for conversion of said digital signals to analog signals for use in subscriber telephonic equipment, said digital main line system adapted to transmit multiple telephonic signals in digital form from said line card to said remote terminal location over a single twisted pair, comprising:
a) a remote terminal emulator at central office facilities for performing a line card test, said remote terminal emulator emulating output of said remote terminal with a predefined output pattern; and
b) means for comparing a response of said line card to emulated output of said remote terminal emulator so as to detect failures in said line card.

5,111,498

HINGED-CASE SOUND AND VISION COMMUNICATIONS TERMINAL, IN PARTICULAR A VIDEO-PHONE

Jacques Guichard, 8-10, rue des Morillons, 75015 Paris, France; Georges Buchner, 34, rue de Picpus, 75012 Paris, France, and Jacques Labat, 98, rue Pierre Brossolette, 92320 Chatillon, France

Continuation of Ser. No. 249,134, Sep. 26, 1988, abandoned. This application Jul. 19, 1990, Ser. No. 555,367
Claims priority, application France, Sep. 25, 1987, 87 13318
Int. Cl.[5] H04N *7/14*
U.S. Cl. 379—53 **11 Claims**

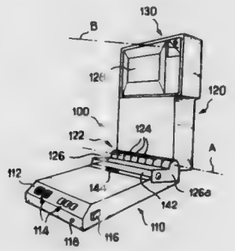
1. A terminal for sound and vision communications, of the

type associated, in particular, with a telephone set, and comprising a case, said case consisting of:

(a) a first, fixed part via which said terminal is supported on a support surface, said first, fixed part containing an electronic assembly for control, coding/decoding, and telephone line interfacing and control means; and

(b) a second, movable part which is hinged to said first part about a substantially horizontal axis and which receives a display screen monitor and a camera provided with optics, said second part being capable of assuming a first, closed angular position resting against said first part and at least two open angular positions relative to said first part corresponding to two different aiming directions for said camera;

(c) said second part being substantially flat and elongated and receiving said camera so that an aiming direction of said camera is perpendicular to a plane of said second part,



said optics including means provided in a region of said second part that is most remote from said hinge for deflection through 90° of an image sensed by said camera;

(d) said display screen monitor being also provided in said region of said second part that is most remote from said hinge and close to said deflecting means;

(e) whereby the thickness of said second part of said case is minimized and said aiming direction of said camera provided with said optics is displaced, in use, well above said support surface; and

(f) wherein, in the utilization position, said camera optics is offset laterally relative to said display screen monitor, and wherein said terminal includes parallax correction means comprising a camera lens disposed in such a manner that the aiming direction of said camera is laterally inclined by a predetermined angle, with a sensitive plane of said camera being inclined by approximately the same angle relative to the plane perpendicular to said aiming direction.

5,111,499

CORDLESS TELEPHONE APPARATUS HAVING A RINGER CIRCUIT OPERABLE DURING POWER FAILURE

Yuji Umemoto; Akio Toki, and Shuji Yamaguchi, all of Hino, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 100,323, Sep. 23, 1987, abandoned. This application Jul. 23, 1990, Ser. No. 555,800

Claims priority, application Japan, Sep. 26, 1986, 61-225817

Int. Cl.[5] H04M *11/02*

U.S. Cl. 379—61 **5 Claims**

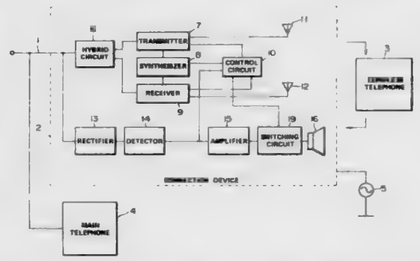
1. A cordless telephone apparatus comprising:

a cordless telephone; and

a connection device connected to a subscriber's line and connectable to said cordless telephone via a radio circuit, said connection device being driven by a power source and including:

a ringer circuit driven with power supplied from the subscriber's line; and

control means for automatically rendering the ringer circuit inoperative when the connection device and the cordless telephone are connected via the radio circuit such that the cordless telephone produces an audible ringing signal in response to an incoming call from the subscriber's line and for automatically rendering the ringer circuit operative if either one of a first condition and a second condition are satisfied; the first condition being that the connection



device and the cordless telephone are not connected via the radio circuit such that the cordless telephone is not capable of producing an audible ringing signal in response to an incoming call from the subscriber's line and the second condition being that power supplied from the power source is interrupted.

5,111,500

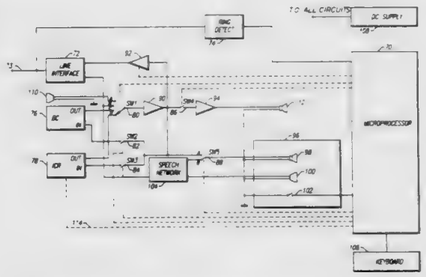
HANDSET OR SPEAKER MESSAGE RETRIEVAL SYSTEM

Eskandar Afshar, Lomita, and Mark Karnowski, Garden Grove, both of Calif., assignors to PhoneMate, Inc., Torrance, Calif.

Filed Jan. 4, 1990, Ser. No. 461,068

Int. Cl.[5] H04M *1/64*

U.S. Cl. 379—67 **3 Claims**



1. A telephone answering machine having a telephone portion for communication between called and calling parties and an answering portion for message recording and playback, said telephone answering machine comprising:

a telephone handset;

message storage means for storing a message from a caller and playing back said message to said called party, said message storage means coupled to said telephone handset;

a speaker coupled to said message storage means, said speaker audibly broadcasting a recorded message from said message storage means;

switching means coupled to said telephone handset, said switching means switchably selecting either said telephone handset or said speaker for audible broadcast of a recorded message from said message storage means; and

control means coupled to said message storage means, said control means suspending and activating operation of said message storage means in response to coincident use of said telephone handset, thereby preserving message transmission order from said message storage means.

5,111,501

TELEPHONE TERMINAL DEVICE HAVING SPEECH RECOGNITION UNIT

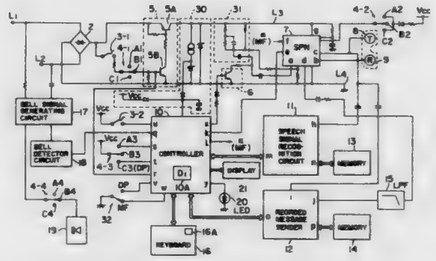
Masanobu Shimanuki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 8, 1990, Ser. No. 476,837

Claims priority, application Japan, Feb. 9, 1989, 1-30614

Int. Cl.[5] H04M *1/26*

U.S. Cl. 379—355 **10 Claims**



6. A telephone terminal device, comprising:

a transmitter microphone;

a bell signal generating circuit for detecting an incoming call from a telephone network, and for generating bell signals;

an electroacoustic transducer for receiving said bell signals and for generating ringing tones;

selector means for selecting between a registration mode and a speech mode;

a speech recognition unit for analyzing speech signals received from said transmitter microphone and storing analysis data when the telephone terminal device is in the registration mode, and for recognizing speech signals received from said transmitter microphone by comparing the speech signals with the analysis data that has been stored beforehand when the telephone terminal devcie is in the speech mode;

hook detector means for detecting a hook status;

switching means for opening and closing a direct current loop for the telephone network, said switching means maintaining the direct current loop current in an open state when the telephone terminal device is in the registration mode, and closing the direct current loop when an off-hook status is detected by said hook detector means and the telephone terminal device is in the speech mode;

a controller for generating a control signal when the incoming call is detected while said speech recongnition unit is receiving speech signals from said transmitter microphone while the telephone terminal device is in the registration mode;

preventing means, responsive to said control signal, for preventing transmission of said bell signals from said bell signal generating circuit to said electroacoustic transducer when the telephone terminal device is in the registration mode; and

display means, responsive to said control signal, for effecting a visible display indicating the reception of the incoming call.

5,111,502

TELEPHONE LINE BRIDGING SENSOR

William C. McClure, Denver, Colo.; Bob D. Kunce, Joplin, Mo., and John Q. McClure, Aurora, Colo., assignors to Command Communications, Inc., Aurora, Colo.

Filed Apr. 25, 1990, Ser. No. 514,131

Int. Cl.[5] H04M *3/22*

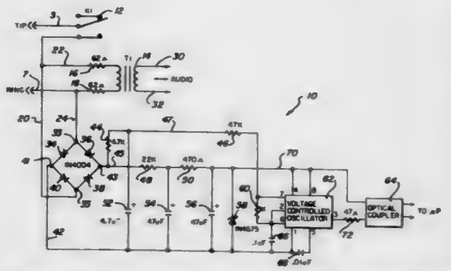
U.S. Cl. 379—380 **15 Claims**

12. A telephone line bridging circuit for sensing when one or more telephone devices are connected or disconnected from a telephone line, said telephone line having a loop current and voltage, said bridging circuit being arranged within a telephone device, the circuit comprising:

a) relay means connected to a telephone line and activated by said telephone device when a ring voltage is present on the telephone line;

b) rectifier means connected to said relay means so that when said relay means is activated the telephone line is connected across said rectifier means, said rectifier means being of the full-wave type;

c) said rectifier means having an output voltage which is indicative of the loop current present in the connected telephone line;



d) voltage controlled oscillator means connected across the output of said rectifier mean whereby the frequency of the output from said oscillator means is proportional to the output voltage from said rectifier means; and

e) microprocessor means arranged to receive the output from said oscillator means, said microprocessor means being arranged to periodically measure the frequency of the output, store one of the frequency measurements as a reference measurement, compare subsequent measurements with said reference measurement and produce a signal when one of the subsequent frequency measurements deviates a predetermined amount indicating that a telephone device has been connected to or disconnected from said telephone line.

5,111,503

PORTABLE TELEPHONE SET

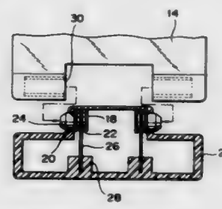
Hisamitsu Takagi, Inagi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 7, 1991, Ser. No. 741,630

Claims priority, application Japan, Aug. 7, 1990, 2-207599

Int. Cl.[5] H04M *1/00;* **E05D** *7/10, 11/10;* **E05F** *1/08*

U.S. Cl. 379—433 **6 Claims**



1. A portable telephone set comprising:

a body provided with a speaker, a microphone and switch means;

a cover attached pivotably to said body, said cover when closed being adapted to cover at least said switch means and when opened function as a reflective sound collector for the microphone;

stopper means provided in said body to inhibit the cover

from rotating at an angle larger than a predetermined angle relative to the body; and

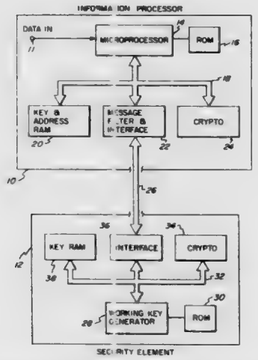
cover holding means for holding said cover pivotably within said predetermined angle relative to said body, said cover holding means including biasing means for holding the cover in a stable position in the rotating direction of the cover when the cover is opened, and said cover holding means permitting the cover to be disengaged from the body when the cover is about to be opened forcibly against said stopper means.

5,111,504

INFORMATION PROCESSING APPARATUS WITH REPLACEABLE SECURITY ELEMENT

James N. Esserman, San Diego, and Paul Moroney, Cardiff, both of Calif., assignors to General Instrument Corporation, Hatboro, Pa.

Filed Aug. 17, 1990, Ser. No. 568,990
Int. Cl.[5] H04L *9/02*
U.S. Cl. 380—21 **68 Claims**



1. A field upgradeable security system for processing signals comprising:

an information processor having a receptacle for receiving a separate unitary replaceable security element;

said replaceable security element including:

means for generating a working key;

means for encrypting said working key with a secret key; and

means for communicating the encrypted working key to said information processor;

wherein said information processor includes means for decrypting the encrypted working key for use in processing a signal.

5,111,505

SYSTEM AND METHOD FOR REDUCING DISTORTION IN VOICE SYNTHESIS THROUGH IMPROVED INTERPOLATION

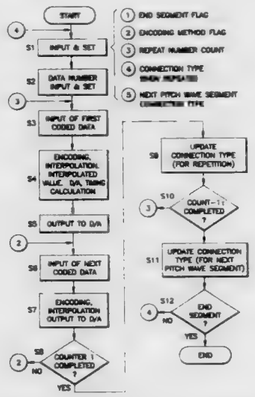
Atsunori Kitoh, Yamatotakada, and Yoshiji Fujimoto, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 381,000, Jul. 17, 1989, abandoned. This application Oct. 16, 1990, Ser. No. 598,826
Claims priority, application Japan, Jul. 21, 1988, 63-183906
Int. Cl.[5] G10L *5/02*
U.S. Cl. 381—51 **11 Claims**

3. A device used with a voice synthesizing device for connecting wave segments, comprising:

a) a connection type memory for storing a plurality of preferred connection types for wave segments, said connection types each representing a connection of an interpolated waveform for an end sampled value of a preceding wave segment of a particular type with an interpolated waveform for a lead sampled value of a following wave segment of a particular type, each of said preferred connection types determining a preferred sampling period for use during connection of said wave segments;

b) means for assigning a connection type to a connection between a preceding wave segment and a following wave segment by interpolating a time axis zero cross point for



said interpolated waveform for said end sampled value of said preceding wave segment and a time axis zero cross point for said interpolated waveform for said lead sampled value of said following wave segment and

c) a wave segment connector providing connection of said preceding and following wave segments using one of said preferred sampling periods as determined by the connection type assigned to the connection between said preceding and following wave segments.

5,111,506

POWER EFFICIENT HEARING AID

Albert J. Charpentier, Malvern; Duane J. Loeper, Phoenixville; Brian J. McLaughlin, Brookhaven; Edouard A. Gauthier, and David W. DiOrio, both of West Chester, all of Pa., assignors to Ensonig Corporation, Malvern, Pa.

Filed Mar. 2, 1989, Ser. No. 318,039
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—68.4 **6 Claims**



1. A hearing aid comprising:

a microphone for converting acoustic energy into electrical signals;

signal amplification means, coupled to said microphone, for amplifying the signals provided thereby to produce amplified electrical signals;

signal processing means for spectrally shaping said amplified electrical signals, said signal processing means including a plurality of amplifier means, each having a predetermined frequency response characteristic and each having first and second terminals coupled to first and second sources of operating potential, respectively and a bias input terminal for applying a biasing potential to establish a quiescent current flow through said plurality of amplifier means from said first source of operating potential to said second source of operating potential; and

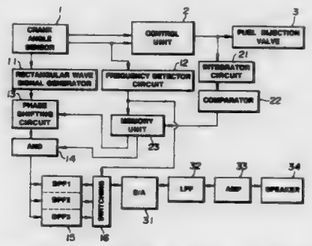
means for adjusting said bias potential to establish said quiescent current within a predetermined range of values representing an approximate optimal level of operating power for said hearing aid without significantly affecting the respective frequency response characteristics of said plurality of amplifier means.

5,111,507

SYSTEM FOR REDUCING NOISE LEVEL IN VEHICULAR CABIN

Yoshiharu Nakaji, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 24, 1990, Ser. No. 556,541
Claims priority, application Japan, Jul. 24, 1989, 1-190905
Int. Cl.[5] G10K *11/16*
U.S. Cl. 381—71 **10 Claims**



1. A system for lowering cabin noise in a vehicular cabin, comprising:

first means for periodically generating a first pulse signal in synchronism with an engine revolution, said first pulse signal having a period proportional to a noise period created by vibration induced in synchronization with said engine revolution;

second means including a flip-flop, in response to the first pulse signal, for generating a rectangular waveform signal having a 50% duty ratio and a rising edge and falling edge being in conformity to a rising edge and subsequent rising edge of said first pulse signal, respectively;

third means for converting said rectangular waveform signal into a digital signal representative thereof; and

fourth means for processing said digital signal for adjusting signal phase and amplitude and outputting adjusted digital signal for canceling the noise created by vibration.

5,111,508

AUDIO SYSTEM FOR VEHICULAR APPLICATION

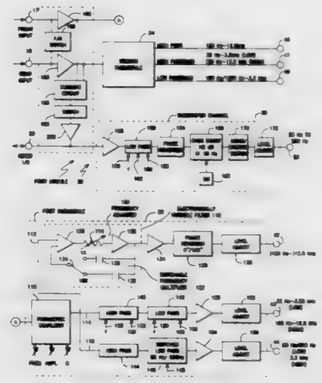
Vannin Gale, Riverside, and David Kwang, Pasadena, both of Calif., assignors to Concept Enterprises, Inc., Vernon, Calif.

Continuation-in-part of Ser. No. 314,509, Feb. 21, 1989, Pat. No. 4,905,284. This application Jan. 3, 1990, Ser. No. 460,635
Int. Cl.[5] H03G *5/00*
U.S. Cl. 381—100 **20 Claims**

11. A system for supplying adjustably variable audio signals to different sound reproduces in an audio system in response to input signals comprising:

first electronic crossover means responsive to the input signals for separating the signals into a number of channels, the channels each including independently adjustable filter means covering overlapping frequency bands and each having predetermined cutoff attenuation characteristics to provide accessible output signals in selectable frequency bands;

the electronic crossover means including switchable input circuit means selectively coupled to the channels and



including means for providing an additional accessible output from at least one of the channels;

a second electronic crossover means corresponding to the first; and

means for intercoupling he accessible output signals from the first electronic crossover means as input signals to the second electronic crossover means.

5,111,509

ELECTRIC ACOUSTIC CONVERTER

Akihiko Takeuchi, and Shigeo Suzuki, both of Shizuoka, Japan, assignors to Yamaha Corporation, Japan

Filed Dec. 21, 1988, Ser. No. 288,028
Claims priority, application Japan, Dec. 25, 1987, 62-332959; Jan. 14, 1988, 63-7280; Feb. 25, 1988, 63-44720
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—154 **15 Claims**



1. An electric acoustic convertor comprising,

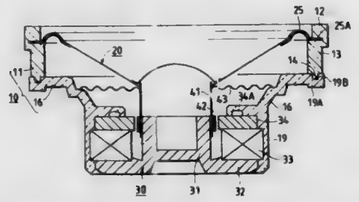
a housing,

a plurality of tubes each defining a resonant chamber having a proximal end attached to said housing and a distal end,

a plurality of tone generating units each having a main sound wave emanating face arranged in said housing and a vibratory member for generating sound waves, and

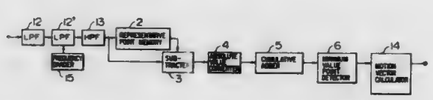
a partition arranged in each of said resonant chambers between said plurality of tone generating units and said distal ends of said resonant chambers, each of said partitions having an aperture for passage of said sound waves from said main sound wave emanating face of one of said tone generating units to one of said resonant chambers.

5,111,510
SPEAKER AND MANUFACTURING METHOD THEREFOR
Kunio Mitobe, Yamagata, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Division of Ser. No. 489,317, Mar. 5, 1990. This application Jul. 16, 1991, Ser. No. 730,747
Claims priority, application Japan, Mar. 30, 1989, 1-81145
Int. Cl.[5] H04R *25/00, 7/00*; H01F *7/06*
U.S. Cl. 381—193 **4 Claims**



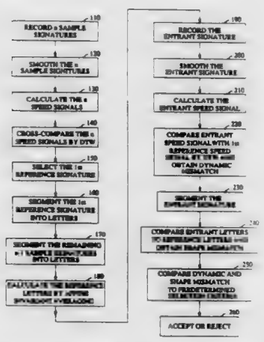
1. A method of manufacturing a speaker comprising the steps of:
insertion-molding an edge onto a diaphragm having a voice coil bobbin attached thereto;
molding a first frame piece so that the edge is integrally combined with the molded first frame piece;
assembling a driver unit;
molding a second frame piece so that the assembled driver unit is integrally combined with the second frame piece;
combining the first and second frame pieces together; and
bonding edges of a damper to said molded second frame piece and to the voice coil bobbin of the diaphragm, respectively.

5,111,511
IMAGE MOTION VECTOR DETECTING APPARATUS
Hirofumi Ishii, Moriguchi, and Atsushi Morimura, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 16, 1989, Ser. No. 367,366
Claims priority, application Japan, Jun. 24, 1988, 63-157146; Oct. 28, 1988, 63-273563
Int. Cl.[5] G06K *9/00*; H04N *7/18*
U.S. Cl. 382—1 **5 Claims**



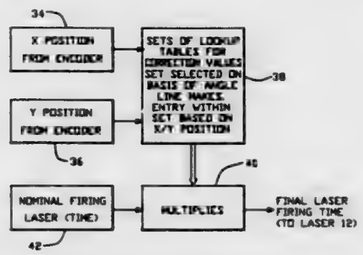
3. A motion vector detecting apparatus comprising:
a low-pass filter means for receiving and filtering input image signals;
a representative point memory means, receiving an output of said low-pass filter means, for storing image signals corresponding to a plurality of representative points arranged within a motion vector detection area for input image signals of a given frame, said representative points being arranged at a predetermined horizontal direction interval LX and at a predetermined vertical direction interval LY;
a subtraction means, receiving stored image signals from said representative point memory means and the input image signals, for obtaining differences between (i) stored image signals stored in said representative point memory means corresponding to each of said plurality of representative points and (ii) input image signals of frames subsequent to the given frame, said subsequent input image signals corresponding to points neighboring each of said plurality of representative points within the motion vector detection area;
a cumulative addition means, responsive to said subtraction means, for adding up the differences obtained by said subtraction means;
a means for obtaining correlation values for discrete shifts of predetermined intervals IX and IY in the horizontal and vertical directions, respectively, within the motion vector detection area based on said differences added up by said cumulative addition means;
a motion vector outputting means, responsive to said correlation values obtaining means, for determining a minimum value point (i', j') corresponding to a minimum value among said correlation values, interpolating the correlation values in accordance with an interpolation polynominal by using a correlation value $\Sigma|\Delta L|$ between the minimum value point and points neighboring the minimum value point, and outputting, as a motion vector, a minimum value point corresponding to a minimum value among the interpolated correlation values obtained in accordance with the interpolation polynominal; and
wherein said low-pass filter means has a non-zero impulse response for at least one of a delay of said predetermined horizontal direction interval LX and a delay of said predetermined vertical direction interval LY with respect to said input image signals.

5,111,512
METHOD FOR SIGNATURE VERIFICATION
Jason Chia-Sun Fan, Adelphi, Md.; Trevor J. Hastie, Berkeley Heights, N.J., and Eyal Kishon, New York, N.Y., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed May 14, 1991, Ser. No. 699,867
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—3 **6 Claims**



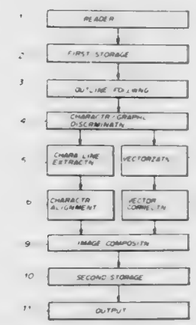
1. A method for controlling access to a system, the method comprising an initializing step wherein at least one authorized signature is recorded and a recognition step wherein an entrant signature is compared to the authorized signature, wherein:
the initializing step comprises the steps of:
a) digitally recording a multiplicity of authorized sample signature received from digitizing means;
b) calculating a speed function corresponding to each sample signature, performing pairwise comparisons of the speed functions by applying dynamic time warping (to be referred to as "DTW"), and selecting that signature, to be referred to as a "representative signature," which is most typical according to the DTW calculations;
c) segmenting the representative signature into individual word features, to be referred to as "letters", based on relatively small local values of the speed function;
d) segmenting each of the remaining sample signatures into letters by mapping thereupon the segmentation of the representative signature by DTW, such that there is a correspondence between the letters of each pair of segmented sample signatures; and
e) constructing a reference signature by averaging each set of corresponding letters from the sample signatures; and
the recognition step comprises the steps of:
f) digitally recording an entrant signature received from digitizing means;
g) calculating a speed function for the entrant signature, and segmenting the entrant signature into letters by mapping thereupon the segmentation of the representative signature by DTW such that there is a correspondence between the letters of the entrant signature and the letters of the reference signature;
h) calculating a dynamic mismatch between the entrant signature and the representative signature by DTW;
i) calculating a shape mismatch, totalled over all the relevant letters, between the entrant signature and the reference signature;
j) comparing the dynamic and shape mismatch values to a predetermined acceptance criterion; and
k) if the acceptance criterion is satisfied, activating an electric circuit such that access to the system is made available.

5,111,513
PROJECTED IMAGE LINEWIDTH CORRECTION APPARATUS AND METHOD
James B. Turner, Menlo Park, and Roderick J. McInnis, Milpitas, both of Calif., assignors to Greyhawk Systems, Inc., Milpitas, Calif.
Continuation of Ser. No. 318,736, Mar. 3, 1989, Pat. No. 5,014,326. This application Apr. 4, 1991, Ser. No. 680,297
The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—8 **14 Claims**



1. An apparatus for correcting linewidth deviations in a projected image formed by an image projection system, comprising:
means for impinging a laser on an image receiving surface to create a test image of a specific number of test points on said image receiving means, each of said test points having a plurality of lines of specific width;
means for determining the differences between the that an entire area of said image receiving means is provided with a correction coefficient;
means for modifying the power of said laser impinging on a specific area of said image receiving means by the correction coefficient for said specific area;
means for storing said correction coefficients; and
laser location positioning means connected at least to said storing means and said modifying means for indicating the position of said laser so that said storing means can transfer stored correction coefficients for a particular location to said modifying means.

5,111,514
APPARATUS FOR CONVERTING HANDWRITTEN CHARACTERS ONTO FINELY SHAPED CHARACTERS OF COMMON SIZE AND PITCH, ALIGNED IN AN INFERRED DIRECTION
Junichi Ohta, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Oct. 5, 1990, Ser. No. 593,818
Claims priority, application Japan, Oct. 5, 1989, 1-258899
Int. Cl.[5] G06K *9/34*
U.S. Cl. 382—9 **10 Claims**



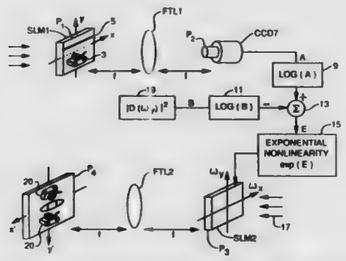
1. A digital image forming apparatus, comprising:
a) image reading means for optically scanning an original including character information and graphic information thereon to generate an input image signal, and photoelectrically converting the input image signal into two-level image information including character images and graphic images;
b) first storage means for storing the two-level image formation from the image reading means;
c) second storage means for storing output image information;
d) character extraction means for individually extracting the character images from said two-level image information to define character line information within the output image information, the character line information including a size of each of the character images, an array of black pixels within the character images, a set of lines of characters and a primary alignment direction;
e) character alignment means for correcting the character images to have the same size and the same distance therebetween, and aligning the set of lines of characters in the primary alignment direction in accordance with the character line information to define output character image information stored in the second storage means; and
f) output means for outputting a copy in which the output image information stored in the second storage means is reproduced;
wherein said character alignment means calculates information with respect to enlargement, reduction and movement of the character information within the original, so that the output character image information has the calculated information with respect to the enlargement, the reduction and the movement and said output character image information is defined in the output image information; and
wherein said information calculated by said character alignment means includes the average height of the character images, the average width thereof and the average distance therebetween, said digital image forming apparatus performing the enlargement, the reduction and the movement of the two-level image information based on said calculated information, so that the extracted character information in the output image information includes character images with the same size and the same distance

therebetween and the set of lines of characters each aligned in the primary alignment direction.

5,111,515
IMAGE DECONVOLUTION BY A LOGARITHMIC EXPONENTIAL NONLINEAR JOINT TRANSFORM PROCESS

Bahram Javidi, West Willington, Conn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 29, 1990, Ser. No. 546,480
Int. Cl.[5] G06F *15/332*
U.S. Cl. 382—43 **5 Claims**



4. Apparatus for recovering a substantially unsmeared image of a smeared input image by performing joint transform processing of a smeared image and its smearing function comprising:

(a) means for producing an optical interference pattern between a Fourier transform of the smeared image and a Fourier transform of an optical image of said smearing function;

(b) means for obtaining a joint power spectrum of said optical interference pattern;

(c) means for producing the power spectrum of said smearing function;

(d) means for dividing the joint power spectrum of said interference pattern by the power spectrum of the smearing function to produce a modified joint power spectrum having the Fourier amplitude and phase of the original input signal; and

(g) means for Fourier transforming said modified joint power spectrum to recover an unsmeared image of said smeared input image.

5,111,516
APPARATUS FOR VISUAL RECOGNITION

Masaru Nakano, Nagoya, and Kazutoshi Sukigara, Aichi, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Apr. 11, 1990, Ser. No. 507,406
Claims priority, application Japan, Apr. 11, 1989, 1-91077
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—14 **8 Claims**

1. A visual recognition apparatus, comprising:

basic image extraction means for extracting a basic image of objects from each pixel in a two-dimensional gray image of said objects;

line image extraction means for extracting a line image obtained through a spatial differentiation of said extracted basic image;

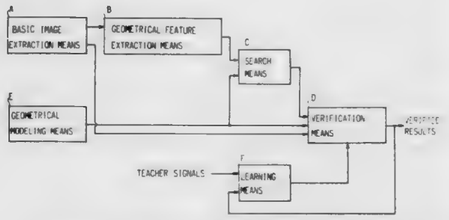
geometrical feature extraction means for extracting geometrical elements representing geometry of said objects from said extracted line image;

search means for searching said extracted geometrical elements which match a geometrical model composed of model elements representing an object to be recognized, and for getting a candidate position/orientation of said object to be recognized, based on a relative position of said geometrical elements and said model elements; and

verification means for verifying whether or not said candidate position/orientation of object to be recognized obtained by said search means accurately matches said object to be recognized;

the verification means including;

network input-value arithmetic operation means for mapping mesh cells obtained by dividing a region fixed to said geometrical model into some small regions on said basic image or said line image based on said candidate position-



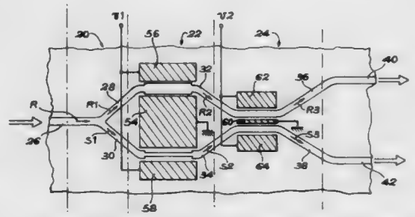
/orientation, matching positions/orientations of said object to be recognized and the geometrical model to each other and determining a value representing each of said mesh cells in reference to a basic image or a line image in each of said mesh cells; and

a neutral network having input elements, each of said input elements one to one corresponding to each cell in said mesh cells and inputting an output-value of each cell obtained by said network input-value arithmetic operation means, having an output element for outputting a true or false value, and calculating an output-value of said output element from input-values to said input elements.

5,111,517
POLARIZATION BEAM SPLITTER FOR GUIDED LIGHT

Luc Riviere, Valbonne Sophia Antipolis, France, assignor to France Telecom Etablissment autonome de Droit Public (Centre National d'Etudes des Telecommunications, Issy les Moulineaux, France

Filed Feb. 12, 1991, Ser. No. 654,544
Claims priority, application France, Feb. 14, 1990, 90 01742
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—11 **7 Claims**



1. A polarization beam splitter for guided light produced on a substrate (14) comprising:

a passive Y-junction **(66)** having an input and two outputs and which is able to separate or split into two waves of the same amplitude and in phase with one another, an input light wave reaching the input of the Y-junction and which is a combination of two guided optical modes, namely a transverse electric mode TE and a transverse magnetic mode TM,

an active phase shifter **(68)** with two arms respectively having two inputs, which respectively extend the two outputs

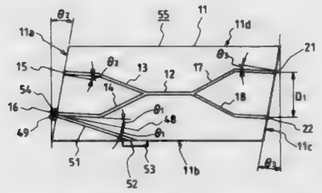
of the Y-junction and two outputs, said phase shifter being able to induce a phase shift F of the TE mode which is propagated in one of the arms with respect to the TE mode which propagates in the other arm and a phase shift −F of the TM mode which propagates in the said arm with respect to the TM mode propagating in the said other arm, the substrate being made from a material making it possible to induce opposite variations DN and −DN respectively on the refractive index associated with the TE mode and on the refractive index associated with the TM mode and,

an active directional coupler **(70)**, independent of the polarization and able to constitute a 3 dB coupler by an appropriate polarization of the electrodes **(78,80,82)** of said coupler and having two inputs, which respectively extend the two outputs of the phase shifter, as well as two outputs, in such a way that when the coupler constitutes a 3 dB coupler the TM mode of the input wave is obtained at one of the two outputs of the coupler and the TE mode of said input wave is obtained at the other output of the coupler by appropriately polarizing the electrodes **(72,74,76)** of the phase shifter.

5,111,518
OPTICAL INTEGRATED CIRCUIT

Kenichi Okada, Tokyo, Japan, assignor to Japan Aviation Electronics Industry, Ltd., Tokyo, Japan

Filed Apr. 17, 1991, Ser. No. 686,597
Claims priority, application Japan, Apr. 20, 1990, 1-14606
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—14 **7 Claims**



1. An optical integrated circuit comprising:

an electro-optic plate having a top face and at least four sides;

first and second optical waveguides formed on the top face of said electro-optic plate, said first and second optical waveguides extending to reach one of said four sides at one ends of said optical waveguides, and said first and second optical waveguides being interconnected at the other ends thereof, a terminal portion of said first optical waveguide forming an angle other than 90 degrees with respect to said one side of said electro-optic plate;

a third optical waveguide formed in the top face of said electro-optic plate, said third optical waveguide having one end thereof connected to the interconnection of said first and second optical waveguides to form a Y-shaped optical coupler wherein light from said third optical waveguide is branched to said first and second waveguides;

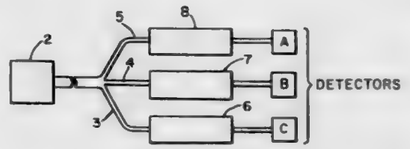
a fourth optical waveguide formed in the top face of said electro-optic plate to extend from said one end of said first optical waveguide at said one of said four sides to another one of said four sides; and

reflecting means formed on said one of said four sides to reflect light from said first optical waveguide to said fourth optical waveguide so that the reflected light is guided by said fourth optical waveguide to said another one of said four sides.

5,111,519
METHOD OF INTERFERENCE REDUCTION FOR FREQUENCY MULTIPLEXED OPTICAL FIBER COMMUNICATION

Ronald F. Mathis, Ramona, Calif., assignor to Tacan Corporation, Carlsbad, Calif.

Filed Feb. 1, 1991, Ser. No. 649,745
Int. Cl.[5] G02B *6/28;* H04J *1/00;* G02F *1/00*
U.S. Cl. 385—24 **5 Claims**



1. A method for reducing interference and cross-talk between channels within a signal comprising a plurality of frequency multiplexed channels being transmitted on a fiberoptic bus to a receiver, said method which comprises:

selecting one or more center frequencies within said signal;

forming a resonant cavity from an optical waveguide for each selected center frequency, said resonant cavity being resonant at said selected center frequency;

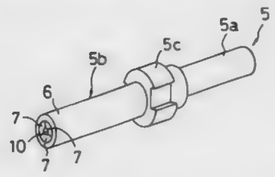
feeding said signal into each resonant cavity;

attenuating the total power of said channels within a signal received at said receiver by attenuating the frequencies within a range surrounding each center frequency more than said each center frequency.

5,111,520
OPTICAL FIBER CONNECTOR TERMINAL

Norihide Kawanami; Kinjiro Okada, both of Tokyo; Nobuaki Kobayashi, and Kimio Masuda, both of Ueda, all of Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1991, Ser. No. 659,074
Claims priority, application Japan, May 16, 1990, 2-124018
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—81 **5 Claims**



1. An optical fiber connector terminal comprising:

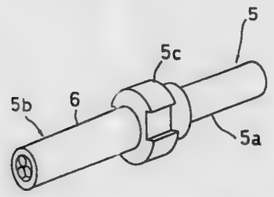
a sleeve made from a first metallic material;

a plurality of separate collet members made of a second metallic material disposed equidistance from a center within said sleeve to define a receiving aperture; and

an optical fiber inserted into and bonded to said receiving aperture;

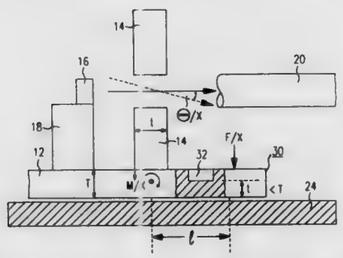
said collet members having a hardness greater than that of said sleeve so that when said sleeve is reduced in diameter, said sleeve collapses to fill spaces between said sleeve and said collet members.

5,111,521
OPTICAL FIBER CONNECTOR TERMINAL AND METHOD OF MAKING SAME
Norihide Kawanami; Kinjiro Okada, both of Tokyo, and Yoshikazu Kozu, Ueda, all of Japan, assignors to Hirose Electric Co. Ltd., Tokyo, Japan
Filed Feb. 22, 1991, Ser. No. 659,091
Claims priority, application Japan, May 16, 1990, 2-124016
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—82 **8 Claims**



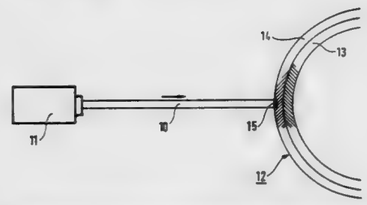
1. An optical fiber connector terminal comprising:
a sleeve made of a first metallic material;
a plurality of pins made of a second metallic material and disposed equidistance form a center within said sleeve to define a receiving aperture;
a plurality of filler means made from a third metallic material for filling spaces between said sleeve and said pins; and
an optical fiber inserted into and bonded to said receiving aperture;
said first and third metallic materials being softer than said second metallic material so that when said sleeve is reduced in diameter, said hard metallic material collapse under pressure to fill spaces between said sleeve and said pins.

5,111,522
OPTICAL PACKAGE WITH REDUCED DEFLECTION OF THE OPTICAL SIGNAL PATH
Ghazi M. Chaoui, Macungie, and Palmer D. Smeltz, Jr., Ruscombmanor Township, Berks County, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Feb. 19, 1991, Ser. No. 657,011
Int. Cl.[5] G02B *6/36*
U.S. Cl. 385—92 **8 Claims**



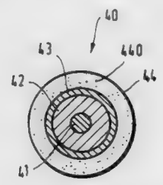
1. An optical package including a base member for supporting an optical device contained therein and at least one package wall including an optical signal path disposed therethrough for providing coupling between the optical device and an optical communication fiber, the package comprising
attachment means disposed contiguous to the base member and externally adjacent to the at least one package wall for securing said optical package to a relatively flat surface, the attachment means comprising a portion with a predetermined thickness less than the thickness of the base member.

5,111,523
LASER-MARKABLE OPTICAL FIBER OR ELECTRIC CABLE
Jean-Pierre Ferlier, Yerres, and Michel Basly, Juvisy sur Orge, both of France, assignors to Filotex, Draveil, France
Filed Jan. 3, 1991, Ser. No. 637,235
Claims priority, application France, Jan. 3, 1990, 90 00030
Int. Cl.[5] G02B *6/44;* **B23K** *26/14;* **H01B** *7/36*
U.S. Cl. 385—100 **5 Claims**



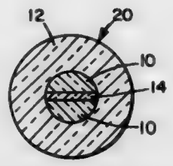
1. A laser-markable cable having an outer protective layer of varnish constituted by an outer layer (**14**) provided with a pigment imparting a base color thereto, the outer layer being sublimable by laser radiation of a first type, the varnish also being formed by an inner underlayer (**13**) of a contrasting color relative to the base color of said outer layer, thereby providing a first method of marking said cable by subliming the outer layer at the point of impact of laser radiation of said first type, and wherein said outer layer (**14**) is of a material capable of having its color modified by laser radiation (**10**) of a second type (**11**) without destroying the thickness of said outer layer (**14**), thereby providing a second method of marking said cable.

5,111,524
SIGNAL TRANSMITTING STEERING CABLE INCLUDING OPTICAL FIBER WITH FLUORESCENT DYE
Bernd Schunk, Düsseldorf; Reinfried Stolllewerk, Roetgen; Gerhard Hubricht, Hagen, and Jörg Peters, Düsseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany
Filed Jul. 26, 1991, Ser. No. 736,643
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1990, 4027295
Int. Cl.[5] G02B *6/44;* **F41G** *7/00;* **A63H** *27/00*
U.S. Cl. 385—102 **5 Claims**



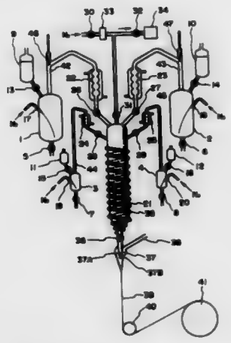
1. A signal transmitting steering cable for remotely controlled flying bodies comprising an inner signal transmitting conductor having a protective surface layer which includes a material which is fluorescent when illuminated with light in a predetermined wavelength range, and wherein said fluorescent material is a fluorescent dye having an emission spectrum including the range between approximately 530 and 680 nm.

5,111,525
SPLIT-CORE FIBER OPTIC WAVEGUIDE AND SENSOR
Edward Hartouni, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.
Filed Oct. 15, 1990, Ser. No. 597,126
Int. Cl.[5] G02B *6/22*
U.S. Cl. 385—126 **2 Claims**

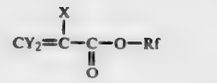


1. A split-core fiber, suitable for use as an optical transmission line or a physical sensor, comprising:
two substantially hemi-cylindrical optical glass cores, the first said core having a first index of refraction and the second said core having a second index of refraction, separated by a layer of optical glass having a third index of refraction;
an outer optical glass sheath having a fourth index of refraction; and
wherein said third and fourth indices of refraction are substantially identical.

5,111,526
PLASTIC OPTICAL FIBERS AND PROCESS FOR THE PRODUCTION THEREOF
Takashi Yamamoto; Tsuruyoshi Matsumoto, and Katsuhiko Shimada, all of Obtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
Filed Jan. 18, 1991, Ser. No. 642,844
Claims priority, application Japan, Jan. 19, 1990, 2-8126; Nov. 20, 1990, 2-312931
Int. Cl.[5] G02B *6/00;* **B32B** *27/00;* **C08F** *8/00;* **B29D** *11/00*
U.S. Cl. 385—145 **9 Claims**



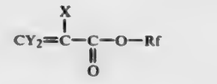
1. A plastic optical fiber comprising (a) a core polymer having a refractive index of N_1 and obtained by polymerizing a monomer represented by the general formula as the main monomer, and (b) a clad polymer comprising a polymer having a refractive index of n_2 and obtained by polymerizing perfluoro (2,2-dimethyl-1,3-dioxole) as the main monomer, and which satisfies the relation $(n_1-n_2 \geqq 0.01)$:



[I]

wherein X represents CH_3, H, D, F, Cl, or CF_3, Y represents H or D, and Rf represents a fluoroalkyl group having a linear or branched chain.

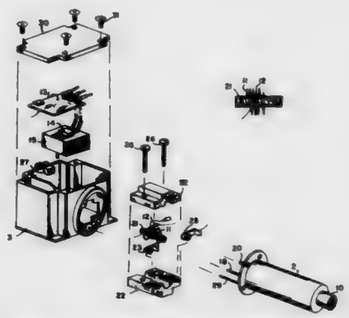
6. A process for the production of a plastic optical fiber comprising (a) using, as a core polymer, a polymer having a refractive index n_1 and composed of the main monomer represented by the general formula, (b) using, as a clad polymer, a polymer having a refractive index n_2 and composed of the main monomer of perfluoro(2,2-dimethyl-1,3-dioxole), (c) selecting the difference (n_1-n_2) to be 0.01 or more, and (d) forming the fiber by a melt-extrusion method:



[I]

wherein X represents CH_3, H, D, F, Cl, or CF_3, Y represents H or D, and Rf represents a fluoroalkyl group having a linear or branched chain.

5,111,527
ELECTRIC HEATER WITH THERMISTOR TEMPERATURE CONTROL
Johathan B. Arold, Exeter; Joan L. Mishou, Portsmouth; Charles R. Parent, Durham; Joseph P. Stark, New Market, and Edward A. Webb, Wolfeboro, all of N.H., assignors to GTE Products Corporation, Stamford, Conn.
Filed Mar. 12, 1990, Ser. No. 491,762
Int. Cl.[5] F24H *3/00*
U.S. Cl. 392—360 **12 Claims**

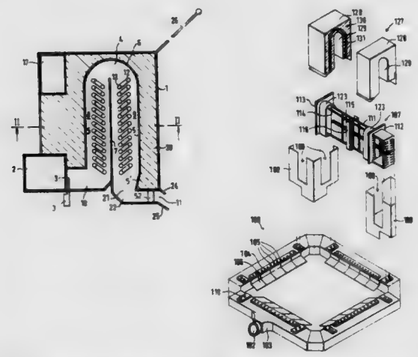


11. A forced gas electric heater comprising: a serpentine heating element, a preheat coil electrically in series with the serpentine heating element, the preheat coil being disposed with respect to the serpentine heating element so that gas being forced through the serpentine heating element in order to be heated thereby must first flow through the preheat coil, a thermistor disposed between two adjacent turns of the preheat coil so as to be in close heat transfer relationship therewith, a solid state power control device electrically in series with the preheat coil and the serpentine heating element, means for varying the high-current conducting state of the solid state power control device in accordance with variations in the temperature of the thermistor, means for introducing gas flow through the preheat coil and serpentine heating element, means for introducing electrical power to the forced gas electric heater, the serpentine heating element being disposed within a

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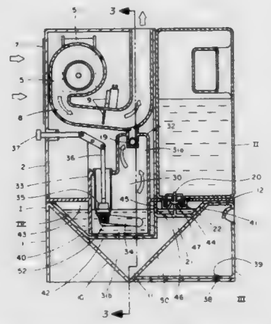
cylindrical shell, the solid state power control device being disposed within an enclosure, the cylindrical shell being fastened to the enclosure, the enclosure having a gas inlet and an exit end, the relationship between the enclosure and the preheat coil being such that gas flowing through the enclosure passes through the preheat coil at about said exit end, there being a heat sink within the enclosure which is cooled by gas flowing through the enclosure, the solid state power control device being mounted on the heat sink.

5,111,528
APPARATUS FOR HEAT SHRINKING WRAPPING USING ELECTRICAL AIR HEATING
Reiner W. Hannen, Goch-Pfalzdorf; Norbert P. Vermeulen, Kleve-Warbeyen, and Josef Schulze-Frenking, Kleve, all of Fed. Rep. of Germany, assignors to MSK-Verpackungs-Systeme Gesellschaft mit Beschrankter Haftung, Kleve, Fed. Rep. of Germany
Filed Mar. 12, 1990, Ser. No. 491,678
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1989, 8902969[U]; Nov. 14, 1989, 8913441[U]
Int. Cl.[5] B29C *61/02*; **B65B** *53/06*
U.S. Cl. 392—379 **23 Claims**



1. A shrink frame for shrinking a plastic film on an article to be shrink-wrapped, said shrink frame comprising:
a plurality of hollow frame members surrounding an opening into which said article can pass;
an air inlet opening into said frame members;
outlet means formed along inner sides of said frame members for directing hot air toward said article when said article is received in said opening;
air-guide passages formed in said members and interconnecting said inlet with said outlet means, said air-guide passages having segments extending substantially linearly in cross sectional planes of said members and defining U-shanks of a U-shaped flow path for air between said air inlet and said outlet means within each of said members formed with a respective pair of opposite spaced apart walls bridged by a respective end wall and defining a respective shaft therebetween;
a respective longitudinal partition extending into each of said shafts parallel to the walls and terminating at a distance from the respective end wall; and
U-shaped electric heating rods in at least one of the U-shanks of each of said U-shaped flow paths for heating air traversing same, said electrical heating rods being oriented at angles to the respective partition in a cross sectional plane of each of said shafts with a spacing between rod centers at least equal to twice a rod diameter and extending in longitudinal directions of said shaft, each of said rods being supported by at least two metal bulkhead plates.

5,111,529
PORTABLE AIR HUMIDIFIER
Dov Z. Glucksman, 137 Larch Row, Wenham, Mass. 01984
Continuation of Ser. No. 287,330, Dec. 21, 1988, Pat. No. 5,014,338. This application Oct. 31, 1990, Ser. No. 606,938
Int. Cl.[5] F22B *1/28*
U.S. Cl. 392—405 **13 Claims**

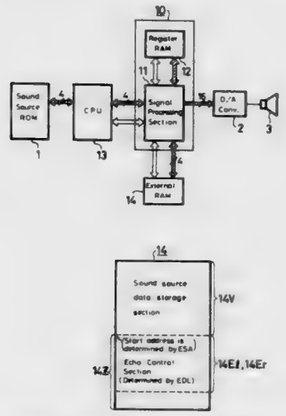


1. A portable warm air humidifier, comprising
a refillable water container having an outlet,
a vaporizer housing having an open ended lower portion defining a vaporizing chamber and having an upper portion provided with a vapor outlet and defining a vapor collection chamber,
a heating element provided within the lower end portion of said vaporizer housing, and
a base having a first compartment and a second compartment in communication with each other, and said compartments being supported on said base
said base being adapted for supporting and accommodating said water container and said vaporizer housing in cooperative relationship with said compartments,
said water container and said vaporizer housing being disposed in juxtaposition with each other and movable and displaceable from and with respect to said compartments on said base,
said water container having its outlet end projecting into said first compartment to supply water thereto and to said vaporizer housing having its lower end portion projecting into said second compartment to immerse said heating element in water in said second compartment to effect the vaporization of water into vapor, said vaporizer housing when moved and displaced in a direction away from said second compartment effecting the withdrawal of the lower end portion to permit access to the heating element and to the interior of said second compartment.

5,111,530
DIGITAL AUDIO SIGNAL GENERATING APPARATUS
Ken Kutaragi; Makoto Furuhashi, both of Kanagawa, and Toshiya Ishibashi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 30, 1989, Ser. No. 428,842
Claims priority, application Japan, Nov. 4, 1988, 63-278721; Nov. 10, 1988, 63-284246; Nov. 16, 1988, 63-289831
Int. Cl.[5] G10L *5/00*; **G06F** *7/00, 15/00*
U.S. Cl. 395—20 **4 Claims**

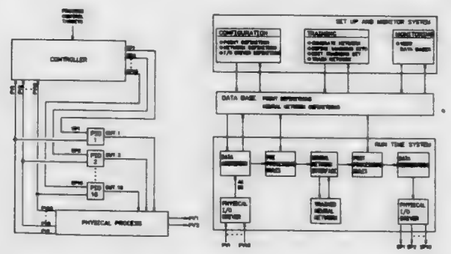
1. An apparatus for generating a digital audio signal comprising:
memory means for storing a digital audio signal;
control means for controlling a reading the digital audio signal from the memory means;
signal processing means for performing a predetermined processing, including reverberation processing, of the digital audio signal read by the control means;

temporary memory means used by both the control means and the signal processing means; and



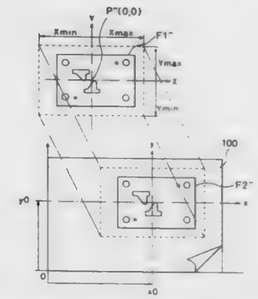
means for setting a delay area in vacant areas of the temporary memory means so as to perform a delay processing when a reverberation sound is added to the digital audio signal processed by the signal processing means.

5,111,531
PROCESS CONTROL USING NEURAL NETWORK
S. Keith Grayson, and John B. Rudd, both of Mobile, Ala., assignors to Automation Technology, Inc., Mobile, Ala.
Filed Jan. 8, 1990, Ser. No. 462,503
Int. Cl.[5] G05B *13/00*
U.S. Cl. 395—23 **31 Claims**



9. A control system for a process characterized by directly controlled process variables and indirectly controlled variables, all said process variables having values that define the state of the process wherein the values of a plurality of process variables are measured and wherein the value of at least one process variable is controlled indirectly by control of a plurality of directly controlled process variables comprising:
control means for establishing the value of the directly controlled variables at set point values applied to said control means,
means for implementing a neural network having a plurality of input neurons for having input values applied thereto and at least one output neuron for providing an output value,
computer means for storing an input value for input neurons of the neural network and at least one computer executable rule to establish the input value associated with an input neuron,
computer means for storing an output value for output neurons of the neural network and at least one computer executable rule for an output neuron,
computer means for establishing a process database defining the state of the process including the instantaneous values of the process variables,
means for continuously updating the process database to reflect the values of the measured process variables,
computer means for executing a rule associated with an input neuron to establish the value of the input neuron,
computer means for executing a rule associated with an output neuron for establishing set point values to be applied to control means,
means for applying the set point values to the control means,
means for training the neural network to generate a predicted value corresponding to the value of said indirectly controlled variable at an output neuron from values at input neurons corresponding to measured process variables,
said control system so constructed and arranged that after the neural network has been trained to generate the predicted value of said indirectly controlled variable a rule associated with said at least one output neuron changes at least one set point value to cause the predicted value of the indirectly controlled variable to approach a directed value.

5,111,532
METHOD OF SETTING DRAWING PARAMETERS FOR AN XY PLOTTER
Masaki Seki, Tokyo; Takeshi Hosono, Oshino; Shizuaki Hayanagi, Oshino, and Koji Suzuki, Oshino, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan
PCT No. PCT/JP89/01193, § 371 Date Jul. 9, 1990, § 102(e) Date Jul. 9, 1990, PCT Pub. No. WO90/06551, PCT Pub. Date Jun. 14, 1990
PCT Filed Nov. 22, 1989, Ser. No. 536,552
Claims priority, application Japan, Nov. 25, 1988, 63-296036
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—102 **3 Claims**



1. A drawing parameter setting method for transferring a portion of a figure from a graphic display screen to plotter paper of an XY plotter, said method comprising the steps of:
(a) manually specifying, on a graphic display screen, two vertices of a rectangular image region in a first two-dimensional coordinate system which define the portion of the figure drawn on the graphic display screen;
(b) automatically determining a plotting scale in accordance with a first longitudinal length and a first lateral length of the rectangular region and a second longitudinal length and a second lateral length of the plotter paper for the XY plotter having a second two-dimensional coordinate system;
(c) automatically determining at least one coordinate parameter value for correlating the first two-dimensional coordinate system and the second two-dimensional coordinate

system, in accordance with the first longitudinal length and the first lateral length of the rectangular image region and the second longitudinal length and the second lateral length of the plotter paper; and

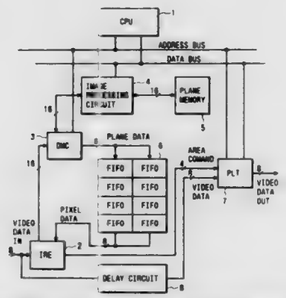
(d) commanding the XY plotter to plot the portion of the figure on the plotter paper based on the plotting scale determined in said step (b) and the coordinate parameter determined in said step (c).

5,111,533

IMAGE PROCESSING SYSTEM FOR THE USE WITH IMAGE RECORDING APPARATUS

Hiroshi Sekine, and Kazuman Taniuchi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1991, Ser. No. 717,404
Claims priority, application Japan, Jun. 19, 1990, 2-160351
Int. Cl.[5] G06A *15/00*
U.S. Cl. 395—109 **8 Claims**



1. An image recording apparatus comprising an image input terminal, an image processing system, an image output terminal, a user interface, a coordinate input means capable of inputting the coordinates of a point on a document, and a control unit that manages the overall operation of the apparatus by coordinating the operations of the individual components, wherein said image processing system comprises a density conversion means for compressing density of an image data, an area command generating means for generating an area command based on both the output of said density conversion means and the coordinates of a point designated by said coordinate input means, a memory means for storing the area command, means for converting the density of the area command read out from said memory means to a higher density, and means for enlarging the region set by the area command by a predetermined number of bits in a predetermined direction in which an uncolored portion is to occur.

5,111,534

METHOD FOR ASSIGNING TELECOMMUNICATIONS CHANNELS IN A CELLULAR TELEPHONE SYSTEM

Frank D. Benner, Calgary, Canada, assignor to Telus Corporation, Edmonton, Canada

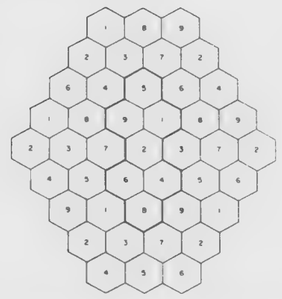
Filed Sep. 4, 1990, Ser. No. 576,744
Claims priority, application Canada, Aug. 10, 1990, 2023053
Int. Cl.[5] H04B *7/26;* **H04Q** *7/02*
U.S. Cl. 455—33.2 **18 Claims**

1. A method of assigning K groups of available frequencies, the groups being numbered in order from k=1, 2, . . . K, each of the frequencies of the kth group differing from the respective frequencies of the kth+1 group by one channel, to a plurality of cells in an initial hexagonal pattern in a cellular telecommunications system, the method comprising:

(a) assigning a first group of frequencies taken from the available frequencies to a first cell;

(b) for each cell adjacent to the first cell, assigning to it a distinct group of frequencies from the first group and from any group assigned to any other cell adjacent to the first cell, such that at least a second group and a third group of distinct frequencies remains unassigned after each cell adjacent to the first cell has been assigned frequencies;

(c) assigning frequencies from the second group to each of three second cells that are non-adjacent to the first cell and that are adjacent to a cell adjacent to the first cell, the three second cells being spaced substantially equally from each other about the first cell; and



(d) assigning frequencies from the third group to each of three third cells that are non-adjacent to the first cell and that are adjacent to a cell adjacent to the first cell, the three third cells being spaced substantially equally from each other about the first cell and the second cells; and

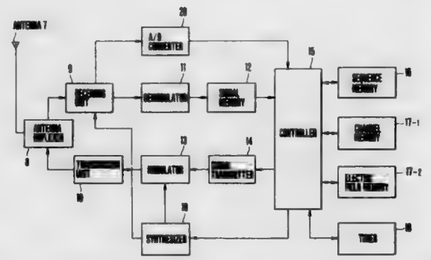
the respective frequencies of the first, second and third groups of frequencies differing from each other by at least three channels.

5,111,535

METHOD AND SYSTEM FOR SWITCHING RADIO FREQUENCY

Koji Tokunaga, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 24, 1989, Ser. No. 314,746
Claims priority, application Japan, Feb. 25, 1988, 63-40700
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 455—33.2 **6 Claims**



1. A system having a plurality of base stations and a plurality of mobile stations,

each of said base stations comprising:

means for time-divisionally transmitting data at a frequency assigned thereto, different frequencies being assigned to said base stations, respectively, said data including first information identifying one of said mobile stations and second information indicating a time of which a next data transmission to be received by the identified mobile stations starts,

each of said mobile stations comprising:

means for receiving data transmitted from other base stations;

means for measuring the reception electric field of said given and other base stations to select among said given and other base stations a base station transmitting the highest electric field; and

switching request means for transmitting a switching request to the selected base station, so that the reception frequency of the mobile station is switched to a frequency assigned to said selected base station.

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DESIGN PATENTS

GRANTED May 5, 1992

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For CLASS	See PATENT NO.
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D21-191	325,968

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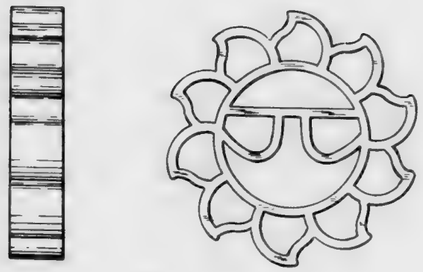
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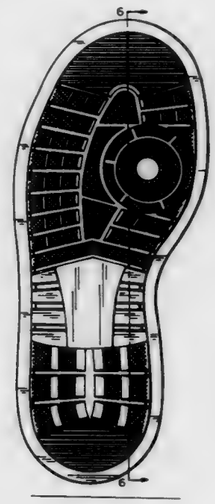
325,804
SUN-SHAPED PASTA
Edward J. Meyers, Jr., Roselle Park, N.J.; Frank Ceglia, and Eileen Fogarty, both of New York, N.Y., assignors to CPC International Inc., Englewood Cliffs, N.J.
Filed Oct. 5, 1990, Ser. No. 594,232
Term of patent 14 years
U.S. Cl. D1—106



325,805
WORK SHOE
Karlheinz Herber, Sinntal-Mottgers, Fed. Rep. of Germany, assignor to ALSA GmbH, Steinau-Uerzell, Fed. Rep. of Germany
Filed May 15, 1990, Ser. No. 523,461
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1989, 8907899
Term of patent 14 years
U.S. Cl. D2—271



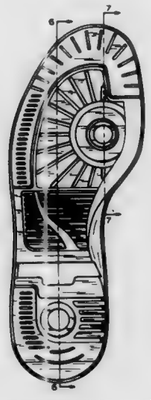
325,806
FOOTWEAR UNIT SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Corporation, North Brookfield, Mass.
Filed Nov. 2, 1990, Ser. No. 608,652
Term of patent 14 years
U.S. Cl. D2—320



325,807
FOOTWEAR UNIT SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Corporation, North Brookfield, Mass.
Filed Nov. 5, 1990, Ser. No. 608,896
Term of patent 14 years
U.S. Cl. D2—320



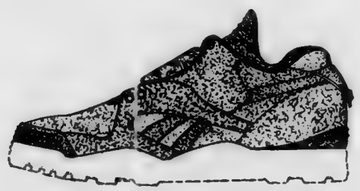
325,808
FOOTWEAR UNIT SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Corporation, North Brookfield, Mass.
Filed Nov. 5, 1990, Ser. No. 608,897
Term of patent 14 years
U.S. Cl. D2—320



325,809
SHOE UPPER
Judith R. Close, Dedham, Mass., assignor to Reebok International Ltd., Stoughton, Mass.
Filed Apr. 12, 1991, Ser. No. 684,201
Term of patent 14 years
U.S. Cl. D2—314



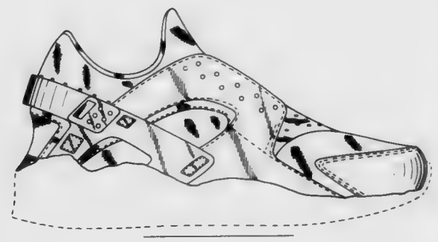
325,810
SHOE UPPER
Joanthan R. Morris, Cranston, R.I., and Ralph Serna, Hingham, Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Apr. 12, 1991, Ser. No. 684,354
Term of patent 14 years
U.S. Cl. D2—314



325,811
SHOE UPPER
Peter P. Backus, Portland, and Craig L. Feller, Tigard, both of Oreg., assignors to Avia Group International, Inc., Portland, Oreg.
Filed Jun. 24, 1991, Ser. No. 718,419
Term of patent 14 years
U.S. Cl. D2—314



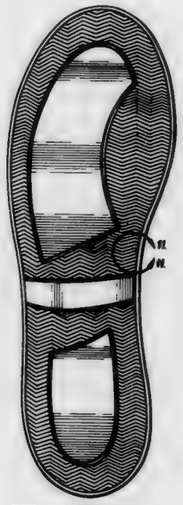
325,812
SHOE UPPER
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., Beaverton, Oreg.
Continuation-in-part of Ser. No. 558,417, Jul. 27, 1990. This application Dec. 7, 1990, Ser. No. 624,662
Term of patent 14 years
U.S. Cl. D2—314



325,813
SHOE UPPER
Christopher J. Kittle, Cohasset, Mass., assignor to Reebok International Ltd., Stoughton, Mass.
Filed Jun. 11, 1991, Ser. No. 713,323
Term of patent 14 years
U.S. Cl. D2—314



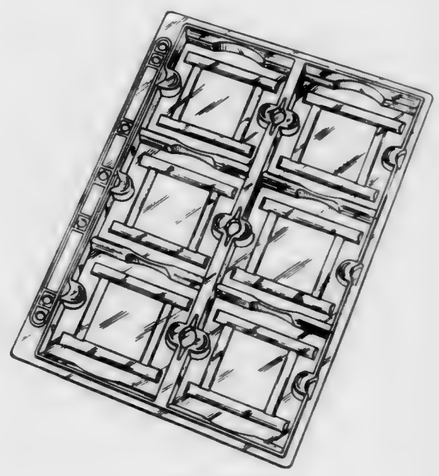
325,814
GYMNASTICS SHOE SOLE BOTTOM
Mario Benatti, Milan, and Francesco Bertone, Turin, both of Italy, assignors to S.T.L. Superga S.p.A., Turin, Italy
Filed May 3, 1989, Ser. No. 346,815
Claims priority, application Italy, Nov. 4, 1988, 22099/88[U]
Term of patent 14 years
U.S. Cl. D2—320



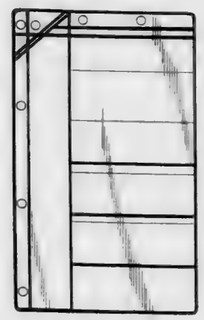
325,815
SHOE SOLE
Jonathan S. Bass, Century City, Calif., assignor to H.G.X. International, Century City, Calif.
Filed Oct. 9, 1990, Ser. No. 594,189
Term of patent 14 years
U.S. Cl. D2—320



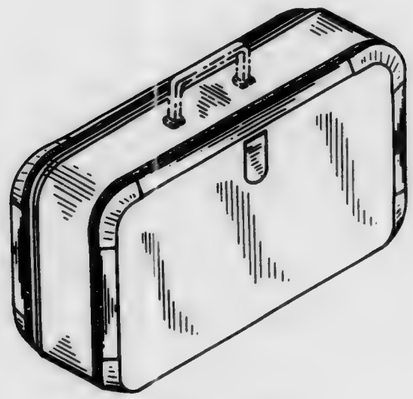
325,816
FILE SHEET FOR COMPACT DISCS
Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan
Filed Oct. 31, 1989, Ser. No. 429,334
Claims priority, application Japan, Jun. 19, 1989, 1-22340
The portion of the term of this patent subsequent to Feb. 18, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—35



325,817
FILE SHEET FOR FLOPPY DISCS
Joseph S. Call, 1987 S. Davis Blvd., Bountiful, Utah 84010
Filed Feb. 6, 1990, Ser. No. 476,025
Term of patent 14 years
U.S. Cl. D3—35



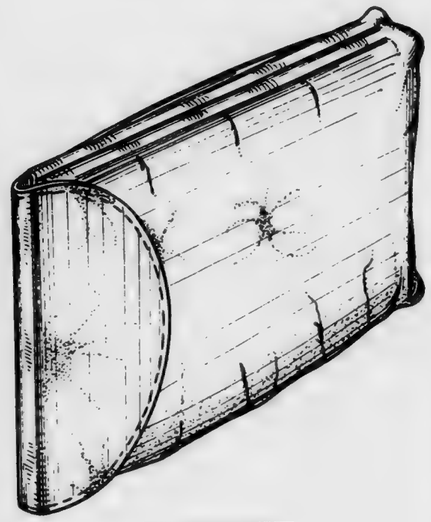
325,818
LUGGAGE CASE
Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Continuation-in-part of Ser. No. 309,434, Feb. 10, 1989, Pat. No. 4,932,506, which is a continuation-in-part of Ser. No. 258,337, Oct. 17, 1988, Pat. No. Des. 321,593. This application Sep. 27, 1989, Ser. No. 414,086
The portion of the term of this patent subsequent to Nov. 19, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—76



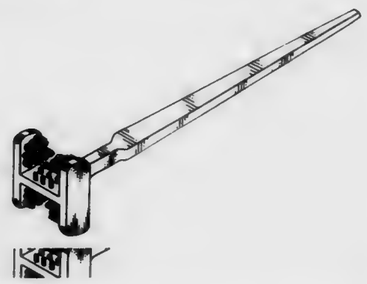
325,819
BRIEF CASE
Shin M. Lee, Taiwan, Taiwan, assignor to Echolac Co., Ltd., Taipei, Taiwan
Filed May 14, 1990, Ser. No. 523,700
Term of patent 14 years
U.S. Cl. D3—76



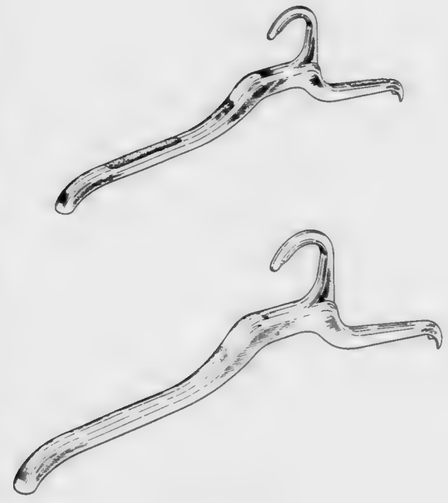
325,820
CARRYING CASE FOR FIREARMS
James O. Holtzclaw, Jr., Broomfield, Colo., assignor to The Hunter Company, Westminster, Colo.
Filed Feb. 23, 1990, Ser. No. 484,617
Term of patent 14 years
U.S. Cl. D3—79



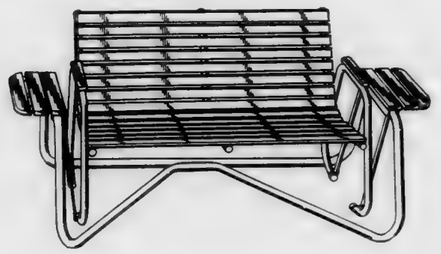
325,821
TOOTHBRUSH
Fery Schwartz, Hagoel Street, 16 Tel Aviv, Israel
Filed Mar. 10, 1989, Ser. No. 311,991
Term of patent 14 years
U.S. Cl. D4—106



325,822
HANGER FOR KNITWEAR OR THE LIKE
Joseph C. Hollis, East Bentleigh, Australia, assignor to Spotless Plastics Pty. Ltd., Victoria, Australia
Filed May 21, 1990, Ser. No. 526,165
Claims priority, application Australia, Nov. 23, 1989, 3831/89
Term of patent 14 years
U.S. Cl. D6—318



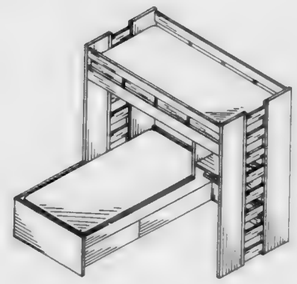
325,823
COMBINED GLIDER AND END TABLE UNIT
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Sep. 7, 1988, Ser. No. 241,552
The portion of the term of this patent subsequent to Nov. 15, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—335



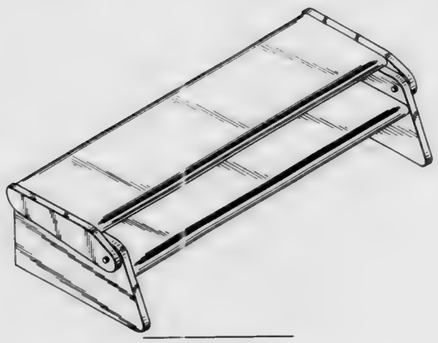
325,824
CHAIR
Giancarlo Piretti, Piazza Trento e Trieste 2/2, Bologna, Italy
Filed Jun. 9, 1989, Ser. No. 365,024
Term of patent 14 years
U.S. Cl. D6—372



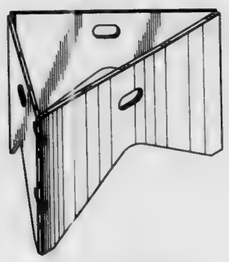
325,825
COMBINED BED AND STORAGE UNIT
Kenneth H. Bell, Lions Bay, Canada, assignor to Magia Furniture Canada Limited, Lions Bay, Canada
Filed Oct. 31, 1988, Ser. No. 265,134
Term of patent 14 years
U.S. Cl. D6—383



325,826
DRESSING KIT
Merlin A. Brunner, Appleton, and Harvey J. Draheim, Weyauwega, both of Wis., assignors to Simmons Juvenile Products Company, Inc., New London, Wis.
Filed Jan. 11, 1990, Ser. No. 463,604
Term of patent 14 years
U.S. Cl. D6—397



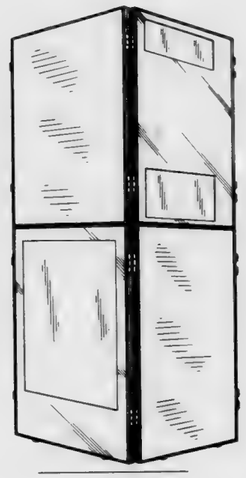
325,827
COLLAPSIBLE WORKSTAND
James S. Hibbard, 809 W. Main St., Space 'H' , Battle Ground, Wash. 98604
Filed May 19, 1989, Ser. No. 354,092
Term of patent 14 years
U.S. Cl. D6—429



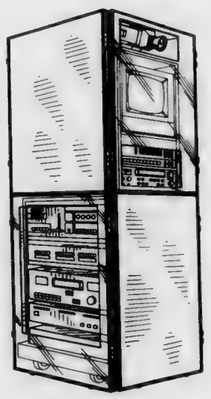
325,828
DISPLAY RACK FOR A REFRIGERATED CASE
Daniel M. Cochran, and John M. Beasley, both of Nashville, Tenn., assignors to Prema Pak Corporation, Nashville, Tenn.
Filed Aug. 29, 1989, Ser. No. 400,039
Term of patent 14 years
U.S. Cl. D6—429



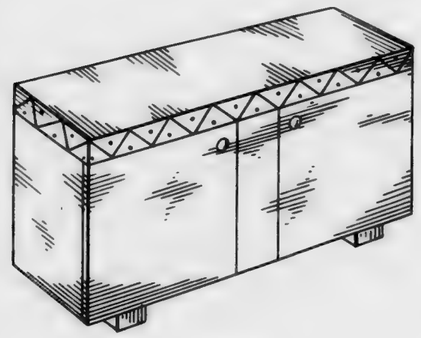
325,829
HOUSING FOR AN ELECTRONICS TOWER FOR SUPPORTING APPARATUS USED IN PRODUCING CUSTOMIZED VIDEO RECORDINGS
Brian L. Cury, 87 Maple St., Teaneck, N.J. 07666
Filed Nov. 16, 1988, Ser. No. 272,205
The portion of the term of this patent subsequent to May 5, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—436



325,830
ELECTRONICS TOWER CONTAINING AUDIO-VISUAL ELECTRONICS USED IN PRODUCING CUSTOMIZED VIDEO RECORDINGS
Brian L. Cury, 87 Maple St., Teaneck, N.J. 07666
Filed Nov. 16, 1988, Ser. No. 272,206
The portion of the term of this patent subsequent to May 5, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—436



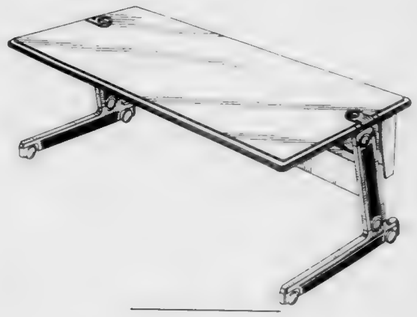
325,831
CABINET
Leon Rosen, Scarsdale, N.Y., assignor to Pace Collection, Inc., Long Island, N.Y.
Filed May 15, 1990, Ser. No. 524,180
Term of patent 14 years
U.S. Cl. D6—446



325,832
COMBINED STORE PARTITION AND DISPLAY CABINET
John L. Allen, Houston, Tex., assignor to Liz Claiborne, Inc., New York, N.Y.
Filed Sep. 21, 1989, Ser. No. 411,601
Term of patent 14 years
U.S. Cl. D6—470



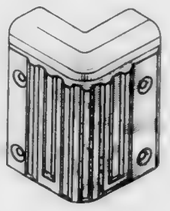
325,833
DESK
Hiroshi Saotome, Machida, Japan, assignor to Okumura Corporation, Kanagawa, Japan
Filed Nov. 3, 1988, Ser. No. 266,495
Claims priority, application Japan, May 18, 1988, 63-19225
Term of patent 14 years
U.S. Cl. D6—484



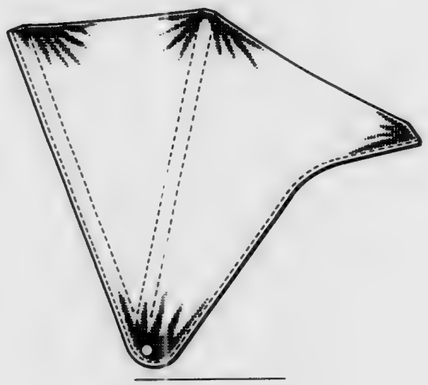
325,834
TABLE
Kevin D. Fredrick, De Pere, Wis., assignor to Krueger International, Inc., Green Bay, Wis.
Filed Oct. 18, 1989, Ser. No. 423,136
Term of patent 14 years
U.S. Cl. D6—487



325,835
CORNER PROTECTOR FOR A SPEAKER
Roland Sollner, Battle, England, assignor to Penn Fabrication (U.S.A.), Inc., Moorpark, Calif.
Filed Aug. 10, 1989, Ser. No. 392,143
Term of patent 14 years
U.S. Cl. D6—491



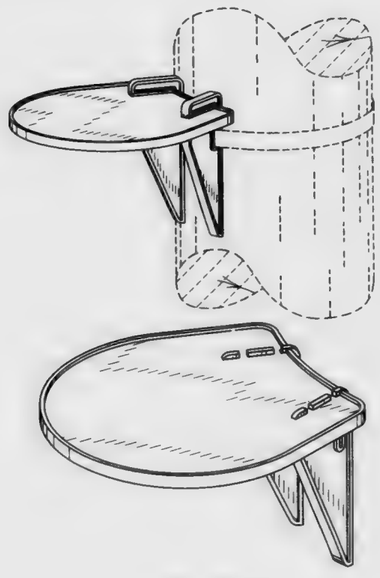
325,836
SUNSHADE FOR AN INFANT'S CAR SEAT
Kenneth P. Morton, East Aurora, N.Y., assignor to Fisher-Price, Inc., East Aurora, N.Y.
Division of Ser. No. 232,579, Aug. 15, 1988, Pat. No. Des. 323,432. This application Oct. 1, 1991, Ser. No. 769,452
Term of patent 14 years
U.S. Cl. D6—491



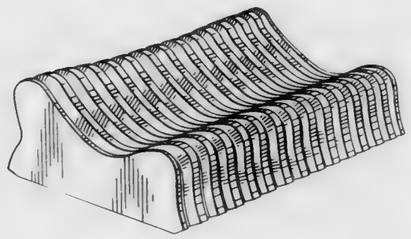
325,837
SEAT
Larry A. Schwartz, Franklin Lakes, N.J., assignor to Magellan International, Inc., Fort Lee, N.J.
Filed Jun. 25, 1991, Ser. No. 721,221
Term of patent 14 years
U.S. Cl. D6—500



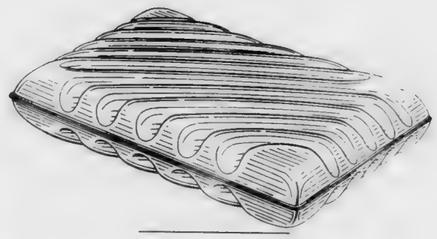
325,838
TEMPORARY STAND FOR ATTACHMENT TO VERTICAL MEMBERS
John P. Lamprey, 5629 W. County Rd. 52E, Bellvue, Colo. 80512
Filed Sep. 14, 1989, Ser. No. 407,769
Term of patent 14 years
U.S. Cl. D6—574



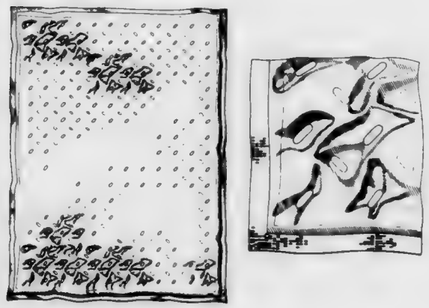
325,839
PILLOW
Ewan J. Main, Guelph, Canada, assignor to Woodbridge Foam Corporation, Ontario, Canada
Filed Jan. 29, 1990, Ser. No. 471,737
Claims priority, application Canada, Dec. 8, 1989, 08-12-89-8
Term of patent 14 years
U.S. Cl. D6—601



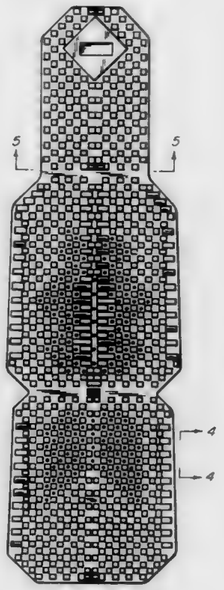
325,840
PILLOW
Ewan J. Main, Guelph, Canada, assignor to Woodbridge Foam Construction, Ontario, Canada
Filed Jan. 29, 1990, Ser. No. 471,738
Claims priority, application Canada, Nov. 21, 1989, 21-11-89-12
Term of patent 14 years
U.S. Cl. D6—601



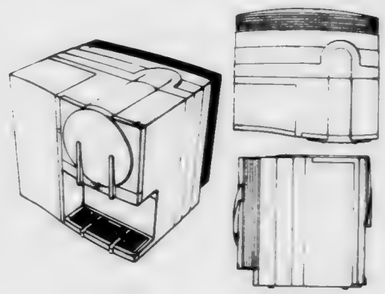
325,841
AIR MATTRESS
Clifford E. Gammons, 242 W. Park Dr., Morganton, N.C. 28655, assignor to Clifford E. Gammons, Morganton, N.C.
Filed Jun. 8, 1989, Ser. No. 365,021
Term of patent 14 years
U.S. Cl. D6—605



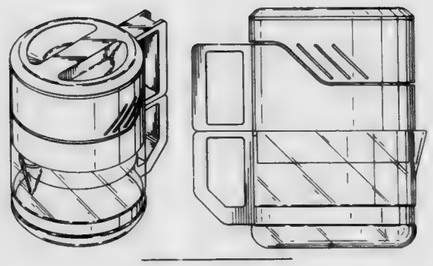
325,842
SEAT COVER
H. Bied, Bd. de la Grande Thumine, 13090 Aix en Provence Cedex 2, France
Filed Dec. 1, 1989, Ser. No. 443,960
Term of patent 14 years
U.S. Cl. D6—611



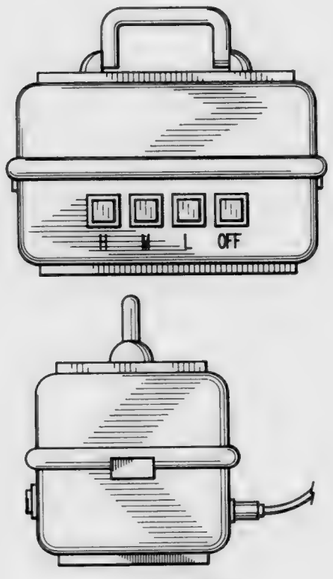
325,843
BEVERAGE DISPENSER
Jörg Ratzlaff, Altensteig, Fed. Rep. of Germany, assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Oct. 23, 1989, Ser. No. 424,970
Term of patent 14 years
U.S. Cl. D7—308



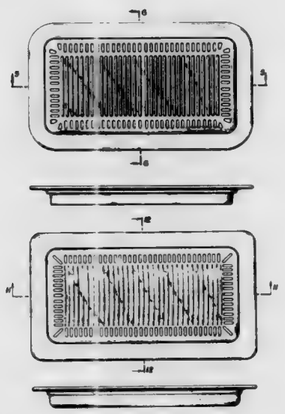
325,844
COFFEE BREWER
John Betts, New York, N.Y., assignor to Farberware Inc., Bronx, N.Y.
Filed Jan. 17, 1989, Ser. No. 298,584
Term of patent 14 years
U.S. Cl. D7—310



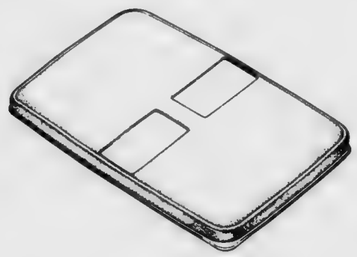
325,846
PORTABLE SANDWICH WARMER
Elbert L. Murray, 4419 Burlingame Common, Trotwood, Ohio 45426
Filed Oct. 12, 1989, Ser. No. 420,225
Term of patent 14 years
U.S. Cl. D7—352



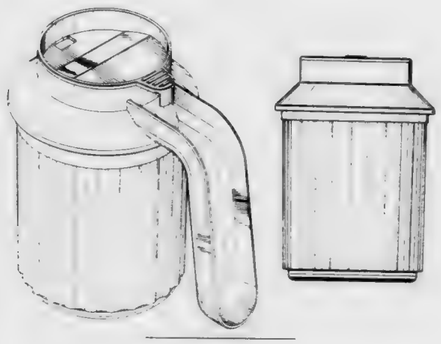
325,845
STOVE TOP GRILL
Barry Helman, Malibu; Andy Helman, Oxnard, and Gregg A. Bond, Sherman Oaks, all of Calif., assignors to Mr. Stove, Ltd., Oxnard, Calif.
Filed Jan. 29, 1991, Ser. No. 647,722
Term of patent 14 years
U.S. Cl. D7—346



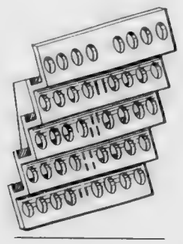
325,847
COVER FOR A FOOD STORAGE CONTAINER OR THE LIKE
Martin J. Wolff, North Providence, R.I., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Nov. 21, 1988, Ser. No. 274,899
Term of patent 14 years
U.S. Cl. D7—391



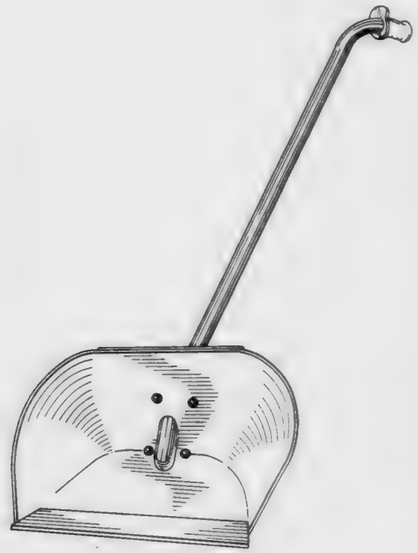
325,848
INSULATED MUG
Donald Embree, Uniontown, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 25, 1989, Ser. No. 385,296
Term of patent 14 years
U.S. Cl. D7—510



325,849
SPICE RACK
Peter B. Melcher, 5921 Dovetail Dr., Agoura Hills, Calif. 91301
Filed Dec. 9, 1988, Ser. No. 281,696
Term of patent 14 years
U.S. Cl. D7—616



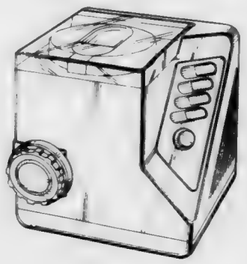
325,851
SNOW SHOVEL
Edgar H. Davis, Calgary, Canada, assignor to Systems Investments Ltd., Alberta, Canada
Filed Jun. 15, 1989, Ser. No. 366,415
Term of patent 14 years
U.S. Cl. D8—10



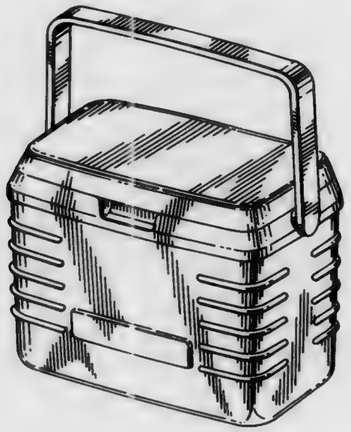
325,850
BOTTLE HOLDER
Charles Chaney, San Juan Capistrano, Calif., assignor to GSA, Inc., Laguna Hills, Calif.
Filed Jan. 12, 1990, Ser. No. 464,753
Term of patent 14 years
U.S. Cl. D7—619



325,852
PASTA-MAKING MACHINE
Giuseppe Giannelli, Olgiate Comasco, Italy, assignor to SIMAC S.r.l., Italy
Filed Jun. 27, 1988, Ser. No. 212,406
Claims priority, application Italy, Jun. 26, 1987, 21889/87[U]
Term of patent 14 years
U.S. Cl. D7—368



325,853
INSULATED COOLER
W. Henry Kahl, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 7, 1990, Ser. No. 519,562
Term of patent 14 years
U.S. Cl. D7—605



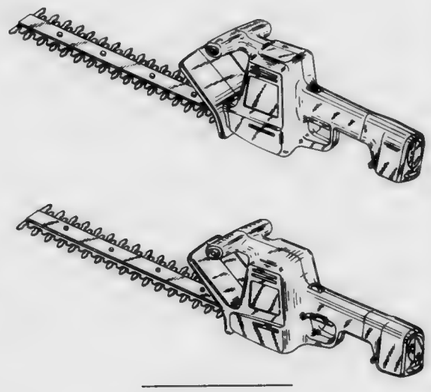
325,854
COMBINED CAKE DECORATING NOZZLE AND RECEPTACLE
Andreas Hofmann, Bad Camberg-Erbach, Fed. Rep. of Germany, assignor to F. Vaihinger GmbH & Co. Kommanditgesellschaft, Rodgau, Fed. Rep. of Germany
Filed Sep. 21, 1989, Ser. No. 410,791
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1989, M8902449.4
Term of patent 14 years
U.S. Cl. D7—669



325,855
COMBINATION CULINARY UTENSIL
Mark A. Rea, Sr., 126 Academy Ave., Providence, R.I. 02908
Filed Sep. 18, 1991, Ser. No. 761,614
Term of patent 14 years
U.S. Cl. D7—692



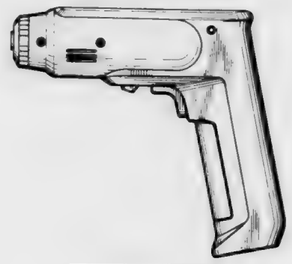
325,856
HEDGE TRIMMER
Martin P. Gierke, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Mar. 22, 1990, Ser. No. 500,825
Term of patent 14 years
U.S. Cl. D8—8



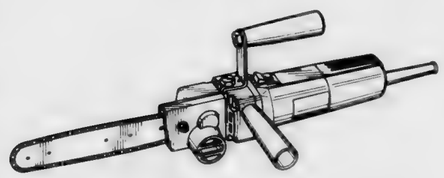
325,857
SCREW DRIVER
Hideaki Hasegawa; Fumio Tashimo, both of Katsuta; Shigehisa Hagura, and Kazuyuki Tuburaya, both of Tokyo, all of Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan
Filed May 19, 1989, Ser. No. 355,244
Claims priority, application Japan, Jun. 10, 1988, 63-23153
Term of patent 14 years
U.S. Cl. D8—61



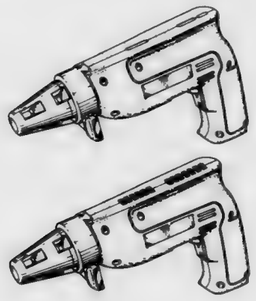
325,858
PORTABLE ELECTRIC DRIVER
Toshiaki Saito, and Masakazu Sakamoto, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Oct. 26, 1989, Ser. No. 429,241
Claims priority, application Japan, Apr. 26, 1989, 1-15937
Term of patent 14 years
U.S. Cl. D8—61



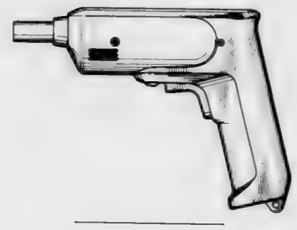
325,859
CHAIN SAW
Takao Yokota, and Hiroshi Kanehagi, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Nov. 20, 1989, Ser. No. 438,379
Claims priority, application Japan, May 24, 1989, 1-19100
Term of patent 14 years
U.S. Cl. D8—65



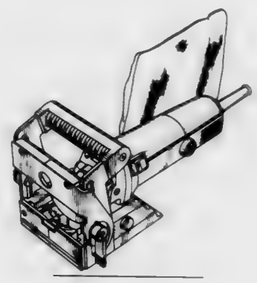
325,860
ELECTRIC SCREW DRIVER
Fusao Fushiya, Nagoya, and Tetsuhisa Kaneko, Anjo, both of Japan, assignors to Makita Electric Works, Ltd., Aichi, Japan
Filed Aug. 9, 1989, Ser. No. 391,460
Claims priority, application Japan, Feb. 15, 1989, 1-5518
Term of patent 14 years
U.S. Cl. D8—68



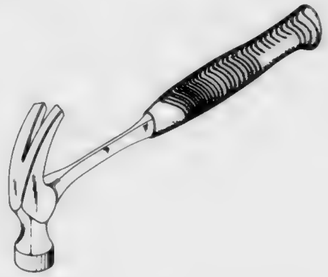
325,861
PORTABLE ELECTRIC DRIVER
Toshiaki Saito, and Masakazu Sakamoto, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Oct. 16, 1989, Ser. No. 421,880
Claims priority, application Japan, Apr. 26, 1989, 1-15936
Term of patent 14 years
U.S. Cl. D8—68



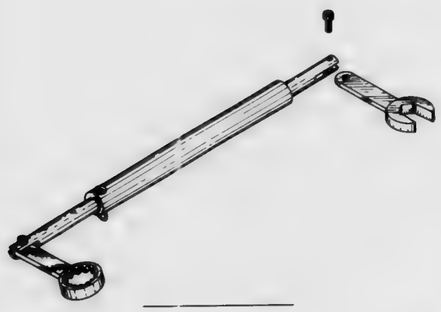
325,862
PORTABLE ELECTRIC MORTISER
Mitsumasa Sato; Masakazu Sakamoto, and Kouichi Miyamoto, all of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Nov. 8, 1989, Ser. No. 433,316
Claims priority, application Japan, May 15, 1989, 1-17857
Term of patent 14 years
U.S. Cl. D8—69



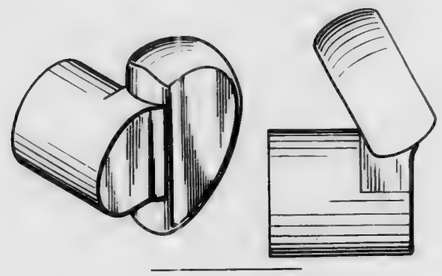
325,863
HAMMER
John Chen, 142-1 Lane 211 Chung Yang Rd., Lung Ching Hsiang, Taichung Hsien, Taiwan
Filed Dec. 19, 1989, Ser. No. 452,378
Term of patent 14 years
U.S. Cl. D8—75



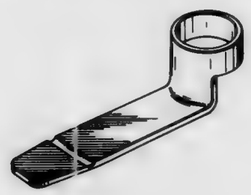
325,864
WRENCH
Edward A. Diego, 4825 NW., 93rd Ter., Sunrise, Fla. 33351
Filed Jan. 17. 1989, Ser. No. 297,543
Term of patent 14 years
U.S. Cl. D8—28



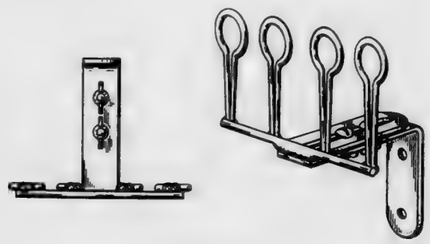
325,865
DOOR KNOB
Marco Del Corno, Milan, Italy, assignor to CAS Di A.A. CAMPI S.p.A., Seveso. Italy
Filed Mar. 5, 1990, Ser. No. 487,049
Claims priority, application Int'l Pat. Institute, Sep. 6, 1989, DM/014 506
Term of patent 14 years
U.S. Cl. D8—306



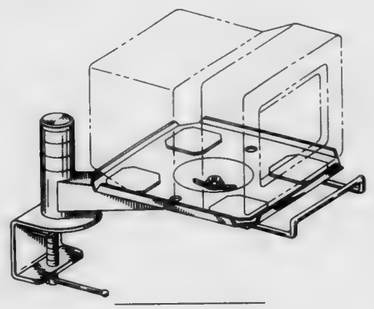
325,866
LIGHT SUPPORT BRACKET
Lonnie F. Gary, Lubbock, Tex., assignor to Gary Products Group, Inc., Lubbock, Tex.
Filed Feb. 27, 1990, Ser. No. 486,278
Term of patent 14 years
U.S. Cl. D8—354



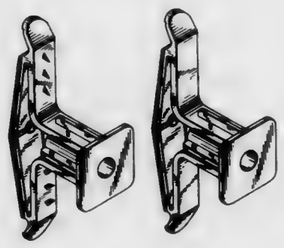
325,867
BRACKET FOR DRAPERY FIXTURES
Johnie E. Williams, P.O. Box 808, Fayetteville, Ga. 30314
Filed Apr. 19, 1990, Ser. No. 510,996
Term of patent 14 years
U.S. Cl. D8—368



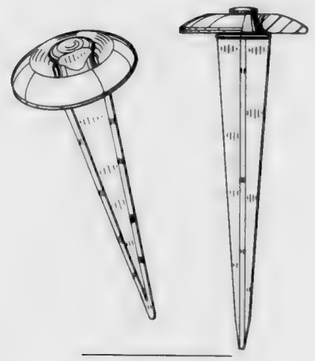
325,868
COMPUTER MONITOR SUPPORT ARM
Stephen Bartok, Rancho Palos Verdes, Calif., assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Aug. 6, 1990, Ser. No. 562,969
Term of patent 14 years
U.S. Cl. D8—380



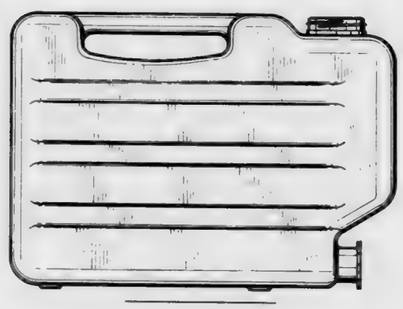
325,869
TOGGLE ANCHOR
Saul Rubenstein, Melville; Michael Hyner, and Dieter Neumann, both of Dix Hills, all of N.Y., assignors to Admiral Molding Corporation, Hauppauge, N.Y.
Filed Jul. 18, 1989, Ser. No. 381,564
Term of patent 14 years
U.S. Cl. D8—385



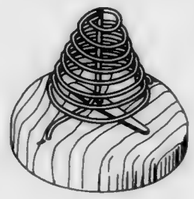
325,870
FABRIC HOLDDOWN STAKE
Rex B. Niles, 404 W. 500 South, P.O. Box 250, Redmond, Utah 84652
Filed Apr. 20, 1989, Ser. No. 340,596
Term of patent 14 years
U.S. Cl. D8—388



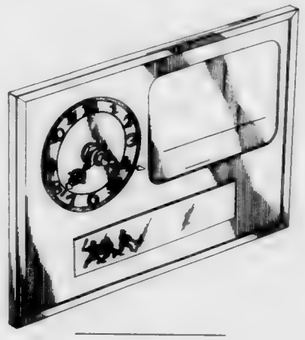
325,871
BOTTLE
Borge Hestehave, Alta Loma, and Kjeld Hestehave, Upland, both of Calif., assignors to Bomatic, Inc., Ontario, Calif.
Filed Jul. 16, 1990, Ser. No. 553,006
Term of patent 14 years
U.S. Cl. D9—520



325,872
SPIRAL CLOCK OR THE LIKE
E. Lakin Phillips, 2733 Centerville Rd., Herndon, Va. 22071
Filed Apr. 4, 1990, Ser. No. 504,646
Term of patent 14 years
U.S. Cl. D10—1

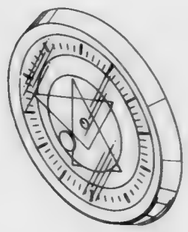


325,873
COMBINED CLOCK AND AWARD PLAQUE
Thomas M. Hosker, Lynn, and John E. Holmes, Brockton, both of Mass., assignors to Time-Frame, Inc., Lynn, Mass.
Filed Apr. 27, 1989, Ser. No. 344,117
Term of patent 14 years
U.S. Cl. D10—2

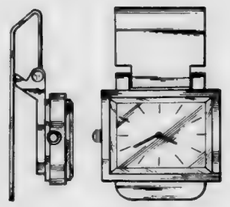


325,874
DESK CLOCK
James M. Luebbers, Louisville, Ky., assignor to Vermont American Corporation, Louisville, Ky.
Filed Aug. 29, 1989, Ser. No. 400,049
Term of patent 14 years
U.S. Cl. D10—6

325,875
WALL CLOCK
E. Lakin Phillips, 2733 Centerville Rd., Herndon, Va. 22071
Filed Dec. 29, 1989, Ser. No. 458,830
Term of patent 14 years
U.S. Cl. D10—22



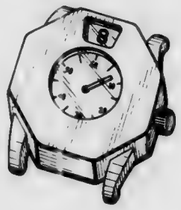
325,876
COMBINED WATCH AND CLIP
Carl E. Klepper, 445 Brook Ave., Deer Park, N.Y. 11729
Filed Sep. 22, 1989, Ser. No. 411,574
Term of patent 14 years
U.S. Cl. D10—31



325,877
WRISTWATCH
Tso C. Fong, Kowloon, Hong Kong, assignor to Pearl Industries Limited, Kowloon, Hong Kong
Filed Jun. 6, 1988, Ser. No. 202,450
Claims priority, application United Kingdom, Dec. 19, 1987, 1047252
Term of patent 14 years
U.S. Cl. D10—32



325,878
WRISTWATCH
Gianni Bulgari, Rome, Italy, assignor to Gianni Bulgari S.p.A., Rome, Italy
Filed Jan. 31, 1989, Ser. No. 304,380
The portion of the term of this patent subsequent to Apr. 28, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—39



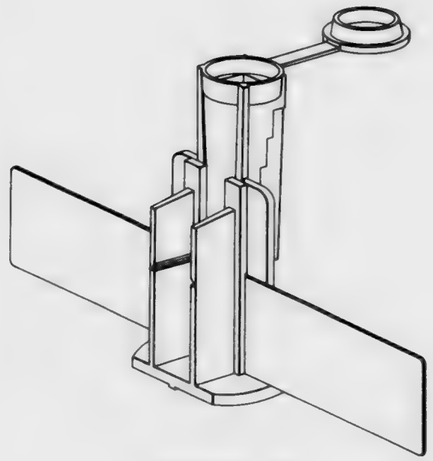
325,879
WRISTWATCH
Gianni Bulgari, Rome, Italy, assignor to Gianni Bulgari S.p.A., Rome, Italy
Filed Jan. 31, 1989, Ser. No. 304,381
The portion of the term of this patent subsequent to Apr. 21, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—39



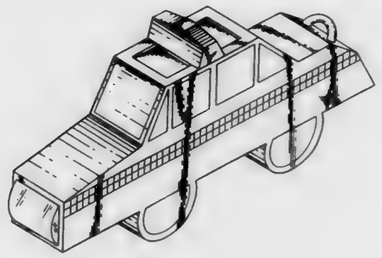
325,880
SONAR TRANSDUCER MOUNT
Felton H. Havins, Graham, Tex., assignor to Aero Marine Engineering, Inc., Bryson, Tex.
Continuation-in-part of Ser. No. 314,903, Feb. 24, 1989, Pat. No. 4,928,915. This application Jan. 2, 1990, Ser. No. 459,597
Term of patent 14 years
U.S. Cl. D10—80



325,881
COLOR COMPARATOR
Scott V. Brayton; Richard D. Vanvalin, and Timothy J. Gaul, all of Loveland, Colo., assignors to Hach Company, Loveland, Colo.
Filed Jul. 24, 1989, Ser. No. 384,663
Term of patent 14 years
U.S. Cl. D10—81



325,882
SIGNAL FOR ATTRACTING ATTENTION OF A TAXI
Linda M. Powell, 42 Pine St., Apt. 6G, Yonkers, N.Y. 10701
Filed Jun. 26, 1990, Ser. No. 543,574
Term of patent 14 years
U.S. Cl. D10—109



325,883
WATCH BRACELET
Gérald A. G. St. Dizier, Gaillard, France, assignor to Rolex Watch U.S.A., Inc., New York, N.Y.
Filed Sep. 20, 1989, Ser. No. 409,874
Claims priority, application Hague, Mar. 23, 1989, DM/013155
Term of patent 14 years
U.S. Cl. D11—21



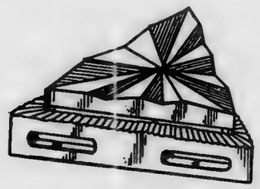
325,884
SKI PIN
Brenda K. Philippon, 12 Antrim St., Nashua, N.H. 03063
Filed Jul. 31, 1990, Ser. No. 560,312
Term of patent 14 years
U.S. Cl. D11—48



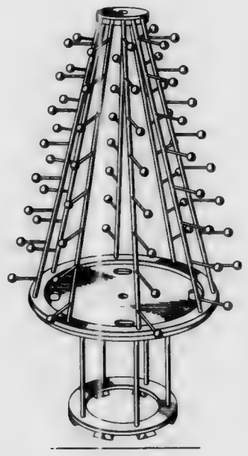
325,885
BROOCH
Jeannie C. Small, Woodlyn Hills, Algona, Iowa 50511
Filed Jun. 22, 1990, Ser. No. 542,399
Term of patent 14 years
U.S. Cl. D11—64



325,886
JEWELRY LINK
Meang Chia, and Cheo Chia, both of 412 W. 6th St., Ste. #1104, Los Angeles, Calif. 90014
Filed Nov. 27, 1989, Ser. No. 441,934
Term of patent 14 years
U.S. Cl. D11—93



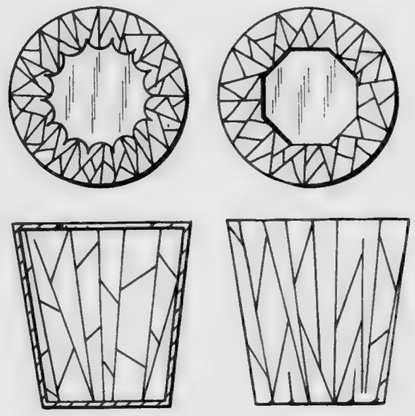
325,887
ARTIFICIAL CHRISTMAS TREE
Joseph J. Vodhanel, Jr., 10937 S. Groveland Ave., Whittier, Calif. 90603
Filed Mar. 3, 1989, Ser. No. 318,761
Term of patent 14 years
U.S. Cl. D11—118



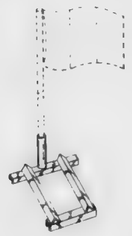
325,888
WALL PLAQUE
Daniel A. Carroll, West Long Branch, N.J., assignor to Carroll Traditionals, Inc., West Long Branch, N.J.
Filed May 24, 1990, Ser. No. 528,185
Term of patent 14 years
U.S. Cl. D11—137



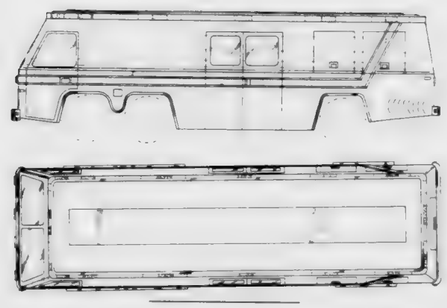
325,889
FLOWER POT COVER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 108,023, Oct. 13, 1987, Pat. No. Des. 317,583, which is a continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. Des. 293,224. This application Mar. 9, 1989, Ser. No. 321,465
The portion of the term of this patent subsequent to Apr. 21, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—152



325,890
FLAG STAFF SUPPORT
Luc Doublet, Seclin, France, assignor to Societe Doublet, Pont-A-Marcq, France
Filed Oct. 11, 1989, Ser. No. 419,830
Term of patent 14 years
U.S. Cl. D11—181



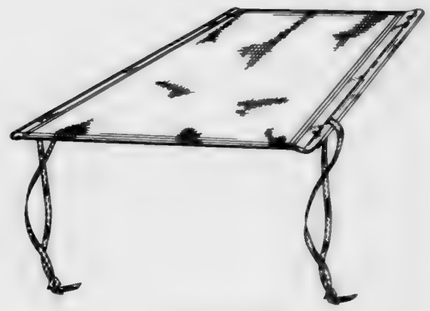
325,891
EMERGENCY VEHICLE
Dennis Zeman, Bonduel, and Kurt Person, Shawano, both of Wis., assignors to T4 Corporation, Shawano, Wis.
Filed Apr. 2, 1990, Ser. No. 502,649
Term of patent 14 years
U.S. Cl. D12—1



325,892
ELECTRICALLY POWERED THREE WHEELED VEHICLE
Elaine M. Nesterick, Ventura; Robert W. Reynolds, Camarillo; Spencer L. MacKay, Agoura Hills, and Cleve A. Graham, Simi Valley, all of Calif., assignors to Everest & Jennings, Inc., Camarillo, Calif.
Filed Oct. 2, 1989, Ser. No. 416,123
Term of patent 14 years
U.S. Cl. D12—85



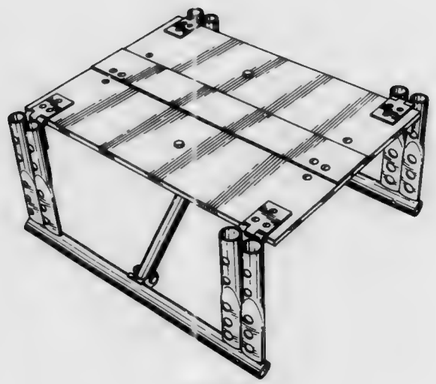
325,893
STRETCHER OR THE LIKE
Jurg O. Schuster, Zumikon, Switzerland, assignor to Samarit Medizintechnik Aktiengesellschaft, Switzerland
Filed Nov. 28, 1989, Ser. No. 442,216
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1989, 8904040
Term of patent 14 years
U.S. Cl. D12—128



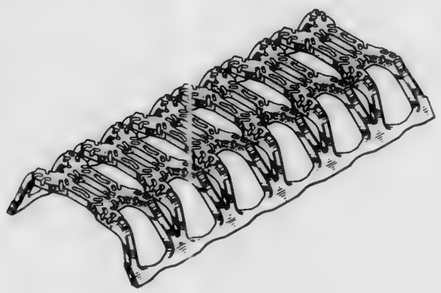
325,894
BABY STROLLER
Hitoshi Kato, and Yuuichi Arai, both of Tokyo, Japan, assignors to Combi Corporation, Tokyo, Japan
Filed Oct. 4, 1990, Ser. No. 594,226
Claims priority, application Japan, Jul. 12, 1990, 2-23369
Term of patent 14 years
U.S. Cl. D12—129



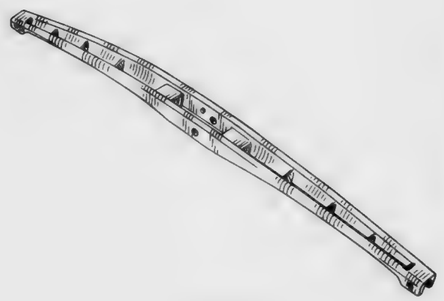
325,895
BASE PORTION OF THE WHEELCHAIR FRAME
Ingvar R. Javér, Olof Skötkonungsgatan 27, Göteborg, Sweden S-412 69
Filed Oct. 15, 1990, Ser. No. 597,596
Term of patent 14 years
U.S. Cl. D12—133



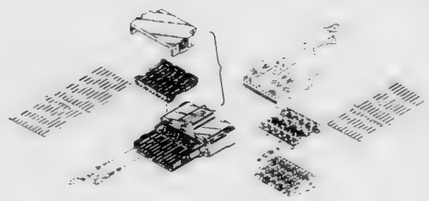
325,896
TIRE TRACTION UNIT
Rolf Pfoertner, 1936 - 20th Street, Langley, British Columbia, V3A 4P4, Canada
Filed May 15, 1990, Ser. No. 524,061
Term of patent 14 years
U.S. Cl. D12—154



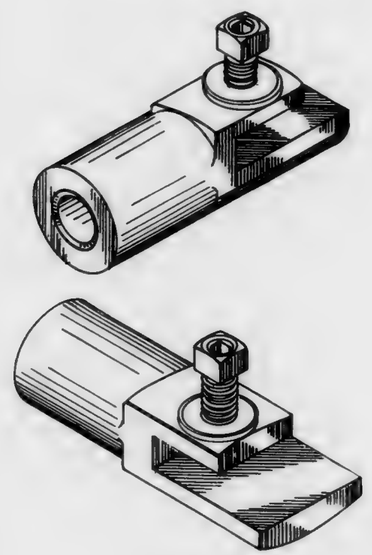
325,897
PRIMARY YOKE FOR A WINDSHIELD WIPER
Franz Buechele, Burlington, and Stephen G. Dipple, Waterdown, both of Canada, assignors to Tridon Limited, Burlington, Canada
Filed Oct. 19, 1990, Ser. No. 600,356
Term of patent 14 years
U.S. Cl. D12—155



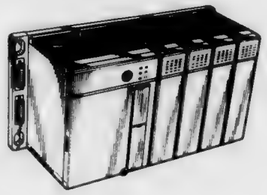
325,898
ELECTRICAL CONNECTOR HOUSING
Katsutoshi Kuzuno; Shigeo Ishizuka, and Masayuki Yamamoto, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed May 22, 1990, Ser. No. 526,808
Claims priority, application Japan, Dec. 5, 1989, 1-43988
Term of patent 14 years
U.S. Cl. D13—147



325,899
ELECTRICAL CONNECTOR LUG
William G. Krokaugger, Chatsworth, Calif., assignor to Mole Richardson Co., Hollywood, Calif.
Filed Jul. 9, 1990, Ser. No. 549,701
Term of patent 14 years
U.S. Cl. D13—148



325,900
PROGRAMMABLE CONTROLLER
Norio Shimizu, and Yuichi Watanabe, both of Tokyo, Japan, assignors to Koyo Electronics Industries Ltd., Tokyo, Japan
Filed Mar. 1, 1989, Ser. No. 317,698
Claims priority, application Japan, Sep. 1, 1988, 63-34660
Term of patent 14 years
U.S. Cl. D13—162



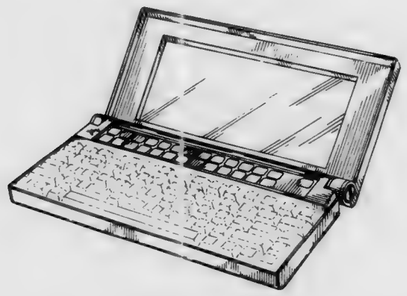
325,901
EXTENSION FOR A LIGHT SWITCH ACTUATOR
Charles C. Vencel, Sr., 1044 Ford Blvd., Lincoln Park, Mich. 48146
Filed Aug. 9, 1990, Ser. No. 564,953
Term of patent 14 years
U.S. Cl. D13—173



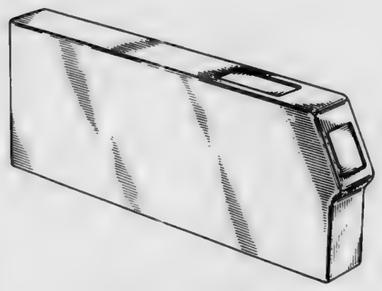
325,902
MULTI-PURPOSE ENCLOSURE FOR CONTROL MODULES OR DEVICES
Hugh F. Hudson, Wauwatosa, Wis.; Joseph F. Munsch, Boulder Creek, and Joseph A. McArdle, Mountain View, both of Calif., assignors to Johnson Service Company, Milwaukee, Wis.
Filed Nov. 30, 1989, Ser. No. 444,093
The portion of the term of this patent subsequent to Sep. 3, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—184



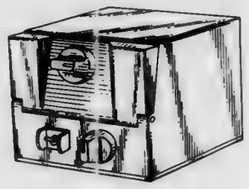
325,903
COMPUTER TERMINAL
Thomas E. Kimble, Glendale, Ohio, assignor to Random Corporation, Cincinnati, Ohio
Filed Aug. 23, 1989, Ser. No. 397,303
Term of patent 14 years
U.S. Cl. D14—106



325,904
RECEIVER-PRINTER INTERFACE FOR A FACSIMILE
Edward R. Prince, III, San Francisco, Calif., assignor to Hybrid Fax, Inc.
Filed Feb. 17, 1989, Ser. No. 312,920
Term of patent 14 years
U.S. Cl. D14—118



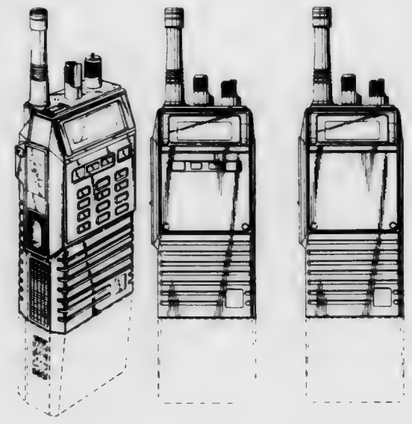
325,905
VIDEO TAPE RECORDER
Makoto Tani, Tokyo, Japan, assignor to Teac Corporation, Tokyo, Japan
Filed Nov. 5, 1990, Ser. No. 609,459
Claims priority, application Japan, May 11, 1990, 2-15913
Term of patent 14 years
U.S. Cl. D14—135



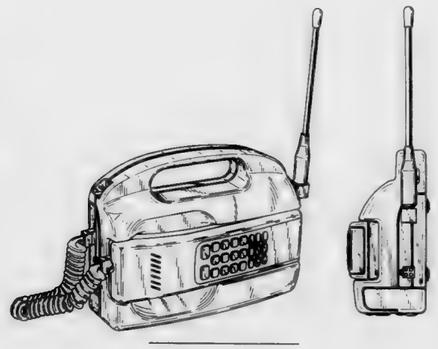
325,906
PORTABLE RADIO
Richard Culbertson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Jul. 21, 1989, Ser. No. 384,662
Term of patent 14 years
U.S. Cl. D14—137



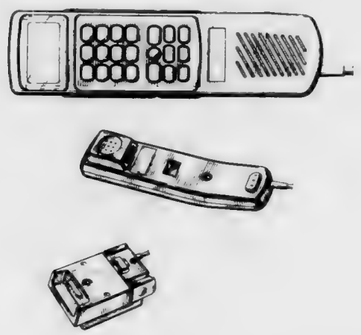
325,907
PORTABLE RADIO
Douglas M. Dickson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Aug. 7, 1989, Ser. No. 390,252
Term of patent 14 years
U.S. Cl. D14—137



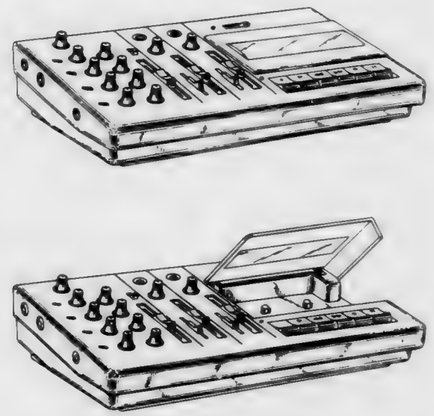
325,908
PORTABLE TELEPHONE SET
Naoko Seki; Katsuhito Watanabe, and Eriko Ino, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jan. 7, 1991, Ser. No. 638,426
Claims priority, application Japan, Sep. 19, 1990, 2-31268
Term of patent 14 years
U.S. Cl. D14—138



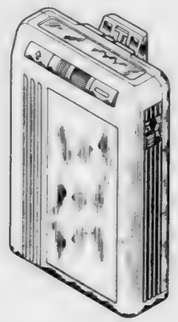
325,909
COMBINED MOBILE CELLULAR TELEPHONE HANDSET AND TRANSPORTER
David A. Shambley, Carrollton, Tex.; Tsutomu Okawa, Tokyo, Japan, and Douglas N. Laube, Nevada, Tex., assignors to NEC America, Inc., Melville, N.Y.
Filed May 31, 1991, Ser. No. 710,898
Term of patent 14 years
U.S. Cl. D14—138



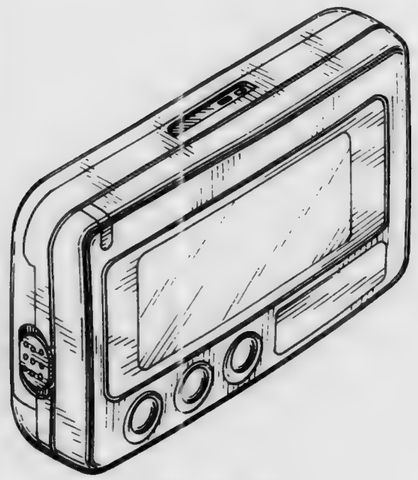
325,910
COMBINED AUDIO MIXER AND TAPE RECORDER
Masafumi Ito, Tokyo; Shigeru Hasegawa, Kodaira; Katsuhiro Takashima, Yokohama, and Keiji Tsunoda, Kokubunji, all of Japan, assignors to Teac Corporation, Tokyo, Japan
Filed Oct. 31, 1990, Ser. No. 606,356
Claims priority, application Japan, May 11, 1990, 2-15914
Term of patent 14 years
U.S. Cl. D14—162



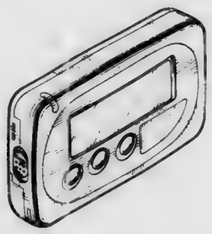
325,911
DISPLAY PAGER OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, and Dennie T. Dy, Boynton Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 3, 1990, Ser. No. 620,694
Term of patent 14 years
U.S. Cl. D14—191



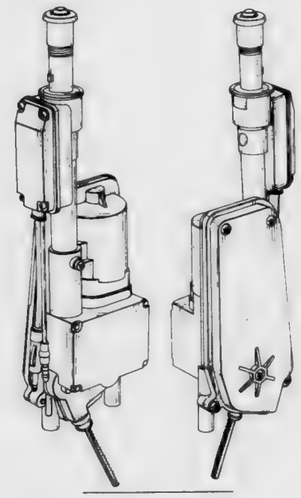
325,912
DISPLAY PAGER
Takahiro Sakai, and Toshiaki Mizushima, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Dec. 11, 1990, Ser. No. 625,616
Claims priority, application Japan, Jun. 12, 1990, 1-19701
Term of patent 14 years
U.S. Cl. D14—191



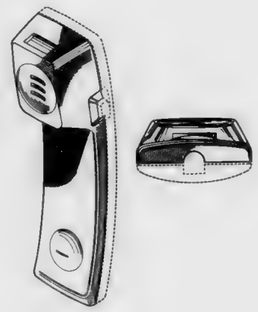
325,913
DISPLAY PAGER
Makoto Takahashi, and Toshiaki Mizushima, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Dec. 11, 1990, Ser. No. 625,618
Claims priority, application Japan, Jun. 12, 1990, 1-19703
Term of patent 14 years
U.S. Cl. D14—191



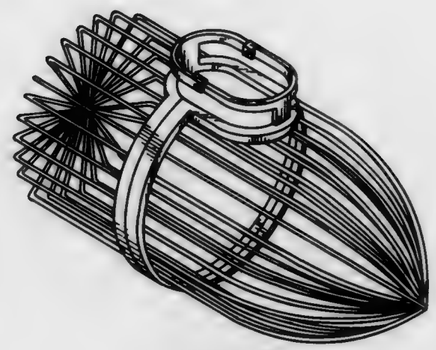
325,914
ANTENNA FOR AUTOMOBILES
Kiyoshi Tezuka, Tokyo, Japan, assignor to Harada Industry Co., Ltd., Tokyo, Japan
Filed Sep. 5, 1989, Ser. No. 402,256
Claims priority, application Japan, Mar. 31, 1989, 1-11400
Term of patent 14 years
U.S. Cl. D14—230



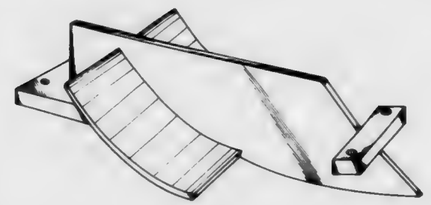
325,915
TELEPHONE HANDSET HOUSING PANEL OR SIMILAR ARTICLE
Albert L. Nagele, Wilmette, and Joseph A. Twarowski, Glen Ellyn, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 18, 1991, Ser. No. 732,323
Term of patent 14 years
U.S. Cl. D14—248



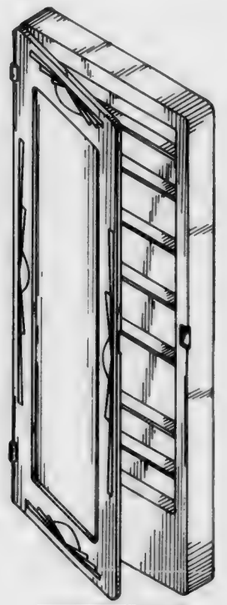
325,916
PROPELLER CAGE FOR A BOAT MOTOR
R. Mitzi Lanier, 1621 S. Orange Blossom Trail, Apopka, Fla. 32703
Filed Jul. 20, 1989, Ser. No. 382,324
Term of patent 14 years
U.S. Cl. D15—4



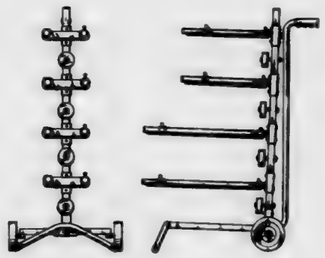
325,917
FLUID FLOW DIRECTING ELEMENT FOR WATERCRAFT
Don R. Moyle, Rte. 1, Box 1762, and Glendon L. Dilworth, 1215 E. 16th, both of Burley, Id. 83318
Continuation of Ser. No. 449,977, Dec. 12, 1989, abandoned. This application Mar. 29, 1991, Ser. No. 677,668
Term of patent 14 years
U.S. Cl. D15—4



325,918
REFRIGERATOR
Helen Lloyd, 2749 Fountainebleu, Atlanta, Ga. 30360
Filed Jan. 23, 1990, Ser. No. 468,983
Term of patent 14 years
U.S. Cl. D15—81



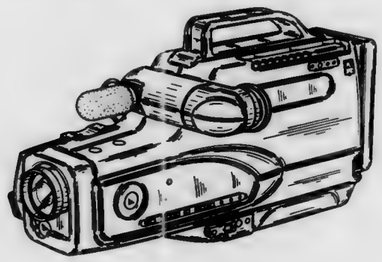
325,919
MASKING STATION
Robert D. Comatov, Yorba Linda, Calif., assignor to Fisher Tool Co., Inc., Los Angeles, Calif.
Filed Nov. 13, 1989, Ser. No. 436,176
Term of patent 14 years
U.S. Cl. D15—145



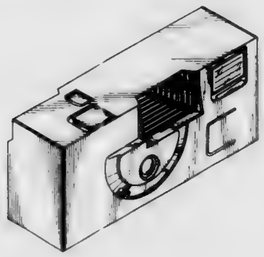
325,920
SPECTACLES
Beate Hornung, Schwäbisch Gmund, Fed. Rep. of Germany, assignor to Marwitz & Hauser GmbH, Stuttgart, Fed. Rep. of Germany
Filed Oct. 3, 1990, Ser. No. 592,077
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1990, 9002423
Term of patent 14 years
U.S. Cl. D16—102



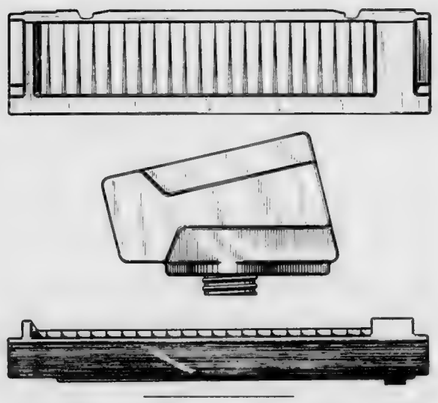
325,921
COMBINED VIDEO TAPE RECORDER AND CAMERA
Hiroshi Ooi, and Seiji Kurokawa, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 20, 1989, Ser. No. 455,734
Claims priority, application Japan, Jun. 21, 1989, 1-22908
Term of patent 14 years
U.S. Cl. D16—202



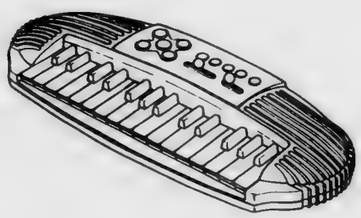
325,922
DISPOSABLE CAMERA
Takuya Arai, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 23, 1990, Ser. No. 483,785
Claims priority, application Japan, Sep. 29, 1989, 1-35813
Term of patent 14 years
U.S. Cl. D16—208



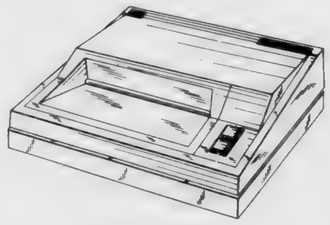
325,923
DEVELOPER SOLUTION CARTRIDGE
Jon F. Boyer, Earleville, Md.; Lee C. Fisher, Rochester, N.Y.; Douglas J. Hohlbein, Central Islip, N.Y.; Anthony P. Montalbano, Bayville, N.Y.; Christopher P. Montalbano, Great Neck, N.Y.; John G. Van Remoortel, Newark, Del., and Joel L. Vanover, Elkton, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 13, 1989, Ser. No. 421,412
The portion of the term of this patent subsequent to Apr. 21, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D16—250



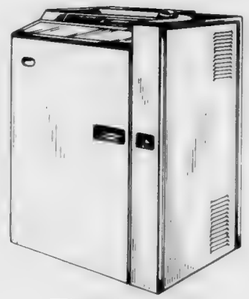
325,924
PORTABLE ELECTRONIC ORGAN
Sun I. Yu, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Yongdungpo, Rep. of Korea
Filed Jun. 27, 1990, Ser. No. 543,951
Claims priority, application Rep. of Korea, Dec. 30, 1989, 18081
Term of patent 14 years
U.S. Cl. D17—5



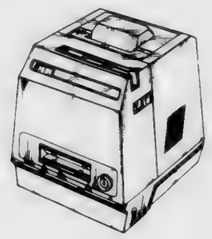
325,925
DOCUMENT SHREDDER
Leon F. Widdison, Warwick, United Kingdom, assignor to Ofrex Group Holdings, Plc, England
Filed Aug. 31, 1988, Ser. No. 239,322
Claims priority, application United Kingdom, Mar. 10, 1988, 1049104
Term of patent 14 years
U.S. Cl. D18—34



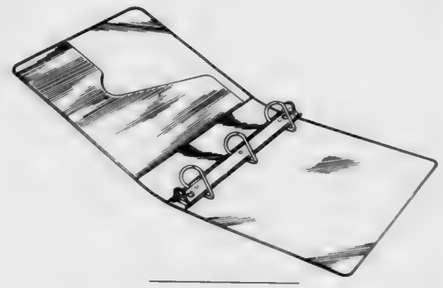
325,926
PRINTER CABINET
Jeffrey L. Quedenfeld, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 25, 1988, Ser. No. 148,401
Term of patent 14 years
U.S. Cl. D18—53



325,927
PRINTER FOR AN ELECTRONIC COMPUTER
Nobuhiro Fushiya, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 22, 1989, Ser. No. 440,281
Claims priority, application Japan, Jun. 16, 1989, 1-22085
Term of patent 14 years
U.S. Cl. D18—54



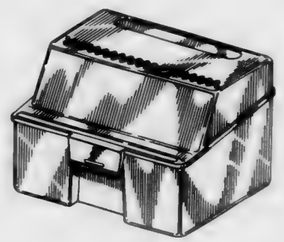
325,928
LOOSELEAF BINDER
Thomas W. Bourgeois, Spring Park, Minn., assignor to American Trading and Production Corporation, Baltimore, Md.
Filed Dec. 5, 1984, Ser. No. 678,283
Term of patent 14 years
U.S. Cl. D19—27



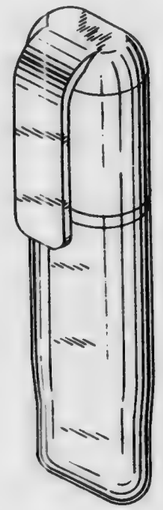
325,929
COMBINED BOOKMARK AND PENHOLDER
Roger L. Larson; Vada J. Larson, both of 8675 Scandia Rd., Waconia, Minn. 55387, and Walter I. Bieger, St. Paul, Minn., assignors to Roger L. Larson and Vada J. Larson, both of Waconia, Minn.
Filed Feb. 13, 1990, Ser. No. 479,594
Term of patent 14 years
U.S. Cl. D19—34



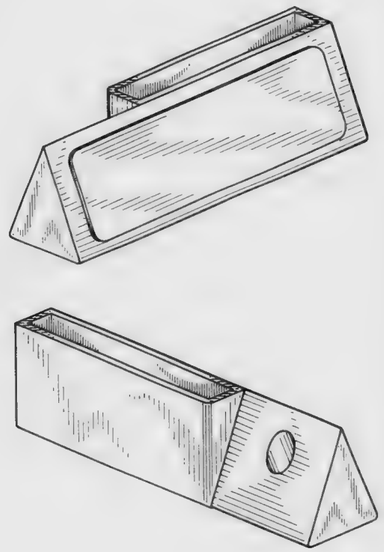
325,930
CARD BOX
John D. Breen, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 19, 1990, Ser. No. 467,239
Term of patent 14 years
U.S. Cl. D19—76



325,931
WRITING INSTRUMENT
Shungo Sekiguchi, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 29, 1989, Ser. No. 373,099
Term of patent 14 years
U.S. Cl. D19—43



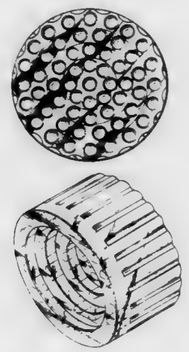
325,933
COMBINED DESK PLAQUE AND HOLDER FOR A WRITING INSTRUMENT AND NOTE PAD
Gary L. Torgison, 1415 SW. 129th St., Seattle, Wash. 98146
Filed May 26, 1989, Ser. No. 357,112
Term of patent 14 years
U.S. Cl. D19—78



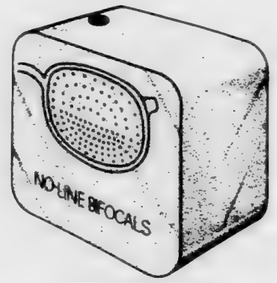
325,934
HOLDER FOR CRAYONS, MARKERS, PENCILS AND THE LIKE
Vinko Ramljak, 16950 Merriman Rd., Livonia, Mich. 48154
Filed Apr. 20, 1990, Ser. No. 511,523
Term of patent 14 years
U.S. Cl. D19—85

325,932
GRIP FOR A WRITING INSTRUMENT
James J. Redfern, 1308 Plateau Dr., North Vancouver, British Columbia V7P 2J6, Canada
Filed Mar. 31, 1989, Ser. No. 331,580
Term of patent 14 years
U.S. Cl. D19—55





325,935
DISPLAY FOR PROMOTING THE SALES OF EYEGLASSES OR THE LIKE
Rayna C. Weiner; Edward G. Weiner, both of Atlanta, and H. Barton Hahn, Marietta, all of Ga., assignors to M.O.D.E., Inc., Jonesboro, Ga.
Filed Apr. 19, 1990, Ser. No. 511,013
Term of patent 14 years
U.S. Cl. D20—19



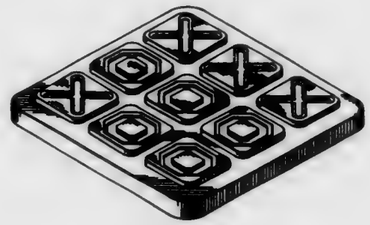
325,936
FOOD AND BEVERAGE MENU HOLDER FOR RESTAURANT TABLES OR THE LIKE
Karen E. Burgess, Branford, Conn., assignor to Gastro-Gnomes, Inc., West Hartford, Conn.
Filed Jan. 22, 1991, Ser. No. 643,829
Term of patent 14 years
U.S. Cl. D20—40



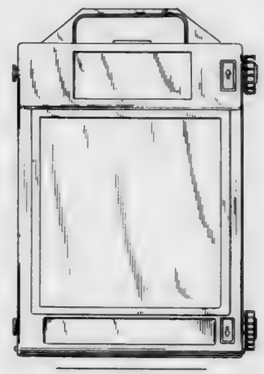
325,937
DART BOARD
John M. Fagan, P.O. Box 3338, Station C, Ottawa, Ontario, Canada K1Y 4J5
Filed May 16, 1990, Ser. No. 524,064
Claims priority, application Canada, Nov. 27, 1989, 2711893
Term of patent 14 years
U.S. Cl. D21—6



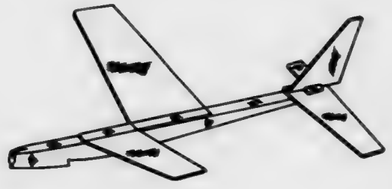
325,938
GAME BOARD
Edwin J. Stuhr, Moline, Ill., assignor to Stuhr Enterprises, Inc., Wilton, Iowa
Filed Apr. 20, 1990, Ser. No. 511,607
Term of patent 14 years
U.S. Cl. D21—34



325,939
DRAWING TOY
Frederick H. Kroll, 11289 Piping Rock Dr., Boynton Beach, Fla. 33437
Filed Mar. 12, 1990, Ser. No. 491,621
Term of patent 14 years
U.S. Cl. D21—59

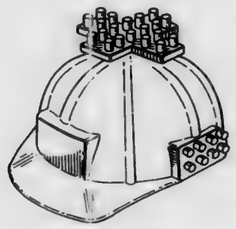


325,940
TOY AIRPLANE
Yasuaki Ninomiya, 20, Utsukushigaoka 1-chome, Midori-ku, Yokohama-shi, Kanagawa, Japan
Filed Jul. 11, 1990, Ser. No. 551,253
Claims priority, application Japan, Aug. 1, 1989, 1-28557
Term of patent 14 years
U.S. Cl. D21—89

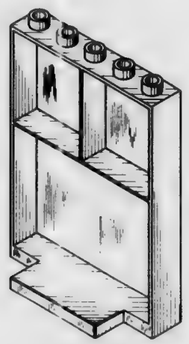


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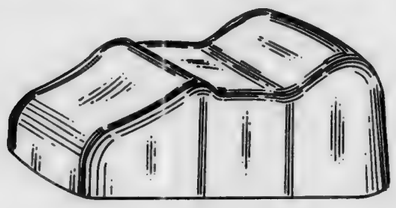
325,941
TOY HAT
Victor J. Bertrand, Ile Bizard, Canada, assignor to The Ritvik Group Inc., Dorval, Canada
Filed Feb. 9, 1990, Ser. No. 478,787
Term of patent 14 years
U.S. Cl. D21—108



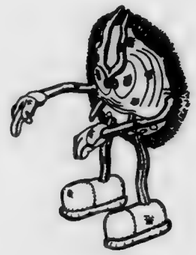
325,942
ELEMENT FOR A TOY BUILDING SET
Charlotte Hoyer, Charlottenlund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,925
Term of patent 14 years
U.S. Cl. D21—108



325,943
FISH CAR
Dennis Kuperman, Glenview, Ill., assignor to RB Toy Development Co., Skokie, Ill.
Filed Jun. 21, 1989, Ser. No. 369,283
Term of patent 14 years
U.S. Cl. D21—128

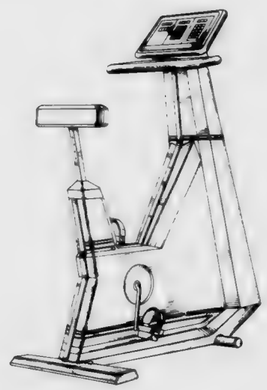


325,944
STUFFED TOY FIGURE
Elizabeth Ashiku, 702 S. Dora, Ukiah, Calif. 95482
Division of Ser. No. 120,813, Nov. 16, 1987, abandoned. This application Aug. 10, 1990, Ser. No. 565,403
Term of patent 14 years
U.S. Cl. D21—185

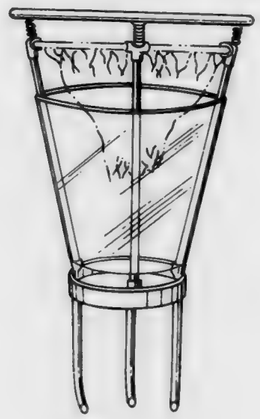


325,945
STRETCHING EXERCISER FOR GOLFERS OR THE LIKE
Joseph S. Gross, 1830 Frederick Rd., Catonsville, Md. 21228
Filed Oct. 25, 1989, Ser. No. 426,693
Term of patent 14 years
U.S. Cl. D21—191

325,946
EXERCISE BICYCLE
William C. Cesaroni, Glenview; David C. Brown; Anthony M. Kulusic, both of Chicago, and Allen L. Ryan, Glenview, all of Ill., assignors to Life Fitness, Franklin Park, Ill.
Filed Sep. 7, 1989, Ser. No. 405,497
Term of patent 14 years
U.S. Cl. D21—194



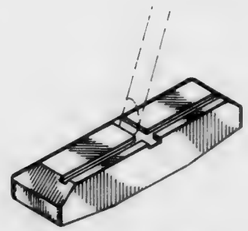
325,947
BASKETBALL PRACTICE TARGET
Norman A. Cass, 54 Foster Rd., Southwick, Mass. 01077
Filed Dec. 30, 1987, Ser. No. 114,391
Term of patent 14 years
U.S. Cl. D21—201



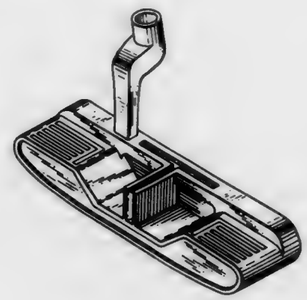
325,948
GOLF PUTTER
Douglas L. Tienan, Edina, Minn., assignor to Wayne Westgor, Bloomington, Minn.
Filed Jan. 16, 1990, Ser. No. 464,785
Term of patent 14 years
U.S. Cl. D21—217



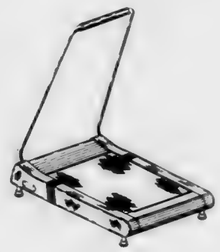
325,949
GOLF PUTTER HEAD
Albert F. Harris, Jr., Leawood, Kans., assignor to Intec Laboratories, Inc., Kansas City, Mo.
Filed Feb. 26, 1990, Ser. No. 484,652
Term of patent 14 years
U.S. Cl. D21—219



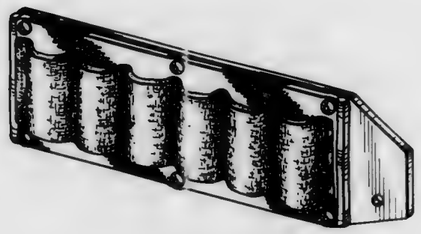
325,950
GOLF PUTTER HEAD
Anthony P. Duran, Lancaster, N.Y., assignor to Dura Golf, Inc., Depew, N.Y.
Filed Feb. 26, 1990, Ser. No. 484,661
Term of patent 14 years
U.S. Cl. D21—219



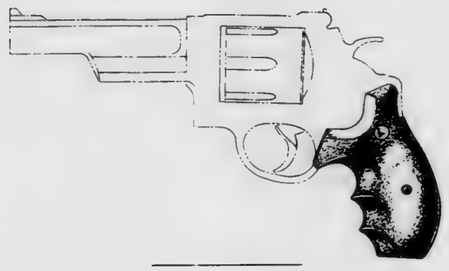
325,951
TRAMPOLINE EXERCISER
Ronald H. Johnson, Barberton, Ohio, assignor to Consumer Direct, Inc., Canton, Ohio
Filed Mar. 27, 1990, Ser. No. 500,260
Term of patent 14 years
U.S. Cl. D21—235



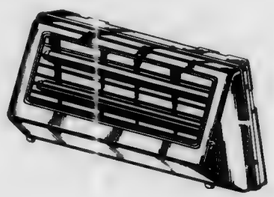
325,952
SHOTSHELL CARRIER
Larry E. Moore, 1598 Sierra Dr., Cottonwood, Ariz. 86326
Filed Nov. 3, 1989, Ser. No. 431,322
Term of patent 14 years
U.S. Cl. D22—108



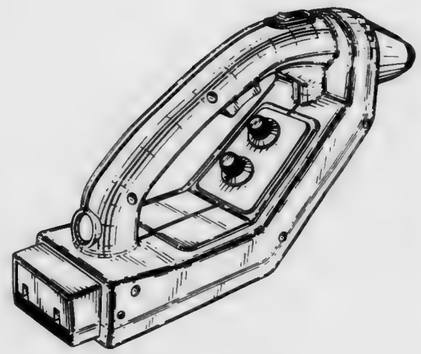
325,953
PISTOL GRIP
Joseph F. Vecchiarelli, Springfield, Mass., assignor to Smith & Wesson Corp., Springfield, Mass.
Filed Nov. 13, 1989, Ser. No. 434,843
Term of patent 14 years
U.S. Cl. D22—108



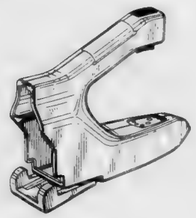
325,954
INSECT TRAP
Edward J. Lazzeroni, Sr., Franksville; Edward J. Lazzeroni, Jr., Racine, and Timothy E. Zollers, Milwaukee, all of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Apr. 14, 1989, Ser. No. 338,064
Term of patent 14 years
U.S. Cl. D22—123



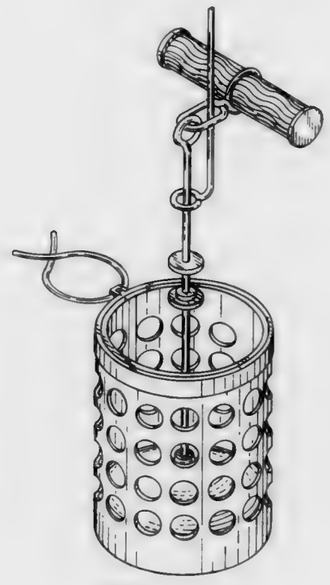
325,955
HANDLE FOR AN HERBICIDE SPRAYER
Eren Ali, Bristol, United Kingdom, assignor to Nomix Manufacturing Company Limited, United Kingdom
Filed Sep. 6, 1989, Ser. No. 403,712
Claims priority, application United Kingdom, Mar. 7, 1989, 1057665
Term of patent 14 years
U.S. Cl. D23—225



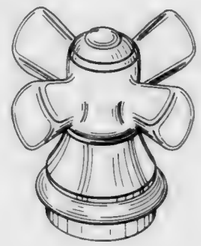
325,956
HANDLE FOR AN HERBICIDE SPRAYER
Eren Ali, Bristol, United Kingdom, assignor to Nomix Manufacturing Company Limited, United Kingdom
Filed Dec. 27, 1989, Ser. No. 457,543
Claims priority, application United Kingdom, Jun. 30, 1989, 1060562
Term of patent 14 years
U.S. Cl. D23—225



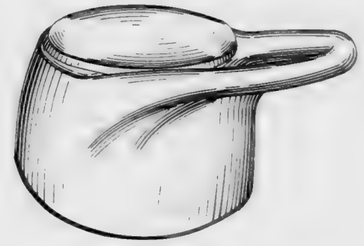
325,957
TOILET TANK FLUSH CONTROL VALVE
L. Albert Van De Veire, 23647 W. Edison Rd., South Bend, Ind. 46628
Filed May 24, 1989, Ser. No. 356,386
Term of patent 14 years
U.S. Cl. D23—236



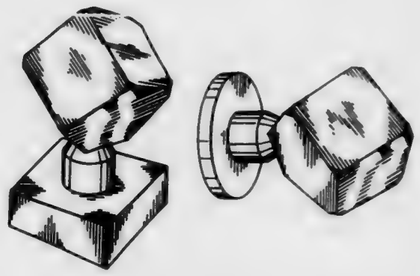
325,958
HANDLE FOR A FAUCET OR THE LIKE
Henry M. Stairs, Jr., Neshanic, and Donna Spano, Bridgewater, both of N.J., assignors to American Standard Inc., New York, N.Y.
Filed Aug. 26, 1988, Ser. No. 236,977
Term of patent 14 years
U.S. Cl. D23—250



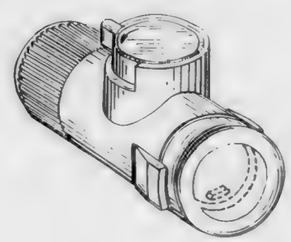
325,959
PLUMBING FITTING HANDLE OR THE LIKE
Paul P. Kolada, Bexley, Ohio, assignor to Sterling Plumbing Group, Inc., Schaumburg, Ill.
Filed Jan. 19, 1989, Ser. No. 300,532
Term of patent 14 years
U.S. Cl. D23—252



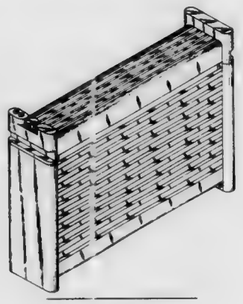
325,960
COMBINED HANDLE AND ESCUTCHEON
Stanley M. Paul, Rye, N.Y., assignor to Kohler Co., Kohler, Wis.
Division of Ser. No. 166,728, Mar. 1, 1988, which is a continuation-in-part of Ser. No. 892,392, Jul. 31, 1986, abandoned. This application Aug. 21, 1991, Ser. No. 748,169
Term of patent 14 years
U.S. Cl. D23—254



325,961
HOSE QUICK CONNECTOR HOUSING
Ronald G. Hayes, Milford, Ohio, assignor to L. R. Nelson Corporation, Peoria, Ill.
Filed Oct. 19, 1989, Ser. No. 423,859
Term of patent 14 years
U.S. Cl. D23—262



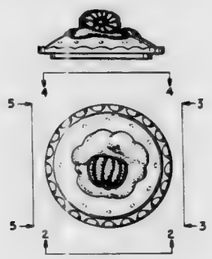
325,962
PORTABLE ELECTRIC HEATER
Melvin Dubin, Great Neck, and Rocco Vozzo, Brooklyn, both of N.Y., assignors to Slant/Fin Corporation, Greenvale, N.Y.
Filed May 13, 1991, Ser. No. 699,783
Term of patent 14 years
U.S. Cl. D23—335



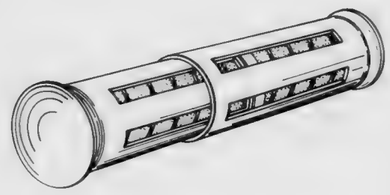
325,963
OUTDOOR HEATER
David L. Anderson, St. Charles, Ill., assignor to Odin Industries, Inc., Elburn, Ill.
Filed Jan. 22, 1991, Ser. No. 580,302
Term of patent 14 years
U.S. Cl. D23—342



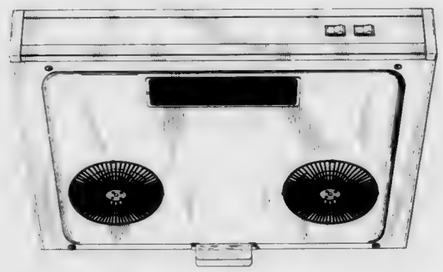
325,964
FRAGRANCE DISH COVER
Howard J. Borakove, Chesterfield, and Cindy L. Morrell, St. Louis, both of Mo., assignors to Willert Home Products, Inc., St. Louis, Mo.
Filed Apr. 25, 1990, Ser. No. 514,651
Term of patent 14 years
U.S. Cl. D23—367



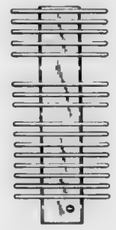
325,965
AIR FRESHENER CONTAINER
Fred J. Donley, 11037 Coachman Rd., Yukon, Okla. 73099, and Robert E. Gonce, Jr., 12805 Castlerock Ct., Oklahoma City, Okla. 73142
Filed Apr. 10, 1989, Ser. No. 335,970
Term of patent 14 years
U.S. Cl. D23—368



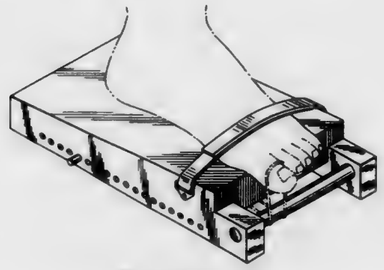
325,966
KITCHEN EXHAUST HOOD
Chin C. Wei, Alhambra, Calif., assignor to Jade Vines International Inc., South El Monte, Calif.
Filed Jan. 31, 1990, Ser. No. 473,364
Term of patent 14 years
U.S. Cl. D23—372



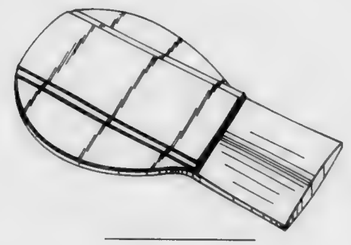
325,967
HEATING ELEMENT FOR USE IN RESIDENCES PREFERABLY OF BATHS AND BOARDING TO BE PLACED STANDING FREE BEFORE A WALL
Richard Dieterle, Emmendingen, and Peter Kriese, Lahr, both of Fed. Rep. of Germany, assignors to Zehnder Verkaufs-und Verwaltungs AG, Gränichen, Switzerland
Filed Mar. 14, 1990, Ser. No. 493,861
Claims priority, application Int'l Pat. Institute, Sep. 14, 1989, DM/014569
Term of patent 14 years
U.S. Cl. D23—386



325,968
REHABILITATION BLOCK
Thomas Nofsinger, 4503 Chapman, The Colony, Tex. 75056
Filed Dec. 14, 1989, Ser. No. 450,383
Term of patent 14 years
U.S. Cl. D21—191



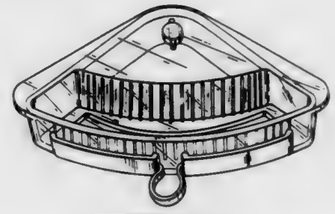
325,969
ANAL PROTECTIVE LINER
Zina V. Davy, Lansing, Mich., assignor to Zinco International, Inc., Detroit, Mich.
Filed Nov. 13, 1989, Ser. No. 434,172
Term of patent 14 years
U.S. Cl. D24—124



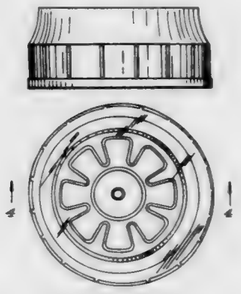
325,970
BONE PLANER
Frank F. Rubin, Quincy, Mass., assignor to Neo-Contemporary Company, Inc., Quincy, Mass.
Filed Feb. 23, 1989, Ser. No. 315,027
Term of patent 14 years
U.S. Cl. D24—147



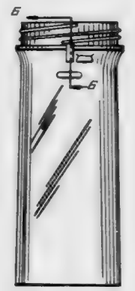
325,971
MOULD TRAY FOR DENTAL MODELS
Steven Hoyle, Brighouse, England, assignor to Malcolm Gill Limited, West Yorkshire, England
Filed Mar. 21, 1989, Ser. No. 326,266
Claims priority, application United Kingdom, Sep. 24, 1988, 1053786
Term of patent 14 years
U.S. Cl. D24—181



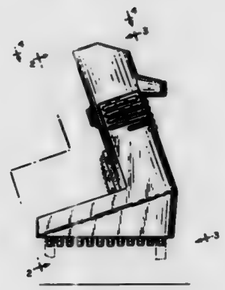
325,972
DISPOSABLE NURSER HOOD
Yin I. Chen, Napersville, Ill., and William Bartasevich, Kent, Ohio, assignors to Lisco, Inc., Tampa, Fla.
Filed Feb. 16, 1990, Ser. No. 481,470
Term of patent 14 years
U.S. Cl. D24—193



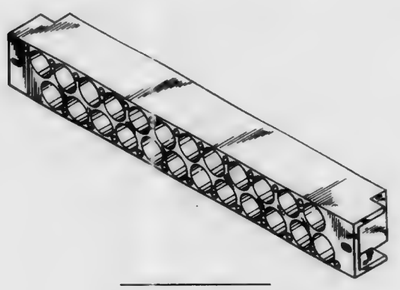
325,973
SHELL FOR A DISPOSABLE NURSER
Yin I. Chen, Napersville, Ill., and William Bartasevich, Kent, Ohio, assignors to Lisco, Inc., Tampa, Fla.
Filed Feb. 16, 1990, Ser. No. 481,470
Term of patent 14 years
U.S. Cl. D24—197



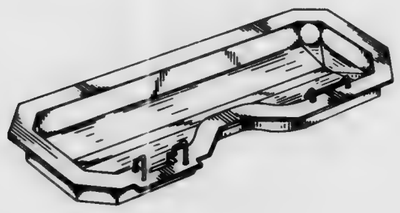
325,974
MULTI-CHANNEL PIPETTER
George P. Kalmakis, Reading, Mass.; Victor A. Torti, Brookline; Matthew D. Bantly, Nashua, both of N.H., and Jack R. Harkins, Hollis, N.H., assignors to Matrix Technologies Corp., Lowell, Mass.
Filed Apr. 28, 1989, Ser. No. 344,370
Term of patent 14 years
U.S. Cl. D24—222



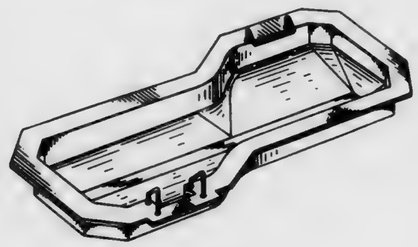
325,975
CARTRIDGE FOR BLOOD MONITOR
Lanny Grade; Duane Kadavy, and Larry Kerr, all of Oklahoma City, Okla., assignors to Akzo N.V., Arnhem, Netherlands
Filed Jun. 1, 1990, Ser. No. 533,050
Term of patent 14 years
U.S. Cl. D24—230



325,976
SWIMMING POOL
Donald H. Weir, York, Pa., assignor to Wexco Incorporated, York, Pa.
Filed Aug. 7, 1989, Ser. No. 395,912
The portion of the term of this patent subsequent to Jan. 14, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—2



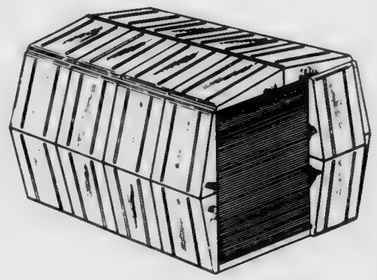
325,977
SWIMMING POOL
Donald H. Weir, York, Pa., assignor to Wexco Incorporated, York, Pa.
Filed Aug. 7, 1989, Ser. No. 395,913
The portion of the term of this patent subsequent to Mar. 31, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—2



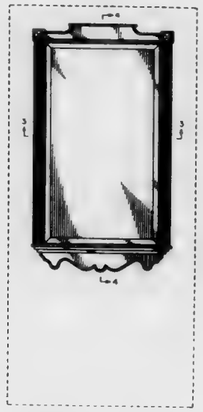
325,978
PORTABLE OPEN AIR DISPLAY STAND
Charles P. Koch, Cincinnati, Ohio, assignor to Adex, Inc., Cincinnati, Ohio
Filed Mar. 2, 1989, Ser. No. 318,010
Term of patent 14 years
U.S. Cl. D25—16



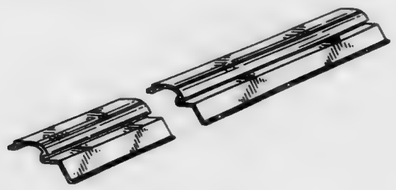
325,979
MODULAR SHED
Harry Mahler, Toronto, Canada, assignor to GSW Inc., Barrie, Canada
Filed Apr. 4, 1990, Ser. No. 504,284
Term of patent 14 years
U.S. Cl. D25—33



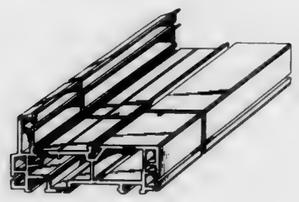
325,980
DOOR MOLDING
Roger C. Hall, 501 Willow Dr., Jasper, Tex. 75951
Division of Ser. No. 261,061, Oct. 24, 1988, Pat. No. Des. 314,626. This application Jan. 15, 1991, Ser. No. 642,721
Term of patent 14 years
U.S. Cl. D25—48



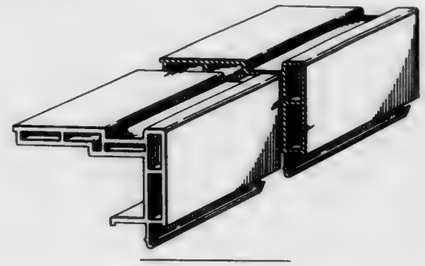
325,981
EXTRUSION FOR USE IN THE CONSTRUCTION OF A WINDOW
Volker S. Valentin, Indiana, Pa., assignor to L. B. Plastics Limited, Belper, England
Filed Jun. 15, 1990, Ser. No. 539,038
Term of patent 14 years
U.S. Cl. D25—119



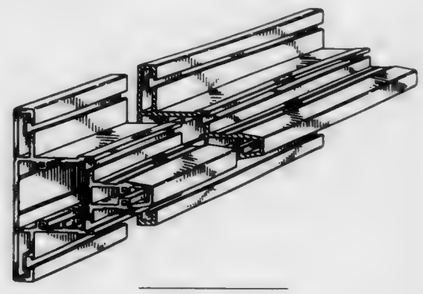
325,982
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, and Dominique Dallaire, both of St. David, Canada, assignors to Dallaire Industries Ltd., Canada
Filed Mar. 1, 1990, Ser. No. 487,173
Term of patent 14 years
U.S. Cl. D25—124



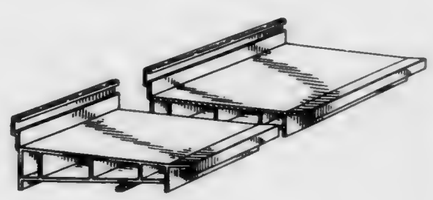
325,983
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, and Dominique Dallaire, both of St. David, Canada, assignors to Dallaire Industries Ltd., Quebec, Canada
Filed May 18, 1990, Ser. No. 525,485
Term of patent 14 years
U.S. Cl. D25—124



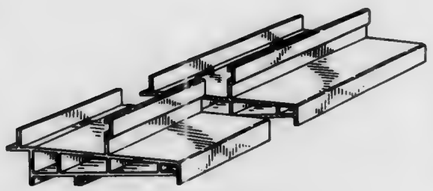
325,984
EXTRUSION FOR USE IN THE CONSTRUCTION OF A WINDOW
Volker S. Valentin, Indiana, Pa., assignor to L. B. Plastics, Belper, England
Filed Jun. 15, 1990, Ser. No. 539,031
Term of patent 14 years
U.S. Cl. D25—122



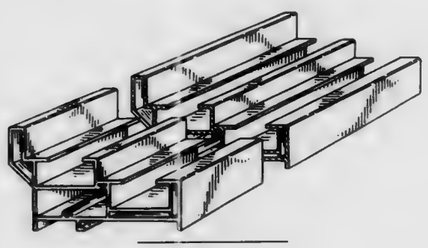
325,985
EXTRUSION FOR USE IN THE CONSTRUCTION OF A WINDOW
Volker S. Valentin, Indiana, Pa., assignor to L. B. Plastics Limited, Belper, England
Filed Jun. 15, 1990, Ser. No. 539,034
Term of patent 14 years
U.S. Cl. D25—124



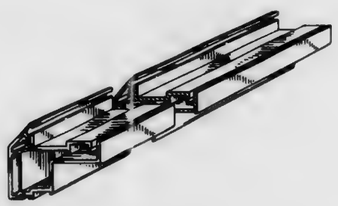
325,986
EXTRUSION FOR USE IN THE CONSTRUCTION OF A WINDOW
Volker S. Valentin, Indiana, Pa., assignor to L. B. Plastics Limited, Belper, England
Filed Jun. 15, 1990, Ser. No. 539,035
Term of patent 14 years
U.S. Cl. D25—124



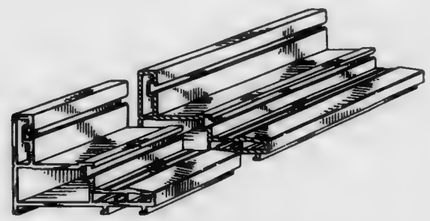
325,987
EXTRUSION FOR USE IN THE CONSTRUCTION OF A WINDOW
Volker S. Valentin, Indiana, Pa., assignor to L. B. Plastics Limited, Belper, England
Filed Jun. 15, 1990, Ser. No. 539,037
Term of patent 14 years
U.S. Cl. D25—124



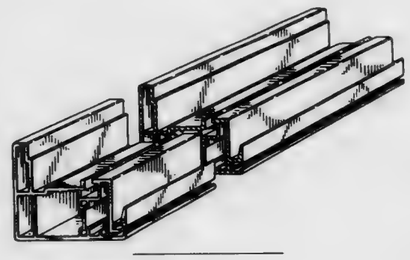
325,988
EXTRUSION FOR USE IN THE CONSTRUCTION OF A WINDOW
Volker S. Valentin, Indiana, Pa., assignor to L. B. Plastics Limited, Belper, England
Filed Jun. 15, 1990, Ser. No. 539,040
Term of patent 14 years
U.S. Cl. D25—124



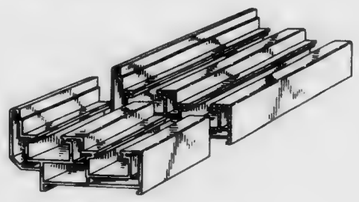
325,989
EXTRUSION FOR USE IN THE CONSTRUCTION OF A WINDOW
Volker S. Valentin, Indiana, Pa., assignor to L. B. Plastics Limited, Belper, England
Filed Jun. 15, 1990, Ser. No. 539,041
Term of patent 14 years
U.S. Cl. D25—124



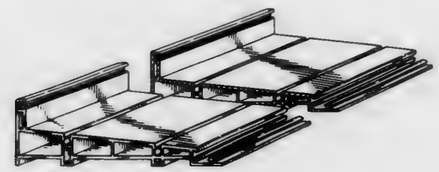
325,990
EXTRUSION FOR USE IN THE CONSTRUCTION OF A WINDOW
Volker S. Valentin, Indiana, Pa., assignor to L. B. Plastics, Limited, Belper, England
Filed Jun. 15, 1990, Ser. No. 539,042
Term of patent 14 years
U.S. Cl. D25—124



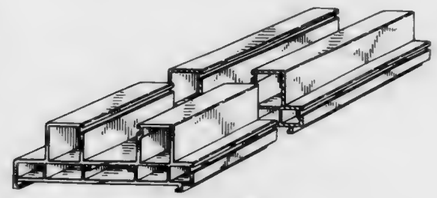
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EXTRUSION FOR USE IN THE CONSTRUCTION OF A WINDOW
Volker S. Valentin, Indiana, Pa., assignor to L. B. Plastics Limited, Belper, England
Filed Jun. 15, 1990, Ser. No. 539,044
Term of patent 14 years
U.S. Cl. D25—124



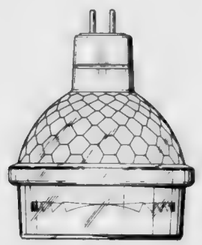
325,992
EXTRUSION FOR USE IN THE CONSTRUCTION OF A WINDOW
Volker S. Valentin, Indiana, Pa., assignor to L.B. Plastics Limited, Belper, England
Filed Jun. 15, 1990, Ser. No. 539,045
Term of patent 14 years
U.S. Cl. D25—124



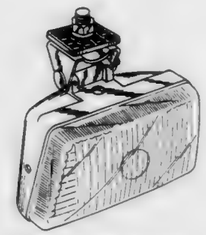
325,993
EXTRUSION FOR USE IN THE CONSTRUCTION OF A WINDOW
Volker S. Valentin, Indiana, Pa., assignor to L.B. Plastics Limited, Belper, England
Filed Jun. 15, 1990, Ser. No. 539,046
Term of patent 14 years
U.S. Cl. D25—124



325,994
LAMP
Roger A. Hume; Richard A. Felstead, both of Melton Mowbray, and Luciano Zucchi, London, all of England, assignors to Thorn Lighting Limited, Borehamwood, England
Filed Oct. 31, 1990, Ser. No. 607,076
Claims priority, application United Kingdom, May 1, 1990, D2006506
Term of patent 14 years
U.S. Cl. D26—2



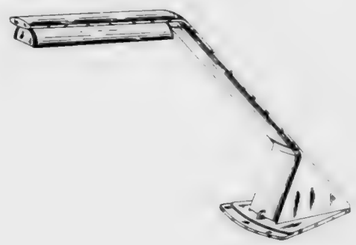
325,995
FOG LIGHT
Vincent Tsai, No.138, Huan Ho Rd., Pan Chiao, Taiwan
Filed Oct. 24, 1990, Ser. No. 601,114
Term of patent 14 years
U.S. Cl. D26—29



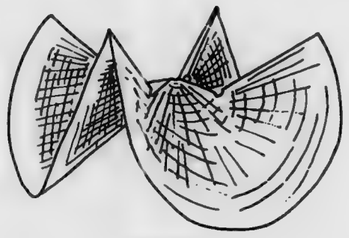
325,996
TABLE LAMP BASE
Craig A. Winn, Carson, Calif., assignor to Dynasty Classics Corporation, Carson, Calif.
Filed Dec. 24, 1990, Ser. No. 632,508
Term of patent 14 years
U.S. Cl. D26—103



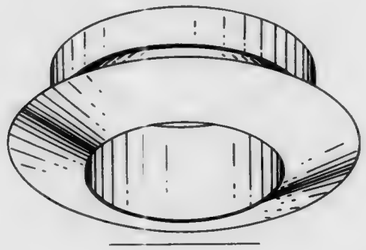
325,997
DESK LAMP
Menno Dieperink, Amsterdam, and Stefanus F. W. Joosten, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 18, 1990, Ser. No. 510,799
Claims priority, application World Int. Prop. O., Oct. 30, 1989, DM/014.914
Term of patent 14 years
U.S. Cl. D26—107



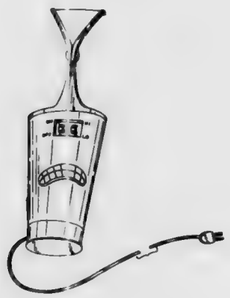
325,998
LAMP SHADE
Haizan Shaw, 1186 Williams St., Monterey Park, Calif. 91754
Filed Nov. 24, 1986, Ser. No. 934,133
Term of patent 14 years
U.S. Cl. D26—131



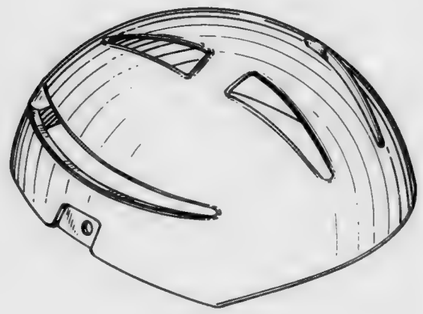
325,999
TRIM FOR RECESSED LIGHTING FIXTURE OR THE LIKE
Robert A. Sonneman, New York, N.Y., assignor to Sonneman Design Group Inc., Long Island City, N.Y.
Filed Sep. 6, 1989, Ser. No. 403,801
Term of patent 14 years
U.S. Cl. D26—152



326,000
DENTAL FLOSS HOLDER
Ronald Williams, 114-2 Van Buren Rd., Voorhees, N.J. 08043
Filed Jul. 10, 1990, Ser. No. 550,359
Term of patent 14 years
U.S. Cl. D28—64



326,001
HELMET
Michele A. Chiarella, Via Vall'Orba 22, Lugano, Switzerland
Filed Jul. 22, 1987, Ser. No. 76,197
Term of patent 14 years
U.S. Cl. D29—12



326,002
RAWHIDE DOG CHEW
Maria del C. Rodriguez, 1581 E. Lake Way, Fort Lauderdale, Fla. 33326
Filed Jan. 17, 1991, Ser. No. 642,376
Claims priority, application Argentina, Jul. 17, 1990, 056,606
Term of patent 14 years
U.S. Cl. D30—160



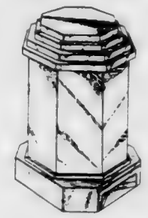
326,003
BIRD FEEDER
Donald Embree, Uniontown, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jun. 12, 1989, Ser. No. 365,233
The portion of the term of this patent subsequent to May 1, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—128



326,004
RAWHIDE DOG CHEW
Maria del C. Rodriguez, 1581 E. Lake Way, Fort Lauderdale, Fla. 33326
Filed Jan. 17, 1991, Ser. No. 642,377
Claims priority, application Argentina, Jul. 17, 1990, 056605
Term of patent 14 years
U.S. Cl. D30—160



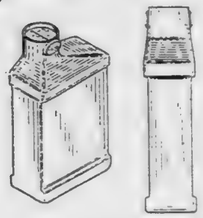
326,005
PEDESTAL VACUUM CLEANER
Dagfinn Andersen, Kristiansand S, Norway, assignor to Meta-Fer Norge A/S, Kristiansand S, Norway
Filed Oct. 18, 1989, Ser. No. 423,198
Term of patent 14 years
U.S. Cl. D32—21



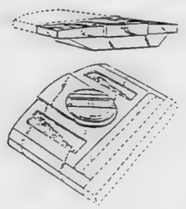
326,006
MAIN BODY OF A VACUUM CLEANER
David W. Moine, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Dec. 24, 1990, Ser. No. 632,512
Term of patent 14 years
U.S. Cl. D32—32



326,007
DIP STICK CLEANER
William W. Gilchrist, 1302 N. Grant, Loveland, Colo. 80538
Filed Apr. 10, 1989, Ser. No. 335,525
Term of patent 14 years
U.S. Cl. D32—43



326,008
STAND FOR A CORDLESS ELECTRIC IRON
Mark Dempsey, London, England, assignor to Housemate Appliances Limited, Cornwall, England
Filed Jan. 23, 1989, Ser. No. 299,518
Claims priority, application United Kingdom, Jul. 21, 1988, 1052473
Term of patent 14 years
U.S. Cl. D32—73



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF MAY, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See—*
Isaksson, Juhani, 5,110,332, Cl. 55-378.000.
Mattelmaki, Esko I., 5,110,289, Cl. 432-106.000.
Mattelmaki, Esko I., 5,110,567, Cl. 423-175.000.

A. Finkl & Sons Co.: *See—*
Finkl, Charles W., 5,110,379, Cl. 148-333.000.

A.L. Sandpiper Corporation: *See—*
Mazur, Duane J.; Weinberg, Norman L.; and Abel, Albert E., 5,110,364, Cl. 134-2.000.

ABB Reaktor GmbH: *See—*
Osusko, Boris, 5,109,915, Cl. 165-11.200.

Abbott, Curtis: *See—*
Nunberg, Geoffrey D.; Stansbury, H. Tayloe; Abbott, Curtis; and Smith, Brian C., 5,111,398, Cl. 364-419.000.

Abbott Laboratories: *See—*
Haviv, Fortuna; and Greer, Jonathan, 5,110,904, Cl. 530-313.000.
Michael, Jacob G., 5,110,794, Cl. 514-2.000.

ABCO Industries, Ltd.: *See—*
Self, James M., 5,110,495, Cl. 252-186.260.

Abdallah, Iman 'al-Amin. Extended neckwear shirt attachment device 5,109,547, Cl. 2-145.000.

Abe, Keietsu; and Uchida, Kinji, to Kikkoman Corporation. Process for selective fermentation with mutants of *Pediococcus halophilus*. 5,110,739, Cl. 435-252.900.

Abe, Mutsumi; Motoda, Takashi; and Aota, Keni-ichi, to Kabushiki Kaisha Kobe Seiko Sho. Composite member and method for making the same. 5,110,687, Cl. 428-551.000.

Abe, Shigeru: *See—*
Inoue, Kazushi; Abe, Shigeru; Tagawa, Yuji; Kondo, Takashi; Watanabe, Yasuhiko; and Shibata, Jun, 5,109,785, Cl. 112-303.000.

Abe, Takao: *See—*
Fusegawa, Izumi; Yamagishi, Hirotoshi; and Abe, Takao, 5,110,404, Cl. 156-603.000.

Abe, Toshiyasu: *See—*
Ito, Mutsuhiro; Abe, Toshiyasu; Orii, Ryuji; and Yamakoshi, Tomio, 5,109,716, Cl. 73-865.500.

Abe, Toyohiko: *See—*
Kohtoh, Noriaki; Abe, Toyohiko; and Fukuro, Hiroyoshi, 5,111,318, Cl. 359-76.000.

Abe, Tunehiko; Nakano, Hiroyuki; Shiotani, Kazuaki; and Takada, Yoshiharu, to Nippon Leakless Industry Co., Ltd.; and Sanshin Kogyo Co., Ltd. Metal gasket and method of producing the same. 5,110,630, Cl. 427-327.000.

Abe, Yoshihiro; and Nicolaou, Kyriacos C., to University of Pennsylvania. Method of synthesizing leukotriene B_4 and derivatives thereof. 5,110,949, Cl. 549-214.000.

Abel, Albert E.: *See—*
Mazur, Duane J.; Weinberg, Norman L.; and Abel, Albert E., 5,110,364, Cl. 134-2.000.

Abel, Gunther. Apparatus for separating liquids and solids. 5,110,461, Cl. 210-158.000.

Abernathy, Ronald N.: *See—*
Maiorca, Philip P.; Abernathy, Ronald N.; and Wadley, George H., 5,110,615, Cl. 427-8.000.

Abidaud, Alvaro, to Monomeros Colombo Venezolanos, S.A. (E.M.A.). Continuous production of potassium nitrate via ion exchange. 5,110,578, Cl. 423-202.000.

ABT, Inc.: *See—*
Thomann, Roland; and Witschi, Heinz, 5,110,235, Cl. 404-4.000.

Acampora, Alfonse A.: *See—*
Kuriacose, Joseph; Acampora, Alfonse A.; and Zdepski, Joel W., 5,111,292, Cl. 358-133.000.

Acharya, Ramesh N., to Oramed, Inc. Calcium polycarbophil-alginate controlled release composition and method. 5,110,605, Cl. 424-487.000.

Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardaix-Luthereau, Renee; Costall, Brenda; and Naylor, Robert, to Societe d'Etudes Scientifiques et Industrielles de L'Ile-de-France. Method of treating disorders of cognitive function with substituted benzamides. 5,110,824, Cl. 514-377.000.

Ackerman, David A.; Ketelsen, Leonard J.; and Koszi, Louis A., to AT&T Bell Laboratories. Analog optical fiber communication system, and laser adapted for use in such a system. 5,111,475, Cl. 372-96.000.

Acrowood Corporation: *See—*
Artiano, Adrian, 5,109,988, Cl. 209-673.000.

Actel Corporation: *See—*
Chen, Shih-Ou; McCollum, John L.; and Chiang, Steve S., 5,111,262, Cl. 357-23.130.

Adams, Stephen P.; and Morrison, William R. Coking process. 5,110,448, Cl. 208-131.000.

Adinolfi, David W., to Siemens Pacesetter, Inc. Implantable tachyarrhythmia control system having a patch electrode with an integrated cardiac activity system. 5,109,842, Cl. 128-419.00D.

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Thevignot, Roger, 5,110,946, Cl. 548-483.000.

Adler, Robert: *See—*
Kaplan, Sam; and Adler, Robert, 5,111,106, Cl. 313-403.000.

Aegis, Inc.: *See—*
Medeiros, Manuel, III; and Greenspan, Jay S., 5,111,277, Cl 357-74.000.

Affinity Biotech, Inc.: *See—*
Geyer, Robert P.; and Tuliani, Vinod, 5,110,606, Cl. 424-489.000.

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Agano, Toshitaka, to Fuji Photo Film Co., Ltd. Medical image reproducing system. 5,111,044, Cl. 250-327.200.

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Ito, Kohzo; Tanabe, Yoshikazu; Sato, Masa-aki; and Kaeriyama, Kyoji, 5,110,504, Cl. 252-500.000.

Agfa Gavaert Aktiengesellschaft: *See—*
Wernicke, Ubbo; Berthold, Werner; Haseler, Helmut; and Tappe, Gustav, 5,110,715, Cl. 430-379.000.

Agie AG fur industrielle Elektronik: *See—*
Lodetti, Attilio; and Medici, Brenno, 5,111,016, Cl. 219-69.120.

AGM Aktiengesellchaft Muller: *See—*
Weber, Fred, 5,110,135, Cl. 273-296.000.

Agrisystemen Limited: *See—*
Lee, Merlin, 5,110,804, Cl. 514-60.000.

Aguirre, Sergio: *See—*
Keate, Christopher R.; Aguirre, Sergio; and Stockdell, Brian L., 5,111,155, Cl. 330-149.000.

Ahlstrom, E. Wayne, to Mallinckrodt Specialty Chemicals Company. Method for precision cleaning of medical devices. 5,110,367, Cl. 134-42.000.

Ahmed, Iqbal: *See—*
Hsieh, Henry L.; and Ahmed, Iqbal, 5,110,887, Cl. 526-287.000.

Ahnfelt-Ronne, Ian; Hansen, Erik T.; Kirstein, Dorte; Nielsen, Ole Bent I.; and Rachlin, Schneur, to Leo Pharmaceutical Products Ltd. Substituted quinolines and medicinal use thereof. 5,110,819, Cl. 514-311.000.

Aihara, Toshio: *See—*
Ueda, Akiyoshi; Ohishi, Haruhito; Aihara, Toshio; Ishikawa, Hisao; Tomida, Kazuyuki; and Hosaka, Hideo, 5,110,343, Cl. 71-88.000.

Aiken, William C.: *See—*
Kallansrude, David K.; Aiken, William C.; Deitz, Dan P.; and Powelson, William D., 5,110,153, Cl. 283-707.000.

Ainslie, Winston C., to Reichhold Chemicals, Inc. Anti-skid coating composition. 5,110,657, Cl. 428-141.000.

Aisan Kogyo Kabushiki Kaisha: *See—*
Kato, Kiyoshi; Suzuki, Isamu; and Toshima, Seiji, 5,110,265, Cl. 417-279.000.

Aisin Aw Co., Ltd.: *See—*
Ishikawa, Kazunori; Tsukamoto, Kazumasa; Taniguchi, Takuji; and Taga, Yutaka, 5,109,733, Cl. 74-868.000.
Otake, Shin-ichi; and Wakuta, Satoru, 5,111,090, Cl. 310-54.000.
Sugiura, Masayuki; Miki, Nobuaki; Nasu, Takeshi; Sugiura, Kiyohiko; and Saito, Masao, 5,111,175, Cl. 336-192.000.
Wakuta, Satoru; and Otake, Shinichi, 5,111,089, Cl. 310-54.000.

Aisin Seiki K.K.: *See—*
Saitou, Yoshitami; Isono, Nobuyuki; and Suzumura, Nobuyasu, 5,109,967, Cl. 192-0.076.

Aisin Seiki Kabushiki Kaisha: *See—*
Inagaki, Akio; Nakai, Kiyotaka; and Tauchi, Hitoshi, 5,110,857, Cl. 524-494.000.
Kondo, Toshio; Urata, Kenji; Katagiri, Masayoshi; and Nakamura, Kenichi, 5,109,959, Cl. 188-73.310.

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Fujita, Shuji; Narita, Masashi; Akada, Masanori; and Azuma, Yoshihiko, 5,111,285, Cl. 358-75.000.

Akai Electric Co., Ltd.: *See—*
Matsuoka, Hideo, 5,111,346, Cl. 360-64.000.

Akao, Michitoshi: *See—*
Yamamoto, Takemi; Sakai, Jun; Kawahara, Hiroshi; Hayashi, Shigeyuki; Sakakibara, Kenji; Akao, Michitoshi; Sasaki, Ichiro; and Komiya, Ryohei, 5,111,237, Cl. 355-27.000.

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320–352 O.G.–92–24

Akao, Mutsuo; and Komatsu, Takuichi, to Fuji Photo Film Co., Ltd. Packaging material for photosensitive materials. 5,110,643, Cl. 428-35.900.

Akay, Metin: *See*—
Semmlow, John L.; Welkowitz, Walter; Kostis, John B.; and Akay, Metin, 5,109,863, Cl. 128-715.000.

Akazawa, Shigeo, to Clarion Co., Ltd. Spread spectrum receiver and carrier sense circuit therefor 5,111,479, Cl. 375-1.000.

Akihiro, Imai: *See*—
Taguchi, Nobuyoshi; Yasuo, Fukui; and Akihiro, Imai, 5,111,215, Cl. 346-76.0PH.

Akimori, Giichiro; and Nebu, Hideaki, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle body cover. 5,109,942, Cl. 180-219.000.

Akimoto, Takayuki: *See*—
Tai, Seiji; Hayashi, Nobuyuki; Kamijima, Koichi; Akimoto, Takayuki; Katayose, Mitsuo; and Hagiwara, Hideo, 5,110,968, Cl. 556-415.000.

Akin, Mickey E.; and Lowery, James O., to Southwire Company. Vacuwipe. 5,109,565, Cl. 15-309.100.

Akio, Shibata, to Mazda Motor Corporation. Automobile rear body structure. 5,110,177, Cl. 296-189.000.

Akiyama, Akitsugu: *See*—
Narukawa, Hiroshi; Mizobe, Akio; Nakahara, Fumio; Kubotsu, Akira; Akiyama, Akitsugu; Nishiyama, Masakazu; Nagamatu, Kenji; and Miyazaki, Hirotoshi, 5,110,678, Cl. 428-364.000.

Akiyama, Masahiro: *See*—
Tanaka, Koutarou; Shikata, Makoto; and Akiyama, Masahiro, 5,111,489, Cl. 377-121.000.

Akiyama, Yukiharu; and Oshima, Yoshio, to Hitachi, Ltd.,. Method and apparatus for wire bonding. 5,110,032, Cl. 228-102.000.

A.B. Dick Company: *See*—
Lebeau, Donald R.; and Kalutkiewicz, Paul J., 5,111,218, Cl. 346-107.00R.

Akutsu, Shigeru: *See*—
Nakano, Yasushi; Miyake, Tohru; Akutsu, Shigeru; and Shimizu, Yuji, 5,110,658, Cl. 428-141.000.

Akzo NV: *See*—
Schutyser, Jan A. J.; Buser, Antonius J. W.; Zuuring, Pieter H.; and Slots, Hendrik J., 5,110,867, Cl. 525-114.000.

Albanesi, Mario; Hertogs, Willy A. M.; Khan, Adil M.; and Pieroni, Lucio, to Procter & Gamble Company, The. Lid assembly. 5,110,004, Cl. 220-355.000.

Albany International Corp.: *See*—
Boucher, Normand; and Bonetti, Giancesare, 5,110,415, Cl. 162-281.000.

Albrecht, John W., to C.V.D. System Cleaners Corporation. Chemical vapor deposition system cleaner. 5,109,562, Cl. 15-56.000.

Alcan International Limited: *See*—
MacPherson, Collin B. P. and Jefferson, Graham N., 5,110,287, Cl. 432-24.000.

Alcatel N.V.: *See*—
Heidemann, Rolf, 5,111,334, Cl. 359-341.000.

Alcoholism and Drug Addiction Research Foundation: *See*—
Grupp, Larry A.; Perlaiski, Edward; and Stewart, Robert B., 5,110,813, Cl. 514-212.000.

Alexander, Richard J.: *See*—
Quarles, James M.; and Alexander, Richard J., 5,110,612, Cl. 426-548.000.

Allaire, Roger A.; and Lipp, G. Daniel, to Corning Incorporated. Shaped fiber-reinforced ceramic composite article. 5,110,652, Cl. 428-114.000.

Allegrini, Pietro: *See*—
Castaldi, Graziano; and Allegrini, Pietro, 5,110,922, Cl. 540-523.000.

Allen-Bradley Company, Inc : *See*—
Murphy, Timothy J.; and Weber, Thaddeus A., 5,111,070, Cl. 307-311.000.

Allen, Jeff: *See*—
Farooque, Mohammad; and Allen, Jeff, 5,110,692, Cl. 429-36.000.

Allen, Paul M., to Cincinnati Microwave, Inc. Bracket and assembly for remote mounting of police radar warning receiver. 5,111,207, Cl. 342-20.000.

Allen, Roy: *See*—
Taylor, Kenneth; and Allen, Roy, 5,110,224, Cl. 385-25.000.

Allergan: *See*—
Grambush, Douglas H.; Holland, Gregory R.; and York, Walter A., 5,111,029, Cl. 219-521.000.

Alley, Russell I.; and Caine, George E., to CAC, Inc. Magnesium oxychloride cement compositions and methods for manufacture and use. 5,110,361, Cl. 106-685.000.

Allgeier, Hans, to Ciba-Geigy Corporation. Anticonvulsive substituted-9-benzyl-9H-purines. 5,110,818, Cl. 514-261.000.

Allied-Signal Inc.: *See*—
Brown, G. Emerson, 5,110,191, Cl. 303-113.00R.
Gu, Alston L., 5,110,220, Cl. 384-105.000.
Haasis, John M., 5,109,671, Cl. 60-39.360.
Hangey, Dale A.; Friedberger, Michael P.; Archie, William A.; and Spitz, Roger N., 5,110,317, Cl. 8-115.600.
Hasegawa, Ryusuke; and Fish, Gordon, 5,110,378, Cl. 148-304.000.
Murry, Roger P., 5,110,264, Cl. 417-45.000.
Smith, Gregory C., 5,110,327, Cl. 55-163.000.

Allsteel Inc.: *See*—
Clark, Craig A.; and Poortvliet, Robert J., 5,110,186, Cl. 297-444.000.

Alperine, Serge; and Josso, Pierre, to Office National d'Etudes et de Recherches Aerospatiales. Method for producing an adherent metal deposit on carbon, and mirror obtained by this method. 5,110,422, Cl. 205-159.000.

Alpha Therapeutic Corporation: *See*—
Kosow, David P.; Bhattacharya, Prabir; and Sternburg, Charles F., 5,110,907, Cl. 530-383.000.

Alps Electric (USA), Inc.: *See*—
Moon, Ronald R., 5,111,349, Cl. 360-78.070.

Altera Corporation: *See*—
Kopec, Stanley J., Jr.; Chan, Yiu-Fai; and Hartmann, Robert F., 5,111,423, Cl. 395-500.000.

Altobelli, Rocco F.; Hlavic, Wallace R.; and Angell-Schram, Annette. Composition and method for coloring and conditioning hair. 5,110,318, Cl. 8-405.000.

Altronic, Inc.: *See*—
Cherry, Mark A., 5,109,817, Cl. 123-272.000.

Aluminum Company of America: *See*—
Ruschak, Michael L.; McAninch, William D.; and Anderson, Dan A., 5,110,553, Cl. 422-68.100.

Alusuisse-Longz Services, Ltd.: *See*—
Meyer, Klaus, 5,110,427, Cl. 204-67.000.

Alvarez, Miguel G. Number selecting device and printing device and pamphlet for playing a lottery. 5,110,129, Cl. 273-138.00A.

Alza Corporation: *See*—
Magruder, Judy A.; Eckenhoff, James B.; Cortese, Richard; Wright, Jeremy C.; and Peery, John R., 5,110,596, Cl. 424-438.000.
Wong, Patrick S. L.; Theeuwes, Felix; Eckenhoff, James B.; Larsen, Steven D.; and Huynh, Hoa T., 5,110,597, Cl. 424-438.000.

Amamo, Yoshiaki: *See*—
Kondo, Yumihito; Amamo, Yoshiaki; Kimura, Shinjiro; and Horiuchi, Susumu, 5,110,559, Cl. 422-109.000.

Amano, Norio: *See*—
Hayashi, Motoshige; Amano, Norio; Taki, Tekeshi; and Hirai, Takaaki, 5,110,844, Cl. 521-182.000.

Amemiya, Hideo; Kuroda, Minoru; and Nitta, Tomio, to Mitsui Toatsu Chemicals, Inc. Injection molding apparatus. 5,110,279, Cl. 425-208.000.

American Cyanamid Company: *See*—
Los, Marinus, 5,110,930, Cl. 546-15.000.

American National Can Company: *See*—
Genske, Roger P., 5,110,642, Cl. 428-35.800.

American On-Premise Advertising Company: *See*—
Huber, Terrence D.; Kutsch, Duane B.; Seaton, William J.; and Skinfill, Donald R., 5,111,193, Cl. 340-783.000.

Amey, Ronald L., to Du Pont de Nemours, E. I., and Company. Dry polyamide-epichlorohydrin resin power for strengthening wet paper. 5,110,878, Cl. 525-430.000.

AMF Machinery Systems, Inc.: *See*—
Cummins, Donald L., 5,110,610, Cl. 426-496.000.

Amgen, Inc.: *See*—
Fisher, Eric F., 5,110,731, Cl. 435-119.000.

Amjadi, Kamran, to Hewlett-Packard Company. Digital image documentation system. 5,111,408, Cl. 364-514.000.

Amoco Corporation: *See*—
Baughman, Ernest H.; and Coughlin, Barbara R., 5,110,744, Cl. 436-53.000.
Harris, James E.; Robeson, Lloyd M.; and Gavula, John P., 5,110,880, Cl. 525-436.000.
Janulis, Rose M., 5,110,984, Cl. 562-487.000.
Venardos, Dean G.; and Goyal, Shri K., 5,110,449, Cl. 208-131.000.

AMP Incorporated: *See*—
Jasinski, John F.; McCormick, Robert P.; Mellinger, Ricky C.; Draper, James K.; and Vyas, Navin N., 5,110,387, Cl. 156-222.000.
Kobler, Robert J., 5,110,302, Cl. 439-357.000.

Anaise, David; and Yland, Marc, to Research Foundation of State University of New York, The. Method for hypothermic organ protection during organ retrieval. 5,110,721, Cl. 435-1.000.

Analog Devices, Inc.: *See*—
Garde, Douglas, 5,111,431, Cl. 365-129.020.

Analogic Corporation: *See*—
Poulo, Louis R.; and Staley, James G., 5,111,133, Cl. 323-286.000.

Anand, Kranti V.; and Thomas, Michael E., to National Semiconductor Corp. High value tantalum oxide capacitor. 5,111,355, Cl. 361-313.000.

Anderegg, Katherine A.: *See*—
Brockbank, Kelvin G. M.; and Anderegg, Katherine A., 5,110,722, Cl. 435-1.000.

Anderson, Dan A.: *See*—
Ruschak, Michael L.; McAninch, William D.; and Anderson, Dan A., 5,110,553, Cl. 422-68.100.

Anderson, Gunnar. Ball-point surface checking device and method. 5,109,609, Cl. 33-502.000.

Anderson, John E.: *See*—
Snyder, William J.; and Anderson, John E., 5,110,285, Cl. 431-8.000.

Ando, Eiichi; Suzuki, Koichi; Ebisawa, Junichi; and Suzuki, Susumu, to Asahi Glass Company Ltd. Amorphous oxide film and article having such film thereon. 5,110,637, Cl. 428-34.000.

Ando, Eiji: *See*—
Suzuki, Masa-aki; and Ando, Eiji, 5,110,648, Cl. 428-64.000.

Ando, Masaru: *See*—
Fujihara, Yuji; and Ando, Masaru, 5,110,314, Cl. 446-34.000.

Andoh, Nobuaki; and Ueda, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Electronic integrated circuit having an electrode layer for element isolation. 5,111,257, Cl. 357-23.400.

Andree, David A., to Vista Enterprises, Inc. Portable windshield assembly for a recreational vehicle. 5,110,174, Cl. 296-77.100.

Andrew Jergens Company, The: *See*—
Rau, Allen H., 5,110,603, Cl. 424-466.000.

Andrione, Norbert: *See*—
Peruzzi, Federigo; and Andrione, Norbert, 5,110,272, Cl. 417-571.000.

Angarola, Barry R.; and Duenser, William F., to Signode Corporation. Toothed seal for hard thermoplastic strap. 5,109,575, Cl. 24-16.0PB.

Angel, Curt: *See*—
Berkowitz, Alan; Baum, Elliott W.; and Angel, Curt, 5,109,778, Cl. 108-127.000.

Angell-Schram, Annette: *See*—
Altobelli, Rocco F.; Hlavic, Wallace R.; and Angell-Schram, Annette, 5,110,318, Cl. 8-405.000.

Anhauser, Dieter; and Klein, Robert-Peter, to LTS Lohmann Therapie-Systeme GmbH & Co. KG. Process for producing an administration and/or dosage form for medicinal active substances by means of a printing process. 5,110,599, Cl. 424-449.000.

Anilionis, Algis: *See*—
Witt, Daniel P.; Colbert, Donald A.; and Anilionis, Algis, 5,110,905, Cl. 530-350.000.

Anritsu Corporation: *See*—
Horiuti, Masao; Kodama, Shunichi; and Kuroda, Kenji, 5,111,335, Cl. 359-350.000.

Ansari, Khalid S., to Domino's Pizza, Inc. Cheese distributor. 5,109,760, Cl. 99-494.000.

Anstey, Henry D.: *See*—
Viaud, Jean; Ardueser, William A.; and Anstey, Henry D., 5,109,652, Cl. 53-508.000.

Antes, Gregor: *See*—
Nyfeler, Alex; Antes, Gregor; and Schmidlin, Hansjorg, 5,109,767, Cl. 101-23.000.

Anthony, Colleen P. Protective liner for cargo area of vehicle. 5,110,171, Cl. 296-39.200.

Anthony, Thomas R.; and Fleischer, James F., to General Electric Company. Transparent diamond films and method for making. 5,110,579, Cl. 423-446.000.

Antkowiak, Thomas A.: *See*—
Stayer, Mark L., Jr.; Antkowiak, Thomas A.; Lawson, David F.; and Koch, Russell W., 5,109,907, Cl. 152-564.000.

Aoai, Toshiaki; and Kokubo, Tadayoshi, to Fuji Photo Film Co., Ltd. Light-sensitive positive working composition containing a pisolfone compound. 5,110,709, Cl. 430-271.000.

Aoki, Harumi; Morisawa, Tahei; Ogawa, Kimiaki; and Mogamiya, Makoto, to Asahi Kogaku Kogyo Kabushiki Kaisha. Still video camera. 5,111,299, Cl. 358-209.000.

Aoki, Hisashi: *See*—
Doke, Harumi; Ishida, Syozi; Iwasa, Hiroki; Nagasaka, Chikao; Ueda, Masuyuki; Kato, Shigeru; Aoki, Hisashi; Shibahara, Makoto; and Mori, Satoshi, 5,111,006, Cl. 200-5.00R.

Aoki, Katsuyuki: *See*—
Sakuma, Kiyoshi; Yoshida, Takayuki; Tezuka, Tomohumi; Aoki, Katsuyuki; Yamada, Makoto; Hujii, Masao; and Morinushi, Ken, 5,109,919, Cl. 165-151.000.

Aoki, Lawrence S., to Hogan Mfg., Inc. Wheelchair lift for transit vehicles having elevated passenger compartment floor. 5,110,252, Cl. 414-549.000.

Aoki, Motoi: *See*—
Tanaka, Fusatoshi; Kurokawa, Toshikazu; Matsuura, Kouji; and Aoki, Motoi, 5,109,811, Cl. 123-52.0MB.

Aoki, Takayoshi: *See*—
Nagatsuka, Ikutaroh; Suzuki, Chiaki; Takeda, Masayuki; Matsumura, Yasuo; and Aoki, Takayoshi, 5,110,703, Cl. 430-108.000.

Aota, Keni-ichi: *See*—
Abe, Mutsumi; Motoda, Takashi; and Aota, Keni-ichi, 5,110,687, Cl. 428-551.000.

Applied Biosystems, Inc.: *See*—
Chin, Allan M., 5,110,424, Cl. 204-180.100.
Moring, Stephen E., 5,110,431, Cl. 204-180.100.

Applied Laser Systems: *See*—
Hollenbeck, William E.; Foster, Timothy P.; and Reed, Adam J., 5,111,476, Cl. 372-107.000.

Applied Research, Inc.: *See*—
Powell, Bradley W.; and Rodgers, Mike H., 5,111,126, Cl. 318-568.160.

Aprakin, Alexandr S.: *See*—
Masyagutov, Robert G.; Drobakh, Viktor T.; and Aprakin, Alexandr S., 5,109,705, Cl. 73-861.830.

Aqua Control, Inc.: *See*—
Meuleman, Guy A., 5,110,086, Cl. 251-118.000.

Aracena, Luis, to Halliburton Company. Controlled weak point for wireline cable. 5,109,921, Cl. 166-65.100.

Arad, Chaim. Emergency eye glass. 5,110,197, Cl. 351-41.000.

Arad Ltd.: *See*—
Galpern, Natan, 5,111,407, Cl. 364-483.000.

Arai, Mitsuo: *See*—
Inaba, Ryohei; Kumamura, Masaaki; Danmoto, Shojiro; Arai, Mitsuo; Tobo, Yozo; Sugawara, Hirofumi; and Miyazaki, Tadanobu, 5,110,522, Cl. 264-40.400.

Arai, Naoto; Kanda, Nobuo; and Nojima, Masaharu, to Kanzaki Paper Manufacturing Co., Ltd. Heat-sensitive recording material. 5,110,786, Cl. 503-204.000.

Arai, Yoshio: *See*—
Senso, Hitoshi; Arai, Yoshio; and Fukuda, Masao, 5,111,303, Cl. 358-335.000.

Arakawa, Hiroshi, to Kabushiki Kaishi Toshiba. Amplifier circuit with open-loop gain that can be varied with respect to closed-loop gain. 5,111,159, Cl. 330-254.000.

Arakawa, Koji: *See*—
Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshioka, Hitoshi; and Norigoe, Isami, 5,111,372, Cl. 363-20.000.

Arch Development Corporation: *See*—
Horwitz, E. Philip; and Dietz, Mark L., 5,110,474, Cl. 210-635.000.

Archie, William A.: *See*—
Hangey, Dale A.; Friedberger, Michael P.; Archie, William A.; and Spitz, Roger N., 5,110,317, Cl. 8-115.600.

Ardueser, William A.: *See*—
Viaud, Jean; Ardueser, William A.; and Anstey, Henry D., 5,109,652, Cl. 53-508.000.

Arima, Hidetoshi, to Tokai Kogyo Kabushiki Kaisha. Process for producing hollow moldings. 5,110,529, Cl. 264-167.000.

Aristech Chemical Corporation: *See*—
Haus, Mary K.; and Sivak, Andrew J., 5,110,971, Cl. 556-446.000.

Arita, Masumi: *See*—
Nishida, Mitsuhiro; and Arita, Masumi, 5,110,273, Cl. 418-55.600.

Arizona Technology Development Corporation: *See*—
Joens, Lynn A.; Cramer, James D.; and Mapother, Mary E., 5,110,589, Cl. 424-92.000.

Arlt, Dieter: *See*—
Schroeder, Georg; Arlt, Dieter; and Jautelat, Manfred, 5,110,975, Cl. 558-44.000.
Weider, Richard; Arlt, Dieter; Leuschke, Christian; and Scholl, Thomas, 5,110,895, Cl. 528-176.000.

Armitage, Peter Robert. Seismic apparatus and method including use of transputers for real time processing of data. 5,111,399, Cl. 364-421.000.

Arneson, Michael R.: *See*—
Heaton, Harley L.; Arneson, Michael R.; and LaRocca, Guy P., 5,111,184, Cl. 340-542.000.

Arnold, Gene W. Exercise devices. 5,110,119, Cl. 482-93.000.

Arnold & Richter Cine Technik GmbH & Co. Betriebs KG: *See*—
Haas, Josef, 5,110,201, Cl. 352-180.000.

Arold, Johathan B.; Mishou, Joan L.; Parent, Charles R.; Stark, Joseph P.; and Webb, Edward A., to GTE Products Corporation. Electric heater with thermistor temperature control. 5,111,527, Cl. 392-360.000.

Arrathoon, Raymond. Method and apparatus for truth table based noncontending optical crossbar switch. 5,111,414, Cl. 364-713.000.

Arrow Pneumatics, Inc.: *See*—
Loughran, James F., 5,110,330, Cl. 55-275.000.

Arst, Margareth C.; Chen, Teh-Yi J.; Ritz, Kenneth N.; and Redkar, Shailesh S., to North American Philips Corp. Formation of composite monosilicon/polysilicon layer using reduced-temperature two-step silicon deposition. 5,110,757, Cl. 437-89.000.

Arthos, James: *See*—
Maddon, Paul J.; Axel, Richard; Sweet, Raymond W.; and Arthos, James, 5,110,906, Cl. 530-350.000.

Artiano, Adrian, to Acrowood Corporation. Machine and method for sorting out fines, pins, and over-thick wood chips. 5,109,988, Cl. 209-673.000.

Artieri, Alain; and Kritter, Sylvain, to SGS-Thompson Microelectronics S.A. Clock frequency doubler. 5,111,066, Cl. 307-271.000.

Arzco Medical Systems, Inc.: *See*—
Jadvar, Hossein; and Metzger, William T., 5,109,851, Cl. 128-642.000.

Arzneimittelwerk Dresden GmbH: *See*—
Palitsch, Peter; Czernotzky, Klaus; Richter, Erhard; Kreher, Berndt; Klump, Wilifried, deceased; and Muller, Rainer, 5,110,923, Cl. 540-589.000.

Asada, Hideki, to NEC Corporation. Electronic circuit equipped with redundant or spare circuit elements for every circuit element. 5,111,060, Cl. 307-219.000.

Asahara, Toshio. Tofu making machine. 5,109,759, Cl. 99-483.000.

Asahi Glass Company Ltd.: *See*—
Ando, Eiichi; Suzuki, Koichi; Ebisawa, Junichi; and Suzuki, Susumu, 5,110,637, Cl. 428-34.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Aoki, Harumi; Morisawa, Tahei; Ogawa, Kimiaki; and Mogamiya, Makoto, 5,111,299, Cl. 358-209.000.
Hayakawa, Masahiro; and Kosako, Kousei, 5,111,222, Cl. 354-64.000.
Kita, Masahiro; and Negoro, Ikuo, 5,111,248, Cl. 355-282.000.
Ogawa, Yuzi, 5,111,227, Cl. 354-199.000.

Asai, Kohtaro; Murakami, Tokumichi; and Matsuzaki, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Motion compensated interframe encoding system with adaptive quantization. 5,111,294, Cl. 358-136.000.

Asakawa, Kenichi: *See*—
Sato, Eiji; Matsuhashi, Ryo; Ito, Satoshi; Tano, Kazuhiro; and Asakawa, Kenichi, 5,110,544, Cl. 420-69.000.

Asano, Masaharu: *See*—
Fujikura, Takashi; Ito, Noriki; Matsumoto, Yuzo; Asano, Masaharu; and Takenaka, Toichi, 5,110,820, Cl. 514-356.000.

Asano, Takanobu; Kitayama, Hirofumi; Iwai, Hiroyuki; and Ono, Yuuji, to Tokyo Electron Sagami Limited. Vertical heat-treatment apparatus having a wafer transfer mechanism. 5,110,248, Cl. 414-172.000.

ASARCO Incorporated: *See*—
Li, Taie; Clement, Thomas P., II; and Hager, John P., 5,110,353, Cl. 75-703.000.

Aschemann, Arnold: *See—*
Dienst, Manfred; and Aschemann, Arnold, 5,110,284, Cl. 425-133.000.

Ash, Dennis: *See—*
Rao, Mohan; Harlamert, Michael E.; Ash, Dennis; Schonauer, Sylvia L.; MacGeorge, Gregory D.; Barkhau, Keith D.; Beltz, John D.; and Kupski, Donald R., 5,110,601, Cl. 426-523.000.

Ash Stevens, Inc.: *See—*
Blumbergs, Peter; Khan Mohammed S.; and Kalamas, Richard L., 5,110,919, Cl. 536-24.000.

Ashby, Robert E., to Moore Business Forms, Inc. Return mailer without fly sheet. 5,110,043, Cl. 229-304.000.

Ashton, Wallace T.: *See—*
Tolman, Richard L.; Ashton, Wallace T.; and Wu, Mu T., 5,110,799, Cl. 514-19.000.

Aslanian, Edouard; Pitts, Leon A.; and Sztucinski, Leon A., to Bull HN Information Systems Inc. System for performing dump analysis. 5,111,384, Cl. 395-575.000.

Aspera S.r.l.: *See—*
Peruzzi, Federigo; and Andrione, Norbert, 5,110,272, Cl. 417-571.000.

Associated Universities, Inc.: *See—*
Sugama, Toshifumi, 5,110,863, Cl. 524-767.000.

Asta Pharma AG: *See—*
Engel, Jurgen; Molliere, Michael; and Szelenyi, Istvan, 5,110,814, Cl. 514-212.000.

Astron Corporation: *See—*
Jahoda, Joseph R.; and Shergold, Steven D., 5,111,213, Cl. 343-722.000.

Asuncion, Andres D.: *See—*
Hingarh, Hemraj; Asuncion, Andres D.; Thomas, Michael; and Brown, Robert, 5,11[illegible]276, Cl. 357-71.000.

Asymptotic Technologies, Inc.: *See—*
Maiorca, Philip P.; Abernathy, Ronald N.; and Wadley, George H., 5,110,615, Cl. 427-8.000.

AT&T Bell Laboratories: *See—*
Ackerman, David A.; Ketelsen, Leonard J.; and Koszi, Louis A., 5,111,475, Cl. 372-96.000.
Bergano, Neal S.; Evangelides, Stephen G., Jr.; and Mollenauer, Linn F., 5,111,322, Cl. 359-122.000.
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Chaoui, Ghazi M.; and Smeltz, Palmer D., Jr., 5,111,522, Cl. 385-92.000.
Fan, Jason Chia-Sun; Hastie, Trevor J.; and Kishon, Eyal, 5,111,512, Cl. 382-3.000.
Gregor, Richard W.; and Leung, Chung W., 5,110,756, Cl. 437-70.000.
Kiely, Philip A.; and Taylor, Geoffrey W., 5,111,255, Cl. 357-22.000.
Miller, Thomas J.; and Monroe, Douglas W., 5,110,335, Cl. 65-3.120.
Parker, John L., Jr., 5,110,036, Cl. 228-256.000.

Atallah, Francois I., to International Business Machines Corporation. Process compensated input switching threshold of a CMOS receiver. 5,111,081, Cl. 307-475.000.

Atkins, Jaspard H.: *See—*
Friend, Stephen O.; Atkins, Jaspard H.; Tennent, Howard G.; and Hausslein, Robert, 5,110,693, Cl. 429-40.000.

Atkins, Martin P.; Jones, William; and Chibwe, Malama, to British Petroleum Co., p.l.c., The. Process for the preparation of glycol ethers. 5,110,992, Cl. 568-618.000.

Atlantic Point Inc.: *See—*
Rinaldi, Fernando, 5,110,031, Cl. 228-50.000.

Atlantic Research Corporation: *See—*
Heaton, Harley L.; Arneson, Michael R.; and LaRocca, Guy P., 5,111,184, Cl. 340-542.000.

Atlantic Richfield Company: *See—*
Jackson, James E., 5,109,933, Cl. 175-66.000.

Atochem North America: *See—*
Burchill, Michael T.; Rafiei, Maryam; and Silbermann, Joseph, 5,110,625, Cl. 427-160.000.
Silbermann, Joseph; and Burchill, Michael T., 5,110,634, Cl. 427-430.100.

Atochem North America, Inc.: *See—*
Burchill, Michael T.; and Silbermann, Joseph, 5,110,626, Cl. 427-160.000.

Atsushi Ogura: *See—*
Ogura, Atsushi, 5,110,774, Cl. 501-126.000.

Attridge, Stephen R.: *See—*
Morona, Renato; and Attridge, Stephen R., 5,110,588, Cl. 424-92.000.

Au, Stacley: *See—*
Wang, Jonas; Patel, Bhiku; Au, Stacley; and Shah, Hemanshu, 5,110,809, Cl. 514-171.000.

Auberon, Marcel: *See—*
Sparks, Charles; Odru, Pierre; Auberon, Marcel; and Fuchs, Jean-Francois, 5,110,644, Cl. 428-36.300.

Aubert, Guy, to Centre National de la Recherche Scientifique. Gradient coil system for NMR machines. 5,111,147, Cl. 324-318.000.

Aubrey, Martin J. Quick release coupling for earthworking machines. 5,110,254, Cl. 414-723.000.

Aulicino, Daniel. Puzzle having tiles transferable between casements connected in a loop. 5,110,130, Cl. 273-153.00S.

Ausburn, Phillip K.: *See—*
Turner, Loyce A.; and Ausburn, Phillip K., 5,111,494, Cl. 378-138.000.

Automation Technology, Inc.: *See—*
Grayson, S. Keith; and Rudd, John B., 5,111,531, Cl. 395-23.000.

Avantek, Inc.: *See—*
Negus, Kevin J., 5,111,455, Cl. 370-112.000.

AVP/Megascan: *See—*
Kriz, J. Stanley, 5,111,174, Cl. 336-73.000.

Avtech, Inc.: *See—*
Houck, Ronald B., 5,109,611, Cl. 33-613.000.

Awad, William M., Jr., to University of Miami. Method of separating proteins. 5,110,914, Cl. 530-416.000.

Axel, Richard: *See—*
Maddon, Paul J.; Axel, Richard; Sweet, Raymond W.; and Arthos, James, 5,110,906, Cl. 530-350.000.

Axelrod, Herbert R. Lithographic print and method. 5,110,156, Cl. 283-117.000.

Ayala, Francisco; and Estradera, Jose M., to Camunsa Manutencion S.A. Multi-story car park. 5,109,642, Cl. 52-79.100.

Ayers, Jack D., to United States of America, Navy. Method of producing glass fiber with cores of a different material. 5,110,334, Cl. 65-2.000.

Azuma, Yoshihiko: *See—*
Fujita, Shuji; Narita, Masashi; Akada, Masanori; and Azuma, Yoshihiko, 5,111,285, Cl. 358-75.000.

Azz International Co., Ltd.: *See—*
Kishimoto, Shunichi, 5,109,553, Cl. 4-518.000.

Azzaroni, Cesare, to C.M.A. S.r.l. Compact automatic machine for emptying and reloading film from and into X-ray cassettes. 5,109,649, Cl. 53-284.400.

B.A.G. Corporation: *See—*
Derby, Norwin C., 5,109,893, Cl. 141-67.000.

B & B W/W, Inc.: *See—*
Baxter, Richard C., 5,110,459, Cl. 210-143.000.

B. F. Goodrich Company: *See—*
Farkas, Julius, 5,110,850, Cl. 524-100.000.

B&G Plastics, Inc.: *See—*
Kolton, Chester; and Spater, Stuart S., 5,110,019, Cl. 223-87.000.

B. V. Optische Industrie "De Oude Delft": *See—*
Elshoud, Nicolaas P.; and Versteeg, Frits J., 5,110,209, Cl. 356-138.000.

Baba, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Magnetic head including thermoelectric positioning means. 5,111,348, Cl. 360-77.060.

Baba, Sueki: *See—*
Ohtsuchi, Tetsuro; Tsutsui, Hiroshi; Ohmori, Koichi; Baba, Sueki; Funakoshi, Hiromasa; Kawara, Toshiyuki; and Yoshizumi, Yoshiyuki, 5,111,052, Cl. 250-370.010.

Baba, Teruo, to Oki Electric Industry Co., Ltd. Onboard telephone package for vehicle. 5,111,360, Cl. 361-391.000.

Babcock & Wilcox Company, The: *See—*
Carter, Hudson R., 5,110,365, Cl. 134-18.000.

Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., to International Business Machines Corporation. Method for forming a pattern. 5,110,711, Cl. 430-296.000.

Bachar, Abraham, to Scitex Corporation Ltd. Method of incorporating a scanned image into a page layout. 5,111,308, Cl. 358-448.000.

Back, Paul R., to Wang Laboratories, Inc. Adjusting delay circuitry. 5,111,086, Cl. 307-603.000.

Baggiolini, Enrico G.; Batcho, Andrew D.; Truitt, Gary A.; Uskokovic, Milan R.; and Wovkulich, Peter M., to Hoffmann-La Roche Inc. Compounds, process and intermediates. 5,110,958, Cl. 549-454.000.

Bahn, Itsuki, to Kabushikigaisha Sekogiken. Reluctance type electric motor. 5,111,091, Cl. 310-68.00B.

Baker Electrical Instrument Company: *See—*
Lebesch, Jeffrey D., 5,111,149, Cl. 324-546.000.

Baker, Gerald S., to Cooper Industries, Inc. Temperature sensitive control valve. 5,109,881, Cl. 137-72.000.

Baker Hughes Incorporated: *See—*
Jurgens, Rainer; and Krehl, Dietmar, 5,109,924, Cl. 166-117.500.
Mody, Rustom K.; Berzin, Vel; Ford, Randle E.; and Burtner, James C., III, 5,109,926, Cl. 166-187.000.
Sheu, Jim J.; and Bland, Ronald G., 5,110,484, Cl. 507-110.000.

Balaban, Jeffrey B.; Olmes, James B.; and Greenblat, Jerris E., to Ski Tote U.S.A. Weather-adaptable ski hat. 5,109,548, Cl. 2-175.000.

Balanzat, Emmanuel; Boiziau, C.; Darnez, Charles; Duraud, Jean-Paul; and LeMoel, Alain, to Commissariat a l'Energie Atomique. Films having in their thickness at least two superimposed zones, including an insulating zone and a conductive zone, and the production thereof by irradiating a polymer film by means of a beam of high energy ions. 5,110,683, Cl. 428-421.000.

Baldini, Giorgio, to Beloit Corporation. Coating head for applying a coating suspension layer on a paper sheet. 5,109,792, Cl. 118-410.000.

Baldry, Michael G. C.; and Cummerson, David A., to Laporte Industries Limited. Absorbent material. 5,109,805, Cl. 119-173.000.

Balfour, Alan R.; and Hendricks, Donald E., to Calcitek, Inc. Endosseous implant system with internal jam nut. 5,110,292, Cl. 433-173.000.

Baliga, Bantval J.: *See—*
Korman, Charles S.; Baliga, Bantval J.; and Chang, Hsueh-Rong, 5,111,253, Cl. 357-15.000.

Ball, David P.; and Ensor, Donald R., to Electronic & Transformer Engineering Limited; and Vusion International Limited. Fluorescent lamp controller. 5,111,115, Cl. 315-239.000.

Ball, David R.: *See—*
Orac, Thomas H.; Quandt, Herbert C.; and Ball, David R., 5,110,359, Cl. 106-473.000.

Ball, Gary A., to United Technologies Corporation. Integrated Kerr shutter and fiber laser optical modulation. 5,111,326, Cl. 359-244.000.

Ballejos, Paul J. Painting shield apparatus for windows. 5,109,793, Cl. 118-505.000.

Balloni, Riccardo; and Keung, Jay K., to Mobil Oil Corporation. One side heat sealable polypropylene film. 5,110,671, Cl. 428-218.000.

Balo Precision Parts Inc.: *See—*
Rapoza, Edward J., 5,110,307, Cl. 439-566.000.

Balogh, Tibor: *See—*
Csanyi, Endre; Csanyi, Gabor; Balogh, Tibor; and Nagy, Laszlo, 5,110,720, Cl. 433-215.000.

Bando Chemical Industries, Ltd.: *See—*
Hatai, Hirotaka; and Mayahara, Akira, 5,110,274, Cl. 425-28.100.

Bank, Howard M., to Dow Corning Corporation. Thermal disproportionation of arylhalosilanes. 5,110,974, Cl. 556-469.000.

Bantel, Thomas E., to General Electric Company. Apparatus and method for inspecting cooling holes. 5,111,046, Cl. 250-330.000.

Bantel, Thomas E.: *See—*
Devitt, John W.; Bantel, Thomas E.; Sparks, Joseph M.; and Kania, Janet S., 5,111,048, Cl. 250-342.000.

Barbalat, Claude: *See—*
Massard, Thierry; Barbalat, Claude; and Lefevre, Jean-Jacques, 5,110,651, Cl. 428-105.000.

Barbera, Todd. Audiophile cable transferring power substantially free from phase delays. 5,110,999, Cl. 174-36.000.

Barbour, Paul J.: *See—*
Prestel, James D.; Hose, Mitchel S.; and Barbour, Paul J., 5,110,646, Cl. 428-43.000.

Barboza, Scott M.; and Moore, Michael A. Adjustable air diffuser with quick mounting means. 5,109,756, Cl. 454-284.000.

Bari, Gerard: *See—*
Hoblingre, Andre; Courvoisier, Patrick; and Bari, Gerard, 5,110,233, Cl. 403-12.000.

Barkhau, Keith D.: *See—*
Rao, Mohan; Harlamert, Michael E.; Ash, Dennis; Schonauer, Sylvia L.; MacGeorge, Gregory D.; Barkhau, Keith D.; Beltz, John D.; and Kupski, Donald R., 5,110,601, Cl. 426-523.000.

Barma, Pradeep; and McMills, Corey J., to Raychem Corporation. Seat heater. 5,111,025, Cl. 219-217.000.

Barmore, Charles R.; and Schirmer, Henry G., to W. R. Grace & Co.-Conn. Lettuce packaging film. 5,110,677, Cl. 428-349.000.

Barrs, John A., to United Technologies Automotive. Automatic mirror repositioning. 5,111,125, Cl. 318-603.000.

Bartholomew, Donald D., to Proprietary Technology, Inc. Means of improving performance of swivelling pressure sealing devices. 5,110,161, Cl. 285-281.000.

Bartos, Andrew L.: *See—*
Patel, Balkrishna R.; and Bartos, Andrew L., 5,111,094, Cl. 310-156.000.

BASF Aktiengesellschaft: *See—*
Horn, Peter; Hoelderich, Wolfgang; Taddey, Rudolf; and Tintelpot, Dieter, 5,110,834, Cl. 521-52.000.
Hungerbuhler, Walter; and Meindl, Hubert, 5,110,582, Cl. 424-47.000.
Kim, Son N., 5,110,708, Cl. 430-270.000.
Kober, Reiner; Theobald, Hans; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; Seele, Rainer; and Wagenblast, Gerhard, 5,110,829, Cl. 514-443.000.
Schroeder, Wolfgang; and Ruider, Guenther, 5,110,928, Cl. 544-395.000.
Walter, Manfred; Wassmer, Karl-Heinz; and Lorenz, Maria, 5,110,835, Cl. 521-57.000.

BASF Corporation: *See—*
Harclerode, William H.; Volz, William E.; Wiman, John V.; Voss, John C.; Pekich, Barry J.; and Knutsen, John C., 5,110,524, Cl. 264-53.000.
Harclerode, William H.; Knutsen, John C.; Pekich, Barry J.; Wiman, John V.; and Voss, John C., 5,110,836, Cl. 521-58.000.
Harclerode, William H.; Volz, William E.; Wiman, John V.; Voss, John C.; Pekich, Barry J.; and Knutsen, John C., 5,110,837, Cl. 521-58.000.

Baskett, Ira E., to Motorola, Inc. Method of heat augmented resistor trimming. 5,110,758, Cl. 437-171.000.

Basly, Michel: *See—*
Ferlier, Jean-Pierre; and Basly, Michel, 5,111,523, Cl. 385-100.000.

Bassett, David R.: *See—*
Lee, Chinsoo; and Bassett, David R., 5,110,903, Cl. 528-397.000.

Batcho, Andrew D.: *See—*
Baggiolini, Enrico G.; Batcho, Andrew D.; Truitt, Gary A.; Uskokovic, Milan R.; and Wovkulich, Peter M., 5,110,958, Cl. 549-454.000.

Bates, Wesley V. Clamp activated jumper cable switch. 5,111,130, Cl. 320-25.000.

Batliwalla, Neville S.; Dharia, Amitkumar N.; Feldman, Randall M.; and Mehan, Ashok K., to Raychem Corporation. Method of making an electrical device comprising a conductive polymer. 5,111,032, Cl. 219-549.000.

Battiste, David R.; Willcox, Kenneth W.; and Morgan, Tommy J., to Phillips Petroleum Company. Apparatus and method for evaluating the propensity of polymers for smoking during processing. 5,110,214, Cl. 374-45.000.

Battisti, Diane: *See—*
Rosenblatt, Aaron; Rosenblatt, David H.; Feldman, David; Knapp, Joseph E.; Battisti, Diane; and Morsi, Badie, 5,110,580, Cl. 423-472.000.

Bauer, Rainer: *See—*
Gugel, Georg; Haefner, Martin; Bauer, Rainer; and Krauss, Peter, 5,109,718, Cl. 73-866.500.

Bauer, Wolfgang; Steckelberg, Willi; and Ritter, Josef, to Cassella Aktiengesellschaft. Water-soluble trisazo dyes. 5,110,917, Cl. 534-815.000.

Baughman, Ernest H.; and Coughlin, Barbara R., to Amoco Corporation. Method for process control. 5,110,744, Cl. 436-53.000.

Baum, Elliott W.: *See—*
Berkowitz, Alan; Baum, Elliott W.; and Angel, Curt, 5,109,778, Cl. 108-127.000.

Baumann, Richard A.: *See—*
Nobile, Frederick E.; Harris, John F., III; Silverman, Gary S.; and Baumann, Richard A., 5,111,316, Cl. 359-52.000.

Baumgartner, William A. Disk toss game. 5,110,139, Cl. 273-400.000.

Bausch, Gunther; and Wachter, Fritz, to Werner & Pfleiderer, GmbH. Rubber injection press. 5,110,281, Cl. 425-406.000.

Baxter International Inc.: *See—*
Buckley, Mary E., 5,109,869, Cl. 128-778.000.
Gordon, Lucas S., 5,110,549, Cl. 422-46.000.

Baxter, Richard C., to B & B W/W, Inc. Septage anaerobic treatment batch processing. 5,110,459, Cl. 210-143.000.

Bay Mills Limited: *See—*
Shoesmith, Roy; and Kittson, Mark O., 5,110,627, Cl. 427-208.400.

Bayer Aktiengesellschaft: *See—*
Schroeder, Georg; Arlt, Dieter; and Jautelat, Manfred, 5,110,975, Cl. 558-44.000.
Weider, Richard; Arlt, Dieter; Leuschke, Christian; and Scholl, Thomas, 5,110,895, Cl. 528-176.000.

Bearss, James G.: *See—*
Chan, C. S.; Bearss, James G.; and Nelson, Terry M., 5,111,302, Cl. 358-298.000.

Beatty, Christopher C.: *See—*
Kessler, Daniel D.; Wu, Robert W.; Beatty, Christopher C.; and Crook, Mark D., 5,110,712, Cl. 430-312.000.

Beauvais, Randall, to Life Force Associates, L.P. Portable seat. 5,110,182, Cl. 297-216.000.

Beck, Leslie M., to Man-Gill Chemical Company. Alkaline cleaner and process for reducing stain on aluminum surfaces. 5,110,494, Cl. 252-156.000.

Becker, Adam: *See—*
Reinhardt, Helmut; Becker, Adam; Kuhlmann, Robert; and Nauroth, Peter, 5,110,574, Cl. 423-335.000.

Becker, Fred: *See—*
Sarkisian, Paul; and Becker, Fred, 5,109,807, Cl. 122-20.00B.

Becker, Gerhard; Gross, Hans-Gunter; Henssen, Johannes; and Schoning, Josef, to Hochtemperatur Reaktorbau GmbH. Heat insulation system for surfaces along which a hot gas stream is conducted. 5,110,006, Cl. 220-442.000.

Beckman Instruments, Inc.: *See—*
Shu, Frank R.; and Chien, Chen-Yie, 5,110,742, Cl. 436-18.000.

Beecham Group p.l.c.: *See—*
Bromidge, Steven M.; Hadley, Michael S.; and Orlek, Barry S., 5,110,828, Cl. 514-413.000.

Beer, Christian; Wassmer, Christoph; and Wyss, Alois, to Menziken Automation Mat AG. Assembly line system. 5,109,974, Cl. 198-346.100.

Beere, Richard F., to Beere Tool Company, Inc. Collet clamping and releasing yoke apparatus. 5,110,146, Cl. 279-43.000.

Beere Tool Company, Inc.: *See—*
Beere, Richard F., 5,110,146, Cl. 279-43.000.

Begonis, Walter B.: *See—*
Thunberg, Jon C.; VanKouwenberg, Steven P.; and Begonis, Walter B., 5,110,965, Cl. 556-148.000.

Beiley, Mark J.: *See—*
Benson, Robert W.; Dieterman, Christopher G.; Beiley, Mark J.; and Sareshwala, Sohel A., 5,110,163, Cl. 285-382.200.

Belco Industries, Inc.: *See—*
Kohn, Michael T.; and Pearson, John F., 5,109,740, Cl. 83-15.000.

Beliveau, Yvan J.: *See—*
Dornbusch, Andrew W.; Beliveau, Yvan J.; Lundberg, Eric J.; and Pratt, Timothy, 5,110,202, Cl. 356-1.000.

Bell Communications Research: *See—*
Shokoohi, Frough K.; and Tarascon, Jean-Marie, 5,110,696, Cl. 429-218.000.

Bell Communications Research, Inc.: *See—*
Patel, Jayantilal S., 5,111,321, Cl. 359-92.000.

Bell Helicopter Textron Inc.: *See—*
Robinson, Madison K., 5,110,259, Cl. 416-134.00A.

Bell & Howell Phillipsburg Co.: *See—*
Bieber, Thomas E., 5,110,107, Cl. 271-35.000.

Bellingham, Godfrey; and Lord, Julia A., to Bellingham Medical Inc. Wound patch. 5,109,874, Cl. 128-888.000.

Bellingham Medical Inc.: *See—*
Bellingham, Godfrey; and Lord, Julia A., 5,109,874, Cl. 128-888.000.

Bellis, Harold E.; and Osterman, Virginia M., to Du Pont de Nemours, E. I., and Company. Biodegradable compositions for controlled release of chemical agents. 5,110,868, Cl. 252-174.230.

Bellis, Harold E., to Du Pont de Nemours, E. I., and Company. Dehydrogenation of diols. 5,110,954, Cl. 549-266.000.

VOL
1138
ISS
1
MY
5
1992
UMI

Belloc, Jacques; Galand, Claude; Lancon, Emmanuel; Milewski, Andre; and Quintin, Michel, to International Business Machines Corp. Digital filter sampling rate conversion method and device. 5,111,417, Cl. 364-724.100.

Bellussi, Giuseppe; Carati, Angela; and Cavani, Fabrizio, to Enitricerche S.p.A; Enichem Synthesis S.p.A.; and Snamprogetti S.p.A. Preparation of crystalline porous boro-silicates. 5,110,570, Cl. 423-277.000.

Belly, Robert T.: *See—*
Mura, Albert J.; Belly, Robert T.; and Lum, Vanessa R., 5,110,723, Cl. 435-4.000.

Beloit Corporation: *See—*
Baldini, Giorgio, 5,109,752, Cl. 118-410.000.
LeBlanc, Peter E., 5,110,456, Cl. 209-273.000.
Montgomery, James R., 5,110,453, Cl. 209-135.000.

Beltz, John D.: *See—*
Rao, Mohan; Harlamert Michael E.; Ash, Dennis; Schonauer, Sylvia L.; MacGeorge Gregory D.; Barkhau, Keith D.; Beltz, John D.; and Kupski, Donald R., 5,110,601, Cl. 426-523.000.

Bemis Manufacturing Company: *See—*
Hand, Joseph M., 5,110,511, Cl. 261-104.000.

Benbenek, Waldyn J.: *See—*
Testone, Anthony Q.; and Benbenek, Waldyn J., 5,110,324, Cl. 55-11.000.

Benfey, Philip N.; and Chua, Nam-Hai, to Rockefeller University, The. Selective gene expression in plants. 5,110,732, Cl. 435-172.300.

Benford, M. Sue. Irradication and treatment of diaper dermatitis and related skin disorders. 5,110,593, Cl. 424-401.000.

Benner, Frank D., to Telus Corporation. Method for assigning telecommunications channels in a cellular telephone system. 5,111,534, Cl. 455-33.200.

Bennett, Richard P.: *See—*
Casale, Frank R.; Casale, Nicola D.; Casale, Antonio A.; Bennett, Richard P.; and Padilla, Gilbert F., 5,109,956, Cl. 186-41.000.

Bennett, Robert A. Squeeze sprayer device. 5,110,051, Cl. 239-327.000.

Benson, Robert W.; Dietemann, Christopher G.; Beiley, Mark J.; and Sareshwala, Sohel A., to Lokring Corporation. Pipe fitting with improved coupling body. 5,110,163, Cl. 285-382.200.

Benz, Mark G.; Knudsen, Bruce A.; Rumaner, Lee E.; and Zabala, Robert J., to General Electric Company. Method of melt forming a superconducting joint between superconducting tapes. 5,109,593, Cl. 29-599.000.

Berco Industries: *See—*
Berkowitz, Alan; Baum, Elliott W.; and Angel, Curt, 5,109,778, Cl. 108-127.000.

Bergano, Neal S.; Evangelides, Stephen G., Jr.; and Mollenauer, Linn F., to AT&T Bell Laboratories. Polarization multiplexing device with solitons and method using same. 5,111,322, Cl. 359-122.000.

Berger, Eric: *See—*
Ramsay, Bruce A.; Ramsay, Juliana; Berger, Eric; Chavarie, Claude; and Brauneg, Gerhart, 5,110,980, Cl. 560-185.000.

Berger, Karl-Heinz: *See—*
Heintzmann, Peter; Berger, Karl-Heinz; and Walbrodt, Peter, 5,110,187, Cl. 299-1.400.

Berggren, Gerard T.: *See—*
Berner, Dana K.; Berggren, Gerard T.; and Snow, Johnnie P., 5,110,805, Cl. 514-76.000.

Bergman, Frederick C.: *See—*
Ontrop, Patrick H.; Schlockman, Robert L.; and Bergman, Frederick C., 5,109,766, Cl. 100-257.000.

Bergman, Mady I. Suitcase having wheels and flexible body construction. 5,109,961, Cl. 190-18.00A.

Bergmann, Konrad, to Ideal Standard GmbH. Sanitary mixing valve. 5,110,044, Cl. 236-12.160

Bergmeier, Dieter: *See—*
Wirz, Arno; and Bergmeier, Dieter, 5,110,110, Cl. 271-98.000.

Bergstresser, Arthur R., Sr.; and Craig, Edward. Instructional device and method thereof. 5,111,426, Cl. 395-600.000.

Berkowitz, Alan; Baum, Elliott W.; and Angel, Curt, to Berco Industries. Folding table. 5,109,778, Cl. 108-127.000.

Berlin, Bryan F.: *See—*
Cawelti, Donald G.; Berlin, Bryan F.; and Kenna, John T., 5,110,065, Cl. 242-158.00R.

Berlin, Kenneth D.; Scherlag, Benjamin J.; Clarke, Cyril R.; Otiv, Surendra R.; Zisman, Stan A.; Sangiah, Subbiah; and Mulekar, Satish V., to Oklahoma State University, Board of Regents of. Salts of 3-azabicyclo(3.3.1) nonanes as antiarrhythmic agents, and precursors thereof. 5,110,933, Cl. 546-114.000.

Berman, Oded. Personal compatibility indicating device. 5,109,789, Cl. 116-325.000.

Bermel, Alexandra D.: *See—*
Wilson, John C.; DeMejo, Lawrence P.; and Bermel, Alexandra D., 5,110,977, Cl. 560-1.000.

Bernard, Harald; and Spies, Alfons, to Dr. Johannes Heidenhain GmbH. Photoelectric device for position measuring. 5,111,040, Cl. 250-237.00G.

Berner, Dana K.; Berggren, Gerard T.; and Snow, Johnnie P., to Board of Supervisors of Louisiana State University, The. Method for protecting plants against soil-borne fungi using glyphosate and imazaquin compositions. 5,110,805. Cl. 514-76.000.

Berry, Dennis: *See—*
Howard, David B.; Kenley, Rodney; Berry, Dennis; Keshaviah, Prakash; and Vishnoi, Rohit, 5,110,477, Cl. 210-647.000.

Berry, Roger P. Pneumatic reel fiber pay out system. 5,110,061, Cl. 242-47.000.

Berthold, Werner: *See—*
Wernicke, Ubbo; Berthold, Werner; Haseler, Helmut; and Tappe, Gustav, 5,110,715, Cl. 430-379.000.

Bertiller, Roland; Schneider, Hubert; and Dieterle, Gerd, to Mauser-Werke Oberndorf GmbH. Smoke exhaust device for gun barrels. 5,109,748, Cl. 89-1.200.

Bertok, Bela: *See—*
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo; Soos, Rudolf; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 5,110,976, Cl. 558-407.000.

Berzin, Vel: *See—*
Mody, Rustom K.; Berzin, Vel; Ford, Randle E.; and Burtner, James C., III, 5,109,926, Cl. 166-187.000.

Berzins, Arnold L.: *See—*
Kalberer, Roderick W.; Henkel, Frederick J.; and Berzins, Arnold L., 5,110,040, Cl. 229-125.140.

Bessler, Warren F.: *See—*
Jaster, Heinz; and Bessler, Warren F., 5,109,678, Cl. 62-175.000.

Beteiligungen Sorg GmbH & Co. KG: *See—*
Pieper, Helmut, 5,110,329, Cl. 55-269.000.

Beth Israel Hospital Association: *See—*
Jenkins, Ronald D., 5,109,859, Cl. 128-662.030.

Beyer, Karl H., Jr. Method for controlling and/or lowering serum triglyceride and/or cholesterol levels in mammals. 5,110,817, Cl. 514-255.000.

Beyers, Billy W., Jr.: *See—*
Duffield, David J.; Deiss, Michael S.; Beyers, Billy W., Jr.; and Bridgewater, Kevin E., 5,111,296, Cl. 358-83.000.

Bhattacharya, A. K.: *See—*
Sehkar, Jainagesh A.; Bhattacharya, A. K.; and Li, Hung P., 5,110,688, Cl. 428-552.000.

Bhattacharya, Prabir: *See—*
Kosow, David P.; Bhattacharya, Prabir; and Sternburg, Charles F., 5,110,907, Cl. 530-383.000.

Bhave, R. R.: *See—*
Sirkar, K. K.; Bhave, R. R.; Taskier, H. T.; and Ostler, M. I., 5,110,326, Cl. 55-158.000.

Bieber, Thomas E., to Bell & Howell Phillipsburg Co. Sheet material feeder. 5,110,107, Cl. 271-35.000.

Biebesheimer, Klaus; Hofsess, Alexander; and Simpfendorfer, Dieter, to Diskus Werke Frankfurt am Main Aktiengesellschaft. Finish-machining machine comprising means for feeding an abrasive slurry at a controlled rate. 5,109,631, Cl. 51-111.00R.

Bienkowski, Lynda J.: *See—*
Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., 5,110,953, Cl. 549-263.000.

Bilakanti, Jaya; and Laskowski, Edward J., to AT&T Bell Laboratories. Selective etch for GaAs-containing group III–V compounds. 5,110,765, Cl. 437-225.000.

Billingsley, Britton G.: *See—*
Engler, David A.; and Billingsley, Britton G., 5,110,655, Cl. 428-143.000.

Bio-Rad Laboratories, Inc.: *See—*
Zhu, Minge-De; Rodriguez, Roberto; and Wehr, C. Timothy, 5,110,434, Cl. 204-183.200.

Biomira, Inc.: *See—*
Samuel, John; and Longenecker, B. Michael, 5,110,911, Cl. 530-395.000.

Birch, Christopher L.: *See—*
Shaw, David; and Birch, Christopher L., 5,110,316, Cl. 446-202.000.

Bird, Graham J.: *See—*
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; and Cross, Linsay E., 5,110,989, Cl. 568-327.000.

Birdwell, Jeffrey D.; and Carl, William P., to Dow Chemical Company, The. Method for forming polymer composite films using a removable substrate. 5,110,385, Cl. 156-155.000.

Bishop, John F.: *See—*
Czekai, David A.; and Bishop, John F., 5,110,717, Cl. 430-512.000.

Biskupek, Warren J.: *See—*
Malone, James P.; Biskupek, Warren J.; and Lurie, Edward B., 5,109,983, Cl. 206-408.000.

Black, Lance L.: *See—*
Knobel, Thomas M.; Dubouchet, Christian; and Black, Lance L., 5,110,669, Cl. 428-215.000.

Blackley, Todd: *See—*
Fields, Randall K.; Quinn, Paul R.; and Blackley, Todd, 5,111,391, Cl. 364-401.000.

Blackshear, David M., to Diamond Electronics, Inc. Surveillance camera system. 5,111,288, Cl. 358-108.000.

Blaha, William E.; and Hyde, Richard R., to Ideal Industries. Combination puller and fish tape reel. 5,110,092, Cl. 254-134.3FT.

Blake, Jeffrey T., to Emhart Inc. Blind rivet setting tool with rivet loader. 5,110,029, Cl. 227-112.000.

Blanc, Annie, to Skis Rossignol S. A. Sport racket. 5,110,125, Cl. 273-73.00C.

Blanco, Ernesto E.; and Samadani, Rosina, to Massachusetts Institute of Technology. Automatic blood monitoring for medication delivery method and apparatus. 5,109,850, Cl. 128-635.000.

Bland, Ronald G.: *See—*
Sheu, Jim J.; and Bland, Ronald G., 5,110,484, Cl. 507-110.000.

Blasczyk, Gotthardt; and Patzelt, Norbert, to Krupp Polysius AG. Method and apparatus for reducing brittle material for subsequent grinding. 5,110,056, Cl. 241-19.000.

Blasdell, Raymond L.: *See—*
Blasdell, Richard J.; and Blasdell, Raymond L., 5,109,839, Cl. 128-203.120.

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Blaser, Peter T., to Heidelberger Druckmaschinen AG. Jaw clutch. 5,109,969, Cl. 192-84.00R.

Blatz, Philip S., to Du Pont de Nemours, E. I., and Company. Barrier blends based on amorphous polyamide and ethylene/vinyl alcohol, unaffected by humidity. 5,110,855, Cl. 524-441.000.

Blechschmidt, James L.; Johnson, Robert D.; and Powell, Robert F., to Shimco, Inc. Shim and computerized chart for simultaneously adjusting camber and toe-in. 5,110,151, Cl. 280-661.000.

Bleisteiner, Robert: *See—*
Nowak, Stefan; and Bleisteiner, Robert, 5,111,378, Cl. 363-98.000.

Blessing, Michael A.; Dembowski, Gregory J.; and Finnell, Gregory K., to Union Carbide Chemicals & Plastics Technology Corporation. Process for recovery of phosphorus ligand from vaporized aldehyde. 5,110,990, Cl. 568-492.000.

Blevins, Charles H., II; Matlock, Paul L.; and Murphy, Gerald J., to Union Carbide Chemicals & Plastics Technology Corporation. Process for the manufacture of certain new silicone polyether copolymers for polyurethan foam manufacture. 5,110,970, Cl. 556-445.000.

Bliven, David C.; Vranicar, Anthony; Vail, Philip B.; Shimirak, Gerald L.; and Mullaney, Julian S., to Raychem Corporation. Alarm and test system for a digital added main line. 5,111,497, Cl. 379-27.000.

Blohm, Margaret L.; Pickett, James E.; and VanDort, Paul C., to General Electric Company. Substituted 3,4-polymethylenedioxythiophenes, and polymers and electro responsive devices made therefrom. 5,111,327, Cl. 526-256.000.

Blount, David H. Flame-retardant polyurethane foam utilizing a phosphorus acid. 5,110,840, Cl. 521-85.000.

Blumbergs, Peter; Khan, Mohammed S.; and Kalamas, Richard L., to Ash Stevens, Inc. Process for the preparation of 2-amino-9-(2,3,5-tri-O-benzyl-beta-D-arabinofuranosyl) adenine and novel intermediates. 5,110,919, Cl. 536-24.000.

Bluml, Hans; Klein, Peter; and Wurl, Ernst, to Mannesmann AG. Injection molding machine having a precision clamping unit. 5,110,283, Cl. 425-589.000.

Board of Regents, The University of Texas System: *See—*
Ogden, Daryl M., 5,110,726, Cl. 435-7.210.

Board of Supervisors of Louisiana State University, The: *See—*
Berner, Dana K.; Berggren, Gerard T.; and Snow, Johnnie P., 5,110,805, Cl. 514-76.000.

Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, The: *See—*
Clarke, Stephen J.; and Bourgeois, Joy, 5,110,363, Cl. 127-46.100.

Boardman, Mark D.; and Irwin, James M., to Eaton Corporation. Range shifting only fault tolerance method/system. 5,109,721, Cl. 74-336.00R.

Boardman, Mark D., to Eaton Corporation. Throttle control fault detection and tolerance method/system. 5,109,729, Cl. 74-858.000.

Boateng, Daniel A. D., to Cominco Ltd. Method for separating dissolved species by electrodialysis. 5,110,432, Cl. 204-182.300.

Boatner, Lynn A.: *See—*
Feenstra, Roeland; and Boatner, Lynn A., 5,110,790, Cl. 505-1.000.

Boatwright, John c., to Boatwright, John C. Combination plate and cup holding apparatus. 5,110,170, Cl. 294-146.000.

Boatwright, John C.: *See—*
Boatwright, John c., 5,110,170, Cl. 294-146.000.

BOC Group, Inc., The: *See—*
Jain, Ravi, 5,110,569, Cl. 423-230.000.

Bochumer Eisenhutte Heintzmann GmbH & Co. KG: *See—*
Heintzmann, Peter; Berger, Karl-Heinz; and Walbrodt, Peter, 5,110,187, Cl. 299-1.400.

Bockisch, Karlheinz. Accordion door. 5,109,911, Cl. 160-199.000.

Boderie, Emile E. M.; and Van Dam, Marinus J. M., to Oce Nederland B.V. Device for measuring light scattered by an information support. 5,111,037, Cl. 250-216.000.

Boehm, Valentine R., Jr.: *See—*
Stransky, Larry W.; Boehm, Valentine R., Jr.; and Phillips, Michael A., 5,109,667, Cl. 60-226.300.

Boehringer Mannheim GmbH: *See—*
Schlipfenbacher, Reiner; and Steinbiss, Joachim, 5,110,550, Cl. 422-56.000.

Boeing Company: *See—*
Brooks, David K.; Waun, Cindy M.; and Gross, Larry E., 5,111,402, Cl. 364-424.040.
Chenoweth, Charles C.; and Shen, Jan-son, 5,109,672, Cl. 60-456.000.
Cooledge, Joseph T.; and Sharif, Reza, 5,111,450, Cl. 370-13.000.
Grande, Donald L.; and Ralph, Harry C., 5,110,068, Cl. 244-102.0SL.
Orgun, Munir; Pappu, Venkata R.; and Toledo, Alfredo A., Jr., 5,111,403, Cl. 364-428.000.
Riley, A. Douglass; and Hanson, Hugh W., 5,110,239, Cl. 409-125.000.

Boersma, Rintje, to Smit Transformatoren B.V. Separation of particles adsorbed on carrier material. 5,110,483, Cl. 210-787.000.

Boettiger, Ulrich C.; and Hafner, Bernhard, to International Business Machines Corporation. Method for forming a photoresist pattern and apparatus applicable therewith. 5,111,240, Cl. 355-53.000.

Bohlen, James W.: *See—*
Carpenter, Harry W.; and Bohlen, James W., 5,110,771, Cl. 501-95.000.

Boiziau, C.: *See—*
Balanzat, Emmanuel; Boiziau, C.; Darnez, Charles; Duraud, Jean-Paul; and LeMoel, Alain, 5,110,683, Cl. 428-421.000.

Bonazza, Benedict R., to Phillips Petroleum Company. Bonding of composites. 5,110,682, Cl. 428-419.000.

Boncella, James M.: *See—*
Wagener, Kenneth B.; Boncella, James M.; Duttweiler, Robert P.; Hillmyer, Marc A.; and Nel, Jan G., 5,110,885, Cl. 526-170.000.

Bonetti, Giancesare: *See—*
Boucher, Normand; and Bonetti, Giancesare, 5,110,415, Cl. 162-281.000.

Bonjouklian, Rosanne; Debono, Manuel; Kirst, Herbert A.; and Wind, Julie A., to Eli Lilly and Company. Derivatives of erythromycylamine. 5,110,800, Cl. 514-29.000.

Bonneau, Philippe R.: *See—*
Kaner, Richard B.; Bonneau, Philippe R.; Gillan, Edward G.; Wiley, John B.; Jarvis, Robert F., Jr.; and Treece, Rande, 5,110,768, Cl. 501-1.000.

Bonnefous, Odile; and Mangotte, Frederic, to U.S. Philips Corporation. Device for measuring the speed of moving organs and blood flows by ultrasonic echography. 5,109,856, Cl. 128-660.010.

Book, Rickey D.: *See—*
Burton, James A.; and Book, Rickey D., 5,110,144, Cl. 277-116.200.

Booth, John W., to Hydravac Corporation. Portable whirlpool bathtub cleaner. 5,109,880, Cl. 134-108.000.

Booth-McGee, Sharon: *See—*
Turpin, Jim L.; Eldridge, Robert B.; and Booth-McGee, Sharon, 5,110,319, Cl. 44-451.000.

Borders, Richard L.; Newkirk, David C.; and Stafford, Daniel G., to Hill-Rom Company, Inc. Shield for birthing bed. 5,109,554, Cl. 5-602.000.

Borg-Warner Automotive Electronic & Mechanical Systems Corporation: *See—*
Studtmann, George H.; Ward, James R.; and Forbes, Terry L., 5,110,087, Cl. 251-129.160.

Borg-Warner Automotive Transmission & Engine Components Corporation: *See—*
Koebele, Ralph R., 5,109,604, Cl. 29-889.500.

Borges, Jerome F.: *See—*
Stepp, Lee W.; Giroux, Richard L.; Crump, Joseph B.; and Borges, Jerome F., 5,109,925, Cl. 166-184.000.

Bose, Bimal K.: *See—*
Lai, Jih-Sheng; and Bose, Bimal K., 5,111,374, Cl. 363-37.000.

Bosiger, Peter: *See—*
McKinnon, Graeme; and Bosiger, Peter, 5,111,143, Cl. 324-307.000.

Boston Metal Products Corp.: *See—*
Kessler, Gerald, 5,110,650, Cl. 428-100.000.

Bosze, Wayne P., to Bourns, Inc. Electrically conductive polymer thick film of improved wear characteristics and extended life. 5,111,178, Cl. 338-160.000.

Botar, Sandor: *See—*
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo; Soos, Rudolf; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 5,110,976, Cl. 558-407.000.

Bothe, Lothar: *See—*
Janocha, Siegfried; Schloegi, Gunter; Bothe, Lothar; and Crass, Guenther, 5,110,670, Cl. 428-216.000.

Botzenhardt, Wolfgang; Dais, Siegfried; Kiencke, Uwe; Litschel, Martin; and Unruh, Jan, to Robert Bosch GmbH. Process for the localization of defective stations in local networks and associated interface controller. 5,111,460, Cl. 371-29.100.

Boucher, Normand; and Bonetti, Giancesare, to Albany International Corp. Composite doctor blade assembly for pulp or papermaking machine doctors. 5,110,415, Cl. 162-281.000.

Boulanger, Henry J., to Texas Instruments Incorporated. Method of waterproof sealing a lead from a pressure or temperature responsive switch. 5,109,603, Cl. 29-859.000.

Bourgeois, Joy: *See—*
Clarke, Stephen J.; and Bourgeois, Joy, 5,110,363, Cl. 127-46.100.

Bourns, Inc.: *See—*
Bosze, Wayne P., 5,111,178, Cl. 338-160.000.

Boutin, Jean; Brun, Pierre; Lamaze, Airy-Pierre; Paillere, Patrick; and Salles, Pascale, to Compagnie Europeenne du Zirconium Cezus. Method of and an apparatus for introducing at least one halide in the liquid or gaseous state into the bath of a cell for dry electrolysis. 5,110,426, Cl. 204-64.00R.

Bowland, Gary E.: *See—*
Daboub, Henry A.; Bowland, Gary E.; and Gray, Paul, 5,109,987, Cl. 209-657.000.

Bradley, Eric M., to Tacan Corporation. Hybrid rugate filter assembly for temperature stabilized emission of grating coupled surface emitting lasers. 5,111,467, Cl. 372-32.000.

Brailsford, Ian; Carter, Robert A.; Gutman, Edward J.; Jugle, Don B.; and Masham, Roger D., to Xerox Corporation. Electrostatographic machine. 5,111,246, Cl. 355-245.000.

Branan, Mac W.: *See—*
Dorinski, Dale W.; and Branan, Mac W., 5,110,298, Cl. 439-65.000.

Branan, Mac William, Jr.; and Robinson, Michael, to Motorola, Inc. Battery identification apparatus. 5,111,128, Cl. 320-2.000.

Brand, Bernd; Klingelhofer, Ernst-Ludwig; and Hoch, Kristiane, to Deutsche Forschungsanstalt fur Luft -und Raumfahrt e.V. Device for ground-based simulation of operations of a manipulator usable in

space by means of a model of a space vehicle. 5,110,294, Cl. 434-34.000.

Brandt, Nils G. L.; and Thelin, Anders G., to Sandvik AB. Ceramic cutting tool material with improved toughness. 5,110,770, Cl. 501-89.000.

Brasington, Glynn M.; and Jones, John L., to Pitney Bowes Inc. Postal charge accounting system. 5,111,030, Cl. 235-375.000.

Braun, Morris, to W. Braun Company. Container with captive cap and internally valved closure and positive closure seals. 5,110,017, Cl. 222-520.000.

Braunegg, Gerhart: *See—*
Ramsay, Bruce A.; Ramsay, Juliana; Berger, Eric; Chavarie, Claude; and Braunegg, Gerhart, 5,110,980, Cl. 560-185.000.

Brehm, Manfred: *See—*
Hoess, Werner; Vetter, Heinz; Brehm, Manfred; Schroeder, Guenter; and Reiner, Roland, 5,110,877, Cl. 525-378.000.

Breslow, Jeffrey D.; and Morrison, Howard J., to Breslow, Morrison, Terzian et al. Game including card display timer. 5,110,140, Cl. 273-459.000.

Breslow, Morrison, Terzian et al.: *See—*
Breslow, Jeffrey D.; and Morrison, Howard J., 5,110,140, Cl. 273-459.000.

Bretschneider, Gerd, to Swiss Aluminium Ltd. Freight container for air transport. 5,109,998, Cl. 220-1.500.

Brewer Science Inc.: *See—*
Lamb, James E., III; Brewer, Terry; and Mori, J. Michael, 5,110,697, Cl. 430-14.000.

Brewer, Terry: *See—*
Lamb, James E., III; Brewer, Terry; and Mori, J. Michael, 5,110,697, Cl. 430-14.000.

Brewer, Tracy E.: *See—*
Lucas, Gary L.; and Brewer, Tracy E., 5,111,289, Cl. 358-108.000.

Briant, James K.; and Driver, Crystal J. Avian inhalation exposure chamber. 5,109,797, Cl. 119-15.000.

Bridgestone Corporation: *See—*
Iwasawa, Toshio, 5,110,085, Cl. 251-29.000.
Kobayashi, Kazuomi, 5,109,902, Cl. 152-209.00R.
Kondo, Hitoshi; Sasaki, Makoto; and Kobayashi, Yukio, 5,110,871, Cl. 525-207.000.
Miyamoto, Kenji; Tanaka, Makoto; and Shimada, Norihiro, 5,109,901, Cl. 152-209.00R.

Bridgestone/Firestone, Inc.: *See—*
Stayer, Mark L., Jr.; Antkowiak, Thomas A.; Lawson, David F.; and Koch, Russell W. 5,109,907, Cl. 152-564.000.

Bridgewater, Kevin E.: *See—*
Duffield, David J.; Deiss, Michael S.; Beyers, Billy W., Jr.; and Bridgewater, Kevin E., 5,111,296, Cl. 358-83.000.

Bries, James L.; and Johnston, Vickie A., to Minnesota Mining and Manufacturing Company. Absorbent, non-skinned foam and the method of preparation. 5,110,843, Cl. 521-159.000.

Bright, Irving; Erickson, Ronald C.; Greene, Dennis K.; Hardy, Gerald D.; Hefner, Robert E.; Johnson, Lowell E.; Schwingel, Donald J.; and Spring, Richard E., to Caterpillar Inc. Powertrain performance assessment system. 5,109,696, Cl. 73-118.100.

Briley, Gary L.: *See—*
Morris, Donald H.; and Briley, Gary L., 5,109,669, Cl. 60-39.821.

Briones, Robert A.: *See—*
Mathildus, Gerardus L.; Hecht, Matthew W.; and Briones, Robert A., 5,111,440, Cl. 369 13.000.

Bristol-Myers Company: *See—*
Oki, Toshikazu; Saitoh, Kyoichiro; Tomatsu, Kozo; Tomita, Koji; Konishi, Masataka; Miyaki, Takeo; Tsunakawa, Mitsuaki; and Nishio, Maki, 5,110,940, Cl. 552-220.000.
Sit, Sing-Yuen; and Wright, John J., 5,110,940, Cl. 548-252.000.

Bristol-Myers Squibb Co.: *See—*
Han, Willima T. W., 5,110,812, Cl. 514-210.000.
Wang, Jonas; Patel, Bhiku; Au, Stacley; and Shah, Hemanshu, 5,110,809, Cl. 514-171.000.

British Petroleum Co., p.l.c., The: *See—*
Atkins, Martin P.; Jones, William; and Chibwe, Malama, 5,110,992, Cl. 568-618.000.
Griffiths, David C.; and Kneale, Brian, 5,110,781, Cl. 502-335.000.
Marshall, Rodney J.; and Sherborne, John M., 5,110,420, Cl. 205-157.000.

British Telecommunications public limited company: *See—*
O'Mahony, Michael J.; and Marshall, Ian W., 5,111,153, Cl. 359-336.000.

Britt, Donald R.: *See—*
Rempinski, Donald R.; and Britt, Donald R., 5,110,093, Cl. 254-266.000.

Brittain, David R.; Brown, Steven P.; Cooper, Anthony L.; Longridge, Jethro L.; Morris, Jeffrey J.; Preston, John; and Slater, Linda, to Imperial Chemical Industries, PLC. Amide derivatives, compositions and use. 5,110,808, Cl. 514-155.000.

Broberg, David E.; and Jackson, Carl A., to Minnesota Mining and Manufacturing Company. Abrasive products bonded with color stabilized base catalyzed phenolic resin. 5,110,320, Cl. 51-295.000.

Broberg, David E.; and Jackson, Carl A., to Minnesota Mining and Manufacturing Company. Abrasives containing ammonium fluoride-based grinding aid. 5,110,321, Cl. 51-295.000.

Brochot, Jean: *See—*
Grey, Howard; Mangan, Ciaran; Brochot, Jean; and Siddiqi, Iqbal, 5,110,746, Cl. 436-88.000.

Brock, John C., to TRW Inc. Collisional ionization detected atomic resonance filter. 5,111,047, Cl. 250-336.100.

Brockbank, Kelvin G. M.; and Anderegg, Katherine A., to CryoLife, Inc. Cell, tissue or organ storage solution. 5,110,722, Cl. 435-1.000.

Bromidge, Steven M.; Hadley, Michael S.; and Orlek, Barry S., to Beecham Group p.l.c. Azabicyclo oxime derivatives. 5,110,828, Cl. 514-413.000.

Brooks, David K.; Waun, Cindy M.; and Gross, Larry E., to Boeing Company. Integrated aircraft test system. 5,111,402, Cl. 364-424.040.

Brooks, David M.: *See—*
Melvin, David B.; and Brooks, David M., 5,109,843, Cl. 128-419.00R.

Brooktree Corporation: *See—*
Katzenstein, Henry S., 5,111,204, Cl. 341-150.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Imoto, Yasuo, 5,111,101, Cl. 310-328.000.
Inoue, Kazushi; Abe, Shigeru; Tagawa, Yuji; Kondo, Takashi; Watanabe, Yasuhiko; and Shibata, Jun, 5,109,785, Cl. 112-303.000.
Kashima, Hiroyuki; and Kinoshita, Naohisa, 5,111,340, Cl. 359-819.000.
Yamamoto, Takemi; Sakai, Jun; Kawahara, Hiroshi; Hayashi, Shigeyuki; Sakakibara, Kenji; Akao, Michitoshi; Sasaki, Ichiro; and Komiya, Ryohei, 5,111,237, Cl. 355-27.000.
Yoshimoto, Satoshi; Nakata, Shigeru; Takama, Noboru; and Taniguchi, Minoru, 5,111,364, Cl. 361-399.000.

Brother Koygo Kabushiki Kaisha: *See—*
Uyama, Yoshiyuki, 5,109,782, Cl. 112-184.000.

Brown, Bradley V.; and Laible, Rodney. Blood sample collection apparatus. 5,110,557, Cl. 422-101.000.

Brown, G. Emerson, to Allied-Signal Inc. Master cylinder with integrated supply regulator. 5,110,191, Cl. 303-113.00R.

Brown, Robert: *See—*
Hingarh, Hemraj; Asuncion, Andres D.; Thomas, Michael; and Brown, Robert, 5,111,276, Cl. 357-71.000.

Brown, Robert A.; Hsieh, Yen-Ping C.; and Court, James L., to Procter & Gamble Company, The. Process of making multi-textured snack chips. 5,110,613, Cl. 426-549.000.

Brown, Steven P.: *See—*
Brittain, David R.; Brown, Steven P.; Cooper, Anthony L.; Longridge, Jethro L.; Morris, Jeffrey J.; Preston, John; and Slater, Linda, 5,110,808, Cl. 514-155.000.

Brown, Wilbur N. Safety lock for a cranked window. 5,110,166, Cl. 292-262.000.

Browne, Arthur, to U.S. Philips Corporation. Object sorting system. 5,111,411, Cl. 364-559.000.

Brozovic, Darko, to Fluid Line Products, Inc. High pressure port fitting system. 5,110,160, Cl. 285-211.000.

Bruderer AG: *See—*
Messner, Helmut, 5,110,026, Cl. 226-152.000.

Bruker, Izi: *See—*
Tait, John S.; and Bruker, Izi, 5,110,278, Cl. 425-175.000.

Brun, Pierre: *See—*
Boutin, Jean; Brun, Pierre; Lamaze, Airy-Pierre; Paillere, Patrick; and Salles, Pascale, 5,110,426, Cl. 204-64.00R.

Brunson, Welton K.: *See—*
Hubbard, Vance M.; and Brunson, Welton K., 5,109,841, Cl. 128-380.000.

Brunswick Corporation: *See—*
Lindstedt, Dennis H., 5,109,668, Cl. 60-310.000.

Bruzzone, Giuseppe; Perrone, Diego; and Sperati, Alessandro, to Luigi Stoppani S.p.A. Product capable of inhibiting the corrosion of the reinforcements present in concrete or cement mortar and related process. 5,110,360, Cl. 106-638.000.

Bryan, Byron D. Automatic fishing device. 5,109,624, Cl. 43-15.000.

Bucci, Carlo G., to Repla Limited. Frame construction system. 5,109,645, Cl. 52-656.000.

Bucher-Guyer AG Maschinenfabrik: *See—*
Gresch, Walter, 5,110,472, Cl. 210-632.000.

Buchholz, Rainer: *See—*
Zodrow, Rudolf; and Buchholz, Rainer, 5,110,402, Cl. 156-573.000.

Buchner, Georges: *See—*
Guichard, Jacques; Buchner, Georges; and Labat, Jacques, 5,111,498, Cl. 379-53.000.

Buck, Steven K.; and Willey, Wendall D., to W. L. Gore & Associates, Inc. Compact connector assembly and termination guide therefor. 5,110,306, Cl. 439-497.000.

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Albrecht, John W., 5,109,562, Cl. 15-56.000.

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Eerkens, Jozef W., 5,110,430, Cl. 204-157.200.

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Cho, George, 5,109,830, Cl. 128-4.000.

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Fujino, Masahisa, 5,111,088, Cl. 310-12.000.
Hagiwara, Hiroyuki, 5,111,339, Cl. 359-813.000.
Haraguchi, Shousuke, 5,111,225, Cl. 354-149.110.
Hoshi, Junichi, 5,111,264, Cl. 357-30.000.
Inaba, Ryohei; Kumamura, Masaaki; Danmoto, Shojiro; Arai, Mitsuo; Tobo, Yozo; Sugawara, Hirofumi; and Miyazaki, Tadanobu, 5,110,522, Cl. 264-40.400.
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Makino, Jun, 5,111,219, Cl. 346-108.000.
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Nagasawa, Kenichi; and Kawamura, Hideaki, 5,111,283, Cl. 358-41.000.
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Tokunaga, Tatsuyuki, 5,111,231, Cl. 354-402.000.
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Meyer, Lee G.; and Cavaliere, Gerald F., 5,110,452, Cl. 208-423.000.

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Thompson, Joseph L., 5,109,916, Cl. 165-59.000.

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Durnil, Michael W., 5,109,633, Cl. 51-163.100.

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Dunham, Jeffrey W.; Carson, Richard A.; and Grosskopf, Bernard J., 5,109,803, Cl. 119-106.000.

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Yamaguchi, Hidefumi; Kiyofuji, Hiroyuki; Shirono, Katsuhiro; Tokuou, Rinpei; and Fuchigami, Jun, 5,110,783, Cl. 502-314.000.

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Cawley, Darrell R. Dispenser for plastic bags. 5,109,978, Cl. 206-225.000.

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Stevens, James E.; Cecchi, Joseph L.; and Colestock, Patrick L., 5,111,111, Cl. 315-111.410.

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Hamilton, Harold J., 5,111,351, Cl. 360-104.000.

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Stienbarger, LeRoy; and Gray, Frank, 5,110,148, Cl. 280-221.000.

Chan, Anthony W. P.; and Phillips, Richard M., to Cooper Industries, Inc. Operating mechanism for throwing toggle switches. 5,111,009, Cl. 200-330.000.

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Chance, Martin D. Apparatus for storing automobiles inside maritime containers. 5,110,242, Cl. 410-26.000.

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Bueter, John C.; Fields, Randall T.; Chandler, Martin D.; Neuls, Frederick W.; and Laffkas, Harry P., 5,109,932, Cl. 173-17.000.

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Korman, Charles S.; Baliga, Bantval J.; and Chang, Hsueh-Rong, 5,111,253, Cl. 357-15.000.

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Naiman, Michael I.; and Chang, James C., 5,110,874, Cl. 525-329.900.

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Chao, Yen-Yau H., to Rohm and Haas Company. Foamed cementitious compositions comprising low water and poly(carboxylic)acid stabilizer. 5,110,839, Cl. 521 83.000.

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Chapman, Derek D.; and Valente, Ronald R., to Eastman Kodak Company. Preparation of di-cation ethers. 5,110,937, Cl. 546-261.000.

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Ramsay, Bruce A.; Ramsay, Juliana; Berger, Eric; Chavarie, Claude; and Braunegg, Gerhart, 5,110,980, Cl. 560-185.000.

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Chen, Walter Y.; and Haddad, Richard A., to Nynex Corporation. Dual mode LMS channel equalizer. 5,111,481, Cl. 375-14.000.

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Chevron Corporation: *See*—
Current, Steven P., 5,110,487, Cl. 252-8.554.

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Vaniglia, Milo M., 5,110,395, Cl. 156-353.000.

Ciriello, Michael P.; and Gorski, Richard A., to Emhart Glass Machinery Inc. H-28 machine having an adjustable neck ring lever. 5,110,339, Cl. 65-238.000.

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Gottlieb, Marc E., 5,109,875, Cl. 128-899.000.

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Okuda, Tetsuo, 5,109,582, Cl. 28-208.000.

Clarion Co., Ltd.: *See*—
Akazawa, Shigeo, 5,111,479, Cl. 375-1.000.
Harada, Masaaki, 5,111,416, Cl. 364-717.000.
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Noguchi, Osamu; and Sugai, Kazuyoshi, 5,111,100, Cl. 310-313.00A.

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Clark, Jimmy E. Apparatus for greasing a wheel bearing hub. 5,109,955, Cl. 184-105.200.

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Clark, Walter B. Device and method for converting a down-light into an up-light. 5,111,370, Cl. 362-147.000.

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Li, Taie; Clement, Thomas P., II; and Hager, John P., 5,110,353, Cl. 75-703.000.

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Ferraris, Paolo C.; and Stradi, Riccardo, 5,110,798, Cl. 514-19.000.

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Jones, Michael A., 5,110,451, Cl. 208-421.000.

Coan, Michael; and Lee, Vivian W., to Miles Inc. Antibody purification method. 5,110,913, Cl. 530-388.230.

Coates, George J. Spherical rotary valve. 5,109,814, Cl. 123-190.140.

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Mongoin, Jacques; Ravet, Georges; and Suau, Jean-Marc, 5,110,358, Cl. 106-462.000.

Coelho, David R.: *See*—
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Cohen, Gordon M.; and Reich, Hans J., to Du Pont de Nemours, E. I., and Company. β-(keto or sulfonyl)esters from reaction of silyketene acetal and acyl or sulfonyl compound. 5,110,869, Cl. 525-194.000.

Cohen, Martha G. Educational device for teaching a child to tie a bow. 5,110,296, Cl. 434-260.000.

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Haller, Eugene E.; Cohen, Marvin L.; and Hansen, William L., 5,110,679, Cl. 428-408.000.

Colbert, Donald A.: *See*—
Witt, Daniel P.; Colbert, Donald A.; and Anilionis, Algis, 5,110,905, Cl. 530-350.000.

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Lloyd, Daniel L.; Crane, Newell D.; and Moore, David E., 5,109,636, Cl. 51-320.000.

Cole, Mark F., Jr.; and Woods, Clyde S., Jr. Adjustable swimming-pool cleaning tool. 5,110,230, Cl. 401-52.000.

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Stevens, James E.; Cecchi, Joseph L.; and Colestock, Patrick L., 5,111,111, Cl. 315-111.410

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Ciallella, Loretta K., 5,110,506, Cl. 252-559.000.
Mack, Robert J., 5,110,640, Cl. 428-35.200.

Colin, George M., to Odyssey Systems Ltd. Carrier for pool vacuum hoses. 5,110,023, Cl. 224-205.000.

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Chu, George H.; Ogawa, Yasushi; McPherson, John M.; Ksander, George; Pratt, Bruce; Hendricks, Diana; and McMullin, Hugh, 5,110,604, Cl. 424-484.000.

Collins, Floyd A.; Kahler, Andrew W.; and Windham, Marvin R., to W. C. Bradley Company. Cart assembly for barbeque grills. 5,109,834, Cl. 126-41.00R.

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Flassayer, Claude; and Collins, Franklin, 5,111,179, Cl. 338-313.000.

Colonias, Karen W.; and Bugbee, Michael W., to Simpson Strong-Tie Company, Inc. Bearing connection. 5,109,646, Cl. 52-712.000.

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Toschi, Fabrizio; and Meneghini, Massimo, 5,109,682, Cl. 68-13.00R.

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Maddon, Paul J.; Axel, Richard; Sweet, Raymond W.; and Arthos, James, 5,110,906, Cl. 530-350.000.

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Perrotti, Patrick A.; and Karoutas, Zeses E., 5,110,539, Cl. 376-439.000.

Comfy Care, Inc.: *See*—
Jeanes, Isaac W., 5,110,183, Cl. 297-343.000.

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Boateng, Daniel A. D., 5,110,432, Cl. 204-182.300.

Command Automation, Inc.: *See*—
Simjian, Luther G., 5,110,181, Cl. 297-185.000.

Command Communications, Inc.: *See*—
McClure, William C.; Kunce, Bob D.; and McClure, John Q., 5,111,502, Cl. 379-380.000.

Commissariat a l'Energie Atomique: *See*—
Balanzat, Emmanuel; Boiziau, C.; Darnez, Charles; Duraud, Jean-Paul; and LeMoel, Alain, 5,110,683, Cl. 428-421.000
Massard, Thierry; Barbalat, Claude; and Lefevre, Jean-Jacques, 5,110,651, Cl. 428-105.000.

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Erickson, Charles H.; Erio, Peter A.; and Kase, James E., 5,111,291, Cl. 358-108.000.

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Hardy, Patrick, 5,111,356, Cl. 361-321.000.

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Gale, Vannin; and Kwang, David, 5,111,508, Cl. 381-100.000.
Concra, Christina T. Educational tracing device. 5,110,295, Cl. 434-88.000.
Conn, David P. Patient leg support. 5,109,872, Cl. 128-845.000.
Conoco Specialty Products Inc.: *See—*
Kalnins, Charles M., 5,110,471, Cl. 210-512.200.
Consortium for Surface Processing, Inc.: *See—*
Stevens, James E.; Cecchi, Joseph L.; and Colestock, Patrick L., 5,111,111, Cl. 315-111.410.
Consumer Products Corporation: *See—*
Medri, Mario W.; and Medri, Nelly, 5,110,584, Cl. 424-61.000.
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Kubis, Charles S.; Walter, John; Roth, Donald J.; and Mohr, Glenn R., 5,109,653, Cl. 53-5[illegible]0.000.
Cook, David G. Camp cot with adjustable to tensioning. 5,109,556, Cl. 5-110.000.
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Coombs, Jeffrey: *See—*
Leatham, Alan; and Coombs, Jeffrey, 5,110,631, Cl. 427-422.000.
Cooper, Anthony L.: *See—*
Brittain, David R.; Brown, Steven P.; Cooper, Anthony L.; Longridge, Jethro L.; Morris, Jeffrey J.; Preston, John; and Slater, Linda, 5,110,808, Cl. 514-155.000.
Cooper, Ian V., to Dow Corning Corporation. Masonry water repellent. 5,110,684, Cl. 428-447.000.
Cooper Industries, Inc.: *See—*
Baker, Gerald S., 5,109,881, Cl. 137-72.000.
Burton, James A.; and Book, Rickey D., 5,110,144, Cl. 277-116.200.
Chan, Anthony W. P.; and Phillips, Richard M., 5,111,009, Cl. 200-330.000.
Ohlhaber, Ronald L., 5,109,599, Cl. 29-828.000.
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Kobayashi, Kouichi, 5,111,230, Cl. 354-400.000.
Corbin, Dennis; and Corbin, Scott, to MicroGold. Process of making a microwaveable bakery product. 5,110,614, Cl. 426-555.000.
Corbin, Scott: *See—*
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Allaire, Roger A.; and Lipp, G. Daniel, 5,110,652, Cl. 428-114.000.
Corral, Jose S. M.; De Aza, Salvador; Poyato, Francisco M.; Valle Fuentes, Francisco J.; Miranda, Isabel O.; Caseres, Rafael M.; and Martinez, Paz C., to Union Explosivos Rio Tinto, S.A. Method for the production of beta-sialon based ceramic powders. 5,110,773, Cl. 501-98.000.
Corrigan, Colin D.; and Haley, Lawrence V., to Research Corporation Technologies, Inc. Explosive detection screening system. 5,109,691, Cl. 73-23.360.
Cortese, Richard: *See—*
Magruder, Judy A.; Eckenhoff, James B.; Cortese, Richard; Wright, Jeremy C.; and Peery, John R., 5,110,596, Cl. 424-438.000.
Costall, Brenda: *See—*
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardaix-Luthereau, Renee; Costall, Brenda; and Naylor, Robert, 5,110,824, Cl. 514-377.000.
Costar Corporation: *See—*
Lyman, George; and Labriola, Anthony, 5,110,556, Cl. 422-101.000.
Cotton, Lawrence M., to Robert Bosch Power Tool Corporation. Electric vise. 5,110,100, Cl. 269-244.000.
Coughlin, Barbara R.: *See—*
Baughman, Ernest H.; and Coughlin, Barbara R., 5,110,744, Cl. 436-53.000.
Coulson, Ian, to Thorn Emi plc. Method of driving a ferroelectric liquid crystal shutter having the application of a plurality of controlling pulses for counteracting relaxation. 5,111,317, Cl. 359-56.000.
Couper, John, to Unisys Corporation. Document transport and detection apparatus. 5,110,115, Cl. 271-265.000.
Court, James L.: *See—*
Brown, Robert A.; Hsieh, Yen-Ping C.; and Court, James L., 5,110,613, Cl. 426-589.000.
Courvoisier, Patrick: *See—*
Hoblingre, Andre; Courvoisier, Patrick; and Bari, Gerard, 5,110,233, Cl. 403-13.000.
Cox, Carolee M. Golf club cover retention apparatus. 5,109,578, Cl. 24-298.000.
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Craig, Edward: *See—*
Bergstresser, Arthur R., Sr.; and Craig, Edward, 5,111,426, Cl. 395-600.000.
Cramer, James D.: *See—*
Joens, Lynn A.; Cramer, James D.; and Mapother, Mary E., 5,110,589, Cl. 424-92.000.
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Lloyd, Daniel L.; Crane, Newell D.; and Moore, David E., 5,109,636, Cl. 51-320.000.
Crano, John C.: *See—*
McBain, Douglas S.; and Crano, John C., 5,110,881, Cl. 525-455.000.
Crass, Guenther: *See—*
Janocha, Siegfried; Schloegi, Gunter; Bothe, Lothar; and Crass, Guenther, 5,110,670, Cl. 428-216.000.
Craun, Gary P.: *See—*
Hunter, Wood E.; and Craun, Gary P., 5,110,851, Cl. 524-106.000.
Creegan, Rosemarie A. Reusable wreath. 5,110,635, Cl. 428-10.000.
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Crook, Mark D.: *See—*
Kessler, Daniel D.; Wu, Robert W.; Beatty, Christopher C.; and Crook, Mark D., 5,110,712, Cl. 430-312.000.
Crosfield Electronics Ltd.: *See—*
MacDonald, Lindsay W.; and Kirk, Richard A., 5,111,286, Cl. 358-75.000.
Cross, Linsay E.: *See—*
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; and Cross, Linsay E., 5,110,989, Cl. 568-327.000.
Cross, Virginia R.; and Shulman, Cindy B., to Exxon Chemical Patents, Inc. Low friction, abrasion resistant polymer coating. 5,110,685, Cl. 428-494.000.
Crump, Joseph B.: *See—*
Stepp, Lee W.; Giroux, Richard L.; Crump, Joseph B.; and Borges, Jerome F., 5,109,925, Cl. 166-184.000.
CryoLife, Inc.: *See—*
Broc'bank, Kelvin G. M.; and Anderegg, Katherine A., 5,110,722, Cl. 435-1.000.
Crystal Semiconductor: *See—*
Piasecki, Douglas S.; Swanson, Eric J.; and Hershbarger, Russell A., 5,111,451, Cl. 370-29.000.
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Csanyi, Gabor: *See—*
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Cubicciotti, Roger S.: *See—*
Law, Say-Jong; Chang, Steve C. S.; Palmacci, Stephen A.; and Cubicciotti, Roger S., 5,110,932, Cl. 546-102.000.
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Cummerson, David A.: *See—*
Baldry, Michael G. C.; and Cummerson, David A., 5,109,805, Cl. 119-173.000.
Cummins, Craig R.: *See—*
Rohn, Dean R.; Selewski, Steven R.; Wood, Stephen J.; and Cummins, Craig R., 5,109,568, Cl. 15-410.000.
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Cummins Electronics Company, Inc.: *See—*
Custer, Robert J.; and Stepper, Mark R., 5,109,819, Cl. 123-399.000.
Cunningham, David G.: *See—*
Coles, Alistair N.; and Cunningham, David G., 5,111,333, Cl. 359-333.000.
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Cunningham, Kenneth: *See—*
Hunter, Henry J.; Marshall, Clifton W.; Cunningham, Kenneth; and Tingdahl, Marvin A., 5,110,071, Cl. 244-137.300.
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Huch, Richard O., 5,110,455, Cl. 209-167.000.
Czech, Bernd A.: *See—*
Peter, Siegfried K.; Weidner, Eckhard O.; Ender, Ulrich M.; and Czech, Bernd A., 5,110,509, Cl. 554-184.000.
Czekai, David A.; and Bishop, John F., to Eastman Kodak Company. Stability improvement of amorphous particle dispersions. 5,110,717, Cl. 430-512.000.
Czernotzky, Klaus: *See—*
Palitsch, Peter; Czernotzky, Klaus; Richter, Erhard; Kreher, Berndt; Klump, Wilifried, deceased; and Muller, Rainer, 5,110,923, Cl. 540-589.000.
Daboub, Henry A.; Bowland, Gary E.; and Gray, Paul, to National Presort, Inc. Multi-level sort machine. 5,109,987, Cl. 209-657.000.
Dague, Gilles: *See—*
Pascal, Yves; and Dague, Gilles, 5,110,538, Cl. 376-402.000.

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Dahlstrom, Gale E. Trailer system design for enhanced load-carrying capacity and maneuverability. 5,110,149, Cl. 280-401.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Fujita, Shuji; Narita, Masashi; Akada, Masanori; and Azuma, Yoshihiko, 5,111,285, Cl. 358-75.000.
Nishiyama, Masashi; Fujii, Hideaki; and Takahashi, Tatsumi, 5,110,663, Cl. 428-195.000.
Umise, Shigeki; and Imamura, Hirokatsu, 5,109,795, Cl. 118-669.000.
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Sudo, Morihiro; Muraki, Tomoyasu; Kawachi, Eiji; and Kawachi, Yasushi, 5,110,621, Cl. 427-44.000.
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Ohlendorf, Rolf; Haussmann, Gerhard; and Krejci, Karl, 5,109,726, Cl. 74-567.000.
Dainippon Screen Mfg. Co., Ltd.: *See—*
Kuwabara, Akira; Tamaki, Eiichi; and Koyama, Yasufumi, 5,111,332, Cl. 359-307.000.
Dais, Siegfried: *See—*
Botzenhardt, Wolfgang; Dais, Siegfried; Kiencke, Uwe; Litschel, Martin; and Unruh, Jan, 5,111,460, Cl. 371-29.100.
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Nakamura, Toshiyuki; Kazami, Kazuyuki; Daitoku, Koichi; and Miyamoto, Hidenori, 5,111,226, Cl. 354-195.100.
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Deierling, Kevin E.; and Zanders, Gary V., 5,111,069, Cl. 307-303.200.
Dalmine S.p.A.: *See—*
D'Avanzo, Raimondo, 5,109,689, Cl. 72-97.000.
Dalven, Israel: *See—*
Frommer, Moshe A.; and Dalven, Israel, 5,110,479, Cl. 210-662.000.
Damewood, John R.: *See—*
Menzel, Jill R.; Damewood, John R.; Ross, Bert A.; and Kerr, Richard C., 5,110,666, Cl. 428-196.000.
Damp, Stephan, to Deutsch-Franzosisches Forschungs-Institut. Method and apparatus for determining the frequency of short oscillation bursts of electrical signals. 5,111,134, Cl. 324-78.00D.
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Inaba, Ryohei; Kumamura, Masaaki; Danmoto, Shojiro; Arai, Mitsuo; Tobo, Yozo; Sugawara, Hirofumi; and Miyazaki, Tadanobu, 5,110,522, Cl. 264-40.400.
Danree, Bernard: *See—*
Houziaux, Patrick; Riffaud, Jean-Pierre; Lacolle, Jean-Yves; and Danree, Bernard, 5,110,816, Cl. 514-255.000.
Dapo, Roland F., to U.S. Philips Corporation. Electrolytic capacitor provided with a low resistivity electrolyte. 5,111,365, Cl. 361-506.000.
Darnez, Charles: *See—*
Balanzat, Emmanuel; Boiziau, C.; Darnez, Charles; Duraud, Jean-Paul; and LeMoel, Alain, 5,110,683, Cl. 428-421.000.
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Gundling, Ray D.; Kaminkow, Joseph E.; and Hoffman, Jay A., Jr., 5,110,617, Cl. 427-14.100.
Data Translation, Inc.: *See—*
Calkins, Robert A., 5,111,203, Cl. 341-141.000.
Dathe, Sigrid: *See—*
Dittrich, Uwe; Dathe, Sigrid; Raabe, Hartmut; Sourisseau, Rolf; and Ruehlmann, Klaus, 5,110,969, Cl. 556-427.000.
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Noakes, Kim P. A.; and Davidson, Peter J., 5,110,563, Cl. 422-191.000.
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Curtis, Cass V., 5,110,176, Cl. 296-188.000.
Davis, Walter L.: *See—*
Oliboni, Mark L.; Woltz, Stephen H.; Drapac, George A.; and Davis, Walter L., 5,111,486, Cl. 375-120.000.
Dawson, Fredric O., Jr. Combination pipe rack and tool locker for a truck bed. 5,110,021, Cl. 224-42.010.
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Dayco Products, Inc.: *See—*
Holden, Homer N.; Lawrence, James L.; Rogers, Jerry W.; and Sanders, John D., 5,109,600, Cl. 29-890.144.
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Corral, Jose S. M.; De Aza, Salvador; Poyato, Francisco M.; Valle Fuentes, Francisco J.; Miranda, Isabel O.; Caseres, Rafael M.; and Martinez, Paz C., 5,110,773, Cl. 501-98.000.
Debono, Manuel: *See—*
Bonjouklian, Rosanne; Debono, Manuel; Kirst, Herbert A.; and Wind, Julie A., 5,110,800, Cl. 514-29.000.
DeCecca, Michael L.; Kroll, Arthur S.; and Dunn, Arthur E., to Eastman Kodak Company. Apparatus for positioning a development unit with respect to an image member. 5,111,245, Cl. 355-245.000.
DeCicco, Thomas J.: *See—*
Miller, Charles D.; DeCicco, Thomas J.; and Laabs, Timothy P., 5,111,007, Cl. 200-43.080
Deere & Company: *See—*
Ernst, Paul J.; and Hanson, Rex A., 5,110,253, Cl. 414-694.000.
Shepherd, Leonard L.; and VonFumetti, Cyril W., 5,110,169, Cl. 294-119.400.
VanGerpen, Harlan W., 5,109,707, Cl. 73-862.620.
Viaud, Jean; Ardueser, William A.; and Anstey, Henry D., 5,109,652, Cl. 53-508.000.
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Defenbaugh, John F.: *See—*
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Evans, Alfred J., 5,109,648, Cl. 53-134.100.
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Hach, Larry R.; and Kelley, Gerard F., 5,111,123, Cl. 318-434.000.
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Hibner, David H.; Buono, Dennis F.; Dembeck, Kurt M.; and Franceschet, Roy D., 5,110,257, Cl. 415-119.000.
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Blessing, Michael A.; Dembowski, Gregory J.; and Finnell, Gregory K., 5,110,990, Cl. 568-492.000.
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Huschka, Hans; Demmich, Joerg; and Maurer, Paul-Gerhard, 5,109,918, Cl. 165-104.180.
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Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshioka, Hitoshi; and Norigoe, Isami, 5,111,372, Cl. 363-20.000.
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Damp, Stephan, 5,111,134, Cl. 324-78.00D.
Deutsche Forschungsanstalt fur Luft -und Raumfahrt e.V.: *See*—
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DeVries, Jeffrey S. Receiving system for a berry harvester. 5,109,657, Cl. 56-330.000.
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Blackshear, David M., 5,111,288, Cl. 358-108.000.
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Higbie, Francis A.; LieBerman, Robert A.; and Rose, Ira M., 5,110,889, Cl. 526-320.000.
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Benson, Robert W.; Dietemann, Christopher G.; Beiley, Mark J.; and Sareshwala, Sohel A., 5,110,163, Cl. 285-382.200.
Dieterle, Gerd: *See*—
Bertiller, Roland; Schneider, Hubert; and Dieterle, Gerd, 5,109,748, Cl. 89-1.200.
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Horwitz, E. Philip; and Dietz, Mark L., 5,110,474, Cl. 210-635.000.
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Stanco, Christoph; Ochs, Heinrich; and Difflipp, Kurt, 5,110,109, Cl. 271-82.000.
Digital Equipment Corporation: *See*—
Das, Shyam C.; and Mallary, Michael L., 5,111,352, Cl. 360-113.000.
Donaldson, Darrel D.; and Gillett, Richard B., Jr., 5,111,424, Cl. 395-725.000.
Edem, Brian C.; Helliwell, Richard P.; Johnston, John T.; and Lary, Richard F., 5,111,465, Cl. 371-54.000.
Dikar, S. Coop, LTDA.: *See*—
Echeberria, Julian, 5,109,622, Cl. 42-69.020.
Dilling-Harris and Ginsan, Inc.: *See*—
Harris, A. Joe; and Grace, Wallace L., 5,110,049, Cl. 239-209.000.
Dillmann, Charles W., to General Electric Company. Turbine-driven control rod drive. 5,110,535, Cl. 376-230.000.
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Tokiwa, Yutaka; and Iwamoto, Akira, 5,110,838, Cl. 521-81.000.
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Biebesheimer, Klaus; Hofsess, Alexander; and Simpfendorfer, Dieter, 5,109,631, Cl. 51-111.00R.
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Nagasubramanian, Ganesan; and DiStefano, Salvador, 5,110,694, Cl. 429-192.000.
Ditchek, Brian M.: *See*—
Levinson, Mark; Ditchek, Brian M.; Rossoni, Philip G.; and Rock, Frederick, 5,111,254, Cl. 357-22.000.
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Clark, Russel W.; and Donovan, James E., 5,110,013, Cl. 222-382.000.
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Trzmiel, Alfred; Fiedler, Olaf; and Weyandt, Johannes. 5,109,813, Cl. 123-90.150.
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Bernard, Harald; and Spies, Alfons, 5,111,040, Cl. 250-237.00G.
Doi, Koji: *See*—
Ueno, Hiroshi; Kikuchi, Yasuo; Takahashi, Kunitomo; Doi, Koji; Onose, Tsukasa; and Ogawa, Toshitaka, 5,111,235, Cl. 355-246.000.
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Rothschild, John J.; and Donahue, James L., 5,110,288, Cl. 432-96.000.
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Clark, Russel W.; and Donovan, James E., 5,110,013, Cl. 222-382.000.
Dorinski, Dale W.; and Branan, Mac W., to Motorola, Inc. Solderless interconnect. 5,110,298, Cl. 439-65.000.
Dornath Mohr, Michelle A.: *See*—
Tauber, Arthur; Finnegan, Robert D.; Dornath Mohr, Michelle A.; and McBride, Frank A., 5,110,767, Cl. 505-1.000.
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Dornier GmbH: *See*—
Sill, Karl-Hermann; and Lenski, Harald, 5,110,406, Cl. 156-621.000.
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Sasao, Nobuyuki; and Yamaguchi, Hiromi, 5,110,562, Cl. 422-186.000.
Doryokuro Kakunenryo Kithatsu Jigyodan: *See*—
Ohtsuka, Katsuyuki; Kondo, Isao; and Okada, Takashi, 5,110,507, Cl. 252-626.000.
Dosdall, James M.: *See*—
James, John V.; Dosdall, James M.; and Marko, Kenneth A., 5,109,695, Cl. 73-117.300.
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Doundoulakis, George J. Bi-stable pressure maintaining gas containers. 5,110,014, Cl. 222-396.000.
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Birdwell, Jeffrey D.; and Carl, William P., 5,110,385, Cl. 156-155.000.
Gartner, Herbert A., 5,110,883, Cl. 526-84.000.
Harris, William J., 5,110,894, Cl. 528-128.000.
Hucul, Dennis A., 5,110,779, Cl. 502-185.000.
Knobel, Thomas M.; Dubouchet, Christian; and Black, Lance L., 5,110,669, Cl. 428-215.000.
Malone, Bruce A., 5,110,841, Cl. 521-94.000.
Weimer, Alan W.; Moore, William G.; and Roach, Raymond P., 5,110,565, Cl. 422-198.000.
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Bank, Howard M., 5,110,974, Cl. 556-469.000.
Caporiccio, Gerardo, 5,110,973, Cl. 556-488.000.
Cifuentes, Martin E.; and Selley, David B., 5,110,891, Cl. 528-34.000.
Cooper, Ian V., 5,110,684, Cl. 428-447.000.
Gray, Thomas E.; and Jensen, Jary D., 5,110,845, Cl. 523-211.000.

King, Russell K.; and Lee, Chi-long, 5,110,967, Cl. 556-407.000.
Williams, Dwight E.; Tangney, Thomas J.; and Revis, Anthony, 5,110,784, Cl. 502-401.000.
Dow Corning Limited: *See*—
Butler, Derek W., 5,110,890, Cl. 528-12.000.
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Hamada, Yuji; Murakami, Ichiro; and Sasaki, Shosaku, 5,110,882, Cl. 525-478.000.
DowElanco: *See*—
Waldrum, John E., 5,110,048, Cl. 239-171.000.
Dowty RFL Industries Inc.: *See*—
Ernst, Leonard, 5,111,358, Cl. 361-334.000.
Drake, Evelyn N.: *See*—
Manalastas, Pacifico V.; Drake, Evelyn N.; Kresge, Edward N.; Thaler, Warren A.; McDougall, Lee A.; Newlove, John C.; Swarup, Vijay; and Geiger, Albert J., 5,110,486, Cl. 252-8.551.
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Oliboni, Mark L.; Woltz, Stephen H.; Drapac, George A.; and Davis, Walter L., 5,111,486, Cl. 375-120.000.
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Jasinski, John F.; McCormick, Robert P.; Mellinger, Ricky C.; Draper, James K.; and Vyas, Navin N., 5,110,387, Cl. 156-222.000.
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DeVigne, Yves, 5,111,459, Cl. 371-27.000.
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Walinsky, Paul; Lewin, Peter A.; and Reid, John M., 5,109,861, Cl. 128-662.060.
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Uribe, Diego; Driskill, Paul; and Hantscho, Rolf, 5,109,770, Cl. 101-425.000.
Driver, Crystal J.: *See*—
Briant, James K.; and Driver, Crystal J., 5,109,797, Cl. 119-15.000.
Drobakh, Viktor T.: *See*—
Masyagutov, Robert G.; Drobakh, Viktor T.; and Aprakin, Alexandr S., 5,109,705, Cl. 73-861.830.
Du Pont Merck Pharmaceutical Company: *See*—
Magolda, Ronald L.; and Wright, Stephen W., 5,110,831, Cl. 514-645.000.
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Knobel, Thomas M.; Dubouchet, Christian; and Black, Lance L., 5,110,669, Cl. 428-215.000.
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Gelly, Jean-Francois; Dubut, Patrick; Reynier, Rene ; and Maerfeld, Charles, 5,109,860, Cl. 128-662.030.
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Duenser, William F.: *See*—
Angarola, Barry R.; and Duenser, William F., 5,109,575, Cl. 24-16.0PB.
Duesman, Kevin G.: *See*—
Lowrey, Tyler A.; Duesman, Kevin G.; and Cloud, Eugene H., 5,110,754, Cl. 437-52.000.
Duffield, David J.; Deiss, Michael S.; Beyers, Billy W., Jr.; and Bridgewater, Kevin E., to Thomson Consumer Electronics, Inc. Data transfer from a television receiver having picture-in-picture capability to an external computer. 5,111,296, Cl. 358-83.000.
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Duke University: *See*—
de Juan, Eugene, Jr.; Humayun, Mark S.; and Phillips, D. Howard, 5,109,844, Cl. 128-419.00R.
Roundhill, David N.; and von Ramm, Olaf T., 5,109,857, Cl. 128-661.080.
Dumais, Francois: *See*—
Ryan, Dominic H.; Strom-Olsen, John O.; Kycia, Jan; Patel, Bipin; and Dumais, Francois, 5,110,695, Cl. 429-206.000.
Duncan Industries Parking Control Systems Corp.: *See*—
Van Horn, John W.; and Carmen, Ralph H., 5,109,972, Cl. 194-217.000.
Dunham, Jeffrey W.; Carson, Richard A.; and Grosskopf, Bernard J. Padded sleeve for pet collar. 5,109,803, Cl. 119-106.000.
Dunn, Arthur E.: *See*—
DeCecca, Michael L.; Kroll, Arthur S.; and Dunn, Arthur E., 5,111,245, Cl. 355-245.000.
Dunn, L. Brian, to Micron Technology, Inc. Handle for wafer carrier. 5,110,001, Cl. 220-94.00R.
Duphar International Research B.V.: *See*—
Halkes, Sebastianus J.; and Overbeek, Wilhelmus R. M., 5,110,924, Cl. 544-233.000.
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Du Pont de Nemours, E. I., and Company: *See*—
Amey, Ronald L., 5,110,878, Cl. 525-430.000.
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Blatz, Philip S., 5,110,855, Cl. 524-441.000.
Cohen, Gordon M.; and Reich, Hans J., 5,110,869, Cl. 525-194.000.
Dudek, Dietmar; and Pfeiffer, Thomas, 5,110,384, Cl. 156-89.000.
Herron, Norman; and Wang, Ying, 5,110,505, Cl. 252-518.000.
Hung, Ming-Hong; and Kaku, Mureo, 5,110,938, Cl. 548-237.000.
Kean, Norman B., 5,110,641, Cl. 428-35.500.
Kim, Young H., 5,110,858, Cl. 524-496.000.
Lawless, Philip A., 5,109,708, Cl. 73-863.110.
Lukhard, Craig R.; Potter, Jerry F.; and Todd, Maurice C., 5,110,517, Cl. 264-40.100.
Muschiatti, Lawrence C., 5,110,998, Cl. 174-24.000.
Waggoner, Marion G.; and Samuels, Michael R., 5,110,896, Cl. 528-190.000.
Duracraft Corporation: *See*—
Chiu, Bernard, 5,110,263, Cl. 416-244.00R.
Duraud, Jean-Paul: *See*—
Balanzat, Emmanuel; Boiziau, C.; Darnez, Charles; Duraud, Jean-Paul; and LeMoel, Alain, 5,110,683, Cl. 428-421.000.
Durnil, Michael W., to Carrier Vibrating Equipment, Inc. Workpeice tumbling and conveying apparatus. 5,109,633, Cl. 51-163.100.
Durso, Joseph M. Golf swing training system. 5,110,133, Cl. 273-187.00R.
Duttweiler, Robert P.: *See*—
Wagener, Kenneth B.; Boncella, James M.; Duttweiler, Robert P.; Hillmyer, Marc A.; and Nel, Jan G., 5,110,885, Cl. 526-170.000.
Dvoroznak, Donald S.; and Holtzclaw, James O., Jr., to Hunter Company, The. Rifle sling with rifle rest. 5,110,022, Cl. 224-150.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Blaser, Horst, 5,109,621, Cl. 42-46.000.
Dynax Corporation: *See*—
Mukai, Kazuhito; and Shibuya, Takao, 5,109,966, Cl. 192-70.120.
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Hammond, James A., Jr.; and Marks, David N., 5,110,900, Cl. 528-340.000.
Selby, Thomas, 5,110,347, Cl. 71-92.000.
E.P. Inc.: *See*—
Liss, Saul; Liss, Bernard; and Manor, Ben, 5,109,847, Cl. 128-421.000.
E. R. Squibb & Sons, Inc.: *See*—
Smith, Anthony D.; and Jobst, Kim A., 5,109,868, Cl. 128-774.000
E-Systems Inc.: *See*—
Montesano, Mark J., 5,111,359, Cl. 361-388.000.
Eadie, William: *See*—
MacWilliams, William A.; and Eadie, William, 5,110,447, Cl. 208-106.000.
Ealba, Robert H.: *See*—
Presz, Walter M., Jr.; Paterson, Robert W.; Werle, Michael J.; and Ealba, Robert H., 5,110,560, Cl. 422-176.000.
Eastern Company, The: *See*—
Miller, Charles D.; DeCicco, Thomas J.; and Laabs, Timothy P., 5,111,007, Cl. 200-43.080.
Eastern Co., Ltd.: *See*—
Yamamoto, Iwao; Ohta, Kazuchika; and Komatsu, Tsuyoshi, 5,110,916, Cl. 534-15.000.
Eastman Kodak Company: *See*—
Chapman, Derek D.; and Valente, Ronald R., 5,110,937, Cl. 546-261.000.
Czekai, David A.; and Bishop, John F., 5,110,717, Cl. 430-512.000.
DeCecca, Michael L.; Kroll, Arthur S.; and Dunn, Arthur E., 5,111,245, Cl. 355-245.000.
DeJager, Donald, 5,111,325, Cl. 359-206.000.
Hansen, David E., 5,111,228, Cl. 354-222.000.
Harder, John W.; and Burns, Paul A., 5,110,942, Cl. 548-262.400.
Harrigan, Michael E., 5,111,343, Cl. 359-888.000.
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Kralles, Christopher J., 5,111,241, Cl. 355-75.000.
May, John W.; Mey, William; and Riblett, Susan E., 5,110,699, Cl. 430-54.000.
Mura, Albert J.; Belly, Robert T.; and Lum, Vanessa R., 5,110,723, Cl. 435-4.000.
Muszak, Martin F., 5,109,728, Cl. 74-820.000.
Ng, Yee S.; and Rimai, Donald S., 5,110,702, Cl. 430-99.000.
Pagano, Daniel M., 5,111,229, Cl. 354-275.000.
Shaw, James D., 5,109,569, Cl. 16-44.000.
Somers, Marc S., 5,109,892, Cl. 141-11.000.
Stevens, Eric G., 5,111,263, Cl. 357-24.000.
Wilson, John C.; DeMejo, Lawrence P.; and Bermel, Alexandra D., 5,110,977, Cl. 560-1.000.
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Boardman, Mark D., 5,109,729, Cl. 74-858.000.
Joyce, Ronald S., 5,109,727, Cl. 74-568.00R.
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Yardley, James V., 5,109,940, Cl. 180-168.000.
Ebe, Kazuyoshi: *See*—
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Hoblingre, Andre ; Courvoisier, Patrick; and Bari, Gerard, 5,110,233, Cl. 403-12.000.
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DeSatnick, Allen H.; Torrie, Paul A.; and Egan, Thomas D., 5,111,212, Cl. 343-709.000.
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Elam, James O. Visually monitored anesthesia breathing circuit. 5,109,838, Cl. 128-203.120.
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Case, Leo L., 5,110,440, Cl. 204-300.0EC.
Elder, Cary S.; Tolman, Dennis K.; and Gates, Dale A., to Northrop Corporation. Backwired 3-D harness tool assembly. 5,109,597, Cl. 29-721.000.
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Turpin, Jim L.; Eldridge, Robert B.; and Booth-McGee, Sharon, 5,110,319, Cl. 44-451.000.
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Futamura, Shoji; and Kurihara, Masaki, 5,111,017, Cl. 219-69.180.
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Ball, David P.; and Ensor, Donald R., 5,111,115, Cl. 315-239.000.
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Kidd, Thomas F.; Thompson, Stephen A.; and Paduano, Guiseppe, 5,109,914, Cl. 164-113.000.
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Ellefson, Lee J. Mole and gopher control apparatus. 5,109,628, Cl. 43-124.000.
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Garrison, Dale L.; and Strutz, William F., 5,110,418, Cl. 202-81.000.
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Ciriello, Michael P.; and Gorski, Richard A., 5,110,339, Cl. 65-238.000.
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Endres, Karl H., to Molex Incorporated. Multi core cable stripping. 5,109,590, Cl. 29-564.400.
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Farooque, Mohammad; and Allen, Jeff, 5,110,692, Cl. 429-36.000.
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Murphy, Colin R. R., 5,110,398, Cl. 156-499.000.
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Bellussi, Giuseppe; Carati, Angela; and Cavani, Fabrizio, 5,110,570, Cl. 423-277.000.
Castaldi, Graziano; and Allegrini, Pietro, 5,110,922, Cl. 540-523.000.
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Ball, David P.; and Ensor, Donald R., 5,111,115, Cl. 315-239.000.
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Morona, Renato; and Attridge, Stephen R., 5,110,588, Cl. 424-92.000.
Erard, Raoul-Henri. Chronometer with tide indicating means. 5,111,439, Cl. 368-19.000.
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Heckard, David P.; and Erekson, Cameron B., 5,110,381, Cl. 156-64.000.
Erhardt, Robert A.: *See—*
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Erickson, Charles H.; Erio, Peter A.; and Kase, James E., to Commonwealth Edison Company. Auto freeze frame display for intrusion monitoring system. 5,111,291, Cl. 358-108.000.
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Erlich, Henry A., to Cetus Corporation. HLA typing method and DNA probes used therein. 5,110,920, Cl. 536-27.000.

Erlich, Simha, to Hughes Aircraft Company. Digital FM modulator. 5,111,163, Cl. 332-117.000.
Ernst, Leonard, to Dowty RFL Industries Inc. Electrical equipment with mode indicator. 5,111,358, Cl. 361-334.000.
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Eshita, Takashi: *See—*
Furumura, Yuji; Mieno, Fumitake; Nakazawa, Tsutomu; Eshita, Takashi; Maeda, Mamoru; and Yamauchi, Tsunenori, 5,111,266, Cl. 357-34.000.
ESL, Inc.: *See—*
Hunt, Peter F., 5,111,196, Cl. 340-825.350.
Esserman, James N.; and Moroney, Paul, to General Instrument Corporation. Information processing apparatus with replaceable security element. 5,111,504, Cl. 380-21.000.
Estis, Leonard F., to Seragen, Inc. Purification of Il-2-containing hybrid compounds. 5,110,912, Cl. 530-413.000.
Estradera, Jose M.: *See—*
Ayala, Francisco; and Estradera, Jose M., 5,109,642, Cl. 52-79.100.
Etlin, Vladimir. Apparatus for recirculation of liquids. 5,110,464, Cl. 210-195.300.
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Kanno, Masahide; Ieoka, Shouichi; Hiyama, Keiichi; Matsunaka, Kenji; and Eto, Tadao, 5,111,306, Cl. 358-403.000.
Evangelides, Stephen G., Jr.: *See—*
Bergano, Neal S.; Evangelides, Stephen G., Jr.; and Mollenauer, Linn F., 5,111,322, Cl. 359-122.000.
Evans, Alfred J., to Delaware Capital Formation, Inc. Packaging device with loop attachment mechanism and skin brake. 5,109,648, Cl. 53-134.100.
Evans, Jonathan C.; and Goralski, Christian T., to Merrell Dow Pharmaceuticals Inc. New organoboron reagents for the preparation unsubstituted propargylic alcohols. 5,110,966, Cl. 556-403.000.
Evans, Neil M., to Rolls-Royce plc. Attachment of a gas turbine engine blade to a turbine rotor disc. 5,110,262, Cl. 416-219.00R.
Evans, William T.: *See—*
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Evenson, Mel; and Melzian, John, to Rubbermaid Office Products Group, Inc. Detachable personal accessory apparatus for use with panel systems. 5,110,079, Cl. 248-222.100.
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Zook, Christopher P., 5,111,463, Cl. 371-39.100.
Explosive Fabricators, Inc.: *See—*
Sharp, William F.; Hingorany, Prem R.; and Mansell, Howard W., 5,109,594, Cl. 29-600.000.
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Cross, Virginia R.; and Shulman, Cindy B., 5,110,685, Cl. 428-494.000.
Dickakian, Ghazi B., 5,110,997, Cl. 570-222.000.
Robinson, Peter M.; and Van-Det, Nguyen, 5,110,864, Cl. 524-801.000.
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Rice, James A., 5,111,437, Cl. 367-57.000.
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Coyle, Catherine L.; Farina, Scott A.; Stiefel, Edward I.; and Greaney, Mark A., 5,110,963, Cl. 556-61.000.
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Manalastas, Pacifico V.; Drake, Evelyn N.; Kresge, Edward N.; Thaler, Warren A.; McDougall, Lee A.; Newlove, John C.; Swarup, Vijay; and Geiger, Albert J., 5,110,486, Cl. 252-8.551.
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Wendt, Horst, 5,109,711, Cl. 73-863.110.
Fagan, John E.: *See—*
Lair, James H.; and Fagan, John E., 5,110,616, Cl. 427-9.000.
Fala, Joseph: *See—*
Madni, Asad M.; and Fala, Joseph, 5,111,206, Cl. 342-15.000.
Fallon, James A., to General Electric Company. Gas turbine fuel pumping apparatus. 5,110,269, Cl. 417-428.000.
Falmagne, Jean-Bernard: *See—*
Pirson, Philippe; Falmagne, Jean-Bernard; and Trouet, Andre , 5,110,935, Cl. 546-171.000.
Fan, Jason Chia-Sun; Hastie, Trevor J.; and Kishon, Eyal, to AT&T Bell Laboratories. Method for signature verification. 5,111,512, Cl. 382-3.000.
Fanuc Ltd.: *See—*
Funakubo, Tsutomu; and Karube, Norio, 5,111,474, Cl. 372-61.000.
Torii, Nobutoshi; Naito, Yasuo; and Ueda, Kunio, 5,111,019, Cl. 219-87.000.
Fanuc Ltd: *See—*
Seki, Masaki; Hosono, Takeshi; Hayanagi, Shizuaki; and Suzuki, Koji, 5,111,532, Cl. 395-102.000.
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Palta, Jiwan P.; and Farag, Karim M., 5,110,341, Cl. 71-86.000.
Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., to International Flavors & Fragrances Inc. Process for preparing compositions containing unsaturated lactones, products produced thereby and organoleptic uses of said products. 5,110,953, Cl. 549-263.000.
Fare, Thomas L.; and Ligler, Frances S., to United States of America, Navy. Receptor-based sensor. 5,111,221, Cl. 357-25.000.
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Farkas, Julius, to B. F. Goodrich Company. Halogen-free, flame-retardant thermoplastic polyurethane containing melamine. 5,110,850, Cl. 524-100.000.
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Farnsworth, John T.; Johnson, Roger D.; Obrecht, Gary W.; and Young, Linda A. Extrusion die assembly. 5,110,276, Cl. 425-133.100.
Farooque, Mohammad; and Allen, Jeff, to Energy Research Corporation. Gasket for molten carbonate fuel cell. 5,110,692, Cl. 429-36.000.
Farquharson, Graeme J.: *See—*
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; and Cross, Linsay E., 5,110,989, Cl. 568-327.000.
Farrar, David: *See—*
Flesher, Peter; and Farrar, David, 5,110,859, Cl. 524-503.000.
Farronato, Silvestro; and Gazzea, Sergio, to Hoechst Sara S.p.A. Process for continuous production of matt or satin powder paints. 5,110,846, Cl. 523-346.000.
Faure, Jean-Francois, to Pechiney Recherche. Method of obtaining an aluminum based alloy with high Young's modulus and high mechanical strength. 5,110,372, Cl. 148-552.000.
Faust, Horst, to Hoechst Aktiengesellschaft. Process for electrostatically coating a substrate using an aerosol. 5,110,618, Cl. 427-32.000.
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Fay, Theodore D.; Morgan, William F.; and Schneider, Stanley, to McDonnell Douglas Corporation. Precision angle sensor. 5,110,210, Cl. 356-150.000.
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Hammond, Peter R.; and Feeman, James F., 5,111,472, Cl. 372-53.000.
Feenstra, Roeland; and Boatner, Lynn A., to Martin Marietta Energy Systems, Inc. Superconducting thin films on potassium tantalate substrates. 5,110,790, Cl. 505-1.000.
Fehlner, James R.: *See—*
Turro, Nicholas J.; and Fehlner, James R., 5,110,425, Cl. 204-158.120.
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Rosenblatt, Aaron; Rosenblatt, David H.; Feldman, David; Knapp, Joseph E.; Battisti, Diane; and Morsi, Badie, 5,110,580, Cl. 423-472.000.
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Batliwalla, Neville S.; Dharia, Amitkumar N.; Feldman, Randall M.; and Mehan, Ashok K., 5,111,032, Cl. 219-549.000.
Fellinger, Michael W.: *See—*
Thomas, Gary E.; and Fellinger, Michael W., 5,109,848, Cl. 128-422.000.
Fellows, Mark W.; Wong, John M.; Toy, Edmond; Erhardt, Robert A.; and Thomsen, James A., Jr., to North American Philips Corporation. Fluorescent lamp controllers. 5,111,118, Cl. 315-307.000.
Ferlier, Jean-Pierre; and Basly, Michel, to Filotex. Laser-markable optical fiber or electric cable. 5,111,523, Cl. 385-100.000.
Ferraris, Paolo C.; and Stradi, Riccardo, to Co Pharma Corporation S.r.l. Purine derivatives having pharmacological action. 5,110,798, Cl. 514-19.000.
Ferry, Thomas V.; Kawa, Jamil; Pierce, Kerry M.; Walker, William G.; and Zampaglione, Michael A., to VLSI Technology, Inc. Reduced switching noise output buffer using diode for quick turn-off. 5,111,075, Cl. 307-443.000.
Fialla, Peter, to ISONOVA Technische Innovationen G.m.b.H. Process for synthesizing 9,9-bis-(hydroxyphenyl)fluorene. 5,110,994, Cl. 568-727.000.
Fickler, Hans. Scoop litter to transport an injured person. 5,109,555, Cl. 5-81.100.
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Trzmiel, Alfred; Fiedler, Olaf; and Weyandt, Johannes, 5,109,813, Cl. 123-90.150.
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available resources as well as employee skill level, availability and priority. 5,111,391, Cl. 364-401.000.
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Bueter, John C.; Fields, Randall T.; Chandler, Martin D.; Neuls, Frederick W.; and Laffkas, Harry P., 5,109,932, Cl. 173-17.000.
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Ferlier, Jean-Pierre; and Basly, Michel, 5,111,523, Cl. 385-100.000.
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Fink, David: *See—*
Effland, Richard C.; and Fink, David, 5,110,815, Cl. 514-228.200.
Finkl, Charles W., to A. Finkl & Sons Co. High temperature fine-grained steel product. 5,110,379, Cl. 148-333.000.
Finnegan, Robert D.: *See—*
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Firey, Joseph C. Cross flow primary reactors for cyclic char burning engines and gasifiers. 5,109,808, Cl. 123-23.000.
Fischbach, Roderick C., to Wickes Manufacturing Company. Convertible with automatic window operation. 5,110,175, Cl. 296-117.000.
Fish, Gordon: *See—*
Hasegawa, Ryusuke; and Fish, Gordon, 5,110,378, Cl. 148-304.000.
Fisher, Charles K.; and Steyn, Willem J., to TRW Inc. Twist-off push-nut fastener. 5,110,246, Cl. 411-429.000.
Fisher Controls International Inc.: *See—*
Fitzgerald, William V., 5,109,692, Cl. 73-168.000.
Fisher, Eric F., to Amgen, Inc. System for biotin synthesis. 5,110,731, Cl. 435-119.000.
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Flamm, Ronald C.; Turner, Leonard O.; and Plunkett, James D., to Intel Corporation. Enclosure assembly with two identical covers having modifiable supports for asymmetrically housing a printed circuit board or the like. 5,111,362, Cl. 361-395.000.
Flassayer, Claude; and Collins, Franklin, to Sfernice Societe Francaise des l'Electro-Resistance. Chip form of surface mounted electrical resistance and its manufacturing method. 5,111,179, Cl. 338-313.000.
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Brozovic, Darko, 5,110,163, Cl. 285-211.000.
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Christian, Donald J.; and Rogers, Steven W., 5,109,715, Cl. 73-865.900.
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Forbes, Terry L.: *See—*
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Ford Motor Company: *See—*
Demiryont, Hulya, 5,111,228, Cl. 359-265.000.
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Rose, Henry H., 5,109,985, Cl. 206-600.000.
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Parker, Jim L.; and Forman, Dave, 5,110,454, Cl. 209-155.000.
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Zacharias, Donald R., 5,110,096, Cl. 266-227.000.
Foster, Daniel N. Exercise chair for the lower back. 5,110,121, Cl. 482-137.000.
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Tomes, Christopher B.; and Tomes, Edward M. R., 5,109,896, Cl. 144-30.000.
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Chevereau, Gerard, 5,110,536, Cl. 376-285.000.
Pascal, Yves; and Dague, Gilles, 5,110,538, Cl. 376-402.000.
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Verdier, Michel, 5,110,540, Cl. 376-441.000.
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Riviere, Luc, 5,111,517, Cl. 385-11.000.
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Hibner, David H.; Buono, Dennis F.; Dembeck, Kurt M.; and Franceschet, Roy D., 5,110,257, Cl. 415-119.000.
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Grube, Louis L.; and Frankoski, Stanley P., 5,110,674, Cl. 428-283.000.
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Syre, Manfred; and Freund, Reinhard, 5,109,744, Cl. 83-818.000.
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Hangey, Dale A.; Friedberger, Michael P.; Archie, William A.; and Spitz, Roger N., 5,110,317, Cl. 8-115.600.
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Friend, Robert N. Disc handling device, method of use and package. 5,110,167, Cl. 294-16.000.
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Frommer, Moshe A.; and Dalven, Israel. Water purification systems. 5,110,479, Cl. 210-662.000.
Froning, Edilbert. Photoelectric vertical sensor with pressure compensation means. 5,111,039, Cl. 250-231.100.
Fu, Timothy S.: *See—*
Farmwald, Paul M.; and Fu, Timothy S., 5,111,464, Cl. 371-40.100.
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Yamaguchi, Hidefumi; Kiyofuji, Hiroyuki; Shirono, Katsuhiro; Tokuou, Rinpei; and Fuchigami, Jun, 5,110,783, Cl. 502-314.000.
Fuchs, Jean-Francois: *See—*
Sparks, Charles; Odru, Pierre; Auberon, Marcel; and Fuchs, Jean-Francois, 5,110,644, Cl. 428-36.300.
Fuchs, Karl-Heinz: *See—*
Graf, Lothar; Fuchs, Karl-Heinz; and Maerte, Leo, 5,110,052, Cl. 239-333.000.
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Watkins, Lawrence J.; and Fuentes, Roland, Jr., 5,110,137, Cl. 273-348.100.
Fuhrmann, Agneta G. M.: *See—*
Forss, Kaj G.; Fuhrmann, Agneta G. M.; and Toroi, Martti, 5,110,414, Cl. 162-163.000.
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Ito, Mutsuhiro; Abe, Toshiyasu; Orii, Ryuji; and Yamakoshi, Tomio, 5,109,716, Cl. 73-865.500.
Fuji Filter Kogyo Kabushiki Kaisha: *See—*
Yuichi, Takahashi; and Katsuji, Azuma, 5,110,463, Cl. 210-194.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Sato, Keiji, 5,109,962, Cl. 192-4.00A.
Fuji Photo Film Co., Ltd.: *See—*
Agano, Toshitaka, 5,111,044, Cl. 250-327.200.
Akao, Mutsuo, 5,110,639, Cl. 428-35.200.
Akao, Mutsuo; and Komatsu, Takuichi, 5,110,643, Cl. 428-35.900.
Aoai, Toshiaki; and Kokubo, Tadayoshi, 5,110,709, Cl. 430-271.000.
Furusawa, Genichi; Yoshioka, Yasuhiro; and Nakai, Yasufumi, 5,110,714, Cl. 430-376.000.
Hayakawa, Hiroshi; and Morimoto, Kiyoshi, 5,110,985, Cl. 562-571.000.
Igarashi, Akira, 5,110,848, Cl. 524-30.000.
Kato, Eiichi; and Ishii, Kazuo, 5,110,701, Cl. 430-96.000.
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Morita, Kiyoo, 5,109,982, Cl. 206-387.000.
Omura, Hiroshi, 5,111,223, Cl. 354-111.000.
Shuto, Sadanobu; Tanemura, Hatsumi; and Hirano, Shigeo, 5,110,719, Cl. 430-569.000.
Taniguchi, Masato; and Sato, Tadahisa, 5,110,941, Cl. 548-262.400.
Yoshida, Kazuaki; and Ishikawa, Takatoshi, 5,110,713, Cl. 430-372.000.
Fuji Xerox Co., Ltd.: *See—*
Matsumura, Takuo; and Nogami, Yutaka, 5,110,106, Cl. 271-9.000.
Nagatsuka, Ikutaroh; Suzuki, Chiaki; Takeda, Masayuki; Matsumura, Yasuo; and Aoki, Takayoshi, 5,110,703, Cl. 430-108.000.
Sekine, Hiroshi; and Taniuchi, Kazuman, 5,111,533, Cl. 395-109.000.
Fujihara, Yuji; and Ando, Masaru, to Keyence Corporation. Device for inclining the tip path plane of a propeller of toy helicopter. 5,110,314, Cl. 446-34.000.
Fujii, Akira: *See—*
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 5,111,234, Cl. 354-455.000.
Fujii, Hideaki: *See—*
Nishiyama, Masashi; Fujii, Hideaki; and Takahashi, Tatsumi, 5,110,663, Cl. 428-195.000.
Fujii, Takashi; Kawahara, Hironobu; Takata, Kazuo; Nishiumi, Masaharu; and Yamamoto, Noriaki, to Hitachi, Ltd. Process for etching. 5,110,408, Cl. 156-643.000.
Fujii, Toshio; Shinohara, Yoshinao; and Handa, Keishin, to Mitsubishi Kasei Corporation. Extensible film or sheet and process for producing the same. 5,110,870, Cl. 525-194.000.
Fujiie, Kazuhiko: *See—*
Nakajima, Heitaro; Hotori, Masahiro; Ogawa, Hiroshi; and Fujiie, Kazuhiko, 5,111,442, Cl. 369-47.000.
Fujika Co., Ltd.: *See—*
Kaneko, Nobusato, 5,109,773, Cl. 102-357.000.
Fujikawa, Yasuo: *See—*
Kiuchi, Manabu; Hirai, Masazumi; Fujikawa, Yasuo; Yamaguchi, Ryuji; Nanba, Akihiko; and Noda, Masato, 5,110,547, Cl. 420-590.000
Fujikura, Takashi; Ito, Noriki; Matsumoto, Yuzo; Asano, Masaharu; and Takenaka, Toichi, to Yamanouchi Pharmaceutical Co., Ltd. Dihydropyridine compounds which process both calcium (2+)-antagonistic and beta receptor blocking activities. 5,110,820, Cl. 514-356.000.
Fujimori, Naoji: *See—*
Imai, Takahiro; and Fujimori, Naoji, 5,111,491, Cl. 378-35.000.
Fujimoto, Hiroaki, to Sanshin Industries Co., Ltd. Temperature control system for a water-cooled internal combustion engine. 5,109,809, Cl. 123-41.310.
Fujimoto, Yoshiji: *See—*
Kitoh, Atsunori; and Fujimoto, Yoshiji, 5,111,505, Cl. 381-51.000.
Fujimura, Setsuo: *See—*
Yamamoto, Hitoshi; Sagawa, Masato; Fujimura, Setsuo; and Matsuura, Yutaka, 5,110,377, Cl. 148-302.000.
Fujino, Masahisa, to Canon Kabushiki Kaisha. Guide rail mounting structure. 5,111,088, Cl. 310-12.000.
Fujisawa Pharmaceutical Company, Ltd.: *See—*
Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, 5,110,811, Cl. 514-183.000.
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 5,110,921, Cl. 540-222.000.
Fujishima, Kazuyasu; and Hart, Charles A., to Mitsubishi Denki Kabushiki Kaisha. Cache contained type semiconductor memory device and operating method therefor. 5,111,386, Cl. 395-425.000.
Fujita, Masami: *See—*
Okada, Shigeru; and Fujita, Masami, 5,109,570, Cl. 16-289.000.
Fujita, Minoru; Fukushima, Yoichi; and Haga, Toshio, to Kyodo Printing Co., Ltd. Method of producing an optical or magneto-optical recording card and transfer type optical or magneto-optical recording medium. 5,110,707, Cl. 430-256.000.
Fujita, Minoru; Kakinuma, Yuji; and Fukushima, Yoichi, to Kyodo Printing Co., Ltd. Optical card. 5,111,033, Cl. 235-488.000.
Fujita, Minoru, to Hitachi Maxell, Ltd. Disk cartridge and disk drive. 5,111,446, Cl. 369-291.000.
Fujita, Shuji; Narita, Masashi; Akada, Masanori; and Azuma, Yoshihiko, to Dai Nippon Insatsu Kabushiki Kaisha. Video printer device. 5,111,285, Cl. 358-75.000.
Fujitsu Limited: *See—*
Furumura, Yuji; Mieno, Fumitake; Nakazawa, Tsutomu; Eshita, Takashi; Maeda, Mamoru; and Yamauchi, Tsunenori, 5,111,266, Cl. 357-34.000.
Kawashima, Hiromi, 5,111,136, Cl. 324-158.00R.
Mukai, Ryoichi, 5,110,759, Cl. 437-173.000.
Ri, Seigen, 5,110,791, Cl. 505-1.000.
Sasaki, Mutsumi; Takahashi, Koji; and Suzuki, Shuichi, 5,111,258, Cl. 357-23.400.
Sato, Toshiyuki, 5,111,161, Cl. 331-25.000.
Suzuki, Takaaki; and Tatematsu, Takeo, 5,111,073, Cl. 307-442.000.
Takagi, Hisamitsu, 5,111,503, Cl. 379-433.000.
Fujiwara, Masakatsu: *See—*
Yuuchi, Takahiro; Tsuchida, Yasuyuki; and Fujiwara, Masakatsu, 5,109,845, Cl. 128-421.000.
Fujiwara, Takuji, to Mazda Motor Corporation. Hydraulic control system for an automatic transmission. 5,109,734, Cl. 74-869.000.
Fukano, Michio: *See—*
Hojo, Takeshi; Fukano, Michio; and Kato, Mitsuru, 5,109,693, Cl 73-497.000.
Fukuda, Ichio: *See—*
Sumi, Shigeo; and Fukuda, Ichio, 5,110,393, Cl. 156-344.000.
Fukuda, Masao: *See—*
Senso, Hitoshi; Arai, Yoshio; and Fukuda, Masao, 5,111,303, Cl. 358-335.000.
Fukuda, Michio; Ohta, Yoshinobu; Taniguchi, Kenichi; and Sasaki, Katuyuki, to Sumitomo Wiring Systems Ltd. Method of and apparatus for inserting wired terminals into connector housing. 5,109,602, Cl. 29-845.000.
Fukuhara, Satoru; Shinada, Hiroyuki; and Seitoh, Shigemitsu, to Hitachi, Ltd. Magnetic field measurement optimization apparatus using a charged particle beam. 5,111,141, Cl. 324-250.000.
Fukui, Hideo: *See—*
Hirono, Hatsuo; Moriyama, Koichi; Fukui, Hideo; and Matsuura, Ikuya, 5,110,782, Cl. 502-303.000.
Fukui, Tetsu; Oota, Yoshimi; and Hasegawa, Shigekazu, to Kubota Corporation. Conical roller type clutch apparatus. 5,109,964, Cl. 192-48.920.
Fukuoka, Hirofumi; and Kanatani, Yoshihara, to Sharp Kabushiki Kaisha. Driving circuit for a matrix type display device. 5,111,195, Cl. 340-811.000.
Fukuro, Hiroyoshi: *See—*
Kohtoh, Noriaki; Abe, Toyohiko; and Fukuro, Hiroyoshi, 5,111,318, Cl. 359-76.000.
Fukushima, Kiyoto: *See—*
Yamakawa, Yoshisuke; Fukushima, Kiyoto; and Matsuno, Koji, 5,110,659, Cl. 428-141.000.
Fukushima, Masao: *See—*
Maeda, Yuuji; Nakamura, Yozo; Nakamura, Kenichi; Sakamoto, Masahide; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,109,815, Cl. 123-192.100.
Fukushima, Yoichi: *See—*
Fujita, Minoru; Fukushima, Yoichi; and Haga, Toshio, 5,110,707, Cl. 430-256.000.
Fujita, Minoru; Kakinuma, Yuji; and Fukushima, Yoichi, 5,111,033, Cl. 235-488.000.
Fukushima, Yoshihisa; and Satoh, Isao, to Matsushita Electric Industrial Co., Ltd. Method of managing defective sectors in a disk-shaped information recording medium and an apparatus for performing the same. 5,111,444, Cl. 369-58.000.
Fukuta, Kenji: *See—*
Kawaguchi, Shin; Ohhashi, Yutaka; and Fukuta, Kenji, 5,110,632, Cl. 427-424.000.
Fukuyama, James M., to General Electric Company. Preparation and polymerization of cyclic aromatic ketones. 5,110,893, Cl. 528-125.000.
Funakoshi, Hiromasa: *See—*
Ohtsuchi, Tetsuro; Tsutsui, Hiroshi; Ohmori, Koichi; Baba, Sueki; Funakoshi, Hiromasa; Kawara, Toshiyuki; and Yoshizumi, Yoshiyuki, 5,111,052, Cl. 250-370.010.
Funakubo, Tsutomu; and Karube, Norio, to Fanuc Ltd. Laser oscillator device. 5,111,474, Cl. 372-61.000.
Funayama, Hidehiko: *See—*
Yukita, Yasuo; Sone, Masakazu; and Funayama, Hidehiko, 5,110,787, Cl. 503-206.000.
Furuhashi, Makoto: *See—*
Kutaragi, Ken; Furuhashi, Makoto; and Ishibashi, Toshiya, 5,111,530, Cl. 395-20.000.
Furukawa, Hisao; Kato, Yasushi; and Kawamura, Jo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Resin composition. 5,110,888, Cl. 526-312.000.
Furumura, Yuji; Mieno, Fumitake; Nakazawa, Tsutomu; Eshita, Takashi; Maeda, Mamoru; and Yamauchi, Tsunenori, to Fujitsu Limited. Semiconductor device having a region doped to a level exceeding the solubility limit. 5,111,266, Cl. 357-34.000.
Furusawa, Genichi; Yoshioka, Yasuhiro; and Nakai, Yasufumi, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photographic material. 5,110,714, Cl. 430-376.000.
Furusawa, Mitsuru: *See—*
Maeda, Susumu; Furusawa, Mitsuru; Marumoto, Yasumasa; Horiuchi, Tadashi; Sato, Yoshinari; and Saeki, Yoshiyuki, 5,110,729, Cl. 435-69.100.
Fuse, Motomasa: *See—*
Shigenaka, Naoto; Hashimoto, Tsuneyuki; and Fuse, Motomasa, 5,111,043, Cl. 250-306.000.
Fusegawa, Izumi; Yamagishi, Hirotoshi; and Abe, Takao, to Shin-Etsu Handotai Co., Ltd. Method for heat processing of silicon. 5,110,404, Cl. 156-603.000.
Futamata, Yukio: *See—*
Hosoya, Masahiro; Saito, Mitsunaga; Endo, Mitsuharu; Ohtaka, Yoshimitsu; and Futamata, Yukio, 5,110,705, Cl. 430-120.000.
Futamura, Shoji; and Kurihara, Masaki, to Electrical Discharge Work's. Power supply circuit for discharge machining. 5,111,017, Cl. 219-69.180.
Future Design Corporation: *See—*
Skrede, Roger W., 5,109,625, Cl. 43-56.000.
Fuyama, Moriaki: *See—*
Nakayama, Takahiro; Tamahashi, Kunihiro; Fuyama, Moriaki; Minemura, Hiroyuki; Sato, Yoshio; Tsuboi, Nobuyoshi; and Koyanagi, Hiroaki, 5,110,792, Cl. 505-1.000.
G. A. Morris Enterprises, Inc.: *See—*
Morris, Glenn A.; and Perkins, Leland M., 5,109,763, Cl. 100-48.000.
Gabrielson, Alan L., to Torrington Company, The. Method for selectively coating surfaces of components. 5,110,421, Cl. 205-131.000.
Gabura, Andrew J., to Sentrol Systems, Ltd. Smoothness sensor. 5,110,212, Cl. 356-429.000.

GAF Building Materials Corporation: *See—*
Grube, Louis L.; and Frankoski, Stanley P., 5,110,674, Cl. 428-283.000.

Gagne, Michel R.: *See—*
Marks, Tobin J.; Nolan, Steven P.; and Gagne, Michel R., 5,110,948, Cl. 548-579.000.

Gahagan, Vicki S. Animal restraint. 5,109,801, Cl. 119-96.000.

Gajari, Antal: *See—*
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo; Soos, Rudolf; Hadvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 5,110,376, Cl. 558-407.000.

Gajewski, Kenneth J.; Hymore, Ronald R.; and Nietering, Kenneth E., to Ford Motor Company. Solar load reduction panel with controllable light transparency. 5,111,329, Cl. 359-275.000.

Galand, Claude: *See—*
Belloc, Jacques; Galand, Claude; Lancon, Emmanuel; Milewski, Andre; and Quintin, Michel, 5,111,417, Cl. 364-724.100.

Gale, Vannin; and Kwang, David, to Concept Enterprises, Inc. Audio system for vehicular application. 5,111,508, Cl. 381-100.000.

Galetto, William G.; and Kent-Riggs, Laura K., to McCormick & Company, Inc. Method and apparatus for measuring flowability of powders. 5,109,717, Cl. 73-866.000.

Galick, Stephen J.; and Sax, James E., to Minnesota Mining and Manufacturing Company. Polymer composition imparting low surface energy. 5,110,667, Cl. 428-202.000.

Galpern, Natan, to Arad Ltd. System for measuring and recording a utility consumption. 5,111,407, Cl. 364-483.000.

Gammerler, Gunter. Cutting knife for rotary cutting apparatuses for paper. 5,109,743, Cl. 83-676.000.

Gamow, Rustem I., to Hyperbaric Mountain Technologies, Inc. Hyperbaric chamber. 5,109,837, Cl. 128-202.120.

Ganapol, David L.; and Small, Gary L., to VLSI Technology, Inc. Method and apparatus for marking or erasing a marking on a semiconductor chip package. 5,110,628, Cl. 427-256.000.

Gardaix-Luthereau, Renee: *See—*
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardaix-Luthereau, Renee; Costall, Brenda; and Naylor, Robert, 5,110,824, Cl. 514-377.000.

Garde, Douglas, to Analog Devices, Inc. Register forwarding multiport register file. 5,111,431, Cl. 365-129.020.

Garman, James A., to Caterpillar Inc. Fastener assembly. 5,110,244, Cl. 411-361.000.

Garmin Corporation: *See—*
Casey, David D., 5,111,150, Cl. 328-155.000.

Garner, John N., to Northern Telecom Limited. Method and apparatus for removing binder from around telecommunications cable core. 5,109,658, Cl. 57-2.500.

Garrison, Dale L.; and Strutz, William F., to Emerson Electric Company. Water distiller having a heating element with temperature sensing and control elements. 5,110,418, Cl. 202-81.000.

Garrison, Dale L.: *See—*
Weber, Thomas J.; Forrest, Richard E.; and Garrison, Dale L., 5,110,419, Cl. 202-185.300.

Gartner, Herbert A., to Dow Chemical Company, The. Process for the production of high molecular weight copolymers of diallylammonium monomers and acrylamide monomers in solution. 5,110,883, Cl. 526-84.000.

Gartner, Klaus W.; and Uyeda, Alan K., to Uyeda, Alan K. Coin roll dispensing mechanism. 5,110,009, Cl. 221-266.000.

Gary, Leonard. Drapery system. 5,109,912, Cl. 160-330.000.

Gary, Lonnie F., to Gary Products Group, Inc. Decorative light support assembly. 5,110,078, Cl. 248-206.200.

Gary Products Group, Inc.: *See—*
Gary, Lonnie F., 5,110,078, Cl. 248-206.200.

Gas Research Institute: *See—*
Sarkisian, Paul; and Becker, Fred, 5,109,807, Cl. 122-20.00B.

Gasper, Elon; and Matthews, Joseph H., III. Authoring and use systems for sound synchronized animation. 5,111,409, Cl. 395-152.000.

Gassman, Paul G.: *See—*
Flisak, Joseph R.; Gassman, Paul G.; Lantos, Ivan; and Mendelson, Wilford L., 5,110,959, Cl. 549-513.000.

Gates, Dale A.: *See—*
Elder, Cary S.; Tolman, Dennis K.; and Gates, Dale A., 5,109,597, Cl. 29-721.000.

Gates, James L., to Hughes Aircraft Company. High density interconnect. 5,110,299, Cl. 439-68.000.

Gathright, Czeu: *See—*
Moore, Christopher; and Phillips, John C., Jr., 5,110,122, Cl. 482-134.000.

Gauthier, Edouard A.: *See—*
Charpentier, Albert J.; Loeper, Duane J.; McLaughlin, Brian J.; Gauthier, Edouard A; and DiOrio, David W., 5,111,506, Cl. 381-68.400.

Gavula, John P.: *See—*
Harris, James E.; Robeson, Lloyd M.; and Gavula, John P., 5,110,880, Cl. 525-436.000.

Gaysert, Herr G.; and Gotz, Herr D., to J. Eberspacher. Device for preheating fuel for an ultrasonic atomizer for heaters. 5,110,286, Cl. 431-208.000.

Gazzea, Sergio: *See—*
Farronato, Silvestro; and Gazzea, Sergio, 5,110,846, Cl. 523-346.000.

Gebruder Frech AG: *See—*
Riner, Felix, 5,109,971, Cl. 193-35.00A.

GEC Alsthom SA: *See—*
Gilas, Francois, 5,110,460, Cl. 210-149.000.

Geens, Rudy E. M.: *See—*
Goodman, David A.; Plumb, John L.; Geens, Rudy E. M.; Snellgrove, Richard A.; and Wyner, Elliot, 5,111,108, Cl. 313-630.000.

Geiger, Albert J.: *See—*
Manalastas, Pacifico V.; Drake, Evelyn N.; Kresge, Edward N.; Thaler, Warren A.; McDougall, Lee A.; Newlove, John C.; Swarup, Vijay; and Geiger, Albert J., 5,110,486, Cl. 252-8.551.

Gelly, Jean-Francois; Dubut, Patrick; Reynier, Rene ; and Maerfeld, Charles, to General Electric CGR SA. Probe with curved bar for an echograph. 5,109,860, Cl. 128-662.030.

Gelorme, Jeffrey D.: *See—*
Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., 5,110,711, Cl. 430-296.000.

General Dynamics Corporation: *See—*
Hartouni, Edward, 5,111,525, Cl. 385-126.000.

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Gelly, Jean-Francois; Dubut, Patrick; Reynier, Rene ; and Maerfeld, Charles, 5,109,860, Cl. 128-662.030.

General Electric CGR S.A.: *See—*
Klausz, Remy, 5,111,492, Cl. 378-99.000.

General Electric Company: *See—*
Anthony, Thomas R.; and Fleischer, James F., 5,110,579, Cl. 423-446.000.
Bantel, Thomas E., 5,111,046, Cl. 250-330.000.
Benz, Mark G.; Knudsen, Bruce A.; Rumaner, Lee E.; and Zabala, Robert J., 5,109,593, Cl. 29-599.000.
Blohm, Margaret L.; Pickett, James E.; and VanDort, Paul C., 5,111,327, Cl. 526-256.000.
Devitt, John W.; Bantel, Thomas E.; Sparks, Joseph M.; and Kania, Janet S., 5,111,048, Cl. 250-342.000.
Dillmann, Charles W., 5,110,535, Cl. 376-230.000.
Fallon, James A., 5,110,269, Cl. 417-428.000.
Fukuyama, James M., 5,110,893, Cl. 528-125.000.
Harshman, Daniel L., 5,109,670, Cl. 60-204.000.
Jaster, Heinz; and Bessler, Warren F., 5,109,678, Cl. 62-175.000.
Komiak, James J., 5,111,157, Cl. 330-286.000.
Korman, Charles S.; Baliga, Bantval J.; and Chang, Hsueh-Rong, 5,111,253, Cl. 357-15.000.
Kuriacose, Joseph; Acampora, Alfonse A.; and Zdepski, Joel W., 5,111,292, Cl. 358-133.000.
Laskaris, Evangelos T., 5,111,172, Cl. 335-216.000.
Minnick, Michael G., 5,110,668, Cl. 428-215.000.
Molnar, Karl J.; Chung-Yih, Ho; Staver, Daniel A.; and Molnar, Barbara D., 5,111,421, Cl. 364-748.000.
Schmidhauser, John C.; and Longley, Kathryn L., 5,110,897, Cl. 528-196.000.
Stransky, Larry W.; Boehm, Valentine R., Jr.; and Phillips, Michael A., 5,109,667, Cl. 60-226.300.
Temple, Victor A. K., 5,111,268, Cl. 357-38.000.
Webb, George, 5,110,069, Cl. 244-110.00B.

General Instrument Corporation: *See—*
Esserman, James N.; and Moroney, Paul, 5,111,504, Cl. 380-21.000.

General Motors Corporation: *See—*
Patel, Balkrishna R.; and Bartos, Andrew L., 5,111,094, Cl. 310-156.000.

Genesis Energy Systems, Inc.: *See—*
Smith, Robert J., 5,111,099, Cl. 310-305.000.

Genske, Roger P., to American National Can Company. Films using blends of polypropylene and polyisobutylene. 5,110,642, Cl. 428-35.800.

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Formaini, Richard E., 5,110,898, Cl. 528-256.000.

Gershman, Leonard B. Highly stable, continuously adjustable trash can transporter. 5,110,147, Cl. 280-79.500.

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Ghoshtagore, Rathindra N.: *See—*
Chen, Li-Shu; Ghoshtagore, Rathindra N.; Turley, Alfred P.; and Yannone, Louis A., 5,110,755, Cl. 437-62.000.

Giancola, Guido, to Pirelli Coordinamento Pneumatici S.p.A. Motorcycle tire having belt layers with different modulus of elasticities. 5,109,906, Cl. 152-536.000.

Gift Asylum, Inc.: *See—*
Rife, Guerin D.; and Willingham, W. Preston, 5,111,366, Cl. 362-31.000.

Giftec, Ltd.: *See—*
Hou, Jack, 5,110,636, Cl. 428-11.000.

Gilas, Francois, to GEC Alsthom SA. Centrifugal separator for a liquid capable of waxing, in particular for diesel oil. 5,110,460, Cl. 210-149.000.

Gilbarco, Inc.: *See—*
Smith, Leon B., 5,110,010, Cl. 222-75.000.

Gilbert, Sylvain. Tree-felling head. 5,109,900, Cl. 144-339.000.

Gilbreath, Gary A.: *See—*
Everett, Hobart R., Jr.; Gilbreath, Gary A.; and Laird, Robin T., 5,111,401, Cl. 364-424.020.

Gill, Manzur; and McElroy, David J., to Texas Instruments Incorporated. Cross-point contact-free floating-gate memory array with silicided buried bitlines. 5,110,753, Cl. 437-52.000.

Gillan, Edward G.: *See—*
Kaner, Richard B.; Bonneau, Philippe R.; Gillan, Edward G.; Wiley, John B.; Jarvis, Robert F., Jr.; and Treece, Rande, 5,110,768, Cl. 501-1.000.

Gillett, Richard B., Jr.: *See—*
Donaldson, Darrel D.; and Gillett, Richard B., Jr., 5,111,424, Cl. 395-725.000.

Giordani, Alberto. Positive-displacement pump for pumping alimentary liquids. 5,110,267, Cl. 417-404.000.

Girand, Michel: *See—*
Delarue, Francois; Girand, Michel; and Montero, Manuel, 5,109,724, Cl. 74-479.000.

Girard, Francis: *See—*
Cattelain, Camille M.; and Girard, Francis, 5,109,634, Cl. 51-237.00R.

Giroux, Richard L.: *See—*
Stepp, Lee W.; Giroux, Richard L.; Crump, Joseph B.; and Borges, Jerome F., 5,109,925, Cl. 166-184.000.

Glaenzer Spicer: *See—*
Lescher, Henri, 5,109,950, Cl. 181-256.000.

Glass, Robert G.: *See—*
Waters, Peter D.; Defenbaugh, John F.; Henderson, Eric A.; and Glass, Robert G., 5,109,676, Cl. 62-117.000.

Glasson, Eric J.; Ty, Henry; White, Alfred J.; and Gondusky, Joseph H., to Texas Instruments Incorporated. Dual exhaust fluid flow control distribution apparatus. 5,110,045, Cl. 236-93.00R.

Glasstech, Inc.: *See—*
McMaster, Harold A., 5,110,338, Cl. 65-182.200.

Glaverbel: *See—*
Depauw, Jean-Michel; and Hoyois, Jean-Claude, 5,110,662, Cl. 428-192.000.

Glaxo Group Limited: *See—*
Storer, Richard; Mo, Chi L.; and Turnbull, John P., 5,110,926, Cl. 544-276.000.

Glucksman, Dov Z. Portable air humidifier. 5,111,529, Cl. 392-405.000.

Goffe, Bobby E.: *See—*
Crenshaw, Rodney D.; Goffe, Bobby E.; and Masters, John V., 5,109,943, Cl. 180-228.000.

Gogolewski, Sylwester; and Pennings, Albert J., to Rijksuniversiteit te Groningen. Filament material polylactide mixtures. 5,110,852, Cl. 524-108.000.

Goins, James V.: *See—*
Duggan, Robert B.; Goins, James V.; Holloway, Donald E.; and Moulder, Ronald, 5,109,806, Cl. 122-13.100.

Golden Aluminum Company: *See—*
McAuliffe, Donald C.; and Marsh, Ivan M., 5,110,545, Cl. 420-534.000.

Goldstar, Co., Ltd.: *See—*
Shin, Kyong S., 5,110,482, Cl. 210-758.000.

Goll, Charles J. Tractor drawbar hitch. 5,109,931, Cl. 172-248.000.

Gomberg, Edward N.; and Zurkiya, Ahmed A., to Synair Corporation. Method for preparing rubber surface for adhesion to polymeric formulation. 5,110,629, Cl. 427-322.000.

Gompertz, Ronald S.; and Escobedo, Victor, to Hewlett-Packard Company. Apparatus including a U-shaped bin having a bar grid network for uniformly stacking cut sheets of printed media. 5,110,111, Cl. 271-186.000.

Gondusky, Joseph H.: *See—*
Glasson, Eric J.; Ty, Henry; White, Alfred J.; and Gondusky, Joseph H., 5,110,045, Cl. 236-93.00R.

Goodman, David A.; Plumb, John L.; Geens, Rudy E. M.; Snellgrove, Richard A.; and Wyner, Elliot, to GTE Products Corporation; and GTE Sylvania N.V. Vapor discharge device with electron emissive material. 5,111,108, Cl. 313-630.000.

Goodman, David E.; Warring, Jessica A.; and Mannheimer, Paul D., to Nellcor, Inc. Perinatal pulse oximetry sensor. 5,109,849, Cl. 128-633.000.

Goralski, Christian T.: *See—*
Evans, Jonathan C.; and Goralski, Christian T., 5,110,966, Cl. 556-403.000.

Gorawara, Jayant K.: *See—*
Haun, Edward C.; Thompson, Gregory J.; and Gorawara, Jayant K., 5,110,444, Cl. 208-89.000.

Gordon, Lucas S., to Baxter International Inc. Liquid and gas separation system. 5,110,549, Cl. 422-46.000.

Gordon, Stanley: *See—*
du Plessis, Jacobus N., 5,109,884, Cl. 137-460.000.

Gorski, Richard A.: *See—*
Ciriello, Michael P.; and Gorski, Richard A., 5,110,339, Cl. 65-238.000.

Goto, Hiroaki: *See—*
Kojima, Shunji; Watanabe, Yoshiki; Goto, Hiroaki; and Moriga, Toshinori, 5,110,847, Cl. 523-412.000.

Goto, Kiyoshi: *See—*
Tomita, Yasuji; Nakai, Hideyuki; and Goto, Kiyoshi, 5,110,710, Cl. 430-278.000.

Goto, Toshio: *See—*
Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, 5,110,811, Cl. 514-183.000.

Gotoh, Hiroshi: *See—*
Ooba, Yasushi; and Gotoh, Hiroshi, 5,109,687, Cl. 72-21.000.

Gottlieb, Marc E., to City of Hope. Ring tissue expanders and their method of use. 5,109,875, Cl. 128-899.000.

Gottlieb, Milton S.: *See—*
Taylor, Lyle H.; Melamed, Nathan T.; and Gottlieb, Milton S., 5,111,038, Cl. 250-225.000.

Gotz, Herr D.: *See—*
Gaysert, Herr G.; and Gotz, Herr D., 5,110,286, Cl. 431-208.000.

Gould, Murray J. Device and method for securing a shoe. 5,109,581, Cl. 24-714.600.

Goyal, Shri K.: *See—*
Venardos, Dean G.; and Goyal, Shri K., 5,110,449, Cl. 208-131.000.

Grace, Wallace L.: *See—*
Harris, A. Joe; and Grace, Wallace L., 5,110,049, Cl. 239-209.000.

Graf, Lothar; Fuchs, Karl-Heinz; and Maerte, Leo, to Ing. Erich Pfeiffer GmbH & Co. KG. Manually operable discharging apparatus for media. 5,110,052, Cl. 239-333.000.

Graham, Malcolm, to National Starch and Chemical Investment Holding Corporation. Single pack polyurethane adhesive. 5,110,892, Cl. 528-48.000.

Grambush, Douglas H.; Holland, Gregory R.; and York, Walter A., to Allergan. Compact heat disinfection unit for contact lenses. 5,111,029, Cl. 219-521.000.

Grande, Donald L.; and Ralph, Harry C., to Boeing Company, The. Multi-axled propped landing gear. 5,110,068, Cl. 244-102.0SL.

Grandy, Kenneth N., Sr., to Master Lock Company. Changeable rotary combination shackle lock. 5,109,684, Cl. 70-25.000.

GRAPHA-Holding AG: *See—*
Muller, Hans, 5,110,108, Cl. 271-69.000.

Grass, Debbie: *See—*
Impastato, Frank; and Grass, Debbie, 5,109,798, Cl. 119-51.030.

Grass Valley Group, The: *See—*
Hershberger, David L., 5,111,160, Cl. 331-1.00A.

Gravrok, Roger J.; and Warner, Raymond M., Jr., to University of Minnesota, Regents of the. Multi-input compound function complementary noise-immune logic. 5,111,074, Cl. 307-443.000.

Gray, Frank: *See—*
Stienbarger, LeRoy; and Gray, Frank, 5,110,148, Cl. 280-221.000.

Gray, John B. Rapid bread cooling apparatus. 5,109,761, Cl. 99-517.000.

Gray, Paul: *See—*
Daboub, Henry A.; Bowland, Gary E.; and Gray, Paul, 5,109,987, Cl. 209-657.000.

Gray, Ralph E. Hydraulic platform lift for truck trailers. 5,110,251, Cl. 414-545.000.

Gray, Thomas E.; and Jensen, Jary D., to Dow Corning Corporation. Extrudable curable organosiloxane compositions. 5,110,845, Cl. 523-211.000.

Grayson, S. Keith; and Rudd, John B., to Automation Technology, Inc. Process control using neural network. 5,111,531, Cl. 395-23.000.

Greaney, Mark A.: *See—*
Coyle, Catherine L.; Farina, Scott A.; Stiefel, Edward I.; and Greaney, Mark A., 5,110,963, Cl. 556-61.000.

Greason, Jeffrey K.: *See—*
Young, Ian A.; and Greason, Jeffrey K., 5,111,077, Cl. 307-446.000.

Greb, Ulrich; and Rowley, Andrew T., to Thorn Emi plc. Discharge tube arrangement. 5,111,117, Cl. 315-248.000.

Green, Bruce: *See—*
Deich, Robert A.; Zlotnick, Gary; and Green, Bruce, 5,110,908, Cl. 530-403.000.

Green, Melvin H., to University of California, The Regents of the. Method of treating viral infections with amino acid analogs. 5,110,600, Cl. 424-45.00D.

Greenblat, Jerris E.: *See—*
Balaban, Jeffrey B.; Olmes, James B.; and Greenblat, Jerris E., 5,109,548, Cl. 2-175.000.

Greene, Dennis K.: *See—*
Bright, Irving; Erickson, Ronald C.; Greene, Dennis K.; Hardy, Gerald D.; Hefner, Robert E.; Johnson, Lowell E.; Schwingel, Donald J.; and Spring, Richard E., 5,109,696, Cl. 73-118.100.

Greenfield, James S.: *See—*
Greenfield, Nancy C.; and Greenfield, James S., 5,110,528, Cl. 264-138.000.

Greenfield, Nancy C.; and Greenfield, James S. Process for making sculptured interfitting pieces. 5,110,528, Cl. 264-138.000.

Greenlee, Thomas W., to Tremco Incorporated. Process for recycling silicone scrap and products relating thereto. 5,110,972, Cl. 556-460.000.

Greenspan, Jay S.: *See—*
Medeiros, Manuel, III; and Greenspan, Jay S., 5,111,277, Cl. 357-74.000.

Greer, Jonathan: *See—*
Haviv, Fortuna; and Greer, Jonathan, 5,110,904, Cl. 530-313.000.

Gregoli, Armand A.; Olah, Andrew M.; Hamshar, John A.; and Rimmer, Daniel P., to Canadian Occidental Petroleum Ltd. Converting heavy hydrocarbons into lighter hydrocarbons using ultrasonic reactor. 5,110,443, Cl. 208-46.000.

Gregor, Richard W.; and Leung, Chung W., to AT&T Bell Laboratories. Method of semiconductor integrated circuit manufacturing which includes processing for reducing defect density. 5,110,756, Cl. 437-70.000.

Gresch, Walter, to Bucher-Guyer AG Maschinenfabrik. Process for treatment of fruits and vegetables, especially for juice extraction, and unit for carrying out the process. 5,110,472, Cl. 210-632.000.

Grey, Howard; Mangan, Ciaran; Brochot, Jean; and Siddiqi, Iqbal, to Pharmacia Diagnostics Inc. Method for the determination of albumin in biological fluids. 5,110,746, Cl. 436-88.000.

Greyhawk Systems, Inc.: *See—*
Turner, James B.; and McInnis, Roderick J., 5,111,513, Cl. 382-8.000.

Gries, Robert J.; and Norman, Marvin N., to Thomson Consumer Electronics, Inc. Voltage booster for CRT electrode supply. 5,111,121, Cl. 315-411.000.

Griffiths, David C.; and Kneale, Brian, to British Petroleum Company p.l.c., The. Catalysts. 5,110,781, Cl. 502-335.000.

Grigger, David J.: *See*—
Schubert, Franz H.; and Grigger, David J., 5,110,436, Cl. 204-129.000.

Groenendaal, John C., Jr., to Westinghouse Electric Corp. Methods and apparatus for attaching a flow guide to a steam turbine for retrofit of longer rotational blades. 5,110,256, Cl. 415-190.000.

Grohmann, Karel: *See*—
Tucker, Melvin P.; Grohmann, Karel; Himmel, Michael E.; and Mohagheghi, Ali, 5,110,735, Cl. 435-209.000.

Gross, Hans-Gunter: *See*—
Becker, Gerhard; Gross, Hans-Gunter; Henssen, Johannes; and Schoning, Josef, 5,110,006, Cl. 220-442.000.

Gross, Larry E.: *See*—
Brooks, David K.; Waun, Cindy M.; and Gross, Larry E., 5,111,402, Cl. 364-424.040.

Grosskopf, Bernard J.: *See*—
Dunham, Jeffrey W.; Carson, Richard A.; and Grosskopf, Bernard J., 5,109,803, Cl. 119-106.000.

Groupement d'Interet Econom que Golf Inov: *See*—
Vautelin, Francis; and Perrier, Robert, 5,109,938, Cl. 180-19.300.

Grovak Grossventiltechnik AG: *See*—
Squirrell, Anton F., 5,109,883, Cl. 137-385.000.

Groves, Dorothy: *See*—
Groves, Trevor K., 5,110,661, Cl. 428-178.000.

Groves, Trevor K., to Groves, Dorothy. Armor component. 5,110,661, Cl. 428-178.000.

Grube, Louis L.; and Frankoski, Stanley P., to GAF Building Materials Corporation. Flame retardant bitumen. 5,110,674, Cl. 428-283.000.

Grubler, Walter; and Kopp, Kurt, to Martin Beilhack Maschinenfabrik und Hammerwerk GmbH. Snow-plow. 5,109,618, Cl. 37-232.000.

Grumman Aerospace Corporation: *See*—
Leib, Kenneth G., 5,111,314, Cl. 359-29.000.

Grupp, Larry A.; Perlanski, Edward; and Stewart, Robert B., to Alcoholism and Drug Addiction Research Foundation. Reduction of voluntary alcohol consumption by treatment with angiotensin converting enzyme inhibitors. 5,110,813, Cl. 514-212.000.

Gstrein, Hippolit: *See*—
Zehle, Wilhelm; and Gstrein, Hippolit, 5,110,672, Cl. 428-234.000.

GTE Government Systems Corporation: *See*—
Sweeney, Harold E., 5,110,217, Cl. 374-123.000.

GTE Laboratories Incorporated: *See*—
Levinson, Mark; Ditchek, Brian M.; Rossoni, Philip G.; and Rock, Frederick, 5,111,254, Cl. 357-22.000.

GTE Products Corporation: *See*—
Arold, Johathan B.; Mishou, Joan L.; Parent, Charles R.; Stark, Joseph P.; and Webb, Edward A., 5,111,527, Cl. 392-360.000.
Goodman, David A.; Plumb, John L.; Geens, Rudy E. M.; Snellgrove, Richard A.; and Wyner, Elliot, 5,111,108, Cl. 313-630.000.
Hunter, Scott R., 5,111,104, Cl. 313-25.000.
Reilly, Kenneth T., 5,110,499, Cl. 252-301.60S.

GTE Rotaflex Limited: *See*—
Woodgate, Terence A., 5,110,300, Cl. 439-121.000.

GTE Sylvania N.V.: *See*—
Goodman, David A.; Plumb, John L.; Geens, Rudy E. M.; Snellgrove, Richard A.; and Wyner, Elliot, 5,111,108, Cl. 313-630.000.

Gu, Alston L., to Allied-Signal Inc. Thrust bearing underspring. 5,110,220, Cl. 384-105.000.

Guegan, Alain; Gy, Jules; Hespel, Jean-Pierre; and Rouyer, Philippe, to Societe d'Applications des Techniques Photoniques. Artificial pancreas. 5,109,866, Cl. 128-771.000.

Gugel, Georg; Haefner, Martin; Bauer, Rainer; and Krauss, Peter, to Siemens Aktiengesellschaft. Apparatus and method for testing a vessel wall. 5,109,718, Cl. 73-866.500.

Guggiari, Andrea, to Pomini Farrel S.p.A. Method and apparatus for maintaining a constant contact pressure on elements for cutting under water in granulator machines. 5,110,523, Cl. 264-40.500.

Guichard, Jacques; Buchner, Georges; and Labat, Jacques. Hinged-case sound and vision communications terminal, in particular a videophone. 5,111,498, Cl. 379-53.000.

Guigan, Jean. Apparatus for performing biological analyses by chemical reaction on a serum. 5,110,552, Cl. 422-64.000.

Guillemin, Jean, to Valeo. Heating and ventilating apparatus for the cabin of an automotive vehicle. 5,109,755, Cl. 454-160.000.

Gullman, Larry S., to Kumahira Safe Co., Inc. Stylus for handwriting identification. 5,111,004, Cl. 178-18.000.

Gundling, Ray D.; Kaminkow, Joseph E.; and Hoffman, Jay A., Jr., to Data East Pinball, Inc. Method of applying multicolor finish to elongated channel member. 5,110,617, Cl. 427-14.100.

Gunter, Kirchhoff, to Handelsgesellschaft fur Medizin und Technik mit beschrankter Haftung. Apparatus for detecting properties, differences and changes of human animal bodies. 5,109,855, Cl. 128-653.100.

Gunther, Schwarz, to Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung (GmbH). Brake disk for disk brakes. 5,109,960, Cl. 188-218.0XL.

Gutierrez, Frederic J. Surveillance system having a miniature television camera and a RF video transmitter mounted in a mannequin. 5,111,290, Cl. 358-108.000.

Gutman, Edward J.: *See*—
Brailsford, Ian; Carter, Robert A.; Gutman, Edward J.; Jugle, Don B.; and Masham, Roger D., 5,111,246, Cl. 355-245.000.

Gutsche, Bernhard: *See*—
Buettgen, Karl-Heinz; Gutsche, Bernhard; Hommers, Friedrich; Johannisbauer, Wilhelm; Peukert, Eberhard; and Sedelies, Reinhold, 5,110,508, Cl. 554-170.000.

Guyomarc'h Nutrition Animale: *See*—
Nguyen, Tan H., 5,110,803, Cl. 514-54.000.

Gy, Jules: *See*—
Guegan, Alain; Gy, Jules; Hespel, Jean-Pierre; and Rouyer, Philippe, 5,109,866, Cl. 128-771.000.

H.G. Weber & Co., Inc: *See*—
Prettie, John, 5,109,975, Cl. 198-411.000.

H & M Pipe Beveling Machine Company, Inc.: *See*—
Dougal, Patrick R., 5,110,095, Cl. 266-55.000.

H. Stoll GmbH & Co.: *See*—
Schmid, Franz; and Ploppa, Jurgen, 5,109,681, Cl. 66-126.00R.

Ha, Muu P. Animal trap. 5,109,626, Cl. 43-78.000.

Haag, Werner O.; and Tsikoyiannis, John G., to Mobil Oil Corp. Catalytic conversion over membrane composed of a pure molecular sieve. 5,110,478, Cl. 210-650.000.

Haas, Guenter: *See*—
Farian, Gerhard; and Haas, Guenter, 5,109,738, Cl. 81-434.000.

Haas, Josef, to Arnold & Richter Cine Technik GmbH & Co. Betriebs KG. Film transport device. 5,110,201, Cl. 352-180.000.

Haasis, John M., to Allied-Signal Inc. Combustion apparatus and method for a turbine engine. 5,109,671, Cl. 60-39.360.

Haberland, Helmut. Apparatus and process for producing a thin layer on a substrate. 5,110,435, Cl. 204-192.310.

Hach, Larry R.; and Kelley, Gerard F., to Delco Electronics Corporation. Motor driver interface fault detection apparatus using initial turn-on and noise timers. 5,111,123, Cl. 318-434.000.

Hachiuma, Masayuki, to Kabushiki Kaisha Toshiba. Current amplifier circuit. 5,111,156, Cl. 330-257.000.

Haddad, Richard A.: *See*—
Chen, Walter Y.; and Haddad, Richard A., 5,111,481, Cl. 375-14.000.

Hadimioglu, Babur B.; Khuri-Yakub, Butrus T.; and Steinmetz, David L., to Xerox Corporation. Fabrication of integrated acoustic ink printhead with liquid level control and device thereof. 5,111,220, Cl. 346-140.00R.

Hadley, Michael S.: *See*—
Bromidge, Steven M.; Hadley, Michael S.; and Orlek, Barry S., 5,110,828, Cl. 514-413.000.

Haefner, Martin: *See*—
Gugel, Georg; Haefner, Martin; Bauer, Rainer; and Krauss, Peter, 5,109,718, Cl. 73-866.500.

Haferl, Peter E., to RCA Licensing Corporation. Raster corrected vertical deflection circuit. 5,111,120, Cl. 315-393.000.

Hafner, Bernhard: *See*—
Boettiger, Ulrich C.; and Hafner, Bernhard, 5,111,240, Cl. 355-53.000.

Haga, Toshio: *See*—
Fujita, Minoru; Fukushima, Yoichi; and Haga, Toshio, 5,110,707, Cl. 430-256.000.

Hagedorn, Myrna L.: *See*—
Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., 5,110,953, Cl. 549-263.000.

Hagen, Richard L.; and Thompson, William W., to North American Dynamics. Parallel path single bay ammunition feed system. 5,109,751, Cl. 89-33.160.

Hagenlocher, Klaus; and Windischbauer, Florian, to Luftschiffbau Zeppelin GmbH. Rigid airship having ribs and long beams forming a carrier frame. 5,110,070, Cl. 244-125.000.

Hager, John P.: *See*—
Li, Taie; Clement, Thomas P., II; and Hager, John P., 5,110,353, Cl. 75-703.000.

Hagihara, Makoto: *See*—
Yoshida, Yoshinori; and Hagihara, Makoto, 5,110,399, Cl. 156-515.000.

Hagino, Sadaaki: *See*—
Yamaguchi, Tetsuro; Takeshita, Takuo; and Hagino, Sadaaki, 5,110,789, Cl. 505-1.000.

Hagiuda, Nobuyoshi: *See*—
Yokonuma, Norikazu; Hagiuda, Nobuyoshi; Matsui, Hideki; and Sakamoto, Hiroshi, 5,111,233, Cl. 354-416.000.

Hagiwara, Hideo: *See*—
Tai, Seiji; Hayashi, Nobuyuki; Kamijima, Koichi; Akimoto, Takayuki; Katayose, Mitsuo; and Hagiwara, Hideo, 5,110,968, Cl. 556-415.000.

Hagiwara, Hiroyuki, to Canon Kabushiki Kaisha. Lens actuator. 5,111,339, Cl. 359-813.000.

Hagiwara, Kazuo: *See*—
Hayashi, Taira; Watanabe, Hiroyuki; Tuchiya, Akira; Hagiwara, Kazuo; and Hishiyama, Iwao, 5,110,526, Cl. 264-127.000.

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Takata, Koji; and Hashida, Koichi, 5,109,886, Cl. 137-596.170.

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Yuasa, Kimihiro; and Hashimoto, Kenji, 5,110,623, Cl. 427-162.000.

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Kokubu, Sadao; Nishio, Minoru; and Hattori, Yoshitaka, 5,111,010, Cl. 200-461.000.

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Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., 5,110,711, Cl. 430-296.000.

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Inaba, Shin-ichi; Shindo, Yasuyuki; Tsubouchi, Shirou; Naganuma, Hiroki; Nakazawa, Yoshio; Hayashi, Ryusuke; and Yamada, Kanji, 5,110,656, Cl. 428-257.000.

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Kumpfbeck, Richard J.; and Hannan, Peter W., 5,111,214, Cl. 343-841.000.
Lopez, A. R., 5,111,208, Cl. 342-174.000.

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Paoletti, Enzo; and Panicali, Dennis, 5,110,587, Cl. 424-89.000.

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Bright, Irving; Erickson, Ronald C.; Greene, Dennis K.; Hardy, Gerald D.; Hefner, Robert E.; Johnson, Lowell E.; Schwingel, Donald J.; and Spring, Richard E., 5,109,696, Cl. 73-118.100.

Hegedus, Agnes: *See*—
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo; Soos, Rudolf; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 5,110,976, Cl. 558-407.000.

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Blaser, Peter T., 5,109,969, Cl. 192-84.00R.
Henn, Manfred; and Kelm, Carsten, 5,110,112, Cl. 271-189.000.
Kusch, Hans-Jurgen, 5,109,587, Cl. 29-132.000.
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Milstein, Norman, 5,110,981, Cl. 562-90.000.

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Buettgen, Karl-Heinz; Gutsche, Bernhard; Hommers, Friedrich; Johannisbauer, Wilhelm; Peukert, Eberhard; and Sedelies, Reinhold, 5,110,508, Cl. 554-170.000.

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Albanesi, Mario; Hertogs, Willy A. M.; Khan, Adil M.; and Pieroni, Lucio, 5,110,004, Cl. 220-355.000.

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Guegan, Alain; Gy, Jules; Hespel, Jean-Pierre; and Rouyer, Philippe, 5,109,866, Cl. 128-771.000.

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Amjadi, Kamran, 5,111,408, Cl. 364-514.000.
Chan, C. S.; Bearss, James G.; and Nelson, Terry M., 5,111,302, Cl. 358-298.000.
Coles, Alistair N.; and Cunningham, David G., 5,111,333, Cl. 359-333.000.
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Kessler, Daniel D.; Wu, Robert W.; Beatty, Christopher C.; and Crook, Mark D., 5,110,712, Cl. 430-312.000.
Limb, John O., 5,111,456, Cl. 370-85.100.
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Hart, Dale, 5,109,735, Cl. 81-56.000.

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Wakimura, Kazuo; Tanaka, Masao; and Hiai, Atsuhiko, 5,110,575, Cl. 423-412.000.

Hibbetts, Bryon T., to FMC Corporation. Seal cartridge for use in idler rollers. 5,110,143, Cl. 277-47.000.

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Byrnes, Francis E.; Hibyan, Edward S.; and Noehren, William L., 5,110,260, Cl. 416-134.00A.

Hicho, Michael D., to Life Systems, Inc. Method and apparatus for analyzing rotating machines. 5,109,700, Cl. 73-660.000.

Hickey, Deirdre M. B.: *See*—
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Hida, Hikaru: *See*—
Ohata, Keiichi; and Hida, Hikaru, 5,111,256, Cl. 357-22.000.

Hida, Junichi, to Hoshizaki Denki Kabushiki Kaisha. Auger type ice making machine. 5,109,679, Cl. 62-320.000.

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Hietala, Alexander W.; and Marry, Patrick J., to Motorola, Inc. Digital frequency synthesizer having AFC and modulation applied to frequency divider. 5,111,162, Cl. 332-127.000.

Higaki, Shigetoshi, to Kabushiki Kaisha Toshiba. PWM-controlled power supply including choke coil with 3-windings. 5,111,373, Cl. 363-37.000.

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Ienaga, Kazuharu; and Higashiura, Kunihiko, 5,110,797, Cl. 514-19.000.

Higbie, Francis A.; LieBerman, Robert A.; and Rose, Ira M., to Diamond Shamrock Chemical Co. Radiation hardenable compositions containing low viscosity diluents. 5,110,889, Cl. 526-320.000.

Higby, Jeffrey P., to Outboard Marine Corporation. Releasable roller clutch reversing transmission. 5,110,312, Cl. 440-75.000.

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Harper, James L.; and Hill, Charles H., 5,111,022, Cl. 219-121.330.
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Borders, Richard L.; Newkirk, David C.; and Stafford, Daniel G., 5,109,554, Cl. 5-602.000.
Hilles, Wilbur I.; and Rieker, David A., to NCR Corporation. Circuit and method for energizing a solenoid in an electronic device for a predetermined energizing period. 5,111,394, Cl. 364-405.000.
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Himmel, Michael E.: *See—*
Tucker, Melvin P.; Grohmann, Karel; Himmel, Michael E.; and Mohagheghi, Ali, 5,110 735, Cl. 435-209.000.
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Hirai, Takaaki: *See—*
Hayashi, Motoshige; Amano, Norio; Taki, Tekeshi; and Hirai, Takaaki, 5,110,844, Cl. 521-182.000.
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Tomoda, Takahisa; Takeuchi, Mikio; Nakano, Kinichiro; and Hirano, Motoki, 5,111,199, Cl. 340-825.720.
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Shuto, Sadanobu; Tanemura, Hatsumi; and Hirano, Shigeo, 5,110,719, Cl. 430-569.000.
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Horibe, Kinya; Hirano, Tomio; Ikeda, Minoru; and Murata, Hideaki, 5,111,023, Cl. 219-121.850.
Hiraoka, Susumu: *See—*
Ono, Tetsuo; Hiraoka, Susumu; and Suzuki, Keizo, 5,110,407, Cl. 156-643.000.
Hirata, Shoji: *See—*
Narui, Hironobu; Yoshimatsu, Hiroshi; Hirata, Shoji; Ozawa, Masafumi; and Mori, Yoshifumi, 5,111,469, Cl. 372-46.000.
Hirayama, Kazutoshi: *See—*
Miyamoto, Hiroshi; and Hirayama, Kazutoshi, 5,111,078, Cl. 307-451.000.
Hiroi, Masakazu: *See—*
Wakao, Naho; Hiroi, Masakazu; Kitahara, Makoto; and Takahashi, Yuji, 5,110,104, Cl. 27[illegible]-3.100.
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Kawanami, Norihide; Okada, Kinjiro; Kobayashi, Nobuaki; and Masuda, Kimio, 5,111,520, Cl. 385-81.000.
Kawanami, Norihide; Okada, Kinjiro; and Kozu, Yoshikazu, 5,111,521, Cl. 385-82.000.
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Shimizu, Hiromitsu, 5,109,783, Cl. 112-231.000.
Hirota, Kazuo: *See—*
Ogata, Yoshitake; Ikeda, Makoto; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Yamanaka, Takashi; Hishinuma, Ieharu; Nagakawa, Junichi; Hirota, Kazuo; Miyamoto, Kaname; Horie, Toru; and Wakabayashi, Tsuneo, 5,110,956, Cl. 549-447.000.
Hiroyuki, Sakamoto, to Nitto Seiko Co., Ltd. Thread forming screw. 5,110,245, Cl. 411-421.000.
Hishinuma, Ieharu: *See—*
Ogata, Yoshitake; Ikeda, Makoto; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Yamanaka, Takashi; Hishinuma, Ieharu; Nagakawa, Junichi; Hirota, Kazuo; Miyamoto, Kaname; Horie, Toru; and Wakabayashi, Tsuneo, 5,110,956, Cl. 549-447.000.
Hishiyama, Iwao: *See—*
Hayashi, Taira; Watanabe, Hiroyuki; Tuchiya, Akira; Hagiwara, Kazuo; and Hishiyama, Iwao, 5,110,526, Cl. 264-127.000.
Hitachi Automotive Engineering Co., Ltd.: *See—*
Okamoto, Yoshio; Nakamura, Yozo; Kashiwaya, Mineo; and Hamashima, Eigi, 5,109,824, Cl. 123-472.000.
Yokoyama, Mizuho; Kanamaru, Hisanobu; Okamoto, Yoshio; Kuroha, Tunemitu; Koshizaka, Atsushi; and Shinozaki, Hironori, 5,109,823, Cl. 123-472.000.
Hitachi, Chemical Company, Ltd.: *See—*
Tai, Seiji; Hayashi, Nobuyuki; Kamijima, Koichi; Akimoto, Takayuki; Katayose, Mitsuo; and Hagiwara, Hideo, 5,110,968, Cl. 556-415.000.
Hitachi Koki Co., Ltd.: *See—*
Tanji, Isamu, 5,110,030, Cl. 227-130.000.
Ueno, Hiroshi; Kikuchi, Yasuo; Takahashi, Kunitomo; Doi, Koji; Onose, Tsukasa; and Ogawa, Toshitaka, 5,111,235, Cl. 355-246.000.
Hitachi, Ltd.,: *See—*
Akiyama, Yukiharu; and Oshima, Yoshio, 5,110,032, Cl. 228-102.000.
Fujii, Takashi; Kawahara, Hironobu; Takata, Kazuo; Nishiumi, Masaharu; and Yamamoto, Noriaki, 5,110,408, Cl. 156-643.000.
Fukuhara, Satoru; Shinada, Hiroyuki; and Seitoh, Shigemitsu, 5,111,141, Cl. 324-250.000.
Hoizumi, Shinichi; and Teranishi, Tsugutomo, 5,109,665, Cl. 60-39.182.
Kondo, Yumihito; Amamo, Yoshiaki; Kimura, Shinjiro; and Horiuchi, Susumu, 5,110,559, Cl. 422-109.000.
Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; and Nagano, Masami, 5,111,405, Cl. 364-431.070.
Maeda, Yuuji; Nakamura, Yozo; Nakamura, Kenichi; Sakamoto, Masahide; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,109,815, Cl. 123-192.100.
Miura, Hideo; Nishimura, Asao; Sakata, Shinji; Shimizu, Tasuku; and Hattori, Shigeo, 5,110,537, Cl. 376-305.000.
Miyaoka, Shuichi, 5,111,432, Cl. 365-190.000.
Miyazaki, Takeshi, 5,111,461, Cl. 371-37.100.
Mizukami, Masao; and Sato, Yoichi, 5,111,080, Cl. 307-475.000.
Nakamura, Shozo; Kaneda, Aizo; Tsunoda, Shigeharu; Hasebe, Akio; and Mitani, Masao, 5,110,515, Cl. 264-25.000.
Nakanishi, Keiichirou; Yamamoto, Masakazu; and Yamada, Minoru, 5,110,664, Cl. 428-195.000.
Nakayama, Takahiro; Tamahashi, Kunihiro; Fuyama, Moriaki; Minemura, Hiroyuki; Sato, Yoshio; Tsuboi, Nobuyoshi; and Koyanagi, Hiroaki, 5,110,792, Cl. 505-1.000.
Nishiyama, Hisashi; Hashimoto, Yasuhiro; Kanda, Hiroshi; and Katakura, Kageyoshi, 5,109,858, Cl. 128-661.090.
Ohmura, Keiji; Okuno, Sumio; Takeichi, Michifumi; Masai, Kentarou; Okamoto, Seiichi; and Nakamura, Masatake, 5,109,777, Cl. 105-401.000.
Okamoto, Yoshio; Nakamura, Yozo; Kashiwaya, Mineo; and Hamashima, Eigi, 5,109,824, Cl. 123-472.000.
Ono, Tetsuo; Hiraoka, Susumu; and Suzuki, Keizo, 5,110,407, Cl. 156-643.000.
Sakurai, Kazuo; and Tamura, Takahiro, 5,110,268, Cl. 417-410.000.
Shigenaka, Naoto; Hashimoto, Tsuneyuki; and Fuse, Motomasa, 5,111,043, Cl. 250-306.000.
Takeuchi, Yusuke; and Miki, Sakae, 5,111,425, Cl. 395-425.000.
Tanaka, Toshiki; Imoto, Katsuyuki; Kuwahara, Hiroshi; and Suzuki, Taihei, 5,111,323, Cl. 359-139.000.
Toyoshima, Hisanori; Jyoraku, Fumio; Ishii, Yoshitaro; Iwase, Yukiji; and Sato, Shigenori, 5,110,266, Cl. 417-312.000.
Yokoyama, Mizuho; Kanamaru, Hisanobu; Okamoto, Yoshio; Kuroha, Tunemitu; Koshizaka, Atsushi; and Shinozaki, Hironori, 5,109,823, Cl. 123-472.000.
Hitachi Maxell, Ltd.: *See—*
Fujita, Minoru, 5,111,446, Cl. 369-291.000.
Yamamoto, Yoshinori; and Sumiya, Kenji, 5,110,680, Cl. 428-413.000.
Hitachi Metals, Ltd.: *See—*
Kashiwagi, Hiromi, 5,111,250, Cl. 355-285.000.
Hitachi Seiki Co., Ltd.: *See—*
Hirano, Takashi; and Yamaga, Hiroshi, 5,109,973, Cl. 198-341.000.
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Irie, Akira; Kanaya, Yasuhiko; and Ohtani, Tamio, 5,109,584, Cl. 29-33.00P.
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Mizukami, Masao; and Sato, Yoichi, 5,111,080, Cl. 307-475.000.
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Hiyama, Keiichi: *See—*
Kanno, Masahide; Ieoka, Shouichi; Hiyama, Keiichi; Matsunaka, Kenji; and Eto, Tadao, 5,111,306, Cl. 358-403.000.
Hiyoshi, Yoshihiko; Ide, Youji; Nagamoto, Masanaka; and Kunitake, Tetsuji, to Ricoh Company, Ltd. Thermosensitive image transfer recording medium. 5,110,389, Cl. 156-234.000.
Hlavic, Wallace R.: *See—*
Altobelli, Rocco F.; Hlavic, Wallace R.; and Angell-Schram, Annette, 5,110,318, Cl. 8-405.000.
Hoag, Peter Y.; and Yeager, David A., to Ford Motor Company. Making a fractured powder metal connecting rod. 5,109,605, Cl. 29-888.090.
Hoarty, John T.; Hodgkinson, Leslie; and Waddicor, Michael J. Cement compositions. 5,110,362, Cl. 106-708.000.
Hobbs, James V., to Lakeland Engineering Corporation. Automatic speed control system for boats. 5,110,310, Cl. 440-1.000.
Hoblingre, Andre ; Courvoisier, Patrick; and Bari, Gerard, to ECIA. Device for temporarily axially immobilizing a shaft in a body such as a steering column casing tube. 5,110,233, Cl. 403-12.000.
Hoch, Kristiane: *See—*
Brand, Bernd; Klingelhofer, Ernst-Ludwig; and Hoch, Kristiane, 5,110,294, Cl. 434-34.000.
Hochtemperatur Reaktorbau GmbH: *See—*
Becker, Gerhard; Gross, Hans-Gunter; Henssen, Johannes; and Schoning, Josef, 5,110,006, Cl. 220-442.000.

Hoda, Takeo: *See—*
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 5,111,234, Cl. 354-455.000.
Hodge, Bobby L.: *See—*
Koch, Hans W.; and Hodge, Bobby L., 5,110,223, Cl. 384-620.000.
Hodgkinson, Leslie: *See—*
Hoarty, John T.; Hodgkinson, Leslie; and Waddicor, Michael J., 5,110,362, Cl. 106-708.000.
Hoechst Aktiengesellschaft: *See—*
Dietz, Erwin; and Urban, Manfred, 5,110,931, Cl. 546-37.000.
Faust, Horst, 5,110,618, Cl. 427-32.000.
Janocha, Siegfried; Schloegi, Gunter; Bothe, Lothar; and Crass, Guenther, 5,110,670, Cl. 428-216.000.
Lau, Jurgen; Siegemund, Gunter; and Rohrscheid, Freimund, 5,110,983, Cl. 562-435.000.
Hoechst Celanese Corp.: *See—*
Chung, Tai-Shung; and Vora, Rohitkumar H., 5,110,879, Cl. 525-432.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See—*
Effland, Richard C.; and Fink, David, 5,110,815, Cl. 514-228.200.
Hoechst Sara S.p.A.: *See—*
Farronato, Silvestro; and Gazzea, Sergio, 5,110,846, Cl. 523-346.000.
Hoeffel, James D.: *See—*
Mazzone, Daniel P.; Hoeffel, James D.; Nevitt, James S.; and Elliott, Richard E., 5,111,142, Cl. 324-262.000.
Hoelderich, Wolfgang: *See—*
Horn, Peter; Hoelderich, Wolfgang; Taddey, Rudolf; and Tintelpot, Dieter, 5,110,834, Cl. 521-52.000.
Hoess, Werner; Vetter, Heinz; Brehm, Manfred; Schroeder, Guenter; and Reiner, Roland, to Rohm GmbH. Method for imidizing an alkyl methacrylate polymer. 5,110,877, Cl. 525-378.000.
Hoffman, Jay A., Jr.: *See—*
Gundling, Ray D.; Kaminkow, Joseph E.; and Hoffman, Jay A., Jr., 5,110,617, Cl. 427-14.100.
Hoffmann-La Roche Inc.: *See—*
Baggiolini, Enrico G.; Batcho, Andrew D.; Truitt, Gary A.; Uskokovic, Milan R.; and Wovkulich, Peter M., 5,110,958, Cl. 549-454.000.
Knierzinger, Andreas; and Scalone, Michelangelo, 5,110,955, Cl. 549-411.000.
Hofmann, Jorg. Hand-operable double-action metering and/or atomizing pump. 5,110,271, Cl. 417-555.100.
Hofmeister, Peter: *See—*
Kober, Reiner; Theobald, Hans; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; Seele, Rainer; and Wagenblast, Gerhard, 5,110,829, Cl. 514-443.000.
Hofsess, Alexander: *See—*
Biebesheimer, Klaus; Hofsess, Alexander; and Simpfendorfer, Dieter, 5,109,631, Cl. 51-111.00R.
Hogan Mfg., Inc.: *See—*
Aoki, Lawrence S., 5,110,252, Cl. 414-549.000.
Hogenkamp, Wilhelm, to Otto Hansel GmbH. Method for distributing pieces of candy to packaging machines. 5,109,650, Cl. 53-443.000.
Hoizumi, Shinichi; and Teranishi, Tsugutomo, to Hitachi, Ltd. Waste heat recovery boiler system. 5,109,665, Cl. 60-39.182.
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Holden, Homer N.; Lawrence, James L.; Rogers, Jerry W.; and Sanders, John D., to Dayco Products, Inc. Method of making a hose construction. 5,109,600, Cl. 29-890.144.
Holland, Andrea G.: *See—*
Teuscher, Leon A.; Mishra, Satchidanand; and Holland, Andrea G., 5,110,700, Cl. 430-64.000.
Holland, Gregory R.: *See—*
Grambush, Douglas H.; Holland, Gregory R.; and York, Walter A., 5,111,029, Cl. 219-521.000.
Hollander, Milton B., to Omega Engineering, Inc. Method of fabricating thermocouple cable and the cable resulting therefrom. 5,111,002, Cl. 174-102.00P.
Hollenbeck, William E.; Foster, Timothy P.; and Reed, Adam J., to Applied Laser Systems. Method and apparatus for aligning a laser diode, and laser diode system produced thereby. 5,111,476, Cl. 372-107.000.
Holloman, Miles E.: *See—*
Otto, William F.; Holloman, Miles E.; and Jordan, Debbee J., 5,110,368, Cl. 136-246.000.
Holloway, Donald E.: *See—*
Duggan, Robert B.; Goins, James V.; Holloway, Donald E.; and Moulder, Ronald, 5,109,806, Cl. 122-13.100.
Holloway, Robert R., to Hewlett-Packard Company. Capillary gel column with polyorganosiloxane coupling layer. 5,110,439, Cl. 204-299.00R.
Holstein und Kappert AG: *See—*
Zodrow, Rudolf; and Buchholz, Rainer, 5,110,402, Cl. 156-573.000.
Holt, Dennis A.; Levy, Mark A.; and Metcalf, Brian W., to Smithkline Beecham Corporation. Intermediates in the preparation of steriod 5-alpha-reductase inhibitors. 5,110,939, Cl. 548-250.000.
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Dvoroznak, Donald S.; and Holtzclaw, James O., Jr., 5,110,022, Cl. 224-150.000.
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Akimori, Giichiro; and Nebu, Hideaki, 5,109,942, Cl. 180-219.000.
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Yahagi, Toshio; Iwagawa, Yoshihiro; Sugimoto, Yoichi; and Satoh, Tsuyoshi, 5,109,694, Cl. 73-9.000.
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Chazono, Hirokazu; Saito, Hiroshi; Honda, Mutsumi; Shizuno, Hisamitsu; and Kishi, Hiroshi, 5,111,357, Cl. 361-321.000.
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Sarma, Kalluri R., 5,110,748, Cl. 437-51.000.
Hong, Amy. Venetian blind. 5,109,909, Cl. 160-168.100.
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Nichols, Dwight E., 5,110,000, Cl. 220-4.160.
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Scoggins, Lacey E.; and Hoover, Kenneth C., 5,110,902, Cl. 528-388.000.
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Husted, David M.; Jones, William H.; and Tighe, William R., 5,109,963, Cl. 192-8.00C.
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Tanimoto, Masahiro, 5,110,554, Cl. 422-78.000.
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Koyama, Shigeo; Tsutsui, Eiji; Kobayashi, Kazuhiro; Horihata, Katsushi; and Tanaka, Hiroyuki, 5,111,244, Cl. 355-210.000.
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Kondo, Yumihito; Amamo, Yoshiaki; Kimura, Shinjiro; and Horiuchi, Susumu, 5,110,559, Cl. 422-109.000.
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Maeda, Susumu; Furusawa, Mitsuru; Marumoto, Yasumasa; Horiuchi, Tadashi; Sato, Yoshinari; and Saeki, Yoshiyuki, 5,110,729, Cl. 435-69.100.
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Tsujimoto, Naohiko; Yamakoshi, Masaru; Kudo, Toshimitsu; Horiuchi, Yukiko; and Shimizu, Jiro, 5,110,915, Cl. 530-502.000.
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Horn, Peter; Hoelderich, Wolfgang; Taddey, Rudolf; and Tintelpot, Dieter, to BASF Aktiengesellschaft. Production of chlorofluorocarbon-free urethane-containing soft-elastic moldings having a cellular core and a compacted peripheral zone. 5,110,834, Cl. 521-52.000.
Horst, Gary E., to Emerson Electric Co. Isolated segmental switch reluctance motor. 5,111,096, Cl. 310-168.000.
Horvath, Robert J. Manual valve cleaner for removing deposits from intake and outtake valves of internal combustion engines. 5,109,564, Cl. 15-236.060.
Horwitz, E. Philip; and Dietz, Mark L., to Arch Development Corporation. Method for liquid chromatographic extraction of strontium from acid solutions. 5,110,474, Cl. 210-635.000.
Horyo Corporation: *See—*
Mohri, Toyoshige; and Makino, Toshiyuki, 5,109,976, Cl. 198-498.000.
Hosaka, Hideo: *See—*
Ueda, Akiyoshi; Ohishi, Haruhito; Aihara, Toshio; Ishikawa, Hisao; Tomida, Kazuyuki; and Hosaka, Hideo, 5,110,343, Cl. 71-88.000.
Hosakawa, Masashi: *See—*
Ochi, Mitsuzo; Nakano, Shoji; and Hosakawa, Masashi, 5,110,386, Cl. 156-204.000.
Hose, Mitchel S.: *See—*
Prestel, James D.; Hose, Mitchel S.; and Barbour, Paul J., 5,110,646, Cl. 428-43.000.
Hoshi, Junichi, to Canon Kabushiki Kaisha. Photoelectric conversion device. 5,111,264, Cl. 357-30.000.

Hoshizaki Denki Kabushiki Kaisha: *See*—
Hida, Junichi, 5,109,679, Cl. 62-320.000.
Hosiden Corporation: *See*—
Ichitsubo, Norio, 5,110,309, Cl. 439-630.000.
Hosoba, Hiroyuki; Seki, Akinori; Hata, Toshio; Kondou, Masafumi; Suyama, Takahiro; and Matsui, Sadayoshi, to Sharp Kabushiki Kaisha. Semiconductor laser device and a method of fabricating the same. 5,111,470, Cl. 372-46.000.
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Miyata, Seizo; Hosomi, Takeshi; Suzuki, Toshio; Watanabe, Toshiyuki; Yamamoto, Hirotsugu; and Hayashi, Akio, 5,110,988, Cl. 564-441.000.
Hosono, Takeshi: *See*—
Seki, Masaki; Hosono, Takeshi; Hayanagi, Shizuaki; and Suzuki, Koji, 5,111,532, Cl. 395-102.000.
Hosoya, Masahiro; Saito, Mitsunaga; Endo, Mitsuharu; Ohtaka, Yoshimitsu; and Futamata, Yukio, to Kabushiki Kaisha Toshiba; and Tokyo Electric Co., Ltd. Contact type developing method and developing unit. 5,110,705, Cl. 430-120.000.
Hostler, Jonathan E.; and Byers, Frank J., to PPG Industries, Inc. Automatic interlayer trimming. 5,109,632, Cl. 51-135.00R.
Hotori, Masahiro: *See*—
Nakajima, Heitaro; Hotori, Masahiro; Ogawa, Hiroshi; and Fujiie, Kazuhiko, 5,111,442, Cl. 369-47.000.
Hou, Jack, to Giftec, Ltd. Decorative display device. 5,110,636, Cl. 428-11.000.
Houben, Paulus A., to U.S. Philips Corporation. Method of determining a display parameter in a picture display tube and method of improving a picture display in a picture display tube. 5,111,110, Cl. 315-10.000.
Houck, Ronald B., to Avtech, Inc. Picture position marking tool. 5,109,611, Cl. 33-613.000.
Houziaux, Patrick; Riffaud, Jean-Pierre; Lacolle, Jean-Yves; and Danree, Bernard, to Institut de Recherches Chimiques et Biologiques Appliquees (I.R.C.E.B.A.). 3-[2-(4-arylpiperazin-1-yl)ethoxy]-p-cymene, the method of preparing and composition thereof. 5,110,816, Cl. 514-255.000.
Howard, David B.; Kenley, Rodney; Berry, Dennis; Keshaviah, Prakash; and Vishnoi, Rohit. Dialyzer clearance check system. 5,110,477, Cl. 210-647.000.
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Kozloski, Edward A.; Seiger, Eric; Howard, Walter E.; and Weldon, James R., 5,110,469, Cl. 210-455.000.
Hoyois, Jean-Claude: *See*—
Depauw, Jean-Michel; and Hoyois, Jean-Claude, 5,110,662, Cl. 428-192.000.
Hsieh, Henry L.; and Ahmed Iqbal, to Phillips Petroleum Company. Superabsorbent crosslinked ampholytic ion pair copolymers. 5,110,887, Cl. 526-287.000.
Hsieh, Henry L.: *See*—
Pettijohn, Ted M.; and Hsieh, Henry L., 5,110,884, Cl. 526-114.000.
Hsieh, Yen-Ping C.: *See*—
Brown, Robert A.; Hsieh, Yen-Ping C.; and Court, James L., 5,110,613, Cl. 426-549.000.
Hsu, David S. Y., to United States of America, Navy. Method of nanometer lithography. 5,110,760, Cl. 437-180.000.
Hsu, Yang-Wen. Light string control apparatus. 5,111,112, Cl. 315-205.000.
Huang, Harrison. Adhesive tape cutter. 5,110,401, Cl. 156-527.000.
Hubbard, Vance M.; and Brunson, Welton K., to Tecnol, Inc. Facial ice pack. 5,109,841, Cl. 128-382.000.
Huber, Terrence D.; Kutsch, Duane B.; Seaton, William J.; and Skinfill, Donald R., to American On-Premise Advertising Company. Electronic display element for electronic display device. 5,111,193, Cl. 340-783.000.
Hubricht, Gerhard: *See*—
Schunk, Bernd; Stolllewerk, Reinfried; Hubricht, Gerhard; and Peters, Jorg, 5,111,524, Cl. 385-102.000.
Huch, Richard O., to Cyprus Minerals Company. Method for achieving enhanced copper flotation concentrate grade by oxidation and flotation. 5,110,455, Cl. 209-167.000.
Hucul, Dennis A., to Dow Chemical Company, The. Polymer hydrogenation catalysts. 5,110,779, Cl. 502-185.000.
Huddleston, David A., to Nalco Chemical Company. Liquid aluminum phosphate salt gelling agent. 5,110,485, Cl. 252-8.551.
Hudzik, James S.: *See*—
Zachman, Julie C.; Kuntz, Robert A.; Smith, Steven R.; and Hudzik, James S., 5,111,405, Cl. 364-474.020.
Huels Aktiengesellschaft: *See*—
Simon, Ulrich; and Scholten, Heinz, 5,110,673, Cl. 428-236.000.
Hufnagle, Donald L.; and Svoboda, Steven J., to Toro Company, The. Self-detenting transmission shift key. 5,109,722, Cl. 74-371.000.
Hughes Aircraft Company: *See*—
Cawelti, Donald G.; Berlin, Bryan F.; and Kenna, John T., 5,110,065, Cl. 242-158.00R.
Erlich, Simha, 5,111,163, Cl. 332-117.000.
Gates, James L., 5,110,299, Cl. 439-68.000.
Ledebuhr, Arno G., 5,111,315, Cl. 359-40.000.
Hujii, Masao: *See*—
Sakuma, Kiyoshi; Yoshida, Takayuki; Tezuka, Tomohumi; Aoki, Katsuyuki; Yamada, Makoto; Hujii, Masao; and Morinushi, Ken, 5,109,919, Cl. 165-151.000.
Hull, Harold L.; and Hale, Brian D. Slide hammer tool. 5,109,739, Cl. 81-463.000.
Hull, Harold L.; and Swinney, Robert R. Closed loop copper cell extraction process. 5,110,354, Cl. 75-726.000.
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Human, David M.: *See*—
Newkirk, Matthew S.; and Human, David M., 5,109,710, Cl. 73-863.110.
Humayun, Mark S.: *See*—
de Juan, Eugene, Jr.; Humayun, Mark S.; and Phillips, D. Howard, 5,109,844, Cl. 128-419.00R.
Hung, Ming-Hong; and Kaku, Mureo, to Du Pont de Nemours, E. I., and Company. Halodioxolane-containing oxazines and oxazolines, and their polymers. 5,110,938, Cl. 548-237.000.
Hung, Nelson C.; and Welk, John R., to Motorola, Inc. Digital cellular TDM system employing 6:1 packing of transcoded information. 5,111,454, Cl. 370-95.300.
Hung, Ying-Teh. Pliers for cutting and peeling telco cord and press-fitting such cord to a telco plug. 5,109,591, Cl. 29-566.400.
Hungerbuhler, Walter; and Meindl, Hubert, to BASF Aktiengesellschaft. Hair-setting preparation. 5,110,582, Cl. 424-47.000.
Hunt, Peter F., to ESL, Inc. Electronic information display module and connector therefor. 5,111,196, Cl. 340-825.350.
Hunter Company, The: *See*—
Dvoroznak, Donald S.; and Holtzclaw, James O., Jr., 5,110,022, Cl. 224-150.000.
Hunter Fan Company: *See*—
Junkin, Leigh A., 5,110,261, Cl. 416-204.00R.
Hunter, Henry J.; Marshall, Clifton W.; Cunningham, Kenneth; and Tingdahl, Marvin A., to United States of America, Air Force. Personnel capsule extraction apparatus. 5,110,071, Cl. 244-137.300.
Hunter, Philip B.; Chou, Chang-Long; and Wang, Muh-Shuh, to USX Corporation. Method of promoting the decarburization reaction in a vacuum refining furnace. 5,110,351, Cl. 75-508.000.
Hunter, Scott R., to GTE Products Corporation. Triple-enveloped metal-halide arc discharge lamp having lower color temperature. 5,111,104, Cl. 313-25.000.
Hunter, Timothy M.; Pham, Hung M.; and Zanghi, John L., to Xerox Corporation. Method and apparatus for reducing pixel clock jitter in a laser scanner. 5,111,062, Cl. 307-269.000.
Hunter, Wood E.; and Craun, Gary P., to Calgon Corporation. Method for producing free-flowing, water-soluble polymer gels. 5,110,851, Cl. 524-106.000.
Huntleigh Technology, Plc: *See*—
Schild, Rolf, 5,109,561, Cl. 5-453.000.
Hurden, Derek, to Trenton Box Company Limited. Cartons with pouring spouts. 5,110,042, Cl. 229-215.000.
Hurst, William: *See*—
Whiteman, Paul L.; and Hurst, William, 5,110,164, Cl. 292-4.000.
Huschka, Hans; Demmich, Joerg; and Maurer, Paul-Gerhard, to Nukem GmbH. Device for the thermal treatment or organic and inorganic substances. 5,109,918, Cl. 165-104.180.
Husco International: *See*—
Voruz, James T., 5,109,699, Cl. 73-632.000.
Husted, David M.; Jones, William H.; and Tighe, William R., to Hoover Universal, Inc. Four way manual seat adjuster clutch assembly. 5,109,963, Cl. 192-8.00C.
Hutchings, Timothy: *See*—
Pink, Harry S.; Hutchings, Timothy; and Stadler, James F., 5,110,490, Cl. 252-35.000.
Hutchinson S.A.: *See*—
Simon, Jean-Michel, 5,110,097, Cl. 267-136.000.
Hutchison, V. James. Merchandise display system and merchandise holder therefor. 5,109,993, Cl. 211-87.000.
Huyck Corporation: *See*—
Zehle, Wilhelm; and Gstrein, Hippolit, 5,110,672, Cl. 428-234.000.
Huynh, Hoa T.: *See*—
Wong, Patrick S. L.; Theeuwes, Felix; Eckenhoff, James B.; Larsen, Steven D.; and Huynh, Hoa T., 5,110,597, Cl. 424-438.000.
Hwang, Edward Y. C., to Westinghouse Electric Corp. Valve position sensing circuit. 5,109,675, Cl. 60-660.000.
Hyde, Richard R.: *See*—
Blaha, William E.; and Hyde, Richard R., 5,110,092, Cl. 254-134.3FT.
Hydraulik-Ring GmbH: *See*—
Trzmiel, Alfred; Fiedler, Olaf; and Weyandt, Johannes, 5,109,813, Cl. 123-90.150.
Hydravac Corporation: *See*—
Booth, John W., 5,109,880, Cl. 134-108.000.
Hydreclaim Corporation: *See*—
Moller, Richard W., 5,110,521, Cl. 264-40.400.
Hylsa S.A. de C.V.: *See*—
Villarreal-Trevino, Juan A.; Zendejas-Martinez, Eugenio; and Martinez-Vera, Enrique R., 5,110,350, Cl. 75-495.000.
Hymore, Ronald R.: *See*—
Gajewski, Kenneth J.; Hymore, Ronald R.; and Nietering, Kenneth E., 5,111,329, Cl. 359-275.000.
Hyperbaric Mountain Technologies, Inc.: *See*—
Gamow, Rustem I., 5,109,837, Cl. 128-202.120.
Hyperion Catalysis International: *See*—
Friend, Stephen O.; Atkins, Jaspard H.; Tennent, Howard G.; and Hausslein, Robert, 5,110,693, Cl. 429-40.000.
Hyun, Whoang J.; and Jo, Mun H., to SamSung Electronics Co., Ltd. Electronic microwave heating apparatus. 5,111,012, Cl. 219-10.55R.
Hyundai Electronics Ind. Co., Ltd.: *See*—
Park, Kyung, 5,109,572, Cl. 16-334.000.

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Suga, Tadoru, 5,109,654, Cl. 53-511.000.
IBM: *See*—
Egitto, Frank D.; and Mlynko, Walter E., 5,110,409, Cl. 156-643.000.
Ice-Cel Pty. Limited: *See*—
Merryfull, Albert E., 5,109,920, Cl. 165-163.000.
Ichihara, Masami: *See*—
Yamamasu, Yoshikazu; Morita, Tetsuyuki; Nakaniwa, Sadao; and Ichihara, Masami, 5,110,541, Cl. 419-2.000.
Ichikawa, Yoshio, to NEC Corporation. Apparatus for allocating subscriber identification numbers to plural service zones in a paging system. 5,111,197, Cl. 340-825.440.
Ichinose, Tadashi: *See*—
Yamauchi, Makoto; Kurata, Yoshiaki; and Ichinose, Tadashi, 5,110,114, Cl. 271-262.000.
Ichitsubo, Norio, to Hosiden Corporation. Multi-pole electrical connector. 5,110,309, Cl. 439-630.000.
Ichizawa, Yasuji: *See*—
Hamada, Fumihiko; Tsuboi, Kunio; Hasegawa, Mitihiko; Ichizawa, Yasuji; Yabe, Toshiya; Yamasaki, Kunitomo; Takahashi, Yasunobu; and Mizuta, Katsuji, 5,111,252, Cl. 355-308.000.
ICI Americas Inc.: *See*—
Woolard, Frank X., 5,110,947, Cl. 548-531.000.
ICI Australia Limited: *See*—
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; and Cross, Linsay E., 5,110,989, Cl. 568-327.000.
Idaho Research Foundation, Inc.: *See*—
Whitaker, Sterling R., 5,111,429, Cl. 365-156.000.
Ide, Takehiko, to Matsushita Electric Industrial Co., Ltd. Printing device having a ribbon cassette with a end of ribbon sensor. 5,110,229, Cl. 400-249.000.
Ide, Youji: *See*—
Hiyoshi, Yoshihiko; Ide, Youji; Nagamoto, Masanaka; and Kunitake, Tetsuji, 5,110,389, Cl. 156-234.000.
Ideal Industries: *See*—
Blaha, William E.; and Hyde, Richard R., 5,110,092, Cl. 254-134.3FT.
Ideal Standard GmbH: *See*—
Bergmann, Konrad, 5,110,044, Cl. 236-12.160.
Idemitsu Kosan Co., Ltd.: *See*—
Hiroi, Yoshio; and Yokoyama, Seiichiro, 5,110,964, Cl. 556-143.000.
Yuasa, Kimihiro; and Hashimoto, Kenji, 5,110,623, Cl. 427-162.000.
Idleman, Thomas E.; and Stamness, Jesse I., to Unisys Corp. Variable rate improvement of disc cache subsystem. 5,111,387, Cl. 395-425.000.
Ienaga, Kazuharu; and Higashiura, Kunihiko, to Nippon Zoki Pharmaceutical Co., Ltd. Peptide compound and a pharmaceutically acceptable salt thereof. 5,110,797, Cl. 514-19.000.
Ieoka, Shouichi: *See*—
Kanno, Masahide; Ieoka, Shouichi; Hiyama, Keiichi; Matsunaka, Kenji; and Eto, Tadao, 5,111,306, Cl. 358-403.000.
IEV International Pty. Limited: *See*—
Do, Christopher N., 5,109,957, Cl. 187-1.00R.
Igarashi, Akira, to Fuji Photo Film Co., Ltd. Wet dispersion process and process of producing heat-sensitive recording material. 5,110,848, Cl. 524-30.000.
Igawa, Kazushige: *See*—
Kamiyama, Katsumi; and Igawa, Kazushige, 5,110,777, Cl. 502-68.000.
Ii, Hiroshi, to Sharp Kabushiki Kaisha. Digital phase locked loop system. 5,111,151, Cl. 328-155.000.
Iida, Kazumasa: *See*—
Yoshida, Masato; Yokoyama, Takanao; Nanba, Muneyoshi; Kato, Yoshihiko; Iida, Kazumasa; and Miyamoto, Katsuhiko, 5,109,821, Cl. 123-425.000.
Iida, Shigeki: *See*—
Hara, Hajime; Orii, Shingo; Satoh, Tetsuo; Toya, Tomohiro; and Iida, Shigeki, 5,110,698, Cl. 430-20.000.
Iida, Yasumasa: *See*—
Kato, Kunio; Iida, Yasumasa; Honda, Takenobu; Sugita, Kazuhiko; and Yamasaki, Shinji, 5,109,958, Cl. 187-20.000.
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Ogata, Yoshitake; Ikeda, Makoto; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Yamanaka, Takashi; Hishinuma, Ieharu; Nagakawa, Junichi; Hirota, Kazuo; Miyamoto, Kaname; Horie, Toru; and Wakabayashi, Tsuneo, 5,110,956, Cl. 549-447.000.
Ikeda, Minoru: *See*—
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Ikeda, Osamu: *See*—
Jikihara, Tetsuo; Shike, Toyohiko; Katsurada, Manabu; Watanabe, Hisao; and Ikeda, Osamu, 5,110,342, Cl. 71-88.000.
Ikeda, Takeshi. LC noise filter. 5,111,169, Cl. 333-181.000.
Ikeda, Tatsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Method for manufacturing semiconductor device. 5,110,749, Cl. 437-26.000.
Ikegami Tsushinki Co., Ltd.: *See*—
Suzuki, Akihiro; Yamamoto, Hiroshi; and Tobita, Hiroshi, 5,110,102, Cl. 270-53.000.
Ikola, Kimmo J.; and Stenman, Kimmo E., to Tamglass Oy. Apparatus for removing a marginal zone external of an outline cut in a glass sheet. 5,110,340, Cl. 65-269.000.
Imaginative Research Associates, Inc.: *See*—
Vishnupad, Mohan; and Ramirez, Jose, 5,110,862, Cl. 524-601.000.
Imai, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Means for securing a photodetector to a base plate or the like. 5,111,041, Cl. 250-239.000.
Imai, Kiyoshi: *See*—
Tsuji, Toshiaki; Imai, Kiyoshi; and Ishizu, Atsushi, 5,111,297, Cl. 358-183.000.
Imai, Takahiro; and Fujimori, Naoji, to Sumitomo Electric Industries, Ltd. X-ray lithography mask and method for producing same. 5,111,491, Cl. 378-35.000.
Imai, Toshihisa: *See*—
Morinushi, Ken; Tanaka, Hideharu; Noguchi, Yoshihiro; Imai, Toshihisa; and Takahashi, Yutaka, 5,110,258, Cl. 415-119.000.
Imamura, Hirokatsu: *See*—
Umise, Shigeki; and Imamura, Hirokatsu, 5,109,795, Cl. 118-669.000.
Immunetech Pharmaceuticals: *See*—
Hahn, Gary S., 5,110,795, Cl. 514-17.000.
Imoto, Katsuyuki: *See*—
Tanaka, Toshiki; Imoto, Katsuyuki; Kuwahara, Hiroshi; and Suzuki, Taihei, 5,111,323, Cl. 359-139.000.
Imoto, Yasuo, to Brother Kogyo Kabushiki Kaisha. Device for magnifying displacement of piezoelectric element and method of producing the same. 5,111,101, Cl. 310-328.000.
Impastato, Frank; and Grass, Debbie. Food supplement dispensing system for animals. 5,109,798, Cl. 119-51.030.
Imperial Chemical Industries, PLC: *See*—
Brittain, David R.; Brown, Steven P.; Cooper, Anthony L.; Longridge, Jethro L.; Morris, Jeffrey J.; Preston, John; and Slater, Linda, 5,110,808, Cl. 514-155.000.
Edwards, Derek W., 5,110,996, Cl. 570-159.000.
Law, Brian R.; and Harris, Christopher, 5,110,007, Cl. 221-25.000.
Nguyen, Nhan H., 5,110,979, Cl. 560-61.000.
Noakes, Kim P. A.; and Davidson, Peter J., 5,110,563, Cl. 422-191.000.
INA Bearing Company, Inc.: *See*—
Koch, Hans W.; and Hodge, Bobby L., 5,110,223, Cl. 384-620.000.
Inaba Denki Sangyo Co., Ltd.: *See*—
Deguchi, Takeshi, 5,110,074, Cl. 248-340.000.
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Tanaka, Toru; and Inari, Masato, 5,110,982, Cl. 562-414.000.
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Roswold, Wesley D., 5,111,011, Cl. 200-550.000.
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Bueter, John C.; Fields, Randall T.; Chandler, Martin D.; Neuls, Frederick W.; and Laffkas, Harry P., 5,109,932, Cl. 173-17.000.
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Lu, Chih-Yuan, 5,110,752, Cl. 437-47.000
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Everts, Robert G., 5,109,607, Cl. 30-276.000.
Infrasonik AB: *See*—
Sandstrom, Roland, 5,109,948, Cl. 181-142.000.
Ing. Erich Pfeiffer GmbH & Co. KG: *See*—
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Inger, Siegfried, to Palitex Project Company GmbH. Operating method and apparatus for the automated removal of yarn remnants from winding tubes by an automated maintenance and servicing device traveling along a textile yarn processing machine. 5,109,662, Cl. 57-305.000.
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Norman, Arthur E., 5,110,249, Cl. 414-217.000.
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Cole, Rodney D., 5,109,979, Cl. 206-229.000.
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Turro, Nicholas J.; and Fehlner, James R., 5,110,425, Cl. 204-158.120.

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Houziaux, Patrick; Riffaud, Jean-Pierre; Lacolle, Jean-Yves; and Danree, Bernard, 5,110,316, Cl. 514-255.000.

Institut Francais Du Petrole et Aerospatiale: *See—*
Sparks, Charles; Odru, Pierre; Auberon, Marcel; and Fuchs, Jean-Francois, 5,110,644, Cl. 428-36.300.

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Dellacherie, Edith; Leonard, Michele; Sacco, Daniel; and Vigneron, Claude, 5,110,909, Cl. 530-385.000.

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Kharitonov, Alexandr S.; Panov, Gennadii I.; Ione, Kazimira G.; Romannikov, Vyacheslav N.; Sheveleva, Galina A.; Vostrikova, Lidia A.; and Sobolev, Vladimir I., 5,110,995, Cl. 568-800.000.

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Instone, Jeremy; and Instone, Giles, 5,109,999, Cl. 220-1.500.

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Mills, Gary N.; Homayoun, Habib; and Semler, Herbert J., 5,111,396, Cl. 364-413.050.

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Sepponen, Raimo E., 5,111,145, Cl. 324-316.000.

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Flamm, Ronald C.; Turner, Leonard O.; and Plunkett, James D., 5,111,362, Cl. 361-395.000.
Tzeng, Jyh-Cherng J., 5,111,270, Cl. 357-23.500.
Wong, Keng L.; and Schutz, Joseph D., 5,111,067, Cl. 307-272.300.
Young, Ian A.; and Greason, Jeffrey K., 5,111,077, Cl. 307-446.000.

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Atallah, Francois I., 5,111,081, Cl. 307-475.000.
Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., 5,110,711, Cl. 430-296.000.
Belloc, Jacques; Galand, Claude; Lancon, Emmanuel; Milewski, Andre; and Quintin, Michel, 5,111,417, Cl. 364-724.100.
Boettiger, Ulrich C.; and Hafner, Bernhard, 5,111,240, Cl. 355-53.000.
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McBride, Donald G., 5,109,601, Cl. 29-840.000.
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Zurfluh, Erwin A., 5,110,194, Cl. 385-16.000.

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Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., 5,110,953, Cl. 549-263.000.

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Krasij, Myron; and Watson, Paul R., 5,110,691, Cl. 429-35.000.

International Paper Company: *See—*
Keeler, Donald E., 5,110,041, Cl. 229-125.150.

International Superconductor Corp.: *See—*
De, Dilip K., 5,110,793, Cl. 505-869.000.

Intevep, S.A.: *See—*
Romero, Irene; and Rodrigues, Rui, 5,109,713, Cl. 73-864.830.

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Sawabe, Atsuhito; and Inuzuka, Tadao, 5,110,405, Cl. 156-610.000.

Involvo AG: *See—*
Roth, Oscar, 5,110,101, Cl. 270-39.000.

Inzerillo, Giuseppe; and Nerdio, Franco. Method for manufacturing watch dials of murrino glass and dials obtained with this method. 5,109,635, Cl. 51-283.00R.

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Rosenblatt, Aaron; Rosenblatt, David H.; Feldman, David; Knapp, Joseph E.; Battisti, Diane; and Morsi, Badie, 5,110,580, Cl. 423-472.000.

Ione, Kazimira G.: *See—*
Kharitonov, Alexandr S.; Panov, Gennadii I.; Ione, Kazimira G.; Romannikov, Vyacheslav N.; Sheveleva, Galina A.; Vostrikova, Lidia A.; and Sobolev, Vladimir I., 5,110,995, Cl. 568-800.000.

Iowa State University Research Foundation: *See—*
Slomka, Bogdan J.; and Buttermore, William H., 5,109,714, Cl. 73-865.500.

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Pirson, Philippe; Falmagne, Jean-Bernard; and Trouet, Andre, 5,110,935, Cl. 546-17[illegible].000.

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Jeanes, Isaac W., 5,110,183, Cl. 297-343.000.

Isaksson, Juhani, to A. Ahlstrom Corporation. Filter for filtration of particles from a hot gas flow. 5,110,332, Cl. 55-378.000.

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Kutaragi, Ken; Furuhashi, Makoto; and Ishibashi, Toshiya, 5,111,530, Cl. 395-20.000.

Ishida, Koichi: *See—*
Hori, Kimihiko; Sakaguchi, Akira; Ishida, Koichi; Nomura, Tomoko; Suzuki, Keiko; and Tsuchiya, Shuichi, 5,110,826, Cl. 514-39.000.

Ishida, Syozi: *See—*
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Sando, Yoshiteru; Nakano, Eiichi; and Ishidoshiro, Hiroshi, 5,110,481, Cl. 210-721.000.

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Kato, Eiichi; and Ishii, Kazuo, 5,110,701, Cl. 430-96.000.

Ishii, Yasuo: *See—*
Itoi, Motokazu; Kobayashi, Shizuko; Ishii, Yasuo; and Kasuya, Minako, 5,110,796, Cl. 514-18.000.

Ishii, Yoshitaro: *See—*
Toyoshima, Hisanori; Jyoraku, Fumio; Ishii, Yoshitaro; Iwase, Yukiji; and Sato, Shigenori, 5,110,266, Cl. 417-312.000.

Ishikawa, Fumihiko: *See—*
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Sakata, Sueo; and Kumano, Masayoshi, 5,111,377, Cl. 363-95.000.

Ishikawa, Hisao: *See—*
Ueda, Akiyoshi; Ohishi, Haruhito; Aihara, Toshio; Ishikawa, Hisao; Tomida, Kazuyuki; and Hosaka, Hideo, 5,110,343, Cl. 71-88.000.

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Ishikawa, Kiyomitsu; and Tanabe, Toru, to Stanley Electric Co., Ltd. Vehicle braking action alarming apparatus. 5,111,182, Cl. 340-479.000.

Ishikawa, Takatoshi: *See—*
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Ishikawajima-Harino Heavy Industries Co., Ltd.: *See—*
Yamamasu, Yoshikazu; Morita, Tetsuyuki; Nakaniwa, Sadao; and Ichihara, Masami, 5,110,541, Cl. 419-2.000.

Ishimura, Tadashi: *See—*
Miyashita, Susumu; Ishimura, Tadashi; and Hironaka, Yoshiaki, 5,110,468, Cl. 210-321.690.

Ishimura, Yoshimasa; and Kurata, Yohei, to Showa Denko K.K. Method for producing L-ascorbic acid 2-phosphates. 5,110,951, Cl. 549-222.000.

Ishizu, Atsushi: *See—*
Tsuji, Toshiaki; Imai, Kiyoshi; and Ishizu, Atsushi, 5,111,297, Cl. 358-183.000.

Isono, Nobuyuki: *See—*
Saitou, Yoshitami; Isono, Nobuyuki; and Suzumura, Nobuyasu, 5,109,967, Cl. 192-0.076.

ISONOVA Technische Innovationen G.m.b.H: *See—*
Fialla, Peter, 5,110,994, Cl. 568-727.000.

Isozaki, Yasuhito: *See—*
Hasegawa, Yo; Okano, Kazuyuki; Isozaki, Yasuhito; Tabata, Munehiro; Hayashi, Chiharu; and Nakanishi, Akira, 5,110,622, Cl. 427-126.100.

ISP Investments Inc.: *See—*
Chaudhuri, Ratan K.; Tracy, David J.; Login, Robert B.; and Helioff, Michael W., 5,110,585, Cl. 424-70.000.

Itabashi, Yasushi: *See—*
Nakahara, Moriya; Saito, Yasuyuki; Shirai, Kenichi; Itabashi, Yasushi; and Turugai, Takashi, 5,110,762, Cl. 437-189.000.

Ito, Kazuhiko: *See—*
Kinoshita, Takao; Ito, Kazuhiko; and Yamagata, Shigeo, 5,111,304, Cl. 358-341.000.

Ito, Kenji; and Kimura, Kaoru, to Toagosei Chemical Industry Co., Ltd. Primer composition containing an organometallic compound for binding substrates with a cyanocrylate adhesive. 5,110,392, Cl. 156-314.000.

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Ito, Mutsuhiro; Abe, Toshiyasu; Orii, Ryuji; and Yamakoshi, Tomio, to Fuji-Davison Chemical Ltd. Apparatus and method for measuring adsorption/desorption. 5,109,716, Cl. 73-865.500.

Ito, Noriki: *See—*
Fujikura, Takashi; Ito, Noriki; Matsumoto, Yuzo; Asano, Masaharu; and Takenaka, Toichi, 5,110,820, Cl. 514-356.000.

Ito, Satoshi: *See—*
Sato, Eiji; Matsuhashi, Ryo; Ito, Satoshi; Tano, Kazuhiro; and Asakawa, Kenichi, 5,110,544, Cl. 420-69.000.

Itoi, Motokazu; Kobayashi, Shizuko; Ishii, Yasuo; and Kasuya, Minako, to Yamanouchi Pharmaceutical Co., Ltd. Prophylactic and therapeutic agents for cataracts. 5,110,796, Cl. 514-18.000.

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Rivera, Duveen J.; and Kotrba, John J., 5,111,202, Cl. 341-139.000.

Iversen, Arthur H. Thermal management of power conditioning systems. 5,111,280, Cl. 357-82.000.

Iwagawa, Yoshihiro: *See—*
Yahagi, Toshio; Iwagawa, Yoshihiro; Sugimoto, Yoichi; and Satoh, Tsuyoshi, 5,109,694, Cl. 73-9.000.

Iwai, Hiroyuki: *See—*
Asano, Takanobu; Kitayama, Hirofumi; Iwai, Hiroyuki; and Ono, Yuuji, 5,110,248, Cl. 414-172.000.

Iwamoto, Akira: *See—*
Tokiwa, Yutaka; and Iwamoto, Akira, 5,110,838, Cl. 521-81.000.

Iwasa, Hiroki: *See—*
Doke, Harumi; Ishida, Syozi; Iwasa, Hiroki; Nagasaka, Chikao; Ueda, Masuyuki; Kato, Shigeru; Aoki, Hisashi; Shibahara, Makoto; and Mori, Satoshi, 5,111,006, Cl. 200-5.00R.

Iwasaki, Yasuhisa: *See—*
Harada, Hiroaki; and Iwasaki, Yasuhisa, 5,110,952, Cl. 549-226.000.

Iwasawa, Toshio, to Bridgestone Corporation. Gas venting device for foam mold. 5,110,085, Cl. 251-29.000.

Iwase, Yukiji: *See—*
Toyoshima, Hisanori; Jyoraku, Fumio; Ishii, Yoshitaro; Iwase, Yukiji; and Sato, Shigenori, 5,110,266, Cl. 417-312.000.

Iwata, Toshiki, to NEC Corporation. Integrated clock driver circuit. 5,111,063, Cl. 307-269.000.

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Iwatani Sangyo Kabushiki Kaisha (Iwatani International Corp.): *See—*
Kuwano, Akira; and Kidowaki, Yoshimasa, 5,110,357, Cl. 106-35.000.

Iwatsuki, Kunihiro; Kimura, Hiromichi; and Otsubo, Hideaki, to Toyota Jidosha Kabushiki Kaisha. Shift control system and method for automatic transmission. 5,109,731, Cl. 74-866.000.

J. Eberspacher: *See—*
Gaysert, Herr G.; and Gotz, Herr D., 5,110,286, Cl. 431-208.000.

J. Josephson, Inc.: *See—*
McPherson, Cheryl; Stanko, Gary; and Urso, Richard, 5,109,991, Cl. 211-45.000.

Jackson, Carl A.: *See—*
Broberg, David E.; and Jackson, Carl A., 5,110,320, Cl. 51-295.000.
Broberg, David E.; and Jackson, Carl A., 5,110,321, Cl. 51-295.000.

Jackson, James E., to Atlantic Richfield Company. Drill cuttings disposal method and system. 5,109,933, Cl. 175-66.000.

Jacobsen, Stephen C.; and Wood, John E., to Sarcos Group. Field-based movement sensor. 5,109,701, Cl. 73-782.000.

Jadvar, Hossein; and Metzger, William T., to Arzco Medical Systems, Inc. Multiple electrode affixable sheet. 5,109,851, Cl. 128-642.000.

Jaeggi, Knut A., to Ciba-Geigy Corporation. Araliphatylaminoalkanediphosphonic acids. 5,110,807, Cl. 514-89.000.

Jahoda, Joseph R.; and Shergold, Steven D., to Astron Corporation. Broadband antenna. 5,111,213, Cl. 343-722.000.

Jahromi, Fazlollah R., to STC PLC. Optical receivers. 5,111,324, Cl. 359-189.000.

Jain, Ravi, to BOC Group, Inc., The. Low temperature purification of gases. 5,110,569, Cl. 423-230.000.

James, Betty L.: *See—*
Panasik, Carl M.; Wilde, Patrick J.; and James, Betty L., 5,111,168, Cl. 333-152.000.

James, John V.; Dosdall, James M.; and Marko, Kenneth A., to Ford Motor Company. Misfire detection in an internal combustion engine. 5,109,695, Cl. 73-117.300.

Janai, Meir I.: *See—*
Orbach, Zvi; and Janai, Meir I., 5,111,273, Cl. 357-51.000.

Janigian, Paul: *See—*
Smith, Rodney A.; and Janigian, Paul, 5,111,395, Cl. 364-408.000.

Janocha, Siegfried; Schloegi, Gunter; Bothe, Lothar; and Crass, Guenther, to Hoechst Aktiengesellschaft. Film for transfer metallizing. 5,110,670, Cl. 428-216.000.

Janulis, Rose M., to Amoco Corporation. Process for increasing the yield of purified isophthalic acid and reducing waste-water treatment a. 5,110,984, Cl. 562-487.000.

Japan Aviation Electronics Industry, Ltd.: *See—*
Okada, Kenichi, 5,111,518, Cl. 385-14.000.

Japan Synthetic Rubber Co., Ltd.: *See—*
Yumoto, Yoshiji; Shimokawa, Tsutomu; and Miura, Takao, 5,110,706, Cl. 430-191.000.

Jarrett, Robert B.: *See—*
Pigott, John M.; and Jarrett, Robert B., 5,111,381, Cl. 363-132.000.

Jarvis, Robert F., Jr.: *See—*
Kaner, Richard B.; Bonneau, Philippe R.; Gillan, Edward G.; Wiley, John B.; Jarvis, Robert F., Jr.; and Treece, Rande, 5,110,768, Cl. 501-1.000.

Jasinski, John F.; McCormick, Robert P.; Mellinger, Ricky C.; Draper, James K.; and Vyas, Navin N., to AMP Incorporated. Method for laminating polymer films. 5,110,387, Cl. 156-222.000.

Jasmer, Wolfgang E.; Kruger, Johann E. W.; and Killat, Ulrich R. P., to U.S. Philips Corporation. Broadband space-division switching network with linkage in a printed circuit board having multi-layer micro-strip lines. 5,111,200, Cl. 340-826.000.

Jaster, Heinz; and Bessler, Warren F., to General Electric Company. Apparatus for controlling a dual evaporator, dual fan refrigerator with independent temperature controls. 5,109,678, Cl. 62-175.000.

Jatco Corporation: *See—*
Suzuki, Akihiro, 5,111,180, Cl. 340-456.000.

JATCTO Corporation: *See—*
Yoshida, Toshiyasu, 5,109,818, Cl. 123-319.000.

Jautelat, Manfred: *See—*
Schroeder, Georg; Arlt, Dieter; and Jautelat, Manfred, 5,110,975, Cl. 558-44.000.

Javidi, Bahram, to United States of America, Air Force. Image deconvolution by a logarithmic exponential nonlinear joint transform process. 5,111,515, Cl. 382-43.000.

Jaxa-Chamiec, Albert A.; and Hickey, Deirdre M. B., to Smith Kline & Franch Laboratories Limited. Polystyrene anion exchange polymers. 5,110,875, Cl. 525-332.200.

Jeanes, Isaac W., to Comfy Care, Inc.; and Isaac W. Jeanes III, a part interest. Customized home chair and method of manufacture. 5,110,183, Cl. 297-343.000.

Jefferson, Graham N.: *See—*
MacPherson, Collin B. P.; and Jefferson, Graham N., 5,110,287, Cl. 432-24.000.

Jenkins, Ronald D., to Beth Israel Hospital Association. Ultrasound guided laser angioplasty. 5,109,859, Cl. 128-662.030.

Jensen, Jary D.: *See—*
Gray, Thomas E.; and Jensen, Jary D., 5,110,845, Cl. 523-211.000.

Jermann, Peter D. Binder. 5,110,232, Cl. 402-8.000.

Jervis, James E., to Raychem Corporation. Splice case. 5,111,001, Cl. 174-92.000.

Jesse, Robert: *See—*
Eich, David M.; Jesse, Robert; and Nestler, John, 5,110,810, Cl. 514-178.000.

Jikihara, Tetsuo; Shike, Toyohiko; Katsurada, Manabu; Watanabe, Hisao; and Ikeda, Osamu, to Mitsubishi Kasei Corporation. Indan-1,3-dione derivative and herbicidal composition containing the same as active ingredient. 5,110,342, Cl. 71-88.000.

JMO Holding, Inc.: *See—*
Norcross, Kenneth L., 5,110,510, Cl. 261-91.000.

Jo, Mun H.: *See—*
Hyun, Whoang J.; and Jo, Mun H., 5,111,012, Cl. 219-10.55R.

JOBS S.p.A.: *See—*
Muselli, Roberto, 5,109,592, Cl. 483-4.000.

Jobst, Kim A.: *See—*
Smith, Anthony D.; and Jobst, Kim A., 5,109,868, Cl. 128-774.000.

Joens, Lynn A.; Cramer, James D.; and Mapother, Mary E., to Arizona Technology Development Corporation. Swine dysentery subunit vaccine and method. 5,110,589, Cl. 424-92.000.

Johannisbauer, Wilhelm: *See—*
Buettgen, Karl-Heinz; Gutsche, Bernhard; Hommers, Friedrich; Johannisbauer, Wilhelm; Peukert, Eberhard; and Sedelies, Reinhold, 5,110,508, Cl. 554-170.000.

Johnson, Bruce H.; Larsen, Lawrence E.; and Welch, Edmund F., to United States of America, Energy. Positive contact, self retaining bearing seals. 5,110,222, Cl. 384-482.000.

Johnson Corporation, The: *See—*
Peter, John H.; and Timm, Gerald L., 5,110,162, Cl. 285-281.000.
Timm, Gerald L., 5,109,612, Cl. 34-119.000.

Johnson, Harold M. High modulus multifilament spokes and method. 5,110,190, Cl. 301-55.000.

Johnson, Ivy D., to Mobil Oil Corporation. Silica-alumina-organic amine product, its synthesis and use in zeolite production. 5,110,573, Cl. 423-328.000.

Johnson, James D. True position probe. 5,109,610, Cl. 33-559.000.

Johnson & Johnson Consumer Products, Inc.: *See—*
Jones, Robin M. F.; Panzera, Carl; and DeLuca, Robert D., 5,109,586, Cl. 29-160.600.

Johnson, Keith: *See—*
Monteith, Robert D.; and Johnson, Keith, 5,110,231, Cl. 401-190.000.

Johnson, Lowell E.: *See—*
Bright, Irving; Erickson, Ronald C.; Greene, Dennis K.; Hardy, Gerald D.; Hefner, Robert E.; Johnson, Lowell E.; Schwingel, Donald J.; and Spring, Richard E., 5,109,696, Cl. 73-118.100.

Johnson, Robert D.: *See—*
Blechschmidt, James L.; Johnson, Robert D.; and Powell, Robert F., 5,110,151, Cl. 280-661.000.

Johnson, Roger D.: *See—*
Farnsworth, John T.; Johnson, Roger D.; Obrecht, Gary W.; and Young, Linda A., 5,110,276, Cl. 425-133.100.

Johnson, Tracy K.: *See—*
Koy, Alison M.; Johnson, Tracy K.; and Mumaugh, Julie, 5,109,557, Cl. 5-655.000.

Johnson, Woodward. Portable power supply. 5,111,127, Cl. 320-2.000.

Johnston, Adam J. L.: *See—*
Nicoll, Kenneth A.; and Johnston, Adam J. L., 5,110,105, Cl 271-5.000.

Johnston, John T.: *See—*
Edem, Brian C.; Helliwell, Richard P.; Johnston, John T.; and Lary, Richard F., 5,111,465, Cl. 371-54.000.

Johnston, Vickie A.: *See—*
Bries, James L.; and Johnston, Vickie A., 5,110,843, Cl. 521-159.000.

Johnstone, Bradford; and Lyons, Robert W., to Trinity Industries Inc. Gondola type railway car with snug fitting center plate arrangement. 5,109,776, Cl. 105-199.300.

Jolys, Pascal; and Lagain, Philippe, to Societe Nationale Industrielle et Aerospatiale. Laser surface treatment nozzle with powder supply. 5,111,021, Cl. 219-121.600.
Jones, Allan S.: *See—*
Harwood, H. James; Jones, Allan S.; and Smook, Malcoln A., 5,110,876, Cl. 525-332.300.
Jones, Elbert C., Jr.: *See—*
Hayden, Rhonda F.; and Jones, Elbert C., Jr., 5,109,876, Cl. 131-365.000.
Jones, Franklin B.; Kemerer, Ray S.; Carter, Charles E.; and Kerfoot, Charles S., to Westinghouse Electric Corp. High power, high frequency resonant inverter using MOS controlled thyristors. 5,111,382, Cl. 363-132.000.
Jones, John L.: *See—*
Brasington, Glynn M.; and Jones, John L., 5,111,030, Cl. 235-375.000.
Jones, Michael A., to Coal Industry (Patents) Limited. Coal extraction process. 5,110,451, Cl. 208-421.000.
Jones, Neil, to TRW Inc. Active suspension system. 5,110,152, Cl. 280-707.000.
Jones, Robin M. F.; Panzera, Carl; and DeLuca, Robert D., to Johnson & Johnson Consumer Products, Inc. Crystalline alumina orthodontic bracket. 5,109,586, Cl. 29-160.600.
Jones, Steven C.: *See—*
Kwan, Stephen C.; and Jones, Steven C., 5,111,071, Cl. 307-350.000.
Jones, Thomas R.: *See—*
Knudson, Milburn I., Jr.; and Jones, Thomas R., 5,110,501, Cl. 252-315.200.
Jones, William: *See—*
Atkins, Martin P.; Jones, William; and Chibwe, Malama, 5,110,992, Cl. 568-618.000.
Jones, William H.: *See—*
Husted, David M.; Jones, William H.; and Tighe, William R., 5,109,963, Cl. 192-8.00C.
Joos, Heinz-Gunter; Kugler, Karl-Heinz; and Kohnle, Hans, to Robert Bosch GmbH. Method and arrangement for recognizing misfires. 5,109,825, Cl. 123-479.000.
Jordan, Debbee J.: *See—*
Otto, William F.; Holloman, Miles E.; and Jordan, Debbee J., 5,110,368, Cl. 136-246.000.
Joseph, Ady A. Ultrasonic energy producing device for an oil well. 5,109,922, Cl. 166-65.100.
Josso, Pierre: *See—*
Alperine, Serge; and Josso, Pierre, 5,110,422, Cl. 205-159.000.
Joyal Products, Inc.: *See—*
Riordan, Edward D., 5,111,015, Cl. 219-56.220.
Joyce, Ronald S., to Eaton Corporation. Rotary adjustment cam. 5,109,727, Cl. 74-568.00R.
JPS/Oiltrol, Inc.: *See—*
Santamaria, Joseph P., 5,110,236, Cl. 405-63.000.
JSP Corporation: *See—*
Tokiwa, Yutaka; and Iwamoto, Akira, 5,110,838, Cl. 521-81.000.
Jugle, Don B.: *See—*
Brailsford, Ian; Carter, Robert A.; Gutman, Edward J.; Jugle, Don B.; and Masham, Roger D., 5,111,246, Cl. 355-245.000.
Juki Corporation: *See—*
Sasamoto, Hideho, 5,109,781, Cl. 112-121.290.
Junkin, Leigh A., to Hunter Fan Company. Fan blade. 5,110,261, Cl. 416-204.00R.
Juren, Joe H.: *See—*
Weston, Tracy; and Juren, Joe H., 5,110,132, Cl. 273-187.00R.
Jurgens, Rainer; and Krehl, Dietmar, to Baker Hughes Incorporated. One trip window cutting tool method and apparatus. 5,109,924, Cl. 166-117.500.
Jyoraku, Fumio: *See—*
Toyoshima, Hisanori; Jyoraku, Fumio; Ishii, Yoshitaro; Iwase, Yukiji; and Sato, Shigenori, 5,110,266, Cl. 417-312.000.
JZD Valassko Se Sidlem Ve Vlachovicich: *See—*
Novotny, Ladislav; Kalvoda, Robert; Novak, Vladimir; and Uher, Karel, 5,110,429, Cl. 204-153.100.
K-2 Industries, Inc.: *See—*
Kremmin, Klaus; and Kremmin, Thomas R. F., 5,109,989, Cl. 211-1.550.
K. W. Thompson Tool Company, Inc.: *See—*
French, Kendrick L., 5,109,623, Cl. 42-90.000.
Kabushiki Kaisha Kobe Seiko Sho: *See—*
Abe, Mutsumi; Motoda, Takashi; and Aota, Keni-ichi, 5,110,687, Cl. 428-551.000.
Yokota, Hisaaki; Yoshiguchi, Tadashi; and Kamimatsuse, Hitoshi, 5,110,328, Cl. 55-180.000.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Kawai, Kazunari; and Mitani, Norio, 5,110,188, Cl. 299-10.000.
Kabushiki Kaisha Kosmek: *See—*
Shirakawa, Tsutomu, 5,110,099, Cl. 269-25.000.
Kabushiki Kaisha Oh-Yoh Keisoku Kenkyusho: *See—*
Nakayama, Mizuo; Kawajima, Shigesumi; Suzuki, Takahito; Miyake, Kazushi; Shibata, Tsutomu; and Seki, Chikashi, 5,111,410, Cl. 364-551.010.
Kabushiki Kaisha Semex Japan: *See—*
Matsuura, Masayuki, 5,109,865, Cl. 128-738.000.
Kabushiki Kaisha Toka-Rika-Denki-Seisakusho: *See—*
Doke, Harumi; Ishida, Syozi; Iwasa, Hiroki; Nagasaka, Chikao; Ueda, Masuyuki; Kato, Shigeru; Aoki, Hisashi; Shibahara, Makoto; and Mori, Satoshi, 5,111,006, Cl. 200-5.00R.
Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See—*
Kokubu, Sadao; Nishio, Minoru; and Hattori, Yoshitaka, 5,111,010, Cl. 200-461.000.
Kabushiki Kaisha Toshiba: *See—*
Hachiuma, Masayuki, 5,111,156, Cl. 330-257.000.
Hatada, Hiroshi; and Mori, Shojiro, 5,111,271, Cl. 357-45.000.
Hatano, Mitsuru, 5,111,243, Cl. 355-209.000.
Higaki, Shigetoshi, 5,111,373, Cl. 363-37.000.
Hosoya, Masahiro; Saito, Mitsunaga; Endo, Mitsuharu; Ohtaka, Yoshimitsu; and Futamata, Yukio, 5,110,705, Cl. 430-120.000.
Kato, Masao, 5,109,723, Cl. 74-411.000.
Kobayashi, Tadahiko; Tokai, Yoichi; and Sahashi, Masashi, 5,110,376, Cl. 148-301.000.
Kobayashi, Takaichi, 5,111,361, Cl. 361-394.000.
Kurosawa, Ryoichi, 5,111,124, Cl. 318-434.000.
Kusakabe, Hiromi, 5,111,068, Cl. 307-303.100.
Kyuma, Yuriko, 5,111,452, Cl. 370-85.100.
Maeda, Satoshi; Sawada, Shizuo; and Shinozaki, Satoshi, 5,110,766, Cl. 437-228.000.
Miyamoto, Junichi, 5,111,435, Cl. 365-230.060.
Miyashita, Naoto; Takahashi, Koichi; Sonobe, Hironori; and Koyama, Mitsutoshi, 5,111,272, Cl. 357-49.000.
Nakagawara, Chikashi, 5,111,154, Cl. 330-85.000.
Nakahara, Moriya; Saito, Yasuyuki; Shirai, Kenichi; Itabashi, Yasushi; and Turugai, Takashi, 5,110,762, Cl. 437-189.000.
Okada, Akira, 5,111,013, Cl. 219-10.55F.
Sawabe, Atsuhito; and Inuzuka, Tadao, 5,110,405, Cl. 156-610.000.
Sawada, Shizuo; and Ogihara, Masaki, 5,111,275, Cl. 357-71.000.
Sekiguchi, Tadashi, 5,111,281, Cl. 358-29.000.
Shimanuki, Masanobu, 5,111,501, Cl. 379-355.000.
Shiraishi, Hajime, 5,111,388, Cl. 395-800.000.
Tanaka, Teruya; and Noguchi, Yoshiyuki, 5,111,014, Cl. 219-10.770.
Tanimoto, Koji; Kimura, Kazuhisa; and Sasama, Kazuo, 5,111,242, Cl. 355-200.000.
Tsugaru, Kazunori, 5,111,269, Cl. 357-43.000.
Umemoto, Yuji; Toki, Akio; and Yamaguchi, Shuji, 5,111,499, Cl. 379-61.000.
Yoshida, Munehiro, 5,110,750, Cl. 437-27.000.
Zenda, Hiroki, 5,111,190, Cl. 340-717.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Nakano, Masaru; and Sukigara, Kazutoshi, 5,111,516, Cl. 382-14.000.
Kabushiki Kaishi Toshiba: *See—*
Arakawa, Hiroshi, 5,111,159, Cl. 330-254.000.
K.K. Sankyo Seiki Seisakusho: *See—*
Ono, Hitoshi; and Komatsu, Fumito, 5,111,347, Cl. 360-75.000.
Kabushikigaisha Sekogiken: *See—*
Bahn, Itsuki, 5,111,091, Cl. 310-68.00B.
Kadakia, Vinod K., to Xerox Corporation. Method to rotate a bitmap image 90 degrees. 5,111,192, Cl. 340-727.000.
Kadomukai, Yuzo: *See—*
Maeda, Yuuji; Nakamura, Yozo; Nakamura, Kenichi; Sakamoto, Masahide; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,109,815, Cl. 123-192.100.
Kadowaki, Shinichi: *See—*
Komma, Yoshiaki; Kadowaki, Shinichi; Kato, Makoto; and Saimi, Tetsuo, 5,111,448, Cl. 369-44.230.
Kadunce, Randy R.; Bush, Paul W.; and Martino, Pamela L., to PPG Industries, Inc. Method of using amorphous precipitated silica parting material for shaping glass sheet doublets. 5,110,336, Cl. 65-24.000.
Kaeriyama, Kyoji: *See—*
Ito, Kohzo; Tanabe, Yoshikazu; Sato, Masa-aki; and Kaeriyama, Kyoji, 5,110,504, Cl. 252-500.000.
Kahler, Andrew W.: *See—*
Collins, Floyd A.; Kahler, Andrew W.; and Windham, Marvin R., 5,109,834, Cl. 126-41.00R.
Kaibushiki Kaisha Toshiba: *See—*
Drawert, Bruce M., 5,111,490, Cl. 378-4.000.
Kakinuma, Yuji: *See—*
Fujita, Minoru; Kakinuma, Yuji; and Fukushima, Yoichi, 5,111,033, Cl. 235-488.000.
Kakizaki, Yuichi: *See—*
Kozuka, Yoshinari; and Kakizaki, Yuichi, 5,111,135, Cl. 324-96.000.
Kaku, Mureo: *See—*
Hung, Ming-Hong; and Kaku, Mureo, 5,110,938, Cl. 548-237.000.
Kaku, Yosutoshi: *See—*
Yagi, Nobuyuki; Inagaki, Jiroh; Morita, Kozo; Kaku, Yosutoshi; Mizuno, Shinji; and Yamanaka, Akiko, 5,111,363, Cl. 361-398.000.
Kalamas, Richard L.: *See—*
Blumbergs, Peter; Khan, Mohammed S.; and Kalamas, Richard L., 5,110,919, Cl. 536-24.000.
Kalberer, Roderick W.; Henkel, Frederick J.; and Berzins, Arnold L. Pour spout construction and method. 5,110,040, Cl. 229-125.140.
Kalfus, Martin; and Foutz, Eugene L., to Motorola, Inc. Formed top contact for non-flat semiconductor devices. 5,110,761, Cl. 437-182.000.
Kallansrude, David K.; Aiken, William C.; Deitz, Dan P.; and Powelson, William D., to Teledyne Industries, Inc. Vehicle for transporting loads. 5,110,153, Cl. 283-707.000.
Kalnins, Charles M., to Conoco Specialty Products Inc. High efficiency liquid/liquid hydrocyclone. 5,110,471, Cl. 210-512.200.
Kalutkiewicz, Paul J.: *See—*
Lebeau, Donald R.; and Kalutkiewicz, Paul J., 5,111,218, Cl. 346-107.00R.

Kalvoda, Robert: *See—*
Novotny, Ladislav; Kalvoda, Robert; Novak, Vladimir; and Uher, Karel, 5,110,429, Cl. 204-153.100.
Kamatics Corporation: *See—*
Narkon, Glennwood H.; and Orkin, Stanley S., 5,110,221, Cl. 384-203.000.
Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshioka, Hitoshi; and Norigoe, Isami, to Toko Kabushiki Kaisha; Nemic Lambda Kabushiki Kaisha; Yutaka Electric Mfg. Co., Ltd.; and Densetsu Corporation. DC-DC converter. 5,111,372, Cl. 363-20.000.
Kamijima, Koichi: *See—*
Tai, Seiji; Hayashi, Nobuyuki; Kamijima, Koichi; Akimoto, Takayuki; Katayose, Mitsuo; and Hagiwara, Hideo, 5,110,968, Cl. 556-415.000.
Kamimatsuse, Hitoshi: *See—*
Yokota, Hisaaki; Yoshiguchi, Tadashi; and Kamimatsuse, Hitoshi, 5,110,328, Cl. 55-180.000.
Kamimura, Kuniaki; Sawada, Kenji; and Yamade, Yasushi, to Minolta Camera Kabushiki Kaisha. Card transporting device for use in a reader printer or the like. 5,111,239, Cl. 355-45.000.
Kaminkow, Joseph E.: *See—*
Gundling, Ray D.; Kaminkow, Joseph E.; and Hoffman, Jay A., Jr., 5,110,617, Cl. 427-14.100.
Kamiyama, Katsumi; and Igawa, Kazushige, to Tosoh Corporation. Copper-containing zeolites and their preparation. 5,110,777, Cl. 502-68.000.
Kanamaru, Hisanobu: *See—*
Yokoyama, Mizuho; Kanamaru, Hisanobu; Okamoto, Yoshio; Kuroha, Tunemitu; Koshizaka, Atsushi; and Shinozaki, Hironori, 5,109,823, Cl. 123-472.000.
Kanao, Shiro. Pressure-resistant helical corrugated pipe. 5,109,889, Cl. 138-173.000.
Kanatani, Yoshiharu: *See—*
Fukuoka, Hirofumi; and Kanatani, Yoshiharu, 5,111,195, Cl. 340-811.000.
Kanaya, Koichi, to Ricoh Company, Ltd. Device for controlling sheet positioning on an intermediate tray. 5,110,113, Cl. 271-241.000.
Kanaya, Yasuhiko: *See—*
Irie, Akira; Kanaya, Yasuhiko; and Ohtani, Tamio, 5,109,584, Cl. 29-33.00P.
Kanda, Hiroshi: *See—*
Nishiyama, Hisashi; Hashimoto, Yasuhiro; Kanda, Hiroshi; and Katakura, Kageyoshi, 5,109,858, Cl. 128-661.090.
Kanda, Nobuo: *See—*
Arai, Naoto; Kanda, Nobuo; and Nojima, Masaharu, 5,110,786, Cl. 503-204.000.
Kanebo Ltd.: *See—*
Inaba, Shin-ichi; Shindo, Yasuyuki; Tsubouchi, Shirou; Naganuma, Hiroki; Nakazawa, Yoshio; Hayashi, Ryusuke; and Yamada, Kanji, 5,110,656, Cl. 428-257.000.
Kaneda, Aizo: *See—*
Nakamura, Shozo; Kaneda, Aizo; Tsunoda, Shigeharu; Hasebe, Akio; and Mitani, Masao, 5,110,515, Cl. 264-25.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Furukawa, Hisao; Kato, Yasushi; and Kawamura, Jo, 5,110,888, Cl. 526-312.000.
Kaneko Fire Works Co. Ltd.: *See—*
Kaneko, Nobusato, 5,109,773, Cl. 102-357.000.
Kaneko, Nobusato, to Fujika Co., Ltd.; and Kaneko Fire Works Co. Ltd. Push-type cracker. 5,109,773, Cl. 102-357.000.
Kaneko, Toshihiko: *See—*
Ogata, Yoshitake; Ikeda, Makoto; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Yamanaka, Takashi; Hishinuma, Ieharu; Nagakawa, Junichi; Hirota, Kazuo; Miyamoto, Kaname; Horie, Toru; and Wakabayashi, Tsuneo, 5,110,956, Cl. 549-447.000.
Kaner, Richard B.; Bonneau, Philippe R.; Gillan, Edward G.; Wiley, John B.; Jarvis, Robert F., Jr.; and Treece, Rande. Rapid solid-state synthesis of refractory materials. 5,110,768, Cl. 501-1.000.
Kaneshima, Yasuo: *See—*
Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, 5,110,856, Cl. 524-459.000.
Kania, Janet S.: *See—*
Devitt, John W.; Bantel, Thomas E.; Sparks, Joseph M.; and Kania, Janet S., 5,111,048, Cl. 250-342.000.
Kanno, Masahide; Ieoka, Shouichi; Hiyama, Keiichi; Matsunaka, Kenji; and Eto, Tadao, to Olympus Optical Co., Ltd. Endoscope image filing system. 5,111,306, Cl. 358-403.000.
Kanoe, Toshio: *See—*
Togami, Masato; and Kanoe, Toshio, 5,110,861, Cl. 524-601.000.
Kansai Paint Co., Ltd.: *See—*
Watanabe, Tsutomu; Yamashita, Masaaki; Kubota, Takahiro; Miyosawa, Yoshiaki; and Nishimoto, Tadashi, 5,110,689, Cl. 428-623.000.
Kansas State University Research Foundation: *See—*
Seib, Paul A.; and Wang, Xiao Y., 5,110,950, Cl. 549-222.000.
Kanzaki Paper Manufacturing Co., Ltd.: *See—*
Arai, Naoto; Kanda, Nobuo; and Nojima, Masaharu, 5,110,786, Cl. 503-204.000.
Kao Corporation: *See—*
Hori, Kimihiko; Sakaguchi, Akira; Ishida, Koichi; Nomura, Tomoko; Suzuki, Keiko; and Tsuchiya, Shuichi, 5,110,826, Cl. 514-39.000.
Rau, Allen H., 5,110,603, Cl. 424-466.000.
Kaplan, Sam; and Adler, Robert, to Zenith Electronics Corporation. Post-mask-deflection type tension mask color cathode ray tube. 5,111,106, Cl. 313-403.000.
Kappel, Johannes; Stock, Gunther; Eickhoff, Karl; and Petschauer, Franz, to Maschinenfabrik Andritz Actiengesellschaft. Double screen belt press with a wedge compression zone for dewatering mixtures of fibrous material suspensions. 5,109,764, Cl. 100-99.000.
Karabinis, Panagiotis D., to Raytheon Company. Adaptive distortion canceller. 5,111,484, Cl. 375-94.000.
Karasawa, Hiroo; Kometani, Kiichi; and Nakamura, Kiyokazu, to Toray Industries, Inc. Polyester composition. 5,110,849, Cl. 524-87.000.
Kardorff, Uwe: *See—*
Kober, Reiner; Theobald, Hans; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; Seele, Rainer; and Wagenblast, Gerhard, 5,110,829, Cl. 514-443.000.
Kark, Uwe. Roll for a roll stand having an exchangeable roll ring and a divided roll body. 5,109,585, Cl. 29-123.000.
Karl M. Reich Maschinenfabrik GmbH: *See—*
Farian, Gerhard; and Haas, Guenter, 5,109,738, Cl. 81-434.000.
Karnowski, Mark: *See—*
Afshar, Eskandar; and Karnowski, Mark, 5,111,500, Cl. 379-67.000.
Karoutas, Zeses E.: *See—*
Perrotti, Patrick A.; and Karoutas, Zeses E., 5,110,539, Cl. 376-439.000.
Karra, Vijia K.; Magerowski, Anthony J.; and Szalanski, Scot E., to Nordberg Inc. Method of high performance jaw crushing. 5,110,057, Cl. 241-30.000.
Karube, Norio: *See—*
Funakubo, Tsutomu; and Karube, Norio, 5,111,474, Cl. 372-61.000.
Kase, James E.: *See—*
Erickson, Charles H.; Erio, Peter A.; and Kase, James E., 5,111,291, Cl. 358-108.000.
Kashima, Hiroyuki; and Kinoshita, Naohisa, to Brother Kogyo Kabushiki Kaisha. Lens device. 5,111,340, Cl. 359-819.000.
Kashiwadate, Ken: *See—*
Satake, Yoshikatsu; Kashiwadate, Ken; Sakaguchi, Yasuo; Katto, Takayuki; and Shiiki, Zenya, 5,110,681, Cl. 428-419.000.
Kashiwagi, Hiromi, to Hitachi Metals, Ltd. Heat-fixing device having a roller selectively loaded through an elastic element. 5,111,250, Cl. 355-285.000.
Kashiwaya, Mineo: *See—*
Okamoto, Yoshio; Nakamura, Yozo; Kashiwaya, Mineo; and Hamashima, Eigi, 5,109,824, Cl. 123-472.000.
Kasten, Eadie Technology Ltd.: *See—*
MacWilliams, William A.; and Eadie, William, 5,110,447, Cl. 208-106.000.
Kasuga, Shinichi, to Nippon Seiko Kabushiki Kaisha. Feed unit apparatus. 5,109,720, Cl. 74-89.150.
Kasuya, Minako: *See—*
Itoi, Motokazu; Kobayashi, Shizuko; Ishii, Yasuo; and Kasuya, Minako, 5,110,796, Cl. 514-18.000.
Katagiri, Masayoshi: *See—*
Kondo, Toshio; Urata, Kenji; Katagiri, Masayoshi; and Nakamura, Kenichi, 5,109,959, Cl. 188-73.310.
Katakura, Kageyoshi: *See—*
Nishiyama, Hisashi; Hashimoto, Yasuhiro; Kanda, Hiroshi; and Katakura, Kageyoshi, 5,109,858, Cl. 128-661.090.
Katayama, Shigeru; Matsumoto, Hiroshi; and Wada, Tatuo, to Nitto Denko Corporation. Thermal transfer image reception. 5,110,788, Cl. 503-227.000.
Katayose, Mitsuo: *See—*
Tai, Seiji; Hayashi, Nobuyuki; Kamijima, Koichi; Akimoto, Takayuki; Katayose, Mitsuo; and Hagiwara, Hideo, 5,110,968, Cl. 556-415.000.
Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Binder for electrophotographic light-sensitive material containing recurring ester units. 5,110,701, Cl. 430-96.000.
Kato, Kiyoshi; Suzuki, Isamu; and Toshima, Seiji, to Aisan Kogyo Kabushiki Kaisha. Fuel pump. 5,110,265, Cl. 417-279.000.
Kato, Kunio; Iida, Yasumasa; Honda, Takenobu; Sugita, Kazuhiko; and Yamasaki, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Brake unit for an elevator hoist apparatus. 5,109,958, Cl. 187-20.000.
Kato, Makoto: *See—*
Komma, Yoshiaki; Kadowaki, Shinichi; Kato, Makoto; and Saimi, Tetsuo, 5,111,448, Cl. 369-44.230.
Kato, Masao, to Kabushiki Kaisha Toshiba. Rotation transmission mechanism. 5,109,723, Cl. 74-411.000.
Kato, Mitsuru: *See—*
Hojo, Takeshi; Fukano, Michio; and Kato, Mitsuru, 5,109,693, Cl. 73-497.000.
Kato, Shigeru: *See—*
Doke, Harumi; Ishida, Syozi; Iwasa, Hiroki; Nagasaka, Chikao; Ueda, Masuyuki; Kato, Shigeru; Aoki, Hisashi; Shibahara, Makoto; and Mori, Satoshi, 5,111,006, Cl. 200-5.00R.
Kato, Tomiya: *See—*
Sato, Toru; Kobayashi, Yoshio; and Kato, Tomiya, 5,109,949, Cl. 181-240.000.
Kato, Yasushi: *See—*
Furukawa, Hisao; Kato, Yasushi; and Kawamura, Jo, 5,110,888, Cl. 526-312.000.
Kato, Yoshihiko: *See—*
Yoshida, Masato; Yokoyama, Takanao; Nanba, Muneyoshi; Kato, Yoshihiko; Iida, Kazumasa; and Miyamoto, Katsuhiko, 5,109,821, Cl. 123-425.000.

Kato, Yuji, to Nissan Motor Co., Ltd. Shift shock attenuation system for automotive power train including automatic transmission and turbocharged internal combustion engine. 5,109,826, Cl. 123-564.000.
Katsuji, Azuma: *See—*
Yuichi, Takahashi; and Katsuji, Azuma, 5,110,463, Cl. 210-194.000.
Katsurada, Manabu: *See—*
Jikihara, Tetsuo; Shike, Toyohiko; Katsurada, Manabu; Watanabe, Hisao; and Ikeda, Osamu, 5,110,342, Cl. 71-88.000.
Katto, Takayuki: *See—*
Satake, Yoshikatsu; Kashiwadate, Ken; Sakaguchi, Yasuo; Katto, Takayuki; and Shiiki, Zenya, 5,110,681, Cl. 428-419.000.
Katzenstein, Henry S., to Brooktree Corporation. Apparatus for converting data between digital and analog values. 5,111,204, Cl. 341-150.000.
Kaufman, Benjamin J.: *See—*
Derosa, Thomas F.; Sung, Rodney L.; Kaufman, Benjamin J.; and O'Rourke, Ronald L., 5,110,491, Cl. 252-47.500.
Kawa, Jamil: *See—*
Ferry, Thomas V.; Kawa, Jamil; Pierce, Kerry M.; Walker, William G.; and Zampaglione, Michael A., 5,111,075, Cl. 307-443.000.
Kawabata, Kohji: *See—*
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 5,110,921, Cl. 540-222.000.
Kawabe, Masaru: *See—*
Matsumura, Hiroshi; Shimamura, Norio; Ohta, Yasuto; Kawabe, Masaru; Shimizu, Makoto; Natori, Naoaki; and Suzuki, Naohiko, 5,111,201, Cl. 340-870.300.
Kawachi, Eiji: *See—*
Sudo, Morihiro; Muraki, Tomoyasu; Kawachi, Eiji; and Kawachi, Yasushi, 5,110,621, Cl. 427-44.000.
Kawachi, Yasushi: *See—*
Sudo, Morihiro; Muraki, Tomoyasu; Kawachi, Eiji; and Kawachi, Yasushi, 5,110,621, Cl. 427-44.000.
Kawachi, Yoshiki: *See—*
Kojima, Takao; Ishiguro, Hiroyuki; Kawachi, Yoshiki; and Yamada, Tetsuyo, 5,110,442, Cl. 204-426.000.
Kawaguchi, Kiyoshi; and Yagishi, Hideki, to Toyo Seikan Kaisha, Ltd. Apparatus for feeding and cutting synthetic resin. 5,110,280, Cl. 425-311.000.
Kawaguchi, Shin; Ohhashi, Yutaka; and Fukuta, Kenji, to Toyota Jidosha Kabushiki Kaisha. Reciprocating painting method. 5,110,632, Cl. 427-424.000.
Kawahara, Hironobu: *See—*
Fujii, Takashi; Kawahara, Hironobu; Takata, Kazuo; Nishiumi, Masaharu; and Yamamoto, Noriaki, 5,110,408, Cl. 156-643.000.
Kawahara, Hiroshi: *See—*
Yamamoto, Takemi; Sakai, Jun; Kawahara, Hiroshi; Hayashi, Shigeyuki; Sakakibara, Kenji; Akao, Michitoshi; Sasaki, Ichiro; and Komiya, Ryohei, 5,111,237, Cl. 355-27.000.
Kawai, Kazunari; and Mitani, Norio, to Kabushiki Kaisha Komatsu Seisakusho. Deformed shield tunneling method and tunneling machine. 5,110,188, Cl. 299-10.000.
Kawai Musical Inst. Mfg. Co., Ltd.: *See—*
Takauji, Kiyomi; and Washiyama, Yutaka, 5,109,746, Cl. 84-607.000.
Kawai, Yasuhiro: *See—*
Konno, Masaaki; and Kawai, Yasuhiro, 5,111,045, Cl. 250-327.200.
Kawamura, Hideaki: *See—*
Nagasawa, Kenichi; and Kawamura, Hideaki, 5,111,283, Cl. 358-41.000.
Kawamura, Jo: *See—*
Furukawa, Hisao; Kato, Yasushi; and Kawamura, Jo, 5,110,888, Cl. 526-312.000.
Kawanami, Norihide; Okada, Kinjiro; Kobayashi, Nobuaki; and Masuda, Kimio, to Hirose Electric Co., Ltd. Optical fiber connector terminal. 5,111,520, Cl. 385-81.000.
Kawanami, Norihide; Okada, Kinjiro; and Kozu, Yoshikazu, to Hirose Electric Co. Ltd. Optical fiber connector terminal and method of making same. 5,111,521, Cl. 385-82.000.
Kawano, Kazuhiko: *See—*
Miyazawa, Takeshige; and Kawano, Kazuhiko, 5,110,346, Cl. 71-90.000.
Kawara, Toshiyuki: *See—*
Ohtsuchi, Tetsuro; Tsutsui, Hiroshi; Ohmori, Koichi; Baba, Sueki; Funakoshi, Hiromasa; Kawara, Toshiyuki; and Yoshizumi, Yoshiyuki, 5,111,052, Cl. 250-370.010.
Kawashima, Hiromi, to Fujitsu Limited. Semiconductor circuit. 5,111,136, Cl. 324-158.00R.
Kawashima, Nobuhiro: *See—*
Morii, Mitsuyoshi; Ohdeka, Masaharu; Kawashima, Nobuhiro; Morii, Noriko; and Suzuki, Toshihiko, 5,110,736, Cl. 435-226.000.
Kawatsu, Tositatsu: *See—*
Komatsu, Fumito; and Kawatsu, Tositatsu, 5,109,794, Cl. 118-660.000.
Kayaian, George, to Kayaian, George. Closed-breech missile and weapon system. 5,109,750, Cl. 89-1.818.
Kaye, David B.; and Melville, Charles D. Method for sensing pressure in an object. 5,109,852, Cl. 128-645.000.
Kazami, Kazuyuki: *See—*
Nakamura, Toshiyuki; Kazami, Kazuyuki; Daitoku, Koichi; and Miyamoto, Hidenori, 5,111,226, Cl. 354-195.100.
Kazuhiko, Mori: *See—*
Yamashita, Tsukasa; Inoue, Nobuhisa; Kazuhiko, Mori; Matano, Masaharu; and Taguchi, Isao, 5,111,447, Cl. 369-44.120.
Kazuma, Kuniharu. Method of opening and closing strip curtain and apparatus therefor. 5,109,913, Cl. 160-332.000.
Kean, Norman B., to Du Pont de Nemours, E. I., and Company. Melt-dispersible package for melt-processible polymers. 5,110,641, Cl. 428-35.500.
Keast, Russell. Drive device for truck mirror. 5,111,341, Cl. 359-841.000.
Keate, Christopher R.; Aguirre, Sergio; and Stockdell, Brian L., to Motorola, Inc. Distortion compensation means and method. 5,111,155, Cl. 330-149.000.
Keeler, Donald E., to International Paper Company. In-line fitment sealing apparatus and method. 5,110,041, Cl. 229-125.150.
Keiper Recaro GmbH & Co.: *See—*
Schmutz, Christian; and Franzmann, Gunther, 5,110,185, Cl. 297-410.000.
Keisei Medical Industrial Co., Ltd.: *See—*
Uetake, Tsuyoshi, 5,109,560, Cl. 5-453.000.
Kelen, George J.; and Henkin, Raphael, to Del Mar Avionics. Method and apparatus for spectral analysis of electrocardiographic signals. 5,109,862, Cl. 128-702.000.
Kelley, Gerard F.: *See—*
Hach, Larry R.; and Kelley, Gerard F., 5,111,123, Cl. 318-434.000.
Kelly, James G.; and Carpenter, Robert N., to United States of America, Navy. Method of acoustic processing for acoustic image classification. 5,111,438, Cl. 367-87.000.
Kelly, Martha J., to Rohm and Haas Company. Synthesis of N-t-alkyl-1,2-diacylhydrazines. 5,110,986, Cl. 564-149.000.
Kelm, Carsten: *See—*
Henn, Manfred; and Kelm, Carsten, 5,110,112, Cl. 271-189.000.
Kemerer, Ray S.: *See—*
Jones, Franklin B.; Kemerer, Ray S.; Carter, Charles E.; and Kerfoot, Charles S., 5,111,382, Cl. 363-132.000.
Kenegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Yamada, Masahiko; and Takahashi, Satomi, 5,110,944, Cl. 548-311.000.
Kenley, Rodney: *See—*
Howard, David B.; Kenley, Rodney; Berry, Dennis; Keshaviah, Prakash; and Vishnoi, Rohit, 5,110,477, Cl. 210-647.000.
Kenna, John T.: *See—*
Cawelti, Donald G.; Berlin, Bryan F.; and Kenna, John T., 5,110,065, Cl. 242-158.00R.
Kennametal Inc.: *See—*
Mogilnicki, Victor D., 5,109,706, Cl. 73-862.210.
Kent-Riggs, Laura K.: *See—*
Galetto, William G.; and Kent-Riggs, Laura K., 5,109,717, Cl. 73-866.000.
Kerfoot, Charles S.: *See—*
Jones, Franklin B.; Kemerer, Ray S.; Carter, Charles E.; and Kerfoot, Charles S., 5,111,382, Cl. 363-132.000.
Kern, Leon O.: *See—*
Zeilinger, James G.; and Kern, Leon O., 5,110,240, Cl. 409-234.000.
Kerr, Richard C.: *See—*
Menzel, Jill R.; Damewood, John R.; Ross, Bert A.; and Kerr, Richard C., 5,110,666, Cl. 428-196.000.
Kershaw, John K.; and McCray, Philip C., to Knox Kershaw, Inc. Ballast reconditioning apparatus with multiple excavating wheels and independent cleaning stations for increased operating speed. 5,109,775, Cl. 104-2.000.
Keshaviah, Prakash: *See—*
Howard, David B.; Kenley, Rodney; Berry, Dennis; Keshaviah, Prakash; and Vishnoi, Rohit, 5,110,477, Cl. 210-647.000.
Kessler, Daniel D.; Wu, Robert W.; Beatty, Christopher C.; and Crook, Mark D., to Hewlett-Packard Company. Incorporation of dielectric layers in a semiconductor. 5,110,712, Cl. 430-312.000.
Kessler, Gerald, to Boston Metal Products Corp. Resilient strip and mounting member for flush fitting protective strip assembly. 5,110,650, Cl. 428-100.000.
Kester, Jervis D.; and Redington, Clarence P., to United Technologies Corporation. Method of operating a combustion chamber for a gas turbine engine. 5,109,664, Cl. 60-39.060.
Ketcham, Larry R., to Unisys Corporation. Software security system for maintaining integrity of compiled object code by restricting users ability to define compilers. 5,111,390, Cl. 395-725.000.
Ketelsen, Leonard J.: *See—*
Ackerman, David A.; Ketelsen, Leonard J.; and Koszi, Louis A., 5,111,475, Cl. 372-96.000.
Keung, Jay K.: *See—*
Balloni, Riccardo; and Keung, Jay K., 5,110,671, Cl. 428-218.000.
Keyence Corporation: *See—*
Fujihara, Yuji; and Ando, Masaru, 5,110,314, Cl. 446-34.000.
Khan, Adil M.: *See—*
Albanesi, Mario; Hertogs, Willy A. M.; Khan, Adil M.; and Pieroni, Lucio, 5,110,004, Cl. 220-355.000.
Khan, Mohammed S.: *See—*
Blumbergs, Peter; Khan, Mohammed S.; and Kalamas, Richard L., 5,110,919, Cl. 536-24.000.
Kharitonov, Alexandr S.; Panov, Gennadii I.; Ione, Kazimira G.; Romannikov, Vyacheslav N.; Sheveleva, Galina A.; Vostrikova, Lidia A.; and Sobolev, Vladimir I., to Institute of Catalysis. Preparation of phenol or phenol derivatives. 5,110,995, Cl. 568-800.000.
Khuri-Yakub, Butrus T.: *See—*
Hadimioglu, Babur B.; Khuri-Yakub, Butrus T.; and Steinmetz, David L., 5,111,220, Cl. 346-140.00R.
Kida, Shiro: *See—*
Ogata, Masaru; Matsumoto, Hiroshi; Shimizu, Sumio; and Kida, Shiro, 5,110,825, Cl. 514-381.000.

Kidd, R. Christopher; and Morrow, Lester W., to Marloro Marketing, Inc. Display system. 5,109,994, Cl. 211-162.000.
Kidd, Thomas F.; Thompson, Stephen A.; and Paduano, Guiseppe, to Electrovert Ltd. Injection nozzle for casting metal alloys with low melting temperatures. 5,109,914, Cl. 164-113.000.
Kidowaki, Yoshimasa: *See—*
Kuwano, Akira; and Kidowaki, Yoshimasa, 5,110,357, Cl. 106-35.000.
Kiefer, Erich: *See—*
Daubenbuchel, Werner; Eiselen, Otto; Friedrichs, Karsten; Hess, Dieter; Kiefer, Erich; and Klusener, Peter, 5,110,519, Cl. 264-40.200.
Kiely, Philip A.; and Taylor, Geoffrey W., to AT&T Bell Laboratories. Buried channel heterojunction field effect transistor. 5,111,255, Cl. 357-22.000.
Kiencke, Uwe: *See—*
Botzenhardt, Wolfgang; Dais, Siegfried; Kiencke, Uwe; Litschel, Martin; and Unruh, Jan, 5,111,460, Cl. 371-29.100.
Kikkoman Corporation: *See—*
Abe, Keietsu; and Uchida, Kinji, 5,110,739, Cl. 435-252.900.
Oguma, Tetsuya; Kikuchi, Mamoru; Mizusawa, Kiyoshi; Tokutake, Shoichi; and Yamaji, Nobuyuki, 5,110,734, Cl. 435-201.000.
Kikuchi, Kenichi: *See—*
Haruki, Toshinobu; and Kikuchi, Kenichi, 5,111,301, Cl. 358-228.000.
Kikuchi, Mamoru: *See—*
Oguma, Tetsuya; Kikuchi, Mamoru; Mizusawa, Kiyoshi; Tokutake, Shoichi; and Yamaji, Nobuyuki, 5,110,734, Cl. 435-201.000.
Kikuchi, Yasuo: *See—*
Ueno, Hiroshi; Kikuchi, Yasuo; Takahashi, Kunitomo; Doi, Koji; Onose, Tsukasa; and Ogawa, Toshitaka, 5,111,235, Cl. 355-246.000.
Killat, Ulrich R. P.: *See—*
Jasmer, Wolfgang E.; Kruger, Johann E. W.; and Killat, Ulrich R. P., 5,111,200, Cl. 340-826.000.
Kilts, Harold J., to Tecnetics Industries, Inc. Sealing arrangement for dry good feeder. 5,110,015, Cl. 222-413.000.
Kim, Chan W.; Robinson, Elizabeth M.; and Rha, Chokyun, to Rohm and Haas Company. Liquid-liquid extraction with particulate polymeric adsorbent. 5,110,733, Cl. 435-183.000.
Kim, James H.: *See—*
Wickersheim, Kenneth A.; Sun, Mei H.; and Kim, James H., 5,109,595, Cl. 29-600.000.
Wickersheim, Kenneth A.; Sun, Mei H.; and Kim, James H., 5,110,216, Cl. 374-122.000.
Kim, Son N., to BASF Aktiengesellschaft. Radiation-sensitive mixture and production of relief images. 5,110,708, Cl. 430-270.000.
Kim, Soonih; Takeda, Kazuhisa; and Sasatani, Seiei, to Ono Pharmaceutical Co., Ltd. Pharmaceutical compositions comprising esters or amides as active ingredients. 5,110,602, Cl. 424-451.000.
Kim, Young H., to Du Pont de Nemours, E. I., and Company. Tetrafluoroethylene polymer compositions containing particulate carbon. 5,110,858, Cl. 524-496.000.
Kimball, Newel: *See—*
McDonald, Philip; and Kimball, Newel, 5,109,835, Cl. 606-241.000.
Kimbara, Kohji, to NEC Corporation. Multilayer wiring substrate. 5,111,003, Cl. 174-255.000.
Kimberly-Clark Corporation: *See—*
Ehlert, Thomas D., 5,110,403, Cl. 156-580.100.
Kime, Byron L., Jr., to Microsurface Finishing Products, Inc. Abrasive sheet material with non-slip backing. 5,109,638, Cl. 51-401.000.
Kimura, Hidetoshi; and Okugawa, Shotaro, to Murata Kikai Kabushiki Kaisha. Bobbin carrying tray. 5,110,064, Cl. 242-129.500.
Kimura, Hiromichi: *See—*
Iwatsuki, Kunihiro; Kimura, Hiromichi; and Otsubo, Hideaki, 5,109,731, Cl. 74-866.000.
Kimura, Junji: *See—*
Takano, Tatsuya; Hashida, Ryoichi; Nakagami, Keiji; and Kimura, Junji, 5,110,738, Cl. 435-240.270.
Kimura, Kaoru: *See—*
Ito, Kenji; and Kimura, Kaoru, 5,110,392, Cl. 156-314.000.
Kimura, Katsunori; Hata, Shinichi; and Nishimura, Yoshitaka, to Mazda Motor Corporation. Apparatus for recovering sequentially controlled apparatus. 5,111,383, Cl. 364-184.000.
Kimura, Kazuhisa: *See—*
Tanimoto, Koji; Kimura, Kazuhisa; and Sasama, Kazuo, 5,111,242, Cl. 355-200.000.
Kimura, Shinjiro: *See—*
Kondo, Yumihito; Amamo, Yoshiaki; Kimura, Shinjiro; and Horiuchi, Susumu, 5,110,559, Cl. 422-109.000.
King, Russell K.; and Lee, Chi-long, to Dow Corning Corporation. Crosslinkers and chain extenders for room temperature vulcanization or crosslinking of polymers. 5,110,967, Cl. 556-407.000.
King, Timothy E., to Rollsec Limited. Rolling mill. 5,109,688, Cl. 72-180.000.
King, William G., Jr.; and Lawrence, W. Edward. Method and apparatus for killing subterranean insects. 5,109,629, Cl. 43-132.100.
Kinlen, Patrick J.; and Williams, Hilliard L., to Monsanto Company. Solid state pH sensor. 5,110,441, Cl. 204-418.000.
Kinnunen, Jukka: *See—*
Lehtonen, Jarmo; and Kinnunen, Jukka, 5,110,417, Cl. 162-358.000.
Kino, Tohru: *See—*
Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, 5,110,811, Cl. 514-183.000.
Kinoshita, Naohisa: *See—*
Kashima, Hiroyuki; and Kinoshita, Naohisa, 5,111,340, Cl. 359-819.000.
Kinoshita, Takao; Ito, Kazuhiko; and Yamagata, Shigeo, to Canon Kabushiki Kaisha. Recording and/or reproducing apparatus. 5,111,304, Cl. 358-341.000.
Kioritz Corporation: *See—*
Miyashita, Susumu; Ishimura, Tadashi; and Hironaka, Yoshiaki, 5,110,468, Cl. 210-321.690.
Kipp, Frederick M., to Pitney Bowes Inc. Transport mechanism for a weighing scale. 5,109,937, Cl. 177-145.000.
Kirk, Richard A.: *See—*
MacDonald, Lindsay W.; and Kirk, Richard A., 5,111,286, Cl. 358-75.000.
Kirsch, Eberhard: *See—*
von Bonin, Jochen; and Kirsch, Eberhard, 5,111,171, Cl. 335-202.000.
Kirst, Herbert A.: *See—*
Bonjouklian, Rosanne; Debono, Manuel; Kirst, Herbert A.; and Wind, Julie A., 5,110,800, Cl. 514-29.000.
Kirstein, Dorte: *See—*
Ahnfelt-Ronne, Ian; Hansen, Erik T.; Kirstein, Dorte; Nielsen, Ole Bent I.; and Rachlin, Schneur, 5,110,819, Cl. 514-311.000.
Kishi, Hiroshi: *See—*
Chazono, Hirokazu; Saito, Hiroshi; Honda, Mutsumi; Shizuno, Hisamitsu; and Kishi, Hiroshi, 5,111,357, Cl. 361-321.000.
Kishimoto, Shunichi, to Azz International Co., Ltd. Shower utensil having brush. 5,109,553, Cl. 4-518.000.
Kishon, Eyal: *See—*
Fan, Jason Chia-Sun; Hastie, Trevor J.; and Kishon, Eyal, 5,111,512, Cl. 382-3.000.
Kita, Masahiro; and Negoro, Ikuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Printing apparatus. 5,111,248, Cl. 355-282.000.
Kitahara, Makoto: *See—*
Wakao, Naho; Hiroi, Masakazu; Kitahara, Makoto; and Takahashi, Yuji, 5,110,104, Cl. 271-3.100.
Kitahara, Shizuo; and Toyoshima, Tetuya, to Nippon Zeon Co., Ltd. Compatibilizing agent and polymer blend composition using the same. 5,110,886, Cl. 526-260.000.
Kitayama, Hirofumi: *See—*
Asano, Takanobu; Kitayama, Hirofumi; Iwai, Hiroyuki; and Ono, Yuuji, 5,110,248, Cl. 414-172.000.
Kitchen, Kirk G.: *See—*
Turloff, Harry E.; Kitchen, Kirk G.; and Levin, Igor, 5,111,188, Cl. 340-623.000.
Kitoh, Atsunori; and Fujimoto, Yoshiji, to Sharp Kabushiki Kaisha. System and method for reducing distortion in voice synthesis through improved interpolation. 5,111,505, Cl. 381-51.000.
Kittson, Mark O.: *See—*
Shoesmith, Roy; and Kittson, Mark O., 5,110,627, Cl. 427-208.400.
Kiuchi, Manabu; Hirai, Masazumi; Fujikawa, Yasuo; Yamaguchi, Ryuji; Nanba, Akihiko; and Noda, Masato, to Rheo-Technology, Ltd. Process and apparatus for the production of semi-solidified metal composition. 5,110,547, Cl. 420-590.000.
Kiyofuji, Hiroyuki: *See—*
Yamaguchi, Hidefumi; Kiyofuji, Hiroyuki; Shirono, Katsuhiro; Tokuou, Rinpei; and Fuchigami, Jun, 5,110,783, Cl. 502-314.000.
Kjeldahl, Poul. Electric connector terminal, primarily a so-called isdn-jack, and a method of manufacturing contact strips therefor. 5,110,304, Cl. 439-398.000.
Klausz, Remy, to General Electric CGR S.A. X-ray diagnosis system for angiographic examination with device for the automatic tracking of a contrast medium. 5,111,492, Cl. 378-99.000.
Klein, Peter: *See—*
Bluml, Hans; Klein, Peter; and Wurl, Ernst, 5,110,283, Cl. 425-589.000.
Klein, Robert-Peter: *See—*
Anhauser, Dieter; and Klein, Robert-Peter, 5,110,599, Cl. 424-449.000.
Klingelhofer, Ernst-Ludwig: *See—*
Brand, Bernd; Klingelhofer, Ernst-Ludwig; and Hoch, Kristiane, 5,110,294, Cl. 434-34.000.
Klump, Dagmar, heir: *See—*
Palitsch, Peter; Czernotzky, Klaus; Richter, Erhard; Kreher, Berndt; Klump, Wilifried, deceased; and Muller, Rainer, 5,110,923, Cl. 540-589.000.
Klump, Wilifried, deceased: *See—*
Palitsch, Peter; Czernotzky, Klaus; Richter, Erhard; Kreher, Berndt; Klump, Wilifried, deceased; and Muller, Rainer, 5,110,923, Cl. 540-589.000.
Klusener, Peter: *See—*
Daubenbuchel, Werner; Eiselen, Otto; Friedrichs, Karsten; Hess, Dieter; Kiefer, Erich; and Klusener, Peter, 5,110,519, Cl. 264-40.200.
Knapheide, Wolfgang: *See—*
Lubke, Herbert; Knapheide, Wolfgang; and Schroder, Volker, 5,109,768, Cl. 101-153.000.
Knapp, Joseph E.: *See—*
Rosenblatt, Aaron; Rosenblatt, David H.; Feldman, David; Knapp, Joseph E.; Battisti, Diane; and Morsi, Badie, 5,110,580, Cl. 423-472.000.
Knauf, Vic C.: *See—*
Kridl, Jean C.; and Knauf, Vic C., 5,110,728, Cl. 435-69.100.
Kneale, Brian: *See—*
Griffiths, David C.; and Kneale, Brian, 5,110,781, Cl. 502-335.000.

Knierzinger, Andreas; and Scalone, Michelangelo, to Hoffmann-La Roche Inc. Tocopherol synthesis: chromane cyclization and catalysis. 5,110,955, Cl. 549-411.000.

Knobel, Thomas M.; Dubouchet, Christian; and Black, Lance L., to Dow Chemical Company, The. Conductive polymer laminates. 5,110,669, Cl. 428-215.000.

Knox Kershaw, Inc.: *See*—
Kershaw, John K.; and McCray, Philip C., 5,109,775, Cl. 104-2.000.

Knudsen, Bruce A.: *See*—
Benz, Mark G.; Knudsen, Bruce A.; Rumaner, Lee E.; and Zabala, Robert J., 5,109,593, Cl. 29-599.000.

Knudson, Milburn I., Jr.; and Jones, Thomas R., to Southern Clay Products, Inc. Process for manufacturing organoclays having enhanced gelling properties. 5,110,501, Cl. 252-315.200.

Knutsen, John C.: *See*—
Harclerode, William H.; Volz, William E.; Wiman, John V.; Voss, John C.; Pekich, Barry J.; and Knutsen, John C., 5,110,524, Cl. 264-53.000.
Harclerode, William H.; Knutsen, John C.; Pekich, Barry J.; Wiman, John V.; and Voss, John C., 5,110,836, Cl. 521-58.000.
Harclerode, William H.; Volz, William E.; Wiman, John V.; Voss, John C.; Pekich, Barry J.; and Knutsen, John C., 5,110,837, Cl. 521-58.000.

Kobayashi, Kazuhiro: *See*—
Koyama, Shigeo; Tsutsui, Eiji; Kobayashi, Kazuhiro; Horihata, Katsushi; and Tanaka, Hiroyuki, 5,111,244, Cl. 355-210.000.

Kobayashi, Kazuo; Terada, Yasushi; and Nakayama, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Nonvolatile content-addressable memory and operating method therefor. 5,111,427, Cl. 365-49.000.

Kobayashi, Kazuomi, to Bridgestone Corporation. Pneumatic tires including a foamed tread base rubber. 5,109,902, Cl. 152-209.00R.

Kobayashi, Kouichi, to COPAL Company Limited. Lens shutter driving mechanism using lens driving mechanism. 5,111,230, Cl. 354-400.000.

Kobayashi, Nobuaki: *See*—
Kawanami, Norihide; Okada, Kinjiro; Kobayashi, Nobuaki; and Masuda, Kimio, 5,111,520, Cl. 385-81.000.

Kobayashi, Seiji: *See*—
Psaltis, Demetri; Yamamura, Alan; and Kobayashi, Seiji, 5,111,445, Cl. 369-103.000.

Kobayashi, Shigeki, to TRW Steering & Industrial Products (Japan) Co., Ltd. Power steering valve assembly mechanism with offset valve sleeve bore. 5,109,753, Cl. 91-375.00A.

Kobayashi, Shizuko: *See*—
Itoi, Motokazu; Kobayashi, Shizuko; Ishii, Yasuo; and Kasuya, Minako, 5,110,796, Cl. 514-18.000.

Kobayashi, Tadahiko; Tokai, Yoichi; and Sahashi, Masashi, to Kabushiki Kaisha Toshiba. Super-magnetostrictive alloy. 5,110,376, Cl. 148-301.000.

Kobayashi, Takaichi, to Kabushiki Kaisha Toshiba. Device having a slider portion and a stand portion for titling a compact electronic apparatus. 5,111,361, Cl. 361 394.000.

Kobayashi, Yasumichi; Yabuuchi, Hidetaka; Eguchi, Osamu; Kondoh, Shinji; and Terai, Haruo, to Matsushita Electric Industrial Co., Ltd. Self-running cleaning apparatus. 5,109,566, Cl. 15-319.000.

Kobayashi, Yoshio: *See*—
Sato, Toru; Kobayashi, Yoshio; and Kato, Tomiya, 5,109,949, Cl. 181-240.000.

Kobayashi, Yukio: *See*—
Kondo, Hitoshi; Sasaki, Makoto; and Kobayashi, Yukio, 5,110,871, Cl. 525-207.000.
Sasaki, Makoto; Kobayashi, Yukio; and Tsuchiya, Shozo, 5,110,872, Cl. 525-216.000.

Kober, Reiner; Theobald, Hans; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; Seele, Rainer; and Wagenblast, Gerhard, to BASF Aktiengesellschaft. 2,2'-thienylbenzothiophenes, their preparation and their use for controlling pests. 5,110,829, Cl. 514-443.000.

Kobler, Ingo; and Petersen, Gerber, to MAN Roland Druckmaschinen AG. Apparatus to remove folded products, particularly folded newspaper products or newspaper sections, from a carrier structure, and method of such removal. 5,110,116, Cl. 271-277.000.

Kobler, Robert J., to AMP Incorporated. Latching means for electrical connectors. 5,110,302, Cl. 439-357.000.

Koboshi, Shigeharu: *See*—
Kuse, Satoru; Koboshi, Shigeharu; and Hagiwara, Moeko, 5,110,716, Cl. 430-429.000.

Koch, Hans W.; and Hodge, Bobby L., to INA Bearing Company, Inc. Shim thrust bearing apparatus. 5,110,223, Cl. 384-620.000.

Koch, Max, to TTC Technology Trading Company. Method and apparatus for feeding cable to a cable processor. 5,109,598, Cl. 29-825.000.

Koch, Russell W.: *See*—
Stayer, Mark L., Jr.; Antkowiak, Thomas A.; Lawson, David F.; and Koch, Russell W., 5,109,907, Cl. 152-564.000.

Kodama, Shunichi: *See*—
Horiuti, Masao; Kodama, Shunichi; and Kuroda, Kenji, 5,111,335, Cl. 359-350.000.

Koebele, Ralph R., to Borg-Warner Automotive Transmission & Engine Components Corporation. Method of assembling a torque converter impeller. 5,109,604, Cl. 29-889.500.

Koepe, Wilfried, to Koepe, Wilfried. Coiling machine for strip-shaped material, more particularly for an edge strip formed in the trimming of steel strips. 5,110,063, Cl. 242-78.100.

Koga, Toshiharu, to Sumitomo Yale Co., Ltd. Safety device for use when driver leaves a seat of an industrial vehicle. 5,109,945, Cl. 180-273.000.

Kohn, Michael T.; and Pearson, John F., to Belco Industries, Inc. Billet cut-off control. 5,109,740, Cl. 83-15.000.

Kohnle, Hans: *See*—
Joos, Heinz-Gunter; Kugler, Karl-Heinz; and Kohnle, Hans, 5,109,825, Cl. 123-479.000.

Kohtoh, Noriaki; Abe, Toyohiko; and Fukuro, Hiroyoshi, to Nissan Chemical Industries Ltd. Ferroelectric liquid crystal element. 5,111,318, Cl. 359-76.000.

Koito Manufacturing Co., Ltd.: *See*—
Shirai, Katutada; and Mochizuki, Hideharu, 5,111,369, Cl. 362-61.000.
Suzuki, Takanori; and Harada, Tatsuhiko, 5,111,368, Cl. 362-61.000.

Koiwa, Mitsuru: *See*—
Nobe, Hisanori; and Koiwa, Mitsuru, 5,109,827, Cl. 123-618.000.

Kojima, Shunji; Watanabe, Yoshiki; Goto, Hiroaki; and Moriga, Toshinori, to Toyo Seikan Kaisha Ltd. Emulsion water paint and process for its production using epoxy acrylic-resolve resin blends. 5,110,847, Cl. 523-412.000.

Kojima, Takao; Ishiguro, Hiroyuki; Kawachi, Yoshiki; and Yamada, Tetsuyo, to NGK Spark Plug Co., Ltd. Reinforced electrolyte function elements. 5,110,442, Cl. 204-426.000.

Kokubo, Tadayoshi: *See*—
Aoai, Toshiaki; and Kokubo, Tadayoshi, 5,110,709, Cl. 430-271.000.

Kokubu, Sadao; Nishio, Minoru; and Hattori, Yoshitaka, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Switch device. 5,111,010, Cl. 200-461.000.

Koleilat, Bashir M. Wellhead bowl protector. 5,109,923, Cl. 166-117.000.

Kolsky, Rodger E.; and Hale, William H., to NET/TECH International, Inc. Method for manufacturing a substantially rigid water-dispersible article. 5,110,525, Cl. 264-122.000.

Kolton, Chester; and Spater, Stuart S., to B&G Plastics, Inc. Garment accessory hanger for ties or scarfs with plural openings and special hook. 5,110,019, Cl. 223-87.000.

Komatsu, Fumito; and Kawatsu, Tositatsu, to Nippon Steel Corporation. Pump device for electrostatic plotter. 5,109,794, Cl. 118-660.000.

Komatsu, Fumito: *See*—
Ono, Hitoshi; and Komatsu, Fumito, 5,111,347, Cl. 360-75.000.

Komatsu, Takuichi: *See*—
Akao, Mutsuo; and Komatsu, Takuichi, 5,110,643, Cl. 428-35.900.

Komatsu, Tsuyoshi: *See*—
Yamamoto, Iwao; Ohta, Kazuchika; and Komatsu, Tsuyoshi, 5,110,916, Cl. 534-15.000.

Kometani, Kiichi: *See*—
Karasawa, Hiroo; Kometani, Kiichi; and Nakamura, Kiyokazu, 5,110,849, Cl. 524-87.000.

Komiak, James J., to General Electric Company. Power amplifier for broad band operation at frequencies above one ghz and at decade watt power levels. 5,111,157, Cl. 330-286.000.

Komiya, Ryohei: *See*—
Yamamoto, Takemi; Sakai, Jun; Kawahara, Hiroshi; Hayashi, Shigeyuki; Sakakibara, Kenji; Akao, Michitoshi; Sasaki, Ichiro; and Komiya, Ryohei, 5,111,237, Cl. 355-27.000.

Komiyama, Mikio; Miyazawa, Yasunao; Ebe, Kazuyoshi; and Saito, Takanori, to Lintec Corporation. Method of dicing and bonding semiconductor chips using a photocurable and heat curable adhesive tape. 5,110,388, Cl. 156-229.000.

Komma, Yoshiaki; Kadowaki, Shinichi; Kato, Makoto; and Saimi, Tetsuo, to Matsushita Electric Industrial Co., Ltd. Optical pickup head having a hologram-associated objective lens and optical information processing apparatus using the same. 5,111,448, Cl. 369-44.230.

Komori Corporation: *See*—
Yamauchi, Makoto; Kurata, Yoshiaki; and Ichinose, Tadashi, 5,110,114, Cl. 271-262.000.

Kondo, Hitoshi; Sasaki, Makoto; and Kobayashi, Yukio, to Bridgestone Corporation; and Nippon Oil Co., Ltd. Rubber compositions. 5,110,871, Cl. 525-207.000.

Kondo, Isao: *See*—
Ohtsuka, Katsuyuki; Kondo, Isao; and Okada, Takashi, 5,110,507, Cl. 252-626.000.

Kondo, Mineji: *See*—
Saito, Shiro; Takagi, Shigeru; and Kondo, Mineji, 5,109,887, Cl. 137-625.460.

Kondo, Takashi: *See*—
Inoue, Kazushi; Abe, Shigeru; Tagawa, Yuji; Kondo, Takashi; Watanabe, Yasuhiko; and Shibata, Jun, 5,109,785, Cl. 112-303.000.

Kondo, Toshio; Urata, Kenji; Katagiri, Masayoshi; and Nakamura, Kenichi, to Aisin Seiki Kabushiki Kaisha. Disc brake pad assembly which resists radial outward displacement. 5,109,959, Cl. 188-73.310.

Kondo, Yasuaki: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Matsumoto, Yukiharu; Oka, Mitsuru; and Sawai, Kiichi, 5,110,945, Cl. 548-453.000.

Kondo, Yumihito; Amamo, Yoshiaki; Kimura, Shinjiro; and Horiuchi, Susumu, to Hitachi, Ltd. Hydrogen generating apparatus. 5,110,559, Cl. 422-109.000.

Kondoh, Shinji: *See*—
Kobayashi, Yasumichi; Yabuuchi, Hidetaka; Eguchi, Osamu; Kondoh, Shinji; and Terai, Haruo, 5,109,566, Cl. 15-319.000.

Kondou, Masafumi: *See*—
Hosoba, Hiroyuki; Seki, Akinori; Hata, Toshio; Kondou, Masafumi; Suyama, Takahiro; and Matsui, Sadayoshi, 5,111,470, Cl. 372-46.000.

Konica Corporation: *See*—
Kuse, Satoru; Koboshi, Shigeharu; and Hagiwara, Moeko, 5,110,716, Cl. 430-429.000.
Nakano, Yasushi; Miyake, Tohru; Akutsu, Shigeru; and Shimizu, Yuji, 5,110,658, Cl. 428-141.000.
Owada, Akihiro, 5,111,249, Cl. 355-285.000.
Tanji, Masaki; and Nishijima, Toyoki, 5,110,718, Cl. 430-546.000.
Tomita, Yasuji; Nakai, Hideyuki; and Goto, Kiyoshi, 5,110,710, Cl. 430-278.000.
Yamamoto, Hiroyuki, 5,111,311, Cl. 358-461.000.

Konishi, Masataka: *See*—
Oki, Toshikazu; Saitoh, Kyoichiro; Tomatsu, Kozo; Tomita, Koji; Konishi, Masataka; Miyaki, Takeo; Tsunakawa, Mitsuaki; and Nishio, Maki, 5,110,960, Cl. 552-220.000.

Konno, Masaaki; and Kawai, Yasuhiro, to Fuji Photo Film Co., Ltd. Apparatus for recording and reading radiation image information. 5,111,045, Cl. 250-327.200.

Kono, Yoshimi; and Maeda, Sabee, to Osaka Soda Co., Ltd. Thermosetting resin composition. 5,110,873, Cl. 525-305.000.

Konrad, Johann: *See*—
Herden, Werner; Konrad, Johann; Sautter, Helmut; and Suchowerskyj, Wadym, 5,109,829, Cl. 123-643.000.

Kontani, Tetsuro, to LSI Logic Corporation. Arithmetic unit using a digital filter forming a digital signal processing system with signal bypass. 5,111,420, Cl. 364-745.000.

Koo, David, to North American Philips Corporation. Method and apparatus for communication channel identification and signal restoration. 5,111,298, Cl. 358-187.000.

Kopec, Stanley J., Jr.; Chan, Yiu-Fai; and Hartmann, Robert F., to Altera Corporation. Programmable interface for computer system peripheral circuit card. 5,111,423, Cl. 395-500.000.

Kopp, Kurt: *See*—
Grubler, Walter; and Kopp, Kurt, 5,109,618, Cl. 37-232.000.

Korman, Charles S.; Baliga, Bantval J.; and Chang, Hsueh-Rong, to General Electric Company. Multicellular FET having a Schottsky diode merged therewith. 5,111,253, Cl. 357-15.000.

Kosako, Kousei: *See*—
Hayakawa, Masahiro; and Kosako, Kousei, 5,111,222, Cl. 354-64.000.

Koshizaka, Atsushi: *See*—
Yokoyama, Mizuho; Kanamaru, Hisanobu; Okamoto, Yoshio; Kuroha, Tunemitu; Koshizaka, Atsushi; and Shinozaki, Hironori, 5,109,823, Cl. 123-472.000.

Kosow, David P.; Bhattacharya, Prabir; and Sternburg, Charles F., to Alpha Therapeutic Corporation. Factor VIII complex purification using heparin affinity chromatography. 5,110,907, Cl. 530-383.000.

Kostis, John B.: *See*—
Semmlow, John L.; Welkowitz, Walter; Kostis, John B.; and Akay, Metin, 5,109,863, Cl. 128-715.000.

Koszi, Louis A.: *See*—
Ackerman, David A.; Ketelsen, Leonard J.; and Koszi, Louis A., 5,111,475, Cl. 372-96.000.

Kotani, Kozo; Negawa, Hideo; and Sakaya, Taiichi, to Sumitomo Chemical Company, Limited. Agricultural film. 5,110,860, Cl. 524-563.000.

Kotani, Norihiko, to Mitsubishi Denki Kabushiki Kaisha. Method for managing production line processes. 5,111,404, Cl. 364-468.000.

Kotowski, Jeffrey P.; and Chapman, Brian, to Motorola, Inc. Overvoltage protection circuit. 5,111,353, Cl. 361-91.000.

Kotrba, John J.: *See*—
Rivera, Duveen J.; and Kotrba, John J., 5,111,202, Cl. 341-139.000.

Koval, Carl A.: *See*—
Noble, Richard D.; Koval, Carl A.; Nixon, Lori; and Slaff, Geoffrey F., 5,110,624, Cl. 427-212.000.

Koy, Alison M.; Johnson, Tracy K.; and Mumaugh, Julie. Nursing pillow. 5,109,557, Cl. 5-655.000.

Koyama, Mitsutoshi: *See*—
Miyashita, Naoto; Takahashi, Koichi; Sonobe, Hironori; and Koyama, Mitsutoshi, 5,111,272, Cl. 357-49.000.

Koyama, Shigeo; Tsutsui, Eiji; Kobayashi, Kazuhiro; Horihata, Katsushi; and Tanaka, Hiroyuki, to Mita Industrial Co., Ltd. Image-forming machine with improved process and optional unit assemblies. 5,111,244, Cl. 355-210.000.

Koyama, Yasufumi: *See*—
Kuwabara, Akira; Tamaki, Eiichi; and Koyama, Yasufumi, 5,111,332, Cl. 359-307.000.

Koyanagi, Hiroaki: *See*—
Nakayama, Takahiro; Tamahashi, Kunihiro; Fuyama, Moriaki; Minemura, Hiroyuki; Sato, Yoshio; Tsuboi, Nobuyoshi; and Koyanagi, Hiroaki, 5,110,792, Cl. 505-1.000.

Koyo Seiko Co., Ltd.: *See*—
Takahata, Ryoichi, 5,111,140, Cl. 324-228.000.

Kozaki, Kengo, to Clarion Co., Ltd. Password controlled anti-theft system for discouraging theft of a multiple-apparatus system. 5,111,185, Cl. 340-568.000.

Kozloski, Edward A.; Seger, Eric; Howard, Walter E.; and Weldon, James R., to Kraft General Foods, Inc. Coffee grounds disposal unit. 5,110,469, Cl. 210-455.000.

Kozlovsky, William J.; and Lenth, Wilfried, to International Business Machines Corporation. Diode laser frequency doubling using nonlinear crystal resonator with electronic resonance locking. 5,111,468, Cl. 372-32.000.

Kozu, Yoshikazu: *See*—
Kawanami, Norihide; Okada, Kinjiro; and Kozu, Yoshikazu, 5,111,521, Cl. 385-82.000.

Kozuka, Yoshinari; and Kakizaki, Yuichi, to NGK Insulators, Ltd. Method for optically measuring electric field and optical voltage/electric-field sensor. 5,111,135, Cl. 324-96.000.

Kraft General Foods, Inc.: *See*—
Kozloski, Edward A.; Seger, Eric; Howard, Walter E.; and Weldon, James R., 5,110,469, Cl. 210-455.000.

Kralles, Christopher J., to Eastman Kodak Company. Bernoulli scan gate. 5,111,241, Cl. 355-75.000.

Kramer, Dennis A., to Rockwell International Corporation. Speed sensor having a closed magnetic flux path for sensing speed from an axial face of a rotating member. 5,111,138, Cl. 324-174.000.

Kramer, Dennis A.: *See*—
Peck, David E.; Platzer, George E.; Kramer, Dennis A.; and Krusel, William D., 5,111,098, Cl. 310-268.000.

Kramer, Paul F., to Sierra Design, Inc. Method of sleeping bag construction and articles made thereby. 5,110,383, Cl. 156-88.000.

Kramer, Walter: *See*—
Heimann, Gisbert; and Kramer, Walter, 5,110,016, Cl. 222-475.100.

Krasij, Myron; and Watson, Paul R., to International Fuel Cells Corporation. Fuel cell component sealant. 5,110,691, Cl. 429-35.000.

Krauss, Peter: *See*—
Gugel, Georg; Haefner, Martin; Bauer, Rainer; and Krauss, Peter, 5,109,718, Cl. 73-866.500.

Krawl, Randy; and Stramel, Matt. Ore sample and water recovery apparatus and method therefor. 5,110,457, Cl. 210-787.000.

Kreher, Berndt: *See*—
Palitsch, Peter; Czernotzky, Klaus; Richter, Erhard; Kreher, Berndt; Klump, Wilifried, deceased; and Muller, Rainer, 5,110,923, Cl. 540-589.000.

Krehl, Dietmar: *See*—
Jurgens, Rainer; and Krehl, Dietmar, 5,109,924, Cl. 166-117.500.

Krejci, Karl: *See*—
Ohlendorf, Rolf; Haussmann, Gerhard; and Krejci, Karl, 5,109,726, Cl. 74-567.000.

Kremar, Djuro, to Valmet-Dominion Inc. Detection apparatus for paper build up on reel bar. 5,110,062, Cl. 242-57.000.

Kremmin, Klaus; and Kremmin, Thomas R. F., to K-2 Industries, Inc. Rotary display. 5,109,989, Cl. 211-1.550.

Kremmin, Thomas R. F.: *See*—
Kremmin, Klaus; and Kremmin, Thomas R. F., 5,109,989, Cl. 211-1.550.

Kresge, Edward N.: *See*—
Manalastas, Pacifico V.; Drake, Evelyn N.; Kresge, Edward N.; Thaler, Warren A.; McDougall, Lee A.; Newlove, John C.; Swarup, Vijay; and Geiger, Albert J., 5,110,486, Cl. 252-8.551.

Kricka, Larry J.; and Wilding, Peter, to University of Pennsylvania, The Trustees of the. Methods of detecting glycated proteins. 5,110,745, Cl. 436-87.000.

Kridl, Jean C.; and Knauf, Vic C., to Calgene, Inc. Acyl carrier protein - DNA sequence and synthesis. 5,110,728, Cl. 435-69.100.

Kritter, Sylvain: *See*—
Artieri, Alain; and Kritter, Sylvain, 5,111,066, Cl. 307-271.000.
Chaisemartin, Philippe; and Kritter, Sylvain, 5,111,488, Cl. 377-47.000.

Kriz, J. Stanley, to AVP/Megascan. Shielded high frequency power transformer. 5,111,174, Cl. 336-73.000.

Kroll, Arthur S.: *See*—
DeCecca, Michael L.; Kroll, Arthur S.; and Dunn, Arthur E., 5,111,245, Cl. 355-245.000.

Kroll, Harry: *See*—
Little, John L.; Schultz, Philip W.; and Kroll, Harry, 5,110,423, Cl. 205-254.000.

Kroy Inc.: *See*—
Richardson, Michael M.; and Swartout, Edwin L., 5,111,216, Cl. 346-76.0PH.

Krueger, David J.; Oh, Siebang; and Tjhie, Lun K., to Littlefuse, Inc. Overload condition indicating fuse. 5,111,177, Cl. 337-243.000.

Kruger, Johann E. W.: *See*—
Jasmer, Wolfgang E.; Kruger, Johann E. W.; and Killat, Ulrich R. P., 5,111,200, Cl. 340-826.000.

Krumeich, Jorg H. Use of a solution of alpha-chymotrypsin. 5,110,590, Cl. 424-94.640.

Krupp Kautex Maschinenbau GmbH: *See*—
Daubenbuchel, Werner; Eiselen, Otto; Friedrichs, Karsten; Hess, Dieter; Kiefer, Erich; and Klusener, Peter, 5,110,519, Cl. 264-40.200.

Krupp Polysius AG: *See*—
Blaszcyk, Gotthardt; and Patzelt, Norbert, 5,110,056, Cl. 241-19.000.

Kruse, George D., to PPA Industries, Inc. B-shaped structural member and fastening system. 5,110,094, Cl. 256-47.000

Krusel, William D.: *See*—
Peck, David E.; Platzer, George E.; Kramer, Dennis A.; and Krusel, William D., 5,111,098, Cl. 310-268.000.

Ksander, George: *See*—
Chu, George H.; Ogawa, Yasushi; McPherson, John M.; Ksander, George; Pratt, Bruce; Hendricks, Diana; and McMullin, Hugh, 5,110,604, Cl. 424-484.000.

Kubis, Charles S.; Walter, John; Roth, Donald J.; and Mohr, Glenn R., to Continental Holdings Inc. Sealing head including an induction heating coil. 5,109,653, Cl. 53-510.000.

Kubota Corporation: *See*—
Fukui, Tetsu; Oota, Yoshimi; and Hasegawa, Shigekazu, 5,109,964, Cl. 192-48.920.

Kubota, Takahiro: *See*—
Watanabe, Tsutomu; Yamashita, Masaaki; Kubota, Takahiro; Miyosawa, Yoshiaki; and Nishimoto, Tadashi, 5,110,689, Cl. 428-623.000.

Kubotsu, Akira: *See*—
Narukawa, Hiroshi; Mizobe, Akio; Nakahara, Fumio; Kubotsu, Akira; Akiyama, Akitsugu; Nishiyama, Masakazu; Nagamatu, Kenji; and Miyazaki, Hirotoshi, 5,110,678, Cl. 428-364.000.

Kudo, Toshimitsu: *See*—
Tsujimoto, Naohiko; Yamakoshi, Masaru; Kudo, Toshimitsu; Horiuchi, Yukiko; and Shimizu, Jiro, 5,110,915, Cl. 530-502.000.

Kuebler, Siegfried, to Head Sportgeraete Gesellschaft m.b.H. & Co. OHG. Tennis racket. 5,110,126, Cl. 273-73.00R.

Kuenast, Christoph: *See*—
Kober, Reiner; Theobald, Hans; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; Seele, Rainer; and Wagenblast, Gerhard, 5,110,829, Cl. 514-443.000.

Kuester & Co. GmbH: *See*—
Roth, Wolfgang; and Medebach, Thomas, 5,109,725, Cl. 74-505.000.

Kufen, David L.: *See*—
Stadler, James F.; Kufen, David L.; and Purvis, James L., 5,110,489, Cl. 252-35.000.

Kugler, Karl-Heinz: *See*—
Joos, Heinz-Gunter; Kugler, Karl-Heinz; and Kohnle, Hans, 5,109,825, Cl. 123-479.000.

Kuhlmann, Robert: *See*—
Reinhardt, Helmut; Becker, Adam; Kuhlmann, Robert; and Nauroth, Peter, 5,110,974, Cl. 423-335.000.

Kuhn, Michael, to U.S. Philips Corp. Magnetic resonance tomography method and magnetic resonance tomography apparatus for performing the method. 5,111,144, Cl. 324-309.000.

Kuhn, Michael H., to U.S. Philips Corporation. Coil system for volume-selective magnetic resonance spectroscopy. 5,111,146, Cl. 324-318.000.

Kumahira Safe Co., Inc.: *See*—
Gullman, Larry S., 5,111,004, Cl. 178-18.000.

Kumamura, Masaaki: *See*—
Inaba, Ryohei; Kumamura, Masaaki; Danmoto, Shojiro; Arai, Mitsuo; Tobo, Yozo; Sugawara, Hirofumi; and Miyazaki, Tadanobu, 5,110,522, Cl. 264-40.400.

Kumano, Masayoshi: *See*—
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Sakata, Sueo; and Kumano, Masayoshi, 5,111,377, Cl. 363-95.000.

Kume, Hisao; Kuwajima, Shuichi; and Sanma, Takahide, to Sony Corporation. Grid apparatus for a color cathode ray tube which eliminates vibration of the grids. 5,111,107, Cl. 313-405.000.

Kumiai Chemical Industry Co., Ltd.: *See*—
Miyazawa, Takeshige; and Kawano, Kazuhiko, 5,110,346, Cl. 71-90.000.

Kummert, Anton, to Siemens Aktiengesellschaft. Method and network configuration for obtaining the gradient of the output signals of a given network for processing discrete-time signals relating to the network parameters. 5,111,418, Cl. 364-724.190.

Kumpfbeck, Richard J.; and Hannan, Peter W., to Hazeltine Corporation. Linear array antenna with E-plane backlobe suppressor. 5,111,214, Cl. 343-841.000.

Kunce, Bob D.: *See*—
McClure, William C.; Kunce, Bob D.; and McClure, John Q., 5,111,502, Cl. 379-381.000.

Kunitake, Tetsuji: *See*—
Hiyoshi, Yoshihiko; Ide, Youji; Nagamoto, Masanaka; and Kunitake, Tetsuji, 5,110,369, Cl. 156-234.000.

Kuntz, Robert A.: *See*—
Zachman, Julie C.; Kuntz, Robert A.; Smith, Steven R.; and Hudzik, James S., 5,111,406, Cl. 364-474.020.

Kuo-Hua, Chou. Hairclip. 5,109,878, Cl. 132-279.000.

Kuo, Zeal-Sain. Double-story parking apparatus having telescopic access. 5,110,250, Cl. 414-229.000.

Kupski, Donald R.: *See*—
Rao, Mohan; Harlamert, Michael E.; Ash, Dennis; Schonauer, Sylvia L.; MacGeorge, Gregory D.; Barkhau, Keith D.; Beltz, John D.; and Kupski, Donald R., 5,110,601, Cl. 426-523.000.

Kuraray Company Limited: *See*—
Narukawa, Hiroshi; Mizobe, Akio; Nakahara, Fumio; Kubotsu, Akira; Akiyama, Akitsugu; Nishiyama, Masakazu; Nagamatu, Kenji; and Miyazaki, Hirotoshi, 5,110,678, Cl. 428-364.000.

Kurata, Yohei: *See*—
Ishimura, Yoshimasa; and Kurata, Yohei, 5,110,951, Cl. 549-222.000.

Kurata, Yoshiaki: *See*—
Yamauchi, Makoto; Kurata, Yoshiaki; and Ichinose, Tadashi, 5,110,114, Cl. 271-262.000.

Kurata, Yukio; Yoshida, Yoshio; and Nagahama, Toshiya, to Sharp Kabushiki Kaisha. Optical pick-up device using diffraction grating element having two sub-regions. 5,111,449, Cl. 369-44.370.

Kureha Kagaku Kogyo K. K.: *See*—
Satake, Yoshikatsu; Kushiwadate, Ken; Sakaguchi, Yasuo; Katto, Takayuki; and Shiik, Zenya, 5,110,681, Cl. 428-419.000.

Kuriacose, Joseph; Acamprora, Alfonse A.; and Zdepski, Joel W., to General Electric Company. Priority selection apparatus as for a video signal processor. 5,111,292, Cl. 358-133.000.

Kurihara, Masaki: *See*—
Futamura, Shoji; and Kurihara, Masaki, 5,111,017, Cl. 219-69.180.

Kurihara, Tokumitsu; Saito, Tatsuo; and Harada, Hidefumi, to Titan Kogyo Kabushiki Kaisha. White colored deodorizer and process for producing the same. 5,110,586, Cl. 424-76.100.

Kurino, Tateshi: *See*—
Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, 5,110,856, Cl. 524-459.000.

Kuroda, Kenji: *See*—
Horiuti, Masao; Kodama, Shunichi; and Kuroda, Kenji, 5,111,335, Cl. 359-350.000.

Kuroda, Minoru: *See*—
Amemiya, Hideo; Kuroda, Minoru; and Nitta, Tomio, 5,110,279, Cl. 425-208.000.

Kuroha, Tunemitu: *See*—
Yokoyama, Mizuho; Kanamaru, Hisanobu; Okamoto, Yoshio; Kuroha, Tunemitu; Koshizaka, Atsushi; and Shinozaki, Hironori, 5,109,823, Cl. 123-472.000.

Kurokawa, Toshikazu: *See*—
Tanaka, Fusatoshi; Kurokawa, Toshikazu; Matsuura, Kouji; and Aoki, Motoi, 5,109,811, Cl. 123-52.0MB.

Kuroki, Mitsushi: *See*—
Inoue, Masahide; Nakano, Tetsuya; Yabe, Naruo; Tsuyama, Koichi; Shimizu, Yoshitake; and Kuroki, Mitsushi, 5,110,704, Cl. 430-110.000.

Kurono, Masayasu; Kondo, Yasuaki; Matsumoto, Yukiharu; Oka, Mitsuru; and Sawai, Kiichi, to Sanwa Kagaku Kenkyusho Co., Ltd. 1-azoniabicyclo[3.3.0]oct-1(5)-ene salt derivatives and process for the preparation of the same. 5,110,945, Cl. 548-453.000.

Kurosawa, Ryoichi, to Kabushiki Kaisha Toshiba. Continuous deadbeat control system with feedback control. 5,111,124, Cl. 318-434.000.

Kurtz, Leo I.: *See*—
Murphy, John D.; and Kurtz, Leo I., 5,109,990, Cl. 211-41.000.

Kusakabe, Hiromi, to Kabushiki Kaisha Toshiba. Diffusion resistor circuit. 5,111,068, Cl. 307-303.100.

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Kusch, Hans-Jurgen, to Heidelberger Druckmaschinen AG. Rubber covered roller in which the physical state of the rubber at the end faces thereof is between a rubber elastic physical state and a glasslike physical state. 5,109,587, Cl. 29-132.000.

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Starks, John W.; and Kyle, E. Wayne, 5,109,952, Cl. 182-63.000.

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Fujita, Minoru; Fukushima, Yoichi; and Haga, Toshio, 5,110,707, Cl. 430-256.000.
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Wang, Chen-Chan, 5,111,114, Cl. 315-225.000.

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Fuentes, Jean-Luc M.; and Robert, Michel M., 5,110,412, Cl. 162-5.000.

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Labes, Mortimer M., to Temple University. Container for liquid crystal cumulative dosimeter. 5,110,215, Cl. 374-106.000.

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Lader, Ernest A. Automatic dry pet food dispenser. 5,109,799, Cl. 119-51.130.

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Noone, Lawrence E.; and Lagasse, Leo J., 5,110,033, Cl. 228-160.000.

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Lair, James H.; and Fagan, John E., to Burford Corp. Method of applying liquid to a pan surface in a controlled sequence. 5,110,616, Cl. 427-9.000.

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Wysocki, Joseph J.; Hark, Sui K.; Hull, Virgil J.; Stephany, Joseph F.; Lakatos, Andras I.; and Narang, Ram S., 5,111,320, Cl. 359-87.000.

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Hobbs, James V., 5,110,310, Cl. 440-1.000.

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Lambe, Donald M. Dual chamber pneumatic tire with the chambers separated by a collapsible partition wall. 5,109,905, Cl. 152-342.100.

Lancon, Emmanuel: *See*—
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Land, David. Fishing casting practice device. 5,110,136, Cl. 273-346.000.

Landi, Curtis L., to Supracor Systems, Inc. Shock absorbing wrap for sporting equipment. 5,110,653, Cl. 428-116.000.

Landis & Gyr Betriebs AG: *See*—
Nyfeler, Alex; Antes, Gregor; and Schmidlin, Hansjorg, 5,109,767, Cl. 101-23.000.

Lang, Heinrich; and Seiboth, Wolfgang, to Mekra Rangau Plastics GmbH & Co. KG. Motor-powered adjustable rear view mirror. 5,110,196, Cl. 359-874.000.

Lang, Josef: *See*—
Prigge, Helene; and Lang, Josef, 5,110,428, Cl. 204-129.300.

Lang, William O., Jr. Vibration-isolating mount. 5,110,081, Cl. 248-635.000.

Lange, Barry C.: *See*—
Sherba, Samuel E.; Mehta, Raj J.; and Lange, Barry C., 5,110,822, Cl. 514-372.000.

Langston Corporation, The: *See*—
Harris, William W., 5,110,396, Cl. 156-382.000.

Lantos, Ivan: *See*—
Flisak, Joseph R.; Gassman, Paul G.; Lantos, Ivan; and Mendelson, Wilford L., 5,110,959, Cl. 549-513.000.

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Newkirk, Marc S., 5,110,675, Cl. 428-312.200.

Laporte Industries Limited: *See*—
Baldry, Michael G. C.; and Cummerson, David A., 5,109,805, Cl. 119-173.000.

LaRocca, Guy P.: *See*—
Heaton, Harley L.; Arneson, Michael R.; and LaRocca, Guy P., 5,111,184, Cl. 340-542.000.

Larsen, Lawrence E.: *See*—
Johnson, Bruce H.; Larsen, Lawrence E.; and Welch, Edmund F., 5,110,222, Cl. 384-482.000.

Larsen, Steven D.: *See*—
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Larson, George G. Combined divot repairer and ball marker/spotter. 5,110,123, Cl. 273-32.00A.

Lary, Richard F.: *See*—
Edem, Brian C.; Helliwell, Richard P.; Johnston, John T.; and Lary, Richard F., 5,111,465, Cl. 371-54.000.

La See, Jack C. Grill clip. 5,109,647, Cl. 52-773.000.

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Laskaris, Evangelos T., to General Electric Company. Demountable coil form for epoxy-impregnated coils. 5,111,172, Cl. 335-216.000.

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Lau, Jurgen; Siegemund, Gunter; and Rohrscheid, Freimund, to Hoechst Aktiengesellschaft. Hexafluoroisopropyl-containing monomers, process for their preparation and their use. 5,110,983, Cl. 562-435.000.

Laughlin, Donald J.; and Wagoner, Lawrence F., to No Peek 21. Card mark sensor and methods for blackjack. 5,110,134, Cl. 273-293.000.

Lauterbach, Jacques. Apparatus for storing and dispensing objects, such as in particular packets of cigarettes, boxes and other like articles, of parallelepipedic or cylindrical shape. 5,110,192, Cl. 312-71.000.

Law, Brian R.; and Harris, Christopher, to Imperial Chemical Industries plc. Dispenser. 5,110,007, Cl. 221-25.000.

Law, Say-Jong; Chang, Steve C. S.; Palmacci, Stephen A.; and Cubicciotti, Roger S., to Ciba Corning Diagnostics Corp. Polysubstituted aryl acridinium esters. 5,110,932, Cl. 546-102.000.

Lawless, Philip A., to Du Pont de Nemours, E. I., and Company. Sampling system and method for sampling concentrated aerosols. 5,109,708, Cl. 73-863.110.

Lawrence, James L.: *See*—
Holden, Homer N.; Lawrence, James L.; Rogers, Jerry W.; and Sanders, John D., 5,109,600, Cl. 29-890.144.

Lawrence, W. Edward: *See*—
King, William G., Jr.; and Lawrence, W. Edward, 5,109,629, Cl. 43-132.100.

Lawson, David F.: *See*—
Stayer, Mark L., Jr.; Antkowiak, Thomas A.; Lawson, David F.; and Koch, Russell W., 5,109,907, Cl. 152-564.000.

Lazansky, Richard W.; Miller, Thomas R.; Coelho, David R.; Scott, Kenneth E.; and Stanculescu, Alec G., to Vantage Analysis Systems, Inc. Computer-aided engineering. 5,111,413, Cl. 364-578.000.

Leatham, Alan; and Coombs, Jeffrey, to Osprey Metals Limited. Production of metal spray deposits. 5,110,631, Cl. 427-422.000.

LeBan, Joseph F.; and Levin, Robert F., to Panduit Corp. Connector feeding apparatus for a connector termination press. 5,110,255, Cl. 414-754.000.

Lebeau, Donald R.; and Kalutkiewicz, Paul J., to A.B. Dick Company. System for electronically controlling LED-array image printer. 5,111,218, Cl. 346-107.00R.

Lebesch, Jeffrey D., to Baker Electrical Instrument Company. Method and apparatus for automatically calculating the integrity of an electrical coil. 5,111,149, Cl. 324-546.000.

LeBlanc, Peter E., to Beloit Corporation. High consistency pressure screen and method of separating accepts and rejects. 5,110,456, Cl. 209-273.000.

Lecat, Roger J., to Societe Civile Particuliere Fact-Anal. Toilet bowls with the aim of economizing water and electric energy. 5,109,551, Cl. 4-431.000.

Lecolier, Serge; Mortreux, Andre; Petit, Francis; and Samain, Henri, to Societe Nationale des Poudres et Explosifs. Catalytic process for the synthesis of an alcohol, new metal complexes and process for the synthesis of these complexes. 5,110,961, Cl. 556-31.000.

Lecorre, Yves, to Polytec. Device for the curved displacement of an object in contact with a surface. 5,109,951, Cl. 182-62.500.

Ledebuhr, Arno G., to Hughes Aircraft Company. Optical system for illuminating a light valve. 5,111,315, Cl. 359-40.000.

Lee, Chi-long: *See*—
King, Russell K.; and Lee, Chi-long, 5,110,967, Cl. 556-407.000.

Lee, Chinsoo; and Bassett, David R., to Union Carbide Chemicals & Plastics Technology Corporation. Process for the preparation of mixed parylene dimers free of alpha-halogens. 5,110,903, Cl. 528-397.000.

Lee, Donald R. Animal trap. 5,109,627, Cl. 43-88.000.

Lee, Duane A., to White Consolidated Industries, Inc. Method and control arrangement for cooking appliances. 5,111,028, Cl. 219-506.000.

Lee, Ernest D.: *See*—
Snyder, Thomas S.; and Lee, Ernest D., 5,110,566, Cl. 423-70.000.

Lee, Kien-yin; and Storm, Carlyle B., to United States of America, Energy. Detonating an insensitive explosive. 5,110,380, Cl. 149-92.000.

Lee, Merlin, to Agrisystemen Limited. Non-toxic insecticide composition and method for killing specific insects. 5,110,804, Cl. 514-60.000.

Lee, Ronald B.: *See*—
Citta, Richard W.; and Lee, Ronald B., 5,111,287, Cl. 358-83.000.

Lee, Vivian W.: *See*—
Coan, Michael; and Lee, Vivian W., 5,110,913, Cl. 530-388.230.

Lefevre, Jean-Jacques: *See*—
Massard, Thierry; Barbalat, Claude; and Lefevre, Jean-Jacques, 5,110,651, Cl. 428-105.000.

Lehtonen, Jarmo; and Kinnunen, Jukka, to Tampella AB. Extended press zone with shallow hydrodynamic pocket. 5,110,417, Cl. 162-358.000.
Leib, Kenneth G., to Grumman Aerospace Corporation. Optical correlator interconnect for optical computer. 5,111,314, Cl. 359-29.000.
Leica Inc.: *See—*
Martino, Ronald J.; and Ramsey, Frederick J., 5,111,336, Cl. 359-378.000.
LeMoel, Alain: *See—*
Balanzat, Emmanuel; Boiziau, C.; Darnez, Charles; Duraud, Jean-Paul; and LeMoel, Alain, 5,110,683, Cl. 428-421.000.
Lemon, J. Robert; Evans, William T.; and Christian, Robert E., to Professional Dental Technologies, Inc. Soft brush gum stimulator. 5,109,563, Cl. 15-167.100.
Lempert, Walter R.: *See—*
Miles, Richard B.; and Lempert, Walter R., 5,110,204, Cl. 356-28.000.
Lenski, Harald: *See—*
Sill, Karl-Hermann; and Lenski, Harald, 5,110,406, Cl. 156-621.000.
Lenth, Wilfried: *See—*
Kozlovsky, William J.; and Lenth, Wilfried, 5,111,468, Cl. 372-32.000.
Leo Pharmaceutical Products Ltd.: *See—*
Ahnfelt-Ronne, Ian; Hansen, Erik T.; Kirstein, Dorte; Nielsen, Ole Bent I.; and Rachlin, Schneur, 5,110,819, Cl. 514-311.000.
Leonard, Michele: *See—*
Dellacherie, Edith; Leonard, Michele; Sacco, Daniel; and Vigneron, Claude, 5,110,909, Cl. 530-385.000.
Lepe-Cisneros, Marco A. Floor mat with various tufting density zones. 5,109,784, Cl. 112-266.200.
Lerner, Bernard J. Recycle spray gas-liquid contactor. 5,110,325, Cl. 55-90.000.
Les fils d'Auguste Maillefer, Societe anonyme a Ballaigues: *See—*
Randin, Jean-Claude, 5,110,291, Cl. 433-156.000.
Lescher, Henri, to Glaenzer Spicer. Silencer for exhaust gases and part of an exhaust line having such a silencer. 5,109,950, Cl. 181-256.000.
Letourneau, Sylvie: *See—*
Normandin, Richard J. F ; Letourneau, Sylvie; Chatenoud, Francoise; and Williams, Robin L., 5,111,466, Cl. 372-22.000.
Leung, Chung W.: *See—*
Gregor, Richard W.; and Leung, Chung W., 5,110,756, Cl. 437-70.000.
Leuschke, Christian: *See—*
Weider, Richard; Arlt, Dieter; Leuschke, Christian; and Scholl, Thomas, 5,110,895, Cl. 528-176.000.
Leveen, Harry H.; and Leveen, Robert F. Treatment of acne. 5,110,801, Cl. 514-34.000.
Leveen, Robert F.: *See—*
Leveen, Harry H.; and Leveen, Robert F., 5,110,801, Cl. 514-34.000.
Levin, Igor: *See—*
Turloff, Harry E.; Kitchen, Kirk G.; and Levin, Igor, 5,111,188, Cl. 340-623.000.
Levin, Robert F.: *See—*
LeBan, Joseph F.; and Levin, Robert F., 5,110,255, Cl. 414-754.000.
Levinson, Mark; Ditchek, Brian M.; Rossoni, Philip G.; and Rock, Frederick, to GTE Laboratories Incorporated. Floating gate array transistors. 5,111,254, Cl. 357-22.000.
Levy, Mark A.: *See—*
Holt, Dennis A.; Levy, Mark A.; and Metcalf, Brian W., 5,110,939, Cl. 548-250.000.
Lew, Hyok S. Vortex flowmeter with balanced vortex sensor. 5,109,704, Cl. 73-861.240.
Lewin, Peter A.: *See—*
Walinsky, Paul; Lewin, Peter A.; and Reid, John M., 5,109,861, Cl. 128-662.060.
Lewis, David A.: *See—*
Lewis, Victor M.; and Lewis, David A., 5,110,609, Cl. 426-402.000.
Lewis, Thomas E.; and Nowak, Michael T., to Presstek, Inc. Spark-discharge lithography plates containing image-support pigments. 5,109,771, Cl. 101-453.000.
Lewis, Victor M.; and Lewis, David A., to Byron Agricultural Company Pty. Ltd. Intermediate moisture vegetables. 5,110,609, Cl. 426-402.000.
Li, Hung P.: *See—*
Sehkar, Jainagesh A.; Bhattacharya, A. K.; and Li, Hung P., 5,110,688, Cl. 428-552.000.
Li, Taie; Clement, Thomas P., II; and Hager, John P., to ASARCO Incorporated. Process for the recovery and separation of arsenic from antimony. 5,110,353, Cl. 75-703.000.
Liang, Wei-Chen; and Lin, I Bin, to Silicon Integrated Systems Corp. High density NOR type read only memory data cell and reference cell network. 5,111,428, Cl. 365-104.000.
Liddell, Eric: *See—*
Piechocki, Edward; and Liddell, Eric, 5,110,155, Cl. 283-117.000.
Lidgate, Deborah M.: *See—*
Cherng-Chyi, Roger F.; and Lidgate, Deborah M., 5,110,493, Cl. 514-413.000.
LieBerman, Robert A.: *See—*
Higbie, Francis A.; LieBerman, Robert A.; and Rose, Ira M., 5,110,889, Cl. 526-320.000.
Liebthal, Siegfried: *See—*
Teekell, Gordon E.; and Liebthal, Siegfried, 5,109,576, Cl. 24-30.50R.
Life Force Associates, L.P.: *See—*
Beauvais, Randall, 5,110,182, Cl. 297-216.000.
Life Systems, Inc.: *See—*
Hicho, Michael D., 5,109,700, Cl. 73-660.000.
Ligler, Frances S.: *See—*
Fare, Thomas L.; and Ligler, Frances S., 5,111,221, Cl. 357-25.000.
Limb, John O., to Hewlett-Packard Company. Apparatus and method for communicating data between a plurality of stations. 5,111,456, Cl. 370-85.100.
Lin, I-Bin: *See—*
Liang, Wei-Chen; and Lin, I-Bin, 5,111,428, Cl. 365-104.000.
Lindquist, Carl E., to San-O Industrial Corporation. Dual position, flat mount piggyback fuse holder. 5,111,176, Cl. 337-188.000.
Lindstedt, Dennis H., to Brunswick Corporation. Marine exhaust manifold and elbow. 5,109,668, Cl. 60-310.000.
Linkow, Leonard I. Neckless blade implant. 5,110,293, Cl. 433-176.000.
Linsuri, Ari; and Odell, Michael H., to Valmet Paper Machinery Inc. Turbulence generator in the headbox of a papermaking machine. 5,110,416, Cl. 162-343.000.
Lintec Corporation: *See—*
Komiyama, Mikio; Miyazawa, Yasunao; Ebe, Kazuyoshi; and Saito, Takanori, 5,110,388, Cl. 156-229.000.
Liotta, Dennis; and Merrill, Alfred H., to Emory University. Method of preparing sphingosine derivatives. 5,110,987, Cl. 564-303.000.
Lipp, G. Daniel: *See—*
Allaire, Roger A.; and Lipp, G. Daniel, 5,110,652, Cl. 428-114.000.
Lisec, Peter. Method and apparatus for filling the inner space of semifinished insulating glass panels with gas. 5,110,337, Cl. 65-58.000.
Liss, Bernard: *See—*
Liss, Saul; Liss, Bernard; and Manor, Ben, 5,109,847, Cl. 128-421.000.
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Literal Corporation: *See—*
Carey, James R.; and Rowden, David L., 5,111,350, Cl. 360-99.060.
Litschel, Martin: *See—*
Botzenhardt, Wolfgang; Dais, Siegfried; Kiencke, Uwe; Litschel, Martin; and Unruh, Jan, 5,111,460, Cl. 371-29.100.
Little, John L.; Schultz, Philip W.; and Kroll, Harry, to Technic Inc. Bath for electroplating bright tin or tin-lead alloys and method thereof. 5,110,423, Cl. 205-254.000.
Littlefuse, Inc.: *See—*
Krueger, David J.; Oh, Siebang; and Tjhie, Lun K., 5,111,177, Cl. 337-243.000.
Lloyd, Daniel L.; Crane, Newell D.; and Moore, David E., to Cold Jet, Inc. Particle blast cleaning apparatus and method. 5,109,636, Cl. 51-320.000.
Lloyd-Davies, William T.: *See—*
Scholle, William R.; Lloyd-Davies, William T.; and Savage, Chester, 5,110,012, Cl. 222-83.500.
Lo, Allen K. W. Multiple-print 3-D printer and process. 5,111,236, Cl. 355-22.000.
Lodetti, Attilio; and Medici, Brenno, to Agie AG fur industrielle Elektronik. Machine for spark erosion cutting with a guide-arm crossing the back wall of the working liquid container. 5,111,016, Cl. 219-69.120.
Loeper, Duane J.: *See—*
Charpentier, Albert J.; Loeper, Duane J.; McLaughlin, Brian J.; Gauthier, Edouard A.; and DiOrio, David W., 5,111,506, Cl. 381-68.400.
Logel, Jean-Pierre: *See—*
Cassat, Robert; and Logel, Jean-Pierre, 5,110,633, Cl. 427-430.100.
Login, Robert B.: *See—*
Chaudhuri, Ratan K.; Tracy, David J.; Login, Robert B.; and Helioff, Michael W., 5,110,585, Cl. 424-70.000.
Lokring Corporation: *See—*
Benson, Robert W.; Dietemann, Christopher G.; Beiley, Mark J.; and Sareshwala, Sohel A., 5,110,163, Cl. 285-382.200.
Lomasney, Gary M.: *See—*
Cramer, Paul S.; Lomasney, Gary M.; and Parkos, Joseph J., Jr., 5,109,589, Cl. 29-527.400.
Londergan, Mark B.; Sismour, Albert C., Jr.; and Richardson, John E., to Westinghouse Electric Corp. Rotor pole crossover. 5,111,097, Cl. 310-261.000.
Loney, Gregory C., to Massachusetts Institute of Technology. High bandwidth steering mirror. 5,110,195, Cl. 359-224.000.
Long, D. Clayton. Positive draft golf iron. 5,110,131, Cl. 273-167.00H.
Long, Paul, to Micron Technology, Inc. Method of isotropically dry etching a poly/WSi_x sandwich structure. 5,110,411, Cl. 156-656.000.
Longenecker, B. Michael: *See—*
Samuel, John; and Longenecker, B. Michael, 5,110,911, Cl. 530-395.000.
Longley, Kathryn L.: *See—*
Schmidhauser, John C.; and Longley, Kathryn L., 5,110,897, Cl. 528-196.000.
Longridge, Jethro L.: *See—*
Brittain, David R.; Brown, Steven P.; Cooper, Anthony L.; Longridge, Jethro L.; Morris, Jeffrey J.; Preston, John; and Slater, Linda, 5,110,808, Cl. 514-155.000.
Lopes, Rui P. Combination beach mat/tote bag. 5,110,219, Cl. 383-4.000.
Lopez, A. R., to Hazeltine Corporation. Calibration of plural - channel system. 5,111,208, Cl. 342-174.000.
Lord, Julia A.: *See—*
Bellingham, Godfrey; and Lord, Julia A., 5,109,874, Cl. 128-888.000.

Lorenz, Maria: *See—*
Walter, Manfred; Wassmer, Karl-Heinz; and Lorenz, Maria, 5,110,835, Cl. 521-57.000.
Los, Marinus, to American Cyanamid Company. Process for the preperation of 2-(2-imidazolin-2-yl) pyridines and quinolines. 5,110,930, Cl. 546-15.000.
Losada, Al. Fastener assembly with retaining fingers for use with a power actuated gun. 5,110,247, Cl. 411-441.000.
Lothmann, Josef; Osborg-Schmitz, Jurgen; and Schonbrenner, Wolfgang, to Zimmermann & Jansen. Closing apparatus for the bottom pouring hole of a casting ladle. 5,110,018, Cl. 222-600.000.
Lou, Kwong L. Beverage drinking set with straw holder. 5,109,995, Cl. 215-1.00A.
Loughran, James F., to Arrow Pneumatics, Inc. Filter dryer. 5,110,330, Cl. 55-275.000.
Louisiana Pacific Corporation: *See—*
Testone, Anthony Q.; and Benbenek, Waldyn J., 5,110,324, Cl. 55-11.000.
Love, Franklin S.; and Rumler, Joseph E., to Milliken Research Corporation. Machine and method to enhance fabric. 5,109,630, Cl. 51-74.00R.
Love, Natalie R. T-top roof cover. 5,110,178, Cl. 296-218.000.
Lowery, James O.: *See—*
Akin, Mickey E.; and Lowery, James O., 5,109,565, Cl. 15-309.100.
Lowrey, Tyler A.; Duesman, Kevin G.; and Cloud, Eugene H., to Micron Technology, Inc. Method of making a DRAM capacitor for use as an programmable antifuse for redundancy repair/options on a DRAM. 5,110,754, Cl. 437-52.000.
LSI Logic Corporation: *See—*
Kontani, Tetsuro, 5,111,420, Cl. 364-745.000.
Pasch, Nicholas F.; Sahakian, Vahak K.; and Dell'Oca, Conrad J., 5,111,279, Cl. 357-81.000.
LTS Lohmann Therapie-Systeme GmbH & Co. KG: *See—*
Anhauser, Dieter; and Klein, Robert-Peter, 5,110,599, Cl. 424-449.000.
Lu, Chih-Yuan, to Industrial Technology Research Institute. Roughened polysilicon surface capacitor electrode plate for high denity dram. 5,110,752, Cl. 437-47.000.
Lu, Jieh-Shan. Nipple assembly with alarm buzzer and body temperature indicator (IV). 5,109,864, Cl. 128-736.000.
Lubke, Herbert; Knapheide, Wolfgang; and Schroder, Volker, to Windmoller & Holscher. Device for moving the impression cylinder of a printing press into and out of printing engagement with an image carrier cylinder. 5,109,768, Cl. 101-153.000.
Lubrizol Corporation, The: *See—*
Tipton, Craig D.; and Tagliamonte, Thomas A., 5,110,488, Cl 252-32.70E.
Lucas, Gary L.; and Brewer, Tracy E. Vehicular mounted surveillance and recording system. 5,111,289, Cl. 358-108.000.
Lucas Industries: *See—*
Stevens, John W., 5,110,054, Cl. 239-533.110.
Lucas Industries Public Limited Company: *See—*
Stevens, John W., 5,110,053, Cl. 239-533.900.
Luftschiffbau Zeppelin GmbH: *See—*
Hagenlocher, Klaus; and Windischbauer, Florian, 5,110,070, Cl. 244-125.000.
Luigi Stoppani S.p.A.: *See—*
Bruzzone, Giuseppe; Perrone, Diego; and Sperati, Alessandro, 5,110,360, Cl. 106-638.000.
Luisoli, Reto: *See—*
Stegmann, Werner; and Luisoli, Reto, 5,110,978, Cl. 560-15.000.
Lukhard, Craig R.; Potter, Jerry F.; and Todd, Maurice C., to Du Pont de Nemours, E. I., and Company. Method for deregistering crimped multifilament tow. 5,110,517, Cl. 264-40.100.
Lum, Vanessa R.: *See—*
Mura, Albert J.; Belly, Robert T.; and Lum, Vanessa R., 5,110,723, Cl. 435-4.000.
Lundberg, Eric J.: *See—*
Dornbusch, Andrew W.; Beliveau, Yvan J.; Lundberg, Eric J.; and Pratt, Timothy, 5,110,202, Cl. 356-1.000.
Lundquist, Lynn C. Cutter enhancement for plastic size reduction equipment. 5,110,060, Cl. 241-158.000.
Lurie, Edward B.: *See—*
Malone, James P.; Biskupek, Warren J.; and Lurie, Edward B., 5,109,983, Cl. 206-408.000.
Lush, Craig L. Emergency snowshoes capable of being nested, hinged and locked together. 5,109,616, Cl. 36-122.000.
Luxtron Corporation: *See—*
Wickersheim, Kenneth A.; Sun, Mei H.; and Kim, James H., 5,109,595, Cl. 29-600.000.
Wickersheim, Kenneth A.; Sun, Mei H.; and Kim, James H., 5,110,216, Cl. 374-122.000.
Lyman, George; and Labriola, Anthony, to Costar Corporation. Multiwell test plate. 5,110,556, Cl. 422-101.000.
Lyons, Robert W.: *See—*
Johnstone, Bradford; and Lyons, Robert W., 5,109,776, Cl. 105-199.300.
Ma, Chun-Ho. Control device and method for an electric rice cooker. 5,111,026, Cl. 219-492.000.
Maassen, Nevil Q.; Romano, Timothy S.; and Peck, Leonard E., to Santa Barbara Research Center. Quick cooldown/low distortion hybrid focal plane array platform for use in infrared detector dewar packages. 5,111,050, Cl. 250-352.000.
MacCabee, Bruce S., to United States of America, Navy. Three dimensional range imaging system. 5,110,203, Cl. 356-5.000.
MacDonald, Lindsay W.; and Kirk, Richard A., to Crosfield Electronics Ltd. Image processing. 5,111,286, Cl. 358-75.000.
MacGeorge, Gregory D.: *See—*
Rao, Mohan; Harlamert, Michael E.; Ash, Dennis; Schonauer, Sylvia L.; MacGeorge, Gregory D.; Barkhau, Keith D.; Beltz, John D.; and Kupski, Donald R., 5,110,601, Cl. 426-523.000.
Mack, Robert J., to Colgate-Palmolive Company. Detergent pouch construction. 5,110,640, Cl. 428-35.200.
MacPherson, Collin B. P.; and Jefferson, Graham N., to Alcan International Limited. Infra-red burner system for furnaces. 5,110,287, Cl 432-24.000.
Macrotech Fluid Sealing, Inc.: *See—*
Szott, Michael J., 5,110,142, Cl. 277-33.000.
MacWilliams, Robert, to Stant Inc. Torque-override cap. 5,110,003, Cl. 220-304.000.
MacWilliams, William A.; and Eadie, William, to Kasten, Eadie Technology Ltd. Process and apparatus for partial upgrading of a heavy oil feedstock. 5,110,447, Cl. 208-106.000.
Maddon, Paul J.; Axel, Richard; Sweet, Raymond W.; and Arthos, James, to Columbia University in the City of New York, The Trustees of; and Smithkline Beckman Corporation. Derivatives of soluble T-4. 5,110,906, Cl. 530-350.000.
Madni, Asad M.; and Fala, Joseph, to Systron Donner Corp. Velocity deception apparatus. 5,111,206, Cl. 342-15.000.
Maeda, Mamoru: *See—*
Furumura, Yuji; Mieno, Fumitake; Nakazawa, Tsutomu; Eshita, Takashi; Maeda, Mamoru; and Yamauchi, Tsunenori, 5,111,266, Cl. 357-34.000.
Maeda, Masao: *See—*
Toyoda, Kazuo; and Maeda, Masao, 5,110,352, Cl. 75-679.000
Maeda, Sabee: *See—*
Kono, Yoshimi; and Maeda, Sabee, 5,110,873, Cl. 525-305.000.
Maeda, Satoshi; Sawada, Shizuo; and Shinozaki, Satoshi, to Kabushiki Kaisha Toshiba. Method of manufacturing a semiconductor device including forming a flattening layer over hollows in a contact hole. 5,110,766, Cl. 437-228.000.
Maeda, Susumu; Furusawa, Mitsuru; Marumoto, Yasumasa; Horiuchi, Tadashi; Sato, Yoshinari; and Saeki, Yoshiyuki, to Danchi Seiyaku Co., Ltd. Method of producing peptides using baculovirus vectors in cultured cells. 5,110,729, Cl. 435-69.100.
Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; and Nagano, Masami, to Hitachi, Ltd. Engine control system. 5,111,405, Cl. 364-431.070.
Maeda, Yuuji; Nakamura, Yozo; Nakamura, Kenichi; Sakamoto, Masahide; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, to Hitachi, Ltd.; and Nissan Motor Co., Ltd. Method and apparatus for reducing vibrations of car body. 5,109,815, Cl. 123-192.100.
Maerfeld, Charles: *See—*
Gelly, Jean-Francois; Dubut, Patrick; Reynier, Rene ; and Maerfeld, Charles, 5,109,860, Cl. 128-662.030.
Maerte, Leo: *See—*
Graf, Lothar; Fuchs, Karl-Heinz; and Maerte, Leo, 5,110,052, Cl 239-333.000.
Magerowski, Anthony J.: *See—*
Karra, Vijia K.; Magerowski, Anthony J.; and Szalanski, Scot E., 5,110,057, Cl. 241-30.000.
Magna Physics Corporation: *See—*
Hendershot, James R., 5,111,095, Cl. 310-168.000.
Magolda, Ronald L.; and Wright, Stephen W., to Du Pont Merck Pharmaceutical Company. Vinylogous hydroxamic acids and derivatives thereof as 5-lipoxygenase inhibitors. 5,110,831, Cl. 514-645.000.
Magruder, Judy A.; Eckenhoff, James B.; Cortese, Richard; Wright, Jeremy C.; and Peery, John R., to Alza Corporation. Delivery system comprising means for delivering agent to livestock. 5,110,596, Cl 424-438.000.
Maina, Bruno, to ROJ Electrotex S.p.A. Weft feeder for fluid jet looms with pneumatic rethreading apparatus. 5,109,891, Cl. 139-450.000.
Maiorca, Philip P.; Abernathy, Ronald N.; and Wadley, George H., to Asymptotic Technologies, Inc. Method for dispensing viscous materials a constant height above a workpiece surface. 5,110,615, Cl 427-8.000.
Makinen, Mauri. Angle joint piece. 5,110,234, Cl. 403-403.000.
Makino, Jun, to Canon Kabushiki Kaisha. Fθ lens and image apparatus using the same. 5,111,219, Cl. 346-108.000.
Makino, Masaaki, to Tokyo Electric Co., Ltd. Apparatus and method for demodulating a digital modulation signal. 5,111,152, Cl 329-300.000.
Makino, Toshiyuki: *See—*
Mohri, Toyoshige; and Makino, Toshiyuki, 5,109,976, Cl 198-498.000.
Makita, Atsuo; Takeuchi, Hirofumi; Shibata, Shinji; and Shimbara, Noboru, to Toto Ltd. Flush water supply system for toilet stool 5,109,550, Cl. 4-300.000.
Malec, Jeffrey M.; and Swanson, Hilmer L., to Harris Corporation. Modulated voltage supply and fault monitoring thereof adapted for use in an RF power amplifier system. 5,111,158, Cl. 330-297.000.
Malhi, Satwinder; and Shah, Rajiv, to Texax Instruments Incorporated Polysilicon FETs. 5,111,260, Cl. 357-23.700.
Malin, Stuart B., to Steelcase Inc. Design system for creating furniture layouts. 5,111,392, Cl. 364-401.000.
Mallary, Michael L.: *See—*
Das, Shyam C.; and Mallary, Michael L., 5,111,352, Cl 360-113.000.
Mallinckrodt Specialty Chemicals Company: *See—*
Ahlstrom, E. Wayne, 5,110,367, Cl. 134-42.000

VOL
1138
SS
1
MY
5
1992
UMI

Malone, Bruce A., to Dow Chemical Company, The. Antistatic polyolefin foams and films and method of making the foam and antistatic composition. 5,110,841, Cl. 521-94.000.
Malone, James P.; Biskupek, Warren J.; and Lurie, Edward B., to Minnesota Mining and Manufacturing Company. Package for an optical fiber jumper. 5,109,983, Cl. 206-408.000.
Maloney, F. H.: *See*—
Terry, Jimmy C.; and Mrosko, John A., 5,110,382, Cl. 156-77.000.
Maloney, Patrick: *See*—
Muderlak, Ken; and Maloney, Patrick, 5,111,477, Cl. 392-390.000.
Man-Gill Chemical Company: *See*—
Beck, Leslie M., 5,110,494, Cl. 252-156.000.
Man Roland Druckmaschinen AG: *See*—
Herold, Manfred; and Rebel, Herbert, 5,110,159, Cl. 285-131.000.
Kobler, Ingo; and Petersen, Godber, 5,110,116, Cl. 271-277.000.
Stanco, Christoph; Ochs, Heinrich; and Difflipp, Kurt, 5,110,109, Cl. 271-82.000.
Manalastas, Pacifico V.; Drake, Evelyn N.; Kresge, Edward N.; Thaler, Warren A.; McDougall, Lee A.; Newlove, John C.; Swarup, Vijay; and Geiger, Albert J., to Exxon Research and Engineering Company. Breaker chemical encapsulated with a crosslinked elastomer coating. 5,110,486, Cl. 252-8.551.
Mang, Paul: *See*—
Driller, Hubert; and Mang, Paul, 5,109,596, Cl. 29-705.000.
Mangan, Ciaran: *See*—
Grey, Howard; Mangan, Ciaran; Brochot, Jean; and Siddiqi, Iqbal, 5,110,746, Cl. 436-88.000.
Mangotte, Frederic: *See*—
Bonnefous, Odile; and Mangotte, Frederic, 5,109,856, Cl. 128-660.010.
Mania Gmbh & Co.: *See*—
Driller, Hubert; and Mang, Paul, 5,109,596, Cl. 29-705.000.
Mannesmann AG: *See*—
Bluml, Hans; Klein, Peter; and Wurl, Ernst, 5,110,283, Cl. 425-589.000.
Mannheimer, Paul D.: *See*—
Goodman, David E.; Warring, Jessica A.; and Mannheimer, Paul D., 5,109,849, Cl. 128-633.000.
Mano, Hiroshi: *See*—
Harada, Akira; and Mano, Hiroshi, 5,110,527, Cl. 264-127.000.
Manor, Ben: *See*—
Liss, Saul; Liss, Bernard; and Manor, Ben, 5,109,847, Cl. 128-421.000.
Mansell, Howard W.: *See*—
Sharp, William F.; Hingorany, Prem R.; and Mansell, Howard W., 5,109,594, Cl. 29-600.000.
Mansukhani, Gul: *See*—
Cherukuri, Subraman R.; Faust, Steven M.; and Mansukhani, Gul, 5,110,608, Cl. 426-3.000.
Mapother, Mary E.: *See*—
Joens, Lynn A.; Cramer, James D.; and Mapother, Mary E., 5,110,589, Cl. 424-92.000.
Maraldo, Claude A. Enclosure for semi-buried electrical distribution apparatus. 5,111,000, Cl. 174-38.000.
Marko, Kenneth A.: *See*—
James, John V.; Dosdall, James M.; and Marko, Kenneth A., 5,109,695, Cl. 73-117.300.
Marks, David N.: *See*—
Hammond, James A., Jr.; and Marks, David N., 5,110,900, Cl. 528-340.000.
Marks, Tobin J.; Nolan, Steven P.; and Gagne, Michel R., to Northwestern University. Organosamarium catalysts for the hydroamination of olefins. 5,110,948, Cl. 548-579.000.
Marley Company, The: *See*—
Duggan, Robert B.; Goins, James V.; Holloway, Donald E.; and Moulder, Ronald, 5,109,806, Cl. 122-13.100.
Marloro Marketing, Inc.: *See*—
Kidd, R. Christopher and Morrow, Lester W., 5,109,994, Cl. 211-162.000.
Maroist, Jules. Fire insulated partition. 5,109,779, Cl. 109-33.000.
Marotta Scientific Controls, Inc.: *See*—
Reinicke, Robert H., 5,111,092, Cl. 310-68.00B.
Marrone, Babetta L.; Simpson, Daniel J.; Unkefer, Clifford J.; and Whaley, Thomas W., to United States of America, Energy. Optical probe for the cytochrome P-450 cholesterol side chain cleavage enzyme. 5,110,725, Cl. 435-11.000.
Marry, Patrick J.: *See*—
Hietala, Alexander W.; and Marry, Patrick J., 5,111,162, Cl. 332-127.000.
Marsh, Ivan M.: *See*—
McAuliffe, Donald C.; and Marsh, Ivan M., 5,110,545, Cl. 420-534.000.
Marshall, Andrew, to Texas Instruments Incorporated. Charge pump. 5,111,375, Cl. 363-60.000.
Marshall, Clifton W.: *See*—
Hunter, Henry J.; Marshall, Clifton W.; Cunningham, Kenneth; and Tingdahl, Marvin A., 5,110,071, Cl. 244-137.300.
Marshall, Ian W.: *See*—
O'Mahony, Michael J.; and Marshall, Ian W., 5,111,153, Cl. 359-336.000.
Marshall, Lyman R., to Scherer Healthcare Ltd. Surgical drape. 5,109,873, Cl. 128-849.000.
Marshall, Rodney J.; and Sherborne, John M., to British Petroleum Company p.l.c., The. Electrochemical process. 5,110,420, Cl. 205-157.000.
Marsulex Inc.: *See*—
Derrah, Russell I., 5,110,581, Cl. 423-479.000.
Martin Beilhack Maschinenfabrik und Hammerwerk GmbH: *See*—
Grubler, Walter; and Kopp, Kurt, 5,109,618, Cl. 37-232.000.
Martin Marietta Energy Systems, Inc.: *See*—
Feenstra, Roeland; and Boatner, Lynn A., 5,110,790, Cl. 505-1.000.
Martin, Richard A. Circuit for sustaining power supply output following momentary interruption of commercial A.C. power. 5,111,058, Cl. 307-66.000.
Martin, Tiby M. High pressure electronic common-rail fuel injection system for diesel engines. 5,109,822, Cl. 123-456.000.
Martinez, Eugene. Enhanced contrast, maximum gain front and rear projection screens. 5,111,337, Cl. 359-443.000.
Martinez, Paz C.: *See*—
Corral, Jose S. M.; De Aza, Salvador; Poyato, Francisco M.; Valle Fuentes, Francisco J.; Miranda, Isabel O.; Caseres, Rafael M.; and Martinez, Paz C., 5,110,773, Cl. 501-98.000.
Martinez-Vera, Enrique R.: *See*—
Villarreal-Trevino, Juan A.; Zendejas-Martinez, Eugenio; and Martinez-Vera, Enrique R., 5,110,350, Cl. 75-495.000.
Martini, Francesco; and Perazzo, Luigi, to W. R. Grance & Co.-Conn. Method of making a laminate. 5,110,390, Cl. 156-244.110.
Martino, Pamela L.: *See*—
Kadunce, Randy R.; Bush, Paul W.; and Martino, Pamela L., 5,110,336, Cl. 65-24.000.
Martino, Ronald J.; and Ramsey, Frederick J., to Leica Inc. Film accumulator. 5,111,336, Cl. 359-378.000.
Marumoto, Yasumasa: *See*—
Maeda, Susumu; Furusawa, Mitsuru; Marumoto, Yasumasa; Horiuchi, Tadashi; Sato, Yoshinari; and Saeki, Yoshiyuki, 5,110,729, Cl. 435-69.100.
Maruyama, Yuichi: *See*—
Nishikawa, Toshio; Maruyama, Yuichi; Ogura, Hiromi; and Michishita, Kenshi, 5,110,308, Cl. 439-582.000.
Marx, Arthur F.: *See*—
Clifford, Kenneth H.; Phillips, Gareth T.; and Marx, Arthur F., 5,110,943, Cl. 546-302.000.
Marzi, Danilo; and Stonier, Roger A., to Selenia Spazio, S.p.A. Process for the perfecting of the grounding of multi-layer insulations (thermal blankets) for space applications. 5,111,354, Cl. 361-218.000.
Masai, Kentarou: *See*—
Ohmura, Keiji; Okuno, Sumio; Takeichi, Michifumi; Masai, Kentarou; Okamoto, Seiichi; and Nakamura, Masatake, 5,109,777, Cl. 105-401.000.
Maschinenfabrik Andritz Actiengesellschaft: *See*—
Kappel, Johannes; Stock, Gunther; Eickhoff, Karl; and Petschauer, Franz, 5,109,764, Cl. 100-99.000.
Mascio, Dennis R.: *See*—
Chirokas, David S.; Michaud, Daniel G.; McDeed, Arthur P., III; Shiel, Michael J.; Soper, G. Michael; and Mascio, Dennis R., 5,111,397, Cl. 364-419.000.
Masham, Roger D.: *See*—
Brailsford, Ian; Carter, Robert A.; Gutman, Edward J.; Jugle, Don B.; and Masham, Roger D., 5,111,246, Cl. 355-245.000.
Massachusetts Institute of Technology: *See*—
Blanco, Ernesto E.; and Samadani, Rosina, 5,109,850, Cl. 128-635.000.
Loney, Gregory C., 5,110,195, Cl. 359-224.000.
Roberge, James K., 5,111,065, Cl. 307-270.000.
Massard, Thierry; Barbalat, Claude; and Lefevre, Jean-Jacques, to Commissariat a l'Energie Atomique. Dielectric or magnetic anisotropy layers, laminated composite material incorporating said layers and their production process. 5,110,651, Cl. 428-105.000.
Master Lock Company: *See*—
Grandy, Kenneth N., Sr., 5,109,684, Cl. 70-25.000.
Masters, John V.: *See*—
Crenshaw, Rodney D.; Goffe, Bobby E.; and Masters, John V., 5,109,943, Cl. 180-228.000.
Maston, Roy E., III; and Murphy, Robert H., to R. H. Murphy Company, Inc. Carrier and carrier system for flatpack integrated circuits. 5,109,981, Cl. 206-331.000.
Masuda, Hiroyuki, to Mitsubishi Denki Kabushiki Kaisha. Driving circuit for semiconductor element. 5,111,061, Cl. 307-254.000.
Masuda, Kimio: *See*—
Kawanami, Norihide; Okada, Kinjiro; Kobayashi, Nobuaki; and Masuda, Kimio, 5,111,520, Cl. 385-81.000.
Masugi, Takashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 5,110,921, Cl. 540-222.000.
Masyagutov, Robert G.; Drobakh, Viktor T.; and Aprakin, Alexandr S. Turbine rate-of-flow transducer. 5,109,705, Cl. 73-861.830.
Matano, Masaharu: *See*—
Yamashita, Tsukasa; Inoue, Nobuhisa; Kazuhiko, Mori; Matano, Masaharu; and Taguchi, Isao, 5,111,447, Cl. 369-44.120.
Mathildus, Gerardus L.; Hecht, Matthew W.; and Briones, Robert A., to North American Philips Corporation. An apparatus for controlling the rotation and stabilizing the position of a magnet device. 5,111,440, Cl. 369-13.000.
Mathis, Hugo, to Rund-Stahl-Bau Gesellschaft m.b.H. Formwork arrangement for erecting a structural wall. 5,109,953, Cl. 182-129.000.
Mathis, Ronald F., to Tacan Corporation. Method of interference reduction for frequency multiplexed optical fiber communication. 5,111,519, Cl. 385-24.000.
Matlock, Gordon E. Switch tie end plating machine. 5,110,028, Cl. 227-39.000.

Matlock, Paul L.: *See*—
Blevins, Charles H., II; Matlock, Paul L.; and Murphy, Gerald J., 5,110,970, Cl. 556-445.000.
Matoba, Hirotsugu: *See*—
Terashima, Shigeo; and Matoba, Hirotsugu, 5,111,031, Cl. 235-456.000.
Matsuda, Tetsuya; Yamamoto, Shunji; Yamada, Tadatoshi; and Ushijima, Toshie, to Mitsubishi Denki Kabushiki Kaisha. Deflection electromagnet for a charged particle device. 5,111,173, Cl. 335-216.000.
Matsuhashi, Ryo: *See*—
Sato, Eiji; Matsuhashi, Ryo; Ito, Satoshi; Tano, Kazuhiro; and Asakawa, Kenichi, 5,110,544, Cl. 420-69.000.
Matsui, Hideki: *See*—
Yokonuma, Norikazu; Hagiuda, Nobuyoshi; Matsui, Hideki; and Sakamoto, Hiroshi, 5,111,233, Cl. 354-416.000.
Matsui, Sadayoshi: *See*—
Hosoba, Hiroyuki; Seki, Akinori; Hata, Toshio; Kondou, Masafumi; Suyama, Takahiro; and Matsui, Sadayoshi, 5,111,470, Cl. 372-46.000.
Matsumoto, Hiroshi: *See*—
Katayama, Shigeru; Matsumoto, Hiroshi; and Wada, Tatuo, 5,110,788, Cl. 503-227.000.
Ogata, Masaru; Matsumoto, Hiroshi; Shimizu, Sumio; and Kida, Shiro, 5,110,825, Cl. 514-381.000.
Matsumoto, Jun; and Tanaka, Ryouchi, to Olympus Optical Company Ltd. Sheath of articulated tube for endoscope. 5,110,645, Cl. 428-36.900.
Matsumoto, Tsuruyoshi: *See*—
Yamamoto, Takashi; Matsumoto, Tsuruyoshi; and Shimada, Katsuhiko, 5,111,526, Cl. 385-145.000.
Matsumoto, Yasuhiko; Nanba, Katsuaki; and Morita, Isao, to Penguin Wax Co., Ltd. Floor coating agent applying machine. 5,109,790, Cl. 118-63.000.
Matsumoto, Yasuhiko; Nanba, Katsuaki; and Morita, Isao, to Penguin Wax Co., Ltd. Floor coating liquid applying machine. 5,109,791, Cl. 118-63.000.
Matsumoto, Yasuhiko, to Yamaha Corporation. Process of fabricating multi-level wiring structure, incorporated in semiconductor device. 5,110,763, Cl. 437-195.000.
Matsumoto, Yoshinori: *See*—
Aizawa, Atsushi; Matsumoto, Yoshinori; Hara, Kenji; and Yamada, Toshiro, 5,110,218, Cl. 374-153.000.
Matsumoto, Yukiharu: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Matsumoto, Yukiharu; Oka, Mitsuru; and Sawai, Kiichi, 5,110,945, Cl. 548-453.000.
Matsumoto, Yuzo: *See*—
Fujikura, Takashi; Ito, Noriki; Matsumoto, Yuzo; Asano, Masaharu; and Takenaka, Toichi, 5,110,820, Cl. 514-356.000.
Matsumura, Hiroshi; Shimamura, Norio; Ohta, Yasuto; Kawabe, Masaru; Shimizu, Makoto; Natori, Naoaki; and Suzuki, Naohiko, to Tokyo Tatsuno Co., Ltd. System radio transmission of liquid level data and battery saving technique. 5,111,201, Cl. 340-870.380.
Matsumura, Shigenori: *See*—
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Sakata, Sueo; and Kumano, Masayoshi, 5,111,377, Cl. 363-95.000.
Matsumura, Takuo; and Nogami, Yutaka, to Fuji Xerox Co., Ltd. Sheet size detector for sheet container. 5,110,106, Cl. 271-9.000.
Matsumura, Yasuo: *See*—
Nagatsuka, Ikutaroh; Suzuki, Chiaki; Takeda, Masayuki; Matsumura, Yasuo; and Aoki, Takayoshi, 5,110,703, Cl. 430-108.000.
Matsunaka, Kenji: *See*—
Kanno, Masahide; Ieoka, Shouichi; Hiyama, Keiichi; Matsunaka, Kenji; and Eto, Tadao, 5,111,306, Cl. 358-403.000.
Matsuno, Koji: *See*—
Yamakawa, Yoshisuke; Fukushima, Kiyoto; and Matsuno, Koji, 5,110,659, Cl. 428-141.000.
Matsuoka, Atsuko: *See*—
Iwata, Toshio; Matsuoka, Atsuko; and Hashimoto, Atsuko, 5,109,820, Cl. 123-425.000.
Matsuoka, Hideo, to Akai Electric Co., Ltd. FM audio record reproducing apparatus having circuitry for preventing discontinuities during channel switching or switching of read heads. 5,111,346, Cl. 360-64.000.
Matsuoka, Noriyuki; and Uratsuji, Kazumi, to Yamaichi Electric Mfg. Co., Ltd. IC carrier with shaft coupling. 5,109,980, Cl. 206-328.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Fukushima, Yoshihisa; and Satoh, Isao, 5,111,444, Cl. 369-58.000.
Hasegawa, Yo; Okano, Kazuyuki; Isozaki, Yasuhito; Tabata, Munehiro; Hayashi, Chiharu; and Nakanishi, Akira, 5,110,622, Cl. 427-126.100.
Ide, Takehiko, 5,110,229, Cl. 400-249.000.
Ishii, Hirofumi; and Morimura, Atsushi, 5,111,511, Cl. 382-1.000.
Kobayashi, Yasumichi; Yabuuchi, Hidetaka; Eguchi, Osamu; Kondoh, Shinji; and Terai, Haruo, 5,109,566, Cl. 15-319.000.
Komma, Yoshiaki; Kadowaki, Shinichi; Kato, Makoto; and Saimi, Tetsuo, 5,111,448, Cl. 369-44.230.
Murai, Mikio; Takahashi, Kiyoshi; and Odagiri, Masaru, 5,110,676, Cl. 428-336.000.
Ohtsuchi, Tetsuro; Tsutsui, Hiroshi; Ohmori, Koichi; Baba, Sueki; Funakoshi, Hiromasa; Kawara, Toshiyuki; and Yoshizumi, Yoshiyuki, 5,111,052, Cl. 250-370.010.
Okada, Shigeru; and Fujita, Masami, 5,109,570, Cl. 16-289.000.
Suzuki, Masa-aki; and Ando, Eiji, 5,110,648, Cl. 428-64.000.
Taguchi, Nobuyoshi; Yasuo, Fukui; and Akihiro, Imai, 5,111,215, Cl. 346-76.0PH.
Tsuji, Toshiaki; Imai, Kiyoshi; and Ishizu, Atsushi, 5,111,297, Cl. 358-183.000.
Tsujihara, Susumu; and Sakanishi, Yasuaki, 5,111,284, Cl. 358-60.000.
Yamada, Yuichiro; Matusita, Yosinari; and Tutui, Yuji, 5,110,437, Cl. 204-298.330.
Matsushita Electric Works, Ltd.: *See*—
Yoshimura, Kamunari; and Nakamura, Kuninori, 5,111,056, Cl. 250-560.000.
Matsuura, Ikuya: *See*—
Hirono, Hatsuo; Moriyama, Koichi; Fukui, Hideo; and Matsuura, Ikuya, 5,110,782, Cl. 502-303.000.
Matsuura, Kouji: *See*—
Tanaka, Fusatoshi; Kurokawa, Toshikazu; Matsuura, Kouji; and Aoki, Motoi, 5,109,811, Cl. 123-52.0MB.
Matsuura, Masayuki, to Kabushiki Kaisha Semex Japan. Method and apparatus for examining ovary and diagnosing the presence of pregnancy in mammals. 5,109,865, Cl. 128-738.000.
Matsuura, Yutaka: *See*—
Yamamoto, Hitoshi; Sagawa, Masato; Fujimura, Setsuo; and Matsuura, Yutaka, 5,110,377, Cl. 148-302.000.
Matsuzaki, Kazuhiro: *See*—
Asai, Kohtaro; Murakami, Tokumichi; and Matsuzaki, Kazuhiro, 5,111,294, Cl. 358-136.000.
Mattelmaki, Esko I., to A. Ahlstrom Corp. Apparatus for heat treatment of lime mud. 5,110,289, Cl. 432-106.000.
Mattelmaki, Esko I., to A. Ahlstrom Corporation. Method and apparatus for heat treatment of lime mud. 5,110,567, Cl. 423-175.000.
Matthews, Joseph H., III.: *See*—
Gasper, Elon; and Matthews, Joseph H., III., 5,111,409, Cl. 395-152.000.
Mattinson, Beverley I. Anti-flash hood. 5,109,549, Cl. 2-202.000.
Matusita, Yosinari: *See*—
Yamada, Yuichiro; Matusita, Yosinari; and Tutui, Yuji, 5,110,437, Cl. 204-298.330.
Mauger, Philip E., to Nanostructures, Inc. Silicon membrane with controlled stress. 5,110,373, Cl. 148-33.200.
Maurer, Paul-Gerhard: *See*—
Huschka, Hans; Demmich, Joerg; and Maurer, Paul-Gerhard, 5,109,918, Cl. 165-104.180.
Mauser-Werke Oberndorf GmbH: *See*—
Bertiller, Roland; Schneider, Hubert; and Dieterle, Gerd, 5,109,748, Cl. 89-1.200.
May, John W.; Mey, William; and Riblett, Susan E., to Eastman Kodak Company. Method and apparatus for forming masters and images therefrom. 5,110,699, Cl. 430-54.000.
Mayahara, Akira: *See*—
Hatai, Hirotaka; and Mayahara, Akira, 5,110,274, Cl. 425-28.100.
Mayer, Stephen H.; and Hall, David, to Professional Coin Grading Service, Inc. Tamperproof coin case. 5,109,977, Cl. 206-0.800.
Mazda Motor Corporation: *See*—
Akio, Shibata, 5,110,177, Cl. 296-189.000.
Fujiwara, Takuji, 5,109,734, Cl. 74-869.000.
Kimura, Katsunori; Hata, Shinichi; and Nishimura, Yoshitaka, 5,111,383, Cl. 364-184.000.
Tanaka, Fusatoshi; Kurokawa, Toshikazu; Matsuura, Kouji; and Aoki, Motoi, 5,109,811, Cl. 123-52.0MB.
Mazur, Duane J.; Weinberg, Norman L.; and Abel, Albert E., to A.L. Sandpiper Corporation. Processes for decontaminating polluted substrates. 5,110,364, Cl. 134-2.000.
Mazzone, Daniel P.; Hoeffel, James D.; Nevitt, James S.; and Elliott, Richard E., to Systems Research Laboratories, Inc. Eddy current proble with adjustable position rotating head. 5,111,142, Cl. 324-262.000.
McAninch, William D.: *See*—
Ruschak, Michael L.; McAninch, William D.; and Anderson, Dan A., 5,110,553, Cl. 422-68.100.
McAuliffe, Donald C.; and Marsh, Ivan M., to Golden Aluminum Company. Aluminum alloy composition. 5,110,545, Cl. 420-534.000.
McAuliffe, Keven P.; Melton, Evelyn A.; Norton, Vern A.; Pfister, Gregoty F.; and Wakefield, Scott P., to International Business Machines Corporation. Aperiodic mapping system using power-of-two stride access to interleaved devices. 5,111,389, Cl. 395-800.000.
McBain, Douglas S.; and Crano, John C., to PPG Industries, Inc. Polymerizable organic resin composition. 5,110,881, Cl. 525-455.000.
McBride, Donald G., to International Business Machines Corporation. Method of marking a thin film package. 5,109,601, Cl. 29-840.000.
McBride, Frank A.: *See*—
Tauber, Arthur; Finnegan, Robert D.; Dornath Mohr, Michelle A.; and McBride, Frank A., 5,110,767, Cl. 505-1.000.
McCants, Malcolm T. Method for production of hydrocarbon diluent from heavy crude oil. 5,109,928, Cl. 166-266.000.
McClenning, Roy. Portable travel pantry. 5,110,193, Cl. 312-282.000.
McClure, John Q.: *See*—
McClure, William C.; Kunce, Bob D.; and McClure, John Q., 5,111,502, Cl. 379-380.000.
McClure, William C.; Kunce, Bob D.; and McClure, John Q., to Command Communications, Inc. Telephone line bridging sensor. 5,111,502, Cl. 379-380.000.
McCollum, John L.: *See*—
Chen, Shih-Ou; McCollum, John L.; and Chiang, Steve S., 5,111,262, Cl. 357-23.130.
McCormick & Company, Inc.: *See*—
Galetto, William G.; and Kent-Riggs, Laura K., 5,109,717, Cl. 73-866.000.

VOL 1138 ISS 1 MY 5 1992 UMI

McCormick, Robert P.: *See—*
Jasinski, John F.; McCormick, Robert P.; Mellinger, Ricky C.; Draper, James K.; and Vyas, Navin N., 5,110,387, Cl. 156-222.000.

McCormick, Ronald O. Glass fiberizing bushing. 5,110,333, Cl. 65-1.000.

McCray, Philip C.: *See—*
Kershaw, John K.; and McCray, Philip C., 5,109,775, Cl. 104-2.000.

McDeed, Arthur P., III: *See—*
Chirokas, David S.; Michaud, Daniel G.; McDeed, Arthur P., III; Shiel, Michael J.; Soper, G. Michael; and Mascio, Dennis R., 5,111,397, Cl. 364-419.000.

McDermott, Robert M.: *See—*
Smith, Paul D.; Padula, Michael J.; and McDermott, Robert M., 5,111,005, Cl. 178-19.000.

McDonald, James A., to Motorola, Inc. Method and apparatus for providing signal synchronization in a spread spectrum communication system. 5,111,478, Cl. 375-1.000.

McDonald, Philip; and Kimball, Newel. Headgear for cervical traction system. 5,109,835, Cl. 606-241.000.

McDonnell Douglas Corporation: *See—*
Dahlberg, Scott E., 5,111 211, Cl. 343-700.0MS.
Fay, Theodore D.; Morgan, William F.; and Schneider, Stanley, 5,110,210, Cl. 356-150.000.

McDougall, Lee A.: *See—*
Manalastas, Pacifico V.; Drake, Evelyn N.; Kresge, Edward N.; Thaler, Warren A.; McDougall, Lee A.; Newlove, John C.; Swarup, Vijay; and Geiger, Albert J., 5,110,486, Cl. 252-8.551.

McDuffie, William L. Hydraulic lifting device. 5,110,090, Cl. 254-124.000.

McElroy, David J.: *See—*
Gill, Manzur; and McElroy, David J., 5,110,753, Cl. 437-52.000.

McGaw, Doonan D.: *See—*
Sabo, Frank J.; and McGaw, Doonan D., 5,110,158, Cl. 285-92.000.

McGregor, Colin R., to Tenneco Canada Inc. Sparger system for discharge of bulk material from hopper cars. 5,110,366, Cl. 134-22.110.

McGregor, Harold R. Vertical bottom-fill auger assembly. 5,109,894, Cl. 141-83.000.

McInnis, Roderick J.: *See—*
Turner, James B.; and McInnis, Roderick J., 5,111,513, Cl. 382-8.000.

McKay Australia Limited: *See—*
Young, Hartley F., 5,110,046, Cl. 238-283.000.

McKenzie, Thomas A.: *See—*
Conaway, Richard; and McKenzie, Thomas A., 5,109,939, Cl. 180-89.150.

McKinnon, Graeme; and Bosiger, Peter, to U.S. Philips Corporation. Magnetic resonance spectroscopy method and apparatus for performing the method. 5,111,143, Cl. 324-307.000.

McKown, Alan G.: *See—*
Laska, Douglas J.; Merton, W. Randolph; and McKown, Alan G., 5,110,011, Cl. 222-82.000.

McLaughlin, Brian J.: *See—*
Charpentier, Albert J.; Loeper, Duane J.; McLaughlin, Brian J.; Gauthier, Edouard A.; and DiOrio, David W., 5,111,506, Cl. 381-68.400.

McMaster, Harold A., to Glasstech, Inc. Method and apparatus for heating a glass sheet. 5,110,338, Cl. 65-182.200.

McMills, Corey J.: *See—*
Barma, Pradeep; and McMills, Corey J., 5,111,025, Cl. 219-217.000.

McMullin, Hugh: *See—*
Chu, George H.; Ogawa, Yasushi; McPherson, John M.; Ksander, George; Pratt, Bruce Hendricks, Diana; and McMullin, Hugh, 5,110,604, Cl. 424-484.000.

McNeill, Willie B., Jr. Compact waste water treatment facility. 5,110,465, Cl. 210-199.000.

McPherson, Cheryl; Stanko Gary; and Urso, Richard, to J. Josephson, Inc. Wallcovering sample storage container. 5,109,991, Cl. 211-45.000.

McPherson, John M.: *See—*
Chu, George H.; Ogawa, Yasushi; McPherson, John M.; Ksander, George; Pratt, Bruce; Hendricks, Diana; and McMullin, Hugh, 5,110,604, Cl. 424-484.000.

Mead Corporation, The: *See—*
Miller, Byron R., 5,109,992, Cl. 211-59.100.
Pokora, Alexander R.; and Stolfo, John J., 5,110,740, Cl. 435-262.000.

Mechanical Technology Incorporated: *See—*
Vitale, Nicholas G., 5,109,673, Cl. 60-520.000.

Mechtronics Corporation: *See—*
Torrence, Arthur L., 5,109,620, Cl. 40-406.000.

Medebach, Thomas: *See—*
Roth, Wolfgang; and Medebach, Thomas, 5,109,725, Cl. 74-505.000.

Medeiros, Manuel, III; and Greenspan, Jay S., to Aegis, Inc. Surface mount device with high thermal conductivity. 5,111,277, Cl. 357-74.000.

Medice Chem.-Pharm. Fabrik Putter GmbH & Co. KG: *See—*
Paradies, Henrich H., 5,110,929, Cl. 544-406.000.

Medici, Brenno: *See—*
Lodetti, Attilio; and Medici, Brenno, 5,111,016, Cl. 219-69.120.

Medri, Mario W.; and Medri, Nelly, to Consumer Products Corporation. Scented nail enamels containing essential oils. 5,110,584, Cl. 424-61.000.

Medri, Nelly: *See—*
Medri, Mario W.; and Medri, Nelly, 5,110,584, Cl. 424-61.000.

Meeks, Crawford R. Magnetic bearing structure. 5,111,102, Cl. 310-90.500.

Megna, Carmine. Wheelchair for invalids. 5,110,173, Cl. 296-65.100.

Mehan, Ashok K.: *See—*
Batliwalla, Neville S.; Dharia, Amitkumar N.; Feldman, Randall M.; and Mehan, Ashok K., 5,111,032, Cl. 219-549.000.

Mehl, Byron R., to Sundstrand Corporation. Voltage balancing circuit. 5,111,376, Cl. 363-71.000.

Mehta, Raj J.: *See—*
Sherba, Samuel E.; Mehta, Raj J.; and Lange, Barry C., 5,110,822, Cl. 514-372.000.

Meindl, Hubert: *See—*
Hungerbuhler, Walter; and Meindl, Hubert, 5,110,582, Cl. 424-47.000.

Mekra Rangau Plastics GmbH & Co. KG: *See—*
Lang, Heinrich; and Seiboth, Wolfgang, 5,110,196, Cl. 359-874.000.

Melamed, Nathan T.: *See—*
Taylor, Lyle H.; Melamed, Nathan T.; and Gottlieb, Milton S., 5,111,038, Cl. 250-225.000.

Mellinger, Ricky C.: *See—*
Jasinski, John F.; McCormick, Robert P.; Mellinger, Ricky C.; Draper, James K.; and Vyas, Navin N., 5,110,387, Cl. 156-222.000.

Melton, Evelyn A.: *See—*
McAuliffe, Keven P.; Melton, Evelyn A.; Norton, Vern A.; Pfister, Gregoty F.; and Wakefield, Scott P., 5,111,389, Cl. 395-800.000.

Melville, Charles D.: *See—*
Kaye, David B.; and Melville, Charles D., 5,109,852, Cl. 128-645.000.

Melvin, David B.; and Brooks, David M., to University of Cincinnati. Extra to-intracorporeal power supply. 5,109,843, Cl. 128-419.00R.

Melzian, John: *See—*
Evenson, Mel; and Melzian, John, 5,110,079, Cl. 248-222.100.

Mendelson, Wilford L.: *See—*
Flisak, Joseph R.; Gassman, Paul G.; Lantos, Ivan; and Mendelson, Wilford L., 5,110,959, Cl. 549-513.000.

Meneghini, Massimo: *See—*
Toschi, Fabrizio; and Meneghini, Massimo, 5,109,682, Cl. 68-13.00R.

Menning, Hunter W., to Sawtek, Inc. Surface acoustic wave device and method utilizing plural multi-strip couplers. 5,111,167, Cl. 333-151.000.

Menzel, Jill R.; Damewood, John R.; Ross, Bert A.; and Kerr, Richard C., to Reeves Brothers, Inc. Coated fabric structure for air bag applications. 5,110,666, Cl. 428-196.000.

Menziken Automation Mat AG: *See—*
Beer, Christian; Wassmer, Christoph; and Wyss, Alois, 5,109,974, Cl. 198-346.100.

Merck & Co., Inc.: *See—*
Tolman, Richard L.; Ashton, Wallace T.; and Wu, Mu T., 5,110,799, Cl. 514-19.000.

Merjanian, John-Michael, to W. R. Grace & Co.-Conn. Universal platen holddown apparatus. 5,110,098, Cl. 269-21.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
Evans, Jonathan C.; and Goralski, Christian T., 5,110,966, Cl. 556-403.000.

Merrill, Alfred H.: *See—*
Liotta, Dennis; and Merrill, Alfred H., 5,110,987, Cl. 564-303.000.

Merryfull, Albert E., to Ice-Cel Pty. Limited. Method of manufacturing heat exchangers. 5,109,920, Cl. 165-163.000.

Merton, W. Randolph: *See—*
Laska, Douglas J.; Merton, W. Randolph; and McKown, Alan G., 5,110,011, Cl. 222-82.000.

Messner, Helmut, to Bruderer AG. Apparatus for a stepwise advancing of a web-shaped workpiece. 5,110,026, Cl. 226-152.000.

Metcalf, Brian W.: *See—*
Holt, Dennis A.; Levy, Mark A.; and Metcalf, Brian W., 5,110,939, Cl. 548-250.000.

Metzger, William T.: *See—*
Jadvar, Hossein; and Metzger, William T., 5,109,851, Cl. 128-642.000.

Meuleman, Guy A., to Aqua Control, Inc. Irrigation valve with baffle and seals. 5,110,086, Cl. 251-118.000.

Mey, William: *See—*
May, John W.; Mey, William; and Riblett, Susan E., 5,110,699, Cl. 430-54.000.

Meyer, Klaus, to Alusuisse-Longz Services, Ltd. Process for the preparation by crushing of scrap comprising metal parts provided with a surface coating. 5,110,427, Cl. 204-67.000.

Meyer, Lee G.; and Cavaliere, Gerald F., to Carbon Fuels Corporation. Method of refining coal by catalyzed short residence time hydrodisproportionation to form a novel coal-derived fuel system. 5,110,452, Cl. 208-423.000.

Micco, James. Blanket for peewee football blocking and tackling dummy. 5,110,124, Cl. 273-55.00A.

Michael, Jacob G., to Abbott Laboratories. Method of immunization with partially cationized substances and said partially cationized substances. 5,110,794, Cl. 514-2.000.

Michal, Jan, to ORE Research Institute. Zero diffusion path gas dosimeter system and method. 5,110,551, Cl. 422-58.000.

Michaud, Daniel G.: *See—*
Chirokas, David S.; Michaud, Daniel G.; McDeed, Arthur P., III; Shiel, Michael J.; Soper, G. Michael; and Mascio, Dennis R., 5,111,397, Cl. 364-419.000.

Michishita, Kenshi: *See—*
Nishikawa, Toshio; Maruyama, Yuichi; Ogura, Hiromi; and Michishita, Kenshi, 5,110,308, Cl. 439-582.000.

MicroGold: *See—*
Corbin, Dennis; and Corbin, Scott, 5,110,614, Cl. 426-555.000.

Micron Technology, Inc.: *See—*
Dunn, L. Brian, 5,110,001, Cl. 220-94.00R.
Long, Paul, 5,110,411, Cl. 156-656.000.
Lowrey, Tyler A.; Duesman, Kevin G.; and Cloud, Eugene H., 5,110,754, Cl. 437-52.000.

Microsurface Finishing Products, Inc.: *See—*
Kime, Byron L., Jr., 5,109,638, Cl. 51-401.000.

Midwest Research Institute: *See—*
Tucker, Melvin P.; Grohmann, Karel; Himmel, Michael E.; and Mohaghegbi, Ali, 5,110,735, Cl. 435-209.000.

Mieno, Fumitake: *See—*
Furumura, Yuji; Mieno, Fumitake; Nakazawa, Tsutomu; Eshita, Takashi; Maeda, Mamoru; and Yamauchi, Tsunenori, 5,111,266, Cl. 357-34.000.

Miki, Nobuaki: *See—*
Sugiura, Masayuki; Miki, Nobuaki; Nasu, Takeshi; Sugiura, Kiyohiko; and Saito, Masao, 5,111,175, Cl. 336-192.000.

Miki, Sakae: *See—*
Takeuchi, Yusuke; and Miki, Sakae, 5,111,425, Cl. 395-425.000.

Miklavcic, Lucijan. Apparatus for reduction of scatter in diagnostic radiology. 5,111,495, Cl. 378-146.000.

Milad Limited Partnership: *See—*
Hendry, James W., 5,110,533, Cl. 264-572.000.

Miles Inc.: *See—*
Coan, Michael; and Lee, Vivian W., 5,110,913, Cl. 530-388.230.
Moore, Craig E.; and Wilson, Kerry, 5,110,555, Cl. 422-100.000.
Tsay, Grace C., 5,110,910, Cl. 530-390.100.

Miles, Richard B.; and Lempert, Walter R., to Princeton University, Trustees of. Velocity measurement by the vibrational tagging of diatomic molecules. 5,110,204, Cl. 356-28.000.

Milewski, Andre: *See—*
Belloc, Jacques; Galand, Claude; Lancon, Emmanuel; Milewski, Andre; and Quintin, Michel, 5,111,417, Cl. 364-724.100.

Milfs, Dennis J.: *See—*
Plonka, Robert J.; Milfs, Dennis J.; and Nickell, David L., 5,111,166, Cl. 333-128.000.

Miller, Byron R., to Mead Corporation, The. Adjustable peg hook. 5,109,992, Cl. 211-59.100.

Miller, Charles D.; DeCicco, Thomas J.; and Laabs, Timothy P., to Eastern Company, The. Switch lock with lighted position indicator. 5,111,007, Cl. 200-43.080.

Miller, Kevin P.: *See—*
Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., 5,110,953, Cl. 549-263.000.

Miller, Thomas J.; and Monroe, Douglas W., to AT&T Bell Laboratories. Method of glass soot deposition using ultrasonic nozzle. 5,110,335, Cl. 65-3.120.

Miller, Thomas R.: *See—*
Lazansky, Richard W.; Miller, Thomas R.; Coelho, David R.; Scott, Kenneth E.; and Stanculescu, Alec G., 5,111,413, Cl. 364-578.000.

Millheim, Keith K.; Mount, Houston B., II; Rai, Chandra S.; and Sondergeld, Carl H. Method of exploration for hydrocarbons. 5,109,697, Cl. 73-153.000.

Milliken Research Corporation: *See—*
Love, Franklin S.; and Rumler, Joseph E., 5,109,630, Cl. 51-74.00R.

Mills, Gary N.; Homayoun, Habib; and Semler, Herbert J., to Instromedix, Inc. Portable ECG data-storage apparatus. 5,111,396, Cl. 364-413.060.

Milstein, Norman, to Henkel Corporation. Process for making alkyl naphthalene sulfonate surfactants. 5,110,981, Cl. 562-90.000.

Minemura, Hiroyuki: *See—*
Nakayama, Takahiro; Tamahashi, Kunihiro; Fuyama, Moriaki; Minemura, Hiroyuki; Sato, Yoshio; Tsuboi, Nobuyoshi; and Koyanagi, Hiroaki, 5,110,792, Cl. 505-1.000.

Ministry of International Trade & Industry: *See—*
Ito, Kohzo; Tanabe, Yoshikazu; Sato, Masa-aki; and Kaeriyama, Kyoji, 5,110,504, Cl. 252-500.000.

Minnesota Mining and Manufacturing Company: *See—*
Bries, James L.; and Johnston, Vickie A., 5,110,843, Cl. 521-159.000.
Broberg, David E.; and Jackson, Carl A., 5,110,320, Cl. 51-295.000.
Broberg, David E.; and Jackson, Carl A., 5,110,321, Cl. 51-295.000.
Engler, David A.; and Billingsley, Britton G., 5,110,655, Cl. 428-143.000.
Galick, Stephen J.; and Sax, James E., 5,110,667, Cl. 428-202.000.
Laska, Douglas J.; Merton, W. Randolph; and McKown, Alan G., 5,110,011, Cl. 222-82.000.
Malone, James P.; Biskupek, Warren J.; and Lurie, Edward B., 5,109,983, Cl. 206-408.000.

Minnick, Michael G., to General Electric Company. Flexible laminate having copolyetherester adhesive. 5,110,668, Cl. 428-215.000.

Minolta Camera Kabushiki Kaisha: *See—*
Kamimura, Kuniaki; Sawada, Kenji; and Yamade, Yasushi, 5,111,239, Cl. 355-45.000.
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 5,111,234, Cl. 354-455.000.

Minster Machine Company, The: *See—*
Ontrop, Patrick H.; Schockman, Robert L.; and Bergman, Frederick C., 5,109,766, Cl. 100-257.000.

Mips Computer Systems, Inc.: *See—*
Farmwald, Paul M.; and Fu, Timothy S., 5,111,464, Cl. 371-40.100.

Miranda, Isabel O.: *See—*
Corral, Jose S. M.; De Aza, Salvador; Poyato, Francisco M.; Valle Fuentes, Francisco J.; Miranda, Isabel O.; Caseres, Rafael M.; and Martinez, Paz C., 5,110,773, Cl. 501-98.000.

Mischke, Todd E. Device for forming a composite image of a person's face. 5,110,206, Cl. 353-30.000.

Mishou, Joan L.: *See—*
Arold, Johathan B.; Mishou, Joan L.; Parent, Charles R.; Stark, Joseph P.; and Webb, Edward A., 5,111,527, Cl. 392-360.000.

Mishra, Satchidanand: *See—*
Teuscher, Leon A.; Mishra, Satchidanand; and Holland, Andrea G., 5,110,700, Cl. 430-64.000.

Mita Industrial Co., Ltd.: *See—*
Inoue, Masahide; Nakano, Tetsuya; Yabe, Naruo; Tsuyama, Koichi; Shimizu, Yoshitake; and Kuroki, Mitsushi, 5,110,704, Cl 430-110.000.
Koyama, Shigeo; Tsutsui, Eiji; Kobayashi, Kazuhiro; Horihata, Katsushi; and Tanaka, Hiroyuki, 5,111,244, Cl. 355-210.000.
Miyoshi, Jun; and Nagai, Hiroyuki, 5,110,103, Cl. 271-3.000.

Mitani, Masao: *See—*
Nakamura, Shozo; Kaneda, Aizo; Tsunoda, Shigeharu; Hasebe, Akio; and Mitani, Masao, 5,110,515, Cl. 264-25.000.

Mitani, Norio: *See—*
Kawai, Kazunari; and Mitani, Norio, 5,110,188, Cl. 299-10.000.

Mitobe, Kunio, to Pioneer Electronic Corporation. Speaker and manufacturing method therefor. 5,111,510, Cl. 381-193.000.

Mitsa, Theophano: *See—*
Parker, Kevin J.; and Mitsa, Theophano, 5,111,310, Cl. 358-456.000.

Mitsubishi Denki K.K.: *See—*
Iwata, Toshio; Matsuoka, Atsuko; and Hashimoto, Atsuko, 5,109,820, Cl. 123-425.000.
Nishida, Mitsuhiro; and Arita, Masumi, 5,110,273, Cl. 418-55.600.
Sugiyama, Takeshi, 5,111,057, Cl. 290-38.00R.
Tanaka, Toshinori, 5,111,093, Cl. 310-88.000.
Tanimura, Yoshihiko; Tada, Yasuo; and Yasui, Katsuaki, 5,109,703, Cl. 73-861.220.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Andoh, Nobuaki; and Ueda, Osamu, 5,111,257, Cl. 357-23.400.
Asai, Kohtaro; Murakami, Tokumichi; and Matsuzaki, Kazuhiro, 5,111,294, Cl. 358-136.000.
Baba, Hiroshi, 5,111,348, Cl. 360-77.060.
Fujishima, Kazuyasu; and Hart, Charles A., 5,111,386, Cl. 395-425.000.
Hattori, Ryo, 5,111,471, Cl. 372-46.000.
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Sakata, Sueo; and Kumano, Masayoshi, 5,111,377, Cl. 363-95.000.
Ikeda, Tatsuhiko, 5,110,749, Cl. 437-26.000.
Imai, Hitoshi, 5,111,041, Cl. 250-239.000.
Kato, Kunio; Iida, Yasumasa; Honda, Takenobu; Sugita, Kazuhiko; and Yamasaki, Shinji, 5,109,958, Cl. 187-20.000.
Kobayashi, Kazuo; Terada, Yasushi; and Nakayama, Takeshi, 5,111,427, Cl. 365-49.000.
Kotani, Norihiko, 5,111,404, Cl. 364-468.000.
Masuda, Hiroyuki, 5,111,061, Cl. 307-254.000.
Matsuda, Tetsuya; Yamamoto, Shunji; Yamada, Tadatoshi; and Ushijima, Toshie, 5,111,173, Cl. 335-216.000
Miyamoto, Hiroshi; and Hirayama, Kazutoshi, 5,111,078, Cl 307-451.000.
Miyamoto, Hiroshi, 5,111,433, Cl. 365-201.000.
Morinushi, Ken; Tanaka, Hideharu; Noguchi, Yoshihiro; Imai, Toshihisa; and Takahashi, Yutaka, 5,110,258, Cl. 415-119.000.
Nobe, Hisanori; and Koiwa, Mitsuru, 5,109,827, Cl. 123-618.000.
Ogawa, Toshiaki, 5,110,394, Cl. 156-345.000.
Sakuma, Kiyoshi; Yoshida, Takayuki; Tezuka, Tomohumi; Aoki, Katsuyuki; Yamada, Makoto; Hujii, Masao; and Morinushi, Ken, 5,109,919, Cl. 165-151.000.
Suzuki, Hiroyoshi; Ogawa, Kenji; and Yamamoto, Toru, 5,110,205, Cl. 356-135.000.
Takata, Ikunori, 5,111,267, Cl. 357-36.000.
Yamaguchi, Satarou, 5,110,534, Cl. 376-143.000.

Mitsubishi Electric Home Appliance Co., Ltd.: *See—*
Morinushi, Ken; Tanaka, Hideharu; Noguchi, Yoshihiro; Imai, Toshihisa; and Takahashi, Yutaka, 5,110,258, Cl. 415-119.000.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Tanaka, Toru; and Inari, Masato, 5,110,982, Cl. 562-414.000.

Mitsubishi Jidosha Kogyo K.K.: *See—*
Iwata, Toshio; Matsuoka, Atsuko; and Hashimoto, Atsuko, 5,109,820, Cl. 123-425.000.
Tanimura, Yoshihiko; Tada, Yasuo; and Yasui, Katsuaki, 5,109,703, Cl. 73-861.220.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Yoshida, Masato; Yokoyama, Takanao; Nanba, Muneyoshi; Kato, Yoshihiko; Iida, Kazumasa; and Miyamoto, Katsuhiko, 5,109,821, Cl. 123-425.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Sato, Toru; Kobayashi, Yoshio; and Kato, Tomiya, 5,109,949, Cl 181-240.000.

Mitsubishi Kasei Corporation: *See—*
Fujii, Toshio; Shinohara, Yoshinao; and Handa, Keishin, 5,110,870, Cl. 525-194.000.

Jikihara, Tetsuo; Shike, Toyohiko; Katsurada, Manabu; Watanabe, Hisao; and Ikeda, Osamu. 5,110,342, Cl. 71-88.000.
Yokomizo, Yuji, 5,110,228, Cl. 400-208.000.

Mitsubishi Materials Corporation: *See—*
Takeshita, Takuo; Nakayama, Ryoji; and Ogawa, Tamotsu, 5,110,374, Cl. 148-101.000.
Yamaguchi, Tetsuro; Takeshita, Takuo; and Hagino, Sadaaki, 5,110,789, Cl. 505-1.000.

Mitsubishi Metal Corporation: *See—*
Odani, Niro; Yoshioka, Kazuyoshi; and Sekiya, Sinichi, 5,110,543, Cl. 419-29.000.

Mitsubishi Pencil Co., Ltd.: *See—*
Yoshida, Mitsuru, 5,110,519, Cl. 264-29.600.

Mitsubishi Rayon Company Ltd.: *See—*
Hongo, Masafumi; and Shigemitsu, Hideyuki, 5,110,866, Cl. 525-67.000.
Yamamoto, Takashi; Matsumoto, Tsuruyoshi; and Shimada, Katsuhiko, 5,111,526, Cl. 385-145.000.

Mitsui Mining Co., Ltd.: *See—*
Sakata, Koji; and Sakawaki, Kouji, 5,110,899, Cl. 528-265.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Yoshida, Yoshinori; and Hagihara, Makoto, 5,110,399, Cl. 156-515.000.

Mitsui Toatsu Chemicals, Inc. *See—*
Amemiya, Hideo; Kuroda, Minoru; and Nitta, Tomio, 5,110,279, Cl. 425-208.000.
Morii, Mitsuyoshi; Ohoka, Masaharu; Kawashima, Nobuhiro; Morii, Noriko; and Suzuki, Toshihiko, 5,110,736, Cl. 435-226.000.
Wakimura, Kazuo; Tanaka, Masao; and Hiai, Atsuhiko, 5,110,575, Cl. 423-412.000.

Miura, Hideo; Nishimura, Asao; Sakata, Shinji; Shimizu, Tasuku; and Hattori, Shigeo, to Hitachi, Ltd. Water quality inspection method and apparatus therefor. 5,110,537, Cl. 376-305.000.

Miura, Takao: *See—*
Yumoto, Yoshiji; Shimokawa, Tsutomu; and Miura, Takao, 5,110,706, Cl. 430-191.000.

Miura, Tsutomu: *See—*
Hatakeyama, Atsushi; Miura, Tsutomu; Niskala, Wayne F.; Sato, Tomonori; and Yumino, Masamichi, 5,110,227, Cl. 400-120.000.

Miyake, Kazushi: *See—*
Nakayama, Mizuo; Kuwajima, Shigesumi; Suzuki, Takahito; Miyake, Kazushi; Shibata, Tsutomu; and Seki, Chikashi, 5,111,410, Cl. 364-551.010.

Miyake, Tohru: *See—*
Nakano, Yasushi; Miyake, Tohru; Akutsu, Shigeru; and Shimizu, Yuji, 5,110,658, Cl. 428-141.000.

Miyaki, Takeo: *See—*
Oki, Toshikazu; Saitoh, Kyoichiro; Tomatsu, Kozo; Tomita, Koji; Konishi, Masataka; Miyaki, Takeo; Tsunakawa, Mitsuaki; and Nishio, Maki, 5,110,960, Cl. 552-220.000.

Miyamoto, Hidenori: *See—*
Nakamura, Toshiyuki; Kazami, Kazuyuki; Daitoku, Koichi; and Miyamoto, Hidenori, 5,111,226, Cl. 354-195.100.

Miyamoto, Hiroshi; and Hirayama, Kazutoshi, to Mitsubishi Denki Kabushiki Kaisha. Input circuit for logic circuit having node and operating method therefor 5,111,078, Cl. 307-451.000.

Miyamoto, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device with inhibiting test mode cancellation and operating method thereof. 5,111,433, Cl. 365-201.000.

Miyamoto, Junichi, to Kabushiki Kaisha Toshiba. Bipolar-CMOS semiconductor memory device. 5,111,435, Cl. 365-230.060.

Miyamoto, Kaname: *See—*
Ogata, Yoshitake; Ikeda, Makoto; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Yamanaka, Takashi; Hishinuma, Icharu; Nagakawa, Junichi; Hirota, Kazuo; Miyamoto, Kaname; Horie, Toru; and Wakabayashi, Tsuneo, 5,110,956, Cl. 549-447.000.

Miyamoto, Katsuhiko: *See—*
Yoshida, Masato; Yokoyama, Takanao; Nanba, Muneyoshi; Kato, Yoshihiko; Iida, Kazumasa; and Miyamoto, Katsuhiko, 5,109,821, Cl. 123-425.000.

Miyamoto, Kenji; Tanaka, Makoto; and Shimada, Norihiro, to Bridgestone Corporation. Pneumatic radial tires having a tread including isolated sipes. 5,109,901, Cl. 152-209.00R.

Miyaoka, Shuichi, to Hitachi, Ltd. Semiconductor integrated circuit device with power consumption reducing arrangement. 5,111,432, Cl. 365-190.000.

Miyashita, Naoto; Takahashi, Koichi; Sonobe, Hironori; and Koyama, Mitsutoshi, to Kabushiki Kaisha Toshiba. Semiconductor device having element regions electrically isolated from each other. 5,111,272, Cl. 357-49.000.

Miyashita, Susumu; Ishimura, Tadashi; and Hironaka, Yoshiaki, to Kioritz Corporation. Fresh water generator. 5,110,468, Cl. 210-321.690.

Miyata, Naoya: *See—*
Miyata, Seizo; Hosomi, Takeshi; Suzuki, Toshio; Watanabe, Toshiyuki; Yamamoto, Hironobu; and Hayashi, Akio, 5,110,988, Cl. 564-441.000.

Miyata, Seizo; Hosomi, Takeshi; Suzuki, Toshio; Watanabe, Toshiyuki; Yamamoto, Hironobu; and Hayashi, Akio, to Sumitomo Bakelite Company Limited; Miyata, Seizo; Miyata, Naoya; and Research Development Corporation of Japan. Nonlinear optical material. 5,110,988, Cl. 564-441.000.

Miyazaki, Hirotoshi: *See—*
Narukawa, Hiroshi; Mizobe, Akio; Nakahara, Fumio; Kubotsu, Akira; Akiyama, Akitsugu; Nishiyama, Masakazu; Nagamatu, Kenji; and Miyazaki, Hirotoshi, 5,110,678, Cl. 428-364.000.

Miyazaki, Tadanobu: *See—*
Inaba, Ryohei; Kumamura, Masaaki; Danmoto, Shojiro; Arai, Mitsuo; Tobo, Yozo; Sugawara, Hirofumi; and Miyazaki, Tadanobu, 5,110,522, Cl. 264-40.400.

Miyazaki, Takatomi; and Ohsaki, Satoshi, to Canon Kabushiki Kaisha. Method for manufacturing a porous static pressure gas bearing. 5,110,520, Cl. 264-40.300.

Miyazaki, Takeshi, to Hitachi, Ltd. Communication control system. 5,111,461, Cl. 371-37.100.

Miyazawa, Takeshige; and Kawano, Kazuhiko, to Kumiai Chemical Industry Co., Ltd. Herbicidal composition and method for killing weeds using the same. 5,110,346, Cl. 71-90.000.

Miyazawa, Yasunao: *See—*
Komiyama, Mikio; Miyazawa, Yasunao; Ebe, Kazuyoshi; and Saito, Takanori, 5,110,388, Cl. 156-229.000.

Miyosawa, Yoshiaki: *See—*
Watanabe, Tsutomu; Yamashita, Masaaki; Kubota, Takahiro; Miyosawa, Yoshiaki; and Nishimoto, Tadashi, 5,110,689, Cl. 428-623.000.

Miyoshi, Jun; and Nagai, Hiroyuki, to Mita Industrial Co., Ltd. Image forming apparatus with improved document feeder. 5,110,103, Cl. 271-3.000.

Mizobe, Akio: *See—*
Narukawa, Hiroshi; Mizobe, Akio; Nakahara, Fumio; Kubotsu, Akira; Akiyama, Akitsugu; Nishiyama, Masakazu; Nagamatu, Kenji; and Miyazaki, Hirotoshi, 5,110,678, Cl. 428-364.000.

Mizukami, Masao; and Sato, Yoichi, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Complementary signal transmission circuit with impedance matching circuitry. 5,111,080, Cl. 307-475.000.

Mizuno, Shinji: *See—*
Yagi, Nobuyuki; Inagaki, Jiroh; Morita, Kozo; Kaku, Yosutoshi; Mizuno, Shinji; and Yamanaka, Akiko, 5,111,363, Cl. 361-398.000.

Mizusawa, Kiyoshi: *See—*
Oguma, Tetsuya; Kikuchi, Mamoru; Mizusawa, Kiyoshi; Tokutake, Shoichi; and Yamaji, Nobuyuki, 5,110,734, Cl. 435-201.000.

Mizuta, Katsuji: *See—*
Hamada, Fumihiko; Tsuboi, Kunio; Hasegawa, Mitihiko; Ichizawa, Yasuji; Yabe, Toshiya; Yamasaki, Kunitomo; Takahashi, Yasunobu; and Mizuta, Katsuji, 5,111,252, Cl. 355-308.000.

Mlynko, Walter E.: *See—*
Egitto, Frank D.; and Mlynko, Walter E., 5,110,409, Cl. 156-643.000.

Mo, Chi L.: *See—*
Storer, Richard; Mo, Chi L.; and Turnbull, John P., 5,110,926, Cl. 544-276.000.

Mobeck, William L.: *See—*
Reed, Thomas B.; and Mobeck, William L., 5,110,785, Cl. 502-404.000.

Mobil Oil Corporation: *See—*
Balloni, Riccardo; and Keung, Jay K., 5,110,671, Cl. 428-218.000.
Calabro, David C.; Schmitt, Kirk D.; and Vartuli, James C., 5,110,572, Cl. 423-328.000.
Chen, Nai Y.; and Partridge, Randall D., 5,110,445, Cl. 208-96.000.
Chitnis, Girish K.; and Herbst, Joseph A., 5,110,776, Cl. 502-64.000.
Haag, Werner O.; and Tsikoyiannis, John G., 5,110,478, Cl. 210-650.000.
Harandi, Mohsen N.; and Owen, Hartley, 5,110,446, Cl. 208-100.000.
Johnson, Ivy D., 5,110,573, Cl. 423-328.000.
Owen, Hartley, 5,110,775, Cl. 502-43.000.
Yan, Tsoung Y., 5,110,480, Cl. 210-670.000.

Mobil Solar Energy Corporation: *See—*
Tornstrom, Eric; and Norbedo, Anthony J., 5,110,369, Cl. 136-251.000.

Mochizuki, David A., to Nabors Industries, Inc. Mobile drilling rig for closely spaced well centers. 5,109,934, Cl. 175-170.000.

Mochizuki, Hideharu: *See—*
Shirai, Katutada; and Mochizuki, Hideharu, 5,111,369, Cl. 362-61.000.

Mochizuki, Nobuo: *See—*
Kusase, You; Murakata, Masatoshi; Mochizuki, Nobuo; and Takebayashi, Michinori, 5,110,925, Cl. 544-234.000.

Mody, Rustom K.; Berzin, Vel; Ford, Randle E.; and Burtner, James C., III, to Baker Hughes Incorporated. Wellbore packer with shearable anti-rotation locking member. 5,109,926, Cl. 166-187.000.

Mogamiya, Hiroyuki; Yamakawa, Noriko; Suzuki, Yoshiichi; Suenaga, Hitoshi; and Hasegawa, Yasuhiro, to Showa Shell Sekiyu Kabushiki Kaisha; and Teikoku Chemical Industry Co., Ltd. Liquid crystal compound. 5,110,496, Cl. 252-299.610.

Mogamiya, Makoto: *See—*
Aoki, Harumi; Morisawa, Tahei; Ogawa, Kimiaki; and Mogamiya, Makoto, 5,111,299, Cl. 358-209.000.

Mogilnicki, Victor D., to Kennametal Inc. Tightening fixture with built-in torque readout device. 5,109,706, Cl. 73-862.210.

Mohagheghi, Ali: *See—*
Tucker, Melvin P.; Grohmann, Karel; Himmel, Michael E.; and Mohagheghi, Ali, 5,110,735, Cl. 435-209.000.

Mohr, Glenn R.: *See—*
Kubis, Charles S.; Walter, John; Roth, Donald J.; and Mohr, Glenn R., 5,109,653, Cl. 53-510.000.

Mohri, Toyoshige; and Makino, Toshiyuki, to Horyo Corporation. Cleaner. 5,109,976, Cl. 198-498.000.

Molex Incorporated: *See—*
Edgley, Richard R.; Palmieri, Daniel M.; and Ponn, Timothy R., 5,110,305, Cl. 439-441.000.
Endres, Karl H., 5,109,590, Cl. 29-564.400.

Mollenauer, Linn F.: *See—*
Bergano, Neal S.; Evangelides, Stephen G., Jr.; and Mollenauer, Linn F., 5,111,322, Cl. 359-122.000.

Moller, Richard W., to Hydreclaim Corporation. Hybrid apparatus and method for blending materials. 5,110,521, Cl. 264-40.400.

Molliere, Michael: *See—*
Engel, Jurgen; Molliere, Michael; and Szelenyi, Istvan, 5,110,814, Cl. 514-212.000.

Molnar, Barbara D.: *See—*
Molnar, Karl J.; Chung-Yih, Ho; Staver, Daniel A.; and Molnar, Barbara D., 5,111,421, Cl. 364-748.000.

Molnar, Karl J.; Chung-Yih, Ho; Staver, Daniel A.; and Molnar, Barbara D., to General Electric Company. System for performing addition and subtraction of signed magnitude floating point binary numbers. 5,111,421, Cl. 364-748.000.

Monarch Knitting Machinery Corporation: *See—*
Pernick, Bruce M., 5,109,680, Cl. 66-93.000.

Moncheaux, Michel: *See—*
Triffaux, Francis; and Moncheaux, Michel, 5,109,765, Cl. 100-155.00G.

Mongoin, Jacques; Ravet, Georges; and Suau, Jean-Marc, to Coatex S.A. Compatibility agent for aqueous polypigmentary suspensions containing hydrated calcium sulfate. 5,110,358, Cl. 106-462.000.

Monier, Jean-Claude: *See—*
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardaix-Luthereau, Renee; Costall, Brenda; and Naylor, Robert, 5,110,824, Cl. 514-377.000.

Monomeros Colombo Venezolanos, S.A. (E.M.A.): *See—*
Abidaud, Alvaro, 5,110,578, Cl. 423-202.000.

Monroe, Douglas W.: *See—*
Miller, Thomas J.; and Monroe, Douglas W., 5,110,335, Cl. 65-3.120.

Monsanto Company: *See—*
Kinlen, Patrick J.; and Williams, Hilliard L., 5,110,441, Cl. 204-418.000.

Monteith, Robert D.; and Johnson, Keith, to Stephenson, George M. Fluid spray cleaning system. 5,110,231, Cl. 401-190.000.

Montero, Manuel: *See—*
Delarue, Francois; Girand, Michel; and Montero, Manuel, 5,109,724, Cl. 74-479.000.

Montesano, Mark J., to E-Systems Inc. Heat transfer device and method. 5,111,359, Cl. 361-388.000.

Montevecchi, Franco M. Apparatus for concurrently oxgenating and pumping blood circulated extra-corporeally in cardiovascular systems. 5,110,548, Cl. 422-48.000.

Montgomery, James R., to Beloit Corporation. Split feed reject claimer. 5,110,453, Cl. 209-135.000.

Monus, Donald T., to Priest, Alfred R. Fish habitat structure. 5,109,796, Cl. 119-3.000.

Moog Inc.: *See—*
Toews, Hans G., 5,110,047, Cl. 239-11.000.

Moon, Ronald R., to Alps Electric (USA), Inc. Digital servo system for moving body by a distance equal to an integral multiple of a predetermined pitch. 5,111,349, Cl. 360-78.070.

Moore Business Forms, Inc.: *See—*
Ashby, Robert E., 5,110,043, Cl. 229-304.000.

Moore, Christopher; and Phillips, John C., Jr., to Gathright, Czeu, a part interest. Exercising apparatus and method. 5,110,122, Cl. 482-134.000.

Moore, Craig E.; and Wilson, Kerry, to Miles Inc. Capillary flow apparatus for inoculation of a test substrate. 5,110,555, Cl. 422-100.000.

Moore, David E.: *See—*
Lloyd, Daniel L.; Crane, Newell D.; and Moore, David E., 5,109,636, Cl. 51-320.000.

Moore, David W., to Super Seal Mfg. Ltd. Dock seal. 5,109,639, Cl. 52-2.120.

Moore, Michael A.: *See—*
Barboza, Scott M.; and Moore, Michael A., 5,109,756, Cl. 454-284.000.

Moore, William G.: *See—*
Weimer, Alan W.; Moore, William G.; and Roach, Raymond P., 5,110,565, Cl. 422-198.000.

Morgan, Tommy J.: *See—*
Battiste, David R.; Willcox, Kenneth W.; and Morgan, Tommy J., 5,110,214, Cl. 374-45.000.

Morgan Trailer Mfg. Co.: *See—*
Whiteman, Paul L.; and Hurst, William, 5,110,164, Cl. 292-4.000.

Morgan, William F.: *See—*
Fay, Theodore D.; Morgan, William F.; and Schneider, Stanley, 5,110,210, Cl. 356-150.000.

Mori, J. Michael: *See—*
Lamb, James E., III; Brewer, Terry; and Mori, J. Michael, 5,110,697, Cl. 430-14.000.

Mori, Satoshi: *See—*
Doke, Harumi; Ishida, Syozi; Iwasa, Hiroki; Nagasaka, Chikao; Ueda, Masuyuki; Kato, Shigeru; Aoki, Hisashi; Shibahara, Makoto; and Mori, Satoshi, 5,111,006, Cl. 200-5.00R.

Mori, Shojiro: *See—*
Hatada, Hiroshi; and Mori, Shojiro, 5,111,271, Cl. 357-45.000.

Mori, Yoshifumi: *See—*
Narui, Hironobu; Yoshimatsu, Hiroshi; Hirata, Shoji; Ozawa, Masafumi; and Mori, Yoshifumi, 5,111,469, Cl. 372-46.000.

Morie, Takashi, to Nippon Telegraph and Telephone Corporation. Non-volatile memory with hot carriers transmitted to floating gate through control gate. 5,111,430, Cl. 365-185.000.

Moriga, Toshinori: *See—*
Kojima, Shunji; Watanabe, Yoshiki; Goto, Hiroaki; and Moriga, Toshinori, 5,110,847, Cl. 523-412.000.

Morii, Mitsuyoshi; Ohoka, Masaharu; Kawashima, Nobuhiro; Morii, Noriko; and Suzuki, Toshihiko, to Mitsui Toatsu Chemicals, Incorporated. Purificaiton procedure of tPA from crude preparations. 5,110,736, Cl. 435-226.000.

Morii, Noriko: *See—*
Morii, Mitsuyoshi; Ohoka, Masaharu; Kawashima, Nobuhiro; Morii, Noriko; and Suzuki, Toshihiko, 5,110,736, Cl. 435-226.000.

Morimoto, Kiyoshi: *See—*
Hayakawa, Hiroshi; and Morimoto, Kiyoshi, 5,110,985, Cl. 562-571.000.

Morimura, Atsushi: *See—*
Ishii, Hirofumi; and Morimura, Atsushi, 5,111,511, Cl. 382-1.000.

Moring, Stephen E., to Applied Biosystems, Inc. On-capillary gap junction for fluorescence detection in capillary electrophoresis. 5,110,431, Cl. 204-180.100.

Morinushi, Ken; Tanaka, Hideharu; Noguchi, Yoshihiro; Imai, Toshihisa; and Takahashi, Yutaka, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Electric Home Appliance Co., Ltd. Blower having a sound-damping structure. 5,110,258, Cl. 415-119.000.

Morinushi, Ken: *See—*
Sakuma, Kiyoshi; Yoshida, Takayuki; Tezuka, Tomohumi; Aoki, Katsuyuki; Yamada, Makoto; Hujii, Masao; and Morinushi, Ken, 5,109,919, Cl. 165-151.000.

Morisawa, Tahei: *See—*
Aoki, Harumi; Morisawa, Tahei; Ogawa, Kimiaki; and Mogamiya, Makoto, 5,111,299, Cl. 358-209.000

Morita, Dai. Insecticides and bactericide made of sell flower essential oil. 5,110,594, Cl. 424-405.000.

Morita, Isao: *See—*
Matsumoto, Yasuhiko; Nanba, Katsuaki; and Morita, Isao, 5,109,790, Cl. 118-63.000.
Matsumoto, Yasuhiko; Nanba, Katsuaki; and Morita, Isao, 5,109,791, Cl. 118-63.000.

Morita, Kiyoo, to Fuji Photo Film Co., Ltd. Cassette container case with recessed walls. 5,109,982, Cl. 206-387.000.

Morita, Kozo: *See—*
Yagi, Nobuyuki; Inagaki, Jiroh; Morita, Kozo; Kaku, Yosutoshi; Mizuno, Shinji; and Yamanaka, Akiko, 5,111,363, Cl. 361-398.000.

Morita, Tetsuyuki: *See—*
Yamamasu, Yoshikazu; Morita, Tetsuyuki; Nakaniwa, Sadao; and Ichihara, Masami, 5,110,541, Cl. 419-2.000.

Moriyama, Koichi: *See—*
Hirono, Hatsuo; Moriyama, Koichi; Fukui, Hideo; and Matsuura, Ikuya, 5,110,782, Cl. 502-303.000.

Moriyama, Takeshi; Ogawa, Katsuji; Ohtake, Fumio; and Nishizawa, Akito, to Nippon Light Metal Company, Ltd. Aluminum alloys for forming colored anodic oxide films thereon and method for producing a sheet material of the alloy. 5,110,371, Cl. 148-691.000.

Morley, Robert E., Jr.; Engebretson, A. Maynard; Engel, George L.; and Sullivan, Thomas J., to Central Institute for the Deaf. Electronic filters, signal conversion apparatus, hearing aids and methods 5,111,419, Cl. 364-724.190.

Morlon, Patrice P., to VLSI Technology, Inc. Digital-to-analog and analog-to-digital converters. 5,111,205, Cl. 341-156.000.

Morona, Renato; and Attridge, Stephen R., to Enterovax Limited. Composite salmonella *E. coli, Vibrio cholerae* vaccine strains. 5,110,588, Cl. 424-92.000.

Moroney, Paul: *See—*
Esserman, James N.; and Moroney, Paul, 5,111,504, Cl. 380-21.000.

Morrick, Joseph Q. Peristaltic pump with spring means to urge slide members and attached rollers radially outward on a rotor. 5,110,270, Cl. 417-477.000.

Morris, Christopher J., to Thorn EMI plc. Drive circuit for providing at least one of the output waveforms having at least four different voltage levels. 5,111,319, Cl. 359-85.000.

Morris, Donald H.; and Briley, Gary L., to Rockwell International Corporation. Passive self-contained auto ignition system. 5,109,669, Cl. 60-39.821.

Morris, Glenn A.; and Perkins, Leland M., to G. A. Morris Enterprises, Inc. Oil filter crusher unit. 5,109,763, Cl. 100-48.000.

Morris, James A.: *See—*
Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., 5,110,953, Cl. 549-263.000.

Morris, Jeffrey J.: *See—*
Brittain, David R.; Brown, Steven P.; Cooper, Anthony L.; Longridge, Jethro L.; Morris, Jeffrey J.; Preston, John; and Slater, Linda, 5,110,808, Cl. 514-155.000.

Morrison, Howard J.: *See—*
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Cunningham, Donald J.; and Smith, Bradley W., 5,109,772, Cl. 102-275.110.

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Baskett, Ira E., 5,110,758, Cl. 437-171.000.
Branan, Mac William, Jr.; and Robinson, Michael, 5,111,128, Cl. 320-2.000.
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Terry, Jimmy C.; and Mrosko, John A., 5,110,382, Cl. 156-77.000.

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Fields, Randall K.; Quinn, Paul R.; and Blackley, Todd, 5,111,391, Cl. 364-401.000.

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Dayan, Ami, 5,110,141, Cl. 277-9.000.

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Hannen, Reiner W.; Vermeulen, Norbert P.; and Schulze-Frenking, Josef, 5,111,528, Cl. 392-379.000.

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Sudmanns, Hans, 5,109,674, Cl. 60-612.000.

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Murakami, Kei: *See—*
Maeda, Yuuji; Nakamura, Yozo; Nakamura, Kenichi; Sakamoto, Masahide; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,109,815, Cl. 123-192.100.

Murakami, Tokumichi: *See—*
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Kusase, You; Murakata, Masatoshi; Mochizuki, Nobuo; and Takebayashi, Michinori, 5,110,925, Cl. 544-234.000.

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Sudo, Morihiro; Muraki, Tomoyasu; Kawachi, Eiji; and Kawachi, Yasushi, 5,110,621, Cl. 427-44.000.

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Horibe, Kinya; Hirano, Tomio; Ikeda, Minoru; and Murata, Hideaki, 5,111,023, Cl. 219-121.850.

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Kimura, Hidetoshi; and Okugawa, Shotaro, 5,110,064, Cl. 242-129.500.

Murata Manufacturing Co., Ltd.: *See—*
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Nishikawa, Toshio; Maruyama, Yuichi; Ogura, Hiromi; and Michishita, Kenshi, 5,110,308, Cl. 439-582.000.

Murphy, Colin R. R., to Engineered Construction Components (America), Inc. Machine for applying heat welds or solvent welds to roof membranes. 5,110,398, Cl. 156-499.000.

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Muschiatti, Lawrence C., to Du Pont de Nemours, E. I., and Company. High speed insulated conductors. 5,110,998, Cl. 174-24.000.

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Uchiyama, Yasuyuki, 5,110,225, Cl. 400-29.000.

Myoken, Yoshinari; Okamoto, Tetsuji; and Sato, J. Denry, to W. Alton Jones Cell Science Center Incorporated. Method for the isolation of hybridomas using cholesterol auxotrophy of myeloma cells. 5,110,737, Cl. 435-240.270.

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Mochizuki, David A., 5,109,934, Cl. 175-170.000.

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Miyoshi, Jun; and Nagai, Hiroyuki, 5,110,103, Cl. 271-3.000.

Nagakawa, Junichi: *See—*
Ogata, Yoshitake; Ikeda, Makoto; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Yamanaka, Takashi; Hishinuma, Ieharu; Nagakawa, Junichi; Hirota, Kazuo; Miyamoto, Kaname; Horie, Toru; and Wakabayashi, Tsuneo, 5,110,956, Cl. 549-447.000.

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Eto, Hiroshi; Oka, Nobuyuki; and Nagaki, Takehiro, 5,111,441, Cl. 369-13.000.

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Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; and Nagano, Masami, 5,111,405, Cl. 364-431.070.

Naganuma, Hiroki: *See—*
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Doke, Harumi; Ishida, Syozi; Iwasa, Hiroki; Nagasaka, Chikao; Ueda, Masuyuki; Kato, Shigeru; Aoki, Hisashi; Shibahara, Makoto; and Mori, Satoshi, 5,111,006, Cl. 200-5.00R.

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Hamaguchi, Fumiko; Nagasaka, Tatsuo; Hakamada, Rie; and Sakurai, Einosuke, 5,110,823, Cl. 514-375.000.

Nagasawa, Kenichi; and Kawamura, Hideaki, to Canon Kabushiki Kaisha. Electronic camera with digital signal processing circuit. 5,111,283, Cl. 358-41.000.

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Nagy, Lajos: *See—*
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo; Soos, Rudolf; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 5,110,976, Cl. 558-407.000.

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Csanyi, Endre; Csanyi, Gabor; Balogh, Tibor; and Nagy, Laszlo , 5,110,720, Cl. 433-215.000.

Naiman, Michael I.; and Chang, James C., to Petrolite Corporation. Methods and compositions for reduction of drag in hydrocarbon fluids. 5,110,874, Cl. 525-329.900.

Naito, Yasuo: *See—*
Torii, Nobutoshi; Naito, Yasuo; and Ueda, Kunio, 5,111,019, Cl. 219-87.000.

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Nakagawa, Yoshikazu, to Rohm Co., Ltd. Method of manufacturing a compound semiconductor device. 5,110,751, Cl. 437-40.000.

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Inagaki, Akio; Nakai, Kiyotaka; and Tauchi, Hitoshi, 5,110,857, Cl. 524-494.000.

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Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 5,111,234, Cl. 354-455.000.

Nakai, Yasufumi: *See—*
Furusawa, Genichi; Yoshioka, Yasuhiro; and Nakai, Yasufumi, 5,110,714, Cl. 430-376.000.

Nakaji, Yoshiharu, to Nissan Motor Company, Limited. System for reducing noise level in vehicular cabin. 5,111,507, Cl. 381-71.000.

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Kondo, Toshio; Urata, Kenji; Katagiri, Masayoshi; and Nakamura, Kenichi, 5,109,959, Cl. 188-73.310.
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Maeda, Yuuji; Nakamura, Yozo; Nakamura, Kenichi; Sakamoto, Masahide; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,109,815, Cl. 123-192.100.

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Karasawa, Hiroo; Kometani, Kiichi; and Nakamura, Kiyokazu, 5,110,849, Cl. 524-87.000.

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Yoshimura, Kamunari; and Nakamura, Kuninori, 5,111,056, Cl. 250-560.000.

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Ohmura, Keiji; Okuno, Sumio; Takeichi, Michifumi; Masai, Kentarou; Okamoto, Seiichi; and Nakamura, Masatake, 5,109,777, Cl. 105-401.000.

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Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; and Nagano, Masami, 5,111,405, Cl. 364-431.070.
Maeda, Yuuji; Nakamura, Yozo; Nakamura, Kenichi; Sakamoto, Masahide; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,109,815, Cl. 123-192.100.
Okamoto, Yoshio; Nakamura, Yozo; Kashiwaya, Mineo; and Hamashima, Eigi, 5,109,824, Cl. 123-472.000.

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Hasegawa, Yo; Okano, Kazuyuki; Isozaki, Yasuhito; Tabata, Munehiro; Hayashi, Chiharu; and Nakanishi, Akira, 5,110,622, Cl. 427-126.100.

Nakanishi, Keiichirou; Yamamoto, Masakazu; and Yamada, Minoru, to Hitachi, Ltd. Thick film and thin film composite substrate and electronic circuit apparatus using it. 5,110,664, Cl. 428-195.000.

Nakaniwa, Sadao: *See—*
Yamamasu, Yoshikazu; Morita, Tetsuyuki; Nakaniwa, Sadao; and Ichihara, Masami, 5,110,541, Cl. 419-2.000.

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Sando, Yoshiteru; Nakano, Eiichi; and Ishidoshiro, Hiroshi, 5,110,481, Cl. 210-721.000.

Nakano, Hiroyuki: *See—*
Abe, Tunehiko; Nakano, Hiroyuki; Shiotani, Kazuaki; and Takada, Yoshiharu, 5,110,630, Cl. 427-327.000.

Nakano, Kinichiro: *See—*
Tomoda, Takahisa; Takeuchi, Mikio; Nakano, Kinichiro; and Hirano, Motoki, 5,111,199, Cl. 340-825.720.

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Nakano, Shoji: *See—*
Ochi, Mitsuzo; Nakano, Shoji; and Hosakawa, Masashi, 5,110,386, Cl. 156-204.000.

Nakano, Tetsuya: *See—*
Inoue, Masahide; Nakano, Tetsuya; Yabe, Naruo; Tsuyama, Koichi; Shimizu, Yoshitake; and Kuroki, Mitsushi, 5,110,704, Cl 430-110.000.

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Nakata, Hidekazu: *See—*
Okamoto, Kenichi; and Nakata, Hidekazu, 5,109,661, Cl. 57-212.000.

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Yoshimoto, Satoshi; Nakata, Shigeru; Takama, Noboru; and Taniguchi, Minoru, 5,111,364, Cl. 361-399.000.

Nakayama, Hiroki, to Canon Kabushiki Kaisha. Zoom Lens. 5,111,338, Cl. 359-686.000.

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Nakayama, Ryoji: *See—*
Takeshita, Takuo; Nakayama, Ryoji; and Ogawa, Tamotsu, 5,110,374, Cl. 148-101.000.

Nakayama, Takahiro; Tamahashi, Kunihiro; Fuyama, Moriaki; Minemura, Hiroyuki; Sato, Yoshio; Tsuboi, Nobuyoshi; and Koyanagi, Hiroaki, to Hitachi, Ltd. Method and apparatus of optical modulation using superconductive oxide material. 5,110,792, Cl. 505-1.000.

Nakayama, Takeshi: *See—*
Kobayashi, Kazuo; Terada, Yasushi; and Nakayama, Takeshi, 5,111,427, Cl. 365-49.000.

Nakayama, Yojiro: *See—*
Ohshima, Kazuyoshi; and Nakayama, Yojiro, 5,109,571, Cl. 16-307.000.

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Furumura, Yuji; Mieno, Fumitake; Nakazawa, Tsutomu; Eshita, Takashi; Maeda, Mamoru; and Yamauchi, Tsunenori, 5,111,266, Cl. 357-34.000.

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Inaba, Shin-ichi; Shindo, Yasuyuki; Tsubouchi, Shirou; Naganuma, Hiroki; Nakazawa, Yoshio; Hayashi, Ryusuke; and Yamada, Kanji, 5,110,656, Cl. 428-257.000.

Nalco Chemical Company: *See—*
Huddleston, David A., 5,110,485, Cl. 252-8.551.

Nam, Seok-Hoon, to SamSung Electronic Co., Ltd. Still video camera with a multi-screen memory. 5,111,300, Cl. 358-209.000.

Nanba, Akihiko: *See—*
Kiuchi, Manabu; Hirai, Masazumi; Fujikawa, Yasuo; Yamaguchi, Ryuji; Nanba, Akihiko; and Noda, Masato, 5,110,547, Cl. 420-590.000.

Nanba, Katsuaki: *See—*
Matsumoto, Yasuhiko; Nanba, Katsuaki; and Morita, Isao, 5,109,790, Cl. 118-63.000.
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Yoshida, Masato; Yokoyama, Takanao; Nanba, Muneyoshi; Kato, Yoshihiko; Iida, Kazumasa; and Miyamoto, Katsuhiko, 5,109,821, Cl. 123-425.000.

Nanbu, Yuichi: *See—*
Sawada, Masami; Nanbu, Yuichi; and Yoshiyasu, Mitsuo, 5,110,647, Cl. 428-43.000.

Nanis, Leonard, to SRI International. Process and apparatus for casting multiple silicon wafer articles. 5,110,531, Cl. 264-219.000.

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Mauger, Philip E., 5,110,373, Cl. 148-33.200.

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Wysocki, Joseph J.; Hark, Sui K.; Hull, Virgil J.; Stephany, Joseph F.; Lakatos, Andras I.; and Narang, Ram S., 5,111,320, Cl. 359-87.000.

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Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, 5,110,856, Cl. 524-459.000.

Narita, Masashi: *See—*
Fujita, Shuji; Narita, Masashi; Akada, Masanori; and Azuma, Yoshihiko, 5,111,285, Cl. 358-75.000.

Narkon, Glennwood H.; and Orkin, Stanley S., to Kamatics Corporation. Self-aligning track roller. 5,110,221, Cl. 384-203.000.

Narlow, Doug; and Patterson, Hubert A., to Sensormatic Electronics Corporation. LC-type electronic article surveillance tag with voltage dependent capacitor. 5,111,186, Cl. 340-572.000.

Narui, Hironobu; Yoshimatsu, Hiroshi; Hirata, Shoji; Ozawa, Masafumi; and Mori, Yoshifumi, to Sony Corporation. Semiconductor laser. 5,111,469, Cl. 372-46.000.

Narukawa, Hiroshi; Mizobe, Akio; Nakahara, Fumio; Kubotsu, Akira; Akiyama, Akitsugu; Nishiyama, Masakazu; Nagamatu, Kenji; and Miyazaki, Hirotoshi, to Kuraray Company Limited. Synthetic polyvinyl alcohol fiber and process for its production. 5,110,678, Cl. 428-364.000.

Nasu, Takeshi: *See—*
Sugiura, Masayuki; Miki, Nobuaki; Nasu, Takeshi; Sugiura, Kiyohiko; and Saito, Masao, 5,111,175, Cl. 336-192.000.

Nath, Prem: *See—*
Vogeli, Craig; and Nath, Prem, 5,110,370, Cl. 136-256.000.

National Presort, Inc.: *See—*
Daboub, Henry A.; Bowland, Gary E.; and Gray, Paul, 5,109,987, Cl. 209-657.000.

National Research Council of Canada: *See—*
Normandin, Richard J. F.; Letourneau, Sylvie; Chatenoud, Francoise; and Williams, Robin L., 5,111,466, Cl. 372-22.000.

National Research Development Corporation: *See—*
De Ronde, Frans C., 5,111,164, Cl. 333-21.00A.
Sullivan, John L.; and Xu, Ning-Sheng, 5,111,042, Cl. 250-251.000.

National Semiconductor Corp.: *See—*
Anand, Kranti V.; and Thomas, Michael E., 5,111,355, Cl. 361-313.000.
Hingarh, Hemraj; Asuncion, Andres D.; Thomas, Michael; and Brown, Robert, 5,111,276, Cl. 357-71.000.

National Starch and Chemical Investment Holding Corporation: *See—*
Graham, Malcolm, 5,110,892, Cl. 528-48.000.

Natori, Naoaki: *See—*
Matsumura, Hiroshi; Shimamura, Norio; Ohta, Yasuto; Kawabe, Masaru; Shimizu, Makoto; Natori, Naoaki; and Suzuki, Naohiko, 5,111,201, Cl. 340-870.380.

Nauroth, Peter: *See—*
Reinhardt, Helmut; Becker, Adam; Kuhlmann, Robert; and Nauroth, Peter, 5,110,574, Cl. 423-335.000.

Naylor, Robert: *See—*
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardaix-Luthereau, Renee; Costall, Brenda; and Naylor, Robert, 5,110,824, Cl. 514-377.000.

NCR Corporation: *See—*
Hilles, Wilbur I.; and Rieker, David A., 5,111,394, Cl. 364-405.000.
Nicoll, Kenneth A.; and Johnston, Adam J. L., 5,110,105, Cl. 271-5.000.
Seidel, Durbin L., 5,111,072, Cl. 307-353.000.
Stewart, John W., 5,111,085, Cl. 307-603.000.

Nebu, Hideaki: *See—*
Akimori, Giichiro; and Nebu, Hideaki, 5,109,942, Cl. 180-219.000.

NEC Corporation: *See—*
Asada, Hideki, 5,111,060, Cl. 307-219.000.
Hara, Tadashi, 5,111,458, Cl. 371-16.500.
Hattori, Naoharu, 5,111,385, Cl. 395-425.000.
Ichikawa, Yoshio, 5,111,197, Cl. 340-825.440.
Iwata, Toshiki, 5,111,063, Cl. 307-269.000.
Kimbara, Kohji, 5,111,003, Cl. 174-255.000.
Ohata, Keiichi; and Hida, Hikaru, 5,111,256, Cl. 357-22.000.
Tanaka, Shin-ichi, 5,111,265, Cl. 357-34.000.
Tokunaga, Koji, 5,111,535, Cl. 455-33.200.
Yokokawa, Sakae, 5,110,654, Cl. 428-137.000.

Negawa, Hideo: *See—*
Kotani, Kozo; Negawa, Hideo; and Sakaya, Taiichi, 5,110,860, Cl. 524-563.000.

Negoro, Ikuo: *See—*
Kita, Masahiro; and Negoro, Ikuo, 5,111,248, Cl. 355-282.000.

Negus, Kevin J., to Avantek, Inc. Interleaved time-division multiplexor with phase-compensated frequency doublers. 5,111,455, Cl. 370-112.000.

Nel, Jan G.: *See—*
Wagener, Kenneth B.; Boncella, James M.; Duttweiler, Robert P.; Hillmyer, Marc A.; and Nel, Jan G., 5,110,885, Cl. 526-170.000.

Nellcor, Inc.: *See—*
Goodman, David E.; Warring, Jessica A.; and Mannheimer, Paul D., 5,109,849, Cl. 128-633.000.

Nelson, Terry M.: *See—*
Chan, C. S.; Bearss, James G.; and Nelson, Terry M., 5,111,302, Cl. 358-298.000.

Nemic Lambda Kabushiki Kaisha: *See—*
Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshioka, Hitoshi; and Norigoe, Isami, 5,111,372, Cl. 363-20.000.

Nesheiwat, Afif M.: *See—*
Hoover, Kenneth C.; Clark, Earl, Jr.; Reger, Roy E.; Scoggins, Lacey E.; and Nesheiwat, Afif M., 5,110,901, Cl. 528-387.000.

Nestler, John: *See—*
Eich, David M.; Jesse, Robert; and Nestler, John, 5,110,810, Cl. 514-178.000.

NET/TECH International, Inc.: *See—*
Kolsky, Rodger E.; and Hale, William H., 5,110,525, Cl. 264-122.000.

Neuls, Frederick W.: *See—*
Bueter, John C.; Fields, Randall T.; Chandler, Martin D.; Neuls, Frederick W.; and Laffkas, Harry P., 5,109,932, Cl. 173-17.000.

Neumann, Karl H.: *See—*
Romano, Timothy S.; Peck, Leonard E., Jr.; Neumann, Karl H.; and Zahuta, Robert E., 5,111,049, Cl. 250-352.000.

Nevitt, James S.: *See—*
Mazzone, Daniel P.; Hoeffel, James D.; Nevitt, James S.; and Elliott, Richard E., 5,111,142, Cl. 324-262.000.

Newkirk, David C.: *See—*
Borders, Richard L.; Newkirk, David C.; and Stafford, Daniel G., 5,109,554, Cl. 5-602.000.

Newkirk, Marc S., to Lanxide Technology Company, LP. Ceramic articles with a polymer component and methods of making same. 5,110,675, Cl. 428-312.200.

Newkirk, Matthew S.; and Human, David M., to Southwest Research Institute. Direct filter injection system for gas chromatographs. 5,109,710, Cl. 73-863.110.

Newlove, John C.: *See—*
Manalastas, Pacifico V.; Drake, Evelyn N.; Kresge, Edward N.; Thaler, Warren A.; McDougall, Lee A.; Newlove, John C.; Swarup, Vijay; and Geiger, Albert J., 5,110,486, Cl. 252-8.551.

Ney, Clyde W.; and Prats, Genaro, to Chrysler Corporation. Vertically retractable soft or flexible tailgate for a pickup truck. 5,110,172, Cl. 296-50.000.

Ng, Yee S.; and Rimai, Donald S., to Eastman Kodak Company. Process for toned image transfer using a roller. 5,110,702, Cl. 430-99.000.

NGK Insulators, Ltd.: *See—*
Kozuka, Yoshinari; and Kakizaki, Yuichi, 5,111,135, Cl. 324-96.000.

NGK Spark Plug Co., Ltd.: *See—*
Kojima, Takao; Ishiguro, Hiroyuki; Kawachi, Yoshiki; and Yamada, Tetsuyo, 5,110,442, Cl. 204-426.000.
Ohya, Kanji, 5,111,170, Cl. 333-219.100.

Nguyen, Nhan H., to Imperial Chemical Industries PLC. Trisubstituted benzoic acid intermediates. 5,110,979, Cl. 560-61.000.

Nguyen, Tan H., to Guyomarc'h Nutrition Animale. Plant polysaccharide fractions inducing prolactin in mammals. 5,110,803, Cl. 514-54.000.

Nichols, Dwight E., to Hoover Group, Inc. Composite shipping container with separable top and bottom structures. 5,110,000, Cl. 220-4.160.

Nichols, Stephen J., to Xerox Corporation. Toner concentration sensing using auger mounted magnet. 5,111,247, Cl. 355-246.000.

Nickell, David L.: *See—*
Plonka, Robert J.; Milfs, Dennis J.; and Nickell, David L., 5,111,166, Cl. 333-128.000.

Nicolaou, Kyriacos C.: *See—*
Abe, Yoshihiro; and Nicolaou, Kyriacos C., 5,110,949, Cl. 549-214.000.

Nicolet Instrument Corporation: *See—*
Zachman, Julie C.; Kuntz, Robert A.; Smith, Steven R.; and Hudzik, James S., 5,111,406, Cl. 364-474.020.

Nicoll, Kenneth A.; and Johnston, Adam J. L., to NCR Corporation. Sheet handling apparatus. 5,110,105, Cl. 271-5.000.

Nielsen, Ole Bent I.: *See—*
Ahnfelt-Ronne, Ian; Hansen, Erik T.; Kirstein, Dorte; Nielsen, Ole Bent I.; and Rachlin, Schneur, 5,110,819, Cl. 514-311.000.

Nielson, Wayne G., to Sterner Lighting Systems Incorporated. Arc-stream correcting lamp holder. 5,111,371, Cl. 362-261.000.

Nietering, Kenneth E.: *See—*
Gajewski, Kenneth J.; Hymore, Ronald R.; and Nietering, Kenneth E., 5,111,329, Cl. 359-275.000.

Nightingale, Douglas J., to Rolls-Royce (1971) Limited. Gas turbine engine nozzle. 5,110,050, Cl. 239-265.390.

Niki, Shoji; and Pawlik, Jon R. Optical interference signal extractor with device for reduced noise from optical light power variation. 5,110,211, Cl. 326-346.000.

Nikon Corporation: *See—*
Nakamura, Toshiyuki; Kazami, Kazuyuki; Daitoku, Koichi; and Miyamoto, Hidenori, 5,111,226, Cl. 354-195.100.
Yokonuma, Norikazu; Hagiuda, Nobuyoshi; Matsui, Hideki; and Sakamoto, Hiroshi, 5,111,233, Cl. 354-416.000.

Nilssen, Ole K. Controlled series-resonance-loaded inverter. 5,111,380, Cl. 363-132.000.

Nimberger, Spencer M. Direct mount system for a fluid sampling pump and method. 5,109,709, Cl. 73-863.840.

Nimberger, Spencer M.; and Ward, Robert L., to Precision General, Inc. Portable sample cylinder with reduced seal permeability. 5,109,712, Cl. 73-864.620.

Nippon Leakless Industry Co., Ltd.: *See—*
Abe, Tunehiko; Nakano, Hiroyuki; Shiotani, Kazuaki; and Takada, Yoshiharu, 5,110,630, Cl. 427-327.000.

Nippon Light Metal Company, Ltd.: *See—*
Moriyama, Takeshi; Ogawa, Katsuji; Ohtake, Fumio; and Nishizawa, Akito, 5,110,371, Cl. 148-691.000.

Nippon Oil Company Ltd.: *See—*
Hara, Hajime; Orii, Shingo; Satoh, Tetsuo; Toya, Tomohiro; and Iida, Shigeki, 5,110,698, Cl. 430-20.000.
Kondo, Hitoshi; Sasaki, Makoto; and Kobayashi, Yukio, 5,110,871, Cl. 525-207.000.
Sasaki, Makoto; Kobayashi, Yukio; and Tsuchiya, Shozo, 5,110,872, Cl. 525-216.000.

Nippon Precision Circuits, Ltd.: *See—*
Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; and Ogiwara, Yoshihisa, 5,111,261, Cl. 357-23.700.

Nippon Seiko Kabushiki Kaisha: *See—*
Kasuga, Shinichi, 5,109,720, Cl. 74-89.150.

Nippon Soda Co., Ltd.: *See—*
Kusase, You; Murakata, Masatoshi; Mochizuki, Nobuo; and Takebayashi, Michinori, 5,110,925, Cl. 544-234.000.
Ueda, Akiyoshi; Ohishi, Haruhito; Aihara, Toshio; Ishikawa, Hisao; Tomida, Kazuyuki; and Hosaka, Hideo, 5,110,343, Cl. 71-88.000.

Nippon Steel Corporation: *See—*
Inaba, Shin-ichi; Shindo, Yasuyuki; Tsubouchi, Shirou; Naganuma, Hiroki; Nakazawa, Yoshio; Hayashi, Ryusuke; and Yamada, Kanji, 5,110,656, Cl. 428-257.000.
Komatsu, Fumito; and Kawatsu, Tositatsu, 5,109,794, Cl. 118-660.000.
Ooba, Yasushi; and Gotoh, Hiroshi, 5,109,687, Cl. 72-21.000.
Sato, Eiji; Matsuhashi, Ryo; Ito, Satoshi; Tano, Kazuhiro; and Asakawa, Kenichi, 5,110,544, Cl. 420-69.000.

Nippon Telegraph and Telephone Corporation: *See—*
Morie, Takashi, 5,111,430, Cl. 365-185.000.

Nippon Valqua Industries, Ltd.: *See—*
Hayashi, Taira; Watanabe, Hiroyuki; Tuchiya, Akira; Hagiwara, Kazuo; and Hishiyama, Iwao, 5,110,526, Cl. 264-127.000.

Nippon Zeon Co., Ltd.: *See—*
Kitahara, Shizuo; and Toyoshima, Tetuya, 5,110,886, Cl. 526-260.000.

Nippon Zoki Pharmaceutical Co., Ltd.: *See—*
Ienaga, Kazuharu; and Higashiura, Kunihiko, 5,110,797, Cl. 514-19.000.

Nippondenso Co., Ltd.: *See—*
Tagami, Hitoshi; Ushida, Masayasu; and Tabata, Taro, 5,109,828, Cl. 123-635.000.
Taniguchi, Toshihisa; Hayashi, Mituyuki; and Sakai, Masahiko, 5,109,690, Cl. 72-206.000.

Nishida, Mitsuhiro; and Arita, Masumi, to Mitsubishi Denki K.K. Scroll-type fluid machine with an improved journal bearing. 5,110,273, Cl. 418-55.600.

Nishijima, Toyoki: *See—*
Tanji, Masaki; and Nishijima, Toyoki, 5,110,718, Cl. 430-546.000.

Nishikawa, Toshio; Maruyama, Yuichi; Ogura, Hiromi; and Michishita, Kenshi, to Murata Manufacturing Co., Ltd. Connector. 5,110,308, Cl. 439-582.000.

Nishimoto, Tadashi: *See—*
Watanabe, Tsutomu; Yamashita, Masaaki; Kubota, Takahiro; Miyosawa, Yoshiaki; and Nishimoto, Tadashi, 5,110,689, Cl. 428-623.000.

Nishimura, Asao: *See—*
Miura, Hideo; Nishimura, Asao; Sakata, Shinji; Shimizu, Tasuku; and Hattori, Shigeo, 5,110,537, Cl. 376-305.000.

Nishimura, Takashi: *See—*
Sugiura, Hisao; Nishimura, Takashi; and Tanaka, Toshinobu, 5,110,827, Cl. 514-399.000.

Nishimura, Yoshitaka: *See—*
Kimura, Katsunori; Hata, Shinichi; and Nishimura, Yoshitaka, 5,111,383, Cl. 364-184.000.

Nishio, Maki: *See—*
Oki, Toshikazu; Saitoh, Kyoichiro; Tomatsu, Kozo; Tomita, Koji; Konishi, Masataka; Miyaki, Takeo; Tsunakawa, Mitsuaki; and Nishio, Maki, 5,110,960, Cl. 552-220.000.

Nishio, Minoru: *See—*
Kokubu, Sadao; Nishio, Minoru; and Hattori, Yoshitaka, 5,111,010, Cl. 200-461.000.

Nishiumi, Masaharu: *See—*
Fujii, Takashi; Kawahara, Hironobu; Takata, Kazuo; Nishiumi, Masaharu; and Yamamoto, Noriaki, 5,110,408, Cl. 156-643.000.

Nishiwaki, Toshihiro; Umeda, Shigeru; and Takatori, Tsuyoshi, to Obara Corporation. Connection member in a welding gun for robot. 5,111,018, Cl. 219-86.250.

Nishiyama, Hisashi; Hashimoto, Yasuhiro; Kanda, Hiroshi; and Katakura, Kageyoshi, to Hitachi, Ltd. Pulse doppler measuring apparatus. 5,109,858, Cl. 128-661.090.

Nishiyama, Masakazu: *See—*
Narukawa, Hiroshi; Mizobe, Akio; Nakahara, Fumio; Kubotsu, Akira; Akiyama, Akitsugu; Nishiyama, Masakazu; Nagamatu, Kenji; and Miyazaki, Hirotoshi, 5,110,678, Cl. 428-364.000.

Nishiyama, Masashi; Fujii, Hideaki; and Takahashi, Tatsumi, to Dai Nippon Insatsu Kabushiki Kaisha. Ultra-high-molecular-weight polyethylene and method for its manufacture. 5,110,663, Cl. 428-195.000.

Nishizawa, Akito: *See—*
Moriyama, Takeshi; Ogawa, Katsuji; Ohtake, Fumio; and Nishizawa, Akito, 5,110,371, Cl. 148-691.000.

Niskala, Wayne F.: *See—*
Hatakeyama, Atsushi; Miura, Tsutomu; Niskala, Wayne F.; Sato, Tomonori; and Yumino, Masamichi, 5,110,227, Cl. 400-120.000.

Nissan Chemical Industries Ltd.: *See—*
Kohtoh, Noriaki; Abe, Toyohiko; and Fukuro, Hiroyoshi, 5,111,318, Cl. 359-76.000.

Nissan Motor Co., Ltd.: *See—*
Kato, Yuji, 5,109,826, Cl. 123-564.000.
Maeda, Yuuji; Nakamura, Yozo; Nakamura, Kenichi; Sakamoto, Masahide; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,109,815, Cl. 123-192.100.
Nakaji, Yoshiharu, 5,111,507, Cl. 381-71.000.
Takizawa, Satoshi, 5,109,732, Cl. 74-866.000.
Tomoda, Takahisa; Takeuchi, Mikio; Nakano, Kinichiro; and Hirano, Motoki, 5,111,199, Cl. 340-825.720.
Torii, Shuji, 5,109,944, Cl. 180-248.000.

Nissei ASB Machine Co., Ltd.: *See—*
Voss, Hermann, 5,110,282, Cl. 425-534.000.

Nissei Plan, Inc.: *See—*
Hihara, Mikio; and Suzuki, Nobuhisa, 5,110,084, Cl. 249-111.000.

Nisshin Flour Milling Co., Ltd.: *See—*
Hamaguchi, Fumiko; Nagasaka, Tatsuo; Hakamada, Rie; and Sakurai, Einosuke, 5,110,823, Cl. 514-375.000.

Nisshin Steel Co., Ltd.: *See—*
Aizawa, Atsushi; Matsumoto, Yoshinori; Hara, Kenji; and Yamada, Toshiro, 5,110,218, Cl. 374-153.000.

Nitta, Masayoshi: *See—*
Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, 5,110,856, Cl 524-459.000.

Nitta, Tomio: *See—*
Amemiya, Hideo; Kuroda, Minoru; and Nitta, Tomio, 5,110,279, Cl. 425-208.000.

Nitto Denko Corporation: *See—*
Katayama, Shigeru; Matsumoto, Hiroshi; and Wada, Tatuo, 5,110,788, Cl. 503-227.000.

Nitto Seiko Co., Ltd.: *See—*
Hiroyuki, Sakamoto, 5,110,245, Cl. 411-421.000.

Niwa, Masatake: *See—*
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo, Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 5,111,234, Cl. 354-455.000.

Nixon, Lori: *See—*
Noble, Richard D.; Koval, Carl A.; Nixon, Lori; and Slaff, Geoffrey F., 5,110,624, Cl. 427-212.000.

NKK Corporation: *See—*
Watanabe, Tsutomu; Yamashita, Masaaki; Kubota, Takahiro; Miyosawa, Yoshiaki; and Nishimoto, Tadashi, 5,110,689, Cl. 428-623.000.

No Peek 21: *See—*
Laughlin, Donald J.; and Wagoner, Lawrence F., 5,110,134, Cl. 273-293.000.

Noakes, Kim P. A.; and Davidson, Peter J., to Imperial Chemical Industries, PLC. Catalytic combustion. 5,110,563, Cl. 422-191.000.

Nobe, Hisanori; and Koiwa, Mitsuru, to Mitsubishi Denki Kabushiki Kaisha. Ignition apparatus for an internal combustion engine. 5,109,827, Cl. 123-618.000.

Nobile, Frederick E.; Harris, John F., III; Silverman, Gary S.; and Baumann, Richard A., to Western Publishing Company. Liquid crystal writing state. 5,111,316, Cl. 359-52.000.

Noble, Richard D.; Koval, Carl A.; Nixon, Lori; and Slaff, Geoffrey F., to University of Colorado Foundation, Inc., The. Method for preparing magnetizable porous particles. 5,110,624, Cl. 427-212.000.

Noda, Masato: *See—*
Kiuchi, Manabu; Hirai, Masazumi; Fujikawa, Yasuo; Yamaguchi, Ryuji; Nanba, Akihiko; and Noda, Masato, 5,110,547, Cl. 420-590.000.

Noehren, William L.: *See—*
Byrnes, Francis E.; Hibyan, Edward S.; and Noehren, William L., 5,110,260, Cl. 416-134.00A.

Nogami, Yutaka: *See—*
Matsumura, Takuo; and Nogami, Yutaka, 5,110,106, Cl. 271-9.000.

Noggle, Michael K., to Southern Plastic Mold, Inc. Picture frame retainer. 5,109,619, Cl. 40-152.100.

Noguchi, Osamu; and Sugai, Kazuyoshi, to Clarion Co., Ltd. Surface acoustic wave device and method for fabricating same. 5,111,100, Cl. 310-313.00A.

Noguchi, Yoshihiro: *See—*
Morinushi, Ken; Tanaka, Hideharu; Noguchi, Yoshihiro; Imai, Toshihisa; and Takahashi, Yutaka, 5,110,258, Cl. 415-119.000.

Noguchi, Yoshiyuki: *See—*
Tanaka, Teruya; and Noguchi, Yoshiyuki, 5,111,014, Cl. 219-10.770.

Nojima, Masaharu: *See—*
Arai, Naoto; Kanda, Nobuo; and Nojima, Masaharu, 5,110,786, Cl. 503-204.000.

Nolan, Steven P.: *See—*
Marks, Tobin J.; Nolan, Steven P.; and Gagne, Michel R., 5,110,948, Cl. 548-579.000.

Nomoto, Seiichiro: *See—*
Ogata, Yoshitake; Ikeda, Makoto; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Yamanaka, Takashi; Hishinuma, Ieharu; Nagakawa, Junichi; Hirota, Kazuo; Miyamoto, Kaname; Horie, Toru; and Wakabayashi, Tsuneo, 5,110,956, Cl. 549-447.000.

Nomura, Tomoko: *See—*
Hori, Kimihiko; Sakaguchi, Akira; Ishida, Koichi; Nomura, Tomoko; Suzuki, Keiko, and Tsuchiya, Shuichi, 5,110,826, Cl. 514-39.000.

Noone, Lawrence E.; and Lagasse, Leo J., to United Technologies Corporation. Segmented brush seal. 5,110,033, Cl. 228-160.000.

Norand Corporation: *See—*
Sherman, Richard A.; and Schultz, Darald R., 5,110,226, Cl. 400-88.000.

Norbedo, Anthony J.: *See—*
Tornstrom, Eric; and Norbedo, Anthony J., 5,110,369, Cl. 136-251.000.

Norcross, Kenneth L., to JMO Holding, Inc. Aeration and mixing apparatus. 5,110,510, Cl. 261-91.000.

Nordberg Inc.: *See—*
Karra, Vijia K.; Magerowski, Anthony J.; and Szalanski, Scot E., 5,110,057, Cl. 241-30.000.

Nordica S.p.A.: *See—*
Sartor, Mariano, 5,109,615, Cl. 36-121.000.

Nordine, Gary A.: *See—*
Hewlett, Kenneth M.; and Nordine, Gary A., 5,109,588, Cl. 29-525.100.

Nordio, Franco: *See—*
Inzerillo, Giuseppe; and Nordio, Franco, 5,109,635, Cl. 51-283.00R.

Norigoe, Isami: *See—*
Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshioka, Hitoshi; and Norigoe, Isami, 5,111,372, Cl. 363-20.000.

Norman, Arthur E., to Innotec Group, Inc. Transport system for inline vacuum processing. 5,110,249, Cl. 414-217.000.

Norman, Marvin N.: *See—*
Gries, Robert J.; and Norman, Marvin N., 5,111,121, Cl. 315-411.000.
Truskalo, Walter; and Norman, Marvin N., 5,111,119, Cl. 315-386.000.

Normandin, Richard J. F.; Letourneau, Sylvie; Chatenoud, Francoise; and Williams, Robin L., to National Research Council of Canada. Optical multilayer structures for harmonic laser emission. 5,111,466, Cl. 372-22.000.

North American Dynamics: *See—*
Hagen, Richard L.; and Thompson, William W., 5,109,751, Cl. 89-33.160.

North American Philips Corp.: *See—*
Arst, Margareth C.; Chen, Teh-Yi J.; Ritz, Kenneth N.; and Redkar, Shailesh S., 5,110,757, Cl. 437-89.000.
Erickson, Frederick L.; and Richeson, William E., 5,109,812, Cl. 123-90.120.
Fellows, Mark W.; Wong, John M.; Toy, Edmond; Erhardt, Robert A.; and Thomsen, James A., Jr., 5,111,118, Cl. 315-307.000.
Koo, David, 5,111,298, Cl. 358-187.000.
Mathildus, Gerardus L.; Hecht, Matthew W.; and Briones, Robert A., 5,111,440, Cl. 369-13.000.
Turner, Loyce A.; and Ausburn, Phillip K., 5,111,494, Cl. 378-138.000.

Northern Telecom Limited: *See—*
Garner, John N., 5,109,658, Cl. 57-2.500.
Serack, James A., 5,111,485, Cl. 375-112.000.

Northrop Corporation: *See—*
Carpenter, Harry W.; and Bohlen, James W., 5,110,771, Cl. 501-95.000.
Elder, Cary S.; Tolman, Dennis K.; and Gates, Dale A., 5,109,597, Cl. 29-721.000.

Northwestern University: *See—*
Marks, Tobin J.; Nolan, Steven P.; and Gagne, Michel R., 5,110,948, Cl. 548-579.000.

Norton Company: *See—*
Narayanan, Kesh S.; and Ramakrishnan, Muni S., 5,110,322, Cl. 51-309.000.

Norton, Vern A.: *See—*
McAuliffe, Keven P.; Melton, Evelyn A.; Norton, Vern A.; Pfister, Gregoty F.; and Wakefield, Scott P., 5,111,389, Cl. 395-800.000.

Novak, Vladimir: *See—*
Novotny, Ladislav; Kalvoda, Robert; Novak, Vladimir; and Uher, Karel, 5,110,429, Cl. 204-153.100.

Novotny, Ladislav; Kalvoda, Robert; Novak, Vladimir; and Uher, Karel, to JZD Valassko Se Sidlem Ve Vlachovicich. Method and arrangement for diagnostics of friction systems of motors. 5,110,429, Cl. 204-153.100.

Nowak, Michael T.: *See—*
Lewis, Thomas E.; and Nowak, Michael T., 5,109,771, Cl. 101-453.000.

Nowak, Stefan; and Bleisteiner, Robert, to Siemens Aktiengesellschaft. DC chopper converter. 5,111,378, Cl. 363-98.000.

Nukem GmbH: *See—*
Huschka, Hans; Demmich, Joerg; and Maurer, Paul-Gerhard, 5,109,918, Cl. 165-104.180.

Numata, Kazuki; and Ochiai, Kiyoshi, to Sumitomo Rubber Industries, Ltd. Snow tire. 5,109,904, Cl. 152-209.00R.

Nummy, William R. Sand trap rake accessory for golf shoes. 5,109,617, Cl. 36-132.000.

Nunberg, Geoffrey D.; Stansbury, H. Tayloe; Abbott, Curtis; and Smith, Brian C., to Xerox Corporation. Processing natural language text using autonomous punctuational structure. 5,111,398, Cl. 364-419.000.

Nunzio's Pizza, Inc.: *See—*
Casale, Frank R.; Casale, Nicola D.; Casale, Antonio A.; Bennett, Richard P.; and Padilla, Gilbert F., 5,109,956, Cl. 186-41.000.

Nyfeler, Alex; Antes, Gregor; and Schmidlin, Hansjorg, to Landis & Gyr Betriebs AG. Device for the embossing of fine structures. 5,109,767, Cl. 101-23.000.

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Chen, Walter Y.; and Haddad, Richard A., 5,111,481, Cl. 375-14.000.
Morrow, Joel I., 5,111,453, Cl. 370-85.130.

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Nishiwaki, Toshihiro; Umeda, Shigeru; and Takatori, Tsuyoshi, 5,111,018, Cl. 219-86.250.

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Obrecht, Gary W.: *See—*
Farnsworth, John T.; Johnson, Roger D.; Obrecht, Gary W.; and Young, Linda A., 5,110,276, Cl. 425-133.100.

Oce Nederland B.V.: *See—*
Boderie, Emile E. M.; and Van Dam, Marinus J. M., 5,111,037, Cl. 250-216.000.

Ochi, Mitsuzo; Nakano, Shoji; and Hosakawa, Masashi, to Uni-Charm Corporation. Method of forming parts of products to be worn. 5,110,386, Cl. 156-204.000.

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Numata, Kazuki; and Ochiai, Kiyoshi, 5,109,904, Cl. 152-209.00R.

Ochs, Heinrich: *See—*
Stanco, Christoph; Ochs, Heinrich; and Difflipp, Kurt, 5,110,109, Cl. 271-82.000.

Odagiri, Masaru: *See—*
Murai, Mikio; Takahashi, Kiyoshi; and Odagiri, Masaru, 5,110,676, Cl. 428-336.000.

Odani, Niro; Yoshioka, Kazuyoshi; and Sekiya, Sinichi, to Mitsubishi Metal Corporation. Cement blade member for cutting-tools and process for producing same. 5,110,543, Cl. 419-29.000.

Odell, Michael H.: *See—*
Linsuri, Ari; and Odell, Michael H., 5,110,416, Cl. 162-343.000.

Oden, Laurance L.: *See—*
White, Jack C.; Traut, Davis E.; Oden, Laurance L.; and Schmitt, Roman A., 5,110,546, Cl. 420-590.000.

Odru, Pierre: *See—*
Sparks, Charles; Odru, Pierre; Auberon, Marcel; and Fuchs, Jean-Francois, 5,110,644, Cl. 428-36.300.

Odyssey Systems Ltd.: *See—*
Colin, George M., 5,110,023, Cl. 224-205.000.

Oea, Inc.: *See—*
Olcer, Nuri Y., 5,109,749, Cl. 89-1.140.

Oelbermann, Max. Filter press. 5,110,467, Cl. 210-225.000.

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Windisch, Arthur; and Pfenninger, Heinz, 5,110,743, Cl. 436-48.000.

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Rebhan, Ulrich; Steinfuhrer, Gerd; Voss, Frank; and Oesterlin, Peter, 5,111,473, Cl. 372-59.000.

Office National d'Etudes et de Recherches Aerospatiales: *See—*
Alperine, Serge; and Josso, Pierre, 5,110,422, Cl. 205-159.000.

Ogata, Masaru; Matsumoto, Hiroshi; Shimizu, Sumio; and Kida, Shiro, to Shionogi & Co., Ltd. Benzofuran derivative. 5,110,825, Cl. 514-381.000.

Ogata, Yoshitake; Ikeda, Makoto; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Yamanaka, Takashi; Hishinuma, Ieharu; Nagakawa, Junichi; Hirota, Kazuo; Miyamoto, Kaname; Horie, Toru; and Wakabayashi, Tsuneo, to Eisai Co., Ltd. Benzodioxale derivatives. 5,110,956, Cl. 549-447.000.

Ogawa, Hiroshi: *See—*
Nakajima, Heitaro; Hotori, Masahiro; Ogawa, Hiroshi; and Fujiie, Kazuhiko, 5,111,442, Cl. 369-47.000.

Ogawa, Katsuji: *See—*
Moriyama, Takeshi; Ogawa, Katsuji; Ohtake, Fumio; and Nishizawa, Akito, 5,110,371, Cl. 148-691.000.

Ogawa, Kenji: *See—*
Suzuki, Hiroyoshi; Ogawa, Kenji; and Yamamoto, Toru, 5,110,205, Cl. 356-135.000.

Ogawa, Kimiaki: *See—*
Aoki, Harumi; Morisawa, Tahei; Ogawa, Kimiaki; and Mogamiya, Makoto, 5,111,299, Cl. 358-209.000.

Ogawa, Tamotsu: *See—*
Takeshita, Takuo; Nakayama, Ryoji; and Ogawa, Tamotsu, 5,110,374, Cl. 148-101.000.

Ogawa, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for forming interconnection pattern. 5,110,394, Cl. 156-345.000.

Ogawa, Toshitaka: *See—*
Ueno, Hiroshi; Kikuchi, Yasuo; Takahashi, Kunitomo; Doi, Koji; Onose, Tsukasa; and Ogawa, Toshitaka, 5,111,235, Cl. 355-246.000.

Ogawa, Yasushi: *See—*
Chu, George H.; Ogawa, Yasushi; McPherson, John M.; Ksander, George; Pratt, Bruce; Hendricks, Diana; and McMullin, Hugh, 5,110,604, Cl. 424-484.000.

Ogawa, Yuzi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom camera. 5,111,227, Cl. 354-199.000.

Ogden, Daryl M., to Board of Regents, The University of Texas System. Immunoassay for antibodies binding platelets. 5,110,726, Cl. 435-7.210.

Ogihara, Masaki: *See—*
Sawada, Shizuo; and Ogihara, Masaki, 5,111,275, Cl. 357-71.000.

Ogino, Nobuyoshi, to Shin-Etsu Handotai Co., Ltd. Method of making a beveled semiconductor silicon wafer. 5,110,764, Cl. 437-224.000.

Ogiwara, Yoshihisa: *See—*
Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; and Ogiwara, Yoshihisa, 5,111,261, Cl. 357-23.700.

Oguma, Tetsuya; Kikuchi, Mamoru; Mizusawa, Kiyoshi; Tokutake, Shoichi; and Yamaji, Nobuyuki, to Kikkoman Corporation. Purified cyclodextrinase. 5,110,734, Cl. 435-201.000.

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Ogura, Atsushi, to Atsushi Ogura. Homogeneous solid solution material and method of manufacturing the same. 5,110,774, Cl. 501-126.000.

Ogura, Hiromi: *See—*
Nishikawa, Toshio; Maruyama, Yuichi; Ogura, Hiromi; and Michishita, Kenshi, 5,110,308, Cl. 439-582.000.

Oh, Jung H. Apparatus for attaching objects to a panel. 5,110,243, Cl. 411-344.000.

Oh, Siebang: *See—*
Krueger, David J.; Oh, Siebang; and Tjhie, Lun K., 5,111,177, Cl. 337-243.000.

Ohata, Keiichi; and Hida, Hikaru, to NEC Corporation. High speed semiconductor device and an optelectronic device. 5,111,256, Cl. 357-22.000.

Ohhashi, Yutaka: *See—*
Kawaguchi, Shin; Ohhashi, Yutaka; and Fukuta, Kenji, 5,110,632, Cl. 427-424.000.

Ohi, Kiyomoto; and Shimizu, Shin, to Toyo Boseki Kabushiki Kaisha. Aeration apparatus for the culture of mammalian cells. 5,110,741, Cl. 435-284.000.

Ohishi, Haruhito: *See—*
Ueda, Akiyoshi; Ohishi, Haruhito; Aihara, Toshio; Ishikawa, Hisao; Tomida, Kazuyuki; and Hosaka, Hideo, 5,110,343, Cl. 71-88.000.

Ohkubo, Takuo: *See—*
Taka, Toshio; Shishido, Kihachi; and Ohkubo, Takuo, 5,110,686, Cl. 428-516.000.

Ohlendorf, Rolf; Haussmann, Gerhard; and Krejci, Karl, to Daimler-Benz AG. Camshaft with barrel-shaped shank. 5,109,726, Cl. 74-567.000.

Ohlhaber, Ronald L., to Cooper Industries, Inc. Miniature coaxial cable by drawing. 5,109,599, Cl. 29-828.000.

Ohmi, Tadahiro; Shibata, Tadashi; and Umeda, Masaru, to Ohmi, Tadahiro. Reduced pressure surface treatment apparatus. 5,110,438, Cl. 204-298.340.

Ohmori, Koichi: *See—*
Ohtsuchi, Tetsuro; Tsutsui, Hiroshi; Ohmori, Koichi; Baba, Sueki; Funakoshi, Hiromasa; Kawara, Toshiyuki; and Yoshizumi, Yoshiyuki, 5,111,052, Cl. 250-370.010.

Ohmura, Keiji; Okuno, Sumio; Takeichi, Michifumi; Masai, Kentarou; Okamoto, Seiichi; and Nakamura, Masatake, to Hitachi, Ltd. Car body for railway rolling stock with joggled adjacent side sheet end construction for smooth exterior. 5,109,777, Cl. 105-401.000.

Ohoka, Masaharu: *See—*
Morii, Mitsuyoshi; Ohoka, Masaharu; Kawashima, Nobuhiro; Morii, Noriko; and Suzuki, Toshihiko, 5,110,736, Cl. 435-226.000.

Ohsaki, Satoshi: *See—*
Miyazaki, Takatomi; and Ohsaki, Satoshi, 5,110,520, Cl. 264-40.300.

Ohshima, Kazuyoshi; and Nakayama, Yojiro, to Sugatsune Industrial Co., Ltd. Door hinge with movable and fixed cams. 5,109,571, Cl. 16-307.000.

Ohta, Junichi, to Ricoh Company, Ltd. Apparatus for converting handwritten characters onto finely shaped characters of common size and pitch, aligned in an inferred direction. 5,111,514, Cl. 382-9.000.

Ohta, Kazuchika: *See—*
Yamamoto, Iwao; Ohta, Kazuchika; and Komatsu, Tsuyoshi, 5,110,916, Cl. 534-15.000.

Ohta, Yasuto: *See—*
Matsumura, Hiroshi; Shimamura, Norio; Ohta, Yasuto; Kawabe, Masaru; Shimizu, Makoto; Natori, Naoaki; and Suzuki, Naohiko, 5,111,201, Cl. 340-870.380.

Ohta, Yoshinobu: *See—*
Fukuda, Michio; Ohta, Yoshinobu; Taniguchi, Kenichi; and Sasaki, Katuyuki, 5,109,602, Cl. 29-845.000.

Ohtaka, Yoshimitsu: *See—*
Hosoya, Masahiro; Saito, Mitsunaga; Endo, Mitsuharu; Ohtaka, Yoshimitsu; and Futamata, Yukio, 5,110,705, Cl. 430-120.000.

Ohtake, Fumio: *See—*
Moriyama, Takeshi; Ogawa, Katsuji; Ohtake, Fumio; and Nishizawa, Akito, 5,110,371, Cl. 148-691.000.

Ohtake, Hisao, to Oki Electric Industry Co. Ltd. MSK signal detector. 5,111,482, Cl. 375-90.000.

Ohtani, Tamio: *See—*
Irie, Akira; Kanaya, Yasuhiko; and Ohtani, Tamio, 5,109,584, Cl. 29-33.00P.

Ohtsuchi, Tetsuro; Tsutsui, Hiroshi; Ohmori, Koichi; Baba, Sueki; Funakoshi, Hiromasa; Kawara, Toshiyuki; and Yoshizumi, Yoshiyuki, to Matsushita Electric Industrial Co., Ltd. Radiation sensor and a radiation detecting apparatus using the same. 5,111,052, Cl. 250-370.010.

Ohtsuka, Katsuyuki; Kondo, Isao; and Okada, Takashi, to Doryokuro Kakunenryo Kithatsu Jigyodan. Method of separating and purifying spent solvent generated in nuclear fuel cycle. 5,110,507, Cl. 252-626.000.

Ohya, Kanji, to NGK Spark Plug Co., Ltd. Dielectric resonator device. 5,111,170, Cl. 333-219.100.

Oji Paper Co., Ltd.: *See—*
Tsujimoto, Naohiko; Yamakoshi, Masaru; Kudo, Toshimitsu; Horiuchi, Yukiko; and Shimizu, Jiro, 5,110,915, Cl. 530-502.000.

Oka, Mitsuru: *See—*
Kurono, Masayasu; Kondo, Yasuaki; Matsumoto, Yukiharu; Oka, Mitsuru; and Sawai, Kiichi, 5,110,945, Cl. 548-453.000.

Oka, Nobuyuki: *See—*
Eto, Hiroshi; Oka, Nobuyuki; and Nagaki, Takehiro, 5,111,441, Cl. 369-13.000.

Okada, Akira, to Kabushiki Kaisha Toshiba. Microwave cooking apparatus having a low waveguide. 5,111,013, Cl. 219-10.55F.

Okada, Kenichi, to Japan Aviation Electronics Industry, Ltd. Optical integrated circuit. 5,111,518, Cl. 385-14.000.

Okada, Kinjiro: *See—*
Kawanami, Norihide; Okada, Kinjiro; Kobayashi, Nobuaki; and Masuda, Kimio, 5,111,520, Cl. 385-81.000.
Kawanami, Norihide; Okada, Kinjiro; and Kozu, Yoshikazu, 5,111,521, Cl. 385-82.000.

Okada, Shigeru; and Fujita, Masami, to Tofuji E.M.I. Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Opening/closing mechanism. 5,109,570, Cl. 16-289.000.

Okada, Takashi: *See—*
Ohtsuka, Katsuyuki; Kondo, Isao; and Okada, Takashi, 5,110,507, Cl. 252-626.000.

Okamoto, Kenichi; and Nakata, Hidekazu, to Sumitomo Electric Industries, Ltd. Steel cord for reinforcing rubber. 5,109,661, Cl. 57-212.000.

Okamoto, Seiichi: *See—*
Ohmura, Keiji; Okuno, Sumio; Takeichi, Michifumi; Masai, Kentarou; Okamoto, Seiichi; and Nakamura, Masatake, 5,109,777, Cl. 105-401.000.

Okamoto, Tetsuji: *See—*
Myoken, Yoshinari; Okamoto, Tetsuji; and Sato, J. Denry, 5,110,737, Cl. 435-240.270.

Okamoto, Yoshio; Nakamura, Yozo; Kashiwaya, Mineo; and Hamashima, Eigi, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Electromagnetic fuel injection valve. 5,109,824, Cl. 123-472.000.

Okamoto, Yoshio: *See—*
Yokoyama, Mizuho; Kanamaru, Hisanobu; Okamoto, Yoshio; Kuroha, Tunemitu; Koshizaka, Atsushi; and Shinozaki, Hironori, 5,109,823, Cl. 123-472.000.

Okano, Kazuyuki: *See—*
Hasegawa, Yo; Okano, Kazuyuki; Isozaki, Yasuhito; Tabata, Munehiro; Hayashi, Chiharu; and Nakanishi, Akira, 5,110,622, Cl. 427-126.100.

Oki Electric Industry Co., Ltd.: *See—*
Baba, Teruo, 5,111,360, Cl. 361-391.000.
Ohtake, Hisao, 5,111,482, Cl. 375-90.000.
Tanaka, Koutarou; Shikata, Makoto; and Akiyama, Masahiro, 5,111,489, Cl. 377-121.000.

Oki, Toshikazu; Saitoh, Kyoichiro; Tomatsu, Kozo; Tomita, Koji; Konishi, Masataka; Miyaki, Takeo; Tsunakawa, Mitsuaki; and Nishio, Maki, to Bristol-Myers Company. Antifungal antibiotics. 5,110,960, Cl. 552-220.000.

Okita, Makoto: *See—*
Ogata, Yoshitake; Ikeda, Makoto; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Yamanaka, Takashi; Hishinuma, Ieharu; Nagakawa, Junichi; Hirota, Kazuo; Miyamoto, Kaname; Horie, Toru; and Wakabayashi, Tsuneo, 5,110,956, Cl. 549-447.000.

Oklahoma State University, Board of Regents of: *See—*
Berlin, Kenneth D.; Scherlag, Benjamin J.; Clarke, Cyril R.; Otiv, Surendra R.; Zisman, Stan A.; Sangiah, Subbiah; and Mulekar, Satish V., 5,110,933, Cl. 546-114.000.

Okuda, Tetsuo, to CKD Corporation. Thread tensioning apparatus. 5,109,582, Cl. 28-208.000.

Okugawa, Shotaro: *See—*
Kimura, Hidetoshi; and Okugawa, Shotaro, 5,110,064, Cl. 242-129.500.

Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, to Fujisawa Pharmaceutical Company, Ltd. Tricyclo compounds, a process for their production and a pharmaceutical composition containing the same. 5,110,811, Cl. 514-183.000.

Okuno, Sumio: *See—*
Ohmura, Keiji; Okuno, Sumio; Takeichi, Michifumi; Masai, Kentarou; Okamoto, Seiichi; and Nakamura, Masatake, 5,109,777, Cl. 105-401.000.

Olah, Andrew M.: *See—*
Gregoli, Armand A.; Olah, Andrew M.; Hamshar, John A.; and Rimmer, Daniel P., 5,110,443, Cl. 208-46.000.

Olah, George A. Boron aluminum and gallium perfluoro alkanesulfonate and resinsulfonate catalysts. 5,110,778, Cl. 502-168.000.

Olcer, Nuri Y., to Oea, Inc. Explosively actuated separable structure. 5,109,749, Cl. 89-1.140.
Oldfield, William W., to Wiltron Company. Microwave coupler and method of operating same utilizing forward coupling. 5,111,165, Cl. 333-116.000.
Oliboni, Mark L.; Woltz, Stephen H.; Drapac, George A.; and Davis, Walter L., to Motorola, Inc. Bit synchronizer. 5,111,486, Cl. 375-120.000.
Olin Hunt Sub III Corp.: *See—*
Pendleton, Phillip, 5,110,355, Cl. 106-1.110.
Olmes, James B.: *See—*
Balaban, Jeffrey B.; Olmes, James B.; and Greenblat, Jerris E., 5,109,548, Cl. 2-175.000.
Olvey, James M., to University Patents, Inc. Process for the hybridization of cotton. 5,110,344, Cl. 71-90.000.
Olvey, James M., to University Patents, Inc. Process for the hybridization of cotton. 5,110,345, Cl. 71-90.000.
Olympus Optical Co., Ltd.: *See—*
Kanno, Masahide; Ieoka, Shouichi; Hiyama, Keiichi; Matsunaka, Kenji; and Eto, Tadao, 5,111,306, Cl. 358-403.000.
Matsumoto, Jun; and Tanaka, Ryouchi, 5,110,645, Cl. 428-36.900.
Tsunefuji, Katsuhiko, 5,111,232, Cl. 354-402.000.
O'Mahony, Michael J.; and Marshall, Ian W., to British Telecommunications public limited company. Non-linear optical amplification. 5,111,153, Cl. 359-336.000.
Omega Engineering, Inc.: *See—*
Hollander, Milton B., 5,111,002, Cl. 174-102.00P.
OmniTech Services Inc.: *See—*
Sorrells, Martin, 5,109,946, Cl. 181-106.000.
Omron Corporation: *See—*
Takagi, Takeshi, 5,111,034, Cl. 250-213.00A.
Omron Tateisi Electronics Co. *See—*
Yamashita, Tsukasa; Inoue, Nobuhisa; Kazuhiko, Mori; Matano, Masaharu; and Taguchi, Isao, 5,111,447, Cl. 369-44.120.
Omura, Hiroshi, to Fuji Photo Film Co., Ltd. Camera system. 5,111,223, Cl. 354-111.000.
Ona, Isao; and Ozaki, Masaru, to Toray Silicone Company, Ltd. Organopolysiloxane emulsion and method for the preparation thereof. 5,110,865, Cl. 524-838.000.
Oneda, Shogo, to Ricoh Company, Ltd. Artificial halftone processing apparatus. 5,111,194, Cl. 340-793.000.
Ono, Hitoshi; and Komatsu, Fumito, to K.K. Sankyo Seiki Seisakusho. Method of detecting tape edge. 5,111,347, Cl. 360-75.000.
Ono Pharmaceutical Co., Ltd. *See—*
Kim, Soonih; Takeda, Kazuhisa; and Sasatani, Seiei, 5,110,602, Cl. 424-451.000.
Ono, Tetsuo; Hiraoka, Susumu; and Suzuki, Keizo, to Hitachi, Ltd. Surface fabricating device. 5,110,407, Cl. 156-643.000.
Ono, Yuuji: *See—*
Asano, Takanobu; Kitayama, Hirofumi; Iwai, Hiroyuki; and Ono, Yuuji, 5,110,248, Cl. 414-172.000.
Onose, Tsukasa: *See—*
Ueno, Hiroshi; Kikuchi, Yasuo; Takahashi, Kunitomo; Doi, Koji; Onose, Tsukasa; and Ogawa, Toshitaka, 5,111,235, Cl. 355-246.000.
Ontrop, Patrick H.; Schockman, Robert L.; and Bergman, Frederick C., to Minster Machine Company, The. Adjustable stroke punch press. 5,109,766, Cl. 100-257.000.
Ooba, Yasushi; and Gotoh, Hiroshi, to Nippon Steel Corporation. Device for adjustment of barrel width of roll type straightener. 5,109,687, Cl. 72-21.000.
Oota, Yoshimi: *See—*
Fukui, Tetsu; Oota, Yoshimi; and Hasegawa, Shigekazu, 5,109,964, Cl. 192-48.920.
Optics for Research: *See—*
VanDelden, Jay S.; and Wilson, Donald K., 5,111,330, Cl. 359-281.000.
Orac, Thomas H.; Quandt, Herbert C.; and Ball, David R., to Ucar Carbon Technology Corporation. Treatment of petroleum cokes to inhibit coke puffing. 5,110,159, Cl. 106-473.000.
Oramed, Inc.: *See—*
Acharya, Ramesh N., 5,110,605, Cl. 424-487.000.
Orbach, Zvi; and Janai, Meir S., to Quick Technologies Ltd. Fabrication of personalizable integrated circuits. 5,111,273, Cl. 357-51.000.
ORE Research Institute: *See—*
Michal, Jan, 5,110,551, Cl. 422-58.000.
Oreste, Pasqua: *See—*
Casu, Benito; Naggi, Annamaria; Oreste, Pasqua; Torri, Giangiacomo; Zoppetti, Giorgio; Sportoletti, Giancarlo; and De Santis, Francesco, 5,110,918, Cl. 536-21.000.
Orgun, Munir; Pappu, Venkata R.; and Toledo, Alfredo A., Jr., to Boeing Company, The. Terrain compensation method and apparatus for aircraft automatic landing systems. 5,111,403, Cl. 364-428.000.
Orii, Ryuji: *See—*
Ito, Mutsuhiro; Abe, Toshiyasu; Orii, Ryuji; and Yamakoshi, Tomio, 5,109,716, Cl. 73-865.500.
Orii, Shingo: *See—*
Hara, Hajime; Orii, Shingo; Satoh, Tetsuo; Toya, Tomohiro; and Iida, Shigeki, 5,110,698, Cl. 430-20.000.
Orkin, Stanley S.: *See—*
Narkon, Glennwood H.; and Orkin, Stanley S., 5,110,221, Cl. 384-203.000.
Orlek, Barry S.: *See—*
Bromidge, Steven M.; Hadley, Michael S.; and Orlek, Barry S., 5,110,828, Cl. 514-413.000.
Ormco Corporation: *See—*
Wong, Raymond F., 5,110,290, Cl. 433-9.000.
Orosco, Anthony R.: *See—*
Pollitt, Gary M.; and Orosco, Anthony R., 5,109,968, Cl. 192-83.000.
O'Rourke, Ronald L.: *See—*
Derosa, Thomas F.; Sung, Rodney L.; Kaufman, Benjamin J.; and O'Rourke, Ronald L., 5,110,491, Cl. 252-47.500.
Osaka Soda Co., Ltd.: *See—*
Kono, Yoshimi; and Maeda, Sabee, 5,110,873, Cl. 525-305.000.
Osborg-Schmitz, Jurgen: *See—*
Lothmann, Josef; Osborg-Schmitz, Jurgen; and Schonbrenner, Wolfgang, 5,110,018, Cl. 222-600.000.
Oshima, Yoshio: *See—*
Akiyama, Yukiharu; and Oshima, Yoshio, 5,110,032, Cl. 228-102.000.
Oskarsson, Rolf: *See—*
Westergren, Kenneth; Weinl, Gerold; and Oskarsson, Rolf, 5,110,349, Cl. 75-233.000.
Osmond, John S. Primer tank toilet flushing apparatus. 5,109,552, Cl. 4-368.000.
Osprey Metals Limited: *See—*
Leatham, Alan; and Coombs, Jeffrey, 5,110,631, Cl. 427-422.000.
Oster, Clark L., to Square D Company. Effective arc stack/efficient contact carrier. 5,111,008, Cl. 200-144.00R.
Osterman, Virginia M.: *See—*
Bellis, Harold E.; and Osterman, Virginia M., 5,110,868, Cl. 252-174.230.
Ostler, M. I.: *See—*
Sirkar, K. K.; Bhave, R. R.; Taskier, H. T.; and Ostler, M. I., 5,110,326, Cl. 55-158.000.
Osusko, Boris, to ABB Reaktor GmbH. Tool and inspection-instrument carrier for an apparatus for examining or repairing a steam generator. 5,109,915, Cl. 165-11.200.
Otake, Shin-ichi; and Wakuta, Satoru, to Aisin Aw Co., Ltd. Cooling device of a motor for vehicle. 5,111,090, Cl. 310-54.000.
Otake, Shinichi: *See—*
Wakuta, Satoru; and Otake, Shinichi, 5,111,089, Cl. 310-54.000.
Otiv, Surendra R.: *See—*
Berlin, Kenneth D.; Scherlag, Benjamin J.; Clarke, Cyril R.; Otiv, Surendra R.; Zisman, Stan A.; Sangiah, Subbiah; and Mulekar, Satish V., 5,110,933, Cl. 546-114.000.
Otsubo, Hideaki: *See—*
Iwatsuki, Kunihiro; Kimura, Hiromichi; and Otsubo, Hideaki, 5,109,731, Cl. 74-866.000.
Otto Hansel GmbH: *See—*
Hogenkamp, Wilhelm, 5,109,650, Cl. 53-443.000.
Otto, William F.; Holloman, Miles E.; and Jordan, Debbee J., to United States of America, Army. Device for spatially transmitting a plurality of signals over a fiberoptic monofilament. 5,110,368, Cl. 136-246.000.
Outboard Marine Corporation: *See—*
Higby, Jeffrey P., 5,110,312, Cl. 440-75.000.
Overbeek, Wilhelmus R. M.: *See—*
Halkes, Sebastianus J.; and Overbeek, Wilhelmus R. M., 5,110,924, Cl. 544-233.000.
Owada, Akihiro, to Konica Corporation. Heat roller fixing device. 5,111,249, Cl. 355-285.000.
Owen, Hartley, to Mobil Oil Corporation. Two stage combustion process for cracking catalyst regeneration. 5,110,775, Cl. 502-43.000.
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Harandi, Mohsen N.; and Owen, Hartley, 5,110,446, Cl. 208-100.000.
Owen, Thomas F., to Southwest Research Institute. Monopole, dipole, and quadrupole borehole seismic transducers. 5,109,698, Cl. 73-632.000.
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Owl, George A., deceased; and Owl, David A., legal representative, 5,110,072, Cl. 244-213.000.
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Oxy-Dry Corporation: *See—*
Uribe, Diego; Driskill, Paul; and Hantscho, Rolf, 5,109,770, Cl. 101-425.000.
Oy Keskuslaboratorio - Centrallaboratorium AB: *See—*
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Ona, Isao; and Ozaki, Masaru, 5,110,865, Cl. 524-838.000.
Ozawa, Masafumi: *See—*
Narui, Hironobu; Yoshimatsu, Hiroshi; Hirata, Shoji; Ozawa, Masafumi; and Mori, Yoshifumi, 5,111,469, Cl. 372-46.000.
Packaged Ice, Inc.: *See—*
Stuart, James F., 5,109,651, Cl. 53-502.000.
Pactec, Inc.: *See—*
Schilling, Michael R., 5,110,005, Cl. 220-404.000.
Padilla, Gilbert F.: *See—*
Casale, Frank R.; Casale, Nicola D.; Casale, Antonio A.; Bennett, Richard P.; and Padilla, Gilbert F., 5,109,956, Cl. 186-41.000.
Paduano, Guiseppe: *See—*
Kidd, Thomas F.; Thompson, Stephen A.; and Paduano, Guiseppe, 5,109,914, Cl. 164-113.000.

Padula, Michael J.: *See—*
Smith, Paul D.; Padula, Michael J.; and McDermott, Robert M., 5,111,005, Cl. 178-19.000.
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Page, Ross C. Ross staging bracket. 5,110,083, Cl. 249-46.000.
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Boutin, Jean; Brun, Pierre; Lamaze, Airy-Pierre; Paillere, Patrick; and Salles, Pascale, 5,110,426, Cl. 204-64.00R.
Palitex Project Company GmbH: *See—*
Inger, Siegfried, 5,109,662, Cl. 57-305.000.
Palitsch, Peter; Czernotzky, Klaus; Richter, Erhard; Kreher, Berndt; Klump, Wilifried, deceased (by Klump, Dagmar, heir); and Muller, Rainer, to Arzneimittelwerk Dresden GmbH. Method for preparing 5-chlorocarbonyl-5H-dibenz(b,f)azepine. 5,110,923, Cl. 540-589.000.
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Law, Say-Jong; Chang, Steve C. S.; Palmacci, Stephen A.; and Cubicciotti, Roger S., 5,110,932, Cl. 546-102.000.
Palmieri, Daniel M.: *See—*
Edgley, Richard R.; Palmieri, Daniel M.; and Ponn, Timothy R., 5,110,305, Cl. 439-441.000.
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Panasik, Carl M.; Wilde, Patrick J.; and James, Betty L., to Texas Instruments Incorporated. Real-time, in-situ saw filter delay adjustment. 5,111,168, Cl. 333-152.000.
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LeBan, Joseph F.; and Levin, Robert F., 5,110,255, Cl. 414-754.000.
Panicali, Dennis: *See—*
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Kharitonov, Alexandr S.; Panov, Gennadii I.; Ione, Kazimira G.; Romannikov, Vyacheslav N.; Sheveleva, Galina A.; Vostrikova, Lidia A.; and Sobolev, Vladimir I., 5,110,995, Cl. 568-800.000.
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Panzera, Carl: *See—*
Jones, Robin M. F.; Panzera, Carl; and DeLuca, Robert D., 5,109,586, Cl. 29-160.600.
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Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo; Soos, Rudolf; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 5,110,976, Cl. 558-407.000.
Pappu, Venkata R.: *See—*
Orgun, Munir; Pappu, Venkata R.; and Toledo, Alfredo A., Jr., 5,111,403, Cl. 364-428.000.
Paradies, Henrich H., to Medice Cham.-Pharm. Fabrik Putter GmbH & Co. KG. Process for the preparation of N-alkylated quaternary nitrogen containing aromatic heterocycles. 5,110,929, Cl. 544-406.000.
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Arold, Johathan B.; Mishou, Joan L.; Parent, Charles R.; Stark, Joseph P.; and Webb, Edward A., 5,111,527, Cl. 392-360.000.
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Cramer, Paul S.; Lomasney, Gary M.; and Parkos, Joseph J., Jr., 5,109,589, Cl. 29-527.400.
Parsons, Kevin L. Baton method of heat treating expandable. 5,110,375, Cl. 148-534.000.
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Teeny, Parry, 5,110,055, Cl. 241-15.000.
Partridge, Randall D.: *See—*
Chen, Nai Y.; and Partridge, Randall D., 5,110,445, Cl. 208-96.000.
Pascal, Yves; and Dague, Gilles, to Framatome. Preheating steam generator. 5,110,538, Cl. 376-402.000.
Pasch, Nicholas F.; Sahakian, Vahak K.; and Dell'Oca, Conrad J., to LSI Logic Corp. Apparatus for isolation of flux materials in "flip-chip" manufacturing. 5,111,279, Cl. 357-81.000.
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Patel, Balkrishna R.; and Bartos, Andrew L., to General Motors Corporation. Permanent magnet rotor having magnet retention apparatus. 5,111,094, Cl. 310-156.000.
Patel, Bhiku: *See—*
Wang, Jonas; Patel, Bhiku; Au, Stacley; and Shah, Hemanshu, 5,110,809, Cl. 514-171.000.
Patel, Bipin: *See—*
Ryan, Dominic H.; Strom-Olsen, John O.; Kycia, Jan; Patel, Bipin; and Dumais, Francois, 5,110,695, Cl. 429-206.000.
Patel, Jayantilal S., to Bell Communications Research, Inc. Dual-polarization liquid-crystal etalon filter. 5,111,321, Cl. 359-92.000.
Paterson, Robert W.: *See—*
Presz, Walter M., Jr.; Paterson, Robert W.; Werle, Michael J.; and Ealba, Robert H., 5,110,560, Cl. 422-176.000.
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Patterson, Hubert A.: *See—*
Narlow, Doug; and Patterson, Hubert A., 5,111,186, Cl. 340-572.000.
Patzelt, Norbert: *See—*
Blasczyk, Gotthardt; and Patzelt, Norbert, 5,110,056, Cl. 241-19.000.
Pavlov, Michael V. Method of manufacturing barbed tape. 5,109,583, Cl. 29-7.100.
Pawlik, Jon R.: *See—*
Niki, Shoji; and Pawlik, Jon R., 5,110,211, Cl. 326-346.000.
Payne, David P. Drills. 5,110,238, Cl. 408-159.000.
Pearson, John F.: *See—*
Kohn, Michael T.; and Pearson, John F., 5,109,740, Cl. 83-15.000.
Pechiney Recherche: *See—*
Faure, Jean-Francois, 5,110,372, Cl. 148-552.000.
Peck, David E.; Platzer, George E.; Kramer, Dennis A.; and Krusel, William D., to Rockwell International Corporation. Unitary rotational speed sensor. 5,111,098, Cl. 310-268.000.
Peck, Leonard E.: *See—*
Maassen, Nevil Q.; Romano, Timothy S.; and Peck, Leonard E., 5,111,050, Cl. 250-352.000.
Peck, Leonard E., Jr.: *See—*
Romano, Timothy S.; Peck, Leonard E., Jr.; Neumann, Karl H.; and Zahuta, Robert E., 5,111,049, Cl. 250-352.000.
Pedtke, Daniel F.: *See—*
Heckleman, Todd E.; and Pedtke, Daniel F., 5,111,187, Cl. 340-574.000.
Peery, John R.: *See—*
Magruder, Judy A.; Eckenhoff, James B.; Cortese, Richard; Wright, Jeremy C.; and Peery, John R., 5,110,596, Cl. 424-438.000.
Pekich, Barry J.: *See—*
Harclerode, William H.; Volz, William E.; Wiman, John V.; Voss, John C.; Pekich, Barry J.; and Knutsen, John C., 5,110,524, Cl. 264-53.000.
Harclerode, William H.; Knutsen, John C.; Pekich, Barry J.; Wiman, John V.; and Voss, John C., 5,110,836, Cl. 521-58.000.
Harclerode, William H.; Volz, William E.; Wiman, John V.; Voss, John C.; Pekich, Barry J.; and Knutsen, John C., 5,110,837, Cl. 521-58.000.
Pendleton, Phillip, to Olin Hunt Sub III Corp. Process for preparing nonconductive substrates. 5,110,355, Cl. 106-1.110.
Penford Products Company: *See—*
Quarles, James M.; and Alexander, Richard J., 5,110,612, Cl. 426-548.000.
Penguin Wax Co., Ltd.: *See—*
Matsumoto, Yasuhiko; Nanba, Katsuaki; and Morita, Isao, 5,109,790, Cl. 118-63.000.
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Pennings, Albert J.: *See—*
Gogolewski, Sylwester; and Pennings, Albert J., 5,110,852, Cl. 524-108.000.
PepsiCo. Inc.: *See—*
Rao, Mohan; Harlamert, Michael E.; Ash, Dennis; Schonauer, Sylvia L.; MacGeorge, Gregory D.; Barkhau, Keith D.; Beltz, John D.; and Kupski, Donald R., 5,110,601, Cl. 426-523.000.
Perazzo, Luigi: *See—*
Martini, Francesco; and Perazzo, Luigi, 5,110,390, Cl. 156-244.110.
Perkins, Leland M.: *See—*
Morris, Glenn A.; and Perkins, Leland M., 5,109,763, Cl. 100-48.000.
Perlanski, Edward: *See—*
Grupp, Larry A.; Perlanski, Edward; and Stewart, Robert B., 5,110,813, Cl. 514-212.000.
Pernick, Bruce M., to Monarch Knitting Machinery Corporation. Method and machine for knitting jacquard pile fabric. 5,109,680, Cl. 66-93.000.
Perrier, Robert: *See—*
Vautelin, Francis; and Perrier, Robert, 5,109,938, Cl. 180-69.300.
Perrone, Diego: *See—*
Bruzzone, Giuseppe; Perrone, Diego; and Sperati, Alessandro, 5,110,360, Cl. 106-638.000.
Perrotti, Patrick A.; and Karoutas, Zeses E., to Combustion Engineering, Inc. Spacer grid assembly fixture. 5,110,539, Cl. 376-439.000.
Peruzzi, Federigo; and Andrione, Norbert, to Aspera S.r.l. Valve unit for a reciprocating compressor for refrigerators and the like. 5,110,272, Cl. 417-571.000.
Peter, John H.; and Timm, Gerald L., to Johnson Corporation, The Anti-corrosive rotary joint. 5,110,162, Cl. 285-281.000.
Peter, Siegfried K.; Weidner, Eckhard O.; Ender, Ulrich M.; and Czech, Bernd A., to Siegfried, Peter K. Process for the recovery of monoglycerides and diglycerides from a mixture containing monoglycerides, diglycerides, and triglycerides. 5,110,509, Cl. 554-184.000.

Peter, Thomas: *See—*
Reyer, Herbert; and Peter, Thomas, 5,109,660, Cl. 57-95.000.
Peters, Alan W., to W. R. Grace & Co.-Conn. Carbon monoxide oxidation catalyst. 5,110,780, Cl. 502-303.000.
Peters, Jorg: *See—*
Schunk, Bernd; Stolllewerk, Reinfried; Hubricht, Gerhard; and Peters, Jorg, 5,111,524, Cl. 385-102.000.
Petersen, Godber: *See—*
Kobler, Ingo; and Petersen Godber, 5,110,116, Cl. 271-277.000.
Peterson, Carleton G. Cambered forestay fairing. 5,109,787, Cl. 114-102.000.
Petit, Francis: *See—*
Lecolier, Serge; Mortreux Andre ; Petit, Francis; and Samain, Henri, 5,110,961, Cl. 556 31.000.
Petrillo, John. Golf ball retriever. 5,110,168, Cl. 294-19.200.
Petrolite Corporation: *See—*
Naiman, Michael I.; and Chang, James C., 5,110,874, Cl 525-329.900.
Petschauer, Franz: *See—*
Kappel, Johannes; Stock, Gunther; Eickhoff, Karl; and Petschauer, Franz, 5,109,764, Cl. 100-99.000.
Pettijohn, Ted M.; and Hsieh, Henry L., to Phillips Petroleum Company. Olefin polymerization. 5,110,884, Cl. 526-114.000.
Peukert, Eberhard: *See—*
Buettgen, Karl-Heinz; Gursche, Bernhard; Hommers, Friedrich; Johannisbauer, Wilhelm Peukert, Eberhard; and Sedelies, Reinhold, 5,110,508, Cl. 554-170.000.
Pfeiffer, Thomas: *See—*
Dudek, Dietmar; and Pfeiffer, Thomas, 5,110,384, Cl. 156-89.000.
Pfenninger, Heinz: *See—*
Windisch, Arthur; and Pfenninger, Heinz, 5,110,743, Cl. 436-48.000.
Pfister, Gregoty F.: *See—*
McAuliffe, Keven P.; Melton, Evelyn A.; Norton, Vern A.; Pfister, Gregoty F.; and Wakefield, Scott P., 5,111,389, Cl. 395-800.000.
Pham, Hung M.: *See—*
Hunter, Timothy M.; Pham, Hung M.; and Zanghi, John L., 5,111,062, Cl. 307-269.000.
Pharmacia Diagnostics Inc.: *See—*
Grey, Howard; Mangan, Ciaran; Brochot, Jean; and Siddiqi, Iqbal, 5,110,746, Cl. 436-88.000.
Philips, Nicholas A., to Weyerhaeuser Company. Single piece food package. 5,110,039, Cl. 229-110.000.
Phillippe, Gary. Supplemental heat exchanger system for heat pump. 5,109,677, Cl. 62-160.000.
Phillips, D. Howard: *See—*
de Juan, Eugene, Jr.; Humayun, Mark S.; and Phillips, D. Howard, 5,109,844, Cl. 128-419.00R.
Phillips, Edwin D. Expandable stopper. 5,109,997, Cl. 215-360.000.
Phillips, Gareth T.: *See—*
Clifford, Kenneth H.; Phillips, Gareth T.; and Marx, Arthur F., 5,110,943, Cl. 546-302.000.
Phillips, John C., Jr.: *See—*
Moore, Christopher; and Phillips, John C., Jr., 5,110,122, Cl. 482-134.000.
Phillips, Michael A.: *See—*
Stransky, Larry W.; Boehm, Valentine R., Jr.; and Phillips, Michael A., 5,109,667, Cl. 60-256.300.
Phillips Petroleum Company. *See—*
Battiste, David R.; Willcox, Kenneth W.; and Morgan, Tommy J., 5,110,214, Cl. 374-45.000.
Bonazza, Benedict R., 5,110,682, Cl. 428-419.000.
Hoover, Kenneth C.; Clark, Earl, Jr.; Reger, Roy E.; Scoggins, Lacey E.; and Nesheiwat, Afif M., 5,110,901, Cl. 528-387.000.
Hsieh, Henry L.; and Ahmed, Iqbal, 5,110,887, Cl. 526-287.000.
Pettijohn, Ted M.; and Hsieh, Henry L., 5,110,884, Cl. 526-114.000.
Scoggins, Lacey E.; and Hoover, Kenneth C., 5,110,902, Cl. 528-388.000.
Phillips, Richard M.: *See—*
Chan, Anthony W. P.; and Phillips, Richard M., 5,111,009, Cl. 200-330.000.
PhoneMate, Inc.: *See—*
Afshar, Eskandar; and Karnowski, Mark, 5,111,500, Cl. 379-67.000.
PhysioDynamics, Inc.: *See—*
Thomas, Gary E., 5,109,846, Cl. 128-421.000.
Thomas, Gary E.; and Fellinger, Michael W., 5,109,848, Cl. 128-422.000.
PIAA Corporation: *See—*
Yamamoto, Teruaki, 5,111,105, Cl. 313-112.000.
Piasecki, Douglas S.; Swanson, Eric J.; and Hershbarger, Russell A., to Crystal Semiconductor. Method and apparatus for synchronizing an optical transceiver over a full duplex data communication channel. 5,111,451, Cl. 370-29.000.
Picker International, Inc.: *See—*
Provost, Terence J., 5,109,854, Cl. 128-653.200.
Pickett, James E.: *See—*
Blohm, Margaret L.; Pickett, James E.; and VanDort, Paul C., 5,111,327, Cl. 526-256.000.
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Ferry, Thomas V.; Kawa, Jamil; Pierce, Kerry M.; Walker, William G.; and Zampaglione, Michael A., 5,111,075, Cl 307-443.000.
Pieritz, John R., Sr., to Rock Island Packaging Corp. Container and method of making same. 5,110,037, Cl. 229-23.00A.
Pieroni, Lucio: *See—*
Albanesi, Mario; Hertogs, Willy A. M.; Khan, Adil M.; and Pieroni, Lucio, 5,110,004, Cl. 220-355.000.
Pigott, John M.; and Jarrett, Robert B., to Motorola, Inc. H-bridge flyback recirculator. 5,111,381, Cl. 363-132.000.
Pilkington Visioncare, Inc.: *See—*
Tait, John S.; and Bruker, Izi, 5,110,278, Cl. 425-175.000.
Piltingsrud, Stephen M., to Truth Division of SPX Corporation. Biased check rail lock. 5,110,165, Cl. 292-242.000.
Pink, Harry S.; Hutchings, Timothy; and Stadler, James F., to Exxon Research and Engineering Company. Water resistant grease composition. 5,110,490, Cl. 252-35.000.
Piokins, Oscar W., Jr. Gyropower unit. 5,109,719, Cl. 74-5.370.
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Mitobe, Kunio, 5,111,510, Cl. 381-193.000.
Senso, Hitoshi; Arai, Yoshio; and Fukuda, Masao, 5,111,303, Cl. 358-335.000.
Yokogawa, Fumihiko, 5,111,443, Cl. 369-54.000.
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Giancola, Guido, 5,109,906, Cl. 152-536.000.
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Brasington, Glynn M.; and Jones, John L., 5,111,030, Cl. 235-375.000.
Kipp, Frederick M., 5,109,937, Cl. 177-145.000.
Pitts, Leon A.: *See—*
Aslanian, Edouard; Pitts, Leon A.; and Sztucinski, Leon A., 5,111,384, Cl. 395-575.000.
Platteter, Dale T.: *See—*
Rabjohns, Douglas T.; VanDuyn, Robert M.; and Platteter, Dale T., 5,111,457, Cl. 371-10.100.
Platzer, George E.: *See—*
Peck, David E.; Platzer, George E.; Kramer, Dennis A.; and Krusel, William D., 5,111,098, Cl. 310-268.000.
Pletsch, Hubert: *See—*
Wolf, Franz J.; and Pletsch, Hubert, 5,110,660, Cl. 428-178.000.
Plonka, Robert J.; Milfs, Dennis J.; and Nickell, David L., to Harris Corporation. N-way power combiner having N reject loads with a common heat sink. 5,111,166, Cl. 333-128.000.
Ploppa, Jurgen: *See—*
Schmid, Franz; and Ploppa, Jurgen, 5,109,681, Cl. 66-126.00R.
Plumb, John L.: *See—*
Goodman, David A.; Plumb, John L.; Geens, Rudy E. M.; Snellgrove, Richard A.; and Wyner, Elliot, 5,111,108, Cl. 313-630.000
Plunkett, James D.: *See—*
Flamm, Ronald C.; Turner, Leonard O.; and Plunkett, James D., 5,111,362, Cl. 361-395.000.
Pneumafil Corporation: *See—*
Williams, Roger D., 5,110,331, Cl. 55-302.000.
Po, Tsai J. Separable blade assembly for rubber raft. 5,110,313, Cl. 440-90.000.
Pokora, Alexander R.; and Stolfo, John J., to Mead Corporation, The. Pretreatment of phenolic resin suspension to remove residual phenol. 5,110,740, Cl. 435-262.000.
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Pollitt, Gary M.; and Orosco, Anthony R. Clutch oscillator assembly. 5,109,968, Cl. 192-83.000.
Polyplastics Co., Ltd.: *See—*
Togami, Masato; and Kanoe, Toshio, 5,110,861, Cl. 524-601.000.
Polytec: *See—*
Lecorre, Yves, 5,109,951, Cl. 182-62.500.
Pomini Farrel S.p.A.: *See—*
Guggiari, Andrea, 5,110,523, Cl. 264-40.500.
Ponn, Timothy R.: *See—*
Edgley, Richard R.; Palmieri, Daniel M.; and Ponn, Timothy R., 5,110,305, Cl. 439-441.000.
Poore, Gerald A.: *See—*
Harper, Richard W.; Poore, Gerald A.; and Rieder, Brent J., 5,110,830, Cl. 514-592.000.
Poortvliet, Robert J.: *See—*
Clark, Craig A.; and Poortvliet, Robert J., 5,110,186, Cl. 297-444.000.
Poremba, Hans-Herbert, to Westerwald AG fur Silikatindustrie. Glass block for use as a cornerstone or an end block. 5,109,644, Cl. 52-306.000.
Potter, James, to Potter, James. Multiple gaming boards. 5,110,127, Cl. 273-85.00R.
Potter, Jerry F.: *See—*
Lukhard, Craig R.; Potter, Jerry F.; and Todd, Maurice C., 5,110,517, Cl. 264-40.100.
Poulo, Louis R.; and Staley, James G., to Analogic Corporation. Converter circuit for current mode control. 5,111,133, Cl. 323-286.000.

Povenmire, Richard M., to Motorola, Inc. Method and apparatus for waveform digitization. 5,111,191, Cl. 340-720.000.
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Powell, Robert F.: *See—*
Blechschmidt, James L.; Johnson, Robert D.; and Powell, Robert F., 5,110,151, Cl. 280-661.000.
Powelson, William D.: *See—*
Kallansrude, David K.; Aiken, William C.; Deitz, Dan P.; and Powelson, William D., 5,110,153, Cl. 283-707.000.
Poyato, Francisco M.: *See—*
Corral, Jose S. M.; De Aza, Salvador; Poyato, Francisco M.; Valle Fuentes, Francisco J.; Miranda, Isabel O.; Caseres, Rafael M.; and Martinez, Paz C., 5,110,773, Cl. 501-98.000.
PPA Industries, Inc.: *See—*
Kruse, George D., 5,110,094, Cl. 256-47.000.
PPG Industries, Inc.: *See—*
Hostler, Jonathan E.; and Byers, Frank J., 5,109,632, Cl. 51-135.00R.
Kadunce, Randy R.; Bush, Paul W.; and Martino, Pamela L., 5,110,336, Cl. 65-24.000.
McBain, Douglas S.; and Crano, John C., 5,110,881, Cl. 525-455.000.
Williams, William A., 5,110,591, Cl. 424-195.100.
Pracht, Gunther. Scissors, in particular hairdresser's scissors. 5,109,608, Cl. 30-341.000.
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Ney, Clyde W.; and Prats, Genaro, 5,110,172, Cl. 296-50.000.
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Pratt, Timothy: *See—*
Dornbusch, Andrew W.; Beliveau, Yvan J.; Lundberg, Eric J.; and Pratt, Timothy, 5,110,202, Cl. 356-1.000.
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Deich, Robert A.; Zlotnick, Gary; and Green, Bruce, 5,110,908, Cl. 530-403.000.
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Nimberger, Spencer M.; and Ward, Robert L., 5,109,712, Cl. 73-864.620.
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Lemon, J. Robert; Evans, William T.; and Christian, Robert E., 5,109,563, Cl. 15-167.100.
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Orac, Thomas H.; Quandt, Herbert C.; and Ball, David R., 5,110,359, Cl. 106-473.000.
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DeSatnick, Allen H.; Torrie, Paul A.; and Egan, Thomas D., 5,111,212, Cl. 343-709.000
Quick Technologies Ltd.: *See—*
Orbach, Zvi; and Janai, Meir I., 5,111,273, Cl. 357-51.000
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Fields, Randall K.; Quinn, Paul R.; and Blackley, Todd, 5,111,391, Cl. 364-401.000.
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Belloc, Jacques; Galand, Claude; Lancon, Emmanuel; Milewski, Andre; and Quintin, Michel, 5,111,417, Cl. 364-724.100
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Maston, Roy E., III; and Murphy, Robert H., 5,109,981, Cl. 206-331.000.
R. J. Reynolds Tobacco Company: *See—*
Hayden, Rhonda F.; and Jones, Elbert C., Jr., 5,109,876, Cl. 131-365.000.
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Raber, Scott M. Extended tool. 5,109,737, Cl. 81-177.200
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Radvany, Erzsebet: *See—*
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo; Soos, Rudolf; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 5,110,976, Cl. 558-407.000.
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Burchill, Michael T.; Rafiei, Maryam; and Silbermann, Joseph, 5,110,625, Cl. 427-160.000.
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Millheim, Keith K.; Mount, Houston B., II; Rai, Chandra S.; and Sondergeld, Carl H., 5,109,697, Cl. 73-153.000.
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Schuman, Michael L., 5,111,129, Cl. 320-2.000.
Ralph, Harry C.: *See—*
Grande, Donald L.; and Ralph, Harry C., 5,110,068, Cl. 244-102.0SL.
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Vishnupad, Mohan; and Ramirez, Jose, 5,110,862, Cl. 524-601.000.
Ramsay, Bruce A.; Ramsay, Juliana; Berger, Eric; Chavarie, Claude; and Braunegg, Gerhart, to Ecole Polytechnique. Separation of poly-β-hydroxyalkanoic acid from microbial biomass. 5,110,980, Cl. 560-185.000.
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Ramsey, Frederick J.: *See—*
Martino, Ronald J.; and Ramsey, Frederick J., 5,111,336, Cl 359-378.000.
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Rao, Mohan; Harlamert, Michael E.; Ash, Dennis; Schonauer, Sylvia L.; MacGeorge, Gregory D.; Barkhau, Keith D., Beltz, John D.; and Kupski, Donald R., to PepsiCo. Inc. Method for simulating open flame broiled meat products. 5,110,601, Cl. 426-523.000
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Rassier, Wallace J. Cutting attachment for trencher. 5,109,895, Cl 144-2.00N.
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Mongoin, Jacques; Ravet, Georges; and Suau, Jean-Marc, 5,110,358, Cl. 106-462.000.

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Barma, Pradeep; and McMills, Corey J., 5,111,025, Cl. 219-217.000.
Bathiwalla, Neville S.; Dharia, Amitkumar N.; Feldman, Randall M.; and Mehan, Ashok K., 5,111,032, Cl. 219-549.000.
Bliven, David C.; Vranicar, Anthony; Vail, Philip B.; Shimirak, Gerald L.; and Mullaney, Julian S., 5,111,497, Cl. 379-27.000.
Jervis, James E., 5,111,001 Cl. 174-92.000.
Vogdes, Christine E.; and Hanson, Kris B., 5,110,638, Cl. 428-35.100.

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Harris, Clarke E., 5,110,207, Cl. 356-4.500.
Karabinis, Panagiotis D., 5,111,484, Cl. 375-94.000.

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Haferl, Peter E., 5,111,120 Cl. 315-393.000.

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Csanyi, Endre; Csanyi, Gabor; Balogh, Tibor; and Nagy, Laszlo, 5,110,720, Cl. 433-215.000.

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Herold, Manfred; and Rebel, Herbert, 5,110,159, Cl. 285-131.000.

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Kester, Jervis D.; and Redington, Clarence P., 5,109,664, Cl. 60-39.060.

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Arst, Margareth C.; Chen, Teh-Yi J.; Ritz, Kenneth N.; and Redkar, Shailesh S., 5,110,757, Cl. 437-89.000.

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Reed Tool Company Limited: *See*—
Hawke, Leslie R., 5,109,935, Cl. 175-434.000.

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Menzel, Jill R.; Damewood, John R.; Ross, Bert A.; and Kerr, Richard C., 5,110,666, Cl. 428-196.000.

Reger, Roy E.: *See*—
Hoover, Kenneth C.; Clark, Earl, Jr.; Reger, Roy E.; Scoggins, Lacey E.; and Nesheiwat, Afif M., 5,110,901, Cl. 528-387.000.

Reich, Hans J.: *See*—
Cohen, Gordon M.; and Reich, Hans J., 5,110,869, Cl. 525-194.000.

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Ainslie, Winston C., 5,110,657, Cl. 428-141.000.

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Reid, John M.: *See*—
Walinsky, Paul; Lewin, Peter A.; and Reid, John M., 5,109,861, Cl. 128-662.060.

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Halter, Hartmut, 5,110,518, Cl. 264-40.100.

Reilly, Kenneth T., to GTE Products Corporation. Method for increasing the brightness and halflife of electroluminescent phosphors. 5,110,499, Cl. 252-301.60S.

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Hoess, Werner; Vetter, Heinz; Brehm, Manfred; Schroeder, Guenter; and Reiner, Roland, 5,110,877, Cl. 525-378.000.

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Syre, Manfred; and Freund, Reinhard, 5,109,744, Cl. 83-818.000.

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Reinicke, Robert H., to Marotta Scientific Controls, Inc. Device for sensing reciprocated armature position. 5,111,092, Cl. 310-68.00B.

Rempinski, Donald R.; and Britt, Donald R., to Sparton Corporation. Sheave plate and cable assembly for a tire lift/carrier winch. 5,110,093, Cl. 254-266.000.

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Bucci, Carlo G., 5,109,645 Cl. 52-656.000.

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Witt, Daniel P.; Colbert, Donald A.; and Anilionis, Algis, 5,110,905, Cl. 530-350.000.

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Corrigan, Colin D.; and Haley, Lawrence V., 5,109,691, Cl. 73-23.360.

Research Development Corporation of Japan: *See*—
Harada, Yutaka, 5,111,082 Cl. 307-476.000.
Miyata, Seizo; Hosomi, Takeshi; Suzuki, Toshio; Watanabe, Toshiyuki; Yamamoto, Hironobu; and Hayashi, Akio, 5,110,988, Cl. 564-441.000.
Takano, Tatsuya; Hashida, Ryoichi; Nakagami, Keiji; and Kimura, Junji, 5,110,738, Cl. 435-240.270.

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Anaise, David; and Yland, Marc, 5,110,721, Cl. 435-1.000.
Hassett, John P., 5,110,473, Cl. 210-634.000.

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Rosenberg, Paul, 5,111,331, Cl. 359-296.000.

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Parker, Kevin J.; and Mitsa, Theophano, 5,111,310, Cl. 358-456.000.

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Williams, Dwight E.; Tangney, Thomas J.; and Revis, Anthony, 5,110,784, Cl. 502-401.000.

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Reynolds, Samuel D., Jr.; and Hargrove, Homer G., to Westinghouse Electric Corp. Method for improving the solderability of corrosion resistant heat exchange tubing. 5,110,035, Cl. 228-183.000.

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Culross, Claude C.; and Reynolds, Steve D., 5,110,450, Cl. 208-413.000.

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Kim, Chan W.; Robinson, Elizabeth M.; and Rha, Chokyun, 5,110,733, Cl. 435-183.000.

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Schunk, Bernd; Stolllewerk, Reinfried; Hubricht, Gerhard; and Peters, Jorg, 5,111,524, Cl. 385-102.000.

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Kiuchi, Manabu; Hirai, Masazumi; Fujikawa, Yasuo; Yamaguchi, Ryuji; Nanba, Akihiko; and Noda, Masato, 5,110,547, Cl. 420-590.000.

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Hayashi, Torahiko, 5,110,277, Cl. 425-141.000.

Ri, Seigen, to Fujitsu Limited. Method for producing oxide superconductor. 5,110,791, Cl. 505-1.000.

Riblett, Susan E.: *See*—
May, John W.; Mey, William; and Riblett, Susan E., 5,110,699, Cl. 430-54.000.

Rice, James A., to Exxon Production Research Company. Method for positioning seismic sources to flatten CDP fold in VSP surveys. 5,111,437, Cl. 367-57.000.

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Londergan, Mark B.; Sismour, Albert C., Jr.; and Richardson, John E., 5,111,097, Cl. 310-261.000.

Richardson, Michael M.; and Swartout, Edwin L., to Kroy Inc. [Tape supply cartridge for] portable thermal printer housing assembly. 5,111,216, Cl. 346-76.0PH.

Richeson, William E.: *See*—
Erickson, Frederick L.; and Richeson, William E., 5,109,812, Cl. 123-90.120.

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Ricoh Company, Ltd.: *See*—
Hiyoshi, Yoshihiko; Ide, Youji; Nagamoto, Masanaka; and Kunitake, Tetsuji, 5,110,389, Cl. 156-234.000.
Kanaya, Koichi, 5,110,113, Cl. 271-241.000.
Ohta, Junichi, 5,111,514, Cl. 382-9.000.
Oneda, Shogo, 5,111,194, Cl. 340-793.000.
Sakata, Seiji, 5,111,309, Cl. 358-455.000.
Takeda, Hiroshi, 5,111,116, Cl. 315-241.00P.
Uno, Mugijirou; and Yuasa, Kazuhiro, 5,111,251, Cl. 355-297.000.

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Harper, Richard W.; Poore, Gerald A.; and Rieder, Brent J., 5,110,830, Cl. 514-592.000.

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Hilles, Wilbur I.; and Rieker, David A., 5,111,394, Cl. 364-405.000.

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Eichenberger, Hansulrich, 5,109,574, Cl. 19-234.000.

Rife, Guerin D.; and Willingham, W. Preston, to Gift Asylum, Inc. Cap having illuminated indicia. 5,111,366, Cl. 362-31.000.

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Houziaux, Patrick; Riffaud, Jean-Pierre; Lacolle, Jean-Yves; and Danree, Bernard, 5,110,816, Cl. 514-255.000.

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Ng, Yee S.; and Rimai, Donald S., 5,110,702, Cl. 430-99.000.

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Gregoli, Armand A.; Olah, Andrew M.; Hamshar, John A.; and Rimmer, Daniel P., 5,110,443, Cl. 208-46.000.

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Riner, Felix, to Gebruder Frech AG. Pallet transport device. 5,109,971, Cl. 193-35.00A.

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Sreepada, Sastry R.; and Rippel, Robert R., 5,110,208, Cl. 356-128.000.

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Bauer, Wolfgang; Steckelberg, Willi; and Ritter, Josef, 5,110,917, Cl. 534-815.000.

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Weimer, Alan W.; Moore, William G.; and Roach, Raymond P., 5,110,565, Cl. 422-198.000.

Robbins, Mark J. Air cushion table game. 5,110,128, Cl. 273-126.00A.

Roberge, James K., to Massachusetts Institute of Technology. Diode driver circuit utilizing discrete-value DC current source. 5,111,065, Cl. 307-270.000.

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Botzenhardt, Wolfgang; Dais, Siegfried; Kiencke, Uwe; Litschel, Martin; and Unruh, Jan, 5,111,460, Cl. 371-29.100.
Herden, Werner; Konrad, Johann; Sautter, Helmut; and Suchowerskyj, Wadym, 5,109,829, Cl. 123-643.000.
Joos, Heinz-Gunter; Kugler, Karl-Heinz; and Kohnle, Hans, 5,109,825, Cl. 123-479.000.
Tauscher, Joachim, 5,109,885, Cl. 137-554.000.

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Cotton, Lawrence M., 5,110,100, Cl. 269-244.000.

Robert, Michel M.: *See*—
Fuentes, Jean-Luc M.; and Robert, Michel M., 5,110,412, Cl. 162-5.000.

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Fowler, Daniel L., 5,111,027, Cl. 219-506.000

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Harris, James E.; Robeson, Lloyd M.; and Gavula, John P., 5,110,880, Cl. 525-436.000.

Robinson, E. H., Jr., to Chase Instruments Corp. Ceramic-coated microscope slide. 5,111,344, Cl. 359-900.000.

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Kim, Chan W.; Robinson, Elizabeth M.; and Rha, Chokyun, 5,110,733, Cl. 435-183.000.

Robinson, Madison K., to Bell Helicopter Textron Inc. Pitch change bearing system. 5,110,259, Cl. 416-134.00A.

Robinson, Michael: *See*—
Branan, Mac William, Jr.; and Robinson, Michael, 5,111,128, Cl. 320-2.000.

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Levinson, Mark; Ditchek, Brian M.; Rossoni, Philip G.; and Rock, Frederick, 5,111,254, Cl. 357-22.000.

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Pieritz, John R., Sr., 5,110,037, Cl. 229-23.00A.

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Benfey, Philip N.; and Chua, Nam-Hai, 5,110,732, Cl. 435-172.300.

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Kramer, Dennis A., 5,111,138, Cl. 324-174.000.
Morris, Donald H.; and Briley, Gary L., 5,109,669, Cl. 60-39.821.
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Peck, David E.; Platzer, George E.; Kramer, Dennis A.; and Krusel, William D., 5,111,098, Cl. 310-268.000.

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Zhu, Minge-De; Rodriguez, Roberto; and Wehr, C. Timothy, 5,110,434, Cl. 204-183.200.

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Holden, Homer N.; Lawrence, James L.; Rogers, Jerry W.; and Sanders, John D., 5,109,600, Cl. 29-890.144.

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Rogers, Walter C. Recliner chair. 5,110,179, Cl. 297-68.000.

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Nakagawa, Yoshikazu, 5,110,751, Cl. 437-40.000.

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Chao, Yen-Yau H., 5,110,839, Cl. 521-83.000.
Kelly, Martha J., 5,110,986, Cl. 564-149.000.
Kim, Chan W.; Robinson, Elizabeth M.; and Rha, Chokyun, 5,110,733, Cl. 435-183.000.
Sherba, Samuel E.; Mehta, Raj J.; and Lange, Barry C., 5,110,822, Cl. 514-372.000.

Rohn, Dean R.; Selewski, Steven R.; Wood, Stephen J.; and Cummins, Craig R., to Rexair, Inc. Handle assembly for a vacuum system cleaning tool. 5,109,568, Cl. 15-410.000.

Rohrscheid, Freimund: *See*—
Lau, Jurgen; Siegemund, Gunter; and Rohrscheid, Freimund, 5,110,983, Cl. 562-435.000.

ROJ Electrotex S.p.A.: *See*—
Maina, Bruno, 5,109,891, Cl. 139-450.000.

Roli Industria Chimica S.p.A.: *See*—
Poli, Stefano; and Del Corona, Lucio, 5,110,936, Cl. 548-200.000.

Rolls-Royce plc: *See*—
Evans, Neil M., 5,110,262, Cl. 416-219.00R.

Rolls-Royce (1971) Limited: *See*—
Nightingale, Douglas J., 5,110,050, Cl. 239-265.390.

Rollsec Limited: *See*—
King, Timothy E., 5,109,688, Cl. 72-180.000.

Romannikov, Vyacheslav N.: *See*—
Kharitonov, Alexandr S.; Panov, Gennadii I.; Ione, Kazimira G.; Romannikov, Vyacheslav N.; Sheveleva, Galina A.; Vostrikova, Lidia A.; and Sobolev, Vladimir I., 5,110,995, Cl. 568-800.000.

Romano, Timothy S.; Peck, Leonard E., Jr.; Neumann, Karl H.; and Zahuta, Robert E., to Santa Barbara Research Center. Remote fired RF getter for use in metal infrared detector dewar. 5,111,049, Cl. 250-352.000.

Romano, Timothy S.: *See*—
Maassen, Nevil Q.; Romano, Timothy S.; and Peck, Leonard E., 5,111,050, Cl. 250-352.000.

Romer Labs, Inc.: *See*—
Romer, Thomas R., 5,110,558, Cl. 422-101.000.

Romer, Thomas R., to Romer Labs, Inc. Apparatus for adsorption detection. 5,110,558, Cl. 422-101.000.

Romero, Irene; and Rodrigues, Rui, to Intevep, S.A. Method and apparatus for treating and storing sulfur containing gas so as to prohibit the degradation of same. 5,109,713, Cl. 73-864.830.

Romick, Jerome M. Unit-dose medication handling and dispensing system. 5,109,984, Cl. 206-531.000.

Ronin, Inc.: *See*—
Van Dyke, Mark W., 5,109,613, Cl. 36-89.000.

Rose, Henry H., to Formall/Blackwood Corporation. End cap locking means for a palletized container. 5,109,985, Cl. 206-600.000.

Rose, Ira M.: *See*—
Higbie, Francis A.; LieBerman, Robert A.; and Rose, Ira M., 5,110,889, Cl. 526-320.000.

Rose, Mitchell. Inductive displacement transducer having an undulatory moveable member. 5,111,139, Cl. 324-207.220.

Rosenberg, Paul, to Research Frontiers Incorporated. Electro-optical light modulator. 5,111,331, Cl. 359-296.000.

Rosenblatt, Aaron; Rosenblatt, David H.; Feldman, David; Knapp, Joseph E.; Battisti, Diane; and Morsi, Badie, to Iolab Corporation. Method and apparatus for chlorine dioxide manufacture. 5,110,580, Cl. 423-472.000.

Rosenblatt, David H.: *See*—
Rosenblatt, Aaron; Rosenblatt, David H.; Feldman, David; Knapp, Joseph E.; Battisti, Diane; and Morsi, Badie, 5,110,580, Cl. 423-472.000.

Ross, Bert A.: *See*—
Menzel, Jill R.; Damewood, John R.; Ross, Bert A.; and Kerr, Richard C., 5,110,666, Cl. 428-196.000.

Rossi, John J.: *See*—
Cantin, Edouard M.; Zaia, John A.; Wallace, R. Bruce; and Rossi, John J., 5,110,802, Cl. 514-44.000.

Rossling, Georg; and Sachse, Andreas, to Schering Aktiengesellschaft. Process for the preparation of aqueous dispersions. 5,110,475, Cl 210-640.000.

Rossoni, Philip G.: *See*—
Levinson, Mark; Ditchek, Brian M.; Rossoni, Philip G.; and Rock, Frederick, 5,111,254, Cl. 357-22.000.

Roswold, Wesley D., to Indak Manufacturing Corp. Mirror control slide switch for automotive vehicles. 5,111,011, Cl. 200-550.000.

Roth, Donald J.: *See*—
Kubis, Charles S.; Walter, John; Roth, Donald J.; and Mohr, Glenn R., 5,109,653, Cl. 53-510.000.

Roth, Oscar, to Involvo AG. Apparatus for subdividing a running web of coherent panels in zig-zag formation. 5,110,101, Cl. 270-39.000.

Roth, Wolfgang; and Medebach, Thomas, to Kuester & Co. GmbH. Motor drive unit for cable window regulator. 5,109,725, Cl. 74-505.000.

Rothschild, John J.; and Donahue, James L. Gravity flow thermal process for reclaiming foundry sand. 5,110,288, Cl. 432-96.000.

Roundhill, David N.; and von Ramm, Olaf T., to Duke University. Ultrasound time domain velocity detection method and apparatus. 5,109,857, Cl. 128-661.080.

Rouyer, Philippe: *See*—
Guegan, Alain; Gy, Jules; Hespel, Jean-Pierre; and Rouyer, Philippe, 5,109,866, Cl. 128-771.000.

Rowan, Robert L., Jr. Adjustable apparatus for supporting machinery or other load. 5,110,082, Cl. 248-678.000.

Rowden, David L.: *See*—
Carey, James R.; and Rowden, David L., 5,111,350, Cl. 360-99.060.

Rowley, Andrew T.: *See—*
Greb, Ulrich; and Rowley, Andrew T., 5,111,117, Cl. 315-248.000.
Royal Institution for the Advancement of Lerning (McGill University), The: *See—*
Ryan, Dominic H.; Strom-Olsen, John O.; Kycia, Jan; Patel, Bipin; and Dumais, Francois, 5,110,695, Cl. 429-206.000.
Rubbermaid Office Products Group, Inc.: *See—*
Evenson, Mel; and Melzian, John, 5,110,079, Cl. 248-222.100.
Rudd, John B.: *See—*
Grayson, S. Keith; and Rudd, John B., 5,111,531, Cl. 395-23.000.
Ruehlmann, Klaus: *See—*
Dittrich, Uwe; Dathe, Sigrid; Raabe, Hartmut; Sourisseau, Rolf; and Ruehlmann, Klaus, 5,110,969, Cl. 556-427.000.
Ruider, Guenther: *See—*
Schroeder, Wolfgang; and Ruider, Guenther, 5,110,928, Cl. 544-395.000.
Rumaner, Lee E.: *See—*
Benz, Mark G.; Knudsen, Bruce A.; Rumaner, Lee E.; and Zabala, Robert J., 5,109,593, Cl. 29-599.000.
Rumler, Joseph E.: *See—*
Love, Franklin S.; and Rumler, Joseph E., 5,109,630, Cl. 51-74.00R.
Rund-Stahl-Bau Gesellschaft m.b.H.: *See—*
Mathis, Hugo, 5,109,953, Cl. 182-129.000.
Ruppel, Robert F., to Cahin Systems Corporation. Dynamic weight control system. 5,109,936, Cl. 177-25.190.
Rupprecht, Georg: *See—*
Pataschnick, Harvey; and Rupprecht, Georg, 5,110,747, Cl. 436-133.000.
Rupprecht & Patashnick Company, Inc.: *See—*
Pataschnick, Harvey; and Rupprecht, Georg, 5,110,747, Cl. 436-133.000.
Ruschak, Michael L.; McAninch, William D.; and Anderson, Dan A., to Aluminum Company of America. Automatic sample preparation for analysis of sample particles. 5,110,553, Cl. 422-68.100.
Rutgers, The State University of New Jersey: *See—*
Semmlow, John L.; Welkowitz, Walter; Kostis, John B.; and Akay, Metin, 5,109,863, Cl. 128-715.000.
Ryan, Dominic H.; Strom-Olsen, John O.; Kycia, Jan; Patel, Bipin; and Dumais, Francois, to Royal Institution for the Advancement of Lerning (McGill University), The. Rechargeable electrolytic cell with amorphous alloy electrode. 5,110,695, Cl. 429-206.000.
Sabo, Frank J.; and McGaw, Doonan D. Connector fitting locking and sealing arrangements. 5,110,158, Cl. 285-92.000.
Sacco, Daniel: *See—*
Dellacherie, Edith; Leonard, Michele; Sacco, Daniel; and Vigneron, Claude, 5,110,909, Cl. 530-385.000.
Sachse, Andreas: *See—*
Rossling, Georg; and Sachse, Andreas, 5,110,475, Cl. 210-640.000.
Saeki, Takao: *See—*
Tomizuka, Kazuo; Sugayama, Sakae; Saeki, Takao; and Sandoh, Fumio, 5,111,274, Cl. 357-53.000.
Saeki, Yoshiyuki: *See—*
Maeda, Susumu; Furusawa, Mitsuru; Marumoto, Yasumasa; Horiuchi, Tadashi; Sato, Yoshinari; and Saeki, Yoshiyuki, 5,110,729, Cl. 435-69.100.
Safe-T-Jack, Inc.: *See—*
Slay, Clyde E., 5,110,089 Cl. 254-8.00B.
Sagawa, Masato: *See—*
Yamamoto, Hitoshi; Sagawa, Masato; Fujimura, Setsuo; and Matsuura, Yutaka, 5,110,377, Cl. 148-302.000.
Sahakian, Vahak K.: *See—*
Pasch, Nicholas F.; Sahakian, Vahak K.; and Dell'Oca, Conrad J., 5,111,279, Cl. 357-81.000.
Sahara, Masayoshi: *See—*
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 5,111,234, Cl. 354-455.000.
Sahashi, Masashi: *See—*
Kobayashi, Tadahiko; Tokai, Yoichi; and Sahashi, Masashi, 5,110,376, Cl. 148-301.000.
Saimi, Tetsuo: *See—*
Komma, Yoshiaki; Kadowaki, Shinichi; Kato, Makoto; and Saimi, Tetsuo, 5,111,448, Cl. 369-44.230.
Saint-Gobain Vitrage: *See—*
Triffaux, Francis; and Moncheaux, Michel, 5,109,765, Cl. 100-155.00G.
Saito, Hiroshi: *See—*
Chazono, Hirokazu; Saito, Hiroshi; Honda, Mutsumi; Shizuno, Hisamitsu; and Kishi, Hiroshi, 5,111,357, Cl. 361-321.000.
Saito, Masao: *See—*
Sugiura, Masayuki; Mixi, Nobuaki; Nasu, Takeshi; Sugiura, Kiyohiko; and Saito, Masao, 5,111,175, Cl. 336-192.000.
Saito, Megumi: *See—*
Shirota, Katsuhiro; Eida, Tsuyoshi; Saito, Megumi; and Yamamoto, Takao, 5,110,356, Cl. 106-22.000.
Saito, Mitsunaga: *See—*
Hosoya, Masahiro; Saito, Mitsunaga; Endo, Mitsuharu; Ohtaka, Yoshimitsu; and Futamata, Yukio, 5,110,705, Cl. 430-120.000.
Saito, Shiro; Takagi, Shigeru; and Kondo, Mineji, to Inax Corporation. Multiway valve. 5,109,887, Cl. 137-625.460.
Saito, Takanori: *See—*
Komiyama, Mikio; Miyazawa, Yasunao; Ebe, Kazuyoshi; and Saito, Takanori, 5,110,388, Cl. 156-229.000.
Saito, Tatsuo: *See—*
Kurihara, Tokumitsu; Saito, Tatsuo; and Harada, Hidefumi, 5,110,586, Cl. 424-76.100.
Saito, Yasuyuki: *See—*
Nakahara, Moriya; Saito, Yasuyuki; Shirai, Kenichi; Itabashi, Yasushi; and Turugai, Takashi, 5,110,762, Cl. 437-189.000.
Saitoh, Kyoichiro: *See—*
Oki, Toshikazu; Saitoh, Kyoichiro; Tomatsu, Kozo; Tomita, Koji; Konishi, Masataka; Miyaki, Takeo; Tsunakawa, Mitsuaki; and Nishio, Maki, 5,110,960, Cl. 552-220.000.
Saitou, Yoshitami; Isono, Nobuyuki; and Suzumura, Nobuyasu, to Aisin Seiki K.K. Electronically controlled clutch engagement speed correcting for an automatic transmission system. 5,109,967, Cl. 192-0.076.
Sakaguchi, Akira: *See—*
Hori, Kimihiko; Sakaguchi, Akira; Ishida, Koichi; Nomura, Tomoko; Suzuki, Keiko; and Tsuchiya, Shuichi, 5,110,826, Cl. 514-39.000.
Sakaguchi, Yasuo: *See—*
Satake, Yoshikatsu; Kashiwadate, Ken; Sakaguchi, Yasuo; Katto, Takayuki; and Shiiki, Zenya, 5,110,681, Cl. 428-419.000.
Sakai, Jun: *See—*
Yamamoto, Takemi; Sakai, Jun; Kawahara, Hiroshi; Hayashi, Shigeyuki; Sakakibara, Kenji; Akao, Michitoshi; Sasaki, Ichiro; and Komiya, Ryohei, 5,111,237, Cl. 355-27.000.
Sakai, Masahiko: *See—*
Taniguchi, Toshihisa; Hayashi, Mituyuki; and Sakai, Masahiko, 5,109,690, Cl. 72-206.000.
Sakakibara, Kenji: *See—*
Yamamoto, Takemi; Sakai, Jun; Kawahara, Hiroshi; Hayashi, Shigeyuki; Sakakibara, Kenji; Akao, Michitoshi; Sasaki, Ichiro; and Komiya, Ryohei, 5,111,237, Cl. 355-27.000.
Sakamoto, Hiroshi: *See—*
Yokonuma, Norikazu; Hagiuda, Nobuyoshi; Matsui, Hideki; and Sakamoto, Hiroshi, 5,111,233, Cl. 354-416.000.
Sakamoto, Masahide: *See—*
Maeda, Yuuji; Nakamura, Yozo; Nakamura, Kenichi; Sakamoto, Masahide; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,109,815, Cl. 123-192.100.
Sakanishi, Yasuaki: *See—*
Tsujihara, Susumu; and Sakanishi, Yasuaki, 5,111,284, Cl. 358-60.000.
Sakata, Koji; and Sakawaki, Kouji, to Mitsui Mining Co., Ltd. Sulfo-group-containing heat-resistant high-molecular material and a preparation process thereof. 5,110,899, Cl. 528-265.000.
Sakata, Seiji, to Ricoh Company, Ltd. Density control system for a digital copier. 5,111,309, Cl. 358-455.000.
Sakata, Shinji: *See—*
Miura, Hideo; Nishimura, Asao; Sakata, Shinji; Shimizu, Tasuku; and Hattori, Shigeo, 5,110,537, Cl. 376-305.000.
Sakata, Sueo: *See—*
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Sakata, Sueo; and Kumano, Masayoshi, 5,111,377, Cl. 363-95.000.
Sakawaki, Kouji: *See—*
Sakata, Koji; and Sakawaki, Kouji, 5,110,899, Cl. 528-265.000.
Sakaya, Taiichi: *See—*
Kotani, Kozo; Negawa, Hideo; and Sakaya, Taiichi, 5,110,860, Cl. 524-563.000.
Sakuma, Kiyoshi; Yoshida, Takayuki; Tezuka, Tomohumi; Aoki, Katsuyuki; Yamada, Makoto; Hujii, Masao; and Morinushi, Ken, to Mitsubishi Denki Kabushiki Kaisha. Heat exchanger. 5,109,919, Cl. 165-151.000.
Sakuma, Shigenori: *See—*
Suzuki, Yoshiichi; Sakuma, Shigenori; and Yamakawa, Noriko, 5,110,497, Cl. 252-299.650.
Suzuki, Yoshiichi; Sakuma, Shigenori; and Yamakawa, Noriko, 5,110,498, Cl. 252-299.660.
Sakurai, Einosuke: *See—*
Hamaguchi, Fumiko; Nagasaka, Tatsuo; Hakamada, Rie; and Sakurai, Einosuke, 5,110,823, Cl. 514-375.000.
Sakurai, Kazuo; and Tamura, Takahiro, to Hitachi, Ltd. Lubricant supply system of a scroll fluid machine. 5,110,268, Cl. 417-410.000.
Salles, Pascale: *See—*
Boutin, Jean; Brun, Pierre; Lamaze, Airy-Pierre; Paillere, Patrick; and Salles, Pascale, 5,110,426, Cl. 204-64.00R.
Samadani, Rosina: *See—*
Blanco, Ernesto E.; and Samadani, Rosina, 5,109,850, Cl. 128-635.000.
Samain, Henri: *See—*
Lecolier, Serge; Mortreux, Andre ; Petit, Francis; and Samain, Henri, 5,110,961, Cl. 556-31.000.
Sampathkumar, Padmini, to Procter & Gamble Company, The. Peroxy acids composition for oral treatment. 5,110,583, Cl. 424-48.000.
SamSung Electronic Co., Ltd.: *See—*
Nam, Seok-Hoon, 5,111,300, Cl. 358-209.000.
SamSung Electronics Co., Ltd.: *See—*
Cho, Soon-In, 5,111,434, Cl. 365-207.000.
SamSung Electronics Co., Ltd.: *See—*
Choi, Hae-yong, 5,111,282, Cl. 358-40.000.
Hyun, Whoang J.; and Jo, Mun H., 5,111,012, Cl. 219-10.55R.
Kwon, In-Gyu, 5,110,512, Cl. 261-122.000.
Samuel, John; and Longenecker, B. Michael, to Biomira, Inc. Human tumor-associated Thomsen-Friedenreich antigen. 5,110,911, Cl. 530-395.000.
Samuels, Michael R.: *See—*
Waggoner, Marion G.; and Samuels, Michael R., 5,110,896, Cl. 528-190.000.
San-O Industrial Corporation: *See—*
Lindquist, Carl E., 5,111,176, Cl. 337-188.000.

Sanders, Christine C.: *See—*
Chastain, Doyle E.; Sanders, W. Eugene, Jr.; and Sanders, Christine C., 5,110,832, Cl. 514-729.000.
Sanders, John D.: *See—*
Holden, Homer N.; Lawrence, James L.; Rogers, Jerry W.; and Sanders, John D., 5,109,600, Cl. 29-890.144.
Sanders, W. Eugene, Jr.: *See—*
Chastain, Doyle E.; Sanders, W. Eugene, Jr.; and Sanders, Christine C., 5,110,832, Cl. 514-729.000.
Sando Iron Works Co., Ltd.: *See—*
Sando, Yoshiteru; Nakano, Eiichi; and Ishidoshiro, Hiroshi, 5,110,481, Cl. 210-721.000.
Sando, Yoshiteru; Nakano, Eiichi; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Method for separation of polyvinyl alcohol from aqueous solutions thereof using peroxodisulfates. 5,110,481, Cl. 210-721.000.
Sandoh, Fumio: *See—*
Tomizuka, Kazuo; Sugayama, Sakae; Saeki, Takao; and Sandoh, Fumio, 5,111,274, Cl. 357-53.000.
Sandstrom, Roland, to Infrasonik AB. Frequency controlled motor driven low frequency sound generator. 5,109,948, Cl. 181-142.000.
Sandvik AB: *See—*
Brandt, Nils G. L.; and Thelin, Anders G., 5,110,770, Cl. 501-89.000.
Westergren, Kenneth; Weinl, Gerold; and Oskarsson, Rolf, 5,110,349, Cl. 75-233.000.
Sangiah, Subbiah: *See—*
Berlin, Kenneth D.; Scherlag, Benjamin J.; Clarke, Cyril R.; Otiv, Surendra R.; Zisman, Stan A.; Sangiah, Subbiah; and Mulekar, Satish V., 5,110,933, Cl. 546-114.000.
Sanma, Takahide: *See—*
Kume, Hisao; Kuwajima, Shuichi; and Sanma, Takahide, 5,111,107, Cl. 313-405.000.
Sanofi S.A.: *See—*
Casu, Benito; Naggi, Annamaria; Oreste, Pasqua; Torri, Giangiacomo; Zoppetti, Giorgio; Sportoletti, Giancarlo; and De Santis, Francesco, 5,110,918, Cl. 536-21.000.
Sanshin Industries Co., Ltd.: *See—*
Fujimoto, Hiroaki, 5,109,809, Cl. 123-41.310.
Sanshin Kogyo Co., Ltd.: *See—*
Abe, Tunehiko; Nakano, Hiroyuki; Shiotani, Kazuaki; and Takada, Yoshiharu, 5,110,630, Cl. 427-327.000.
Sanshin Kogyo Kabushiki Kaisha: *See—*
Motose, Hitoshi, 5,111,132, Cl. 322-90.000.
Santa Barbara Research Center: *See—*
Maassen, Nevil Q.; Romano, Timothy S.; and Peck, Leonard E., 5,111,050, Cl. 250-352.000.
Romano, Timothy S.; Peck, Leonard E., Jr.; Neumann, Karl H.; and Zahuta, Robert E., 5,111,049, Cl. 250-352.000.
Santamaria, Joseph P., to JPS/Oiltrol, Inc. Self-righting oil containment boom. 5,110,236, Cl. 405-63.000.
Sanwa Kagaku Kenkyusho Co., Ltd.: *See—*
Kurono, Masayasu; Kondo, Yasuaki; Matsumoto, Yukiharu; Oka, Mitsuru; and Sawai, Kiichi, 5,110,945, Cl. 548-453.000.
Sanyo Electric Co., Ltd.: *See—*
Hamada, Fumihiko; Tsuboi, Kunio; Hasegawa, Mitihiko; Ichizawa, Yasuji; Yabe, Toshiya; Yamasaki, Kunitomo; Takahashi, Yasunobu; and Mizuta, Katsuji, 5,111,252, Cl. 355-308.000.
Haruki, Toshinobu; and Kikuchi, Kenichi, 5,111,301, Cl. 358-228.000.
Tomizuka, Kazuo; Sugayama, Sakae; Saeki, Takao; and Sandoh, Fumio, 5,111,274, Cl. 357-53.000.
Yuuchi, Takahiro; Tsuchida, Yasuyuki; and Fujiwara, Masakatsu, 5,109,845, Cl. 128-421.000.
Sarcos Group: *See—*
Jacobsen, Stephen C.; and Wood, John E., 5,109,701, Cl. 73-782.000.
Sareshwala, Sohel A.: *See—*
Benson, Robert W.; Dietemann, Christopher G.; Beiley, Mark J.; and Sareshwala, Sohel A., 5,110,163, Cl. 285-382.200.
Sarkisian, Paul; and Becker, Fred, to Gas Research Institute. High output mini hydronic heater. 5,109,807, Cl. 122-20.00B.
Sarkoezi, Imre, to Siemens Aktiengesellschaft. Method for equalization of the pulse widths of a digital signal. 5,111,480, Cl. 375-4.000.
Sarma, Kalluri R., to Honeywell Inc. Method for fabricating high mobility thin film transistors as integrated drivers for active matrix display. 5,110,748, Cl. 437-51.000.
Sartor, Mariano, to Nordica S.p.A. Support adjuster device for the quarters of ski boots. 5,109,615, Cl. 36-121.000.
Sasaki, Ichiro: *See—*
Yamamoto, Takemi; Sakai, Jun; Kawahara, Hiroshi; Hayashi, Shigeyuki; Sakakibara, Kenji; Akao, Michitoshi; Sasaki, Ichiro; and Komiya, Ryohei, 5,111,237, Cl. 355-27.000.
Sasaki, Katuyuki: *See—*
Fukuda, Michio; Ohta, Yoshinobu; Taniguchi, Kenichi; and Sasaki, Katuyuki, 5,109,602, Cl. 29-845.000.
Sasaki, Makoto; Kobayashi, Yukio; and Tsuchiya, Shozo, to Nippon Oil Co., Ltd. Rubber composition. 5,110,872, Cl. 525-216.000.
Sasaki, Makoto: *See—*
Kondo, Hitoshi; Sasaki, Makoto; and Kobayashi, Yukio, 5,110,871, Cl. 525-207.000.
Sasaki, Mutsumi; Takahashi, Koji; and Suzuki, Shuichi, to Fujitsu Limited. Semiconductor device with a multi-stepped source region and method for producing the same. 5,111,258, Cl. 357-23.400.
Sasaki, Shizuo, to Toyota Jidosha Kabushiki Kaisha. Direct fuel injection type spark ignition internal combustion engine. 5,109,816, Cl. 123-263.000.
Sasaki, Shosaku: *See—*
Hamada, Yuji; Murakami, Ichiro; and Sasaki, Shosaku, 5,110,882, Cl. 525-478.000.
Sasama, Kazuo: *See—*
Tanimoto, Koji; Kimura, Kazuhisa; and Sasama, Kazuo, 5,111,242, Cl. 355-200.000.
Sasamoto, Hideho, to Juki Corporation. Stacking apparatus for sewing machine. 5,109,781, Cl. 112-121.290.
Sasao, Nobuyuki; and Yamaguchi, Hiromi, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Laser isotope separation apparatus. 5,110,562, Cl. 422-186.000.
Sasatani, Seiei: *See—*
Kim, Soonih; Takeda, Kazuhisa; and Sasatani, Seiei, 5,110,602, Cl. 424-451.000.
Satake, Yoshikatsu; Kashiwadate, Ken; Sakaguchi, Yasuo; Katto, Takayuki; and Shiiki, Zenya, to Kureha Kagaku Kogyo K. K. Meltstable poly(arylene thioether-ketone) prepregs and molded or formed products thereof. 5,110,681, Cl. 428-419.000.
Sato, Eiji; Matsuhashi, Ryo; Ito, Satoshi; Tano, Kazuhiro; and Asakawa, Kenichi, to Nippon Steel Corporation. Stainless steel exhibiting excellent anticorrosion property for use in engine exhaust systems. 5,110,544, Cl. 420-69.000.
Sato, J. Denry: *See—*
Myoken, Yoshinari; Okamoto, Tetsuji; and Sato, J. Denry, 5,110,737, Cl. 435-240.270.
Sato, Keiji, to Fuji Jukogyo Kabushiki Kaisha. Transmission ratio control system for a continuously variable transmission. 5,109,962, Cl. 192-4.00A.
Sato, Masa-aki: *See—*
Ito, Kohzo; Tanabe, Yoshikazu; Sato, Masa-aki; and Kaeriyama, Kyoji, 5,110,504, Cl. 252-500.000.
Sato, Shigenori: *See—*
Toyoshima, Hisanori; Jyoraku, Fumio; Ishii, Yoshitaro; Iwase, Yukiji; and Sato, Shigenori, 5,110,266, Cl. 417-312.000.
Sato, Tadahisa: *See—*
Taniguchi, Masato; and Sato, Tadahisa, 5,110,941, Cl. 548-262.400.
Sato, Tomonori: *See—*
Hatakeyama, Atsushi; Miura, Tsutomu; Niskala, Wayne F.; Sato, Tomonori; and Yumino, Masamichi, 5,110,227, Cl. 400-120.000
Sato, Toru; Kobayashi, Yoshio; and Kato, Tomiya, to Mitsubishi Jukogyo Kabushiki Kaisha. Muffler of industrial engine. 5,109,949, Cl. 181-240.000.
Sato, Toshiyuki, to Fujitsu Limited. PLL with lock detector for detecting a specified signal in a plurality of input signals. 5,111,161, Cl 331-25.000.
Sato, Yoichi: *See—*
Mizukami, Masao; and Sato, Yoichi, 5,111,080, Cl. 307-475.000
Sato, Yoshinari: *See—*
Maeda, Susumu; Furusawa, Mitsuru; Marumoto, Yasumasa; Horiuchi, Tadashi; Sato, Yoshinari; and Saeki, Yoshiyuki, 5,110,729, Cl. 435-69.100.
Sato, Yoshio: *See—*
Nakayama, Takahiro; Tamahashi, Kunihiro; Fuyama, Moriaki; Minemura, Hiroyuki; Sato, Yoshio; Tsuboi, Nobuyoshi; and Koyanagi, Hiroaki, 5,110,792, Cl. 505-1.000
Satoh, Isao: *See—*
Fukushima, Yoshihisa; and Satoh, Isao, 5,111,444, Cl. 369-58.000.
Satoh, Tetsuo: *See—*
Hara, Hajime; Orii, Shingo; Satoh, Tetsuo; Toya, Tomohiro; and Iida, Shigeki, 5,110,698, Cl. 430-20.000.
Satoh, Tsuyoshi: *See—*
Yahagi, Toshio; Iwagawa, Yoshihiro; Sugimoto, Yoichi; and Satoh, Tsuyoshi, 5,109,694, Cl. 73-9.000.
Sautter, Helmut: *See—*
Herden, Werner; Konrad, Johann; Sautter, Helmut; and Suchowerskyj, Wadym, 5,109,829, Cl. 123-643.000.
Savage, Chester: *See—*
Scholle, William R.; Lloyd-Davies, William T.; and Savage, Chester, 5,110,012, Cl. 222-83.500.
Savage, Kerry D.: *See—*
Supernaw, Irwin R.; and Savage, Kerry D., 5,109,927, Cl. 166-248.000.
Sawabe, Atsuhito; and Inuzuka, Tadao, to Kabushiki Kaisha Toshiba. Method of manufacturing single-crystal diamond particles. 5,110,405, Cl. 156-610.000.
Sawada, Kenji: *See—*
Kamimura, Kuniaki; Sawada, Kenji; and Yamade, Yasushi, 5,111,239, Cl. 355-45.000.
Sawada, Masami; Nanbu, Yuichi; and Yoshiyasu, Mitsuo, to Takata Corporation. Cover for a vehicle air bag. 5,110,647, Cl. 428-43.000.
Sawada, Shizuo; and Ogihara, Masaki, to Kabushiki Kaisha Toshiba. Multicell semiconductor memory device. 5,111,275, Cl. 357-71.000.
Sawada, Shizuo: *See—*
Maeda, Satoshi; Sawada, Shizuo; and Shinozaki, Satoshi, 5,110,766, Cl. 437-228.000.
Sawai, Kiichi: *See—*
Kurono, Masayasu; Kondo, Yasuaki; Matsumoto, Yukiharu; Oka, Mitsuru; and Sawai, Kiichi, 5,110,945, Cl. 548-453.000.
Sawtek, Inc.: *See—*
Menning, Hunter W., 5,111,167, Cl. 333-151.000.
Sax, James E.: *See—*
Galick, Stephen J.; and Sax, James E., 5,110,667, Cl. 428-202.000.

Scalone, Michelangelo: *See—*
Knierzinger, Andreas; and Scalone, Michelangelo, 5,110,955, Cl. 549-411.000.
Schacht, Peter. Process for the manufacture of multi-ply panel boards preferably for floors. 5,109,898, Cl. 144-350.000.
Scherer Healthcare Ltd.: *See—*
Marshall, Lyman R., 5,109,873, Cl. 128-849.000.
Schering Aktiengesellschaft: *See—*
Rossling, Georg; and Sachse, Andreas, 5,110,475, Cl. 210-640.000.
Scherlag, Benjamin J.: *See—*
Berlin, Kenneth D.; Scherlag, Benjamin J.; Clarke, Cyril R.; Otiv, Surendra R.; Zisman, Stan A.; Sangiah, Subbiah; and Mulekar, Satish V., 5,110,933, Cl. 546-114.000.
Scheuhing, Robert B.: *See—*
Proctor, Richard D. J.; and Scheuhing, Robert B., 5,109,832, Cl. 128-24.00R.
Scheuring, Bernhard, to Werner & Pfleiderer GmbH. Extruder for the preparation of plastic material with the introduction of at least one fibre strand. 5,110,275, Cl. 425-113.000.
Schild, Rolf, to Huntleigh Technology, Plc. Alternating pressure pad. 5,109,561, Cl. 5-453.000.
Schilling, Michael R., to Pactec, Inc. Waste container liner. 5,110,005, Cl. 220-404.000.
Schirmer, Henry G.: *See—*
Barmore, Charles R.; and Schirmer, Henry G., 5,110,677, Cl. 428-349.000.
Schlipfenbacher, Reiner; and Steinbiss, Joachim, to Boehringer Mannheim GmbH. Test carrier for the analytical determination of a component of a liquid sample. 5,110,550, Cl. 422-56.000.
Schloegi, Gunter: *See—*
Janocha, Siegfried; Schloegi, Gunter; Bothe, Lothar; and Crass, Guenther, 5,110,670, Cl. 428-216.000.
Schmid, Franz; and Ploppa, Jurgen, to H. Stoll GmbH & Co. Device for the selectively controlled mutual displacement of yarn guides of flat-bed knitting machines. 5,109,681, Cl. 66-126.00R.
Schmidhauser, John C.; and Longley, Kathryn L., to General Electric Company. Thermoplastic polycarbonate composition having improved oxygen barrier properties from diester diol. 5,110,897, Cl. 528-196.000.
Schmidlin, Hansjorg: *See—*
Nyfeler, Alex; Antes, Gregor; and Schmidlin, Hansjorg, 5,109,767, Cl. 101-23.000.
Schmidt, Paul: *See—*
Hesse, Alfons, 5,110,237, Cl. 405-184.000.
Schmidt, Stephen R.: *See—*
Welsh, William A.; and Schmidt, Stephen R., 5,110,769, Cl. 501-12.000.
Schmidt, Werner: *See—*
Zahn, Klaus; and Schmidt, Werner, 5,109,730, Cl. 74-866.000.
Schmitt, Jean-Paul: *See—*
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardaix-Luthereau, Renee; Cestall, Brenda; and Naylor, Robert, 5,110,824, Cl. 514-377.000.
Schmitt, Kirk D.: *See—*
Calabro, David C.; Schmitt, Kirk D.; and Vartuli, James C., 5,110,572, Cl. 423-328.000.
Schmitt, Roman A.: *See—*
White, Jack C.; Traut, Davis E.; Oden, Laurance L.; and Schmitt, Roman A., 5,110,546, Cl. 420-590.000.
Schmutz, Christian; and Franzmann, Gunther, to Keiper Recaro GmbH & Co. Vehicle seat. 5,110,185, Cl. 297-410.000.
Schneider, Hubert: *See—*
Bertiller, Roland; Schneider, Hubert; and Dieterle, Gerd, 5,109,748, Cl. 89-1.200.
Schneider, Rudolf T. Convertible chair-bed for indoor and outdoor use. 5,110,180, Cl. 297-78.000.
Schneider, Stanley: *See—*
Fay, Theodore D.; Morgan, William F.; and Schneider, Stanley, 5,110,210, Cl. 356-150.000.
Schockman, Robert L.: *See—*
Ontrop, Patrick H.; Schockman, Robert L.; and Bergman, Frederick C., 5,109,766, Cl. 101-257.000.
Schoenky, John H. Flanged pipe support. 5,110,073, Cl. 248-49.000.
Scholl, Thomas: *See—*
Weider, Richard; Arlt, Dieter; Leuschke, Christian; and Scholl, Thomas, 5,110,895, Cl. 428-176.000.
Scholle Corporation: *See—*
Scholle, William R.; Lloyd-Davies, William T.; and Savage, Chester, 5,110,012, Cl. 222-83.500.
Scholle, William R.; Lloyd-Davies, William T.; and Savage, Chester, to Scholle Corporation. Beverage container with regulated pressure. 5,110,012, Cl. 222-83.500.
Scholten, Heinz: *See—*
Simon, Ulrich; and Scholten, Heinz, 5,110,673, Cl. 428-236.000.
Schonauer, Sylvia L.: *See—*
Rao, Mohan; Harlamert, Michael E.; Ash, Dennis; Schonauer, Sylvia L.; MacGeorge, Gregory D.; Barkhau, Keith D.; Beltz, John D.; and Kupski, Donald R., 5,110,601, Cl. 426-523.000.
Schonbrenner, Wolfgang: *See—*
Lothmann, Josef; Osborg-Schmitz, Jurgen; and Schonbrenner, Wolfgang, 5,110,018, Cl. 222-600.000.
Schoning, Josef: *See—*
Becker, Gerhard; Gross, Hans-Gunter; Henssen, Johannes; and Schoning, Josef, 5,110,006, Cl. 220-442.000.
Schott Glaswerke: *See—*
Heimann, Gisbert; and Kramer, Walter, 5,110,016, Cl. 222-475.100.
Schroder, Volker: *See—*
Lubke, Herbert; Knapheide, Wolfgang; and Schroder, Volker, 5,109,768, Cl. 101-153.000.
Schroeder, Georg; Arlt, Dieter; and Jautelat, Manfred, to Bayer Aktiengesellschaft. Isocyanatoalkyl sulphonates and a process for their preparation. 5,110,975, Cl. 558-44.000.
Schroeder, Guenter: *See—*
Hoess, Werner; Vetter, Heinz; Brehm, Manfred; Schroeder, Guenter; and Reiner, Roland, 5,110,877, Cl. 525-378.000.
Schroeder, Wolfgang; and Ruider, Guenther, to BASF Aktiengesellschaft. Preparation of N-aryl-substituted 2-aminoalkyl-2-hydroxyalkylamines and N-aryl-substituted piperazines. 5,110,928, Cl. 544-395.000.
Schubert, Franz H.; and Grigger, David J., to United States of America, National Aeronautics and Space Administration. Water electrolysis. 5,110,436, Cl. 204-129.000.
Schultz, Darald R.: *See—*
Sherman, Richard A.; and Schultz, Darald R., 5,110,226, Cl. 400-88.000.
Schultz, Philip W.: *See—*
Little, John L.; Schultz, Philip W.; and Kroll, Harry, 5,110,423, Cl. 205-254.000.
Schulze-Frenking, Josef: *See—*
Hannen, Reiner W.; Vermeulen, Norbert P.; and Schulze-Frenking, Josef, 5,111,528, Cl. 392-379.000.
Schuman, Michael L., to Rainbow Lifeguard Products, Inc. Waterproof switch and charging jack assembly. 5,111,129, Cl. 320-2.000.
Schunk, Bernd; Stolllewerk, Reinfried; Hubricht, Gerhard; and Peters, Jorg, to Rheinmetall GmbH. Signal transmitting steering cable including optical fiber with fluorescent dye. 5,111,524, Cl. 385-102.000.
Schutyser, Jan A. J.; Buser, Antonius J. W.; Zuuring, Pieter H.; and Slots, Hendrik J., to Akzo NV. Interpenetrating polymer network of epoxy resin, polyallyl polymer and anhydride. 5,110,867, Cl. 525-114.000.
Schutz, Joseph D.: *See—*
Wong, Keng L.; and Schutz, Joseph D., 5,111,067, Cl. 307-272.300.
Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung (GmbH): *See—*
Gunther, Schwarz, 5,109,960, Cl. 188-218.0XL.
Schwall, Edward A.: *See—*
Hechler, Valentine, IV; and Schwall, Edward A., 5,110,458, Cl. 210-90.000.
Schwingel, Donald J.: *See—*
Bright, Irving; Erickson, Ronald C.; Greene, Dennis K.; Hardy, Gerald D.; Hefner, Robert E.; Johnson, Lowell E.; Schwingel, Donald J.; and Spring, Richard E., 5,109,696, Cl. 73-118.100.
SCIPAR, Inc.: *See—*
Singh, Surjit, 5,110,502, Cl. 252-319.000.
Scitex Corporation Ltd.: *See—*
Bachar, Abraham, 5,111,308, Cl. 358-448.000.
Scoggins, Lacey E.; and Hoover, Kenneth C., to Phillips Petroleum Company. Aromatic sulfide/sulfone polymer production with complex of alkali metal hydrosulfide and alkali metal amino alkanoate. 5,110,902, Cl. 528-388.000.
Scoggins, Lacey E.: *See—*
Hoover, Kenneth C.; Clark, Earl, Jr.; Reger, Roy E.; Scoggins, Lacey E.; and Nesheiwat, Afif M., 5,110,901, Cl. 528-387.000.
Scott, Kenneth E.: *See—*
Lazansky, Richard W.; Miller, Thomas R.; Coelho, David R.; Scott, Kenneth E.; and Stanculescu, Alec G., 5,111,413, Cl. 364-578.000.
Scoville, John R.: *See—*
Engel, Darryl L.; and Scoville, John R., 5,110,091, Cl. 254-126.000.
Scripps Research Institute, The: *See—*
Edgington, Thomas S.; and Morrissey, James H., 5,110,730, Cl. 435-69.600.
Seaton, William J.: *See—*
Huber, Terrence D.; Kutsch, Duane B.; Seaton, William J.; and Skinfill, Donald R., 5,111,193, Cl. 340-783.000.
Sedelies, Reinhold: *See—*
Buettgen, Karl-Heinz; Gutsche, Bernhard; Hommers, Friedrich; Johannisbauer, Wilhelm; Peukert, Eberhard; and Sedelies, Reinhold, 5,110,508, Cl. 554-170.000.
Seele, Rainer: *See—*
Kober, Reiner; Theobald, Hans; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; Seele, Rainer; and Wagenblast, Gerhard, 5,110,829, Cl. 514-443.000.
Seeley, Philip G.: *See—*
DeMichael, Thomas; and Seeley, Philip G., 5,109,606, Cl. 29-889.100.
Seger, Eric: *See—*
Kozloski, Edward A.; Seger, Eric; Howard, Walter E.; and Weldon, James R., 5,110,469, Cl. 210-455.000.
Sehkar, Jainagesh A.; Bhattacharya, A. K.; and Li, Hung P., to University of Cincinnati. Dieless micro-pyretic manufacturing technique for fabricating bearing materials and the bearing materials produced thereby. 5,110,688, Cl. 428-552.000.
Seib, Paul A.; and Wang, Xiao Y., to Kansas State University Research Foundation. Method of preparing 2-phosphorylated compounds of ascorbic acid. 5,110,950, Cl. 549-222.000.
Seiboth, Wolfgang: *See—*
Lang, Heinrich; and Seiboth, Wolfgang, 5,110,196, Cl. 359-874.000.
Seidel, Durbin L., to NCR Corporation. Sample-and-hold switch with low on resistance and reduced charge injection. 5,111,072, Cl. 307-353.000.

Seidler, David. Self-molding cosmetic sampler applicator. 5,109,879, Cl. 132-320.000.
Seiko Instruments, Inc.: *See—*
Suzuki, Katsumi, 5,111,053, Cl. 250-424.000.
Seikosha Co., Ltd.: *See—*
Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; and Ogiwara, Yoshihisa, 5,111,261, Cl. 357-23.700.
Seitoh, Shigemitsu: *See—*
Fukuhara, Satoru; Shinada, Hiroyuki; and Seitoh, Shigemitsu, 5,111,141, Cl. 324-250.000.
Seki, Akinori: *See—*
Hosoba, Hiroyuki; Seki, Akinori; Hata, Toshio; Kondou, Masafumi; Suyama, Takahiro; and Matsui, Sadayoshi, 5,111,470, Cl. 372-46.000.
Seki, Chikashi: *See—*
Nakayama, Mizuo; Kuwajima, Shigesumi; Suzuki, Takahito; Miyake, Kazushi; Shibata, Tsutomu; and Seki, Chikashi, 5,111,410, Cl. 364-551.010.
Seki, Masaki; Hosono, Takeshi; Hayanagi, Shizuaki; and Suzuki, Koji, to Fanuc Ltd. Method of setting drawing parameters for an XY plotter. 5,111,532, Cl. 395-102.000.
Seki, Mitsuhiro: *See—*
Nagafuchi, Yasuhiro; Seki, Mitsuhiro; Sumi, Shigeo; and Hamamura, Fumio, 5,110,400, Cl. 156-521.000.
Sekida, Minoru: *See—*
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 5,111,234, Cl. 354-455.000.
Sekiguchi, Tadashi, to Kabushiki Kaisha Toshiba. Color correction device for an endoscope. 5,111,281, Cl. 358-29.000.
Sekine, Hiroshi; and Taniuchi Kazuman, to Fuji Xerox Co., Ltd. Image processing system for the use with image recording apparatus. 5,111,533, Cl. 395-109.000.
Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
Hayashi, Motoshige; Amano, Norio; Taki, Tekeshi, and Hirai, Takaaki, 5,110,844, Cl. 521-182.000.
Sekiya, Sinichi: *See—*
Odani, Niro; Yoshioka, Kazuyoshi; and Sekiya, Sinichi, 5,110,543, Cl. 419-29.000.
Selby, Thomas, to E. I Du Pont de Nemours and Company. Substituted fused heterocyclic herbicides. 5,110,347, Cl. 71-92.000.
Selenia Spazio, S.p.A.: *See—*
Marzi, Danilo; and Stonier, Roger A., 5,111,354, Cl. 361-218.000.
Selewski, Steven R.: *See—*
Rohn, Dean R.; Selewski, Steven R.; Wood, Stephen J.; and Cummins, Craig R., 5,109,568, Cl. 15-410.000.
Self, James M., to ABCO Industries, Ltd. Organic peroxide dispersions. 5,110,495, Cl. 252-186.260.
Selley, David B.: *See—*
Cifuentes, Martin E.; and Selley, David B., 5,110,891, Cl. 528-34.000.
Semler, Herbert J.: *See—*
Mills, Gary N.; Homayoun, Habib; and Semler, Herbert J., 5,111,396, Cl. 364-413.060.
Semmlow, John L.; Welkowitz, Walter; Kostis, John B.; and Akay, Metin, to Rutgers, The State University of New Jersey; and University of Medicine and Dentistry of New Jersey. Noninvasive diagnostic system for coronary artery disease. 5,109,863, Cl. 128-715.000.
Senoo, Seiiti; and Watanabe, Yoshio, to Sharp Kabushiki Kaisha. Battery voltage discriminator circuit. 5,111,148, Cl. 324-433.000.
Senso, Hitoshi; Arai, Yoshio; and Fukuda, Masao, to Pioneer Electronic Corporation. Video signal recording system and picture display system in a high-definition television system. 5,111,303, Cl. 358-335.000.
Sensormatic Electronics Corporation: *See—*
Narlow, Doug; and Patterson, Hubert A., 5,111,186, Cl. 340-572.000.
Sentrol Systems, Ltd.: *See—*
Gabura, Andrew J., 5,110,212, Cl. 356-429.000.
Separation Dynamics, Inc.: *See—*
Taylor, John A., 5,110,462, Cl. 210-180.000.
Taylor, John A., 5,110,476, Cl. 210-640.000.
Sepponen, Raimo E., to Instrumentarium Corp. Method and apparatus for studying the properties of a material. 5,111,145, Cl. 324-316.000.
Serack, James A., to Northern Telecom Limited. Method of and circuit for synchronizing data. 5,111,485, Cl. 375-112.000.
Seragen, Inc.: *See—*
Estis, Leonard F., 5,110,912, Cl. 530-413.000.
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; and Cross, Linsay E., to ICI Australia Limited. Herbicidal compounds and compositions. 5,110,989, Cl. 568-327.000.
Serfaty, Salomon, to Motorola, Inc. Trellis decoder. 5,111,483, Cl. 375-94.000.
Serizawa, Haruo: *See—*
Hitachi, Yuzo; and Serizawa, Haruo, 5,110,561, Cl. 422-180.000.
Usui, Masayoshi; and Serizawa, Haruo, 5,110,690, Cl. 428-678.000.
Sextant Avionique: *See—*
Fima, Henri, 5,111,055, Cl. 250-461.100.
Seymour, Sydney K., to R. J. Reynolds Tobacco Company. Method and apparatus for measuring concentration of a material in a sample. 5,110,213, Cl. 356-445.000.
Sfernice Societe Francaise des l'Electro-Resistance: *See—*
Flassayer, Claude; and Collins, Franklin, 5,111,179, Cl. 338-313.000.
SGS-Thompson Microelectronics S.A.: *See—*
Artieri, Alain; and Kritter, Sylvain, 5,111,066, Cl. 307-271.000.
SGS-Thomson Microelectronics, Inc.: *See—*
Steele, Randy C., 5,111,079, Cl. 307-465.000.
SGS-Thomson Microelectronics S.A.: *See—*
Chaisemartin, Philippe; and Kritter, Sylvain, 5,111,488, Cl. 377-47.000.
Shackleford, J. Barry, to Hewlett-Packard Company. Asynchronous leading zero counter employing iterative cellular array. 5,111,415, Cl. 364-715.040.
Shah, Hemanshu: *See—*
Wang, Jonas; Patel, Bhiku; Au, Stacley; and Shah, Hemanshu, 5,110,809, Cl. 514-171.000.
Shah, Rajiv: *See—*
Malhi, Satwinder; and Shah, Rajiv, 5,111,260, Cl. 357-23.700.
Sharber, John P.: *See—*
Sharber, Norman G.; and Sharber, John P., 5,111,379, Cl. 363-128.000.
Sharber, Norman G.; and Sharber, John P., to Coffelt Manufacturing, Inc. Electrofishing apparatus and method. 5,111,379, Cl. 363-128.000.
Sharif, Reza: *See—*
Cooledge, Joseph T.; and Sharif, Reza, 5,111,450, Cl. 370-13.000.
Sharp, Jeffrey O.: *See—*
Cassity, Terry A.; and Sharp, Jeffrey O., 5,109,897, Cl. 144-144.5GT.
Sharp Kabushiki Kaisha: *See—*
Fukuoka, Hirofumi; and Kanatani, Yoshiharu, 5,111,195, Cl. 340-811.000.
Hosoba, Hiroyuki; Seki, Akinori; Hata, Toshio; Kondou, Masafumi; Suyama, Takahiro; and Matsui, Sadayoshi, 5,111,470, Cl. 372-46.000.
Ii, Hiroshi, 5,111,151, Cl. 328-155.000.
Kitoh, Atsunori; and Fujimoto, Yoshiji, 5,111,505, Cl. 381-51.000.
Kurata, Yukio; Yoshida, Yoshio; and Nagahama, Toshiya, 5,111,449, Cl. 369-44.370.
Senoo, Seiiti; and Watanabe, Yoshio, 5,111,148, Cl. 324-433.000.
Terashima, Shigeo; and Matoba, Hirotsugu, 5,111,031, Cl. 235-456.000.
Sharp, William F.; Hingorany, Prem R.; and Mansell, Howard W., to Explosive Fabricators, Inc. Method of making a sealed transition joint. 5,109,594, Cl. 29-600.000.
Shaw, David; and Birch, Christopher L., to Shaw, David. Practical joke device. 5,110,316, Cl. 446-202.000.
Shaw, Edwin L. High torque low speed motor. 5,109,754, Cl. 91-499.000.
Shaw, James D., to Eastman Kodak Company. Non-oscillating caster. 5,109,569, Cl. 16-44.000.
Shaw, Jane M.: *See—*
Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., 5,110,711, Cl. 430-296.000.
Shell Internationale Research Maatschappij B.V.: *See—*
Clifford, Kenneth H.; Phillips, Gareth T.; and Marx, Arthur F., 5,110,943, Cl. 546-302.000.
Hopwood, William J., 5,110,348, Cl. 71-100.000.
Shell Research Limited: *See—*
Pryce, Robert J.; Hawes, John E.; and Handa, Sheetal, 5,110,957, Cl. 549-450.000.
Shen, Jan-son: *See—*
Chenoweth, Charles C.; and Shen, Jan-son, 5,109,672, Cl. 60-456.000.
Shepherd, Leonard L.; and VonFumetti, Cyril W., to Deere & Company. Grease loaded grapple dampener. 5,110,169, Cl. 294-119.400.
Sherba, Samuel E.; Mehta, Raj J.; and Lange, Barry C., to Rohm and Haas Company. Synergistic combinations of 4,5-dichloro-2-n-octyl-3-isothiazolone or 2-methyl-3-isothiazolone with ferric dimethyl dithiocarbamate fungicide. 5,110,822, Cl. 514-372.000.
Sherborne, John M.: *See—*
Marshall, Rodney J.; and Sherborne, John M., 5,110,420, Cl. 205-157.000.
Shergold, Steven D.: *See—*
Jahoda, Joseph R.; and Shergold, Steven D., 5,111,213, Cl. 343-722.000.
Sherman, Howard F., to Smith Corona Corporation. Brake mechanism for a pivotable character display. 5,109,573, Cl. 16-341.000.
Sherman, Richard A.; and Schultz, Darald R., to Norand Corporation. Battery operated data entry terminal device and printer attachment 5,110,226, Cl. 400-88.000.
Sheu, Jim J.; and Bland, Ronald G., to Baker Hughes Incorporated. Drilling fluid with stabilized browning reaction anionic carbohydrate. 5,110,484, Cl. 507-110.000.
Sheveleva, Galina A.: *See—*
Kharitonov, Alexandr S.; Panov, Gennadii I.; Ione, Kazimira G.; Romannikov, Vyacheslav N.; Sheveleva, Galina A.; Vostrikova, Lidia A.; and Sobolev, Vladimir I., 5,110,995, Cl. 568-800.000.
Shibahara, Makoto: *See—*
Doke, Harumi; Ishida, Syozi; Iwasa, Hiroki; Nagasaka, Chikao; Ueda, Masuyuki; Kato, Shigeru; Aoki, Hisashi; Shibahara, Makoto; and Mori, Satoshi, 5,111,006, Cl. 200-5.00R.
Shibata, Jun: *See—*
Inoue, Kazushi; Abe, Shigeru; Tagawa, Yuji; Kondo, Takashi; Watanabe, Yasuhiko; and Shibata, Jun, 5,109,785, Cl. 112-303.000.
Shibata, Shinji: *See—*
Makita, Atsuo; Takeuchi, Hirofumi; Shibata, Shinji; and Shimbara, Noboru, 5,109,550, Cl. 4-300.000.

Shibata, Tadashi: *See—*
Ohmi, Tadahiro; Shibata, Tadashi; and Umeda, Masaru, 5,110,438, Cl. 204-298.340.
Shibata, Tsutomu: *See—*
Nakayama, Mizuo; Kuwajima, Shigesumi; Suzuki, Takahito; Miyake, Kazushi; Shibata, Tsutomu; and Seki, Chikashi, 5,111,410, Cl. 364-551.010.
Shibuya, Takao: *See—*
Mukai, Kazuhito; and Shibuya, Takao, 5,109,966, Cl. 192-70.120.
Shiel, Michael J.: *See—*
Chirokas, David S.; Michaud, Daniel G.; McDeed, Arthur P., III; Shiel, Michael J.; Soper, G. Michael; and Mascio, Dennis R., 5,111,397, Cl. 364-419.000.
Shigemitsu, Hideyuki: *See—*
Hongo, Masafumi; and Shigemitsu, Hideyuki, 5,110,866, Cl. 525-67.000.
Shigenaka, Naoto; Hashimoto, Tsuneyuki; and Fuse, Motomasa, to Hitachi, Ltd. Apparatus for material surface observation. 5,111,043, Cl. 250-306.000.
Shih, Sen-Tien. Water-control stopper. 5,110,088, Cl. 251-149.100.
Shiiki, Zenya: *See—*
Satake, Yoshikatsu; Kashiwadate, Ken; Sakaguchi, Yasuo; Katto, Takayuki; and Shiiki, Zenya, 5,110,681, Cl. 428-419.000.
Shikata, Makoto: *See—*
Tanaka, Koutarou; Shikata, Makoto; and Akiyama, Masahiro, 5,111,489, Cl. 377-121.000.
Shike, Toyohiko: *See—*
Jikihara, Tetsuo; Shike, Toyohiko; Katsurada, Manabu; Watanabe, Hisao; and Ikeda, Osamu, 5,110,342, Cl. 71-88.000.
Shikoku Research Institute Incorporated: *See—*
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Sakata, Sueo; and Kumano, Masayoshi, 5,111,377, Cl. 363-95.000.
Shimada, Katsuhiko: *See—*
Yamamoto, Takashi; Matsumoto, Tsuruyoshi; and Shimada, Katsuhiko, 5,111,526, Cl. 385-145.000.
Shimada, Norihiro: *See—*
Miyamoto, Kenji; Tanaka, Makoto; and Shimada, Norihiro, 5,109,901, Cl. 152-209.00R.
Shimamura, Norio: *See—*
Matsumura, Hiroshi; Shimamura, Norio; Ohta, Yasuto; Kawabe, Masaru; Shimizu, Makoto; Natori, Naoaki; and Suzuki, Naohiko, 5,111,201, Cl. 340-870.380.
Shimano Inc.: *See—*
Toda, Junichi, 5,110,066, Cl. 242-255.000.
Shimanuki, Masanobu, to Kabushiki Kaisha Toshiba. Telephone terminal device having speech recognition unit. 5,111,501, Cl. 379-355.000.
Shimbara, Noboru: *See—*
Makita, Atsuo; Takeuchi, Hirofumi; Shibata, Shinji; and Shimbara, Noboru, 5,109,550, Cl. 4-300.000.
Shimco, Inc.: *See—*
Blechschmidt, James L.; Johnson, Robert D.; and Powell, Robert F., 5,110,151, Cl. 280-691.000.
Shimirak, Gerald L.: *See—*
Bliven, David C.; Vranicar, Anthony; Vail, Philip B.; Shimirak, Gerald L.; and Mullaney, Julian S., 5,111,497, Cl. 379-27.000.
Shimizu, Hiromitsu, to Hirose Manufacturing Co., Ltd. Full rotary hook with an increased amount of bobbin thread wound around the bobbin. 5,109,783, Cl. 112-231.000.
Shimizu, Jiro: *See—*
Tsujimoto, Naohiko; Yamakoshi, Masaru; Kudo, Toshimitsu; Horiuchi, Yukiko; and Shimizu, Jiro, 5,110,915, Cl. 530-502.000.
Shimizu, Makoto: *See—*
Matsumura, Hiroshi; Shimamura, Norio; Ohta, Yasuto; Kawabe, Masaru; Shimizu, Makoto; Natori, Naoaki; and Suzuki, Naohiko, 5,111,201, Cl. 340-870.380.
Shimizu, Shin: *See—*
Ohi, Kiyomoto; and Shimizu, Shin, 5,110,741, Cl. 435-284.000.
Shimizu, Sumio: *See—*
Ogata, Masaru; Matsumoto, Hiroshi; Shimizu, Sumio; and Kida, Shiro, 5,110,825, Cl. 514-381.000.
Shimizu, Tasuku: *See—*
Miura, Hideo; Nishimura, Asao; Sakata, Shinji; Shimizu, Tasuku; and Hattori, Shigeo, 5,110,537, Cl. 376-305.000.
Shimizu, Yoshitake: *See—*
Inoue, Masahide; Nakano, Tetsuya; Yabe, Naruo; Tsuyama, Koichi; Shimizu, Yoshitake; and Kuroki, Mitsushi, 5,110,704, Cl. 430-110.000.
Shimizu, Yuji: *See—*
Nakano, Yasushi; Miyake, Tohru; Akutsu, Shigeru; and Shimizu, Yuji, 5,110,658, Cl. 428-141.000.
Shimokawa, Tsutomu: *See—*
Yumoto, Yoshiji; Shimokawa, Tsutomu; and Miura, Takao, 5,110,706, Cl. 430-191.000.
Shimomura, Naoyuki: *See—*
Ogata, Yoshitake; Ikeda, Makoto; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Yamanaka, Takashi; Hishinuma, Icharu; Nagakawa, Junichi; Hirota, Kazuo; Miyamoto, Kaname; Horie, Toru; and Wakabayashi, Tsuneo, 5,110,956, Cl. 549-447.000.
Shin-Etsu Handotai Co., Ltd.: *See—*
Fusegawa, Izumi; Yamagishi, Hirotoshi; and Abe, Takao, 5,110,404, Cl. 156-603.000.
Ogino, Nobuyoshi, 5,110,764, Cl. 437-224.000.
Shin, Kyong S., to Goldstar, Co., Ltd. Water repurification method of city water and its equipment. 5,110,482, Cl. 210-758.000.
Shinada, Hiroyuki: *See—*
Fukuhara, Satoru; Shinada, Hiroyuki; and Seitoh, Shigemitsu, 5,111,141, Cl. 324-250.000.
Shindo, Yasuyuki: *See—*
Inaba, Shin-ichi; Shindo, Yasuyuki; Tsubouchi, Shirou; Naganuma, Hiroki; Nakazawa, Yoshio; Hayashi, Ryusuke; and Yamada, Kanji, 5,110,656, Cl. 428-257.000.
Shinohara, Yoshinao: *See—*
Fujii, Toshio; Shinohara, Yoshinao; and Handa, Keishin, 5,110,870, Cl. 525-194.000.
Shinozaki, Hironori: *See—*
Yokoyama, Mizuho; Kanamaru, Hisanobu; Okamoto, Yoshio; Kuroha, Tunemitu; Koshizaka, Atsushi; and Shinozaki, Hironori, 5,109,823, Cl. 123-472.000.
Shinozaki, Satoshi: *See—*
Maeda, Satoshi; Sawada, Shizuo; and Shinozaki, Satoshi, 5,110,766, Cl. 437-228.000.
Shionogi & Co., Ltd.: *See—*
Ogata, Masaru; Matsumoto, Hiroshi; Shimizu, Sumio; and Kida, Shiro, 5,110,825, Cl. 514-381.000.
Shiotani, Kazuaki: *See—*
Abe, Tunehiko; Nakano, Hiroyuki; Shiotani, Kazuaki; and Takada, Yoshiharu, 5,110,630, Cl. 427-327.000.
Shirai, Katsuo: *See—*
Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; and Ogiwara, Yoshihisa, 5,111,261, Cl. 357-23.700.
Shirai, Katutada; and Mochizuki, Hideharu, to Koito Manufacturing Co., Ltd. Headlight for motor vehicle. 5,111,369, Cl. 362-61.000.
Shirai, Kenichi: *See—*
Nakahara, Moriya; Saito, Yasuyuki; Shirai, Kenichi; Itabashi, Yasushi; and Turugai, Takashi, 5,110,762, Cl. 437-189.000.
Shiraishi, Hajime, to Kabushiki Kaisha Toshiba. Processing apparatus with functional hierarchical structure using corresponding hierarchical machine instruction fields. 5,111,388, Cl. 395-800.000.
Shirakawa, Tsutomu, to Kabushiki Kaisha Kosmek. Hydraulic clamp with direct operated clamping-member. 5,110,099, Cl. 269-25.000.
Shires, Mark R. Real-time electronically modulated cylindrical holographic autostereoscope. 5,111,313, Cl. 359-17.000.
Shirono, Katsuhiro: *See—*
Yamaguchi, Hidefumi; Kiyofuji, Hiroyuki; Shirono, Katsuhiro; Tokuou, Rinpei; and Fuchigami, Jun, 5,110,783, Cl. 502-314.000.
Shirota, Katsuhiro; Eida, Tsuyoshi; Saito, Megumi; and Yamamoto, Takao, to Canon Kabushiki Kaisha. Ink, and recording process using the same. 5,110,356, Cl. 106-22.000.
Shishido, Kihachi: *See—*
Taka, Toshio; Shishido, Kihachi; and Ohkubo, Takuo, 5,110,686, Cl. 428-516.000.
Shizuno, Hisamitsu: *See—*
Chazono, Hirokazu; Saito, Hiroshi; Honda, Mutsumi; Shizuno, Hisamitsu; and Kishi, Hiroshi, 5,111,357, Cl. 361-321.000.
Shoesmith, Roy; and Kittson, Mark O., to Bay Mills Limited. Process for making reinforcements for asphaltic paving. 5,110,627, Cl. 427-208.400.
Shokoohi, Frough K.; and Tarascon, Jean-Marie, to Bell Communications Research. Rechargeable lithiated thin film intercalation electrode battery. 5,110,696, Cl. 429-218.000.
Shook, Robert E. Milling machine vise lifter and storage apparatus. 5,110,241, Cl. 409-235.000.
Showa Aluminum Corporation: *See—*
Toyoda, Kazuo; and Maeda, Masao, 5,110,352, Cl. 75-679.000.
Showa Denko K.K.: *See—*
Ishimura, Yoshimasa; and Kurata, Yohei, 5,110,951, Cl. 549-222.000.
Taka, Toshio; Shishido, Kihachi; and Ohkubo, Takuo, 5,110,686, Cl. 428-516.000.
Showa Shell Sekiyu K.K.: *See—*
Suzuki, Yoshiichi; Sakuma, Shigenori; and Yamakawa, Noriko, 5,110,497, Cl. 252-299.650.
Suzuki, Yoshiichi; Sakuma, Shigenori; and Yamakawa, Noriko, 5,110,498, Cl. 252-299.660.
Showa Shell Sekiyu Kabushiki Kaisha: *See—*
Mogamiya, Hiroyuki; Yamakawa, Noriko; Suzuki, Yoshiichi; Suenaga, Hitoshi; and Hasegawa, Yasuhiro, 5,110,496, Cl. 252-299.610.
Shporer, Mordechai: *See—*
Taicher, Zvi; and Shporer, Mordechai, 5,109,853, Cl. 128-653.200.
Shu, Frank R.; and Chien, Chen-Yie, to Beckman Instruments, Inc. Indirect potentiometric method and diluent for analysis of lithium. 5,110,742, Cl. 436-18.000.
Shulman, Cindy B.: *See—*
Cross, Virginia R.; and Shulman, Cindy B., 5,110,685, Cl. 428-494.000.
Shuto, Sadanobu; Tanemura, Hatsumi; and Hirano, Shigeo, to Fuji Photo Film Co., Ltd. Process for preparing a direct positive photographic material. 5,110,719, Cl. 430-569.000.
Siddiqi, Iqbal: *See—*
Grey, Howard; Mangan, Ciaran; Brochot, Jean; and Siddiqi, Iqbal, 5,110,746, Cl. 436-88.000.
Siedband, Melvin P., to Wisconsin Alumni Research Foundation. Portable X-ray system with ceramic tube. 5,111,493, Cl. 378-103.000.
Siegemund, Gunter: *See—*
Lau, Jurgen; Siegemund, Gunter; and Rohrscheid, Freimund, 5,110,983, Cl. 562-435.000.
Siegfried, Peter K.: *See—*
Peter, Siegfried K.; Weidner, Eckhard O.; Ender, Ulrich M.; and Czech, Bernd A., 5,110,509, Cl. 554-184.000.

Siemens Aktiengesellschaft: *See—*
Gugel, Georg; Haefner, Martin; Bauer, Rainer; and Krauss, Peter, 5,109,718, Cl. 73-866.500.
Kummert, Anton, 5,111,418, Cl. 364-724.190.
Nowak, Stefan; and Bleisteiner, Robert, 5,111,378, Cl. 363-98.000.
Sarkoezi, Imre, 5,111,480, Cl. 375-4.000.
Siemens Pacesetter, Inc.: *See—*
Adinolfi, David W., 5,109,842, Cl. 128-419.00D.
Sierra Design, Inc.: *See—*
Kramer, Paul F., 5,110,383, Cl. 156-88.000.
Sigma Instruments, Inc.: *See—*
Yeh, Thomas, 5,111,189, Cl. 340-664.000.
Signode Corporation: *See—*
Angarola, Barry R.; and Duenser, William F., 5,109,575, Cl. 24-16.0PB.
Silbermann, Joseph; and Burchill, Michael T., to Atochem North America. Process for making a surface modified polymer article. 5,110,634, Cl. 427-430.100.
Silbermann, Joseph: *See—*
Burchill, Michael T.; Rafiei, Maryam; and Silbermann, Joseph, 5,110,625, Cl. 427-160.000.
Burchill, Michael T.; and Silbermann, Joseph, 5,110,626, Cl. 427-160.000.
Silicon Integrated Systems Corp.: *See—*
Liang, Wei-Chen; and Lin, I-Bin, 5,111,428, Cl. 365-104.000.
Sill, Karl-Hermann; and Lenski, Harald, to Dornier GmbH. Manipulating liquid under condition of weightlessness. 5,110,406, Cl. 156-621.000.
Silny, Jiri; and Rau, Gunter, to Forschungsgesellschaft fur Biomedizinische Technik e.V. Apparatus for and method of motility and peristalsis monitoring. 5,109,870, Cl. 128-780.000.
Silverman, Gary S.: *See—*
Nobile, Frederick E.; Harris, John F., III; Silverman, Gary S.; and Baumann, Richard A., 5,111,316, Cl. 359-52.000.
Simjian, Luther G., to Command Automation, Inc. Chair with moving seat and moving mirror. 5,110,181, Cl. 297-185.000.
Simmonds, Michael B., to Quantum Magnetics, Inc. Superconducting bonds for thin film devices. 5,110,034, Cl. 228-179.000.
Simon, Jean-Michel, to Hutchinson S.A. Elastic mounting, particularly for a vehicle engine. 5,110,097, Cl. 267-136.000.
Simon, Ulrich; and Scholten, Heinz, to Huels Aktiengesellschaft. Fusible adhesives for textile fastening inserts. 5,110,673, Cl. 428-236.000.
Simpfendorfer, Dieter: *See—*
Biebesheimer, Klaus; Hofsess, Alexander; and Simpfendorfer, Dieter, 5,109,631, Cl. 51-111.00R.
Simpson, Daniel J.: *See—*
Marrone, Babetta L.; Simpson, Daniel J.; Unkefer, Clifford J.; and Whaley, Thomas W., 5,110,725, Cl. 435-11.000.
Simpson Strong-Tie Company, Inc.: *See—*
Colonias, Karen W.; and Bugbee, Michael W., 5,109,646, Cl. 52-712.000.
Singh, Surjit, to SCIPAR, Inc. Method of suppressing formation of contrails and solution therefor. 5,110,502, Cl. 252-319.000.
Sinkkonen, Matti, to Tana-Jyra Ky. Transfer device to grip a double wheel. 5,110,067, Cl. 244-50.000.
Sirkar, K. K.; Bhave, R. R.; Taskier, H. T.; and Ostler, M. I., to Celanese Corporation. Immobilized liquid membrane. 5,110,326, Cl. 55-158.000.
Sismour, Albert C., Jr.: *See—*
Londergan, Mark B.; Sismour, Albert C., Jr.; and Richardson, John E., 5,111,097, Cl. 310-261.000.
Sit, Sing-Yuen; and Wright, John J., to Bristol-Myers Company. Antihypercholesterolemic tetrazole compounds. 5,110,940, Cl. 548-252.000.
Sivak, Andrew J.: *See—*
Haus, Mary K.; and Sivak, Andrew J., 5,110,971, Cl. 556-446.000
Ski Tote U.S.A.: *See—*
Balaban, Jeffrey B.; Olmes, James B.; and Greenblat, Jerris E., 5,109,548, Cl. 2-175.000.
Skinfill, Donald R.: *See—*
Huber, Terrence D.; Kutsch, Duane B.; Seaton, William J.; and Skinfill, Donald R., 5,111,193, Cl. 340-783.000.
Skis Rossignol S. A.: *See—*
Blanc, Annie, 5,110,125, Cl. 273-73.00C.
Skrede, Roger W., to Future Design Corporation. Bait bucket with locking bait tray. 5,109,625, Cl. 43-56.000.
Skyba, Helmut K. Weight bearing apparatus for hanging on upright structures. 5,109,954, Cl. 182-189.000
Slaff, Geoffrey F.: *See—*
Noble, Richard D.; Koval, Carl A.; Nixon, Lori; and Slaff, Geoffrey F., 5,110,624, Cl. 427-212.000.
Slater, Linda: *See—*
Brittain, David R.; Brown, Steven P.; Cooper, Anthony L.; Longridge, Jethro L.; Morris, Jeffrey J.; Preston, John; and Slater, Linda, 5,110,808, Cl. 514-155.000.
Slay, Clyde E., to Safe-T-Jack, Inc. Extendible jack stand. 5,110,089, Cl. 254-8.00B.
Slingerland, Hendrik N., to U.S. Philips Corp. Heat-actuated vacuum valve for a particle beam apparatus. 5,111,054, Cl. 250-441.110.
Slomka, Bogdan J.; and Buttermore, William H., to Iowa State University Research Foundation. Method and means for dynamic measurement of rates of adsorption from solutions. 5,109,714, Cl. 73-865.500.
Slots, Hendrik J.: *See—*
Schutyser, Jan A. J.; Buser, Antonius J. W.; Zuuring, Pieter H.; and Slots, Hendrik J., 5,110,867, Cl. 525-114.000.
Slouf, Elizabeth J.: *See—*
Slouf, James W.; and Slouf, Elizabeth J., 5,109,780, Cl. 112-80.030.
Slouf, James W.; and Slouf, Elizabeth J. Embroidery tool. 5,109,780, Cl. 112-80.030.
Small, Gary L.: *See—*
Ganapol, David L.; and Small, Gary L., 5,110,628, Cl. 427-256.000.
Smeltz, Palmer D., Jr.: *See—*
Chaoui, Ghazi M.; and Smeltz, Palmer D., Jr., 5,111,522, Cl. 385-92.000.
Smit Transformatoren B.V.: *See—*
Boersma, Rintje, 5,110,483, Cl. 210-787.000.
Smith, Anthony D.; and Jobst, Kim A., to E. R. Squibb & Sons, Inc. Method for diagnosing sentile dementia of the Alzheimer's type. 5,109,868, Cl. 128-774.000.
Smith, Bradley W.: *See—*
Cunningham, Donald J.; and Smith, Bradley W., 5,109,772, Cl 102-275.110.
Smith, Brian C.: *See—*
Nunberg, Geoffrey D.; Stansbury, H. Tayloe; Abbott, Curtis; and Smith, Brian C., 5,111,398, Cl. 364-419.000.
Smith Corona Corporation: *See—*
Sherman, Howard F., 5,109,573, Cl. 16-341.000.
Smith, Gregory C., to Allied-Signal Inc. Compressed air dryer 5,110,327, Cl. 55-163.000.
Smith Kline & Franch Laboratories Limited: *See—*
Jaxa-Chamiec, Albert A.; and Hickey, Deirdre M. B., 5,110,875, Cl. 525-332.200.
Smith, Leon B., to Gilbarco, Inc. Automatic fuel dispenser actuator. 5,110,010, Cl. 222-75.000.
Smith, Paul D.; Padula, Michael J.; and McDermott, Robert M., to Summagraphics Corporation. Graphics tablet with N-dimensional capability. 5,111,005, Cl. 178-19.000.
Smith, Robert J., to Genesis Energy Systems, Inc. Apparatus and method for converting radioactive energy into electrical energy. 5,111,099, Cl. 310-305.000.
Smith, Rodney A.; and Janigian, Paul. Automated fund collection system including means to eliminate duplicate entries from a mailing list. 5,111,395, Cl. 364-408.000.
Smith, Steven R.: *See—*
Zachman, Julie C.; Kuntz, Robert A.; Smith, Steven R.; and Hudzik, James S., 5,111,406, Cl. 364-474.020.
Smithkline Beckman Corp.: *See—*
Flisak, Joseph R.; Gassman, Paul G.; Lantos, Ivan; and Mendelson, Wilford L., 5,110,959, Cl. 549-513.000
Maddon, Paul J.; Axel, Richard; Sweet, Raymond W.; and Arthos, James, 5,110,906, Cl. 530-350.000.
Smithkline Beecham Corporation: *See—*
Holt, Dennis A.; Levy, Mark A.; and Metcalf, Brian W., 5,110,939, Cl. 548-250.000.
Kwan, Lilian; and Steber, William, 5,110,598, Cl. 424-438.000
Smolucha, Walter, to Williams Electronics Games, Inc. Back box latch for pinball games. 5,110,120, Cl. 273-121.00R.
Smook, Malcoln A.: *See—*
Harwood, H. James; Jones, Allan S.; and Smook, Malcoln A., 5,110,876, Cl. 525-332.300.
Snamprogetti S.p.A.: *See—*
Bellussi, Giuseppe; Carati, Angela; and Cavani, Fabrizio, 5,110,570, Cl. 423-277.000.
Snellgrove, Richard A.: *See—*
Goodman, David A.; Plumb, John L.; Geens, Rudy E. M.; Snellgrove, Richard A.; and Wyner, Elliot, 5,111,108, Cl. 313-630.000
Snook, Richard, to Technitex, Inc. Video keratometer. 5,110,200, Cl 351-212.000.
Snow, Johnnie P.: *See—*
Berner, Dana K.; Berggren, Gerard T.; and Snow, Johnnie P., 5,110,805, Cl. 514-76.000
Snyder, Stephen J.; and Wilson, John L., to Cal-Surgical, Inc. Adjustable multipole support stand for medical fluids. 5,110,076, Cl. 248-125.000.
Snyder, Thomas S.; and Lee, Ernest D., to Westinghouse Electric Corp Chromatographic separation of zirconium isotopes with reduced waste liquor. 5,110,566, Cl. 423-70.000
Snyder, William J.; and Anderson, John E., to Union Carbide Industrial Gases Technology Corporation. Fluidic burner. 5,110,285, Cl 431-8.000.
Soane, David S., to Soane Technologies, Inc. Controlled casting of a shrinkable material. 5,110,514, Cl. 264-22.000
Soane Technologies, Inc.: *See—*
Soane, David S., 5,110,514, Cl. 264-22.000.
Sobolev, Vladimir I.: *See—*
Kharitonov, Alexandr S.; Panov, Gennadii I.; Ione, Kazimira G.; Romannikov, Vyacheslav N.; Sheveleva, Galina A.; Vostrikova, Lidia A.; and Sobolev, Vladimir I., 5,110,995, Cl. 568-800.000
Societe anonyme dite Hispano-Suiza: *See—*
Cattelain, Camille M.; and Girard, Francis, 5,109,634, Cl. 51-237.00R.
Societe Civile Particuliere Fact-Anal: *See—*
Lecat, Roger J., 5,109,551, Cl. 4-431.000
Societe d'Applications des Techniques Photoniques: *See—*
Guegan, Alain; Gy, Jules; Hespel, Jean-Pierre; and Rouyer, Philippe, 5,109,866, Cl. 128-771.000.
Societe d'Etudes Scientifiques et Industrielles de L'Ile-de-France: *See—*
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Gardaix-Luthereau, Renee; Costall, Brenda; and Naylor, Robert, 5,110,824, Cl. 514-377.000.

Societe Nationale des Poudres et Explosifs: *See*—
Lecolier, Serge; Mortreux, Andre ; Petit, Francis; and Samain, Henri, 5,110,961, Cl. 556-31.000.
Societe Nationale Elf Aquitaine: *See*—
Cahiez, Gerard; Laboue, Blandine; and Tozzolino, Pierre, 5,110,962, Cl. 556-46.000.
Societe Nationale Industrielle et Aerospatiale: *See*—
Jolys, Pascal; and Lagain, Philippe, 5,111,021, Cl. 219-121.600.
Soeda, Mizuo; and Watanabe, Kazuyoshi, to Cabot Corporation. Carbon block having a high specific surface area. 5,110,576, Cl. 423-445.000.
Solindo Equipment Leasing Limited: *See*—
Instone, Jeremy; and Instone, Giles, 5,109,999, Cl. 220-1.500.
Somar Corporation: *See*—
Nagafuchi, Yasuhiro; Seki, Mitsuhiro; Sumi, Shigeo; and Hamamura, Fumio, 5, 10,400, Cl. 156-521.000.
Sumi, Shigeo; and Fukuda, Ichio, 5,110,393, Cl. 156-344.000.
Taguchi, Hiroshi; and Washizaki, Youji, 5,110,391, Cl. 156-250.000.
Somers, Marc S., to Eastman Kodak Company. Process for packaging amorphous polyolefins. 5,109,892, Cl. 141-11.000.
Somerville, Thomas A., to Burr-Brown Corporation. Compact low noise low power dual mode battery charging circuit. 5,111,131, Cl. 320-32.000.
Somfai, Eva: *See*—
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo; Soos, Rudolf; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 5,110,976, Cl. 558-407.000.
Sondergeld, Carl H.: *See*—
Millheim, Keith K.; Mount, Houston B., II; Rai, Chandra S.; and Sondergeld, Carl H., 5,109,697, Cl. 73-153.000.
Sone, Masakazu: *See*—
Yukita, Yasuo; Sone, Masakazu; and Funayama, Hidehiko, 5,110,787, Cl. 503-206.000.
Soni, Dalip S., to Stone & Webster Engineering Corp. Process for the return of recovered particulate solids by a cyclone separator to a vessel. 5,110,323, Cl. 55-1.000.
Sonobe, Hironori: *See*—
Miyashita, Naoto; Takahashi, Koichi; Sonobe, Hironori; and Koyama, Mitsutoshi, 5,111,272, Cl. 357-49.000.
Sony Corporation: *See*—
Eto, Hiroshi; Oka, Nobuyuki; and Nagaki, Takehiro, 5,111,441, Cl. 369-13.000.
Kume, Hisao; Kuwajima, Shuichi; and Sanma, Takahide, 5,111,107, Cl. 313-405.000.
Kutaragi, Ken; Furuhashi, Makoto; and Ishibashi, Toshiya, 5,111,530, Cl. 395-20.000.
Nakajima, Heitaro; Hotori, Masahiro; Ogawa, Hiroshi; and Fujiie, Kazuhiko, 5,111,442, Cl. 369-47.000.
Narui, Hironobu; Yoshimatsu, Hiroshi; Hirata, Shoji; Ozawa, Masafumi; and Mori, Yoshifumi, 5,111,469, Cl. 372-46.000.
Psaltis, Demetri; Yamamura, Alan; and Kobayashi, Seiji, 5,111,445, Cl. 369-103.000.
Toriyama, Ichiro, 5,111,209, Cl. 342-357.000.
Yamashita, Noriyuki, 5,111,305, Cl. 358-342.000.
Yukita, Yasuo; Sone, Masakazu; and Funayama, Hidehiko, 5,110,787, Cl. 503-206.000.
Soos, Rudolf: *See*—
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo; Soos, Rudolf; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 5,110,976, Cl. 558-407.000.
Soper, G. Michael: *See*—
Chirokas, David S.; Michaud, Daniel G.; McDeed, Arthur P., III; Shiel, Michael J.; Soper, G. Michael; and Mascio, Dennis R., 5,111,397, Cl. 364-419.000.
Sorrells, Martin, to OmniTech Services Inc. Apparatus for pack-off locking of seismic energy source. 5,109,946, Cl. 181-106.000.
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Dittrich, Uwe; Dathe, Sigrid; Raabe, Hartmut; Sourisseau, Rolf; and Ruehlmann, Klaus, 5,110,969, Cl. 556-427.000.
Southern Clay Products, Inc.: *See*—
Knudson, Milburn I., Jr.; and Jones, Thomas R., 5,110,501, Cl. 252-315.200.
Southern Plastic Mold, Inc.: *See*—
Noggle, Michael K., 5,109,619, Cl. 40-152.100.
Southwest Research Institute: *See*—
Newkirk, Matthew S.; and Human, David M., 5,109,710, Cl. 73-863.110.
Owen, Thomas F., 5,109,698, Cl. 73-632.000.
Southwire Company: *See*—
Akin, Mickey E.; and Lowery, James O., 5,109,565, Cl. 15-309.100.
Sparks, Charles; Odru, Pierre; Auberon, Marcel; and Fuchs, Jean-Francois, to Institut Francais Du Petrole et Aerospatiale. Composition material tube substantially insensitive to the variations of length under the effect of the internal pressure. 5,110,644, Cl. 428-36.300.
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Devitt, John W.; Bantel, Thomas E.; Sparks, Joseph M.; and Kania, Janet S., 5,111,048, Cl. 250-342.000.
Sparring Elfa Aktiebolag: *See*—
Rieman, Martin, 5,110,080, Cl. 248-225.100.
Sparton Corporation: *See*—
Rempinski, Donald R.; and Britt, Donald R., 5,110,093, Cl. 254-266.000.
Spater, Stuart S.: *See*—
Kolton, Chester; and Spater, Stuart S., 5,110,019, Cl. 223-87.000.
Spatial Positioning Systems, Inc.: *See*—
Dornbusch, Andrew W.; Beliveau, Yvan J.; Lundberg, Eric J.; and Pratt, Timothy, 5,110,202, Cl. 356-1.000.
Spears Manufacturing Corp.: *See*—
Spears, Robert W., 5,109,929, Cl. 169-16.000.
Spears, Robert W., to Spears Manufacturing Corp. Sprinkler head adapter. 5,109,929, Cl. 169-16.000.
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Daleiden, John P., 5,109,840, Cl. 128-205.130.
Spector, Donald. Camera for producing pictures of individuals jointly with characters. 5,111,224, Cl. 354-125.000.
Speers, George A. Overhanging structure. 5,109,643, Cl. 52-90.000.
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Champion, Donald H.; and Speranza, George P., 5,110,991, Cl. 568-618.000.
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Bruzzone, Giuseppe; Perrone, Diego; and Sperati, Alessandro, 5,110,360, Cl. 106-638.000.
Spies, Alfons: *See*—
Bernard, Harald; and Spies, Alfons, 5,111,040, Cl. 250-237.00G.
Spitz, Roger N.: *See*—
Hangey, Dale A.; Friedberger, Michael P.; Archie, William A.; and Spitz, Roger N., 5,110,317, Cl. 8-115.600.
Sportoletti, Giancarlo: *See*—
Casu, Benito; Naggi, Annamaria; Oreste, Pasqua; Torri, Giangiacomo; Zoppetti, Giorgio; Sportoletti, Giancarlo; and De Santis, Francesco, 5,110,918, Cl. 536-21.000.
Sprecker, Mark A.: *See*—
Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., 5,110,953, Cl. 549-263.000.
Spring, Richard E.: *See*—
Bright, Irving; Erickson, Ronald C.; Greene, Dennis K.; Hardy, Gerald D.; Hefner, Robert E.; Johnson, Lowell E.; Schwingel, Donald J.; and Spring, Richard E., 5,109,696, Cl. 73-118.100.
Spuler, Rolf. Piezoelectric bridge sound pick-up for string instruments. 5,109,747, Cl. 84-731.000.
Square D Company: *See*—
Cassity, Terry A.; and Sharp, Jeffrey O., 5,109,897, Cl. 144-144.5GT.
Oster, Clark L., 5,111,008, Cl. 200-144.00R.
Squirrell, Anton F., to Grovak Grossventiltechnik AG. Isolator with a hydraulic actuator and with a rotation-trueing coupling for the isolator shaft. 5,109,883, Cl. 137-385.000.
Sreepada, Sastry R.; and Rippel, Robert R., to United States of America, Energy. Measurement of average density and relative volumes in a dispersed two-phase fluid. 5,110,208, Cl. 356-128.000.
SRI International: *See*—
Nanis, Leonard, 5,110,531, Cl. 264-219.000.
Stacher, Angelo; and Weber, Heribert, to Sulzer Brothers Limited. Loom sley drive. 5,109,890, Cl. 139-190.000.
Stadler, James F.; Kufen, David L.; and Purvis, James L., to Exxon Research and Engineering Company. Water resistant grease composition. 5,110,489, Cl. 252-35.000.
Stadler, James F.: *See*—
Pink, Harry S.; Hutchings, Timothy; and Stadler, James F., 5,110,490, Cl. 252-35.000.
Stafford, Daniel G.: *See*—
Borders, Richard L.; Newkirk, David C.; and Stafford, Daniel G., 5,109,554, Cl. 5-602.000.
Stahl, Werner; and Buggisch, Hans, to Stahl, Werner. Process for extruding a wet material. 5,110,611, Cl. 426-512.000.
Stahlecker, Fritz; and Stahlecker, Hans. Arrangement for open end rotor spinning. 5,109,663, Cl. 57-407.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz; and Stahlecker, Hans, 5,109,663, Cl. 57-407.000.
Staley, James G.: *See*—
Poulo, Louis R.; and Staley, James G., 5,111,133, Cl. 323-286.000.
Stamness, Jesse I.: *See*—
Idleman, Thomas E.; and Stamness, Jesse I., 5,111,387, Cl. 395-425.000.
Stanco, Christoph; Ochs, Heinrich; and Difflipp, Kurt, to MAN Roland Druckmaschinen AG. Adjustable gripper device for sheet-fed rotary presses. 5,110,109, Cl. 271-82.000.
Stanculescu, Alec G.: *See*—
Lazansky, Richard W.; Miller, Thomas R.; Coelho, David R.; Scott, Kenneth E.; and Stanculescu, Alec G., 5,111,413, Cl. 364-578.000.
Stanko, Gary: *See*—
McPherson, Cheryl; Stanko, Gary; and Urso, Richard, 5,109,991, Cl. 211-45.000.
Stanley Electric Co., Ltd.: *See*—
Ishikawa, Kiyomitsu; and Tanabe, Toru, 5,111,182, Cl. 340-479.000.
Stansbury, H. Tayloe: *See*—
Nunberg, Geoffrey D.; Stansbury, H. Tayloe; Abbott, Curtis; and Smith, Brian C., 5,111,398, Cl. 364-419.000.
Stant Inc.: *See*—
MacWilliams, Robert, 5,110,003, Cl. 220-304.000.
Stark, Joseph P.: *See*—
Arold, Johathan B.; Mishou, Joan L.; Parent, Charles R.; Stark, Joseph P.; and Webb, Edward A., 5,111,527, Cl. 392-360.000.
Starks, John W.; and Kyle, E. Wayne. Mobile and adjustable scaffold system for tunnel roofing and other applications. 5,109,952, Cl. 182-63.000.

Staver, Daniel A.: *See*—
Molnar, Karl J.; Chung-Yih, Ho; Staver, Daniel A.; and Molnar, Barbara D., 5,111,421, Cl. 364-748.000.
Stayer, Mark L., Jr.; Antkowiak, Thomas A.; Lawson, David F.; and Koch, Russell W., to Bridgestone/Firestone, Inc. Diene polymers and copolymers terminated by reaction with N-alkyl and N-aryl imines. 5,109,907, Cl. 152-564.000.
STC PLC: *See*—
Jahromi, Fazlollah R., 5,111,324, Cl. 359-189.000.
Taylor, Kenneth; and Allen, Roy, 5,110,224, Cl. 385-25.000.
Steamatic, Inc.: *See*—
Harrison, Richard R., 5,109,567, Cl. 15-345.000.
Steber, William: *See*—
Kwan, Lilian; and Steber, William, 5,110,598, Cl. 424-438.000.
Steckelberg, Willi: *See*—
Bauer, Wolfgang; Steckelberg, Willi; and Ritter, Josef, 5,110,917, Cl. 534-815.000.
Steelcase Inc.: *See*—
Malin, Stuart B., 5,111,392, Cl. 364-401.000.
Steele, Randy C., to SGS-Thomson Microelectronics, Inc. Power reduction circuit for programmable logic device. 5,111,079, Cl. 307-465.000.
Steer, Adrian M., to T & N Technology Limited. Intumescent sheet material. 5,110,413, Cl. 162-145.000.
Stegmann, Werner; and Luisoli, Reto, to Ciba-Geigy Corporation. Process for the preparation of phenolic thiocarboxylic acid esters. 5,110,978, Cl. 560-15.000.
Stein, Craig B.: *See*—
Stein, Scott C.; Stein, Craig B.; and Stein, Sean T., 5,110,184, Cl. 297-349.000.
Stein, Scott C.; Stein, Craig B.; and Stein, Sean T. Rotatable beach chair. 5,110,184, Cl. 297-349.000.
Stein, Sean T.: *See*—
Stein, Scott C.; Stein, Craig B.; and Stein, Sean T., 5,110,184, Cl. 297-349.000.
Steinbiss, Joachim: *See*—
Schlipfenbacher, Reiner; and Steinbiss, Joachim, 5,110,550, Cl. 422-56.000.
Steinfuhrer, Gerd: *See*—
Rebhan, Ulrich; Steinfuhrer, Gerd; Voss, Frank; and Oesterlin, Peter, 5,111,473, Cl. 372-59.000.
Steinmetz, David L.: *See*—
Hadimioglu, Babur B.; Khuri-Yakub, Butrus T.; and Steinmetz, David L., 5,111,220, Cl. 346-140.00R.
Stenman, Kimmo E.: *See*—
Ikola, Kimmo J.; and Stenman, Kimmo E., 5,110,340, Cl. 65-269.000.
Stephany, Joseph F.: *See*—
Wysocki, Joseph J.; Hark, Sui K.; Hull, Virgil J.; Stephany, Joseph F.; Lakatos, Andras I.; and Narang, Ram S., 5,111,320, Cl. 359-87.000.
Stephenson, George M.: *See*—
Monteith, Robert D.; and Johnson, Keith, 5,110,231, Cl. 401-190.000.
Stepp, Lee W.; Giroux, Richard L.; Crump, Joseph B.; and Borges, Jerome F., to Halliburton Company. Multiple stage inflation packer with secondary opening rupture disc. 5,109,925, Cl. 166-184.000.
Stepper, Mark R.: *See*—
Custer, Robert J.; and Stepper, Mark R., 5,109,819, Cl. 123-399.000.
Sterling Drug Inc.: *See*—
Diana, Guy D., 5,110,821, Cl. 514-364.000.
Sternburg, Charles F.: *See*—
Kosow, David P.; Bhattacharya, Prabir; and Sternburg, Charles F., 5,110,907, Cl. 530-383.000.
Sterner Lighting Systems Incorporated: *See*—
Nielson, Wayne G., 5,111,371, Cl. 362-261.000.
Stevens, Eric G., to Eastman Kodak Company. Charge-coupled device (CCD) image sensor operable in either interlace or non-interlace mode. 5,111,263, Cl. 357-24.000.
Stevens, James E.; Cecchi, Joseph L.; and Colestock, Patrick L., to Consortium for Surface Processing, Inc. Method and apparatus for coupling a microwave source in an electron cyclotron resonance system. 5,111,111, Cl. 315-111.410.
Stevens, John W., to Lucas Industries Public Limited Company. Fuel injection nozzle. 5,110,053, Cl. 239-533.900.
Stevens, John W., to Lucas Industries. Fuel injector. 5,110,054, Cl. 239-533.110.
Stewart, Bob W. Coupling mechanism for efficient conversion of axi-symmetric beam profiles into profiles suitable for diffraction-free transmission in free space. 5,111,312, Cl. 359-11.000.
Stewart, John W., to NCR Corporation. Digitally controlled delay circuit. 5,111,085, Cl. 307-603.000.
Stewart, Kevin J.: *See*—
Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., 5,110,711, Cl. 430-296.000.
Stewart, Patrick A. Power tool adaptor. 5,110,145, Cl. 279-24.000.
Stewart, Robert B.: *See*—
Grupp, Larry A.; Perlanski, Edward; and Stewart, Robert B., 5,110,813, Cl. 514-212.000.
Steyn, Willem J.: *See*—
Fisher, Charles K.; and Steyn, Willem J., 5,110,246, Cl. 411-429.000.
Stiebel, Ariel. Method and apparatus for controlling electrical resistance spot welding. 5,111,020, Cl. 219-110.000.
Stiefel, Edward I.: *See*—
Coyle, Catherine L.; Farina, Scott A.; Stiefel, Edward I.; and Greaney, Mark A., 5,110,963, Cl. 556-61.000.
Stienbarger, LeRoy; and Gray, Frank, to Champion Toy Company. Three-wheeled scooter with reciprocating treadle drive. 5,110,148, Cl. 280-221.000.
Stitt, Paul A. Method of increasing live births to female animals and animal feed blend suitable for same. 5,110,592, Cl. 424-195.100.
Stock, Gunther: *See*—
Kappel, Johannes; Stock, Gunther; Eickhoff, Karl; and Petschauer, Franz, 5,109,764, Cl. 100-99.000.
Stockdell, Brian L.: *See*—
Keate, Christopher R.; Aguirre, Sergio; and Stockdell, Brian L., 5,111,155, Cl. 330-149.000.
Stoddard Sekers International plc: *See*—
Fraser, Neil S., 5,110,397, Cl. 156-435.000.
Stolfo, John J.: *See*—
Pokora, Alexander R.; and Stolfo, John J., 5,110,740, Cl. 435-262.000.
Stolllewerk, Reinfried: *See*—
Schunk, Bernd; Stolllewerk, Reinfried; Hubricht, Gerhard; and Peters, Jorg, 5,111,524, Cl. 385-102.000.
Stone & Webster Engineering Corp.: *See*—
Soni, Dalip S., 5,110,323, Cl. 55-1.000.
Stonier, Roger A.: *See*—
Marzi, Danilo; and Stonier, Roger A., 5,111,354, Cl. 361-218.000.
Storer, Richard; Mo, Chi L.; and Turnbull, John P., to Glaxo Group Limited. Process for the preparation of a carbocyclic nucleoside analogue. 5,110,926, Cl. 544-276.000.
Storm, Carlyle B.: *See*—
Lee, Kien-yin; and Storm, Carlyle B., 5,110,380, Cl. 149-92.000.
Stradi, Riccardo: *See*—
Ferraris, Paolo C.; and Stradi, Riccardo, 5,110,798, Cl. 514-19.000.
Stramel, Matt: *See*—
Krawl, Randy; and Stramel, Matt, 5,110,457, Cl. 210-787.000.
Stransky, Larry W.; Boehm, Valentine R., Jr.; and Phillips, Michael A., to General Electric Company. Method and apparatus for automatic bypass operation. 5,109,667, Cl. 60-226.300.
Street, Glenn M. Combination ski pole and glove. 5,110,154, Cl. 280-822.000.
Strom-Olsen, John O.: *See*—
Ryan, Dominic H.; Strom-Olsen, John O.; Kycia, Jan; Patel, Bipin; and Dumais, Francois, 5,110,695, Cl. 429-206.000.
Strong, Donald. Attachment for miter gage. 5,109,742, Cl. 83-421.000.
Strukelj, Marko: *See*—
Hay, Allan S.; and Strukelj, Marko, 5,110,934, Cl. 546-159.000.
Strutz, William F.: *See*—
Garrison, Dale L.; and Strutz, William F., 5,110,418, Cl. 202-81.000.
Stuart, James F., to Packaged Ice, Inc. Ice bagger. 5,109,651, Cl. 53-502.000.
Studtmann, George H.; Ward, James R.; and Forbes, Terry L., to Borg-Warner Automotive Electronic & Mechanical Systems Corporation. Variable force solenoid hydraulic control valve. 5,110,087, Cl. 251-129.160.
Suau, Jean-Marc: *See*—
Mongoin, Jacques; Ravet, Georges; and Suau, Jean-Marc, 5,110,358, Cl. 106-462.000.
Subotic, Nikola S.; and Eismann, Michael T. 2D charge coupled device memory with acoustic charge transport multiplexer. 5,111,436, Cl. 365-238.000.
Suchowerskyj, Wadym: *See*—
Herden, Werner; Konrad, Johann; Sautter, Helmut; and Suchowerskyj, Wadym, 5,109,829, Cl. 123-643.000.
Sudmanns, Hans, to MTU Motoren-und Turbinen-Union Friedrichshaften GmbH. Piston internal-combustion engine having a supercharging operation using a group of switchable exhaust gas turbochargers. 5,109,674, Cl. 60-612.000.
Sudo, Morihiro; Muraki, Tomoyasu; Kawachi, Eiji; and Kawachi, Yasushi, to Daikyo Gomu Seiko Ltd. Process for the production of modified polysiloxane-coated sanitary rubber article. 5,110,621, Cl. 427-44.000.
Suenaga, Hitoshi: *See*—
Mogamiya, Hiroyuki; Yamakawa, Noriko; Suzuki, Yoshiichi; Suenaga, Hitoshi; and Hasegawa, Yasuhiro, 5,110,496, Cl. 252-299.610.
Suga, Tadoru, to Ibaraki Precision Machinery Co., Ltd. Gas feed arrangement for supply of gas into bags in a packaging machine. 5,109,654, Cl. 53-511.000.
Sugai, Kazuyoshi: *See*—
Noguchi, Osamu; and Sugai, Kazuyoshi, 5,111,100, Cl. 310-313.00A.
Sugama, Toshifumi, to Associated Universities, Inc. Solid-gel precursor solutions and methods for the fabrication of polymetallicsiloxane coating films. 5,110,863, Cl. 524-767.000.
Sugatsune Industrial Co., Ltd.: *See*—
Ohshima, Kazuyoshi; and Nakayama, Yojiro, 5,109,571, Cl. 16-307.000.
Sugawara, Hirofumi: *See*—
Inaba, Ryohei; Kumamura, Masaaki; Danmoto, Shojiro; Arai, Mitsuo; Tobo, Yozo; Sugawara, Hirofumi; and Miyazaki, Tadanobu, 5,110,522, Cl. 264-40.400.
Sugayama, Sakae: *See*—
Tomizuka, Kazuo; Sugayama, Sakae; Saeki, Takao; and Sandoh, Fumio, 5,111,274, Cl. 357-53.000.

Sugimoto, Yoichi: *See—*
Yahagi, Toshio; Iwagawa, Yoshihiro; Sugimoto, Yoichi; and Satoh, Tsuyoshi, 5,109,694, Cl. 73-9.000.
Sugita, Kazuhiko: *See—*
Kato, Kunio; Iida, Yasumasa; Honda, Takenobu; Sugita, Kazuhiko; and Yamasaki, Shinji, 5,109,958, Cl. 187-20.000.
Sugiura, Hisao; Nishimura, Takashi; and Tanaka, Toshinobu, to Ube Industries, Ltd. Imidazole compounds having fungicidal activity. 5,110,827, Cl. 514-399.000.
Sugiura, Kiyohiko: *See—*
Sugiura, Masayuki; Miki, Nobuaki; Nasu, Takeshi; Sugiura, Kiyohiko; and Saito, Masao, 5,111,175, Cl. 336-192.000.
Sugiura, Masayuki; Miki, Nobuaki; Nasu, Takeshi; Sugiura, Kiyohiko; and Saito, Masao, to Aisin AW Co., Ltd. Resin molding with embedded coil for electromagnetic valve with thermal shock protection of coil leads. 5,111,175, Cl. 336-192.000.
Sugiyama, Takeshi, to Mitsubishi Denki K.K. Starter of an engine. 5,111,057, Cl. 290-38.00R.
Sukigara, Kazutoshi: *See—*
Nakano, Masaru; and Sukigara, Kazutoshi, 5,111,516, Cl. 382-14.000.
Suko, Scott K., to Westinghouse Electric Corp. Low loss drain pulser circuit for solid state microwave power amplifiers. 5,111,084, Cl. 307-571.000.
Sullivan, Charles J. Nursing bottle assembly with means to remove air. 5,109,996, Cl. 215-11.600.
Sullivan, John L.; and Xu, Ning-Sheng, to National Research Development Corp. Method and apparatus for generating particle beams. 5,111,042, Cl. 250-251.000
Sullivan, Thomas J.: *See—*
Morley, Robert E., Jr.; Engebretson, A. Maynard; Engel, George L.; and Sullivan, Thomas J., 5,111,419, Cl. 364-724.190.
Sulzer Brothers Limited: *See—*
Stacher, Angelo; and Weber, Heribert, 5,109,890, Cl. 139-190.000.
Sumi, Shigeo; and Fukuda, Ichio, to Somar Corporation. Method of peeling a bonded film from a circuit board. 5,110,393, Cl. 156-344.000.
Sumi, Shigeo: *See—*
Nagafuchi, Yasuhiro; Seki, Mitsuhiro; Sumi, Shigeo; and Hamamura, Fumio, 5,110,400, Cl. 156-521.000.
Sumitomo Bakelite Company Limited: *See—*
Miyata, Seizo; Hosomi, Takeshi; Suzuki, Toshio; Watanabe, Toshiyuki; Yamamoto, Hironobu; and Hayashi, Akio, 5,110,988, Cl. 564-441.000.
Sumitomo Chemical Company, Limited: *See—*
Kotani, Kozo; Negawa, Hideo; and Sakaya, Taiichi, 5,110,860, Cl. 524-563.000.
Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, 5,110,856, Cl. 524-459.000.
Sumitomo Electric Industries: *See—*
Takata, Koji; and Hashida, Koichi, 5,109,886, Cl. 137-596.170.
Sumitomo Electric Industries Ltd.: *See—*
Harada, Akira; and Maro, Hiroshi, 5,110,527, Cl. 264-127.000.
Imai, Takahiro; and Fujimori, Naoji, 5,111,491, Cl. 378-35.000.
Okamoto, Kenichi; and Nakata, Hidekazu, 5,109,661, Cl. 57-212.000.
Sumitomo Rubber Industries, Ltd.: *See—*
Numata, Kazuki; and Oshiai, Kiyoshi, 5,109,904, Cl. 152-209.00R.
Sumitomo Special Metals Co., Ltd.: *See—*
Yamamoto, Hitoshi; Sagawa, Masato; Fujimura, Setsuo; and Matsuura, Yutaka, 5,110,377, Cl. 148-302.000.
Sumitomo Wiring System Ltd.: *See—*
Inoue, Nori; and Chishima, Masamitsu, 5,110,301, Cl. 439-310.000.
Sumitomo Wiring Systems Ltd.: *See—*
Fukuda, Michio; Ohta, Yoshinobu; Taniguchi, Kenichi; and Sasaki, Katuyuki, 5,109,602, Cl. 29-845.000.
Sumitomo Yale Co., Ltd.: *See—*
Koga, Toshiharu, 5,109,945, Cl. 180-273.000.
Sumiya, Kenji: *See—*
Yamamoto, Yoshinori; and Sumiya, Kenji, 5,110,680, Cl. 428-413.000.
Summagraphics Corporation: *See—*
Smith, Paul D.; Padula, Michael J.; and McDermott, Robert M., 5,111,005, Cl. 178-19.000.
Sun, Mei H.: *See—*
Wickersheim, Kenneth A.; Sun, Mei H.; and Kim, James H., 5,109,595, Cl. 29-600.000.
Wickersheim, Kenneth A.; Sun, Mei H.; and Kim, James H., 5,110,216, Cl. 374-122.000.
Sundstrand Corporation: *See—*
Mehl, Byron R., 5,111,276, Cl. 363-71.000.
Waters, Peter D.; Defenbaugh, John F.; Henderson, Eric A.; and Glass, Robert G., 5,109,676, Cl. 62-117.000.
Sung, Rodney L.: *See—*
Derosa, Thomas F.; Sung, Rodney L.; Kaufman, Benjamin J.; and O'Rourke, Ronald L., 5,110,491, Cl. 252-47.500.
Super Seal Mfg. Ltd.: *See—*
Moore, David W., 5,109,639, Cl. 52-2.120.
Superlite Co., Ltd.: *See—*
Chu, Ching C., 5,111,113, Cl. 315-210.000.
Supernaw, Irwin R.; and Savage, Kerry D. RF in situ heating of heavy oil in combination with steam flooding. 5,109,927, Cl. 166-248.000.
Supracor Systems, Inc.: *See—*
Landi, Curtis L., 5,110,953, Cl. 428-116.000.
Survival Safety Engineering, Inc.: *See—*
Morse, Robert L., 5,111,210, Cl. 342-455.000.
Suyama, Takahiro: *See—*
Hosoba, Hiroyuki; Seki, Akinori; Hata, Toshio; Kondou, Masafumi; Suyama, Takahiro; and Matsui, Sadayoshi, 5,111,470, Cl. 372-46.000.
Suzuki, Akihiro; Yamamoto, Hiroshi; and Tobita, Hiroshi, to Ikegami Tsushinki Co., Ltd. Article pressing device and sorter with the same. 5,110,102, Cl. 270-53.000.
Suzuki, Akihiro, to Jatco Corporation. Apparatus for detecting range selected in automatic transmission. 5,111,180, Cl. 340-456.000.
Suzuki, Chiaki: *See—*
Nagatsuka, Ikutaroh; Suzuki, Chiaki; Takeda, Masayuki; Matsumura, Yasuo; and Aoki, Takayoshi, 5,110,703, Cl. 430-108.000.
Suzuki, Hiroyoshi; Ogawa, Kenji; and Yamamoto, Toru, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for detecting alcohol concentration. 5,110,205, Cl. 356-135.000.
Suzuki, Isamu: *See—*
Kato, Kiyoshi; Suzuki, Isamu; and Toshima, Seiji, 5,110,265, Cl. 417-279.000.
Suzuki, Katsumi, to Seiko Instruments, Inc. Controlling a liquid metal ion source by analog feedback and digital CPU control. 5,111,053, Cl. 250-424.000.
Suzuki, Keiko: *See—*
Hori, Kimihiko; Sakaguchi, Akira; Ishida, Koichi; Nomura, Tomoko; Suzuki, Keiko; and Tsuchiya, Shuichi, 5,110,826, Cl. 514-39.000.
Suzuki, Keizo: *See—*
Ono, Tetsuo; Hiraoka, Susumu; and Suzuki, Keizo, 5,110,407, Cl. 156-643.000.
Suzuki, Koichi: *See—*
Ando, Eiichi; Suzuki, Koichi; Ebisawa, Junichi; and Suzuki, Susumu, 5,110,637, Cl. 428-34.000.
Suzuki, Koji: *See—*
Seki, Masaki; Hosono, Takeshi; Hayanagi, Shizuaki; and Suzuki, Koji, 5,111,532, Cl. 395-102.000.
Suzuki, Masa-aki; and Ando, Eiji, to Matsushita Electric Industrial Co., Ltd. Optical storage medium. 5,110,648, Cl. 428-64.000.
Suzuki, Naohiko: *See—*
Matsumura, Hiroshi; Shimamura, Norio; Ohta, Yasuto; Kawabe, Masaru; Shimizu, Makoto; Natori, Naoaki; and Suzuki, Naohiko. 5,111,201, Cl. 340-870.380.
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Hihara, Mikio; and Suzuki, Nobuhisa, 5,110,084, Cl. 249-111.000.
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Takeuchi, Akihiko; and Suzuki, Shigeo, 5,111,509, Cl. 381-154.000.
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Sasaki, Mutsumi; Takahashi, Koji; and Suzuki, Shuichi, 5,111,258, Cl. 357-23.400.
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Ando, Eiichi; Suzuki, Koichi; Ebisawa, Junichi; and Suzuki, Susumu, 5,110,637, Cl. 428-34.000.
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Tanaka, Toshiki; Imoto, Katsuyuki; Kuwahara, Hiroshi; and Suzuki, Taihei, 5,111,323, Cl. 359-139.000.
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Nakayama, Mizuo; Kuwajima, Shigesumi; Suzuki, Takahito; Miyake, Kazushi; Shibata, Tsutomu; and Seki, Chikashi, 5,111,410, Cl. 364-551.010.
Suzuki, Takanori; and Harada, Tatsuhiko, to Koito Manufacturing Co., Ltd. Shade arrangement for a dual filament bulb in a vehicle headlamp. 5,111,368, Cl. 362-61.000.
Suzuki, Toshihiko: *See—*
Morii, Mitsuyoshi; Ohoka, Masaharu; Kawashima, Nobuhiro; Morii, Noriko; and Suzuki, Toshihiko, 5,110,736, Cl. 435-226.000.
Suzuki, Toshio: *See—*
Miyata, Seizo; Hosomi, Takeshi; Suzuki, Toshio; Watanabe, Toshiyuki; Yamamoto, Hironobu; and Hayashi, Akio, 5,110,988, Cl. 564-441.000.
Suzuki, Yoshiichi; Sakuma, Shigenori; and Yamakawa, Noriko, to Showa Shell Sekiyu K.K. Component for liquid crystal composition and liquid crystal composition containing the same. 5,110,497, Cl. 252-299.650.
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Mogamiya, Hiroyuki; Yamakawa, Noriko; Suzuki, Yoshiichi; Suenaga, Hitoshi; and Hasegawa, Yasuhiro, 5,110,496, Cl. 252-299.610.
Suzumura, Nobuyasu: *See—*
Saitou, Yoshitami; Isono, Nobuyuki; and Suzumura, Nobuyasu, 5,109,967, Cl. 192-0.076.
Svoboda, Steven J.: *See—*
Hufnagle, Donald L.; and Svoboda, Steven J., 5,109,722, Cl. 74-371.000.
Swanson, Eric J.: *See—*
Piasecki, Douglas S.; Swanson, Eric J.; and Hershbarger, Russell A., 5,111,451, Cl. 370-29.000.
Swanson, Hilmer I.: *See—*
Malec, Jeffrey M.; and Swanson, Hilmer I., 5,111,158, Cl. 330-297.000.
Swartout, Edwin L.: *See—*
Richardson, Michael M.; and Swartout, Edwin L., 5,111,216, Cl. 346-76.0PH.

Swarup, Vijay: *See—*
Manalastas, Pacifico V.; Drake, Evelyn N.; Kresge, Edward N.; Thaler, Warren A.; McDougall, Lee A.; Newlove, John C.; Swarup, Vijay; and Geiger, Albert J., 5,110,486, Cl. 252-8.551.
Sweeney, Harold E., to GTE Government Systems Corporation. Method for optically and remotely sensing subsurface water temperature. 5,110,217, Cl. 374-123.000.
Sweet, Raymond W.: *See—*
Maddon, Paul J.; Axel, Richard; Sweet, Raymond W.; and Arthos, James, 5,110,906, Cl. 530-350.000.
Swinney, Robert R.: *See—*
Hull, Harold L.; and Swinney, Robert R., 5,110,354, Cl. 75-726.000.
Swiss Aluminium Ltd.: *See—*
Bretschneider, Gerd, 5,109,998, Cl. 220-1.500.
Synair Corporation: *See—*
Gomberg, Edward N.; and Zurkiya, Ahmed A., 5,110,629, Cl. 427-322.000.
Syntex (U.S.A.) Inc.: *See—*
Cherng-Chyi, Roger F.; and Lidgate, Deborah M., 5,110,493, Cl. 514-413.000.
Syre, Manfred; and Freund, Reinhard, to Reinhard Freund Maschinenbau. Band saw for cutting animal carcasses. 5,109,744, Cl. 83-818.000.
Systems Research Laboratories, Inc.: *See—*
Mazzone, Daniel P.; Hoeffel, James D.; Nevitt, James S.; and Elliott, Richard E., 5,111,142, Cl. 324-262.000.
Systron Donner Corp.: *See—*
Madni, Asad M.; and Fala, Joseph, 5,111,206, Cl. 342-15.000.
Szabolcsi, Tamas: *See—*
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo; Soos, Rudolf; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 5,110,976, Cl. 558-407.000.
Szalanski, Scot E.: *See—*
Karra, Vijia K.; Magerowski, Anthony J.; and Szalanski, Scot E., 5,110,057, Cl. 241-30.000.
Szekely, Istvan: *See—*
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo; Soos, Rudolf; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 5,110,976, Cl. 558-407.000.
Szelenyi, Istvan: *See—*
Engel, Jurgen; Molliere, Michael; and Szelenyi, Istvan, 5,110,814, Cl. 514-212.000.
Szott, Michael J., to Macrotech Fluid Sealing, Inc. Valve stem oil seal. 5,110,142, Cl. 277-33.000.
Sztucinski, Leon A.: *See—*
Aslanian, Edouard; Pitts, Leon A.; and Sztucinski, Leon A., 5,111,384, Cl. 395-575.000.
T & N Technology Limited: *See—*
Steer, Adrian M., 5,110,413, Cl. 162-145.000.
Tabata, Munehiro: *See—*
Hasegawa, Yo; Okano, Kazuyuki; Isozaki, Yasuhito; Tabata, Munehiro; Hayashi, Chiharu; and Nakanishi, Akira, 5,110,622, Cl. 427-126.100.
Tabata, Taro: *See—*
Tagami, Hitoshi; Ushida, Masayasu; and Tabata, Taro, 5,109,828, Cl. 123-635.000.
Tacan Corporation: *See—*
Bradley, Eric M., 5,111,467, Cl. 372-32.000.
Mathis, Ronald F., 5,111,519, Cl. 385-24.000.
Tada, Yasuo: *See—*
Tanimura, Yoshihiko; Tada, Yasuo; and Yasui, Katsuaki, 5,109,703, Cl. 73-861.220.
Taddey, Rudolf: *See—*
Horn, Peter; Hoelderich, Wolfgang; Taddey, Rudolf; and Tintelpot, Dieter, 5,110,834, Cl. 521-52.000.
Taga, Yutaka: *See—*
Ishikawa, Kazunori; Tsukamoto, Kazumasa; Taniguchi, Takuji; and Taga, Yutaka, 5,109,733, Cl. 74-868.000.
Tagami, Hitoshi; Ushida, Masayasu; and Tabata, Taro, to Nippondenso Co., Ltd. Apparatus for supplying high voltage to spark plug of internal combustion engine. 5,109,828, Cl. 123-635.000.
Tagawa, Yuji: *See—*
Inoue, Kazushi; Abe, Shigeru; Tagawa, Yuji; Kondo, Takashi; Watanabe, Yasuhiko; and Shibata, Jun, 5,109,785, Cl. 112-303.000.
Tagliamonte, Thomas A.: *See—*
Tipton, Craig D.; and Tagliamonte, Thomas A., 5,110,488, Cl. 252-32.70E.
Taguchi, Hiroshi; and Washizaki, Youji, to Somar Corporation. Method and apparatus for automatically bonding film to a substrate and cutting the film to desired size. 5,110,391, Cl. 156-250.000.
Taguchi, Isao: *See—*
Yamashita, Tsukasa; Inoue, Nobuhisa; Kazuhiko, Mori; Matano, Masaharu; and Taguchi, Isao, 5,111,447, Cl. 369-44.120.
Taguchi, Nobuyoshi; Yasuo, Fukui; and Akihiro, Imai, to Matsushita Electric Industrial Co., Ltd. Resistive sheet transfer printing and electrode heads. 5,111,215, Cl. 346-76.0PH.
Tai, Seiji; Hayashi, Nobuyuki; Kamijima, Koichi; Akimoto, Takayuki; Katayose, Mitsuo; and Hagiwara, Hideo, to Hitachi, Chemical Company Ltd. Naphthalocyanine derivatives, production thereof, optical recording medium using the same, and production thereof. 5,110,968, Cl. 556-415.000.
Taicher, Zvi; and Shporer, Mordechai, to Taicher, Zvi. Remote temperature monitoring apparatus and technique. 5,109,853, Cl. 128-653.200.
Taira, Yoshito: *See—*
Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, 5,110,856, Cl. 524-459.000.
Tait, John S.; and Bruker, Izi, to Pilkington Visioncare, Inc. Injection molding apparatus for producing a toric lens casting mold arbor. 5,110,278, Cl. 425-175.000.
Taiyo Yuden Company, Ltd.: *See—*
Chazono, Hirokazu; Saito, Hiroshi; Honda, Mutsumi; Shizuno, Hisamitsu; and Kishi, Hiroshi, 5,111,357, Cl. 361-321.000.
Taka, Toshio; Shishido, Kihachi; and Ohkubo, Takuo, to Showa Denko K.K. Low temperature heat shrinkable film and process for producing the same. 5,110,686, Cl. 428-516.000.
Takada, Yoshiharu: *See—*
Abe, Tunehiko; Nakano, Hiroyuki; Shiotani, Kazuaki; and Takada, Yoshiharu, 5,110,630, Cl. 427-327.000.
Takagi, Hisamitsu, to Fujitsu Limited. Portable telephone set. 5,111,503, Cl. 379-433.000.
Takagi, Shigeru: *See—*
Saito, Shiro; Takagi, Shigeru; and Kondo, Mineji, 5,109,887, Cl. 137-625.460.
Takagi, Takeshi, to Omron Corporation. Apparatus utilizing light emitting semiconductor device. 5,111,034, Cl. 250-213.00A.
Takahashi, Kiyoshi: *See—*
Murai, Mikio; Takahashi, Kiyoshi; and Odagiri, Masaru, 5,110,676, Cl. 428-336.000.
Takahashi, Koichi: *See—*
Miyashita, Naoto; Takahashi, Koichi; Sonobe, Hironori; and Koyama, Mitsutoshi, 5,111,272, Cl. 357-49.000.
Takahashi, Koji: *See—*
Sasaki, Mutsumi; Takahashi, Koji; and Suzuki, Shuichi, 5,111,258, Cl. 357-23.400.
Takahashi, Kunitomo: *See—*
Ueno, Hiroshi; Kikuchi, Yasuo; Takahashi, Kunitomo; Doi, Koji; Onose, Tsukasa; and Ogawa, Toshitaka, 5,111,235, Cl. 355-246.000.
Takahashi, Satomi: *See—*
Yamada, Masahiko; and Takahashi, Satomi, 5,110,944, Cl. 548-311.000.
Takahashi, Tatsumi: *See—*
Nishiyama, Masashi; Fujii, Hideaki; and Takahashi, Tatsumi, 5,110,663, Cl. 428-195.000.
Takahashi, Yasunobu: *See—*
Hamada, Fumihiko; Tsuboi, Kunio; Hasegawa, Mitihiko; Ichizawa, Yasuji; Yabe, Toshiya; Yamasaki, Kunitomo; Takahashi, Yasunobu; and Mizuta, Katsuji, 5,111,252, Cl. 355-308.000.
Takahashi, Yuji: *See—*
Wakao, Naho; Hiroi, Masakazu; Kitahara, Makoto; and Takahashi, Yuji, 5,110,104, Cl. 271-3.100.
Takahashi, Yutaka: *See—*
Morinushi, Ken; Tanaka, Hideharu; Noguchi, Yoshihiro; Imai, Toshihisa; and Takahashi, Yutaka, 5,110,258, Cl. 415-119.000.
Takahata, Ryoichi, to Koyo Seiko Co., Ltd. Apparatus and method for measuring repulsive displacement and repulsive force characteristics of a superconductor with respect to a magnet. 5,111,140, Cl. 324-228.000.
Takama, Noboru: *See—*
Yoshimoto, Satoshi; Nakata, Shigeru; Takama, Noboru; and Taniguchi, Minoru, 5,111,364, Cl. 361-399.000.
Takano, Tatsuya; Hashida, Ryoichi; Nakagami, Keiji; and Kimura, Junji, to Research Development Corporation of Japan. Monoclonal antibody capable of recognizing arteriosclerotic lesions and agents for detecting and treating arteriosclerosis. 5,110,738, Cl. 435-240.270.
Takase, Satoshi: *See—*
Tani, Yatsuhiro; and Takase, Satoshi, 5,110,620, Cl. 427-40.000.
Takasugi, Hisashi: *See—*
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 5,110,921, Cl. 540-222.000.
Takata Corporation: *See—*
Sawada, Masami; Nanbu, Yuichi; and Yoshiyasu, Mitsuo, 5,110,647, Cl. 428-43.000.
Takata, Ikunori, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having a multilayer electrode structure and method for fabricating the same. 5,111,267, Cl. 357-36.000.
Takata, Kazuo: *See—*
Fujii, Takashi; Kawahara, Hironobu; Takata, Kazuo; Nishiumi, Masaharu; and Yamamoto, Noriaki, 5,110,408, Cl. 156-643.000.
Takata, Koji; and Hashida, Koichi, to Sumitomo Electric Industries. Fluid pressure controller. 5,109,886, Cl. 137-596.170.
Takatori, Tsuyoshi: *See—*
Nishiwaki, Toshihiro; Umeda, Shigeru; and Takatori, Tsuyoshi, 5,111,018, Cl. 219-86.250.
Takauji, Kiyomi; and Washiyama, Yutaka, to Kawai Musical Inst. Mfg. Co., Ltd. Envelope generator for use in an electronic musical instrument. 5,109,746, Cl. 84-607.000.
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, to Fujisawa Pharmaceutical Co., Ltd. 7-acylamino-3-vinylcephalosporanic acid derivatives. 5,110,921, Cl. 540-222.000.
Takebayashi, Michinori: *See—*
Kusase, You; Murakata, Masatoshi; Mochizuki, Nobuo; and Takebayashi, Michinori, 5,110,925, Cl. 544-234.000.
Takeda, Hiroshi, to Ricoh Company, Ltd. Stroboscopic controller. 5,111,116, Cl. 315-241.00P.

Takeda, Kazuhisa: *See—*
Kim, Soonih; Takeda, Kazuhisa; and Sasatani, Seiei, 5,110,602, Cl. 424-451.000.
Takeda, Masashi: *See—*
Uejikkoku, Nario; and Takeda, Masashi, 5,110,842, Cl. 521-134.000.
Takeda, Masayuki: *See—*
Nagatsuka, Ikutaroh; Suzuki, Chiaki; Takeda, Masayuki; Matsumura, Yasuo; and Aoki, Takayoshi, 5,110,703, Cl. 430-108.000.
Takeda, Shiro. Make-up brush device. 5,109,877, Cl. 132-218.000.
Takehara, Zenichiro: *See—*
Ogumi, Zempachi; and Takehara, Zenichiro, 5,110,619, Cl. 427-38.000.
Takeichi, Michifumi: *See—*
Ohmura, Keiji; Okuno, Sumio; Takeichi, Michifumi; Masai, Kentarou; Okamoto, Seiichi; and Nakamura, Masatake, 5,109,777, Cl. 105-401.000.
Takenaka, Toichi: *See—*
Fujikura, Takashi; Ito, Noriki; Matsumoto, Yuzo; Asano, Masaharu; and Takenaka, Toichi, 5,110,820, Cl. 514-356.000.
Takeshita, Takuo; Nakayama, Ryoji; and Ogawa, Tamotsu, to Mitsubishi Materials Corporation. Rare earth-iron-boron magnet powder and process of producing same. 5,110,374, Cl. 148-101.000.
Takeshita, Takuo: *See—*
Yamaguchi, Tetsuro; Takeshita, Takuo; and Hagino, Sadaaki, 5,110,789, Cl. 505-1.000.
Takeuchi, Akihiko; and Suzuki, Shigeo, to Yamaha Corporation. Electric acoustic converter. 5,111,509, Cl. 381-154.000.
Takeuchi, Hirofumi: *See—*
Makita, Atsuo; Takeuchi, Hirofumi; Shibata, Shinji; and Shimbara, Noboru, 5,109,550, Cl. 4-300.000.
Takeuchi, Mikio: *See—*
Tomoda, Takahisa; Takeuchi, Mikio; Nakano, Kinichiro; and Hirano, Motoki, 5,111, 99, Cl. 340-825.720.
Takeuchi, Yusuke; and Miki, Sakae, to Hitachi Ltd. Single chip communication data processor with direct memory access controller having a channel control circuit. 5 111,425, Cl. 395-425.000.
Taki, Tekeshi: *See—*
Hayashi, Motoshige; Amano, Norio; Taki, Tekeshi; and Hirai, Takaaki, 5,110,844, Cl. 521-182.000.
Takizawa, Satoshi, to Nissan Motor Co., Ltd. Adaptive control of servo activating pressure for motor vehicle automatic transmission. 5,109,732, Cl. 74-866.000.
Tamahashi, Kunihiro: *See—*
Nakayama, Takahiro; Tamahashi, Kunihiro; Fuyama, Moriaki; Minemura, Hiroyuki; Sato, Yoshio; Tsuboi, Nobuyoshi; and Koyanagi, Hiroaki, 5,110,792, Cl. 505-1.000.
Tamaki, Eiichi: *See—*
Kuwabara, Akira; Tamaki, Eiichi; and Koyama, Yasufumi, 5,111,332, Cl. 359-307.000.
Tamglass Oy: *See—*
Ikola, Kimmo J.; and Stenman, Kimmo E., 5,110,340, Cl. 65-269.000.
Tamor, Michael A.; and Hass, Kenneth C., to Ford Motor Company. Process of depositing a carbon film having metallic properties. 5,110,577, Cl. 423-445.000.
Tampella AB: *See—*
Lehtonen, Jarmo; and Kinnunen, Jukka, 5,110,417, Cl. 162-358.000.
Tamrock World Corporation: *See—*
Haines, Marvin L., 5,110 189, Cl. 299-30.000.
Tamura, Takahiro: *See—*
Sakurai, Kazuo; and Tamura, Takahiro, 5,110,268, Cl. 417-410.000.
Tana-Jyra Ky: *See—*
Sinkkonen, Matti, 5,110,667, Cl. 244-50.000.
Tanabe, Toru: *See—*
Ishikawa, Kiyomitsu; and Tanabe, Toru, 5,111,182, Cl. 340-479.000.
Tanabe, Yoshikazu: *See—*
Ito, Kohzo; Tanabe, Yoshikazu; Sato, Masa-aki; and Kaeriyama, Kyoji, 5,110,504, Cl. 252-500.000.
Tanaka, Fusatoshi; Kurokawa, Toshikazu; Matsuura, Kouji; and Aoki, Motoi, to Mazda Motor Corporation. Intake system for multi-cylinder engine. 5,109,811, Cl. 123-52.0MB.
Tanaka, Hideharu: *See—*
Morinushi, Ken; Tanaka, Hideharu; Noguchi, Yoshihiro; Imai, Toshihisa; and Takahashi, Yutaka, 5,110,258, Cl. 415-119.000.
Tanaka, Hirokazu: *See—*
Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, 5,110,811, Cl. 514-183.000.
Tanaka, Hiroyuki: *See—*
Koyama, Shigeo; Tsutsui, Eiji; Kobayashi, Kazuhiro; Horihata, Katsushi; and Tanaka, Hiroyuki, 5,111,244, Cl. 355-210.000.
Tanaka, Koutarou; Shikata, Makoto; and Akiyama, Masahiro, to Oki Electric Industry Co., Ltd. Frequency-dividing circuit. 5,111,489, Cl. 377-121.000.
Tanaka, Makoto: *See—*
Miyamoto, Kenji; Tanaka, Makoto; and Shimada, Norihiro, 5,109,901, Cl. 152-209.00R.
Tanaka, Masao: *See—*
Wakimura, Kazuo; Tanaka, Masao; and Hiai, Atsuhiko, 5,110,575, Cl. 423-412.000.
Tanaka, Ryouchi: *See—*
Matsumoto, Jun; and Tanaka, Ryouchi, 5,110,645, Cl. 428-36.900.
Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; and Ogiwara, Yoshihisa, to Seikosha Co., Ltd.; and Nippon Precision Circuits, Ltd. Silicon thin film transistor with an intrinsic silicon active layer formed within the boundary defined by the edges of the gate electrode and the impurity containing silicon layer. 5,111,261, Cl. 357-23.700.
Tanaka, Shin-Ichi, to NEC Corporation. Collector-top type transistor causing no deterioration in current gain. 5,111,265, Cl. 357-34.000.
Tanaka, Teruya; and Noguchi, Yoshiyuki, to Kabushiki Kaisha Toshiba. Electromagnetic cooker including load control. 5,111,014, Cl. 219-10.770.
Tanaka, Toru; and Inari, Masato, to Mitsubishi Gas Chemical Company, Inc. Process for producing 2,6-napthalene dicarboxylic acid. 5,110,982, Cl. 562-414.000.
Tanaka, Toshiki; Imoto, Katsuyuki; Kuwahara, Hiroshi; and Suzuki, Taihei, to Hitachi, Ltd. Optical switching system. 5,111,323, Cl. 359-139.000.
Tanaka, Toshinobu: *See—*
Sugiura, Hisao; Nishimura, Takashi; and Tanaka, Toshinobu, 5,110,827, Cl. 514-399.000.
Tanaka, Toshinori, to Mitsubishi Denki K.K. Engine starter with dust seal arrangement. 5,111,093, Cl. 310-88.000.
Tanemura, Hatsumi: *See—*
Shuto, Sadanobu; Tanemura, Hatsumi; and Hirano, Shigeo, 5,110,719, Cl. 430-569.000.
Tangney, Thomas J.: *See—*
Williams, Dwight E.; Tangney, Thomas J.; and Revis, Anthony, 5,110,784, Cl. 502-401.000.
Tani, Yatsuhiro; and Takase, Satoshi, to Toyo Boseki Kabushiki Kaisha. Method for the production of an electret sheet. 5,110,620, Cl. 427-40.000.
Taniguchi, Kenichi: *See—*
Fukuda, Michio; Ohta, Yoshinobu; Taniguchi, Kenichi; and Sasaki, Katuyuki, 5,109,602, Cl. 29-845.000.
Taniguchi, Masato; and Sato, Tadahisa, to Fuji Photo Film Co., Ltd. Methods of producing 1H-pyraolo(5,1-c)-1,2,4-triazoles and pyrazole derivatives. 5,110,941, Cl. 548-262.400.
Taniguchi, Minoru: *See—*
Yoshimoto, Satoshi; Nakata, Shigeru; Takama, Noboru; and Taniguchi, Minoru, 5,111,364, Cl. 361-399.000.
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Camera system with means for varying exposure control data. 5,111,234, Cl. 354-455.000.
Taniguchi, Takuji: *See—*
Ishikawa, Kazunori; Tsukamoto, Kazumasa; Taniguchi, Takuji; and Taga, Yutaka, 5,109,733, Cl. 74-868.000.
Taniguchi, Toshihisa; Hayashi, Mituyuki; and Sakai, Masahiko, to Nippondenso Co., Ltd. Tension apparatus. 5,109,690, Cl. 72-206.000.
Tanii, Kiyoshi. Filter press. 5,110,466, Cl. 210-225.000.
Tanimoto, Koji; Kimura, Kazuhisa; and Sasama, Kazuo, to Kabushiki Kaisha Toshiba. Image forming apparatus having a more smoothly controlled image forming element. 5,111,242, Cl. 355-200.000.
Tanimoto, Masahiro, to Horiba, Ltd. Combustion furnace for burning sample to be analyzed. 5,110,554, Cl. 422-78.000.
Tanimura, Yoshihiko; Tada, Yasuo; and Yasui, Katsuaki, to Mitsubishi Denki K.K.; and Mitsubishi Jidosha Kogyo K.K. Vortex flow meter. 5,109,703, Cl. 73-861.220.
Taniuchi, Kazuman: *See—*
Sekine, Hiroshi; and Taniuchi, Kazuman, 5,111,533, Cl. 395-109.000.
Tanji, Isamu, to Hitachi Koki Co., Ltd. Pneumatic fastener driving tool having an air exhaust arrangement. 5,110,030, Cl. 227-130.000.
Tanji, Masaki; and Nishijima, Toyoki, to Konica Corporation. Silver halide photographic sensitive material. 5,110,718, Cl. 430-546.000.
Tano, Kazuhiro: *See—*
Sato, Eiji; Matsuhashi, Ryo; Ito, Satoshi; Tano, Kazuhiro; and Asakawa, Kenichi, 5,110,544, Cl. 420-69.000.
Tappe, Gustav: *See—*
Wernicke, Ubbo; Berthold, Werner; Haseler, Helmut; and Tappe, Gustav, 5,110,715, Cl. 430-379.000.
Tarascon, Jean-Marie: *See—*
Shokoohi, Frough K.; and Tarascon, Jean-Marie, 5,110,696, Cl. 429-218.000.
Target Therapeutics: *See—*
Twyford, Robert H., Jr., 5,109,867, Cl. 128-772.000.
Tarng, Min Ming. Digital superbuffer. 5,111,076, Cl. 307-446.000.
Tarrant, David R., to U.S. Philips Corporation. Decoders for Hamming encoded data. 5,111,462, Cl. 371-37.100.
Taskier, H. T.: *See—*
Sirkar, K. K.; Bhave, R. R.; Taskier, H. T.; and Ostler, M. I., 5,110,326, Cl. 55-158.000.
Tatematsu, Takeo: *See—*
Suzuki, Takaaki; and Tatematsu, Takeo, 5,111,073, Cl. 307-442.000.
Tauber, Arthur; Finnegan, Robert D.; Dornath Mohr, Michelle A.; and McBride, Frank A., to United States of America, Army. Method of depositing a superconducting film by electrophoresis. 5,110,767, Cl. 505-1.000.
Tauchi, Hitoshi: *See—*
Inagaki, Akio; Nakai, Kiyotaka; and Tauchi, Hitoshi, 5,110,857, Cl. 524-494.000.
Tauscher, Joachim, to Robert Bosch GmbH. Solenoid valve, in particular for fuel-injection pumps. 5,109,885, Cl. 137-554.000.
Taylor, Geoffrey W.: *See—*
Kiely, Philip A.; and Taylor, Geoffrey W., 5,111,255, Cl. 357-22.000.
Taylor, John A., to Separation Dynamics, Inc. Condenser/membrane permeater. 5,110,462, Cl. 210-180.000.
Taylor, John A., to Separation Dynamics, Inc. Hollow fiber membrane system for removal of viruses and bacteria. 5,110,476, Cl. 210-640.000.

Taylor, Kenneth; and Allen, Roy, to STC PLC. Flexible cable termination with swivel couplings. 5,110,224, Cl. 385-25.000.
Taylor, Lewis C.: *See—*
Forrest, William J.; and Taylor, Lewis C., 5,109,831, Cl. 128-20.000.
Taylor, Lyle H.; Melamed, Nathan T.; and Gottlieb, Milton S., to Westinghouse Electric Corp. Acousto-optic tunable filter apparatus and method for detecting and identifying an optical radiation source. 5,111,038, Cl. 250-225.000.
TDK Corporation: *See—*
Yamakawa, Yoshisuke; Fukushima, Kiyoto; and Matsuno, Koji, 5,110,659, Cl. 428-141.000.
Teague, Harold J. Assembly system for demonstrating chemical structures. 5,110,297, Cl. 434-278.000.
Technic Inc.: *See—*
Little, John L.; Schultz, Philip W.; and Kroll, Harry, 5,110,423, Cl. 205-254.000.
Technical Concepts, L.P.: *See—*
Muderlak, Ken; and Maloney, Patrick, 5,111,477, Cl. 392-390.000.
Technitex, Inc.: *See—*
Snook, Richard, 5,110,200, Cl. 351-212.000.
Tecnetics Industries, Inc.: *See—*
Kilts, Harold J., 5,110,015, Cl. 222-413.000.
Tecnol, Inc.: *See—*
Hubbard, Vance M.; and Brunson, Welton K., 5,109,841, Cl. 128-380.000.
Teekell, Gordon E.; and Liebthal, Siegfried. Closure device. 5,109,576, Cl. 24-30.50R.
Teeny, Parry, to Partek Corporation. Method and apparatus for cleaning thermoplastic material for reuse. 5,110,055, Cl. 241-15.000.
Teikoku Chemical Industry Co., Ltd.: *See—*
Mogamiya, Hiroyuki; Yamakawa, Noriko; Suzuki, Yoshiichi; Suenaga, Hitoshi; and Hasegawa, Yasuhiro, 5,110,496, Cl. 252-299.610.
Teikoku Tsushin Kogyo Co., Ltd.: *See—*
Yagi, Nobuyuki; Inagaki, Jiroh; Morita, Kozo; Kaku, Yosutoshi; Mizuno, Shinji; and Yamanaka, Akiko, 5,111,363, Cl. 361-398.000.
Tektronix, Inc.: *See—*
Titterington, Donald R., 5,110,665, Cl. 428-195.000.
Tekulve, Daniel R. Articulating rotary mower. 5,109,655, Cl. 56-6.000.
Teledyne Industries, Inc.: *See—*
Kallansrude, David K.; Aiken, William C.; Deitz, Dan P.; and Powelson, William D., 5,110,153, Cl. 283-707.000.
Watkins, Lawrence J.; and Fuentes, Roland, Jr., 5,110,137, Cl. 273-348.100.
Telus Corporation: *See—*
Benner, Frank D., 5,111,534, Cl. 455-33.200.
Temple University: *See—*
Labes, Mortimer M., 5,110,215, Cl. 374-106.000.
Temple, Victor A. K., to General Electric Company. Semiconductor device with improved turn-off capability. 5,111,268, Cl. 357-38.000.
Teng, Clarence; and Ying, Peter, to Texas Instruments Incorporated. Trench capacitor memory cell with curved capacitors. 5,111,259, Cl. 357-23.600.
Tenneco Canada Inc.: *See—*
McGregor, Colin R., 5,110,366, Cl. 134-22.110.
Tennent, Howard G.: *See—*
Friend, Stephen O.; Atkins, Jaspard H.; Tennent, Howard G.; and Hausslein, Robert, 5,110,693, Cl. 429-40.000.
Terada, Yasushi: *See—*
Kobayashi, Kazuo; Terada, Yasushi; and Nakayama, Takeshi, 5,111,427, Cl. 365-49.000.
Terai, Haruo: *See—*
Kobayashi, Yasumichi; Yabuuchi, Hidetaka; Eguchi, Osamu; Kondoh, Shinji; and Terai, Haruo, 5,109,566, Cl. 15-319.000.
Teranishi, Tsugutomo: *See—*
Hoizumi, Shinichi; and Teranishi, Tsugutomo, 5,109,665, Cl. 60-39.182.
Terashima, Shigeo; and Matoba, Hirotsugu, to Sharp Kabushiki Kaisha. Optical card and a recording/reproduction apparatus for the same. 5,111,031, Cl. 235-456.000.
Terry, Jimmy C.; and Mrosko, John A., to Maloney, F. H. Method for making a roller assembly for grain shellers. 5,110,382, Cl. 156-77.000.
Testone, Anthony Q.; and Benbenek, Waldyn J., to Louisiana Pacific Corporation. Electrostatic separation method and apparatus. 5,110,324, Cl. 55-11.000.
Tetrault, Gregory J. Method and apparatus for securing a pile of newspapers or magazines or other materials. 5,109,762, Cl. 100-2.000.
Teuscher, Leon A.; Mishra, Satchidanand; and Holland, Andrea G., to Xerox Corporation. Electrophotographic imaging member. 5,110,700, Cl. 430-64.000.
Texaco Chemical Company: *See—*
Champion, Donald H.; and Speranza, George P., 5,110,991, Cl. 568-618.000.
Texaco Inc.: *See—*
Derosa, Thomas F.; Sung, Rodney L.; Kaufman, Benjamin J.; and O'Rourke, Ronald L., 5,110,491, Cl. 252-47.500.
Texas Instruments Incorporated: *See—*
Boulanger, Henry J., 5,109,603, Cl. 29-859.000.
Elkind, Jerry L., 5,110,410, Cl. 156-643.000.
Gill, Manzur; and McElroy, David J., 5,110,753, Cl. 437-52.000.
Glasson, Eric J.; Ty, Henry; White, Alfred J.; and Gondusky, Joseph H., 5,110,045, Cl. 236-93.00R.
Kwan, Stephen C.; and Jones, Steven C., 5,111,071, Cl. 307-350.000.
Marshall, Andrew, 5,111,375, Cl. 363-60.000.
Panasik, Carl M.; Wilde, Patrick J.; and James, Betty L., 5,111,168, Cl. 333-152.000.
Teng, Clarence; and Ying, Peter, 5,111,259, Cl. 357-23.600.
Texax Instruments Incorporated: *See—*
Malhi, Satwinder; and Shah, Rajiv, 5,111,260, Cl. 357-23.700.
Tezuka, Tomohumi: *See—*
Sakuma, Kiyoshi; Yoshida, Takayuki; Tezuka, Tomohumi; Aoki, Katsuyuki; Yamada, Makoto; Hujii, Masao; and Morinushi, Ken, 5,109,919, Cl. 165-151.000.
TFI Telemark: *See—*
Harper, James L.; and Hill, Charles H., 5,111,022, Cl. 219-121.330
Thaler, Warren A.: *See—*
Manalastas, Pacifico V.; Drake, Evelyn N.; Kresge, Edward N.; Thaler, Warren A.; McDougall, Lee A.; Newlove, John C.; Swarup, Vijay; and Geiger, Albert J., 5,110,486, Cl. 252-8.551.
Theeuwes, Felix: *See—*
Wong, Patrick S. L.; Theeuwes, Felix; Eckenhoff, James B.; Larsen, Steven D.; and Huynh, Hoa T., 5,110,597, Cl. 424-438.000.
Thelin, Anders G.: *See—*
Brandt, Nils G. L.; and Thelin, Anders G., 5,110,770, Cl. 501-89.000.
Theobald, Hans: *See—*
Kober, Reiner; Theobald, Hans; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; Seele, Rainer; and Wagenblast, Gerhard, 5,110,829, Cl. 514-443.000.
Thevignot, Roger, to Adir et Compagnie. Preparation of 4-chloro-3-sulphamoyl-N-(2,3-dihydro-2-methyl-1H-indol-1-yl)-benzamide from 2,3-dihydro-2-methyl-1H-indole and hydroxylamine-O-sulphonic acid. 5,110,946, Cl. 548-483.000.
Thinking Machines Corporation: *See—*
Kuszmaul, Bradley C., 5,111,198, Cl. 340-825.520.
Thomann, Roland; and Witschi, Heinz, to ABT, Inc. Locking component for securing a cover on a frame. 5,110,235, Cl. 404-4.000.
Thomas, Gary E., to PhysioDynamics, Inc. Apparatus and method for electrotherapeutic treatment of structures associated with the eye. 5,109,846, Cl. 128-421.000.
Thomas, Gary E.; and Fellinger, Michael W., to PhysioDynamics, Inc. Electrotherapeutic apparatus. 5,109,848, Cl. 128-422.000
Thomas Jefferson University: *See—*
Walinsky, Paul; Lewin, Peter A.; and Reid, John M., 5,109,861, Cl. 128-662.060.
Thomas, Michael: *See—*
Hingarh, Hemraj; Asuncion, Andres D.; Thomas, Michael; and Brown, Robert, 5,111,276, Cl. 357-71.000.
Thomas, Michael E.: *See—*
Anand, Kranti V.; and Thomas, Michael E., 5,111,355, Cl 361-313.000.
Thompson, Gregory J.: *See—*
Haun, Edward C.; Thompson, Gregory J.; and Gorawara, Jayant K., 5,110,444, Cl. 208-89.000.
Thompson, Herb. Traction enhancement system. 5,109,941, Cl. 180-182.000.
Thompson, Joseph L., to Carrier Corporation. Air conditioning filter system. 5,109,916, Cl. 165-59.000.
Thompson, Stephen A.: *See—*
Kidd, Thomas F.; Thompson, Stephen A.; and Paduano, Guiseppe, 5,109,914, Cl. 164-113.000.
Thompson, William W.: *See—*
Hagen, Richard L.; and Thompson, William W., 5,109,751, Cl. 89-33.160.
Thomsen, James A., Jr.: *See—*
Fellows, Mark W.; Wong, John M.; Toy, Edmond; Erhardt, Robert A.; and Thomsen, James A., Jr., 5,111,118, Cl. 315-307.000.
Thomson-Brandt Armements: *See—*
Deffayet, Jean, 5,109,774, Cl. 102-382.000.
Thomson Consumer Electronics, Inc.: *See—*
Duffield, David J.; Deiss, Michael S.; Beyers, Billy W., Jr.; and Bridgewater, Kevin E., 5,111,296, Cl. 358-83.000.
Gries, Robert J.; and Norman, Marvin N., 5,111,121, Cl. 315-411.000.
Truskalo, Walter; and Norman, Marvin N., 5,111,119, Cl. 315-386.000.
Wilber, James A., 5,111,122, Cl. 315-411.000.
Thorn Emi plc: *See—*
Coulson, Ian, 5,111,317, Cl. 359-56.000.
Greb, Ulrich; and Rowley, Andrew T., 5,111,117, Cl. 315-248.000
Morris, Christopher J., 5,111,319, Cl. 359-85.000.
Thornton, Thomas F. Health product. 5,109,871, Cl. 128-844.000
Thunberg, Jon C.; VanKouwenberg, Steven P.; and Begonis, Walter B., to W.R. Grace & Co.-Conn. Process for the preparation of salts of iron amino and hydroxy carboxylic acid complexes. 5,110,965, Cl. 556-148.000.
Tighe, William R.: *See—*
Husted, David M.; Jones, William H.; and Tighe, William R., 5,109,963, Cl. 192-8.00C.
Timm, Gerald L., to Johnson Corporation, The. Aspirated syphon shoe. 5,109,612, Cl. 34-119.000.
Timm, Gerald L.: *See—*
Peter, John H.; and Timm, Gerald L., 5,110,162, Cl. 285-281.000.
Tingdahl, Marvin A.: *See—*
Hunter, Henry J.; Marshall, Clifton W.; Cunningham, Kenneth; and Tingdahl, Marvin A., 5,110,071, Cl. 244-137.300.
Tintelpot, Dieter: *See—*
Horn, Peter; Hoelderich, Wolfgang; Taddey, Rudolf; and Tintelpot, Dieter, 5,110,834, Cl. 521-52.000.

Tipton, Craig D.; and Tagliamonte, Thomas A., to Lubrizol Corporation, The. Lubricating compositions containing reduced levels of phosphorus. 5,110,488, Cl. 252-32.70E.

Titan Kogyo Kabushiki Kaisha: *See*—
Kurihara, Tokumitsu; Saito, Tatsuo; and Harada, Hidefumi, 5,110,586, Cl. 424-76.100.

Titmas, James A.; and Flauto, Phillip J. Solid waste shredder. 5,110,059, Cl. 241-47.000.

Titterington, Donald R., to Tektronix, Inc. Light-transmissive substrates coated to promote adhesion of phase-change inks. 5,110,665, Cl. 428-195.000.

Tjhie, Lun K.: *See*—
Krueger, David J.; Oh, Siebang; and Tjhie, Lun K., 5,111,177, Cl. 337-243.000.

TNS Mills, Inc.: *See*—
Tsuzuki, Kiyohiro, 5,109,659, Cl. 57-66.000.

Toagosei Chemical Industry Co., Ltd.: *See*—
Ito, Kenji; and Kimura, Kaoru, 5,110,392, Cl. 156-314.000.

Tobita, Hiroshi: *See*—
Suzuki, Akihiro; Yamamoto, Hiroshi; and Tobita, Hiroshi, 5,110,102, Cl. 270-53.000.

Tobo, Yozo: *See*—
Inaba, Ryohei; Kumamura, Masaaki; Danmoto, Shojiro; Arai, Mitsuo; Tobo, Yozo Sugawara, Hirofumi; and Miyazaki, Tadanobu, 5,110,522, Cl. 264-40.400.

Toda, Junichi, to Shimano Inc. Speed change apparatus for a fishing reel. 5,110,066, Cl. 242-255.000.

Todd, Maurice C.: *See*—
Lukhard, Craig R.; Potter, Jerry F.; and Todd, Maurice C., 5,110,517, Cl. 264-40.100.

Toews, Hans G., to Moog Inc. Vane-type nozzle(s) for varying the magnitude and direction of a thrust vector, and methods of operating same. 5,110,047, Cl. 239-11.000.

Tofuji E.M.I. Co., Ltd.: *See*—
Okada, Shigeru; and Fujita, Masami, 5,109,570, Cl. 16-289.000.

Togami, Masato; and Kanoe, Toshio, to Polyplastics Co., Ltd. Sealing resin composition for electronic component and electronic component. 5,110,861, Cl. 524-601.000.

Tokai Kogyo Kabushiki Kaisha: *See*—
Arima, Hidetoshi, 5,110,729, Cl. 264-167.000.
Unuma, Sadao, 5,110,025, Cl. 226-74.000.

Tokai, Yoichi: *See*—
Kobayashi, Tadahiko; Tokai, Yoichi; and Sahashi, Masashi, 5,110,376, Cl. 148-301.000.

Toki, Akio: *See*—
Umemoto, Yuji; Toki, Akio; and Yamaguchi, Shuji, 5,111,499, Cl. 379-61.000.

Tokiwa, Yutaka; and Iwamoto, Akira, to Director-General of Agency of Industrial Science and Technology; and JSP Corporation. Biodisintegrable thermoplastic resin foam and a process for producing same. 5,110,838, Cl. 521-81.000.

Toko Kabushiki Kaisha: *See*—
Kameyama, Shigeru; Arikawa, Koji; Watanabe, Kazushi; Yoshioka, Hitoshi; and Nonigoe, Isami, 5,111,372, Cl. 363-20.000.

Tokunaga, Koji, to NEC Corporation. Method and system for switching radio frequency. 5,111,535, Cl. 455-33.200.

Tokunaga, Tatsuyuki, to Canon Kabushiki Kaisha. Camera system. 5,111,231, Cl. 354-402.000.

Tokuou, Rinpei: *See*—
Yamaguchi, Hidefumi; Kiyofuji, Hiroyuki; Shirono, Katsuhiro; Tokuou, Rinpei; and Fuchigami, Jun, 5,110,783, Cl. 502-314.000.

Tokutake, Shoichi: *See*—
Oguma, Tetsuya; Kikuchi, Mamoru; Mizusawa, Kiyoshi; Tokutake, Shoichi; and Yamaji, Nobuyuki, 5,110,734, Cl. 435-201.000.

Tokyo Electric Co., Ltd.: *See*—
Hosoya, Masahiro; Saito, Mitsunaga; Endo, Mitsuharu; Ohtaka, Yoshimitsu; and Futamata, Yukio, 5,110,705, Cl. 430-120.000.
Makino, Masaaki, 5,111,252, Cl. 329-300.000.

Tokyo Electron Sagami Limited: *See*—
Asano, Takanobu; Kitayama, Hirofumi; Iwai, Hiroyuki; and Ono, Yuuji, 5,110,248, Cl. 414-172.000.

Tokyo Keiki Co., Ltd.: *See*—
Hojo, Takeshi; Fukano, Michio; and Kato, Mitsuru, 5,109,693, Cl. 73-497.000.

Tokyo Tatsuno Co., Ltd.: *See*—
Matsumura, Hiroshi; Shimamura, Norio; Ohta, Yasuto; Kawabe, Masaru; Shimizu, Makoto; Natori, Naoaki; and Suzuki, Naohiko, 5,111,201, Cl. 340-870.380.

Toledo, Alfredo A., Jr.: *See*—
Orgun, Munir; Pappu, Venkata R.; and Toledo, Alfredo A., Jr., 5,111,403, Cl. 364-428.000.

Tolman, Dennis K.: *See*—
Elder, Cary S.; Tolman, Dennis K.; and Gates, Dale A., 5,109,597, Cl. 29-721.000.

Tolman, Richard L.; Ashton, Wallace T.; and Wu, Mu T., to Merck & Co., Inc. Antiherpetic agents. 5,110,799, Cl. 514-19.000.

Tomatsu, Kozo: *See*—
Oki, Toshikazu; Saitoh, Kyoichiro; Tomatsu, Kozo; Tomita, Koji; Konishi, Masataka; Miyaki, Takeo; Tsunakawa, Mitsuaki; and Nishio, Maki, 5,110,960, Cl. 552-220.000.

Tomes, Christopher B.; and Tomes, Edward M. R., to Foxcroft Capital Corp. Machine for sharpening wooden stake. 5,109,896, Cl. 144-30.000.

Tomes, Edward M. R.: *See*—
Tomes, Christopher B.; and Tomes, Edward M. R., 5,109,896, Cl. 144-30.000.

Tomida, Kazuyuki: *See*—
Ueda, Akiyoshi; Ohishi, Haruhito; Aihara, Toshio; Ishikawa, Hisao; Tomida, Kazuyuki; and Hosaka, Hideo, 5,110,343, Cl. 71-88.000.

Tomioka, Kiyoshi: *See*—
Watanabe, Susumu; and Tomioka, Kiyoshi, 5,109,903, Cl. 152-209.00R.

Tomita, Junji, to Yamaha Corporation. Tremolo unit for an electronic guitar. 5,109,745, Cl. 84-313.000.

Tomita, Koji: *See*—
Oki, Toshikazu; Saitoh, Kyoichiro; Tomatsu, Kozo; Tomita, Koji; Konishi, Masataka; Miyaki, Takeo; Tsunakawa, Mitsuaki; and Nishio, Maki, 5,110,960, Cl. 552-220.000.

Tomita, Yasuji; Nakai, Hideyuki; and Goto, Kiyoshi, to Konica Corporation. Light-sensitive lithographic printing plate wherein the support is treated with an aqueous solution containing nitrites. 5,110,710, Cl. 430-278.000.

Tomizuka, Kazuo; Sugayama, Sakae; Saeki, Takao; and Sandoh, Fumio, to Sanyo Electric Co., Ltd. Semiconductor integrated circuit with circuit blocks, dummy islands, and bias and shield electrodes. 5,111,274, Cl. 357-53.000.

Tomoda, Takahisa; Takeuchi, Mikio; Nakano, Kinichiro; and Hirano, Motoki, to Nissan Motor Company, Limited. Pocket-portable radio code signal transmitter for automotive keyless entry system. 5,111,199, Cl. 340-825.720.

Toray Industries, Inc.: *See*—
Karasawa, Hiroo; Kometani, Kiichi; and Nakamura, Kiyokazu, 5,110,849, Cl. 524-87.000.
Uejikkoku, Nario; and Takeda, Masashi, 5,110,842, Cl. 521-134.000.

Toray Silicone Company, Ltd.: *See*—
Ona, Isao; and Ozaki, Masaru, 5,110,865, Cl. 524-838.000.

Torii, Nobutoshi; Naito, Yasuo; and Ueda, Kunio, to Fanuc Ltd. Variable-pitch spot welding gun assembly for a welding robot. 5,111,019, Cl. 219-87.000.

Torii, Shuji, to Nissan Motor Co., Ltd. Four wheel-drive system with viscous coupling. 5,109,944, Cl. 180-248.000.

Toriyama, Ichiro, to Sony Corporation. Satellite-based position determining system. 5,111,209, Cl. 342-357.000.

Tornblom, Bengt H., to Tornbloms Kvalitetskontroll AB. Composite sensing transducer. 5,111,412, Cl. 364-571.040.

Tornbloms Kvalitetskontroll AB: *See*—
Tornblom, Bengt H., 5,111,412, Cl. 364-571.040.

Tornstrom, Eric; and Norbedo, Anthony J., to Mobil Solar Energy Corporation. Cable interconnections for solar cell modules. 5,110,369, Cl. 136-251.000.

Toro Company, The: *See*—
Hufnagle, Donald L.; and Svoboda, Steven J., 5,109,722, Cl. 74-371.000.

Toroi, Martti: *See*—
Forss, Kaj G.; Fuhrmann, Agneta G. M.; and Toroi, Martti, 5,110,414, Cl. 162-163.000.

Torrence, Arthur L., to Mechtronics Corporation. Flowing liquid illusion. 5,109,620, Cl. 40-406.000.

Torri, Giangiacomo: *See*—
Casu, Benito; Naggi, Annamaria; Oreste, Pasqua; Torri, Giangiacomo; Zoppetti, Giorgio; Sportoletti, Giancarlo; and De Santis, Francesco, 5,110,918, Cl. 536-21.000.

Torrie, Paul A.: *See*—
DeSatnick, Allen H.; Torrie, Paul A.; and Egan, Thomas D., 5,111,212, Cl. 343-709.000.

Torrington Company, The: *See*—
Gabrielson, Alan L., 5,110,421, Cl. 205-131.000.

Tortorella, Osmar; and Tortorella, Yolanda. Vertical curtain panel assembly. 5,109,910, Cl. 160-197.000.

Tortorella, Yolanda: *See*—
Tortorella, Osmar; and Tortorella, Yolanda, 5,109,910, Cl. 160-197.000.

Toschi, Fabrizio; and Meneghini, Massimo, to Color Service SRL. Apparatus for the preparation and distribution of dye solutions in dyeing plants. 5,109,682, Cl. 68-13.00R.

Toshima, Seiji: *See*—
Kato, Kiyoshi; Suzuki, Isamu; and Toshima, Seiji, 5,110,265, Cl. 417-279.000.

Tosoh Corporation: *See*—
Kamiyama, Katsumi; and Igawa, Kazushige, 5,110,777, Cl. 502-68.000.

Toto Ltd.: *See*—
Makita, Atsuo; Takeuchi, Hirofumi; Shibata, Shinji; and Shimbara, Noboru, 5,109,550, Cl. 4-300.000.
Yokosawa, Kiyoshi; and Wajima, Naohito, 5,110,470, Cl. 210-500.230.

Toussant, Eugene. Keyhole guide for locks and method of using the same. 5,109,686, Cl. 70-454.000.

Toy, Edmond: *See*—
Fellows, Mark W.; Wong, John M.; Toy, Edmond; Erhardt, Robert A.; and Thomsen, James A., Jr., 5,111,118, Cl. 315-307.000.

Toya, Tomohiro: *See*—
Hara, Hajime; Orii, Shingo; Satoh, Tetsuo; Toya, Tomohiro; and Iida, Shigeki, 5,110,698, Cl. 430-20.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Ohi, Kiyomoto; and Shimizu, Shin, 5,110,741, Cl. 435-284.000.
Tani, Yatsuhiro; and Takase, Satoshi, 5,110,620, Cl. 427-40.000.

Toyo Seikan Kaisha, Ltd.: *See*—
Kawaguchi, Kiyoshi; and Yagishi, Hideki, 5,110,280, Cl. 425-311.000.

Kojima, Shunji; Watanabe, Yoshiki; Goto, Hiroaki; and Moriga, Toshinori, 5,110,847, Cl. 523-412.000.

Toyoda, Kazuo; and Maeda, Masao, to Showa Aluminum Corporation. Method of producing aluminum material for use as electronic material. 5,110,352, Cl. 75-679.000.

Toyoshima, Hisanori; Jyoraku, Fumio; Ishii, Yoshitaro; Iwase, Yukiji; and Sato, Shigenori, to Hitachi, Ltd. Electric blower having improved return passage for discharged air flow. 5,110,266, Cl. 417-312.000.

Toyoshima, Tetuya: *See*—
Kitahara, Shizuo; and Toyoshima, Tetuya, 5,110,886, Cl. 526-260.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Ishikawa, Kazunori; Tsukamoto, Kazumasa; Taniguchi, Takuji; and Taga, Yutaka, 5,109,733, Cl. 74-868.000.
Iwatsuki, Kunihiro; Kimura, Hiromichi; and Otsubo, Hideaki, 5,109,731, Cl. 74-866.000.
Kawaguchi, Shin; Ohhashi, Yutaka; and Fukuta, Kenji, 5,110,632, Cl. 427-424.000.
Sasaki, Shizuo, 5,109,816, Cl. 123-263.000.

Tozzolino, Pierre: *See*—
Cahiez, Gerard; Laboue, Blandine; and Tozzolino, Pierre, 5,110,962, Cl. 556-46.000.

Tracy, David J.: *See*—
Chaudhuri, Ratan K.; Tracy, David J.; Login, Robert B.; and Helioff, Michael W., 5,110,585, Cl. 424-70.000.

Traut, Davis E.: *See*—
White, Jack C.; Traut, Davis E.; Oden, Laurance L.; and Schmitt, Roman A., 5,110,546, Cl. 420-590.000.

Travis, Beth R.; and Travis, Darin P. Eye wear with interlocking frame sections. 5,110,198, Cl. 351-124.000.

Travis, Darin P.: *See*—
Travis, Beth R.; and Travis, Darin P., 5,110,198, Cl. 351-124.000.

Treece, Rande: *See*—
Kaner, Richard B.; Bonneau, Philippe R.; Gillan, Edward G.; Wiley, John B.; Jarvis, Robert F., Jr.; and Treece, Rande, 5,110,768, Cl. 501-1.000.

Tremco Incorporated: *See*—
Greenlee, Thomas W., 5,110,972, Cl. 556-460.000.

Trenton Box Company Limited: *See*—
Hurden, Derek, 5,110,042, Cl. 229-215.000.

Triffaux, Francis; and Moncheaux, Michel, to Saint-Gobain Vitrage. Device for assembling laminated glazings. 5,109,765, Cl. 100-155.00G.

Trinity Industries Inc.: *See*—
Johnstone, Bradford; and Lyons, Robert W., 5,109,776, Cl. 105-199.300.

Trouet, Andre : *See*—
Pirson, Philippe; Falmagne, Jean-Bernard; and Trouet, Andre , 5,110,935, Cl. 546-171.000.

Truitt, Gary A.: *See*—
Baggiolini, Enrico G.; Batcho, Andrew D.; Truitt, Gary A.; Uskokovic, Milan R.; and Wovkulich, Peter M., 5,110,958, Cl. 549-454.000.

Truskalo, Walter; and Norman, Marvin N., to Thomson Consumer Electronics, Inc. Scan loss detector for cathode ray tube. 5,111,119, Cl. 315-386.000.

Truth Division of SPX Corporation: *See*—
Piltingsrud, Stephen M., 5,110,165, Cl. 292-242.000.

TRW Inc.: *See*—
Brock, John C., 5,111,047, Cl. 250-336.100.
Fisher, Charles K.; and Steyn, Willem J., 5,110,246, Cl. 411-429.000.
Jones, Neil, 5,110,152, Cl. 280-707.000.

TRW Steering & Industrial Products (Japan) Co., Ltd.: *See*—
Kobayashi, Shigeki, 5,109,753, Cl. 91-375.00A.

Trzmiel, Alfred; Fiedler, Olaf; and Weyandt, Johannes, to Dr. Ing. h.c.F. Porsche AG; and Hydraulik-Ring GmbH. Chain drive tensioning and adjusting arrangement. 5,109,813, Cl. 123-90.150.

Tsav, Grace C., to Miles Inc. Virucidal euglobulin precipitation. 5,110,910, Cl. 530-390.100.

Tsikoyiannis, John G.: *See*—
Haag, Werner O.; and Tsikoyiannis, John G., 5,110,478, Cl. 210-650.000.

Tsuboi, Kunio: *See*—
Hamada, Fumihiko; Tsuboi, Kunio; Hasegawa, Mitihiko; Ichizawa, Yasuji; Yabe, Toshiya; Yamasaki, Kunitomo; Takahashi, Yasunobu; and Mizuta, Katsuji, 5,111,252, Cl. 355-308.000.

Tsuboi, Nobuyoshi: *See*—
Nakayama, Takahiro; Tamahashi, Kunihiro; Fuyama, Moriaki; Minemura, Hiroyuki; Sato, Yoshio; Tsuboi, Nobuyoshi; and Koyanagi, Hiroaki, 5,110,792, Cl. 505-1.000.

Tsubouchi, Shirou: *See*—
Inaba, Shin-ichi; Shindo, Yasuyuki; Tsubouchi, Shirou; Naganuma, Hiroki; Nakazawa, Yoshio; Hayashi, Ryusuke; and Yamada, Kanji, 5,110,656, Cl. 428-257.000.

Tsuchida, Yasuyuki: *See*—
Yuuchi, Takahiro; Tsuchida, Yasuyuki; and Fujiwara, Masakatsu, 5,109,845, Cl. 128-421.000.

Tsuchiya, Shozo: *See*—
Sasaki, Makoto; Kobayashi, Yukio; and Tsuchiya, Shozo, 5,110,872, Cl. 525-216.000.

Tsuchiya, Shuichi: *See*—
Hori, Kimihiko; Sakaguchi, Akira; Ishida, Koichi; Nomura, Tomoko; Suzuki, Keiko; and Tsuchiya, Shuichi, 5,110,826, Cl. 514-39.000.

Tsugaru, Kazunori, to Kabushiki Kaisha Toshiba. Bipolar transistor structure containing a resistor which assures reduction in layout area. 5,111,269, Cl. 357-43.000.

Tsuji, Toshiaki; Imai, Kiyoshi; and Ishizu, Atsushi, to Matsushita Electric Industrial Co., Ltd. Picture-in-picture double-scanning television receiver. 5,111,297, Cl. 358-183.000.

Tsujihara, Susumu; and Sakanishi, Yasuaki, to Matsushita Electric Industrial Co., Ltd. Digital convergence unit for adjusting the convergence in a color display system. 5,111,284, Cl. 358-60.000.

Tsujimoto, Naohiko; Yamakoshi, Masaru; Kudo, Toshimitsu; Horiuchi, Yukiko; and Shimizu, Jiro, to Oji Paper Co., Ltd. Process for preparation of lignocellulose phenolic compound composite product. 5,110,915, Cl. 530-502.000.

Tsukamoto, Kazumasa: *See*—
Ishikawa, Kazunori; Tsukamoto, Kazumasa; Taniguchi, Takuji; and Taga, Yutaka, 5,109,733, Cl. 74-868.000.

Tsunakawa, Mitsuaki: *See*—
Oki, Toshikazu; Saitoh, Kyoichiro; Tomatsu, Kozo; Tomita, Koji; Konishi, Masataka; Miyaki, Takeo; Tsunakawa, Mitsuaki; and Nishio, Maki, 5,110,960, Cl. 552-220.000.

Tsunefuji, Katsuhiko, to Olympus Optical Co., Ltd. Camera having fuzzy inference function. 5,111,232, Cl. 354-402.000.

Tsunoda, Shigeharu: *See*—
Nakamura, Shozo; Kaneda, Aizo; Tsunoda, Shigeharu; Hasebe, Akio; and Mitani, Masao, 5,110,515, Cl. 264-25.000.

Tsutsui, Eiji: *See*—
Koyama, Shigeo; Tsutsui, Eiji; Kobayashi, Kazuhiro; Horihata, Katsushi; and Tanaka, Hiroyuki, 5,111,244, Cl. 355-210.000.

Tsutsui, Hiroshi: *See*—
Ohtsuchi, Tetsuro; Tsutsui, Hiroshi; Ohmori, Koichi; Baba, Sueki; Funakoshi, Hiromasa; Kawara, Toshiyuki; and Yoshizumi, Yoshiyuki, 5,111,052, Cl. 250-370.010.

Tsuyama, Koichi: *See*—
Inoue, Masahide; Nakano, Tetsuya; Yabe, Naruo; Tsuyama, Koichi; Shimizu, Yoshitake; and Kuroki, Mitsushi, 5,110,704, Cl. 430-110.000.

Tsuzuki, Kiyohiro, to TNS Mills, Inc. Magnetic ring for the spinning of textile yarn and method. 5,109,659, Cl. 57-66.000.

TTC Technology Trading Company: *See*—
Koch, Max, 5,109,598, Cl. 29-825.000.

Tuchiya, Akira: *See*—
Hayashi, Taira; Watanabe, Hiroyuki; Tuchiya, Akira; Hagiwara, Kazuo; and Hishiyama, Iwao, 5,110,526, Cl. 264-127.000.

Tucker, Melvin P.; Grohmann, Karel; Himmel, Michael E.; and Mohagheghi, Ali, to Midwest Research Institute. Thermostable purified endoglucanase from thermophilic bacterium acidothermus cellulolyticus. 5,110,735, Cl. 435-209.000.

Tucker, Terence. Protective cap with seal for beverage container. 5,110,002, Cl. 220-254.000.

Tuliani, Vinod: *See*—
Geyer, Robert P.; and Tuliani, Vinod, 5,110,606, Cl. 424-489.000.

Turley, Alfred P.: *See*—
Chen, Li-Shu; Ghoshtagore, Rathindra N.; Turley, Alfred P.; and Yannone, Louis A., 5,110,755, Cl. 437-62.000.

Turloff, Harry E.; Kitchen, Kirk G.; and Levin, Igor, to Turloff, Harry E. Electronic fluid-level sensor with three state indicator. 5,111,188, Cl. 340-623.000.

Turnbull, John P.: *See*—
Storer, Richard; Mo, Chi L.; and Turnbull, John P., 5,110,926, Cl. 544-276.000.

Turner, James B.; and McInnis, Roderick J., to Greyhawk Systems, Inc. Projected image linewidth correction apparatus and method. 5,111,513, Cl. 382-8.000.

Turner, Leonard O.: *See*—
Flamm, Ronald C.; Turner, Leonard O.; and Plunkett, James D., 5,111,362, Cl. 361-395.000.

Turner, Loyce A.; and Ausburn, Phillip K., to North American Philips Corporation. Magnet for use in a drift tube of an X-ray tube. 5,111,494, Cl. 378-138.000.

Turpin, Jim L.; Eldridge, Robert B.; and Booth-McGee, Sharon, to University of Little Rock Arkansas, The Board of Trustees of the. Process for extracting ethanol from fermentation broths for direct blending into gasoline while preserving the broth for recycling. 5,110,319, Cl. 44-451.000.

Turro, Nicholas J.; and Fehlner, James R., to Inrad, Inc. Terminal chlorination of normal alkane hydrocarbons. 5,110,425, Cl. 204-158.120.

Turugai, Takashi: *See*—
Nakahara, Moriya; Saito, Yasuyuki; Shirai, Kenichi; Itabashi, Yasushi; and Turugai, Takashi, 5,110,762, Cl. 437-189.000.

Tutui, Yuji: *See*—
Yamada, Yuichiro; Matusita, Yosinari; and Tutui, Yuji, 5,110,437, Cl. 204-298.330.

Twyford, Robert H., Jr., to Target Therapeutics. Extendable guidewire assembly. 5,109,867, Cl. 128-772.000.

Ty, Henry: *See*—
Glasson, Eric J.; Ty, Henry; White, Alfred J.; and Gondusky, Joseph H., 5,110,045, Cl. 236-93.00R.

Tzeng, Jyh-Cherng J., to Intel Corporation. Three-dimensional contactless non-volatile memory cell. 5,111,270, Cl. 357-23.500.

Ube Industries, Ltd.: *See*—
Sugiura, Hisao; Nishimura, Takashi; and Tanaka, Toshinobu, 5,110,827, Cl. 514-399.000.

Ucar Carbon Technology Corporation: *See*—
Orac, Thomas H.; Quandt, Herbert C.; and Ball, David R., 5,110,359, Cl. 106-473.000.

VOL
1138
ISS
1
MY
5
1992
UMI

Uchida, Kinji: *See*—
Abe, Keietsu; and Uchida Kinji, 5,110,739, Cl. 435-252.900.
Uchiyama, Yasuyuki, to Mutoh Industries Ltd. Manual printer. 5,110,225, Cl. 400-29.000.
Ueda, Akiyoshi; Ohishi, Haruhito; Aihara, Toshio; Ishikawa, Hisao; Tomida, Kazuyuki; and Hosaka, Hideo, to Nippon Soda Co., Ltd. Cyclohexenone derivatives. 5,110,343, Cl. 71-88.000.
Ueda, Kunio: *See*—
Torii, Nobutoshi; Naito, Yasuo; and Ueda, Kunio, 5,111,019, Cl. 219-87.000.
Ueda, Masuyuki: *See*—
Doke, Harumi; Ishida, Syozi; Iwasa, Hiroki; Nagasaka, Chikao; Ueda, Masuyuki; Kato, Shigeru; Aoki, Hisashi; Shibahara, Makoto; and Mori, Satoshi, 5,111,006, Cl. 200-5.00R.
Ueda, Osamu: *See*—
Andoh, Nobuaki; and Ueda, Osamu, 5,111,257, Cl. 357-23.400.
Uejikkoku, Nario; and Takeda, Masashi, to Toray Industries, Inc. Electron-beam cured sheet-type foam. 5,110,842, Cl. 521-134.000.
Ueno, Hiroshi; Kikuchi, Yasuo; Takahashi, Kunitomo; Doi, Koji; Onose, Tsukasa; and Ogawa, Toshitaka, to Hitachi Koki Co., Ltd. Method of operating electrophotographic printing apparatus. 5,111,235, Cl. 355-246.000.
Uetake, Tsuyoshi, to Keisei Medical Industrial Co., Ltd. Ventilated air mattress with alternately inflatable air cells having communicating upper and lower air chambers. 5,109,560, Cl. 5-453.000.
Uhde GmbH: *See*—
Herbort, Hans-Joachim, 5,110,564, Cl. 422-197.000.
Uher, Karel: *See*—
Novotny, Ladislav; Kalvoda, Robert; Novak, Vladimir; and Uher, Karel, 5,110,429, Cl. 204-153.100.
Uhl, Michael. Tote bag. 5,110,020, Cl. 224-32.00R.
Ullrich, Manfred F., to Deutsche ITT Industries GmbH. Circuit arrangement for calculating product sums. 5,111,422, Cl. 364-750.500.
Umeda, Masaru: *See*—
Ohmi, Tadahiro; Shibata, Tadashi; and Umeda, Masaru, 5,110,438, Cl. 204-298.340.
Umeda, Shigeru: *See*—
Nishiwaki, Toshihiro; Umeda, Shigeru; and Takatori, Tsuyoshi, 5,111,018, Cl. 219-86.250.
Umemoto, Yuji; Toki, Akio; and Yamaguchi, Shuji, to Kabushiki Kaisha Toshiba. Cordless telephone apparatus having a ringer circuit operable during power failure. 5,111,499, Cl. 379-61.000.
Umise, Shigeki; and Imamura, Hirokatsu, to Dai Nippon Insatsu Kabushiki Kaisha. Apparatus for making thermal transfer recording sheet. 5,109,795, Cl. 118-669.000.
Uni-Charm Corporation: *See*—
Ochi, Mitsuzo; Nakano, Shoji; and Hosakawa, Masashi, 5,110,386, Cl. 156-204.000.
Union Carbide Chemicals & Plastics Technology Corporation: *See*—
Blessing, Michael A.; Dembowski, Gregory J.; and Finnell, Gregory K., 5,110,990, Cl. 568-492.000.
Blevins, Charles H., II; Matlock, Paul L.; and Murphy, Gerald J., 5,110,970, Cl. 556-445.000.
Lee, Chinsoo; and Bassett, David R., 5,110,903, Cl. 528-397.000.
Union Carbide Industrial Gases Technology Corporation: *See*—
Snyder, William J.; and Anderson, John E., 5,110,285, Cl. 431-8.000.
Union Explosivos Rio Tinto, S.A.: *See*—
Corral, Jose S. M.; De Aza, Salvador; Poyato, Francisco M.; Valle Fuentes, Francisco J.; Miranda, Isabel O.; Caseres, Rafael M.; and Martinez, Paz C., 5,110,773, Cl. 501-98.000.
Unisys Corporation: *See*—
Couper, John, 5,110,115, Cl. 271-265.000.
Idleman, Thomas E.; and Stamness, Jesse I., 5,111,387, Cl. 395-425.000.
Ketcham, Larry R., 5,111,390, Cl. 395-725.000.
United Solar Systems Corporation: *See*—
Vogeli, Craig; and Nath, Prem, 5,110,370, Cl. 136-256.000.
United States of America
Administrator, National Aeronautics & Space Administration: *See*—
Muller, Ronald M., 5,111,345, Cl. 360-48.000.
Air Force: *See*—
Charlie, Wayne A.; and Butler, Leo W., 5,109,702, Cl. 73-84.000.
Hunter, Henry J.; Marshall, Clifton W.; Cunningham, Kenneth; and Tingdahl, Marvin A., 5,110,071, Cl. 244-137.300.
Javidi, Bahram, 5,111,515, Cl. 382-43.000.
Army: *See*—
Otto, William F.; Holloman, Miles E.; and Jordan, Debbee J., 5,110,368, Cl. 136-246.000.
Tauber, Arthur; Finnegan, Robert D.; Dornath Mohr, Michelle A.; and McBride, Frank A., 5,110,767, Cl. 505-1.000.
Energy: *See*—
Hammond, Peter R.; and Feeman, James F., 5,111,472, Cl. 372-53.000.
Johnson, Bruce H.; Larsen, Lawrence E.; and Welch, Edmund F., 5,110,222, Cl. 384-482.000.
Lee, Kien-yin; and Storm, Carlyle B., 5,110,380, Cl. 149-92.000.
Marrone, Babetta L.; Simpson, Daniel J.; Unkefer, Clifford J.; and Whaley, Thomas W., 5,110,725, Cl. 435-11.000.
Sreepada, Sastry R.; and Rippel, Robert R., 5,110,208, Cl. 356-128.000.
Health and Human Services: *See*—
Pitha, Josef; and Kusiak, John W., 5,110,927, Cl. 544-291.000.
Interior: *See*—
White, Jack C.; Traut, Davis E.; Oden, Laurance L.; and Schmitt, Roman A., 5,110,546, Cl. 420-590.000.
National Aeronautics and Space Administration: *See*—
Nagasubramanian, Ganesan; and DiStefano, Salvador, 5,110,694, Cl. 429-192.000.
Schubert, Franz H.; and Grigger, David J., 5,110,436, Cl. 204-129.000.
Navy: *See*—
Ayers, Jack D., 5,110,334, Cl. 65-2.000.
Dibble, John G., 5,111,036, Cl. 250-214.0AL.
Everett, Hobart K., Jr.; Gilbreath, Gary A.; and Laird, Robin T., 5,111,401, Cl. 364-424.020.
Fare, Thomas L.; and Ligler, Frances S., 5,111,221, Cl. 357-25.000.
Hsu, David S. Y., 5,110,760, Cl. 437-180.000.
Kelly, James G.; and Carpenter, Robert N., 5,111,438, Cl. 367-87.000.
MacCabee, Bruce S., 5,110,203, Cl. 356-5.000.
Young, Michael B., 5,109,577, Cl. 24-71.200.
U.S. Philips Corporation: *See*—
Bonnefous, Odile; and Mangotte, Frederic, 5,109,856, Cl. 128-660.010.
Browne, Arthur, 5,111,411, Cl. 364-559.000.
Dapo, Roland F., 5,111,365, Cl. 361-506.000.
Delarue, Francois; Girand, Michel; and Montero, Manuel, 5,109,724, Cl. 74-479.000.
Houben, Paulus A., 5,111,110, Cl. 315-10.000.
Jasmer, Wolfgang E.; Kruger, Johann E. W.; and Killat, Ulrich R. P., 5,111,200, Cl. 340-826.000.
Kuhn, Michael, 5,111,144, Cl. 324-309.000.
Kuhn, Michael H., 5,111,146, Cl. 324-318.000.
McKinnon, Graeme; and Bosiger, Peter, 5,111,143, Cl. 324-307.000.
Patron, Christian S. A. E.; and Walters, Theodorus H. J., 5,111,024, Cl. 219-121.540.
Slingerland, Hendrik N., 5,111,054, Cl. 250-441.110.
Tarrant, David R., 5,111,462, Cl. 371-37.100.
Van Es, Ludovicus P. C.; and Van Der Ploeg, Robert, 5,111,496, Cl. 378-177.000.
United Technologies Automotive: *See*—
Barrs, John A., 5,111,125, Cl. 318-603.000.
United Technologies Corporation: *See*—
Ball, Gary A., 5,111,326, Cl. 359-244.000.
Byrnes, Francis E.; Hibyan, Edward S.; and Noehren, William L., 5,110,260, Cl. 416-134.00A.
Cramer, Paul S.; Lomasney, Gary M.; and Parkos, Joseph J., Jr., 5,109,589, Cl. 29-527.400.
DeMichael, Thomas; and Seeley, Philip G., 5,109,606, Cl. 29-889.100.
Hibner, David H.; Buono, Dennis F.; Dembeck, Kurt M.; and Franceschet, Roy D., 5,110,257, Cl. 415-119.000.
Kester, Jervis D.; and Redington, Clarence P., 5,109,664, Cl. 60-39.060.
Noone, Lawrence E.; and Lagasse, Leo J., 5,110,033, Cl. 228-160.000.
Presz, Walter M., Jr.; Paterson, Robert W.; Werle, Michael J.; and Ealba, Robert H., 5,110,560, Cl. 422-176.000.
Universal Fountain Brush Co.: *See*—
Wright, Donald C., Jr., 5,109,769, Cl. 101-329.000.
Universal Tool & Stamping Co.: *See*—
Engel, Darryl L.; and Scoville, John R., 5,110,091, Cl. 254-126.000.
Universidad Autonoma Metropolitana: *See*—
de Luca, Adriano, 5,111,035, Cl. 250-213.0VT.
University of California, The Regents of the: *See*—
Clements, John A., 5,110,806, Cl. 514-78.000.
Green, Melvin H., 5,110,600, Cl. 424-45.00D.
Haller, Eugene E.; Cohen, Marvin L.; and Hansen, William L., 5,110,679, Cl. 428-408.000.
University of Cincinnati: *See*—
Melvin, David B.; and Brooks, David M., 5,109,843, Cl. 128-419.00R.
Sehkar, Jainagesh A.; Bhattacharya, A. K.; and Li, Hung P., 5,110,688, Cl. 428-552.000.
University of Colorado Foundation, Inc., The: *See*—
Noble, Richard D.; Koval, Carl A.; Nixon, Lori; and Slaff, Geoffrey F., 5,110,624, Cl. 427-212.000.
University of Florida: *See*—
Wagener, Kenneth B.; Boncella, James M.; Duttweiler, Robert P.; Hillmyer, Marc A.; and Nel, Jan G., 5,110,885, Cl. 526-170.000.
Walker, James K., 5,110,500, Cl. 252-301.160.
University of Little Rock Arkansas, The Board of Trustees of the: *See*—
Turpin, Jim L.; Eldridge, Robert B.; and Booth-McGee, Sharon, 5,110,319, Cl. 44-451.000.
University of Medicine and Dentistry of New Jersey: *See*—
Semmlow, John L.; Welkowitz, Walter; Kostis, John B.; and Akay, Metin, 5,109,863, Cl. 128-715.000.
University of Miami: *See*—
Awad, William M., Jr., 5,110,914, Cl. 530-416.000.
University of Minnesota, Regents of the: *See*—
Gravrok, Roger J.; and Warner, Raymond M., Jr., 5,111,074, Cl. 307-443.000.
University of Pennsylvania: *See*—
Abe, Yoshihiro; and Nicolaou, Kyriacos C., 5,110,949, Cl. 549-214.000.
Kricka, Larry J.; and Wilding, Peter, 5,110,745, Cl. 436-87.000.
University of Tennessee Research Corp., The: *See*—
Lai, Jih-Sheng; and Bose, Bimal K., 5,111,374, Cl. 363-37.000.

University Patents, Inc.: *See*—
Olvey, James M., 5,110,344, Cl. 71-90.000.
Olvey, James M., 5,110,345, Cl. 71-90.000.
Unkefer, Clifford J.: *See*—
Marrone, Babetta L.; Simpson, Daniel J.; Unkefer, Clifford J.; and Whaley, Thomas W., 5,110,725, Cl. 435-11.000.
Uno, Mugijirou; and Yuasa, Kazuhiro, to Ricoh Company, Ltd. Apparatus for cleaning photoconductive belt. 5,111,251, Cl. 355-297.000.
Unruh, Jan: *See*—
Botzenhardt, Wolfgang; Dais, Siegfried; Kiencke, Uwe; Litschel, Martin; and Unruh, Jan, 5,111,460, Cl. 371-29.100.
Unuma, Sadao, to Tokai Kogyo Kabushiki Kaisha. Paper feeder having a paper exhaustion detector. 5,110,025, Cl. 226-74.000.
UOP: *See*—
Haun, Edward C.; Thompson, Gregory J.; and Gorawara, Jayant K., 5,110,444, Cl. 208-89.000.
Urata, Kenji: *See*—
Kondo, Toshio; Urata, Kenji; Katagiri, Masayoshi; and Nakamura, Kenichi, 5,109,959, Cl. 188-73.310.
Uratsuji, Kazumi: *See*—
Matsuoka, Noriyuki; and Uratsuji, Kazumi, 5,109,980, Cl. 206-328.000.
Urban, Manfred: *See*—
Dietz, Erwin; and Urban, Manfred, 5,110,931, Cl. 546-37.000.
Uribe, Diego; Driskill, Paul; and Hantscho, Rolf, to Oxy-Dry Corporation. Printing cylinder cleaning system. 5,109,770, Cl. 101-425.000.
Urso, Richard: *See*—
McPherson, Cheryl; Stanko, Gary; and Urso, Richard, 5,109,991, Cl. 211-45.000.
Ushida, Masayasu: *See*—
Tagami, Hitoshi; Ushida, Masayasu; and Tabata, Taro, 5,109,828, Cl. 123-635.000.
Ushijima, Toshie: *See*—
Matsuda, Tetsuya; Yamamoto, Shunji; Yamada, Tadatoshi; and Ushijima, Toshie, 5,111,173, Cl. 335-216.000.
Uskokovic, Milan R.: *See*—
Baggiolini, Enrico G.; Batcho, Andrew D.; Truitt, Gary A.; Uskokovic, Milan R.; and Wovkulich, Peter M., 5,110,958, Cl. 549-454.000.
Usui Kokusai Sangyo Kabushiki Kaisha: *See*—
Hitachi, Yuzo; and Serizawa, Haruo, 5,110,561, Cl. 422-180.000.
Usui, Masayoshi; and Serizawa, Haruo, 5,110,690, Cl. 428-678.000.
Usui Kokusai Sangyo Kaisha Ltd.: *See*—
Inoue, Hiroshi, 5,109,965, Cl. 192-58.00B.
Usui, Masayoshi. High-pressure metallic pipe provided with connecting head part and method for formation thereof. 5,109,888, Cl. 138-109.000.
Usui, Masayoshi; and Serizawa, Haruo, to Usui Kokusai Sangyo Kabushiki Kaisha. Substantially flat and thin steel band. 5,110,690, Cl. 428-678.000.
USX Corporation: *See*—
Hunter, Philip B.; Chou, Chang-Long; and Wang, Muh-Shuh, 5,110,351, Cl. 75-508.000.
Uyama, Yoshiyuki, to Brother Koygo Kabushiki Kaisha. Cover plate and bobbin holder thread tensioning guides. 5,109,782, Cl. 112-184.000.
Uyeda, Alan K.: *See*—
Gartner, Klaus W.; and Uyeda, Alan K., 5,110,009, Cl. 221-266.000.
Vacuum Furnace Systems Corporation: *See*—
Ripley, Fred W., 5,109,917, Cl. 165-75.000.
Vail, Philip B.: *See*—
Bliven, David C.; Vranicar, Anthony; Vail, Philip B.; Shimirak, Gerald L.; and Mullaney, Julian S., 5,111,497, Cl. 379-27.000.
Valente, Ronald R.: *See*—
Chapman, Derek D.; and Valente, Ronald R., 5,110,937, Cl. 546-261.000.
Valeo: *See*—
Guillemin, Jean, 5,109,755, Cl. 454-160.000.
Valle Fuentes, Francisco J.: *See*—
Corral, Jose S. M.; De Aza, Salvador; Poyato, Francisco M.; Valle Fuentes, Francisco J.; Miranda, Isabel O.; Caseres, Rafael M.; and Martinez, Paz C., 5,110,773, Cl. 501-98.000.
Valmet-Dominion Inc.: *See*—
Kremar, Djuro, 5,110,062, Cl. 242-57.000.
Valmet Paper Machinery Inc.: *See*—
Linsuri, Ari; and Odell, Michael H., 5,110,416, Cl. 162-343.000.
Van Dam, Marinus J. M.: *See*—
Boderie, Emile E. M.; and Van Dam, Marinus J. M., 5,111,037, Cl. 250-216.000.
VanDelden, Jay S.; and Wilson, Donald K., to Optics for Research. Optical isolators employing wavelength tuning. 5,111,330, Cl. 359-281.000.
Vandermeide, Benjamin. Toy shooting gallery. 5,110,138, Cl. 273-391.000.
Van Der Ploeg, Robert: *See*—
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Robinson, Peter M.; and Van-Det, Nguyen, 5,110,864, Cl. 524-801.000.
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Blohm, Margaret L.; Pickett, James E.; and VanDort, Paul C., 5,111,327, Cl. 526-256.000.
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Thunberg, Jon C.; VanKouwenberg, Steven P.; and Begonis, Walter B., 5,110,965, Cl. 556-148.000.
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Lazansky, Richard W.; Miller, Thomas R.; Coelho, David R.; Scott, Kenneth E.; and Stanculescu, Alec G., 5,111,413, Cl. 364-578.000.
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Calabro, David C.; Schmitt, Kirk D.; and Vartuli, James C., 5,110,572, Cl. 423-328.000.
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Hannen, Reiner W.; Vermeulen, Norbert P.; and Schulze-Frenking, Josef, 5,111,528, Cl. 392-379.000.
Versteeg, Frits J.: *See*—
Elshoud, Nicolaas P.; and Versteeg, Frits J., 5,110,209, Cl. 356-138.000.
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Vigneron, Claude: *See*—
Dellacherie, Edith; Leonard, Michele; Sacco, Daniel; and Vigneron, Claude, 5,110,909, Cl. 530-385.000.
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Eich, David M.; Jesse, Robert; and Nestler, John, 5,110,810, Cl. 514-178.000.
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Howard, David B.; Kenley, Rodney; Berry, Dennis; Keshaviah, Prakash; and Vishnoi, Rohit, 5,110,477, Cl. 210-647.000.
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Andree, David A., 5,110,174, Cl. 296-77.100.
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Conaway, Robert M., 5,110,542, Cl. 419-25.000.
Vitale, Nicholas G., to Mechanical Technology Incorporated. Relative gas spring configuration free-piston stirling cycle system. 5,109,673, Cl. 60-520.000.
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Ferry, Thomas V.; Kawa, Jamil; Pierce, Kerry M.; Walker, William G.; and Zampaglione, Michael A., 5,111,075, Cl. 307-443.000.
Ganapol, David L.; and Small, Gary L., 5,110,628, Cl. 427-256.000.
Morlon, Patrice P., 5,111,205, Cl. 341-156.000.
Ward, James, 5,111,064, Cl. 307-270.000.
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Harclerode, William H.; Volz, William E.; Wiman, John V.; Voss, John C.; Pekich, Barry J; and Knutsen, John C., 5,110,837, Cl. 521-58.000.

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Shepherd, Leonard L.; and VonFumetti, Cyril W., 5,110,169, Cl. 294-119.400.

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Roundhill, David N.; and von Ramm, Olaf T., 5,109,857, Cl. 128-661.080.

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Chung, Tai-Shung; and Vora, Rohitkumar H., 5,110,879, Cl. 525-432.000.

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Harclerode, William H.; Volz, William E.; Wiman, John V.; Voss, John C.; Pekich, Barry J; and Knutsen, John C., 5,110,524, Cl. 264-53.000.
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Kharitonov, Alexandr S.; Panov, Gennadii I.; Ione, Kazimira G.; Romannikov, Vyacheslav N.; Sheveleva, Galina A.; Vostrikova, Lidia A.; and Sobolev, Vladimir I., 5,110,995, Cl. 568-800.000.

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Bliven, David C.; Vranicar, Anthony; Vail, Philip B.; Shimirak, Gerald L.; and Mullaney, Julian S., 5,111,497, Cl. 379-27.000.

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Ball, David P.; and Ensor, Donald R., 5,111,115, Cl. 315-239.000.

Vyas, Navin N.: *See—*
Jasinski, John F.; McCormick, Robert P.; Mellinger, Ricky C.; Draper, James K.; and Vyas, Navin N., 5,110,387, Cl. 156-222.000.

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Myoken, Yoshinari; Okamoto, Tetsuji; and Sato, J. Denry, 5,110,737, Cl. 435-240.270.

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Braun, Morris, 5,110,017, Cl. 222-520.000.

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Collins, Floyd A.; Kahler, Andrew W.; and Windham, Marvin R., 5,109,834, Cl. 126-41.00R.

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Buck, Steven K.; and Willey, Wendall D., 5,110,306, Cl. 439-497.000.

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Barmore, Charles R.; and Schirmer, Henry G., 5,110,677, Cl. 428-349.000.
Havens, Marvin R., 5,110,530, Cl. 264-171.000.
Merjanian, John-Michael, 5,110,098, Cl. 269-21.000.
Parker, Frederick J., 5,110,772, Cl. 501-97.000.
Peters, Alan W., 5,110,780, Cl. 502-303.000.
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Welsh, William A.; and Schmidt, Stephen R., 5,110,769, Cl. 501-12.000.

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Martini, Francesco; and Perazzo, Luigi, 5,110,390, Cl. 156-244.110.

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Zaborszki, Tony, 5,109,970, Cl. 193-2.00R.

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Bausch, Gunther; and Wachter, Fritz, 5,110,281, Cl. 425-406.000.

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Prigge, Helene; and Lang Josef, 5,110,428, Cl. 204-129.300.

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Katayama, Shigeru; Matsumoto, Hiroshi; and Wada, Tatuo, 5,110,788, Cl. 503-227.000.

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Hoarty, John T.; Hodgkinson, Leslie; and Waddicor, Michael J., 5,110,362, Cl. 106-708.000.

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Maiorca, Philip P.; Abernathy, Ronald N.; and Wadley, George H., 5,110,615, Cl. 427-8.000.

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Kober, Reiner; Theobald, Hans; Kardorff, Uwe; Kuenast, Christoph; Hofmeister, Peter; Seele, Rainer; and Wagenblast, Gerhard, 5,110,829, Cl. 514-443.000.

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Laughlin, Donald J.; and Wagoner, Lawrence F., 5,110,134, Cl. 273-293.000.

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Yokosawa, Kiyoshi; and Wajima, Naohito, 5,110,470, Cl. 210-500.230.

Wakabayashi, Seiichi: *See—*
Yagi, Kiyoshi; and Wakabayashi, Seiichi, 5,111,109, Cl. 313-622.000.

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Ogata, Yoshitake; Ikeda, Makoto; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Yamanaka, Takashi; Hishinuma, Ieharu; Nagakawa, Junichi; Hirota, Kazuo; Miyamoto, Kaname; Horie, Toru; and Wakabayashi, Tsuneo, 5,110,956, Cl. 549-447.000.

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McAuliffe, Keven P.; Melton, Evelyn A.; Norton, Vern A.; Pfister, Gregoty F.; and Wakefield, Scott P., 5,111,389, Cl. 395-800.000.

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Otake, Shin-ichi; and Wakuta, Satoru, 5,111,090, Cl. 310-54.000.

Walbrodt, Peter: *See—*
Heintzmann, Peter; Berger, Karl-Heinz; and Walbrodt, Peter, 5,110,187, Cl. 299-1.400.

Waldrum, John E., to DowElanco. Spray nozzles. 5,110,048, Cl. 239-171.000.

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Ferry, Thomas V.; Kawa, Jamil; Pierce, Kerry M.; Walker, William G.; and Zampaglione, Michael A., 5,111,075, Cl. 307-443.000.

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Cantin, Edouard M.; Zaia, John A.; Wallace, R. Bruce; and Rossi, John J., 5,110,802, Cl. 514-44.000.

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Kubis, Charles S.; Walter, John; Roth, Donald J.; and Mohr, Glenn R., 5,109,653, Cl. 53-510.000.

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Patron, Christian S. A. E.; and Walters, Theodorus H. J., 5,111,024, Cl. 219-121.540.

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Back, Paul R., 5,111,086, Cl. 307-603.000.
Chirokas, David S.; Michaud, Daniel G.; McDeed, Arthur P., III; Shiel, Michael J.; Soper, G. Michael; and Mascio, Dennis R., 5,111,397, Cl. 364-419.000.

Wang, Muh-Shuh: *See—*
Hunter, Philip B.; Chou, Chang-Long; and Wang, Muh-Shuh, 5,110,351, Cl. 75-508.000.

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Seib, Paul A.; and Wang, Xiao Y., 5,110,950, Cl. 549-222.000.

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Herron, Norman; and Wang, Ying, 5,110,505, Cl. 252-518.000.

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Hay, Allan S.; and Wang, Zhi Y., 5,110,993, Cl. 568-721.000.

Ward, James, to VLSI Technology, Inc. Slow ramp high drive output pad. 5,111,064, Cl. 307-270.000.

Ward, James R.: *See—*
Studtmann, George H.; Ward, James R.; and Forbes, Terry L., 5,110,087, Cl. 251-129.160.

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Nimberger, Spencer M.; and Ward, Robert L., 5,109,712, Cl. 73-864.620.

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Cherukuri, Subraman R.; Faust, Steven M.; and Mansukhani, Gul, 5,110,608, Cl. 426-3.000.
Yang, Robert K., 5,110,607, Cl. 426-3.000.

Warner, Raymond M., Jr.: *See—*
Gravrok, Roger J.; and Warner, Raymond M., Jr., 5,111,074, Cl. 307-443.000.

Warring, Jessica A.: *See—*
Goodman, David E.; Warring, Jessica A.; and Mannheimer, Paul D., 5,109,849, Cl. 128-633.000.

Washiyama, Yutaka: *See—*
Takauji, Kiyomi; and Washiyama, Yutaka, 5,109,746, Cl. 84-607.000.

Washizaki, Youji: *See—*
Taguchi, Hiroshi; and Washizaki, Youji, 5,110,391, Cl. 156-250.000.

Wassmer, Christoph: *See—*
Beer, Christian; Wassmer, Christoph; and Wyss, Alois, 5,109,974, Cl. 198-346.100.

Wassmer, Karl-Heinz: *See—*
Walter, Manfred; Wassmer, Karl-Heinz; and Lorenz, Maria, 5,110,835, Cl. 521-57.000.

Watanabe, Hiroyuki: *See—*
Hayashi, Taira; Watanabe, Hiroyuki; Tuchiya, Akira; Hagiwara, Kazuo; and Hishiyama, Iwao, 5,110,526, Cl. 264-127.000.

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Jikihara, Tetsuo; Shike, Toyohiko; Katsurada, Manabu; Watanabe, Hisao; and Ikeda, Osamu, 5,110,342, Cl. 71-88.000.

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Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshioka, Hitoshi; and Norigoe, Isami, 5,111,372, Cl. 363-20.000.

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Soeda, Mizuo; and Watanabe, Kazuyoshi, 5,110,576, Cl. 423-445.000.

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Miyata, Seizo; Hosomi, Takeshi; Suzuki, Toshio; Watanabe, Toshiyuki; Yamamoto, Hironobu; and Hayashi, Akio, 5,110,988, Cl. 564-441.000.

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Watanabe, Yasuhiko: *See—*
Inoue, Kazushi; Abe, Shigeru; Tagawa, Yuji; Kondo, Takashi; Watanabe, Yasuhiko; and Shibata, Jun, 5,109,785, Cl. 112-303.000.

Watanabe, Yoshiaki: *See—*
Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; and Ogiwara, Yoshihisa, 5,111,261, Cl. 357-23.700.

Watanabe, Yoshiki: *See—*
Kojima, Shunji; Watanabe, Yoshiki; Goto, Hiroaki; and Moriga, Toshinori, 5,110,847, Cl. 523-412.000.

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Senoo, Seiiti; and Watanabe, Yoshio, 5,111,148, Cl. 324-433.000.

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Watson, Keith G.: *See—*
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; and Cross, Linsay E., 5,110,989, Cl. 568-327.000.

Watson, Paul R.: *See—*
Krasij, Myron; and Watson, Paul R., 5,110,691, Cl. 429-35.000.

Waun, Cindy M.: *See—*
Brooks, David K.; Waun, Cindy M.; and Gross, Larry E., 5,111,402, Cl. 364-424.040.

Webb, Edward A.: *See—*
Arold, Johathan B.; Mishou, Joan L.; Parent, Charles R.; Stark, Joseph P.; and Webb, Edward A., 5,111,527, Cl. 392-360.000.

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Weber, Fred, to AGM Aktiengesellschaft Muller. Card game. 5,110,135, Cl. 273-296.000.

Weber, Heribert: *See—*
Stacher, Angelo; and Weber, Heribert, 5,109,890, Cl. 139-190.000.

Weber, Thaddeus A.: *See—*
Murphy, Timothy J.; and Weber, Thaddeus A., 5,111,070, Cl. 307-311.000.

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Wehr, C. Timothy: *See—*
Zhu, Minge-De; Rodriguez, Roberto; and Wehr, C. Timothy, 5,110,434, Cl. 204-183.200.

Weider, Richard; Arlt, Dieter; Leuschke, Christian; and Scholl, Thomas, to Bayer Aktiengesellschaft. Polyester and polyester carbonate from terephthalic or isophthalic acid, phosgene and phenols with heat resistance and light stability. 5,110,895, Cl. 528-176.000.

Weidner, Eckhard O.: *See—*
Peter, Siegfried K.; Weidner, Eckhard O.; Ender, Ulrich M.; and Czech, Bernd A., 5,110,509, Cl. 554-184.000.

Weimer, Alan W.; Moore, William G.; and Roach, Raymond P., to Dow Chemical Company, The. Apparatus for producing uniform, fine ceramic powder. 5,110,565, Cl. 422-198.000.

Weinberg, Norman L.: *See—*
Mazur, Duane J.; Weinberg, Norman L.; and Abel, Albert E., 5,110,364, Cl. 134-2.000.

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Westergren, Kenneth; Weinl, Gerold; and Oskarsson, Rolf, 5,110,349, Cl. 75-233.000.

Welch, Edmund F.: *See—*
Johnson, Bruce H.; Larsen, Lawrence E.; and Welch, Edmund F., 5,110,222, Cl. 384-482.000.

Weldon, James R.: *See—*
Kozloski, Edward A.; Seger, Eric; Howard, Walter E.; and Weldon, James R., 5,110,469, Cl. 210-455.000.

Welk, John R.: *See—*
Hung, Nelson C.; and Welk, John R., 5,111,454, Cl. 370-95.300.

Welkowitz, Walter: *See—*
Semmlow, John L.; Welkowitz, Walter; Kostis, John B.; and Akay, Metin, 5,109,863, Cl. 128-715.000.

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Wendt, Horst, to Fag Kugelfischer Georg Schafer. Probe for sampling particulates in gases from flues. 5,109,711, Cl. 73-863.110

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Presz, Walter M., Jr.; Paterson, Robert W.; Werle, Michael J.; and Ealba, Robert H., 5,110,560, Cl. 422-176.000.

Werner & Pfleiderer, GmbH: *See—*
Bausch, Gunther; and Wachter, Fritz, 5,110,281, Cl. 425-406.000.
Scheuring, Bernhard, 5,110,275, Cl. 425-113.000

Wernicke, Ubbo; Berthold, Werner; Haseler, Helmut; and Tappe, Gustav, to Agfa Gavaert Aktiengesellschaft. Photographic reversal process. 5,110,715, Cl. 430-379.000.

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Harwood, H. James; Jones, Allan S.; and Smook, Malcoln A., 5,110,876, Cl. 525-332.300.

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Western Atlas International, Inc.: *See—*
Rector, James W., III, 5,109,947, Cl. 181-106.000.

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Yu, Dino, 5,109,752, Cl. 89-33.170.

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Nobile, Frederick E.; Harris, John F., III; Silverman, Gary S.; and Baumann, Richard A., 5,111,316, Cl. 359-52.000.

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Poremba, Hans-Herbert, 5,109,644, Cl. 52-306.000.

Westinghouse Electric Corp.: *See—*
Chen, Li-Shu; Ghoshtagore, Rathindra N.; Turley, Alfred P.; and Yannone, Louis A., 5,110,755, Cl. 437-62.000.
Groenendaal, John C., Jr., 5,110,256, Cl. 415-190.000
Hwang, Edward Y. C., 5,109,675, Cl. 60-660.000
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Trzmiel, Alfred; Fiedler, Olaf; and Weyandt, Johannes, 5,109,813, Cl. 123-90.150.

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Philips, Nicholas A., 5,110,039, Cl. 229-110.000.

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Marrone, Babetta L.; Simpson, Daniel J.; Unkefer, Clifford J.; and Whaley, Thomas W., 5,110,725, Cl. 435-11.000

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Glasson, Eric J.; Ty, Henry; White, Alfred J.; and Gondusky, Joseph H., 5,110,045, Cl. 236-93.00R.

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Fischbach, Roderick C., 5,110,175, Cl. 296-117.000.

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Panasik, Carl M.; Wilde, Patrick J.; and James, Betty L., 5,111,168, Cl. 333-152.000

Wilding, Peter: *See—*
Kricka, Larry J.; and Wilding, Peter, 5,110,745, Cl. 436-87.000.
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Buck, Steven K.; and Willey, Wendall D., 5,110,306, Cl. 439-497.000.
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Smolucha, Walter, 5,110,120, Cl. 273-121.00R.
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Kinlen, Patrick J.; and Williams, Hilliard L., 5,110,441, Cl. 204-418.000.
Williams, Robin L.: *See—*
Normandin, Richard J. F.; Letourneau, Sylvie; Chatenoud, Francoise; and Williams, Robin L., 5,111,466, Cl. 372-22.000.
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Rife, Guerin D.; and Willingham, W. Preston, 5,111,366, Cl. 362-31.000.
Wilson, Donald K.: *See—*
VanDelden, Jay S.; and Wilson, Donald K., 5,111,330, Cl. 359-281.000.
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Snyder, Stephen J.; and Wilson, John L., 5,110,076, Cl. 248-125.000.
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Moore, Craig E.; and Wilson, Kerry, 5,110,555, Cl. 422-100.000.
Wiltron Company: *See—*
Oldfield, William W., 5,111,165, Cl. 333-116.000.
Wiman, John V.: *See—*
Harclerode, William H.; Volz, William E.; Wiman, John V.; Voss, John C.; Pekich, Barry J.; and Knutsen, John C., 5,110,524, Cl. 264-53.000.
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Wind, Julie A.: *See—*
Bonjouklian, Rosanne; Debono, Manuel; Kirst, Herbert A.; and Wind, Julie A., 5,110,800, Cl. 514-29.000.
Windham, Marvin R.: *See—*
Collins, Floyd A.; Kahler, Andrew W.; and Windham, Marvin R., 5,109,834, Cl. 126-41.00R.
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Hagenlocher, Klaus; and Windischbauer, Florian, 5,110,070, Cl. 244-125.000.
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Lubke, Herbert; Knapheide, Wolfgang; and Schroder, Volker, 5,109,768, Cl. 101-153.000.
Winey, Timothy. Resistance mechanism for exercise equipment. 5,110,118, Cl. 482-73.000.
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Fuchs, Siegfried, 5,109,741, Cl. 83-100.000.
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Palta, Jiwan P.; and Farag, Karim M., 5,110,341, Cl. 71-86.000.
Siedband, Melvin P., 5,111,493, Cl. 378-103.000.
Witman, David F.: *See—*
Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., 5,110,711, Cl. 430-296.000.
Witschi, Heinz: *See—*
Thomann, Roland; and Witschi, Heinz, 5,110,235, Cl. 404-4.000.
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Wolf, Franz J.; and Pletsch, Hubert, 5,110,660, Cl. 428-178.000.
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Oliboni, Mark L.; Woltz, Stephen H.; Drapac, George A.; and Davis, Walter L., 5,110,486, Cl. 375-120.000.
Wong, John M.: *See—*
Fellows, Mark W.; Wong, John M.; Toy, Edmond; Erhardt, Robert A.; and Thomsen, James A., Jr., 5,111,118, Cl. 315-307.000.
Wong, Keng L.; and Schutz, Joseph D., to Intel Corporation. Power up reset circuit. 5,111,067, Cl. 307-272.300
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Wood, John E.: *See—*
Jacobsen, Stephen C.; and Wood, John E., 5,109,701, Cl. 73-782.000.
Wood, Stephen J.: *See—*
Rohn, Dean R.; Selewski, Steven R.; Wood, Stephen J.; and Cummins, Craig R., 5,109,568, Cl. 15-410.000.
Woodgate, Terence A., to GTE Rotaflex Limited. Electric current distribution apparatus. 5,110,300, Cl. 439-121.000.
Woods, Clyde S., Jr.: *See—*
Cole, Mark F., Jr.; and Woods, Clyde S., Jr., 5,110,230, Cl. 401-52.000.
Woodworth, George K., to International Business Machines Corporation. Power transfer unit for transferring power supplied to a load between power sources responsive to detected SCR gate-cathode voltage. 5,111,059, Cl. 307-87.000.
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Wovkulich, Peter M.: *See—*
Baggiolini, Enrico G.; Batcho, Andrew D.; Truitt, Gary A.; Uskokovic, Milan R.; and Wovkulich, Peter M., 5,110,958, Cl. 549-454.000.
Wright, Donald C., Jr., to Universal Fountain Brush Co. Inking apparatus for printing on non porous surfaces. 5,109,769, Cl. 101-329.000.
Wright, Jeremy C.: *See—*
Magruder, Judy A.; Eckenhoff, James B.; Cortese, Richard; Wright, Jeremy C.; and Peery, John R., 5,110,596, Cl. 424-438.000.
Wright, John J.: *See—*
Sit, Sing-Yuen; and Wright, John J., 5,110,940, Cl. 548-252.000.
Wright, Stephen W.: *See—*
Magolda, Ronald L.; and Wright, Stephen W., 5,110,831, Cl. 514-645.000.
Wu, Mu T.: *See—*
Tolman, Richard L.; Ashton, Wallace T.; and Wu, Mu T., 5,110,799, Cl. 514-19.000.
Wu, Robert W.: *See—*
Kessler, Daniel D.; Wu, Robert W.; Beatty, Christopher C.; and Crook, Mark D., 5,110,712, Cl. 430-312.000.
Wurl, Ernst: *See—*
Bluml, Hans; Klein, Peter; and Wurl, Ernst, 5,110,283, Cl. 425-589.000.
Wyner, Elliot: *See—*
Goodman, David A.; Plumb, John L.; Geens, Rudy E. M.; Snellgrove, Richard A.; and Wyner, Elliot, 5,111,108, Cl. 313-630.000.
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Wyss, Alois: *See—*
Beer, Christian; Wassmer, Christoph; and Wyss, Alois, 5,109,974, Cl. 198-346.100.
Xerox Corporation: *See—*
Brailsford, Ian; Carter, Robert A.; Gutman, Edward J.; Jugle, Don B.; and Masham, Roger D., 5,111,246, Cl. 355-245.000.
Hadimioglu, Babur B.; Khuri-Yakub, Butrus T.; and Steinmetz, David L., 5,111,220, Cl. 346-140.00R.
Hunter, Timothy M.; Pham, Hung M.; and Zanghi, John L., 5,111,062, Cl. 307-269.000.
Kadakia, Vinod K., 5,111,192, Cl. 340-727.000.
Nichols, Stephen J., 5,111,247, Cl. 355-246.000.
Nunberg, Geoffrey D.; Stansbury, H. Tayloe; Abbott, Curtis; and Smith, Brian C., 5,111,398, Cl. 364-419.000.
Rabjohns, Douglas T.; VanDuyn, Robert M.; and Platteter, Dale T., 5,111,457, Cl. 371-10.100.
Teuscher, Leon A.; Mishra, Satchidanand; and Holland, Andrea G., 5,110,700, Cl. 430-64.000.
Wysocki, Joseph J.; Hark, Sui K.; Hull, Virgil J.; Stephany, Joseph F.; Lakatos, Andras I.; and Narang, Ram S., 5,111,320, Cl. 359-87.000.
Xu, Ning-Sheng: *See—*
Sullivan, John L.; and Xu, Ning-Sheng, 5,111,042, Cl. 250-251.000.
Yabe, Naruo: *See—*
Inoue, Masahide; Nakano, Tetsuya; Yabe, Naruo; Tsuyama, Koichi; Shimizu, Yoshitake; and Kuroki, Mitsushi, 5,110,704, Cl. 430-110.000.
Yabe, Toshiya: *See—*
Hamada, Fumihiko; Tsuboi, Kunio; Hasegawa, Mitihiko; Ichizawa, Yasuji; Yabe, Toshiya; Yamasaki, Kunitomo; Takahashi, Yasunobu; and Mizuta, Katsuji, 5,111,252, Cl. 355-308.000.
Yabuuchi, Hidetaka: *See—*
Kobayashi, Yasumichi; Yabuuchi, Hidetaka; Eguchi, Osamu; Kondoh, Shinji; and Terai, Haruo, 5,109,566, Cl. 15-319.000.
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Yagishi, Hideki: *See—*
Kawaguchi, Kiyoshi; and Yagishi, Hideki, 5,110,280, Cl. 425-311.000.
Yahagi, Toshio; Iwagawa, Yoshihiro; Sugimoto, Yoichi; and Satoh, Tsuyoshi, to Honda Giken Kogyo Kabushiki Kaisha, Corp. Method for estimating a reference vehicle speed of a four-wheel motor vehicle. 5,109,694, Cl. 73-9.000.
Yamada, Kanji: *See—*
Inaba, Shin-ichi; Shindo, Yasuyuki; Tsubouchi, Shirou; Naganuma, Hiroki; Nakazawa, Yoshio; Hayashi, Ryusuke; and Yamada, Kanji, 5,110,656, Cl. 428-257.000.
Yamada, Makoto: *See—*
Sakuma, Kiyoshi; Yoshida, Takayuki; Tezuka, Tomohumi; Aoki, Katsuyuki; Yamada, Makoto; Hujii, Masao; and Morinushi, Ken, 5,109,919, Cl. 165-151.000.
Yamada, Masahiko; and Takahashi, Satomi, to Kenegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing 5-hydroxyhydantoin. 5,110,944, Cl. 548-311.000.
Yamada, Minoru: *See—*
Nakanishi, Keiichirou; Yamamoto, Masakazu; and Yamada, Minoru, 5,110,664, Cl. 428-195.000.
Yamada, Tadatoshi: *See—*
Matsuda, Tetsuya; Yamamoto, Shunji; Yamada, Tadatoshi; and Ushijima, Toshie, 5,111,173, Cl. 335-216.000.
Yamada, Tetsusyo: *See—*
Kojima, Takao; Ishiguro, Hiroyuki; Kawachi, Yoshiki; and Yamada, Tetsusyo, 5,110,442, Cl. 204-426.000.
Yamada, Toshiro: *See—*
Aizawa, Atsushi; Matsumoto, Yoshinori; Hara, Kenji; and Yamada, Toshiro, 5,110,218, Cl. 374-153.000.
Yamada, Yuichiro; Matusita, Yosinari; and Tutui, Yuji, to Matsushita Electric Industrial Co., Ltd. Plasma processing apparatus. 5,110,437, Cl. 204-298.330.
Yamade, Yasushi: *See—*
Kamimura, Kuniaki; Sawada, Kenji; and Yamade, Yasushi, 5,111,239, Cl. 355-45.000.
Yamaga, Hiroshi: *See—*
Hirano, Takashi; and Yamaga, Hiroshi, 5,109,973, Cl. 198-341.000.
Yamagata, Shigeo: *See—*
Kinoshita, Takao; Ito, Kazuhiko; and Yamagata, Shigeo, 5,111,304, Cl. 358-341.000.
Yamagishi, Hirotoshi: *See—*
Fusegawa, Izumi; Yamagishi, Hirotoshi; and Abe, Takao, 5,110,404, Cl. 156-603.000.
Yamaguchi, Hidefumi; Kiyofuji, Hiroyuki; Shirono, Katsuhiro; Tokuou, Rinpei; and Fuchigami, Jun, to Catalysts & Chemicals Industries Co., Ltd. Hydrotreating catalyst and method for preparation thereof. 5,110,783, Cl. 502-314.000.
Yamaguchi, Hiromi: *See—*
Sasao, Nobuyuki; and Yamaguchi, Hiromi, 5,110,562, Cl. 422-186.000.
Yamaguchi, Ryuji: *See—*
Kiuchi, Manabu; Hirai, Masazumi; Fujikawa, Yasuo; Yamaguchi, Ryuji; Nanba, Akihiko; and Noda, Masato, 5,110,547, Cl. 420-590.000.
Yamaguchi, Satarou, to Mitsubishi Denki Kabushiki Kaisha. Power source for nuclear fusion reactor. 5,110,534, Cl. 376-143.000.
Yamaguchi, Shuji: *See—*
Umemoto, Yuji; Toki, Akio; and Yamaguchi, Shuji, 5,111,499, Cl. 379-61.000.
Yamaguchi, Tetsuro; Takeshita, Takuo; and Hagino, Sadaaki, to Mitsubishi Materials Corporation. Superconductive ceramic wire and method for making same. 5,110,789, Cl. 505-1.000.
Yamaha Corporation: *See—*
Matsumoto, Yasuhiko, 5,110,763, Cl. 437-195.000.
Takeuchi, Akihiko; and Suzuki, Shigeo, 5,111,509, Cl. 381-154.000.
Tomita, Junji, 5,109,745, Cl. 84-313.000.
Yamaichi Electric Mfg. Co., Ltd.: *See—*
Matsuoka, Noriyuki; and Uratsuji, Kazumi, 5,109,980, Cl. 206-328.000.
Yamaji, Nobuyuki: *See—*
Oguma, Tetsuya; Kikuchi, Mamoru; Mizusawa, Kiyoshi; Tokutake, Shoichi; and Yamaji, Nobuyuki, 5,110,734, Cl. 435-201.000.
Yamakawa, Noriko: *See—*
Mogamiya, Hiroyuki; Yamakawa, Noriko; Suzuki, Yoshiichi; Suenaga, Hitoshi; and Hasegawa, Yasuhiro, 5,110,496, Cl. 252-299.610.
Suzuki, Yoshiichi; Sakuma, Shigenori; and Yamakawa, Noriko, 5,110,497, Cl. 252-299.650.
Suzuki, Yoshiichi; Sakuma, Shigenori; and Yamakawa, Noriko, 5,110,498, Cl. 252-299.660.
Yamakawa, Yoshisuke; Fukushima, Kiyoto; and Matsuno, Koji, to TDK Corporation. Lapping tape. 5,110,659, Cl. 428-141.000.
Yamakoshi, Masaru: *See—*
Tsujimoto, Naohiko; Yamakoshi, Masaru; Kudo, Toshimitsu; Horiuchi, Yukiko; and Shimizu, Jiro, 5,110,915, Cl. 530-502.000.
Yamakoshi, Tomio: *See—*
Ito, Mutsuhiro; Abe, Toshiyasu; Orii, Ryuji; and Yamakoshi, Tomio, 5,109,716, Cl. 73-865.500.
Yamamasu, Yoshikazu; Morita, Tetsuyuki; Nakaniwa, Sadao; and Ichihara, Masami, to Ishikawajima-Harino Heavy Industries Co., Ltd. Method of manufacturing electrodes of molten carbonate fuel cell. 5,110,541, Cl. 419-2.000.
Yamamoto Chemicals, Inc.: *See—*
Harada, Hiroaki; and Iwasaki, Yasuhisa, 5,110,952, Cl. 549-226.000.
Yamamoto, Hironobu: *See—*
Miyata, Seizo; Hosomi, Takeshi; Suzuki, Toshio; Watanabe, Toshiyuki; Yamamoto, Hironobu; and Hayashi, Akio, 5,110,988, Cl. 564-441.000.
Yamamoto, Hiroshi: *See—*
Suzuki, Akihiro; Yamamoto, Hiroshi; and Tobita, Hiroshi, 5,110,102, Cl. 270-53.000.
Yamamoto, Hiroyuki, to Konica Corporation. Image reading apparatus with black level correction. 5,111,311, Cl. 358-461.000.
Yamamoto, Hitoshi; Sagawa, Masato; Fujimura, Setsuo; and Matsuura, Yutaka, to Sumitomo Special Metals Co., Ltd. Process for producing permanent magnets and products thereof. 5,110,377, Cl. 148-302.000.
Yamamoto, Iwao; Ohta, Kazuchika; and Komatsu, Tsuyoshi, to Eastern Co., Ltd.; and Yamamoto, Iwawo, a part interest. Bis (octaalkylphthalocyaninate) lanthanides. 5,110,916, Cl. 534-15.000.
Yamamoto, Iwawo: *See—*
Yamamoto, Iwao; Ohta, Kazuchika; and Komatsu, Tsuyoshi, 5,110,916, Cl. 534-15.000.
Yamamoto, Masakazu: *See—*
Nakanishi, Keiichirou; Yamamoto, Masakazu; and Yamada, Minoru, 5,110,664, Cl. 428-195.000.
Yamamoto, Noriaki: *See—*
Fujii, Takashi; Kawahara, Hironobu; Takata, Kazuo; Nishiumi, Masaharu; and Yamamoto, Noriaki, 5,110,408, Cl. 156-643.000.
Yamamoto, Shunji: *See—*
Matsuda, Tetsuya; Yamamoto, Shunji; Yamada, Tadatoshi; and Ushijima, Toshie, 5,111,173, Cl. 335-216.000.
Yamamoto, Takao: *See—*
Shirota, Katsuhiro; Eida, Tsuyoshi; Saito, Megumi; and Yamamoto, Takao, 5,110,356, Cl. 106-22.000.
Yamamoto, Takashi; Matsumoto, Tsuruyoshi; and Shimada, Katsuhiko, to Mitsubishi Rayon Co., Ltd. Plastic optical fibers and process for the production thereof. 5,111,526, Cl. 385-145.000.
Yamamoto, Takemi; Sakai, Jun; Kawahara, Hiroshi; Hayashi, Shigeyuki; Sakakibara, Kenji; Akao, Michitoshi; Sasaki, Ichiro; and Komiya, Ryohei, to Brother Kogyo Kabushiki Kaisha. Image forming apparatus. 5,111,237, Cl. 355-27.000.
Yamamoto, Teruaki, to PIAA Corporation. Vehicular lighting device. 5,111,105, Cl. 313-112.000.
Yamamoto, Toru: *See—*
Suzuki, Hiroyoshi; Ogawa, Kenji; and Yamamoto, Toru, 5,110,205, Cl. 356-135.000.
Yamamoto, Yoshinori; and Sumiya, Kenji, to Hitachi Maxell, Ltd. Magnetic recording medium. 5,110,680, Cl. 428-413.000.
Yamamura, Alan: *See—*
Psaltis, Demetri; Yamamura, Alan; and Kobayashi, Seiji, 5,111,445, Cl. 369-103.000.
Yamanaka, Akiko: *See—*
Yagi, Nobuyuki; Inagaki, Jiroh; Morita, Kozo; Kaku, Yosutoshi; Mizuno, Shinji; and Yamanaka, Akiko, 5,111,363, Cl. 361-398.000.
Yamanaka, Hideaki: *See—*
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 5,110,921, Cl. 540-222.000
Yamanaka, Takashi: *See—*
Ogata, Yoshitake; Ikeda, Makoto; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Yamanaka, Takashi; Hishinuma, Icharu; Nagakawa, Junichi; Hirota, Kazuo; Miyamoto, Kaname; Horie, Toru; and Wakabayashi, Tsuneo, 5,110,956, Cl. 549-447.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Fujikura, Takashi; Ito, Noriki; Matsumoto, Yuzo; Asano, Masaharu; and Takenaka, Toichi, 5,110,820, Cl. 514-356.000
Itoi, Motokazu; Kobayashi, Shizuko; Ishii, Yasuo; and Kasuya, Minako, 5,110,796, Cl. 514-18.000.
Yamasaki, Kunitomo: *See—*
Hamada, Fumihiko; Tsuboi, Kunio; Hasegawa, Mitihiko; Ichizawa, Yasuji; Yabe, Toshiya; Yamasaki, Kunitomo; Takahashi, Yasunobu; and Mizuta, Katsuji, 5,111,252, Cl. 355-308.000
Yamasaki, Shinji: *See—*
Kato, Kunio; Iida, Yasumasa; Honda, Takenobu; Sugita, Kazuhiko; and Yamasaki, Shinji, 5,109,958, Cl. 187-20.000.
Yamashita, Masaaki: *See—*
Watanabe, Tsutomu; Yamashita, Masaaki; Kubota, Takahiro; Miyosawa, Yoshiaki; and Nishimoto, Tadashi, 5,110,689, Cl 428-623.000.
Yamashita, Noriyuki, to Sony Corporation. Video disk player having CLV format. 5,111,305, Cl. 358-342.000.
Yamashita, Shinichi, to Canon Kabushiki Kaisha. Predictive coding device having a sampling means and a predictive coding means 5,111,293, Cl. 358-135.000.
Yamashita, Tsukasa; Inoue, Nobuhisa; Kazuhiko, Mori; Matano, Masaharu; and Taguchi, Isao, to Omron Tateisi Electronics Co. Integral pick up for an optical digital disc using saw deflection and lense. 5,111,447, Cl. 369-44.120.
Yamauchi, Makoto; Kurata, Yoshiaki; and Ichinose, Tadashi, to Komori Corporation. Method and apparatus for multiple sheet detection. 5,110,114, Cl. 271-262.000.
Yamauchi, Tsunenori: *See—*
Furumura, Yuji; Mieno, Fumitake; Nakazawa, Tsutomu; Eshita, Takashi; Maeda, Mamoru; and Yamauchi, Tsunenori, 5,111,266, Cl. 357-34.000.
Yan, Tsoung Y., to Mobil Oil Corporation. On-line rejuvenation of spent absorbents. 5,110,480, Cl. 210-670.000.

Yang, Robert K., to Warner-Lambert Company. Chewing gum composition and method of making same. 5,110,607, Cl. 426-3.000.
Yannone, Louis A.: *See—*
Chen, Li-Shu; Ghoshtagore, Rathindra N.; Turley, Alfred P.; and Yannone, Louis A., 5,110,755, Cl. 437-62.000.
Yardley, James V., to Eaton-Kenway, Inc. Automated guided vehicle top disposed towing apparatus. 5,109,940, Cl. 180-168.000.
Yasui, Katsuaki: *See—*
Tanimura, Yoshihiko; Tada, Yasuo; and Yasui, Katsuaki, 5,109,703, Cl. 73-861.220.
Yasuo, Fukui: *See—*
Taguchi, Nobuyoshi; Yasuo, Fukui; and Akihiro, Imai, 5,111,215, Cl. 346-76.0PH.
Yazaki Corporation: *See—*
Horibe, Kinya; Hirano, Tomio; Ikeda, Minoru; and Murata, Hideaki, 5,111,023, Cl. 219-121.850.
Yagi, Kiyoshi; and Wakabayashi, Seiichi, 5,111,109, Cl. 313-622.000.
Yeager, David A.: *See—*
Hoag, Peter Y.; and Yeager, David A., 5,109,605, Cl. 29-888.090.
Yeh, Thomas, to Sigma Instruments, Inc. Fault indicator with timing control. 5,111,189, Cl. 340-664.000.
Ying, Peter: *See—*
Teng, Clarence; and Ying, Peter, 5,111,259, Cl. 357-23.600.
Yland, Marc: *See—*
Anaise, David; and Yland, Marc, 5,110,721, Cl. 435-1.000.
Yoder, Evan W. Automatic integrated real-time flight crew information system. 5,111,400, Cl. 364-424.010.
Yokogawa, Fumihiko, to Pioneer Electronic Corporation. Optical recording apparatus. 5,111,443, Cl. 369-54.000.
Yokohama Rubber Co. Ltd.: *See—*
Watanabe, Susumu; and Tomioka, Kiyoshi, 5,109,903, Cl. 152-209.00R.
Yokokawa, Sakae, to NEC Corporation. Ceramic multilayer wiring substrate. 5,110,654, Cl. 428-137.000.
Yokomizo, Yuji, to Mitsubishi Kasei Corporation. Cassette with a loosening prevention mechanism. 5,110,228, Cl. 400-208.000.
Yokonuma, Norikazu; Hagiuda, Nobuyoshi; Matsui, Hideki; and Sakamoto, Hiroshi, to Nikon Corporation. Electronic flashing device. 5,111,233, Cl. 354-416.000.
Yokosawa, Kiyoshi; and Wajima, Naohito, to Toto Ltd. Ceramic filter and process for making it. 5,110,470, Cl. 210-500.230.
Yokota, Hisaaki; Yoshiguchi, Tadashi; and Kamimatsuse, Hitoshi, to Kabushiki Kaisha Kobe Seiko Sho. Solvent adsorber and solvent recovery system. 5,110,328, Cl. 55-180.000.
Yokoyama, Mizuho; Kanamaru, Hisanobu; Okamoto, Yoshio; Kuroha, Tunemitu; Koshizaka, Atsushi; and Shinozaki, Hironori, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Fuel injector device and method of producing the same. 5,109,823, Cl. 123-472.000.
Yokoyama, Seiichiro: *See—*
Hiroi, Yoshio; and Yokoyama, Seiichiro, 5,110,964, Cl. 556-143.000.
Yokoyama, Takanao: *See—*
Yoshida, Masato; Yokoyama, Takanao; Nanba, Muneyoshi; Kato, Yoshihiko; Iida, Kazumasa; and Miyamoto, Katsuhiko, 5,109,821, Cl. 123-425.000.
York, Walter A.: *See—*
Grambush, Douglas H.; Holland, Gregory R.; and York, Walter A., 5,111,029, Cl. 219-521.000.
Yoshida, Kazuaki; and Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photographic material. 5,110,713, Cl. 430-372.000.
Yoshida Kogyo K.K.: *See—*
Hirono, Hatsuo; Moriyama, Koichi; Fukui, Hideo; and Matsuura, Ikuya, 5,110,782, Cl. 502-303.000.
Yoshida, Masato; Yokoyama, Takanao; Nanba, Muneyoshi; Kato, Yoshihiko; Iida, Kazumasa; and Miyamoto, Katsuhiko, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Engine control system. 5,109,821, Cl. 123-425.000.
Yoshida, Mitsuru, to Mitsubishi Pencil Co., Ltd. Process of making a lead wire of hard carbon. 5,110,516, Cl. 264-29.600.
Yoshida, Munehiro, to Kabushiki Kaisha Toshiba. Semiconductor device and method of making the same. 5,110,750, Cl. 437-27.000.
Yoshida, Takayuki: *See—*
Sakuma, Kiyoshi; Yoshida, Takayuki; Tezuka, Tomohumi; Aoki, Katsuyuki; Yamada, Makoto; Hujii, Masao; and Morinushi, Ken, 5,109,919, Cl. 165-151.000.
Yoshida, Toshiyasu, to JATCO Corporation. Engine speed limiting apparatus. 5,109,818, Cl. 123-319.000.
Yoshida, Yoshinori; and Hagihara, Makoto, to Mitsui Petrochemical Industries, Ltd. Heat-cutting/bonding blade and heat-bonding apparatus. 5,110,399, Cl. 156-515.000.
Yoshida, Yoshio: *See—*
Kurata, Yukio; Yoshida, Yoshio; and Nagahama, Toshiya, 5,111,449, Cl. 369-44.370.
Yoshiguchi, Tadashi: *See—*
Yokota, Hisaaki; Yoshiguchi, Tadashi; and Kamimatsuse, Hitoshi, 5,110,328, Cl. 55-180.000.
Yoshimatsu, Hiroshi: *See—*
Narui, Hironobu; Yoshimatsu, Hiroshi; Hirata, Shoji; Ozawa, Masafumi; and Mori, Yoshifumi, 5,111,469, Cl. 372-46.000.
Yoshimoto, Satoshi; Nakata, Shigeru; Takama, Noboru; and Taniguchi, Minoru, to Brother Kogyo Kabushiki Kaisha. Impact resistant layer for a circuit board. 5,111,364, Cl. 361-399.000.
Yoshimura, Kamunari; and Nakamura, Kuninori, to Matsushita Electric Works, Ltd. Optical measurement system determination of an object profile. 5,111,056, Cl. 250-560.000.
Yoshino, Motoaki, to Canon Kabushiki Kaisha. Facsimile machine. 5,111,307, Cl. 358-407.000.
Yoshioka, Hitoshi: *See—*
Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshioka, Hitoshi; and Norigoe, Isami, 5,111,372, Cl. 363-20.000.
Yoshioka, Kazuyoshi: *See—*
Odani, Niro; Yoshioka, Kazuyoshi; and Sekiya, Sinichi, 5,110,543, Cl. 419-29.000.
Yoshioka, Yasuhiro: *See—*
Furusawa, Genichi; Yoshioka, Yasuhiro; and Nakai, Yasufumi, 5,110,714, Cl. 430-376.000.
Yoshiyasu, Mitsuo: *See—*
Sawada, Masami; Nanbu, Yuichi; and Yoshiyasu, Mitsuo, 5,110,647, Cl. 428-43.000.
Yoshizumi, Yoshiyuki: *See—*
Ohtsuchi, Tetsuro; Tsutsui, Hiroshi; Ohmori, Koichi; Baba, Sueki; Funakoshi, Hiromasa; Kawara, Toshiyuki; and Yoshizumi, Yoshiyuki, 5,111,052, Cl. 250-370.010.
Young, Hartley F., to McKay Australia Limited. Rail fastening system. 5,110,046, Cl. 238-283.000.
Young, Ian A.; and Greason, Jeffrey K., to Intel Corporation. BiCMOS noninverting buffer and logic gates. 5,111,077, Cl. 307-446.000.
Young, Linda A.: *See—*
Farnsworth, John T.; Johnson, Roger D.; Obrecht, Gary W.; and Young, Linda A., 5,110,276, Cl. 425-133.100.
Young, Michael B., to United States of America, Navy. Cable-line shortening device. 5,109,577, Cl. 24-71.200.
Yu, Dino, to Western Design Corp. Universal self-timing ammunition loader. 5,109,752, Cl. 89-33.170.
Yuasa, Kazuhiro: *See—*
Uno, Mugijirou; and Yuasa, Kazuhiro, 5,111,251, Cl. 355-297.000.
Yuasa, Kimihiro; and Hashimoto, Kenji, to Idemitsu Kosan Co., Ltd. Method of orienting a liquid crystal material, apparatus therefor, and liquid crystal device oriented thereby. 5,110,623, Cl. 427-162.000.
Yuichi, Takahashi; and Katsuji, Azuma, to Fuji Filter Kogyo Kabushiki Kaisha. Slurry filter apparatus with means to direct slurry to filter face at an angle. 5,110,463, Cl. 210-194.000.
Yukita, Yasuo; Sone, Masakazu; and Funayama, Hidehiko, to Sony Corporation. Roll paper for thermal printer. 5,110,787, Cl. 503-206.000.
Yumino, Masamichi: *See—*
Hatakeyama, Atsushi; Miura, Tsutomu; Niskala, Wayne F.; Sato, Tomonori; and Yumino, Masamichi, 5,110,227, Cl. 400-120.000.
Yumoto, Yoshiji; Shimokawa, Tsutomu; and Miura, Takao, to Japan Synthetic Rubber Co., Ltd. I-line radiation-sensitive alkali-soluble resin composition utilizing 1,2-quinone diazide compound and hydroxy-chalcone additive. 5,110,706, Cl. 430-191.000.
Yutaka Electric Mfg. Co., Ltd.: *See—*
Kameyama, Shigeru; Arakawa, Koji; Watanabe, Kazushi; Yoshioka, Hitoshi; and Norigoe, Isami, 5,111,372, Cl. 363-20.000.
Yuuchi, Takahiro; Tsuchida, Yasuyuki; and Fujiwara, Masakatsu, to Sanyo Electric Co., Ltd. Wireless low-frequency medical treatment device. 5,109,845, Cl. 128-421.000.
Zabala, Robert J.: *See—*
Benz, Mark G.; Knudsen, Bruce A.; Rumaner, Lee E.; and Zabala, Robert J., 5,109,593, Cl. 29-599.000.
Zaborszki, Tony, to W.S. Tyler, Inc. Aggregate particle shield. 5,109,970, Cl. 193-2.00R.
Zacharias, Donald R., to Foseco International Limited. One-piece tundish lining. 5,110,096, Cl. 266-227.000.
Zachman, Julie C.; Kuntz, Robert A.; Smith, Steven R.; and Hudzik, James S., to Nicolet Instrument Corporation. Method for determining drill target locations in a multilayer board panel. 5,111,406, Cl. 364-474.020.
Zahn, Klaus; and Schmidt, Werner, to Deere & Company. Control system for shifting a gearbox. 5,109,730, Cl. 74-866.000.
Zahuta, Robert E.: *See—*
Romano, Timothy S.; Peck, Leonard E., Jr.; Neumann, Karl H.; and Zahuta, Robert E., 5,111,049, Cl. 250-352.000.
Zaia, John A.: *See—*
Cantin, Edouard M.; Zaia, John A.; Wallace, R. Bruce; and Rossi, John J., 5,110,802, Cl. 514-44.000.
Zampaglione, Michael A.: *See—*
Ferry, Thomas V.; Kawa, Jamil; Pierce, Kerry M.; Walker, William G.; and Zampaglione, Michael A., 5,111,075, Cl. 307-443.000.
Zanders, Gary V.: *See—*
Deierling, Kevin E.; and Zanders, Gary V., 5,111,069, Cl. 307-303.200.
Zanghi, John L.: *See—*
Hunter, Timothy M.; Pham, Hung M.; and Zanghi, John L., 5,111,062, Cl. 307-269.000.
Zawitz, Richard. Annular support device with pivotal segments. 5,110,315, Cl. 446-102.000.
Zdepski, Joel W.: *See—*
Kuriacose, Joseph; Acampora, Alfonse A.; and Zdepski, Joel W., 5,111,292, Cl. 358-133.000.
Zehle, Wilhelm; and Gstrein, Hippolit, to Huyck Corporation. Papermakers' press felt with base fabric that does not require seaming. 5,110,672, Cl. 428-234.000.
Zeilinger, James G.; and Kern, Leon O., to DeVlieg-Bullard, Inc. Apparatus for coupling tool holders. 5,110,240, Cl. 409-234.000.

Zeise, Eric K., to Eastman Kodak Company. Dot printer and method for grey level recording. 5,111,217, Cl. 346-107.00R.
Zenda, Hiroki, to Kabushiki Kaisha Toshiba. Plasma display control system. 5,111,190, Cl. 340-717.000.
Zendejas-Martinez, Eugenio: *See—*
Villarreal-Trevino, Juan A.; Zendejas-Martinez, Eugenio; and Martinez-Vera, Enrique R., 5,110,350, Cl. 75-495.000.
Zenith Electronics Corporation: *See—*
Citta, Richard W.; and Lee, Ronald B., 5,111,287, Cl. 358-83.000.
Kaplan, Sam; and Adler, Robert, 5,111,106, Cl. 313-403.000.
Zhu, Minge-De; Rodriguez, Roberto; and Wehr, C. Timothy, to Bio-Rad Laboratories, Inc. Use of zwitterions to mobilize isoelectrically focused ampholyte zones. 5,110,434, Cl. 204-183.200.
Zimmer, Richard T. Rotary cutting mechanism. 5,109,656, Cl. 56-17.500.
Zimmermann & Jansen: *See—*
Lothmann, Josef; Osborg-Schmitz, Jurgen; and Schonbrenner, Wolfgang, 5,110,018, Cl. 222-600.000.
Zinser Textilmaschinen GmbH: *See—*
Reyer, Herbert; and Peter, Thomas, 5,109,660, Cl. 57-95.000.
Zisman, Stan A.: *See—*
Berlin, Kenneth D.; Scherlag, Benjamin J.; Clarke, Cyril R.; Otiv, Surendra R.; Zisman, Stan A.; Sangiah, Subbiah; and Mulekar, Satish V., 5,110,933, Cl. 546-114.000.
Zlotnick, Gary: *See—*
Deich, Robert A.; Zlotnick, Gary; and Green, Bruce, 5,110,908, Cl. 530-403.000.
Zodrow, Rudolf; and Buchholz, Rainer, to Holstein und Kappert AG. Labelling machine for labelling containers such as bottles having a labelling box for a stack of labels in a labelling station. 5,110,402, Cl. 156-573.000.
Zoltan, Sandor: *See—*
Hidasi, Gyorgy; Szekely, Istvan; Bertok, Bela; Zoltan, Sandor; Nagy, Lajos; Gajari, Antal; Somfai, Eva; Hegedus, Agnes; Pap, Laszlo; Soos, Rudolf; Radvany, Erzsebet; Botar, Sandor; and Szabolcsi, Tamas, 5,110,976, Cl. 558-407.000.
Zook, Christopher P., to Exabyte Corporation. Error correction method and apparatus. 5,111,463, Cl. 371-39.100.
Zoppetti, Giorgio: *See—*
Casu, Benito; Naggi, Annamaria; Oreste, Pasqua; Torri, Giangiacomo; Zoppetti, Giorgio; Sportoletti, Giancarlo; and De Santis, Francesco, 5,110,918, Cl. 536-21.000.
Zurfluh, Erwin A., to International Business Machines Corporation. Controlled fiber-optic switch. 5,110,194, Cl. 385-16.000.
Zurkiya, Ahmed A.: *See—*
Gomberg, Edward N.; and Zurkiya, Ahmed A., 5,110,629, Cl. 427-322.000.
Zuuring, Pieter H.: *See—*
Schutyser, Jan A. J.; Buser, Antonius J. W.; Zuuring, Pieter H.; and Slots, Hendrik J., 5,110,867, Cl. 525-114.000.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF MAY, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Advanced Cardiovascular Systems, Inc.: *See*—
Samson, Wilfred J.; and Solar, Ronald J., Re. 33,911, Cl. 128-772.000.

Ayres, James William: *See*—
Doan, Darryl J., Re. 33,915, Cl. 252-631.000.

Belokin, Paul: *See*—
Kral, Rudy; and Belokin, Paul, Re. 33,913, Cl. 211-59.200.

Bode, Albert: *See*—
Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, Re. 33,908, Cl. 8-639.000.

Boos, Margareta: *See*—
Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, Re. 33,908, Cl. 8-639.000.

Brenner, Raul; and DiMartino, John M., to Kay-Ray/Sensall, Inc. Steam quality meter. Re. 33,909, Cl. 73-29.030.

Burch, Ronald H.: *See*—
Lapeyre, James M., deceased; Farrell, John P.; Burch, Ronald H.; Sutton, Mark E.; and Scamardo, Joseph F., Jr., Re. 33,917, Cl. 452-158.000.

Cassella Aktiengesellschaft: *See*—
Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, Re. 33,908, Cl. 8-639.000.

Compton, Ronald E., to Cross Company, The. CNC turning machine. Re. 33,910, Cl. 82-18.000.

Cross Company, The: *See*—
Compton, Ronald E., Re. 33,910, Cl. 82-18.000.

DiMartino, John M.: *See*—
Brenner, Raul; and DiMartino, John M., Re. 33,909, Cl. 73-29.030.

Doan, Darryl J., to Ayres, James William; and Rowsell, Farrell D. Disposable hazardous and radioactive liquid hydrocarbon waste composition and method. Re. 33,915, Cl. 252-631.000.

Farrell, John P.: *See*—
Lapeyre, James M., deceased; Farrell, John P.; Burch, Ronald H.; Sutton, Mark E.; and Scamardo, Joseph F., Jr., Re. 33,917, Cl. 452-158.000.

International Business Machines Corporation: *See*—
Saenz, Jesus A.; Yosim, Paul S.; and Rackley, Darwin P., Re. 33,916, Cl. 340-703.000.

Jones Environics Ltd.: *See*—
Lapkowski, Andrew, Re. 33,912, Cl. 165-166.000.

Kay-Ray/Sensall, Inc.: *See*—
Brenner, Raul; and DiMartino, John M., Re. 33,909, Cl. 73-29.030.

Kral, Rudy; and Belokin, Paul, to M & M Mars. Dispensing rack. Re. 33,913, Cl. 211-59.200.

Kruse, Hubert: *See*—
Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, Re. 33,908, Cl. 8-639.000.

Kuhn, Reinhard: *See*—
Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, Re. 33,908, Cl. 8-639.000.

Laitram Corporation, The: *See*—
Lapeyre, James M., deceased; Farrell, John P.; Burch, Ronald H.; Sutton, Mark E.; and Scamardo, Joseph F., Jr., Re. 33,917, Cl. 452-158.000.

Lapeyre, James M., deceased (by Lapeyre, Noreen B., administratrix); Farrell, John P.; Burch, Ronald H.; Sutton, Mark E.; and Scamardo, Joseph F., Jr., to Laitram Corporation, The. Support apparatus for use in video imaging and processing of transverse fish sections. Re. 33,917, Cl. 452-158.000.

Lapeyre, Noreen B., administratrix: *See*—
Lapeyre, James M., deceased; Farrell, John P.; Burch, Ronald H.; Sutton, Mark E.; and Scamardo, Joseph F., Jr., Re. 33,917, Cl. 452-158.000.

Lapkowski, Andrew, to Jones Environics Ltd. Heat exchanger. Re. 33,912, Cl. 165-166.000.

M & M Mars: *See*—
Kral, Rudy; and Belokin, Paul, Re. 33,913, Cl. 211-59.200.

Rackley, Darwin P.: *See*—
Saenz, Jesus A.; Yosim, Paul S.; and Rackley, Darwin P., Re. 33,916, Cl. 340-703.000.

Robillard, Jean J. A., to Scully, Richard L. Infrared imaging system and method. Re. 33,914, Cl. 250-331.000.

Rowsell, Farrell D.: *See*—
Doan, Darryl J., Re. 33,915, Cl. 252-631.000.

Saenz, Jesus A.; Yosim, Paul S.; and Rackley, Darwin P., to International Business Machines Corporation. Digital display system. Re. 33,916, Cl. 340-703.000.

Samson, Wilfred J.; and Solar, Ronald J., to Advanced Cardiovascular Systems, Inc. Catheter guide wire with short spring tip and method of using the same. Re. 33,911, Cl. 128-772.000.

Scamardo, Joseph F., Jr.: *See*—
Lapeyre, James M., deceased; Farrell, John P.; Burch, Ronald H.; Sutton, Mark E.; and Scamardo, Joseph F., Jr., Re. 33,917, Cl. 452-158.000.

Scully, Richard L.: *See*—
Robillard, Jean J. A., Re. 33,914, Cl. 250-331.000.

Solar, Ronald J.: *See*—
Samson, Wilfred J.; and Solar, Ronald J., Re. 33,911, Cl. 128-772.000.

Sutton, Mark E.: *See*—
Lapeyre, James M., deceased; Farrell, John P.; Burch, Ronald H.; Sutton, Mark E.; and Scamardo, Joseph F., Jr., Re. 33,917, Cl. 452-158.000.

Tappe, Horst; Kruse, Hubert; Kuhn, Reinhard; Bode, Albert; and Boos, Margareta, to Cassella Aktiengesellschaft. Mixtures of blue mono-azo disperse dyestuffs and their use for dyeing polyester. Re. 33,908, Cl. 8-639.000.

Yosim, Paul S.: *See*—
Saenz, Jesus A.; Yosim, Paul S.; and Rackley, Darwin P., Re. 33,916, Cl. 340-703.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Accurate Sound Corporation: *See*—
Newdoll, Ronald M.; and Phillips, John E., B1 4,410,917, Cl. 360-15.000.

Fukuhara, Naoshige: *See*—
Hanafusa, Kunio; Fukuhara, Naoshige; and Tachibana, Takaaki, B1 4,951,986, Cl. 293-120.000.

Hanafusa, Kunio; Fukuhara, Naoshige; and Tachibana, Takaaki, to Minoru Industrial Co., Ltd. Plastic bumper. B1 4,951,986, 5-5-92, Cl. 293-120.000.

Minoru Industrial Co., Ltd.: *See*—
Hanafusa, Kunio; Fukuhara, Naoshige; and Tachibana, Takaaki, B1 4,951,986, Cl. 293-120.000.

Newdoll, Ronald M.; and Phillips, John E., to Accurate Sound Corporation. Method of and apparatus for recording information from a master medium onto a slave medium employing digital techniques. B1 4,410,917, 5-5-92, Cl. 360-15.000.

Phillips, John E.: *See*—
Newdoll, Ronald M.; and Phillips, John E., B1 4,410,917, Cl. 360-15.000.

Tachibana, Takaaki: *See*—
Hanafusa, Kunio; Fukuhara, Naoshige; and Tachibana, Takaaki, B1 4,951,986, Cl. 293-120.000.

LIST OF DESIGN PATENTEES

Adex, Inc.: *See*—
Koch, Charles P., 325,978, Cl. D25-16.000.

Admiral Molding Corporation: *See*—
Rubenstein, Saul; Hyner, Michael; and Neumann, Dieter, 325,869, Cl. D8-385.000.

Aero Marine Engineering, Inc.: *See*—
Havins, Felton H., 325,880, Cl. D10-80.000.

Airway Industries, Inc.: *See*—
Kim, Hyun S., 325,818, Cl. D3-76.000.

Akzo N.V.: *See*—
Grade, Lanny; Kadavy, Duane; and Kerr, Larry, 325,975, Cl. D24-230.000.

Ali, Eren, to Nomix Manufacturing Company Limited. Handle for an herbicide sprayer. 325,955, 5-5-92, Cl. D23-225.000.

Ali, Eren, to Nomix Manufacturing Company Limited. Handle for an herbicide sprayer. 325,956, 5-5-92, Cl. D23-225.000.

Allen, John L., to Liz Claiborne, Inc. Combined store partition and display cabinet. 325,832, 5-5-92, Cl. D6-470.000.

ALSA GmbH: *See*—
Herber, Karlheinz, 325,805, Cl. D2-271.000.

American Standard Inc.: *See*—
Stairs, Henry M., Jr.; and Spano, Donna, 325,958, Cl. D23-250.000.

American Trading and Production Corporation: *See*—
Bourgeois, Thomas W., 325,928, Cl. D19-27.000.

Andersen, Dagfinn, to Meta-Fer Norge A/S. Pedestal vacuum cleaner. 326,005, 5-5-92, Cl. D32-21.000.

Anderson, David L., to Odin Industries, Inc. Outdoor heater. 325,963, 5-5-92, Cl. D23-342.000.

Arai, Takuya, to Fuji Photo Film Co., Ltd. Disposable camera. 325,922, 5-5-92, Cl. D16-208.000.

Arai, Yuuichi: *See*—
Kato, Hitoshi; and Arai, Yuuichi, 325,894, Cl. D12-129.000.

Ashiku, Elizabeth. Stuffed toy figure. 325,944, 5-5-92, Cl. D21-185.000.

Austin, Arnold S., to Quabaug Corporation. Footwear unit sole. 325,806, 5-5-92, Cl. D2-320.000.

Austin, Arnold S., to Quabaug Corporation. Footwear unit sole. 325,807, 5-5-92, Cl. D2-320.000.

Austin, Arnold S., to Quabaug Corporation. Footwear unit sole. 325,808, 5-5-92, Cl. D2-320.000.

Avia Group International, Inc.: *See*—
Backus, Peter P.; and Feller, Craig L., 325,811, Cl. D2-314.000.

Backus, Peter P.; and Feller, Craig L., to Avia Group International, Inc. Shoe upper. 325,811, 5-5-92, Cl. D2-314.000.

Bantly, Matthew D.: *See*—
Kalmakis, George P.; Torti, Victor A.; Bantly, Matthew D.; and Harkins, Jack R., 325,974, Cl. D24-222.000.

Bartasevich, William: *See*—
Chen, Yin I.; and Bartasevich, William, 325,972, Cl. D24-193.000.
Chen, Yin I.; and Bartasevich, William, 325,973, Cl. D24-197.000.

Bartok, Stephen, to Rubbermaid Incorporated. Computer monitor support arm. 325,868, 5-5-92, Cl. D8-380.000.

Bass, Jonathan S., to H.G.X. International. Shoe sole. 325,815, 5-5-92, Cl. D2-320.000.

Beasley, John M.: *See*—
Cochran, Daniel M.; and Beasley, John M., 325,828, Cl. D6-429.000.

Bell, Kenneth H., to Magia Furniture Canada Limited. Combined bed and storage unit. 325,825, 5-5-92, Cl. D6-383.000.

Benatti, Mario; and Bertone, Francesco, to S.T.L. Superga S.p.A. Gymnastics shoe sole bottom. 325,814, 5-5-92, Cl. D2-320.000.

Bertone, Francesco: *See*—
Benatti, Mario; and Bertone, Francesco, 325,814, Cl. D2-320.000.

Bertrand, Victor J., to Ritvik Group Inc., The. Toy hat. 325,941, 5-5-92, Cl. D21-108.000.

Betts, John, to Farberware Inc. Coffee brewer. 325,844, 5-5-92, Cl. D7-310.000.

Bied, H. Seat cover. 325,842, 5-5-92, Cl. D6-611.000.

Bieger, Walter I.: *See*—
Larson, Roger L.; Larson, Vada J.; and Bieger, Walter I., 325,929, Cl. D19-34.000.

Black & Decker Inc.: *See*—
Gierke, Martin P., 325,856, Cl. D8-8.000.

Bomatic, Inc.: *See*—
Hestehave, Borge; and Hestehave, Kjeld, 325,871, Cl. D9-520.000.

Bond, Gregg A.: *See*—
Helman, Barry; Helman, Andy; and Bond, Gregg A., 325,845, Cl. D7-346.000.

Borakove, Howard J.; and Morrell, Cindy L., to Willert Home Products, Inc. Fragrance dish cover. 325,964, 5-5-92, Cl. D23-367.000.

Bourgeois, Thomas W., to American Trading and Production Corporation. Looseleaf binder. 325,928, 5-5-92, Cl. D19-27.000.

Boyer, Jon F.; Fisher, Lee C.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; Van Remoortel, John G.; and Vanover, Joel L., to Du Pont de Nemours, E. I., and Company. Developer solution cartridge. 325,923, 5-5-92, Cl. D16-250.000.

Brayton, Scott V.; Vanvalin, Richard D.; and Gaul, Timothy J., to Hach Company. Color comparator. 325,881, 5-5-92, Cl. D10-81.000.

Breen, John D., to Rubbermaid Incorporated. Card box. 325,930, 5-5-92, Cl. D19-76.000.

Brown, David C.: *See*—
Cesaroni, William C.; Brown, David C.; Kulusic, Anthony M.; and Ryan, Allen L., 325,946, Cl. D21-194.000.

Brunner, Merlin A.; and Draheim, Harvey J., to Simmons Juvenile Products Company, Inc. Dressing kit. 325,826, 5-5-92, Cl. D6-397.000.

Buechele, Franz; and Dipple, Stephen G., to Tridon Limited. Primary yoke for a windshield wiper. 325,897, 5-5-92, Cl. D12-155.000.

Bulgari, Gianni, to Gianni Bulgari S.p.A. Wristwatch. 325,878, 5-5-92, Cl. D10-39.000.

Bulgari, Gianni, to Gianni Bulgari S.p.A. Wristwatch. 325,879, 5-5-92, Cl. D10-39.000.

Burgess, Karen E., to Gastro-Gnomes, Inc. Food and beverage menu holder for restaurant tables or the like. 325,936, 5-5-92, Cl. D20-40.000.

Bycraft, John T.: *See*—
Pomeroy, Charles; and Bycraft, John T., 325,823, Cl. D6-335.000.

Call, Joseph S. File sheet for floppy discs. 325,817, 5-5-92, Cl. D3-35.000.

Carroll, Daniel A., to Carroll Traditionals, Inc. Wall plaque. 325,888, 5-5-92, Cl. D11-137.000.

Carroll Traditionals, Inc.: *See*—
Carroll, Daniel A., 325,888, Cl. D11-137.000.

CAS Di A.A. CAMPI S.p.A.: *See*—
Del Corno, Marco, 325,865, Cl. D8-306.000.

Cass, Norman A. Basketball practice target. 325,947, 5-5-92, Cl. D21-201.000.

Ceglia, Frank: *See*—
Meyers, Edward J., Jr.; Ceglia, Frank; and Fogarty, Eileen, 325,804, Cl. D1-106.000.

Cesaroni, William C.; Brown, David C.; Kulusic, Anthony M.; and Ryan, Allen L., to Life Fitness. Exercise bicycle. 325,946, 5-5-92, Cl. D21-194.000.

Chaney, Charles, to GSA, Inc. Bottle holder. 325,850, 5-5-92, Cl. D7-619.000.

Chen, John. Hammer. 325,863, 5-5-92, Cl. D8-75.000.

Chen, Yin I.; and Bartasevich, William, to Lisco, Inc. Disposable nurser hood. 325,972, 5-5-92, Cl. D24-193.000.

Chen, Yin I.; and Bartasevich, William, to Lisco, Inc. Shell for a disposable nurser. 325,973, 5-5-92, Cl. D24-197.000.

Chia, Cheo: *See*—
Chia, Meang; and Chia, Cheo, 325,886, Cl. D11-93.000.

Chia, Meang; and Chia, Cheo. Jewelry link. 325,886, 5-5-92, Cl. D11-93.000.

Chiarella, Michele A. Helmet. 326,001, 5-5-92, Cl. D29-12.000.

Close, Judith R., to Reebok International Ltd. Shoe upper. 325,809, 5-5-92, Cl. D2-314.000.

Coca-Cola Company, The: *See*—
Ratzlaff, Jorg, 325,843, Cl. D7-308.000.

Cochran, Daniel M.; and Beasley, John M., to Prema Pak Corporation. Display rack for a refrigerated case. 325,828, 5-5-92, Cl. D6-429.000.

Comatov, Robert D., to Fisher Tool Co., Inc. Masking station. 325,919, 5-5-92, Cl. D15-145.000.

Combi Corporation: *See*—
Kato, Hitoshi; and Arai, Yuuichi, 325,894, Cl. D12-129.000.

Consumer Direct, Inc.: *See*—
Johnson, Ronald H., 325,951, Cl. D21-235.000.

CPC International Inc.: *See*—
Meyers, Edward J., Jr.; Ceglia, Frank; and Fogarty, Eileen, 325,804, Cl. D1-106.000.

Culbertson, Richard, to General Electric Company. Portable radio. 325,906, 5-5-92, Cl. D14-137.000.

Cury, Brian L. Housing for an electronics tower for supporting apparatus used in producing customized video recordings. 325,829, 5-5-92, Cl. D6-436.000.

Cury, Brian L. Electronics tower containing audio-visual electronics used in producing customized video recordings. 325,830, 5-5-92, Cl. D6-436.000.

Dallaire, Dominique: *See*—
Dallaire, Raymond; and Dallaire, Dominique, 325,982, Cl. D25-124.000.
Dallaire, Raymond; and Dallaire, Dominique, 325,983, Cl. D25-124.000.

Dallaire Industries Ltd.: *See*—
Dallaire, Raymond; and Dallaire, Dominique, 325,982, Cl. D25-124.000.
Dallaire, Raymond; and Dallaire, Dominique, 325,983, Cl. D25-124.000.

Dallaire, Raymond; and Dallaire, Dominique, to Dallaire Industries Ltd. Window component extrusion. 325,982, 5-5-92, Cl. D25-124.000.

Dallaire, Raymond; and Dallaire, Dominique, to Dallaire Industries Ltd. Window component extrusion. 325,983, 5-5-92, Cl. D25-124.000.

Dart Industries Inc.: *See*—
Wolff, Martin J., 325,847, Cl. D7-391.000.

Davis, Edgar H., to Systems Investments Ltd. Snow shovel. 325,851, 5-5-92, Cl. D8-10.000.

Davy, Zina V., to Zinco International, Inc. Anal protective liner. 325,969, 5-5-92, Cl. D24-124.000.

Del Corno, Marco, to CAS Di A.A. CAMPI S.p.A. Door knob. 325,865, 5-5-92, Cl. D8-306.000.

Dempsey, Mark, to Housemate Appliances Limited. Stand for a cordless electric iron. 326,008, 5-5-92, Cl. D32-73.000.

Dickson, Douglas M., to General Electric Company. Portable radio. 325,907, 5-5-92, Cl. D14-137.000.

Diego, Edward A. Wrench. 325,864, 5-5-92, Cl. D8-28.000.

Dieperink, Menno; and Joosten, Stefanus F. W., to U.S. Philips Corporation. Desk lamp. 325,997, 5-5-92, Cl. D26-107.000.
Dieterle, Richard; and Kriese, Peter, to Zehnder Verkaufs-und Verwaltungs AG. Heating element for use in residences preferably of baths and boarding to be placed standing free before a wall. 325,967, 5-5-92, Cl. D23-386.000.
Dilworth, Glendon L.: *See—*
Moyle, Don R.; and Dilworth, Glendon L., 325,917, Cl. D15-4.000.
Dipple, Stephen G.: *See—*
Buechele, Franz; and Dipple, Stephen G., 325,897, Cl. D12-155.000.
Donley, Fred J.; and Gonce, Robert E., Jr. Air freshener container. 325,965, 5-5-92, Cl. D23-368.000.
Doublet, Luc, to Societe Doublet. Flag staff support. 325,890, 5-5-92, Cl. D11-181.000.
Draheim, Harvey J.: *See—*
Brunner, Merlin A.; and Draheim, Harvey J., 325,826, Cl. D6-397.000.
Dubin, Melvin; and Vozzo, Rocco, to Slant/Fin Corporation. Portable electric heater. 325,962, 5-5-92, Cl. D23-335.000.
Du Pont de Nemours, E. I., and Company: *See—*
Boyer, Jon F.; Fisher, Lee C.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; Van Remoortel, John G.; and Vanover, Joel L., 325,923, Cl. D16-250.000.
Dura Golf, Inc.: *See—*
Duran, Anthony P., 325,950, Cl. D21-219.000.
Duran, Anthony P., to Dura Golf, Inc. Golf putter head. 325,950, 5-5-92, Cl. D21-219.000.
Dy, Dennie T.: *See—*
Scheid, William J.; and Dy, Dennie T., 325,911, Cl. D14-191.000.
Dynasty Classics Corporation: *See—*
Winn, Craig A., 325,996, Cl. D26-103.000.
Echolac Co., Ltd.: *See—*
Lee, Shin M., 325,819, Cl. D3-76.000.
Embree, Donald, to Rubbermaid Incorporated. Insulated mug. 325,848, 5-5-92, Cl. D7-510.000.
Embree, Donald, to Rubbermaid Incorporated. Bird feeder. 326,003, 5-5-92, Cl. D30-128.000.
Everest & Jennings, Inc.: *See—*
Nesterick, Elaine M.; Reynolds, Robert W.; MacKay, Spencer L.; and Graham, Cleve A., 325,892, Cl. D12-85.000.
F. Vaihinger GmbH & Co. Kommanditgesellschaft: *See—*
Hofmann, Andreas, 325,854, Cl. D7-669.000.
Fagan, John M. Dart board. 325,937, 5-5-92, Cl. D21-6.000.
Farberware Inc.: *See—*
Betts, John, 325,844, Cl. D7-310.000.
Feller, Craig L.: *See—*
Backus, Peter P.; and Feller, Craig L., 325,811, Cl. D2-314.000.
Felstead, Richard A.: *See—*
Hume, Roger A.; Felstead, Richard A.; and Zucchi, Luciano, 325,994, Cl. D26-2.000.
Fisher, Lee C.: *See—*
Boyer, Jon F.; Fisher, Lee C.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; Van Remoortel, John G.; and Vanover, Joel L., 325,923, Cl. D16-250.000.
Fisher-Price, Inc.: *See—*
Morton, Kenneth P., 325,836, Cl. D6-491.000.
Fisher Tool Co., Inc.: *See—*
Comatov, Robert D., 325,919, Cl. D15-145.000.
Fogarty, Eileen: *See—*
Meyers, Edward J., Jr.; Ceglia, Frank; and Fogarty, Eileen, 325,804, Cl. D1-106.000
Fong, Tso C., to Pearl Industries Limited. Wristwatch. 325,877, 5-5-92, Cl. D10-32.000.
Fredrick, Kevin D., to Krueger International, Inc. Table. 325,834, 5-5-92, Cl. D6-487.000.
Fuji Photo Film Co., Ltd.: *See—*
Arai, Takuya, 325,922, Cl. D16-208.000.
Fushiya, Fusao; and Kaneko, Tetsuhisa, to Makita Electric Works, Ltd. Electric screw driver. 325,860, 5-5-92, Cl. D8-68.000.
Fushiya, Nobuhiro, to Kabushiki Kaisha Toshiba. Printer for an electronic computer. 325,927, 5-5-92, Cl. D18-54.000.
Gammons, Clifford E., to Gammons, Clifford E. Air mattress. 325,841, 5-5-92, Cl. D6-605.000.
Gary, Lonnie F., to Gary Products Group, Inc. Light support bracket. 325,866, 5-5-92, Cl. D8-354.000.
Gary Products Group, Inc.: *See—*
Gary, Lonnie F., 325,866, Cl. D8-354.000.
Gastro-Gnomes, Inc.: *See—*
Burgess, Karen E., 325,926, Cl. D20-40.000.
Gaul, Timothy J.: *See—*
Brayton, Scott V.; Vanvalin, Richard D.; and Gaul, Timothy J., 325,881, Cl. D10-81.000.
General Electric Company: *See—*
Culbertson, Richard, 325,906, Cl. D14-137.000.
Dickson, Douglas M., 325,907, Cl. D14-137.000.
Giannelli, Giuseppe, to SIMAC S.r.l. Pasta-making machine. 325,852, 5-5-92, Cl. D7-368.000.
Gianni Bulgari S.p.A.: *See—*
Bulgari, Gianni, 325,878, Cl. D10-39.000.
Bulgari, Gianni, 325,879, Cl. D10-39.000.
Gierke, Martin P., to Black & Decker Inc. Hedge trimmer. 325,856, 5-5-92, Cl. D8-8.000.
Gilchrist, William W. Dip stick cleaner. 326,007, 5-5-92, Cl. D32-43.000.
Goldstar Co., Ltd.: *See—*
Yu, Sun I., 325,924, Cl. D17-5.000.
Gonce, Robert E., Jr.: *See—*
Donley, Fred J.; and Gonce, Robert E., Jr., 325,965, Cl. D23-368.000.
Grade, Lanny; Kadavy, Duane; and Kerr, Larry, to Akzo N.V. Cartridge for blood monitor. 325,975, 5-5-92, Cl. D24-230.000.
Graham, Cleve A.: *See—*
Nesterick, Elaine M.; Reynolds, Robert W.; MacKay, Spencer L.; and Graham, Cleve A., 325,892, Cl. D12-85.000.
Gross, Joseph S. Stretching exerciser for golfers or the like. 325,945, 5-5-92, Cl. D21-191.000.
GSA, Inc.: *See—*
Chaney, Charles, 325,850, Cl. D7-619.000.
GSW Inc.: *See—*
Mahler, Harry, 325,979, Cl. D25-33.000.
H.G.X. International: *See—*
Bass, Jonathan S., 325,815, Cl. D2-320.000.
Hach Company: *See—*
Brayton, Scott V.; Vanvalin, Richard D.; and Gaul, Timothy J., 325,881, Cl. D10-81.000.
Hagura, Shigehisa: *See—*
Hasegawa, Hideaki; Tashimo, Fumio; Hagura, Shigehisa; and Tuburaya, Kazuyuki, 325,857, Cl. D8-61.000.
Hahn, H. Barton: *See—*
Weiner, Rayna C.; Weiner, Edward G.; and Hahn, H. Barton, 325,935, Cl. D20-19.000.
Hall, Roger C. Door molding. 325,980, 5-5-92, Cl. D25-48.000.
Harada Industry Co., Ltd.: *See—*
Tezuka, Kiyoshi, 325,914, Cl. D14-230.000.
Harkins, Jack R.: *See—*
Kalmakis, George P.; Torti, Victor A.; Bantly, Matthew D.; and Harkins, Jack R., 325,974, Cl. D24-222.000.
Harris, Albert F., Jr., to Intec Laboratories, Inc. Golf putter head. 325,949, 5-5-92, Cl. D21-219.000.
Hasegawa, Hideaki; Tashimo, Fumio; Hagura, Shigehisa; and Tuburaya, Kazuyuki, to Hitachi Koki Company, Limited. Screw driver. 325,857, 5-5-92, Cl. D8-61.000.
Hasegawa, Shigeru: *See—*
Ito, Masafumi; Hasegawa, Shigeru; Takashima, Katsuhiro; and Tsunoda, Keiji, 325,910, Cl. D14-162.000.
Hatfield, Tinker L., to Nike, Inc.; and Nike International Ltd. Shoe upper. 325,812, 5-5-92, Cl. D2-314.000.
Havins, Felton H., to Aero Marine Engineering, Inc. Sonar transducer mount. 325,880, 5-5-92, Cl. D10-80.000.
Hayes, Ronald G., to L. R. Nelson Corporation. Hose quick connector housing. 325,961, 5-5-92, Cl. D23-262.000.
Helman, Andy: *See—*
Helman, Barry; Helman, Andy; and Bond, Gregg A., 325,845, Cl. D7-346.000.
Helman, Barry; Helman, Andy; and Bond, Gregg A., to Mr. Stove, Ltd. Stove top grill. 325,845, 5-5-92, Cl. D7-346.000.
Herber, Karlheinz, to ALSA GmbH. Work shoe. 325,805, 5-5-92, Cl. D2-271.000.
Hestehave, Borge; and Hestehave, Kjeld, to Bomatic, Inc. Bottle. 325,871, 5-5-92, Cl. D9-520.000.
Hestehave, Kjeld: *See—*
Hestehave, Borge; and Hestehave, Kjeld, 325,871, Cl. D9-520.000.
Hibbard, James S. Collapsible workstand. 325,827, 5-5-92, Cl. D6-429.000.
Highland Supply Corporation: *See—*
Weder, Donald E., 325,889, Cl. D11-152.000.
Hitachi Koki Company, Limited: *See—*
Hasegawa, Hideaki; Tashimo, Fumio; Hagura, Shigehisa; and Tuburaya, Kazuyuki, 325,857, Cl. D8-61.000.
Hofmann, Andreas, to F. Vaihinger GmbH & Co. Kommanditgesellschaft. Combined cake decorating nozzle and receptacle. 325,854, 5-5-92, Cl. D7-669.000.
Hohlbein, Douglas J.: *See—*
Boyer, Jon F.; Fisher, Lee C.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; Van Remoortel, John G.; and Vanover, Joel L., 325,923, Cl. D16-250.000.
Hollis, Joseph C., to Spotless Plastics Pty. Ltd. Hanger for knitwear or the like. 325,822, 5-5-92, Cl. D6-318.000.
Holmes, John E.: *See—*
Hosker, Thomas M.; and Holmes, John E., 325,873, Cl. D10-2.000.
Holtzclaw, James O., Jr., to Hunter Company, The. Carrying case for firearms. 325,820, 5-5-92, Cl. D3-79.000.
Hoover Company, The: *See—*
Moine, David W., 326,006, Cl. D32-32.000.
Hornung, Beate, to Marwitz & Hauser GmbH. Spectacles. 325,920, 5-5-92, Cl. D16-102.000.
Hosker, Thomas M.; and Holmes, John E., to Time-Frame, Inc. Combined clock and award plaque. 325,873, 5-5-92, Cl. D10-2.000.
Housemate Appliances Limited: *See—*
Dempsey, Mark, 326,008, Cl. D32-73.000.
Hoyer, Charlotte, to Interlego A.G. Element for a toy building set. 325,942, 5-5-92, Cl. D21-108.000.
Hoyle, Steven, to Malcolm Gill Limited. Mould tray for dental models. 325,971, 5-5-92, Cl. D24-181.000.
Hudson, Hugh F.; Munsch, Joseph F.; and McArdle, Joseph A., to Johnson Service Company. Multi-purpose enclosure for control modules or devices. 325,902, 5-5-92, Cl. D13-184.000.
Hume, Roger A.; Felstead, Richard A.; and Zucchi, Luciano, to Thorn Lighting Limited. Lamp. 325,994, 5-5-92, Cl. D26-2.000.
Hunter Company, The: *See—*
Holtzclaw, James O., Jr., 325,820, Cl. D3-79.000.

Hybrid Fax, Inc.: *See—*
Prince, Edward R., III, 325,904, Cl. D14-118.000.
Hyner, Michael: *See—*
Rubenstein, Saul; Hyner, Michael; and Neumann, Dieter, 325,869, Cl. D8-385.000.
Ino, Eriko: *See—*
Seki, Naoko; Watanabe, Katsuhito; and Ino, Eriko, 325,908, Cl. D14-138.000.
Intec Laboratories, Inc.: *See—*
Harris, Albert F., Jr., 325,949, Cl. D21-219.000.
Interlego A.G.: *See—*
Hoyer, Charlotte, 325,942, Cl. D21-108.000.
International Business Machines Corporation: *See—*
Quedenfeld, Jeffrey L., 325,926, Cl. D18-53.000.
Ishizuka, Shigeo: *See—*
Kuzuno, Katsutoshi; Ishizuka, Shigeo; and Yamamoto, Masayuki, 325,898, Cl. D13-147.000.
Ito, Masafumi; Hasegawa, Shigeru; Takashima, Katsuhiro; and Tsunoda, Keiji, to Teac Corporation. Combined audio mixer and tape recorder. 325,910, 5-5-92, Cl. D14-162.000.
Jack-Post Corporation: *See—*
Pomeroy, Charles; and Bycraft, John T., 325,823, Cl. D6-335.000.
Jade Vines International Inc.: *See—*
Wei, Chin C., 325,966, Cl. D23-372.000.
Javer, Ingvar R. Base portion of the wheelchair frame. 325,895, 5-5-92, Cl. D12-133.000.
Johnson, Ronald H., to Consumer Direct, Inc. Trampoline exerciser. 325,951, 5-5-92, Cl. D21-235.000.
Johnson Service Company: *See—*
Hudson, Hugh F.; Munsch, Joseph F.; and McArdle, Joseph A., 325,902, Cl. D13-184.000.
Joosten, Stefanus F. W.: *See—*
Dieperink, Menno; and Joosten, Stefanus F. W., 325,997, Cl. D26-107.000.
Kabushiki Kaisha Toshiba: *See—*
Fushiya, Nobuhiro, 325,927, Cl. D18-54.000.
Kadavy, Duane: *See—*
Grade, Lanny; Kadavy, Duane; and Kerr, Larry, 325,975, Cl. D24-230.000.
Kahl, W. Henry, to Rubbermaid Incorporated. Insulated cooler. 325,853, 5-5-92, Cl. D7-605.000.
Kalmakis, George P.; Torti, Victor A.; Bantly, Matthew D.; and Harkins, Jack R., to Matrix Technologies Corp. Multi-channel pipetter. 325,974, 5-5-92, Cl. D24-222.000.
Kanehagi, Hiroshi: *See—*
Yokota, Takao; and Kanehagi, Hiroshi, 325,859, Cl. D8-65.000.
Kaneko, Tetsuhisa: *See—*
Fushiya, Fusao; and Kaneko, Tetsuhisa, 325,860, Cl. D8-68.000.
Kato, Hitoshi; and Arai, Yuuichi, to Combi Corporation. Baby stroller. 325,894, 5-5-92, Cl. D12-129.000.
Kerr, Larry: *See—*
Grade, Lanny; Kadavy, Duane; and Kerr, Larry, 325,975, Cl. D24-230.000.
Kim, Hyun S., to Airway Industries, Inc. Luggage case. 325,818, 5-5-92, Cl. D3-76.000.
Kimble, Thomas E., to Random Corporation. Computer terminal 325,903, 5-5-92, Cl. D14-106.000.
Kittle, Christopher J., to Reebok International Ltd. Shoe upper. 325,813, 5-5-92, Cl. D2-314.000.
Klepper, Carl E. Combined watch and clip. 325,876, 5-5-92, Cl. D10-31.000.
Koch, Charles P., to Adex, Inc. Portable open air display stand. 325,978, 5-5-92, Cl. D25-16.000.
Kohler Co.: *See—*
Paul, Stanley M., 325,960, Cl. D23-254.000.
Kolada, Paul P., to Sterling Plumbing Group, Inc. Plumbing fitting handle or the like. 325,959, 5-5-92, Cl. D23-252.000.
Koyo Electronics Industries Ltd.: *See—*
Shimizu, Norio; and Watanabe, Yuichi, 325,900, Cl. D13-162.000.
Kriese, Peter: *See—*
Dieterle, Richard; and Kriese, Peter, 325,967, Cl. D23-386.000.
Krokaugger, William G., to Mole Richardson Co. Electrical connector lug. 325,899, 5-5-92, Cl. D13-148.000.
Kroll, Frederick H. Drawing toy. 325,939, 5-5-92, Cl. D21-59.000.
Krueger International, Inc.: *See—*
Fredrick, Kevin D., 325,834, Cl. D6-487.000.
Kulusic, Anthony M.: *See—*
Cesaroni, William C.; Brown, David C.; Kulusic, Anthony M.; and Ryan, Allen L., 325,946, Cl. D21-194.000.
Kuperman, Dennis, to RB Toy Development Co. Fish car. 325,943, 5-5-92, Cl. D21-128.000.
Kurokawa, Seiji: *See—*
Ooi, Hiroshi; and Kurokawa, Seiji, 325,921, Cl. D16-202.000.
Kuzuno, Katsutoshi; Ishizuka, Shigeo; and Yamamoto, Masayuki, to Yazaki Corporation. Electrical connector housing. 325,898, 5-5-92, Cl. D13-147.000.
L. B. Plastics: *See—*
Valentin, Volker S., 325,984, Cl. D25-122.000.
L. B. Plastics Limited: *See—*
Valentin, Volker S., 325,981, Cl. D25-119.000.
Valentin, Volker S., 325,985, Cl. D25-124.000.
Valentin, Volker S., 325,986, Cl. D25-124.000.
Valentin, Volker S., 325,987, Cl. D25-124.000.
Valentin, Volker S., 325,988, Cl. D25-124.000.
Valentin, Volker S., 325,989, Cl. D25-124.000.
Valentin, Volker S., 325,990, Cl. D25-124.000.
Valentin, Volker S., 325,991, Cl. D25-124.000.
Valentin, Volker S., 325,992, Cl. D25-124.000.
Valentin, Volker S., 325,993, Cl. D25-124.000.
L. R. Nelson Corporation: *See—*
Hayes, Ronald G., 325,961, Cl. D23-262.000.
Lamprey, John P. Temporary stand for attachment to vertical members. 325,838, 5-5-92, Cl. D6-574.000
Lanier, R. Mitzi. Propeller cage for a boat motor. 325,916, 5-5-92, Cl. D15-4.000.
Larson, Roger L.; Larson, Vada J.; and Bieger, Walter I., to Larson, Roger L.; and Larson, Vada J. Combined bookmark and penholder 325,929, 5-5-92, Cl. D19-34.000.
Larson, Vada J.: *See—*
Larson, Roger L.; Larson, Vada J.; and Bieger, Walter I., 325,929, Cl. D19-34.000.
Laube, Douglas N.: *See—*
Shambley, David A.; Okawa, Tsutomu; and Laube, Douglas N., 325,909, Cl. D14-138.000.
Lazzeroni, Edward J., Jr.: *See—*
Lazzeroni, Edward J., Sr.; Lazzeroni, Edward J., Jr.; and Zollers, Timothy E., 325,954, Cl. D22-123.000.
Lazzeroni, Edward J., Sr.; Lazzeroni, Edward J., Jr.; and Zollers, Timothy E., to S. C. Johnson & Son, Inc. Insect trap. 325,954, 5-5-92, Cl. D22-123.000.
Lee, Shin M., to Echolac Co., Ltd. Brief case. 325,819, 5-5-92, Cl. D3-76.000.
Life Fitness: *See—*
Cesaroni, William C.; Brown, David C.; Kulusic, Anthony M.; and Ryan, Allen L., 325,946, Cl. D21-194.000.
Lisco, Inc.: *See—*
Chen, Yin I.; and Bartasevich, William, 325,972, Cl. D24-193.000
Chen, Yin I.; and Bartasevich, William, 325,973, Cl. D24-197.000
Liz Claiborne, Inc.: *See—*
Allen, John L., 325,832, Cl. D6-470.000
Lloyd, Helen. Refrigerator. 325,918, 5-5-92, Cl. D15-81.000.
Luebbers, James M., to Vermont American Corporation. Desk clock 325,874, 5-5-92, Cl. D10-6.000
M.O.D.E., Inc.: *See—*
Weiner, Rayna C.; Weiner, Edward G.; and Hahn, H. Barton, 325,935, Cl. D20-19.000.
MacKay, Spencer L.: *See—*
Nesterick, Elaine M.; Reynolds, Robert W.; MacKay, Spencer L.; and Graham, Cleve A., 325,892, Cl. D12-85.000.
Magellan International, Inc.: *See—*
Schwartz, Larry A., 325,837, Cl. D6-500.000.
Magia Furniture Canada Limited: *See—*
Bell, Kenneth H., 325,825, Cl. D6-383.000.
Mahler, Harry, to GSW Inc. Modular shed. 325,979, 5-5-92, Cl. D25-33.000.
Main, Ewan J., to Woodbridge Foam Corporation. Pillow. 325,839, 5-5-92, Cl. D6-601.000
Main, Ewan J., to Woodbridge Foam Construction. Pillow. 325,840, 5-5-92, Cl. D6-601.000
Makita Electric Works, Ltd.: *See—*
Fushiya, Fusao; and Kaneko, Tetsuhisa, 325,860, Cl. D8-68.000
Malcolm Gill Limited: *See—*
Hoyle, Steven, 325,971, Cl. D24-181.000
Marwitz & Hauser GmbH: *See—*
Hornung, Beate, 325,920, Cl. D16-102.000
Matrix Technologies Corp.: *See—*
Kalmakis, George P.; Torti, Victor A.; Bantly, Matthew D.; and Harkins, Jack R., 325,974, Cl. D24-222.000.
McArdle, Joseph A.: *See—*
Hudson, Hugh F.; Munsch, Joseph F.; and McArdle, Joseph A., 325,902, Cl. D13-184.000.
Melcher, Peter B. Spice rack. 325,849, 5-5-92, Cl. D7-616.000.
Meta-Fer Norge A/S: *See—*
Andersen, Dagfinn, 326,005, Cl. D32-21.000.
Meyers, Edward J., Jr.; Ceglia, Frank; and Fogarty, Eileen, to CPC International Inc. Sun-shaped pasta. 325,804, 5-5-92, Cl. D1-106.000
Mr. Stove, Ltd.: *See—*
Helman, Barry; Helman, Andy; and Bond, Gregg A., 325,845, Cl. D7-346.000.
Miyamoto, Kouichi: *See—*
Sato, Mitsumasa; Sakamoto, Masakazu; and Miyamoto, Kouichi, 325,862, Cl. D8-69.000
Mizushima, Toshiaki: *See—*
Sakai, Takahiro; and Mizushima, Toshiaki, 325,912, Cl. D14-191.000.
Takahashi, Makoto; and Mizushima, Toshiaki, 325,913, Cl. D14-191.000.
Moine, David W., to Hoover Company, The. Main body of a vacuum cleaner. 326,006, 5-5-92, Cl. D32-32.000
Mole Richardson Co.: *See—*
Krokaugger, William G., 325,899, Cl. D13-148.000
Montalbano, Anthony P.: *See—*
Boyer, Jon F.; Fisher, Lee C.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; Van Remoortel, John G.; and Vanover, Joel L., 325,923, Cl. D16-250.000
Montalbano, Christopher P.: *See—*
Boyer, Jon F.; Fisher, Lee C.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; Van Remoortel, John G.; and Vanover, Joel L., 325,923, Cl. D16-250.000
Moore, Larry E. Shotshell carrier. 325,952, 5-5-92, Cl. D22-108.000.

Morrell, Cindy L.: *See—*
Borakove, Howard J.; and Morrell, Cindy L., 325,964, Cl. D23-367.000.
Morris, Joanthan R.; and Serna, Ralph, to Reebok International Ltd. Shoe upper. 325,810, 5-5-92, Cl. D2-314.000.
Morton, Kenneth P., to Fisher-Price, Inc. Sunshade for an infant's car seat. 325,836, 5-5-92, Cl. D6 491.000.
Motorola, Inc.: *See—*
Nagele, Albert L.; and Twarowski, Joseph A., 325,915, Cl. D14-248.000.
Scheid, William J.; and Dy, Dennie T., 325,911, Cl. D14-191.000.
Moyle, Don R.; and Dilworth, Glendon L. Fluid flow directing element for watercraft. 325,917, 5-5-92, Cl. D15-4.000.
Munsch, Joseph F.: *See—*
Hudson, Hugh F.; Munsch, Joseph F.; and McArdle, Joseph A., 325,902, Cl. D13-184.000.
Murray, Elbert L. Portable sandwich warmer. 325,846, 5-5-92, Cl. D7-352.000.
Nagele, Albert L.; and Twarowski, Joseph A., to Motorola, Inc. Telephone handset housing panel or similar article. 325,915, 5-5-92, Cl. D14-248.000.
NEC America, Inc.: *See—*
Shambley, David A.; Okawa, Tsutomu; and Laube, Douglas N., 325,909, Cl. D14-138.000.
NEC Corporation: *See—*
Sakai, Takahiro; and Mizushima, Toshiaki, 325,912, Cl. D14-191.000.
Takahashi, Makoto; and Mizushima, Toshiaki, 325,913, Cl. D14-191.000.
Neo-Contemporary Company Inc.: *See—*
Rubin, Frank F., 325,970, Cl. D24-147.000.
Nesterick, Elaine M.; Reynolds, Robert W.; MacKay, Spencer L.; and Graham, Cleve A., to Everest & Jennings, Inc. Electrically powered three wheeled vehicle. 325,892, 5-5-92, Cl. D12-85.000.
Neumann, Dieter: *See—*
Rubenstein, Saul; Hyner, Michael; and Neumann, Dieter, 325,869, Cl. D8-385.000.
Nike, Inc.: *See—*
Hatfield, Tinker L., 325,812, Cl. D2-314.000.
Nike International Ltd.: *See—*
Hatfield, Tinker L., 325,812, Cl. D2-314.000.
Niles, Rex B. Fabric holddown stake. 325,870, 5-5-92, Cl. D8-388.000.
Ninomiya, Yasuaki. Toy airplane. 325,940, 5-5-92, Cl. D21-89.000.
Nofsinger, Thomas. Rehabilitation block. 325,968, 5-5-92, Cl. D21-191.000.
Nomix Manufacturing Company Limited: *See—*
Ali, Eren, 325,955, Cl. D3-225.000.
Ali, Eren, 325,956, Cl. D3-225.000.
Odin Industries, Inc.: *See—*
Anderson, David L., 325,963, Cl. D23-342.000.
Ofrex Group Holdings, Plc: *See—*
Widdison, Leon F., 325,925, Cl. D18-34.000.
Okawa, Tsutomu: *See—*
Shambley, David A.; Okawa, Tsutomu; and Laube, Douglas N., 325,909, Cl. D14-138.000.
Oki Electric Industry Co., Ltd.: *See—*
Seki, Naoko; Watanabe, Katsuhito; and Ino, Eriko, 325,908, Cl. D14-138.000.
Okumura Corporation: *See—*
Saotome, Hiroshi, 325,833, Cl. D6-484.000.
Ooi, Hiroshi; and Kurokawa, Seiji, to Sharp Corporation. Combined video tape recorder and camera. 325,921, 5-5-92, Cl. D16-202.000.
Ozeki, Jiro, to Slidex Corporation. File sheet for compact discs. 325,816, 5-5-92, Cl. D3-35.000.
Pace Collection, Inc.: *See—*
Rosen, Leon, 325,831, Cl. D6-446.000.
Paul, Stanley M., to Kohler Co. Combined handle and escutcheon. 325,960, 5-5-92, Cl. D23-254.000.
Pearl Industries Limited: *See—*
Fong, Tso C., 325,877, Cl. D10-32.000.
Penn Fabrication (U.S.A.), Inc.: *See—*
Sollner, Roland, 325,835, Cl. D6-491.000.
Pentel Kabushiki Kaisha: *See—*
Shungo, Sekiguchi, 325,931, Cl. D19-43.000.
Person, Kurt: *See—*
Zeman, Dennis; and Person, Kurt, 325,891, Cl. D12-1.000.
Pfoertner, Rolf. Tire traction unit. 325,896, 5-5-92, Cl. D12-154.000.
Philippon, Brenda K. Ski pin. 325,884, 5-5-92, Cl. D11-48.000.
Phillips, E. Lakin. Spiral clock or the like. 325,872, 5-5-92, Cl. D10-1.000.
Phillips, E. Lakin. Wall clock or the like. 325,875, 5-5-92, Cl. D10-22.000.
Piretti, Giancarlo. Chair. 325,824, 5-5-92, Cl. D6-372.000.
Pomeroy, Charles; and Bycraft, John T., to Jack-Post Corporation. Combined glider and end table unit. 325,823, 5-5-92, Cl. D6-335.000.
Powell, Linda M. Signal for attracting attention of a taxi. 325,882, 5-5-92, Cl. D10-109.000.
Prema Pak Corporation: *See—*
Cochran, Daniel M.; and Beasley, John M., 325,828, Cl. D6-429.000.
Prince, Edward R., III, to Hybrid Fax, Inc. Receiver-printer interface for a facsimile. 325,904, 5-5-92, Cl. D14-118.000.
Quabaug Corporation: *See—*
Austin, Arnold S., 325,806, Cl. D2-320.000.
Austin, Arnold S., 325,807, Cl. D2-320.000.
Austin, Arnold S., 325,808, Cl. D2-320.000.
Quedenfeld, Jeffrey L., to International Business Machines Corporation. Printer cabinet. 325,926, 5-5-92, Cl. D18-53.000.
Ramljak, Vinko. Holder for crayons, markers, pencils and the like. 325,934, 5-5-92, Cl. D19-85.000.
Random Corporation: *See—*
Kimble, Thomas E., 325,903, Cl. D14-106.000.
Ratzlaff, Jorg, to Coca-Cola Company, The. Beverage dispenser. 325,843, 5-5-92, Cl. D7-308.000.
RB Toy Development Co.: *See—*
Kuperman, Dennis, 325,943, Cl. D21-128.000.
Rea, Mark A., Sr. Combination culinary utensil. 325,855, 5-5-92, Cl. D7-692.000.
Redfren, James J. Grip for a writing instrument. 325,932, 5-5-92, Cl. D19-55.000.
Reebok International Ltd.: *See—*
Close, Judith R., 325,809, Cl. D2-314.000.
Kittle, Christopher J., 325,813, Cl. D2-314.000.
Morris, Joanthan R.; and Serna, Ralph, 325,810, Cl. D2-314.000.
Reynolds, Robert W.: *See—*
Nesterick, Elaine M.; Reynolds, Robert W.; MacKay, Spencer L.; and Graham, Cleve A., 325,892, Cl. D12-85.000.
Ritvik Group Inc., The: *See—*
Bertrand, Victor J., 325,941, Cl. D21-108.000.
Rodriguez, Maria del C. Rawhide dog chew. 326,002, 5-5-92, Cl. D30-160.000.
Rodriguez, Maria del C. Rawhide dog chew. 326,004, 5-5-92, Cl. D30-160.000.
Rolex Watch U.S.A., Inc.: *See—*
St. Dizier, Gerald A. G., 325,883, Cl. D11-21.000.
Rosen, Leon, to Pace Collection, Inc. Cabinet. 325,831, 5-5-92, Cl. D6-446.000.
Rubbermaid Incorporated: *See—*
Bartok, Stephen, 325,868, Cl. D8-380.000.
Breen, John D., 325,930, Cl. D19-76.000.
Embree, Donald, 325,848, Cl. D7-510.000.
Embree, Donald, 326,003, Cl. D30-128.000.
Kahl, W. Henry, 325,853, Cl. D7-605.000.
Rubenstein, Saul; Hyner, Michael; and Neumann, Dieter, to Admiral Molding Corporation. Toggle anchor. 325,869, 5-5-92, Cl. D8-385.000.
Rubin, Frank F., to Neo-Contemporary Company, Inc. Bone planer. 325,970, 5-5-92, Cl. D24-147.000.
Ryan, Allen L.: *See—*
Cesaroni, William C.; Brown, David C.; Kulusic, Anthony M.; and Ryan, Allen L., 325,946, Cl. D21-194.000.
Ryobi Ltd.: *See—*
Saito, Toshiaki; and Sakamoto, Masakazu, 325,858, Cl. D8-61.000.
Saito, Toshiaki; and Sakamoto, Masakazu, 325,861, Cl. D8-68.000.
Sato, Mitsumasa; Sakamoto, Masakazu; and Miyamoto, Kouichi, 325,862, Cl. D8-69.000.
Yokota, Takao; and Kanehagi, Hiroshi, 325,859, Cl. D8-65.000.
S. C. Johnson & Son, Inc.: *See—*
Lazzeroni, Edward J., Sr.; Lazzeroni, Edward J., Jr.; and Zollers, Timothy E., 325,954, Cl. D22-123.000.
S.T.L. Superga S.p.A.: *See—*
Benatti, Mario; and Bertone, Francesco, 325,814, Cl. D2-320.000.
St. Dizier, Gerald A. G., to Rolex Watch U.S.A., Inc. Watch bracelet. 325,883, 5-5-92, Cl. D11-21.000.
Saito, Toshiaki; and Sakamoto, Masakazu, to Ryobi Ltd. Portable electric driver. 325,858, 5-5-92, Cl. D8-61.000.
Saito, Toshiaki; and Sakamoto, Masakazu, to Ryobi Ltd. Portable electric driver. 325,861, 5-5-92, Cl. D8-68.000.
Sakai, Takahiro; and Mizushima, Toshiaki, to NEC Corporation. Display pager. 325,912, 5-5-92, Cl. D14-191.000.
Sakamoto, Masakazu: *See—*
Saito, Toshiaki; and Sakamoto, Masakazu, 325,858, Cl. D8-61.000.
Saito, Toshiaki; and Sakamoto, Masakazu, 325,861, Cl. D8-68.000.
Sato, Mitsumasa; Sakamoto, Masakazu; and Miyamoto, Kouichi, 325,862, Cl. D8-69.000.
Samarit Medizintechnik Aktiengesellschaft: *See—*
Schuster, Jurg O., 325,893, Cl. D12-128.000.
Saotome, Hiroshi, to Okumura Corporation. Desk. 325,833, 5-5-92, Cl. D6-484.000.
Sato, Mitsumasa; Sakamoto, Masakazu; and Miyamoto, Kouichi, to Ryobi Ltd. Portable electric mortiser. 325,862, 5-5-92, Cl. D8-69.000.
Scheid, William J.; and Dy, Dennie T., to Motorola, Inc. Display pager or similar article. 325,911, 5-5-92, Cl. D14-191.000.
Schuster, Jurg O., to Samarit Medizintechnik Aktiengesellschaft. Stretcher or the like. 325,893, 5-5-92, Cl. D12-128.000.
Schwartz, Fery. Toothbrush. 325,821, 5-5-92, Cl. D4-106.000.
Schwartz, Larry A., to Magellan International, Inc. Seat. 325,837, 5-5-92, Cl. D6-500.000.
Seki, Naoko; Watanabe, Katsuhito; and Ino, Eriko, to Oki Electric Industry Co., Ltd. Portable telephone set. 325,908, 5-5-92, Cl. D14-138.000.
Serna, Ralph: *See—*
Morris, Joanthan R.; and Serna, Ralph, 325,810, Cl. D2-314.000.
Shambley, David A.; Okawa, Tsutomu; and Laube, Douglas N., to NEC America, Inc. Combined mobile cellular telephone handset and transporter. 325,909, 5-5-92, Cl. D14-138.000.
Sharp Corporation: *See—*
Ooi, Hiroshi; and Kurokawa, Seiji, 325,921, Cl. D16-202.000.
Shaw, Haizan. Lamp shade. 325,998, 5-5-92, Cl. D26-131.000.
Shimizu, Norio; and Watanabe, Yuichi, to Koyo Electronics Industries Ltd. Programmable controller. 325,900, 5-5-92, Cl. D13-162.000.

Shungo, Sekiguchi, to Pentel Kabushiki Kaisha. Writing instrument. 325,931, 5-5-92, Cl. D19-43.000.
SIMAC S.r.l.: *See—*
Giannelli, Giuseppe, 325,852, Cl. D7-368.000.
Simmons Juvenile Products Company, Inc.: *See—*
Brunner, Merlin A.; and Draheim, Harvey J., 325,826, Cl. D6-397.000.
Slant/Fin Corporation: *See—*
Dubin, Melvin; and Vozzo, Rocco, 325,962, Cl. D23-335.000.
Slidex Corporation: *See—*
Ozeki, Jiro, 325,816, Cl. D3-35.000.
Small, Jeannie C. Brooch. 325,885, 5-5-92, Cl. D11-64.000.
Smith & Wesson Corp.: *See—*
Vecchiarelli, Joseph F., 325,953, Cl. D22-108.000.
Societe Doublet: *See—*
Doublet, Luc, 325,890, Cl. D11-181.000
Sollner, Roland, to Penn Fabrication (U.S.A.), Inc. Corner protector for a speaker. 325,835, 5-5-92, Cl. D6-491.000.
Sonneman Design Group Inc.: *See—*
Sonneman, Robert A., 325,999, Cl. D26-152.000.
Sonneman, Robert A., to Sonneman Design Group Inc. Trim for recessed lighting fixture or the like. 325,999, 5-5-92, Cl. D26-152.000.
Spano, Donna: *See—*
Stairs, Henry M., Jr.; and Spano, Donna, 325,958, Cl. D23-250.000.
Spotless Plastics Pty. Ltd.: *See—*
Hollis, Joseph C., 325,822, Cl. D6-318.000.
Stairs, Henry M., Jr.; and Spano, Donna, to American Standard Inc. Handle for a faucet or the like. 325,958, 5-5-92, Cl. D23-250.000.
Sterling Plumbing Group, Inc.: *See—*
Kolada, Paul P., 325,959, Cl. D23-252.000.
Stuhr, Edwin J., to Stuhr Enterprises, Inc. Game board. 325,938, 5-5-92, Cl. D21-34.000.
Stuhr Enterprises, Inc.: *See—*
Stuhr, Edwin J., 325,938, Cl. D21-34.000
Systems Investments Ltd.: *See—*
Davis, Edgar H., 325,851, Cl. D8-10.000.
Takahashi, Makoto; and Mizushima, Toshiaki, to NEC Corporation. Display pager. 325,913, 5-5-92, Cl. D14-191.000.
Takashima, Katsuhiro: *See—*
Ito, Masafumi; Hasegawa, Shigeru; Takashima, Katsuhiro; and Tsunoda, Keiji, 325,910, Cl. D14-162.000.
Tani, Makoto, to Teac Corporation. Video tape recorder. 325,905, 5-5-92, Cl. D14-135.000.
Tashimo, Fumio: *See—*
Hasegawa, Hideaki; Tashimo, Fumio; Hagura, Shigehisa; and Tuburaya, Kazuyuki, 325,857, Cl. D8-61.000.
Teac Corporation: *See—*
Ito, Masafumi; Hasegawa, Shigeru; Takashima, Katsuhiro; and Tsunoda, Keiji, 325,910, Cl. D14-162.000.
Tani, Makoto, 325,905, Cl. D14-135.000.
Tezuka, Kiyoshi, to Harada Industry Co., Ltd. Antenna for automobiles. 325,914, 5-5-92, Cl. D14-230.000.
Thorn Lighting Limited: *See—*
Hume, Roger A.; Felstead, Richard A.; and Zucchi, Luciano, 325,994, Cl. D26-2.000.
Tienan, Douglas L., to Westgor, Wayne. Golf putter. 325,948, 5-5-92, Cl. D21-217.000.
Time-Frame, Inc.: *See—*
Hosker, Thomas M.; and Holmes, John E., 325,873, Cl. D10-2.000.
Torgison, Gary L. Combined desk plaque and holder for a writing instrument and note pad. 325,933, 5-5-92, Cl. D19-78.000.
Torti, Victor A.: *See—*
Kalmakis, George P.; Torti, Victor A.; Bantly, Matthew D.; and Harkins, Jack R., 325,974, Cl. D24-222.000.
Tridon Limited: *See—*
Buechele, Franz; and Dipple, Stephen G., 325,897, Cl. D12-155.000.
Tsai, Vincent. Fog light. 325,995, 5-5-92, Cl. D26-29.000.
Tsunoda, Keiji: *See—*
Ito, Masafumi; Hasegawa, Shigeru; Takashima, Katsuhiro; and Tsunoda, Keiji, 325,910, Cl. D14-162.000.
Tuburaya, Kazuyuki: *See—*
Hasegawa, Hideaki; Tashimo, Fumio; Hagura, Shigehisa; and Tuburaya, Kazuyuki, 325,857, Cl. D8-61.000.
Twarowski, Joseph A.: *See—*
Nagele, Albert L.; and Twarowski, Joseph A., 325,915, Cl. D14-248.000.
T4 Corporation: *See—*
Zeman, Dennis; and Person, Kurt, 325,891, Cl. D12-1.000.
U.S. Philips Corporation: *See—*
Dieperink, Menno; and Joosten, Stefanus F. W., 325,997, Cl. D26-107.000.
Valentin, Volker S., to L. B. Plastics Limited. Extrusion for use in the construction of a window. 325,981, 5-5-92, Cl. D25-119.000.
Valentin, Volker S., to L. B. Plastics. Extrusion for use in the construction of a window. 325,984, 5-5-92, Cl. D25-122.000.
Valentin, Volker S., to L. B. Plastics Limited. Extrusion for use in the construction of a window. 325,985, 5-5-92, Cl. D25-124.000.
Valentin, Volker S., to L. B. Plastics Limited. Extrusion for use in the construction of a window. 325,986, 5-5-92, Cl. D25-124.000.
Valentin, Volker S., to L. B. Plastics Limited. Extrusion for use in the construction of a window. 325,987, 5-5-92, Cl. D25-124.000.
Valentin, Volker S., to L. B. Plastics Limited. Extrusion for use in the construction of a window. 325,988, 5-5-92, Cl. D25-124.000.
Valentin, Volker S., to L. B. Plastics Limited. Extrusion for use in the construction of a window. 325,989, 5-5-92, Cl. D25-124.000.
Valentin, Volker S., to L. B. Plastics, Limited. Extrusion for use in the construction of a window. 325,990, 5-5-92, Cl. D25-124.000.
Valentin, Volker S., to L. B. Plastics Limited. Extrusion for use in the construction of a window. 325,991, 5-5-92, Cl. D25-124.000.
Valentin, Volker S., to L.B. Plastics Limited. Extrusion for use in the construction of a window. 325,992, 5-5-92, Cl. D25-124.000.
Valentin, Volker S., to L.B. Plastics Limited. Extrusion for use in the construction of a window. 325,993, 5-5-92, Cl. D25-124.000.
Van De Veire, L. Albert. Toilet tank flush control valve. 325,957, 5-5-92, Cl. D23-236.000.
Vanover, Joel L.: *See—*
Boyer, Jon F.; Fisher, Lee C.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; Van Remoortel, John G.; and Vanover, Joel L., 325,923, Cl. D16-250.000.
Van Remoortel, John G.: *See—*
Boyer, Jon F.; Fisher, Lee C.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; Van Remoortel, John G.; and Vanover, Joel L., 325,923, Cl. D16-250.000.
Vanvalin, Richard D.: *See—*
Brayton, Scott V.; Vanvalin, Richard D.; and Gaul, Timothy J., 325,881, Cl. D10-81.000.
Vecchiarelli, Joseph F., to Smith & Wesson Corp. Pistol grip. 325,953, 5-5-92, Cl. D22-108.000.
Vencel, Charles C., Sr. Extension for a light switch actuator. 325,901, 5-5-92, Cl. D13-173.000.
Vermont American Corporation: *See—*
Luebbers, James M., 325,874, Cl. D10-6.000.
Vodhanel, Joseph J., Jr. Artificial christmas tree. 325,887, 5-5-92, Cl. D11-118.000.
Vozzo, Rocco: *See—*
Dubin, Melvin; and Vozzo, Rocco, 325,962, Cl. D23-335.000
Watanabe, Katsuhito: *See—*
Seki, Naoko; Watanabe, Katsuhito; and Ino, Eriko, 325,908, Cl. D14-138.000.
Watanabe, Yuichi: *See—*
Shimizu, Norio; and Watanabe, Yuichi, 325,900, Cl. D13-162.000.
Weder, Donald E., to Highland Supply Corporation. Flower pot cover. 325,889, 5-5-92, Cl. D11-152.000.
Wei, Chin C., to Jade Vines International Inc. Kitchen exhaust hood. 325,966, 5-5-92, Cl. D23-372.000.
Weiner, Edward G.: *See—*
Weiner, Rayna C.; Weiner, Edward G.; and Hahn, H. Barton, 325,935, Cl. D20-19.000.
Weiner, Rayna C.; Weiner, Edward G.; and Hahn, H. Barton, to M.O.D.E., Inc. Display for promoting the sales of eyeglasses or the like. 325,935, 5-5-92, Cl. D20-19.000.
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Weir, Donald H., to Wexco Incorporated. Swimming pool. 325,977, 5-5-92, Cl. D25-2.000.
Westgor, Wayne: *See—*
Tienan, Douglas L., 325,948, Cl. D21-217.000.
Wexco Incorporated: *See—*
Weir, Donald H., 325,976, Cl. D25-2.000.
Weir, Donald H., 325,977, Cl. D25-2.000.
Widdison, Leon F., to Ofrex Group Holdings, Plc. Document shredder. 325,925, 5-5-92, Cl. D18-34.000.
Willert Home Products, Inc.: *See—*
Borakove, Howard J.; and Morrell, Cindy L., 325,964, Cl. D23-367.000.
Williams, Johnie E. Bracket for drapery fixtures. 325,867, 5-5-92, Cl. D8-368.000.
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Winn, Craig A., to Dynasty Classics Corporation. Table lamp base. 325,996, 5-5-92, Cl. D26-103.000.
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Woodbridge Foam Construction: *See—*
Main, Ewan J., 325,840, Cl. D6-601.000.
Woodbridge Foam Corporation: *See—*
Main, Ewan J., 325,839, Cl. D6-601.000.
Yamamoto, Masayuki: *See—*
Kuzuno, Katsutoshi; Ishizuka, Shigeo; and Yamamoto, Masayuki, 325,898, Cl. D13-147.000.
Yazaki Corporation: *See—*
Kuzuno, Katsutoshi; Ishizuka, Shigeo; and Yamamoto, Masayuki, 325,898, Cl. D13-147.000.
Yokota, Takao; and Kanehagi, Hiroshi, to Ryobi Ltd. Chain saw. 325,859, 5-5-92, Cl. D8-65.000.
Yu, Sun I., to Goldstar Co., Ltd. Portable electronic organ. 325,924, 5-5-92, Cl. D17-5.000.
Zehnder Verkaufs-und Verwaltungs AG: *See—*
Dieterle, Richard; and Kriese, Peter, 325,967, Cl. D23-386.000
Zeman, Dennis; and Person, Kurt, to T4 Corporation. Emergency vehicle. 325,891, 5-5-92, Cl. D12-1.000.
Zinco International, Inc.: *See—*
Davy, Zina V., 325,969, Cl. D24-124.000.
Zollers, Timothy E.: *See—*
Lazzeroni, Edward J., Sr.; Lazzeroni, Edward J., Jr.; and Zollers, Timothy E., 325,954, Cl. D22-123.000.
Zucchi, Luciano: *See—*
Hume, Roger A.; Felstead, Richard A.; and Zucchi, Luciano, 325,994, Cl. D26-2.000.

VOL
1138
SS
1
MY
5
1992
UMI

LIST OF PLANT PATENTEES

California Florida Plant Co., L.P.: *See—*
Jessel, Walter H., Jr., 7,862, Cl. 71.000.
Jessel, Walter H., Jr., 7,863, Cl. 71.000.
Cornell Research Foundation, Inc.: *See—*
Reisch, Bruce I.; Pool, Robert M.; and Einset, John, deceased, 7,860, Cl. 47.000.
Einset, Hjordis, executrix: *See—*
Reisch, Bruce I.; Pool, Robert M.; and Einset, John, deceased, 7,860, Cl. 47.000.
Einset, John, deceased: *See—*
Reisch, Bruce I.; Pool, Robert M.; and Einset, John, deceased, 7,860, Cl. 47.000.
Jessel, Walter H., Jr., to California Florida Plant Co., L.P. Carnation plant named 'CFPC Chanon'. 7,862, 5-5-92, Cl. 71.000.
Jessel, Walter H., Jr., to California Florida Plant Co., L.P. Carnation plant named CFPC Concerto. 7,863, 5-5-92, Cl. 71.000.
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Plantas de Navarra S.A.: *See—*
Lopez, Jose M. A., 7,861, Cl. 48.000.
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Reisch, Bruce I.; Pool, Robert M.; and Einset, John, deceased (by Einset, Hjordis, executrix), to Cornell Research Foundation, Inc. Grapevine, 'Chardonel' . 7,860, 5-5-92, Cl. 47.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 5TH DAY OF MAY, 1992

Abhiraman, A. S.: *See—*
Peebles, Leighton H., Jr.; Abhiraman, A. S.; and Bhat, Gajanan S., H1052, Cl. 423-447.700.
Atochem North America, Inc.: *See—*
Kydonieus, Nicholas; Hall, Jeffrey A.; Phillips, James D., Jr.; and Sturm, John A., H1055, Cl. 528-499.000.
Bernard, Jean-Marie. Tripeptide, its preparation and use. H1056, 5-5-92, Cl. 530-333.000.
Bhat, Gajanan S.: *See—*
Peebles, Leighton H., Jr.; Abhiraman, A. S.; and Bhat, Gajanan S., H1052, Cl. 423-447.700.
Bonafede, Earl H.: *See—*
Regalia, Floyd W.; and Bonafede, Earl H., H1057, Cl. 174-47.000.
Briguglio, Emanuel, to United States of America, United States. Antenna stabilizing buoy. H105 , 5-5-92, Cl. 441-28.000.
Coffey, Donald G.; Rebstock, Donald A.; and Meyer, Wilfred C., to Dow Chemical Company, The. Composition and method of forming extrudable food items. H105 , 5-5-92, Cl. 426-573.000.
Dow Chemical Company, The: *See—*
Coffey, Donald G.; Rebstock, Donald A.; and Meyer, Wilfred C., H1053, Cl. 426-573.000.
Garnett, Charles R.: *See—*
Henderson, William M.; Wilson, Leonard T.; and Garnett, Charles R., H1047, Cl. 102-496.000.
Wilson, Leonard T.; Garnett, Charles R.; and Henderson, William M., H1048, Cl. 102-496.000.
Gillette Company, The: *See—*
Petrillo, Richard J., H1050, Cl. 401-6.000.
Hall, Jeffrey A.: *See—*
Kydonieus, Nicholas; Hall, Jeffrey A.; Phillips, James D., Jr.; and Sturm, John A., H1055, Cl. 528-499.000.
Henderson, William M.; Wilson, Leonard T.; and Garnett, Charles R., to United States of America, Navy. Fragmenting notched warhead rod. H1047, 5-5-92, Cl. 102-496.000.
Henderson, William M.: *See—*
Wilson, Leonard T.; Garnett, Charles R.; and Henderson, William M., H1048, Cl. 102-496.000.
Herrick, Charlene, executrix: *See—*
Herrick, Roger A., deceased; and Herrick, Charlene, executrix, H1058, Cl. 324-206.000.
Herrick, Roger A., deceased; and Herrick, Charlene, executrix. Transducer for measuring the separator of rocket stages. H1058, 5-5-92, Cl. 324-206.000.
Khadduri, Farid M.; and Kurzeja, Stanley J. Gas generation for a missile post-boost control system. H1049, 5-5-92, Cl. 102-530.000.
Konig, Charles E., to United States of America, Army. Fiber optic RF signal channelizer. H1059, 5-5-92, Cl. 359-124.000.
Kurzeja, Stanley J.: *See—*
Khadduri, Farid M.; and Kurzeja, Stanley J., H1049, Cl. 102-530.000.
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Lazich, Michael, to United States of America, Navy. Microstructure correlation counter. H1060, 5-5-92, Cl. 382-6.000.
Meyer, Wilfred C.: *See—*
Coffey, Donald G.; Rebstock, Donald A.; and Meyer, Wilfred C., H1053, Cl. 426-573.000.
Peebles, Leighton H., Jr.; Abhiraman, A. S.; and Bhat, Gajanan S. Method for stabilization of pan-based carbon fibers. H1052, 5-5-92, Cl. 423-447.700.
Petrillo, Richard J., to Gillette Company, The. Writing instrument. H1050, 5-5-92, Cl. 401-6.000.
Phillips, James D., Jr.: *See—*
Kydonieus, Nicholas; Hall, Jeffrey A.; Phillips, James D., Jr.; and Sturm, John A., H1055, Cl. 528-499.000.
Rebstock, Donald A.: *See—*
Coffey, Donald G.; Rebstock, Donald A.; and Meyer, Wilfred C., H1053, Cl. 426-573.000.
Regalia, Floyd W.; and Bonafede, Earl H. Conductive hose. H1057, 5-5-92, Cl. 174-47.000.
Stout, Gordon R.: *See—*
Tinney, Ronnie C.; and Stout, Gordon R., H1046, Cl. 81-120.000.
Sturm, John A.: *See—*
Kydonieus, Nicholas; Hall, Jeffrey A.; Phillips, James D., Jr.; and Sturm, John A., H1055, Cl. 528-499.000.
Tinney, Ronnie C.; and Stout, Gordon R., to United States of America, Air Force. Drill chuck remover. H1046, 5-5-92, Cl. 81-120.000.
United States of America
Air Force: *See—*
Tinney, Ronnie C.; and Stout, Gordon R., H1046, Cl. 81-120.000.
Army: *See—*
Konig, Charles E., H1059, Cl. 359-124.000.
Walker, Charles W., Jr., H1054, Cl. 429-194.000.
Wilson, Arthur D., H1045, Cl. 73-40.000.
Navy: *See—*
Henderson, William M.; Wilson, Leonard T.; and Garnett, Charles R., H1047, Cl. 102-496.000.
Lazich, Michael, H1060, Cl. 382-6.000.
Wilson, Leonard T.; Garnett, Charles R.; and Henderson, William M., H1048, Cl. 102-496.000.
United States: *See—*
Briguglio, Emanuel, H1051, Cl. 441-28.000.
Walker, Charles W., Jr., to United States of America, Army. Electrochemical cell that delivers high power pulses. H1054, 5-5-92, Cl. 429-194.000.
Wilson, Arthur D., to United States of America, Army. Air bubble leak detection test device. H1045, 5-5-92, Cl. 73-40.000.
Wilson, Leonard T.; Garnett, Charles R.; and Henderson, William M., to United States of America, Navy. Composite fragmenting rod for a warhead case. H1048, 5-5-92, Cl. 102-496.000.
Wilson, Leonard T.: *See—*
Henderson, William M.; Wilson, Leonard T.; and Garnett, Charles R., H1047, Cl. 102-496.000.

CLASSIFICATION OF PATENTS

ISSUED MAY 5, 1992

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2
70 5,109,546
145 5,109,547
175 5,109,548
202 5,109,549

CLASS 4
300 5,109,550
368 5,109,552
431 5,109,551
518 5,109,553

CLASS 5
81.1 5,109,555
110 5,109,556
451 5,109,559
453 5,109,560
5,109,561
602 5,109,554
611 5,109,558
655 5,109,557

CLASS 8
115.6 5,110,317
405 5,110,318
639 Re.33,908

CLASS 15
56 5,109,562
167.1 5,109,563
236.06 5,109,564
309.1 5,109,565
319 5,109,566
345 5,109,567
410 5,109,568

CLASS 16
44 5,109,569
289 5,109,570
307 5,109,571
334 5,109,572
341 5,109,573

CLASS 19
234 5,109,574

CLASS 24
16 PB 5,109,575
30.5 R 5,109,576
71.2 5,109,577
298 5,109,578
339 5,109,579
458 5,109,580
714.6 5,109,581

CLASS 28
208 5,109,582

CLASS 29
7.1 5,109,583
33 P 5,109,584
123 5,109,585
132 5,109,587
160.6 5,109,586
525.1 5,109,588
527.4 5,109,589
564.4 5,109,590
566.4 5,109,591
599 5,109,593
600 5,109,594
5,109,595
705 5,109,596
721 5,109,597
825 5,109,598
828 5,109,599
840 5,109,601
845 5,109,602
859 5,109,603
888.09 5,109,605
889.1 5,109,606
889.5 5,109,604
890.144 5,109,600

CLASS 30
276 5,109,607
341 5,109,608

CLASS 33
502 5,109,609
559 5,109,610
613 5,109,611

CLASS 34
119 5,109,612

CLASS 36
89 5,109,613
100 5,109,614
121 5,109,615
122 5,109,616
132 5,109,617

CLASS 37
232 5,109,618

CLASS 40
152.1 5,109,619
406 5,109,620

CLASS 42
46 5,109,621
69.02 5,109,622
90 5,109,623

CLASS 43
15 5,109,624
56 5,109,625
78 5,109,626
88 5,109,627
124 5,109,628
132.1 5,109,629

CLASS 44
451 5,110,319

CLASS 51
74 R 5,109,630
111 R 5,109,631
135 R 5,109,632
163.1 5,109,633
237 R 5,109,634
283 R 5,109,635
295 5,110,320
5,110,321
309 5,110,322
320 5,109,636
391 5,109,637
401 5,109,638

CLASS 52
2.12 5,109,639
12 5,109,640
62 5,109,641
79.1 5,109,642
90 5,109,643
306 5,109,644
656 5,109,645
712 5,109,646
773 5,109,647

CLASS 53
134.1 5,109,648
284.4 5,109,649
443 5,109,650
502 5,109,651
508 5,109,652
510 5,109,653
511 5,109,654

CLASS 55
1 5,110,323
11 5,110,324
90 5,110,325
158 5,110,326
163 5,110,327
180 5,110,328
269 5,110,329
275 5,110,330
302 5,110,331
378 5,110,332

CLASS 56
6 5,109,655
17.5 5,109,656
330 5,109,657

CLASS 57
2.5 5,109,658
66 5,109,659
95 5,109,660
212 5,109,661
305 5,109,662
407 5,109,663

CLASS 60
39.06 5,109,664
39.182 5,109,665
39.36 5,109,671
39.464 5,109,666
39.821 5,109,669
204 5,109,670
226.3 5,109,667
310 5,109,668
456 5,109,672
520 5,109,673
612 5,109,674
660 5,109,675

CLASS 62
117 5,109,676
160 5,109,677
175 5,109,678
320 5,109,679

CLASS 65
1 5,110,333
2 5,110,334
3.12 5,110,335
24 5,110,336
58 5,110,337
182.2 5,110,338
238 5,110,339
269 5,110,340

CLASS 66
93 5,109,680
126 R 5,109,681

CLASS 68
13 R 5,109,682

CLASS 70
14 5,109,683
25 5,109,684
368 5,109,685
454 5,109,686

CLASS 71
86 5,110,341
88 5,110,342
5,110,343
90 5,110,344
5,110,345
5,110,346
92 5,110,347
100 5,110,348

CLASS 72
21 5,109,687
97 5,109,689
180 5,109,688
206 5,109,690

CLASS 73
9 5,109,694
23.36 5,109,691
29.03 Re 33,909
84 5,109,702
117.3 5,109,695
118.1 5,109,696
153 5,109,697
168 5,109,692
497 5,109,693
632 5,109,698
5,109,699
660 5,109,700
782 5,109,701
861.22 5,109,703
861.24 5,109,704
861.83 5,109,705
862.21 5,109,706
862.62 5,109,707
863.11 5,109,708
5,109,710
5,109,711
863.84 5,109,709
864.62 5,109,712
864.83 5,109,713
865.5 5,109,714
5,109,716
865.9 5,109,715
866 5,109,717
866.5 5,109,718

CLASS 74
5.37 5,109,719
89.15 5,109,720
336 R 5,109,721
371 5,109,722
411 5,109,723
479 5,109,724
505 5,109,725
567 5,109,726
568 R 5,109,727
820 5,109,728
858 5,109,729
866 5,109,730
5,109,731
5,109,732
868 5,109,733
869 5,109,734

CLASS 75
233 5,110,349
495 5,110,350
508 5,110,351
679 5,110,352
703 5,110,353
726 5,110,354

CLASS 81
56 5,109,735
57.4 5,109,736
177.2 5,109,737
434 5,109,738
463 5,109,739

CLASS 82
18 Re 33,910

CLASS 83
15 5,109,740
100 5,109,741
421 5,109,742
676 5,109,743
818 5,109,744

CLASS 84
313 5,109,745
607 5,109,746
731 5,109,747

CLASS 89
1.14 5,109,749
1.2 5,109,748
1.818 5,109,750
33.16 5,109,751
33.17 5,109,752

CLASS 91
375 A 5,109,753
499 5,109,754

CLASS 99
419 5,109,757
443 C 5,109,758
483 5,109,759
494 5,109,760
517 5,109,761

CLASS 100
2 5,109,762
48 5,109,763
99 5,109,764
155 G 5,109,765
257 5,109,766

CLASS 101
23 5,109,767
153 5,109,768
329 5,109,769
425 5,109,770
453 5,109,771

CLASS 102
275.11 5,109,772
357 5,109,773
382 5,109,774

CLASS 104
2 5,109,775

CLASS 105
199.3 5,109,776
401 5,109,777

CLASS 106
1.11 5,110,355
22 5,110,356
35 5,110,357
462 5,110,358
473 5,110,359
638 5,110,360
685 5,110,361
708 5,110,362

CLASS 108
127 5,109,778

CLASS 109
33 5,109,779

CLASS 112
80.03 5,109,780
121.29 5,109,781
184 5,109,782
231 5,109,783
266.2 5,109,784
303 5,109,785

CLASS 114
89 5,109,786
102 5,109,787
261 5,109,788

CLASS 116
325 5,109,789

CLASS 118
63 5,109,790
5,109,791
410 5,109,792
505 5,109,793
660 5,109,794
669 5,109,795

CLASS 119
3 5,109,796
15 5,109,797
51.03 5,109,798
51.13 5,109,799
61 5,109,800
96 5,109,801
98 5,109,802
106 5,109,803
171 5,109,804
173 5,109,805

CLASS 122
13.1 5,109,806
20 B 5,109,807

CLASS 123
23 5,109,808
41.31 5,109,809
51 R 5,109,810
52 MB 5,109,811
90.12 5,109,812
90.15 5,109,813
190.14 5,109,814
192.1 5,109,815
263 5,109,816
272 5,109,817
319 5,109,818
399 5,109,819
425 5,109,820
5,109,821
456 5,109,822
472 5,109,823
5,109,824
479 5,109,825
564 5,109,826
618 5,109,827
635 5,109,828
643 5,109,829

CLASS 126
41 R 5,109,834

CLASS 127
46.1 5,110,363

CLASS 128
4 5,109,830
20 5,109,831
24 R 5,109,832
28 5,109,833
200.24 5,109,836
202.12 5,109,837
203.12 5,109,838
5,109,839
5,109,840
205.13 5,109,841
380 5,109,842
419 D 5,109,843
419 R 5,109,844
5,109,845
5,109,846
5,109,847
422 5,109,848
633 5,109,849
635 5,109,850
642 5,109,851
645 5,109,852
653.1 5,109,855
653.2 5,109,853
5,109,854
660.01 5,109,856
661.08 5,109,857
661.09 5,109,858
662.03 5,109,859
5,109,860
662.06 5,109,861
702 5,109,862
715 5,109,863
736 5,109,864
738 5,109,865
771 5,109,866
772 Re 33,911
5,109,867
774 5,109,868
778 5,109,869
780 5,109,870
844 5,109,871
845 5,109,872
849 5,109,873
888 5,109,874
899 5,109,875

CLASS 131
365 5,109,876

CLASS 132
218 5,109,877
279 5,109,878
320 5,109,879

CLASS 134
2 5,110,364
18 5,110,365
22.11 5,110,366
42 5,110,367
108 5,109,880

CLASS 136
246 5,110,368
251 5,110,369
256 5,110,370

CLASS 137
72 5,109,881
355.21 5,109,882
385 5,109,883
460 5,109,884
554 5,109,885
596.17 5,109,886
625.46 5,109,887

CLASS 138
109 5,109,888
173 5,109,889

CLASS 139
190 5,109,890
450 5,109,891

CLASS 141
11 5,109,892
67 5,109,893
83 5,109,894

CLASS 144
2 N 5,109,895
30 5,109,896
144.5 GT 5,109,897
339 5,109,900
350 5,109,898
378 5,109,899

CLASS 148
33.2 5,110,373
101 5,110,374
301 5,110,376
302 5,110,377
304 5,110,378
333 5,110,379
534 5,110,375
552 5,110,372
691 5,110,371

CLASS 149
92 5,110,380

CLASS 152

209 R 5,109,901
5,109,902
5,109,903
5,109,904
342.1 5,109,905
536 5,109,906
564 5,109,907

CLASS 156

64 5,110,381
77 5,110,382
88 5,110,383
89 5,110,384
155 5,110,385
204 5,110,386
222 5,110,387
229 5,110,388
234 5,110,389
244.11 5,110,390
250 5,110,391
314 5,110,392
344 5,110,393
345 5,110,394
353 5,110,395
382 5,110,396
435 5,110,397
499 5,110,398
515 5,110,399
521 5,110,400
527 5,110,401
573 5,110,402
580.1 5,110,403
603 5,110,404
610 5,110,405
621 5,110,406
643 5,110,407
5,110,408
5,110,409
5,110,410
656 5,110,411

CLASS 160

84.1 5,109,908
168.1 5,109,909
197 5,109,910
199 5,109,911
330 5,109,912
332 5,109,913

CLASS 162

5 5,110,412
145 5,110,413
163 5,110,414
281 5,110,415
343 5,110,416
358 5,110,417

CLASS 164

113 5,109,914

CLASS 165

11.2 5,109,915
59 5,109,916
75 5,109,917
104.18 5,109,918
151 5,109,919
163 5,109,920
166 Re.33,912

CLASS 166

65.1 5,109,921
5,109,922
117 5,109,923
117.5 5,109,924
184 5,109,925
187 5,109,926
248 5,109,927
266 5,109,928

CLASS 169

16 5,109,929

CLASS 172

13 5,109,930
248 5,109,931

CLASS 173

17 5,109,932

CLASS 174

24 5,110,998
36 5,110,999
38 5,111,000
92 5,111,001
102 P 5,111,002
255 5,111,003

CLASS 175

66 5,109,933
170 5,109,934
434 5,109,935

CLASS 177

25.19 5,109,936
145 5,109,937

CLASS 178

18 5,111,004
19 5,111,005

CLASS 180

19.3 5,109,938
89.15 5,109,939
168 5,109,940
182 5,109,941
219 5,109,942
228 5,109,943
248 5,109,944
273 5,109,945

CLASS 181

106 5,109,946
5,109,947
142 5,109,948
240 5,109,949
256 5,109,950

CLASS 182

62.5 5,109,951
63 5,109,952
129 5,109,953
189 5,109,954

CLASS 184

105.2 5,109,955

CLASS 186

41 5,109,956

CLASS 187

1 R 5,109,957
20 5,109,958

CLASS 188

73.31 5,109,959
218 X1. 5,109,960

CLASS 190

18 A 5,109,961

CLASS 192

0.07 5,109,967
4 A 5,109,962
8 C 5,109,963
48.92 5,109,964
58 B 5,109,965
70.12 5,109,966
83 5,109,968
84 R 5,109,969

CLASS 193

2 R 5,109,970
35 A 5,109,971

CLASS 194

217 5,109,972

CLASS 198

341 5,109,973
346.1 5,109,974
411 5,109,975
498 5,109,976

CLASS 200

5 R 5,111,006
43.03 5,111,007
144 R 5,111,008
330 5,111,009
461 5,111,010
550 5,111,011

CLASS 202

81 5,110,418
185.3 5,110,419

CLASS 204

64 R 5,110,426
67 5,110,427
129 5,110,436
129.3 5,110,428
153.1 5,110,429
157.20 5,110,430
158.1 5,110,425
180.1 5,110,424
5,110,431
182.3 5,110,432
183.2 5,110,434
192.3 5,110,435
298.3 5,110,437
298.34 5,110,438
299 R 5,110,439
300 F C 5,110,440
418 5,110,441
426 5,110,442

CLASS 205

131 5,110,421
157 5,110,420
159 5,110,422
254 5,110,423

CLASS 206

0.8 5,109,977
225 5,109,978
229 5,109,979
328 5,109,980
331 5,109,981
387 5,109,982
408 5,109,983
531 5,109,984
600 5,109,985
5,109,986

CLASS 208

46 5,110,443
89 5,110,444
96 5,110,445
100 5,110,446
106 5,110,447
131 5,110,448
5,110,449
413 5,110,450
421 5,110,451
423 5,110,452

CLASS 209

135 5,110,453
155 5,110,454
167 5,110,455
273 5,110,456
657 5,109,987
673 5,109,988

CLASS 210

90 5,110,458
143 5,110,459
149 5,110,460
158 5,110,461
180 5,110,462
194 5,110,463
195.3 5,110,464
199 5,110,465
225 5,110,466
5,110,467
321.69 5,110,468
455 5,110,469
500.23 5,110,470
512.2 5,110,471
632 5,110,472
634 5,110,473
635 5,110,474
640 5,110,475
5,110,476
647 5,110,477
650 5,110,478
662 5,110,479
670 5,110,480
721 5,110,481
758 5,110,482
787 5,110,457
5,110,483

CLASS 211

1.55 5,109,989
41 5,109,990
45 5,109,991
59.1 5,109,992
59.2 Re.33,913
87 5,109,993
162 5,109,994

CLASS 215

1 A 5,109,995
11.6 5,109,996
360 5,109,997

CLASS 219

10.55 F 5,111,013
10.55 R 5,111,012
10.77 5,111,014
56.22 5,111,015
69.12 5,111,016
69.18 5,111,017
86.25 5,111,018
87 5,111,019
110 5,111,020
121.33 5,111,022
121.54 5,111,024
121.6 5,111,021
121.85 5,111,023
217 5,111,025
492 5,111,026
506 5,111,027
5,111,028
521 5,111,029
549 5,111,032

CLASS 220

1.5 5,109,998
5,109,999
4.16 5,110,000
94 R 5,110,001
254 5,110,002
304 5,110,003
355 5,110,004
404 5,110,005
442 5,110,006

CLASS 221

25 5,110,007
259 5,110,008
266 5,110,009

CLASS 222

75 5,110,010
82 5,110,011
83.5 5,110,012
382 5,110,013
396 5,110,014
413 5,110,015
475.1 5,110,016
520 5,110,017
600 5,110,018

CLASS 223

87 5,110,019

CLASS 224

32 R 5,110,020
42.01 5,110,021
150 5,110,022
205 5,110,023
328 5,110,024

CLASS 226

74 5,110,025
152 5,110,026

CLASS 227

8 5,110,027
39 5,110,028
112 5,110,029
130 5,110,030

CLASS 228

50 5,110,031
102 5,110,032
160 5,110,033
179 5,110,034
183 5,110,035
256 5,110,036

CLASS 229

23 A 5,110,037
103 5,110,038
110 5,110,039
125.14 5,110,040
125.15 5,110,041
215 5,110,042
304 5,110,043

CLASS 235

375 5,111,030
456 5,111,031
488 5,111,033

CLASS 236

12.16 5,110,044
93 R 5,110,045

CLASS 238

283 5,110,046

CLASS 239

11 5,110,047
171 5,110,048
209 5,110,049
265.39 5,110,050
327 5,110,051
333 5,110,052
533.11 5,110,054
533.9 5,110,053

CLASS 241

15 5,110,055
19 5,110,056
30 5,110,057
47 5,110,059
158 5,110,060
264 5,110,058

CLASS 242

47 5,110,061
57 5,110,062
78.1 5,110,063
129.5 5,110,064
158 R 5,110,065
255 5,110,066

CLASS 244

50 5,110,067
102 SL 5,110,068
110 B 5,110,069
125 5,110,070
137.3 5,110,071
213 5,110,072

CLASS 248

49 5,110,073
79 5,110,075
125 5,110,076
205.3 5,110,077
206.2 5,110,078
222.1 5,110,079
225.1 5,110,080
340 5,110,074
635 5,110,081
678 5,110,082

CLASS 249

46 5,110,083
111 5,110,084

CLASS 250

213 A 5,111,034
213 VT 5,111,035
214 AL 5,111,036
216 5,111,037
225 5,111,038
231.10 5,111,039
237 G 5,111,040
239 5,111,041
251 5,111,042
306 5,111,043
327.2 5,111,044
5,111,045
330 5,111,046
331 Re.33,914
336.1 5,111,047
342 5,111,048
352 5,111,049
5,111,050
363.02 5,111,051
370.01 5,111,052
424 5,111,053
441.11 5,111,054
461.1 5,111,055
560 5,111,056

CLASS 251

29 5,110,085
118 5,110,086
129.16 5,110,087
149.1 5,110,088

CLASS 252

8.551 5,110,485
5,110,486
8.554 5,110,487
32.7 E 5,110,488
35 5,110,489
5,110,490
47.5 5,110,491
90 5,110,492
156 5,110,494
174.23 5,110,868
186.26 5,110,495
299.61 5,110,496
299.65 5,110,497
299.66 5,110,498
301.16 5,110,500
301.6 S 5,110,499
315.2 5,110,501
319 5,110,502
325 5,110,503
500 5,110,504
518 5,110,505
559 5,110,506
626 5,110,507
631 Re.33,915

CLASS 254

8 B 5,110,089
124 5,110,090
126 5,110,091
134.3 FT 5,110,092
266 5,110,093

CLASS 256

47 5,110,094

CLASS 261

91 5,110,510
104 5,110,511
122 5,110,512

CLASS 264

19 5,110,513
22 5,110,514
25 5,110,515
29.6 5,110,516
40.1 5,110,517
5,110,518
40.2 5,110,519
40.3 5,110,520
40.4 5,110,521
5,110,522
40.5 5,110,523
53 5,110,524
122 5,110,525
127 5,110,526
5,110,527
138 5,110,528
167 5,110,529
171 5,110,530
219 5,110,531
257 5,110,532
572 5,110,533

CLASS 266

55 5,110,095
227 5,110,096

CLASS 267

136 5,110,097

CLASS 269

21 5,110,098
25 5,110,099
244 5,110,100

CLASS 270

39 5,110,101
53 5,110,102

CLASS 271

3 5,110,103
3.1 5,110,104
5 5,110,105
9 5,110,106
35 5,110,107
69 5,110,108
82 5,110,109
98 5,110,110
186 5,110,111
189 5,110,112
241 5,110,113
262 5,110,114
265 5,110,115
277 5,110,116

CLASS 273

32 A 5,110,123
55 A 5,110,124
73 C 5,110,125
73 R 5,110,126
85 R 5,110,127
121 R 5,110,120
126 A 5,110,128
138 A 5,110,129
153 S 5,110,130
167 H 5,110,131
187 R 5,110,132
5,110,133
293 5,110,134
296 5,110,135
346 5,110,136
348.1 5,110,137
391 5,110,138
400 5,110,139
459 5,110,140

CLASS 277

9 5,110,141
33 5,110,142
47 5,110,143
116.2 5,110,144

CLASS 279

24 5,110,145
43 5,110,146

CLASS 280

79.5 5,110,147
221 5,110,148
401 5,110,149
642 5,110,150
661 5,110,151
707 5,110,152
822 5,110,154

CLASS 283

117 5,110,155
5,110,156
707 5,110,153

CLASS 285

8 5,110,157
92 5,110,158
131 5,110,159
211 5,110,160
281 5,110,161
5,110,162
382.2 5,110,163

CLASS 290

38 R 5,111,057

CLASS 292

4 5,110,164
242 5,110,165
262 5,110,166

CLASS 293

120 B1 4,951,986

CLASS 294

16 5,110,167
19.2 5,110,168
119.4 5,110,169
146 5,110,170

CLASS 296

39.2 5,110,171
50 5,110,172
65.1 5,110,173
77.1 5,110,174
117 5,110,175
188 5,110,176
189 5,110,177
218 5,110,178

CLASS 297

68 5,110,179
78 5,110,180

185 5,110,181
216 5,110,182
343 5,110,183
349 5,110,184
410 5,110,185
444 5,110,186

CLASS 299

1.4 5,110,187
10 5,110,188
30 5,110,189

CLASS 301

55 5,110,190

CLASS 303

113 R 5,110,191

CLASS 307

66 5,111,058
87 5,111,059
219 5,111,060
254 5,111,061
269 5,111,062
5,111,063
270 5,111,064
5,111,065
271 5,111,066
272.3 5,111,067
303.1 5,111,068
303.2 5,111,069
311 5,111,070
350 5,111,071
353 5,111,072
442 5,111,073
443 5,111,074
5,111,075
446 5,111,076
5,111,077
451 5,111,078
465 5,111,079
475 5,111,080
5,111,081
476 5,111,082
527 5,111,083
571 5,111,084
603 5,111,085
5,111,086

CLASS 310

11 5,111,087
12 5,111,088
54 5,111,089
5,111,090
68 B 5,111,091
5,111,092
88 5,111,093
90.5 5,111,102
156 5,111,094
168 5,111,095
5,111,096
261 5,111,097
268 5,111,098
305 5,111,099
313 A 5,111,100
328 5,111,101

CLASS 312

71 5,110,192
282 5,110,193

CLASS 313

2.1 5,111,103
25 5,111,104
112 5,111,105
403 5,111,106
405 5,111,107
622 5,111,109
630 5,111,108

CLASS 315

10 5,111,110
111.41 5,111,111
205 5,111,112
210 5,111,113
225 5,111,114
239 5,111,115
241 P 5,111,116
248 5,111,117
307 5,111,118
386 5,111,119
393 5,111,120
411 5,111,121
5,111,122

CLASS 318

434 5,111,123
5,111,124
568.16 5,111,126
603 5,111,125

CLASS 320

2 5,111,127
5,111,128
5,111,129
25 5,111,130
32 5,111,131

CLASS 322

90 5,111,132

CLASS 323

286 5,111,133

CLASS 324

78 D 5,111,134
96 5,111,135
158 R 5,111,136
5,111,137
174 5,111,138
207.22 5,111,139
228 5,111,140
250 5,111,141
262 5,111,142
307 5,111,143
309 5,111,144
316 5,111,145
318 5,111,146
5,111,147
433 5,111,148
546 5,111,149

CLASS 326

346 5,110,211

CLASS 328

155 5,111,150
5,111,151

CLASS 329

300 5,111,152

CLASS 330

85 5,111,154
149 5,111,155
254 5,111,159
257 5,111,156
286 5,111,157
297 5,111,158

CLASS 331

1 A 5,111,160
25 5,111,161

CLASS 332

117 5,111,163
127 5,111,162

CLASS 333

21 A 5,111,164
116 5,111,165
128 5,111,166
151 5,111,167
152 5,111,168
181 5,111,169
219.1 5,111,170

CLASS 335

202 5,111,171
216 5,111,172
5,111,173

CLASS 336

73 5,111,174
192 5,111,175

CLASS 337

188 5,111,176
243 5,111,177

CLASS 338

160 5,111,178
313 5,111,179

CLASS 340

456 5,111,180
467 5,111,181
479 5,111,182
5,111,183
542 5,111,184
568 5,111,185
572 5,111,186
574 5,111,187
623 5,111,188
664 5,111,189
703 Re.33,916
717 5,111,190
720 5,111,191
727 5,111,192
783 5,111,193
793 5,111,194
811 5,111,195
825.35 5,111,196
825.44 5,111,197
825.52 5,111,198
825.72 5,111,199
826 5,111,200
870.380 5,111,201

CLASS 341

139 5,111,202
141 5,111,203
150 5,111,204
156 5,111,205

CLASS 342

15 5,111,206
20 5,111,207
174 5,111,208
357 5,111,209
455 5,111,210

CLASS 343

700 MS 5,111,211
709 5,111,212
722 5,111,213
841 5,111,214

CLASS 346

76 PH 5,111,215
5,111,216
107 R 5,111,217
5,111,218
108 5,111,219
140 R 5,111,220

CLASS 351

41 5,110,197
124 5,110,198
169 5,110,199
212 5,110,200

CLASS 352

180 5,110,201

CLASS 353

30 5,110,206

CLASS 354

64 5,111,222
111 5,111,223
125 5,111,224
149.11 5,111,225
195.1 5,111,226
199 5,111,227
222 5,111,228
275 5,111,229
400 5,111,230
402 5,111,231
5,111,232
416 5,111,233
455 5,111,234

CLASS 355

22 5,111,236
27 5,111,237
40 5,111,238
45 5,111,239
53 5,111,240
75 5,111,241
200 5,111,242
209 5,111,243
210 5,111,244
245 5,111,245
5,111,246
246 5,111,235
5,111,247
282 5,111,248
285 5,111,249
5,111,250
297 5,111,251
308 5,111,252

CLASS 356

1 5,110,202
4.5 5,110,207
5 5,110,203
28 5,110,204
128 5,110,208
135 5,110,205
138 5,110,209
150 5,110,210
429 5,110,212
445 5,110,213

CLASS 357

15 5,111,253
22 5,111,254
5,111,255
5,111,256
23.13 5,111,262
23.4 5,111,257
5,111,258
23.5 5,111,270
23.6 5,111,259
23.7 5,111,260
5,111,261
24 5,111,263
25 5,111,221
30 5,111,264
34 5,111,265
5,111,266
36 5,111,267
38 5,111,268
43 5,111,269
45 5,111,271
49 5,111,272
51 5,111,273
53 5,111,274
71 5,111,275
5,111,276
74 5,111,277
75 5,111,278
81 5,111,279
82 5,111,280

CLASS 358

29 5,111,281
40 5,111,282
41 5,111,283
60 5,111,284
75 5,111,285
5,111,286
83 5,111,287
5,111,296
108 5,111,288
5,111,289
5,111,290
5,111,291
133 5,111,292
135 5,111,293
136 5,111,294
140 5,111,295
183 5,111,297
187 5,111,298
209 5,111,299
5,111,300
228 5,111,301
298 5,111,302
335 5,111,303
341 5,111,304
342 5,111,305
403 5,111,306
407 5,111,307
448 5,111,308
455 5,111,309
456 5,111,310
461 5,111,311

CLASS 359

11 5,111,312
17 5,111,313
29 5,111,314
40 5,111,315
52 5,111,316
56 5,111,317
76 5,111,318
85 5,111,319
87 5,111,320
92 5,111,321
122 5,111,322
139 5,111,323
189 5,111,324
206 5,111,325
224 5,110,195
244 5,111,326
265 5,111,328
275 5,111,329
281 5,111,330
296 5,111,331
307 5,111,332
333 5,111,333
336 5,111,153
341 5,111,334
350 5,111,335
378 5,111,336
443 5,111,337
686 5,111,338
813 5,111,339
819 5,111,340
841 5,111,341
872 5,111,342
874 5,110,196
888 5,111,343
900 5,111,344

CLASS 360

15 B1 4,410,917
48 5,111,345
64 5,111,346
75 5,111,347
77.06 5,111,348
78.07 5,111,349
99.06 5,111,350
104 5,111,351
113 5,111,352

CLASS 361

91 5,111,353
218 5,111,354
313 5,111,355
321 5,111,356
5,111,357
334 5,111,358
388 5,111,359
391 5,111,360
394 5,111,361
395 5,111,362
398 5,111,363
399 5,111,364
506 5,111,365

CLASS 362

31 5,111,366
32 5,111,367
61 5,111,368
5,111,369
147 5,111,370
261 5,111,371

CLASS 363

20 5,111,372
37 5,111,373
5,111,374
60 5,111,375
71 5,111,376
95 5,111,377
98 5,111,378
128 5,111,379
132 5,111,380
5,111,381
5,111,382

CLASS 364

184 5,111,383
401 5,111,391
5,111,392
405 5,111,394
408 5,111,395
413.06 5,111,396
419 5,111,397
5,111,398
421 5,111,399
424.01 5,111,400
424.02 5,111,401
424.04 5,111,402
428 5,111,403
431.07 5,111,405
468 5,111,404
474.02 5,111,406
483 5,111,407
514 5,111,408
551.01 5,111,410
559 5,111,411
571.04 5,111,412
578 5,111,413
713 5,111,414
715.04 5,111,415
717 5,111,416
724.1 5,111,417
724.19 5,111,418
5,111,419
745 5,111,420
748 5,111,421
750.5 5,111,422

CLASS 365

49 5,111,427
104 5,111,428
129.02 5,111,431
156 5,111,429
185 5,111,430
190 5,111,432
201 5,111,433
207 5,111,434
230.06 5,111,435
238 5,111,436

CLASS 367

57 5,111,437
87 5,111,438

CLASS 368

19 5,111,439

CLASS 369

13 5,111,440
5,111,441
44.12 5,111,447
44.23 5,111,448
44.37 5,111,449
47 5,111,442
54 5,111,443
58 5,111,444
103 5,111,445
291 5,111,446

CLASS 370

13 5,111,450
29 5,111,451
85.1 5,111,452
5,111,456
85.13 5,111,453
95.3 5,111,454
112 5,111,455

CLASS 371

10.1 5,111,457
16.5 5,111,458
27 5,111,459
29.1 5,111,460
37.1 5,111,461
5,111,462
39.1 5,111,463
40.1 5,111,464
54 5,111,465

CLASS 372

22 5,111,466
32 5,111,467
5,111,468
46 5,111,469
5,111,470
5,111,471
53 5,111,472
59 5,111,473
61 5,111,474
96 5,111,475
107 5,111,476

CLASS 374

45 5,110,214
106 5,110,215
122 5,110,216
123 5,110,217
153 5,110,218

CLASS 375

1 5,111,478
5,111,479
4 5,111,480
14 5,111,481
90 5,111,482
94 5,111,483
5,111,484
112 5,111,485
120 5,111,486

CLASS 376

143 5,110,534
230 5,110,535
285 5,110,536
305 5,110,537
402 5,110,538
439 5,110,539
441 5,110,540

CLASS 377

44 5,111,487
47 5,111,488
121 5,111,489

CLASS 378

5,111,490
35 5,111,491
99 5,111,492
103 5,111,493
138 5,111,494
146 5,111,495
177 5,111,496

CLASS 379

27 5,111,497
53 5,111,498
61 5,111,499
67 5,111,500
355 5,111,501
380 5,111,502
433 5,111,503

CLASS 380

21 5,111,504

CLASS 381

51 5,111,505
68.4 5,111,506
71 5,111,507
100 5,111,508
154 5,111,509
193 5,111,510

CLASS 382

1 5,111,511
3 5,111,512
8 5,111,513
9 5,111,514
14 5,111,516
43 5,111,515

CLASS 383

4 5,110,219

CLASS 384

105 5,110,220
203 5,110,221
482 5,110,222
620 5,110,223

CLASS 385

11 5,111,517
14 5,111,518
16 5,110,194
24 5,111,519
25 5,110,224
81 5,111,520
82 5,111,521
92 5,111,522
100 5,111,523
102 5,111,524
126 5,111,525
145 5,111,526

CLASS 392

360 5,111,527
379 5,111,528
390 5,111,477
405 5,111,529

CLASS 395

20 5,111,530
23 5,111,531
102 5,111,532
109 5,111,533
152 5,111,409

VOL 1138 ISS 1 MAY 1992 UMI

425 5,111,385
5,111,386
5,111,387
5,111,425
500 5,111,423
575 5,111,384
600 5,111,426
725 5,111,390
5,111,424
800 5,111,388
5,111,389

CLASS 400

29 5,110,225
88 5,110,226
120 5,110,227
208 5,110,228
249 5,110,229

CLASS 401

52 5,110,230
190 5,110,231

CLASS 402

8 5,110,232

CLASS 403

12 5,110,233
403 5,110,234

CLASS 404

4 5,110,235

CLASS 405

63 5,110,236
184 5,110,237

CLASS 406

159 5,110,238

CLASS 409

125 5,110,239
234 5,110,240
235 5,110,241

CLASS 410

26 5,110,242

CLASS 411

344 5,110,243
361 5,110,244
421 5,110,245
429 5,110,246
441 5,110,247

CLASS 414

172 5,110,248
217 5,110,249
229 5,110,250
545 5,110,251
549 5,110,252
694 5,110,253
723 5,110,254
754 5,110,255

CLASS 415

119 5,110,257
5,110,258
190 5,110,256

CLASS 416

134 A 5,110,259
5,110,260
204 R 5,110,261
219 R 5,110,262
244 R 5,110,263

CLASS 417

45 5,110,264
279 5,110,265
312 5,110,266
404 5,110,267
410 5,110,268
428 5,110,269
477 5,110,270
555.1 5,110,271
571 5,110,272

CLASS 418

55.6 5,110,273

CLASS 419

2 5,110,541
25 5,110,542
29 5,110,543

CLASS 420

69 5,110,544
534 5,110,545
590 5,110,546
5,110,547

CLASS 422

46 5,110,549
48 5,110,548
56 5,110,550
58 5,110,551
64 5,110,552
68.1 5,110,553
78 5,110,554
100 5,110,555
101 5,110,556
5,110,557
5,110,558
109 5,110,559
176 5,110,560
180 5,110,561
186 5,110,562
191 5,110,563
197 5,110,564
198 5,110,565

CLASS 423

105 5,110,566
114 5,110,567
116 5,110,578
137 5,110,568
141 5,110,569
5,110,570
143 5,110,571
178 5,110,572
5,110,573
192 5,110,574
195 5,110,575
5,110,576
5,110,577
196 5,110,579
202 5,110,580
215 5,110,581

CLASS 424

216 45 D 5,110,600
218 47 5,110,582
234 48 5,110,583
236 61 5,110,584
257 70 5,110,585
283 76.1 5,110,586
312.2 89 5,110,587
336 92 5,110,588
349 5,110,589
364 94.6 5,110,590
408 195.1 5,110,591
413 195.100 5,110,592
419 401 5,110,593
421 405 5,110,594
447 422 5,110,595
494 438 5,110,596
516 5,110,597
551 5,110,598
552 449 5,110,599
623 451 5,110,602
678 466 5,110,603
484 5,110,604
487 5,110,605
489 5,110,606

CLASS 425

28.100 5,110,274
113 5,110,275
133.1 5,110,276
141 5,110,277
175 5,110,278
183 5,110,284
208 5,110,279
311 5,110,280
406 5,110,281
534 5,110,282
589 5,110,283

CLASS 426

3 5,110,607
5,110,608
402 5,110,609
496 5,110,610
512 5,110,611
523 5,110,601
548 5,110,612
549 5,110,613
555 5,110,614

CLASS 427

8 5,110,615
9 5,110,616
14.1 5,110,617
32 5,110,618
38 5,110,619
40 5,110,620
44 5,110,621
126.1 5,110,622
160 5,110,625
5,110,626
162 5,110,623
208.4 5,110,627
212 5,110,624
256 5,110,628
322 5,110,629
327 5,110,630
422 5,110,631
424 5,110,632
430.1 5,110,633
5,110,634

CLASS 428

10 5,110,635
11 5,110,636
34 5,110,637
35.1 5,110,638
35.2 5,110,639
5,110,640
35.5 5,110,641
35.8 5,110,642
35.9 5,110,643
36.3 5,110,644
36.9 5,110,645
43 5,110,646
5,110,647
64 5,110,648
100 5,110,649
5,110,650
105 5,110,651
114 5,110,652
116 5,110,653
137 5,110,654
141 5,110,657
5,110,658
5,110,659
143 5,110,655
178 5,110,660
5,110,661
192 5,110,662
195 5,110,663
5,110,664
5,110,665
196 5,110,666
202 5,110,667
215 5,110,668
5,110,669
216 5,110,670
218 5,110,671
234 5,110,672
236 5,110,673
257 5,110,656
283 5,110,674
312.2 5,110,675
336 5,110,676
349 5,110,677
364 5,110,678
408 5,110,679
413 5,110,680
419 5,110,681
5,110,682
421 5,110,683
447 5,110,684
494 5,110,685
516 5,110,686
551 5,110,687
552 5,110,688
623 5,110,689
678 5,110,690

CLASS 429

35 5,110,691
36 5,110,692
40 5,110,693
192 5,110,694
206 5,110,695
218 5,110,696

CLASS 430

14 5,110,697
20 5,110,698
54 5,110,699
64 5,110,700
96 5,110,701
99 5,110,702
108 5,110,703
110 5,110,704
120 5,110,705
191 5,110,706
256 5,110,707
270 5,110,708
271 5,110,709
278 5,110,710
296 5,110,711
312 5,110,712
372 5,110,713
376 5,110,714
379 5,110,715
429 5,110,716
512 5,110,717
546 5,110,718
569 5,110,719

CLASS 431

8 5,110,285
208 5,110,286

CLASS 432

24 5,110,287
96 5,110,288
106 5,110,289

CLASS 433

9 5,110,290
156 5,110,291
173 5,110,292
176 5,110,293
215 5,110,720

CLASS 434

34 5,110,294
88 5,110,295
260 5,110,296
278 5,110,297

CLASS 435

1 5,110,721
5,110,722
4 5,110,723
7.21 5,110,726
11 5,110,724
5,110,725
13 5,110,727
69.1 5,110,728
5,110,729
69.6 5,110,730
119 5,110,731
172.3 5,110,732
183 5,110,733
201 5,110,734
209 5,110,735
226 5,110,736
240.27 5,110,737
5,110,738
252.9 5,110,739
262 5,110,740
284 5,110,741

CLASS 436

18 5,110,742
48 5,110,743
53 5,110,744
87 5,110,745
88 5,110,746
133 5,110,747

CLASS 437

26 5,110,749
27 5,110,750
40 5,110,751
47 5,110,752
51 5,110,748
52 5,110,753
5,110,754
62 5,110,755
70 5,110,756
89 5,110,757
171 5,110,758
173 5,110,759
180 5,110,760
182 5,110,761
189 5,110,762
195 5,110,763
224 5,110,764
225 5,110,765
228 5,110,766

CLASS 439

65 5,110,298
68 5,110,299
121 5,110,300
310 5,110,301
357 5,110,302
367 5,110,303
398 5,110,304
441 5,110,305
497 5,110,306
566 5,110,307
582 5,110,308
630 5,110,309

CLASS 440

1 5,110,310
37 5,110,311
75 5,110,312
90 5,110,313

CLASS 446

34 5,110,314
102 5,110,315
202 5,110,316

CLASS 452

158 Re.33,917

CLASS 454

160 5,109,755
284 5,109,756

CLASS 455

33.2 5,111,534
5,111,535

CLASS 482

54 5,110,117
73 5,110,118
93 5,110,119
134 5,110,122
137 5,110,121

CLASS 483

4 5,109,592

CLASS 501

1 5,110,768
12 5,110,769
89 5,110,770
95 5,110,771
97 5,110,772
98 5,110,773
126 5,110,774

CLASS 502

43 5,110,775
64 5,110,776
68 5,110,777
168 5,110,778
185 5,110,779
303 5,110,780
5,110,782
314 5,110,783
335 5,110,781
401 5,110,784
404 5,110,785

CLASS 503

204 5,110,786
206 5,110,787
227 5,110,788

CLASS 505

1 5,110,767
5,110,789
5,110,790
5,110,791
5,110,792
869 5,110,793

CLASS 507

110 5,110,484

CLASS 514

2 5,110,794
17 5,110,795
18 5,110,796
19 5,110,797
5,110,798
5,110,799
29 5,110,800
34 5,110,801
39 5,110,826
44 5,110,802
58 5,110,803
60 5,110,804
76 5,110,805
78 5,110,806
89 5,110,807
155 5,110,808
171 5,110,809
178 5,110,810
183 5,110,811
210 5,110,812
212 5,110,813
5,110,814
228.2 5,110,815
255 5,110,816
5,110,817
261 5,110,818
311 5,110,819
356 5,110,820
364 5,110,821
372 5,110,822
375 5,110,823
377 5,110,824
381 5,110,825
399 5,110,827
413 5,110,493
5,110,828
443 5,110,829
592 5,110,830
645 5,110,831
729 5,110,832

CLASS 521

50 5,110,833
52 5,110,834
57 5,110,835
58 5,110,836
5,110,837
81 5,110,838
83 5,110,839
85 5,110,840
94 5,110,841
134 5,110,842
159 5,110,843
182 5,110,844

CLASS 523

211 5,110,845
346 5,110,846
412 5,110,847

CLASS 524

30 5,110,848
87 5,110,849
100 5,110,850
106 5,110,851
108 5,110,852
375 5,110,853
439 5,110,854
441 5,110,855
459 5,110,856
494 5,110,857
496 5,110,858
503 5,110,859
563 5,110,860
601 5,110,861
5,110,862
767 5,110,863
801 5,110,864
838 5,110,865

CLASS 525

67 5,110,866
114 5,110,867
194 5,110,869
5,110,870
207 5,110,871
216 5,110,872
305 5,110,873
329.9 5,110,874
332.2 5,110,875
332.3 5,110,876
378 5,110,877
430 5,110,878
432 5,110,879
436 5,110,880
455 5,110,881
478 5,110,882

CLASS 526

84 5,110,883
114 5,110,884
170 5,110,885
256 5,111,327
260 5,110,886
287 5,110,887
312 5,110,888
320 5,110,889

CLASS 528

12 5,110,890
34 5,110,891
48 5,110,892
125 5,110,893
128 5,110,894
176 5,110,895
190 5,110,896
196 5,110,897
256 5,110,898
265 5,110,899
340 5,110,900
387 5,110,901
388 5,110,902
397 5,110,903

CLASS 530

313 5,110,904
350 5,110,905
5,110,906
383 5,110,907
385 5,110,909
388.23 5,110,913
390.1 5,110,910
395 5,110,911
403 5,110,908
413 5,110,912
416 5,110,914
502 5,110,915

CLASS 534

15 5,110,916
815 5,110,917

CLASS 536

21 5,110,918
24 5,110,919
27 5,110,920

CLASS 540

222 5,110,921
523 5,110,922
589 5,110,923

CLASS 544

233 5,110,924
234 5,110,925
276 5,110,926
291 5,110,927
395 5,110,928
406 5,110,929

CLASS 546

15 5,110,930
37 5,110,931
102 5,110,932
114 5,110,933
159 5,110,934
171 5,110,935
261 5,110,937
302 5,110,943

CLASS 548

200 5,110,936
237 5,110,938
250 5,110,939
252 5,110,940
262.4 5,110,941
5,110,942
311 5,110,944
453 5,110,945
483 5,110,946
531 5,110,947
579 5,110,948
513 5,110,959

CLASS 552

220 5,110,960

CLASS 554

170 5,110,508
184 5,110,509

CLASS 556

31 5,110,961
46 5,110,962
61 5,110,963
143 5,110,964
148 5,110,965
403 5,110,966
407 5,110,967
415 5,110,968
427 5,110,969
445 5,110,970
446 5,110,971
460 5,110,972
469 5,110,974
488 5,110,973

CLASS 558

44 5,110,975
407 5,110,976

CLASS 560

1 5,110,977
15 5,110,978
61 5,110,979
185 5,110,980

CLASS 562

90 5,110,981
414 5,110,982
435 5,110,983
487 5,110,984
571 5,110,985

CLASS 564

149 5,110,986
303 5,110,987
441 5,110,988

CLASS 568

327 5,110,989
492 5,110,990
618 5,110,991
5,110,992
721 5,110,993
727 5,110,994
800 5,110,995

CLASS 570

159 5,110,996
222 5,110,997

CLASS 606

241 5,109,835

CLASSIFICATION OF DESIGNS

D1— 106 325,804
D2— 271 325,805
314 325,809
325,810
325,811
325,812
325,813
320 325,806
325,807
325,808
325,814
325,815
D3— 35 325,816
325,817
76 325,818
325,819
79 325,820
D4— 106 325,821
D6— 318 325,822
335 325,823
372 325,824
383 325,825
397 325,826
429 325,827
325,828
436 325,829
325,830
446 325,831
470 325,832
484 325,833
487 325,834
491 325,835
325,836
500 325,837
574 325,838
601 325,839
325,840
605 325,841
611 325,842
D7— 308 325,843
310 325,844
346 325,845
352 325,846
368 325,852
391 325,847
510 325,848
605 325,853
616 325,849
619 325,850
669 325,854
692 325,855
D8— 8 325,856
10 325,851
28 325,864
61 325,857
325,858
65 325,859
68 325,860
325,861
69 325,862
75 325,863
306 325,865
354 325,866
368 325,867
380 325,868
385 325,869
388 325,870
D9— 520 325,871
D10— 1 325,872
2 325,873
6 325,874
22 325,875
31 325,876
32 325,877
39 325,878
325,879
80 325,880
81 325,881
109 325,882
D11— 21 325,883
48 325,884
64 325,885
93 325,886
118 325,887
137 325,888
152 325,889
181 325,890
D12— 1 325,891
85 325,892
128 325,893
129 325,894
133 325,895
154 325,896
155 325,897
147 325,898
148 325,899
162 325,900
173 325,901
184 325,902
D13— 106 325,903
118 325,904
135 325,905
137 325,906
325,907
138 325,908
325,909
162 325,910
191 325,911
325,912
325,913
230 325,914
248 325,915
D15— 4 325,916
325,917
81 325,918
145 325,919
D16— 102 325,920
202 325,921
208 325,922
250 325,923
D17— 5 325,924
D18— 34 325,925
53 325,926
54 325,927
D19— 27 325,928
34 325,929
43 325,931
55 325,932
76 325,930
78 325,933
85 325,934
D20— 19 325,935
40 325,936
D21— 6 325,937
34 325,938
59 325,939
89 325,940
108 325,941
325,942
D25— 2 325,976
325,977
16 325,978
33 325,979
48 325,980
119 325,981
122 325,984
124 325,982
325,983
325,985
325,986
D22— 108 325,952
325,953
123 325,954
D23— 225 325,955
325,956
236 325,957
250 325,958
252 325,959
D26— 2 325,994
254 325,960
262 325,961
335 325,962
342 325,963
367 325,964
368 325,965
D28— 64 326,000
D29— 12 326,001
D30— 128 326,003
D24— 124 325,969
147 325,970
181 325,971
D32— 21 326,005
193 325,972
32 326,006
197 325,973
43 326,007
222 325,974
73 326,008
230 325,975
325,995
103 325,996
107 325,997
131 325,998
152 325,999
326,004

CLASSIFICATION OF PLANTS

P— 47 7,860
48 7,861
71 7,862
7,863

STATUTORY INVENTION REGISTRATIONS

73— 40 H1045
81— 120 H1046
102— 496 H1047
H1048
530 H1049
174— 47 H1057
324— 206 H1058
359— 124 H1059
382— 6 H1060
401— H1050
423— 447.7 H1052
426— 573 H1053
429— 194 H1054
441— 28 H1051
528— 499 H1055
530— 333 H1056

VOL
1138
SS
1
MY
5
1992
UMI

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	5,109,775	5,109,842	5,110,383		5,111,049	5,109,702		5,110,675
	5,109,934	5,109,849	5,110,424		5,111,050	5,109,704		5,110,855
	5,110,061	5,109,852	5,110,430		5,111,075	5,109,749		5,110,858
	5,110,137	5,109,867	5,110,431		5,111,076	5,109,837		5,110,868
	5,110,153	5,109,869	5,110,434		5,111,092	5,109,846		5,110,878
	5,110,368	5,109,872	5,110,439		5,111,102	5,109,848		5,110,896
	5,111,126	5,109,875	5,110,487		5,111,129	5,109,952		5,110,938
	5,111,531	5,109,912	5,110,493		5,111,130	5,109,993		5,110,954
04 :	5,109,607	5,109,929	5,110,514		5,111,160	5,110,452		5,110,998
	5,109,793	5,109,930	5,110,528		5,111,165	5,110,545	11 :	5,111,221
	5,109,839	5,109,947	5,110,531		5,111,178	5,110,624	12 :	5,109,580
	5,110,065	5,109,961	5,110,535		5,111,192	5,110,712		5,109,606
	5,110,151	5,109,968	5,110,549		5,111,196	5,110,731		5,109,626
	5,110,230	5,109,977	5,110,596		5,111,202	5,110,735		5,109,675
	5,110,344	5,109,995	5,110,597		5,111,204	5,110,785		5,109,769
	5,110,345	5,110,002	5,110,600		5,111,206	5,111,058		5,109,780
	5,110,455	5,110,008	5,110,604		5,111,220	5,111,072		5,109,796
	5,110,589	5,110,009	5,110,615		5,111,262	5,111,137		5,109,836
	5,110,748	5,110,012	5,110,628		5,111,270	5,111,149		5,109,910
	5,110,758	5,110,021	5,110,638		5,111,276	5,111,290		5,110,035
	5,110,761	5,110,023	5,110,646		5,111,279	5,111,440		5,110,129
	5,111,064	5,110,027	5,110,653		5,111,280	5,111,463		5,110,152
	5,111,131	5,110,034	5,110,679		5,111,315	5,111,502		5,110,181
	5,111,155	5,110,071	5,110,694		5,111,342	09 : Re.33,916		5,110,184
	5,111,191	5,110,072	5,110,724		5,111,349	5,109,589		5,110,256
	5,111,216	5,110,075	5,110,728		5,111,351	5,109,620		5,110,298
	5,111,379	5,110,076	5,110,730		5,111,355	5,109,664		5,110,311
	5,111,381	5,110,079	5,110,742		5,111,370	5,109,871		5,110,465
05 :	5,109,563	5,110,081	5,110,757		5,111,387	5,109,937		5,110,500
	5,109,624	5,110,089	5,110,768		5,111,390	5,110,029		5,110,533
	5,109,972	5,110,111	5,110,771		5,111,398	5,110,051		5,110,832
	5,110,319	5,110,118	5,110,778		5,111,401	5,110,058		5,110,885
06 :	Re.33,911	5,110,122	5,110,795		5,111,408	5,110,219		5,110,914
	5,109,546	5,110,123	5,110,802		5,111,413	5,110,221		5,111,097
	5,109,548	5,110,147	5,110,804		5,111,415	5,110,247		5,111,128
	5,109,552	5,110,163	5,110,806		5,111,423	5,110,257		5,111,167
	5,109,576	5,110,166	5,110,840		5,111,445	5,110,339		5,111,186
	5,109,595	5,110,198	5,110,907		5,111,455	5,110,355		5,111,366
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56 : 5,109,627

DESIGN PATENTS

04 325,952
06 325,815
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325,891
325,902
325,954
325,847
325,855

PLANT PATENTS

06 7,862
7,863
36 7,860

STATUTORY INVENTION REGISTRATIONS

04 H1045
06 H1058
H1060
24 H1049
H1051
25 H1050
26 H1053
34 H1054
36 H1059
40 H1046
42 H1055
51 H1047
H1048
H1052
H1057

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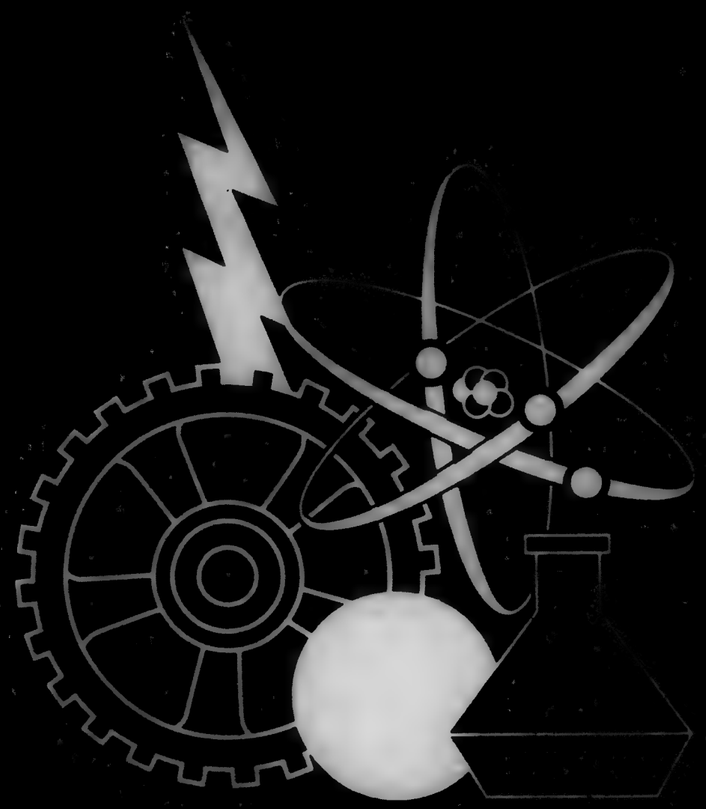
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

May 12, 1992



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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1138
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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
May 12, 1992 Volume 1138 Number 2

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1138 OG 16
Notice of Maintenance Fees Payable	1138 OG 16
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1138 OG 17
Reissue Applications Filed	1138 OG 20
Requests for Reexaminations Filed	1138 OG 21
Extension of Time to File Statement of Use	1138 OG 21
Registration to Practice	1138 OG 22
CD-ROM Patent Images by Technology	1138 OG 22
Registration to Practice	1138 OG 22
Patents Available for License or Sale	1138 OG 22
Patents Certificates of Correction	1138 OG 23
Special Boxes for Mail	1138 OG 24
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1138 OG 25
Patent Examining Corps	1138 OG 27
Reexaminations	699
Reissue Patents Granted (33,918)	703
Plant Patents Granted (7,864)	707
Patents Granted	
General and Mechanical (5,111,536)	709
Chemical (5,112,357)	989
Electrical (5,113,036)	1189
Design Patents Granted (326,009)	1361
Index of Patentees	PI 1
Indices of Reissue, Reexaminations, Design, and Plant Patents	PI 87
Classification of	
Patents (Including Reissues and Reexaminations)	PI 95
Designs, and Plants Applications	PI 99
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 101
Designs and Plant Applications	PI 103
Change of Address Form	PI 105
Subscription Order Form	PI 107

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SS
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1992
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	600.00
—Corresponding prior U.S. national application filed	400.00
—Supplemental search fee, per additional invention	160.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	440.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	650.00
—Additional examination fee, per additional invention	220.00
International fees	
Basic fee	525.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	127.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	161.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	310.00	620.00
USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA	460.00	920.00
Filing with an EPO or JPO search report	400.	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on May 9, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,827,534 through 4,829,598
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 7, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,514,861 through 4,516,272
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9f) $450.00
By other than a small entity $900.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9f) $905.00
By other than a small entity $1,810.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§1.9(f)) $1,365.00
By other than a small entity..... $2,730.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable $600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 8, 1992
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,434,512	06/288,362	3/06/84
4,434,516	06/455,746	3/06/84
4,434,517	06/371,920	3/06/84
4,434,521	06/393,916	3/06/84
4,434,523	06/285,265	3/06/84
4,434,528	06/381,264	3/06/84
4,434,530	06/241,199	3/06/84
4,434,533	06/349,850	3/06/84
4,434,534	06/341,291	3/06/84
4,434,549	06/431,002	3/06/84
4,434,552	06/353,757	3/06/84
4,434,553	06/369,872	3/06/84
4,434,554	06/393,378	3/06/84
4,434,562	06/298,575	3/06/84
4,434,563	06/239,172	3/06/84
4,434,566	06/384,320	3/06/84
4,434,567	06/369,982	3/06/84
4,434,570	06/376,449	3/06/84
4,434,574	06/393,200	3/06/84
4,434,575	06/427,690	3/06/84
4,434,580	06/334,641	3/06/84
4,434,583	06/280,904	3/06/84
4,434,593	06/257,606	3/06/84
4,434,594	06/413,825	3/06/84
4,434,595	06/380,879	3/06/84
4,434,603	06/281,555	3/06/84
4,434,604	06/359,383	3/06/84
4,434,606	06/374,705	3/06/84
4,434,609	06/289,807	3/06/84
4,434,611	06/341,113	3/06/84
4,434,612	06/378,325	3/06/84
4,434,620	06/393,335	3/06/84
4,434,621	06/299,393	3/06/84
4,434,624	06/248,603	3/06/84
4,434,626	06/367,787	3/06/84
4,434,627	06/369,645	3/06/84
4,434,638	06/403,909	3/06/84
4,434,643	06/336,315	3/06/84
4,434,645	06/288,167	3/06/84
4,434,647	06/287,238	3/06/84
4,434,659	06/350,474	3/06/84
4,434,660	06/245,304	3/06/84
4,434,664	06/280,578	3/06/84
4,434,665	06/343,105	3/06/84
4,434,667	06/314,917	3/06/84
4,434,673	06/272,618	3/06/84
4,434,681	06/327,690	3/06/84
4,434,682	06/299,124	3/06/84
4,434,687	06/438,174	3/06/84
4,434,697	06/296,413	3/06/84
4,434,702	06/356,002	3/06/84
4,434,703	06/270,331	3/06/84
4,434,706	06/283,155	3/06/84
4,434,715	06/331,630	3/06/84
4,434,721	06/365,663	3/06/84
4,434,727	06/503,079	3/06/84
4,434,731	06/341,704	3/06/84
4,434,736	06/458,425	3/06/84
4,434,737	06/302,830	3/06/84
4,434,740	06/491,802	3/06/84
4,434,742	06/421,434	3/06/84
4,434,745	06/431,315	3/06/84
4,434,746	06/472,398	3/06/84
4,434,748	06/372,303	3/06/84
4,434,751	06/333,801	3/06/84
4,434,754	06/432,887	3/06/84
4,434,761	06/222,098	3/06/84
4,434,775	06/399,956	3/06/84
4,434,777	06/392,486	3/06/84
4,434,781	06/345,703	3/06/84
4,434,783	06/333,864	3/06/84
4,434,785	06/431,725	3/06/84
4,434,787	06/301,007	3/06/84
4,434,788	06/286,753	3/06/84
4,434,796	06/350,398	3/06/84
4,434,798	06/314,463	3/06/84
4,434,803	06/290,321	3/06/84
4,434,808	06/389,646	3/06/84
4,434,811	06/402,561	3/06/84
4,434,812	06/486,134	3/06/84
4,434,814	06/355,940	3/06/84
4,434,817	06/335,453	3/06/84
4,434,825	06/326,394	3/06/84
4,434,827	06/385,724	3/06/84
4,434,828	06/450,985	3/06/84
4,434,829	06/296,567	3/06/84
4,434,830	06/473,840	3/06/84
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VOL
1138
ISS
2
MY
12
19 92
UMI

Patent Number	Serial Numer	Issue Date
4,434,848	06/332,026	3/06/84
4,434,850	06/326,456	3/06/84
4,434,852	06/297,805	3/06/84
4,434,856	06/300,492	3/06/84
4,434,874	06/356,684	3/06/84
4,434,876	06/512,572	3/06/84
4,434,877	06/429,122	3/06/84
4,434,879	06/285,011	3/06/84
4,434,882	06/280,120	3/06/84
4,434,887	06/414,061	3/06/84
4,434,888	06/285,289	3/06/84
4,434,889	06/346,441	3/06/84
4,434,891	06/476,475	3/06/84
4,434,894	06/439,311	3/06/84
4,434,900	06/460,887	3/06/84
4,434,906	06/436,961	3/06/84
4,434,910	06/451,933	3/06/84
4,434,912	06/292,716	3/06/84
4,434,921	06/330,709	3/06/84
4,434,926	06/302,394	3/06/84
4,434,929	06/325,184	3/06/84
4,434,934	06/387,372	3/06/84
4,434,939	06/450,389	3/06/84
4,434,940	06/230,673	3/06/84
4,434,944	06/316,045	3/06/84
4,434,955	06/386,144	3/06/84
4,434,956	06/312,497	3/06/84
4,434,960	06/361,771	3/06/84
4,434,961	06/488,030	3/06/84
4,434,968	06/306,250	3/06/84
4,434,975	06/428,938	3/06/84
4,434,978	06/504,083	3/06/84
4,434,981	06/320,837	3/06/84
4,434,982	06/416,913	3/06/84
4,434,983	06/430,311	3/06/84
4,434,984	06/348,983	3/06/84
4,434,989	06/340,514	3/06/84
4,434,991	06/410,306	3/06/84
4,434,993	06/343,170	3/06/84
4,434,994	06/372,619	3/06/84
4,435,008	06/383,000	3/06/84
4,435,010	06/338,520	3/06/84
4,435,014	06/274,081	3/06/84
4,435,018	06/292,532	3/06/84
4,435,022	06/342,082	3/06/84
4,435,024	06/392,539	3/06/84
4,435,025	06/325,164	3/06/84
4,435,028	06/241,575	3/06/84
4,435,033	06/421,389	3/06/84
4,435,036	06/267,966	3/06/84
4,435,045	06/372,877	3/06/84
4,435,046	06/251,452	3/06/84
4,435,054	06/361,972	3/06/84
4,435,056	06/326,515	3/06/84
4,435,057	06/395,079	3/06/84
4,435,060	06/346,768	3/06/84
4,435,065	06/356,646	3/06/84
4,435,071	06/246,811	3/06/84
4,435,082	06/380,530	3/06/84
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4,435,104	06/409,190	3/06/84
4,435,106	06/349,558	3/06/84
4,435,115	06/294,271	3/06/84
4,435,125	06/265,617	3/06/84
4,435,127	06/292,125	3/06/84
4,435,128	06/387,399	3/06/84
4,435,129	06/304,634	3/06/84
4,435,144	06/271,800	3/06/84
4,435,146	06/460,827	3/06/84
4,435,148	06/360,413	3/06/84
4,435,151	06/266,138	3/06/84
4,435,153	06/284,782	3/06/84
4,435,154	06/399,293	3/06/84
4,435,156	06/365,053	3/06/84
4,435,157	06/339,506	3/06/84
4,435,163	06/350,207	3/06/84
4,435,166	06/381,747	3/06/84
4,435,168	06/384,899	3/06/84
4,435,173	06/355,102	3/06/84
4,435,179	06/319,769	3/06/84
4,435,192	06/444,140	3/06/84
4,435,194	06/372,327	3/06/84
4,435,195	06/400,900	3/06/84
4,435,197	06/367,046	3/06/84
4,435,199	06/371,630	3/06/84
4,435,209	06/363,812	3/06/84
4,435,219	06/384,368	3/06/84
4,435,229	06/308,127	3/06/84
4,435,231	06/364,050	3/06/84
4,435,232	06/448,874	3/06/84
4,435,235	06/321,231	3/06/84
4,435,246	06/432,646	3/06/84
4,435,252	06/422,799	3/06/84
4,435,258	06/426,054	3/06/84
4,435,262	06/453,225	3/06/84
4,435,267	06/433,753	3/06/84
4,435,268	06/411,765	3/06/84
4,435,270	06/515,717	3/06/84
4,435,271	06/451,597	3/06/84
4,435,277	06/368,531	3/06/84
4,435,284	06/405,478	3/06/84
4,435,291	06/360,860	3/06/84
4,435,294	06/429,945	3/06/84
4,435,295	06/379,210	3/06/84
4,435,302	06/383,060	3/06/84
4,435,305	06/460,669	3/06/84
4,435,310	06/321,854	3/06/84
4,435,313	06/293,381	3/06/84
4,435,315	06/366,374	3/06/84
4,435,319	06/514,341	3/06/84
4,435,322	06/301,191	3/06/84
4,435,323	06/353,871	3/06/84
4,435,330	06/457,609	3/06/84
4,435,333	06/401,357	3/06/84
4,435,337	06/298,447	3/06/84
4,435,348	06/419,862	3/06/84
4,435,351	06/418,917	3/06/84
4,435,355	06/405,310	3/06/84
4,435,357	06/227,441	3/06/84
4,435,358	06/259,638	3/06/84
4,435,359	06/390,277	3/06/84
4,435,362	06/441,062	3/06/84
4,435,363	06/280,113	3/06/84
4,435,366	06/262,828	3/06/84
4,435,372	06/458,403	3/06/84
4,435,374	06/281,846	3/06/84
4,435,383	06/284,700	3/06/84
4,435,395	06/471,958	3/06/84
4,435,400	06/399,615	3/06/84
4,435,406	06/290,032	3/06/84
4,435,407	06/337,897	3/06/84
4,435,409	06/329,160	3/06/84
4,435,412	06/458,511	3/06/84
4,435,413	06/461,845	3/06/84
4,435,418	06/449,350	3/06/84
4,435,438	06/388,864	3/06/84
4,435,439	06/395,999	3/06/84
4,435,453	06/399,824	3/06/84
4,435,466	06/421,400	3/06/84
4,435,490	06/454,572	3/06/84
4,435,493	06/329,407	3/06/84
4,435,497	06/385,601	3/06/84
4,435,507	06/355,588	3/06/84
4,435,509	06/294,563	3/06/84
4,435,512	06/324,571	3/06/84
4,435,517	06/414,194	3/06/84
4,435,522	06/400,422	3/06/84
4,435,545	06/317,532	3/06/84
4,435,547	06/465,226	3/06/84
4,435,550	06/356,475	3/06/84
4,435,563	06/377,251	3/06/84
4,435,567	06/334,470	3/06/84
4,435,570	06/423,249	3/06/84
4,435,572	06/243,775	3/06/84
4,435,574	06/398,910	3/06/84

Patent Number	Serial Number	Issue Date
4,435,577	06/242,538	3/06/84
4,435,579	06/397,253	3/06/84
4,435,580	06/374,284	3/06/84
4,435,581	06/374,385	3/06/84
4,435,591	06/390,979	3/06/84
4,435,601	06/281,248	3/06/84
4,435,616	06/296,238	3/06/84
4,435,618	06/341,080	3/06/84
4,435,625	06/353,966	3/06/84
4,435,631	06/331,242	3/06/84
4,435,642	06/361,216	3/06/84
4,435,650	06/331,060	3/06/84
4,435,654	06/259,470	3/06/84
4,435,661	06/376,791	3/06/84
4,435,662	06/313,122	3/06/84
4,435,671	06/371,827	3/06/84
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4,435,709	06/266,983	3/06/84
4,435,710	06/253,322	3/06/84
4,435,712	06/292,573	3/06/84
4,435,727	06/382,803	3/06/84
4,435,742	06/344,891	3/06/84
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4,435,748	06/375,717	3/06/84
4,435,751	06/279,814	3/06/84
4,435,759	06/273,530	3/06/84
4,435,773	06/236,823	3/06/84
4,435,776	06/228,904	3/06/84
4,435,781	06/501,060	3/06/84
4,435,783	06/251,664	3/06/84
4,435,789	06/290,515	3/06/84
4,435,795	06/251,880	3/06/84
4,435,796	06/396,440	3/06/84
4,435,798	06/361,140	3/06/84
4,435,800	06/377,150	3/06/84
4,435,802	06/298,772	3/06/84
4,435,808	06/227,156	3/06/84
4,435,809	06/302,028	3/06/84
4,435,810	06/300,763	3/06/84
4,435,814	06/460,302	3/06/84
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4,729,136	06/902,778	3/08/88
4,729,137	06/898,484	3/08/88
4,729,140	07/036,441	3/08/88
4,729,141	07/002,288	3/08/88
4,729,143	06/909,563	3/08/88
4,729,146	06/896,598	3/08/88
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4,729,151	06/905,422	3/08/88
4,729,158	06/859,394	3/08/88
4,729,159	06/906,922	3/08/88
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4,729,562	06/921,535	3/08/88
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4,729,961	06/807,773	3/08/88
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4,730,178	07/091,562	3/08/88
4,730,181	07/010,773	3/08/88
4,730,183	06/680,402	3/08/88
4,730,184	06/801,192	3/08/88
4,730,190	06/924,390	3/08/88
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4,730,278	06/914,957	3/08/88
4,730,284	07/066,631	3/08/88
4,730,285	06/876,892	3/08/88
4,730,295	06/839,247	3/08/88
4,730,302	06/920,190	3/08/88
4,730,319	06/744,013	3/08/88
4,730,325	06/840,620	3/08/88
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4,730,348	06/909,281	3/08/88
4,730,349	07/006,298	3/08/88
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Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,400,220, Re. S.N. 07/822,051, Filed Jan. 7, 1992, Cl. 134/18, SUPPRESSION OF RESPIRABLE DUST WITH FOAM, Howard W. Cole, Jr., Owner of Record: *Deter Co., Inc., Burgin, Ky.*, Attorney or Agent: James C. Eaves, Jr., Ex. Gp.: 1109

4,723,671, Re. S.N. 07/861,555, Filed Apr. 1, 1992, Cl. 180/068.1, ENGINE COOLING SYSTEM FOR MOTORCYCLE, Mitsuo Kitada, Owner of Record: *Inventor*, Attorney or Agent: Ernest A. Beutler, Ex. Gp.: 3106

4,890,542, Re. S.N. 07/859,268, Filed Mar. 25, 1992, Cl. 92, HIGH-PRESSURE-FLUID MACHINE, A SEAL, Bernard E. Miller, et. al., Owner of Record: *Dresser-Rand Co., New York, N.Y.*, Attorney or Agent: Bernard J. Murphy, Ex. Gp.: 3401

4,901,480, Re. S.N. 07/839,315, Filed Feb. 20, 1992, Cl. 51/209R, LENS GENERATING TOOL, AND METHOD FOR GENERATING A LENS, Lawrence A. Dillon, Owner of Record: *CDP Diamond Products, Inc., Livonia, Mich.*, Attorney or Agent: Charles W. Chandler, Ex. Gp.: 3203

4,903,132, Re. S.N. 07/838,649, Filed Feb. 20, 1992, Cl. 358/209, ELECTRONIC STILL CAMERA WITH SLOW-IN, FAST OUT MEMORY ADDRESSING, Masao Yamawaki, Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Michael J. Strauss, Ex. Gp.: 2606

4,907,842, Re. S.N. 07/852,376, Filed Mar. 13, 1992, Cl. 303/13, VEHICLE AIR BRAKE SYSTEM AND VALVES FOR IT, Nathan L. Goldfein, Owner of Record: *Rollins Investment Fund, Atlanta, Ga.*, Attorney or Agent: Marvin B. Eickenroht, Ex. Gp.: 3103

4,916,869, Re. S.N. 07/845,603, Filed Mar. 4, 1992, Cl. 51/293, BONDED ABRASIVE GRIT STRUCTURE, Hoyd R. Oliver, Owner of Record: *L. R. Oliver & Co., Inc., Anchorville, Mich.*, Attorney or Agent: Richard L. Carlson, Ex. Gp.: 3203

4,924,387, Re. S.N. 07/830,211, Filed Jan. 30, 1992, Cl. 364/409, COMPUTERIZED COURT REPORTING SYSTEM, John C. Jeppesen, Owner of Record: *Stenusync, Inc., Ventura, Calif.*, Attorney or Agent: Donald A. Streck, Ex. Gp.: 2306

4,978,203, Re. S.N. 07/858,602, Filed Mar. 27, 1992, Cl. 359/74, LIQUID CRYSTAL DEVICE WITH AN APPARENT HYSTERESIS, Shunpei Yamazaki, et. al., Owner of Record: *The Semiconductor Laboratory, Co., Ltd., Atsugi-shi, Japan*, Attorney or Agent: Donald R. Studebaker, Ex. Gp.: 2504

4,998,268, Re. S.N. 07/861,182, Filed Mar. 31, 1992, Cl. 378/63, APPARATUS AND METHOD FOR THERAPEUTICALLY IRRADIATING A CHOSEN AREA USING A DIAGNOSTIC COMPUTER TOMOGRAPHY SCANNER, James Winter, Owner of Record: *Inventor*, Attorney or Agent: Marvin H. Klienberg, Ex. Gp.: 2506

5,046,124, Re. S.N. 07/860,960, Filed Mar. 30, 1992, Cl. 455/20, FREQUENCY MODULATED RADIO FREQUENCY BROADCAST NETWORK EMPLOYING A SYNCHRONOUS FREQUENCY MODULATED BOOSTER SYSTEM, Joseph C. Wu, et. al., Owner of Record: *TFT, Inc., Santa Clara, Calif.*, Attorney or Agent: Jack M. Wiseman, Ex. Gp.: 2607

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,245,420, Reexam. No. 90/002,689, Requested Apr. 3, 1992, Cl. 43/42.060, AQUATIC BAIT FOR AQUATIC SPECIES, William E. S. Carr, Owner of Record: *University of Florida, Gainesville, Fla.*, Attorney or Agent: Dennis P. Clarke, Kerham, Stowell, Kondracki & Clarke, Falls Church, Va., Ex. Gp.: 1504, Requester: Owner

4,396,391, Reexam. No. 90/002,687, Requested Apr. 2, 1992. Cl. 008/181, TREATING CELLULOSE TEXTILE FABRICS WITH DIMETHYLOL DIHYDROYETHYLENEUREE POLYOL, Bernard F. North, Owner of Record: *Sequa Chemicals, Inc., Hackensack, N.J.*, Attorney or Agent: Mitchell D. Bittman, Hackensack, N.J., Ex. Gp.: 1105, Requester: Owner

4,445,114, Reexam. No. 90/002,693, Requested Apr. 6, 1992, Cl. 340/724.000, APPARATUS FOR SCROLLING A VIDEO DISPLAY, David R. Stubben, Owner of Record: *Atari Games Corp., Milpitas, Calif.*, Attorney or Agent: Knobbe, Martens, Olson & Bear, Newport Beach, Calif., Ex. Gp.: 2609, Requester: Nintendo of America, Redmond, Va.

4,463,018, Reexam. No. 90/002,688, Requested Apr. 3, 1992, Cl. 426/1.000, AQUATIC BAIT FOR AQUATIC SPECIES, William E. S. Carr, Owner of Record: *University of Florida, Gainesville, Fla.*, Attorney or Agent: Dennis P. Clarke, Kerham, Stowell, Kondracki & Clarke, Falls Church, Va., Ex. Gp.: 1302, Requester: Owner

4,701,743, Reexam. No. 90/002,696, Requested Apr. 10, 1992, Cl. 340/084, SIGNAL APPARATUS, Barry Pearlman, et. al., Owner of Record: *Public Safety Equipment, Inc, St. Louis, Mo.*, Attorney or Agent: Frank R. Agovino, Senniger, Powers, Leavitt & Roedel, St. Louis, Mo., Ex. Gp.: 2608, Requester: Federal Signal Corp., Oak Brook, Ill.

4,817,909, Reexam. No. 90/002,686, Requested Mar. 30, 1992, Cl. 248/610, ELASTOMETRIC HANGER STRUCTURE, Donald L. Deane, Owner of Record: *Gen Corp., Inc., Fairlawn, Ohio*, Attorney or Agent: Frank C. Rote, Jr., Fairlawn, Ohio, Ex. Gp.: 3505, Requester: Owner

4,887,770, Reexam. No. 90/002,690, Requested Apr. 3, 1992, Cl. 239/703, ELECTROSTATIC ROTARY ATOMIZING LIQUID SPRAY COATING APPARATUS, Robert L. Wacker, et. al., Owner of Record: *Nordson Corp., Westlake, Ohio*, Attorney or Agent: Donald F. Frei, Wood, Herron & Evans, Cincinnati, Ohio, Ex. Gp.: 3104, Requester: Owner

4,930,333, Reexam. No. 90/002,695, Requested Apr. 9, 1992, Cl. 072/447, VEHICLE ALIGNMENT APPARATUS, Lynwood E. Marbury, Owner of Record: *Inventor, Dunwoody, Ga.*, Attorney or Agent: Steven D. Kerr, Atlanta, Ga., Ex. Gp.: 3201, Requester: Dataliner AB, c/o Michael E. Dergosits, San Fransicso, Calif.

5,030,131, Reexam. No. 90/002,692, Requested Apr. 6, 1992, Cl. 439/387, ELECTRICAL TERMINAL CONNECTOR, William J. Boehm, Owner of Record: *Connector Manufacturing Co., Hamilton, Ohio*, Attorney or Agent: Biebel & French, Dayton, Ohio, Ex. Gp.: 3202, Requester: Owner

5,056,686, Reexam. No. 90/002,694, Requested Apr. 3, 1992, Cl. 222/129.2, BEVERAGE DISPENSING SYSTEM, C. C. Jarrett, Owner of Record: *Nutri-Fruit, Inc., Bellevue, Wash.*, Attorney or Agent: Lee E. Johnson & David S. Goldenberg, Christensen, O'Connor, Johnson & Kindness, Seattle, Wash., Ex. Gp.: 3108, Requester: Owner

5,064,802, Reexam. No. 90/002,691, Requested Apr. 3, 1992, Cl. 502/155, METAL COMPLEX COMPOUNDS, James C. Stevens, et. al., Owner of Record: *The Dow Chemical Co., Midland, Mich.*, Attorney or Agent: Richard D. Waterman, Midland, Mich., Ex. Gp.: 1106, Requester: Owner

Appropriate Parties to Sign Request for Extension of Time to File Statement of Use

* * * *

Filing of Petition Does Not Stay Period for Filing Further Extension Request or Statement of Use

One of the most common reasons for the ITU/Divisional Unit to reject a request for an extension of time to file a Statement of Use, filed in connection with an application based upon a bona fide intention to use the mark in commerce under Section 1(b) of the Trademark Act, is because the request was signed by the attorney of record or other inappropriate party.

Under Trademark Rule 2.89, 37 CFR 2.89, only the "applicant" may sign the extension request. Thus, the only persons who may sign extension requests, in cases where the applicant is a corporation, are corporate officers; in cases where the applicant is a partnership, are general partners; and in cases where the applicant is a sole proprietorship or individual filer, is the sole proprietor or individual applicant. An attorney will not be the proper party to sign an extension request unless he or she is also an officer, a general partner, a sole proprietor, or an individual, as discussed above.

An extension request which is not signed by the appropriate party will be rejected. If no time remains in the six-month statutory period to file an acceptable extension request, the application will be declared abandoned, unless a timely-filed petition to the Commissioner is granted. Under Trademark Rule

2.89(g), 37 CFR 2.89(g), a petition to the Commissioner, to review the action of the ITU/Divisional Unit rejecting an extention request, must be filed within one month of the date of the mailing of the action rejecting the request.

Further, Trademark Rule 2.89(g), 37 CFR 2.89(g), states that "[f]ailure to notify the applicant of the grant or denial of the request prior to the expiration of the existing period or requested extension does not relieve the applicant of the responsibility of timely filing a statement of use..." This is also true in the case where the applicant has petitioned the Commissioner, under Trademark Rule 2.66, to revive an abandoned application or, under Trademark Rule 2.146, to review the action of the ITU/Divisional Unit rejecting an extension request or Statement of Use. The petition does not stay the time for filing subsequent extension requests or a Statement of Use. *In re Hoffmann–LaRoche, Inc.* ____ USPQ 2d ____ (Comm'r Pats. 1992)

Therefore, it is important to note that, once a petition has been filed, the applicant must continue to file acceptable extension requests, or a Statement of Use, if appropriate, before the expiration of each successive extension period. If the petition is denied, the fees for these documents, paid during the pendency of the petition, will be refunded.

April 13, 1992 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Registration to Practice

The following list contains the names of persons who successfully passed the registration examination that was held August 21, 1991, Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before June 24, 1992.

Bernstein, Denise C., 609 North Carolina Ave., S.E., Washington, D.C. 20003
Kulas, Charles J., 775 Post St., #108, San Francisco, Calif. 94109
McPhail, Donald R., 6280 Rathlin Dr., Springfield, Va. 22152
Plotkin, Judith A., 5947 Kara Place, Burke, Va. 22015
Storm, Paul V., 402 Lucile Cir., DeSoto, Tex. 75115
Tennent, Andrew P., 527 Hawthorne Ln., #6, Charlotte, N.C. 28204

April 15, 1992 CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

CD-ROM Patent Images by Technology

The U.S. Patent and Trademark Office announces the implementation of a demonstration project to provide classified sets of patent images in CD-ROM format. The classified sets are collections of U.S. patents which, by virtue of their placement in the U.S. Patent Classification System, represent meaningful technological groupings.

The two classified sets selected for this project are: Genetic Engineering, as defined by Class 935 and Class 435, subclass 172.3; and Acid Rain, as defined by Class 55, subclass 73 and Class 423, subclasses 220-234 and 242-244.

The sets will contain:

1) current classification information
2) full images for all patents in the set, and
3) full text for those patents in the set where the text is available in electronic format, i.e., since 1971

All available text and classification information will be indexed and searchable, thus allowing all patents in the set to be retrieved by their associated classification information, and/or by words in the text. Images of all patents in the set will be stored in numeric sequence on the discs and may be located on a disc other than the disc where the text and indexes are stored. Images may be retrieved by patent number after loading the appropriate image disc.

It is anticipated that the demonstration CD-ROM sets will be available July 1992. Each set will consist of approximately three discs. They are available for order now by the public for $150 per set. This price represents the marginal cost to the U.S. Patent and Trademark Office to produce and distribute these discs based upon the volume of orders anticipated.

Purchasers will be invited to participate in a voluntary survey to be conducted in October 1992 to assess the usefulness of this demonstration product.

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Washington, D.C. 20231
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Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before June 25, 1992.

Bergmann, Saul M., 12218 Greenleaf Ave., Potomac, Md. 20854
Marquis, Steven P., 12530 Post Creek Pl., Germantown, Md. 20874
Merecki, John A., 124 W. Main St., Cambridge, N.Y. 12816
Peet, Richard C., 5974 Powells Landing Rd., Burke, Va. 22015

April 15, 1992 CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

Patents Available for License or Sale

4,227,537 "ENDOMETROAL BRUSH WITH SLIDABLE PROTECTIVE SLEEVE" Thomas N. Suciu and Herbert J. Schmidt, Tuscon Medical Instruments, Inc., 5741 N. Camino Del Sol, Tuscon, Ariz. 85718, (602) 529-0567

4,839,779 "MULTIPLE COLOR LIGHT WITH STRUCTURE TO PREVENT COLOR BLEEDING" George Kasoboske, c/o Victor Kral, Dual Tech Corp., 9307 South 86th Court, Hickory Hills, Mich. 60457, Tel. #(708) 598-1842 Fax #(312) 772-8534

4,913,472 "SEALED JOINT FOR A ROCKET EMPLOYING FUSED INORGANIC VITREOUS MATERIAL" B. V. Janakirama-Rao, 2267 SW 43rd Place. Gainesville, Fla. 32608, (904) 371-3592

5,035,347 "DEVICE FOR SQUEEZING TUBES CONTAINING A PASTE" Federico Trovo, P.O. Box 905, 35122 Padova, Italy

5,102,534 "AUTOMATIC FILTER CLEANING DEVICE BY ULTRASONIC GENERATOR MODULATED THRU DEVICE SIDE WALL (AS AMENDED)" A. Gabet, c/o Neil F. Greenblum, Sandler, Greenblum & Bernstein, 2920 South Glebe Rd., Arlington, Va. 22206, (703) 739-0333

PATENT NOTICES

Certificates of Correction For Week of May 12, 1992

B1. Re. 32,702	4,922,241	4,956,843	4,975,414
B1. 4,449,182	4,922,910	4,957,061	4,975,619
D. 313,055	4,922,920	4,957,118	4,975,878
P. 7,387	4,923,264	4,957,289	4,976,080
Re. 33,324	4,924,675	4,957,445	4,976,253
Re. 33,463	4,926,780	4,957,556	4,976,378
Re. 33,495	4,926,862	4,957,968	4,976,978
4,107,381	4,927,523	4,958,117	4,977,330
4,382,892	4,928,563	4,958,803	4,977,367
4,400,220	4,928,941	4,959,010	4,977,419
4,490,981	4,929,184	4,959,208	4,977,488
4,578,079	4,929,259	4,959,714	4,977,521
4,729,769	4,929,590	4,960,685	4,977,626
4,733,003	4,930,677	4,960,702	4,977,827
4,734,657	4,931,423	4,960,828	4,977,899
4,743,514	4,932,033	4,961,239	4,978,013
4,756,370	4,932,095	4,961,314	4,978,051
4,776,350	4,932,805	4,961,837	4,978,053
4,780,232	4,933,221	4,962,053	4,978,101
4,786,512	4,933,869	4,962,169	4,978,397
4,794,235	4,934,736	4,962,203	4,978,648
4,795,670	4,935,439	4,962,357	4,978,672
4,805,009	4,935,683	4,962,776	4,978,906
4,811,670	4,936,952	4,962,968	4,978,953
4,814,819	4,937,947	4,963,134	4,979,992
4,816,516	4,938,219	4,963,484	4,979,543
4,817,693	4,939,263	4,963,590	4,979,831
4,829,187	4,939,739	4,963,608	4,979,874
4,830,443	4,940,111	4,963,884	4,980,089
4,842,944	4,940,497	4,964,114	4,980,526
4,846,982	4,941,910	4,964,280	4,980,940
4,848,082	4,942,040	4,964,563	4,980,979
4,850,310	4,942,118	4,964,618	4,981,670
4,856,248	4,942,892	4,964,879	4,981,756
4,857,135	4,942,911	4,964,944	4,981,985
4,858,199	4,943,778	4,964,949	4,982,047
4,863,186	4,944,007	4,964,951	4,982,300
4,863,619	4,944,067	4,965,120	4,982,422
4,866,116	4,945,293	4,965,570	4,982,582
4,874,812	4,946,491	4,965,790	4,982,731
4,881,423	4,946,926	4,966,003	4,982,772
4,881,824	4,947,057	4,966,035	4,982,872
4,882,780	4,947,448	4,966,092	4,982,877
4,884,122	4,947,583	4,966,364	4,982,880
4,885,548	4,948,419	4,966,629	4,983,162
4,885,649	4,948,508	4,967,177	4,983,276
4,886,728	4,949,018	4,967,287	4,983,330
4,888,356	4,949,236	4,967,386	4,983,449
4,891,662	4,950,319	4,967,956	4,983,555
4,894,823	4,950,348	4,968,160	4,983,792
4,894,873	4,950,361	4,968,406	4,984,133
4,895,190	4,950,531	4,968,568	4,984,405
4,897,458	4,951,940	4,968,654	4,984,525
4,897,898	4,952,120	4,968,776	4,984,910
4,898,939	4,952,452	4,969,480	4,984,263
4,899,228	4,952,502	4,970,008	4,985,501
4,899,340	4,952,574	4,970,139	4,985,503
4,900,824	4,952,849	4,970,872	4,985,669
4,902,603	4,952,943	4,971,174	4,985,827
4,905,074	4,952,967	4,971,284	4,986,228
4,905,619	4,953,614	4,971,768	4,998,717
4,907,200	4,953,787	4,971,990	5,000,138
4,909,510	4,953,915	4,972,135	5,001,414
4,912,494	4,953,964	4,972,433	5,007,982
4,912,624	4,954,520	4,972,505	5,015,742
4,912,702	4,955,044	4,972,697	5,030,530
4,914,034	4,955,363	4,972,871	5,041,328
4,914,736	4,955,747	4,972,883	5,042,793
4,917,017	4,955,772	4,973,208	5,044,266
4,917,319	4,955,835	4,973,379	5,047,222
4,917,366	4,955,982	4,974,247	5,055,031
4,918,049	4,956,148	4,974,420	5,077,078
4,918,052	4,956,179	4,974,644	5,077,719
4,918,338	4,956,358	4,974,859	5,081,070
4,921,858	4,956,411	4,975,337	

Disclaimers

3,837,988.—*Donald E. Hennen*, Cottage Grove, *Leroy I. Kusilek*, River Falls, Wis. COMPOSITE MAT. Patent dated Sept. 24, 1974. disclaimer filed Sept. 13, 1991, by the assignee, Minnesota Mining anf Manufacturing Company.

Hereby enters this disclaimer to claims 6 and 7 of said patent.

4,879,648.—*Nancy P. Cochran*, Nyack, N.Y., *Susan Byrnes*, East Hartford, Conn. SEARCH SYSTEM WHICH CONTINUOUSLY DISPLAYS SEARCH TERMS DURING SCROLLING AND SELECTIONS OF INDIVIDUALLY DISPLAYED DATA SETS. Patent dated Nov. 7, 1989. Disclaimer filed Mar. 17, 1992, by the assignee, Nancy P. Cochran.

Hereby enters this disclaimer to claims 1, 8, 9, and 31-38 of said patent.

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Box TRADEMARK	New trademark application and associated papers and APPLICATION fees.
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Box Reexam	Requests for Reexamination for *original* request papers *only*.
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Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
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Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
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	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8847
Connecticut	New Haven: Science Park Library	(203) 786-5447
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	Big Rapids: Abigail S. Timme Library, Ferris State University	Not Yet Operational
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Misssissippi	Jackson: Mississippi Library Commission	Not Yet Operational
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	St. Louis Public Library	(314) 241-2288 Ext. 390
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New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
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South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
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	Nashville: Stevenson Science Library,Vanderbilt University	(615) 322-2775
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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-4510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

VACANT, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110 — D. E. TALBERT, Director	308-0661	1/11/91
ORGANIC CHEMISTRY, GROUP 120 — JOHN F. TERAPANE, JR., Director	308-1235	6/02/91
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130 — DONALD CZAJA, Acting Director	308-0651	3/13/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150 — J. O. THOMAS, Director	308-2351	10/24/90
BIOTECHNOLOGY, GROUP 180 — BARRY S. RICHMAN, Acting Director	308-0196	10/15/90
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210 — D. G. KELLY, Director	308-1782	9/13/90
SPECIAL LAWS ADMINISTRATION, GROUP 220 — ROBERT E. GARRETT, Director	308-0511	9/13/90
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230 — GERALD GOLDBERG, Director	308-0754	12/23/89
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 240 — CARLTON CROYLE, Director	308-0771	3/05/91
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250 — JOSEPH J. ROLLA, Director	308-0956	4/01/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 — BOBBY R. GRAY, Director	308-0962	9/14/90
DESIGN, GROUP 290 — ROBERT E. GARRETT, Director	308-0511	10/09/89
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 310 — F. R. SCHMIDT, Director	308-1113	4/24/91
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320 — N. GODICI, Director	308-1148	4/23/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330 — J. J. LOVE, Director	308-0858	1/09/91
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340 — JOHN KITTLE, Director	308-0861	4/13/91
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 350 — A.L. SMITH, Director	308-0651	1/20/91

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during April 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,873,996 to 3,881,195 inclusive
Plant Patents ..... P. 3,697 to 3,712

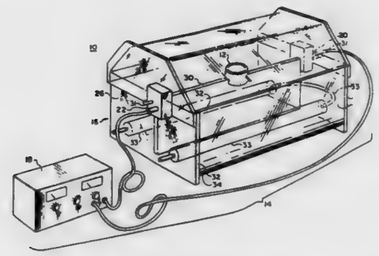
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Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,159,933 (1694th)
SAMPLE CONCENTRATOR

William B. Allington, deceased, late of Lincoln, Nebr. by Richard T. Emery, executor ; James W. Nelson, Lincoln, Nebr.; Arthur L. Cordry, Lincoln, Nebr.; Gail A. McCullough, Lincoln, Nebr., and Don E. Mitchell, Lincoln, Nebr., assignors to Instrumentation Specialties Co., Lincoln, Nebr.

Reexamination Request No. 90/001,863, Oct. 13, 1989.
Reexamination Certificate for Patent No. 4,159,933, issued Jul. 3, 1979, Ser. No. 781,176, Mar. 25, 1977.
Int. Cl.[5] G01N *27/40, 27/26, 27/28*
U.S. Cl. 204—182.3



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **4**, **5** and **8** are determined to be patentable as amended.

Claims **2–3**, **6–7** and **9**, dependent on an amended claim, are determined to be patentable.

New claims **10–16** are added and determined to be patentable.

1. A method of *separating, concentrating and* removing at least one molecular species from a sample *as a concentrate*, comprising the steps of:

placing buffer liquid in first and second buffer compartments of an electrode housing wherein the first and second buffer compartments are separated by a separating wall with at least one of the two buffer compartments being open at the top, whereby a sample concentrating cell may be lowered onto the separating wall;

lowering the sample concentrating cell onto and mounting it to the separating wall wherein buffer solution in said first buffer compartment wets a first location of said sample concentrating cell and buffer solution in said second buffer compartment wets a second location of said sample concentrating cell;

moving [the] said sample to [a] *said* first location *wherein the sample is spaced from said second location in said sample concentrating cell;*

transporting said one molecular species to [a] said second location spaced from the first location on a first side of a membrane having pores sufficiently small to hold said *one* molecular species *through a passageway that communicates between the first and second locations;*

said step of transporting said one molecular species including the steps of establishing an electrical field between said first location and a third location spaced a greater distance from said first side of said membrane than said first location and establishing a path for ion flow between the third location and the second side of said membrane, whereby the one molecular species is moved by electrophoresis from the ssample to a position against the first side of the membrane;

removing at least a portion of the [first] *one* molecular species from the first side of the membrane *in concentrated form from said second location as a concentrate;*

[the step of transporting said one molecular species to a second location including the step of transporting said one molecular species to a second location spaced from the first location on a first side of a first membrane;]

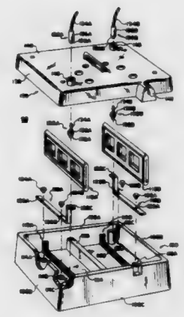
said step of moving the sample to a first location including the step of placing said sample on a first side of a second membrane; and

the step of establishing an electrical field between the first location and a third location including the step of establishing an electrical potential between the second side of the second membrane and the second side of the first membrane.

B1 4,164,464 (1695th)
SAMPLE CONCENTRATOR

William B. Allington, deceased, late of Lincoln, Nebr. by Richard T. Emery, executor ; James W. Nelson, Spring, Tex.; Arthur L. Cordry, Lincoln, Nebr.; Gail A. McCullough, Lawndale, Calif., and Don E. Mitchell, Lincoln, Nebr., assignors to Instrumentation Specialties Co., Lincoln, Nebr.

Reexamination Request No. 90/001,864, Oct. 13, 1989.
Reexamination Certificate for Patent No. 4,164,464, issued Aug. 14, 1979, Ser. No. 896,370, Apr. 14, 1978.
Division of Ser. No. 781,176, Mar. 25, 1977
Int. Cl.[5] G01N *27/26, 27/28*
U.S. Cl. 204—299 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **5** is cancelled.

Claims **1**, **4**, **6**, **12**, **16**, **20**, **28** and **29** are determined to be patentable as amended.

Claims **2**, **3**, **7–11**, **13–15**, **17–19** and **21–27**, dependent on an amended claim, are determined to be patentable.

New claims **30–32** are added and determined to be patentable.

1. Apparatus for separating *and concentrating* at least one

molecular species from a sample *to form a concentrate*, comprising:

a sample concentrating cell;

said sample concentrating cell having first and second sections;

said first section including a member adapted to receive a sample *between a first location and a second location in said first section, whereby said sample has a first side adjacent to said first location and a second side adjacent to said second location;*

said member and second section communicating with each other through a passageway wherein said member and second section are adapted to contain buffer solution before said second section receives said one molecular species;

said second section including a membrane having pores sufficiently small to permit the membrane to hold said one molecular species and being adapted to receive at least one of the separated molecular species;

said membrane having a first side and a second side;

wall means for at least partly confining said first and second sections and adapted to support a buffer solution;

means for establishing an electrical potential between the [side of the sample] *first location* and the *second* side of said membrane, [farthest from each other] *whereby an electrical circuit is formed between the first location and second side of the membrane with the first side of the sample, the second side of the sample, the second location and the first side of the membrane being electrically in circuit between the first location and second side of the membrane;*

an electrophoretic cell;

said electrophoretic cell including walls defining first and second buffer compartments;

one of said walls defining said first and second buffer compartments comprising an electrically insulating separating wall between said first and second buffer compartments;

said first and second buffer compartments including means for receiving different electrodes, whereby a potential difference may be established between said first and second buffer compartments wherein said one molecular species is concentrated against the first side of said membrane for withdrawal therefrom;

said sample concentrating cell including means for mounting said sample concentrating cell to said separating wall from above the separating wall with said membrane in electrical contact with said first buffer compartment and the first section in electrical contact with said second buffer compartment; and

said means for mounting said sample concentrating cell to said separating wall including wall portions for receiving an upper portion of said separating wall so that the sample concentrating cell rests upon the separating wall whereby said concentrating cell may be removably mounted to said electrophoretic cell from above.

B1 4,222,379 (1696th)

MULTIPLE BLOOD BAG HAVING PLASTICIZER-FREE PORTIONS HIGH BLOOD COMPONENT SURVIVAL RATE

Dale A. Smith, Barrington, Ill., assignor to Baxter Travenol Laboratores, Inc., Deerfield, Ill.

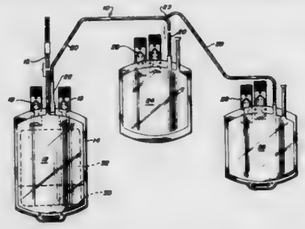
Reexamination Request No. 90/001,356, Oct. 16, 1987.
Reexamination Certificate for Patent No. 4,222,379, issued Sep. 16, 1980, Ser. No. 955,059, Oct. 26, 1978.
Int. Cl.[5] A61M *5/00;* **A61J** *1/10*
U.S. Cl. 604—410

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **25–28** is confirmed.

Claims **1–24** and **29–37** are cancelled.

25. In a multiple blood bag system which comprises a donor bag for receiving blood from a donor, at least one transfer bag for receiving a blood component from said donor bag, and conduit means providing sealed, flow communication between said donor bag and transfer bag, the improvement comprising: said transfer bag being made of a translucent, flexible, sterilizable material which is free of blood-extractable plasticizer, said



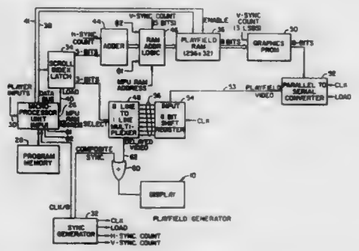
donor bag being made of a translucent, flexible, sterilizable plastic material, said donor bag containing in its interior an insert portion of plastic material which contains at least 5 percent by weight of a blood-extractable plasticizer selected from the group consisting of dioctylphthalates and dioctyladipates.

B1 4,445,114 (1697th)

APPARATUS FOR SCROLLING A VIDEO DISPLAY

David R. Stubben, Milpitas, Calif., assignor to Atari Game Corporation, Milpitas, Calif.

Reexamination Request Nos. 90/002,251, Jan. 9, 1991 and 90/002,266, Feb. 5, 1991 and 90/002,441, Sep. 17, 1991.
Reexamination Certificate for Patent No. 4,445,114, issued Apr. 24, 1984, Ser. No. 193,699, Oct. 3, 1980.
Continuation of Ser. No. 3,447, Jan. 15, 1979, abandoned.
Int. Cl.[5] G09G *1/16*
U.S. Cl. 340—726



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim(s) **1–19** is confirmed.

1. Apparatus for controlling the display of symbols on a raster type display comprising:

timing means for generating timing signals;

means for providing an index command indicative of a desired offset in the positioning of said symbols on said raster-type display;

first memory means for storing graphics data representative of said symbols to be displayed and communicating selected elements of the graphics data to said display in response to received address data;

second memory means for storing addresses corresponding to said symbols, and for communicating to the first memory means a selected sequence of said addresses, said sequence selected in response to an offset address;

address means for deriving the offset address from thetiming signals and an offset determined by a first portion of the index command and for communicating the offset address to the second memory means; and

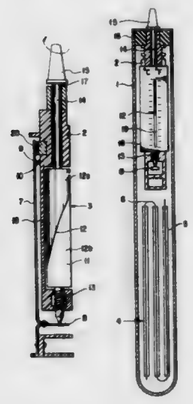
delay means coupled to the address means for receiving a second portion of the index command to selectively delay communication of the graphics data in the first memory means to said display in response to the second portion of the index command.

B1 4,812,626 (1698th)

THERMOSTATICALLY CONTROLLED ELECTRIC IMMERSION HEATER FOR QUARIUMS

Antonio Strada, Via Interna, 44/c, 33170 Pordenone, Italy

Reexamination Request No. 90/001,962, Mar. 19, 1990.
Reexamination Certificate for Patent No. 4,812,626, issued Mar. 14, 1989, Ser. No. 927,168, Nov. 5, 1986.
Claims priority, application Italy, Nov. 8, 1985, 619498/85
Int. Cl.[5] H05B *1/02, 3/78;* **H01H** *37/52*
U.S. Cl. 219—523



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2**, **4**, **5** and **8** are cancelled.

The patentability of claims **1** and **6** are determined to be patentable as amended.

Claims **3**, **7** and **9** dependent on an amended claim, are determined to be patentable.

1. In an immersion heater for an aquarium including, within a vertically disposed waterproof elongated transparent tubular envelope, an electric heating element in the lower portion of said envelope and an adjustable temperature regulating unit in the upper portion of said envelope *supported by an insulating body and controlling operation of the heating element, the temperature regulating unit including both a bimetal strip responsive to the temperature of said envelope and axially movable adjustment means operable from the exterior of said envelope for varying the rest position of said bimetal strip and thus the operating temperature of the device, the improvement wherein said adjustment means includes in combination*

a threaded pin (**13**) [having an end resting against the bimetal strip (**7**) and] rotatable by means extending through the upper end of said envelope to the exterior thereof,

a cylindrical body (**11**) *coaxially rotatable with said threaded pin and provided on its outer surface with a helical line (12) running over the entire length of said outer surface and dividing it into two differently colored portions,*

a screen (**18**) within said envelope adjacent said cylindrical body and visible from the exterior of said envelope, said screen having a vertically disposed longitudinal slot (**19**) through which a short portion of said helical line (**12**) is visible,

at least one graduated scale alongside said slot indicating temperature values which, for each angular position of said [regulating unit (**3**) and, therefore, for each axial position of its end in contact with the bimetal strip (**7**)] *threaded pin, correspond to an operating temperature of the device as indicated on said scale by that portion of the helical line (12) visible through the slot (19),*

said bimetal (7) being elongated and being fastened at one end to the insulating body (2) through a flexible strip (8) arranged perpendicularly to the rotation axis of said threaded pin (13) and contacted by the end of the pin for adjustment of the position of the bimetal strip (7) by rotation of the pin, and

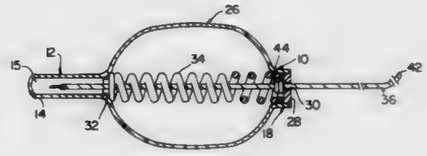
said bimetal strip (7) extending upwards in spaced parallel coextensive relationship to the cylindrical body (11) and having a free upper end equipped with a contact (9) working jointly with another contact (10) applied to the insulating body (2) in orderto establish and interrupt the electric continuity of the supply circuit of the heating element (4), as the degree of deformation of the bimetal strip (7) varies.

B1 4,813,934 (1699th)

VALVED CATHETER DEVICE AND METHOD

Erick T. Engelson, Palo Alto, and John R. Daniels, Pacific Palisades, both of Calif., assignors to Target Therapeutics, San Jose, Calif.

Reexamination Request No. 90/002,397, Aug. 8, 1991.
Reexamination Certificate for Patent No. 4,813,934, issued Mar. 21, 1989, Ser. No. 83,624, Aug. 7, 1987.
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—99



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **13–16** is confirmed.

Claims **1** and **6** are determined to be patentable as amended.

Claims **2**, **3** and **7–12** dependent on an amended claim, are determined to be patentable.

New claims **17–20** are added and determined to be patentable.

1. A catheter device for accessing an internal tissue site along a vessel path from an external body access site, comprising:

a catheter having an inner lumen extending between proximal and distal ends, an inflatable balloon disposed in a distal end region of the catheter, and means communicating the catheter lumen with the balloon, to allow bidirectional fluid flow between the balloon and the catheter lumen, [and means defining an aperture disposed distally to the communicating means between the lumen and the balloon, such that when the aperture is blocked, fluid supplied through the lumen is forced into the balloon,]

a flexible guide wire having proximal and distal ends and

carried in said catheter for axial sliding movement therein, [and]

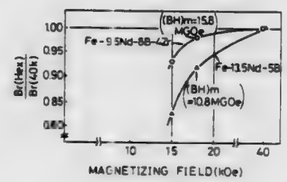
an annular ring mounted within the lumen distally to the communicating means, said ring defining an aperture through which the guide wire is received and which when blocked causes fluid supplied through the lumen to be forced into the balloon, and

valve structure defined by said aperture and [guide wire designed to block the aperture at one or more selected guide wire positions to permit the catheter balloon to be inflated by supplying fluid through the catheter lumen and to allow the balloon to deflate when the guide wire is moved away from said selected positions] *an annular enlargement on the guide wire dimensioned to block the aperture when the enlargement is advanced against the ring.*

B1 4,836,868 (1700th)
PERMANENT MAGNET AND METHOD OF PRODUCING SAME

Kohichi Yajima, Urawa; Osamu Kohmoto, Kamagaya, and Tetsuhito Yoneyama, Narashino, all of Japan, assignors to TDK Corporation

Reexamination Request No. 90/002,141, Sep. 18, 1990.
Reexamination Certificate for Patent No. 4,836,868, issued Jun. 6, 1989, Ser. No. 38,195, Apr. 14, 1987.
Claims priority, application Japan, Apr. 15, 1986, 61-86850; Apr. 23, 1986, 61-94247; May 14, 1986, 61-109970; May 14, 1986, 61-109971; May 14, 1986, 61-109972; May 15, 1986, 61-111087; Feb. 5, 1987, 62-23509; Mar. 17, 1987, 62-052215; Mar. 17, 1987, 62-062198
Int. Cl.[5] H01F *1/053*
U.S. Cl. 148—302



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

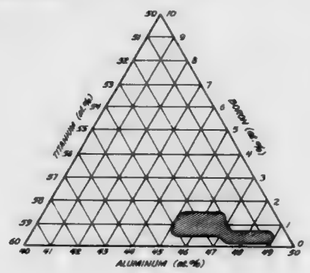
The patentability of claims **1** to **21** is confirmed.

1. A permanent magnet which consists of a composition of $\{R_d(Ce_bLa_{1-b})_{1-a}\}_x(Fe_{1-z}Co_z)_{100-x-y-w}B_yM_w$ (R is at least one rare earth element except for La and Ce but including Y, $5.5 \leqq x < 12$, $2 \leqq y < 15$, $0 \leqq z \leqq 0.7$, $0.1 \leqq w \leqq 10$, $0.80 \leqq a \leqq 1.00$, $0 \leqq b \leqq 1$, M is at least one element selected from the group consisting of Zr, Nb, Mo, Hf, Ta, W, Ti, and V, having a structure including fine crystals formed by a rapid cooling of a melt having said composition, and in which the presence of said at least one M element increases the maximum energy product (BH)max) to a value higher than that of a composition wherein x is higher than 12.

B1 4,842,820 (1701st)
BORON-MODIFIED TITANIUM ALUMINUM ALLOYS AND METHOD OF PREPARATION

Shyh-Chin Huang, Latham, and Michael F. X. Gigliotti, Jr., Scotia, both of N.Y., assignors to General Electric Company

Reexamination Request No. 90/002,205, Nov. 19, 1990.
Reexamination Certificate for Patent No. 4,842,820, issued Jun. 27, 1989, Ser. No. 138,486, Dec. 28, 1987.
Int. Cl.[5] C22C *14/00*
U.S. Cl. 420—418



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–3** are determined to be patentable as amended.

Claims **4–9**, dependent on an amended claim, are determined to be patentable.

New claims **10–14** are added and determined to be patentable.

1. [A boron-modified titanium aluminum] *A solid solution* alloy *composition cast by rapid solidification means having high strength and ductility of about 1 percent outer fiber strain and a microstructure consisting essentially of titanium aluminide solid solution phases* consisting essentially of titanium, aluminum and boron in the approximate atomic ratios displayed in the hatched area of FIG. **10**.

B1 4,883,657 (1702nd)
REARRANGER PROCESS AND COMPOSITION FOR PERMANENT WAVING PROCESS

Barry W. Williams, Chicago, Ill., Pamela M. Daniels, Gary, Ind., assignors to Amethyst Investment Group, Inc.

Reexamination Request No. 90/002,208, Nov. 20, 1990.
Reexamination Certificate for Patent No. 4,883,657, issued Nov. 28, 1989, Ser. No. 158,209, Feb. 19, 1988.
Int. Cl.[5] A61K *7/09, 7/11*
U.S. Cl. 424—72

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–13** are cancelled.

[**1**. A process for waving hair, comprising the following steps in combination:

(a) applying to the hair a rearranging composition with chemical properties sufficient to break the cystine bonds in the hair keratin, siad rearranging composition comprises a homogenous mixture of a salt of thioglycolic acid, and a cationic homopolymer of methylacrylamidopropyltrimethyl ammonium chloride;

(b) rinsing the hair to substantially remove the rearranging composition;

(c) applying a wrapping lotion composition to the hair;

(d) wrapping the hair around a rod to produce a curl pattern and allowing the hair and wrapping lotion to set for a predetermined length of time;

(e) rinsing the wrapped hair;

(f) applying a neutralizer composition to the curl pattern; and

(g) rinsing the hair to substantially remove the neutralizer composition, whereby the process produces thicker, fuller hair with loose, bouncy curls.]

REISSUES

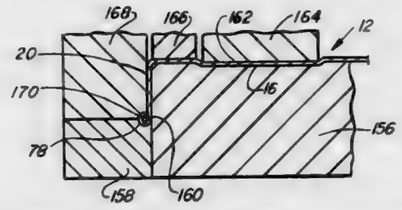
MAY 12, 1992

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,918
IRONING BOARD

Danny Simpson, Seymour, Ind., assignor to Lear Siegler Seymour Corp., Seymour, Ind.

Original No. 4,769,894, dated Sep. 13, 1988, Ser. No. 140,601, Jan. 4, 1988. Division of Ser. No. 944,957, Dec. 22, 1986, Pat. No. 4,759,296. Application for reissue May 9, 1989, Ser. No. 349,525
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—437 **9 Claims**



1. A method of making an ironing board (**10**) including the steps of: pressing a sheet of metal (**140**) [downwardly] *in a first direction* over a *first* die (**142**) and forming a top board (**12**) and flange (**20**) [thereabout] *extending in the first direction from the top board* with an edge (**148**) of the flange (**20**) curved *outwardly* away from the top board (**12**); cutting the metal (**140**) about the edge (**148**); and [curling the edge (**148**) of the flange (**20**) outwardly into the flange (**20**) by forming a curled and closed portion (**78**) curled away from the top board (**12**) when said flange (**20**) is viewed in cross section.] *pressing the outwardly curved edge (148) of the flange (20) into a curved form (160) in a second die (158) in a second direction further outwardly curling the curved edge (148) and pressing the outwardly curling edge (148) with a third die (168) in a direction towards the board inwardly curling the edge into engagement with the flange (20).*

Re. 33,919
PNEUMATIC STARTER FOR INTERNAL COMBUSTION ENGINE

John J. Kristoff, and Michael Elwer, both of Marion, Ohio, assignors to Sycon Corporation, Marion, Ohio

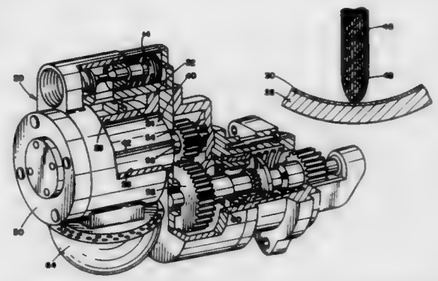
Original No. 4,846,122, dated Jul. 11, 1989, Ser. No. 167,402, Mar. 14, 1988. Continuation-in-part of Ser. No. 31,399, Mar. 27, 1987, abandoned, which is a continuation of Ser. No. 781,216, Sep. 26, 1985, abandoned. Application for reissue Nov. 29, 1989, Ser. No. 442,729
Int. Cl.[5] F02N *17/00*; F01C *1/344, 21/00*
U.S. Cl. 123—179.31 **24 Claims**

1. A starter arrangement for an engine, comprising:

a fluid actuated rotary vane motor which is adapted to engage an associated engine, said rotary motor having a hub and at least one blade which is slidably mounted in said hub and is made from a fiber reinforced plastic material to reduce friction, and wherein said at least one blade has a wear surface made of the same material;

a housing including a sleeve in which said rotary motor is positioned, said sleeve having on its inner surface a hard metallic coating to reduce friction, wherein said sleeve inner surface coating comprises a chromium [electrocating] *electrocoating* having a hardness which measures at least 70 on the Rockwell C hardness scale and a microfinish of [less than] *approximately* 10 micro-inches R.M.S.; and,

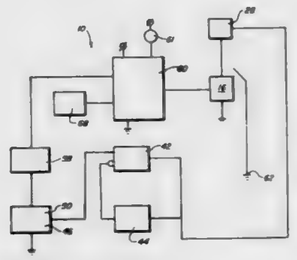
[a relay valve means for selectively providing a pressurized operating fluid to said rotary motor,] wherein said blade material and said sleeve inner surface coating cooperate to enable said motor to rotate in said sleeve with a minimum of friction thereby obviating the need for a lubricating system for the starter arrangement.



Re. 33,920
SMOKE DETECTOR HAVING VARIABLE LEVEL SENSITIVITY

William P. Tanguay, Downers Grove, and James McCrink, Lisle, both of Ill., assignors to Seatt Corporation, Downers Grove, Ill.

Original No. 4,792,797, dated Dec. 20, 1988, Ser. No. 22,099, Mar. 5, 1987. Application for reissue Jul. 11, 1989, Ser. No. 390,713
Int. Cl.[5] G08B *17/10*
U.S. Cl. 340—628 **38 Claims**



34. A smoke detector comprising:

means for sensing smoke levels and generating a signal characteristic of said smoke levels;

means for generating an alarm signal responsive to said sensing means detecting a first predetermined smoke level;

means for diminishing for a temporary time period the sensitivity of said smoke detector by increasing the magnitude of said smoke level required for generation of said alarm signal from said first predetermined smoke level to a second predetermined smoke level that is higher than said first predetermined smoke level; and

means for user testing the operability of said smoke detector, said user testing means being operative throughout substantially the entire duration of said time period while said diminishing means is operative.

Re. 33,921

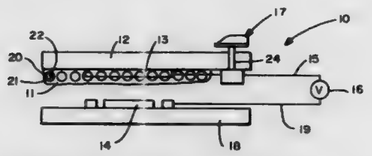
NCAP LIQUID CRYSTAL APPARATUS INCORPORATING A CONTROL MEANS AND ELECTRODE MEANS THEREOF INCORPORATING A CIRCUIT MEANS

Charles W. McLaughlin, Portola Valley; James L. Fergason, Atherton, and Robert Parker, Alamo, all of Calif., assignors to Taliq Corporation, Sunnyvale, Calif.

Original No. 4,699,470, dated Oct. 13, 1987, Ser. No. 620,377, Jun. 12, 1984. Application for reissue Oct. 12, 1989, Ser. No. 420,559

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—85 **45 Claims**



8. A liquid crystal apparatus, comprising:

a liquid crystal material and containment means for inducing a distorted alignment of said liquid crystal material which in response to such alignment at least one of scatters and absorbs light and which in response to an electric field reduces the amount of such scattering or absorption;

electrode means for applying said electric field;

substrate means for supporting said electrode means and the combination of said liquid crystal material and said containment means; and

at least one electromechanical control element extending through a portion of said substrate means for controlling a prescribed function.

41. A liquid crystal apparatus, comprising:

a liquid crystal material and containment means for inducing a distorted alignment of said liquid crystal material which in response to such alignment at least one of scatters and absorbs light and which in response to an electric field reduces the amount of such scattering or absorption;

electrode means for applying said electric field;

substrate means for supporting said electrode means, and said liquid crystal material and containment means; and

circuit means for energizing said electrode means to apply said electric field, said circuit means electrically connected to said electrode means through an opening extending through said substrate means in the area thereof on which said liquid crystal material and containment means are supported.

Re. 33,922

MEMORY CIRCUIT FOR GRAPHIC IMAGES

Koichi Kimura, Yokohama; Toshihiko Ogura, Ebina; Hiroaki Aotsu, Yokohama; Mitsuru Ikegami, Ashigarakami; Tadashi Kuwabara, Yokohama; Hiromichi Enomoto, and Tadashi Kyouda, both of Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,868,781, dated Sep. 19, 1989, Ser. No. 240,380, Aug. 29, 1988. Continuation of Ser. No. 779,676, Sep. 24, 1985, abandoned. Application for reissue Jun. 21, 1990, Ser. No. 542,028

Claims priority, application Japan, Oct. 5, 1984, 59-208266; May 20, 1985, 60-105850

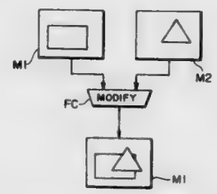
Int. Cl.[5] G06F *15/62*

U.S. Cl. 395—425 **27 Claims**

1. A memory circuit formed on an LSI device, comprising:

(a) memory means for effecting data read, data write and store data operations, and having input means, output means and a plurality of storage locations for storing data; and

(b) control means having an output connected to said input means of said memory means, and including first data input means, second data input means, third data input means, said second data input means being connected to receive data from said output means of said memory means, and controlling means operating in a first mode to a write data input from said first data input means into said memory means in response to a first value of data received from said third data input means, and operating a second mode to transfer data received from said output means of said memory means via said second data input means to



said memory means in inverted form in response to a combination of a first value of data input from said first data input means and a second value of data input from said third data input means and to transfer data received from said output means of memory means via said second data input means to said memory means without modification in response to a combination of a second value of data input from said first data input means and a second value of data input from said third data input means.

Re. 33,923

STRUCTURAL ELEMENT FORMED OF A RESIN-HARDENED VELOUR FABRIC AND FABRICATION METHOD

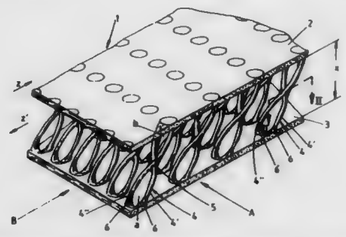
Wolfgang Böttger, Ködnitz; Kurt Biedermann, and Werner Pensel, both of Kulmbach, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Original No. 4,840,828, dated Jun. 20, 1989, Ser. No. 219,398, Jul. 15, 1988. Application for reissue Oct. 11, 1989, Ser. No. 419,756

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723681

Int. Cl.[5] B32B *3/06, 5/08, 7/08*

U.S. Cl. 428—112 **11 Claims**



1. [Structural] *A rigid structural* element comprising a velour fabric formed of two generally parallel layers and intermediate ribs connected between and separating said layers, said intermediate ribs being formed of threads, said velour fabric being made of aramid fibers, carbon fibers, ceramic fibers or glass fibers, and a hardened resin impregnated within said velour fabric.

Re. 33,924

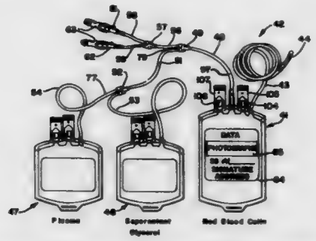
APPARATUS AND METHOD FOR STORING AND PROCESSING BLOOD

Cesare R. Valeri, Marblehead, Mass., assignor to Autologous Blood Corp., Miami, Fla.

Original No. 4,804,363, dated Feb. 14, 1989, Ser. No. 886,196, Jul. 16, 1986. Application for reissue Dec. 14, 1990, Ser. No. 627,405

Int. Cl.[5] A61M *37/00*

U.S. Cl. 604—6 **15 Claims**



1. A method of processing blood *in an homologous and/or autologous blood systems* utilizing a sterile closed assembly including a primary bag having an anticoagulant therein, and a sterilely closed tube harness including a first tube connected to the primary bag, a secondary tube connected to the first tube and first and second sealed ports connected to the first tube, comprising the steps of:

(a) collecting blood from a donor in said primary bag and mixing in said primary bag said blood and said anticoagulant;

(b) separating said blood in said primary bag into a plurality of blood components;

(c) retaining in said primary bag a unit of one of said components while removing through said first tube to said secondary tube the remainder of said components;

(cc) sealing off and removing said secondary tube from said first tube;

(d) sterilely connected to said first port a supply of cryoprotective solution;

(e) feeding said solution into said primary bag through said first port and said first tube and mixing said solution with said unit in said primary bag;

(f) freezing the mixture of said unit and said solution in said primary bag;

(g) subsequently thawing said mixture in said primary bag;

(h) sterilely connecting said second port to a blood processor and a supply of wash solution;

(i) flowing said mixture through said second port to said processor and combining said wash solution with said mixture in said processor;

(j) separating said wash solution and said cryoprotective solution from said unit, flowing said unit into said primary bag through said first tube and said second port; and

(k) removing said primary bag from said blood processor.

Re. 33,925

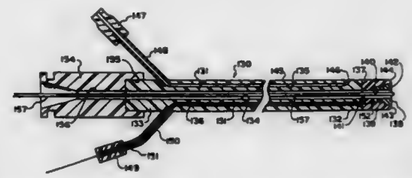
ELECTROSURGICAL CATHETER ANED METHOD FOR VASCULAR APPLICATIONS

Thomas O. Bales, Coral Gables, and Kevin W. Smith, Miami, both of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.

Original No. 4,682,596, dated Jul. 28, 1987, Ser. No. 612,879, May 22, 1984. Application for reissue Dec. 8, 1988, Ser. No. 281,063

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—48 **47 Claims**



40. An electrosurgical plaque-eroding device having a distal end which is insertable within and along the lumen of a blood vessel and manipulatable therethrough without causing undue trauma to a desired position where the device is operated to thermally erode atherosclerotic plaque buildup in the blood vessel to reestablish desired blood flow through the blood vessel, said device comprising: an elongate flexible hollow tubular body having an inner lumen, a distal end, a proximal end, and an outer diameter smaller than the diameter of the vessel into which said device is inserted; a hollow tip member mounted at said distal end of said flexible hollow tubular body, having a distal end and a proximal end, and having an axial passageway therethrough communicating said tip member distal end with said lumen of said hollow tubular body; means for withdrawing material which collects at said tip member distal end; means for supplying flushing fluid to said tip member distal end; an electrode assembly adjacent to and in operative association with said hollow tip member and including first and second electrodes for thermally eroding plaque, said tip member being beveled or rounded at the distal end of said device to facilitate insertion thereof into a blood vessel, and means for supplying a high-frequency electrical current to said electrodes for cutting plaque, which high frequency can extend up to 20 megahertz.

VOL
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PLANT PATENTS

GRANTED MAY 12, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,864

STRAWBERRY PLANT NAMED MILSEI

Jose M. A. Lopez, Tudela Navarra, Spain, assignor to Plantas de Navarra S.A., Navarra, Spain

Filed Aug. 8, 1990, Ser. No. 564,446
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—48 **1 Claim**

1. A new and distinct cultivar of strawberry plant named Milsei, as illustrated and described.

7,865

STRAWBERRY PLANT SMADAR

Eva Izsak, and Shamai Izhar, both of Rehovot, Israel, assignors to State of Israel, Ministry of Agriculture, Bet Dagan, Israel

Continuation of Ser. No. 490,102, Mar. 6, 1990, abandoned. This application Jul. 25, 1991, Ser. No. 735,967
Claims priority, application Israel, Mar. 17, 1989, 1431/89
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—48 **1 Claim**

1. A new distinct variety of strawberry substantially as illustrated and described and distinguished as being able to grow in September and produce fruit starting in November and lasting until summer, with fruit having a good taste and shape and a long shelf life.

7,866

BOUVARDIA NAMED STEPHANIE

John M. F. de Jong, Floraweg 67, 2371 AM Roelofarendsveen, Netherlands

Filed Nov. 28, 1990, Ser. No. 619,022
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive Bouvardia cultivar, substantially as herein shown and described, characterized by the distinctive coloration of its profusely blooming flowers.

7,867

BOUVARDIA NAMED REDROX

John M. F. de Jong, Floraweg 67, 2371 AM Roelofarendsveen, Netherlands

Filed Nov. 28, 1990, Ser. No. 619,024
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive Bouvardia cultivar, substantially as herein shown and described, characterized by the distinctive coloration of its profusely blooming flowers.

VOL
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PATENTS

GRANTED May 12, 1992

ERRATA

For CLASS	See PATENT NO.
165-001	5,111,548
244-003	5,111,553
483-001	5,111,573
056-367	5,111,636
051-424	5,111,652
454-159	5,111,738
454-306	5,111,739
102-308	5,111,746
128-738	5,111,799
602-019	5,111,806
606-244	5,111,807
602-023	5,111,808
128-873	5,111,850
277-081	5,112,039
482-053	5,112,043
482-068	5,112,044
482-009	5,112,045
244-035	5,112,120
359-015	5,112,212
359-332	5,112,122
433-021	5,112,221
055-053	5,112,357
426-321	5,112,380
134-007	5,112,406
205-148	5,112,447
205-118	5,112,448
205-175	5,112,449
205-165	5,112,462
514-772	5,112,603
530-389	5,112,606
514-180	5,112,620
422-052	5,112,646
427-226	5,112,676
430-175	5,112,743
436-008	5,112,758
430-058	5,112,759
435-320	5,112,767

VOL
1138
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ERRATA—Continued

For CLASS	See PATENT NO.
435-039	5,112,768
435-501	5,112,769
544-302	5,112,835
525-045	5,112,931
065-011	5,113,035
385-100	5,113,036
200-400	5,113,056
313-701	5,113,113
310-270	5,113,114
310-328	5,113,117
355-027	5,113,211
355-027	5,113,211
355-022	5,113,213
219-220	5,113,223
385-024	5,113,244
395-200	5,113,339
395-109	5,113,355
395-108	5,113,356
395-124	5,113,357
395-003	5,113,366
395-250	5,113,368
395-325	5,113,369
395-375	5,113,370
369-044	5,113,378
359-152	5,113,403
359-115	5,113,524
395-425	5,115,393
395-141	5,115,402
395-143	5,115,404
395-650	5,115,410
313-616	5,115,418
377-058	5,115,458
395-400	5,115,490

PATENTS

GRANTED MAY 12, 1992

GENERAL AND MECHANICAL

5,111,536
EYEGLASSES PROTECTIVE AGAINST GASES
Volker Hünnebeck, Berlin, Fed. Rep. of Germany, assignor to Auergesellschaft GmbH, Fed. Rep. of Germany
Filed Nov. 23, 1988, Ser. No. 276,217
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1988, 3740949
Int. Cl.[5] A61F *9/02*
U.S. Cl. 2—428 **6 Claims**

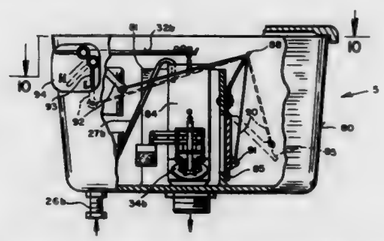


1. Safety eyeglasses which protect against gases, wherein the eyeglasses include a frame, made from a pliable material, having a flat surface and eye openings surrounding both eyes of a user, the area around said eye openings equipped with fittings to accept eye lenses, with said fittings attached asymmetrically at a corresponding angle (α) to the flat surface, the improvement comprising:

on the flat surface of the eyeglass frame and protruding from the surface, first and second single-fold bellows surrounding the first and second eye openings, which allows the bellows to fold together flat, and

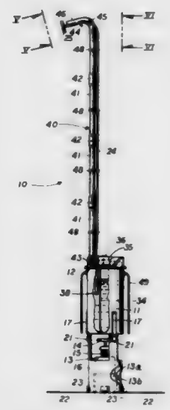
the fittings for the eye lenses being attached to the bellows.

5,111,537
TOILET APPARATUS
Wenzel Zaruba, 20 Battleridge Trail, Totowa, N.J. 07512
Filed Jun. 8, 1989, Ser. No. 363,047
The portion of the term of this patent subsequent to Sep. 12, 2008, has been disclaimed.
Int. Cl.[5] E03D *1/14, 3/12*
U.S. Cl. 4—324 **4 Claims**



1. A toilet apparatus comprising: storage means for storing a volume of fluid; fluid supply means for supplying the fluid; low volume discharge means for discharging a relatively low volume of the fluid; and high volume discharge means for discharging a relatively high volume of the fluid, wherein said storage means includes a toilet tank for water; said toilet tank having a plurality of walls; said plurality of walls including a partition wall separating a first compartment from a second compartment, said partition wall having a gate opening with a gate door; said high volume discharge means includes a discharge valve which extends through and sealingly engages a wall of the tank in the first compartment and further includes the gate door in its open position for flow from both compartment; said low volume discharge means includes said discharge valve and further includes the gate door in its closed position for flow from the first compartment only, including a handle subassembly having an outside plate with instruction marking; said handle subassembly having a first valve discharge handle for actuating the discharge valve; said handle subassembly having a second gate door discharge handle for actuating the gate door; said outside plate having a sleeve extending through a front wall of the tank; said gate door handle having a hollow shaft extending through the sleeve; said discharge valve handle having a rod extending through the hollow shaft and wherein said gate door handle hollow shaft has an inside arm for connection to a gate door chain-like member; said tank front wall has an inside plate having a leaf spring for locking the inside arm when in a high volume position with the gate door open; said inside plate has a release means for actuating the leaf spring in order to unlock the inside arm for movement of the inside arm to a low volume position with the gate door closed; said release means including a cylinder having a piston movable relative thereto; said piston having an end portion for actuating the leaf spring; said cylinder having a chamber with an inlet for connection to a supply valve overflow tube and with an outlet for connection to an overflow outlet whereby the piston actuates the leaf spring and releases the inside arm from its high volume position after water discharges from the tank first compartment.

5,111,538
KNOCKDOWN PORTABLE HOTWATER SHOWER AND SHOWER HEAD THEREFOR
Donald L. Chapman, P. O. Box 744, Meadow Vista, Calif. 95722
Filed Jun. 4, 1990, Ser. No. 533,087
Int. Cl.[5] A47K *3/22*
U.S. Cl. 4—599 **23 Claims**



1. A knockdown portable hot water shower having a disassembled configuration utilized for storing and transporting the shower when not in use, and an assembled configuration utilized for showering by an individual when in use, the knockdown portable hot water shower is comprised of:

a container for use as a storage container when the shower is in the disassembled configuration, wherein components of the portable shower are received therein for the storage

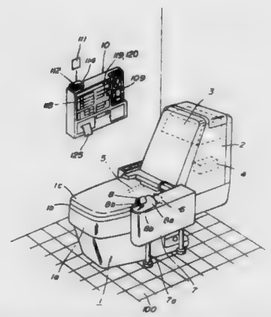
thereof, and further for use as a reservoir when the shower is in the assembled configuration, wherein water is received and heated therein for the use thereof;
a gas burner including a burner head which is positioned above the gas burner and both of which are positioned below the container when the shower is in the assembled configuration, wherein the water in the container is heated for showering by an individual when in use, the gas burner and burner head sized for being received in the container when the shower is in the disassembled configuration, wherein the gas burner is stored when not in use;
means for supporting the container above the gas burner;
a flexible water conduit having a first lower end and a second upper end, the conduit extending upwardly from the container when the shower is in the assembled configuration, wherein hot water is delivered upwardly through the conduit from the first end to the second end for showering by an individual when in use;
a shower head carried by the second end of the flexible water conduit above the container when the shower is in the assembled configuration, wherein hot water delivered from the second end of the conduit passes therethrough and is delivered therefrom as a hot water spray for showering by an individual when in use, the shower head being received in the container when the shower is in the disassembled configuration, wherein the shower head is stored when not in use;
means for supporting the flexible water conduit with the second end carrying the shower head thereon above the first end of the conduit when the shower is in the assembled configuration;
a pump between the water in the container and the first end of the water conduit when the shower is in the assembled configuration for pumping the hot water from the container, wherein hot water is delivered for showering by an individual when in use;
wherein when the shower is in the assembled configuration, the shower may be readily knocked-down into the disassembled configuration and the components thereof may be carried by the container with at least a portion of the components nested therein; and
the container including a handle for transporting the portable shower when in the disassembled configuration, wherein all of the components of the shower may be transported therewith when not in use.
wherein the means for supporting the container above the gas burner in the assembled configuration is comprised of:
a support housing for housing the gas burner therein when the shower is in the assembled and disassembled configurations, and further for supporting the container thereon above the gas burner when the shower is in the assembled position, the support housing being sized, so as to be nested in the container with the gas burner nested therein, when the shower is in the disassembled configuration.

5,111,539
TOILET DEVICE WITH SYSTEM FOR INSPECTING HEALTH CONDITIONS

Yoshiki Hiruta; Naoki Tsukamura; Yoshinobu Uchimura; Toshifumi Shigematsu; Hironori Yamasaki, and Toshio Yamaguchi, all of Fukuoka, Japan, assignors to Toto Ltd., Fukuoka, Japan

Filed Aug. 27, 1990, Ser. No. 573,645
Claims priority, application Japan, Aug. 25, 1989, 1-99193; Aug. 25, 1989, 1-99200; Aug. 25, 1989, 1-99203; Aug. 25, 1989, 1-99208; Aug. 25, 1989, 1-219211; Aug. 25, 1989, 1-219214; Aug. 25, 1989, 1-219217; Aug. 25, 1989, 1-219218
Int. Cl.[5] E03B *11/02*; G01N *33/493*
U.S. Cl. 4—661 **35 Claims**

1. A toilet device comprising:
a toilet having a bowl surface and a urine reservoir composite with said bowl surface and isolated therein for holding a urine sample;
a housing having at least a water tank disposed rearwardly and upwardly of said toilet, said housing having an outlet opening in a bottom thereof;
a slider mounted within said housing for holding a urine test paper piece, said slider being movable from within said housing toward said urine reservoir to immerse the urine test paper piece in the urine sample in said urine reservoir;
a urine analyzing device disposed in said housing, for analyzing constituents of the urine sample based on said urine test paper piece which has been immersed in the urine sample;

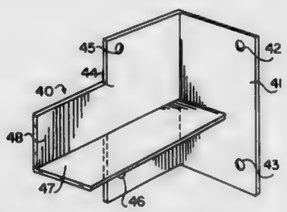


a lifting and lowering mechanism disposed in said housing for reciprocally lifting and lowering said slider through said outlet opening along a substantially vertical inclined path between said urine analyzing device and said urine reservoir; and
a display panel associated with said toilet device for controlling said lifting and lowering mechanism and said urine analyzing device and for displaying results of a urine analysis effected by said urine analyzing device.

5,111,540
BUNK BED

Mario Caya, R.R. #1, Pakenham, Ontario, Canada K0A 2X0

Division of Ser. No. 520,508, May 8, 1990, Pat. No. 5,003,650. This application Mar. 22, 1991, Ser. No. 673,935
Claims priority, application Canada, Aug. 29, 1989, 609758
Int. Cl.[5] A47C *19/00*; A47D *7/00*
U.S. Cl. 5—9.1 **7 Claims**



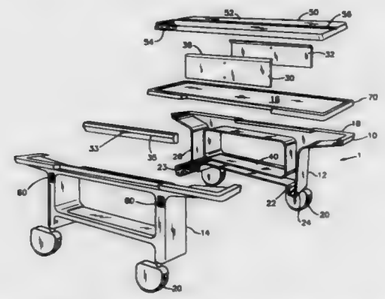
1. An improvement in a bunk bed including a head board having a pair of spaced-apart legs and upper and lower transverse frames, a tail board having a pair of spaced-apart legs and upper and lower transverse frames and connecting members comprising a pair of transversely spaced-apart upper and lower longitudinally-extending frames comprised of outer frames, and inner frame pieces, the improvement comprising an assembly bracket adapted to interconnect an associated leg to an associated transverse frame and longitudinally-extending frame comprising: an apertured side plate adapted to be connected to an associated longitudinally-extending frame; an apertured face plate securely-connected thereto and adapted to be connected to an associated leg; and a perpendicularly-

extending ledge extending along the length of said side plate and also extending from a face of said face plate and being securely-connected to an intermediate region of said side plate and also to an intermediate region of said face plate said ledge being adapted to support a portion of a longitudinally-extending frame.

5,111,541
NON-METALLIC GURNEY FOR PATIENT TRANSPORT

Kenneth E. Wagner, 11819 Caves Rd., Chesterland, Ohio 44026

Filed Jan. 14, 1991, Ser. No. 641,046
Int. Cl.[5] A61G *7/00*
U.S. Cl. 5—81.1 **18 Claims**



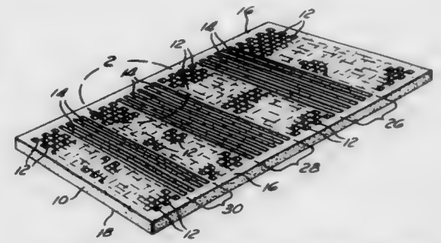
10. A wheeled gurney for supporting a patient in a substantially horizontal position comprising:
a substantially rectangular undercarriage having a pair of spaced piers, each having a substantially hollow space therewithin;
four castered wheels connected to said undercarriage, two spaced apart at the base of each said pier to provide an overall substantially rectangular arrangement of said four wheels for substantially simultaneous engagement thereof with a flat surface; and
a substantially rectangular, substantially flat, and substantially horizontal patient support that bridges said piers and extends longitudinally somewhat beyond each said pier;
wherein said gurney is further characterized by its being fabricated completely of materials that are substantially unaffected by strong magnetic fields, thereby to permit the use of said gurney in environments wherein such strong magnetic fields exist;
wherein said gurney is further characterized by a substantially horizontal shelf bridging the space between said two piers;
and wherein said gurney is fabricated from two identical mating molded base units and a patient support surface.

5,111,542
ANATOMICALLY CONFORMABLE FOAM SUPPORT PAD

David L. Farley, 18672 Evergreen Ave., Yorba Linda, Calif. 92686

Continuation-in-part of Ser. No. 411,051, Sep. 22, 1989, Pat. No. 5,010,609, which is a continuation of Ser. No. 176,925, Apr. 4, 1989, Pat. No. 4,879,776. This application Jul. 2, 1991, Ser. No. 725,004
Int. Cl.[5] A47C *27/14*
U.S. Cl. 5—464 **12 Claims**

1. A pad for supporting a recumbent human being comprising:
(a) a substantially planar substrate comprised of a resilient material;
(b) a first region of grooves extending laterally substantially across said substrate, said first region defining a first shoulder support area;
(c) a second region of grooves extending laterally substantially across said substrate, said second region defining a tail support area; and
(d) wherein the remainder of said resilient substrate defines a

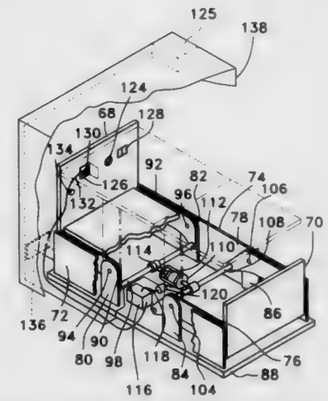


general support area, the quantity of resilient material per unit volume in the general support area being greater than the quantity per unit volume in the shoulder and tail support areas.

5,111,543
BED WITH FOLDABLE EARTHQUAKE PROTECTIVE COVER

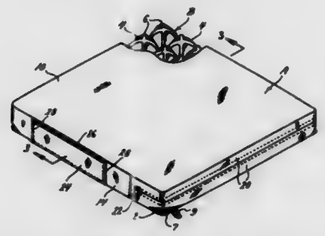
Yefim Epshetsky, San Francisco; Garry Belenky, Daly City, and Boris Khlevner, San Francisco, all of Calif., assignors to Alexander Shkolnik, San Mateo, Calif., a part interest

Filed Apr. 18, 1991, Ser. No. 687,104
Int. Cl.[5] A47C *29/00*
U.S. Cl. 5—424 **23 Claims**



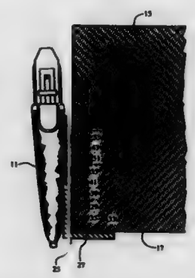
1. A bed with a foldable earthquake protective cover, comprising:
a support frame for supporting a flat sleep support surface; and
at least two moveable members which form a headboard and a footboard of said bed, said headboard and said footboard being pivotally attached to said support frame and capable of being pivoted between a folded position in which said headboard and said footboard are positioned away from said flat sleep support surface and an unfolded position in which they are positioned above said flat sleep support surface, said headboard and said footboard being oppositely arranged and pivotally supported by said support frame so that they can be pivotally turned toward each other from said folded position to cover said sleep support surface.

5,111,544
COVER WITH ELASTIC TOP AND FRICTIONAL BOTTOM FOR A CUSHION
Robert H. Graebe, 7 Persimmon Ridge Dr., Belleville, Ill. 62221
Filed Jul. 1, 1991, Ser. No. 723,408
Int. Cl.[5] A47G *9/00*; A47C *31/00*
U.S. Cl. 5—470 14 Claims



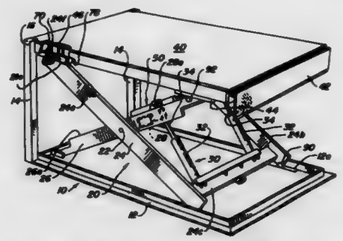
1. In combination with a cellular cushion having a rectangular base and air cells projecting upwardly from the base to form an array of air cells in which the upper ends of the cells form a seating surface that will conform to the shape of a user's buttocks, a cover fitted over the cushion and comprising:
(a) a top panel located over the upper ends of the cells and being formed from a highly elastic fabric;
(b) a bottom panel located under the rectangular base and covering substantially the entire base, said bottom panel being formed from a high friction mesh, said mesh being flexible and having parallel ribs and thinner connecting segments extended between the ribs;
(c) side panels located between and connected to the top and bottom panels at the peripheral margins of the top and bottom panels, said side panels being formed from a highly flexible but substantially non-elastic fabric, one of the side panels being divided into sections which are normally joined, but may be detached to permit the cover to be removed from or fitted over the cushion; and
(d) the coefficient of friction between the mesh of the bottom panel and traditional cusion-supporting surfaces being substantially greater than the coefficient of friction between the side panels or top panel and such traditional cushion-supporting surfaces.

5,111,545
HOLSTER MOUNT
Diana J. Krozal, 6817 Lomo Alto, Apt. 10, Dallas, Tex. 75205
Filed Oct. 11, 1991, Ser. No. 775,038
Int. Cl.[5] A47C *31/00*
U.S. Cl. 5—503.1 7 Claims



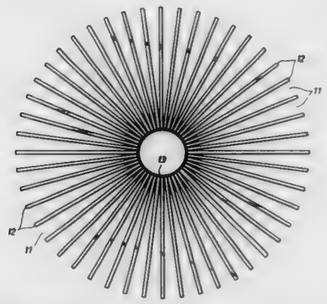
1. A holster mount for mounting a holster on a bed, comprising:
a horizontal plate for placement between a horizontal portion of a bed frame and a bottom surface of a set of box springs;
a vertical plate attached to the horizontal plate for placement between a vertical portion of the bed frame and a vertical side of the set of box springs;
a support plate extending upward from the vertical plate; and
a connector attached to the holster and passing through a hole completely through the support plate for connecting the holster to the support plate.

5,111,546
DOCK LEVELER LIFT ASSEMBLY AND METHOD FOR OPERATION
Norbert Hahn, Franklin, Wis., and Robert W. Naegeli, Edmond, Okla., assignors to Rite Hite Corporation, Milwaukee, Wis.
Continuation of Ser. No. 411,866, Sep. 25, 1989, Pat. No. 4,995,130. This application Nov. 13, 1990, Ser. No. 613,262
The portion of the term of this patent subsequent to Feb. 26, 2008, has been disclaimed.
Int. Cl.[5] E01D *1/00*
U.S. Cl. 14—7.3 6 Claims



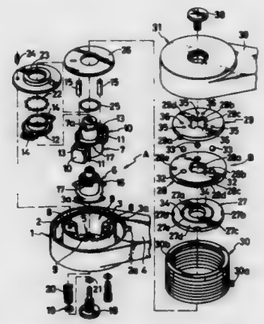
1. A dock leveler lift assembly for facilitating loading and unloading operations from a substantially horizontal platform surface of a loading dock, said assembly comprising:
a frame having a base section, and a rear elevated portion adapted to be disposed adjacent to but beneath the platform surface;
a first means mountable on the base section and selectively movable between a predetermined lowered position, a predetermined elevated position, and a plurality of intermediate positions;
a first actuating means connected to the first means for selectively raising and lowering same;
a deck releasably mountable on said first means and movable therewith to a selected position, one of said positions of said first means effecting a substantially coplanar relation of said deck to said platform surface;
a lip hingedly connected to a front edge portion of the deck and movable relative thereto between a depending position and an outwardly extended cantilevered position;
a second means disposed proximate a rear edge portion of the deck and being movable between operative and inoperative modes, when in an operative mode said second means releasably retaining the deck rear edge portion in pivotally attached relation with the frame rear elevated portion;
a third means movable between operative and inoperative modes, disposed proximate said second means and in cooperative realtion therewith, and adapted when in the operative mode to releasably retain the deck rear edge portion in pivotal engagement with said first means enabling said deck to assume an upwardly inclined position;
when said third means is in said inoperative mode said second means is in said operative mode whereby movement of the first means to one of said intermediate positions allows pivotal movement of said deck to a lowered declining position.

5,111,547
METHOD FOR FORMING PRECISION LIQUID/VAPOR SEPARATING BRISTLE ASSEMBLY
Boyd B. Moore, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Division of Ser. No. 428,527, Oct. 30, 1989, Pat. No. 5,007,277.
This application Nov. 19, 1990, Ser. No. 615,096
Int. Cl.[5] A46B *3/00*
U.S. Cl. 15—187 5 Claims



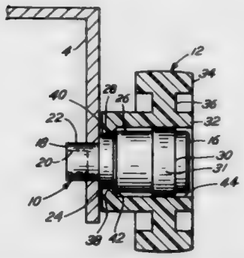
1. A bristle assembly comprising:
a circular shaped array of uniformly spaced bristles bent to extend radially outward from one end of a cylindrical flange, each bristle being separated from an adjacent bristle by a slot which extends into the flange past a location where the bristle is bent.

5,111,548
LIQUID CHECK AND CLOSER
Kazuyoshi Ohshima, Tokyo, Japan, assignor to Sugatsune Industrial Co., Ltd., Tokyo, Japan
Filed Mar. 19, 1991, Ser. No. 672,663
Claims priority, application Japan, May 23, 1990, 2-133135
Int. Cl.[5] E05F *3/04*
U.S. Cl. 16—51 2 Claims



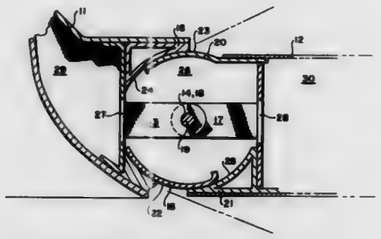
1. A door closer comprising:
a damper having a body case including an arm fixed to a door, a rotational shaft supported at the center of said body case and formed in said body case, a pair of chambers filled with high viscous liquids communicating via passages of said rotational shaft, a pair of rotary blades respectively having passages with check valves on said rotational shaft and internally mounted in said pair of chambers, said rotary blades being rotated together with said rotational shaft by a sub case fixed with a sub arm against a return spring at the time of opening the door, the door being automatically closed by the accumulated recovering force of said spring at the time of closing the door, the door being effected by the resistance force of said high viscous liquid against the closing door,
a stationary plate fixed to said body case disposed vertically in a stacked state by inserting the rotational shaft of said damper into the center thereof,
an intermediate plate so engaged with said rotational shaft as to be rotatable at a predetermined angle against said return spring by said rotational shaft,
a movable plate so engaged with said sub case as to be rotatable together with said sub case,
a plurality of rotary connectors respectively movably engaged with a plurality of through holes formed at an interval in a circumferential direction on the rotating circumferential line of said intermediate plate and having diameters larger than the thickness of said intermediate plate, and
an angle clutch made up of said stationary plate, said intermediate plate, said movable plate and said rotary connectors such that recesses in said stationary plate and recesses in said movable plate alternately engage and disengage said rotary connectors in through holes of said intermediate plate in such a manner that said movable plate and said intermediate plate can be locked within a range from a door closing positions to a predetermined door opening angle, said movable plate is released from the lock to said intermediate plate by the rotation of said movable plate in the door opening direction at a predetermined door opening angle in the range therefrom up to the door fully opening angle, and said intermediate plate can be locked to said stationary plate.

5,111,549
HANGER WHEEL MOUNT
Larry A. Johnson, Elkhart, Ind., assignor to L. E. Johnson Products, Inc., Elkhart, Ind.
Filed Nov. 30, 1990, Ser. No. 621,245
Int. Cl.[5] A47H *15/00*; E05D *15/06*
U.S. Cl. 16—97 5 Claims



1. In combination a mounting pin and a wheel for connection of said wheel to a door hanger bracket, said wheel including a hub having a smooth continuous inner surface and an inwardly extending annular lip, said pin including a cylindrical body and a protrusion extending longitudinally from one end of said body for connecting said pin to said hanger bracket, said lip contacting said pin adjacent said protrusion to prevent said wheel from laterally shifting relative to said pin, said pin including an annular land formed about said body, said land spaced longitudinally from said lip and pin contact and also contacting a portion of said inner surface of said hub and constituting a bearing surface for said wheel said hub extending with radial clearance at all times about said body between said land and said lip and between said land and the opposite end of the body irrespective of the operational forces applied to said wheel.

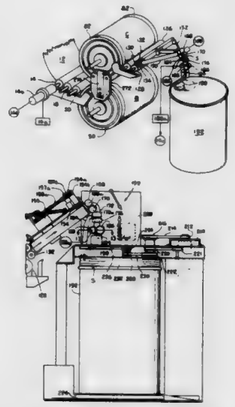
5,111,550
HINGED FLUID PASSAGE ASSEMBLY
George F. LeBlanc, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed May 6, 1991, Ser. No. 696,468
Int. Cl.[5] E05D *1/04*
U.S. Cl. 16—356 **4 Claims**



1. A hinged fluid passage assembly comprising:
a first component and a second component, each of said components including
a hollow interior portion,
a seal member extending from a first surface of the component, said seal member having a convex part-cylindrical surface, said convex surface having a first radius of curvature,
a seal support member extending from the first surface, said seal support member having a concave part-cylindrical surface, said concave surface having a second radius of curvature essentially equal to the first radius of curvature,
at least one opening communicating with the hollow interior portion, the opening located between the seal member and the seal support member extending from the component,
at least one lug extending from the component and having a pin hole therein, and
means for pivotably connecting each component to the other component;
wherein the convex part-cylindrical surface of each component slidably engages the concave part-cylindrical surface of the other component in sealing contact as the second component pivots relative to the first component.

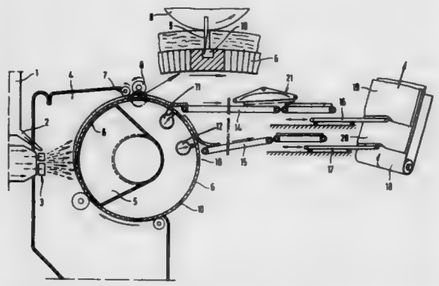
5,111,551
COMPACT CARDING APPARATUS WITH SLIVER THREAD-UP AND METHOD
John D. Hollingsworth, Greenville; Joe K. Garrison, Piedmont; Joel C. Collins, Easley; William A. Warnock, deceased, late of Lyman, all of S.C.; by Lillith M. Weiskel, legal representative, Nahant, Mass.; by Muriel R. Nyberg, legal representative, Lake Worth, Fla.; by Charles F. Warnock, legal representative, Fort Collins, Colo., and by Lorraine Pergande, legal representative, Winter Haven, Fla., assignors to John D. Hollingsworth on Wheels, Inc., Greenville, S.C., a part interest
Division of Ser. No. 352,394, May 16, 1989, Pat. No. 5,016,321, which is a division of Ser. No. 106,521, Oct. 9, 1987, Pat. No. 4,831,691. This application May 2, 1991, Ser. No. 694,752
Int. Cl.[5] D01H *5/72*
U.S. Cl. 19—150 **31 Claims**

1. Apparatus for threading up a textile sliver produced from a web on a textile carding machine upon start-up of said machine, said apparatus comprising in combination:
(a) transport means for collecting said web from said carding machine and condensing said web into a sliver;
(b) a pair of transfer rolls having a transfer nip for receiving said sliver;
(c) drive means for operating said transfer rolls at a first surface speed to produce a faster sliver delivery speed than said transport means causing excessive drafting of said sliver during start-up to progressively separate fibrous parts from the end of said start-up sliver and form a generally pointed sliver thread-up end; and said drive means driving said transfer rolls at a second surface speed to produce a sliver delivery speed generally equal to said transport means after said excessive drafting;
(d) conveyor means for conveying said fibrous parts away from said sliver;



(e) condensor means disposed downstream of said conveyor means for receiving said thread-up end and sliver from said transfer means for condensing said sliver; and
(f) delivery means for drawing said sliver through said condensor means.

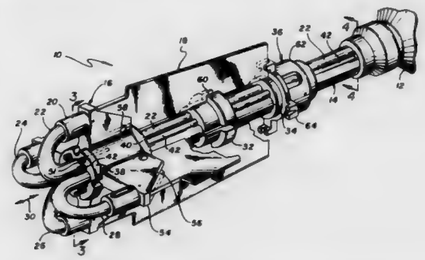
5,111,552
METHOD AND DEVICE FOR MANUFACTURING A MINERAL WOOL WEB
Henning J. E. Laurén; Tom E. E. Nurmi, and Tapio O. Moisala, all of Pargas, Finland, assignors to Oy Partek AB, Pargas, Finland
PCT No. PCT/FI87/00054, § 371 Date Oct. 20, 1988, § 102(e) Date Oct. 20, 1988, PCT Pub. No. WO87/06631, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 24, 1987, Ser. No. 263,799
Claims priority, application Finland, Apr. 25, 1986, 861761
Int. Cl.[5] D01G *25/00*
U.S. Cl. 19—308 **42 Claims**



1. A method for forming a mineral wool web from several layers of a primary web comprising the steps of:
depositing fibers on a collecting surface to form the primary web;
splitting the primary web into separate sheets;

feeding the separate sheets along at least two paths to a receiving conveyor: and
depositing the separate sheets on the receiving conveyor in an overlapping manner, wherein a rate of flow of deposit of each separate path of sheets onto the receiving conveyor is less than a rate of motion of the collecting surface.

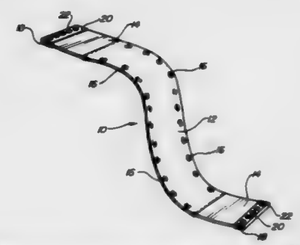
5,111,553
FLIGHT CONTROL APPARATUS FOR AN ANTI-TANK PROJECTILE
David Muggeridge; William F. Ryan, and Dieter Haase, all of Phoenix, Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Sep. 28, 1990, Ser. No. 589,851
Int. Cl.[5] F42B *10/66*
U.S. Cl. 244—3.22 **9 Claims**



1. Flight control apparatus for a cannon-launched anti-tank projectile, comprising:
a boom assembly having an axial length extending from fore to aft ends of the assembly, the assembly comprising four tubes collectively defining a longitudinal axis of the assembly, the tubes being intersecured such that they are mutually parallel and parallel to the longitudinal axis along at least a majority of the axial length;
a fin support member secured to the boom assembly and radially surrounding an axially-extending portion thereof, the support member having four equiangularly spaced projections extending in a radially outward direction from the assembly;
four fins, each pivotally secured to one of the four projections; and
four equiangularly spaced nozzles, each secured to an aft end of one of the four tubes such that it is in fluid communication therewith and spaced from the longitudinal axis, the nozzles collectively being positionally adapted to provide for roll stability of the projectile by thrust control.

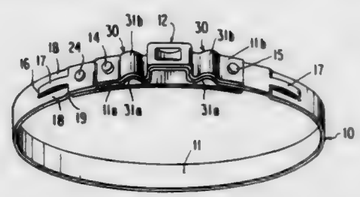
5,111,554
HOLD-DOWN STRAP FOR A TARP
Ronald L. Sweers, 6165 E. Atherton Rd., Flint, Mich. 48507
Filed Aug. 7, 1989, Ser. No. 390,198
Int. Cl.[5] B60P *7/06*
U.S. Cl. 24—16 R **13 Claims**

1. A hold-down strap for holding a tarp or the like, said strap comprising:
an elongated pliable body portion having a first edge and a second edge;
a pair of elastic ends interconnecting said body portion; said elastic ends including a multiplicity of means for attaching;
said body portion being composed of a webbed material; and



said webbed material comprises a resin-permeated fiber glass mat.

5,111,555
HIGH STRENGTH CLAMP STRUCTURE
Hans Oetiker, CH-8812, Horgen, Switzerland
Continuation-in-part of Ser. No. 922,408, Oct. 23, 1986, which is a continuation of Ser. No. 622,764, Jun. 20, 1984, and a continuation-in-part of Ser. No. 567,085, Aug. 14, 1990. This application Feb. 22, 1991, Ser. No. 659,182
Int. Cl.[5] B65D *63/06*
U.S. Cl. 24—20 R **42 Claims**

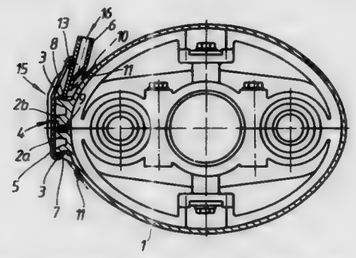


1. A hose clamp, comprising clamping band means with overlapping band portions, and means for tightening the clamp structure, said means for tightening the clamp structure including ear-like means in each of the overlapping band portions, said ear-like means being of complementary shape to enable to ear-like means to assume a nested relationship with the ear-like means in an inner band portion engaging from within the clamp into the ear-like means in an outer overlapping band portion, said first means within an area of the inner overlapped band portion following its ear-like means in the circumferential direction for connecting at least a free end portion of the inner overlapped band portion to the corresponding overlapping outer band portion.

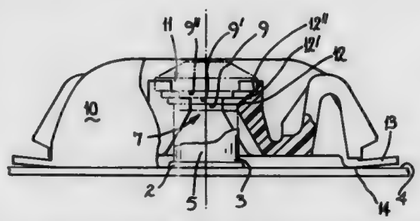
5,111,556
ARRANGEMENT FOR CLOSING A CABLE SOCKET FOR CONNECTING AND BRANCHING CABLES, PARTICULARLY TELECOMMUNICATION CABLES
Helmut Dehling, Dorsten, Fed. Rep. of Germany, assignor to Stewing Kunststoffbetrieb GmbH, Dorsten, Fed. Rep. of Germany
Filed Sep. 28, 1990, Ser. No. 590,474
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1989, 3932734; Dec. 14, 1989, 8914665[U]
Int. Cl.[5] F16L *33/12*
U.S. Cl. 24—270 **7 Claims**

1. In an arrangement for closing a cable socket for connecting and branching cables, particularly telecommunication cables, the arrangement including a socket pipe longitudinally divided along longitudinal edges, and first and second closing sections bordering on the longitudinal edges, each closing

section having an undercut, and a gripping closure which engages in the undercuts and extends over the closing sections, the gripping closure including a gripping member and a gripping stirrup, the gripping member engaging behind the first closing section, the gripping stirrup being pivotally mounted on the gripping member and forming in a pivoted position a claw for engaging behind the second closing section, the improvement comprising the gripping member being a cover member having two longitudinal sides, the cover member having another claw for engaging behind the first closing section, wherein, when the gripping stirrup is pivoted beyond a dead center position, the longitudinal edges of the socket pipe are pressed together and the cover member extends over the longitudinal edges of the socket pipe.

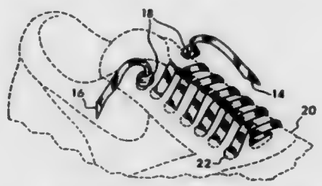


5,111,557
METAL WELD STUD AND PLASTIC CLIP
Heinz O. Baum, Giessen-Allendorf, and Johann Reindl, Biebertal, both of Fed. Rep. of Germany, assignors to Emhart Inc., Newark, Del.
Filed Dec. 3, 1991, Ser. No. 802,081
Int. Cl.[5] A44B *17/00*; F16B *21/00*
U.S. Cl. 24—662 **2 Claims**



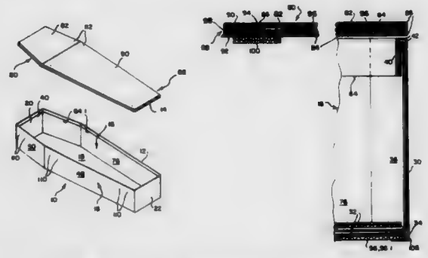
1. A metal stud having a projecting head for welding to a receptor surface and a resilient clip for mounting on said stud and retained by said projecting head characterised in that the underside of said head has a tapered shoulder which reduces progressively to the diameter of said stud, in that said clip has a retaining hole of which the internal diameter increases correspondingly from a diameter equal to that of the stud whereby it engages the tapered shoulder under said head when the clip is applied to the stud and in that said clip is provided with at least two retaining members which contact said receptor surface to urge the clip into close engagement with the tapered shoulder under the head of the stud.

5,111,558
DURABLE ELASTIC LACE FOR ATHLETIC SHOES
Stephen F. Ridley, 600 Arapboe St. #6, Boulder, Colo. 80302, and Louis T. Sicotte, 3107 Kingsridge Blvd., Boulder, Colo. 80301
Filed Jun. 7, 1991, Ser. No. 712,072
Int. Cl.[5] A43C *9/00*
U.S. Cl. 24—715.3 **13 Claims**



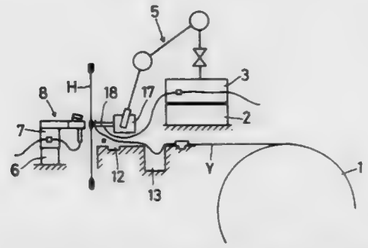
1. A lace for shoes, particularly athletic shoes, said lace comprising:
a single elongated strand of elastic thermoplastic polyurethane for securing a shoe on the foot of an individual, said strand including:
means for providing constant uniform tension throughout said lace during periods of movement and non-movement of said foot;
means for resisting abrasion of said strand; and
means for resisting environmental degradation of said strand.

5,111,559
COFFINS
Jacob G. Mohr; Michael H. Kane, and Etienne Le Riche, all of Cape Town, South Africa, assignors to Timbalyte Close Corporation, Cape Town, South Africa
Filed Jan. 3, 1991, Ser. No. 637,052
Claims priority, application South Africa, Jan. 4, 1990, 90/0045; Feb. 28, 1990, 90/1547
Int. Cl.[5] A63G *17/00*
U.S. Cl. 27—4 **10 Claims**



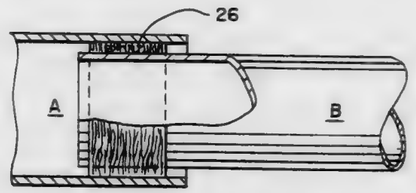
1. A coffin which is of corrugated board and which comprises a lid and a base, the base having a base wall comprising a base insert which extends the full length of the coffin, which is wider at a shoulder zone thereof and which tapers towards the ends thereof and a base wall panel which is adhered to the underside of the base insert, the base further including side walls each of which comprises a side panel having first and second panel parts with a vertically extending bend between them at said shoulder zone, and bottom flaps integral with said panel parts and joined thereto along right angled bends, said bottom flaps being adhered to the underside of the base wall panel.

5,111,560
AUTOMATIC WARP THREADING APPARATUS
Takumi Sato, Tachikawa, Japan, assignor to Kabushiki Kaisha Nishiki, Osaka, Japan
PCT No. PCT/JP88/00775, § 371 Date Sep. 21, 1990, § 102(e) Date Sep. 21, 1990, PCT Pub. No. WO89/01066, PCT Pub. Date Feb. 9, 1989
PCT Filed Aug. 4, 1988, Ser. No. 348,663
Claims priority, application Japan, Aug. 4, 1987, 62-195714
Int. Cl.[5] D03J *1/14*
U.S. Cl. 28—204 **8 Claims**



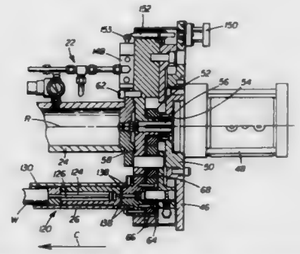
1. An automatic warp threading apparatus for automatically threading warps (Y) through the eyes (E) of heddles from one side of a row of multiple parallel heddles (H), said apparatus comprising a thread path table (4), a stationary base (2), and a thread feed table (3) movable on the stationary base (2) disposed at said one side of the row of heddles, the thread feed table (3) carrying a thread feeder (5), the thread feeder (5) including finger members (18, 18') for clamping the warps (Y) arranged on said thread path table (4), and a jet nozzle (20) attached to the finger members (18, 18') for ejecting a gas between said finger members to thread said warps through said eyes.

5,111,561
METHOD OF FORMING SPACING RING FOR TUBES IN HIGH TEMPERATURE ENVIRONMENT
Yukihiro Nakagawa, Aza Higashinokawa 19, Oaza Takadaji, Shikatsucho, Nishikasugaigun, Aichi-Prefecture, Japan, and Alan L. Brittingham, 1531 13th St., Columbus, Ind. 47201
Division of Ser. No. 444,535, Dec. 1, 1989, Pat. No. 5,056,832. This application Jan. 23, 1991, Ser. No. 644,514
Claims priority, application Japan, Dec. 2, 1988, 63-157872
Int. Cl.[5] F16C *27/02*
U.S. Cl. 29—4.55 **11 Claims**



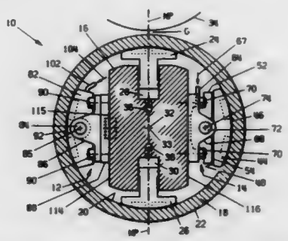
1. A method of forming a spacing ring for placement between a radially inwardly facing annular surface on a first member so as to maintain said first and second members in predetermined radially spaced relationship, said method comprising the steps of:
providing a metal wool material consisting of a plurality of matted metal threads;
wrapping the metal wool material around an annular surface on a core bar; and
compressing the wool material on the core bar into an annular configuration with a radially inwardly facing annular surface and a radially outwardly facing annular surface, with each said ring surface having a predetermined diameter.

5,111,562
SPINDLE APPARATUS FOR HOLDING A WORKPIECE
Eric S. Burke, Lexington, Ky., assignor to Versa Tech Engineering, Lexington, Ky.
Filed Nov. 27, 1990, Ser. No. 618,664
Int. Cl.[5] B23B *13/04, 15/00*
U.S. Cl. 29—37 R **23 Claims**



1. A spindle apparatus for holding a workpiece, comprising:
a support means;
a rotary spindle member for holding a workpiece;
means for orbitally mounting said rotary spindle member to said support means;
means for rotatively driving said spindle member and said mounting means, said driving means including a rotary indexer and a transmission, said transmission including a stationary gear mounted in a fixed position, a planetary gear orbiting said stationary gear and a rotary spindle drive gear engaging said planetary gear;
means for axially advancing an incremental length of said workpiece through said rotary spindle member for machining; and
means for operatively controlling both said driving means and said advancing means.

5,111,563
SELF-LOADING, CONTROLLED DEFLECTION ROLL
Dale A. Brown, Milton, and Arnold J. Roerig, Beloit, both of Wis., assignors to Beloit Corporation, Beloit, Wis.
Filed Feb. 4, 1991, Ser. No. 650,348
Int. Cl.[5] B21B *13/02*
U.S. Cl. 29—116.2 **7 Claims**



1. A self-loading, controlled deflection roll for use in engaging another roll along a nip line of contact therewith, including a stationary support shaft having a longitudinal axis of the roll, a roll shell having inner and outer cylindrical surfaces, said roll shell disposed about the shaft and defining, with the shaft, a space between the shaft and the inner surface of the roll shell,

support shoe means mounted on the shaft and disposed to move the roll shell translationally along a nip plane relative to the support shaft and into, and out of, nipping engagement with the other roll and for supporting the roll shell, the combination comprising:

guide shoe means attached to the support shaft near both ends thereof, the guide shoe means at either end of the shaft including a pair of pivoted guide shoes in substantially opposed array on either side of the shaft and nip plane, each pivoted guide shoe including a curved face surface for engaging the inner surface of the roll shell and providing, with the other of said each pair of guide shoes, substantially opposed stabilizing forces to the roll shell as the roll shell translates and the guide shoes pivot during operation;

the support shoes and guide shoes providing the sole support of the roll shell about the support shaft;

the pivot of at least one said guide shoe is provided by pivotally mounting the guide shoe to support means;

the support means is rotatably attached to the support shaft and is so constructed and arranged as to permit the support means to rotate in a plane substantially parallel to the nip plane.

5,111,564

HEATABLE ROLL FOR USE IN CALENDERS AND THE LIKE

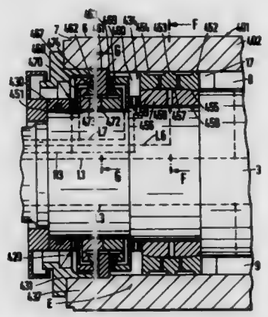
Josef Pav; Reinhard Wenzel, both of Krefeld; Hans Bresser, Kerken, and Rudolf Vosunerbäumer, Krefeld, all of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Division of Ser. No. 344,261, Apr. 27, 1989, Pat. No. 4,964,202. This application Sep. 20, 1990, Ser. No. 585,621

Claims priority, application Fed. Rep. of Germany, May 2, 1988, 3814794

Int. Cl.[5] B21B *13/02*

U.S. Cl. 29—116.2 **13 Claims**



1. A roll for use in web treating machines, comprising a hollow tubular shell having an internal space and first and second end portions having internal surfaces; first and second inserts installed in said space within said first and second end portions, respectively, each of said inserts including at least one hydrostatic bearing; a first heating device having means for heating said shell between said inserts; and a discrete second heating device including a source of hydraulic fluid, means for heating the fluid and means for conveying heated fluid to said bearings, said second heating device having means for directly heating said shell at said end portions with heated hydraulic fluid and said bearings defining heated fluid paths which extend along the internal surfaces of the respective end portions of the shell, said paths containing said heated hydraulic fluid, said heated hydraulic fluid being in direct contact with the internal surfaces of the respective end portions of the shell.

5,111,565

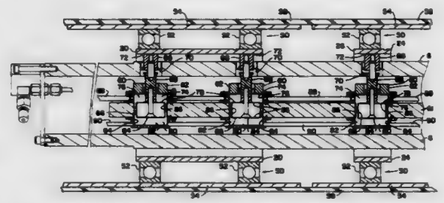
COMPENSATING ROLL ASSEMBLY FOR FLEXIBLE WEB MATERIAL

James J. Beaudreault, North Providence, R.I., and James O. Gallant, Dighton, Mass., assignors to S.W. Industries, Inc., Providence, R.I.

Filed Dec. 14, 1990, Ser. No. 628,385

Int. Cl.[5] B21B *13/02*

U.S. Cl. 29—116.2 **11 Claims**



1. A compensating roll assembly for flexible web material, said roll assembly comprising a central axle member, a first end axle member fixed to a first end of said central axle member, a second end axle member fixed to a second end of said central axle member, a first support ring means disposed around said first end axle member, a second support ring means disposed around said second end axle member, spool means rotatably disposed on each of said support ring means and said central axle member, roll surface means disposed on said spool means and adapted to engage said web material, and first and second moving means disposed, respectively, within said first and second end axle members to automatically move said first and second support ring means, respectively, relative to said respective first and second end axle members, during a rolling operation, to move said roll surface means to maintain substantially constant pressure on said web by said roll surface means, said first and second moving means being independent of each other.

5,111,566

CONTROLLED DEFLECTION ROLL

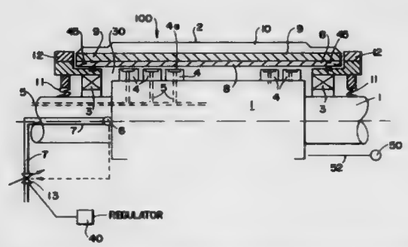
Eugen Schnyder, Waltenschwil, and Rolf Lehmann, Rudolfstetten, both of Switzerland, assignors to Sulzer Escher Wyss AG, Zurich, Switzerland

Filed Jun. 4, 1991, Ser. No. 710,016

Claims priority, application Switzerland, Jun. 25, 1990, 02113/90

Int. Cl.[5] B21B *13/02*

U.S. Cl. 29—116.2 **6 Claims**



1. A controlled deflection roll having a predetermined operating condition, comprising:

a stationary carrier means;

a roll shell;

means mounting the roll shell for rotational movement about the stationary carrier means;

at least one support element for bracing the roll shell against the stationary carrier means and exerting a pressing force at least in a predetermined support direction;

said roll shell comprising an inner roll shell part and an outer roll shell part;

the inner roll shell part and the outer roll shell part forming a press fit with respect to one another in the predetermined operating condition of the controlled deflection roll; and

means for providing play between the inner roll shell part and the outer roll shell part to enable axial movement of the outer roll shell part in relation to the inner roll shell part during dismantling and exchange of the outer roll shell part of the roll shell.

5,111,567

ROLL FOR USE IN PAPER PRODUCTION AND METHOD OF MANUFACTURE THEREOF

Jorma Leino; Juhani Vestola; Jukka Salo, and Ari Telama, all of Jyväskylä , Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed Oct. 18, 1990, Ser. No. 599,628

Claims priority, application Finland, Oct. 27, 1989, 895104

Int. Cl.[5] B21B *31/08*

U.S. Cl. 29—132 **17 Claims**

1. A roll for use in the production of paper comprising:

a center roll body having a mantle;

a corrosion protection layer abutting said mantle; and

a surface layer abutting said corrosion protection layer, said surface layer being formed by thermally sprayed powder particles having a particles size from about 5 to about 100 μm wherein metal and ceramic phases are in each powder particle, said ceramic phase comprising a sufficient amount of carbides having a suitably small particle size to achieve a surface layer having a microhardness greater than about 900 HV 0.3, said corrosion protection layer having sufficient thickness such that it can be rewarded when the surface layer is worn through.

5,111,568

PAPER MACHINE ROLL

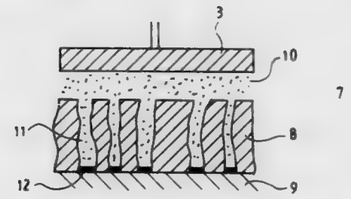
Ari Telama, Jyvaskylä, Finland, assignor to Valmet Paper Machinery Inc., Finland

Division of Ser. No. 569,070, Aug. 17, 1990, Pat. No. 5,056,220. This application Jul. 26, 1991, Ser. No. 736,597

Claims priority, application Finland, Aug. 24, 1989, 893970

Int. Cl.[5] B21B *31/08*; B60B *5/00, 21/00*

U.S. Cl. 29—132 **5 Claims**



1. A roll used for paper or paperboard making, such roll comprising

a central core;

a porous coating having pores therethrough formed on an outside surface of said central core;

a precipitate electrochemically obtained from an electrolyte formed in said pores, said electrolyte functioning to seal said pores.

5,111,569

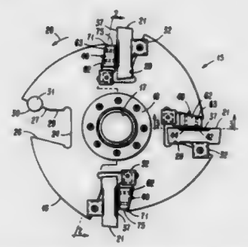
METHOD OF LOCKING AN IMPELLER BAR AGAINST A SEAT

David A. Ostergaard, Cedar Rapids, Iowa, assignor to Cedarapids, Inc., Cedar Rapids, Iowa

Division of Ser. No. 440,597, Nov. 22, 1989, Pat. No. 5,004,169. This application Mar. 29, 1991, Ser. No. 677,780

Int. Cl.[5] B23Q *17/00*

U.S. Cl. 29—407 **4 Claims**



1. A method of locking an impeller bar against a seat within a recess of a rotor and opposite a wedging side wall of the recess, the impeller bar having a thickness chosen from impeller bars having thicknesses within a known range of thicknesses, the method comprising:

placing the impeller bar against the seat of the rotor;

determining the gap width between the side wall opposite the seat and an adjacent surface of the impeller bar at a radial distance of one-half of the radial height of a wedge inward from the periphery of the rotor;

adjusting the mean width of the wedge to be substantially equal to the determined gap width; and

urging the wedge into wedging engagement between the wedging side wall of the recess and the adjacent surface of the impeller bar.

5,111,570

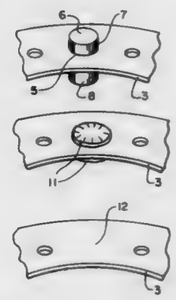
FORGE JOINING REPAIR TECHNIQUE

Robert W. Baumgarten, Palm Beach Gardens, and John M. Robertson, Tequesta, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 10, 1990, Ser. No. 566,005

Int. Cl.[5] B23P *6/00*

U.S. Cl. 29—402.13 **19 Claims**



1. A method for the repair of a damaged area in a metal alloy substrate including the steps of:

a) enlarging the damaged area to a cylindrical hole passing through said substrate, said hole having a predetermined uniform diameter;

b) preparing the walls of said hole to remove contamination;

c) positioning in said hole a cylindrical plug comprising a material similar to said metal alloy and having a similar

heat treatment, said plug having been prepared by removal of contamination, and being of a uniform diameter from 0.0005 to 0.004 inches less than the predetermined uniform diameter of said hole, and extending beyond the ends of said hole; and

d) applying a force to the ends of said plug, while locally heating said plug and the walls of said hole to a temperature which causes deformation and softening of said plug, metal flow, and formation of a bond-line interface between said plug and said walls.

5,111,571

METHOD FOR MANUFACTURING A BODY WITH A SURFACE OF REVOLUTION AT ITS END WITH THE AXIS THEREOF ALIGNED WITH AN AXIS OF THE BODY

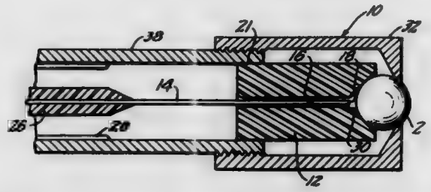
Moreno Ciboldi, Carate Brianza, and Ugo Maregatti, Sesto S. Giovanni, both of Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

Division of Ser. No. 464,353, Jan. 12, 1990, Pat. No. 5,042,335. This application Mar. 7, 1991, Ser. No. 665,904

Claims priority, application Italy, Jan. 20, 1989, 19140 A/89

Int. Cl.[5] B23H *7/00*; **B23Q** *17/00*

U.S. Cl. 29—407 **10 Claims**



1. Method for manufacturing a body having a predetermined longitudinal axis and having a surface of revolution at one end, the axis of said surface of revolution being aligned with said predetermined longitudinal axis, said method comprising:

mounting said body on a rotatable shaft with said end of said body extending beyond an end of said shaft, said shaft being movable by a predetermined amount in a direction transversely to said longitudinal axis whereby said shaft and said end of said body will oscillate transversely to said longitudinal axis with rotation of said shaft if compensating forces opposing the transverse oscillation of said shaft are not applied thereto.

while rotating said shaft, measuring the oscillations of said end of said body with rotation of said shaft and applying compensating forces to said shaft transversely to said longitudinal axis which oppose the oscillations of said shaft and said end of said body and which at least substantially maintain the portion of said longitudinal axis at said end in a fixed position; and

while rotating said shaft and said body and while applying said forces, removing material at said end of said body to form a surface thereat in the shape of a surface of revolution.

5,111,572

METHOD OF MECHANICAL SURFACE TREATMENT OF A BLANK METAL SHEET

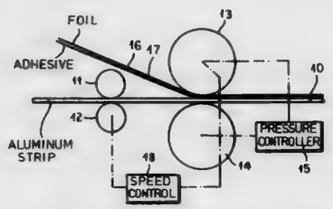
Gottfried Haiml, and Johann Langgartner, both of Braunau-/Inn, Austria, assignors to Austria Metall Aktiengesellschaft, Braunau am Inn, Austria

Continuation of Ser. No. 487,495, Mar. 1, 1990, abandoned. This application Feb. 22, 1991, Ser. No. 660,247

Claims priority, application Austria, Mar. 1, 1989, A459/89

Int. Cl.[5] B21D *35/00*

U.S. Cl. 29—469.5 **6 Claims**



1. A method of mechanically structuring a blank surface of a sheet metal workpiece, comprising the steps of:

(a) applying to said blank surface of said sheet metal workpiece an adherent but non-adhesively bonded foil;

(b) pressing said foil against said surface with a roll, thereby deforming said surface and impressing a texture of said foil in a deformed state into said surface;

(c) during said pressing of said foil against said surface in step (b) varying a ratio of peripheral speed of said roll to speed of advance of said workpiece and varying a pressure of said roll against said workpiece to control said deformation of said foil and said sheet metal, said varying of ratio and pressure being performed during said pressing step; and

(d) recovering the sheet metal with a deformed and textured surface.

5,111,573

DEVICE AND METHOD OF EXCHANGING TOOLS

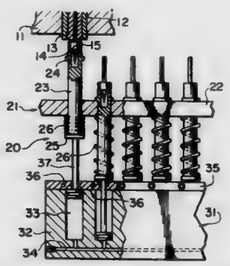
Yasushi Ito; Tamio Otani, both of Hadano; Tadanori Dobashi, Kawasaki; Akira Irie, Kanagawa, and Akihiro Matsuya, Ebina, all of Japan, assignors to Hitachi Seiko Ltd., Ebina, Japan

Filed Apr. 18, 1991, Ser. No. 687,064

Claims priority, application Japan, Apr. 20, 1990, 2-102979; Jun. 2, 1990, 2-144667

Int. Cl.[5] B23Q *3/157*

U.S. Cl. 483—1 **7 Claims**



1. A tool exchange device for exchanging tools between a tool holding device having a plurality of tool holding members disposed at predetermined intervals and a spindle having an axis and axially movable toward and away from said tool holding device, wherein each of said plurality of tool holding members has an axis substantially parallel to the axis of said spindle and is supported for movement in an axial direction of said each of said plurality of tool holding members, and driving means is provided for moving said each of said plurality of tool holding members in the axial direction, said plurality of tool holding members being arranged in a matrix pattern, said driving means including a plurality of fluid-operated cylinders having axes and disposed in a matrix pattern in an axially aligned relationship with said plurality of tool holding members, respectively, wherein said driving means further include:

fluid supplying means including a first group of a plurality of fluid passages for supplying a fluid pressure to respective rows of a first group of rows of cylinders, a second group of a plurality of fluid passages for supplying a fluid pressure to respective rows of a second group of rows of cylinders, a first group of a plurality of valves for respectively supplying fluid to the plurality of fluid passages of said first group so as to respectively provide the cylinders in the rows of said first group with downward forces, a second group of a plurality of valves for respectively supplying fluid to the plurality of fluid passages of said second group so as to respectively provide the cylinders in the rows of said second group with upward forces, and controlling means for operating said first and second groups of valves; and

means for urging a tool holding member of said plurality of tool holding members aligned with one cylinder of said plurality of fluid-operated cylinders when said one cylinder is simultaneously provided with the downward and upward forces, to thereby keep said one cylinder at a lowered position.

5,111,574

METHOD AND APPARATUS FOR PRODUCING SUPERCONDUCTING JOINTS

David B. Smathers, Salem, Oreg., assignor to Teledyne Industries, Inc., Albany, Oreg.

Filed Dec. 5, 1988, Ser. No. 279,777

Int. Cl.[5] H01L *39/24*

U.S. Cl. 29—599 **13 Claims**



1. In unalloyed wires for superconducting said wires comprising a bundle of filaments of tin (Sn) and niobium (Nb) contained within a binder metal, a method of joining two wires with a superconducting joint comprising the steps of:

a) exposing the filaments on the ends of the wires to be joined;

b) intertwining the exposed filaments;

c) sealing the exposed filaments in a copper-enriched chamber; and,

d) heating the chamber to a temperature and for a time sufficient for the Sn and Nb to diffuse together and form Nb_3Sn at their interface.

5,111,575

SWAGING TOOL FOR BEARING INSTALLATION

Mark R. Grunze, Naperville, and Robert E. Franzen, Wheaton, both of Ill., assignors to Rexnord Corporation, Milwaukee, Wis.

Filed Feb. 24, 1989, Ser. No. 315,389

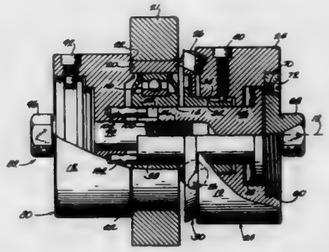
Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—725 **16 Claims**

1. A tool for swaging a lip of a bearing into a chamfer of a bearing housing, the bearing having an axially extending bore therethrough, said tool comprising:

a roller fixture assembly adapted to be generally positioned on one side of the bearing and including a roller fixture shell having a first side obliquely supporting at least three rollers for engagement with the bearing lip to swage the lip against the bearing housing, said roller fixture assembly further including a roller fixture clamping body supported by said roller fixture shell for rotation about the axis of the bore, relative to said roller fixture shell, said roller fixture clamping body including an axially extending threaded portion at the side thereof axially closest to the bearing bore, the first side of said roller fixture shell having an axially extending bore allowing said threaded portion of said clamping body to be exposed, said roller fixture shell having a second side axially opposite said first side and adapted to be rotated about the axis of the bearing bore, with respect to the bearing;

a locating fixture assembly adapted to be generally positioned on the other side of the bearing and including a locating fixture shell having a first side adapted to be positioned against the bearing, a second side axially opposite said first side, said locating fixture assembly further



including a clamping screw supported by said locating fixture shell for rotation about the axis of the bore, relative to said locating fixture shell, said clamping screw including an axially extending threaded portion at the side thereof axially closest the bearing bore, the first side of said locating fixture shell having an axially extending bore allowing said threaded portion of said clamping screw to be exposed, said threaded portion of said clamping screw being adapted to mate with said threaded portion of said clamping body along the axis of the bearing bore, relative rotation of said clamping screw with respect to said clamping body causing said roller fixture assembly to be pulled toward said clamping fixture assembly to provide a swaging force between said rollers and the bearing lip, a portion of said clamping screw being exposed from said second side of said locating fixture shell and adapted to be rotated about the axis with respect to said locating fixture shell; and

means for preventing rotation of said locating fixture shell relative to said roller fixture clamping body and about the axis.

5,111,576

METHOD OF MAKING A FLEXPROP

William G. Kuhnle, Hopatcong, and James F. Murnane, II, Andover, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 349,557, May 8, 1989. This application May 7, 1990, Ser. No. 520,300

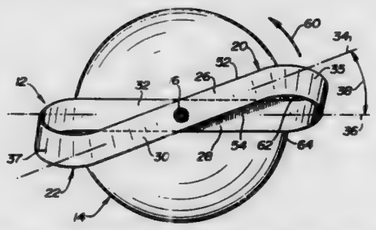
Int. Cl.[5] B21K *3/04*

U.S. Cl. 29—889.23 **2 Claims**

1. A process of manufacture of a propeller with a rotation axis, including the steps of:

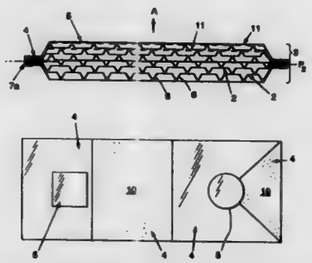
shaping a structural ribbon into two substantially bow-shaped blades with each blade having an upper portion

with a leading edge and a trailing edge and having a lower portion with a leading edge and a trailing edge;
aligning the upper portions along a common upper axis;
aligning the lower portions along a common lower axis;
angularly displacing the upper portions and common upper



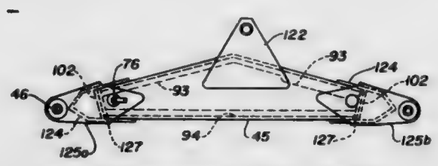
axis relative to the lower portions and common lower axis to form a projected angle between the common upper axis and the common lower axis and to form tilted angles in the upper portions and to form bent return tip portions; and
fixedly connecting the upper portions to the lower portions adjacent to the rotation axis.

5,111,577
PAD INCLUDING HEAT SINK AND THERMAL INSULATION AREAS
William M. Sheridan, St. Louis, and Raymond E. Ragland, Union, both of Mo., assignors to ATD Corporation, St. Louis, Mo.
Division of Ser. No. 468,425, Jan. 22, 1990, Pat. No. 5,011,743. This application Jan. 8, 1991, Ser. No. 638,460
Int. Cl.[5] B21D *53/00*; **B21K** *29/00*; **P23P** *15/26*
U.S. Cl. 29—890.039 **19 Claims**



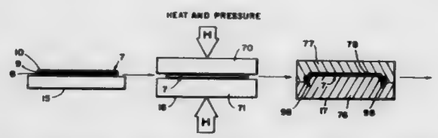
1. A method of making a heat insulating pad having insulating and heat sink areas, comprising:
a step of assembling a plurality of layers of metal foil in a stack wherein said layers are arranged one above another in a vertical direction, at least two of said layers being separated from each other by a plurality of embossments on at least one of said layers;
a step of compressing at least one portion of said stack such that heat sink and insulating areas are formed therein with said layers providing better heat conduction in said vertical direction at said heat sink area than at said insulating area, said embossments in said insulating area separating said layers so as to provide a gap therebetween; and
a step of securing said layers together in said heat sink area, said securing step including interengaging said layers in said heat sink area with each other.

5,111,578
METHOD OF MANUFACTURING A BACKHOE BOOM
Garry L. Ball, Lancaster, Pa.; Russell I. Johnson, Leonard, Mich., and Daniel D. Radke, Antwerp, Belgium, assignors to Ford New Holland, Inc., New Holland, Pa.
Division of Ser. No. 440,936, Nov. 22, 1989, Pat. No. 4,997,333. This application Feb. 21, 1991, Ser. No. 658,625
Int. Cl.[5] B21D *11/00*
U.S. Cl. 29—891 **4 Claims**



1. A method of manufacturing a boom member for a backhoe assembly operably mounted at the rear of a prime mover comprising the steps of:
rough cutting a pair of blanks in a desired configuration such that each blank has first, second and third roughly formed edges and a pair of opposing roughly formed end edges;
bending said blanks along a first set of bend lines to form generally perpendicularly extending legs corresponding to said first, second and third edges;
rebending said blanks along a second set of bend lines to reorient said legs to form a pair of C-shaped channel members with said first and second edges of each said channel member being oriented in a facing relationship with respect to the corresponding third edge;
affixing said channel members to one another in an oppositely facing configuration with the corresponding said legs adjoining, such that said first, second and third edges are positioned internally;
affixing end caps, containing a shear panel oriented transversely to said legs, to said cojoined channel members adjacent the opposing end edges thereof, said shear panels being positioned relative to the respective said end edges to create a gap between each said shear panel and the corresponding said end edge so that a specified distance between corresponding extremities of said end caps can be maintained; and
affixing pivot carriers to said cojoined channel members adjacent the opposing end edges thereof so that said end caps and said pivot carriers conceal said roughly formed end edges.

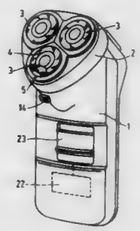
5,111,579
METHOD FOR MAKING A FRAMELESS ACOUSTIC COVER PANEL
Carl W. Andersen, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Dec. 14, 1989, Ser. No. 450,917
Int. Cl.[5] B23P *17/00*
U.S. Cl. 29—897.32 **39 Claims**



1. A method for making acoustic cover panels for portable room partitions of the type having a freestanding frame with at least one acoustic cover panel connected with an enclosing an associated side of the frame, said method comprising:

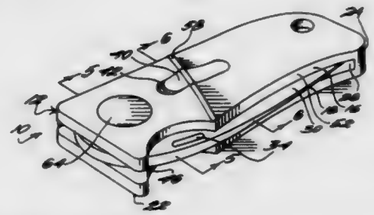
providing a non-woven backing material of the type having adjacent fibers interconnected by heat fusible means;
cutting a backing sheet from the backing material to a predetermined shape with a marginal edge;
providing an upholstery material having a finished exterior surface;
cutting an upholstery sheet from the upholstery material to a predetermined shape with a marginal edge and a size commensurate with the backing sheet;
assembling the backing sheet and the upholstery sheet by positioning an interior side of the upholstery sheet on an exterior side of the backing sheet.
adhering the interior side of the upholstery sheet to the exterior side of the backing sheet to define a composite sheet with a marginal edge;
heating the composite sheet to soften the heat fusible means in the backing sheet;
forming the heated composite sheet by creasing outer portions of the composite sheet along predetermined crease lines spaced inwardly from the marginal edge of the composite sheet to form integral flanges which are bent inelastically inwardly from the crease lines at a selected angle to the remaining generally planar portion of the composite sheet to create a one-piece, frameless molded cover panel with a predetermined, tray-like shape adapted to mate with and cover one side of the panel frame;
cooling the composite sheet while in the predetermined tray-like shape, such that the composite sheet permanently assumes the predetermined tray-like shape, which serves to stiffen and rigidify the one-piece, frameless cover panel to a degree which facilitates manual handling of the same and attachment to the panel frame, yet permits selected flexure along at least one of the flanges to facilitate mating abuttment with either the frame or an adjacent one of the cover panels.

5,111,580
ELECTRIC SHAVING APPARATUS
Geert J. Bosscha, and Andries C. Pasma, both of Drachten, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Dec. 5, 1990, Ser. No. 622,665
Claims priority, application Netherlands, Dec. 14, 1989, 8903065
Int. Cl.[5] B26B *19/44, 19/48*; **H01H** *9/00, 9/18*
U.S. Cl. 30—41.7 **16 Claims**



1. An electric shaving apparatus having a housing, a switch for activating a switching cycle in which the apparatus is switched on and off, a holder for at least one external shaving member with hair-entry apertures, and an internal shaving member, the housing having a collecting space for shaving particles, which collecting space has a closing member with a locking mechanism having an actuating member for locking and unlocking the closing member, the apparatus comprising detection means for determining that cleaning of the collecting space is desirable, and a signalling device for signalling that cleaning of the collecting space is desirable, said detecting means being effective to activate said signalling means responsive to a selected or predetermined indication of soiling of the collecting space, wherein the signalling device comprises a light-emitting element in combination with the actuating member of said locking mechanism.

5,111,581
BOLT OPERATED LOCKING MECHANISM FOR FOLDING KNIFE
Walter W. Collins, P.O. Box 100, North, S.C. 29112
Filed Nov. 6, 1991, Ser. No. 788,489
Int. Cl.[5] B26B *1/04, 1/00, 1/06*
U.S. Cl. 30—161 **9 Claims**

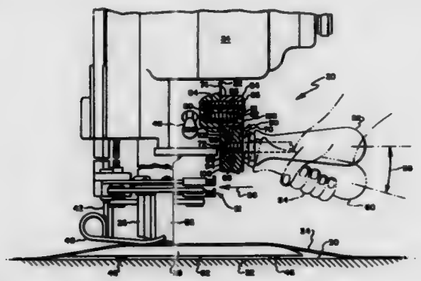


1. A device comprising:
a handle having two sides, a first end, a second end, and a groove running from said first end to said second end;
a pivot post integral with said first end of said handle;
an implement pivotally attached to said handle at said first end, said implement having a hole at one end, said hole dimensioned to receive said pivot post,
said implement having an extended position and a closed position, said implement being in said closed position when pivoted about said pivot post into said groove of said handle, said groove dimensioned to receive said implement, said implement being in said extended position when pivoted about said pivot post out of said groove; and
means for locking said implement in said extended position, said locking means carried within said handle;
a slidable bolt operable from at least one of said sides of said handle, said bolt slidable between a first position and a second position, said first position being toward said second end of said handle and said second position being toward said first end of said handle;
means for engaging said implement, said engaging means having an implement engaging position and an implement disengaging position, said implement prevented from pivoting about said pivot post when said engaging means is in said engaging position, said engaging means carried by said handle; and
means for transferring sliding motion of said bolt to said engaging means so that said bolt can move said engaging means between said engaging position and said disengaging position, said engaging means in said disengaging position when said bolt is in said second position.

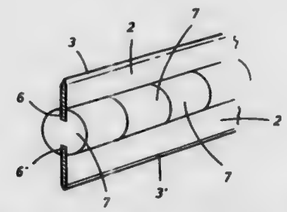
5,111,582
ERGONOMIC HANDLE FOR CUTTING MACHINE
Robert J. Pieroni, Youngstown, N.Y., assignor to Eastman Machine Company, Buffalo, N.Y.
Filed Sep. 9, 1991, Ser. No. 756,823
Int. Cl.[5] B25F *3/00*; **A47B** *95/02*; **F16C** *11/00*
U.S. Cl. 30—225 **21 Claims**

1. An adjustable handle mechanism in combination with a machine, comprising a block, means for rigidly mounting said block to a machine housing, a link, a longitudinal handle connected to said link and extending outwardly of the housing, a first pin pivotally connecting said link to said block, means comprising a second pin having an eccentric portion in engagement with said link for pivotally moving said link through a

predetermined angle in response to rotatable movement of said second pin, and means for rotating said second pin whereby the angular position of the handle relative to the machine housing may be adjusted.



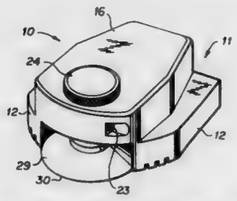
5,111,583
BLADED IMPLEMENT
Jose M. Martinez Alcala, s/n, Energia Street, 08004 Barcelona, Spain
Filed Jul. 12, 1991, Ser. No. 729,347
Claims priority, application Spain, Oct. 17, 1990, 9002614
Int. Cl.[5] B26B *9/00*
U.S. Cl. 30—346 **10 Claims**



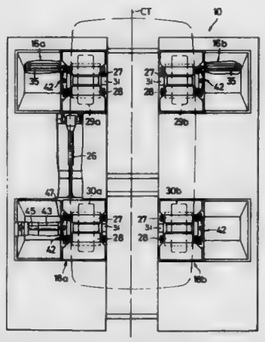
1. A bladed implement which comprises a handle and a flexible blade extending from the handle, a longitudinal guide which extends along the blade from the handle to a distal end adjacent a free end of the blade, a series of slides mounted end to end along said guide for sliding movement along the guide, the slides having an inoperative position in which they are separated from one another permitting flexing movements of the blade, and an operating mechanism at least partially housed in the handle for causing the slides to be releasably applied with pressure against one another end to end with an endmost one of the slides being applied against a stop provided at the distal end of the guide, thereby forming the blade into a substantially rigid body which resists said flexing movements.

5,111,584
CROWN PLANING TOOL
David A. Iero, 3330 Danielle Way, Suwanee, Ga. 30174, and Homer Hardeman, 3756 Sherwood Dr., Douglasville, Ga. 30135
Filed Oct. 21, 1991, Ser. No. 779,880
Int. Cl.[5] B27G *17/02*
U.S. Cl. 30—489 **7 Claims**

1. A crown planing tool comprising a body having a pair of juxtaposed runners with a channel therebetween open at at least one end and with said runners having coplanar bottom surfaces, and a disc-shaped blade mounted to said body at least partially within said channel with a cutting edge positioned substantially coplanar with said runner bottom surfaces, whereby a crown, raised ridge or the like formed in constructing or repairing furniture may be planed level with the surface surrounding it by sliding the tool over the crown with the runners straddling the crown so that the blade may plane the crown level with the surrounding surface without the tool being lifted or tilted by the crown.

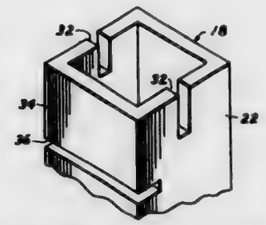


5,111,585
METHOD AND APPARATUS FOR MEASURING AND ADJUSTING THE WHEEL ALIGNMENT OF AUTOMOTIVE VEHICLES
Tsunenori Kawashima, Chiba; Morihiro Shimada, Tokyo, and Hiroshi Fujii, Hiroshima, all of Japan, assignors to Iyasaka Seiki Co., Ltd., Tokyo and Mazda Motor Corporaton, Hiroshima, both of, Japan
Filed Nov. 20, 1990, Ser. No. 616,777
Claims priority, application Japan, Nov. 21, 1989, 1-302500; Nov. 21, 1990, 2-316651
Int. Cl.[5] G01B *5/255, 7/315*
U.S. Cl. 33—203.12 **4 Claims**



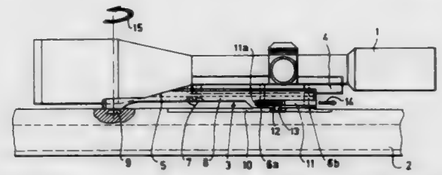
1. A method of measuring and adjusting the wheel alignment of a four-wheeled automotive vehicle wherein the toe-in-angle of each wheel must be checked and adjusted to manufacturer's specifications, which comprises the steps of:
(a) rotating the front and rear tires of the vehicle on respective roller units which are held for free horizontal movement longitudinally of the vehicle;
(b) bringing the outer side walls of both front tires into pressure contact with a first sensor unit and restricting axial movement of the front tires;
(c) measuring the pressure developed on contact of the front tires with the first sensor unit;
(d) measuring the toe-in-angle of each of the front and rear tires with a second sensor circuit;
(e) adjusting the toe-in-angle of each of the rear tires to the manufacturer's specifications until the pressure measured in step (c) becomes zero; and
(f) adjusting the toe-in-angle of each of the front tires.

5,111,586
VEHICLE WHEEL ALIGNMENT TOOLS
Nichol C. Huynh, 505 Harr Dr., Apt. G, Midwest City, Okla. 73110
Continuation-in-part of Ser. No. 700,432, May 15, 1991. This application Sep. 11, 1991, Ser. No. 757,771
Int. Cl.[5] G01B *5/255*
U.S. Cl. 33—203.18 **4 Claims**



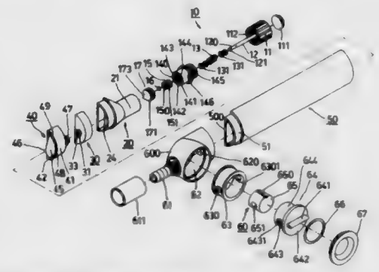
1. A vehicle wheel alignment testing apparatus comprising:
a pair of support posts having upper and lower end portions, the upper end portion of each post of said pair of posts having a transverse end slot and a transverse wall slot;
mounting means at the lower end portion of each post of said pair of posts for connecting each post in a vertical plane to the respective wheel of a pair of vehicle wheels;
a pair of protractor plate means including a protractor scale having a center point on each plate means of said pair of protractor plate means, each plate means of said pair of plate means being supported by a selected one of the slots in the upper end portion of each post of said pair of posts for cooperatively supporting said protractor scales in selected horizontal or vertical coplanar relation; and,
strand means extending between the center points of said protractor scales and intersecting the respective protractor scale for indicating the angular position of each wheel of said pair of wheels relative to each other and the vehicle chassis.

5,111,587
ADAPTOR FOR RELEASABLY ATTACHING A SIGHTING TELESCOPE TO A WEAPON
Franz Plank, Munich, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany
Filed May 29, 1991, Ser. No. 706,878
Claims priority, application Fed. Rep. of Germany, May 30, 1990, 9006133[U]
Int. Cl.[5] F41G *1/38*
U.S. Cl. 33—247 **19 Claims**



10. A removable adaptor for releasably holding a sighting telescope and for releasably attaching the sighting telescope to a weapon, the adaptor comprising:
an elongated base body having upper and lower sides;
holding means formed on said upper side for holding the sighting telescope therein;
rigid fixing means formed on said lower surface for engaging the weapon at a first location on the weapon;
movable fixing means for releasably engaging the weapon at a second location on the weapon; and
said holding means defining a supporting surface for the sighting telescope extending over the entire length of said base body;
the sighting telescope having a rail formed thereon;
said holding means including a rail guide formed on said upper side and said rail guide defining an opening having a wedge-shaped cross section for receiving said rail of the sighting telescope therein; and,
said movable fixing means including: a rigid stop formed on said base body for engaging said weapon at a first position thereon at said second location; a movable clamping piece pivotally mounted on said base body for movement between a clamp position wherein said clamping piece engages the weapon at a second position thereon at said second location to coact with said stop to clamp said base body to the weapon and a disengage position wherein said clamping piece is disengaged from said weapon.

5,111,588
LEVEL VIAL
Wen-Pin Wung, No. 146, Chi-Kuang St., Chung Dist., Taichung City, and Wen-Jenn Worng, No. 28, Alley 1, Ta-Ho I Lane, Hsi-Tun Dist., Taichung City, Taiwan
Filed Aug. 14, 1991, Ser. No. 744,982
Int. Cl.[5] G01C *5/04, 9/22*
U.S. Cl. 33—367 **11 Claims**



1. A level vial, comprising:
a pair of elongated vessels, each including a transparent tube portion having a top open end and a bottom open end, a gradually tapered portion extending from said top open end of said transparent tube portion, a neck portion extending outwardly from one end of said tapered portion, and an annular flange extending inwardly from said one end of said tapered portion and defining an axial opening;
a flexible elongated pipe having two ends respectively connected to said bottom open end of said transparent tube portion of said elongated vessels to communicate with said transparent tube portion so as to contain water therein;
a pair of air venting means, each of which including a solid cylindrical air guide member having a lower end portion sealingly extending into said neck portion, an upper end portion extending outwardly from said lower end portion, an axial through opening and axially extending air passages; a tubular rotary cap having a closed top end and a lower portion screwed to said upper end portion of said air guide member; an axial guide shaft extending inwardly from said closed top end of said rotary cap through said axial through opening of said air guide member and having a distal end provided with a piston to selectively extend into said annular flange and seal said axial opening of said annular flange; and a spring means provided around said guide shaft and maintaining said rotary cap away from said air guide member when said rotary cap is unscrewed from said air guide member;
a float restraining member fixed to and extending inwardly from an inner wall surface of said transparent tube portion of each of said elongated vessels, said float restraining

member being disposed adjacent to said top open end of said transparent tube portion and defining an axial through hole; and

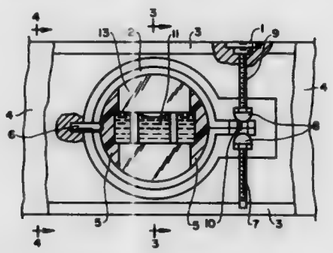
a floating article provided in said transparent tube portion of each of said elongated vessels inwardly of said float restraining member, said floating article blocking said axial through hole of said float restraining member when water inside said transparent tube portion rises to the vicinity of said top open end of said transparent tube portion.

5,111,589

ADJUSTABLE PLUMB/LEVEL

Edwin M. Tate, 3801 South Quail La., Chattanooga, Tenn. 37415

Filed Sep. 26, 1991, Ser. No. 765,831
Int. Cl.[5] G01C *9/28*
U.S. Cl. 33—385 **14 Claims**



1. An adjustable plumb level, comprising:

an I-shaped structure beam having first and second opposite, flat sides;

means disposed on said first side and said second side for protecting said adjustable plumb level;

wherein said I beam shaped structure and said protecting means include a circular aperture formed completely therethrough from a first surface to a second surface;

a replaceable indicating mechanism disposed in said circular aperture, said indicating mechanism including:

a straight levelling-type vial having a levelling bubble and levelling marks between which said levelling bubble sits to indicate proper level or plumb;

a circular vial container including means for retaining said straight vial therein, and outer surfaces defining a circular shape;

vial protecting means for protecting said straight vial, disposed between said outer surfaces of said circular vial container and said first and second side of said I beam-shaped structure; and

means for retaining said vial container within said circular aperture while allowing rotation of said outer surfaces relative to said circular aperture;

means for adjusting a rotational position of said indicating mechanism relative to said first and second sides, said adjusting means interacting with said vial container; and

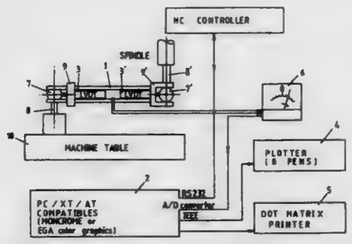
means for restraining said vial container so that said adjusting means can only move said indicating mechanism over a limited range.

5,111,590

MEASURING METHOD OF MACHINE TOOL ACCURACY USING A COMPUTER AIDED KINEMATIC TRANSDUCER LINK AND ITS APPARATUS

Joon-ho Park, 13-803 Woosung Apt, Chamsilbondong, Songpaku, Seoul, Rep. of Korea

Filed May 21, 1990, Ser. No. 526,266
Claims priority, application Rep. of Korea, May 23, 1989, 89-6892
Int. Cl.[5] G01C *25/00*
U.S. Cl. 33—502 **6 Claims**



1. A computer aided kinematic transducer link system for assessing the contouring capabilities of a machine tool on a working table, comprising:

a first ball mounted on a spindle at an end of said machine tool and supported with a first ball holding support,

a second ball mounted on a magnetic base on said working table and supported with a second ball holding support,

a kinematic transducer link having single axis linear transducers supported between said first and second balls in a pseudo kinematic way, said kinematic transducer link being aligned by a spring loading onto a three point contact with said second ball at a workpiece position on said working table and a forked linear guide action on said first ball at a working position of said machine tool,

a kinematic transducer link setting fixture for set-up of required set-up lengths of said kinematic transducer link, and

electronic probes respectively mounted beside said first and second balls and within said kinematic transducer link for assessing the contouring capabilities of said machine tool during operation of said machine tool.

5,111,591

PROTECTIVE ARRANGEMENT FOR A LONGITUDINALLY EXTENDIBLE MACHINE COMPONENT

Heinz Abramowsky, Giengen; Helmut Müller, Schwäbisch-Gmünd, and Roland Roth, Waldstetten, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

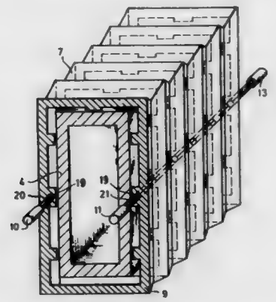
Division of Ser. No. 416,724, Oct. 3, 1989, Pat. No. 5,038,488. This application Mar. 18, 1991, Ser. No. 670,926
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1988, 3833680
Int. Cl.[5] G01B *5/20*
U.S. Cl. 33—503 **4 Claims**

1. A protective arrangement for an elongated machine component defining a longitudinal axis and being extendible and retractable along said axis so as to be at a first position corresponding to a first distance away from a reference position and to then be at a second position corresponding to a second distance away from the reference position, the protective arrangement comprising:

a light barrier unit having a response sensitivity and including: a light source for directing a light beam parallel to said axis and, first and second detectors for receiving first and second portions of the light beam and for supplying

first and second signals indicative of the intensities of said portions;

said light source and said detectors being mounted on said machine component so that the length of the light beam between said source and said detectors and the respective light intensities received by said detectors change in correspondence to said distances as said machine component is extended or retracted;



shading means for shading said light beam in response to a contact engagement of said shading means with an object or person; and,

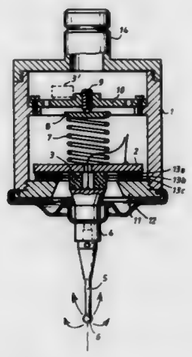
comparator circuit means for comparing said signals and remaining nonconductive so long as said light intensities uniformly increase or decrease with changes in said distances and to provide an output signal for bringing said machine component to standstill in response to uneven changes in said intensities relative to each other when said light beam becomes shaded by said shading means.

5,111,592

PROBE HEAD OF THE SWITCHING TYPE

Peter Aehnelt, Oberkochen, and Eckhard Enderle, Aalen-Dewangen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, d/b/a Carl Zeiss, Oberkochen, Oberkochen, Fed. Rep. of Germany

Filed Oct. 17, 1991, Ser. No. 779,362
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1991, 4123081
Int. Cl.[5] G01B *5/03*
U.S. Cl. 33—561 **18 Claims**



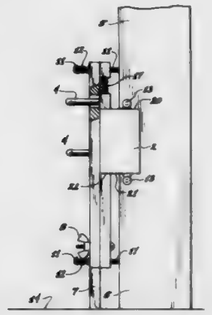
1. A probe head of the switching type, comprising a fixed part (1) and a deflectable part (2) which mounts a probe pin (5) having a longitudinal axis that is centered in a position of rest by a leaf-spring coupling (13), said deflectable part (2) being urged axially and indirectly toward the fixed part (1) of the probe head by reason of the leaf-spring coupling (13) being interposed between the fixed and deflectable parts, the coupling (13) comprising a stacked plurality of individual leaf-spring disks (13*a–c*) lying on top of one another and interconnected at local sector regions which, with respect to said axis, are angularly offset from each other for the connection of successive adjacent pairs of disk surfaces, the connections being such that, in the position of rest, the disks are in flat-to-flat surface abutment with each other in the stack as well as in flat-to-flat surface abutment with said fixed part and with said movable part.

5,111,593

TEMPLATE FOR POSITIONING OUTLET BOXES

Patrick K. Gehen, Sr., 63 S. Ogden St., Buffalo, N.Y. 14210

Filed Jun. 17, 1991, Ser. No. 716,102
Int. Cl.[5] B25B *11/00, 3/00*
U.S. Cl. 33—613 **6 Claims**



1. A template for installing electrical outlet boxes which comprises in combination a main panel having on its front face handle means and on an opposite back face a clamping means, said clamping means adapted to firmly hold an electrical outlet box in position, movably located on a lower section of said main panel is a vertical adjusting means which is adapted to measure and determine the vertical location of the box as it is mounted onto main panel via said clamping means and wherein said main panel has depth determining means located on all four corners of said main panel.

5,111,594

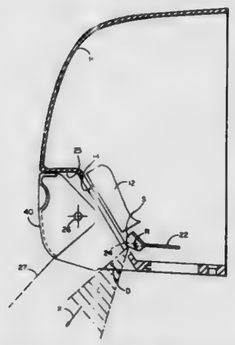
HAND DRIER HAVING A PLURALITY OF TRANSMITTERS AND AT LEAST ONE RECEIVER LOCATED IN THE VICINITY OF THE OUTLET

Peter W. Allen, Eynsham, United Kingdom, assignor to Airdri Limited, England

Filed Mar. 15, 1991, Ser. No. 669,423
Claims priority, application United Kingdom, Mar. 17, 1990, 9006068
Int. Cl.[5] F26B *3/34*
U.S. Cl. 34—1 X **5 Claims**

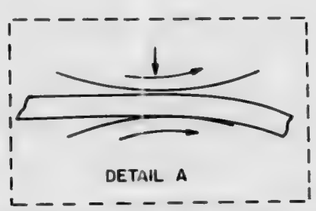
1. A hand drier having an air outlet at which an object for drying is presented to activate the hand drier, characterised by a plurality of transmitters of electromagnetic radiation and at least one receiver, sensitive to the radiation to be emitted by at least one of the plurality of transmitters, being located in the vicinity of the outlet, the plurality of transmitters being spaced apart one from another and from the at least one receiver, the at least one receiver being masked from receiving direct emissions from any of the plurality of transmitters; and the plurality of transmitters and the at least one receiver being located relative to a working volume at the air outlet so that, upon an

object being located in the working volume, a drying cycle is initiated by the passage of emission from the transmitters being



scattered by the object so as to cause at least indirect emission from the object to be reflected to the at least one receiver.

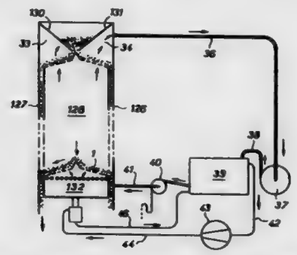
5,111,595
CHILL ROLL NIP
Daniel J. Bessinger, Green Bay, and Philip E. Netzer, Appleton, both of Wis., assignors to W. R. Grace & Co.-Conn., New York, N.Y.
Filed Feb. 21, 1990, Ser. No. 482,465
Int. Cl.[5] F26B *3/00*
U.S. Cl. 34—18 **12 Claims**



9. A method of substantially eliminating web coating solvent condensate from accumulating on a surface of a chill roll onto which said web is directed to travel in partial wrapping engagement, said method comprising creating, in association with the weight and tension of said web, a force opposing that formed as said web approaches said chill roll, to cause said web to move towards said chill roll surface, said force being created by positioning a second roll in relation to said chill roll so as to form a nip through which said web travels, said nip being larger than the thickness of said web.

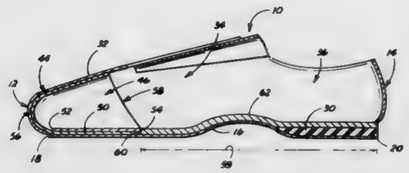
5,111,596
DRYING PROCESS AND TOWER FOR PRODUCTS IN GRAIN FORM
François Laureaty, 52 Rue Lenain de Tillemont, 93100 Montreuil, France
Filed Jul. 5, 1990, Ser. No. 548,625
Claims priority, application France, Jul. 6, 1989, 89 09143
Int. Cl.[5] F26B *17/00, 17/12*
U.S. Cl. 34—57 A **15 Claims**

1. Process for drying granulous products with substantial energy saving with a drying fluid selected from the group comprising steam saturated air, steam saturated inert gas, saturated steam and a solvent in counterflow with respect to said products admitted at the top of a vertical drying tower comprising a number of stages of superimposed perforated grills adapted to support said products with series of heating crossed tubes located under each of said grills, said process comprising: admitting said drying fluid at the bottom of said tower and under the first series of said crossed tubes at a temperature of θ_0, ascendantelly circulating said drying fluid from one stage to the other, whereby said drying fluid becomes progressively saturated with steam evaporated by the granulous products being dried, and is superheated to a temperature greater than



θ_0 by contact with said crossed tubes under each stage and is thus heated to a temperature θ_2 higher than θ_0, and then passing said drying fluid through the perforated grill of each stage and through the granulous products supported by said grill, fluidizing said products and drying them in each stage until said drying fluid emerges from the top of said tower at a temperature θ_1 less than θ_0, and recycling said drying fluid to the bottom of said tower at said temperature θ_0.

5,111,597
DANCE SHOE WITH TOE SUPPORT
Mindy L. Hansen, and Mandy L. Hansen, both of 11601 Blue Sage Rd., Oklahoma City, Okla. 73120
Filed May 16, 1989, Ser. No. 352,845
Int. Cl.[5] A43B *5/12*
U.S. Cl. 36—8.3 **5 Claims**

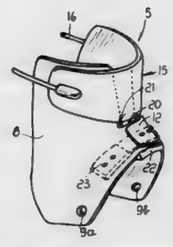


1. An improved jazz dance shoe of the type having a toe end and a heel end with an outer sole constructed of a flexible material and without a rigid shank extending between the toe end and the heel end, and an outer covering constructed of a flexible material connected to the outer sole and cooperating with the outer sole to substantially encompass a foot space with a foot opening being formed through the outer covering whereby an individual's foot is disposable through the foot opening and into the foot space with the outer covering substantially covering an upper portion of the individual's foot and extending over a substantial portion of the individual's arch, and means for securing the outer covering to the individual's foot whereby the outer sole and the outer covering are secured snugly to the individual's foot and cooperate to cover the individual's foot, the jazz dance shoe being worn by the individual and suitable for use when the individual performing jazz dance movements, the improvement comprising:

a rigid toe support having an forward end and a rearward end and encompassing a toe space with a toe opening formed through the rearward end thereof intersecting the toe space, the toe support being disposed in the foot opening near the toe end of the jazz dance shoe with the forward end of the toe support being disposed near the toe

end of the jazz dance shoe, whereby an individual's toes are disposable through the toe opening and disposed within the toe space when the individual's foot is disposed in the foot space, the toe support being constructed and adapted to provide a support for cooperating to enable an individual to stand on the ends of an individual's toe when the individual's foot is supported within the foot space in the jazz dance shoe, the jazz dance shoe being without a rigid shank extending between the toe end and the heel end of the jazz dance shoe, and the rearward end of the toe support being spaced a distance from the heel end of the jazz dance shoe greater than one-half of the length of the jazz dance shoe extending generally between the toe end and the heel end of the jazz dance shoe, and the jazz dance shoe with the toe support being suitable for use by the individual when performing jazz dance movements.

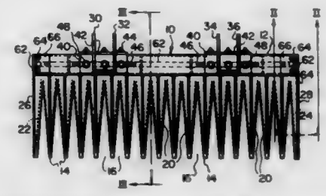
5,111,598
SKI BOOT WITH MIXED FRONT ENTRY AND REAR ENTRY STRUCTURE
Mariano Sartor, Montebelluna, and Valerio Tonel, Biadene, both of Italy, assignors to Nordica S.p.A., Montebelluna, Italy
Filed Feb. 8, 1991, Ser. No. 652,695
Claims priority, application Italy, Feb. 16, 1990, 82523 A/90
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—117 **10 Claims**



1. Ski boot with mixed front entry and rear entry structure, comprising a shell, a front quarter and a rear quarter, said rear quarter being pivotally connected to said shell, said front quarter comprising a first lateral element and a second lateral element arranged at opposite sides of said ski boot, each of said first lateral element and said second lateral element having a lower portion connected to said shell and an upper portion, said upper portion of each of said first lateral portion and said second lateral portion defining a flap element, wherein said ski boot further comprises a band element arranged externally to each said upper portion of said first lateral element and said second lateral element, said band element being slidably engaged with said flap element of each of said first lateral portion and said second lateral portion of said front quarter, by being connected to the first and second elements at a location spaced below the flap elements said ski boot further comprising means for applying longitudinal traction to opposite lateral ends of said band element to thereby apply a closing pressure to each said flap element of said front quarter.

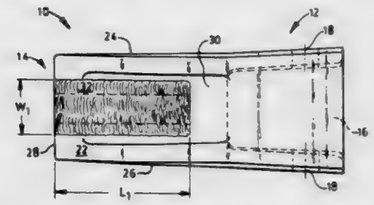
5,111,599
BRUSH CLEARING IMPLEMENT
Stanley A. DeSalvo, and Diane Scissons, both of R.R. #1, Lombardy, Ontario, Canada K0G 1L0
Filed Nov. 2, 1990, Ser. No. 608,461
Claims priority, application Canada, Jan. 19, 1990, 2008203
Int. Cl.[5] E02F *3/76*
U.S. Cl. 37—2 R **3 Claims**

1. An implement for uprooting bushes and trees adapted to be mounted on a tractor having a front end loading apparatus, said implement comprising a substantially horizontal transversely extending bar having a front side and a back side, a plurality of pointed tooth-like projections mounted along said bar in side by side relation, said tooth-like projections having first and second tapered elongated side edges with the ends of said side edges of adjacent tooth-like projections which abut said bar converging so as to form an apex forward of said front side of said bar thereby defining V-shaped openings between said adjacent tooth-like projections such that said V-shaped



openings are narrow at the end adjacent said front side of said bar and wide at the opposite end, said tooth-like projections being constructed and arranged in order to engage bushes and trees of varying diameters and retain said bushes and trees to uproot said bushes and trees, and a pair of spaced apart brackets on said bar for connection to lifting members on said front end loading apparatus.

5,111,600
TOOTH WITH HARD MATERIAL APPLIED TO SELECTED SURFACES
Paul J. Lukavich, Washington, and Joseph W. Puckett, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Jul. 30, 1991, Ser. No. 739,127
Int. Cl.[5] E02F *9/28*
U.S. Cl. 37—141 T **10 Claims**



1. A tooth adapted for use on an implement to work earthen material, the tooth comprising:

a proximal end portion adapted for attachment of the tooth to the implement;

a distal end portion having a top surface, a bottom surface, opposed side surfaces, and a transverse forward edge having a predetermined width, each of the surfaces extending longitudinally form the proximal end portion to the transverse forward edge, the top surface and the bottom surface converge at the transverse forward edge to form a sharp edge for better penetration;

a first portion of hard wear resistant material having a predetermined width and length applied to the bottom surface at a location extending form adjacent the transverse forward edge longitudinally towards the proximal end portion, the predetermined width of the first portion of hard material being less than the predetermined width of the transverse forward edge; and

a second portion of hard material having a predetermined width and length applied to the top surface at a location extending from adjacent the transverse forward edge longitudinally towards the proximal end portion, the predetermined width of the second portion of hard material being less than the predetermined width of the first portion of hard material, the first portion of hard material in cooperation with the second portion of hard material

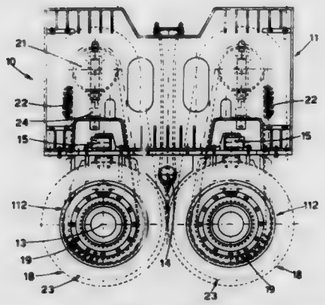
being operative during the life of the tooth to both increase the wear resistance of the tooth and maintain the sharp edge of the tooth for better penetration of the material being worked.

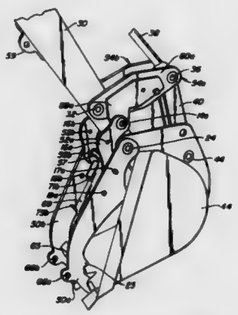
5,111,601

EXCAVATION DEVICE WITH ROTARY CUTTER HAVING A HORIZONTAL AXIS

Bruno Casagrande, Fontanafredda, Italy, assignor to Casagrande SpA, Fontanafredda, Italy

Filed Mar. 1, 1991, Ser. No. 662,958
Claims priority, application Italy, Mar. 16, 1990, 83350 A/90
Int. Cl.[5] E02F *3/24*
U.S. Cl. 37—91 **4 Claims**





1. Excavation device (**10**) with rotary cutter having a horizontal axis, said device (**10**) comprising:

a support structure (**11**);

excavation means including pairs of cutter wheels (**12–112**) mounted for rotation about their axis (**13**), said excavation means including drive means (**15**) and suitable transmission means for rotating said cutter wheels, said cutter wheels (**12–112**) being equipped with spaced apart main excavation tools (**18**),

said device (**10**) further including:

a plurality of excavation chains (**22**), each chain including secondary excavation tools (**23**) and associated with each respective cutter wheel (**12–112**),

a sprocket wheel (**19**) firmly secured (**20**) to the respective cutter wheel (**12–112**) for actuating each respective chain and

a transmission means (**21**) secured to the support structure (**11**) for mounting each said chain, said secondary excavation tools (**23**) borne by the excavation chains (**22**) of each pair of cutter wheels (**12–112**) covering a majority of the space between the main excavation tools (**18**).

5,111,602

BACKHOE CLAMP IMPROVEMENT

Joel V. Risch, 3275 Lucia Ave., Eureka, Calif. 95501

Filed Jul. 26, 1990, Ser. No. 558,880
Int. Cl.[5] E02F *3/76*
U.S. Cl. 37—117.5 **13 Claims**

1. Apparatus for attachment to a backhoe for conversion thereof to a clamping device, said backhoe having a bucket, a dipper arm and a pair of bucket links, said bucket being pivotally coupled to said bucket links along a first pivot axis, said bucket links being pivotally coupled to said dipper arm along a second pivot axis, and said bucket being pivotally coupled to said sipper arm along a third pivot axis, said apparatus comprising:

a mounting bracket mounted on each bucket link;

a pair of clamp links, one end portion of each clamp link being pivotally and substantially permanently coupled to one of said mounting brackets along a fourth pivot axis which is closer to said second pivot axis than to said first pivot axis;

said bucket links having means for temporarily immobilizing said clamp links at a position adjacent the respective bucket link when said bucket is positioned adjacent the dipper arm;

a pair of clamp arms, each clamp arm being pivotally coupled to one of said clamp links along a fifth pivot axis, said clamp arms also being pivotally coupled to said dipper arm; and

support webbing interconnecting said clamp arms, said support webbing comprising a bottom plate extending between and generally perpendicular to said clamp arms, a pair of clamp link guides positioned parallel to and spaced from said clamp arms, said clamp link guides welded to said bottom plate, guide gussets extending perpendicular to and connecting the clamp arms and clamp link guides, clamp arm gussets positioned generally parallel to said guide gussets and generally perpendicular to said clamp arms, a center reinforcement member extending under and in contact with said bottom plate and extending between said clamp arms, and a stop member extending between clamp arms, said support webbing connecting said clamp arms so that it permits said bucket to travel to a full closed arc position without interference between the dipper arm and clamp arms.

5,111,603

COUPLING FOR A SNOW PLOW

Leland P. Knowlton, 80 Forest St., Worcester, Mass. 01609, and Kirk A. Knowlton, P.O. Box 742, Worcester, Mass. 01602

Filed Aug. 29, 1990, Ser. No. 574,660
Int. Cl.[5] E01H *5/04*
U.S. Cl. 37—231 **6 Claims**

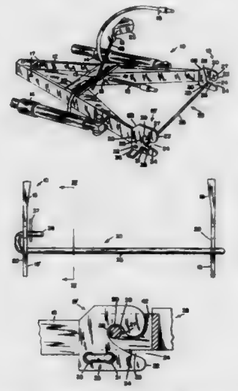
1. A coupling for a plow comprising:

(a) a push beam which is attachable to the front of a plow pushing vehicle, said push beam having at least one forwardly-extending arm at each end of the beam and a horizontal connecting pin for each arm which extends transversely of the arm, each of said arms having a bottom edge,

(b) a supporting frame which is attachable to the back side of a plow, said frame having a pair of rearwardly extending arms,

(c) a vertical mounting tab which is rigidly attached to the rearward end of each of said rearwardly-extending arms, said tab having a rear edge, an opening at said rear edge for receiving the corresponding one of said connecting pins, said opening continuing into a slot which extends upwardly and forwardly from said opening and which terminates in a forward edge, said slot enabling said connecting pin to travel from said opening to said forward edge as said push beam is moved toward said plow, each of said tabs having an aperture which is below said slot and forward of said opening, and

(d) an elongated bar which is removably mounted in said apertures so that when the bar is mounted in said apertures when said connecting pins are positioned in said slots, the bar is located directly below the bottom edges of said forwardly-extending arms so that the bar will be struck by said bottom edges when said connecting pins move rearwardly along said slots towards said openings, thereby preventing said pins from reaching said openings.

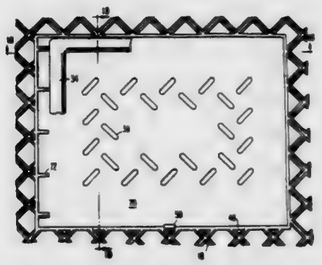


5,111,604

BASKET WALL AND PLACARD DISPLAY ASSEMBLY

Houston Rehrig, Richmond, Va. 23226, assignor to Rehrig International, Inc., Richmond, Va.

Division of Ser. No. 636,014, Jan. 4, 1991, which is a continuation of Ser. No. 333,680, Apr. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 190,065, May 4, 1988, Pat. No. 4,922,639, and a continuation-in-part of Ser. No. 579,052, Sep. 7, 1990, which is a division of Ser. No. 333,680, Apr. 6, 1989, and Ser. No. 533,144, Jun. 6, 1990, which is a continuation-in-part of Ser. No. 333,680, Apr. 6, 1989, and a continuation-in-part of Ser. No. 190,065, May 4, 1988, Pat. No. 4,922,639. This application Mar. 1, 1991, Ser. No. 663,023
Int. Cl.[5] G09F *3/00*
U.S. Cl. 40—308 **45 Claims**



1. A basket wall and display card assembly, comprising:

a basket wall having interior and exterior wall surface planes;

a back plate secured to and integrally formed and molded with said basket wall so as to lie generally encircled by said basket wall to form a single piece structure said back plate having a front face, a plate perimeter and an upright edge wall around a substantial portion of said plate perimeter and extending out from said front face, said front face being recessed in a distance from said exterior wall surface plane;

a display card frame, said back plate and said frame being manufactured as separate pieces; and

holding means for releasably holding said frame relative to said edge wall such that said frame and said back plate are in a securely held position, and for allowing said frame and said back plate to be completely separable one from the other;

wherein when said frame and said back plate are in the held position, a display card display area is defined generally therebetween wherein a replaceable display card can be held and viewed generally through said frame.

5,111,605

CODING BAND, IN PARTICULAR FOR ELECTRIC CABLES, AND CODING METHOD

Daniele Bossi, Milan, Italy, assignor to Co.E.P.T.E. Costruzioni Elettromec-Caniche per Trazione Elettrica S.r.l., Magenta, Italy

Filed Nov. 20, 1989, Ser. No. 440,560
Claims priority, application Italy, Aug. 9, 1989, 21480 A/89
Int. Cl.[5] G09F *3/20*
U.S. Cl. 40—316 **4 Claims**



1. In combination, an identification strip and a supporting element, said supporting element being attachable in particular to an electric cable which defines a longitudinal extension, said supporting element defining a channel-like seat extending, when said supporting element is attached to said cable, along the longitudinal extension of the cable, said channel-like seat defining an internal partition arrangeable near the cable and an external partition arrangeable away from the cable, said external partition being transparent, said strip defining a first end and a second end, said strip also defining a longitudinal extent which extends from said first end to said second end and a transverse extend which is perpendicular to said longitudinal extent, said strip defining a first portion arranged at said first end and a second portion arranged at said second end, said first portion of said strip defining a region provided with identifying information, said second portion being narrower in said transverse extent than said first portion, said second portion of said strip being slidably inserted into and through said channel-like seat to thereby be a pulling portion for said first portion of said strip, said first portion of said strip being lodged inside said channel-like seat with its said region with identifying information facing said transparent external partition, said strip being bent in a middle portion defined between said first and said second ends thereof and said second portion being folded substantially 180 degrees and reinserted back into said channel-like seat and lodged therein between said first portion of said strip and said internal partition of said channel-like seat.

5,111,606

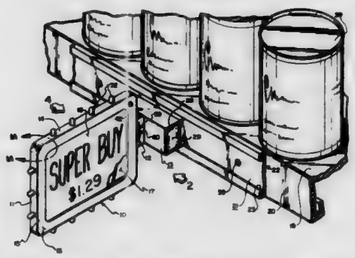
AT-SHELF LIGHTED MERCHANDISING DISPLAY

Randy B. Reynolds, 2194 E. Country View La., Salt Lake City, Utah 84121

Filed Jun. 11, 1990, Ser. No. 536,765
Int. Cl.[5] G09F *3/18*
U.S. Cl. 40—642 **3 Claims**

1. An at-shelf lighted merchandising display, including, in

combination, a panel having opposite faces defined by peripheral margins surrounding viewing openings, said panel also being provided with pockets contiguous with and communicating with said viewing openings, display cards bearing advertising indicia and removably disposed in said pockets, said panel also including a central portion defining inner sides of said pockets and having a flexible outwardly extending tab

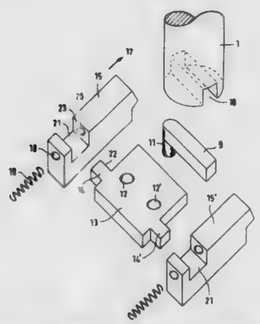


portion, a mounting clip secured to said tab portion and constructed to releasably engage the outer edge of an external display shelf, the combination of said panel and mounting clip being provided with an electrical circuit comprising a series of lights and a battery selectively coupled to said lights, said panel including a slot, said battery being disposed in said panel slot, and a cover is attached to said panel to cover said slot.

5,111,607
RESETTABLE BREECHBLOCK WEDGES IN A BREAK-OPEN FIREARM WITH TOP LEVER BREECHBLOCK

Horst Blaser, Isny im Allgäu, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Jan. 14, 1991, Ser. No. 640,865
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1990, 4000817
Int. Cl.[5] F41A *3/58*
U.S. Cl. 42—44 **8 Claims**

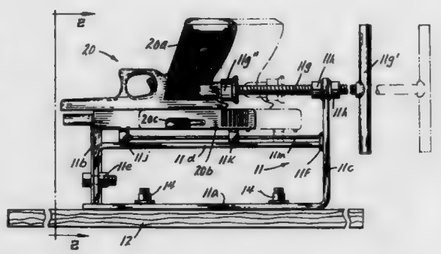


1. A break-open firearm having at least one breechblock wedge movably guided in a barrel direction wherein the breechblock wedge is driven by a control part, at least one force-transmitting compression spring arranged between the breechblock wedge and the control part for permitting absorption of a distance when the breechblock wedge is no longer movable but the control part, for attainment of a desired position of a lever, is moved still further, characterized in that the movement of the control part takes place by way of a breechblock lever shaft having a groove on an underside thereof and being arranged perpendicularly to the barrel direction, that the transmission of movement from the breechblock lever shaft to the control part takes place through a connecting member provided with a tenon on one side of the connecting member, that the connecting member is inserted in the groove on the underside of the breechblock lever shaft, that two bores are provided in the control part and are adapted to engage the tenon in the connecting member and arranged in the control part so that, depending upon the orientation of the connecting member in the groove on the underside of the breechblock lever shaft, a movement of the breechblock lever shaft in either the clockwise direction or in the counterclockwise direction for a right-handed or left-handed shooter, respectively, leads in each case to a desired opening movement of the breechblock wedge.

5,111,608
DEFECTIVE BULLET DISLODGER

James P. Weisheit, 1330 Leopold St., Jasper, Ind. 47546

Filed Jan. 29, 1991, Ser. No. 647,239
Int. Cl.[5] F41D *35/00*
U.S. Cl. 42—90 **6 Claims**



1. In combination with a handgun, a mechanism serving to dislodge a bullet jammed within said handgun, the latter including a barrel, a handle and a slide assembly, comprising a framework, said handgun mounted in an inverted position on said framework, and clamp means disposed at one end of a rotatable shaft mounted on said framework engaging and moving said handle and said barrel of said handgun with respect to said slide assembly which remains at a stationary location, where said movement of said handle and said barrel reveals an ejection port in said slide assembly through which said bullet, now dislodged, passes.

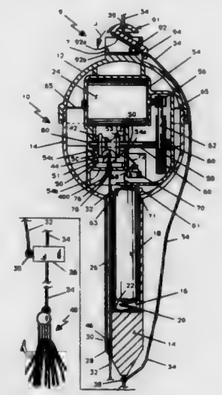
5,111,609
BAIT MOVING FISHING BOBBER

Larry D. Flo, 1020 S. Kansas, Newton, Kans. 67114

Filed Jul. 22, 1991, Ser. No. 733,350
Int. Cl.[5] A01K *93/00*
U.S. Cl. 43—26.1 **10 Claims**

1. A bait moving fishing bobber comprising a hollow upper bobber housing; and generally a hollow lower bobber housing secured to said upper bobber housing, said lower bobber housing having a structure defining a lower recess and a longitudinal opening for allowing the atmosphere to communicate with the inside of said generally hollow lower bobber housing; a support frame disposed in said upper and lower bobber housing; a shaft rotatably engaged to said support frame, said shaft including a catch means secured thereto for releasably engaging a reel member; a reel member rotatably mounted on said shaft; a lever member means slidably mounted on said shaft for movably engaging said reel member to move said reel member into and out of engagement with said catch means on said shaft, said lever means having a structure defining a lever aperture; a line member engaged to said reel member and passing through said lever aperture and said longitudinal opening, said line member including a first means for moving the lever member in a first direction and a second means for moving the lever

member in a second direction opposite the first direction; a battery is disposed in said lower recess; and a motor means

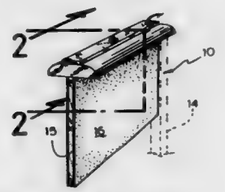


coupled to said shaft and electrically engaged to said battery for receiving power to cause said shaft the rotate.

5,111,610
INSECT-KILLING DEVICE

Bernard G. Morisset, 5353 Dudemaine St., Montreal, Canada H4J 1P2

Continuation-in-part of Ser. No. 440,747, Nov. 24, 1989, abandoned. This application Sep. 10, 1990, Ser. No. 579,633
Int. Cl.[5] A01M *1/20*
U.S. Cl. 43—132.1 **12 Claims**

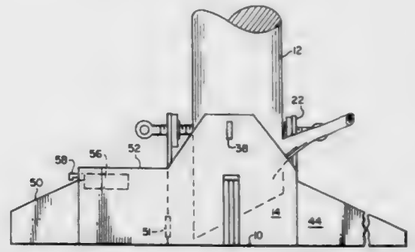


1. An insect-killing device comprising:
(a) a rigid support panel;
(b) a glue compound, spread over said support panel and defining an inner layer, of adhesive nature and adhesively anchored to said support panel, and an outer layer, said outer layer defining a main free surface of non-sticky nature;
(c) a granular material consisting of a plurality of granular particles each defining sharp outwardly protruding edges, said granular particles sprinkled over and partially embedded into at least a substantial portion of said outer layer of the glue compound said adhesive inner layer then being cured to said outer layer, wherein a substantial portion of said granular particles protrudes outwardly from said glue compound free surface, so that said sharp edges thereof will shearingly injure insects wandering thereabout; and
(d) luring means, to draw insects toward said glue compound main free surface.

5,111,611
CHRISTMAS TREE STAND AND IRRIGATION DEVICE

Wilson Elder, 115 Meadowbrook Rd., Athens, Ga. 30606

Filed Jul. 24, 1990, Ser. No. 556,506
Int. Cl.[5] A47G *33/12*
U.S. Cl. 47—40.5 **5 Claims**



1. A Christmas tree stand and irrigation device comprising:
a. A tree-supporting enclosure, including a base with convergent upstanding sides, defining an upper aperture encircling the sides of a tree trunk supported within the enclosure, said sides defining vertical slots and including a plurality of tree engaging bolts extending through the sides to engage the sides of a tree supported within said aperture;
b. A plurality of lateral braces engagable with with said vertical slots and extending from the sides of said enclosure, so as to engage a lower supporting surface;
c. A float reservoir including a base and upstanding sides supported adjacent and communicant with said tree-supporting enclosure;
d. A valve housing communicant with a source of liquid and pivotably supported at a side of said float reservoir and further including:
i) a float extensible inwardly from said valve housing and engagable with liquid held within the float reservoir;
ii) a compressible valve seat supported at an inner end of said valve housing, and;
iii) a feeding valve extending from outside of said float reservoir and into said valve housing in alignment with said compressible valve seat, said feeding valve defining an inlet conduit extending through the side of said float reservoir at an outer end and sealingly engagable with said compressible valve seat at its inner end, as liquid in said reservoir engages enters through said conduit to engage said float and pivot upwardly said valve housing supported upon the inner end of the valve inlet conduit.

5,111,612
PLANT CULTURE APPARATUS

Seiji Takishima; Yuji Hirosawa; Hiromitsu Takada, and Fumito Takagi, all of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan

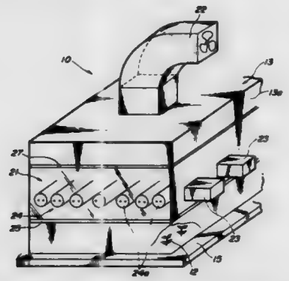
Filed Apr. 3, 1990, Ser. No. 504,130
Claims priority, application Japan, Apr. 25, 1989, 1-105494
Int. Cl.[5] A01G *31/00*
U.S. Cl. 47—60 **15 Claims**

1. A plant culture apparatus comprising:
a body within which a plurality of plants to be cultured are disposed;
a culture bed arranged within said body for culturing the plants;
illuminating means arranged within said body for emitting a light to the plants on said culture bed; and
air-conditioning means mounted to said body for recirculating air through said body and removing heat from said body which is created by said illuminating means;
said illuminating means comprising:

lighting means for emitting ultraviolet rays to said plants; and

transducing means disposed below said lighting means for transducing the ultraviolet rays emitted from said lighting means to visible radiation when the ultraviolet rays pass through said transducing means, such that the visible radiation is uniformly emitted to said plants;

said transducing means having long-wave absorbability and comprising plate means having a surface which is entirely coated with phosphor;



wherein said air-conditioning means comprises:

an introducing duct means for introducing air into said body, said introducing duct means being mounted to an upper surface of said body and

discharge duct means for discharging air from said body, said discharge duct means being mounted to a peripheral surface of said body at a location above said transducing means.

5,111,613

PLEATED FLOWER POT OR FLOWER POT COVER

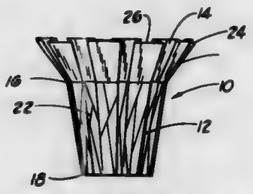
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, Continuation of Ser. No. 613,080, May 22, 1984, abandoned. This application Jun. 15, 1989, Ser. No. 366,588

The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.

Int. Cl.[5] A01G *9/02*

U.S. Cl. 47—72 **20 Claims**



1. A flower pot cover adapted for providing a decorative cover for a flower pot, comprising:

a base having an upper end and a lower end with an object opening extending through the upper end and having a plurality of overlapping folds formed in the base for cooperating to provide structural integrity to the base; and

a skirt connected to the upper end of the base and extending a outwardly from the upper end of the base terminating with an outer peripheral surface, the skirt having a plurality of folds extending from about the upper end of the base outwardly toward the outer peripheral surface of the skirt, a substantial portion of the folds in the skirt generally near the outer peripheral surface being connected and the remaining portions of the folds in the skirt being unconnected.

5,111,614

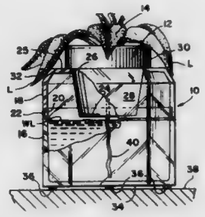
PLANT WATERING CONTAINER

Reinhold Holtkamp, Sr., Werther Strasse 112, D-4294 Isselberg, Fed. Rep. of Germany

Continuation of Ser. No. 504,054, Apr. 4, 1990, which is a continuation of Ser. No. 281,622, Dec. 9, 1988, abandoned. This application Sep. 27, 1990, Ser. No. 588,847

Int. Cl.[5] A01G *25/00*

U.S. Cl. 47—81 **11 Claims**



1. A watering container for a potted plant, comprising:

a) a lower container section having a side wall and a bottom wall which together define a reservoir for holding liquid, said lower container section being open at the top and said side wall being formed with a continuous mounting flange at the upper end thereof, the top of the lower container section defining the fluid capacity of the reservoir;

b) an upper container section having a top wall, a continuous side wall and having an open bottom, said side wall being formed with a continuous mounting flange at its bottom, said top wall being formed with an opening adapted to receive a pot containing plant material in a growing medium;

c) the continuous mounting flanges of the lower and upper container sections being cooperatively configured and dimensioned to form a continuous interengagement surface when the upper container section is positioned over the lower container section to form an assembled container, such arrangement serving to inhibit and close the container against evaporization and the drying out of plant roots;

d) a plurality of supporting feet projecting downwardly from the bottom surface of the bottom wall of the lower container section and being within the confines of the side wall of the lower container section so as to position the container above the supporting surface therefor, thereby inhibiting moisture transfer to the supporting surface from the container; and

e) a downwardly and outwardly beveled continuous wall extending around the periphery of the top wall of the upper container section between the top wall and the side wall thereof, the beveled wall forming a supporting surface for leaves of the potted plant extending downwardly below the top of the pot.

5,111,615

WINDOW WITH PIVOTABLE SASH AND MECHANISM FOR LOCKING THE SASH IN CLOSED POSITION

Erhard Kuhnt, Heiligenhaus, and Karl-Heinz Dreifert, Velbert, both of Fed. Rep. of Germany, assignors to Wilhelm Weidtmann GmbH & Co. KG, Velbert, Fed. Rep. of Germany

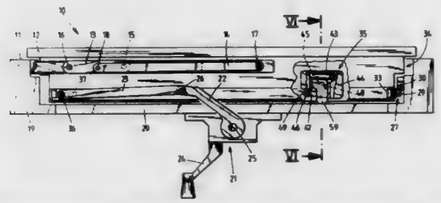
Filed Apr. 15, 1991, Ser. No. 685,555

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1990, 4012234; Mar. 26, 1991, 4109852

Int. Cl.[5] E05F *11/02*

U.S. Cl. 49—279 **37 Claims**

1. A window comprising a frame; a sash movable relative to said frame between open and closed positions; means for movably securing said sash to said frame; means for moving said sash relative to said frame; an arresting device having a mechanism for locking and unlocking said sash in the closed position; means for permanently coupling said arresting device with said



moving means to unlock said sash prior to movement of the sash from said closed position and to lock said sash upon return movement to said closed position; and means for blocking said mechanism in response to movement of said sash from the closed position.

5,111,616

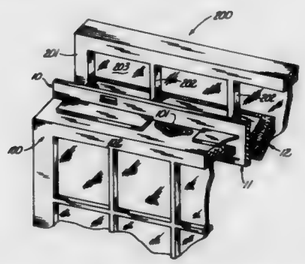
WEATHERSEAL APPARATUS FOR DOUBLE HUNG WINDOWS

Anthony R. Calabrese, 95 Arlmont St., Arlington, Mass. 02174

Filed Jul. 10, 1991, Ser. No. 727,775

Int. Cl.[5] B65B *31/00*

U.S. Cl. 49—406 **6 Claims**



1. A weatherproof sealing apparatus for the openings created between upper and lower window sashes having stiles and window panes when the window sashes are disposed in an open position; wherein, the sealing apparatus comprises:

a support unit including a generally elongated rigid yet severable support member; wherein, said support member comprises at least two initially elongated rectangular panels connected together and disposed generally perpendicular to one another;

a resilient sealing unit operatively attached to the support member and including an initially generally elongated resilient rectangular sealing block operatively associated with said support member wherein both the support member and the block member have selected portions removed to accommodate portions of said upper window sash; wherein said sealing block is operatively attached at the juncture of said perpendicularly disposed panels; and,

means for operatively positioning and supporting said support unit and said resilient sealing unit between the upper and lower window sashes.

5,111,617

END STRUCTURE OF WEATHER-STRIP

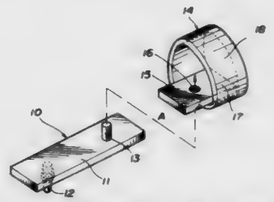
Shinji Saiga, Chiba, Japan, assignor to Kinugawa Rubber Industrial Co., Ltd., Japan

Filed Jan. 28, 1991, Ser. No. 646,393

Claims priority, application Japan, Jan. 30, 1990, 2-20044

Int. Cl.[5] E06B *7/16*

U.S. Cl. 49—494 **7 Claims**



1. An end structure for attachment of a weather-strip having a hollow end portion to a vehicle body comprising:

stay means for providing additional rigidity to said weather-strip end portion, said stay means including an attachment member at a desired position of a first surface of said stay means for determining a position of said end structure against said vehicle via said weather-strip; and

sealing means including a base member attached to said stay means and a covering member fixed to said base member to cover said hollow end of said weather-strip for establishing sealing of said hollow end of said weather-strip from an ambient environment.

5,111,618

REFRIGERATOR DOOR ASSEMBLY WITH STYLIZED SUBSTANTIALLY ALL GLASS FRONT

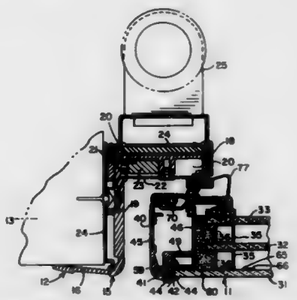
Melvin Kaspar; Jeffrey Kostos, both of LaGrange Park; Matthew Rolek, Chicago, and Paul Artwohl, Flossmoor, all of Ill., assignors to Ardco, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 602,791, Oct. 24, 1990, Pat. No. 5,024,023, which is a division of Ser. No. 448,328, Dec. 11, 1989, Pat. No. 4,998,382. This application Mar. 12, 1991, Ser. No. 668,135

The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.

Int. Cl.[5] E06B *3/00*

U.S. Cl. 49—501 **17 Claims**



1. A refrigerator door assembly comprising a cabinet frame for mounting adjacent an opening of a refrigerator cabinet, an insulated glass door comprising an insulated glass unit having a plurality of glass panes disposed in side-by-side relation and including a forward pane and at least one pane disposed rearwardly of said forward pane, a spacer interposed between said panes for maintaining said panes in parallel relation with an air space therebetween, said spacer including vertical spacer ele-

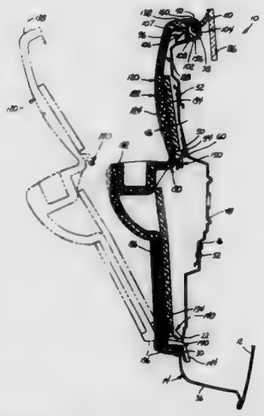
ments disposed adjacent opposite sides of said glass panes and top and bottom spacer elements connected to said vertical spacer elements and disposed adjacent top and bottom ends of said glass panes, said spacer elements each having an inner peripheral edge disposed inwardly from a respective outer peripheral edge of said forward glass pane, an outer structural door support frame about the periphery of said glass unit, said structural support frame including vertical frame support elements disposed adjacent opposite sides of said door and top and bottom frame support elements disposed adjacent top and bottom ends of said door and rigidly connected to said vertical frame support elements for supporting the weight of said glass unit, said vertical frame support elements being disposed outwardly of said vertical spacer elements and said top and bottom structural frame support elements being disposed outwardly of said top and bottom spacer elements, means supporting said structural support frame and hence the glass unit supported thereby for movement relative to said cabinet frame, said forward glass pane being larger in size than said rearwardly disposed pane and extending outwardly substantially to the outer perimeter of said door, said structural support frame having at least a portion located rearwardly of a peripheral portion of said forward glass pane and being without any portion which extends in overlapping relation to a forward side of said forward pane a distance greater than the distance said rearwardly located structural support frame portion is disposed inwardly from an outer peripheral edge of said forward glass pane, and masking means about a peripheral portion of said forward glass pane and extending inwardly at least a distance corresponding to the inner peripheral edge of said spacer elements for preventing viewing of said spacer elements and the portion of said structural support frame located rearwardly of said forward glass pane through said forward glass pane from a front side thereof while permitting unobstructed viewing of an interior of the refrigerator cabinet within which said door assembly is mounted.

5,111,619

DOOR TRIM PANEL RETAINING ASSEMBLY

Martin P. Billin, Troy; Christopher G. Wedow, Mount Clemens, and Dan M. Nedwick, Farmington, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 12, 1991, Ser. No. 744,198
Int. Cl.[5] B60J *5/04*
U.S. Cl. 49—502 **5 Claims**



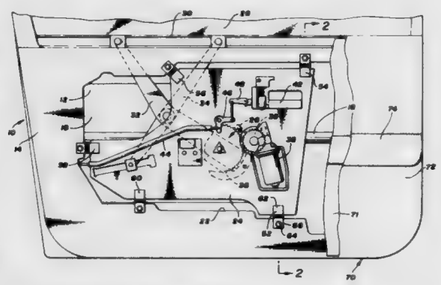
1. An assembly for mounting a door trim panel to a vehicle body door, the assembly comprising:
the door trim panel having a plurality of appendages which project downward from the door trim panel and at least one finger depending downward from the door trim panel;
the door having a plurality of openings for receiving the appendages of the door trim panel adapted for securing the door trim panel to the door; and
at least one clip secured to the vehicle body door having a ramp surface for engagement by the finger of the door trim panel and adapted to slide the trim panel vertically relative to the body door as the door trim panel is moved towards the body door and then the clip engaging the finger securing the trim panel to the body door.

5,111,620

ENERGY ABSORBING MODULAR DOOR

Ian V. Lau, Troy, and Jeffrey A. Welch, St. Clair Shores, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 633,629, Dec. 24, 1990, Pat. No. 5,048,234. This application Jul. 15, 1991, Ser. No. 728,885
Int. Cl.[5] B60J *5/04*
U.S. Cl. 49—502 **3 Claims**



1. A vehicle door comprising:
a door inner panel and door outer panel attached together to form a door hingedly mounted on the vehicle body, said inner panel having a plurality of openings therein, a plurality of door operating components adapted for mounting on the inner panel within the openings of the inner panel, and a plurality of energy absorbing means extending between the inner panel and the individual door operating components to individually mount the operating components on the door inner panel and enable energy absorbing movement of the operating components relative to the door upon impact of the occupant against the door.

5,111,621

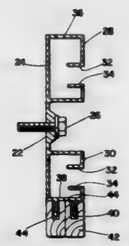
METHOD AND APPARATUS FOR CLADDING WINDOW FRAMES

Leo J. Meyers, 125 McAlister Dr., Pittsburgh, Pa. 15235

Filed Jan. 18, 1991, Ser. No. 643,451
Int. Cl.[5] E06B *1/04*
U.S. Cl. 49—504 **30 Claims**

1. A portal frame for a building which comprises:
a. an elongate inner frame section having oppositely facing front and back sides and oppositely facing lateral sides;
b. said back side forming an abutment surface for abutting said inner frame to a framed opening;
c. said front side having means thereon for releasable attachment to window slide mechanisms;

d. rigid pronged projections extending outwardly from one of said lateral sides;



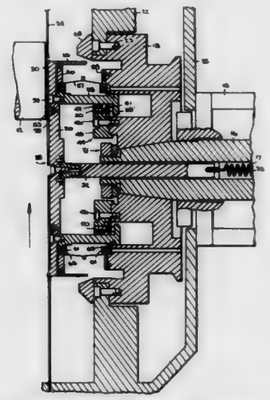
e. strips of grooved decorative material having their grooves co-operatively attached over said pronged projections so as to substantially cover said one lateral side.

5,111,622

SLICING AND GRINDING SYSTEM FOR A WAFER SLICING MACHINE

Robert E. Steere, Jr., Boonton, N.J., assignor to Silicon Technology Corporation, Oakland, N.J.

Filed May 18, 1989, Ser. No. 353,879
Int. Cl.[5] B24B *7/00*
U.S. Cl. 51—5 C **35 Claims**



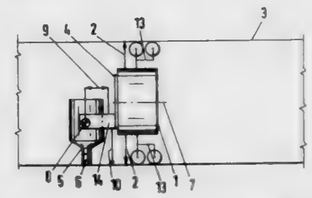
1. A slicing and grinding system for a wafer slicing machine, said system comprising
a rotatable spindle
an internal diameter saw blade rotatably mounted on said spindle, said blade having a bore and an annular cutting edge about said bore for slicing a wafer from an ingot;
a grind wheel rotatably mounted on said spindle coaxially of said blade for grinding a surface of an ingot prior to slicing of a wafer therefrom; and
means for moving said grind wheel coaxially of said saw blade between a retracted position and an extended position for grinding the surface of an ingot, said means including an annular piston secured to said grind wheel, an annular chamber slidably receiving said piston and passageway means for delivering a pressurized fluid to said chamber for expelling said piston therefrom.

5,111,623

PROCESS AND APPARATUS FOR MACHINING THE INNER SURFACES OF HOLLOW BODIES

Peter Lehmann, Hilden, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed May 15, 1990, Ser. No. 523,794
Claims priority, application Fed. Rep. of Germany, May 16, 1989, 3916113
Int. Cl.[5] B24B *5/40*
U.S. Cl. 51—165.93 **13 Claims**



1. An apparatus for machining an area of the inner surface of a tubular member having an axis, said apparatus comprising:
a tool carrier;
means for moving said tool carrier in the direction of the axis of the tubular member to a location adjacent the area to be machined;
a remotely controlled clamping apparatus for rigidly fixing said tool carrier in the tubular member at the location adjacent the area to be machined;
a pivot drive carried by said tool carrier, said pivot drive having a pivot axis parallel to the axis of the tubular member;
a supporting member secured to said pivot drive on said tool carrier;
at least one tool holder fastened to said supporting member, said tool holder for being advanced about the inner surface of the tubular member by said pivot drive;
a cutting tool movably positioned on said tool holder; and
means for providing a pendulum movement of said tool holder about a pendulum axis that is perpendicular to the pivot axis of said pivot drive.

5,111,624

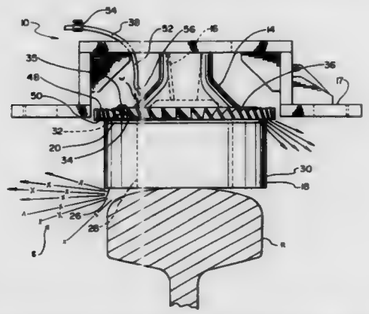
METHOD AND APPARATUS FOR LIMITING THE DISPERSION OF RAIL GRINDING MACHINE SPARK AND DUST RESIDUE

John J. Shoenhair, New Hope, and Bruce E. Kallevig, Monticello, both of Minn., assignors to Loram Maintenance of Way, Inc., Hamel, Minn.

Filed Sep. 10, 1990, Ser. No. 579,891
Int. Cl.[5] E01B *31/17*; B24B *55/02*
U.S. Cl. 51—178 **15 Claims**

1. In a rail grinding machine having a grinding module with a rotatable grinding stone carried by a grinding head assembly for grinding contact of said grinding stone with a railroad track rail, the contact of said grinding stone with said rail generating a stream of airborn rail grinding byproducts, the improvement comprising:
fan means operably carried by said grinding head assembly for inducing a downdraft about said stone whereby the downdraft intercepts said stream of airborn rail grinding byproducts and limits the dispersion of said airborn byproducts into the atmosphere,
said grinding stone comprising a generally annular stone having a grinding surface, an opposed upper surface, and a generally cylindrical outer sidewall extending between

said grinding surface and said upper surface and defining an outer stone diameter, said fan means including a plural-



ity of fan blades oriented above said grinding surface and extending beyond said outer stone diameter.

5,111,625

MACHINE FOR CONTOUR GRINDING OUTSIDE PERIPHERAL SURFACES OF WORKPIECES

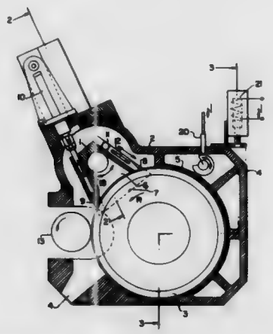
Dieter Simpfendorfer, Mühlheim; Walter Weil, and Phon Dao-Xuan, both of Frankfurt, all of Fed. Rep. of Germany, assignors to Diskus Werke Frankfurt am Main Aktiengesellschaft, Frankfurt-Fechenheim, Fed. Rep. of Germany

Filed May 20, 1991, Ser. No. 702,836

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1990, 4017716

Int. Cl.[5] B24B *55/02*

U.S. Cl. 51—267 **6 Claims**



1. In a machine for contour grinding the peripheral surface of workpieces, comprising

a grinding wheel having a wheel axis and operable to rotate in a predetermined sense about said wheel axis and having a peripheral surface including a grinding surface portion engageable by a workpiece to be ground,

a guard hood covering said peripheral surface and leaving said grinding surface portion exposed, and

a nozzle, which is disposed radially outwardly of said peripheral surface and defines an internal cavity, which flares toward said peripheral surface and adjacent to said peripheral surface has an opening which extends throughout the width of said peripheral surface, which nozzle is operable to discharge a cooling and lubricating fluid from said internal cavity through said opening onto said peripheral surface has first and second sides respectively facing opposite to and in the direction of movement of said peripheral surface adjacent to said nozzle when said grinding wheel is rotating in said predetermined sense,

said nozzle being provided on said first side with a lip, which protrudes beyond said opening toward said peripheral surface and is adjustable toward and away from said peripheral surface,

the improvement residing in that

said nozzle is pivoted on an axis that is parallel to said wheel axis,

said nozzle is provided on said second side with a slidable mounted valve member, which protrudes beyond said opening toward said peripheral surface and is adjustable toward and away from said peripheral surface, and

said nozzle is provided with actuating means for adjusting said valve member toward and away from said peripheral surface to control the volume flow rate of said cooling and lubricating fluid on said peripheral surface past said valve member.

5,111,626

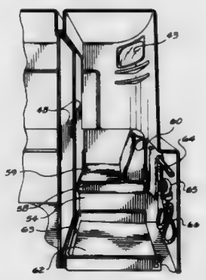
SELF-CONTAINED MODULAR UNIT

Jeffrey L. Fortune, 502 Sandy Hook Dr., Treasure Island, Fla. 33706

Filed Oct. 22, 1990, Ser. No. 601,285

Int. Cl.[5] E04H *1/00*

U.S. Cl. 52—79.1 **19 Claims**



1. A portable modular unit comprising a modular housing having;

an outer shell,

an inner shell,

electrical conduits, plumbing, television lines and telephone lines routed between said inner shell and said outer shell,

structural foam filling the space between said inner shell and said outer shell,

an entry door extending through one side of said modular housing into an interior space defined by said modular housing;

a utility space defined by inner walls extending from said inner shell, and separating said utility space from said interior space;

a service door extending through one side of said modular housing into said utility space; and

a service unit removably coupled to said modular housing and located in said utility space.

5,111,627

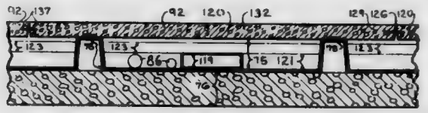
MODULAR-ACCESSIBLE-UNITS

John G. Brown, 20205 State Line Rd., Harvard, Ill. 60033

Continuation-in-part of Ser. No. 436,158, Nov. 13, 1989, abandoned, which is a continuation of Ser. No. 106,204, Oct. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 783,309, Oct. 2, 1985, Pat. No. 4,698,249, which is a continuation of Ser. No. 391,760, Jun. 24, 1982, Pat. No. 4,546,024, which is a continuation of Ser. No. 131,516, Mar. 18, 1980, abandoned, and a continuation of Ser. No. 567,151, Jan. 3, 1984, Pat. No. 4,681,786. This application Apr. 6, 1990, Ser. No. 506,644

Int. Cl.[5] E04B *9/00*

U.S. Cl. 52—126.5 **71 Claims**



1. A paver floor system comprising a conductor-accommodating supporting layer disposed over a base surface and an array of removable pavers disposed over the supporting layer, characterized in that the supporting layer comprises a plurality of plinths arranged in a patterned layout and removably supporting said array of pavers, each of said plinths having a plurality of vertically extending slots, and a plurality of side plates selectively insertable into said slots to selectively define conductor-accommodating passages and node boxes which are accessible beneath said array of removable pavers.

5,111,628

PANEL TO PRODUCE SWIMMING POOLS PARTICULARLY AND ITS PRODUCTION PROCESS

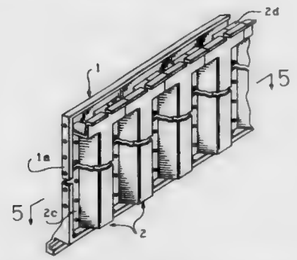
J. L. Desjoyaux; P. L. Desjoyaux, and C. Desjoyaux Epouse Jandros, all of R. N. 82, 42480 La Fouillouse, France

Filed Dec. 26, 1989, Ser. No. 456,735

Claims priority, application France, Jan. 9, 1989, 89 00722

Int. Cl.[5] E02D *27/00*

U.S. Cl. 52—169.7 **9 Claims**



1. A panel for the construction of swimming pools having a dimension of height comprising

a prefabricated structure **1** of reinforced resin concrete,

at least one separate reinforcement element **2** corresponding to the height of the panel,

the separate reinforcement element **2** comprising a transversal section suitable for defining a vertical gutter **2***a* formed between two support wings **2***a*–**2***b* . . . located in one and the same plane, which wings are constructed and arranged so as to assure the fixation of the element **2** on one of the faces of the structure,

the separate reinforcement element **2** comprising a squared edge **2***d* in its upper part,

the vertical gutter **2***a* of the separate reinforcement element **2** communicating with the squared edge **2***d*, and

the vertical gutter **2***a* receiving concrete over totality of its height in communication with a series of clamps located in the squared edge **2***d* of the separate reinforcement element.

5,111,629

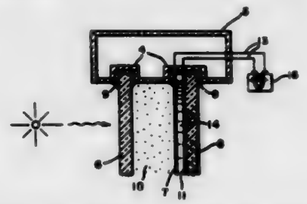
DUAL-PANE THERMAL WINDOW WITH LIQUID CRYSTAL SHADE

Ray H. Baughman, Morris Plains; Ernest D. Buff, Far Hills; Helmut Eckhardt, Madison, and Gerhard H. Fuchs, Far Hills, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 597,216, Oct. 15, 1990, Pat. No. 5,025,602, which is a division of Ser. No. 515,034, Apr. 26, 1990, Pat. No. 5,089,044, which is a division of Ser. No. 425,263, Oct. 23, 1989, Pat. No. 4,964,251, which is a division of Ser. No. 398,599, Aug. 25, 1989, Pat. No. 4,899,503, which is a division of Ser. No. 350,808, May 12, 1989, Pat. No. 4,893,902, which is a division of Ser. No. 66,299, Jun. 25, 1987, Pat. No. 4,848,875. This application Apr. 18, 1991, Ser. No. 687,280

Int. Cl.[5] E04C *2/54*; G02F *1/133*

U.S. Cl. 52—171 **21 Claims**



1. A method for decreasing radiative and conductive heat transfer between the exterior and the interior of a building, comprising the steps of:

(a) mounting within a window frame a plurality of spaced window panes, a first and a second of said panes having opposing faces;

(b) affixing to one of the opposing faces a first wall of a liquid crystal cell, said first wall being composed of transparent, electrically conductive film and cooperating with a second wall composed of transparent electrically conductive film to form a cavity containing an electro-optically responsive liquid crystal material providing a selected light transmittance; said film being composed of plastic and said first and second walls having sufficient supporting strength to maintain the integrity of said cell; and

(c) delimiting between said second wall of said cell and the other of said opposing faces of said panes a space providing a thermal break.

5,111,630

ACCESS FLOOR PANEL WITH PERIPHERAL TRIM

R. Jack Munsey, Caledonia; Gordon J. Cooper, Alto; and Todd N. Rose, Kentwood, all of Mich., assignors to C-Tec, Inc., Grand Rapids, Mich.

Continuation of Ser. No. 138,337, Dec. 28, 1987, Pat. No. 4,850,176. This application Feb. 15, 1989, Ser. No. 311,236

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[5] E04B *5/48*; E04C *2/34, 2/38*; E04F *19/02*

U.S. Cl. 52—508 **4 Claims**

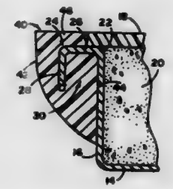
1. An access floor panel system, comprising:

a generally rectangular pan having a bottom and sides joined to said bottom, said pan including a peripheral flange having a horizontal portion and a downwardly extending portion, and wherein said flange along with said sides defines a downwardly opening channel extending around the periphery thereof;

a core disposed within said pan;

a plurality of elongated trim pieces disposed within said

channel, each of said trim pieces being an integral member and including a generally L-shaped slot dimensioned to receive said flange, said trim pieces each including an outer surface, an inner surface adjacent one of said sides and having a lower edge joined to said outer surface and a top surface, said L-shaped slot opening through said



inner surface and including a first portion extending in spaced generally parallel relationship to said top surface and a second portion extending generally perpendicular to said top surface; and

support means including a pedestal for supporting the pan above a structural floor.

5,111,631

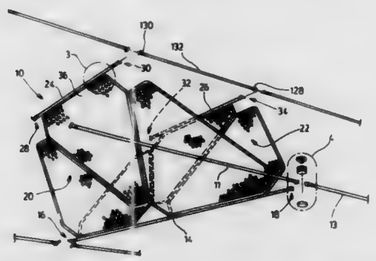
MODULAR DISPLAY CONSTRUCTION SYSTEM

Ronald Flood, 5 Forsyth Road, Toronto, Ontario, Canada M4S 2P8 , and Kenneth Young, 45 Roxborough Street West, Toronto, Ontario, Canada M4R 1T9

Filed Mar. 14, 1988, Ser. No. 167,997

Int. Cl.[5] E04H *12/18*

U.S. Cl. 52—646 **23 Claims**



1. A component adapted to be joined with substantially identical components to form a knock-down cellular structure, comprising:

an elongate base portion having an axis and a pair of opposing base vertices spaced-apart along the axis;

first and second side portions rigidly fixed to and extending away from the portion, the first side portion defining a first pair of opposing spaced-apart edge vertices and the second side portion defining a second pair of opposing spaced-apart edge vertices, the first pair of edge vertices defining with the base vertices a first set of vertices in a trapezoidal vertex relationship, the second pair of edge vertices defining with the base vertices a second set of vertices in a trapezoidal vertex relationship substantially identical to the trapezoidal vertex relationship of the first set of vertices, the first and second side portions together having a generally V-shaped cross-section with a fixed predetermined angle between general planes of the first and second side portions when viewed along the axis of the base portion;

each vertex of the component comprising a connector portion for use in releasably securing the vertex of the component to a proximate vertex of a substantially identical component;

the vertices of each set being so spaced relative to one another and the fixed angle being so selected that one of the pair of base vertices and an adjacent edge vertex of the component are substantially parallel to one of the pair of base vertices and an adjacent edge vertex of a substantially identical component when respective general planes of the component and the substantially identical component are substantially perpendicular.

5,111,632

EXPANDABLE JOIST HANGER

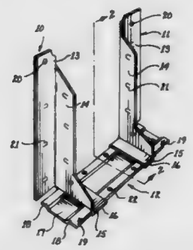
Arthur R. Turner, 9, The Parapet, Terranora, New South Wales 248, Australia

Filed Sep. 19, 1990, Ser. No. 584,898

Claims priority, application Australia, Sep. 6, 1990, 62222/90

Int. Cl.[5] E04B *1/38*

U.S. Cl. 52—702 **7 Claims**



1. A joist hanger to attach the end of a joist to a vertical side face of a member which is to support the joist comprising:

a pair of side brackets, each one of said pair of side brackets having a flange for fixture to the vertical side face, each one of said pair of side brackets providing one of a pair of substantially parallel flanges extending outwardly and perpendicularly from the vertical side face to receive the end of a joist therebetween; and

a platform member means mounted to the side brackets near their lower extremity, the platform member means spanning the distance therebetween and supported thereby to support the joist;

the side brackets being slidable in a direction along the platform member means relative to each other to vary the relative spacing therebetween.

5,111,633

DEVICE FOR APPLYING STRIPS OF MATERIAL OF PACKETS OF SUBSTANTIALLY PARALLELEPIPED SHAPE

Florenzo Draghetti, Medicina, Italy, assignor to G. D. Societa Per Azioni, Bologna, Italy

Filed Dec. 17, 1990, Ser. No. 628,223

Claims priority, application Italy, Dec. 18, 1989, 3771 A/89

Int. Cl.[5] B65B *61/00*

U.S. Cl. 53—136.1 **9 Claims**

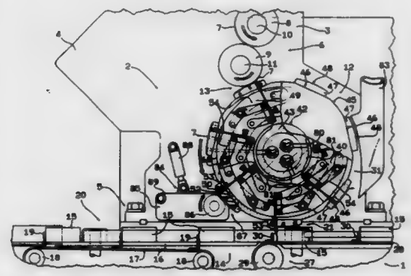
1. A device for applying strips of material bearing adhesive on a face thereof, to packets of substantially parallelepiped shaped each having a face and an end, which intersect at a corner, said device comprising:

a station at which strips are affixed singly and in succession to respective ones of said packets;

a feed system by which said packets are directed singly and in succession toward the affixing station with said face of each said packet oriented toward affixing station and said end thereof trailing;

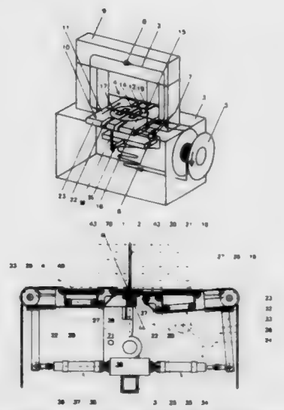
a feed unit, by which strips bearing adhesive on a face thereof are supplied singly to the affixing station with said face thereof presented radially outwards, said feed unit including a rotary conveyor revolving about an axis so as to have a radially outer periphery moved substantially tangentially to the affixing station and equipped on said outer periphery with a plurality of detaining means for successively temporarily detaining individual ones of said strips, each said detaining means having a continuous, radially outer peripheral surface for supporting the whole length of said strip and for pressing a portion of said strip against the face of the packets, suction means for temporarily holding each strip by suction facewise against said radially outer peripheral surface of a respective said detaining means as said feed unit is rotated about said axis from a strip-accepting position, to said affixing station;

folding means respectively associated with each of said detaining means and serving to fold a respective detained strip; means mounting each said folding means for substantially radial movement in relation to said rotary conveyor; and



operating means radially moving each said folding means between a retracted position in which the respective folding means lies retracted within the radially outer perimeter of said rotary conveyor, and a working position, temporarily assumed at said affixing station, in which the respective folding means is extended so as to project radially outwardly beyond the outer perimeter of said rotary conveyor through a respective said outer peripheral surface of a respective said detailing means so as to momentarily adjacently trail a said end of a respective said packet, thereby folding a respective said strip around a respective said corner into affixing relation with both a said face and a said end of a respective said packet.

rotation (**39**), which are selectively positioned in vertical alignment above the tape guide channel (**44**) and of which one is in each case situated above the tape guide channel (**44**), wherein the conveying device (**10**) has conveying sections (**29, 30**)



protruding through recesses (**20, 21**) in the work table (**19**) and in the sectors (**14** through **17**) of the rotating disk (**18**) and wherein devices are provided to lower the conveying sections (**28, 30**) of the conveying device (**10**) out of the rotating disk (**18'**) and the work table (**18**).

5,111,635

ARRANGEMENT FOR CLOSING BOTTLES

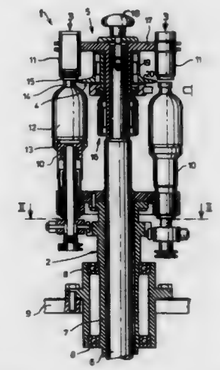
Fritz Neber, Schwäbisch Hall, Fed. Rep. of Germany, assignor to Firma Groninger & Co. GmbH, Crailsheim, Fed. Rep. of Germany

Filed May 3, 1990, Ser. No. 518,114

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1990, 9000905[U]

Int. Cl.[5] B67B *3/18, 3/20;* B65B *7/28*

U.S. Cl. 53—334 **19 Claims**



1. An arrangement for closing bottles, comprising a rotor arranged to move bottles over a partially circular path; a flanging device provided with a flanging element arranged to engage with lower edges of caps to be placed on the bottles; bottle gripping means connected with said rotor and arranged to rotate the bottles about their own axes and also to disengage the bottles from said flanging element, said flanging element including a centrally arranged disc having a ring-shaped part

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5,111,634

PACKAGING STATION FOR A PACKAGING MACHINE, IN WHICH A STACK OF GOODS IS HOOPED WITH A PACKAGING TAPE

Wilhelm Rauch, Bindlach, Fed. Rep. of Germany, assignor to SMB Schwede Maschinenbau, Fed. Rep. of Germany

Filed Feb. 27, 1991, Ser. No. 661,665

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1990, 4007264

Int. Cl.[5] B65B *13/06*

U.S. Cl. 53—176 **27 Claims**

1. A packaging station of a packaging machine, in which a stack of goods (**1**) is hooped with a packaging tape (**2**), with a work table (**19**) to receive a stack of goods (**1**), with a conveying device (**10**) to convey a stack of goods (**1**) in a conveying direction (**11**) into a hooping position and out of this position, and with a tape guiding device (**9, 44**) to guide the packaging tape (**2**) around the stack of goods (**1**) in an entering direction (**8**) at right angles to the conveying direction (**11**), the work table (**19**) being provided with a tape guide channel (**44**) to be opened towards the stack of goods (**1**) and vertically aligned with the tape guiding device (**9**) and extending at right angles to the conveying direction (**11**), wherein the work table (**19**) is at least partially formed by a rotating disk (**18**), which is drivable to rotate about an axis of rotation (**39**), and which consists of at least four sectors (**14, 15, 16, 17**) having at least two spaces (**46, 46'**), which extend diametrically relative to the axis of

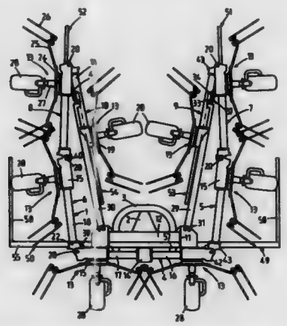
with a peripheral edge engageable with the cap, said disc having an axis which extends parallel and is eccentric relative to an axis of said rotor, and said disc being arranged so that the partially circular path of the bottles extends around said peripheral edge of said disc.

5,111,636

HAYMAKING MACHINE HAVING MULTIPLE ROTORS

Michel Quiris, Wasselonne, France, assignor to Kuhn S.A., Saverne, France

Filed Apr. 25, 1991, Ser. No. 691,401
Claims priority, application France, Apr. 27, 1990, 90 05610
Int. Cl.[5] A01D *78/10, 80/00*
U.S. Cl. 56—367 **37 Claims**



1. A haymaking machine for being coupled to a tractor and which comprises a frame carrying a plurality of rotors driven in rotation during working operation by transmission elements which are housed in the frame

said frame including:

a central section

a first, second and third lateral section placed on each side of said central section, said central and said lateral sections being connected to one another by pins oriented so as to extend in the direction of movement of the machine

wherein each of said lateral section comprises a pipe and a housing equipped with a rotor

and wherein a hydraulic cylinder extends directly from said central section to each third lateral section for transporting said lateral sections into a working position in which said lateral sections are approximately aligned and a transporting position in which said lateral sections are folded about said pins, so that said first and second lateral sections being directed upward and the third lateral section being directed downward starting from their respective pins.

5,111,637

METHOD FOR WRAPPING A FLORAL GROUPING

Donald E. Weder, Highland, Ill.; Franklin J. Craig, Valley Park, Mo.; William F. Straeter, Breese, Ill., and Joseph G. Straeter, Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation of Ser. No. 391,463, Aug. 9, 1989, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application Feb. 15, 1991, Ser. No. 658,413
Int. Cl.[5] B65B *11/56, 51/02, 61/06*
U.S. Cl. 53—397 **4 Claims**

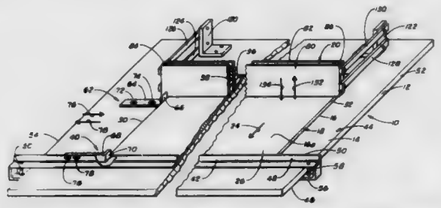
1. A method for wrapping a floral grouping having a stem portion and a flower end, comprising:

providing a sheet of material having an upper surface and a lower surface and constructed of a non-heat sealable, non-shape sustaining material;

passing at least a portion of the sheet of material through an adhesive applicator which applies an adhesive to at least one of the upper and lower surfaces thereof;

placing the floral grouping on the sheet of material after the adhesive has been applied thereto; and

wrapping the sheet of material about the floral grouping to a position, wherein the portion of the sheet of material having the adhesive thereon contacts another portion of the sheet of material for adhesively connecting the sheet of material and securing the sheet of material about the floral grouping, the sheet of material substantially encompassing and surrounding a substantial portion of the stem



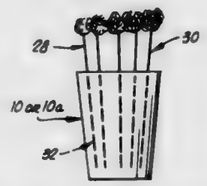
portion of the floral grouping with the sheet of material wrapped about the floral grouping having an opening extending through the lower end thereof and an opening extending through the upper end thereof with the stem portion of the floral grouping extending through the opening in the lower end and the flower end of the floral grouping being exposed near the opening in the upper end, the sheet of material being wrapped tightly about the stem portion of the floral grouping and the sheet of material wrapped loosely about the flower end of the floral grouping.

5,111,638

METHOD FOR WRAPPING AN OBJECT WITH A MATERIAL HAVING PRESSURE SENSITIVE ADHESIVE THEREON

Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.

Continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,274, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned. This application Jan. 31, 1991, Ser. No. 649,379
Int. Cl.[5] B65B *25/02, 11/02, 11/04*
U.S. Cl. 53—397 **16 Claims**



1. A method for packaging an item, comprising the steps of:

providing a sheet of material having a first side and a second side, a first end and a second end, an upper surface and a lower surface, the sheet of material having a pressure sensitive adhesive only on the upper surface of the sheet of material;

providing a floral grouping having an upper end consisting of a flower end and a stem end lower end consisting of a stem portion, the floral grouping comprising the item;

placing the floral grouping on the sheet of material;

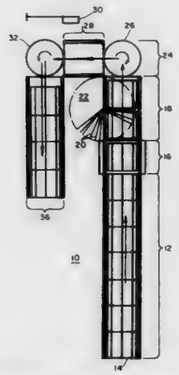
wrapping the sheet of material about the floral grouping with the first side of the sheet of material overlapping portions of the sheet of material and bonding the overlapping portions of the sheet of material by contacting the pressure sensitive adhesive on the upper surface with adjacent overlapping portions of the sheet of material whereby the first side of the sheet of material is bonded to overlapping portions of the sheet of material generally between the first and second ends of the sheet of material and with the sheet of material substantially encompassing and surrounding a substantial portion of the stem portion of the floral grouping and being held about the floral grouping by the bonding of the overlapping portions of the sheet of material, the sheet of material wrapped about the floral grouping forming a conically shaped wrapping having an opening extending through a lower end thereof and an opening extending through the upper end thereof with the stem end of the floral grouping extending through the opening in the lower end and the flower end of the floral grouping being exposed near the opening in the upper end thereof.

5,111,639

METHOD AND APPARATUS FOR BAGGING PRODUCT UNITS

Kevin J. Bolejack, and Frederick Forgnone, both of Salinas, Calif., assignors to Transfresh Corporation, Salinas, Calif.

Division of Ser. No. 311,225, Feb. 15, 1989, Pat. No. 5,046,302. This application Mar. 27, 1991, Ser. No. 675,741
Int. Cl.[5] B65B *31/04*
U.S. Cl. 53—408 **31 Claims**



1. A method of bagging a plurality of pallet-borne pluralities of packages containing perishables in a process for sealing an open plastic bag to a plastic sheet joined to a pallet base to provide a gastight container for said perishables, comprising:

draping a plurality of folded bags over horizontal members of a pallet bagger frame above a bagging station such that each of said horizontal members supports only one of said bags;

positioning each of said plurality of pallet-borne pluralities of packages, one at a time, in succession, below one of said folded bags on the pallet bagger frame horizontal members;

locating the plastic sheet joined to the pallet base with sheet edge margins extending upwardly beyond peripheral edges of said pallet base;

opening the mouth of said one of said folded bags and slipping said one bag over the top of said pallet-borne plurality of packages down to the pallet base with the bag open edge margins extending downwardly and lying laterally opposite said upwardly extending edge margins of the plastic sheet; and

affixing the plastic sheet to the open edge margins of said one bag.

5,111,640

PACKAGING CONTAINER AND PACKAGING METHOD OF ACRYLAMIDE CRYSTAL

Mareo Tokunaga, Kaizuka, and Wataru Isozaki, Takaishi, both of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Aug. 28, 1990, Ser. No. 573,702
Claims priority, application Japan, Sep. 5, 1990, 1-228368
Int. Cl.[5] B65B *55/00*
U.S. Cl. 53—449 **5 Claims**

1. A packaging method for acrylamide crystals having a water moisture content of 0.1–2.0% by weight which can cause condensation in a package, comprising the steps of:

(a) enclosing and sealing said acrylamide crystals in an inner bag consisting of a packaging material having moisture permeability of at least 300 g/m^2.24 hour at 40° C. in 90% RH,

(b) enclosing and sealing said inner bag and drying agent in an interlayer bag consisting of a packaging material having a water-vapor permeability of 10 g/m^2.24 hours or less at 40° C. in 90% RH and a gas barrier property, and

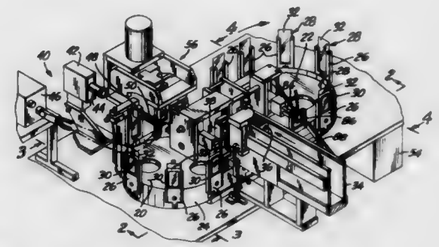
(c) enclosing and sealing said interlayer bag in an outer bag consisting of an exterior material; so that the moisture vapor from the acrylamide crystals permeate through the inner bag into the interlayer bag where it is absorbed by the drying agent, thereby preventing condensation of the moisture vapor on the inside surface of the inner bag.

5,111,641

INNER POUCH SEALING APPARATUS AND METHOD

David L. Brown, Wallingford, and Stanley J. Malinowski, Gilford, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Apr. 15, 1991, Ser. No. 685,521
Int. Cl.[5] B65B *57/08, 51/14, 41/18*
U.S. Cl. 53—477 **14 Claims**



1. A method for sealing an open inner pouch through an outer pouch comprising the steps of:

providing a supply of open inner pouches contained within outer pouches;

sequentially transporting individual inner pouches contained within an outer pouch to a viewing apparatus;

viewing said individual inner pouches to determine the position of said inner pouches relative to a base position;

generating a positioning signal from said viewing apparatus to a sealing apparatus;

positioning said sealing apparatus in response to said positioning signal; and

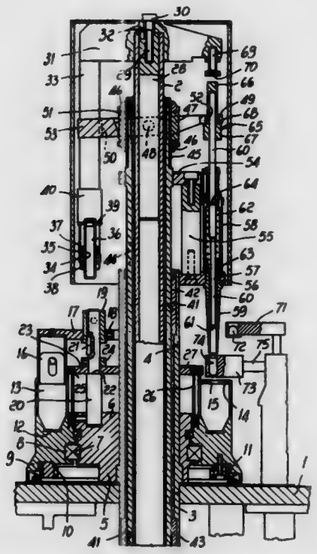
sealing said individual inner pouches through said outer pouches.

5,111,642

MACHINE FOR THE DOSAGE OF POWDERS IN CAPSULES, IN PARTICULAR FOR THE PHARMACEUTICAL INDUSTRY

Franco Chiari, Bologna, Italy, assignor to Macofar S.p.A., Milan, Italy

Filed Jan. 23, 1991, Ser. No. 644,807
Int. Cl.[5] B65B *63/02*
U.S. Cl. 53—529 **4 Claims**



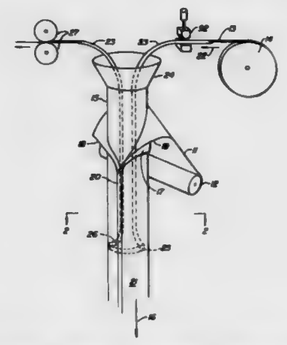
1. Machine for the dosage of powder in capsules composed of a shell and of a cap associable to said shell, in particular for the pharmaceutical industry, comprising a framework defining a horizontal table, a sleeve vertically fixed on said table, an annular hopper rotatably supported on said sleeve and defining a channel containing the powder to be dosed, a vertical outer tube guided in said sleeve, a central tube guided in said outer tube, a casing fixed to said outer tube and having a lower pipe parallel to said tube, a ring arranged on said outer tube and longitudinally positionable thereon, a lever pivoted to said ring, a rod guided in said casing, a plunger provided, at a lower portion of said rod and guided inside said pipe, means for supporting an adjustable-height loading cell and an adjustable abutment aligned with said rod, said lever having an end operatively associated with an upper portion of said rod, and an opposite end adapted for acting on said loading cell, said outer and central tubes being actuated to carry out, in succession, a descent stroke of the outer tube so as to cause insertion of the pipe into said channel and the filling thereof with a preset amount of powder, as well as the resting of the opposite end of said lever on said loading cell, a rising stroke of the central tube for causing said supporting means to oscillate said lever thus causing descent of the plunger and consequent compaction of the powder contained in the pipe, and formation of a compacted dose of powder inside said pipe, a rising stroke of the outer tube for raising the pipe to a level which lies above said channel in alignment with a shell positioned between said pipe and said channel for receiving the compacted dose of powder, and finally a descent stroke of the central tube for moving said adjustable abutment, to act on the rod of the plunger whereby to expel the compacted dose into the aligned shell.

5,111,643

APPARATUS AND FASTENER SUPPLY STRIP FOR ATTACHING RECLOSABLE FASTENER TO PLASTIC BAGS

Edgar G. Hobock, Fresno, Calif., assignor to Sun-Maid Growers of California, Kingsburg, Calif.

Filed Aug. 23, 1991, Ser. No. 749,062
Int. Cl.[5] B65B *9/20*; B31B *1/90*
U.S. Cl. 53—551 **7 Claims**



1. Apparatus for the manufacture of a reclosable bag, said apparatus comprising:

a hollow cylindrical forming tube having a longitudinal axis;

first conveying means for drawing an elongate sheet of web material from a continuous supply thereof around said forming tube while joining together the longitudinal edges of said elongate sheet to form a continuous cylinder of said web material;

second conveying means for drawing a continuous carrier strip into the interior of said forming tube, then through a first port in the wall of said forming tube to pass between said forming tube and said continuous cylinder of web material, and then through a second port in said wall of said forming tube displaced from said first port along the circumference of said forming tube, to return to the interior of said forming tube, said continuous carrier strip having affixed thereto mated fastener strip material;

first bonding means for bonding the portion of said mated fastener strip material between said first and second ports to said continuous cylinder of web material and for separating said mated fastener strip material thus bonded from said carrier strip; and

second bonding means for converting said continuous cylinder of web material with said mated fastener material thus bonded thereto into bags sealed at both ends, as aid mated fastener strip material thereby forming a reclosable closure on each such bag.

5,111,644

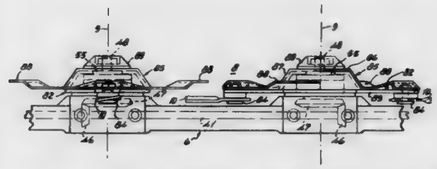
MOWING MACHINE

Ary van der Lely, Maasland, Netherlands, assignor to C. van der Lely N.V., Maasland, Netherlands

Continuation of Ser. No. 307,151, Feb. 7, 1989, Pat. No. 4,984,418, which is a continuation of Ser. No. 88,974, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 878,520, Jun. 23, 1986, abandoned, which is a continuation of Ser. No. 743,870, Jun. 11, 1985, abandoned, which is a continuation of Ser. No. 498,196, May 9, 1983, abandoned. This application Jan. 14, 1991, Ser. No. 640,875
Claims priority, application Netherlands, Sep. 9, 1982, #104178
Int. Cl.[5] A01D *34/66*
U.S. Cl. 56—13.6 **6 Claims**

1. A mowing machine which comprises main frame means,

said main frame means being provided with a plurality of cutting units spaced longitudinally therealong, said cutting units being rotatably mounted to said frame means so as to be rotatable about upwardly extending axes, said cutting units being provided with disc-shaped members bearing oppositely of said axes of said cutting units, said cutting units comprising cutting members mounted to said disc-shaped members by fastening parts, each said disc-shaped member having a circular upper and inner part, said disc-shaped member terminating in a frusto conical part from the circular edge of said inner part, said frusto conical part being prolonged, viewed in the outward direction, to circumferential portions perpendicular to the axis of the respective cutting units, parts of said circumferential portions lying below a nut of said disc-shaped member defining upwardly directed areas extending substantially parallel to each other and substantially radially to the axis of the cutting unit, said areas terminating relative to said axis outwardly up to the circumference to said disc, the upwardly directed areas extending in further areas which are downwardly inclined away from said upwardly directed areas so as to be prolonged in the peripheral areas of each said disc-shaped member, said further areas extending in radial directions substantially over the entire width of the circumferential portions.

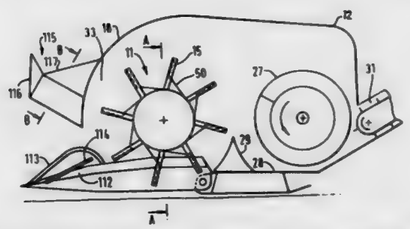


5,111,645

CROP HARVESTING APPARATUS AND METHODS

Wilfred E. Klinner, Woburn Sands, United Kingdom, assignor to National Research Development Corporation, London, England

Division of Ser. No. 340,783, Apr. 20, 1989, Pat. No. 4,991,385, which is a division of Ser. No. 35,909, Apr. 8, 1987, Pat. No. 4,843,806, which is a continuation-in-part of Ser. No. 879,109, filed as PCT/GB85/00442, Sep. 26, 1985, Pat. No. 4,790,128. This application Nov. 29, 1990, Ser. No. 619,611
Claims priority, application United Kingdom, Sep. 27, 1984, 8424395; Apr. 9, 1986, 8608585
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.[5] A01D *43/02*
U.S. Cl. 56—364 **30 Claims**



1. Apparatus for harvesting required crop parts from standing crop comprising;

a mobile frame for movement over the ground,

moveable support means mounted for driven movement relative to the frame,

a plurality of outwardly projecting crop engaging elements mounted on said moveable support means,

guide means cooperating with said crop engaging elements to form a crop flow passage, and

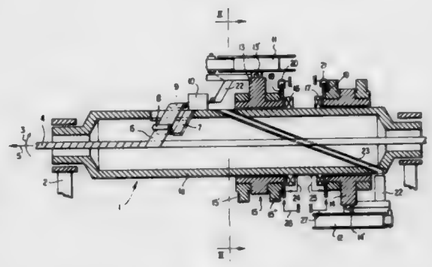
drive means for driving said moveable support means to carry said elements upwardly at a front region of the apparatus so as to detach from standing crop predetermined required parts of the crop and to move said detached crop parts along the crop flow passage, the crop engaging elements being arranged to engage standing crop while projecting forwardly relative to the direction of forward travel of the apparatus, and said crop engaging elements providing in operation a plurality of crop gathering regions, each crop gathering region having an inwardly extending slot following a wave-shaped path for inducing a lateral shaking motion in the stems of crop which pass into the slot.

5,111,646

TAPE WRAPPING DEVICE WITH PLURAL INDEPENDENTLY ROTATABLE SPOOL CARRIERS

Rüdiger Lange, Neuss, Fed. Rep. of Germany, assignor to Stolberger Maschinenfabrik GmbH & Co. KG, Stolberg, Fed. Rep. of Germany

PCT No. PCT/EP89/01592, § 371 Date Sep. 4, 1990, § 102(e) Date Sep. 4, 1990, PCT Pub. No. WO90/07780, PCT Pub. Date Jul. 12, 1990
PCT Filed Dec. 22, 1989, Ser. No. 573,187
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1989, 3900060
Int. Cl.[5] D02G *3/36*; D07B *7/14*
U.S. Cl. 57—15 **14 Claims**



1. A device for helically taping a continuous strand of material having a segment which extends along a straight path, the straight segment of the strand having a longitudinal axis, comprising:

a machine frame;

a hollow housing through which the straight segment of the strand extends, the housing being mounted on the machine frame for rotation about the longitudinal axis of the straight segment;

first reel means for holding a first tape having a beginning end;

first reel carrier means, on which the first reel means is mounted, for moving the first reel means along a path that encircles the longitudinal axis of the straight segment of the strand, the first reel carrier means being rotatable with respect to the housing;

first guiding device means for guiding the beginning end of the first tape;

first releasable coupling means for selectively coupling the first reel carrier means to the housing so that the first reel carrier means and the housing are rotatable in unison;

first brake means for selectively fixing the first reel carrier means with respect to the machine frame;

second reel means for holding a second tape having a beginning end;

second reel carrier means, on which the second reel means is mounted, for moving the second reel means along a path that encircles the longitudinal axis of the straight segment of the strand, the second reel carrier means being rotatable with respect to the housing;

second guiding device means for guiding the beginning end of the second tape;

second releasable coupling means for selectively coupling the second reel carrier means to the housing so that the second reel carrier means and the housing are rotatable in unison.

second brake means for selectively fixing the second reel carrier means with respect to the machine frame; and

wherein the first and second releasable coupling means and the first and second brake means are selectively operable during rotation of the housing to permit a depleted reel means to be replaced while the device continues helically taping the strand.

5,111,647

TWISTING SPINDLE DRIVEN BY AN INDIVIDUAL ELECTRIC MOTOR

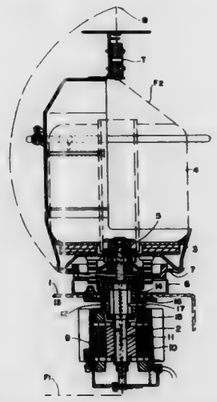
Carlos M. Gabalda, Granges Les Valence, France, assignor to ICBT Lyon, Caluire, France

Filed Apr. 17, 1990, Ser. No. 509,778

Claims priority, application France, Apr. 25, 1989, 89 05768

Int. Cl.[5] D01H *13/00, 7/86;* **H02K** *5/00*

U.S. Cl. 57—100 **6 Claims**



1. A double-twist twisting spindle for use in a textile apparatus comprising:

a spindle shank having first and second ends, and a central axis corresponding to the axial direction of said double-twist twisting spindle;

a rotor mounted to said first end of said shank;

a machine stand vertically supporting said shank and disposed between said first and said second end of said shank;

a motor housing arranged around said first end of said shank;

a supporting sleeve having first and second ends, said sleeve being fixed inside said motor housing at said first end thereof and being elastically mounted to said machine stand at said second end thereof;

a stator fixed to an interior of said first end of said sleeve within said motor housing, wherein said stator and said rotor comprise an electric motor within said motor housing and interact to rotatably drive said shank;

a bushing disposed at an interior of said second end of said sleeve;

bearings mounted to an interior of said bushing for securing said shank therein;

a rotary guide member mounted on said second end of said shank;

holding means adjacent to said rotary guide member for holding a reel of yarn such that the central axis of said reel of yarn extends in said axial direction;

a locking device for removably mounting said bushing to said sleeve, wherein said shank, said rotor, said bushing, said bearings, said rotary guide member and said holding means can simultaneously be freely removed from said sleeve in an axial direction of said shank upon unlocking said locking device.

5,111,648

APPARATUS FOR INITIATING THE FEED OF YARN IN A YARN PROCESSING MACHINE

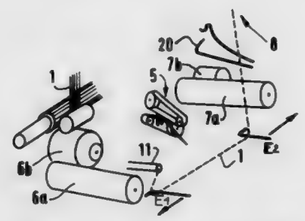
Bernard Isoard, Ecully, France, assignor to Devtex, France

Filed Jul. 24, 1990, Ser. No. 557,193

Claims priority, application France, Jul. 27, 1989, 89 10391

Int. Cl.[5] D01H *5/00*

U.S. Cl. 57—261 **7 Claims**



1. In a yarn processing machine having a supply of yarn to be processed positioned upstream of input and output delivery feed roller systems, mounted on either side of a treatment block to form therewith a spinning plane, and a winding/storage reel system positioned downstream from said output feed roller system; means for automatically starting up the feeding of yarn through the machine comprising:

vacuum operated temporary storage means positioned below said spinning plane between said input and output delivery feed roller systems;

a small supply of processed yarn wound on said winding/storage reel positioned downstream of said second delivery feed roller system;

means for introducing the free end of said small supply of processed yarn on said winding/storage reel into said vacuum operated temporary storage means;

guide wire means for forming a loop of processed yarn from said winding/storage reel and temporary storage means about said input and output delivery feed roller systems; and

means for causing said loop of yarn to move axially along the input and output feed delivery roller systems into the treatment block therebetween to pick up the yarn to be processed and carry it through the treatment block to the output feed delivery roller system and to the winding/storage reel for rewinding after processing.

5,111,649

METHOD OF MANUFACTURING STEEL TIRE CORDS

Hidenori Watakabe, Yamaguchi, Japan, assignor to Kokoku Wire Steel Ltd., Tokyo, Japan

Division of Ser. No. 428,225, Oct. 26, 1989, Pat. No. 5,020,312.

This application Mar. 7, 1991, Ser. No. 666,058

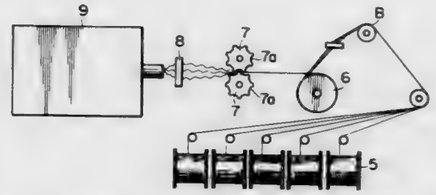
Claims priority, application Japan, May 23, 1989, 1-130674

Int. Cl.[5] D07B *3/00*

U.S. Cl. 57—311 **3 Claims**

1. A method of manufacturing a steel tire cord comprised of more than three strands of wire, said method comprising the steps of:

forming at least one of said strands in a zig-zag manner along the longitudinal direction thereof so as to form sharp angles therealong; and



twisting said strands together to form said steel tire cord such that gaps are formed in the center thereof corresponding to positions of the angles.

5,111,650

APPARATUS FOR REFILLILNG A YARN WETTING AGENT INTO A YARN WETTING DEVICE FOR A TEXTILE MACHINE

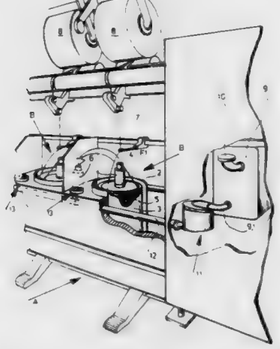
Ulrich Lossa, Krefeld, and Heinz Stenmans, Grefrath, both of Fed. Rep. of Germany, assignors to Palitex Project Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Jul. 9, 1990, Ser. No. 550,112

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1989, 3924359

Int. Cl.[5] D01H *1/10, 13/30*

U.S. Cl. 57—296 **6 Claims**



1. In a textile machine having a plurality of spindle assemblies for successive processing of supply packages of yarn which runs along the spindle assembly axis, each of said spindle assemblies including a yarn wetting device having a storage tank for containing a wetting agent and a porous wetting body extending into said tank for absorbing the wetting agent by capillary action and being positioned along the spindle assembly axis in the path of the running yarn for applying wetting agent to the running yarn during yarn processing and which must be removed from the spindle axis and running yarn path between successive yarn processing operations; the combination therewith of:

apparatus for refilling said storage tank of each of said wetting devices when said wetting device is removed from the spindle axis and running yarn path and comprising a supply tank for containing wetting agent, conduit means connected at one end to said supply tank and leading therefrom to each of said spindle assemblies out of the spindle assembly axis and running yarn path for conveying wetting agent, and valve means mounted at each of said spindle assemblies and connected to said conduit means, and cooperating valve means in said storage tank of said wetting device for connecting with said refilling apparatus valve means and allowing filling of said wetting device storage tank with wetting agent from said refilling apparatus.

5,111,651

OPEN-END SPINNING DEVICE

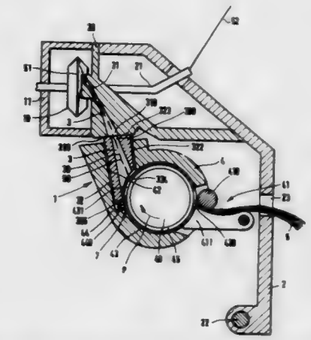
Johann Pohn, Ziegeleistr. 45, and Romeo Pohn, Weicheringerstr. 142, both of, D-8070 Ingolstadt, Fed. Rep. of Germany

Filed Jul. 10, 1990, Ser. No. 550,391

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 3923060

Int. Cl.[5] D01H *7/882, 4/30*

U.S. Cl. 57—413 **13 Claims**



1. An open-end spinning device having a spinning element disposed within a spinning housing and a rotatable fiber opening roller disposed within an opening roller housing, connected by a fiber feeding channel, said fiber feeding channel comprising:

a) a first feeding channel section disposed within said opening roller housing for receiving opened fiber from said opening roller;

b) a cover for closing said spinning housing;

c) a second feeding channel section disposed within said cover for receiving fiber from said first feeding channel section when said cover is closed;

d) said first feeding channel section being defined by an insert;

e) means for supporting said insert for movement along its longitudinal axis;

f) mating interfacing surfaces surrounding adjacent ends of said first and second feeding channel sections for abutting contact with each other when said cover is closed; and

g) resilient means for urging said insert supported for movement into abutting contact with the other section when said cover is closed.

5,111,652

CUTTING JET RECEPTACLE FOR A FLUID JET CUTTING MACHINE

Joël R. Andre, Bougival, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Jul. 9, 1990, Ser. No. 549,768

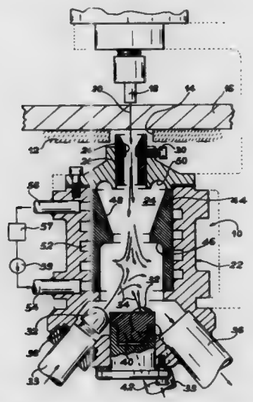
Claims priority, application France, Jul. 18, 1989, 89 09626

Int. Cl.[5] B24C *9/00*

U.S. Cl. 51—424 **11 Claims**

1. Cutting jet receptacle for a fluid jet cutting machine and including a hollow body having one cutting jet feed orifice kept in the alignment of this jet, two nozzles delivering counter-jets inside this hollow body said counter-jets orientated in

opposition with respect to the cutting jet traversing said orifice along directions inclined by a given angle with respect to one axis of the latter and distributed at regular intervals around this



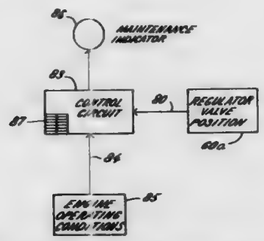
axis and under a certain pressure so that this counter-jet strikes the cutting jet and destroys it, and means for evacuating the fluid outside the hollow body.

5,111,653

FUEL DELIVERY SYSTEM WITH CAPACITY MONITOR

Plato J. Leeson, Rockford, Ill., assignor to Woodward Governor Company, Rockford, Ill.

Filed Apr. 11, 1990, Ser. No. 508,241
Int. Cl.[5] F02C *7/22*
U.S. Cl. 60—39.02 **26 Claims**



16. A method of monitoring the capacity of a gas turbine aircraft engine fuel delivery system in which the fuel system has a fuel supply, a pump for creating a high pressure fuel source, a metering valve for metering fuel from the high pressure source to the engine and a regulating valve for maintaining a substantially constant pressure differential across the metering valve, the method comprising the steps of:

monitoring the position of the regulating valve as a measure of excess fuel system delivery capacity at actual engine operating conditions, producing a first signal related to the monitored position,

producing a second signal indicative of actual engine operating conditions, and

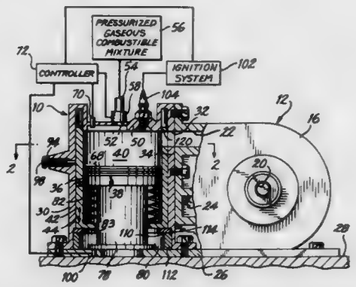
processing the first and second signals and estimating from the monitored regulating valve position at the corresponding actual engine operating conditions whether the fuel delivery system is capable of meeting predetermined operating specifications.

5,111,654

MOTIVE FORCE COMBUSTION PRODUCTS GENERATOR AND METHOD

Anthony T. Sertich, 137 MacIntyre Ln., Allendale, N.J. 07401

Continuation-in-part of Ser. No. 396,364, Aug. 21, 1989, abandoned. This application Mar. 1, 1991, Ser. No. 663,416
Int. Cl.[5] F02C *5/06*
U.S. Cl. 60—39.8 **21 Claims**



1. A combustion products generator for converting a pressurized gaseous combustible mixture from a source of such pressurized combustible mixture to combustion products which provide motive force to an engine driven by the combustion products, the combustion products generator comprising:

a cylinder;

a piston arrange for reciprocating movement within the cylinder to define a combustion chamber of variable volume, the piston being movable relative to the cylinder between a first position, wherein the volume of the combustion chamber is at a minimum, and a second position, wherein the volume of the combustion chamber is at a maximum;

first valve means between the source of the pressurized combustible mixture and the cylinder for admitting to the cylinder the pressurized combustible mixture such that the piston is driven by the pressurized combustible mixture from the first position toward the second position, and the maximum volume of the combustion chamber is filled with the pressurized combustible mixture;

ignition means for igniting the pressurized combustible mixture in the combustion chamber;

second valve means between the cylinder and the engine and movable between a closed condition, wherein the combustion products are confined to the combustion chamber, and an open condition, wherein the combustion products are released for conduct from the combustion chamber to the engine, the second valve means including valve-operating means for normally maintaining the second valve means in the closed condition, the valve-operating means being responsive to a predetermined combustion condition in the combustion chamber to move the second valve means to the open condition in response to the occurrence of the predetermined combustion condition;

return means for returning the piston to the first position subsequent to movement of the second valve means to the open condition; and

piston responsive means for returning the second valve mans to the closed condition in response to return of the piston from the second position to the first position, the piston responsive means including coupling means for coupling the piston with the second valve means such that upon return movement of the piston from the second position to the first position the second valve means is returned to the closed condition;

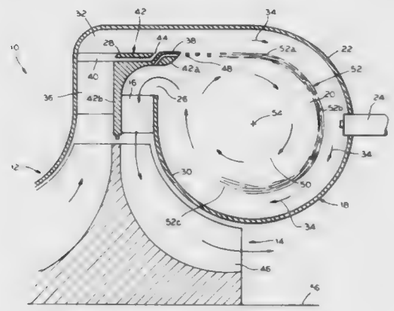
the valve-operating means including latching means normally latching the second valve means in the closed condition, the latching means being responsive to the predetermined combustion condition to unlatch the second valve means in response to the occurrence of the combustion condition.

5,111,655

SINGLE WALL COMBUSTOR ASSEMBLY

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 22, 1989, Ser. No. 455,245
Int. Cl.[5] F02C *3/14*
U.S. Cl. 60—39.36 **8 Claims**



1. A turbine engine, comprising:

a rotary compressor;

a turbine wheel coupled to said compressor for driven movement thereof;

an annular nozzle proximate said turbine wheel for directing gases of combustion thereat;

an annular combustor defining an annular combustion space disposed about said turbine wheel and in fluid communication with both said compressor and said nozzle, said combustor being defined by a single substantially continuous and generally annular combustor wall and having at least one igniter mounted therein, said combustor being adapted to receive fuel from a source and air from said compressor and to combust fuel and air in said combustion space to generate said gases of combustion;

said combustor having a combustor outlet leading to said nozzle, said outlet being defined by a pair of turbine shrouds, said combustor also having a combustor inlet leading to said combustion space, said inlet being defined by said combustor wall and one of said turbine shrouds;

means for injecting air from said compressor into said combustor at said combustor inlet in a manner creating a generally annular air flow in said combustor about said combustor wall; and

means for injecting fuel from said source into said combustor at said combustor inlet radially inwardly of and directed parallel to said air injected by said air injecting means for atomization thereby;

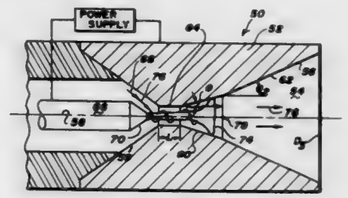
said turbine shrouds including a front turbine shroud having a radially extending portion and an axially extending portion spaced inwardly of said combustor wall to define said combustor inlet, said fuel injecting means including a fuel passage leading from said source to said axially extending portion of said front turbine shroud for injecting fuel at low velocity into said combustor inlet in the form of a fuel film, said fuel passage leading to a fuel orifice in a radially outwardly facing surface of said axially extending portion of said front turbine shroud for interaction with said injected air to form said fuel film.

5,111,656

ARCJET NOZZLE HAVING IMPROVED ELECTRICAL-TO-THRUST CONVERSION EFFICIENCY AND HIGH VOLTAGE OPERATION

Mark A. Simon, Redmond, and George W. Butler, Seattle, both of Wash., assignors to Olin Corporation, Cheshire, Conn.

Filed Jul. 12, 1990, Ser. No. 552,711
Int. Cl.[5] F02K *11/00*
U.S. Cl. 60—203.1 **28 Claims**



1. An arcjet thruster comprising:

an electrically conductive anode body having an anode cavity therein defining a divergent nozzle symmetrical about a central axis therethrough, said nozzle having a tandemly arranged cylindrical constrictor, a divergent recombination portion and a divergent expansion portion, said divergent expansion portion having a greater rate of divergence than said recombination portion;

a cathode body coaxial with and spaced from said anode body by a gap;

an electrical current supplying means connected to said cathode body and said anode body for producing an electrical arc across said gap between said bodies; and

means for injecting a vortex flow of propellant gas through said gap into said nozzle, said arc at least partially ionizing and disassociating said propellant gas;

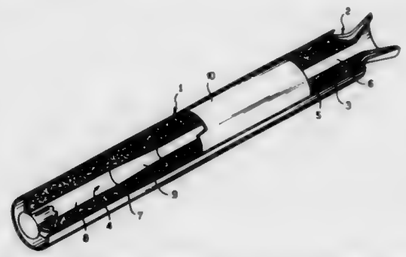
said propellant flow pushing one end of said arc into said recombination portion, a portion of said ionized and disassociated propellant recombining in said recombination portion so as to increase the energy conversion efficiency of said propellant gas flowing through said nozzle.

5,111,657

PROPULSION DEVICE COMPRISING A BLOCK OF PROPELLANT PROVIDED WITH A CENTRAL DUCT OF VARIABLE SECTION

Michel Hivert, Merignac, and Raymond Coleno, Saint-Aubin De Medoc, both of France, assignors to Societe Nationale Des Poudres et Explosifs, Paris, France

Filed Jun. 12, 1990, Ser. No. 536,463
Claims priority, application France, Jun. 15, 1989, 89 07907
Int. Cl.[5] F02K *9/10*
U.S. Cl. 60—224 **4 Claims**



1. Propulsion device comprising a body (1) equipped with a nozzle (2) including a convergent and a divergent portion and a block of propellant (3) having a longitudinal central duct (4)

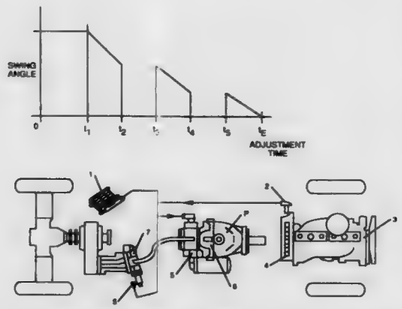
of variable section, characterized in that the block of propellant covers the convergent and divergent portion of said nozzle, and comprises a downstream part (5) having a cylindrical duct (6) which has a circular section whose diameter is less than two thirds of the diameter of the throat of the nozzle (2) and an upstream part (7) whose duct (8) on the one hand has a diameter which exceeds the diameter of the duct (6) of the downstream part and is less than the diameter of the throat of the nozzle (2), and on the other hand is connected to the duct (6) of the downstream part by a portion in the shape of a truncated cone (9), the length of this upstream part (7) being on the one hand between two and four times the external diameter of the block of propellant and on the other hand less than the length of the downstream part (5), the total length of the block of propellant being more than six times the external diameter of the block of propellant.

5,111,658

METHOD OF BRAKING A VEHICLE

Hilmar Strenzke, Aschaffenburg, and Norbert Fehn, Elsenfeld, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 12, 1990, Ser. No. 478,368
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—327 **2 Claims**



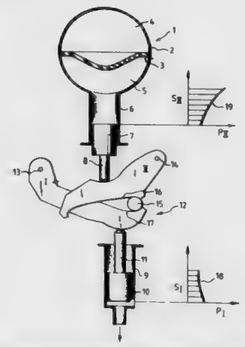
1. A method of braking a vehicle having a drive motor, a hydrostatic drive unit including adjustable hydraulic machines with adjusting devices, and an electronic subassembly controlling said adjusting devices for said hydraulic machines, whereby by continuous adjustment of said hydraulic machines, said drive motor can exert a braking moment that slows the movement of said vehicle, including rapidly adjusting said hydraulic machines at selectable intervals by said electronic subassembly toward a setting that relieves said drive motor after a limiting rpm value on said drive motor is exceeded with associated energy reduction in said hydrostatic drive unit by pressure limiting valves and associated renewed adjustment of said hydraulic machines that loads said drive motor, until the rpm of said drive motor drops below the limiting rpm value.

5,111,659

DEVICE FOR ADAPTING THE CHARACTERISTIC CURVE OF A HYDRAULIC ACCUMULATOR TO THE CHARACTERISTIC CURVE OF A CONSUMER

Hans-Christof Klein, Hattersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP88/00836, § 371 Date Jun. 15, 1989, § 102(e) Date Jun. 15, 1989, PCT Pub. No. WO89/03334, PCT Pub. Date Apr. 20, 1989
PCT Filed Sep. 13, 1988, Ser. No. 382,797
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735236
Int. Cl.[5] B60T *13/14*; F16D *31/02*
U.S. Cl. 60—413 **6 Claims**



1. A device for modifying the pressure characteristics of an accumulator in combination with a master cylinder of an automotive hydraulic brake system including a brake pedal for operating said master cylinder, said accumulator having an expandable fluid chamber having a volume of fluid therein, accumulating the same under pressure, said device including a first cylinder and a first piston slidable therein, a first cylinder fluid space on one side of said first piston subjected to the pressure of said fluid in said accumulator expansible fluid chamber, a second cylinder having a second piston slidable therein, mechanical transmission means drivingly connecting the other side of said first piston to one side of said second piston, said mechanical transmission means including variable ratio means providing a variable ratio mechanical advantage between said first and second pistons increasing over the course of movement of said first piston in said first cylinder as said fluid chamber expands;

said second cylinder including a driver fluid space on the other side of said second piston containing a volume of fluid delivered to said fluid pressure operated mechanism by movement of said second piston in the direction of said other side thereof, said fluid space in fluid communication with said fluid pressure operated mechanism;

said brake system master cylinder requiring a predetermined pressure to be operated, and said pressure in said accumulator expandable fluid chamber at a level producing a maximum fluid pressure developed in said driver fluid space lower than that predetermined pressure required to operate said brake system master cylinder; and

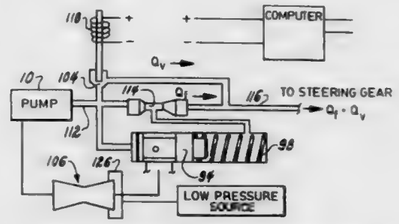
said brake pedal comprising means for applying a force to selectively increase the fluid pressure at said master cylinder over said maximum fluid pressure delivered from said second cylinder to enable operation of said master cylinder by means of fluid pressure generated by the combination of said accumulator and said brake pedal, whereby providing a booster for said brake pedal operation of said master cylinder.

5,111,660

PARALLEL FLOW ELECTRONICALLY VARIABLE ORIFICE FOR VARIABLE ASSIST POWER STEERING SYSTEM

Roger W. Gettel, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 11, 1991, Ser. No. 667,125
Int. Cl.[5] F16D *31/02*; B62D *5/06*
U.S. Cl. 60—468 **10 Claims**



1. A system for supplying fluid to a power steering gear, comprising:

a fluid pressure source having an outlet port through which fluid leaves said source;

an inlet passage connectable to the power steering gear, through which fluid enters the steering gear;

electronically variable orifice means having a first orifice located between the pressure source outlet port and the steering gear inlet passage, connecting the inlet passage to the outlet port;

a second orifice having a flow area of fixed size, located between he pressure source outlet port and the steering gear inlet passage, disposed in parallel flow arrangement with the electronically variable orifice means;

a bypass port;

flow control valve means located between the pressure source outlet port and the bypass port, for adjusting the flow area of the bypass port in accordance with the magnitude of fluid pressure supplied o the steering gear;

a source of low pressure fluid;

a diffuser passage means communicating with the bypass port and the low pressure fluid source, fluid passing through the bypass port mixing in said diffuser passage means with fluid from the low pressure source; and

bypass diffuser means supplied with fluid from the diffuser passage means, having a constricted flow area located along its length, or converting inertia energy of the fluid a passing therethrough to an increase of fluid pressure delivered to the fluid pressure source.

5,111,661

DUAL MASTER CYLINDER

Henri Savidan, Luzarches, and Andre Vachet, Seugy, both of France, assignors to General Motors France, Gennevilliers Hauts-de-Seine, France

Filed Aug. 24, 1990, Ser. No. 569,327
Claims priority, application United Kingdom, Sep. 14, 1989, 8920875
Int. Cl.[5] B60T *11/28*
U.S. Cl. 60—562 **4 Claims**

1. A dual master cylinder for the braking system of a motor vehicle comprising a bore having an open end and a closed end;

a primary portion including a primary piston slidable in the bore, a low pressure chamber within the bore and defined by the shape of the primary piston, and a compensation port opening into the low pressure chamber and connectable with a primary fluid reservoir;

and a secondary portion including a secondary piston slidable in the bore, a low pressure chamber within the bore and defined by the shape of the secondary piston, and a compensation port opening into the low pressure chamber and connectable with a secondary fluid reservoir;

the primary portion including a high pressure chamber within the bore between the primary piston and the secondary piston, and the secondary portion including a high pressure chamber within the bore between the secondary piston and the closed end of the bore;

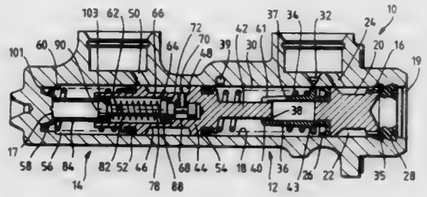
a seal being mounted on the primary piston between the low and high pressure chambers of the primary portion;

a seal being mounted on the secondary piston between the low and high pressure chambers of the secondary portion;

the high pressure chamber of the primary portion being fluidly connectable with the primary fluid reservoir by dilation means;

the high pressure chamber of the secondary portion including a check valve mounted within a piston bore in the secondary piston, the piston bore providing a fluid passage between the high pressure chamber and the low pressure chamber of the secondary portion, the piston bore comprising a large diameter portion which opens into the high pressure chamber of the secondary portion and the piston bore comprising a small diameter portion, a piston bore shoulder being positioned between the piston bore large diameter portion and the piston bore small diameter portion, the piston bore also having end wall means within the piston bore small diameter portion, the check valve allowing hydraulic fluid to flow through the fluid passage during a rest mode or a release mode of the dual master cylinder, but preventing such flow during an apply mode;

wherein the check valve comprises a check valve piston and



a ring seal positioned around the check valve piston, the check valve being slidably mounted in the piston bore and having a first abutment face adjacent the ring seal engageable with the ring seal which is in turn engageable with the shoulder in the piston bore to prevent flow of hydraulic fluid through the fluid passage on actuation of the respective piston;

wherein an aperture extends through the secondary piston between the small diameter portion and secondary piston between the small diameter portion and the low pressure chamber of the secondary portion and a hollow pin is positioned in the aperture to project into the small diameter portion of the piston bore, the pin forming an abutment means with the second portion of the piston bore;

and wherein the check valve piston comprises a main body positioned within the large diameter portion of the piston bore, and a secondary body slidably positioned in the small diameter portion of the piston bore, the first abutment face being positioned between the main body and the secondary body, the secondary body having a channel in its surface and wherein the check valve piston secondary body has an end face for contact with the piston bore end wall means to limit movement of the check valve piston first abutment face towards the piston bore shoulder to limit the compression of the ring seal, and wherein the check valve piston secondary body has a reduced diameter portion adjacent the aperture, the reduced diameter portion defining a shoulder on the check valve piston secondary portion for engagement with the pin to limit the relative position of the piston first abutment face away

from the secondary piston bore shoulder, and the piston main body portion having a second abutment face facing generally opposite the first abutment face and a third abutment face on an end of the main body more adjacent the master cylinder closed end facing in the same direction as the first abutment face, the third abutment face being contained within the secondary valve piston;

a piston spring support and stop spring within the secondary portion spring biased away from the secondary piston by a secondary spring, the piston spring support being positioned adjacent the master cylinder closed end, the piston spring support having stop means for engagement with the check valve piston third abutment face to limit the displacement of the check valve piston away from the piston spring support and stop thereby set the maximum distance of the check valve piston first abutment from the piston bore shoulder, and the piston spring support and stop being spring biased away from the check valve via engagement of a piston check valve spring contact with the check valve piston second abutment face;

the fluid passage being defined by the aperture, the channel, and the large diameter portion of the piston bore.

5,111,662

GAS/STEAM POWER STATION PLANT

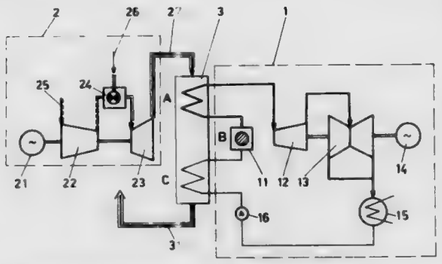
Curt Nicolin, Grodinge, Sweden; Hans-Ulrich Frutschi, Riniken, and Giacomo Bolis, Zurich, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Oct. 19 1990, Ser. No. 599,737

Claims priority, application Switzerland, Oct. 24, 1989, 3839/89

Int. Cl.[5] F01K *23/10*

U.S. Cl. 60—655 **12 Claims**



1. A gas/steam power station plant comprising:

at least one fossil fuel circuit producing electric power and at least one steam circuit producing electric power;

said fossil fuel circuit having turbine means receiving combustion gases for operating an electric generator;

said steam circuit having reactor means for producing saturated steam from feed water and turbine means receiving said saturated steam for operating an electric generator;

at least one heat exchanger means for heating said feed water and said saturated steam of said steam circuit with exhaust gases of said fossil fuel circuit;

said at least one heat exchanger means including preheat stage means for preheating at least a portion of said feed water prior to introduction of said feed water to said reactor means; and,

said at least one heat exchanger means including superheat stage means for superheating at least a portion of said saturated steam prior to introduction of said saturated steam to said turbine means.

5,111,663

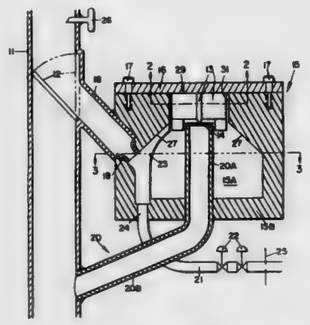
TURBINE START-UP PARTICULATE SEPARATOR

Ronald E. Brandon, 1734 Lenox Rd., Schenectady, N.Y. 12308

Filed Nov. 12, 1991, Ser. No. 790,447

Int. Cl.[5] F01K *13/02*

U.S. Cl. 60—656 **11 Claims**



1. Start-up particulate separating apparatus for the inlet steam flow to a steam turbine comprising: a steam inlet pipe to the turbine, a centrifugal separator, means for directing the inlet steam from the inlet pipe to the separator, an inlet nozzle in the separator for accelerating the steam to a high centrifugal velocity, collection means in the separator for capturing centrifugal particulate material, a dump steam line leading from the collection means to a condenser or other location for discharging a combination of a small steam flow and the collected particulate material from the separator, a steam discharge pipe for cleaned steam to redirect the flow from the separator back to the turbine inlet pipe; and valve means for closing off the fow to the centrifugal separator whenever conditions indicate that particulate material is not a problem and for simultaneously opening the normal fow path of admission steam through the steam inlet pipe to the turbine.

5,111,664

PORTABLE REFRIGERATING/HEATING APPARATUS

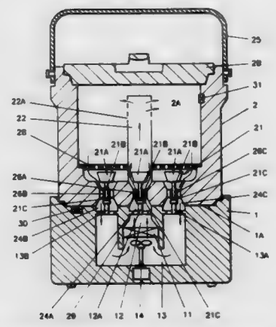
Kun M. Yang, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 29, 1990, Ser. No. 529,638

Claims priority, application Rep. of Korea, May 29, 1989, 89-7187

Int. Cl.[5] F25B *21/02;* **F25D** *17/04*

U.S. Cl. 62—3.62 **10 Claims**



1. A portable refrigerating/heating apparatus, including a Peltier heat exchanging unit, comprising:

a heat exchange case having an air supply passage, at least one air collecting passage, a plurality of support pins and a coupling detection switch, wherein said air supply passage is comprised of a support member having said heat exchanging unit mounted thereon;

a preserving case having a hollow storage chamber formed therein, coupling means for coupling said preserving case on top of said heat exchanging case, at least two air passages and at least two air passage opening/closing means connected to said air passages and a cover, wherein said at least two air passage opening/closing means align with said support pins for controlling said at least two passage opening/closing means to open when said preserving case is coupled to said heat exchanging case; and

blower means for cycling air from said at least one air collecting passage, over said heat exchanging unit, through said air supply passage, into said storage chamber and back through said at least one air collecting passage.

5,111,665

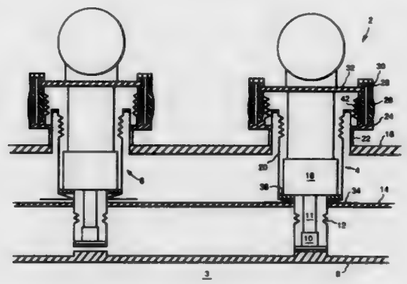
REDUNDANT CRYOREFRIGERATOR SYSTEM FOR A REFRIGERATED SUPERCONDUCTIVE MAGNET

Robert A. Ackermann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 19, 1991, Ser. No. 656,920

Int. Cl.[5] F25B *9/00*

U.S. Cl. 62—6 **15 Claims**



1. A cryorefrigerator system for a refrigerated superconductive magnet which is comprised of:

a mounting means rigidly attached to said magnet;

at least two cryorefrigerator means mounted on said mounting means such that said cryorefrigerator means moves on said mounting means and at least one of said two cryorefrigerator means being substantially out of contact with said magnet; and

an adjustment means rigidly attached to said cryorefrigerator means for moving said at least one of said cryorefrigerator means.

5,111,666

HOLDING CONTAINER FOR CRYOGENIC LIQUID

Cornelis Klok, Noiseau, and Daniel Delatte, Saint Maur, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

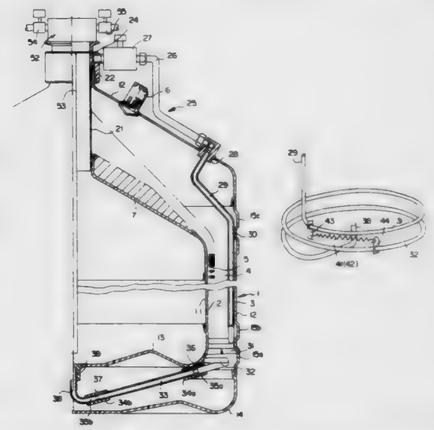
Filed Nov. 7, 1990, Ser. No. 609,761

Claims priority, application France, Dec. 1, 1989, 89 15843

Int. Cl.[5] F17C *3/08, 7/04, 13/00*

U.S. Cl. 62—48.1 **14 Claims**

1. Holding container for cryogenic liquid comprising an inner casing (2) and an outer casing (3) defining an inner space (4) therebetween and a cryogenic liquid withdrawing pipe connected to said inner casing and including a first portion (29) extending into the inner space (4), wherein the pipe (29) includes a section (31, 32) in resilient contact against the inner face of the outer casing (3), the pipe section comprising at least one spiral turn (31, 32) and resilient means (42, 41) cooperating with the spiral turn to induce a radial opening of the spiral turn.



5,111,667

TWO-STAGE CRYOPUMP

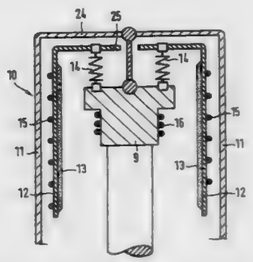
Hans-Ulrich Häfner, Cologne; Hans-Hermann Klein, Friedberg, and Uwe Timm, Frankfurt, all of Fed. Rep. of Germany, assignors to Leybold AG, Hanau, Fed. Rep. of Germany

Filed Mar. 4, 1991, Ser. No. 663,130

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1990, 4006755

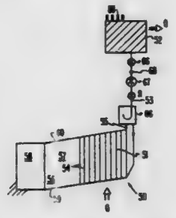
Int. Cl.[5] B01D *8/00*

U.S. Cl. 62—55.5 **18 Claims**



1. In a two-stage cryopump having a refrigerator including a first stage and a second stage being colder than the first stage; a condensation member having a condensation surface; first coupling means for connecting said condensation member to said second stage in a thermally conducting manner; an adsorption member having an adsorption surface and being spaced from said condensation member; and second coupling means for connecting said adsorption member to said second stage in a thermally conducting manner; the improvement comprising heating means for heating said adsorption member during time periods for regenerating said adsorption member; further wherein said second coupling means comprises means for thermally insulating said adsorption member from said second stage and from said condensation member at least during heating periods of said adsorption member by said heating means for preventing heating said condensation member by said heating means.

5,111,668
COOLING DEVICE AND METHOD FOR HAZARDOUS MATERIALS SUITS
Clyde F. Parrish, Melbourne, and Robert P. Scaringe, Rockledge, both of Fla., assignors to Mainstream Engineering Corp., Rockledge, Fla.
Continuation-in-part of Ser. No. 593,044, Oct. 5, 1990. This application Feb. 26, 1991, Ser. No. 660,996
Int. Cl.[5] F25D *23/12*
U.S. Cl. 62—259.3 **8 Claims**

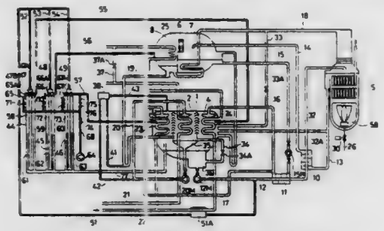


1. A personal cooling device, comprising
a sealed garment containing a working fluid in an evaporator section which fluid is adapted to be vaporized by heat generated from a person wearing the garment;
a bed consisting of one of an adsorbent, an absorbent and other known desiccants; and
a pressure-regulating valve operatively communicating the garment and the bed for maintaining a desired pressure in the evaporator section transport of the working fluid vapor.

5,111,669

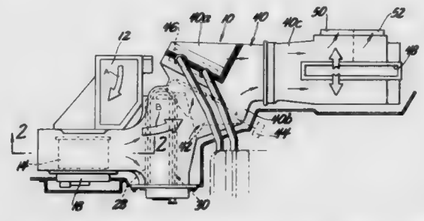
Patent Not Issued For This Number

5,111,670
ABSORPTION REFRIGERATION SYSTEM
Masahiro Furukawa; Kazuhiro Yoshii, and Masayuki Oonou, all of Oizumi, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Nov. 19, 1990, Ser. No. 615,580
Claims priority, application Japan, Nov. 20, 1989, 1-134630; Nov. 20, 1989, 1-301119
Int. Cl.[5] F25B *43/04*
U.S. Cl. 62—475 **10 Claims**



1. An absorption refrigeration system comprising:
an absorption refrigeration cycle, which is formed by connecting a plurality of absorbers, a regenerator, a condenser and an evaporator with one another by means of pipes;
a plurality of noncondensing gas bleeding portions, each said portion being connected for bleeding noncondensing gas accumulated in a respective one of said plurality of absorbers; and
a respective noncondensing gas tank connected to each of said bleeding portions for storing the noncondensing gas which is bled from the associated absorber.

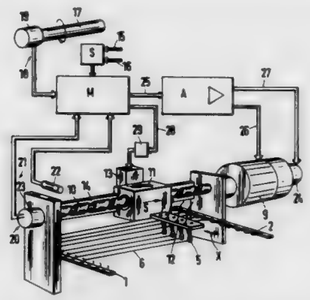
5,111,671
EVAPORATOR WITH EXPANDING AND CONTRACTING PASSES FOR IMPROVING UNIFORMITY OF AIR TEMPERATURE DISTRIBUTION
Prasad S. Kadle, Getzville, N.Y., assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 7, 1991, Ser. No. 651,878
Int. Cl.[5] F25B *39/02*
U.S. Cl. 62—515 **7 Claims**



1. An air conditioning ventilation unit for a motor vehicle having a refrigerant system including a liquid refrigerant conduit adapted to be connected to the inlet of a refrigerant evaporator and a low pressure refrigerant vapor conduit adapted to connect the outlet of the evaporator to the inlet of a mechanical refrigerant compressor and further including an air blower for directing air flow across the evaporator which includes an inlet face with an uneven air flow pattern thereacross including a higher air flow portion and a lesser air flow portion the improvement comprising:
an evaporator core having an inlet fitting adapted to be connected to the low pressure liquid conduit of the air conditioning and an outlet adapted to be connected to the low pressure refrigerant vapor conduit;
said evaporator core including first tube pass means forming an expanding volume passage for flow of refrigerant with respect to the higher air flow portion and a second tube pass means in series flow relationship with said first tube pass means forming a contracting volume passage for directing a back pressure on said first tube pass means for retaining liquid phase refrigerant within said first tube pass so as to increase the loss of heat energy from the higher volume air flow portion.

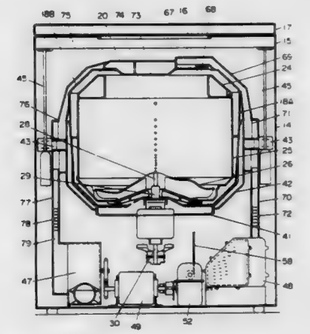
5,111,672
WEFT THREAD INSERTION ARRANGEMENT
Friedrich Gille, Obertshausen; Rolf Naumann, Muhlheim, and Gerhard Bergmann, Heusenstamm, all of Fed. Rep. of Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany
Filed Sep. 26, 1990, Ser. No. 588,654
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1989, 3932184
Int. Cl.[5] D04B *23/12*
U.S. Cl. 66—84 A **17 Claims**

1. A weft thread insertion arrangement for the weft thread magazine of a warp knitting machine adapted to receive weft thread and having a main shaft and a needle bed, comprising:
an insert carriage for laying weft thread;
two forwarding means for forwarding to the needle bed the weft threads laid by said insert carriage;
a drive means for driving said insert carriage to travel between said two forwarding means, said drive means being coupled to and regulated by the main shaft of the warp knitting machine, said drive means comprising a computer provided with at least one data storage means and programed to process data under at least one predetermined movement path formula;
a servomotor coupled to said computer and coupled to said insert carriage to move the carriage; and
a sensor coupled to said computer for providing thereto a sensor signal responsive to the number of revolutions and the angular displacement position of the main shaft to enable the computer to compute from the sensor signal a



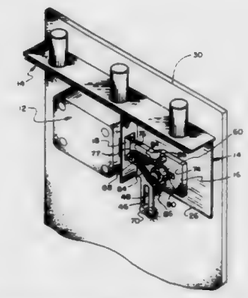
target drive speed value for the servomotor based upon said sensor signal and based upon said predetermined movement path formula.

5,111,673
WASHING-DRYING MACHINE
Katsuhiko Kadoya, Kishiwada; Yukinobu Omichi, Ikoma; Eiji Matsuda, Katano, and Kenji Takenaka, Minou, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Japan
Continuation of Ser. No. 465,150, filed as PCT/JP89/00598, Jun. 15, 1989, abandoned. This application Jul. 3, 1991, Ser. No. 726,126
Claims priority, application Japan, Sep. 29, 1988, 63-244913; Nov. 24, 1988, 63-296468; Mar. 15, 1989, 1-62448; Mar. 15, 1989, 1-62450; Jun. 15, 1989, 63-152628
Int. Cl.[5] D06F *25/00, 33/02, 37/20*
U.S. Cl. 68—12.04 **3 Claims**



1. A washing-drying machine for laundry having a washing cycle, a rinsing cycle, a spin-drying cycle and a warm-air tumble drying cycle, comprising:
a prism-shaped housing;
a tub in said housing;
a perforated rotary drum in said tub for holding laundry:
an oscillating pulsator in said drum for washing laundry;
pivot means secured to opposite sides of said tub and to said housing for rotary movement of said tub about a substantially horizontal axis extending substantially through diagonally opposite corners of said housing, between a substantially vertical position for washing, rinsing and spin-drying cycles and a substantially horizontal position for a warm-air tumble drying cycle;
means for rotating said tub between said positions;
means defining a path for warm-drying air including said drum, a heater and a blower;
an upward-opening overflow outlet on a side of said tub arranged to be in the vicinity of a corner of said housing when said tub is substantially vertical; and
a water outlet in communication with said overflow outlet, mounted to the underside of said tub and arranged to be positioned in the vicinity of a corner of said housing when said tub is substantially vertical.

5,111,674
SAFE LOCKING MECHANISM
Ho-Ton Huang, 8822 N.E. 10th St., Bellevue, Wash. 98004
Filed Sep. 17, 1990, Ser. No. 583,728
Int. Cl.[5] E05B *63/14*
U.S. Cl. 70—118 **8 Claims**



1. A locking mechanism for mounting on the interior surface of safe doors and the like, comprising:
a) key lock housing means including a generally horizontal lock bolt having an extended locked position and a retracted unlocked position, said lock housing means including bolt activating means,
b) a lock pin body means including lock pin members adapted to have a door locked and a door unlocked position depending on movement of said body means, said body means having a mounting ledge to which are connected said lock pin members for engaging locking elements and also having an actuator section which extends downwardly from said mounting ledge in close proximity to said interior surface adjacent said key lock housing means, said body means further including a generally vertically disposed guide slot means and a generally vertically disposed shaft slot means in the actuator section thereof,
c) generally horizontally disposed slide plate latch means operatively connected to said actuator section and having a base section and a forward section, said base section being provided with a generally horizontal key hole shaped slot having a round end and a narrower rectangular end opening into said round end, said forward section having an elongated, generally horizontally disposed forward slot and a forward generally vertical front edge for engaging said locking bolt,
d) a spring pin mounted on said actuator section and disposed to coact with said forward slot of said slide plate means, said slide plate means including spring means attached thereto and to said spring pin for biasing said slide plate means toward said key lock housing means so that said front edge contacts said lock bolt,
e) rotatable shaft means extending through said door and through said shaft slot means of said actuator section and thence through said key hole slot of said slide plate means, said shaft means including a neck portion aligned with said slide plate means, whereby when said lock bolt is extended to its locked position said slide plate means is moved

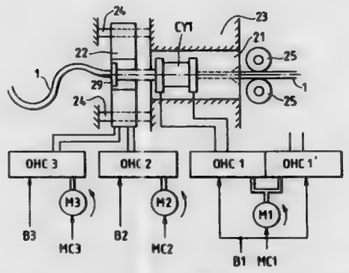
against spring tension to align said shaft means with said round end of said key hole shaped slot, and when said lock bolt is retracted to its unlocked position said slide plate means follows said lock bolt to align said neck portion of said shaft means with said rectangular end of said key hole slot and whereby rotational movement of said shaft means rotates said slide plate means to move said lock pin body means downwardly to disengage said lock pin members from their locking elements.

5,111,675

PENETRATION BENDING METHOD AND PENETRATION BENDING MACHINE THEREFOR

Makoto Murata, Yokohama, Japan, assignor to Nissin Seiki Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1990, Ser. No. 523,128
Claims priority, application Japan, May 15, 1989, 1-120894
Int. Cl.[5] B21D *7/12*
U.S. Cl. 72—7 **14 Claims**



1. A method for bending a rod-like member with apparatus for penetration bending of a rod-like member, the rod-like member having a first end, a second end, and a longitudinal axis disposed therebetween, said apparatus comprising:

a guide member for restrainably receiving the rod-like member, said guide member having a first end, a second end, and a longitudinal axis disposed therebetween, said guide member for permitting movement of the rod-like member within said guide member in a direction along the longitudinal axis of the rod-like member;

a die member disposed adjacent an end of said guide member;

means for moving at least one of said die member and said guide member relative to the other of said die member and said guide member along a plurality of paths within a plane perpendicular to the longitudinal axis of said guide member;

means for moving at least one of said die member and said guide member relative to the other of said die member and said guide member in a direction parallel to the longitudinal axis of said guide member to thereby alter the distance between said die member and said guide member;

said die member comprising a bearing for restrainably bearing a portion of the rod-like member to thereby bend the rod-like member as the rod-like member is passed through said guide member and said die member, said bearing portion having a given point; and

means for moving said rod-like member longitudinally through said guide member and said die member;

said method comprising the steps of:

positioning at least one of said die member and said guide member a desired distance from the other of said die member and said guide member in a direction parallel to the longitudinal axis of the rod-like member;

moving at least one of said die member and said guide member in a multiplicity of angular directions along at least one of said plurality of paths within said plane perpendicular to the longitudinal axis of said guide member to relatively offset the longitudinal axis of said guide member a desired amount from the given point of said bearing portion of said die member;

advancing the rod-like member through said guide member with said means for moving said rod-like member in the direction along the longitudinal axis of the rod-like member;

further advancing the rod-like member with said means for moving said rod-like member past said die member so that a portion of the rod-like member contacts said bearing portion of said die member to thereby bend the rod-like member a desired amount in a plurality of directions;

said moving comprises moving said at least one of said die member and said guide member relative to the other of said die member and said guide member during said advancing of the rod-like member through said guide member and said die member to alter the offset amount between the longitudinal axis of said guide member and the given point of said bearing member to thereby alter at least one of:

the amount of bending of the rod-like member, and

the direction of bending of the rod-like member;

the offset amount between the longitudinal axis of said guide member and the given point of said bearing portion is continuously variable; and

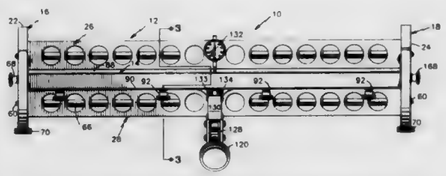
said moving at least one of said die member and said guide member comprises moving at least one of said die member and said guide member relative to the other of said die member and said guide member in at least one of said plurality of directions and continuously angularly variable over a given solid angle.

5,111,676

TOOL FOR SELECTIVELY BENDING THE TRAILING EDGE TAB OF A HELICOPTER BLADE WHILE SIMULTANEOUSLY MEASURING THE TRUE DEGREE OF TAB BENDING

Harry L. Ruzicka, Jr., Easton, and Anton J. Kompare, Hamden, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 4, 1990, Ser. No. 592,428
Int. Cl.[5] B21C *51/00*; B21D *7/00, 53/92*
U.S. Cl. 72—34 **14 Claims**



1. A tool for selectively bending the trailing edge tab of a helicopter blade comprising:

a. two C-shaped support members;

b. first support means supporting said C-shaped members in spaced relation so that their spacing is larger than the span dimension of the trailing edge tab to be bent;

c. second support means for supporting said C-shaped members and said first support means in fixed position from a helicopter blade;

d. trailing edge tab bending means supported by frictionless bearings between said C-shaped members so as to be pivotable with respect thereto about a selected axis and about which axis the trim tab is to be bent along its span dimension, including;

(1) fixed and movable members shaped to flushly engage the top and bottom surfaces of the trailing edge tab throughout substantially its full span dimension, and terminating in alignment substantially along said selected axis;

e. means to cause said tab bending means to selectively rotate about said selected axis so that when engaging a trim tab, it will bend the trim tab about said selected axis; and

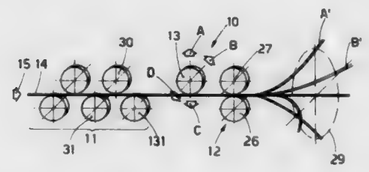
f. negator spring means connected to said bending means and operable to resiliently apply a moment thereto in opposition to the moment which would be applied by the weight of the tab bending means to a trailing edge tab being bent so that the true degree of bending of the tab can be ascertained at any time during the bending operation.

5,111,677

ORTHOGONAL ADJUSTMENT UNIT FOR STRAIGHTENING BARS

Marcello Del Fabro, Udine, and Giorgio Del Fabro, Montegnacco, both of Italy, assignors to MEP Macchine Elettroniche Piegatrici SpA, Rojale, Italy

Continuation of Ser. No. 463,446, Jan. 11, 1990, abandoned. This application Jan. 23, 1991, Ser. No. 643,682
Claims priority, application Italy, Jan. 18, 1989, 15901 A/89
Int. Cl.[5] B21D *3/02*
U.S. Cl. 72—164 **8 Claims**



1. A bar straightening machine through which bars pass along a nominal axis and having an orthogonal adjustment unit, comprising:

a straightening assembly having a plurality of rolls arranged in first and second rows with said nominal axis passing between said first and second rows, rolls of said first row being opposed to and staggered with rolls of said second row, and at least a plurality of said rolls being powered;

a contrast unit provided downstream of said straightening assembly and comprising at least a pair of opposing rollers, a first plane perpendicular to the axes of said opposing rollers and passing through said opposing rollers being substantially the same as a plane passing through said rolls of said straightening assembly and perpendicular to the axes of said rolls of said straightening assembly; and

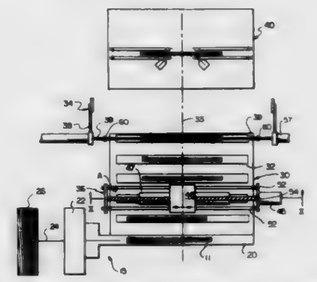
an orthogonal adjustment unit provided between said straightening assembly and said contrast unit, said orthogonal adjustment unit comprising at least one adjustment roll capable of idling and of being movable along two orthogonal axes, each of which is perpendicular to said nominal axis, such that said adjustment roll is positionable as required within an angle of 360° on a plane normal to said nominal axis, said at least one adjustment roll being provided such that a plane passing through said adjustment roll and perpendicular to the axis of said adjustment roll is parallel to or coinciding with said first plane, wherein said orthogonal adjustment unit can impart a desired variable deformation to a bar passing through said straightening assembly and said contrast unit so as to oppose a curved development imparted to said bar by said straightening assembly.

5,111,678

ELECTRIC HEATER COIL TRANSFERRING AND FORMING APPARATUS AND METHOD OF USE

Arthur Evans, Sherburne, and John R. McManus, Marcellus, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 457,229, Dec. 26, 1989, abandoned. This application May 28, 1991, Ser. No. 705,835
Int. Cl.[5] B21C *47/00*; B21D *43/10*
U.S. Cl. 72—134 **7 Claims**



1. An apparatus for centering a straight length helical electric resistance heating coil in a manufacturing station comprising;

a movable support means for receiving a singular straight length helical electric resistance heating coil thereon in a manner wherein said singular straight length helical electric resistance heating coil is positioned generally transverse to an axis of movement of said support means wherein unequal lengths of said singular straight length helical electric resistance heating coil are positioned on each side of said axis of movement of said support means, said support means includes a plurality of individual saddle members for supporting said singular straight length helical electric resistance heating coil during movement of said support means,

centering means for gripping each singular straight length helical electric resistance heating coil having said unequal lengths positioned on each side of said axis of movement of said support means and positioning generally equal lengths of said singular straight helical electric resistance heating coil on each side of said axis of movement of said support means, said centering means includes movable rod means insertable into each end of the singular straight length helical electric resistance heating coil to hold said coil during centering; and

transfer means for gripping a portion of said singular straight length helical electric resistance heating coil centered about said axis of movement of said support means and releasably transferring said singular straight length helical electric resistance heating coil to a second station.

5,111,679

METHOD FOR FORMING BARREL FOR TWO-PIECE CAN

Tomomi Kobayashi; Akira Kobayashi, both of Yokohama; Hiroshi Fujimoto, Tokyo; Norihiko Saiki, Kawasaki, and Katsuhiro Imazu, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 544,725
Claims priority, application Japan, Jun. 27, 1989, 1-162806
Int. Cl.[5] B21D *22/20*
U.S. Cl. 72—348 **2 Claims**

1. A method for forming a barrel for a two-piece can, comprising the following steps:

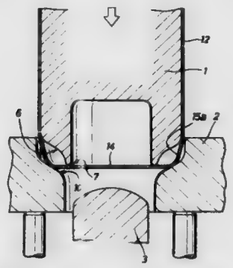
forming a barrel having a flat bottom by subjecting a metal sheet to drawing or draw-ironing;

forming a taper portion in the side wall of the barrel adjacent

said bottom wall having an inner diameter gradually decreasing toward the bottom wall of the barrel;

supporting the bottom of said barrel using an annular die having a circumferential frustoconical portion having a shape corresponding to the shape of a portion of the bottom of the final barrel;

inserting a cylindrical punch in said barrel, said punch having an outer circumferential frustoconical portion complimentary to the shape of said frustoconical portion of said annular die so as to mate therewith and having an outer



diameter greater than the inner diameter of the barrel taper portion, insertion of said punch causing at least a portion of said taper portion of said barrel to expand radially outwardly, said punch having an annular projecting portion extending downwardly therefrom defining a recess therein; and

draw-forming the bottom while engaging the bottom with a doming die having an outer diameter slightly smaller than a diameter of said recess, said doming die being disposed at least partially in said recess so as to form a dome portion of the bottom of said barrel.

5,111,680

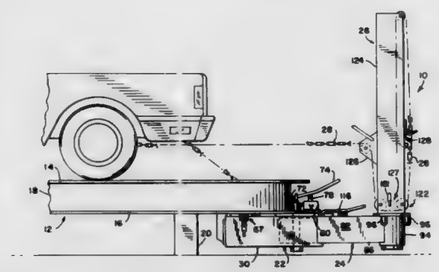
FREE FLOATING TOWER ASSEMBLY FOR A WORK PLACE

James G. Ballard, Waukesha, and Craig A. Wisner, Wauwatosa, both of Wis., assignors to Hein-Werner Corporation, Waukesha, Wis.

Filed Nov. 28, 1990, Ser. No. 619,257

Int. Cl.[5] B21D *1/12*

U.S. Cl. 72—447 **12 Claims**



1. A tower assembly for applying a force on a damaged part of a vehicle mounted on a work rack having upper and lower plates having inner and outer flanges, said assembly comprising:

a carriage mounted on the inner and outer flanges of the lower plate,

a beam pivotally mounted on said carriage and extending radially outward therefrom,

a tower mounted on the outer end of said beam,

a vertically adjustable bracket mounted on one side of the tower and having a guide member pivotally mounted thereon,

a chain-a-liner rail assembly mounted on the bottom of said tower for guiding a chain through the tower,

a chain dog assembly mounted for reciprocal motion on the other side of said tower,

a chain aligned with said chain dog assembly, said rail assembly and said bracket and being connected to the damaged vehicle,

said chain dog assembly including a plate angled outwardly and upwardly from said tower, said plate including an inner slot and a circular opening at the outer end of said slot whereby said chain will be cammed into said slot on upward movement of said chain dog assembly and into said opening on downward movement of said bracket, and

a force applying means mounted in said tower for moving said dog assembly vertically upwardly to pull said chain through said bracket and rail assembly and apply a force to the damaged vehicle.

5,111,681

MOTOR DRIVEN HYDRAULIC TOOL

Tadashi Yasui, Kyoto, and Masayuki Kobayashi, Matsumoto, both of Japan, assignors to Japan Storage Battery Co., Ltd. and Izumi Products Co.

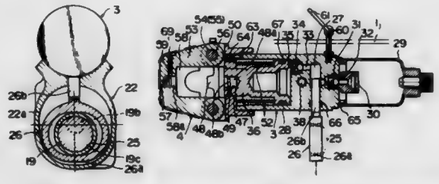
Continuation of Ser. No. 442,694, Nov. 29, 1989, abandoned.

This application Feb. 4, 1991, Ser. No. 649,184

Claims priority, application Japan, Mar. 31, 1989, 1-37854[U]; Mar. 31, 1989, 1-37855[U]

Int. Cl.[5] H01R *43/042*

U.S. Cl. 72—453.03 **3 Claims**



1. A portable hydraulic tool for use in cable laying comprising:

a tool head including a stationary tool member and a movable tool member,

a hydraulic transmitting mechanism for displacing said movable tool member toward and away from said stationary tool member,

a unit generating a hydraulic pressure by reciprocating a plunger by means of a cam crank mechanism, a speed reduction unit of a motor for driving said cam crank mechanism, and an electric power supply source for the motor, characterized in that said cam crank mechanism comprises a rotational shaft, an eccentric shaft integral with said rotational shaft, a cam plunger assembly having a reciprocal plunger for generating a hydraulic pressure, said reciprocal plunger having first and second longitudinal ends and a ring at one of said longitudinal ends, the eccentric shaft being fitted in said ring so as to be freely rotatable with respect thereto to reciprocate the plunger along a longitudinal axis thereof, said ring bearing an inner surface formed in a non-circular contour so as to contact the eccentric shaft solely in the reciprocating direction and thereby displace the plunger solely along said longitudinal axis, said speed reduction unit comprising three sets of planetary gears, and

a portable battery serving as said electric power supply source for driving the motor bearing.

5,111,682

APPARATUS AND METHOD FOR DETERMINING THE FLOW CHARACTERISTICS OF A VOLUMETRIC FLOWMETER

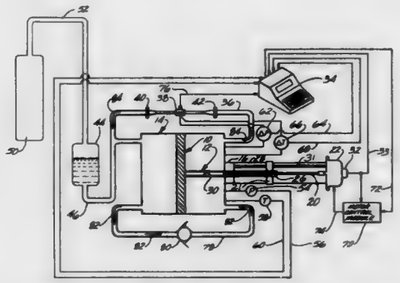
Michael W. Halpin, Chandler, Ariz., assignor to Flow Technology, Inc., Phoenix, Ariz.

Continuation of Ser. No. 188,978, May 2, 1988, Pat. No. 4,854,154. This application May 3, 1989, Ser. No. 346,720

The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.[5] G01F *25/00*

U.S. Cl. 73—3 **1 Claim**



1. A method for calibrating a flowmeter by means of a positive displacement-calibrating device comprising a cylinder, a piston forming a fluid barrier movable through the cylinder from end to end and a rod connected at one end to the piston and extending at the other end external of the cylinder, the method comprising the steps of:

connecting a fluid line between the ends external of the measuring cylinder;

connecting in the fluid line a flowmeter to be calibrated;

pulling the other end of the rod external of the cylinder to displace the fluid barrier from one end of the cylinder to the other end during test runs;

pushing the other end of the rod external of the cylinder to displace the fluid barrier from the other end of the cylinder to the one end between test runs; and

sensing the response of the flowmeter and the piston displacement during the test run.

5,111,683

CALIBRATION METHOD FOR A PULSE RESPONSE FLOWMETER

Andre Fond, Meyzieu, France, assignor to HOSPAL Industrie, Meyzieu, France

Filed Aug. 13, 1990, Ser. No. 566,499

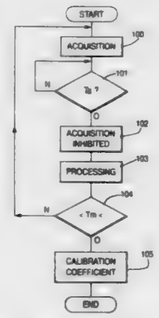
Claims priority, application France, Aug. 16, 1989, 89 11083

Int. Cl.[5] G01F *25/00*

U.S. Cl. 73—3 **17 Claims**

1. A calibration method for a flowmeter delivering an electric pulse signal whose frequency corresponds to the rate of flow of a fluid circulating in a circuit, the method including the steps of:

measuring during a data acquisition stage of a specified duration (Ta), each elementary period ($T_7(i)$, $T_8(i)$) separating two pulses staggered by a specified measurement span;



counting the number of pulses (n, m) emitted during the acquisition stage (Ta); and

calculating the mean calibration period (Tm_7, Tm_8).

5,111,684

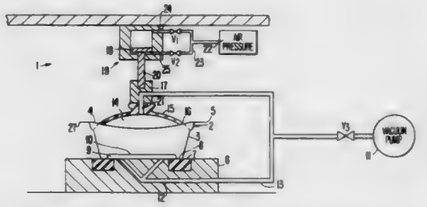
METHOD AND APPARATUS FOR LEAK TESTING PACKAGES

Anton Stauffer, Bedford, N.Y., and Heinz Wolf, Budd Lake, N.J., assignors to Pack Systems, Tuchahoe, N.Y.

Filed Nov. 21, 1990, Ser. No. 616,840

Int. Cl.[5] G01M *3/36*

U.S. Cl. 73—49.3 **15 Claims**



1. A method for leak testing a sealed package having at least opposed flexible wall portions and a sealed flange between adjacent wall portions of the package comprising:

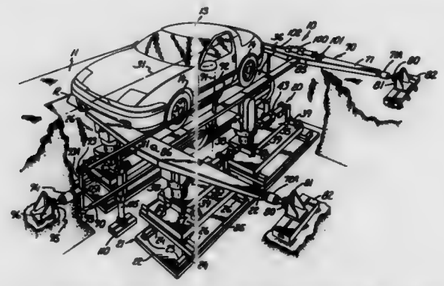
providing said sealed package,

applying a force to at least one flexible wall portion of the package spaced from at least a seal-exposing edge of the sealed flange to stress the package while at least the seal-exposing edge of the sealed flange is exposed to a gas pressure equal to a or greater than atmospheric pressure, and

detecting the reaction of the sealed package to the stressing, wherein said step of applying a force includes establishing a pressure which is less than atmospheric on the outside of said opposed flexible wall portions of the package by placing first and second vacuum enclosure means over respective ones of the opposed flexible wall portions of the package for enclosing a space on the outside surface of each of the respective opposed flexible wall portions which are spaced from at least the seal-exposing edge of the sealed flange and communicating the enclosed spaces with a vacuum pump to lower the pressure on the outside of the opposed flexible wall portions within the respective vacuum enclosure means, wherein said step of applying force further comprises pulling at least one of the vacuum enclosure means in a direction away from the other to stress said sealed flange of the package, and wherein said step of detecting the reaction of the sealed package com-

prises detecting a local bulging of at least one of the opposed flexible wall portions of the package that is subjected to said lower pressure in said vacuum enclosure means during said step of applying said force.

5,111,685
ROADWAY SIMULATOR RESTRAINT
William J. Langer, Eden Prairie, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.
Filed Dec. 20, 1989, Ser. No. 453,627
Int. Cl.[5] G01M *17/00*
U.S. Cl. 73—117 **19 Claims**



1. A restraint apparatus for a vehicle supported on a simulated roadway and being movable in longitudinal, lateral, yaw, pitch, roll, and vertical directions, said restraint apparatus comprising:

first and second substantially parallel beams, first ends of the beams being mounted with respect to the vehicle at spaced connection locations thereon about universal pivotal connections that are each capable of moving about a connection point, a line between the connection points at the spaced connection locations of the first ends of the first and second beams passing through a desired kinematic center of the vehicle, opposite ends of said first and second beams being mounted with respect to a support base about universal pivoting connections;

a first link having a longitudinal axis parallel to the line and being pivotally mounted at opposite ends thereof to the respective beams to couple the beams together;

a second link coupled to said first link through a universal pivotal connection that pivots about a point lying in a plane normal to the first link and passing through the vehicle kinematic center; and

means for coupling said second link to said base about a universal pivotal connection.

5,111,686
FAULT DIAGNOSIS APPARATUS FOR MOUNTING ON A VEHICLE
Kenji Kamiya, Anjo; Hiroyuki Ina, Kariya; Akimasa Nakamura, Obu, and Masakazu Honda, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Feb. 19, 1991, Ser. No. 656,963
Claims priority, application Japan, Feb. 26, 1990, 2-045273
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—117.3 **8 Claims**

1. A fault diagnosis apparatus for mounting on a vehicle, comprising:

operating condition detecting means for detecting operating conditions of the vehicle;

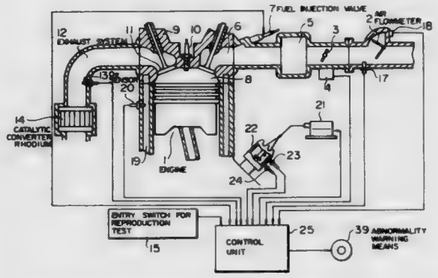
abnormal condition memory means for memorizing an occurrence of an abnormal condition of the vehicle;

vehicle operating condition memory means for storing the operating conditions when the abnormal condition occurs in the vehicle;

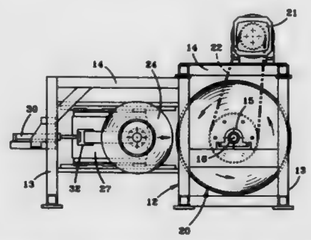
reproduction mode instruction means for instructing to execute an abnormal condition reproduction test mode;

operating condition comparison means for comparing current vehicle operating conditions in the abnormal condition reproduction mode set by said instruction means with vehicle operating conditions at the time of abnormality occurrence; and

notifying means for notifying a result of said comparison of vehicle operating conditions.

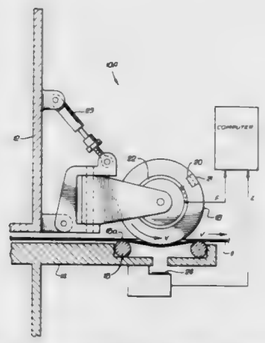


5,111,687
ROADWHEEL FOR TIRE TESTING APPARATUS
Charles F. Hill, Canton, Ohio, assignor to Standards Testing Laboratories, Inc., Massillon, Ohio
Filed Nov. 26, 1990, Ser. No. 617,561
Int. Cl.[5] G01M *17/02*
U.S. Cl. 73—146 **4 Claims**



1. An improved roadwheel for testing tires at high speed comprising a rotatable wheel having a circular outer rim portion, said rim portion being formed with a spaced pair of annular stepped portions; a hub portion for supporting said wheel on a frame, said hub portion being formed with a spaced pair of annular stepped portions; means for driving said wheel from low to high speeds of rotation, said wheel having a pair of similar annular web plate members joining said hub portion to said outer rim portion, said web plates being joined to the hub and outer rim portions at the annular stepped portions thereof, in a symmetrical uniform convex arrangement by welds; a plurality of reinforcing members extending between and interconnecting the web plates; and the outer rim portion having tapered thickness outer ends extending beyond the web plates.

5,111,688
DEVICE AND METHOD FOR CALIBRATING A NON-DESTRUCTIVE SHEET STRENGTH MEASURING SYSTEM
Paul J. Houghton, Los Gatos; John D. Goss, San Jose, and Mathew G. Boissevain, Los Altos Hills, all of Calif., assignors to Measurex Corporation, Cupertino, Calif.
Continuation of Ser. No. 509,659, Apr. 16, 1990, abandoned, which is a division of Ser. No. 146,930, Jan. 22, 1988, Pat. No. 4,936,140. This application Mar. 21, 1991, Ser. No. 673,856
Int. Cl.[5] G01L *5/04*
U.S. Cl. 73—159 **10 Claims**



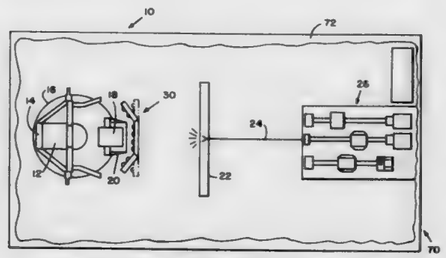
1. A device for determining a physical characteristic of a material, said physical characteristic being related to the force required to puncture the material, the device comprising:

a rotatable wheel having a peripheral surface adapted to contact said material;

a blade mounted to protrude from the periphery of the wheel, said blade being fully retractable into the wheel; and

a force sensor operatively associated with said blade for generating a signal indicative of the force exerted by said blade when the blade punctures the material.

5,111,689
BACKGROUND ILLUMINATION SIMULATOR
Elisa R. Towry, Fayetteville, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Oct. 7, 1991, Ser. No. 772,733
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—167 **9 Claims**



1. A testing apparatus for testing and evaluating the performance of laser seeking warheads for missiles, under simulated weather conditions, comprising:

(a) support means for supporting a warhead seeker;

(b) laser means for generating a laser beam and for directing a laser beam towards said seeker;

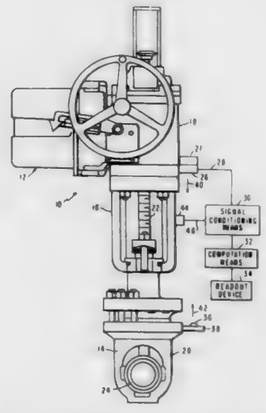
(c) a diffusion screen interposed between said seeker support means and said laser means for diffusing said laser beam;

(d) a collimating lens interposed between said diffusion screen and said seeker support means for collimating the diffused laser beam and for directing said collimated laser beam onto a warhead seeker, supported in said seeker support;

(e) background illuminator means for illuminating said seeker support and a seeker disposed therein, supported for movement into and out of an operating position between said diffusion means and said collimating lens for providing background lighting in simulation of weather lighting conditions; and

(f) control means for controlling the intensity of the light provided by said illuminator means to simulate various weather conditions.

5,111,690
VALVE STEM LOAD MONITORING SYSTEM WITH MEANS FOR MONITORING CHANGES IN THE VALVE YOKE ELONGATION
Winslow K. Duff, Export, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 9, 1990, Ser. No. 550,175
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—168 **12 Claims**



1. A valve stem load monitoring system for determining the axial load on a valve stem of a valve assembly having a valve operator, a valve operator housing in which said valve operator is mounted, a valve, a valve housing in which said valve is received for selective movement between opened and closed positions, a valve yoke substantially rigidly interconnecting said valve operator housing and said valve housing, and a valve stem interconnecting said valve and said valve operator, said valve operator being selectively operable for moving the valve between opened and closed positions within said valve housing and thereby imposing an axial load on the valve stem and a parallel axial load, of substantially equal amount and of opposite sense to the valve stem axial load, on the valve yoke and the valve operator housing and the valve housing interconnected thereby, the respective loads on the valve stem and the valve yoke producing corresponding changes, of opposite sense, in the respective parallel axial lengths of the valve stem and the valve yoke, said system comprising:

first and second supports, respectively mounted on said valve assembly at respective, first and second mounting positions and defining respective, first and second reference positions relatively displaced, along a measurement axis parallel to the valve stem axis, by a distance spanning

at least a substantial portion of the entire axial length of said yoke; and

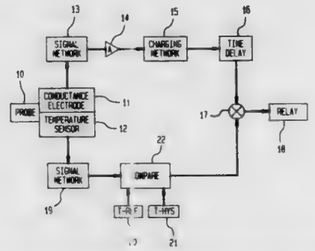
distance measuring means, having first and second portions respectively affixed to said first and second supports, for directly measuring changes in the distance between the first and second reference positions and as produced by axial loads imposed on the valve stem and generating output signals which are representative of said measured distance changes and thus proportional to the corresponding axial loads imposed on said valve stem.

5,111,691

CONDUCTANCE/THERMAL LIMIT CONTROL APPARATUS AND METHOD

Robert S. John, Deerfield, and Jack R. Piper, Mount Prospect, both of Ill., assignors to ITT Corporation, New York, N.Y.

Filed Dec. 20, 1990, Ser. No. 630,912
Int. Cl.[5] G01F *23/00*; G01K *13/02*
U.S. Cl. 73—292 **6 Claims**



1. Control apparatus for simultaneously sensing liquid conductance and liquid temperature in a liquid container comprising:

a probe having a conductance electrode and temperature sensor contained therein, and said probe having an electrically conductive threaded shell insulated from said electrode and being adapted for insertion in a liquid container;

conductance control means coupled to said conductance electrode to receive a liquid impedance signal and determine if said signal representing the liquid impedance at said probe exceeds a predetermined value;

temperature limit control means coupled to said sensor to receive a temperature indication signal and determine if said temperature indication signal representing the liquid temperature exceeds a predetermined limit value;

a relay controlled by said conductance controls means and said temperature limit control means; and

said conductance control means includes a conductance signal network for receiving said conductance signal, an amplifier coupled between said network and a charging network, and a time delay circuit coupled to receive an output signal from said charging network.

5,111,692

TEMPERATURE COMPENSATED LIQUID LEVEL AND FLUID FLOW SENSOR

Malcolm M. McQueen, Fallbrook, and David J. Allen, San Marcos, both of Calif., assignors to Fluid Components, Inc., San Marcos, Calif.

Continuation-in-part of Ser. No. 499,948, Mar. 27, 1990, abandoned. This application Feb. 14, 1991, Ser. No. 656,568
Int. Cl.[5] G01F *23/24, 1/68*
U.S. Cl. 73—295 **27 Claims**

1. A method for detecting liquid level and fluid flow employing a circuit comprising an electrical input line and an electrical output line, a resistance temperature detector (RTD) having a variable resistance related to temperature connected between the input and output lines, a fixed value temperature compensating resistor connected between the input and output lines in parallel with the RTD, the parallel combination being selectively coupled through the input line to a constant current source through a selectively actuable switch, and voltage sensing means connected between the input and output lines across the parallel combination, said method comprising the steps of:

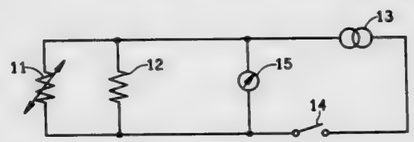
closing the switch and taking a reference voltage reading at initial process temperature;

self heating the RTD for a first predetermined period of time with current from the constant current source;

shunting increasing amounts of current through the fixed value temperature compensating resistor as the resistance of the RTD increases with temperature, thereby reducing the amount of power dissipated in the RTD in relation to the total power dissipated in the parallel combination;

taking a measurement temperature voltage reading at the end of the first predetermined period;

comparing the reference voltage with the measurement temperature voltage, a large temperature differential within a predetermined differential range indicated that the liquid level has not reached the RTD or that there is no or low fluid flow, a relatively smaller temperature



differential within a second predetermined differential range indicating that the liquid level has reached the RTD or that there is significant fluid flow; and

opening the switch to remove heating current from the RTD and to allow the RTD to return to a reference temperature.

3. A sensor for detecting liquid level and fluid flow, said sensor comprising:

an electrical input line;

an electrical output line;

a resistance component having a variable resistance related to temperature connected between said input and output lines;

a temperature stable, temperature compensating resistor of fixed resistance value connected between said input and output lines in parallel with said resistance component;

a constant current source for applying current to said parallel combination of said resistance component and said compensating resistor through said input line; and

switch means for selectively coupling said constant current source to said parallel combination and causing self heating of said resistance component.

5,111,693

MOTION RESTRAINTS FOR MICROMECHANICAL DEVICES

Paul Greiff, Wayland, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 373,032, Jun. 28, 1989, abandoned, Ser. No. 479,854, Feb. 14, 1990, which is a continuation-in-part of Ser. No. 143,515, Jan. 13, 1988, abandoned. This application Jul. 30, 1990, Ser. No. 560,374
Int. Cl.[5] G01P *15/02*
U.S. Cl. 73—514 **8 Claims**

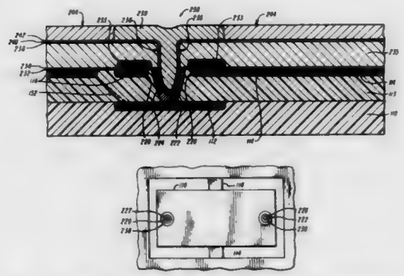
1. A system of restraints for use with a micromechanical transducer comprising:

a moveable transducer element flexibly supported within a recess of a semiconductor substrate;

at least one thick metal layer region deposited over a region of plural thin metal layers, disposed at one or more positions about said recess, fixed to said semiconductor substrate, and extending towards said element so as to prevent displacement of said transducer element beyond a predetermined limit,

wherein said thick metal layer region extends from the surface of said semiconductor substrate over said moveable transducer element; and

a stalk supporting said thick metal layer region and extending from a portion of said substrate through an aperture in said transducer element.

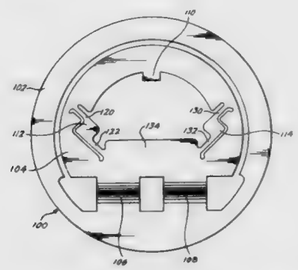


5,111,694

ACCELEROMETER WITH REBALANCE COIL STRESS ISOLATION

Steven A. Foote, Issaquah, Wash., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 17, 1990, Ser. No. 569,398
Int. Cl.[5] G01P *15/13*
U.S. Cl. 73—497 **8 Claims**



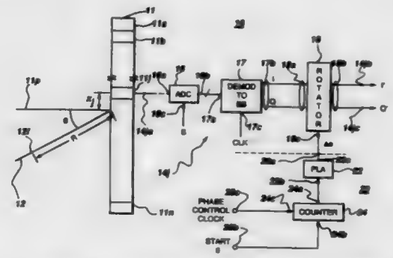
1. In an accelerometer comprising a paddle suspended from a support for movement with respect thereto, and coil means mounted to the paddle, the improvement wherein the coil means is mounted to the paddle at a plurality of mounting sites on the paddle, at least one mounting site being non-compliant and, at least one mounting site being connected to the paddle by suspension means, the suspension means being co-planar with the paddle and, being compliant for movement of the mounting site with respect to the paddle in a plane in which the paddle lies.

5,111,695

DYNAMIC PHASE FOCUS FOR COHERENT IMAGING BEAM FORMATION

William E. Engeler, Scotia; Matthew O'Donnell, Schenectady; John T. Pedicone, Schenectady, and John J. Bloomer, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 11, 1990, Ser. No. 551,093
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—626 **18 Claims**



1. A method for dynamic focus of received energy, in a vibratory energy imaging system, into a beam in which contribution from each transducer in an array of N such transducers, is progressively enabled dependent upon distance x_j between a particular j-th transducer (where $1 \leqq j \leqq N$) and an array midpoint, responsive to a range R of a focal point at any instant of time and an initial steering angle q, with respect to the array normal, comprising the steps of:

separately sampling for each j-th transducer on a respective channel, a stream of digital baseband data words, each individually delayed by a selected channel time delay interval, which may be different for each channel, the delay being responsive to the predetermined range R and angle q;

generating a range clock signal at the start of beam formation;

counting the range clock signal to determine the time when each j-th off-normal transducer channel is enabled to add to the beam; and

thereafter finely adjusting the channel time delay to properly focus the beam after the enablement of the channel.

5,111,696

METHOD OF VISUALIZING REFLECTION CHARACTERISTIC IN ULTRASONIC EXAMINATION

Svend A. Lund, Birkerød, and Bent E. Nielsen, Lyngby, both of Denmark, assignors to Akademiet For De Tekniske Videnskaber, Svejsecentralen, Brondby, Denmark

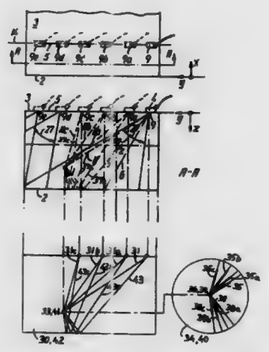
Continuation of Ser. No. 300,934, Jan. 24, 1989, abandoned. This application Oct. 24, 1990, Ser. No. 602,046
Int. Cl.[5] G01N *9/24*; G06F *15/20*
U.S. Cl. 73—627 **26 Claims**

1. A method of visualizing reflection characteristics of reflecting inhomogeneities located by pulse-echo ultrasonic examination of an otherwise homogeneous object, said method comprising the steps of:

moving at least one ultrasonic probe over the surface of an object, the probe transmitting at predetermined intervals of time at least one short pulse of ultrasonic energy in the form of a sound beam with a central axis into the object and receiving echo pulses reflected from internal inhomogeneities;

storing, with a digital computing system, digital signals containing information on the corresponding, successive positions of the point of incidence and directions of the central axis of the sound beam and, on receipt of an echo pulse, information on the amplitude of the echo pulse and

on the length of the sound path from the point of incidence to the reflecting point causing the echo pulse;
using the digital signals to display a first video flaw image of a sectional plane through the object;
displaying in at least one second separate video sectional image line segments representing the echo amplitudes, wherein the line segments have the length thereof repre-



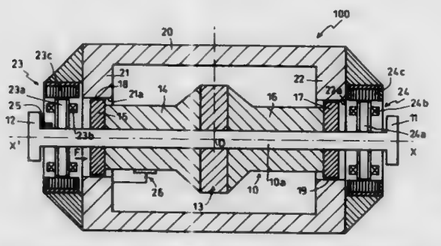
senting the amplitude of the echoes and originate at the image pixel;
placing the chosen image pixel at the center of the image; and
forming the line segments in the directions corresponding to the projections on the sectional plane of the incoming ultrasonic pulses at the location.

5,111,697

LARGE-AMPLITUDE LOW-FREQUENCY VIBRATOR

Helmut Habermann, Vernon, and Jean Jolivet, Gasny, both of France, assignors to Societe de Mecanique Magnetique S.A., Saint-Marcel, France

Filed Feb. 12, 1991, Ser. No. 654,304
Claims priority, application France, May 18, 1990, 90 06274
Int. Cl.[5] G01N *29/00*; H02K *7/09*
U.S. Cl. 73—668 **19 Claims**



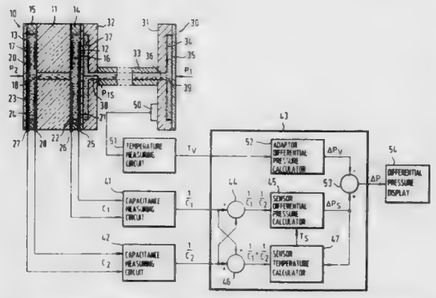
1. A low-frequency vibrator acting in a low-frequency vibration domain for fixing to and applying low-frequency vibrations on a frame in a predetermined direction X'X wherein the vibrator comprises:
(a) a first structure comprising first and second cylindrical pole pieces which are cylindrical about an axis extending along said direction X'X and which are provided at their peripheries with respective first and second coils, and at least one means for creating a magnetic field, said means being disposed between said first and second cylindrical pole pieces to cause magnetic flux to be established therebetween;
(b) a second structure essentially comprising a cylindrical ferromagnetic mass coaxial about said axis and having third and fourth cylindrical pole pieces whose peripheries are situated facing said first and second coils respectively, enabling said magnetic flux to be established through said ferromagnetic mass;
(c) first and second radial active magnetic bearings disposed on both sides of an assembly constituted by said first and second pole pieces for holding the second structure radially relative to the first structure without making contact therewith;
(d) at least one detector for detecting vibrations including said low frequency vibrations along said axis, and disposed on one of said first and second structures; and
(e) servo-control circuits for controlling the current flowing through the coils as a function of signals delivered at least by said detector.

5,111,698

DIFFERENTIAL PRESSURE MEASURING APPARATUS

Karlheinz Banholzer, Schopfheim; Peter Gerst, Karlsruhe, and Peter Jung, Steinen, all of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Continuation of Ser. No. 591,388, Oct. 1, 1990, abandoned. This application Jul. 29, 1991, Ser. No. 741,181
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1989, 3933512
Int. Cl.[5] G01L *9/12, 13/02, 19/04*
U.S. Cl. 73—708 **3 Claims**



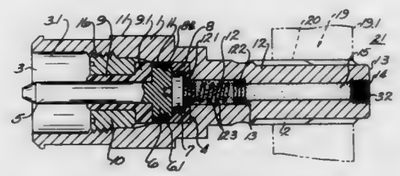
1. Differential pressure measuring apparatus comprising a single chamber differential pressure sensor which comprises two resilient sensor diaphragms enclosing a volume filled with a fluid and in which two measuring capacitors are formed whose capacitances vary in opposite senses as a function of the sensor differential pressure which results from the pressures acting on the two sensor diaphragms, and further comprising an evaluation circuit which calculates the sensor differential pressure from the capacitances of the measuring capacitors and comprises a first compensation arrangement which compensates the influences of the sensor temperature and of sensor parameters on the calculated sensor differential pressure, the single chamber differential pressure sensor being connected with at least one adaptor comprising a volume filled with a fluid, which is closed on the one hand by one of the two sensor diaphragms and on the other hand by a resilient adaptor diaphragm, and the evaluation circuit comprising a further compensation arrangement for each adaptor, which compensates the influences of the adaptor temperature and of adaptor parameters on the sensor differential pressure corrected by the first compensation arrangement.

5,111,699

SENSOR FOR MEASURING THE PRESSURE OF A MEDIUM

Hidde Walstra, Almelo, and Arie J. Kolling, Enschede, both of Netherlands, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 1, 1991, Ser. No. 679,500
Claims priority, application Netherlands, Apr. 5, 1990, 9000802
Int. Cl.[5] G01L *9/08*; G01M *15/00*
U.S. Cl. 73—754 **11 Claims**



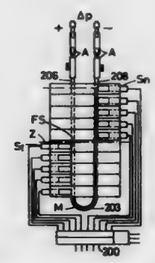
1. A sensor for measurement of a pressure medium comprising a screw-threaded bolt having a head and a shank and having a bore extending entirely through the head and shank of the bolt, a transducer comprising a piezoelement disposed within bore adapted to convert a change in applied pressure into an electrical signal, an electrical connection to the transducer leading through the bore in the head of the bolt, and an incompressible material disposed inside the bore extending from an end of the bore at the shank of the bolt to the transducer to transmit pressure force from a pressure medium at the end of the bore at the shank of the bolt to the transducer, characterized in that an electrical terminal is disposed in the bore to be accessible from an end of the bore at the head of the bolt to provide the electrical connection to the transducer, electrically insulating means are disposed intermediate the terminal and the bolt, a locking nut positions the terminal in the bore, and a contact spring disposed in the bore presses the transducer against the electrical terminal.

5,111,700

METHOD AND APPARATUS FOR OBTAINING ELECTRICAL SIGNALS CORRELATED WITH THE POSITION OF A MASS OF MERCURY IN INSTRUMENTS AND THE LIKE

Pier-Luigi Floris, and Yvonne O'Toole, both of Via Pitzolo 23, I - 09100 Cagliari, Italy

Continuation of Ser. No. 399,421, Aug. 28, 1989, abandoned, which is a continuation of Ser. No. 206,921, May 31, 1988, abandoned, which is a continuation of Ser. No. 45,236, May 1, 1987, abandoned, which is a continuation of Ser. No. 765,538, Aug. 14, 1985, abandoned, which is a division of Ser. No. 515,526, Jul. 20, 1983, Pat. No. 4,554,535. This application Jul. 24, 1990, Ser. No. 555,791
Claims priority, application Italy, Jul. 27, 1982, 9482 A/82
Int. Cl.[5] G01L *9/10*
U.S. Cl. 73—749 **2 Claims**



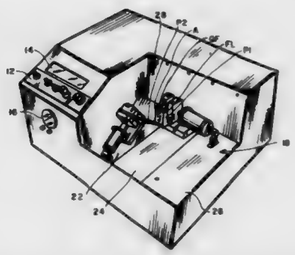
1. A differential manometer comprising a U-shaped two-section tube of non metallic material, each section of which is connectable to one of two pressure sources, a mercury mass within a portion of said tube movable due to the difference between said pressure sources, both said tube sections being equipped each with a series of metal proximity sensors the sensors of one of the tube sections being offset with respect to the sensors of the other section in order to uninterruptedly emit a variable signal of proximity when a meniscus of the mercury mass in the other section is midway between two successive sensors along the same section.

5,111,701

CONTAINER CORNER SECTION GLUE BOND TESTER

Gregory N. Klein, 7932 Westview La., Woodridge, Ill. 60517

Filed May 3, 1991, Ser. No. 695,395
Int. Cl.[5] G01N *3/08*
U.S. Cl. 73—827 **15 Claims**



1. A device for testing the strength of a glue bond of a paperboard container corner section, which section includes one wall panel adhesively secured in face-to-face relationship to a glue flap which is foldably joined to and extends at right angles from another wall panel, by determining the force required to separate said one wall panel from said glue flap, said device comprising:
(a) a housing having a control/display unit and an external work station;
(b) said work station including a platform having:
(i) a first section mounted on a horizontally disposed drive shaft, for pivotal movement with said drive shaft, and including first clamping means for gripping said one wall panel;
(ii) a second section mounted on said drive shaft, for limited movement relative to said drive shaft, and including second clamping means disposed at right angles to said first clamping means for gripping said other wall panel;
(c) means for rotating said drive shaft and said first platform section relative to said second platform section to pull said one wall panel away from said glue flap;
(d) a load cell associated with said second platform section and being arranged and disposed to measure the force required to separate said one wall panel from said glue flap, based on movement of said second platform section relative to movement of said first platform section, and to transmit to said control/display unit electrical signals representative of said force.

5,111,702

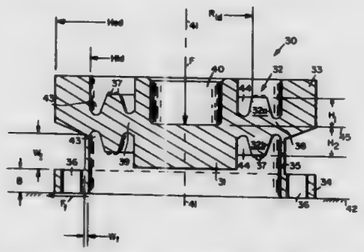
TORSION RING TRANSDUCER

Joseph H. Antkowiak, Oxford, Mass., assignor to Hottinger Baldwin Measurements, Inc., Marlboro, Mass.

Filed Jun. 22, 1990, Ser. No. 543,046
Int. Cl.[5] G01L *1/22*
U.S. Cl. 73—862.65 **20 Claims**

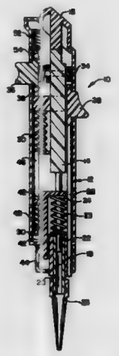
1. A torsion ring transducer for measuring forces within a rated load range having an upper load limit defined by a maxi-

mum permissible load, comprising a ring housing having a central rotational axis, a load application body arranged concentrically in said ring housing, a deformation sensing ring having surfaces for securing strain gage means to said sensing ring located concentrically between said ring housing and said load application body, a first ring web connecting said load application body to said deformation sensing ring, a second ring web connecting said deformation sensing ring to said ring housing, a mounting base for securing said ring transducer to a support, and mounting effect isolating means operatively connected at one end to said mounting base and at another end to said ring housing for substantially preventing mounting effects from reaching said sensing ring, wherein said mounting effect



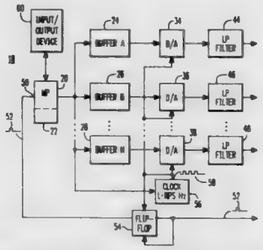
isolating means comprise an isolating ring cylinder rigidly connected at one end to said mounting base and at another end to said ring housing, said isolating ring cylinder having an axial cylinder wall length (W_l) and a radial cylinder wall thickness (W_t) which are so selected that the condition $F_f < \mu \cdot RC$ is satisfied, wherein F_f is a force sufficient for holding said mounting base in place on a support, wherein μ is a friction coefficient between said mounting base and said support, and wherein RC is said rated maximum permissible load or rated capacity, and wherein the ratio of (W_l to W_t) is within a range having an upper limit sufficient to avoid buckling of said isolating ring cylinder when said maximum permissible load is applied and a lower limit which still substantially prevents mounting effects from reaching said sensing ring.

5,111,703
LIQUID ASPIRATING PIPETTE AND DISPENSING SYSTEM
Terry W. Allen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 10, 1990, Ser. No. 580,041
Int. Cl.[5] G01N *1/14*; B01L *3/02*
U.S. Cl. 73—864.11 **6 Claims**



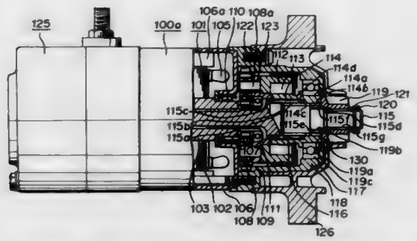
1. A manually operable liquid aspirating pipette, comprising:
a pipette housing;
an actuating linkage extending within said housing and being manually movable relative thereof;
liquid aspirator means positioned generally within said housing and operatively connected to said actuating linkage for movement between first and second positions, said aspirator means being operable to aspirate liquid during movement from said second position to said first position, and operable to dispense liquid during movement from said first position to said second position;
biasing means operatively connected to said aspirator means for biasing said aspirator means from said second position into said first position;
manually operable pull-back means operatively connected to said aspirator means, said pull-back means being operable to releasably retain said aspirator means in a third position, intermediate said first and second positions, during movement of said aspirator means from said second position to said first position, so that manual operation of said pull-back means releases said aspirator means to permit movement from said third position to said first position by said biasing means;
a secondary actuating member operatively connected to said aspirator means for moving said aspirator means between said first and second positions; and
pull-back lock-out means operatively connected with said secondary actuating member and said pull-back means, said lock-out means operating to prevent said pull-back means from retaining said aspirator means in said third position thereof when said secondary actuating member is operated to move said aspirator means, to thereby permit movement of said aspirator means from said second position to said first position without being releasably retained in said third position,
wherein said pipette permits a liquid sample to be aspirated during movement of said aspirator means from said second position to said third position, followed by aspiration of air during movement of said aspirator means from said third position to said first position by release of said pull-back means.

5,111,704
APPARATUS AND METHOD FOR SIMULATING BLADE PASS SENSOR SIGNALS
Peter D. Hill, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 30, 1990, Ser. No. 574,977
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—866.4 **5 Claims**



1. An apparatus for generating signals incorporating known turbine blade vibration information, comprising:
first means for providing N series of discrete values, each series approximately a sinusoidal signal, said first means including processor means, memory means having a first portion for storing a program for solving an equation including several variables, and N buffer means, said processor means being responsive to said first portion of said memory means for performing the program to produce said N series of discrete values, each of said series being stored in one of said N buffer means;
N converter means each for receiving one of said N series of discrete values and for producing an analog signal therefrom, said analog signals having zero crossings incorporating known turbine blade vibration information;
N filter means each responsive to one of said N converter means for filtering said analog signals;
means for producing an output pulse simulating a once per revolution pulse, and
clock means for producing clock pulses, said clock pulses input to said N converter means and said means for producing an output pulse for synchronizing the operation of said N converter means with the operation of said means for producing an output pulse.

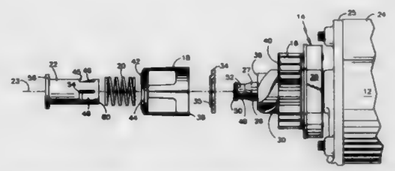
5,111,705
STARTER MOTOR
Shuzou Isozumi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 8, 1990, Ser. No. 534,911
Claims priority, application Japan, Jun. 22, 1989, 1-162344
Int. Cl.[5] F02N *15/06*
U.S. Cl. 74—6 **3 Claims**



1. A starter motor adapted to transmit through an overrunning clutch device a rotating force of an armature to a rotary output shaft to which a pinion having a plurality of teeth is fitted by means of a linear spline structure, characterized in that the rotary output shaft has a shoulder portion between a helical spline portion, which is engaged with a helical spline which in turn is formed at the inner circumference of the front part of a clutch inner member in the overrunning clutch device, and a linear spline portion to which the pinion is fitted, said shoulder portion having a diameter smaller than the diameter of the root of the helical spline of the rotary output shaft, and a spring disposed and axially between the helical spline of the rotary output shaft and the rear end face of the pinion so that the pinion is pushed forwardly, substantially the entire axial length of said spring being surrounded by said helical spline of said clutch inner member.

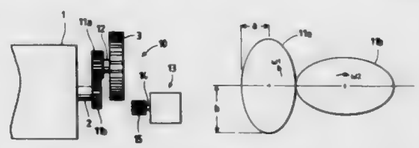
5,111,706
ENGINE STARTER PINION DRIVE ASSEMBLY
Bobby E. McMillen, Columbus, Miss., assignor to United Technologies Motor Systems, Inc., Columbus, Miss.
Filed Mar. 14, 1991, Ser. No. 669,267
Int. Cl.[5] F02N *15/06*
U.S. Cl. 74—7 C **10 Claims**

1. An engine starter assembly comprising
a starter motor having a housing and a rotatable shaft extending therefrom, said shaft having a terminal end portion,
a clutch subassembly slidably mounted on aid shaft for frictionally coupling a pinion gear to the shaft,
a pinion gear adapted for engaging an engine drive gear, said pinion gear being mounted for axial movement along said shaft between a first position engaging the drive gear and a second position disengaged from the drive gear, and



a retainer sleeve configured for axial push-on mounting over the end portion of said shaft, said retainer sleeve having means for snap lock engagement with said shaft to retain said clutch subassembly on said shaft.

5,111,707
ENGINE STARTER APPARATUS
Takeshi Sugiyama, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan
Filed Mar. 29, 1991, Ser. No. 677,041
Claims priority, application Japan, Apr. 11, 1990, 2-96719
Int. Cl.[5] F02N *15/00*; F16H *55/17*
U.S. Cl. 74—7 E **4 Claims**

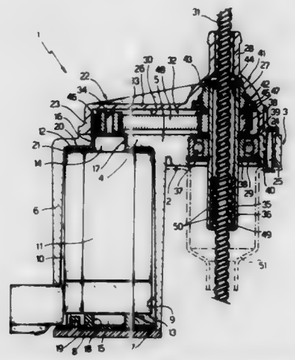


1. An engine starter apparatus comprising:
first and second noncircular gears operatively engaged with each other and interposed between a crankshaft and a ring gear in an engine starter drive system, said first noncircular gear being subjected to a change in angular velocity in relation to a change in torque caused at said crankshaft due to a characteristic of the engine, an angular velocity of said second noncircular gear being kept constant;
a starter motor for imparting a torsional force to start said engine, said starter motor having a pinion which is removably engageable with said ring gear; and
said first and second noncircular gears having a peripheral shape that is of a continuous curve.

5,111,708
ELECTROMECHANICAL LINEAR ACTUATOR
Enzo Brusasco, Turin, Italy, assignor to R.G.B. S.p.A., Turin, Italy
Filed Mar. 9, 1990, Ser. No. 491,109
Claims priority, application Italy, Mar. 9, 1989, 67162 A/89
Int. Cl.[5] F16H *29/20*; H02K *7/06*
U.S. Cl. 74—89.15 **5 Claims**

1. An electromechanical linear actuator comprising an electric motor with a rotary output shaft; a load-bearing structure defining a housing for said electric motor; a tubular shaft substantially parallel to said output shaft and having a first portion connected in rotary manner to said load-bearing structure; an output member coaxial with said tubular shaft; parallel rotary shaft drive means for drivingly connecting said tubular and said output shafts and being located between said tubular and said output shafts; and screw-nut-screw coupling means for drivingly connecting said tubular shaft and said output member and being located between said tubular shaft and said output member; characterised by the fact that it also comprises a supporting member integral with said load-bearing structure and having means for connection in rotary manner to a second

portion of said tubular shaft, said supporting member being made of plastic; said load-bearing structure being made of

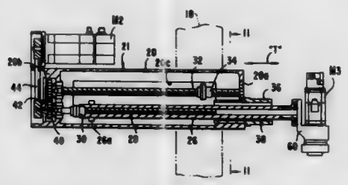


relatively heavy material; said drive comprising a flexible drive member; and damping means being provided between said motor and said housing.

5,111,709
INDUSTRIAL ROBOT WITH A TELESCOPIC HORIZONTAL ARM

Nobutoshi Torii, Tokyo; Susumu Ito, Yamanashi; Masayuki Hamura, Yamanashi, and Akira Tanaka, Yamanashi, all of Japan, assignors to Fanuc, Ltd., Yamanashi, Japan

Filed Sep. 26, 1990, Ser. No. 589,836
Claims priority, application Japan, Sep. 27, 1989, 1-249119
Int. Cl.[5] F16H *27/02;* **B25J** *18/02*
U.S. Cl. 74—89.15 **7 Claims**

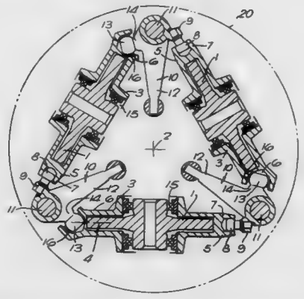


1. An industrial robot including an upright column extending vertically with respect to a robot base portion, and a horizontal arm unit supported by the upright column, wherein the horizontal arm unit comprises:
- an arm casing mounted on a part of the upright column to be horizontally slidably moved relative to the upright column;
- a telescopic arm held by said arm casing for being retracted inside and extended outward from inside said arm casing;
- a common drive source mounted externally on said arm casing;
- a rotation to linear motion converting means for converting a rotational output given by said common drive source to a linear motion input to cause linear movements of the arm casing and the horizontal telescopic arm.

5,111,710
TOROIDAL RACE ROLLING TRACTION TRANSMISSION UNITS

Forbes G. Perry, Long Meadow, Church St., Charlbury, Oxford OX73PP, England

PCT No. PCT/GB89/01134, § 371 Date Mar. 28, 1991, § 102(e) Date Mar. 28, 1991, PCT Pub. No. WO90/04729, PCT Pub. Date May 3, 1990
PCT Filed Sep. 26, 1989, Ser. No. 668,504
Claims priority, application United Kingdom, Oct. 27, 1988, 8825198
Int. Cl.[5] F16H *15/08*
U.S. Cl. 74—200 **3 Claims**



1. A toroidal race rolling traction transmission unit comprising
- a pair of confronting coaxial discs;
- a plurality of rollers engaging said discs, said rollers being movable to provide a variable transmission ratio between said discs;
- a plurality of carriages, each carriage supporting a roller;
- a plurality of rocker arms, each said rocker arm including a sliding pivot connecting one side of said rocker arm to a carriage, and
- a spherical ball joint connecting the other side of said rocker arm to a different carriage, said spherical ball joint including a ball on said rocker arm and a ball race carried by said carriage;

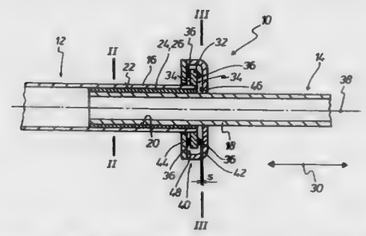
pairs of said sliding pivots and said ball joints defining a plurality of axes about each of which a carriage is rotatable whereby movement of said rocker arms causes a change in said transmission ratio, said ball race on each said carriage being set at an angle of substantially more that 0° and substantially less than 90° to the axis of rotation of said carriage.

5,111,711
COUPLING DEVICE FOR THE GEARSHIFT LINKAGE OF MOTOR VEHICLES

Michael Engel, Neuendorf; Karl-Heinz Pepping, Schleiden, and Gunther Gebhardt, Stadtkyll, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Feb. 6, 1991, Ser. No. 651,578
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1990, 4004104
Int. Cl.[5] F16B *7/00;* **F16D** *3/64, 3/76*
U.S. Cl. 74—473 R **8 Claims**

1. Coupling device for coupling a first gear-shift rod which is connected with a transmission of a motor vehicle with a second gearshift rod which is connected with a shift lever for the motor vehicle, wherein the two gear-shift rods have mutually interengaging end sections each having a cross-section deviating from a circular shape for forming a connection therebetween secured against relative rotation; an intermediate element for damping sounds conducted through solids being interposed between the interengaging end sections of said gearshift rods, a cage being fastened to one said gearshift rod and a central body being fastened to the other said gearshift rod, said central body being enclosed by said cage, said cage including two facing and at least approximately radially oriented internal surfaces and said central body including two

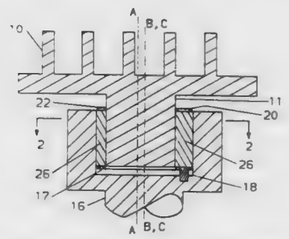


opposingly facing end surfaces which are at least approximately radially oriented located opposite the internal surfaces of the cage at spacings therefrom; and spring elements on either the two end surfaces of the central body or on the two internal surfaces of the cage for attenuating or absorbing power peaks encountered from the transmission.

5,111,712
ROLLING ELEMENT RADIAL COMPLIANCY MECHANISM

Thomas L. Kassouf, Syracuse; Howard H. Fraser, Jr., Lafayette; Shahrokh Etemad, East Syracuse, and William R. Lane, Dewitt, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 6, 1988, Ser. No. 254,058
Int. Cl.[5] G05G *1/00;* **F04C** *11/02*
U.S. Cl. 74—570 **8 Claims**

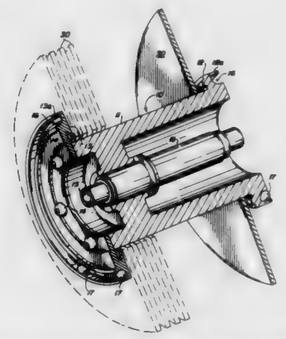


1. A rolling element radial compliancy mechanism comprising:
- a first element having a generally cylindrical recess formed therein;
- a second element having a generally cylindrical portion adapted to be received within said cylindrical recess with a clearance therebetween;
- bearing means located in said clearance and including a plurality of roller elements adapted to be in line contact with both said first and second elements and a cage for supporting said plurality of roller elements, said plurality of roller elements being of varying diameters such that said second element is positioned eccentrically within said cylindrical recess.

5,111,713
DYNAMICALLY BALANCED ROTARY UNIT

T. Jay Cameron, Pleasanton; Elwyn G. Erickson, San Jose, and Cornelius H. Hemphill, Arnold, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1989, Ser. No. 452,031
Int. Cl.[5] F16F *15/22*
U.S. Cl. 74—573 R **2 Claims**



1. A dynamically balanced rotary unit comprising:
- a rotatable hub;
- a pair of annular means, each adjacent a respective one of the axial ends of the hub, and each having an annular channel formed in a respective one of its generally radial side edges and concentric with the axis of rotation of the hub; each annular channel being (i) separated by an annular interference ridge into respective inner and outer portions offset in the direction of said axis, and (ii) encircled by a flexible rim that at least in part defines its outer periphery; and
- two sets of balls, those of each set being of similar size and weight and freely rotatable in a respective one of the outer portions of an associated one of the channels;
- each rim, following dynamic balancing, having been flexed sufficiently to permit each rim to spread and enable the associated set of balls to be moved over the associated interference ridge into the corresponding inner portion of the channel which is constricted and in which the balls of each set are retained by the associated ridge and held against movement by pressure from the then flexed flexible rim for maintaining the rotary unit in dynamically balanced condition.

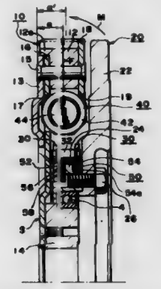
5,111,714
TORSIONAL DAMPER TYPE FLYWHEEL DEVICE

Shinji Honoki, Nagoya; Katsuyuki Kobayashi, Aichi; Mitsuhiro Umeyama, and Toshihiro Ootake, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 11, 1990, Ser. No. 580,796
Claims priority, application Japan, Sep. 11, 1989, 1-105313[U]; Sep. 11, 1989, 1-105314[U]; Sep. 11, 1989, 1-105315[U]
Int. Cl.[5] F16D *3/14;* **F16F** *15/12*
U.S. Cl. 74—574 **35 Claims**

1. A torsional damper type flywheel device comprising:
- a drive side flywheel including an outer ring, an inner ring disposed radially inside the outer ring, an engine side drive plate disposed on an engine side of the outer ring, and a clutch side drive plate disposed on a clutch side of the outer ring, the engine side drive plate and the clutch side drive plate being fastened to the outer ring, the inner ring being fastened to the engine side drive plate, the drive side flywheel further including an inertial plate disposed on an

engine side of the engine side drive plate, the inertial plate being fastened to the assembly of the outer ring, the engine side drive plate and the clutch side drive plate;



a driven side flywheel coaxial with and rotatable relative to the drive side flywheel, and

at least one spring mechanism connected between the drive side flywheel and the driven side flywheel.

5,111,715

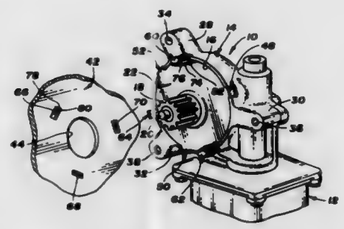
WINDOW MOTOR ATTACHMENT TO VEHICLE DOOR

Timothy M. Farris, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 3, 1991, Ser. No. 725,724

Int. Cl.[5] F16H *57/02*

U.S. Cl. 74—606 R **5 Claims**



1. In a vehicle door having a window regulator carried by a panel and a motor drive unit with a drive gear projecting from an opening in a housing and adapted to drive the window regulator, the improvement comprising:

a cover for attachment on the housing to close the opening, said cover having a plurality of spaced apart first tangs engaging the housing to effect attachment of the cover on the housing, and said cover having a plurality of spaced apart second tangs projecting away from the housing;

and a plurality of openings in the panel registering with the plurality of second tangs and adapted to receive the second tangs in snap fitting engagement therewith whereby the motor drive unit is attached to the door.

5,111,716

AUTOMATIC TRANSMISSION FOR HYDRAULIC DRIVE AUXILIARY SPEED CHANGE GEAR

Masayuki Sato, Komatsu, and Haruyuki Matsuda, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

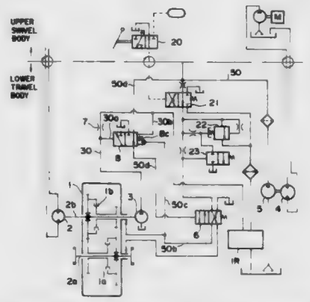
PCT No. PCT/JP89/01284, § 371 Date Jul. 1, 1991, § 102(e) Date Jul. 1, 1991, PCT Pub. No. WO90/07661, PCT Pub. Date Jul. 12, 1990

PCT Filed Dec. 21, 1989, Ser. No. 721,451

Claims priority, application Japan, Dec. 29, 1988, 63-331273

Int. Cl.[5] F16H *47/02*

U.S. Cl. 74—733.1 **18 Claims**



1. An automatic transmission for a hydraulically driven auxiliary speed change gear which is a power transmitting/-speed change gear including a hydraulically driven motor and an auxiliary speed change gear provided with hydraulically operated clutches engaged and disengaged to attain high and low speeds, said automatic transmission comprising:

an automatic change-over valve provided in a hydraulic circuit which connects said high and low speed clutches to a clutch operating hydraulic pump, a first conduit pipe which conducts one end of said automatic change-over valve to a hydraulic circuit connected to a discharge side of said clutch operating hydraulic pump, an automatic speed changing valve provided in said first conduit pipe, a rotation sensing hydraulic pump coupled to an input shaft of said auxiliary speed change gear, a second conduit pipe which connects a hydraulic circuit connected to a discharge side of said rotation sensing hydraulic pump to one end of said automatic speed changing valve, a third conduit pipe which connects the hydraulic circuit connected to the discharge side of said rotation sensing hydraulic pump to the other end of said automatic speed changing valve through an orifice, and a fourth conduit pipe which connects the other end of said automatic speed changing valve to a hydraulic circuit which is located between said low-speed clutch and said automatic change-over valve.

5,111,717

CLOSED LOOP DOWNSHIFT QUALITY CONTROL FOR AN AUTOMATIC TRANSMISSON

Jun Takeuchi, Zama; Takashi Shibayama, Isehara, and Masahiro Iida, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 31, 1990, Ser. No. 472,555

Claims priority, application Japan, Jan. 31, 1989, 1-22295

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—866 **10 Claims**

1. A vehicle comprising:

an internal combustion engine;

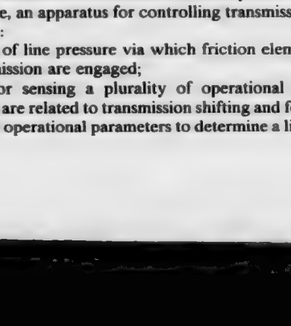
a torque converter;

an automatic transmission drivingly coupled through said torque converter with said internal combustion engine and having an output member, said automatic transmission including a predetermined hydraulically operated friction element which is engaged when said automatic transmission effects a predetermined downshift in gear;

first sensor means located before the torque converter, for detecting a revolution speed of said internal combustion engine and generating an input revolution speed indicative signal indicative of said revolution speed of said internal combustion engine detected;

second sensor means for detecting a revolution speed of said output member of said automatic transmission and generating an output revolution speed indicative signal indicative of said revolution speed of said output member of said automatic transmission detected;

a hydraulic fluid circuit for said predetermined hydraulically operated friction element, said hydraulic fluid circuit including a variable flow restrictor for restricting flow of hydraulic fluid passing therethrough; and



a control unit operatively connected with said first and second sensor means and with said variable flow restrictor,

said control unit including means for determining a speed ratio of said input revolution speed indicative signal to said output revolution speed indicative signal and generating a speed ratio indicative signal indicative of said speed ratio determined, means for generating a reference speed ratio value indicative signal, and means for controlling said variable flow restrictor such that said variable flow restrictor restricts the flow of hydraulic fluid to a first degree when said speed ratio indicative signal fails to attain a predetermined relationship with said reference speed ratio value indicative signal, but when said speed ratio indicative signal attains said predetermined relationship with said reference speed ratio value indicative signal, said variable flow restrictor switches to restrict the flow of hydraulic fluid to a second degree which is less than said first degree.

5,111,718

LINE PRESSURE CONTROL FOR AUTOMATIC TRANSMISSION

Naonori Iizuka, Shizuoka, Japan, assignor to Jatco Corporation, Japan

Filed Jun. 21, 1991, Ser. No. 718,652

Claims priority, application Japan, Jun. 22, 1990, 2-164938

Int. Cl.[5] B60K *41/06*

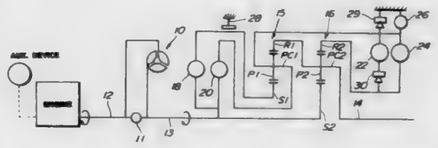
U.S. Cl. 74—866 **14 Claims**

1. In an automatic transmission which is operatively coupled to an engine, an apparatus for controlling transmission shifting comprising:

a source of line pressure via which friction elements of the transmission are engaged;

means for sensing a plurality of operational parameters which are related to transmission shifting and for using the sensed operational parameters to determine a line pressure correction value via which the level of line pressure which is output from said source, is corrected; and

means for sensing the operation of a device which consumes engine rotational energy and thus reduces the amount of



engine torque which is supplied to the transmission when the device is in operation, and for inhibiting the determination of the line pressure correction value during the operation of the device.

5,111,719

SHIFT CONTROL TO ENGINE BRAKING OR REVERSE DRIVE

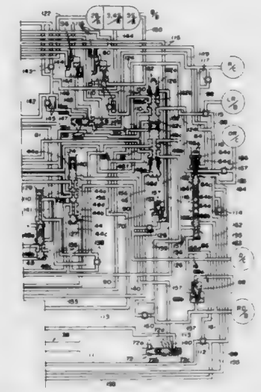
Hirofumi Okahara, Isehara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 18, 1990, Ser. No. 525,560

Claims priority, application Japan, May 18, 1989, 1-122725

Int. Cl.[5] B60K *41/10*

U.S. Cl. 74—867 **12 Claims**



1. An automatic transmission for a motor vehicle with an engine, comprising:

a main gearing;

an auxiliary gearing drivingly connected to said main gearing, said auxiliary gearing having a high gear position and a low gear position and being shiftable from said high gear position to said low gear position owing to disengagement of a first frictional device and engagement of a second frictional device, said auxiliary gearing including a one-way clutch arranged in parallel to said second frictional device during engine drive forward running;

means for controlling a rate of increase in hydraulic fluid acting on said second friction device into engagement therewith when said auxiliary gearing shifts from said high gear position to said low gear position;

means for generating an engine brake forward running demand and a reverse running demand selectively;

means, responsive to said engine brake forward running demand and said reverse running demand, for allowing a bypass flow of hydraulic fluid, bypassing said controlling means, toward said second frictional device to change said rate of increase in hydraulic fluid acting on said second

frictional device to a different rate of increase when said auxiliary gearing shifts from said high gear position to said low gear position;

wherein said controlling means include a hydraulic fluid line having one end communicating with said second friction device and an opposite end, a one-way orifice means disposed in said hydraulic fluid line for dividing said hydraulic fluid line into a first portion extending between said one-way orifice means and said second frictional device and a second portion extending between said one-way orifice means and said opposite end, and an accumulator in an uninterrupted fluid communication with said first portion of said hydraulic fluid line whereby there is a continuous pressure at all times from said hydraulic fluid line influencing said accumulator irrespective of said controlling means.

5,111,720

ROTARY WIRE STRIPPER

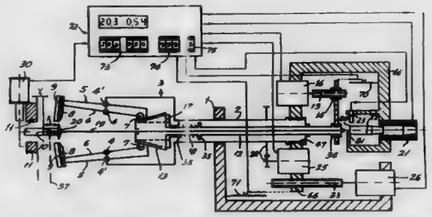
Jiri Stepan, Sargans, Switzerland

Continuation of Ser. No. 449,545, Dec. 12, 1989, Pat. No. 4,981,054, which is a continuation of Ser. No. 183,782, Apr. 20, 1988, Pat. No. 4,920,830, which is a continuation of Ser. No. 832,463, Feb. 21, 1986, Pat. No. 4,745,828. This application Nov. 29, 1990, Ser. No. 619,720

Claims priority, application Switzerland, Feb. 22, 1985, 815/85

Int. Cl.[5] H02G *1/12*

U.S. Cl. 81—9.51 **31 Claims**



1. A device for removing at least two layers from a cable, comprising

frame means;

blade means mounted on said frame means;

first actuating means for rotating said blade means around the axis of the cable, enabling the blade means to sever said at least two layers to be removed;

second actuating means for moving the blade means radially toward the cable into at least two different preselectable radial positions with respect to said cable, for contacting said at least two layers of the cable to be removed; and

electronic means for storing said at least two different preselectable radial positions and controlling at least said second actuating means.

5,111,721

TUBE TRUNCATION APPARATUS AND METHOD

Jean-Paul Languillat, Vellieres par Thorigny-sur-Oreuse, France, assignor to Laboratoire S.A., Pont-Sur-Yonne, France

Continuation of Ser. No. 924,443, Oct. 29, 1986, Pat. No. 4,889,023. This application Jul. 26, 1989, Ser. No. 385,289

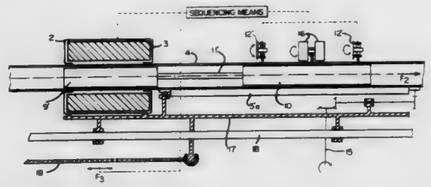
Claims priority, application France, Oct. 30, 1985, 85 16135

The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.

Int. Cl.[5] B23B *3/04*

U.S. Cl. 82—47 **23 Claims**

1. Tube truncation apparatus comprising at least one knife adapted to cooperate at the end of its cutting extent with a counter-knife disposed in the interior of a tube to be cut, said counter-knife being associated with a magnetizable core, and a magnetic induction means adapted to create a magnetic field in the core across said tube to longitudinally change the position of the core and correspondingly said counter-knife during truncation of a tube, wherein said apparatus is adapted to truncate a tube which is continuously formed, said at least one knife being mounted to be moved longitudinally at the moment



of truncation, in a synchronous manner with the advancement of the tube in the course of manufacture, and wherein said magnetic induction means is adapted to create a magnetic field of variable position, and further comprising means for sequencing the displacement of the field, and consequently the position of said core and said counter-knife, to the truncation cycle.

5,111,722

BELT-SHAPED MEMBER SUPPLYING METHOD AND APPARATUS

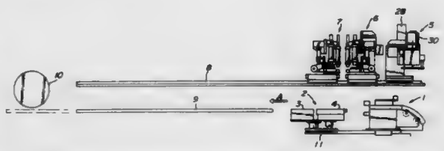
Shigeru Tada, Tokyo; Jun Nagano, Tokorozawa, and Yoshihiro Fukamachi, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 14, 1990, Ser. No. 612,363

Claims priority, application Japan, Nov. 24, 1989, 1-303163

Int. Cl.[5] B29D *30/30*

U.S. Cl. 83—23 **13 Claims**



1. A belt-shaped member supplying method for cutting a long material paid out of a winding roll into a belt shaped member of a predetermined length and supplying the belt-shaped member onto a winding drum, comprising steps of; modifying an extending direction of a front edge of said long material, whose initial front end portion has been cut off, into a desired direction by applying a force upon a front end portion of the long material, holding the front end portion of the long material, paying out the long material of a predetermined length, cutting the pad out long material to form a belt-shaped member, changing an extending direction of a rear edge of the belt-shaped member into a desired direction by applying a force upon a rear end portion of the belt-shaped member, holding the rear end portion of the belt-shaped member, transferring the entire belt-shaped member to a predetermined position, taking up any slack of the belt-shaped member, holding the belt-shaped member against a plate-shaped transfer means, and moving the plate-shaped transfer means together with the belt-shaped member to the winding drum.

5,111,723

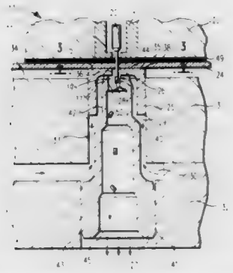
PUNCH APPARATUS WITH POSITIVE SLUG REMOVAL

Franz Andrusch, Deckenpfronn; Siegfried Beerhalter, Schwaebisch, both of Fed. Rep. of Germany; Wolfgang F. Mueller, Hot Spring Village, Ark., and Felix B. Zykoff, Poughkeepsie, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 12, 1991, Ser. No. 667,945

Int. Cl.[5] B26D *7/18*

U.S. Cl. 83—24 **21 Claims**



1. A method for single stroke punching comprising the steps of:

providing a workpiece proximate a workpiece receiving surface of a die plate defining an aperture;

punching a slug from the workpiece through a clearance feature of an end wall of a support bushing deposed in the aperture;

directing a gas flow through a flow passage defined by the support bushing, the interior wall of the die plate of the aperture, and a deformable polymeric slug removal bushing disposed in the aperture; and

impinging the gas flow on the slug attached to the punch proximate the end wall to remove the slug from the punch through a slug removal passage of the slug removal bushing.

5,111,724

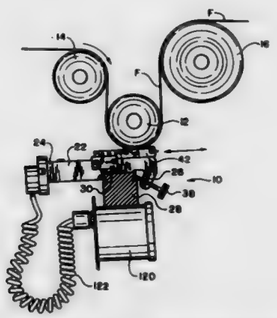
SLITTER KNIFE ARRANGEMENT

Bob C. Kanaga, Mesa, and Ronald R. Beyerle, Higley, both of Ariz., assignors to Gould Inc., Eastlake, Ohio

Filed May 21, 1991, Ser. No. 703,406

Int. Cl.[5] B26D *1/10*

U.S. Cl. 83—58 **6 Claims**



1. An assembly for slitting a continuous web of metallic foil comprising:

a roller rotatable about a fixed axis, said roller having a cylindrical outer surface including at least one annular groove formed therein;

an elongated support base having linear guide means formed therein, said guide means defining a generally linear guide path;

a blade holder dimensioned to be received within said guide means and be movable along said guide path, said blade holder dimensioned to hold a cutting blade having a linear cutting surface wherein said linear cutting surface is oriented generally parallel to said guide path;

means for positioning said support base adjacent said roller wherein said cutting surface of said cutting blade is aligned with said annular groove in said roller and a portion of said cutting surface is received therein;

reversible drive means secured to said base means operable to reciprocally move said blade holder along said guide path at a controllable rate of speed; and

control means for controlling said drive means, said control means including sensing means operable to monitor movement of said blade holder and the operation of said drive means, said control means monitoring said sensing means to ensure proper operation of said assembly.

5,111,725

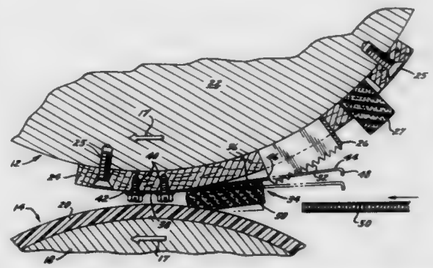
SCRAP EJECTOR FOR ROTARY DIE CUTTING APPARATUS

Jack R. Simpson, Raleigh, and Jeffrey A. Geer, Apex, both of N.C., assignors to Container Graphics Corporation, Cary, N.C.

Filed May 31, 1991, Ser. No. 709,922

Int. Cl.[5] B26D *7/18*

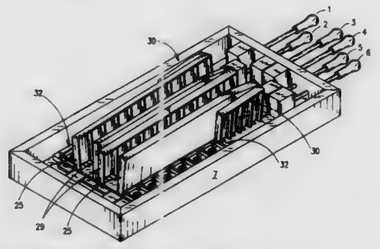
U.S. Cl. 83—117 **16 Claims**



1. A rotary die apparatus having a die roll and an anvil roll mounted in generally parallel relationship to each other for rotation in opposite directions and defining a nip therebetween, said die roll having a cutting rule extending outwardly from the outer surface of said roll for, in cooperation with said anvil roll, cutting material off of the leading edge portion of paperboard stock passing through said nip between said rolls; and a scrap ejector for ejecting said material away from said paperboard stock following cutting thereof, the improvement comprising:

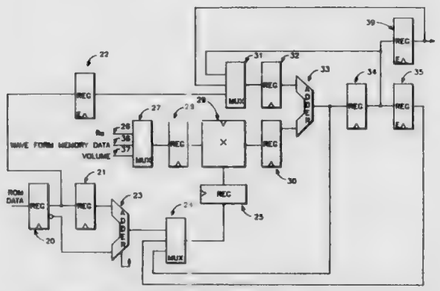
said scrap ejector including an elongated flexible body having a leading end portion, a trailing end portion, and resilient compressible means projecting away from said die roll and toward said anvil roll, said leading end portion of said scrap ejector being connected to said die roll adjacent said outer surface thereof and passing through said nip between said rolls prior to said trailing end of said scrap ejector, said trailing end portion of said body of said scrap ejector normally being spaced outwardly from said outer surface of said die roll, and being movable toward said die roll surface by engagement of said resilient compressible means with said anvil roll during passage of said scrap ejector into said nip between said rolls.

5,111,726
DUAL PITCHED MELODEON
Randy E. Falcon, 227 Norris Rd., Duson, La. 70529
Filed Aug. 15, 1990, Ser. No. 567,680
Int. Cl.[5] G10D *11/00*
U.S. Cl. 84—375 12 Claims



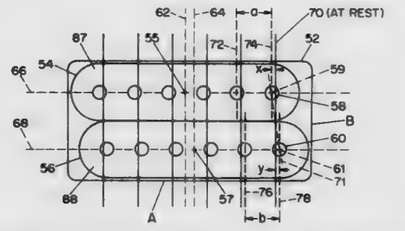
7. A dual pitch melodeon comprising:
a) a keyboard box, having two different pitch sets of high, medium, and low octave treble reeds mounted thereto;
b) a left hand end box, having two different pitch sets of bass reeds mounted thereto; and
c) a bellows, connecting said key board box to said left hand end box.

5,111,727
DIGITAL SAMPLING INSTRUMENT FOR DIGITAL AUDIO DATA
David P. Rossum, Aptos, Calif., assignor to E-mu Systems, Inc., Scotts Valley, Calif.
Filed Jan. 5, 1990, Ser. No. 462,392
Int. Cl.[5] G10H *7/10, 7/12*
U.S. Cl. 84—603 10 Claims



1. A digital sampling instrument operating at a certain sampling frequency for the multichannel interpolative playback of digital audio data stored in a waveform memory comprising:
low pass coefficient memory means for storing one or more impulse responses whose corresponding spectra have notches at multiples of said sampling frequency which are of a different value than the remainder of said spectra,
convolution means for computing a sum of products of the contents of said coefficient memory means times the contents of said waveform memory for each of several output channels to form a convolution,
means for outputting the result of said convolution for each of said channels.

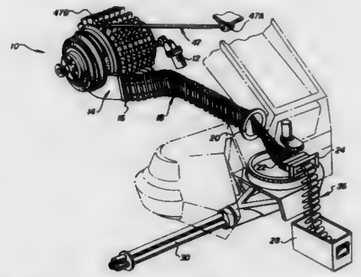
5,111,728
ELECTROMAGNETIC PICKUP DEVICE FOR ELECTRICAL STRING MUSICAL INSTRUMENTS
Steven L. Blucher, New York, and Michael T. Altilio, Staten Island, both of N.Y., assignors to DiMarzio Musical Instrument Pickups, Inc., Staten Island, N.Y.
Filed Sep. 6, 1990, Ser. No. 578,763
Int. Cl.[5] G10H *3/18*
U.S. Cl. 84—726 5 Claims



1. An electromagnetic pickup device for an electrical musical instrument having a plurality of strings comprising
a first laterally extending coil potion having an upper surface;
a first plurality of spaced apart elongated magnetic pole pieces equal in number to said strings carried by said first coil portion, each said pole piece having one end extending through the upper surface of said first coil portion and said pole pieces being disposed in substantially parallel relationship to each other, all of said pole pieces having said one ends magnetized with the same given polarity;
a second laterally extending coil potion having an upper surface;
a second plurality of spaced part elongated magnetic pole pieces equal in number to said strings carried by said second coil portion, each said pole piece having one end extending thought the upper surface of said scan coil portion and said pole pieces being disposed in parallel relationship to each other, all of said second plurality of pole pieces having said one ends magnetized with the same polarity and opposite to said given polarity of said one ends of said first polarity of pole pieces;
said first and second coil portions being disposed alongside one another with their upper surfaces substantially int he same plane and with said first and second pluralities of magnetic pole pieces extending from said respective upper surfaces towards said strings, whereby with said pickup device installed on the instrument, each string is operatively associated with a separate pair of pole pieces, one of said pair carried by each oil portion, the pole pieces of each such pair presenting opposite polarities to its respective string;
each of said strings having a resting position and the central vertical axes of the pair of magnetic pole pieces associated with at least one string lying on opposite sides of said string and an a plane which intersects the string when said string is in its resting position.

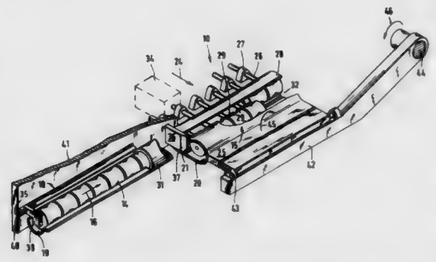
5,111,729
AMMUNITION STORAGE SYSTEM
Douglas P. Tassie, St. George, Vt., assignor to General Electric Company, Burlington, Vt.
Filed Oct. 4, 1990, Ser. No. 592,740
Int. Cl.[5] F41A *9/75*
U.S. Cl. 89—33.02 9 Claims

1. A storage system for a belt of linked together rounds of ammunition comprising:
a base means;
a helical fin having a plurality of uniformly spaced apart layers and journaled to said base means for rotation about its longitudinal axis;
said layers of said helical fin defining a helical gap having a pair of mutually opposed helical side walls;
said layers of said helical fin having a peripheral surface radially spaced from said longitudinal axis and defining the radial height of said helical gap;



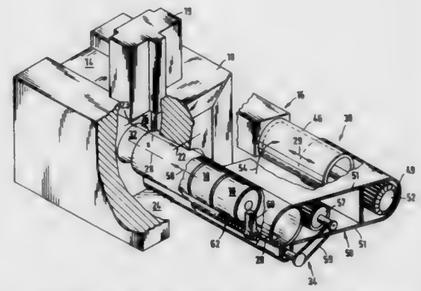
a plurality of pairs of mutually spaced apart cavities, said pairs being disposed sequentially along the helical length of said gap, each pair extending longitudinally into mutually opposed portions of said side walls and radially inwardly from said peripheral surface.

5,111,730
APPORTIONING APPARATUS FOR LOADING A LOADING TRAY WITH A VARIABLE NUMBER OF PROPELLING CHARGE MODULES
Dieter Grabner, Willich, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany
Filed Sep. 18, 1990, Ser. No. 583,996
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1989, 3931059
Int. Cl.[5] F41A *9/38*
U.S. Cl. 89—45 6 Claims



1. An apportioning apparatus in combination with a transporting device for transporting propelling charge modules in an axial direction of the transporting device and a loading tray for receiving propelling charge modules which are to be loaded into a gun, wherein said apportioning apparatus is arranged opposite to said transporting device in an axial transporting direction of the propelling charge modules and extends laterally of and parallel to the loading tray; and said apportioning apparatus comprises at least one pusher which simultaneously transports a predetermined number of propelling charge modules transversely into the loading tray.

5,111,731
LOADING DEVICE FOR MODULAR PROPELLING CHARGES
Dieter Grabner, Willich, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany
Filed Sep. 19, 1990, Ser. No. 585,010
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1989, 3932130
Int. Cl.[5] F41A *9/14, 9/16, 9/42*
U.S. Cl. 89—46 9 Claims



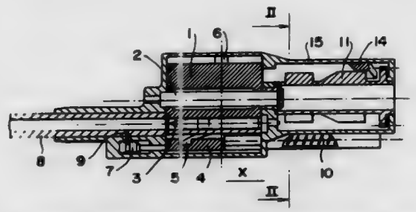
1. A loading device for loading a propelling charge into a chamber of a gun barrel having a breech ring, wherein a loading trough is disposed behind the breech ring with the chamber beginning at the rear of the breech ring and the gun barrel has a bore axis, comprising:
a transfer arm mounted for pivotal movement in a direction about an elevation axis of the gun barrel;
a loading tray pivotal transversely tot eh direction of movement of said transfer arm from a first position off the bore axis of the gun barrel to a second position aligned with the bore axis of the gun barrel and behind and separated from the breech ring;
pivoting means connected to said transfer arm and said loading tray for pivoting said loading tray between the first and second positions;
displacement means constituting part of said transfer arm and operatively connected with said loading tray for moving said loading tray along an extension of the bore axis of the gun barrel from the second position through the loading trough to a third position where said loading tray is in contact with the rear of said breech ring; and
transporting means operatively connected with said loading tray for transporting a propelling charge disposed on said loading tray when said loading tray is the third position into the chamber of the gun barrel.

5,111,732
AUTOMATIC WEAPON WITH SMALL BARREL FOR RAPID FIRING
Joël Marcon, St Etienne; Evelyne Montet, Bourges; Didier Gobet, Bourges; Guy Ferrand, Bourges; Patrick Pochard, Bourges, and Georges Simon, St Germain Du Puy, all of France, assignors to Etat Francais, France
Continuation of Ser. No. 413,685, Sep. 28, 1989, abandoned. This application Mar. 14, 1991, Ser. No. 670,381
Claims priority, application France, Sep. 28, 1988, 88 12654
Int. Cl.[5] F41A *9/36*
U.S. Cl. 89—135 8 Claims

1. A medium caliber automatic firearm, comprising:
a rotatable cylinder comprising a plurality of radially spaced cartridge chambers, each cartridge chamber being successively aligned with at least one barrel operating on explosive gases generated from firing cartridges;
a feeding device comprising in combination (1) a star drum axially aligned with and driven in indexed rotation by said

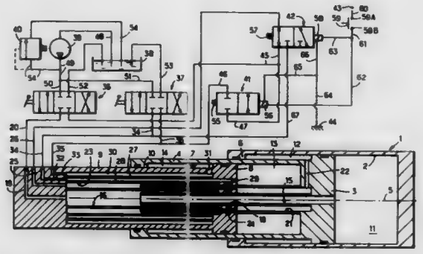
VOL 1138 ISS 2 MY 12 1992 UMI

rotatable cylinder, (2) a star wheel mounted to the side of and axially parallel to said star drum, (3) by a coupling device provided between said star drum and said atar wheel to rotate said star wheel synchronously with said star drum, (4) means disconnecting said coupling device to empty said cylinder, said star wheel contacting links of an ammunition belt partially wound around said star wheel to drive said belt relative to the rotation of said star drum and to supply ammunition cartridges to said star drum, and (5)



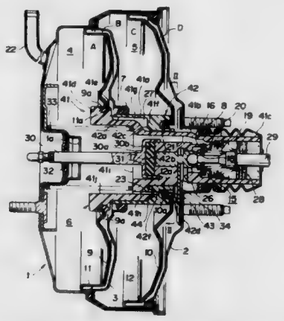
a stationary stripper mechanism interposed between said star drum and said star wheel to separate radially ammunition cartridges from the links of the ammunition belt and to convey individually the cartridges to said star drum while allowing the links to be evacuated from the firearm;
means for introducing the conveyed cartridges into successive chambers of the rotatable cylinder, the cartridges being aligned with said chambers as said star drum rotates; and
electrical means for detonating said cartridges.

5,111,733
MULTIPLE STAGE HYDRAULIC JACK FOR USE WITH TELESCOPIC JIB
Robert Baraniak, Saint Vallier, France, assignor to PPM, Monteau Les Mines, France
Filed Mar. 5, 1991, Ser. No. 665,382
Claims priority, application France, Mar. 6, 1990, 90 02810
Int. Cl.[5] F15B *11/18*
U.S. Cl. 91—167 R **16 Claims**



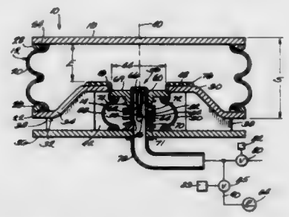
1. A multiple jack comprising:
a first cylinder;
a first piston, mounted to slide inside the first cylinder, which defines therein a first large chamber, of large useful cross section, and a first small chamber, of small useful cross section;
a first piston rod, which extends from the first piston, traverses a bottom of the first cylinder, to define the first small chamber of the first cylinder, and contains a cylindrical central first recess;
a second cylinder which is constituted by the first recess of the first piston rod,
a second piston, mounted to slide inside the second cylinder, which defines therein a second large chamber, of large useful cross section, and a second small chamber, of small useful cross section;
a second piston rod which extends from the second piston and traverses a bottom of the second cylinder to define the second small chamber;
a first inner conduit connecting the first larger chamber to a first outer conduit;
a second inner conduit connecting the first small chamber to a second outer conduit;
a third inner conduit connecting the second larger chamber to a third outer conduit;
a fourth inner conduit connecting the second small chamber to a fourth outer conduit;
the first large and first small chambers and the second large and small chambers are not connected by any link inside the jack;
a first tubular conduit and a second tubular conduit, cylindrical, coaxial and distinct, extending from the first piston, a space separating the first and second tubular conduits, the first tubular conduit being contained in the second tubular conduit and comprising a cylindrical bore constituting a part of the first inner conduit;
a third tubular conduit, extending from the bottom of the second piston rod and penetrating the space separating the first and second tubular conduits;
two O-rings disposed between the second and third tubular conduits, the O-rings defining a chamber which communicates, via an orifice, with the interior of the third tubular conduit such that the cross sectional areas of the first tubular conduit and of the chamber are equal.

5,111,734
BOOSTER
Haruo Suzuki, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan
Filed Mar. 13, 1991, Ser. No. 669,101
Claims priority, application Japan, Apr. 5, 1990, 2-90932; Apr. 12, 1990, 2-97267
Int. Cl.[5] F15B *9/10*
U.S. Cl. 91—376 R **14 Claims**



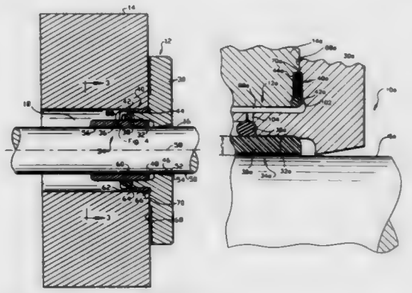
1. A booster including a center plate which divides the interior of a shell into a forwardly located, front chamber and a rearwardly located, rear chamber, a valve body slidably extending through the center plate while maintaining a hermetic seal therewith, a front power piston mounted on the valve body and disposed within the front chamber, a rear power piston mounted on the valve body and disposed within the rear chamber, a front diaphragm applied across the front power piston and the shell for dividing the interior of the front chamber into a forwardly located, constant pressure chamber and a rearwardly located, variable pressure chamber, a rear diaphragm applied across the rear power piston and the shell for dividing the interior of the rear chamber into a forwardly located, constant pressure chamber and a rearwardly located, variable pressure chamber, a constant pressure passage for providing a communication between the constant pressure chambers in the front and the rear chamber, and a variable pressure passage for providing a communication between the variable pressure chambers in the front and the rear chamber;
characterized in that the valve body comprises a first tubular member having the front power piston and the front diaphragm connected therein, and a second tubular member disposed in surrounding relationship with the first tubular member, slidably extending through the center plate while maintaining a hermetic seal therewith nd having the rear power piston and the rear diaphragm connected thereto, the variable pressure passage being formed by an axial space defined between the outer peripheral surface of the first tubular member and the inner peripheral surface of the surrounding second tubular member, and wherein, in all slidable positions of said valve body, said peripheral surfaces of said tubular members both extend from behind said rear power piston forwardly beyond said center plate into said front chamber.

5,111,735
AIR SPRING WITH QUICK RELEASE VALVE
Noel R. Johnson, Janesville, Wis., assignor to Beloit Corporation, Beloit, Wis.
Filed Oct. 30, 1990, Ser. No. 606,025
Int. Cl.[5] F15B *11/10*
U.S. Cl. 91—433 **5 Claims**



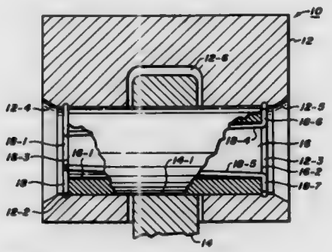
1. Air spring apparatus, having a quick release of air pressure and volume to quickly shorten its effective stroke, comprising, in combination:
a primary air spring having inner and outer bead plates and an exhaust port in the inner bead plate;
a base plate;
a secondary air spring disposed between the base plate and the inner bead plate and having a valve plate for moving into, and out of, sealing engagement with the exhaust port;
air flow control means, including a guide tube, for selectively 1) controlling the flow of pressurized air into the primary and secondary air springs to inflate the primary air spring and raise it to a predetermined height and to inflate the secondary air spring and provide a pressure force to move the valve plate to seal the exhaust port to maintain air pressure within the primary air spring, and 2) controlling the glow of exhaust air out of the secondary air spring to decrease the pressure force on the valve plate to thereby cause the release of the valve plate from the exhaust port and permit the rapid decrease in air pressure within the primary air spring and rapid exhaustion of air therefrom to quickly shorten the effective stroke of the air spring apparatus;
one or more orifices in the guide tube for establishing air communication between the guide tube and interior of the secondary air spring;
the air flow control means includes a check valve having the guide tube extending between the base plate and the valve plate and defining a passageway for the flow of air between the primary and secondary air springs and the exterior of the air spring apparatus;
the check valve includes a stem and a head, the stem disposed between the guide tube and resiliently biased to urge the head into sealing engagement with an end of the tube extending through the valve plate against the force of pressurized air within the guide tube when the air pressure in the primary air spring reaches a predetermined level.

5,111,736
VENTED STATIC SEAL ASSEMBLY
Anton H. Buchberger, 16713 - 127th Ave. SE., Renton, Wash. 98058; Olivier L. Tremoulet, Jr., 18334 Andover St., Edmonds, Wash. 98020, and Sigurd C. Mordre, P.O. Box 5087, Vashon Island, Wash. 98070
Continuation-in-part of Ser. No. 333,343, Apr. 4, 1989, abandoned, and Ser. No. 333,342, Apr. 4, 1989. This application Dec. 20, 1989, Ser. No. 455,579
Int. Cl.[5] F15J *15/18*
U.S. Cl. 92—168 **17 Claims**



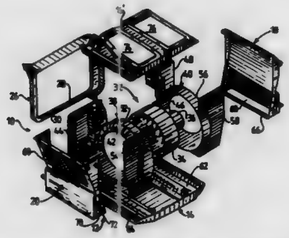
1. A seal assembly comprising:
a. a high pressure structural assembly having a high pressure side which is exposed alternately to high and low pressures in a high pressure area and having two opposed groove defining side surfaces and a groove defining back surface which collectively define a seal groove, and having adjacent surfaces which extend from an area of said back surface and for which a seal is to be provided;
b. a resilient seal member which is configured to fit in said groove and which has a high pressure surface portion facing said high pressure area, two side surface portions adapted to come into sealing engagement with the side surfaces of the structural assembly, and a back surface portion adapted to be positioned against the back surface of the structural assembly;
c. said seal member and said structural assembly being arranged so that under a high pressure condition in said high pressure area, said seal member is pressed into a high pressure sealing configuration where each of the side surface portions presses against related side sealing surface portion of said surfaces in a related side sealing area, and where the back surface portion of the seal member is adjacent the groove defining back surface at a back seal area;
d. said seal assembly having relief passageway means leading from at least one of the side sealing areas to said high pressure side
whereby subsequent to periods of high pressure in said high pressure area, pressure relief in said back sealed area is permitted.

5,111,737
WRIST PIN RETAINER FOR BLIND ASSEMBLY
Michael J. Dormer, Fabius; Bruce A. Fraser, Manlius, and Timothy V. Nelson, Nedrow, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Apr. 8, 1991, Ser. No. 681,594
Int. Cl.[5] F16J 1/14
U.S. Cl. 92—187 **3 Claims**



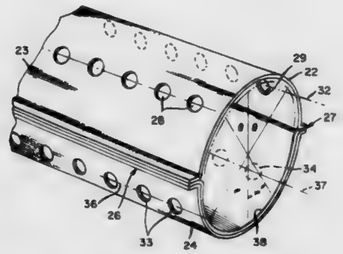
1. A piston assembly comprising:
piston means having a diametrically extending bore formed therein and at least one annular groove formed in said bore;
connecting rod means adapted to be received in said piston means and having a bore formed therein which is continuous with said bore in said piston means when said connecting rod means is received in said piston means;
wrist pin means having a bore and defining an annular cylinder adapted to be received in said continuous bore defined by said piston means and said connecting rod means; and
a retainer means defined by a single wire located in said bore of said wrist pin means and extending therethrough so as to be retained therein and including a curved portion located outside of said bore in said wrist pin means and coacting with said annular groove when said wrist pin means is in said continuous bore whereby said connecting rod means is pivotably connected to said piston means.

5,111,738
AIR BLOWER UNIT FOR A MOTOR VEHICLE HEATING AND VENTILATING SYSTEM
Michel Becquerel, Le Mesnil-Saint-Denis, France, assignor to Valeo Thermique Habitacle, Le Mesnil-Saint-Denix, France
Filed Jul. 8, 1991, Ser. No. 726,885
Claims priority, application France, Jul. 11, 1990, 90 08849
Int. Cl.[5] B60H 1/24
U.S. Cl. 454—159 **11 Claims**



1. An air blower unit for a heating and ventilating system of a motor vehicle, comprising a casing and an air blower mounted in the casing, the air blower comprising two generally symmetrical half shells mated together to define a volute chamber, a motor within the volute chamber, and a blower rotor coupled with the motor so as to be driven thereby, each half shell having a central opening and a lateral half opening, such that one of the central openings serves as an air inlet and the other to support the motor, while the two said lateral half openings together define an air outlet, said casing comprising an upper wall, a lower wall, and two opposed side walls together defining two open and opposed end faces having the same profile, the casing further including a mounting frame defining a datum plane and two opposed mounting sides which are symmetrical about said datum plane, so that the mounting frame can be fitted over the air outlet of the air blower on either one of its two said mounting sides indiscriminately, whereby to obtain two casing configurations in which the mounting frame retains the same spatial orientation with respect to the casing.

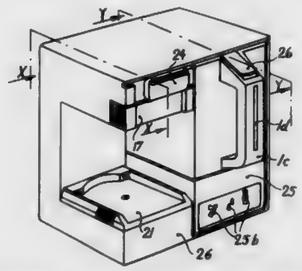
5,111,739
AIR FLOW CONTROL SYSTEM
James F. Hall, 4150 Charms Ct., Milford, Mich. 48012
Continuation-in-part of Ser. No. 434,300, Nov. 13, 1989, abandoned. This application Oct. 10, 1990, Ser. No. 596,310
Int. Cl.[5] F24F 7/06
U.S. Cl. 454—306 **26 Claims**



1. An air flow control system comprising:
(a) an elongated, cylindrical, flexible duct having a set of air exit holes along the duct;
(b) a flexible liner sheet within the duct and extending longitudinally along the duct; and
(c) means defining first and second lines of attachment attaching opposite longitudinal edges of the sheet to the duct to divide the interior space in the duct into first and second longitudinal compartments with the air exit holes being in a first portion of the duct on one side of the sheet and in the first compartment, the width of the sheet between the lines of attachment being at least substantially equal to the inner circumferential dimension of the duct between the lines of attachment, whereby air can be directed longitudinally along the first longitudinal compartment to escape through the air exit holes or along the second longitudinal compartment to force the sheet against the inner surface of the portion of the duct wall containing the air exit holes to block those holes.

5,111,740
ELECTRICAL APPARATUS USEFUL TO PREPARE A HOT BEVERAGE
Peter Klein, 19763-44th Avenue, Langley, British Columbia, Canada V3A 3C9
Filed Mar. 9, 1990, Ser. No. 490,849
Int. Cl.[5] A47J 31/00; A23F 5/00
U.S. Cl. 99—295 **16 Claims**

1. An electrical apparatus useful to prepare a hot beverage from a flavour substance comprising:
a single serve filter unit comprising a filter carrier with a filter and flavour substance and an upper closure for the filter carrier;
a storage container for liquid with a volume of at least one cup of finished brew;
a volumetric measurement tank with a volume of one cup of finished brew to receive liquid from the storage container;
a shut-off valve between the storage container and the volumetric measurement tank;
venting pipes joining the top of the volumetric measurement tank with the top of the storage container;
a heater for the liquid;
a shower head to align with the filter unit and a cup;
means to align the shower head with the filter unit and cup including a guide for the shower head, a support for the filter unit movable outwardly of the apparatus, the aligned position of the shower head with the filter unit and the cup being defined by the support for the filter unit being retracted into the apparatus and locked in position by a latch mechanism which can be released manually;



a support for the cup whereby the guide for the shower head allows movement of the shower head perpendicular to the surface of the upper closure of the filter unit yet prevents movement of the shower head in a direction within the plane of the upper closure of the filter unit;
a first pipe communicating the shower head with the heater; and
means which, prior to the brewing, allow the liquid to pass from the storage tank into the volumetric measurement tank yet prevent liquid from passing from the volumetric measurement tank to the shower head, and which during brewing prevent liquid to pass from the storage tank into the volumetric measurement tank yet allow liquid to pass from the volumetric measurement tank through the first pipe through the Shower Head into the filter unit.

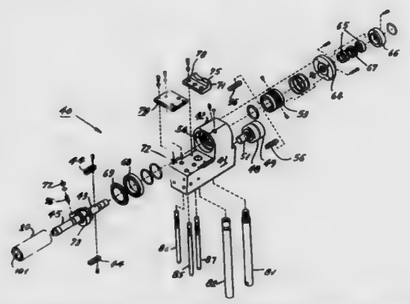
5,111,741
SYSTEM FOR BALING STRANDS OF MATERIAL INCLUDING MEANS FOR FEEDING AND MEANS FOR WEIGHING MATERIAL CHARGES
Donald E. Weder, and Erin H. Weder, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Division of Ser. No. 640,566, Jan. 14, 1991, abandoned, which is a continuation of Ser. No. 499,222, Mar. 26, 1990, abandoned, which is a continuation of Ser. No. 270,779, Nov. 7, 1988, Pat. No. 4,961,375, which is a division of Ser. No. 605,386, Apr. 30, 1984, Pat. No. 4,884,682. This application Jul. 19, 1990, Ser. No. 733,046
Int. Cl.[5] B30B 15/30, 15/10, 5/00
U.S. Cl. 100—45 **11 Claims**

1. An apparatus for baling strands of material comprising:
a pressing container having a first end wall and a second end wall and a material receiving space formed in a portion thereof extending generally between the first and the second end walls, the strands of material to be baled being disposed in the material receiving space, and a portion of the pressing container generally near the second end wall being substantially enclosed, the pressing container having an upper end wall and a lower end wall with a material receiving opening being formed through a portion of the upper end wall of the pressing container;
a horiaontal pressing ram having a pressing surface formed thereon, the horizontal pressing ram being moved through at least a portion of the material receiving space in the pressing container;
means connected to the horizontal ram for moving the horizontal pressing ram from a storage position to an engaging position, the pressing surface of the horizontal pressing ram compressingly engaging the strands of material within the substantially enclosed portion of the pressing container for forming the strands of material into a bale of material;
a weighing container having a material receiving space formed in a portion thereof, the strands of material to be baled being received within the material receiving space of the weighing container, a receiving opening formed through a portion of the weighing container in communication with the material receiving space in the weighing container and a discharge opening being formed through a portion of the weighing container in communication with the material receiving space in the weighing container, the strands of material to be baled being passed through the receiving opening in the weighing container and into the material receiving space in the weighing container and the strands of material to be baled being passed from the material receiving space in the weighing container through the discharge opening in the weighing container for passing the strands of material to be baled from the weighing container, the weighing container having an upper end wall and a lower end wall with the

discharge opening being formed through the lower end wall of the weighing container;
a scale assembly supporting the weighing container and providing an output indication indicating that a predetermined weight of strands of material is disposed in the material receiving space in the weighing container;
means for supporting the weighing container on the scale assembly and for supporting the weighing container above the pressing container with the lower end wall of the weighing container being disposed above and spaced a distance from the upper end wall of the pressing container, the discharge opening in the weighing container being aligned with the material receiving opening in the pressing container, the strands of material to be baled being passed from the material receiving space in the weighing container through the discharge opening in the weighing container and through the material receiving opening in the pressing container into the material receiving space within the pressing container;
a support door assembly having an opened position and a closed position, the support door assembly substantially closing the discharge opening in the weighing container in the closed position and the support door assembly being removed from the discharge opening in the weighing container in the opened position, the strands of material to be baled being passed from the receiving space in the weighing container through the discharge opening in the

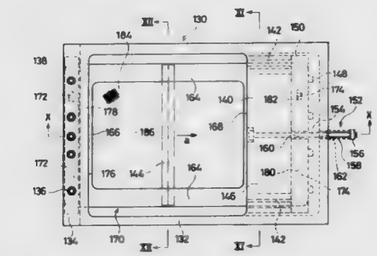
weighing container in the opened position of the support door assembly;
means for moving the support door assembly from the opened position to the closed position and from the closed position to the opened position;
an upper pressing ram having a pressing surface formed on a portion thereof; and
means for moving the upper pressing ram from a storage position to an engaging position, the pressing surface of the upper pressing ram being moved into compressing engagement with the strands of material in the material receiving space in the pressing container in the engaging position of the upper pressing ram; and
wherein the weighing container is further defined to include a ram opening formed through a portion of the upper end wall of the weighing container; and
wherein the upper pressing ram is defined further as being supported within a portion of the ram opening in the weighing container and substantially closing the ram opening in the weighing container in the storage position of the upper pressing ram; and
wherein the means for moving the upper pressing ram to the storage position into the engaging position is defined further as moving the upper pressing ram to the storage position wherein the upper pressing ram is disposed within and substantially closes the ram opening in the weighing container in the storage position of the upper pressing ram and as moving the upper pressing ram from the ram opening through a portion of the material receiving space in the weighing container through the discharge opening in the weighing container and into the material receiving opening in the pressing container as the upper pressing ram is moved from the storage to the engaging position, the upper pressing ram being disposed within and substantially closing the material receiving opening in the pressing container in the engaging position of the upper pressing ram.

5,111,742
MANDREL TRIP SUBASSEMBLY FOR CONTINUOUS MOTION CAN DECORATORS
Russell DiDonato, Maplewood, and Enn Sirvet, Washington Township, Bergen County, both of N.J., assignors to Sequa Corporation, New York, N.Y.
Filed Aug. 13, 1990, Ser. No. 565,695
Int. Cl.[5] B41F *17/22*
U.S. Cl. 101—40 **13 Claims**



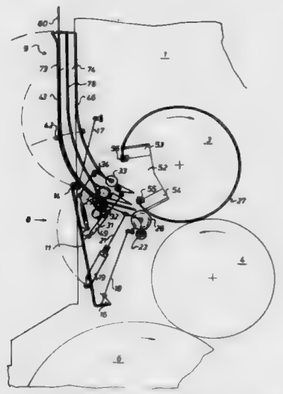
1. Apparatus for decorating cylindrical articles, said apparatus including:
a carrier mounted for continuous rotation on a main axis;
a plurality of equally angularly spaced mandrel/actuator subassemblies mounted on said carrier in an array about said main axis as a center;
decorating means past which subassemblies move as said carrier rotates;
stationary cam means disposed about said main axis;
each of said subassemblies including a cylindrical article receiving mandrel, a base, a rotary actuator on said base including a chamber and a rotor within said chamber mounted to pivot between normal and trip positions about a rotor axis which is parallel to said main axis, means extending from an end of said rotor and defining a rotational axis for said mandrel disposed laterally offset from said rotor axis, cam follower means on said base cooperating with said stationary cam means to radially position said subassembly so that an article on said mandrel will be in operative engagement with said decorating means when said rotor is in said normal position during a predetermined range of angular movement for said base about said main axis;
detecting means for determining whether an article is properly loaded on said mandrel and upon determining that said mandrel is not properly loaded, controlling operation of said actuator to pivot said rotor to said trip position wherein an article on said mandrel is disengaged from said decorating means during movement of said base through said predetermined range;
each of said rotary actuators being powered by pressurized fluid that enters said chambers.

5,111,743
SCREEN PROCESS PRINTING PLATE FOR PRINTING WITH HIGH PRECISION
Takayuki Umaba; Jiro Ono; Syunsuke Takagi; Makoto Sawada; Hideki Adachi; Hirofumi Shimizu; Mokuhei Hashimoto, and Tetsu Takahashi, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan
Continuation of Ser. No. 529,064, May 29, 1990, abandoned. This application Aug. 15, 1991, Ser. No. 749,469
Claims priority, application Japan, May 29, 1989, 1-62165
Int. Cl.[5] B05C *17/08*
U.S. Cl. 101—127 **11 Claims**



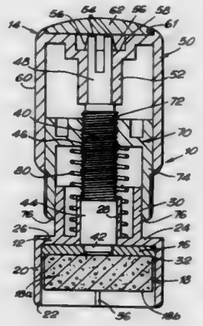
1. A screen process printing plate comprising:
screen holding means having an opening and formed of a flat plate having flexibility and restoring capability:
printing screen means fixed to said screen holding means, the printing screen means covering at least a part of said opening and defining a plane substantially coincident with a surface of said screen holding means;
expansibility of said screen holding means in said defined plane being smaller than expansibility of said printing screen means in said plane;
a fixed member for fixedly holding one end of said screen holding means;
a movable member attached to an opposite end of said screen holding member and movable along a predetermined straight line parallel to the plane defined by said printing screen means;
biasing means for biasing said movable member in a prescribed first direction away from said fixed member along said straight line;
said opening defined by a pair of first sides parallel to said prescribed first direction and by a pair of second sides intersecting with said pair of first sides; and
said screen holding means comprising a pair of screen holding portions defining said respective first sides and extending in said prescribed first direction, the flexibility of said screen holding means being such that upon application of a force to said screen holding means in a direction transverse to said plane, said screen holding portions deform in the direction of the force, and the restoring capability of the screen holding means being such that upon removal of the force said screen holding portions are restored to their original positions.

5,111,744
METHOD AND APPARATUS FOR AUTOMATICALLY CHANGING A PRINTING PLATE
Erich G. Wieland, Wurzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany
Filed Dec. 4, 1990, Ser. No. 621,966
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1989, 3940796
Int. Cl.[5] B41F *27/06, 27/12*
U.S. Cl. 101—216 **14 Claims**



1. A method for automatically changing a printing plate on a plate cylinder of a rotating printing machine including the steps of:
providing a plate cylinder having a discontinuous peripheral surface including recessed area;
positioning a first printing plate having leading and trailing ends on said peripheral surface;
providing means for releasably clamping said leading and trailing ends of said printing plate on said plate cylinder;
providing a printing plate storage chamber having first and second upper, generally vertical printing plate storage compartments and first and second front curved walls having first and second lower ends;
locating said printing plate storage chamber adjacent said plate cylinder with said first and second lower ends of said first and second curved front walls being adjacent and generally tangential to said peripheral surface of said plate cylinder;
locating at least one movable lifting finger between said peripheral surface of said plate cylinder and said second lower end of said second curved wall;
placing a second printing plate to be secured to said plate cylinder in said first storage compartment of said storage chamber located adjacent said plate cylinder;
rotating said plate cylinder in a first direction to a printing plate trailing end releasing position;
opening said trailing end clamping means on said plate cylinder and releasing said trailing end of said first printing plate to be removed from said plate cylinder;
moving said lifting finger into a selected one of said recessed areas and beneath said peripheral surface of said plate cylinder and into engagement with an inner surface of said released trailing end of said first printing plate;
rotating said plate cylinder in a second direction opposite to said first direction;
positioning said lifting finger between said released trailing end of said first printing plate and said peripheral surface of said plate cylinder and separating said first printing plate from said plate cylinder;
directing said trailing end of said first printing plate into engagement with said second curved wall;
continuing rotation of said plate cylinder in said second direction and guiding said separated first printing plate into said second storage compartment;
opening said leading end clamping means on said plate cylinder and releasing said leading end of said first printing plate;
feeding a leading end of said second printing plate from said first storage compartment to said leading end clamping means;
closing said leading end clamping means and securing said leading end of said second printing plate on said plate cylinder;
rotating said plate cylinder in said first direction and withdrawing said second printing plate from said first storage compartment and placing said second printing plate on said plate cylinder; and
closing said trailing end clamping means to secure a trailing end of said second printing plate to said plate cylinder.

5,111,745
INK STAMPS
Tse M. S. Wilson, 16 Fontana Gardens, 6th Floor, Hong Kong, Hong Kong
Filed Aug. 24, 1990, Ser. No. 573,348
Int. Cl.[5] B41K *1/42*
U.S. Cl. 101—333 **3 Claims**



1. An ink stamp for making an inked impression on a surface, comprising:
a hollow base including a top abutment surface, an upwardly extending guide sleeve and downwardly extending side edges, said side edges having lower edges capable of resting on said surface to be provided with an inked impression so positioning the stamp over the surface;
a pre-inked stamp having a lower relief printing surface positioned within said hollow base;
an upwardly extending shaft slidably received within and extending through said guide sleeve and having an upper end, a lower end and an external screw thread over at least

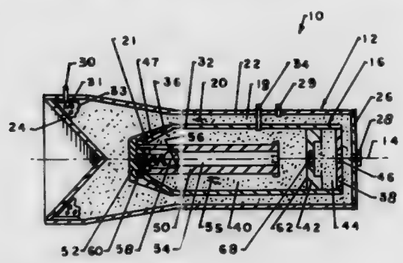
part of its length, said stamp being attached to said lower end of said shaft;
a handle affixed to said upper end of the shaft, said handle being movable downwardly relative to said base to bring said relief printing surface into contact with said surface to be given an inked impression;
an intermediate member mounted on said shaft separately from said handle, said intermediate member having an internal screw thread meshing with said external screw thread on the shaft and a lower abutment surface capable of contacting said top abutment surface on said hollow base to limit downward movement of said handle, shaft and stamp, whereby rotation of said intermediate member relative to said handle vertically adjusts the position of the lower relief printing surface once the lower and upper abutment surfaces are in contact; and
a spring positioned between the upper abutment surface of the hollow base and the intermediate member to urge the intermediate member, shaft and handle upwardly, downward pressure on the handle overcoming the resiliency of the spring and pressing the relief printing surface against the surface to be given the impression.

5,111,746

MULTIPLE STAGE MUNITION

Jerry Pentel, Montville, and Gary G. Fairbanks, Newtown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 21, 1991, Ser. No. 718,700
Int. Cl.[5] F42B *1/02, 12/18*
U.S. Cl. 102—308 **10 Claims**



1. A munition comprising:
an outer body which has an axis and a front shaped charge;
an inner body which is disposed coaxially inside the outer body and which forms therebetween a chamber;
a first explosive which is disposed in the chamber;
a penetrator unit which is partly disposed coaxially inside the inner body and which forms therebetween a cavity; and
a second explosive for exploding in the penetrator unit.

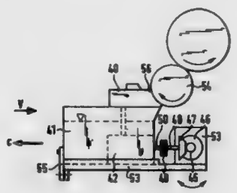
5,111,747

CHAMBERED DOCTOR BLADE INKER SYSTEM

Ingo Kobler, Anhausen; Thomas John, Augsburg; Franz X. Gollinger, Hirschbach, and Georg Bock, Augsburg, all of Fed. Rep. of Germany, assignors to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Sep. 18, 1990, Ser. No. 584,249
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1989, 8912194[U]
Int. Cl.[5] B41F *31/00*
U.S. Cl. 101—365 **12 Claims**

1. The combination of a printing machine with a plurality of chambered doctor blade inkers, to apply ink to an anilox roller (54, 79, 90, 90', 113),
wherein said doctor blade inkers form integral inker units,
wherein said printing machine includes a carrier structure releasably supporting said integral inker units selectively in predetermined positions, removable from said carrier structure;
a main drive shaft (45, 69, 96) extending parallel to the axis of said anilox roller; and
motor means (43) coupled to said main drive shaft, wherein at least one of said integral inker units includes a doctor blade (56, 80, 77, 89, 117) positionable against the surface of the anilox roller;
an ink supply trough (41, 62, 86, 111);
an ink application means (40, 61, 88, 112);
means (42, 50; 63, 64; 87, 101; 112) including ink pump means (42, 63, 87) for transporting ink from the ink supply trough to said ink application means; and
clutch means (49, 65, 100) coupled to said pump means (42, 63, 87),



and wherein individual drive connections from said main drive shaft (45, 69, 96) to said integral units are provided, said drive connection comprising
first bevel gear means (46, 68, 97) on said main drive shaft (45, 69, 96) and second bevel gear means (47, 67, 98) on said integral inker units and coupled to said clutch means (49, 65, 100), to permit selectively individually coupling said first bevel gear means on said main drive shaft to drive the pump means of any selected unit, and removal of a selected integral unit from said combination by tilting said selected unit about the axis of the main drive shaft and optionally severing the second bevel gear means of the unit from the first bowel gear means on said main drive shaft.

5,111,748

SUBMUNITION DEPLOYABLE THROUGH AN ARTILLERY PROJECTILE

Gunther Thurner, Schwaig, and Helmut Hammer, Heroldsberg, both of Fed. Rep. of Germany, assignors to DIEHL GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Oct. 29, 1990, Ser. No. 604,870
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1989, 3937762
Int. Cl.[5] F42B *12/58*
U.S. Cl. 102—387 **6 Claims**



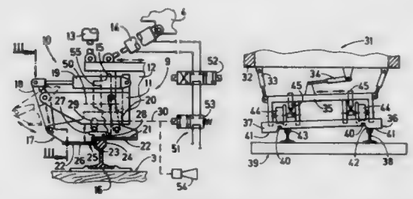
1. Artillery projectile-delivered article of submunition including release means for a braking parachute stowed in the tail end region of said article of submunition; a retarding element operatively connected to said release means for activating said release means, said retarding element including operative structure for activation thereof responsive to the exit of the article of submunition from a casing of the carrier projectile contacted by said operative structure, said release means including a tension cord extended behind the braking parachute in the packed condition of said parachute; and separating means for releasing said tension cord in response to the influence of said retarding element being exerted thereon upon exit from said casing.

5,111,749

APPARATUS FOR PLACING A CARRIAGE ON A TRACK

Josef Theurer, Vienna, and Wilhelm Praschl, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jul. 22, 1991, Ser. No. 734,245
Claims priority, application Austria, Sep. 27, 1990, 1957/90
Int. Cl.[5] G01B *5/20*
U.S. Cl. 104—2 **14 Claims**



1. An apparatus for placing a carriage on a track comprising two rails, each rail having a rail head, the carriage having a flanged wheel associated with each rail, the flanged wheel defining a radial plane, the carriage being linked to a frame of a track working machine mounted for mobility on the track and drive means linking the carriage to the track working machine frame for displacing the carriage between an inoperative and an operating position, the apparatus comprising
(a) a rail sensing element mounted on the carriage for sensing a respective one of the rails, the rail sensing element being positioned in the radial plane of at least one of the flanged wheels when the carriage is placed on the track and emitting a control signal in this position,
(b) a hydraulic drive for displacing the carriage transversely with respect to the track, the hydraulic drive being part of the drive means linking the carriage to the track working machine frame, and
(c) a means responsive to the control signal and connected to the hydraulic drive for interrupting the transverse displacement upon receiving the control signal.

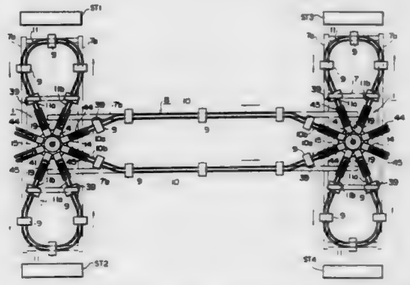
5,111,750

CONVEYOR SYSTEM

Yoshihisa Nozaki, Toyokawa, and Takashi Inden, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 20, 1990, Ser. No. 556,736
Claims priority, application Japan, Jul. 21, 1989, 1-191612
Int. Cl.[5] B61J *1/00*
U.S. Cl. 104—88 **10 Claims**

1. A conveyor system for conveying a carrier member which supports a workpiece among working stations, comprising:
a plurality of course changing means for changing a conveying course of said carrier member;
a plurality of pairs of intermediate tracks, each of said pairs of intermediate tracks being disposed between adjacent two of said course changing means, one intermediate track of each of said pairs of intermediate tracks guiding said carrier member in one direction and the other intermediate track of each of said pairs of intermediate tracks guiding said carrier member in a direction opposite said one direction, each of said pairs of intermediate tracks having a sending portion at one end thereof and a receiving portion at another end thereof, said carrier member being transferred from a course changing means to the sending portion of each of said pairs of intermediate tracks and said carrier member being transferred from a receiving portion of each of said pairs of intermediate tracks to said course changing means;
first moving means for moving a carrier member along said pairs of intermediate tracks;
a plurality of station tracks guiding said carrier, each of said station tracks being disposed between a working station and a course changing means, said station tracks each having a sending portion at one end thereof and a receiving portion at another end thereof, said carrier member being transferred from said course changing means to said sending portion of said station tracks, and said carrier member being transferred from said receiving portion of said station tracks to said course changing means;



second moving means for moving said carrier member along said station tracks;
a rotating member rotatably supported by said course changing means;
at least eight support members radially and symmetrically mounted on said rotating member, each of said support members corresponding to one of said sending portions and receiving portions of one of said pair of intermediate tracks and one of said station tracks, each of said support members receiving said carrier member when transferred from its corresponding receiving portion of said one of said pairs of intermediate tracks and said one of said station tracks and sending said carrier member to said sending portion of said one of said pairs of intermediate tracks and said one of said station tracks;
means for pivotally supporting said support members on said rotating member between a first position and a second position; and
rotating means for rotating said rotating member for changing the orientation of a carrier member received by a support member.

5,111,751

LINKABLE CLAMPING DEVICE FOR THE COUPLING OF TRANSPORT MEANS TO A MOBILE CABLE

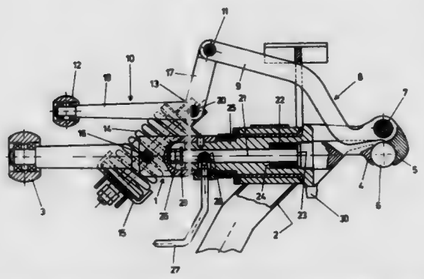
Rudolf Zlotek, Mutters, Austria, assignor to Felix Wopfner KG

Filed Nov. 25, 1988, Ser. No. 276,473
Claims priority, application Austria, Nov. 25, 1987, 3102/87
Int. Cl.[5] B61B *12/12*
U.S. Cl. 104—209 **16 Claims**

8. Clamp capable of coupling for clamping of transport means to a movable rope (6), in particular for a suspension attachment (2) of an aerial ropeway with at least one pair of clamping jaws (4, 5) gripping the rope (6), where at least one

clamping jaw (5) is pressed by a compression spring (14) to the rope (6) or, respectively, is liftable from this rope by a tiltable lever, controlled by a spatially fixed connecting rail, and where the movable clamping jaw (5) is formed as a first two-arm lever (8), where one arm of the first two-arm lever (8) forms the clamping jaw (5), and where the second arm (9) of the first two-arm lever (8) is loaded by a compression spring (14), where

an angle lever (10) is tiltably hinged at the other end of the first two-arm lever (8), where a first arm (17) of the angle lever (10) is hinged at the first-mentioned two-arm lever



(8) and where the first arm (17), during closed clamp, encloses with the axis (18) directed toward the rope of the clamping body (1) an acute angle, such that the compression spring (14) engages in the region of the vertex (13) of the angle lever (10), which compression spring (14) is tiltably supported at the clamping body (1), wherein the spring is essentially released when the clamp is opened, wherein the spring is compressed when the clamp is closed, and wherein a second arm (19) of the angle lever (10), cooperating with the connecting rail, is directed away from the clamping jaws (4, 5).

5,111,752

MEMBRANE SYSTEM FOR CONNECTING SUCCESSIVE RAILWAY OR ROADWAY VEHICLES

Jean-Paul Carimentrand, Le Bois Bourgeot, France, assignor to Caoutchouc Manufacture at Plastiques, S.A., Versailles Cedex, France

Division of Ser. No. 500,406. Mar. 28, 1990, Pat. No. 5,060,578. This application Apr. 19, 1991, Ser. No. 687,976
Claims priority, application France, Mar. 28, 1989, 89 04125
Int. Cl.[5] B60D *5/00*
U.S. Cl. 105—18 **14 Claims**



1. A system for connection of consecutive vehicles, providing for intercommunication between consecutive ones of the vehicles, said system comprising:

an elastically deformable membrane being substantially in one-piece, and self-supporting for providing substantially weatherproof protection of a passage way between the consecutive vehicles;

said membrane being formed by a plurality of successive corrugations;

said corrugations comprising substantially straight sections;

said corrugations comprising elastomer means;

said membrane having one end means for being connected to one end surface of a first vehicle;

said membrane having an opposite end means opposite said one end means for being fastened to and unfastened from an end surface of a second vehicle consecutive to the first vehicle;

said plurality of corrugations being disposed between said end means;

said corrugations of said membrane being flexible for extension and compression within a range of distances between the consecutive vehicles;

said corrugations of said membrane comprising successive peaks;

said corrugations of said membrane comprising intermediate portions disposed between the successive peaks;

said peaks comprising an outer portion of peaks for being disposed away from the passage way and an inner portion of peaks for being disposed towards the passage way;

said outer portion of peaks for being substantially aligned with an exterior surface of the consecutive vehicles;

said corrugations having a depth between the successive peaks;

said corrugations having a substantially constant thickness in the intermediate portions thereof disposed between successive peaks;

said outer portion of peaks having a thickness being substantially greater than the substantially constant thickness of the intermediate portions of the corrugations, said greater thickness being configured for stiffening said outer portion of peaks, preventing kinking of said membrane, and protecting the elastomer means from abrasion and pitting by external forces, the external forces comprising water, dust, and dirt;

said greater thickness being the result of an addition of an extra-thickness comprised of a profile of elastomer compound applied to only said outer portion of peaks, said profile of elastomer compound being applied onto the elastomer means;

the extra-thickness stiffening the exterior peak of each corrugation has a thickness which is slightly different from the essentially constant thickness of the intermediate portions;

the elastomer means of said corrugations has a Young's modulus of elasticity;

the elastomer compound of said profile of elastomer compound has a Young's modulus of elasticity; and

the Young's modulus of elasticity of said elastomer compound of said profile of elastomer compound is higher than the Young's modulus of elasticity of the elastomer means.

5,111,753

LIGHT WEIGHT FATIGUE RESISTANT RAILCAR TRUCK BOLSTER

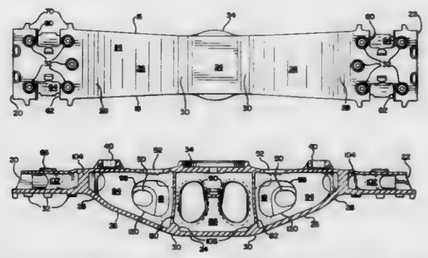
Herbert L. Zigler, Alliance, Ohio; Robert D. Wronkiewicz, Park Ridge, Ill.; Franklin McKeown, Jr., St. Louis, Mo., and William A. Wachter, Granite City, Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Dec. 21, 1990, Ser. No. 631,905
Int. Cl.[5] B61F *5/04*
U.S. Cl. 105—230 **5 Claims**

1. An improved cast steel railcar truck bolster of relatively light weight construction, said bolster comprising:

a top member and side walls having lightener holes therein;

a bottom member of continuous metal without any opening therein, said bottom member including two diagonal panels of a given thickness interconnected at lower bend points by a central portion of relatively greater thickness, said diagonal panels connected at upper bend points to outwardly extending bolster ends; and



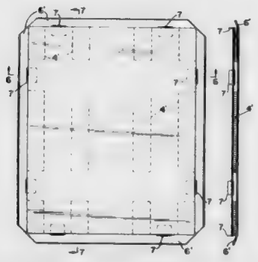
an internal riser at each of said upper and lower bend points, said internal risers connected to said bottom member.

5,111,754

PORTABLE SHIPPING PLATFORM FOR USE WITH SLIPSHEET HANDLING EQUIPMENT AND FORK LIFTS

Stephen C. Adams, Jr., 14605 SE. 45th St., Bellevue, Wash. 98006

Filed Jun. 22, 1990, Ser. No. 541,955
Int. Cl.[5] B65D *19/00*
U.S. Cl. 108—51.3 **16 Claims**



1. In a portable, unitary, stand-alone shipping platform comprising upper and lower thin, flat, flexible support sheets and spacers separating said support sheets vertically, said spacers being spaced apart laterally so as to define channels into which blades of a forklift are insertable, the improvement consisting of:

an entry porch formed by extending outwardly at least a portion of one edge of said lower support sheet beyond a corresponding edge of said upper sheet for placement of tips of the blades of a fork lift so as to serve as a guide by which vertical positioning of the blades relative to said channels is facilitated prior to entry of said blades into said channels; and

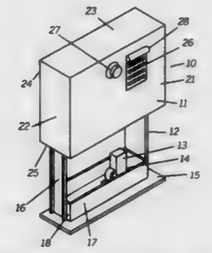
guide tabs protruding from said corresponding edge of said upper support sheet so as to aid in guiding spaced fork lift blades into said channels.

5,111,755

SAFE GUN STORAGE APPARATUS

Mark J. Rouse, 4411 NW. 18th St., Suite M-206, Lauderhill, Fla. 33313

Continuation-in-part of Ser. No. 468,225, Jan. 22, 1990, abandoned. This application Sep. 18, 1991, Ser. No. 762,636
Int. Cl.[5] E05G *1/00*
U.S. Cl. 109—25 **15 Claims**



1. A child-deterrent, safe gun storage apparatus for storage therein of a loaded handgun comprising

a container,

gun drawer storage means, lockingly fitted within said container,

a first locking means for locking a second locking means,

said second locking means providing for release of said gun storage drawer containing said gun, and

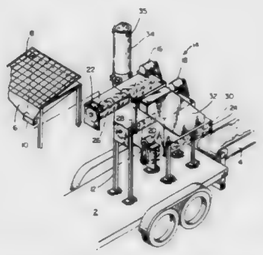
said second locking means comprising locking apparatus having a variously shaped groove in combination with a pin or like device which groove and pin are unobservable from outside of the container, whereby said second locking means is unlocked by moving said groove relative to said pin in a predetermined sequence of axial and circumferential movements.

5,111,756

APPARATUS FOR CLEANING CONTAMINATED SOIL

John D. Anderson, North Bend, Wash., assignor to Enviro-Klean Soils, Inc., Snoqualmie, Wash.

Continuation-in-part of Ser. No. 586,268, Sep. 21, 1990, Pat. No. 5,027,721. This application May 23, 1991, Ser. No. 704,942
Int. Cl.[5] F23D *13/00, 15/00*
U.S. Cl. 110—240 **3 Claims**

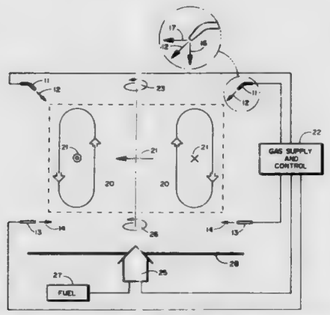


1. A self-contained device for sanitizing contaminated soil comprising:

a vertically stacked multi-compartment, substantially sealed sanitizing unit wherein each compartment includes an auger to stir and move the soil and including means causing the soil to fall in a sheet to the next lower compartment, said unit mounted upon a trailer for easy transportation to the site of the contamination, and including a soil entry hopper and an exhaust release stack mounted on top of the upper-most compartment and a heat generating

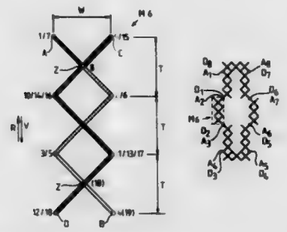
means at the lower portion of the device whereby heated air is circulated through the soil as it cascades downwardly through each stage of the device driving off the volitiles.

5,111,757
DYNAMIC CONTAINMENT VESSEL
Wilhelm J. Reindl, St. Paul, and Kenneth J. Reid, Edina, both of Minn., assignors to Regents of the University of Minnesota, St. Paul, Minn.
Filed May 21, 1991, Ser. No. 704,679
Int. Cl.[5] F23D *1/02*
U.S. Cl. 110—264 **29 Claims**



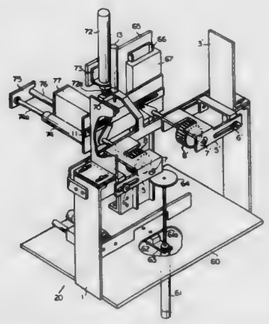
1. A dynamic containment vessel defined by stable fluid recirculation within a generally cylindrical containment region, the dynamic vessel being maintained by fluid momentum, and including first and second means spaced from each other along the direction of the longitudinal axis of the cylindrical containment region for establishing superposed line and ring vortices within the containment region, the dynamic containment vessel having means for injecting material in a vortical pattern in general alignment with the longitudinal axis, and wherein at least one of said first and second means is active.

5,111,758
METHOD OF MAKING GROUPS OF SEWN PATTERNS WITH ZIG-ZAG SEWING MACHINES
Karl Nufer, Steckborn, Switzerland, and Lorenz Reber, Gaienhofen, Fed. Rep. of Germany, assignors to Fritz Gegauf Aktiengesellschaft Bernina Nahmaschinenfabrik, Steckborn, Switzerland
Filed Jul. 31, 1991, Ser. No. 738,462
Claims priority, application Switzerland, Jan. 24, 1991, 00202/91
Int. Cl.[5] D05C *17/00;* **D05B** *3/02*
U.S. Cl. 112—266.1 **8 Claims**



1. A method of stitching at least one row of at least two cruciform patterns with a movable needle and a thread in a work on a zig-zag sewing machine, the work including a field having first and second sides, comprising the steps of making in the field a first series of zig-zag stitches including a first stitch and a last stitch; effecting a penetration of the needle into the field substantially in the middle of at least one of the first and last stitches of the first series of the stitches; and thereupon making in the field a second series of zig-zag stitches which are mirror images of the stitches of the first series and each of which crosses one stitch of the first series of stitches, each of said stitches extending between the two sides of the field.

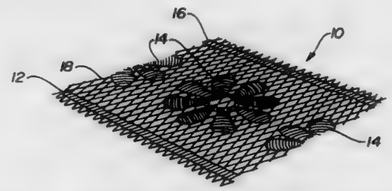
5,111,759
INCONSTANT-THICKNESS WORKPIECE FEEDING APPARATUS
Toru Hiramatsu, and Akiyoshi Urano, both of Chofu, Japan, assignors to Juki Corporation, Tokyo, Japan
Filed Dec. 18, 1990, Ser. No. 629,405
Claims priority, application Japan, Dec. 19, 1989, 1-328725; May 22, 1990, 2-131613
Int. Cl.[5] D05B *27/10;* **B65H** *3/06*
U.S. Cl. 112—322 **6 Claims**



1. An inconstant thickness workpiece feeding apparatus comprising:
(a) a support for supporting a workpiece stack, said support having an opening so that al lowermost workpiece in the stack is partially exposed,
(b) roller means disposed at said opening to contact with the lowermost workpiece in the stack,
(c) means for rotating said roller means to slacken said lowermost workpiece to form a space between said lowermost workpiece and said stack,
(d) rod means adapted to insert into said space between said lowermost workpiece and said stack,
(e) means for moving down said rod means to draw down said lowermost workpiece, and
(f) a clamp plate under said opening of said support and means for moving said clamp plate to clamp said lowermost workpiece between said rod means and said clamp plate.

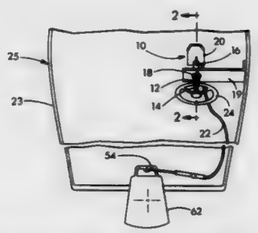
5,111,760
DOUBLE-EMBROIDERED LACE
Raymond G. Garzone, Jr., 505 Fordham Pl., Paramus, N.J. 07652
Filed Jun. 22, 1989, Ser. No. 369,726
Int. Cl.[5] D05C *17/00*
U.S. Cl. 112—439 **6 Claims**

1. A Schiffli embroidered fabric, comprising:
a base material;
a first Schiffli embroidered design, embroidered onto the base material, the embroidered design comprising a metallic yarn selected from the group consisting of gold, silver, and pearlescent; and
a second Schiffli embroidered design overlaying, at least in part, the first embroidered design, and embroidered onto the base material and the first embroidered design, the second design comprising a second yarn,



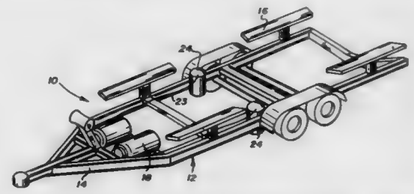
wherein a portion of the metallic yarn is visible through a portion of the second embroidered design.

5,111,761
STEERING SYSTEM FOR BOATS
Gary G. Gilbertson, 195 N. Main St., Fond du Lac, Wis. 54935
Filed Oct. 1, 1990, Ser. No. 591,405
Int. Cl.[5] B63H *25/10*
U.S. Cl. 114—160 **19 Claims**



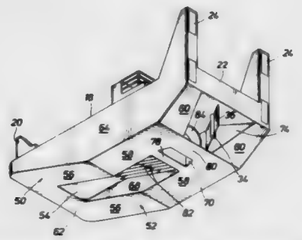
1. A steering system for a boat comprising:
(a) a steering column rotatable about a columnar axis and having an input end and an output end;
(b) a disc having a circumferential surface and rotatable about a rotation axis;
(c) means for transferring rotation of the steering column to rotation of the disc;
(d) a cable having a first end and a second end, and means for connecting the first end to the circumferential surface of the disc with a portion of the cable being wrapped around the circumferential surface of the disc and extending tangentially from the circumferential surface such that rotation of the disc in one direction causes the cable to be wrapped further around the circumferential surface and the second end to be pulled toward the disc, and rotation of the disc in the other direction causes the cable to be unwrapped from the circumferential surface of the disc and the second end to be pushed away from the disc;
(e) a housing into which the output end of the steering column extends and that encloses the disc and the means for transferring rotation, the housing having a cable access door and a port, the cable access door being capable of being opened to allow for removal and replacement of the cable, and the port providing a passage for the cable to exit from the housing, the cable access door mounted to open to expose a portion of the circumferential surface of the disc and the means for connecting the first end of the cable to the circumferential surface of the disk, wherein the housing includes a base and a cover, the disc mounted between the base and cover for rotation, the access door mounted between the base and cover to open to expose the circumferential surface of the disc.

5,111,762
METHOD AND APPARATUS FOR CLEANING MARINE EQUIPMENT INCLUDING BOATS, ENGINES AND TRAILERS THEREFOR
George P. Frangiamore, 502 Quail Crossing, Grand Prairie, Tex. 75051
Filed Jun. 22, 1990, Ser. No. 542,924
Int. Cl.[5] B63B *59/00*
U.S. Cl. 114—222 **26 Claims**



1. An apparatus for fostering the proper care of boats and their accessories including water-cooled marine engines and the trailers that are routinely used to store and transport such boats and engines, said apparatus being particularly adapted for combination with a boat trailer having a frame and a superstructure that is configured for supporting a boat on the frame in an elevated position, comprising:
a) an air tank for holding compressed air;
b) a water reservoir for holding fresh water;
c) means for mounting the air tank and water reservoir on the frame of a boat trailer, such that the air tank and water reservoir will be present at the time and place when a boat is being removed from a body of water and placed on the boat trailer for transportation;
d) a water hose connected to the water reservoir, said hose being configured to serve as a conduit for the selective discharge of water from the reservoir;
e) a water valve associated with the water reservoir and the water hose for permitting the selective discharge of water through the water hose; and
f) means for connecting the air tank to the water reservoir in such a way as to pressurize the water in the reservoir, whereby a stream of fresh water is forced out of the water reservoir when the water valve is opened, and whereby a pressurized stream of fresh water is available for rinsing a boat and accessories related to the boat immediately after the boat is removed from a body of water and placed on the boat trailer.

5,111,763
STEERING UNIT FOR BARGES
Ronald C. Moerbe, 450 Honesuckle, Bridge City, Tex. 77611
Filed Jun. 23, 1989, Ser. No. 370,766
Int. Cl.[5] B63B *21/56*
U.S. Cl. 114—246 **12 Claims**



1. A barge steering unit adapted to be attached to the front end of a string of connected barges pushed by a boat for steer-

ing the string of barges along a waterway; said barge steering unit comprising:

an elongate water buoyant body of a generally rectangular shape in plan and having a hull with a bow and a stern, said hull formed of a pair of longitudinally extending side portions spaced from each other to define a longitudinally extending cavity therebetween for the flow of water therethrough from said bow to said stern, said cavity defined by a pair of generally vertically extending spaced side surfaces connected at their upper edges by a generally horizontal planar surface to define the upper portion of the cavity and the bottom of the hull;

each of said side portions of said hull having a forward included planar surface and an intermediate planar surface, said forward surface extending downwardly from adjacent said bow to said intermediate surface for at least one third of the length of said unit to reduce drag;

a propeller mounted in said cavity for contact with the water flowing through the cavity to propel said barge steering unit;

said pair of spaced side surfaces defining surface portions diverging outwardly from adjacent said propeller to said stern of the barge steering unit;

power means for rotating said propeller to propel said steering unit;

a rudder means mounted in said cavity rearwardly of said propeller for pivotal movement for guiding the movement of said steering unit, said rudder is of a height substantially the depth of the cavity;

said rudder mounted for pivotal movement between a position engaging one of said diverging rear side surface portions and a position engaging the other of said diverging rear side surface portions, said rudder when positioned against a selected side portion of the cavity substantially blocking the flow of water along such selected side portion for directing the thrust along a desired direction; and

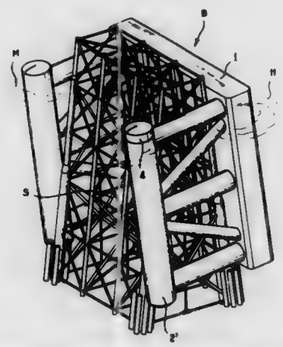
means for pivoting said rudder to a desired angle relative to the flow of water through the cavity for steering said unit and the string of barges connected thereto along the waterway.

5,111,764

METHOD AND APPARATUS FOR RECOVERING THE SUBSTRUCTURE OF AN OFFSHORE PLATFORM

Jean-Marie D'Ettorre, Montigny-sur-Loing, France, assignor to Bouygues Offshore, Montigny-Le-Bretonneux, France

Filed Jan. 29, 1991, Ser. No. 647,503
Claims priority, application France, Jan. 31, 1990, 90 01127
Int. Cl.[5] B63B *35/40*
U.S. Cl. 114—259 **9 Claims**



1. A method of recovering a substructure of an offsea platform, with the general shape of the substructure being substantially that of a truncated pyramid, the method comprising the following operations:

bringing a floating barge close to the substructure, the barge including a ballastable hull forming a deck suitable for receiving the substructure in a substantially horizontal position and including ballastable floats above said deck to left and to right of the intended location for the substructure;

ballasting the hull and the floats so that although still floating the barge moves down in the water and tilts by pivoting through an angle of more than 90° to take up a position in which the deck of the barge is tilted beyond the vertical and may be applied against a face of the substructure;

fixing the barge to the substructure;

disconnecting the substructure from the sea bed;

removing ballast from the hull and the floats to cause the barge to tilt in the opposite direction and to raise it to a position in which the barge is floating with the substructure resting on the deck of the barge; and

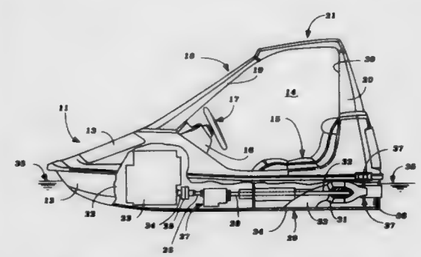
displacing the floating barge carrying the substructure to the desired location for unloading the substructure.

5,111,765

HULL CONSTRUCTION FOR SMALL WATERCRAFT

Noboru Kobayashi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 9, 1990, Ser. No. 478,572
Claims priority, application Japan, Feb. 9, 1989, 1-31871
Int. Cl.[5] B63B *43/02*
U.S. Cl. 114—270 **5 Claims**



1. A hull construction for a small watercraft having a rigid hull defining a rider's compartment containing a seat for accommodating one or more riders seated in side by side fashion and a rigid roof supported at least in part above said rider's compartment by means of a pair of upwardly and rearwardly inclined rigid front pillars and a rigid upwardly extending rear pillar, said roof having sufficient height and buoyancy so as to prevent the watercraft from coming inverted even if capsized, said roof, pillars and hull defining generally open sides for access to said rider's seat and to permit water to be drained therefrom if the watercraft is capsized so as to facilitate righting thereof.

5,111,766

SEA WING

Leon D. Ortemond, Rte. 2, Box 2290, Abbeville, La. 70510

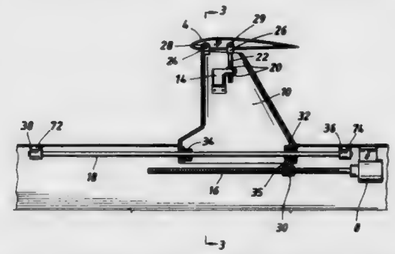
Filed Jan. 18, 1991, Ser. No. 642,807
Int. Cl.[5] B63B *1/32*
U.S. Cl. 114—273 **12 Claims**

1. A boat wing apparatus, comprising:

(a) a vessel for traveling on water surfaces, said vessel having starboard and port sides, said vessel having a top deck and a hull, said vessel having a bow and a stern, said vessel having a propulsion means for moving said vessel through said water at varying speeds, said vessel having a variable center of gravity dependant on loading of said vessel including forces acting on said vessel as said vessel travels, said vessel having a longitudinal axis running from said bow to said stern of said vessel;

(b) at least one substantially rigid wing attaching to said vessel;

(c) a pair of rigid struts permanently fixed in an upwardly extending position from said vessel disposed in spaced relation to one another but being slidably secured to said vessel on opposite sides thereof such that said struts translate fore and aft with respect to said vessel, said wing



being attached to said struts such that said wing is translatable fore and aft without changing the pitch of said wing and so that said wing can be positioned proximate to said variable center of gravity of said vessel; and

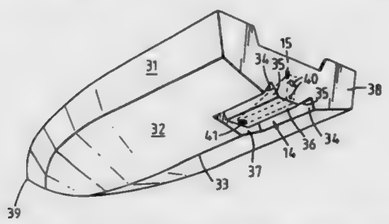
(d) a power unit connected to said struts for translating said struts and said wing fore and aft, said power unit being operable to allow powered translation during travel of said vessel to correct for said forces acting on said boat during travel in order to control the pitch of said vessel.

5,111,767

BOAT HULLS

John S. Haines, P.O. Box 91, Goodna, Old 4300, Australia

Filed May 25, 1990, Ser. No. 529,083
Claims priority, application Australia, May 26, 1989, PJ4399
Int. Cl.[5] B63B *1/32*
U.S. Cl. 114—288 **13 Claims**



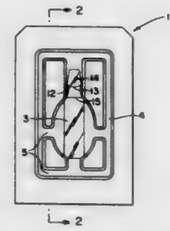
1. A boat hull comprises an underside, a transom, a recess not containing a propeller adjacent the transom being extending at least partially a transverse dimension along the hull underside, a transverse step defining a transverse boundary of the recess, a hollow venting body within the hull, the venting body having at least a pair of access ports which are of restricted cross sectional size compared with an enlarged cross sectional area of the venting body, with one access port communicating to the hull exterior and another access port communicating with the recess through a wall of the recess, whereby during travel of the boat hull, venting of a low pressure area adjacent the recess can take place and, in the event of hard turning or reversing, water is precluded from gaining access to the boat hull interior other than in the venting body.

5,111,768

FREEZE INDICATOR

Raymond P. Larsson, Deaville, and George T. Levendusky, Bayonne, both of N.J., assignors to Pymah Corporation, Somerville, N.J.

Filed Jun. 7, 1991, Ser. No. 712,335
Int. Cl.[5] G01K *5/32*; G01N *31/00*
U.S. Cl. 116—216 **36 Claims**



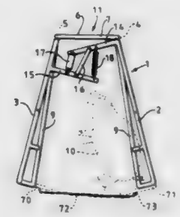
1. In a freeze indicator comprising a frangible ampule containing a liquid which expands upon freezing and a nucleating agent, said nucleating agent and said liquid having substantially similar space groupings, the improvement which comprises utilizing as a nucleating agent for the liquid a nucleating agent system comprising a metal compound insoluble in the liquid, said metal compound and said liquid having substantially similar molecular space groupings, in combination with a nucleating agent poison inhibitor comprising a salt of the same metal as the metal compound, said salt being soluble in said liquid.

5,111,769

FARROWING CRATES

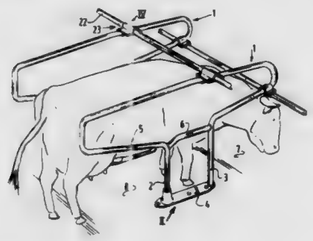
Keith Proctor, The Grove, Greenhill, South Littleton, Evesham, United Kingdom

PCT No. PCT/GB89/01243, § 371 Date Mar. 12, 1991, § 102(e) Date Mar. 12, 1991, PCT Pub. No. WO90/04327, PCT Pub. Date May 3, 1990
PCT Filed Oct. 20, 1989, Ser. No. 663,859
Claims priority, application United Kingdom, Oct. 22, 1988, 8824791; Jan. 9, 1989, 8900379; Mar. 15, 1989, 8905895
Int. Cl.[5] A01D *1/02*
U.S. Cl. 119—20 **8 Claims**



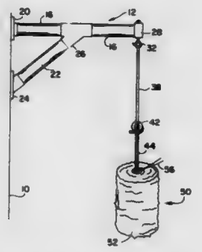
1. A farrowing crate for confining a sow in such a manner as to allow only limited movement of the sow, the crate having two side members (2, 3) each of which is pivoted at a corresponding end about a respective vertical axis and between which the sow is positioned in use, wherein each of the side members (2, 3) comprises a rigid frame incorporating at least two horizontal rails (9, 32, 35, 36), and linkage means (11) coupling together the side members (2, 3) such that pivoting of one of the side members (2, 3) in one direction about the associated vertical axis causes corresponding pivoting of the other side member (2, 3) in the opposite direction about the associated vertical axis.

5,111,770
CUBICLE PARTITION
Johannes M. W. Weelink, No. 58, Tynaarlosestraat, NL-9481 AD Vries, Netherlands
Filed Jan. 14, 1991, Ser. No. 640,880
Claims priority, application Netherlands, Jan. 19, 1990, 9000142
Int. Cl.[5] A01K *5/00*
U.S. Cl. 119—27 **20 Claims**



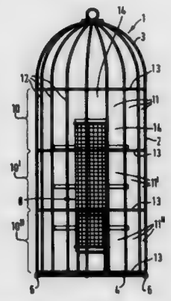
1. A partition comprising:
a standing pipe;
a bracket-shaped rail of bent tube material connected to an upper end of said standing pipe, said bracket-shaped rail forming an upper portion of said partition;
a mounting plate mounted on a horizontal support surface and weldedly fixed to a lower end of said standing pipe;
a reinforcing foot surrounding a bottom portion of the standing pipe, said reinforcing foot comprising an upper end and a lower end, wherein the lower end of said reinforcing foot is weldedly fixed to the mounting plate separate from the connection of the lower end of the standing pipe to the mounting plate, and the upper end of said reinforcing foot is separately connected to said standing pipe, said reinforcing foot extending divergingly downward from its upper end to its lower end.

5,111,771
EXERCISE AND AMUSEMENT DEVICE FOR PETS
Steven W. Mathews, 6967 SW. 40th St., Miramar, Fla. 33023
Continuation-in-part of Ser. No. 469,928, Jan. 25, 1990, abandoned. This application Apr. 10, 1990, Ser. No. 507,661
Int. Cl.[5] A01K *15/00*
U.S. Cl. 119—29 **14 Claims**



1. An exercise and amusement device for a pet, comprising in combination:
a cylindrical resilient body member suitable for providing resistance against chewing actions by the pet, said resilient body member comprising a flexible tube, a foam stuffing within said flexible tube, and a bottom panel having an aperture covering an open bottom end of said flexible tube;
resilient suspending means for hanging said body member from above at a predetermined height to permit the body member to swing freely when struck, and for providing elastic resistance to pulling of said body member by the pet, said resilient suspending means including a tether passing through said body member and said aperture and knotted at a bottom side thereof to prevent said tether from passing back through said aperture; and
removable covering means, for covering said body member.

5,111,772
BIRD FOOD DISPENSING SYSTEM WITH SQUIRREL PROOF HOUSING
Leslie Lipton, The Round, 42 Dene Road, Northwood, Middlesex HA6 2DA, England
Filed Feb. 6, 1991, Ser. No. 651,066
Int. Cl.[5] A01K *5/00*
U.S. Cl. 119—579 **19 Claims**

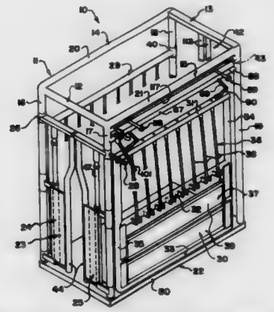


1. A food dispensing system for birds, comprising:
a food dispenser elongate along a central axis and having a plurality of food dispensing apertures disposed along and around said central axis; and
a housing encircling said food dispenser so as to define an enclosed space, said housing including at least one band of contiguous entry/exit apertures extending around said housing for providing entry into and exit from the enclosed space,
said entry/exit apertures being elongate transversely of said band with each of said entry/exit apertures having a width of about 2 to 4 cm over at least about a 5 cm length thereof;
and wherein said entry/exit apertures are aligned with said food dispensing apertures along lines perpendicular to said central axis.

5,111,773
SQUEEZE CHUTE
Edward A. Akins, Box 158, St. Boniface, Winnipeg, Manitoba, Canada R2H 3B4
Filed Dec. 12, 1990, Ser. No. 626,454
Int. Cl.[5] A01K *1/06, 1/015*
U.S. Cl. 119—99 **23 Claims**

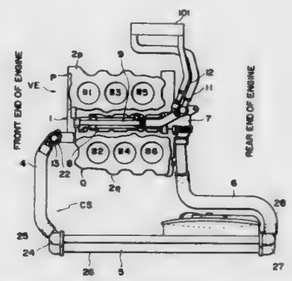
1. An animal confinement apparatus comprising a generally channel shaped frame structure having a head end for receiving a head of an animal to be confined, two sides each for extending along a respective side of the animal to be confined, a tail end remote from the head end, a head gate assembly at the head end operable to move from a release position to a closed position in which the neck of the animal is grasped for confinement thereof, a squeeze side panel, said panel being operable to move from an initial outward position inwardly toward the opposed side to squeeze the animal to be confined, the squeeze side panel comprising a substantially planar panel having a plurality of horizontal rail members, a plurality of parallel drop bars on one horizontal member so as to extend to an adjacent horizontal rail member, each of the drop bars having one end mounted on said one horizontal rail member

for pivotal movement relative thereto from a closed position in which an opposed end is attached to the adjacent horizontal rail member to an open position in which the opposed end is free to be pivoted out of the plane of the panel to expose the confined animal, each drop bar comprising a main bar part extending from said one rail member to a free end adjacent said



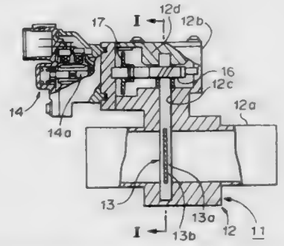
adjacent rail member, a cap part mounted on the free end and slidable longitudinally thereof relative to the main part and spring means biasing the cap part outwardly from the main part, said adjacent rail member including receptacle means for receiving the cap part and shaped to release the cap part on movement of the cap part against said spring bias.

5,111,774
ENGINE COOLING SYSTEM
Nobuo Hiramoto, Akitsu; Seiji Nanba, Fuchu; Soichiro Ogawa, Hiroshima, and Osamu Nozaki, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Sep. 25, 1990, Ser. No. 587,842
Claims priority, application Japan, Sep. 25, 1989, 1-111783[U]; Sep. 27, 1989, 1-113144[U]; Sep. 27, 1989, 1-113145[U]
Int. Cl.[5] F01P *7/14*
U.S. Cl. 123—41.1 **43 Claims**



1. An engine cooling system comprising:
an engine body having a plurality of cylinder banks;
a plurality of water jackets communicated with each other for individually cooling said cylinder banks;
a cooling water passage comprising a plurality of branch portions connected to reflective said water jackets and a joining portion convergently continued from said branch portions; and
a cooling water filler provided on said joining portion at a position near one of said cylinder banks.

5,111,775
COOLING WATER TEMPERATURE CONTROLLING APPARATUS
Mamoru Sumida, Jimeji; Masashi Hashimoto, and Osamu Matsumoto, both of Himeji, all of Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan
Filed Dec. 5, 1990, Ser. No. 622,655
Claims priority, application Japan, Dec. 6, 1989, 1-318429; Dec. 13, 1989, 1-324539; Dec. 13, 1989, 1-324540; Mar. 7, 1990, 2-56838
Int. Cl.[5] F01P *7/14*
U.S. Cl. 123—41.1 **5 Claims**

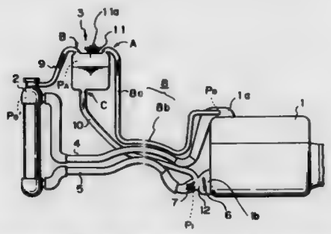


1. A cooling water temperature controlling apparatus for an internal combustion engine having a cooling system including a cooling water passage through which the water is fed to a radiator, and a bypass passage connected to said cooling water passage at a bypass point which bypasses said radiator, said apparatus comprising:
a butterfly valve placed in said cooling water passage for the internal combustion engine at a position downstream of said bypass point, and a stepper motor connected to the butterfly valve through a reduction gear in a gear box housing and having a worm gear wheel so as to adjust a degree of opening of the butterfly valve depending on the temperature of cooling water so as to correspondingly control the flow of water through said radiator based on the temperature thereof, wherein a spring member is connected at one end thereof to the gear box housing and at the other end thereof to said worm wheel for driving the butterfly valve so as to force the valve body of the butterfly valve in the direction of opening.

5,111,776
COOLING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE
Ryuichi Matsushiro; Toru Kosuda, both of Okazaki; Shigeo Sasao, Nishio; Taro Ikeya, Okazaki; Yoshiharu Chino, and Yasuaki Uekawa, both of Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan
Filed Sep. 25, 1990, Ser. No. 587,940
Claims priority, application Japan, Sep. 26, 1989, 1-248049
Int. Cl.[5] F01P *3/22*
U.S. Cl. 123—41.54 **10 Claims**

1. A cooling system for an internal combustion engine, comprising:
a radiator having an inlet portion at a top portion and an outlet portion at a bottom portion thereof;
said engine being provided with an inner cooling water passageway having an inlet portion at a bottom portion and an outlet portion at a top portion thereof;
main pipes connecting said inlet portion and outlet portion of the inner cooling water passageway to the outlet portion and inlet portion of the radiator, respectively, to thereby create a recirculating passageway by which a recirculation of the cooling water between the radiator and the engine is ensured;
a reservoir tank for storing an amount of cooling water, said

reservoir tank having at an upper portion thereof a relief valve for discharging vapor to the atmosphere;
inlet pipe means for introducing said cooling water into said reservoir tank from said recirculating passageway, and;
outlet pipe means for discharging said cooling water to said recirculating passageway from said reservoir tank;



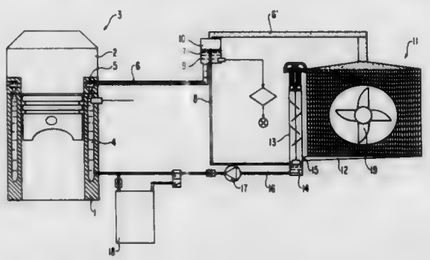
said inlet and outlet pipe means having inner diameters of from 3 mm to 12 mm;
a minimum total cross section of said inlet pipe means being 1.5 to 3 timers larger than a minimum total cross section of said outlet pipe means.

5,111,777

EVAPORATION COOLING SYSTEM FOR A LIQUID-COOLED INTERNAL-COMBUSTION ENGINE

Peter Steinberg, Maitenbeth, and Peter Kinninger, Rosenheim, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Jan. 17, 1991, Ser. No. 642,431
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1990, 4001208
Int. Cl.[5] F01P *3/22*
U.S. Cl. 123—41.54 **26 Claims**



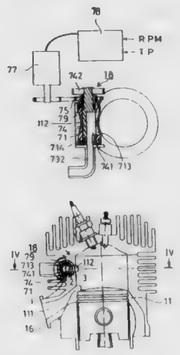
1. An evaporation cooling system for a liquid-cooled internal-combustion engine having a coolant jacket filled completely with coolant, comprising a condenser, a forward flow line operatively connected with the condenser, a vapor separator arranged at a high point in the forward-flow line to the condenser, a condensate pump arranged in a return flow line from the condenser to the cooling jacket and having a connecting line extending from the vapor separator in parallel with the condenser to the return flow line, and an expansion tank connected to the vapor space of the condenser, wherein the expansion tank, is when the coolant is cold, connected with the atmosphere and is, at an operating temperature to the coolant, disconnected from the atmosphere,
a temperature-controlled vent valve is operatively arranged in the expansion tank, and
a molecular sieve is arranged, as viewed in a flow direction, downstream of the vent valve.

5,111,778

AUXILIARY EXHAUSTING DEVICE

Huei-Huay Huang, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Taiwan

Filed Feb. 20, 1991, Ser. No. 657,908
Int. Cl.[5] F02B *75/02*
U.S. Cl. 123—65 PE **7 Claims**



1. An auxiliary exhausting device for a two-stroke engine including a crankshaft and a cylinder provided, in a wall thereof, with scavenging ports, said auxiliary exhausting device including at least one auxiliary exhausting port provided in the cylinder wall and located closer to the top of the cylinder than the scavenging ports,
an inner rotating member having a first opening communicable with said auxiliary exhausting port;
a first timing wheel fixed to said inner member and driven by said crankshaft;
a hollow outer rotating member coaxially and rotatably receiving therein said inner member and having a second opening communicable with said auxiliary exhausting port;
a second timing wheel fixed to said outer member;
a positive driving device engaging said second timing wheel for rotatably driving said outer member; and
a controller responsive to an operating condition of said engine for controlling operation of said positive driving device such that the timing of rotation of said outer member is always as desired.

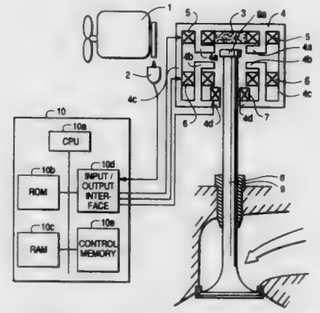
5,111,779

ELECTROMAGNETIC VALVE ACTUATING SYSTEM

Hideo Kawamura, Koza, Japan, assignor to Isuzu Ceramics Research Institute Co., Ltd., Fujisawa, Japan

PCT No. PCT/JP89/01333, § 371 Date Aug. 28, 1990, § 102(e) Date Aug. 28, 1990, PCT Pub. No. WO90/07636, PCT Pub. Date Jul. 12, 1990
PCT Filed Dec. 28, 1989, Ser. No. 571,527
Claims priority, application Japan, Dec. 28, 1988, 63-334958
Int. Cl.[5] F01L *9/04*
U.S. Cl. 123—90.11 **10 Claims**

1. An electromagnetic valve actuating system for opening and closing a valve, such as an intake and exhaust valve of an engine, comprising:
a movable magnetic pole coupled to the valve having a first and second end, said movable magnetic pole being mounted for reciprocating movement;
an upper fixed permanent magnet confronting said movable magnetic pole;
a first intermediate fixed magnetic pole coupled to said upper fixed permanent magnet and confronting said movable magnetic pole;
a second intermediate fixed magnetic pole coupled to said upper fixed permanent magnet and confronting the end of said movable magnetic pole when the valve is open;
a distal fixed magnetic pole coupled to said second intermediate fixed magnetic pole and confronting a side of said valve;
a first coil for generating a magnetic flux passing through said first intermediate fixed magnetic pole;



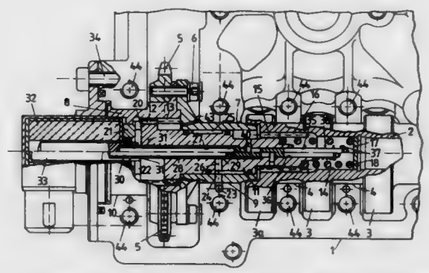
a second coil for generating a magnetic flux passing through said second intermediate fixed magnetic pole;
a third coil for generating a magnetic flux passing through said movable magnetic pole; and
energization control means for energizing said first, second, and third coils to open and close said valve.

5,111,780

DRIVE ARRANGEMENT FOR A CAMSHAFT IN AN INTERNAL COMBUSTION ENGINE

Wilhelm Hannibal, Neckarsulm, Fed. Rep. of Germany, assignor to Audi AG, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/EP89/00635, § 371 Date Jan. 14, 1991, § 102(e) Date Jan. 14, 1991, PCT Pub. No. WO90/00670, PCT Pub. Date Jan. 25, 1990
PCT Filed Jun. 6, 1989, Ser. No. 635,111
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1988, 3824062
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.17 **10 Claims**



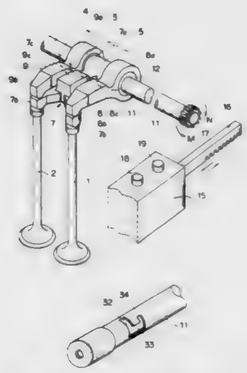
1. A drive arrangement for a camshaft (2) of an internal combustion engine, with a device for rotating the camshaft (2), which runs on bearings in the cylinder head (1) of the internal combustion engine, relative to a coaxial drive wheel (5), with a shift sleeve (11), which is disposed coaxially to the camshaft (2), can be shifted axially between two end positions and is connected on one end to the drive wheel (5) by a spiral gear (12, 13) and on an other end to the camshaft (2) by a straight gear (15, 16) that is disposed axially next to the shift sleeve (11) and protrudes with the other end into a recess (14) in the end of the camshaft (2) adjacent to the drive wheel (5), characterized in that the drive wheel (5) is disposed on a hub (7, 8), which runs on bearings in the cylinder head (1) on either side of the drive wheel (5) and that the camshaft (2) ends between a cam (3a) adjacent to the drive wheel (5) and the cylinder head bearing adjacent to this cam.

5,111,781

VALVE ACTUATING MECHANISM IN FOUR-STROKE CYCLE ENGINE

Shinji Kaku, Higashiwakabayashi, and Tatsuya Shinkai, Hamamatsu, both of Japan, assignors to Suzuki Kabushiki Kaisha, Takatsuka, Japan

Filed Mar. 12, 1991, Ser. No. 667,981
Claims priority, application Japan, Mar. 14, 1990, 2-24892[U]; Mar. 20, 1990, 2-27683[U]; Mar. 20, 1990, 2-68276
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.16 **25 Claims**



1. A valve actuating mechanism disposed within a four-stroke cycle engine in which exhaust and intake valves are disposed, comprising:
a rocker shaft rotatably supported upon a cylinder head of an engine unit and having eccentric large-diameter portions formed upon said rocker shaft;
rocker arm means including a first rocker arm rotatably mounted directly upon said rocker shaft, and scanned and third rocker arms rotatably mounted upon said eccentric large-diameter portions of said rocker shaft with said first rocker arm being interposed between said second and third rocker arms;
cam means including first, second, and third cam members, which drives said first, second, and third rocker arms, respectively, said second and third cams having the same cam profiles and said first cam having a cam profile which is different from those of said second and third cams; and
a stopper mechanism for controlling a sliding position of said rocker shaft and including a stopper screw hole formed within said cylinder head, a stopper screw threadedly engaged within said stopper screw hole, and a stopper means disposed upon one end portion of said rocker shaft.

5,111,782

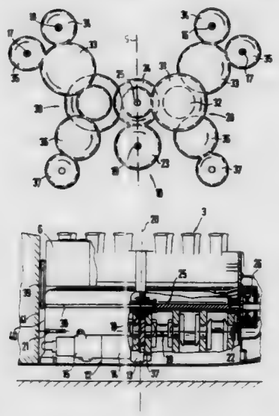
RECIPROCATING ENGINE WITH A GEAR DRIVE

Hans Mezger, Freiberg, Fed. Rep. of Germany, assignor to Dr. Ing h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Mar. 13, 1991, Ser. No. 669,011
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1990, 4032593
Int. Cl.[5] F01L *1/02;* **F01B** *1/04;* **F02B** *67/04, 75/22*
U.S. Cl. 123—90.31 **16 Claims**

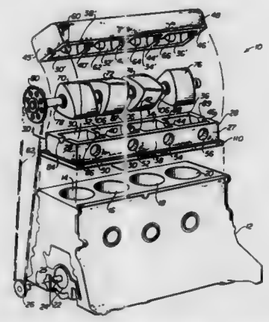
1. A reciprocating engine with two cylinder banks arranged

in a V-shape and with a gear drive which originates from a crankshaft and leads to an output shaft connected with a clutch as well as to camshafts and liquid pumps for cooling water and



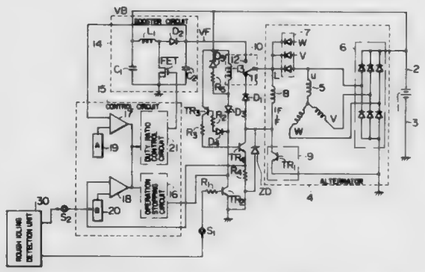
lubricating oil of the engine, wherein the crankshaft, the camshafts, and liquid pumps rotate in one rotating direction, and the output shaft and the clutch rotate in the other opposite rotating direction.

5,111,783
ROTARY VALVE SYSTEM FOR INTERNAL COMBUSTION ENGINES
Richard G. Moore, Decatur, Ga., assignor to Jack P. Janetatos, a part interest
Filed Dec. 26, 1990, Ser. No. 633,765
Int. Cl.[5] F01L *7/10*
U.S. Cl. 123—190.4 **13 Claims**



1. A fuel intake and exhaust system for use with a four stroke engine of a type having an engine block formed with at least one piston cavity having an upper opening in the top surface of said block a piston having an upper surface reciprocating in said cavity toward and away from said upper opening, a crankshaft and a connecting rod secured to said piston and crankshaft, the improvement comprising:
a housing disposed over said block and having an interior chamber formed with a lower opening located directly over said upper opening and said lower opening having approximately the same dimension as said upper opening; said housing formed with fuel intake and exhaust ports; a rotor shaft rotatably received in said chamber; a triangular rotor having first second and third surfaces carried by said shaft and movable therewith; means connecting said crankshaft to said rotor shaft for relative rotative movement therebetween;
said first surface of said rotor spanning said upper opening at a particular rotative disposition of said rotor while isolating said intake and exhaust ports from said piston cavity.

5,111,784
APPARATUS FOR REDUCING VIBRATIONS OF THE BODY OF A VEHICLE
Shigeru Kuriyama; Yuji Maeda, both of Katsuta; Yozo Nakamura, Ibaraki; Kenichi Nakamura; Keiichi Mashino, both of Katsuta; Yuzo Kadomukai, Ibaraki; Masao Fukushima, Machida, and Kei Murakami, Zama, all of Japan, assignors to Hitachi, Ltd., Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan
Filed Feb. 1, 1991, Ser. No. 649,500
Claims priority, application Japan, Feb. 1, 1990, 2-20414
Int. Cl.[5] F02B *75/06*
U.S. Cl. 123—192.1 **6 Claims**

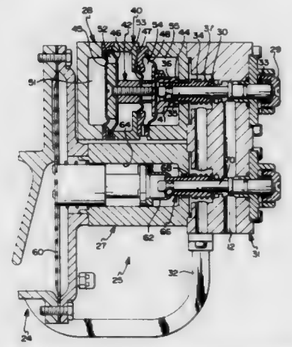


1. An apparatus for reducing vehicle body vibrations due to irregular combustion in an engine in a vehicle, comprising:
a generator attached to the vehicle engine and including a voltage regulator for controlling field winding current of the generator such that a predetermined voltage is output to a battery;
means for detecting an occurrence of irregular combustion in the engine on the basis of at least a change in the engine speed;
means responsive to a detection of irregular combustion for generating a command signal to command an increase in the field winding current a predetermined time after the detection of the irregular combustion, the predetermined time being determined by the inherent vibration period of one of the engine and the vehicle body;
a high voltage circuit responsive to the command signal for generating a voltage higher than the output voltage of said generator for a predetermined time; and
means responsive to the command signal for applying the voltage generated by said high voltage circuit to the field winding to increase the field current and hence the load torque on said generator.

5,111,785
ENGINE PROTECTOR WITH NON-OVERRIDE RESET
Roland J. Frase, Roselle, Ill., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 11, 1991, Ser. No. 728,411
Int. Cl.[5] F01P *5/14*
U.S. Cl. 123—198 D **7 Claims**

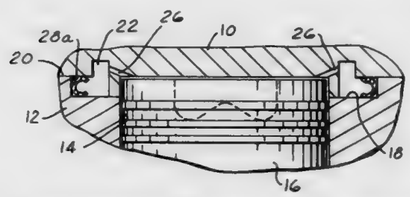
1. An engine protector for monitoring at least one engine fluid pressure and signaling engine turn-off when such pressure reaches a prescribed limit condition comprising:
a housing;
a valve actuator movably mounted in the housing;

first biasing means acting on the valve actuator for biasing the valve actuator in one direction;
a valve mounted in the housing for movement in opposite directions for valve opening and closing movement;
means for releasably coupling the valve actuator to the valve;
second biasing means acting on the valve for biasing the



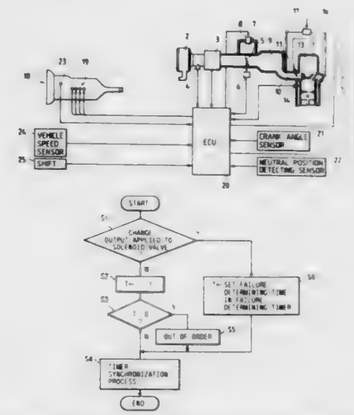
valve in one direction to a turn-off signaling position, the first biasing means being capable of overcoming the second biasing means when the valve is coupled to the valve actuator for biasing the valve in the other direction to a normal position; and
means responsive to engine fluid pressure reaching a prescribed limit condition for releasing the coupling means to permit valve operation to signal engine turn-off.

5,111,786
AIR CELL FOR AN INTERNAL COMBUSTION ENGINE
Dominic Fontichiaro, Dearborn Heights, and Daniel M. Kabat, Oxford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed May 3, 1991, Ser. No. 695,064
Int. Cl.[5] F02B *19/18*
U.S. Cl. 123—256 **10 Claims**



1. An internal combustion engine having an air cell combustion system, comprising:
a cylinder block having at least one bore, with a piston reciprocably housed therein;
a cylinder head attached to said cylinder block and defining a primary combustion chamber with said cylinder block and piston;
a reservoir for air compressed by said piston, with said reservoir being delimited by:
a concentric counterbore in the deck surface of said cylinder block; and by
a concentric annular space formed in said cylinder head and communicating with said counterbore; and by
a compression seal interposed between said cylinder head and said cylinder block at the outer periphery of said counterbore, with said air cell further comprising a plurality of passages extending from said reservoir into said combustion chamber.

5,111,787
ELECTRONIC CONTROL DEVICE FOR MOTOR VEHICLE USE
Katsuhiko Kondo, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan
Filed Jul. 30, 1991, Ser. No. 737,878
Claims priority, application Japan, Aug. 20, 1990, 2-220643
Int. Cl.[5] F02D *41/08*
U.S. Cl. 123—339 **6 Claims**

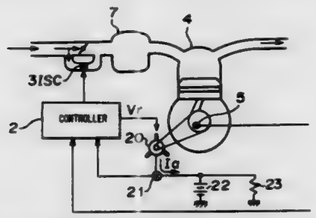


1. An electronic control device for motor vehicle comprising:
a plurality of sensors for detecting the operation conditions of a motor vehicle;
control means for calculating control data for said motor vehicle in view of output signals of said sensors, and for outputting control signals according to said control data;
solenoid valve controlled in view of said control signals outputted by said control means; and
failure detecting means for monitoring the state of said solenoid valve every predetermined period of time to determine that said solenoid valve and a drive circuit thereof are out of order, when said solenoid valve is held in the same state for a predetermined period of time.

5,111,788
ROTATION SPEED CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE
Shoichi Washino, Amagasaki, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan
Filed Dec. 19, 1990, Ser. No. 629,329
Claims priority, application Japan, Jan. 12, 1990, 2-5187
Int. Cl.[5] F02D *41/16*
U.S. Cl. 123—339 **4 Claims**

1. A rotational speed control device of an internal combustion engine whose speed idles at a predetermined steady level, said engine having an alternator and an actuator for controlling an intake air flow rate, said rotational speed control device comprising:
means for detecting a variation in engine torque;
means for controlling said actuator;
means for detecting delay characteristics of said actuator that effect said air flow rate to said engine; and
means for controlling an amount of electric current generated by said alternator in accordance with said detected delay characteristics of said actuator;

wherein, by controlling said amount of current generated by said alternator, said engine torque is reduced so that said engine speed is maintained at said predetermined steady level.

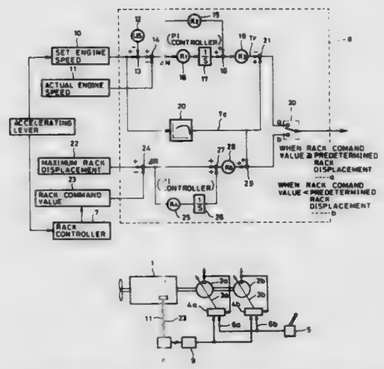


5,111,789

METHOD FOR CONTROLLING TORQUE OF A PUMP

Naoyuki Moriya, Kobe, and Makoto Sameshima, Takasago, both of Japan, assignors to Shin Caterpillar Mitsubishi Ltd., Minato, Japan

Filed Jun. 19, 1990, Ser. No. 540,906
Claims priority, application Japan, Jun. 21, 1989, 1-159069
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—357 **7 Claims**



1. An apparatus for controlling torque of an engine pump system, said torque determining a pumping effectiveness of a plurality of variable delivery pumps, said variable delivery pumps being driven by an engine of a type having a fuel injection pump, comprising:

means for producing a rack command value;

said rack command value having a maximum;

said rack command value being useable by said fuel injection pump for injecting fuel into said engine;

means for producing a first signal related to an engine torque at each value of said rack command value;

means for producing a second signal related to engine torque at each value of engine speed;

means for determining a third signal related to engine torque at each value of engine speed command;

means, responsive to said rack command value being at a predetermined value related to said maximum, for controlling said torque in response to sum of said third signal and said second signal to produce a first sum;

means for biasing said first sum to a low-speed side of an engine response; and

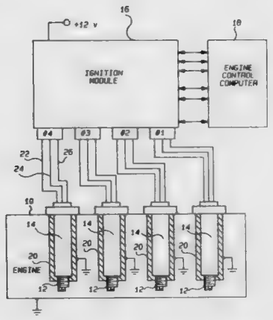
means responsive to said rack command being less than said predetermined value for controlling said torque in response to a sum of said third signal and an engine torque produced with a rack displacement corresponding to said predetermined value.

5,111,790

DIRECT FIRE IGNITION SYSTEM HAVING INDIVIDUAL KNOCK DETECTION SENSOR

Mark E. Grandy, Port Huron, Mich., assignor to Prestolite Wire Corporation, Farmington Hills, Mich.

Filed Sep. 28, 1990, Ser. No. 590,301
Int. Cl.[5] F02P *5/15, 17/00;* **G01L** *23/22*
U.S. Cl. 123—425 **52 Claims**



1. A direct fire ignition system for an internal combustion engine having at least one cylinder, a spark plug associated with said at least one cylinder to ignite an air fuel mixture within said at least one cylinder, and an engine computer control responsive to the operational parameters of said internal combustion engine for generating a fire signal at a time calculated to optimize ignition of said air fuel mixture by said spark plug, said direct fire ignition system comprising:

ignition module means responsive to said fire signal generated by said engine computer control for generating an ignition drive pulse signal;

a coil assembly mounted directly on said spark plug, said coil assembly having a primary coil energized by said ignition drive pulse signal and a secondary coil inducing a high voltage across said spark plug sufficient to cause said spark plug to generate a spark under normal operating conditions in response to said primary coil being energized by said ignition drive pulse signal generated by said ignition module means; and

spark sensor means for generating a spark confirmation signal in response to signals within a predetermined frequency range being induced in said primary coil when a spark is generated by said spark plug.

5,111,791

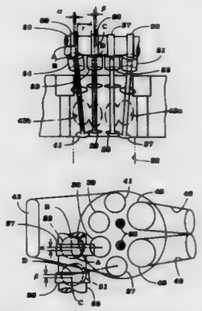
CYLINDER HEAD AND VALVE TRAIN ARRANGEMENT FOR MULTIPLE VALVE ENGINE

Hiroki Onodera, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 483,404, Feb. 13, 1990, Pat. No. 5,016,592.
This application Dec. 7, 1990, Ser. No. 623,698
Claims priority, application Japan, Feb. 14, 1989, 1-32587; Feb. 14, 1989, 1-32588; Feb. 14, 1989, 1-32589; Mar. 31, 1989, 1-78302
Int. Cl.[5] F02B *15/00*
U.S. Cl. 123—432 **16 Claims**

1. In a valve train arrangement for an internal combustion engine comprising a cylinder defining a bore for receiving a piston, a cylinder head affixed relative to said cylinder and having a surface defining with said bore and the piston a combustion chamber, a pair of poppet valves serving said bore and supported for reciprocation relative to said cylinder head

about axes that are disposed non parallel to each other, one of said axes being inclined at an acute angle to a first plane containing the axis of said bore and lying in a second plane perpendicular to said first plane, the other of said axes being inclined at an acute angle to said first plane and also at an acute angle to said second plane, and a camshaft supported for rotation about an axis parallel to said first plane, a first cam lobe on said camshaft for operating said first valve, and a second cam lobe on said camshaft for operating said second valve, said second cam lobe having its cam surface extending in a direction inclined to the axis of rotation of said camshaft.

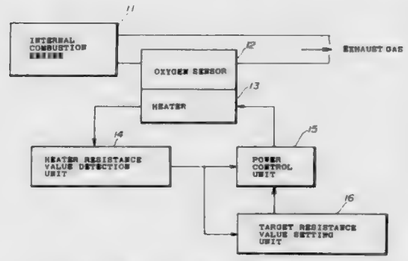


5,111,792

APPARATUS FOR CONTROLLING HEATER FOR OXYGEN SENSOR AND FUEL CONTROL APPARATUS USING THE SAME

Toshinari Nagai; Hiroshi Tanaka, both of Susono, and Makoto Suzuki, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 7, 1991, Ser. No. 712,120
Int. Cl.[5] F02M *7/00*
U.S. Cl. 123—440 **17 Claims**



1. An apparatus for controlling a heater for an oxygen sensor, said apparatus comprising:

heater resistance value detecting means for detecting a heater resistance value of said heater;

power control means, operatively coupled to said heater and said heater resistance value detecting means, for controlling a power supplied to said heater so that the heater resistance value is equal to a target resistance value; and

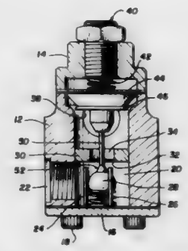
target resistance value setting means, operatively coupled to said heater resistance value detecting means and said power control means, for calculating a rate of change in the heater resistance value detected by said heater resistance value detecting means and for determining said target resistance value on the basis of the rate of change in the heater resistance value.

5,111,793

FUEL PUMP REGULATOR

Ted D. Deeds, Carson City, Nev., assignor to Mallory, Inc., Carson City, Nev.

Filed Mar. 30, 1989, Ser. No. 330,483
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—457 **34 Claims**



1. In a fluid flow control valve, the combination comprising valve body means, at least one chamber formed within said valve body means, said chamber being defined at least in part by a valve seat member, a ball seal member located in said chamber and adapted for motion on a line to seal and unseal with respect to said valve seat member to thereby control the flow of fluid through said chamber, means to control the motion of said ball member on said line in said chamber with respect to said valve seat member, said motion controlling means comprising a plurality of pins fixed to said body means and extending substantially parallel to said line of motion of said ball member, the volume within said chamber occupied by said pins and said ball member being sufficiently less than the total volume of said chamber and the cross-sectional area of said pins being sufficiently less than the cross-sectional area of said chamber that when said ball member is unsealed with respect to said valve seat member said pins provide substantially no impediment to fluid flow through chamber and the impediment to flow through said chamber created by said ball member is reduced, wherein said fluid flow control valve is part of a pressure regulator for use with a fuel pump of an internal combustion engine, said pressure regulator being positioned in the fuel flow path between said fuel pump and the carburetor of said engine, said chamber comprising an inlet chamber of said pressure regulator, said regulator further comprising spring loaded diaphragm means, spring means normally urging said ball member into sealing engagement with said valve seat member, said diaphragm means being located in said valve body means on the opposite side of said valve seat member from said ball member; said diaphragm means including means extending into said valve seat member contacting said ball member and adapted to unseal said ball member from said valve seat member; and means to expose said diaphragm means to the changes in pressure in said fuel flow path from said regulator to said carburetor.

5,111,794

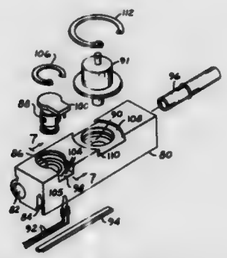
FUEL RAIL FOR BOTTOM AND SIDE FED INJECTORS

Louis G. DeGrace, Jr., Newport News, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Jun. 29, 1990, Ser. No. 546,476
Int. Cl.[5] F02M *41/00, 55/02*
U.S. Cl. 123—470 **8 Claims**

1. An internal combustion engine fuel rail assembly comprising a rail member which contains a fuel hole via which fuel is made available to a plurality of electrically operated fuel injectors mounted on said rail member, each of said fuel injectors comprising a fuel inlet, a fuel outlet, and an electrical connector, said fuel inlet being intermediate opposite axial ends of the fuel injector, said fuel outlet being disposed toward one of said axial ends relative to said fuel inlet, and said electrical connec-

tor being disposed toward the other of said axial ends relative to said fuel inlet, said rail member comprising transverse through-hole structures that are spaced apart along the length of said rail member and whose own lengths are arranged transverse to the length of said rail member, each of said fuel injectors being disposed in a corresponding one of said through-hole structures such that the injector's inlet is communicated with said fuel hole via an opening between the corresponding

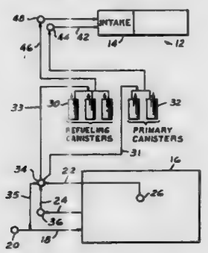


through-hole structure and said fuel hole, said rail member also containing electrical conductors extending from an input connector to individual receptacles for each fuel injector, each such receptacle being open in a direction that faces the electrical connector of the corresponding fuel injector, and said electrical connector of each fuel injector being open in a direction facing the corresponding receptacle and mated with the corresponding receptacle to establish electrical connection of the fuel injector to said input connector.

5,111,795
FLUIDIC CONTROLLER FOR AUTOMOTIVE FUEL TANK VAPOR COLLECTION SYSTEM

Robert H. Thompson, Redford, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 9, 1991, Ser. No. 742,827
Int. Cl.[5] F02M *37/00*
U.S. Cl. 123—519 **10 Claims**

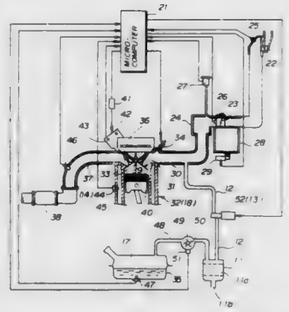


1. A fluidic logic controller for operating a fuel vapor recovery system for an automotive vehicle with an air-breathing, liquid-fueled engine and a fuel system including one or more canisters for collecting fuel vapor conveyed through both a primary vapor conduit and a refueling vapor conduit and a fuel tank with a fill tube having fill pipe closure device, comprising:
- a first chamber which is operatively connected to a sensor conduit communicating with the fill tube in the region in which the cap is installed, such that said first chamber is subjected to tank pressure when said cap is installed and to atmospheric pressure when said cap has been removed;
- a second chamber which is subjected to pressure which is slightly superatmospheric when said cap is installed, and to tank pressure when said cap has been removed;
- a third chamber which is subjected to pressure which is slightly superatmospheric both when said cap is installed, and when said cap has been removed, with said third chamber being operatively connected with said at least one vapor collection canister;
- a fourth chamber operatively connected to said primary vapor conduit, and a fifth chamber operatively connected to said refueling vapor conduit, with both of said fourth and fifth chambers being subjected to tank pressure when the cap is removed and when it is installed;
- first valve means for controlling the flow of fuel vapor between the fourth chamber and the second chamber, with said first valve means being responsive to the pressures within said first chamber and said fourth chamber such that the first valve means will open when the cap has been removed;
- second valve means for controlling the flow of fuel vapor from the fourth chamber to the third chamber, with said second valve means being responsive to pressure within said second, third and fourth chambers; and
- third valve means for controlling the flow of fuel vapor from the fifth chamber to the third chamber, with said third valve means being responsive to pressure within said first and fifth chambers;
- whereby said controller will operate such that a first vapor pathway will be established from said refueling vapor conduit through said fifth chamber and past said third valve and into said third chamber and then into said canister when said cap has been removed, with said controller operating further to establish a second vapor pathway from said primary vapor conduit through said fourth chamber and past said second valve and into said third chamber and then into said canister when said cap has been installed.

5,111,796
EVAPORATIVE FUEL CONTROL SYSTEM

Tamotu Ogita, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 7, 1990, Ser. No. 610,275
Claims priority, application Japan, Nov. 11, 1989, 1-292859
Int. Cl.[5] F02M *23/12*
U.S. Cl. 123—520 **8 Claims**

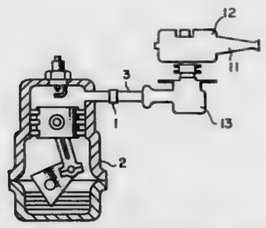


1. An evaporative fuel control system comprising:
- a canister for storing a fuel vapor supplied from a fuel tank;
- a purge passage provided between said canister and an intake manifold of an internal combustion engine;
- a valve provided at an intermediate portion of the purge passage for regulating a flow of a fuel vapor from the canister into the intake manifold in accordance with an operating condition of the internal combustion engine;
- engine temperature sensing means for sensing an engine temperature of the internal combustion engine;
- fuel distillation sensing means for sensing a fuel distillation characteristic of a fuel within the fuel tank;
- first valve control means, responsive to the engine temperature supplied form the engine temperature sensing means, for adjusting a valve position of the valve to control the flow of fuel vapor from the canister to the intake manifold; and
- second valve control means, responsive to the fuel distillation characteristic supplied from the fuel distillation sensing means, for adjusting a time of turning the valve ON at which a supply of the fuel vapor form the valve to the intake manifold is started, wherein the second valve control means allows the valve to be turned ON when the engine temperature signal is higher than a predetermined engine temperature level, the engine temperature level being changed depending on the fuel distillation characteristic supplied form the fuel distillation sensing means.

5,111,797
PROCESS AND DEVICE FOR IMPROVING COMBUSTION EFFICIENCY OF A COMBUSTION MACHINE

Yasushi Shikanai, 5-11, Asahimachi, Mutsu-shi, Aomori-ken, Japan, assignor to Yasushi Shikanai; Toho Seisakusho Co., Ltd. and Japan International Development Organization Ltd., all of, Japan

Filed Dec. 3, 1990, Ser. No. 621,062
Int. Cl.[5] F02M *33/00*
U.S. Cl. 123—539 **10 Claims**



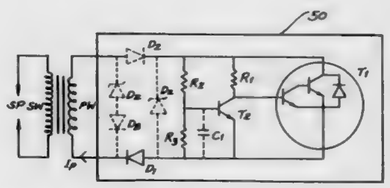
1. A process for improving combustion efficiency of a combustion machine having a duct for introducing air into a combustion chamber, comprising the steps of:
- preparing a source of extreme infra-red radiation having a wavelength of from 8 μm to 10 μm; and
- placing said source of extreme infra-red radiation in the vicinity of said duct so that the air incoming through said duct is irradiated by said extreme infra-red radiation before combustion within the combustion chamber
- whereby the combustion efficiency of the combustion engine is improved.

5,111,798
TRANSISTOR IGNITION CIRCUIT

John A. Notaras, and Angelo L. Notaras, both of 15 Reynolds Street, Balmain, New South Wales 2041, Australia

Division of Ser. No. 147,116, Jan. 21, 1988, Pat. No. 4,911,126, which is a continuation-in-part of Ser. No. 45,804, Apr. 24, 1987, which is a continuation of Ser. No. 800,613, Nov. 21, 1985. This application Feb. 6, 1990, Ser. No. 459,986
Claims priority, application Australia, Nov. 22, 1984, PG8247; Mar. 13, 1985, PG9696
Int. Cl.[5] F02P *1/08*
U.S. Cl. 123—637 **15 Claims**

1. An ignition circuit comprising:
- a. a magneto transformer including a primary winding;
- b. a potential divider connected in parallel with said primary winding and having two impedances connected together in series to define a point of intermediate potential of said potential divider;
- c. a first transistor means having a collector, an emitter, and a base and a collector-emitter conduction path, with said collector-emitter conduction path being connected in parallel with said potential divider;
- d. a first resistor connected between the collector of said first transistor means and an interconnection of said base of said first transistor means and a collector of a second transistor means;
- e. said second transistor means having its collector-emitter conduction path connected in parallel with the base-emitter junction of the first transistor means and having a base

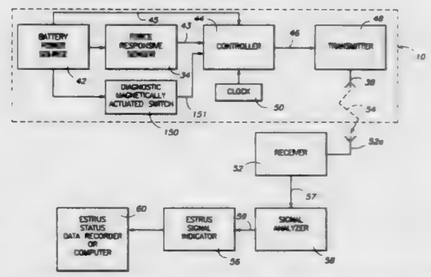


directly connected to said point of the intermediate potential of said potential divider; and,
- f. a halfwave rectifier means interposed between said primary winding and said potential divider said halfwave rectifier means permitting current to flow in said potential divider only in response to one polarity of the voltage induced in said primary winding, and in the direction in which said first transistor conducts current between its collector and emitter.

5,111,799
ESTROUS DETECTION SYSTEMS

Phillip L. Senger, and Willard C. Becker, both of Pullman, Wash., assignors to Washington State University Research Foundation, Inc., Pullman, Wash.

Filed Mar. 28, 1990, Ser. No. 502,032
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—738 **36 Claims**



1. A subcutaneously implantable apparatus for detecting and signaling estrus in a female animal which exhibits standing heat behavior, comprising:
- a substantially fluid-tight capsule made of tissue compatible material suitable for surgical subcutaneous implanation in said animal;
- a tissue connector connected to the capsule for aiding in attachment of the apparatus to tissue in said animal to thereby assist in maintaining the apparatus in a desired location under the hide of the animal:
- a self-contained electrical power source mounted within the capsule;
- a force responsive sensor connected to the capsule for detecting force applied thereto;
- a controller mounted within the capsule and connected to

receive electrical power from the self-contained electrical power source; said controller being connected to receive information from the force responsive sensor which is indicative of application of force to the force responsive sensor; said controller being capable of producing a transmission activation signal;

a transmitter mounted within said capsule and connected to receive electrical power from said self-contained electrical power source; said transmitter being capable of producing a telemetric signal which is capable of broadcast through the hide of said animal when the apparatus is implanted; said transmitter being connected to receive said transmission activation signal from the controller to control production of the telemetric signal by the transmitter; and

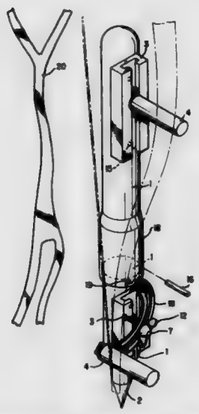
an antenna connected to the capsule and electrically connected to receive the telemetric signal from said transmitter and to broadcast the telemetric signal.

5,111,800

BOWHUNTER'S GROUND BOW HOLDER

Gary E. Reynolds, 1114 S. 9½ St., Monmouth, Ill. 61462

Filed Dec. 17, 1990, Ser. No. 630,276
Int. Cl.[5] A45F *3/44*
U.S. Cl. 124—88 **2 Claims**



1. A device for holding all styles of bows for bowhunters who hunt from the ground which comprises:

(a) a pole;

(b) an elongated support structure having a slotted open channel along the length of a first side and a plurality of holes spaced along the length of a second side, the support structure being connected to the pole by a plurality of connecting means extending through said holes;

(c) a plurality of adjustable support members spaced along the elongated support structure, each member having attachment means for selectively attaching the member to the slotted open channel of the support structure in a plurality of selected positions along the length of the channel and each member having an engagement means for engaging and supporting a bow in a selected position; and

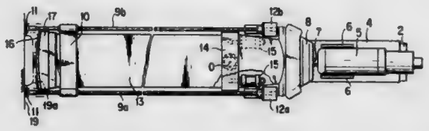
(d) means affixed to the bottom of the pole for insertion into the ground to fix the pole to the ground in an upright position.

5,111,801

APPARATUS FOR FORMING SLIT IN ROCK AND CONCRETE SURFACE

Yutaka Katoh, 1853, Kokufuhongoh, Oiso-machi, Naka-gun, Kanagawa-ken 259-01, Japan

PCT No. PCT/JP88/00643, § 371 Date Jul. 12, 1990, § 102(e) Date Jul. 12, 1990, PCT Pub. No. WO89/06741, PCT Pub. Date Jul. 27, 1989
PCT Filed Jun. 27, 1988, Ser. No. 543,832
Claims priority, application Japan, Jan. 14, 1988, 63-4942
Int. Cl.[5] E21B *6/00*
U.S. Cl. 125—23.01 **11 Claims**



1. An apparatus for forming a slit in a rock and a concrete surface comprising: a frame supported in such a manner that it may be turned freely in the vertical direction; a sliding base mounted on the frame in such a manner that it may be slidably moved in the longitudinal direction thereof; a striker means fixedly secured onto the sliding base and having an actuating shaft; a striker plate extending forwardly along said frame and fixedly secured to the leading end of the shaft; two lengths of longitudinally extending rods spaced apart widthwise of said frame and in parallel with each other, each of the rods having one drill bit mounted on the leading end thereof; a first support base fixedly secured to the front end portion of said frame so as to support the portions of these rods near the leading ends thereof such that they may be slidably moved forwardly in the longitudinal direction of said frame; a second rod supporting means fixedly mounted on said sliding base and adapted to slidably support the portions of these rods near the base or trailing ends thereof so as to keep the base ends of said two lengths of rods in contact with the contact surface of said striker plate; a plate having a plate type bit mounted on the leading end thereof, said plate being located in between said two lengths of rods such that the plate type bit is disposed somewhat behind said drill bits when not in use and the base end of the plate is kept into contact with the contact surface of said striker plate; and a plate swinging means for swinging the plate widthwise of said frame.

5,111,802

BARBECUE

Patrick Lin, 14th Fl., No. 228, Sec. 3, Minsheng E. Rd., Taipei, Taiwan

Filed Sep. 20, 1991, Ser. No. 763,117
Int. Cl.[5] A47J *37/00*
U.S. Cl. 126—25 R **1 Claim**



1. A barbecue comprising:

a body including two opposite portions each being formed with a group of holes;

a cover for covering said body including two opposite portions each being formed with a hole; and

two cover-positioning devices each including:

a plate defining a substantially L-shaped slot including a first end, a second end, and a middle portion being arranged between and above said ends;

a plurality of holes each corresponding to one of said holes of said body;

a plurality of tubes each defining an inner thread;

a plurality of threaded bolts each being insertable through one of said holes of said plate and engaging with said inner thread, thereby securing said plate to said tube;

a plurality of threaded bolts each being insertable through one of said holes of said body and engaging with said inner thread, thereby securing said plate to said body; and

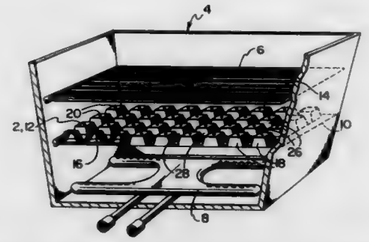
two bolts each being insertable through said slot and including an unthreaded portion being slidable along said slot and a threaded portion being insertable through said hole of said cover and engageable with a nut.

5,111,803

FLARE REDUCTION BUFFER FOR GAS BARBECUES

James Barker, and Vern Maller, both of Edmonton, Canada, assignors to Barbecue Innovations Incorporated, Edmonton, Canada

Filed Jul. 3, 1991, Ser. No. 725,508
Int. Cl.[5] A47J *37/00*; F24C *3/00*
U.S. Cl. 126—41 R **10 Claims**



1. A flare reduction buffer to be situated between a burner element and a grill in a gas barbacue to provide even heating in the barbecue and reduce flare-up during cooking, the buffer comprising a plate having upper and lower surfaces, made of impervious heat resistant material and formed with a plurality of pockets spaced from each other in regular fashion over the plate, the pcokets each having an entrance, side walls and bottom being oriented so that their entrances open towards the lower surface, performations being provided in the plate in the bottoms of the pockets and the spaces between the pockets forming channels along the upper surface.

5,111,804

ELECTRONIC ENDOSCOPE

Toshio Funakoshi, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 13, 1990, Ser. No. 479,411
Claims priority, application Japan, Feb. 15, 1989, 1-033812
Int. Cl.[5] A61B *1/04*; H04N *11/00*
U.S. Cl. 128—6 **17 Claims**

1. An endoscope apparatus comprising:

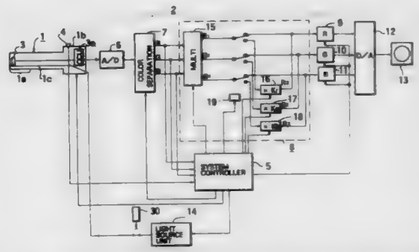
an endoscope;

an endoscope body;

a light source for selectively emitting continuous light through the endoscope to the endoscope body during a moving-picture imaging operation or emitting pulsatory light during a still-picture imaging operation, the light spectral characteristic of said light source means being different from each other during said moving-picture imaging operation and said still-picture imaging operation;

imaging means for optically imaging through the endoscope a biological body under medical examination while illuminating said biological body by said light source means;

means for collecting said light, thereby to obtain electronic imaging signals thereof;



first multiplier means for multiplying said electronic imaging signals by a predetermined white balance coefficient so as to obtain white-balanced imaging signals; and

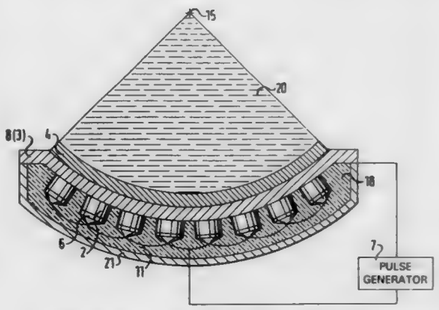
second multiplier means for multiplying said white-balanced imaging signals with a predetermined color correcting coefficient during said still-picture imaging operation, thereby to obtain white-balanced still-picture color signals.

5,111,805

PIEZOELECTRIC TRANSDUCER

Peter Jaggy, Ötisheim; Werner Krauss, Knittlingen; Dagobert Schäfer, Bretten, and Helmut Wurster, Oberderdingen, all of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Aug. 28, 1990, Ser. No. 574,331
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1989, 3932959
Int. Cl.[5] A61B *17/22*; H01L *41/08*; H04R *17/00*
U.S. Cl. 128—24 EL **19 Claims**



1. A piezoelectric transducer for producing pulsed, focused ultrasonic shock waves for use in lithotripsy, for and transmission by way of a coupling medium to the body of a patient to be treated by means of said shock waves, said transducer comprising:

a piezoelectric transducer element support;

a pulse generator;

a plurality of individual piezoelectric transducer elements made of a material selected from the group consisting of ceramic material and ceramic-like material, and each of said elements being connected to each of the poles of the

pulse generator and fixed to said support in mosaic form, and being laterally insulated from one another, said transducer elements being acoustically terminated in essentially reflection free fashion; and

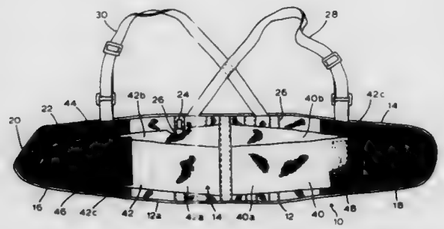
at least one layer of an intermediate medium interposed between said transducer elements and said coupling medium, the acoustic impedance of which ,at least one layer lies between that of the material of said transducer elements and that of said coupling medium, the thickness of d said layer being chosen in accordance with the relationship $d > \tau_k \cdot c_{LA}$, where τk is the propagation time of sound in said material of said transducer elements and c_{LA} is the sound velocity in said intermediate medium.

5,111,806

SUPPORT BELT WITH COLOR INDICATOR

Jack M. Travis, Wake Forest, N.C., assignor to Champion Ergonomics, Inc., Wake Forest, N.C.

Filed Aug. 1, 1991, Ser. No. 739,301
Int. Cl.[5] A61F *5/02, 5/37*
U.S. Cl. 602—19 **9 Claims**



1. A back support belt sized to fit the waist of the user comprising:

(a) a primary band having an intermediate portion, and two elastic end portions extending in opposite directions from the intermediate portion wherein said end portions overlap one another when said primary band is extended about the waist of the worker;

(b) fastening means for fastening the end portions of the primary band in overlapping condition;

(c) a secondary band for providing support for the user's abdominal and back muscles, said secondary band including first and second portions having one end fixed to the primary band and the opposite end being free, said secondary band portions being made of an elastic, which is stretchable in the longitudinal direction to extend around the user's waist;

(d) cooperative fastening means for securing the free ends of the secondary band in an overlapping condition when the band is stretched; and

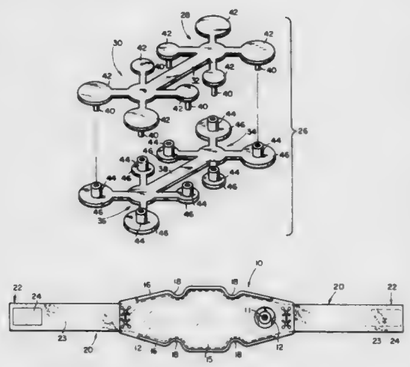
(e) a tension indicator secured to the underlying free end portion of the secondary band for indicating when the secondary band is properly tensioned, said tension indicator being positioned on the underlying free end portion so as to be completely concealed when the first and second band portions are stretched sufficiently to provide the proper tension, and at least partially exposed when the first and second band portions are not stretched sufficiently to provide the proper tension.

5,111,807

BACK BELT

James G. Spahn, Indianapolis; Steven P. Langley, and Michael L. Jacobs, both of Martinsville, all of Ind., assignors to EHOB Inc., Indianapolis, Ind.

Filed Oct. 11, 1990, Ser. No. 595,574
Int. Cl.[5] A61F *5/02;* **A63H** *33/08*
U.S. Cl. 606—244 **9 Claims**



1. A back belt, comprising:

a continuous, non-baffled, pressurizable air chamber having a top edge, a bottom edge, and a pair of opposing ends defining the periphery thereof;

cushioning rims along the top and bottom edges of said air chamber;

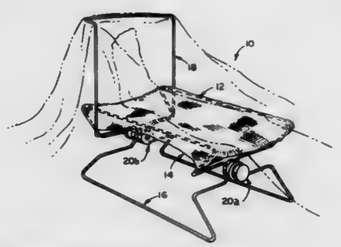
symmetrical contouring notches along the top and bottom edges of said air chamber and along said cushioning rims; belt means connected to the ends of said air chamber; and valve means on said air chamber operable to allow pressurization of said air chamber to a desired internal air pressure.

5,111,808

FOOT ELEVATOR BLANKET CRADLE

Roy A. Meals, Los Angeles, Calif., assignor to Bissell Healthcare Corporation, Grand Rapids, Mich.

Filed Nov. 29, 1990, Ser. No. 619,738
Int. Cl.[5] A61F *3/00*
U.S. Cl. 602—23 **38 Claims**



1. A collapsible foot elevator comprising:

an upper peripheral frame defining a cradle support area and having distal and proximal ends;

cradle means connected with the upper frame at the cradle support area;

a base peripheral frame defining a supporting base for the upper peripheral frame and having distal and proximal ends; and

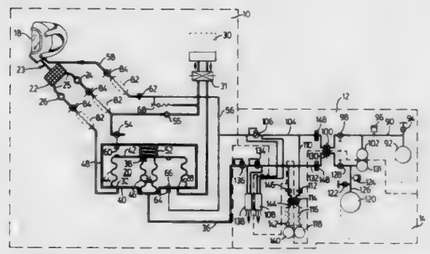
releasable attachment means at each end of each frame for releasably attaching the distal ends together in a predetermined position relative to one another and releasably attaching the proximal ends together in a predetermined position relative to one another.

5,111,809

BREATHING SYSTEM

Bruce B. Gamble, West Hartford, and Douglas A. Snowdon, Somers, both of Conn., assignors to Avstar Aerospace Corporation, North York, Canada

Filed Dec. 1, 1988, Ser. No. 278,399
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—204.18 **29 Claims**



1. A respiratory apparatus for supplying breathing gas to a user, said apparatus comprising:

a respiratory circuit including a first variable volume chamber which contracts and expands during inhalation and exhalation respectively and which functions as a respiratory flow transducer subjected to the breathing gas demand by said user, a connection means for supplying breathing gas to and receiving exhaled gas from a user;

an oxygen flow regulator connected to said respiratory circuit for the introduction of oxygen and comprising a second variable volume chamber and a normally closed oxygen admission valve connected between the second variable volume chamber and the respiratory circuit, which valve opens in response to excess pressure in the second variable volume chamber to admit oxygen into said respiratory circuit; an oxygen supply inlet connected to said oxygen flow regulator; and,

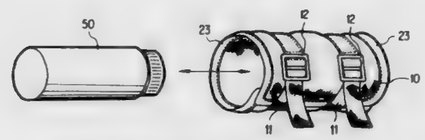
linkage means connecting said first and second variable volume chambers and constraining the first and second variable volume chambers to operate together, whereby there is a substantially constant ratio between the breathing gas flow rate and the oxygen flow rate.

5,111,810

THERAPEUTIC THERMAL WRAP KIT

Donald Fortney, P.O. Box 195, Clarksville, Md. 21029

Filed Dec. 11, 1990, Ser. No. 625,531
Int. Cl.[5] A61F *7/00*
U.S. Cl. 128—402 **22 Claims**



1. A therapeutic thermal wrap kit, comprising:

(A) a holder comprising

(1) at least two sheets of material peripherally attached to each other, said sheets forming a pocket, and

(2) adjustable fastening means provided on the outside of said holder, sufficiently long to secure said holder to an affected body part;

(B) a thermal compress, which is inserted into said pocket;

(C) a container, around which the holder containing the thermal compress is placed, said container providing a means by which a therapeutically effective temperature can be maintained for at least eight hours at 86° F.; and

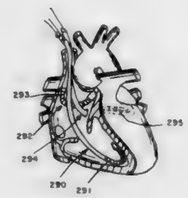
(D) an insulated bag, into which the assembled holder, thermal compress and container are placed.

5,111,811

CARDIOVERSION AND DEFIBRILLATION LEAD SYSTEM WITH ELECTRODE EXTENSION INTO THE CORONARY SINUS AND GREAT VEIN

Karel F. A. A. Smits, KL Oirsbeek, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 408,466, Sep. 18, 1989, abandoned, which is a continuation of Ser. No. 220,642, Jul. 18, 1988, abandoned, which is a division of Ser. No. 925,030, Oct. 30, 1986, Pat. No. 4,744,952, which is a division of Ser. No. 746,694, Jun. 20, 1985, Pat. No. 4,641,656. This application Mar. 26, 1990, Ser. No. 499,141
Int. Cl.[5] A61N *1/39*
U.S. Cl. 128—419 D **9 Claims**



1. A method of applying energy to a human heart, comprising:

inserting a first electrode lead having an elongated first electrode adjacent a distal end of said lead into the coronary sinus and great vein of said heart such that said elongated electrode extends into the great vein of said heart;

applying a second electrode to the right ventricle of said heart; and

delivering electrical energy to said heart, via said first and second electrodes.

5,111,812

DEFILBRILLATION ELECTRODE HAVING SMOOTH CURRENT DISTRIBUTION

David K. Swanson, Roseville; Roger W. Dahl, Andover, and Douglas J. Lang, Arden Hills, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Jan. 23, 1990, Ser. No. 468,739
Int. Cl.[5] A61N *1/39*
U.S. Cl. 128—419 D **10 Claims**

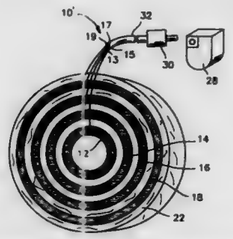
1. An implantable defibrillation/cardioversion system including at least two defibrillation electrodes implanted in the region of the heart, said system comprising:

an implantable defibrillation electrode comprising a conductive discharge surface region having a predetermined surface area for delivering electrical energy to the heart, said discharge surface region comprising multiple discrete conductive segments;

pulse generating means including means for generating multiple simultaneous shock pulses of differing voltages which multiple shock pulses are discharged simultaneously and thereby define a single defibrillation/cardioversion shock; and

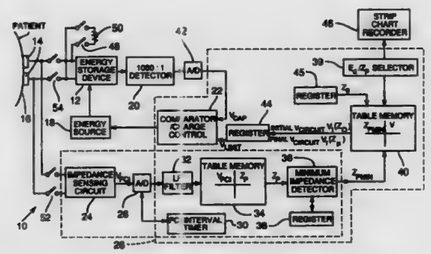
lead means including a plurality of conductors, each of said

conductors connected to select ones of said conductive segments and to said pulse generating means for convey-



ing select ones of said shock pulses to said select ones of said conductive segments.

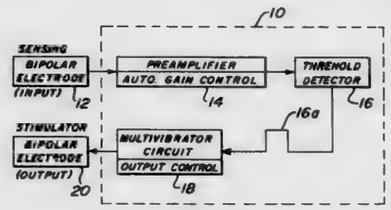
5,111,813
DEFIBRILLATION EMPLOYING AN IMPEDANCE-CORRECTED DELIVERED ENERGY
Francis M. Charbonnier, McMinnville, and Martin G. Rockwell, Sherwood, both of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed May 18, 1990, Ser. No. 526,412
Int. Cl.[5] A61N *1/39*
U.S. Cl. 128—419 D **15 Claims**



9. A defibrillator for providing a defibrillation pulse to a patient to restore normal cardiac rhythm, comprising:
a capacitor;
means for establishing a desired value of impedance-corrected delivered energy (E_dZ);
means for measuring a transthoracic impedance Z of the patient;
means for determining the voltage to which the capacitor must be charged to provide the desired value of impedance-corrected delivered energy to a patient having the transthoracic impedance measured:
means for providing charge to or from the capacitor until the voltage thereacross equals the calculated voltage; and
means for discharging the charged capacitor through the patient.

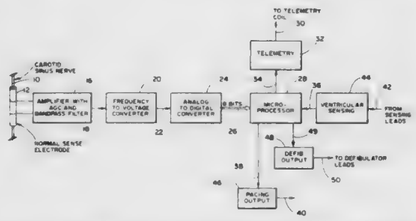
5,111,814
LARYNGEAL PACEMAKER
David Goldfarb, Cherry Hill, N.J., assignor to Thomas Jefferson University, Philadelphia, Pa.
Filed Jul. 6, 1990, Ser. No. 549,275
Int. Cl.[5] A61N *1/18*
U.S. Cl. 128—419 R **37 Claims**

1. A laryngeal pacemaker comprising:
a) a sensing electrode having adapted for electrical coupling to a first, normally functioning crico-arytenoid muscle and for providing electrical signals indicative of muscle activity thereof;
b) a stimulating electrode having means for electrical coupling to a second, dysfunctional crico-arytenoid muscle;
c) processing means coupled to receive the electrical signals provided by the sensing electrode for providing stimulating signals to the stimulating electrode in substantial syn-



chronism with the electrical signals provided by the sensing electrode;
the dysfunctional crico-arytenoid muscle, in pacemaker operation, being stimulated in substantial mirror image synchronism with the activity of the normally functioning crico-arytenoid muscle.

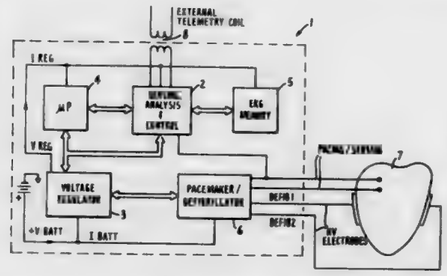
5,111,815
METHOD AND APPARATUS FOR CARDIOVERTER/PACER UTILIZING NEUROSENSING
Morton M. Mower, Edina, Minn., assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.
Filed Oct. 15, 1990, Ser. No. 597,378
Int. Cl.[5] A61N *1/362*
U.S. Cl. 128—419 PG **23 Claims**



1. A programmable baroreceptor nerve sensing based cardioverter and pacemaker apparatus comprising:
(a) a neurosense electrode having a neurosignal output wherein the neurosense electrode is in contact with a sensed nerve and provides a neurosignal thereon;
(b) a neurosense amplifier having an automatic gain control and band pass filter including an input connected to the neurosignal output wherein the neurosense amplifier further has an output and provides an amplified neurosignal thereon;
(c) a frequency-to-voltage converter having a first input connected to the neurosense amplifier output wherein the frequency-to-voltage converter has an output and provides a voltage converted signal thereon proportional to the frequency of the amplified neurosignal;
(d) an analog-to-digital converter including an input connected to the frequency-to-voltage converter output wherein the analog-to-digital converter has an output and provides a digital signal representative of the voltage converted signal thereon; and
(e) a microprocessor for executing a pressure responsive control algorithm in response to the representative digital signal including an input connected to the analog-to-digital converter output wherein the microprocessor has an input/output port, an output for providing pacing signals

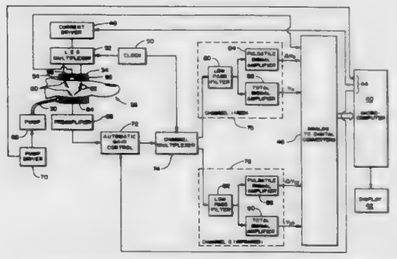
according to the control algorithms and a second output for providing defibrillation signals according to the control algorithm.

5,111,816
SYSTEM CONFIGURATION FOR COMBINED DEFIBRILLATOR/PACEMAKER
Benjamin Pless, Menlo Park; John G. Ryan, and James M. Culp, both of San Jose, all of Calif., assignors to Ventritex, Sunnyvale, Calif.
Continuation of Ser. No. 355,927, May 23, 1989, abandoned. This application Oct. 22, 1990, Ser. No. 600,257
Int. Cl.[5] A61N *1/362*
U.S. Cl. 128—419 PG **37 Claims**



1. In an implantable medical device utilizable for delivering a biphasic defibrillation waveform to the heart and including first and second defibrillation electrodes adapted to be connected to the heart, charging circuitry for generating a defibrillation signal, delivery circuitry responsive to control signals for selectively providing the defibrillation signal to the first and second defibrillation electrodes and control means for generating the control signals, the delivery circuitry comprising:
(a) first switching means disposed between the charging circuitry and the first defibrillation electrode and responsive to a first floating gate drive signal for providing the defibrillation signal to the first defibrillation electrode;
(b) second switching means disposed between the second defibrillation electrode and ground and responsive to a first ground switch drive signal for connecting the second defibrillation electrode to ground;
(c) third switching means disposed between the charging circuitry and the second defibrillation electrode and responsive to a second floating gate drive signal for providing the defibrillation signal to the second defibrillation electrode;
(d) fourth switching means disposed between the first defibrillation electrode and ground and responsive to a second ground switch drive signal for connecting the first defibrillation electrode to ground;
(e) means responsive to a first control signal for simultaneously generating the first floating gate drive signal and the first ground switch drive signal; and
(f) means responsive to a second control signal for simultaneously generating the second floating gate drive signal and the second ground switch drive signal
wherein each of the first and third switching means further includes means for preventing current leakage through the switching means to the corresponding defibrillation electrode.

5,111,817
NONINVASIVE SYSTEM AND METHOD FOR ENHANCED ARTERIAL OXYGEN SATURATION DETERMINATION AND ARTERIAL BLOOD PRESSURE MONITORING
Justin S. Clark, Salt Lake City, and William D. Wallace, Midvale, both of Utah, assignors to Medical Physics, Inc., Salt Lake City, Utah
Filed Dec. 29, 1988, Ser. No. 291,769
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—633 **72 Claims**

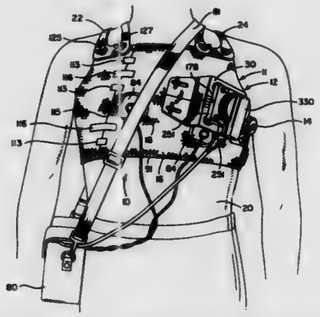


1. A system for enhancing noninvasive monitoring of a patient's arterial oxygen saturation level, said system comprising:
light means for passing at least a first light beam and a second light beam into a body part of said patient containing both arterial and nonarterial blood vessels;
detection means for detecting relative amounts of each said light beam absorbed by blood in the blood vessels;
enhancement means for increasing the absorption of the light beams by blood in the arterial blood vessels in relation to blood in the nonarterial blood vessels; processor means, electronically coupled to the light means, the detection means and the enhancement means, for coordinating the operation of each said means in relation to one another, and for deriving from the detected relative amounts of each said light beam an arterial oxygen saturation level; and
display means, electronically coupled to the processor means, for outputting a visually perceptible indication of the arterial oxygen saturation level.

5,111,818
AMBULATORY PHYSIOLOGICAL EVALUATION SYSTEM INCLUDING CARDIAC MONITORING
Arata Suzuki; Marcia Suzuki, both of Ramsey, N.J.; William T. Tyberg, Springvalley, N.Y., and George Banks, Emerson, N.J., assignors to Capintec, Inc., Ramsey, N.J.
Division of Ser. No. 96,521, Sep. 15, 1987, Pat. No. 5,007,427, which is a continuation-in-part of Ser. No. 46,854, May 7, 1987, Pat. No. 4,920,969, which is a division of Ser. No. 785,549, Oct. 8, 1985, abandoned, which is a continuation of Ser. No. 53,753, May 26, 1987, abandoned. This application May 8, 1990, Ser. No. 520,405
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—644 **11 Claims**

1. Apparatus for aligning a radiation detector relative to the left ventricle of the heart of a patient, said apparatus comprising:
a vest adapted to be worn about the torso of the patient and covering the heart;
a mounting bracket to be mounted to said vest and to receive said radiation detector;
a first mounting means for adjustably mounting said bracket relative to said vest;
a planar alignment fixture having a centerline cursor made from elements that do not pass gamma radiation;

registration means for aligning said alignment fixture in a predetermine position on said mounting bracket; and



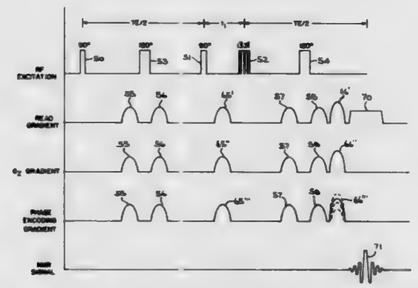
means for fixedly mounting said alignment fixture to said mounting bracket.

5,111,819

NMR IMAGING OF METABOLITES USING A MULTIPLE QUANTUM EXCITATION SEQUENCE

Ralph E. Hurd, Milpitas, Calif., assignor to General Electric, Milwaukee, Wis.

Filed Nov. 25, 1988, Ser. No. 276,173
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653.2 **8 Claims**



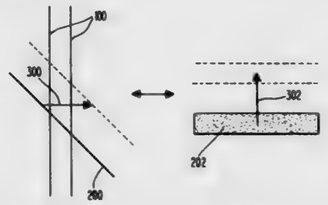
1. A method for producing an NMR image of the distribution and levels of metabolites in vivo, the steps comprising:
applying a polarizing magnetic field to metabolite nuclei in a region of interest;
applying a set of three RF excitation field pulses to the metabolite nuclei to produce a multiple quantum excitation of the metabolite nuclei in the region of interest;
applying magnetic field gradient pulses to the metabolite nuclei after the multiple quantum excitation to dephase the metabolite nuclei as a function of their position in the region of interest and to thereby position encode NMR signals which they produce;
acquiring NMR signals produced by the metabolite nuclei in the region of interest.
reconstructing an image using the acquired NMR signals; and
wherein the third of said RF excitation field pulses is a selective excitation pulse which is tuned to enhance the components of the acquired NMR signal which is produced by a methyl component of the metabolite nuclei.

5,111,820

SYSTEM AND METHOD FOR MAGNETIC RESONANCE IMAGING OF 3-DIMENSIONAL HEART WALL MOTION WITH SPATIAL MODULATION OF MAGNETIZATION

Leon Axel, Philadelphia, Pa., and Lawrence Dougherty, Wenonah, N.J., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Nov. 2, 1990, Ser. No. 608,209
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653 A **16 Claims**



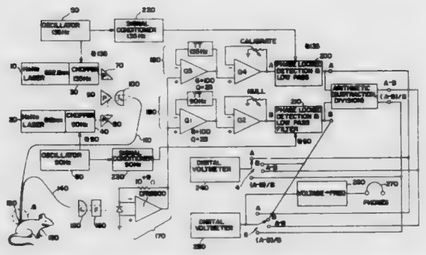
1. A method of magnetic resonance imaging of a body portion of a patient, comprising the steps of:
applying to the body portion an external magnetic field so as to produce a resultant magnetization;
applying a pre-imaging sequence to the body portion so as to spatially modulate transverse and longitudinal components of the resultant magnetization, thereby producing a spatial modulation pattern in an imaging plane;
applying an imaging sequence to the body portion;
providing an image representing magnetic resonance signals having said spatial modulation pattern and a displacement of said modulation pattern through said imaging plane as emitted from the patient; and
determining said displacement of said modulation pattern through said imaging plane in a direction substantially perpendicular to said imaging plane during a pre-imaging time interval between the times of application of said pre-imaging and imaging sequences.

5,111,821

FLUOROMETRIC METHOD FOR DETECTING ABNORMAL TISSUE USING DUAL LONG-WAVELENGTH EXCITATION

William R. Potter, Grand Island, N.Y., assignor to Health Research, Inc., Buffalo, N.Y.

Filed Nov. 8, 1988, Ser. No. 268,723
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—654 **7 Claims**



1. A method for detecting abnormal tissue in a patient, including the steps of:
providing the patient with a photosensitizing drug;
illuminating a diagnostic region simultaneously with first and second wavelengths of incident light;
detecting fluorescence arising from the incident light from the diagnostic region;

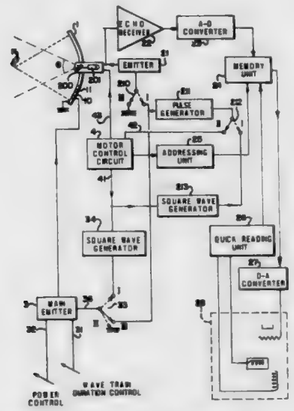
differentiating between a contribution to the fluorescence due to the first wavelength of light and a contribution to the fluorescence from the second wavelength of the light; and
providing an output to a user of the method, the output reflecting the differentiation for indicating presence of abnormal tissue at the diagnostic region;
wherein the illuminating step is carried out by the use of a first laser emitting a 612 nm beam and a second laser emitting a 632.8 nm beam.

5,111,822

PIEZOELECTRIC ARTICLE

Jacques Dory, Coupvray-Esbly, France, assignor to EDAP International, S.A., France

Division of Ser. No. 37,369, Apr. 13, 1987, abandoned, which is a division of Ser. No. 728,905, Apr. 30, 1985, Pat. No. 4,658,828, which is a continuation-in-part of Ser. No. 674,889, Nov. 26, 1984, Pat. No. 4,617,931. This application May 16, 1989, Ser. No. 352,516
Claims priority, application France, Dec. 14, 1983, 83 25041; May 3, 1984, 84 06877
Int. Cl.[5] A61B *8/00;* **A61N** *5/00*
U.S. Cl. 128—660.03 **21 Claims**



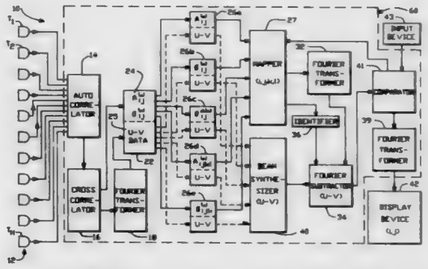
1. An article of manufacture comprising:
(a) a movable focusing member and piezoelectric element means for emitting therapeutic treatment waves mounted in operative relation to said member, said member having a concave focusing surface shaped so that therapeutic treatment waves emitted from said element means when activated converge at a focal zone;
(b) a hole through said member;
(c) a support and auxiliary sectorial sweep scanning transducer means for generating a sectorial sweep mounted on said support, said scanning transducer means sweeping independently of movement of said member; and
(d) said support passing through said hole so that said scanning transducer means is between said zone and said surface.

5,111,823

APPARATUS AND METHOD FOR GENERATING ECHOGRAPHIC IMAGES

Nathan Cohen, Boston, Mass., assignor to National Fertility Institute, San Francisco, Calif.

Continuation-in-part of Ser. No. 341,047, Apr. 20, 1989 abandoned.
Filed Apr. 16, 1990, Ser. No. 508,131
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.07 **46 Claims**



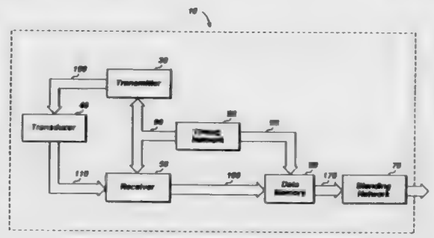
1. In a method of generating an echographic image of a target object including the steps of transmitting a plurality of ultrasonic signals toward said target object, receiving a corresponding plurality of echo signals from said target object, correlating said ultrasonic signals and said echo signals to produce correlated data including amplitude data sufficient to map an image of said target object and phase data, mapping said amplitude data, the improvement comprising the steps of:
partitioning said correlated data into a plurality of data sets including a visibility amplitude data set and a visibility phase data set;
reducing noise present in said correlated data by at least one of: (i) a side lobe subtraction process, (ii) a hybrid mapping process, (iii) a vectorial summing of possible combinations of three visibility phase data values to produce a closure phase data set, and (iv) forming ratios of possible combinations of four visibility amplitude data values to produce a closure amplitude data set; and
during said mapping step, mapping said amplitude data and said phase data after said step of reducing noise.

5,111,824

COMPOSITE BEAM ULTRASOUND IMAGING SYSTEM HAVING REDUCED IMAGE ARTIFACT

John C. Lazenby, Fall City, and James Riley, Redmond, both of Wash., assignors to Quantum Medical Systems, Incorporated, Issaquah, Wash.

Filed Aug. 1, 1990, Ser. No. 561,108
Int. Cl.[5] A61B *8/00;* **G01N** *29/04*
U.S. Cl. 128—661.01 **19 Claims**



1. A system for blending data obtained from a plurality of ultrasound returns generated from ultrasound beams focused at

different tissue depths to simulate an ultrasound beam having a relatively narrow focus over a wide depth of field, comprising:

memory means for storing a plurality of coefficients each of which is a function of the distance between the tissue depth at which each ultrasound beam is focused and the depth of each ultrasound return in said beam so that returns from tissue depths that are closer to the tissue depth at which an ultrasound beam is focused have a larger coefficient than returns from tissue depths that are farther from the tissue depth at which said ultrasound beam is focused;

multiplication means receiving said coefficients from said memory means for multiplying data from each ultrasound return by a coefficient corresponding to the depth of said ultrasound return and the tissue depth at which the ultrasound beam generating said ultrasound return is focused, said multiplication means generating adjusted ultrasound return data from products of ultrasound returns and corresponding coefficients; and

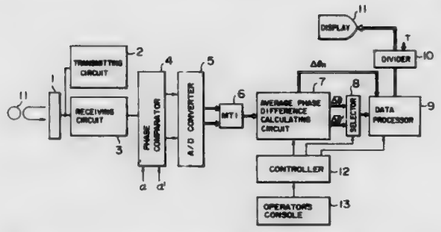
accumulator means receiving said adjusted ultrasound returned data from said multiplication means, said accumulator means summing adjusted ultrasound return data for a plurality of tissue depths from at least two ultrasound beams thereby simulating an ultrasound beam having a relatively narrow focus over a wide depth of field.

5,111,825

ULTRASONIC DOPPLER FLOW METER

Hisashi Nishiyama, Tokyo; Toshio Ogawa, Chiba, and Kageyoshi Katakura, Tokyo, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Nov. 6, 1990, Ser. No. 609,657
Claims priority, application Japan, Nov. 8, 1989, 1-288908
Int. Cl.[5] A61B *8/02*
U.S. Cl. 128—661.09 **10 Claims**



1. An ultrasonic Doppler flow meter comprising:

transmitter-receiver means for transmitting an ultrasonic pulsed continuous wave repeatedly toward an object at predetermined intervals, receiving a reflected wave from the object, and generating a reception signal from the received reflected wave;

phase detecting means for generating a phase vector indicative of a phase of the reception signal each time the reception signal is generated;

phase difference detecting means for generating a phase difference value representing a phase difference between a present phase vector and a preceding phase vector each time the phase vector is generated;

phase difference classifying means for classifying a plurality of phase difference values outputted from the phase difference detecting means into a first group consisting of positive phase difference values and a second group consisting of negative phase difference values;

means for calculating a first average angle from the phase difference values belonging to the first group and obtaining a cosine value and a sine value of the first average angle;

means for calculating a second average angle from the phase difference values belonging to the second group and obtaining a cosine value and a sine value of the second average angle;

means for calculating a weighted sum of the cosine values of the first and second average angles by adding a first product to a second product, the first product being a product of the cosine value of the first average angle and a first weighting coefficient corresponding to the number of phase difference values belonging to the first group, the second product being a product of the cosine value of the second average angle and a second weighting coefficient corresponding to the number of phase difference values belonging to the second group;

means for calculating a weighted sum of the sine values of the first and second average angles by adding a third product to a fourth product, the third product being a product of the sine value of the first average angle and the first weighting coefficient, the fourth product being a product of the sine value of the second average angle and the second weighting coefficient;

means for calculating an argument of a vector from real and imaginary parts of the vector which are equal to the weighted sum of the cosine values and the weighted sum of the sine values, respectively, the argument being a first total average value of the phase difference values outputted from the phase difference detecting means; and

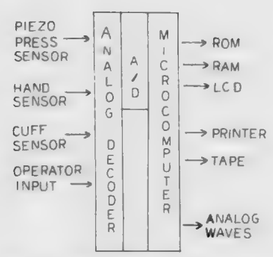
means for transforming the first total average value into a flow speed.

5,111,826

INDIRECT CONTINUOUS BLOOD PRESSURE METHOD

Roger E. Nasiff, 9422 LeBeau La., Brewerton, N.Y. 13029

Continuation-in-part of Ser. No. 679,560, Dec. 7, 1984, abandoned. This application Mar. 16, 1987, Ser. No. 26,434
The portion of the term of this patent subsequent to Dec. 12, 2008, has been disclaimed.
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—672 **6 Claims**



1. The method of determining the absolute blood pressure comprising the steps of:

applying a piezoelectric pressure transducer having an output signal indicating a total pressure onto a palmar side of the 3rd finger segment of a hand,

clamping said transducer onto said finger with a fluid-filled cuff,

attaching an ultrasonic hand position/height sensor which produces a pressure signal to the hand and heart levels,

converting the output signal from said transducer to a voltage signal for use as a direct indicator of blood pressure,

measuring said voltage signal that indicates the total pressure on said piezoelectric transducer,

measuring pressure in the cuff in terms of a voltage that indicates the said cuff pressure, and

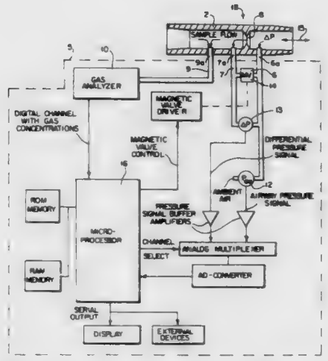
defining the blood pressure, in terms of a voltage, as said piezoelectric pressure indicating voltage minus said cuff pressure indicating voltage minus said ultrasonic hand position/height sensor pressure signal.

5,111,827

RESPIRATORY SAMPLING DEVICE

Börje Rantala, Helsinki, Finland, assignor to Instrumentarium Corp., Finland

Continuation-in-part of Ser. No. 292,933, Jan. 3, 1989, abandoned. This application Dec. 26, 1990, Ser. No. 633,979
Claims priority, application Finland, Feb. 11, 1988, 880624
Int. Cl.[5] A61B *5/08, 5/087*
U.S. Cl. 128—719 **6 Claims**



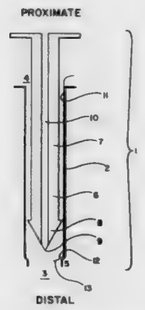
1. A respiratory apparatus comprising a gas intubation tube to conduct a flow of gas, a gas sampling connector mounted in the tube, a spirometer mounted in said tube and spaced longitudinally of said connector, a gas analyzer connected to said sampling connector for measuring the composition of said gas, said spirometer including means for measuring the flow rate of said gas in said tube, and microprocessor means for adjusting the measurement of said flow rate in accordance with the measurement of said composition.

5,111,828

DEVICE FOR PERCUTANEOUS EXCISIONAL BREAST BIOPSY

Elliot Kornberg, Cocoa Beach, Fla., and William R. Tarello, Bethesda, Md., assignors to PEB Biopsy Corporation, Cocoa Beach, Fla.

Filed Sep. 18, 1990, Ser. No. 584,614
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—754 **2 Claims**



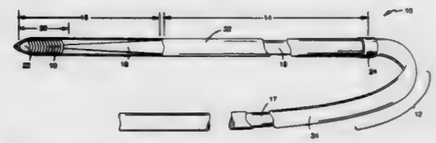
1. A percutaneous excisional breast biopsy device comprising, in combination, a cannula member having upper proximal and lower distal ends and including a cannula open at the proximal and distal ends, said cannula having a sharp cutting surface at the distal end, and a stylet member having upper proximal and lower distal ends and including a stylet having a pointed distal end capable of spreading tissue, said stylet being slidable in said cannula for simultaneous insertion with said cannula, said stylet having a hollow central shaft capable of receiving a localizing needle, said device further comprising an additional means of cutting tissue and a localizing needle capable of being received into said stylet, said localizing needle capable of receiving a guide wire, said device further comprising a guide wire capable of being received into said localizing needle, said guide wire capable of holding tissue.

5,111,829

STEERABLE HIGHLY ELONGATED GUIDEWIRE

Fernando Alvarez de Toledo, Concord, Mass., assignor to Boston Scientific Corporation, Watertown, Mass.

Continuation of Ser. No. 374,348, Jun. 28, 1989, abandoned. This application Jan. 18, 1991, Ser. No. 644,671
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—772 **6 Claims**



1. A steerable guidewire of length in excess of the order of about 350 centimeters and sufficient for use in gastro-intestinal procedures,

said guidewire comprising

an elongated distal body portion having a distal end and a proximal end,

an elongated handle portion extending proximally of the proximal end of said distal body portion,

at least a distal end region of said distal body portion, including said distal end, being formed of a flexible kink resistant material comprising a super-elastic metallic nickel-titanium alloy material,

a flexible distal tip portion ball welded to said distal end of said elongated distal body portion, said distal tip portion being formed of a radiopaque material comprising platinum, and

a plastic sleeve disposed closely about said distal end region of said distal body portion and said distal tip portion joined thereto,

said guidewire constructed in a manner whereby substantially all of an angular rotational force applied to said handle portion outside of a patient's body is transmitted to the distal tip portion within the body.

5,111,830

PACEMAKER LEAD WITH AUXILIARY STIMULATION POLE

Marc Bemurat, 20 Allées du Bicon, 33850 Leognan, France

Filed Nov. 29, 1990, Ser. No. 619,459
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—786 **7 Claims**

1. A pacemaker lead, comprising:

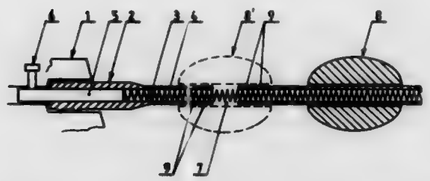
a flexible cord having at least one spiralled electric conductor and a main sheath of insulating material surrounding said conductor;

first connection means, located at one end of said cord, for removably coupling said conductor to a pacemaker;

second connection means, located at an opposite end of said cord, for coupling said conductor to an electrode stimulation device;

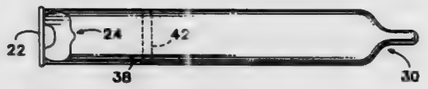
a preformed opening in said sheath between said ends of said cord; and

a closure member coupled to said sheath for movement between an open position in which said closure member is spaced from said opening to expose and provide access to



said conductor, and a closed position in which said closure member sealingly closes and insulated said opening from a surrounding environment.

5,111,831
SCROTUM SUPPORTING CONDOM WITH RETENTION MEANS
David J. Foggia, 1505 SW. 6th, Portland, Oreg. 97207
Filed Feb. 16, 1990, Ser. No. 480,808
Int. Cl.[5] A61F *6/02, 6/04*
U.S. Cl. 128—842 **21 Claims**

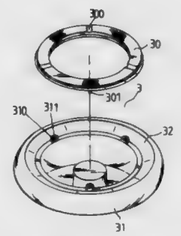


1. A condom comprising:
(a) an elongate thin-walled tubular sheath of resilient material being closed at one end and having an opening at the other end, said opening including a discontinuous periphery with a discontinuous elongated bead at its edge;
(b) retention means for retaining said condom in place during use located in said periphery; and
(c) tactile identification means, in said periphery where said periphery and said bead are discontinuous, for locating said retention means when the condom is rolled.

5,111,832
PROCESSES FOR THE CONTROL OF TACHYARRHYTHMIAS BY IN VIVO LASER ABLATION OF HUMAN HEART TISSUE
Sanjeev Saksena, 33 Fairway Dr., Gree Brook, N.J. 08812
Continuation of Ser. No. 559,501, Jul. 24, 1990, abandoned, which is a continuation of Ser. No. 383,225, Jul. 19, 1989, abandoned, which is a continuation of Ser. No. 55,685, May 29, 1987, abandoned. This application Dec. 31, 1990, Ser. No. 636,543
Int. Cl.[5] A61B *17/36*
U.S. Cl. 128—898 **5 Claims**

1. A method for the in vivo control of supraventricular tachycardia, ventricular tachycardia or ventricular fibrillation, which method comprises obtaining access to the heart of a living human by open-chest surgery, obtaining access by open heart surgery to an area within said heart, said area comprising diseased heart tissue as being a focus causing supraventricular tachycardia, ventricular tachycardia or ventricular fibrillation, said area having been located by cardiac mapping, said area being in the atrium or in the atrioventricular (A-V) bypass tract of said heart, ablating heart tissue from at least one site within said area by exposing said tissue to a laser beam, said ablating step comprising transmitting a beam of laser energy to said site by means of an elongated, thin optical fiber having a distal end, said beam being visible to the human eye, visually observing said laser beam, manually guiding said distal end of said optical fiber in response to visually observing said laser beam, and manually aiming said distal end to cause said laser beam to impact heart tissue at said site, said beam being emitted in a series of short discrete pulses having sufficient energy and for a sufficient time to create a focal lesion at said site, said ablating creating a focal lesion in which there is less carbonization of tissue, less coagulation, and a lesser radial distance of tissue damage than would occur during an electrical energy ablation process.

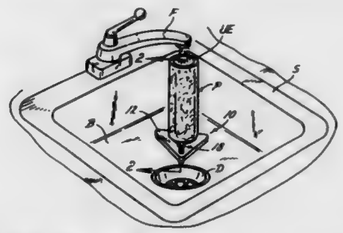
5,111,833
STRUCTURE OF ASHTRAY
Juan-Bao Leu, No. 128, Nanchin Wu Str., Feng Shan City, Kaohsiung Hsien, Taiwan
Filed Jul. 23, 1991, Ser. No. 734,610
Int. Cl.[5] A24F *19/10*
U.S. Cl. 131—231 **1 Claim**



1. An ashtray comprising a base container defining therein a chamber for collecting tobacco ashes, and a top ring mounted on said base container at the top for placing a burning cigarette; wherein:
said base container has a ring-shaped, tapered top edge and three ornamental posts vertically equiangularly rising from said ring-shaped, tapered top edge, each of said ornamental posts having a hole on the topmost edge thereof;
said top ring having an outer diameter smaller than the outer diameter of said ring-shaped, tapered top edge of said base container and comprising three pins equiangularly extending downward from the bottom edge thereof and respectively fastened in said hole on the topmost edge of each of said ornamental posts and a plurality of grooves equiangularly made on the topmost edge thereof in radial directions for placing a burning cigarette, said grooves being respectively staggered from said pins; and wherein:
a cigarette butt dropping from any of said grooves on said top ring will be guided by said ring-shaped, tapered top edge of said base container to fall to said chamber.

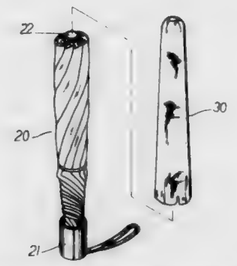
5,111,834
PAINT ROLLER FLUSHING STAND
Gene E. O'Brien, 736 Catalpa Ave., St. Louis, Mo. 63119
Filed Mar. 8, 1991, Ser. No. 666,341
Int. Cl.[5] B08B *3/04*
U.S. Cl. 134—137 **11 Claims**

1. A paint roller flushing stand for supporting a generally cylindrical paint roller having an open upper end under a faucet to facilitate flushing accumulated paint from the paint roller, the paint roller stand comprising:
a base;
means for mounting the paint roller on the base such that the paint roller extends generally upwardly from the base with the open upper end of the paint roller facing generally upwardly such that the paint roller is positioned for receiving water from the faucet into the interior of the paint roller;
leveling means associated with the base for selectively adjusting the orientation of the paint roller to maintain portions of the paint roller surrounding the open upper end in a generally horizontal plane such that water received into



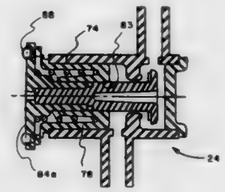
the paint roller, upon filling the interior volume of the paint roller, spills over the upper end of the paint roller and down all sides thereof in generally equal volume rates.

5,111,835
WATER COLLECTING HANDLE WITH A FOLDABLE SHEATH FOR A FOLDING UMBRELLA
Hou-Tu Lin, Changhua, Taiwan
Filed Jun. 24, 1991, Ser. No. 719,439
Int. Cl.[5] A45B *25/28*
U.S. Cl. 135—34.2 **5 Claims**



1. A water-collecting handle for connection to the bottom of an outer hollow shaft of a conventional telescoping umbrella having an inner shaft which slides outward in said outer hollow shaft when said umbrella is actuated open by the force of a spring, said water-collecting handle comprising;
hollow tubular handle means connected to said bottom of said outer hollow shaft for holding said umbrella and for housing a folded sheath,
a folded sheath for covering a collapsed umbrella when said sheath is extended open,
said folded sheath housed in said hollow tubular handle means,
cap means separably engageable to said hollow tubular handle means for sealing said folded sheath in said hollow tubular handle means when said cap means is engaged and for gaining access to extend said folded sheath and collecting water off of a collapsed and wet umbrella enclosed by an extended sheath when said cap means is disengaged from said hollow tubular handle means,
a first end of said folded sheath slidably engaged on a projection on said cap means and said projection being insertable into said hollow tubular handle means,
a plurality of elastic cords engaged to said first end of said folded sheath,
said elastic cords engaged to an end of said inner shaft slidable in said outer shaft so that an extended sheath is automatically pulled into and folded in said tubular handle means when said umbrella is opened.

5,111,836
FRANGIBLE ELEMENT VALVE USABLE IN AN IMPROVED PACKAGING SYSTEM FOR A STERILIZABLE CALIBRATABLE MEDICAL DEVICE
Richard W. Grabenkort, Barrington, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.
Filed Dec. 20, 1990, Ser. No. 631,859
Int. Cl.[5] F16K *17/40*
U.S. Cl. 137—68.1 **2 Claims**



1. A valve assembly comprising:
a housing having an inlet port and an outlet port connected by a fluid passage that extends through the housing;
an inner sleeve rigidly connected to the housing, and having a central passage therethrough;
an actuator coaxial with the inner sleeve and having an outer surface slidably extending through the passage formed in the center of the inner sleeve;
first means for biasing the actuator to a normally-closed position for the valve assembly in which fluid communication between the inlet and outlet ports is interrupted;
second means for retaining the actuator against the bias of said first means in a normally-open position for the valve assembly in which fluid communication is achieved between the inlet and outlet ports, the second retaining means including an actuator outer end having a plurality of holes disposed therein at spaced-apart intervals and circumferentially around and just inside the perimeter thereof, and a corresponding plurality of tabs each connected to the inner sleeve by a respective frangible element, the tabs on the inner sleeve to align with the holes in the outer end of the actuator, and movement of the actuator on the tabs driving the valve assembly to an open position and thereafter deforming the ends of the tabs retains the valve assembly in a normally-open position; the tabs being frangible to enable the first means to bias the actuator to the normally-closed position when the second means is broken.

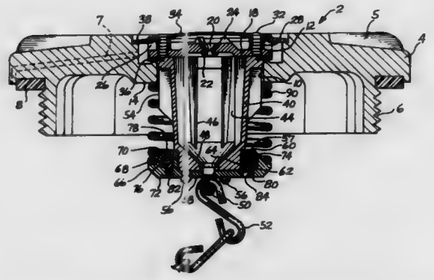
5,111,837
PRESSURE/THERMAL RELIEF VALVE FOR FUEL TANK
John M. Morris, Auburn; Charles E. Stephens, Kent, and Alan K. Forsythe, Vashon, all of Wash., assignors to GT Development Corporation, Tukwila, Wash.
Filed Jul. 17, 1991, Ser. No. 731,530
Int. Cl.[5] F16K *17/36*
U.S. Cl. 137—72 **14 Claims**

1. An improved relief valve for a fuel tank, said valve being of a type having a vent opening surrounded by an outwardly directed valve seat and an inwardly directed spring abutment surface, a valve plug positioned outwardly of the valve seat and including a closure surface directed toward the valve seat, a connector member extending inwardly from the valve plug through the vent opening, said connector member having an inner end spaced from the spring abutment surface, a spring abutment member surrounding the inner end of said connector member, a coil spring having an outer end in contact with the spring abutment surface and an inner end in contact with the spring abutment member, and a ring of fusible material interconnecting the inner end of the connector member and the

spring abutment member, wherein the improvement comprises:

said connector member defining, at its inner end, a radially outwardly opening recess and a first pair of axially spaced apart confronting surfaces;

said spring abutment member defining a radially inwardly opening recess and a second pair of axially spaced apart confronting surfaces;



said first pair of confronting surfaces confronting and substantially contacting said second pair of confronting surfaces;

said recesses together defining a substantially closed annular chamber; and

said ring of fusible material being cast in situ within said chamber.

5,111,838

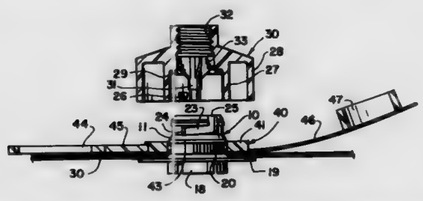
DUNNAGE BAG AIR VALVE AND COUPLING

Lonnie W. Langston, Crossett, Ark., assignor to Shipping Systems, Inc., Monroe, La.

Filed Nov. 25, 1991, Ser. No. 796,778

Int. Cl.[5] B65B *1/18*; F16L *37/28*

U.S. Cl. 137—223 **19 Claims**



14. A valve and coupling arrangement for a dunnage bag having a dunnage bag wall with a hole therethrough, comprising:

a valve stem extending through said dunnage bag wall hole and having a base extending outwardly of the wall and carrying teeth around said base;

a retaining ring having an opening for receiving said base, said ring having a plurality of teeth extending radially inwardly of the opening in said ring and engaged with the teeth of said base for preventing relative rotation between said ring and said stem;

a handle connected to said ring for facilitating the holding of said valve stem;

a pair of diametrically opposed circumferentially extending slots extending partly around said stem, above said stem base, each slot having a closed end at an opposite open end, the open end of each slot extending axially for receiving a lug; and

a coupling having a cylindrical portion with a pair of inwardly extending lugs, each lug engageable into an opening of one slot and, with rotation of said coupling, each lug being movably circumferentially in each respective slot for engaging said coupling to stem.

5,111,839

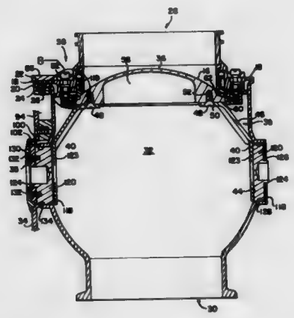
AIRPLANE TOILET DRAIN VALVE ASSEMBLY

David J. Schroepfer, Laguna Hills, and Tadeusz Podkanski, Mission Viejo, both of Calif., assignors to Rogerson Aircraft Corporation, Irvine, Calif.

Filed Apr. 24, 1991, Ser. No. 690,600

Int. Cl.[5] F16K *1/18, 25/00*

U.S. Cl. 137—242 **20 Claims**



1. An improved valve assembly comprising:

a valve housing having inlet and outlet openings, said housing including a fluid passageway extending through said housing and connecting said openings;

a valve means for closing and opening the fluid passageway rotatably mounted within said valve housing;

a sealing means for preventing fluid flow past said valve means mounted within said valve housing, said sealing means moveable from a first position in a sealing engagement with said valve means and a second position of non-engagement with said valve means;

a rotatable lifting means mounted about said valve housing for moving said sealing means between said first and second positions; and

a handle means for operating said lifting means and for rotating said valve means.

5,111,840

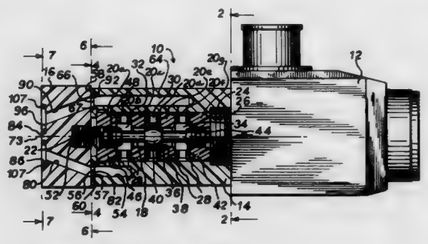
MODULAR VALVE

Douglas P. Miller, New Berlin; Edward T. Arters, and Ronald J. Morgenson, both of Milwaukee, Wis., assignors to Applied Power Inc., Butler, Wis.

Filed Mar. 14, 1991, Ser. No. 669,121

Int. Cl.[5] F16K *11/02*

U.S. Cl. 137—270 **8 Claims**



1. A modular valve, comprising:

a valve housing having a manifold interface;

a manifold block having a valve interface and a mounting interface;

means for mounting said valve housing to said manifold block with said manifold interface adjacent to said valve interface in either of a first position or a second position of the valve housing relative to the manifold block;

a first manifold port in said valve housing, said first manifold port opening to said manifold interface;

a second manifold port in said valve housing, said second manifold port opening to said manifold interface;

a third manifold port in said valve housing, said third manifold port opening to said manifold interface;

means for providing communication between said first and third manifold ports in a first state of said valve;

means for providing communication between said second and third manifold ports in a second state of said valve;

a first passageway in said manifold block opening at a first valve port in said valve interface and at a first mounting port in said mounting interface to provide fluid communication between said first valve port and said first mounting port;

a second passageway in said manifold block opening at a second valve port in said valve interface and at a second mounting port in said mounting interface to provide fluid communication between said second valve port and said second mounting port;

a third passageway in said manifold block opening at a third valve port in said valve interface and at a third mounting port in said mounting interface to provide fluid communication between said third valve port and said third mounting port;

wherein said manifold ports and said valve ports are arranged to provide fluid communication: (a) between said first manifold port and said first valve port, between said second manifold port and said second valve port, and between said third manifold port and said third valve port in said first position of said valve housing relative to said manifold block or (b) between said first manifold port and said second valve port, between said second manifold port and said first valve port, and between said third manifold port and said third valve port in said second position of said valve housing relative to said manifold block; and

wherein said third passageway has at least two third valve ports opening in said valve interface and at least one of said third valve ports is in registration with said third manifold port in each of the first and second positions of the valve housing relative to the manifold block.

5,111,841

CENTRAL VACUUM SYSTEM WALL VALVE

William S. Houston, Avon; Darwin T. McKnight, Louisville, and Greg A. Bilek, Norton, all of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Nov. 26, 1990, Ser. No. 618,076

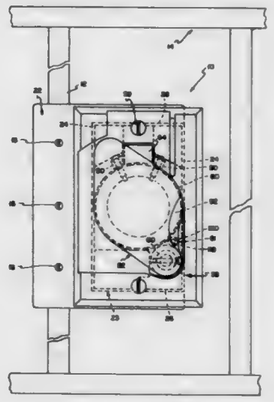
Int. Cl.[5] F16L *5/00*

U.S. Cl. 137—360 **21 Claims**

1. A wall valve for use with a central vacuum system comprising;

a) a valve port for communicating with said central vacuum system;

b) means for mounting said wall valve in a room wall having an exposed planar surface; and



c) a valve door covering said valve port, having a surface suitable for engagement by a suction hose, and pivoting on an axis perpendicular to said planar surface of said wall.

5,111,842

CARTRIDGE FOR A VALVE WITH HARD MATERIAL PLATES, HAVING MEANS FOR RETAINING THE FIXED PLATE IN CONSTRAINT STATE

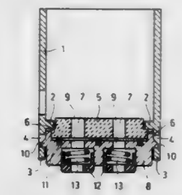
Alfons Knapp, Biberack/Riss, Fed. Rep. of Germany, assignor to Gevipi A.G., Vaduz, Liechtenstein

Filed Mar. 26, 1991, Ser. No. 674,963

Claims priority, application Italy, Apr. 2, 1990, 67243 A/90

Int. Cl.[5] F16K *11/06*

U.S. Cl. 137—454.6 **11 Claims**



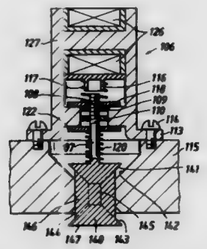
1. A replaceable cartridge for a hydraulic valve, comprising a cartridge cage, a supporting member, a hard material plate mounted, operatively stationary, in said supporting member, said cage having a portion extending a substantial distance beyond said plate in a direction away from said supporting member so as to provide a housing for the cartridge, at least one sealing gasket interposed between said plate and said supporting member, and retainment means intended for applying a pressure to said sealing gasket interposed between said fixed plate and said supporting member, said supporting member for the plate comprising a bottom constructively separate from said cartridge cage and fixedly secured to said cartridge cage; said cartridge cage having a seat for direct support of said fixed plate; said seat and said cage portion being integral with each other; said retainment means acting between said bottom and said cartridge cage, whereby said bottom pushes said fixed plate, through said interposed gasket, against said seat formed in the cartridge cage, without applying to said fixed plate any concentrated stress.

5,111,843

EXPANSIBLE CHAMBER DEVICE HAVING VARIABLY RESTRAINED VALVE SYSTEMS

Thomas R. Glass, 15307 Horborne La., Pflugerville, Tex. 78660, and Weldon R. Hudson, 8312 Renton, Austin, Tex. 78758

Division of Ser. No. 430,338, Nov. 2, 1989, Pat. No. 4,981,068.
This application Oct. 11, 1990, Ser. No. 596,943
Int. Cl.[5] F16K *17/26*
U.S. Cl. 137—513 **13 Claims**



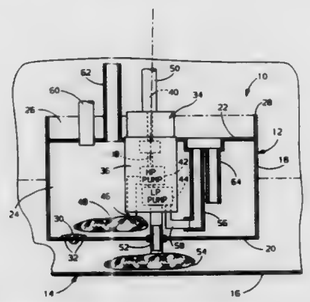
1. Valve apparatus comprising: a wall having a port; a seat surrounding said port on one side of said wall; valve means responsive to a closing force resulting from an instantaneous velocity of fluid flow through said port and adapted to move into engagement with said seat to close said port; and restraining means on the opposite side of said wall from said seat for providing an inhibiting force that holds said valve means substantially motionless until said closing force exceeds said inhibiting force.

5,111,844

AUTOMOTIVE FUEL SYSTEM

Dan H. Emmert, Grand Blanc; John E. Creager, Linden, and Timothy F. Coha, Davison, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1991, Ser. No. 783,666
Int. Cl.[5] E03B *11/00*
U.S. Cl. 137—567 **4 Claims**



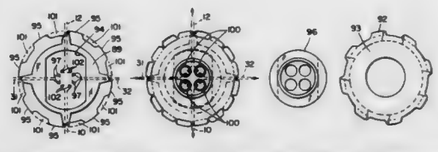
1. An automotive fuel system comprising:
a fuel tank,
a high pressure discharge pipe between said tank and an engine for conducting high pressure fuel to said engine,
a low pressure return pipe between said tank and said engine for conducting low pressure fuel overage to said tank,
a reservoir in said fuel tank including a partition dividing said reservoir into an upper chamber and a lower chamber,
means connecting said return pipe directly to said lower chamber so that said fuel overage is confined to said lower chamber,
a high pressure fuel pump in said reservoir having an inlet connected to said lower chamber and a discharge connected to said high pressure discharge pipe so that said high pressure fuel pump transfers fuel from said lower chamber to said engine,
a low pressure pump having an inlet open directly to said fuel tank and a discharge connected directly to said upper chamber so that said low pressure pump transfers fuel from said fuel tank directly to said upper chamber,
means connecting said upper chamber to said fuel tank so that overflow from said upper chamber is to said fuel tank, and
a drain between said upper chamber and said lower chamber conducting gravity induced fuel flow from said upper chamber into said lower chamber at a rate equal to the difference between the rate at which said high pressure pump transfers fuel from said lower chamber and the rate at which said return pipe transfers fuel overage into said lower chamber.

5,111,845

PARTITION VALVE FOR FLUID DELIVERY SYSTEM

Brevard S. Garrison, Reading, Mass., assignor to Millipore Corporation, Mass.

Filed Dec. 21, 1990, Ser. No. 633,717
Int. Cl.[5] F16K *11/074*
U.S. Cl. 137—567 **4 Claims**



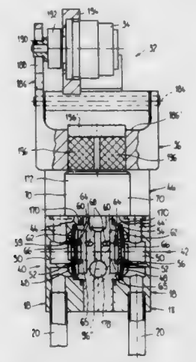
1. The system for directing a plurality of fluids in sequence from a plurality of fluid reservoirs to a plurality of treatment reservoirs which comprises a fluid transport means for each of said fluid reservoirs comprising a check valve, a diaphragm pump and an injector in fluid communication with each of said reservoirs;
said check valve having a check valve inlet, a check valve outlet, a diaphragm positioned between said check valve inlet and said check valve outlet, and means for positioning said diaphragm between a position for preventing fluid communication between said check valve inlet and said check valve outlet and a position for permitting fluid communication between said check valve inlet and said check valve outlet;
said diaphragm pump including a plenum and a pump diaphragm and means for moving said pump diaphragm between a position for filling said plenum with fluid and for emptying said plenum of fluid;
said injector including an injector diaphragm positioned between an injector inlet and an injector outlet, means for moving said injector diaphragm between a position for providing fluid communication between said injector inlet and said injector outlet and a second position for preventing fluid communication between said injector inlet and said injector outlet;
plate means including passageways for providing fluid communication between said check valve, said diaphragm pump and said injector
at least one common channel in fluid communication with a plurality of said injectors
and a partition valve for directing fluid from one of a plurality of said common channels to one of a plurality of said treatment reservoirs,
said partition valve comprising
a plurality of inlet channels and a plurality of outlet channels,
each of said inlet channels being subdivided into a plurality of substream inlets,
each of said outlet channels being subdivided into a plurality of substream outlets,
a partition diaphragm having a first surface in contact with said substream inlets and said substream outlets,
means for selectively pressurizing a second surface of said partition diaphragm to effect either fluid communication between a substream inlet and an adjacent substream outlet or to prevent fluid communication between a substream inlet and an adjacent substream outlet,
and means for retaining said partition diaphragm and said means for pressurizing in a desired position relative to said substream inlets and said substreams outlets.

5,111,846

ELECTRICALLY CONTROLLED FITTING

Ferdinand Hochstrasser, Auenstein, Switzerland, and Helmut Oesterle, Feldkirch, Austria, assignors to KWC AG, Unterkulm, Switzerland

Filed Nov. 6, 1990, Ser. No. 609,913
Claims priority, application Switzerland, Nov. 16, 1989, 04125/89
Int. Cl.[5] F16K *31/10, 31/385*
U.S. Cl. 137—607 **14 Claims**



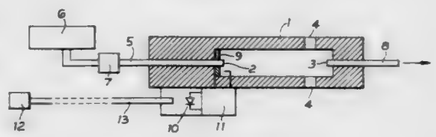
1. An electrically controlled sanitary fitting having a hot water inlet and a cold water inlet and an outlet and having in each case one hydraulically operable shutoff valve arranged between the relevant inlet and the outlet for releasable blocking of the hot and cold water flow, the hydraulic control circuit of which shutoff valve is connected to the relevant inlet and the outlet and can be closed or interrupted by means of an auxiliary valve for opening and closing the shutoff valve which auxiliary valve is operable by a drive arrangement (**32**) fed by electricity, wherein a common drive arrangement (**32**) fed by electricity is provided for both auxiliary valves (**70, 70'**), each shutoff valve (**40, 42**) having a diaphragm-shaped or piston-shaped closure part (**56**), on the one side of which there is provided a valve seat (**52**) interacting with the closure part (**56**) and, on the other side, a pilot control space (**60**) which is connected to the respective inlet (**20,20'**) via a passage (**62**), can be connected via the auxiliary valve (**70,70'**) to the outlet (**24**) to open the shutoff valve (**40,42**) and can be separated from said outlet for closing the shutoff valve, the auxiliary valves being apart from the pilot control spaces, wherein the drive arrangement (**32**) has a drive member (**34**) fed by electricity and a transmission element (**36**) which is in effective connection with said drive member and acts on both auxiliary valves (**70,70'**), wherein the drive member (**34**) has a solenoid arrangement with a plunger (**112**) which operates both auxiliary valves (**70, 70'**) via a transmission linkage (**114**), and wherein each auxiliary valve (**70, 70'**) has a stationary, annular auxiliary valve seat (**130**) and a closure element (**132**) interacting with said auxiliary valve seat having an operating shaft (**134**) extending through the auxiliary valve seat (**130**).

5,111,847

PNEUMATIC ACTUATOR

Fang-Quan Hu, Manchester; Michael Page, Staffordshire, and John M. Watson, Manchester, all of England, assignors to Norgren Martonair Limited, United Kingdom

Filed Apr. 10, 1991, Ser. No. 683,540
Claims priority, application United Kingdom, Apr. 10, 1990, 9008153
Int. Cl.[5] F15C *1/04*
U.S. Cl. 137—828 **9 Claims**



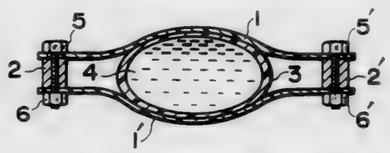
1. A pneumatic actuator comprising:
(a) a cell having an inlet for pressurized gas, for example air, an outlet for said gas disposed opposite said inlet, and one or more exhaust outlets;
(b) means to control the flow of gas to said inlet so that, normally, a laminar stream of gas will flow through the cell from said inlet to said outlet thereby producing a pressure output at the outlet; and
(c) an electro-acoustic transducer for producing, in response to an oscillating electrical signal, an acoustic signal for imparting turbulence to said laminar stream thereby causing at least some of the air in said stream to exhaust through said exhaust outlet(s) and thus a reduction in the value of said pressure output; and
(d) an opto-electrical transducer responsive to optical control signals to provide, directly or indirectly, said electrical signal.

5,111,848

APPARATUS FOR PREVENTING PULSATIONS IN A FLOWING FLUID

Yuzo Inukai, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 169,682, Mar. 18, 1988, abandoned.
This application Apr. 15, 1991, Ser. No. 684,514
Claims priority, application Japan, Mar. 19, 1987, 62-62677
Int. Cl.[5] F16L *55/04*
U.S. Cl. 138—30 **14 Claims**



1. An apparatus for preventing pulsations in a flowing fluid, comprising:
a tube having at least a portion thereof which is flexible, said flexible portion having a flexible wall with a first flexural ability in a circumferential direction of the wall as viewed in a transverse cross section of the tube, and a second flexural ability in a radial direction of the wall, said second flexural ability being substantially greater than the first flexural ability, said tube transporting the flowing fluid so that a cross-sectional area of the flexible portion changes

in response to a change in a pressure of the flowing fluid, and so that a circumferential length of said tube wall does not change in response to the change in the pressure of the flowing fluid; and

a pair of flexible sheets, disposed so as to sandwich the at least flexible portion, for applying respective reaction forces so as to restore the cross-sectional area of the flexible portion to that cross-sectional area which existed before the change in pressure of the flowing fluid.

14. An apparatus for preventing pulsations in a flowing fluid, comprising:

a tube having at least a portion thereof which is flexible, said tube transporting the flowing fluid so that a cross-sectional area of the flexible portion changes in response to a change in a pressure of the flowing fluid; and

a pair of flexible sheets, disposed so as to sandwich the at least flexible portion, for applying respective reaction forces so as to restore the cross-sectional area of the flexible portion to that cross-sectional area which existed before the change in pressure of the flowing fluid;

wherein said pair of sheets are secured to each other along both sides thereof, and wherein said sheets are secured to each other with spacers interposed between the sheets.

5,111,849

HELICAL PIPES AND METHOD OF MANUFACTURE THEREOF

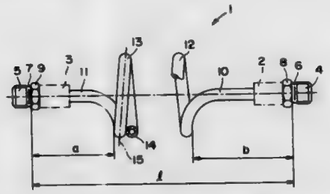
Bernhard Zeh, Trimmis, Fed. Rep. of Germany, assignor to EMS-Inventa AG, Switzerland

Filed Dec. 26, 1989, Ser. No. 456,366

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1988, 3844256

Int. Cl.[5] F16L *11/04*

U.S. Cl. 138—118 **48 Claims**



1. A method of making a resilient helical pipe from a thermoplastic processable polymer comprising winding a base pipe having a longitudinal axis around a mandrel in a downstream direction in a cold state to form a helix, twisting said pipe around said axis before or during said winding in an upstream direction opposite to said downstream direction to form twisted pipe, and thereafter thermally fixing said twisted pipe.

5,111,850

BODY RESTRAINING DEVICE

Morris I. Kunofsky, 6010 Royalcrest, Dallas, Tex. 75230

Filed Aug. 14, 1990, Ser. No. 567,292

Int. Cl.[5] A61F *5/37*

U.S. Cl. 128—873 **7 Claims**

1. A body restraining device for a person to be restrained comprising:

a portable shroud means of a foraminous composition and of tubular cross-section for progressive head toward foot slipover placement in a capturing relation about an individual, said shroud means being compressible into a collapsed state and expandable from said state to extend between opposite ends so as to define an internal cavity therein accessed by an opening at one of said ends through which to effect said slipover placement; and p1 said shroud means being of high strength and dimensioned in length and cavity cross-section to exceed the height and width dimensions for an individual to be restrained and effective when emplaced to capture and immobilize the



head, arms and feet of the restrained individual against harmful behavior.

5,111,851

METHOD OF RESTORING A BROKEN WARP AFTER MENDING THE SAME

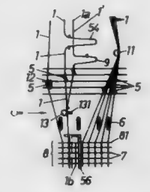
Yujiro Takegawa, Kahoku, Japan, assignor to Tsudakoma Corp., Ishikawa, Japan

Filed Mar. 28, 1991, Ser. No. 675,971

Claims priority, application Japan, Mar. 28, 1990, 2-80228; Apr. 27, 1990, 2-113471

Int. Cl.[5] D03J *1/14;* **D03D** *23/00*

U.S. Cl. 139—1 R **6 Claims**



1. A method of restoring a broken warp after mending the same, comprising the steps of:

drawing a mending yarn connected to a trailing portion of the broken warp through a drop wire and a heddle supported on a heddle frame;

cutting a normal warp drawn through the same slit between adjacent dents of a reed as the trailing portion of the broken warp is to be drawn through, and connecting a mending yarn to the cut normal warp by inserting the mending yarn between the free ends of the cut normal warp;

connecting the mending yarn connected to the trailing portion of the broken warp to the normal warp drawn through the same slit between the adjacent dents of the reed as the trailing portion of the broken warp is to be drawn through, at a position between the heddle of the heddle frame and the dents between which the trailing portion of the broken warp is to be drawn; and

drawing forward the normal warp drawn through the same slit between the adjacent dents of the reed as the trailing portion of the broken warp is to be drawn through in order to drawn the broken warp through the slit between the adjacent dents.

5,111,852

WEFT INSERTING NOZZLE WITH SEPARATE THREADING DUCT

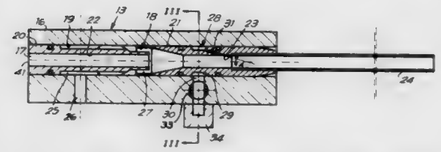
Jozef Verhulst, Zillebeke, Belgium, assignor to Picanol N.V., Belgium

Filed Sep. 13, 1990, Ser. No. 581,308

Claims priority, application Belgium, Sep. 19, 1989, 8901006

Int. Cl.[5] D03D *47/34*

U.S. Cl. 139—435.4 **13 Claims**



1. In a blow device for weft threads in weaving machines including a nozzle comprising a thread guide duct extending through a housing and first blowing means disposed in the housing and cooperating with the thread guide duct to transport a weft thread through the duct to a shed of the weaving machine, the improvement comprising, said nozzle including a second blowing means also disposed in the housing and cooperating with the thread guide duct to thread the nozzle, said second blowing means including at least one blow duct intersecting the thread guide duct at an angle (A) arranged to cause the leading end of a weft thread presented at the entry of the thread guide duct to be thrust through the thread guide duct; means for actuating the second blowing means during a threading of the nozzle; and an air supply duct for supplying air to the second blowing means; and wherein the means for actuating the second blowing means during the threading of the nozzle comprises a normally closed manually operable air flow control valve for controlling flow of compressed air through the duct and said second blowing means.

5,111,853

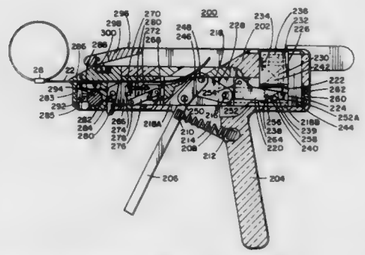
BANDING TOOL

Michael G. Scruggs, Orlando, Fla., assignor to Daniels Manufacturing Corporation, Orlando, Fla.

Filed Apr. 5, 1991, Ser. No. 681,557

Int. Cl.[5] B21F *09/02*

U.S. Cl. 140—123.6 **12 Claims**



1. A banding tool for tightening a band about an object to a tension within preselected tension limits, the tool including:

a housing;

a reciprocal shuttle mounted in the housing and including means for gripping a band;

a pivotable lever coupled to the shuttle and extending from the housing, actuation of the lever being effective to cause motion of said shuttle in a direction to effect tightening of the band, a return spring being coupled to said lever to return said lever to a non-actuated position;

said shuttle having a first part for supporting said gripping means and a second part connected to said lever arm, spring means for holding said second part in a preselected position with respect to said first part, said second part being movable with respect to said first part when the tension exerted on the band exceeds the instantaneous force of said spring means;

an overcenter linkage connected to said lever and arranged to transition to an overcenter position when said lever is moved to a preselected end position, said shuttle being reciprocally movable a preselected distance by motion of said lever, said distance allowing said linkage to retract from an overcenter position in response to force from said return spring; and

means responsive to relative displacement between said first part and said second part of said shuttle for limiting reciprocal motion of said shuttle to a second distance less than said preselected distance when tension on the band is within the preselected tension limits whereby said overcenter linkage is forcibly retained in said overcenter position to prevent release of said lever to said non-actuated position.

5,111,854

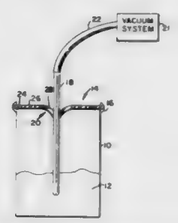
PARTICLE MOVEMENT SYSTEM WITH CONTROL OF DUST

Brendan J. Begley, Bound Brook, and Subrahmanyam Cheruvu, Mercerville, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Mar. 1, 1991, Ser. No. 662,660

Int. Cl.[5] B65B *3/04*

U.S. Cl. 141—65 **16 Claims**



1. A combination of a container containing particulate material therein; a lid, adapted to cover said container, said lid comprising an iris formed of a resilient material said iris comprising multiple slits therein radially disposed about a predetermined point; and a wand inserted into said container through said iris; wherein said iris is so designed and constructed as to permit said wand to be inserted therethrough, and, when said wand is inserted therethrough, to permit unimpeded contact between said particulate material and ambient air.

5,111,855

PLANT AND APPARATUS FOR PRODUCING PERFUMES

Alexander Boeck, Duesseldorf; Eckhard Niebaum, Moers; Walter Sommer, Krefeld, and Guenter Sparenberg, Ratingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 383,394, Jul. 20, 1989, abandoned. This application Jan. 24, 1991, Ser. No. 647,181

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1988, 3824727

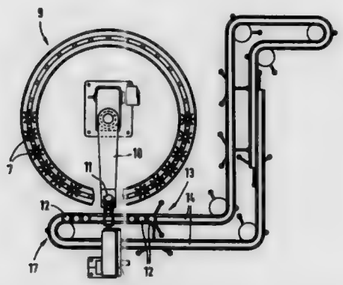
Int. Cl.[5] B01F *15/04, 15/02;* **G01F** *11/00;* **A61K** *7/00*

U.S. Cl. 141—83 **5 Claims**

1. A perfume processing plant for mixing predetermined doses of different substances to produce desired perfume formulations, said plant comprising:

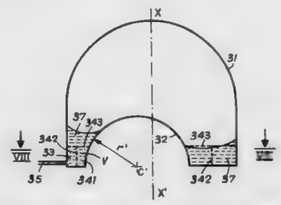
a computer for controlling said processing plant;

a plurality of containers each for holding a different substance that may be included in a selected perfume formulation;
a plurality of dosing valves arranged in a circle and associated with individual ones of said plurality of containers, respectively;
a weighing unit for receiving a mixing vessel and for sending a signal to said computer indicative of the weight of said mixing vessel and its content;
an elongated rotatable arm including said weighing unit mounted on an outward end of said arm, an inward end of said arm being mounted for rotation at the center of said circle of dosing valves, said rotatable arm being controlled by said computer for movement in a circle for positioning said mixing vessel under selected ones of said dosing valves in a successive manner;
a conveyor belt having at least one portion thereof substantially tangential to one outside circumferential portion of said circle of dosing valves at a loading/unloading position;
a handling unit positioned on the opposite side of said conveyor belt to said circle of dosing valves, proximate said one portion of said conveyor belt;
a plurality of mixing vessels, said mixing vessels initially being empty and placed in juxtaposition on a first storage area of said conveyor belt;



said computer being programmed for in a sequential manner (1) operating said conveyor belt to position an empty one of said mixing vessels between said rotatable arm and said handling unit, (2) operating said handling unit to move said one mixing vessel from said conveyor belt onto said weighing unit on said rotatable arm, (3) rotating said arm to position said one mixing vessel for a given period of time proximate and under different selected ones of said dosing valves, respectively, (4) operating said dosing valves at appropriate times for discharging a predetermined quantity of an associated substance into said one mixing vessel, said computer being responsive to said weighing unit for controlling the quantity of a substance being dispensed, (5) after filling said one mixing vessel with appropriate quantities of said substances for obtaining a given perfume formulation, rotating said arm to move said one mixing vessel proximate said conveyor belt at said loading/unloading position, (6) operating said handling unit to move said one mixing vessel from said weighing unit back onto said conveyor belt, (7) operating said conveyor belt to both move said one mixing vessel to a second storage area of said conveyor belt for filled mixing vessels, and to move another empty one of said mixing vessels to said loading/unloading position, and (8) repeating said processing until a desired number of mixing vessels have been filled with preselected perfume formulations.

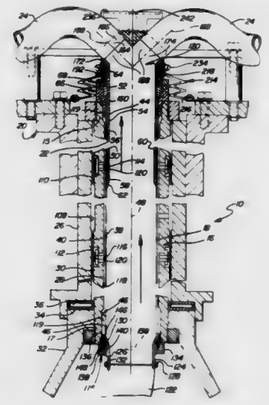
5,111,856
TANK HAVING A SHELL CAPILLARY EFFECT
Denis L. Baralle, Vernon, France, assignor to Societe Europeenne de Propulsion, Suresnes, France
Filed Dec. 14, 1990, Ser. No. 627,698
Claims priority, application France, Dec. 19, 1989, 89 16829
Int. Cl.[5] B65B *3/04, 1/04*
U.S. Cl. 141—230 **17 Claims**



1. A liquid and gas tank for operation, in particular, in satellites subject to low acceleration, and making use of the separation force produced by surface tension to collect liquid in a privileged zone of the tank without allowing gas to escape via said privileged zone, wherein the tank comprises:
an outer first shell element of curvilinear shape and having a liquid side and an external side, said outer first shell element including at one end a surface portion S of radius of curvature r which is concave on said liquid side;
an inner second shell element, fixed to said outer first shell element, and of curvilinear shape, and having a liquid side and an external side, being convex on the liquid side, and including a surface portion S' having a part which is slightly inclined relative to the surface portion S in said privileged zone forming a narrowest zone between the surface portions S and S', the surface portion S' having a radius of curvature r' which is less than the radius of curvature r, at least in said narrowest zone such that liquid is confined by a capillary effect in said narrowest zone between said first and second shell elements; and
at least one drawing-off element opening out into said narrowest zone lying between said surface portions S and S'.

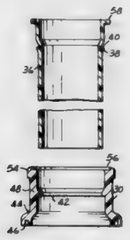
5,111,857
CENTER SUPPLY TUBE FOR A CONTAINER FILLING ASSEMBLY
Robert W. LaWarre, Sr., Titusville, Fla., assignor to Lawarre Precision Technologies, Inc., Titusville, Fla.
Filed Dec. 20, 1990, Ser. No. 631,387
Int. Cl.[5] B65B *3/12*
U.S. Cl. 141—234 **50 Claims**

1. A container filling assembly (**10**) for supplying liquid connection with filling valves (**12**) of the type used for filling a plurality of containers (**14**) with liquid by distributing liquid from a main fluid path to the filling valves, said assembly comprising:
a stationary support housing (**16**) having an integral interior surface (**28**) and an integral exterior surface (**30**);
fixed liquid conducting means (**18**) wholly within and adjacent to said support housing (**16**) and having a top end (**44**) and a bottom end (**46**) defining a central vertical axis (**48**) extending therethrough for conducting liquid from said bottom end to said top end;
fluid distribution means (**20**) rotatably and axially moveable with respect to said vertical axis (**48**) and said fixed liquid conducting means (**18**) and operatively connected to said fixed liquid conducting means for distributing the liquid from said fixed liquid conducting means to a plurality of containers (**14**);
said fluid distribution means (**20**) including at least one distribution conduit (**24**) having a receiving end (**164**) extending from said top end (**44**) of said fixed liquid conducting means (**18**) for directing the liquid to the fillings valves (**12**);
said assembly (**10**) characterized by said fluid distribution means (**20**) including rotating liquid conducting means (**22**) having a first end (**50**) disposed in contacting and



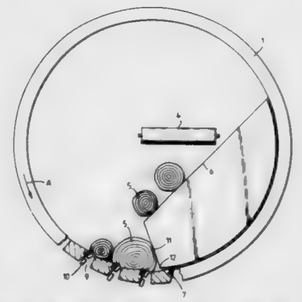
telescoping engagement within said top end (**44**) of said fixed liquid conducting means (**18**) and a second end (**52**) extending beyond said housing means (**16**) and connected to said receiving end (**164**) of said distribution conduit (**24**) for conducting the liquid from said fixed liquid conducting means to said distribution conduit.

5,111,858
INTERENGAGEABLE PLASTIC FUEL FLANGE AND PLASTIC FILLER TUBE
Robert W. Aittama, Livonia, and Francis E. Noggle, Rochester, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Dec. 24, 1990, Ser. No. 632,576
Int. Cl.[5] B65B *3/04;* **B60K** *15/04*
U.S. Cl. 141—312 **9 Claims**



9. A plastic fuel assembly comprising: a plastic fuel tank having a plastic fuel flange disposed at an opening thereof and a plastic filler tube having a portion disposed in interengagement with said plastic fuel flange, wherein said fuel flange comprises:
a first end portion adaptable to be connected to a fuel tank; and
a substantially cylindrical section attached to said first end portion and having an annular flange disposed on an inner surface thereof; and a second end portion adjacent to said cylindrical section and including a recess having a recessed abutment surface for receiving a flanged surface of a radial flange of said filler tube; and
a cylindrical portion disposable inside said fuel flange and having a means for interengaging said annular flange when said radial flange of said filler tube is received in said recess, thereby substantially preventing relative axial movement between said filler tube and said fuel flange.

5,111,859
CHIPPING METHOD AND DEVICE
Antti Tohkala, Rauma, and Esko Unkuri, Nakkila, both of Finland, assignors to Sunds Defibrator Rauma Woodhandling Oy, Pori, Finland
Filed Apr. 29, 1991, Ser. No. 692,558
Claims priority, application Finland, Apr. 27, 1990, 90 2147
Int. Cl.[5] B27L *11/02;* **B27C** *1/00*
U.S. Cl. 144—373 **5 Claims**

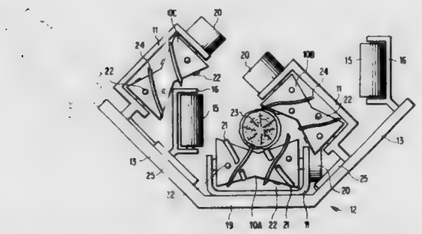


1. A method for cutting chips of elongated pieces of wood comprising the steps of:
transporting a piece of wood into the interior of a rotary cylinder, said rotating cylinder having a plurality of blade rows, each blade row extending along a length of said rotating cylinder, and each blade row having a plurality of blades;
directing said piece of wood into said rotating cylinder such that said piece of wood is positioned in said cylinder at an acute angle with respect to said blade rows; and
maintaining said piece of wood in contact with at least two blades wherein each of said at least two blades is disposed in a different blade row such that said piece of wood is secured in position.

5,111,860
COMPRESSION LOG DEBARKING APPARATUS
Robin Wingate-Hill, Greenleigh, and Ian J. MacArthur, Bungendore, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, Australia
Division of Ser. No. 457,902, Dec. 27, 1989, Pat. No. 5,022,446, which is a continuation-in-part of Ser. No. 260,551, Oct. 20, 1988, abandoned. This application Mar. 27, 1991, Ser. No. 681,420
Claims priority, application Australia, Oct. 20, 1987, PI4967
Int. Cl.[5] B27L *1/00*
U.S. Cl. 144—208 F **9 Claims**

1. Apparatus for removing bark from a log by a compression debarking action, said apparatus comprising:
a) a framework;
b) a first roller, fixedly mounted on the framework;
c) second and third rollers mounted on the framework for linear movement thereon, said second and third rollers being mounted in spaced apart relationship in the direction of movement of the log through the apparatus, the axis of rotation of each roller being perpendicular to the direction of movement of a log through the apparatus and at an angle of substantially 60° relative to the axes of rotation of each of the other rollers; the first, second and third rollers each being in the form of a double cone, the cones of each roller being tapered towards the middle of the roller;

d) a pair of guide rollers mounted on the framework, each guide roller being associated with a respective one of the double-cone second and third rollers and having its axis of rotation substantially perpendicular to the direction of movement of the log through the equipment and substantially perpendicular to the axis of rotation of the first double-cone roller, each guide roller being adapted for linear movement on the framework in a direction parallel to the direction of movement of the second or third double-cone roller with which it is not associated;



e) movement means to move said second and third rollers and said guide rollers linearly on said framework and to cause said first, second and third rollers and said guide rollers to apply pressure to said log;

f) motor means for rotating said first, second and third rollers; and

g) cutting means mounted on each of said rollers to cut the bark of said log.

5,111,861

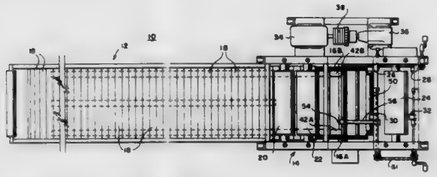
APPARATUS FOR CAMBERING WOOD TRUSSES

Charles E. Gore, Colleyville; Frank E. Fairley, San Antonio; Edward Hardee, Bedford, and Carl T. Medeen, Grapevine, all of Tex., assignors to Truswal Systems Corporation, Arlington, Tex.

Division of Ser. No. 243,698, Sep. 13, 1988, abandoned. This application Jun. 22, 1990, Ser. No. 541,476

Int. Cl.[5] B27H *1/00*

U.S. Cl. 144—256.1 **11 Claims**



1. Apparatus for imparting camber to a wood truss, said truss being comprised of oppositely positioned top and bottom chords and a plurality of web members interconnecting the top and bottom chords, said apparatus comprising:

a relatively flat conveyor surface for supporting said truss;

means for moving said truss in a predetermined direction;

an arm member pivotally mounted on one side of said apparatus;

first and second spaced apart camber rollers mounted on one side of said arm member for contacting the top chord of the truss, said first and second camber rollers being movable out of alignment with respect to an axis which is parallel to the predetermined direction when said arm member is pivoted from a predetermined position at which said arm member is substantially parallel to the predetermined direction;

third and fourth spaced apart camber rollers positioned on an opposite side of said apparatus for contacting the bottom chord of the truss, said third and fourth camber rollers being maintained substantially in alignment along an axis which is parallel to the predetermined direction, said third and fourth camber rollers for cooperating with said first and second camber rollers to impart a predetermined amount of camber to the truss, the amount of displacement of said arm member from said predetermined position for determining the amount of camber imparted thereto;

adjustment means for selectively pivoting said arm member to position said arm member to impart a predetermined amount of camber to the truss; and

means for engaging an opposite side of said arm member to prevent said arm member from pivoting back toward said predetermined position after said arm member has been pivoted away from said predetermined position, thereby counteracting torque exerted on said arm member by said truss tending to bend said arm member back toward said predetermined position.

5,111,862

METHOD FOR FLATTENING LOGS

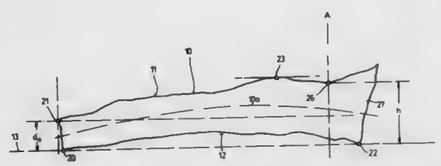
Hans Dietz, Ammerbuch, Fed. Rep. of Germany, assignor to Wurster u. Dietz GmbH u. Co. Maschinenfabrik, Tubingen-Derendingen, Fed. Rep. of Germany

Filed Feb. 1, 1991, Ser. No. 649,040

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1990, 4003023

Int. Cl.[5] B27B *1/00*

U.S. Cl. 144—357 **1 Claim**



1. A method for flattening logs, said logs having a first end of a first, smaller diameter and a second, enlarged end of a second, larger diameter, said logs having, further, one convex lateral side and one opposite, concave side with a curved longitudinal center line there between, the method comprising the steps of:

positioning said log, in a first position, horizontally on a reference support plane with said concave side down and said convex side up, said first end resting on said plane in a first point and said second end resting on said plane in a second point;

determining a third point on said convex side, said third point having highest elevation of all points of said convex side above said plane;

determining a fourth point on said convex side, said fourth point having lowest elevation of all points of said convex side between said third point and said second end;

lowering said second point on said second end of said log below said plane, while said first point on said first end remains on said plane, and monitoring the elevation of said fourth point above said plane during said step of lowering until, in a second position, said fourth point has an elevation above said plane being equal to said first diameter;

gripping said log in said second position; and

flattening said log by machining-off said log from below up to said plane.

5,111,863

PNEUMATIC TIRE INCLUDING DIVIDED BELT PLIES

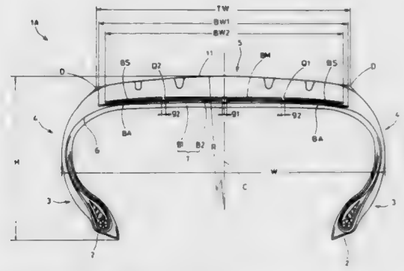
Eiji Nakasaki, Kakogawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Aug. 8, 1990, Ser. No. 564,403

Claims priority, application Japan, Aug. 10, 1989, 1-209295; Aug. 15, 1989, 1-211161

Int. Cl.[5] B60C *9/00, 9/18*

U.S. Cl. 152—526 **16 Claims**



1. A pneumatic tire comprising

a carcass extending from a tread part through a side-wall part and wrapped around a bead core in each of two bead parts, and

a belt layer placed radially outside the carcass in the tread part, wherein:

said belt layer includes a first belt ply B1 and a second belt ply B2 that are formed in sequence from the carcass side;

the width BW1 of the first belt ply in the axial direction of the tire is in a range from greater than 0.9 to less than 0.95 times the tread width TW, wherein tread width TW is the length between outer edges of the tread in the axial direction of the tire;

the width BW2 of the second belt ply B2 in the axial direction of the tire is in a range from greater than 0.88 to less than 0.92 times the tread width TW;

one of the belt plies, the first belt ply B1 or second belt ply B2, is divided into and composed of two belt ply parts BA1 and BA2 which are separated by a gap g1 on the tire's equator C; and

the other belt ply is divided into and composed of a middle belt ply part BM and two side-belt ply parts BS1 and BS2 which are separated by a pair of gaps g2*a* and g2*b*, respectively located at two division points a distance of 0.2 to 0.3 times the width of the one of belt plies B1 or B2 from the tire's equator C on both respective sides in the axial direction of the tire.

5,111,864

HEAVY DUTY PNEUMATIC RADIAL TIRES WHOSE BELT INCLUDES A PAIR OF NARROW-WIDTH AUXILIARY PROTECTIVE STRIPS

Minoru Nakano, Koganei; Akihito Goto, and Yoichi Nakamura, both of Kodaira, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

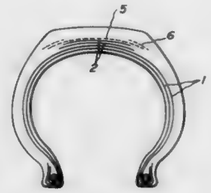
Continuation-in-part of Ser. No. 288,933, Dec. 23, 1988, abandoned. This application Nov. 2, 1989, Ser. No. 430,466

Claims priority, application Japan, Dec. 25, 1987, 62-195964[U]

Int. Cl.[5] B60C *9/18, 9/20*

U.S. Cl. 152—527 **12 Claims**

1. A heavy duty pneumatic radial tire comprising: a radial carcass ply of cords extending between a pair of bead cores in substantially a radial direction of the tire and turning up around respective bead cores, plural belt layers comprising two main belt layers each containing substantially inextensible steel cords arranged outside the radial carcass ply and a protect belt layer containing high elongation steel cords arranged outside the main belt layers, and a pair of narrow-width auxiliary protective strips having free ends of cords at both side ends in axial direction to cover the belt end and protrude beyond the belt end outward in the widthwise direction, cords of said



protective strips having an inclination angle of 25°–50° with respect to the circumferential direction of the tire and being the same direction as in the cord direction of the belt layer supporting the auxiliary protective strip.

5,111,865

TIRE AND RIM COMBINATION

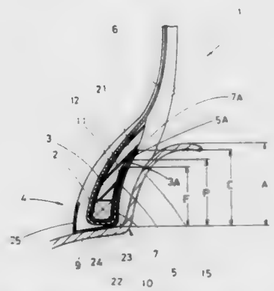
Yasushi Shinmura, Shirakawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Aug. 4, 1989, Ser. No. 389,802

Claims priority, application Japan, Aug. 11, 1988, 63-202559

Int. Cl.[5] B60C *15/06*

U.S. Cl. 152—542 **5 Claims**



2. A tire and rim combination comprising:

a tire;

a rim supporting said tire;

a pair of bead cores disposed one in each bead of said tire;

a carcass turned up around the bead cores from the axially inside to the outside thereof to form two turned up portions;

a bead filler ply disposed between the carcass and each bead core and extending radially outwardly from the bead core to form an axially inner portion and an outer portion; and

a chafer having a main portion extending along the bottom of the bead and an outside portion extending radially outwardly from the main portion along the axially outside the carcass turned up portion,

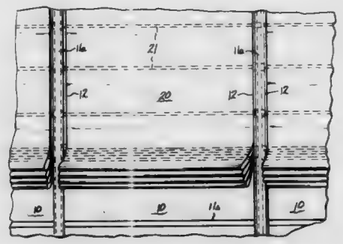
the height F of the edge of the outer portion of the bead filler ply,

the height P of the edge of the turned up portion of the carcass,

the height C of the edge of the outside portion of the chafer, and the height A of the edge of said flange of said rim for the tire, the heights F, P, C and A being the height from the bead base, respectively, and satisfying the following conditions:

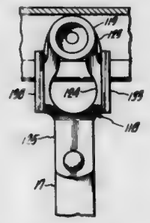
$A > C$, $C > P$, and $C > F$.

5,111,866
MOVABLE SHADE SYSTEM
Robert N. Prostko, 128 Quinnipiac Ave., North Haven, Conn. 06473
Filed Jun. 5, 1991, Ser. No. 710,576
Int. Cl.[5] E06B *3/94*
U.S. Cl. 160—90 **15 Claims**



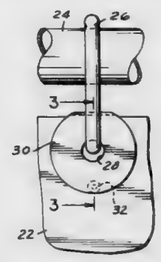
1. An improved movable shade system in combination with a window, a frame supporting said window and at least two substantially parallel spaced tracks supported by said frame, which comprises: a shade covering said window movable from a first position to a second position; a plurality of shade carriers supporting said shade in spaced parallel relationship to each other and disposed substantially perpendicular to said tracks, said carriers being secured to and movable in said tracks to move the shade from said first position to said second position; sliding means affixed to said carriers and terminating in a guide means seated in said tracks and movable therein; and retaining means on at least one of said sliding means including a holding member adjacent said guide means and seated external to said track, wherein a portion of the track is positioned between said holding member and guide means, said retaining means releasably firmly holding at least one sliding means in any desired position in said tracks, wherein said holding member is freely movable on said sliding means towards and away from said guide means and including means to urge said holding member into engagement with said track.

5,111,867
HEAVY CURTAIN SUPPORT ROLLER DEVICE
Terry F. Horton, Whittier, and Steve A. Ross, Montclair, both of Calif., assignors to Utility Trailer Manufacturing Co., City of Industry, Calif.
Filed May 23, 1986, Ser. No. 867,799
Int. Cl.[5] A47H *15/00*
U.S. Cl. 160—330 **2 Claims**
MICROFICHE APPENDIX INCLUDED
(051115798 Microfiche, Pages)



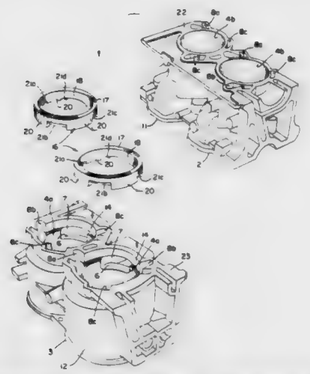
1. A support roller device for use with like support roller devices spaced along and supporting a heavy curtain of substantial length on an open side of a cargo vehicle from a track extending the length of the open side and along the vehicle roof wherein the track has two upwardly facing rails spaced apart with facing edges defining a slot therebetween, each roller device comprising, a roller having two spaced wheel portions for engaging the two upwardly facing rails, respectively, and a central portion, said roller central portion having a circular cross section of a diameter smaller than the wheel portions, a hanger means having a loop portion with a semicircular inside diameter slightly larger than said roller central portion circular cross section for being rotatably supported thereon, said hanger means having a lower portion for connecting to and supporting the heavy curtain, the hanger means having an intermediate portion between said loop portion and lower portion positioned in the track slot, said intermediate portion including guide means of a low friction material for slidably engaging said track rail edges defining the slot, said guide means of substantially the same width as the slot, and said guide means extending longitudinally of the slot beyond the longitudinally extent of the roller wheels and all other portions of the hanger means for engaging, spacing and separating adjacent support roller devices, wherein said hanger means is an integral unit formed of low friction material and wherein said intermediate portion of said hanger means has a semicircular area connected to said loop portion of said hanger means and adapted to allow said roller to fit through the semicircular area of said hanger means and to allow said roller means to move upwardly into engagement with said loop portion for rotatably supporting said hanger means.

5,111,868
REPLACEMENT EYELET FOR FLEXIBLE CURTAINS
Frederick J. Sawaya, 5631 Farmington Rd., West Bloomfield, Mich. 48322
Filed Jul. 2, 1991, Ser. No. 724,677
Int. Cl.[5] A47K *3/24;* **A47H** *1/00*
U.S. Cl. 160—330 **3 Claims**



1. A shower curtain comprising:
a generally planar rectangular curtain member, said curtain member having a plurality of holes adjacent one edge thereof, there being a small distance between said holes and said adjacent one edge;
reinforcement members being received about said holes, said reinforcement members having respective apertures aligned with said holes in said curtain member, said reinforcement members having portions received in said small distance to reinforce said curtain member along said small distance, and said reinforcement members having integral cutting elements cutting through said curtain member to secure said reinforcement members to said curtain member, said reinforcement members formed of two generally planar sides connected by a hinge, one of said planar sides having said cutting elements for extending through said curtain member, the other of said planar sides having an integral cap for receiving said cutting elements, said hinge being received outwardly of one end of said planar side, said cutting elements extending through said planar side having said cap and into said cap, said cap being formed on an opposed face of said planar side removed from said cutting element.

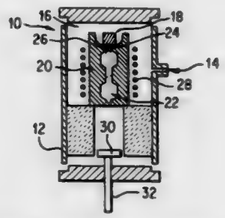
5,111,869
EVAPORABLE FOAM PATTERN FOR CASTING A CYLINDER BLOCK OF A TWO-CYCLE ENGINE
William D. Corbett, and Benjamin L. Sheaffer, both of Fond du Lac, Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed Dec. 28, 1990, Ser. No. 635,762
Int. Cl.[5] B22C *7/02*
U.S. Cl. 164—45 **14 Claims**



1. A pattern assembly for casting a metal engine block for a two-cycle engine, comprising a pattern formed of an evaporable polymeric material and having a crankcase end and a head end and having at least one cylinder extending from said crankcase end toward said head end, said pattern having at least one transfer passage disposed longitudinally of the cylinder with said transfer passage having an inlet end communicating with the crankcase end of said pattern and having a discharge end communicating through a transfer port with said cylinder adjacent said head end, said pattern including a crankcase section and a head section joined together along a parting line disposed normal to the axis of said cylinder, a first section of said cylinder being disposed in said crankcase section of said pattern and a second section of said cylinder being disposed in said head pattern section, a portion of said second cylinder section adjacent said parting line being enlarged in diameter, said head pattern section having a plurality of circumferentially spaced ledges interconnecting said second cylindrical section and said enlarged portion, said ledges bordering said transfer passage, a separate ring formed of evaporable polymeric material and disposed in said enlarged portion and having a first end disposed in engagement with said ledges, the portion of said first end of said ring disposed between said spaced ledges defining an edge of said transfer port, and-adhesive means joining the contiguous surfaces of said head section and said crankcase section and said ring.

11. A method of producing an evaporable foam pattern for use in casting a metal engine block for a two cycle engine, comprising the steps of forming an evaporable polymeric foam crankcase pattern section having a lower crankcase end and an upper end and having a lower cylinder section and a lower transfer passage section extending between said ends, forming an evaporable polymeric foam head pattern section having a lower end and an upper end and having an upper cylinder section and an upper transfer passage section extending from said lower end and communicating with said upper cylinder section, forming a portion of the upper cylinder section adjacent said lower end with an enlarged diameter with a ledge interconnecting said enlarged portion with said upper cylinder section, forming a ring of evaporable polymeric foam material having an internal diameter substantially equal to the diameter of said cylinder sections, inserting the ring in said enlarged diameter portion and positioning an upper end of the ring against said ledge, securing the contiguous surfaces of said ring and said head pattern section together, disposing the upper end of the crankcase pattern section and the lower end of the head pattern section in abutting relation with said cylindrical sections and said transfer passage sections being in mating relation, and securing said abutting ends together.

5,111,870
TOP FILL CASTING
Arnold J. Cook, Pittsburgh, Pa., assignor to PCast Equipment Corporation, Pittsburgh, Pa.
Filed Oct. 11, 1990, Ser. No. 596,062
Int. Cl.[5] B22D *18/00, 19/14*
U.S. Cl. 164—61 **14 Claims**



1. An apparatus for casting comprising:
a pressure vessel;
means for pressurizing the vessel, said pressurizing means fluidically connected to the vessel;
a chamber disposed in the pressure vessel within which material is melted;
a mold adapted to contain a preform and disposed in the pressure vessel and in fluidic connected with the chamber by a passage such that melted material in the chamber can be forced down into the mold through the passage as the pressurizing means pressurizes the vessel, said passage contains a filter such that the melted material is prevented from entering the interior of the mold prior to pressurization but passes through the filter upon a desired pressurization;
means for heating material in the chamber and the mold such that material is melted in the chamber and stays melted as it is forced down into the mold while the pressurizing means pressurizes the vessel, said heating means disposed in the vessel;
a chill plate for cooling the mold; and
a chill plate lifter, separable from said mold, for selectively moving the chill plate into and out of contact with the bottom of the mold.

6. A method for casting comprising the steps of:
loading a pressure vessel by disposing a material within a crucible whereby the crucible is in fluidic connection with a mold containing a preform through a passage, said passage having a filter disposed therein;
melting the material in the crucible wherein the melted material fluidically seals the passage thereby isolating the interior of the mold from the interior of the vessel, said filter prevents melted material from entering the interior of the mold;
pressurizing the vessel such that the melted material is forced past said filter and down into the interior of the mold and into the preform; and
cooling the melted material within the mold by lifting a separable chill plate into thermal contact with the bottom of the mold.

5,111,871

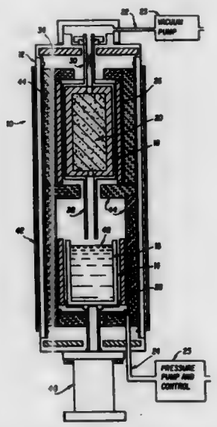
METHOD OF VACUUM CASTING

Arnold J. Cook, Pittsburgh, Pa., assignor to PCast Equipment Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 325,221, Mar. 17, 1989, abandoned. This application Nov. 1, 1990, Ser. No. 607,847

Int. Cl.[5] B22D *18/06, 19/14*

U.S. Cl. 164—63 **3 Claims**



1. A method for casting comprising the steps of:
placing a porous preform in a permanent, nonporous, thin walled mold chamber of a pressure vessel;
placing a material in a crucible of the pressure vessel;
evacuating the pressure vessel through a snorkel fluidically connected to the mold chamber and extending therefrom out of the pressure vessel;
melting the material in the crucible;
placing the crucible in fluidic communication with the mold chamber such that the melted material fluidically seals the inside of the mold chamber and the snorkel from the interior of the pressure vessel to fluidically isolate the mold chamber from the interior of the pressure vessel so that a pressure differential exists therebetween;
pressurizing the vessel at a controlled rate such that the pressure in the mold chamber is able to have time to be driven towards equilibrium with the vessel and therefore allowing differential pressure control while the mold chamber is continuously evacuated, such that the melted material is drawn into the mold chamber and into the snorkel where solidifying means in thermal communication with the snorkel cools the melted material within the snorkel thereby forming a solidification plug and the material is forced into the porous preform.

5,111,872

TRANSMISSION CASING COVER WITH TUBULAR MECHANICALLY CRIMPED CONDUIT CAST IN SITU

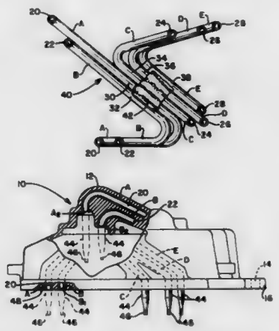
Rodney A. Diehl, Mt. Pleasant; Robert L. Uhrman, Jr., Brentwood, both of Tenn.; Robert G. Bishop, Troy, Mich., and Donald B. Campbell, Franklin, Tenn., assignors to Saturn Corporation, Troy, Mich.

Continuation of Ser. No. 546,989, Jul. 2, 1990, abandoned, which is a division of Ser. No. 481,533, Feb. 20, 1990, Pat. No. 4,958,537. This application Jul. 8, 1991, Ser. No. 728,312

Int. Cl.[5] B22D *19/00*

U.S. Cl. 164—98 **2 Claims**

2. A method of making a cover for one end of an automatic transmission casing comprising the steps of: forming a plurality of individual metallic tubes into a plurality of conduits each of which will interconnect with the hydraulic system of an automatic transmission system; providing each conduit with at least one linear portion; combining the plurality of formed conduits into a unitary manifold by fastening the conduits together along the linear portions; closing the terminal ends of all of the conduits by mechanically crimping to form airtight ends; mounting the unitary manifold in a mold having a cavity to



form the body portion of the cover; casting the body portion of the cover to encapsulate the unitary manifold in situ within the body portion of the cover; removing the selvage portion of each conduit; and, machining ports in the body portion of the cover through which the conduits open.

5,111,873

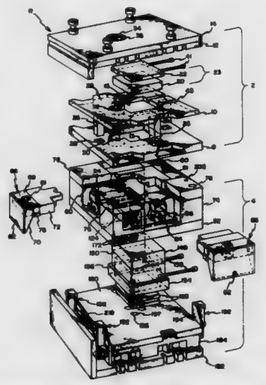
DIE CASTING FRAME

Mile A. Kordovski, Rochester, and Donald R. Read, Bergen, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 16, 1991, Ser. No. 685,775

Int. Cl.[5] B22D *33/04*

U.S. Cl. 164—312 **10 Claims**



1. A frame for manufacturing die cast parts in a die casting machine, the frame comprising a cover half adapted to be attached to the stationary side of a die casting machine platen and an ejector half adapted to be attached to the movable side of a die casting machine platen, the cover half and the ejector half having a closed position at a main parting plane for die casting a part and an open position for ejecting a die cast part, the cover half comprising a cover cavity retainer plate and a cover manifold retainer plate, said plates being stacked and clamped together to define a pocket to receive and support a cover mold block, passages to accommodate heating/cooling of said mold block and a passage for molten metal into said mold block,
the ejector half comprising an ejector cavity retainer plate, an ejector manifold plate and cast part ejector means, said plates being stacked and clamped together to define a pocket to receive and support an ejector mold block and fluid passages for cooling said ejector mold block,
a said cover mold block and a said ejector mold block being accessible in and removable from their respective pockets when the cover half and ejector half are in their open positions.

5,111,874

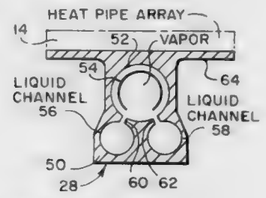
HEAT PIPE SWITCH

Robert L. Kosson, Mass, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Mar. 7, 1991, Ser. No. 666,013

Int. Cl.[5] F28D *15/02;* **F28F** *27/00*

U.S. Cl. 165—32 **8 Claims**



1. A heat pipe switch comprising:
a body;
a vapor channel formed in the body;
a first liquid channel formed in the body and continuously extending in parallel spaced relation to the vapor channel;
a first passageway existing between the vapor channel and first liquid channel;
a second liquid channel formed in the body and continuously extending in parallel spaced relationship to the vapor channel;
a second passageway existing between the vapor channel and the second liquid channel;
sufficient working fluid to fill only one liquid channel connected to an operative fluid cooler.

5,111,875

MODULAR HEAT INSTALLATION FOR PREMISES WITH WATER AS A HEAT TRANSMITTING MEDIUM

Curt Hammarstedt, Nygatan 6, S-360 75 Alstermo, Sweden

PCT No. PCT/SE89/00045, § 371 Date Aug. 1, 1990, § 102(e) Date Aug. 1, 1990, PCT Pub. No. WO89/07224, PCT Pub. Date Aug. 10, 1989

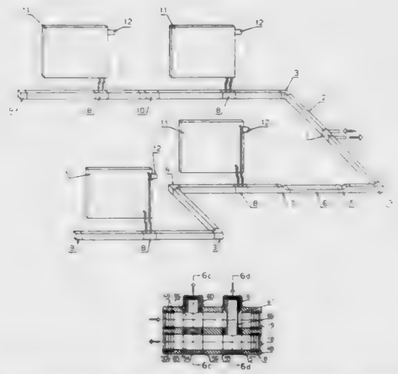
PCT Filed Feb. 6, 1989, Ser. No. 548,981

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 8801457[U]

Int. Cl.[5] F24D *3/00, 19/00;* **F28D** *1/03;* **F28F** *9/26*

U.S. Cl. 165—50 **19 Claims**

1. A heating system for building, using water as a heat transmitting medium, comprising two conduits (18, 19), one of which is a supply conduit and the other of which is a return conduit, and at least one of the two conduits being connected with at least one radiator (11), characterized in that the heating system comprises a plurality of different modular building elements (1–10) interconnectable with one another to form a flow path for the water therethrough, and each building elements (1–10) has a said supply and a said return conduit supported therein disposed adjacent and substantially parallel one another, wherein at least one of the building elements of the heating system is a connection element (8) which connects the at least one radiator (11) to the heating system, the connection element (8) comprises an elongate element carrying a said supply and a said return conduit and having two spaced apart bores (51) extending therethrough at right angles to the two conduits and disposed within a plane defined by the two conduits, a removable bore insert (54, 55) is positioned within each bore (51) and each bore insert having two transverse openings therethrough aligned with said supply and return conduits and interconnects the at least one radiator with a desired one of the two conduits of the connection element, and the bore inserts are removable from their respective bores, said bore inserts



(54, 55) comprising either of identical bore inserts, each interconnecting the at least one radiator with the same conduit, provided in the two bores of the connection element (8) so that a series piping system is achieved or dissimilar bore inserts, each interconnecting the at least one radiator with a different one of the two conduits, provided in the two bores of the connection element (8) so that a parallel piping system is achieved.

5,111,876

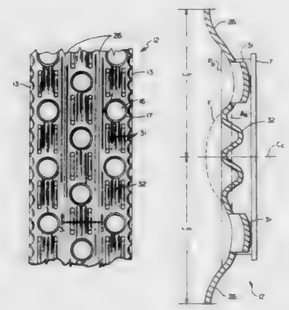
HEAT EXCHANGER PLATE FIN

Eric J. Nash, Manlius, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 31, 1991, Ser. No. 786,203

Int. Cl.[5] F28F *1/30*

U.S. Cl. 165—151 **6 Claims**



1. An improved plate fin (12) for a plate fin and tube heat exchanger (10), said plate fin having
an edge (13),
a first side,
a second side,
a fin collar base plane,
a row of circular fin collars (17) having a common centerline that is parallel to said edge with each fin collar extending

outward from said first side and from said fin collar base plane and

a main corrugation, sinusoidal in a plane perpendicular to said edge and having a first wavelength and a first axis of symmetry that lies in said base plane, in said fin,

the improvement comprising:

elongated lance elements (31), each having a longer dimension that is parallel to said edge, raised outward from said first side at points of maximum displacement of said fin outward from said base plane; and

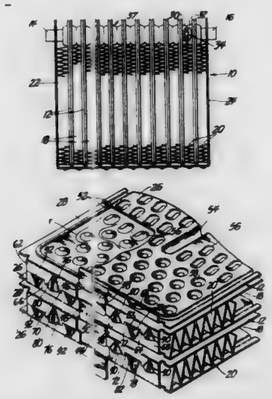
corrugated drainage channel sections (32), sinusoidal in said perpendicular plane and having a second wavelength and a second axis of symmetry parallel to said base plane, between pairs of adjacent fin collars in said row, replacing said main corrugation in said fin for one half said first wavelength.

5,111,877

MULTI-TUBE HEAT EXCHANGER WITH MECHANICALLY INTERLOCKED TUBES FORMED FROM MECHANICALLY INTERLOCKED PLATES

William J. Buchanan, Olcott, and Siegfried A. Wasse, Grand Island, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 1, 1991, Ser. No. 724,015
Int. Cl.[5] F28D *1/03*
U.S. Cl. 165—153 **4 Claims**



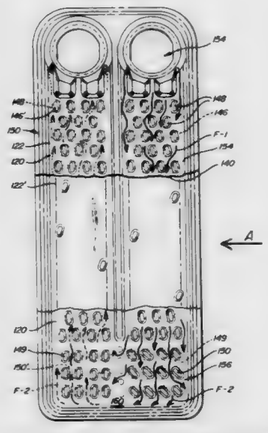
4. A plurality of tubes for operative connection in a multi tube heat exchanger, each of said tubes comprising first and second plates of thin wall sheet material adapted to be paired and connected together in faced alignment to form a fluid flow passage having an inlet for admitting a heat exchanger fluid thereto and having an outlet for discharging said fluid therefrom after circulating through a path within said tube, each of said plates being elongated and having a generally planar body and having protuberance means at one end thereof which extends in a general direction outward of the plane of said body to define a portion of said inlet and outlet of each tube, each of said plates having first and second laterally spaced flange means at the other end thereof which extends in the same direction as said protuberance means, said first flange means having laterally spaced projection means extending therefrom to define notch means therebetween, said second flange means having a projecting portion extending outwardly therefrom, each of said plate having a locking arm located between the first and second flange means and extending in a direction opposite to the direction of extension of said first and second flange means, locking arm slot means formed in said plate adjacent to said locking arm means, said locking arm of a first plate being received in said slot means in a second plate to lock a pair of said first and second plates into a tube, said projecting portion of said second flange means being adapted to fit in a non-overlapping manner within said notch means of an adjacent plate of an adjacent tube to space adjacent tubes from one another.

5,111,878

U-FLOW HEAT EXCHANGER TUBING WITH IMPROVED FLUID FLOW DISTRIBUTION

Prasad S. Kadle, Getzville, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 1, 1991, Ser. No. 724,033
Int. Cl.[5] F28D *1/03*
U.S. Cl. 165—176 **4 Claims**



3. A heat exchanger having a plurality of flattened tubes operatively interconnected together to provide passage for conducting a volatile heat exchanger fluid therethrough, connector means for interconnecting said tubes so that air can blow between tubes which are adjacent to one another, each of said tubes having a leading edge and a trailing edge and flattened side portion that are laterally spaced from one another, divider rib means in each of said tubes extending to a terminal end therein to define a plurality of discrete side flow section means disposed in each of said tubes, a specialized crossover section for transmitting a portion of said volatile heat exchanger fluid form one side flow section means to the other section means in each of said tubes and flow directing rib means entirely separate from said divider rib means and operatively formed in said crossover section in each of said tubs for directing a portion of said fluid throughout each of said crossover sections so that said heat exchanger has optimized potential for heat transfer by vaporization of said fluid.

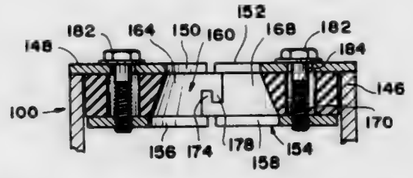
4. A tube for use in an evaporator for an air conditioning system comprising a pair of plates interconnected in a face to face relationship, said tube having an inlet and an outlet for fluid refrigerant flow therethrough, said tube further having a centralized divider rib terminating in an end within said tube and defining a plurality of separate side sections in series respectively connected to said inlet and to said outlet, a crossover passage spaced form the end of said divider rib and operatively connecting said side flow sections to one another to provide a passage for said fluid refrigerant flowing therethrough, and discrete fluid flow direction means spaced form said end of said divider rib and operatively formed in said crossover section to direct refrigerant into all areas of said crossover section while at least in a partial liquid state to thereby minimize the area of dry out which may occur in said crossover passage.

5,111,879

SANITARY LOCKING LIP SPLIT WELL SEAL

Terry H. Jozwiak, Witter, and Eugene C. Hunley, Jr., Rogers, both of Ark., assignors to Amtrol Inc., West Warwick, R.I.

Filed Jun. 6, 1990, Ser. No. 533,838
Int. Cl.[5] E21B *33/02*
U.S. Cl. 166—82 **4 Claims**



1. A well seal for cooperating with a casing of a wall, comprising:

(a) a first split plate;

(b) a second split plate having a size and shape to allow insertion within the well casing;

(c) a split packer, which is provided with at least one tapered through hole, positioned between first split plate (a) and second split plate (b), the split packer having a size and shape approximately the same as an inner dimension of the well casing to allow insertion therein, split packer (c) having at least two sections with interlocking lips to provide an effective sanitary seal by providing a leakproof labyrinth path to avoid a straight-through leak path; and

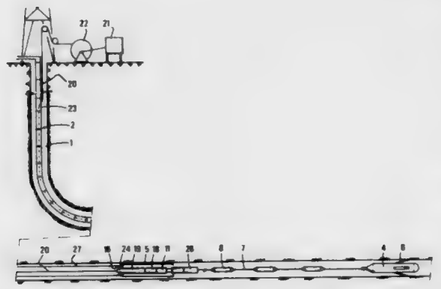
(d) clamp means for compressing split packer (c) between first split plate (a) and second split plates (b) to expand said split packer (c) into sealing engagement with an inner wall of the well casing.

5,111,880

SYSTEM FOR DRIVING A NON RIGID EXPLORATION DEVICE INTO A WELL WHERE ITS PROGRESSION BY GRAVITY IS DIFFICULT

Christian Wittrisch, Rueil-Malmaison, and Jean-Claude Du-Bois, Courdimanche, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Dec. 5, 1990, Ser. No. 622,835
Claims priority, application France, Dec. 5, 1989, 89 16170
Int. Cl.[5] E21B *47/12*
U.S. Cl. 166—250 **15 Claims**



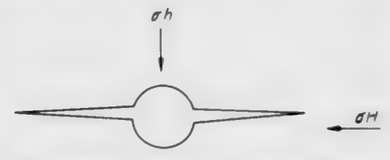
1. A guiding system for driving in wells, including deflected wells, where progression by effect of gravity is difficult, a non rigid exploration device comprising emitting means and receiving means in at least one first well tool and a second well tool linked with said at least first well tool by a supple connecting means, and anchoring members associated with motor means for releasably stopping said second well tool in the well, the guiding system comprising a tubular column with an inner cross-section larger than the outer cross-section of the at least first well tool including the receiving means, a guiding member provided with releasable anchoring means, with a first electric connecting means suitable for a deferred electric engagement with a second electric connecting means at the end of a multifunction cable means which is connected with a surface installation and with detachable locking means for tightly securing together the first and the second electric connecting means, with blocking means for engagement with said locking means at a position where the exploration device is in a backward position wherein the at least first well tool is contained in the column, and with stop means for said guiding member at a position in the end part where the exploration device is in a forward position wherein the at least first well tool and the second well tool are totally outside the column; said guiding system also including displacement means at the surface installation for displacing said exploration device from the backward position to the forward position by pulling back said column when said first well tool is stopped in the well.

5,111,881

METHOD TO CONTROL FRACTURE ORIENTATION IN UNDERGROUND FORMATION

Mohamed Y. Soliman, Lawton; James J. Venditto, Duncan, both of Okla., and A. Ali Daneshy, Leiden, Netherlands, assignors to Halliburton Company, Duncan, Okla.

Filed Sep. 7, 1990, Ser. No. 579,126
Int. Cl.[5] E21B *43/267, 49/00*
U.S. Cl. 166—250 **11 Claims**



1. A method of controlling hydraulic fracture orientation in hydrocarbon bearing formations penetrated by a wellbore comprising the steps of:

determining the anticipated fracture orientation of the hydrocarbon bearing formation;

perforating or notching the wellbore within the formation in a direction parallel to the anticipated fracture orientation;

perforating or notching the wellbore within the formation in a direction perpendicular to the anticipated fracture orientation;

first fracturing the formation in the direction parallel to the anticipated fracture orientation by injecting a fluid through said wellbore and into said formation; and

while injection is proceeding in the first fracture, fracturing the formation in a direction perpendicular to the anticipated fracture orientation.

5,111,882

USE OF TRACERS TO MONITOR IN SITU MISCIBILITY OF SOLVENT IN OIL RESERVOIRS DURING EOR

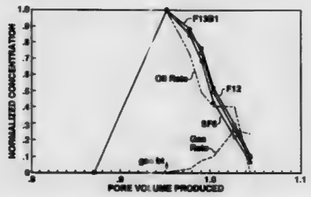
Joseph S. Tang, and Bradford C. Harker, both of Calgary, Canada, assignors to Exxon Production Research Company, Houston, Tex.

Filed Jun. 6, 1991, Ser. No. 711,284
Int. Cl.[5] E21B *49/00, 43/22*
U.S. Cl. 166—252 **6 Claims**

1. A method for monitoring in situ miscibility of a solvent with reservoir oil, comprising,

selecting at least two tracers from the group consisting of halo-hydrocarbons, halocarbons, sulfur hexafluoride, tritium gas, radioactive isotopes of inert gases, and tritiated or carbon 14tagged hydrocarbons, said tracers being miscible with the solvent and having different boiling points;

forming a mixture comprising said tracers and said solvent;
injecting said mixture into an injection well;
producing fluids from a production well in communication with said injection well; and



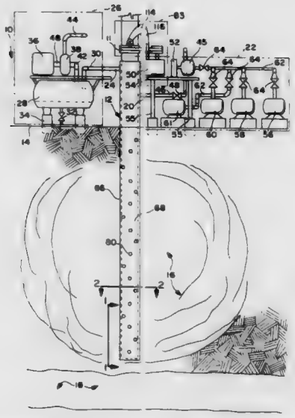
analyzing said fluids for the presence of said tracers to determine solvent miscibility with the reservoir oil.

5,111,883

VACUUM APPARATUS AND PROCESS FOR IN-SITU REMOVING UNDERGROUND LIQUIDS AND VAPORS

Winsor Savery, 14655 Champ Forest Dr., Houston, Harris County, Tex. 77069.

Filed May 24, 1990, Ser. No. 527,899
Int. Cl.[5] E21B *43/18, 43/22, 43/12*
U.S. Cl. 166—269 **59 Claims**



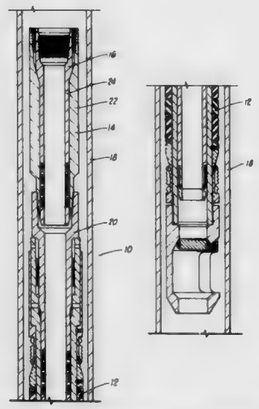
1. An apparatus for removing underground contaminants from a contaminated subsurface area including:
means, having an input and an output port, positioned in the contaminated subsurface area in a predetermined manner for releasing predetermined substances into selected areas of the contaminated subsurface area so that the substances and contaminates are intermixed and for recovering the intermixture of substances and contaminates from selected areas of the contaminated subsurface area;
means for rotating portions of the releasing and recovering means along a first predetermined path and for sliding the said portions of the releasing and recovering means along a second predetermined path;
means coupled to the input port of the releasing and recovery means for injecting the predetermined substances into the releasing and recovering means;
means coupled to the output port of the releasing and recovery means for applying pressure to the releasing and recovering means so that the intermixture of substances and contaminants can be extracted from the contaminated area; and
means coupled to the pressure applying means for collecting and storing the intermixture of substances and contaminates as the intermixture is extracted from the contaminated subsurface area.

5,111,884

METHOD AND APPARATUS FOR REWORKING WELLS

Steven G. Striech; Ricky D. Jacobi, both of Duncan, Okla.; Daniel C. Herndon, Littleton, Colo., and Louis C. Floyd, Corpus Christie, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 10, 1991, Ser. No. 727,714
Int. Cl.[5] E21B *23/02*
U.S. Cl. 166—382 **11 Claims**



1. A well completion apparatus for removably installing a new well casing string and a production tubing string in said new well casing string in a well bore having a casing installed therein; said well completion apparatus comprising:
a packer installed in said casing in said well bore, the packer having a plurality of lugs in the interior thereof;
an adapter assembly having a portion thereof releasably sealingly engaging the packer and having a portion thereof connected to said new well casing string; and
a stinger assembly having a portion thereof releasably, sealingly engaging a portion of the adapter assembly and having a portion thereof connected to said production tubing string.

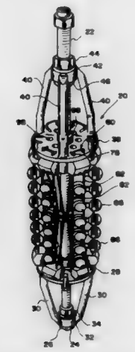
5,111,885

DECENTRALIZED CASING HOLE PUNCHER

Donald V. Umphries, New Iberia, La., assignor to Directional Wireline Service, Inc., Homa, La.

Filed Oct. 17, 1990, Ser. No. 598,932
Int. Cl.[5] E21B *43/117*
U.S. Cl. 166—297 **10 Claims**

1. A decentralized casing hole puncher comprising:
a centrally located, solid shaft extending the entire length of the hole puncher,
at least two spaced disks rotatably mounted on said shaft for changing of phasing,
lock means for securing said disks to said shaft at a desired degree of phasing,
mounting means extending between said at least two disks and spaced about a periphery of said at least two disks for mounting of explosive charges in contact with a periphery of an inner surface of a pipe string, spaced about the periphery, said mounting means providing for sliding movement of explosive charges so that the charges may be grouped tightly together to increase charge density or so that the changes may be spread apart to decrease charge density, and



biasing means mounted on and extending from said shaft for biasing said mounting means radially outwardly and for moving explosive charges mounted in said mounting means in relation to the inner surface of the pipe string.

5,111,886

CROSSLINKED HYDROXYETHYLCELLULOSE AND ITS USES

Hoai T. Dovan, Yorba Linda, and Richard D. Hutchins, Placentia, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed May 7, 1991, Ser. No. 696,625
Int. Cl.[5] E21B *43/26*
U.S. Cl. 166—300 **46 Claims**

31. A method for fracturing a subterranean formation penetrated at least partially by a well bore, the method comprising injecting a fracturing fluid through the well bore and into at least a portion of the formation, the fracturing fluid being injected at a rate and a pressure sufficient to fracture the subterranean formation, wherein the fracturing fluid is a composition capable of forming a gel, the composition comprising:
(a) a crosslinkable polymer selected from the group consisting of acrylic acid-acrylamide copolymers, acrylic acid-methacrylamide copolymers, polyacrylamides, polymethacrylamides, partially hydrolyzed polyacrylamides, partially hydrolyzed polymethacrylamides, polyvinyl alcohol, polyvinyl acetate, polyvinyl pyrrolidone, polyalkyleneoxides, carboxycelluloses, carboxyalkylhydroxyethyl celluloses, substituted hydroxyethylcellulose, heteropolysaccharides obtained by the fermentation of starch-derived sugar, ammonium salts thereof, and alkali metal salts thereof; and
(b) a lanthanide.

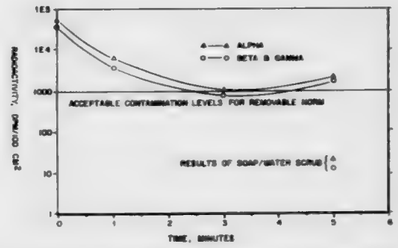
5,111,887

METHOD FOR REDUCING RADIOACTIVITY OF OILFIELD TUBULAR GOODS CONTAMINATED WITH RADIOACTIVE SCALE

Richard L. Morris, Duncanville, and James M. Paul, DeSoto, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 369,897, Jun. 22, 1989, Pat. No. 4,980,077, which is a continuation-in-part of Ser. No. 332,147, Apr. 3, 1989.
This application Nov. 16, 1990, Ser. No. 614,470
Int. Cl.[5] E21B *37/00, 43/25, 43/28*
U.S. Cl. 166—312 **5 Claims**

1. A method for reducing the radioactivity of oilfield tubular goods contaminated with radioactive, radium-containing scale of deposited alkaline earth metal sulfates, comprising contacting the scale on the tubular goods with an aqueous composition for dissolving alkaline earth sulfate scale comprising an aqueous alkaline solution having a pH of from about 8 to about 14, from about 0.1M to about 1.0M of a chelating agent comprising a polyaminopolycarboxylic acid or a salt of such an acid, and



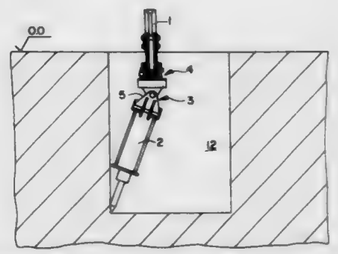
from about 0.1M to about 1.0M of oxalate anion to improve the scale removing characteristics of the composition, for a time sufficient to remove the scale from the tubular goods.

5,111,888

HAMMER-SWINGING MECHANISM

Alois Wimmer, Gitzen 85, A-5322 Hof b.Salzburg, Salzburg, Austria

PCT No. PCT/AT89/00050, § 371 Date Jan. 26, 1990, § 102(e) Date Jan. 26, 1990, PCT Pub. No. WO89/11568, PCT Pub. Date Nov. 30, 1989
PCT Filed May 18, 1989, Ser. No. 465,095
Claims priority, application Austria, May 20, 1988, A1327/88
Int. Cl.[5] E21C *11/00*; B25D *17/28*
U.S. Cl. 173—42 **3 Claims**

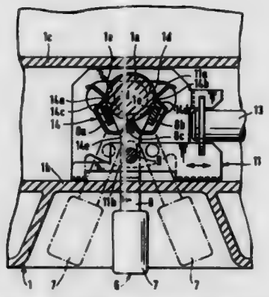


1. Mounting for a swingable suspension of a cutter hammer to a boom of an excavator which is floatingly suspended and swingable transversely to the tilting plane about an axis which extends in the tilting plane of the boom, characterized in that the cutter hammer (2) is locked in the desired swinging position relative to the boom (1) by a form-fitting coupling (6, 7, 8, 9) comprising a bolt (6) shiftable in an axial direction of the bolt by a hydraulic piston/cylinder unit mounted on the cutter hammer, said bolt extending through guide bores within eyelets on the cutter hammer, a swivel plate mounted to the boom and extending between the eyelets, said swivel plate having locking bores for selectively receiving the bolt to lock the cutter hammer in a desired angular position relative to the boom.

5,111,889
DRILLING TOOL SPEED SHIFTING UNIT

Anton Neumaier, Fürstenfeldbruck, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Mar. 25, 1991, Ser. No. 674,564
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1990, 4010037
Int. Cl.[5] B23B *45/02*
U.S. Cl. 173—48 4 Claims



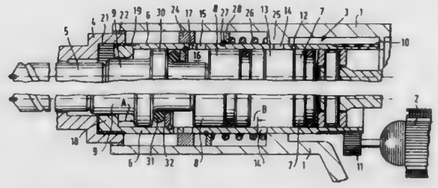
1. Drilling tool comprising a shifting unit including a shifting lever (**6**) with shifting cam means (**9**) for switching between different operating speeds of the drilling tool, said shifting lever (**6**) being rotatably displaceable between different operating positions relative to a tool housing (**1**), a spring clip (**14**) mounted on said shifting lever, said spring clip comprising detent means (**14***a*, **14***b*) for engagement in recesses (**1***d*, **1***e*) defining operating positions of the lever (**6**), wherein the improvement comprises that said spring clip (**14**) is rotatable by said shifting lever (**6**) relative to said tool housing (**1**), said spring clip (**14**) is a shaped member with said detent means (**14***a*, **14***b*) comprising a pair of detents (**14***a*, **14***b*) located substantially diagonally opposite one another adjacent opposite ends of said spring clip, said recesses (**1***d*, **1***e*) are formed in said housing and comprise two pairs of said recesses (**1***d*, **1***e*) with each pair located diagonally opposite one another on a part (**1***a*) of said housing.

said pairs of recesses (**1***d*, **1***d*, **1***e*, **1***e*) are formed in said part and said part is a bolt-like part (**1***a*) formed by said tool housing (**1**) in the interior thereof, said spring clip (**14**) is in engagement with and is rotatable around a circular surface of said bolt-like part (**1***a*), said detents (**14***a*, **14***b*) in said spring clip are located on diametrically opposite sides of an axis of rotation formed by said bolt-like part, and said two pair of recesses (**1***d*, **1***d*, **1***e*, **1***e*) arranged diametrically opposite one another in the circular surface of said bolt-like part (**1***a*) for defining the operating positions of the drilling tool, said spring clip (**14**) comprises driving shoulders (**14***c*, **14***d*) extending outwardly from said detents (**14***a*, **14***b*) relative to said bolt-like part (**1***a*) and arranged to cooperate with said shifting lever (**6**) for rotationally displacing said spring clip, so that said detents (**14***a*, **14***b*) selectively engage one of said pairs of recesses (**1***d*, **1***d*, **1***e*, **1***e*) for securing said shifting lever (**6**) in an operating position, said shifting lever (**6**) comprises a gripping member (**7**) located on the exterior of said tool housing (**1**) and an elongated arm (**8**) secured on the outside of said tool housing to said gripping member (**7**) and extending through an opening in said tool housing into the interior of said housing and rotationally mounted on said bolt-like part (**1***a*), and means (**8***c*) on said arm (**8**) for holding said spring clip (**14**) on said bolt-like part (**1***a*) during rotational movement of said lever (**6**) relative to said bolt-like part (**1***a*).

5,111,890
HAMMER DRILL

Ulrich Ranger; Karl Wanner; Johann Kaltenecker, all of Leinfelden-Echterdingen; Manfred Hellbach, Ostfildern, and Gerhard Meixner, Filderstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE89/00478, § 371 Date Jan. 29, 1991, § 102(e) Date Jan. 29, 1991, PCT Pub. No. WO90/01400, PCT Pub. Date Feb. 22, 1990
PCT Filed Jul. 19, 1989, Ser. No. 646,606
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1988, 3826213
Int. Cl.[5] B25D *9/04*
U.S. Cl. 173—104 13 Claims

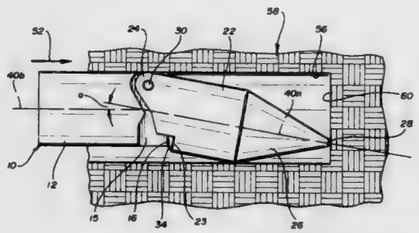


1. A power hammer drill, comprising a housing; a tool holder located in said housing; an air cushion striking mechanism arranged in said housing for driving a tool and including a striker, a reciprocating piston for displacing said striker, and an axially displaceable guide tube for guiding said piston in reciprocating movement thereof and having at least one control opening for venting an air cushion; and means for holding the striker in a forward position thereof adjacent to said tool holder in an idling condition of said hammer drill, said holding means comprising a guide element supported in said housing for guiding said guide tube during axial displacement of said guide tube, said guide element being fixed in said housing against axial displacement, said control opening having one of closed and open conditions in accordance with an axial position of said guide tube.

5,111,891
BORING HEAD FOR A SUBSURFACE SOIL-BORING APPARATUS

Frank R. Kinnan, Camas Valley, Oreg., assignor to Underground Technologies, Byron, Calif.

Filed Nov. 8, 1990, Ser. No. 610,520
Int. Cl.[5] E21B *7/26*
U.S. Cl. 175—21 20 Claims



1. A boring head for a subsoil boring apparatus capable of imparting rotation and advancing said head via a pipe string coupled to said head comprising:

a body portion having a first end and a second end extending along a longitudinal axis, said body portion having a first surface and a second surface;

said first end of said body portion coupled to a pipe string;

a nose portion having a forward tapered portion for engaging the subsoil adjacent said boring head and a rearward portion, said nose portion having a third surface and a fourth surface;

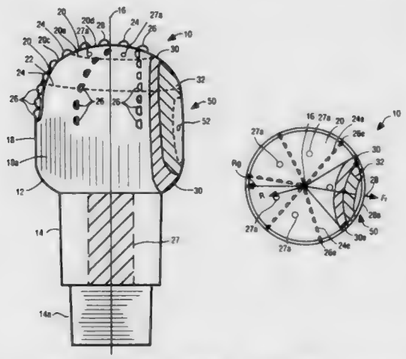
a pivotal coupling for joining said nose portion to said body portion with said second end of said body portion adjacent said rearward portion of said nose portion, said pivotal coupling being located on an axis parallel with perpendicular to and displaced from the longitudinal axis of said body portion and adjacent said second surface and said fourth surface, said nose portion capable of taking positions from alignment along the longitudinal axis of said body portion with said second surface adjacent said fourth surface to an acute angle of its longitudinal axis with the longitudinal axis of said body portion; and

biasing means coupled between said body portion and said nose portion adjacent said rearward portion of said nose position opposite said pivotal coupling and adjacent said first surface and said third surface to return the longitudinal axis of said nose portion into alignment with the longitudinal axis of said body portion, said body portion and said nose portion remaining aligned along a common longitudinal axis when said boring head is rotated and advanced for boring along said longitudinal axis and said nose portion being deflectable with respect to said body portion when said boring head is advanced without rotation to move in a direction at an acute angle to the longitudinal axis of said body portion.

5,111,892
IMBALANCE COMPENSATED DRILL BIT WITH HYDROSTATIC BEARING

L. Allen Sinor, 2250 S. Oswego Pl., Tulsa, Okla. 74114, and Tommy M. Warren, Rte. 1, Box 130-10, Coweta, Okla. 74429

Filed Oct. 3, 1990, Ser. No. 592,151
Int. Cl.[5] E21B *10/60*
U.S. Cl. 175—65 9 Claims



1. A subterranean rotary drill bit comprising:

a rotary drill bit body having a base portion disposed about a longitudinal bit axis, a gauge portion disposed about the bit axis and extending from the base portion, and a face portion disposed about the bit axis extending from the gauge portion;

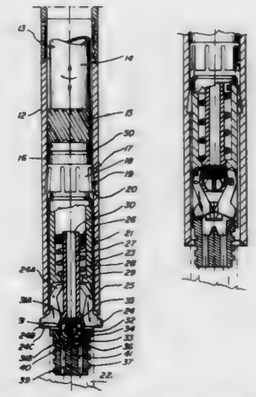
a plurality of cutting elements fixedly disposed on and projecting from the face portion and spaced from one another; and

a hydrostatic bearing means disposed in the gauge portion for forcing drilling fluid out the hydrostatic bearing means towards a borehole wall.

5,111,893
DEVICE FOR DRILLING IN AND/OR LINING HOLES IN EARTH

Alf G. Kvello-Aune, N-6598 Foldefjorden, Norway

Filed Dec. 24, 1990, Ser. No. 632,979
Int. Cl.[5] E21B *10/66*
U.S. Cl. 175—258 15 Claims



1. A device for drilling holes in earth, rock or similar bodies, comprising a casing which is designed to be lowered together with a drilling unit, wherein the drilling unit is mounted on a rotating drilling string which is centrally positioned within the casing and the drilling string being provided with a first abutment which on downward movement of the drilling string is pressed against a second abutment within the casing to press the casing downward, said drilling string being provided with a plurality of cutters which can either be pivoted between an active and a passive position by activating means, said activating means comprising a hollow activating member which is operated by drilling fluid passing through the drilling string, characterized in that the activating member further includes an annular piston which is received within a cylinder arranged at the lower end of the drilling string, said annular piston connected to a concave rod and an activating cam having a passage way communicating with a valve for controlling the drilling fluid supplied to the cutters, and the lower end of the activating member is arranged to operatively engage the drilling cutters to move them to and from the active and passive positions and said valve being arranged to open when the cutters are moved to the active position.

5,111,894
UNINTERRUPTED DRILL BIT

Edward B. Williams, Jr., College Station, Tex., assignor to Sybil J. Williams, Bryan, Tex.

Continuation of Ser. No. 574,497, Aug. 23, 1990, abandoned, which is a continuation of Ser. No. 476,123, Feb. 2, 1990, abandoned, which is a continuation of Ser. No. 352,690, May 10, 1989, abandoned, which is a continuation of Ser. No. 224,270, Jul. 25, 1988, abandoned, which is a continuation of Ser. No. 78,263, Jul. 27, 1987, abandoned. This application Feb. 19, 1991, Ser. No. 657,293
Int. Cl.[5] E21B *10/12*
U.S. Cl. 175—373 2 Claims

1. A set of cones adapted for use with a drill bit for drilling a bore in the earth; said set of cones comprising:

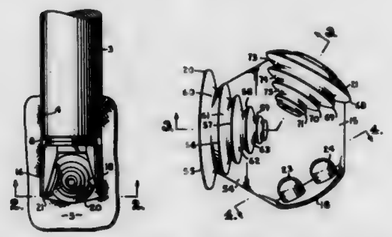
(a) first and second cones each having bases and axes of rotation and each being adapted to be rotatably mounted on a drill bit;

(b) said first cone having attached thereto and extending radially outward therefrom in adjacent and spaced align-

ment a plurality of cutting edges; each of said cutting edges being generally continuous and circular so as to provide a generally uninterrupted cut on a surface over which said first cone is rotated;

(c) said second cone having attached thereto and extending radially outward therefrom in adjacent and spaced alignment one less cutting edge than said first cone; said cutting edges of said second cone being generally continuous and circular so as to provide a generally uninterrupted cut on a surface over which said second cone bit is rotated; and wherein:

(d) said first and second cones are adapted to be secured to a drill bit such that at least one cutting edge of said second cone is interspaced between a pair of adjacent cutting



edges of said first cone such that a path of at lest one cutting edge of said second cone passes between paths traversed by a pair of adjacent cutting edges of said first cone;

(e) said cutting edges of said first and second cone are parallel to a base of each of said first and second cone; each of said cutting edges being smaller than a previous cutting edge starting at the cutting edge closest to a respective cone base;

(f) the ratio of base to height of said first cone is about 1.8:1;

(g) the ratio of base to height of said second cone is about 1.8:1; and

(h) the ratio of the base of said first cone to the base of said second cone is about 1.15:1.

5,111,895

CUTTING ELEMENTS FOR ROTARY DRILL BITS

Nigel D. Griffin, 15 Paynes Meadow, Whitminster, Gloucestershire, England

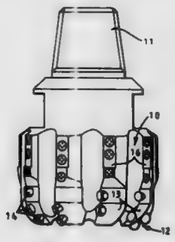
Continuation-in-part of Ser. No. 321,772, Mar. 10, 1989, Pat. No. 4,947,945, and a continuation-in-part of Ser. No. 479,958, Feb. 14, 1990, abandoned. This application Apr. 16, 1990, Ser. No. 510,160

Claims priority, application United Kingdom, Mar. 11, 1988, 8805789; Feb. 14, 1989, 8903246; Nov. 10, 1989, 8925409

The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.

Int. Cl.[5] E21B *10/46, 10/52*

U.S. Cl. 175—425 **15 Claims**



1. A cutting element for a rotary drill bit comprising a thin superhard table of polycrystalline diamond material, defining a front cutting ace, bonded to a less hard substrate, wherein the substrate is formed from a material comprising at least about 50% (by weight) tungsten metal.

5,111,896

BELT CONVEYOR WEIGHBRIDGE

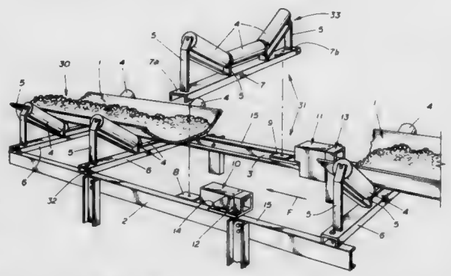
Vincenzo Porcari, and Gianluigi Riva, both of Mipano, Italy, assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Apr. 12, 1991, Ser. No. 685,234

Claims priority, application Italy, Apr. 20, 1990, 20091 A/90

Int. Cl.[5] G01G *11/14*

U.S. Cl. 177—16 **10 Claims**



1. A weighbridge for a conveyor belt assembly for measuring a weight of a section of conveyor belt carrying a load of material to be transported along the conveyor belt assembly, with said assembly having frame members positioned longitudinally alongside the conveyor belt at opposite sides thereof and a plurality of crossmembers extending beneath the conveyor belt transversely thereof and carried on the frame members for engaging an underside of the conveyor belt and supporting said conveyor belt, said weighbridge comprising:

A) one of said crossmembers, with said member being mounted for movement of at least one end thereof relative to an adjacent frame member in a direction generally normal to an longitudinal axis of said conveyor belt under the weight of the conveyor belt and constituting a weighbridge crossmember;

B) a load sensing assembly mounted on said adjacent frame member having a load support portion to which the movable end of the weighbridge crossmember is detachably secured for supporting the crossmember; and

C) means for selectively mounting the load sensing assembly on said adjacent frame member in a first position in which the load assembly and weighbridge crossmember are free to move longitudinally and transversely with respect to said adjacent frame member within a limited range of movement, and a second adjacent frame member against such movement, whereby on installation and adjustment of the weighbridge the mounting means is moved to its first position allowing the load sensing assembly to relieve longitudinal and transverse forces otherwise induced in the weighbridge, and prior to use of the conveyor assembly the mounting means is moved to said second position for affixedly mounting the load sensing assembly in condition free of induced longitudinal and transverse forces.

5,111,897

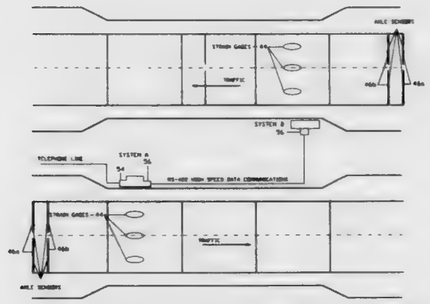
BRIDGE WEIGH-IN-MOTION SYSTEM

Richard E. Snyder, Russell; Fred Moses, Cleveland Hts.; Bryan E. Burke, Cleveland Hts., and Dean A. Kennedy, Cleveland Hts., all of Ohio, assignors to Bridge Weighing Systems, Inc., Cleveland, Ohio

Filed Sep. 27, 1990, Ser. No. 589,468

Int. Cl.[5] G01G *19/52*

U.S. Cl. 177—132 **26 Claims**



1. A self-operating apparatus for weighing a moving vehicle, comprising:

a plurality of strain gauges adapted to be attached to existing bridge structures, each of said strain gauges adapted to sense strain sustained by said bridge structure when a vehicle passes thereover, and outputting an analog strain signal in response to said strain;

at least one pair of axle sensors, each of said axle sensors adapted to automatically sense a vehicle axle passing thereover and output an axle sense signal in response thereto;

means for converting said analog strain signal to a digital strain signal;

central processing circuitry adapted to (i) perform first computations on said axle sense signal to determine vehicle speed and vehicle axle spacing, and (ii) perform second computations on said digital strain signal and said axle sense signal to determine vehicle weight, said central processing circuitry further adapted to output results of said first and second computations;

random access memory circuitry directly accessible by a digital computer and adapted to receive and retain said results of said first and second computations;

means to supply power to said strain gauges, said axle sensors, said signal converting means, said central processing circuitry, and said random access memory circuitry; and

electrical interconnection means for electronically interconnecting said means to supply power, said strain gauges, said axle sensors, said signal converting means, said central processing circuitry and said random access memory circuitry.

5,111,898

VARIABLE CONFIGURATION INTERVENTION VEHICLE FOR ROUGH GROUND

Jean R. Argouarc'h, Bures-Sur-Yvette, France, assignor to Compagnie Generale d'Electricité , Paris, France

Filed Oct. 29, 1990, Ser. No. 604,625

Claims priority, application France, Oct. 31, 1989, 89 14281

Int. Cl.[5] B62D *55/00*

U.S. Cl. 180—9.52 **4 Claims**

1. A variable configuration intervention vehicle for rough ground, said vehicle comprising:

(a) a vehicle body having a length and a width respectively in a longitudinal direction and in a transverse direction;

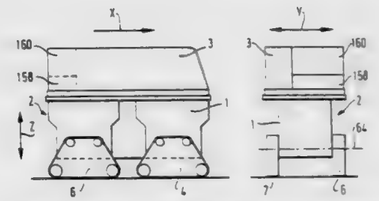
(b) propulsion units bearing, in operation, against said ground by applying support forces thereto which can be represented by support parameters, so as to support said vehicle body and to enable it to be propelled along said longitudinal direction;

(c) propulsion unit displacement actuators for displacing said propulsion units relative to said vehicle body;

(d) advance motors supplying each of said propulsion units with mechanical advance drive for propelling said vehicle;

(e) propulsion unit carrying means carried by said vehicle body to carry said propulsion units, said propulsion unit carrying means comprising, for each of said lateral propulsion units,

(i) a propulsion unit carrying structure which is movable and guided relative to said vehicle body to enable said structure to move in translation relative thereto at least over a displacement range extending in a corresponding displacement direction perpendicular to said transverse



direction, said structure carrying said propulsion unit; and

(ii) a vertical guide structure carrying said propulsion unit and guided vertically to provide it with suspension displacement in one of said displacement ranges which is vertical; and

(iii) a longitudinal guide structure carrying said vertical guide structure by means of suspension means for suspending said vehicle, said longitudinal guide structure being guided longitudinally relative to said vehicle body and being driven by said positioning actuator to impart one of said controlled positions thereto within one of said displacement ranges, which range is longitudinal; and

(iv) propulsion unit positioning means comprising a positioning actuator which constitutes one of said propulsion unit displacement actuators and which serves to impose a controlled position within one of said displacement ranges on said propulsion unit carrying structure.

5,111,899

MOTORIZED ROLLING-CHAIR

Jean Reimann, Puplinge, Switzerland, assignor to Aluweld S.A., Geneva, Switzerland

Filed May 8, 1990, Ser. No. 520,453

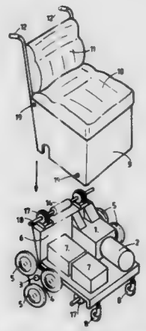
Claims priority, application Switzerland, May 17, 1989, 1836/89

Int. Cl.[5] B60K *1/00*

U.S. Cl. 180—65.1 **1 Claim**

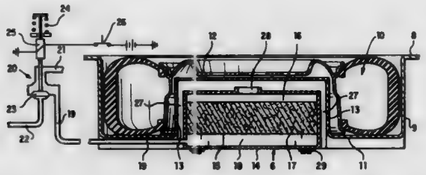
1. Motorized rolling-chair, comprising a motor-transmission assembly, an output shaft of which extends on either side of a transmission gear and comprises at each of its ends a rolling train; the motor-transmission assembly carrying a support on which are fastened batteries and which is provided at its lower front end with at least a roller; a casing on which the seat and the back of the armchair, in synthetic material, are directly injected; and rapid fixing means to couple and uncouple the casing to the motor-transmission assembly, wherein the rapid

fixing means of the casing onto the motor-transmission assembly comprise at least one telescopic member fastened to the



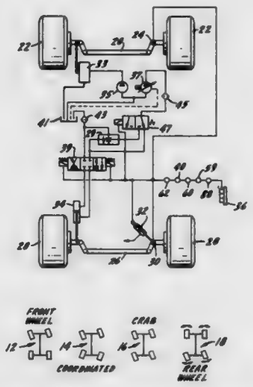
support by blocks, the ends of this telescopic member being adapted to cooperate with holes provided in the casing.

5,111,900
MOTOR VEHICLE
Wulf Leitermann, Bad Wimpfen, Fed. Rep. of Germany, assignor to Audi AG, Neckarsalm, Fed. Rep. of Germany
PCT No. PCT/EP89/00095, § 371 Date Aug. 3, 1990, § 102(e) Date Aug. 3, 1990, PCT Pub. No. WO89/08034, PCT Pub. Date Sep. 8, 1989
PCT Filed Feb. 2, 1989, Ser. No. 573,031
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805711
Int. Cl.[5] B60K *15/035*
U.S. Cl. 180—69.4 **2 Claims**



1. A motor vehicle powered by an internal combustion engine with a fuel tank comprising:
a filling tube with a tank cap,
an apparatus for trapping vapors escaping from the fuel tank while said tank is being filled, said apparatus having a canister that is in communication with the atmosphere and is brought into communication alternately with the fuel tank and with the air intake system of the internal combustion engine; and,
a trunk compartment with a recess for accommodating a spare wheel with a web, wherein a bottom of the recess is drawing upwardly in the area of the web of the spare wheel to form a pot having a circumferential wall;
wherein the canister is disposed at least partially in said pot and,
wherein an annular gap open at the bottom is formed between a peripheral wall of the canister and the circumferential wall of the pot, said gap being in communication with the interior of the canister through at least one opening in the top of the canister.

5,111,901
ALL WHEEL STEERING SYSTEM
Anthony A. Bachhuber, and Donald H. Verhoff, both of Oshkosh, Wis., assignors to Oshkosh Truck Company, Oshkosh, Wis.
Continuation of Ser. No. 390,728, Aug. 8, 1989, abandoned. This application Feb. 27, 1991, Ser. No. 660,981
Int. Cl.[5] B62D *6/02*
U.S. Cl. 180—140 **20 Claims**

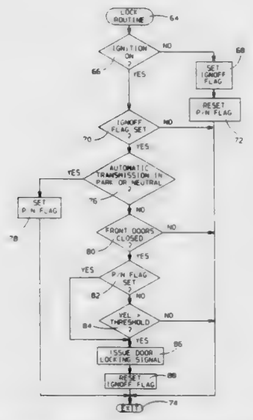


1. A four wheel steering system for a vehicle comprising front and rear pairs of steerable wheels, control means for selecting a plurality of steering modes, said modes including a first mode in which steering of said rear pair of wheels is generally fixed, a second mode in which movement of said rear pair of wheels is generally opposite to that of said front pair, a third mode in which movement of said rear pair is generally similar to that of said front pair, and a fourth mode in which movement of said rear and front pairs of wheels can be controlled independently and simultaneously from a single steering control location, locking means for limiting steering of said rear pair of wheels, said locking means being automatically actuated when said vehicle exceeds a predetermined vehicle speed.

5,111,902
AUTOMATIC POWER DOOR LOCK SYSTEM
Arthur R. Sundeen, Lansing; Darryl L. Burris, Holt; Roger A. Cook, Okemos, and Dennis M. Lombardo, Haslett, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed May 13, 1991, Ser. No. 699,034
Int. Cl.[5] B60R *28/12*
U.S. Cl. 180—281 **10 Claims**

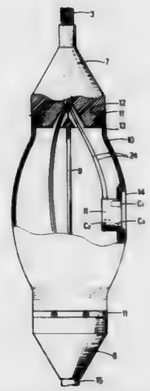
1. A system for automatically locking the doors of a vehicle equipped with power door locks, which provides a first mode of operation for vehicles having automatic transmissions and a second mode of operation for vehicles having manual transmissions, the system comprising:
means for sensing vehicle operating conditions necessary for automatically locking vehicle doors in accordance with the first and second modes of operation;
means for determining whether the vehicle is equipped with the automatic type of transmission;
means for locking the power door locks after sensing the necessary operating conditions associated with the first mode of operation, when the vehicle is determined to be equipped with the automatic type of transmission; and

means for locking the power door locks after sensing the necessary operating conditions associated with the second



mode of operation, when the vehicle is determined not to be equipped with the automatic type of transmission.

5,111,903
SIGNAL RECEIVING SYSTEM ABLE TO BE COUPLED WITH THE WALL OF A WELL OR DRILLING
Patrick Meynier, Garennes, France, assignor to Institut Francais du Petrole, Reuil-Malmaison, France
Continuation of Ser. No. 582,088, Sep. 14, 1990, abandoned, which is a continuation of Ser. No. 410,417, Sep. 21, 1989, abandoned. This application Oct. 10, 1991, Ser. No. 774,306
Claims priority, application France, Sep. 21, 1988, 88 12422
Int. Cl.[5] G01V *1/40;* **E21B** *33/127*
U.S. Cl. 181—102 **19 Claims**



1. System for acquiring and receiving signals in a well or drilling at an operating depth, the system comprising at least one closed expansible chamber adapted to be lowered into the well at an extremity of a cable and being provided with a ductile wall, a plurality of seismic signal sensing means each respectively accommodated in a housing, said housings of said plurality of seismic signal sensing means being integrated in said ductile wall at different locations along said at least one closed expansible chamber, local hydraulic means including hydraulic circuits and means for maintaining hydraulic fluid in said hydraulic circuits at a minimum pressure equal to a pressure existing in the well at the operating depth for intermittently injecting hydraulic fluid into the at least one closed expansible chamber so as to expand the same and bring the ductile wall into firm pressing contact with an elongated portion of the well whereby each of said seismic signal sensing means integrated into said ductile wall is directly coupled to formations traversed by the well in an expansion position of said at least one closed expansible chamber.

5,111,904
MOLDED ARTICLE HAVING ELASTOMERIC MOLD MEMBER USED THEREWITH
Thomas J. Packard, Somerset, Wis., and James H. Quackenbush, Eden Prairie, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jun. 2, 1989, Ser. No. 360,473
Int. Cl.[5] A61B *7/02*
U.S. Cl. 181—131 **17 Claims**

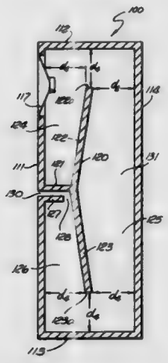


10. A stethoscope, comprising: flexible tubing having at least one sound passageway, a chestpiece, and at least one ear tube, said tubing connecting said sound passageway between said chestpiece and said ear tube, said tubing having embedded therein an elastomeric member having a flexibility compatible with said tubing.

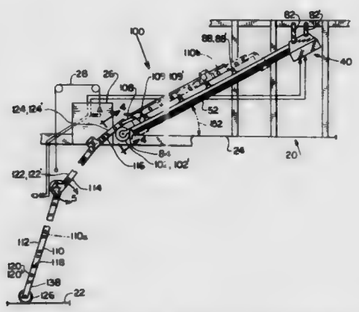
5,111,905
SPEAKER ENCLOSURE
Howard Rodgers, Canoga Park, Calif., assignor to Rogersound Labs, Inc., Canoga Park, Calif.
Continuation-in-part of Ser. No. 443,914, Nov. 30, 1989. This application Sep. 20, 1990, Ser. No. 585,489
Int. Cl.[5] H05K *5/00;* **A47K** *81/06;* **G10K** *11/00*
U.S. Cl. 181—152 **15 Claims**

8. An enclosure for a loudspeaker comprising:
a front wall having a first aperture therethrough for receiving the loudspeaker;
a top wall, a bottom wall, a rear wall and a pair of side walls coupled to said front wall to form a generally box-like structure enclosing an interior volume, said box-like structure having a second aperture therethrough;
an at least partially inclined partition abutting said front wall below said aperture and extending between said side walls, said partition disposed so as to define a folded acoustic path within said interior volume between said first and second apertures, said folded acoustic path having a region of decreasing cross-sectional area proximate to said second aperture, wherein said partition comprises a first generally horizontal portion abutting said front wall,

a second inclined portion extending upwardly from said first portion, and a third inclined portion extending downwardly from said first portion so as to define a generally "Y"-shaped partition.

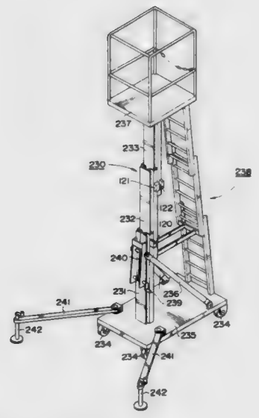


5,111,906
RETRACTABLE LADDER APPARATUS
Auguste Abadia, 2360 Greenfield, Los Angeles, Calif. 90064
Filed Feb. 7, 1991, Ser. No. 652,082
Int. Cl.[5] E06C *9/06*
U.S. Cl. 182—19 **19 Claims**



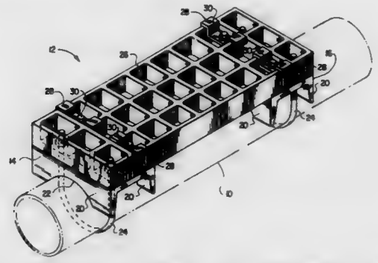
1. A ladder apparatus providing access between a lower floor and an upper floor, comprising:
a carrier;
reversible moving means to move said carrier;
a ladder removably connected to said carrier, said ladder having a lower end; and
support means for said ladder to move thereon;
said ladder thereby movable on said support means between a position where said ladder is substantially contained within the upper floor and a position where said lower end abuts the lower floor, said ladder adjustable on and removable from said carrier.

5,111,907
LIFTING APPARATUS
Mitsuhiro Kishi, Tochigi, Japan, assignor to Japanic Corporation, Tochigi, Japan
Filed Feb. 19, 1991, Ser. No. 657,636
Claims priority, application Japan, Feb. 20, 1990, 2-39374; Jul. 16, 1990, 2-187622
Int. Cl.[5] E06C *5/04;* **E04G** *1/22*
U.S. Cl. 182—63 **22 Claims**



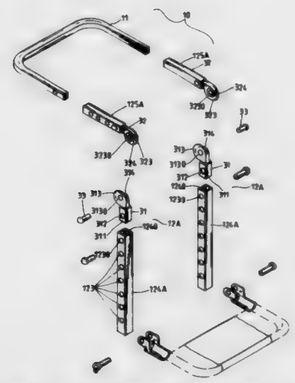
1. A lifting apparatus comprising:
a base;
a generally horizontally enlarged platform positioned above said base;
a vertically extendable mast assembly connected between said base and said platform for effecting raising and lowering of the platform relative to the base, said mast assembly having a plurality of masts including a vertically elongate first mast which is fixed to said base and projects upwardly therefrom, a vertically elongate second mast which is vertically movably supported on said first mast and is vertically movable from a lowered position adjacent said first mast into a raised position wherein said second mast projects vertically upwardly a significant extent above said first mast, a vertically elongate third mast which is vertically movably supported on said second mast and is vertically movable from a lowered position adjacent said second mast into a raised position wherein said third mast projects vertically upwardly a significant extent above said second mast, and a fourth mast which is vertically movably supported on said third mast for vertical movement between raised and lowered positions relative to said third mast, said fourth mast being fixed to said platform;
lifting means cooperating between said base and said platform for raising and lowering of said platform relative to said base, said lifting means including winding means mounted on the base, pulleys provided at upper and lower ends of each of said first, second and third masts, and cable means wound around said pulleys and having opposite ends thereof connected to the winding means and said fourth mast; and
sequencing means cooperating between said plurality of masts for controlling raising of said platform from a fully lowered position to a fully raised position by first causing solely raising of said fourth mast followed by raising of said third and fourth masts as a unit and thereafter followed by raising of said second and third and fourth masts as a unit.

5,111,908
PIPE STEP
John T. Reiter, Ingleside; David M. Ellis; Rick D. Smith, both of Corpus Christi, and Roger D. Leach, Portland, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.
Filed Oct. 3, 1991, Ser. No. 770,400
Int. Cl.[5] E06C *7/08*
U.S. Cl. 182—92 **3 Claims**



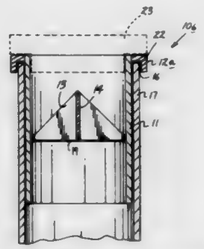
1. A pipe step for providing a generally flat supporting surface on the upper surface of a generally horizontal pipe of preselected diameter comprising:
a pair of channel members each having a web portion and a pair of flange portions, each flange portion having a transverse arc of diameter corresponding to said pipe diameter cut therein,
a rectangular section of grating fastened to and extending between the web portions of said channel members,
a pair of U-bolts of diameter corresponding to said pipe diameter, each fastened to the web portion of one of said channel members between the flange portions thereof and in alignment with transverse arcs cut in said flange portions.

5,111,909
STEP FOR ATTACHMENT TO A WHEEL
Steve Liu, No 304, Chung Cheng South Road, Yung Kang Hsiang, Tainan Hsien, Taiwan
Filed Oct. 1, 1991, Ser. No. 769,240
Int. Cl.[5] B60R *3/00*
U.S. Cl. 182—150 **3 Claims**



1. A portable step apparatus for removable connection to a vehicle wheel for providing a stable platform for supporting a person while working on said vehicle, the apparatus comprising:
a support frame assembly means having a spaced-apart side supporting frame members held in a spaced-apart relationship, each of the side supporting frame members comprising a leg and an adjustment portion extending from a top end of the leg over the top of the vehicle wheel, both of the leg and adjustment portion being formed with a plurality of openings at regular intervals;
an internal passageway extending from one end of the adjustment portion towards the top end of the leg;
a U-shaped gripping member having a pair of tubular attachment bars bent from two ends of an elongated member, each of the tubular attachment bars being formed with a opening and dimensioned to slide along the respective internal passageway of the adjustment portion;
lock means accommodated in the tubular attachment bars to secure one of the tubular attachment bars to one of the adjustment portions at a plurality of predetermined locations to adjust a distance between the elongated member of the U-shaped gripping member and the legs of the side supporting frame members for an attachment to the vehicle wheel;
a planar member; and
means for adjustably and hingedly attaching the planar members to the legs of the side supporting frame members comprising a pair of bracket members each having a base rigidly attached to a bottom of the planar member and two spaced-apart plates extending upwardly then rearwardly from the planar member and having horizontally aligned openings adapted to correspond to one of a plurality of the openings of the legs for releasably connecting the planar member to the legs with pins at a plurality of predetermined locations so that the planar member is collapsible when not in use.

5,111,910
OIL FILL TUBE INSERT
William A. Sheppard, Jr., 5128 McNamara Dr., Fredericksburg, Va. 22407
Filed Jan. 14, 1991, Ser. No. 640,611
Int. Cl.[5] F01M *11/04*
U.S. Cl. 184—1.5 **1 Claim**



1. An oil fill tube insert in combination with a cylindrical oil fill tube, the cylindrical oil fill tube defined by a predetermined internal diameter, and wherein the cylindrical oil fill tube is further defined by a predetermined wall thickness, and the insert comprises,
a cylindrical tube, the cylindrical tube defined by a first diameter less than equal the first diameter of the oil fill tube, and
a cylindrical coolar fixedly mounted to an upper terminal end of the cylindrical tube, the cylindrical tube and the cylindrical collar coaxially aligned relative to one another, and the cylindrical collar defining an annular groove between the cylindrical collar and the cylindrical tube, and
piercing means coaxially mounted within the cylindrical tube below the upper terminal end of the cylindrical tube, and
wherein the piercing means includes a first isosceles triangular web intergrally and orthogonally mounted to a second

isosceles triangular web, the first and second isosceles triangular webs are each diametrically aligned to the cylindrical tube and define a piercing tip coaxially aligned with the cylindrical tube at an upper terminal end of an intersection defining the first triangular web mounted to the second triangular web, and

wherein the first triangular web and the second triangular web are mounted to a mounting ring, the mounting ring defined by a mounting ring diameter substantially equal to an internal tube diameter defined by the cylindrical tube, and the mounting ring fixedly mounted to outer peripheral apex portions of each of the first and second webs, and

wherein a screen disk is coextensively mounted within the mounting ring, and

wherein an epoxy resin tubular ring is mounted within the annular groove in contiguous association with an epoxy hardner ring mounted within the annular groove permitting an adhesive mixture to be formed by mounting of the annular groove overlying the oil fill tube, and

wherein the insert further includes a covering cap positionable within the cylindrical collar.

5,111,911

Patent Not Issued For This Number

5,111,912

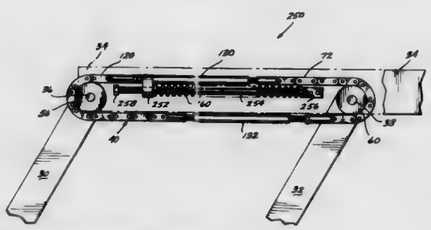
SPRING-LOADED DRIVE ASSEMBLY FOR A WHEELCHAIR LIFT

Dale Kempf, Modesto, Calif., assignor to Hogan Mfg., Inc., Escalon, Calif.

Continuation-in-part of Ser. No. 629,117, Dec. 17, 1990. This application May 15, 1991, Ser. No. 701,681

Int. Cl.[5] B66B *11/22*

U.S. Cl. 187—17 **15 Claims**



1. A platform lift comprising:

a platform;

two linkage arms, each said linkage arm having a proximal end and a distal end opposite said proximal end and wherein said linkage arm distal ends are pivotably connected to separate platform pivot points on said platform;

a carriage arm having first and second carriage arm pivot points, wherein each said linkage arm proximal end is connected to a separate one of said carriage arm pivot points so that said platform can shift position relative to said carriage arm;

a first drive member attached to a first one of said linkage arms at said first carriage arm pivot point to rotate about said first carriage arm pivot point with movement of said first linkage arm;

a second drive member attached to a second one of said linkage arms at said second carriage arm pivot point to rotate about said second carriage arm pivot point with movement of said second linkage arm;

a drive linkage connected to said first and second drive members so as to cause said drive members to rotate simultaneously; and

a biasing member connected at a first point to said drive linkage and at second point to said carriage arm and arranged to exert a force on said drive linkage so as to urge said drive linkage towards one of said drive members.

5,111,913

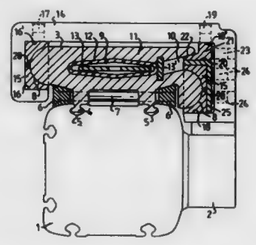
BRAKING ARRANGEMENT IN OPERATING DEVICES FOR LINEAR MOTION

Bo Granbom, Södergatan 5, S-736 00 Kungsör, Sweden

Filed Jan. 30, 1991, Ser. No. 647,780

Int. Cl.[5] F16D *63/00*

U.S. Cl. 188—67 **14 Claims**



1. A brake arrangement in linear motion operating devices, comprising a cylinder **(1)**, a piston which is movable in said cylinder, and a rail **(3)** which is mounted on the outside of the cylinder **(1)**, parallel with the cylinder axis, and extends substantially along the whole of the path travelled by the piston in effecting a working stroke, said rail being configured with slide surfaces **(8)** on opposite sides thereof, and further comprising a slide **(14)** which is configured with slide shoes **(15)** and which is guided for linear movement along said slide cy the slide surfaces **(8)**, said slide **(14)** being connected to a dogging element **(2)** connected to the piston, characterized in that the rail has formed therein at least one cavity **(9)** which extends along the rail **(3)** and which is open through the intermediary of a passageway **(10)**, whereby the rail presents at least one leg **(11)** which is resilient in a direction transversely to the cylinder axis and which defines one side of the passageway, and which leg coacts with a brake body **(21)** mounted on the slide **(14)** and having a brake surface **(22)**, wherein the cavity can be placed under pressure for the purpose of moving said one side of said passageway.

5,111,914

SPOT-TYPE DISC BRAKE

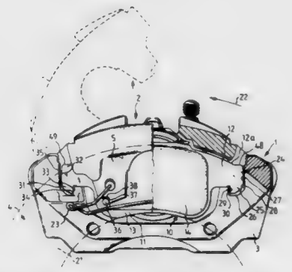
Rudolf Thiel, Frankfurt am Main; Ulrich Klimt, Muehltal, and Georg Halasy-Wimmer, Eschborn, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Filed Jan. 6, 1989, Ser. No. 294,333

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1988, 3800157

Int. Cl.[5] F16D *65/09*

U.S. Cl. 188—73.34 **31 Claims**



1. A spot-type disc brake, for automotive vehicles, comprising, in combination: a housing furnished with a housing bridge and a brake carrier provided with two parallel arms which are positioned at a distance from each other and with a brake lining slidably guided at the arms in the direction of brake application and furnished with a carrier plate, said brake lining being connected to said arms in a positive locking fit in the direction of the circumferential so that the frictional force occurring at the brake lining is transmitted on both of said arms at least at elevated brake application forces, said arms with surfaces facing each other forming a guide which is open in outward direction and serves to accommodate and guide a brake shoe, at least one of said arms being formed with a groove extending in the direction of brake application and being open outwardly, the housing being arranged axially slidably on pins by means of pin guides and said housing bridge being supported through the carrier plate, wherein a projection of said carrier plate projects into a recessed opening of said housing bridge to centrally support said housing through said carrier plate onto said brake carrier and which constrains circumferential rotation of said carrier plate relative to said housing, and wherein the contour of the brake lining is located outside a swinging range of said housing.

5,111,915

SLIDING SADDLE DISK BRAKE

Bernd Rupprecht, Edingen-Neckarhausen, Fed. Rep. of Germany, assignor to Deutsche Perrot-Bremse GmbH, Mannheim, Fed. Rep. of Germany

Filed Oct. 11, 1990, Ser. No. 596,077

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1989, 3934019

Int. Cl.[5] F16D *65/02, 65/16*

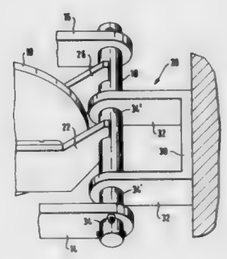
U.S. Cl. 188—73.45 **6 Claims**

1. In a sliding saddle disc brake and mounting bracket assembly including a brake saddle with opposed legs, a brake actuator mounted in one of said legs, first and second brake shoes between and associated with said legs, pairs of projections extending from opposite sides of said saddle, aligned bores in each pair of projections, a respective mounting bolt extending through said aligned bores in each pair of projections and extending substantially parallel with the rotational axis of a brake disc to be received between said brake shoes, the improvement comprising:

two mounting bracket members for securing to a vehicle on opposite sides of said saddle;

at least one cross-bar on each bracket member having a guide bore therein;

said bolts securing said saddle between said bracket members by insertion of said respective bolts through said



respective aligned bores in said projections and through respective guide bores in said at least one cross bar of each bracket member;

dimensions for said mounting bolts and aligned bores in said projections for fitting said bolts in said aligned bores substantially without radial clearance so that said bolts are substantially rigidly connected to said saddle; and

dimensions for said mounting bolts and said guide bores in said cross-bars to provide radial clearance for allowing radial and axial movement therebetween so that said bolts are movably guided in said guide bores.

5,111,916

APPARATUS FOR ENGAGING AND DISENGAGING A PERMANENT-MAGNET SLIPPER BRAKE

Walter Müller, Bassersdorf, and Max Koller, Schleinikon, both of Switzerland, assignors to Oerlikon-Knorr Eisenbahntechnik AG, Zurich, Switzerland

Filed Jul. 9, 1990, Ser. No. 549,755

Claims priority, application Switzerland, Jul. 21, 1989, 02745/89

Int. Cl.[5] B60L *7/00;* **B60T** *13/00*

U.S. Cl. 188—165 **4 Claims**

1. An apparatus for engaging and disengaging a permanent-magnet slipper brake for a rail vehicle equipped with a pneumatic main air line and a pneumatic feed line, comprising:

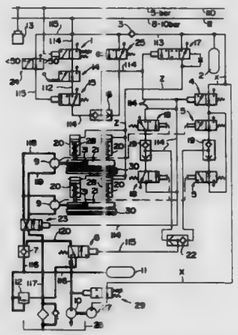
a hydraulic motor;

said permanent-magnet slipper brake being engageable and disengageable by rotation of said hydraulic motor;

a pneumatically driven hydraulic power pump;

said pneumatically driven hydraulic power pump driving said hydraulic motor;

a pneumatic motor connected to said pneumatic feed line;
said pneumatic motor driving said hydraulic power pump;
said permanent-magnet slipper brake being controllable in response to air pressure in said pneumatic main air line;
said apparatus being supplied with compressed air by said pneumatic feed line;
a hydraulic line provided between said hydraulic power pump and said hydraulic motor;
a check valve arranged in said hydraulic line and provided between said hydraulic power pump and said hydraulic motor;



a pneumatically actuatable seat valve actuating said check valve;
a pneumatic line provided between said pneumatic feed line and said seat valve;
a control valve arranged in said pneumatic line and provided between said pneumatic feed line and said seat valve;
said control valve actuating said seat valve; and
said control valve being actuated in response to predetermined air pressure in said main air line in order to engage said permanent-magnet slipper brake.

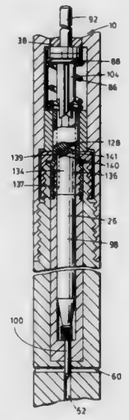
5,111,917

DAMPENER VALVING CONTROL MECHANISM

John Rotharmel, Vernon Hills, and Paul Smeltzer, Naperville, both of Ill., assignors to Maremont Corporation, Carol Stream, Ill.

Filed Feb. 26, 1991, Ser. No. 660,882
Int. Cl.[5] B16F *9/44*
U.S. Cl. 188—319 **12 Claims**

1. An improved variable damping shock absorber, the improvement comprising in combination:
(A) an outer cylinder having a piston passage penetrating one end of the cylinder;
(B) a piston rod having one retained end slidably disposed within the outer cylinder, an intermediate section extending from the retained end through the piston passage in the outer cylinder and terminating in an external end external to the cylinder, an internal cavity extending within the piston rod, and at least one fluid passage providing means for fluid communication between the internal cavity and the outer periphery of the piston rod disposed within the outer cylinder;
(C) push means slidably penetrating the internal cavity;
(D) a slide valve slidably penetrating the internal cavity and having: (i) a valving end slidable to penetrate the fluid passage, and (ii) a ratchet end opposite the valving end; and
(E) a spring loaded ratcheting means for simultaneously urging the valving end of the slide valve axially away from the fluid passage, urging the push means axially outwardly of the internal cavity, and translating axial motion of the push means inwardly of the internal cavity into rotational and axial motion of the ratchet end of the slide valve whereby the valving end alternately slides between: (i) a blocking position at least partially obstructing the fluid passage upon a first axial motion of the push



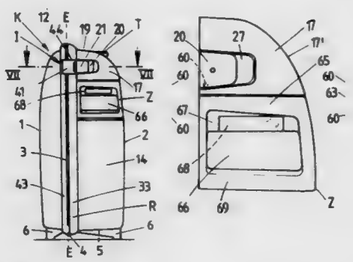
means axially inwardly of the internal cavity; and (ii) an opened position, reducing blocking penetration of the fluid passage, upon a second axial motion of the push rod axially inwardly toward the internal cavity.

5,111,918

ROLLABLE SUITCASE

Laszlo Bako, Solingen, and Helmut Klein, Velbert, both of Fed. Rep. of Germany, assignors to S. Franzen Söhne (GmbH & Co.), Solingen, Fed. Rep. of Germany

Filed Mar. 8, 1991, Ser. No. 666,726
Claims priority, application Fed. Rep. of Germany, May 25, 1990, 9005955; European Pat. Off., Oct. 26, 1990, 90120574
Int. Cl.[5] A45C *5/14, 13/26*
U.S. Cl. 190—18 A **30 Claims**



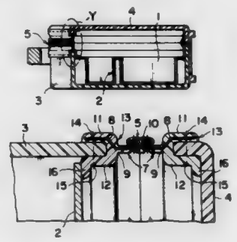
1. A suitcase comprising
a first suitcase shell, a second suitcase shell, and a fold joint serving as an interface between said first suitcase shell and said second suitcase shell upon a folding of said first and said second suitcase shells together;
a plurality of castors, a pull handle, and a mounting plate which is attached to said second suitcase shell, one of said casters being mounted to said first suitcase shell and a second of said castors being mounted to said second suitcase shell;
wherein each of said suitcase shells has a narrow side and a wide side, and said pull handle is located on the narrow side of said second suitcase shell opposite said second caster and is swingably seated on said mounting plate;
said suitcase further comprises at least one closure which extends over said fold joint for connecting said second suitcase shell to said first suitcase shell; and
said closure comprises a hasp closure, there being an interpenetration between said hasp closure and said mounting plate upon a closing of said suitcase.

5,111,919

CONTAINER WITH INNER COMPARTMENT CASE

Tsutomu Hamatani, Toyama, and Seihei Tomita, Tokyo, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jun. 28, 1991, Ser. No. 723,380
Claims priority, application Japan, Jun. 28, 1990, 2-69455
Int. Cl.[5] A45C *11/00*
U.S. Cl. 190—109 **1 Claim**



1. A container comprising:
(a) a container body;
(b) an inner compartment case having compartments and a flat peripheral edge and being disposed in said container body;
(c) a lid for covering an opening of said container body; and
(d) a slide fastener for opening and closing the lid, said slide fastener including a pair of stringers attached to said container and said lid by using a pair of forked support members sandwiching respective tapes of said stringers, each said forked support member having an upper piece and a lower piece, and at least said lower piece which is in contact with an inner peripheral edge of said container body having at its edge a bend which is in contact with said flat peripheral edge of said inner compartment case so as to cover a space between said container body and said inner compartment case.

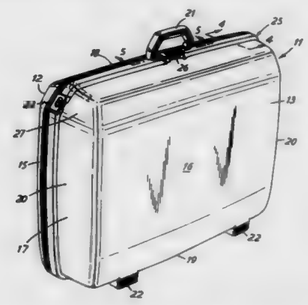
5,111,920

LUGGAGE CASE WITH RECESSED LATCHES

Renato Castelli, Gent; Willibald Van Hoye, Zwijnaarde, both of Belgium; Richard Miles, Crowborough Hill, and Stephen T. Green, Clanfield, both of United Kingdom, assignors to Samsonite Corporation, Denver, Colo.

PCT No. PCT/GB86/00606, § 371 Date Aug. 24, 1987, § 102(e) Date Aug. 24, 1987, PCT Pub. No. WO87/02553, PCT Pub. Date May 7, 1987
Continuation of Ser. No. 319,843, Mar. 7, 1989, abandoned, which is a continuation of Ser. No. 73,795, Aug. 24, 1987, abandoned. This PCT application Oct. 8, 1986, Ser. No. 530,502
Claims priority, application European Pat. Off., Oct. 31, 1985, 85307923.4
Int. Cl.[5] A45C *5/02, 13/10*
U.S. Cl. 190—120 **20 Claims**

1. A luggage case comprising two shells, one constituting a base shell and the other a lid shell, said luggage case having a case back wall and a case front wall opposite said case back wall and case end walls extending between said case front wall and case back wall, said shells being hinged together at the case back wall, each of said shells having a peripheral side wall which engages the peripheral side wall of the other of said shells at the edges of said peripheral side walls when the case is closed, the shells being constructed such that if latched closed only along the case front wall, the edges have a tendency to gap open at the case end walls when the case is overfilled or when someone sits on the case, and latch means releasably fastening said edges together when the case is closed, the peripheral side wall of said base shell including a front wall, a back wall and end walls, said front wall of said base shell including a handle means for carrying said case, said latch means including latches positioned on front portions of



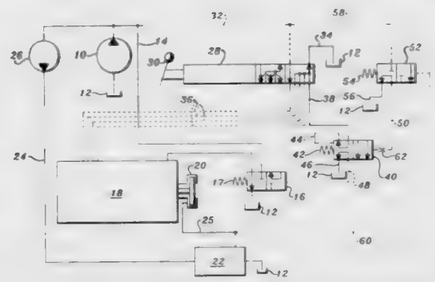
the case end walls at the corners between the case front wall and the case end walls, the peripheral side wall of said base shell is deeper along the back and end walls than along the front wall, the depth of the peripheral wall of said base shell increasing from the front wall to the end walls substantially only in said front portions, whereby resistance to said tendency to gap open is improved.

5,111,921

PARK BRAKE SENSOR AND TRANSMISSION OVERRIDE

Jeffrey C. Marks, and Jon R. Delaney, both of Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 20, 1990, Ser. No. 615,951
Int. Cl.[5] B60K *41/26*
U.S. Cl. 192—4 A **7 Claims**



1. A transmission override circuit for selectively switching a transmission to neutral, wherein the position of the transmission is controlled by pressure in at least one control line and said transmission is provided with a selectively actuable park brake, the circuit comprising:
a. a sump containing a supply of working fluid;
b. at least one pump having an inlet drawing fluid from said sump and an outlet providing pressurized fluid;
c. speed selector means for controlling the flow of pressurized fluid from said pump outlet to the at least one control line of the transmission, said speed selector means having a neutral position for placing the transmission in neutral and at least one other position for placing the transmission in gear;
d. engagement override valve means for selectively overriding said speed selector means to place the transmission in

neutral whenever said pump is started with said speed selector means not in its neutral position;

e. an engagement override valve control line the pressure in which controls said engagement override valve means; and

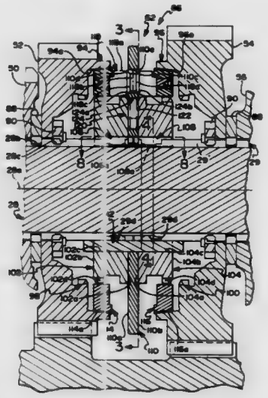
f. park brake sensor valve means for sensing whether said park brake is engaged and activating said engagement override valve means to override the speed selector means whenever said park brake is engaged, said park brake sensor valve means connecting said engagement override valve control line to sump when said park brake is activated and to the outlet of said at least one pump when said park brake is deactivated.

5,111,922

PRE-ENERGIZER FOR A SYNCHRONIZER

Joseph D. Reynolds, Climax, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 24, 1990, Ser. No. 632,881
Int. Cl.[5] F16D *23/06*
U.S. Cl. 192—53 E **8 Claims**



1. A pin-type synchronizer mechanism for first and second axially spaced apart ratio gears secured against axial movement on a shaft having an axis about which the gears and shaft rotate relative to each other, the mechanism comprising:

first and second jaw and friction clutch members respectively affixed to the first and second gears, and a clutching assembly disposed between the gears and concentric to the shaft, the assembly including:

jaw clutch means secured for rotation with the shaft and axially movable into engagement with the first jaw clutch member in response to a shift force moving a radially extending flange axially from a neutral position in one direction toward the first gear and the jaw clutch means axially movable into engagement with the second jaw clutch member in response to the shift force moving of the flange from the neutral position in a direction opposite the one direction toward the second gear;

first and second friction rings rigidly connected together in axially spaced relation by a plurality of pins extending through circumferentially spaced openings in the flange, each pin having a reduced diameter portion for allowing limited relative rotation between the flange and pin, and axially spaced apart ends of each reduced diameter portion having blocker shoulders engagable with blocker shoulders defined about each flange opening;

the jaw clutch means being third and fourth jaw members respectively engagable with the first and second jaw members, the third and fourth jaw members having mutually facing radially extending end surfaces sandwiching a portion of the radially extending flange therebetween;

pre-energizer means for resiliently moving the first and second friction rings into frictional engagement respectively with the first and second friction members in response to initial axial movement of the flange towards the first and second gears, respectively, the frictional engagement for effecting the limited relative rotation and engagement of the blocker shoulders to prevent asynchronous engagement of the jaw clutch means and to transmit the shift force via the blocker shoulders to the frictionally engaged ring; characterized by:

the flange including elongated slots equal in number to the flange openings, each slot having a transverse extent extending axially through axially facing end faces of the flange and an elongated extent extending between the third and fourth jaw members end surfaces with one end of the elongated extent extending into the associated flange opening and the other end being a reaction surface;

resilient means disposed in each slot with one end reacting against the reaction surface and another end reacting against a plunger;

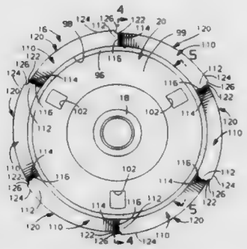
each plunger having a head portion received by the reduced diameter portion of the pin disposed in the associated opening with the flange in the neutral position, each plunger having axially spaced sidewalls slidably embraced by the jaw member end surfaces for retaining the plunger relative to the axial direction of the flange.

5,111,923

RAMPED CLUTCH PLATE FOR A VISCOUS FLUID CLUTCH

Lawrence C. Kennedy, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 22, 1991, Ser. No. 688,769
Int. Cl.[5] F16D *35/00*
U.S. Cl. 192—58 B **4 Claims**



1. A clutch plate for a viscous fluid clutch, adapted to be rotatably driven by an input shaft and aligned substantially parallel with a pump plate dividing the interior of the clutch into a working chamber containing the clutch plate and a fluid reservoir, comprising:

(a) a central hub portion for receiving the input shaft and a disk portion having a first surface oriented toward the pump plate and a second opposite surface;

(b) a plurality of concentric, annular lands and grooves in the disk portion second surface encircling the hub portion; and

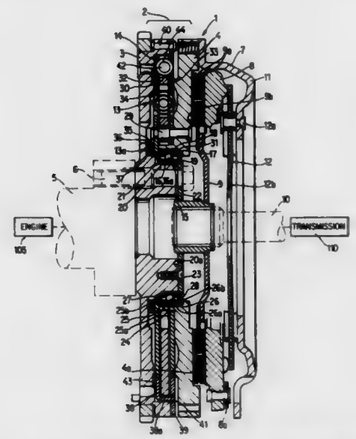
(c) ramp means, integrally formed in the disk portion first surface and not protruding substantially above a plane aligned with the first surface, for enhancing the pumping of fluid in the clutch.

5,111,924

TORQUE TRANSMITTING AND TORSION DAMPING APPARATUS FOR USE IN MOTOR VEHICLES

Wolfgang Reik, Bühl, and Hans-Dieter Elison, Offenburg, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Division of Ser. No. 616,640, Nov. 21, 1990, which is a division of Ser. No. 283,792, Dec. 13, 1988, Pat. No. 4,989,710, which is a division of Ser. No. 132,909, Dec. 14, 1987, which is a division of Ser. No. 470, Jan. 5, 1987, Pat. No. 4,727,970, which is a continuation-in-part of Ser. No. 716,838, Mar. 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 799,006, Nov. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 848,732, Apr. 4, 1986, abandoned. This application Jul. 17, 1991, Ser. No. 731,817
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421709; Nov. 23, 1984, 3442679; Apr. 15, 1985, 3513449; Apr. 16, 1985, 3513479
The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.
Int. Cl.[5] F16D *3/14*
U.S. Cl. 192—70.17 **34 Claims**



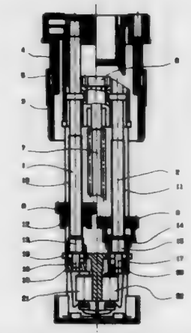
1. A torque transmitting and torsion damping appartus, especially for taking up and compensating for fluctuations of torque which is transmitted between an internal combustion engine and a variable-speed transmission in a motor vehicle, comprising first and second flywheels movable angularly relative to each other, said first flywheel being connectable to the engine and said second flywheel being connectable to the transmission; bearing means comprising an antifriction bearing interposed between said flywheels and having coaxial first and second races and at least one row of antifriction rolling elements between said races, one of said flywheels having a central protuberance and the other of said flywheels having a recess receiving at least a portion of said protuberance, one of said races being provided on said protuberance and the other of said races being disposed in said recess; a friction clutch operable to receive torque from said second flywheel and to transmit torque to the transmission with attendant generation of heat, said second fly-wheel and said clutch having cooperating first and second friction-and heat-generating surfaces; means for yieldably opposing angular movements of said flywheels relative to each other, including at least one damper having an input member on one of said flywheels and an output member on the other of said flywheels; and means including at least one thermal barrier for impeding the transfer of heat from said first surface to said bearing means.

5,111,925

DEVICE FOR AUTOMATICALLY HALTING AN ELECTRIC MOTOR AFTER A CERTAIN NUMBER OF REVOLUTIONS

Gérard Evreux, Ayze, and Didier Camps, Cluses, both of France, assignors to Somfy, Cluses, France

Filed Dec. 13, 1990, Ser. No. 626,735
Claims priority, application France, Dec. 22, 1989, 89 17072
Int. Cl.[5] H01H *19/18*; E06B *9/68*; H02P *3/02*
U.S. Cl. 192—141 **8 Claims**



1. A device for automatically halting an electric motor after a certain number of revolutions, comprising at least one threaded bar (**1**, **2**) on which is mounted a first sliding-gear nut (**8**, **9**; **80**), means (**5**, **6**) for coupling to the motor which drive one of these elements, the bar or the nut, in rotation, means (**42**) for immobilizing the other of said elements in rotation, and a switch (**21**, **22**) actuated when the sliding-gear nut reaches the end of its travel on the threaded part of the bar, wherein the threaded bar has a first threaded part and a second threaded part (**13**, **15**) at one of its ends, said second threaded part substantially shorter than the first threaded part (**10**, **11**) and has a diameter (**12**) greater than the diameter of the first thread part and the thread of said second threaded part has a pitch substantially greater than the pitch of the thread of the first threaded part, wherein the device comprises a second sliding-gear nut (**12**, **14**) linked to the first sliding-gear nut and interacting with the second threaded part of the bar, and means (**23** to **30**; **121**, **122**) for making the two nuts integral in rotation whilst at the same time permitting a limited relative axial displacement of the nuts, when the second nut engages with the second threaded part of the bar, the switch being actuated directly or indirectly by the second nut after a certain displacement of the latter on the second threaded part of the bar.

5,111,926

SINGULATING AND ORIENTING SLIDE CONVEYOR

William C. Long, Houston, Tex., assignor to ESM International Inc., Houston, Tex.

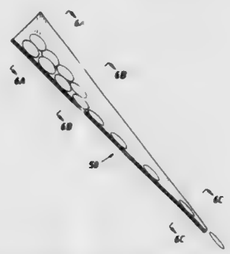
Filed Aug. 7, 1991, Ser. No. 741,665
Int. Cl.[5] B65G *47/24*
U.S. Cl. 193—46 **6 Claims**

1. A slide conveyor for singulating and orienting small, approximately flat fungible products for viewing in an optical sorting machine, the conveyor being connected for receiving a large quantity of the products and conveying the products by gravity action, the conveyor comprising

a narrow U-shaped bottom for accepting the products on edge and not crosswise,

an upper section for receiving the products oriented so that a line bisecting the angle of said U-shaped bottom in said upper section is substantially vertical so as to at least approximately vertically orient the flat sides of the products as they pass through said upper section,

a lower section of the conveyor oriented so that the flat sides of the products are oriented at least approximately normal to vertical for flat side optical viewing as they emerge from said lower section, and



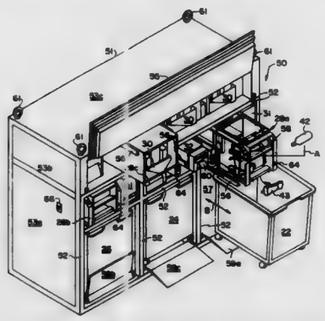
an intermediate section of the conveyor gradually curvingly joining said upper section to said lower section.

5,111,927

AUTOMATED RECYCLING MACHINE

Everett E. Schulze, Jr., 1741 Fulton, Aurora, Colo. 80010

Continuation-in-part of Ser. No. 462,394, Jan. 5, 1990. This application May 7, 1990, Ser. No. 520,715
Int. Cl.[5] G07F *7/06*; B07C *5/00*
U.S. Cl. 194—209 **9 Claims**



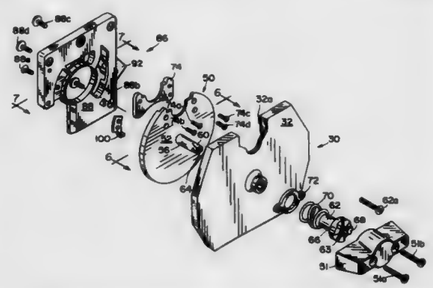
9. An apparatus for recycling containers, comprising:
first means for determining whether a container includes at least a threshold amount of metal;
second means for receiving the container;
third means for providing information relating to the size of the container;
fourth means, disposed downstream of said first means relative to movement of the container, for checking whether the container has a predetermined amount of metal;
fifth means for crushing the container, said fifth means including a container crushing chamber that has a movable lower door; and
means for causing movement of said lower door in response to a determination that said crushing chamber contains a container made substantially of an unwanted material.

5,111,928

UNIVERSAL COIN RECEIVING MECHANISM

Murray R. Kovens, Whitehall, Md., assignor to Parkway Machine Corporation, Timonium, Md.

Filed Sep. 6, 1990, Ser. No. 578,217
Int. Cl.[5] G07F *5/02, 11/44*
U.S. Cl. 194—292 **19 Claims**



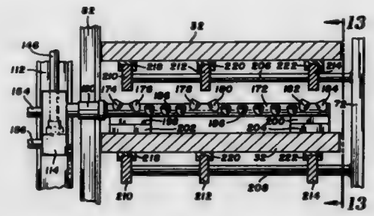
1. A coin receipt mechanism in a coin-operated machine, comprising:
means for operating the machine, said means including a rotatable coin carrier wheel connected to the machine, said coin carrier comprising a first cooperating element of a coin drop through channel; and
convertible discriminating means, connected to said coin carrier, for discriminating a coin from a first predetermined denomination of a first diameter and first thickness and for converting to discriminate from a second predetermined denomination of a second diameter and second thickness, said convertible discriminating means including a calibrated coin receiving insert, said receiving insert defining a pocket for receiving a coin of predetermined denomination and comprising a second cooperating element of a coin drop through channel, said first and second cooperating elements coacting to establish the coin drop through channel, for rejecting a coin of unauthorized denomination.

5,111,929

SPIRAL CONVEYOR CLEANING SYSTEM

Richard L. Pierick, Crystal, and Ross A. Hoium, Brooklyn Park, both of Minn., assignors to Checker Machine, Inc., New Hope, Minn.

Filed Apr. 24, 1991, Ser. No. 690,561
Int. Cl.[5] B65G *45/22*
U.S. Cl. 198—495 **28 Claims**



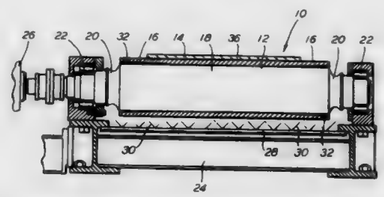
1. A material conveying apparatus, including:
an endless conveyor means;
a stationary carrier means for supporting the endless conveyor means by gravity along a predetermined path;
a drive means, mounted with respect to the endless conveyor means, for moving the endless conveyor means along the path;
a fluid spraying means, and a coupling means for supporting the fluid spraying means for travel along said path responsive to movement of the drive means; and
a fluid providing means for supplying a cleaning fluid under pressure to the fluid spraying means, thereby causing the spraying means to direct the cleaning fluid onto the carrier means as the spraying means travels along said path.

5,111,930

NON-WARPING TABLE ROLLS

Vladimir B. Ginzburg, Pittsburgh, and F. Ronald Vidil, McKeesport, both of Pa., assignors to International Rolling Mill Consultants, Inc. and United Engineering, Inc., both of Pittsburgh, Pa.

Filed Mar. 18, 1991, Ser. No. 671,125
Int. Cl.[5] B65G *13/02*
U.S. Cl. 198—780 **14 Claims**



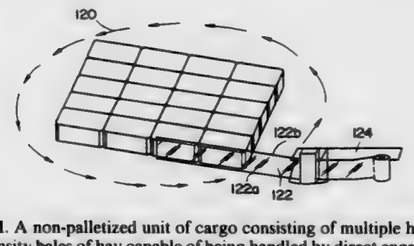
1. A table roll for use in roll tables comprising; an arbor having a generally cylindrical body, and a sleeve having a mid-portion and two end-portions fitted onto said cylindrical body, said sleeve being tightly fitted to said cylindrical body only at said mid-portion and said end-portions are sufficiently free of any tight fitting onto said cylindrical body to minimize any heat transfer from said end-portions of said sleeve to said cylindrical body and permit said end-portions of said sleeve to undergo thermal expansion independent of said cylindrical body.

5,111,931

UNITIZED PALLETLESS MULTIPLE BALE CARGO UNIT

John M. Gombos, Bakersfield, and Moshe Leashno, Long Beach, both of Calif., assignors to A.C.X., Inc., Bakersfield, Calif.

Division of Ser. No. 526,186, May 18, 1990, which is a continuation-in-part of Ser. No. 353,811, May 17, 1989, Pat. No. 5,001,974. This application May 14, 1991, Ser. No. 699,772
Int. Cl.[5] B65D *71/00, 85/00, 71/08, 65/00*
U.S. Cl. 206—83.5 **12 Claims**



1. A non-palletized unit of cargo consisting of multiple high density bales of hay capable of being handled by direct engagement of the bottom surface thereof by the tines of a fork lift truck, comprising:
a plurality of partially compressible bales of hay arranged in at least a first layer of multiple rows of said bales of hay defining vertical peripheral sides and a planar bottom support surface extending to said peripheral sides; and
binding means consisting essentially of an elongated sheet of a polymer film pre-stretched from about 25% to about 220% wrapped in multiple layers solely and snugly around and in direct engagement with the peripheral sides of said stack of bales for applying a continuous laterally inwardly directed force for biasing said bales inwardly thereby at least partially compressing and forcing the vertical surfaces of the bales into partially interlocking binding engagement with laterally adjacent bales for binding said bales together as a unit without a bottom engaging support sheet while maintaining said layer in place due to said partially interlocking of the vertical surfaces of the bales, with an edge portion of said sheet film overlying an edge portion of the top of said stack around the periphery thereof, and an edge portion of said film overlying an edge portion of the bottom of said stack around the periphery thereof.

5,111,932

SPREADABLE MATERIAL PACKAGE WITH SPREADER

Rolf W. J. Campbell, Minneapolis, Minn., assignor to Land O'Lakes, Inc., Arden Hills, Minn.

Continuation of Ser. No. 389,063, Aug. 3, 1989. This application Dec. 20, 1990, Ser. No. 630,993
Int. Cl.[5] B65D *85/74*
U.S. Cl. 206—216 **18 Claims**



1. A package having a spreader portion for spreadable material comprising:
a first sheet;
a second sheet joined to the first sheet to form a chamber for holding the spreadable material;
a spreader portion disposed at one end portion joined first and second sheets in flow communication with the chamber; and
first and second indentations disposed on the first sheet at a position overlying the chamber such that the indentations provide a stiffening effect to the spreader portion.

5,111,933

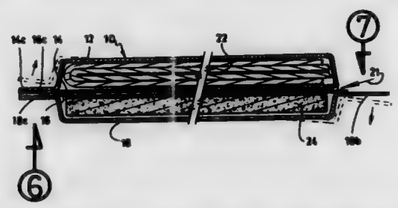
KIT PROVIDING THERMALLY DEGRADABLE COMPOST BAG

Daniel J. Di Biasi, Pittsford, N.Y., and Frederick C. Schwab, Metuchen, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 16, 1991, Ser. No. 690,178
Int. Cl.[5] B65D *69/00, 30/02*
U.S. Cl. 206—223 **2 Claims**

1. A kit useful for the disposal of refuse comprising:
a) at least one degradable container comprising a major portion of a polyethylene, a thermal oxidative degradation catalyst and an antioxidant; and
b) a vapor-proof package enveloping said container thereby preventing ambient oxygen from contacting said container, wherein said package comprises a compostable polymer.

5,111,934
PORTABLE CLEANING KIT
Eugéne Morin, 842, Ruisseau de Anges Sud, Apt. 3, Saint-Roche-de-l'Achigan, Québec, Canada J0K 3H0
Filed Jul. 22, 1991, Ser. No. 733,878
Int. Cl.[5] B65D *71/02*
U.S. Cl. 206—229 **2 Claims**



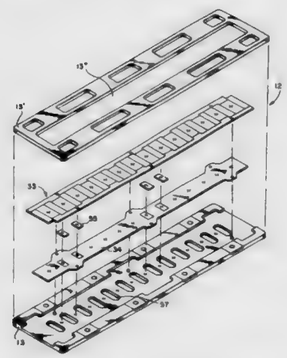
1. A portable cleansing kit comprising a flat, flexible packet having two separate, stacked, air-tight, openable, flat compartments each comprising two quadrangular walls sealed together around the entire periphery of the walls, the four walls defining a pair of outer walls and a pair of inner walls, the latter walls adjacent to each other and sealed to each other along three sides of their periphery, an opening being formed between the fourth sides of the inner walls to gain access to a planar gap defined between said inner walls, a sponge moistened with a cleansing liquid solution located within one compartment and adhered to the associated inner wall by adhering means, and a sheet of dry, wiping, liquid absorbing towel material loosely contained in the other compartment; wherein said sponge compartment outer wall has an intermediate, outwardly-projecting, semi-circular ear about said opening for manual capture and pulling thereof in view of gaining access to said sponge compartment, either by free engagement of a person's finger into said sponge compartment or by outright peeling of the sponge compartment outer wall from the inner wall thereof to completely expose said sponge; and further including a semi-circular notch made edgewisely of said inner walls and of said sponge compartment outer wall intermediately of the edgewise portions thereof opposite said opening, for providing a finger-engaging locus for facilitating peeling action of said dry towel outer wall to gain access to said dry towel.

5,111,935
UNIVERSAL LEADFRAME CARRIER
Robert H. Bond; Michael A. Olla, both of Denton; Barry Morrison, Bedford, and Linn C. Garrison, Dallas, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.
Division of Ser. No. 170,069, Mar. 14, 1988, Pat. No. 4,815,595, which is a continuation of Ser. No. 937,558, Dec. 3, 1986, abandoned. This application Oct. 31, 1988, Ser. No. 265,231
The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.
Int. Cl.[5] B65D *73/02*
U.S. Cl. 206—329 **8 Claims**

1. A chip carrier insert for supporting semiconductor chips in alignment with groups of inner leads of a lead frame during a manufacturing operation in which lead frame inner lead end portions are to be bonded to bonding pads on the semiconductor chips with the chip carrier insert and lead frame being sandwiched between first and second lead frame carriers, said chip carrier insert being a strip of conductive metal fabricated to predetermined dimensions of length and width to fit between the first and second lead frame carriers, said strip of conductive metal having surface portions adapted for retaining a plurality of semiconductor chips in bonding alignment with the end portions of a plurality of lead frame inner lead groups, respectively;

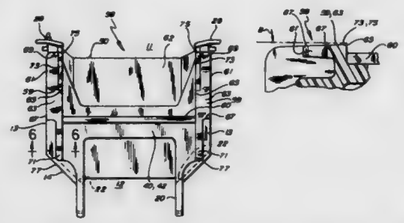
a selected one of said lead frame carriers having first and second shoulder portions spaced apart across an elongated channel, wherein said strip of conductive metal has length and width dimensions adapted to fit within the elongated channel between the first and second shoulders; and,

a plurality of pins attached to said selected lead frame carrier and projecting into the elongated channel, said lead frame



and strip of conductive metal being intersected by a plurality of bores, wherein said pins project through said chip carrier insert and through said lead frame for aligning the chip bonding pads with the lead frame inner ends and securing the selected lead frame carrier, chip carrier insert and lead frame together.

5,111,936
WAFER CARRIER
Robert D. Kos, Victoria, Minn., assignor to Fluoroware, Chaska, Minn.
Filed Nov. 30, 1990, Ser. No. 620,274
Int. Cl.[5] B65D *85/48*
U.S. Cl. 206—334 **13 Claims**

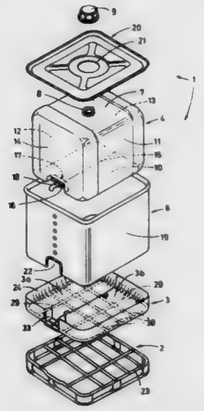


1. A molded plastic carrier for wafers, the carrier being indexable upon a flat platform of wafer transfer equipment with indexing webbing on the platform, having an open top for insertion and removal of the wafers, a pair of opposed upright sidewalls with inner opposed ribs and wafer pockets therebetween for spacing and supporting the wafers in axial alignment in the carrier, one upright end wall with a horizontal indexing bar being indexable upon the webbing of the transfer equipment, comprised of opposing, upright transfer equipment contact rails each with upper and lower portions with an arch therebetween formed by an upright ramp along one of the portions of the rails one each rail thereby forming a four point flat contact between the carrier and platform of the transfer equipment.

12. A molded plastic carrier for wafers, the carrier being indexable upon a flat platform of wafer transfer equipment with indexing webbing on the platform, having an open top for insertion and removal of the wafers, a pair of opposed upright sidewalls with inner opposed ribs and wafer pockets therebetween for spacing and supporting the wafers in axial alignment in the carrier, one upright end wall with a horizontal indexing bar being indexable upon the webbing of the transfer equipment, comprised of opposing transfer equipment contact rails each with upper and lower portions, an end surface; inner and outer upright side edges that slope rearwardly from the inner side edge to the outer side edge and a raised ramp projecting from said end surface along the inner side edge beginning at the upper portion and extending downwardly toward the flush with the end surface at said lower portion, thereby forming four points of flat contact between the carrier and the platform of the equipment at the inner side edges of the upper and lower portions.

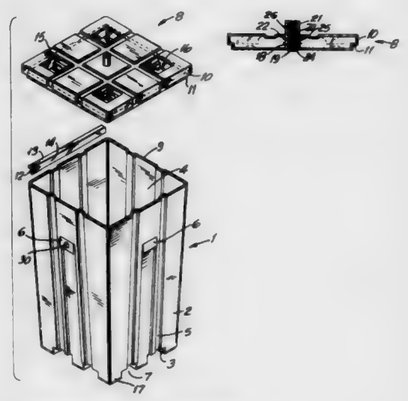
13. A molded plastic carrier for wafers, the carrier being indexable upon a flat platform of wafer transfer equipment with indexing webbing on the platform, having an open top for insertion and removal of the wafers, a pair of opposed upright sidewalls with inner opposed ribs and wafer pockets therebetween for spacing and supporting the wafers in axial alignment in the carrier, one upright end wall with a horizontal indexing bar being indexable upon the webbing of the transfer equipment, comprised of opposing transfer equipment contact rails each with upper and lower portions and being substantially flat with an inner side edge sloping rearwardly to an outer side edge and a raised ramp beginning at the upper portion along the inner side edge and extending downward to intermediate of the upper and lower portions thereby forming four points of flat contact between the carrier and the platform of the equipment with two points of contact at the top of the ramps and the other two points of contact at the inner side edge of the lower portions.

5,111,937
PALLET CONTAINER
Udo Schutz, Ruckersteg 4, D-5418 Selters, Fed. Rep. of Germany
Filed Feb. 22, 1991, Ser. No. 659,450
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1990, 4005633
Int. Cl.[5] B65D *19/00*
U.S. Cl. 206—386 **10 Claims**



1. In a pallet container for the transport and storage of liquids, with an inner container of a synthetic resin with sealable filling and outlet openings, an outer container supporting the synthetic-resin inner container, with an access hole in a lid of the outer container to the filling opening and another access hole in the outer container to the outlet opening of the inner container, and a carrying member supporting the inner container on a pallet, having a vibration-damping and shock absorber function; the improvement wherein the carrying member is an elastic supporting shell (**3**) of a synthetic resin which accommodates in shape-mating fashion a bottom section (**5**) of the inner container (**4**) and rests, with a continuously extending outer, hollow supporting collar (**24**), with an inwardly curved supporting through (**26**) on its underside (**25**), and with longitudinally and transversely extending supporting troughs (**29**, **30**), arranged on the underside (**28**) of a bottom (**27**) of the shell and formed by hollow ribs (**31**, **32**) molded to the shell bottom (**27**), on an upper frame (**23**) of said pallet (**2**), said outer supporting collar (**24**) having an opening (**33**) for a drain fitting (**18**) of the inner container (**4**) from said outlet opening.

5,111,938
SOLID WASTE CONTAINER
Toby L. Soprano, Floral Park; Benjamin J. Scolavino, Chester; Albert N. Caro, Essex Falls, and Robert A. Angione, Emerson, all of N.J., assignors to Segri-Gator Associates L.P., Montville, N.J.
Filed Oct. 12, 1990, Ser. No. 595,865
Int. Cl.[5] B65D *81/20*
U.S. Cl. 206—386 **12 Claims**



1. A waste container comprising:

a container body having an open top;

lid means disposable on the top;

means for sealing the lid to the container body; and

means for evacuating air from the sealed container, comprising a passage, extending through the container body or lid, filter means disposed inwardly of the passage within the container and flow reversal prevention means located downstream in the passage from the filter, the flow reversal prevention means allowing air to be withdrawn from the container and preventing air from reentering the container through the passage.

5,111,939
SELF-SUPPORTING STACKED DISPLAY AND DISPENSER STRUCTURE
Christopher E. Schafer, Rural Route 2, Adair, Iowa 50002
Filed Dec. 17, 1990, Ser. No. 628,546
Int. Cl.[5] B65D *21/00*
U.S. Cl. 206—503 **9 Claims**

1. A stacked display and dispensing structure comprising:

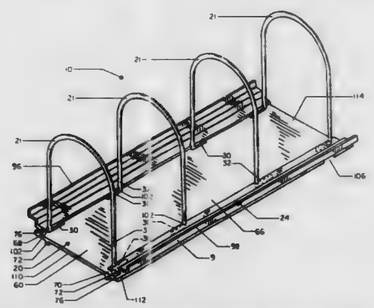
a base unit of box-like configuration having a floor, a roof, front wall means extending between and fixedly joined to the floor and roof respectively at bottom front and top front corners, and rear wall means extending between and fixedly joined to the floor and roof respectively at bottom rear and top rear corners, the angle between the front wall

means and the floor being less than ninety degrees so that the front wall means slopes upwardly and rearwardly from the floor and the angle between the front wall means and the roof being greater than ninety degrees so that the roof slopes upwardly and rearwardly from the front wall means in divergent relation to the floor;



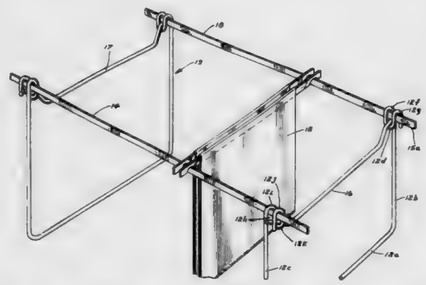
a second unit having a floor and front wall means joined together at a bottom front corner and angle identical to the bottom front corner and angle of the base unit, said second unit being mounted atop the base unit via the floor of the second unit and the roof of the base unit with the second unit bottom front corner directly above the top front corner of the base unit, whereby the planes of the two front wall units meet at a dihedral angle.

5,111,940
STORAGE RACK ASSEMBLY
Andrew J. VanNoord, Grand Rapids, Mich., assignor to Kent Design & Manufacturing, Inc., Grand Rapids, Mich.
Continuation-in-part of Ser. No. 111,442, Oct. 21, 1987, Pat. No. 4,887,725. This application Feb. 1, 1989, Ser. No. 305,429
Int. Cl.[5] A47B *63/00*
U.S. Cl. 211—41 **12 Claims**



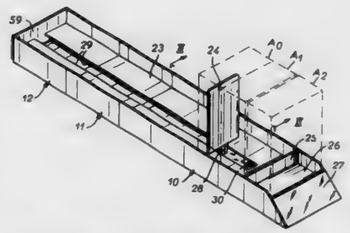
1. A storage rack assembly for storing articles such as audio cassettes, video cassettes, and compact disc containers, said storage rack assembly comprises a storage rack, for retaining said articles in an upright and face-to-face relationship, wherein said storage rack comprises:
a base having opposing lateral sides;
article support means connected to said lateral sides adapted to provide vertical and lateral support to said articles;
retainer means mounted substantially perpendicular to said base and adapted to provide longitudinal support to said articles;
said article support means comprises stepped means for vertically and laterally supporting and accommodating said articles of differing sizes in face-to-face relationships;
said stepped means comprises a pair of elongated sections extending longitudinally along each opposing lateral side of said base, with each of said elongated sections having at least two step portions so as to accommodate said articles having at least two of said differing sizes; and
each of said retainer means comprises a wire form having a pair of legs, each of said legs having a longitudinally extending foot, and each of said elongated sections comprises means for releasably retaining said feet in said elongated sections.

5,111,941
SELF LOCKING FOLDER HANGER STRUCTURE
Jerome Hillestad, 1861 Viking Blvd., Cedar, Minn. 55011
Filed Jun. 10, 1991, Ser. No. 712,574
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—46 **2 Claims**



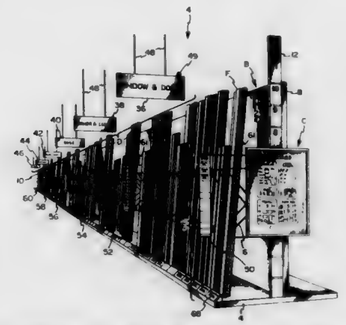
1. A file drawer file folder suspension hanger, having in combination,
a pair of longitudinally spaced upstanding end support members,
said support members each including upstanding side members,
a pair of transversely spaced longitudinally disposed suspension frame members,
means in connection with each of said upstanding side members securing said suspension members,
said means comprising an upper end of each of said upstanding side members being doubled over forming an upper closed loop end,
said doubled upstanding end portion being redoubled forming a pair of longitudinally spaced closed upper end loop portions, said first mentioned closed end loop being doubled over into a depending position,
said redoubled upper end portion having a channel formed therein,
an adjacent end of a suspension member being disposed into said channel,
a transverse member being disposed between the side members of each of said support members,
the end portions of said transverse members being angled,
said transverse members respectively with their ends angled downwardly being disposed through said upper end loops of said end support members overlying said depending loop ends therein and underlying said adjacent end portions of said suspension members, whereby
said transverse member is rotated into a reverse vertical position causing said angled end portions thereof to bear upwardly against the adjacent end portions of said suspension members and locking the same in position by pressure thereof against said closed upper end loop portions.

5,111,942
DISPLAY TRAY FOR ALIGNED ARTICLES
Didier Bernardin, 60 Rue de Varenne, 75007 Paris, France
Filed Mar. 25, 1991, Ser. No. 691,385
Claims priority, application France, Apr. 25, 1990, 90 05276
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—59.3 **17 Claims**



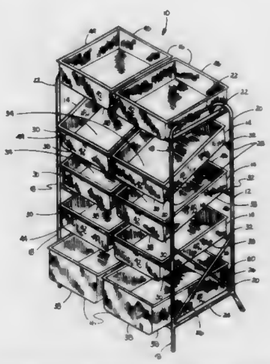
1. Queued object merchandiser comprising a channel adapted to receive partly nested objects forming a queue, said channel being provided with a clamp/pusher member fastened to a foot member adapted to slide in a guide slot and associated with a return spring urging it towards an anterior abutment wall, the foot member of the clamp/pusher member being fastened to a slide member disposed in a central guide passage disposed under a bottom of the channel, the return spring being coupled to the slide member and there being provided to either side of the central passage two side passages, the return spring describing at least an outward run in each of the side passages between at least one direction-changer pulley wheel and an anchor point.

5,111,943
METHOD AND APPARATUS FOR DISPLAYING A PLURALITY OF ARTICLES
Arthur J. Ramey, Abingdon, Va., assignor to Marley Mouldings Inc.
Filed Jan. 22, 1991, Ser. No. 643,494
Int. Cl.[5] B65D *71/00*
U.S. Cl. 211—59.4 **31 Claims**



1. An apparatus for displaying a plurality of moulding strips which permits a customer to readily locate a desired moulding strip, comprising:
a) support means for supporting a plurality of moulding strips;
b) directly means for listing at least first and second types of moulding strips supported by said support means, said directory means includes at least first and second portions, said first portion being formed from a first color corresponding to the first type of moulding strip, said second portion being formed from a second color corresponding to the second type of moulding strip;
c) identifying means for identifying the location of the first and second types of moulding strips on said support means, said identifying means includes at least first and second members, at least a portion of said first member is formed from said first color and at least a portion of said second member is formed from said second color; and,
d) said directly means having graphic illustrations depicting the first and second types of moulding strips in an installed position thereby readily indicating to the customer a possible use thereof.

5,111,944
CONTAINER STATION
Walter H. Ostermeyer, 2415 Forest Park Blvd., Fort Wayne, Ind. 46805
Filed May 29, 1990, Ser. No. 529,439
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—133 **23 Claims**

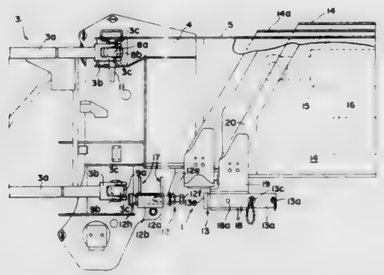


1. A container station comprising a plurality of cornerposts, means for retaining said cornerposts in spaced relation, a plurality of cradles extending between opposed pairs of said cornerposts, each said cradle having a front support member and a rear support member, and a plurality of primary containers depending from said cradles, respectively, each said primary container having a front and rear brim and a bottom, each said primary container being movable between a rest position and an access position, said front brim overlying and being supported by a respective one of said front support members in said rest position, said front brim being disposed below and being unsupported by a respective one of said front support members in said access position, said bottom being continuously supported by a respective one of said rear support members adjacent to said rear brim during movement between said rest position and said access position.

5,111,945
BOOM EXTENSION ALIGNMENT DEVICE
William E. Hull, and Henry D. Barthalow, both of Greencastle, Pa., assignors to Kidde Industries, Inc., Iselin, N.J.
Filed Sep. 13, 1991, Ser. No. 759,675
Int. Cl.[5] B66C *23/66*
U.S. Cl. 212—168 **8 Claims**

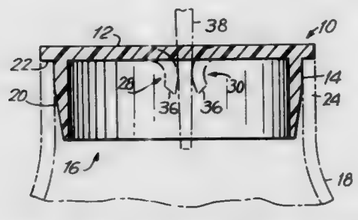
1. In a crane boom having relatively movable telescopic boom sections and a side stowable boom extension swingable from a stowed position to a working position and connectable to a nose assembly or a boom section by upper and lower clevis connections on each side of the nose assembly, each clevis connection including an apertured bifurcated arm on the boom extension insertable on an apertured nose assembly shaft por-

tion, the improvement comprising an alignment device operatively connected between the nose assembly boom section and another boom section, whereby upon relative telescopic movement between the nose assembly boom section and said an-



other boom section a bifurcated arm on the boom extension is engaged by the alignment device to align the apertures therein with the apertures in the nose assembly shaft portion to facilitate the insertion of a pin through the aligned apertures.

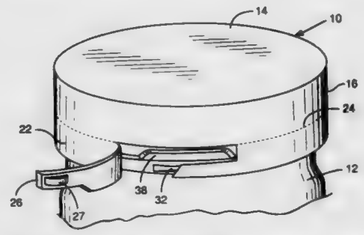
5,111,946
SAFETY BOTTLE
Elliot Glanz, 4005 Greentree Dr., Oceanside, N.Y. 11572
Filed Nov. 30, 1990, Ser. No. 620,050
Int. Cl.[5] B65D *39/04, 47/36*
U.S. Cl. 215—247 **5 Claims**



1. A safety container comprising a container chamber having a walled necked aperture for access thereinto and a cover frictionally insertable within said aperture, said cover having a generally flat top and a peripheral depending side wall, said side wall adapted to engage the wall of said necked aperture, said top having an integral one-way valve located therein, said valve comprising flap means formed by said top, the flap means having edges, the edges of said flap being beveled, said valve being adapted and dimensioned to allow insertion of an object through said top into the interior of said container chamber to withdraw contents therefrom, while otherwise sealing the chamber to prohibit escape of contents, an intermediate portion of said top acting as hinge means for said flap means.

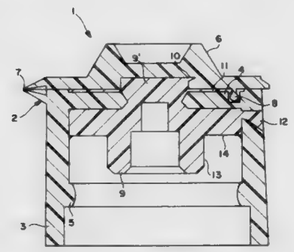
5,111,947
TAMPER PROOF CAP AND CONTAINER
Michael C. Patterson, 2674 Maplewood Dr., Longview, Wash. 98632
Filed Dec. 4, 1990, Ser. No. 621,765
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—256 **12 Claims**

1. A tamper proof cap for use on a container having a threaded neck and one portion of an interlocking tooth and notch arrangement of spaced-apart teeth and notches below the threads, comprising:
a top portion;
an annular skirt portion depending from the top portion and having internal threads complementary to the container threads;
a separable strip depending from the bottom of the skirt portion and having internally the other portion of the tooth and notch arrangement of spaced-apart teeth and notches, a boundary between the skirt portion and separable strip defined by a line of weakness; and
means for grasping the separable strip to sever it from the skirt portion along the line of weakness, thereby allowing the skirt portion to be unthreaded,



the notches each being constructed with a first surface extending substantially perpendicularly inward from the circumference of the neck or annular portion wherein the notches are defined and a second surface extending from the circumference of the neck or annular portion to intersect the first surface at substantially a right angle, the notches positioned to allow the teeth to slide past the notches upon rotation of the cap in a threading direction until the cap reaches a sealed position on the container threads, the teeth thereby engaging the notches to prevent rotation of the cap from the sealed position in an unthreading direction.

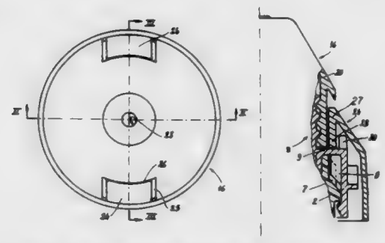
5,111,948
CAP ASSEMBLY AND METHOD FOR PRODUCING SUCH AN ASSEMBLY
Ronald J. C. Wijnschenk, Lelystad, Netherlands, assignor to Microplast B.V., Lelystad, Netherlands
PCT No. PCT/NL89/00053, § 371 Date Dec. 28, 1990, § 102(e) Date Dec. 28, 1990, PCT Pub. No. WO90/00143, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 27, 1989, Ser. No. 613,808
Claims priority, application Netherlands, Jun. 28, 1988, 8801643
Int. Cl.[5] B65D *55/16, 41/28*
U.S. Cl. 215—306 **8 Claims**



1. In a cap assembly (1, 15) for a container, comprising an easily deformable plug member (9, 21) and a neck member (3, 16) having an opening, said neck member being adapted to cover an upper part of a container neck and partially covering said plug member (9, 21), and a cover member (6, 19) for said plug member (9, 21); the improvement wherein said cover member (6, 19) is provided with a central cavity (10, 22),

which at least on one location increases in its cross section in the direction of opening, a locking member (9', 23) being engagably positioned within said cavity (10, 22), said locking member (9', 23) consisting of an easily deformable material which is secured to said neck member and shape-matingly engages in said cavity, whereby said locking member (9', 23) can be pulled from said cavity but cannot be reinserted into said cavity.

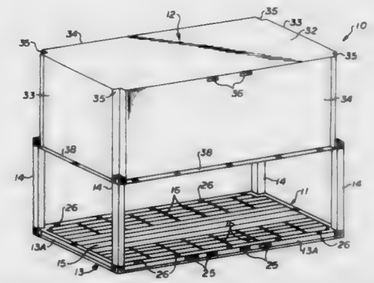
5,111,949
STOPPERING DEVICE WITH ROTATING CAP
Jacques Ambrosi, Villefranche sur Saone, and Philippe Odet, Chasselay, both of France, assignors to Astra Plastique, De Reneins, France
Filed Mar. 19, 1991, Ser. No. 671,971
Claims priority, application France, Apr. 13, 1990, 90 05157
Int. Cl.[5] B65D *51/16*
U.S. Cl. 215—313 **8 Claims**



1. A stoppering device for selectively closing a container having a neck cooperating with a threaded body, the threaded body defining a shoulder having an axis perpendicular to the longitudinal axis of the body and a projection extending from the shoulder in a longitudinal direction of the body, the stoppering device comprising:
a cap having corresponding threads for rotational association with said body, said cap including a cylindrical skirt, a frustoconical portion extending from said skirt, and a connecting zone defined between the frustoconical portion and the cylindrical portion and located along the longitudinal axis at a level adjacent to the shoulder;
said connecting zone including at least one tongue elastically radially displaceable relative to the longitudinal axis of the body and having an extension projecting therefrom for selective engagement with the projection on the shoulder to prevent rotational disassociation of said cap and body, said tongue being elastically displaced radially inwardly to disengage the extension from the projection to permit rotational disassociation of said cap and body; wherein said tongue is defined by two vertical slots extending in a longitudinal direction relative to the body and a horizontal slot extending between the two vertical slots, and the extension projects from an edge of the tongue defined by the horizontal slot in a longitudinal direction relative to the body.

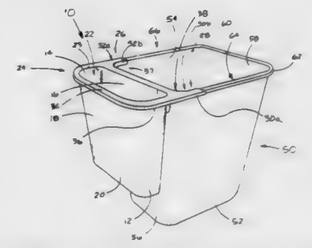
5,111,950
SHIPPING CONTAINER
Kurt Wylenzek, c/o Cross & Co., Inc., 5535 Harvey Wilson, Houston, Tex. 77020
Filed Sep. 11, 1990, Ser. No. 580,666
Int. Cl.[5] B65D *88/00*
U.S. Cl. 220—1.5 **13 Claims**

1. A shipping container comprising;
a pallet comprising a rectangular frame of metal channel members forming a rectangular pallet base, square metal tubing posts extending vertically from and secured to the corners of the base and a wood or metal load-supporting pallet floor on the base,
tie-down means adjustably supported on said pallet floor for securing cargo to said pallet floor,
a generally rectangular hollow metal cover member having a top wall, opposed end walls, opposed side walls, and an open bottom,
each corner of said cover member having square cross-section vertically-extending recesses fitted inside said posts,
said cover being guided for vertical sliding movement relative to said pallet,



a cover-holding latch on said posts movable between an unlatched position permitting movement of said cover and a latched position supporting said cover in a raised position supported on said posts, whereby
said cover may be either lifted vertically above said posts and removed from said pallet or may be moved vertically relative to said pallet within said posts between a raised position above said pallet floor for loading cargo on said pallet floor and a lowered position engaging said pallet base for completely covering said pallet floor and cargo loaded thereon.

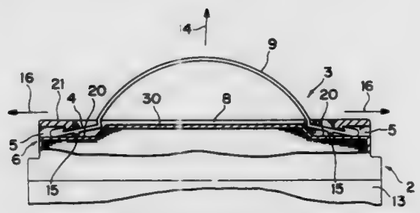
5,111,951
SUPPLEMENTAL WASTE RECYCLING CONTAINER FOR MOUNTING TO A WASTEBASKET
John D. Breen, Wooster, and Thomas Scherer, Mansfield, both of Ohio, assignors to Rubbermaid Office Products Group, Inc., Inglewood, Calif.
Filed Nov. 12, 1991, Ser. No. 792,142
Int. Cl.[5] A47G *19/00;* **B65D** *21/02*
U.S. Cl. 220—23.4 **19 Claims**



1. A supplemental waste container for mounting to, and depending from, a top rim of a wastebasket, the supplemental container being adapted for depending from either an inside or an outside surface of the wastebasket, said supplemental container having an upper out-turned rim with mounting members extending therefrom, said out-turned rim and said mounting members together comprising first and second mounting sections each shaped complementarily with an end portion of the upper rim of the wastebasket for engaging with, and mounting securely over, said end portion of the upper rim of the wastebasket, with said first mounting section adapted for mounting the supplemental container to the outside surface of the waste-

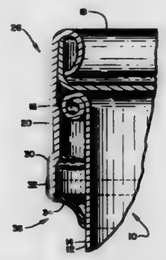
basket and said second mounting section adapted for mounting the supplemental container to the inside surface of the wastebasket.

5,111,952
LID WITH A HANDLE FOR CONTAINERS OF ACCUMULATORS
Olimpio Stocchiero, 5 Via Kennedy, 36050 Montorso Vicenting (VI), Italy
Filed Mar. 5, 1991, Ser. No. 665,315
Claims priority, application Italy, Mar. 6, 1990, 85539 A/90
Int. Cl.[5] B65D *23/10*
U.S. Cl. 220—94 R **4 Claims**



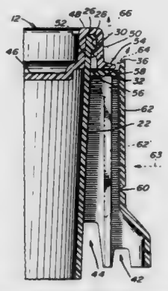
1. A lid equipped with a handle, for use with a container, comprising:
an essentially flat surface which is part of an upper portion of the lid,
said upper portion including two aligned openings on opposite sides of said upper portion,
each of said openings having at least one projecting grip pawl located therein,
a handle formed by an elastic body, having two ends which are received in said openings and having at least one projecting tooth on each end,
a handle housing located in said upper portion and receiving said handle when it is not in use, and the projecting teeth of the handle engaging in the corresponding grip pawls of the lid when the handle is lifted.

5,111,953
SEAL SYSTEM AND METHOD FOR CONTAINERS
Michael C. Faust, North St. Paul; Keith T. Pinckney, Bloomington, and Janelle K. Wong, White Bear Lake, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 277,291, Nov. 29, 1988, abandoned.
This application Oct. 30, 1990, Ser. No. 607,770
Int. Cl.[5] B65D *41/02*
U.S. Cl. 220—214 **6 Claims**



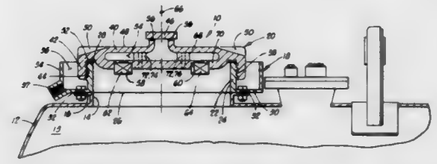
1. A prefabricated sealable lid assembly of the type which is adapted to be placed upon a container to seal said container comprising:
lid means for fitting upon said container, said lid means having an annular rim, said annular rim having an outer circumferential surface and an inner circumferential surface;
heat shrink strip means, having a length substantially equal to the circumference of said outer circumferential surface of said lid means, said heat shrink strip forming a substantially cylindrical seal ring, having an inner circumferential surface and an outer circumferential surface, and having an upper edge, and a lower edge, said upper edge abutting said annular rim, and said ring extending from, projecting below, and not overlapping said annular rim, for tamper evident sealing of said container;
adhesive band means for attaching said heat shrink means to said lid means, having a length substantially equal to the circumference of said outer circumferential surface of said lid means, said adhesive band means having an attachment surface having adhesive thereon, said attachment surface divided into a first, lid means attachment portion, and divided into a second, heat shrink strip means attachment portion, said first lid means attachment portion coupled to said outer circumferential surface of said lid means, said second heat shrink means attachment portion coupled to said outer circumferential surface of said heat shrink strip means;
whereby, said heat shrink strip means will shrink to engage said container forming a tamper evident seal, when heat is applied to said heat shrink strip means.

5,111,954
TAMPER EVIDENT CONTAINER
Mario Gaudreault, St-Damien, Canada, assignor to IPL Inc.
Filed Oct. 2, 1990, Ser. No. 591,775
Int. Cl.[5] B65D *41/32*
U.S. Cl. 220—266 **6 Claims**



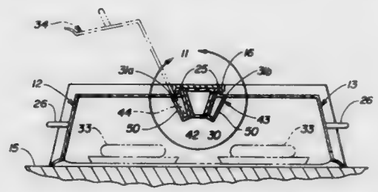
1. A container adapted to securely engage a cover displaying a peripheral depending skirt, comprising:
a body including side walls having an upper edge portion adapted to engage the peripheral depending skirt of a cover; said side walls including a peripheral flange consisting of a horizontal portion projecting outwardly from said side wall and of an outer vertical portion distanced from said side wall, said portions adapted to receive in close relationship therewithin a lower part of the skirt; and
tab means having a horizontal portion integrally formed with said side wall and with said horizontal portion of said flange and a downwardly extending vertical portion integrally formed with said vertical portion of said flange; said horizontal and vertical portions of said tab means being connected to said horizontal and vertical portions of said flange through weakened areas to thereby render said tab means breakable when pressure is applied thereon thus providing visual indication of tampering, whether authorized or unauthorized, and adapted to allow removal of the cover from the container;
wherein said downwardly extending vertical portion of said tab means includes an enlarged area relative to said vertical portion of said flange thus defining a handle for said container; said tab means being provided in said enlarged area;
wherein said container defines four slightly inclined walls, said handle being provided on each of two opposite side walls of said container.

5,111,955
NON-METALLIC ACID HATCH
Robert L. Baker; Larry D. Billingsley, and Calvin L. Stegemoeller, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.
Filed Aug. 16, 1990, Ser. No. 568,912
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—303 **29 Claims**



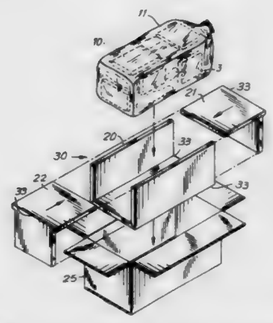
1. A hatch apparatus for a container having a container opening defined therein with a container flange surrounding said container opening, comprising:
a non-metallic hatch base including a base flange complementary to and constructed to be bolted to said container flange, said hatch base having a hatch opening defined therethrough and including a male base thread defined on said hatch base and surrounding said hatch opening;
a non-metallic hatch lid having a female lid thread defined thereon, said female lid thread being complementary to said male base thread so that said hatch lid can be attached to said hatch base to close said hatch opening by threaded engagement of said female lid thread with said male base thread; and
annular seal means disposed between said hatch base and said hatch lid and surrounding said hatch opening for sealing between said hatch base and said hatch lid around said hatch opening, said seal means being disposed inside of said female lid thread and said male base thread so that liquid in said container is prevented from reaching said threads.

5,111,956
FOOD COVER FOR PROVIDING BOTH A FULL CLOSED POSITION AND A QUASI-OPEN, SNEEZE GUARD POSITION AND INCLUDING SIDE PANELS, A SEGMENTED HINGE AND MIRROR IMAGE FRONT AND BACK PANELS
Warren Jow, 5222 Gordon Ave., El Cerrito, Calif. 94530
Filed Jan. 19, 1990, Ser. No. 467,805
Int. Cl.[5] B65D *43/24*
U.S. Cl. 220—338 **12 Claims**



1. A food cover for providing closed and quasi-closed sneeze positions relative to a horizontal base, comprising
(i) a pair of upright side panels,
(ii) front and back panels each having enlarged lip means along a side thereof,
(iii) a hinge means disconnectably connecting said front and back panels relative to said side panels, and including first and second support members each Cee-shaped in cross section and comprising a plurality of wall segments and passageway means to permit entry of said enlarged lip means of said front and back panels therein, wherein friction forces are created between said side panels and said support members based upon flexing support of at least one of said front and back panels by at least one of said plurality of wall segments thereby permitting transfer of increased loading to said side panels in surface contact with other wall segments of said hinge means.

5,111,957
METHOD AND APPARATUS FOR PACKAGING REFRIGERATED GOODS
David S. Hollander, Brooklyn, N.Y., and Mark S. Rubenstein, Edison, N.J., assignors to Transtech Service Network, Inc., Rosedale, N.Y.
Continuation-in-part of Ser. No. 203,943, Jun. 2, 1988, Pat. No. 4,928,847. This application Jan. 19, 1990, Ser. No. 467,678
Int. Cl.[5] B65D *5/56*
U.S. Cl. 220—408 **11 Claims**

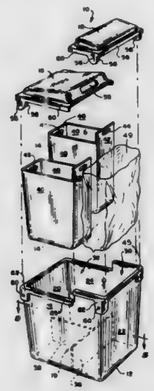


1. A chill box adapted to provide insulated packaging for refrigerated goods, comprising:
a plurality of separate portions, each portion having at least two panels and a bendable corner therebetween, each of said panels having a top, a bottom surface, and edges, and aluminum foil covering at least said top surface, and bottom surface and an insulating material having a geometrically patterned structure to provide air space therein and to strengthen said package disposed therebetween to insulate refrigerated goods packaged within said chill box, each said foil being formed of a first layer of a polyethylene coating, a layer of aluminum and a second layer of polyethylene coating.

5,111,958
COMPARTMENTALIZED REFUSE COLLECTION UNIT
Carol A. Witthoeft, 890 Western St., Hoffman Estates, Ill. 60194
Filed Jun. 17, 1991, Ser. No. 716,095
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—524 **9 Claims**

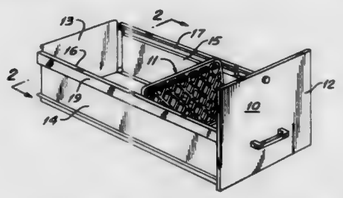
8. A refuse collection unit for segregated collection of differing types of refuse, said unit comprising:
(a) a container body defining first and second storage areas therein, each area including a pivotal cover member therefor and each of said cover members being pivotally movable to an open position therefor in a direction away from the other cover member;

(b) said cover members in closed positions therefor lying in parallel planes; and
(c) a pair of removable rigid liners each of which includes an upwardly stepped back wall, said stepped back walls,



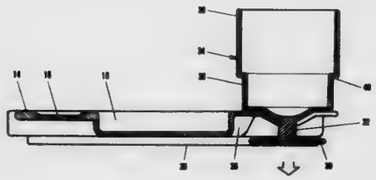
when placed coplanar within said second storage area of said container, separate the two storage areas from each other; and each rigid liner includes a hand-gripping means thereon for easy removal of the rigid liners from within the container body.

5,111,959
INJECTION MOLDED FOLLOW BLOCK FOR FILE DRAWER
Joel I. Glickman, Hungtingdon Valley, Pa., assignor to Magic Mold Corporation, Hatfield, Pa.
Filed Oct. 15, 1990, Ser. No. 597,888
Int. Cl.[5] B65D *57/00*
U.S. Cl. 220—544 **10 Claims**



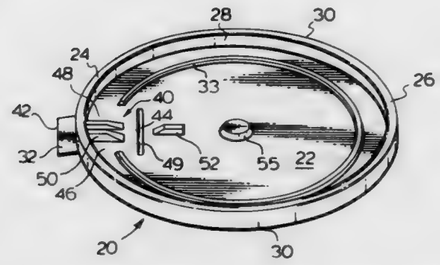
1. An adjustable follow block for use in combination with a file drawer having spaced-apart vertical side walls, longitudinally extending recessed guide channels extending lengthwise in each of said side walls intermediate the top and bottom edges thereof, and follow block positioning means associated with said guide channels, which comprises
(a) a molded plastic panel member of a width to be received within said file drawer between said vertical side walls and of a height suitable to serve as a follow block for items stored in said file drawer forwardly of said panel member,
(b) a pair of longitudinally extending guide bars integral with said panel member and mounted at the opposite side extremities thereof,
(c) said guide bars being spaced apart a distance greater than the space between said vertical side walls whereby said guide bars can be received within and confined in said guide channels for longitudinal movement therein,
(d) said guide bars being of a length greater than the height of said guide channels and having portions extending longitudinally from the plane of said panel member,
(e) the longitudinally projecting portions of said guide bars being laterally deflectable with respect to said panel member to a sufficient degree to accommodate installation of said follow block in said file drawer by a twisting motion from a starting position disposed at an acute angle to the side walls of said drawer to an installed position at right angles to said side walls.

5,111,960
INTERLOCKING PLATE AND CUP SET
Kent Zilliox, 471 S. Bascom Ave., San Jose, Calif. 95128
Filed Apr. 15, 1991, Ser. No. 684,995
Int. Cl.[5] B65D *21/02*
U.S. Cl. 220—575 **20 Claims**



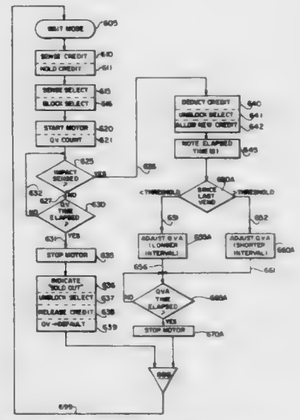
1. A mating plate and cup set, comprising:
a plate having upper and lower major surfaces which face in opposite directions, said upper and lower surfaces being joined by an edge,
said plate having a notch extending in from an edge thereof for receiving the stem of a cup, said notch terminating at a location on said plate spaced in from said edge,
the portion of said plate surrounding the termination of said notch, when viewed from a direction orthogonal to said upper surface thereof, comprising a concavity which surrounds said termination of said notch, said concavity having a predetermined shape and a given dimension when measured in a direction parallel to said upper surface of said plate, and
a mating cup having a body which is capable of carrying a quantity of liquid, a base which is below said base and which is capable of supporting said cup in a stable manner on a flat, horizontal surface, and a stem interconnecting said body and said base, said stem having an axis and being narrower than said body and said base and able to slide in said notch of said plate,
the bottom surface of said body having a peripheral area which is substantially flat and perpendicular to said axis of said stem, and a downwardly projecting convex portion which is surrounded by said peripheral area and surrounds and is adjacent to said stem,
said convex portion extending down from said peripheral area and having a predetermined shape which conformingly mates with said concavity when said cup is mated with said plate by inserting said stem into said notch and positioning said inner portion of said cup into said concavity of said plate,
said peripheral and inner portions of said bottom surface of said plate being dimensioned, when said plate and cup are mated and when measured in said direction parallel to said upper surface of said plate, such that said peripheral portion will rest on an area of said plate surrounding said concavity thereof,
whereby said plate and cup will remain very stable and said cup will resist tipping when said cup and said plate are mated.

5,111,961
CUP LID
Hubert Van Melle, Etobicoke, Canada, assignor to Amhil Enterprises Ltd., Mississauga, Canada
Filed Dec. 10, 1990, Ser. No. 625,025
Int. Cl.[5] A47G *19/22*
U.S. Cl. 220—712 **9 Claims**



1. A substantially circular disposable lid adapted for secure placement onto a cup and over the opening therein, made from a plastic material having orientation lines caused by extrusion, comprising:
a cover portion and lip portion;
said lip portion being displaced peripherally around said cover portion and adapted to allow said lid to engage a corresponding rim on the cup, said lip portion having a grasp tab exending from the periphery thereof;
said cover portion being generally planar and having a foldback portion therein located near the periphery of said cover portion and extending into said lip portion and spanning a minor segment of said cover portion and said lip portion, and also having a generally circular ridge near the periphery of said cover portion, said ridge providing overall structural strength to said cover portion, at least one co-operating protrusion for receiving and retaining said foldback portion, and a "U"-shaped hinge;
each of said at least one co-operating protrusion having a pair of outer walls that are adapted to be in intimate contact with said foldback portion;
said foldback portion having a first side, a second side, a first end, and a second end, said first end being coincident with said grasp tab of said lip portion and said second end being coincident with said "U"-shaped hinge;
said foldback portion being adapted to be lifted at its end and partially separated from the rest of said lid by lifting said foldback portion and tearing it inwardly, said foldback portion separating from the rest of said lid along a pair of tear lines, one on each side of said foldback portion with said tear lines defining the first and second sides of said foldback portion;
said foldback portion including at least one protruding tab for interfacing with said at least one co-operating protrusion on said cover portion, each of said at least one protruding tab having an inner wall that is adapted to be in intimate engagement with one of said outer walls of said co-operating protrusion;
wherein said "U"-shaped hinge is adapted to preclude said foldback portion from tearing further into said lid by bending once said tear lines reach said hinge; and
wherein said lid is oriented in a direction in said plastic material in such a manner that said tear lines are oriented along said orientation lines of said material and are defined solely as a consequence thereof.

5,111,962
VENDING APPARATUS WITH INTELLIGENT DISPENSATION CONTROL
Kenneth W. Oden, Charles Town, W. Va., assignor to Royal Vendors, Inc., Kearneysville, W. Va.
Filed Aug. 21, 1989, Ser. No. 406,518
Int. Cl.[5] G07F *11/00*
U.S. Cl. 221—1 **6 Claims**

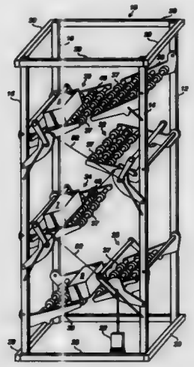


1. A vending apparatus, comprising:
an article selection device for receiving a customer selection, and generating an article selection signal;
means for storing one or more articles to be dispensed;
a dispensation mechanism for dispensing the articles from the means for storing;
a sensor for sensing when an article has been dispensed, the sensor generating an article dispensation signal; and
a dispensation controller for controlling the dispensation of articles by the dispensation mechanism, the dispensation controller comprising:
a) means for activating the dispensation mechanism in response to the article selection signal;
b) means, responsive to the article dispensation signal from the sensor, for effectively measuring the times of occurrence of one or more recent dispensations; and
c) means for deactivatign the dispensation mechanism in accordance with the measured times of the one or more sensed dispensations, so as to reduce a time delay between a subsequent article selection and the dispensation of that article.

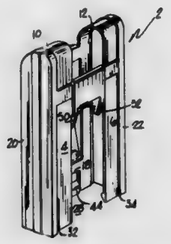
5,111,963
CONTAINER STORAGE AND DISPENSING APPARATUS
Robert W. Grace, Sr., Fort Lauderdale, Fla., assignor to Frederick J. Stingel, Lake Park, Fla.
Filed May 24, 1991, Ser. No. 705,512
Int. Cl.[5] G07F *11/06, 11/08*
U.S. Cl. 221—75 **29 Claims**

1. A storage and dispensing apparatus for articles, containers and the like comprising:
a first plurality of substantially vertically spaced shelf assemblies supported by support structure; and
a second plurality of substantially vertically spaced shelf assemblies supported by support structure;
each of said shelf assemblies comprising:
a shelf for receiving, storing and discharging containers, the shelves of the first plurality of shelf assemblies being substantially staggered vertically relative to the shelves of the second plurality of shelf assemblies, with free ends of each plurality facing the free ends of the other plurality,

each shelf being mounted to its respective vertical support for pivotal movement between an upwardly tilted receiving position and a downwardly tilted discharge position;
biasing structure adapted to urge the shelf to the receiving position;
a transfer stop operatively connected to the shelf and moveable between a lock position retaining the shelf in the receiving position when a shelf of a next lower shelf assembly is not prepared to receive a container and a release position allowing the shelf to move to the discharge position under weight of a container disposed on said shelf when the shelf of the next lower shelf assembly is prepared to receive a container; and
a transfer control operatively connected between the transfer stop and the next lower shelf assembly for releasing the transfer stop when the next lower shelf is prepared to receive a container.

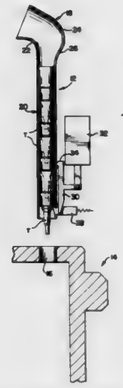


5,111,964
DEVICE FOR HOLDING ARTICLES AND PERMITTING THE REMOVAL THEREOF
John R. Couper, 533 E. Fourth #8, Loveland, Colo. 80537
Filed Jul. 3, 1991, Ser. No. 725,531
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—111 20 Claims



1. A device for holding a plurality of articles and having means for permitting removal of at least one of the articles comprising:
a hollow housing for holding a plurality of articles and formed from a relatively rigid material;
resilient means for preventing movement of said articles when in said hollow housing;
said hollow housing having an opening therein for permitting the removal of said articles when in said hollow housing;
said hollow housing having first access means to permit access to a predetermined number of said articles when in said hollow housing to apply a force thereto to overcome at least a portion of said resilient means and remove said predetermined number of said articles from said hollow housing; and
at least another portion of said resilient means preventing movement of the articles remaining in said hollow housing until it is desired to remove another of said predetermined number of said articles.

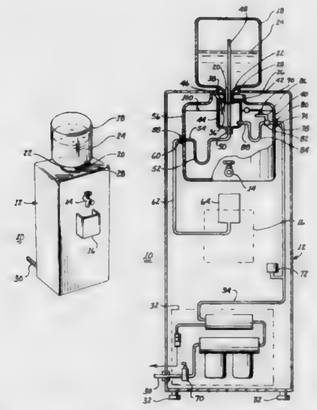
5,111,965
APPARATUS FOR FEEDING PIPETTE TIPS
Terry W. Allen, and James J. Pioch, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 4, 1990, Ser. No. 576,878
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—281 9 Claims



1. An apparatus for feeding pipette tips to a pipette, comprising:
a carrier for presenting each said pipette tip to an associated pipette; and
feed magazine means for receiving and storing a plurality of said pipette tips, and means for loading said tips into said carrier included on the means for receiving and storing said feed magazine including entrance port means for preventing insertion of said pipette tips into said feed magazine means in an incorrect orientation relative thereto, while permitting insertion of said pipette tips in a correct orientation relative thereto.

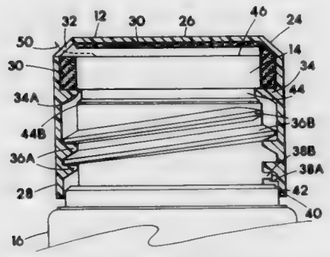
5,111,966
WATER DISPENSER
Jerome Y. Fridman, Tempe, Ariz., assignor to Kelco Water Engineering, Inc., Tempe, Ariz.
Filed May 18, 1990, Ser. No. 525,195
Int. Cl.[5] B67B *5/08*
U.S. Cl. 222—1 22 Claims

1. A water dispenser for dispensing water, said water dispenser comprising in combination:
a) a cabinet, said cabinet including a top side and an aperture imposed in said top side;
b) a source of water to be drawn at will;
c) a container disposed within said cabinet for receiving water from said source of water;
d) means for regulating water flow from said source of water into said container as a function of the water level in said container;
e) an inverted water bottle supported by and extending upwardly from said cabinet for providing a visually perceivable indication of the water level within said water bottle, said water bottle including a neck and an outlet therein, said neck being disposed within said aperture of said cabinet;
f) a housing disposed within said cabinet for receiving said neck and said outlet of said water bottle;
g) means for sealing said neck with said housing;
h) means for conveying a flow of water from said source of water into said housing and into said water bottle;



i) means for venting said water bottle as a function of the water level within said water bottle;
j) means for controlling water flow from said source of water to said container and to said water bottle as a function of the back pressure presented by said conveying means; and
k) means for dispensing water from said container at will.

5,111,967
DISPENSING CLOSURE FOR A CONTAINER
Alexander R. Schreiber, 159 Windsong St., Thousand Oaks, Calif. 91360
Filed Feb. 11, 1991, Ser. No. 653,505
Int. Cl.[5] B67D *5/32, 3/00*
U.S. Cl. 222—39 2 Claims



1. In combination; a dispensing control cap placed over a neck of a container, said neck being a tubular structure defined by an elongated annular wall attached to said container and having an exterior surface,
said cap made of plastic material and having an interior and an exterior separated and defined by a relatively rigid annular sidewall of said cap and a relatively rigid cap top attached to said sidewall by an exterior portion of said sidewall angling inward and attaching to said cap top, the angling inward of said sidewall defining an annular corner bevel of said cap,
said cap top at the attachment thereof to said sidewall defining a generally closed end of said cap,
said cap further having an open end oppositely disposed from said closed end of said cap, said open end of said cap placed over said neck so as to place said neck within the interior of said cap,
said cap being positionable into a first position on said neck and alternately into a second position on said neck,
said cap further including an annular relatively soft surface of plastic material affixed within the interior of said cap against an underside of said cap top, said soft surface sized and positioned within said cap to provide a seal when engaged with an annular top surface of said neck, the engagement of said soft surface against said top surface of said neck existing when said cap is positioned in said second position on said neck, said soft surface being disengaged from said top surface of said neck and positioned upward above said top surface of said neck when said cap is in said first position on said neck, said top surface of said neck including an annular bevel angling inward toward an open center of said neck, said annular bevel of said neck providing means for directing any existing product back into said neck upon the engagement of said soft surface against said top surface of said neck,
said soft surface within said cap including an affixed annular soft side portion providing a seal engaged against and encircling an upper portion of said exterior surface of said neck adjacent said top surface of said neck, the engagement of said side portion of said soft surface against said exterior surface of said neck being maintained with said cap in said first position and maintained with said cap in said second position on said neck,
said cap further including a dispensing aperture passing through said corner bevel and through said side portion of said soft surface of said cap,
said cap in said first position on said neck being a position wherein said cap is raised relative to said neck and said dispensing aperture is positioned above said top surface of said neck for dispensing product from within said container by way of a dispensing flow path extending from within said container through said neck and through said dispensing aperture,
said second position of said cap on said neck being a position wherein said cap is lowered relative to said neck and product dispensing from said container by way of said dispensing flow path is prevented by blockage of said dispensing aperture by the engagement of said soft surface against said top surface of said neck,
said cap having threads affixed to said sidewall within the interior of said cap, said threads of said cap positioned between said open end of said cap and said side portion of said soft surface,
said neck having threads affixed to said exterior surface of said neck, said threads of said neck positioned on said neck between said container and the engagement of said side portion of said soft surface against said neck,
said threads of said neck cooperatively engaged with said threads of said cap so as to provide means to allow rotation of said cap on said neck and further to provide means during rotation of said cap to move said cap between said first position and said second position by way of raising and lowering said cap relative to said neck, the raising and lowering of said cap on said neck providing means for the disengagement and engagement of said soft surface against said top surface of said neck and thereby the opening and closing of said dispensing aperture,
said cap further having an annular seal tongue affixed to said sidewall within the interior of said cap, said annular seal tongue extending inward toward said neck, said annular seal tongue positioned between said threads of said cap and said side portion of said soft surface of said cap, said annular seal tongue being engaged against said neck

within an annular groove in said exterior surface of said neck to provide a slidable seal maintained between said cap and said neck so as to prevent product from within said container from leaking between said cap and said neck and onto the engaged said threads, said annular groove in said neck positioned between said threads of said neck and said top surface of said neck,

said cap and said neck further including means for limiting the rotation of said cap from said first position into said second position so as to prevent inadvertent removal of said cap from said neck during rotation for opening of said dispensing aperture, said means for limiting the rotation of said cap including two stop blocks abutable against one another with rotation of said cap, one said stop block being affixed on said exterior surface of said neck between said container and said threads of said neck, the other of said two stop blocks being affixed on said sidewall of said cap within the interior of said cap between said open end of said cap and said threads of said cap,

said cap and said neck further including vibration means for indicating an open said dispensing aperture, said vibration means including a first portion of said vibration means affixed to said sidewall of said cap within the interior of said cap, and a second portion of said vibration means affixed to said exterior surface of said neck and placed relative to said first portion of said vibration means so as to abut said first portion of said vibration means and cause a momentary snap-like vibration in said cap approximately upon the abutting of said stop blocks against one another during rotation of said cap.

5,111,968

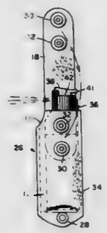
CANISTERS FOR PRESSURIZED GAS AND PERSONAL SECURITY DEVICES UTILIZING SAME

William E. Wilkerson, 10201 Harwin, Town Park-110, Houston, Tex. 77036

Continuation of Ser. No. 43,202, Apr. 27, 1987, abandoned, which is a division of Ser. No. 713,490, Mar. 19, 1985, Pat. No. 4,667,851, which is a division of Ser. No. 306,528, Sep. 28, 1981, Pat. No. 4,511,062. This application Dec. 15, 1988, Ser. No. 285,300

Int. Cl.[5] B67D *5/22*

U.S. Cl. 222—47 **5 Claims**



1. A personal security device comprising, in combination, an elongate canister having a discharge nozzle with an operating plunger at the top of the canister adapted to be depressed by thumb pressure for discharging from the canister contents such as tear gas, and an elongate holster in which the canister is received snugly with the nozzle having a discharge opening at one side of the holster, the holster including a main body part and a fold-over flap with fastener means to secure an end of the flap to the main body part with the flap extending over the nozzle and with the flap and the main body part defining an opening by which the contents of the canister may be discharged through the nozzle at said one side of the holster, the flap being sufficiently flexible to permit the thumb of a user's hand to depress the plunger of the nozzle while the canister is in the holster, the main body part of the holster having an elongate ridge extending along the length of said one side of the holster to engage fingers of said hand and having at the opposite side of the holster a smooth curvature along its length to fit the palm of the hand, whereby when the device is grasped in the user's hand in an emergency, the fingers engage said ridge by feel and the smoothly curved side of the holster fits in the palm of the user's hand, with the thumb on the flap, and the discharge opening is aimed toward an assailant automatically when the ridge is oriented toward the assailant.

5,111,969

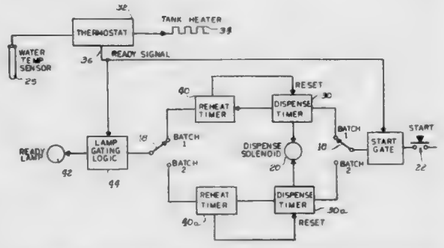
HOT WATER DISPENSER WITH ELECTRONIC CONTROL

Knepler, John T., Chatham, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Sep. 27, 1990, Ser. No. 589,080

Int. Cl.[5] B67D *5/08*; **G04C** *23/00*

U.S. Cl. 222—54 **9 Claims**



4. Control apparatus for a hot water dispensing mechanism having a hot water reservoir and an electrically operated dispensing control valve and temperature sensing means for sensing the temperature of water in said reservoir and producing temperature control signals for respectively permitting or preventing opening of said dispensing control valve in accordance with said temperature, said control apparatus comprising:

dispensing duration timer means responsive to said temperature control signal for permitting operation of said dispensing control valve, for producing a dispensing control signal for a selectable amount of time for controlling the time duration of opening of said dispensing control valve;

and delay timer means responsive to said dispensing duration timer control signal for producing a delay timer control signal for a selectable amount of time following said dispensing duration timer control signal for preventing a further operation of said dispensing duration timer means for a selectable amount of time following each dispensing operation.

5,111,970

FLUID DISPENSER HAVING A REMOVABLE SEALING DIAPHRAGM

Christopher C. Rutter, Oakland, and Terry Quashnick, Lodi, both of Calif., assignors to Rapak, Inc., Hayward, Calif.

Filed Mar. 12, 1991, Ser. No. 667,870

Int. Cl.[5] B67B *7/24*

U.S. Cl. 222—83 **13 Claims**

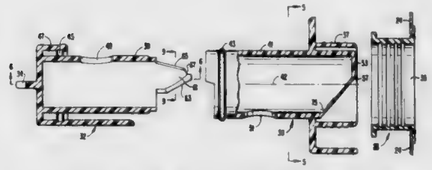
1. A fluid dispenser, comprising:

a first tubular member having a first fluid outlet in one sidewall thereof,

a second tubular member having a second fluid outlet in one sidewall thereof and positioned within said first tubular member in a manner to be rotatable with respect thereto about a common longitudinal axis between a first position wherein said first and second fluid outlets are aligned and a second position wherein said first and second outlets are substantially sealed by an overlap of sidewalls of respective second and first tubular members, whereby fluid flow

is permitted from within said second tubular member and out of said first and second outlets when said second tubular member is in its said first rotatable position while closing off such fluid flow when said second tubular member is in its second rotatable position,

a diaphragm positioned at one end of said first tubular member at an acute angle with respect to said longitudinal axis and sealing said first tubular member one end, said diaphragm having a cutting track of reduced thickness formed adjacent the sidewall of said first tubular member for a portion of a circumference thereof and having first, second and third segments, the first track segment being of a given thickness and width, the second track segment



having a greater thickness and width than the first segment, and the third track segment having a thickness and width that is less than those of said second segment and a width greater than that of said first segment, and

a knife positioned at one end of said second tubular member and adapted to travel along said diaphragm track when the second tubular member is rotated with respect to said first tubular member from said second rotatable position to said first rotatable position, whereby a first such rotation causes the knife to cut the diaphragm along said track to form a flap that is positioned out of a fluid path into an interior of said second tubular member through said first and second tubular member one ends.

5,111,971

SELF-PRESSURIZED CONTAINER HAVING A CONVOLUTED LINER AND AN ELASTOMERIC SLEEVE

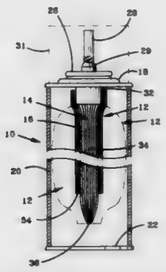
Robert Winer, 2290 Thurmont Rd., Akron, Ohio 44313

PCT No. PCT/US90/03062, § 371 Date Jan. 28, 1991, § 102(e) Date Jan. 28, 1991, PCT Pub. No. WO90/14284, PCT Pub. Date Nov. 29, 1990

Continuation-in-part of Ser. No. 358,392, May 26, 1989, abandoned. This PCT application May 25, 1990, Ser. No. 646,621

Int. Cl.[5] B65D *35/28*

U.S. Cl. 222—95 **18 Claims**



1. A fluid dispensing assembly for a self-pressurized container, said assembly comprising:

(a) an elongated radially expandable generally cyclindrical flexible plastic liner open at one end and closed at the other end, said liner being of sufficient thickness to be self-supporting in the unstressed state and having upper sidewall means adjacent to the open end and a regularly convoluted portion comprising a plurality of longitudinally extending convolutions extending from said upper sidewall means towards the closed end, said liner having an outwardly turned flange at the open end thereof, said liner having an essentially uniform thickness in the range of about 0.010 inch to about 0.020 inch over its entire length except optionally adjacent to the closed end; and

(b) an essentially cylindrical elastomeric sleeve open at both ends and surrounding at least a major portion of said liner in close fitting relationship, with no structural element between said liner and said sleeve, the normal inside diameter of said sleeve being substantially smaller than the exterior diameter of the liner in its folded state, said sleeve being free to elongate axially and having an axial length at least about 25% greater in the pressurized state than in the non-pressurized state.

5,111,972

CREAMY SUBSTANCE CONTAINER

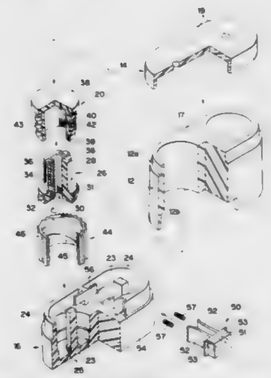
Yoshihumi Sakurai, Fujieda; Yuzi Ideshita, Yokohama, and Takashi Sugiyama, Higashi-Murayama, all of Japan, assignors to Pola Chemical Industries Inc., Shizuoka and Yoshida Industry Co., Ltd., Tokyo, both of, Japan

Filed Dec. 19, 1990, Ser. No. 631,059

Claims priority, application Japan, Jul. 11, 1990, 2-72951[U]

Int. Cl.[5] B67D *5/52*

U.S. Cl. 222—135 **14 Claims**



1. A container capable of containing a plurality of creamy substances and of simultaneously extruding the plurality of creamy substances, said container comprising:

a tubular case formed with through holes in an upper wall thereof;

a plurality of chambers formed within said case for containing the plurality of creamy substances;

a respective tubular member disposed in each said chamber movably in the longitudinal direction thereof and nonrotatably relative to said case, said tubular member having a first external thread formed on a lower portion thereof and an interlocking means formed in an upper portion thereof;

a respective hollow cylinder rotatably fitted over each said tubular member, said hollow cylinder having longitudinal teeth formed on an outer surface thereof and an internal thread on an inner surface thereof;

a respective extrusion plunger disposed nonrotatably in each said chamber for axial movement to extrude the creamy substance therein through a respective said through hole, said extrusion plunger comprising a tubular boss fitted between the respective said tubular member and the re-

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spective said hollow cylinder and a plate member formed at an upper end of said tubular boss, said tubular boss having a second external thread on an outer surface thereof and an engaging means on an inner surface thereof for engagement with said interlocking means of said tubular member, and said plate member being fitted in the respective said chamber in a liquid-tight manner;

said internal thread being in engagement with one of said first and second external threads; and

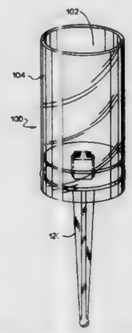
an operating means movably disposed in a lower portion of said case, said operating means being adapted to engage said teeth of each said hollow cylinder for turning said hollow cylinders upon movement of said operating means, whereby the movement of said operating means causes said hollow cylinders to turn by a predetermined angle for elevating said extrusion plungers through said one of said first and second external threads being engaged with said internal threads.

5,111,973

DISCHARGE DEVICE FOR DISPENSING CONTAINER

Martin Mueller, 4929 E. Lake Shore Dr., Wonder Lake, Ill. 60097

Filed Dec. 12, 1990, Ser. No. 626,561
Int. Cl.[5] B67D *5/42*
U.S. Cl. 222—386 **19 Claims**



1. A discharge device for a dispensing container holding a food, said discharge device including a piston and said dispensing container including a tube wherein:

a. said piston includes a first guiding platform, a second sealing platform and a stick;

b. said first guiding platform and said second sealing platform are secured to said stick;

c. said first guiding platform is at a first end of said stick;

d. said second sealing platform is adjacent to said first guiding platform;

e. said first guiding platform and said second sealing platform are at least partially flexible;

f. said first guiding platform has a first tapered edge;

g. said first guiding platform guides said piston into said tube;

h. said second sealing platform is in a sealing relationship with said tuble;

i. said first guiding platform and said second sealing platform are substantially perpendicular to said stick;

j. said first guiding platform is substantially parallel to said second sealing platform;

k. said second sealing platform has a second tapered edge;

l. said first guiding platform has a diameter slightly less than a diameter of said tube;

m. said second sealing platform has a diameter slightly larger than a diameter of said tube;

n. said stick has a second end of said stick oppositely from said first end of said first stick;

o. said tube has a substantially constant diameter;

p. said second sealing platform is closer to said second end of said stick than said first platform; and

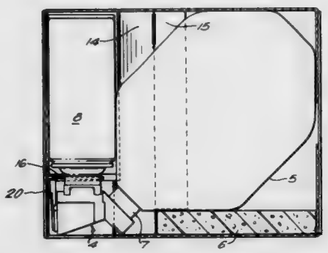
q. said first guiding platform is inserted into said tube prior to said second sealing platform.

5,111,974

DISPENSERS FOR GASIFIED BEVERAGES

Alan Parker, Kent, England, assignor to Reed Pakaging Limited, Kent, England

Filed May 17, 1989, Ser. No. 354,410
Claims priority, application United Kingdom, May 18, 1988, 8811759
Int. Cl.[5] B65D *83/00*
U.S. Cl. 222—399 **17 Claims**



1. A dispenser for a gasified beverage comprising a walled housing, a container of gasified beverage in said housing, a container of pressurized gas in said housing for topping pu the beverage container with gas, said containers each having an outlet with said outlets positioned adjacent each other in said housing, said gas container having a normally-closed outlet valve on its outlet, and a single dispensing valve unit directly mounted on the outlets of both said containers and manually accessible to the user, said valve unit including a valve member such that, when operated, to physically open said normally-closed outlet valve to admit pressurized gas to said dispensing valve unit, for the same operation of said valve unit to open the outlet of the beverage container to dispense the beverage from the beverage container, and for the same operation of said valve unit also to cause topping up gas to be released from the gas container and supplied to the beverage container, said normally-closed outlet valve returning to a closed condition when said operation of said valve unit is discontinued.

5,111,975

DECANTER HAVING SHOCK ABSORBER

Melvin F. Roberts, Niles, Ill., assignor to Specialty Equipment Companies, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 662,790, Mar. 1, 1991. This application Sep. 9, 1991, Ser. No. 756,973
Int. Cl.[5] A47G *19/14*
U.S. Cl. 222—475.1 **8 Claims**

1. A container for serving liquids comprising

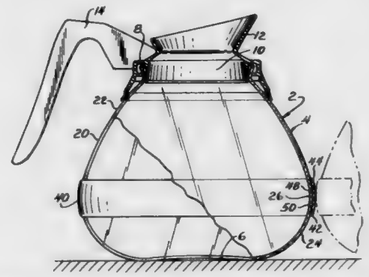
a bowl forming a liquid receiving cavity, said bowl having a bottom and a continuous side wall defining the sides of the cavity,

shock absorber means exteriorly positioned on said side wall for preventing damage to said side wall from impact,

said shock absorber means being a band positioned around the bowl,

said band includes an interior surface in contact with said side wall at upper and lower edge portions of said band,

said interior surface forming an interior cavity between said bowl and said band, and



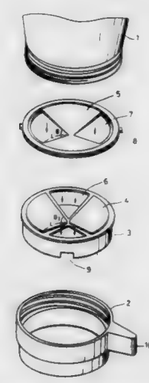
said interior cavity being disposed between said upper and lower edge portions.

5,111,976

POWDER DEVELOPER CONTAINER WITH A SEALING MEMBER HAVING SPECIFIC HARDNESS, COMPRESSIVE SET, FRICTION COEFFICIENT AND COMPRESSION

Yutaka Ban, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 257,018, Feb. 28, 1990, abandoned. This application Jan. 7, 1991, Ser. No. 638,023
Claims priority, application Japan, Oct. 15, 1987, 62-260856
Int. Cl.[5] B65B *1/06*
U.S. Cl. 222—485 **12 Claims**



1. A powder developer container, comprising:

a container for containing the powder developer;

a first shutter member having a first opening and including means for preventing rotation of said first shutter member when said container is rotated;

a second shutter member including means for rotating said second shutter member with respect to said first shutter member, said second shutter member being disposed between said container and said first shutter member and defining a second opening through which the developer can be discharged;

a sealing member interposed between said first and second shutter members, said sealing member being fixed to said first shutter member and being slidable relative to said second shutter member, said sealing member having a hardness of 20° to 70°, a compressive set lower than 4%, a coefficient of friction μ between itself and said second shutter member with which said sealing member is slidable no greater than 0.8, said sealing member being compressed between said first and second shutter members at a compression rate higher than 20% when said pair of shutter members is in a closed state; and

an open-ended cap fitted over said first and second shutter members and secured to said container, wherein rotating said cap rotates said container and said second shutter member to align the first and second openings.

8. A powder developer container, comprising:

a first shutter member;

a second shutter member including a mating member having open end portions, being relatively displaceable with respect to said first shutter member so as to be placed in an open state and selectively provide an opening through which the developer can be discharged;

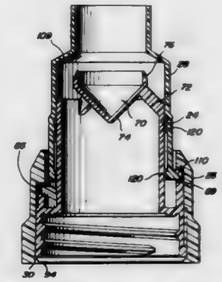
a sealing member interposed between said first and second shutter members, said sealing member being fixed to said first shutter member and being slidable relative to said second shutter member, said sealing member having a hardness of 20° to 70°, a compressive set lower than 4%, a coefficient of friction μ between itself and said mating member of said second shutter member with which said sealing member is slidable no greater than 0.8, said sealing member being compressed between said first and second shutter members at a compression rate higher than 20% when said pair of shutter members is in a closed state, wherein said sealing member is a small-foaming-rate ploy urethane foam having a cell size of 60 to 300 μm and a specific gravity of 0.2 to 0.5.

5,111,977

SEALABLE AND DISPENSING POURING SPOUT

Paul R. Maguire, 4284 Sea View La., Los Angeles, Calif. 90065, and John M. Lown, 222 La Jolla La., Newport Beach, Calif. 92663

Filed Aug. 24, 1990, Ser. No. 573,629
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—521 **16 Claims**



1. A rotatable closure structure for attaching to container bottles and the like, comprising:

a tubular body member having an attachment end and a pouring end, the attachment end having means for securing the tubular body member to a container bottle;

a collar member fixedly mounted on the tubular body member adjacent to the attachment end thereof, the collar member and tubular member cooperatively defining a cam surface therebetween, and

a spout shaped member rotatably mounted on the tubular body member, the funnel member having an outlet end through which material to be dispensed from the container flows, the spout shaped member having a cam follower which engages the cam surface so that rotation of the spout shaped member in one direction causes the outlet end thereof to move toward the pouring end of the tubular body member and rotation of the spout shaped member in the other direction causes the spout shaped

member to move away from the pouring end of the tubular body member, the tubular body member and spout shaped member having cooperative closure means responsive to the movement of the outlet end of the funnel member toward and away from the pouring end of the tubular body member for closing and opening the pouring end of the tubular body member.

5,111,978

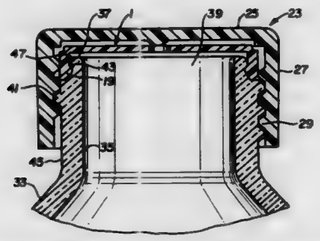
FITMENT RETAINED IN CONTAINER CLOSURE

Gary L. Mengeu, Wheeling, W. Va., assignor to Continental Plastics, Inc., Triadelphia, W. Va.

Filed Jan. 16, 1991, Ser. No. 652,793

Int. Cl.[5] B65D *47/00*

U.S. Cl. 222—545 **8 Claims**



1. A dispensing fitment for use with a screw cap having a skirt with internal threads which thread onto an external thread on a container neck which also has fitment securing means, said dispensing fitment comprising:

a circular end wall having at least one dispensing opening therein, a cylindrical sidewall extending axially from said circular end wall and terminating in a free end, container engagement means on said sidewall, and retaining means comprising flexible planar members extending radially outward from said sidewall of the fitment substantially parallel to said end wall and engaging the internal threads in said cap, and ribs extending axially along the sidewall of the fitment and radially outward to contact said internal thread on said cap, said retaining means retaining said fitment within said cap until said cap is threaded onto said container neck and said container engagement means engages said fitment securing means to secure said fitment to said container neck when said cap is threaded off of said container neck.

5,111,979

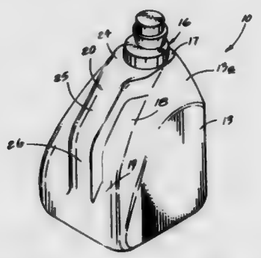
FLUID DISPENSING CONTAINER

Ali Athar, 4698 Hwy. 124, Hoschton, Ga. 30548

Filed Jan. 25, 1990, Ser. No. 470,258

Int. Cl.[5] B65D *25/40*

U.S. Cl. 222—568 **1 Claim**



1. A fluid dispensing container including a planar floor, a forward planar wall orthogonally mounted to the floor, spaced parallel planar side wall panels orthogonally mounted to the floor, and a top wall secured to the forward wall, and

arcuate side wall portions extending from each side wall panel upwardly to the top wall, and

a rear wall extending from the top wall downwardly and rearwardly from the top wall to the floor, and

a cylindrical boss orthogonally directed through the top wall including a spout opening, and

including a handle mounted to the rear wall, wherein the handle is mounted in alignment with the top wall at an upper end and mounted at its lower end to a lower portion of the rear wall, and

wherein a top portion of the handle is oriented parallel to the floor, with a rear portion of the handle oriented parallel to the forward wall, and

wherein the spout opening includes a forward surface aligned with an interior surface of the forward wall, and

pouring spout including a pouring cap, the pouring cap including an internally threaded skirt threadedly securable to the cylindrical boss, and the pouring cap including a top planar wall, and

wherein the pouring cap includes a cap pouring spout mounted to the top planar wall and having a spout bore having a diameter substantially less than that of a cap diameter defined by the cap, and wherein the spout bore is arranged diagonally relative to the spout opening and the cap pouring spout bore includes a pouring spout axis intersecting a cap axis below the top planar wall, and wherein the cap pouring spout includes a second cap securable to the cap pouring spout, and

wherein the cap pouring spout includes a boss member spaced above the planar top wall of the cap, and wherein the boss member includes a planar floor portion, the planar floor portion extending forwardly and beyond the cap top planar wall terminating in a projection, the projection including a concave bottom surface directed from the projection downwardly intersecting a forward portion of the cap.

5,111,980

APPARATUS FOR MOUNTING A CASTING PIPE TO AN OUTLET OF A METALLURGICAL VESSEL

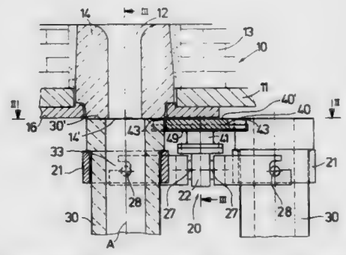
Heinrich Amsler, Chriesbaumhof 12,, CH-6404 Greppen, Switzerland

Filed Nov. 8, 1990, Ser. No. 611,093

Claims priority, application Switzerland, Dec. 6, 1989, 04370/89-0

Int. Cl.[5] B22D *41/24*

U.S. Cl. 222—600 **19 Claims**



1. An apparatus for mounting a casting pipe, having a discharge opening formed therethrough, to an outlet of a metallurgical vessel to enable discharge of molten metal from the vessel through an opening of the outlet and through the discharge opening of the casting pipe, said apparatus comprising:

a support member having means for supporting at least one casting pipe;

means for mounting said support member at a position adjacent the outlet of the vessel;

a separate closing member mounted on said support member in a manner such that a closing surface of said closing member is at a position to extend from a periphery of an upper end surface of the casting pipe supported by said support member to a position offset laterally from the periphery of the upper end surface of the casting pipe supported by said support member; and

means for adjustably moving said support member, and thus the casting pipe supported thereby and said closing member, relative to the outlet in first opposite directions to be parallel to a longitudinal axis of the outlet opening and in second opposite directions transverse said first opposite directions and to be transverse to the longitudinal axis, and thereby for selectively moving the casting pipe supported by said support member into a discharge position sealingly against the outlet and opening the outlet opening, and for selectively moving said closing member supported by said support member to a closed position sealingly against the outlet and closing the outlet opening.

5,111,981

GAME CALL HOLDER

Melvin L. Allen, 16 Welch Dr., Haughton, La. 71037

Filed Feb. 19, 1991, Ser. No. 657,175

Int. Cl.[5] A45F *3/01*

U.S. Cl. 224—202 **9 Claims**



1. A game call holder comprising support means adapted for positioning near the neck of a user; arm strap means carried by said support means for extending around an arm of the user and stabilizing said support means on the user's chest or shoulder; a clip carried by said support means for engaging an article of clothing worn by the user and locating said support means in a selected position near the neck of the user; and at least one holder strap carried by said support means for receiving a game call and selectively positioning the game call on said support means.

5,111,982

Patent Not Issued For This Number

5,111,983

CAMERA STABILIZING DEVICE

Elex M. Simmons, 3429 Gimli Dr., Amelia, Ohio 45102, and William E. Houser, 3856 Round Bottom Rd., Cincinnati, Ohio 45244

Continuation of Ser. No. 828,139, Feb. 10, 1986, abandoned. This application Mar. 9, 1987, Ser. No. 23,842

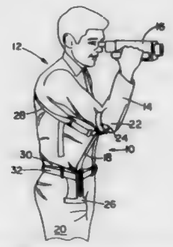
Int. Cl.[5] A45F *3/14*

U.S. Cl. 224—258 **3 Claims**

1. A camera stabilizing device for steadying a hand-held camera, which comprises:

a member for supporting the arm of the person holding the camera which extends from the arm of the person at its upper end, through a point adjacent the person's midsection where it is retained at the person's waist, downward to the person's thigh at its lower end where it engages the thigh to support and stabilize the person's arm so the viewfinder of the camera is kept at eye level when the person wears the device, wherein the member is bent approximately in the middle so that the lower half of the member is nearly vertical and adjacent to the person's body, and the upper half of the member extends outward from the body of the person at an angle to support the person's elbow;

an arm rest attached to the upper end of the member for maintaining the elbow of the person holding the camera in position on top of the member;



a means for engaging the belt of the person using the device attached to the member at the point the member is adjacent the person's midsection for restricting lateral movement of the device;

a thigh support attached to the lower end of the member for stabilizing the device on the person's thigh; and,

a strap connected to the member which passes around the body of the person wearing the device to hold the device in place.

5,111,984

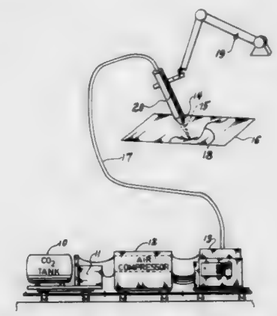
METHOD OF CUTTING WORKPIECES HAVING LOW THERMAL CONDUCTIVITY

Patrick J. Niedbala, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 15, 1990, Ser. No. 597,212

Int. Cl.[5] B26F *3/00*

U.S. Cl. 225—1 **6 Claims**



1. A method of cutting and severing any portion of a nonferrous workpiece having a thickness generally less than 0.090 inches and a thermal conductivity significantly less than metal, comprising:

translating a focused jet of CO_2 crystallites and a gas, pressurized to at least 100 psi, across said workpiece at a translating velocity of 250–1000 mm/sec, said crystallites being intermixed during jet formation to have a density at impact with the workpiece of about 0.03–0.4 g/cm^3, said jet having a converging focus substantially near the surface of said workpiece (i) to thermally embrittle said

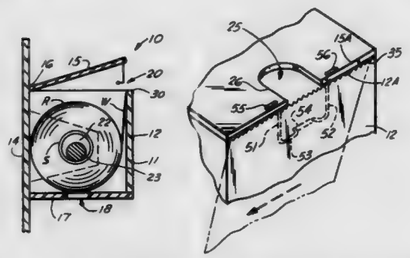
workpiece immediately surrounding said focus, and (ii) to fracture said workpiece at said focus by gas pressure.

5,111,985

RECEPTACLE FOR DISPENSING A CONTINUOUS WEB OF PAPER FROM A ROLL

Fernard S. Lapeyre, 1224 Octavia St., New Orleans, La. 70115

Filed Apr. 6, 1990, Ser. No. 505,777
Int. Cl.[5] B26F *3/02*
U.S. Cl. 225—51 **5 Claims**



1. A container for dispensing a web of paper from a roll wherein the web unwinds from the bottom of the roll during use, comprising:

a) a receptacle having bottom, an upstanding transverse wall that angularly intersects the bottom wall so that the roll abuts the bottom wall and transverse wall at spaced apart positions of contact, opposed left and right sidewalls, and a top with an interior space for holding the paper roll;

b) an upper opening in the receptacle for adding/removing the roll from the interior space;

c) the receptacle including an upper surface for dispensing the web from the receptacle interior over the upper surface;

d) a weighted member mounted during use in the hollow transverse opening and independently of attachment to the receptacle, for continuously holding the roll against the receptacle as the roll decreases in size; and

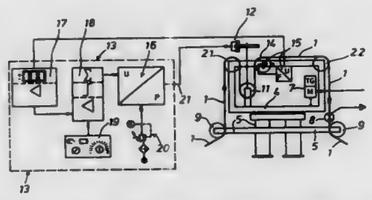
e) severing means at the front upper surface for severing a portion of the web adjacent the free end of the web.

5,111,986

WEB-MOTION CONTROLLER

Heinrich Niemann, Eager, Fed. Rep. of Germany, assignor to Erhard & Leimer GmbH, Augsburg, Fed. Rep. of Germany

PCT No. PCT/DE90/00244, § 371 Date Oct. 25, 1990, § 102(e) Date Oct. 25, 1990, PCT Pub. No. WO90/11954, PCT Pub. Date Oct. 18, 1990
PCT Filed Mar. 27, 1990, Ser. No. 613,474
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1989, 3910548
Int. Cl.[5] B65H *23/028, 23/14*
U.S. Cl. 226—21 **7 Claims**



1. A device for controlling and aligning of a web of material travelling along a path, said device comprising;

a guide frame pivotable about a frame axis;

first and second spaced apart guide rollers mounted on said frame and rotatable about respective parallel coplanar roller axes lying in a plane and perpendicular to said frame axis, the web passing over said guide rollers parallel to said plane over a stretch;

deflecting means for deflecting said web at a right angle from said stretch along said path at each end of said stretch;

actuating means including a servomotor for pivoting said frame about said frame axis;

a position sensor operatively connected with said actuating means and downstream of said second roller for controlling lateral deviations of the web and forming an output signal corresponding to an actual position thereof for controlling said servomotor to pivot said frame in response to said outputs signal;

a braking roller on said frame between said guide rollers rotatable about a respective axis parallel to said roller axis but offset therefrom, said braking roller being wrapped by said web and said web entraining said braking roller in rotation;

a braking device operatively connected with said braking roller for exerting a brake torque thereupon, so that a web traction in a direction of the travel of the web produced by said braking roller is modified;

a servo drive on said frame operatively connected with said braking device for actuating same; and

stress-measuring means for controlling said web traction, said stress-measuring means being provided with:

means for generating a measured-value signal corresponding to the web traction in said travel direction, and

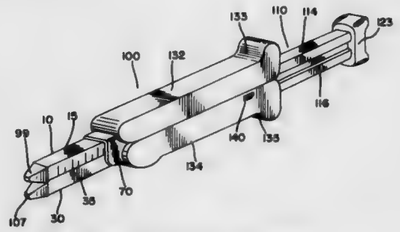
a control unit having a preselected value signal and operatively connected with said servo drive of the braking device for controlling said drive in response to a controlling signal resulted upon comparing of said measured-value and preselected value signals.

5,111,987

SEMI-DISPOSABLE SURGICAL STAPLER

Manssour H. Moeinzadeh, 2012 Byrnebruk Rd., Champaign, Ill. 61821; Lawrence M. Kaplan, 1021 Arlington Blvd. #312E, Arlington, Va. 22209, and Jeffrey A. Gurosh, 15031 Chicago Rd., Dolton, Ill. 60419

Filed May 14, 1990, Ser. No. 522,583
Int. Cl.[5] A61B *17/04*
U.S. Cl. 227—180 **11 Claims**



1. A surgical stapling instrument comprising:

(a) an upper elongate frame member for receiving a staple holder, said upper elongate frame member further comprising a forward section defining an elongate upper jaw member;

(b) a lower elongate frame member, said lower elongate frame member further comprising a forward section defining an elongate lower jaw member, said elongate lower jaw member comprising an anvil section;

(c) hinge means, attaching said upper and lower elongate frame members at their respective rearward extremities, to enable said anvil section to be positioned directly opposed to said staple holder;

(d) a locking means, for substantially maintaining said upper and lower elongate frame members in fixed relative position;

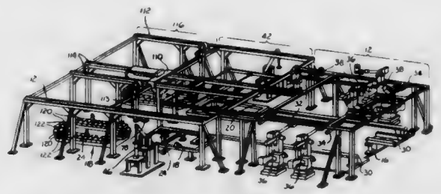
wherein said upper and lower elongate frame members are in contact along substantially their entire lengths rearward of said elongate upper and lower jaw members when said upper and lower elongate frame members are locked in fixed relative position, whereby deflections of the elongate upper and lower jaw members are minimized.

5,111,988

FLEXIBLE AUTOMATED BODY ASSEMBLY SYSTEM AND METHOD

William W. Strickland, Lake Orion, Mich., assignor to Saturn Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 509,375, Apr. 16, 1990, abandoned. This application Mar. 11, 1991, Ser. No. 667,115
Int. Cl.[5] B23K *37/04*
U.S. Cl. 228—102 **5 Claims**



1. A body assembly system of the type having a welding station receiving a succession of differing body component parts to weld such components into integrated body structures of a different type, comprising:

a fixture frame having a plurality of fixtures mounted thereon to clamp and locate the component parts in predetermined position within the welding station,

welding means fixedly and immovably adapted to apply welds to the positioned component parts,

disconnectable fixture holding means mounting said fixtures on the fixture frame and permitting removal of said fixtures from the fixture frame and permitting the mounting of different fixtures thereon for the subsequent clamping and locating of the body components for a different body structure,

and programmable fixture changing robot means adapted to disconnect said fixtures from the fixture frame and mount different fixtures thereon for the welding of the next of the successive body structures to be welded.

5,111,989

METHOD OF MAKING LOW PROFILE FINE WIRE INTERCONNECTIONS

William J. Holdgrafer, Burlington, N.J.; Michael J. Sheaffer, Newtown, and Lee R. Levine, New Tripoli, both of Pa., assignors to Kulicke and Soffa Investments, Inc., Wilmington, Del.

Filed Sep. 26, 1991, Ser. No. 766,627
Int. Cl.[5] B23K *20/10*; H01L *21/607*
U.S. Cl. 228—110 **19 Claims**

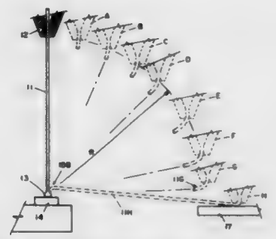
1. A method of making low profile slack free fine wire interconnections, comprising the steps of:

making a first ball bond with a capillary bonding tool at the end of a fine wire to be connected to a lead frame,

paying out the fine wire from the capillary while moving from said first ball bond to a point on the lead frame short of the second bond target position,

engaging said fine wire against said lead frame with a first bonding force,

simultaneously mashing, forward extruding and wire drawing said fine wire under the working face of said capillary bonding tool while moving away from said first ball bond to said second bond target position, and



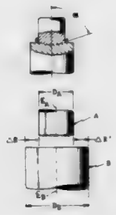
bonding said fine wire to said lead frame using a second bond force and the application of ultrasonic energy.

5,111,990

INERTIA WELD NOTCH CONTROL THROUGH THE USE OF DIFFERENTIAL WALL THICKNESSES

Jack S. Thrower, West Palm Beach; Dennis C. Stewart, Palm City, and Enrique E. Montero, Okeechobee, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1988, Ser. No. 286,912
Int. Cl.[5] B23K *20/12*
U.S. Cl. 228—113 **1 Claim**



1. A method for inertia weld repair of high strength superalloy articles which comprises:

a) removal of a damaged portion of the article leaving a nondamaged portion;

b) replacement of said damaged portion by inertia welding a replacement portion of an equivalent superalloy to the damage free portion, producing a residual notch in the weld zone, wherein said replacement is larger in cross section at the weld zone than said nondamaged portion and produces thereby a curved weld zone and so that the residual weld notch does not extend into the nondamaged portion;

c) removal of the excess material from the replacement portion.

5,111,991

METHOD OF SOLDERING COMPONENTS TO PRINTED CIRCUIT BOARDS

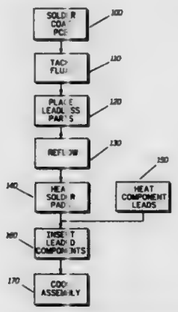
Robert A. Clawson, Kokomo, Ind., and John R. Thome, Fort Worth, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 22, 1990, Ser. No. 601,541
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—180.1 **22 Claims**

1. A method of manufacturing printed circuit assemblies having a printed circuit board and components, comprising:

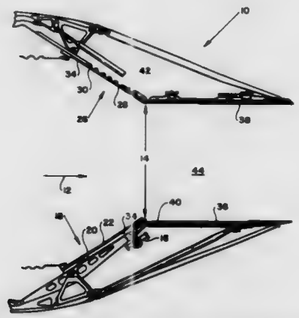
applying solder material to exposed metal pads of the printed circuit board;

applying heat to the printed circuit board, to effect melting of at least a portion of the solder material;
applying heat to the components;



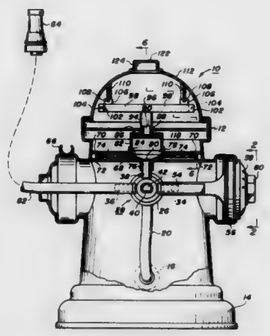
placing the heated components into the molten solder; and
cooling the assembly to solidify the solder material.

5,111,992
VARIABLE THROAT CONVERGENT/DIVERGENT NOZZLE
William K. Barcza, Stuart, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Apr. 19, 1991, Ser. No. 687,667
Int. Cl.[5] B64C *9/38*; F02K *1/06*
U.S. Cl. 239—127.3 **2 Claims**



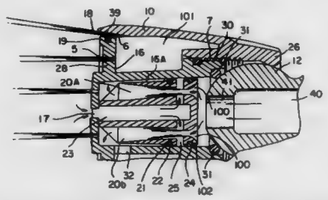
1. A variable throat convergent/divergent nozzle for a gas turbine engine comprising:
a plurality of convergent flap assemblies, each flap assembly comprising a convergent flap and a convergent flap liner;
a plurality of convergent seal assemblies, each seal assembly comprising a convergent seal and a convergent seal liner;
a plurality of divergent flaps;
a plurality of divergent seals;
a variable diameter throat formed at the junction of said convergent flaps and seals and said divergent flaps and seals, variable from a minimum area to an intermediate area and to a maximum area;
a forced flow cooling path through said convergent flap liners;
a forced flow cooling path through said convergent seal liners;
an ambient air plenum surrounding said plurality of flaps and seals;
a plurality of openings in the outer edges of the upstream end of said divergent flaps in fluid communication with the interior of said nozzle and with said plenum; and
a barometric damper in each opening, permitting flow from said plenum into said interior of said nozzle, but not from said interior of said nozzle to said plenum.

5,111,993
WATER SPRINKLER
Paul J. Baker, Kenmore, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jul. 10, 1990, Ser. No. 550,721
Int. Cl.[5] B05B *1/00*
U.S. Cl. 239—211 **15 Claims**



9. A twirling pulsing sprinkler comprising:
a generally cylindrical sprinkler housing having an end cap;
a funnel chamber having a water inlet, a water outlet in the end cap, and a water spout;
a valve body rotatably mounted in the funnel chamber;
a sprinkler head mounted on the funnel chamber and comprising at least one jet outlet for imparting a rotational motion to the sprinkler head when water is expelled from the jet outlet for producing a rotatable stream of water;
means coupling the sprinkler head tot eh valve body for rotating the valve body in synchronism with the sprinkler head and for hydraulically connecting the funnel chamber to the sprinkler head; and
spout control means on the valve body for intermittently opening the spout to a flow of water in synchronism with the rotation of the sprinkler head for producing a pulsating stream of water from the water spout.

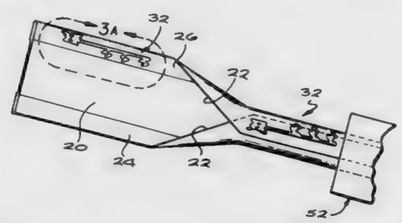
5,111,994
FLOW BOOSTER APPARATUS
Teodoro J. Gonzalez, Canyon Country, Calif., assignor to Emhart Inc., Newark, Del.
Filed Jul. 30, 1987, Ser. No. 79,718
Int. Cl.[5] B05B *7/00*
U.S. Cl. 239—428.5 **6 Claims**



1. An apparatus for boosting the flow of water comprising:
an outer housing portion;
a front plate portion adapted to sealably engage said outer housing portion, said front plate portion having a plurality of apertures therethrough for providing a plurality of jet

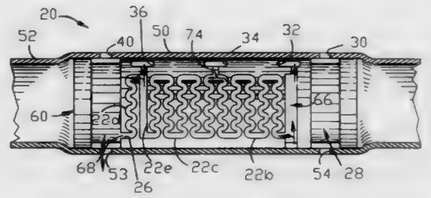
sprays, said plate portion further having an air inlet port therethrough for providing ambient air;
a flow booster means, said flow booster means comprising:
an air chamber in fluid communication with said air inlet port for receiving said ambient air;
a water conduit for receiving water from a water supply source;
a plurality of mixing chambers disposed adjacent said air chamber with each mixing chamber having a reduced forward portion, a rearward opening in fluid communication with said water conduit for receiving said water, said plurality of mixing chambers further being in fluid communicating with said air chamber for continuously drawing and receiving said ambient air from said air chamber, said rearward opening tapering towards said reduced forward portion such that the velocity of said water entering said rearward opening is increased and such that said air is mixed with said water within said mixing chamber to provide a turbulent mixture of air and water, said reduced forward portion being in fluid communication with said apertures such that said turbulent mixture of air and water is emitted in said jet sprays.

5,111,995
DRIP IRRIGATION TUBE
Octavian P. Dumitrascu, Fountain Valley, and Charles A. McMillen, Alta Loma, both of Calif., assignors to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed Dec. 18, 1990, Ser. No. 630,309
Int. Cl.[5] B05B *15/00*
U.S. Cl. 239—542 **35 Claims**



1. A drip irrigation tube adapted to be coupled to a source of pressurized water for supplying irrigating water at a substantially constant flow rate over a range of source pressures between a preselected minimum and maximum to a plurality of discrete locations spaced longitudinally along the tube, said drip irrigation tube comprising:
an elongated web of predetermined width, said web having a central wall portion of relatively small thickness and a pair of laterally spaced wall portions of relatively greater thickness extending longitudinally along the side edge portions of said web, said web being rolled upon itself with said relatively thick wall portions in substantially overlapped confronting relation with each other to form an elongated tube having an inside and an outside and defining an internal conduit for receiving water under pressure from the source;
a plurality of discrete emitter elements formed at spaced longitudinal locations along said tube, each of said emitter elements being formed by a recessed groove in one of said relatively thick wall portions and disposed to form passageways for communicating water from said internal conduit to said outside of said tube between said overlapped confronting thick wall portions;
means bonding said overlapped thick wall portions to each other around said groove such that unbonded portions including said groove define an inlet passageway section, a regulating passageway section and an outlet passageway section, the passageways of said inlet and said outlet sections each having a cross-sectional size substantially larger than the cross-sectional size of the passageway of said regulating section;
said passageway of said regulating section extending longitudinally along said web and being deformable to reduce its cross-sectional size in response to an increase of water pressure within said internal conduit.

5,111,996
INCREMENTAL PRESSURE-COMPENSATING DRIP IRRIGATION EMITTER
Gershon Eckstein, Fresno, Calif., assignor to Drip Irrigation Systems, Ltd., Nicosia, Cyprus
Filed Feb. 27, 1991, Ser. No. 661,880
Int. Cl.[5] B05B *1/30*
U.S. Cl. 239—542 **12 Claims**

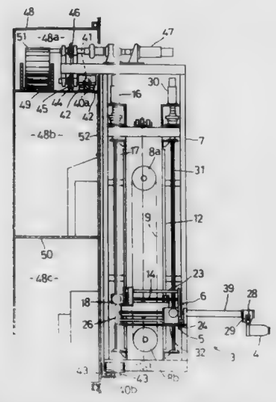


1. A drip irrigation emitter operatively installed in an irrigation pipe having an interior containing pressurized fluid and an exterior exposed to ambient conditions, the interior communicating with the exterior via at least one outlet opening in the pipe, the drip irrigation emitter comprising:
means defining a flow-limiting fluid passageway having an inlet end for receiving the pressurized fluid from the pipe and an outlet end for emitting fluid from the passageway for communicating the interior of the pipe to said at least one outlet opening in the pipe, the flow-limiting fluid passageway having a maximum fluid-flow path length;
channel means coupled to an intermediate portion of the passageway located between the inlet end and the outlet end, for transmitting fluid between the intermediate portion of the passageway and one of the pipe interior and said at least one outlet opening in the pipe; and
valve means coupled to the channel means, and operable in a fluid-flow restricting state and in a fluid-flow nonrestricting state, and being responsive to the fluid pressure inside the pipe for operating in one of the operating states when the pressure inside the pipe is less than a predetermined pressure and for operating in the other of the operating states when the pressure inside the pipe is more than the predetermined pressure, whereby the length of the shortest path of fluid flowing through the passageway to said at least one outlet opening is less than the maximum length when the valve means is operating in the nonrestricting state.

5,111,997
AUTOMATIC SPRAY PAINTING MACHINE
Shizuo Ikuta, Sagamihara; Masaharu Okuda, and Takashi Sakamoto, both of Yokohama, all of Japan, assignors to Taikisha, Ltd., Tokyo, Japan
Filed Nov. 19, 1990, Ser. No. 615,229
Claims priority, application Japan, Nov. 21, 1989, 1-304202
Int. Cl.[5] B05B *3/00, 3/18*
U.S. Cl. 239—750 **7 Claims**

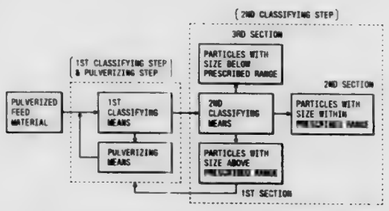
1. An automatic spray painting machine comprising:
a first movable portion movable in a direction toward and away from a work object,
a second movable portion movable in a specified direction

perpendicular to the moving direction of the first movable portion,
a supporting portion for supporting a spray nozzle,
a first actuator for moving the first movable portion, and
a second actuator for moving the second movable portion,
wherein the first and second actuators are mounted on the supporting portion, wherein a transmission mechanism for transmitting drive of the actuator to the movable portion positioned closer to the spray nozzle in the supporting



order effects drive transmission, with the other movable portion positioned closer to the supporting portion in the supporting order being allowed to move, and
wherein the transmission mechanism comprises a first spline shaft rotated by said second actuator,
a first ball spline slidably fitted on said first spline shaft for receiving rotation of this first spline shaft,
a first gear means for transmitting rotation of said first ball spline.

5,111,998
PROCESS FOR PRODUCING TONER FOR DEVELOPING ELECTROSTATIC IMAGE AND APPARATUS SYSTEM THEREFOR
Hitoshi Kanda, Yokohama; Yusuke Yamada, Machida; Masayoshi Kato, Iruma; Yasuhide Goseki, Yokohama, and Satoshi Mitsumura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 27, 1991, Ser. No. 676,067
Claims priority, application Japan, Mar. 30, 1990, 2-80699
Int. Cl.[5] B02C *19/12*
U.S. Cl. 241—5 **15 Claims**



1. A process for producing a toner for developing an electrostatic latent image, comprising the step of;
melt-kneading a composition comprising at least a binder resin and a coloring agent, cooling the kneaded product to solidification, and pulverizing the solidified product to produce a pulverized feed material;
feeding the pulverized feed material to a first classifying means to classify the feed material into coarse powder and fine powder;
feeding the classified coarse powder to a pulverizing means and thereafter feeding back the pulverized product to the first classifying means;
introducing the classified fine powder to a second classifying means having a multi-division classification zone divided into at least three sections, to which the particles of the fine powder are allowed to fall along curved lines by the Coanda effect, where a coarse powder portion mainly comprised of particles having a particle size above a prescribed range is dividedly collected in a first divided section, a median powder portion mainly comprised of particles having a particle size within the prescribed range is dividedly collected in a second divided section, and a fine powder portion mainly comprised of particles having a particle size below the prescribed range is dividedly collected in a third divided section; and
feeding back said classified coarse powder collected in the first divided section, to one of said pulverizing means and said first classifying means;
wherein said median powder collected in the second divided section has a volume average particle diameter of from 4 μm to 10 μm and a coefficient of variation of number distribution, represented by A, satisfying the following condition:

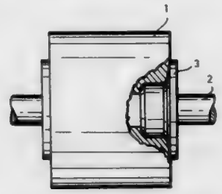
$$20 \leqq A \leqq 45$$

wherein A represents the coefficient of variation $(S/\overline{D}_1) \times 100$ in the number distribution of the median powder, wherein S represents the standard deviation in the number distribution of the median powder and $\overline{D}_1$ represents the number average particle diameter (μm) of the median powder; and
when the weight per unit time of the pulverized feed material fed to the first classifying means is represented by B, the weight per unit time of the fine powder introduced to the second classifying means is represented by C, the weight per unit time of the coarse powder collected in the first divided section and fed back to the pulverizing means or the first classifying means is represented by G, the weight per unit time of the median powder collected in the second divided section is represented by M and the weight per unit time of the fine powder collected in the third divided section is represented by F, the weights B, C, F, G and M are controlled to satisfy the following expressions:

$0.3 \leqq \text{weight B/weight C} \leqq 0.8$,
$0.2 \leqq \text{weight G/weight C} \leqq 0.7$, and
$0.8 \leqq \text{weight B/(weight F+weight M)} \leqq 1.2$.

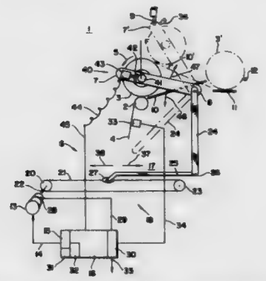
5,111,999
ARRANGEMENT FOR FASTENING THE GRINDSTONE OF A PULP GRINDER TO A ROTARY SHAFT
Raimo Pessa, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland
Filed Dec. 7, 1990, Ser. No. 626,201
Claims priority, application Finland, Dec. 20, 1989, 896125
Int. Cl.[5] B02C *19/00*
U.S. Cl. 241—293 **6 Claims**

1. An arrangement for fastening a grindstone of a pulp grinder to a rotatory shaft, comprising fastening flanges positioned at both ends of the grindstone, each fastening flange having a sleeve-like projection extending into a recess provided in the grindstone to support the grindstone radially, each said fastening flange having a recess defined therein so that the rotatory shaft may extend through said recess provided in the grindstone and said recess provided in the fastening flanges, fastening nuts having internal threads that are engageable with corresponding external threads on said rotatory shaft so that said fastening nuts can be screwed unto said rotatory shaft to engage each fastening flange and force each fastening flange towards the grindstone to fix the grindstone unrotatably with respect to the rotatory shaft, and a support member being provided at both ends of the grindstone around the rotatory shaft, one side of the support member bearing against the



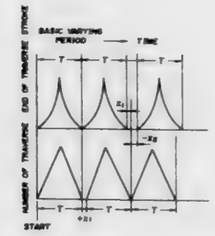
rotatory shaft and the other side of the support member bearing against the fastening flange so that the radial forces acting on the grindstone are substantially transmitted through the support member instead of through the threads of the fastening nut to the rotatory shaft.

5,112,000
APPARATUS FOR CONTROLLING THE CONTACT PRESSURE AND/OR RELATIVE MOTION BETWEEN A BOBBIN CYLINDER AND A BOBBIN
Josef Derichs, Mönchengladbach, and Ferdinand-Josef Hermanns, Erkelenz, both of Fed. Rep. of Germany, assignors to W. Schlafhorst AG & Co., Mönchengladbach, Fed. Rep. of Germany
Filed Aug. 17, 1990, Ser. No. 569,175
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1989, 3927142
Int. Cl.[5] B65H *54/42, 54/52, 54/38*
U.S. Cl. 242—18 DD **31 Claims**



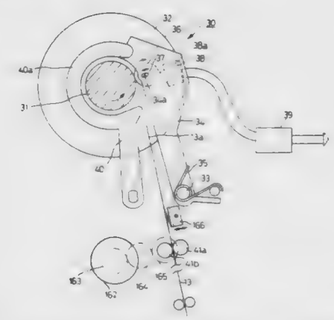
1. In a machine having a frame, a rotatable configuration of two partners in the form of a bobbin cylinder and a bobbin resting on the bobbin cylinder for winding yarn or tape-like material onto the bobbin in a traversing motion, one of the partners being firmly attached to the frame and one of the partners being driven by drive means, and a carrier being movable relative to the one partner for supporting the other of the partners, an apparatus for controlling at least one of contact pressure and relative motion of the partners of the rotatable configuration, comprising an electromechanical power proportional or current proportional torque adjuster connected to the carrier, and a control device connected to said adjuster for controlling the contact pressure with said adjuster to provide slip between the partners in ribbon zones resulting from the traversing motion.

5,112,001
YARN WINDING METHOD
Shigeru Yamamoto; Tutomu Ogiso, and Takashi Ikeuchi, all of Matsuyama, Japan, assignors to Teijin Seiki Co., Ltd., Osaka, Japan
Filed Sep. 27, 1990, Ser. No. 589,395
Claims priority, application Japan, Sep. 30, 1989, 1-256320
Int. Cl.[5] B65H *54/32, 54/38*
U.S. Cl. 242—43 R **3 Claims**



1. A method of winding a yarn onto a bobbin to form a wound package, comprising the steps of:
traversing said yarn reciprocally across said bobbin through a traverse stroke while rotating said bobbin at a selected winding speed;
varying the length of said traverse stroke according to a predetermined pattern having a basic time period T;
varying the number of traverse strokes per unit of time according to a predetermined pattern having a basic time period T; and
offsetting the starting points of the varying periods T for varying the length of said traverse stroke and varying the number of traverse strokes per unit of time from each other by a preselected interval.

5,112,002
AUTOMATIC WINDING MECHANISM FOR A CONTINUOUS SHEET AND THE LIKE
Eiji Shibata, and Mototsugu Ono, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Division of Ser. No. 471,633, Jan. 29, 1990. This application Jul. 30, 1991, Ser. No. 737,468
Claims priority, application Japan, Jan. 30, 1989, 1-20401; Jan. 31, 1989, 1-10581; Jan. 31, 1989, 1-11259
Int. Cl.[5] B65H *18/10*
U.S. Cl. 242—57 **13 Claims**



1. An automatic winding mechanism for a continuous sheet comprising:
a rotatable winding shaft for winding a continuous sheet thereon;

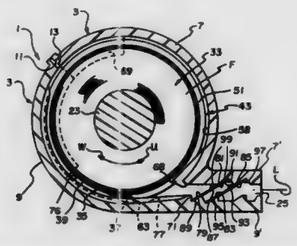
feeding means for feeding a continuous sheet toward said winding shaft;
first guide means for guiding a leader portion of a continuous sheet along a peripheral surface of said winding shaft, said first guide means supporting a guide roller for rotation and for movement from a first position to a second position in a radial direction with respect to a radius of said winding shaft, said first guide means being movable radially toward and away from said winding shaft and having a resilient member at one end thereof for biasing said first guide means toward said winding shaft wherein said guide roller is urged to contact a peripheral surface of said winding shaft by said resilient member;
second guide means including a U-shaped guide portion for partially surrounding said winding shaft;
sensor means for sensing a movement of said guide roller in said radial direction of said winding shaft; and
control means for controlling said feeding means so as to start feeding of a continuous sheet when movement of said guide roller from said first position to said second position is sensed by said sensor means and to prevent feeding of a continuous sheet when movement of said guide roller from said first position to said second position is not sensed by said sensor means so that said feeding means is not started when said winding shaft is not mounted.

5,112,003

FILM CASSETTE WITH SHUTTER LIGHT-LOCK

Roger G. Covington, Rochester, and Daniel M. Pagano, Henrietta, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1991, Ser. No. 722,540
Int. Cl.[5] G03B *1/04*
U.S. Cl. 242—71.1 **1 Claim**



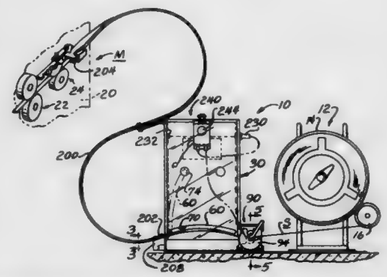
1. An improved film cassette where (a) a cassette shell has a pair of oppositely spaced throat portions defining a film passageway to the exterior of said shell, (b), a spool is supported for rotation in an unwinding direction inside said shell, (c) a convoluted film roll whose outermost convolution is a film leader is coiled about said spool, and (d) a stripper is located immediately inwardly of said passageway to be received between a leading end of said film leader and a next-inward convolutions of said film roll responsive to rotation of said spool in the unwinding direction to divert said leading end into said passageway to permit the leading end to be advanced from said shell, and wherein the improvement comprises:
said pair of throat portions defining said passageway has a flat surface along one of the throat portions and a flat surface along the other throat portion which are arranged in offset, co-planar relation to locate one flat surface inward of the other flat surface but in the same plane; and
a resiliently flexible shutter blade has two opposite ends one of which is secured to said one flat surface and the other of which rests freely against said other flat surface to normally block said passageway but to permit said leading end of the film leader to deflect said shutter blade out of its way when the leading end is diverted into said passageway.

5,112,004

STRAP DISPENSING AND ACCUMULATING APPARATUS AND COMBINATION OF SAME WITH STRAPPING MACHINE

Allison D. Tipton, Bloomingdale, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Nov. 7, 1990, Ser. No. 610,434
Int. Cl.[5] B65H *20/24, 20/40*
U.S. Cl. 242—75.51 **20 Claims**



1. Strap dispensing and accumulating apparatus to be used with a strap of thermoplastic material and with a strapping machine having a strapping head operable at certain times so as to draw portions of said strap forwardly into said strapping machine and at other times to draw portions of said strap backwardly from said strapping machine, said dispensing and accumulating apparatus also being used to accumulate strap portions before those portions are drawn by said strapping head into said strapping machine, to accumulate strap portions drawn by said strapping head from said strapping machine, and to dispense accumulated strap portions of said strap to said strapping head, said dispensing and accumulating apparatus comprising:
a stretch-out box having a strap inlet and a strap outlet and including two side walls disposed in a parallel relationship with respect to each other and a lower wall defining a guiding surface between said strap inlet and said strap outlet;
a strap guide disposed between said side walls of said stretch-out box and movable between a lower, operative position and an upper, inoperative position, said strap guide having a guiding surface, which overlies said guiding surface of said lower wall of said stretch-out box when disposed in said lower position, so as to extend between said strap inlet and said strap outlet and to define with said guiding surface of said lower wall of said stretch-out box a guide channel for guiding said strap being fed into said stretch-out box through means of said strap inlet and for guiding said strap as said strap moves from said strap inlet toward said strap outlet; and
means for feeding said strap from a supply of said strap in an indeterminate length amount into said stretch out box by means of said strap inlet.

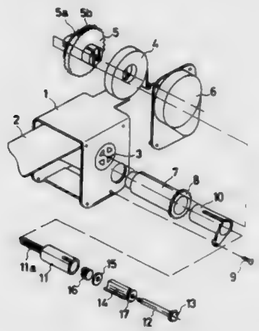
5,112,005

SEAT BELT RETRACTOR

Naoaki Hoshihara, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 25, 1991, Ser. No. 674,152
Claims priority, application Japan, Mar. 28, 1990, 2-80320
Int. Cl.[5] B65H *75/48*
U.S. Cl. 242—107 **15 Claims**

1. A seat belt retractor, comprising:
a casing;
a spool rotatably mounted in the casing, including a length of webbing wound thereon and a gear portion;
spring means connected to the spool for providing a biasing force and rotating the spool in the direction of the winding to retract the webbing;
an inner cylinder disposed in the casing, the inner cylinder including an inner surface;
a shaft rotatably mounted in the inner cylinder, including



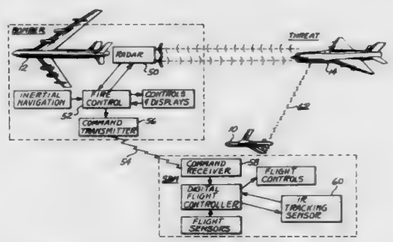
pinions means for engaging the gear portion of the spool to provide unitary rotation of the shaft and spool; and
an elastic member connected to the shaft and engageable with the inner surface of reducing the biasing force of the spring means at times when the spool is rotated in the direction of the winding of the webbing.

5,112,006

SELF DEFENSE MISSILE

John P. Palmer, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 12, 1975, Ser. No. 557,560
Int. Cl.[5] F41G *7/20*
U.S. Cl. 244—3.16 **5 Claims**



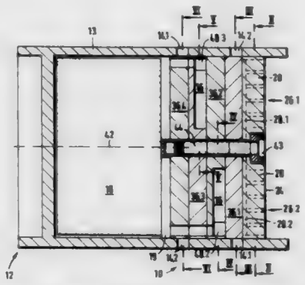
1. A self defense air-to-air missile comprising:
a) an aerodynamically shaped body, said body having a forward end, a middle portion, and an aft end, said body containing an explosive warhead, fuzing means operatively connected to said warhead for detonating said warhead, target detecting means being disposed within the aft end of said body and being further disposed to be responsive to targets located substantially aft of said missile, guidance means responsive to said target detecting means, and control means responsive to said guidance means;
b) a wing operably attached to said body and having lift sufficient to support said missile when said missile is moving in the forward direction relative to the surrounding air; and,
c) vertical and horizontal stabilizing and steering means operably attached to said body and being responsive singly and in combination to said control means, whereby said missile can be made to fly in a straight line or made to change direction.

5,112,007

MISSILE STEERING DEVICE

Sigfrid Büchele-Buecher, Meerbusch, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 20, 1991, Ser. No. 672,562
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1990, 4012153
Int. Cl.[5] F42B *10/66*
U.S. Cl. 244—3.22 **7 Claims**



1. In a missile steering device disposed within a shell of a missile and comprising: a plurality of radially oriented steering nozzles disposed along the circumference of the shell of the missile; a gas generator for producing a high pressure gas stream; at least one branching conduit each connecting at least a pair of steering nozzles with an output of said gas generator; and means for generating a steering pulse including at least one fluidic wall jet element disposed within a wall of each respective said branching conduit for changing the flow direction of the high pressure gas stream within the branching conduit when actuated, and an associated respective actuator, in the form of at least one of miniature flame capsules and compressed gas cartridges, for each said fluidic wall jet element; the improvement wherein:
(a) said miniature flame capsules or compressed gas cartridges are all disposed in at least one disc-shaped recess within said missile shell;
(b) said receptacle is divided into a number of chambers corresponding to the number of said fluidic wall jet elements, with said chambers being separated by partitions;
(c) each said chamber contains a plurality of said miniature flame capsules or compressed gas cartridges which are combined into a respectively separate group; and
(d) each said chamber includes a respective antechamber which is connected via a respective control line with a respective said fluidic wall jet element.

5,112,008

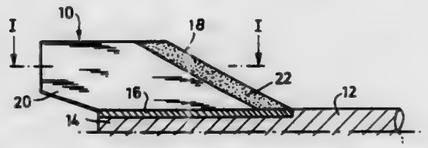
FIN STABILIZED PROJECTILE HAVING HEAT RESISTANT FINS

Klaus-Dieter Pahnke, Solingen, and Wilfried Becker, Düsseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 23, 1990, Ser. No. 571,678
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3927917
Int. Cl.[5] F42B *10/08*
U.S. Cl. 244—3.24 **20 Claims**

1. A fin stabilized projectile comprising: a projectile body; a stabilizing unit, including a plurality of guide fins, disposed at and fastened to the tail of said projectile body; and wherein each said guide fin is composed, at least in the region of its leading edge, of a heat resistant composite fiber material which is one of a ceramic material reinforced with carbon or glass fibers, an a titanium aluminide reinforced with silicon carbide

fibers, whereby the thermal resistance of the guide fins against the danger of burning or melting due to overheating of the



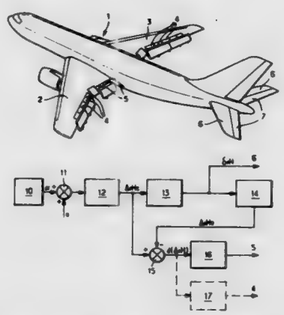
material as a result of friction with the air during the flight of the projectile is increased.

5,112,009

PITCH CONTROL SYSTEM FOR AIRCRAFT

Jacques Farineau, Toulouse, France, assignor to Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Apr. 24, 1991, Ser. No. 690,310
Claims priority, application France, Apr. 24, 1990, 90 05227
Int. Cl.[5] B64C *9/34, 13/16;* **G05D** *1/08*
U.S. Cl. 244—75 R **9 Claims**



1. A pitch control system for an aircraft flying at a Mach number greater than 0.7 and including a horizontal plane that is adjustable in deflection and air brakes that have a nose-down effect, the aerodynamic pitching couple (Cm) on said aircraft varying as a function of its aerodynamic incidence (α) in such a manner that:

below a first incidence threshold (α0) said aerodynamic pitching couple decreases with increasing aerodynamic incidence and increases with decreasing aerodynamic incidence;

between said first incidence threshold (α0) and a second incidence threshold (α2) greater than said first threshold, said aerodynamic pitching couple increases with increasing aerodynamic incidence and decreases with decreasing aerodynamic incidence; and

above said second incidence threshold (α2) said aerodynamic pitching couple decreases with increasing aerodynamic incidence and increases with decreasing aerodynamic incidence;

wherein the system comprises:

first means providing the aerodynamic incidence (α) of said aircraft at each instant;

an adder for adding a phase advance component (a) to said aerodynamic incidence (α);

second means for generating a nose-down first command (ΔiHc) for said adjustable horizontal plane when said aerodynamic incidence is greater than said first threshold (α0), the amplitude of said first command being such that if said adjustable horizontal plane were to take up the corresponding position instantaneously, it would compensate the increase in the nose-up effect on said aircraft due to the way in which said aerodynamic pitching couple varies above said first threshold;

third means for generating a signal (ΔiHe) representative of the deflection response rate of said adjustable horizontal plane in response to said first command;

fourth means for forming the difference d(ΔiH) between said first command (ΔiHc) and said signal (ΔiHe) representative of the response of said adjustable horizontal plane; and

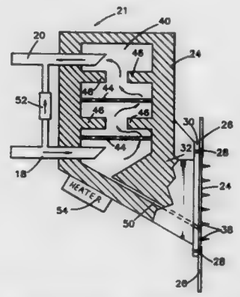
fifth means for responding to said difference d(ΔiH) to generate a nose-down second command for said air brakes having a nose-down effect.

5,112,010

AIR DRYER USING AMBIENT COLD

Paul Simison, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 18, 1990, Ser. No. 539,499
Int. Cl.[5] B64C *1/00*
U.S. Cl. 244—129.1 **7 Claims**



1. A system for pressurizing an electronic enclosure located in unheated, unpressurized regions of an aircraft, comprising in combination:

a chiller for drying air including a lightweight thermally conducting body with a heat exchanging cavity therein, said chiller for drying air mounted in the aircraft with a portion of said body thermally coupled to the atmosphere outside said aircraft;

an air input passage in said body for coupling air into said cavity and an air output passage in said body for coupling air from said cavity; and

an air input duct for coupling air from a heated, pressurized region of said aircraft to said air input passage, and an air output duct for coupling air from said air output passage to said electronic enclosure.

5,112,011

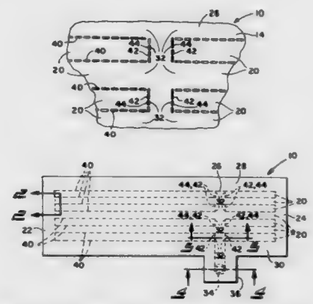
PNEUMATIC DEICER FOR SHEDDING THIN ICE

Norbert A. Weisend, Jr.; Bernard F. Trares, both of Cuyahoga Falls, and Kevin L. Leffel, Akron, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 4, 1989, Ser. No. 445,232
Int. Cl.[5] B64D *15/18*
U.S. Cl. 244—134 A **10 Claims**

1. An inflatable deicer for mounting on an aircraft comprising an inner ply, an outer ply, of fabric coated with resilient rubber-like material covered by an outer sheet member of resilient rubber-like material, a plurality of passages forming deicing tubes, a manifold tube extending across said deicing tubes intersecting ends of at least some of said passages for communicating high pressure fluid to said passages, said passages being defined by adjacent rows of stitching between said inner ply and said outer ply, said stitching being turned at said intersecting ends of said passages and continued to a position

spaced from said intersecting ends providing a reinforced edge of said manifold tube, said adjacent rows of stitching being spaced apart from about 0.25 to 0.50 inches (0.64 to 1.27 cm.), said manifold tube being connected to a source of fluid pressure providing air pressure of from about 75 to 125 psi (4.39 to 8.79 kg/cm^2) for an activation time of from about one-tenth to one-half second at intervals of about ten to fifteen seconds to shed ice having a thickness of from about 0.02 to 0.04 inches (0.51 to 1.02 cm).

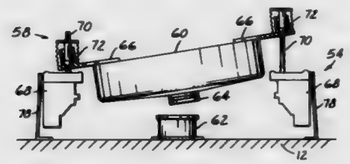


5,112,012

TILTING MOMENTUM WHEEL FOR SPACECRAFT

Mark S. Yuan, 18341 Mt. Waterman St., Fountain Valley, Calif. 92708, and Alois Wittmann, 29017 Geronimo Dr., Palos Verdes, Calif. 90274

Filed Oct. 26, 1989, Ser. No. 427,675
Int. Cl.[5] B64G *1/28*
U.S. Cl. 244—165 **21 Claims**



1. Apparatus for compensating for disturbing torques acting on a stabilized spacecraft or the like, comprising:

momentum wheel means including a momentum wheel rotatable about an axis for applying a torque to said spacecraft to compensate for said disturbing torques;

means for mounting said momentum wheel means on a base carried by said spacecraft, said mounting means including

(A) three support means circumferentially spaced around said momentum wheel means, at least two of said support means including an extensible member operable for displacing said momentum wheel means in a manner to change the orientation of said rotation, and

(B) means for connecting each of said support means between said momentum wheel means and said base at circumferentially spaced locations around said momentum wheel in a manner to allow tilting of said momentum wheel means relative to said base; and

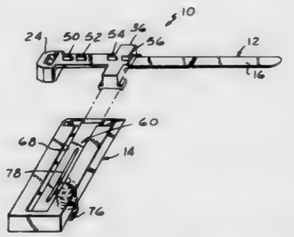
releasable locking means connected between said momentum wheel means and said base for protecting said connecting means from loads exceeding tilt movement loads.

5,112,013

TIE STRAP STRUCTURE FOR ELECTRIC WIRING

Robert J. Tolbert, Detroit, and Glen A. DeGrendel, Fraser, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Feb. 25, 1991, Ser. No. 660,189
Int. Cl.[5] B65D *63/00*
U.S. Cl. 248—74.3 **6 Claims**



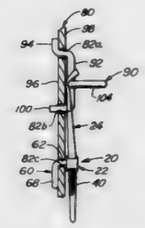
1. A tie strap structure for electric wiring comprising a tie strap member including a flexible tie strap for encircling a bundle of wires, a buckle provided at one end of the tie strap for engaging the other end of the tie strap to secure the tie strap in place on a bundle of wires, a cross member provided on the tie strap intermediate the ends thereof, a mounting bracket including an elongated slot, the cross member being slidably retained in the slot, the slot adapted to extend in the direction of the length of a bundle of wires when the tie strap structure is secured on a bundle of wires, a fastener extending outwardly from the mounting bracket for reception in an opening provided in a support structure to which the tie strap structure is to be attached, the mounting bracket being slidable with respect to the cross member lengthwise of a bundle of wires to permit alignment of the fastener with an opening without stretching a bundle of wires, the cross member having an outer face, the slot having a face oppositely disposed thereto, one of the faces having an elongated ridge projecting outwardly therefrom, the other of the faces having an elongated groove therein, the ridge being receivable in the groove to initially position the cross member in the slot.

5,112,014

PEG BOARD HANGERS AND RETAINERS

Byron Nichols, 95 Tonnancour, Grosse Pointe Farms, Mich. 48236

Filed May 4, 1989, Ser. No. 347,198
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—220.3 **10 Claims**



1. A retainer for holding an associated article support peg board hook against a peg board having holes therein such that the peg board hook is mounted to lie against a first surface defining one side of the peg board by pivotal engagement with such board via an associated peg board hole so as to be pivotably supported on such board, said retainer comprising:

a variable length strap including a loop-forming portion for

at least partially surrounding a portion of an associated peg board hook in board-restraining relation thereto with the associated peg board hook mounted on said board against said first surface thereof; and

a one-piece peg board attachment hook means operably connected to said strap, said attachment hook means including prong means removably insertable from said first surface of said one side of said board through a selected hole of said peg board in the subjacent vicinity of the hole or holes to which the associated peg board hook is mounted, said spring means having an arm or bite portion with a longitudinal axis extending in the board-mounted condition of said retainer generally perpendicularly to said first surface of said board, said prong means also having an elongate tang or leg portion with a longitudinal axis oriented generally perpendicularly to said longitudinal axis of said arm or bit portion or said prong means for engaging along the length of said tang or leg portion a second surface defining a second side of said peg board opposite from and extending parallel to said first surface of said one side of said board against which the associated peg board hook lies, such that any force tending to pivot the associated peg board hook increases the clamping tension exerted by said strap thus increasingly resisting any movement of said hook, said strap being tensionable for increasing the grip of said retainer on the shank of the associated peg board hook to be retained to thereby retain the associated peg board hook on the board despite pivotal dislodgment forces being exerted on such peg board hook,

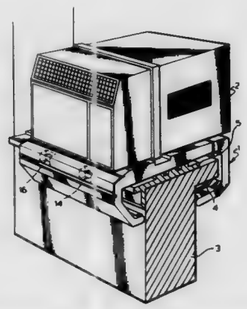
said attachment means comprising a head having a through-passageway with a resilient locking means operably disposed therein, and said variable length strap comprising a long, narrow flexible member affixed at one end to said head to extend lengthwise therefrom clear of said passageway, the other end of said strap being free, said strap having teeth formed thereon and being dimensioned for sliding insertion through said passageway for pawl and ratchet engagement of said strap teeth with said locking means to thereby provide an adjustable loop of variable length to thereby serve as said loop-forming portion of said strap.

5,112,015

AIR CONDITIONER BRACKET ASSEMBLY

Chris Williams, 36 Brahms Avenue, Willowdale, Ontario, Canada M2H 1H4

Filed Mar. 19, 1990, Ser. No. 495,175
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—236 **10 Claims**



1. An apparatus for mounting an air conditioner unit on a sill of a window opening in a wall wherein said apparatus comprises

a substantially horizontal platform adapted for resting on said sill and receiving said air conditioner unit and having a recess adapted for receiving an airseal on the underside of said air conditioner unit, said platform comprising a first jaw rigidly engaging a first portion of said platform and a second jaw rigidly engaging a second portion of said platform, said first portion slidingly engaging said second portion, said jaws extending the width of said platform and below said platform from opposite ends thereof, said jaws comprising a straight vertically extending portion and an integral horizontally extending portion having ends thereof adapted for frictional engagement with said wall remote from said platform and below said sill, said first portion integral with said first jaw and said second portion integral with said second jaw and biasing means for releasably gripping said jaws onto said wall, said biasing means adapted for expanding said jaws over said sill, for urging said jaws together clamping said apparatus onto said wall and for expanding said jaws releasing said apparatus from said wall, whereby said apparatus, sill and wall form a non-yielding structure when said apparatus is clamped on said wall and said ends of said horizontal portion of said jaws frictionally engage said wall supporting opposite ends of said platform.

5,112,016

PARKING PASS-CARD HANDLING DEVICE

Mark Pull, Box 342, Stonewall, Manitoba, Canada ROC 2Z0

Filed May 6, 1991, Ser. No. 695,987
Int. Cl.[5] A47F *5/00*
U.S. Cl. 248—309.1 **7 Claims**



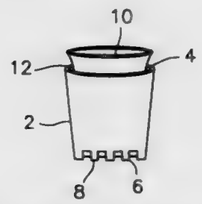
1. A card handling device for manipulating a stiff card for insertion of the card into a card reader, the device comprising an elongate handle and card engaging means at one end of the handle for engaging one end of the card, said card engaging means comprising a card engaging member extending transversely of the handle and channel means extending along the member for engaging and retaining an edge of the card.

5,112,017

HOLDER FOR A BEAKER CONTAINING A DRINK

Hian S. Pang, 7 Watten Drive, Singapore, Singapore 1128

Filed Mar. 19, 1991, Ser. No. 671,405
Claims priority, application European Pat. Off., Mar. 19, 1990, 90302940.3
Int. Cl.[5] A47K *1/08*
U.S. Cl. 248—311.2 **10 Claims**



1. A holder for a rigid beaker containing a drink, comprising:

hollow cylindrical body means for receiving said rigid beaker, for grasping the beaker to drink therefrom, and for insulating the grasping of the beaker to prevent discomfort of a user drinking from the beaker; and

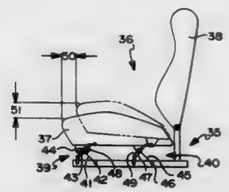
convection means for providing through-flow of air when the beaker is contained in the holder moving from the ambient environment, across the surface of the beaker upwardly when the beaker contains a hot drink and downwardly when the beaker contains a cold drink, and then back into the ambient environment.

5,112,018

VEHICLE SEAT TRACK APPARATUS

Robert J. Wahls, Pickney, Mich., assignor to ITT Corporation, New York, N.Y.

Filed Aug. 5, 1991, Ser. No. 740,822
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—394 **8 Claims**



1. A split-frame power seat track mechanism for supporting and positioning a seat assembly including a seat cushion and a seat back within a motor vehicle, said mechanism comprising:

laterally spaced rail members;

a carriage carried by said rail members for controlled longitudinal displacement, said seat assembly disposed upon said carriage; and

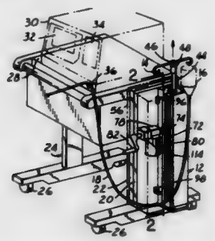
means interconnecting said carriage and seat cushion operable to effect limited relative motion therebetween in response to an operator input, said motion comprising simultaneous vertical and longitudinal translation of said seat cushion between a fully extended, lowermost end limit of travel and a fully retracted, uppermost end limit of travel.

5,112,019

MOTORIZED IV POLE ASSEMBLY

Michael E. Metzler, Webster Groves; Michael S. Ameiss, O'Fallon, and James P. Baum, Defiance, all of Mo., assignors to Storz Instrument Company, St. Louis, Mo.

Filed Feb. 4, 1991, Ser. No. 705,818
Int. Cl.[5] A61M *5/00;* **A47G** *29/00*
U.S. Cl. 248—405 **30 Claims**



1. A system for supporting a parenteral liquid container comprising:

hanger means for supporting said parenteral liquid container;

vertical telescoping support means for changing the height of said hanger means, including concentric outer, middle, and inner elongated support members, said hanger means being attached to one end of said inner support member;

said middle support member having a pulley attached near its upper end;

cable means having a first end attached to the other end of said inner support member and having a second end attached to said outer support member, said cable means engaging with said pulley; and

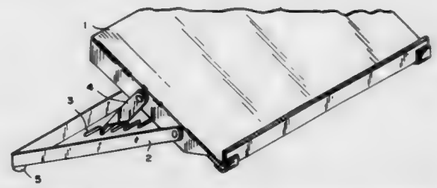
drive means coupled to said middle support member for moving vertically said middle support member wherein said vertical motion of said middle support member is transferred through said cable means to said inner support member.

5,112,020

KEYBOARD STAND

Jacob J. Ginsberg, 165 Elgin St., Newtown, Mass. 02159

Filed Dec. 20, 1989, Ser. No. 453,692
Int. Cl.[5] A47G *1/24*
U.S. Cl. 248—456 **10 Claims**



1. A stand for altering the angle of a keyboard comprising:

(a) a support for said keyboard;

(b) a means of elevating one side of said support by tilting one side in an upward manner;

(c) a means for securing said keyboard to said support; and

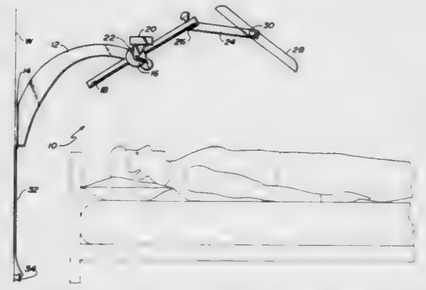
(d) a means of frictionally stabilizing said stand, wherein said means of elevation further comprises at least one rigid member attached pivotally to said means of support, and at least one second member attached pivotally to said means of support wherein said first member engages said second member at a point opposite said pivot.

5,112,021

BOOKHOLDER

Philip D. Greene, 336 Ridgewood Ave., Mill Valley, Calif. 94941

Filed Nov. 6, 1990, Ser. No. 609,585
Int. Cl.[5] A47B *97/00*
U.S. Cl. 248—444.1 **8 Claims**



1. A bookholder device for supporting a book in front of a reclined individual, said bookholder device comprising:

a main arm portion;

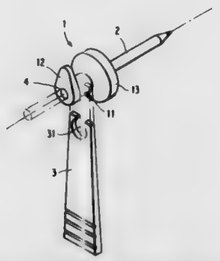
a clutch assembly portion attached to said main arm portion;

a rod member releasably engaged by said clutch assembly portion, said rod member conditioned for pitch, roll, and longitudinal adjustment by said clutch assembly portion;

a tray bracket member connected to said rod member; and

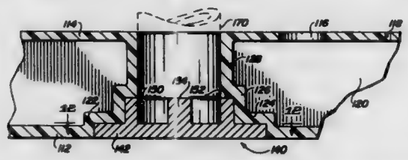
a book tray portion pivotally supported by said tray bracket member.

5,112,022
FRAME HANGER
Alberto T. Cardas, Madrid, Spain, assignor to Colis Internacional, S.A., Madrid, Spain
Filed Mar. 19, 1991, Ser. No. 671,381
Int. Cl.[5] A47G *1/16*
U.S. Cl. 248—493 4 Claims



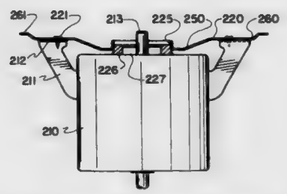
1. A frame hanger having a body including a hook portion, a base portion and a salient portion, said body having a passage longitudinally extending through said body, said frame hanger further including attachment means initially positioned in frictional engagement with said passage and extending from a front surface of said salient portion by a significantly greater distance than from a rear surface of said base portion, whereby said base portion may be placed against a surface and the frame hanger affixed to said surface by driving said attachment means through said aperture into said surface.

5,112,023
POLE SUPPORT APPARATUS HAVING TANK BASE
Ricky R. Sowers, 7306 East 6th Ave., Scottsdale, Ariz. 85251
Filed Jun. 12, 1989, Ser. No. 364,104
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—519 17 Claims



1. Apparatus for supporting a pole having a notched bottom, comprising, in combination:
cup means for receiving the notched bottom of the pole, including
a base plate,
a cup extending upwardly from the base plate for receiving the pole, and
a ridge extending diametrically across the cup for extending into the notched bottom of the pole;
bottom wall means, including
a bottom wall,
a vertically extending wall about the base plate,
an inwardly extending wall over the base plate, and
an upwardly extending wall about the cup;
side wall means secured to the bottom wall and extending upwardly from the bottom wall and defining upwardly extending sides of the apparatus; and
top means secured to the side wall means for closing the apparatus and for defining, with the bottom wall means and the side wall means, an enclosed and generally hollow base for receiving a quantity of water for ballast to support the pole.

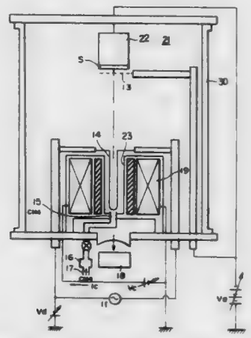
5,112,024
MODULAR ROOM AIR CONDITIONER AND METHOD FOR MAKING SAME
John Stanko, Bayonne, N.J., assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Continuation of Ser. No. 234,566, Aug. 22, 1988, abandoned.
This application Oct. 17, 1990, Ser. No. 600,841
Int. Cl.[5] F25D *19/00*
U.S. Cl. 248—603 7 Claims



1. A noise and vibration suppressing assembly comprising:
an electric motor;
a sheet metal bulkhead having an aperture therein, said motor having a housing having an outer peripheral surface, an end surface adjacent said bulkhead, a rotatable shaft journaled in said housing and having an end extending through said aperture;
a plurality of mounting legs extending between said housing and said bulkhead, each of said legs having one end rigidly secured to said outer peripheral surface and the other end rigidly secured to said bulkhead, said other ends lying in a circle having a diameter greater than the diameter of said outer peripheral surface, the portion of each of said legs between said ends being substantially flat and lying in a plane extending through the axis of said shaft; and
an annular ring of resilient material secured to said housing end coaxial with said shaft and extending into said aperture, said annular ring having an outside diameter and said aperture having a diameter smaller than said outside diameter, said resilient material thereby being radially compressed by the portion of said bulkhead surrounding said aperture.

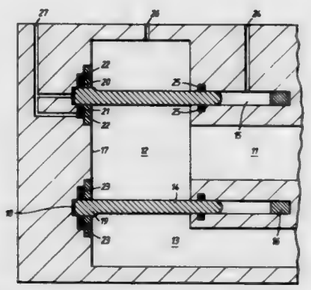
5,112,025
MOLDS HAVING WEAR RESISTANT RELEASE COATINGS
Masatoshi Nakayama; Kunihiro Ueda, both of Saku; Toshihiko Ishida, Komoro, and Hiroshi Tanabe, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Feb. 22, 1990, Ser. No. 483,242
Int. Cl.[5] B29C *33/56*
U.S. Cl. 249—115 6 Claims

1. A mold defining a cavity having an inner surface, characterized in that at least a portion of said inner surface is coated with a film comprised of a material selected from the group consisting of a diamond-like carbon having a Vickers hardness



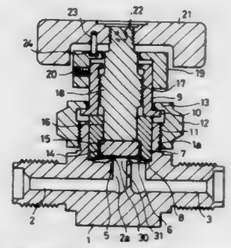
of 5,000–10,000 kg/mm^2 and a fluoride of a material forming said portion of said inner surface.

5,112,026
FLUID DISCHARGE VALVE
Raymond J. O'Connor, Farnham, and Nicholas C. Henly, Petersfield, both of England, assignors to Ferranti International plc, England
Filed Sep. 24, 1991, Ser. No. 765,002
Int. Cl.[5] F16K *1/00*
U.S. Cl. 251—63 3 Claims



1. A fluid discharge valve operable to allow the rapid discharge of a fluid from a reservoir (13) to a working volume (12), which valve includes a housing, a cylindrical sleeve (14) movable axially within the housing between a closed position in which it separates the reservoir (13) from the working volume (12) and an open position in which the reservoir (13) communicates with the working volume (12), sealing means (20, 21) arranged to prevent leakage of fluid from the reservoir (13) to the working volume (12) when the sleeve is in the closed position and valve actuation means for moving the sleeve (14) between its two positions, the sealing means comprising first and second seals (20, 21) located so as to engage one end (19) of the sleeve (14) around the outer and inner periphery respectively thereof when the sleeve is in the closed position, the first seal (20) being forced into engagement with the sleeve (14) by the presence of fluid in the reservoir (13) and the second seal (21) being forced into engagement with the sleeve only when fluid pressure is applied by the actuating means to move the sleeve (14) from its closed position to its open position.

5,112,027
METAL DIAPHRAGM VALVE
Takaomi Hanyu, Yamato, and Kouki Tada, Yokohama, both of Japan, assignors to Benkan Corporation, Tokyo, Japan
Filed Jun. 1, 1990, Ser. No. 531,717
Claims priority, application Japan, Jun. 21, 1989, 1-159043; Aug. 19, 1989, 1-213940
Int. Cl.[5] F16K *7/16, 31/50*
U.S. Cl. 251—331 2 Claims



1. A metal diaphragm valve for use in piping systems for ultra-clean fluids, comprising:
a valve casing including therein an inlet passage and an outlet passage,
a valve chamber into which one end of each of the inlet and outlet passage open,
the valve chamber being defined by an inverted bowl-shaped metal diaphragm that is disposed within the valve chamber above the inlet and outlet passages, with the opposite end being connected with an external piping system,
the metal diaphragm having a center and being held clamped along a periphery thereof between a ledge formed within the valve caging and a retainer located above the ledge,
a semi-toroidal collar disk having a downward projection of an annular cross-section integral with the metal diaphragm and of substantially similar thickness as the metal diaphragm,
an annular valve seat disposed below the collar disk and having a central bore that opens into the valve chamber,
the valve seat being formed with a flat burnished top for providing sealing contact with the collar disk,
a vertically disposed valve stem reciprocably disposed in an axial bore formed in the retainer, and
a stem piece mounted on top of the metal diaphragm,
whereby said burnished flat top and said collar disk operatively cooperate to effect a sealing contact when the valve stem causes the stem piece to move against the metal diaphragm thereby forcing the metal diaphragm against the burnished flat top of the valve seat, said sealing being accomplished without appreciable deformation of the collar disk due to the said configuration thereof and without appreciable formation of metal particles from multiple use of the valve.

5,112,028
ROADWAY IMPACT ATTENUATOR
John F. Laturner, Carmichael, Calif., assignor to Energy Absorption Systems, Inc., Chicago, Ill.
Filed Sep. 4, 1990, Ser. No. 577,638
Int. Cl.[5] A01K *3/00*
U.S. Cl. 256—13.1 32 Claims

1. In a collapsible roadway impact attenuator of the type comprising a plurality of support elements arranged in a sequence along an axis, with adjacent support elements spaced from one another and at least some of the support elements supported for movement along the axis when the impact attenuator is struck axially by a vehicle, the improvement comprising:
a set of bendable energy absorbing sheets, each having first

and second ends secured to respective adjacent support elements such that the energy absorbing sheets extend generally axially between the support elements and, when the support elements move toward one another when the impact attenuator is struck axially by a vehicle, the energy absorbing sheets bend to resist axial collapse of the impact attenuator;



at least one of said energy absorbing sheets secured to the support elements to form along said axis at least one outwardly convex portion and at least one outwardly concave portion during axial collapse of the impact attenuator, thereby enhancing energy absorbing efficiency of the energy absorbing sheets;

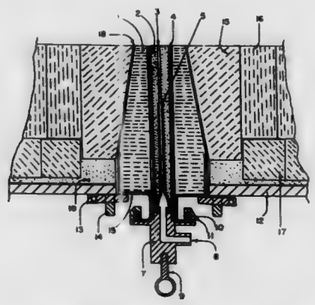
said energy absorbing sheets providing a primary vehicle retarding force during axial collapse of the impact attenuator.

5,112,029

QUICK FLUID INJECTION ASSEMBLY REPLACEMENT IN METALLURGICAL REACTERS

Arturo Lazcano-Navarro; Gregorio Vargas-Gutierrez; Jose E. Hernandez-Ruiz, and Carlos Maroto-Cabrera, all of Saltillo, Mexico, assignors to Instituo Mexicano de Investigaciones Siderurgicas, Mexico

Filed Jul. 22, 1991, Ser. No. 733,423
Int. Cl.[5] C21B *7/16*
U.S. Cl. 266—47 **10 Claims**



1. A fluid injection assembly in a metallurgical reactor for treating liquid metals permitting the quick interchange of fluid injection main components, said assembly including;

a) An interchangeable blowing element composed of an exterior metallic pipe containing a ceramic body which has at least one passage-way connecting one inlet port with at least one outlet port, wherein said passage-way is surrounded by a metallic conduit only part way upwardly from the bottom of said blowing element to mate at an intersection with at least one hole in said ceramic body for operation with higher supply pressures and completely stopped feed of fluid while avoiding fusion and clogging of said passage-way, means for connecting said blowing element to a fluid supply, and providing at said intersection means operable when said passage-way is clogged to require replacement of said interchangeable blowing element for extracting the blowing element;

b) an interchangeable wear-resistant block having a truncated conical shape and having a cylindrical centered hole running along the longitudinal axis for receiving said blowing element, a flanged metallic base for said block to secure therein the blowing element; said cylindrical hole being adapted to receive an extraction device for removing the block after extraction of said blowing element from the hole; and

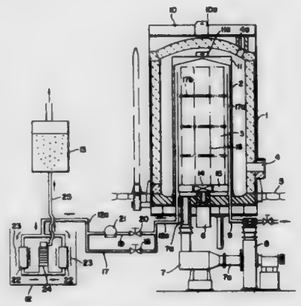
c) means to facilitate the extraction of the said blowing element from said wear-resistant block consisting of a ceramic coating applied to the external surfaces of said blowing element thereby avoiding bonding at the joint between said ceramic body and said wear-resistant block and wear caused by high temperature chemical diffusion.

5,112,030

HEAT TREAT FURNACE FOR FLUORINATING STEEL MATERIAL

Masaaki Tahara; Haruo Senbokuya; Kenzo Kitano, all of Osaka, and Teruo Minato, Wakayama, all of Japan, assignors to Daidoussanso Co., Ltd. and Maizuru Kogyo Co., Ltd., both of Osaka, Japan

Filed Oct. 1, 1990, Ser. No. 590,825
Int. Cl.[5] C21D *9/663*
U.S. Cl. 266—256 **2 Claims**



1. A heat treat furnace for fluorinating steel material comprising a lifting type inner cover adapted to contain the steel material therein removably, a lifting type bell formed outer cover which covers the inner cover and forms a defined space from the inner cover, the inside of the inner cover forming a fluorinating chamber, a feeding pipe for fluorine- or fluoride-containing gas, a source of fluorine- or fluoride containing gas communicating with the feeding pipe, an exhaust pipe communicating with said fluorinating chamber, a noxious substance eliminator communicating with said exhaust pipe, said eliminator including means for converting fluorine containing gases to CF4 and removing HF, the defined space between the inner cover and the outer cover forming a heating chamber, and a means for heating the fluorinating chamber disposed in said heating chamber.

5,112,031

INTERLOCKING MOUNTING BUSHING ASSEMBLY FOR A STABILIZER BAR

Ernest J. Hynds, and Keith A. Stowe, both of Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich.

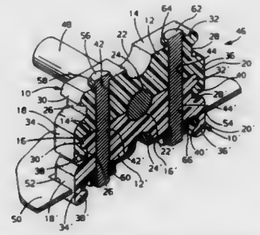
Filed Aug. 27, 1990, Ser. No. 572,297
Int. Cl.[5] B60G *7/04*; F16F *1/16*; F16B *21/07*
U.S. Cl. 267—276 **9 Claims**

1. A bushing assembly for mounting a rotatable tubular stabilizer bar to a vehicular chassis, the assembly comprising:

a first bushing block having a seat for rotatably seating the stabilizer bar;

a second bushing block substantially identical to the first block having a seat for rotatably seating the stabilizer bar;

first locking means provided on the first bushing block for snap fitting the first bushing block to the second bushing block; and



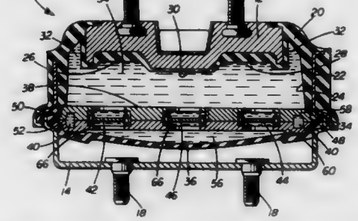
second locking means provided on the second bushing block for snap fitting the second bushing block to the chassis.

5,112,032

HYDRAULIC MOUNT WITH TRIPLE DECOUPLERS

Robert R. Klein, Dayton, and John F. Hoying, Centerville , both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 9, 1991, Ser. No. 638,925
Int. Cl.[5] F16F *13/00*
U.S. Cl. 267—140.1 A **2 Claims**



1. A hydraulic mount assembly providing variable damping characteristics, comprising:

a pair of mounting members;

a hollow body connected to said mounting members and defining at least three dome areas, spaced along the longitudinal axis of said hollow body;

a resilient diaphragm closing said hollow body and forming therewith a closed cavity that is filled with liquid;

means for partitioning said cavity into a primary chamber including said dome areas and a secondary chamber enclosed by said diaphragm;

at least three decouplers on said partitioning means, each decoupler being generally aligned with one of said dome areas; and

an orifice track in said partitioning means for connecting said chambers so as to effect damping;

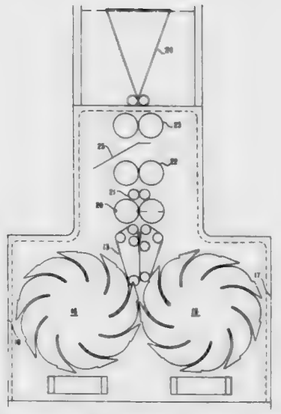
said dome areas serving to concentrate dynamic fluid pressure in said primary chamber and focus that pressure generally in a column over said decouplers for rapid response to localized pressure variations whereby a low dynamic rate for relatively small displacements is provided at relatively high frequencies while maintaining damping for large displacements.

5,112,033

FOLDER APPARATUS FOR A WEB-FED PRINTING PRESS

Richard E. Breton, Rochester, N.H., assignor to Harris Graphics Corporation, Dover, N.H.

Continuation of Ser. No. 521,263, May 9, 1990, abandoned. This application Oct. 21, 1991, Ser. No. 782,757
Int. Cl.[5] B42C *1/00*
U.S. Cl. 270—47 **22 Claims**



1. Folder apparatus of a web-fed printing press having a printed-product delivery with two fan arrangements, each of which is formed of a plurality of mutually adjacent fans spaced-apart from one another on a common axis, the respective common axis of each of the two fan arrangements being disposed parallel to the common axis of the other, each of the fans of one of the fan arrangements being disposed adjacent to and in a respective common plane with a respective one of the fans of the other of the fan arrangements, each of the fans being formed with blades having the tips located at a circumference of the respective fan, the circumferences of the fans in the respective common plane intersecting with one another, and means provided on the fans for preventing a collision of respective blade tips of the fans disposed in the respective common plane, the blades of the fans being formed with respective recesses at a radially outer region thereof, for receiving therein the tips of the blades of the fans disposed therewith in the respective common planes.

5,112,034

SHEET HANDLING APPARATUS

Nobutaka Uto, Yokohama, and Takeshi Honjo, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 626,371, Dec. 5, 1990, abandoned, which is a continuation of Ser. No. 535,984, Jun. 8, 1990, abandoned, which is a continuation of Ser. No. 436,973, Nov. 16, 1989, abandoned, which is a continuation of Ser. No. 209,959, Jun. 22, 1988, abandoned. This application Jun. 28, 1991, Ser. No. 724,472
Claims priority, application Japan, Nov. 10, 1987, 62-284565
Int. Cl.[5] B42B *1/04*
U.S. Cl. 270—53 **58 Claims**

1. A sheet handling apparatus comprising:

sheet processing means for processing sheets;

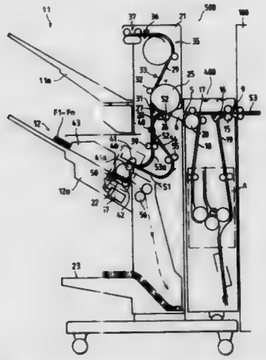
a first sheet transport path for transporting sheets to said sheet processing means;

a second sheet transport path, separate from said first sheet transport path, for transporting sheets to said sheet processing means;

transport direction switch means for guiding the sheet either

to said first sheet transport path or to said second sheet transport path; and

control means for controlling said transport direction switch means so that a first sheet is guided to said second path



while a second sheet is guided to said first path after an operating demand to said sheet processing means has been outputted;

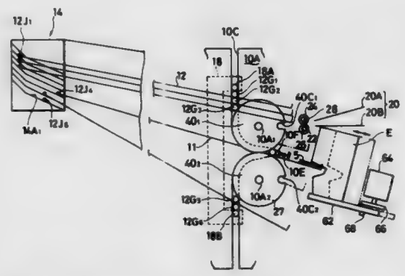
wherein the first and second sheets are sent to said sheet processing means in a mutually superposed state.

5,112,035

SORTER

Hiroshi Yamamoto, Ibaraki, and Hiroshi Tobita, Omiya, both of Japan, assignors to Ikegami Tsushinki Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1991, Ser. No. 639,200
Claims priority, application Japan, Jan. 16, 1990, 2-6561
Int. Cl.[5] B65H *39/11*
U.S. Cl. 270—53 **14 Claims**



1. A sorter comprising

a plurality of vertically movable trays;

means for shifting said plurality of trays and for maintaining a tray in a predetermined position in which sheets can be received thereon, said shifting and maintaining means including at least one set of Geneva wheel arrangements having two Geneva wheels vertically arranged and rotatably supported in a predetermined relationship with one another, each of the Geneva wheels having at least one recess formed therein; and a frame having a pair of guide slots, including first and second guide slots, each having vertical portions, mirror image first and second curved portions respectively corresponding to the locus of said recess in each of said Geneva wheels, and tangential extrapolations which merge together at an intersection portion;

means for ejecting a sheet onto a tray which is maintained in said predetermined position;

means associated with said set of Geneva wheel arrangements and said first and second guide slots for inducing one of said trays to undergo lateral displacement; and

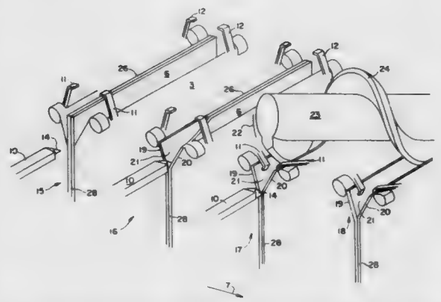
fastening means for fastening a stack of sheets accumulated on said laterally displaced tray together.

5,112,036

OPENER FOR FOLDER PRINTED PRODUCTS

Walter Hatt, Yardley, Pa., assignor to Graphic Management Associates, Inc., Southborough, Mass.

Filed Aug. 27, 1990, Ser. No. 573,493
Int. Cl.[5] B65H *39/02*
U.S. Cl. 270—54 **12 Claims**



1. A device for opening a printed product which has a folded edge, an open edge parallel to and spaced apart from said folded edge, and first and second open sides extending between said open edge and said folded edge,

said device comprising a pocket adapted to hold said printed product and having a first wall and a second wall connected by a hinge, said first wall and said second wall pivoted at said hinge for motion toward each other into a closed position and away from each other into an open position,

a preopener comprising a splitter adapted for movement parallel to said open edge and toward said first open side when said pocket is in said closed position, and away from said open side, whereby said splitter is inserted into said printed product at said open edge, thereby separating said product into two groups of pages at a first location adjacent said first side and said open edge,

a pair of first grippers adjacent said first location, each of said first grippers adapted to retain one of said groups in spaced apart relation to the other of said groups, thereby forming a gap therebetween,

a spreader comprising a spiral adapted for insertion into said gap and for movement from said gap to a second location adjacent said open edge and said second side, thereby extending said gap substantially to said second location,

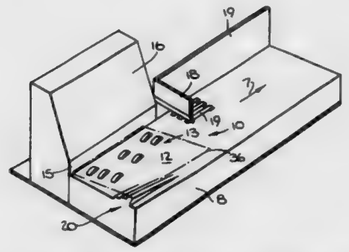
a pair of second grippers adjacent said second location, each of said second grippers adapted to retain one of said groups in spaced apart relation to the other of said groups, whereby at least one insert can be placed between said groups.

5,112,037

FRONT FEEDER FOR LARGE SIZE MAIL HANDLING MACHINE

Russell W. Holbrook, Middlebury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 24, 1990, Ser. No. 633,726
Int. Cl.[5] B65H *5/00*
U.S. Cl. 271—2 **6 Claims**



1. An improved feeder apparatus for stacked articles of different sizes comprising:

(a) a hopper region for receiving a stack of the articles, said hopper region comprising:

(i) a deck along which the articles are to be fed in a downstream direction,

(ii) a registration wall alongside the deck and substantially parallel to the downstream direction,

(b) transport means in the deck for moving the articles in the downstream direction,

the improvement comprising

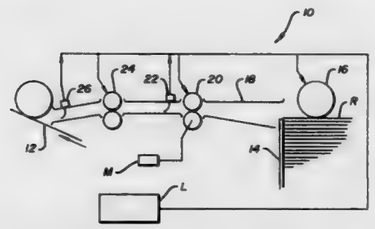
(c) guiding means associated with the deck for guiding only the larger width articles toward the registration wall to prevent misregistration of larger width articles, wherein the guiding means includes a fixed plurality of steps at different heights, each higher step being spaced further from the registration wall.

5,112,038

FEEDBACK CONTROL FOR RECEIVER MEMBER IN-TRACK REGISTRATION IN AN ELECTROSTATOGRAPHIC REPRODUCTION APPARATUS OR THE LIKE

David L. Dunaway, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 1, 1991, Ser. No. 723,981
Int. Cl.[5] B65H *3/06*
U.S. Cl. 271—10 **15 Claims**



1. In an electrostatographic reproduction apparatus or the like in which receiver members are fed seriatem by feeding means respectively at a predetermined time from a supply and transported along a travel path, including a registration mechanism adapted to selectively intercept said travel path and stop a receiver member at an intercept position established by said registration mechanism, and means for actuating said registration mechanism to advance said receiver member intercepted by said registration mechanism from the intercept position into registered association with a marking particle developed image for transfer of such image to such receiver member, a feedback control comprising:

means for establishing a desired dwell period for said receiver member at the intercept position prior to actuation of said registration mechanism by said actuating means;

means for sensing an advanced receiver member at a predetermined location downstream of said registration mechanism and providing a signal indicative thereof;

means, responsive to said signal from said downstream sensing means, for determining the time from actuation of said registration mechanism to sensing of a receiver member by said downstream sensing means;

means for comparing said determined time from actuation of said registration mechanism to sensing of a receiver member by said downstream sensing means to a preselected absolute time expected for sensing of a receiver member by said downstream sensing means; and

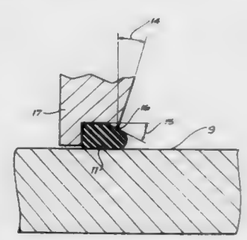
means for providing feedback control to said registration mechanism actuating means, in response to such comparison, to alter the actuation time thereof and, based on such altered actuation time, altering the start of such dwell period by said dwell period establishing means to provide for in-track registration error correction and improved long term accuracy of receiver member to marking particle developed image registration.

5,112,039

ANNULAR ELASTOMERIC SLURRY SEAL

Craig I. Walker, Artarmon, Australia, assignor to Warman International Limited, New South Wales, Australia

Continuation of Ser. No. 332,278, filed as PCT/AU88/00220, Jun. 29, abandoned.
Claims priority, application Australia, Jul. 8, 1987, PI-2977
Int. Cl.[5] F16J *15/38*
U.S. Cl. 277—81 R **2 Claims**



1. In a rotary mechanical seal for a rotating axially extending shaft passing into a pressure vessel containing slurries of abrasive particles, said seal comprising

a seal housing having a circular groove bounded by a generally radially extending side wall, a generally axially extending floor contiguous to said side wall, a a generally axially and radially extending open face defining a protrusion opposite said side wall, and a generally axially extending open face radially opposite said floor and facing radially inwardly; and

an elastomeric annular member located in said groove and extending radially inwardly to bear on a seal face holder in a sealing manner;

the improvement comprising said protrusion being located facing a high pressure area of the pressure vessel, said protrusion extending from said groove floor towards said seal face holder;

said protrusion having an edge formed by a surface facing the groove, which forms an angle to said groove floor of less than 45°, and a surface facing externally of the groove,

which forms an angle to a plane normal to said groove floor of less than 45°; and

said elastomeric annular member in use being configured and dimensioned to extend lengthwise along said groove abutting and sealing against the inner surface of said protrusion and to extend at least to said protrusion edge, thereby preventing crystallization and clogging around said elastomeric annular member.

5,112,040

SHEET SEPARATING APPARATUS

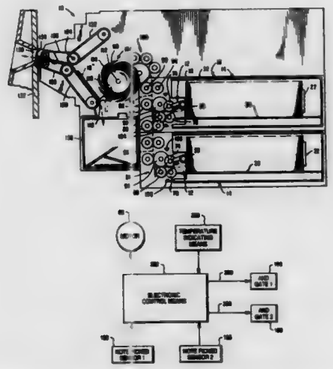
Adam J. L. Johnston, and James N. T. Doig, both of Dundee, England, assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 26, 1990, Ser. No. 557,817

Claims priority, application United Kingdom, Mar. 23, 1990, 9006542

Int. Cl.[5] B65H *5/08*

U.S. Cl. 271—11 **7 Claims**



6. In an apparatus for removing sheets one by one from a stack by a suction member, the improvement comprising:

means for sensing the temperature within the apparatus and for generating a temperature output in accordance with the temperature in said apparatus; and

means for applying a stronger vacuum to said suction member in response to said temperature output as the temperature within the apparatus falls when compared to a predetermined temperature and vacuum.

5,112,041

PROCESS AND APPARATUS FOR TRANSPORTING PRINTING PRODUCTS ARRIVING IN IMBRICATED FORMATION

Werner Honegger, Tann Rüti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Sep. 10, 1990, Ser. No. 579,537

Claims priority, application Switzerland, Sep. 13, 1989, 3339/89

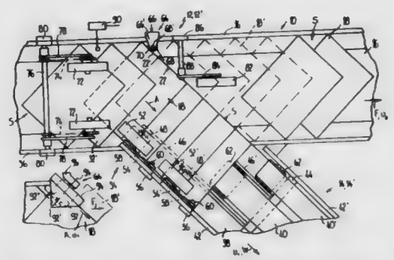
Int. Cl.[5] B65H *29/60*

U.S. Cl. 271—286 **20 Claims**

9. An apparatus for transporting printing products arriving in an imbricated formation, and for feeding the arriving printing products to, and at least partially past, a branch-off point, their position being essentially retained with respect to the conveying direction of the conveying device, comprising:

a conveying device leading past said branch-off point;

a branching-off device provided at the branch-off point for leading a number of the fed printing products in a branch-off direction running at an angle to the conveying direction, wherein the branch-off point, viewed in the conveying direction, is followed downstream by a removal conveyor for guiding away the printing products led in the branch-off direction, the conveying device transporting the printing products with a leading edge thereof running at an angle defining an incline with respect to the conveying direction, and said printing products overlapping one another, wherein said branching-off device comprises a deflecting member which can be brought into and out of action on a region exposed by the incline of the fed printing products, and wherein the deflecting member comprises, on the side opposite the removal conveyor with respect to the conveying device, a deflecting element and a branching-off element, respectively, and, on the side facing the removal conveyor, a branching-off element for leading the printing product in the branch-off direction by acting on a region of the same printing product.



5,112,042

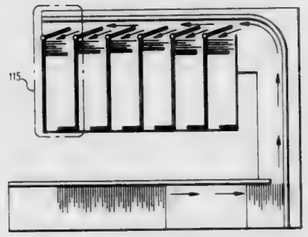
DOCUMENT TRANSFER DEVICE FOR MULTIPLE PASS DOCUMENT SORTING MACHINE

David J. Tilles, Baltimore; Stanley K. Wakamiya, Ellicott City; Bruce A. Krein, Columbia; Dale H. Brown, Glen Burnie, all of Md.; Sharon A. Duggan, Washington, D.C., and Mark S. Schroeder, Severna Park, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 30, 1990, Ser. No. 502,009

Int. Cl.[5] B65H *39/10*

U.S. Cl. 271—297 **32 Claims**



1. A document transfer system for moving a cluster with a front and a back face of accumulated stacked documents from a receiving area at the first end of an output holder having first and second ends to the second end of the output holder and subsequently accepting a next cluster of stacked documents into the receiving area for transfer to the second end of the output holder, said system comprising:

a) an output holder partition;

b) means for permitting movement of the output holder partition between the first and second ends of the output holder;

c) means for orienting the output holder partition in an extended orientation to contact the back face of the cluster and in a retracted orientation to avoid contact with the cluster with the output holder partition having an initial extended orientation at the output holder first end;

d) a sweeper partition;

e) means for moving the sweeper partition between the first end of the output holder to at least the second end of the output holder;

f) means for orienting the sweeper partition in an extended orientation to contact the front face of the cluster and in a retracted orientation to avoid contacting the cluster, with the sweeper partition having an initial retracted orientation at the output holder first end and;

g) an output holder gate at the second end of the output holder to stop the document cluster when the cluster is moved to the output holder second end, whereby the sweeper partition, when a cluster has accumulated within the output holder first end, is oriented in an extended orientation and advanced to advance an accumulated document cluster in the output holder receiving area against the output holder partition which is in an extended orientation to the second end of the output holder, the output holder partition then is retracted and returned to the initial extended position, and a next cluster may be provided to the receiving area of the output holder; wherein the output holder partition and the output holder gate are mateably configured to permit the output holder partition in an extended orientation to pass the output holder gate unobstructed such that when the document cluster is advanced to the second end of the output holder by the sweeper, the output holder partition passes the output holder gate, the document cluster becomes captured between the sweeper partition and the output holder gate and the output holder partition passes the output holder gate, situates in the retracted orientation and returns to the extended orientation at the initial position.

5,112,043

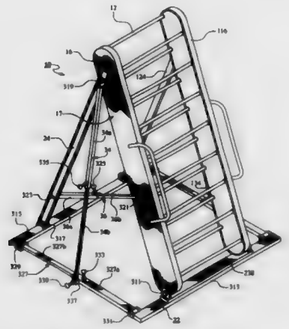
PHYSICAL THERAPY APPARATUS

Henry J. Gilfillian, Jr., P.O. Box 450, Raywood, Tex. 77582

Filed Oct. 3, 1990, Ser. No. 592,286

Int. Cl.[5] A63B *23/06, 7/04*

U.S. Cl. 482—53 **6 Claims**



1. A physical therapy climbing apparatus, comprising in combination:

a pair of spaced apart carrier members, each having an upper end and a lower end;

a pair of sprocket shafts respectively mounted between the carrier members near each end of each of the carrier members;

a pair of chain sprockets mounted on each of the sprocket shafts;

a pair of sprocket chains mounted between the sprocket shafts and around a corresponding sprocket of each of the chain sprockets;

a plurality of cylindrical ladder rungs mounted between the sprocket chains at selected intervals along the lengths of the sprocket chains for receiving a person's foot and grasping by a person's hands;

hydraulic control means connected to one of the sprocket shafts for adjustably controlling the rate of rotation of the sprocket shafts and corresponding linear movement of the sprocket chains;

a forward base member adapted to rest on a floor;

means for pivotally mounting the lower ends of the carrier members to the forward base member for allowing the carrier members to move from a storage position substantially perpendicular to the forward base member to selected inclined positions relative to the forward base member;

a rearward base member adapted to rest on the floor rearward of the forward base member while in an operational position;

a pair of legs, each having an upper end pivotally mounted to one of the carrier members, wherein each of the braces is extensible for selectively varying the lengths of the braces for supporting the frame at selected inclinations relative to the forward base member, and for allowing the legs to be moved forward relative to the carrier members to a storage position near the upper end of the carrier members, each having a lower end pivotally mounted to the rearward base member;

a pair of braces, each pivotally connected between one of the legs and one of the carrier members; and

brace extension means for selectively varying the lengths of the braces for supporting the frame at selected inclinations relative to the forward base member, and for allowing the legs to be moved to forward relative to the carrier members to a storage position.

5,112,044

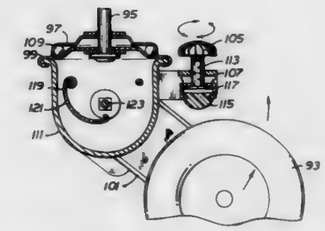
PERAMBULATING THERAPEUTIC SUPPORT

Barbara A. Dubats, 117 Neptune La., Apt. E, Holmes Beach, Fla. 34217

Filed Oct. 22, 1990, Ser. No. 600,860

Int. Cl.[5] A45B *1/02*

U.S. Cl. 482—68 **15 Claims**



1. An apparatus having utility as a walking aid, comprising:

a "U"-shaped lower frame assembly including a transversely disposed forward part and a pair of parallel, longitudinally extending parts integral therewith that extend rearwardly therefrom to collectively form a three-sided area within which an individual using said apparatus may walk or stand;

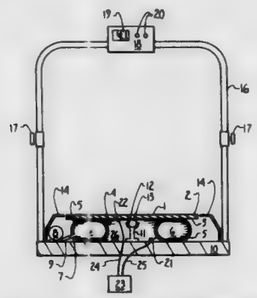
a "U"-shaped upper frame assembly having substantially the same configuration as said lower frame assembly, said upper frame assembly being vertically spaced upwardly of said lower frame assembly, and said upper frame assembly lying in a plane parallel to a plane defined by said lower frame assembly;

a transversely disposed rear stay bar disposed in interconnecting relation to transversely opposed opposite ends of said upper frame assembly to enclose on four sides an individual using said apparatus;

an annular harness adapted to circumscribe an individual's waist, said harness being oriented in a plane parallel to the

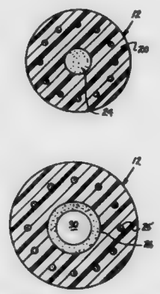
respective planes of said upper and lower frame assemblies;
said harness being positioned below the plane of said upper frame assembly and above the plane of said lower frame assembly;
a diametrically extending support strap interconnecting diametrically opposite parts of said harness;
a plurality of harness support straps extending radially from said harness to the transversely extending forward part of said upper frame assembly and said rear stay bar, said harness support straps having a preselected length to position said harness substantially centrally of said upper frame assembly;
said apparatus being rotatably supported by a plurality of caster wheels;
means for braking said caster wheels when downward pressure is applied thereto;
said upper frame assembly being vertically adjustable with respect to said lower frame assembly so that said apparatus accommodates individuals of differing heights;
height adjustment means for adjusting the height of said upper frame assembly with respect to said lower frame assembly;
width adjustment means operative to widen said apparatus to accommodate individuals of differing widths; and
means for folding said apparatus.

5,112,045
KINESTHETIC DIAGNOSTIC AND REHABILITATION DEVICE
Jeffrey T. Mason, Escondido; Bradley R. Mason, Olivenhain, and Mark E. Howard, El Cajon, all of Calif., assignors to Breg, Inc., Vista, Calif.
Filed Sep. 5, 1990, Ser. No. 578,509
Int. Cl.[5] A63B *5/00*
U.S. Cl. 482—9 **14 Claims**



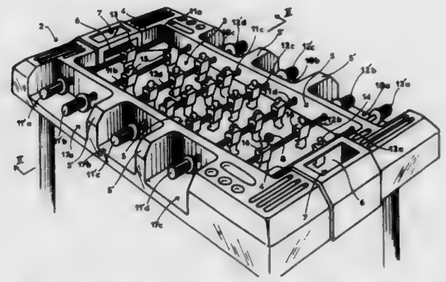
1. An apparatus for diagnosing or rehabilitating kinesthetic impairment comprising:
a rigid disk-shaped platform having sufficient surface area for a user to stand thereon with at least one foot in continuous contact with said platform;
an elastically deformable fluid-containing bladder upon which said rigid platform is positioned, wherein said bladder is in the shape of a toroid having a diameter substantially less than the diameter of said disk-shaped platform such that said platform has a continuous overhang circumscribing the entirety of said bladder;
a valve in said bladder for adding or withdrawing fluid therefrom, wherein the stability of said bladder is increased by adding fluid thereto and the stability of said bladder is decreased by withdrawing fluid therefrom;
a pump in fluid communication with said bladder across said valve for adding fluid to said bladder;
a pressure control means in communication with said pump and said valve for the user to effect addition or withdrawal of fluid from said bladder while standing on the platform; and
a diagnostic means for determining inclination of the platform as a function of time and correlating inclination data to the degree of kinesthetic impairment of the user.

5,112,046
BILLIARD CUE DEVICE
James F. Thorpe, 15830½ N St., Mojave, Calif. 93501
Filed Mar. 12, 1991, Ser. No. 668,231
Int. Cl.[5] A63D *15/08*
U.S. Cl. 273—68 **2 Claims**



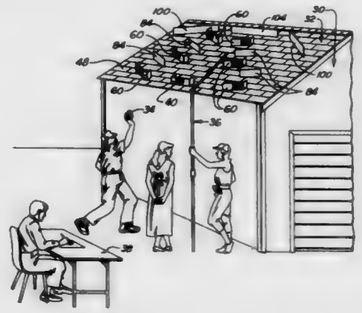
1. A billiard cue device comprising in combination,
a forward section defined by a first truncated conical configuration securably mounted to a rear section defined by a further truncated conical configuration, wherein the forward section and rear sections are coaxially aligned along a common axis when the forward section is secured to the rear section, and the forward section including a forward section top wall and a forward section bottom wall, with the forward section top wall and the forward section bottom walls parallel relative to one another and orthogonally aligned relative to the common axle, and
the rear section including a rear section top wall and rear section bottom wall, and the rear section top wall and rear section bottom wall are parallel relative to one another and are orthogonally aligned relative to the common axis, and
connector means mounted to the forward section bottom wall and the rear section top wall for selective securement of the forward section to the rear section, and
wherein the connector means includes an externally threaded boss coaxially aligned with the common axis integrally and orthogonally mounted to the forward section bottom wall, and an internally threaded boss integrally and orthogonally mounted to the rear section top wall threadedly receiving the externally threaded boss therewithin, and a truncated hollow conical guide bushing fixedly mounted to the forward section bottom wall, wherein the conical guide bushing is of a yet further truncated conical configuration aligned with an exterior surface of the forward section and the rear section when the forward section and rear section are secured together, and
wherein the forward section includes a compressed carbon graphite core extending coaxially of the forward section along the common axis and extending from the forward section bottom wall spaced from the forward section top wall, and the rear section including a further compressed carbon graphite core extending from the rear section top wall coaxially thereof along the common axis, wherein the further compressed carbon graphite core includes a compressed carbon graphite tube in surrounding relationship relative to a handle bore extending coaxially along the common axis from the rear section bottom wall along the common axis interiorly of the rear section, wherein the handle bore is defined by a predetermined internal diameter, and a plurality of carbon filaments directed coextensively along the compressed carbon graphite core in the forward section coextensively directed along the carbon graphite core in surrounding relationship thereto, and further carbon filaments are directed in surrounding relationship relative to the further compressed carbon graphite core and the compressed carbon graphite tube coextensively of the rear section.

5,112,047
TABLE FOOTBALL MACHINE
Alain Monneret, Montain-Voiteur, France, assignor to Monneret Jouets, France
Filed Aug. 27, 1991, Ser. No. 750,319
Claims priority, application France, Aug. 28, 1990, 90 10921
Int. Cl.[5] A63F *7/06*
U.S. Cl. 273—85 D **2 Claims**



1. A table football machine comprising a box structure having a rectangular base that reproduces a football pitch, a pair of transverse vertical walls and a pair of longitudinal vertical walls having a first width; each of said transverse vertical walls having, in its longitudinal center, an opening corresponding to a goal mouth and wherein each of said longitudinal vertical walls carries end bearings for receiving a plurality of horizontal rods; each of said rods having a free end and an opposite extreme end and being disposed generally above said base and transversely to the longitudinal direction of the box structure and slidably extendable beyond the width of said longitudinal vertical walls; each of said horizontal rods being freely, pivotally mounted and axially slidable in its respective end bearings and carrying, thereupon, one or more figurines or players; each of said figurines designating a single team member according to its location within the box structure; each figurine comprising opposite horizontal ends disposed in abutting relation to the horizontal rod upon which said figurine is mounted; each figurine having a foot portion disposed generally away from said horizontal rod, wherein a lowermost extent of said foot portion of each of said figurines is substantially level with the base of the box structure; each of said extreme ends of each of said horizontal rods being provided with a player operable maneuvering handle, wherein all of said rods supporting figurines that designate a single team are disposed with their respective maneuvering handles located exterior to the first width along the same longitudinal vertical wall; each horizontal rod being composed of a single element and wherein each longitudinal vertical wall of the box structure comprises, exterior to said first width and at least in a region housing each of said end bearings that support the free end of each of said horizontal rods; a housing having a thickness dimensionally greater than said first width and equal to at least the length of the axial travel of said free end beyond said width of said longitudinal vertical wall; said housing receiving and fully enclosing said free end when said free end is displaced to its maximum axial travel exterior to the first width of the longitudinal vertical walls of the box structure.

5,112,048
GARAGE ROOF PARTY GAME
Robert N. Kienle, 242 Fisher Rd., Grosse Pointe Farms, Mich.
Filed Nov. 5, 1990, Ser. No. 609,430
Int. Cl.[5] A63F *9/02*
U.S. Cl. 273—121 R **8 Claims**

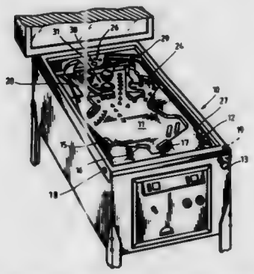


1. An outdoor scoring game for individual participants which comprises:
(a) an elevated sloping roof on a garage,
(b) a series of spaced retainer bins mounted on said roof having means to retain a ball rolling down to the roof,
(c) one or more balls to be cast onto the roof by a participant,
(d) a series of spaced upright deflectors mounted on said sloping roof above said retainer bins in random array to provide a tortuous path for a ball descending said roof,
(e) said roof being composed of overlapping shingles, and said retainer bins and said deflectors comprise upstanding portions projecting away from the plane of said roof and retention portions lying flat against said roof, said retention portions underlying overlapping shingles to be retained in position by frictional engagement with said shingles, and
(f) a shaft to be manually manipulated, a portion on said shaft to reach over said roof, and a locator tool on the distal end of said portion selectively to lift, locate and push a retainer bin into a position where a retention portion is located under an overlapping shingle,
(g) said locator tool comprising an L-shaped element shaped to carry a retention bin or deflector having an upstanding leg to push against the upstanding portion of a bin or deflectors, and a lifting shelf to introduce the retention portion under an overlapping shingle.

5,112,049
PINBALL MACHINE HAVING A PLAY FIELD WHICH IS CHANGED DURING PLAY
John D. Borg, Glen Ellyn, Ill., assignor to Premier Technology, Beaucnville, Ill.
Filed Aug. 10, 1989, Ser. No. 392,049
Int. Cl.[5] A63F *7/02*
U.S. Cl. 273—127 D **21 Claims**

1. In a pinball game, the combination comprising:
a play field having components mounted thereon;
means operable by a player for projecting a ball over said play field to contact said components; and
means for changing a section of said play field to replace the components mounted thereon with different components, wherein said means for changing includes means selec-

tively actuated by an electrical signal for rotating said section of said play field to expose different components

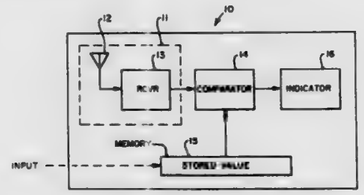


preciously stored beneath the play field surface and an electrical circuit providing said electrical signal.

5,112,050
BROADCAST LOTTERY

John R. Koza, 25372 La Rena La., Los Altos Hills, Calif. 94022; John R. Ferguson, Greenbrae, and Maximiano D. Torneros, Fremont, both of Calif., assignors to John R. Koza, Los Altos Hills, Calif.

Filed Jan. 5, 1990, Ser. No. 461,418
Int. Cl.[5] A63F *9/24, 3/06*
U.S. Cl. 273—139 **38 Claims**



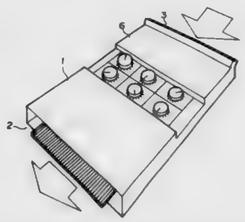
1. A portable electrical ticket apparatus for a game, comprising:
- a radio frequency receiver for receiving a broadcast of a dual-tone multifrequency signal containing a winning variable for the game, wherein the broadcast signal is broadcast over a transmission medium;
- a dual-tone multifrequency decoder for decoding the broadcast signal received into a multibit decoded signal;
- storage means for storing a first variable;
- a central processing unit coupled to the decoder and to the storage means for ascertaining whether the first variable stored in the storage means is the winning variable in view of the multibit decoded signal.

5,112,051
INTERFACING DEVICE FOR A COMPUTER GAMES SYSTEM

Richard Darling; Edward A. Carron, and David Darling, all of Leamington Spa, England, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 30, 1990, Ser. No. 530,617
Claims priority, application United Kingdom, Jun. 5, 1989, 8912866; Jul. 12, 1989, 8915975
Int. Cl.[5] A63F *9/22*
U.S. Cl. 273—148 B **36 Claims**

1. An interfacing device for connecting a processing unit of a computer games system to an external data storage medium so as to enable the processing unit to address, and receive data from, different storage locations in the external data storage medium, said interfacing device being removably connectable to the processing unit and to the external data storage medium and comprising means responsive to the processing unit for

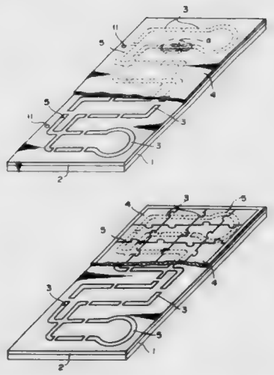


recognition of a selected address and means responsive to said recognition for modification of data processed by the processing unit.

5,112,052
GROOVED GAME BOARD HAVING MAGNETIC SURFACE PROJECTILE AND PUZZLE OVERLAY

Toranosuke Yamaura, 31-7, Yanagihara 1-chrome, Adachi-ku, Yanagihara 1-chome, Adachi-ku, Tokyo, Japan, assignor to Yonezawa Corporation and Toranosuke Yamaura, both of Tokyo, Japan

Filed Jul. 23, 1990, Ser. No. 556,895
Claims priority, application Japan, Jul. 31, 1989, 1-90914[U]
Int. Cl.[5] A63H *18/10;* **A63F** *9/10*
U.S. Cl. 273—153 R **2 Claims**



1. A multipurpose board for use as a game board on which a traveling toy can be driven and jigsaw puzzles can be assembled, as a hanger board on which items can be hung, as a wall covering, and as a book cover, said multipurpose board comprising:
- a substrate sheet having a predetermined size;
- a support member having a size substantially equal to the predetermined size of said substrate sheet and secured thereon, said support member having upper and lower surfaces and a plurality of grooves extending from the upper surface to the lower surface, said plurality of grooves having straight line groove portions, curved line groove portions, crossing groove portions, and angled groove portions arranged with respect to each other so as to define a traveling path for the traveling toy;
- a plurality of solid bodies composed of one of an iron-containing material and a magnetic material, and fitted into said grooves so that upper surfaces of said solid bodies are co-planar with the upper surface of said support member; and

- means for covering said support member and hiding said upper surface thereof, said covering means comprising a jigsaw puzzle comprising a plurality of interlocking pieces.

5,112,053
GOLF CLUB AND PLUMBING DEVICE THEREOF

Alexander Brucker, 1332 Prospect Hill Rd., Villanova, Pa. 19085

Filed Apr. 22, 1991, Ser. No. 689,461
Int. Cl.[5] A63B *69/36, 53/00;* **G01C** *9/14, 9/28*
U.S. Cl. 273—162 B **20 Claims**



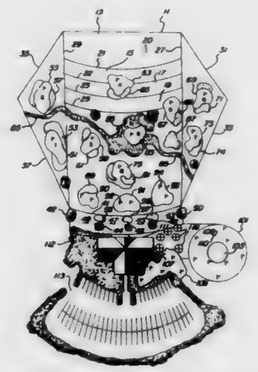
1. A device for use in golf comprising:
- an inner member having an internal bore dimensioned to be seated about the shaft of a golf club; and
- an outer member having an internal opening, said inner member being seated in said opening and freely movable relative to the outer member whereby when the inner member is seated on the shaft and the outer member is gripped by a user, the free movement of the inner member relative to the outer member permits the shaft to assume a vertical position for facilitating use of said club as a plumb line.

5,112,054
GOLF PARK

Gordon Oswald, 6211 Oakbrook Cir., Huntington Beach, Calif. 92648

Continuation-in-part of Ser. No. 493,910, Mar. 15, 1990, abandoned. This application Jun. 28, 1990, Ser. No. 546,039
Int. Cl.[5] A63B *67/02, 69/36*
U.S. Cl. 273—176 A **7 Claims**

1. A compact golf course, comprising:
- an elongated fan-shaped fairway having distinct distance markers at a central extreme end of the fairway for indicating the length of a drive;
- a ball hitting area at an end opposite the central extreme end of said fairway from which all shots are taken, said area having a plurality of tee sections;
- at least nine target greens, each green having a flag and cup, located throughout said fan-shaped fairway at different distances and at different horizontal projections from each one of said tee sections of said ball hitting area;
- a water hazard or sand trap associated with each of said target greens;
- a plurality of chipping greens located in front of and in close proximity to said gall hitting area, each of said chipping greens having a plurality of cups with a flag therein;
- a plurality of sand traps located in front of said ball hitting area and behind said plurality of chipping greens;
- a plurality of trees scattered throughout said fan-shaped fairway;
- a stream running across said fan-shaped fairway with a small lake in the center thereof almost completely surrounding one of said target greens; and
- a single putting green containing the same number of flags and cups as there are target greens, and having a single

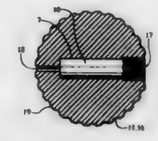


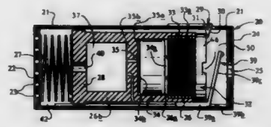
start to putt area in the center thereof, said putting green located in an area adjacent to said ball hitting area.

5,112,055
GOLF BALL INCLUDING SOUND EMITTING MEANS

William R. Barnhill, P.O. Box 34213, Clermont, Ind. 46234

Filed Jun. 13, 1991, Ser. No. 714,633
Int. Cl.[5] A63B *43/00*
U.S. Cl. 273—213 **15 Claims**





1. A golf ball including a sound-emitting device, comprising, in combination:
- an outer carrier member carried by the golf ball interiorly thereof;
- an inner carrier member;
- a battery;
- an impact-receiving member carried by the outer carrier member;
- a sound-emitting means, electrically energizable;
- electric circuitry operatively connecting the sound-emitting means and the battery; switch means in said circuitry in operative series with the battery and the sound-emitting means;
- the switch means and the impact-receiving means being carried respectively by the inner carrier member and the outer carrier member;
- the inner carrier member and the outer carrier member being relatively movable into and between a sound-silent condition in which the switch means is in an open-circuit condition, and a sound-emitting condition in which the switch means is in a closed-circuit condition;
- a spring operatively interconnecting the outer carrier member and the inner carrier member, and biasing the inner

carrier member and the outer carrier member toward a relative position having sound-emitting condition of the switch means, and maintaining that sound-emitting condition until opposing force is exerted as specified below;

releasable holding means operative to maintain the outer carrier member and the inner carrier member in a relative position which maintains sound-silent condition of the switch means;

the releasable holding means, by impact of a golf club upon the impact-receiving member, permitting the spring to cause the inner carrier member and the outer carrier member to move relatively to one another to achieve sound-emitting condition of the switch means;

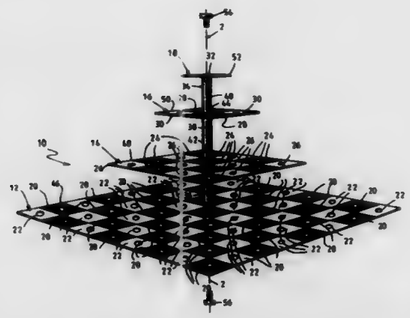
and there is provided operative access to the inner carrier member for manual force to be operatively applied to the inner carrier member to achieve silencing of the sound-emitting means; and also to establish said releasably-held condition of the releasable holding means to maintain the silence of the sound emitting means, and to cook the device for the subsequent impacting of the ball by a golf club to re-start the sound-emitting operativity of the sound-emitting means, by a single manual force action of the user.

5,112,056

METHOD OF PLAYING A THREE DIMENSIONAL PYRAMIDAL CHESS GAME

Edward J. Ching, 50 S. Beretania St., Ste. C113, Honolulu, Hi. 96813

Division of Ser. No. 606,167, Oct. 31, 1990, Pat. No. 5,033,751.
This application May 13, 1991, Ser. No. 699,487
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—241 **21 Claims**



1. The method of playing a three-dimensional chess game comprising the steps of:

providing a game board having a first tier, a second tier vertically displaced a distance above said first tier, and a third tier vertically displaced said distance above said second tier, each of said first, second and third tiers including a playing surface having at least one row and at least one column of equally sized squares, said equally sized squares alternating in color from clear to tinted;

providing a fourth tier vertically displaced said distance above said third tier, said fourth tier including only one square;

providing a plurality of game pieces divided into two sets, one set being clear and the other set being tinted, each set including one Pharaoh, one Queen, two Pyramids, two Sphinx, four Guards, and eight Slaves;

assigning a set of game pieces to each player;

initially arranging said clear game pieces on one side of said first tier and arranging said tinted game pieces on the opposite side of said first tier;

assigning movement limitations to each of said game pieces;

each player, in turn, moving one of their playing pieces according to its movement limitations;

assigning to said Guard pieces, the movement limitation of moving diagonally along diagonally adjacent squares of a tier, or moving along diagonally elevated squares between one tier to another on a diagonally elevated slant, initially designating said Guard pieces to move along the diagonal squares of common color corresponding to the color of the square it is initially placed at the start of the game;

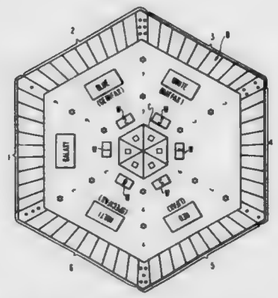
allowing a Guard piece to move from its designated color diagonal squares to the diagonal squares of the opposite color by moving said Guard piece in a diagonally elevated slant from a designated color square on the third tier to the square on the fourth tier, then in another turn moving said Guard piece in a diagonally elevated slant back down to the third tier to a square having the opposite color, then in another turn said Guard piece being allowed to move diagonally along diagonally adjacent opposite colored squares of a tier, or to move along diagonally elevated opposite colored squares between tiers.

5,112,057

APPARATUS FOR PLAYING A GAME

Nenad Popovic, 99 Station Street, Cheslyn Hay, Nr. Walsall, West Midlands, United Kingdom

Filed Oct. 25, 1990, Ser. No. 603,637
Claims priority, application United Kingdom, Oct. 26, 1989, 8924169
Int. Cl.[5] A63F *3/00, 9/18*
U.S. Cl. 273—243 **12 Claims**



1. Apparatus for playing a mystery entity identification game, the apparatus comprising a plurality of clue providing means relating to a plurality of mystery entities, each of the clue providing means providing a clue as to a specific mystery entity to which that particular clue providing means relates, initial selection of such clue providing means being effective to determine the mystery entity to be identified, said apparatus being adapted to permit the clue provided by that clue providing means to be progressively revealed in the course of the game, and a selection of information carrying articles to be collected by players in the course of the game for later comparison with the predetermined mystery entity when the latter has been identified, each such article specifying one of a number of possible characteristics which individual such mystery entities have.

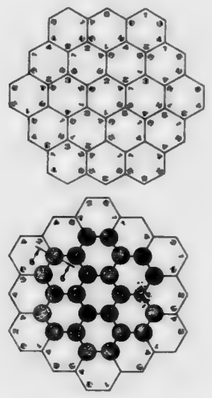
5,112,058

GAME CARD

Lowell Sandeen, Rte. 1, Box 159, McIntosh, Minn. 56556

Filed Nov. 8, 1990, Ser. No. 610,847
Int. Cl.[5] A63F *3/06*
U.S. Cl. 273—269 **4 Claims**

4. A game car comprising a generally planar surface having a matrix printed thereon, said matrix including a plurality of polygons interfitted to define a multiplicity of interstices formed by adjacent angular portions of contiguous polygons, a plurality of numbers and blanks being randomly disposed on said angular portions, wherein each angular portion either carrying a number or a blank with no number.

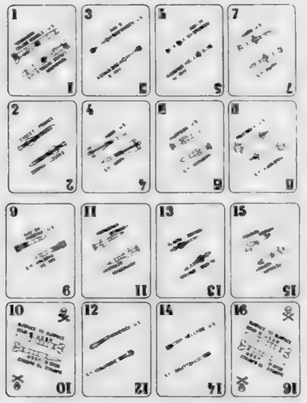


5,112,059

CARD GAME

Craig M. Mundle, 555 Huntercreek Ridge Ct., Des Peres; David D. Jahnke, 1639 Mason Knoll Rd., Town and Country, both of Mo. 63131; Michael T. Rickert, 155 N. Hanley, Unit 202, University City, Mo. 63105, and William N. Robertson, 14120 Westernmill, Chesterfield, Mo. 63017

Filed Apr. 22, 1991, Ser. No. 689,143
Int. Cl.[5] A63F *1/00*
U.S. Cl. 273—292 **8 Claims**



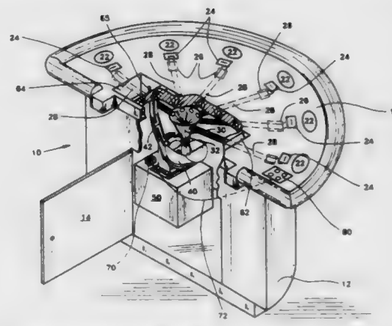
1. The pack of playing cards consisting essentially of sixty cards divided into five categories wherein one category consisting essentially of sixteen cards numbered consecutively from one to sixteen, a second category consisting essentially of fourteen cards numbered consecutively from one to fourteen, a third category consisting essentially of fourteen cards numbered consecutively from one to fourteen, a fourth catagory consisting essentially of fourteen cards numbered consecutively from one to fourteen and a fifth category consisting essentially of two non-numbered cards.

5,112,060

GAMING TABLE APPARATUS

Daniel A. Jones, 5520 Del Rey Ave., Las Vegas, Nev. 89102

Filed May 16, 1991, Ser. No. 701,670
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—309 **15 Claims**



1. A gaming table comprising:

a) a gaming table base having a hollow interior,

b) a coin hopper positioned on the interior of the gaming table,

c) a gaming table top mounted on the gaming table base and including at least one player location provided with a coin slot adjacent thereto,

d) a conduit extending from the coin slot to the coin hopper on the interior of the gaming table,

e) a chip rack mounted in the gaming table top, the chip rack including at least one chip row and a chip bin,

f) the hopper including a coin storage area and an escalator arm extending from the coin storage area of the hopper to the chip bin in the chip rack

whereby coins from the hopper can be recycled into the chip bin whenever the coin supply in the chip rack runs low.

5,112,061

COURT GAME SET AND PROJECTILE THEREFOR

Stuart Lamle, 3 Fordham Hill Oval, Suite 15F, Bronx, N.Y. 10468

Filed May 23, 1991, Ser. No. 704,445
Int. Cl.[5] A63B *61/00, 65/00, 71/02*
U.S. Cl. 273—411 **21 Claims**

1. A court game set for at least two opponents comprising:

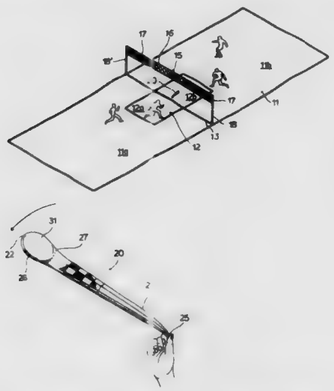
means for defining an outer court and an inner court located centrally within the outer court and a mid-line dividing the courts laterally into two equal sides providing respective playing areas for respective opponents;

net means comprising an inner net portion at least as long as the maximum width of the inner court and having upper and lower horizontally extending edges and at least marking lines extending from respective opposite ends of upper edges and being of lengths at least equal to the widths of portions of the outer court remaining outside the inner court;

means for supporting the net means above the mid-line with the inner net portion and outer net portions aligned with the inner court and with the remaining portions of the outer court, respectively, and with the inner net portion spanning a vertical area extending between overarm throwing heights of standing and jumping opponents and the marking lines extending level with the upper edge thereof;

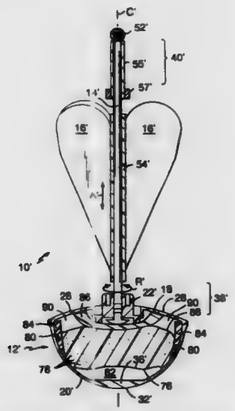
a catchable projectile comprising:

a collapsed elongate tube of flexible material having a leading blind end and a trailing end formed with a grasping portion;
a round, resiliently compressible, impact absorbing, compact integral body mass received in the blind end;
whereby the projectile can be swung and launched at great



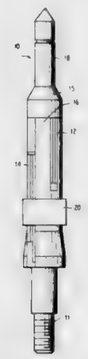
speed by an opponent holding the grasping portion and caught with minimal impact as a result of the impact absorption of the body mass and a projectile launched by an opponent from one side of the net passing above the net and hitting the ground on the other side of the net within the outer court or passing below the net and hitting the ground of only the inner court will score.

5,112,062
SAFETY LAWN DART
Kenneth W. Pratt, Ware, Mass., assignor to Seneca Sports Inc., Milford, Mass.
Filed Sep. 27, 1991, Ser. No. 767,063
Int. Cl.[5] A63B *65/02*
U.S. Cl. 273—420 **32 Claims**



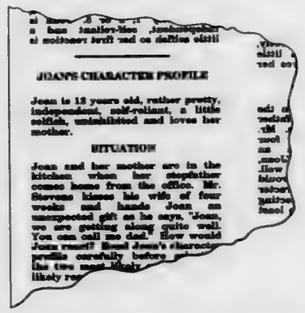
1. A safety lawn dart for use in lawn games comprising:
an elongated shaft defining an axis, said shaft having a first end region and an opposite second end region, said second end region of said shaft defining a hand gripping region,
a cushion, shock-absorbing head assembly mounted at said first end region of said shaft, said head assembly comprising a hub, at least one wall element defining a chamber, and cushioning means, said wall element defining a lower surface disposed for engagement with a target surface, said hub defining a coaxial orifice, and said shaft extending through said orifice into said chamber,
a sleeve mounted coaxially about said shaft, said sleeve adapted for movement axially and rotationally relative to said shaft, and
a plurality of elongated flight members mounted on said sleeve and adapted to impart rotational motion to said sleeve about said axis during flight.

5,112,063
TUBULAR RESTRAINT FOR BROADHEAD WITH DEPLOYABLE CUTTING BLADES
Riley Puckett, Lorton, Va., assignor to Pucketts Blood Trailers Broadhead, Inc., Lorton, Va.
Filed Dec. 21, 1990, Ser. No. 632,332
Int. Cl.[5] F42B *6/02*
U.S. Cl. 273—421 **7 Claims**



1. A broadhead, comprising:
a body having a top, a bottom, and a middle region, said bottom of said body being connectable to an arrow shaft, said middle region of said body defining a first outer perimeter measuring a first distance around said body at said middle region;
a pair of cutting blades which are deployable from opposite sides of said body at said middle region, each of said pair of cutting blades having first and second ends wherein a first end is close to said body when said pair of cutting blades are either in a retracted position or a deployed position but said second end is close to said body only when said cutting blades are in said retracted position and is extended away from said body when said pair of cutting blades are in said deployed position, each of said cutting blades having a cutting edge located between said first and second ends that is directed away from said body when said pair of cutting blades are in said retracted position, said cutting edges of said pair of cutting blades being includable in a second outer perimeter which is the same size or larger than said first outer perimeter and which measures a second distance that includes the distance around said body at said middle region plus the distance around said cutting blades if they extend beyond said first outer perimeter that is when said cutting blades are in said retracted position;
means for moving said pair of cutting blades from said retracted position to said deployed position; and
a cuttable tubular restraining device having an internal diameter approximately equal to said first outer perimeter and being located around said first outer perimeter to hold said pair of cutting blades in said retracted position, said cuttable tubular restraining device being made of a material and having dimensions which can withstand forces that occur when an arrow is shot or in flight which would otherwise cause said cutting edges of said pair of cutting blades to cut through said cuttable tubular restraining device but which allows said cutting edges of said pair of cutting blades to cut through said cuttable tubular restraining device upon impact of the broadhead with a target.

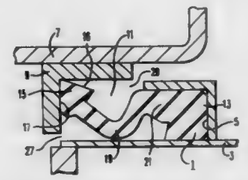
5,112,064
PSYCHOLOGY GAME
Gail H. Weedman, 607 Tumbleweed Ct., Kokomo, Ind. 46901
Continuation-in-part of Ser. No. 537,915, Jun. 13, 1990, Pat. No. 5,020,804. This application Dec. 19, 1990, Ser. No. 631,088
The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.
Int. Cl.[5] A63F *9/18;* **G09B** *19/00*
U.S. Cl. 273—429 **9 Claims**



6. A method of playing a psychology game with one or more players wherein, said method comprising the steps of:
(1) providing to the player a hypothetical person having a plurality of disclosed character traits and at least one undisclosed character trait, a description of a circumstance with which the hypothetical person is confronted, and a plurality of descriptions of possible reactions of the hypothetical person to the circumstance;
(2) selecting as most appropriate one of the plurality of descriptions of possible reactions to the selected circumstance;
(3) determining the accuracy of the player's reaction selection in the reaction selection step;
(4) rewarding the one or more player's with a performance rating which is a game benefit in proportion to the accuracy of the player's reaction selection determined in the accuracy determining step; and
(5) determining the at least one undisclosed character trait by comparing the player's selected circumstances and reaction selection to the circumstances to the respective performance ratings awarded to the player,
whereby the determination of the at least one undisclosed character trait of the hypothetical person increases a player's ability to determine the most appropriate selection in the reaction selection step.

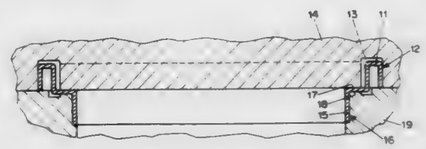
5,112,065
DOUBLE DIRECTIONAL GASKET
Jeffry R. Meyer, Penn Hills Township, Allegheny County, and Richard P. Kole, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 14, 1991, Ser. No. 669,261
Int. Cl.[5] B60J *10/08;* **F16J** *15/02*
U.S. Cl. 277—167.5 **7 Claims**

1. A double directional elastomer gasket for forming a fluid tight seal between a first member having a groove about its periphery and a second member having an L shaped portion about its periphery when the members are brought together by a force sufficient to seal the gasket, said gasket having two extensive margins, one of said margins having a thick portion adjacent thereto, which is configured to form a seal and be captured within said groove; said other margin being arrowhead shaped with a tip portion tapered to a radius and disposed to seat adjacent a corner of said L shaped portion and a straight



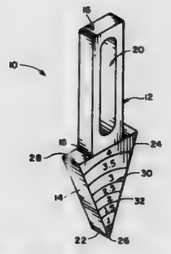
strip like portion extending at an angle from said thick portion to said arrowhead shaped portion and toward the corner of said L shaped portion, when the seal is being formed; said groove having an extension on one side thereof, which cooperates with the L shaped portion to form a peripheral partial enclosure in which the straight strip like portion buckles whereby the cross section of the strip portion of the gasket forms a general S shape when the seal is formed, to produce a fluid tight seal irrespective of the side of the gasket subjected to high pressure.

5,112,066
RESILIENT SEALING RING
Arne Remmerfelt, Vintergatan 42, S-541 33 Skövde, Sweden
Filed Dec. 5, 1990, Ser. No. 622,722
Int. Cl.[5] F16J *15/00*
U.S. Cl. 277—236 **15 Claims**



1. A sealing ring for sealing against fluid leakage between mainly planar surfaces of a pair of parts that are mounted in forced relation against each other, said ring comprising:
a resilient member having a radially projecting annular section comprising a pair of axially opposite surfaces and first and second ends projecting generally in opposite axial directions, respectively, from radially inner and radially outer portions of said annular section, said first end having a radially outer surface; and
said second end comprising a first member projecting generally axially from said annular section, a second member projecting generally radially outwardly from said first member, and a third member projecting from said second member generally axially towards said annular member, said third member having a radially outer surface, such that said first, second and third members collectively have a generally U-shaped cross section,
whereby said radially outer surfaces of said first end and of said third member of said second end comprise sealing surfaces and said pair of surfaces of said annular member comprise generally parallel sealing surfaces.

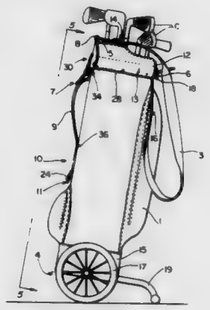
5,112,067
UNIVERSALLY ADAPTABLE BOREGRINDING CHUCK ASSEMBLY
Albert D. Rinchak, 106 Pear Ct., Hebron, Ind. 46341
Filed May 16, 1991, Ser. No. 701,035
Int. Cl.[5] B23B *31/10*
U.S. Cl. 279—151 **9 Claims**



9. A boregrinding chuck assembly comprising:
A) a boregrinding chuck for holding a tubular workpiece undergoing boregrinding;
B) a plurality of workpiece-holding jaws mounted on said boregrinding chuck, each jaw including
(1) a rectangular body having a distal end and a proximal end,
(2) a triangular head attached to said body proximal end, said head being in the shape of an isosceles triangle with the base thereof attached to said body proximal end and being shaped and sized so that an arc length between any two corresponding points on the equal length legs of said triangular shaped head is slightly less than the total outer circumference of said workpiece divided by the total number of jaws so that there is only a small gap defined between adjacent jaws when all of said jaws are engaged against the workpiece and the curve of said arc length essentially matches the curve of the workpiece whereby said arc length will fit essentially flush against the workpiece during a boregrinding operation, and
(3) guide means on said head for guiding a customizing operation of said head to fit a particular workpiece, said guide means including a plurality of arcuate lines on said head.

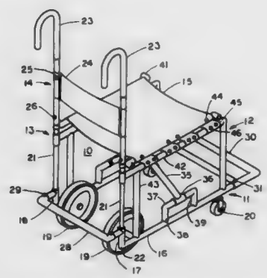
5,112,068
CONVERTIBLE GOLF CART AND BAG
Henry H. Liao, and Meishin A. Liao, both of 3091 Quail Run Rd., Los Alamitos, Calif. 90720
Filed Dec. 19, 1990, Ser. No. 631,107
Int. Cl.[5] B62B *1/04*
U.S. Cl. 280—30 **7 Claims**

1. A convertible golf bag comprising:
an elongated closed conventionally shaped golf bag body terminating at one end in a golf club receiving opening and at the other end in a bag support portion;
a plurality of first and second openings defined in said bag support portion;
a pair of axles;
a wheel rotatably mounted to each axle;
the free end of each axle mounted in said first openings to support said bag on said wheels for movement along the ground;
a first elongated strap having one end secured to the bag in the vicinity of said club receiving opening;
a ring and a first buckle mounted near the top of said bag, and a second buckle mounted on the side of said bag, said first strap being of predetermined length and securable at its one end to said ring and at its other end to said buckles in a plurality of configurations, a first configuration for pulling said bag by said wheels along the ground by a golfer with the strap being draped over the golfer's shoulder, and a second configuration for carrying said bag with the strap draped over the golfer's shoulder, said configurations involving different buckles; and
a second elongated strap having one end secured to the bag



in the vicinity of both said club receiving opening and said one end of said first strap, and having a second free end said second strap of sufficient length to allow the golfer to grasp the free end to pull said bag by said wheels along the ground.

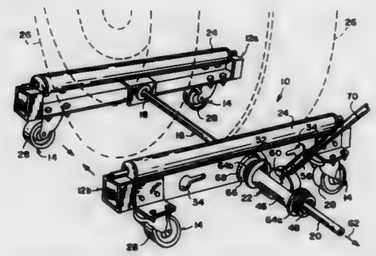
5,112,069
TRAVEL-AIR CHAIR
Richard E. Aldus, and Anita L. Aldus, both of 407 Valletta Ct., Punta Gorda, Fla. 33950
Filed Sep. 16, 1991, Ser. No. 760,094
Int. Cl.[5] B62B *3/02*
U.S. Cl. 280—42 **3 Claims**



1. A narrow, light-weight folding wheel chair that can be easily and rapidly unfolded and folded comprising:
a pair of side frames including two lower horizontal tubes in parallel relationship to each other, said tubes having upwardly extending tubes at a first end, and forwardly extending tubes at a second end, pivot means affixed on each of said lower horizontal tubes between said first and second ends, a pair of vertical support means including vertical tubes affixed at a lower end to said horizontal tubes near said first and second ends, and a pair of horizontal seat bars, each affixed at a top end of each of said vertical tubes,
an extension tube removably attached to each of said upwardly extending tubes for holding said side frames in spaced relationship,
means removably attached to each of said forwardly extending tubes for providing a horizontal foot rest,
a plurality of strap means looped over and affixed to and between each of said horizontal seat bars,

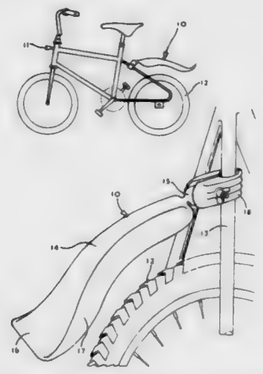
a pair of fixed wheels and a pair of swivel wheels attached to said lower horizontal tubes,
seat means having a pair of seat bars affixed to a pair of intersecting braces connected together by a longitudinal bolt, a bottom section of each brace having a sleeve affixed thereto, each of said sleeves being fitted over one of each of said pivot means and fabric means looped over and fastened to and between said seat bars, and
seat back means removably attached to said side frames at said first end.

5,112,070
DUAL WHEEL PULLER/DOLLY
Kevin C. Hahn, 247 Commack Rd., Mastic Beach, N.Y. 11951
Filed Nov. 29, 1990, Ser. No. 620,345
Int. Cl.[5] B62B *1/00*; **B60B** *29/00*
U.S. Cl. 280—79.4 **1 Claim**



1. A dual wheel puller/dolly for causing a wheel hub to be pulled loose from a vehicle which comprises:
a) a pair of elongated frame members;
b) means on a bottom of each frame member, for making said frame members mobile about a flat supporting floor surface, wherein said mobile means includes four casters, two each of which are spaced apart and affixed respectively to the bottom of each said frame member;
c) an elongated rod, extending transversely between said frame members, having a large head formed on the first end of said elongated rod so as to be held to said first frame member, so that a first end of said rod is retained in said first frame member, while a second end of said rod extends outwardly through said second frame member and a latch mechanism on said first frame member to slideably engage with said large head on said elongated rod to retain said large head thereto;
d) a jack mechanism, removably securable to said second frame member for cooperatively pulling on the second end of said rod;
e) a pair of elongated rollers, each rotatively mounted to the top of each said frame member, to engage with a lower peripheral surfaces of a large heavy motor vehicle dual pair of wheels, so that when said jack mechanism is appropriately orientated with respect to said second frame member and operated, said rod will be pulled allowing said frame members to move towards each other, so that and said elongated rollers will lift the large heavy motor vehicle dual pair of wheels upwardly away from the flat supporting floor surface to be moved about, when said pair of wheels have been removed from said vehicle;
f) said second frame member having a pair of spaced apart keyhole shaped apertures therethrough;
g) a pair of chains, each affixable at one end to a hub of one of the large heavy motor vehicle wheels and at other end to one of said keyhole shaped apertures in said second frame members, so that when said first frame member is removed and not used, said second frame member can bear against the wheel rim;
h) a socket to be placed between the end of said elongated rod and the wheel hub; and
i) said jack mechanism orientated with said second frame member, so that when said jack mechanism is operated said rod will be pushed against said socket causing the wheel hub to be pulled loose by said chains, thereby facilitating the removal of a wheel bearing therefrom.

5,112,071
ATTACHMENT ASSEMBLY FOR A BICYCLE MUDGUARD
Richard J. Jones, Wheal Cottage, Mount Wise, Newquay, Cornwall, England
Continuation of Ser. No. 525,834, May 18, 1990, abandoned.
This application Jun. 11, 1991, Ser. No. 713,569
Int. Cl.[5] B62D *25/18*
U.S. Cl. 280—152.3 **8 Claims**

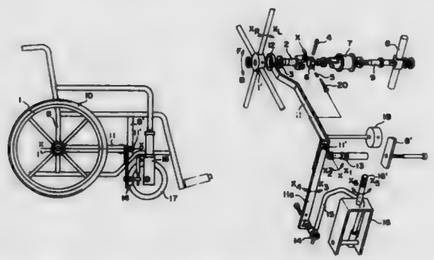


4. A bicycle which includes a frame, front and rear wheels carried by the frame, a moulded plastic mudguard and attachment means for attachment of the mudguard to the frame, said attachment means including a ball and socket joint the ball of which is an integral part of the moulded plastic mudguard and the socket of which includes two separate identical plastic mouldings and fastener means for interconnecting the separate plastic mouldings for gripping attachment of both the integrally formed ball of the plastic mudguard and the bicycle frame.

5,112,072
WHEELCHAIR FOR SINGLE-HAND OPERATION
Akira Korosue, 19-6-604 Tashiro-cho, Nishinomiya, Hyogo, Japan
Filed Jan. 18, 1991, Ser. No. 642,803
Claims priority, application Japan, Jan. 19, 1990, 2-9586
Int. Cl.[5] B62M *1/16*
U.S. Cl. 280—240 **3 Claims**

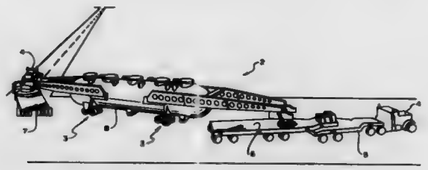
1. A wheelchair capable of moving forward and backward for single-hand operation comprising at least one driving wheel, a universal joint provided on an axis of said one driving wheel and outside the one driving wheel, said universal joint including a yoke, a single operation ring fastened at a shaft end of said yoke, and a forwardly extending extension arm with a base of said extension arm provided and supported at the shaft end of the yoke between the universal joint and the operation ring such that said shaft end of the yoke can rotate freely, a direction-changing caster provided at a front of the wheelchair, and an interlocking member that converts oscillations over a front-rear axis of the extension arm into direction changes of said direction-changing caster, through which interlocking member a front end of the extension arm and a

yoke of the direction-changing caster are linked with each other, whereby said wheelchair is not only driven by rotating



said single operation ring but also steered by swaying said operation ring to a right and a left.

5,112,073
STEERING SYSTEM FOR LOAD SUPPORTING DOLLY
James R. McGhie, Eagan, Minn., and Lowell K. Pendelton, Henderson, Nev., assignors to Trans World Crane, Inc., Eagan, Minn.
Filed Aug. 27, 1990, Ser. No. 573,443
Int. Cl.[5] B60D *3/00*; B62D *53/04*
U.S. Cl. 280—404 **17 Claims**



1. A steerable dolly for use with vehicles for transporting heavy loads, said dolly for supporting a portion of the load and comprising

a) a chassis arranged along a longitudinal axis;

b) at least one axle aligned along an axle axis which is orthogonal to said longitudinal axis, and a plurality of ground-contacting wheels attached to said axle; said axle having a medial bore therethrough, orthogonal to said axle axis;

c) a generally cylindrical bearing rotatably mounted in said chassis and encircling said at least one axle, said bearing having an aperture aligned with said axle medial bore;

d) at least one king-pin received in the aligned bearing aperture and the axle medial bore, whereby said at least one axle may be pivoted about said king-pin, and whereby the cylindrical bearing, the axle and the king-pin may be rotated about said axle axis.

5,112,074
TOW BAR ASSEMBLY
Roger R. Smith, Imlay City, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation-in-part of Ser. No. 431,279, Nov. 3, 1989, abandoned. This application Mar. 5, 1991, Ser. No. 664,707
Int. Cl.[5] B60D *1/14*
U.S. Cl. 280—483 **5 Claims**

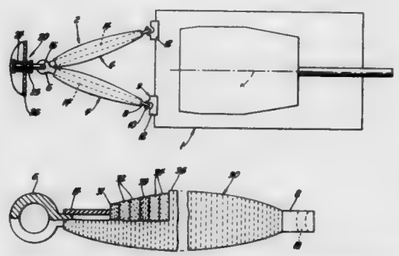
1. A towing mechanism comprising;

a. two circular hook members mounted horizontally on a disabled vehicle, said hook members being spaced equidistant from the disabled vehicle's center line;

b. two identical tow bars;

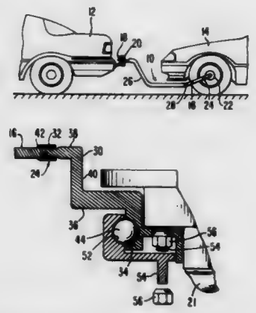
c. each of said tow bars comprising an elongated tube, a front eye member affixed to one end of the tube and a rear eye member affixed to the end of the tube opposite the front eye member, said rear eye member being perpendicularly oriented relative to said front eye member;

d. said front eye member of each identical tow bars having a circular opening sized to fit over a common pintle of a towing vehicle;



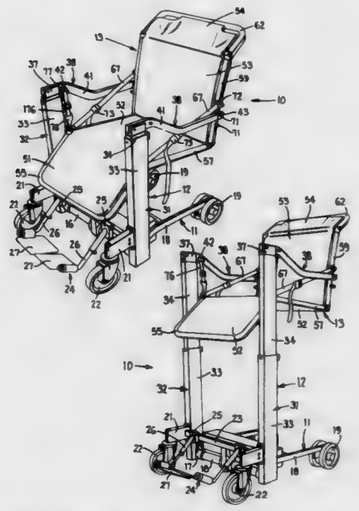
e. said rear eye member of each identical tow bar comprising a flat plate having a portion attached to said elongated tube, and a portion located outside the tube; said outside portion having a partial toroidal opening sized to fit around one of said circular hooks each rear eye member fitting on a separate circular hook whereby said tow bar may freely swing onto said hook members.

5,112,075
VEHICULAR TOWING SYSTEM
John A. Tomse, 380 Esplanade Ave., Pacifica, Calif. 94044
Continuation-in-part of Ser. No. 377,550, Jul. 10, 1989, abandoned. This application Nov. 19, 1990, Ser. No. 615,240
Int. Cl.[5] B60D *1/14*
U.S. Cl. 280—503 **9 Claims**



1. A vehicular towing system for connecting a rear end of a towing vehicle with a forward end of a vehicle being towed comprising a coupling frame gaving a pair of side bars, each of said side bars including a rotatable coupling member adapted to allow tiltable movement of front wheels of said towed vehicle freely and independently of each other, said wheels being rotatably moveable on a road surface about an axis parallel to a path of said towed vehicle in a clockwise and counterclockwise direction, said coupling member comprising a front section having a rotatable arm and end portion having a fixed socket, said rotatable arm being inserted into said fixed socket to insure a smooth rotational movement therein.

5,112,076
WHEELCHAIR WITH REMOVABLE SEAT
Harold R. Wilson, 1384 Natchez St., Holland, Mich. 49424
Filed Feb. 23, 1990, Ser. No. 484,570
Int. Cl.[5] A61G *5/10, 5/04*
U.S. Cl. 280—657 **8 Claims**



1. A wheelchair, such as for transporting an invalid or handicapped person, comprising:

a wheeled base assembly having a front, a rear and opposite sides;

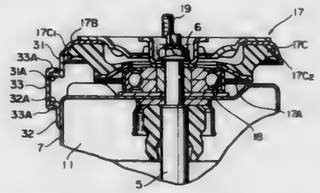
an upright assembly fixedly secured to and projecting upwardly from said base assembly, said upright assembly including a pair of upright post arrangements located adjacent to said opposite sides of said base assembly and close to the front of said base assembly, each said post arrangement being vertically extendable and retractable;

drive means drivingly coupled to said post arrangements for effecting both raising and lowering thereof;

said upright assembly including a pair of elongate support arm means having front and rear ends, said support arm means adjacent to the front ends thereof being mounted on said post arrangements adjacent to the upper ends thereof, said support arm means projecting rearwardly from said post arrangements in generally parallel and cantilevered relationship; and

a seat assembly positioned between and removably attached to said support arm means, said seat assembly including a seat portion and a backrest portion which is normally maintained in upwardly inclined relation to the seat portion when in a seating position, said seat and backrest portions being joined by hinge structure which permits the backrest portion to be folded downwardly into substantially aligned relation with the seat portion, manually releasable catch means coacting between opposite sides of said backrest portion and the respective support arm means in the vicinity of the rear ends thereof to effect partial support of said seat assembly on said support arm means, and manually releasable support means cooperating between opposite sides of said seat portion and the respective support arm means at a location spaced forwardly from the rear ends thereof, said support means including adjustable length means.

5,112,077
SUSPENSION SYSTEM
Naoki Makita, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan
Filed Jan. 22, 1991, Ser. No. 643,946
Claims priority, application Japan, Jan. 20, 1990, 2-4231[U]
Int. Cl.[5] B60G *11/48*
U.S. Cl. 280—673 **8 Claims**



1. A suspension system comprising:

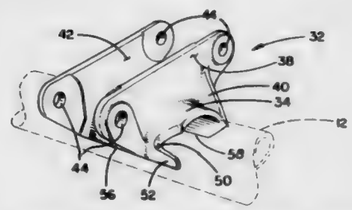
a shock absorber body;

a piston rod that projects upwardly from an upper end of said shock absorber body;

a mount, provided on an end portion of said piston rod which projects from said shock absorber body, for attaching said end portion to a vehicle body, said mount including a first mounting member that is attached to said piston rod, a second mounting member that is to be attached to the vehicle body, and a rubber mount member provided between said first and said second mounting members, said rubber mount member having thick- and thin-walled diametrically opposing portions; and

engagement means for disengageably receiving a retainer which will retain said thick-walled portion of said rubber mount member in a compressed state, said engagement means including engagement portions fixed relative to said second mounting member and to said piston rod, respectively.

5,112,078
AXLE MOUNTING ASSEMBLY
Gregory T. Galazin, Montague, and William C. Pierce, Muskegon, both of Mich., assignors to Neway Corp., Muskegon, Mich.
Filed Dec. 21, 1990, Ser. No. 633,120
Int. Cl.[5] B60G *11/26*
U.S. Cl. 280—711 **41 Claims**



1. A vehicle suspension system for mounting ground-engaging wheels to a vehicle frame, the suspension system comprising at least two substantially rigid arms secured to opposite sides of the frame through substantially aligned pivot mounts; at least one wheel-carrying axle between said arms; and a bracket assembly securing said axle to each of said arms; said bracket assembly comprising a wrapper plate having an elongated surface complementary to the axle; the wrapper plate having longitudinal side edges and end edges; and welds between the side edges of the wrapper plate and the axle to secure the wrapper plate to the axle; the improvement which comprises:

the wrapper plate having a notch at one end edge forming at least one finger at one corner of said wrapper plate; and one of said welds extending along an outer edge of said finger.

5,112,079

ARRANGEMENT FOR PROTECTING AN OCCUPANT OF A VEHICLE

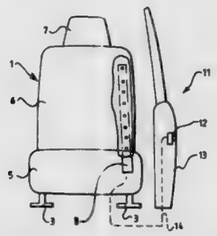
Lars Y. Haland, Falsterbo, and Einar T. Skanberg, Billdal, both of Sweden, assignors to General Engineering (Netherlands) B.V., Utrecht, Netherlands

Filed Jun. 1, 1990, Ser. No. 531,394

Claims priority, application United Kingdom, Jun. 13, 1989, 8913563

Int. Cl.[5] B60R *21/22*

U.S. Cl. 280—730 **10 Claims**



1. An arrangement to protect an occupant of a motor vehicle, the arrangement comprising a seat including a squab and a back, an inflatable bag, gas generator means to inflate the bag, and a diffuser fluidly connected with said gas generator means, said diffuser extending substantially the length of said back and having a plurality of openings fluidly connected with said bag, the bag having an uninflated form and an inflated form, said inflated form being when said gas generator means inflates said bag and being larger than said uninflated form, the bag, when in its uninflated form, being mounted within the structure of said seat, the bag being mounted in position and configurated for causing the inflated form of the bag to be located between an occupant of the vehicle sitting on the seat, and a side of the vehicle when the bag is inflated by the gas generator means, the inflated form of the bag extending from at least the squab of the seat to the top of the back of the seat, the centre of the inflated form of the bag contacting the occupant of the vehicle and being substantially aligned with the centre of gravity of the torso of the occupant when an occupant is seated on the vehicle seat.

5,112,080

SENSOR CONTROL CIRCUIT

Masami Okano, Saitama, Japan, assignor to Zexel Corporation, Tokyo, Japan

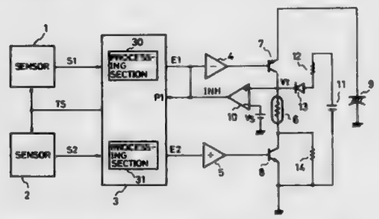
Filed Nov. 14, 1990, Ser. No. 612,913

Claims priority, application Japan, Nov. 14, 1989, 1-295729

Int. Cl.[5] B60R *21/32*

U.S. Cl. 280—735 **10 Claims**

1. A sensor control circuit comprising:
a first sensor for detecting an event;
a second sensor having identical characteristics with those of said first sensor for detecting said event at the same time;
a processing unit having a first processing section for receiving and processing a first sensor signal from said first sensor and a second processing section for receiving and processing a second sensor signal from said second sensor;
first switching means for switching in response to a first output from said first processing section;
second switching means for switching in response to a second output from said second processing section;
said first and second processing sections being made so as to turn on said first switching means prior to said second switching means in response to said first and second sensor signals; and



monitor means for preventing current conduction to a load if said second switching means is turned on prior to said first switching means.

5,112,081

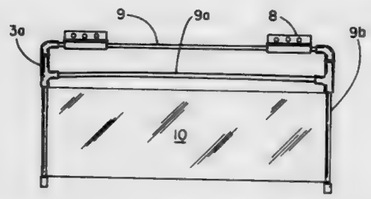
CAR PROTECTIVE DEVICE FOR PASSENGERS

Julius Kesseru, 1410 Morrow Rd., Pittsburgh, Pa. 15241

Continuation-in-part of Ser. No. 468,213, Feb. 20, 1990, abandoned. This application Jun. 17, 1991, Ser. No. 716,388

Int. Cl.[5] B60R *21/06*

U.S. Cl. 280—749 **4 Claims**



1. The occupant protective device for passenger and driver comprising of a nylon sheet attached to a U shaped steel frame, said frame being pivotally attached above and along the windshield and releasable attached to a trigger means, said trigger means being attached to a sensor, springs means attached to the U frame and anchored to the dashboard corners, retaining means attached to the U frame and to the roof, said sensor activates the trigger upon collision, to release the U frame from the car roof, allowing said spring means to pull the nylon covered U frame forward to a position between the occupants and the windshield, said retaining means preventing the said frame from hitting the windshield and the occupants' heads are unable to hit the windshield, only the elastic nylon sheet.

5,112,082

LOW PROFILE VEHICLE CONSTRUCTION

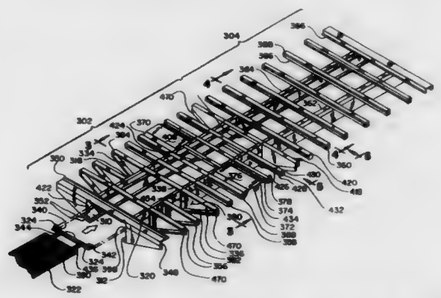
William F. Clelland, Columbia, Mo., assignor to Ryder Truck Rental, Inc., Miami, Fla.

Filed Mar. 22, 1991, Ser. No. 674,591

Int. Cl.[5] B62D *21/00*

U.S. Cl. 280—783 **9 Claims**

1. A low profile cargo vehicle having a cab and a cargo storage area with walls, a floor, and a ramp, comprising:
a pair of spaced longitudinally-extending chassis frame rails having front and rear sections;
a first spaced pair of longitudinally-extending body rails superposed over said front section of said chassis frame rails;
a second spaced pair of longitudinally extending body rails superposed over said rear section of said chassis frame rails, said second body rails providing a ramp storage region between them, said chassis frame rails and said first and second body rails each having a vertical surface facing exteriorly, the combined height of the vertical surfaces of said first body rails and said chassis frame rails in said front section being less than the combined height of the vertical surfaces of said second body rails and said chassis frame rails in said rear section;
at least one pair of outrigger supports mounted opposite each other and bearing against said vertical surfaces of said second body rails and said chassis frame rails, said outrigger supports each having an upper flange;



a plurality of cross supports mounted transversely to said second body rails, said cross supports each having an upper surface substantially coplanar with said upper flanges of said outrigger supports; and
a plurality of beam supports mounted transversely to said first body rails, said beam supports each having an upper surface and a vertical dimension such that said upper surfaces of said beam supports and cross supports and said upper flanges of said outrigger supports provide a substantially planar supporting surface for said cargo area floor.

5,112,083

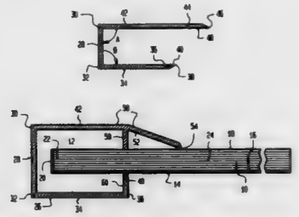
PAPER PAD CONSTRUCTION AND CLIP MEANS THEREFOR

Ross Morrone, Cranbury, N.J., assignor to All-State Legal Supply Co., Cranford, N.J.

Filed Aug. 22, 1990, Ser. No. 569,801

Int. Cl.[5] B42D *1/10*; B42F *3/00*

U.S. Cl. 281—47 **20 Claims**



1. A paper pad construction comprising:
(a) a paper pad means including a plurality of individual paper sheet members stacked vertically upon one another, said paper pad means defining a base surface therebelow and an upper surface thereabove;
(b) an edge gluing means extending along one edge of said paper pad means to facilitate initial retainment of said individual paper sheet members with respect to one another;
(c) a pad securement clip means comprising:
(1) an end member extending over one edge of said paper pad means over said edge gluing means to facilitate retainment thereof, said end member including an upper end and a lower end defined thereon;
(2) a base member secured with respect to said lower end of said end member and extending outwardly therefrom across said base surface of said paper pad means, said base member being flexibly resilient to exert an upwardly directed bias against said base surface of said paper pad means to facilitate retainment of said individual paper sheet members included therein, said base member including a base member end means including a first obliquely angled tip member to facilitate exertion of the upwardly directed bias against said paper pad means; and
(3) an upper member secured with respect to said upper end of said end member and extending outwardly therefrom across sad upper surface of said paper pad means, said upper member extending outwardly from said end member to a distance greater than the lateral distance which said base member extends from said end member to facilitate downwardly directed bias therefrom and to facilitate removal of individual paper sheet members from said paper pad, said upper member being flexibly resilient to exert a downwardly directed bias against said upper surface of said paper pad means to facilitate retainment of said individual paper sheet members included therein, said upper member including an upper member end means including a second obliquely angled tip member to facilitate exertion of the downwardly directed bias against said paper pad means.

5,112,084

CONNECTOR FOR SMALL-DIAMETER PIPING

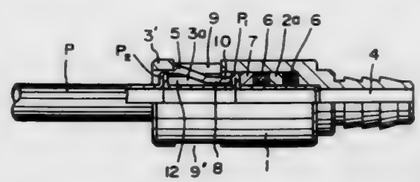
Katsushi Washizu, Shizuoka, Japan, assignor to Usui Kokusai Sangyo Kaisha, Ltd., Japan

Filed Feb. 5, 1990, Ser. No. 475,434

Claims priority, application Japan, Feb. 7, 1989, 1-13407; Feb. 7, 1989, 1-28019

Int. Cl.[5] F16L *35/00*

U.S. Cl. 285—24 **16 Claims**



1. A connector for a small-diameter pipe having an expanded portion in proximity to one end thereof, said connector comprising:
a connector body having opposed front and rear ends, a through hole extending axially therethrough from the front end to the rear end, a small-diameter chamber defined in the connector body contiguous to the through hole therein, portions of the through hole adjacent said rear end defining an accepting chamber, said accepting chamber being an extension of the small diameter chamber, a peripheral wall portion of the accepting chamber being formed with elongate lock openings, a rear wall portion of the accepting chamber adjacent the lock openings defining a lock wall, and at least one sealing element being fitted to the inner surface of the small-diameter chamber, and
a socket member comprising a peripheral wall defining opposed front and rear axial ends and a through hole extending therebetween, the through hole being dimensioned to fit over the small-diameter pipe such that the front end of the peripheral wall engages the expanded portion of the pipe, the socket member being dimensioned to be seated in the accepting chamber of the connector body, said socket member being made of elastic material and having an axial cutoff formed in the peripheral wall

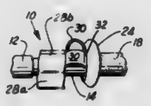
thereof and extending from the front end to the rear end to assume a substantial C-shape in section, the peripheral wall of the socket member having a pair of resilient pawl portions integral therewith and cantilevered from a location intermediate the front and rear ends to extend obliquely outward toward the rear end, portions of the rear end of the peripheral wall in alignment with the pawl portions being discontinuous to facilitate inward deflection of the pawl portions, and the distal end of each of the paired pawl portions having means adjacent the rear end of the peripheral wall for resilient engagement with the lock wall of the connector body.

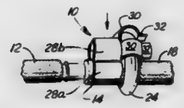
5,112,085

TUBE COUPLING WITH COMBINATION RETAINER AND DISASSEMBLY TOOL

John Busch, Grosse Ile, and William E. Potter, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 16, 1990, Ser. No. 614,525
Int. Cl.[5] F10L *35/00*
U.S. Cl. 285—39 **13 Claims**





10. A tube coupling and combination retainer and disassembly tool, comprising:

a first tube having a first end portion comprising means for telescopically receiving a tube having a second end portion therein;

a second tube having a second end portion comprising:

means for telescopically engaging said first end portion; and

spring means for securing said first and second end portions to each other; and

secondary fastening means for selectively securing said first and second end portions to each other and for disengaging said spring means, with said secondary fastening means comprising a clip having:

a mounting segment for maintaining said clip in engagement with said first end portion;

a retention segment for maintaining the engagement of said first and second end portions; and

a release segment for disengaging said spring means.

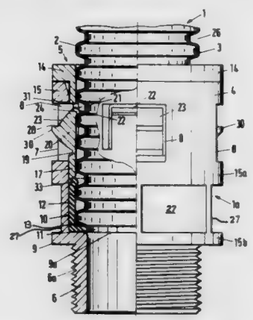
5,112,086

COUPLING DEVICE FOR A CORRUGATED PIPE OR HOSE

Ernst Gruber, Hanau, and Alfred Bamberg, Grosskrotzenburg, both of Fed. Rep. of Germany, assignors to FLEXA GmbH & Co. Produktion und Vertrieb KG, Hanau, Fed. Rep. of Germany

Filed Jun. 20, 1991, Ser. No. 717,929
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1990, 4020171
Int. Cl.[5] F16J *15/00*; F16L *39/00*
U.S. Cl. 285—86 **8 Claims**

8. A coupling device for releasably connecting a corrugated member having radially outwardly extending corrugation ridges therein to said coupling device, comprising a housing with at least one lateral opening therein, an operating sleeve (5) axially movable in said housing, said operating sleeve (5) having at least one radially extending stop flange cooperating with an axially facing end of said housing, said operating sleeve further having at least one locking claw tiltable in a radial direction in said lateral opening of said housing for locking said corrugated member against axial withdrawal when said operating sleeve is in one position and for releasing said corrugated member when said operating sleeve is in another axial position in said housing.

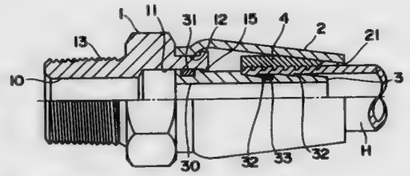


5,112,087

PIPE JOINT

Shimade Haruki, Nara, Japan, assignor to Nitta-Moore Co., Ltd., Osaka, Japan

Filed Oct. 12, 1990, Ser. No. 596,322
Claims priority, application Japan, Oct. 25, 1989, 1-277950; Mar. 23, 1990, 2-74292
Int. Cl.[5] F16L *17/04*
U.S. Cl. 285—101 **9 Claims**



1. A pipe joint comprising:

a cylindrical main body provided with open ends, one of said open ends being a connecting port and the other end being a pipe inserting port engagement means within said cylindrical main body intermediate said connecting port and pipe receiving port defining a sliding range, said cylindrical main body being further provided with a tapered part having an inner circumferential surface which diminishes in diameter towards said pipe inserting port;

a cylindrical insert which is provided water-stanchly in said cylindrical main body and slideable within said predetermined sliding range, said cylindrical insert being further provided with a radially outwardly directed protruding member;

a co let provided between said tapered part of said inner circumferential surface of said cylindrical main body and said cylindrical insert, said collet being expandable and contractible when moved in an axial direction of said cylindrical main body, said collet and said cylindrical insert forming an inserting space between said collet and cylindrical insert for receiving and holding an end of a pipe inserted through said pipe inserting port; and wherein said engagement means includes

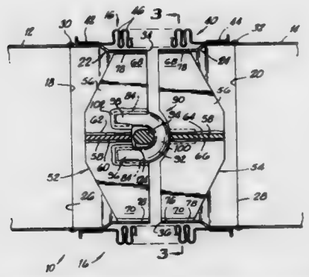
a projecting part projecting radially inwardly on said cylindrical main body at an end of said sliding range in which said cylindrical insert slides in said cylindrical main body for engagement with said protruding member to prevent said cylindrical insert from coming out of said cylindrical main body.

5,112,088

DUCT JOINT LINK ASSEMBLY

Arthur L. Moore, Valencia; Peter Wolff, Santa Monica; Leon H. Ruther, Granada Hills, and Walter E. Pike, Sylmar, all of Calif., assignors to Stainless Steel Products, Inc., Burbank, Calif.

Filed Oct. 10, 1990, Ser. No. 597,184
Int. Cl.[5] F16L *13/02*
U.S. Cl. 285—114 **9 Claims**



1. In a bellows joint for use in a high pressure aircraft ducting system to unite one duct with another wherein there is a first collar secured to a first duct and a second collar secured to a second duct and each collar includes cross bars extending across the diameters of each of said collars and a bellows means exterior of said collars which unites said collars yet is yieldable to allow flexing of said joint due to required angulation of said ducting system as well as due to gas pressures created in said aircraft ducting system, the improvement including:

a pair of link leg cutouts in each of said cross bars;

link means in the form of a pair of U shaped link members interlocked one with the other with each being secured within said link leg cutouts of said cross bars to retain said joint in an operable united relationship yet allowing flexing of one of said collars with the other, wherein each link includes a pair of generally parallel legs and a web portion extending between said legs;

weld bands securing said legs within said link leg cutouts, and at least some of said weld bands secure said bars and said legs at right angles to each other whereby excessive welds uniting parts at a greater than 90° degrees to each other is avoided;

at least one of said U shaped links having a web portion of a greater width than either of said leg portions, and the thickness of each leg and web defined by a common flat parallel top and bottom surface and each leg having exterior sides which are normal to the plane of said top and bottom flat surface; and

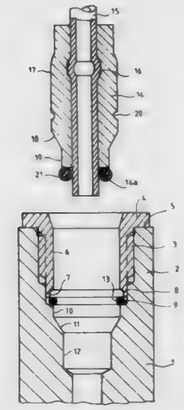
said web and legs having curved interior sides all on a common plane whereby when engaged by said other link member rotation of either link will be accomplished at reduced frictional contact.

5,112,089

RAPID ASSEMBLY CONNECTOR

Denis Richard, Choisy-le-Roy, France, assignor to Automobiles Peugeot and Automobiles Citroen, both of, France

PCT No. PCT/FR88/00053, § 371 Date Oct. 3, 1988, § 102(e) Date Oct. 3, 1988, PCT Pub. No. WO88/05882, PCT Pub. Date Aug. 11, 1988
PCT Filed Feb. 2, 1988, Ser. No. 275,133
Claims priority, application France, Feb. 3, 1987, 87 01499
Int. Cl.[5] F16L *21/06*
U.S. Cl. 285—321 **7 Claims**



1. High pressure hydraulic connector for rapid connection comprising, a female connector and a male connector element fixed to a connector tube, and comprising, a toric seal on said tube adjacent said male element and a latchable lock ring, cooperating slidable cylindrical portions on said male element and female connector, and comprising, a first cylindrical wall of the female connector of a diameter less than the relaxed diameter of the toric seal and a second cylindrical wall of the female connector of a diameter greater than the diameter of the toric seal, a lock ring groove in said male element in a cylindrical wall slidable in the second wall of the female connector, a toric surface for said lock ring in said second wall of said female connector, a first conical portion on said female connector for compressing said toric seal of said male element into said first cylindrical wall, a second conical portion on said female connector, of larger diameter than said first conical portion, for compressing said locking ring, for the same displacement of the male connector element into the female connector to produce compression of both the seal and lock ring, said lock ring being demountable and being confined, after the application of high pressure, by the groove and the toric surface of the male element and female connector, and said toric seal being confined between said tube, said male element, and said first cylindrical wall of the female connector and having a free surface facing away from said male element, said free surface of the seal being subjected to high pressure so that the seal is pressed into sealing engagement with the tube, the male element and the first cylindrical wall of the female connector.

5,112,090

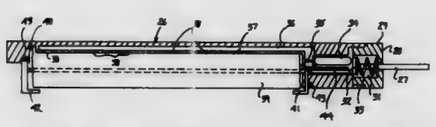
SECURITY LOCK APPARATUS

Voyd E. Stogsdill, 18868 Westlawn, Hesperia, Calif. 92345

Filed Jul. 12, 1991, Ser. No. 729,441
Int. Cl.[5] E05C *19/18*
U.S. Cl. 292—258 **3 Claims**

1. A security lock apparatus for securement to a frame flange containing a sliding frame slidably mounted relative to the frame flange, wherein the apparatus comprises,

at least one rigid body, the rigid body including a top wall spaced from a bottom wall a predetermined height, and
a front wall spaced from a rear wall, and including spaced side walls, and
the rigid body including a slot orthogonally oriented relative to the top wall extending downwardly relative to the top wall a predetermined depth less than the predetermined height, and
the top wall including a top wall rear edge spaced from a top wall front edge, and
the top wall rear edge including abutment means mounted in contiguous communication to the rear edge for abutment of the sliding frame when the flange is mounted within the slot, and
the slot including spaced parallel side walls, each side wall orthogonally oriented relative to the top wall, and
the front wall including an internally threaded bore directed from the front wall extending through at least one side wall, and
an externally threaded lock bolt threadedly received within the internally threaded bore, wherein the lock bolt projects into the slot, and
the internally threaded bore defines an acute included angle in the at least one side wall and the internally threaded bore, and
the abutment means includes a plate member, the plate member fixedly mounted to the rear edge extending laterally beyond each side wall of the rigid body, and
the abutment means includes an abutment housing, the abutment housing including an abutment housing top wall, the abutment housing top wall substantially coextensive with the top wall of the rigid body, and the abutment housing

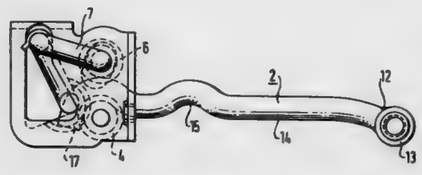


including a housing forward end wall orthogonally oriented relative to the abutment housing top wall and positioned beyond the rigid body, the forward housing end wall including a cavity positioned within the abutment housing adjacent the abutment housing forward end wall, and an actuator rod orthogonally and slidably directed through the abutment housing forward end wall positioned within the cavity, and the actuator rod including a rod plate positioned within the cavity orthogonally oriented relative to the actuator rod, and a captured spring positioned between the rod plate and an interior surface of the abutment housing forward end wall, and
a compressed gas canister orthogonally oriented relative to and adjacent the rod plate in contiguous communication with the rod plate, and a displacement rod positioned in contiguous communication with the rod plate adjacent the compressed gas canister, and the gas conduit directed through the housing, the compressed gas canister including a conduit floor, the conduit floor positioned above a balloon cavity, wherein the balloon cavity is directed through an abutment housing bottom wall within the abutment housing, and the balloon housing cavity including a balloon contained within the balloon cavity fixedly mounted to the conduit floor, the conduit floor including a plurality of conduit floor openings, wherein each conduit floor opening is directed interiorly of the balloon, and a piercing rod positioned in longitudinal alignment with the compressed gas canister for piercing the compressed gas canister to direct compressed gas through the gas conduit, through the conduit floor openings, and into the balloon upon displacement of the actuator rod within the abutment housing.

5,112,091
DOOR HOLDING DEVICE FOR MOTOR VEHICLE DOOR

Bernd A. Klüting, Radevormwald, Fed. Rep. of Germany, assignor to Ed. Scharwächter GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

Filed Dec. 28, 1990, Ser. No. 635,768
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1989, 3943407
Int. Cl.[5] E05C *17/20*
U.S. Cl. 292—262 **19 Claims**

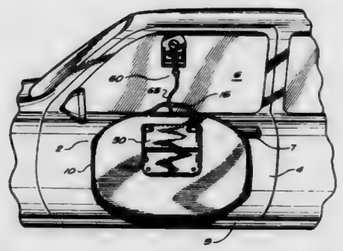


1. In a door holding device for a motor vehicle door, including a door holding rod which is pivotally connected by means of a bearing block to a first door installation member, the door holding rod being provided with locking means for holding the door in predetermined positions and with an end stop means for holding the door in an end position, the device further including a holder housing rigidly connected to a second door installation member, the door holding rod extending through the holder housing, a first abutment roller being mounted in the holder housing so as to be rotatable about a rigid axis, a torsion rod spring resting against the holder housing by means of a support arm, the torsion rod spring having a load-applying arm, a second load-applying roller being rotatably mounted on the load-applying arm, the door holding rod extending between the two rollers, the door holding rod having a longitudinal axis and a length which comes into engagement with the rollers, the improvement comprising the door holding rod having over the entire length which comes into engagement with the rollers a rounded cross-sectional shape, the locking means being at least one bent portion of the door holding rod, the at least one bent portion being directed transversely of the longitudinal axis of the door holding rod.

5,112,092
APPARATUS FOR ELMINATION OF VEHICLE DOOR DENTS

Ricco D. Pucci, 3622 Kennington Ct., Huffman, Tex. 77336

Filed Mar. 21, 1991, Ser. No. 672,843
Int. Cl.[5] B60R *19/42*
U.S. Cl. 293—128 **17 Claims**

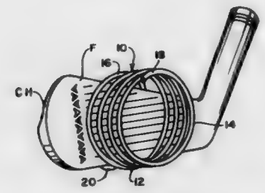


1. In a vehicle having a plurality of doors with windows, an apparatus for elimination of dents to an external surface of at least one of said doors, said apparatus comprising:
padding means having cushioning means and a plurality of layering means, said padding means configured to be releasably received by said external surface of said one door, and disposed longitudinally thereof;
said layering means comprising:
an inner plastic wrap layer fixedly attached to and totally encasing said cushioning means for containment of said cushioning means;
at least one intermediate fabric layer fixedly attached to and totally encasing said inner plastic wrap layer for protection of said inner plastic wrap layer; and
an outer upholstery layer fixedly attached to and totally encasing said intermediate fabric layer for protection of said intermediate fabric layer and for aesthetics; and
securing means fixedly attached to said padding means for sustaining a medial disposition of said securing means between said padding means and said external surface of said one door.

5,112,093
GOLF BALL RETRIEVER

Alexander T. Kindling, 5619 Kentucky Ave., Pittsburgh, Pa. 15232

Filed Aug. 28, 1991, Ser. No. 751,874
Int. Cl.[5] A63B *47/02*
U.S. Cl. 294—19.2 **17 Claims**



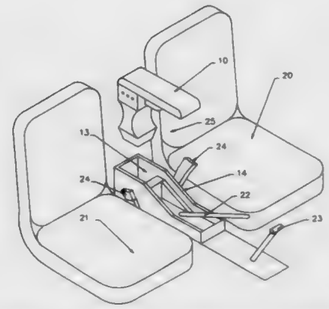
1. A golf ball retriever for use with the head of an iron golf club having a ball striking face and a side opposite the face comprising:
a coil of continuous wire like material having a number of convolutions and having a substantial degree of resistance against expansion of its convolutions,
said coil having a ball receiving end section and an opposite club head attachment end section,
at least several of the convolutions of said receiving end section having diameters greater than the diameter of the ball to be retrieved,
the axial distance formed by several of said convolutions starting with the first convolution at said receiving end section being such that the ball may be supported by at least several of said convolutions,
said attachment end section terminating into a free unattached end,
said attachment end section also having a portion that tightly wraps around the face and the side opposite the face of the club head, in a manner that said unattached end forcefully engages the head, to establish a strong gripping relationship between the retriever and the club head, and in a manner that the retriever may be quickly placed on the club head in a position extending generally perpendicular to the club head in a position to retrieve a ball.

5,112,094
VEHICLE ARM REST

David E. Kribe, 368 Peninsular Ct., Haines City, Fla. 33844

Filed Mar. 28, 1991, Ser. No. 676,556
Int. Cl.[5] B60R *7/00*
U.S. Cl. 296—37.8 **1 Claim**

1. An arm rest for a vehicle to be fitted snugly into a cavity that is part of a molded console that is located between a driver seat and a front passenger seat of certain vehicles, said arm rest comprising:
a. a base piece, said base piece including a bottom end and an upper end, the bottom end of which fits snugly into the cavity that is part of the molded console, the upper end includes a groove;
b. an arm rest piece, said arm rest piece including a tongue attached to an underside of the arm rest piece, said tongue fits into said groove;

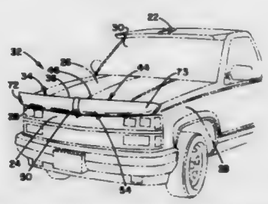


c. a longitudinal adjustment means, said adjustment means comprising a plurality of apertures in the upper end of the base piece, a plurality of apertures in the tongue, and a fastener insertable into said base piece and tongue apertures in order to fix the arm rest at a given longitudinal position relative to the driver and passenger seats, said adjustment means for selectively varying the longitudinal position of the arm rest piece tongue.

5,112,095
VEHICLE SHIELD DEVICE

James R. Lund, Champlin, and Alan B. Eke, Blaine, both of Minn., assignors to Lund Industries, Incorporated, Minneapolis, Minn.

Filed Jul. 26, 1990, Ser. No. 556,491
Int. Cl.[5] B60J *1/20*
U.S. Cl. 296—91 **10 Claims**



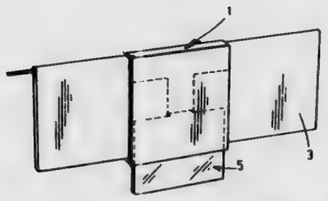
1. An airflow deflector apparatus adapted to be mounted on a hood of a vehicle, operable between a first, open position, for deflecting airflow and a second, closed position, in substantial conformity with said hood of said vehicle, said airflow deflector comprising:
a first lateral wing member;
a second lateral wing member;
first lateral hinge means defining a first hinge axis for coupling said first lateral wing member to said hood and for permitting rotational movement while restraining longitudinal movement of said first wing member between said open position and said closed position relative to said first hinge axis;
second lateral hinge means defining a second hinge axis for coupling said second lateral wing member to said hood and for permitting rotational movement while restraining

longitudinal movement of said second wing member between said open position and said closed position relative to said second hinge axis;

central hinge means defining a central hinge axis for connecting a central wing section means to said hood and for permitting rotational movement of said central wing section means between said open position and said closed position relative to said central hinge axis; and

central wing section means for retaining adjacent ends of said first and second lateral wing members and for permitting relative movement between said lateral wing members and said central wing section means during movement of said lateral wing members and said central wing section means between said open position and said closed position.

5,112,096
GLARE-REDUCED SHIELD ASSEMBLY FOR SUN VISOR
John B. Keenan, 2535 Chassé, Ste Foy, Quebec, Canada G1W 1M1
Filed Jul. 22, 1991, Ser. No. 733,622
Int. Cl.[5] B60J *3/00*
U.S. Cl. 296—97.6 **16 Claims**



1. A retractable glare-reducing shield assembly comprising:

a sleeve defining an open-ended tubular passage, said sleeve including a pair of overlapping panels comprising an inner panel located inside said passage, said inner panel having a top border, and an outer panel forming one lateral side of said sleeve;

means fixing said panels together so as to form between them a shield-receiving chamber having a closed end and a chamber opening opposite said closed end; said fixing means including spots of adhesive material attaching together the top border of said inner panel to said outer panel to form said closed end of said chamber;

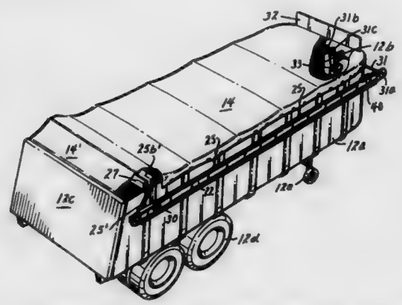
a glare-reducing shield mounted in said chamber for movement thereof through said chamber opening between an extracted position, where a major portion of said shield extends out of said chamber, and a retracted position where said major portion lies in said chamber; and

restraining means preventing said shield from moving out of said chamber when in said extracted position,

wherein said inner panel is formed with a through slot having a bottom edge adjacent said chamber opening, said slot extending in a direction of movement of said shield, and

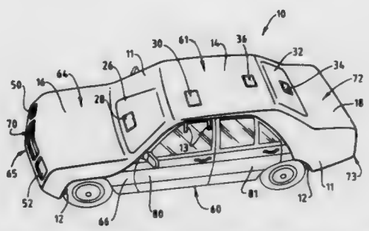
wherein said restraining means comprise a hook at one end of said shield, said hook being turned toward said inner panel and slidably inserted into said slot in such a manner that, in said extracted position, said hook engages said slot bottom edge and holds said shield to prevent it from moving out of said chamber through said chamber opening, said closed end of said chamber limiting inward movement of said shield within said chamber.

5,112,097
TRUCK TRAILER COVER
Frederick Turner, Jr., R. 2, Harrisburg, Ill. 62946
Filed Apr. 29, 1991, Ser. No. 692,702
Int. Cl.[5] B60P *7/04*
U.S. Cl. 296—100 **6 Claims**



1. A covering arrangement for the cargo area of a truck defined by a front wall, side walls, and a rear entry comprising rails fixedly secured to the outer surfaces of said side walls, trolley assemblies movable along said rails, a covering fabric overlying said cargo area, where said trolley assemblies are secured to edges of said covering fabric, where said trolley assemblies continually urge said covering fabric into a sealing relationship, and means selectively moving said trolley assemblies in a forward and a rearward direction on said rails, where a portion of said cargo area spaced from said rear entry includes a lateral cushioned bar overlaid by separate covering fabric, and where the rearmost of said trolley assemblies mounts a lateral cushioned bar overlaid by said covering fabric and selectively engaging said lateral cushioned bar spaced from said rear entry in a sealing relationship.

5,112,098
ANTI-THEFT VEHICLE COVER FOR TRANSPORT AND STORAGE
Robert S. Lichtmann, 20675 Nordhoff St., Chatsworth, Calif. 91311
Filed Jun. 4, 1990, Ser. No. 532,376
Int. Cl.[5] B60J *11/00*
U.S. Cl. 296—136 **12 Claims**



1. In a vehicle cover having a body member for forming a skin over a vehicle excepting at least one door thereof, said skin defining openings for a radiator grill and a pair of headlights of the vehicle, said skin also including means for exposing a portion of a windshield of the vehicle; said vehicle cover further comprising means including bendable, shape retaining tabs for selectively anchoring said vehicle cover to the vehicle and means for preventing said vehicle cover from being easily removed.

5,112,099
PLATE TRAILER JOINTS
Howard J. Yurgevich, Monticello, and Stanley J. Mavoczynski, Lafayette, both of Ind., assignors to Rosby Corporation, Monon, Ind.
Division of Ser. No. 664,668, Mar. 5, 1991, Pat. No. 5,066,066.
This application Oct. 4, 1991, Ser. No. 771,744
Int. Cl.[5] B62D *33/04*
U.S. Cl. 296—181 **11 Claims**



10. A joining member for joining a pair of adjacent plates on a side of a cargo carrier, each plate having outer surfaces, the joining member comprising:

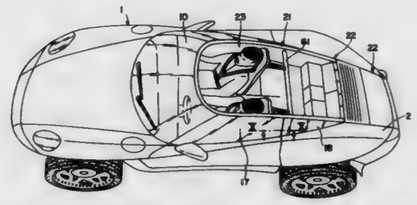
an outer and inner rectilinear strip each having an outer surface, an inner surface and parallel edges joining the outer and inner surfaces;

means for fastening said outer and said inner rectilinear strips to said plates;

flange means attached to said inner surface of said outer strip and positioned between said pair of adjacent plates, said flange means for forming a channel of uniform depth wherein said flange means projects towards said outer surface of said inner strip; and

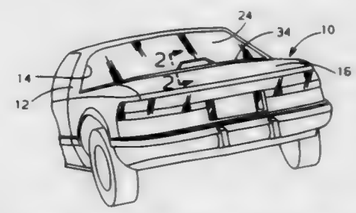
means for receiving logistics fittings aligned with said channel.

5,112,100
PASSENGER CAR, PARTICULARLY A SPORTS CAR
Stephen Murkett, Gerlingen, and Reinhold Schreiber, Renningen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany
Filed Sep. 5, 1990, Ser. No. 577,571
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1989, 3929831
Int. Cl.[5] B60J *7/11*
U.S. Cl. 296—186 **25 Claims**



1. A passenger car having an aerodynamic advantageously constructed vehicle body which, above a belt line, comprises a windshield, a top, a rearmost window, door window panes and rear side windows, wherein a supporting frame is provided which extends to a rear area along an upper edge of the windshield, of the door window panes and of the rear side windows arranged behind said door window panes, the supporting frame forming a supporting structure including two laterally exterior legs connected at one end by a substantially transverse piece forming an approximately U-shaped construction of the supporting structure from a top view and, each leg having another end directed toward the rear of the passenger car, and wherein the top and the rearmost window are detachably fastened to the supporting frame with said rearmost window being disposed directly behind said top.

5,112,101
WINDOW REVEAL MOLDING
Ricky V. Katcherian, Northville, and Stephen R. Roddy, Grosse Pointe Park, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jun. 17, 1991, Ser. No. 716,468
Int. Cl.[5] B60J *1/00*
U.S. Cl. 296—201 **4 Claims**



1. A motor vehicle window molding concealing a space between an edge of a window panel and a compartment lid and the molding mounted on a body panel of the motor vehicle by a curable adhesive, the molding comprising:

a C-shaped channel emember of plastic material fitted on the edge of the window panel and having sapced apart outer and inner legs which forcibly grip the opposed outer and inner faces of the window panel;

sapcing means coextruded with the channel member and adapted for engaging the body panel of the motor vehicle to sapce the window panel from the motor vehicle;

a locking nub extruded with the channel member and having a head sapced from the channel member and the sapcing means by a neck and the head adapted to seat within the curable adhesive to mechnically retain the modling onto the body panel;

a decorative portion extruded integral with the spacing means and having a brim projecting towards the compartment lid for overlying the sapce between window panel and the compartment lid; and

a close out lip extruded integral with the spacing means and underlying the brim and depending into engagement with the body panel underlying the compartment lid and adapted for covering the underlying body panel.

5,112,102
VEHICLE BODY, PARTICULARLY FOR PASSENGER CARS
Willi Wurl, Niefern-Oeschelbronn, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany
Filed Apr. 22, 1991, Ser. No. 688,270
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1990, 4013784
Int. Cl.[5] B62D *23/00*
U.S. Cl. 296—204 **14 Claims**

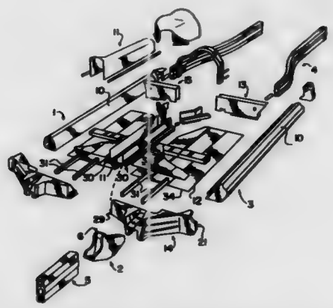
1. A vehicle body structure for a passenger car comprising:

a forward member;

an exterior side member, the forward member and the side member being formed by extruded profiles;

a light metal junction connecting the forward member and the side member, said junction being formed by a cast part and having a first junction element having an open end and a closed end and extending in the longitudinal direction of the vehicle for receiving an end of the forward

member in said open end, and a second junction element aligned essentially transversely to the longitudinal direction of the vehicle and which abuts the side member, said second junction element having a receiving channel that receives the first junction element, wherein the body



structure includes a floor and a transmission tunnel, said second junction element abutting said floor and said transmission tunnel of the body structure; and

means for additionally connecting the first and second junction elements.

5,112,103

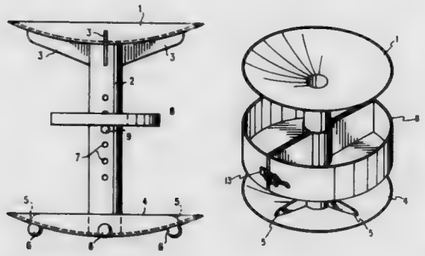
PEDESTALED SEAT

Stephen H. Downer, 443 Deerwood Dr., Fredericksburg, Va. 22401

Continuation-in-part of Ser. No. 519,104, May 4, 1990, abandoned. This application May 29, 1991, Ser. No. 707,308

Int. Cl.[5] A47C *3/02*

U.S. Cl. 297—270 **12 Claims**



1. A stool comprising:

a seat;

a vertical supporting member on which said seat rests;

a bowl like base on which said vertical supporting member rest, said base having a concave upper surface and a spheroidal convex lower surface to allow the stool to rock in all direction on a soft surface;

means for preventing rocking on a flat hard surface but allowing rocking on a flat soft surface including a plurality of elements fixedly secured to and protruding from said lower surface.

5,112,104

CAR SEAT COVER HAVING THE APPEARANCE OF ANIMALS

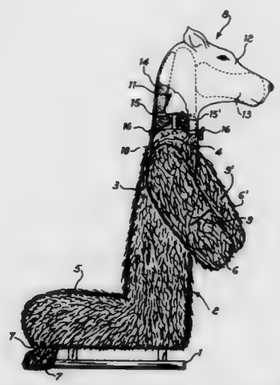
Giancarlo De Giacomi, Via Legnano, 6-Garbagnate (Milano), Italy

Filed Oct. 2, 1990, Ser. No. 591,901

Claims priority, application Italy, Oct. 2, 1989, 21863/89[U]; Mar. 16, 1990, 20844/90[U]

Int. Cl.[5] A47C *31/10*

U.S. Cl. 297—229 **4 Claims**



1. A seat cover for a car seat having a seat cushion, a back-rest and a head-rest upwardly protruding from the backrest, comprising: a back-seat cover portion to envelope a back-rest of a car-seat; a seat-cushion cover portion joined to said back-rest cover portion; and a head-rest cover portion; said head-rest cover portion having inner cushioning means to make one side of the head-rest cover portion protrude from the head-rest, and disengageable connecting means between said head-rest cover portion and said back-rest cover portion; and wherein seat cover further comprises first and second foldable tubular members connected to sides of at least one of said back-rest and seat-cushion cover portions, said tubular members hanging freely from and being rearwardly disposed and forwardly foldable in respect to the back-rest of the seat; said seat cover being in the form of an animal shape in which said back-rest cover portion, said head-rest cover portion and said tubular members define body, head and limbs of said animal shape.

5,112,105

SAFETY PLAY CHAIR WITH ANTIPINCH HANDLE

Marcella H. Schmitt, 190 S. Wood Dale Rd., #706, Wood Dale, Ill. 60191

Continuation-in-part of Ser. No. 376,417, Jul. 7, 1989, Pat. No. 5,004,297, which is a continuation-in-part of Ser. No. 328,088, Mar. 23, 1989, Pat. No. 4,988,090. This application Apr. 1, 1991, Ser. No. 678,816

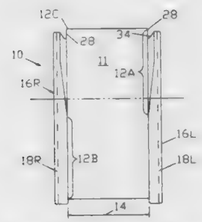
Int. Cl.[5] A42C *3/02*

U.S. Cl. 297—270 **15 Claims**

1. In a safety play chair having a chair body including a wall closed inwardly upon itself to form upper and lower portions, said inwardly closed wall forming inner and outer sides and having a length extending between a pair of opposite edges of the wall, and a base for supporting the lower portions of the chair body against tipping and rolling movement, the improvement being an antipinch handle assembly, comprising:

a rib extending inwardly from an edge of the inwardly closed wall to an inner distal end; and

a handle member mounted to the rib at the inner distal end and having an outermost portion spaced inwardly from



the outer side of the upper portion of the inwardly closed wall.

5,112,106

ARRANGEMENT IN CONNECTION WITH AN ADJUSTABLE BACK REST CUSHION OF A CHAIR

Svein Asbjornsen, and Jan Lade, both of Sykkylven, Norway, assignors to Svein Asbjornsen & Jan Lade A/S, Skkylven, Norway

PCT No. PCT/NO89/00085, § 371 Date Apr. 17, 1990, § 102(e) Date Apr. 17, 1990, PCT Pub. No. WO90/02504, PCT Pub. Date Mar. 22, 1990

PCT Filed Aug. 29, 1989, Ser. No. 473,979

Claims priority, application Norway, Jul. 9, 1988, 883983

Int. Cl.[5] A47C *3/00*

U.S. Cl. 297—284 F **9 Claims**



1. An arrangement in connection with a height adjustable back rest cushion for use with a chair having a back rest and a seat, comprising a contoured rail disposed in said back rest at a position rearward from a front side of said back rest, said rail having a groove formed therein along a longitudinal direction of said rail, and a slide means including a slide member having a rear portion that is moveable along said groove and a cushion holder member having means on a front part for engagement with a rear portion of said back rest cushion so that said back rest cushion is moveable as an integrated part of said cushion holder member and with no relative movement to said slide member along said longitudinal direction, said cushion holder member having a rear part that is pivotally connected to one end of a front portion of said slide member and is snap lock engageable with an other end of said front portion of said slide member by a snap lock means when said cushion holder member is pivoted about said one end of said slide member front portion in a direction towards said rail.

5,112,107

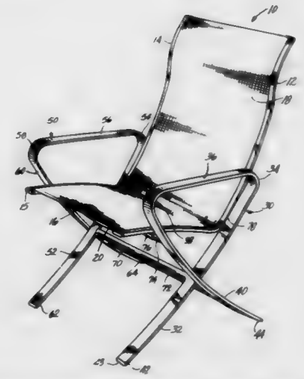
SPRING-ACTION CHAIR

Fred C. Doughty, South Pasadena, Calif., assignor to Brown Jordan Company, El Monte, Calif.

Filed Sep. 12, 1990, Ser. No. 581,467

Int. Cl.[5] A47C *3/00*

U.S. Cl. 297—288 **11 Claims**



1. A spring-action chair comprising a seat frame having left and right sides, and left and right spring-action support means secured to the left and right sides of the seat frame for elevating the seat frame above the ground, each support means comprising an elongated, continuous one-piece support member of a configuration having sections which include a first angular section terminating at the ground and extending upwardly and rearwardly from a first ground engaging end along a first angle, the support member then having a first reversed bend and an elevated intermediate section extending forwardly therefrom adjacent the seat frame to a second reversed bend, with the support member then having a second angular section extending downwardly and rearwardly at a second angle and terminating at the ground at a second ground engaging end spaced longitudinally from and being unconnected at ground level to the first ground engaging end, the first and second angular sections bypassing one another with a lateral spacing between them normally being maintained to avoid contact between them, so that the left and right spring-action support means, when secured to the sides the seat frame, can act in unison as elongated spring members for transmitting a rocking motion to the seat frame when pressure is applied from the seat frame toward the support members.

5,112,108

SEATING FURNITURE

Otto Zapf, Herzog-Adolph-Str. 5, W-6420 Königstein, Fed. Rep. of Germany

Filed Jul. 9, 1991, Ser. No. 727,537

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1990, 9010340[U]

Int. Cl.[5] A47C *1/024*

U.S. Cl. 297—291 **3 Claims**

1. In a seating furniture including

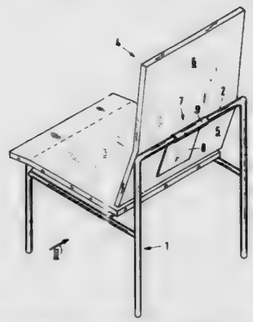
a frame having a backrest mounting portion;

a seat disposed on said frame;

a backrest disposed adjacent said backrest mounting portion; said backrest including upper and lower backrest parts extending respectively above and below said backrest mounting portion; and

connecting means for attaching said backrest to said backrest mounting portion;

the improvement wherein said connecting means comprises a leaf spring secured to said backrest mounting portion and said backrest; said leaf spring positioning said backrest in a predetermined angular orientation and resiliently



resisting an angular displacement of said backrest from said predetermined angular orientation; said leaf spring being formed of a curved connecting portion attached to said backrest mounting portion and a flat, planar main body portion lying substantially in its entirety on said lower backrest part in a face-to-face engagement therewith.

5,112,109

SLIDING SEAT BOTTOM INTERCONNECTED WITH BACK HAVING HINGED UPPER AND LOWER SEAT BACKS

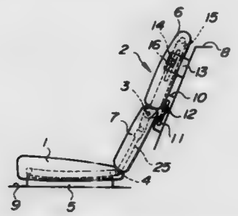
Naoyuki Takada, Kanagawa, and Hironobu Murakami, Kanagawa, both of Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Dec. 15, 1989, Ser. No. 451,174

Claims priority, application Japan, Dec. 28, 1988, 63-168384[U]

Int. Cl.[5] A47C *1/00*

U.S. Cl. 297—343 **11 Claims**



1. A vehicular seat comprising:

a set cushion which is adjustable in position forward and rearward of a vehicle;

a seat back, including upper and lower seat backs, said upper seat back being located above said lower seat back;

means for hingedly connect said lower seat back with said seat cushion;

means defining a first guide opening extending generally vertically of the vehicle, said first guide opening means including a bracket fixed to a back panel of a vehicle body, said bracket being formed with said first guide opening;

means for allowing an upper end section of said lower seat back to slidingly move along said first guide opening when said seat cushion moves forward and rearward of the vehicle, said lower seat back upper end section allowing means including a rigid member securely connected with an upper end section of a frame of said lower seat back and extending backward, and a pin fixed to a free end section of said rigid member, said pin being slidably engaged with said first guide opening; and

means for hingedly connecting the upper end section of said lower seat back with a lower end section of said upper seat back.

5,112,110

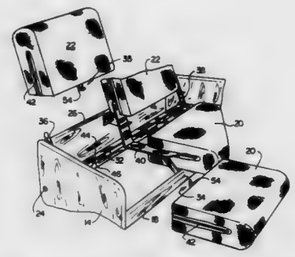
SEATING UNIT HAVING LOCKABLE CUSHIONS

Landon E. Perkins, Martinsville, Va., assignor to Ladd Furniture, High Point, N.C.

Filed Oct. 29, 1990, Ser. No. 606,436

Int. Cl.[5] A47C *4/02*

U.S. Cl. 297—440 **23 Claims**



1. A seating unit, said seating unit comprising:

(a) a frame having vertically disposed ends;

(b) at least one removable seat cushion and back cushion;

(c) means associated with said frame and said cushions for receiving and positioning said cushions in a seating arrangement; and

(d) locking means associated with said frame for engagement with said cushions, thereby preventing the unauthorized removal of said cushions, said locking means including:

(i) an elongated bar movably attached between the vertically disposed ends of said frame and aligned substantially parallel to the rear surface of said cushions and perpendicular to said positioning means, said bar being movable between first and second positins; and

(ii) attachment means in the form of apertures in said bar adapted for engagement with complimentary means on both of said cushions in said first position and for disengagement with said complimentry means cushions in said second position.

5,112,111

APPARATUS AND METHOD FOR CONTINUOUS MINING

Larry C. Addington; Robert R. Addington; Larry M. Addington, all of Catlettsburg; Albert E. Lynch, Flatwoods, all of Ky.; John Susia, Charleston, W. Va.; David L. Conley, Ashland, Ky.; John J. Sartaine, Russell, Ky., and David E. Price, Solder, Ky., assignors to Addington Resources, Inc., Ashland, Ky.

Filed Dec. 10, 1990, Ser. No. 625,211

Int. Cl.[5] F21C *29/00, 35/20*

U.S. Cl. 299—18 **30 Claims**

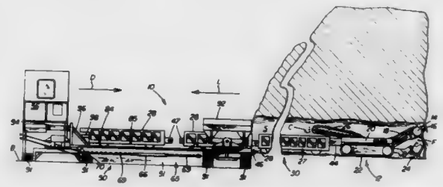
17. A method of continuously mining aggregate material from a seam utilizing a mining means and conveying means, comprising the steps of:

cutting aggregate material from said seam;

conveying said aggregate material cut from said seam to a recovery location;

advancing said mining mans and conveying means into said

seam by pulling said conveying means at a forward end and pushing said conveying means at a rearward end; and



extending said conveying means without interrupting conveying of aggregate material.

5,112,112

CENTER HUB CAP FOR VEHICLE WHEELS

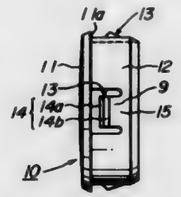
Yuko Baba, Yokohama, Japan, assignor to Hashimoto Forming Industry Co., Ltd., Japan

Continuation of Ser. No. 282,193, Dec. 9, 1988, abandoned. This application Apr. 16, 1991, Ser. No. 686,295

Claims priority, application Japan, Dec. 26, 1987, 62-1987391[U]

Int. Cl.[5] B60B *7/08*

U.S. Cl. 301—108 A **10 Claims**



1. A center hub cap for vehicle wheels, comprising a generally disc-like main body composed of a resilient thermoplastic synthetic resin material, said main body having a rear surface which is provided with an integral annular wall projecting axially rearwardly from said rear surface to terminate in an open rear end, said annular wall being flexible in relation to said main body; a plurality of hook-like projections formed integrally with said annular wall and adapted to engage with the periphery of a center hole of a wheel upon which the hub cap is mounted, said hub cap to be aligned with an axle of the vehicle, said annular wall having an outer peripheral surface, and a plurality of cutout portions for defining said hook-like projections therein, each projection having a free end in the form of a stepped portion which projects radially outwardly beyond said outer peripheral surface of the annular wall and a root end portion connected to said free end portion by an arm, said hook-like projections being integrally connected to said annular wall solely at said root end portion, said free end being separated from said cutout portions of said annular wall and said rear surface of said disc-like main body, said arm and said free end portion being in the form of a resilient cantilever, said arm lying generally in the same curve as said annular wall, the length of said resilient cantilever permitting a reduced deflection per unit length due to an increased effective length of the hook-like projections to reduce the bending moment, said hook-like projections being arranged between said rear surface of the main body said open rear end of the annular wall said annular wall being formed with a pair of slits which are circumferentially spaced from each other on both sides of each projection, and which extend axially forwardly from said rear end of the annular wall toward said main body.

5,112,113

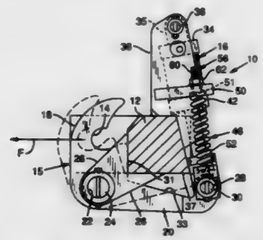
TOW HOOK ACTIVATED BRAKE RELEASE METHOD AND APPARATUS

Edwin R. Wagner, Eagle Creek, and Allen P. Forsyth, Portland, both of Oreg., assignors to Atlas Copco Construction & Mining Technique, Sweden

Filed Apr. 24, 1991, Ser. No. 692,442

Int. Cl.[5] B60T *13/22*

U.S. Cl. 303—71 **17 Claims**



1. A brake release apparatus for a vehicle equipped with spring-applied selectively-applied-force-released vehicle brake, the apparatus comprising:

a towing connection for the vehicle; and

brake release means operably connected to the towing connection,

said brake release means being operable to release said vehicle brake in response to application of a connection force to the towing connection, such that the vehicle may be towed without brake resistance when the vehicle is disabled.

5,112,114

ANTI-SPIN HYDRAULIC BRAKE SYSTEM

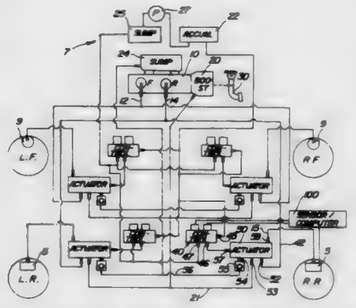
James A. Cogswell, II, Clarkston, and James L. Coulter, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1990, Ser. No. 509,641

The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.

Int. Cl.[5] B60T *13/08*

U.S. Cl. 303—113 TR **4 Claims**



1. A traction control system for a vehicle having a plurality of powered wheels, with at least two of said wheels having fluid actuated brakes, said system also having a master cylinder responsive to the command of a vehicle operator to supply brake fluid of a first viscosity to said wheel brakes, said traction control system in combination comprising:

a first mechanical closed hydraulic system for selectively supplying pressurized brake fluid to a respective wheel brake or withdrawing brake fluid from said respective

wheel brake independent of said master cylinder, said first mechanical closed hydraulic system including a displacement piston slidably mounted within a piston body housing;

sensing means to determine the rotational displacement of said respective wheel and means to compare said wheel rotational displacement with the displacement of said vehicle and to generate a signal in response thereof;

a first control valve means fluidly connected with said piston body housing, said first control valve means governing fluid communication of a hydraulic control fluid of a second viscosity differing from said first viscosity to said piston body housing, said hydraulic control fluid being fluidly separated from said brake fluid by said displacement piston, said first control valve means being fluidly isolated from said wheel brake and said first control valve means being normally closed, said first control valve providing for modulated fluid communication between said first mechanical hydraulic system and said wheel brake in response to said signal from said sensing means;

isolating valve means, normally opened allowing fluid communication between said respective wheel brake and said master cylinder to allow operator actuation of said wheel brake, said isolating valve means in a closed position preventing fluid communication between said wheel brake and said master cylinder when said first mechanical hydraulic system is in communication with said wheel brake;

hydraulic means to latch said isolation valve means to said closed position when said first mechanical hydraulic system is supplying or withdrawing brake fluid from said brake cylinder; and

hydraulically-actuated means to override said first control valve means to return said isolating valve means to said open position whereby said operator can again control said wheel brakes.

5,112,115

ANTI-SKID BRAKE CONTROL SYSTEM

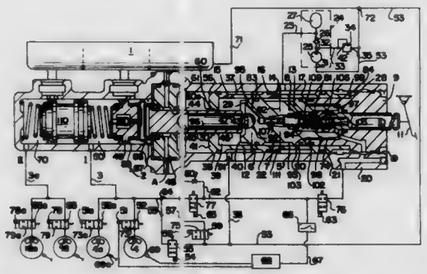
Karl-Heinz Willmann, Freiberg/N; Dietmar Rischen, Korntal-Muenchingen, and Wolf-Dieter Jonner, Beilstein Schmidhausen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 31, 1990, Ser. No. 606,263

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1989, 3936851

Int. Cl.[5] B60T *8/32*

U.S. Cl. 303—114 R **19 Claims**



1. An anti-skid control system for vehicles, with anti-skid controlled wheels, each wheel having a wheel brake control means that is supplied with bake pressure from a multi-circuit master cylinder (2) via at least one brake line (3, 3*a*), at least one valve assembly located in the at least one brake line and connected with at least one of the wheel brake control means of the anti-skid-controlled wheels, said at least one valve assembly assumes switching positions for at least pressure buildup and pressure reduction at least one wheel brake cylinder in the anti-skid control situation, said master cylinder including a pair of tubular members having smooth surfaces, at least one servo piston (7) including a follower valve assembly (8) operable in a cup-shaped restoring piston (12) in at least one of said tubular members, said at least one servo piston being displaceably supported in a slide chamber (93) which defines a pilot pressure chamber (74) that is pressure relieved toward a pressure fluid tank (1) by means of the follower valve assembly and is connected to a pressure fluid source (24) via a pressure line (23), an intermediate chamber (39) bordering the servo piston and located in the slide chamber (93), said cup-shaped restoring piston (12) is operative with the servo piston (7) supported in an adjusting chamber (56), said cup-shaped restoring piston is acted upon with pressure fluid counter to a brake applying operative direction of the servo piston in the anti-skid control situation, for case-by-case limitation of a displacement path of the servo piston in a brake applying direction of the multi-circuit master cylinder as well as for displacement of the at least one servo piston toward an outset position in which the slide chamber (93) is formed inside the cup-shaped restoring piston (12), said cup-shaped restoring piston (12) is embodied with a cylnder wall (6) and a bottom (41), and that said cylinder wall (6) guidingly encompasses the servo piston (7) and in turn said cup-shaped restoring piston is dispaceably supported in a guide bore (19).

5,112,116

ANTI-LOCK BRAKING SYSTEM WITH ELECTROMAGNETIC BRAKE

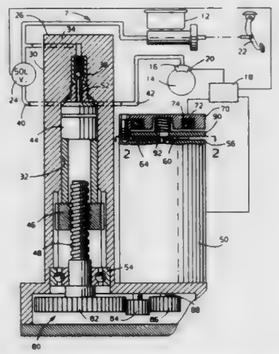
Naila Mikhaeil-Boules, Troy; Robert J. Hammersmith, Rochester Hills; Kevin G. Leppek, Troy, all of Mich.; Paul D. Wilkey, Vandalia; Thomas H. Gardner, Englewood, both of Ohio; Dennis J. Ricker, Huber Heights, and James J. Kowalik, West Carrollton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 352,971, May 17, 1989, Pat. No. 5,000,523. This application Mar. 14, 1991, Ser. No. 669,144

The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.

Int. Cl.[5] B60T *8/42*

U.S. Cl. 303—115 EC **11 Claims**



1. A vehicle wheel anti-lock braking system (ABS) comprising;

master cylinder means for supplying pressurized fluid;

a wheel brake receiving pressurized fluid from said master cylinder means and for restraining rotational movement of said wheel;

an ABS controller cognizant of the rotational condition of said wheel and providing a signal when said wheel condition is within preset parameters;

an actuator frame having a longitudinal bore with first means of fluid communication with said wheel brake;

check valve means to allow fluid communication between said master cylinder means and said wheel brake when the pressure in said wheel brake is lower than the pressure within said master cylinder means via said longitudinal bore;

a piston slidably sealably mounted within said longitudinal bore for providing a variable control volume in communication with said wheel cylinder and thereby modulating the pressure therein;

means to reciprocally move said piston;

a reversible motor torsionally connected with said means to reciprocally move said piston, said motor having a rotor with a connected disc;

a friction surface for engagement with said disc to restrain rotation of said rotor to lock the position of said piston;

a plunger biased into a position to urge said friction surface into engagement with said disc; and

an electromagnetic core responsive to a signal by said controller to move said plunger to a position allowing removal of engagement between said friction surface and said disc allowing rotation of said motor and movement of said piston.

5,112,117

VEHICLE BRAKE SYSTEM WITH ANTI-SKID APPARATUS

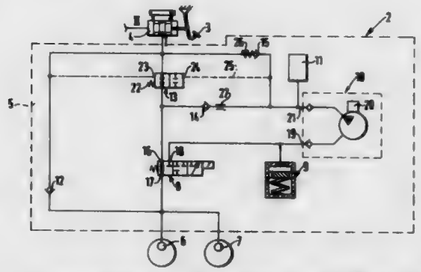
Rainer Altmann, Erligheim; Rainer Lauer, Muenchingen; Guenther Schmidt, Tamm-Hohenstange; Kasimir Stromski, Filderstadt; Anton van Zanten, Ditzingen-Schoeckingen; Harald Heilmann, Ludwigsburg; Karl Veil, Uhingen; Hans-Joerg Fees, Bietigheim-Bissingen; Wolf-Dieter Jonner, Beilstein Schmidhausen, and Reinhard Gutzeit, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 7, 1991, Ser. No. 651,821

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1990, 4004315

Int. Cl.[5] B60T *8/58, 13/68*

U.S. Cl. 303—116 R **14 Claims**



1. A vehicle brake system comprising a master brake cylinder embodying a first brake pressure source, at least one wheel brake suppliable from the master brake cylinder, at least one anti-skid apparatus including an anti-skid valve assembly (8, 8*a*) between the master brake cylinder and the wheel brake, a return pump (10) with an inlet and an outlet serving as a second brake pressure source, a first pressure fluid holder (9) communicating with the inlet of the return pump for holding pressure fluid from the wheel brake through the anti-skid valve assembly, a fillable second pressure fluid holder (11) embodied as a hollow chamber defined by a substantially rigid wall connected to the outlet of the return pump, a throttle (27) disposed downstream of the second pressure fluid holder (11) in a direction toward the anti-skid valve assembly (8, 8*a*), a brake pressure source selection valve (13) and a return pump pressure drop protection valve (15, 15*a*) which is operative between the outlet of the return pump and the master brake cylinder, the brake pressure source selection valve (13) is embodied as a hydraulically controllable 2/2-way valve disposed between the first brake pressure source (4) and the anti-skid valve assembly (8, 8*a*), having at least one opening spring (22) and a first control inlet (23) and a second control inlet (24) and having a check valve (14) that is openable in the direction of the anti-skid valve assembly (8, 8*a*) by a pressure drop, said check valve (14) is located downstream of the second brake pressure source; said first control inlet (23) of the 2/2-way valve communicates permanently with the first brake pressure source (4) and the second control inlet (24) communicates permanently with the second brake pressure source 910, 11); and the 2/2-way valve (13) is embodied such that it assumes its closing position when the pressure in the second control inlet (24) is higher, by a preselected variable, than the pressure in the first control inlet (23).

5,112,118

COUNTER WITH PIVOTABLE FRONT PANEL

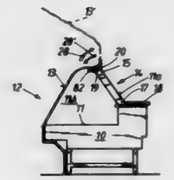
Franz Wiehle, Iserlohn, Fed. Rep. of Germany, assignor to Gerd und Bernd Vieler KG, Iserlohn, Fed. Rep. of Germany

Filed Aug. 28, 1990, Ser. No. 574,298

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1989, 3929218; Jan. 16, 1990, 4000975; Feb. 16, 1990, 4004796

Int. Cl.[5] E05F *11/24*

U.S. Cl. 312—116 **42 Claims**



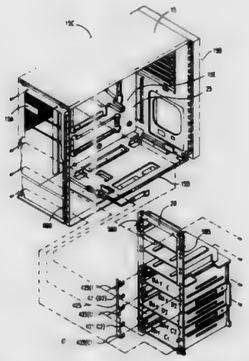
1. A counter, particularly an article of furniture for temporary storage, cooling and simultaneous displaying of commodities in supermarkets and other establishments, comprising a case having a front side which is faced by customers in an establishment and a rear side opposite said front side, said case including a hollow upper portion comprising a plurality of spaced apart hollow supports disposed at said rear side and each having an upper end and a lower end; at least one front panel; hinges provided at said upper ends and articulately connecting said at least one panel to said supports for movement about a fixed substantially horizontal axis between a first position in which said at least one panel overlies said front side and a second position in which said panel affords access into said hollow upper portion at said front side; and means for moving said panel between said first and second positions, including a linear actuator in at least one of said supports, said actuator comprising a first member, means for articulately coupling said first member to the lower end of said at least one support, a second member movable with respect to said first member, a motor operable to move said second member relative to said first member, and means for articulately connecting said second member to the hinge at the upper end of said at least one support so that the hinge at the upper end of said at least one support moves said panel between said first and second positions exclusively in response to motor-induced movement of said second member relative to said first member, said connecting means being spaced apart from said coupling means.

5,112,119

SUPPORT STRUCTURE FOR DEVICES IN A COMPUTER APPARATUS

Kevin K. Cooke, Delray Beach, and John R. Dewitt, Boca Raton, both of Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 27, 1989, Ser. No. 428,099
Int. Cl.[5] H05K *5/00*
U.S. Cl. 312—283 **18 Claims**



1. A personal computer enclosure comprising:
a substantially parallelepiped outer box including an interior defined by a front member, a back member that opposes and is substantially parallel with respect to said front member, a top member, a bottom member and a side member that are all substantially perpendicular with respect to said front member, and an open side, opposing said side member, for receiving an inner support structure, wherein said front member includes an opening for providing access to the interior of said box, said box including a plurality of means for mounting the inner support structure on the interior of said box onto said front member and at least one of the members that is substantially perpendicular with respect to said front member; and
an inner support structure situated within said outer box and including a plurality of bays for receiving respective disk drives therein, the bays of said structure communicating with said opening, said structure being attached to said outer box via said means for mounting onto said front member and at least one of the members that is substantially perpendicular with respect to said front member to provide structural integrity thereto.

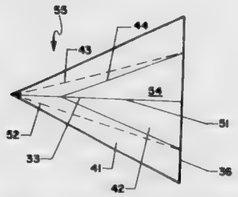
5,112,120

NATURAL FLOW WING

Richard M. Wood, Virginia Beach, and Steven X. S. Bauer, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 31, 1990, Ser. No. 560,923
Int. Cl.[5] B64C *3/14*
U.S. Cl. 244—35 R **17 Claims**

1. A natural flow wing for providing improved drag and lift performance comprising:
an upper surface and a lower surface, each surface extending in a streamwise and in a spanwise direction and being three-dimensional;
the upper surface having an outboard region of pressure below freestream static pressure and an inboard region of pressure higher than the outboard region, with a line of recompression emanating from an apex of the wing and extending toward a trailing edge, the line of recompression marking a boarder between the outboard region and the inboard region;
the upper surface further having a first line of maximum thickness extending from a root of the wing to the trailing edge, the first line of maximum thickness marking a border between a first forward-sloping surface, the first line of maximum thickness being located near the line of recompression;
the inboard region providing a small first forward-sloping surface area ahead of the first line of maximum thickness and a large first rearward-sloping surface area behind the first line of maximum thickness;



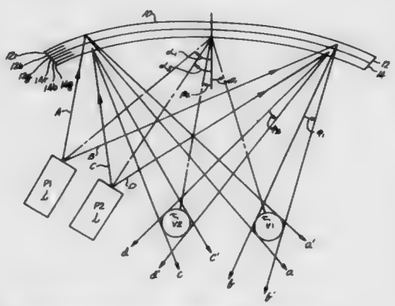
the outboard region providing a large first forward-sloping surface area ahead of the first line of maximum thickness and a small first rearward-sloping surface behind the first line of maximum thickness;
the lower surface having a second line of maximum thickness extending from the root of the wing toward the trailing edge; and
the lower surface further providing a small second forward-sloping surface area ahead of the second line of maximum thickness and a larger second rearward-sloping surface behind the second line of maximum thickness.

5,112,121

DISPLAY SYSTEM FOR MULTIVIEWER TRAINING SIMULATORS

David B. Chang, 14212 Livingston St., Tustin, Calif. 92680; Norton L. Moise, 1674 Palisades Dr., Pacific Palisades, Calif. 90272, and I-Fu Shih, 3351 St. Albans Dr., Los Alamitos, Calif. 90720

Filed Mar. 21, 1989, Ser. No. 326,712
Int. Cl.[5] G03H *1/28*
U.S. Cl. 359—15 **4 Claims**



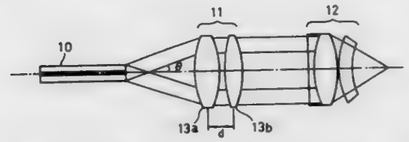
3. A flight simulator optical system comprising:
a pilot's position;
a co-pilot's position;
a screen having multiple holographic optical elements with first and second superimposed holographic elements;
a first projector reflecting light from each of the first holographic elements to the pilot's position; and
a second projector reflecting light from each of the second holographic elements to the co-pilot's position.

5,112,122

FIBER-TYPE LIGHT CONVERSION DEVICE

Kiyofumi Chikuma, and Sota Okamoto, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 5, 1990, Ser. No. 577,751
Claims priority, application Japan, Sep. 7, 1989, 1-232099
Int. Cl.[5] G02F *1/37*
U.S. Cl. 359—332 **4 Claims**



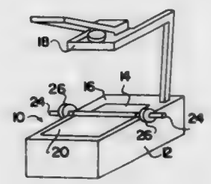
1. A fiber-type light conversion device comprising:
a fiber-type light conversion element having a core made of non-linear optical crystal for changing the wavelength of an incident light by means of non-linear optical effect; and
a collimating optical system for transforming an emergent light beam emitted from said light conversion element into a parallel light beam, wherein said collimating optical system has lenses having a large spherical aberration.

5,112,123

MASKING DEVICE FOR OVERHEAD PROJECTOR

Robert Fagan, deceased, late of Bethesda, and by Ellen Fagan, personal administrator, 7829 Fulbright Ct., Bethesda, Md. 20817

Filed May 24, 1991, Ser. No. 705,357
Int. Cl.[5] G03B *21/54*
U.S. Cl. 353—97 **3 Claims**



1. A masking device for overhead projectors comprising: an opaque flexible sheet means that has sufficient surface area to cover all imprinted material on transparent sheets positioned on said overhead projector for projection of said imprinted material, one side of said opaque flexible sheet means attached to said overhead projector so said opaque flexible sheet means can be positioned over said transparent sheet to prevent projection of said imprinted material; and a spool means with a side of said opaque flexible sheet means opposite said side attached to said overhead projector being attached to a rod of said spool means.

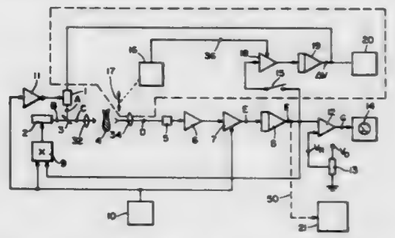
5,112,124

METHOD AND APPARATUS FOR MEASURING THE CONCENTRATION OF ABSORBING SUBSTANCES

Hannu Harjunmaa, Vessy, Switzerland; Robert A. Peura, Princeton, and Yitzhak Mendelson, Worcester, both of Mass., assignors to Worcester Polytechnic Institute, Worcester, Mass.

Filed Apr. 19, 1990, Ser. No. 511,341
Int. Cl.[5] G01N *21/59, 33/49*
U.S. Cl. 356—39 **18 Claims**

1. A method for non-invasive in vivo determining and measuring in a living body matrix the concentration of an analyte which absorbs electromagnetic radiation of wavelength λ_1, this method comprising the steps of:
a) generating said radiation of wavelength λ_1 and another wavelength of electromagnetic radiation λ_2 at which the absorption coefficient of the analyte is different from the one at λ_1, and wherein the extinction coefficient of the matrix is the same at λ_1 and at λ_2;
b) combining said radiations into a probing beam which alternates in time at wavelengths λ_1 and λ_2, the intensity of the beam being controllable in at least one of the wavelength durations, and directing this beam, from a location outside the body, at the body to produce an incident beam;
c) detecting the incident beam after it has traversed a path in the body and exited the body and producing an alternating



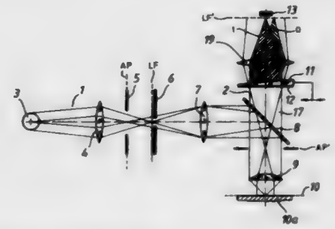
signal corresponding to the difference between the intensities of the two wavelength radiations in the incident beam and wherein the alternating signal is nulled when substantially no analyte, or minimal analyte, is present in the sample;
d) generating an intensity control signal from the said alternating signal;
e) using the said intensity control signal to control the intensity of one of the two wavelength radiations of the probing beam to reduce the alternating signal substantially to zero;
f) using the value of the intensity control signal needed to restore the alternating signal substantially to zero as a measure of the concentration of the analyte in the matrix.

5,112,125

SPECTRAL MICROSCOPE WITH A PHOTOMETER

Burkhard Neumann, Wetzlar, Fed. Rep. of Germany, assignor to Wild Leitz, GmbH, Wetzlar, Fed. Rep. of Germany

PCT No. PCT/DE89/00772, § 371 Date Aug. 24, 1990, § 102(e) Date Aug. 24, 1990, PCT Pub. No. WO90/07723, PCT Pub. Date Jul. 12, 1990
PCT Filed Dec. 14, 1989, Ser. No. 566,385
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843876
Int. Cl.[5] G01J *3/18, 3/36*
U.S. Cl. 356—73 **26 Claims**



1. A microscope comprising:
a photometer for measuring an intensity distribution of light in an object plane; and

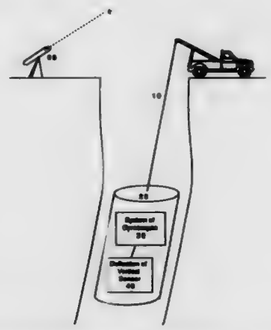
a grating monochromator for measuring a spectral composition of light coming from an object, wherein an optical slit for measuring a surface of the object is located in a plane conjugated relative to the object plane, and wherein a combined observation-measuring beam path of the microscope includes an infinite beam path where an optical transmission grating is located, a slit image of the object being passed through the transmission grating and wherein diffraction patterns of zero order and first order diffraction are reproduced on at least one subsequent optical planar sensor.

5,112,126

APPARATUSES AND METHODS FOR MAKING GEOPHYSICAL MEASUREMENTS USEFUL IN DETERMINING THE DEFLECTION OF THE VERTICAL

Peter Graebner, Santa Ana, Calif., assignor to Chevron Research & Technology Company, San Francisco, Calif.

Filed Jul. 27, 1990, Ser. No. 558,931
Int. Cl.[5] G01B *11/26*; G01C *1/00*; E21B *47/022*
U.S. Cl. 356—152 **10 Claims**



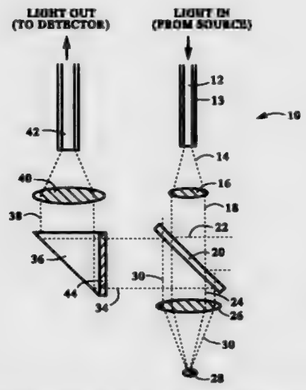
1. A non-magnetic apparatus comprising:
(a) means for finding an instrument spatial angle between a reference direction and an instrument characterization direction, wherein the means for finding said instrument spatial angle comprises a gyroscope, and
(b) means for finding a deflection spatial angle between said instrument characterization direction and a direction along a plumb line, wherein the means for finding a deflection spatial angle is attached to the means for finding an instrument spatial angle.

5,112,127

APPARATUS FOR MEASURING RAMAN SPECTRA OVER OPTICAL FIBERS

Michael M. Carrabba, Franklin, and R. David Rauh, Newton, both of Mass., assignors to EIC Laboratories, Inc., Norwood, Mass.

Filed Nov. 28, 1989, Ser. No. 442,235
Int. Cl.[5] G01J *3/44*
U.S. Cl. 356—301 **13 Claims**



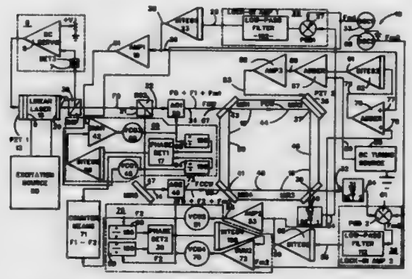
1. An optical probe useful for conducting Raman spectroscopy remotely over optical fibers with minimal interference from Raman scattering and or luminescence within said fibers comprising
a first optical fiber transmissive at the wavelength used for Raman excitation for transmitting the Raman excitation light to the sample
a probe head assembly of optical elements said assembly having the functions of delivering light from the end of said first optical fiber to the sample, of collecting Raman scattered light from the sample and of focusing said Raman scattering light into a second optical fiber
said second optical fiber transmitting said Raman scattering light to a detector means for measuring the intensity and or spectral distribution of said Raman scattered light
said probe head optical assembly also having the geometric configuration such that the input and output fibers are colinear and are connected to the proximal end of the probe and the sample is illuminated from the distal end of the probe head wherein
said probe head assembly comprising
a first lens or lens assembly spaced from the exit of said first optical fiber for collimating the light exiting said first optical fiber, followed in the optical path by
a primary optical filter that is tuned to pass said Raman excitation wavelengths, but that is rejecting of light of other wavelengths generated within said first optical fiber by said excitation light
said primary optical filter being arranged at approximately 45° with respect to the light path, followed in the optical path by
a second lens or lens assembly for focusing the light
said second lens or lens assembly directing the Raman excitation light onto the sample
the scattered light from the sample being collected and collimated by the same second lens or lens assembly used for focusing the exciting light
said collimated scattered light impinging onto the back face of said angled primary optical filter
said primary filter admitting light of said Raman excitation wavelengths while reflecting the remaining light at approximately 90°, said remaining light containing the desired Raman spectrum, followed in the optical path by
a second reflecting element inserted at approximately 45° with respect to the light path
said second reflecting element reflecting the light at approximately 90° thus returning the light on a path approximately parallel, but in reverse direction to the input light, said second reflecting element being followed in the optical path by
a third lens or lens assembly for focusing said reflected light into the end aperture of said second optical fiber or fiber bundle, approximately parallel to said first optical fiber or fiber bundle and transmissive at the wavelengths of the Raman scattered light
said second optical fiber transmitting said Raman scattering light to a detector means for measuring the intensity and or spectral distribution of said Raman scattered light.

5,112,128

SOURCED LOCKED FREQUENCY MODULATED DUAL SERVO PRLG

Kie L. SooHoo; James H. Doty, both of Anaheim, and Paul H. Ito, Los Angeles, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 77,134, Jul. 23, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 281,422
Int. Cl.[5] G01C *19/64*
U.S. Cl. 356—350 **18 Claims**



1. A balanced dual servo passive ring resonator gyroscope having enhanced stability and sensitivity comprising:
a first and second fixed frequency reference signal generator to provide respective first and second reference signals, each reference signal having a fixed reference frequency (Fm1, Fm2);
a single piece body having laser and passive resonator cavities, said passive resonator cavity being a passive high Q evacuated cavity;
a laser means having a power source, using said laser resonator cavity for providing first and second single frequency rays (F0).
a first voltage controlled oscillator means responsive to said first single frequency ray, to a first control signal and to said first reference signal (Fm1) for frequency shifting the center frequency of said first single frequency ray by a first variable offset frequency signal (F1+Fm1) to supply a propagating light ray (FCW); for coupling said propagating light ray into said passive resonator cavity to form a propagating light beam; and for outputting a first offset signal (F1);
a second voltage controlled oscillator means responsive to said second single frequency ray, to a second control signal, and to said second reference signal (Fm2) for frequency shifting the center frequency of said second single frequency ray by a second variable offset frequency signal (F2+Fm2) to supply a counterpropagating light ray (FCCW) and for coupling said counterpropagating light ray into said passive resonator cavity to form a counterpropagating light beam; and for outputting a second offset signal (F2);
a detector means optically coupled to sample said propagating light beam (FCW) for detecting a first offset frequency error signal at said first reference signal frequency (Fm1) and to provide a first offset frequency error signal, said detector means also being optically coupled to sample said counterpropagating light beam (FCCW) for detecting a second offset frequency error signal at said second reference signal frequency (Fm2) to provide a second offset frequency error signal;
cavity servo means responsive to said first and second reference signals Fm1, Fm2 and to said respective first and second offset frequency error signals from said detector means for providing
said first control signal to said first voltage controlled oscillator means for shifting the frequency of said propagating light ray by a first variable offset frequency (F1+Fm1) to control and maintain said propagating light beam (FCW) in said passive resonator at peak resonance and for providing
said second control signal to said second voltage controlled oscillator means for shifting the frequency of said counterpropagating light ray by a second variable offset frequency (F2+Fm1) to control and maintain said counterpropagating light beam (FCCW) in said passive cavity at peak resonance;
single frequency light locking means responsive to said first and second control signals for balancing said first and second control signals;
output counter means for measuring and outputting the frequency difference between said first offset frequency (F1) and said second offset frequency (F2), the measured frequency difference representing the difference in frequency due to an input gyro body rate.

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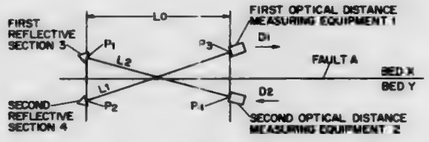
METHOD OF IMAGE ENHANCEMENT FOR THE COHERENCE PROBE MICROSCOPE WITH APPLICATIONS TO INTEGRATED CIRCUIT METROLOGY

Mark Davidson, Palo Alto, Calif.; Kalman Kaufman, and Isaac Mazor, both of Haifa, Israel, assignors to KLA Instruments Corporation, San Jose, Calif.

Filed Mar. 2, 1990, Ser. No. 488,583
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—359 **14 Claims**

1. A method of inspecting an object and generating synthetic image data comprising the steps of:
(a) using an interference optical system including an object channel and a reference channel for simultaneously inspecting an object and a reflective reference surface and developing a plurality of images formed by the interference between object wave energy passing from said object and through said object channel to an image plane and reference wave energy passing from said reference surface and through said reference channel to said image plane, each said image being formed in response to a change in position of either said object or said reference surface;
(b) modifying each of the plurality of images by adding the intensity from a fixed selected point of the images to all the other points with a weighting factor to produce a modified plurality of images;
(c) determining for each modified image the absolute value of the coherence between said object wave energy and said reference wave energy; and
(d) using said absolute value coherence data to generate synthetic image data representative of a particular characteristic of said object, wherein the brightness of each pixel element of a synthetic image developed using said synthetic image data is proportional to said absolute value coherence data.

5,112,130
APPARATUS AND METHOD FOR MEASURING RELATIVE DISPLACEMENT OF OBJECTS
Nobuo Izawa, Tokyo, Japan, assignor to Kabushiki Kaisha Topcon, Tokyo, Japan
Filed Oct. 16, 1989, Ser. No. 422,114
Claims priority, application Japan, Oct. 18, 1988, 63-262401
Int. Cl.[5] G01B *11/14*; G01D *9/00*
U.S. Cl. 356—373 **7 Claims**



4. A method for measuring relative displacement between first and second objects along a common plane separating the objects comprising the steps of:

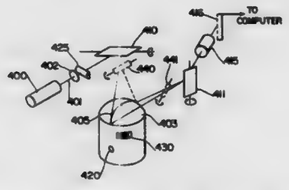
simultaneously optically measuring a first distance between a first point on said first object located near said separation plane and a second point on said second object located near said separation plane at a predetermined distance along said separation plane from said first point, and a second distance between a third point on said second object located near said separation plane opposite said first point and a fourth point on one or the other of said first and second objects located said predetermined distance along said separation plane from said first and third points, and

calculating the difference between said measured first and second distances to obtain a measure of the relative displacement, if any, of said first and second objects along said separation plane.

5,112,132

Patent Not Issued For This Number

5,112,131
CONTROLLED MACHINING OF COMBUSTION CHAMBERS, GEARS AND OTHER SURFACES
Timothy R. Pryor, Windsor, Canada, assignor to Diffracto, Ltd., Canada
Continuation of Ser. No. 42,527, Apr. 27, 1987, Pat. No. 5,012,574, which is a continuation of Ser. No. 767,374, Aug. 20, 1985, abandoned, which is a continuation of Ser. No. 560,259, Dec. 12, 1983, Pat. No. 4,559,684, which is a continuation of Ser. No. 238,702, Feb. 21, 1981, abandoned. This application Apr. 16, 1990, Ser. No. 509,295
Int. Cl.[5] G01B *11/24*
U.S. Cl. 356—376 **4 Claims**



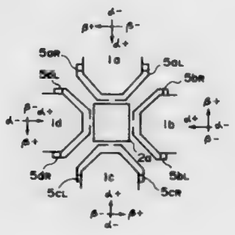
1. A method for determining surface locations along a line comprising the steps of:

sequentially illuminating points on said surface with a laser spot scanned by a moving transmitting mirror or optical element having a first axis of rotation which is in a first direction,

imaging said spot on said surface onto a photodetector array with a lens whose axis is moved in space by a moving receiving mirror or optical element having an second axis of rotation which is in a second direction that is not parallel to said first direction so as to approximately track said spot scanned by said first mirror,

determining the spot position on said detector array and, from said spot position, determining said surface location.

5,112,133
ALIGNMENT SYSTEM
Hiroshi Kurosawa, Atsugi; Koji Uda, Yokohama; Kunitaka Ozawa, Isehara; Shunichi Uzawa, Tokyo; Ryuichi Ebinuma, Kawasaki, and Takao Kariya, Hino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 572,623, Aug. 27, 1990, abandoned. This application Oct. 1, 1991, Ser. No. 769,495
Claims priority, application Japan, Aug. 30, 1989, 1-221540
Int. Cl.[5] G01B *11/00*
U.S. Cl. 356—401 **11 Claims**



1. An alignment system usable in an exposure apparatus for printing a pattern of a mask on a wafer, for aligning the mask and the wafer, said system comprising:

a plurality of position detecting devices;

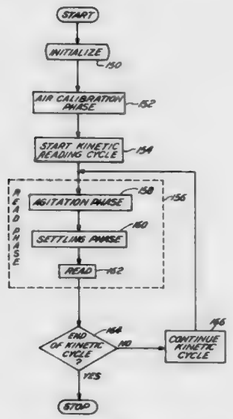
a plurality of driving stages corresponding to said position detecting devices, respectively, each driving stage being adapted to move a corresponding one of said position detecting devices two-dimensionally along a plane which is substantially opposed to the mask:

a plurality of contacts corresponding to said position detecting devices, respectively, each contact being provided at an end portion of a corresponding one of said position detecting devices, along said plane and facing the pattern side;

detecting means for detecting mutual approach of said position detecting devices through at least one of said contacts; and

control means for controlling movement of at least one of said driving stages in accordance with the detection by said detecting means.

5,112,134
SINGLE SOURCE MULTI-SITE PHOTOMETRIC MEASUREMENT SYSTEM
Calvin Y. H. Chow, Portola Valley; Gillian M. Humphries, Los Altos; Viola T. Kung, Menlo Park, and Michael M. Lacy, Ben Lomand, all of Calif., assignors to Molecular Devices Corporation, Menlo Park, Calif.
Continuation of Ser. No. 427,942, Oct. 25, 1989, abandoned, which is a continuation of Ser. No. 901,445, Aug. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 782,635, Sep. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 597,135, Apr. 5, 1984, Pat. No. 4,591,550, which is a continuation-in-part of Ser. No. 585,334, Mar. 1, 1984, abandoned. This application Jan. 8, 1991, Ser. No. 639,313
Int. Cl.[5] G01N *21/31, 21/59*
U.S. Cl. 356—427 **1 Claim**



1. A photometric kinetic measurement device for analyzing samples contained in a plurality of sample sites disposed on a multi-site assay plate, the device comprising:

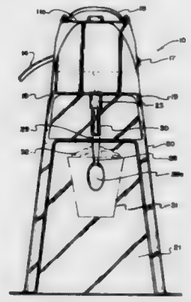
a light source for providing light to one or more of said sample sites;

photodetector means for receiving light transmitted through each of said one or more sample sites and for providing a signal in response to said light received wherein the light vertically passes through the sample;

means for imparting oscillatory movement to said multi-site assay plate for a pre-determined time before each of a series of readings is performed on a sample site in order to agitate the sample therein; and

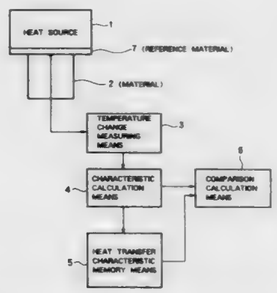
a means for kinetic analysis of the signal of the photodetector means.

5,112,135
MIXER
Carl A. Rupp, 2382 S. Redwood Rd., Salt Lake City, Utah 84119
Filed Jun. 25, 1990, Ser. No. 543,104
Int. Cl.[5] B01F *7/16*
U.S. Cl. 366—197 **5 Claims**



1. A mixer comprising, a housing arranged to admit a cup of material to be mixed; an electric motor arranged in said housing that includes an output shaft; switch means for operating said electric motor; quick release means for releasable mounting a handle end of a spoon to said motor output shaft consisting of a spoon mount that is mounted axially to the end of said output shaft, the opposite spoon mount end slotted longitudinally to receive said spoon handle end that closely fits between opposing faces of said longitudinal slot; and a resilient tube means that is telescoped in close fitting relationship over said spoon mount, the inner surface of said resilient tube means for closely fitting to the handle edges of said spoon so as to provide a friction engagement with said spoon handle edges.

5,112,136
METHOD OF AND APPARATUS FOR MEASURING THERMAL CONDUCTIVITY
Kiyoshi Sakuma, and Masayoshi Kaji, both c/o Nippon Steel Chemical Co., Ltd., 13-16, Ginza 5-chome, Chuo-ku, Tokyo, Japan
Filed Sep. 24, 1990, Ser. No. 587,121
Int. Cl.[5] G01N *25/018*
U.S. Cl. 374—44 **6 Claims**



1. A method of measuring thermal conductivity comprising the steps of:

placing a reference material and a material in contact with each other;

measuring a temperature change at an interface between said material and said reference material of which thermal properties are known, while one end surface of one of the

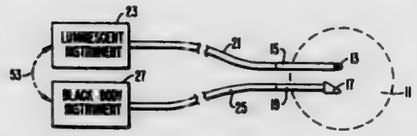
material and the reference material is in contact with a heat source maintained at a predetermined temperature;
obtaining a temperature change characteristic from results of the temperature change;
obtaining the thermal conductivity of the material by comparison of predetermined temperature change characteristics and heat transfer characteristics based on unsteady heat transfer between the heat source, the material and the reference material in consideration of a heat transfer resistance at the interface.

5,112,137

TEMPERATURE MEASUREMENT WITH COMBINED PHOTO-LUMINESCENT AND BLACK BODY SENSING TECHNIQUES

Kenneth A. Wickersheim, Menlo Park, Calif., and Bruce E. Adams, Portland, Oreg., assignors to Luxtron Corporation, Santa Clara, Calif.

Filed Apr. 10, 1991, Ser. No. 683,258
Int. Cl.[5] G01K *11/20*; G01J *5/08*
U.S. Cl. 374—131 **32 Claims**



1. A method of measuring the temperature of a local environment, comprising the steps of:
positioning in thermal communication with said environment a material structure characterized by emitting radiation in the infrared region of the electromagnetic energy spectrum as a first optical signal having an intensity level that is related to the temperature of said structure,
simultaneously positioning in thermal communication with said local environment a quantity of photoluminescent material that is characterized by emitting, when excited with optical radiation, photoluminescent radiation as a second optical signal having an intensity characteristic that is related to the temperature of the photoluminescent material,
exciting the photoluminescent material with optical radiation in a manner to cause it to emit said second optical signal,
establishing a first temperature range for use of said first optical signal and a second temperature range for use of said second optical signal, said first range extending to higher temperatures than said second range and said second range extending to lower temperatures than said first range,
detecting at least one of the first or second optical signals, and
determining the temperature of the local environment from the detected at least one of the first or second signals, whereby the temperature is measurable over all of said first and second ranges.

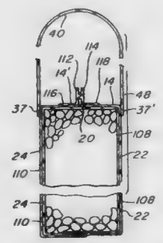
26. A system for measuring temperature over a given range, comprising:
a sensor characterized by emitting first and second optical signals, said first optical signal being related to the temperature of the sensor within an upper portion of said given range and falling within an infrared region of the electromagnetic energy spectrum, said second optical signal being related to the temperature of the sensor within a lower portion of said given range and resulting from a temperature dependent emission of a photoluminescent material in response to excitation by optical radiation,
means receiving said first and second optical signals for generating at least one electrical signal related thereto, and
means receiving said at least one electrical signal for providing a measurement of the temperature of said sensor within said given range.

5,112,138

RESEALABLE REUSABLE FLEXIBLE PLASTIC BAG WITH LOOP HANDLE

Harry R. Peppiatt, Doylestown, Pa., assignor to Paramount Packaging Corporation, Chalfont, Pa.

Continuation of Ser. No. 425,500, Oct. 19, 1989, abandoned, which is a continuation of Ser. No. 140,445, Jan. 4, 1988, abandoned, and a continuation-in-part of Ser. No. 931,298, Nov. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 821,561, Jan. 21, 1986, Pat. No. 4,713,839, which is a continuation-in-part of Ser. No. 388,381, Jun. 14, 1982, Pat. No. 4,573,203, which is a continuation-in-part of Ser. No. 3,110, Jan. 14, 1987, abandoned. This application Jun. 8, 1990, Ser. No. 536,057
The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.
Int. Cl.[5] B65D *30/20, 33/10, 33/16*
U.S. Cl. 383—29 **25 Claims**



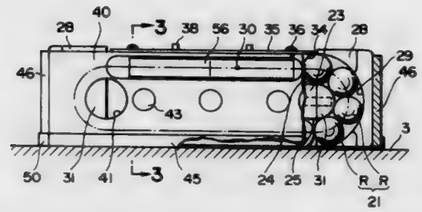
1. A resealable reusable flexible plastic bag comprising:
an outer unitary piece of flexible plastic material including generally rectangular front and rear plastic panels and a gusset connecting said panels at a first end portion of the bag;
an inner unitary piece of flexible plastic material including generally rectangular front and rear panels and a gusset connecting said last-mentioned panels at said first end portion of the bag, ends of said inner and outer unitary pieces of flexible plastic materials opposite said first end of the bag being open to facilitate introducing goods into the bag, the side edges of said gussets and said panels being connected together so that the bag when filled can approximate the shape of a hexahedron with said gusset of said outer piece of flexible plastic material being flattened and closing said first end portion of the bag, at least a portion of said outer unitary piece being frangible so as to facilitate access to the goods in the bag and thereafter permit reuse of the bag;
closure means connected to said outer unitary piece for preventing access to the goods in the bag when said closure means is closed and for facilitating access to the goods in the bag when said closure means is opened; and
a handle defined by a loop of flexible plastic material having two ends connected to said bag adjacent said gusset of said outer piece of flexible plastic material.

5,112,139

ROLLER TYPE LINEAR MOVEMENT GUIDE BEARING

Toru Tsukada, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1991, Ser. No. 675,752
Claims priority, application Japan, Mar. 28, 1990, 32664[U]
Int. Cl.[5] F16K *29/06*
U.S. Cl. 384—15 **2 Claims**



1. In a roller type linear movement guide bearing capable of linear movement in an axial direction along a raceway surface, the linear movement guide bearing including a pair of roller trains each having a plurality of rollers infinitely circulating while rolling in contact with the raceway surface, a main body supporting a load through the roller trains and accommodating the pair of roller trains respectively at both sides of a vertical center wall, the roller trains being guided by side surfaces of the vertical center wall, and end caps respectively attached to axial opposite ends of the main body and having curved paths formed therein for making a U-turn of the roller trains in the end caps, the improvement comprising:
a pair of side protection covers for covering both lateral sides of the main body and both side surfaces of the end caps and for guiding the roller trains;
a pair of end protection covers for covering the axial end surfaces of the end caps;
a first pair of seal members respectively fixed to lower edges of the pair of side protection covers so as to be slidably in contact with the raceway surface; and
a second pair of seal members respectively fixed to lower edges of the pair of end protection covers so as to be slidably in contact with the raceway surface.

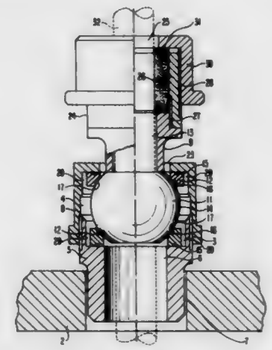
5,112,140

SEAL ASSEMBLY FOR RECIPROCATING MEMBERS

Dmitry Cherny; Nicolai Cherny, and Dimitry Cherny, all of 159 Apsley Rd, Willetton 6155, W.A., Australia

Continuation of Ser. No. 437,830, Nov. 17, 1989, abandoned. This application Jan. 22, 1991, Ser. No. 644,018
Claims priority, application Australia, Nov. 17, 1988, PJ1522
Int. Cl.[5] F16C *29/02*
U.S. Cl. 384—16 **5 Claims**

1. A seal assembly for use in establishing a seal between two members one of which is a stationary member and the other of which is a reciprocating member adapted to extend through and reciprocate relative to said stationary member, said seal assembly comprising:
a mounting base having means thereon for securing it to said stationary member, a bearing carrier engaged with the mounting base, the mounting base and the bearing carrier defining a bearing chamber,
a passage extending through said mounting base adapted to substantially coaxially enclose said reciprocating member during relative movement thereof with respect to said stationary member,
a guide member having an axial bore therethrough for alignment with said passage and through which said reciprocating member is adapted to extend, said guide member having a bearing portion at one axial end and a stuffing box unit at the other axial end thereof, said stuffing box unit being arranged to receive packing material to form a seal with said reciprocating member,
said bearing portion being located in said bearing chamber said bearing carrier having an oversize bore at an end thereof remote from said mounting base, and said guide member extending through said oversize bore,
bearing means located in said bearing chamber and engaging



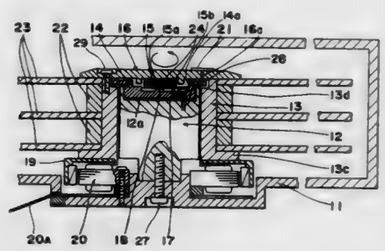
said bearing portion of said guide member, said bearing means permitting angular axial displacement of said guide member with respect to said mounting base and bearing carrier, and
said bearing means being mounted for transverse movement with respect to said mounting base and bearing carrier, whereby said stuffing box unit can self-align with said reciprocating member.

5,112,141

DISK DRIVING APPARATUS

Takafumi Asada, Hirakata; Masato Morimoto, and Takashi Sonoda, both of Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

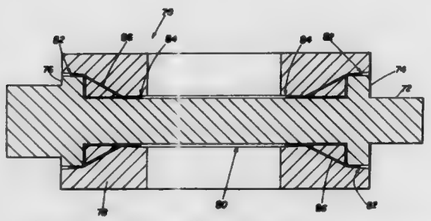
Filed Jun. 26, 1990, Ser. No. 543,585
Claims priority, application Japan, Jun. 30, 1989, 1-170150
Int. Cl.[5] F16C *17/10, 32/06*
U.S. Cl. 384—100 **4 Claims**



1. A disk driving apparatus comprising:
a chassis;
a fixed shaft having one end attached to said chassis;
a hub rotatably mounted around an outer circumferential surface of said fixed shaft and at least one disk mounted on an outer circumferential surface of said hub;
the other end of said fixed shaft having a stopper means thereon for engaging said hub for retaining said hub on said fixed shaft;
a disk fixing plate positioned over the other end of said fixed shaft and fixing said at least one disk to said hub and

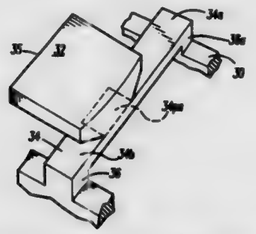
having a surface opposed to said other end of said fixed shaft;
a thrust bearing element movably mounted between said disk fixing plate surface and one of said other end of said fixed shaft and said stopper means; and
a hydrodynamic pressure generating groove formed in one of a herringbone pattern and a helical pattern and being on one of an outer circumferential surface of said fixed shaft and an inner circumferential surface of said hub.

5,112,142
HYDRODYNAMIC BEARING
Forrest Titcomb, and Jackie Cordova, both of Colorado Springs, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.
Continuation of Ser. No. 233,289, Aug. 17, 1988, abandoned, which is a division of Ser. No. 84,985, Aug. 12, 1987, Pat. No. 4,795,275. This application Jul. 19, 1989, Ser. No. 382,251
Int. Cl.[5] F16C *32/06, 33/74;* F16J *15/40*
U.S. Cl. 384—107 **54 Claims**



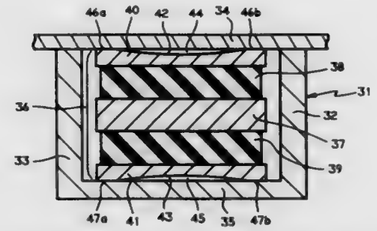
1. A hydrodynamic bearing comprising:
a relatively rotatable shaft disposed within a sleeve, the shaft and sleeve including mating tapered portions at each end of the bearing defining lubricant fillable clearance spaces for supporting radial and axial loads, each clearance space sealed by an internal and an external surface tension dynamic seal, and further including pressure equalization ports connecting the internal and external seals.

5,112,143
BEAM MOUNTED BEARING PAD AND METHODS OF MAKING SAME
Russell D. Ide, 28 Daniel Dr., Coventry, R.I. 02816
Continuation-in-part of Ser. No. 55,340, May 29, 1987, abandoned. This application Oct. 25, 1988, Ser. No. 283,529
Int. Cl.[5] F16C *17/03*
U.S. Cl. 384—117 **38 Claims**



1. A hydrodynamic bearing adapted to support a shaft, said bearing comprising a unitary cylindrical housing, said housing comprising a radially outer surface and a radially inner surface; said housing being formed with a plurality of radial cuts extending radially outward of the inner surface of the housing and a plurality of circumferential cuts in continuance of said radial cuts; said radial and circumferential cuts together defining a plurality of circumferentially arranged bearing pads and a unitary support structure comprising at least one integral beam-like member that supports each pad, wherein each pad comprises axially extending and radially extending edges and a circumferential shaft engaging face surface, one of said axially extending edges of each pad comprising a leading edge and another axially extending edge of each pad comprising a trailing edge, the face of the pad being adapted under the action of friction and pressure on said surface to rock relative to the support member whereby the trailing edge of the face surface of the pad is moved radially inward toward said shaft and said leading edge is moved radially outward away from said shaft.

5,112,144
ELEVATED TEMPERATURE ELASTOMERIC BEARING
Thomas R. Law, Edinboro, Pa., assignor to Lord Corporation, Erie, Pa.
Filed Jan. 29, 1991, Ser. No. 647,095
Int. Cl.[5] F16C *27/06;* B64D *27/26;* B60G *11/22*
U.S. Cl. 384—215 **20 Claims**



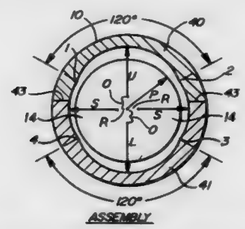
1. In an elastomeric bearing assembly particularly suited for use in high or low temperature environments, the bearing including a load member having opposite sides extending transversely to a direction of load application, a support member disposed outward of said opposite sides, and at least one elastomeric layer disposed between said opposite sides of said load member and said support member, the improvement comprising fulcrum means disposed between said elastomeric layer and at least one of said members for providing clearance adjacent said one member to accommodate expansion of the elastomeric layer in said load direction in response to heating of the bearing assembly, whereby undesirable stress build-ups in the bearing are avoided.

16. A laminated elastomeric bearing assembly for mounting an engine to an aircraft, the bearing assembly including a load support member, a frame member, and alternating layers of elastomeric material and shims disposed between said members, said bearing assembly being subjected to engine heat which causes the elastomeric layers to expand in a load direction, the improvement comprising: means providing at least one fulcrum defining a clearance between at least one of said elastomeric layers and at least one of said members for enabling said elastomeric layer to expand in said load direction in response to an increase in temperature, whereby thermally-induced stresses in the elastomeric layers are minimized.

5,112,145
PISTON AND BEARING ASSEMBLIES
James W. MacGregor, Ann Arbor, Mich., assignor to Detroit Diesel Corporation, Detroit, Mich.
Division of Ser. No. 467,136, Jan. 18, 1990, Pat. No. 5,072,654. This application Jun. 11, 1991, Ser. No. 713,974
Int. Cl.[5] F16C *33/04*
U.S. Cl. 384—286 **13 Claims**

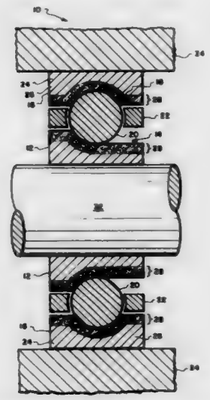
1. A journal bearing for rotatively supporting a journal pin member and comprising:
a generally cylindrical inner bearing surface adapted to receive the journal pin member and having a center,

said inner bearing surface including two pairs of diametrically opposed arcuate bearing surface portions,
one said pair of diametrically opposed arcuate bearing surface portions being generated by first respective radii equal to the radius of the journal pin member and from a respective axis lying on a first division diameter extending through said center and offset therefrom a predetermined distance toward the respective bearing surface portion generated thereby,
the other said pair of diametrically opposed arcuate bearing surface portions being generated by second respective radii from a respective axis lying on a second division diameter perpendicular to said first division diameter and extending through said center and offset therefrom a



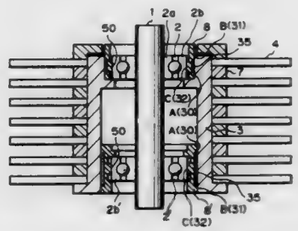
predetermined distance toward the respective bearing surface portion generated thereby,
the said predetermined distances said two pairs of diametrically opposed arcuate bearing surface portions are offset being substantially equal,
one of said pair of diametrically opposed arcuate bearing surface portions comprising an upper bearing section and a lower bearing section,
at least one of said upper and lower bearing sections extending circumferentially from end to end an arc distance less than 180°;
and the other of said pair of diametrically opposed bearing sections being in contiguous engagement with said one bearing section at respective ends thereof.

(ii) an intermediate metallic matrix layer having a hardness intermediate the metallic sub-matrix and an outer layer



of very hard low friction material the surface of which contacts the bearing element.

5,112,147
ROTATING SUPPORT APPARATUS IN DISK STORAGE DEVICE
Takahiro Imamura, Fujisawa; Yoshifumi Mizoshita, Tama, and Keiji Aruga, Hiratsuka, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Feb. 4, 1991, Ser. No. 650,271
Claims priority, application Japan, Feb. 5, 1990, 2-24406
Int. Cl.[5] F16C *19/52*
U.S. Cl. 384—605 **17 Claims**



1. A rotating support apparatus in a disk storage device, comprising a stationary shaft, ball bearings rotatably fitted on the stationary shaft, a rotatable member rotatably supported by and on the ball bearings, and buffer rings superimposed between the associated ball bearings and the rotatable member to absorb a thermal deformation of the rotatable member due to a change in a temperature, said buffer rings having a same coefficient of linear expansion as that of the material of which the rotatable member is made, each of said buffer rings being in contact, at three points of the outer and inner surfaces thereof in total, with the rotatable member and the associated ball bearing.

5,112,146
FUNCTIONALLY GRADATED ROLLING ELEMENT BEARING RACES
Maynard L. Stangeland, Thousand Oaks, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.
Filed Jul. 17, 1991, Ser. No. 731,697
Int. Cl.[5] F16C *33/62*
U.S. Cl. 384—492 **3 Claims**

1. In a bearing assembly including:
(a) an inner race element having a raceway therein;
(b) an outer race element having a raceway therein;
(c) a bearing element carried in said raceway and being movable relative thereto, the improvement therein being gradated race elements comprising:
(i) a corrosion resistant metallic sub-matrix layer; and

5,112,148

ELECTRONIC TYPEWRITER WITH OVERRIDE OF SPELLING-CHECKING FUNCTION

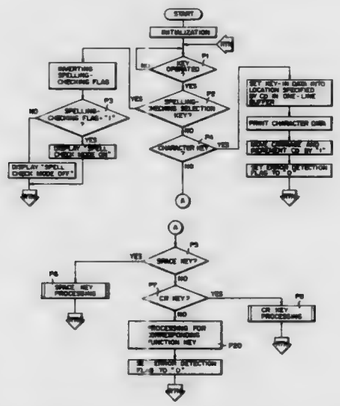
Koki Tanaka; Yoshikazu Hoshiki, and Takeshi Nakayama, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 488,394, Feb. 27, 1990, abandoned, which is a continuation of Ser. No. 211,457, Jun. 12, 1988, abandoned. This application Jan. 14, 1991, Ser. No. 640,570

Claims priority, application Japan, Jun. 27, 1987, 62-160131; Jun. 27, 1987, 62-160132; Jun. 27, 1987, 62-160136; Jun. 27, 1987, 62-160139; Jun. 27, 1987, 62-160140

Int. Cl.[5] G06F *7/04*

U.S. Cl. 400—63 **18 Claims**



1. An electronic typewriter comprising:

a printing head;

a carriage on which said printing head is mounted and movable to sequential printing positions located along a printing line;

a carriage pointer means for indicating at which of said sequential printing positions the carriage is located;

a buffer memory including sequentially-accessed memory locations corresponding, respectively, to said sequential printing positions;

a keyboard including a plurality of character keys and at least one carriage-movement control key;

processing means for performing a processing operation when any one of the plurality of character keys is operated, in which said processing operation (a) a character code representing a character on a character key that has been operated is stored into a memory location of said buffer memory corresponding to the printing position then indicated by said carriage pointer means, (b) said printing head is driven to print a character represented by a character code corresponding to the operated character key, and (c) said carriage is moved forward to the next printing position, wherein a word stored in said buffer memory includes an uninterrupted sequence of character codes at least one character code in length in said sequentially-accessed memory locations;

means for identifying a particular word stored in said buffer memory as a word for which the at least one character code thereof was stored corresponding to at least one printing position passed by said carriage immediately before a printing position specified by the carriage pointer means when said carriage-movement control key is operated;

spell-checking means for checking the spelling of said particular word and providing an indication as to whether a spelling error has been detected;

monitoring means for providing an output signal indicative of whether a detected spelling error has been corrected; and

control means for (a) if no spelling error in said particular word is detected by said spell checking means, moving said carriage to a predetermined position selected by operation of a carriage-movement control key, (b) if a spelling error in the particular word is detected by the spell checking means, inhibiting movement of said carriage to said predetermined position in response to first operation of said carriage-movement control key and, if said monitoring means indicates that the detected spelling error is not corrected, moving said carriage to said predetermined position in response to further operation of said carriage-movement control key.

5,112,149

VELOCITY RESPONSIVE HEAD DRIVING CONTROL APPARATUS OF MANUAL SWEEPING PRINTER

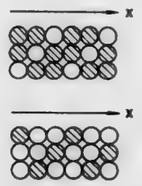
Takashi Suenaga, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 381,140, Jul. 14, 1989, abandoned. This application Dec. 3, 1990, Ser. No. 622,230

Claims priority, application Japan, Jul. 21, 1988, 63-180354

Int. Cl.[5] B41J *3/36, 2/37*

U.S. Cl. 400—88 **15 Claims**



14. Apparatus for printing while being swept manually across a printing medium, comprising:

printing means having a plurality of printing elements arranged in a line for printing images on a printing medium;

means for generating a printing position signal in response to movement of said printing means a predetermined distance over the printing medium in a direction perpendicular to said line;

means responsive to one printing position signal for energizing a predetermined portion of all the printing elements in accordance with printing data obtained for a particular printing position;

means for energizing at said particular printing position at least one other predetermined portion of all the plurality of printing elements during a selected time interval after energization of said predetermined portion is initiated; and

means for inhibiting energization of printing elements at said particular printing position when another printing position signal is generated before termination of said selected time interval.

5,112,150

SERIAL TYPE COLOR PRINTER WITH INK RIBBON CASSETTE POSITION SENSOR

Kiyohide Iwata, Shimizu, Japan, assignor to Star Seimitsu Kaubshiki Kaisha, Japan

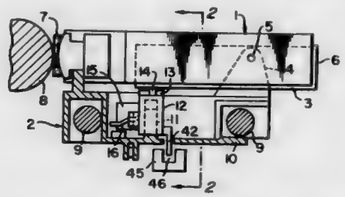
Division of Ser. No. 283,323, Nov. 23, 1988. This application Oct. 29, 1990, Ser. No. 604,950

Claims priority, application Japan, Apr. 13, 1987, 62-88877; Apr. 13, 1987, 62-88878

Int. Cl.[5] B41J *35/10*

U.S. Cl. 400—216.1 **10 Claims**

1. A serial printer comprising: a fame; a platen; a printing head opposed to said platen; a carriage carrying the printing head and capable of being reciprocated along the platen on the frame; a cassette holder for holding dismountably an ink ribbon cassette having several longitudinally parallel color stripes and being pivotally mounted on the carriage so that the ink ribbon cassette may be moved in a direction vertical to the platen; an ink ribbon change-over means connected to the cassette holder for moving the ink ribbon in the direction vertical to the platen; and discerning means for discerning a home position of the carriage and a home position of the cassette holder, the discerning means comprising a single position sensing means



for sensing the home position of the cassette holder and the home position of the carriage, a first shutter plate and a second shutter plate arranged on the carriage with a gap therebetween, a movable third shutter plate located in said gap and driven up and down within said gap with the ink ribbon change-over mechanism, whereby the positioning of the carriage and the cassette holder at their respective home positions is discerned by the discerning means dependent upon positions sensed by the single position sensing means of the three shutter plates.

5,112,151

COVER FOR ARTIST'S PASTEL

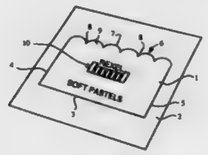
Theresa Collignon, Sydney, Australia, assignor to Ofrex Group Holdings, PLC, West Dryaton, Middlesex, United Kingdom

Filed Feb. 12, 1990, Ser. No. 478,601

Claims priority, application United Kingdom, Feb. 10, 1989, 8903052

Int. Cl.[5] B43K *19/14;* **B32B** *27/10*

U.S. Cl. 401—96 **8 Claims**





1. A marking implement comprising:

a stick of a marking material, said stick having a longitudinal external surface with respect to a central axis of said stick; and

self-adhesive covering means for covering said longitudinal external surface, said covering means comprising a polymer layer of an axially oriented polymer and a substrate layer of glassine paper, said polymer layer being laminated to said substrate layer, said covering means being axially wrapped around said longitudinal external surface with respect to said central axis so that a first edge of the covering means is disposed substantially parallel to said central axis and so that said first edge is overlaid by a portion of said covering means, a second edge of the covering means having a plurality of regions separated by cusps, each of said regions forming a tear-tab.

5,112,152

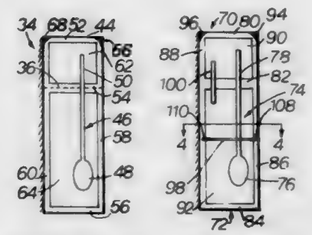
COMBINATION APPLICATOR AND PACKAGE

Carla McBride, 1318 Tamm, St. Louis, Mo. 63139

Continuation of Ser. No. 308,038, Feb. 8, 1989, abandoned. This application Mar. 4, 1991, Ser. No. 663,790

Int. Cl.[5] B43K *5/14*

U.S. Cl. 401—132 **22 Claims**



1. An applicator and package combination, comprising:

a generally flexible envelope including a generally flexible front leaf and a generally flexible rear leaf, the front and rear leaves being interchangeable and sealed in an opposing manner, the sealed leaves defining at least one sealed chamber;

a fluid contained within the sealed chamber;

applicator means contained within the sealed chamber having a portion extending through the sealing means without breaking the seal; and

opening means for opening the envelope and providing access to the applicator means, the opening means allowing partial separation of the front leaf from the rear leaf so as to allow access to an exposed portion of the applicator means without separating the front leaf and the rear leaf into the sealed chamber, thereby providing access to the exposed portion of the applicator means without releasing a significant portion of the fluid.

5,112,153

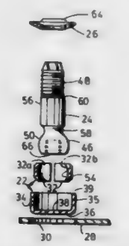
END CONNECTOR ASSEMBLY WITH BALL HELD CAPTIVE IN SOCKET BEARING AND SHELL HOUSING AND METHOD OF ASSEMBLY

Gary R. Gunn, Mullins; Wallace T. Colcord, Marion; Tommy G. Wood, Conway; Gary Weber, Florence; Stan J. Lovendoski, Marion, all of S.C., and James B. Chamberlin, Charlotte, N.C., assignors to Maremont Corporation, Carol Stream, Ill.

Filed Jul. 17, 1990, Ser. No. 554,295

Int. Cl.[5] B25G *3/00*

U.S. Cl. 403—7 **14 Claims**



14. An improved captive ball and socket joint assembly used to connect and provide a relatively movable linkage between an end of a gas spring and a mounting for the end of the gas spring, the improved assembly comprising in combination:

(A) a ball sub-assembly including an elongated, generally cylindrical ball post having a ball on one end thereof, a shank portion between the ends thereof, and means on the other end thereof adapted for connecting the ball post to the mounting for the end of the gas spring, with the ball including a preselected, spherically contoured surface that constitutes the major portion of the ball and that terminates, adjacent to the one end, in a generally circular plane which is transverse to the longitudinal axis of the ball post, which has a preselected diameter substantially equal to the diameter of the shank portion and which includes a recess adapted to receive a rotary tool;

(B) a socket sub-assembly including an annular, split ring bearing that includes a first opening and a second, circular opening which is adjacent to the circular plane and whose diameter is substantially equal to the diameter of the circular plane, with the split ring bearing having a generally spherically contoured internal surface that matches the spherical contoured surface of the ball and that provides a socket for receiving and encompassing the ball; and a bearing housing shell having a bottom wall and a side wall that has a preselected outer shape and size, that extends from the bottom wall so as to define a cup shaped interior and that terminates in a peripheral edge, with the split ring bearing being deposed within the interior of the housing shell and being held tightly therein by the peripheral edge of the side wall, with the peripheral edge defining a third opening which is co-axial with the first opening of the split ring bearing, through which the shank portion of the ball post projects, and which has a diameter substantially equal to the diameter of the first opening of the split ring bearing and less than the diameter of the shank portion of the ball post, and with the bottom wall of the housing shell having a fourth opening that has a diameter substantially equal to the diameter of the circular plane, that is co-axial with the second opening in the split ring bearing and that is adapted to permit the passage of a rotary tool adapted for engaging the recess in the circular plane of the ball and for rotating the ball post about its longitudinal axis and relative to the socket sub-assembly;

(C) a flat metal plate including a first surface and having an aperture therein, with the aperture having a shape that is congruent to the outer shape of the side wall of the housing shell and a size that is substantially equal to the size of the housing shell so that the housing shell fits within the aperture and so that the fourth opening is uncovered by the metal plate and is accessible, and with the first surface being adapted to be disposed in surface to surface contact with the end of the gas spring; and

means for securing the housing shell within the aperture in the metal plate.

5,112,154

CONNECTION SPACE REDUCTION MECHANISM

Malcolm B. Milam, Laurel, Md., assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 31, 1990, Ser. No. 636,532
Int. Cl.[5] B25G *3/00*
U.S. Cl. 403—13 **20 Claims**

1. A connector assembly for providing at least electrical power and electrical data connections at an interface between two interconnected structural members, comprising:

first and second mating connector assembly halves, wherein said first half of said connector assembly includes,

a first frame,

an active connector sub-assembly mounted on said first frame,

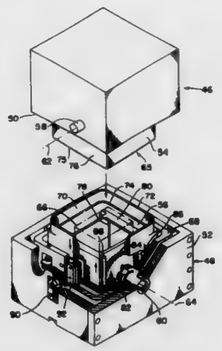
first connector member mounting means positioned inside of said active connector sub-assembly, and

means coupling said connector sub-assembly and said first connector member mounting means for providing relative movement between said sub-assembly and said first mounting means in mutually opposite directions when a portion of said active connector sub-assembly is urged in a predetermined direction; and

wherein said second half of said connector assembly includes,

a second frame,

a passive connector sub-assembly mounted on said second frame,



a second connector member mounting means positioned inside of said passive connector sub-assembly, and

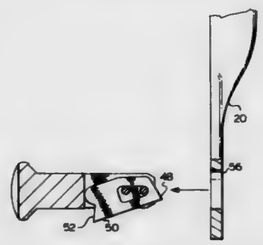
means on said passive connector sub-assembly for activating said means for providing movement in said predetermined direction when said first and second halves of said connector assembly are brought together and said first connector member mounting means moves towards said second connector member mounting means.

5,112,155

CONNECTOR FOR ASSEMBLING COMPONENTS OF SCAFFOLDING

George W. Jackson, 2570 Drew Rd., Mississauga, Ontario, Canada L4T 3M5

Filed Nov. 4, 1991, Ser. No. 787,426
Int. Cl.[5] E04G *7/00*
U.S. Cl. 403—49 **4 Claims**



1. A connector for use in interlocking a brace to a frame, said connector comprising

a barrel having one end adapted to be mounted onto a frame and an opposite end having a longitudinally extending slot,

a pivot pin and an abutment pin extending across the slot and mounted at the opposite end of the barrel,

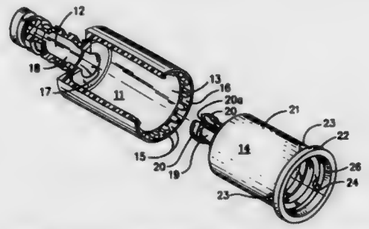
a free hanging latch having an offset aperture for pivotally mounting onto the pivot pin and a channel for receiving the abutment pin, the latch pivots between a locked position wherein one end thereof hangs beyond the diameter of the barrel in the locked position to prevent egress of a connected brace and an unlocked position wherein the latch substantially aligns with the barrel, wherein the improvement comprises one end of the channel being configured to abut with the abutment pin when the latch is in the locked position and the other end of the channel being configured to abut the abutment pin when the latch is in the unlocked position and the latch has a tab which is offset beyond the end of the barrel whereby pressing on the tab, the latch pivots from the locked position to the unlocked position.

5,112,156

TOOL HANDLE/EXTENSION COUPLER

Richard L. Boyer, 9277 W. Maryland Pl., Lakewood, Colo. 80232

Filed May 2, 1991, Ser. No. 694,484
Int. Cl.[5] B25G *3/00*
U.S. Cl. 403—287 **3 Claims**



1. A quick release coupling for tools and extension handles consisting essentially of two single piece fittings, one fitting having an externally threaded male element for screwed in connection to a threaded female element of a tool and the other fitting having an internally threaded element for screwed on connection to a threaded male element of an extension handle, one of the fittings additionally having a female connector element which has channel means for receiving a male connector element and the other of the fittings additionally having a flexible, longitudinally slotted male connector element with dually tapered flange means on its outer surface for seating in the channel means of the female connector element, the two connector elements being substantially complementary in shape and size to prevent substantial longitudinal movement of the fittings relative to each other when the male connector element is seated within the female connector.

5,112,157

FLEXIBLE CONNECTOR FOR CURTAIN RODS

Steven R. Haarer, Sturgis, Mich., assignor to Cooper Industries, Houston, Tex.

Filed Apr. 26, 1990, Ser. No. 514,529
Int. Cl.[5] F16B *7/00*
U.S. Cl. 403—292 **6 Claims**

1. A connector for connecting a first curtain rod section to a second curtain rod section, the connector comprising:

a body having a substantially flat flexible portion;

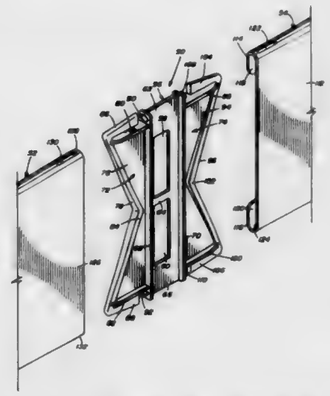
a first flange extending from the body for providing a stop to a telescopic advancement of the first curtain rod section towards the connector;

a second flange extending from the body for providing a stop to a telescopic advancement of the second curtain rod section towards the connector;

first connecting means for telescopically connecting the body to the first curtain rod section;

second connecting means for telescopically connecting the body to the second curtain rod section;

first snap means extending from the first connecting means for lockingly connecting the first connecting means to the first curtain rod section; and



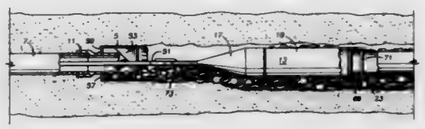
second snap means extending from the second connecting means for lockingly connecting the second connecting means to the second curtain rod section.

5,112,158

UNDERGROUND PIPE REPLACEMENT METHOD AND APPARATUS

W. Harry McConnell, P.O. Box 751803, Houston, Tex. 77275-1803

Filed Mar. 25, 1991, Ser. No. 675,635
Int. Cl.[5] F16L *1/00, 55/00*
U.S. Cl. 405—154 **19 Claims**



1. Apparatus for replacing an existing, frangible underground pipe disposed in a borehole with a new pipe as large as, or larger than, the existing pipe, comprising:

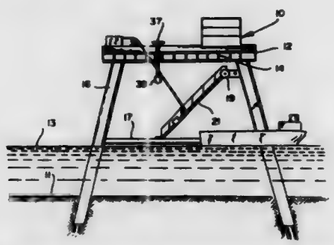
a crushing tool including a tubular main body having a leading end, a trailing end, and a bore with an inner diameter larger than the outer diameter of the existing pipe, an end of the existing pipe being received within said bore from said leading end of said main body;

crushing means disposed within said bore of said main body for engaging the outer surface of the existing pipe and crushing the existing pipe entirely inwardly into shards as the main body is forced along the exterior surface of the existing pipe;

expanding means attached to said trailing end of said main body for forcing the shards of the crushed pipe outwardly into the surrounding soil and expanding the borehole previously occupied by the crushed pipe sufficiently to accommodate a replacement pipe as large as, or larger than, the existing pipe; and

means for forcing said main body of said crushing tool along the exterior surface of the existing pipe.

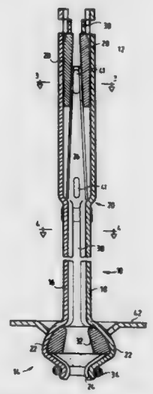
5,112,159
STAIRWAY GUARD FOR OFFSHORE MARINE STRUCTURE
Allen J. Verret, Abita Springs, La., assignor to Texaco, Inc., White Plains, N.Y.
Filed Dec. 3, 1990, Ser. No. 620,793
Int. Cl.[5] E02B *17/00*
U.S. Cl. 405—195.1 **1 Claim**



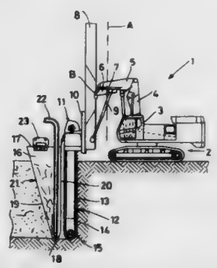
1. In a Marine structure for use in a body of water, which structure includes:
a deck positioned above the water's surface,
a vessel landing stage depending from said structure,
a stairway having an upper end operably engaged to said deck at a hinged joint to allow pivotal movement of the stairway about said joint when the stairway is raised into its upper position, and having a lower end supported on said landing stage,
elevating means depending from said deck and engaging said stairway, being operable to raise the stairway lower end from a lowered position in contact with the landing stage, to an upper position when the stairway lower end elevated above said landing stage,
docking means depending from said deck to slidably register said stairway when the latter is adjusted to said upper position, said docking means including a plurality of docking guide members depending downwardly from said deck, defining a downwardly extending stairway registering docking slip therebetween,
latching means being operable to fixedly engage the stairway to docking guide members when the stairway is in the upper position,
each of said plurality of docking guide members including a flexible coupling at the lower end thereof, positioned to engage a mating coupling member on the stairway, to define a cushioned connection,
at least one of said plurality of docking members including a collar fixed to said at least one guide member, and
said stairway including a generally cylindrical shaped member defining a cavity therein of sufficient size to slidably register said collar when the stairway is raised to said elevated position.

5,112,160
ROCK ANCHOR
Erik D. Jensen, Helderkruin, and Richard R. Wood, Randpark Ridge, both of South Africa, assignors to Delkor Technik Limited, Transvaal, South Africa
Filed Jul. 26, 1989, Ser. No. 385,812
Claims priority, application South Africa, Jul. 26, 1988, 88/5434; Aug. 4, 1988, 88/5720
Int. Cl.[5] E21D *21/00*
U.S. Cl. 405—259.5 **15 Claims**

1. A rock anchor, comprising: a composite anchor rod including an anchor head formed at one end of the composite anchor rod; wedge means, positioned within the anchor head, for expanding the anchor head into frictional engagement with a rock wall of a hole; tensioning arrangement means, positioned at an opposite end, opposite said anchor head, for preventing said opposite end from entering the hole and for providing a support structure against which said composite rod may be tensioned, said composite rod including a plurality of elongated tensioning members positioned substantially in parallel relationship around a central rod access, said tensioning members defining slots extending over a length of said composite rod between said anchor head and said tensioning arrangement means; and passage means defined by said tensioning members for receiving a settable member, said passage means including a rod passage extending through said tensioning arrangement means and said passage means communicating with the hole through said slots for allowing the settable material to surround the rock anchor.

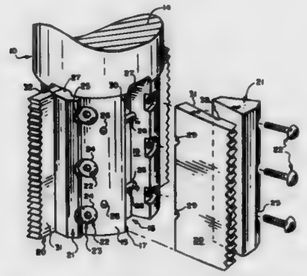


5,112,161
METHOD FOR EXCAVATING AND CONSTRUCTING MONOLITHIC CONTINUOUS STRAIGHT OR CIRCULAR STRUCTURAL WALLS AND A MACHINE FOR REALIZING SUCH A METHOD
Davide Trevisani, Cesena, Italy, assignor to Trevi S.p.A., Cesena, Italy
Filed Jul. 9, 1990, Ser. No. 549,609
Claims priority, application Italy, Jul. 10, 1989, 3550 A/89; Jul. 10, 1989, 3551 A/89
Int. Cl.[5] E02D *5/20*
U.S. Cl. 405—267 **5 Claims**



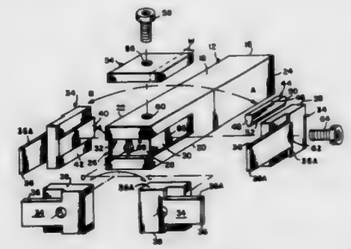
1. A device for the simultaneous excavation and construction of straight and curved continuous monolithic structural walls comprising:
a motor driven vehicle, said motor driven vehicle having first pivoting means for supporting a bracket member therefrom for rotational movement about a vertical axis A;
support means mounted on said bracket member and including second pivoting means for supporting a beam member therefrom for oscillating movement in a vertical plane about a point B;
a slide member mounted for vertical movement on said beam;
excavator means movably mounted on said slide member for excavating material from an area;
plate means carried by said slide member and extending beyond either side of said excavator means so as to define therewith an excavated area;
vibrating means associated with said plate means; and
concrete delivery means for delivering concrete to said excavated area for forming said structural wall.
3. A method for the simultaneous excavating and construction of straight and curved continuous monolithic structural walls in ground comprising:
providing a motor driven vehicle having a vertically disposed excavator means vertically movable thereon;
positioning said excavator means vertically in the ground at a desired depth;
advancing the vehicle a distance X so as to form a longitudinal trench by means of said excavator means;
introducing side wall means into said trench on either side of said excavator means wherein an excavated area is defined by said excavator and side wall means in the trench;
fixing said side wall means to said excavator means;
locating cement feed means within said excavated area; and
simultaneously advancing said vehicle and feeding cement to said cement feed means so as to form a wall.

5,112,162
THREAD MILLING CUTTER ASSEMBLY
James T. Hartford, Prairie View, and Laszlo Frecska, Highland Park, both of Ill., assignors to Advent Tool and Manufacturing, Inc., Mundelein, Ill.
Filed Dec. 20, 1990, Ser. No. 630,827
Int. Cl.[5] B23G *5/06*
U.S. Cl. 407—49 **20 Claims**



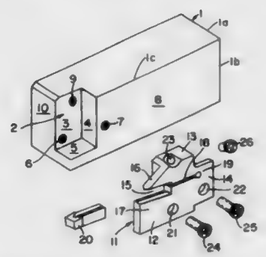
1. A cutting tool comprised of tool hardened steel having a holder end and an opposite end, a series of axially extending slots at an outer circumference of said opposite end, said slots each having a radially extending slot wall positioned so as to extend in a plane that intersects a longitudinal axis of said opposite end, each of said slots also having a generally radially and diagonally extending slot wall confronting said radially extending slot wall associated therewith, jig ground pins mounted in said opposite end and extended across a radially inner end of the associated slot, a series of cutter bits mounted in said slots and bottomed on said jig ground pins positioned at the radially inner end of the associated slot, a series of wedge shaped shims each being mounted in an associated one of said slots and physically positioned in engagement with and between said radially and diagonally extending slot wall associated therewith and one of said cutter bits for asserting pressure against the bits to hold the bits against leading sides of said slots, and screws screwed into said opposite end of the tool and which bear against said shims locking the shims and the blades in said slots in unitary assembly therewith.

5,112,163
VARIABLE TOOL BIT HOLDER
Thomas Veilleux, 22 Perry Ave., Lawrence, Mass. 01841
Filed Sep. 20, 1991, Ser. No. 763,356
Int. Cl.[5] B23P *15/28*
U.S. Cl. 407—101 **9 Claims**



1. A tool for machining a workpiece comprising:
a shank member having a generally elongated rectangular configuration in elevation including front and rear opposing end surfaces, top and bottom surfaces, and left and right surfaces;
a support blade member having identical top and bottom surfaces each defined by a frontally disposed V-shaped bit-receiving forward edge portion and a rearwardly disposed planer top surface disposed above the plane of the V-shaped bit-receiving portion;
an insert bit having opposing cutting tips and a V-shaped bottom edge adapted to be received in the V-shaped bit-receiving portion of said support blade;
means for securing said support blade to a selected surface of said shank member whereby said insert bit extends in a selected position beyond an end portion of said shank member; and
clamping means releasably secured to a portion of the surface of the shank member adjacent to the top surfaces of the bit member and support blade whereby a portion of the clamping means clamps said insert bit between the support blade and the clamping means and the top surface of said support blade.

5,112,164
CUTTING TOOL SYSTEM HAVING AN EXCHANGEABLE ADAPTOR
Joseph Pano, Nahariya, Israel, assignor to Iscar Ltd., Tefen, Israel
Filed Sep. 5, 1990, Ser. No. 578,071
Claims priority, application Israel, Sep. 8, 1989, 91574
Int. Cl.[5] B26D *1/12*
U.S. Cl. 407—110 **5 Claims**



1. A metal cutting tool assembly comprising a tool block; a substantially planar adaptor to be screw-clamped to the tool block; first and second clamping jaws formed integrally with

the adaptor and defining between them an insert receiving slot for receiving a cutting insert; a relatively narrow neck portion formed integrally with the adaptor and serving to couple the first jaw with the remainder of the adaptor and screw coupling means for clamping the adaptor to the tool block; wherein

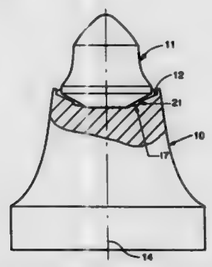
the screw coupling means includes unthreaded and threaded screw receiving bores formed respectively in the adaptor and the block so as to be aligned with each other so as to have a common axis located in a pair of orthogonally directed planes respectively parallel to the front and side faces of the tool block, said common axis defining respective primary and secondary angles with respect to an axis of intersection of said planes; and a clamping screw insertable into said bores so as to be screwed into said threaded bore leaving some play with defining walls of said unthreaded bore; the arrangement being such that the screw insertion of said clamping screw into said bores effectively clamps the adaptor against the tool block and, at the same time, by displacing the axis of the unthreaded bore with respect to that of the threaded bore with the two axes remaining parallel to each other, exerts a resultant force on a first jaw so as to pivot it about the neck portion into effectively clamping the insert against the second jaw.

5,112,165

TOOL FOR CUTTING SOLID MATERIAL

Jan-Gunnar Hedlund, Sandviken, and Bengt A. Asberg, Gävle, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed Apr. 23, 1990, Ser. No. 512,402
Claims priority, application Sweden, Apr. 24, 1989, 8901481
Int. Cl.[5] B23P *15/28*
U.S. Cl. 407—118 **14 Claims**



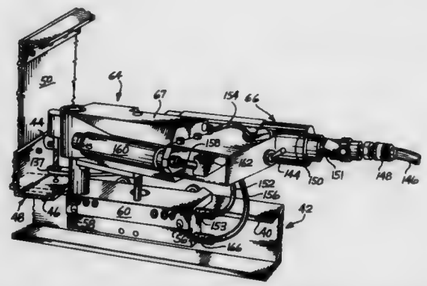
1. A tool for cutting solid material, comprising a tool body and a cutting insert mounted on said tool body, said tool body defining a front-to-rear extending longitudinal axis and having a forwardly facing surface, said cutting insert including a rearwardly facing surface opposing said forwardly facing surface, one of said surfaces defining an axially open recess receiving the other of said surfaces, said rearwardly facing surface including a first conical surface portion carrying rearwardly projecting spacer projection means arranged annularly about said axis, said forwardly facing surface including a second conical surface portion on which said insert is supported, said axis constituting a longitudinal axis of said second conical surface portion, said second conical surface portion carrying forwardly open indentation means arranged annularly about said axis and receiving said spacer projection means, said indentation means including supporting surface means engaged by said spacer projection means for retaining said cutting insert in a predetermined radial and axial orientation relative to said tool body and forming an axial space between said forwardly and rearwardly facing surfaces to receive a brazing material which secures said insert to said tool body.

5,112,166

SELF-INDEXING POWER FEED RIB BOLT DRILL

Douglas D. Doeden, Hicksville, Ohio, and Arvid L. Kalnoski, Issaquah, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1990, Ser. No. 589,742
Int. Cl.[5] B23B *45/14*
U.S. Cl. 408—1 R **12 Claims**



12. A method of precisely positioning a drill bit at a stringer and an overlapping leg of a rib chord, for drilling a hole at said predetermined position, comprising:

inserting said stringer flange in a longitudinal slot in a clamp body, with a free edge of said stringer flange abutting a pair of set screws projecting into said slot from a blind side of said longitudinal slot to correctly position said clamp body crosswise of said stringer flange;

sliding said clamp body along said stringer flange until a stand-off connected to said clamp body engages an upright face of said rib chord to correctly position said clamp body lengthwise along said stringer flange and crosswise of said rib chord;

energizing a pull-in clamp in said clamp body to pull said stringer flange into said slot against said set screws, and energizing a gripping clamp to clamp said stringer flange vertically in said slot;

energizing a power drill feed to feed said drill bit, held in a power drill supported on said clamp body, vertically onto said stringer flange and said rib chord; and

energizing said power drill to rotate said drill bit against said stringer flange and said rib chord to drill said hole.

5,112,167

HIGH SPEED BURNISHING DRILL

Kiyotaka Shiga; Akio Fukui; Akiomi Ryu, and Katsumi Okuno, all of Toyota, Japan, assignors to Fuji Seiko Corporation, Toyota, Japan

PCT No. PCT/JP89/00804, § 371 Date Aug. 14, 1990, § 102(e) Date Aug. 14, 1990, PCT Pub. No. WO90/14189, PCT Pub. Date Nov. 29, 1990
PCT Filed Aug. 4, 1989, Ser. No. 566,477
Int. Cl.[5] B23B *51/02*
U.S. Cl. 408—211 **3 Claims**

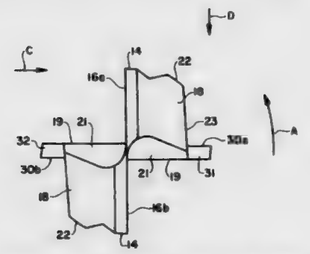
1. A high-speed burnishing drill comprising:

a shank;

an externally axially straight-grooved, generally cylindrical drill body connected at one end thereof with said shank as a coaxial extension therefrom, said drill body also having an axially opposite, forward end;

a pair of drilling edges located at said opposite end of the drill body, said drilling edges being opposed to each other diametrically about the longitudinal axis of the drill body from the center of the forward end of the drill body, and inclining axially in a rearward direction with a first cutting angle, said drilling edges having respective outermost margins thereof disposed on a reduced-diameter portion of said drill body, said reduced diameter portion having an external diameter which is smaller than the maximum external diameter of the drill body;

a pair of reaming edges formed on a first plane intersecting a second plane including said drilling edges about the longitudinal axis of said drill body, extending radially outward from a position inward of an outermost peripheral wall of said drilling edges, and inclining axially in the forward direction with a second cutting angle;



said reduced-diameter portion extending axially backward from the outermost peripheral wall of said drilling edges along a major portion of the length of said drill body; and

two enlarged-diameter guide faces formed on said drill body, each to extend from a slope formed at a position behind the corresponding drilling edge in the rotational direction toward the shank, the axially foremost end of each enlarged-diameter guide face being located at a position axially behind the corresponding reaming edge.

5,112,168

TAP WITH TAPERED THREAD

Helmut Glimpel, Lauf a.d. Pegnitz, Fed. Rep. of Germany, assignor to Emuge-Werk Richard Glimpel Fabrik für Präzisionswerkzeuge Vormals Moschkau & Glimpel, Lauf/Pegnitz, Fed. Rep. of Germany

Continuation of Ser. No. 638,626, Jan. 8, 1991, abandoned. This application Aug. 22, 1991, Ser. No. 750,754
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1990, 4001483
Int. Cl.[5] B23G *5/06*
U.S. Cl. 408—220 **2 Claims**



1. A conical tap, comprising:

a front end piece provided with one of a chamfer and a chasing; and

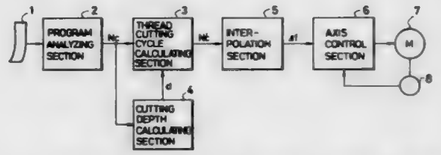
a conical threaded portion following the front end piece and having thread teeth located in a conical region, which teeth are provided with a relief arranged at a clearance angle, the clearance of the thread teeth located in the threaded portion being constant or increasing rearwardly.

5,112,169

THREAD CUTTING METHOD AND APPARATUS

Masato Ryoki, and Kenji Ito, both of Ooguchi, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Continuation of Ser. No. 520,658, May 10, 1990, abandoned. This application May 9, 1991, Ser. No. 701,330
Claims priority, application Japan, May 10, 1989, 1-116823
Int. Cl.[5] B23C *3/34*; B23B *1/00*
U.S. Cl. 409—66 **4 Claims**



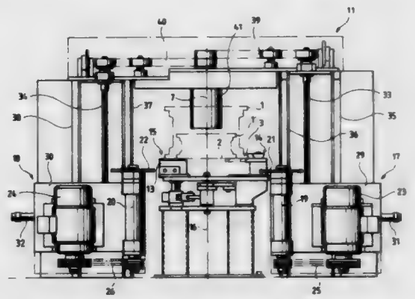
1. A thread cutting method in which a thread having a desired shape is obtained by repeatedly conducting thread cutting operations while changing a cutting depth from the crest of thread for the respective thread cutting operations so as to be less than and closest to a predetermined allowable cutting amount; wherein the cutting depths for the thread cutting operations from the second thread cutting operation to the thread cutting operation at the cutting depth which corresponds to the bottom of thread are determined in sequence in accordance with a predetermined cutting depth for the first thread cutting operation and a cutting amount at that cutting depth, and a predetermined cutting depth at the bottom of thread and the cutting amount at that cutting depth, and the equation $S=axd+b$ which expresses the relationship between the cutting depth from the crest of thread and the cutting amount, and in that the thread cutting operations are repeatedly conducted using the cutting depths including that for the first thread cutting operation, d being the cutting depth from the crest of thread and S being the cutting amount and a and b being constants.

5,112,170

CASTING FIN REMOVING APPARATUS FOR ALUMINUM WHEEL

Hitoshi Sasaki, Yoshida, Japan, assignor to Endo Kogyo Co., Ltd., Niigata, Japan

Filed Jan. 25, 1991, Ser. No. 649,769
Claims priority, application Japan, Mar. 20, 1990, 2-68369
Int. Cl.[5] B23C *3/12*
U.S. Cl. 409—124 **4 Claims**



1. A casting fin removing apparatus for removing a casting fin extending on a tire-mounting surface of an aluminum wheel along an axial direction of the aluminum wheel, comprising:

positioning means for positioning a center of the aluminum wheel at a predetermined position and positioning said

casting fin on a predetermined line passing through said predetermined position;

stylus means for movement following a profile of the tire-mounting surface of the aluminum wheel;

a cutter having a rotary shaft parallel to a center axis of the aluminum wheel as positioned by said positioning means;

and means for moving said cutter into cutting engagement with the casting fin along a second line passing through said predetermined position at a predetermined angle with respect to said predetermined line, and for moving said cutter along the tire-mounting surface of the aluminum wheel in accordance with said movement of said stylus means to thereby remove the casing fin.

5,112,171

MILLING HEAD FOR THE FINE MACHINING OF WORKPIECES, IN PARTICULAR GRAVURE CYLINDERS

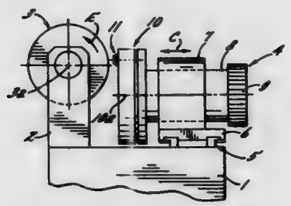
Max Daetwyler, Bleienbach, Switzerland, assignor to MDC Max Daetwyler Bleienbach AG, Bleienbach, Switzerland

Filed Nov. 23, 1990, Ser. No. 617,508

Claims priority, application Switzerland, Nov. 24, 1989, 04226/89

Int. Cl.[5] B23C *3/04*

U.S. Cl. 409—131 **11 Claims**



11. A method of fine machining the surface of cylinder bodies comprising the steps of

supporting the cylinder body on a milling head connected to a drive spindle, the milling head having a basic body and end face,

rotating the cylinder body about a rotational axis,

moving a cutter into engagement with the cylinder body for machining the cylinder body and wherein the cutter is moved so that the cutter holder on which the cutter is held projects beyond the end face of the basic body and the cutting edge of the cutter extends transverse to the direction of rotation, and

adjusting the inclination of the cutting edge relative to a plane disposed at right angles to the rotational axis by rotating a setting disc engaging the cutter holder, wherein the disc includes opposing inclined faces with one of the faces resting on the supporting surface of the basic body and the other face contacting the cutter holder.

5,112,172

SLIDING PULL UP STANCHION AND METHOD

Thomas H. Engle, Cape Vincent, N.Y., assignor to Knorr Brake Holding Corporation, Westminster, Md.

Filed Sep. 12, 1990, Ser. No. 581,328

Int. Cl.[5] B60P *7/13*

U.S. Cl. 410—59 **37 Claims**

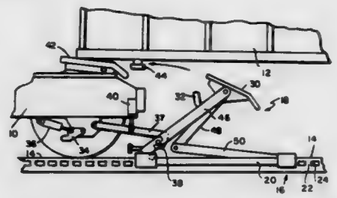
1. A stanchion to support trailers on a railroad car, comprising:

sled means for moving along a surface of a railroad car;

stand means, mounted to said sled means and having lowered and raised positions, for receiving and securing a portion of a trailer;

latch means on said sled means for normally engaging said railroad car to prevent movement of said sled means along; and

biasing means for biasing said latch means to its locked position,



whereby said latch means is disengaged from its locked position during the application of an external force sufficient to overcome said biasing means.

5,112,173

LOCKING MECHANISM FOR LATCHING A CARGO PIECE TO A LOADING FLOOR

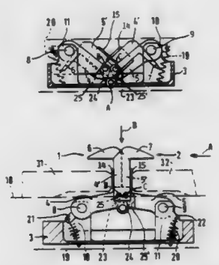
Wilfried Ellenstein, Stuhr, and Guenter Vogg, Bremen, both of Fed. Rep. of Germany, assignors to Deutsche Airbus GmbH, Hamburg, Fed. Rep. of Germany

Filed Dec. 27, 1990, Ser. No. 634,466

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1989, 3943077

Int. Cl.[5] B65D *19/44*

U.S. Cl. 410—79 **6 Claims**



1. A locking mechanism for latching cargo pieces to a loadng floor, comprising a housing, first and second journal shafts mounted in said housing in parallel to each other and with a fixed spacing between said journal shafts, a first latch journalled to said first journal shaft, a second latch journalled to said second journal shaft, each of said latches having a latching claw, one latching claw facing in a first direction, the other latching claw facing in a second opposite direction when said first and second latching claws are in a cargo latching position, said latching claws extending approximately perpendicularly to a cargo moving direction, each latch comprising a ramp member having a ramp surface arranged so that both ramp surfaces are slanting in opposite directions relative to each other, coupling means forming a link lever joint for interconnecting said first and second latches with each other, said lever joint being connected to said first and second latches eccentrically of said journal shafts, and spring means connected between said housing and said first and second latches for biasing said first and second latches.

5,112,174

EXPANDING PLUG

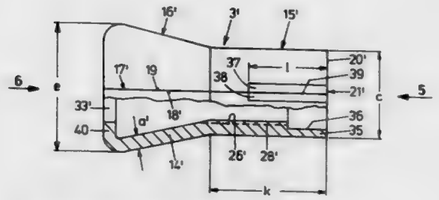
Anton Gerhard, Nuremberg, Fed Rep. of Germany, assignor to "Toge-Dubel" A Gerhard GmbH, Nuremberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 599,197, Oct. 17, 1990, abandoned. This application May 10, 1991, Ser. No. 698,050

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1989, 3934534

Int. Cl.[5] F16B *13/06*

U.S. Cl. 411—53 **26 Claims**



1. An expanding plug comprising:

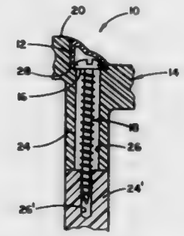
an expanding sleeve (1) provided at least over part of its length with at least one slot (4), having a central longitudinal axis (5) and having a first end with a rim (8) and a second end opposite said first end, said second end being a plug-in end (6);

an expanding screw (2) having a head (12) at one end and an external thread (11) at another end and arranged in the expanding sleeve (1) concentrically to said central longitudinal axis (5) and said head (12) bearing against said rim (8); and

an expanding cone (3,3') provided with an internal thread (26,26') taking up said external thread (11) of the expanding screw (2), and with an expanding section (16,16') and arranged in the plug-in end (6) in an untwistable manner with respect to the expanding sleeve (1) and expanding said expanding sleeve (1) when being pulled into the expanding sleeve (1) by means of the expanding screw (2);

wherein the expanding cone (3,3') consists of a bent metal sheet having a wall (14,14') with a first edge (18,18') and a second edge (19,19') limiting a joint gap (17,17') and wherein said first edge (18,18') and said second edge (19,19') are tightly connected with each other in the direction of said central longitudinal axis (5) and tangentially to it.

a top wall connected to the entire periphery of the upper edge of the circumferential wall, said top wall and said



side wall together defining a cavity for receiving a screw head, said top wall being nonplanar.

5,112,175

SCREW HOLE PLUG

Steven R. Wilkening, Wyoming, Mich., assignor to ODL, Incorporated, Zeeland, Mich.

Filed Nov. 6, 1990, Ser. No. 609,605

Int. Cl.[5] F16B *43/00*

U.S. Cl. 411—371 **9 Claims**

9. A screw hole plug comprising:

a cylindrical circumferential side wall having a lower edge defining a plane generally perpendicular to the axis of the circumferential wall and a nonplanar upper edge; and

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5,112,176

SHROUDED ANTI-THEFT LOCKNUT

Peter L. McCauley, Williamsville, and Jeffrey R. Sullivan, Boston, both of N.Y., assignors to McGard, Inc., Orchard Park, N.Y.

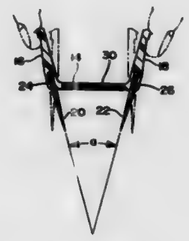
Filed May 9, 1991, Ser. No. 697,998

Int. Cl.[5] F16B *37/08*

U.S. Cl. 411—432 **10 Claims**

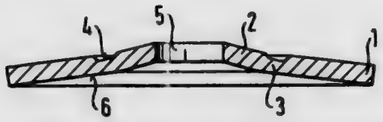
1. A locknut for mounting on a threaded stud and bearing against a member to be secured to said stud comprising a nut member having an inner nut end and an outer nut end and a central nut portion therebetween, an internal and external surface on said nut member, internal thread means on said internal surface of said nut member extending substantially throughout the entire axial length thereof for threadably mounting said nut on said threaded stud, an annular shroud having an inner shroud end and an outer shroud end and a central shroud portion therebetween, surface means on said inner shroud end for bearing against said member to be secured to said stud, coacting means between said nut member and said annular shroud for causing said surface means to bear against said member when said nut member is threaded onto said stud, mounting means for permanently rotatably mounting said annular shroud in assembled relationship on said nut member when said locknut is not mounted on said stud, a key-receiving configuration on said external surface at said outer nut end, and said outer shroud end surrounding said key-receiving configuration on said outer nut end and lying in radial overlapping relationship therewith.

5,112,177
FLEXIBLE FASTENER
Antony W. Chamings, 2386 Camilla, Troy, Mich. 48083
Continuation-in-part of Ser. No. 479,156, Feb. 13, 1990, Pat. No. 5,015,135. This application May 13, 1991, Ser. No. 699,982
The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.
Int. Cl.[5] F16B *15/00*
U.S. Cl. 411—447 11 Claims



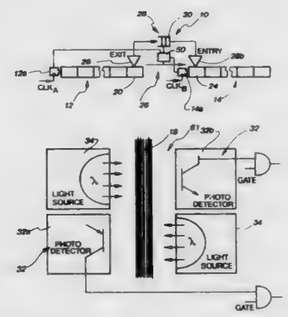
1. A flexible fastener, comprising:
(a) a body formed form a flexible material, the body having a spacer section;
(b) means for bending the body in response to finger pressure, the bending means being operable to flexibly bend the spacer section when pressure is applied thereto; and
(c) at least a pair of spaced apart outwardly extending pins, the pins being normally disposed in a non-parallel converging configuration so as to define an angle therebetween;
wherein the body is deformable to temporarily align the pins in a substantially parallel configuration.

5,112,178
SPRING WASHER FOR SECURING SCREWS, NUTS OR THE LIKE
Egon Overhues, Neuenrade, and Reiner Krolow, Lüdenscheid, both of Fed. Rep. of Germany, assignors to Teckentrup GmbH & Co. KG, Herscheid, Fed. Rep. of Germany
Filed Jul. 31, 1991, Ser. No. 738,464
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1990, 4025146
Int. Cl.[5] F16B *43/02;* F16F *1/34*
U.S. Cl. 411—544 13 Claims



1. A spring washer for securing screws, nuts and the like, said washer having a first side and a second side and comprising substantially annular inner and outer bodies having substantially conical surfaces at said first side, and an intermediate section disposed between and merging gradually into each of said bodies at said first side of the washer, said intermediate section having a groove which is disposed at said second side and said bodies being deformable from said second side to convert said conical surfaces into substantially flat surfaces each of which can lie flush against a substantially flat support at the first side of the washer.

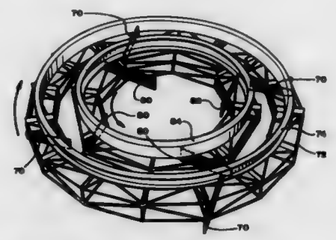
5,112,179
BINDING LINE BOOK TRACKING SYSTEM AND METHOD
Wai-Kwong Chan, Chicago; Mary F. Allsopp, Glen Ellyn; Kevin T. McGuire, Aurora; Robert W. Nonnemann, Batavia; Gordon A. Obrecht, Lisle; Ronald B. Saluski, Bolingbrook; James A. Trchka, Clarendon Hills; Hans J. Viebach, New Lenox, all of Ill.; Peter A. Brandt, Glasgow, Ky.; Robert R. Butler, Glasgow, Ky.; Michael W. Shircliff, Glasgow, Ky.; Samuel A. Walker, Glasgow, Ky., and Thomas R. Miller, Chicago, Ill., assignors to R.R. Donnelley & Sons Company, Chicago, Ill.
Division of Ser. No. 321,012, Mar. 9, 1989, abandoned. This application Jun. 29, 1990, Ser. No. 545,549
Int. Cl.[5] B42B *2/00, 9/00;* B42C *1/00*
U.S. Cl. 412—1 93 Claims



1. A binding line, comprising:
a first binding line section including means for transporting books therealong to a book exit station;
a second binding line section including means for transporting books therealong from a book entry station;
means for transferring books from said book exit station of said first binding line section to said book entry station of said second binding line section;
said first binding line section being synchronously related to said second binding line section;
said means for transporting books along said second binding line section being dependently operable relative to said means for transporting books along said first binding line section; and
intrinsic book identification means associated with each of said books leaving said book exit station and entering said book entry station to provide a separate identification therefor for tracking each of said books through time and space between said first and second binding line sections.

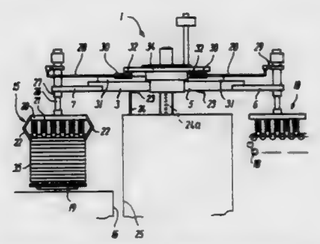
57. A method of tracking books in a binding line, comprising the steps of:
providing each of said books with intrinsic book identification means to provide a separate identification therefor for tracking each of said books;
transporting books along a first binding line section to a book exit station in a dependently operable manner relative to a second binding line section;
transferring books from said book exit station of said first binding line section to a book entry station of a second binding line section;
tracking each of said books leaving said book exit station and entering said book entry station through time and space between said first and second binding line sections; and
transporting books along said second binding line section from said book entry station in a dependently operable manner relative to said first binding line section;
said books being transported along said first binding line section in synchronous relation to said books being transported along said second binding line section.

5,112,180
SILO TOP UNLOADER
Richard M. Hough, Lansing, Mich., assignor to Hough International, Inc., Albertville, Ala.
Filed Jan. 22, 1991, Ser. No. 643,735
Int. Cl.[5] B65G *65/38*
U.S. Cl. 414—305 15 Claims



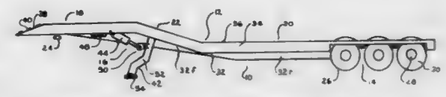
1. A silo unloader comprising:
means for defining a central discharge;
oppositely driven plow means arranged for forcing material toward said central discharge when said plow means is rotated in opposite directions;
drive means operably associated with said plow means for rotating said plow means in opposite directions;
said means being concentrically arranged in a manner that, when rotated in opposite directions, said plow means cooperate to successively force material toward said discharge.

5,112,181
FEEDING APPARATUS FOR TRANSFERRING EGGS
Hans Kristian L. Rasmussen, Morud, Denmark, assignor to Sanovo Engineering A/S, Odense NV, Denmark
Filed Oct. 15, 1990, Ser. No. 597,036
Claims priority, application Denmark, Oct. 19, 1989, 5189/89
Int. Cl.[5] B65G *47/90*
U.S. Cl. 414—416 6 Claims



1. An apparatus for transferring eggs from a pile of egg trays to an egg depositing position on means for conveying eggs to an egg processing machine, said apparatus comprising:
(a) at least three egg and egg tray transfer units, each of said units comprising:
(i) means for lifting each individual egg from an egg tray and retaining the eggs until the eggs are transferred to said egg depositing position on the means for conveying eggs, and
(ii) grappler means for releasably retaining an egg tray;
(b) means for moving said transfer units between a first position of operation, a second position of operation and a third position of operation along a closed path and for vertically lowering and raising said units between an operational level and an upper conveyance level when said units are located at each of said first, second and third positions of operation, wherein said first position of operation is located in the vicinity of means for supplying piles of egg trays containing eggs, said second position of operation is located in the vicinity of means for removing emptied egg trays and said third position of operation is located in the vicinity of said egg depositing position;
(c) means for effecting release of an egg tray retained by said grappler means of said transfer units when said transfer units are positioned at said second operational position; and
(d) control means for controlling orientations of said transfer units such that said transfer units are oriented to transfer eggs and egg trays from a pile of egg trays at said first operational position having its egg trays arranged 90° in relation to an adjacent egg tray in said pile.

5,112,182
POWER ACTIVATED DROP-NOSE TRAILER
William H. Nuttall, P.O. Box 267, Atoka, Okla. 75425
Filed Nov. 4, 1988, Ser. No. 267,031
Int. Cl.[5] B60P *1/04*
U.S. Cl. 414—481 20 Claims



1. A power actuated drop nose trailer, comprising
an elongate body with a nose and a rear, having a main load platform disposed low to the ground surface extending from the rear of said body a majority of the distance toward the nose of said body, a load carrying coupling platform disposed at a greater height from the ground surface than said main load platform and parallel to said main load platform, and a load carrying transitional platform rigidly interconnected between the end of said main load platform nearest the nose of said body and the end of said coupling platform nearest the rear of said body, with said translational platform disposed at an angle relative to said main load and coupling platforms, said body further including a plurality of longitudinal main beams with their upper edges in the planes defined by the respective platforms of said body and their lower edges configured to support said body upon the ground surface through the portion of the length of said lower edges of said main beams underlying the interconnections between said platforms with the nose of said body lowered to the ground surface, and a pair of longitudinal side beams disposed parallel to said main beams with one of said side beams along each edge of said body;
coupling means extending downward from said coupling platform near the nose of said body for the purpose of coupling the trailer to a two vehicle;
running gear disposed near the rear of said body, including a plurality of axle assemblies disposed perpendicular to the longitudinal axis of said body, a plurality of suspension means, a plurality of wheels, and a plurality of tires equal in number to the number of said wheels;
a landing gear assembly disposed between said body and the ground surface, inciting a plurality of lever arms having first and second ends, pivotally interconnected at their first ends to said body between said side beams with the point of interconnection intermediate the two ends of said transitional platform of said body, an elongate ground support plate disposed with its longitudinal axis perpendicular to the longitudinal axis of said body and pivotally interconnected to the second end of each of said lever arms; and
one or more actuating means each having first and second ends, with the first end of each actuating means pivotally interconnected to the lower surface of said body between the nose of said body and the interconnection of said lever

arms to said body, and with the second end of each actuating means pivotally interconnected to one or more of said lever arms of said landing gear intermediate said first and second ends thereof, for the purpose of applying force between said body and said lever arms and inducing rotation of said lever arms about their pivotal interconnection to said body to effect raising or lowering of the nose of said body to or from the ground surface.

5,112,183

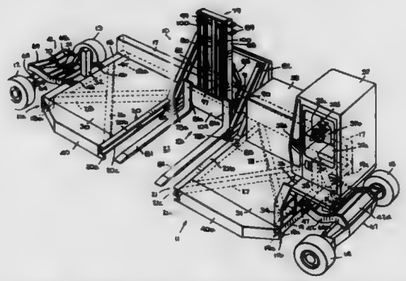
SIDE-LOADING FORK LIFT VEHICLE

Howard G. Nusbaum, 53 Heritage La., Stamford, Conn. 06903, and James A. Bevan, Ottumwa, Iowa, assignors to Howard G. Nusbaum, Stamford, Conn.

Continuation-in-part of Ser. No. 342,999, Apr. 25, 1989, Pat. No. 4,595,774. This application Feb. 25, 1991, Ser. No. 660,777

Int. Cl.[5] B62D *1/00*; B66F *9/00*

U.S. Cl. 414—544 **19 Claims**



1. A side-loading fork lift vehicle for handling a heavy load which is long relative to its width, said vehicle comprising:

a. an elongated vehicle body having front and rear ends and opposite sides, said vehicle body including an elongated load-carrying frame section which includes (i) first torsion beam means extending longitudinally of said vehicle body at one side and from said front end to said rear end thereof, (ii) second and third torsion beam means located at said front end and said rear end of said vehicle body, respectively, and each extending from said one side of said vehicle body to the other side of the latter, with each of said second and third torsion beam means being rigidly affixed at a first end of the same to said first torsion beam means at said one side of said vehicle body and having a second end located substantially at said other side of said vehicle, (iii) a pair of parallel transverse beam means located in the midregion of said frame section and defining a first space therebetween, with each of said transverse beam means being rigidly affixed at a first end of the same to said first torsion beam means at said one side of said vehicle body and having a second end located substantially at said other side of said vehicle body, and said transverse beam means being separated by respective second and third spaces from said second and third torsion beam means, and (iv) respective cross-brace means located in said second and third spaces and being rigidly affixed to the associated one of said second and third torsion beam means and the proximate one of said transverse beam means;

b. front axle means supporting a pair of front ground wheels, rear axle means supporting a pair of rear ground wheels, front rocker frame means pivotally connected to said second torsion beam means for angular up and down movement about a first axis parallel to the latter and supporting said front axle means at a position spaced from and located rearwardly of said third torsion beams means, and respective hydraulic piston and cylinder units articulated each between one of said second and third torsion beam means and the associated one of said front and rear rocker frame means, said hydraulic piston and cylinder units being operable to elevate said load-carrying frame section relative to said wheels and away from the ground when the vehicle is to be in motion and being operable to lower said load-carrying frame section relative to said wheels and to the ground when the vehicle is to be stationary during an on-loading or off-loading operation;

c. respective motor means for driving said front and rear ground wheels in forward and reverse, and means for controlling the orientations of said front and rear ground wheels through respective arcs to either the left or the right relative to the longitudinal axis of said vehicle body for enabling movement of the vehicle at least in either a straight ahead mode or a radius turning mode in either the forward or the reverse direction;

d. guideway means on said transverse beam means and extending along the latter, a trolley located in said first space and mounted on said guideway means for reciprocal movement therealong, and first hydraulic piston and cylinder means operatively interconnected between said load-carrying frame section and said trolley for reciprocally moving the latter along said guideway means;

e. load-handling means arranged on said trolley and including a vertical framework carried by said trolley, mast means mounted in said framework for vertical up and down movement relative thereto, second hydraulic piston and cylinder means operatively interconnected between said trolley and said mast means for moving the latter up and down relative to said framework and said trolley, and a plurality of fork arms carried by said mast means and extending therefrom in a direction away from said one side of said vehicle body, said fork arms being adapted, upon an appropriate movement of said trolley, to be retracted to a position within the confines of said load-carrying frame section or protracted to a position outside the confines of said load-carrying frame section beyond said other side of said vehicle body; and

f. an operator's cab mounted on said vehicle body, said cab being supported by said torsion beam means at an elevation above the level of said load-carrying frame section.

5,112,184

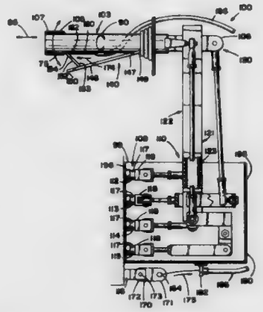
MULTI-FUNCTION HYDRAULIC CONTROL HANDLE

Glen D. Tapper; Timothy J. Raymond, and Ernest E. Enlund, all of Duluth, Minn., assignors to Reach All, Duluth, Minn.

Filed Jun. 11, 1990, Ser. No. 535,836

Int. Cl.[5] B66C *23/60*

U.S. Cl. 414—728 **10 Claims**



8. Maneuverable equipment comprising:

(a) a derrick;

(b) a telescoping boom system including first and second boom portions; said telescoping boom being mounted on said derrick and constructed and arranged to selectively perform four movement functions including:

(i) rotation about an axis generally perpendicular to a surface on which the derrick sits;

(ii) rotation about an axis generally parallel to the surface on which the derrick sits;

(iii) extension of said first boom portion; and

(iv) extension of said second boom portion; and

(c) a control system for controlling said four movement functions; said control system comprising a handle member having a first longitudinal axis; said handle member including an internal handle portion and an external handle portion; and,

(i) said external handle portion being rotatable, relative to said internal handle portion, about said longitudinal handle axis;

(ii) said handle member being pivotally mounted, at a first pivot point, in said control system, to a first axis generally perpendicular to said longitudinal handle axis;

(iii) said handle member being pivotally mounted, at a second pivot point, in said control system, to a second axis generally perpendicular to both of said first axis and said longitudinal handle axis;

(iv) said handle member being mounted in said control system, for selected movement in a path of motion such that said longitudinal handle axis is selectively movable from a first longitudinal axis position to a second longitudinal axis position; said first and second longitudinal axis positions being generally coplanar with, spaced from and parallel to, one another;

(d) means directing a different one of the four movement functions of said telescoping boom upon each of the following four movements of said handle member;

(i) rotational motion of said external handle portion relative to said coaxial internal handle portion, and about said longitudinal handle axis;

(ii) pivotal motion of said handle member about said first axis;

(iii) pivotal motion of said handle member about said second axis; and

(iv) movement of said handle member to move said longitudinal handle axis between said first longitudinal axis position and said second longitudinal axis position.

5,112,185

METHOD FOR REPLACING A DEPOSIT SHIELD IN AN EVACUATED FILM FORMING CHAMBER

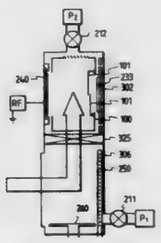
Atsushi Koike, Chiba, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 674,314, Mar. 25, 1991, Pat. No. 5,065,698, which is a continuation of Ser. No. 337,312, Apr. 13, 1989, abandoned. This application Sep. 6, 1991, Ser. No. 756,058

Claims priority, application Japan, Apr. 14, 1988, 63-90407; Apr. 11, 1989, 1-91633

Int. Cl.[5] C23C *16/00*

U.S. Cl. 414—786 **1 Claim**



1. A method for changing a deposit shield member with another deposit shield member in a film forming chamber capable of being evacuated, comprising:

evacuating said film forming chamber;

opening an open-shut means which keeps airtightness between said film forming chamber and a vacuum chamber capable of being evacuated and in which a first deposit shield member for preventing deposits from adhering to the inner wall surface of said film forming chamber can be replaced with a second deposit shield member;

transferring said first deposit shield member from said film forming chamber through said open-shut means into said vacuum chamber by use of a carrying means;

shutting said open-shut means;

opening said open-shut means and transferring said second deposit shield member from said vacuum chamber through said open shut means into said film forming chamber by use of said carrying means; and

shutting said open-shut means;

wherein, during the changing of said first deposit shield member with said second deposit shield member, a vacuum is maintained continuously in said film forming chamber.

5,112,186

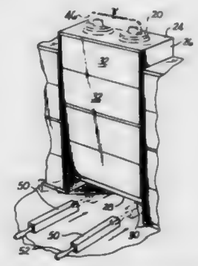
METHOD OF LEVELING A LATERIAL FILE CABINET

Edward R. Katz, 4847 Cambridge Dr., Dunwoody, Ga. 30338

Filed Jan. 25, 1991, Ser. No. 645,803

Int. Cl.[5] B65G *7/00*

U.S. Cl. 414—786 **2 Claims**



1. A method for leveling file cabinets that have adjustable feet, comprising the steps of:

(a) lifting the cabinet completely off of a support surface by means of a vacuum suction lifting device;

(b) placing a safety block between the bottom of the cabinet and the support surface after the lifting step;

(c) adjusting at least one of the adjustable feet of the cabinet;

(d) removing the safety block from between the cabinet and the support surface after the adjusting step is completed;

(e) lowering the cabinet to the support surface;

(f) determining the level of the cabinet; and

(g) repeating the above steps until the cabinet is level.

5,112,187

EROSION CONTROL THROUGH REDUCTION OF MOISTURE TRANSPORT BY SECONDARY FLOW

Joseph Davids, Maitland, and George J. Silvestri, Jr., Winter Park, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

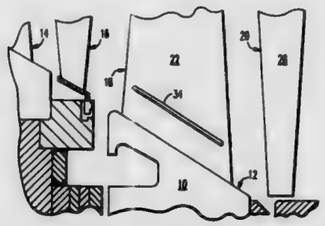
Continuation of Ser. No. 580,993, Sep. 12, 1990. This application Aug. 19, 1991, Ser. No. 747,406

Int. Cl.[5] F01D *25/32*

U.S. Cl. 415—169.3 **6 Claims**

1. A steam turbine with reduced rotating blade edge erosion from moisture transported by secondary flow, the turbine including a plurality of rows of rotating blades interspersed with a plurality of rows of stationary blades, and further including a water barrier extending substantially across a suction

side of each blade of at least one of the rows of stationary blades, each water barrier being positioned relatively near a



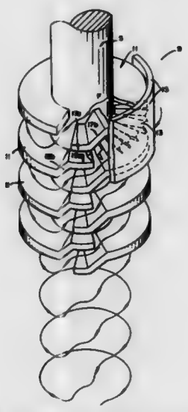
radially outer end of a respective blade and substantially parallel to an adjacent end wall of the turbine.

5,112,188

MULTIPLE STAGE DRAG AND DYNAMIC TURBINE DOWNHOLE MOTOR

Eduardo Barnetche-Gonzalez, Rio Grijalva No. 11, Col. Vista Hermosa, Cuernavaca, Moselos, Mexico

Filed Jan. 25, 1991, Ser. No. 654,423
Int. Cl.[5] F01D *9/00;* **F03B** *13/00*
U.S. Cl. 415—198.1 **11 Claims**



1. A turbine for driving a downhole motor, said turbine being driven by the flow of a fluid therethrough said turbine comprising:

(a) a housing;

(b) a shaft positioned in said housing, said shaft rotating about the longitudinal axis thereof;

(c) a rotor assembly having a plurality of turbine stages mounted on said shaft for rotation therewith, each turbine stage including a rim means coaxial with said shaft and a plurality of turbine blades fixed to said rim means; and

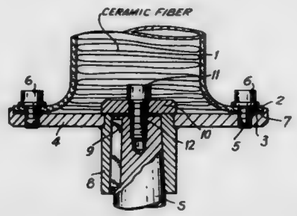
(d) a stator assembly having a plurality of flow directing stator means, each of said stator means being positioned between adjacent turbine stages, each of said stator means having a wall means and diverter means, wherein said wall means are perpendicular to the axis of said shaft and said diverter means are at an angle of less than 90° with respect to the axis of said shaft, wherein at least one of said turbine blades and said diverter means form a seal for preventing the flow from passing therebetween, such that flow through a turbine stage is perpendicular to the axis of said shaft in the space between adjacent wall means and wherein said diverter means are positioned with respect to said wall means for diverting flow from the turbine stage to an adjacent turbine stage.

5,112,189

ARRANGEMENT FOR CONNECTING BLOWER WHEEL

Werner Halek, Menden, Fed. Rep. of Germany, assignor to Schmetz GmbH & Co KG Unternehmensverwaltung, Menden, Fed. Rep. of Germany

Filed Apr. 3, 1990, Ser. No. 503,723
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1989, 3910674
Int. Cl.[5] F03B *13/00;* **F01D** *1/00*
U.S. Cl. 415—200 **5 Claims**



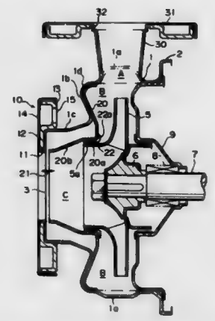
1. An arrangement for connecting a heat-resistant blower wheel located in a oven, comprising a hollow projection formed on a wheel at its side facing toward a motor and provided with a coaxial flange; a metal disc connectable with a perpendicularly extending-motor shaft, said wheel and said projection being composed of carbon-fiber reinforced graphite; and a disc-shaped element located between said flange and said disc in the region of their connection and formed as a springy element and composed of a graphite laminate.

5,112,190

SHEET-METAL CENTRIFUGAL PUMP CASING

Kenichi Kajiwara, Kanagawa; Kikuichi Mori, Chiba; Hideo Ikeda, and Shinichiro Arakawa, both of Kangawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Jul. 13, 1990, Ser. No. 552,027
Claims priority, application Japan, Jul. 15, 1989, 1-183341; Apr. 20, 1990, 2-104542
Int. Cl.[5] F04D *29/42, 29/44*
U.S. Cl. 415—215.1 **18 Claims**



1. A sheet-metal centrifugal pump casing comprising a casing shell having a suction port and being formed of a steel plate by means of deep drawing using a press, and a suction flange firmly attached to the suction port of the casing shell, said centrifugal pump casing further comprising a partition body firmly attached to an inner surface of said casing shell for partitioning a space within said casing shell into a suction

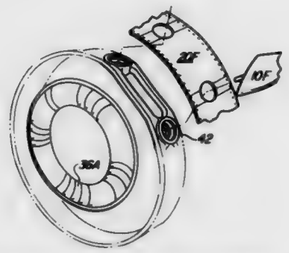
chamber and a pressure chamber, and a diffuser which is integrally extended from the suction side end portion of the partition body and which tapers off toward peripheral edge of said suction port so that an axial gap is formed between the end edge of the diffuser and the peripheral edge of said suction port.

5,112,191

ROTATING COWLING

William J. Strock, Cincinnati, Ohio; Thomas G. Wakeman, Lawrenceburg, Ind., and Ambrose A. Hauser, Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 11, 1989, Ser. No. 336,375
Int. Cl.[5] B64C *11/14, 27/00*
U.S. Cl. 416—94 **7 Claims**



3. An aircraft propulsion system comprising:

a) a pair of counterrotating turbines;

b) an annular ring surrounding each turbine;

c) an array of propfan blades extending from each ring; and

d) a cowl surrounding each ring and through which the propfan blades extend, and

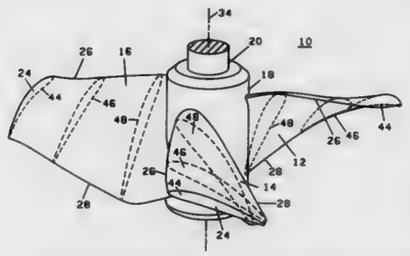
e) difussion means located near the root of the propfan blades which reduces the tendency of the air to accelerate as it enters each propfan array.

5,112,192

MIXING IMPELLERS AND IMPELLER SYSTEMS FOR MIXING AND BLENDING LIQUIDS AND LIQUID SUSPENSIONS HAVING A WIDE RANGE OF VISCOSITIES

Ronald J. Weetman, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Jul. 26, 1990, Ser. No. 559,126
Int. Cl.[5] B63H *1/00*
U.S. Cl. 416—201 A **32 Claims**



1. An impeller which produces flow ranging from turbulent to laminar flow in bodies of liquid and liquid suspensions and which is effective in mixing and blending such bodies, said impeller comprising a plurality of blades rotatable about an axis, said blades having tips which define the radius (R) of said impeller, said blades extending from said tips radially toward said axis, said blades having twist defined by inclinations thereof with respect to a plane perpendicular to said axis at angles which increase smoothly along said blades toward said axis to provide an over pitched condition, where the pitch ratio (PR) of the blades at a section thereof spaced 0.4 R from said axis is greater than PR at said tips, where PR is defined by the following equation:

$$PR = \frac{r}{R}\,\pi\tan\beta\,\frac{r}{R}$$

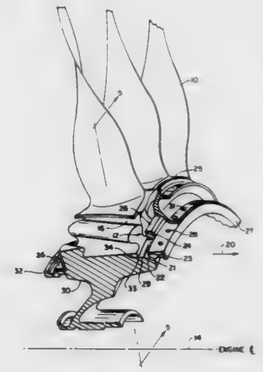
where r is the radius from the axis of rotation to the section where PR is computed in accordance with said equation, and β is the angle of inclination at said section in degrees.

5,112,193

FAN BLADE AXIAL RETENTION DEVICE

John Greer, Burlington; Haruhisa Chijiiwa, Mississauga, and Michael J. Dowhan, Milton, all of Canada, assignors to Pratt & Whitney Canada, Longueuil, Canada

Filed Sep. 11, 1990, Ser. No. 580,885
Int. Cl.[5] F01D *5/32*
U.S. Cl. 416—220 R **4 Claims**



1. A device for retaining a blade for an axial fan having a dovetail root received within a corresponding dovetail channel in an annular hub, wherein the dovetail channel further slopes radially outward with respect to the fan axial, comprising:

a radially outward facing circumferential groove cut into the exterior surface of the annular hub, wherein the groove is adjacent to the aft end of the dovetail channel;

a plurality of collar segments received within said groove, wherein said segments each have a radial dimension sufficient to block aftward movement of the blade root beyond the end of the dovetail channel; and

an annular rear cover plate secured to the hub and disposed circumferentially around the hub, and closely fitting around said collar segments, thereby holding said segments radially within said groove.

5,112,194

COMPOSITE BLADE HAVING WEAR RESISTANT TIP

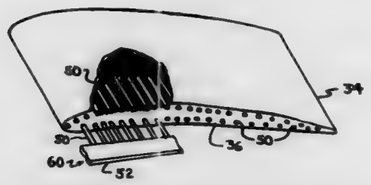
Edwin R. More, Hadley, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 18, 1990, Ser. No. 600,646
Int. Cl.[5] F01D *11/00, /5/14*
U.S. Cl. 416—230 **3 Claims**

1. A blade for use in a ducted rotary device of the type having a plurality of blades extending outwardly from a central rotating hub and a duct disposed coaxially about the hub and having a circumferential band of sacrificial material mounted

therein in closely spaced relationship about the tips of the blades, said blade comprising:

a. an airfoil shell fabricated from a composite material having a relatively low wear resistance and having an outboard tip portion having an end face surface juxtaposed in facing relationship to the surrounding duct; and



b. means operatively associated with the end face surface of the outboard tip portion of said blade for cutting away the sacrificial material in the circumferential band upon contact of the tip portion of said blade therewith, the cutting means comprising a plurality of elements of high wear resistance material embedded in the outboard surface of the tip portion of the relatively low wear resistance shell of said blade.

5,112,195

RADIAL FLOW ROTORS

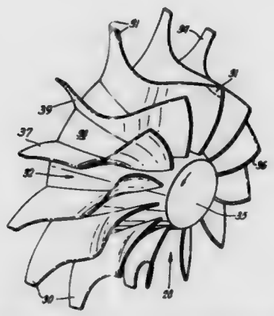
John C. Cox, Derby, England, assignor to Rolls-Royce plc, London, England

Continuation of Ser. No. 392,910, Aug. 14, 1989, abandoned. This application Mar. 15, 1991, Ser. No. 670,395

Claims priority, application United Kingdom, Oct. 19, 1988, 8824463

Int. Cl.[5] F04D *29/38*

U.S. Cl. 416—223 B **7 Claims**



1. A radial turbine engine including a radial flow turbine, the radial flow rotor having an axis of rotation and being provided with a plurality of generally axially extending vanes,

the axially extending vanes of the radial flow rotor defining generally axially extending gas passages,

the axially extending vanes of the radial flow rotor defining the axially extending gas passages being so configured that adjacent surfaces of each of the axially extending vanes define pressure and suction surfaces, whereby during operation of the radial flow rotor, at least a part of the axial extent of each of said axially extending vanes has a pressure surface which is convex in a radial direction.

5,112,196

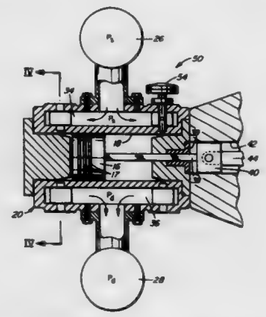
METHOD AND APPARATUS FOR ANALYZING THE OPERATING CONDITION OF A MACHINE

David N. Schuh, Calgary, Canada, assignor to Beta Machinery Analysis Ltd., Calgary, Canada

Filed Dec. 21, 1990, Ser. No. 631,872

Int. Cl.[5] F04B *21/08*

U.S. Cl. 417—63 **44 Claims**



1. A machine, comprising

a piston mounted for reciprocating movement in a cylinder;

a pressure activated valve movable between an open position and a closed position for controlling fluid flow between the interior and the exterior of the cylinder; and

means operative when the valve is in the closed position for measuring fluid flow across the valve.

5,112,197

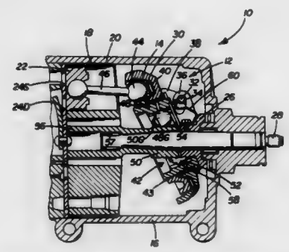
CROSS GROOVE JOINT SOCKET PLATE TORQUE RESTRAINT ASSEMBLY FOR A VARIABLE DISPLACEMENT COMPRESSOR

James C. Swain, Columbus; John P. Wilcox, Delaware, and David L. Thomas, Columbus, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 1, 1990, Ser. No. 591,993

Int. Cl.[5] F04B *1/26*; F16H *23/04*

U.S. Cl. 417—222 R **3 Claims**



1. An assembly for providing torque restraint of a socket plate for a variable displacement wobble plate compressor having a fixed housing and cylinder block and a rotatable drive hub, comprising:

a non-rotary cross groove joint means with grooves having longitudinal axes that intersect for restraining torque applied to said socket plate by said hub and for reducing vibration;

shaft means connected to said joint means;

means for fixedly mounting said shaft means on said housing;

means to provide relative translational axial motion between said shaft means and said joint means;

said shaft means transmitting the socket plate restraining torque to said compressor housing;

whereby socket plate rotation is prevented and torsional vibration is substantially eliminated.

5,112,198

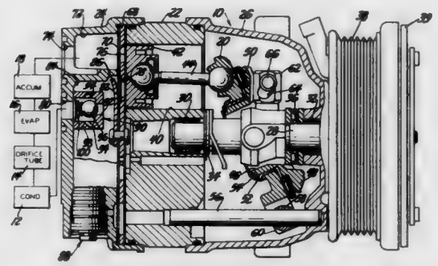
REFRIGERANT COMPRESSOR HAVING VARIABLE RESTRICTION PRESSURE PULSATION ATTENUATOR

Timothy J. Skinner, E. Amherst, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 8, 1991, Ser. No. 652,763

Int. Cl.[5] F04B *21/00*; F01N *7/10*

U.S. Cl. 417—269 **4 Claims**



1. A compressor assembly of the type for compressing a recirculated refrigerant fluid, comprising:

a compression chamber;

a suction valve for admitting fluid to said compression chamber;

a discharge valve for discharging fluid from said compression chamber;

a discharge cavity having a fluid inlet at said discharge valve and a downstream fluid outlet;

the improvement comprising a first orifice disposed in said discharge cavity between said discharge valve and said fluid outlet for directing fluid through said discharge cavity, a movable valve member biased into fluid sealing engagement with said first orifice for opening said first orifice to flow therethrough in response to a predetermined pressure upstream of said valve member in said discharge cavity, and a second orifice disposed in said discharge cavity between said discharge valve and said fluid outlet for directing fluid through said discharge cavity in a path around said valve member to provide an uninterrupted fluid flow through said discharge cavity at pressures below said predetermined pressure.

5,112,199

FLUID PUMP UNIT WITH FLOW CONTROL VALVE

Mizuo Otaki, and Miyoko Hamao, both of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Kanagawa, Japan

Filed Sep. 25, 1990, Ser. No. 587,667

Claims priority, application Japan, Sep. 26, 1989, 1-112195[U]

Int. Cl.[5] F04B *49/00*

U.S. Cl. 417—310 **11 Claims**

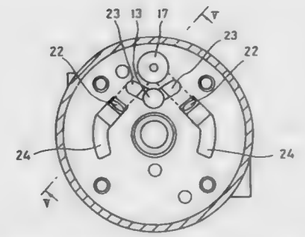
1. A fluid pump unit comprising:

a pump casing defining therein an internal space and having inlet and discharge passages;

a pump assembly housed within the internal space of the pump casing, said pump assembly receiving working fluid from a fluid source through said inlet passage and discharging pressurized working fluid to a pressure chamber formed between said pump casing and said pump assembly for supplying said pressurized working fluid to an external load through said discharge passage;

a flow control valve having a spool chamber defined in said pump casing, and a valve spool movably housed within said spool chamber, said spool chamber being communicated with said pressure chamber and having a plurality of through openings, said valve spool movable within said spool chamber from a first position in which said valve spool closes said through openings to a second position in which said valve spool opens said through openings when pressure within said pressure chamber becomes greater than a predetermined value; and

a plurality of drain passages formed in said pump casing independently of each other, and being respectively communicated with said through openings of the spool chamber, said drain passages having open ends opening to said



spool chamber directed essentially in a radial direction with respect to the axis of said spool chamber, said opening ends of said drain passages being arranged in circumferential alignment and at mutually different angular positions so as to exert fluid pressure onto said valve spool at mutually different angular orientation, said open ends of said drain passages being selectively opened and closed according to axial position of said valve spool for returning a part of the pressurized working fluid in said pressure chamber to said inlet passage when said valve spool opens said through openings of the spool chamber.

5,112,200

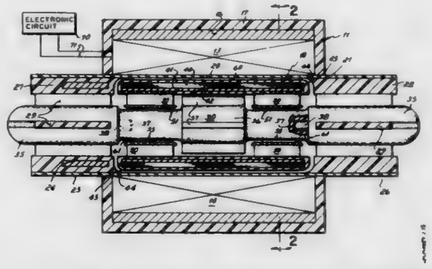
HYDRODYNAMICALLY SUSPENDED ROTOR AXIAL FLOW BLOOD PUMP

Milton S. Isaacson, and Anthony P. Lioi, both of Dayton, Ohio, assignors to Nu-Tech Industries, Inc., Dayton, Ohio

Filed May 29, 1990, Ser. No. 529,598

Int. Cl.[5] F04B *17/00*

U.S. Cl. 417—356 **12 Claims**



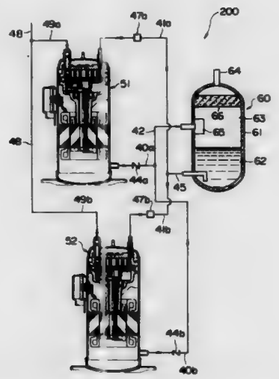
1. A brushless DC motor and blood pump combination comprising:

a sator having an axial cylindrical bore, said stator having windings and a control circuit to create flux in the said bore,

a cylindrical rotor disposed in said bore and having permanent magnets spaced around its perimeter to interact with said flux to rotate said rotor,

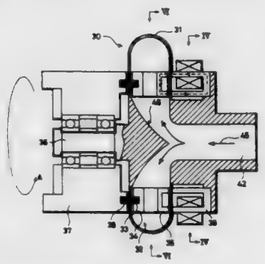
a gap of about 0.008 inch said rotor and said stator,
said rotor having a central axial passageway for the passage of blood, impellers mounted on said rotor in said passageway to pump blood through said passageway as said rotor rotates,
the relative motion between said rotor and said stator causing a pressure distribution in the blood within said gap that supports said rotor, thus forming a hydrodynamic bearing between said rotor and stator.

5,112,201
SCROLL COMPRESSOR APPARATUS WITH SEPARATE OIL RESERVOIR VESSEL
Takahiro Tamura, Shimizu, and Kazuo Sakurai, Shizuoka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 26, 1990, Ser. No. 557,788
Claims priority, application Japan, Aug. 2, 1989, 1-199432
Int. Cl.[5] F04B *39/06*; F04C *18/04, 23/00, 29/02*
U.S. Cl. 417—366 **2 Claims**



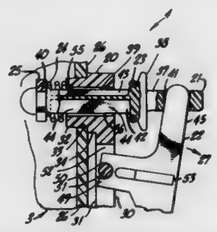
1. A scroll compressor apparatus comprising:
a closed scroll compressor;
an oil reservoir vessel separate from said closed scroll compressor and accommodating compressed compression medium and a lubricating oil;
a discharge pipe through which a discharge port of said closed scroll compressor is communicated with a part of said oil reservoir vessel in which the compression medium is accommodated; and
an oil supply pipe through which an oil supply port of said closed scroll compressor is communicated with another part of said oil reservoir vessel in which the lubricating oil is accommodated,
said closed scroll compressor comprising:
a closed container having a suction port through which the compression medium is suctioned;
a scroll compression mechanism unit encased in said closed container for compressing the compression medium and having a fixed scroll, an orbiting scroll and a driving shaft for rotatably driving said orbiting scroll;
a motor encased in said closed container for rotatably driving said driving shaft;
a first oil supply passage extending through an end plate of said fixed scroll and through which a first opening facing a sliding contact portion with said orbiting scroll is communicated with said oil supply port;
a second oil supply passage formed in an end plate of said orbiting scroll and through which said first opening is communicated with a second opening facing an end face of said driving shaft; and
a third oil supply passage formed in said driving shaft and through which said second opening is communicated with a third opening facing a bearing supporting said driving shaft,
wherein said discharge port is provided on said closed container at a portion located on the opposite side to said scroll compression mechanism unit with respect to said motor.

5,112,202
TURBO PUMP WITH MAGNETICALLY SUPPORTED IMPELLER
Saburo Oshima; Tsugito Nakazeki, both of Shizuoka; Teruaki Akamatsu, Kyoto, and Motoharu Niki, Nara, all of Japan, assignors to NTN Corporation, Osaka, Japan
Filed Jan. 23, 1991, Ser. No. 644,777
Claims priority, application Japan, Jan. 31, 1990, 2-22849; Oct. 11, 1990, 2-274656; Oct. 11, 1990, 2-274657
Int. Cl.[5] F04B *17/00, 35/04*; F03B *13/00*
U.S. Cl. 417—423.7 **15 Claims**



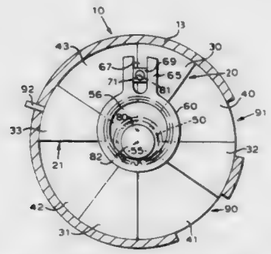
1. A pump, comprising:
a rotating member having blades providing energy to a fluid, and adapted to be capable of receiving a magnetic action from the outside;
a casing for housing said rotating member;
means for supporting said rotating member from outside of said casing in a non-contacting manner with said casing; and
rotatable means for magnetically rotating said rotating member from outside of said casing.

5,112,203
VESSEL VACUUM RELEASE
Theodore C. Neward, 521 Scripps Dr., Claremont, Calif. 91711
Filed Jul. 30, 1990, Ser. No. 559,621
Int. Cl.[5] A61F *5/41*; F04B *39/08*; F16K *31/44*
U.S. Cl. 417—440 **10 Claims**



1. A valve for use with a vessel having a wall with an opening for receiving the valve comprising:
a base adapted to be frictionally held in the opening and having a channel communicating between a first and a second space defined by the wall;
a plunger disposed within the channel to reciprocate between an open and a closed position, and having at least one longitudinal passageway through which gas can travel between the first and second spaces when the plunger is in the open position, and through which gas is prevented from traveling between the first and second spaces when the plunger is in the closed position;
rocker means for reciprocating the plunger between the open and the closed positions, the rocker means sized and dimensioned to be finger operated; and
the base, plunger and rocker being interconnected such that the vacuum release can be removably attached to the vessel wall as a single unit.

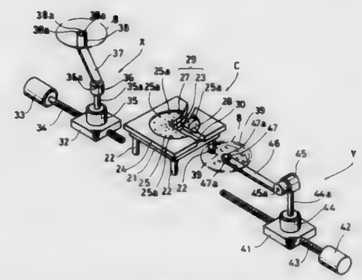
5,112,204
OSCILLATORY ROTATING ENGINES WITH ROTOR SPEED CONTROL
Bryan N. V. Parsons, Stoney Stanton, United Kingdom, assignor to Jaguar Cars Limited, United Kingdom
Filed Nov. 13, 1990, Ser. No. 613,157
Claims priority, application United Kingdom, Nov. 15, 1989, 8925868
Int. Cl.[5] F01C *1/07*
U.S. Cl. 418—36 **17 Claims**



1. An oscillatory rotating engine comprising a pair of rotors, each rotor defining a pair of diametrically opposed radially extending lobes, the rotors being mounted coaxially of one another within a cylindrical housing defined by a pair of end walls and a cylindrical wall, the lobes in sealing engagement with the end walls and cylindrical wall of the cylindrical housing to define four working chambers; the rotors being drivingly connected to an output shaft, one of the rotors being connected to the output shaft by means of an internal/external gear train, one of the gears being mounted for rotation with said one rotor, the other gear being rotatably mounted eccentrically on the output shaft so that it meshes with said one gear, said other gear having a formation which engages a complementary formation to prevent free rotation of said other gear, the formation on the other gear being capable of linear and pivotal movement relative to said complementary formation so as to impose an oscillatory rotation on said other gear; said other rotor being drivingly connected to the output shaft for rotation in the same direction as said one rotor and at the same overall velocity ratio.

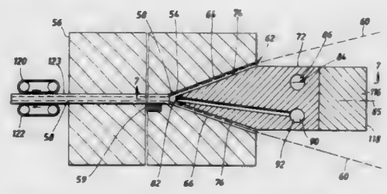
5,112,205
OPTICAL-DISK MANUFACTURING APPARATUS
Hidetoshi Watanabe, Ibaragi; Hirotsugu Suzuki, Chiba, and Masanobu Yamamoto, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed May 4, 1990, Ser. No. 519,398
Claims priority, application Japan, May 15, 1989, 1-121073; May 17, 1989, 1-123680
Int. Cl.[5] B29D *17/00*
U.S. Cl. 425—111 **11 Claims**

1. An optical-disk manufacturing apparatus in which a disk plate supplied from a disk plate supplying section is coated with a synthetic resin on one side thereof in a synthetic resin supplying section and then transported to a transfer section to transfer a pattern provided in a stamper to the synthetic resin of the disk plate, the synthetic resin supplying section comprising:
a table having a disk plate setting section for mounting the disk plate, and a curved slot formed there through by which a center of the disk plate setting section communicates with an outside portion of the table; and
a first disk plate transport means having suction means for attracting a central part of the disk plate and transporting the attracted disk plate to the disk plate setting section of the table;



wherein said first disk plate transport means includes first means for moving the suction means of the first disk plate transport means toward and away from said table in a plane substantially parallel thereto, second means for raising and lowering said suction means relative to the plane of the table, and third means for rotating said suction means about an axis substantially perpendicular to the plane of said table, so as to move said suction means into the curved slot of said table for transporting the disk plate from the outside portion of the table to the center of the disk plate section of the table.

5,112,206
APPARATUS FOR THE RESIN-IMPREGNATION OF FIBERS
Steven L. Stewart, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Filed May 16, 1991, Ser. No. 700,824
Int. Cl.[5] B29C *47/04*
U.S. Cl. 425—114 **6 Claims**



1. An apparatus capable of impregnating a fiber with a hardenable resin, said apparatus comprising;
an impregnation die having an inlet end and an outlet end and having a central duct opening defined therebetween sized for the passage of at least one resin-impregnated fiber therethough, said inlet end of said impregnation die having a tapered opening defined by at least one tapered surface convergedly intersecting said central duct opening,
a resin feed head cooperatively positionable within said tapered opening, a portion of said resin feed head sized to be spaced from said tapered surface to allow at least one fiber to be drawn therebetween and thereafter into said central duct opening, said resin feed head having a mixing

face positioned adjacent said central duct opening, said resin feed head having a first resin flow opening means and a second resin flow opening means defined therethrough, said resin flow opening means defining separate resin flow openings in said mixing face, and

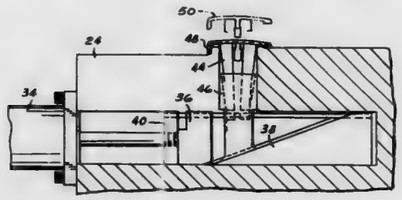
ultrasonic driver means operatively coupled to said resin feed head which vibrates said resin feed head.

5,112,207

SELF-RELEASING MOLD

Alec Pinsonneault, St. Joachim, Canada, assignor to Build-A-Mold Limited, Windsor, Canada

Filed Apr. 4, 1991, Ser. No. 680,291
Int. Cl.[5] B29C *45/44*
U.S. Cl. 425—192 R **14 Claims**



1. A mold comprising:

a mold top and a mold bottom selectively movable towards each other to define a cavity therebetween, a plastic injection port injecting fluent plastic into the cavity to form a part, at least one mold pin associated with said mold bottom to define a cavity portion to form a portion of the part, said portion of the part extending away from a body of the part, said mold pin being movable from a molding position at which it defines a cavity to form the portion of the part and a release position at which it allows the portion of the part to move outwardly of the cavity to release the part;

first means to move said mold pin between said molding position and said release position, and second means to eject the part from the mold after said mold pin has moved to said release position;

said first means to move said mold pin between the molding and release positions includes a ramp member and a holder causing said mold pin to move between said molding and release positions, said ramp being moved to move the holder relative to said mold pin, and said holder camming said mold pin between said molding and release positions; and

a bolt extends freely through an aperture in said mold pin, said bolt moving with said ramp member, said bolt being removable from said ramp member such that said mold pin can be removed from said mold bottom.

5,112,208

PIZZA DOUGH ROLLER MACHINE

Dean Voth, P.O. Box 191, Lampe, Mo. 65681

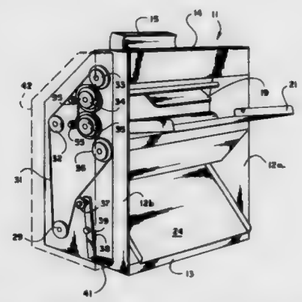
Division of Ser. No. 538,761, Jun. 15, 1990, abandoned. This application May 6, 1991, Ser. No. 700,091
Int. Cl.[5] B29C *53/16*
U.S. Cl. 425—367 **10 Claims**

1. For use in a dough rolling machine having a rotating roller mounted on a fixed axis between a pair of walls and a rotating roller on a movable axis parallel thereto, an improved eccentric mechanism for adjusting the space between the rollers comprising:

a pair of eccentric housings, one in each of said walls, rotatably mounted about a housing fixed axis parallel to said fixed roller axis, said movable roller being eccentrically mounted between said housing on an axis parallel to said fixed axes, said housing having gear teeth about circumferential surfaces thereof exterior to said walls;

a shaft journalled through said walls for rotation about a shaft fixed axis parallel to said roller and housing fixed axes;

a pair of sprockets mounted on said shaft, one exteriorly of each of said walls, each of said sprockets having gear teeth



rotatably engaged with said gear teeth of its respective housing; and

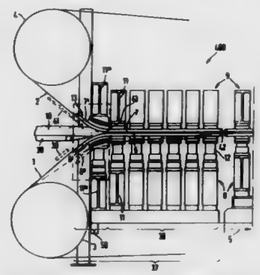
means for rotating said shaft about said shaft fixed axis whereby said sprockets and said housings are simultaneously rotated to alter the spacing between said fixed and movable rollers while maintaining said fixed roller axis and said variable roller axis in parallel relationship.

5,112,209

TWIN-BELT PRESS FOR MANUFACTURING PARTICLE BOARDS

Karl-Heinz Ahrweiler, Willich, and Bernd Heimes, Monchengladbach, both of Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GmbH & Co KG, Krefeld, Fed. Rep. of Germany

PCT No. PCT/DE88/00602, § 371 Date Apr. 5, 1990, § 102(e) Date Apr. 5, 1990, PCT Pub. No. WO89/03288, PCT Pub. Date Apr. 20, 1989
PCT Filed Sep. 30, 1988, Ser. No. 466,309
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734180
Int. Cl.[5] B27N *3/24*; B30B *5/06*
U.S. Cl. 425—371 **13 Claims**



1. A double-band press for the continuous production of wood-chip boards and similar board materials from panel materials consisting of wood-particles held together by a binding agent that is curable under heat and pressure, said press comprising:

two metallic form bands heated to an elevated temperature, each having upper and lower runs; means for continuously circulating said form bands about upper and lower guide drums at substantially the same speed so that the form bands advance within a substantially flat compression section from a feed-in section, said compression section being adapted to compress a mat formed from the particles between the two form bands in a feed gap under the influence of pressure and heat;

a feeding device conveying the mat to the feed gap between the form bands, said feeding device having a feed tray on which the mat is introduced between the form bands, said feed tray extending away from the flat compression section from a position closely above a portion of the feed-in section of the upper run of a lower of said form bands that is in the vicinity of the upper guide drum;

an upper support structure having an upper support plate and a lower support structure having a lower support plate, each of said support structures supporting one of said form bands and transferring heat and pressure thereto, each of said support plates having a zone forming the feed-in section; and

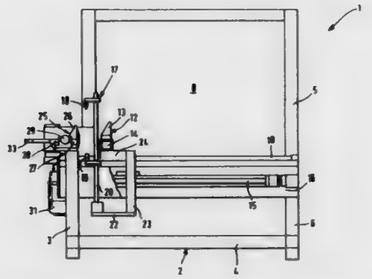
an initial feeder segment disposed at an end of said feed-in section remote from said compression section, said initial feeder segment formed by corresponding portions of each support plate to convey the mat through the feed-in section to the flat compression section, at least one of the corresponding portions having a curvature that is convex relative to the other corresponding portion in the vertical, longitudinal plane of the double-band press, and said form band supported on said convex corresponding portion conforms to the curvature thereof, said convex corresponding portion of the support plate having a length beginning at a first contact point between the mat and said form band supported on said convex corresponding portion and ending at a transition point in the feed-in section, said length equalling a distance which, at said speed of said form bands, is traversed by the form bands over a time period during which the heat transmitted by the form bands has not yet reached an inner zone of the mat, the corresponding portion of the lower support plate forming the initial feeder segment and the lower support plate zone forming the feed-in section together form an inflexible unit, said inflexible unit being pivotable about a cross shaft disposed at an end of the feed-in section remote from the initial feeder segment, a perpendicular distance between the cross shaft and the upper support plate being adjustable.

5,112,210

BENDING MACHINE

Rinhard Weissfloch, Aachen, Fed. Rep. of Germany, assignor to Wegener GmbH, Fed. Rep. of Germany

Filed Oct. 31, 1990, Ser. No. 604,908
Claims priority, application European Pat. Off., Nov. 1, 1989, 89120237.6
Int. Cl.[5] B29C *53/04*
U.S. Cl. 425—383 **20 Claims**



1. A bending machine for thermoplastic workpieces, comprising:

a. a first clamp assembly comprising first and second clamping jaws;

b. a second clamp assembly disposed along a first side of said first clamp assembly and comprising third and fourth clamping jaws, said second clamp assembly displaceable relative to said first clamp assembly;

c. a heater assembly comprising at least a first heating knife disposed along said first side and displaceable relative to said first clamp assembly; and,

d. a bending jaw disposed along an opposite second side of said first clamp assembly and being pivotal between a first position in planar alignment with said second clamping jaw and a second position angularly disposed relative thereto.

5,112,211

PIPE LINING APPARATUS

Patrick LeDoux, and Lac Fourgant, both of New Orleans, La., assignors to Pipe Liners, Inc., Metairie, La.

Division of Ser. No. 114,949, Oct. 30, 1987, Pat. No. 4,985,196.
This application Dec. 12, 1990, Ser. No. 626,536
Int. Cl.[5] B29C *35/00*
U.S. Cl. 425—384 **8 Claims**



1. Apparatus for installing a collapsed generally U-shaped liner within a pipe wherein the liner has a radially inwardly extending fold extending longitudinally along its length, comprising:

means for pulling said liner into and through said pipe such that said liner extends outwardly from opposite ends of said pipe;

means for mechanically initiating expansion of said liner at opposite ends thereof and including a pair of generally cylindrical members, each of said members having a wedge shape at one end defining a generally inclined face between opposite sides thereof, with one side extending axially beyond the opposite side to define a tip along said opposite side for engaging within an outwardly extending end of the generally U-shaped pipe liner between one side of the liner and the inwardly extending fold thereof to reform the liner end into a generally cylindrical configuration;

each said wedge-shaped member having packing means for sealing the cylindrical end of the liner after the initial expansion thereof into the cylindrical configuration, one of said members having an internal bore for connection to a fluid source for introducing fluid into the liner; and

means for applying heat within said liner including flowing heated fluid through said bore to raise the temperature of the liner.

5,112,212

SHOOTING POT WITH COMBINED VALVE AND PISTON

Vitaly Akselrud, Richmond Hill, and Stefan von Buren, Toronto, both of Canada, assignors to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed May 2, 1991, Ser. No. 694,766
Int. Cl.[5] B29C *45/02*
U.S. Cl. 425—557 **15 Claims**

1. A metering device for inclusion in a conduit means, said conduit means providing a single path for advancing precise quantities of a thermoplastic material from a source of said

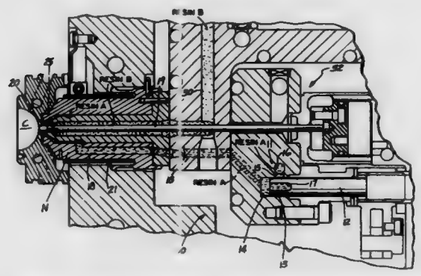
material to a mold cavity via a hot runner system including a nozzle means for delivering said material to said mold cavity, said nozzle means having a valve stem communicating with said mold cavity, said metering device comprising:

a cylinder means for housing a piston means within said hot runner system, spaced from and independent of said valve stem,

a piston means within said cylinder means for injecting said material,

a first reservoir in said cylindrical means for receiving said material,

said first reservoir having inlet means communicating with said source, via said conduit means, providing entry into said cylindrical means and outlet means providing a connection with said conduit means communicating with said nozzle means,



means for rotating and means for reciprocating said piston means,

said piston means being movable in a first direction from a first position wherein said inlet means is open to a second position wherein said inlet means is closed by said piston means to block back flow of said material into said conduit means,

said piston means being movable further in a second direction to a third position to inject said material from said first reservoir through said outlet means toward said nozzle means whereby said piston means is operable dually to function as a valve and to function as a means for advancing said material.

5,112,213

DRIVEN RING-TYPE NON-RETURN VALVE FOR INJECTION MOLDING

David C. Oas, Westlake, Ohio, assignor to Van Dorn Company, Cleveland, Ohio

Filed Feb. 26, 1991, Ser. No. 660,513
Int. Cl.[5] B29C *45/52*
U.S. Cl. 425—562 **11 Claims**



1. A non-return valve assembly for use in an injection molding machine including a plasticating screw rotatably and axially movable within a barrel and having means for controlling rotation of said plasticating screw in both clockwise and counterclockwise directions within said barrel, said assembly comprising:

a) a tip member having a rearward end removably affixed to the forward end of said plasticating screw, a configured forward retainer end and an intermediate rod portion between said retainer and rearward ends;

b) an annular check valve seat member adjacent said rearward end of said tip member and the forward end of said plasticating screw;

c) an annular check ring concentrically receiving said rod portion to axially and radially move relative to said rod portion between said retainer and rearward ends of said tip member, said check ring having a valve seat formed on its rearward end and a forward end defined by a forward annular edge surface; and

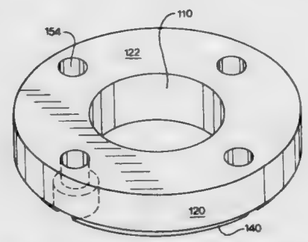
d) cam means associated with said forward annular edge surface of said check ring and said retainer end for positively forcing said check ring valve seat to sealingly close against said annular valve seat member through mechanical contact between said check ring and said retainer end when said plasticating screw is rotated in a direction opposite to that whereat molding material flows from said screw through said check ring.

5,112,214

LOCATOR RING FOR INJECTION MOLD AND COMPOSITION THEREFOR

Edward W. Glatt, Jr., 538 Crown Point Ct., Buffalo Grove, Ill. 60089

Filed Mar. 12, 1991, Ser. No. 668,054
Int. Cl.[5] B29C *45/17, 45/26*
U.S. Cl. 425—567 **6 Claims**



1. A locater ring for assisting in a placement of a mold in an injection molding device wherein:

a. said locater ring is formed from a composition comprising a nylon resin mixture;

b. said nylon resin mixture including a high impact nylon, and a heat stabilized and lubricated nylon;

c. said locater ring being donut shaped with a top tapered edge and a bottom cylindrical portion; and

d. said locater ring including a mold securing means for allowing attachment of said locater ring to said mold.

5,112,215

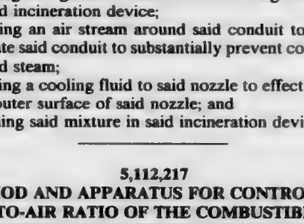
APPARATUS FOR COMBUSTION, POLLUTION AND CHEMICAL PROCESS CONTROL

Michael B. Frish, Andover; Joseph Morency, Salem; Stephen A. Johnson, and Arthur A. Boni, both of Andover, all of Mass., assignors to Physical Sciences, Inc., Andover, Mass.

Filed Jun. 20, 1991, Ser. No. 724,540
Int. Cl.[5] F23J *7/00*
U.S. Cl. 431—3 **32 Claims**

1. A system for controlling operating parameters of a combustion process yielding products including flowing gases having particles entrained therein, said system comprising:

a. plural photodetectors for detecting preselected wavelengths of light emitted from particles entrained in the combustion product gas stream, wherein the intensities of the light at said preselected wavelengths are indicative of inefficiencies in the combustion process, and wherein each photodetector detects a band of wavelengths of light different from the others; and



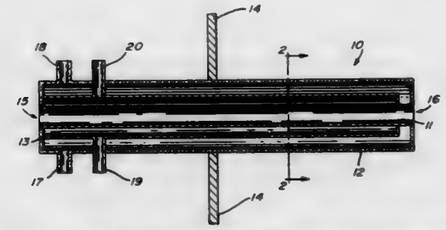
b. means for generating a signal indicative of the intensities of light at said wavelengths detected by the photodetectors, for indicating the presence of inefficiency.

5,112,216

PULP MILL GAS COMBUSTION PROCESS

Trevor I. Tenn, North Vancouver, Canada, assignor to Chemetics International Company Inc., North York, Canada

Filed Sep. 29, 1989, Ser. No. 414,403
Claims priority, application Canada, Dec. 22, 1988, 586928
Int. Cl.[5] F23D *14/00*
U.S. Cl. 431—5 **3 Claims**



1. A process for the combustion of non-condensable gases produced in a pulp mill in an incineration device said gases comprising total reduced sulfur gases and explosive gases, which have toxic and auto-ignition properties, said device having an injection nozzle comprising a conduit and a portion defining an outer surface disposed within said incineration device said process comprising

(a) mixing said gases with steam to produce a gaseous steam mixture,

(b) passing said gaseous steam mixture through said conduit to said incineration device;

(c) passing an air stream around said conduit to thermally insulate said conduit to substantially prevent condensation of said steam;

(d) passing a cooling fluid to said nozzle to effect cooling of said outer surface of said nozzle; and

(e) burning said mixture in said incineration device.

5,112,217

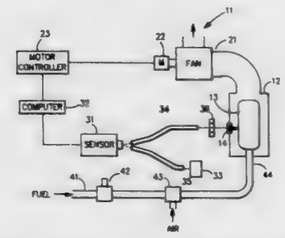
METHOD AND APPARATUS FOR CONTROLLING FUEL-TO-AIR RATIO OF THE COMBUSTIBLE GAS SUPPLY OF A RADIANT BURNER

Chester D. Ripka, E. Syracuse, and Daniel R. Clark, Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 20, 1990, Ser. No. 557,355
Int. Cl.[5] F23N *3/00*
U.S. Cl. 431—12 **9 Claims**

1. In a heating appliance employing a surface combustion or radiant burner that burns a combustible gas comprised of a mixture of gaseous fuel and combustion air and that emits radiation while burning said combustible gas, having means for supplying said gaseous fuel to said radiant burner at one or more flow rates and having means for supplying said combustion air to said radiant burner at a variable flow rate, a method of setting the proportion of said gaseous fuel to said combustion air in said combustible gas to a desired proportion comprising the steps of:

determining a reference intensity, said reference intensity being the intensity of radiation emitted by said radiant burner when said radiant burner is burning a reference combustible gas, said reference combustible gas being a combustible gas having a proportion of gaseous fuel to combustion air that is equal to said desired proportion;



setting said gaseous fuel supply means at a given flow rate;

sensing the intensity of radiation emitted by said radiant burner while said radiant burner is burning said combustible gas; and

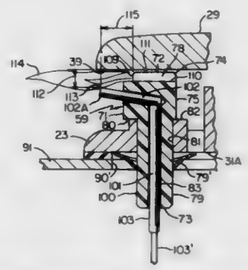
controlling said combustion air supply means so as to reach and maintain a flow of combustion air that will produce a resultant combustible gas having such a proportion of gaseous fuel to combustion air that, when said radiant burner burns said resultant combustible gas, said radiant burner will emit radiation at an intensity equal to said reference intensity.

5,112,218

BURNER CONSTRUCTION, IGNITER ASSEMBLY THEREFOR AND METHODS OF MAKING THE SAME

Kent K. Sigler, Youngwood, Pa., assignor to RobertShaw Controls Company, Richmond, Va.

Filed Sep. 13, 1991, Ser. No. 759,217
Int. Cl.[5] F23Q *3/00*
U.S. Cl. 431—266 **4 Claims**



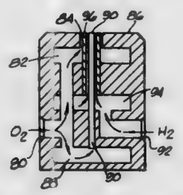
1. In a method of making a burner construction comprising a burner body means and said burner body means having a chamber means therein and having opposed end means one of which is open to said chamber means and the other of which has means for interconnecting a source of fuel to said chamber means, and a removable cap means closing said one end means of said body means, said burner construction having port means interconnecting said chamber means to the exterior of said burner construction and through which said fuel can issue to burn externally to said burner construction, said body means having an annular surface means interrupted by a plurality of

radially disposed groove means that are spaced apart by land means of said annular surface means, said cap means having an annular surface means cooperating with said annular surface means of said body means to close said groove means on one end thereof whereby said groove means define said port means, said body means having an igniter receiving slot means therein, and an igniter assembly having a part thereof disposed in said slot means, said igniter assembly comprising an electrically insulating member having an intermediate portion and having opposed end surface means one of which is disposed adjacent said cap means, and an electrically conductive L-shaped electrode means carried by said body member and having two legs one of which extends out of said intermediate portion thereof for sparking to said cap means and the other of which extends out of the other of said opposed end surface means of said insulating body member for electrical connection purposes, the improvement comprising the steps of forming said body member to comprise a one-piece member, forming said two legs of said electrode means to initially comprise two separate parts, disposing said two legs so as to respectively have end means thereof adjacent each other in said body member, and then securing said adjacent end means together inside said body member.

5,112,219
DUAL MIXING GAS BURNER

Scott Hiemstra, Colorado Springs, Colo., assignor to Rocky Mountain Emprise, Inc., Colorado Springs, Colo.

Filed Sep. 14, 1990, Ser. No. 582,485
Int. Cl.[5] B05B *7/00*; F23D *14/48*
U.S. Cl. 431—354 **3 Claims**

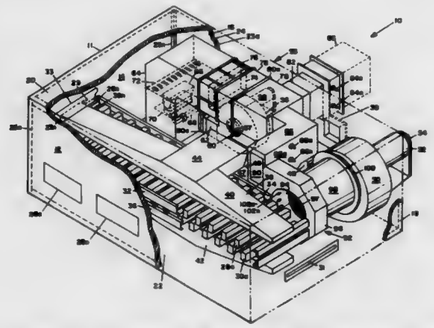


1. A multiple-jet, dual mixing gas burner comprising:
housing means, said housing means having a flat front burner surface containing a multiplicity of jets, a flat rear surface, and at least one side surface;
an oxygen port located on said side surface for permitting entry of oxygen gas into the housing means;
a fuel gas port located on said side surface opposite said oxygen port for permitting entry of a fuel gas into the housing means;
first and second oxygen chambers within said housing means for receiving oxygen entering said housing means at said oxygen port, said first oxygen chamber being located adjacent said flat rear surface within said housing means and said second oxygen chamber being located adjacent said front burner surface within said housing means;
central oxygen jet means, associated with each of said multiplicity of jets, said central oxygen jet means being coupled between said first oxygen chamber and each of said multiplicity of jets contained on said front burner surface of said housing means for conveying oxygen gas from said first oxygen chamber to each of said multiplicity of jets contained on said front burner surface;
a fuel gas chamber within said housing means for receiving fuel gas entering said housing means at said fuel gas port, said fuel gas chamber being located between said first and second oxygen chambers within said housing means;
fuel gas jet means, coaxially positioned with and surrounding each of said central oxygen jet means associated with each of said multiplicity of jets, for conveying fuel gas from said fuel gas chamber to an annular area on said front burner surface around each of said central oxygen jet means associated with each of said multiplicity of jets; and
outer oxygen jet means, coaxially positioned with and surrounding each of said fuel gas jet means, for conveying oxygen gas from said second oxygen chamber to an annular area on said front burner surface around each of said fuel gas jet means.

5,112,220
AIR FLOTATION DRYER WITH BUILT-IN AFTERBURNER

Richard J. Wimberger, DePere, and Richard A. Carman, Green Bay, both of Wis., assignors to W.R. Grace & Co.-Conn., Lexington, Mass.

Filed Jun. 7, 1988, Ser. No. 203,137
Int. Cl.[5] F26B *13/00*
U.S. Cl. 432—8 **7 Claims**



6. Process of circulating air through an air flotation dryer with an afterburner comprising:
a. supplying heated air from an air supply to opposing air bars for flotation and drying of a web;
b. recirculating spent air back to said air supply with a recirculating fan;
c. adding makeup air to said recirculated air;
d. exhausting spent air with vaporous solvents to a burner area with an exhaust fan;
e. adding combustion air to said burner air and oxidizing said vaporous solvents to produce a heated combustion exhaust;
f. returning a portion of the said combustion exhaust to said supply air with said recirculating fan;
g. exhausting a portion of the combustion exhaust outside of said air flotation dryer; and,
h. mixing with a sprager said air supply with said hot return air.

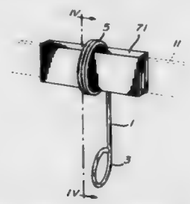
5,112,221
EXTRUSION SPRING ARM

Sally J. Terry, 137 Beekman St., Plattsburgh, N.Y. 12901

Filed Jul. 12, 1990, Ser. No. 551,797
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—21 **5 Claims**

1. An extrusion spring arm for aiding in the eruption of a palatally impacted tooth of a patient and mountable on an archwire fixed in said patient's mouth, comprising:
an elongated resilient wire having a first end and a second end;
said first end being formed in the shape of loop means;
said second end being formed as spring means;
said first and second ends being in substantial alignment;
means for mounting said resilient wire on said archwire;

said spring means being fixedly attached to said means for mounting;
wherein said spring means comprises a coil spring;

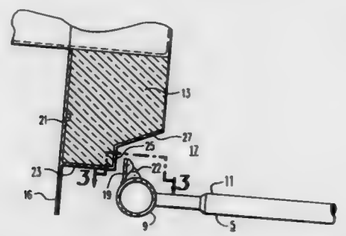


and wherein said means for mounting comprises a tubular member, said tubular member comprising a closed tube;
said coil spring surrounding said closed tube and being fixedly attached thereto.

5,112,222
DEBRIS TOLERANT SEAL

Donald P. Flading, Manor, and Robert S. Mavretish, New Stanton, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 1, 1991, Ser. No. 694,159
Int. Cl.[5] F27B *7/24*
U.S. Cl. 432—115 **5 Claims**

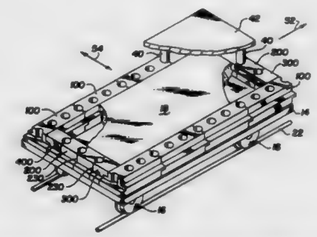


1. An improved debris tolerant seal between a refractory ring and a ring header disposed at an inlet end of a rotary combustor which rotates about an inclined axis and in which municipal solid waste is burned, said seal comprising a circumferential bar attached to and extending radially inwardly from the ring header, the circumferential bar is made up of a plurality of segments, each of said segments being disposed parallel to a plane perpendicular to the axis of the rotary combustor, the refractory ring having a pair of outer sheathed surfaces adjacent the circumferential bar, one of the sheathed surfaces being parallel to and spaced from the circumferential bar and the other sheathed surface being contiguous with the one sheathed surface and inclined so as to extend radially inwardly and away from said inlet end of said combustor, and away from said circumferential bar whereby large pieces of debris are prevented from entering the space between the one sheathed surface and the circumferential bar a small debris can pass therebetween, the circumferential bar having a refractory material disposed on the combustor side thereof to prevent the circumferential bar from burning out.

5,112,223
HOLLOW LOAD-BEARING UNIVERSAL KILN CAR REFRACTORY MODULES

Warren R. Walle, Gettysburg; Jack B. Ross, Biglerville; Jesse A. Hamilton, Gettysburg, all of Pa., and Delfin C. Martinez, San Pedro, N. Mex., assignors to Dal-Tile Corporation, Dallas, Tex.

Filed Mar. 4, 1991, Ser. No. 664,405
Int. Cl.[5] F27B *9/26*
U.S. Cl. 432—241 **20 Claims**

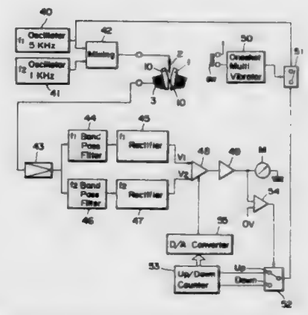


10. A thermal insulating apparatus positionable between the platform of a film car and a load of refractory ware, the thermal insulating apparatus comprising: a curb formed of modules positioned end to end around the periphery of the platform of the kiln car, each module having a curved end wall segment configured such that curved end wall segments of adjacent modules form a socket adapted to receive and support a vertically extending cylindrical refractory post spaced above the platform of a kiln car; and an insulating amount of refractory insulation dispersed over the platform of the kiln car within said curb of modules.

5,112,224
DENTAL DETECTION APPARATUS FOR POSITION OF ROOT APEX

Kazunari Shirota, Tokyo, Japan, assignor to Shirota Denki Rozai Kabushiki Kaisha, Tokyo, Japan.

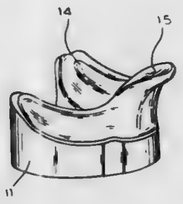
Filed Mar. 12, 1991, Ser. No. 667,995
Claims priority, application Japan, Jul. 13, 1990, 2-75018[U]
Int. Cl.[5] A61C *1/00, 5/02*; A61B *5/103*
U.S. Cl. 433—27 **1 Claim**



1. A dental detection apparatus for locating the position of a root apex of a tooth in a body of a dental patient comprising:
a reamer for insertion into a root canal of said tooth;
a single electrode contacting said body of said dental patient near said tooth;
two oscillators which generate currents having two different frequencies;
said oscillators connected to said reamer;

said currents passing through said reamer and said body as attenuated currents to said single electrode;
a differential amplifier connected to said single electrode for detecting a difference $_{D}V$ of respective impedance variations in said attenuated currents;
a direct current amplifier connected to said differential amplifier for amplifying the output of said differential amplifier;
a meter connected to said direct current amplifier for displaying the output of said direct current amplifier;
a comparator connected to an output side of said direct current amplifier and to an input side of a two contact analog switch,
a binary up/down counter connected to an output side of said two contact analog switch for switching said counter to an up or to a down condition depending on an input frequency of said two contact analog switch;
a direct current/alternating current converter connected to an output side of said binary up/down counter;
an output side of said direct current/alternating current converter connected to said differential amplifier to create an offset of said differential amplifier;
an automatic calibration switch connected to one of said two oscillators for passing a frequency signal from said one of said two oscillators when switched on to said binary up/-down counter through said two contact analog switch;
wherein switching on said automatic calibration switch when said reamer is first inserted into said root canal determines a condition of said root canal displayed on said meter and when thereafter switching off said automatic calibration switch enables further insertion of said reamer to compensate for said condition and locate said root apex by display on said meter.

5,112,225
CUSTOM DENTAL TRAY
Michael Diesso, P.O. Box 648, Wareham, Mass. 02538
Filed Aug. 2, 1991, Ser. No. 739,879
Int. Cl.[5] A61C *9/00*
U.S. Cl. 433—48 7 Claims



1. A custom dental tray comprising a polymer composition containing at least about 75% by weight of polycaprolactone polymers wherein said composition has melting point of from about 120° F. to about 160° F.; said polycaprolactone polymers have an average molecular weight of from about 35,000 to about 60,000, and said polycaprolactone polymers have the formula



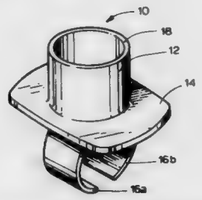
wherein R is an aliphatic group, and n is 300 to 650.

5,112,226
CONSTANT PRESSURE PERIODONTAL PROBE
J. Robert Lemon, Charlotte; William T. Evans; Robert E. Christian, both of Batesville, all of Ark., and Herbert I. Bader, Sharon, Mass., assignors to Professional Dental Technologies, Inc., Batesville, Ark.
Filed Oct. 25, 1990, Ser. No. 603,638
Int. Cl.[5] A61C *19/04*
U.S. Cl. 433—72 8 Claims



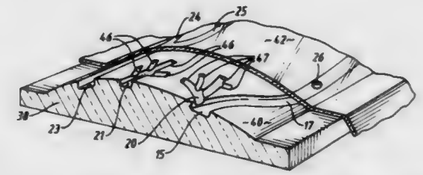
1. A constant pressure periodontal probe comprising a handle, a probing portion extending from the handle, and a rigid backing portion extending from the handle adjacent to but spaced away from the probing portion by a gap, a flexing joint provided in the probing portion, the flexing joint being a portion of reduced strength to allow the probing portion to be displaced about the flexing joint as resistance to insertion increases, the backing portion providing a stop to limit displacement of the probing portion, contact between the backing portion and the probing portion indicating that a desired insertion pressure has been reached.

5,112,227
MATERIAL HOLDING APPARATUS WITH INTEGRATED FINGER MOUNT
Charles L. Bull, Lake Rd. 54-22, Box 468, Osage Beach, Mo. 65065
Filed Oct. 19, 1990, Ser. No. 600,585
Int. Cl.[5] A61C *3/00*; A41D *19/00*; A61B *19/02*
U.S. Cl. 433—163 26 Claims



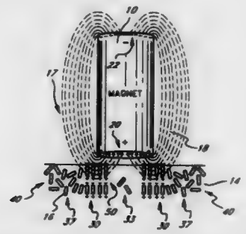
1. A materials holding device sized to fit the human hand consisting of a receptacle, a platform creating a planar flange and a positioning means all formed from a single piece of material wherein said receptacle consists of a generally cylindrical wall having an open mouth defined by the rim of said wall at a first end and converging substantially perpendicularly at its second end with a first side of said platform, a portion of said first side of said platform creating the bottom of said receptacle; and wherein said platform stabilizes said device on the hand of said user when said device is in use; and wherein said positioning means extends from a second side of said platform at a location opposite the area where said receptacle converges with said platform; and wherein said positioning means is adapted to detachably position said device on the hand of the user and wherein said receptacle is in the center of said platform and is substantially concentric therewith.

5,112,228
VASCULAR MODEL
Sally V. Zouras, Sacramento, Calif., assignor to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.
Continuation of Ser. No. 435,956, Nov. 13, 1989, abandoned. This application May 13, 1991, Ser. No. 702,144
Int. Cl.[5] G09B *23/30*
U.S. Cl. 434—272 7 Claims



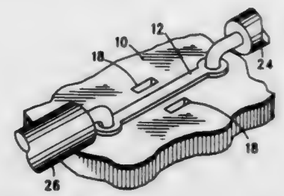
4. An anatomical model representing a portion of a human arterial system including a relatively flat body having a plurality of interconnected open-top channels in the upper surface thereof and a covering over the upper surface to close the open channels to thereby define the artery-simulating passageways.

5,112,229
MAGNETIC VISUAL DISPLAY
Michael A. Gilano, Irvine, Calif., and Gordon B. Langford, Sandy, Utah, assignors to The Ohio Art Company, Bryan, Ohio
Continuation of Ser. No. 437,744, Nov. 16, 1989, Pat. No. 5,018,979. This application Mar. 13, 1991, Ser. No. 668,914
The portion of the term of this patent subsequent to May 28, 2007, has been disclaimed.
Int. Cl.[5] B43L *1/00*
U.S. Cl. 434—409 19 Claims



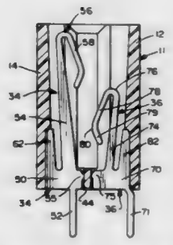
1. A magnetic marking apparatus, comprising:
an enclosure having a transparent or translucent surface and forming a single liquid sealing space;
a dispersion medium having a plurality of randomly oriented, magnetically active flakes contained within said liquid sealing space; and
a magnet outside said enclosure having a magnetic field, said flakes aligning when said magnetic field is displayed to said flakes, said dispersion medium containing aligned flakes having transmission characteristics different from said dispersion medium containing said randomly oriented magnetically active flakes.

5,112,230
RECONFIGURABLE SUBSTRATE FOR ELECTRIC CIRCUIT CONNECTIONS
Michael J. DeSimone, Mansfield, Tex., assignor to Motorola, Inc., Schaumburg, N.Y.
Continuation-in-part of Ser. No. 639,771, Jan. 14, 1991, abandoned, which is a continuation of Ser. No. 524,716, May 17, 1990, abandoned, which is a continuation of Ser. No. 391,262, Aug. 2, 1989, abandoned. This application Jul. 11, 1991, Ser. No. 728,460
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—55 14 Claims



1. A substrate that supports at least two electrical elements that are substantially intended to alter at least one of: frequency, current, voltage, and resistance, comprising:
A) a conductive strip disposed on the substrate which connects at least two said electrical elements; and
B) the substrate having at least one edge and a portion supporting a portion of the strip, the substrate constructed and weakened to facilitate subsequent removal of the supporting portion, thereby severing the conductive strip without removing a portion of the edge of the substrate.

5,112,231
ELECTRICAL CARD EDGE CONNECTOR ASSEMBLY
Frank A. Harwath, Downers Grove; Kent E. Regnier, Lombard, and Dennis Scheer, Hanover Park, all of Ill., assignors to Molex Incorporated, Lisle, Ill.
Continuation of Ser. No. 501,577, Mar. 30, 1990, Pat. No. 5,071,371. This application Jun. 19, 1991, Ser. No. 717,587
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—60 6 Claims



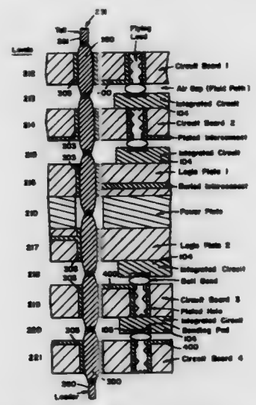
1. An electrical connector for providing electrical connection between a plurality of card contacts on a printed circuit card and a plurality of board contacts on a printed circuit board, said printed circuit card being generally planar and having first and second faces, said first and second faces each having upper and lower rows of card contacts, said card contacts of said upper row being electrically isolated from those of said lower row, said connector comprising:
a housing having a base, an elongated cavity for receiving said card contacts, and a plurality of terminal receiving slots along the cavity; and
a plurality of first and second resiliently deflectable terminals stamped from sheet metal stock to create a stamped edge which is perpendicular to said sheet metal stock, each terminal having a base and a beam section, each beam

section extending in cantilever fashion away from said base to a U-shaped section, a contacting portion of the stamped edge of each U-shaped section making contact with one of said plurality of card contacts, the beam section of each first terminal being longer than the beam section of said second terminal, the beam section of each first terminal being stiffer where it emerges from the base than the beam section of each second terminal where it emerges from the base, and the first and second terminals are dimensioned so that the contacting portion of said first and second terminals exert equal normal forces on said card contacts.

5,112,232
TWISTED WIRE JUMPER ELECTRICAL INTERCONNECTOR

Seymour R. Cray, and Nicholas J. Krajewski, both of Chippewa Falls, Wis., assignors to Cray Computer Corporation, Colorado Springs, Colo.

Division of Ser. No. 347,507, May 4, 1989, Pat. No. 5,014,519, which is a continuation-in-part of Ser. No. 53,142, May 21, 1987, Pat. No. 5,054,192. This application Feb. 15, 1991, Ser. No. 657,653
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—75 **17 Claims**

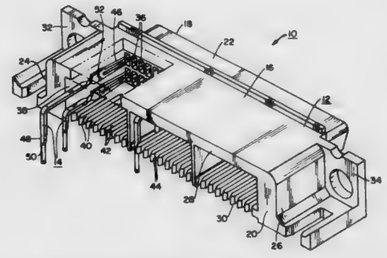


1. An elongated jumper for interconnecting a plurality of electronic assemblies, comprising a plurality of cylindrical portions and a plurality of connector portions separated by a cylindrical portion along the length of the jumper, wherein:
each of the plurality of cylindrical portions comprises:
a central core stand;
a helically wound, multiple strand coil sheath surrounding said central core strand; and
each of the plurality of connector portions comprises:
a plurality of resilient strands forming a barrel shaped cage extending transversely outward a greater distance than the sheath of an adjacent cylindrical portion, the barrel shaped cage adapted for connection with said electronic assemblies.

5,112,233
ELECTRICAL CONNECTOR HAVING CONTACT RETENTION MEANS

Brent B. Lybrand, Spartanburg, S.C., assignor to Thomas & Betts Corporation, Bridgewater, N.J.

Filed May 30, 1991, Ser. No. 707,369
Int. Cl.[5] H01R *13/41*
U.S. Cl. 439—79 **16 Claims**

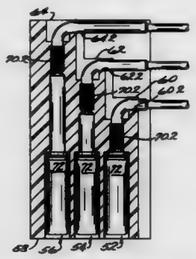


1. An electrical connector, comprising:
an insulator of insulative material including a body having a front face and a rear face and a plurality of contact receiving apertures extending therethrough, said body including a locator plate having a plurality of slots, each slot being defined by a pair of spaced, opposing sidewalls and opening adjacent the body rear face and extending toward said body front face; and
a plurality of electrical contacts each having a mating portion, a retention portion and a terminal portion, each mating portion being received in a respective body aperture, each retention portion being received in interference fit in a said locator plate slot, each terminal portion projecting outwardly from said locator plate, each said contact retention portion having a solid cross-section and at least one barb having an exterior linear edge disposed obliquely relative to and in engagement with one of said slot sidewalls, said exterior edge extending along a line converging with said sidewall in a direction extending between said body rear face and said front face.

5,112,234
PRINTED CIRCUIT CONNECTOR APPARATUS AND METHOD OF MAKING SAME

Larry K. Johnson, North Attleboro, and Austin S. O'Malley, Rehoboth, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 19, 1990, Ser. No. 629,807
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—79 **13 Claims**

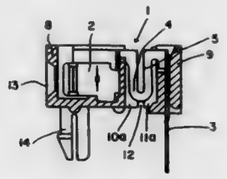


1. A printed circuit board connector comprising an elongated body of electrically insulative material having a flat bottom surface and having a plurality of platforms formed in an opposite surface of the body, the platforms being spaced progressively further away from the flat bottom surface, a plurality of rows of apertures formed in the body in communication with the flat bottom surface, each row of apertures extending to a different platform, each aperture being a bore having first and second diameters, the second smaller than the first, the first diameter bore being in communication with the flat bottom surface and the second diameter bore being in communication with one of the platforms, a shoulder being formed between the first and second bores, a generally cylindrical contact pin having first and second ends and having a mounting portion along a portion of its length intermediate its ends the mounting portion being knurled, the diameter of the knurled portion being selected to be slightly larger than the second diameter bore, an outwardly extending flange formed on each pin, a pin received in each aperture with the mounting portion received in the second diameter bore and the flange bottomed out against the shoulder, an end of the pin extending out of the second diameter bore and being bent 90° along the platform.

5,112,235
ELECTRICAL CONNECTOR

Masahiro Enomoto, Inagi, and Minoru Fukushima, Yokohama, Japan, assignors to Molex Incorporated, Lisle, Ill.

Continuation of Ser. No. 557,238, Jul. 25, 1990, abandoned. This application Dec. 12, 1990, Ser. No. 632,581
Claims priority, application Japan, Aug. 1, 1989, 1-90903[U]
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—83 **15 Claims**



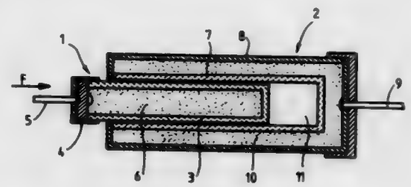
1. An electrical connector comprising:
a dielectric housing having first and second passageways;
an electrically conductive contact member being disposed within said first passageway for receiving an electrically conductive pin inserted into the passageway in a given direction;
an electrically conductive solder tail member being disposed within said second passageway and being electrically connected to said contact member;
resilient planar spring means intermediate said contact member and said solder tail member, said spring means having at least two leg members oriented generally transverse to said given direction and a base member intermediate said leg members, said spring means permitting said contact member to move relative to said solder tail member during insertion of a pin into said contact member; and
means for preventing over-stressing of said spring means.

5,112,236
ELECTRICAL CONTACT

Jean-Paul Martin, St. Pierre du Perray, and Jean-Claude Moisand, Bois D'Arcy, both of France, assignors to Societe Cetra S.a.r.l., La Croix Blanche Ouest, France

Filed May 16, 1991, Ser. No. 701,289
Claims priority, application France, May 17, 1990, 90 06600
Int. Cl.[5] H01R *4/58, 3/08, 13/53*
U.S. Cl. 439—86 **3 Claims**

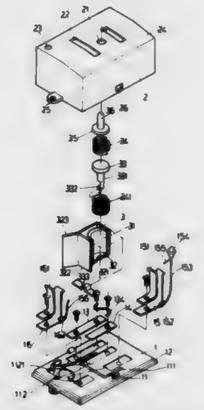
1. An electrical contact comprising a male element and a female element in which said male element is mounted for sliding with a tight fit, an air chamber being formed between an end of said male element and a bottom of said female element, said male and female elements being at least partially made from a porous material impregnated with an aqueous solution charged with submicron metal particles.



5,112,237
SAFETY PLUG RECEPTACLE

Chung-Chieh Yang, Bo.21, Pa-Dah Road, Chia-An Village, Lung-Tan, Taiwan

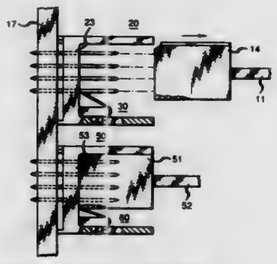
Filed Apr. 5, 1991, Ser. No. 680,887
Int. Cl.[5] H01R *29/00*
U.S. Cl. 439—188 **5 Claims**



1. A safety plug receptacle of the type comprising a base plate covered with a cover, said base plate having a first conductive clamp connected to a first conductive plate, said first conductive plate being connected to a positive terminal of an external power supply, and a second conductive clamp connected to a negative terminal of said external power supply, said cover having two plug holes respectively disposed in alignment with said first and second conductive clamps, the improvement comprising:
a second conductive plate mounted on said base plate and connected to said first conductive plate via a fuse;
a socket means made from non-conductive material, mounted on said base plate, defining therein a hollow space, said hollow space being divided by a division board into an upper receiving chamber and a lower receiving chamber;
a shuttle means made from non-conductive material, set in said upper receiving chamber and supported by a spring means, said shuttle means comprising an upper segment having an extension projecting over said cover and a lower segment having a hooked end extending into said lower receiving chamber;

a conductivity bridge secured to the hooked end of the lower segment of said shuttle means;
an indicator lamp mounted on said cover, having two terminals respectively connected to said first and second conductive clamps; and
wherein inserting the two plug pins of an appliance plug in said first and second conductive clamps through said two plug holes causes said shuttle means to force said conductivity bridge to electrically connect said second conductive plate to said first conductive clamp forming with said second conductive clamp and said external power supply a closed circuit, releasing of said appliance plug from said first and second conductive clamps causes said shuttle means to be moved upwards by said spring means to separate said conductivity bridge from said second conductive plate and said first conductive clamp and simultaneously to disconnect said first conductive clamp from said external power supply.

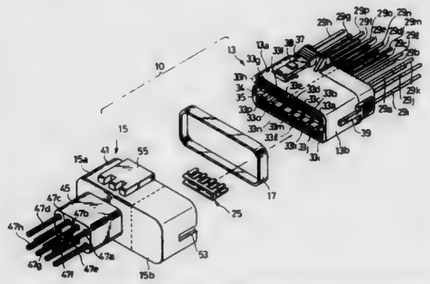
5,112,238
ELECTRICAL CONNECTOR
Miguel Cizin, Bedminster Township, Somerset County, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jul. 12, 1991, Ser. No. 729,526
Int. Cl.[5] H01R *13/70, 31/08*
U.S. Cl. 439—188 **10 Claims**



1. An electrical connector comprising:
an insulating shroud including at least one wall;
a plurality of pins mounted within the shroud so that the pins extend in a direction essentially parallel to the wall;
a contact member mounted to the wall, said member comprising an insulating block; and
a spring contact comprising a tab and at least a pair of tynes at an acute angle thereto, the tab being mounted in the block so that the pair of tynes make electrical contact with two of the pins.

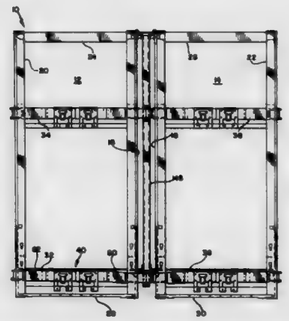
5,112,239
ELECTRICAL CONNECTOR
Sakai Yagi, and Masanori Tsuji, both of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed Aug. 6, 1991, Ser. No. 740,907
Claims priority, application Japan, Aug. 7, 1990, 2-83087[U]
Int. Cl.[5] H01R *31/08, 4/24*
U.S. Cl. 439—189 **4 Claims**

1. An electrical connector, comprising:
a first connector member having first and second sections both including a plurality of electrical terminals therein;
a second connector member adapted to be fitted to the first connector member, the second connector member having a first section including a plurality of electrical terminals therein and a second section including no electrical terminals therein, in which the electrical terminals in the first section of the second connector member are adapted to be connected to the terminals in the first section of the first connector member to establish electrical connection between these terminals when the first and second connector members are fitted together; and
a joint member for establishing electrical connection among at least two of the terminals in the second section of the first connector member, the joint member being adapted



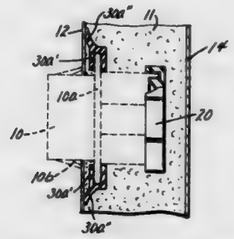
to be removably fitted to the at least two electrical terminals of the second section of the first connector member and to achieve electrical connection therebetween through the joint member when the joint member is fitted thereto.

5,112,240
ELECTRIFIED WALL PANEL SYSTEM
James H. Nienhuis, Wyoming; Jeffrey L. Clark, Holland; Michael L. De Pree, Hamilton, and Robert L. Beck, Zeeland, all of Mich., assignors to Herman Miller, Inc., Zealand, Mich.
Division of Ser. No. 526,064, May 18, 1990, Pat. No. 5,013,252, which is a continuation-in-part of Ser. No. 467,267, Jan. 18, 1990, abandoned. This application Jan. 7, 1991, Ser. No. 638,211
Int. Cl.[5] H01R *25/00*
U.S. Cl. 439—215 **5 Claims**



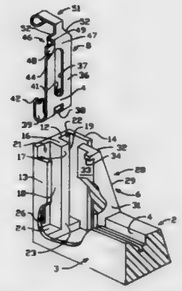
1. An electrified wall panel system comprising:
at least two wall panel units;
a wall panel unit connector including means for releasably connecting adjacent ends of said two wall panel units, said wall panel unit connector further including a vertical skeletal post within said wall panel unit connector and housing means spaced around said skeletal post;
power distribution means within each of said two wall panel units each including a wire harness which extends to the end of the respective wall panel unit; and
inter-panel electrical connector with at least a first and second connector port matable with end connector ports of said wire harnesses for electrically connecting the wire harnesses of the two wall panel units, said inter-panel electrical connector comprising attaching means for releasable attachment to the skeletal post, whereby said inter-panel electrical connector can be attached to said skeletal post within said housing means and at various heights along the skeletal post.

5,112,241
CONNECTOR SEAL ARRANGEMENT
Paul B. Chesnut, Owensboro, Ky.; Michael D. Cooper, and Jerry A. Neas, both of Greeneville, Tenn., assignors to Incor Systems, Inc., Brentwood, Tenn.
Filed Nov. 29, 1990, Ser. No. 619,496
Int. Cl.[5] H01R *13/52*
U.S. Cl. 439—273 **3 Claims**



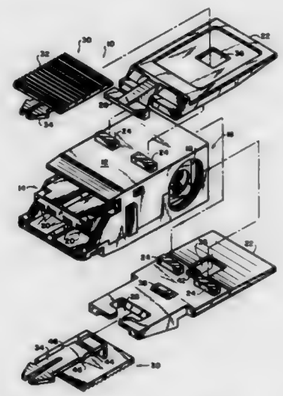
1. A seal for an electrical connector having a peripheral flange at the mid-region thereof comprising a closure overlying an end of said electrical connector in a moisture blocking relationship, where said electrical connector extends through an opening in an inner wall of a refrigerator, where another part of said electrical connector extends into space between said inner wall and an outer wall of said refrigerator, where said seal includes a bifurcated inner portion adapted to be received on said flange on said electrical connector, where a skirt extending from said inner portion selectively engages the inner surface of said inner wall around said opening through which said electrical connector passes, and where sealing is maintained by means of insulation flow in said space between said outer wall and said inner wall bearing against the skirt.

5,112,242
DURABLE LATCH FOR MEMORY MODULE BOARD
Conrad Y. Choy, San Francisco, and Jack Yu, Sunnyvale, both of Calif., assignors to Foxconn International, Inc., Sunnyvale, Calif.
Filed Nov. 20, 1990, Ser. No. 615,987
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—326 **25 Claims**



1. As an article of manufacture, a latch member adapted to be mounted on one end of a connector member for retaining the associated end of an in-line memory module operatively seated in the connector member, said latch member comprising:
a) a main body portion constituting an intermediate section of an elongated inherently resilient metallic strip including first and second opposite end portions integral with said main body portion, the width of said main body portion further is defined by longitudinally extending laterally spaced first and second parallel edges;
b) a latch lever formed on said first end portion and projecting angularly out of the plane of said main body portion to form a cantilever projection therefrom, said latch lever further projects asymmetrically from said main body portion so that it lies closer to one edge than the other;
c) a latch lug formed on said first end portion adjacent said latch lever and projecting out of the plane of said main body portion in a direction opposite to the direction of projection of said latch lever, said latch lug including a cam surface inclined to said main body portion and a lock surface perpendicular to said main body portion; and
d) a pair of laterally spaced fingers formed on said second end portion and extending out of the plane of said main body portion in a direction opposite to said latch lug.

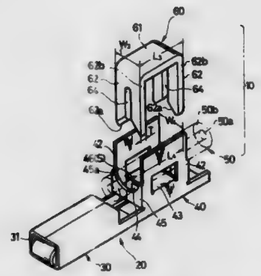
5,112,243
LATCHING DEVICE FOR AN ELECTRICAL CONNECTOR
Hsiu-Shen Chow, Pan-Chiao, Taiwan, and Leonard Ellentuch, Wallkill, N.Y., assignors to Chian Chyun Enterprise Co. Ltd., Taipei Hsien, Taiwan and Resco, Inc., Newburgh, N.Y.
Filed Feb. 20, 1991, Ser. No. 657,912
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—352 **13 Claims**



1. An electrical connector comprising:
(a) a housing having a plurality of contacts therein adapted to mate with contacts of another, mateable connecting device; and
(b) latching means comprising:
(1) an elongate latching member having two opposite ends and a longitudinal axis therebetween, said latching member being captively supported by a pivot on said housing, said pivot being located generally intermediate said two ends of said latching member such that said ends may move generally transversely of said longitudinal axis toward and away from said housing, one end of said latching member including a latch for mechanically interlocking with a cooperating latch of said mateable connecting device; and
(2) a movable locking member, captively supported on said latching member, for slidable movement thereon in the direction of said longitudinal axis between a first position and a second position, said locking member including:
(i) an exposed gripping portion to permit a manual change of its position, and

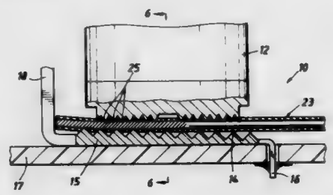
(ii) a sliding portion, attached to said gripping portion, which is operative, when said locking member is in said first position, to prevent said one end of said latching member from being pivoted toward said housing; wherein said gripping portion and said sliding portion are both integral portions of the same member; wherein said sliding portion is attached to the side of said gripping portion which faces said latching member; and wherein said sliding portion extends through an opening in said latching member.

5,112,244
TERMINAL CONNECTOR
Katsutoshi Kuzuno; Shigeo Ishizuka, and Masayuki Yamamoto, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed Apr. 4, 1991, Ser. No. 680,416
Claims priority, application Japan, Apr. 6, 1990, 2-36562[U]
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—395 **19 Claims**



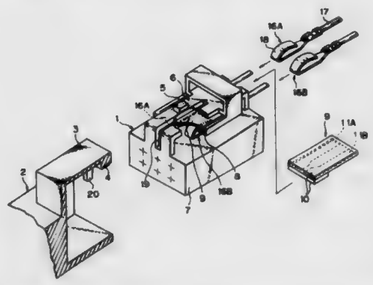
1. A terminal connector to which an electrical wire having a conductor and an insulating cover surrounding the conductor is to be connected, which comprises:
a terminal body having an electrical connecting section to which a partner terminal is to be electrically connected and a wire connecting section to which the electrical wire is to be connected; and
a connecting member, which is separate from the terminal body, adapted to be mounted to the wire connecting section to establish electrical connection between the conductor of the electrical wire and the wire connecting section when the connecting member is mounted to the wire connecting section;
wherein the electrical wire connecting section comprises:
a base plate having opposite edges along the elongated direction of the terminal body;
side walls integrally formed on the respective edge of the base plate, the side walls being opposite with each other in such a manner that the electrical wire is received therebetween when the electrical wire is connected to the wire connecting section and that the connecting member is fitted therebetween when the connecting member is mounted to the wire connecting section;
first means provided between the side walls for supporting the electrical wire thereon when the electrical wire is connected to the wire connecting section, the first wire supporting means having front and rear sides; and
second means for supporting the electrical wire thereon, the second wire supporting means being provided on the front and rear sides of the first wire supporting means through spaces defined between the first wire supporting means and each of the second wire supporting means, respectively, and the connecting member being adapted to be inserted into the spaces when the connecting member is mounted to the wire connecting section.

5,112,245
TELECOMMUNICATIONS TERMINAL BLOCK AND TERMINAL
Gerald L. Shimirak, Danville, and Darcey L. Messner, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 701,436, May 15, 1991, abandoned.
This application Sep. 27, 1991, Ser. No. 767,553
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—412 **69 Claims**



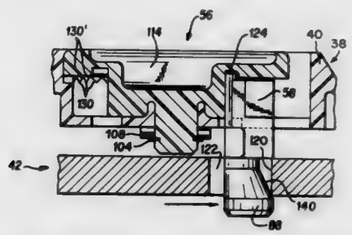
1. A terminal, comprising:
a) a series of teeth configured for receiving a conductor therealong,
b) means defining a surface juxtaposable in a predetermined position opposite said teeth, and
c) tapering means cooperating with at least a region of said teeth for presenting a sequence thereof which defines a substantially progressive taper toward said surface when in said predetermined position for progressively engaging a conductor located therebetween.

5,112,246
METHOD OF DETECTING A FITTINGLY LOCKED STATE OF A CONNECTOR AND A CONNECTOR EMPLOYING THE METHOD
Hajime Kawase, Mie, and Takeshi Kawasumi, Ohita, both of Japan, assignors to Sumitomo Wiring System, Ltd., Mie, Japan
Filed Jan. 8, 1991, Ser. No. 638,532
Claims priority, application Japan, Jan. 8, 1990, 2-2140
Int. Cl.[5] H01R *3/00*
U.S. Cl. 439—489 **8 Claims**



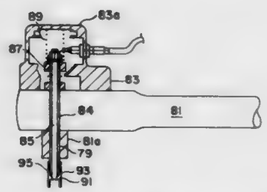
1. A connector, comprising:
first and second connector housings for connection to each other;
a locking mechanism, said locking mechanism comprising a lock arm disposed on said first connector housing, said lock arm having a leading end with a locking projection formed thereon, and an elastic locking beam provided on said second connector housing, said elastic locking beam having a locking portion formed thereon, whereby said connector housings can be locked together in a fitted posture by engaging said locking projection of said lock arm with said locking portion on said elastic beam when said connector housings are connected to each other; and
a detecting mechanism for detecting when said connector housings are locked together in a fitted posture, said detecting mechanism comprising:
an operating portion provided on said lock arm,
an electricity detecting conducting body having a pressure sensing switch element portion and a pair of electricity conducting plates extending rearwardly therefrom, said electricity conducting body being disposed on said elastic locking beam such that said pressure sensing switch element faces said operating portion of said lock arm when said connector housings are locked together in a fitted posture,
a pair of detecting terminals having respective contact portions for elastically contacting respective said electricity conducting plates, and
a pair of electricity conducting cords connected to respective said detecting terminals, whereby said pressure sensing switch element portion is pressed by said operating portion when said connector housings are locked together in a fitted posture to establish relative electrical communication between said electricity conducting cords through said detecting terminals.

5,112,247
MOUNTING MEANS
William J. Rudy, Jr., Annville, and Howard R. Shaffer, Millersburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Aug. 31, 1990, Ser. No. 576,338
Int. Cl.[5] H01R *13/79*
U.S. Cl. 439—571 **10 Claims**



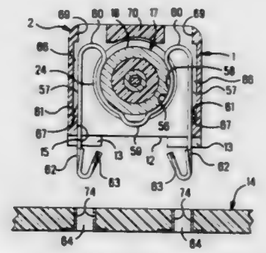
1. A mounting means for mounting a first member to an other member such as a panel having a plurality of predetermined engaging surfaces formed thereon, comprising:
at least one fixed engaging member at least secured to and extending from said first member to coextend along and engage one of said engaging surfaces of said other member when said first member is positioned adjacent said other member to be mounted thereto; and
at least one movable engaging member positioned on a support member movably secured to said first member, said movable engaging member extending outwardly of said first member to coextend along another of said engaging surfaces of said other member,
said movable engaging member comprising a cam follower engaged by a cam secured to said first member and operable by an actuating means,
said movable engaging member being translatably operable between disengaged and engaged positions whereby said movable engaging member positions said first member and moves both of said engaging members into engagement in the operable position and disengagement in the inoperable position, with respect to said engaging surfaces of said other member.

5,112,248
ELECTRICAL CONTACT MECHANISM FOR ULTRASONIC TRANSDUCERS ON FASTENERS
Ian E. Kibblewhite, Ambler, and Robert H. Strunk, Philadelphia, both of Pa., assignors to SPS Technologies, Inc., Newtown, Pa.
Division of Ser. No. 616,513, Nov. 21, 1990, abandoned, which is a division of Ser. No. 419,053, Oct. 10, 1989, Pat. No. 5,018,988.
This application May 14, 1991, Ser. No. 699,532
Int. Cl.[5] H01R *3/00, 17/04*
U.S. Cl. 439—577 **4 Claims**



1. An electrical contact mechanism for electrically connecting electronic circuitry cabling to an ultrasonic transducer which can be alternatively embedded in, permanently attached to, or temporarily attached to a fastener, said transducer providing a contact surface on said fastener, said electrical contact mechanism being positioned within a fastener tightening tool and making said electrical connection when said tightening tool is positioned on said fastener, comprising:
a first electrically isolated conduction path through said tightening tool;
a first electrical connector on a first end of said conduction path, said first electrical connector having a protruding moveable pin spring biased outwardly and being fixed so as not to rotate relative to the tool; and
a second electrical conduction path through said tightening tool;
wherein said first electrical conduction path includes an outer metal casing having an electrically insulated inner bore; a rod operating within said electrically insulated inner bore; an electrical contact pin extending outwardly from one end of said rod; a boot mounted on the opposite end of said rod and extending outwardly and about said outer metal casing; and a spring mounted to operate against said boot and bias said rod and its contact pin outwardly from said insulated inner bore.

5,112,249
CONNECTOR LOCKING CLIP
Randall R. Henry, and Michael R. Sneed, both of Harrisburg, Pa., assignors to Amp Incorporated, Harrisburg, Pa.
Filed Oct. 18, 1991, Ser. No. 779,451
Int. Cl.[5] H01R *17/04*
U.S. Cl. 439—581 **6 Claims**



1. An electrical connector assembly for mounting on a

printed circuit board having a ground trace comprising; an insulative housing having a mounting face and a mating face perpendicular thereto, said housing having a contact passage extending rearwardly from said mating face to said mounting face; and an electrical connector encircled by the insulative housing and secured in the passage and comprising; an electrically conductive shell adapted to be received within the contact passage and including a compliant ground contact for insertion into apertures in the circuit board, a dielectric insert having center bore and adapted to be received and secured within said conductive shell, and a signal carrying electrical disconnect contact pressed into the bore of said insert, wherein said compliant ground contact comprises:

a clip having an yoke-shaped portion and elongated electrical terminals, the yoke-shaped portion shaped along its length to conform to and to engage against the exterior of the electrically conductive shell with an open side for receiving passage of the shell, and each terminal extending from a respective end of the yoke-shaped portion to form double back curved resilient springs opposing one another across the width of the clip, the end of each terminal formed into an elongated channel and each channel having an end bent to an angle to the plane of the longitudinal axis of the terminal to form a resilient hook.

5,112,250

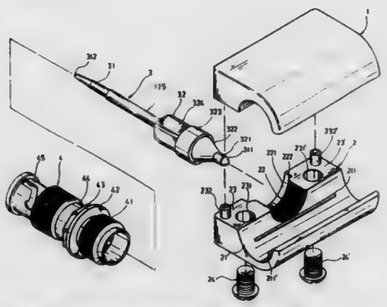
T-TYPE COAXIAL CABLE CONNECTOR

Tsan-Chi Wang, 1F, No. 13, Lane 312, Chung Cheng Rd., Hsin Tien City, Taiwan

Filed May 31, 1991, Ser. No. 708,578

Int. Cl.[5] H01R *13/36*

U.S. Cl. 439—582 **4 Claims**



1. T-type coaxial cable adapter, comprising:

an upper made of metal material in an elongated shape having a first elongated, semi-circular groove disposed in longitudinal direction, a first semi-circular bolt hole disposed in transverse direction and connected to said first elongated, semi-circular groove at the middle, a first pair of raised top edges at two opposite sides relative to said first semi-circular bolt hole, said first pair of raised top edges having each a bolt hole and a round hole, said first elongated semi-circular groove having at least one cutter means fastened thereon;

a bottom cover made of metal material in an elongated shape having a second elongated, semi-circular groove disposed in longitudinal direction, a second semi-circular bolt hole disposed in transverse direction and connected to said second elongated, semi-circular groove at the middle, a second pair of raised top edges at two opposite sides relative to said second semi-circular bolt hole, said second pair of raised top edges having each a through-hole and a stub rod corresponding to said bolt hole and stub rod on either of said first pair of raised top edges;

a BNC casing being a hollow metal shell having made around the outer wall surface thereof in proper order an outer thread, a projecting ring, a polygonal projection and a flange and, having fastened therein a BNC connector at one end opposite to said outer thread;

a terminal fastened in said BNC casing, comprising an elongated metal core covered with an outer insulator, said metal core having an arrow-headed front end extending out of said outer insulator and said BNC casing and a rear end extending out of said outer insulator and disposed inside said BNC connector; and

wherein two screws respectively fastened through the through-holes on said second pair of raised top edges in the bolt holes on said first pair of raised top edges to firmly secure said upper cover to said bottom cover, permitting said first and second semi-circular bolt holes to incorporate with each other into a bolt hole for fastening the outer thread on said BNC casing and, permitting said first and second elongated, semi-circular holes to incorporate with each other into a through-hole for mounting an coaxial cable having a conductor and a braid shield insulated from said conductor and covered with an insulative jacket, so as to let the conductor of said coaxial cable to be electrically connected to said metal core and the braid shield of said coaxial cable to be electrically connected to said BNC connector via said cutter means.

5,112,251

ELECTRICAL CONNECTOR FOR CONNECTING A SHIELDED MULTICONDUCTOR CABLE TO AN ELECTRICAL ASSEMBLY LOCATED INSIDE A CHASSIS

Charles Cesar, Saint Martin D'Heres, France, assignor to Bull S.A., Paris, France

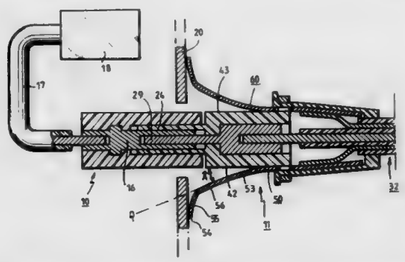
PCT No. PCT/FR90/00415, § 371 Date Mar. 27, 1991, § 102(e) Date Mar. 27, 1991, PCT Pub. No. WO90/16096, PCT Pub. Date Dec. 27, 1990

PCT Filed Jun. 13, 1990, Ser. No. 651,345

Claims priority, application France, Jun. 15, 1989, 89 07945

Int. Cl.[5] H01R *13/648*

U.S. Cl. 439—607 **17 Claims**



1. An electrical connector for connecting a multiconductor cable having shielding to a termination at an opening of a metal chassis, comprising:

a first connector part disposed at least partially within said opening of said metal chassis, said first connector part having a first plurality of electrical contact elements; and

a second connector part operative to mate with said first connector part through said opening in said metal chassis, said second connector part comprising:

a second connector part insulating body having a second plurality of electrical contact elements operative to mate with said first plurality of electrical contact elements,

at least one pair of sheets of conductive material disposed on opposite sides of said second connector part insulating body, each sheet being generally coextensive with said second connector part insulating body and each sheet being sufficiently sized to contact said metal chassis when said sheet is disposed on said members and said second connector part is mated with said first connector part,

at least one retaining member for retaining said at least one pair of sheets of conductive material in a fixed position on said opposite sides of said second connector part insulating body; and

a pair of covers operative to retain said sheets in said fixed position on said at least one retaining member and in electrical contact with said shielding of said multiconductor cable whereby a shielding is effected between said metal chassis and said multiconductor cable.

5,112,252

INTRINSICALLY SAFE ELECTRICAL CONNECTOR

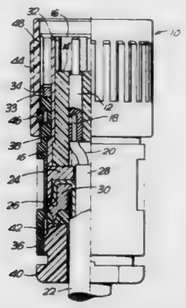
Paul Harris, Whitstable, England, assignor to Amphenol Corporation, Wallingford, Conn.

Continuation of Ser. No. 417,058, Oct. 4, 1989, abandoned. This application May 7, 1991, Ser. No. 698,340

Claims priority, application United Kingdom, Oct. 5, 1988, 8823387

Int. Cl.[5] H01R *9/03*

U.S. Cl. 439—610 **10 Claims**



1. An electrical connector member comprising one or more electrical contacts mounted in a connector shell of insulating material, a generally cylindrical one-piece casing around the contact or contacts and the insulating shell, said casing being of conductive material and shaped so as to contact a corresponding conductive casing in a second electrical connector member when the two members are connected and so as to provide a full 360° screening, locking means which co-operate with means on said second connector member to lock the two members together when connected, and a hollow outer body covering at least a part of the conductive casing, wherein the locking means and the hollow outer body are of non-conductive material and the hollow outer body is partially overlapped by said locking means, the locking means and hollow outer body together forming a continuous outer casing of non-conductive material.

5,112,253

ARRANGEMENT FOR REMOVABLY MOUNTING A TRANSIENT SUPPRESSION OR ELECTRICAL FILTER DEVICE IN AN ELECTRICAL CONNECTOR

Peter R. Swift, Toronto, Canada, assignor to Amphenol Corporation, Wallingford, Conn.

Filed Aug. 15, 1991, Ser. No. 745,185

Int. Cl.[5] H01R *13/66*

U.S. Cl. 439—620 **15 Claims**

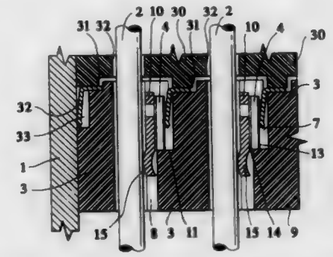
1. A connector, comprising:

a conductive shell;

a first insulator member supported by said shell and including a first aperture extending through said insulator member, said first aperture arranged to permit passage of a feedthrough contact, and a second aperture extending partially through said insulator member in communication with said first aperture, said second aperture including a floor and two opposed walls which support an electrical component having first and second electrodes;

a conductive clip secured within said second aperture and including means for electrically contacting said feedthrough contact;

a ground plate including means for electrically connecting said ground plate to said shell, and a resilient ground contact member which extends into said second aperture,



wherein said ground contact member is biased against said first electrode, thereby biasing said second electrode against said conductive clip in order to establish an electrical connection between said feedthrough contact and said second electrode via said conductive clip, and between said first electrode and said shell via said ground plate.

5,112,254

ELECTRICAL CONTACTS

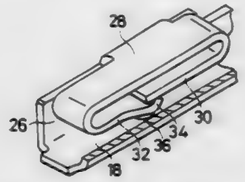
Hiroshi Endo, Tokyo, Japan, assignor to Japan Aviation Electronics Industry, Ltd., Tokyo, Japan

Filed Nov. 15, 1989, Ser. No. 436,616

Claims priority, application Japan, Dec. 5, 1988, 63-157705[U]

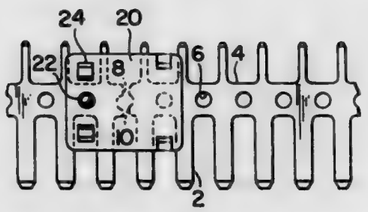
Int. Cl.[5] H01R *11/22*

U.S. Cl. 439—852 **1 Claim**



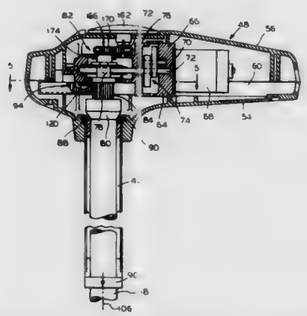
1. In an electrical socket contact adapted to receive a pin contact element, the socket contact being formed from a single sheet of conductive material comprising a base portion, first and second side walls which are respectively folded from each side of the base portion, and a spring base which is bent from the outside of the first side wall; the improvement comprising free ends of the spring base being respectively bent in U-form to overlap each other for receiving the pin contact element between one of the U-shaped ends and the base portion and for making electrical contact therewith, an outside portion of the second side wall being inwardly bent at a right angle from the second side wall to form a top wall for surrounding the backside of the spring base from the outside, and a portion of one end of the top wall being inwardly bent at a right angle to form a front cover to prevent the pin contact element from inserting into a space between the backside of the spring base and the top wall.

5,112,255
JOINER AND METHOD OF JOINING TERMINAL STRIP SEGMENTS
Eugene E. Daley, Jr., Fort Wayne, Ind., assignor to United Technologies Automotive, Dearborn, Mich.
Filed Apr. 1, 1991, Ser. No. 677,916
Int. Cl.[5] H01R *13/02*
U.S. Cl. 439—885 **8 Claims**



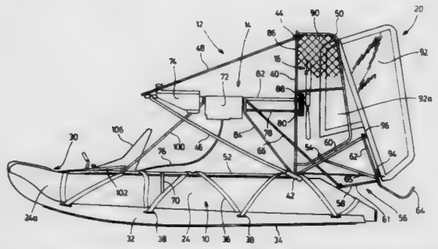
1. A joiner comprising identical, hermaphroditic first and second joiner halves, each joiner half having:
(a) an optically detectable solid body;
(b) means extending from said solid body for engaging a pilot hole on a terminal strip segment; and
(c) means extending from said solid body for securely grasping another joiner half;
such that when assembled into a joiner, the first joiner half is capable of engaging a pilot hole on a first terminal strip segment and securely grasping the second joiner half and the second joiner half is capable of engaging a pilot hole on a second terminal strip segment and securely grasping the first joiner half, thereby joining the two terminal strip segments together in a consistent manner which permits the joiner to be automatically detected against a background of a continuous strip of terminals by a terminal insertion machine.

5,112,256
GEAR TRAIN OF A SERVO-CONTROLLED TROLLING MOTOR
Tim Clement, Starkville, Miss., assignor to Zebco Corporation, Tulsa, Okla.
Filed Jul. 24, 1990, Ser. No. 558,212
Int. Cl.[5] B63H *21/17*
U.S. Cl. 440—7 **10 Claims**



1. In a trolling motor system including a trolling motor carried on a column rotatably received in a mounting means for mounting the trolling motor to a boat, an improved speed and steering control head mounted to said mounting means, comprising:
a control housing having a base fixedly mounted to said mounting means and a cover secured to said base;
a drive subassembly positioned in said housing including a gear case enclosing a motive input shaft connected through a gear drive to an output shaft operatively engaging said column for driving said column to effect rotation thereof, wherein said gear drive comprises a friction clutch; and
a control subassembly positioned in said housing including electrical steering control means for controlling said drive subassembly motive input shaft to control steering of said trolling motor and electrical speed control means for controlling speed of said trolling motor.

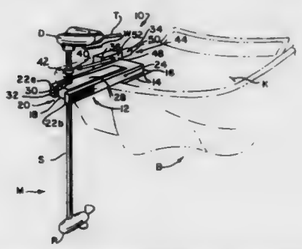
5,112,257
MULTI-USE VEHICLE
Frederick J. Grise, R.R. #1, Aston Resort, Bracebridge, Ontario, Canada P0B 1C0
Filed Sep. 17, 1990, Ser. No. 583,092
Int. Cl.[5] B63H *7/02*
U.S. Cl. 440—37 **9 Claims**



1. A multi-use vehicle, for use on water, and on ice, and comprising;
a flotation hull having at least a generally flat floor portion, and peripheral flotation chamber means, extending at least around the forward end and sides of said floor portion;
cover panel means of protective material attachable over the underside of said floor portion to provide a smooth running surface for said vehicle, and adapted to extend at least partially around the exterior of said flotation chamber means, and having means for attaching same on said hull;
frame means adapted to be attached to said hull, located above the rearward end of said hull, and defining an open space forwardly of said frame means, within said hull;
wherein said frame means comprises a generally upright rectangular frame structure, mounted adjacent the rear of said hull, and generally pyramid-like frame rod means extending forwardly therefrom;
motor means supported by said frame means within said pyramid-like frame rod means;
air propulsion means connected to said motor means and adapted to be driven thereby, whereby to create forward thrust;
means for transferring said forward thrust to said hull;
seat means, in said open space forwardly of said frame means, and,
guide means mounted on said frame means and being moveable from side to side, whereby to guide movement of said vehicle.

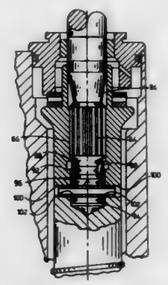
5,112,258
APPARATUS FOR RAISING AND LOWERING A TROLLING MOTOR
Richard R. Folsom, 2223 W. 10th St., Irving, Tex. 75060
Filed Dec. 31, 1990, Ser. No. 635,990
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—63 **19 Claims**

1. Apparatus for use with a trolling motor on a fishing boat to lower the motor into the water so it can slowly move the boat about while fishing takes place and to raise the motor to a storage position when not in use for movement of the boat by an alternate power source, comprising:
frame means attached to the boat;
movable bracket means one end of which fixedly attached to the motor and the other end of which is rotatably connected to the frame means;
reversible electric motor means connected with the frame means, gear means interconnected with the motor means and providing for speed reduction in the operations of the



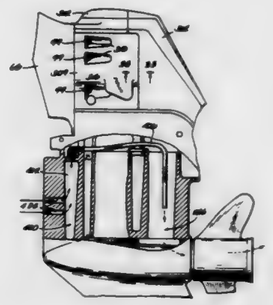
motor means, lever means connected to the gear means for moving the trolling motor between its lowered and raised positions, one end of the lever means being directly connected to the gear means, while the opposite end of the lever means connected to the trolling motor, and the gear means being driven by the motor means to move the lever means, whereby moving the lever means in one direction lowers the trolling motor into the water, and in the opposite direction when the trolling motor is raised to its storage position.

5,112,259
TWO PIECE DRIVE SHAFT RETENTION DEVICE FOR OUTBOARD MOTOR
Kennedy K. McElroy, Jr., Lindenhurst, and Edmund H. DuBois, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Jun. 29, 1989, Ser. No. 373,283
Int. Cl.[5] B63H *23/34*
U.S. Cl. 440—83 **22 Claims**



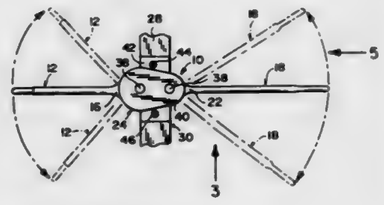
1. An outboard motor comprising an engine, a propeller shaft, a first drive shaft portion defining an axis and having a first end connected to said engine, and a second end opposite said first end, a second drive shaft portion coaxially aligned with said first drive shaft portion, and having a first end connected to said propeller shaft, and a second end opposite said first end of said second drive shaft portion, one of said second end of said first drive shaft portion and said second end of said second drive shaft portion including a splined male end, the other of said second end of said first drive shaft portion and said second end of said second drive shaft portion including a splined female socket having an open end telescopically receiving said splined male end to prevent relative rotation therebetween about the axis, and having a closed end opposite said open end, an aperture extending through said second end of said first drive shaft portion in transverse relation to the axis defined by said first drive shaft portion, an aperture extending through said second end of said second drive shaft portion in alignment with the aperture through said second end of said first drive shaft portion, means for biasing said male end away from said closed end, and a pin passing through said aperture in said second end of said second drive shaft portion and through said aperture in said second end of said first drive shaft portion, said pin preventing axial separation of said male end from said closed end against the force of said biasing means.

5,112,260
MARINE PROPULSION DEVICE EXHAUST SYSTEM
Gerald F. Bland, Glenview; James C. Kantola, Waukegan, and Martin J. Mondek, Wonder Lake, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Continuation-in-part of Ser. No. 351,856, May 12, 1989, abandoned. This application Dec. 17, 1990, Ser. No. 657,241
Int. Cl.[5] B63H *21/10*
U.S. Cl. 440—88 **15 Claims**



1. A marine propulsion device comprising a propulsion unit which is adapted to be mounted on a boat transom and which includes a housing having a water inlet, an exhaust passageway having an upstream end adapted to communicate with an engine having a cooling system including a water pump, and a conduit communicating with said water inlet and extending in by-passing relation to the cooling system water pump for introducing water into said exhaust passageway.

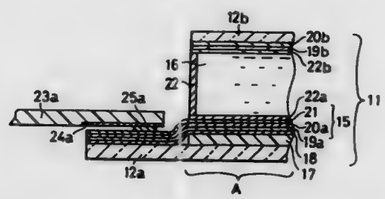
5,112,261
REVERSE BOAT OARS
James A. Humphrey, 15930 Menlo Ave., Gardena, Calif. 90247
Filed Apr. 11, 1991, Ser. No. 683,701
Int. Cl.[5] B63H *16/10*
U.S. Cl. 440—103 **1 Claim**



1. A reverse boat oar comprising:

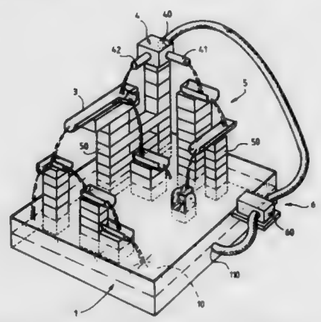
a) an oar handle arm having a large gear portion formed on its distal end;
b) an oar paddle arm having a small gear portion formed on its distal end;
c) means for holding the large gear portion and the small gear portion in a meshing rotative relationship comprising a housing having a wide end and a narrow end sized to receive the large gear portion and the small gear portion respectively;
a pair of shafts, each extending through the center of the large gear portion and the small gear portion and said housing so that said gear portions can mesh together;
a top cover to fit over said gear portions in said housing to prevent external objects from contacting said gear portions; and
d) an oar lock to attach said holding means to a gunwale of a boat, comprising an elongate mounting plate having openings, to receive screws for securement onto the top of the gunwale of the boat, a pair of upwardly extending lugs on said mounting plate;
a downwardly projection lug on the underside of said housing received together with a portion of the housing intermediate the ends between the lugs; and
an axle pin force fitted in at least one of said upwardly extending lugs for rotatively securing said upwardly extending lugs to said downwardly projecting lug and permitting said holding means with said oar handle arm and said oar paddle arm to seesaw up and down on the gunwale.

5,112,262
APPARATUS AND METHOD FOR ELECTRICAL CONNECTIONS OF A DISPLAY DEVICE
Masao Obata, Nara; Masaki Arima, Yamatokoriyama, and Kouki Taniguchi, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Mar. 13, 1990, Ser. No. 492,915
Claims priority, application Japan, Mar. 15, 1989, 1-64161
Int. Cl.[5] H05K *3/32*
U.S. Cl. 445—24 **18 Claims**



1. A method for electrically connecting a display device having a displaying electrode substrate, to at least one wiring substrate, each one of the substrates having at least one electrode, comprising the steps of;
(a) electrically connecting to a first portion of an electrode formed on the displaying electrode substrate to an electrode formed on the wiring substrate, that individually corresponds to the electrode on the displaying electrode substrate,
(b) separating the wiring substrate from the electrode on the displaying electrode substrate in the event that any abnormality occurs, from the electrical connection of the substrates, and
(c) electrically connecting the electrode the wiring substrates electrically to a second portion of the electrode on the displaying electrical substrate.

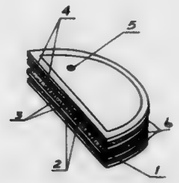
5,112,263
MODULAR LIQUID FLOW DEVICE, IN PARTICULAR A WATER CONSTRUCTION KIT
Philippe Penillard, and Aimee Penillard, both of Le Vesinet, France, assignors to Interlego A.G., Baar, Switzerland
Filed May 21, 1990, Ser. No. 525,738
Claims priority, application France, May 26, 1989, 89 06958
Int. Cl.[5] A63H *33/10*
U.S. Cl. 446—89 **23 Claims**



1. A modular device comprising, in combination:
a receptacle (1) for containing a liquid;
support means (5) connectable to the receptacle to define, together with said receptacle, a structure extending in part above the level of liquid contained in the receptacle, said structure being provided with support surfaces, each provided with a plurality of assembly components in a first predetermined pattern;
a plurality of liquid-conveying elements (3) each possessing a plurality of assembly components in a second predetermined pattern complementary to the first pattern for releasable locking engagement with the assembly components on said support surfaces, said elements being independently mountable on said support surfaces, by engagement of said assembly compontents of said liquid-conveying elements with said assembly components of said support surfaces in positions aligned for conveying the liquid directly from one liquid-conveying element to another and/or to the receptacle;
liquid-distribution means (4) co-operating with at least one of the liquid-conveying elements; and
liquid-raising means (6) for raising liquid from the receptacle to the liquid-distribution means.

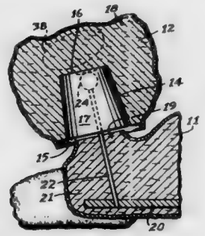
5,112,264
INSERT CONNECTING TOY
Sun Y. Ning, and Fan L. Huan, both of Nanjing, China, assignors to Nanjing Jingcheng Patent Technique Development Company, China
Continuation of Ser. No. 563,717, Aug. 7, 1990, abandoned. This application Jul. 8, 1991, Ser. No. 728,330
Claims priority, application China, Aug. 8, 1989, 89-2052945
Int. Cl.[5] A63H *33/08*
U.S. Cl. 446—108 **6 Claims**

1. An insert-connecting toy comprising a plurality of irregular construction units, wherein said construction units are divided into at least one meta-element and one or more sub-elements; the thicknesses of the thinnest sub-element being a predetermined unit thickness, and the thicknesses of the other sub-elements each being an integer number times the unit thickness; a plurality of alternating grooves and lands being arranged on said meta-element, the width of each of said grooves and lands being an integer number times said unit thickness; and a plurality of additional alternating grooves and lands being arranged on at least one of the sub-elements, and the width of each of said grooves and lands also being an integer number times the unit thickness, whereby said additional alternating grooves and lands are adapted to interconnect respective ones of said lands and grooves of said meta-element for forming multiple insert-connection models, wherein



each construction unit and at least one of the lands being provided with an edge chamfered by circular bead, and the cross-section of the groove is trapezoidal, and wherein tenoning surfaces of said construction units are arranged with minute circular bosses.

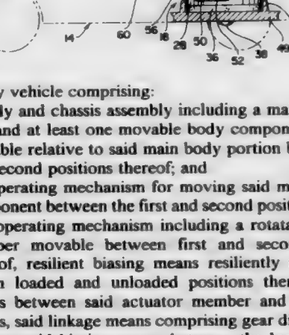
5,112,265
TOY ANIMAL HAVING OSCILLATING PARTS
Elena D. Naum, 1212 N. Graycroft, Madison, Tenn. 37115
Filed Jan. 17, 1991, Ser. No. 642,433
Int. Cl.[5] A63H *3/46, 3/02, 13/18*
U.S. Cl. 446—384 **7 Claims**



1. A toy animal comprising:
(a) a main body part having upper and lower portions,
(b) an oscillating body part having upper and lower portions,
(c) mounting means connecting said oscillating body part to said main body part,
(d) said mounting means comprising an elongated standard fixed to said main body part and projecting upward from said main body part,
(e) a spherical bearing support fixed on said standard,
(f) a mounting chamber within said oscillating body part having a top wall and a bottom opening,
(g) said top wall comprising a flat bearing surface, and
(h) coupling means loosely connecting said spherical bearing support to said top wall within said mounting chamber for rotary and rolling engagement between said spherical bearing support and said flat bearing surface.

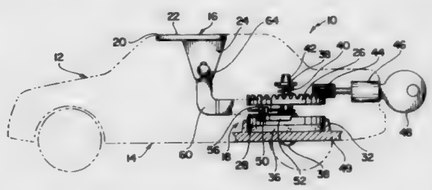
5,112,266
NOISE MAKING DEVICE
Shirl F. Hall, 3585 Jefferson Rd., Ashtabula, Ohio 44004
Filed Apr. 6, 1988, Ser. No. 178,260
Int. Cl.[5] A63H *33/08, 5/00;* **G10D** *13/08;* **A44B** *18/00*
U.S. Cl. 446—422 **3 Claims**

1. A noise making device for creating selective clapping sounds comprised of a pair of identical section halves of molded plastic construction, each section including:
a handle portion having a cavity formed therein, said cavity having a wall section extending about the periphery thereof, said wall section having a planar mating surface and an inwardly facing flat wall surface perpendicular to said planar mating surface,
an elongated, flat blade portion extending from said handle portion diverging from said planar surface at a predetermined angle,
positioning means for aligning respective mating surfaces of said section halves in registry with each other, and
securing means for joining one section half to the other



along said planar mating surface to form an integral unit having a defined handle with said blade portions extending therefrom juxtaposed at a predetermined angle relative to each other, said securing means being comprised of generally L-shaped posts positioned to engage in snap-lock fashion a corresponding post on the opposing member, and being disposed within said cavity such that when said section halves are joined said locking means are within said defined handle.

5,112,267
TOY VEHICLE WITH MOVABLE BODY COMPONENT
Dexter C. Liu, 302 Corey La., Middletown, R.I. 92840; Ronald J. Campanell, 126 Touisset, Touisset, R.I. 02885, and Paul J. Kotowski, Foster, all of R.I., assignors to Dexter C. Liu and Ronald J. Campanell, Middletown, R.I.
Filed Dec. 21, 1990, Ser. No. 632,141
Int. Cl.[5] A63H *17/26, 29/00;* **F16F** *9/30;* **F03G** *1/00*
U.S. Cl. 446—470 **15 Claims**



1. A toy vehicle comprising:
a) a body and chassis assembly including a main body portion and at least one movable body component which is movable relative to said main body portion between first and second positions thereof; and
b) an operating mechanism for moving said movable body component between the first and second positions thereof, said operating mechanism including a rotatable actuator member movable between first and second positions thereof, resilient biasing means resiliently movable between loaded and unloaded positions thereof, linkage means between said actuator member and said biasing means, said linkage means comprising gear disc means for moving said biasing means between the loaded and unloaded positions thereof in response to movement of said

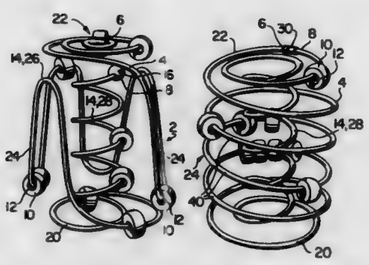
actuator member between the first and second positions thereof, said biasing means being operatively connected to said movable body component such that when said movable body component is in the first position thereof movement of said biasing means from the unloaded position thereof to the loaded position thereof causes said movable body component to be biased toward the second position thereof, and means for dampening the movement of said movable body component between the first and second positions thereof.

5,112,268

BEADS AND WIRE FRAME TOY

Kathy Klaus, 169 Aspen Heights 23330 Rd. 522, Sherwood Park, T8B 1H8 Alberta, Canada

Filed May 1, 1991, Ser. No. 694,408
Int. Cl.[5] **A63H** *33/00*
U.S. Cl. 446—489 **15 Claims**



1. A toy comprising a frame formed from a continuous length of rigid elongated wire having ends, the wire between its ends being bent to form multiple curves to give the frame a three dimensional configuration with top, bottom and sides, the curves of the wire at the bottom lying in a plane to form a flat supporting surface for the frame; a plurality of beads, with a hole in each bead, movably supported on the wire, with the wire passing through each hole, the holes being sufficiently large to permit the beads to freely slide over the curves of the wire between its ends.

5,112,269

PROCEDURE FOR SHELLING OF CRUSTACEOUS SHELLFISH, ESPECIALLY SHRIMPS, AND APPARATUS FOR PERFORMANCE OF THE PROCEDURE

Frede H. Petersen, deceased, late of Aalborg, and Kaj A. Sorensen, Bavnevangen 35, DK-9210 Aalborg SO, both of Denmark

PCT No. PCT/DK89/00121. § 371 Date Aug. 9, 1990, § 102(e) Date Aug. 9, 1990, PCT Pub. No. WO89/10699, PCT Pub. Date Nov. 16, 1989
PCT Filed May 12, 1989, Ser. No. 458,632
Claims priority, application Denmark, May 13, 1988, 2630/88
Int. Cl.[5] **A22C** *29/02*
U.S. Cl. 452—5 **8 Claims**

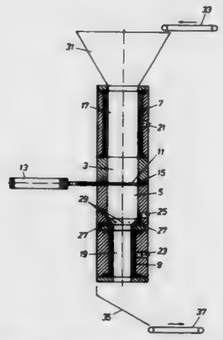
1. A method for shelling crustaceous shellfish, comprising the steps of

(a) boiling and cooling the shellfish,

(b) introducing the shellfish into a pressure-tight chamber (5) and heating the shellfish in the pressure-tight chamber while exposing the shellfish when within said chamber to an increase of pressure,

(c) opening a valve (9) to said chamber, to cause a pressure reduction in said chamber, and

(d) causing the shellfish to exit said chamber after opening of said valve and strike against a surface (35) of solid material



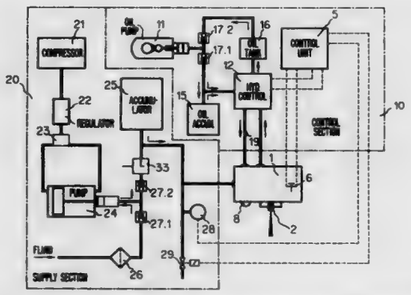
so that the shells of the shellfish are separated from the meat.

5,112,270

METHOD FOR STUNNING ANIMALS FOR SLAUGHTER

Johannes Howard, Bern, and Lucie Fuchs, Adlikon, both of Switzerland, assignors to Roll and Go AG, Stanastad, Switzerland

Filed Sep. 25, 1990, Ser. No. 587,728
Claims priority, application Switzerland, Oct. 7, 1989, 3665/89
Int. Cl.[5] **A22B** *3/00*
U.S. Cl. 452—66 **26 Claims**



1. A method for stunning an animal for slaughter comprising the steps of

forming a jet of fluid under high pressure, and

directing the jet of fluid through the air to the head of an animal so that the jet of fluid penetrates the skull and liquifies brain substance within the skull.

5,112,271

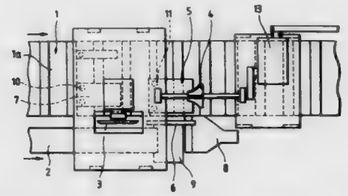
METHOD AND APPARATUS FOR GUTTING FISH

Seiichi Urushibara, Ninohe, and Kuniya Yusa, Kitazawa, both of Japan, assignors to Taiyo Fishery Co., Ltd., Tokyo, Japan

Division of Ser. No. 457,377, Dec. 27, 1989, Pat. No. 4,993,116. This application Nov. 29, 1990, Ser. No. 619,381
Claims priority, application Japan, Mar. 1, 1989, 1-46481
Int. Cl.[5] **A22C** *25/00*
U.S. Cl. 452—108 **3 Claims**

1. A method for gutting fish, which comprises the steps of: feeding a fish onto a conveyor including a number of segments extending at given intervals substantially perpendicular to its moving direction and operating at a selected

speed in a certain direction, with the venter of the fish leading and the head of the fish projected from one side edge of said conveyor, cutting off the head of said fish along said side edge of said conveyor by means of a cutter, causing a guts squeezer member to be forcedly moved



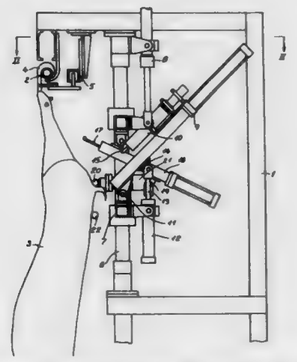
over the venter of said fish from the anus toward the cut end at which said fish has been beheaded, while forcing the dorsal region of said fish onto said conveyor and also engaging the dorsal side of said cut end of said fish with a fixed guide plate, thereby squeezing the guts out of said fish.

5,112,272

METHOD FOR PROVIDING A CUT AROUND THE ANUS OF AN ANIMAL, WHICH IS SUSPENDED FROM ITS BACK FEET, TO FREE THE RECTUM FROM THE CARCASS, AND APPARATUS FOR PERFORMING SAID METHOD

Børge C. Andersen Værløse, Denmark, assignor to Nutridan Engineering A/S, Denmark

PCT No. PCT/DK89/00085, § 371 Date Oct. 22, 1990, § 102(e) Date Oct. 22, 1990, PCT Pub. No. WO89/10060, PCT Pub. Date Nov. 2, 1989
PCT Filed Apr. 13, 1989, Ser. No. 585,063
Claims priority, application Denmark, Apr. 22, 1988, 2190/88
Int. Cl.[5] **A22B** *5/00*
U.S. Cl. 452—122 **18 Claims**



1. A method of automatically positioning and cutting an animal carcass for removal of its rectum, comprising the steps of:

supporting the carcass;

positioning the carcass such that its hind is fixed in a predetermined position;

sensing the location of the root of the animal carcass tail;

positioning a rotating cylindrical knife relative to the location of the root of the carcass tail;

inserting a gauge into the animal carcass anus to a predetermined depth;

advancing the knife to a cutting position; and

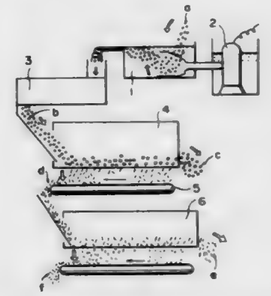
cutting around the anus with the knife to the predetermined depth.

5,112,273

PROCESS AND APPARATUS FOR SEPARATING FINE BONES FROM FISH FLAKES

Kyosuke Nishiya, Miyagi, Japan, assignor to Towa Chemical Industry Co. Ltd., Tokyo, Japan

Filed Jul. 27, 1990, Ser. No. 558,344
Claims priority, application Japan, Aug. 8, 1989, 1-202804; Apr. 6, 1990, 2-90247
Int. Cl.[5] **A22C** *25/16*
U.S. Cl. 452—135 **21 Claims**



1. A process for separating fine bones from fish flakes obtained from fish after said fish are prepared, skinned and heated in water or steam comprising

a) dehydrating said fish flakes containing said fine bones by subjecting said fish flakes to compression or centrifugation sufficient to remove essentially most of the water therefrom,

b) dispersing said fish flakes and fine bones,

c) passing said dispersed fish flakes and fine bones over a surface having a plurality of slits therein, said slits being of a size sufficient to permit said fine bones to pass therethrough but of a size insufficient to permit the major portion of said fish flakes from passing through said slits, and

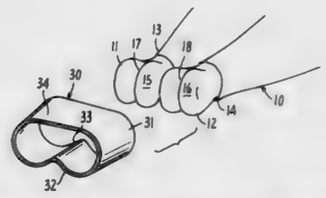
d) removing said major portion of said fish flakes from said surface.

5,112,274

ANKLE STRAP POULTRY TRUSSING DEVICE

Henry J. Volk, 1863 Anning, Turlock, Calif. 95380

Filed Jul. 11, 1991, Ser. No. 728,349
Int. Cl.[5] **A22C** *21/00*
U.S. Cl. 452—174 **1 Claim**



1. A poultry trussing device for use in conjunction with a poultry carcass to hold the legs of said carcass in a position wherein the hocks are adjacent each other and near the tail of the carcass, wherein the hocks are exposed and wherein each hock extends from an ankle and has a smooth, dimpled bony

surface extending in an upward direction, said trussing device comprising:

an ankle strap adapted to be slipped over said exposed hocks and to engage the ankle of each leg and to hold said hocks adjacent each other, said ankle strap having a lower portion which engages the back side of said ankles, said lower portion having an indent formed therein which extends upwardly between said ankles.

5,112,275

COIN SEPARATOR WITH MEANS FOR DETECTING AN ERRONEOUSLY SEPARATED COIN

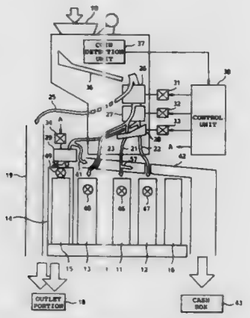
Naoto Sato, Maebashi, Japan, assignor to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 251,848, Oct. 3, 1988, abandoned. This application Jul. 11, 1990, Ser. No. 552,844

Claims priority, application Japan, Oct. 1, 1987, 62-149226[U]; Oct. 2, 1987, 62-150560[U]; Oct. 7, 1987, 62-152681[U]

Int. Cl.[5] **G07D** *3/02*

U.S. Cl. 453—5 **63 Claims**



19. A coin separator comprising:

a coin path;

coin sorting means for sorting deposited coins generally by size and directing coins of generally a first diameter to said coin path and coins of diameters generally different from the first diameter to at least one other coin path different from said coin path;

a coin storage tube to which coins following said coin path flow; and

erroneous coin sorting detection means for defining an opening in the axis of said coin path and having diameter dimensions such that a coin of the first diameter passes therethrough to said coin storage tube and a coin of a second diameter larger than the first diameter which has been erroneously sorted is blocked from passing therethrough to said coin storage tube;

wherein said coin path is generally vertically disposed such that coins following therealong generally freely drop to said opening.

5,112,276

COMBINATION COIN AND MILEAGE MINDER

Ronald A. Spaeth, 3318 Doane Hwy., Grand Ledge, Mich. 48837

Filed May 7, 1991, Ser. No. 696,719

Int. Cl.[5] **C07D** *1/08*; **G09F** *11/04*

U.S. Cl. 453—54 **19 Claims**

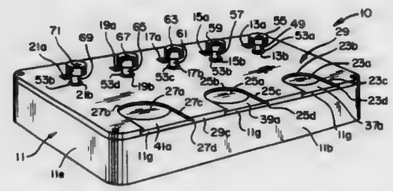
1. A combination coin dispenser and numerical register device which comprises:

(a) a housing means having a bottom wall and at least one sidewall extending from the bottom wall to a face plate, the face plate providing for at least one coin opening for dispensing coins at an edge of the face plate of the housing means and at least one indicia opening;

(b) at least one sleeve means depending from an underside of the face plate inside the housing means, the sleeve means having spaced apart ends providing an opening along a longitudinal axis of the sleeve means for mounting a plurality of coins in the opening of the sleeve means with the opening of the sleeve means in communication with the coin opening in the face plate of the housing means;

(c) at least one wheel means mounted inside the housing means on a shaft means, the shaft means extending through the face plate of the housing means to allow for rotation of the shaft means and the wheel means being provided with indicia so that when the shaft is rotated, an indicia on the wheel means is indexed in the indicia opening in the face plate of the housing means;

(d) an indexing means mounted on the shaft means adjacent to the wheel means inside the housing means; and



(e) at least one advancing means mounted inside the housing means and servicing the sleeve means and the indexing means, the advancing means having a proximal portion and a distal portion, wherein the proximal portion of the advancing means advances the coins along the longitudinal axis of the sleeve means after an upper most coin is removed from the coin opening in the face plate of the housing means and wherein the distal portion of the advancing means is in engagement with the indexing means on the shaft means to maintain the wheel means in a particular position, so that the shaft means selectively indexes the indicia on the wheel means in the indicia opening in the face plate of the housing means for viewing by an operator.

5,112,277

BLOWING DOOR FOR ULTRA-CLEAN CONFINEMENT CONTAINER

Didier Cruz, Grenoble, and Jacques Daval, Meylan, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 28, 1991, Ser. No. 662,162

Claims priority, application France, Mar. 7, 1990, 90 02871

Int. Cl.[5] **B65G** *69/00*

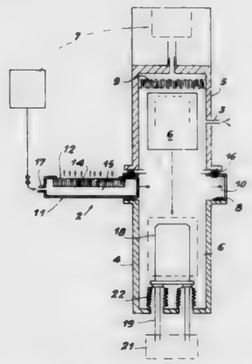
U.S. Cl. 454—195 **8 Claims**

1. A blowing door for an ultra-clean confinement container intended to hermetically seal a first container coupled to a second container to permit the passage of a flat object from said first container to said second container, said first container having at least one opening and an interior portion, said second container having at least one opening and an interior portion, said blowing door comprising:

a first face slidably fitting over the opening of said first container and facing the interior portion of said first container;

a second face opposite said first face, said first face and second face defining an inner chamber therebetween;

sealing means for fixing said first face to said first container; and



ventilation means for said second face of said blowing door such that an ultra-clean atmosphere is maintained in an environment immediately facing said second face.

5,112,278

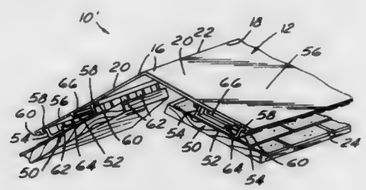
EXTRUDED PLASTIC ROOF RIDGE VENTILATOR

Edward A. Roberts, Mount Clemens, Mich., assignor to Color Custom, Inc., Warren, Mich.

Filed Sep. 11, 1990, Ser. No. 580,640

Int. Cl.[5] **F24F** *7/02*

U.S. Cl. 98—365 **11 Claims**



1. A plastic roof ridge ventilator comprising:

an elongated plastic ridge cover extruded as a unit including a pair of cap portions having inner and outer ends and also including a ridge connection that integrally connects the inner ends of the cap portions to each other; and

a pair of elongated plastic vents having vent openings through which air flows outwardly from below the ridge cover, each vent including a flap portion having a first and integrally connected to the outer end of the associated cap portion and also having a second distal end, and each vent also including a base portion having a first end integrally connected to the outer end of the associated cap portion and also having a second distal end.

5,112,279

DISCHARGE STRUCTURE FOR AN AXIAL SEPARATOR

Roderick J. Jensen, Moline, and Jerry L. Weber, Aledo, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed May 10, 1991, Ser. No. 698,762

Int. Cl.[5] **A01F** *7/04, 12/00, 12/30*

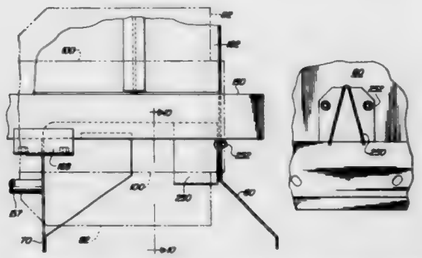
U.S. Cl. 460—69 **10 Claims**

1. An agricultural combine for harvesting and threshing a crop in a field, the combine comprising:

a supporting structure;

a transverse threshing cylinder and concave is mounted to the supporting structure for threshing a harvested crop;

an axial separator is mounted to the supporting structure for receiving threshed crop material from the transverse threshing cylinder and concave, the axial separator further separating grain and chaff from straw of the threshed crop material, the axial separator is provided with a pair of side-by-side axial separator units, each axial separator unit is provided with a rotor and a casing in which the respective rotor is housed and rotates, the axial separator is



provided with a forward portion for receiving threshed crop material from the threshing cylinder and concave and a rear portion, the rear portion of the axial separator is provided with a bottom that is open forming a discharge area for ejecting straw from the axial separator; and

a wedge shaped deflector having an apex, the wedge shaped deflector extends axially over a portion of the discharge area.

5,112,280

SYSTEM FOR CONTROLLING A CONTINUOUSLY VARIABLE TRANSMISSION

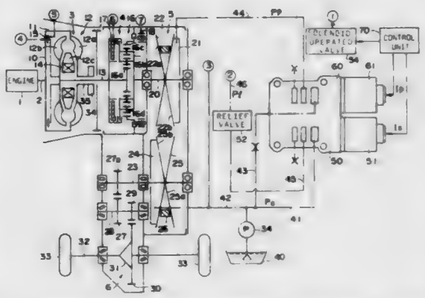
Keiji Sato, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1991, Ser. No. 656,001

Claims priority, application Japan, Dec. 14, 1990, 2-33308

Int. Cl.[5] **F16H** *59/00*

U.S. Cl. 474—18 **4 Claims**



1. A system for controlling pressure in a belt drive continuously variable transmission for transmitting power of an engine to wheels of a motor vehicle through a torque converter with a lockup clutch, the system having a solenoid operated valve for engaging the lockup clutch, a primary pulley connected to an output member of the torque converter, a secondary pulley operatively connected to said wheels, an endless belt running over said primary and secondary pulleys, a primary cylinder and a secondary cylinder for changing effective diameters of both pulleys, a secondary pressure control valve for controlling secondary pressure applied to said secondary cylinder, a primary pressure control valve for producing a primary pressure applied to said primary cylinder, and actuating means for actuating the secondary pressure control valve in accordance

with driving conditions of the vehicle for controlling the secondary pressure, the system comprising;

detector means for detecting said vehicle driving conditions for engaging and disengaging the lockup clutch and for producing an engagement signal and a disengagement signal in accordance with detected conditions;

timing adjusting means responsive to the engagement signal for producing a lockup signal for operating the solenoid operated valve to engage the lockup clutch and for producing a pressure reduction signal for actuating the actuating means to reduce the secondary pressure after a predetermined first delay time; and

said timing adjusting means further responsive to the disengagement signal for producing a pressure increase signal for actuating the actuating means to increase the secondary pressure, and for producing a lockup release signal for operating the solenoid operated valve to disengage the lockup clutch after a predetermined second delay.

5,112,281

DRIVING SYSTEM FOR AUXILIARIES OF ENGINE AND METHOD FOR ADJUSTING TENSION OF BELT FOR DRIVING AUXILIARIES

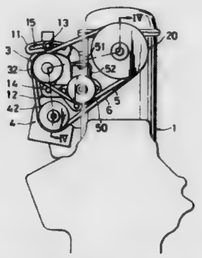
Norio Minato; Makoto Kishida; Yumi Yamada; Izumi Watanabe, and Kiyomi Kimura, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 27, 1991, Ser. No. 661,169

Claims priority, application Japan, Mar. 7, 1990, 2-23501[U]; Mar. 7, 1990, 2-23502[U]

Int. Cl.[5] **F16H** *7/08*

U.S. Cl. 474—84 **16 Claims**



1. A driving system for driving auxiliaries comprising:

a first driving pulley and a second driving pulley disposed parallel to a driving shaft;

a first auxiliary mounted movable to an engine body;

a first following pulley fixed to an operating shaft of said first auxiliary;

an idle pulley disposed rotatably and coaxially with said operating shaft thereof;

a second auxiliary fixed to the engine body;

a second following pulley fixed to an operating shaft of said second auxiliary;

a tension pulley mounted movably to the engine body;

a first belt wound around said first driving pulley, said first following pulley and said tension pulley; and

a second belt wound around said second driving pulley, said idle pulley and said second following pulley.

5,112,282

HIGH TEMPERATURE POLYURETHANE BELT

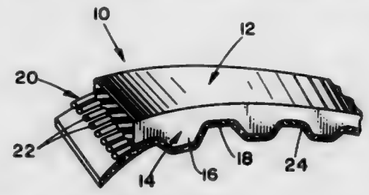
Philip M. Patterson, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Dec. 27, 1990, Ser. No. 633,510

Int. Cl.[5] **F16G** *5/00*

U.S. Cl. 474—260 **32 Claims**

1. A high and low temperature resistant endless belt comprising a main belt body portion prepared from elastomeric material, tensile means disposed in said body portion, and a sheave contact portion integral with said main body portion, said elastomeric material having high and low temperature resistant properties and formed from the reaction product of polyolpropylene oxide polyol having a molecular weight of up



to 10,000, an hydroxyl or amine terminated chain extender, and a polyisocyanate-containing composition adapted for rapid reaction with said extender when admixed therewith in a mold to retain flexibility and resiliency over heat age of said belt.

5,112,283

CONTINUOUS SPEED-SHIFTING DEVICE

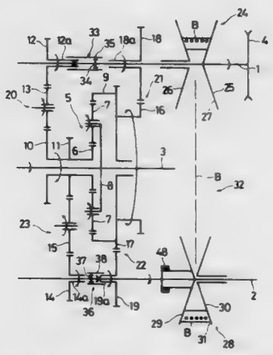
Hirofumi Miyata, and Yutaka Furukawa, both of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Japan

Filed Sep. 4, 1990, Ser. No. 577,426

Claims priority, application Japan, Sep. 4, 1989, 1-22947

Int. Cl.[5] **F16H** *37/06*

U.S. Cl. 475—211 **6 Claims**



1. A continuous speed-shifting device comprising:

first, second and third rotary shafts arranged in parallel with one another;

a differential gear mechanism having first, second and third gear elements, of which the first gear element is fixedly mounted on the third rotary shaft for rotation thereon;

a variable speed pulley mechanism having first and second variable pulleys fitted to the first and the second rotary shafts, respectively, each of said pulleys including a fixed sheave fixedly mounted on an associated one of said shafts and a movable sheave axially slidably mounted on an associated one of said shafts and facing said fixed sheave, and a belt trained between both of said pulleys, thereby connecting the first and the second rotary shafts speed-changeably;

a first driving power gear mechanism connecting the first rotary shaft to the second gear element of the differential gear mechanism;

a second driving power gear mechanism connecting the first rotary shaft to the third gear element of the differential gear mechanism;

a first circulating power gear mechanism which connects the second rotary shaft to the third gear element of the differential gear mechanism;

a second circulating power gear mechanism which connects the second rotary shaft to the second gear element of the differential gear mechanism;

a first gear clutch positionable to connect the first rotary shaft to the first or the second driving power gear mechanism, or disconnect the first rotary shaft from the first or the second driving power gear mechanism; and

a second gear clutch positionable to connect the second rotary shaft to the first or the second circulating power gear mechanism, or disconnect the second rotary shaft from the first or the second circulating power gear mechanism;

whereby rotating direction of the first gear element of the differential gear mechanism is switched by positioning the first and second gear clutches and the rotational speed of the second or third gear element of the differential gear mechanism connected alternately to the first or second driving power gear mechanism, respectively, is kept higher than that of the third or second gear element connected alternately to the first or second circulating power gear mechanism, respectively, and circulating power is transmitted to the variable speed pulley mechanism.

5,112,284

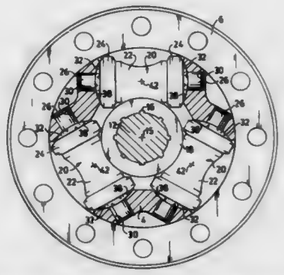
ROCKER-MOUNTING FOR DIFFERENTIAL GEAR

James S. Dye, Walworth, N.Y., assignor to Zexel-Gleason USA, Inc., Rochester, N.Y.

Filed Dec. 10, 1990, Ser. No. 630,050

Int. Cl.[5] **F16H** *1/30, 1/38, 1/48, 57/00*

U.S. Cl. 475—228 **4 Claims**



1. In a differential assembly of the type which includes a differential case having means for receiving a pair of axle ends each of which is fixed to a respective side gear for rotation therewith about a common axis, said case also having means for supporting at least one pair of combination gears so that each respective one of said paired combination gears is in meshing engagement with a respective one of said side gears and so that said paired combination gears are also in meshing engagement with each other for interconnecting said side gears and their respective axle ends in a mutual driving relationship, the improvement wherein said supporting means for at least one combination gear of each said pair further comprises cylindrical mounting means for permitting said combination gear to be positionally adjusted in said mounting only about an axis parallel to the axis of the respective side gear with which it is in meshing engagement.

5,112,285

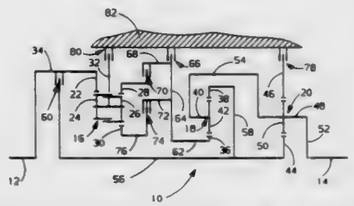
TRANSMISSION GEAR ARRANGEMENT

Arthur Hall, III, Cicero, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 1, 1991, Ser. No. 724,300

Int. Cl.[5] **F16H** *57/08, 1/46*

U.S. Cl. 475—280 **7 Claims**



1. A power transmission providing a plurality of forward and reverse drive ratios, comprising:

(a) input means for delivering power;

(b) first selectively engageable clutch means operatively connected to the input means;

(c) output means for delivering power from the transmission;

(d) compound planetary gear means drivingly connected to the input means;

(e) first and second simple planetary gear means drivingly connected to the first clutch means;

(f) second and third selectively engageable clutch means drivingly connected to the compound planetary gear means and operatively connected to the first simple planetary gear means;

(g) means drivingly connecting the first and second simple planetary gear means;

(h) means drivingly connecting the second simple planetary gear means and the output shaft; and

(i) selectively engageable brake means cooperating with the compound planetary gear means; the first and second simple planetary gear means and the second and third clutch means to establish selected drive ratios.

5,112,286

METHOD OF TESTING AND/OR EXERCISING THE CERVICAL MUSCLES OF THE HUMAN BODY

Arthur A. Jones, 1155 NE. 77th St., Ocala, Fla. 32670

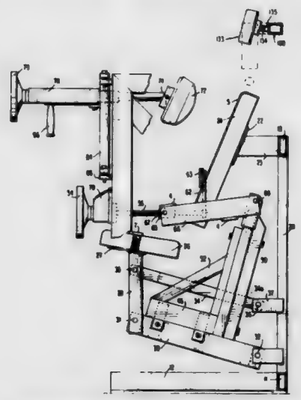
Division of Ser. No. 307,473, Feb. 8, 1989, Pat. No. 5,002,269, which is a continuation-in-part of Ser. No. 236,367, Aug. 25, 1988, Pat. No. 4,902,009, Ser. No. 181,372, Apr. 14, 1988, Pat. No. 4,834,365, and Ser. No. 60,679, Jun. 11, 1987, Pat. No. 4,836,536, said Ser. No. 236,367, and Ser. No. 181,372, each is a continuation-in-part of Ser. No. 60,679,. This application Nov. 5, 1990, Ser. No. 608,758

Int. Cl.[5] **A63B** *21/00*

U.S. Cl. 482—100 **10 Claims**

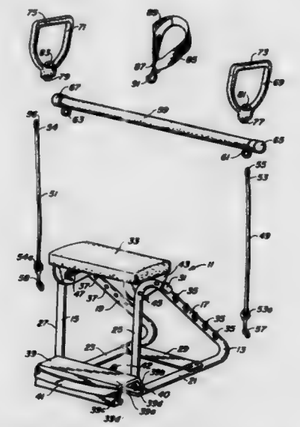
1. A method of dynamic exercising and static testing of the cervical muscles of the neck of a person comprising the steps of immobilizing the upper torso of the person while in seated position against a fixed backrest, positioning the head of the person against a movement arm, applying with said muscles a force to pivot the movement arm with the head about a generally horizontal axis in a rearward direction, biasing said movement arm against movement in said rearward direction by means of a freely movable resistance weight connected to the movement arm and being of a predetermined magnitude less than the maximum static strength of said muscles and repeating the exercise until said muscles fatigue and are no longer capa-

ble of pivoting the movement arm and wherein there is further included the step of counterbalancing the weight of the head



and neck of the subject relative to said axis by means of a counterweight connected to the movement arm.

5,112,287
EXERCISING DEVICE
Aaron F. Brewer, 7620 Valentine St., Oakland, Calif. 94605
Filed Nov. 27, 1990, Ser. No. 619,073
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—130 **16 Claims**



1. An exercising device comprising

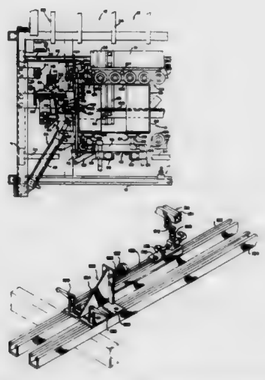
a rigid base portion having a pair of vertical support members, each of said vertical support members having a horizontal bottom portion, an angled side portion, said angled side portion forming an acute angle with said bottom portion, and a second side portion, and spacing means for securing the vertical support members in a spaced relation;

at least one tension member, said tension member having connecting means disposed on at least one end thereof;

at least one body engaging member disposed on one end of said tension member; and

securement means disposed in a plurality of vertical positions on the angled side portion of at least one of the vertical support members for securing the connecting means of said tension member to a selected position on said angled side portion whereby the maximum tension on said body engaging member can be varied by securing said tension member to a different vertical position on the angled side portion.

5,112,288
CARTON ERECTOR APPARATUS
Lawrence W. Ulrich, and Conrad Walker, both of Darien, Ill., assignors to Durable Packaging Corp., Chicago, Ill.
Filed Jan. 7, 1991, Ser. No. 638,075
Int. Cl.[5] B31B *1/76, 1/80*
U.S. Cl. 493—27 **5 Claims**



1. Carton erecting apparatus for setting up and bottom closing of cartons which are supplied to the apparatus as knocked-down carton blanks having side and end panels and top and bottom flaps formed integral therewith; said apparatus comprising:

(a) a carton blank storage section having a magazine means for storing and urging knocked-down carton blanks towards a carton set-up section positioned adjacent to said carton blank storage section;

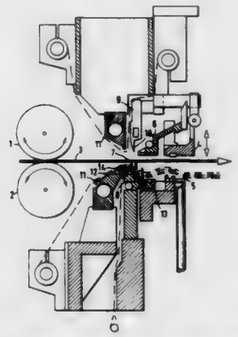
(b) said carton set-up section including a carton opening assembly for receiving a carton blank from said magazine means and setting up said carton blank in a tubular form;

(c) said apparatus having a bottom flap folding section positioned adjacent said carton set-up section, said bottom flap folding section having a bottom flap folding means associated therewith for infolding the bottom flaps of the set-up carton;

(d) a carriage assembly having a substantially horizontal carriage plate mounted in said bottom flap folding section for movement through a substantially horizontal plane by first means connected to said carriage plate between a first position within said bottom flap folding section and a second position extending into said carton set up section and comprising means for receiving and delivery of the set-up carton into said bottom flap folding section without interfering with the operation of said carton opening assembly; and

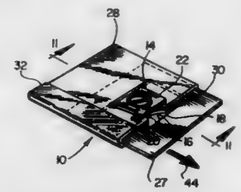
(e) control means for contacting and selectively stopping the travel of said carriage assembly at locations in said bottom flap folding section and thereby controlling the distance said carriage assembly travels into said bottom flap folding section when it reaches its first position.

5,112,289
DEVICE FOR TRANSVERSE CUTTING AND WELDING OF WEBS
Uwe Köhn, Bielefeld, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany
Filed Oct. 25, 1990, Ser. No. 602,950
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1989, 3936515
Int. Cl.[5] B31B *23/10, 1/08, 23/16*
U.S. Cl. 493—194 **3 Claims**



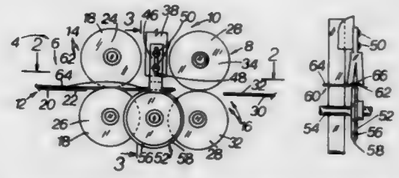
1. A device for transverse cutting and welding of webs of thermoplastic material comprising a pair of feed rolls for feeding the web in steps equal to a length to which the web is to be cut, a transverse cutting device for cutting the web between each step into segments of said length, a transverse welding device for forming transverse welds in the web, two vertically movable transversely extending parallel rails displaced from each other in a feed direction of the web of which one of the rails which is downstream of the other of the rails in the feed direction acts as a gripping rail for pressing the web against a support and the other of said rails is disposed between the cutting device and said one rail and acts as a tautening rail for tautening the web between the feed rolls and the gripping rail before it is cut, and means for reversing rotation of the feed rolls after operation of the gripping rail and prior to operation of the cutting device and the welding device, so that said feed rolls feed the web in said cutting length steps by feeding the web in lengths greater than said cutting length with said reversing operating to partially draw back the web between each cut.

5,112,290
POP-OUT SLIDE AND METHOD OF MAKING SAME
Susan Hibsch, Woodridge, Ill., assignor to The Lehigh Press, Inc., Cherryhill, N.J.
Division of Ser. No. 575,421, Aug. 30, 1990. This application Jan. 9, 1991, Ser. No. 639,107
Int. Cl.[5] B31D *7/00*
U.S. Cl. 493—325 **6 Claims**



1. A method of fabricating a pop-out slide from a single continuous web of material comprising the steps of: cutting said web of material to define a through slot and a cutout, such that said cutout in turn defines a pop-out member superimposable with and shaped and alignable for selective extension through said slot; slitting said web into two ribbons, one of said ribbons being a slot-carrying ribbon and the other of said ribbons including said cutout and said pop-out member; stacking said ribbons in a position for aligning said pop-out member with said slot; applying a seam of glue adjacent said slot; marrying the ribbon carrying said pop-out member with the ribbon carrying said slot; folding over a portion of said slot-carrying ribbon so as to partly enclose said ribbon carrying said pop-out member and such that said seam of glue extends through the cutout defining said pop-out member to adhesively secure with a facing surface of said slot-carrying ribbon to the other side thereof.

5,112,291
OVERBENDING DEVICE
H. Richard VerMehren, 2626 Woodson Rd., St. Louis, Mo. 63141
Continuation of Ser. No. 462,135, Jan. 8, 1990, abandoned. This application Apr. 19, 1991, Ser. No. 688,370
Int. Cl.[5] B65H *45/12*
U.S. Cl. 493—409 **19 Claims**



1. An overbending device for a member including a bend line, the bend line generally defining adjacent planar member portions of the planar member, one adjacent planar member portion on either side of the bend line, the bend line encouraging the desired bending of one adjacent portion onto over the other adjacent portion, the overbending device comprising:

means for forcing a member in a direction against a preexisting bend line formed in the member, the forcing means acting in opposition to the direction of the bend produced by the pre-folded bend line,

pressing means for pressing portions of the member, the pressing means acting on opposite sides of the bend line and in opposition to the desired bend direction, the pressing means resisting movement of the member due to the engagement of the forcing means with the member; and

the forcing means including an edge portion operatively contacting the member generally along the reverse side of the bend line and the pressing means including engaging portions engaging the member, the pressing means engaging portions located sufficiently below a plane generally defined by the member and the forcing means edge portion located sufficiently above the plane, whereby operative cooperation of the forcing means and of the pressing means causes the member to over bend along the bend line in a direction in opposition to the desired bend direction so as to create a substantially, generally planar member.

5,112,292
HELIFOIL PUMP
Ned H. C. Hwang, Houston, and David P. Summers, Montgomery, both of Tex., assignors to American Biomed, Inc., The Woodlands, Tex., a part interest
Division of Ser. No. 295,234, Jan. 9, 1989, Pat. No. 4,969,865. This application Oct. 25, 1990, Ser. No. 603,160
Int. Cl.[5] A61F *1/24*
U.S. Cl. 600—16 **3 Claims**

1. A method of temporarily providing circulatory assistance to the heart of a patient, comprising the steps of:

(a) positioning a pump carried by a catheter in the vascular system of a patient, said pump having intake port means at an intake end thereof, discharge port means at an opposite end thereof and a continuous rotating passage, said positioning step including inserting the intake port means of said pump into the heart of the patient and the discharge port means in the vascular system of the patient downstream of the heart.



(b) creating a pressure differential in the pump for maximizing blood flow through the pump at a physiological pressure level; and

(c) pumping blood from the intake port means to the discharge port means through the continuous rotating passage within the pump transforming mass displacement at the intake port means into transformational blood flow at the discharge port means.

5,112,293

DOOR ASSEMBLY

Robert K. Vaccaro, Philadelphia, Pa., assignor to Air-Shields, Inc., Hatboro, Pa.

Continuation of Ser. No. 269,250, Nov. 9, 1988, abandoned. This application Feb. 28, 1991, Ser. No. 663,292

Int. Cl.[5] A61G *11/00*

U.S. Cl. 600—22 **14 Claims**



13. An infant incubator door assembly comprising:

an incubator canopy having an opening;

a door;

means for mounting said door on said incubator canopy at a first side of said opening for pivotal movement of said door about a first axis between open and closed positions of said door;

a first door spring urging said door to pivot in a first direction to said open position of said door;

an impact absorbing roller mounted on said door opposite from said mounting means for rotational movement of said impact absorbing roller about a second axis parallel to said first axis;

a latch member mounted on said incubator canopy at a second side of said opening opposite from said first side of said opening for pivotal movement of said latch member about a third axis parallel to said first and said second axes, said latch member having (1) a contact surface engaged by rolling contact of said impact absorbing roller to pivot said latch member in a first direction as said door pivots against said first spring in a second direction opposite to said first direction of pivoting of said door toward said closed position of said door, and (2) a detent at an end of said contact surface which, when reached by said impact absorbing roller, permits said latch member to pivot in a second direction opposite to said first direction of pivoting of said latch member;

a second spring urging said latch member to pivot in said second direction of pivoting of said latch member against said impact absorbing roller to latch said impact absorbing roller in said detent in said latch member;

means for pivoting said latch member in said first direction of pivoting of said latch member to disengage said impact absorbing roller and said latch member and release said impact absorbing roller from said detent to permit said door to pivot to said open position;

and an elastomeric stop member attached to said latch member and positioned to engage said incubator canopy upon movement of said latch member in said second direction of pivoting of said latch member.

5,112,294

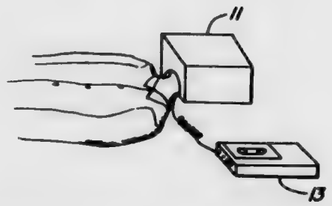
METHOD AND SYSTEM FOR FACILITATING CHAMBER-TYPE MEDICAL PROCEDURES

Charles S. Syers, 325 Ascot Rd., Hillsborough, Calif. 94010

Filed Nov. 15, 1990, Ser. No. 613,336

Int. Cl.[5] A61M *21/00*

U.S. Cl. 600—27 **14 Claims**



9. A system for preparing a subject suffering from claustrophobia for a medical procedure which requires placement of at least the head of said subject inside a chamber, said system comprising:

a shell sized to fit over the head of an adult human, said shell being one which is readily removable by an adult human over whose head said shell has been placed and which has an interior surface bearing a pictorial representation approximating the appearance of the inside of said chamber;

a recording of sounds approximating those audible to one undergoing said medical procedure; and

means for playing said recording to a subject over whose head said shell has been placed.

5,112,295

PENILE PROSTHESIS AND METHOD

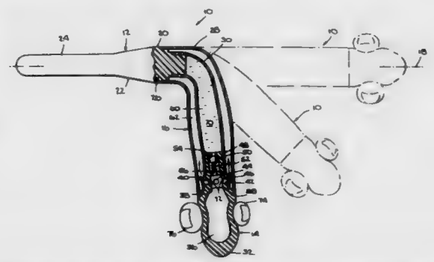
Norman R. Zinner, 23451 Madison St., Suite 340, Torrance, Calif. 90505, and Arthur M. Sterling, 11748 Manorwood Dr., Baton Rouge, La. 70815

Continuation of Ser. No. 511,563, Apr. 20, 1990, Pat. No. 5,069,201. This application Sep. 30, 1991, Ser. No. 769,121

Int. Cl.[5] A61F *5/00*

U.S. Cl. 600—40 **10 Claims**

1. A penile prosthesis comprising a normally flaccid but selectively rigidifiable axially elongate main body portion, a proximal end portion extending from a corresponding proximal end of the main body portion, and a distal end portion extending from a corresponding distal end of said main body portion, said main body portion including at least one chamber having a fluid fillable space, filler means in said fluid fillable space, pumping means communicable with said one chamber and actuatable for pumping fluid in a predetermined direction between said fluid fillable space and said pumping means, and valve means disposed between said pumping means and said one chamber and cooperable with said pumping means for controlling the predetermined direction of flow of fluid between said one chamber and said pumping means during actuation of said pumping means such that movement of said fluid in said predetermined direction in response to activation of said



pumping means cause rigidification of said one chamber, and wherein said filler means includes means for limiting change in the radial magnitude of said one chamber beyond a predetermined amount when said chamber is rigidified.

5,112,296

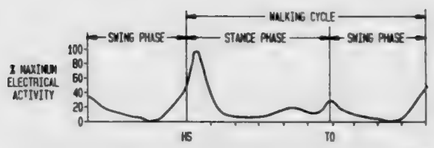
BIOFEEDBACK ACTIVATED ORTHOSIS FOR FOOT-DROP REHABILITATION

John Beard, Baton Rouge; Verdell M. Banner, Vacherie, both of La.; Mushahid Khan, Houston, Tex., and Norman J. Leonard, Baker, La., assignors to The Board of Supervisors of Louisiana State University, Baton Rouge, La.

Filed Apr. 30, 1991, Ser. No. 693,816

Int. Cl.[5] A61F *5/00*

U.S. Cl. 602—28 **20 Claims**



1. A biofeedback activated orthosis for foot-drop rehabilitation, comprising:

a. a lifting means for mechanically lifting a foot during the swing phase of a walking cycle, attachable to a human body at a point above said foot and attachable to said foot;

b. a muscle activity sensing means for detecting muscle activity and transmitting data relating to said activity to a control means, attached to an affected leg of said human body and operatively connected to said control means;

c. a control means for receiving and processing said data from said muscle activity sensing means and controlling operation of said lifting means, operatively connected to said lifting means and said muscle activity sensing means; and

d. an electrogoniometer means for detecting the angular position between the thigh and the shin of said leg, and for transmitting data reflecting said position to said control means, operatively connected to said leg of said human body and said control means.

5,112,297

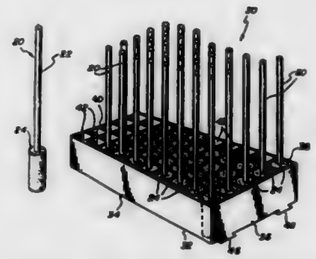
TOPICAL ANESTHETIC APPLICATOR, DISPENSER SYSTEM, AND METHOD

Robert W. Stalcup, 21152 Peppertree La., Mission Viejo, Calif. 92691, and Robert G. McCall, 7468 E. Raintree Crt., Scottsdale, Ariz. 95258

Continuation-in-part of Ser. No. 400,281, Aug. 29, 1989, Pat. No. 5,016,651. This application Mar. 5, 1990, Ser. No. 488,658

Int. Cl.[5] A61M *35/00*

U.S. Cl. 604—1 **10 Claims**



1. An applicator dispenser system for topical anesthetic applicators, comprising:

a plurality of applicators having:

a soft, sponge-like applicator member characterized by a relatively high absorptivity and having a substantially cylindrical configuration with a diameter in the range of ¼ to ½ inch and a length sufficient to allow coverage of mucosal tissue adjacent at least two adult human teeth;

a predetermined amount of topical anesthetic suitable for application to human oral mucosal tissue preapplied to said applicator member; and

an elongated handle affixed to said applicator member; and

an applicator dispenser apparatus for storing said applicators and allowing selective removal thereof for use, said applicator dispenser apparatus having a refill dispenser housing structure comprising means for defining a plurality of wells for receiving said applicators.

5,112,298

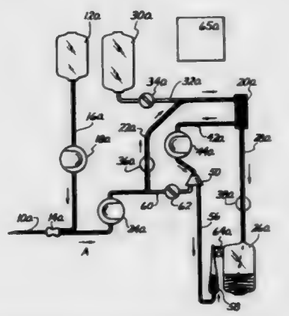
APHERESIS METHOD AND DEVICE

Paul R. Prince, San Juan Capistrano; William Miller, Santa Ana, and Grant S. Benjamin, Costa Mesa, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Jun. 25, 1990, Ser. No. 542,846

Int. Cl.[5] A61M *1/00*

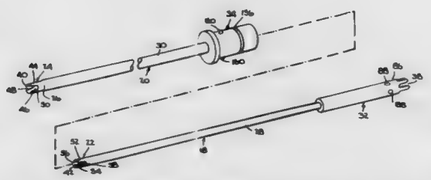
U.S. Cl. 604—6 **14 Claims**



1. An apheresis method comprising the steps of:

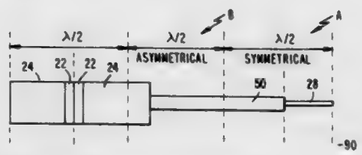
(a) fluidly connecting a blood separation device to the vasculature of a human subject;
(b) operating at least one pump to withdraw whole blood from the human subject and to move said whole blood into said separation device;
(c) providing a single weighing device having a first blood fraction container and a second blood fraction container positioned thereon, such that said weighing device will measure the combined weight of the said first blood fraction container and said second blood fraction container, along with any material contained therein;
(d) recording an initial weight on said weighing device when said first blood fraction container and said second blood fraction container are empty;
(e) operating said separation device to fraction the whole blood into at least a first blood fraction and a second blood fraction;
(f) recording a second weight on said weighing device after said first blood fraction and said second blood fraction have been collected in said first blood fraction container and said second blood fraction container;
(g) providing a fluid connection between said first blood fraction container and said human subject;
(h) operating at least one pump to reinfuse said first blood fraction, through said fluid connection, into said human subject; and
(i) recording a third weight on said weighing device after said first blood fraction has been removed from said first blood fraction container reinfused into said human subject.

5,112,299
ARTHROSCOPIC SURGICAL APPARATUS AND METHOD
John Pascaloff, Goleta, Calif., assignor to Hall Surgical Division of Zimmer, Inc., Carpinteria, Calif.
Continuation of Ser. No. 427,438, Oct. 25, 1989, abandoned. This application Jun. 5, 1991, Ser. No. 715,304
Int. Cl.[5] A61B *17/32*
U.S. Cl. 604—22 **2 Claims**



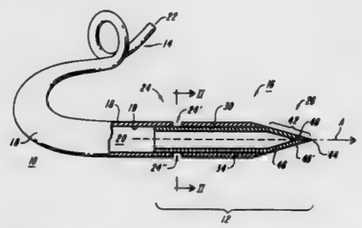
1. An arthroscopic tissue cutting apparatus adapted to be coupled to an aspirator and to a rotary drive motor, said apparatus comprising a hollow, cylindrical sheath member elongated along a longitudinal axis and having a substantially fully open distal end, and a hollow cylindrical blade member rotatable within said sheath member, said blade member being elongated along an axis corresponding to said longitudinal axis and having an open interior space, said blade member having a proximal end adapted to be coupled to said aspirator, and a substantially fully open distal end, the distal end of said blade member extending a predetermined longitudinal amount beyond the distal end of said sheath member, the respective distal ends of said blade member and said sheath member each being provided with a pair of spaced, longitudinally extending, diametrically opposed tabs, each of said tabs on each of said blade and sheath members including at least one longitudinally extending cutting edge, the cutting edges on the tabs of one of said blade and sheath members being cooperable with the corresponding cutting edges on the tabs of the other of said blade and sheath members for cutting tissue positioned in the space between the tabs of said sheath member when said blade member is rotated relative to said sheath member, said cut tissue being aspirated through the interior space of said hollow blade member.

5,112,300
METHOD AND APPARATUS FOR CONTROLLING ULTRASONIC FRAGMENTATION OF BODY TISSUE
Alexander Ureche, El Toro, Calif., assignor to Alcon Surgical, Inc., Fort Worth, Tex.
Filed Apr. 3, 1990, Ser. No. 503,666
Int. Cl.[5] A61B *17/00*
U.S. Cl. 604—22 **7 Claims**



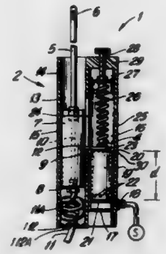
1. An ultrasonic apparatus comprising:
a handpiece assembly;
a power source;
transducer means mounted in said handpiece assembly and being operable for converting electrical power from said power source to ultrasonic mechanical vibrational energy;
motion amplifying means acoustically coupled at one end to said transducer means, said amplifying means including an operative tip portion at another end thereof for contacting body tissue to be removed;
said amplifying means including a symmetrical horn portion comprising a first portion, a second portion and a first step separating said first and said second portions, wherein said first and said second portions are equal in length about said first step and an asymmetrical horn portion comprising a third portion, a fourth portion and a second step separating said third and said fourth portions, wherein said third portion and said fourth portion are unequal in length about said second step, said symmetrical and asymmetrical horn portions being connected in series with each other, said operative tip portion being included as one of said horn portions and being operable for providing a desired degree of displacement at a distal end segment thereof.

5,112,301
BIDIRECTIONAL CHECK VALVE CATHETER
Paul V. Fenton, Jr., Marblehead, Mass.; Thomas M. Young, Traverse City, Mich., and William J. Gorman, Newburyport, Mass., assignors to Strato Medical Corporation, Beverly, Mass.
Filed Jun. 19, 1991, Ser. No. 717,618
Int. Cl.[5] A61H *1/00*
U.S. Cl. 604—30 **12 Claims**



1. A bidirectionally valved catheter comprising:
at least one elongated, flexible tubular element defining a lumen extending along an axis substantially parallel to the central axis of said tubular element and adapted for selective flow of fluid therein between a proximal end and a distal end of said tubular element, and
a first bidirectional check valve assembly coupled to said lumen and disposed near said distal end of said tubular element, said valve assembly including an aspiration valve for fluid inflow from outside to inside said tubular element and an infusion valve for fluid outflow from inside to outside said tubular element, said aspiration valve including a sleeve valve positioned near said distal end, and said infusion valve including a slit valve at said distal end.

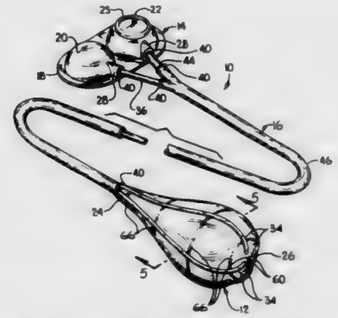
5,112,302
METHOD AND APPARATUS FOR PERFORMING LIPOSUCTION
Robert L. Cucin, 8 E. 62nd St., New York, N.Y. 10021
Filed Jul. 16, 1990, Ser. No. 553,881
Int. Cl.[5] A61B *17/00*
U.S. Cl. 604—35 **37 Claims**



1. Apparatus for use in liposuction treatment, which comprises:
a hand-holdable housing having a first cavity;
a cannula having a distal end and a proximal end, and at least one suction aperture about said distal end and a base operably associated with said proximal end, said cannula being insertable within said first cavity so that said cannula is free to reciprocate relative to said housing; and
reciprocation means disposed within said housing and operable associated with said cannula so that said cannula can be selectively caused to reciprocate relative to said hand-holdable housing within said first cavity.

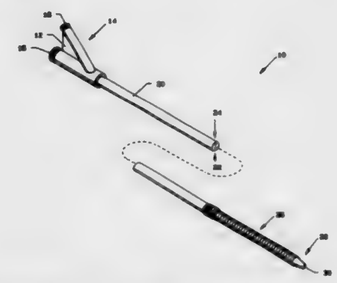
5,112,303
TUMOR ACCESS DEVICE AND METHOD FOR DELIVERING MEDICATION INTO A BODY CAVITY
Robert H. Pudenz, South Pasadena, and Gary P. East, Santa Barbara, both of Calif., assignors to Pudenz-Schulte Medical Research Corporation, Goleta, Calif.
Filed May 2, 1991, Ser. No. 694,679
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—49 **33 Claims**

1. A surgically implantable device for accessing a body cavity through a relatively small cavity wall aperture, and delivering medication through the device into the body cavity, the device comprising:
means for receiving a first fluid subcutaneously by injection into the device at a location remote from the body cavity;
a first conduit extending from the first fluid receiving means to the cavity wall aperture;
a flexible, fluid impermeable bag configured for insertion into the body cavity through the cavity wall aperture, the fluid impermeable bag having an exterior surface and a bag inlet connected to the first conduit opposite to the first fluid receiving means such that fluid injected into the first fluid receiving means flows into the fluid impermeable bag to inflate it within the body cavity, and such that fluid withdrawn from the first fluid receiving means collapses the fluid impermeable bag permitting it to be withdrawn from the body cavity;
means for receiving by injection, at a location remote from the fluid impermeable bag, medication into the device;
a second conduit connected to the medication receiving means and extending adjacent to the first conduit to the cavity wall aperture; and



means for delivering the medication from the medication receiving means into a space between walls defining the body cavity and the exterior surface of the fluid impermeable bag, wherein the medication delivering means includes at least one medication outlet which directs the medication injected into the medication receiving means into said space such that the medication substantially surrounds the fluid impermeable bag.

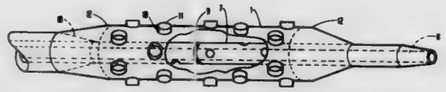
5,112,304
BALLOON CATHETER
Edward A. Barlow, Bloomington, and Gregory G. Brucker, Minneapolis, both of Minn., assignors to Angeion Corporation, Plymouth, Minn.
Filed Mar. 17, 1989, Ser. No. 324,913
Int. Cl.[5] A61M *25/10*
U.S. Cl. 604—96 **17 Claims**



1. Balloon catheter comprising:
a. catheter tube including a guidewire passage and an inflation/deflation passage;
b. a hub including a guidewire entry port and an inflation/-deflation port on a proximal end of said catheter tube;
c. a tube of elastomeric material of a short length affixed to the distal end of said catheter tube; and,
d. a balloon fixedly secured to the outer surface of said distal end of said catheter tube at one end of said balloon and fixedly secured to the outer surface of a distal end of said tube at the other end of said balloon, wherein said balloon includes a braided fiber layer located between an inner elastomeric material layer with memory and an outer

elastomeric material layer with memory and wherein said braided fiber layer is fixedly secured adjacent said distal end of said catheter tube and fixedly secured adjacent said distal end of said tube.

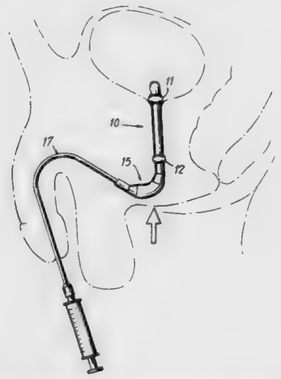
5,112,305
CATHETER DEVICE FOR INTRAMURAL DELIVERY OF THERAPEUTIC AGENTS
Peter Barath, West Hollywood, Calif., and Ferenc Denes, Budapest, Hungary, assignors to Cedars-Sinai Medical Center, Los Angeles, Calif.
Continuation-in-part of Ser. No. 472,898, Jan. 31, 1990. This application Oct. 16, 1990, Ser. No. 598,405
Claims priority, application Hungary, Jun. 20, 1989, 3145/89
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—96 **2 Claims**



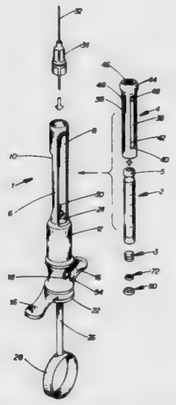
1. A method of treating a blood vessel which contains an atherosclerotic lesion whereby a therapeutic agent is delivered into the vessel wall at or near the side f the atherosclerotic lesion comprising:
insertion of a catheter device system into a diseased blood vessel, the catheter being one which contains an inflatable balloon studded with hollow tubular extensions that communicate between the outer surface of the balloon and the inner lumen of the catheter device system;
slow filling of the catheter balloon so that the balloon surface's tubular extensions abut the inner vessel wall; and,
rapid infusion of a bolus of a therapeutic agent fluid sufficient to effect bursting of the vessel's endothelium by the tubular extensions and delivery of a therapeutic agent to the deeper layers of the vessel wall through the extensions.

5,112,306
METHOD AND APPARATUS FOR VALVING BODY FLUIDS
John H. Burton, Minnetonka; Eric P. Berg, Woodbury; Bradford G. Staehle, Minnetonka, all of Minn., and Frank B. Scott, Houston, Tex., assignors to American Medical Systems, Inc., Minnetonka, Minn.
Continuation of Ser. No. 267,748, Nov. 2, 1988, Pat. No. 4,909,785, which is a continuation of Ser. No. 843,747, Mar. 25, 1986, abandoned. This application Dec. 27, 1989, Ser. No. 457,423
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—101 **35 Claims**

1. An indwelling valving device, comprising:
a flexible tubular body having distal and proximal ends and defining a longitudinal passageway therethrough;
anchoring means for securing said body in place; and
collapsible blocking means for blocking said passageway, said blocking means operable to collapse by manual pressure to allow fluid flow through said passageway and operable to expand by gradual pressure equalization to again block said passageway when the desired fluid flow is completed.



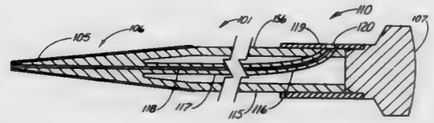
5,112,307
DENTAL SYRINGE HAVING A MEDICATION FILLED CARPULE AND AN AUTOMATICALLY-DETACHING PISTON STEM
Terry M. Haber, Lake Forest, and Clark B. Foster, Laguna Niguel, both of Calif., assignors to Habley Medical Technology Corp., Laguna Hills, Calif.
Filed Apr. 24, 1990, Ser. No. 513,246
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 **20 Claims**



1. A syringe assembly comprising:
a hollow body portion having an elongated opening;
a sleeve receivable in said hollow body portion through said opening, said sleeve having distal and proximal ends;
a carpule for holding a fluid injection including means for securing a needle carrier thereto and being slidably disposed within said sleeve from a first position disposed at the distal end of said sleeve to a second position disposed at the proximal end of said sleeve, said carpule having distal and proximal ends;
detent means for retaining said needle carrier at said second position at said proximal end of said sleeve;

a piston disposed at the proximal end of said carpule and movable through said carpule to the distal end of the carpule for expulsing the fluid injection through the distal end of said carpule when said carpule is in said first position, the piston having a proximal end;
a frangible insert carried by said piston at the proximal end of said piston;
a stem including a tip for engaging said frangible insert for joint movement of said tip and said frangible insert and for returning said piston from the distal end of the carpule to the proximal end of the carpule;
stop means for preventing withdrawal of said piston from said carpule upon retraction of said stem an amount sufficient to remove said sleeve and carpule through said opening when said carpule is in said first position; and
release means disposed on said frangible insert and being breakable for disengaging said tip and said frangible insert when said stop means prevents withdrawal of said piston.

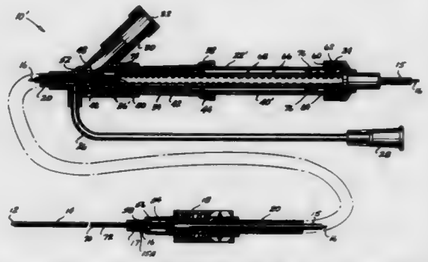
5,112,308
MEDICAL DEVICE FOR AND A METHOD OF ENDOSCOPIC SURGERY
Douglas O. Olsen, Brentwood, Tenn.; Brian L. Bates, and Thomas A. Osborne, both of Bloomington, Ind., assignors to Cook Incorporated, Bloomington, Ind.
Filed Oct. 3, 1990, Ser. No. 592,676
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—164 **25 Claims**



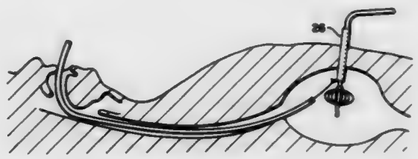
1. A medical device for endoscopic surgery comprising:
an elongated member having a tapered first distal end for dilating an entry site of a patient, a first proximal end, and an outside lateral wall extending between said first ends;
a first passageway extending longitudinally in said member and opening from said tapered first distal end distally and from said outside lateral wall about said first proximal end; and
an end cap positioned at said first proximal end and extending radially beyond said outside lateral wall of said elongated member for imparting force to said elongated member when dilating the entry site.

5,112,309
SENSOR DELIVERY DEVICE
Francois X. Bertaud, Libertyville; Richard W. Grabenkort, Barrington, both of Ill.; Beverly A. Magrane, Redmond, Wash., and Gerald G. Vurek, Mountain View, Calif., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Jul. 25, 1990, Ser. No. 558,035
Int. Cl.[5] H61M *25/00*
U.S. Cl. 604—171 **11 Claims**

1. Apparatus for maintaining a medical device in a sterile environment and delivering the medical device and an attached line through a catheter, comprising:
an elongate tubular housing having a proximal end and a distal end, said proximal end having an opening through which the line extends, said distal end including means for attachment to the catheter, an interior portion of the tubular housing, defining the sterile environment in which the medical device is maintained, the tubular housing including means for moving the medical device therefrom through the catheter after the catheter is attached to the tubular housing; and
a flexible sheath disposed within the interior of the tubular housing, sealingly attached to the line and to the tubular housing and extending between the tubular housing and the line, thereby sealingly enclosing said medical device within said sterile environment, said flexible sheath collapsing on itself, but continuing to provide a barrier against external contamination of the sterile environment as the medical device is advanced from the interior portion of the tubular housing into the catheter so that the sterile environment is maintained and not contaminated by exposure to a nonsterile portion of the line that is advanced into the tubular housing.



5,112,310
APPARATUS AND METHODS FOR PERCUTANEOUS ENDOSCOPIC GASTROSTOMY
James L. Grobe, 550 S. Beretania St., Honolulu, Hi. 96813
Filed Feb. 6, 1991, Ser. No. 651,558
Int. Cl.[5] A61M *25/00, 5/00*
U.S. Cl. 604—175 **21 Claims**



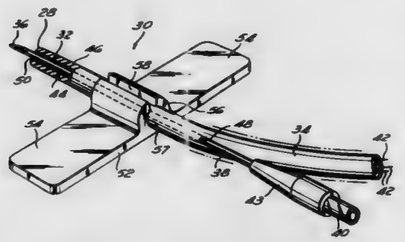
7. Apparatus for performing percutaneous endoscopic gastrostomy comprising:
an elongated flexible guide wire having a length sufficient to extend from a location outside the abdominal wall of a patient through the patient's stomach and esophagus and out the patient's mouth;
an elongated sleeve having a tapered end portion and an internal diameter sized to enable slidable movement thereof along said guide wire, said sleeve having a length sufficient to extend from a location outside the abdominal wall of a patient through the patient's stomach and esophagus and out the patient's mouth; and
a gastrostomy tube for reception within said sleeve and having a retention device adjacent an end portion thereof for retaining the gastrostomy tube within the patient's stomach in position for feeding.

5,112,311
GUARDED WINGED NEEDLE ASSEMBLY
David S. Utterberg, 1080 Chestnut St., San Francisco, Calif. 94109, and Neil J. Sheehan, Palo Alto, Calif., assignors to David S. Utterberg, San Francisco, Calif.
Continuation of Ser. No. 252,564, Sep. 30, 1988, abandoned. This application Jul. 30, 1990, Ser. No. 562,419
Int. Cl.[5] A61M 5/32
U.S. Cl. 604—177 56 Claims



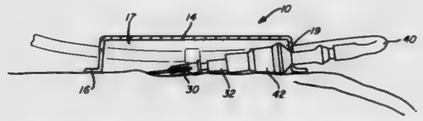
1. A guard slidably enclosing a sliding assembly comprising a needle and a winged needle hub having a first wing and a second wing, said first and second wings each having generally planar portions joined to said needle hub and extending outwardly therefrom, said planar portions having major and minor dimensions, the major dimension located parallel with the, needle length, said guard comprising:
a hollow member having a first, distal end and a second, proximal end separated along a longitudinal axis, and a side wall defining a first slot and a second slot, wherein the first slot slidably receives the first wing planar portion and the second slot slidably receives the second wing planar portion; said first and second wings being long enough to cause a substantial portion of each wing to extend outwardly beyond said hollow member side wall, whereby said wing portions can lie flat on a patients's skin with the needle penetrating the skin; and
means for locking the sliding assembly in a retracted position in which the needle is enclosed by the hollow member after the sliding assembly has been translated along the longitudinal axis into the hollow member.

5,112,312
VASCULAR/VENOUS ACCESS DEVICE AND METHOD OF UTILIZING AND FORMING THE SAME
Ronald B. Luther, Newport Beach, Calif., assignor to Luther Medical Products, Inc., Tustin, Calif.
Filed Mar. 14, 1991, Ser. No. 669,679
Int. Cl.[5] A61M 5/32
U.S. Cl. 604—177 15 Claims



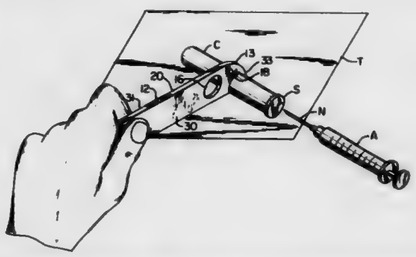
1. A vascular/venous access system comprising:
(a) a flexible catheter having a distal end and a proximal end and an axial bore extending therethrough, a portion of said catheter located at the distal end of said catheter being formed of material having greater rigidity than the remainder of said catheter; and
(b) a needle cannula disposed within the bore adjacent the distal end of the catheter with the sharp end of the needle cannula extending outwardly beyond the distal end of the catheter and the opposite end of the needle extending through the wall of the catheter between the distal end and proximal end of the catheter.

5,112,313
IV COVER/PROTECTOR
Patricia L. Sallee, 2115 Yorktown Ct. S., League City, Tex. 77573
Continuation-in-part of Ser. No. 393,401, Aug. 11, 1989, abandoned. This application Mar. 20, 1991, Ser. No. 673,260
Int. Cl.[5] A61M 5/32, 5/00
U.S. Cl. 604—180 17 Claims



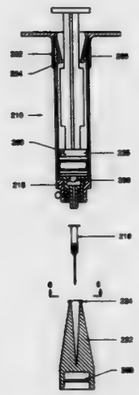
1. An intravenous needle protector for the protection of a needle inserted into a body which comprises
an adaptor extending from the needle;
a housing with a body and a terminating surface;
said body having at least one opening at said terminating surface for the passage of the adaptor extending from the needle;
said terminating surface extending from said body sufficiently for attachment of tape means;
at least two tape means attached to said terminating surface for holding said housing over the needle on a person's body; and
recedable retention means encircling said adaptor and juxtapositional with respect to said opening which prevents withdrawal of the needle through said opening independent of rotation of the needle and which allows motion of said opening away from said adaptor.

5,112,314
HYPODERMIC NEEDLE RECAPPING DEVICE
Steven B. Aragon, 6229 S. Iola Way, and James W. Heller, 6190 S. Jamaica Ct., both of Englewood, Colo. 80111
Filed Apr. 15, 1991, Ser. No. 685,446
Int. Cl.[5] A61M 5/32
U.S. Cl. 604—192 12 Claims



1. A needle recapping device for replacing a cap on a hypodermic needle comprising:
an elongated body member having opposite rounded ends;
at least one generally circular aperture extending through the thickness of said body member adjacent to one of said opposite rounded ends, said aperture being of a size larger than the diameter of said cap; and
at least one notch in the form of a genrally semi-circular opening extending through the thickness of said body member in an outer edge of said body member adjacent to said one of said round ends to at least partically surround said cap and press it against a surface when said cap is resting on said surface in order to facilities insertion of a needlle into an open end of said cap by grasping said body member in one's hand and holding said body member on edge with said notch downwardly against said cap.

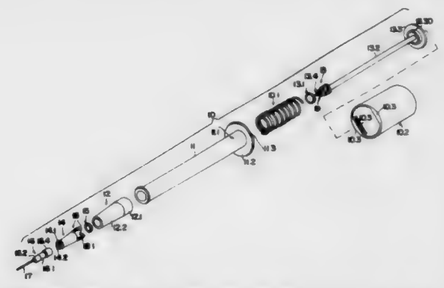
5,112,315
RETRACTABLE SYRINGE
Walter W. Gloyer, and Frederick G. Bright, both of Tomball, Tex., assignors to Retrax, Inc., Tomball, Tex.
Filed Oct. 4, 1990, Ser. No. 592,623
Int. Cl.[5] A61M 5/32
U.S. Cl. 604—195 11 Claims



1. A needle carrier for attaching a hypodermic needle cartridge to a retractable syringe, said syringe including a barrel having a proximal end and a distal end, the proximal end of the barrel including a mounting collar with a bore having a wall and the distal end of the barrel telescopingly receiving a piston plunger therewithin, comprising:
a body having a proximal end and a distal end;
means disposed on said body and engageable with the mounting collar for releasably latching said body in the mounting collar bore, said distal end of said body having means engageable with the piston plunger for retracting said body into the barrel; and needle cartridge attachment means disposed on said proximal end of said body for releasably attaching the hypodermic needle cartridge thereto.

5,112,316
DISPOSABLE SAFETY SYRINGE
Aldo Venturini, Via Orbetello, N., 176 I-10148 Turin Italy
Filed Jun. 23, 1989, Ser. No. 370,866
Claims priority, application Italy, Jun. 23, 1988, 67588 A/88
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—195 26 Claims

1. A disposable safety syringe, containing a tubular syringe body with a needle-holder head integral to one of its axial end zones, wherefrom there axially extends an empty needle communicating, by means of a mounting bushing integral with said needle, with the cavity of the syringe body for the purpose of injecting liquids contained in said cavity, and further comprising a plunger, housed in said syringe body in a tight and axially-slidable fashion, and which can be slide-driven by means of a shaft, extending with one of its end zones outside the syringe body through an aperture in said body provided at its axial end zone opposite to the needle holder head, and also means for inseparable coupling between the empty needle and the abovementioned plunger, by means of the said mounting bushing, achieving said coupling at the end of the stage for injecting the liquid contained in the syringe body, and means for automatically returning the plunger to a position retracted in an axial direction inside the syringe body, which means consist of a spring which is loaded by depression of the plunger during the stage for injecting the liquid contained in the syringe body and acts upon cessation of the manual action exerted on the plunger upon completion of the injection of liquid contained in the syringe body, as well as means for retaining the empty needle in the use position, which means are separate from and disengageably bind the bushing to the needle-holder head, in which the bushing is itself inserted in such a way that it can be retracted in an axial direction, and means of disengaging these retaining means, which disengaging means are integral with the plunger and are led thereby to contact the retaining means at the end of the stage for injecting the liquid contained in the syringe body, and disengage the bushing for mounting the empty needle to retaining means, characterized in that the above-mentioned means for automatically returning the plunger to a retracted position are separate from and independent of the empty needle and its mounting bushing before and



during the stage for injecting the liquid contained in the syringe body and are connected with the empty needle and its mounting bushing, through the plunger and the means for inseparable coupling between the empty needle and the plunger, upon completion the stage for injecting the liquid contained in the syringe body,
thereby ensuring that the bushing for mounting the empty needle can be retracted, in an axial direction, from the needle-holder head upon completion of the stage for injecting the liquid contained in the syringe body, substantially in step with the action for inseparable coupling between the plunger and the bushing for mounting the empty needle, in such a way that, upon completion of the stage for injecting the liquid, the plunger is automatically retracted, by the said automatic plunger return means, into the syringe body and, in a manner integral to and inseparable from the plunger, the empty needle and its mounting bushing are also automatically retracted into a safety position inside the syringe body, irrespective of the operator's intention.

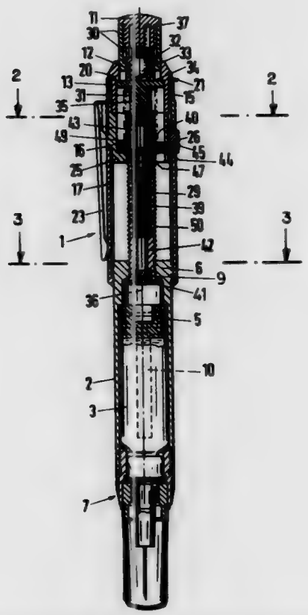
5,112,317
INJECTION DEVICE
Peter Michel, Burgdorf, Switzerland, assignor to Nosta Ag., Basel, Switzerland
Filed Jan. 18, 1989, Ser. No. 298,171
Claims priority, application Switzerland, Jan. 22, 1988, 00200/88
Int. Cl.[5] A61M 5/24
U.S. Cl. 604—208 10 Claims

1. A device for delivering a plurality of preselected doses of a liquid drug from a loaded liquid reservoir (3), co-axially abutting against a plunger (5) at its upper end and a needle holder (7) at its lower end, having a first housing member (2) to accommodate the liquid reservoir (3) and a second housing member (1) coaxially and telescopically movably connected

relative to the first housing member (2), and a drive stem (39) connected on the axis (36) of the device for reciprocal movement forward and backward exclusively by the same stroke distance l_1 moveable into contact with the plunger (5) to cause the plunger (5) to advance to deliver doses of liquid from the liquid reservoir through the needle holder, the improvement comprising:

means (11, 30, 32, 31, 35, 44, 29, 42, 50,) connected in said second housing member (1) and connected (9, 50, 25, 26) for rotative movement to both said first and second housing members (2, 1) to move the first and second housing members (2, 1) into each other by a selectable axial path l_x;

said means including push button means (11, 30, 32, 31) connected for reciprocal movement in said second housing member (1) and said means (11, 30, 32, 31, 35, 66, 29, 42, 50) and having a portion (11, 30) projecting from said second housing member (1);



said drive stem (39) connected at one end to said push button means (11, 30, 32, 31) and connected for reciprocal movement in said means (11, 30, 32, 31, 35, 44, 29, 42 50) to position the opposite end (41) of said drive stem (39) relative to the plunger (5) at an axial distance corresponding to the stroke path l_1, and the opposite end (41) of said drive stem (39) extending from said means (11, 30, 32, 31, 35, 44, 29, 42, 50) into said first housing member (2) adjacent said plunger 5, whereby rotation of said means (11, 30, 32, 31, 35, 44, 29, 42, 50) by said push button means (11) by a selected amount moves said first housing member (2) into said second housing member (1) by a selected axial distance l_x corresponding to the selected dose to be delivered thereby reducing the preset axial distance l_1 between said opposite end (41) of the drive stem (39) and the plunger (5) to l_1-l_x and causing the plunger (5) to be axially advanced by the amount of l_x only upon reciprocally moving the drive stem (39) along its stroke path l_1 by said push button means (11).

5,112,318

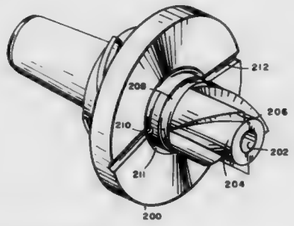
SAFETY SYRINGE NEEDLE DEVICE WITH INTERCHANGEABLE AND RETRACTABLE NEEDLE PLATFORM

Laurel A. Novacek; Fraser R. Sharp, and Donald A. McLean, all of Vancouver, Canada, assignors to Patco Ventures Ltd., Vancouver, Canada

Continuation-in-part of Ser. No. 607,127, Oct. 3, 1990, and a continuation-in-part of Ser. No. 410,318, Sep. 21, 1989, Pat. No. 5,030,208, and a continuation-in-part of Ser. No. 327,344, Mar. 22, 1989, abandoned, and a continuation-in-part of Ser. No. 285,012, Dec. 14, 1988, abandoned. This application Apr. 18, 1991, Ser. No. 687,108

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—240 **37 Claims**



1. A syringe comprising:

(a) a hollow axially-elongated barrel for containing fluid to be injected by the syringe;

(b) an adapter removably mounted at the distal end of said barrel, having a portion projecting into the barrel toward its proximal end and having a fluid passage in communication with the interior of the barrel;

(c) a ferrule carrying a hollow needle and adapted for removable connection with one of the distal barrel end and the adapter adjacent the barrel end, with the hollow needle in communication with the fluid passage of the adapter;

(d) a plunger axially movable in the hollow barrel; and

(e) and adapter engagement structure disposed at the distal end of the plunger and engageable with a mating connection engagement structure on the projecting adapter portion in response to axial movement of the plunger toward the distal end of the barrel, said structures being cooperable to cause (1) relative rotation of the plunger end and the adapter in response to such axial movement, and (2) the adapter and needle ferrule with the needle attached thereto to part from the end of the barrel in response to subsequent relative rotation of the plunger and the barrel, thereby enabling the adapter and the needle ferrule with the needle attached thereto to be withdrawn into the interior of the barrel when the plunger is withdrawn from the distal end of the barrel;

(f) said fluid passage of said adapter having a passage portion opening into said barrel at a location between the proximal end of said projecting adapter portion and the distal end of said barrel to enable air to be vented from said barrel through said needle upon receiving fluid into said barrel and moving said plunger toward the distal end of said barrel.

5,112,319

INFUSION ALARM SYSTEM

Eric Lai, 3F, No. 1, La. 119, Baoyi Rd., Taipei, Taiwan

Filed May 14, 1991, Ser. No. 699,717

Int. Cl.[5] A61M *5/00*; **G08B** *21/00*

U.S. Cl. 604—246 **3 Claims**

1. An infusion alarm system, comprising:

a housing in cylindrical shape having two legs bilaterally externally disposed at a lower end, a plurality of retaining slots spaced from one another at equal intervals and disposed at an upper end around the inner wall thereof, a toothed, rectangular window at the front face thereof, a guide groove vertically disposed at the back side thereof;

an upper cover secured to said housing at the top by a screw means, having a hanger portion at the top for suspending from a drip infusion stand, a plurality of hooked strips around the periphery thereof and respectively hooked in said retaining slots of said housing, three LEDs on the front face thereof including a green, a yellow and a red;

a battery box set inside said housing, having a center hole vertically disposed at the center with a tension spring set therein, a plurality of battery chambers vertically disposed around said center hole for holding dry batteries, a pin retaining hole transversely disposed at the top of said center hole with a pin fastened therein to suspend said tension spring, a conductive battery cover at the top covering over said battery chamber and said center hole, a control circuit fastened inside said conductive battery cover, and two guide grooves externally vertically disposed at two opposite sides;

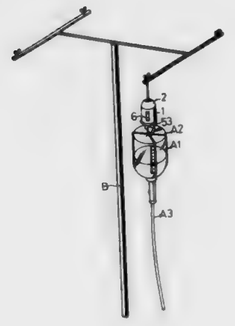
an inner shell movably set between said housing and said battery box, made in a cup-like shape, having a projecting strip transversely projecting outwards at the top and incorporated with a copper strip and connected to said circuit board by a conductor, two elongated projecting plates vertically disposed at two opposite locations on the inner wall surface thereof and respectively engaged in the two guide grooves of said battery box, a projecting guide block externally disposed at a location opposite to said projecting strip and engaged in the guide groove of said housing, and a hook suspended from said tension spring at the bottom for holding a drip infusion bottle;

an adjusting key set comprised of an inner key and an outer key and movably engaged in said toothed, rectangular window of said housing, said inner key having a plurality of teeth at two opposite sides sloping in one direction and engaged with the teeth of said toothed, rectangular window, a finger-press portion at the top, an invertedly disposed triangular bottom end, a hollow space at the inside with a strip spring set therein, said strip spring being to extend outwards forcing the teeth of said inner key to engage with the teeth of said toothed, rectangular window, said outer key being made of an elongated, transparent board having graduation made on the outer wall surface thereof, a top opening at the top for inserting said inner key, two side openings at two opposite sides through which the teeth of said inner key are exposed to engage with the teeth of said toothed, rectangular window, two tapered stop blocks bilaterally disposed at the bottom inside said top opening to limit the down stroke of said inner key in said outer key, and a projecting rod at the back coupled with a conductive strip connected to said circuit board through a conductor;

wherein suspending said drip infusion bottle from said hook causes said tension spring to expand; reducing of infusion solution in said drip infusion bottle during drip infusion process causes said tension spring to pull up said inner shell permitting said copper strip of said inner shell to connect with said conductive strip of said adjusting key set so as to drive said control circuit to produce audio and visual alarm signals.

5,112,320

Patent Not Issued For This Number



5,112,321

TROCAR SLEEVE HAVING MANUAL CLOSURE

Siegfried Hiltebrandt, Knittlingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Jun. 7, 1991, Ser. No. 712,359

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—264 **6 Claims**

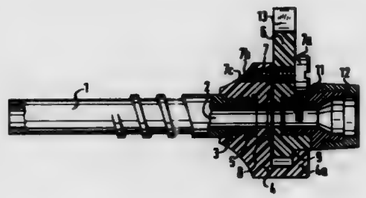
1. An apparatus for guiding a medical instrument into a body cavity comprising:

a trocar sleeve comprising an elongated tube forming a channel and having an axis and a proximal and distal end;

a handle part connected to said proximal end of said sleeve, said handle part comprising a handle part opening in axial alignment with said tube channel and a proximal end face, and a U-shaped projection;

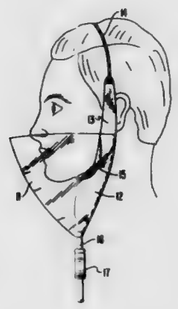
a closure part formed as a disc having at lest one closure part opening therein and being movably mounted on said proximal end face of said handle part, said closure part comprising means for introducing said medical instrument through said tube and said channel and being movable transversely to said sleeve axis from a first position wherein said closure part seals said tube channel to a second position wherein said closure part opening is in axial alignment with said tube channel for permitting the insertion of said instrument; and

a fastening pin being opposite said U-shaped projection and extending parallel to said sleeve axis through said disc into said handle part for permitting said movement of said disc thereabout, wherein said closure part is retained against



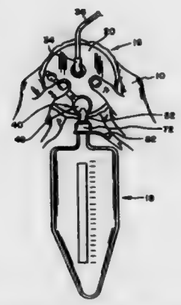
said proximal end face of said handle part on one side of said tube channel by means of said fastening pin and is retained against said proximal end face on the opposite side of said tube channel by means of said projection.

5,112,322
EMESIS HEAD APPLIANCE
Lucille Hathaway, 1229 Azulea Ct. West, Melbourne, Fla. 32935, assignor to Lucille Hathaway, Melbourne, Fla.
Filed Oct. 19, 1990, Ser. No. 600,616
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—317 **20 Claims**



1. A head appliance comprising head securing means, a non-rigid basin sized and configured to fit under and extend below a wearer's chin having sufficient volumetric capacity to prevent spillage of discharge from the wearer, side panels operatively connected with the basin and sized so as to extend upwardly to the wearer's temple and prevent the spillage of the discharge from contacting the wearer's head said side panels having inner and outer surfaces, said inner surfaces contacting the face of the wearer, said basin connected to said side panels at said outer surfaces so as to provide sufficient free breathing space defined by an opening between an upper free end of the basin and the face of the wearer in the regions of the wearer's nose, mouth and chin, and a selectively closable drainage tube arranged at a bottom region of the basin.

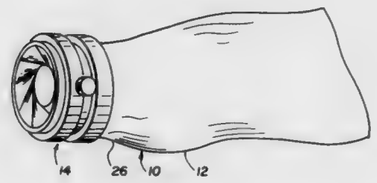
5,112,323
WOUND EVACUATOR
Duane K. Winkler, Dover, and Daniel H. Olson, Louisville, both of Ohio, assignors to Snyder Laboratories, Inc., Dover, Ohio
Filed Feb. 8, 1990, Ser. No. 476,844
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—319 **1 Claim**



1. A wound evacuator for extracting body fluids from a patient via tubing extending from the patient to the evacuator, the evacuator including end walls connected by a side wall to form a cavity for receiving the body fluids, means within the cavity biasing the end walls away from each other, one of the end walls including a first opening and a second opening, the first opening including a one-way check valve and communicating with the tubing to permit flow of body fluids into the cavity from the tubing and substantially prevent flow of body fluids from the cavity to the patient, the second opening including a discharge valve assembly with a cap coupled to the one end wall, the valve assembly further including a valve seat within the second opening and a valve member cooperating with the valve seat to selectively restrict fluid communication through the second opening into the cavity, the cap defining a passageway and carrying an end fitting remote from the one end wall and directed away from the one-way check valve, the end fitting defining a bore in communication with the passageway such that body fluids within the cavity are selectively communicated outwardly from the end fitting to a collection bas via the passageway and the bore, the valve member being free to move between the valve seat and the cap in the absence of any spring force such that the valve member moves away from the valve seat and into the passageway when the end walls are moved toward each other to transmit body fluids outwardly from the cavity via the second opening as the wound evacuator is disposed in an upright position with the collection bag disposed below the evacuator, the cap including a ridge engageable with the valve member when the latter is in the passageway to prevent the valve member from closing the end fitting bore and the valve member is pressure responsive to a vacuum within the cavity when the end walls are moving apart to move from the passageway to a sealing engagement with the valve seat, the cavity being expandable to receive body fluids which are initially pulled from the passageway and end fitting bore so that fluids are removed from the passageway and end fitting bore before the valve member is brought into sealing engagement with the valve seat, thereby reducing leakage from the end fitting bore and passageway, the one end wall further defining a boss extending outwardly to form the second opening, the cap including a first tubular end engageable with the boss and a second tubular end substantially perpendicular to the first tubular end for carrying the end fitting in a substantially perpendicular direction to the boss so that the second tubular end is pointed downwardly when the wound evacuator is disposed in the upright position, the first tubular end forming a shoulder facing the end of the boss and the valve seat including a flange secured between the shoulder and the

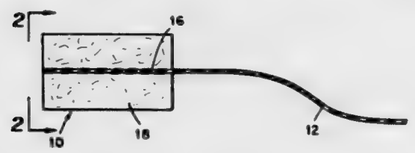
end of the boss for positioning the valve member within the second opening.

5,112,324
URINAL AND INCONTINENCE APPARATUS
Rodney Wallace, 1113 Funston Ave., Pacific Grove, Calif. 93950
Filed Sep. 13, 1991, Ser. No. 759,897
Int. Cl.[5] A61F *5/44*
U.S. Cl. 604—349 **15 Claims**



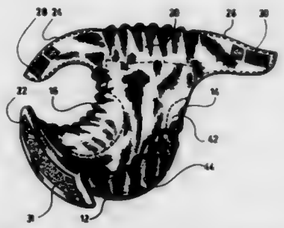
1. Apparatus for use as a urinal or incontinence device to collect urine from a human penis, comprising the combination of first and second annular collars defining a passageway sized to fit about the penis, means for mounting the collars for coaxial relative rotation, an elastic tubular membrane having one end attached around a circumference of the first collar and having an opposite end attached around a circumference of the second collar at a position which is axially spaced from the circumference of the first collar, said tubular membrane having a mid-portion which extends between said ends, operating means for selectively causing relative rotation between the collars in one rotational sense for twisting the mid-portion of the membrane toward a constricted opening at a position about the penis to form a fluid-tight seal therewith, said operating means further causing relative rotation between the collars in a rotational sense which is opposite said one sense for twisting the mid-portion of the membrane toward an expanded opening at an open position radially spaced about the penis and collecting means attached to one of said collars for collecting urine from the penis when the membrane is in a closed position.

5,112,325
SURGICAL SPONGE WITH PLURALITY OF RADIOPAQUE MONOFILAMENTS
Kathy W. Zachry, Kingston, Tenn., assignor to DeRoyal Industries, Inc., Powell, Tenn.
Filed Feb. 17, 1989, Ser. No. 312,029
Int. Cl.[5] A61F *13/36*
U.S. Cl. 604—362 **2 Claims**



1. A medical sponge comprising an absorbent web and a locator string attached to a surface thereof, said locator string comprising a plurality of individual radiopaque monofilaments assembled into an elongated bundle and a yarn encircling the circumference of said bundle and gathering the monofilaments into a coherent elongated member wherein the attachment between said locator string and said web extends substantially across one full dimension of said web.

5,112,326
ADJUSTABLE DIAPER
Giuseppe Quadrini, 5270 des Tilleuls, Montreal, Quebec, Canada H1T 2H6
Continuation-in-part of Ser. No. 623,120, Dec. 6, 1990, abandoned. This application Jun. 14, 1991, Ser. No. 715,385
Int. Cl.[5] A61F *13/15, 13/20*
U.S. Cl. 604—391 **7 Claims**



1. An adjustable size diaper made of a piece of cloth having a front lap and a breech portion adapted to cover the front and the rear of an infant's pelvis, said front lap having a substantially rectilinear upper edge, an inner and outer face and a first strip of hook and loop fastener disposed on said outer face below and adjacent said upper edge, said front lap adapted to be folded downwardly along a fold line below and adjacent said first strip for reducing the size of the diaper, a second strip of hook and loop fastener being exposed forwardly on said front lap when the latter is folded along said fold line, a strip of cloth longitudinally fixed to the upper edge of said front lap and adapted to be reversibly folded over the inner and the outer face of said front lap, said strip of cloth having a width sufficient to cover said first strip of hook and loop fastener, whereby said strip of cloth is adapted to cover the one of said strips of hook and loop fastener when facing the infant's pelvis.

5,112,327
DOUBLE-SIDED NEEDLE ASSEMBLY
Mitsuhisa Iinuma, Nagoya; Hideo Yamada; Hiroaki Matsushima, both of Nishinomiya, and Hisao Tobiki, Kobe, all of Japan, assignors to Nihon Medi-Physics Co., Ltd., Takarazuka, Japan
Filed Dec. 26, 1989, Ser. No. 456,956
Claims priority, application Japan, Jan. 18, 1989, 1-4047[U]; Sep. 29, 1989, 1-114829[U]
Int. Cl.[5] A61B *19/00*
U.S. Cl. 604—413 **4 Claims**



1. A double-sided needle assembly comprising:
an insert needle for insertion into a vessel;
an afflux needle for supplying pharmaceutical liquid in a syringe of an injector to said insert needle, said afflux needle having a connecting member fixed at one end; and
a transparent luer member having one end to which said

insert needle is fixed and the other end to which the connecting member of said afflux member is fixed so that said insert needle is connected with said afflux needle through a space defined between an end of said insert needle and the connecting member of said afflux needle in said luer member, said luer member having at the other end a recess for fitting one end of the syringe to hold said insert and afflux needles on the syringe and a rib for preventing said afflux needle from slipping off from said luer member.

5,112,328

METHOD AND APPARATUS FOR LASER SURGERY

John Taboada, and Robert H. Poirier, both of San Antonio, Tex., assignors to Refractive Laser Research & Development Program, Ltd., San Antonio, Tex.

Continuation of Ser. No. 148,425, Jan. 25, 1988, abandoned. This application Aug. 7, 1990, Ser. No. 563,849

Int. Cl.[5] A61N *5/02*

U.S. Cl. 606—4 **62 Claims**



1. Apparatus for delivering laser energy comprising:
means for generating a laser beam in TEM(oo) mode,
a hand piece for receiving said laser beam having proximal and distal ends, and an axis and,
means in said handpiece for focusing said beam to a focus spot beyond said handpiece and positioned a predetermined distance from said focussing means,
whereby to effect modification of a site within a body through a portion of which said beam has passed.

5,112,329

FOUR JOINT MEDICAL INSTRUMENT WITH AN ENDOSCOPE

Karl Storz, Auf dem Schildrain 39, 7200 Tuttlingen, Fed. Rep. of Germany

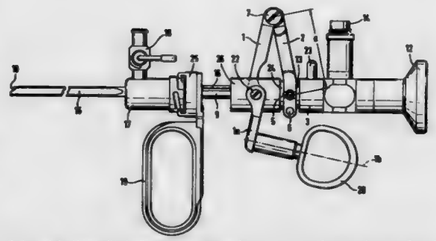
Filed Aug. 13, 1990, Ser. No. 566,581

Claims priority, application Fed. Rep. of Germany, May 1, 1990, 4000170

Int. Cl.[5] A61B *17/32*

U.S. Cl. 606—46 **4 Claims**

1. A medical instrument with an endoscope in which one of a wire loop, gripper arms or the like is displaceable in the longitudinal direction of the endoscope, comprising:
(a) one of a wire loop, gripper arms or the like and a carrier therefor, both displaceable in the longitudinal direction of the endoscope,
(b) a periscope disposed in a fixed sleeve,
(c) an axially displaceable slide movable on said sleeve,
(d) first, second, third and fourth joints,
(e) a fixed ring connected to said sleeve,
(f) first and second levers interconnected by said first joint, said first lever connected to said axially displaceable slide, said first lever being connected by said second joint to said slide, said second lever being connected by said third joint to said fixed ring,
(g) a movable ring disposed within said fixed ring and secured to said periscope,



(h) said fourth joint connected to an end portion of said second lever and said movable ring so that the periscope displacement is smaller than the wire loop electrode displacement.

5,112,330

RESECTOSCOPE APPARATUS

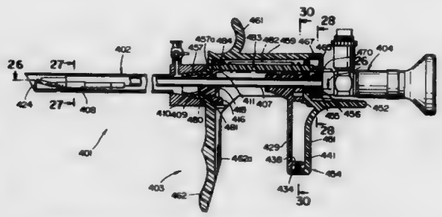
Shinichi Nishigaki, Tokyo, and Shiro Bito, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 23, 1989, Ser. No. 355,740

Claims priority, application Japan, Sep. 16, 1988, 63-231867; Sep. 17, 1988, 63-233321; Nov. 2, 1988, 63-277915; Feb. 28, 1989, 1-49040

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—46 **44 Claims**



1. A resectoscope apparatus comprising:
an elongate hollow sheath to be inserted into a body cavity;
an endoscope having an insertable part including an optical system inserted through said sheath for making the body cavity observable;
an operating part connected to said sheath;
a slider provided in said operating part, said slider including an electrode and a cord connected to said electrode for feeding a high frequency current from a high frequency current source to said electrode, said electrode being inserted through said sheath for making such treatment as resecting or coagulating tissues within a body cavity by using high frequency current;
said electrode being mounted in said slider and projecting therefrom in a sliding direction, said slider being movable with respect to said operating part in said sliding direction for inserting said electrode through said sheath, and
said electrode having a bent portion within said slider bending away from said sliding direction, said electrode being fixed to said slider by a holding part within said slider formed to hold said electrode at least one of said bent

portion and a terminal portion proximal to said bent portion.

5,112,331

ORTHOPEDIC PINS FOR EXTERNAL FIXATOR

Vel Miletich, 917 Via Panorama, Palos Verdes Estates, Calif. 90274

Continuation of Ser. No. 366,694, Jun. 15, 1989, abandoned. This application Nov. 20, 1990, Ser. No. 617,431

Int. Cl.[5] A61B *17/56*

U.S. Cl. 606—53 **2 Claims**



1. A method of forming an orthopedic pin for an external fixator comprising the steps of:
providing a cylindrical solid piece of metal having a first end, a second end, and a central portion;
selecting a central portion diameter that is larger than a diameter of an osteal bore through which the pin is adapted to be disposed such that, after the pin is properly inserted, a portion of the central portion will abut the bone through which the pin is inserted;
forming the central portion into the selected central portion diameter;
forming the first and second ends into a diameter smaller than the selected central portion diameter; and
selecting a first surface configuration from the axis of the pin to the central portion that will minimize trauma to soft tissue during insertion of the pin and minimize the depth of insertion of the central portion into the osteal bore; and
forming a surface on the central portion of the pin adjacent the first end in the selected first configuration so as to form a first configured region on the central portion of the pin to provide an integral unitary high strength pin.

5,112,332

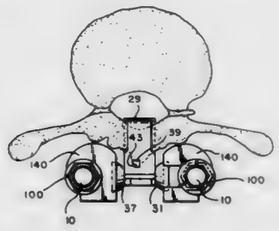
METHOD OF PERFORMING SPINAL SURGERY

Trent E. Cozad, Fort Wayne; Antony J. Lozier, Warsaw; Jerry L. Lower, Bourbon, all of Ind., and Allan F. Tencer, Seattle, Wash., assignors to Zimmer, Inc., Warsaw, Ind.

Division of Ser. No. 287,245, Dec. 21, 1988. This application May 14, 1991, Ser. No. 700,230

Int. Cl.[5] A61F *5/00*

U.S. Cl. 606—61 **20 Claims**



1. The method of performing surgery on a spinal column, including the steps of:
a) preparing the surgery site by performing an incision to reveal said spinal column;
b) providing an elongated spinal rod;
c) placing a plurality of spinal column appliances in position at spaced locations, each said appliance having interface means associated therewith including a tapered open back recess placeable over said rod and spaced therefrom to provide a part annular space;
d) inserting tapered locking means into each said part annular space;
e) activating each locking means to lock each said appliance to said rod; and wherein each said tapered locking means comprises a sleeve with a tapered portion insertable in a said tapered recess, a lock nut securable over a surface of said sleeve, and a surface adjacent said recess against which said nut may bear to cause a frictional interconnection between said sleeve and said rod, and between said sleeve and said recess.

5,112,333

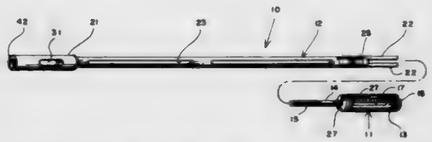
INTRAMEDULLARY NAIL

Irving E. Fixel, 111 N. 31st Ave., Hollywood, Fla. 33021

Filed Feb. 7, 1990, Ser. No. 476,977

Int. Cl.[5] A61B *17/56*

U.S. Cl. 606—62 **15 Claims**



1. An intramedullary nail adapted for use with a fractured bone having an intramedullary canal therein comprising:
a stem member having a first threaded end and a second threaded end, said first threaded end being adapted to be threadingly connected to said intramedullary canal of said bone.
a rod member having an axial opening therethrough, having a first end and a first flange means there within fitting over the second send of said stem member which extends through said first flange means,
a fastening member attached to said second threaded end of said stem member and bearing against said flange means within said rod member
said rod member having a second flange means at a second end thereof
whereby said fractured bone is compressed between said first threaded end of said stem member and said second flange means on said rod member when said fastening member is tightened.

5,112,334

SURGICAL INSTRUMENT FOR FACILITATING ACCURATE OSTEOTOMY CUTS IN BONE AND METHOD FOR UTILIZING SAME

Stephen L. Alchermes, 43 Duck Pond Rd., and Mark A. Lombardo, 7 Landing Rd., both of Glen Cove, N.Y. 11542

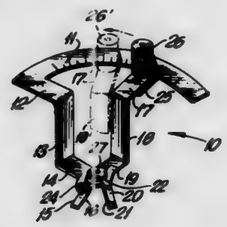
Filed Oct. 25, 1990, Ser. No. 604,077

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—87 **7 Claims**

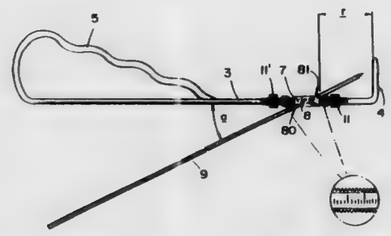
1. A surgical instrument for use in achieving acute angle osteotomy cuts in bone comprising:
(a) a calibration arm;
(b) an angle member structurally affixed to said calibration arm and lying within the same plane of said calibration arm;
(c) a first elevational member, structurally affixed to said angle member and perpendicular to the plane defined by said calibration arm and said angle member;
(d) a first pedestal member structurally affixed to said first elevational member and perpendicular to said first elevational member;
(e) a first aligning member structurally affixed to said first

pedestal member which further defines a first guiding edge;
(f) and indicator arm;
(g) a second elevational member structurally affixed to said indicator arm and perpendicular to said indicator arm;
(h) a second pedestal member structurally affixed to said second elevational member and perpendicular to said second elevational member;
(i) a second aligning member structurally affixed to said second pedestal member which further defines a second guiding edge;



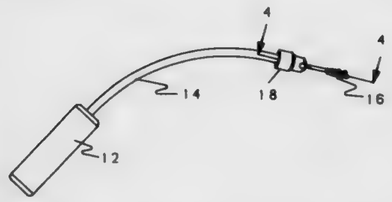
(j) coupling means capable of structurally coupling said first pedestal member to said second pedestal member so as to allow for the pivoting about said coupling means of said first pedestal member with said second pedestal member thereby selectively defining an acute angle capable of guiding, during a surgical procedure, a cutting instrument capable of causing the cutting of a bone; and
(k) a spike member structurally affixed to said first aligning member.

5,112,335
INSTRUMENT FOR MARKING AND DRILLING FEMORAL AND TIBIAL INSERTION TUNNELS
Jacques-Philippe Laboureau, 24, rue Fontaine Billenois, and Alain Cazenave, 22bis, rue du Docteur Calmette, both of 21000 Dijon, France
Filed Jul. 10, 1990, Ser. No. 550,618
Claims priority, application France, Jul. 11, 1989, 89 09325
Int. Cl.[5] A61F *2/32*
U.S. Cl. 606—88 **18 Claims**



1. Surgical ancillary instrument for marking and drilling of the femoral and tibial insertion tunnels of at least one bundle of neo-ligaments for the reconstruction of the anterior cruciate of the knee, said instrument comprising:
a straight rod having a distal end and a proximal end;
a handle at said proximal end;
a hook at said distal end, said hook being substantially perpendicular to said rod;
means including a passageway guidable along said rod on a graduated scale in relation to said hook for obtaining predetermined horizontal and vertical directions of said passageway to obtain an alignment of marking and drilling directions of the femur and tibial insertion tunnels when the knee is in extension based on a predetermined radius associated with the isometric point of a knee, and said means including a passageway include a cursor having a tunnel positioned therein, said tunnel having an inlet, an outlet and predetermined horizontal and vertical directions, said cursor being guidable along said graduated scale, means for stopping said cursor to obtain a distance between said outlet of said tunnel and said hook which is equal to a predetermined radius associated with the isometric point of a knee.

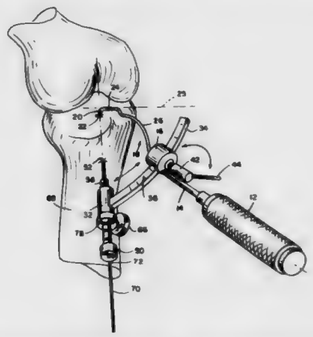
5,112,336
DRILL GUIDE AND TEMPLATE FOR PROSTHETIC DEVICES
Janet L. Krevolin, Austin, and Steven G. Brown, Plugerville, both of Tex., assignors to Intermedics Orthopedics, Inc., Austin, Tex.
Filed May 14, 1991, Ser. No. 699,737
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—96 **6 Claims**



1. An orthopedic surgical drill guide for placement of drilled bores into a resected surface of a bone of a patient, said drill guide comprising
means for guiding a bone-cutting surgical bit, said guiding means comprising a plate having at least one bore extending therethrough;
a handle; and
a ball and socket joint connecting said handle and said guiding means, said ball and socket joint comprising a nut threadedly engaging a distal end of said handle, said nut having an open distal end with a plurality of inwardly curved fingers extending distally therefrom, and
a ball captured within said nut, said ball being rigidly connected to said guiding means.

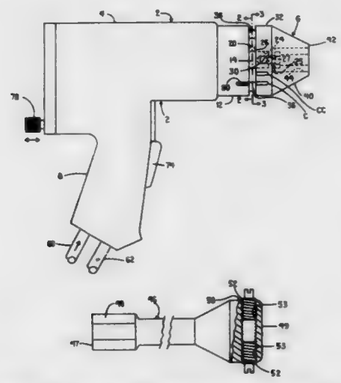
5,112,337
VARIABLE ANGLE, SELECTIVE LENGTH TIBIAL DRILL GUIDE
Lonnie E. Paulos; E. Paul France, both of Salt Lake City, and Richard L. Ellingson, Draper, all of Utah, assignors to DePuy Du Pont Orthopaedics, Warsaw, Ind.
Filed Feb. 5, 1991, Ser. No. 650,680
Int. Cl.[5] A11B *17/00*
U.S. Cl. 606—96 **11 Claims**

1. A drill guide for drilling a tunnel in a tibia for anterior cruciate ligament replacement comprising a target hook having a point for engaging and determining the exit of the tunnel in the tibial plateau, a handle rigidly attached to the target hook, said target hook having a downwardly extending point portion terminating with said point, a sight arm extending away from the point portion to be generally parallel to the tibial plateau, and an arch portion extending back from the sight arm and rigidly connected to said handle, said handle carrying a drill guide sleeve holder and selectively variable means for adjusting and rigidly fixing the angular position of said holder relative to the sight arm, said holder defining a drill axis which generally intersects said point, said drill guide also comprising a drill sleeve longitudinally selectively adjustably received in said holder for axial movement toward and away from said point, said drill sleeve having indicia means longitudinally spaced therealong for selecting the position of said drill sleeve, said drill sleeve having a proximal end extending toward said point, said drill sleeve being cannulated to receive a guide wire with a sharpened point headed toward said target hook point, and said holder comprising engagement means for holding said drill sleeve in a selected position, thereby Preselecting the desired tunnel length defined between said proximal end of said drill sleeve and said target hook point, such that



placing said target hook point on the desired exit point of the tunnel and then adjusting the angle of said holder relative to said sight arm until the proximal end of said drill sleeve contacts a desired location on the outer anterior surface of the tibia will position the guide wire for penetrating movement through the drill sleeve from said desired location on the anterior surface of the tibia to the tibial plateau adjacent said target hook point.

5,112,338
SURGICAL INSTRUMENT FOR REMOVING ARTIFICIAL ACETABULAR CUPS
William E. Anspach, III, 1349 S. Killian Dr., Lake Park, Fla. 33403
Filed Feb. 11, 1991, Ser. No. 653,151
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—99 **12 Claims**



1. A surgical instrument for removing an artifical acetabular cup comprising a hand-held housing, a motor means therein for rotating both clockwise and counter-clockwise, a drive shaft connected to said motor means extending from said housing, means for rotating said drive shaft both clockwise and counter-clockwise for only a small number of degrees, extension means having one end adapted to be connected to said drive shaft, said extension means having a free end with raidal projections for attachment to an artificial acetabular cup for removal by rotational impact.

5,112,339
APPARATUS FOR EXTRACTING CATARACTOUS TISSUE
Jerry Zelman, Miami, Fla., assignor to Ophthalmocare, Inc., Los Gatos, Calif.
Filed Jun. 18, 1990, Ser. No. 539,444
Int. Cl.[5] A61B *17/50*
U.S. Cl. 606—107 **33 Claims**

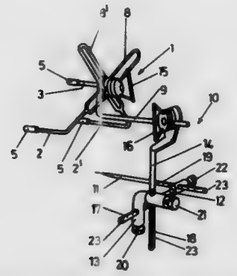


1. An apparatus for extracting fragments of cataractous tissue comprising:
a handpiece having a main body portion and a probe adapted for insertion into an eye, said main body portion having an irrigation passage and an aspiration passage defined therethrough, means provided at a proximal end of said main body portion for fluidly coupling said aspiration passage to a source of suction and for fluidly coupling said irrigation passage to a source of irrigating fluid;
said probe including a tubular element having an aspiration passage defined therethrough from a proximal end to a distal end thereof and a sleeve provided in surrounding relation to said tubular element along at least a portion of the length thereof so as to define an irrigation passage between an outer surface of said tubular element and an inner surface of said sleeve, said irrigation passage and said aspiration passage of said probe being operatively coupled to said irrigation and aspiration passage, respectively, of said main body portion, and at least one irrigation opening defined through a distal portion of said sleeve for allowing communication between said irrigation passage and a surgical site;
said tubular element terminating distally in a wedge-shaped tip, said aspiration passage opening distally through a port defined through an inclined face of said wedge-shaped tip, edges of said wedge-shaped tip being polished so as to be smooth, blunt and rounded.

5,112,340
FIXATION DEVICE WITH FRAME MEMBERS AND PINS
Christian Krenkel, Mooestrasse 126, A-5020 Salzburg, and Georg Lixl, Untereching 72, A-5110 Oberndorf, both of Austria
Filed Nov. 5, 1990, Ser. No. 609,697
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1989, 3937555
Int. Cl.[5] A61F *11/00*
U.S. Cl. 606—130 **16 Claims**

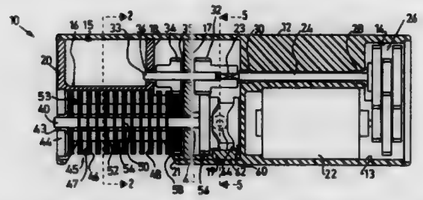
1. A device for fixing a point relative to the human body, comprising:
a frame for attachment to the human body, including a plurality of frame members, each said frame member having a foot portion, and each said foot portion having a connection means for connecting to a pin;
a pointer adjustably mounted to said frame, said pointer having an indicator end for indicating a point on the human body; and

a plurality of pins, each said pin comprising a means for anchoring said pin in the human skeleton and a means for



detachably connecting said pin to a said connection means of a respective said foot portion.

5,112,341
HAIR REMOVAL DEVICE WITH CENTRAL MULTIPLE-TWEEZER ELEMENT
Moshe Doley, 22 Yehiam St., Ramat Hasharon, Israel
Filed Mar. 5, 1991, Ser. No. 664,768
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—133 **14 Claims**



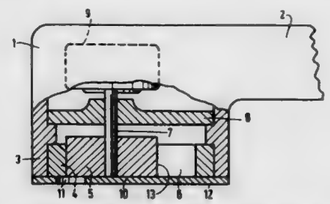
9. A method of removing unwanted skin hair comprising the steps of:

providing a multiple-tweezer hair plucking means coupled to a means of rotational power, said hair plucking means comprising of set of interleaved fixed-position and movable planar elements defining spaces therebetween and being arranged for rotation with a central shaft which is slidable therethrough laterally in either direction, said movable elements being movable laterally with said shaft between said fixed-position elements by a motion control means arranged to force repetitive, lateral push-pull sliding motion of said shaft; and

rotating said hair plucking means while it is passed over the skin, sliding motion of said shaft therewithin causing said spaces to alternately open and tightly close, trapping skin hair in said spaces when opened and plucking it when closed.

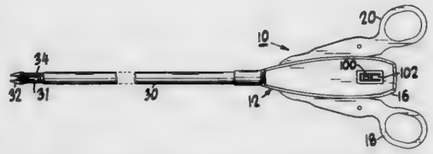
5,112,342
DEPILATOR
Gerhard R. H. Foerster, Vienna, Austria; Foppe Kramer, Drachten; Robert H. Munnig Schmidt, Groningen, both of Netherlands, and Franciscus M. J. Van Roemburg, Klagenfurt, Austria, assignors to U.S. Philips Corp., New York, N.Y.
Filed Feb. 20, 1990, Ser. No. 483,194
Claims priority, application Netherlands, Mar. 9, 1989, 8900576
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—133 **18 Claims**

1. A depilator having a housing which includes in a wall thereof a skin-following surface for the skin to be depilated; at least one drivable first hair pulling element having an inside wall and rotatably mounted in the housing, the axis of the first element being directed perpendicular to the skin-following



surface, and a cylindrical second hair pulling element adjoining the inside wall of the first hair pulling element, the first hair pulling element being arranged annularly relative to at least the cylindrical second hair pulling element.

5,112,343
ENDOSCOPIC CLIP APPLIERS
Curtis W. Thornton, Cary, N.C., assignor to Edward Weck Incorporated, Princeton, N.J.
Filed Apr. 5, 1991, Ser. No. 681,212
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—143 **6 Claims**



1. In an instrument for applying surgical ligating clips, said instrument comprising a housing, a first activating mechanism for feeding the clips successively to a position in which they may be crimped and a second activating mechanism for crimping a clip at said position, the improvement comprising:

trigger means for selectively enabling the operation of said first activating mechanism, said trigger means comprising:

pawl means operatively secured to said first activating mechanism and adapted to slide within said housing along a predetermined track;

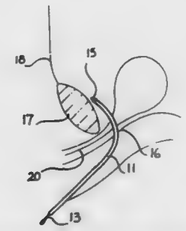
a pawl post attached to said pawl means and deflectable from a normal, unbiased position to a biased position as said pawl means slides proximally;

ramp means fixedly situated relative to said predetermined track and adapted to have said pawl post slidably move along said ramp means as said pawl means slides proximally;

stop means to engage said pawl post to prevent it from moving distally beyond a predetermined point along said track;

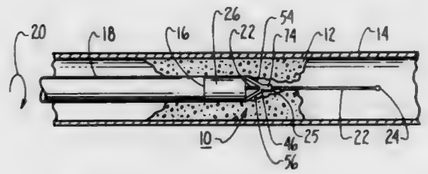
means operable by a user of said instrument to disengage said pawl post from said stop means.

5,112,344
SURGICAL INSTRUMENT AND METHOD OF UTILIZATION OF SUCH
Peter E. Petros, 3 Wilson Street, Claremont, Australia 6010
PCT No. PCT/AU89/00432, § 371 Date Feb. 11, 1991, § 102(e) Date Feb. 11, 1991, PCT Pub. No. WO90/03766, PCT Pub. Date Apr. 19, 1990
PCT Filed Oct. 4, 1989, Ser. No. 654,648
Claims priority, application Australia, Oct. 4, 1988, PJ0756
Int. Cl.[5] A61B *17/04, 19/00;* **A61F** *2/02*
U.S. Cl. 606—148 **3 Claims**



1. A surgical instrument for the application of a filamentary element into the body for the purpose of treating female incontinence, said instrument comprising a substantially rigid linear tubular shaft having a handle at one end and being curved towards its other end to form a curved portion, a flexible needle element slidably received in the shaft and adapted at one end to receive a filamentary element and having an enlarged portion at its other end, whereby when the needle element is fully received in the shaft the enlarged portion of the needle defines a non-incisive convergent surface at the other end of the shaft and the one end of the needle element is exposed at the one end of the shaft, the shaft being dimensioned and curved towards its other end whereby when in use and in position the curved portion extends from the anterior vaginal wall to the anterior surface of the abdomen past the pubis.

5,112,345
ATHERECTOMY CUTTER WITH ARCUATE BLADES
Andrew F. Farr, Spring Valley, Calif., assignor to InterVentional Technologies, San Diego, Calif.
Filed Dec. 17, 1990, Ser. No. 628,397
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—159 **5 Claims**



1. An atherectomy cutter which comprises:

a hollow cylindrical sleeve defining a longitudinal axis and having a sharpened distal edge;

a pair of straight blades each said straight blade extending distally from said distal edge of said sleeve and angled from said distal edge toward said axis to establish a pair of arcuate blades, on said distal edge between said straight blades; and

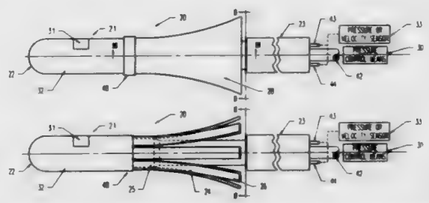
a hollow cylindrical body having a proximal end and a distal end, said straight blades being attached to said distal end of said body, said body being held within said sleeve an interference fit therewith.

5,112,346
RETROGRADE CUTTING HOOK PUNCH
Siegfried Hiltebrandt, Knittlingen; Andreas Dingler, Birkenfeld; Ernst Falk, Sternenfels-Diefenbach, all of Fed. Rep. of Germany, and Martin F. Fischmeister, Linz, Austria, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany
Filed Apr. 16, 1990, Ser. No. 509,666
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1989, 3918720
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—170 **4 Claims**



1. A retrograde cutting hook punch for performing an operation in a knee joint, comprising a longitudinal axis, a barrel having a proximal end, a distal end and a traction and thrust rod therethrough, a pivotable jaw member and a fixed jaw member, each of the jaw members being located at the distal end of the barrel, the pivotable jaw member, which is operated by the traction and thrust rod, being pivotably movable about a pivot axis in a retrograde direction between a first position wherein the pivotable jaw member abuts the traction and thrust rod and a second position wherein the pivotable jaw member abuts the fixed jaw member, each jaw member having a first portion extending outwardly from the barrel towards the proximal end thereof at an angle to the barrel and the longitudinal axis of the punch, each jaw member having one end remote from the pivot axis of the pivotable jaw member, said first portion of said fixed jaw member including a slot for complementarily receiving the first portion of the pivotable jaw member to form a cutting edge, the pivotable jaw member having an axially directed second portion which is pivotable in a longitudinal slot defined in a second portion of the fixed jaw member, the pivotable jaw member defining a downwardly open longitudinal slot for receiving the traction and thrust rod.

5,112,347
EMBOLECTOMY CATHETER, AND METHOD OF OPERATING SAME
Syde A. Taheri, 268 Dan Troy, Williamsville, N.Y. 14221
Filed May 14, 1991, Ser. No. 699,664
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—200 **16 Claims**



1. An inflatable balloon-type catheter for use in performing an embolectomy, comprising:

an elongated catheter having a distal end adapted to be inserted into a patient's blood vessel, and having a proximal end adapted to remain outside the patient's body;

a plurality of fingers having first ends mounted on a distal

marginal end portion of said catheter in circumferentially-spaced relation to one another, said fingers having respective second ends arranged farther from said catheter distal end than said finger first ends, each of said fingers being configured as a leaf-spring and having an unbiased radius of curvature such that said finger second ends will normally be spaced farther radially outwardly from said catheter than said first ends;

a balloon surrounding said fingers and operatively secured to said catheter so that said fingers are arranged within an inflatable chamber defined between said catheter and said balloon; and

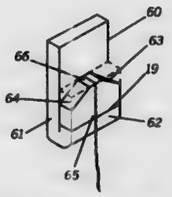
pressure control means in communication with the inflatable chamber for selectively varying the absolute pressure within said chamber so as to concomitantly vary the pressure differential across said balloon;

whereby said pressure control means may be operated so as to create one pressure differential across said balloon to cause said finger second ends to move radially toward said catheter, and another pressure differential across said balloon to cause said fingers to move radially away from said catheter.

5,112,348
TAMPON CONSTRUCTION

Jacob A. Glassman, 1680 Michigan Ave., Miami Beach, Fla. 33139

Continuation-in-part of Ser. No. 455,789, Jan. 2, 1990, Pat. No. 5,047,024, which is a continuation-in-part of Ser. No. 400,449, Aug. 30, 1989, abandoned. This application Aug. 1, 1990, Ser. No. 561,347
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—358 **3 Claims**



1. A tampon adapted to be inserted within a vaginal canal for absorption of menstrual fluid comprising

at least one piece of absorptive material having a lower portion and an upper portion, said lower portion being folded over upon itself at least one time toward the upper portion, said folded over lower portion having a lower free end and an upper end,

a pull string attached to said at least one piece of material and positioned such that it extends from said upper end of the folded over lower portion downwardly toward and past the lower free end of the folded over lower portion,

said lower portion having opposite side edges that convergingly taper to said upper end of the folded over lower portion.

5,112,349
HEART ASSIST PUMP

David P. Summers, and Jeddy D. Nixon, both of Houston, Tex., assignors to American BioMed, Inc., Montgomery, Tex.

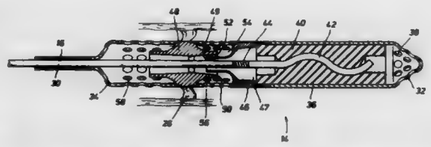
Division of Ser. No. 248,830, Sep. 27, 1988, Pat. No. 4,964,864. This application Oct. 22, 1990, Ser. No. 601,881
Int. Cl.[5] A61M *1/10*; A61F *1/24*
U.S. Cl. 623—3 **4 Claims**

1. A temporary circulatory assist pump, comprising:

(a) an elongate, cylindrical biocompatible pump having at least one intake port and at least one discharge port, said pump being sized for passage through a human blood vessel and insertion into a heart;

(b) said pump comprising a stator and a rotor whereby orbiting motion of the rotor moves a seal continuously through the stator for pumping of blood therethrough;

(c) wherein said pump includes a discharge nozzle supported in line with said stator, said discharge nozzle including a restriction for pressurizing and jetting blood pumped therethrough;



(d) wherein said pump further includes a venturi tube located in line with said discharge nozzle for forming a negative pressure area within said pump;

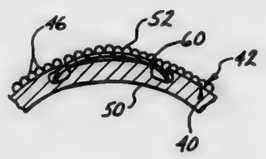
(e) extravascular power means connected to said pump for driving said rotor; and

(f) drive shaft means connecting said pump to said power means, said drive shaft means being connected to said rotor by a flexible joint, said flexible joint permitting flexure deformation thereby enabling said rotor to move through an orbital path upon rotation of said rotor by said power means.

5,112,350
METHOD FOR LOCATING ON A CORNEA AN ARTIFICIAL LENS FABRICATED FROM A COLLAGEN-HYDROGEL FOR PROMOTING EPITHELIAL CELL GROWTH AND REGENERATION OF THE STROMA

Linda Civerchia, Ft. Lauderdale, Fla., and Dennis D. Shepard, Santa Maria, Calif., assignors to CBS LENS, a California general partnership, Santa Maria, Calif.

Continuation-in-part of Ser. No. 511,847, Apr. 6, 1990, Pat. No. 4,994,081, which is a continuation of Ser. No. 920,070, Oct. 16, 1986, abandoned. This application Feb. 15, 1991, Ser. No. 657,000
Int. Cl.[5] A61F *2/14, 9/00*
U.S. Cl. 623—5 **10 Claims**



1. A method for locating on the cornea an optical lens having a preselected geometric shape and power, said optical lens comprising an optical portion having an outer edge, a posterior surface and an anterior surface, said optical lens being formed of a hydrogel polymer formed by the free radical polymerization of a hydrophilic monomer solution gelled and crosslinked to form a three dimensional polymeric meshwork for anchoring collagen; and a stock solution of collagen added to and interdisposed within said polymeric meshwork forming a collagen-hydrogel for promoting epithelial cell growth and regeneration of the stroma wherein said collagen-hydrogel material has a ratio by weight of collagen-to-hydrogel in the range of about 0.6-to-1000 and less than 0.6-to-1000 but at a level wherein sufficient collagen is present by weight to at least one

of promote epithelial cell growth and regeneration of the stroma comprising the steps of:

removing from Bowman's membrane over the pupillary zone of the eye a portion of corneal epithelium on an area slightly greater than the generalized shape of said optical lens;

forming on Bowman's membrane a "v" shaped annular groove having a diameter substantially equal to the maximum geometrical dimensions of said optical lens and defining therearound a peripheral edge and medial edge and having a preselected depth which is less than the thickness of the corneal stroma;

dissecting the peripheral edge of said groove forming a wing of corneal tissue having a preselected length;

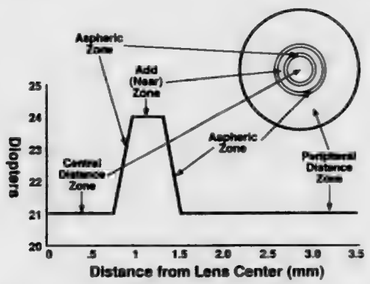
placing the posterior surface of said optical lens on the anterior surface of Bowman's membrane and positioning the outer edge of said optical lens under said corneal wing, whereby the corneal wing lies flush with and in contact with the anterior surface of said lens; and

affixing the optical lens to the Bowman's membrane over the pupillary zone of the eye to maintain the same on the cornea with the posterior surface in contact with Bowman's membrane and the corneal wing overlying the edge of said optical lens enabling corneal epithelium to touch and interact with said optical lens formed of a stock solution of collagen added to a hydrogel polymer for promoting epithelial cell growth and adherence to said optical lens and to respond to the epithelial cells growth promoting constituent in said optical lens formed of a stock solution of collagen added to a hydrogel polymer over a healing period wherein epithelial cells grow in from the edge of said optical lens and over the same enabling the epithelial cells to adhere to and implant said optical lens in the cornea under a new growth of corneal epithelium formed from several layers of epithelial cells adhering to the optical lens and the stroma has regenerated in the vicinity of the optical lens.

5,112,351
MULTIFOCAL INTRAOCULAR LENSES

Bruce Christie, and Amitava Gupta, both of Irwindale, Calif., assignors to Ioptex Research Inc., Irwindale, Calif.

Filed Oct. 12, 1990, Ser. No. 596,681
Int. Cl.[5] A61F *2/16*; G02C *7/04, 7/06*
U.S. Cl. 623—6 **12 Claims**

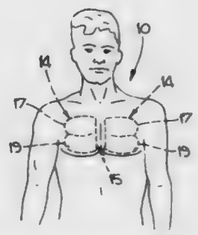


1. A multifocal intraocular lens which comprises a lens body having at least five optical zones, a first zone comprising a central constant power zone for distance vision, a second zone comprising an annular aspheric zone, a third zone comprising a constant power zone for near vision, a fourth zone comprising an aspheric zone to bring the power back to the distance vision level and a fifth zone comprising a constant power zone for distance vision, whereby the radii for each optical zone is determined to minimize spherical aberrations and wherein the percent optical area for near and distance vision is calculated based on pupillary diameter and variation of pupillary apertures in humans for whom said lenses are designed.

5,112,352
PECTORAL IMPLANT AND METHOD FOR IMPLANTING THE SAME

Brian Novack, 2131 Century Park La., #201, Los Angeles, Calif. 90067

Filed Jul. 18, 1991, Ser. No. 732,056
Int. Cl.[5] A61F *2/12*
U.S. Cl. 623—8 **7 Claims**



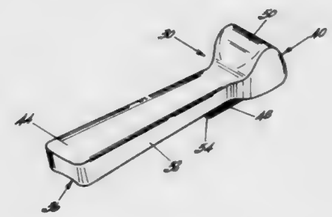
1. A male chest implant comprising:

a unitary body of implant material having a slightly concave cross-section and being divided into a first section and a second section, each section having an inside edge and an outside edge, the inside edges of the first and second sections being adjacent one another with the first and second sections being attached to one another only at one end of the respective inside edge of each section.

5,112,353
CONTOUR NASAL IMPLANT

Ole H. Johansson, 725 Yananoli St., Santa Barbara, Calif. 93103, and Robert J. Capriotti, 2800 Garth, Baytown, Tex. 77521

Continuation of Ser. No. 220,013, Jul. 15, 1988, abandoned. This application Dec. 31, 1990, Ser. No. 637,983
Int. Cl.[5] A61F *2/78*
U.S. Cl. 623—20 **15 Claims**



1. A contour nasal implant comprising

an elongated central member having a first end and a second end wherein the second end is spaced a predetermined distance from said first end, said first end having a concave surface on a selected side to define a dorsal support end which is adapted to be positioned over the nasal dorsum in the nose of a patient to augment the frontal and profile views of the nasal dorsum of the patient's nose, said second end including means defining a tip having a predetermined shape in the form of a protuberant mass which is

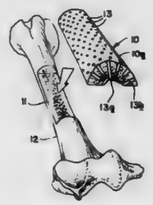
located on the side of the elongated central member which is opposite to the selected side having said concave surface defining said dorsal support end said second end further including means for defining a keel having a predetermined width and a length which extends beyond the concave surface and length, said keel being located on the second end under said predetermined shaped tip in the form of a protuberant mass and being positioned substantially perpendicular to said elongated central member with the length of the keel generally parallel to said elongated central member, said predetermined shaped tip in the form of a protuberant mass being operative to elevate the nasal tip of the nose of a patient into which the contour nasal implant is implanted and to cooperate with the dorsal support end to elevate and contour the nose of the patient in the area of the nasal dorsum.

5,112,354

BONE ALLOGRAFT MATERIAL AND METHOD

Bryan S. Sires, Seattle, Wash., assignor to Northwestern University, Evanston, Ill.

Filed Nov. 16, 1989, Ser. No. 437,189
Int. Cl.[5] A61F *2/28*
U.S. Cl. 623—16 **12 Claims**



1. A method for preparing a bone allograft comprising the steps of treating a section of cadaver bone to remove all soft tissue therefrom; then texturing said section b forming a multiplicity of holes extending inwardly from a surface thereof; said holes being of a diameter within the range of 200 to 2000 um and being spaced apart distances within the range of 100 to 1200 um; and then demineralizing said section by immersing the same in a demineralizing bath containing a protease inhibitor for retaining the bioactivity of the extracellular matrix proteins bound thereto and providing a rigid collagen scaffold for reconstructive allogenic implantation in a living subject.

5,112,355

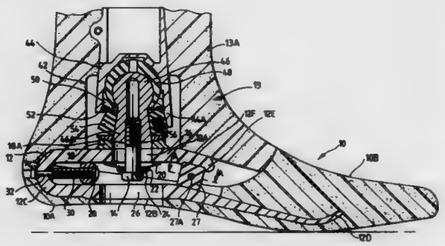
Patent Not Issued For This Number

5,112,356

LOWER LIMB PROSTHESIS WITH MEANS FOR RESTRICTING DORSI-FLEXION

Graham J. Harris, Basingstoke, and Victor J. Woolnough, North Waltham, both of England, assignors to Chas A. Blatchford & Sons Limited, Basingstoke, England

Continuation-in-part of Ser. No. 318,917, Mar. 3, 1989. This application Feb. 25, 1991, Ser. No. 661,440
Claims priority, application United Kingdom, Mar. 4, 1988, 8805191; Dec. 23, 1988, 8830149; Feb. 28, 1990, 9004430; Dec. 19, 1990, 9027531
Int. Cl.[5] A61F *2/66*
U.S. Cl. 623—49 **9 Claims**



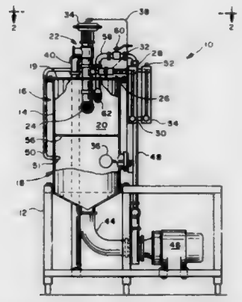
1. A lower limb prosthesis comprising:
an energy-storing foot comprising a keel which has an anterior portion and an ankle mounting portion, and is resiliently deformable such that the anterior portion is able to execute an energy-storing dorsi movement relative to the ankle mounting portion, the anterior portion forming part of a lower keel portion extending lengthwise in the foot from a heel part of the foot to an anterior part of the foot, the keel further comprising a posterior connecting portion connecting the ankle mounting portion of the keel to the lower keel portion in the heel part of the foot; and
an ankle joint assembly having a first part for connection to an upper component of the prosthesis, a second part connected to the ankle mounting portion of the keel, and means connecting the second part to the first part and arranged to allow plantar flexion of the ankle joint assembly from a neutral state but to substantially to prevent dorsi-flexion;
the foot further comprising a dorsi-flexion restricting device for location between an anterior end part of the ankle mounting portion of the keel and the lower keel portion.

5,112,357

DEOXYGENATION SYSTEM AND METHOD

Gunnar Bjerklund, Rolling Meadows; Gino Notardonato, Park Ridge, and Casimir Pulawski, Chicago, all of Ill., assignors to Universal Beverage Equipment, Inc., Willowbrook, Ill.

Filed Oct. 5, 1990, Ser. No. 593,054
Int. Cl.[5] B01D *19/00*
U.S. Cl. 55—53 **18 Claims**



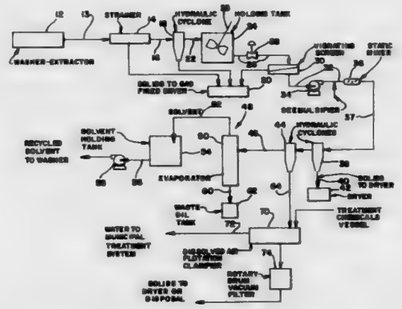
12. A process for deoxygenating a liquid containing oxygen comprising the steps of:
providing a tank defining a deoxygenating chamber;
providing a liquid flow to the chamber;
injecting stripping gas capable of stripping oxygen from the liquid into the liquid flow;
dispensing the stripping gas and liquid into the chamber;
discharging deoxygenated liquid from the chamber;
discharging stripped oxygen containing gas from the chamber; and
injecting additional stripping gas into the chamber at a position to achieve counter current flow of the additional stripping gas with the liquid dispensed into the chamber.

5,112,358

METHOD OF CLEANING HEAVILY SOILED TEXTILES

James F. Deal, III, Fernandina Beach, Fla., assignor to Paradigm Technology Co., Inc., Fernandina Beach, Fla.

Filed Jan. 9, 1990, Ser. No. 462,657
Int. Cl.[5] D06L *1/22*
U.S. Cl. 8—137 **21 Claims**



1. A method of cleaning heavily soiled textiles with a mixture of at least one of a cyclic and acyclic hydrocarbon terpene solvent and at least one of an oil-soluble anionic, an oil soluble nonionic and an oil-soluble cationic surfactant having an HLB number of about 1 to about 10, said mixture containing the surfactant in an amount from about 0.5 to about 2.0 percent by weight of solvent, said method comprising the steps of:
soaking the heavily soiled textiles in an amount of said solvent/surfactant mixture sufficient substantially to saturate the textiles with said mixture;
forming a solvent-in-water emulsion in contact with said soiled textiles by adding water to said mixture-saturated textiles only in an amount sufficient to form a solvent-water emulsion and by agitating the soiled textiles, the solvent/surfactant mixture and the added water together;
effecting a first low water level wash step by adding a low volume of water to said solvent-in-water emulsion and agitating the soiled textiles therein to separate a substantial portion of the soil from the textiles such that the soil forms a part of the solvent-in-water emulsion;
separating the washed textiles from a major portion of the solvent-in-water emulsion from the first wash step;
effecting a second low water level wash step by adding a low volume of an aqueous alkaline salt solution to the washed textiles and agitating the washed textiles and aqueous alkaline salt solution to remove a substantial portion of the solvent remaining from with the textiles from the first wash step and for additional soil removal therefrom; and
separating the textiles from a major portion of the solvent and water from said second wash step to achieve textiles substantially free of solvent.

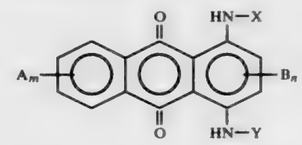
5,112,359

HAIR COLORANTS

Bryan P. Murphy, Monroe, and Gabriella Wis-Surel, Milford, both of Conn., assignors to Clairol, Inc., New York, N.Y.

Filed Jun. 4, 1990, Ser. No. 532,299
Int. Cl.[5] A61K *7/13*
U.S. Cl. 8—405 **13 Claims**

1. In an aqueous composition for coloring keratinaceous substrates, said composition containing (a) a mixture of two or more dyestuffs, one of which being a substituted 1,4-diaminoanthriaquinone of formula I:



(I)

wherein
X is C_{1-6} alkyl, C_{1-6} haloalkyl or C_{1-6} aminoalkyl;
Y is a hydroxy-substituted C_{1-6} alkyl group containing 1 to 4 hydroxyl groups and 0 to 4 amino groups, or a C_{1-6} alkyl group;
A and B are independently selected from halo, X and Y;
m=0–4; and
n=0–2;
(b) an organic carrier for the dyestuffs, and (c) water, wherein the improvement comprises the compound of formula I being in a dispersant-free form and, whereby, upon dyeing, the keratinaceous substrates are dyed more intensely.

5,112,360

PROCESSES FOR DYEING KERATINOUS FIBRES BASED ON 5,6 DIHYDROXYINDOLE OR AN INDOLE DERIVATIVE AND AT LEAST ONE RARE EARTH SALT AND COMPOSITIONS FOR IMPLEMENTATION THEREOF

Didier Garoche, Levallois-Perret, and Jean F. Grollier, Paris, both of France, assignors to L'Oreal, Paris, France

Filed Jun. 21, 1989, Ser. No. 369,344

Claims priority, application Luxembourg, Jun. 21, 1988, 87256

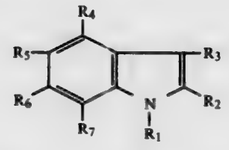
Int. Cl.[5] A61K 7/13

U.S. Cl. 8—406 29 Claims

1. Process for dyeing keratinous fibers comprising applying to said fibers:

(a) a component (A) containing at least one rare earth salt in a medium suitable for dyeing said fibers, and

(b) a component (B) containing, in a medium suitable for dyeing said fibers, at least one indole derivative having formula (I):



(I)

wherein

R_1 represents hydrogen or C_1–C_4 alkyl,

R_2 and R_3, each independently, represent hydrogen, C_1–C_4 alkyl, carboxyl or (C_1–C_4 alkoxy) carbonyl,

R_4, R_5, R_6 and R_7, each independently represent hydrogen; C_1–C_4 alkyl; carboxyl C_1–C_4 carboxyalkyl; (C_1–C_4 alkoxy) carbonyl; (C_1–C_4 alkoxy) carbonyl (C_1–C_4 alkyl); carbamyl; halogen; mono- or polyhydroxy (C_1–C_4 alkyl); C_1–C_4 aminoalkyl; OZ wherein Z represents hydrogen or C_1–C_{20} linear or branched alkyl; aryl (C_1–C_4 alkyl); formyl; linear or branched C_2–C_{20} acyl; linear or branched C_3–C_{20} alkenoyl; $-SiR_{11}R_{12}R_{13}$; $-P(O)(OR_8)_2$ or R_8OSO_2-,

or R_4 and R_5, or alternatively R_5 and R_6, or alternatively R_6 and R_7 form, together with the carbon atoms to which they are attached, a ring optionally containing a carbonyl group, a thiocarbonyl group, a $>P(O)(OR_8)$ group or a $>CR_9R_{10}$ group,

with the proviso that at least one of R_4 to R_7 represents OZ or alternatively R_4 and R_5, or alternatively R_5 and R_6, or alternatively R_6 and R_7 form a ring,

R_8 and R_9 represent hydrogen or C_1–C_4 alkyl,

R_{10} represents C_1–C_4 alkoxy or mono- or di (C_1–C_4 alkyl) amino, and

R_{11}, R_{12} and R_{13}, each independently, represent linear or branched C_1–C_4 alkyl,

and the corresponding alkali metal salt, alkaline earth metal salt, ammonium salt, amine salt, addition salt of an inorganic acid or addition salt of an organic acid,

components (A) and (B) being applied on said fibers using a single composition, or component (A) being applied on said fibers prior or subsequent to the application of component (B),

said rare earth salt being present in an amount ranging from 0.1 to 8 percent by weight relative to the total weight of the composition applied to the fibers and said indole derivative being present in an amount ranging from 0.1 to 5 percent by weight relative to the total weight of said composition applied to the said fibers.

5,112,361

METHOD OF MANUFACTURING COLOR FILTERS FOR LIQUID CRYSTAL CELLS

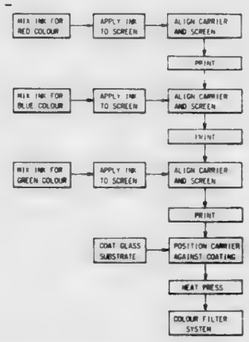
Andrew N. Carrington, Hemel Hempstead; Bernard J. Green, Harrow, and Francis Jones, deceased, late of Leeds, all of England by Jean Jones, Legal Representative , assignors to Thorn EMI plc, London, England

Filed Jan. 29, 1991, Ser. No. 647,015

Claims priority, application United Kingdom, Jan. 30, 1990, 9002099

Int. Cl.[5] D06P 5/00

U.S. Cl. 8—471 10 Claims



1. A method of manufacturing a colour filter for a liquid crystal cell, the method comprising applying a number of patterns each of a respective dye intermediate material to a single carrier element, and effecting transfer of the dye intermediate materials from said single carrier element to a substrate carrying a substrate layer of material having free acid groups for forming dyes in the substrate layer, on interaction with the dye intermediate materials, to produce a number of colour patterns each of a respective colour, for the colour filter.

5,112,362

NAVY DYE MIXTURES OF AZO DISPERSE DYES FOR POLYESTER

Erwin Hahn, Heidelberg; Guenter Hansen, Ludwigshafen; Gunther Lamm, Hassloch; Helmut Reichelt, Neustadt, and Gerhard Wagenblast, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

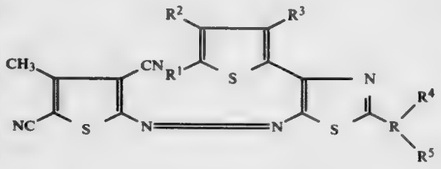
Filed Apr. 2, 1991, Ser. No. 679,100

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1990, 4010512

Int. Cl.[5] C09B 29/00

U.S. Cl. 8—639 4 Claims

1. A dye mixture containing at least one dye of the formula I



(I)

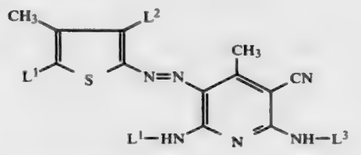
where

R^1, R^2 and R^3 are identical or different and each is independently of the others hydrogen or C_1–C_4-alkyl,

R^4 is C_1–C_4-alkyl or C_3–C_8-alkyl which is interrupted by from 1 to 3 oxygen atoms in ether function, and

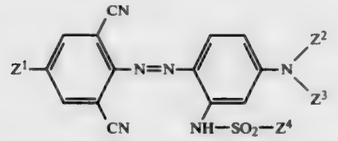
R^5 is C_1–C_4-alkyl or C_3–C_{12}-alkyl which is interrupted by from 1 to 4 oxygen atoms in ether function,

and also at least one dye of the formula II



(II)

or at least one dye of the formula III



(III)

where

L^1 and L^2 are each cyano or one of the two radicals may also be C_1–C_2-alkoxycarbonyl,

one of the two radicals L^3 and L^4 is hydrogen while the other is a radical of the formula $(CH_2)_2O(CH_2)_2OH$, $(CH_2)_2O(CH_2)_2OCOCH_3$, $(CH_2)_3OCH(CH_3)CH_2OCH_3$, $(CH_2)_3O(CH_2)_4OH$, $(CH_2)_3O(CH_2)_4OCHO$, $(CH_2)_3O(CH_2)_4OCOCH_3$ or $(CH_2)_3O(CH_2)_2OCH_3$ and

Z^1, Z^2, Z^3 and Z^4 are identical or different and each is independently of the others C_1–C_4-alkyl,

wherein the weight ratio of dye I:dye II and/or III is from 80:20 to 96:4.

5,112,363

FLUIDIZING AND DISPERSING ADDITIVES FOR COAL-WATER DISPERSIONS

Edoardo Platone, Asti; Aldo Prevedello, and Riccardo Rausa, both of San Donato Milanese, all of Italy, assignors to Enitricerche S.p.A., Milan, Italy

Division of Ser. No. 187,488, Apr. 28, 1988, Pat. No. 4,969,929.

This application Aug. 10, 1990, Ser. No. 565,800

Claims priority, application Italy, May 26, 1987, 20671 A/87

Int. Cl.[5] C10L 1/32; B01J 13/00

U.S. Cl. 44—280 13 Claims

1. A process for preparing a stabilized and pumpable water-coal composition comprising combining an amount of an ethoxylated derivative of humic acid effective to stabilize with coal and water to form a dispersion, wherein said ethoxylated derivative of humic acid is selected from the group consisting of products of oxidation of coal and acidic materials obtained by the extraction of coal oxidation products with aqueous alkaline solutions, followed by acidification of the coal oxidation products.

5,112,364

GASOLINE-ENGINE FUELS CONTAINING POLYETHERAMINES OR POLYETHERAMINE DERIVATIVES

Hans P. Rath, Gruenstadt; Helmut Mach, Heidelberg; Knut Oppenlaender, Ludwigshafen; Willibald Schoenleben, Heidelberg, and Hans-Henning Vogel, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

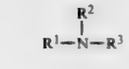
Continuation of Ser. No. 379,935, Jul. 14, 1989, abandoned. This application Apr. 29, 1991, Ser. No. 697,529

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1988, 3826608

Int. Cl.[5] C10L 1/18, 1/22

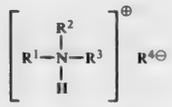
U.S. Cl. 44—418 8 Claims

1. A gasoline-engine fuel containing per kg of fuel, 10 to 2000 mg of a polyetheramine and/or a polyetheramine derivative of



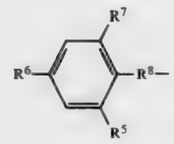
(I)

or



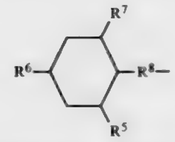
(II)

where R^1 is a phenolpolyether or alkylphenolpolyether radical of the formula



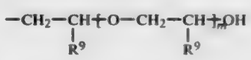
(IIIa)

or a cyclohexylpolyether or alkylcyclohexylpolyether radical of the formula



(IIIb)

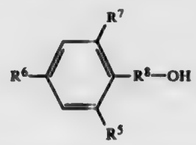
R^2 and R^3 may be identical or different and are each hydrogen, a phenolpolyether or alkylphenolpolyether radical (IIIa), a cyclohexylpolyether or alkylcyclohexylpolyether radical (IIIb), an acyl radical of a carboxylic acid of 2 to 24 carbon atoms or a hydroxyalkyl radical of the formula



(IV)

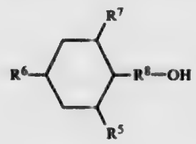
or R^2 is alkyl of 1 to 20 carbon atoms and R^3 is hydrogen, a phenolpolyether or alkylphenolpolyether radical (IIIa), a cyclohexylpolyether or alkylcyclohexylpolyether radical (IIIb), an acyl radical of a carboxylic acid of 2 to 24 carbon atoms or a hydroxyalkyl radical (IV), R^4 is a carboxylate radical of a carboxylic acid of 2 to 24 carbon atoms, R^5, R^6, and R^7 may be identical or different and are each hydrogen or a hydrocarbon radical of 1 to 30 carbon atoms, R^8 is a polyether chain ob-

tained from butylene oxide, having from 2 to 100 butylene oxide units in the chain, and R^9 is hydrogen or a hydrocarbon radical of 1 to 6 carbon atoms and m is from 0 to 5, the mean molecular weight M_n of the polyetheramines or polyetheramine derivatives (I) or (II), respectively, being from 500 to 8,000 and the polyetheramines, or the polyetheramines on which the polyetheramine derivatives are based, being prepared by reductive amination of phenolpolyethers or alkylphenolpolyethers of the formula



(Va)

or of cyclohexylpolyethers or alkylcyclohexylpolyethers of the formula



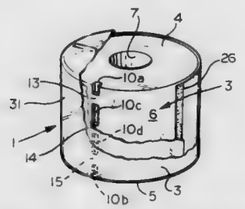
(Vb)

where R^5, R^6, R^7, and R^8 have the stated meanings, with ammonia or primary alkylmonamines with 1 to 20 carbon atoms at temperatures of from 160° to 250° C. and pressures up to 600 bars in the presence of nickel or cobalt containing catalysts.

5,112,365
FUEL BLOCK

John E. MacIsaac, Alliance, and Mark K. MacIsaac, Louisville, both of Ohio, assignors to Sebring Forest Industries, Inc., Sebring, Ohio

Filed Jan. 25, 1991, Ser. No. 645,692
Int. Cl.[5] C10L *5/14, 5/00*
U.S. Cl. 44—576 **19 Claims**

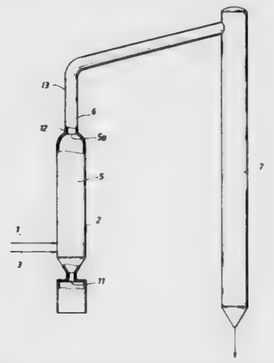


1. A controlled burning fuel block including:
a) an elongated body having top, bottom and outer surfaces formed of compacted particles of a combustible material and a binder;
b) a series of individual depressions formed in the outer surface of the body and spaced longitudinally along said outer surface;
c) a combustible wrapper covering at least the outer surface of the body in a tightly wrapped relationship against said outer surface; and
d) an outer weatherproof protective wrapper completely enclosing the body and the combustible wrapper, wherein the combustible wrapper in combination with the individual depressions control the burning of the body from the top surface towards the bottom surface in a series of combustion layers having different burn rates defined by the spaced depressions, upon igniting the top surface of said body.

5,112,366
SLAG DEPOSITION DETECTION

Chih-hsiung F. Liu, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 17, 1990, Ser. No. 628,822
Int. Cl.[5] C10J *3/46, 3/82, 3/86*
U.S. Cl. 48—210 **10 Claims**



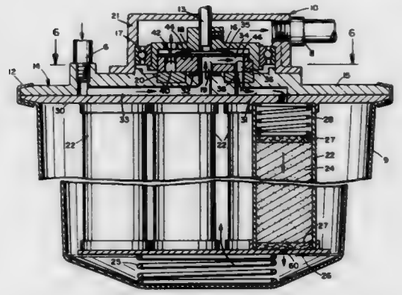
1. A process for monitoring slag deposit formation during a process for the gasification of coal on heat exchange surfaces at the outlet of a gasification zone and heat exchange surfaces proximate thereto, and heat exchange surfaces at or near the outlet of the gasification zone in a heat exchange zone in flow communication with the gasification zone comprising feeding coal and oxygen to the gasification zone for partial oxidation of the coal therein,
determining the heat transfer rate value at a first locus in said heat exchange zone near the outlet of said gasification zone, concurrently determining the heat transfer rate value at a second locus in said heat exchange zone, said second locus being further displaced in said heat exchange zone from said gasification zone than the first locus; and
comparing the values obtained concurrently with each other to determine correlated slag deposition events.

5,112,367
FLUID FRACTIONATOR

Charles C. Hill, 2518 Via Merano, Del Mar, Calif. 92014

Continuation of Ser. No. 438,786, Nov. 20, 1989, abandoned. This application Feb. 25, 1991, Ser. No. 660,177
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—26 **13 Claims**

1. An improved process for removing a fluid component of a particular fluid from a stream of a mixture of fluids or a contaminating component from a stream of a single fluid through pressure swing adsorption having a pressurizing phase and a desorbing phase comprising the steps of:
a. admitting a pressurized fluid mixture into a rotary valve distributor;
b. said rotary valve distributor comprising:
i. a fluid manifold for receiving said fluid mixture and purging said contaminating component;
ii. an immobile port plate having a first and second plurality of openings in fluid communication with a first and second plurality of columns; said port plate further having an integral inlet channel for a substantially continuous flow of fluid; and
iii. rotatable distributor means in fluid communication with said manifold, said means comprising a rotor and rotor shoe having an arcuate distribution port which sequentially pressurizes said first plurality of columns as said rotor shoe rotates said distribution port over said first plurality of openings in said port plate; and arcuate exhaust port which sequentially and simultaneously exhausts fluid carrying the contaminating component and emanating from each of said second plurality of columns as said rotor rotates said exhaust port over said second plurality of openings in said port plate; a cross-porting channel with two ports, each situated between the two arcuate ports, for connecting two columns, which are in transition between the pressurizing and desorbing phases, allowing rapid pressure equalization; said rotor shoe further having an integral exhaust channel for a substantially continuous exhaust of fluid carrying the contaminating component; and



c. sequentially distributing said compressed fluid mixture, by means of a rotating member of said rotary valve distributor, into one or more of said first plurality of columns packed with an adsorbent material selective for the fluid or contaminant to be removed, where said fluid or contaminant is retained and desired product fluid is allowed to pass through; and
d. simultaneously refluxing, under low pressure, a portion of product fluid through one or more of said second plurality of columns, each fluid entering through an orifice at one end of each said column and exiting through the opposite end and into the atmosphere; and
e. simultaneously withdrawing purified product fluid as required.

5,112,368
PROCESS FOR REMOVING DUST FROM HIGH TEMPERATURE GAS STREAMS

Gérard Gosselin, Charlesbourg, Canada, assignor to Biothermica International Inc., Montréal, Canada

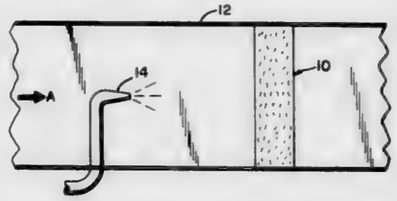
Filed Aug. 27, 1990, Ser. No. 572,653
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—97 **7 Claims**

1. A method for filtering exhaust gases from a bark or wood residue boiler, said gases being at a high temperature of 300 to 1,400° F. and containing up to 10,000 mg/m^3 of dust, before being filtered, said method comprising the steps of:
passing said gases through a stainless steel woven fabric mounted on a rigid, supporting metallic structure, said fabric being porous and having pores of a size ranging between 15 and 80 microns; and
letting some of said dust, embers and sparks to accumulate on said filter to form a filter cake upstream of the fabric which, in trun, will enable filtration of particles as small as 0.3 micron and thus very substantial reduction of dust and particle concentration in said gases downstream said fabric, said downstream concentration being as low as 50 mg/m^3.

5,112,369
METHOD OF APPLYING A WETTANT TO A FILTERING MEDIA

Peter Brownell, Exeter, R.I., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Oct. 2, 1991, Ser. No. 771,070
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—97 **12 Claims**

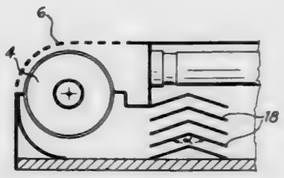


1. Method for applying a wettant to a filtering media for filtering particulate contaminants from an air to be passed through the media with a maximum expected face velocity when the media is used to filter the contaminants from the air, comprising the steps of dispersing the wettant in a carrier air stream before the carrier air stream is passed through the media, and then passing the carrier air stream through the media at a face velocity substantially greater than the face velocity to which the media is subjected when used in filtering.

5,112,370
DEVICE FOR STERILIZING A FORCED AIR FLOW BY MEANS OF ULTRAVIOLET RADIATIONS

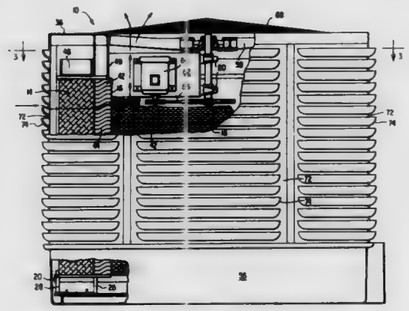
Michele Gazzano, Via Alessi 15, 20123 Milan, Italy

Continuation-in-part of Ser. No. 615,215, Nov. 19, 1990, abandoned. This application Jul. 31, 1991, Ser. No. 740,863
Claims priority, application Italy, Dec. 13, 1989, 22682 A/89
Int. Cl.[5] B03C *3/38*
U.S. Cl. 55—102 **9 Claims**



1. A device for sterilising a forced air flow by means of ultraviolet radiations comprising:
a housing having input and output openings for the air and provided with reflecting inner surfaces;
a low pressure mercury vapor lamp located inside said housing; and
an optical labyrinth with a plurality of parallel and spaced sheets defining paths for the air flow and shielding and absorbing the ultraviolet radiation to prevent the escaping thereof outside the device.

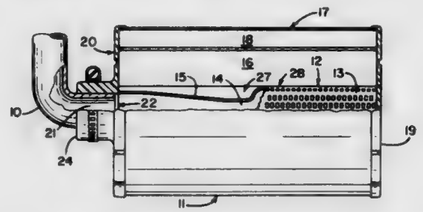
5,112,371
RADIAL FLOW COOLING TOWER
Joseph R. Tippmann, HRC-33, Box 8419, Rapid City, S. Dak. 57701, and Vincent P. Tippmann, 8605 N. River Rd., New Haven, Ind. 46774
Filed Apr. 16, 1991, Ser. No. 686,147
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—233 **1 Claim**



1. A radial flow cooling tower for liquid comprising:
(a) a base means having inner and outer concentric spaced-apart support rings,
(b) a plurality of horizontally disposed pairs of radially extending support members secured to said support rings and a plurality of vertically disposed pairs of support members positioned between and secured to said horizontally disposed pairs of support members to thereby define a plurality of first and second open-sided chambers,
(c) fill media removably mounted in said first open-sided chambers and extending between said inner and outer support rings,
(d) liquid eliminator means removably mounted in said second open-sided chambers adjacent said fill media downstream thereof, said eliminator means defining an unobstructed central area,
(e) a circular trough provided with openings positioned above said fill media and a liquid distribution header in said trough adapted to be connected to a source of liquid to be cooled,
(f) fan means in said central area for drawing air through said fill media and said water eliminator means to thereby cool said liquid,
(g) pan means beneath said support means for receiving said cooled liquid, and
(h) louvered panel means secured to said vertical support members, said panel means having an outwardly upstanding curved surface for trapping liquid droplets emanating from said fill media means and returning said liquid to said pan means.

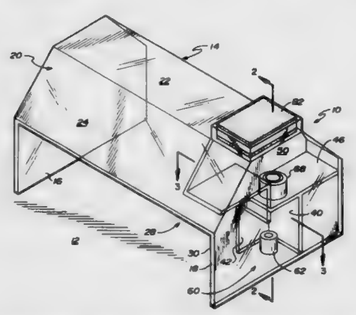
5,112,372
ADVANCED DISPOSABLE AIR CLEANER
Thomas A. Boeckermann, Lakeville; Larry R. Nepsund, Savage, and John D. Sandkamp, Minnetonka, all of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.
Filed Oct. 22, 1991, Ser. No. 780,928
Int. Cl.[5] B01D *46/00, 50/00*
U.S. Cl. 55—276 **14 Claims**

1. An air cleaner for use with a rigid engine air intake tube, said air cleaner comprising:
a. an outer shell having first and second ends;
b. a tubular filter element located within said outer shell and defining a space therebetween, said filter element having first and second ends and an inner opening;
c. a tubular nozzle element located in said inner opening, having first and second ends, comprising a perforated filter element support portion at said first end, a generally centrally located throat portion, and a noise suppressing portion converging from a nozzle element outlet at said second end to said throat;
d. a first end cap fixed to and forming a fluid-tight junction with each of said first ends;



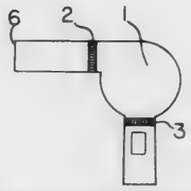
e. a second end cap affixed to and forming a fluid-tight junction with each of said second ends, said second end cap having an aperture with a periphery aligned with said nozzle element outlet; and
f. at least one air intake aperture in said air cleaner located to place said space between said shell and said filter element in fluid communication with air outside the air cleaner.

5,112,373
APPARATUS FOR CONTROLLING AND ELIMINATING VAPOR EMISSIONS AT A MANICURE WORK STATION
Hung Pham, 5082 Appian Way, El Sobrante, Calif. 94803
Filed Jun. 17, 1991, Ser. No. 716,551
Int. Cl.[5] B01D *50/00*
U.S. Cl. 55—316 **8 Claims**



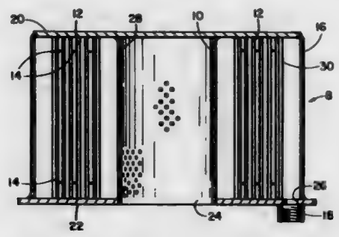
1. Apparatus for controlling and eliminating vapor emissions at a manicure work station having a support surface, said apparatus comprising, in combination:
a housing including a pair of spaced side walls positionable on said support surface and a cover extending between the side walls, said side walls and cover defining an interior and a pair of opposed, spaced housing openings extending upwardly from said support surface when said housing is positioned on said support surface and providing communication between said interior and the ambient atmosphere;
a first chamber wall extending from one of said side walls and having a lower end located at said support surface when the housing is positioned on the support surface and a second chamber wall extending from said first chamber wall, said chamber walls and said one side wall at least partially defining an isolation chamber for accommodating one or more containers of vapor emitting materials in use by a manicurist and a chamber opening leading from said isolation chamber to that portion of said housing interior not occupied by said isolation chamber, said chamber opening being spaced inwardly from and oriented toward one of said housing openings;
plenum defining means connected to said housing adjacent to said one side wall at least partially defining a plenum chamber in fluid-flow communication with said isolation chamber;
filter means disposed between said plenum chamber and the ambient atmosphere; and
fan means for creating an air flow from said isolation chamber into said plenum chamber and out of said plenum chamber through said filter means into the ambient atmosphere through an outlet.

5,112,374
HAIR DRYER AIR FILTER
Timothy T. Ackerman, 14 Wilkenda Ave., East Haven, Conn. 06512
Filed Feb. 6, 1991, Ser. No. 651,201
Int. Cl.[5] B01D *50/00*
U.S. Cl. 55—385.1 **1 Claim**



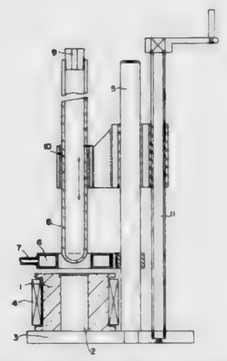
1. A filter for a hand held hair dryer having air inlets comprising:
a stretchable filter material which covers the air inlets of the hair dryer and forms the shape of the portion of the hair dryer it covers;
a circular seal at one end of the filter material which stretches and is positioned around the upper portion of the handle of the hair dryer and keeps dirt from entering between the filter material and the handle and
a second circular seal at a 90 degree angle to the other seal and which stretches and is positioned around the air outlet nozzle of the hair dryer for the purpose of keeping dirt from entering between the air outlet nozzle and the filter material wherein the filter material defines an enclosure and the circular seals define openings.

5,112,375
RADIAL VANE DEMISTING SYSTEM IN A SEPARATOR FOR REMOVING ENTRAINED DROPLETS FROM A GAS STREAM
Michael R. Brown, Tulsa, Okla., assignor to Natco, Tulsa, Okla.
Filed Apr. 18, 1991, Ser. No. 687,299
Int. Cl.[5] B01D *45/00*
U.S. Cl. 55—440 **2 Claims**



1. A gas demister for separating entrained droplets from a gas stream, comprising:
an inner and a concentric outer perforated cylinder, the cylinders being upright and of substantially identical length, each cylinder having a top and a bottom end, the cylinders providing an annular area therebetween and having a common cylindrical axis;
a top plate closing said top ends of both said cylinders;
a bottom plate having a central opening therein of diameter substantially that of said inner cylinder, the bottom plate being secured to said bottom ends of said cylinders, the opening therein providing a gas inlet passageway into said inner perforated cylinder;
a plurality of vertically and radially arranged vanes positioned in said annular area between said inner and outer perforated cylinders and between said top and bottom plates wherein each vane has a plurality of spaced apart flat inline portions past which a gas flow stream flows, the flat inline portions being in a radial plane of said common cylindrical axis, and a plurality of angled flat portions each extending at an angle to and integrally formed with said inline portions such that entrained droplets impact against such angled portions;
the inline and angled portions being repeated between each vane inner end and outer end, the inner end of each vane being adjacent and spaced from said inner perforated cylinder providing an open annular area between said inner perforated cylinder and said vanes and the outer end of each vane being adjacent and spaced from said outer perforated cylinder providing an open annular area between said outer perforated cylinder and said vanes, the vanes providing a plurality of generally radially extending contoured flow paths for gas passing through said inner perforated cylinder and outwardly through said outer perforated cylinder, the vanes forming surfaces for the collection of droplets therein which drain downwardly onto said bottom plate, the bottom plate having a drainage opening therein through which liquid collected from entrained droplets passes out of the demisting system.

5,112,376
PROCESS AND APPARATUS FOR THE OUTER CALIBRATION OF SECTIONS OF GLASS TUBE
Steffen Dietl, Hackenheim, Fed. Rep. of Germany, assignor to Schott Glaswerke, Mainz, Fed. Rep. of Germany
Continuation of Ser. No. 629,816, Dec. 21, 1990, abandoned.
This application Oct. 23, 1991, Ser. No. 780,839
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1989, 3942566
Int. Cl.[5] C03B *9/30*
U.S. Cl. 65—29 **24 Claims**



1. In a process for the outer calibration of sections of glass tube having a hollow interior and an outer wall, comprising softening said glass tube over a section of length to be cali-

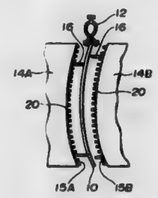
brated, expanding resultant softened section of length in a mold having an inner wall comprising a cylindrical cavity of precise dimensions, said mold being open on at least one end, by generating a higher pressure in the interior of the tube than outside the tube, until said outer wall of the tube comes completely into contact with the inner wall of the mold, the improvement which comprises employing a one piece mold consisting essentially of a glass ceramic block having a cylindrical mold bore, said glass ceramic being a dimensionally and thermally stable glass ceramic of a lower thermal expansion than that of the glass being calibrated, and subsequently cooling the mold containing the resultant expanded section of length until the resultant cooled section of length is releasable from the mold due to its grater shrinkage.

5,112,377

METHOD OF TOUGHENING GLASS SHEET BY QUENCHING

Shin-ichi Aratani, Mie, Japan, assignor to Central Glass Company, Limited, Ube, Japan

Filed Mar. 12, 1991, Ser. No. 668,015
Claims priority, application Japan, Mar. 19, 1990, 2-68762
Int. Cl.[5] C08B *27/04*
U.S. Cl. 65—114 **9 Claims**



1. A method of toughening a glass sheet, comprising the steps of:

(a) heating the glass sheet to a temperature above the strain point of the glass;

(b) positioning the heated glass sheet between two oppositely arranged blastheads such that the two opposite surfaces of the glass sheet face the two blastheads, respectively, each of the two blastheads being provided with a plurality of first nozzles to which air for quenching the heated glass sheet can be supplied from a compressor and a plurality of second nozzles to which air can be supplied from a blower; and

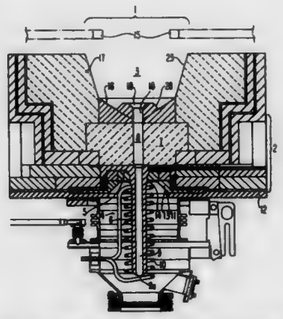
(c) blowing first cooling air from said first nozzles of each of the two blasthead onto the heated glass sheet and simultaneously blowing second cooling air from said second nozzles of each of the two blasteads onto the heated glass sheet, said first cooling air being supplied from said compressor and forced to rapidly expand so as to produce a shock wave and have a first predetermined pressure at the exit of each of said first nozzles, said second cooling air being supplied from said blower so as to have a second predetermined pressure at the exit of each of said second nozzles, said second predetermined pressure being higher than said first predetermined pressure with the proviso that the difference between said second predetermined pressure and said first predetermined pressure being not greater than 0.05 kg/cm^2.

5,112,378

BOTTOM OUTLET DEVICE FOR A GLASS MELTING FURNACE

Siegfried Weisenburger, Au/Rhein; Wolfgang Grünewald, Eggenstein, and Hartmut Seiffert, Karlsruhe, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Feb. 25, 1991, Ser. No. 660,029
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1990, 4005746
Int. Cl.[5] C03B *5/26, 7/08*
U.S. Cl. 65—327 **5 Claims**



1. A bottom outlet device for a glass melting furnace, with heating of a glass melt taking place to within the temperature range at which the glass melt is electrically conductive by way of electrodes disposed in the interior of the furnace and projecting into the melt, comprising:

an inductively heatable and metallic outlet unit projecting from the bottom of the furnace and including an outlet opening and an interior outlet channel communicating with said outlet opening;

an outlet block comprised of ceramic bricks disposed above said outlet unit and including a throughgoing channel which opens toward an interior of the furnace and which is flush with the interior outlet channel of said outlet unit; and

a bottom electrode comprised of metal and disposed at a lowermost portion of the interior of the furnace and seated above said outlet block, said bottom electrode being penetrated by a further channel which is flush with the throughgoing channel in said outlet block and thereby is in communication with the outlet opening of said outlet unit.

5,112,379

MULTICOMPONENT SOIL SUPPLEMENT

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 664,885, Oct. 26, 1984, abandoned.
This application Oct. 29, 1987, Ser. No. 114,458
Int. Cl.[5] C05D *9/02*
U.S. Cl. 71—31 **18 Claims**

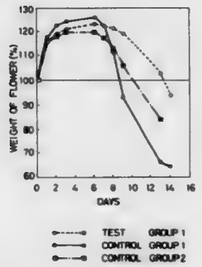
1. A plant nutrient composition comprising particles of a water-soluble plant nutrient dispersed throughout the sulfur matrix of sulfur particles having average particle diameters of about ¼ inch or less prepared by the method including the steps of admixing a sulfur melt comprising about 1 to about 50 weight percent solid particles of a water-soluble plant nutrient and at least about 40 weight percent molten sulfur with a non-phytotoxic oil with sufficient agitation and under conditions sufficient to comminute and solidify said sulfur melt in said oil and form said sulfur particles having average particle diameters of about ¼ inch or less and containing about 1 to about 50 weight percent of said water-soluble, plant nutrient particles dispossessed throughout the continuous sulfur matrix of said particles.

5,112,380

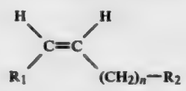
PRESERVATIVE FOR PLANTS COMPRISING ALKENYLPHOSPHONIC ACIDS AND, OPTIONALLY, DIPICOLINIC ACID

Kazuhiro Yamamoto; Noriko Yoshioka, both of Tokyo, Japan, and Tadayasu Furukawa, Chesterfield, Mo., assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1990, Ser. No. 507,332
Claims priority, application Japan, Apr. 10, 1989, 1-90379; Aug. 15, 1989, 1-209666
Int. Cl.[5] A01N *3/02, 57/04, 43/40*
U.S. Cl. 426—321 **8 Claims**



1. A method for maintaining the freshness of a harvested plant or plant part which comprises treating the plant or plant part with a preservative containing an olefin compound represented by the general formula (I), or a salt or ester thereof:


(I)

wherein R_1 represents an alkyl group having from 1 to 3 carbon atoms, R_2 represents a phosphono group, and n represents an integer from 0 to 3.

5,112,381

BIOLOGICAL CONTROL OF KNAPWEED BY *PYTHIUM ROSTRATUM*

Eduardo E. Trujillo, Honolulu, Hi., assignor to The Confederated Tribes of the Colville Reservation, Nespelem, Wash.

Filed Feb. 14, 1990, Ser. No. 480,479
Int. Cl.[5] A01N *63/04;* C12N *1/14*
U.S. Cl. 71—79 **14 Claims**



1. A method for selectively killing knapweed, comprising:

(a) growing *Pythium rostratum* which selectively kills knapweed and which has been mutagenized such that it produces no oospores on a carrier saturated with a liquid nutrient capable of supporting *Pythium rostratum* growth and the production of zoosporangia; and

(b) applying the *Pythium rostratum* carrier to knapweed-infested land under moisture and temperature conditions sufficient to support *Pythium rostratum* growth and zoospore release by the zoosporangia, said zoospores being capable of killing knapweed.

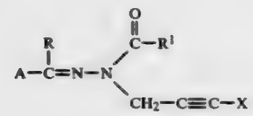
5,112,382

HALOPROPARGYL COMPOUNDS, COMPOSITIONS, USES AND PROCESSES OF PREPARATION

Adam C. Hsu, Lansdale, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 24, 1990, Ser. No. 528,653
Int. Cl.[5] C07D *257/04*
U.S. Cl. 71—88 **8 Claims**

1. A compound of the formula


(I)

wherein

A is selected from the group consisting of (1) phenyl, (2) naphthyl, (3) phenyl substituted with one or more halo, cyano, (C_1–C_4)alkyl, nitro, (C_1–C_4)haloalkyl, and (C_1–C_4)thioalkyl, (4) naphthyl substituted with one or more halo, cyano, (C_1–C_4)alkyl, nitro, (C_1–C_4)haloalkyl, and (C_1–C_4)thioalkyl, (5) thiophene, (6) furan, (7) thiophene substituted with one or more substituents selected from halo and nitro, and (8) furan substituted with one or more substituents selected from halo and nitro;

R is selected from the group consisting of hydrogen, (C_1–C_4)alkyl and substituted or unsubstituted phenyl wherein the substituents are selected from one or more halo, cyano, (C_1–C_4)alkyl, nitro, (C_1–C_4)haloalkyl, and (C_1–C_4)-thioalkyl;

R^1 is selected from the group consisting of (C_1–C_4) alkoxy hydrogen; optionally substituted phenyl wherein the phenyl substituents are selected from the group consisting of halo,cyano, (C_1–C_4)alkyl, nitro, (C_1–C_4)haloalkyl, and (C_1–C_4)thioalkyl; (C_1–C_8) alkyl; and optionally substituted heterocycles wherein said heterocycles are selected from the group consisting of thiophene, furan, imidazole, and triazole, which are optionally substituted with (C_1–C_3)alkyl, halo, and nitro; and

X is selected from the group consisting of I and Br.

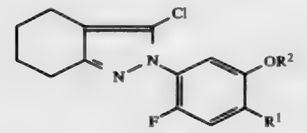
5,112,383

TETRAHYDROINDAZOLES WITH A PHENYL ETHER STRUCTURE, COMPOSITIONS AND USE

Lothar Rueb, Speyer; Karl Eicken, Wachenheim; Peter Plath, Frankenthal; Karl-Otto Westphalen, Speyer, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

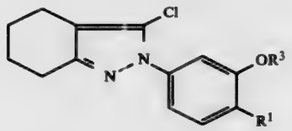
Division of Ser. No. 592,906, Oct. 4, 1990, abandoned, which is a division of Ser. No. 457,973, Dec. 27, 1989, Pat. No. 4,997,472.
This application Aug. 23, 1991, Ser. No. 749,352
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1989, 3901550
Int. Cl.[5] A01N *43/56;* C07D *231/56*
U.S. Cl. 71—92 **3 Claims**

1. An N-phenyl-tetrahydroindazole of the formula Ia or Ib


Ia

-continued

Ib



where

R^1 is halogen;

R^2 is C_1–C_6-alkoxycarbonyl-C_3–C_5-alkenyl or C_1–C_3-alkyl which is substituted in the 1- or 2-position by C_1–C_6-alkoxycarbonyl and

R_3 is C_2–C_7-alkyl, C_3–C_6-alkenyl, C_1–C_4-alkoxycarbonyl-C_3–C_5-alkenyl or C_1–C_3-alkyl which is substituted in the 1-or 2-position by C_1–C_4-alkoxycarbonyl.

5,112,384

3-(SUBSTITUTED PHENYL) PYRAZOLE DERIVATIVES HERBICIDAL COMPOSITION CONTAINING THE SAME AND METHOD OF CONTROLLING WEEDS USING SAID COMPOSITION

Yuzo Miura, Nishinomiya; Masanobu Ohnishi, Osaka; Tsutomu Mabuchi, Kawachinagano, and Isao Yanai, Osakasayama, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1991, Ser. No. 659,729

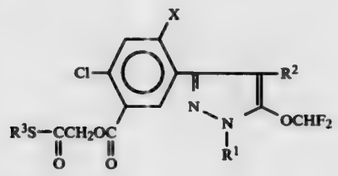
Claims priority, application Japan, Feb. 28, 1990, 2-048071

Int. Cl.[5] A01N *43/56;* **C07D** *233/70*

U.S. Cl. 71—92 **8 Claims**

1. A 3-(substituted phenyl)pyrazole derivative or a salt thereof, the derivative being represented by the general formula

(I)



wherein,

X denotes halogen, R^1 denotes lower alkyl, R^2 denotes halogen and R^3 denotes lower alkyl, lower alkenyl or benzyl group.

5,112,385

SUBSTITUTED PYRIDYLOXYUREAS AND USE THEREOF AS HERBICIDES

Isao Hashimoto, Iwakuni; Tatsuyodihi Ishida, Ohtake; Kazutaka Tsuru, Iwakuni; Yuji Yamada; Takeshige Miyazawa, both of Shizuoka; Yasuo Nakamura, Shizuoke; Susumu Katou, Shizuoka, and Katsuya Takahashi, Otake, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Mitsui Petrochemical Industries, Ltd., both of Tokyo, Japan

Division of Ser. No. 232,634, Aug. 16, 1988, Pat. No. 4,968,341, which is a continuation of Ser. No. 800,031, Nov. 20, 1985, abandoned, and a continuation of Ser. No. 159,966, Feb. 17, 1988, abandoned, and a continuation of Ser. No. 151,516, Feb. 17, 1988, abandoned. This application Jun. 29, 1990, Ser. No. 545,837

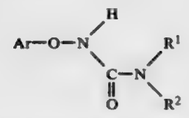
Claims priority, application Japan, Nov. 26, 1984, 248040; May 26, 1986, 119293; May 26, 1986, 119294

Int. Cl.[5] C07D *401/12;* **A01N** *43/40, 43/44, 43/46*

U.S. Cl. 71—94 **8 Claims**

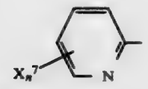
1. A substituted aryloxyurea represented by the following formula (I):

(I)



wherein Ar represents

(g)



in which X^7 represents a hydrogen atom, a halogen atom, a cyano group, a lower alkoxy group or a trifluoromethyl group, and

R^1 and R^2 form together with carbon and the nitrogen atom to which they are bonded, a 4–8 membered monocyclic ring which may have one or more alkyl branches.

5,112,386

FUNGICIDES

Anthony Vivienne, Maidenhead; John M. Clough, Marlow; Paul deFraine, Wokingham; Christopher R. A. Godfrey, Bracknell; Patrick J. Crowley, Crowthorne, and Kenneth Anderton, Bury, all of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 39,401, Apr. 17, 1987, Pat. No. 4,826,531. This application Dec. 30, 1988, Ser. No. 292,308

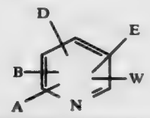
Claims priority, application United Kingdom, Apr. 17, 1986, 8609456; Jan. 26, 1987, 8701627

Int. Cl.[5] A01N *43/40;* **A61K** *31/44, 31/505;* **C07D** *213/04*

U.S. Cl. 71—94 **14 Claims**

1. A compound having the general formula

(I)



and stereoisomers thereof, wherein W, which is attached to the pyridine ring at the 2-, 3- or 4-position, is R^1O_2C—C=CH—Zr^2, wherein R^1 ; and R^2, which are the same or different, are C_{1-6}-alkyl or fluoro(C_{1-6})alkyl groups, and Z is either an oxygen or sulphur atom; A is pyridinyloxy, pyridinylthio or pyridinyloxyalkyl; B, D and E, which are the same or different, are hydrogen or halogen atoms, or hydroxy, C_{1-6}alkyl optionally substituted with halogen, hydroxy, alkoxy or phenoxy, C_{1-6}alkoxy, phenyl(C_{1-6})alkyl, phenyl-(C_{1-6})alkoxy, C_{2-6}alkenyl optionally substituted with phenyl, C_{2-6}alkynyl, phenyl, phenoxy, phenylthio, —NR′R″, —NHCOR[1], —O-COR[1] (in which R′ and R″ are as defined below), phenylazo, nitro, cyano, $—CO_2R^3$, $—CONR^3R^4$, $—COR^3$, $—CR^3NR^4$, $—N{=}CR^3R^4$ or $—S(O)_nR^3$ groups; n is 0, 1 or 2; and R^3 and R^4, which are the same or different, are hydrogen atoms or C_{1-6}alkyl, C_{3-6}cycloalkyl, C_{3-6}cycloalkyl C_{1-4}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, phenyl or phenyl(C_{1-6})alkyl groups; any foregoing aryl moiety or the pyridinyl ring of A being optionally substituted with one or more of halogen, hydroxy, C_{1-4}alkyl, (C_{1-4})alkoxy, halo(C_{1-4})alkyl, halo(C_{1-4})alkoxy, C_{1-4}alkylthio, C_{1-4}alkoxy(C_{1-4})alkyl, C_{3-6}cycloalkyl, C_{3-6}cycloalkyl(C_{1-4})alkyl, phenyl phenoxy, phenyl(C_{1-4})alkyl, phenyl(C_{1-4})alkoxy, phenoxy(C_{1-4})alkyl, acetyloxy, benzoyloxy, cyano, thiocyanato, nitro, —NR′R″, —NHCOR′, —NHCONR′R″, —CONR′R″, —COOR′, $—OSO_2R'$, $—SO_2R'$, —COR′, —CR′=NR″ or —N=CR′R″ in which R′ and R″ are independently hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, phenyl or benzyl, the phenyl and benzyl groups being optionally substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy; and metal complexes thereof.

5,112,387

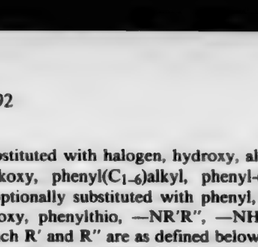
PRODUCING STAINLESS STEELS IN ELECTRIC ARC FURNACES WITHOUT SECONDARY PROCESSING

Arturo Lazcano-Navarro, Coahuila, Mexico, assignor to Instituto Mexicano de Investigaciones Siderurgicas, Mexico

Filed Aug. 21, 1991, Ser. No. 748,049

Int. Cl.[5] C22B *4/00*

U.S. Cl. 75—10.42 **6 Claims**



1. A method to produce stainless steels in an electric arc furnace without using a secondary processing vessel including the steps of:

charging a solid charge composed of stainless steel scrap, high-carbon ferrochromium, ferrosilicon and fluxes,

melting said charge while stirring with a stirring gas blown through secured injection devices such as plugs in the bottom wall of the furnace,

after melting and deslagging, raising electrodes in the furnace to an upper position,

providing a charging door stopper and orifice in the furnace to avoid liquid bath ejections through said charging orifice while the bath is being stirred,

then oxidizing with blowing oxygen while stirring with said stirring gas at an oxygen flow rate high enough to obtain a decarburization level of about 0.03% in a short time period, and

thereafter suspending the blowing oxygen, removing the charging door stopper, and adding a reducer deoxidant while maintaining the stirring gas flow rate at a level high enough to obtain good mixing conditions.

5,112,388

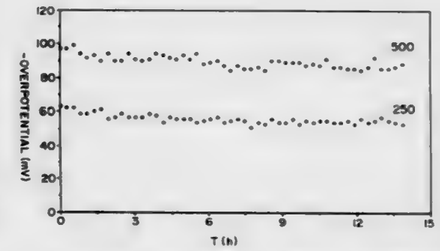
PROCESS FOR MAKING NANOCRYSTALLINE METALLIC ALLOY POWDERS BY HIGH ENERGY MECHANICAL ALLOYING

Robert Schulz, Brossard; Jean-Yves Huot, St-Hubert, and Michel Trudeau, Longueuil, all of Canada, assignors to Hydro-Quebec, Montreal, Canada

Filed Aug. 22, 1989, Ser. No. 396,677

Int. Cl.[5] C23C *10/00;* **B22F** *1/00*

U.S. Cl. 75—255 **8 Claims**



1. A process for producing metallic powders suitable for preparing electrodes having electrocatalytic properties enabling said electrodes to give hydrogen by water electrolysis, said process comprising providing particles of nickel and particles of molybdenum in a proportion to produce nanocrystals of a main alloy of nickel and molybdenum comprising at least about 40 At. % nickel, the balance being molybdenum; and subjecting said particles to high energy mechanical alloying under conditions and for a sufficient period of time to produce said nanocrystals of said main alloy.

5,112,389

PROCESS FOR THE REMOVAL OF AN EMBEDDING BODY FROM THE EMBEDDED COMPONENT

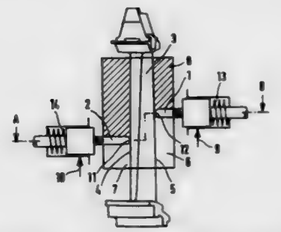
Horst Pelz, Unterschleissheim; Armin Klier, Neufahrn, and Herbert Graf, Kirchdorf, all of Fed. Rep. of Germany, assignors to MTU Motoren und Turbinen-Union Muchen GmbH, Fed. Rep. of Germany

Filed Oct. 1, 1990, Ser. No. 590,796

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1989, 3932571

Int. Cl.[5] B23P *19/04*

U.S. Cl. 75—401 **10 Claims**



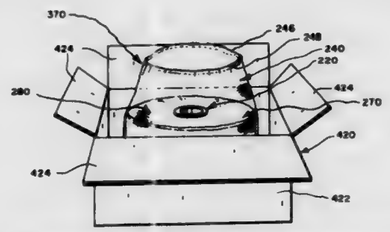
1. A process for the removal of an embedding material of low-melting metal from an embedded higher-melting metal component or ceramic component, comprising the steps of:

a) forming grooves in the embedding material along spaced position to follow a contour of the embedded component, and

b) widening the grooves in the embedding material along the spaced portions and

c) removing the embedding material from the embedded component.

5,112,390
REPLACEABLE CORE SILVER RECOVERY EQUIPMENT AND METHOD OF MAKING AND USING
Michael T. MacKay, Sandy, Utah, assignor to Pioneer Refining Services, Inc., Salt Lake City, Utah
Filed Dec. 7, 1990, Ser. No. 624,172
Int. Cl.[5] C22B *3/02*
U.S. Cl. 75—733 **22 Claims**



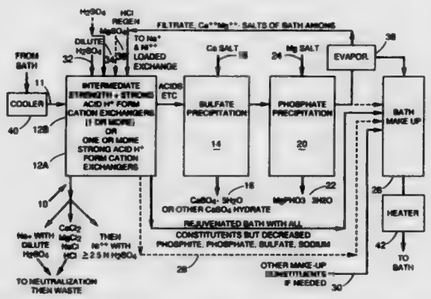
21. A method of recovering silver from silver-containing liquid comprising the steps of:
placing a wound coil of ionic exchange metal into an interior of a selectively pervious mesh bag;
placing the bag with the coil therein in a silver recovery container;
delivering silver containing liquid directly into the interior of the bag and thence selectively through the coil within the bag to obtain silver sludge through ionic exchange;
accommodating flow of said liquid through the bag into the container while accumulating and retaining the silver sludge in the bag.

5,112,391
METHOD OF FORMING ORE PELLETS WITH SUPERABSORBENT POLYMER
David O. Owen, Aurora, and Jacqueline J. Bonin, Oak Park, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.
Filed Mar. 30, 1990, Ser. No. 502,383
Int. Cl.[5] C22B *1/244*
U.S. Cl. 75—772 **3 Claims**

1. A method of forming metal ore pellets from wetted crushed ore comprising treating said ore with from 0.10 pounds per long ton of ore to about 5.0 pounds per long ton of ore of a binding agent comprising the ingredients: (a) superabsorbent polymer, (b) linear water-soluble vinyl addition polymer, (c) polysaccharide, wherein a:b:c is in the weight ratio of 10:0:1 to 10:1:10 to 10:10:1 to 1:10:10, admixing said binding agent and said ore to form an admixture, then pelletizing and drying said admixture to form said metal ore pellets.

5,112,392
RECOVERY PROCESS FOR ELECTROLESS PLATING BATHS
Roger W. Anderson, Farragut, and Wayne A. Neff, Knoxville, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.
Filed Jun. 21, 1991, Ser. No. 719,201
Int. Cl.[5] B01D *15/04*
U.S. Cl. 106—1.22 **20 Claims**

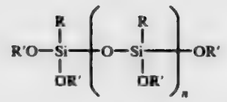
1. A process for the removal of deleterious contaminants from a used electroless metal plating bath solution containing at least plating metal ions and sodium ions in sulfate form to recover said plating ions and to permit reuse of said solution at a selected pH, the process comprising the steps:
passing at least a portion of said used bath solution through an acid cation exchanger in hydrogen form, said acid cation exchanger selected from the group consisting of strong acid exchangers and a combination of intermediate acid and strong acid exchangers, to remove said sodium ions and said plating metal ions by exchange with hydrogen ions of said cation exchanger and to convert sulfate, phosphites and non-sorbed constituents in said at least portion of said used bath solution to their respective acids in an effluent from said exchanger;
adding a basic calcium salt to said effluent from said exchanger to precipitate from said effluent calcium sulfate hemihydrate;
removing said precipitated calcium sulfate hemihydrate to produce a liquid phase;



recovering said liquid phase from said precipitation of said calcium sulfate hemihydrate;
adding a basic magnesium salt to said liquid phase from said precipitation of said calcium sulfate hemihydrate to precipitate magnesium phosphite trihydrate;
removing said precipitated magnesium phosphite trihydrate to produce a magnesium sulfate liquid phase;
recovering said magnesium sulfate liquid phase from said precipitation of said magnesium phosphite trihydrate; and
eluting said plating metal ions from said cation exchanger.

5,112,393
METHOD OF RENDERING MASONRY MATERIALS WATER REPELLENT WITH LOW VOC ORGANOALKOXYSILANES
James F. Engel, Kansas City, Mo., and Gerald E. Boyer, Naples, Fla., assignors to ProSoCo, Inc., Kansas City, Kans.
Filed Oct. 9, 1990, Ser. No. 594,653
Int. Cl.[5] B32B *27/36*; B05D *3/02*
U.S. Cl. 106—2 **23 Claims**

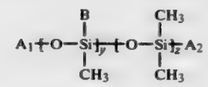
1. A method of treating a substrate so as to impart water repellency to the substrate comprising the steps of:
(a) applying to said substrate a substantially solvent-free organoalkoxysilane liquid of the following general formula:



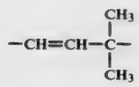
wherein:
R is an alkyl, cycloalkyl, arylalkyl, or alkaryl group or mixtures thereof having from 1 to, about 30 carbon atoms wherein said carbon atoms are fully saturated with hydrogen or partially saturated with hydrogen with double bonds therebetween or with heteroatoms or fluorinated derivatives thereof;
R′ is an alkyl or alkoxyalkyl group having from 1 to about 8 carbon atoms or mixtures thereof; and n is between 1 and about 8; and
(b) allowing said organoalkoxysilane to cure.

5,112,394
FURNITURE POLISH CONCENTRATE AND FORMULATIONS
Eric J. Miller, Racine, Wis., assignor to S.C. Johnson & Son, Inc., Racine, Wis.
Continuation-in-part of Ser. No. 543,605, Jun. 25, 1990, abandoned, which is a continuation-in-part of Ser. No. 286,907, Dec. 20, 1988, Pat. No. 4,936,914. This application Aug. 28, 1990, Ser. No. 576,090
The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.
Int. Cl.[5] C09G *1/10*; C09D *3/2*
U.S. Cl. 106—3 **2 Claims**

1. A furniture polish concentrate consisting essentially of dimethyl silicone and a poly(dimethyl)-co-poly(methyl, oxygen-containing) siloxane copolymer, structurally depicted as



wherein "A_1" is Si-$(CH_3)_3$; wherein "A_2" is O-Si-$(—CH_3)_3$; wherein "B" is $(CH_2)_i(M)_j(L)$ $(CH_2CH_2O)_nR$; wherein "i" is either 0 or an integer value of 3 to 8 inclusive; wherein "j" is either 1 when "i" is 0 or is 0 when "i" is 3 to 8 inclusive; wherein "M" is



wherein "L" is either —O— or is —COO—; wherein "n" is either 0 or is an integer value of 1 to 3 inclusive; wherein "R" is either —H, CH_3, $—C_2H_5$; wherein "y" is about 18 to about 60 mole percent; and wherein the sum of "A_1", "A_2", "y" and "z" is 100 mole percent, wherein the siloxane copolymer and the dimethyl silicone are immiscible, wherein the siloxane copolymer possesses a relatively greater specific gravity than the dimethyl silicone, and wherein the siloxane copolymer has a greater refractive index than the dimethyl silicone.

5,112,395
COMPOSITIONS AND PROCESS FOR METAL TREATMENT
Toan M. Ngo, Eureka, Mo., assignor to Monsanto Company, St. Louis, Mo.
Division of Ser. No. 313,768, Feb. 22, 1989, Pat. No. 5,026,423. This application Mar. 25, 1991, Ser. No. 674,260
Int. Cl.[5] C23F *11/167*
U.S. Cl. 106—14.12 **12 Claims**

1. A process for preparing a particulate Jernstedt salt concentrate for use in producing protective phosphate coatings on metal surfaces by admixture with water comprising:
(a). preparing an aqueous solution of a water soluble titanium ion producing compound and heating said solution to a temperature above about 60° C. and below the deactivating temperature of said titanium ion;
(b). combining said solution with an alkali metal phosphate salt selected from the group consisting of primary, secondary and tertiary salts of orthophosphoric acid and mixtures thereof to form a product;
(c). drying the product of step (b) to remove free water to form a dried product; and
(d). combining the dried product of step (c) with additional amounts of said alkali metal phosphate salt wherein the product of step (b) contains from about 20% to about 40%, by weight, of the total amount of alkali metal phosphate salt in said concentrate.

5,112,396
ANTI-SAPSTAIN WOOD TREATMENT
Bryan Hegarty, Peymeinade, France, assignor to Rohm and Haas Company, Philadelphia, Pa.
Filed Feb. 5, 1990, Ser. No. 475,613
Int. Cl.[5] A61L *13/00*; C09D *5/14, 5/16*
U.S. Cl. 106—15.05 **7 Claims**

1. The method of using a solution as an anti-sapstain treatment composition, wherein the solution comprises an isothiazolone and a simple quaternary ammonium compound in an amount at least equal to the amount of isothiazolone in the solution.

5,112,397
PROCESS FOR STABILIZING ZINC PYRITHIONE PLUS CUPROUS OXIDE IN PAINT
Douglas A. Farmer, Jr., Madison; Rahim Hani, Cheshire, and Craig Waldron, Waterbury, all of Conn., assignors to Olin Corporation, Cheshire, Conn.
Filed Jun. 17, 1991, Ser. No. 716,415
Int. Cl.[5] C09D *5/14*
U.S. Cl. 106—18.33 **16 Claims**

1. A paint or paint base composition characterized by enhanced biocidal efficacy and gellation resistance wherein the paint or paint base contains a biocide consisting essentially of cuprous oxide and zinc pyrithione, and the paint or paint base further comprises an amine of the formula $(NH_2)_xR_1NH_2$, where x is 0 or 1 and R_1 is C_1 to C_{10} alkyl, alkenyl, alkynyl, cycloalkyl, or cycloalkynyl, and wood rosin or esterified wood rosin esterified by an alcohol of the formula $(HO)_yR_2OH$, where y is 0 or 1 and R_2 is C_1 to C_{10} alkyl, alkenyl, alkynyl, cycloalkyl, or cycloalkynyl, said zinc pyrithione being present in an amount of between about 1% and about 25% and said cuprous oxide being present in an amount of between about 20% and about 70%, the total amount of said pyrithione salt plus said cuprous oxide being between about 20% and about 80% based upon the total weight of the paint or paint base, said amine being present in an amount of between 0.1% and 15% based upon the total weight of the paint or paint base composition, and said wood rosin or esterified wood rosin being present in an amount of between about 1% and 20% based upon the total weight of the paint or paint base.

5,112,398
JET PRINTING INK
Jurgen M. Kruse, Clinton, Conn., assignor to Xaar Limited, Cambridge, England
Continuation-in-part of Ser. No. 366,636, Jun. 15, 1989, abandoned. This application Mar. 27, 1991, Ser. No. 676,190
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—20 **17 Claims**

1. An ink jet ink composition comprising a mixture of:
(a) a non-aqueous solvent;
(b) an amount of resin which is substantially insoluble in said solvent at room temperature but which is capable of being substantially completely dissolved in said solvent at a temperature in the range of about 50° C. to about 65° C.; and,
(c) a dyestuff which is soluble in said resin at room temperature and above but substantially insoluble in said solvent at room temperature, the proportions of said solvent, resin, and dye being selected to provide an ink composition which is fluid at room temperature.

5,112,399
PLAIN PAPER INKS
Leonard Slevin, San Diego, and Mark S. Hickman, Escondido, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Continuation-in-part of Ser. No. 378,113, Jul. 11, 1989, abandoned. This application Jan. 28, 1991, Ser. No. 649,123
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—22 **12 Claims**

1. A process for increasing the frequency of printing an ink in a thermal ink-jet printer, while retaining the print quality of said ink associated with printing at lower frequencies, said ink comprising a vehicle comprising about 5 to 20 wt % of a glycol or glycol ether and the balance water and about 1 to 6wt % of a dye, wherein the improvement comprises adding an alginate to said ink in the amount of about 0.1 to 1 wt % of said composition.

5,112,400
CLAY THICKENER FOR USE IN WATER-BASED SYSTEMS AND JOINT COMPOOUNDS CONTAINING SUCH COMPOSITIONS
Hemi N. Nae, Princeton; Wei M. Cheng, Piscataway, and Michael A. DeSesa, Fair Haven, all of N.J., assignors to Rheox, Inc., Hightstown, N.J.
Filed Mar. 6, 1990, Ser. No. 489,195
Int. Cl.[5] C09D *101/02*
U.S. Cl. 106—197.1 **17 Claims**



1. A thickener composition for water-based systems comprising hectrorite clay deposit and modified cellulose, said hectrorite clay deposit and said modified cellulose being present in an amount effective to thicken the sytems as much as or more than the combined amount of hectrorite in the clay deposit alone, and the cellulose.

5,112,401
CORRECTION FLUID FOR ELECTROPHOTO PLATES FOR OFFSET PRINTING
Hajime Yoshida, Aichi, Japan, assignor to Nikken Chemical Laboratory Co., Ltd., Nagoya, Japan
Filed Mar. 14, 1990, Ser. No. 493,418
Claims priority, application Japan, Mar. 23, 1989, 1-71192
Int. Cl.[5] C07F *7/22*
U.S. Cl. 106—287.19 **21 Claims**

1. A hydrophilic stannous chelate compound consisting of stannous ion and an acidic phosphate ester of an aliphatic alcohol as a ligand, wherein the proportion of the salt acidic phosphate ester of an aliphatic alcohol to the said stannous ion is from 0.5/1.0 to 1.0/1.0.

5,112,402
PIGMENT SYSTEM FOR PAINTS
Gary M. Freeman, and Thad T. Broome, both of Macon, Ga., assignors to J. M. Huber Corporation, Rumson, N.J.
Continuation of Ser. No. 518,715, May 4, 1990, abandoned. This application Sep. 3, 1991, Ser. No. 753,545
Int. Cl.[5] C04B *33/04*
U.S. Cl. 106—416 **8 Claims**

1. A structured clay pigment slurry consisting of at least 50% solids comprising an approximately 50:50 combination of a fine particle kaolin clay and an alkali metal alumino-silicate having a composition in terms of mole ratio of oxides as follows:

$$xM_2O:Al_2O_3:ySiO_2:zH_2O$$

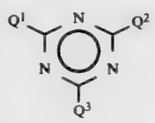
wherein x is the number of moles of alkali metal oxide and is an integer of 0.01 to 2.0, M is an alkali metal, y is the number of moles of SiO_2 associated with the compositions and is an integer of 2.0 to 20.0, and z is the number of moles of bound water and is an integer of 1.0 to 5.0, wherein primary particles of said alkali metal alumino-silicate comprise a core of clay platelets having an integral adjacent area of essentially amorphous alkali metal silicate base-kaolin clay reaction product.

5,112,403
COATING COMPOSITION
Ken Okura, Tokyo; Satoru Matsuzaki, Iwata; Tsutomu Katamoto, and Nanao Horiishi, both of Hiroshima, all of Japan, assignors to Toda Kogyo Corp., Hiroshima and Dainic Iseika Color & Chemicals Mfg. Co. Ltd, Tokyo, both of, Japan
Continuation-in-part of Ser. No. 530,862, May 31, 1990, abandoned. This application Sep. 11, 1991, Ser. No. 756,562
Claims priority, application Japan, Jun. 5, 1989, 1-143811
Int. Cl.[5] C04B *14/20*
U.S. Cl. 106—418 **11 Claims**

1. A coating composition comprising plate-like iron oxide particles having an average particle diameter of 0.5 to 5.0 μm, a lamellar thickness of 50 to 500 Å and a plate ratio (the ratio of the average particle diameter to the lamellar thickness) of 50:1 to 500:1, at least one pigment selected from the group consisting of a coloring pigment, a mica pigment and a metal powder pigment, a film-forming polymer, and an organic solvent.

5,112,404
PIGMENT FORMULATIONS, PROCESSES FOR THEIR PREPARATION AND THEIR USE
Andreas Sommer, Niederrahausen; Erwin Dietz, Kelkheim, and Manfred Urban, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Continuation of Ser. No. 244,995, Sep. 15, 1988, abandoned. This application Apr. 4, 1990, Ser. No. 506,564
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1987, 3731637; Oct. 10, 1987, 3836864
Int. Cl.[5] H01B *1/06*
U.S. Cl. 106—506 **12 Claims**

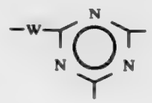
1. A pigment formulation consisting essentially of:
a) 99.8% to 50% by weight of one or more pigments selected from the group consisting of organic or inorganic azo pigments, azaporphines, quinacridones, diketopyrrolopyrroles, flavanthrone, anthanthrone and pyranthrone substances, derivatives of naphthalenetetracarboxylic acid, perylenetetracarboxylic acid, thioindigo, dioxazine or tetrachloroisoindolinone, magnesium lake pigments, calcium lake pigments, barium lake pigments, aluminum lake pigments, manganese and nickel lakes of dyestuffs containing acid groups, and corresponding mixtures thereof and b) 0.2% to 30% by weight of one or more colorless or only slightly colored compounds of the formula (I)



(I)

in which
Q^1, Q^2 and Q^3 independently of one another each denote a —X—A, —OR^1, —SR^1, halogen or —NR^2R^3 radical or a

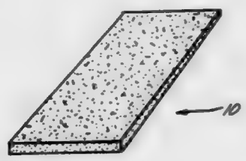
radical Q of one, two or up to fifteen trivalent groups of the formula (Ia)



(Ia)

each of which is bonded via the divalent group W to a free valency of the next group of the formula (Ia) or to the triazine ring of the parent substance of the formula (I) and on the other free valencies in each case to a —X—A, —OR^1, —SR^1, halogen or —NR^2R^3 radical and which, in the case of more than two groups of the formula (Ia), are bonded to one another in linear or branched form, at least one radical of the formula —X—A being present in the compound of formula (I) and
A stands for the radical of an aromatic ring system with 2 to 6 fused-on rings and with a total of at least 9 ring atoms, or stands for the radical of a group of 2 to 3 bonded aromatic ring systems in each case of one ring or 2 to 4 fused-on rings with in each case 5 to 7 ring atoms per ring, in which the bonded aromatic ring systems are bonded via a direct bond or a divalent group from the series consisting of —O—, —S—, —CO—, —SO—, —SO_2— and C_1–C_{12}-alkylene, or stands for one of the radicals mentioned, which contain one or more substituents selected from the series consisting of C_1–C_{24}-alkyl, —OR′, halogen, —NR′R″, —COOR′, —CONR′R″, —NR′COR″, —CN, —CF_3 and —NO_2, in which R′ and R″ independently of one another denote hydrogen or a straight-chain or branched C_1–C_{12}-alkyl, or together with the N atom denote a 5- or 6-membered heterocyclic radical,
X stands for a divalent group —NR^*—, —O— or —S— in which R^* denotes a radical from the series consisting of hydrogen, C_1–C_6-alkyl, C_1–C_6-hydroxyalkyl, (C_1–C_4-alkoxy) -C_1–C_6-alkyl and C_5–C_7-cycloalkyl,
R^1, R^2 and R^3 independently of one another stand for the hydrogen radical, straight-chain or branched C_1–C_{24}-alkyl or C_2–C_{24}-alkenyl, C_5-C_{12}-cycloalkyl with one or two rings, C_7–C_{18}-aralkyl, heteroaryl with 1 or 2 rings and a total of 5 to 8 ring atoms, phenyl, a phenyl radical which is substituted by at least one radical form the group consisting of C_1–C_{12}-alkyl, halogen, —OR^4, —NR^4R^5, —$COOR^4$, —$CONR^4R^5$, —NR^5COR^4, —CN, —CF_3, —NO_2 and —T— $(CH_2)_p$—NR^qR^t, in which R^4 and R^5 independently of one another denote hydrogen or C_1–C_{24}-alkyl, R^q and R^t independently of one another denote C_1–C_{24}-alkyl, p denotes a number from 1 to 6 and T denotes a direct bond or a divalent group from the series consisting of —O—, —S—, —CO—, —SO—, —SO_2—, —NR^a— —NR^aCO—, —NR^aSO_2—, —SO_2NR^a and —$CONR^a$ and R^a denotes hydrogen or C_1–C_{12}-alkyl group, or stands for C_1–C_{12}-hydroxyalkyl or polyhydroxyalkyl or stands for a C_1–C_{30}-alkyl radical, which is interrupted in the chain by one or more non-adjacent divalent groups of the formula —O— or —NR^v—, in which R^v denotes hydrogen or C_1–C_{24}-alkyl, or a combination of at least two of the divalent groups and which can be substituted by a 5- or 6-membered heterocyclic ring, or
R^1 has the above mentioned meaning and R^2 and R^3, together with the n atom, stand for a 5- or 6-membered ring of a heterocyclic system with one or two rings, and
W represents a divalent group of the formula —NR^s—Y—NR^t—, —O—Y—O—, —O—Y—NE^8—, —S—Y—S—, —O—Y—S— or —NR^s—Y—S—, wherein, in the above formulae, Y stands for a straight-chain or branched C_2–C_{20}-alkylene group of a C_2–C_{20}-alkylene group, which is interrupted by one or more groups —O—, —S—, —NR^u, in which R^u denotes hydrogen or C_1–C_{24}-alkyl, —CO—, —SO—, —SO_2—, C_5–C_7-cycloalkylene or C_5–C_{10}-arylene, a divalent heterocyclic ring with 5 to 7 ring atoms or a combination of the above groups, which is optionally further substituted, or stands for a divalent 1-, 2- or 3-nuclear saturated, unsaturated or aromatic carbocyclic or heterocyclic ring system with 5 to 14 ring atoms, or two of the ring systems which are linked via a direct bond or a C_1–C_6-alkylene, —O—, —S—, —CO—, —SO— or —SO_2— group, the ring systems being optionally further substituted, and R^s and R^t independently of one another denote a hydrogen radical, C_1–C_{24}-alkyl, C_1–C_6-hydroxyalkyl, (C_1–C_4-alkoxy)-C_1–C_6-alkyl or C_5–C_7-cycloalkyl or, together with N—Y—N, denote a heterocyclic ring,
c) 0 to 20% by weight of an anionic, cationic or non-ionic surfactant, selected from the group consisting of alkyl sulfates, alkyl sulfonates, alkyl phosphates, alkyl benzenesulfonates, lauryl sulfate, stearyl sulfate, dodecyl sulfate, dodecyl sulfonates, octadecyl phosphates, dodecylbenzenesulfontes, sulfosuccinic acid esters, condensation products of a fatty acid and taurine or hydroxyethanesulfonic acid, resin soaps, alkoxylation products of alkylphenols, fatty alcohols, fatty amines, fatty acids, fatty acid amides, reaction products of nonylphenol, dodecylphenol, lauryl alcohol, coconut fatty alcohol, stearyl alcohol, oleyl alcohol, coconut fatty amine, tallow fatty amine, stearylamine, oleylamine, coconut fatty acid, stearic acid or oleic acid with 2 to 100 mol of ethylene oxide, reaction products of oxyethylated alkylphenols and fatty alcohols with chlorosulfonic acid and phosphorus oxychlorides, quaternary ammonium salts, hexadecyltrimethylammonium chloride, or mixtures thereof and
d) 0 to 20% by weight of customary additives, the amounts of constituents b), c) and d) being based on the weight of the pigment or pigments.

5,112,405
LIGHTWEIGHT CONCRETE BUILDING PRODUCT
Michael A. Sanchez, 442 W. San Bernardino Ave., Rialto, Calif. 92376
Continuation-in-part of Ser. No. 301,241, Jan. 24, 1989, abandoned. This application Nov. 16, 1990, Ser. No. 615,441
Int. Cl.[5] C04B *24/00, 24/16*
U.S. Cl. 106—608 **10 Claims**



1. A method for preparing an aqueous admixture for conditioning cement comprising:
adding from 0.2 to 2 percent by weight of triethanolamine to an aqueous solution of sodium silicate;
forming a semi-viscous mixture by adding the triethanolamine and sodium silicate solution to an aqueous solution wherein calcium chloride is present in an amount up to 40 percent by weight; and
diluting the semi-viscous mixture with additional calcium chloride solution for forming an admixture having a major portion of calcium chloride and minor portions of triethanolamine and sodium silicate.

5,112,406
PROCESS FOR REMOVING COATINGS FROM SENSITIVE SUBSTRATES, AND SODIUM SULFATE-CONTAINING BLASTING MEDIA USEFUL THEREIN

Michael S. Lajoie, Basking Ridge, and Lawrence Kirschner, Flanders, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Dec. 3, 1991, Ser. No. 801,758
Int. Cl.[5] B08B *7/00*; B24C *1/08*
U.S. Cl. 134—7 **10 Claims**

1. A process for removing coatings from sensitive hard surface metal composite surfaces, masonry, stucco, plaster or wood which comprises blasting said surfaces with a high velocity fluid stream containing as a blasting medium water-soluble crystalline sodium sulfate particles, said particles having average particle sizes within the range of 50 to 1000 microns, admixed with a hydrophobic silica or hydrophobic polysiloxane flow/anti-caking agent, or mixture thereof wherein the flow/anti-caking agent is present in an amount of from 0.05 to 2.0% by weight of the particles.

5,112,407
PROCESS TO PREPARE MALTOSE POWDER

Shuzo Sakai; Hiroshi Akai, and Toshio Miyake, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

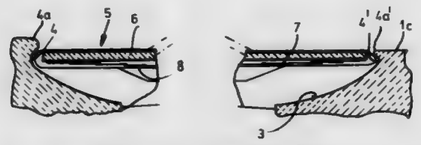
Continuation of Ser. No. 195,002, May 17, 1988, abandoned. This application May 22, 1990, Ser. No. 526,958
Claims priority, application Japan, May 29, 1987, 62-135697
Int. Cl.[5] C12P *19/22*; C07H *3/00*; C13F *1/02*
U.S. Cl. 127—58 **3 Claims**

3. A process for preparing cyrstalline β-maltose hydrate consisting of:
(a) concentrating an aqueous solution of a high-purity maltose having a maltose content of at least 85% by weight, on a dry solids basis, to provide a high-concentration syrup having a moisture content below 10% by weight;
(b) crystallizing α-maltose in the resultant high-concentration syrup to increase the moisture content in an amorphous part of the syrup while maintaining the syrup at a temperature in the range of 60°–120° C., said crystallizing being carried out in the presence of crystalline α-maltose seed or a mixture of crystalline α-maltose seed with crystalline β-maltose hydrate;
(c) converting said crystalline α-maltose in the resultant mixture to β-maltose hydrate while maintaining the mixture at 20°–70° C.; and
(d) pulverizing the mixture mainly composed of crystalline β-maltose hydrate.

5,112,408
ROOFING TILE ASSEMBLY

Bernd Melchior, Remscheid, Fed. Rep. of Germany, assignor to BMC Melchior Solartechnik KG, Remscheid, Fed. Rep. of Germany

Filed Jan. 31, 1991, Ser. No. 648,489
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1990, 4002711
Int. Cl.[5] H01L *31/048*; E04D *13/18*
U.S. Cl. 136—251 **19 Claims**

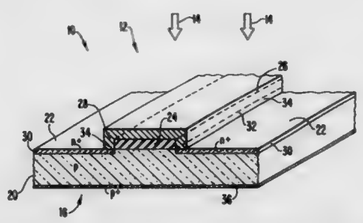


1. A roofing tile assembly, comprising:
a rigid roofing tile consisting of a full-surface tile plate composed of a material selected from the group which consists of clay, ceramic, concrete, synthetic resin, and hardened composites, said plate being formed with rabbet and rib formations interlockable with adjacent roofing tiles of corresponding assemblies to form a weather-tight roof covering;
a solar plate having a plurality of photovoltaic solar cells mounted on said tile plate, said solar plate having two opposite edges, said tile plate being formed unitarily with formations engaging over said opposite edges of said solar plate along at least a portion of the lengths thereof for retaining said solar plate on said roofing tile against forces tending to lift said solar plate therefrom.

5,112,409
SOLAR CELLS WITH REDUCED RECOMBINATION UNDER GRID LINES, AND METHOD OF MANUFACTURING SAME

Donald Warfield, Woodbine, Md., and Jerry Silver, East Windsor, N.J., assignors to Solarex Corporation, Rockville, Md.

Filed Jan. 23, 1991, Ser. No. 646,802
Int. Cl.[5] H01L *31/06*, *31/18*
U.S. Cl. 136—256 **16 Claims**

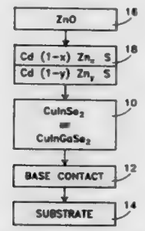


1. Photovoltaic apparatus for converting incident radiant energy to electrical energy comprising:
a first photovoltaic material layer of one conductivity type and having a surface;
an insulative material layer formed directly on said first layer surface in a pattern corresponding substantially to a preselected grid pattern and having a surface spaced from said first layer surface;
a second photovoltaic material layer of the opposite conductivity type formed on those portions of said first layer surface not covered by said patterned insulative layer, adjacent portions of said insulative and second layers defining boundaries therebetween; and
a metalized grid layer formed directly on said insulative layer surface in said preselected grid pattern, said grid layer covering said insulative layer and overlapping at least a portion of said second layer for electrically contacting said second layer along said defined boundaries, the radiant energy being incident on said second layer and said grid layer.

5,112,410
CADMIUM ZINC SULFIDE BY SOLUTION GROWTH

Wen S. Chen, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 372,271, Jun. 27, 1989, abandoned. This application Aug. 7, 1990, Ser. No. 563,494
Int. Cl.[5] H01L *31/072, 31/18, 31/0328*
U.S. Cl. 136—260 **18 Claims**

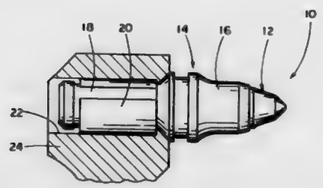


15. A photoelectric cell comprising a thin film of CdZnS that forms a continuous coating free of pin holes and has a thickness that is sufficiently thin to provide at least 70% transmission of radiation having a wavelength 400 nm.

5,112,411
PROCESS OF MAKING MINING/CONSTRUCTION TOOL BIT BODY FABRICATED FROM MN/B STEEL ALLOY COMPOSITION

Mark S. Greenfield, Cary, N.C., assignor to Kennametal Inc., Latrobe, Pa.

Division of Ser. No. 404,703, Sep. 8, 1989, Pat. No. 5,008,073, which is a division of Ser. No. 39,208, Apr. 16, 1987, Pat. No. 4,886,710. This application Nov. 29, 1990, Ser. No. 619,800
Int. Cl.[5] C21D *8/06*
U.S. Cl. 148—528 **4 Claims**

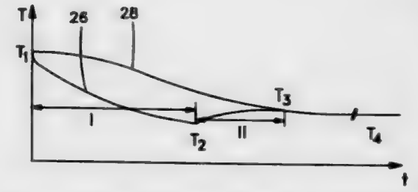


1. A process for making a mining and construction bit body, comprising the steps of:
(a) providing a rod in an as-rolled condition and being composed of a Mn-B steel alloy composition the alloy content of which in percents by weight including: carbon, 0.33–0.38; manganese, 1.10–1.35; boron, 0.0005 minimum; silicon 0.15–0.30; sulfur, 0.045 maximum; and phosphorus, 0.035 maximum, wherein said composition has a minimum hardenability of 47 Rockwell C at the Jominy 6/16 position and a maximum as-rolled hardness of 22 Rockwell C such that without anneal said composition meets hardenability and machinability requirements making it useful for fabricating mining and construction bit bodies of all sizes;
(b) machining the rod in its as-rolled condition without an anneal to the desired size and shape of a bit body; and
(c) heat treating the bit body to obtain the desired mechanical properties of hardness and toughness.

5,112,412
COOLING OF CAST BILLETS

Miroslaw Plata, Sion, and Jean-Jaques Theler, Sierre, both of Switzerland, assignors to Alusuisse-Lonza Services Ltd., Zurich, Switzerland

Filed Nov. 13, 1990, Ser. No. 612,890
Claims priority, application Switzerland, Nov. 23, 1989, 4215/89
Int. Cl.[5] C21D *1/00*
U.S. Cl. 148—688 **13 Claims**



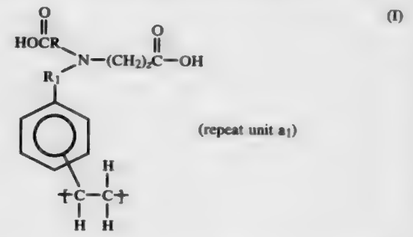
1. Method of cooling cast billets made of an aluminum alloy after a homogenizing anneal, which comprises:
providing billets having a surface and an internal portion;
feeding the billets emerging from a full-annealing furnace continuously one after the other in the longitudinal direction at a first temperature (T_1) to a spray unit;
guiding said billets in-line through the spray unit at a program-controlled feed rate and while being sprayed on the surface with a cooling medium in a program-controlled manner to reach an adjustable surface temperature (T_2); and
equalizing the internal and surface temperature of the billets after leaving the spray unit.

5,112,413
METHOD FOR TREATING METAL SURFACES WITH A POLYMER SOLUTION

William S. Carey, Ridley Park; Fu Chen, Newtown, and David W. Reichgott, Richboro, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Jun. 26, 1990, Ser. No. 543,642
Int. Cl.[5] C23C *22/05*
U.S. Cl. 148—251 **17 Claims**

1. A method for treating a metal surface comprising contacting said surface with a water soluble or water dispersible polymer comprising a repeat unit (a_1) having the structure:



or salt form of said repeat unit, wherein R and R_1 are the same or different and are independently chosen from C_1–C_3 lower alkylene and wherein z is an integer of from 1–3.

5,112,414

TITANIUM FREE COMPOSITION AND PROCESS FOR ACTIVATING METAL SURFACES PRIOR TO ZINC PHOSPHATING

Karl-Dieter Brands; Helmut Eadres; Peter Christophliemk, all of Duesseldorf, and Wolf-Achim Roland, Solingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 344,883, Apr. 28, 1989, Pat. No. 5,039,362. This application May 10, 1991, Ser. No. 698,650

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1988, 3814363

Int. Cl.[5] **C23C** *22/78*

U.S. Cl. 148—254 **9 Claims**

1. A titanium-free composition for the activation of metal surfaces prior to phosphating said surfaces with phosphating baths containing zinc ions, said composition comprising a product of reaction, in the presence of water and at a temperature within the range of about 75° to 120° C., between (A) poly(aldehydocarboxylic acids) and alkali metal salts thereof; and (B) phosphoric acids and their alkali metal salts, components (A) and (B) being reacted at a weight ratio within the range of from about 0.1:10 to about 1:10.

5,112,415

ENGINE VALVE STEM AS WELL AS HEAD PORTION OF TITANIUM ALLOY

Yoshiharu Mae, Omiya, Japan, assignor to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Jan. 17, 1991, Ser. No. 642,356

Claims priority, application Japan, Jan. 18, 1990, 2-8894

Int. Cl.[5] **F01L** *3/00*

U.S. Cl. 148—421 **1 Claim**

1. An engine valve of titanium alloy comprising a stem portion constituted of a cold-worked titanium alloy essentially consisting of 2% to 4% by weight of aluminum, 1.5% to 3.5% by weight of vanadium and with the balance being titanium; and a head portion welded to said stem portion constituted of a cast titanium alloy essentially consisting of 5% to 10% by weight of aluminum and with the balance being titanium.

5,112,416

ALUMINUM BASED ALLOY BEARING HAVING STRENGTHENED INTERMEDIATE BONDING LAYER

Tadashi Tanaka, Konan; Masaaki Sakamoto, Nagoya; Yoshiaki Sato, Gifu, and Tohru Kato, Seto, all of Japan, assignors to Daido Metal Company Ltd., Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 611,595

Claims priority, application Japan, Nov. 27, 1989, 1-307342

Int. Cl.[5] **C22C** *21/00*; **B32B** *15/10*

U.S. Cl. 148—437 **9 Claims**

1. An aluminum based ally bearing having a strengthened intermediate bonding layer, which consists of

an aluminum based bearing, an intermediate bonding layer and a backing steel, said intermediate bonding layer having a hardness in a range of from 40% to 70% of that of said aluminum based bearing alloy layer in terms of Vicker's hardness, wherein said aluminum based bearing alloy layer has a thickness of 0.2 to 1.0 mm and is produced through a casting process and/or rolling process.

5,112,417

METHOD OF CONTROLLING THE INCREASE IN POTLIFE OF PROPELLANTS DURING PROCESSING

David C. Sayles, Huntsville, Ala., assignor to United States of America, Washington, D.C.

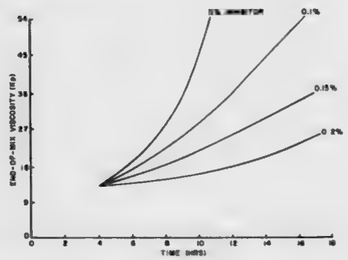
Filed May 20, 1991, Ser. No. 703,304

Int. Cl.[5] **D03D** *23/00*

U.S. Cl. 149—109.6 **3 Claims**

1. A method of controlling the increase in potlife of a propellant composition during processing said method comprising:

(i) providing a propellant composition having the characteristics of a decreased potlife when processed without a polymerization inhibitor, said propellant composition comprised of an inorganic oxidizer salt of ammonium perchlorate of about 64.5 weight percent consisting of a blend of 400 micrometers particle size, 200 micrometer particle size, and 20 micrometer particle size; aluminum powder of about 14.0 weight percent; an organic oxidizer salt of about 10.0 weight percent; hydroxyl terminated polybutadiene prepolymer of about 11.4 weight percent, and isophorone diisocyanate in an isocyanate to hydroxyl ratio of about 0.89;



(ii) incorporating into said propellant composition an additive from about 0.1 weight percent to about 0.2 weight percent of the polymerization inhibitor tris(N-nitrosophenylhydroxylaminium)aluminum to control the increase in the viscosity during processing; and,

(iii) blending said propellant composition containing said additive to achieve an end-of-mix viscosity and extended potlife to enable said propellant composition to be stored for an extended time period before its viscosity becomes too high for the propellant composition to be readily cast into a rocket motor.

5,112,418

METHOD FOR BONDING JOINTS WITH AN ORGANIC ADHESIVE USING A WATER SOLUBLE SILANE MODIFIED AMORPHOUS HYDRATED METAL OXIDE PRIMER

Roscoe A. Pike, Granby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 13, 1989, Ser. No. 450,335

The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.

Int. Cl.[5] **C09J** *5/04*

U.S. Cl. 156—319 **7 Claims**

1. A method for bonding a plurality of adherends together by placing a polymeric adhesive in contact with and between the adherends and applying pressure and optionally heat, to said adherends wherein the improvement comprises:

a) reacting aluminum, titanium, silicon, iron or zirconium with HBr or HI,

b) oxidizing the reaction product with a water soluble oxidizing agent to form a hydrosol and reduce the anion concentration;

c) forming a mixture of said hydrosol and a hydrolyzable organofunctional silane; and

d) applying said mixture to a surface of at least one of the adherends prior to applying adhesive on its surface.

5,112,419

METHOD FOR PRODUCTING STRIP CABLE

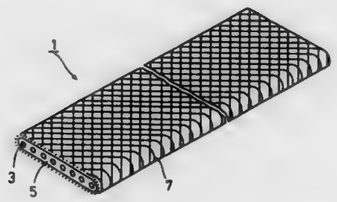
Asaharu Nakagawa, Yokkaichi, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan

Division of Ser. No. 419,588, Oct. 10, 1989, abandoned. This application Sep. 19, 1990, Ser. No. 584,773

Claims priority, application Japan, Oct. 12, 1988, 63-256429

Int. Cl.[5] **H01B** *7/08, 13/22*

U.S. Cl. 156—51 **10 Claims**



1. A method of manufacturing a strip cable that is resistant to electromagnetic noise, comprising the steps of:

arranging a plurality of signal conductors in the same plane in a strip-shaped metal mold;

pouring insulating resin in a liquid state into the metal mold to form an insulating layer around the plurality of signal conductors;

curing the insulating resin;

extracting the insulating layer and signal conductors from the metal mold;

forming a low-melting film onto the surface of the cured insulating resin;

adhering meshed metal onto the surface of the cured insulating resin by heating the low-melting film.

5,112,420

METHOD OF MAKING TEXTILE LABELS TO BE APPLIED TO GARMENTS

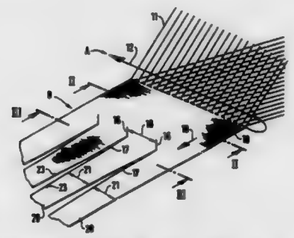
Willi Diesner, Murg-Hänner, Fed. Rep. of Germany, assignor to Vaupel Textilmaschinen KG, Wuppertal, Fed. Rep. of Germany

Filed Mar. 22, 1990, Ser. No. 497,435

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1989, 3910218

Int. Cl.[5] **D03D** *47/40, 47/50*; **D06C** *25/00*; **B32B** *31/00*

U.S. Cl. 156—88 **18 Claims**



1. A method of converting an elongated web of filamentary material into chains of coherent panels having a predetermined width, comprising the steps of subdividing the web into a plurality of elongated strips each having a width exceeding said predetermined width, two longitudinally extending marginal portions and a central portion having a width at least approximating said predetermined width; folding the marginal portions of each strip against one side of the respective central portion; securing the thus folded marginal portions of each strip to the respective central portion; and making the web, including providing the web with tubes each of which forms part of a marginal portion and of the respective central portion, said folding step including folding each of the tubes into an elongated loop.

2. A method of converting an elongated web of filamentary textile material into chains of coherent labels which are to be applied to garments and have a predetermined width, comprising the steps of making the web from filaments which are meltable in response to heating, including forming a substrate having a right side and a second side and labels constituted by woven patterns at the right side; subdividing the web into a plurality of elongated strips each having a width exceeding said predetermined width and each having a chain of woven patterns, two longitudinally extending marginal portions, a central portion having a width at least approximating said predetermined width and weakened zones intermediate the marginal portions and the respective central portions to facilitate folding of the marginal portions of each strip over the second side of the respective central portion, said subdividing step immediately following said making step and including heating the web in the regions between the strips at least close to the melting point so that the filaments of marginal portions between the strips are fused to each other and thus prevent fraying of marginal portions between the strips; advancing the web and the strips in a predetermined direction along a predetermined path; folding the marginal portions of each strip against the second side of the respective central portion along the respective weakened zones; and sealing the thus folded marginal portions of each strip to the respective central portion to thus reduce the width of each strip to said predetermined width, said sealing including flattening the folded marginal portions against the respective central portions and fusing the thus flattened marginal portions against the respective central portions.

5,112,421

METHOD FOR THE PRODUCTION OF A COMPOSITE SHEET FOR ARTIFICIAL LEATHER

Yuzuru Honda; Tateo Fujii, and Koji Watanabe, all of Shiga, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 912,125, Sep. 26, 1986, abandoned. This application Apr. 7, 1989, Ser. No. 336,606

Claims priority, application Japan, Sep. 27, 1985, 60-212279

Int. Cl.[5] **B32B** *5/06*

U.S. Cl. 156—148 **23 Claims**



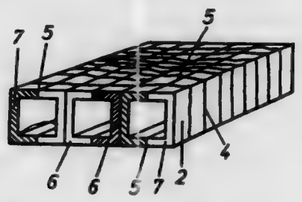
1. A method of making a composite sheet comprising a fabric which is either of a woven or knitted construction and a non-woven fiber web, comprising the steps of:

a) superimposing on one another said fabric which is constructed at least partly from high twist multifilament yarn of at least 1000 t/m, and said non-woven fiber web which is constructed from fibers having an average fiber length of at least 20 mm;

b) anchoring fibers of said non-woven fiber web with said fabric by needle punching, while keeping said fibers of said non-woven fiber web substantially free from intertwining with filaments of said multifilament yarn, to form said composite sheet, and

c) coating or impregnating said composite sheet with a binder solution.

5,112,422
METHOD OF MANUFACTURING CARBON FIBRE-REINFORCED CARBON ELONGATED STRUCTURAL COMPONENTS
Susumu Takahashi, Yokohama, Japan, assignor to Kanto Yakin Kogyo K.K., Japan
Filed Jan. 14, 1991, Ser. No. 640,877
Claims priority, application Japan, Jan. 19, 1990, 2-9910
Int. Cl.[5] B65H *81/06, 81/00*; C01B *31/00*
U.S. Cl. 156—175 **2 Claims**



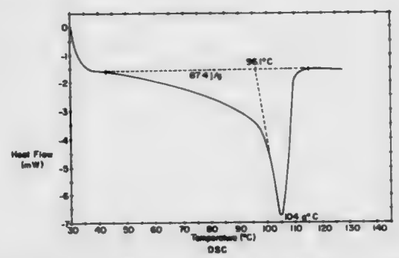
1. A method of making elongated structural components of a desired cross sectional configuration, which comprises:
preparing each of a plurality of square tubes by winding a large number of carbon fibres around a mandrel, and in such manner that the fibres frequently cross each other;
impregnating the resulting tubes with thermo-hardening adhesives;
arranging the tubes side-by-side and parallel to each other so that their adjacent sides abut each other and so that they form a block;
winding snugly around the block aramid fibres having a negative coefficient of linear expansion;
heating the block so that the aramid fibres shrink to tightly fasten the tubes together and so that the adhesives are carbonized; and
cutting the block into a number of pieces which correspond to the structural components of the desired configuration.

5,112,423
METHOD OF MAKING AND APPLYING ALIGNMENT-MAINTAINING PLASTIC LETTERING MATERIAL
Robert J. Liebe, Jr., 1577 Kehrs Mill Rd., Chesterfield, Mo. 63005
Filed Jan. 2, 1991, Ser. No. 636,877
Int. Cl.[5] B44C *1/17, 1/165*; B32B *31/18*
U.S. Cl. 156—234 **3 Claims**



1. For lettering a substrate, making and using polyvinyl chloride sheet lettering material having a release sheet and adhesive layer comprising the steps of
compounding a display layer by intermixing polyvinyl chloride, partially carboxylated polyvinyl chloride, and pigments,
applying and heat curing said display layer onto a release sheet,
whereby to form a vinyl display layer wherein said partially carboxylated polyvinyl chloride affords enhanced adhesion to said release sheet, and
applying a layer of non-encapsulating thermoplastic adhesive having a lower melting point than said display layer onto the surface of said display layer while the temperature of said display layer is higher than the fusing point of said adhesive layer,
allowing said lettering material to cool to room temperature, and thereafter
cutting outlines of a plurality of adjacent substantially separate lettering elements through said adhesive and display layers, but not through said release sheet,
removing from said release sheet those portions of said display layer and said adhesive layer not included within said outlines,
positioning said substantially separate lettering elements, so aligned by their continued adherence to said release sheet, onto such substrate with their adhesive layer in contact with such substrate,
applying, against the portions of said release sheet overlaying said lettering elements so positioned, heat and pressure sufficient to soften said adhesive layer and fuse said elements to such substrate, and
removing said release sheet.

5,112,424
LOW TEMPERATURE MULTI-LAYER EXTRUSION COATING PROCESS
John W. Cook, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 1, 1989, Ser. No. 403,215
Int. Cl.[5] B29C *47/06*
U.S. Cl. 156—243 **19 Claims**



1. A process for the low-temperature multi-layer extrusion coating of a substrate with a first, polyethylene-coating layer which is subjected to a temperature no greater than about 480° F., and at least one additional layer comprising at least one second extrudable composition, said process comprising:
applying to at least one surface of said substrate a polyethylene-containing composition to form said first, polyethylene-containing layer, comprising:
(a) a polyethylene component having a melt index in the range of about 10 up to 100 dg per minute at 190° C. and having a sufficiently broad molecular weight distribution so that the resulting composition is capable of being extrusion coated at a temperature less than about 480° F. to a thickness as thin as 0.0003 inches (0.0075 mm) at a speed of at least 1000 feet per minute (300 meters per minute), and
(b) in the range of about 5 up to 15 wt %, based on the weight of the total composition, of a hydrocarbon tackifying resin having a Ring and Ball Softening Point in the range of about 125° up to 140° C., and
at least one second extrudable composition selected from:
polyethylenes having a melt index different than the melt index of said first polyethylene component,
polyethylenes having a density different than the density of said first polyethylene component,

polyethylenes modified with polymer additives,
polypropylene homopolymers, comonomers, copolymers, and terpolymers, optionally modified with polymer additives,
polyethylene comonomers, copolymers and terpolymers, including extrudable ionomers, optionally modified with polymer additives,
extrudable polymers of higher olefins having in the range of 4 up to 8 carbon atoms, optionally modified with polymer additives,
extrudable polyvinylidene chloride, optionally modified with polymer additives,
extrudable polyamides, optionally modified with polymer additives, or
extrudable polyesters, optionally modified with polymer additives;
wherein said process is carried out by multi-layer extrusion coating of said substrate; and wherein the temperature of said polyethylene-containing composition is no greater than about 480° F. during the extrusion process.

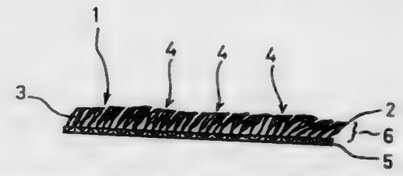
5,112,425
POLYMETHYLPENTENE RELEASE SHEET METHOD OF USE
Erica M. Besso, Manotick, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada
Division of Ser. No. 330,875, Mar. 30, 1989, Pat. No. 4,937,278. This application Feb. 7, 1990, Ser. No. 476,334
Claims priority, application Canada, Apr. 5, 1988, 563299
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—247 **18 Claims**

1. A process for the manufacture of printed circuit boards from prepregs of a reinforcing material impregnated with a curable polyimide resin, comprising the steps of:
(a) selecting a release sheet of poly-4-methylpentene-1 film containing (i) a copper salt of alkanoic acid and (ii) an alkali metal halide or an alkaline earth metal halide,
(b) placing said release sheet on at least one side of said prepreg,
(c) curing said resin at a temperature of 200°–250° C., and
(d) stripping away the release sheet from the prepreg without shredding or shattering the release sheet.

10. A process for the manufacture of printed circuit boards from prepregs of a reinforcing material impregnated with a curable epoxy resin, comprising the steps of:
(a) selecting a release sheet of poly-4-methylpentene-1 film containing (i) a copper salt of alkanoic acid and (ii) an alkali metal halide or an alkaline earth metal halide,
(b) placing said release sheet on at least one side of said prepreg,
(c) curing said resin at a temperature of 150°–200° C., and
(d) stripping away the release sheet from the prepreg without shredding or shattering the release sheet.

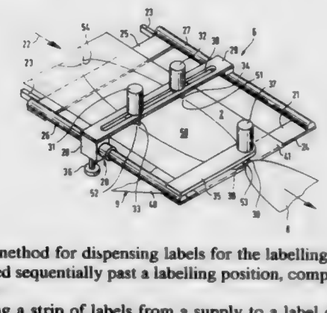
5,112,426
METHOD OF PREPARING THREE DIMENSIONAL FABRIC HAVING A UNIQUE STRUCTURE
Tamotu Nakajima, Shiga, and Shusuke Yoshida, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Division of Ser. No. 311,563, Oct. 21, 1988, Pat. No. 4,939,006. This application Apr. 18, 1990, Ser. No. 510,775
Claims priority, application Japan, Feb. 27, 1987, 62-42745; May 2, 1987, 62-47318
Int. Cl.[5] B29C *65/18*
U.S. Cl. 156—250 **7 Claims**

1. A method for preparing a three dimensional fabric having a face surface, an opposite fabric surface and a piled body of pile fibers therebetween, the steps comprising heating and compressing the face surface of said pile fibers to adhere adjoining pile fibers at said face surface with each other, form apexes over a wide surface area and make thereby a film-shaped surface, and thereafter crumpling said film-shaped



surface and splitting said film-shaped surface into film-shaped surface units of smaller area.

5,112,427
METHOD AND DEVICE FOR DISPENSING OF LABELS
Per Bekker-Madsen, Vojens, Denmark, assignor to Dennison Systems Denmark, Vojens, Denmark
Division of Ser. No. 411,393, Sep. 22, 1989, Pat. No. 5,017,412. This application Oct. 26, 1990, Ser. No. 604,749
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1988, 3832239; Aug. 23, 1989, 3927821
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—259 **13 Claims**

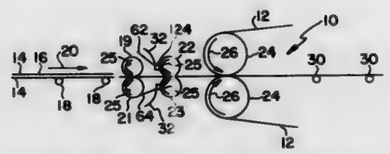


1. A method for dispensing labels for the labelling of goods conveyed sequentially past a labelling position, comprising the steps of:
feeding a strip of labels from a supply to a label dispenser, individual labels being pre-punched in the material of said strip over the entire periphery of the label excepting a plurality of narrow adhesive bridges, to define a label skeleton surrounding said labels;
advancing the label strip from the label dispenser to the labelling position in a linear extension of its travel from the supply to the label dispenser, so that a label arrives at the labelling position as the succeeding label reaches a ready position at the labelling dispenser;
separating each label arriving at the label dispenser from the remainder of the label strip by deflecting the label skeleton material in a direction diverging considerably from the direction of travel of the label as it advances to the labelling position, wherein forwardmost adhesive bridges of the label strip are separated first followed by adhesive bridges located further to the rear.

5,112,428
WET LAMINATION PROCESS AND APPARATUS
Jose L. Correa, Fullerton; Robert C. Stumpf, Orange; Charles L. Farnum, Riverside, and Leo Roos, Laguna Beach, all of Calif., assignors to Morton International, Inc., Chicago, Ill.
Division of Ser. No. 282,174, Dec. 9, 1988, Pat. No. 4,976,817. This application Jun. 4, 1990, Ser. No. 532,537
Int. Cl.[5] B05D *1/28*; C09J *5/00*
U.S. Cl. 156—324 **7 Claims**

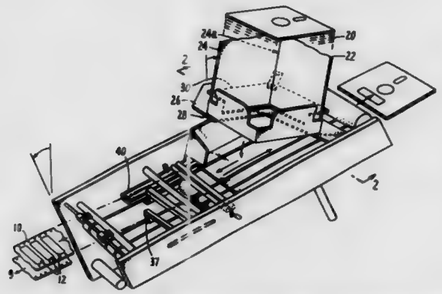
1. A process for laminating a photopolymerizable film onto at least one surface of a substrate comprising the steps of:

(a) supplying a fluid to at least one of a pair of fluid absorbent rollers;
(b) applying from the fluid absorbent roller the fluid to the at least one substrate surface;
(c) laminating the film to the at least one substrate surface with fluid thereon;
(d) filtering and recirculating excess fluid supplied to the roller;
(e) controlling the fluid flow to the roller to supply an excess



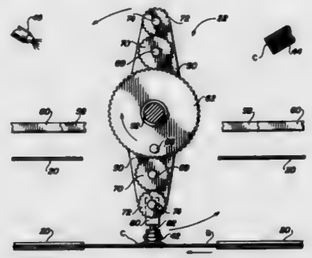
amount of fluid to the roller and to minimize the amount of excess fluid supplied to the roller to thereby apply excess fluid to the substrate but wherein the amount of excess fluid is minimized;
wherein a pair of superposed laminating rolls are used to laminate the film to the at least one substrate surface, the process further comprising engaging the surface of the lower one of the laminating rolls with at least one smear roll to distribute excess fluid applied to the substrate over the surface of the laminating roll.

5,112,429
LABELING APPARATUS
Dan N. Costas, 1006 Gray Fox Cir., Pleasanton, Calif. 94566
Filed Aug. 17, 1990, Ser. No. 570,161
Int. Cl.[5] B44C *1/00*
U.S. Cl. 156—542 **17 Claims**



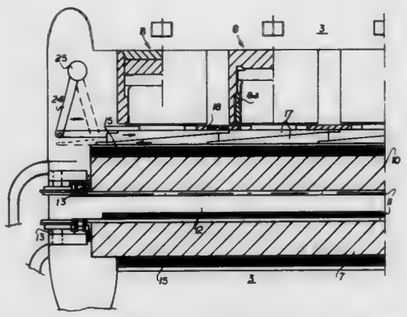
1. An apparatus for applying a label from a continuous web to an object comprising:,
a. a pair of fixed rotatable rollers sequentially aligned to engage and transport the object, the rollers having a gap therebetween;
b. at least one movable idler wheel positioned opposite the stationary rollers to engage and hold the object against the stationary rollers; and
c. a floating pin having a diameter larger than that of the gap between the stationary rollers and movably positioned between the rollers and the object;
whereby the web is threaded through the gap, around the floating pin, and back through the gap, such that upon pulling the web, the web and pin are forced against the rollers, causing them to rotate and transport the engaged object in a first direction at the same speed as the web, and whereby the label is separated from the web as the web is pulled around the floating pin, the label being simultaneously transferred to the object as the object is transported by the rollers in the first direction.

5,112,430
APPARATUS FOR APPLYING A SHEET TO A SUBSTRATE
Donald R. Hudson, West Monroe, La., assignor to Riverwood International Corporation, Denver, Colo.
Filed Mar. 30, 1990, Ser. No. 502,394
Int. Cl.[5] B32B *31/04*
U.S. Cl. 156—556 **15 Claims**



1. Apparatus for depositing a small sheet onto a larger moving substrate, comprising:
a first rotating shaft;
support arm means connected to the first rotating shaft so as to rotate therewith;
a second shaft attached to the support arm means at a location spaced from the first shaft;
sheet holding means mounted on the second shaft;
means causing the sheet holding means to release a sheet held thereby upon reaching a predetermined location on the moving substrate; and
planetary gear means for rotating the second shaft to cause the sheet holding means to present the sheet to the predetermined location on the moving substrate in substantially parallel relationship to the substrate.

5,112,431
PRESS FOR MAKING PRESSED BOARD
Klaus Gerhardt, Rheurdt, and Hans-Dietrich Sitzler, Nettetal, both of Fed. Rep. of Germany, assignors to C. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany
Filed Apr. 20, 1990, Ser. No. 511,412
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1989, 3914105
Int. Cl.[5] B30B *7/00*
U.S. Cl. 156—583.5 **8 Claims**

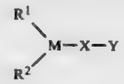


1. A press for making pressed board, the press comprising:
a plurality of longitudinally spaced rigid frames;
a lower press plate extending longitudinally through the frames and having an upwardly directed upper surface and a downwardly directed lower surface;

a layer of insulation upwardly directly engaging the lower press plate and downwardly directly engaging the press frames, the lower press plate being supported via the insulation layer directly on the frames;
an upper press plate extending longitudinally above the lower plate through the frames and having a lower surface defining with the lower press plate a longitudinally throughgoing press gap;
a plurality of vertically effective hydraulic actuators carried on the frames above the upper plate, each actuator including
a pair of transversely extending wedges one of which is transversely displaceable relative to the other;
means for pressurizing the actuators and thereby vertically expanding same through the same relatively short vertical stroke, the wedge pairs being individually adjustable to adjust the shape of the upper press plate along its length;
a layer of insulation upwardly directly engaging the wedges and downwardly directly engaging the upper press plate, the upper press plate being supported via the respective insulation layer directly on the wedges;
respective upper and lower endless belts having respective lower and upper stretches extending through the gap immediately below and above the respective upper and lower plates;
respective upper and lower rollers engaged between the upper and lower plates and the lower and upper belt stretches; and
means for heating the upper and lower plates at the respective lower and upper surfaces and also for heating the lower plate at the respective lower surface.

5,112,432
ORGANOMETALLIC COMPOUNDS
Dietrich Erdmann, Mühltal; Max E. Van Ghemen; Ludwig Pohl, both of Darmstadt; Herbert Schumann, Berlin; Uwe Hartmann, Berlin; Wilfried Wassermann, Berlin; Meino Heyen, and Holger Jürgensen, both of Aachen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 96,583, Sep. 15, 1987, Pat. No. 4,880,492. This application Aug. 3, 1989, Ser. No. 389,197
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1986, 3631469
The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.
Int. Cl.[5] C23C *16/30*; C30B *25/02, 29/40*
U.S. Cl. 156—610 **7 Claims**

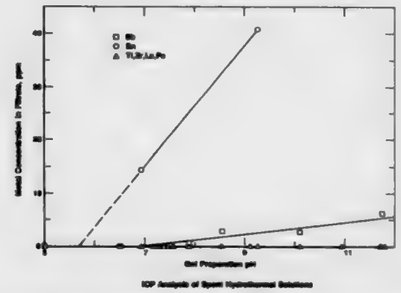
1. In a process for gas-phase deposition of a metal compound containing Al, In or Ga on a substrate, the improvement wherein a source of Al, In or Ga for the deposition process is an organometallic compound of the formula



I

wherein
M is Al, In or Ga;
X is $-(CHR^5)_n-$ where n=2, 3, 4 or 5, $-2-C_6H_4-(CH_2)_m-$, $-(CH_2)_m-$, $-(CH_2)_m-2-C_6H_4-$, $-2-C_6H_{10}-(CH_2)_m-$, or $-(CH_2)_m-2-C_6H_{10}-$ where m=1 or 2;
R^5 is H or alkyl containing 1–4 carbon atoms;
Y is $-PR^3R^4$, $-AsR^3R^4$, SbR^3R^4, or a 5- or 6-membered heterocyclic ring where the heteroatoms are from group 5A; and
R^1, R^2, R^3 and R^4 are each independently H, straight-chain or branched alkyl containing 1–8 carbon atoms, partially or completely fluorinated straight-chain or branched alkyl containing 1–8 carbon atoms, cycloalkyl, alkenyl or cycloalkenyl containing in each case 3–8 carbon atoms, unsubstituted phenyl or substituted phenyl.

5,112,433
PROCESS FOR PRODUCING SUB-MICRON CERAMIC POWDERS OF PEROVSKITE COMPOUNDS WITH CONTROLLED STOICHIOMETRY AND PARTICLE SIZE
William J. Dawson, Columbus, and Scott L. Swartz, Dublin, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio
Filed Dec. 9, 1988, Ser. No. 295,166
Int. Cl.[5] C30B *7/10, 29/22*
U.S. Cl. 156—623 R **16 Claims**



1. A process for making a crystalline ceramic powder having a perovskite structure, ABO_3, comprising:
a. preparing a first acidic solution containing one or more elements selected from the group consisting of hafnium, zirconium, titanium, niobium, tantalum, uranium, iron, antimony, lanthanum, bismuth, thorium, indium, nickel, manganese, neodymium, samarium, cobalt, tungsten, tin, vanadium, dysprosium, praseodymium, yttrium, promethium, europium, cerium, ytterbium, lutetium, scandium, gadolinium, terbium, holmium, erbium, thulium, chromium, potassium, and lithium;
b. preparing a second basic solution containing a sufficient concentration of hydroxide to provide a pH when mixed with the first solution to achieve nearly complete incorporation of elements added in step (d) during the hydrothermal treatment step (e) and adding the first acidic solution to the second basic solution to precipitate a substantially pure mixture of hydroxides;
c. washing the precipitate to remove hydroxide and salt impurities that solubilize lead or other constituent elements of the powder;
d. preparing an aqueous slurry of the washed precipitate and adding oxides or hydroxides of one or more of the elements selected from the group consisting of barium, strontium, calcium, magnesium, lead, zinc, yttrium, magnesium, manganese, cobalt, zinc and nickel, in an amount to achieve the desired stoichiometry;
e. hydrothermally treating the slurry at an elevated temperature and pressure for a time sufficient to from the powder; and
f. drying the powder; wherein when lead, zirconium and titanium are selected the perovskite has the general formula:

$$Pb(Zr_{1-x}Ti_x)O_3$$

wherein when x has a value of:
(1) between 0 and 0.44, the total dopant and solid substitution level ranges from 0 to 50 mole percent;
(2) between 0.44 and 0.55, then the total dopant and solid solution substitution has a level between 13 to 50 mole percent;

(3) between 0.55 to 1.00 the total dopant and solid substitution level ranges from 0 to 50 mole percent.

5,112,434

METHOD FOR PATTERNING ELECTROLESS METAL ON A SUBSTRATE FOLLOWED BY REACTIVE ION ETCHING

Robert L. Goldberg, Sharon, Mass., assignor to Shipley Company Inc., Newton, Mass.

Filed Mar. 20, 1991, Ser. No. 672,402

Int. Cl.[5] B44C *1/22;* **H01L** *21/306;* **C23F** *1/00;* **B29C** *37/00*

U.S. Cl. 156—628 **22 Claims**

1. A process for altering the surface of a substrate comprising the steps of:

(a) coating the substrate with a layer of a polymer capable of complexing with a noble metal compound;

(b) contacting the layer of polymer with a noble metal compound to form a complexed polymer;

(c) selectively irradiating the complexed polymer in a predetermined pattern;

(d) etching the complexed polymer whereby the irradiated portions of the complexed polymer etch at a slower rate than the non-irradiated portions of the complexed polymer;

(e) electrolessly depositing metal over the complexed polymer to form a metal mask; and

(f) dry developing said coated substrate.

5,112,435

MATERIALS AND METHODS FOR ETCHING SILICIDES, POLYCRSTALLINE SILICON AND POLYCIDES

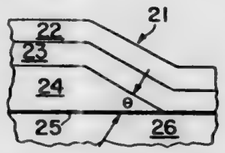
David N. Wang, Cupertino; Mei Cheng, San Jose, both of Calif., and Toung K. Leong, deceased, late of Santa Clara, Calif. by Peter P. Leong, executor , assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 185,256, Apr. 19, 1988, abandoned, which is a continuation of Ser. No. 786,783, Oct. 11, 1985, abandoned. This application Nov. 29, 1989, Ser. No. 443,811

The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.

Int. Cl.[5] H01L *21/00*

U.S. Cl. 156—643 **12 Claims**



1. A method for residue-free etching of a non-planar stepped topography of a layer of refractory metal silicide selected from molybdenum silicide and tungsten silicide formed on a layer of polysilicon on silicon oxide, comprising:

supplying RF electrical energy between a pair of electrodes in a chamber, one of which electrodes supports a masked, non-planar stepped composite comprising an organic mask over silicide selected from molybdenum silicide and tungsten silicide over polysilicon over silicon oxide; and

communicating into said chamber a reactive gas mixture comprising principally a mixture of chlorine and BCl_3 along with HCl and a small amount of dopant gas, not exceeding twenty volume percent of the total gas flow, selected from the group consisting of fluorine-containing gas, oxygen, and a mixture of fluorine-containing gas and oxygen, for etching the silicide anisotropically with a high selectivity to the organic mask for preserving the mask, and with a silicide to polysilicon selectivity of at least about 2/1.

5,112,436

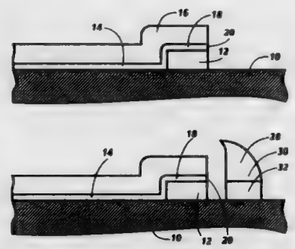
METHOD OF FORMING PLANAR VACUUM MICROELECTRONIC DEVICES WITH SELF ALIGNED ANODE

Igor I. Bol, Sherman Oaks, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 24, 1990, Ser. No. 632,870

Int. Cl.[5] B44C *1/22;* **C23F** *1/02;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **3 Claims**



1. A method for forming on a substrate a microelectronic device having a first and a second element, comprising the steps of:

a. depositing a first conductive layer on said substrate;

b. depositing a cap material;

c. forming said first element and the first element cap from said first conductive layer and said cap material, respectively;

d. conformally depositing a sacrificial material;

e. conformally depositing a second conductive layer;

f. anisotropically etching said second conductive layer to form said second element; and

g. anisotropically etching said sacrificial material.

5,112,437

OXIDE FILM REMOVING APPARATUS AND REMOVING METHOD THEREOF USING AZEOTROPIC VAPOR MIXTURE

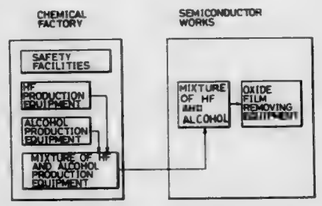
Nobuatsu Watanabe, 136 Uguisudail, Nagaokakyo-shi, Kyoto; Yong-Bo Chong, Kyoto; Toshio Tatsuno; Tomoyoshi Okada, both of Osaka; Akira Izumi, and Keiji Toei, both of Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd.; Nobuatsu Watanabe, both of Kyoto and Morita Kagaku Co., Ltd., Osaka, all of, Japan

Filed Feb. 20, 1991, Ser. No. 658,054

Claims priority, application Japan, Feb. 20, 1990, 2-40388

Int. Cl.[5] B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—646 **14 Claims**



1. An oxide film removing method system for removing an oxide film from a substrate by using hydrogen fluoride, comprising the steps of:

preparing a mixture of hydrogen fluoride and alcohol in a chemical factory wherein said hydrogen fluoride and alcohol are separately manufactured beforehand,

generating azeotropic vapor of said prepared mixture, and removing said oxide film of the substrate by using said generated azeotropic vapor,

said steps of generating said azeotropic vapor and removing the oxide film of the substrate by using said azeotropic vapor being performed at a facility where the removal of said oxide film is carried out.

5,112,438

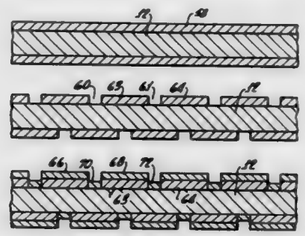
PHOTOLITHOGRAPHIC METHOD FOR MAKING HELICES FOR TRAVELING WAVE TUBES AND OTHER CYLINDRICAL OBJECTS

Harold C. Bowers, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 29, 1990, Ser. No. 619,541

Int. Cl.[5] B44C *1/22;* **C23F** *1/02;* **C25D** *5/02*

U.S. Cl. 156—655 **27 Claims**



1. A method for making a helix for a slow wave structure of a traveling wave tube comprising the steps of:

forming an elongated cylindrical mandrel,

applying a coating of a photo resist to said mandrel,

processing said photo resist to form a spiral pattern of photo resist having a plurality of helical turns winding helically around said mandrel to provide a first helical pattern between adjacent ones of said helical turns, and a second helical pattern in registration with said helical turns,

applying a pattern of electrically conductive material to said mandrel in registration with one of said first and second helical patterns,

removing said pattern of photo resist from said mandrel and pattern of electrically conductive material, and

removing said mandrel from said electrically conductive material.

5,112,439

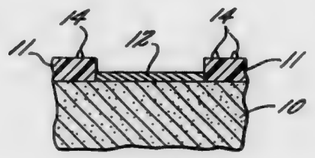
METHOD FOR SELECTIVELY DEPOSITING MATERIAL ON SUBSTRATES

Arnold Reisman, Raleigh, and Gary W. Jones, Durham, both of N.C., assignors to MCNC, Research Triangle Park, N.C.

Division of Ser. No. 402,794, Sep. 5, 1989, Pat. No. 5,037,775, which is a continuation-in-part of Ser. No. 278,088, Nov. 30, 1988, abandoned. This application Nov. 14, 1990, Ser. No. 585,238

Int. Cl.[5] H01L *21/00*

U.S. Cl. 156—656 **28 Claims**



1. A method of selectively depositing a predetermined thickness of a material on the surface of a substrate having a mask layer thereon and located in a reaction chamber, comprising the steps of:

heating said reaction chamber;

reducing a gas of a reducible compound of said material to deposit said material on said surface and which results in formation of nuclei of said material on said mask layer, by flowing a gas of a reducible compound of said material and a reducing gas through said heated reaction chamber;

effecting a disproportionation reaction, by interrupting the flow of the reducing gas while continuing the flow of the reducible compound gas in the heated reaction chamber in the absence of laser excitation and in the absence of plasma excitation, to etch the nuclei of said material which form on said mask layer, and to a lesser extent etch the material on said surface; and

repeating said reducing and disproportionation nuclei etching steps of selectively deposit said predetermined thickness of said material on said surface.

5,112,440

METHOD FOR MAKING METALLIC PATTERNS

Christopher P. Banks, Saffron Walden, and Edward Irving, Higher Whitley, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 22, 1990, Ser. No. 601,162

Claims priority, application United Kingdom, Oct. 26, 1989, 8924142

Int. Cl.[5] B44C *1/22;* **C23F** *1/02*

U.S. Cl. 156—659.1 **20 Claims**

1. A method for making a metallic pattern on a substrate having a surface comprising bare metal in predetermined areas and metal coated by a resist in remaining areas which comprises (i) protecting the bare metal with a film-forming resin, which resin is applied by dipping, rolling, brushing or spraying, (ii) removing any film-forming resin from the resist, (iii) removing the resist from said remaining areas using a solvent which will not remove the film-forming resin, thereby exposing metal in said remaining areas, (iv) etching the metal exposed in (iii) using an etchant which does not remove the film-forming resin and (v) removing the film-forming resin with a suitable solvent.

5,112,441

PROCESS FOR THE RECOVERY OF HEAT AND CHEMICALS FROM SPENT LIQUOR

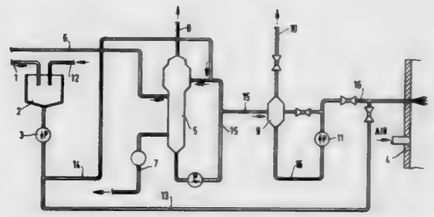
Tuomo Ruohola; Erik Saiha, both of Tampere; Kari Kuukkanen, Ylöjärvi, and Paavo Hyöty, Tampere, all of Finland, assignors to Oy Tampella AB, Tampere, Finland

Continuation of Ser. No. 855,899, Apr. 24, 1986, abandoned. This application Aug. 7, 1990, Ser. No. 565,220

Claims priority, application Finland, Apr. 25, 1985, 851641

Int. Cl.[5] B01D *1/00, 3/06*

U.S. Cl. 159—47.3 **3 Claims**



1. A process for the recovery of heat and chemicals from spent liquors containing solids consisting essentially of the steps of:

(a) evaporating water from the liquor in a concentrator

vessel to increase the concentration of the solids therein to above 65% by heating under pressure greater than atmospheric to a temperature above the atmospheric boiling point of the liquor;

(b) feeding the liquor from the concentrator vessel to an expansion vessel where the pressure and temperature are lowered but still maintained above the atmospheric pressure and above the atmospheric boiling point of the liquor to further increase the concentration of the solids therein to above 80% without increasing the kinematic viscosity of the liquor above about 200 cSt.; and

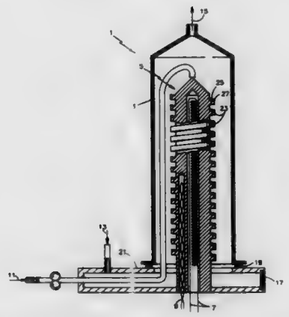
(c) feeding the concentrated liquor into a soda-ash furnace while maintaining the raised pressure and a temperature of at least 115° C. in the expansion vessel.

5,112,442

LIQUID VAPORIZING PROCESS FOR MANUFACTURING IRON OXIDE

Forrest R. Goodson, San Jose, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 27, 1990, Ser. No. 588,911
Int. Cl.[5] B01D *1/22*; H05B *3/00*
U.S. Cl. 159—49 **5 Claims**



1. A method for vaporizing a liquid comprising:

a. introducing a liquid to be vaporized onto the top surface of a vertical evaporator positioned inside a gas tight housing at such a rate that the liquid is completely evaporated before it reaches the base of the evaporator;

b. causing said liquid to flow down the surface of the evaporator;

c. heating said evaporator surface to a temperature sufficient to cause the liquid to evaporate forming vapors;

d. simultaneously introducing a purge gas to said housing to remove said vapors;

e. monitoring the evaporation rate of the liquid to ensure complete evaporation of the liquid before said liquid reaches the base of the evaporator.

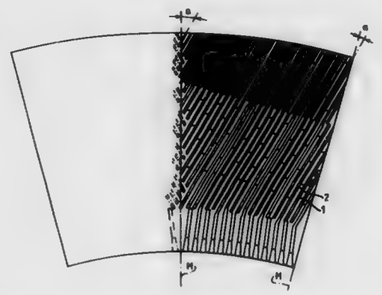
5,112,443

METHOD AND APPARATUS FOR THE MANUFACTURE OF FIBRE PULP

Nils Virving, Vällingby, and Anders E. E. Havén, Tyresö, both of Sweden, assignors to Sunds Defibrator Industries Aktiebolag, Sweden

PCT No. PCT/SE89/00527, § 371 Date Mar. 22, 1991, § 102(e) Date Mar. 22, 1991, PCT Pub. No. WO90/04673, PCT Pub. Date May 3, 1990
PCT Filed Oct. 2, 1989, Ser. No. 669,415
Claims priority, application Sweden, Oct. 25, 1988, 8803805
Int. Cl.[5] D21B *1/14*; B02C *7/12*
U.S. Cl. 162—23 **6 Claims**

4. A method for the manufacture of fiber pulp from lignocellulose-containing material comprising feeding said lignocellulose-containing material at a dry solids content of at least about 15% to a pair of counter-rotating grinding discs, passing said lignocellulose-containing material radially outwardly between said pair of counter-rotating grinding discs, and defibrating and fibrillating said lignocellulose-containing material by providing said pair of counter-rotating grinding discs with first and second radially extending grinding segments, each of said first and second radially extending grinding segments including an inner radial zone and an outer radial zone, said inner radial zone including a first plurality of alternating raised bars and grooves projecting radially outwardly thereon in a direction substantially parallel to the radius of said radially



extending grinding segments, and said outer radial zone including a second plurality of alternating raised bars and grooves projecting radially outwardly thereon substantially parallel to each other at an angle with respect to said radius of said radially extending grinding segments of between about 5 and 30° and extending entirely across said outer radial zone whereby said lignocellulose-containing material and steam generated therein can pass outwardly across said outer radial zone, whereby said lignocellulose-containing material is defibered and fibrillated by a shear-like effect between said pair of radially extending grinding segments on said pair of counter-rotating grinding discs.

5,112,444

METHOD FOR TREATING PULP

Kaj Henricson, Kotka, and Olavi Pikka, Karhula, both of Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Mar. 28, 1990, Ser. No. 500,475
Claims priority, application Finland, Mar. 29, 1989, 891484
Int. Cl.[5] D21C *9/00*
U.S. Cl. 162—55 **6 Claims**

1. A method of treating a pulp suspension in a screening plant of a pulp mill, comprising:

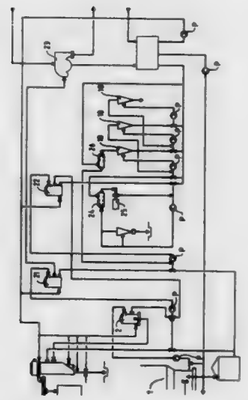
dividing the pulp suspension into reject impurities and accept fiber material by a pulp screening and/or a centrifugal cleaning operation;

thickening the accept fiber material to a consistency of from about 10 to about 20%;

treating the reject impurities in the screening plant by at least one of cleaning and defibering to form an acceptable fiber material and a discarded reject material; and

recycling said acceptable fiber material into the original, undivided pulp suspension for further pulp treatment, wherein said pulp screening or centrifugal cleaning operation and said subsequent thickening operation are conducted in a closed, pressurized space in the screening

plant, while preventing the access of air to the pulp, and maintaining the pressure at which the thickening operation is conducted at the outlet pressure of the preceding pulp screening or centrifugal cleaning operation.



5,112,445

GELLAN GUM SIZING

Philip E. Winston, Jr., San Diego; Harold D. Dial, El Cajon, Kenneth Clare, Vista; Theresa M. Ortega, San Diego, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 23, 1989, Ser. No. 370,496
Int. Cl.[5] D21H *17/31, 17/24, 17/26*
U.S. Cl. 162—178 **2 Claims**

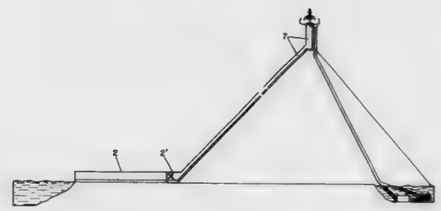
1. A method for sizing paper which comprises coating paper with a composition comprising 0.03–0.6 wt. % gellan gum, 6–12 wt. % film forming polymer, 0.02–0.2 wt. % gelling salt, and water.

5,112,446

DEVICE FOR PRODUCING FRESH WATER BY SOLAR ENERGY-DRIVEN SEA WATER DESALTING MEANS

Roger Vallon, 3,rue des pleins champs, F-76000 Rouen, France

Filed Jun. 19, 1990, Ser. No. 540,362
Claims priority, application France, Jan. 30, 1989, 89 01449
Int. Cl.[5] B01D *3/10*; C02F *1/14*
U.S. Cl. 202—185.2 **8 Claims**



1. A device for the production of fresh water from sea or brackish water, comprising:

(a) at least one evaporation pan, covered with a translucent material;

(b) at least one ascending chimney-gallery, the upper end of which is open to air and the lower end of which is connected to at least one evaporation pan, wherein said at least one chimney-gallery condenses water vapor generated from the at least one evaporation pan;

(c) a condensate collecting chamber;

(d) means for opening and closing of the communication between the at least one evaporation pan and the at least one chimney-gallery and for closing and opening of a direct communication of the bottom section of the chimney-gallery with the air;

(e) near the upper end of the ascending chimney-gallery, means for forcing air circulation;

(f) means constituting a separate condensation chamber; and

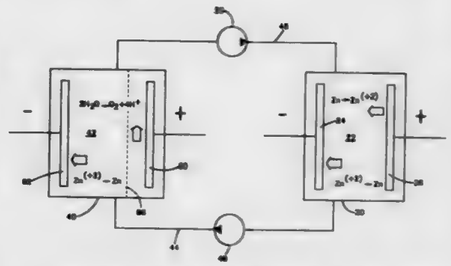
(g) means for spraying downwards into the chimney-gallery water collected in the condensation chamber.

5,112,447

PROCESS FOR ELECTROPLATING

Lawrence J. Gestaut, Chagrin Falls; James R. Brannan, Perry; Anthony J. Vaccaro, Mentor, all of Ohio, and Donald J. Groszek, Sugar Land, Tex., assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Aug. 19, 1991, Ser. No. 746,550
Int. Cl.[5] C25D *21/00*
U.S. Cl. 205—148 **4 Claims**



1. A process for electroplating metals in an electroplating cell which comprises a bath containing a plating solution of a metallic salt, a cathode comprising a workpiece to be plated, and a soluble anode, in which the anode current efficiency of the cell is greater than the cathode current efficiency and the anode is soluble in the plating solution, said process comprising the steps of:

(i) providing an electrowinning cell which includes at least one insoluble anode, at least one cathode, and a bath which communicates with the bath of said electroplating cell

(ii) connecting a source of direct electric current across the anode and cathode of said electroplating cell so as to cause electroplating of metal onto said workpiece;

(iii) circulating said plating solution between said cells;

(iv) connecting a source of direct electric current across said anode and cathode of the electrowinning cell; and

(v) controlling said current so as to cause deposition of metal from said plating solution onto said cathode at a rate effective to compensate for both (a) the difference in current efficiencies between the anode and cathode in the electroplating cell and (b) the chemical dissolution of the anode in the electroplating cell.

5,112,448

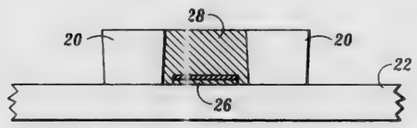
SELF-ALIGNED PROCESS FOR FABRICATION OF INTERCONNECT STRUCTURES IN SEMICONDUCTOR APPLICATIONS

Kishore K. Chakravorty, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 28, 1989, Ser. No. 442,238
Int. Cl.[5] C25D *5/02*; H01L *21/288*
U.S. Cl. 205—118 **46 Claims**

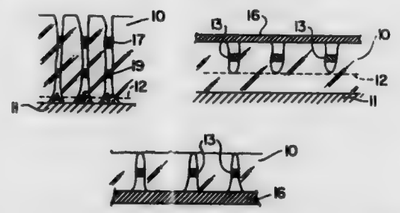
22. A method for forming an interconnect structure fabricated in a dielectric in a self-aligned manner, the method comprising the steps of:

applying a dielectric film on a substrate;
patterning the dielectric film to form a trench in the dielectric film;
depositing a thin electroplating seed layer on the dielectric film and on the substrate in the trench, wherein the electroplating seed layer on the substrate is electrically isolated from the electroplating seed layer on the dielectric film;
curing the dielectric film, thereby anisotropically shrinking the dielectric film;



applying a photoresist layer over the dielectric film and the substrate;
heating the photoresist layer sufficiently to cause it to shrink;
etching the photoresist layer and thereby exposing the electroplating seed layer on the dielectric film;
removing the electroplating seed layer from the dielectric film;
stripping the photoresist layer; and
electroplating a conductive layer on the electroplating seed layer, within the trench.

5,112,449
TWO PHASE METAL/OXIDE FILMS
Mark A. Jozefowicz, and Aron M. Rosenfeld, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada
Filed Mar. 22, 1990, Ser. No. 497,555
Claims priority, application Canada, Mar. 22, 1989, 594495; Sep. 29, 1989, 615000
Int. Cl.[5] C25D *11/12, 5/44*
U.S. Cl. 205—175 **10 Claims**



5. A process of producing a two phase metal/oxide film containing metal deposits positioned between inner and outer ends of pores in said film, which process comprises:
carrying out a first porous anodization of an anodizable metal substrate to form an initial porous oxide film layer on said substrate;
depositing a metal at inner ends of pores in said initial porous oxide film layer to form metal deposits in said film layer;
carrying out a second porous anodization step to form an additional layer of porous oxide film below said initial layer and to lengthen said pores;
introducing a weakened stratum into said additional porous layer at inner ends of said lengthened pores; and
detaching said initial and said additional porous film layers containing said metal deposits from said metal substrate along said weakened stratum.

5,112,450
PROCESSABLE CONDUCTIVE POLYMERS
Stanley J. Jasne, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Division of Ser. No. 595,667, Apr. 2, 1984. This application Oct. 10, 1991, Ser. No. 774,552
Int. Cl.[5] C25B *3/02*; H01B *1/00*; C08F *26/06*; C08G *73/06*
U.S. Cl. 204—59 R **10 Claims**

1. A method for the production of a processable conductive polymer which comprises electropolymerizing an electropolymeriable monomer in an electrolytic medium comprising a reaction solvent; an electropolymerizable monomer exhibiting solubility in said reaction solvent and having an oxidation potential below that of the solvent; and a polymeric electrolyte having anionic surface character, said polymeric electrolyte being present in said electrolytic medium in a dispersed phase during the electropolymerization of the electropolymerizable monomer.

5,112,451
ELECTROCHEMICAL PREPARATION OF IRON NITROSYL CARBONYL AND ITS USE AS A CATALYST
Duane E. Heaton, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 348,625, May 8, 1989, Pat. No. 4,973,568. This application Sep. 5, 1990, Ser. No. 578,110
Int. Cl.[5] C25B *1/00, 3/04*
U.S. Cl. 204—86 **9 Claims**

1. A process for preparing iron nitrosyl carbonyl by electrochemically reducing either an iron nitrosyl halide or a mixture of iron chloride and a source of NO in the presence of CO.

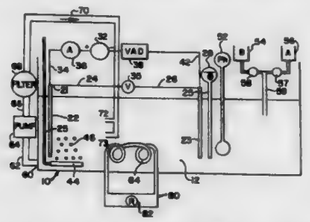
5,112,452
REMOVAL OF THIOSULFATE FROM HYDROSULFITE SOLUTIONS
John L. Stubbs, Jr., Cleveland; Roger E. Bolick, II, and Everett F. Hauser, Jr., both of Chattanooga, all of Tenn., assignors to Olin Corporation, Cheshire, Conn.
Filed Jul. 22, 1991, Ser. No. 734,362
Int. Cl.[5] C25B *1/14*
U.S. Cl. 204—92 **18 Claims**

1. A process for treating an alkali metal hydrosulfite solution containing thiosulfate ions as an impurity which comprises reducing cathodically the alkali metal hydrosulfite solution to convert thiosulfate ions to sulfide ions, the alkali metal hydrosulfite solution having a residual alkalinity of from about 0.1 to about 20 grams per liter of hydroxide ion.

5,112,453
METHOD AND APPARATUS FOR PRODUCING ETCHED PLATES FOR GRAPHIC PRINTING
Omri M. Behr, and Marion R. Behr, both of 24 Fishel Rd., Edison, N.J. 08820
Continuation-in-part of Ser. No. 606,871, Oct. 31, 1990, Pat. No. 5,102,520. This application Nov. 5, 1991, Ser. No. 788,244
The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.
Int. Cl.[5] C25F *3/14, 7/00*
U.S. Cl. 204—129.2 **30 Claims**

1. A process of etching a roughened surface directly onto a metallic object, the original surface whereof is partially covered by a resist surface and causing the thus exposed portions of said metal object to be subjected to the action of an etchant force in an electrolytic bath containing an aqueous electrolyte, an electrode and a source of direct current voltage having a positive pole and a negative pole, comprising the steps of
a) immersing said metallic object to be etched in said bath proximate to but spaced from said electrode,
b) connecting the negative pole of said direct current voltage source to said electrode and the positive pole to said metal object whereby said electrode becomes the cathode and said metal object becomes the anode and

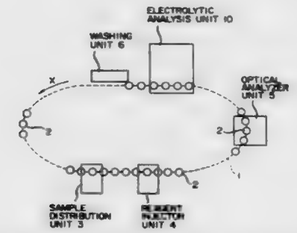
c) applying direct current voltage, wherein the improvement comprises
providing the applied voltage so that it shall be at least that of the ionization potential of the metal of the object in the electrolyte chosen and shall not substantially exceed the sum of the decomposition voltage of the aqueous electrolyte and the over-voltage of the cathode selected, whereby hydrogen evolution is avoided and



applying said selected voltage until the desired depth of metal has been removed from the exposed portions of the anode and the desired degree of roughness attained thereon.

14. The process of claim 1 additionally comprising the step of sensing the pH of the electrolyte.

5,112,454
ION CONCENTRATION-MEASURING METHOD
Yasuji Tanaka, Tochigi, and Akiko Tanaka, Ootawara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 273,725, Nov. 18, 1988, abandoned, which is a continuation of Ser. No. 60,677, Jun. 11, 1987, abandoned. This application Feb. 16, 1990, Ser. No. 484,431
Claims priority, application Japan, Jun. 16, 1986, 61-138305
Int. Cl.[5] G01N *27/26, 27/333*
U.S. Cl. 204—153.1 **4 Claims**



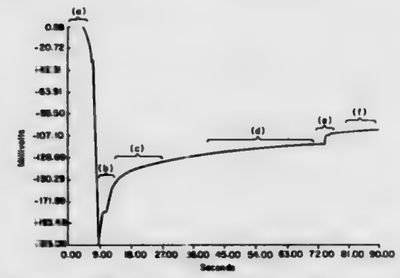
1. A method for measuring an ion concentration of a test liquid using an electrode device including a reference electrode, ion-selective electrodes and a liquid path through which a test liquid to be tested is passed for measuring electromotive forces generated between the reference electrode and the ion-selective electrodes, comprising the steps of:
conducting a reference liquid with a known ion concentration into the liquid path of the electrode device to measure a first electromotive force;
conducting a first standard liquid with a concentration having a value smaller than that of the reference liquid into the liquid path of the electrode device to measure a second electromotive force;
conducting the reference liquid with the known ion concentration into the liquid path of the electrode device to measure a third electromotive force after the measuring of the second electromotive force is performed;
obtaining a first mean value of the first and third electromotive forces of the reference liquid;
calculating a first electromotive force difference between the first mean value and the second electromotive force;
conducting the reference liquid with the known ion concentration into the liquid path of the electrode device to measure a fourth electromotive force;
conducting a second standard liquid with a known high ion concentration having a value larger than that of the reference liquid into the liquid path to measure a fifth electromotive force;
conducting the reference liquid with the known ion concentration into the liquid path to measure a sixth electromotive force after the measuring of the second standard liquid is performed;
obtaining a second mean value of the fourth and sixth electromotive forces of the reference liquid;
calculating a second electromotive force difference between the second mean value and the fifth electromotive force;
generating at calibration curve according to the first and second electromotive force differences;
conducting the reference liquid into the liquid path of the electrode device to measure a seventh electromotive force;
conducting the test liquid into the liquid path to measure an eighth electromotive force;
conducting the reference liquid into the liquid path of the electrode device to wash the liquid path after measurement of the eighth electromotive force of the test liquid is performed;
conducting the reference liquid into the liquid path to measure a ninth electromotive force after the liquid path is washed by the reference liquid;
obtaining an electromotive force of the reference liquid by weighting with constants the seventh and ninth electromotive forces of the reference liquid obtained before and after the measurement of the eighth electromotive force of the test liquid;
obtaining a third electromotive force difference between the eighth electromotive force of the test liquid and the weighted electromotive force of the reference liquid; and
determining an unknown ion concentration of the test liquid by plotting the third electromotive force difference against the generated calibration curve.

5,112,455
METHOD FOR ANALYTICALLY UTILIZING MICROFABRICATED SENSORS DURING WET-UP
Stephen N. Cozzette, Highstown; Graham Davis, Plainsboro; Lisa A. Hollerittter, Oak Ridge, all of N.J.; Imants R. Lauks, Yardley, Pa.; Sylvia Piznik, Jackson, N.J.; Nicolaas J. Smit, Woodlawn, Canada; Jody A. Tirinato, Plainsboro, N.J.; Henry J. Wieck, Plainsboro, N.J., and Michael P. Zelin, Plainsboro, N.J., assignors to I Stat Corporation, Princeton, N.J.
Filed Jul. 20, 1990, Ser. No. 555,976
Int. Cl.[5] G01N *27/26*; C25F *7/00*
U.S. Cl. 204—153.12 **68 Claims**

1. A method of determining the concentration of a preselected analyte species present in a sample fluid comprising:
(a) providing an external computational means, a reference electrode and at least one substantially dry-stored microfabricated sensor capable of exhibiting a response to changes in the concentration of a preselected analyte species;
(b) establishing electrical contact between said sensor, reference electrode and external computational means;
(c) contacting said sensor and reference electrode with a calibrant fluid;
(d) performing a first signal measurement in a first time window in the presence of said calibrant fluid before said sensor attains full equilibrated wet-up;
(e) displacing said calibrant fluid after performing said first signal measurement;

(f) contacting said sensor and reference electrode with a sample fluid;

(g) performing a second signal measurement in a second time window in the presence of said sample fluid before said sensor attains full equilibrated wet-up; and



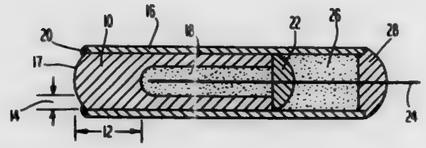
(h) relating said first and second signal measurements to determine the concentration of said preselected analyte species in said sample fluid.

5,112,456

ELECTROCHEMICAL SENSORS AND METHODS FOR THEIR USE

Wayne Worrell, Narberth, Pa.; Qingguo Liu, and Yuhua Tang, both of Bejing, China, assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Dec. 12, 1989, Ser. No. 449,781
Int. Cl.[5] G01N *27/411*
U.S. Cl. 204—153.18 **19 Claims**



17. A method for monitoring the concentration of oxygen in a melt comprising:

A. contacting said melt with an electrochemical sensor comprising:

1. protective sheath means having at least one opening therein;

2. a zirconia sensing body having predetermined length and width and an end wall having predetermined thickness, said sensing body being:

within said protective sheath means and in contact therewith along substantially the entire length of the sensing body, and

sealed to said sheath means at said opening to expose a portion of the zirconia sensing body; and

3. reference electrode composition in contact with said zirconia sensing body;

the thickness of the end wall adjacent to the exposed portion being greater than the width of the sensing body and being at least about 5 mm;

B. measuring the electrochemical potential of said sensor a plurality of times; and

C. relating said measurements of electrochemical potential to the oxygen concentration in the melt.

5,112,457

PROCESS FOR PRODUCING HYDROXYLATED PLASMA-POLYMERIZED FILMS AND THE USE OF THE FILMS FOR ENHANCING THE COMPATIBLITY OF BIOMEDICAL IMPLANTS

Roger E. Marchant, Shaker Hts., Ohio, assignor to Case Western Reserve University, Cleveland, Ohio

Filed Jul. 23, 1990, Ser. No. 556,740
Int. Cl.[5] H05F *3/00*
U.S. Cl. 204—165 **14 Claims**

1. A process for producing a hydroxylated plasma-polymerized N-vinyl-2-pyrrolidone polymer comprising the steps of:

a) plasma-polymerizing N-vinyl-2-pyrrolidone monomers to produce an insoluble plasma-polymerized N-vinyl-2-pyrrolidone polymer; and

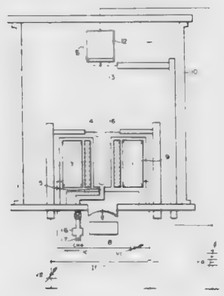
b) reducing the carbonyl groups in the insoluble plasma-produced N-vinyl-2-pyrrolidone polymer to alcohol groups by chemical reduction using an aqueous solution of sodium borohydride.

5,112,458

PROCESS FOR PRODUCING DIAMOND-LIKE FILMS AND APPARATUS THEREFOR

Masatoshi Nakayama, and Kunihiro Ueda, both of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,511
Int. Cl.[5] C01B *31/00*
U.S. Cl. 204—173 **9 Claims**



1. A process for producing a diamond-like film, comprising the steps of:

passing a hydrocarbon feed gas or a feed gas which produces a hydrocarbon on decomposition or reaction through a plasma exciter exciting said feed gas;

introducing said hydrocarbon feed gas or a feed gas which produces a hydrocarbon on decomposition or reaction into a vacuum;

ionizing said feed gas; and

depositing said ionized feed gas on a substrate to form a diamond-like film thereon.

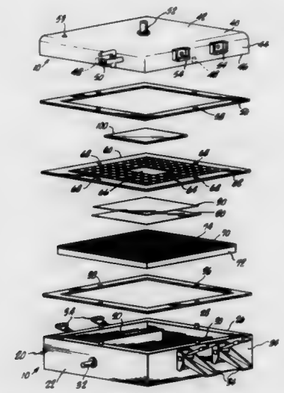
5,112,459

APPARATUS AND METHOD FOR TRANSFER OF MACROMOLECULES

Joseph A. Sorge, San Diego, and Keith V. Sylvester, La Jolla, both of Calif., assignors to Stratagene Cloning Systems, La Jolla, Calif.

Filed Jul. 7, 1989, Ser. No. 376,419
Int. Cl.[5] G01N *27/26;* B01D *57/02*
U.S. Cl. 204—180.1 **40 Claims**

23. A method for transferring molecular components from a source medium to a transfer medium comprising the steps of placing a source medium in proximal relation to a transfer medium, and applying a positive pressure to said source medium, wherein said positive pressure is greater than atmospheric pressure and said pressure is provided by any combination of pressurized gas and liquid, whereby molecular components are displaced from said source to said transfer medium.

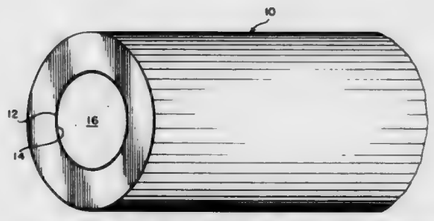


5,112,460

HIGH PERFORMANCE MICROCAPILLARY GEL ELECTROPHORESIS

Barry L. Karger, Newton, and Aharon S. Cohen, Brookline, both of Mass., assignors to Northeastern University, Boston, Mass.

Continuation-in-part of Ser. No. 359,728, May 31, 1989, which is a continuation of Ser. No. 921,311, Oct. 21, 1986, Pat. No. 4,865,706. This application Oct. 13, 1989, Ser. No. 421,609
Int. Cl.[5] G01N *27/26;* B01D *57/02*
U.S. Cl. 204—182.8 **7 Claims**



1. A gel-containing microcapillary column for high precision and high performance electrophoresis, comprising:

a microcapillary having an interior cavity and a wall with an inner surface;

a layer of coating material covalently bonded to said inner surface of said wall; and

a polymeric gel filling said interior cavity, said polymeric gel comprising polymerized uncrosslinked monomer.

5,112,461

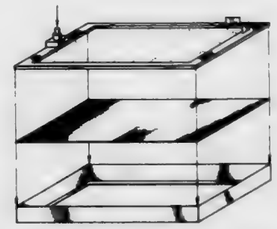
GELTRANS, A DEVICE FOR TRANSFER OF GEL TO PAPER

Wayne M. Barnes, 223 Renaldo Dr., Chesterfield, Mo. 63017

Filed May 10, 1990, Ser. No. 521,758
Int. Cl.[5] C25B *1/00;* B01D *61/42*
U.S. Cl. 204—182.8 **8 Claims**

1. Apparatus for aiding removal of a gel from the surface of a plate, comprising:

a generally horizontal frame having an upper surface defining an inner open area, said frame comprising a liquid inlet, a channel, and a plurality of liquid outlets, said inlet, channel and outlets all being in liquid communication to allow a liquid entering said inlet to pass through said channel to said outlets; wherein each said outlet is constructed and arranged to cause liquid passing through said outlets to be projected toward said inner open area; and wherein said frame is adapted to hold a plate generally horizontally over said inner open area; and



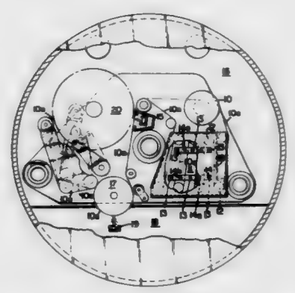
a generally horizontal grid positioned below said inner open area, and adapted to hold a sheet of filter plate in a generally horizontal position below said inner open area; wherein said grid and frame are positioned relative to each other to allow a gel on the under surface of said plate to be removed by liquid flowing from said outlets, and fall onto the upper surface of said grid.

5,112,462

METHOD OF MAKING METAL-FILM LAMINATE RESISTANT TO DELAMINATION

Richard L. Swisher, Northfield, Minn., assignor to Sheldahl Inc., Northfield, Minn.

Filed Sep. 13, 1990, Ser. No. 580,505
Int. Cl.[5] C25D *5/56*
U.S. Cl. 205—165 **30 Claims**



8. A process for the manufacture of a metal-polymeric film laminate resistant to the separation of the metal from the film, which process comprises:

(a) contacting a polymeric film with a plasma, produced from at least two metallic electrodes, said plasma comprising ionized oxygen, to form on said film a non-continuous random distribution of a metal or a metal-oxide, said metal being selected from the group consisting of iron, chromium, nickel, molybdenum, manganese, zirconium or mixtures thereof, said distribution being less than 20 atomic layers in thickness, said metal or metal-oxide being derived from said metallic electrodes; and

(b) forming by vapor metallization a first metal layer having a thickness of about 50 to 500 nanometers on the metal-oxide treated film; and

(c) forming a second metal layer having a thickness of about 0.1 to 40 μm on the first metal layer, wherein no metallic tie-coat layer is formed in the manufacture of the laminate.

10. The process of claim 9 wherein the second metal layer is formed by electrodeposition.

5,112,463

APPARATUS FOR WATER ELECTROLYSIS

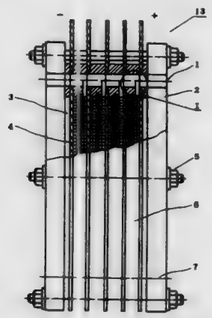
XueMing Zhang, P.O. Box 314, Beidaihe, Hebei 066100, PRC; Shucheng Zhang, Beidaihe; Shuxia Zhang, Beidaihe; Congshan Liu, Beidaihe; Haibuo Zhang, Beidaihe; Wenrong Li, Beidaihe; Qingyan Ji, Beidaihe; Shufang Zhang, Beidaihe, and Shuwei Zhang, Biedaihe, all of China, assignors to XueMing Zhang, China

Filed Jan. 18, 1991, Ser. No. 643,597

Claims priority, application China, Sep. 3, 1990, 90107241.9

Int. Cl.[5] C25B *1/08, 1/10, 1/12, 9/00*

U.S. Cl. 204—237 **6 Claims**



1. An apparatus for water electrolysis comprises an electrolysis cell, a gas-liquid separating mechanism and a power source, wherein said electrolyser is composed of a plurality of electrolysis compartments connected with each other in series; each electrolysis compartment has two electrode plates defining an anode and a cathode respectively; a membrane assembly made of an iron sieve and a nickel sieve sandwiched therebetween a thin sheet of asbestos material is disposed between said electrode plates with iron sieve facing the cathode and nickel sieve facing the anode; said cathode and said iron sieve of the membrane assembly are spaced by a concavo-convex iron net connected therebetween, said anode and said nickel sieve are spaced by a concavo-convex nickel net connected therebetween such that said iron sieve and said nickel sieve form a part of cathode and a part of anode respectively; said electrode plates and said membrane assemblies have upper opening for gas exhaust and lower openings as liquid inlet near the upper and lower ends and perpendicular to the planes thereof; said plurality of electrolysis compartments are fastered together to form said electrolyser.

5,112,464

APPARATUS TO CONTROL REVERSE CURRENT FLOW IN MEMBRANE ELECTROLYTIC CELLS

Yu-Min Tsou; Roy L. Hicks, both of Lake Jackson, and Harry S. Burney, Jr., Richwood, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 15, 1990, Ser. No. 539,111

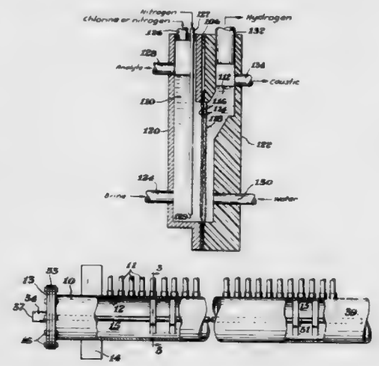
Int. Cl.[5] C25B *9/00*

U.S. Cl. 204—265 **6 Claims**

1. A sparging apparatus for distributing a stripping gas flow to a plurality of anolyte compartments in a stack of membrane electrolytic cells to control reverse current flow, the apparatus comprising:

an anolyte inlet manifold defining a chamber through which a flow of anolyte solution is conveyed to the anolyte compartments during normal cell operation, the anolyte inlet manifold having an interior surface with a plurality of inlet ports located on said surface, each inlet port defining a passage between the chamber and an anolyte compartment;

a porous conduit having an inlet end and a closed end, the porous conduit positioned within the chamber such that the stripping gas flow is conveyed from the porous conduit to the anolyte compartments through the inlet ports;



means for securing the porous conduit within th e anolyte inlet manifold; and

means for connecting the inlet end of the porous conduit to a source of stripping gas.

5,112,465

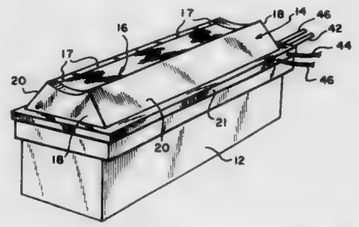
ELECTRODEPOSITION APPARATUS

George Danielson, 7682 Everest Cir., Huntington Beach, Calif. 92647

Filed Dec. 4, 1990, Ser. No. 622,002

Int. Cl.[5] C25C *1/10, 7/00, 7/04*; C25D *21/04*

U.S. Cl. 204—278 **10 Claims**



1. An apparatus for electro depositing chrome onto a substrate comprising:

(a) a tank for containing a plating solution;

(b) an adapter assembly connected to said tank;

(c) an open top hood connected to said adapter assembly; and

(d) a thin, stainless steel membrane connected to said hood and extending over said open top, said membrane having a multiplicity of fine pores of a size to permit passage of hydrogen there through but of a size to substantially prevent the passage of chromium atoms therethrough.

5,112,466

APPARATUS FOR FORMING A THIN FILM

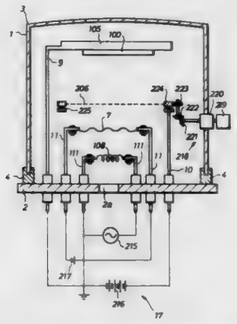
Wasaburo Ohta, Yokohama; Mikio Kinoshita, Kawasaki, and Tadao Katsuragawa, Yamato, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 228,451, Aug. 5, 1988, Pat. No. 4,960,072. This application Sep. 14, 1990, Ser. No. 597,331

Claims priority, application Japan, Aug. 5, 1987, 62-196012; Oct. 29, 1987, 62-274442; Nov. 5, 1987, 62-169404

Int. Cl.[5] C23C *16/50*

U.S. Cl. 204—298.05 **8 Claims**



1. An apparatus for forming a thin film comprising;

a vacuum container evacuated to a high vacuum and receiving a gas for vapor deposition therein;

generation means for generating a vapor of a material for vapor deposition and introducing said vapor into said container;

a counter electrode disposed within said container and holding a substrate to be vapor-deposited such that said substrate opposes said generation means;

a first grid disposed between said generation means and said electrode for allowing said vapor to pass therethrough and accelerating said vapor, and electrical potential of said first grid set positive relatively to an electrical potential of said electrode;

a second grid disposed between said first grid and said electrode in the vicinity of said electrode for allowing said vapor to pass therethrough and accelerating said vapor, an electrical potential of said second grid set negative relatively to said potential of said first grid;

a filament disposed between said first gird and said generation means for emitting thermions to ionize said vapor; and

moving means for moving at least said first grid and said second grid with respect to said electrode on a predetermined track in order to form the thin film having uniform thickness on said substrate.

5,112,467

CATHODE SPUTTERING APPARATUS

Jaroslav Zejda, Rodenbach, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Fed. Rep. of Germany

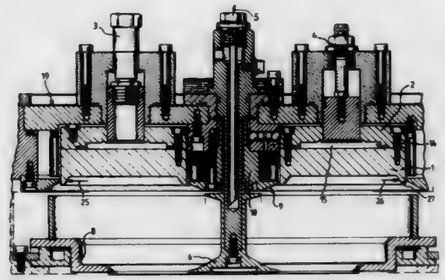
Filed Feb. 15, 1991, Ser. No. 656,235

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1990, 4020659

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—298.12 **20 Claims**

1. A cathode sputtering apparatus comprising a target unit and a quick disconnect clamp mechanism securing said target unit within said cathode sputtering apparatus, wherein said quick disconnect clamp mechanism comprises a rotatable sleeve member provided with at least one camming surface and a camming member engageable with said camming surface so that upon rotation of said sleeve member said camming member operatively is wedged between said camming surface and



another surface to secure said target unit within said cathode sputtering apparatus.

5,112,468

TARGET FOR MAGNETRON-SPUTTERING SYSTEMS

Martin Weigert, Hanau; Lorenz Berchtold, Neurmberg, and Stephan U. Schittny, Alzenau-Kaelberau, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 360,482, Jun. 2, 1989, abandoned. This application Feb. 4, 1991, Ser. No. 651,050

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1988, 3819906

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—298.13 **7 Claims**

1. A target obtained by forming a ferromagnetic alloy into a magnetron sputter target for magnetron - sputtering systems comprising a ferromagnetic alloy whose phase diagram exhibits a cubic and a hexagonal phase, whereby during magnetron sputtering operation of the target the hexagonal phase is present in a state of equilibrium with portions of cubic phase, wherein the amount of hexagonal phase is greater than the amount of cubic phase and the hexagonal phase is aligned with the hexagonal prism axes (0001) mostly vertical to the target surface, wherein the X-ray backscatter intensity of the hexagonal (0001) Bragg reflex, measured with Mo-Kα radiation, vertical to the target plane is greater by more than a factor 1.5 than the average X-ray intensity, averaged over the entire half space over the target plane.

5,112,469

APPARATUS FOR THE INWARD AND OUTWARD TRANSFER OF A WORKPIECE IN A VACUUM CHAMBER

Stefan Kempf, Alzenau, and Jaroslav Zejda, Rodenbach, Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 402,637, Sep. 5, 1989. This application Aug. 27, 1990, Ser. No. 572,263

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1989, 3910244; Mar. 26, 1990, 4009603

Int. Cl.[5] C23C *14/56*

U.S. Cl. 204—298.25 **25 Claims**

1. An apparatus for inward and outward transfer of a workpiece to and from a vacuum chamber, comprising:

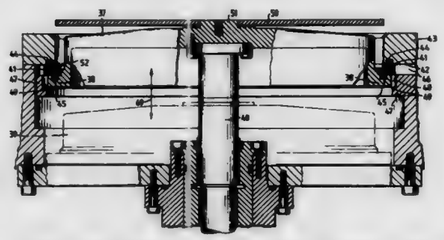
a vacuum chamber;

a disk-shaped conveyor means in the vacuum chamber for conveying the workpiece;

holding means having a central opening and peripheral support means for supporting the workpiece;

a plate-shaped lifting and support means having flange means for lifting and supporting the workpiece holding means;

said disk-shaped conveyor means having at least one opening passing therethrough defining an edge which surrounds said plate-shaped lifting and supporting means



when said at least one opening is aligned with the lifting and supporting means; and

said holding means carrying the workpiece only in a region of an outer edge thereof.

5,112,470

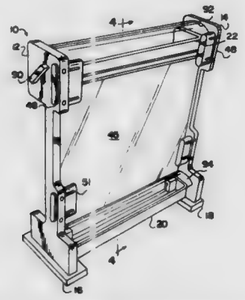
ELECTROPHORESIS APPARATUS

Keith V. Sylvester, Del Mar, Calif., assignor to Stratagene, La Jolla, Calif.

Filed Dec. 7, 1990, Ser. No. 624,074

Int. Cl.[5] G01N *27/28, 27/26*

U.S. Cl. 204—299 R **22 Claims**



1. A vertically oriented gel electrophoresis apparatus comprising:

a support structure for supporting in a generally vertical plane a gel plate assembly comprised of a pair of generally planar, spaced apart plates, said support structure including:

a pair of side members between which is disposed said gel plate assembly;

a support plate lying generally in a vertical plane and extending between said side members;

retaining means associated with said side members and selectively engageable with said gel plate assembly for retaining said gel plate assembly in place between said retaining means and said support plate;

a lower tank member positioned between said side members for supporting the bottom edge of said gel plate assembly in position in said support structure, said lower tank member adapted to contain a buffer solution in contact with the bottom edge of said gel plate assembly and the gel disposed between said generally planar plates thereof;

an upper tray member supported between said side members adjacent the upper edge of said gel plate assembly for movement towards and for selective sealing engagement of said gel plate assembly adjacent the upper edge thereof, said upper tray member adapted to contain a buffer solution in contact with the upper edge of said gel plate assembly and the gel disposed between said generally planar plates thereof; and

electrode means in circuit making contact with said buffer solutions in said upper tray and said lower tank for completing a circuit between said electrodes through said gel plate assembly.

5,112,471

ION SELECTIVE ELECTRODE

Yasuhisa Shibata, Naka; Naoto Oki; Satoshi Ozawa, both of Hitachi, and Hiroyuki Miyagi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

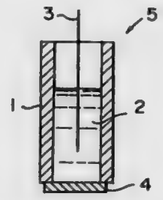
Continuation of Ser. No. 343,275, Apr. 26, 1989, abandoned. This application May 18, 1990, Ser. No. 526,782

Claims priority, application Japan, Apr. 28, 1988, 63-103935; Jul. 18, 1988, 63-178374

The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—418 **14 Claims**



1. An ion selective electrode having a sensitive membrane, comprising: a polymer material, an ion sensitive material and a plasticizer, wherein a tetraalkyl ammonium salt or tetraalkylphosphonium salt containing four identical alkyl groups is used as the ion sensitive material, and a compound having the formula (1): wherein x represents an alkyl group, a phenyl group or a phenyl group to which a functional group bonds is used as the plasticizer.

5,112,472

PROCESS FOR CONVERTING HYDROCARBON OILS

Johan W. Gosselink; Lucas R. Groeneveld, and Hennie Schaper, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 27, 1990, Ser. No. 544,446

Claims priority, application United Kingdom, Nov. 16, 1989, 8925980

Int. Cl.[5] C10G *13/02, 37/02*

U.S. Cl. 208—59 **11 Claims**

1. A process for converting hydrocarbon oils into products of lower average molecular weight and lower boiling point comprising contacting a hydrocarbon oil which contains less than 200 ppm N at a temperature of about 250° C. to about 500° C. and a pressure of about 20 bar to about 300 bar in the presence of hydrogen with a catalyst A comprising zeolite Y having a unit cell size below 24.45 Å, a binder and at least one hydrogenation component selected from the group consisting of a Group VI metal, a Group VIII metal, and mixtures thereof, wherein the hydrocarbon oil is subsequently contacted at a temperature of about 250° C. to about 500° C. and a pressure of about 20 bar to about 300 bar, without intermediate separation or liquid recycle, with an amorphous silica-alumina containing catalyst B comprising at least one hydrogenation component selected from the group consisting of a Group VI metal, a Group VIII metal, and mixtures thereof, wherein catalysts A and B are present such that the catalyst A/catalyst B volume ratio is in the range of from about 0.25 to about 4.0.

5,112,473

HYDROTREATING OR CRACKING PROCESS EMPLOYING AN ACIDIFIED DEALUMINATED Y-ZEOLITE

Pei-Shing E. Dai, and David E. Sherwood, Jr., both of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 4, 1990, Ser. No. 533,222

Int. Cl.[5] C10G *11/02*

U.S. Cl. 208—120 **7 Claims**

1. A hydrotreating or cracking process which comprises

passing a hydrocarbon charge stock at hydrotreating or cracking conditions into contact with a catalyst comprising

(i) an acidified dealuminated Y-zeolite having a silica to alumina mole ratio of about 10–120 selected from the group consisting of (i) an ammonium form of dealuminated Y-zeolite having a silica to alumina mole ratio of about 10–120, (ii) a hydrogen form of dealuminated Y-zeolite having a silica to alumina mole ratio of about 10–120, and (iii) a metal exchanged dealuminated Y-zeolite having a silica to alumina mole ratio of about 10–120 characterized by (i) an increased Secondary Pore Volume of about 0.14–0.20 cc/g, (ii) a decreased Lattice Constant of about 24.23A–24.33A, (iii) a Secondary Pore Mode of about 115A–145A) (iv) a Secondary Pore Diameter of about 100A–600A, (v) a surface Silicon to Aluminum Atom Ratio of about 24–45, and (vi) an Acid Site Density of about 1–5 cc NH_3/g catalyst;

(ii) a binder; and

(iii) a catalytic metal;

thereby forming a product hydrocarbon; and

recovering said product hydrocarbon.

5,112,474

SCREENING APPARATUS WITH TILTABLE VIBRATORY SCREEN

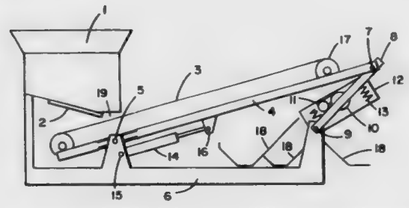
Patrick J. Douglas, 2 School Lane, Santon, Douglas, Isle of Man

Continuation of Ser. No. 226,805, Aug. 1, 1988, abandoned. This application Jul. 20, 1989, Ser. No. 384,063

Claims priority, application United Kingdom, Jul. 31, 1987, 8718161

Int. Cl.[5] B07B *1/46, 1/28*

U.S. Cl. 209—240 **8 Claims**



1. A screening apparatus for screening particulate material and comprising:

a base frame;

an elevating conveyor arranged to convey material from a loading station at or near a lower end of the conveyor to a discharge station at an upper end of the conveyor;

a conveyor carrying frame adjustably mounted on the base frame and arranged so as to be capable of moving the conveyor generally lengthwise relative to the mounting of the carrying frame on the base frame;

a sub-frame pivotally mounted on the base frame and carrying a vibratory screen arranged to receive material falling under gravity from the upper end of the conveyor;

discharge means for discharging separate screened portions of the material after treatment by the vibratory screen;

drive means for adjusting the position of the conveyor generally lengthwise relative to the mounting of the carrying frame on the base frame;

guide means for guiding the movement of the conveyor carrying frame; and,

a direct pivotal connection between the sub-frame and the conveyor carrying frame arranged so that lengthwise adjustment of the conveyor relative to the mounting of the carrying frame on the base frame is accompanied by pivotal adjustment of the sub-frame relative to the base frame such that the vibratory screen takes up an adjusted attitude, to suit any particular operating requirement, and in which said vibratory screen receives material falling under gravity from the upper end of the conveyor.

5,112,475

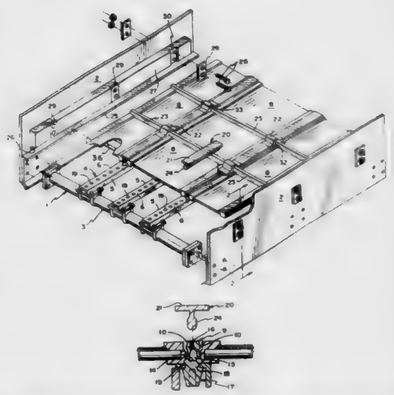
PANEL MOUNTING SYSTEM

Robert E. Henry, Jr., Princeton, W. Va., assignor to Conn-Weld Industries, Inc., Princeton, W. Va.

Filed Aug. 6, 1990, Ser. No. 563,062

Int. Cl.[5] B07B *1/12, 1/46*

U.S. Cl. 209—399 **15 Claims**



1. A system for mounting screen and other panels in screening apparatus, comprising fastener means having a base anchored to a frame of said apparatus and having a flexible side normally upright or outwardly projecting relative to said base, said side of said fastener means on yieldable flexing inward or away from a side of a panel being alternately engageable and disengageable by said panel side, and means insertible in said fastener means for releasably locking said panel side to said side of said fastener means.

5,112,476

LIQUID FILTER ASSEMBLY

Edmond H. Cote, Warren, and Matthew B. Prendergast, Warwick, both of R.I., assignors to Allied-Signal Inc., Morristown, N.J.

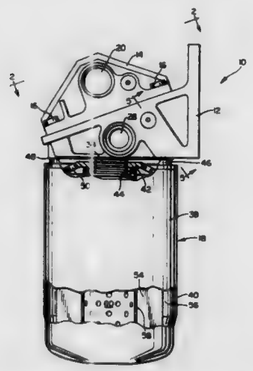
Filed Dec. 3, 1989, Ser. No. 622,885

Int. Cl.[5] B01D *27/10*

U.S. Cl. 210—85 **7 Claims**

1. Filter assembly for filtering the lubricating oils of an internal combustion engine comprising a housing having an inlet and an outlet and defining a flowpath for communicating lubricating oils between the inlet and the outlet, a screen supported within said housing in said flowpath for removing relatively large particles from lubricating oil communicated through said flowpath and passing through said screen, said relatively large particles being retained on said screen, said housing including removable cover means for covering said screen and for permitting examination of said screen upon

removal of said cover, said screen permitting particles smaller than said relatively large particles to pass through said screen, said housing defining a bypass passage communicating said inlet directly to said filtering media bypassing said screen, and a relief valve in said bypass passage opening to permit flow of lubrication oil carrying said relatively large particles and smaller particles through said bypass passage when the pressure differential across said screen exceeds a predetermined level, and a filtering media separate from said screen between said screen and said outlet, said filtering media including oil permeable means for removing particles from said lubricating oil not removed by said screen including said relatively large particles carried by said lubricating oil through said bypass passage.



5,112,477

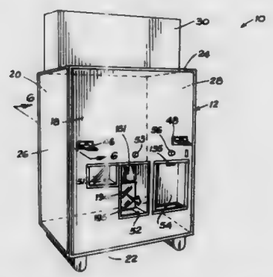
PURIFIED WATER AND ICE DISPENSING APPARATUS

Jerry J. Hamlin, 502 West 3rd Ave., No. 3, Mesa, Ariz. 85210

Filed Mar. 1, 1991, Ser. No. 662,718

Int. Cl.[5] B01D *35/00*

U.S. Cl. 210—85 **9 Claims**



9. A vending machine for the alternative dispensing of purified water and purified ice comprising:

(a) a housing, consisting of a bottom cabinet with a hinged front door and a top enclosure;

(b) a pre-storage water treatment system consisting of a series connected assembly comprising:

a water supply inlet pipe;

a five micron filter unit;

a medium copper-zinc alloy filter unit;

a five micron carbon filter unit;

a pump; and

a reverse osmosis membrane unit, including a series connected sub-assembly comprising a waste water outlet pipe, a waste water tank having an outlet pipe, a pump having an outlet pipe, and an exterior waste water line;

(c) a purified water storage system consisting of a storage tank having an inlet pipe connected to said pre-storage water treatment system and having an outlet pipe;

(d) a post-storage water treatment system consisting of a series connected assembly comprising:

an inlet pipe connected to said outlet pipe of said purified water storage system;

a pump;

a five micron carbon block filter unit;

an ultraviolet light unit; and

a T-shaped connection having a first outlet pipe and a second outlet pipe;

(e) a purified ice making system consisting of an ice making machine having an inlet pipe connected to said second outlet pipe of said T-shaped connection in said post-storage water treatment system and having an outlet pipe;

(f) a purified ice storage system consisting of an insulated bin connected to said outlet pipe of said purified ice making system, having an ice stirring shaft to prevent the formation of ice accumulations, having a conveyor for delivering ice, and wherein the frontal side of said insulated bin is directly exposed to ambient conditions in order to facilitate the elimination of water resulting from ice melting in the bin;

(g) a purified water dispensing system comprising a normally-closed valve connected to said first outlet pipe of said T-shaped connection in said post-storage water treatment system, and further comprising a purified water dispenser unit for receiving a container provided by a user;

(h) a purified ice dispensing system comprising a chute connected to said conveyor for delivering ice in said purified ice storage system, a purified ice dispenser unit for receiving a container provided by a user, and further comprising an ice bag storage and dispenser unit, wherein a normally-latched slidable door prevents unauthorized access to the bags and wherein said door is unlatched during operation of the ice dispensing cycle; and

(i) means for controlling the functioning of all said systems, comprising two sets of one manually operated coin acceptor, one push-button switch, one timer, and logic circuitry for each of the purified water and purified ice dispensing cycles.

5,112,478

FUEL FILTER FOR PREVENTING WATER AND PARTICULATE CONTAMINATION

Kirby S. Mohr, Jenks, Okla., assignor to Facet Quantek, Inc., Tulsa, Okla.

Filed Feb. 19, 1991, Ser. No. 657,080

Int. Cl.[5] B01D *27/10*

U.S. Cl. 210—96.1 **12 Claims**

1. A fuel filter having means of preventing water and particulate contaminant from passing therethrough, comprising:

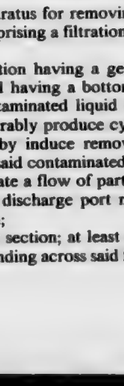
a rigid tubular fuel pervious member having a first end and a second end;

flexible filter media surrounding said tubular member through which fuel freely passes from the exterior thereof into said tubular member but which resists the passage of particulate matter and water;

a first end cap secured to said tubular member first end having a projectile portion extending within said tubular member and in the direction towards said tubular member second end, the projectile portion being severable from the first end cap when the differential fuel pressure thereacross reaches a preselected level, and, when severed, opens a passageway through the first end cap communicating with the interior of said tubular members;

a second end cap secured to said tubular member second end having a passageway therethrough in communication with the interior of said tubular member and having an annular seating surface therein, said projectile portion being configured to, when severed from said first end cap, engage and close against said annular seating surface to block further fuel flow through the filter; and

wherein one of said projectile portion and said annular seating surface has at least one large diameter circumferential ridge thereon and the other of said projectile portion and said annular seating surface has at least one mating circumferential annular groove therein whereby upon engagement therewith said projectile portion is locked to said seating surface.



5,112,479

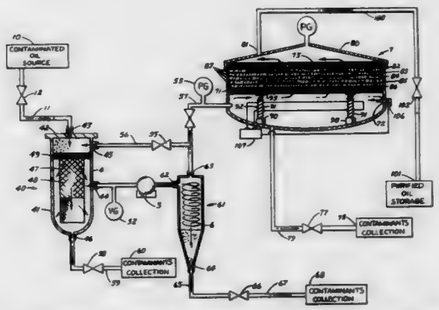
OIL PURIFICATION UNIT WITH CYCLONIC RESERVOIR SECTION AND FILTRATION SECTION

Vichai Srimongkolkul, Machesney Park, Ill., assignor to Micropure Filtration, Inc., Rockford, Ill.

Filed May 30, 1990, Ser. No. 530,823

Int. Cl.[5] B01D *36/00*

U.S. Cl. 210—149 **9 Claims**



9. A filtration apparatus for removing impurities from contaminated liquid comprising a filtration unit; said filtration unit having:

(a) a reservoir section having a generally hollow circular cross-section and having a bottom, tangential means for introducing contaminated liquid into said reservoir section so as to operably produce cyclonic flow within said section to thereby induce removal of relatively heavy impurities from said contaminated liquid using centrifugal force and to create a flow of partially cleaned liquid;

(b) a contaminant discharge port near the bottom of said reservoir section;

(c) a filter element section; at least one layer of particulate filter media extending across said filter element section for removing impurities from the partially cleaned liquid as such liquid passes through said filter media;

(d) a purified liquid discharge port in said filter element section positioned downstream from said filter media layer;

(e) a heater element in said reservoir section; and

(f) a temperature control mechanism operably coupled to said heater element for controlling the temperature of said heater element and enabling control of the flow rate of contaminated liquid through said unit.

5,112,480

BLOOD RESERVOIR

Hiromichi Hukasawa, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00681, § 371 Date Mar. 2, 1990, § 102(e) Date Mar. 2, 1990, PCT Pub. No. WO89/00056, PCT Pub. Date Dec. 1, 1989

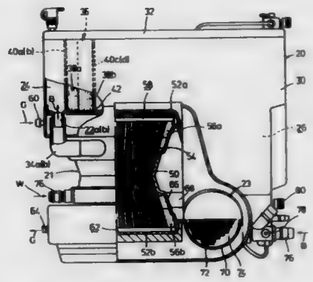
PCT Filed Jul. 6, 1988, Ser. No. 457,786

Claims priority, application Japan, Jul. 7, 1987, 62-167768

The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.

Int. Cl.[5] B01D *19/00*

U.S. Cl. 210—188 **4 Claims**



1. A blood reservoir comprising a blood inlet chamber having a blood inlet port, a blood storage chamber communicating with the blood inlet chamber and having a blood outlet port in a lower end which is positioned downwardly of said blood inlet chamber, and a blood debubblizer extending fully across a blood passage of said blood inlet chamber which leads to said blood storage chamber, comprising a rib held against the side of said debubblizer closer to said blood storage chamber and extending fully across said blood passage, said rib projecting a predetermined distance upwardly from the bottom of said blood inlet chamber.

5,112,481

FILTER SYSTEM HAVING MULTIPLE FILTER ELEMENTS AND BACKFLUSHING ASSEMBLIES

Mordeki Drori, 89 Zahal Street, Kiron, Israel

Continuation of Ser. No. 245,783, Sep. 16, 1988, Pat. No. 4,923,601. This application Oct. 12, 1989, Ser. No. 420,387

Claims priority, application Israel, Sep. 18, 1987, 83950; Feb. 24, 1988, 85543; Aug. 2, 1988, 87308

Int. Cl.[5] B01D *37/02*

U.S. Cl. 210—193 **9 Claims**

1. A fluid filter comprising:

a housing;

a central aperture formed in the bottom of said housing;

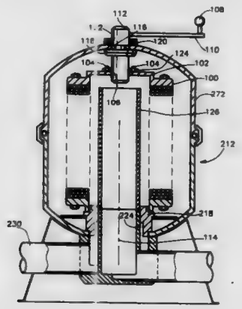
a filter element rotatably mounted in said housing and arranged to receive a flow of fluid to be filtered fraom an upstream side of said element to a downstream side thereof;

a fluid inlet arranged to receive a flow of fluid to be filtered;

a fluid outlet arranged to receive a flow of fluid from a downstream side of said filter element;

a fluid inlet and outlet manifold threadably and sealingly joined to said housing in fluid communication with said central aperture, for providing fluid inlet communication through said central aperture from said fluid inlet and for providing fluid outlet communication through said central aperture to said fluid outlet,

said fluid inlet and outlet manifold and said central aperture



together defining first and second generally coaxial volumes,

said first coaxial volume fluidly communicating between said fluid inlet and said upstream side of said filter element and said second coaxial volume fluidly communicating between said downstream side of said filter element and said fluid outlet, and

means for causing disengagement of filter aid material associated with said upstream side of said filter element so as to enable regeneration of said filter aid material.

5,112,482

FILTER FOR REMOVING HYDROPEROXIDES FROM LUBRICATING OILS

Harold Shaub, Berkeley Heights; Darrell W. Brownawell, Scotch Plains, and Arthur DiBenedetto, Rahway, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 404,250, Sep. 7, 1989, Pat. No. 4,997,546. This application Nov. 29, 1990, Ser. No. 619,570

Int. Cl.[5] B01D *27/00*

U.S. Cl. 210—209 **6 Claims**

1. An oil filter suitable for removing hydroperoxides from a lubricating oil which comprises means for passing said lubricating oil through said filter, means for contacting said lubricating oil with a heterogenous hydroperoxide decomposer wherein the hydroperoxide decomposer is $Mo_4S_4(RCOS_2)_6$, and R is an alkyl group having from 2 to 20 carbon atoms.

5,112,483

SLOW SAND/NANOFILTRATION WATER TREATMENT SYSTEM

C. Brent Cluff, 310 W. Camino Fairhaven, Tucson, Ariz. 85704

Filed Feb. 4, 1991, Ser. No. 650,291

Int. Cl.[5] C02F *9/00*

U.S. Cl. 210—223 **12 Claims**

1. A water filtration device comprising:

a cylindrically formed nanofilter formed of a plurality of layers of membrane elements separated by spacer elements and having a cylindrical opening extending axially therethrough,

an elongated housing surrounding said manifold in spaced relationship thereto,

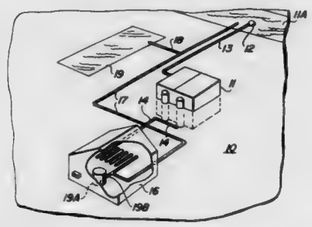
a pair of axially aligned caps one attached to each end of said housing,

each of the caps having an aperture extending axially therethrough and defining between said cap and the associated ends of said housing first and second manifolds,

a pair of T-shaped pipe fittings fastened one to each of said caps and extending outwardly and axially thereof for providing a water inlet port and a water outlet port respectively,

each of said T-shaped pipe fittings being spacedly arranged to said pipe and sealed thereto at its outer ends for forming a passageway around said pipe axially thereof, and

a pipe extending axially through said T-shaped pipe fittings, said caps and said nanofilter and being provided with a



plurality of apertures spacedly arranged along the length of the portion of said pipe within said nanofilter,

means for causing water entering the T of one of said T-shaped fittings to flow axially thereof around said pipe into a first one of the manifolds and laterally inwardly through said nanofilter with a purified portion of said water flowing through said apertures and into said pipe and outwardly of one end thereof and a reject portion of said water flowing out of said nanofilter longitudinally thereof and into said second manifold and from there through the other of said T-shaped pipe fittings.

5,112,484

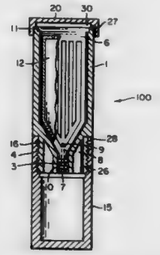
FILTRATION APPARATUS

Peter Zuk, Jr., Harvard, Mass., assignor to Zuk, Inc., Harvard, Mass.

Filed Oct. 11, 1990, Ser. No. 595,533

Int. Cl.[5] B01D *61/06*

U.S. Cl. 210—247 **19 Claims**



1. A batch process filtration apparatus for separating filtrate and concentrate from a solution comprising:

a housing having a discharge opening therein at its lower end, the housing being capable of containing a solution therein;

a multiple sided filter unit insertable within the housing such that the sides of the unit are exposed therein, said filter unit comprising:

a semipermeable membrane, capable of allowing filtrate therethrough, located on one or more sides of the filter unit for separating filtrate and concentrate,

an opening on one or more sides of the filter unit for allowing filtrate to flow from one or more sides of the filter unit into a passage means, said passage means being at a lower portion of the filter unit for allowing filtrate to flow therethrough into the discharge opening,

sealing means for preventing concentrate within said housing from escaping through the discharge opening wherein said opening is positioned above the sealing means during filtration to prevent the apparatus from filtering to dryness; and

means for collecting filtrate.

5,112,485

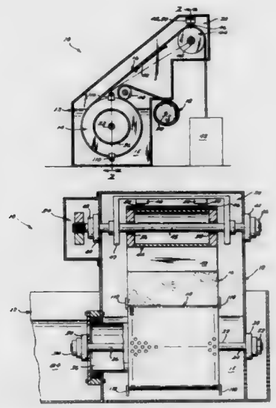
DRUM FILTER

Gene Hirs, 6865 Meadowlake Dr., Birmingham, Mich. 48010

Filed Feb. 19, 1991, Ser. No. 656,517

Int. Cl.[5] B01D *33/044*

U.S. Cl. 210—387 **5 Claims**



1. An automatic drum filter comprising

a tank having a contaminated fluid section and a clean fluid section,

a perforate right cylindrical filter drum in the contaminated fluid section of said tank and supported for rotation about its central longitudinal axis thereof,

means for withdrawing filtered fluid from the interior of said drum to the clean fluid section of said tank,

a continuous filter media having a portion wrapped substantially around the entire periphery of said filter drum,

a supply roll of said media supported externally of said tank for rotation about an axis substantially parallel to the axis of said drum,

an idler drum supported on a shaft for free rotation about an axis substantially parallel to the axis of said filter drum,

a pressure plate,

means for mounting said pressure plate in spaced relation to said idler drum for the acceptance of contaminated media therebetween,

means for advancing said pressure plate toward said idler drum to clamp said media therebetween, and

means for effecting rotation of said pressure plate and said idler drum, so as to effect advancement of said media and rotation of said filter drum.

5,112,486

MACHINE ELEMENT FOR USE IN LIQUID TREATING SYSTEM

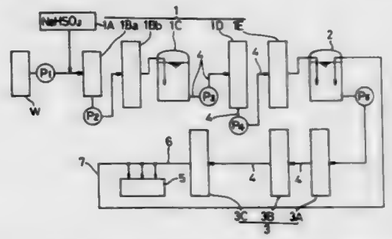
Goro Fujiwara; Mitsunobu Masuda; Masanori Shiraishi, and Nobuya Matsumoto, all of Osaka, Japan, assignors to Takuma Co., Ltd.; Suntory Limited, both of Osaka and Shinanen New Ceramic Corporation, Tokyo, all of, Japan

Continuation of Ser. No. 308,685, Feb. 9, 1989, abandoned. This application Jun. 28, 1990, Ser. No. 545,763

Claims priority, application Japan, Feb. 12, 1988, 63-31507

Int. Cl.[5] B01D *36/00*

U.S. Cl. 210—416.1 **3 Claims**



1. In a liquid treating system comprising liquid contacting structural machine elements of packings, o-rings, gaskets, films, plates, valves, filters, couplers, connectors, pipes, bolts, sealing members, pumps, couples and containers the improvement wherein a liquid-contact portion of at least one of said structural machine elements consists of a resin material having antibacterially active zeolite fine particles bonded with at least two metal ions selected from the group consisting of Ag and Zn ion in a ratio of about 1:3 or Ag ion with remaining exchange groups bonded with Na, Sn or Cu.

5,112,487

POROUS MEMBRANE AND PRODUCTION PROCESS THEREOF

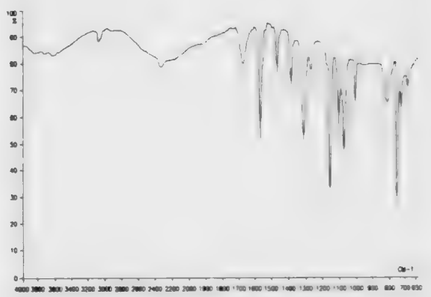
Yoshio Himeshima; Hideaki Tanisugi; Tetsuo Watanabe, all of Otsu; Tadahiro Uemura, Kyoto, and Masaru Kurihara, Otsu, all of Japan, assignors to Toray Industries, Inc., Japan

Filed May 29, 1990, Ser. No. 476,413

Claims priority, application Japan, Sep. 29, 1988, 63-245260; Oct. 14, 1988, 63-259830

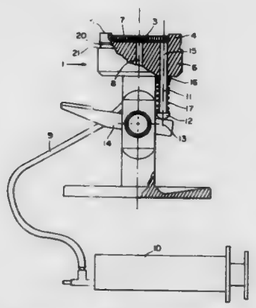
Int. Cl.[5] B01D *67/00*

U.S. Cl. 210—490 **20 Claims**



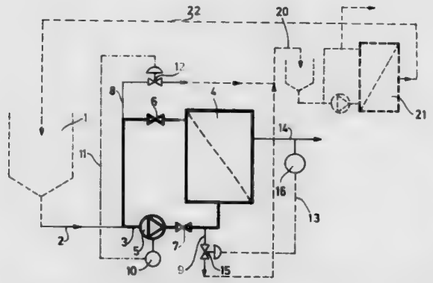
1. A porous membrane having heterogeneous structure, which consists essentially of a phenylenesulfide-based copolymer of the following formula $-(-Ph-S-Ph-X-)_q-$, wherein Ph represents phenylene group, X represents $-SO_2-$ or $-CO-$, and q represents an integer from 80–400.

5,112,488
FILTER MEMBRANE SUPPORT AND FILTRATION FUNNEL
Jean Lemonnier, Le Vesinet, France, assignor to Millipore Corporation, Bedford, Mass.
Filed Jun. 17, 1991, Ser. No. 717,241
Claims priority, application France, Jun. 28, 1990, 90 08171
Int. Cl.[5] B01D *61/20*
U.S. Cl. 210—541 **24 Claims**



1. A support apparatus for a filter membrane which comprises a central porous support section and a peripheral support section, said central porous support section adapted to support a central portion of a filter membrane and said peripheral support section adapted to support a peripheral portion of a filter membrane, a base support for said central support section and said peripheral support section, and means integral to said apparatus for sufficiently separating said central porous support section from said peripheral support section for enabling said filter to be detached intact from said peripheral support section and to be grasped by its edge intact during handling.

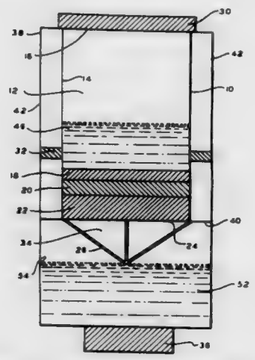
5,112,489
PROCESS AND UNIT FOR CLARIFICATION OF LIQUIDS
Eduard Hartmann, Schneisingen, Switzerland, assignor to Bucher-Guyer AG Maschinenfabrik, Niederweningen, Switzerland
Filed Jul. 3, 1991, Ser. No. 725,084
Claims priority, application Switzerland, Jul. 4, 1990, 02216/90
Int. Cl.[5] B01D *61/14, 61/18, 61/22*
U.S. Cl. 210—637 **18 Claims**



1. Process for clarification of liquids, especially raw juice from plant products and products produced by bioengineering, by continuous crosscurrent filtration, especially microfiltration and ultrafiltration with a high solid portion in the retentate circulating circuit, characterized in that during the starting phase at least one additional retentate discharge from the retentate circulating circuit takes place, which is relatively small in comparison with retentate discharge occurring during the stationary operating phase sufficient to renew the retentate in the retentate circulating circuit during the starting phase for improving filtration output.

15. An apparatus for the clarification of liquids, particularly raw juices from plant products and products produced by bioengineering, comprising a cross current filtration device having at least one stage and having a retentate side and a permeate side, a retentate circuit connected to said retentate side of said cross current filtration device, a source of raw juice connected to said retentate circuit, a first retentate discharge pipe connected to said retentate circuit adjacent its outlet from the cross current filtration device to remove retentate during a stationary operating phase, a second retentate discharge pipe connected to said retentate circuit downstream of said first retentate discharge pipe, the cross sectional area of said first retentate discharge pipe being several times greater than that of the second retentate discharge pipe such that a limited amount of retentate is removed through said second retentate pipe during the starting phase sufficient to renew the retentate in the retentate circulating circuit during the starting phase for improving filtration output.

5,112,490
SAMPLE FILTRATION, SEPARATION AND DISPENSING DEVICE
Jon Turpen, 230 Jumping Brook Dr., Toms River, N.J. 08753
Division of Ser. No. 193,348, May 12, 1988, Pat. No. 5,000,922, which is a continuation-in-part of Ser. No. 831,253, Feb. 19, 1986, abandoned. This application Jan. 4, 1991, Ser. No. 637,644
Int. Cl.[5] B01D *61/18, 69/06*
U.S. Cl. 210—645 **2 Claims**

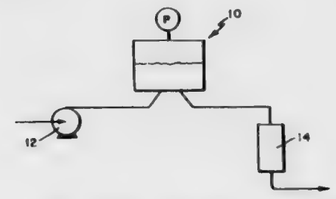


1. A method of dispensing a predetermined amount of a sample comprising blood plasma and at least one reagent from a membrane into a fluid, wherein said at least one reagent is capable of reacting with said blood plasma and said fluid, said method comprising:
exposing a predetermined area of a surface of said membrane containing said sample to contact with said fluid; and
vortexing said fluid to a predetermined velocity for a predetermined time, whereby said fluid contacts said membrane and said sample contained on said surface of said membrane, whereby a predetermined amount of said sample is dispensed from said membrane into said fluid.

5,112,491
MANAGEMENT OF WASTE SOLUTION CONTAINING PHOTORESIST MATERIALS
John W. Strantz, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 1, 1991, Ser. No. 663,004
Int. Cl.[5] B01D *61/00*
U.S. Cl. 210—651 **19 Claims**

1. A process for removing photoresist material, color and COD from a non-aged waste solution obtained from the treatment of photoresist material by a treating solution containing an alkalizing agent and an antifoam agent comprising feeding the non-aged waste solution to the feedside of a membrane at sufficient pressure to cause a permeate to pass through the membrane, the membrane being a thin-film piperazine-based membrane modified to increase MWCO for uncharged organic molecules sufficiently so that, on a weight basis, alkalizing agent passage is greater than 90 percent, photoresist material rejection is essentially complete, color rejection is greater than 95 percent and COD rejection is greater than 80 percent.

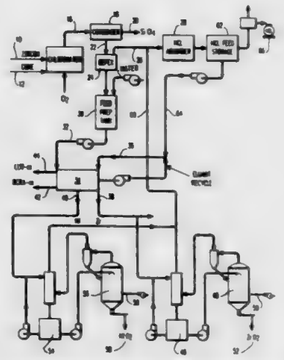
5,112,492
AUTOMATED BUBBLE TRAP
Thomas C. Ransohoff, Fairfield, Conn., assignor to Biotage Inc., Charlottesville, Va.
Filed Dec. 11, 1990, Ser. No. 625,506
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—656 **2 Claims**



1. An automated method of trapping air in a liquid chromatography system comprising the steps of supplying a liquid to a liquid chromatography column via a reservoir, maintaining the level of the liquid in the reservoir between lower and upper elevations, automatically interrupting the supply of liquid to the column in the event the liquid level falls below the lower elevation, supplying liquid to the reservoir, and automatically restoring the supply of liquid to the column in the event the liquid level reaches the upper elevation within a predetermined elapsed time.

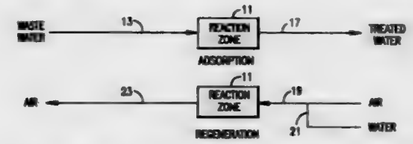
5,112,493
ZIRCONIUM-HAFNIUM PRODUCTION IN A ZERO LIQUID DISCHARGE PROCESS
Thomas S. Snyder, Oakmont, Pa., and Ernest D. Lee, Ogden, Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 10, 1990, Ser. No. 624,782
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—656 **18 Claims**

1. A zero liquid discharge, continuous process for separating and purifying zirconium and hafnium which substantially eliminates waste disposal problems comprising:
(a) preparing a concentrated aqueous zirconium and hafnium-containing feed solution;
(b) loading said feed solution into a resin medium at a first point on a continuous annular chromatograph;
(c) feeding an aqueous acid eluant to said resin medium at a second point angularly displaced from said first point on said chromatograph to elute said feed solution;
(d) continuously rotating said chromatograph during steps (b) and (c) while said feed solution and said eluant diffuse through said resin medium;
(e) separately collecting a substantially pure zirconium fraction, a substantially pure hafnium fraction and at least one waste fraction at locations on the annular chromatograph angularly and longitudinally displaced from said first point;



(f) further separately processing said zirconium fraction and said hafnium fraction to produce nuclear quality zirconium metal and hafnium metal;
(g) subjecting said waste fraction to volume reduction and disposing of said waste fraction as a dry solid; and
(h) recycling said acid eluant for reuse in step (c).

5,112,494
REMOVAL OF CYANIDE FROM WATER
Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.
Filed Sep. 3, 1991, Ser. No. 754,087
Int. Cl.[5] C02F *1/28, 1/74*
U.S. Cl. 210—668 **20 Claims**



1. A method of removing cyanides from a cyanide-containing waste water comprising the steps of:
(a) feeding said cyanide-containing waste water into a reaction zone containing a porous solid substrate having a water insoluble metal compound deposited thereon;
(b) contacting said waste water with said substrate which adsorbs the cyanide from said waste water; and
(c) discharging the waste water from the reaction zone whereby said waste water is substantially free of said cyanide.

5,112,495
METHOD OF CLEANING UP PETROLEUM OIL SPILLS
John Bartha, 6805 Louise Ave., Van Nuys, Calif. 91406, and Gyorgy Csapo, 33, Boszormenyi U., Hungary
Filed Sep. 27, 1990, Ser. No. 588,791
Int. Cl.[5] E02B *15/04*
U.S. Cl. 210—691 **12 Claims**

1. A method of cleaning up petroleum oil spills, said method comprising:

a) spraying a surface covered with a petroleum oil spill slick with molten hydrocarbon wax, said was floating on said surface;
b) solidifying said wax on said surface;
c) removing the solidified wax with entrained petroleum oil trapped thereon from said surface to clean said surface; and,
d) heating said solidified wax with entrained petroleum oil above the melting point of said wax and decanting molten wax from said petroleum oil for reuse in said method.

5,112,496

METHODS FOR INHIBITION OF SCALE IN HIGH BRINE ENVIRONMENTS

Balram Dhawan; Derek Redmore, and John L. Przybylinski, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

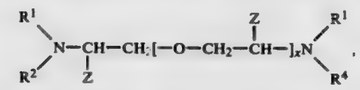
Continuation-in-part of Ser. No. 502,191, Mar. 30, 1990, abandoned, which is a division of Ser. No. 368,699, Jun. 15, 1989, Pat. No. 4,931,189, which is a division of Ser. No. 266,449, Nov. 2, 1988, abandoned. This application Mar. 5, 1991, Ser. No. 664,900

The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.

Int. Cl.[5] C02F *5/14*

U.S. Cl. 210—700 **2 Claims**

1. A method for inhibiting oilfield scale formation including calcite in a high brine environment comprising introducing an effective amount of a scale inhibiting composition to a high brine environment susceptible to calcite scale formation, said environment having a total dissolved solids content of at least about 150 g/l, and said scale inhibiting composition comprising an aminomethylene phosphonate of the formula



wherein x is 2 or 3, each Z is independently selected from the group consisting of H and CH_3, and R^1, R^2, R^3 and R^4 are independently selected from the group consisting of hydrogen and $—CH_2PO_3M_2$ wherein the M's are independently selected from the group consisting of hydrogen and cations associated with Lewis bases, such that at least about 80% of the R^1, R^2, R^3 and R^4 in the composition is $—CH_2PO_3M_2$.

5,112,497

APPARATUS FOR SALVAGING AND REMOVING MARINE OIL SPILLS

Thomas C. Braid, 3146 Marion Way, Nanaimo, British Columbia, Canada V9T 1J1

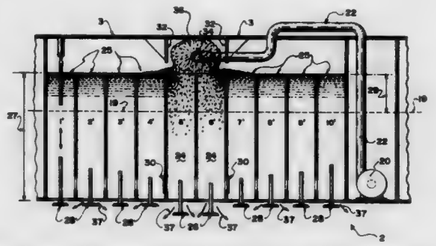
Division of Ser. No. 522,988, May 14, 1990. This application Feb. 28, 1991, Ser. No. 662,631

Claims priority, application Canada, Jun. 27, 1989, 603973

Int. Cl.[5] C02F *1/40*

U.S. Cl. 210—708 **6 Claims**

1. A method of separating oil from an oil-water mixture which comprises directing two flows of an oil-water mixture from substantially opposite directions against one another and at substantially equal velocity, without intervening baffles between the two flows and at a position above a container, the two flows being directed against each other at a velocity sufficient to disperse the oil into small particles and to reduce the net velocity of the opposed flows to substantially zero, whereby the oil and water of the two flows fall into the container with a substantial number of the oil particles floating on the surface of the water within the container.



5,112,498

METHOD OF COALESCING A DISPERSE PHASE WITHIN A CONTINOUS PHRASE OF A FLUID MIXTURE

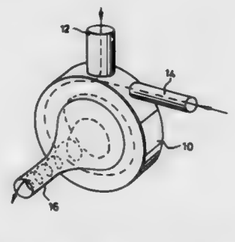
Simon R. H. Davies, Edinburgh, Scotland, assignor to Orkney Water Test Centre Limited, England

Filed Nov. 28, 1990, Ser. No. 619,221

Claims priority, application United Kingdom, Nov. 28, 1989, 8926890

Int. Cl.[5] C02F *1/38*

U.S. Cl. 210—708 **9 Claims**



1. A method of coalescing a disperse phase within a continuous phase of a fluid mixture comprising the steps of:
(a) supplying said fluid mixture to a primary inlet of a coalescing device;
(b) passing said fluid mixture from said primary inlet to a substantially cylindrical chamber of said coalescing device, said primary inlet being arranged substantially radially of said chamber;
(c) introducing a fluid to said chamber via a secondary inlet of said coalescing device, said secondary inlet being arranged substantially tangentially to said chamber, thereby setting said fluid mixture into rotating motion within said chamber; and
(d) allowing said fluid and said fluid mixture to exit said chamber via an outlet of said coalescing device having a longitudinal axis arranged coaxially with said chamber, such that said exiting fluid and fluid mixture are caused to spin about said longitudinal axis to cause coalescing of said disperse phase.

5,112,499

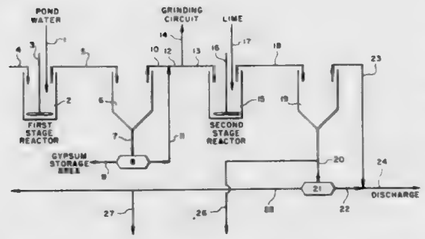
PROCESS FOR TREATING POND WATER

Michael A. Murray, Harvey, and Charles W. Weston, Prairieville, both of La., assignors to Freeport-McMoran Resource Partners, Limited Partnership, New Orleans, La.

Filed May 22, 1991, Ser. No. 704,203

Int. Cl.[5] C02F *1/60, 1/52*

U.S. Cl. 210—713 **13 Claims**



1. A two-stage process for treating gypsum pond water from wet process phosphoric acid plants, wherein the pond water has a pH of less than 2.3 and contains compounds of fluorides and phosphates in solution, to produce partially treated pond water suitable for use in the wet grinding circuits of the phosphoric acid plants and fully treated pond water for discharge, comprising:
a. transferring gypsum pond water to a first stage reaction vessel of a first stage comprising said first stage reaction vessel and a solids-liquid separation device;
b. admixing in the first stage reaction vessel said gypsum pond water with sufficient concentrated aqueous slurry of recycled calcium phosphate solids having a pH of 6 to 10, to obtain a partially treated pond water slurry with a pH of 2.4 to 3.5, wherein said pH is sufficiently low to cause the calcium phosphate to dissolve and sufficiently high enough to cause partial precipitation of fluoride and silica compounds as CaF_2 and SiO_2;
c. transferring the partially treated pond water containing the CaF_2 and SiO_2 precipitates to the solids-liquid separation device of the first stage and separating the CaF_2 and SiO_2 precipitates from the pond water slurry and recovering a partially treated pond water of pH 2.4 to 3.5 with lowered fluoride compound content but containing, in solution, substantially all the phosphate compounds originally contained in the gypsum pond water;
d. forwarding a portion of the partially treated pond water to a reaction vessel of a second stage comprising a second stage reaction vessel and a solids-liquid separation device;
e. adding sufficient lime to the partially treated pond water contained in the second stage reaction vessel to adjust the pH to about 6 to 10 thereby causing the precipitation of calcium phosphate and producing a dilute aqueous slurry of calcium phosphate solids;
f. transferring the dilute aqueous slurry of calcium phosphate to the solids-liquid separation device of the second stage and separating a concentrated aqueous slurry of calcium phosphate solids from the dilute aqueous slurry of calcium phosphate solids to produce a fully treated pond water of pH 6 to 10, wherein said water is suitable for disposal; and
g. recycling all or a part of the concentrated aqueous slurry containing calcium phosphate solids to the first stage reaction vessel of Step (b).

5,112,500

PURIFICATION OF AQUEOUS LIQUOR

Graham Jones, Ontario, Canada, assignor to Allied Colloids Limited, England

Filed Jun. 29, 1990, Ser. No. 546,436

Int. Cl.[5] C02F *1/56*

U.S. Cl. 210—728 **4 Claims**

1. A process in which suspended solids are separated from an aqueous suspension and comprising providing a cationic polymeric organic coagulating flocculant that contains quaternary ammonium groups and that has intrinsic viscosity up to 3 dl/g and that is in the form of dry solid particles that are individual particles or aggregates of particles that have a size of at least 90% by weight 30 μm to 1 mm and selecting a desired dosage of the dry solid particles within the range of 0.1–20 mg/l suspension, providing an anionic polymeric organic bridging flocculant that contains carboxylic or sulphonic acid groups in the form of an alkali metal salt and that has intrinsic viscosity above 5 dl/g and that is counterionic to the cationic flocculant and that is incompatible in solution with the cationic flocculant and that is in the form of dry solid particles that are individual particles or aggregates of particles that have a size of at least 90% by weight 30 μm to 1 mm and selecting a desired dosage of the dry solid particles within the range of 0.1–20 mg/l suspension, adding the selected dosages of the anionic and cationic particulate flocculants substantially simultaneously to the suspension as a premixed blend, and mixing the particles into the suspension and thereby dissolving the solid flocculants and flocculating the suspension, and separating the resultant flocculated material from the suspension.

5,112,501

METHOD FOR REDUCING INDUSTRIAL OR URBAN EFFLUENT COD

Riccardo Rausa; Vincenzo Calemma, and Roberto Menicagli, all of San Donato Milanese, Italy, assignors to Eniricerche S.p.A., Milan, Italy

Filed Mar. 5, 1990, Ser. No. 488,659

Claims priority, application Italy, Mar. 10, 1989, 19735 A/89

Int. Cl.[5] C02F *1/54*

U.S. Cl. 210—730 **4 Claims**

1. A method of reducing industrial or urban effluent chemical oxygen demand due to the presence of organic material comprising:
a) adjusting the pH of the effluent to between 1 and 3.5;
b) treating said adjusted effluent with an aqueous solution of alkaline salts, ammonium salts or a mixture of alkaline and ammonium salts of humic acids, at a concentration of no more than 2000 mg/l of effluent and in the absence of inorganic flocculating agents, said salts being prepared by the dry oxidation of coal with oxygen, nitrogen, or a mixture of oxygen and nitrogen at a temperature of between 120° and 350° C. at an oxygen partial pressure of between 0.1 and 10 atmospheres for a contact time of between 15 and 600 minutes, and thereafter extracting the crude oxidation product with an alkaline solution, an ammoniacal solution or a mixture of said alkaline and ammoniacal solutions.

5,112,502

HOMOGENEOUS SUBSTITUTION METHOD AND APPARATUS FOR CAKE USING FILTER PRESS

Kazuo Satoh; Koichiro Sekine; Kou Kakisada, and Minoru Morita, all of Tokyo, Japan, assignors to Tsukishima Kikai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 500,386, Mar. 27, 1990. This application Jul. 18, 1991, Ser. No. 732,740

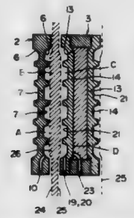
Int. Cl.[5] B01D *25/164, 25/28*

U.S. Cl. 210—770 **2 Claims**

1. A homogeneous substitution washing method for a cake using a filter press which comprises a plurality of pairs of opposed squeezed and squeezing filtering plate units, a plural-

ity of pairs of opposed squeezed and squeezing filtering cloths, each pair of said pairs of squeezed and squeezing filtering cloths being arranged between a corresponding pair of said pairs of squeezed and squeezing filtering plate units, and a plurality of diaphragms, each of said diaphragms being arranged on each side opposed to the squeezed filtering plate unit of the squeezing filtering plate unit or a corresponding pair of said pairs of squeezed and squeezing filtering plate units, the homogeneous substitution washing method comprising the steps of:

supplying stock solution into a space between the pair of squeezed and squeezing filtering cloths,



pressurizing and dehydrating the stock solution using the diaphragm to form the cake, and

wash-processing the cake to obtain a clean raw material;

wherein the wash-processing step comprises the step of:

in parallel with the pressurizing and dehydrating step, pouring a washing liquid into a space between the diaphragm and the squeezing filtering cloth abutted against the diaphragm, at a pressure at least equal to a pressurizing and dehydrating pressure applied to the stock solution through the diaphragm, to wash the cake between the pair of squeezed and squeezing filtering cloths.

5,112,503

MODULAR FILTER ASSEMBLY

Stuart M. Raifman, Sharon, Mass., assignor to Systems Engineering and Manufacturing Corp., Stoughton, Mass.

Filed Apr. 9, 1990, Ser. No. 507,045

Int. Cl.[5] B01D *25/02*

U.S. Cl. 210—777 **23 Claims**



1. A modular filter assembly comprising a filter stack having a plurality of filter sheets and a plurality of filter support plates each having a perimeter and an internal filter flow passageway portion, with said stack having a top and a bottom,

each of said sheets being sandwiched between surrounding plates to form said stack with said filter flow passageway portions being aligned to form a filter flow passageway extending through said filter sheets and said support plates from top to bottom and said stack having a minimized top to bottom dimension,

said support plates comprising a fluid exposure chamber on one side thereof and a fluid collection chamber on another side thereof, and further defining outer fluid flow slots on said periphery of each plate on a first side of each plate and inner fluid flow slots on a second side of each plate; and

an integral mating engaging means for aligning said plates with said filters sandwiched between successive plates and for applying a clamping force at the periphery of each plate by means of said integral mating means to seal each filter between each pair of plates and maintain said stack position.

5,112,504

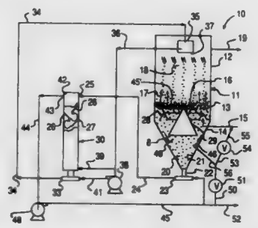
SYSTEM AND METHOD OF DECREASING WASTE FLUID IN CONTINUOUS BACKWASH FILTRATION

Bruce R. Johnson, Salt Lake City, Utah, assignor to Baker Hughes Incorporated, Houston, Tex.

Filed May 22, 1991, Ser. No. 703,978

Int. Cl.[5] B01D *24/28, 24/46*

U.S. Cl. 210—792 **17 Claims**



11. In a method for filtering a liquid-solids feed stream supplied through a feed inlet to a filter media bed in a vessel, the stream flowing, during the filtration thereof, through said bed and being discharged from the media bed as cleaned effluent, and wherein the filter media of the filter bed during filtration flows downwardly and is transported from the filter media bed through a dirtied media outlet in the vessel to a washing section for separating contaminants from the dirtied filter media and wherein the cleaned filter media is returned to a top surface of the filter bed and a contaminants-containing washing fluid is transported as a waste stream to waste, the improvement comprising recycling a portion of the waste stream to a location in said vessel between said dirtied media outlet and said feed inlet.

5,112,505

CERTAIN DITHIOCARBAMATES AND METHOD OF USE FOR REDUCING ASPHALTENE PRECIPITATIO IN ASPHALTENIC RESERVOIRS

Irwin C. Jacobs, Eureka, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 321,602, Mar. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 22,704, Mar. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 863,645, May 15, 1986, abandoned. This application Sep. 13, 1990, Ser. No. 581,856

Int. Cl.[5] C09K *7/00, 7/02, 7/06*

U.S. Cl. 252—8.552 **10 Claims**

1. Method of reducing asphaltene precipitation in an asphaltenic reservoir treated with a strong acid solution which comprises the steps of (a) dispersing within said acid a compound represented by the formula:

$$R\ [(CH_2)_n\ ]_x[(CH_2)_n\ ]_y[(CH_2)_n\ ]_z—H$$

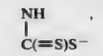
wherein:

R represents alkyl, alkenyl or alkadienyl radicals having from 8 to 25 carbon atoms;

n is an integer of 2 or 3;

x, y, and z are independently zero or 1 with the proviso that the sum of x+y+z is 1, 2, or 3;

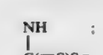
(N_1), (N_2), (N_3), and (N_4) are independently



NH, or NH_2+ with the proviso that when (N_1) is not



then (N_2), (N_3), and (N_4) must be



with the proviso that when the compound has a net negative charge, then the compound is associated with at least one acceptable counterion in an amount effective to sequester a significant amount of ferrous iron and (b) treating said reservoir with said strong acid in the presence of an anti-sludging agent.

5,112,506

OVERBASED METAL SULPHONATE COMPOSITION

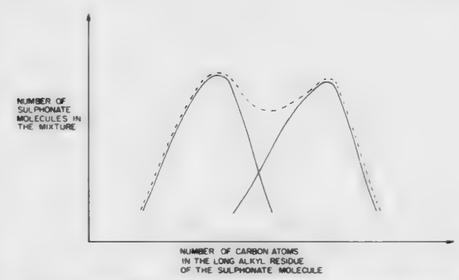
John F. Marsh, Abingdon, United Kingdom; Marc R. M. Vernet, Andresy, France, and Graham W. Hamey, Radley, United Kingdom, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Oct. 11, 1988, Ser. No. 255,886

Claims priority, application United Kingdom, Oct. 12, 1987, 8723907

Int. Cl.[5] C10M *159/24*

U.S. Cl. 252—33.4 **19 Claims**



1. An overbased calcium sulphonate composition comprising a liquid vehicle and

(A) at least one calcium alkyl aryl sulphonate containing 1 to 3 alkyl groups, one of which alkyl groups contains an average number of carbon atoms of at least 40 while any remaining alkyl groups contain less than 10 carbon atoms, and

(B) at least one calcium alkyl aryl sulphonate containing 1 to 3 alkyl groups, one of which alkyl groups contains an average number of carbon atoms of 10 to 33 while any remaining alkyl groups contain less than 10 carbon atoms.

5,112,507

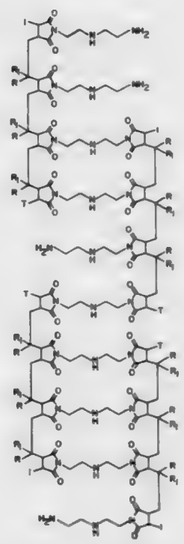
POLYMERIC DISPERSANTS HAVING ALTERNATING POLYALKYLENE AND SUCCINIC GROUPS

James J. Harrison, Novato, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 251,613, Sep. 29, 1988, abandoned. This application Sep. 29, 1989, Ser. No. 414,993

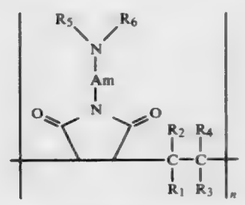
Int. Cl.[5] C10M *149/10;* **C10L** *1/22*

U.S. Cl. 252—51.5 A **68 Claims**



1. A copolymer of an unsaturated acidic reactant and a high molecular weight alkylvinylidene olefin having a sufficient number of carbon atoms such that the resulting copolymer is soluble in lubricating oil and wherein the olefin has at least about 1 branch per 2 carbon atoms along the chain.

43. A compound of the formula:



wherein n is one or greater, AM has from about 0 to about 10 amine nitrogen atoms and from about 2 to about 40 carbon atoms; and R_1, R_2, R_3 and R_4 are selected from hydrogen, lower alkyl of 1 to 6 carbon atoms and high molecular weight polyalkyl; wherein either R_1 and R_2 are hydrogen and one of R_3 and R_4 is lower alkyl and the other is high molecular weight polyalkyl, or R_3 and R_4 are hydrogen and one of R_1 and R_2 is lower alkyl and the other is high molecular weight polyalkyl; and R_5 and R_6 are independently hydrogen, lower alkyl of 1 to 6 carbon atoms, phenyl or taken together are alkylene of 3 to 6 carbon atoms to give a ring, and wherein the high molecular weight polyalkyl has at least about 1 branch per 2 carbon atoms along the chain.

5,112,508

VI IMPROVER, DISPERSANT, AND ANTIOXIDANT ADDITIVE AND LUBRICATING OIL COMPOSITION

Thomas F. DeRosa, Passaic, N.J.; Ronald W. Von Allmen, Glenham, N.Y.; Benjamin J. Kaufman, Hopewell Junction, N.Y., and Rosemary J. Jennejahn, Nelsonville, N.Y., assignors to Texaco, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 516,376, Apr. 30, 1990, abandoned. This application Sep. 24, 1990, Ser. No. 587,135

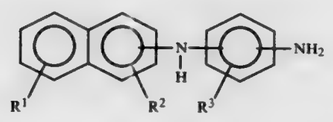
Int. Cl.[5] C10M *149/06*

U.S. Cl. 252—51.5 A **24 Claims**

1. An additive composition prepared by the steps comprising:

(a) reacting a polymer prepared from ethylene and at least one C_3 to C_{10} alpha-monoolefin and, optionally, a polyene selected from non-conjugated dienes and trienes with at least one olefinic carboxylic acid acylating agent to form one or more acylating reaction intermediates characterized by having a carboxylic acid acylating function within their structure and comprising from about 15 to 80 mole percent of ethylene, from about 20 to 85 mole percent of said C_3 to C_{20} alpha-monoolefin, and from about 0 to 15 mole percent of said polyene, and

(b) reacting said reaction intermediate in (a) with a hydrocarbon substituted or unsubstituted N-naphthylphenylenediamine represented by the formula:



in which R^1, R^2 and R^3 are hydrogen or a linear or branched hydrocarbon radical containing from 1 to 10 carbon atoms that may be alkyl, alkenyl, alkoxyl, alkaryl, aralkyl, hydroxyalkyl, or aminoalkyl.

5,112,509

NON-DISPERSANT, SHEAR-STABILIZING, AND WEAR-INHIBITING VISCOSITY INDEX IMPROVER

Edward C. Brink, Jr.; Clifton C. Henderson; James R. Whiteman, all of Port Arthur, Tex., and Henry K. Sowers, Greenville, N.C., assignors to Texaco, Inc., White Plains, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,202

Int. Cl.[5] C10M *145/16, 145/14*

U.S. Cl. 252—56 R **12 Claims**

1. A method of making a methyl methacrylate-lauryl methacrylate copolymer for use as a non-dispersant, shear-stabilizing, Viscosity Index-improving and wear inhibiting additive in hydraulic fluids and lubricating oils, said method comprising:

(a) first reacting a weight ratio of 10–20 parts methyl methacrylate to 80–90 parts lauryl methacrylate in the presence of 1.0–2.0 weight percent of an alkyl mercaptan at a temperature of 150°–200° F.;

(b) further reacting the reaction product of step (a) in the presence of 0.01–1.0 weight percent of azobis(isobutyronitrile) catalyst at a temperature of 150°–200° F.; and

(c) thereafter heating the reaction product of step (b) at a temperature of 200°–300° F.

5,112,510

CARBOXYLATE POLYMER AND VISCOSITY INDEX IMPROVER CONTAINING OLEAGINOUS COMPOSITIONS

Albert Rossi, Warren, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 28, 1989, Ser. No. 316,728

Int. Cl.[5] C10M *157/10*

U.S. Cl. 252—56 R **106 Claims**

1. A lubricating oil composition comprising lubricating oil and

(i) an amount effective to improve the low temperature flow properties of said lubricating oil composition of additive consisting essentially of at least one low molecular weight non-ethylene containing polymer of interpolymer containing pendent ester groups comprising repeating methylene units derived from mixture of aliphatic alcohols, said mixture containing at least about 35 weight percent C_{14} alcohol; and

(ii) an amount effective to improve the viscosity index of said lubricating oil composition of additive comprising copolymer of ethylene and at least one other alpha-olefin monomer, said copolymer comprising intramolecularly heterogeneous copolymer chains containing at least one crystallizable segment of methylene units and at least on e low crystallinity ethylene-alphaolefin copolymer segment, wherein said at least one crystallizable segment comprises at least about 10 weight percent of said copolymer chain and contains an average ethylene content of at least about 57 weight percent, wherein said low crystallinity segment contains an average of not greater than about 53 weight percent ethylene, and wherein said copolymer has a molecular weight distribution wherein at least the ratio of $\overline{M}w/\overline{M}n$ is less than 2 or the ratio of $\overline{M}z/\overline{M}w$ is less than 1.8, and wherein at least two portions of an individual intramolecularly heterogeneous chain, each portion comprising at least 5 weight percent of said chain, differ in composition from one another by at least 7 weight percent ethylene.

5,112,511

ELECTROLYTE FOR ELECTROLYTIC CAPACITOR

Fumihiko Shinozaki, and Yutaka Yokoyama, both of Ome, Japan, assignors to Nippon Chemi-Con Corporation, Tokyo, Japan

Filed Oct. 10, 1986, Ser. No. 917,637

Claims priority, application Japan, Dec. 28, 1985, 60-293660; Dec. 28, 1985, 60-293661

The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.

Int. Cl.[5] H01G *4/04*

U.S. Cl. 252—62.2 **6 Claims**

1. An electrolyte for electrolytic capacitors containing within an aprotic solvent a hexafluorophosphate of an organic amine compound as solute; wherein said organic amine compound is a compound containing one or two pyridine rings; or a primary, secondary, or tertiary amine; or a quaternary ammonium compound in which to a nitrogen atom is bonded 1 to 4 alkyl, alkenyl or aryl groups and 1 to 3 hydrogen atoms.

5,112,512

SOLID POLYMER ELECTROLYTE OF AN ORGANOPOLYSILOXANE CROSSLINKED WITH POLYALKYLENE OXIDE

Takashi Nakamura, Chiba, Japan, assignor to Dow Corning Toray Silicone Company, Ltd., Tokyo, Japan

Filed Sep. 18, 1990, Ser. No. 584,543

Claims priority, application Japan, Sep. 28, 1989, 1-252690

Int. Cl.[5] H01B *1/12;* **C08G** *77/46*

U.S. Cl. 252—62.2 **8 Claims**

1. Ionically conductive material which comprises crosslinked copolymer prepared by the reaction of

(A) organopolysiloxane and polyoxyalkylene copolymer which has at least 2 silicon-bonded hydrogen atoms in each molecule with

(B) polyoxyalkylene having at least 2 aliphatically unsaturated hydrocarbon groups in each molecule, and

(C) metal ion from Group I or Group II of the Periodic Table,

wherein said metal ion is dispersed in said crosslinked copolymer, the material having been cured by heating at from room temperature to 150° C.

5,112,513

SOLUTION AND PROCESS FOR ETCHING AND ACTIVATING SURFACES OF A NONCONDUCTIVE SUBSTRATE

Burkhard Bressel; Hans-Joachim Grapentin, and Detlef Tessmann, all of Berlin, Fed. Rep. of Germany, assignors to Schering AG, Berlin, Fed. Rep. of Germany

Filed May 10, 1989, Ser. No. 349,700

Claims priority, application Fed. Rep. of Germany, May 10, 1988, 3816494

Int. Cl.[5] B05D *3/00, 5/00*

U.S. Cl. 252—79.1 **3 Claims**

1. An aqueous solution for etching and activating a surface of a nonconductive substrate, said aqueous solution consisting essentially of both an activator and an etching agent and being used to prepare said surface for subsequent deposition of a metal coating, the subsequent deposition including chemical deposition, wherein said activator consists essentially of at least one compound selected from the group consisting of salts containing a metal from groups Ib and VIII of the periodic table and cyanocomplexes containing a metal from groups Ib and VIII of the periodic table and said etching agent is selected from the group consisting of aqueous akaline solutions of manganate ion, aqueous alkaline solutions of permanganate ion and mixtures thereof, wherein said salts are selected from the group consisting of nitrates, sulfates and halides.

5,112,514

OXIDANT DETERGENT CONTAINING STABLE BLEACH ACTIVATOR GRANULES

Steven A. Bolkan, Pleasanton; Kelly J. Brodbeck, Danville; Kevin J. Brodbeck, Pleasanton; David L. Deleeuw, San Ramon; Dale S. Steichen, Byron; Bruce B. Strand, Pleasanton; Richard J. V. Suk, Newark; Kathleen D. Szuch, Walnut Creek, and Alfred G. Zielske, Pleasanton, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Division of Ser. No. 258,225, Oct. 14, 1988, Pat. No. 5,002,691, and a continuation-in-part of Ser. No. 928,070, Nov. 6, 1986, Pat. No. 4,778,618. This application Mar. 25, 1991, Ser. No. 675,240

The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.

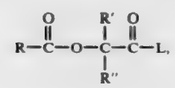
Int. Cl.[5] C11D *7/38;* **C01B** *15/00;* **C09K** *3/00*

U.S. Cl. 252—99 **9 Claims**

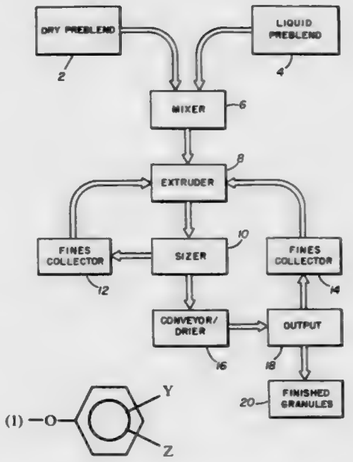
1. An activated oxidant detergent comprising:

a) bleach activator granules comprising:

i) a peroxygen bleach activator having the structure:



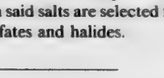
wherein R is C_{1-20} branched or straight chain alkyl, cycloalkyl, alkenyl, aryl, alkylaryl; R′ and R″ are independently H, C_{1-4} alkyl; and L is a leaving group selected from the group consisting of:



wherein Y and Z are individually H, SO_3M, SO_4M, OH, halo substituent, OR^1, R^2, $NR^3{}_3X$, and mixtures thereof, wherein M is an alkali metal or alkaline earth metal counterion, R^1 of OR^1 is C_{1-20} alkyl, R^2 is C_{1-6} alkyl, R^3 of $NR^3{}_3$ is C_{1-30} alkyl and X is a counterpart ion thereto, and Y and Z can be the same or different;

(2) halide;

—ONR^4, wherein R^4 contains at least one carbon which is singly or doubly bonded directly to N;



wherein R^5 is a C_{1-10} alkyl; and (4) mixtures thereof;

ii) a pliable binding material selected from materials having a melting completion temperature of greater than about 40° C.; and, optionally,

iii) a filler material;

b) a detergent base which comprises:

i) builders;

ii) fillers;

iii) a surfactant selected from the group consisting of anionic, nonionic, cationic, amphoteric, zwitterionic surfactants, and mixtures thereof; and

c) a bleach-effective amount of a source of hydrogen peroxide, which acts in combination with the activator granules of a).

5,112,515

PHENOTHRIN SHAMPOO

Ian R. Buxton; Sandra T. A. Malkowska; Derek A. Prater; Deborah L. Singh; Stewart T. Leslie, all of Cambridge, United Kingdom, and Ronald B. Miller, Basel, Switzerland, assignors to Euroceltique, S.A., Luxembourg

Filed Feb. 5, 1991, Ser. No. 650,677

Claims priority, application United Kingdom, Feb. 9, 1990, 9003017

Int. Cl.[5] C11D *3/48;* **A61K** *7/06*

U.S. Cl. 252—106 **13 Claims**

1. Lousicidal shampoo composition comprising a shampoo base comprising from about 5 to about 90 percent water and at least one surface active agent, said shampoo base having distributed therethrough a lousicidal effective amount of phe-

nothrin and an antimicrobial preservative effective amount of 2-bromo-2-nitropropane-1,3-diol alone or in combination with 2,4-dichlorobenzyl alcohol, said at least one surface active agent being in an amount effective to dissolve said phenothrin in said shampoo base.

5,112,516
HIGH TEMPERATURE FLASHPOINT, STABLE CLEANING COMPOSITION
A. Richard Koetzle, Rochester, N.Y., assignor to William D. Sheldon, III, Rochester, N.Y.
Filed Jan. 11, 1991, Ser. No. 640,219
Int. Cl.[5] C11D *7/22, 7/32, 7/50*
U.S. Cl. 252—162 **20 Claims**

1. A cleaning composition comprised of:
10 to 35 weight percent terpene alcohol, wherein said terpene alcohol contains no significant amount of alpha pinene or beta pinene;;
1 to 35 weight percent of a surfactant; and the balance of said composition being water.

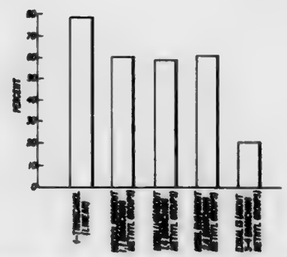
5,112,517
CLEANING COMPOSITIONS COMPRISING DICHLOROTRIFLUOROETHANES AND ALKANOLS
Hans Buchwald, Ronnenberg; Andreas Brackmann, Hanover, and Boleslaus Raschkowski, Wiedensahl, all of Fed. Rep. of Germany, assignors to Kalie-Chemie AG, Hanover, Fed. Rep. of Germany
Filed Jul. 11, 1990, Ser. No. 550,975
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1989, 3924889
The portion of the term of this patent subsequent to May 19, 2009, has been disclaimed.
Int. Cl.[5] C11D *7/50, 7/30*
U.S. Cl. 252—171 **15 Claims**

1. A composition of matter which consists essentially of an azeotrope-like binary solvent mixture having a boiling point range of from 27° C. to 31° C. at atmospheric pressure and consisting essentially of from 99.5% to 98.0% by weight 1,1-dichloro-2,2,2-trifluoroethane (=R 123) and from 0.5% to 2.0% by weight ethanol, the total of the constituents being 100% by weight.

5,112,518
ENZYMATIC DISHWASHING COMPOSITION CONTAINING A CHLORINE-TYPE BLEACHING AGENT
Jan Klugkist, Vlaardingen, and Willem R. Van Dijk, Oud-Beijerland, both of Netherlands, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 364,740, Jun. 9, 1989, abandoned. This application Dec. 8, 1989, Ser. No. 449,134
Claims priority, application United Kingdom, Jun. 9, 1988, 8813688
Int. Cl.[5] C11D *3/386, 3/395*
U.S. Cl. 252—174.12 **8 Claims**

1. A dishwashing or rinsing composition comprising
(a) about 0.5 to 10% by weight of a surfactant;
(b) about 0.5 to 10% by weight of a chlorine-type bleaching agent; and
(c) a lipolytic enzyme in an amount in the range 0.005 to 100 lipase units per mg, dry wt., of the composition, wherein said lipolytic enzyme (c) is obtained by cloning the gene from Humicola lanuginosa and expressing this gene in Aspergillus oryzae, and wherein bleach component (b) is free of encapsulating agents or slow-release agents.

5,112,519
PROCESS FOR PRODUCTION OF BIODEGRADABLE SURFACTANTS AND COMPOSITIONS THEREOF
Thomas J. Giacobbe, Skillman, and George A. Ksenic, Edison, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Jun. 5, 1989, Ser. No. 361,628
Int. Cl.[5] C11D *1/66*
U.S. Cl. 252—174.21 **8 Claims**



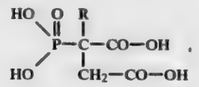
1. A process for the production of biodegradable surfactant comprising:
a) contacting C_3, C_4 olefins, or mixtures thereof, with ZSM-23 catalyst under oligomerization conditions to form oligomers having the formula $(C_3)_x$, $(C_4)_x$, or mixtures thereof, where x has the value of 1 to 10, said oligomers having an average of 0.8 to 2.0 methyl branches per 12 carbon atoms;
b) contacting step (a) oligomers with hydroformylating catalyst comprising tributyl phosphine modified cobalt carbonyl under hydroformylating conditions comprising temperature between 140° C. and 180° C. and pressure between 200 psig and 1000 psig to form a saturated alcohol containing an average of not more than 2.5 methyl branches per 12 carbon atoms;
c) reacting step (b) saturated alcohol with ethylene oxide, or derivative thereof, under ethoxylating conditions comprising temperature below 150° C. in contact with ethoxylating catalyst comprising potassium alcoholate; and
d) recovering a nonionic branched biodegradable surfactant containing an average of about 9 ethylene oxide recurring units.

5,112,520
METHOD FOR IMPROVING THE SOIL ANTI-REDEPOSITION PROPERTIES OF WASHING DETERGENTS AND PRODUCT
Thomas L. Krinski, Granite City, Ill., and Tam H. Tran, St. Louis, Mo., assignors to Protein Technologies International, Inc., St. Louis, Mo.
Filed Apr. 30, 1990, Ser. No. 516,178
Int. Cl.[5] C11D *7/32, 3/26, 3/382, 3/38*
U.S. Cl. 252—174.23 **15 Claims**

1. A laundry detergent having one or more surfactants and additive materials the improvement comprising, the addition of a soil anti-redeposition agent, which is a vegetable protein modified by reaction with an anionic or cationic monomer in an amount at least about 0.2% by weight to substantially reduce the amount of suspended soil which is redeposited on washed fabric during a wash cycle.

5,112,521
CALCIUM HYPOCHLORITE COMPOSITIONS CONTAINING PHOSPHONOBUTANE POLYCARBOXYLIC ACID SALTS
Richard M. Mullins, Madison; Richard B. Wood, Bristol, and John A. Wojtowicz, Cheshire, all of Conn., assignors to Olin Corporation, Cheshire, Conn.
Continuation-in-part of Ser. No. 419,237, Oct. 10, 1989, Pat. No. 5,004,549. This application Feb. 25, 1991, Ser. No. 661,380
Int. Cl.[5] C02F *5/10*
U.S. Cl. 252—180 **17 Claims**

1. A solid calcium hypochlorite composition comprising calcium hypochlorite and at least 0.005 percent by weight of an alkali metal salt of phosphonobutane polycarboxylic acid represented by the formula:



(I)

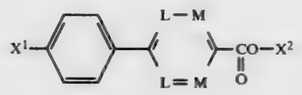
in which
R represents H or CHR′—CHR″—CO—OH,
R′ represents H, a lower alkyl group, or CO—OH, and
R″ represents H or a lower alkyl group,
the composition having an available chlorine concentration of at least 50 percent by weight.

5,112,522
MERCAPTAN CHAIN TRANSFER AGENT COMPOSITIONS USEFUL IN AQUEOUS POLYMERIZATIONS
Zaev Sharaby, Cleveland Heights, Ohio, assignor to The B. F. Goodrich Company, Brecksville, Ohio
Division of Ser. No. 854,203, Apr. 21, 1986, Pat. No. 4,918,151, and a continuation-in-part of Ser. No. 660,180, Oct. 12, 1984, abandoned. This application Apr. 16, 1990, Ser. No. 509,687
Int. Cl.[5] C09K *3/00*
U.S. Cl. 252—182.3 **4 Claims**

1. A chain transfer composition for the polymerization of vinyl chloride and vinyl esters consisting essentially of (a) at least one mercaptan chain transfer agent and (b) at least one vinyl ester which is miscible with said mercaptan and which is capable of being copolymerized with vinyl chloride monomer wherein the total amount of vinyl ester in the polymerization is from about 1 part to about 20 parts per 100 parts of vinyl chloride.

5,112,523
PHENYLPYRIMIDINECARBOXYLATE DERIVATIVE
Naoyuki Yoshida, Kamakura; Kisei Kitano, and Tetsuya Ogawa, both of Yokohama, all of Japan, assignors to Chisso Corporation, Japan
Division of Ser. No. 75,657, Jul. 20, 1987, Pat. No. 4,874,546, which is a continuation-in-part of Ser. No. 863,505, May 15, 1986, abandoned. This application Jun. 13, 1989, Ser. No. 365,306
Claims priority, application Japan, May 15, 1985, 60-103512; May 21, 1985, 60-108504
Int. Cl.[5] C09K *19/34;* **C07D** *239/02*
U.S. Cl. 252—299.61 **26 Claims**

14. A liquid crystal composition having at least two components, one of which is a phenylpyrimidinecarboxylate derivative expressed by the general formula



wherein X^1 represents an alkyl group or an alkoxy group each of 1 to 10 carbon atoms; X^2 represents a 4-substituted phenyl group having as a substituent a F, Cl, or Br atom or a cyano group at the 4-position or a 3,4-disubstituted phenyl group having a F, Cl, or Br atom or a cyano group at the 4-position and a F, Cl, or Br atom at the 3-position; L represents a N atom; and M represents a C atom.

5,112,524
UNACTIVATED YTTRIUM TANTALATE PHOSPHOR
Vaddi B. Reddy, Sayre, Pa., and Ha K. Cheung, Baltimore, Md., assignors to GTE Products Corporation, Stamford, Conn.
Filed Jul. 19, 1991, Ser. No. 732,886
Int. Cl.[5] C09K *11/78*
U.S. Cl. 252—301.4 R **6 Claims**

1. An unactivated yttrium tantalate phosphor having M prime monoclinic structure and containing one or more additives of Rb and Al in an amount of between about 0.001 to 0.1 moles per mole of yttrium tantalate to improve brightness under X-radiation.

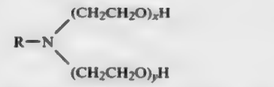
5. An unactivated yttrium tantalate phosphor having M prime monoclinic structure and containing additives of Sr in an amount of between 0.001 to 0.1 moles per mole of yttrium tantalate and one or more of Rb and Al in an amount of between 0.001 to 0.1 moles per mole of yttrium tantalate the phosphor exhibiting a greater brightness under X-radiation than said phosphor absent Rb and Al.

5,112,525
METHOD FOR MAKING A POST-FOAMING GEL
Alan Straw, Cheshire, and Roger D. Ellis, Lancashire, both of United Kingdom, assignors to Colgate-Palmolive Company, Piscataway, N.J.
Division of Ser. No. 131,222, Dec. 10, 1987, Pat. No. 4,915,881. This application Feb. 7, 1990, Ser. No. 476,965
Int. Cl.[5] B01J *13/00;* **B65B** *1/04;* **C09K** *3/30;* **C11D** *17/00*
U.S. Cl. 252—315.3 **1 Claim**

1. A method of making a post-foaming gel, comprising the steps of: cycling a gel base between first and second cylinders and a heat exchanger; and introducing a foaming agent to the cycled gel base through said heat exchanger while said gel base is being cycled.

5,112,526
METHOD FOR MODIFYING THE SURFACE OF MICROCAPSULE
Jyuzo Kuroda, Yamatokooriyama, Japan, assignor to 501 Sakura Color Products Corporation, Osaka, Japan
Filed Jun. 19, 1990, Ser. No. 540,165
Claims priority, application Japan, Jun. 23, 1989, 1-161937
Int. Cl.[5] C08L *61/20;* **B01J** *13/20;* **C09D** *11/00;* **C07J** *7/02*
U.S. Cl. 252—363.5 **6 Claims**

1. A method for modifying the surface of the microcapsule consisting of an outer layer composed of a urea-formaldehyde copolymer, a melamine-formaldehyde copolymer or a urea-melamine-formaldehyde terpolymer and an inner phase composed of hydrophobic organic components, the method comprises contacting the microcapsule with a water-immiscible organic solvent and at least one member selected from the group of compound of general formula (I)



(I)

wherein R is an alkyl group having 8 to 22 carbon atoms; x and y are each a whole number not less than 0 and their sum is a whole number of not more than 60, provided that x and y cannot be simultaneously equal to 0.

5,112,527

PROCESS FOR CONVERTING NATURAL GAS TO SYNTHESIS GAS

Thaddeus P. Kobylinski, Lisle, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Apr. 2, 1991, Ser. No. 679,095
Int. Cl.[5] C07C *1/02*
U.S. Cl. 252—373 **30 Claims**

1. A process for converting gaseous lower alkanes to synthesis gas, comprising the steps of:
(a) thoroughly mixing said alkanes with air to form a homogeneous gaseous mixture;
(b) subjecting said mixture to simultaneous partial oxidation and steam reforming reactions in a first reaction zone in the presence of a first catalyst having partial oxidation and steam reforming activity and sufficient water to sustain said steam reforming reaction to a degree sufficient to maintain the temperature in said first reaction zone below the decomposition temperature of said alkanes in order to convert a portion of said alkanes to a gaseous first reaction product comprising unconverted alkanes, hydrogen, and carbon monoxide; and
(c) reacting said unconverted alkanes with water in a second reaction zone in the presence of a second catalyst having steam reforming activity to convert said unconverted alkanes to carbon monoxide and hydrogen to produce a gaseous second reaction product comprising carbon monoxide and hydrogen, said process being carried out under conditions whereby less than about 20% of said alkanes are completely oxidized to carbon dioxide and water.

5,112,528

ANTISTATIC POLYOLEFIN FOAMS AND FILMS AND METHOD OF MAKING THE FOAM AND ANTISTATIC COMPOSITION

Bruce A. Malone, Granville, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 735,135, Sep. 16, 1991. This application Oct. 25, 1991, Ser. No. 782,925
Int. Cl.[5] H01B *1/00*; C08K *5/16*
U.S. Cl. 252—500 **6 Claims**

1. An antistatic composition comprising:
(a) at least one quaternary ammonium salt; and
(b) at least one partial ester of a long chain fatty acid with a polyol
which antistatic composition when incorporated into a polyolefin resin has a static decay time faster than either (a) or (b) when used alone at the same amount as is present in the antistatic composition.

5,112,529

CONDUCTIVE MATERIAL AND PROCESS FOR PRODUCING THE SAME

Kazuo Saito, Tokyo, Japan, assignor to Nisshinbo Industries, Inc., Tokyo, Japan

Filed Sep. 4, 1990, Ser. No. 577,710
Claims priority, application Japan, Sep. 5, 1989, 1-229860
Int. Cl.[5] H01B *1/00, 1/06*; C08F *6/00*
U.S. Cl. 252—500 **10 Claims**

1. A conductive material comprising (a) an insoluble and infusible substrate obtained by heat-treating a polycarbodiimide resin which is a homopolymer or copolymer comprising at least one repeating unit represented by the formula

$$-R-N=C=N-$$

where R is an aromatic diisocyanate residue, at a temperature of 350–900° C. in vacuum or in an inert gas atmosphere to obtain said substrate and (b) (i) an electron-donating dopant selected from metals of group 1A of the periodic table or (ii) an electron-accepting dopant selected from the group consisting of halogens, halides, SO_3, N_2O_3, H_2SO_4, HNO_3, and $HClO_4$, the electron-donating dopant or electron-accepting dopant being present in an amount sufficient to increase the conductivity of said substrate.

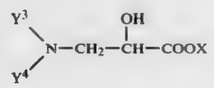
5,112,530

USE OF 2-HYDROXY-3-AMINOPROPIONIC ACID DERIVATIVES AS COMPLEXING AGENTS, BLEACH STABILIZERS AND BUILDERS IN DETERGENT COMPOSITIONS

Richard Baur, Mutterstadt; Charalampos Gousetis; Stefan Birnbach, both of Ludwigshafen; Michael Kneip, Frankenthal, and Alfred Oftring, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 13, 1990, Ser. No. 552,098
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1989, 3925727
Int. Cl.[5] C11D *3/30, 7/32, 9/30*; C07C *229/24*
U.S. Cl. 252—548 **7 Claims**

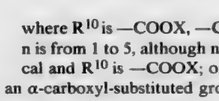
1. A method of washing or cleaning using for this purpose a 2-hydroxy-3-aminopropionic acid derivative of the general formula Ia



Ia

where X is hydrogen, an alkali metal or ammonium which may be substituted by C_1–C_4-alkyl or C_1–C_4-hydroxyalkyl, and Y^3 and Y^4 have the following meanings:

A) a β-hydroxyl-substituted group of the general formula



where R^{10} is —COOX, —CH_2OH or —CH_2—NY^3Y^4 and n is from 1 to 5, although n is not 1 if Y^3 and Y^4 are identical and R^{10} is —COOX; or

an α-carboxyl-substituted group of the general formula



where

R^4 is hydrogen, methyl or hydroxymethyl and R^5 is hydroxymethyl or —CH(OH)—COOX or —$(CH_2)_p$—COOX, where p is 1 or 2; or

Y^3 is —CH_2—CH_2—(OH)—COOX and Y^4 is —CH_2—COOX.

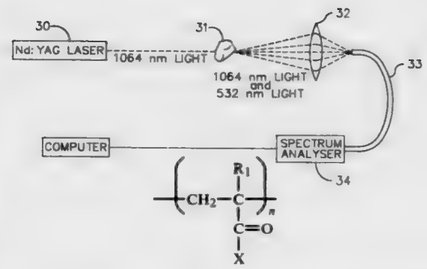
5,112,531

OPTOELECTRONIC DEVICES

Leslie H. Sperling, Bethlehem; Clarence J. Murphy, Stroudsburg; Warren A. Rosen, Hartsville; Himanshu Jain, Bethlehem, and Warren N. Herman, Huntingdon Valley, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

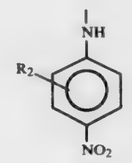
Filed Jul. 16, 1990, Ser. No. 554,051
Int. Cl.[5] C09K *19/52*; F21V *9/00*; G02B *5/02*; C08F *20/34*
U.S. Cl. 252—582 **6 Claims**

1. An electrical device for processing optical signals containing an optical component comprising an acrylic polymer capable of changing its refractive index in an electric or electromagnetic field having the formula:

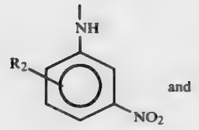


wherein X is a monovalent moiety selected from the group consisting of

(a)

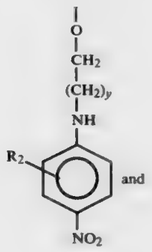


(b)



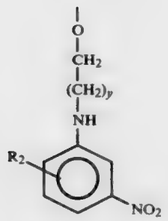
and

(c)



and

(d)



where R_1 is either hydrogen, methyl or ethyl group, R_2 is a lower alkyl group of 1 to 5 carbon atoms, y has a value ranging from 0 to 10 and n has a value ranging from about 50 to 10,000.

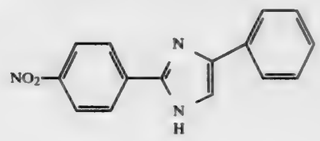
5,112,532

NON-LINEAR OPTICAL MATERIAL AND NON-LINEAR OPTICAL DEVICE EMPLOYING IT

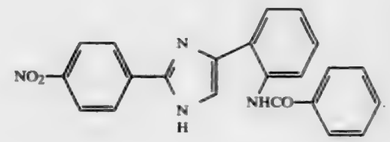
Hidetaka Ninomiya; Noritaka Nakayama; Toyoaki Masukawa, and Miki Morita, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 24, 1989, Ser. No. 384,965
Claims priority, application Japan, Jul. 30, 1988, 63-191021
Int. Cl.[5] F21V *9/04, 9/00*; G02B *6/10*
U.S. Cl. 252—587 **4 Claims**

1. A non-linear optical device in wave-guide form comprising a compound selected from the group consisting of



and



5,112,533

FIRE SUPPRESSING COMPOSITIONS AND METHODS

Penny M. Pope, 5557 E. Exeter, Phoenix, Ariz. 85018; Sean O'Bannon, 1818 E. Bell Rd., Space B-20, Phoenix, Ariz. 85022, and Steven R. Pope, 5557 E. Exeter, Phoenix, Ariz. 85018

Filed Jan. 22, 1990, Ser. No. 467,987
Int. Cl.[5] C09K *21/00*
U.S. Cl. 252—607 **21 Claims**

1. A fire suppressing composition for the pretreatment of flammable substances to protect against fire comprising an aqueous solution containing one part of lignosulfonate obtained from spent liquor of the sulfite-pulping process and from 0.1 to 0.5 parts by weight of carbonate of soda, said composition comprising chemically modified lignosulfonate containing radicals which are heat releasable as carbon dioxide.

5,112,534

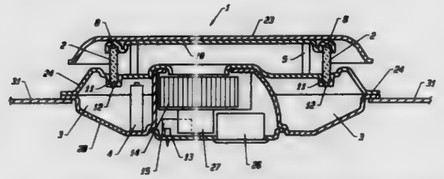
YTTRIUM AND RARE EARTH STABILIZED FAST REACTOR METAL FUEL

Jerold Guon, Woodland Hills; LeRoy F. Grantham, Calabasas, and Eugene R. Specht, Simi Valley, all of Calif., assignors to The United States of America as represented by The United States Department of Energy, Washington, D.C.

Filed Mar. 5, 1990, Ser. No. 489,296
Int. Cl.[5] G21G *4/00*
U.S. Cl. 252—640 **9 Claims**

1. An improved metal alloy reactor fuel consisting essentially of uranium, plutonium, and at least one element from the group consisting of yttrium, lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium.

5,112,535
VEHICLE HAVING A COOLING SYSTEM
Joe E. Roberson, 39 Colgate Dr., Rancho Mirage, Calif. 92270
Filed Sep. 7, 1990, Ser. No. 579,930
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—27 **17 Claims**



1. In combination, a golf cart and an apparatus mounted on said golf cart for removing heat from warm or hot air and then blowing cooled air into the occupant compartment of said golf cart, comprising:

a water recirculating system having a reservoir for containing water comprising:

a. filter means for positioning water such that some water makes contact with warm or hot air;

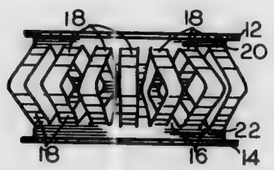
b. pumping means for pumping water from said reservoir through said filter means;

c. drawing means for passing warm or hot air through said filter means such that as warm or hot air passes through said filter means, contact is made between water and warm or hot air, wherein warm or hot air looses heat due to water evaporation and cooler air results; and

d. blower means for blowing resultant cooled air into said compartment of said golf cart; and

interruption means for automatically interrupting power to said pumping means when said golf cart is tilted from the horizontal in any direction.

5,112,536
RANDOM PACKING ELEMENT AND METHOD
Kenneth J. McNulty, Atkinson, N.H.; Neil Yeoman, Merrick, N.Y., and Chang Li-Hsieh, Carlisle, Mass., assignors to Koch Engineering Company, Inc., Wichita, Kans.
Filed Mar. 13, 1991, Ser. No. 668,595
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—94 **28 Claims**



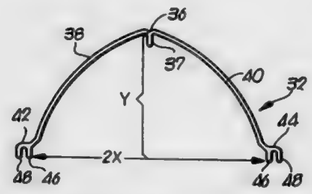
1. A saddle-type random packing element for use in a vapor-liquid or liquid-liquid contact column, which packing element comprises:

a) an arcuate body having first and second, generally parallel, spaced-apart, radially upright, arcuate, longitudinal flange elements on either side of the arcuate body;

b) a plurality of inner and outer, transverse, arched, generally parallel rib elements extending from and between the first and second arcuate flange elements to define a generally arcuate space within the arcuate body; and

c) the rib elements extending from the one to the other longitudinal end of the arcuate body, the rib elements alternating between rib elements extending radially outwardly and radially inwardly from the one to the other end of the arcuate body and the width of the inner rib elements of about the same or less width than the width of the outer rib elements.

5,112,537
PERFORATED ARCH-SHAPED FILL BAR FOR SPLASH TYPE WATER COOLING TOWER
Ohler L. Kinney, Jr., Leawood, Kans., assignor to The Marley Cooling Tower Company, Mission, Kans.
Filed Apr. 25, 1991, Ser. No. 691,135
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—111 **10 Claims**

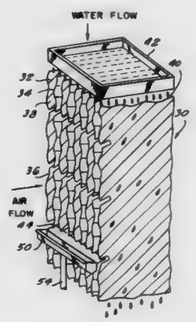


1. A splash-type fill bar for evaporative water cooling towers and comprising:

an elongated body presenting an uppermost, fore and aft extending apex section and a pair of downwardly and outwardly diverging sidewalls extending from said apex section and each defining, at the lowermost ends thereof, a pair of elongated, laterally spaced apart feet for said body, each of said sidewalls being arcuate in cross-section and having a series of apertures therethrough,

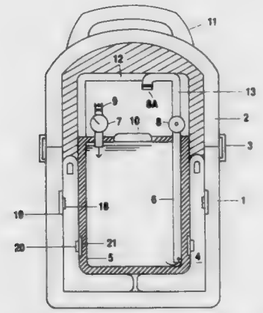
the vertical height of said body, when resting on said feet, being greater than one-half the lateral distance between the adjacent opposed inner surfaces of said feet.

5,112,538
APPARATUS FOR CONCENTRATING BLEED-OFF WATER FOR EVAPORATING COOLERS
Patricia T. Thomas, North Fort Myers, Fla., assignor to Munters Corporation, Fort Myers, Fla.
Continuation-in-part of Ser. No. 614,277, Nov. 15, 1990, Pat. No. 5,055,239. This application Oct. 2, 1991, Ser. No. 769,798
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—112.2 **11 Claims**



1. A gas and liquid contact apparatus in which gas and liquid flow in cross-flow relationship to one another comprising, a contact body including first and second sets of corrugated sheets having corrugations formed therein disposed in a direction transversely of the horizontal plane of the contact body, the sheets of the first set being disposed alternatively with the sheets of the second set with the corrugations of the first set crossing the corrugations of the second set, said body having a gas inlet edge and a gas outlet edge defined by the opposite edges of the sheets and said crossed corrugations defining passageways penetrating from said gas inlet edge to said gas outlet edge of said body; said gas inlet edge having a plurality of generally channel-shaped notches formed therein whereby liquid flowing through the contact body will agglomerate at said notches; and means in at least one of said rows for removing liquid in that row of notches from the contact body.

5,112,539
BEVERAGE CARBONATING, COOLING AND DISPENSING SYSTEM
Dietmar Parnet, R.R. #1, Anderson Road, Kenora, Ontario, Canada P9N 3W7
Filed Jan. 29, 1990, Ser. No. 471,511
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—128 **6 Claims**



1. Apparatus for carbonating and dispensing a beverage liquid comprising a tank, a filler opening, means for sealing the filler opening, a gas inlet valve on the tank for temporary connection of a supply of carbon dioxide, a liquid discharge duct having an opening and a valve for controlling flow of liquid therethrough, output hose connector means and handle means for manual carrying of the tank, a portable insulating carry container into which the tank can be positioned and means in said container for cooling said tank and said liquid therein, said handle means incorporating said liquid discharge duct with said opening and valve mounted on said handle means.

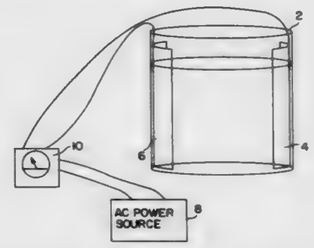
5,112,540
METHOD OF MAKING MICROCAPSULES HAVING AN IMPROVED PRE-WALL
Jing-Den Chen, Spring Valley; Kerry Kovacs, Centerville; Margaret T. Thomas, Medway, and Rong-Chang Liang, Centerville, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio
Filed Dec. 14, 1989, Ser. No. 450,709
Int. Cl.[5] B01J *13/00*
U.S. Cl. 264—4.7 **23 Claims**

1. A method for preparing microcapsules which comprises:

dispersing a hydrophobic oily liquid in a continuous aqueous phase, said hydrophobic oily liquid containing a pre-wall former and a chain extender, said chain extender being a polyhydric compound which reacts with said pre-wall former at a rate such that said chain extender does not substantially react with said pre-wall former prior to dispersing said hydrophobic oily liquid in said continuous aqueous phase to form a pre-wall surrounding the oil droplets; and

forming capsules walls around the droplets of said hydrophobic oily liquid in said continuous aqueous phase.

5,112,541
MICROENCAPSULATED LUBRICATING FLUIDS AND ADDITIVES AND METHOD OF MAKING SAME
David R. Friend, Menlo Park, Calif., assignor to Idemitsu Kosan Company, Ltd., Tokyo, Japan
Filed Jan. 29, 1988, Ser. No. 150,056
Int. Cl.[5] B01J *13/18, 13/02*
U.S. Cl. 264—4.7 **1 Claim**



1. A method of preparing microencapsulated lubricants and lubricant additives consisting of the ordered steps of:

preparing an emulsion stabilizer by dissolving polyvinyl alcohol in water by applying an AC power field to a mixture of polyvinyl alcohol and water;

preparing an emulsification medium including said emulsion stabilizer and a surfactant;

adding a core material selected from eh group consisting of lubricants and oil soluble lubricating additives to the emulsification medium;

stirring the emulsification medium and lubricant;

emulsifying the emulsification medium and lubricant to form an emulsion;

mixing together resorcinol and dimethylol aurea to form a first solution;

adding the first solution to the emulsion while vigorously stirring the emulsion;

acidifying the first solution and emulsion;

mixing together resorcinol and dimethylol urea to form a second solution;

adding the second solution to the acidified first solution and emulsion while vigorously stirring to form a microcapsule suspension;

adjusting a pH of the microcapsule suspension to be basic;

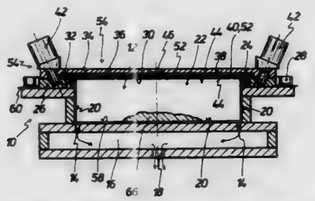
filtering and washing the microcapsule suspension to separate microcapsules form any residue of the first and second solutions; and

drying the microcapsules.

5,112,542
PROCESS AND APPARATUS FOR THE PRODUCTION OF A COMPONENT COMPRISING A SUPPORT ELEMENT AND FOAM PORTIONS ON RESPECTIVE SIDES THEREOF
Johann Beer, Schirmitz, Fed. Rep. of Germany, assignor to Grammer AG, Amberg, Fed. Rep. of Germany
Filed Feb. 7, 1991, Ser. No. 652,068
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1990, 4030547
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—46.7 **5 Claims**

1. A process for the production of a component comprising an at least substantially flat support element which is of a stable shape and has first and second surfaces with foam portions adhering to the surfaces of the support element, wherein: the support element is arranged with its first surface over a first mold cavity of a mold; a cover is sealingly fixed on the mold in such a way that a second mold cavity is defined between the cover and the second surface of the support element; a first reaction mixture is then introduced into the second mold cav-

ity through a runner gate, reaction of the first reaction mixture forming a first foam portion which is firmly bonded to the second surface of the support element; the cover with the support element and its first foam



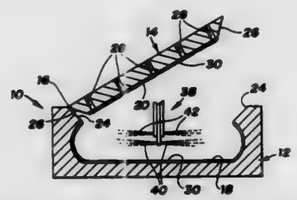
portion so that when the reaction occurs the second reaction mixture fills the first mold cavity and forms the second foam portion which is mechanically firmly bonded to the second surface of the support element; the cover is removed from the first mold cavity, the support element with the first and second foam portions remaining on the first mold cavity; and thereupon the component consisting of the support element and the foam portions adhering to the two main surfaces thereof is removed from the first mold cavity.

5,112,543

MOLDING OF OPEN CELL SOFT POLYURETHANE FOAM UTILIZING RELEASE AGENT

Christian Thary, Farmington Hills, Mich., assignor to Creme Art Corporation, Walled Lake, Mich.

Filed Dec. 21, 1989, Ser. No. 454,645
Int. Cl.[5] B29C *33/58*
U.S. Cl. 264—51 **3 Claims**



1. A method for molding open cell soft polyurethane foam within a mold having rigid mold portions movable between open and closed positions with respect to each other and having interior surface that cooperatively define a generally enclosed mold cavity in the closed position, the method comprising:

coating the interior surfaces of the mold portions with an aqueous gel of an acrylic acid polymer; and

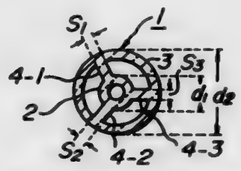
introducing a foamable liquid polyurethane mixture into the mold for foaming to fill the mold cavity as the aqueous gel at the interior surfaces functions as a release agent to prevent bonding of the foam to the interior surfaces and to also define a thin escape passage for gas generated during the foaming.

5,112,544

METHOD OF MANUFACTURING ONE-END CLOSED CERAMIC DOUBLE TUBE

Hidenobu Misawa, and Satoru Yamada, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Division of Ser. No. 454,891, Dec. 22, 1989, abandoned. This application Jan. 11, 1991, Ser. No. 640,280
Claims priority, application Japan, Dec. 22, 1988, 63-322156; Dec. 22, 1988, 63-322157; Dec. 22, 1988, 63-322158; Dec. 22, 1988, 63-322159
Int. Cl.[5] B29C *47/00, 47/12*
U.S. Cl. 264—67 **6 Claims**



1. A method for manufacturing an one-end closed ceramic double tube, comprising the steps of:

extruding a ceramic material from a die having at least one circular outer slit, at least one circular inner slit arranged concentrically with said at least one outer slit, and at least one slit extending centripetally from said outer slit to said inner slit, to thereby mold a ceramic double tube consisting of an outer cylinder and an inner cylinder arranged concentrically and connected integrally with said outer cylinder by at least one support portion, said outer cylinder, said inner cylinder and said support portion extending uniformly along a longitudinal axis of said ceramic double tube;

drying said ceramic double tube;

forming at least one passage at one end of said inner cylinder, said passage communicating an inner space of said inner cylinder with a gap formed between said inner cylinder and said outer cylinder;

sealing one end of said outer cylinder proximate said one end of said inner cylinder, such that said one end of said outer cylinder is sealed entirely and said at least one passage at said one end of said inner cylinder remains open; and

firing said ceramic double tube.

5,112,545

COMPOSITE PREFORMS AND ARTICLES AND METHODS FOR THEIR MANUFACTURE

Raymond G. Spain, Farmington Hills, and Susan M. DeGrood, Wixom, both of Mich., assignors to Airfoil Textron Inc., Lima, Ohio

Filed Feb. 14, 1990, Ser. No. 480,061
Int. Cl.[5] B29D *28/00;* B01D *28/00;* D02G *1/20*
U.S. Cl. 264—103 **8 Claims**

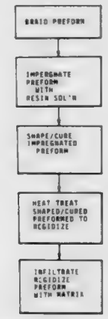
1. A method of making a preform, comprising:

(a) forming a preform of reinforcement strands,

(b) impregnating the preform with a silicone resin solution comprising silicone solids thermally convertable to silica solids,

(c) curing the resin of the impregnated preform under conditions that a selected shape is imparted to said preform, and

(d) heating the shaped preform at a temperature effective to convert the cured silicone resin to silica solids in sufficient quantity to rigidize the shaped preform to allow subsequent handling and infiltration of the shaped preform with an inorganic matrix material.

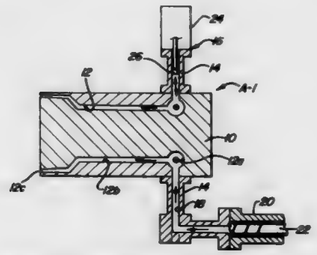


5,112,546

METHOD OF CONTROLLING THICKNESS OF THERMOPLASTIC EXTRUDED PROFILE

Gordon A. Comfort, 6408 Rogers Hwy., Tecumseh, Mich. 49286

Filed May 10, 1991, Ser. No. 698,286
Int. Cl.[5] B29C *47/20*
U.S. Cl. 264—167 **8 Claims**



1. A method of controlling the wall thickness of a corrugated thermoplastic extruded profile, comprising directing a continuously moving stream of molten thermoplastic material into an extrusion die having an orifice formed therein, and delivering into or removing from the continuously moving stream variable volumes of molten thermoplastic material to thereby vary the volume of thermoplastic material issuing from the die orifice, resulting in control over the wall thickness of the extruded corrugated profile.

5,112,547

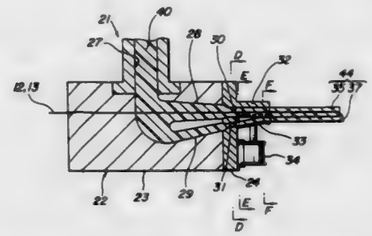
METHOD OF MAKING AN ELONGATE ARTICLE

Tukasa Nakashima; Tetsuo Hotta, and Tatsuya Tamura, all of Yokohama, Japan, assignors to Hashimoto Forming Industry Co., Ltd., Japan

Filed Aug. 7, 1989, Ser. No. 390,413
Int. Cl.[5] B29C *47/04, 47/06;* B32B *31/30*
U.S. Cl. 264—167 **8 Claims**

1. A method of manufacturing first and second elongate articles each including at least a first section comprising a common cross-section portion, said second elongate article further including a second section comprising at least one additional cross-sectional portion in addition to said common cross-sectional portion, said first and second elongate articles being extruded from a single extrusion die head, said single extrusion die head comprising a die plate with a common orifice and at least one additional orifice which are arranged close to each other, said common orifice comprising a first cross-sectional contour and corresponding to said common cross-sectional portion of said first and second elongate articles, said at least one additional orifice comprising a second cross-sectional contour and corresponding to said at least one additional cross-sectional portion of said second elongate article, said method comprising the steps of:

feeding a molten synthetic resin material to said common orifice of said die plate and to said at least one additional orifice of said die plate from a common source of said molten synthetic resin material;



extruding said molten synthetic resin material from said common orifice of said die plate to continuously form a first elongate article with said first section and without said second section; and

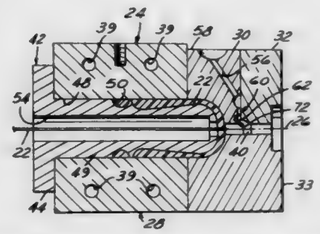
extruding said molten synthetic resin material from said common orifice and also from said at least one additional orifice of said die plate, and selectively joining first and second sections to each other when both sections are in a molten state, to continuously form a second elongate article from said first and second sections.

5,112,548

EXTRUSION METHOD AND APPARATUS FOR PRODUCING A MOLDING STRIP

Edward A. Roberts, Mt. Clemens, Mich.; Douglas W. Spittal, Clearwater, Canada, and Stanley T. Kisiel, Livonia, Mich., assignors to Color Custom, Inc., Warren, Mich.

Division of Ser. No. 231,279, Aug. 12, 1988, Pat. No. 4,965,103, and a continuation-in-part of Ser. No. 114,500, Oct. 30, 1987, Pat. No. 4,963,403. This application Aug. 30, 1990, Ser. No. 575,205
The portion of the term of this patent subsequent to May 12, 2009, has been disclaimed.
Int. Cl.[5] B29C *47/06*
U.S. Cl. 264—171 **7 Claims**



1. A method for continuously forming a composite molding strip, the method utilizing a single extrusions die which includes first and second passages communicating the outer surface of the die with a common bonding chamber formed in the die, the method consisting essentially of the steps of:

extruding a molten flexible PVC through the first passage and into a bottom portion of the bonding chamber; and

extruding molten polyurethane plastic through the second

passage and into the top portion of the bonding chamber, wherein the PVC plastic has an outer surface and the polyurethane plastic has an inner surface int he bonding chamber, the polyurethane plastic being interbonded with the PVC plastic by interfusion between the surfaces while in the molten state to form the molding strip.

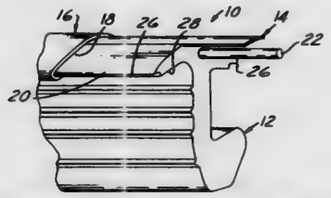
3. An extrusion die for use in forming a continuous, composite molding strip along a forming axis, the molding strip having a flexible PVC plastic body having an outer surface and an outer, polyurethane plastic layer having an inner surface, the die consisting essentially of: a bonding chamber therewithin the die; a first passage extending from the outer surface of the die and into a bottom portion of the bonding chamber to receive the flexible PVC plastic in molten form; a second passage extending from the outer surface of the die and into a top portion of the bonding chamber to receive the polyurethane plastic; means for directing the flow of the polyurethane molten plastic from the second passage into the bonding chamber in a direction parallel to the forming axis, a bottom portion of said means for directing at least partially defining an opening extending along the forming axis and communicating the first passage with the bonding chamber wherein the PVC plastic and the polyurethane plastic are interbonded by interfusion between the surfaces within the bonding chamber to form the molding strip.

5,112,549

EXTRUSION METHOD AND APPARATUS FOR PRODUCING A MOLDING STRIP

Edward Roberts, Mt. Clemens, Mich.; James H. Greatorex, Wellsbourne, England, and Douglas W. Spittal, Canlachie, Canada, assignors to Color Custom, Inc., Warren, Mich.

Division of Ser. No. 114,500, Oct. 30, 1987, Pat. No. 4,963,403.
This application Aug. 29, 1990, Ser. No. 574,603
Int. Cl.[5] B29C *47/06*
U.S. Cl. 264—174 **7 Claims**



1. A method for continuously forming a unitary composite molding strip, the method utilizing a single extrusion die which includes first, second and third passages communicating the outer surface of the die with a common bonding chamber formed in the die, the method comprising the steps of:

extruding a molten first plastic through the first passage and into a bottom portion of the bonding chamber to form a body of extruded plastic having a top surface and a stem extending from the opposite side of the top surface, the stem having at least a pair of receiving and retaining grooves on the opposite side thereof, one groove being capable of receiving and retaining a body panel and the other a sheet of glass;

feeding a thin, narrow, plastic strip having a decorative layer formed thereon through a second passage and into a top portion of the bonding chamber; and

extruding a molten, clear, second plastic through the third passage and into the top portion of the bonding chamber, wherein the plastic strip is disposed between a bottom surface of the second plastic and a top surface of the first plastic, the clear plastic being interbonded with the first plastic by interfusion between the surfaces while in the molten state to form the molding strip with the plastic strip disposed therebetween so that the decorative layer can be seen through the clear second plastic.

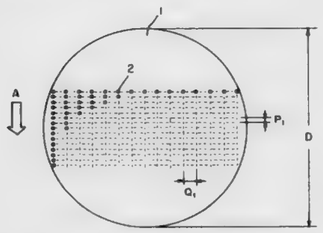
3. An extrusion die for use in forming a continuous composite molding strip along a forming axis, the molding strip having a body of a first plastic, a clear top coat of a second plastic and a plastic strip interposed between the plastic body and the plastic top coat, the die including: a bonding chamber therewithin the die, the bonding chamber being configured to form the body having a top surface and stem extending from the opposite side of the top surface, the stem having at least a pair of receiving and retaining grooves on the opposite sides thereof, one groove being capable of receiving and retaining a body panel and the other a sheet of glass; a first passage extending from the outer surface of the die and into a bottom portion of the bonding chamber to receive the first plastic in molten form; a second passage communicating the outer surface of the die with the bonding chamber to receive the plastic strip; a third passage extending from the outer surface of the die and into a top portion of the bonding chamber to receive the clear second plastic; and a snout having an aperture communicating the second passage with the bonding chamber and extending along a direction parallel to the forming axis to permit the passage of the plastic strip therethrough into the bonding chamber between a bottom surface of the clear second plastic and a top surface of the first plastic; an upper portion of the snout directing the flow of the clear molten plastic from the third passage into the bonding chamber in a direction parallel to the forming axis, a bottom portion of the snout at least partially defining an opening extending along the forming axis and communicating the first passage with the bonding chamber wherein the first plastic and the clear second plastic are interbonded by interfusion between surfaces within the bonding chamber with plastic strip disposed therebetween to form the molding strip.

5,112,550

PROCESS AND APPARATUS FOR PRODUCING SUPERFINE FIBERS

Masumi Gotoh, and Tadayosi Sakurai, both of Tsuruga, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed May 2, 1991, Ser. No. 694,482
Claims priority, application Japan, May 11, 1990, 2-122504
Int. Cl.[5] D01D *4/02*
U.S. Cl. 264—211.14 **4 Claims**



1. A process for producing superfine fibers having a total denier of not less than 20 denier and a monofilament denier of not more than 1.1 denier when winding up upon spinning comprises using a spinneret having nozzle orifices arranged in a lattice pattern extending toward a quench direction and the right angled direction to the quench direction, said arrangement being provided so as to satisfy the following formulas (1) to (4):

$$(1/5)D \leqq P_i(P-1) \leqq (\tfrac{1}{4})D \quad (1)$$

$$(\tfrac{1}{4})D \leqq Q_i(Q-1) \leqq D \quad (2)$$

$$Q_i/P_i \geqq 2 \quad (3)$$

$$Q(P-1) \leqq H \leqq P \times Q \quad (4)$$

wherein D is an effective diameter of the spinneret (mm), P_i is a nozzle orifice pitch in the quench direction (mm), P is the maximum number of nozzle orifices arranged in the quench direction, Q_i is a nozzle orifice pitch in the right angled direction to the quench direction (mm), Q is the maximum number of nozzle orifices arranged in the right angled direction to the quench direction and H is a total number of the orifices.

3. A spinneret for producing superfine fibers having a total denier of not less than 20 denier and a monofilament denier of not more than 1.1 denier when winding up upon spinning which has nozzle orifices arranged in a lattice pattern extending toward a quench direction and the right angled direction to the quench direction, said arrangement being provided so as to satisfy the following formulas (1) to (4):

$$(1/5)D \leqq P_i(P-1) \leqq (\tfrac{1}{4})D \quad (1)$$

$$(\tfrac{1}{4})D \leqq Q_i(Q-1) \leqq D \quad (2)$$

$$Q_i/P_i \geqq 2 \quad (3)$$

$$Q(P-1) \leqq H \leqq P \times Q \quad (4)$$

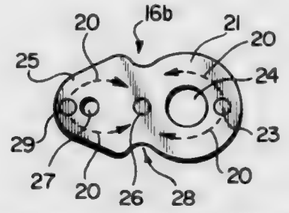
wherein D is an effective diameter of the spinneret (mm), P_i is a nozzle orifice pitch in the quench direction (mm), P is the maximum number of nozzle orifices arranged in the quench direction, Q_i is a nozzle orifice pitch in the right angled direction to the quench direction (mm), Q is the maximum number of nozzle orifices arranged in the right angled direction to the quench direction and H is a total number of the orifices.

5,112,551

METHOD OF MOLDING AN IMPROVED LINKAGE LEVER

Peter J. Hylak, Northbrook, and Gary L. Berge, Crystal Lake, both of Ill., assignors to E & H Plastics, Inc., Chicago, Ill.

Filed Sep. 7, 1990, Ser. No. 578,419
Int. Cl.[5] B29C *45/13*
U.S. Cl. 264—219 **1 Claim**



1. A method of molding a flipper link to reduce or eliminate the tendency of said flipper link to break, said flipper link being used in flipper assemblies of pinball machines for coupling together a solenoid and a flipper of said assemblies, comprising the steps of:

forming in a mold a cavity for forming a flipper link having a first end portion, a second end portion and an intermediate necked-down portion, which necked-down portion provides an area between said first and second end portions which more easily twists and absorbs stress exerted on said flipper link during use;

providing pin means in said cavity for forming an aperture in each of said first and second end portions;

injecting plastic material into said mold to form said flipper link while gating the plastic material into said cavity at each of said first and second end portions such that said plastic material flows into said cavity about said pin means and a knit line of lines formed in said flipper link are formed in said area at a location substantially centrally of said necked-down portion, whereby said stress on said flipper link will be transferred away from said apertures to said area so as to substantially eliminate the tendency of said flipper links to break about said apertures.

5,112,552

THERMOFUSIBLE AUTOADHESIVE SHAPES AND PROCESS FOR THEIR PRODUCTION

Claude Wittmann, and Jean-Patrick Lambert, both of Compiegne, France, assignors to Coca S.A., Paris la Defense, France

Division of Ser. No. 76,087, Jul. 21, 1987, abandoned. This application Nov. 13, 1990, Ser. No. 612,116
Claims priority, application France, Jul. 21, 1986, 86 10552
Int. Cl.[5] B29C *39/12*
U.S. Cl. 264—255 **8 Claims**

1. The process of making thermofusible autoadhesive shapes consisting of a thermofusible autoadhesive interior and an intimately connected adherent continuous outer layer of a nonautoadhesive material having nonadherent exterior surfaces comprising:

(a) spraying a nonautoadhesive thermofusible material in a molten state onto the walls and bottom of a mold so as to form a substantially uniform solid continuous layer thereof on said walls and bottom,

(b) introducing a molten thermofusible autoahesive into said mold onto said layer and partially cooling the same, and

(c) spraying nonadhesive thermofusible material onto the free upper surface of said thermofusible autoadhesive and cooling the resultant mass to ambient temperature to form a solid thermofusible adhesive shape having a continuous nonadherent exterior surface.

5,112,553

IMPROVEMENT IN INJECTION MOLDED ARTICLES HAVING THREE DIMENSIONAL SURFACES

Shigeru Nedzu, Shizuoka, Japan, assignor to Polyplastics Co., Ltd., Osaka, Japan

Filed Sep. 4, 1990, Ser. No. 577,127
Claims priority, application Japan, Sep. 4, 1989, 1-229080
Int. Cl.[5] B29C *45/16, 59/02*
U.S. Cl. 264—259 **1 Claim**

1. A process for preparing an improved injection-molded article having a three-dimensional undistorted pattern on a surface thereof, comprising the steps of:

placing a master film of a thermoplastic resin having a three-dimensional master pattern formed on a region thereof into a mold such that the master pattern is exposed to the mold cavity;

injecting an injection-moldable resin selected from the group consisting of polybutylene terephthalate resins, polyethylene terephthalate resin, polycarbonate resins, polyarylate resins, polyamide resins, polymethylpentene resins, polypropylene resins, and copolymers thereof at an injection molding temperature into the mold cavity so as to cause a surface region of the resin to conform to the three-dimensional master pattern on the master film, and to thereby transfer the master pattern onto said surface region of the resin; and then

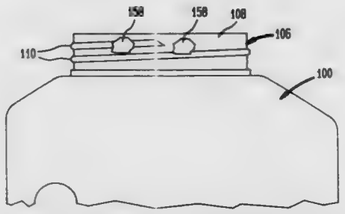
removing said master film from the surface region of the injection molded resin to thereby expose said three-dimensional pattern formed thereupon, wherein

said step of placing a master film of a thermoplastic resin includes the step of selecting a composite film having a film layer which consists essentially of a crystalline thermoplastic polybutylene terephthalate resin having a melting point lower than the injection molding temperature, and a protective evaporated metal layer, which is at least one metal selected from the group consisting of aluminum, zinc, silver, chromium, nickel and copper, deposited upon and covering one surface of said film layer, and wherein distortion of the pattern on the surface of the injection molded article is prevented by

said composite film being placed within said mold cavity such that said thermoplastic resin film layer is adjacent walls forming said mold cavity with the metal layer being exposed to said mold cavity and thereby in contact with

said injection-moldable resin injected into said mold cavity.

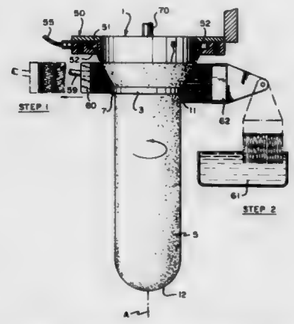
5,112,554
PROCESS OF SEALING A TOP ELEMENT TO A CONTAINER USING HOT MELT MATERIAL
Ricardo R. Perez, Naperville, and George S. Ulatowski, Thornton, both of Ill., assignors to J. L. Prescott Company, South Holland, Ill.
Filed Oct. 18, 1990, Ser. No. 599,520
Int. Cl.[5] B29C *43/18*; B32B *1/10*
U.S. Cl. 264—262 **23 Claims**



1. A method of applying a top element having an interior surface and an annular end wall to the neck of a container to provide a seal therebetween, said neck having a top surface and spaced apart interior and exterior surfaces, said interior surface of said top element and said exterior surface of said neck having cooperating mechanical interlocking means for securing said top element to said neck, said method comprising applying hot melt material in a flowable molten state solely to said exterior surface of said neck while said top surface of said neck and said interior surface and said annular end wall of said top element remains free of said hot melt material, applying said top element having said interior surface and said annular end wall thereof free of said hot melt material about said exterior surface of said neck while said hot melt material is still in a flowable state, mechanically securing said top element to said neck utilizing said cooperating mechanical interlocking means upon relative rotation between said neck and said top element, said hot melt material being applied in a sufficient quantity such that said hot melt material is spread solely about said exterior surface of said neck and said cooperating mechanical interlocking means while said interior surface and said top surface of said neck and said annular end wall of said top element remain free of said hot melt material to form when solidified a seal between said exterior surface of said neck and said interior surface of said top element, and engaging said annular end wall of said top element directly against said top surface of said neck in the absence of said hot melt adhesive therebetween.

5,112,555
METHOD OF FORMING BANDED CONDOMS
Harold A. Morelli, Wyckoff, and Eugene K. Lubbs, Milford, both of N.J., assignors to Schmid Laboratories, Inc., Little Falls, N.J.
Continuation of Ser. No. 154,893, Feb. 11, 1988, abandoned.
This application Apr. 30, 1990, Ser. No. 516,921
Int. Cl.[5] B29C *41/14*
U.S. Cl. 264—271.1 **12 Claims**

1. A method of banding collagen condoms comprising the steps of:
placing an elastic glue-free band in a first band position on a phallic mandrel having a head and a tail end, the first position being proximate to the tail end;
applying a coat of regenerated collagen gel over a body region of said mandrel extending from the head toward the tail end, the body region approaching, but not including, the first band position;
drying the coat to form a corresponding collagen film layer having a size and shape corresponding to the mandrel over the body region, said coat being open toward the tail end;
repeating said applying and drying steps a predetermined number of times to form a corresponding number of integrated inner collagen film layers extending over the body region, each of the layers having a homogeneous composition and a predetermined thickness, the layers together forming an inner sheath extending over the body region of the mandrel;
displacing the elastic band in the direction of the head of the mandrel to a final band position proximate to the open end and encircling the inner sheath;
moistening at least a portion of a tailward region of the inner sheath proximate to the elastic band in its final band position, the tailward region terminating at said open end;
applying a coat of the regenerated collagen gel to a headward region of the inner sheath proximate to the elastic band in its final band position;

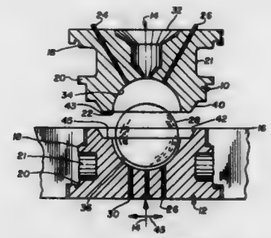


folding at least a portion of the moistened tailward region over the elastic band in its final band position, the folded part forming at least one flap having an inner and an outer surface;
contacting at least part of the inner surface of the flap with the coated headward region, thereby enfolding the elastic band;
resuming and repeating said applying and drying steps a predetermined number of times to form a corresponding number of integrated outer collagen film layers extending over the body region and covering the final banding position, the outer layers forming an outer sheath, the elastic band being enveloped by the inner and outer sheaths, the sheaths together forming a condom body having the elastic band incorporated therein as an integral part thereof; and
removing the condom body integral with the elastic band from the mandrel.

5,112,556
GOLF BALL APPARATUS AND METHOD FOR MANUFACTURE
Seward S. Miller, Avon Lake, Ohio, assignor to WPI Acquisition Corporation, Elyria, Ohio
Continuation-in-part of Ser. No. 463,286, Jan. 10, 1990, abandoned. This application Jul. 23, 1991, Ser. No. 735,182
Int. Cl.[5] B29C *45/00*
U.S. Cl. 264—279 **4 Claims**

1. In a method for making a golf ball in a two part spherical cavity wherein two mold halves are moved relative to each other along an axis into engagement to define a cavity having a circular parting line, the improvement comprising the steps of moving the mold halves into engagement along said axis, providing engageable inclined alignment surfaces on the respective mold halves with said surfaces being concentric with

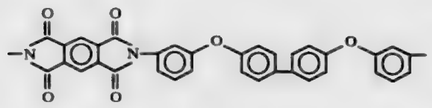
said parting line, said inclined surfaces being engaged upon engagement of said mold halves, and while said mold halves are brought into engagement, allowing relative movement of



one of said mold halves only in a direction perpendicular to said axis to cause the engagement of said alignment surfaces to bring the mold halves into precise alignment at said circular parting line.

5,112,557
PROCESS FOR PREPARING A POLYIMIDE MOLDED FORM
Masumi Saruwatari; Yasuhiko Ohta; Yasuhiro Fujii, and Yasuko Honji, all of Aichi, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed Aug. 31, 1990, Ser. No. 576,215
Claims priority, application Japan, Sep. 16, 1989, 1-238399
Int. Cl.[5] B29C *55/00*
U.S. Cl. 264—289.3 **14 Claims**

1. A process for preparing a polyimide molded form comprising the steps of selling a primary molded form essentially consisting of polyimide having recurring units represented by the formula (I):

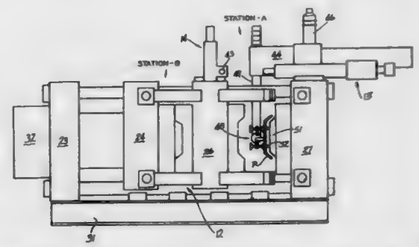


(I)

to a degree of swelling of 10 to 150% in an aprotic polar solvent and successively stretching the swelled form 1.1 to 10 times in a temperature range of from room temperature to less than the boiling point of the aprotic polar solvent.

5,112,558
INJECTION MOLDING PROCESS
Robert D. Schad, Toronto, Canada, and Paul Brown, Sunny Isle, V.I., assignors to Husky Injection Molding Systems Ltd., Bolton, Canada
Continuation-in-part of Ser. No. 150,157, Jan. 29, 1988, Pat. No. 4,867,938. This application Aug. 24, 1989, Ser. No. 398,255
The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.
Int. Cl.[5] B29C *45/42*
U.S. Cl. 264—297.2 **9 Claims**

1. A process for molding plastic parts utilizing an injection molding machine having injection means and at least one first mold located at a first molding station and at least one second mold located at a second molding station, said molds comprising cooperating mold halves supported by fixed and movable platens, said platens being arranged in tandem, comprising the steps of:
providing molten plastic distributor means operable to communicate selectively with one of said first and second molds;
injecting molten plastic into said molds to form plastic parts molded in a first physical and spatial orientation wherein the physical and spatial orientation of the parts in the first and second molds is the same;
providing a robot with a robot heat including a first plastic part pick up unit oriented to pick up the plastic parts in said first physical and spatial orientation;
removing the plastic part from the first mold with the first plastic part pick up unit;
subsequently removing the plastic part from the second mold with the first plastic part pick up unit, wherein the first plastic part pick up unit retains the same physical and spatial orientation during removal of the parts from both the first and second molds, said orientation of the first plastic part pick up unit corresponding to the physical and spatial orientation of the plastic parts in the first and second molds; and

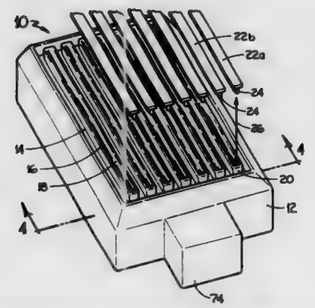


wherein the robot head moves sequentially from the first mold to the second mold and wherein the first and second molds open and close sequentially so that one of said molds is open while a second of said molds is closed and wherein the plastic part pick up unit picks up plastic parts from an open mold while the other of said molds is closed; and
fixing said robot to a stationary platen, wherein said sequential movements include sequentially moving a first leg of said robot along a longitudinal axis of said machine followed by moving a second leg of said robot along a second axis of said machine to move said robot head into register with said part, and wherein said sequential movement of said legs operate in sequence with the sequential opening and closing of the molds.

5,112,559
MULTI-WELL DISH
Jean C. Lebrun, Greenwood, S.C., assignor to Warner-Lambert Company, Morris Plains, N.J.
Division of Ser. No. 380,919, Jul. 17, 1989, Pat. No. 4,997,359.
This application Oct. 31, 1990, Ser. No. 606,373
Int. Cl.[5] B28B *5/00*
U.S. Cl. 264—297.8 **8 Claims**

1. A method for coating capsule molds comprising the steps of:
holding a bath of liquid gelatin;
creating a plurality of wells each with spaced apart sidewalls

and an open top located above said bath for holding said liquid gelatin during coating of said molds;



circulating said gelatin through said wells, over said top of each well and into said bath; and

dipping said molds in said wells to coat said molds.

5,112,560

METHOD OF MAKING AN INFLATABLE SHOE INSOLE

Armenak Moumdjian, Nor Marash Street, Bourj-Hammud, Beirut, Lebanon

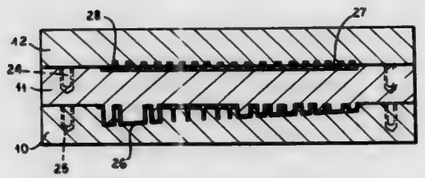
Division of Ser. No. 295,438, Jan. 10, 1989, abandoned, which is a division of Ser. No. 74,765, Jul. 17, 1987, Pat. No. 4,845,861.

This application Nov. 2, 1990, Ser. No. 608,570

Claims priority, application Italy, May 29, 1987, 20715 A/87

Int. Cl.[5] B29C *49/00, 49/20*

U.S. Cl. 264—516 **1 Claim**



1. A method of producing a foot-supporting element in the shape of an insole receivable in a shoe, with heel, shank and foot-ball portions, said insole being composed of an elastic material and having a top wall, a bottom wall, a sidewall extending around the perimeter of said element and partitions within said element extending between said bottom and top walls and surrounded by a chamber formed in said element into which air under pressure can be introduced, said method comprising the steps of:

(a) molding between a first outer die member and an intermediate die member a first part of said element including a support wall, said sidewall and said partitions and such that said partitions define cells open at said support wall and closed at a side opposite said support wall and distributed over said element in a load-supporting pattern, said cells including a substantially circular cell at said heel, a plurality of elongated cells extending along said shank and a plurality of transverse cells extending across said ball portion, and simultaneously molding between said intermediate die member and a second outer die member a second planar part of said element constituting at least another support wall such that one of said support walls constitutes said top wall and the other of said support walls constitutes said bottom wall from said material;

(b) while said material remains fusible, withdrawing said intermediate die member from between said first and second outer die members and bringing said first and second outer die members together to fuse said first and second parts together in registry to form said element and define said chamber between said first and second parts from the cells formed by said partitions, open at said support wall of said first part and closed at said support wall of said second part whereby said cells extend a full height of said element between said top and bottom walls;

(c) maintaining said intermediate die member at a controlled temperature to prevent complete setting of said first and second parts at regions thereof to be fused together before said first and second parts are brought into contact with one another in step (b);

(d) introducing a gas under pressure into said chamber during the fusion of said first and second parts together;

(e) inserting a chamber-pressurizing checkvalve in one of said walls simultaneously with the fusion of said first and second parts together; and

(f) removing said element from said first and second outer die members.

5,112,561

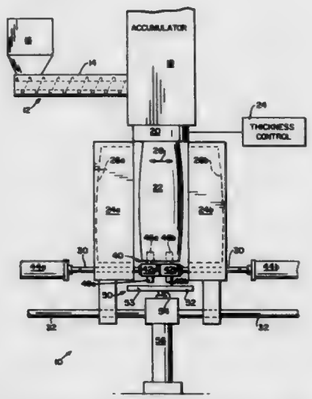
BLOW-MOLDING METHODS FOR FABRICATING HOLLOW ARTICLES FROM AN OPEN-ENDED TUBULAR BODY OF THERMOPLASTIC MATERIAL

Albert B. Dickinson, Muscle Shoals, Ala., assignor to Edward S. Robbins, III, Florence, Ala.

Filed Oct. 19, 1990, Ser. No. 600,401

Int. Cl.[5] B29C *49/04, 49/42*

U.S. Cl. 264—531 **9 Claims**



1. A blow-molding method for fabricating hollow articles from an open-ended tubular body of thermoplastic material comprising the steps of:

aligning a plate having a peripheral edge surface of preselected dimension and geometry with the open end of said tubular body;

contacting the open end of said tubular body with a stretching assembly and then moving the stretching assembly so as to stretch the open end of said tubular body to an expanded dimension sufficient to accommodate the peripheral edge surface of said plate therewithin;

positioning the peripheral edge surface of said plate within said dimensionally expanded open end of said tubular body;

draping the dimensionally expanded open end of the tubular body against the peripheral edge surface of the plate by releasing contact between the stretching assembly and the dimensionally expanded open end of the tubular body to allow the open end of the tubular body to dimensionally contract under its own weight;

sealingly pinching the open end of the tubular body against the peripheral edge surface of the plate by closing mold halves which define a female mold cavity about the parison; and then

introducing pressurized fluid into said tubular body to urge the same into conformance with the female mold cavity.

5,112,562

METHOD AND APPARATUS FOR MANUFACTURING NONWOVEN FABRICS

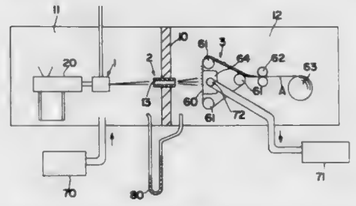
Takayuki Mende, Kuga, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jan. 25, 1991, Ser. No. 645,612

Claims priority, application Japan, Jan. 27, 1990, 2-17031

Int. Cl.[5] D01D *5/085*

U.S. Cl. 264—555 **11 Claims**



1. A method for manufacturing nonwoven fabrics comprising the steps of: spinning for obtaining a continuously drawn fiber by blowing a molten resin extruded out of a spinning nozzle by heated gases blown out of the periphery of the spinning nozzle to a place at a distance of 0.5 m to 2 m from the extreme end of said nozzle; drawing at said place for further drawing the obtained continuously drawn fiber by an air stream produced due to a pressure difference of gases; collecting for collecting the drawn continuous fiber to collect the fibers; and uniting for uniting the collected continuous fibers together to form nonwoven fabrics.

5,112,563

PROCESS OF INJECTION MOLDING WITH PRESSURIZED GAS ASSIST

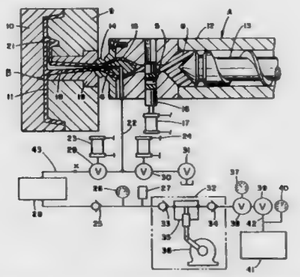
Indra R. Baxi, Troy, Mich., assignor to Nitrojection Corporation, Middlefield, Ohio

Continuation of Ser. No. 121,908, Nov. 17, 1987, Pat. No. 4,935,191, which is a continuation-in-part of Ser. No. 919,670, Oct. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 864,892, May 19, 1986, abandoned. This application Mar. 22, 1990, Ser. No. 497,525

The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.

Int. Cl.[5] B29C *45/00, 45/34;* **B29D** *22/00*

U.S. Cl. 264—572 **18 Claims**



14. A process for producing an injection molded product, comprising:

injecting an amount of a molten thermoplastic material sufficient for the preparation of the product into a mold space having interior surfaces;

introducing a pressurized fluid into the mold space to expand and distribute the molten thermoplastic material over the interior surfaces of the mold space thereby forming a fluid cavity in the molten thermoplastic material;

cooling a hollow shaped body so formed to a temperature below a softening point of the thermoplastic material thereby allowing the product to take its final shape; and,

venting the fluid from the fluid cavity in a controlled manner wherein said step of venting comprises the subsidiary steps of:

reducing a pressure within said fluid cavity from a first pressure to a second, and lower, pressure,

maintaining said second pressure in said gas cavity until the relatively viscous material has cooled and solidified, and

reducing the pressure within said fluid cavity to atmospheric pressure.

5,112,564

ION EXTRACTION AND ACCELERATION DEVICE FOR REDUCING THE RE-ACCELERATION OF SECONDARY ELECTRONS IN A HIGH-FLUX NEUTRON TUBE

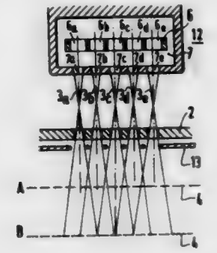
Henri Bernardet, Saint-Michel sur Orge; Xavier L. M. Godechot, Yerres, and Claude A. Lejeune, Gif/Yvette, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 4, 1989, Ser. No. 416,891

Claims priority, application France, Oct. 7, 1988, 88 13186

Int. Cl.[5] H05H *3/06*

U.S. Cl. 376—116 **7 Claims**



1. A device for extracting and accelerating ions in a high flux neutron tube containing a low-pressure gaseous deuterium-tritium mixture, said neutron tube having an ion source supplying at least one ion beam to a target electrode to form a fusion reaction emitting neutrons, said device comprising:

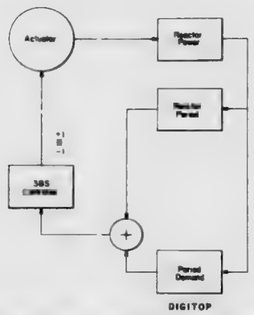
(a) first electrode means for extracting said at least one ion beam and for accelerating said at least one ion beam at a high energy to said target electrode, and

(b) additional electrode means coupled with said first electrode means for limiting acceleration of secondary electrons to said ion source, said secondary electrons being created by ionization of gas in a space between said electrode means and said target means, wherein said space is increased to reduce inhomogeneities of ion bombardment of said target electrode,

wherein said first electrode means includes a final acceleration electrode to impart a nominal energy to ions of said at least one ion beam, said nominal energy relating to a same potential as said target electrode, and

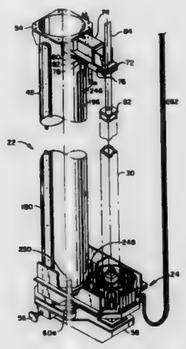
wherein said additional electrode means acts as an electron repulsion electrode carrying a negative potential with respect to said final acceleration electrode, said additional electrode means having a plane situated near an exit plane of aid final acceleration electrode in an equipotential space between said final acceleration electrode and said target electrode.

5,112,565
NUCLEAR REACTOR MULTI-STATE DIGITAL CONTROL USING DIGITAL TOPOLOGY
Russell M. Ball, 1620 Belfield Pl., Lynchburg, Va. 24503, and John J. Madaras, 215 Shady Oak La., Forest, Va. 24551
Filed Jan. 3, 1990, Ser. No. 460,438
Int. Cl.[5] G21C *7/30*
U.S. Cl. 376—216 **7 Claims**



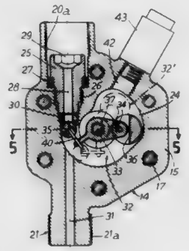
1. A control system for a nuclear reactor in which the power level is altered by adjustments in reactor reactivity, comprising:
means for determining the reactivity of the nuclear reactor, said determining means having a cycle time which is less than the delayed neutron lifetimes in the nuclear reactor; and
stepping drive means for adjusting said reactivity by incrementally changing a parameter by a fixed amount of either plus or minus one unit.

5,112,566
DEVICE FOR DIMENSIONALLY CHARACTERIZING ELONGATE COMPONENTS
Donald F. Butzin, Wilmington, N.C.; Edward W. Meeka, Pleasanton; George W. Tunnell, Foster City, both of Calif., and Edgar E. Salvo, Jr., Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.
Filed Apr. 12, 1989, Ser. No. 336,999
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—245 **23 Claims**



1. A movable carriage for use in a device for measuring dimensional characteristics of an elongate component, said device including a rigid support which is adapted to bear said movable carriage and to retain said component in a predetermined fixed orientation, which comprises:
a sensor carrier movably mounted to said rigid support and having an opening penetrating therethrough for receiving said elongate component, said carrier bearing a plurality of pivotally-mounted bell cranks spaced about said opening, each said bell crank having a wheel for riding on said component during movement of the carrier and being in contact with a sensor capable of providing a signal correlative to displacement of said bell crank during movement of the carrier along the elongate component.

5,112,567
DEVICE FOR SHUTTING OFF A VERTICAL CONDUIT FOR SUPPORTING AND GUIDING AN ELEMENT OF ELONGATE SHAPE
René Feurgarg, La Celle Saint Cloud, France, assignor to Framatome, Courbevoie, France
Filed Nov. 1, 1990, Ser. No. 607,739
Claims priority, application France, Nov. 2, 1989, 89 14374
Int. Cl.[5] G21C *17/08*
U.S. Cl. 376—245 **12 Claims**

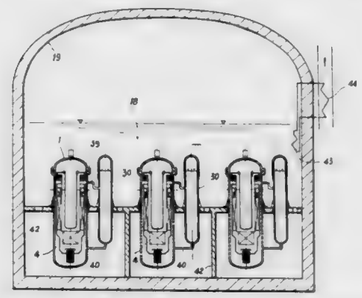


1. In a nuclear reactor system having a pressure vessel and a guide conduit for a measurement probe of elongate and generally cylindrical shape extending into said reactor vessel, a device for shutting off said conduit, said device comprising
(a) a housing inserted between a lower section of the conduit in communication with the pressure vessel and an upper section of the conduit and having two means for leakproof connection to the lower section and the upper section of the conduit, respectively, and a wall bounding an inner chamber of said housing;
(b) a passage channel for the measurement probe comprising an upper part passing through the means of connection of the housing to the upper section of the conduit and a lower part passing through the means of connection of the housing to the lower section of the conduit, emerging in an inner chamber of the housing;
(c) a shutter arranged in said inner chamber and oscillating about a horizontal axis between a closed and an open position of an inner end of the upper part of the passage channel emerging in the inner chamber and comprising a closing member which cooperates with said inner end in a closed position to close the passage channel and a counterweight for returning the closing member in the closed position; and
(d) means for measuring the pressure into the inner chamber of the housing.

5,112,568

Patent Not Issued For This Number

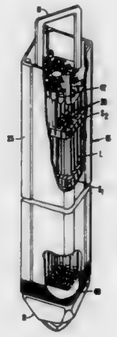
5,112,569
INTRINSIC-SAFETY NUCLEAR REACTOR OF THE PRESSURIZED WATER TYPE
Luciano Cinotti, Genoa, Italy, assignor to Ansaldo S.p.A., Genoa, Italy
Filed Sep. 15, 1989, Ser. No. 407,661
Claims priority, application Italy, Sep. 15, 1988, 12545 A/88
Int. Cl.[5] G21C *9/00*
U.S. Cl. 376—282 **10 Claims**



1. Intrinsic-safety nuclear reactor of the pressurized-water type comprising:
a reactor vessel having a core and containing a hot column of a primary fluid,
a pressurized non-thermally insulated container surrounding the reactor vessel and defining therein a tank having a column of cold first neutron absorbing liquid,
pipes providing communication between said pressurized container and said vessel, and
means defining an enclosed pool, containing a second neutron absorbing liquid kept at atmospheric pressure,
said pressurized container being positioned in said pool and being completely submerged in said second neutron absorbing liquid contained therein.

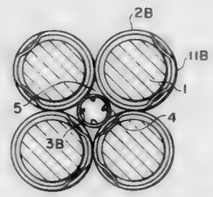
5,112,570
TWO-PHASE PRESSURE DROP REDUCTION BWR ASSEMBLY DESIGN
Gary E. Dix; Russell L. Crowther, both of Saratoga; Mark J. Colby, San Jose; Bruce Matzner, San Jose, and Robert B. Elkins, San Jose, all of Calif., assignors to Hewlett-Packard Company
Filed Apr. 4, 1988, Ser. No. 176,975
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.
Int. Cl.[5] G21C *15/00*
U.S. Cl. 376—370 **30 Claims**

1. In a boiling water reactor having discrete bundles of fuel rods confined within channel enclosed fuel assemblies, an improvement to a fuel bundle assembly for placement in said reactor wherein said fuel bundle includes:
a fuel channel having vertically extending walls forming a continuous channel around a fuel assembly volume, said channel being open at the bottom end for engagement to a lower tie plate and open at the upper end for engagement to an upper tie plate:
a plurality of rods for placement within said channel, each said rod containing fissile material for producing nuclear reaction when in the presence of sufficient moderated neutron flux;
a lower tie plate for supporting said bundle of rods within said channel, said lower tie plate joining the bottom of said channel to close the bottom end of said channel, said lower tie plate providing defined apertures for the inflow of water in said channel between said rods for the generation of steam during said nuclear reaction;
said plurality of fuel rods extending from said lower tie plate wherein a single phase region of said water in said bundle is defined to an upward portion of said bundle wherein a two phase region of said water and steam in said bundle is defined during nuclear steam generating reaction in said fuel bundle;
an upper tie plate for supporting the upper end of said bundle of rods, said upper tie plate joining the top of said channel to close the top end of said channel, said upper tie plate providing defined apertures for the outflow of water and steam in said channel from the generation of steam during nuclear reaction;
spacers intermediate said upper and lower tie plates at preselected elevations along said fuel rods for maintaining said



rods in spaced apart locations along the length of said fuel assembly;
the improvement to said fuel rods comprising:
a plurality of said fuel rods being partial length fuel rods extending from said lower tie plate toward said upper tie plate, said partial length rods terminating within the two phase region of said bundle before reaching said upper tie plate; and,
at least two of said partial length rods being separate from one another so as to define in at least two locations in said bundle spaced apart and separate vents commencing at the top of said partial length rods and extending to said upper tie plate, each of said spaced apart vents being immediately adjoined by adjacent full length fuel rods.

5,112,571
FUEL ASSEMBLY AND FUEL SPACER
Akihito Orii, Hitachi; Osamu Yokomizo, Ibaraki; Yasuhiro Masuhara, Katsuta; Koji Nishida, Hitachi; Shigeto Murata, Katsuta; Shin-ichi Kashiwai, Hitachi; Kotaro Inoue, Ibaraki, and Yuichiro Yoshimoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 17, 1990, Ser. No. 510,192
Claims priority, application Japan, Apr. 26, 1989, 1-106589
Int. Cl.[5] G21C *3/34*
U.S. Cl. 376—439 **13 Claims**



1. A fuel assembly having fuel rods inserted into hollow cylindrical cells welded to one another in a grating arrange-

ment so as to form a spacer which keeps the fuel rods correctly spaced from one another, the spacer having spacer elements disposed in a plurality of stages in the longitudinal direction of the fuel rods, said fuel assembly comprising:

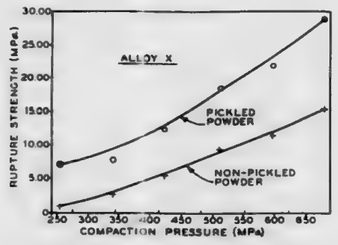
vanes formed on said cells at least at positions corresponding to the uppermost of said stages of said spacer elements, each vane being bent from a cut formed in a part of the side wall of the cell, said vanes obliquely projecting into the corresponding spaced between adjacent fuel rods and allowing a coolant flowing through said spaces and forming two-phase flows to generate swirling flows toward said fuel rods and enabling adherence of a liquid film on said fuel rods.

5,112,572

DEOXIDATION TREATMENT FOR CONSOLIDATED ATOMIZED METAL POWDER

Thijs Eerkes; James A. E. Bell, both of Oakville, and Carlos M. Diaz, Mississauga, all of Canada, assignors to Inco Limited, Toronto, Canada

Filed Oct. 1, 1991, Ser. No. 769,956
Int. Cl.[5] B22F *1/00*
U.S. Cl. 419—30 **15 Claims**



1. A method for producing metal products from chromium containing metal powder having an oxidized surface comprising the steps of:

a) treating said metal powder with an alkaline solution containing an oxidizer capable of oxidizing chromium to a hexavalent state to dissolve chromium oxides from said oxidized surface of said metal powder,

b) treating said metal powder with an acidic solution essentially devoid of hydrofluoric acid to remove remaining oxides from said oxidized surface of said metal powder,

c) rinsing said metal powder,

d) drying said metal powder, and

e) consolidating said metal powder into a desired shape.

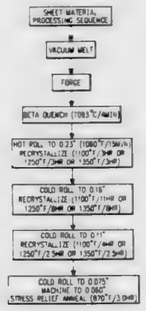
5,112,573

ZIRLO MATERIAL FOR LIGHT WATER REACTOR APPLICATIONS

John P. Foster, Monroeville; Robert J. Comstock, Penn Township, Westmoreland County, both of Pa.; Samuel A. Worcester, Butte, Mont., and George P. Sabol, Export, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 28, 1989, Ser. No. 399,662
Int. Cl.[5] C22C *16/00*
U.S. Cl. 420—422 **16 Claims**

1. An alloy comprising, by weight percent, 0.5–2.0 niobium, 0.7–1.5 tin, 0.07–0.14 iron, and 0.03–0.14 of at least one of nickel and chromium, and at least 0.12 total of iron, nickel and chromium, and up to 220 ppm carbon, and the balance essentially zirconium, the alloy having a 520° C. high temperature weight gain at 15 days of no more than 633 mg/dm^2.

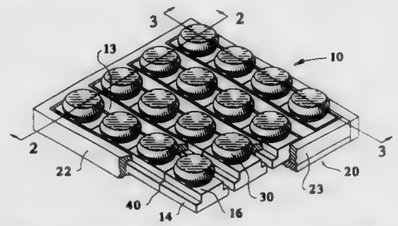


5,112,574

MULTITITER STOPPER ARRAY FOR MULTITITER PLATE OR TRAY

Nikki Horton, Arlington, Va., assignor to Imanigation, Ltd., Gaithersburg, Md.

Filed Apr. 26, 1991, Ser. No. 691,811
Int. Cl.[5] B01L *3/00, 11/00*; C12M *1/00, 1/18*
U.S. Cl. 422—102 **4 Claims**



1. Multititer stopper array for multititer plate or tray comprising

T-shaped means defining a generally elongated construction throughout and having a free surface area extending along a bottom side to engage with open cells or open wells in the tray,

lid means defining a frame having a plurality of recess means for slidingly receiving the T-shaped means in securement within the frame of the lid means,

a series of stopper means integrally disposed on the free surface area of the T-shaped means, and

the series of stopper means extending from said free surface area to be matingly received in a series of the open cells or open wells.

5,112,575

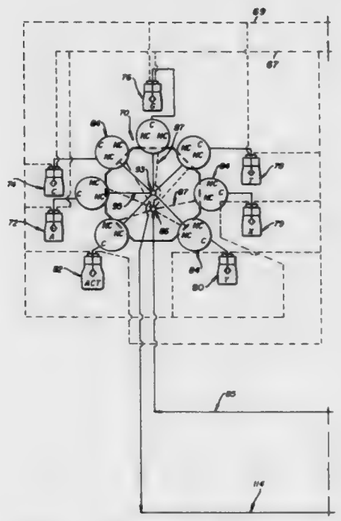
POLYNUCLEOTIDE SYNTHESIZER

Craig M. Whitehouse, Branford; Glenn P. Whitehouse, Wallingford; Debra A. Sesholtz, West Haven, all of Conn., and David Norman, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 285,277, Dec. 16, 1988, abandoned. This application Feb. 14, 1991, Ser. No. 657,871
Int. Cl.[5] G05D *7/00*; C12M *1/40, 1/36*
U.S. Cl. 422—116 **6 Claims**

1. In a synthesizer apparatus for synthesizing peptides or polynucleotides, the apparatus including supply means for supplying a) liquid reactants for synthesizing the peptides or polynucleotides, b) liquid reagents that assist in said synthesis, and c) a wash liquid; a first reactor column; means for fluidly connecting said supply means with said first reactor column; means for positively displacing with gas pressure, liquid reactants and reagents, and wash liquid from said supply means into said connecting means; and controlling means connected to said first reactor column and containing a temporary storage chamber, for allowing liquid to flow under the force of said gas pressure and at a controlled rate, into said temporary storage chamber and for thereafter emptying the temporary storage chamber;

the improvement wherein said apparatus further includes means for delivering liquid from said first reactor column to said controlling means and wherein said controlling means is a positive displacement controlling means that contacts said delivered liquid and is fluidly positioned only downstream of said first reactor column, and further including means for preventing flow from said temporary storage chamber back to said first reactor column, so that said first reactor column is precluded from contamination



by reactants or reagents in said controlling means, and said controlling means needs no cleaning to prevent it from contaminating said first reactor column,

and wherein said apparatus further includes a parallel manifold having i) sufficient inlet means to receive each of said liquid reactants, ii) a common inlet to receive the wash liquid, and iii) an outlet connected to said connecting means to supply reactant or reagent to said first reactor column or said controlling means, each of said inlet means including a pair of tandem two-way valves, both of the valves of said pair having a common outlet that feeds into said manifold outlet, one portion of each pair of said tandem valves being connected to said common inlet for said wash liquid and the other portion of said valves being connected to said inlet means for one of said liquid reactants,

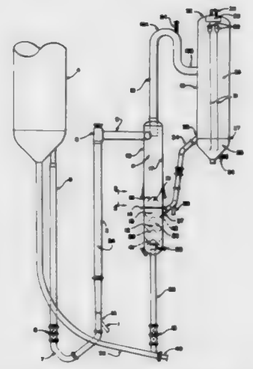
and means for selectively opening only one of the pairs of tandem valves at a time to a source of wash liquid, in a predetermined sequence, whereby an adequate source of wash liquid can be provided for each of said valve pairs of said parallel manifold.

5,112,576

CATALYTIC CRACKING UNIT WITH COMBINED CATALYST SEPARATOR AND STRIPPER

Larry W. Kruse, Crete, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed May 25, 1990, Ser. No. 529,191
Int. Cl.[5] B01J *8/18*
U.S. Cl. 422—144 **18 Claims**



1. An apoparatus for the catalytic cracking of a hydrocarbon feed, comprising:

a. a reactor comprising a reactor outlet for contacting a hydrocarbon feed with catalytic cracking catalyst at catalytic cracking conditions and producing a suspension of hydrocarbon product and coked catalyst;

b. a disengager vessel defining an interior, a product inlet and a hydrocarbon gas outlet and containing and enclosing at least one internal cyclone positioned in the interior of said disengager vessel; and

c. external means positioned external to, outwardly of, and in comuunication with said reactor and said disengager vessel, said external means located downstream of said reactor outlet and upstream of said disengager product inlet and comprising and substantially enclosing separator means for grossly separating a substantial amount of said coked catalyst from hydrocarbon product, stripping means for removing a substantial amount of volatile hydrocarbon from said coked catalyst, and an annular frusto conical deflector positioned between said separator means and said stripping means, said annular frusto conical deflector defining a central opening, an upwardly converging top, and a downwardly diverging bottom.

5,112,577

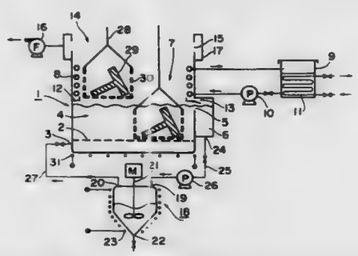
APPARATUS FOR REMOVING DISPERSION MEDIUM IN METAL OR CERAMIC MOLDED BODY

Hiroaki Nishio, Tokyo, Japan, assignor to NKK Corporation, Tokyo, Japan

Filed Sep. 7, 1990, Ser. No. 578,998
Claims priority, application Japan, Sep. 7, 1989, 1-230356
Int. Cl.[5] B01J *8/00*; B01D *11/04*
U.S. Cl. 422—187 **2 Claims**

1. An apparatus for removing a dispersion medium for metal or ceramic in a metal or ceramic molded body which comprises a dispersion medium-removing vessel comprising a condensing zone containing cooling means, which condensing zone is located in an upper part of the vessel and a boiling zone containing heating means located in a lower part of the vessel, said vessel also comprising means to introduce a metal or ceramic molded body into the boiling zone, a separator to separate a solvent in the dispersion medium solution which is in solution as discharged from the vessel by heating the solution

at a temperature higher than the boiling point of the solvent to evaporate the solvent, said boiling zone being connected to said separator through a pipe to transport the dispersion medium solution and a pipe which transports the vaporized solvent from one to the other, thereby forming a circuit, and a pump provided in the circuit.

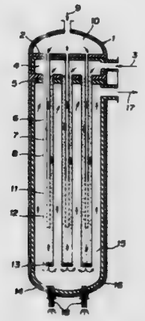


5,112,578

REACTOR FOR REFORMING HYDROCARBON AND PROCESS FOR REFORMING HYDROCARBON

Katsutoshi Murayama; Masatoshi Yamaguchi, and Tooru Nakamura, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 336,905
Claims priority, application Japan, Apr. 12, 1988, 63-88248
Int. Cl.[5] B01J *8/06*
U.S. Cl. 422—197 **6 Claims**



1. A reactor for the reforming of hydrocarbons by a steam reforming reaction and a partial oxidation reaction, which comprises:

a reactor shell having a peripheral wall;

an upper tube sheet fixed to said peripheral wall of said reactor shell within an upper portion of said reactor shell, an upper chamber being defined in said reactor shell above said upper tube sheet for holding an oxygen-containing gas therein;

a lower tube sheet fixed to said peripheral wall of said reactor shell below said upper tube sheet, a middle chamber being defined in said reactor shell between said upper and lower tube sheets for holding a mixture gas of hydrocarbon with steam therein, and a lower chamber being defined below said lower tube sheet for heat exchange of a reformed gas;

at least one reaction tube mounted to and extending perpendicularly downwardly from said lower tube sheet into said lower chamber, said at least one reaction tube having an aperture at an upper end portion opening into said middle chamber and having an outlet at a lower end portion into said lower chamber, said outlet being permeable to a reformed gas, and said reaction tube defining a gas flow path from said middle chamber to said lower chamber for passage therethrough of the mixture gas and for carrying out the reforming and partial oxidation reactions of the mixture gas;

an inner tube mounted to said upper tube sheet and extending perpendicularly therefrom and downwardly inside each of said at least one reaction tube, said inner tube having an aperture at an upper end portion opening into said upper chamber and a plurality of holes along a lower end portion, said inner tube having a length within said reaction tube which is smaller than the length of said reaction tube by 10 to 20% so that said lower end portion of said inner tube is spaced apart from said outlet of said reaction tube, and said inner tube defining a gas flow path from said upper chamber into said lower end portion of said reaction tube for feeding of the oxygen-containing gas to said reaction tube;

a catalyst for reforming and oxidation of a mixture gas of hydrocarbon with steam to thereby obtain a reformed gas, said catalyst packed inside each of said at least one reaction tube, filling the space between said reaction tube and said inner tube and filling the space between the lower end portion of said inner tube and said outlet of said reaction tube, said outlet of said at least one reaction tube comprising a catalyst support for supporting said catalyst within said reaction tube, and said catalyst support permitting the reformed gas to pass therethrough;

inlet means for feeding the oxygen-containing gas into said upper chamber;

inlet means for feeding the mixture gas of hydrocarbon and steam into said middle chamber;

outlet means for discharging the reformed gas from said lower chamber; and

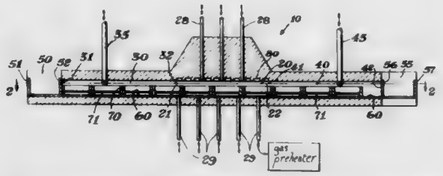
wherein the upper length of said reaction tube from said upper end portion to said lower end portion proximate to said inner tube holes defines a flow path for carrying out a primary steam reforming reaction of the mixture gas of hydrocarbon with steam, and wherein the lower length of said reaction tube from said lower end portion proximate to said inner tube holes to said catalyst support defines a flow path for carrying out a further reforming reaction and an oxidation reaction of the primary reformed gas.

5,112,579

CONTINUOUS CARBOTHERMAL REACTOR

David A. Dunn; Michael S. Paquette, both of Midland, Mich.; Henry Easter, Atkins, and Roger K. Pihlaja, Russellville, both of Ark., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 447,310, Dec. 7, 1989, Pat. No. 4,983,553.
This application Dec. 12, 1990, Ser. No. 626,648
Int. Cl.[5] B01J *8/02*
U.S. Cl. 422—198 **9 Claims**



1. An apparatus for converting solid reactants to solid reaction products comprising:

a) a tunnel having sides, a top and a bottom, the tunnel being apportioned along its length into three chambers, said chambers being respectively a first tunnel chamber, a reaction chamber and a second tunnel chamber, the first and second tunnel chambers being connected to, and in fluid communication with, opposed ends of the reaction chamber, said reaction chamber having disposed therein a plurality of heating elements arrayed in a manner sufficient to impart heat to contents of at least one of a plurality of solid reactant container means as said container means traverse the reaction chamber, the disposition of the heating elements serving to define opposing first and second ends of said reaction chamber;

b) a plurality of solid reactant container means, each of which has a bottom out of which a gaseous material receiving chamber is cut and a porous floor that has an upper, solid reactant receiving surface, a lower, gaseous chamber surface that serves as a ceiling for the gaseous material receiving chamber and a plurality of passageways defined therein, the gaseous material receiving chamber being in fluid communication with the solid reactant material receiving surface via said passageways, said container means being in operative contact with the bottom of the tunnel and movable along its length;

c) a means for moving said container means at least once through the reaction chamber of said tunnel;

d) means for supplying gaseous materials to the gaseous material receiving chamber of each solid reactant container means while said container means are conveyed through the reaction chamber, said means for supplying gaseous materials being in fluid communication with a lower portion of the reaction chamber; and

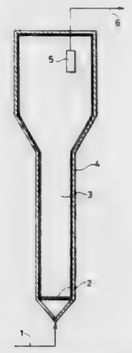
e) means for removing gaseous reaction products from the reaction chamber, said means for removing gaseous reaction products being in fluid communication with an upper portion of the reaction chamber.

5,112,580

REACTOR FOR THE PRODUCTION OF CHLORINE

Masanobu Ajioka, Yokohama; Shinji Takenaka; Hiroyuki Itoh, both of Omuta; Masafumi Kataita, Houya, and Yoshitsugu Kohno, Omuta, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 169,951, Mar. 18, 1988, Pat. No. 4,956,169.
This application May 21, 1990, Ser. No. 525,724
Claims priority, application Japan, Mar. 18, 1987, 62-61332
Int. Cl.[5] B01J *1/10*
U.S. Cl. 422—241 **13 Claims**



1. A reactor suitable for producing chlorine by reacting hydrogen chloride and oxygen in the presence of a chromium oxide catalyst, wherein the reactor is made of a material having an iron content of less than 1% and comprises a reactor wall, said wall having a catalyst-contacting part which is lined with a lining material having the formula:

$$M_aX_b$$

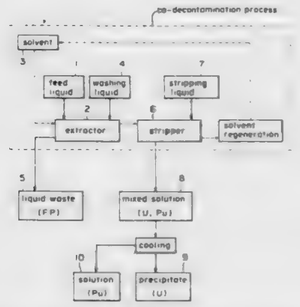
where M is boron, aluminum, silicon, titanium, zirconium or chromium; X is oxygen, nitrogen or carbon; a is an integer of 1 to 2, and b is an integer of 1 to 3; or with a mixture of at least two of the above lining materials.

5,112,581

METHOD OF SEPARATING URANIUM AND PLUTONIUM FROM MIXED SOLUTION CONTAINING URANIUM AND PLUTONIUM

Jin Ohuchi; Isao Kondoh, both of Naka, and Takashi Okada, Katsuta, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Jul. 31, 1991, Ser. No. 738,545
Claims priority, application Japan, Oct. 1, 1990, 2-263379
Int. Cl.[5] G01G *56/00*
U.S. Cl. 423—3 **3 Claims**



1. A method of separating uranium and plutonium from a mixed solution containing uranium and plutonium, said method comprising cooling a mixed solution containing uranyl nitrate and plutonium nitrate to a temperature ranging from −40 to −20° C. to thereby selectively precipitate uranyl nitrate and separating the precipitated uranyl nitrate from the solution while leaving plutonium nitrate to remain in the solution.

5,112,582

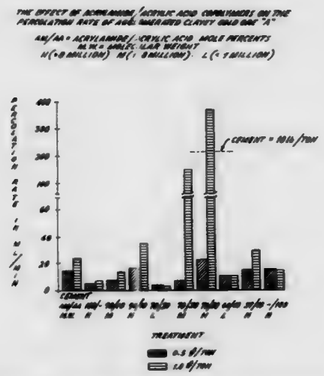
AGGLOMERATING AGENTS FOR CLAY CONTAINING ORES

David M. Polizzotti, Yardley, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 508,517, Apr. 9, 1990, abandoned, which is a continuation of Ser. No. 325,608, Mar. 20, 1989, abandoned. This application May 11, 1990, Ser. No. 522,436
The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.
Int. Cl.[5] C22B *11/00, 3/00*
U.S. Cl. 423—27 **4 Claims**

1. In a process for percolation leaching of precious metal from a mineral bearing ore wherein the mineral bearing ore is first agglomerated with an agglomeration agent, formed into a heap and then leached by percolating a leaching solution through the heap which extracts the precious metal from the agglomerated ore for subsequent recovery, the improvement in which the agglomerating agent comprises an anionic copolymer of acrylamide and acrylic acid wherein the mole ratio

of acrylamide to acrylic acid ranges from about 90 to 10 to about 70 to 30, said copolymer having a molecular weight



above about 1 million with sufficient lime to provide a pH of from about 9.5 to 11.

5,112,583

PROCESS FOR RECOVERING CHROMIC ANHYDRIDE FROM EXHAUSTED AQUEOUS CHROMIUM PLATING BATH SOLUTIONS WITH EXPLOITATION OF THE RECOVERED CHROMIUM

Giuseppe Bruzzone, Varazze; Giovanni Ghelli, Savona, and Diego Perrone, Cogoleto, all of Italy, assignors to Luigi Stoppani S.p.A., Milan, Italy

PCT No. PCT/IT88/00038, § 371 Date Nov. 7, 1990, § 102(e) Date Nov. 7, 1990, PCT Pub. No. WO89/09188, PCT Pub. Date Oct. 5, 1989

PCT Filed May 24, 1988, Ser. No. 573,019

Claims priority, application Italy, Mar. 23, 1988, 19916A/88

Int. Cl.[5] C01G *37/14;* **C25B** *1/16;* **C02F** *1/46*

U.S. Cl. 423—55 **6 Claims**

1. A process for recovering chromic anhydride from exhausted chromium plating baths polluted by metal compounds, comprising the steps of:

a) adding an alkali to the exhausted solution to adjust it to a pH range between 3 and 7;

b) precipitating the metallic pollutants; and

c) separating the precipitate obtained in step b) from the solution containing hexavalent chromium by filtration, wherein the chromium of said solution are partially oxidized from the trivalent to the hexavalent state and said metallic pollutants are coprecipitated together with chromium chromate.

5,112,584

METHOD FOR PRODUCTION OF MAGNESIUM CHLORIDE

Glor T. Mejdell; Hanne M. Baumann, both of Porsgrunn, and Kjell W. Tveten, Skien, all of Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Continuation-in-part of Ser. No. 221,452, Jul. 15, 1988, abandoned. This application Apr. 17, 1990, Ser. No. 509,956

Claims priority, application Norway, Jul. 15, 1987, 872945

Int. Cl.[5] C01F *5/32*

U.S. Cl. 423—161 **10 Claims**

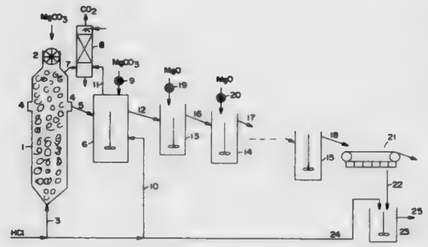
1. A method for production of magnesium chloride for use in production of magnesium metal, by leaching magnesite in hydrochloric acid, which consists essentially of

feeding magnesite-containing lumps, the greater part of which have a size of 5-400 mm, to a first reactor to form a packed bed of the lumps,

dissolving the magnesite by introducing hydrochloric acid into the first reactor countercurrent to the lumps, and wherein liberated CO_2 and acid brine flow cocurrently upwards in the first reactor,

separating CO_2 and gaseous HCl off from the first reactor,

introducing the resultant magnesium chloride-containing solution from the first reactor into a second reactor,



adding either magnesite of a grain size less than 3 mm or hydrochloric acid to the second reactor to obtain approximately chemical equivalence between magnesium and chlorine, and

precipitating impurities from the resultant solution.

5,112,585

PROCESS OF REMOVING FLUE GAS CLEANING RESIDUES DURING THE WET CLEANING OF FLUE GASES BY DRYING AND CONSTRUCTION

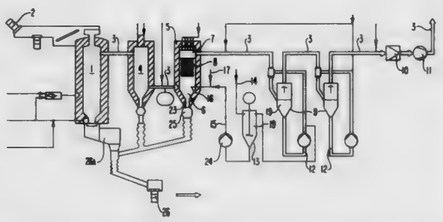
Friedrich Dirks, Gondelsheim; Ortwin Batsch; Wilhelm Hempelmann, both of Leopoldshafen, and Hans Leibold, Ettlingen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Dec. 6, 1989, Ser. No. 446,730

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1988, 3841009

Int. Cl.[5] B01D *47/00;* **C01B** *17/48, 21/20*

U.S. Cl. 423—210 **7 Claims**



1. A process for removing flue gas cleaning residues in a combustion system, the combustion system including: a combustion chamber; a hot gas filter located downstream from the combustion chamber, the hot gas filter including an inlet chamber for receiving hot flue gases, an outlet chamber sapced from the inlet chamber, and filter elements held by a holding plate in an upright position located between the inlet chamber and the outlet chamber and containing outlet openings; washers located downstream from the hot gas filter for receiving filtered flue gas from the outlet chamber, the wahsers empolying a washing liquid for precipitating contaiminants in the flue gas, said process comprising steps of:

precipitating contaiminants present in the flue gas in the washing liquid;

neutralizing the washing liquid, thereby enriching the washing liquid with salts of the precipitated vontaminants;

spraying the enriched washing liquid into the inlet chamber,

whereby the wahing liquidevaporates the salts contained in the washing liquid are dposited on the filter elements;

blowing compressed air by way of blow lances communicating with the outlet openings of the filter elements into the filter elements to release thed eposited salts from the filter elements, whereby the deposited salts drop into a lower portion of the inlet chamber; and

removing the salts from the lower porton of the inlet chamber.

5,112,586

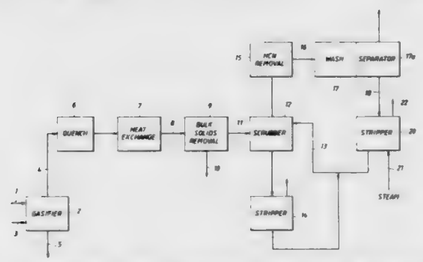
PROCESS FOR PURIFICATION OF SYNTHESIS GAS

Daniel C. Baker, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 18, 1990, Ser. No. 599,546

Int. Cl.[5] C01B *17/16, 31/20;* **C01C** *3/00;* **B01D** *45/00*

U.S. Cl. 423—220 **3 Claims**



1. A process for the purification of a synthesis gas stream containing CO_2 and minor amounts of NH_3 and HCN, and from which the bulk of the flyslag has been removed but which contains residual flyslag particles, comprising

(a) passing said synthesis gas stream to a solids scrubbing zone and scrubbing said gas stream with an effective amount of an aqueous scrubbing solution and removing residual flyslag particles from said stream, producing a substantially solids-free synthesis gas stream containing HCN, CO_2 and NH_3 and possibly COS;

(b) removing HCN, and possibly COS, from said solids-free synthesis gas stream.

(c) contacting said solids-free stream with water and cooling said stream, and producing cooled synthesis gas and a solution containing NH_3 and dissolved CO_2.

(d) stripping said solution containing ammonia and CO_2 to produce a stripped aqueous solution containing a reduced concentration of ammonia and CO_2;

(e) utilizing the stripped aqueous solution from step (d) as at least part of the aqueous scrubbing solution of step (a).

5,112,587

METHOD FOR THE DENITRATION OF WASTE GASES WITH OBTENTION OF HNO_3

Wedigo von Wedel, Offenbach; Elke Senft, Langenselbold, and Oswald Helmling, Hasselroth, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 6, 1991, Ser. No. 696,011

Claims priority, application Fed. Rep. of Germany, May 12, 1990, 4015284

Int. Cl.[5] C01B *21/00, 21/38, 21/40;* **B01J** *8/00*

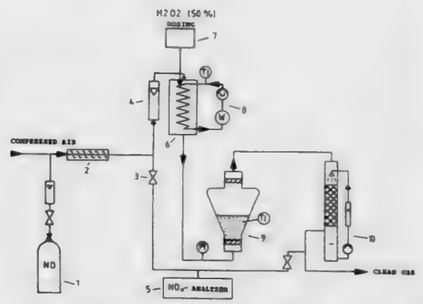
U.S. Cl. 423—235 **18 Claims**

1. A method for the removal of nitrogen oxides from waste gases, comprising: determining the content of nitrogen oxides of the waste gas, treating the waste gas with a solution of hydrogen peroxide converted into the gaseous state in an amount which is adapted to the amount of nitrogen oxides in said waste gas to be removed and is at least stoichiometrically sufficient for the reaction equations:

$$2\ NO + 3\ H_2O_2 \rightarrow 2\ HNO_3 + 2\ H_2O$$

and

$$2\ NO_2 + H_2O_2 \rightarrow 2\ HNO_3,$$



to thereby obtain a gaseous reaction mixture containing the nitrogen oxides and the hydrogen peroxide, reacting the gaseous mixture on a solid catalyst which can absorb at least H_2O_2 but which does not excessively decompose the hydrogen peroxide, and thereafter withdrawing the reacted gaseous mixture.

5,112,588

METHOD OF AND APPARATUS FOR THE REMOVAL OF GASEOUS CONTAMINANTS FROM FLUE GAS OR REDUCTION OF THE CONTENT OF GASEOUS CONTAMINANTS IN A FLUE GAS

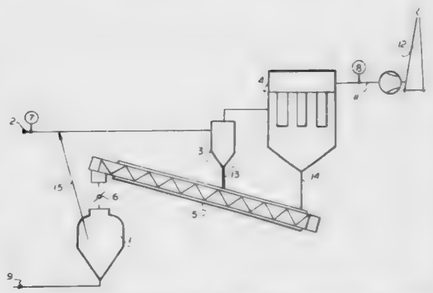
Gernot Staudinger, Messendorfberg 99, A-8042 Graz, and Gernot Krammer, Pensionsweg 12, A-8043 Graz, both of Austria

Filed Jul. 24, 1990, Ser. No. 557,200

Claims priority, application Austria, Jul. 28, 1989, 1835/89

Int. Cl.[5] B01D *53/34;* **C01B** *17/60*

U.S. Cl. 423—244 **3 Claims**



1. A process for removing gaseous contaminants selected from the group which consists of SO_2, SO_3, HCl and HF from a flue gas, said process comprising the steps of:

(a) producing a fly ash capable of activation for use as a sorbent by introducing an adsorbent lime compound into a fossil-fuel combustion in the form of coal-fired combustion, oil-fired combustion and refuse combustion to form said fly ash;

(b) recovering said fly ash from said combustion;

(c) cooling the recovered fly ash to a temperature between 10° and 50° C. below a dewpoint termperature of a dry steam, and introducing the cooled recovered fly ash into a fluidized bed reactor;

(d) fluidizing said cooled recovered fly ash in said fluidized

bed reactor with steam by introducing said dry steam as a fluidizing gas into said fluidized bed reactor at a temperature between 10° and 40° C. above said dewpoint temperature, thereby activating said fly ash and forming a sorbent therefrom;

(e) cooling said flue gas;

(f) recovering said sorbent from said fluidized bed reactor and introducing the recovered sorbent into the flue gas cooled in step (e) thereby absorbing said gaseous contaminants from said flue gas;

(g) thereafter separating said sorbent from the flue gas from which said gaseous contaminants have been absorbed; and

(h) recycling sorbent separated in step (g) to steps (c) and (d) for cooling and activation with said fly ash therein.

5,112,589

METHOD FOR SYNTHESIZING MESOPOROUS CRYSTALLINE MATERIAL USING ACID

Ivy D. Johnson, Medford, and John P. McWilliams, Woodbury, both of N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 625,238, Dec. 10, 1990, which is a continuation-in-part of Ser. No. 470,008, Jan. 25, 1990. This application Jun. 25, 1991, Ser. No. 720,286

Int. Cl.[5] C01B *33/34*

U.S. Cl. 423—328 **10 Claims**

1. A method for synthesizing a composition of matter comprising an inorganic, non-layered, porous crystalline phase material exhibiting, after calcination, an X-ray diffraction pattern with at least one peak at a position greater than about 18 Angstrom Units and having a benzene adsorption capacity of greater than about 15 grams benzene per 100 grams at 50 torr and 25° C., which comprises (i) preparing a reaction mixture capable of forming said composition, said mixture comprising one or a combination of oxides selected from the group consisting of divalent element, trivalent element, tetravalent element and pentavalent element, organic directing agent and solvent or solvent mixture, said organic directing agent comprising an ion of the formula $R_1R_2R_3R_4Q^+$, wherein Q is nitrogen or phosphorus and wherein at lest one of R_1, R_2, R_3, and R_4 is aryl or alkyl of from 6 to about 36 carbon atoms or combinations thereof, the remainder of R_1, R_2, R_3, and R_4 being selected from the group consisting of hydrogen, alkyl of from 1 to 5 carbon atoms and combinations thereof, (ii) maintaining said mixture under sufficient conditions of pH, temperature and time for formation of said composition of matter and (iii) recovering said composition of matter, wherein a strong acid having a pK_a less than about 1 is added to said reaction mixture.

5,112,590

SEPARATION OF GAS MIXTURES INCLUDING HYDROGEN

Ramachandran Krishnamurthy, Piscataway; Steven L. Lerner, Berkeley Heights; Yagya Shukla, Roselle Park, all of N.J., and Alan G. Stokley, Wokingham, England, assignors to The BOC Group plc, Surrey, England

Filed Nov. 14, 1988, Ser. No. 270,927

Claims priority, application United Kingdom, Nov. 16, 1987, 87 26804

Int. Cl.[5] B01D *53/04*; **C01B** *31/18, 31/20, 3/24*

U.S. Cl. 423—415 A **30 Claims**

12. A process of forming hydrogen and carbon monoxide products comprising:

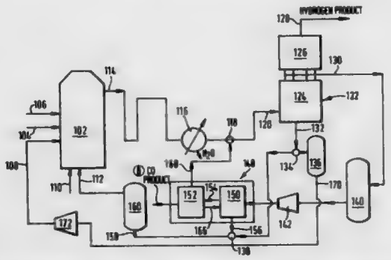
(a) reforming a hydrocarbon with steam and carbon dioxide to form a gas mixture comprising hydrogen, carbon monoxide, and carbon dioxide;

(b) subjecting said gas mixture to at least one sorptive separation by pressure swing adsorption to produce a hydrogen product, a gas mixture product enriched in carbon monoxide and a gas mixture enriched in carbon dioxide, said sorptive separation comprising sequentially feeding said gas mixture through first and second adsorptive regions in series, in each of which carbon monoxide is more strongly adsorbed than hydrogen but less strongly adsorbed than carbon dioxide, withdrawing a hydrogen product from the outlet end of the second region, discontinuing feeding of said gas mixture to said first adsorptive region, withdrawing a gas mixture product enriched in carbon monoxide from both adsorptive regions at a location intermediate said first and second adsorptive regions, and withdrawing a gas mixture enriched in carbon dioxide from the inlet end of said first adsorptive region.

24. Apparatus for forming hydrogen and carbon monoxide products from hydrocarbon comprising:

(a) a reformer for converting hydrocarbon to a gas mixture comprising hydrogen, carbon monoxide and carbon dioxide,

(b) means for introducing steam and carbon dioxide into said reformer for reaction with said hydrocarbon,



(c) a gaseous product recovery system which comprises at least one sorptive separator comprising first and second adsorption zones, each adsorption zone having an inlet end and an outlet end,

(d) conduit means joining the outlet end of said first adsorption zone with the inlet end of said second adsorption zone,

(e) means for withdrawing a hydrogen product from the outlet end of said second adsorption zone,

(f) means for withdrawing a carbon dioxide enriched gas mixture from the inlet end of said first adsorption zone, and

(g) means for separately withdrawing a carbon monoxide stream from said system at superatmospheric pressure through the outlet end of said first adsorption zone and the inlet end of said second adsorption zone.

5,112,591

PROCESS FOR PREPARING PRECURSORS OF CATALYSTS CONTAINING COPPER, ALUMINUM AND ZINC, USABLE FOR THE SYNTHESIS AND THE DECOMPOSITION OF METHANOL

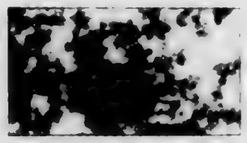
Patrick Chaumette, Bougival; Fabienne Le Peltier, Rueil-Malmaison; Raymond F. Szymanski, Maisons Lffitte; Philippe Courty, Houilles, and Catherine Verdon, Rueil-Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Division of Ser. No. 514,059, Apr. 24, 1990, Pat. No. 5,019,547. This application Feb. 19, 1991, Ser. No. 656,892

Claims priority, application France, Apr. 24, 1989, 89 05424

Int. Cl.[5] C01B *3/22, 31/18*; **C07C** *27/06*

U.S. Cl. 423—415 A **23 Claims**



1. In a catalytic process for reacting CO_2 and CO with hydrogen or for decomposing at least one C_1 to C_5 primary alcohol into CO and CO_2, the improvement comprising employing a catalyst comprising copper, zinc, and aluminum in the following proportions by weight in relation to the total weight of the metals present in said catalyst:

15 to 80% of copper,

4 to 50% of aluminum, and

10 to 70% of zinc,

wherein said catalyst is prepared from a catalyst precursor containing copper, aluminum, and zinc, at least 50% by weight of said precursor being made up of the mixing of a roderite phase consisting of copper, aluminum, and zinc and showing an atomic ratio (Cu+Zn)/Al ranging from 3.5 to 16 and an atomic ratio Zn/Al ranging from 1.6 to 6, and of a prespinel phase consisting of copper, aluminum, and zinc and showing an atomic ratio (Cu+Zn)/Al ranging from 0.20 to 2.10 and an atomic ratio Zn/Al ranging from 0.1 to 1.50, characterized in that said precursor results from the mixing of two ternary precursors, each comprising copper, aluminum, and zinc, one of said ternary precursors containing at least 50% by weight of roderite phase and the other one of said ternary precursors containing at least 50% by weight of prespinel phase, said mixing taking place between, on one hand, one of the ternary precursors obtained at the end of one of stages (1) to (4) of a process P comprising the following stages:

(1) co-precipitation reaction between an aqueous solution of at least one compound of a constituent selected from the group consisting of the alkali metals and the ammonium ion, said compound being selected from the group consisting of the carbonates, the hydrogen carbonates, and the hydroxides, and an aqueous solution containing, in the form of compounds selected from the group consisting of the soluble salts and the soluble complexes, copper, aluminum, and zinc in such proportions that the atomic ratio (CU+Zn)/Al ranges from 3.5 to 16 and the atomic ratio Zn/Al ranges from 1.6 to 6, said reaction taking place at a pH value ranging from 6.3 to 7.3, at a temperature ranging from 70° to 90° C., with a residence time ranging from 0.1 to 60 minutes;

(2) filtration, then water washing of the product obtained at the end of stage (1);

(3) drying of the product obtained at the end of stage (2), between 50° to 200° C.;

(4) calcination of the product obtained at the end of stage (3), between 250° and 500° C.; and, on the other hand, one of the ternary precursors obtained at the end of one of stages (1) to (4) of a process P' comprising the following stages:

(1) co-precipitation reaction between an aqueous solution of at least one compound of a constituent selected from the group consisting of the alkali metals and the ammonium ion, said compound being selected from the group consisting of the carbonates, the hydrogen carbonates, and the hydroxides, and an aqueous solution containing, in the form of compounds selected from the group consisting of the soluble salts and the soluble complexes, copper, aluminum, and zinc in such proportions that the atomic ratio (Cu+Zn)/Al ranges from 0.20 to 2.10 and the atomic ratio Zn/Al ranges from 0.10 to 1.50, said reaction taking place at a pH value ranging from 6.3 to 7.3, at a temperature ranging from 45° to 65° C., with a residence timing ranging from 0.1 to 60 minutes;

(2) filtration, then water washing of the product obtained at the end of stage (1),

(3) drying of the product obtained at the end of stage (2), between 50° and 200° C.,

said mixing being followed by:

filtering and water washing, then drying between 50° and 200° C. and, afterwards, calcining between 250° and 500° C., if at least one of the two ternary precursors which have been mixed together has been previously obtained at the end of stage (1) of one of the processes P and P';

drying between 50° and 200° C., then calcining between 250° and 500° C., if one of the ternary precursors which have been mixed together has been previously obtained at the end of stage (2) of any one of processes P and P', the other one of the two ternary precursors which have been mixed together being obtained at the end of one of stages (2) to (4) of one of the processes P and P'; and

calcining between 250° and 500° C., if the two ternary precursors which have been mixed together have been previously obtained at the end of one of stages (3) and (4) of one of the processes P and P'.

5,112,592

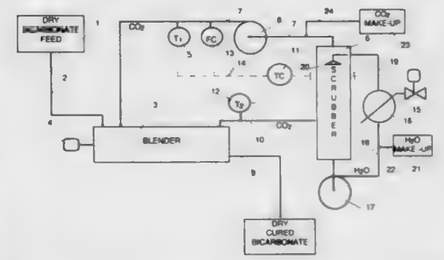
PROCESS FOR CURING BICARBONATES

Andrew D. Kurtz, Somerville, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Filed Jun. 17, 1991, Ser. No. 716,813

Int. Cl.[5] C01B *31/24*

U.S. Cl. 423—419 R **8 Claims**



1. A process for curing, or reducing the amount of residual carbonate having the formula M_2CO_3 on a bicarbonate having the formula $MHCO_3$, wherein M is an alkali metal, which comprises the steps:

(a) feeding the dry bicarbonate into a reaction zone,

(b) introducing into the reaction zone carbon dioxide gas saturated with water vapor at a temperature T_1 controlled as described in step (d),

(c) turbulently mixing the bicarbonate and the carbon dioxide gas saturated with water vapor to insure thorough contact of said bicarbonate with said carbon dioxide gas saturated with water vapor,

(d) measuring the temperature T_2 of the carbon dioxide stream exiting the reaction zone and controlling temperature T_1 so as to result in a drop in temperature from T_1 to T_2 that is calculated to condense a controlled amount of water vapor sufficient to supply exactly enough water to accomplish the reaction but no detrimental excess,

(e) and reacting the bicarbonate, carbon dioxide, and condensed water vapor, in the substantial absence of excess liquid water, for a sufficient time to produce dry cured bicarbonate product with less carbonate content and not requiring a separate drying step.

5,112,593

PRODUCTION PROCESS OF CHLORINE

Hiroyuki Itoh; Yoshitsugu Kono; Isao Kikuchi; Shinji Takenaka, all of Ohmuta, and Masanobu Ajioka, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation-in-part of Ser. No. 317,566, Mar. 1, 1989, abandoned. This application Oct. 9, 1990, Ser. No. 595,651

Claims priority, application Japan, Mar. 1, 1988, 63-045785

Int. Cl.[5] C01B *7/04*

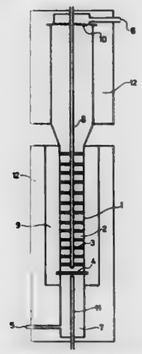
U.S. Cl. 423—502 **3 Claims**

1. A process for producing chlorine by reacting a feed gas comprising hydrogen chloride and oxygen in the presence of a catalyst composed of chromium oxide as a principal component, which comprises using a fluidized bed reactor equipped at vertical intervals not greater than 100 cm with a plurality of perforated horizontal plates having a perforation orate of

10–60% in a reaction zone in which the catalyst is fluidized in operation, said reaction zone being above a gas diffuser plate, wherein

(1) the average particle size of said catalyst is 40–100 μm, the maximum particle size does not exceed 200 μm and particles having a particle size of 40 μm or smaller account for at least 10 wt. % and said catalyst is used in an amount such that the height of the catalyst layer is at least 0.1 m when the reactor is not in operation;

(2) the molar ratio of oxygen to hydrogen chloride in said feed gas is at least 0.25;



(3) said feed gas is charged at an hourly rate of 200–1800 Nl, in terms of hydrogen chloride, per kg of said catalyst;

(4) the superficial velocity, at which said feed gas flows through the reactor, is maintained at 0.1–1.0 m/sec;

(5) said reacting is carried out at a temperature of 350° to 450° C. and at a pressure which is at least atmospheric;

(6) said reactor is made of nickel and contains 1 wt. % or less of iron;

(7) the area of each perforation of said perforated plates is less than or equal to 20 cm^2; and

(8) the diameter of each perforation is larger than the thickness of said perforated plates.

5,112,594

KIT FOR PREPARING A TECHNETIUM-99M MYOCARDIAL IMAGING AGENT

Steven R. Woulfe, Ballwin; Edward A. Deutsch, St. Louis; Mary M. Dyszlewski, Maryland Heights, and William L. Neumann, Grover, all of Mo., assignors to Mallinckrodt Medical, Inc., St. Louis, Mo.

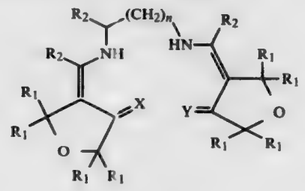
Filed Apr. 4, 1991, Ser. No. 680,446

Int. Cl.[5] A61K *49/02;* **B65D** *69/00*

U.S. Cl. 424—1.1 **16 Claims**

1. A kit for preparing a technetium 99m myocardial imaging agent, said kit comprising:

a first vial containing a lyophilized pyrogen free, sterile mixture of an effective reducing agent and a first ligand having the following general formula:



wherein the R_1 groups may be the same or different and are selected from the group consisting of hydrogen, hydroxy, C_1–C_5 alkyl, C_1–C_5 alkyl substituted by hydroxyl, ether, ester, amide, ketone, aldehyde and nitrile; the R_2 groups may be the same or different and are selected from the group consisting of hydrogen, hydroxy, C_1–C_5 alkyl, C_1–C_5 alkyl substituted by hydroxyl, ether, ester, amide, ketone, aldehyde and nitrile; the X and Y groups may be the same or different and are selected from the group consisting of oxygen and sulfur; and n is equal to 1 or 2; and

a second vial containing a lyophilized pyrogen free, sterile protected salt of a phosphine ligand having the following general formula:



wherein R_4 is selected from the group consisting of hydrogen, C_1–C_5 alkyl, ether, C_1–C_5 alkylaryl and C_1–C_5 dioxanylalkyl; and the R_5 groups may be the same or different and are selected from the group consisting of C_1–C_5 alkyl, ether, C_1–C_5 alkylaryl and C_1–C_5 dioxanylalkyl.

5,112,595

99MTC(III) MYOCARDIAL IMAGING AGENTS AND METHOD OF USE

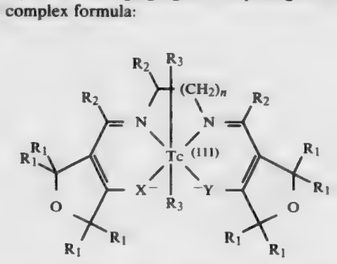
Steven R. Woulfe, Ballwin; Edward A. Deutsch, St. Louis; Mary M. Dyszlewski, Maryland Heights, and William L. Neumann, Grover, all of Mo., assignors to Mallinckrodt Medical, Inc., St. Louis, Mo.

Filed Dec. 21, 1990, Ser. No. 632,285

Int. Cl.[5] A61K *49/02;* **C07F** *13/00*

U.S. Cl. 424—1.1 **19 Claims**

1. A myocardial imaging agent comprising the following general complex formula:



wherein the R_1 groups may be the same or different selected from the group consisting of hydrogen, hydroxy, C_1–C_5 alkyl, C_1–C_5 alkyl substituted by hydroxyl, ether ester, amide, ketone, aldehyde and nitrile; the R_2 groups may be the same or different selected from the group consisting of hydrogen, hydroxy, C_1–C_5 alkyl, C_1–C_5 alkyl substituted by hydroxyl, ether, ester, amide, ketone, aldehyde and nitrile; the X and Y groups may be the same or different selected from the group consisting of oxygen and sulfur; the R_3 groups may be the same or different phosphine ligands comprising the following general formula:



wherein R_4 is selected from the group consisting of hydrogen, C_1–C_5 alkyl, ether, C_1–C_5 alkylaryl, and C_1–C_5 dioxanylalkyl; and the R_5 groups may be the same or different from the R_4 group selected from the group consisting of C_1–C_5 alkyl, ether, C_1–C_5 alkylaryl, and C_1–C_5 dioxanylalkyl; and n is equal to 1 or 2.

5,112,596

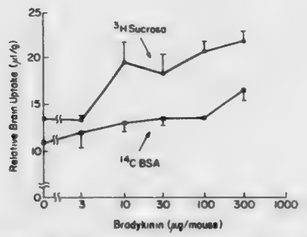
METHOD FOR INCREASING BLOOD-BRAIN BARRIER PERMEABILITY BY ADMINISTERING A BRADYKININ AGONIST OF BLOOD-BRAIN BARRIER PERMEABILITY

Bernard Malfroy-Camine, Arlington, Mass., assignor to Alkermes, Inc., Cambridge, Mass.

Filed Apr. 23, 1990, Ser. No. 512,913

Int. Cl.[5] G01N *1/00;* **A61K** *37/00*

U.S. Cl. 424—2 **16 Claims**



1. A method for increasing the permeability of the blood-brain barrier of a host to a neuropharmaceutical or diagnostic agent comprising co-administering intravenously to said host said agent and an effective amount of a bradykinin agonist of blood-brain barrier permeability; said agonist being effective for increasing blood-brain permeability to said agent.

5,112,597

RADICAL LITHIUM PHTHALOCYANINE CRYSTALS, THEIR PREPARATION PROCESS AND THEIR USE FOR THE IN VIVO DETERMINATION OF MOLECULAR OXYGEN

Mehdi Moussavi, Saint Egreve, France, assignor to Commissariat a l'Energie Atomique, Paris, France

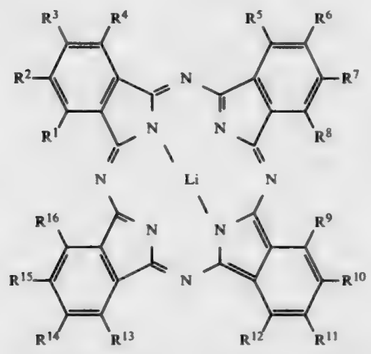
Filed Jun. 28, 1991, Ser. No. 723,243

Claims priority, application France, Jul. 10, 1990, 90 08739

Int. Cl.[5] A61K *31/40, 49/00;* **C07D** *487/22*

U.S. Cl. 424—9 **7 Claims**

1. Radical lithium phthalocyanine crystals according to the formula:



in which R^1 to R^{16} which can be the same or different, represent a deuterium or hydrogen atom and have a tetragonal crystalline structure belonging to the space group P4/mcc.

5,112,598

VITAMIN A AEROSOL-INHALATE PREPARATIONS

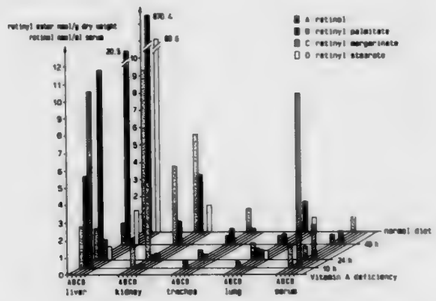
Hans K. Biesalski, Albig, Fed. Rep. of Germany, assignor to Hermes Fabrik Pharmazeutischer Preparate Franz Gradinger GmbH & Co. KG, Grosshesselohe, Fed. Rep. of Germany

Filed May 2, 1989, Ser. No. 346,439

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815221

Int. Cl.[5] A61L *9/04, 9/14, 31/07;* **A01N** *31/04*

U.S. Cl. 424—46 **30 Claims**



1. An aerosol-inhalate pharmaceutical preparation comprising 0.01–50% by weight of at least one active substance selected from the group consisting of an ester of retinol and an ester of retinoic acid, and, in the case of dust aerosols, the balance of the composition 50–99.99% by weight carrier gas, and in the case of mist aerosols, the balance of the composition selected from the group consisting of:

(a) 0–49.99% by weight non-aqueous lipophilic readily volatile and physiologically compatible solvent, and 50–99.99% by weight propellant gas; and

(b) 50–99.99% by weight water or water plus a water-miscible, physiologically compatible liquid and carrier gas.

5,112,599

ORAL COMPOSITIONS

Bryony E. Coulson, Port Sunlight, Great Britain, assignor to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Nov. 30, 1990, Ser. No. 620,502

Claims priority, application United Kingdom, Nov. 30, 1989, 8927073

Int. Cl.[5] A61K *7/16, 7/18*

U.S. Cl. 424—52 **1 Claim**

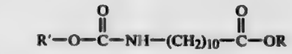
1. An oral composition in the form of an aqueous toothpaste for combating dental caries, comprising from about 50 to about 5,000 ppm of a fluorine-containing anti-caries agent selected from the group consisting of sodium fluoride and sodium monofluorophosphate and from about 1–50% by weight of a particulate hydroxyapatite abrasive material, said composition having a pH of between 7.5 and 8.5.

5,112,600
NOVEL COMPOSITIONS
Robert J. Jackson; Susan A. Duke, and Paul Barnett, all of Weybridge, England, assignors to Beecham Group p.l.c., England
Division of Ser. No. 499,712, Mar. 27, 1990, Pat. No. 5,026,539.
This application May 16, 1991, Ser. No. 701,667
Claims priority, application United Kingdom, Mar. 28, 1989, 8906913
Int. Cl.[5] A61K *7/16, 7/24*
U.S. Cl. 424—55 **13 Claims**

1. An oral hygiene composition in the form of a non-fluoride mouthwash, comprising:
(a) greater than 0 to 10% by weight of a source of hydrogen citrate ions;
(b) greater than 0 to 7% by weight of an oxalate salt; and
(c) an orally acceptable excipient;
the composition having a pH of from 4 to 7 and containing no fluoride anti-caries agent.

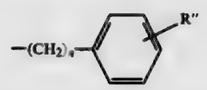
5,112,601
ALKYL ESTERS OF N-CARBOALKYLOXY AMINO-11-UNDECANOIC ACIDS, THEIR USE AS THICKENING AGENTS
Henri Sebag, Paris, and Didier Semeria, Gif sur Yvette, both of France, assignors to L'Oreal, Paris, France
Filed May 17, 1990, Ser. No. 524,783
Claims priority, application France, May 23, 1989, 89 06734
Int. Cl.[5] A61K *7/043*
U.S. Cl. 424—61 **7 Claims**

6. A process of thickening organic media comprising oily liquids or organic solvents used in cosmetics, pharmaceuticals, paints, varnishes, lubricants, fuels or in the food industry, wherein said oily liquids are selected from the group consisting of animal, vegetable and mineral oils and said solvents are selected from the group consisting of hydrocarbons, chlorinated hydrocarbons, esters, alcohols, ketones and glycol ethers, comprising mixing with said oily liquids or organic solvents a thickening effect amount of any alkyl ester of N-carboalkyloxy-11-amino undecanoic acid of general formula:



(I)

in which:
R is H or is linear or branched C_1-C_{30} alkyl, linear or branched C_4-C_{22} alkenyl or a radical of formula:



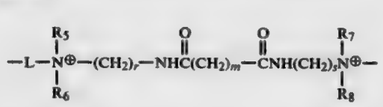
in which n is 0 to 5;
R″ is hydrogen or linear or branched C_1–C_9 alkyl; and
R′ is linear C_{10}–C_{18} alkyl.

5,112,602
DEODORANT CARRYING URETHANE FOAM AND PROCESS OF PREPARING THE SAME
Yoshiaki Miki, and Tsuneharu Ueda, both of Kanagawa; Nobuaki Hiramatsu, and Koji Toyonaka, both of Tokyo, all of Japan
Filed Apr. 20, 1988, Ser. No. 184,124
Claims priority, application Japan, Apr. 23, 1987, 62-98535
Int. Cl.[5] A61L *9/04*
U.S. Cl. 424—76.3 **10 Claims**

1. A deodorant-carrying urethane foam having a deodorant power superior to that of a urethane foam produced by an impregnation process, said deodorant-carrying urethane foam being produced by a process comprising the steps of (a) uniformly dispersing a chemically-reactive deodorant in a stock mixture from which a urethane foam is produced, said chemically-reactive deodorant being added in an amount of 0.05–20% by weight with respect to the stock mixture, said chemically-reactive deodorant being selected from the group consisting of anhydrous sulfates, anhydrous nitrates, phosphoric acids and acid salts thereof, anhydrous polycarboxylic acids having 4 or more carbon atoms and metal salts thereof, α, β-unsaturated dicarboxylic anhydride polymers, and mixtures thereof, said deodorant exhibiting a weight loss of not more than 15% when maintained at 150° C. under atmospheric pressure for one hour; and (b) foaming said stock mixture.

5,112,603
THICKENING AGENTS FOR AQUEOUS SYSTEMS
Richard J. Nadolsky, Clarksburg, and Joseph M. Laryea, Old Bridge, both of N.J., assignors to Miranol Inc., Dayton, N.J.
Filed Dec. 30, 1988, Ser. No. 292,510
Int. Cl.[5] A61K *31/10, 31/74*
U.S. Cl. 514—772.3 **22 Claims**

1. An aqueous thickening composition having a pH of at least 6.5 comprising a smectite clay in combination with a quaternary ammonium polymer comprising a repeating unit of the formula:



wherein R_5, R_6, R_7 and R_8 may be the same or different and are selected from the group consisting of C_{1-3} alkylm C_{1-3} hydroxy alkyl or polyoxy alkylene, L is a linking group derived from a dihalide, m is an integer from 0 to 34, and r and s are the same or different and are integers from 1 to 6.

5,112,604
ORAL SUSPENSION FORMULATION
Joseph M. Beaurline, North St. Paul; Stephen M. Berge, and Robert K. Schultz, both of Shoreview, all of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.
Filed Sep. 1, 1989, Ser. No. 411,903
Int. Cl.[5] A61K *31/79*
U.S. Cl. 424—490 **28 Claims**

1. An aqueous pharmaceutical suspension for oral administration which suspension, based on the total weight of the suspension, comprises from about 0.1 to 15 percent by weight of a particulate medicament with an average particle size of less than about 150 μm; about 0.02 percent to about 5 percent by weight of a pharmaceutically acceptable wetting agent; about 0.02 to about 0.10 percent by weight of a hydrocolloid gum; about 0.2 to about 2.0 percent by weight of colloidal silicon dioxide; about 0.1 to 0.3 percent by weight of an antifoaming agent; a carbohydrate which is dissolved in the suspension; and water; the suspension being further characterized in that the medicament remains suspended uniformly for a period of at least about 90 days when tested according to the Test Method for suspension uniformity.

5,112,605
TEMPORAL GAMMA-INTERFERON ADMINISTRATION FOR ALLERGIES
Paula Jardieu, Belmont, Calif., assignor to Genentech, Inc., South San Francisco, Calif.
Filed Mar. 17, 1989, Ser. No. 325,406
Int. Cl.[5] A61K *37/66*
U.S. Cl. 424—85.5 **17 Claims**

1. A method for the prophylaxis and amelioration of an allergic response to an allergen in a patient known to be susceptible to such response, which comprises administering the allergen to the patient followed by the administration of a therapeutically effective dose of gamma interferon within a predetermined temporal period, which period is sufficient to suppress the allergic response in such patient upon subsequent exposure to the allergen.

5,112,606
METHOD OF PRODUCING ANTIBODIES USING COLLOIDAL METAL AS CARRIER
Sadao Shiosaka, 402-671 William Ave., Winnipeg, Manitoba, R3E 0Z2, Canada; Johji Kohno, 5-5-4, Fujisawadi, Tondabayashi-shi, Osaka, Japan; Hiroshi Kiyama, 4-27-506, Shimoyoshiwar, Nishinomiya-shi, Hyogo-ken, Japan; Masaya Tohyama, 2-9-3, Shinsenrikitamachi, Toyonaka-shi, Osaka, Japan, and Yahe Shiotani, 2-3, Uoyamachi, Kishiwada-shi, Osaka, Japan
Continuation of Ser. No. 1,860, Jan. 9, 1987, abandoned. This application Sep. 29, 1989, Ser. No. 414,608
Claims priority, application Japan, Jan. 10, 1986, 61-3825
Int. Cl.[5] A61K *39/395;* **C07K** *15/28*
U.S. Cl. 530—389.2 **5 Claims**

1. A method of producing an antibody specific for a substance selected from the group consisting of an amino acid, taurine, acetylcholine, serotonin, noradrenaline, histamine and a steroid, which comprises
(i) adsorbing the substance onto colloidal gold in the absence of any additional agents or carriers,
(ii) administering the complex to a mammal to induce an immune response against the substance, and
(iii) isolating either the antibody producing cells, or the antiserum from the immunized mammal.

5,112,607
POTENTIATION OF IMMUNOTOXIN ACTION BY BREFELDIN A
Thomas H. Hudson, Bethesda, and Michael A. King, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jun. 5, 1991, Ser. No. 715,094
Int. Cl.[5] A61K *39/39, 39/395*
U.S. Cl. 424—85.91 **15 Claims**

1. A method for potentiating the cytotoxicity of toxin A chain containing conjugates effective to selectively delete target cells from a system including a population of cells which comprises aiding an amount of Brefeldin A effective to potentiate the cytotoxicity of said toxin A chain containing conjugates.

5,112,608
USE OF PROTEASE NEXIN-I TO MEDIATE WOUND HEALING
Randy W. Scott, Sunnyvale, Calif., and Richard A. Berg, Lambertville, N.J., assignors to Incyte Pharmaceuticals, Redwood City, Calif.
Continuation-in-part of Ser. No. 25,450, Mar. 13, 1987, which is a continuation-in-part of Ser. No. 871,501, Jun. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 870,232, Jun. 3, 1986, abandoned. This application Apr. 5, 1990, Ser. No. 505,442
Int. Cl.[5] A61K *37/547*
U.S. Cl. 424—94.64 **15 Claims**

1. A method of treating a wound on a living mammal, comprising the steps of:
applying a therapeutically effective amount of purified protease nexin-I locally to the area of the wound; and
allowing the protease nexin-I to remain in contact with the wound for a sufficient period of time to allow for the protease nexin-I to promote healing of the wound.

5,112,609
ACIDIC FORMULATIONS OF T-PA
Michael D. Johnston, Beckenham, England, and Henry Berger, Cary, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.
Continuation of Ser. No. 862,774, May 13, 1986, abandoned. This application May 21, 1990, Ser. No. 527,634
Claims priority, application United Kingdom, May 28, 1985, 851358; Aug. 31, 1985, 8521704
The portion of the term of this patent subsequent to Nov. 6, 2007, has been disclaimed.
Int. Cl.[5] A61K *37/547;* **C12N** *9/50*
U.S. Cl. 424—94.64 **31 Claims**

1. A sterilized unbuffered aqueous parenteral solution of t-PA substantially corresponding to human t-PA, in which the pH is from 2 to 5.

5,112,610
METHOD OF MAKING A NATURAL SWEETENER BASED ON *STEVIA REBAUDIANA*, AND USE THEREOF
Udo Kienle, Weidachstrasse 12, 7000 Stuttgart 70, Fed. Rep. of Germany
Filed Sep. 24, 1990, Ser. No. 586,690
Int. Cl.[5] A61K *35/78;* **C07H** *15/24*
U.S. Cl. 424—195.1 **18 Claims**

1. A method of making a natural sweetener substantially free of bitter aftertaste from an extract obtained from plant parts of Stevia rebaudiana; comprising the step of extracting said extract with a supercritical gas to obtain an extraction residue.

5,112,611
PHARMACEUTICAL COMPOSITIONS FOR AIDING HUMAN DIGESTION
Mohammad R. Ahmad, Glenview, and Oscar A. Barke, Skokie, both of Ill., assignors to Floss Products Corporation, Morton Grove, Ill.
Filed Sep. 10, 1990, Ser. No. 579,824
Int. Cl.[5] A61K *35/78, 37/54*
U.S. Cl. 424—195.1 **8 Claims**

1. A pharmaceutical composition for aiding human digestion essentially consisting of the combination of the active ingredients of papain, hyssop and grapefruit extracts blended together, the papain and hyssop being in a ratio between 1:1 and 5:1 parts papain to parts hyssop and the papain and grapefruit extracts being in a ratio between 1:1 and 10:1 parts papain to parts grapefruit, and a carrier blended with the active ingredients.

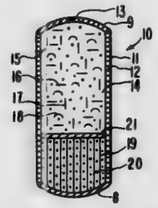
5,112,612
SPHEROIDAL SILICA
Michael J. Garvey, Wirral; Ian C. Griffiths, Merseyside, and John H. S. Rennie, Cheshire, all of England, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands
Division of Ser. No. 202,563, Jun. 6, 1988, Pat. No. 5,011,690. This application May 23, 1990, Ser. No. 527,888
Int. Cl.[5] A61K *9/00*
U.S. Cl. 424—400 **3 Claims**

1. Porous spheroidal silica having a particle size in the range 1 to 400 microns, axial ratios of 1:1 to 1:12, and up to 50% by weight of the SiO_2 of included material dispersed in the silica as particles or droplets in the size range 0.01 to 10 μm, wherein the included material is selected from the group comprising perfumes, flavouring materials, pigments, germicides, bactericides, fungicides, bleaching agents, and mixtures thereof.

5,112,613
COSMETIC COMPOSITION
Shinkichi Honda, Kawasaki; Yoichiro Arai, and Hiroshi Toida, both of Ibaraki, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan
Filed Jan. 23, 1991, Ser. No. 644,567
Claims priority, application Japan, Jan. 27, 1990, 2-16484/90
Int. Cl.[5] A61K 7/00
U.S. Cl. 424—400 4 Claims

1. A cosmetic composition comprising 0.001–10.0 w/w % of N-acetylglutamine or a salt thereof and a cosmetically acceptable component selected from the group consisting of fats and oils, hydrocarbons, waxes, fatty acids, synthetic esters, alcohols, surfactants, thickeners, moisturizers, preservatives, and fragrances.

5,112,614
IMPLANTABLE DELIVERY DISPENSER
Judy A. Magruder, Mt. View; James B. Eckenhoff, and Jeremy C. Wright, both of Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.
Filed Sep. 14, 1989, Ser. No. 407,489
Int. Cl.[5] A61M 37/00; A61K 9/107
U.S. Cl. 424—422 19 Claims



1. An improvement in an implantable dispenser for delivering a beneficial agent to an animal, the implantable dispenser comprising:
(a) a wall in at least a part comprising a composition permeable to the passage of fluid, which wall surrounds;
(b) an internal lumen;
(c) a composition when contacted by fluid increases in volume for displacing a formulation from the implantable dispenser; and,
(d) an exit port in the wall that connects the exterior of the implantable dispenser with the lumen, and wherein the improvement comprises:
(e) a pharmaceutically acceptable beneficial agent formulation in the lumen, which formulation comprises (1) a beneficial agent; (2) an oil that is a carrier for the agent; and (3) a polymer that imparts gel properties to the oil, whereby, through the combined operations of (a), (c), (d) and (e) the beneficial agent formulation is delivered at a rate controlled by the implantable dispenser to the animal over time.

5,112,615
SOLUBLE HIRUDIN CONJUGATES
Ralph K. Ito, Quincy, and Frank W. LoGerfo, Belmont, both of Mass., assignors to New England Deaconess Hospital Corporation, Boston, Mass.
Continuation-in-part of Ser. No. 227,700, Aug. 3, 1988,. This application Oct. 4, 1990, Ser. No. 592,554
Int. Cl.[5] A61F 2/00; A61K 31/00; C07K 3/00
U.S. Cl. 424—426 18 Claims

1. A soluble, biocompatible, pharmacological agent for inhibiting thrombin generation and thrombus formation comprising:
(a) a soluble, biocompatible carrier "selected from the group consisting of a protein, peptide, lipoprotein, glycoprotein, glycosaminoglycan and mixtures thereof"; and
(b) a thrombogenesis inhibitor covalently immobilized on said carrier, said inhibitor being hirudin or an active analog or active fragment thereof.

5,112,616
FAST DISSOLVING BUCCAL TABLET
John A. McCarty, Biscayne Park, Fla., assignor to Schering Corporation, Kenilworth, N.J.
Division of Ser. No. 278,099, Nov. 30, 1988, Pat. No. 5,073,374.
This application Oct. 8, 1991, Ser. No. 773,183
Int. Cl.[5] A61K 9/20, 47/00
U.S. Cl. 424—435 1 Claim

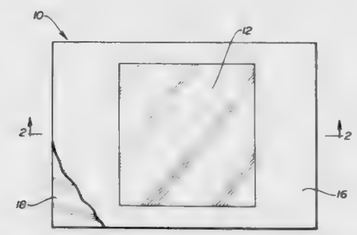
1. A buccal tablet comprising:
(a) an effective amount of a buccally absorbable active ingredient;
(b) a buccal tablet excipient selected from the group consisting of: solids selected from polyethylene glycols and glycerides, which glycerides melt in the range of 25° to 45° C.; surfactants selected from the group consisting of nonionic poly(oxypropylene)poly(oxyethylene) copolymers, polyoxyethylene polysorbate derivatives and sodium lauryl sulfate; and a combination of a surfactant and a solid, wherein the solid and surfactant are as defined above, said excipient being present in an amount ranging from 90 to 99 percent of the tablet weight; and
(c) a pharmaceutically acceptable lubricant wherein the lubricant is magnesium stearate or sodium dodecyl sulfate in an amount ranging from 1 to 3 percent of the tablet weight;
wherein the lubricant is chosen so that disintegration occurs from 0.5 to 5 minutes after administration.

5,112,617
METHOD FOR CONTROLLING COLD SYMPTOMS
Pascual A. Criscuolo, Pueyrredon 2488, Piso 11°"A", and Arnaldo J. Caldirola, Rosetti 236, both of Capital Federal, Argentina
Filed Mar. 1, 1990, Ser. No. 487,415
Int. Cl.[5] A01N 25/04; A61K 9/10, 31/075, 31/045
U.S. Cl. 424—434 4 Claims

1. A method for the reduction of nasal secretion and congestion in upper respiratory cavities in a human being comprising:
applying to a nasal mucosa of a human being an effective dosage, in liquid form, for the reduction of nasal secretion and congestion in upper respiratory cavities of a human being of a mixture of 80 to 90% of 8% strength hydrogen peroxide, 3 to 7% of Hamamelis water, 3 to 7% of orange flower water, 0.1 to 0.5% of magnesium carbonate in very fine suspension, 0.05 to 0.15% of almond essence and 3 to 6% of ethyl alcohol; where the value of the percentage of each component is to be selected in such a way that the sum total amounts to 100%.

5,112,618
HYDROGEL WOUND DRESSING PRODUCT
James V. Cartmell; Wayne R. Sturtevant, both of Centerville, Ohio; Manuel Valadez, Castaic, Calif., and Michael L. Wolf, West Milton, Ohio, assignors to NDM Acquisition Corp., Minneapolis, Minn.
Division of Ser. No. 430,188, Nov. 1, 1989, Pat. No. 5,059,424.
This application Jun. 7, 1991, Ser. No. 712,342
Int. Cl.[5] A61F 13/00
U.S. Cl. 424—443 6 Claims

1. A method of treating wounds comprising the step of applying a substantially transparent hydrogel material to a wound site, said hydrogel material comprising from about 15% to about 30% by weight of a polyhydric alcohol, from about 8% to about 14% by weight of an isophorone diisocyanate terminated prepolymer, from about 5% to about 10% by



weight of a polyethylene oxide based diamine, up to about 1% by weight of a sodium chloride, and the balance water.

5,112,619
ORALLY ADMINISTERABLE SUSTAINED RELEASE PHARMACEUTICAL FORMULATION
Arvind L. Thakkar, Indianapolis, and Lowell L. Gibson, Beech Grove, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Continuation of Ser. No. 336,195, Apr. 11, 1989, abandoned, which is a division of Ser. No. 233,771, Aug. 19, 1988, Pat. No. 4,847,092, which is a division of Ser. No. 797,305, Nov. 12, 1985, Pat. No. 4,797,286. This application Sep. 14, 1989, Ser. No. 407,097
The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.
Int. Cl.[5] A61K 9/64
U.S. Cl. 424—456 4 Claims

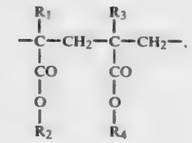
1. A pharmaceutical formulation in capsule unit dosage form comprising a gelatin capsule containing a semi-solid matrix, said semi-solid matrix comprising from about 0.1% to about 60% by weight of a pharmaceutically active agent selected from the group consisting of cardiovascular agents, central nervous system agents and non-steroidal antiinflammatory agents, from about 30% to about 60% by weight of a pharmaceutically acceptable hydrophobic carrier matrix and from about 10% to about 40% by weight of a hydrophilic substance capable of creating channels in the hydrophobic carrier matrix thereby providing a sustained rate of release of the active agent from the formulation.

5,112,620
POLYETHYLENE GLYCOL OINTMENT FOR APTHOUS ULCERS
Michael A. Repka, Pleasanton, and Thomas G. Gerding, Georgetown, both of Tex., assignors to Mikkur, Inc., Pleasanton, Tex.
Filed Sep. 20, 1990, Ser. No. 585,666
Int. Cl.[5] A61K 9/06, 47/32, 47/34, 31/575
U.S. Cl. 514—180 15 Claims

1. A composition for the topical treatment of recurrent aphthous ulcers consisting essentially of from about 3 to 15% by weight of a water soluble salt of a copolymer of methyl vinyl ether and maleic acid or anhydride and from about 85 to 97% by weight of polyethylene glycol, and a therapeutically effective amount of medicament comprising an anesthetic and a steroid effective in the treatment of said ulcers.

5,112,621
SUSTAINED RELEASE PHARMACEUTICAL COMPOSITION OF DILTIAZEM
Howard Stevens, Grande-Bretagne, Scotland; Maryvonne Chariot, Maisons-Alfot, France; Françoise Arnold, Plainsboro, N.J., and Gareth Lewis, Dourdan, France, assignors to Synthelabo, Paris, France
Continuation of Ser. No. 286,871, Dec. 20, 1988, abandoned.
This application Jul. 26, 1990, Ser. No. 559,429
Claims priority, application France, Dec. 21, 1987, 87 17855
Int. Cl.[5] A61K 9/16, 9/58, 9/62
U.S. Cl. 424—497 9 Claims

1. A sustained release pharmaceutical composition, comprising microparticles which contain diltiazem hydrochloride and which are coated with a coating mixture consisting essentially of ethyl cellulose and an acrylic resin in a ratio of from 6:4 to 4:6 by weight, wherein said resin is a polymerisate of acrylic and methacrylic esters, has a molecular weight of at least 100,000 and is comprised of 5% by weight trimethylammonium methacrylate chloride units and units that have the general chemical formula:



wherein:
R_1 is hydrogen or methyl;
R_2 is methyl or ethyl;
R_3 is methyl, and
R_4 is $—CH_2CH_2N(CH_3)_3Cl$.

5,112,622
INTRAVENOUS SOLUTIONS FOR INFLUENCING RENAL FUNCTION AND FOR MAINTENANCE THERAPY
Klaus F. Kopp, Asslkofener Strasse 4, D-8017 Ebersberg, Fed. Rep. of Germany
Filed Jan. 19, 1990, Ser. No. 467,166
Int. Cl.[5] A01N 59/08, 59/10; A61K 33/14
U.S. Cl. 424—663 8 Claims

1. A method of treating a human patient suffering from altered renal function or prophylactically conditioning the human patient so that the kidneys resist entering a condition of altered renal function, which comprises the step of intravenously administering to a patient in need thereof a therapeutically effective amount of a sterile solution comprising at least the following electrolytes at the concentrations indicated:

	mval/liter
Na^+	130 to 150
K^+	0 to 6
Cl^-	80 to 125
HCO_3^-	25 to 70

5,112,623
FUMIGATION METHODS USING A THIOCARBONATE/UREA AQUEOUS COMPOSITION
James A. Green, Chino, and Donald C. Young, Fullerton, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.
Division of Ser. No. 55,923, May 29, 1987, Pat. No. 5,013,350, which is a continuation of Ser. No. 685,454, Apr. 30, 1984, Pat. No. 4,726,144, which is a continuation-in-part of Ser. No. 490,461, May 2, 1983, abandoned, which is a continuation-in-part of Ser. No. 315,492, Oct. 27, 1981, Pat. No. 4,476,113. This application Jan. 31, 1991, Ser. No. 649,585
The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.
Int. Cl.[5] A01N *59/02*
U.S. Cl. 424—713 24 Claims

1. A method for controlling pests selected from the group consisting of bacteria, fungi, insects, rodents, nematodes, and combinations thereof, which comprises applying to the vicinity occupied by said pests an effective amount of a composition consisting essentially of a thiocarbonate selected from the group consisting of alkali and alkaline earth metal thiocarbonates and combinations thereof, urea, and a quantity of water, wherein the combined concentration of dissolved urea and thiocarbonate is greater than that which could dissolve in said quantity of water were said solution an ideal solution.

5,112,624
PREVENTION OF DIGESTIVE DISTURBANCES IN HERBIVORES
Josef Johna, Mutterstadt; Lothar Rasthofer, Munich, and Hermann Daum, Birkenau, all of Fed. Rep. of Germany, assignors to Knoll AG, Ludwigshafen, Fed. Rep. of Germany
Filed Jun. 19, 1990, Ser. No. 540,122
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1989, 3920561
Int. Cl.[5] A23K *1/00*
U.S. Cl. 426—2 10 Claims

1. A method for preventing digestive disturbances in horses which are employed in sport or breeding for sport, consisting essentially of the step of:
feeding said horse feed with 5–200 mg of pancreatin per kg of body weight per day.

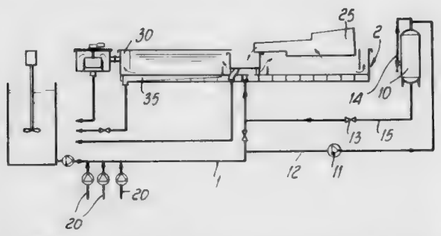
5,112,625
AQUEOUS ZEIN COATED SWEETENERS AND OTHER INGREDIENTS FOR CHEWING GUM
Steven E. Zibell, Tinley Park; Robert J. Yatka, Orland Park, and Henry T. Tyrpin, Palos Hills, all of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.
Continuation-in-part of Ser. No. 383,291, Jul. 17, 1989, which is a continuation of Ser. No. 205,495, Jun. 6, 1988, abandoned, which is a continuation of Ser. No. 921,753, Oct. 22, 1986, abandoned, and a continuation-in-part of Ser. No. 311,125, Feb. 15, 1989, and Ser. No. 4,005, Jul. 17, 1990, and Ser. No. 2,255, Apr. 25, 1990, and Ser. No. 1,269, Mar. 28, 1989, and Ser. No. 3,764, Aug. 30, 1989, and Ser. No. 5,296, Nov. 22, 1989, and Ser. No. 4,400, Dec. 9, 1988, abandoned. This application Aug. 9, 1990, Ser. No. 565,605
Int. Cl.[5] A23G *3/30*
U.S. Cl. 426—5 12 Claims

1. A method of producing chewing gum with a zein coated, high-potency sweetener comprising the steps of:
a) preparing a solution of zein dissolved in water with a pH of between about 11.5 and about 12.1% with a zein content of between about 1% and about 25%;
b) combining a high-potency sweetener with the aqueous zein solution to form a zein coated, high-potency sweetener; and
c) mixing the zein coated, high-potency sweetener in a chewing gum formulation.

5,112,626
AERATED FROZEN DESSERT COMPOSITIONS AND PRODUCTS
Victor T. Huang, Mounds View; William A. Barrier, Plymouth; Luther H. Leake, Arden Hills, all of Minn., and Sharon G. Wittinger, Morristown, N.J., assignors to The Pillsbury Company, Minneapolis, Minn.
Filed Dec. 31, 1990, Ser. No. 636,229
Int. Cl.[5] A23G *9/02;* A23C *9/13*
U.S. Cl. 426—43 29 Claims

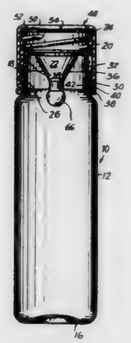
1. A sweetened, aqueous composition suitable for preparing a frozen aerated dairy dessert product, comprising: partially hydrolyzed starch in an amount greater than about 6 wt-%, a sweetening agent, milk protein in an amount to provide a ratio of partially hydrolyzed starch to milk protein of at least about 0.8:1, and water in an amount of about 10 to 70 wt-%; the composition being free of added stabilizing gums, the weight percentages being based upon the total weight percentage of the composition, and the composition being capable of substantially retaining creaminess with substantially reduced iciness under conditions of partial thawing and refreezing when the composition is aerated and frozen.

5,112,627
STABILIZATION PROCESS PARTICULARLY FOR GRAPE MUST
Fabio Perletti, Piazzale dello Sport 4, 20151 Milan; Erminio Collareda, and Bruno Collareda, both of Schio, all of Italy, assignors to O.M.C. Officina Meccanica Collareda S.r.l, Schio and Fabio Perletti, Milan, both of, Italy
Filed Jan. 14, 1991, Ser. No. 640,749
Claims priority, application Italy, Jan. 19, 1990, 19101A/90
Int. Cl.[5] C12G *1/00;* A23B *7/144*
U.S. Cl. 426—50 14 Claims



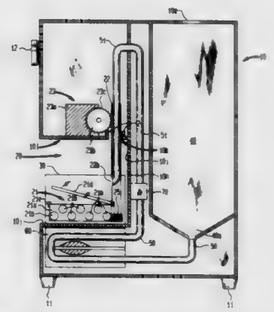
1. Stabilization process for must comprising the steps of preliminarily subjecting crude must to a depectizing treatment by enzyme addition and subsequently subjecting the must to an oxidation an flotation treatment, said oxidation treatment comprising the dissolving of an oxygen-containing gaseous substance in the must, said oxygen causing the oxidation and polymerization of polyphenolic substances for the coagulation of protein substances present in the must, said flotation treatment comprising causing said gaseous substance to achieve supersaturated conditions and thereby be released in the form of microscopic bubbles, said microscopic bubbles clinging to particles suspended in the must thereby causing said particles to float, said flotation being carried out in a flotation tank. said flotation treatment further comprising removing said floated particles from the surface of said tank, settled heavy solids being removed from the bottom thereof, said process thereby producing a stabilized must which is extracted from said tank.

5,112,628
NIPPLE FITMENT WITH SAFETY OVERCAP
George R. Conrad, Dunwoody, Ga., assignor to General Electric Company, Mt. Vernon, Ind.
Continuation of Ser. No. 289,936, Dec. 27, 1988, abandoned.
This application Jun. 14, 1990, Ser. No. 538,594
The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.
Int. Cl.[5] B65D *41/04, 41/34, 49/12;* A61J *9/00*
U.S. Cl. 426—117 2 Claims



1. A hermetically sealed bottle feeder of drinkable liquid that is under vacuum comprising:
a container holding a liquid under vacuum, said container having a cylindrical neck with an opening therein to allow the ingress and egress of said liquid, said neck including a top and a first helical thread located on said neck;
an overcap mounted on said neck and comprising a downwardly extending vertical side wall coupled to at its lower end a tamper evident band by a frangible portion and said overcap having at its upper end a horizontally directed flange extending perpendicularly to said side wall and defining an overcap opening on the top of said overcap, said side wall having a complimentary helical groove for engagement with said first helical thread;
said first thread cooperating with said overcap to form a vacuum seal for said container;
said container neck further including below said first helical thread, retainer means for retaining said tamper evident band on said neck when said overcap is removed by causing the frangible portion to fracture detaching the band from the sidewall;
said overcap and said container defining an enclosed vacuum space;
a nipple and a hold-down cap captured between said overcap and said neck and secured in said enclosed vacuum space by the overcap, said hold-down cap having an upper end containing said nipple and a lower end with said lower end having means to receive and be coupled with corresponding means on the neck of said container for dispensing the contents thereof;
said overcap being screwed down onto the container with the hold-down cap in inverted position with its normally upper end pressed down on the top of the neck of the bottle and its normally lower end directed upwardly;
vacuum seal indicating means comprising a downwardly bowed disc covering said opening in the overcap to seal said container;
said vacuum seal indicating means extending across and below the opening in the overcap and being completely extensive with the opening in the overcap; and
wherein said overcap secures the vacuum seal indicating means to the upwardly directed end of the inverted overcap which itself is tightly and hermetically sealed to the upper edge of the container.

5,112,629
METHOD FOR AUTOMATIC COFFEE BREWING
Michael Antonini, 40 Temple La., Suffern, N.Y. 10901
Division of Ser. No. 487,194, Mar. 1, 1990, Pat. No. 5,027,696.
This application Jun. 24, 1991, Ser. No. 720,960
Int. Cl.[5] A23F *5/00*
U.S. Cl. 426—231 6 Claims

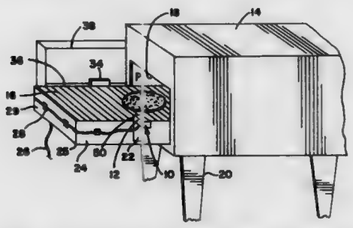


1. A method of automatically preparing coffee in a coffee maker for more efficient use of coffee grounds comprising the steps of:
filling a water storage receptacle disposed in the coffee maker with water;
filling a coffee grounds basket disposed in the coffee maker with coffee grounds;
enclosing the coffee grounds in the coffee grounds basket by closing a basket lid onto said coffee grounds basket after filling the coffee basket with coffee grounds;
setting a timer disposed in the coffee maker for selecting the length of time for operation of the coffee maker;
activating the operation of the coffee maker by means of a switch disposed in the coffee maker;
lowering the coffee grounds basket into a coffee pot in response to activating the switch by means of a rotating gear mechanism communicating with a traveling rod attached to the coffee grounds basket;
pumping water from the water storage receptacle to the coffee pot in response to activating the switch;
heating the water in the coffee pot to a boil by means of a heating element disposed in the coffee maker in response to activating the switch;
steeping the coffee grounds contained in the basket in the boiled water; and
raising the coffee grounds basket from the coffee pot in accordance with the length of time selected by the timer by means of the rotating gear mechanism.

5,112,630
PIZZA PAGER SIGNALING PROCESS
Arthur C. Scott, 427 Elm St., Deerfield, Ill. 60015
Filed Sep. 12, 1991, Ser. No. 758,739
Int. Cl.[5] A23L *1/00;* G01N *33/00*
U.S. Cl. 426—233 20 Claims

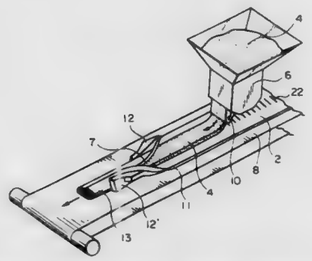
1. A food preparation process, comprising the steps of:
moving comestible material through an oven; while concurrently

heating and cooking said comestible material in said oven;
discharging said cooked comestible material from said oven;
conveying said comestible material from said oven; and



signaling when said cooked comestible material has been discharged from said oven.

5,112,631
METHOD OF CONTINUOUSLY PRODUCING STRUDELS CONTAINING CAKE OR CAKE AND A FILLING
Yasuhiro Nakamura, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Tochigi, Japan
Filed Jan. 31, 1990, Ser. No. 472,384
Claims priority, application Japan, Feb. 2, 1989, 1-24642
Int. Cl.[5] A21D *13/08*
U.S. Cl. 426—297 **16 Claims**



1. A method of continuously producing strudels containing cake, comprising continuously extruding raw cake dough from a dough extruder onto the upper surface of a continuous pastry dough sheet being continuously conveyed, continuously enveloping said raw cake dough by the continuous pastry dough sheet to form a pastry dough body containing raw cake dough, and baking said pastry dough body only once while holding the temperature substantially constant during said baking.

5,112,632
METHOD AND APPARATUS FOR FORMING AND HERMETICALLY SEALING SLICES OF FOOD ITEMS
Vincent A. Meli, Greenbay; Michael A. Matharani, DePere; Ted A. Brzezinski, Greenbay; David L. Shaft, Greenbay, and James L. Urmanski, Greenbay, all of Wis., assignors to Schreiber Foods, Inc., Green Bay, Wis.
Filed Jun. 5, 1989, Ser. No. 361,219
Int. Cl.[5] B65B *9/00*
U.S. Cl. 426—392 **18 Claims**

1. In a process for packaging a food item formed into a soft mass wherein the food item is wrapped in individual slices, the improvement comprising

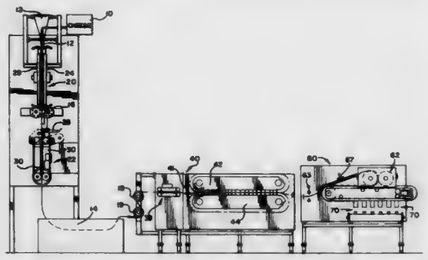
folding a continuous web of heat-sealable thermoplastic material into V-folded condition including a folded longitudinal first side and an open longitudinal second side, the web on one side of the V-fold defining a front sheet and the web on the other side of the V-fold defining a rear sheet;

moving the web in a forward direction;

forming hermetic seal along the open longitudinal side of the web in V-folded condition to define a continuous tubular web;

inserting the food item into the tubular web;

after the food item is inserted, flattening the web to form a



continuous slice of the food item disposed between a top layer and a bottom layer of the web;

forming a plurality of hermetically sealed cross-seals from the first side longitudinal to the second longitudinal side of the web at predetermined intervals in the flattened web while the web is continuously moved forward, whereby hermetically sealed slices of the food item are defined; and

cooling the web after the web is flattened and before the cross-seals are formed.

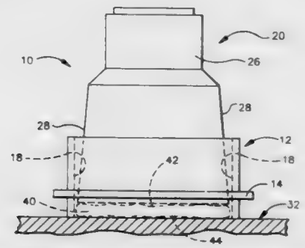
5,112,633
AUTOMATIC STIRRING OF BATCH FRIED FOOD PRODUCTS
Clark K. Benson, Millbrae, and Andrew A. Caridis, Foster City, both of Calif., assignors to Heat and Control, Inc., South San Francisco, Calif.
Division of Ser. No. 297,415, Jan. 13, 1989, Pat. No. 4,977,821.
This application May 11, 1990, Ser. No. 522,238
Int. Cl.[5] A23L *1/01, 1/217*
U.S. Cl. 426—438 **7 Claims**



1. In a batch process for cooking a food product, the steps comprising, providing a vat of cooking oil and heating the oil to achieve a first preselected temperature, form a position over the vat dispensing in a blast of air a batch of uncooked food product in slice-like form, the slice-like product free falling into the cooking oil in a substantially clump free array, stirring and dunking the slice-like product in the cooking oil while progressively shifting the batch of product towards one end of the vat and then progressively towards the other end for a

period of time in which the product is substantially cooked, collecting the slice-like product together and moving it to a removal station, and then removing the product from the cooking oil.

5,112,634
METHOD AND APPARATUS FOR MAKING GROUND MEAT PATTIES
Ralph M. Swearingen, 167 Foster Rd., West Union, Ohio 45693
Filed Jul. 31, 1991, Ser. No. 738,451
Int. Cl.[5] A22C *7/00*
U.S. Cl. 426—513 **10 Claims**



1. A method for making ground meat patties having smooth surfaces, comprising the steps of:

(a) placing a hollow, round outer collar on a flat surface;

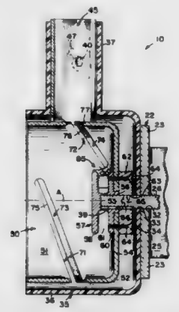
(b) placing a quantity of ground meat into the hollow portion of said round outer collar;

(c) placing a center plug with a concave end surface containing protruding dimples into the hollow portion of said round outer collar;

(d) pressing said center plug down so as to engage the ground meat with said protruding dimples while turning the plug alternatively clockwise and counterclockwise, shaping the ground meat into a patty which has a smooth upper surface; and

(e) removing the center plug from the ground meat while turning the plug, so as to cleanly separate the plug from said patty such that the patty retains its smooth upper surface.

5,112,635
METHOD OF SAFE HIGH SPEED SLICING/SHAVING OF A FOOD PRODUCT
Benno E. Liebermann, Louisville, Ky., assignor to Beltec International, Louisville, Ky.
Filed Dec. 3, 1990, Ser. No. 621,145
Int. Cl.[5] B26D *1/00*
U.S. Cl. 426—518 **29 Claims**



1. A method of slicing/shaving a food product comprising the steps of providing a slicing/shaving edge of a generally arcuate configuration upon the exterior peripheral surface of a cylindrical drum, rotating the slicing/shaving edge along an arcuate path of travel with the slicing/shaving edge disposed at an oblique angle to the axis of said drum, and said slicing/-shaving edge being in a cylindrical plane corresponding to the exterior peripheral surface of the cylindrical drum, and guiding a food product onto a relief area opposite said slicing edge, and then along a slicing/shaving edge whereby continuous rotation of the slicing/shaving edge along the arcuate path effects continuous slicing/shaving of the fed food product.

5,112,636
HYPOALLERGENIC BUTTER AND PROCESS OF MAKING
Leonard S. Girsh, Melrose Park, Pa., assignor to Immunopath Profile, Inc., Melrose Park, Pa.
Division of Ser. No. 297,451, Jan. 13, 1989, Pat. No. 4,954,361.
This application Aug. 3, 1990, Ser. No. 562,776
Int. Cl.[5] A23C *15/04*
U.S. Cl. 426—581 **2 Claims**

1. A process for preparing hypoallergenic butter comprising:

(a) melting salt-free 99.99% anhydrous milk fat in boiling water to produce a mixture of sterilized butter oil and boiling water, and

(b) removing the resulting sterilized butter oil from the mixture.

5,112,637
EXTRACTION OF GOSSYPOL FROM COTTONSEED
Robert J. Hron, Sr., New Orleans; George Abraham, Metairie; Myong S. Kuk, Metairie, and Gordon S. Fisher, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Nov. 5, 1990, Ser. No. 608,786
Int. Cl.[5] A23B *9/16*
U.S. Cl. 426—629 **26 Claims**

1. A process for extraction of gossypol from cottonseed, which process comprises:

(a) contacting cottonseed with a solvent solution comprised of: (i) a water miscible organic solvent; (ii) water, and; (iii) an acid which is characterized as being strong enough to prevent binding of gossypol to cottonseed protein, but not so strong that it will hydrolyze a substantial portion of said cottonseed protein; under conditions providing extraction of gossypol from said cottonseed by said solvent solution, thereby producing cottonseed meal of reduced gossypol content and solvent solution having gossypol therein; and

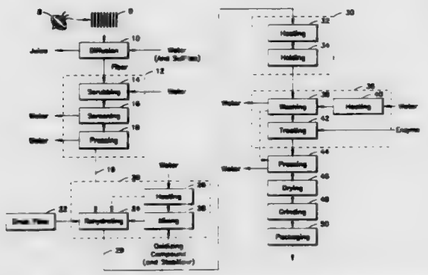
(b) separating said cottonseed meal of reduced gossypol content from said solvent solution having gossypol therein.

5,112,638
PROCESS FOR THE IMPROVEMENT OF EDIBLE FIBER AND PRODUCT
Paul M. Cagley; James O. Kysilka, both of Fargo, N. Dak., and Terry D. McGillivray, Moorhead, Minn., assignors to American Crystal Sugar Company, Moorhead, Minn.
Continuation of Ser. No. 406,954, Sep. 11, 1989. This application Sep. 10, 1990, Ser. No. 580,263
Int. Cl.[5] A23L *1/214*
U.S. Cl. 426—640 **20 Claims**

1. A processed sugarbeet fiber material having a wet flavor profile characterized by:

a. a wet earthy flavor of no greater than about 26 on a scale of 0 to 60;

b. a wet rancid flavor of no greater than about 7 on a scale of 0 to 60; and,



c. having been processed in the absence of an organic extraction solvent.

5,112,639

REUSABLE BRINE FOR CONSERVING CUCUMBER

Pentti K. Sewon, Pirttilahdegatan 11, Abo SF-20320, Finland

Continuation-in-part of Ser. No. 522,604, May 11, 1990, Pat. No. 5,039,545. This application Mar. 29, 1991, Ser. No. 677,155 The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.

Int. Cl.[5] A23L *3/00*

U.S. Cl. 426—654 **7 Claims**

1. A reusable brine for conserving cucumber in bulk in stirred containers comprising in solution per liter of the brine: at least 0.02 kg calcium chloride and 0.02–0.12 kg of an ingestible acid or a non-toxic salt thereof.

5,112,640

SILICONE ELASTOMER LINED PROSTHETIC DEVICES AND METHODS OF MANUFACTURE

Stephen P. Warunek, Lancaster, and Soren E. Sorensen, Williamsville, both of N.Y., assignors to The Research Foundation of State University of New York University at Buffalo, Buffalo, N.Y.

Filed May 4, 1990, Ser. No. 519,165

Int. Cl.[5] A01N *1/02*

U.S. Cl. 427—2 **12 Claims**

1. A method of forming a composite-like structure of a silicone elastomer and a prosthetic appliance which comprises, in the order indicated, the steps of:

a) applying a film of silane coupling agent to said appliance, said coupling agent comprising a compound of the formula:

$$X—Si—(R)_3$$

wherein X is methyl or vinyl and R is —O—CO—CH_3 or —O—N=C—(CH_3)—CH_2CH_3;

b) drying the silane film on said appliance;

c) applying to said dried silane film on said appliance a silicone elastomer to form said composite-like structure, said elastomer consisting essentially of a platinum-catalyzed organopolysiloxane copolymer of from about 99.90 to about 99.99 mole percent dimethyl siloxane units and from about 0.01 to about 0.10 mole percent methylvinyl siloxane units; and

d) curing the composite-like structure at above ambient temperature conditions.

5,112,641

WAFER TRANSFER METHOD IN VERTICAL CVD DIFFUSION APPARATUS

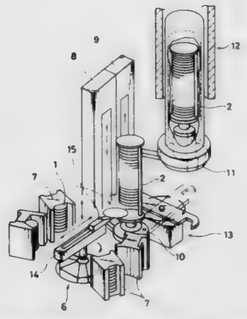
Yasuhiro Harada, Ome; Toshikazu Karino, Higashimurayama; Ryoji Saito, Tokyo; Koji Tometsuka, Tokyo, and Shoichiro Izumi, Tokyo, all of Japan, assignors to Kokusai Electric Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1990, Ser. No. 466,973

Claims priority, application Japan, Jan. 28, 1989, 1-19230

Int. Cl.[5] C23C *16/00*

U.S. Cl. 427—8 **4 Claims**



1. A wafer transfer method for use in a vertical CVD diffusion apparatus provided with a boat having plural spaces arranged in multiple steps, to which spaces wafers are stocked in a horizontal orientation, comprising the steps of;

transferring product wafers in groups of five;

transferring dummy wafers in groups of five or less than five wafers; and

transferring one or more monitor wafers and inserting said monitor wafers between said product wafers one by one.

5,112,642

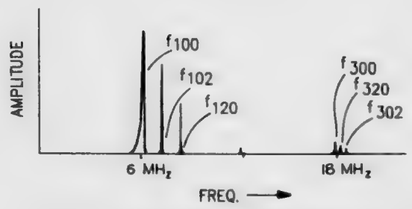
MEASURING AND CONTROLLING DEPOSITION ON A PIEZOELECTRIC MONITOR CRYSTAL

Abdul Wajid, East Syracuse, N.Y., assignor to Leybold Inficon, Inc., E. Syracuse, N.Y.

Filed Mar. 30, 1990, Ser. No. 505,668

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—10 **8 Claims**



1. A method of measuring and or controlling the ate of material deposition onto a piezoelectric crystal that has a fundamental resonance frequency f_1 and at least one additional nearby anharmonic resonance frequency f_2 next above said fundamental resonance frequency, said fundamental and anharmonic resonance frequencies having predetermined initial frequencies f_{1u} and f_{2u} prior to any material being deposited on the crystal, and shifting to lower frequencies f_{1c} and f_{2c} under mass loading of the crystals as the material is deposited thereon, the method comprising:

generating successive sweeps of frequencies in a frequency generator and applying said sweeps of frequencies to said crystals as said material is being deposited thereon;

analyzing a response characteristic of said crystal to said sweeps of frequencies to identify the shifted fundamental resonance frequency f_{1c} and the shifted anharmonic resonance frequency f_{2c} for the crystal as it is being coated;

computing an areal mass density m of the coating of material on the crystal based on the initial resonance frequencies f_{1u} and f_{2u} for the uncoated crystal and the shifted resonance frequencies f_{1c} and f_{2c} for the crystal being coated;

computing the rate of material deposit based on changes in said areal mass density m for successive sweeps of frequencies; and

controlling the rate of material deposition based on the computed rate of material deposit.

5,112,643

GASEOUS PHASE SYNTHESIZED DIAMOND AND METHOD FOR SYNTHESIZING SAME

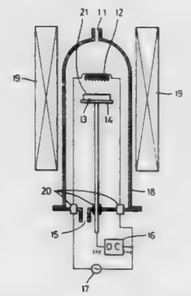
Akihiko Ikegaya, and Masaaki Tobioka, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 392,286, Aug. 11, 1989, abandoned, which is a division of Ser. No. 76,721, Jul. 22, 1987, Pat. No. 4,900,628. This application Sep. 4, 1991, Ser. No. 754,318

Claims priority, application Japan, Jul. 23, 1986, 61-173365; Mar. 27, 1987, 62-75282; May 13, 1987, 62-116598

Int. Cl.[5] C23C *16/26, 16/48, 16/50*

U.S. Cl. 427—38 **6 Claims**



1. A method for synthesizing a diamond film on a substrate in a reaction vessel in a low-pressure gaseous phase, consisting essentially of

preparing a raw material gas from a carbon source and hydrogen, said carbon source selected from the group consisting of solid carbon, a hydrocarbon, a hydrocarbon containing O or N in a bonding group, and carbon tetrachloride, and

activating said raw material gas by a thermoelectron-radiating material and by formation of a DC plasma to deposit the diamond film on a surface of the substrate,

wherein the surface of the substrate is heated from 600° to 1200° C., the thermoelectron-radiating material is heated to at least 1,600° C. and is connected to a negative pole while the substrate to be coated is connected to a positive pole, the DC plasma is formed between the thermoelectron-radiating material and the substrate by applying a direct current voltage from a direct current power source and a pressure within the reaction vessel, in which the plasma is formed, is set between 100 and 500 Torr.

5,112,644

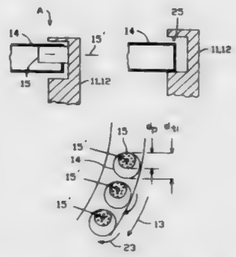
HORIZONTAL PRECESSION TOOLING AND METHOD FOR TUBE ROTATION

Richard I. Seddon, and Michael D. Temple, both of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Mar. 8, 1990, Ser. No. 491,474

Int. Cl.[5] C23C *14/34, 14/50, 16/50, 14/32*

U.S. Cl. 427—38 **12 Claims**



1. Apparatus for imparting double rotary motion to an article or article holder, comprising: rack means mounted for rotation about a first axis, the rack means comprising two spaced plates; means for capturing a workpiece or workpiece holder between the two plates such that the article or article holder is rotatable about a second axis spaced from the first axis and said article or article holder remains in contact with both capturing means during rotation; and means mounting the rack means and orienting the second axis such that gravity-induced frictional contact between the article or article holder and the rack means rotates the article or article holder about the second axis during rotation of the rack means about the first axis.

6. A method of imparting double rotary movement to an article having opposite tubular ends, comprising: providing a rack means comprising two spaced plates oriented transverse to a first axis and having oppositely-positioned pegs of diameter smaller than the diameter of the tubular ends; rotating the rack means about the first axis while capturing the article to the rack means so that the article is rotatable about a second axis spaced from the first axis and while orienting the second axis such that gravity-induced frictional contact between the article and the rack means rotates the article about the second axis.

5,112,645

PHOTOTREATING METHOD AND APPARATUS THEREFOR

Makoto Sekine, Yokohama; Haruo Okano, and Yasuhiro Horiike, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 333,006, Apr. 4, 1989, abandoned, which is a division of Ser. No. 180,687, Apr. 8, 1988, Pat. No. 4,844,774, which is a continuation of Ser. No. 868,516, May 30, 1986, abandoned. This application Dec. 6, 1990, Ser. No. 622,275

Claims priority, application Japan, Jun. 3, 1985, 60-120263

Int. Cl.[5] B05D *3/06, 1/32, 1/00*

U.S. Cl. 427—43.1 **5 Claims**

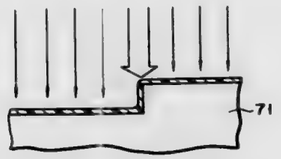
1. A phototreating method comprising the steps of:

introducing a photoreactive gas comprising a deposition gas into a chamber housing a workpiece having a step provided on a predetermined surface of the workpiece, said step having an upper face which is parallel to the predetermined surface;

applying a first light beam to the predetermined surface and to the step in a direction perpendicular to said upper face of said step; and

while applying said first light beam, also selectively applying a second light beam to the step in a direction perpendicular to said upper face of said step, said second light being applied only at the step provided on said surface;

wherein a uniform film is deposited on the surface of the workpiece and on the step, as a reaction product of a photochemical reaction of the photoreactive gas caused by radiation of the first light and the second light; and



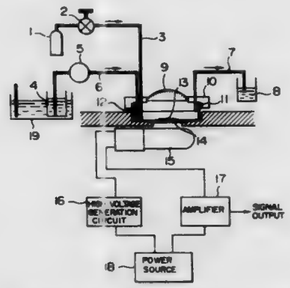
wherein the first light and the second light have a wavelength that results in dissociation of the deposition gas to form the film on the surface and step of the workpiece.

5,112,646

APPARATUS FOR BIOLUMINESCENCE MEASUREMENT

Hiroyuki Koshi, and Minoru Owada, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 230,080, Aug. 9, 1988, abandoned. This application Jan. 28, 1991, Ser. No. 658,441
Claims priority, application Japan, Aug. 12, 1987, 62-199772
Int. Cl.[5] G01N *21/76*
U.S. Cl. 422—52 **11 Claims**



8. An apparatus for bioluminescent measurement comprising:

container means for containing a sample of a living body therein, said container means being a light-transmissible culturing dish containing cultured cells of said sample;

receptor means having a recess hole for receiving said culturing dish therein;

a light transmissible window provided at a portion of the recess hole lower than a bottom portion of said culturing dish;

means for supplying and discharging fluid into and out of said culturing dish for enabling culturing of said sample in said culturing dish, said means for supplying and discharging fluid including first and second tubular members;

lid means removably attached to said container means for forming a closed chamber together with said culturing dish, said lid means having at least one light-focusing mirror disposed on a surface thereof for focusing luminescence from said sample, said first and second tubular members being fixed to said lid means; and

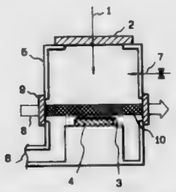
means for detecting said luminescence from said sample of cells in said closed chamber, said detecting means being disposed adjacent to said culturing dish for detecting said luminescence through a portion of said culturing dish as focused by said at least one light-focusing mirror and passing through said light-transmissible window.

5,112,647

APPARATUS FOR THE PREPARATION OF A FUNCTIONAL DEPOSITED FILM BY MEANS OF PHOTOCHEMICAL VAPOR DEPOSITION PROCESS

Akiharu Takabayashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 124,626, Nov. 24, 1987, abandoned. This application Feb. 20, 1990, Ser. No. 481,690
Claims priority, application Japan, Nov. 27, 1986, 61-280671
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—53.1 **4 Claims**



1. A process for forming a functional silicon containing deposited film on a substrate by a photochemical reaction which comprises the steps of:

(a) introducing a silane or a halogen-substituted silane raw material gas into a reaction space of a reaction chamber containing said substrate on which said silicon contained deposited film is to be formed, said substrate being positioned on a substrate holder;

(b) supplying infrared radiation, having a wavelength capable of vibrationally exciting and silane or halogen-substituted silane raw material gas;

(c) simultaneously with step (b) supplying light energy having a wavelength more than 200 nm which is different from said infrared radiation, through a light transmissive window of said reaction chamber into said reaction space such that said vibrationally excited raw material gas is irradiated with said light energy to decompose or polymerize said vibrationally excited raw material gas, whereby said functional silicon containing deposited film is formed on said substrate at a high deposition rate without said light transmissive window being deposited with a film and wherein said light energy being (i) incapable of decomposing or polymerizing said silane or halogen-substituted silane raw material gas absent said vibrational excitation and (ii) capable of decomposing or polymerizing said silane or halogen-substituted silane raw material gas while vibrationally excited.

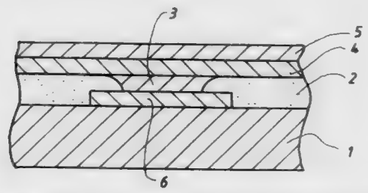
5,112,648

METHOD OF MANUFACTURING A PRINTED CIRCUIT BOARD

Hirotaka Okonogi; Katsutomo Nikaido; Junichi Ichikawa, and Yoshio Nishiyama, all of Saitama, Japan, assignors to Nippon CMK Corp., Japan

Filed Apr. 9, 1991, Ser. No. 682,921
Claims priority, application Japan, Jul. 18, 1990, 2-190157
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—96 **3 Claims**

1. A method of manufacturing a printed circuit board, comprising steps of providing a substrate for said printed circuit board, forming circuit patterns on one or both sides of said substrate, and shielding the whole or a required part of said circuit patterns by using a shield layer in such a manner that



said shield layer and a grounding circuit of said circuit patterns are connected through a resistor.

5,112,649

METHOD OF DEPOSITING MICRO-CRYSTALLINE SOLID PARTICLES BY HOT FILAMENT CVD

Udo Bringmann, Halstenbek; Claus-Peter Klages, Hamburg; Rolf Six, Hennstedt-Ulzburg, and Lothar Schafer, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1990, Ser. No. 603,579
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1989, 3935865
Int. Cl.[5] C23C *16/00*; B05D *3/14*
U.S. Cl. 427—249 **8 Claims**

1. A method of depositing micro-crystalline solid particles from a vapor phase containing a carbonaceous gas, using chemical vapor deposition (CVD), in which the solid particles to be deposited are deposited at a pressure in the range from 10^{-5} to 1 bar onto a substrate which has been heated to a temperature in the range from 450° to 1200° C. and in which the chemical vapor phase reactions are effected in the gas phase which is thermally excited by means of a resistance heat conductor, the improvement wherein, a resistance heat conductor made of a carbide of at least one transition metal from the secondary group IVa to VIa of the periodic table of the elements (PTE) with a content of carbon which substantially corresponds to a stoichiometrical composition of the carbide and having a melting point of >2000° C. is used.

5,112,650

CHEMICAL VAPOR DEPOSITION OF METAL CHALCOGENIDE FILMS

Charles H. Winter, Grosse Pointe Park, and T. Suren Lewkebandara, Detroit, both of Mich., assignors to Wayne State University, Detroit, Mich.

Filed Apr. 10, 1991, Ser. No. 683,273
Int. Cl.[5] C23C *16/00*
U.S. Cl. 427—255.2 **16 Claims**

1. A process for depositing a thin film of a metal chalcogenide comprising the steps of:

providing a source of vaporous metal halide so that it is delivered into a reaction zone provided with an inlet for the introduction thereof;

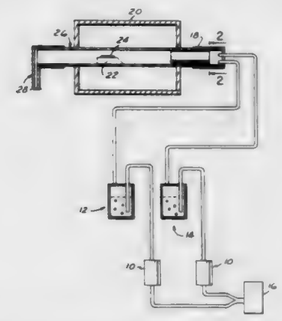
providing a source of vaporous chalcogen in communication with the inlet to provide an efficient intermixing of the chalcogen with the vaporous metal halide;

disposing a substrate downstream from the inlet of said reaction zone to define a surface upon which deposition may occur;

heating the reaction zone to about 200–800 degrees Centigrade;

flushing the reaction zone with the chalcogen transported by an inert carrier gas;

passing said carrier gas with said metal halide and said chalcogen into said reaction zone across said substrate; and



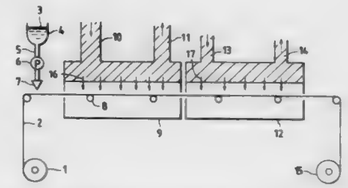
reacting said vaporous metal halide and said vaporous chalcogen in said reaction zone to produce a film of metal chalcogenide which is deposited on the substrate.

5,112,651

METHOD AND APPARATUS AN IMAGE-RECEIVING ELEMENT IN DIFFUSION TRANSFER PHOTOGRAPHY INCLUDING DRYING AND HEATING STAGES

Toshihiro Watanabe; Masashi Ishiyama, and Noriaki Masuda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 8, 1989, Ser. No. 433,232
Claims priority, application Japan, Nov. 9, 1988, 63-283125
Int. Cl.[5] B05D *3/04*
U.S. Cl. 427—339 **16 Claims**



8. A method of forming a silver image receiving element in diffusion transfer photography by hydrolyzing a surface of an alkali-impermeable polymer layer on a continuously running web so as to convert said polymer to an alkali-permeable polymer, comprising the steps of:

(A) applying a liquid mixture of hydrolyzing agent and a softening agent to the surface of said alkali-impermeable polymer layer;

(B) evaporating said softening agent in said liquid mixture by performing non-contact drying of said surface in an evaporating chamber so as to form a concentrated layer of said hydrolyzing agent; and thereafter

(C) accelerating the occurrence of hydrolysis by performing non-contact heating of said surface in an accelerating chamber separate from said evaporating chamber so as to initiate hydrolysis reaction of said surface so as to convert said alkali-impermeable polymer layer to an alkali-permeable polymer layer.

5,112,652

FORMALDEHYDE SCAVENGING PROCESS USEFUL IN MANUFACTURING DURABLE PRESS FINISHED FABRIC

Jack T. Greene, Columbus, Ga., assignor to East Central Wax Company, Inc., Columbus, Ga.

Division of Ser. No. 400,096, Aug. 29, 1989, abandoned. This application Oct. 29, 1990, Ser. No. 604,813

Int. Cl.[5] B05D *3/10;* **D06M** *13/402*

U.S. Cl. 427—342 **1 Claim**

1. In the process of manufacturing a durable press finished fabric where cellulosic fiber fabrics are finished with a nitrogen containing methylol resin, dried and cured, the improvement comprising the step of contacting the fabric with a treatment bath containing acetoacetamide in the process of finishing it in an amount sufficient to scavenge substantially all formaldehyde without adversely affecting the durable press finished fabric.

5,112,653

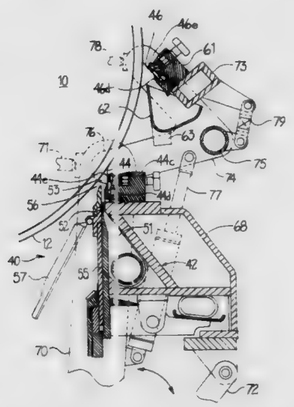
METHOD OF AND APPARATUS FOR COATING HIGH SPEED TRAVELING WEBS

Wayne A. Damrau, Wisconsin Rapids, and Michael A. Mayer, Stevens Point, both of Wis., assignors to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Continuation-in-part of Ser. No. 375,241, Jul. 3, 1989, abandoned. This application Jan. 31, 1991, Ser. No. 648,655

Int. Cl.[5] B05D *3/12*

U.S. Cl. 427—356 **31 Claims**



1. A method of rectifying the problems of an appearance of machine direction streakiness and reduced surface smoothness due to cross direction caliper variations in a coating applied to a moving web of paper by short dwell time type application means when operated at web speeds of 3,000 and more feet per minute, wherein the method includes the steps of

moving the web in a given direction at a speed of at least 3,000 feet per minute,

supporting the moving web through a portion of its path of movement,

forming on the supported portion of the web a short dwell coating liquid application zone having a limited dimension in the direction of web movement and having rear and side edges effectively engageable with the supported web and a front edge spaced from the supported web and defining a gap between itself and the web at the upstream front edge of the application zone,

forming and maintaining a reservoir of coating liquid in a turbulent state on the supported web within the application zone by substantially sealing the side edges of the application zone to the web and by forming a liquid seal between the turbulent liquid in the application zone and the surface of the web in the vicinity of the gap between the web and the front edge of the zone,

continuously flowing an excess of coating liquid through the application zone for purging the zone, for forming and maintaining the liquid seal, and for excluding air and foreign matter from the coating liquid adjacent the rear edge of the zone,

distributing coating liquid in a turbulent state over the surface of the supported web through the limited application zone,

subjecting the coating liquid on the supported web to a primary doctoring immediately at the rear edge of the application zone, within about 0.0004 to about 0.0100 second of its turbulent application to the web within the zone, by means of a primary doctor blade biased under a relatively low doctoring pressure against the coated web to form on the traveling web a generally uniform and relatively quiescent layer of coating liquid having a wet film thickness sufficiently in excess of the final wet film thickness to accommodate a subsequent final wet film doctoring of the coating liquid on the web, and

at a location spaced downstream from the rear edge of the application zone and physically and hydrodynamically isolated from the turbulent coating liquid in the application zone, but within about 0.003 to about 0.040 second following the primary doctoring step, subjecting the generally uniform and relatively quiescent layer of coating liquid on the supported web to a final doctoring by means of a final doctor blade biased under final doctoring pressure against the coated web to remove the excess coating from the web and to level and smooth the coating retained on the web to final wet film thickness and smoothness,

the wet film thickness of the generally uniform and quiescent layer of coating liquid formed on the web by the primary doctor blade having a lower limit sufficiently in excess of the final wet film thickness to provide at the final doctor blade an excess amount of coating liquid adequate to cause a substantially continuous run-off of excess coating liquid from the final blade to purge and flush the final doctor blade, and having an upper limit preventing hydrodynamic overloading of the final doctor blade and minimizing the work required of the final doctor blade,

the dwell time of the coating liquid on the web between the primary and final doctor blades enabling the boundary layer of coating liquid next to the web to become substantially immobilized for supporting the final doctor blade, whereby the final leveling and smoothing of the coating takes place where the coating is substantially stable,

the final doctor blade being isolated from the turbulence of the coating liquid in the application zone and being biased under pressure substantially uniformly across the web against a substantially uniform, quiescent and stable layer of coating liquid of minimal excess wet film thickness for leveling and smoothing the coating liquid retained on the web to a uniform final wet film thickness, an improved surface smoothness substantially free of cross direction caliper variations, and an appearance free of machine direction streakiness.

5,112,654

METHOD FOR FORMING A SURFACE COATING

Terry D. Claar, Newark, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Filed Jun. 25, 1990, Ser. No. 543,277

Int. Cl.[5] B05D *3/02*

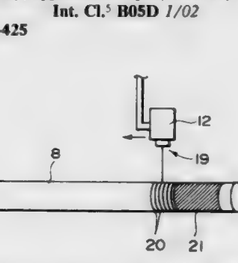
U.S. Cl. 427—376.6 **21 Claims**

1. A method for forming a coating on a substrate material comprising:

providing a substrate body comprising a carbon-based material;

placing a powdered parent metal and a powdered solid oxidant comprising boron carbide, or boron carbide and a carbon donor material, or boron carbide and a boron donor material on at least a portion of at least one surface of said substrate body;

heating said powdered parent metal, said powdered solid oxidant and said at least one surface of said substrate body



to cause said parent metal and said powdered solid oxidant to react; and

continuing said reaction for a sufficient amount of time to produce a coating on at least one surface of said substrate material.

5,112,655

SOLVENT BASED TIECOATING FOR USE WITH MASTIC COATING

Gary R. Larson, Hatfield, and Allen P. Marks, Richboro, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 297,502, Jan. 13, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 606,647

Int. Cl.[5] B05D *1/36, 7/00*

U.S. Cl. 427—407.1 **6 Claims**

1. A method for improving the quality of a mastic coating system comprising:

(a) forming a tiecoat composition comprising at least one solvent-soluble polymer, wherein said polymer has a glass transition temperature from about −20 C. to about 20 C.;

(b) applying said tiecoat composition to a substrate surface; and

(c) applying a mastic coating to said tiecoat composition coated onto said surface.

5,112,656

COATING METHOD SUITABLE FOR USE IN PRODUCTION OF PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY

Kazushige Nakamura, Yokohama; Mitsuru Honda, Tokyo; Hitoshi Toma, Kawasaki; Shigemori Tanaka, Tokyo; Keiichi Murai, Kashiwa; Akira Unno, Yokohama, and Ako Takemura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 255,486

Claims priority, application Japan, Oct. 15, 1987, 62-260857

Int. Cl.[5] B05D *1/02*

U.S. Cl. 427—425 **26 Claims**

1. A process for producing a photosensitive member for electrophotography, comprising:

discharging a paint for providing a photosensitive member through an aperture onto a cylindrical substrate to coat the substrate with the discharged paint, wherein the paint is discharged from the aperture in the form of a continuous string substantially free from spraying.

5,112,657

SIMULATED MARBLE PRODUCTS

George E. Melber, Buffalo, N.Y., assignor to Pierce & Stevens Corporation, Buffalo, N.Y.

Filed Jul. 11, 1990, Ser. No. 551,074

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—15 **9 Claims**

1. A simulated marble produce comprising a cast or molded article formed of a polymeric binder, an inert filler predominantly comprising calcium carbonate, and from about 15 to about 70 volume percent of a low density filler comprising hollow thermoplastic microspheres having a density of less than about 0.06 grams per cubic centimeter, and a surface coating of an inert particulate or fibrous barrier material thermally bonded thereto.

5,112,658

COATING COMPOSITIONS FOR GLASS CONTAINERS

Bolesh J. Skutnik, New Britain, and Harry L. Brielmann, Jr., West Hartford, both of Conn., assignors to Ensign-Bickford Optics Company, Avon, Conn.

Filed Nov. 16, 1988, Ser. No. 272,133

Int. Cl.[5] B65D *11/16*

U.S. Cl. 428—34.6 **27 Claims**

1. A container, comprising:

a glass substrate, and

a coating on the glass substrate, said coating being formed by curing a composition comprising:

an ethylenically unsaturated monoene;

an ethylenically unsaturated polyene; and

a curing initiator.

5,112,659

RABBIT FOR RADIATION

Hideo Katoh, Shiroyama; Masahiro Hosoi, Tokyo; Hisashi Hamano, Sagamihara, and Yasuhiko Saito, Matsuyama, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 18, 1990, Ser. No. 510,688

Claims priority, application Japan, Apr. 20, 1989, 1-98756; Sep. 29, 1989, 1-252326; Oct. 13, 1989, 1-264891

Int. Cl.[5] B27D *22/00;* **G01N** *21/01;* **C08F** *283/04*

U.S. Cl. 428—35.7 **4 Claims**

1. A rabbit for radiation formed of an aromatic polyester composed of ethylene-2,6-naphthalene dicarboxylate units as main recurring units and having an intrinsic vicosity of 0.50 to 0.70, in which the aromatic polyester contains at most 50 ppm of titanium as a metal impurity and is substantially free from a metal impurity other than titanium, and wherein the rabbit has a container wall in which at least a part of the container wall is substantially non-oriented and has a density of lower than 1.345 g/cm^3.

5,112,660

REFRIGERANT-IMPERMEABLE HOSE

Tomoji Saito, and Akira Sato, both of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Inc., Tokyo, Japan

Filed Jun. 8, 1990, Ser. No. 535,146

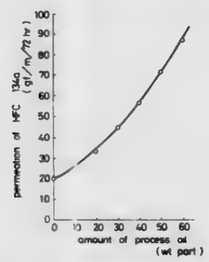
Claims priority, application Japan, Jun. 28, 1989, 1-166168

Int. Cl.[5] F16L *11/04*

U.S. Cl. 428—36.8 **8 Claims**

1. A hose for use in transporting refrigerant fluids which comprises an inner tube, reinforcing layer and an outer cover superimposed in the order mentioned, said inner tube being formed of a rubber composition comprising an ethylene-propylene-diene terpolymer as a base rubber, said base rubber having

an iodine value of from 15 to 50, rubber composition containing not more than 20 parts by weight of process oil per 100 parts by weight of said ethylene-propylene-diene terpolymer,



and said rubber composition having a 1,1,1,2-tetrafluroethane gas permeation level of not more than 35 gf/m/72 hr as vulcanized when heated at 100° C. and measured over a period of time of from 24 hours to 96 hours.

5,112,661

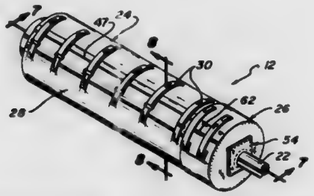
MACHINE INSULATION JACKET ASSEMBLY

Gordon M. Pendergraft, 10425 E. 111th St. S., Mulvane, Kans. 67110; John R. Pendergraft, 1023 Foulk Dr., Belle Plaine, Kans. 67013, and Dan Sherrill, 2213 Timbergien Dr., Flower Mound, Tex. 75028

Filed Jun. 25. 1990, Ser. No. 543,105

Int. Cl.[5] F16L *9/14*

U.S. Cl. 428—36.91 **19 Claims**



1. A machine insulation jacket assembly operable to engage, surround, and enclose a heater element on a machine, comprising:

a) a primary jacket assembly including a main support body member having an inner wall section, and outer wall section, and an insulation body section mounted therebetween;

b) said inner and outer wall sections constructed of a heat resistant material which is not damaged by contact with a high temperature material and which will not adhere thereto;

c) said primary jacket assembly having connector strap members secured to said outer wall section and operable to hold said main support body member in a secure closed sealed manner about the heater element; and

d) said inner and outer wall sections constructed of a TEFLON material which are resistant to heat and prevents the high temperature material from adhering thereto.

5,112,662

METHOD FOR PROVIDING A LUBRICANT COATING ON THE SURFACE OF A MAGNETO-OPTICAL DISK AND RESULTING OPTICAL DISK

Quock Y. Ng, Scottsdale, Ariz., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 7, 1991, Ser. No. 772,476

Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—64 **11 Claims**

1. A method for providing a lubricant coating on the surface of a magneto-optical disk, comprising the steps of:

(a) forming a lubricant solution by dissolving a functionalized fluorinated lubricant compound in a solvent, said compound containing at least one fluorinated alkyl chain, a functional group selected from an alcohol group (OH), carboxyl group (COOH) and phosphate group (PO_4), and said compound having a melting point above the ambient operating temperature of said magneto-optical disk and below about 85° C., and a viscosity in the range of about one hundred to about one thousand centipoises in the temperature range of about 60° to about 85° C.;

(b) coating the surface of the magneto-optical disk with said lubricant solution; and

(c) evaporating the solvent to produce a lubricant coating on the surface of a magneto-optical disk.

5,112,663

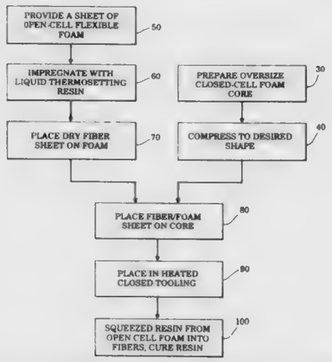
METHOD OF MANUFACTURING COMPOSITE STRUCTURES

Paul W. Morenz, Rancho Santa Fe, and Charles E. Knox, Carlsbad, both of Calif., assignors to General Dynamics Corporation, Convair Division, San Diego, Calif.

Filed Apr. 22, 1991, Ser. No. 689,202

Int. Cl.[5] B32B *3/26*

U.S. Cl. 428—71 **9 Claims**



8. The method of making a light weight, high strength composite structure which comprises the steps of:

providing a closed-cell foam core having a selected configuration;

compressing said core to a a selected, shape retaining, configuration having a volume of about 70 to 95% of the original core volume;

impregnating an about 0.125 to 1.0 inch thick sheet of open-cell polyurethane foam with a liquid epoxy resin precursor;

placing a multi-layer sheet of dry fiber material on at least one surface of said foam sheet;

wrapping said assembled sheets around said core;

placing the resulting assembly in a closed, tight-fitting, mold; and

heating said mold to initially expand said core and then cure said epoxy resin;

whereby said core expands and forces sufficient liquid resin out of said foam sheet into said fiber sheet to fully impregnate said fiber sheet prior to cure of said thermosetting resin.

5,112,664

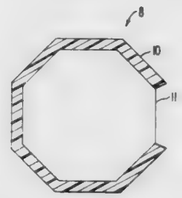
SHIELDED GASKET ASSEMBLY

Alfred F. Waterland, III, Elkton, Md., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Nov. 30, 1990, Ser. No. 620,501

Int. Cl.[5] B32B *3/08;* **F16J** *15/10*

U.S. Cl. 428—76 **8 Claims**



1. A shielded gasket assembly for use in corrosive gas and liquid environments comprising a core gasket of a synthetic rubber and a shielding material of high density non-vapor permeable expanded polytetrafluoroethylene having an adhesive on at least one side of said shielding material at least partially enveloping the surface perimeter of said core gasket and adhesively bonding said shielding material to said core gasket.

5,112,665

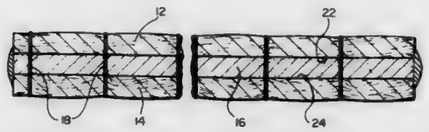
WATER BARRIER OF WATER-SWELLABLE CLAY SANDWICHED BETWEEN INTERCONNECTED LAYERS OF FLEXIBLE FABRIC

William Alexander, Naperville, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Continuation of Ser. No. 481,455, Feb. 15, 1990, abandoned. This application Jul. 19, 1991, Ser. No. 732,586

Int. Cl.[5] B01D *39/00;* **B32B** *5/26, 5/30*

U.S. Cl. 428—102 **4 Claims**



1. A multi-layer article of manufacture useful as a waterproofing material comprising a pair of flexible sheet material layers having a layer of a water-swellable clay sandwiched therebetween, said pair of sheet material layers structurally interconnected by sewing one to the other with continuous, elongated fabric-extraneous fibers at spaced intervals over essentially the entire major external surfaces of both sheet material layers to confine the clay therebetween, and further including a layer of flexible water-impermeable material substantially coextensive with and adhered to one of the sheet material layers.

5,112,666

CBW PROTECTIVE CLOTHING

Richard D. Langston, Wokingham, England, assignor to Charcoal Cloth Limited, Berkshire, England

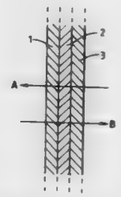
PCT No. PCT/GB88/00475, § 371 Date Dec. 21, 1988, § 102(e) Date Dec. 21, 1988, PCT Pub. No. WO88/10134, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 21, 1988, Ser. No. 457,683

Claims priority, application United Kingdom, Jun. 22, 1987, 8714535

Int. Cl.[5] B32B *3/06*

U.S. Cl. 428—104 **21 Claims**



1. A multi-ply material suitable for use as a protective material, which comprises, in combination:

(1) an outer layer of an abrasion-resistant, water-repellent material;

(2) an intermediate layer comprising activated charcoal cloth treated to provide liquid-repellency; and

(3) an inner layer of an abrasion-resistant material, said intermediate layer being adhesively bonded to said inner layer.

5,112,667

IMPACT RESISTANT HELMET

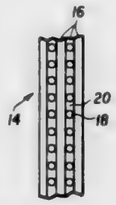
H. L. Li, Parsippany, and D. C. Prevorsek, Morris Township, Morris County, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 377,807, Jul. 10, 1989, Pat. No. 4,953,234, which is a continuation of Ser. No. 81,075, Aug. 3, 1987, abandoned. This application Jul. 31, 1990, Ser. No. 560,918

The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.

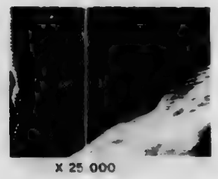
Int. Cl.[5] B32B *5/08*

U.S. Cl. 428—113 **22 Claims**



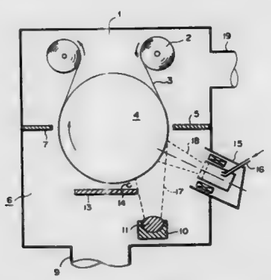
1. An improved impact resistant article of manufacture having at least one surface defined by a plurality of points, at least two of said points located in different horizontal planes comprising a plurality of prepreg packets where each prepreg packet comprises at least 2 prepreg layers, with each prepreg layer comprising a plurality of unidirectional coplanar fibers embedded in a polymeric matrix, the fibers of adjacent layers in the prepreg packet being at an angle of about 45° to 90° from each other.

5,112,668
INSULATED METAL SUBSTRATES AND PROCESS FOR THE PRODUCTION THEREOF
Jacques Rabiet, Goncelin; Philippe Gimenez, Echirolles; Rémi Guillou, Nantes, and Claude Drapier, Vaucresson, all of France, assignors to Pechiney Recherche, Courbevoie, France
Filed Apr. 9, 1990, Ser. No. 506,108
Claims priority, application France, Apr. 24, 1989, 89 06136
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—137 **14 Claims**



1. Insulated metal substrates having an aluminium base, an insulant constituted by an alumina film obtained by anodization of said base on at least one of its faces and at least one metallic film for transformation by chemical etching into a conductive network, characterized in that the said alumina film is formed of a uniform compact non-porous amorphous zone on at least one surface of the aluminium base and having a thickness of about 500 nm to about 1200 nm, and a porous layer of about 5,000 nm to about 50,000 nm with a rough outer surface.

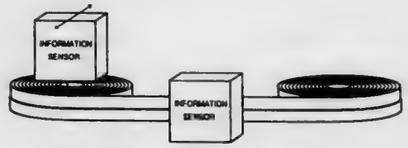
5,112,669
MAGNETIC RECORDING MEDIUM
Kenichi Yoden, and Tadashi Yasunaga, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 26, 1990, Ser. No. 498,517
Claims priority, application Japan, Mar. 31, 1989, 1-80498
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—141 **17 Claims**



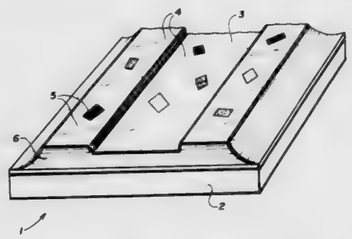
1. A magnetic recording medium comprising a non-magnetic substrate, and a thin magnet layer which is overlaid on the non-magnetic substrate wherein the volume of pores in said thin magnetic metal layer falls within the range of 0.005 to 0.05 ml per gram of said thin magnetic metal layer, said thin magnetic layer having a thickness which falls within the range of 0.2 μm to 2 μm.

5,112,670
QUASI-RANDOMLY/SERIALLY ACCESSIBLE MASS STORAGE MEDIUM
Michael J. Ure, Arlington, Va., assignor to Vastor Inc., Menlo Park, Calif.
Filed Jul. 29, 1991, Ser. No. 737,332
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—156 **3 Claims**

1. An information-bearing tape having a stepped profile, wherein said tape has a non uniform cross section of lesser thickness adjacent one edge of said tape than at another portion of said tape, such that when said tape is wound, gaps remain between adjacent loops of tape along one edge.



5,112,671
TILE PRODUCT HAVING MULTIPLE LEVELS OF HEIGHT, MULTIPLE LEVELS OF GLOSS AND MORTAR-LINE SURROUND
Ivan Diamond, Edgware; James J. Lawson, Fenham, both of England; Walter J. Lewicki, Jr., Lancaster, Pa., and Stavros C. Stavrinou, Nicosia, Cyprus, assignors to Armstrong World Industries, Inc., Lancaster, Pa.
Continuation-in-part of Ser. No. 337,470, Apr. 13, 1989, abandoned. This application Jun. 4, 1990, Ser. No. 532,915
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—156 **16 Claims**



1. A tile comprising a substantially non-porous base and a wear layer, wherein said wear layer is a polymeric film laminated to said base, said film being embossed, said film being of substantially homogeneous composition, said film having an exposed surface opposite said base, said exposed surface having multiple levels of height and multiple levels of gloss, the tile having a mortar-line surround around the periphery of the tile, said mortar-line surround being a mechanically embossed depression around the periphery of the tile, the depression being at least 6 mils deep, wherein the mortar-line surround depression is in registration with a pattern printed on the tile, the gloss level difference being at least 20 as measured by a Gardner gloss meter at 60°.

5,112,672
SECURITY DOCUMENT HAVING AN ELECTRICALLY CONDUCTIVE SECURITY ELEMENT EMBEDDED THEREIN
Wittich Kaule, Emmering; Wilhelm Ilgmann, Wolfratshausen; Gerhard Schwenk, Puchheim, and Gerhard Stenzel, Munich, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany
Filed Dec. 21, 1989, Ser. No. 454,624
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3843075
Int. Cl.[5] B32B *15/08, 3/16*
U.S. Cl. 428—209 **19 Claims**

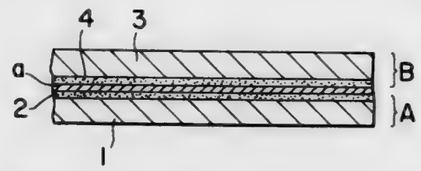
1. A security element having an embedded security element in the form of a thread or strip comprising at least one carrier sheet; at least one layer of metal associated with the carrier sheet; and at least one other electrically conductive layer

associated with the carrier sheet and coextensive with the metal layer, said other layer comprising an electrically conductive non-metallic material comprising electrically conductive pigments or electrically conductive plastic directly adjacent



and electrically connected with the metal layer, whereby said other layer maintains electrical continuity of said metal layer in case said metal layer is rendered electrically discontinuous by breakage.

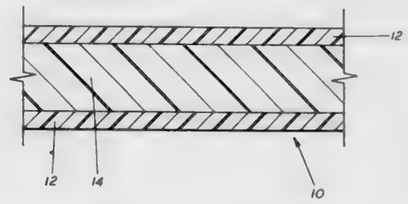
5,112,673
LAMINATED MOISTUREPROOF FILM WITH SILICON OXIDE CORE LAYER
Tsutomu Sawada; Shinichi Ohhasi, and Shigenobu Yoshida, all of Tsuchiura, Japan, assignors to Mitsubishi Kasei Polytec Company, Tokyo, Japan
Filed Dec. 5, 1989, Ser. No. 446,094
Claims priority, application Japan, Dec. 5, 1988, 63-307591
Int. Cl.[5] B32B *13/12, 27/08*
U.S. Cl. 428—216 **6 Claims**



1. A moistureproof film of a laminated structure comprising a core layer (A) and a protective layer (B) joined to one side of said core layer, wherein:
(a) said core layer (A) is composed of a transparent film of a polyvinyl alcohol having a degree of saponification of 99 mol % or higher, said film having a silicon oxide thin film formed on at least one side thereof; and
(b) said protective layer (B) is composed of a transparent film including at least one layer of a transparent plastic film having a transparent silicon oxide thin film formed on at least one side thereof.

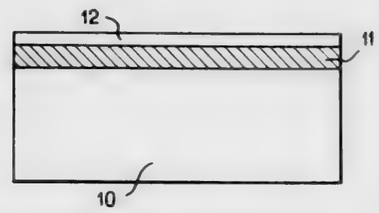
5,112,674
CLING PACKAGING FILM FOR WRAPPING FOOD PRODUCTS
Paul M. German, Friendswood, and Marsha M. Arvedson, Houston, both of Tex., assignors to Exxon Chemical Company Inc., Linden, N.J.
Filed Nov. 7, 1989, Ser. No. 432,959
Int. Cl.[5] B32B *7/02*
U.S. Cl. 428—216 **26 Claims**

1. A transparent, cling packaging film having at least two layers, comprising:
a skin layer comprising linear low density polyethylene in an amount of from about 90 to about 100 percent by weight; and a core layer comprising a copolymer of ethylene and



an ethylenically unsaturated polar comonomer, and an elastomeric polymer.

5,112,675
MONOLITHIC SOLAR PROTECTION GLAZING AND PROCESS OF ITS MANUFACTURE
Isabelle Wuest, Paris; Charles E. Anderson, Courbevoie, and Jacques Tabare, Presles, all of France, assignors to Saint-Gobain Vitrage International, Courbevoie, France
Filed Nov. 30, 1989, Ser. No. 443,178
Claims priority, application France, Dec. 8, 1988, 88 16112
Int. Cl.[5] B32B *17/06*
U.S. Cl. 428—216 **7 Claims**



1. Glazing for solar protection comprising:
a) a support glass sheet;
b) a thin layer of titanium carbide coated on the glass sheet; and
c) a layer of indium-tin oxide having a thickness of less than 50 nm coated on the titanium carbide, whereby abrasion resistance of the glazing is increased.

5,112,676
METHOD FOR THE PREPARATION OF METALLIC OXIDE COATINGS
Louis Cot, Castelnaule-Lez; Jacques C. Rouviere, Montpellier; Christian G. Guizard, Gignac, and Andre Larbot, Saint-Clement-la-Riviere, all of France, assignors to Centre National De La Recherche Scientifique 'CNRS, Paris, France
PCT No. PCT/FR88/00471, § 371 Date Jul. 17, 1989, § 102(e) Date Jul. 17, 1989, PCT Pub. No. WO89/02869, PCT Pub. Date Apr. 6, 1989
PCT Filed Sep. 27, 1988, Ser. No. 368,351
Claims priority, application France, Sep. 29, 1987, 87 13411
Int. Cl.[5] B05D *3/02, 5/12;* **C01B** *13/32*
U.S. Cl. 427—226 **19 Claims**

1. Method for coating a substrate, comprising applying to a substrate the product resulting from contacting alkoxides consisting essentially of metal alkoxides or consisting essentially of metal alkoxides in solution in a hydrophobic solvent with an emulsion containing a surfactant and reverse micelles of water in a hydrophobic solvent for said metal alkoxides, wherein said product is applied to said substrate after significant hydrolysis but before complete gelation has taken place, completing the hydrolysis after application of said product to the substrate so

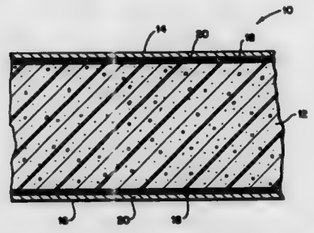
as to form a polymer gel, and thermally treating said polymer gel so as to obtain a substrate coated with metallic oxides of the metals of the corresponding metal alkoxides.

5,112,677
ELECTRET SHEET AND A METHOD FOR THE PRODUCTION OF THE SAME
Yatsuhiro Tani, and Satoshi Takase, both of Ohtsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan
Filed Nov. 28, 1988, Ser. No. 276,617
Claims priority, application Japan, Nov. 28, 1987, 62-301302; Apr. 6, 1988, 63-85985
Int. Cl.[5] D03D *25/00;* H01B *19/00;* B32B *33/00*
U.S. Cl. 428—240 **6 Claims**



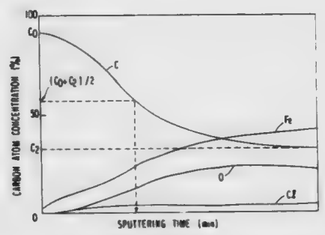
1. An electret sheet comprising a porous sheet made of a dielectric polymer and at least one solid material selected from the group consisting of (1) organic materials that are solid at room temperature and consist of organic carboxylic acids, metal salts of organic carboxylic acids, polyethylene, polypropylene, polyethylene terephthalate, polyamide, polyvinylidene fluoride, polytetrafluoroethylene, polystyrene, polyvinyl chloride, polyvinylidene chloride, cellulose, or polyvinyl alcohol; (2) inorganic materials that are ceramics, metal nitrides, or carbon black; and (3) metallic materials that consist of aluminum, silver, tin, nickel, or copper, said porous sheet having said material in particulate form spaced at various intervals on the surface of the dielectric polymer, wherein said sheet having the material in particulate form on the surface thereof has been electrified while said material in particulate form is present.

5,112,678
METHOD AND COMPOSITION FOR COATING MAT AND ARTICLES PRODUCED THEREWITH
William M. Gay; Robert H. Blanpied, both of Meridian; Philip W. Bush, Laurel; Richard L. Donald; James L. Williams, both of Meridian, and James H. Williams, Little Rock, all of Miss., assignors to Atlas Roofing Corporation, Meridian, Miss.
Continuation-in-part of Ser. No. 568,705, Aug. 17, 1990, Pat. No. 5,001,005. This application Nov. 21, 1990, Ser. No. 616,593
Int. Cl.[5] B32B *3/26, 17/02, 5/16*
U.S. Cl. 428—268 **23 Claims**



1. A method of producing a mat comprising coating a predominantly glass fiber porous web substrate with a coating, the coating comprising an aqueous mixture of:
(1) at least one mineral pigment;
(2) a first binder material comprised of a polymer latex adhesive material which comprises no more than 5.0% by weight of the total weight of the coating on a dried weight basis; and,
(3) a second binder material comprised of an inorganic adhesive material.

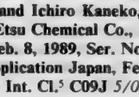
5,112,679
MAGNETIC DISK
Jun Nakagawa; Toshio Kawamata, and Kunihiko Sano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 10, 1989, Ser. No. 419,361
Claims priority, application Japan, Oct. 13, 1988, 63-257660
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—323 **6 Claims**



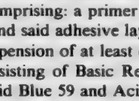
1. A magnetic disk comprising a non-magnetic support having provided thereon a magnetic layer comprising ferromagnetic particles, a lubricating agent and a binder resin, wherein said magnetic layer is such that when sputtering is conducted from an upper surface of said magnetic layer into the bulk of said magnetic layer in a depthwise direction of the magnetic layer by the Auger electron spectroscopic method, and the concentration of carbon atoms resulting from the sputtering is measured, a sputtering time (T_1) required for the carbon atom concentration to be $(C_O+C_2)/2$ is in the range of from 8 to 98 minutes, wherein C_O is a carbon atom concentration value obtained at the initiation of the sputtering and C_2 is a carbon atom concentration value after the carbon atom concentration becomes constant, and wherein
said lubricating agent is a fatty acid ester having a molecular weight of 430 or more and having an unsaturated bond or a branched structure in acid residues or alcohol residues and is present in an amount of 1 to 20 wt % based on the weight of ferromagnetic particles, and wherein said ferromagnetic particles have a specific surface area of 20 m^2/g or more.

5,112,680
MAGNETIC RECORDING MEDIUM
Hiroo Inaba; Takeshi Kakuta; Koichi Yamauchi, and Akihiro Matsufuji, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 25, 1988, Ser. No. 185,214
Claims priority, application Japan, Apr. 24, 1987, 100144/87
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—329 **18 Claims**

1. A magnetic recording medium comprising a nonmagnetic support having provided thereon a magnetic layer comprising a ferromagnetic powder dispersed in a binder, wherein said ferromagnetic powder has a specific surface area of 40 m^2/g or more as measured by the BET method; said magnetic layer further comprising Al_2O_3 particles having an average particle diameter of from about 0.1 to 0.5 μm; and said binder comprising the combination of (1) a vinyl chloride resin containing a phosphate ester group represented by



wherein M_1 and M_2, which may be the same or different, each represents Na, K, Li, H, $N\oplus R_3$, or $N\oplus HR_2$ wherein R represents an alkyl group or a hydrogen atom, and (2) at least one resin other than said vinyl chloride resin containing at least one of $-SO_3M$, $-OSO_2M$, —COOM, and



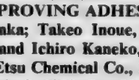
wherein M, M_1, and M_2, which may be the same or different, each represents Na, K, Li, H, $N\oplus R_3$, or $N\oplus HR_2$ wherein R represents an alkyl group or a hydrogen atom; provided that the weight ratio of said resin other than said vinyl chloride resin to said vinyl chloride resin is from about 0.4 to 2.5.

5,112,681
METHOD FOR TREATING A POLYPHENYLENE ETHER-POLYAMIDE MATERIAL, AND ARTICLES MADE BY SUCH A METHOD
Koji Myojo, Susono, and Hiromichi Uohashi, Mishima, both of Japan, assignors to GE Plastics Japan, Ltd., Tokyo, Japan
Filed Dec. 13, 1989, Ser. No. 450,132
Claims priority, application Japan, Dec. 13, 1988, 63-312822
Int. Cl.[5] B32B *27/08*
U.S. Cl. 428—335 **6 Claims**

1. An improved paint adhered thermoplastic article, which comprises;
a substrate molded from a thermoplastic consisting essentially of a mixture of 0 to 70 weight percent of polyphenylene ether resin and 30 to 100 weight percent of a thermoplastic polyamide resin; and
a paint coating adhered directly to the substrate in the absence of an intervening primer coating, said paint coating having a thickness, as cured, of less than 50 microns.

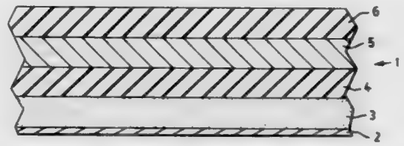
5,112,682
PRIMER FOR IMPROVING ADHESION TO PLASTICS
Yoshio Inouye, Annaka; Takeo Inoue, Yokohama; Toshihide Shimizu, Kamisu, and Ichiro Kaneko, Hazaki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Feb. 8, 1989, Ser. No. 307,637
Claims priority, application Japan, Feb. 9, 1988, 63-29798
Int. Cl.[5] C09J *5/02*
U.S. Cl. 428—353 **10 Claims**

1. In an assembly comprising a plastic article selected from the group consisting of polyethylene, polypropylene, polytetrafluorethylene, polyphenylene sulfide, polyethylene terephthalate, polyphenylene ethers, polybutylene terephthalate, polyacetal, polycarbonate and nylon articles, wherein an adhesive layer is deposited onto at least one surface of said article, the improvement comprising: a primer composition layer between said surface and said adhesive layer obtained by applying a solution or suspension of at least one azine dye selected from the group consisting of Basic Red 2, Solvent Black 5, Solvent Black 7, Acid Blue 59 and Acid Black 2; and at least one organosilicon compound represented by formula (I):



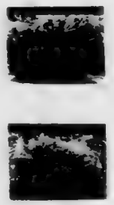
wherein R^1 represents a C_1–C_7 monovalent hydrocarbon group; R^2 represents a monovalent hydrocarbon group or a C_1–C_3 alkoxylalkyl group; R^3 represents X— or X—R^4—, where X represents a C_1–C_6 monovalent hydrocarbon group containing an epoxy group, a C_1–C_6 substituted or unsubstituted amino group, an alkenyl group, an acryloyloxy group, a methacryloyloxy group, a mercapto group or a halogen atom, and R^4 represents a C_1–C_5 saturated divalent hydrocarbon group; and n is an integer of 0 to 2.

5,112,683
HIGH TEMPERATURE RESISTANCE MASK
Eivind Johansen, Weare, N.H., assignor to Chomerics, Inc., Woburn, Mass.
Filed Oct. 30, 1990, Ser. No. 605,631
Int. Cl.[5] B05D *1/08;* B32B *7/12*
U.S. Cl. 428—354 **13 Claims**



1. A high temperature resistant paint mask comprising
a) a lowermost adhesive layer;
b) a barrier layer formed of a high temperature resistant polymer superimposed upon the adhesive layer;
c) a perforated metal layer superimposed upon the barrier layer; and
d) a sacrificial layer formed of a high temperature resistant polymer superimposed upon the metal layer.

5,112,684
FILLINGS AND OTHER ASPECTS OF FIBERS
Walter B. Halm, Lippetal, Fed. Rep. of Germany; William J. Jones, Jr., Greenville, N.C.; James F. Kirkbride, Wilmington, Del.; Ilan Marcus, Versoix, Switzerland, and Adrian C. Snyder, Greenville, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 508,878, Apr. 12, 1990, Ser. No. 549,818, Jul. 9, 1990, and Ser. No. 549,847, Jul. 9, 1990, each is a continuation-in-part of Ser. No. 290,385, Dec. 27, 1988, Pat. No. 4,940,502, which is a continuation-in-part of Ser. No. 921,644, Oct. 21, 1986, Pat. No. 4,794,038, which is a continuation-in-part of Ser. No. 734,423, May 15, 1985, Pat. No. 4,618,531. This application Sep. 28, 1990, Ser. No. 589,960
Int. Cl.[5] D02G *3/00;* D04H *1/58*
U.S. Cl. 428—357 **10 Claims**



1. Fiberballs having a random distribution and entanglement of fibers within each ball, characterized in that the fiberballs have an average diameter of about 2 to about 20 mm, and that

the individual fibers have a length of about 10 to about 100 mm and are prepared from fibers having a primary and a secondary crimp, said primary crimp having a frequency of about 14 to about 40 crimps/10 cm and said secondary crimp having a frequency of about 4 to about 16 crimps/10 cm, and whereby the average amplitude of the secondary crimp is at least 4 times the average amplitude of the primary crimp.

5,112,685

DRYER SCREEN MADE FROM POLY(2-METHYL-1,5-PENTYLENE) TEREPHTHALAMIDE

Robert B. Rashbrook; Clyde W. Alexander, both of Charlotte, N.C., and Edward C. Bland, Gaffney, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Feb. 11, 1991, Ser. No. 653,825

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—364 **3 Claims**

1. A dryer screen comprising a fabric comprising poly(2-methyl-1,5-pentylene) terephthalamide monofilaments having a solution viscosity of greater than 700 and having a diameter of 8 to 40 mils.

5,112,686

LINEAR ETHYLENE POLYMER STAPLE FIBERS

Stephen P. Krupp, Houston; John O. Bieser, and Edward N. Knickerbocker, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 339,335, Apr. 17, 1989, Pat. No. 4,990,204, which is a continuation of Ser. No. 114,169, Oct. 27, 1987, Pat. No. 4,842,922. This application Oct. 27, 1989, Ser. No. 428,280

Int. Cl.[5] D01F *8/06, 6/30;* C08L *23/08, 23/16*

U.S. Cl. 428—401 **15 Claims**

1. Staple fiber having a broad thermal bonding window prepared from a blend of linear ethylene polymers, wherein said blend is melt drawn to approximately 1 to 15 denier at commercially feasible throughput rates, optionally followed by mechanical drawing to produce fiber sizes of less than 6.0 denier/filament, said blend comprising

an amount of high molecular weight linear ethylene polymer having a MFR value within the range between 0.1 to 25 g/10 minutes and a density aboe 0.918/cm^3, and

an amount of low molecular weight linear ethylene polymer having a MFR value within the range of greater than 25 to 600 g/10 minutes and a density above 0.91 g/cm^3 sufficient to provide a blend having a Q value above about 4.5.

5,112,687

HIGHLY CONDUCTIVE POLYMER THICK FILM COMPOSITIONS

Richard L. Frentzel, Chino Hills, and Andrew Chen, Covina, both of Calif., assignors to Advanced Products Inc., Cheshire, Conn.

Division of Ser. No. 518,052, May 2, 1990, Pat. No. 5,089,173. This application Sep. 30, 1991, Ser. No. 767,768

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—402 **2 Claims**

1. A substrate having a cured conductive polymer thick film coating thereon which comprises, by weight, a cured admixture of:

(a) about 3–15 parts of at least one thermoplastic vinyl acetate/vinyl chloride/dicarboxylic acid multipolymer;

(b) a second thermoplastic resin selected from the group consisting of:

(i) about 1–6 parts of at least one thermoplastic polyurethane resin;

(ii) about 2–10 parts of at least one thermoplastic polyester resin; or

(iii) about 1–10 parts of a mixture of at least one thermoplastic polyurethane and at least one polyester resin;

(c) about 0.05–1 parts of a tertiary amine; and

(d) about 50–80 parts of silver flake.

5,112,688

MICROCAPSULES CONTAINING HYDROPHOBIC LIQUID CORE

Daniel W. Michael, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 316,252, Feb. 27, 1989, abandoned. This application Dec. 6, 1990, Ser. No. 624,484

Int. Cl.[5] B01J *13/06;* C11D *17/00;* A61K *7/46*

U.S. Cl. 428—402.2 **11 Claims**

1. Microcapsules containing a central hydrophobic liquid core having a diameter of greater than about 50 microns and less than about 350 microns, said core being surrounded by a wall having a thickness of from about 2 to about 50 microns at the thinnest point, said wall having from about 1% to about 25% by weight of the amount of said core of wall inclusion particles which have diameters of less than about 15 microns, and said inclusion particles have essentially the same composition as said central hydrophobic liquid core.

5,112,689

COMPOSITE PARTICLE

Tasaburo Ueno, Osaka; Hisaki Tanabe, Kyoto; Ryozo Takagawa; Yoshio Eguchi, both of Osaka; Koichi Tsutsui, Kyoto, and Naoya Yabuuchi, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Dec. 7, 1989, Ser. No. 447,511

Claims priority, application Japan, Dec. 7, 1988, 63-310492

Int. Cl.[5] B32B *9/01*

U.S. Cl. 428—407 **4 Claims**

1. A composite particle comprising 2 to 98% by weight of a base resin and 98 to 2% by weight of an anisotropic crystalline polymer, the former being a high molecular weight polymer having a softening point of −10° to 120° C. and having a number average molecular weight of 600 or more, and the latter being a polymer capable of forming an anisotropic molten phase, having a number average molecular weight of 600 to 10,000 and a phase transition point of 60° to 230° C. and having a structure in which a repeating unit (I) of the formula (I)

A—X—B (I)

wherein 100 to 50 mol % of A stands for a mesogenic group selected from the group consisting of a polyphenylene in which 2 or more benzene rings are directly connected with each other at their respective para-positions, a polyphenylene in which 2 or more benzene rings are mutually connected with each other at the respective para-positions through an azo, azoxy, ester or transvinylene bond, 2,6-naphthylene and 2,6-anthrylene and their ring-substituted derivatives, the remaining 0 to 50 mol % of A being selected from the groups consisting of a p-phenylene, m-phenylene and trans-1,4-cyclohexylene group; B is a spacer group represented by the formula:

$$—(CH)_n$$

or the formula:

$$—(CH_2CH_2O)_mCH_2CH_2—$$

in which n is an integer of 2 to 20 and m is an integer of 1 to 19; and X is selected from the group consisting of an ester bond, a carbonate bond, an amide bond, a urethane bond, a urea bond, and a repeating unit of the formula:

R (II)

wherein R stands for a bivalent to hexavalent hydrocarbon residue having 2 to 12 carbon atoms, which may include up to 4 hydroxyl, sulfonic acid, carboxyl, amino, pyridinium or quaternary ammonium groups, connected to each other, in any successive orders and in a weight ratio of (I)/(II)=99.9/0.1 to 60/40, through an ester bond, a carbonate bond, an amide bond, a urethane bond or a urea bond, and whose end portions are occupied by at least one functional group selected from the group consisting of hydroxyl, carboxyl, sulfonic acid, primary amino, secondary amino, tertiary amino, quaternary ammonium, pyridinium and phosphoric acid groups.

5,112,690

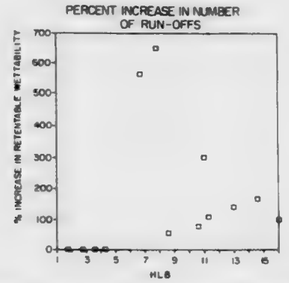
LOW HYDROHEAD FIBROUS POROUS WEB WITH IMPROVED RETENTIVE WETTABILITY

Bernard Cohen, Berkeley Lake, and Michael T. Morman, Alpharetta, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 1, 1990, Ser. No. 608,103

Int. Cl.[5] B05D *3/06*

U.S. Cl. 428—411.1 **24 Claims**



1. A method of treating a low hydrohead fibrous porous web to improve the web's retentive wettability by increasing, by at least about 50%, as compared to untreated web material, the average number of run-off tests that the low hydrohead web material can sustain without unacceptable run-off, the method comprising:

providing a low hydrohead fibrous porous web material;

forming a surface concentration on the web material of at least about 0.05%, by weight of the web material, of a surface active agent having a hydrophile-lipophile balance of at least about 6; and

applying a corona discharge equivalent to a charge of at least about 0.6 watt minute per square foot per side of the web material to the surface active agent bearing web material.

5,112,691

ADHESIVE FOR LOW TEMPERATURE APPLICATIONS

Paul C. Briggs, Charlestown, and Donald E. Gosiewski, Peabody, both of Mass., assignors to Illinois Tool Works, Inc., Chicago, Ill.

Division of Ser. No. 238,302, Aug. 29, 1988, Pat. No. 4,942,201. This application Jul. 5, 1990, Ser. No. 547,970

Int. Cl.[5] B32B *27/30, 27/08, 27/04, 15/08*

U.S. Cl. 428—412 **10 Claims**

1. A bonded assembly which is comprised of at least two components wherein a surface of one component is bonded to a surface of the other component with a cured adhesive comprising before curing:

a) a methacrylate ester monomer;

b) an elastomeric polymer selected from the group consisting of nitrile rubber; polychloroprene; copolymers of butadinene or isoprene with styrene; copolymers of butadiene or styrene with acrylate esters; copolymers of butadiene or styrene with methacrylate esters; copolymers of ethylene and acrylate esters; homopolymers of epichlorohydrin; and copolymers of epichlorohydrin and ethylene oxide, wherein said elastomeric polymer is soluble in the ester monomer and has a Tg below about −25° C.;

c) a core-shell graft copolymer which swells in the monomer but does not dissolve therein; and

d) a free radical producing catalyst.

5,112,692

POLYVINYLIDENE FLUORIDE COMPOSITE AND METHOD

Albert Strassel, Oullins, and Gilbert Duperray, Civrieux d'Azergues par Lauzanne, both of France, assignors to Atochem, Courvevoie, France

Continuation of Ser. No. 824,430, Jan. 31, 1986, abandoned. This application Jul. 11, 1990, Ser. No. 551,032

Claims priority, application France, Feb. 14, 1985, 8502092

Int. Cl.[5] B32B *27/08;* B29C *23/00*

U.S. Cl. 428—421 **9 Claims**

1. A composite material comprising a polyvinylidene fluoride homopolymer layer, a substrate that does not adhere to polyvinylidene fluoride, and an intermediate binder layer between said fluoride layer and substrate comprising a blend of a polyvinylidene fluoride and a polymer containing carbonyl groups,

$$—\overset{\overset{O}{\|}}{C}—,$$

in its polymer chain, said substrate being free of said carbonyl group containing polymer.

2. The composite of claim 1 wherein said carbonyl group containing polymer is selected from polymers containing polyurethane groups, polyurea groups, polyamide groups, polyester groups, or ethylene-carbon monoxide groups.

5,112,693

LOW REFLECTANCE, HIGHLY SATURATED COLORED COATING FOR MONOLITHIC GLAZING

Frank H. Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 3, 1988, Ser. No. 252,475

The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl.[5] B32B *15/04, 17/06*

U.S. Cl. 428—432 **10 Claims**

1. An article of manufacture for the reflectance of solar energy comprising:

a. a transparent substrate;

b. a transparent metal oxide film comprising zinc and tin of a thickness which exhibits intense color by interference effects deposited on a surface of said substrate; and

c. a reflective transparent metallic film deposited on said metal oxide film

wherein the combination of colored metal oxide and reflective metallic films forms a reflective coating of relatively saturated color.

5,112,694

FLEXIBLE PRINTED-CIRCUIT BASE BOARD AND PROCESS FOR PRODUCING THE SAME

Shiro Konotsune, Yokosukashi; Hitoshi Yano, Ichiharashi; Souichiro Hiraki, Ichiharashi, and Kazutsune Kikuta, Ichiharashi, all of Japan, assignors to Chisso Corporation, Japan

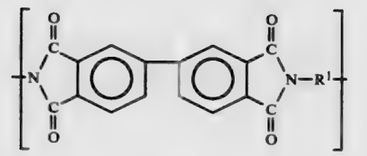
Filed Jul. 24, 1990, Ser. No. 556,408

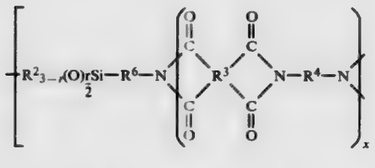
Claims priority, application Japan, Jul. 31, 1989, 1-199130

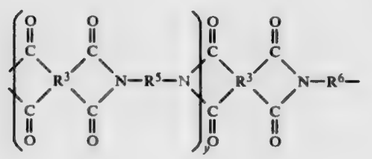
Int. Cl.[5] B32B *9/00*

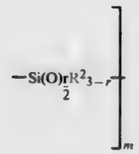
U.S. Cl. 428—457 **2 Claims**

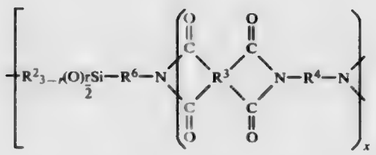
1. A flexible printed-circuit base board comprising two copper foils and a resin layer of a composite material essentially composed of a polyimide having recurring units represented by the following general formula (I) and a polyimide-silicone represented by the following general formula (II), wherein said resin layer is formed directly between said two copper foils:

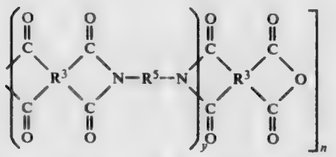




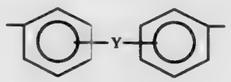




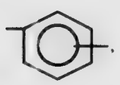




wherein R^1 stands for a bivalent aromatic hydrocarbon group represented by the formula



or



provided that both kinds of aromatic hydrocarbon groups of the above-mentioned formulae are contained in the polyimide (I) with units of the formula (I); R^2 stands for a monovalent aliphatic hydrocarbon group having at most 5 carbon atoms or a monovalent aromatic hydrocarbon group having at most 9 carbon atoms; R^3 stands for a tetravalent aromatic hydrocarbon group; R^4 stands for a bivalent aromatic hydrocarbon group; R^5 stands for a siloxane chain; R^6 stands for a bivalent aliphatic hydrocarbon group having 3 to 5 carbon atoms or a bivalent aromatic hydrocarbon group having 6 to 9 carbon atoms; Y stands for —O—, —CO—, —SO_2—, or —CH_2—; r is 2 or 3; the molar ratio of x:y is in the range of 97–60:3–40; the molar ratio of m:n is in the range of 50–100:50–0.

5,112,695

VESSEL LID COMPRISING LAMINATED MATERIAL

Toshiaki Watanabe; Masatsune Shibue, both of Kawasaki; Hiroshi Matsubayashi, Kamakura, and Ikuo Komatsu, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

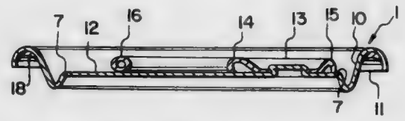
PCT No. PCT/JP90/00990, § 371 Date May 20, 1991, § 102(e) Date May 20, 1991, PCT Pub. No. WO91/01922, PCT Pub. Date Feb. 21, 1991

PCT Filed Aug. 2, 1990, Ser. No. 651,255

Claims priority, application Japan, Aug. 2, 1989, 1-199353

Int. Cl.[5] B32B *15/08*

U.S. Cl. 428—458 **5 Claims**



1. An easily openable vessel lid of a can having excellent corrosion resistance, openability and feathering resistance, which comprises a laminate constructed of a metallic material for the vessel lid and a biaxially drawn polyester film composed mainly of ethylene terephthalate units provided onto at least the internal surface, the aforementioned film having an X-ray diffraction intensity ratio represented by the following formula:

(II) $$17 \geqq I_A/I_B \geqq 4$$

wherein I_A is the X-ray diffraction intensity on the plane of diffraction parallel to the surface of the polyester film, which has a spacing of about 0.34 nm (CuKα X-ray diffraction angle is 21.5 Deg. to 24 Deg.), and

I_B is the X-ray diffraction intensity by the plane of diffraction parallel to the polyester film surface, which has a spacing of about 0.39 nm (CuKα X-ray diffraction angle is 21.5 Deg. to 24 Deg.), and having an in-planed anisotropy index of crystal orientation of 30 or less.

5,112,696

TOUGH MONOLAYER SHRINK FILM FOR PRODUCTS CONTAINING MOISTURE

Richard K. Roberts, Clinton, Iowa, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 383,330, Jul. 20, 1989, abandoned. This application Mar. 15, 1991, Ser. No. 670,327

Int. Cl.[5] C08L *23/08, 23/16;* **B32B** *27/32;* **B29C** *55/02*

U.S. Cl. 428—516 **18 Claims**

1. A shrink film comprising at least one polymeric layer, at least one said layer consisting essentially of a blend of:

(a) about 10 to about 80 percent by weight of at least one ethylene-alpha olefin linear copolymer having a density of about 0.890 to about 0.914;

(b) about 4 to about 70 weight percent of at least one branched low-density polyethylene from a tubular reactor having a density of about 0.920 to about 0.925 and a ratio of weight average molecular weight to number average molecular weight of at least about 8; and

(c) 0 to about 52 weight percent of at least one ethylene-alpha olefin linear copolymer having a density of at least about 0.915; and

(d) 0 to about 25 weight percent of at least one copolymer of ethylene with at least one copolymerized vinyl alkanoate, alkyl acrylate, or alkyl methacrylate;

provided that when the amount of component (b) is less than about 15 percent by weight, the amount of component (d) is at least about 1 percent by weight, said shrink film being obtained by stretching in at least one direction a sheet or tube of the composition at a temperature below its melting point.

5,112,697

STABILIZED METAL FOAM BODY

Iljoon Jin; Lorne D. Kenny, both of Inverary, and Harry Sang, Kingston, all of Canada, assignors to Alcan International Limited, Montreal, Canada

Continuation-in-part of Ser. No. 403,588, Sep. 6, 1989, Pat. No. 4,933,358. This application Aug. 27, 1990, Ser. No. 573,716

The portion of the term of this patent subsequent to Nov. 27, 2007, has been disclaimed.

Int. Cl.[5] B32B *5/18*

U.S. Cl. 428—613 **9 Claims**



1. A stabilized metal foam body, comprising:

a metal matrix having dispersed therethrough a plurality of completely closed cells substantially filled with gas;

and finely divided solid stabilizer particles dispersed within said matrix, wherein the stabilizer particles contained in the matrix are concentrated adjacent the interfaces between the matrix metal and the closed cells.

5,112,698

CERAMIC COATING

Knut Horvei, and Jonas S. Sandved, both of Sandnes, Norway, assignors to Den norske stats oljeselskap a.s, Norway

Division of Ser. No. 317,084, Feb. 28, 1989, Pat. No. 4,988,538. This application Sep. 25, 1990, Ser. No. 588,142

Claims priority, application Norway, Apr. 30, 1986, 861700

Int. Cl.[5] B32B *15/04*

U.S. Cl. 428—632 **20 Claims**

1. A structure comprising a metal substrate having a ceramic coating composition deposited thereon, said ceramic coating composition being characterized by being produced by first applying a chromium oxide containing coating material to said substrate and, subsequently, glazing said chromium oxide coating material by means of laser irradiation, whereby the coating material is at least partially melted and chemical bonds form in the coating material while leaving the substrate essentially unaffected.

5,112,699

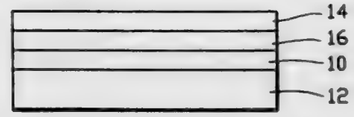
METAL-METAL EPITAXY ON SUBSTRATES AND METHOD OF MAKING

Chin-An Chang, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 492,050, Mar. 12, 1990, abandoned. This application May 25, 1990, Ser. No. 529,033

Int. Cl.[5] B32B *15/20;* **C30B** *25/18*

U.S. Cl. 428—641 **59 Claims**



1. A method of epitaxially growing a metal on an elemental semiconductor substrate at room temperature comprising the steps of:

coating an elemental semiconductor substrate of a crystal orientation with an epitaxially grown layer of copper, and

if the metal epitaxially grows on copper, then depositing a layer of the metal onto the layer of copper at room temperature without applying external heat to the coated substrate,

if the metal does not epitaxially grow on copper, then sequentially depositing at least one intermediate metal layer onto the layer of copper for providing lattice matching between said metal and the last sequentially deposited intermediate metal layer, between sequentially deposited intermediate metal layers and between the first deposited intermediate metal layer and the layer of copper, and depositing a layer of the metal on the last of said sequentially deposited intermediate metal layers, each layer being deposited at room temperature without applying external heat to the coated substrate.

5,112,700

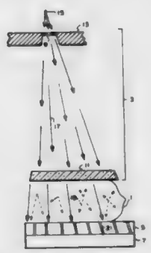
PHOSPHOR COMPOSITION AND X-RAY INTENSIFYING SCREEN CAPABLE OF EMITTING PRINCIPALLY IN THE SPECTRAL REGION OF NATIVE SILVER HALIDE SENSITIVITY

Patrick M. Lambert, Rochester; Philip S. Bryan, Webster; Gregory S. Jarrold, Henrietta, and Christine M. Towers, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 556,588, Jul. 20, 1990, abandoned. This application May 28, 1991, Ser. No. 706,510

Int. Cl.[5] B32B *19/00;* **C09K** *11/67*

U.S. Cl. 428—690 **24 Claims**



1. An intensifying screen comprised of

a support and

a fluorescent layer containing a phosphor capable of absorbing X-radiation and emitting electromagnetic radiation principally in the spectral region to which silver halide exhibits native sensitivity,

characterized in that the phosphor is titanium activated hafnium zirconium germanate in which hafnium, zirconium and germanium satisfy the relationship:

$$D_{1+x}Ge_{1-x}$$

where

D is the combined sum of zirconium and hafnium and x is 0.25 to −0.70.

5,112,701

MAGNETO-OPTIC RECORDING MEDIA AND PROCESS FOR PRODUCING THE SAME

Tadao Katsuragawa, Yamato, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 23, 1989, Ser. No. 328,059

Claims priority, application Japan, Mar. 25, 1988, 63-71057; Jul. 27, 1988, 63-187386; Aug. 5, 1988, 63-196295; Aug. 8, 1988, 63-197521; Nov. 7, 1988, 63-281991

Int. Cl.[5] G11B *5/66*

U.S. Cl. 428—694 **8 Claims**



2. Magneto-optic recording media, comprising a thin magnetic film oriented along C-axis comprising nitrides represented by M_xN wherein M represents at least one metal selected from the group consisting of Fe, Co and Ni and x is 2–3 said nitrides being present in an amount sufficient to result in the following properties: a Faraday rotational angle of not less than 0.3 deg/μm and a magnetic field with perpendicular magnetic anisotropy of not less than 4 KOe, a reflective layer and a non-magnetic support,

said thin magnetic film being formed directly or indirectly by way of the reflective layer on the non-magnetic support, providing that said reflective layer is formed on the thin magnetic layer when said thin magnetic layer is directly disposed on the non-magnetic support.

5,112,702

ELECTROCHEMICAL SYNTHESIS OF H_2O_2

Talvildis Berzins, Kennett Square, Pa., and Lawrence W. Gosser, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 495,674, Mar. 19, 1990, abandoned. This application Dec. 31, 1990, Ser. No. 636,868

Int. Cl.[5] C25B *1/30;* **H01M** *8/06*

U.S. Cl. 429—17 **46 Claims**

1. An electrochemical process for making hydrogen peroxide by the cathodic reduction of oxygen in an electrolytically conductive reaction medium comprising:

(a) forming an electrolytically conductive reaction medium comprising halide ions, hydrogen ions and molecular oxygen; and

(b) electrolyzing said medium through a cathode, and an inert anode, such that the voltage at the cathode relative to a Hg/Hg_2SO_4 reference electrode is in the range of about −0.2 to about −0.75 volts,

whereby said molecular oxygen is reduced to hydrogen peroxide.

5,112,703

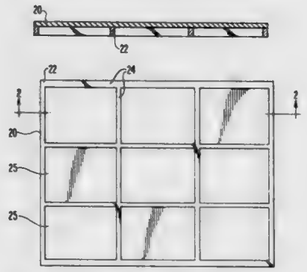
ELECTROCHEMICAL BATTERY CELL HAVING A MONOLITHIC BIPOLAR FLAT PLATE BETA" ALUMINA SEPARATOR

Albert Koenig, Coatesville, Pa., assignor to Beta Power, Inc., Salt Lake City, Utah

Filed Jul. 3, 1990, Ser. No. 547,302

Int. Cl.[5] H01M *10/39*

U.S. Cl. 429—103 **41 Claims**



1. An electrochemical battery cell, comprising:

a flexible beta" alumina plate serving as an electrolyte;

rigid frame means for supporting said beta" alumina plate, including an outer peripheral portion and at least one central portion defining at least two adjoining generally rectangular openings, said frame means having planar surfaces on opposite sides, said beta" alumina plate being fixed to one surface of said frame means;

a cathode compartment disposed on one side of said frame means and beta" alumina plate partially enclosing a cathode;

an anode compartment disposed on the opposite side of said frame means and beta" alumina plate partially enclosing sodium; and

a metallic seal plate sealing said anode compartment, said seal plate including an electric current collector.

5,112,704

NON-AQUEOUS ELECTROLYTE CELL

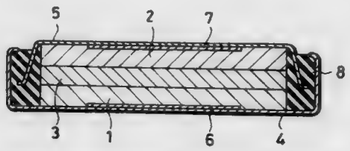
Nobuhiro Furukawa; Seiji Yoshimura, and Masatoshi Takahashi, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 267,591, Nov. 7, 1988, abandoned. This application Feb. 28, 1990, Ser. No. 492,267

Claims priority, application Japan, Jul. 1, 1988, 63-165724; Jul. 1, 1988, 63-165725; Jul. 1, 1988, 63-165726

Int. Cl.[5] H01M *6/14, 4/58*

U.S. Cl. 429—194 **10 Claims**



1. A non-aqueous electrolyte cell having a positive electrode comprising lithium, a negative electrode and an electrolyte contained in a cell can, the electrolyte including a solute and an organic solvent, the solute comprising lithium trifluoromethane sulfonate,

wherein said positive electrode is selected from the group consisting of MnO_2, modified MnO_2, densified MnO_2, MnO_2 containing lithium, MoO_3, CuO, CrO_x, V_2O_5, FeS, TiS_2, MoS_2, and $(CF)_n$;

wherein said organic solvent comprises an organic solvent

mixture of 5 to 30 volume percent of each of at least two high boiling point solvents including at least one cyclic carbonate.

5,112,705

COATED ANODE CURRENT COLLECTOR FOR ALKALINE CELLS

James C. Hunter, Elyria; John C. Nardi, Brunswick; Edwin T. Russell, Medina, and Robert F. Scarr, Westlake, all of Ohio, assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Aug. 17, 1989, Ser. No. 395,223

The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.

Int. Cl.[5] H01M *10/26, 4/66*

U.S. Cl. 429—206 **19 Claims**

1. An electrochemical cell comprising an anode, a cathode, an alkaline electrolyte, and a conductive anode current collector comprising a substrate coated with a layer of a discontinuous dispersion of lead in which the amount of lead contained in the layer on the surface of the anode current collector is at least 150 parts per million based on the weight of a 0.1 micron thick portion of the layer on the surface of said substrate.

5,112,706

COATED SUBSTRATES

Naum Pinsky, Thousand Oaks, and Saulius A. Alkaitis, Venice, both of Calif., assignors to Ensci, Inc., Santa Monica, Calif.

Division of Ser. No. 272,539, Nov. 17, 1988, which is a continuation-in-part of Ser. No. 82,277, Aug. 6, 1987, Pat. No. 4,787,125, which is a division of Ser. No. 843,047, Mar. 24, 1986, Pat. No. 4,713,306. This application Aug. 24, 1989, Ser. No. 398,051

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.[5] H01M *4/66*

U.S. Cl. 429—233 **45 Claims**

1. An article comprising an acid resistant substrate other than electrically conductive fluoride ion doped tin oxide in the form of fibers or particles coated with electrically conductive, fluoride ion doped tin oxide.

5,112,707

MASK STRUCTURE FOR LITHOGRAPHY

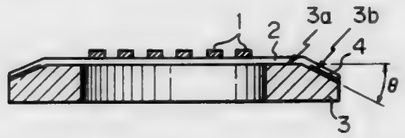
Hideo Kato; Hirohumi Shibata, both of Yokohama; Keiko Matsushita, Tokyo, and Osamu Takamatsu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 398,309, Aug. 25, 1989, Pat. No. 4,956,249, which is a continuation of Ser. No. 910,309, Sep. 22, 1986, abandoned, Continuation of Ser. No. 652,107, Sep. 17, 1984, abandoned. This application Jun. 8, 1990, Ser. No. 534,875

Claims priority, application Japan, Sep. 26, 1983, 58-177285; Sep. 26, 1983, 58-177286

Int. Cl.[5] G03F *9/00*

U.S. Cl. 430—5 **26 Claims**



7. A mask structure for lithography according to claim 6, wherein said adhesive is at least one selected from the group consisting of solvent type, heat curable type and photocurable type.

5,112,708

MEMBER FOR CHARGING WITH SURFACE LAYER OF N-ALKOXYMETHYLATED NYLON EFFECTING CHARGING AT LOWER VOLTAGE

Masami Okunuki, Tokyo; Hisami Tanaka, Yokohama; Hiroyuki Ohmori, Tokyo, and Masafumi Hisamura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 306,993, Feb. 7, 1989, abandoned. This application May 2, 1991, Ser. No. 696,977

Claims priority, application Japan, Feb. 11, 1988, 63-29774

Int. Cl.[5] G03G *13/02*

U.S. Cl. 430—31 **16 Claims**

1. A member for contact charging an electrophotographic photosensitive member when said electrophotographic photosensitive member is in contact with said member for charging, said member for contact charging comprising: an electroconductive substrate and a surface layer of N-alkoxymethylated nylon.

5,112,709

RED REPRODUCTION-IMPROVING ELECTROPHOTOGRAPHIC IMAGE-FORMING METHOD USING AN AMORPHOUS SILICON PHOTOSENSITIVE MEMBER HAVING A SURFACE LAYER COMPOSED OF A HYDROGENATED AMORPHOUS SILICON CARBIDE

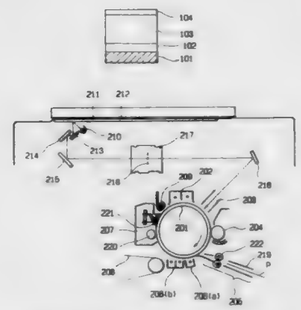
Koji Yamazaki, Ebina; Shigenori Ueda, and Toshiyuki Ehara, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 373,022, Jun. 29, 1989, abandoned. This application Jan. 9, 1991, Ser. No. 637,955

Claims priority, application Japan, Jul. 1, 1988, 63-164204; Oct. 5, 1988, 63-249813

Int. Cl.[5] G03G *13/01, 13/22*

U.S. Cl. 430—46 **7 Claims**



4. An electrophotographic image-forming method which comprises:

(a) employing an amorphous silicon system photosensitive member comprising a substrate and a light receiving layer disposed on said substrate; said light receiving layer comprising a 1 to 100 μm thick photoconductive layer having a refractive index of 3.2 to 3.5 composed of an amorphous material containing silicon atoms as the matrix and at least hydrogen atoms and a 0.4 to 1 μm thick surface layer having a refractive index of 1.9 to 2.3 composed of an amorphous material containing silicon atoms, carbon atoms and hydrogen atoms and wherein the refractive index of said surface layer is n and the thickness of said surface layer is D, said D is in one of the following five ranges (i) to (v): (i) range of D_1–D_2, (ii) range of D_3–D_4, (iii) range of D_5–D_6, (iv) range of D_7–D_8, and (v) range of D_9–D_{10}, wherein each of D_1 to D_{10} is:

$D_1 = -2047 \times n + 8393$

$D_2 = -2416 \times n + 9932$

$D_3 = -2693 \times n + 11087$
$D_4 = -3063 \times n + 12626$
$D_5 = -3386 \times n + 13973$
$D_6 = -3756 \times n + 15512$
$D_7 = -4033 \times n + 16666$
$D_8 = -4403 \times n + 18206$
$D_9 = -4680 \times n + 19360$
$D_{10} = -5050 \times n + 20899$,

(b) subjecting said photosensitive member to charging by a corona charger through the surface of said photosensitive member,

(c) reflecting light from a light source capable of generating light having a continuous wavelength of 400 nm to 700 nm at the surface of an original to irradiate the surface of said photosensitive member, thereby forming a latent image on the surface of said photosensitive member,

(d) forming a toner image on the surface of said photosensitive member in a development mechanism employing a magnetic toner as the developer corresponding to said latent image,

(e) transferring said toner image onto a transfer sheet, and

(f) cleaning the surface of said photosensitive member by a magnet roller.

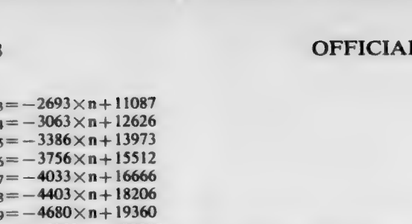
7. An electrophotographic image-forming method according to claim 4, including employing a plurality of development devices corresponding to the number of magnetic color toners to be used for forming a colored toner image as the development mechanism.

5,112,710

ELECTROPHOTOGRAPHIC IMAGE FORMING METHOD

Hidetsugu Shimura, Nagano, and Hiroshi Ito, Nagano, both of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 247,003, Sep. 20, 1988, Pat. No. 5,002,845. This application Jan. 28, 1991, Ser. No. 646,047
Claims priority, application Japan, Sep. 21, 1987, 62-236466
Int. Cl.[5] G03G *13/01, 13/22*
U.S. Cl. 430—46 **15 Claims**



1. A method of forming an electrophotographic image, comprising:

charging an electrophotographic image forming member with a first charge q_1 and administering a first exposure, the first exposure during or immediately after the first charging, the image forming member including a conductive base layer, an organic photosensitive layer disposed on the conductive layer the photosensitive layer having a first charge generation layer adjacent to the conductive layer, a charge transportation layer thereon and a second charge generation layer disposed on the charge transportation layer, and a dielectric layer on the photosensitive layer;

charging the image forming member with a second charge q_2, such that q_2 is smaller in magnitude and of opposite polarity than q_1 so that there are charges with the same polarity as q_1 at the surface of the dielectric layer and a greater quantity of charges having the polarity of q_2 at the interface of the dielectric layer and the photosensitive layer and the overall charge of the device is of the same polarity as q_2;

exposing the image forming member with a second exposure corresponding to an image so that the charge of the image forming member at the portions exposed with the second exposure is of the polarity of q_1, to form a latent image;

development of the latent image on the image forming member with toner having a charge of the same polarity as q_1, the first charging; and

transferring the toners from the image forming member onto a transfer medium and fixing the toners onto the transfer medium.

13. The method of forming an electrophotographic image of claim 1, wherein the steps of charging, exposing and developing are repeated for selected toner colors.

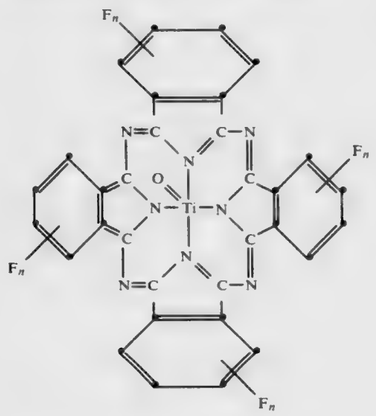
5,112,711

ELECTROPHOTOGRAPHIC RECORDING ELEMENTS CONTAINING A COMBINATION OF TITANYL PHTHALOCYANINE-TYPE PIGMENTS

Khe Chanh Nguyen, Pittsford, and Thomas R. Klose, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1990, Ser. No. 533,634
Int. Cl.[5] G03G *5/06*
U.S. Cl. 430—58 **6 Claims**

1. In an electrophotographic recording element containing photoconductive materials dispersed in a binder, the improvement wherein the photoconductive materials comprise a combination of pigments of (A) titanyl phthalocyanine with (B) titanyl fluorophthalocyanine having the formula:



where each n is an integer of 1–4.

5,112,712

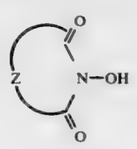
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIALS COMPRISING AN INORGANIC PHOTOCONDUCTOR AND N-HYDROXYIMIDE COMPOUNDS

Seishi Kasai; Kazuo Ishii, and Eiichi Kato, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1990, Ser. No. 600,047
Claims priority, application Japan, Oct. 20, 1989, 1-274440
Int. Cl.[5] G03G *5/087*
U.S. Cl. 430—95 **4 Claims**

1. An electrophotographic photosensitive material comprising a conductive support having thereon a photoconductive layer containing at least an inorganic photoconductor and a binder resin, characterized in that the photoconductive layer

contains an N-hydroxyimide compound represented by the following general formula (I):



(I)

wherein Z represents an organic residue capable of forming a cyclic compound having a saturated or unsaturated bond.

5,112,713

ELECTROPHOTOGRAPHIC PHOTORECEPTOR WITH POLAR GROUP CONTAINING COMB-TYPE RESIN BINDER

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 23, 1990, Ser. No. 527,451
Claims priority, application Japan, May 23, 1989, 1-127819
Int. Cl.[5] G03G *5/087*
U.S. Cl. 430—96 **10 Claims**

1. An electrophotographic light-sensitive material comprising a support having thereon a photoconductive layer containing at least inorganic photoconductive particles and a binder resin, wherein the binder resin contains (A) at least one resin comprising a graft copolymer having a weight average molecular weight of from 1.0×10^3 to 2.0×10^4 and containing, as copolymer components, at least (A-i) a monofunctional macromonomer (MA) having a weight average molecular weight of not more than 2×10^4 and containing at least one polymer component represented by formula (IIa) or (IIb) shown below and at least one polymer component having at least one polar group selected from the group consisting of —COOH, $-PO_3H_2$, $-SO_3H$, —OH, and

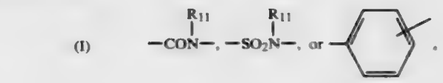


wherein R_1 represents a hydrocarbon group or $-OR_2$ (wherein R_2 represents a hydrocarbon group), with a polymerizable double bond group represented by formula (I) shown below being bonded to one terminal of the main chain thereof, and (A-ii) a monomer represented by formula (III) shown below, and (B) at least one resin comprising a copolymer containing, as copolymer components, at least (B-i) a monofunctional macromonomer (MB) having a weight average molecular weight of not more than 2×10^4 and containing at least one polymer component represented by formula (IIa) or (IIb) shown below, with a polymerizable double bond group represented by formula (I) shown below being bonded to one terminal of the main chain thereof and (B-ii) a monomer represented by formula (III) shown below:

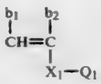


(I)

wherein X_0 represents —COO—, —OCO—, $-CH_2OCO-$, $-CH_2COO-$, —O—, $-SO_2-$, —CO—, —CONHCOO—, —CONHCONH—, $-CONHSO_2-$,



wherein R_{11} represents a hydrogen atom or a hydrocarbon group; a_1 and a_2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —COO—Z_1, or —COO—Z_1 bonded through a hydrocarbon group (wherein Z_1 represents a substituted or unsubstituted hydrocarbon group:

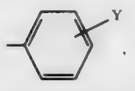


(IIa)

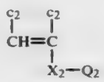


(IIb)

wherein X_1 has the same meaning as X_0; Q_1 represents an aliphatic group having from 1 to 18 carbon atoms or an aromatic group having from 6 to 12 carbon atoms; b_1 and b_2, which may be the same or different, each has the same meaning as a_1 and a_2; V represents —CN, $-CONH_2$, or



wherein Y represents a hydrogen atom, a halogen atom, a hydrocarbon group, an alkoxyl group, or $-COOZ_2$, wherein Z_2 represents an alkyl group, an aralkyl group, or an aryl group:



(III)

wherein X_2 has the same meaning as X_0 in formula (I); Q_2 has the same meaning as Q_1 in formula (IIa); and c_1 and c_1, which may be the same or different, have the same meaning as a_1 and a_2 in formula (I).

5,112,714

DRY MAGNETIC ELECTROSTATIC DEVELOPER

Eiichi Imai, Narashino; Kiichiro Sakashita, Kawasaki; Seiichi Takagi, Yokohama, and Tsutomu Kukimoto, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 336,531, Apr. 12, 1989, abandoned, which is a continuation of Ser. No. 55,931, Jun. 1, 1987, abandoned, which is a division of Ser. No. 769,951, Aug. 27, 1985, Pat. No. 4,702,986. This application Nov. 19, 1990, Ser. No. 614,679
Claims priority, application Japan, Aug. 30, 1984, 59-182284; Aug. 31, 1984, 59-182169; Apr. 19, 1985, 60-82665; Apr. 22, 1985, 60-84613
Int. Cl.[5] G03G *9/083*
U.S. Cl. 430—106.6 **16 Claims**

1. A dry developer for developing electrostatic images using a heated fixing roller which comprises:

a) magnetic toner particles comprising 100 parts by weight of at least one styrene-acrylic type copolymer as a binder resin and 1–20 parts by weight of a polyalkylene selected

from the group consisting of polypropylene and ethylene-propylene copolymer having a ratio of weight average molecular weight to number average molecular weight of 5–8 and Z average molecular weight determined by gel permeation chromatography of 10,000–200,000 and containing 5–60% by weight of a component soluble in n-hexane at boiling point, and 10–70 percent by weight of magnetic powder having a Mohs scale of 5–7 based on the magnetic toner particles, the magnetic toner particles having a kinetic friction coefficient of 0.20–0.50, and

b) silica fine powder having BET specific surface area according to a nitrogen adsorbing method of 0.5–500 m^2/g.

5,112,715

TONER COMPOSITIONS CONTAINING A MULTI-PURPOSE ADDITIVE

Lawrence P. DeMejo, Rochester; John M. McCabe, Pittsford, and John C. Wilson, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1990, Ser. No. 563,011

Int. Cl.[5] G03G *9/087*

U.S. Cl. 430—109 **3 Claims**

1. Toner compositions comprising a linear or branched carboxylated polyester resin having an acid content of about 0.1 to about 0.7 milliequivalents based upon hydronium ion weight per gram that is crosslinked with a multifunctional epoxy novolac resin and a multi-purpose additive that is a catalyst for the crosslinking reaction and a charge control agent for the toner composition.

5,112,716

LIQUID DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY

Eiichi Kato, and Hideyuki Hattori, both of Haibara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 11, 1990, Ser. No. 507,535

Claims priority, application Japan, Apr. 12, 1989, 1-90550; May 17, 1989, 1-121406; May 18, 1989, 1-122835

The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.

Int. Cl.[5] G03G *9/00, 9/12*

U.S. Cl. 430—114 **9 Claims**

1. A liquid developer for electrostatic photography comprising at least resin grains dispersed in a non-aqueous solvent having an electric resistance of at least 10^9 Ωcm and a dielectric constant of not higher than 3.5, wherein the dispersed resin grains are polymer resin grains obtained by polymerizing a solution containing at least a monofunctional monomer (A) which is soluble in the aforesaid non-aqueous solvent, but becomes insoluble therein by being polymerized in the presence of a dispersion-stabilizing resin (BA) soluble in the non-aqueous solvent, which is a polymer containing a recurring unit represented by the following formula (I) and having no graft group which is polymerizable with said monofunctional monomer (A), at least a part of the main chain of the polymer being crosslinked:



(I)

wherein X^1 represents —COO—, —OCO—, —CH_2OCO—, —CH_2COO—, —O—, or —SO_2—; Y^1 represents an aliphatic group having from 6 to 32 carbon atoms; and a^1 and a^2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group having from 1 to 8 carbon atoms, —COO—Z^1 or —COO—Z^1 bonded via a hydrocarbon group having from 1 to 8 carbon atoms (wherein Z^1 represents a hydrocarbon group having from 1 to 22 carbon atoms).

5,112,717

METHOD AND APPARATUS FOR TREATING TONER IMAGE BEARING RECEIVING SHEETS

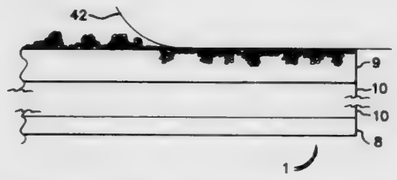
Carlton D. Baxter, and Muhammad Aslam, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 19, 1989, Ser. No. 409,194

The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.

Int. Cl.[5] G03G *13/20;* **B28B** *11/08;* **B29C** *59/00*

U.S. Cl. 430—124 **14 Claims**



1. A method of treating a thermoplastic layer on a receiving sheet, said layer having a surface which defines an outside surface of said sheet and in which surface is embedded a fixed toner image, said method comprising:

positioning said receiving sheet between a pair of pressure members, one of said pressure members contacting said thermoplastic layer and having a hard texturizing or glossing surface,

heating said pressure member contacting the side of said sheet opposite said thermoplastic layer to a temperature sufficient to raise or maintain said thermoplastic layer to or above its glass transition temperature without independently heating the pressure member contacting said thermoplastic layer to a surface temperature greater than 10° C. above said glass transition temperature, and

applying sufficient pressure between said pressure members to impart a texture to or enhance the gloss of said thermoplastic layer.

5,112,718

LIQUID DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY

Eiichi Kato, and Hideyuki Hattori, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 11, 1990, Ser. No. 535,674

Claims priority, application Japan, Jun. 12, 1989, 1-146671; Sep. 27, 1989, 1-249095; Sep. 28, 1989, 1-250580

Int. Cl.[5] G03G *9/13*

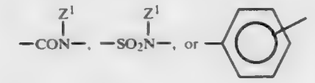
U.S. Cl. 430—114 **7 Claims**

1. A liquid developer for electrostatic photography comprising resin grains dispersed in a non-aqueous solvent having an electric resistance of at least 10^9 Ω cm and a dielectric constant of not higher than 3.5, wherein the dispersed resin grains are polymer resin grains obtained by polymerizing a solution containing at least one monofunctional monomer (A) which is soluble in the said non-aqueous solvent but becomes insoluble in said non-aqueous solvent by being polymerized, in the presence of a dispersion-stabilizing resin which is soluble in said non-aqueous solvent and is a comb-like copolymer having a polymer main chain, said comb-like copolymer formed from (1) at least a mono-functional macromonomer (M) having a weight average molecular weight of from 1×10^3 to 2×10^4 and (2) at least a monomer represented by the following formula (III), said mono-functional macromonomer (M) having (i) a polymer main chain containing at least one polymer component represented by the following formula (IIa) or (IIb) and (ii) a polymerizable double bond group represented by the following formula (I) bonded to only one terminal of the polymer main chain of the macromonomer (M);

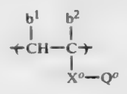


(I)

wherein V represents —COO—, —OCO—, $CH_2{}_mOCO$—, $CH_2{}_mCOO$—, —O—, —CONHCOO—, —CONHCO, $-SO_2-$, —CO—,



(wherein Z^1 represents a hydrogen atom or a hydrocarbon group and m represents an integer of from 1 to 3); a^1 and a^2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —COO—Z^2, or —COO—Z^2 bonded via a hydrocarbon group (wherein Z^2 represents a hydrogen atom or a hydrocarbon group which may be substituted);



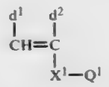
(IIa)



(IIb)

wherein X^o has the same meaning as V in formula (I); Q^o represents an aliphatic group having from b 1 to 22 carbon atoms or an aromatic group having from 6 to 12; Q represents —CN or

wherein Y represents a hydrogen atom, a halogen atom, an alkoxy group, or —$COOZ^3$ (wherein Z^3 represents an alkyl group, an aralkyl group, or an aryl group); and b^1 and b^2, which may be the same or different, have the same meanings as a^1 and a^2 in formula (I);



(III)

wherein X^1 has the same meaning as X^o in formula (IIa); Q^1 has the same meaning as Q^o in formula (IIa); and d^1 and d^2, which may be the same or different, have the same meanings as a^1 and a^2 in formula (I); with the proviso that, in the component of the macromonomer (M) represented by formula (IIa) and in the component of the monomer represented by formula (III), at least one of Q^o and Q^1 represents an aliphatic group having form 10 to 22 carbon atoms, wherein the proportion of the mono-functional macromonomer (M) as a copolymer component of the comb-like copolymer is from 1% by weight to 70% by weight based on the weight of the copolymer; and wherein the content of the monomer shown by formula (III) is from 30% by weight to 99% by weight based on the weight of the copolymer.

5,112,719

POSITIVE RESIST COMPOSITION CONTAINING ALKALI-SOLUBLE PHENOLIC RESIN, QUINONEDIAZIDE SULFONIC ACID ESTER PHOTOSENSITIVE AGENT AND POLYHYDROXY SENSITIZER

Takamasa Yamada, Komaki; Shoji Kawata, Kawasaki, and Masayuki Oie, Kamakura, all of Japan, assignors to Nippon Zeon Co., Ltd., Japan

Filed Oct. 26, 1990, Ser. No. 603,355

Claims priority, application Japan, Dec. 28, 1989, 1-342193

Int. Cl.[5] G03F *7/023;* **G03C** *1/61*

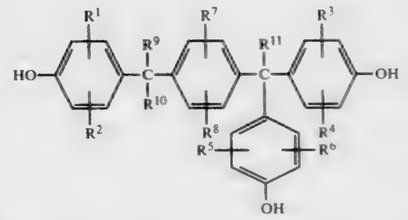
U.S. Cl. 430—191 **1 Claim**

1. A positive resist composition comprising in admixture:

(i) 100 parts by weight of an alkali-soluble phenolic resin;

(ii) 1–100 parts by weight of a photosensitive agent formed of a quinonediazide sulfonic acid ester;

(iii) 1–100 parts by weight of at least one compound represented by the following general formula (I):



(I)

wherein

R^1 through R^6 mean individually a hydrogen or halogen atom, a hydroxyl group or an alkyl or alkenyl group having 1–4 carbon atoms and may be equal to or different from one another,

R^7 and R^8 denote individually a hydrogen or halogen atom, or an alkyl group having 1–4 carbon atoms and may be equal to or different from each other, and

R^9 through R^{11} stand individually for a hydrogen atom or an alkyl group having 1–4 carbon atoms and may be equal to or different from one another; and

(iv) sufficient solvent to dissolve the foregoing composition components.

5,112,720

COLOR DIFFUSION TRANSFER PHOTOGRAPHIC FILM UNIT WITH DYE TRAPPING LAYER

Yukio Karino, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 20, 1990, Ser. No. 495,968

Claims priority, application Japan, Mar. 20, 1989, 1-68749

Int. Cl.[5] G03G *5/54*

U.S. Cl. 430—213 **13 Claims**

1. A color diffusion transfer photographic film unit comprising:

(1) a support having a light-shielding function in itself and/or having thereon a layer having a light-shielding function;

(2) a light-sensitive element on said support having a light-shielding function said element comprising in order from said support having a light-shielding function at least;

(a) a color image-receiving layer comprising mordant agent in a binder,

(b) a peeling layer, and

(c) at least one silver halide emulsion layer associated with a color image-forming substance;

(3) a light-shielding agent-containing alkali processing composition; and

(4) a cover sheet comprising at least a layer having a neutralizing function on a transparent support;

wherein said cover sheet is characterized by having a dye-trapping layer comprising a mordant agent in a binder adjacent said alkali processing composition, and wherein said support having a light-shielding function further has a light-reflecting function in itself and/or has thereon a layer having a light-reflecting function, and wherein said layer having a light-reflecting function is on the side of said color image receiving layer (a) opposite said silver halide emulsion layer (c) and said layer having a light-shielding function is on the side of said layer having a light-reflecting function opposite said silver halide emulsion layer (c).

5,112,721

PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING SENSITIZER MIXTURES

August D. Kuchta, Sayre, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 471,307, Jan. 29, 1990, abandoned. This application Jul. 19, 1991, Ser. No. 732,721

Int. Cl.[5] G03F *7/031*

U.S. Cl. 430—281 **27 Claims**

1. A photopolymerizable composition consisting essentially of:

(1) at least one ethylenically unsaturated monomer capable of free radical initiated addition polymerization;

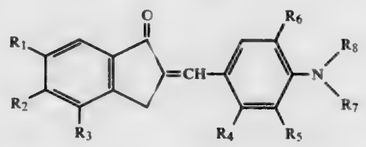
(2) at least one polymeric binder;

(3) an initiator system, capable of being activated by actinic radiation, said initiator system comprising:

(a) a hexaarylbisimidazole;

(b) a chain transfer agent;

(c) a sensitizer of the following structure:



wherein:

R_1 and R2 are each independently hydrogen, substituted or unsubstituted alkyl from 1 to 6 carbon atoms, or substituted or unsubstituted alkoxyl from about 1 to 6 carbon atoms, or R_1 and R_2 together equal $—CHC_2O—$ or are joined to form a carbocyclic substituted or unsubstituted five or six membered ring;

R_3 is hydrogen or methyl;

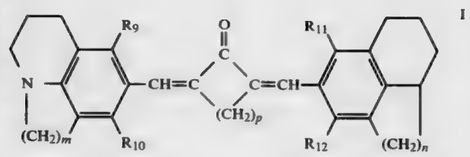
R_4 is hydrogen or methyl;

R_5 is hydrogen and R_7 is alkyl from about 1 to about 6 carbon atoms, or R_5 and R_7 together are $—(CH_2)_2—$ or $—(CH_2)_3—$;

R_6 is hydrogen and R_8 is alkyl from about 1 to about 6 carbon atoms, or R_6 and R_8 together are $—(CH_2)_2—$ or $—(CH_2)_3—$;

R_6 is hydrogen and R_8 is alkyl from about 1 to about 6 carbon atoms, or R_6 and R_8 together are $—(CH_2)_2—$ or $—(CH_2)_3—$, provided the combination of R_5 and R_7 and the combination of R_6 and R_8 cannot be $—(CH_2)_2—$ at the same time; and

(d) a co-sensitizer, said co-sensitizer having its wavelength of maximum absorption at longer wavelength than that of said sensitizer, and selected from the group consisting of:

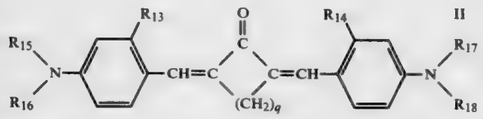


I

wherein:

m, n, and p are independently 2 or 3; and

R_9, R_{10}, R_{11}, and R_{12} are each independently hydrogen, alkyl of from 1 to 4 carbon atoms, and alkoxyl for 1 to 4 carbon atoms;



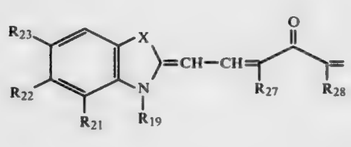
II

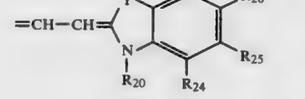
wherein:

q is 2 or 3

R_{13} and R_{14} are independently hydrogen, methoxy, or alkyl from 1 to 4 carbon atoms;

R_{15}, R_{16}, R_{17}, and R_{18} are each independently alkyl from 1 to 4 carbon atoms; and





III

wherein:

R_{19} and R_{20} are each independently alkyl of 1 to 6 carbon atoms or substituted or unsubstituted phenyl;

R_{21}, R_{22}, R_{23}, R_{24}, R_{25}, R_{26} are each independently alkyl from 1 to 6 carbon atoms, alkoxyl of 1 to 6 carbon atoms, substituted or unsubstituted phenyl, or chlorine, or

R_{21} and R_{22} together or R_{22} and R_{23} together, and R_{24} and R_{25} together or R_{25} and R_{26} together form an aliphatic or aromatic ring;

or R_{27} and R_{28} together are $—(CHR_{29}CHR_{30})—$ or $—(CH_2CHR_{31}CH2)—$, where

R_{29} and R_{30} are hydrogen or together are joined to form an aromatic ring and R_{31} is hydrogen or alkyl of from 1 to 6 carbon atoms; and

X and Y are independently O, S or $CR_{32}R_{33}$, where R_{32} and R_{33} are each independently alkyl from 1 to 4 carbon atoms.

5,112,722

METHOD OF PRODUCING LIGHT CONTROL PLATE WHICH INDUCES SCATTERING OF LIGHT AT DIFFERENT ANGLES

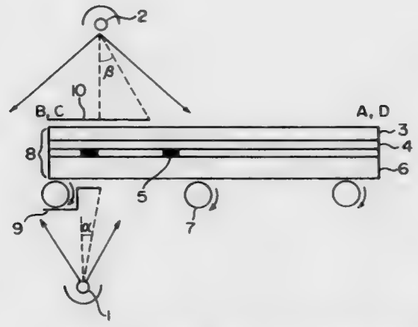
Toshifumi Tsujino; Koichi Maeda; Satoshi Ishizuka; Hiroaki Yamamoto, all of Osaka; Shinichiro Kitayama, and Shigeo Hozumi, both of Tsukuba, all of Japan, assignors to Nippon Sheet Glass Co., Ltd. and Sumitomo Chemical Company, Limited, both of Osaka, Japan

Filed Apr. 10, 1990, Ser. No. 507,114

Claims priority, application Japan, Apr. 12, 1989, 1-92151

Int. Cl.[5] G03C *5/00*

U.S. Cl. 430—290 **6 Claims**



1. A method of producing a light control plate which induces scattering of light at different angles of incidence for different places, which comprises:

(1) preparing an assembly comprising a film of a photopolymerizable composition and a light-pervious body having a light-impervious pattern arranged along the surface of the film, said polymerizable composition being selected from the group consisting of

(a) an intimate mixture of at least two monomers having polymerizable carbon-carbon double bonds and being capable of forming polymers having different refractive indices,

(b) at least one monomer having a plurality of polymerizable carbon-carbon double bonds in the molecule, and

(c) an intimate mixture of a compound free from a polymerizable carbon-carbon double bond and at least one monomer having a polymerizable carbon-carbon double bond and capable of forming a polymer having a different refractive index from that of said compound;

(2) irradiating light to the assembly from that side where the light-pervious body exists while moving the assembly continuously in the planar direction of the film, thereby to polymerize at least part of the photopolymerizable film, the light being irradiated from a fixed first linear light source whose long axis is positioned in a direction crossing the moving direction of the assembly at a predetermined angle (α) to the surface which is at right angles to the surface of the film and which passes the long axis of the linear light; and thereafter

(3) polymerizing the photopolymerizable composition of that portion of the film which is covered with the light-impervious pattern of the light-pervious body by light irradiation or heating.

5,112,723

PHOTOSENSITIVE RECORDING ELEMENT

Wolfgang Huemmer, Limburgerhof; Walter Dobler, Heidelberg, and Dieter Littmann, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 8, 1990, Ser. No. 476,939

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 3905765

Int. Cl.[5] G03C *1/73;* **G03F** *7/038*

U.S. Cl. 430—287 **4 Claims**

1. A photosensitive recording element for the production of relief printing plates and photoresists, comprising

A) a dimensionally stable substrate and

B) at least one photopolymerizable recording layer consisting essentially of

b_1) at least one partially or virtually completely hydrolyzed poly(vinyl alkanecarboxylate) and/or at least one partially or virtually completely hydrolyzed vinyl alkanecarboxylate/alkylene oxide graft copolymer as a binder,

b_2) at least one photopolymerization initiator which, on exposure to short-wavelength actinic light, provides free radicals which initiate the photopolymerization,

b_3) at least one photopolymerizable olefinically unsaturated compound (monomer) which is compatible with the binder (b_1), and/or photopolymerizable olefinically unsaturated radicals which are bonded as side radicals and/or terminal radicals to the binder (b_1), and

b_4) at least two assistants, at least one of the said assistants (b_4) being selected from the group consisting of

b_{41}) the isoalloxazines and the alloxazines, and at least one of the other assistants (b_4) being selected from the group consisting of

b_{42}) the potassium salt of N-nitrosocyclohexylhydroxylamine, N-nitrosodiphenylamine and hydroquinone monomethyl ether,

the amount used of the said assistants (b_{41}) and (b_{42}) being from 0.1 to 6% by weight, based on the total weight of the photopolymerizable recording layer (B), and the weight ratio (b_{41}):(b_{42}) being from 1:2 to 1:1,000.

5,112,724

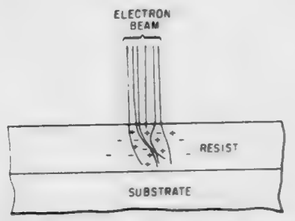
LITHOGRAPHIC METHOD

Keith Bradshaw, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1989, Ser. No. 443,991

Int. Cl.[5] G03C *5/00*

U.S. Cl. 430—296 **6 Claims**



1. A method of lithography, comprising the steps of:

(a) providing a resist layer;

(b) exposing a predetermined pattern on said resist layer with an electron beam to provide less than full exposure of said resist, the net charges generated onto said resist by said electron beam migrating and averaging out before a subsequent exposure step to thereby obtain less beam deflection and thus less spatial fluctuation;

(c) then repeating step (b) at least once on the totality of said predetermined pattern until said predetermined pattern is fully exposed; and

(d) then developing said fully exposed resist.

5,112,725

PREPARATION OF RECORDING LAYERS AND THEIR USE FOR THE PRODUCTION OF FLEXOGRAPHIC PRINTING PLATES

Karl-Rudolf Kurtz, Heidelberg; Horst Koch, Gruenstadt, and Guenther Schulz, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 428,040, Oct. 26, 1989, abandoned, which is a continuation of Ser. No. 90,749, Aug. 28, 1987, abandoned. This application Mar. 14, 1991, Ser. No. 668,337

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1986, 3630474

Int. Cl.[5] G03F *7/16*

U.S. Cl. 430—306 **9 Claims**

1. A process for the production of a flexographic printing plate which is resistant to ozone cracking and where the flexographic printing plate has a flexible recording layer which has an anisotropy factor AF of less than 1.5. AF being defined as the ratio of the moduli of elasticity at 100% elongation of strips measuring 2×15 cm which have been punched from the flexible recording layer during production of the raw plate, on the one hand along the flow direction of the photosensitive mixture used and on the other hand crosswise to the said flow direction and then exposed uniformly, comprising the following steps:

(1) applying a photosensitive mixture to a dimensionally stable base, said photosensitive mixture consisting essentially of

A) one or more block copolymers containing at least one thermoplastic non-elastomeric polymer block and at least one elastomeric diene polymer block,

B) a mixture of

B1) from 7 to 15% by weight, based on the photosensitive mixture, of one or more photopolymerizable organic compounds which are compatible with (A) and contain one or more olefinic double bonds, and

B2) from 2 to 8% by weight, based on the photosensitive mixture, of one or more monoolefinically unsaturated organic compounds which are compatible with (A) and whose homopolymers have glass transition temperatures which are below room temperature,

C) from 0.1 to 10% by weight, based on the photosensitive mixture, of one or more photoinitiators, and

D) from 0 to 27% by weight, based on the photosensitive mixture, of conventional assistants and additives;

(2) subjecting the photosensitive mixture on the dimensionally stable base to calendaring and/or lamination to produce a photosensitive recording element comprising a dimensionally stable base and a photosensitive recording layer;

(3) exposing, imagewise, the photosensitive recording element; and

(4) developing by washing the exposed recording element with an organic solvent to form a flexographic relief printing plate comprising a dimensionally stable base and a photopolymerized relief layer.

5,112,726

EMBEDDED CATALYST RECEPTORS FOR METALLIZATION OF DIELECTRICS

Abraham B. Cohen, Springfield; Roxy N. Fan, E. Brunswick, and John A. Quinn, Morganville, all of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 947,833, Dec. 30, 1986, Pat. No. 4,859,571. This application Jun. 6, 1989, Ser. No. 362,137

Int. Cl.[5] G03F *7/40, 7/30*

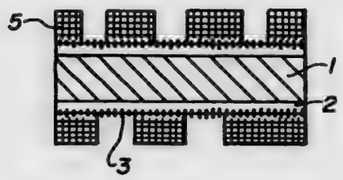
U.S. Cl. 430—315 **4 Claims**

1. The method of making an electrolessly plated printed circuit comprising the sequential steps of

1. imagewise exposing the photodielectric surface of a laminate comprising

a. a substrate

b. at least one surface of the substrate having an adherent layer of polymeric adhesive, having partially embedded therein finely divided microporous particles of adsorbent which protrude from the adhesive surface away from the substrate, the protrusive surfaces of which are adsorptive with respect to electroless plating catalysts or reductive precursors thereof, and



c. a solid layer of photodielectric adherently overlying the layer of adhesive and adsorbent particles, to active radiation to effect a solubility change in the light-exposed image areas of the photodielectric;

2. removing the soluble images areas of the photodielectric by solvent development thus exposing the underlying protrusive adsorbent particles;

3. adsorbing onto the particle surfaces an electroless plating catalyst with or without a previous step using a reductive precursor thereof; and

4. electrolessly plating conductive metal onto the particles.

5,112,727

METHOD OF AND PHOTOMASK FOR MANUFACTURING OPTICAL MEMORY ELEMENT

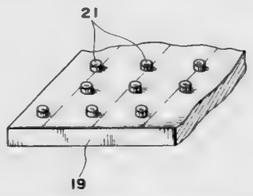
Tetsuya Inui; Junji Hirokane; Akira Shibata; Yoshiyuki Nagahara, and Kenji Ohta, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 278,378, Dec. 1, 1988, Pat. No. 4,946,730. This application May 23, 1990, Ser. No. 527,265

Claims priority, application Japan, Dec. 4, 1987, 62-307127

Int. Cl.[5] G03C *5/00*

U.S. Cl. 430—321 **13 Claims**



1. A method of manufacturing a sampled servo type optical memory which includes discontinuous raised convex portions which are followed by a laser beam spot of a tracking apparatus to provide tracking, comprising the steps of:

exposing a positive type photoresist coated on a glass substrate by using a photomask to irradiate light onto first portions of the photoresist to solubilize the first portions of the photoresist against developing solution and to prevent irradiation of second portions of the photoresist;

developing the photoresist by using a developing solution so as to remove the first portions of the photoresist; and

etching the glass substrate corresponding to the removed first portions of the photoresist so as to directly form the discontinuous raised convex portions on a surface of the glass substrate corresponding to the second portions of the photoresist.

5,112,728

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masaki Tanji, Fujisawa; Toyoki Nishijima; Takahiro Ogawa, both of Odawara; Shun Takada, Odawara, and Kazuhiro Murai, Odawara, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 25, 1990, Ser. No. 587,736

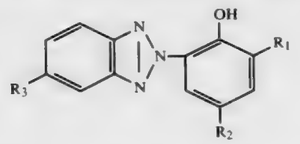
Claims priority, application Japan, Oct. 5, 1989, 1-260627; Oct. 6, 1989, 1-211738

Int. Cl.[5] G03C *1/815*

U.S. Cl. 430—507 **20 Claims**

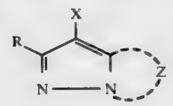
1. A silver halide photographic light-sensitive material comprising a support having thereon a photographic silver halide emulsion layer containing a magenta coupler, a photographic silver halide emulsion layer containing a yellow coupler, a photographic silver halide emulsion layer containing a cyan coupler and a non-light-sensitive layer containing a binder and a UV absorbent, wherein said silver halide photographic light-sensitive material has not more than 7.6 g/m^2 of gelatin, said UV absorbent is a compound represented by Formula a and has a melting point of from −100° to 15° C., and said magenta coupler is a compound represented by Formula I; with

Formula a



wherein R_1, R_2, and R_3 each represent a hydrogen atom, an alkyl group or an alkoxy group, and

Formula I



wherein Z represents a non-metallic group necessary to form a nitrogen-containing heterocyclic ring, X represents a hydrogen atom or a group capable of being split upon reaction with an oxidation product of a color developing agent, and R represents a hydrogen atom or substituent.

5,112,729

SILVER HALIDE COLOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIALS

Keiji Mihayashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 22, 1990, Ser. No. 468,416

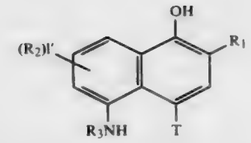
Claims priority, application Japan, Jan. 20, 1989, 1-11024

Int. Cl.[5] G03C *1/38*

U.S. Cl. 430—546 **14 Claims**

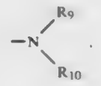
1. A silver halide color photographic photosensitive material which has at least one silver halide emulsion layer on a support, wherein at least one type of cyan coupler which is represented by general formula (A) indicated below is included in at least one layer, a high boiling point organic solvent is present in the layer which contains said coupler in a weight ratio of zero to not more than 0.3 with respect to said coupler in said layer, and an ultraviolet absorber is included in said layer at a rate of at least 0.05 in terms of the ratio by weight with respect to said cyan coupler:

(A)

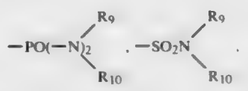


wherein R_1 represents a halogen atom, an aliphatic group, an aromatic group, a heterocyclic group, an amidino group, a guanidino group, or a —COR_4, —SO_2R_4, —SOR_4, —$NHCOR_4$, —$NHSO_2R_4$, —$NHSOR_4$, or

R_2 represents a halogen atom, a hydroxyl group, a carboxyl group, a sulfo group, an amino group, a cyano group, a nitro group, an aliphatic group, an aromatic group, a carboxyamido group, a sulfonamido group, a carbamoyl group, a sulfamoyl group, a ureido group, an acyl group, an acyloxy group, an aliphatic oxy group, an aromatic oxy group, an aliphatic sulfonyl group, an aromatic sulfonyl group, an aliphatic sulfinyl group, an aromatic sulfinyl group, an aliphatic oxycarbonyl group, an aromatic oxycarbonyl group, an aliphatic oxycarbonylamino group, an aromatic oxycarbonylamino group, a sulfamoylamino group, a heterocyclic group or an imido group, l' represents an integer of from 0 to 3, R_3 represents a hydrogen atom or an R_6U group, and T represents a hydrogen atom or a group which can be released by means of a coupling reaction with an oxidized form of a primary aromatic amine developing agent; R_4 and R_5 each independently represents an aliphatic group, an aromatic group, a heterocyclic group, an amino group, an aliphatic oxy group or an aromatic oxy group, R_6 represents a hydrogen atom, an aliphatic group, an aromatic group, a heterocyclic group, an —OR_7, —SR_7, —COR_8,



—$PO(R_7)_2$, —$PO(—OR_7)_2$.



—CO_2R_7, —SO_2R_7 or —SO_2OR_7 group, or an imido group, and U represents



—CO—, —SO_2—, —SO— or a single bond; R_7 represents an aliphatic group, an aromatic group or a heterocyclic group, R_8 represents a hydrogen atom, an aliphatic group, an aromatic group or a heterocyclic group, and R_9 and R_{10} each independently represents a hydrogen atom, an aliphatic group, an aromatic group, a heterocyclic group, an acyl group, an aliphatic sulfonyl group or an aromatic sulfonyl group; in those cases where l' is 2 or 3, the R_2 groups may be the same or different, and they may be joined together to form a ring; R_2 and R_3, or R_3 and T may be joined together to form a ring; and dimers or larger units (oligomers or polymers) can be formed by linking with divalent groups or groups of higher valency in any of the groups R_1, R_2, R_3 or T.

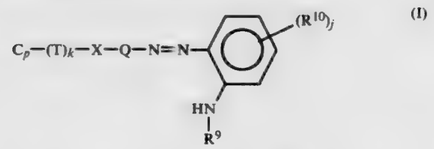
5,112,730

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL COMPRISING A YELLOW-COLORED CYAN COUPLER

Atsuhiro Ohkawa; Takayoshi Kamio; Masuzi Motoki, and Keiji Mihayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 5, 1990, Ser. No. 622,702
Claims priority, application Japan, Dec. 6, 1969, 1-316951
Int. Cl.[5] G03C *7/333, 7/34*
U.S. Cl. 430—553 **10 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer and at least one cyan coupler which can release a water-soluble compound residual group which contains a 2-acylaminophenylazo group or 2-sulfonamidophenylazo group via a coupling reaction with an oxidation product of a primary aromatic amine developing agent, wherein the cyan coupler is represented by the following general formula (I):



(I)

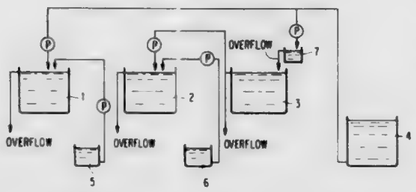
wherein C_p represents a cyan coupler residue; T represents a timing group; k represents an integer of 0 or 1; X represents a divalent linking group which contains an N, O or S atom and which is bonded to $(T)_k$ by this atom; Q represents an arylene group or a divalent heterocyclic group; R^9 represents an acyl group or a sulfonyl group; R^{10} represents a substituent group; and j represents an integer of from 0 to 4; provided that when j is an integer of 2 or more, than R^{10} groups may be the same or different; and that at least one of the groups T, X, Q, R^9 or R^{10} contains a water soluble group.

5,112,731

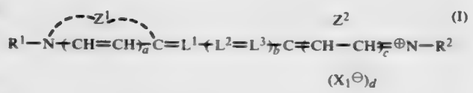
SILVER HALIDE PHOTOGRAPHIC MATERIAL

Nobuaki Miyasaka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

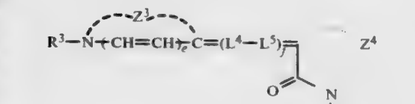
Division of Ser. No. 501,396, Mar. 27, 1990, which is a continuation of Ser. No. 181,331, Apr. 14, 1988, abandoned. This application Aug. 30, 1990, Ser. No. 574,863
Claims priority, application Japan, Apr. 14, 1987, 62-91424
Int. Cl.[5] G03C *1/035, 1/12*
U.S. Cl. 430—567 **17 Claims**



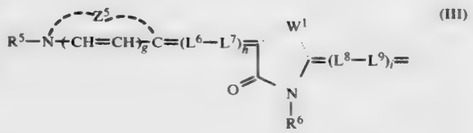
1. A method for processing a silver halide photographic material comprising subjecting to a development processing an image-wise exposed silver halide photographic material comprising a support having coated thereon at least one silver halide emulsion layer and at least one light-insensitive hydrophilic colloid layer, wherein said emulsion layer comprises tabular grains of silver chloride, silver bromide, silver chlorobromide or silver chloroiodobromide having an iodide content of 1 mol% or less, which have an average aspect ratio of 3 or more and which have been spectrally sensitized with at least one spectral sensitizing dye represented by general formulae (I), (II), (III), (IV), (V) and (VI):



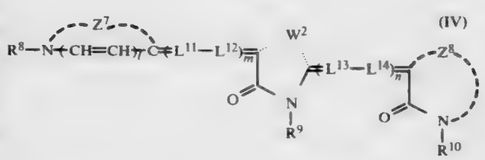
(I)



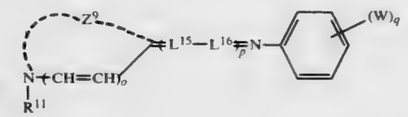
(II)



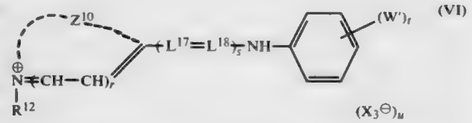
(III)



(IV)



(V)



(VI)

wherein, Z^1 and Z^{10} and W^1 and W^2, which may be the same or different, each represents a group of non-metal atoms, which together with the adjacent atoms, form a 5- or 6-membered heterocyclic ring; R^1, R^2, R^3, R^5, R^7, R^8, R^{11} and R^{12}, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a heterocyclic group; a, c, d, e, g, h, j, k, l, o, r and u each independently is 0 or 1; b, f, i, m, n, p, q, s and t each independently is 0, 1, 2 or 3; L^1 to L^{18} each represents a substituted or unsubstituted methine group; X_1 and X_3 each represents an anion; and W and W' each represents a halogen atom, a cyano group, an alkoxycarbonyl group, a substituted or unsubstituted carbamoyl group, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkoxy group or a substituted or unsubstituted acyl group, and wherein the melting time of the hydrophilic colloid layer in the photographic material is from 70 to 200 minutes at 50° C.;

and wherein said silver halide photographic material is a medical X-ray silver halide photographic material or a CRT image silver halide photographic material.

5,112,732

DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Kazunori Hayashi, deceased, late of Hikone; Masahiro Hayashi, heir, and Masako Hayashi, heir, both of Nara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 28, 1990, Ser. No. 500,350
Claims priority, application Japan, Mar. 31, 1989, 1-80492
Int. Cl.[5] G03C *1/485*
U.S. Cl. 430—596 **6 Claims**

1. A direct positive silver halide photographic material comprising a support having thereon at least one internal latent image silver halide emulsion layer which has not been prefogged and another hydrophilic colloid layer, wherein the grains in said internal latent image silver halide emulsion are formed in the presence of an iron complex compound which is potassium ferrocyanide, potassium ferricyanide, or an EDTA iron complex salt.

5,112,733

SILVER HALIDE PHOTOGRAPHIC EMULSION

Mikio Ihama, Minami-Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 31, 1990, Ser. No. 531,310
Claims priority, application Japan, May 31, 1989, 1-138940
Int. Cl.[5] G03C *1/09*
U.S. Cl. 430—603 **12 Claims**

1. A silver halide photographic emulsion subjected to selenium sensitization in the presence of a palladium compound in an amount of not less than 1×10^{-4} mol per mol of a silver halide, wherein said palladium compound is added after grain formation and before desalting.

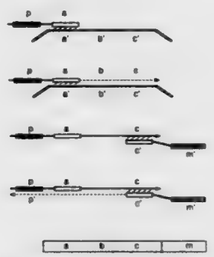
6. A silver halide photographic emulsion subjected to selenium sensitization, sulfur sensitization, and gold sensitization in the presence of a palladium compound in an amount of not less than 1×10^{-4} mol per mol of a silver halide, wherein said palladium compound is added after grain formation and before desalting.

5,112,734

TARGET-DEPENDENT SYNTHESIS OF AN ARTIFICIAL GENE FOR THE SYNTHESIS OF A REPLICATABLE RNA

Fred R. Kramer, New York, N.Y., and Paul M. Lizardi, Cuernavaca, Mexico, assignors to Gene-Trak Systems, Framingham, Mass.

Filed May 26, 1989, Ser. No. 358,399
Int. Cl.[5] C12Q *1/68;* **C07H** *21/04*
U.S. Cl. 435—6 **66 Claims**



1. A method of detecting a target nucleic acid sequence, comprising the steps of:

a) hybridizing a first single-stranded oligodeoxynucleotide probe-primer to a first region of the target sequence, the first probe-primer having a 5' portion comprising a promoter sequence and a 3' portion comprising a sequence complementary to the first region of the target sequence;

b) extending the probe-primer on the template of the target sequence through a second region of the target sequence which is adjacent to, though not necessarily abutting, the first region of the target sequence, to produce a DNA extension product;

c) separating the DNA extension product from the target sequence;

d) hybridizing a second oligodeoxynucleotide probe-primer to the DNA extension product, the second probe-primer having a 5' portion comprising a DNA sequence that can serve as a template for the synthesis of a replicatable RNA and a 3' portion comprising a sequence complementary to the complement of the second region of the target sequence which is present in the DNA extension product;

e) extending the second probe-primer on the template of the DNA extension product to produce a double-stranded DNA comprising a functional double-stranded promoter and DNA that can serve as a template for the synthesis of a replicatable RNA;

f) transcribing the DNA to produce a replicatable RNA;

g) replicating the RNA; and

h) detecting the replicated RNA as indicative of the presence or the amount of the target nucleic acid sequence.

5,112,735

DETECTION OF LYMPHOCYTE AMPLIFICATION

Richard J. Albertini, Underhill Center, Vt., assignor to University of Vermont, Burlington, Vt.

Continuation-in-part of Ser. No. 65,357, Jun. 22, 1987, abandoned. This application Apr. 13, 1989, Ser. No. 337,400
Int. Cl.[5] C12Q *1/68;* **G01N** *33/53, 33/566, 33/48*
U.S. Cl. 435—6 **15 Claims**

1. A method for detecting clonal lymphocyte amplification in a mammal, comprising the steps of:

(a) obtaining a sample of lymphocytes from said mammal;

(b) cloning said lymphocytes in the presence of an agent indicative of a prior somatic mutation event at a gene locus in a lymphocyte, to produce cloned cell populations;

(c) selecting those cloned cell populations that are indicated to have had said prior mutation event;

(d) growing said selected cloned cell populations separately to provide isolated mutated cloned cell populations;

(e) determining in said isolated mutated cloned cell populations the arrangement of the regions of the nucleic acid encoding an antigen receptor specific to a particular antigen;

(f) comparing the arrangement of the regions of the nucleic acid encoding an antigen receptor specific to a particular antigen among the isolated mutated cloned cell populations; and

(g) identifying cells undergoing amplification in response to a particular antigen stimulus, whereby the presence of a similar structure of the regions of nucleic acid encoding a specific antigen receptor in separate isolated mutated cell clones indicates clonal lymphocyte amplification in said mammal.

5,112,736

DNA SEQUENCING USING FLUORESCENCE BACKGROUND ELECTROBLOTTING MEMBRANE

Karin D. Caldwell; Tun-Jen Chu, both of Salt Lake City, and William G. Pitt, Orem, all of Utah, assignors to University of Utah, Salt Lake City and Brigham Young University, Provo, both of, Utah

Filed Jun. 14, 1989, Ser. No. 365,693
Int. Cl.[5] C12Q *1/68*
U.S. Cl. 435—6 **26 Claims**

1. A method for the multiplex sequencing of DNA comprising:

(a) providing a target DNA sample to be sequenced wherein the DNA fragments have been chain terminated and separated according to a specific adenine, guanine, cytosine or thymine base groupings;

(b) subjecting base separated groupings of target DNA

fragments to gel electrophoresis to resolve the DNA fragments in each base grouping by chain length;

(c) electroblotting said resolved target DNA fragments from said gel onto the surface of a non-aromatic polymeric microporous membrane said membrane being selected from the group consisting of hydrocarbons, fluorocarbons, chlorofluorocarbons, vinyl alcohols and vinyl chlorides and copolymers and blends thereof and exhibiting low background fluorescence said membrane having been surface modified by subjecting said membrane to an aminating agent in the presence of radio frequency plasma discharge or microwave frequency plasma discharge to contain amino groups in order to physically adsorb said DNA fragments on said membrane surface and washing said membrane to remove unadsorbed DNA fragments;

(d) treating said membrane containing said physically adsorbed DNA fragments with crosslinking means to chemically bind said DNA fragments to said membrane through said amino groups contained on the surface thereof;

(e) subjecting said chemically bound DNA fragments on said membrane to hybridization probing with a tagged probe specific to the sequence of the DNA fragments and washing said membranes to remove probe which has not been hybridized; and

(f) detecting and reading said tagged probes hybridized to said target DNA fragments.

5,112,737

MONOCLONAL ANTIBODIES AGAINST ACTIVATED RAS PROTEINS WITH AMINO ACID MUTATIONS AT POSITION 13 OF THE PROTEIN

Walter P. Carney, Brighton, Mass., assignor to Applied bioTechnology, Inc., Cambridge, Mass.

Division of Ser. No. 158,730, Feb. 22, 1988, Pat. No. 5,028,527. This application Jul. 1, 1991, Ser. No. 724,224

Int. Cl.[5] C12Q *1/00;* **G01N** *33/53;* **C07K** *15/28;* **C12N** *5/20*

U.S. Cl. 435—7.92 **6 Claims**

1. Monoclonal antibody which specifically binds to an epitope on oncogenic ras proteins which comprises valine at position 13, but does not bind an epitope of normal, nononcogenic ras protein comprising glycine at position 13.

5,112,738

HISTAMINE DERIVATIVES, IMMUNOGEN CONJUGATES AND ANTIBODIES RAISED THERETO

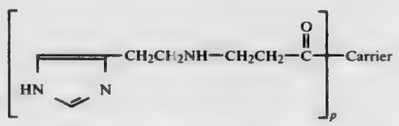
Robert T. Buckler, Edwardsburg, Mich.; Frank A. Dailey, Veradale; John A. Ficalora, Colbert, both of Wash.; John J. Gavin, Germantown, Md., and Gregory A. Plunkett, Spokane, Wash., assignors to Miles Inc., Elkhart, Ind.

Continuation of Ser. No. 752,320, Jul. 3, 1985, abandoned. This application Oct. 28, 1988, Ser. No. 266,227

Int. Cl.[5] G01N *33/535;* **C07K** *15/28*

U.S. Cl. 435—7.93 **6 Claims**

1. The immunogen conjugate represented by the formula:



wherein p is from about 1 to about 120 and carrier is an immunogenic carrier material.

6. A test kit for measuring histamine comprising the histamine immunogen conjugate of claim 1 bound to a solid support and a monoclonal antibody capable of specifically binding with histamine which antibody is produced by the cell line having American Type Culture Collection Accession Number HB 8831 and has been labeled with horseradish peroxidase.

5,112,739

ENZYME CONTROLLED RELEASE SYSTEM

Frank A. Meneghini, Arlington, and Paul S. Palumbo, West Newton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 2, 1988, Ser. No. 227,141

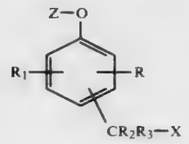
Int. Cl.[5] C12Q *1/54*

U.S. Cl. 435—14 **13 Claims**

7. A method for determining the presence of an analyte in a fluid comprising:

contacting a fluid sample including an analyte with a binding partner of said analyte conjugated to an enzyme and an immobilized analogue of said analyte to form bound and free immunocomplexes;

contacting said bound and free immunocomplexes with a compound represented by the formula



wherein R and R_1 each independently is hydrogen, a substituent affecting the mobility or reactivity of the compound or a substituent including a biologically active group;

R_2 and R_3 each is hydrogen;

X is leaving group;

Z is an enzyme substrate moiety;

$—CR_2R_3X$ is either ortho or para to the —O—Z moiety;

wherein said active enzyme is capable of cleaving said enzyme substrate moiety Z from said compound whereby said leaving group X is released from said compound;

separating said bound and free immunocomplexes to form a solid phase and a liquid phase;

and detecting the presence of said analyte in said solid phase or said liquid phase as a function of said leaving group.

5,112,740

CARBON DIOXIDE ASSAY FOR BODY FLUIDS COMPRISING CARBONIC ANHYDRASE

Daniel A. Nealon, Rochester, and Richard B. Coolen, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 18, 1989, Ser. No. 451,912

Int. Cl.[5] C12Q *1/32, 9/12;* **C12N** *9/88*

U.S. Cl. 435—15 **6 Claims**

1. A multilayer dry element for the quantitative assay of CO_2 in body fluids comprising:

a) a spreading layer comprising at least 10 mg/M^2 of acetazolamide and having a pH in the range 7.0 to 9.0;

b) a reagent layer comprising phosphoenolpyruvate carboxylase and a phosphoenolpyruvate salt;

c) a registration layer comprising reduced nicotinamide adenine dinucleotide and malate dehydrogenase.

5,112,741

ACETALDEHYDE TRAPPING SYSTEM

John L. Palmer, Philadelphia; Marsha W. Timmerman, and Stephan D. Daubney, both of Allentown, all of Pa., assignors to Enzymatics, Inc., Horsham, Pa.

Filed Jul. 7, 1988, Ser. No. 216,008

Int. Cl.[5] C12Q *1/26*

U.S. Cl. 435—25 **33 Claims**

1. A method for trapping an aldehyde or ketone in an assay for alcohol comprising:

reacting an active amine trap comprising a combination of at least one alpha-effect amine and at least one primary amine, wherein each of the amines employed is substantially non-volatile and has a pKa of at least about 7.5, with a fluid sample comprising an aldehyde or ketone which is an oxidation product of an enzymatic oxidation reaction of an enzyme substrate, wherein the concentration of said enzyme substrate and oxidation product is greater than about 5 mM.

17. A reagent system for trapping an aldehyde or ketone in an assay for alcohol comprising:

an active amine trap comprising a combination of at least one alpha-effect amine and at least one primary amine, wherein each of the amines employed is substantially non-volatile and has a pKa of at least about 7.5; and

a fluid sample comprising an aldehyde or ketone which is an oxidation product of an enzymatic oxidation reaction of an enzyme substrate, wherein the substrate and oxidation product are present in a concentration greater than about 5 mM.

5,112,742

SCREENING FOR ANTI-ADHESIN ANTIBIOTICS BY EMPLOYING PHOTOINDUCED CYANOBACTERIA

Norman Lazaroff, Vestal, N.Y., assignor to State University of New York, Albany, N.Y.

Filed Feb. 23, 1990, Ser. No. 484,212

Int. Cl.[5] C12Q *1/18;* **C12P** *17/08;* **C07D** *321/04*

U.S. Cl. 435—32 **11 Claims**



A) INTERFERENCE WITH SPIRAL AGGREGATION ON PHOTOINDUCED LAWN.

B) TRICHOME DESTRUCTION; CLEARING OF AGAR LAYER ON PHOTOINDUCED OR UN-INDUCED LAWN.

C) DOUBLE ZONES; INHIBITION OF AGGREGATION AND DESTRUCTION OF CYANOBACTERIAL TRICHOMES IN PHOTOINDUCED LAWN.

D) PHOTOINDUCED SPIRAL AGGREGATION OF HORMOGONIA.

E) UN-INDUCED LAWN OF HETEROCYSTOUS FILAMENTS.

1. A method for screening chemicals or source of organisms to determine whether a chemical or source of organisms interferes with spiral aggregation in a Nostoc lawn comprising:

A. preparing a seeded Nostoc layer by growing a Nostoc strain in light deficient in the red portion of the spectrum for about 7–14 days, sedimenting said growth strain, washing said sedimented strain and adding said washed strain to a bottom growth layer containing Medium I plus about 0.7–0.9% purified agar, about 0.5–1.0% glucose and about 10^{-3}% proteose peptone;

B. illuminating said seeded Nostoc layer under light deficient in the red portion of the spectrum for about 48–72 hours at about 22°–25° C.;

C. pouring a top growth medium containing Medium I plus about 0.5–1.0% sucrose, about 10^{-3}% proteose peptone and about 1.0–1.5% purified agar over said illuminated seeded Nostoc layer to form a two-layer system;

D. solidifying said two-layer system;

E. placing on said solidified two-layer system chemicals or a source of organisms to form a test system;

F. incubating said test system for about 48–72 hours at about 20°–27° C. while simultaneously illuminating said test system under light deficient in the red portion of the spectrum;

G. incubating said illuminated test system under red fluorescent light for about 24–48 hours; and

H. observing zone of interference formed from the presence of said chemicals or source of organisms in the lawn of aggregating hormogonia produced from the seeded Nostoc layer.

5,112,743

LIGHT-SENSITIVE COMPOSITION AND PRESENSITIZED PLATE FOR USE IN MAKING LITHOGRAPHIC PRINTING PLATES

Akihiko Kamiya; Akinobu Koike, and Masanori Imai, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed May 16, 1990, Ser. No. 523,997

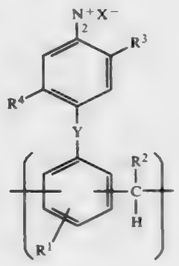
Claims priority, application Japan, May 24, 1989, 1-130493; May 31, 1989, 1-137890; May 31, 1989, 1-137891

Int. Cl.[5] G03C *1/60*

U.S. Cl. 430—175 **25 Claims**

1. A light-sensitive composition comprising a diazo resin having at least one repeating unit represented by the following general formula (I):

(I)



wherein R^1 represents a hydrogen atom, an alkyl group, an alkoxy group, a hydroxyl group, a carboxy ester group or a carboxyl group; R^2 represents a carboxyl group or a group having at least one carboxyl group; R^3 and R^4 each represents a hydrogen atom or an alkyl group or an alkoxy group; X− represents an anion; and Y represents —NH—, —O— or —S—.

5,112,744

PLASMIDS FOR THE PRODUCTION OF HUMAN CU-ZN SUPEROXIDE DISMUTASE, BACTERIAL HOSTS CONTAINING THE PLASMIDS AND METHODS FOR PRODUCTION AND RECOVERY OF SUCH SUPEROXIDE DISMUTASE

Amos B. Oppenheim, Jerusalem; Avigdor Levanon, Netanya; Hilla Locker-Galadi, Jerusalem, and Marian Gorecki, Rehovot, all of Israel, assignors to Bio-Technology General Corp., New York, N.Y.

Continuation of Ser. No. 155,111, Feb. 11, 1988, abandoned, which is a continuation of Ser. No. 644,671, Aug. 27, 1984, abandoned. This application Jun. 15, 1990, Ser. No. 539,367

Int. Cl.[5] C12N *15/00, 15/73, 9/02, 1/21*

U.S. Cl. 435—189 **4 Claims**

1. A plasmid for production of a polypeptide having an identical amino acid sequence to, and the biological activity of, naturally-ocurring human Cu-Zn superoxide dismutase designated pSOBβ;TT-1 having the restriction map shown in FIG. 16.

2. A host plasmid system comprising the plasmid of claim 1 in an *Escherichia coli* host.

4. A method for producing a polypeptide having an identical amino acid sequence to, and the biological activity of, naturally-occurring human Cu-Zn superoxide dismutase which comprises growing the host plasmid system of claim 2 under condi-

tions permitting production of the polypeptide having an identical amino acid sequence to, and the biological activity of, naturally-occurring human Cu-Zn superoxide dismutase and recovering the polypeptide having an identical amino acid sequence to, and the biological activity of, naturally-occurring human Cu-Zn superoxide dismutase so produced.

5,112,745

RAPID IDENTIFICATION OF MICROBIAL ORGANISMS AND DETERMINATION OF ANTIBIOTIC SENSITIVITY BY INFRARED SPECTROSCOPY

David Lorr, Garrett Park, Md., assignor to Space Medical Systems, Inc., Garrett Park, Md.

Continuation-in-part of Ser. No. 414,291, Sep. 29, 1989, abandoned. This application Jun. 18, 1990, Ser. No. 539,599

Int. Cl.[5] C12Q *1/02, 1/18, 1/04*

U.S. Cl. 435—38 **29 Claims**

1. A method for determining the identity of an unknown microbial organism in a sample without destroying the microbial organism, comprising the steps of:

(a) inoculating a growth medium with a sample containing a pure culture of an unknown microbial organism, said medium being capable of supporting the growth of said microbial organism, to create a microbial culture;

(b) incubating said culture for a period of up to and including at least the exponential growth phase of said culture;

(c) scanning the microbial culture, at a predetermined time point after inoculation, with electromagnetic radiation having a wavelength between about 700 and about 500 nm, and obtaining a spectral signature at a predetermined range of wavelengths therebetween so as to provide characterizing data of the organism; and

(d) comparing visually or with the assistance of a computer said spectral signature obtained in step (c) with spectral signatures in a preexisting library of known characterizing data of known microbial organisms to determine if there is a match, said match indicating identity of the microbial organism,

wherein said library of spectral signatures has been obtained by scanning the known microbial organisms under the same culture conditions and scan time points as in steps (a)–(c) above, thereby determining the identity of said microbial organism.

5,112,746

METHOD FOR MAKING ANTIPARASITIC AGENTS

Christopher J. Dutton, Sandwich; Stephen P. Gibson, Margate, and Nigel D. A. Walshe, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

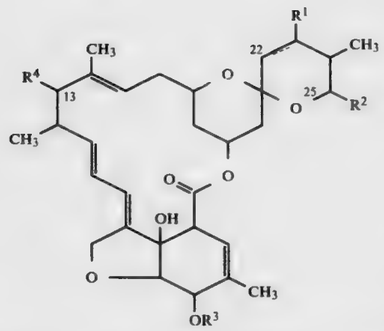
Division of Ser. No. 575,039, Aug. 29, 1990, Pat. No. 5,057,498, which is a division of Ser. No. 371,461, Jun. 26, 1989, Pat. No. 4,980,370. This application Jun. 21, 1991, Ser. No. 718,527

Claims priority, application United Kingdom, Jul. 5, 1988, 8815967

Int. Cl.[5] C12P *19/14;* **C07H** *17/08;* **C07D** *335/00*

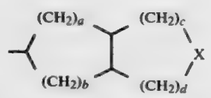
U.S. Cl. 435—100 **5 Claims**

1. A process for preparing a compound of formula (I)



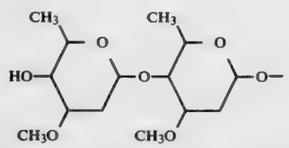
(I)

wherein the broken line at the 22–23 position represents an optional double bond; R^1 is hydrogen or hydroxy; R^2 is phenyl, substituted phenyl where said substituent is alkyl having one to four carbon atoms, alkoxy having one to four carbon atoms, alkylthio having one to four carbon atoms, chloro, fluoro, trifluoromethyl or cyano or a group of the formula



(II)

where X is O, S or $—CH_2—$ and a, b, c and d are each 0 to 2 such that the sum of a, b, c and d does not exceed 5; R^3 is hydrogen or methyl; and R^4 is hydrogen, hydroxy or a 4'-(alpha-L-oleandrosyl)-alpha-L-oleandrosyloxy group of the formula



with the proviso that when the double bond is present at the 22–23 position R^1 is hydrogen which comprises: fermenting a *Streptomyces avermitilis* mutant organism ATCC 53567, 53568 or 53692 in the presence of an N-alkanoyl cysteamine thioester of formula (III):

$$R^2COS(CH_2)_2NHCOR^6$$

wherein R^2 is as defined as above and R^6 is a C_1–C_{10} alkyl group; and isolating the compound of formula (I) wherein R^1 is OH and the double bond is absent, or wherein the double bond is present and R^1 is absent, and R^4 is 4'-(alpha-L-oleandrosyl)-alpha-L-oleandrosyloxy.

5,112,747

PROCESS FOR THE PREPARATION OF INDOLE ON THE BASIS OF A TRYPTOPHAN CONTAINING STARTING MEDIUM

Adrianus M. Van Grinsven, Oss; Alfons L. J. Peters, and Robert Roos, both of Bussum, all of Netherlands, assignors to Unilever Patent Holdings BV, Rotterdam, Netherlands

Filed Feb. 20, 1991, Ser. No. 657,860

Claims priority, application European Pat. Off., Feb. 20, 1990, 90200398.7

Int. Cl.[5] C12P *17/00;* **A23L** *1/00;* **C12N** *1/20;* **C12R** *1/425*

U.S. Cl. 435—121 **15 Claims**

1. Method for the preparation of indole from tryptophan characterized by

a) culturing a microorganism capable of converting tryptophan into indole in a fermentation medium containing tryptophan of natural origin,

b) isolating the obtained indole from the fermentation medium with a food grade extraction agent selected from the group consisting of:

(a) water;

(b) oily product;

(c) propane, butane, butyl acetate, ethyl acetate, ethanol, carbon dioxide, acetone, nitrous oxide, diethyl ether, isobutane, hexane, cyclohexane, methyl acetate, butan-1-ol, butan-2-ol, ethylmethylketone, dichloromethane and methylpropane-1-ol; and

(d) mixtures thereof (a)–(c).

5,112,748

HYBRID CELLS PRODUCING AN ANTIGEN CHARACTERISTIC OF THE HEPATITIS B VIRUS OBTAINED FROM HEPATOCYTES AND ESTABLISHED MONKEY CELLS, A PROCESS FOR OBTAINING THESE HYBRID CELLS AND THEIR APPLICATION TO THE PRODUCTION OF THE AFORESAID ANTIGEN

Nicole Chenciner, Paris, and Jean-Francois Houssais, Le Perray en Yvelines, both of France, assignors to Institut Pasteur and Centre National de la Recherche Scientifique, Paris, France

PCT No. PCT/FR86/00147, § 371 Date Feb. 19, 1987, § 102(e) Date Feb. 19, 1987

Continuation-in-part of Ser. No. 800,080, filed as PCT/FR86/00147, Apr. 29, 1989, abandoned. This PCT application Apr. 29, 1986, Ser. No. 31,465

Claims priority, application France, May 2, 1985, 85 06706

Int. Cl.[5] C12N *15/06*

U.S. Cl. 435—172.2 **9 Claims**

7. A process for producing cellular hybrids which express a cloned DNA sequence of hepatitis B virus, comprising:

(A) providing non-tumoral monkey cells lacking a selectable genetic marker;

(B) providing monkey hepatocytes containing said selectable genetic marker;

(C) fusing in a co-culture said monkey cells and said monkey hepatocytes to form cellular hybrids;

(D) transfecting said cellular hybrids with a cloned DNA sequence of hepatitis B virus;

(E) selecting for viable cellular hybrids in selective culture medium; and

(F) selecting for cells expressing said cloned DNA sequence of hepatitis B virus.

5,112,749

VACCINES FOR THE MALARIA CIRCUMSPOROZOITE PROTEIN

Robert N. Brey, III, Rochester; William R. Majarian, Pittsford; Subramonia Pillai, Rochester, and Wayne T. Hockmeyer, Pittsford, all of N.Y., assignors to Praxis Biologics, Inc., Rochester, N.Y.

Filed Oct. 2, 1987, Ser. No. 104,735

Int. Cl.[5] C12N *15/00, 1/21, 1/00;* **C12P** *21/02;* **A01N** *63/00;* **C07H** *15/12;* **C07K** *3/00*

U.S. Cl. 435—172.3 **50 Claims**

22. A method of expressing an epitope of the circumsporozoite protein of a malaria parasite comprising:

a. transforming an attenuated enteroinvasive bacterium of the genus Salmonella or Shigella with a vector comprising a recombinant DNA sequence which encodes an epitope of the circumsporozoite protein of a malaria parasite; and

b. allowing the bacterium to grow under conditions which induce the expression of said circumsporozoite protein.

5,112,750

IMMOBILIZED CELLS AND CULTURE METHOD UTILIZING THE SAME

Hideo Tanaka, Niiharigun; Masatoshi Matsumura, Tsukubagun; Satoru Harada, Tsukubagun, and Mizuo Yajima, Tokyo, all of Japan, assignors to Asama Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1985, Ser. No. 748,473

Int. Cl.[5] C12N *11/02, 11/10, 11/14, 11/08*

U.S. Cl. 435—177 **21 Claims**

1. A composition comprising:

spherically immobilized microbial cells which comprise microbial cells, an absorbent for an antimicrobial organic solvent, and a gel carrier, wherein said microbial cells are prepared by combining said absorbent and said gel carrier in an aqueous solution so as to form spherically immobilized microbial cells that maintain the vital activity of said microbial cells; and

a culture medium that contains said spherically immobilized microbial cells and that contains an antimicrobial organic solvent wherein the antimicrobial organic solvent is 2-octanol, toluene, or benzene.

5,112,751

METHOD FOR INACTIVATING DEHYDROPEPIDASE ACTIVITY IRREVERSIBLY WITH ALKENOIC ACID COMPOUNDS

Shahriar Mobashery, Flint, Mich., assignor to Board of Governors of Wayne State University, Detroit, Mich.

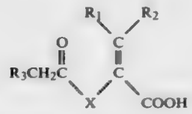
Filed Feb. 6, 1991, Ser. No. 651,465

Int. Cl.[5] C12N *9/99, 9/48*

U.S. Cl. 435—184 **10 Claims**

1. A method for inactivating a dehydropeptidase irreversibly which comprises:

(a) providing the dehydropeptidase with an alkenoic acid compound of the formula:



wherein X is selected from the group consisting of —O—, $—CH_2—$ and —NH— moieties and R_1 is selected from hydrogen and aliphatic and aromatic moieties containing 1 to 12 carbon atoms, and R_2 is hydrogen, R_3 is selected from the group consisting of halomethylene and cyano; and

(b) reacting the dehydropeptidase with the alkenoic acid compound to inactivate the dehydropeptidase irreversibly.

5,112,752

BIOCATALYTIC OXIDATION USING SOYBEAN AND OTHER LEGUME PEROXIDASES

Mark A. Johnson, Chillicothe; Alexander R. Pokora, Pickerington, and William L. Cyrus, Jr., Ray, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 599,584, Oct. 18, 1990. This application May 22, 1991, Ser. No. 704,073

Int. Cl.[5] C12N *9/08*; C12P *7/22*

U.S. Cl. 435—192 **3 Claims**

1. A method for the purification of a peroxidase enzyme comprising forming a solution of a peroxidase enzyme and a protein fixative selected from the group consisting of tannic acid, tannins, monolignols, fulvic acids, lignan, humic acids, melanoidins, proanthcyanidins, stilbenes, depsides, lignin model compounds, soluble suberin, flavonoids, dihydroxyphenyl compounds, kerogen, gallic acid esters, phenolic acids, gallic acid amides, hexahydroxydiphenic glucose estes, polymeric phenols, bis (hydroxyphenyl) sulfones, bitumens, soluble lignite extracts, sulfonated phenols and naphthols and their copolymers, melamineglyoxal/glyoxylate-phenol/naphthol condensates; peat euphorbia, cassia, rose, tea, grape and saxifragea; sulfonated extracts, and bark extracts, and graft copolymers derived from said extracts and syntans; adding a non-solvent for said enzyme to said solution to cause said enzyme to precipitate, and redissolving said enzyme and the peroxidase is recovered.

5,112,753

METHOD OF IDENTIFICATION AND PREPARATION OF PROBES FOR PESTIVIRUSES, OLIGONUCLEOTIDES AND PROBES THUS OBTAINED AND A METHOD OF DETECTION OF PESTIVIRUSES

André J. J. Renard, Liege, Belgium, assignor to Societe Europeene De Biotechnologie, Esneux, Belgium and Rhone Merieux, Lyon, France

Filed Jun. 12, 1990, Ser. No. 536,892

Claims priority, application France, Jun. 15, 1989, 89 07970

Int. Cl.[5] C12Q *1/70, 1/68*; C12P *19/34*; C07H *15/12*

U.S. Cl. 435—5 **33 Claims**

1. Process of identification and preparation of general oligonucleotide probes and specific oligonucleotide probes for varieties of Pestivirus, comprising the steps of:

a) amplification of a length of approximately 110 to 115 bases, situated towards the 5' end of the Pestivirus genome in the non-coding region corresponding to the region situated between bases 200 and 310 of the genome of the BVD Osloss virus, by means of convergent primers in a polymerase chain reaction,

b) determination of the sequence of the amplified length,

c) identification of the homologous and specific oligonucleotide sequences by comparison to other similar previously sequenced lengths of other Pestivirus varieties,

d) using these homologous and specific sequences for the production of general and specific probes respectively.

5,112,754

TISSUE PLASMINOGEN-ACTIVATING FACTOR AND NONOCLONAL ANTIBODY

André J. J. Renard, Didier G. J. Allaer, Michel T. J. Rossius, Dolores Vaira, all of Liege, Belgium, assignors to Societe Europeene De Biotechnologie, Esneux, Belgium and Rhone Merieux, Lyon, France

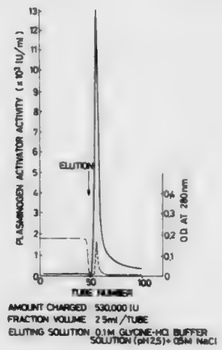
Continuation of Ser. No. 841,818, Mar. 20, 1986, abandoned. This application Feb. 23, 1990, Ser. No. 483,800

Claims priority, application Japan, Mar. 26, 1985, 60-61716

Int. Cl.[5] A61K *37/547*; C12N *9/48*

U.S. Cl. 435—212 **3 Claims**

1. A novel tissue plasminogen activator having the following characteristics: molecular weight of 65,000–72,000 Daltons as measured by SDS-PAGE electrophoresis using a 7.5% agarose gel; plasminogen activator specific activity of about 10.4×10^4 IU/mg, wherein specific activity is defined as the ratio of fibrinolytic activity of purified t-PA measured on fibrin-agarose plates to milligrams of protein; about 83.1% absorption of t-PA by a fibrin-Sepharose column when applied; binds to a Concanavalin A column when applied; the fibrinolytic activity is substantially undiminished by heating at 60° C. for 60 minutes or 95° C. for 5 minutes relative to unheated t-PA; unreactive with polyclonal antisera raised against



urokinase; the fibrinolytic activity is substantially stable at pH 5–10; exhibits fibrinolytic activity at pH 7.5–9.0 and temperature 39° C.–41° C.; a Km value of about 1.16×10^{-3} mol/liter and a V_{max} of about 1.7×10^{-8} mol/liter for substrate S-2288; and fibrinolytic activity is inhibited by Co^{2+}, Zn^{2+}, Cd^{2+}, Hg^{2+}, Ni^{2+} and Cu^{2+}.

5,112,755

PREPARATION OF FUNCTIONAL HUMAN UROKINASE PROTEINS

Herbert L. Heyneker, Burlingame; William E. Holmes, San Mateo, and Gordon A. Vehar, San Carlos, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 894,372, Aug. 6, 1986, abandoned, which is a continuation of Ser. No. 474,930, Mar. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 368,773, Apr. 15, 1982, abandoned. This application Jul. 19, 1988, Ser. No. 221,487

Int. Cl.[5] C12N *9/72, 15/58*

U.S. Cl. 435—215 **15 Claims**

12. A process which comprises expressing a DNA sequence encoding a human urokinase in a recombinant host cell, said recombinant host cell obtained by transforming a microorganism or cell culture with an expression vector containing said DNA sequence.

5,112,756

CONTINUOUS PRODUCTION OF BOVINE MAEDI-VISNA-LIKE VIRAL ANTIGENS IN CF2TH CELLS

Alain M. P. Bouillant, Aylmer; Klaus Nielsen, Richmond; Gerda M. Ruckerbauer; Bakhshish S. Samagh, both of Nepean, and William C. D. Hare, North Gower, all of Canada, assignors to Canadian Patents and Development Limited, Canada

Filed Jun. 1, 1987, Ser. No. 57,213

Claims priority, application Canada, Jun. 2, 1986, 510622

Int. Cl.[5] C12N *7/00, 7/02, 5/10*

U.S. Cl. 435—235.1 **7 Claims**

1. A transformed canine Cf2Th thymus cell line infected with bovine Maedi-Visna-like virus, the cells of which cell line have continuously reproduced themselves for at least 25 passages after initial infection with said virus, and continuously produce viral antigens.

5,112,757

METHOD FOR OBTAINING HUMAN HEPATOCYTE CULTURES

Christiane Guguen-Guillouzo; André Guillouzo, and Michel Bourel, all of Rennes, France, assignors to Institut National de la Sante et de la Recherche, Paris, France

Continuation of Ser. No. 694,518, Dec. 27, 1984, abandoned. This application Apr. 6, 1987, Ser. No. 34,983

Claims priority, application France, Apr. 29, 1983, 83 07148

Int. Cl.[5] C12N *5/08*

U.S. Cl. 435—240.2 **27 Claims**

1. A method of culturing human hepatocytes comprising combining a first cell population comprising a culture of human hepatocytes including a medium, and a second cell population of mammalian epithelial cells of hepatic origin, said second cell population being from a different species with respect to said first cell population, cells of said second cell population being capable of forming numerous contacts with cells of said first cell population, whereby a co-culture is formed in which filamentous structures comprising collagen fibers appear in the intracellular spaces.

5,112,758

TREATING BODY FLUIDS FOR DIAGNOSTIC TESTING

Jack H. Fellman, and Andrew S. Goldstein, both of Portland, Oreg., assignors to Epitope, Inc., Beaverton, Oreg.

Filed May 9, 1988, Ser. No. 192,015

Int. Cl.[5] G01N *31/00*

U.S. Cl. 436—8 **26 Claims**

1. A method of testing a mucopolysaccharide-containing body fluid for the presence of a metabolite of interest, comprising reducing the viscosity of the mucopolysaccharide-containing body fluid by the sequential steps of collecting the fluid in a container and mixing said body fluid with a cationic quaternary ammonium reagent, and then testing the reduced viscosity fluid for the presence of the metabolite of interest in the body fluid.

5,112,759

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Akihiro Senoo; Kazushi Iuchi; Hajime Miyazaki; Shintetsu Go, all of Yokohama, and Toshie Miyaji, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

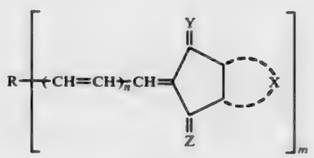
Filed Mar. 30, 1990, Ser. No. 501,880

Claims priority, application Japan, Mar. 30, 1989, 1-80876; Mar. 30, 1989, 1-80877; Jun. 12, 1989, 1-146861; Jul. 14, 1989, 1-180230

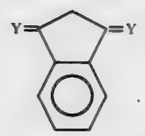
Int. Cl.[5] G03G *5/047, 5/06*

U.S. Cl. 430—58 **11 Claims**

1. An electrophotographic photosensitive member, which comprises an electroconductive support and a photosensitive layer on the electroconductive support, the photosensitive layer containing a compound represented by the following general formula (1):



wherein R is a substituted or unsubstituted aromatic condensed polycyclic group or aromatic amine; X is substituted or unsubstituted benzenediyl, 2,3-pyridinediyl, 3,4-pyridinediyl or 2,3-pyrazinediyl; Y is an oxygen atom, a sulfur atom or a dicyanomethylene group, Z is an oxygen atom, a sulfur atom, a dicyanomethylene group or



m is an integer of 2 or 3; and n is an integer of 0 or 1.

4. An electrophotographic photosensitive member according to claim 1, wherein the photosensitive layer is a function-separated type photosensitive layer comprising a lamination of a charge generation layer containing the compound represented by the general formula (1) and the charge transport layer containing a charge transporting material, laid on the electroconductive support.

5,112,760

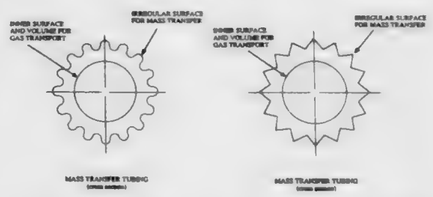
MASS TRANSFER MEMBRANE FOR OXYGENATION OF ANIMAL CELL REACTORS

Mark F. Baumgartner, St. Charles; William R. Tolbert, Manchester, and John Shanahan, Florissant, all of Mo., assignors to Centocor, Incorporated, Malvern, Pa.

Filed Jun. 5, 1990, Ser. No. 534,125

Int. Cl.[5] C12N *5/00*

U.S. Cl. 435—240.242 **4 Claims**



1. A method to culture animal cells requiring oxygen in liquid medium which method comprises passing a gaseous fluid containing oxygen through the lumen of a permeable tubular membrane, said membrane having an interior surface and an exterior surface, said membrane being disposed in said cell culture medium, and wherein said membrane is characterized by an irregular shaped exterior surface.

5,112,761

BICMOS PROCESS UTILIZING NOVEL PLANARIZATION TECHNIQUE

James A. Matthews, Milpitas, Calif., assignor to MicroUnity Systems Engineering, Sunnyvale, Calif.

Filed Jan. 10, 1990, Ser. No. 463,290

Int. Cl.[5] H01L *21/328, 21/335, 21/225*

U.S. Cl. 437—31 **50 Claims**

1. A method of fabricating metal-oxide-semiconductor field-effect type devices (MOSFETs) and bipolar junction transistors (BJTs) in a semiconductor substrate comprising the steps, steps (e) and (f) being performed in no particular order, of:

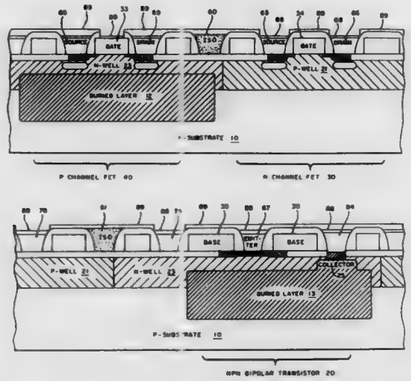
(a) defining active regions in said substrate for said MOSFETs and said BJTs;

(b) forming a gate dielectric over said substrate;

(c) depositing a first layer of polysilicon over said gate dielectric;

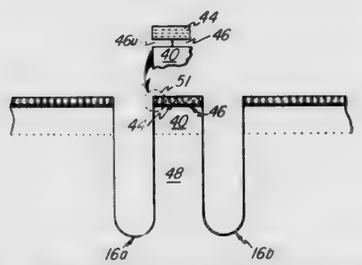
(d) selectively etching said first polysilicon layer to form a plurality of first polysilicon members separated by a corresponding plurality of substantially equal spaces, a first portion of said first polysilicon members forming the gates of said MOSFETs, a second portion forming the extrinsic base contacts of said BJTs, and a third portion functioning

as dummy members for maintaining the spacing between said first polysilicon members;
(e) doping said active regions of said BJTs to form intrinsic base regions;
(f) insulating said first polysilicon members;
(g) depositing an additional layer of polysilicon to fill said spaces, each of said spaces being filled uniformly at substantially the same rate;
(h) etching said additional polysilicon layer to form a plural-



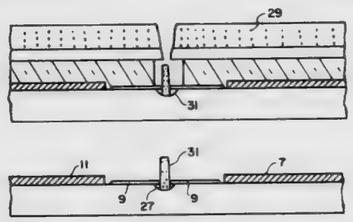
ity of second polysilicon members within each of said spaces, said second polysilicon members being electrically isolated from said first polysilicon members with the surface of said first and second polysilicon members being substantially coplanar to one another;
(i) diffusing impurity atoms from said second polysilicon members into said substrate to form source, drain, extrinsic base, and emitter regions therein; and
(j) interconnecting said MOSFETs and said BJTs to form an integrated circuit.

5,112,762
HIGH ANGLE IMPLANT AROUND TOP OF TRENCH TO REDUCE GATED DIODE LEAKAGE
Dirk N. Anderson, 2117 Maple Leaf; William R. McKee, 1529 Papeete, both of Plano, Collin County, Tex. 75075, and Gishi Chung, 1703 Highgate Pl., Garland, Tex. 75044
Filed Dec. 5, 1990, Ser. No. 622,468
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—35 **12 Claims**



10. A method of implanting dopant into a wall of semiconductor material, comprising the steps of:
implanting dopant into a wall of semiconductor material at a one angle with respect to the wall; and
implanting dopant into a part of the wall of the semiconductor material at another angle with respect to the wall so that the part of the wall is more heavily doped than the rest of the wall.

5,112,763
PROCESS FOR FORMING A SCHOTTKY BARRIER GATE
Thomas W. Taylor, and Donald C. D'Avanzo, both of Santa Rosa, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Sep. 17, 1990, Ser. No. 583,926
Continuation-in-part of Ser. No. 265,615, Nov. 1, 1988, abandoned.
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—39 **30 Claims**

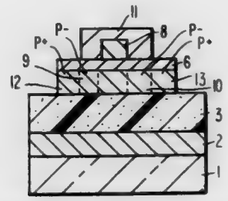


1. A process for fabricating a Schottky barrier gate on a substrate, comprising the steps of:
depositing a lift-off agent on the substrate;
depositing a layer of photoresist on the lift-off agent;
exposing the photoresist layer using a clear field mask, such that an opaque portion of the mask corresponds to a Schottky barrier gate region;
developing the photoresist, leaving unexposed photoresist adherent to the lift-off agent only on those surface areas of the lift-off agent not exposed by the mask;
depositing a metal transfer layer on the surface of the lift-off agent;
removing the unexposed photoresist to provide a hole through the metal transfer layer for defining a Schottky barrier gate region;
etching through the lift-off agent to provide a hole in the lift-off agent aligned with the hole in the metal transfer layer;
etching into the substrate surface through the hole in the metal transfer layer and the hole in the lift-off agent;
depositing a Schottky metal layer over the metal transfer layer and through the hole therein onto the substrate to create a Schottky barrier gate on the substrate; and
dissolving the lift-off agent and lifting off the metal transfer layer to form the Schottky barrier gate.

5,112,764
METHOD FOR THE FABRICATION OF LOW LEAKAGE POLYSILICON THIN FILM TRANSISTORS
Udayanath Mitra, Tarrytown, and Mahalingam Venkatesan, Mohegan Lake, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.
Filed Sep. 4, 1990, Ser. No. 578,106
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—40 **13 Claims**

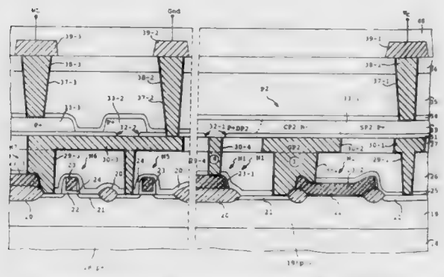
1. A low temperature method of manufacturing a thin film transistor having a low leakage current, said method comprising:
a) depositing a thin layer of an alkali-inert inorganic material on a glass substrate having a annealing point less than 650° C.,
b) depositing a first relatively thick layer of silicon oxide on the layer of inorganic material by chemical vapor deposition,
c) depositing a relatively thin polysilicon layer, at a temperature of 520°–570° C., on the first layer of silicon oxide,

d) annealing said relatively thin polysilicon layer at a temperature of less than 650° C. in a nitrogen atmosphere, to form a large grain polysilicon layer,
e) etching said relatively thin polysilicon layer to remove portions of said polysilicon layer and expose selected areas of said first layer of silicon oxide and form islands in said polysilicon layer,
f) oxidizing at least one of said islands under high pressure at a temperature below 650° C. to form a thin gate oxide layer on said island(s) of polysilicon,
g) depositing a relatively thick, heavily doped polysilicon layer on said gate oxide layer and etching away portions of said relatively heavily doped polysilicon layer to form a gate,



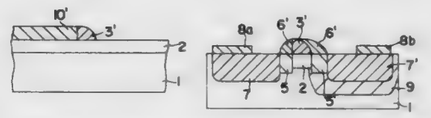
h) relatively lightly implanting p or n dopants in areas of said island of polysilicon laterally adjacent to said gate to form lightly doped source and drain areas,
i) providing by chemical vapor deposition a second relatively thin layer of silicon oxide on said gate and on adjacent lightly doped source and drain areas,
j) relatively heavily doping areas of said first layer of silicon adjacent to said relatively lightly doped source and drain areas,
k) annealing said source and drain areas at a temperature below 650° C., and
l) hydrogenating the resultant device at a temperature of 200°–400° C. with a hydrogen plasma.

5,112,765
METHOD OF FORMING STACKED TUNGSTEN GATE PFET DEVICES AND STRUCTURES RESULTING THEREFROM
Carl Cederbaum, Paris; Roland Chanclou, Perthess; Myriam Combes, Evry; Patrick Mone, Ponthierry, and Vincent Vallet, Mennecy, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 16, 1991, Ser. No. 730,736
Claims priority, application European Pat. Off., Jul. 31, 1990, 90480109.9
Int. Cl.[5] H01L *21/283, 21/90, 21/335*
U.S. Cl. 437—41 **14 Claims**



1. A method of forming stacked tungsten gate PFET devices on a semiconductor IC base structure having active regions of plural devices and a plurality of polysilicon lines formed therein, comprising the steps of:
a) depositing a first thick passivating layer of dielectric material that can be planarized onto the base structure;
b) forming a set of first stud openings in said first thick passivating layer exposing at least one active region and one of said polysilicon lines;
c) depositing a first layer of conductive material to fill said set of first stud openings and define a set of first contact studs, such that the upper part of at least one of said first contact studs comprising a gate electrode of said stacked tungsten gate PFET devices;
d) planarizing the structure to make the top surface of said first contact studs coplanar with the surface of said first thick passivating layer;
e) depositing a thin insulating layer to form the gate dielectric of said stacked tungsten gate PFET devices and patterning it to define contact openings to expose at least one of said first contact studs at desired locations;
f) depositing a polysilicon layer lightly doped with an impurity of a first type of conductivity;
g) patterning said polysilicon layer to define a plurality of polysilicon lands contacting said first contact studs at said desired locations;
h) selectively implanting ions of a second type of conductivity dopant in the structure to define the source and drain regions of said stacked tungsten gate PFET devices and interconnection conductors in at least one polysilicon land or portions thereof;
i) depositing a second thick passivating layer of dielectric material that can be planarized;
j) forming a set of second stud openings in said second thick passivating layer to expose desired portions of said polysilicon lands and portions of said first contact studs;
k) depositing a second layer of conductive material in said set of second stud openings to define a second set of second contact studs;
l) planarizing the structure to make the top surface of said second contact studs coplanar with the surface of said second thick passivating layer.

5,112,766
METHOD OF MANUFACTURING FIELD EFFECT TRANSISTORS
Takayuki Fujii, and Mitsunori Nakatani, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Jul. 16, 1991, Ser. No. 730,626
Claims priority, application Japan, Jul. 17, 1990, 2-189838
Int. Cl.[5] H01L *21/18*
U.S. Cl. 437—41 **17 Claims**



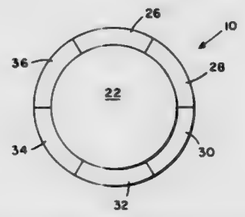
1. A method of producing a field effect transistor comprising:
forming a first conductivity type active layer having a first concentration of dopant impurities producing the first conductivity type in a semi-insulating semiconductor substrate;
forming a mask film on the substrate on part of the first conductivity type region;
depositing a gate metal film on the mask film and on the substrate not covered by the mask film;
etching the gate metal film and leaving a portion of the gate metal film on the substrate adjacent to and contacting the mask film as a gate electrode;
implanting dopant impurities producing a second conductiv-

ity type opposite the first conductivity type in the substrate using the mask film and the gate electrode as an implantation mask;
annealing the substrate at an elevated temperature to activate the implanted dopant impurities whereby some of the implanted dopant impurities diffuse laterally within the substrate to produce a second conductivity type region in the substrate underneath part of the gate electrode;
removing the mask film;
implanting dopant impurities producing the first conductivity type in the substrate using the gate electrode as an ion implantation mask to produce first and second doped regions in the substrate on opposite sides of the gate electrode and having a second concentration of dopant impurities larger than the first concentration, the second doped region being disposed within the second conductivity type region that extends underneath part of the gate electrode; and
forming a source electrode on the first doped region and a drain electrode on the second doped region.

5,112,767
VECTORS WITH ENHANCER DOMAINS
Pradip Roy-Burman, Monterey Park, and David A. Spodick, Newport Beach, both of Calif., assignors to University of Southern California, Los Angeles, Calif.
Filed Mar. 4, 1988, Ser. No. 164,280
Int. Cl.[5] C12N *15/85, 15/67, 15/79;* **C07H** *21/04*
U.S. Cl. 435—320.1 **7 Claims**

1. A constructed vector comprising:
a promoter domain;
at least one heterologous structural gene operably linked to said promoter domain; and
an enhancer domain upstream of said promoter domain and operable to enhance activity of the promoter domain in specific tissues,
wherein said enhancer domain comprises at least one sequence DR-A selected from the group consisting of
TAACCGCTTTCATTTCGCTTCTGTAAAACCGCTTATGCGCCCC ACCC and
TAACCGCTTTCCTCTCGCTTCTGTAATCTTGCTTACGCGCCCA ACCA, and
at least one sequence DR-B selected from the group consisting of
CGCAACCCGGGCCCCGAGTTGCATCAGCCG,
CGCAACCCGGGCTCCGAGTTGCATCAGCCG
and
CGCAGCCCGGGCTCCAAGTTGCATCAGCCA.

5,112,768
REAL-TIME PASSIVE DETECTION OF HUMIDITY USING VANILLIN
Patricia T. Carver, 83 The Phelps, Kidlington Oxford, England OX5 1TL
Filed Jun. 18, 1990, Ser. No. 539,622
Int. Cl.[5] G01N *33/18*
U.S. Cl. 436—39 **18 Claims**



1. A method for passive colorimetric detection of humidity comprising the steps of:
(a) providing a substrate coated with vanillin acidified with sulfuric acid in acetone; and
(b) exposing said substrate to a humid environment, said substrate changing from a first color to a second color as a function of the humidity to which said substrate has been exposed.

5,112,769
STABLE SINGLE LIQUID REAGENT FOR DETERMINATION OF DIRECT BILIRUBIN IN SERA AND METHOD OF FORMING SAME
Ivan E. Modrovich, 96 Natalie Way, Camarillo, Calif. 93010
Continuation-in-part of Ser. No. 357,023, May 25, 1989, Pat. No. 4,965,210, which is a continuation-in-part of Ser. No. 101,776, Sep. 29, 1987, abandoned. This application Oct. 19, 1990, Ser. No. 602,006
Int. Cl.[5] G01N *33/72*
U.S. Cl. 436—97 **17 Claims**

1. A stable liquid single reagent solution for determination of direct bilirubin in sera which comprises an essentially surfactant free aqueous solution containing a diazonium salt in a concentration sufficient to diazonize conjugated bilirubin to a detectable chromogen, an organic sulfate present in a concentration sufficient to at least stabilize the diazonium salt, urea in an amount to solubilize protein, a heavy metal complexing agent present in amount sufficient to complex with heavy metal ions, said solution having an acidic pH less than 1 and sufficiently low to hinder solubilization of unconjugated bilirubin said reagent being stable for at least 18 months at 2 to 8°πC.

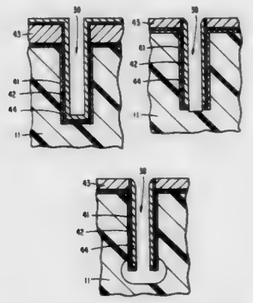
5,112,770
PRECIPITATION OF MULTIVALENT ANTILIGANDS WITH AFFINITY SURFACTANTS
Ruben G. Carbonell; Roberto Guzman, and Peter K. Kilpatrick, all of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.
Filed Jun. 8, 1988, Ser. No. 204,424
Int. Cl.[5] G01N *33/566*
U.S. Cl. 436—501 **26 Claims**

1. An affinity precipitation test procedure for detecting the presence or absence of a multivalent antiligand in a sample suspected of containing said multivalent antiligand, said procedure comprising:
(a) providing a single phase aqueous solution having therein dissolved an affinity surfactant, said affinity surfactant comprising a surfactant having a ligand bound thereto, which ligand binds to said multivalent antiligand;
(b) combining said sample with said single phase aqueous solution; and then
(c) determining the presence or absence of a precipitate comprised of an affinity surfactant-multivalent antiligand aggregate in said solution, said aggregate formed from repeating surfactant-to-surfactant hydrophobic interactions, the presence of said precipitate indicating the presence of said multivalent antiligand in said solution.

5,112,771
METHOD OF FIBRICATING A SEMICONDUCTOR DEVICE HAVING A TRENCH
Tatsuya Ishii; Yoji Mashiko; Masao Nagatomo, and Michihiro Yamada, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 167,792, Mar. 14, 1988, abandoned. This application Jun. 12, 1989, Ser. No. 349,737
Claims priority, application Japan, Mar. 20, 1987, 2-66257; Jul. 21, 1987, 62-182703
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—67 **6 Claims**

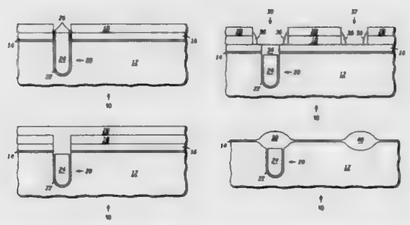
1. A method for manufacturing a semiconductor device having a trench, comprising the steps of:
forming a first silicon oxide film on a semiconductor substrate,

etching a trench in said semiconductor substrate with the silicon oxide film used as an etching mask,
forming a second silicon oxide film on the entire exposed surface of said semiconductor substrate and said first silicon oxide film,
anisotropically etching said second silicon oxide film until the second silicon oxide film remains only on the side walls of said trench,
enlarging the trench by etching the semiconductor substrate,



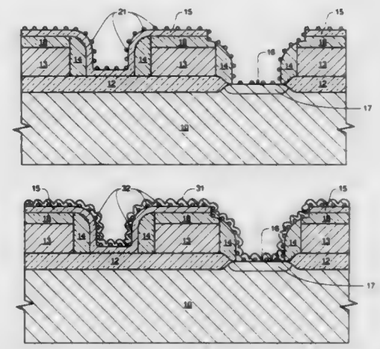
previously exposed only on a bottom surface of said trench by an isotropic etching process, to enlarge the width of a bottom portion of said trench,
wherein said second oxide film is formed on the side wall portion and the bottom surface portion of said trench, forming a silicon nitride film which will be the oxidation mask on said second oxide film and comprising the further step of forming, a further silicon oxide film which will be the etching mask on the side wall portion of the trench formed on the silicon nitride film.

5,112,772
METHOD OF FABRICATING A TRENCH STRUCTURE
Syd R. Wilson, Phoenix; Han-Bin K. Liang, Mesa; Thomas Zirkle, and Yee-Chaung See, both of Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 27, 1991, Ser. No. 766,316
Int. Cl.[5] H01L *21/76, 21/302*
U.S. Cl. 437—67 **14 Claims**



1. A method of fabricating a trench structure comprising the steps of:
providing a substrate having at least a first layer disposed on a surface thereof and a second layer disposed on said first layer;
forming a trench through said first and second layers and into said substrate;
forming a dielectric liner in said trench, said liner extending above said surface of said substrate;
forming trench fill material in said trench, said trench fill material extending above said surface of said substrate;
removing portions of said trench liner disposed above said trench fill material;
forming a conformal layer on said structure including said trench and said second layer; and
oxidizing said conformal layer and a portion of said trench fill material.

5,112,773
METHODS FOR TEXTURIZING POLYSILICON UTILIZING GAS PHASE NUCLEATION
Mark E. Tuttle, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Apr. 10, 1991, Ser. No. 683,215
Int. Cl.[5] H01L *21/203*
U.S. Cl. 437—109 **16 Claims**



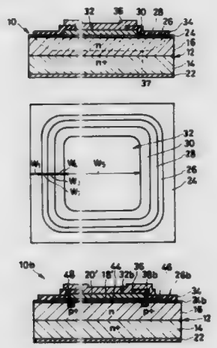
1. A process for forming a textured polycrystalline silicon layer on a silicon wafer surface, comprising the following steps:
a) depositing an initial polycrystalline silicon by chemical vapor deposition utilizing a polysilicon source gas whereby varying a combination of deposition conditions causes gas phase nucleation of said initial polycrystalline silicon thereby forming poly nodules; and
b) depositing subsequent conformal polycrystalline silicon layers superjacent said wafer surface thereby coating said poly nodules and causing said initial polycrystalline silicon to become texturized.

5,112,774
METHOD OF FABRICATING A HIGH-VOLTAGE SEMICONDUCTOR DEVICE HAVING A RECTIFYING BARRIER
Koji Ohtsuka, Shiki, and Hirokazu Goto, Hannou, both of Japan, assignors to Sanken Electric Co., Ltd., Saitama, Japan
Division of Ser. No. 427,734, Oct. 26, 1989. This application Feb. 15, 1991, Ser. No. 640,032
Claims priority, application Japan, Nov. 11, 1988, 63-285048
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—175 **3 Claims**

2. A method of fabricating a semiconductor device which comprises:
(a) providing a semiconductor substrate having a first and a second semiconductor region of opposite conductivity types disposed contiguous to each other for creating therebetween a p-n junction having an annular periphery exposed at a surface of the semiconductor substrate, the first semiconductor region being higher in resistivity than the second semiconductor region;
(b) forming a first layer of a metal on the surface of the semiconductor substrate;
(c) forming a second layer of another metal on the first layer;
(d) removing annular peripheral part of the second layer for exposing corresponding annular peripheral part of the first

layer, the thus-exposed annular peripheral part of the first layer being spaced outwardly from the exposed annular periphery of the p-n junction of the semiconductor substrate;

(e) oxidizing the exposed annular peripheral part of the first layer to a first prescribed degree by using the remaining part of the second layer as a mask, in order to provide a first metal oxide region having a first sheet resistance and creating a Schottky barrier at its interface with the first semiconductor region;



(f) again removing annular peripheral part of the remaining part of the second layer for exposing second corresponding part of the first layer, the thus-exposed second part of the first layer extending across the exposed periphery of the p-n junction of the semiconductor substrate; and

(g) again oxidizing the exposed second part of the first layer to a second prescribed degree, lower than the first prescribed degree, by using the remaining part of the second layer as a mask, in order to provide a second metal oxide region having a second sheet resistance, lower than the first sheet resistance, and creating a Schottky barrier at its interface with the first semiconductor region.

5,112,775

METHOD OF MAKING DIAMOND N-TYPE SEMICONDUCTOR DIAMOND P-N JUNCTION DIODE USING DIPHOSPHORUS PENTOXIDE AND HOT FILAMENT CVD METHOD

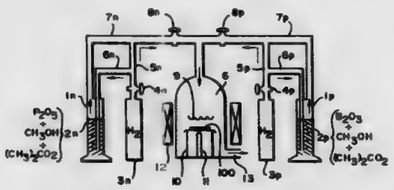
Masamori Iida, Tokyo; Tateki Kurosu, Isehara, and Ken Okano, Tokyo, all of Japan, assignors to The Tokai University Juridical Foundation, Japan

Filed Nov. 7, 1990, Ser. No. 609,792

Claims priority, application Japan, Nov. 22, 1989, 1-302209

Int. Cl.[5] H01L *21/00, 21/02, 21/205, 29/72*

U.S. Cl. 437—225 **3 Claims**



1. A process for producing a diamond N-type semiconductor, comprising the steps of:

selecting diphosphorus pentoxide (P_2O_5) as a compound containing an impurity element;

dissolving the diphosphorus pentoxide in a liquid organic compound as a diamond material, thereby preparing a solution, and

vaporizing the solution and subjecting it to a hot filament CVD method, thereby forming a diamond thin film doped with a phosphorus element on a substrate.

5,112,776

METHOD FOR PLANARIZING AN INTEGRATED CIRCUIT STRUCTURE USING LOW MELTING INORGANIC MATERIAL AND FLOWING WHILE DEPOSITING

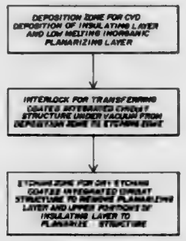
Jeffrey Marks, Sunnyvale; Kam S. Law, Union City; David N. Wang, Saratoga, and Dan Mayden, Los Altos Hills, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 541,449, Jun. 21, 1990, abandoned, which is a continuation of Ser. No. 269,508, Nov. 10, 1988, abandoned. This application Jan. 22, 1991, Ser. No. 644,853

The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.

Int. Cl.[5] H01L *21/461*

U.S. Cl. 437—228 **34 Claims**



1. A process for planarizing an integrated circuit structure in an apparatus which comprises:

(a) depositing a first layer of an insulating material over an integrated circuit structure in a chemical vapor deposition zone in said apparatus;

(b) depositing over said insulating layer a low melting inorganic planarizing layer having a flow temperature of not greater than 500° C. in a chemical vapor deposition zone in said apparatus at a deposition temperature within a range of from about 300° C. to about 500° C. and sufficiently high within said range to permit said low melting inorganic planarizing material to flow as it is deposited; and

(c) dry etching said inorganic planarizing layer in an etching zone in said apparatus to planarize said structure until substantially all of said inorganic planarizing layer has been removed.

5,112,777

GLASS-CERAMIC-BONDED CERAMIC COMPOSITES

John F. MacDowell, Penn Yan, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Jan. 9, 1991, Ser. No. 639,196

Int. Cl.[5] C03C *14/00, 10/02*

U.S. Cl. 501—32 **6 Claims**

1. A sintered glass-ceramic-bonded ceramic composite article consisting essentially of hard refractory ceramic particulates bonded together by a glass-ceramic, the ratio of ceramic particulates to glass-ceramic bonding material ranging from 90% ceramic:10% glass-ceramic to 30% ceramic: 70% glass-ceramic, said glass-ceramic containing a divalent metal borate crystal phase and being thermally crystallized in situ from a glass consisting essentially, expressed in terms of weight percent on the oxide basis, of 25–65% B_2O_3, 20–75% RO, wherein RO consists of at least one divalent metal oxide selected fromm the group consisting of CaO, SrO, BaO, MnO, and ZnO, the sum of B_2O_3+RO constituting at least 55% of the total composition, and up to 45% total of optional ingredients in the indicated proportions selected from the group consisting of up to 20% SiO_2, up to 10% F., up to 10% ZrO_2, up to 40% Al_2O_3, and up to 10% $La_2O_3+Y_2O_3+CeO_2+PbO+TiO_2$ consisting up to 10% La_2O_3, up to 10% Y_2O_3, up to 10% CeO_2, up to 10% PbO and up to 10% TiO_2.

5,112,778

BATCH COMPOSITION FOR MAKING INFRARED AND ULTRAVIOLET RADIATION ABSORBING GREEN GLASS

J. Joseph Cheng; Richard R. Snow, both of Perrysburg, Ohio; Geoffrey Evans, Preston; Charles R. Bamford, Ainsdale, and Harold B. Milnes, Billinge, all of United Kingdom, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Continuation-in-part of Ser. No. 472,593, Jan. 30, 1990, abandoned. This application May 13, 1991, Ser. No. 699,314

Int. Cl.[5] C03C *6/04, 3/087, 3/095, 4/08*

U.S. Cl. 501—31 **27 Claims**

1. A glass batch composition for producing an infrared energy and ultraviolet radiation absorbing green-colored glass, the glass having a ferrous value between about 22% and about 29%, said batch composition comprising:

A) a soda-lime-silica float glass batch mixture;

B) an ultraviolet radiation absorbing quantity of a cerium containing compound in an amount which results in a glass containing from about 0.2 to about 1.4 weight percent CeO_2;

C) an amount of an iron containing compound so as to result in at least 0.70 weight percent total iron in the glass; and

D) a quantity of carbon, which is less than the amount of carbon required to achieve the same ferrous value in a glass produced from a glass batch comprising ingredients A, B, and an amount of iron containing compound so as to result in 0.5 weight percent total iron in the glass.

5,112,779

HIGH DENSITY SILICON CARBIDE SINTERED BODIES FROM BOROSILOXANES

Gary T. Burns, and Gregg A. Zank, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 458,204, Dec. 28, 1989, abandoned. This application Mar. 25, 1991, Ser. No. 674,005

Int. Cl.[5] C04B *35/54*

U.S. Cl. 501—90 **31 Claims**

1. A method of preparing a sintered body of silicon carbide, said method comprising:

(a) blending components comprising silicon carbide powder, a preceramic borosiloxane, and an additive selected from the group consisting of crosslinking agents, crosslinking agent modifiers and mixtures thereof to a uniform mixture, where the additive is present in an effective amount to induce crosslinking, and where the amount of preceramic borosiloxane is such that (i) the amount of boron in the mixture is 0.08–3 weight percent based on the total weight of the silicon carbide powder and the char derived from the preceramic borosiloxane and (ii) the free carbon value of the mixture is greater than 0.1 weight percent based on the total weight, of the silicon carbide powder and the char derived from the preceramic borosiloxane;

(b) forming the uniform mixture into the desired shape under pressure at a temperature less than about 500° C. to obtain a handleable green body; and

(c) sintering the handleable green body in an inert atmosphere at a temperature greater than 1900° C. to obtain a sintered body of silicon carbide with a density greater than 2.4 g/cm^3.

5,112,780

SIALON BASED COMPOSITE AND METHOD OF MANUFACTURING THE SAME

Yasuhiro Goto, Tokyo; Takeyuki Yonezawa, Machida; Akihiko Tsuge, and Michiyasu Komatsu, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 10, 1990, Ser. No. 521,548

Claims priority, application Japan, May 12, 1989, 1-117512; Dec. 21, 1989, 1-329510

Int. Cl.[5] C04B *35/58, 35/80*

U.S. Cl. 501—95 **16 Claims**

1. A sialon based composite consisting essentially of 5 wt % to 40 wt % of SiC fibers, 0.3 wt % to 10 wt % of an Hf component which is calculated in terms of Hf oxide, and the balance of a sialon as a major constituent.

5,112,781

PROCESS FOR PRODUCING ZIRCONIUM BASED GRANULES AND ZIRCONIUM OXIDE FIBERS

Sivananda S. Jada, Englewood, Colo., assignor to Manville Corporation, Denver, Colo.

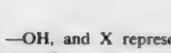
Division of Ser. No. 522,348, May 11, 1990, Pat. No. 5,053,294, which is a division of Ser. No. 131,594, Dec. 11, 1987, Pat. No. 4,927,622, which is a continuation-in-part of Ser. No. 65,809, Jun. 19, 1987, abandoned. This application Mar. 6, 1991, Ser. No. 665,622

Int. Cl.[5] C04B *35/48;* **C01G** *25/02*

U.S. Cl. 501—95 **12 Claims**

1. A process for making fibers of zirconium oxide, said process consisting essentially of the steps of:

(a) adding about 2–15 wt % of a suitable phase stabilizer to an aqueous solution, based upon the total weight of ZrO_2 in solution, comprising a compound of the formula $Zr(R)_4$ or zirconyl halide, wherein each R group individually represents either



—OX; —NO_3, halogen or —OH, and X represents a C_1–C_{10} hydrocarbyl group, to produce an aqueous solution having a pH in the range of about 4–7 comprising a zirconium based complex and phase stabilizer;

(b) drying said aqueous solution comprising said zirconium based complex and said phase stabilizer at a temperature below about 250° C. for a time sufficient to evaporate said aqueous solution thereby forming amorphous zirconium based granules containing said phase stabilizer;

(c) forming an aqueous solution of said zirconium based granules of step (b);

(d) fiberizing said solution of step (c); and

(e) heating the resulting fibers under conditions sufficient to form zirconium oxide fibers.

5,112,782

CATIONICALLY PROCESSED CALCINED KAOLIN CLAY

Steven A. Brown, New Brunswick, and Paul Sennett, Colonia, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 593,356, Oct. 1, 1990, abandoned, which is a continuation of Ser. No. 347,612, May 4, 1989, abandoned, and a continuation-in-part of Ser. No. 347,834, May 4, 1989, and a continuation-in-part of Ser. No. 347,611, May 4, 1989. This application May 23, 1991, Ser. No. 707,257

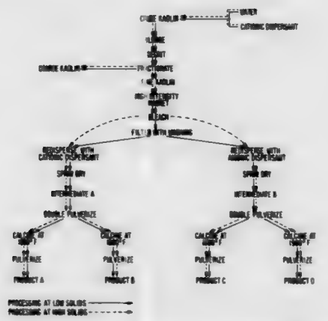
The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.

Int. Cl.[5] C04B *33/24*

U.S. Cl. 501—144 **15 Claims**

1. A process for producing a low abrasion calcined kaolin pigment which comprises blunging a crude kaolin clay in

water in the presence of a cationic polyelectrolyte to produce an acidic dispersed fluid aqueous clay pulp, the kaolin in said kaolin crude being at least about 80% by weight finer than 2 micrometers, removing grit from said pulp, recovering the resultant dispersed acidic pulp after removal of grit to recover



a fine particle size fraction of kaolin particles, drying said fraction of fine kaolin particles, and then pulverizing, calcining at a temperature above 400° C. and repulverizing, said process being carried out without adding an anionic dispersant to said kaolin at any stage of the processing from blunging through calcination.

5,112,783

CONDUCTIVE COPPER OXIDE CERAMICS AND PROCESS FOR PRODUCING SAME

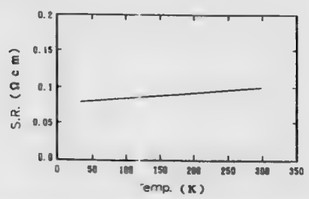
Ryoji Sugise, Yamaguchi; Hiroshi Daimon, Chiba; Itsuhiro Fujii, Yamaguchi; Hideo Ihara, Ibaraki; Norio Terada, Ibaraki; Masatoshi Jo, Ibaraki, and Masayuki Hirabayashi, Ibaraki, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi and Agency of Industrial Science & Technology, Tokyo, both of, Japan

Filed Jan. 14, 1991, Ser. No. 639,931

Claims priority, application Japan, Jan. 22, 1990, 2-12085; Mar. 27, 1990, 2-78380

Int. Cl.[5] C04B *35/02*

U.S. Cl. 501—126 **7 Claims**



1. Conductive copper oxide ceramics which are represented by the following formula I:

$$(M_xCu_y)_7O_zA_w \quad \text{I}$$

wherein M represents at least one element selected from the group consisting of In, Sc, Y, Tl, and Ga, A represents Cl, NO_3, or Cl and NO_3, x+y is a value of 1, x/y is a number of from 0 to 10, z is a number of from 6 to 8, and w is a number of from 1 to 9.

5,112,784

PROCESS FOR THE PREPARATION OF CATALYSTS

Martin P. Atkins, Sunbury-on-Thames; William Jones, Cambridge, and Malama Chibwe, Romford, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Sep. 24, 1990, Ser. No. 586,825

Claims priority, application United Kingdom, Oct. 4, 1989, 8922359

Int. Cl.[5] B01J *21/16*

U.S. Cl. 502—80 **8 Claims**

1. A process for the preparation of a catalytically active material, which comprises calcining an anionic double hydroxide clay; rehydrating the resulting material by treatment with water substantially free from dissolved ions; and calcining the rehydrated material.

2. A process as claimed in claim 1, in which calcination is carried out by heating to a temperature of from 300° to 550° C. under non-reducing conditions.

5. A process as claimed in claim 2, in which the catalytically active material contains magnesium and aluminium.

5,112,785

METHOD FOR THE TREATMENT OF A CATALYTIC COMPONENT ON A POROUS METAL OXIDE SUPPORT FOR THE POLYMERIZATION OF OLEFINS IN THE GAS PHASE AND METHOD OF POLYMERIZING OLEFINS

Claude Brun, Idron Bizanos; Auguste Cheux, Arthez-de-Bearn, and Eric Barthel, Pau, all of France, assignors to Atochem, Puteaux, France

Continuation of Ser. No. 206,119, Jun. 13, 1988, abandoned. This application Oct. 30, 1989, Ser. No. 429,017

Claims priority, application France, Jun. 16, 1987, 87 08403

Int. Cl.[5] C08F *4/654*

U.S. Cl. 502—108 **7 Claims**

1. The method of forming a granular catalytic component for use in the polymerization of ethylene or a copolymerization of ethylene and at least one C_3 to C_{12} alpha olefin in a gas-phase comprising impregnating a porous metal oxide support with at least one titanium compound, magnesium compound, and chloride compound, and prepolymerizing ethylene and a monomer mixture of ethylene and at least one C_3 to C_{12} alpha olefin, at least partially in suspension, in the presence of said impregnated porous metal oxide support and least one alkylaluminum compound, of the formula $Al(R'')_cX^1_dH_e$ in which X^1 is Cl or R'', R'' is a C_1 to C_{14} saturated hydrocarbon radical, with $o<d<1.5$; $o<3<1$, and $c+d+e=3$, complexed with at least one electron donor, the monomer or monomer mixture being introduced into the reaction during the first hour of prepolymerization at a flow rate equal to or less than 10 $NL\times h^{-1}\times g^{-1}$ of catalytic component on the porous metal oxide support.

5,112,786

CATALYST FOR POLYMERIZATION OF OLEFIN MONOMERS

Takashi Fujita, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Jun. 19, 1991, Ser. No. 717,514

Claims priority, application Japan, Jun. 21, 1990, 2-163409

Int. Cl.[5] C08F *4/656*

U.S. Cl. 502—119 **6 Claims**

1. A catalyst for polymerization of olefin monomers, comprising:

Component (A) which is a solid catalytic compound obtained by subjecting at least the following Sub-components (i) to (iii) to a contact reaction:

Sub-component (i) which is a component for Ziegler catalysts comprising titanium, magnesium and a halogen as essential components;

Sub-component (ii) which is a silicon compound represented by the formula $R^1_{4-n}SiX_n$ wherein R^1 is a hydrocarbyl group having 1 to 20 carbon atoms, X is a halogen, and n is a number in the range of $0<n\leqq 4$; and

Sub-component (iii) which is divinylbenzene, the amount of said Sub-component (iii) polymerized in the course of said contact reaction being from 0.01 to 10 g

Component (B) which is an organoaluminum compound.

5,112,787

SUPPORTED CATALYST FOR OXIDIZING CARBON MONOXIDE

Holger Falke, Hemmingen, and Guenther Strauss, Hanover, both of Fed. Rep. of Germany, assignors to GUTEC, Gesellschaft zur Entwicklung von Umweltschutztechnologie mbH, Hanover, Fed. Rep. of Germany

Filed Jun. 14, 1990, Ser. No. 537,597

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1989, 3920427; Mar. 24, 1990, 4009575

Int. Cl.[5] B01J *31/06*

U.S. Cl. 502—159 **15 Claims**

1. A supported catalyst for oxidizing carbon monoxide at a temperature below about 100° C., comprising a foamed, substantially open-pored organic polymer support, and a catalytically active component applied to said support, said catalytically active component being present as a coating on said foamed polymer support and comprising a mixture of gold and iron (III) oxide, a mixture of gold and tricobalt tetroxide, a mixture of gold and nickel (II) oxide, or a mixture of two or more of the foregoing mixtures, and said supported catalyst being in the form of monolithic bodies having a spatial volume of at least 5 cm^3.

5,112,788

ALKOXYLATION USING MODIFIED GROUP IIA METAL-CONTAINING BIMETALLIC OR POLYMETALLIC CATALYSTS

Stephen W. King, Scott Depot, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 30, 1988, Ser. No. 251,432

Int. Cl.[5] B01J *31/00*

U.S. Cl. 502—162 **27 Claims**

1. A method for providing an alkoxylation catalyst comprising:

(a) reacting or solubilizing, at least partially, a Group IIA metal other than calcium or a Group IIA metal-containing compound other than a calcium-containing compound by mixing with an activator having the formula

$$Z_a\text{-}X\text{-}Q\text{-}Y\text{-}Z'_b$$

wherein X and Y are the same or different electronegative, heteroatoms selected from the group consisting of oxygen, nitrogen, sulfur and phosphorus; a and b are the same or different integers satisfying the valency requirements of X and Y; Q is an organic radical which is electropositive or essentially neutral relative as to X and/or Y; Z and Z' are the same or different and are either hydrogen or an organic radical which does not prevent said reacting or solubilizing, thereby forming a Group IIA metal-containing composition which has titratable alkalinity;

(b) reacting a divalent or polyvalent metal other than calcium or a divalent or polyvalent metal-containing compound other than a calcium-containing compound with an organic compound having at least one active hydrogen to produce a divalent or polyvalent metal-containing composition;

(c) reacting the Group IIA metal-containing composition with the divalent or polyvalent metal-containing composition under effective reaction conditions to produce a catalyst precursor composition; and

(d) reacting the catalyst precursor composition with a divalent or polyvalent oxyacid or a divalent or polyvalent metal salt of an oxyacid or mixtures thereof under effective reaction conditions to produce the alkoxylation catalyst.

5,112,789

ALKOXYLATION CATALYSIS

James H. McCain, Charleston; Stephen W. King, Scott Depot; Robert J. Knopf, St. Albans; Charles A. Smith, South Charleston, and Charles F. Hauser, Charleston, all of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 30, 1988, Ser. No. 251,431

Int. Cl.[5] B01J *31/00*

U.S. Cl. 502—162 **26 Claims**

1. A method for providing an alkoxylation catalyst comprising:

(a) reacting or solubilizing, at least partially, a first divalent or polyvalent metal or metal-containing compound wherein said metal is selected from the group consisting of either (i) boron, aluminum, gallium, indium, thallium, titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, manganese, iron, cobalt, nickel, copper, and zinc, or (ii) carbon, silicon, germanium, tin, lead, titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, manganese, iron, cobalt, nickel, copper and zinc, by mixing with an activator having the formula:

$$Z_a\text{—}X\text{—}Q\text{—}Y\text{—}Z'_b$$

wherein X and Y are the same or different electronegative, heteroatoms selected from the group consisting of oxygen, nitrogen, sulfur and phosphorus; a and b are the same or different integers satisfying the valency requirements of X and Y; Q is an organic radical which is electropositive or essentially neutral relative as to X and/or Y; Z and Z' are the same or different and are either hydrogen or an organic radical which does not prevent said reacting or solubilizing, thereby forming a first divalent or polyvalent metal-containing composition;

(b) reacting a second divalent or polyvalent metal or a second divalent or polyvalent metal-containing compound wherein said metal is selected from the group consisting of either (i) boron, aluminum, gallium, indium, thallium, titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, manganese, iron, cobalt, nickel, copper, and zinc, or (ii) carbon, silicon, germanium, tin, lead, titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, manganese, iron, cobalt, nickel, copper and zinc, with an organic compound having at least one active hydrogen to produce a second divalent or polyvalent metal-containing composition;

(c) reacting the first divalent or polyvalent metal-containing composition with the second divalent or polyvalent metal-containing composition under effective reaction conditions to produce a catalyst precursor composition; and

(d) reacting the catalyst precursor composition with a divalent or polyvalent oxyacid or a divalent or polyvalent metal salt of an oxyacid or mixtures thereof under effective reaction conditions to produce the alkoxylation catalyst; provided that when the first divalent or polyvalent metal or metal-containing compound is selected from (i), the second divalent or polyvalent metal or metal-containing compound is selected from (ii), and further provided that when the first divalent or polyvalent metal or metal-containing compound is selected from (ii), the second divalent or polyvalent metal or metal-containing compound is selected from (i).

5,112,790

CATALYST FOR PURIFICATION OF EXHAUST GASES

Yoshihide Watanabe; Mareo Kimura, and Shinichi Matsumoto, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 27, 1990, Ser. No. 515,420
Claims priority, application Japan, May 1, 1989, 1-112488
Int. Cl.[5] B01J *27/185, 27/182, 27/188;* C01B *53/34*
U.S. Cl. 502—213 6 Claims

1. A catalyst for purifying exhaust gases comprising:

a porous support material having a silicoaluminophosphate framework with a chemical composition represented by the formula

$$(Si_xAl_yP_z)O_2$$

where $x+y+z=1$, $0.01 \leqq x > 0.8$, and $z \geqq 0.01$, when it is an anhydrous form; and

catalytically active elements comprising at least one base metal selected from Cu and Co and at least one metal of the platinum group selected from Pd, Pt and Rh, said at least one base metal and said one metal of the platinum group being carried on ion exchange sites of said framework in a coexistent state,

said framework having uniformly sized pores with a diameter exceeding 3 Å and carrying said metal of the platinum group in an amount ranging from 10 to 50% by weight of said base metal.

5,112,791

DIMERIZATION PROCESS AND CATALYSTS THEREFOR

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 27, 1990, Ser. No. 572,735
Int. Cl.[5] B01J *21/14, 23/04*
U.S. Cl. 502—243 18 Claims

1. A composition comprising:

a) at least one elemental alkali metal; and

b) a support comprising alkali metal carbonate and at least one low surface area silica-alumina compound;

wherein component (a) is supported on component (b).

5. A composition according to claim 1 wherein said low surface area silica-alumina compound is selected from the group consisting of porous silica-alumina and vitrified silica alumina having a surface area in the range of from about 0.001 to 50.0 about m^2/gm and a pore volume in the range of from about 0.01 to about 1.0 cc/gm.

6. A composition according to claim 5 wherein said porous low surface area silica-alumina compound is present in an amount within the range of from about 1 to about 40 weight percent based on total weight of the support.

5,112,792

NICKEL/SILICA CATALYST AND THE PREPARATION AND USE THEREOF

Cornelis M. Lok, Domela Nieuwenhuisstraat 14, 6941 BL Didam, Netherlands

Filed May 16, 1990, Ser. No. 524,262
Claims priority, application European Pat. Off., May 16, 1989, 89201229.5
Int. Cl.[5] B01J *21/14, 23/78*
U.S. Cl. 502—250 13 Claims

1. A nickel/silica catalyst which optionally also contains cations of a lower Group II metal (X), characterized in that the reduced catalyst satifies the following combination of features:

1) a molar ratio of $SiO_2/Ni=0.15-0.40$

2) a molar ratio of $X/Ni=0-0.15$

3) an active nickel surface area above 120 m^2/g nickel

4) a BET surface area of which at least 55% is found with pores having a radius below 1.5 nanometers.

11. In a process for preparing a nickel/silica catalyst which optionally contains cations of a lower Group II metal (X) by continuously precipitating nickel ions from an aqueous salt solution optionally together with X-ions with an excess alkaline precipitating agent in a stirred reactor with a residence time of between 20 and 120 seconds followed by continuous addition of aqueous silicate solution, optionally in a second reactor, collecting, drying and reducing the precipitate, the improvement wherein the temperature of the suspension when adding the aqueous silicate solution is between 90 and 95, for a period of between 10 and 300 minutes.

5,112,793

CATALYST COMPOSITION FOR THE PREPARATION OF ETHYLENE FROM ETHANE

Angelo J. Magistro, Brecksville, Ohio, assignor to The B.F. Goodrich Company, Brecksville, Ohio

Continuation-in-part of Ser. No. 567,510, Aug. 15, 1990, abandoned. This application Apr. 25, 1991, Ser. No. 691,647
Int. Cl.[5] B01J *23/02, 23/10, 23/26, 23/34*
U.S. Cl. 502—303 20 Claims

1. A solid solution catalyst comprising α-Al_2O_3 catalyst support particles with iron cations substituted for aluminum cations in the host lattice of α-Al_2O_3 catalyst support having an iron content of 0.1 to 20% by weight expressed as the oxide stabilized with a total lanthanide content of 0.1 to 20% by weight expressed as the oxide and modified with at least two metal cations selected from the group consisting of barium, cobalt, chromium, magnesium and manganese, wherein barium is one of said metal cations and wherein said metal cations are present in amounts of 0.05 to 10% of each metal by weight expressed as the oxide; wherein said lanthanide content expressed as the oxide is selected from oxides of the elements 57 to 71 of the Periodic Table, and mixtures thereof; said solid solution catalyst having X-ray diffraction pattern having peak positions different than that of the host lattice.

5,112,794

ARSENIC-RESISTANT MIXED OXIDE CATALYST AND PROCESS FOR PRODUCING THE SAME

Erich Hums, and Günther Spitznagel, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 21, 1990, Ser. No. 541,714
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1989, 3920311
Int. Cl.[5] B01J *21/04, 21/06, 23/22, 23/28*
U.S. Cl. 502—309 26 Claims

1. Arsenic resistant mixed oxide catalyst for reducing nitrogen oxides in flue gases in the presence of a reducing agent, comprising oxides consisting of at least the metals vanadium and molybdenum, having a MoO_3 phase and at least one oxygen-rich mixed oxide phase being at least partly converted into a mixed oxide phase being poorer in oxygen for increasing arsenic resistance, the mixed oxide phase being poorer in oxygen being a $V_9Mo_4O_{25}$ phase.

5,112,795

SUPPORTED SILVER CATALYST, AND PROCESSES FOR MAKING AND USING SAME

David M. Minahan, Cross Lanes; Erlind M. Thorsteinson, and Albert C. Liu, both of Charleston, all of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Oct. 12, 1990, Ser. No. 596,228
Int. Cl.[5] B01J *37/02, 23/68, 23/50, 23/89, 23/66, 23/08, 23/10, 23/14*
U.S. Cl. 502—324 49 Claims

1. A process for preparing a supported silver catalyst for the production of alkylene oxide by the vapor phase oxidation of alkene with an oxygen containing gas comprising:

contacting a silver-containing catalyst support with a solution comprising a solvent and at least one metal-containng promoter other than alkali metals or alkaline earth metals at conditions sufficient to associate the desired amount of said metal-containing promoter with said silver-containing catalyst support to enhance the performance of said supported silver catalyst, wherein said solvent does not coordination couple with said metal-containing promoter and said metal-containing promoter in said solution has an increased affinity to said silver-containing catalyst support relative to the affinity of said metal-containing promoter in a similar solution to a similar catalyst support without silver.

5,112,796

MANGANESE DIOXIDE IMPREGNATED FILTER

Joseph Iannicelli, Jekyll Island, Ga., assignor to Aquafine Corporation, Brunswick, Ga.

Continuation of Ser. No. 132,272, Dec. 14, 1987, abandoned, which is a division of Ser. No. 764,740, Aug. 12, 1985, Pat. No. 4,713,225, Continuation-in-part of Ser. No. 574,285, Feb. 26, 1984, abandoned. This application Jun. 12, 1990, Ser. No. 536,070
Int. Cl.[5] B01J *20/26, 20/10, 20/08, 20/24*
U.S. Cl. 502—402 20 Claims

1. A foraminous polyurethane foam filter or a fiber filter useful for removing particulates from a gas flowed therethrough having impregnated therein an essentially crystal-line manganese dioxide obtained by oxidizing manganese (II) hydroxide which had previously been precipitated throughout the filter by reacting manganese (II) ions with ammonia, said manganese dioxide being active for removal of Total Reduced Sulfur compounds from said gas.

5,112,797

DONOR SHEET FOR PRESSURE-SENSITIVE IMAGE RECORDING

Shunsuke Takahashi, Tokyo, and Hirokazu Tsukahara, Ushiku, both of Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Sep. 28, 1990, Ser. No. 589,519
Claims priority, application Japan, Nov. 30, 1989, 1-311118
Int. Cl.[5] B41M *5/40*
U.S. Cl. 503—200 3 Claims

1. A donor sheet for pressure-sensitive image recording which comprises a support, an undercoating layer applied onto said support, and an overcoating layer applied onto said undercoating layer, said undercoating layer comprising microcapsules containing a solid wax, and said overcoating layer comprising microcapsules containing an image-forming component.

5,112,798

HEAT-SENSITIVE RECORDING SHEET

Masahiro Miyauchi, Takasago, Japan, assignor to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Aug. 24, 1990, Ser. No. 571,999
Claims priority, application Japan, Oct. 13, 1989, 1-267097
Int. Cl.[5] B41M *5/30*
U.S. Cl. 503—209 4 Claims

1. A heat-sensitive recording sheet which comprises a support, an undercoat layer provided on said support and a heat-sensitive color forming layer provided on said undercoat layer, said heat sensitive color forming layer containing a colorless or palely colored dye precursor, a developer which reacts with said dye precursor upon application of heat to cause said dye precursor to form color, N-methylolbehenic acid amide, and at least one sensitivity enhancing agent.

5,112,799

HEAT TRANSFER IMAGE-RECEIVING SHEET

Noritaka Egashira, and Yoshinori Nakamura, both of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Oct. 17, 1989, Ser. No. 422,667
Claims priority, application Japan, Oct. 17, 1988, 63-259576; Oct. 21, 1988, 63-264026
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 7 Claims

1. An image-transfer system comprising:

a dye donor sheet comprising a substrate sheet and a dye layer formed thereon, said dye layer comprising a dye and a binder; and

an image-receiving sheet for receiving dye thermally transferred from said dye donor sheet, said image-receiving sheet comprising a base sheet and a dye receiving layer formed on at least one surface of said base sheet, said dye receiving layer comprising an acidic resin having an acid value of 2 or more.

5,112,800

PREPARATION OF SUPERCONDUCTING TL-BA-CA-CU-O THIN FILMS BY TL_2O_3 VAPOR PROCESSING

Allen M. Hermann, and Zhengzhi Sheng, both of Fayetteville, Ark., assignors to The University of Arkansas, Little Rock, Ark.

Continuation of Ser. No. 308,896, Feb. 9, 1989, Pat. No. 4,997,811, which is a continuation-in-part of Ser. No. 236,507, Aug. 25, 1988. This application Jul. 30, 1990, Ser. No. 559,900
The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.
Int. Cl.[5] B05D *5/12*
U.S. Cl. 505—1 11 Claims

2. A method for making thin-film Tl-Ca-Ba-Cu-O superconductors comprising the steps of:

mixing and heating $BaCO_3$, CaO, and CuO to obtain a Ca-Ba-Cu-O powder;

forming a Ca-Ba-Cu-O thin film from the Ca-Ba-Cu-O powder by physical or chemical deposition; and

heating the film in oxygen with a quantity of Tl_2O_3 in oxygen to create a Tl_2O_3 vapor processed film.

5,112,801

MECHANICAL ALIGNMENT OF PARTICLES FOR USE IN FABRICATING SUPERCONDUCTING AND PERMANENT MAGNETIC MATERIALS

William J. Nellis, Berkeley, and M. Brian Maple, Del Mar, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 24, 1990, Ser. No. 469,897
Int. Cl.[5] H01L *39/00*
U.S. Cl. 505—1 42 Claims

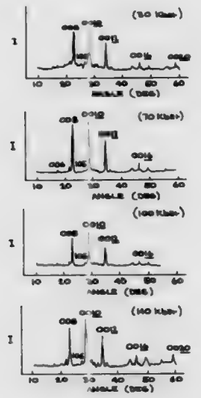
1. A method of fabricating oriented compacts of superconducting and/or permanent magnetic material comprising:

a. providing a base layer of support material,

b. mechanically orienting aligned superconducting or permanently magnetic particles into the desired orientation

on said base layer, without mixing said particles with a liquid,

c. optionally covering said particles with a support material,



d. fabricating the base layer and oriented particles assemblage into a desired construct and

e. recovering the resulting fabricated material.

5,112,802

SUPERCONDUCTING CERAMICS ELONGATED BODY AND METHOD OF MANUFACTURING THE SAME

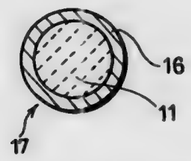
Satoshi Takano; Kenichi Takahashi; Kenji Miyazaki; Noriyuki Yoshida; Shinji Inazawa, and Noriki Hayashi, all of Osaka, Japan, assignors to Sumitomo Electric Co., Ltd., Osaka, Japan

Filed Aug. 22, 1988, Ser. No. 234,643

Claims priority, application Japan, Aug. 20, 1987, 62-207743; Aug. 20, 1987, 62-207744; Aug. 21, 1987, 62-208924; Aug. 21, 1987, 62-208925; Aug. 22, 1987, 62-208886; Aug. 22, 1987, 62-208887

Int. Cl.[5] **B32B** *9/00*

U.S. Cl. 505—1 **6 Claims**



1. A high T_c superconducting ceramics elongated body comprising:

a flexible ceramics elongated substrate comprising zirconia, alumina, magnesium oxide or strontium titanate;

an oxide ceramics superconducting layer formed on at least part of the surface of said ceramics substrate to longitudinally extend along said ceramics elongated substrate wherein the thickness of said superconducting ceramics elongated body is not more than 500 μm;

said superconducting layer having a layered perovskite crystal structure.

5,112,803

OCTALACTONE-CONTAINING COMPOSITION, FERMENTATION PROCESS FOR PRODUCING SAME AND ORGANOLEPTIC USES THEREOF

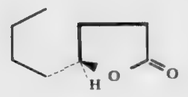
Mohamad I. Farbood, Holmdel; Lynda B. McLean, Matawan; James A. Morris, Howell, and Henry A. Bondarovich, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jun. 21, 1991, Ser. No. 719,154

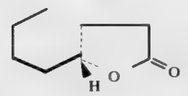
Int. Cl.[5] **A61K** *7/46*

U.S. Cl. 512—11 **4 Claims**

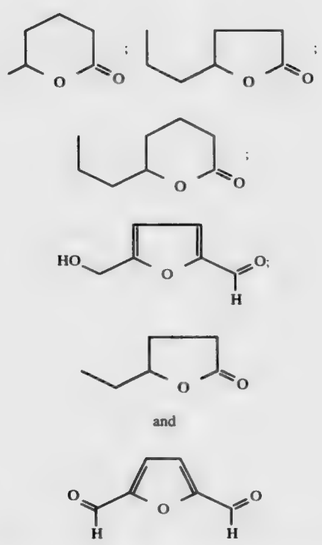
1. A process for augmenting or enhancing the aroma or taste of a consumable material comprising the step of intimately admixing with said consumable material an aroma or taste augmenting or enhancing quantity of a composition containing a significant amount of optically active gamma octalactones having the structures:



and

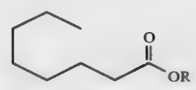


and, in addition, a mixture of compounds having the structures:



produced according to the process comprising the sequential steps of:

(i) carrying out a fermentation of a compound having the structure:



in the presence of an organism selected from the group consisting of:

Mortierella isabellina, ATCC 44583;

Mortierella isabellina, ATCC 38063;

Syncephalastrum racemosum, NRRL A-5889;

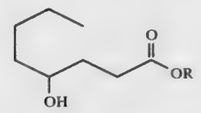
Mortierella isabellina, IFO 7884;

Mortierella ramanniana var. angulispora, IFO 8187;

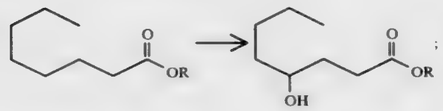
Mortierella isabellina, CBS 221.29; and

Mortierella isabellina, IFO 7873;

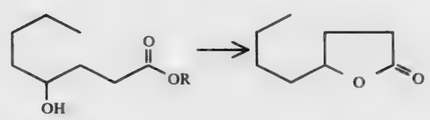
whereby compounds defined according to the structure:



are produced wherein R represents hydrogen or ethyl, according to the reaction:

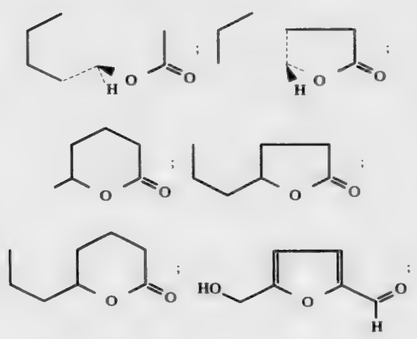


(ii) effecting lactonization of the resulting gamma hydroxy octanoic acid derivative according to the reaction:

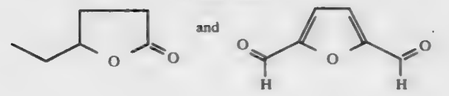


and

(iii) distilling the resulting mixture at a vapor temperature of 91°–98° C. and a pressure of 1–3 mm Hg to yield a mixture of compounds having the structures:



-continued



5,112,804

PHARMACEUTICAL COMPOSITION AND METHOD OF INTRANASAL ADMINISTRATION

Hanna R. Kowarski, Pikesville, Md., assignor to Temple University of the Commonwealth System of Higher Education, Philadelphia, Pa.

Continuation-in-part of Ser. No. 33,325, Apr. 1, 1987, abandoned. This application Sep. 14, 1989, Ser. No. 407,373

Int. Cl.[5] **A61K** *9/00, 37/26, 37/02*

U.S. Cl. 514—3 **32 Claims**

1. In a composition for the intranasal administration of a pharmaceutically active substance containing an effective amount of said pharmaceutically active substance, the improvement comprising the inclusion of glycyrrhetinic acid in an amount effective for enhancing permeation of said active substance across the nasal membrane, and a basic salt of an amino acid as an adjuvant,

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5,112,805

PHARMACEUTICAL PREPARATION FOR PROMOTING EPITHELIAL HEALING AND PREVENTION OF EPITHELIAL DESTRUCTION

Eeva-Marjatta Salonen, Espoo, Finland, assignor to Labsystems, OY, Helsinki, Finland

Continuation of Ser. No. 838,339, Mar. 11, 1986, Pat. No. 4,849,406. This application Apr. 11, 1989, Ser. No. 336,231

The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.

Int. Cl.[5] **A61K** *37/02, 37/64*

U.S. Cl. 514—8 **2 Claims**

1. An aprotinin eye drop composition consisting essentially of an opthalomogically acceptable carrier containing an amount of aprotinin ranging from about 5 IU/ml to about 200 IU/ml and about 10 μg/ml to about 1,000 μg/ml fibronectin therapeutically effective to inhibit the proteolytic activity of plasmin present in tear fluids of eyes characterized by plasmin-induced epithelial lesions, and hereby promote the healing of said epithelial lesions.

5,112,806

ANTIBIOTIC, MERSACIDIN, A PROCESS FOR THE PREPARATION THEREOF AND THE USE THEREOF AS A PHARMACEUTICAL

Sukumar Chatterjee; Sugata Chatterjee; Bimal N. Ganguli; Deepak K. Chatterjee; Rajendra K. H. Jani, all of Bombay, India; Richard H. Rupp, Königstein/Taunus, Fed. Rep. of Germany; Hans-Wolfram Fehlhaber, Idstein/Taunus, Fed. Rep. of Germany; Herbert Kogler, Kelkheim, Fed. Rep. of Germany; Gerhard Seibert, Darmstadt, Fed. Rep. of Germany, and Volker Teetz, Hofheim am Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 15, 1989, Ser. No. 393,953

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827868

Int. Cl.[5] **A61K** *37/02;* **C07K** *7/54*

U.S. Cl. 514—9 **3 Claims**

1. A compound of the formula I

5,112,807

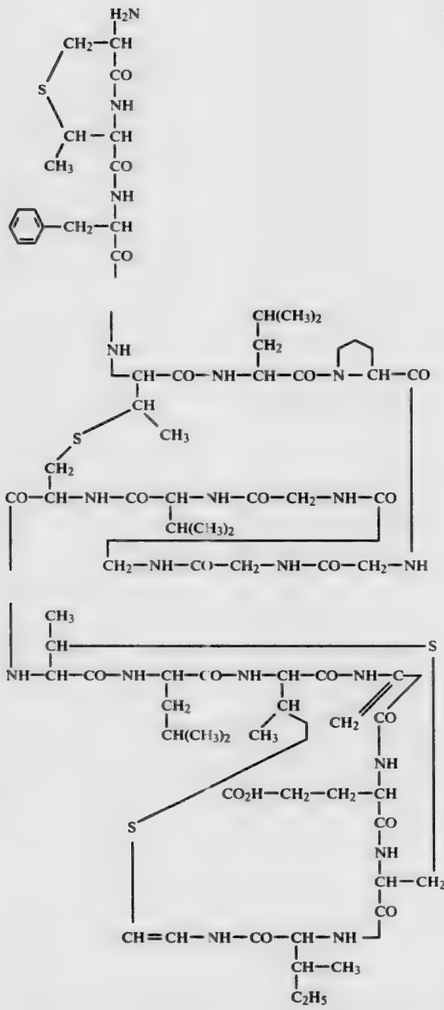
COMPOUND "LEUALACIN", ITS PREPARATION AND ITS USE IN THE TREATMENT OF CARDIOVASCULAR DISORDERS

Kiyoshi Hamano; Kouhei Furuya; Kazuhiko Tanzawa; Takeshi Kagasaki; Masaaki Miyamoto, and Takeshi Kinoshita, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Filed Sep. 5, 1989, Ser. No. 403,117
Claims priority, application Japan, Sep. 5, 1988, 63-221960
Int. Cl.[5] A61K *37/02;* **C07K** *7/50, 7/54, 11/02*
U.S. Cl. 514—11 **4 Claims**

1. A compound of formula (I):

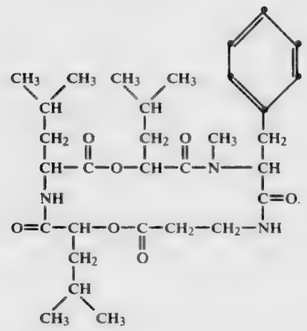
(I)



as made by and isolated from the cultivation of *Eubacterium Bacillus* sp. Y-85,54728 (DSM 4584), or a physiologically tolerated salt thereof.

3. A pharmaceutical composition comprising an antibiotically effective amount of a compound as claimed in claim **1**, and a pharmacologically acceptable carrier.

(I)



3. A method for the treatment of hypertension in an animal comprising the administration thereto of an effective amount of a calcium channel blocker, wherein said calcium channel blocker is the compound as claimed in claim **1**.

5,112,808

ALKYLATED HORMONE-RELEASING PEPTIDES AND METHOD OF TREATIG MAMMALS THEREWITH

David H. Coy, New Orleans, and William A. Murphy, Slidell, both of La., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 48,203, May 11, 1987, abandoned. This application May 10, 1988, Ser. No. 187,402
Int. Cl.[5] A61K *37/02;* **C07K** *7/10*
U.S. Cl. 514—12 **11 Claims**

1. A peptide having a formula:

R_1-A-Asp-Ala-Ile-Phe-Thr-Asn-Ser-Tyr-Arg-R-Val-Leu-Gly-Gln-Leu-Ser-Ala-R-R-Leu-Leu-Gln-Asp-Ile-I-Ser-R-NH_2,

wherein

R_1 is N^{α}-R_{18}-Tyr or N^{α}-R_{18}-D-Tyr;

A is Ala or D-Ala;

R is Arg or Lys;

I is Met or Nle;

R_{18} is straight or branched C_2–C_7 alkyl, cyclohexyl or benzyl; or a pharmaceutically acceptable salt thereof.

5,112,809

CRF ANALOGS

Jean E. F. Rivier, and Wylie W. Vale, Jr., both of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 209,537, Jun. 21, 1988, abandoned. This application Nov. 20, 1990, Ser. No. 615,838
Int. Cl.[5] C07K *7/38, 7/08;* **A61K** *37/02*
U.S. Cl. 514—12 **16 Claims**

1. A CRF agonist peptide having either the formula: Y-Ser-Glu-Glu-Pro-Pro-Ile-Ser-Leu-Asp-Leu-Thr-Phe-His-Leu-Leu-Arg-Glu-Val-Leu-His-Xaa_{21}-Ala-Arg-Ala-Glu-Xaa_{26}-Leu-Ala-Gln-Gln-Ala-Xaa_{32}-Ser-Asn-Arg-Xaa_{36}-Leu-Xaa_{38}-Ser-Asn-NH_2, or the formula: Y-Ser-Gln-Glu-Pro-Pro-Ile-Ser-Leu-Asp-Leu-Thr-Phe-His-Leu-Leu-Arg-Glu-Val-Leu-His-Xaa_{21}-Thr-Lys-Ala-Hsp-Xaa_{26}-Leu-Ala-Gln-Gln-Ala-Xaa_{32}-Ser-Asn-Arg-Xaa_{36}-Leu-Xaa_{38}-Asp-Ile-Ala-NH_2

wherein Y a: the N-terminus is hydrogen or an acyl group having 7 or less carbon atoms; from 1 to 5 residues can be deleted in sequence beginning at the N-terminus; Xaa_{21} is Met, Arg or Nle; Xaa_{26} is Gln or Gly; Xaa_{32} is His or Leu; Xaa_{36} is Lys or Asn; and Xaa_{38} is Met, Leu or Nle, or a nontoxic addition salt thereof.

5,112,810

METHOD FOR TREATING MULTIPLE SCLEROSIS

Yoshitaka Nagai, Tokyo; Hayao Abe, Chiba, and Masanobu Arita, Kanagawa, all of Japan, assignors to Mitsui Pharmaceuticals, Inc., Tokyo, Japan

Continuation of Ser. No. 420,617, Sep. 21, 1981, abandoned. This application May 15, 1985, Ser. No. 734,259
Claims priority, application Japan, Sep. 22, 1981, 56-148725
Int. Cl.[5] A61K *37/02, 35/16*
U.S. Cl. 514—15 **1 Claim**

1. A method for the treatment of multiple sclerosis comprising administering to a host an effective multiple sclerosis treating amount of serum thymic factor consisting of a nonapeptide of natural origin having an amino acid sequence of p—Glu—Ala—Lys—Ser—Gln—Gly—Gly—Ser—Asn—OH, wherein p—Glu represents pyroglutamic acid, Ala represents alanine, Lys represents lysine, Ser represents serine, Gln represents glutamine, Gly represents glycine, and Asn represents asparagine.

5,112,811

SDK PEPTIDES AND THERAPEUTIC COMPOSITIONS CONTAINING THEM

Maryse Lenfant, and Josiane Thierry, both of Yvette, France, assignors to Societe de Conseils de Recherches et d'Applications Scientifiques, Paris, France

Filed Mar. 6, 1990, Ser. No. 489,449
Claims priority, application United Kingdom, Mar. 11, 1989, 8905606
Int. Cl.[5] C07K *5/08, 5/10, 7/06*
U.S. Cl. 514—17 **11 Claims**

1. A peptide having the general formula

H_2N - W - Ser - Asp - Lys - X - OH

wherein X represents a Pro or Lys residue or a valence bond ; and W represents a Thr or Pro residue or a valence bond ; with the proviso that if X represents a Pro residue then W also represents a Pro residue, and therapeutically acceptable salts thereof.

5,112,812

PEPTIDE PREPARATION, A PROCESS FOR PRODUCING IT AND USE OF THE PEPTIDE PREPARATION

Ernst-Gunnar Samuelsson, Magnoliavej 40, DK-2000 Frederiksberg, and Otto M. Poulsen, Laasbyvej 19, DK-2610 Rodovre, both of Denmark

PCT No. PCT/DK86/00135, § 371 Date Oct. 16, 1987, § 102(e) Date Oct. 16, 1987, PCT Pub. No. WO87/03786, PCT Pub. Date Jul. 2, 1987
Continuation of Ser. No. 138,036, Oct. 16, 1987, abandoned. This PCT application Dec. 18, 1986, Ser. No. 728,322
Claims priority, application Denmark, Dec. 18, 1985, 5897/85
Int. Cl.[5] C07K *7/10*
U.S. Cl. 514—21 **21 Claims**

1. A hypoallergenic and substantially lactose-free composition, comprising peptides that are derived from the hydrolysis of substantially casein-free whey, wherein said composition is substantially lactose-free and the peptides that are derived from whey, have a maximum molecular weight of about 6,000 Daltons, whereby said composition contains substantially no substances that would cause an allergic reaction in an individual who is allergic to milk.

5,112,813

PROCESS FOR THE PREPARATION OF A VISCOSITY-STABLE ANTACID COMPOSITION

Joseph R. Luber, Lafayette Hills; Kenneth M. Feld, Chalfont; Richard J. Harwood, Bensalem, and Wayne M. Grim, Doylestown, all of Pa., assignors to Rhône-Poulenc Rorer Pharmaceuticals Inc., Fort Washington, Pa.

Continuation of Ser. No. 837,527, Mar. 7, 1986, Pat. No. 4,744,986. This application Mar. 7, 1988, Ser. No. 164,551
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.
Int. Cl.[5] A61K *31/715, 31/10, 33/08*
U.S. Cl. 514—54 **11 Claims**

1. A viscosity-stable aqueous antacid composition containing an alginic acid salt and a stabilized aluminum-containing antacid, and prepared by the process comprising:

(A) forming an aqueous mixture of an alginic acid salt and an aluminum-containing antacid material having a tendency to form reaction products which effect the viscosity of said composition:

(B) forming a stabilized reaction product comprising said stabilized aluminum-containing antacid under conditions which include heating said aqueous mixture to an elevated temperature; and

(C) recovering the stabilized reaction product in a form which is capable of being used as a viscosity-stable aqueous antacid composition.

5,112,814

METHOD OF TREATMENT OF PARKINSON'S DISEASE USING PHYTIC ACID

Robert Sabin, Goosedown Estate, Box 332, Horseshoe Rd., Mill Neck, Long Island, N.Y. 11765

Filed Oct. 24, 1990, Ser. No. 602,819
Int. Cl.[5] A61K *31/66*
U.S. Cl. 514—75 **7 Claims**

1. A method of treating Parkinson's Disease comprising administering to a subject an effective sympton-alleviating amount of one or more compounds selected from the group consisting of phytic acid, a phytate salt, and an isomer or hydrolysate of phytic acid or a phytate salt.

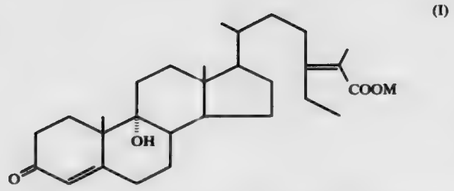
5,112,815

NOVEL 9 PH-DROXY-3-OXO-4, 24 (25)-STIGMASTADIEN-26-OIC ACID DERIVATIVES, A PROCESS FOR PREPARING SAME AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Gábor Ambrus; Andrea Maderspach; Antalné Jekkel; András Jávor; Éva Ilkoy; György Hajós; László Szporny, all of Budapest; József Nagy, Debrecen; Gyula Horváth, Budapest, and Imre Moravcsik, Budapest, all of Hungary, assignors to Richer Gedeon Vegyeszet, Budapest, Hungary

PCT No. PCT/HU90/00033, § 371 Date Feb. 17, 1991, § 102(e) Date Feb. 17, 1991, PCT Pub. No. WO90/13559, PCT Pub. Date Nov. 15, 1990
PCT Filed May 10, 1990, Ser. No. 635,623
Claims priority, application Hungary, May 11, 1989, 2359/89
Int. Cl.[5] C07J *51/00;* **A61K** *31/56*
U.S. Cl. 514—178 **6 Claims**

1. A 9α-hydroxy-3-oxo-4,24(25)-stigmastadien-26-oic acid derivative of the formula (I),



(I)

wherein M stands for hydrogen, C_{1-4} alkyl or a pharmaceutically acceptable cation.

5,112,816

CORTICORSTEROID-CONTAINING OINTMENTS

Takashi Narui, Sakura; Tetsuo Kaneko, Narita; Katsumi Imamori, and Akira Iwase, both of Yotsukaido, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1990, Ser. No. 577,559

Int. Cl.[5] A61K *31/57, 31/58, 9/06*

U.S. Cl. 514—179 **9 Claims**

1. An anhydrous ointment consisting essentially of the following ingredients (a) and (b):

(a) 0.05–1 wt % of deprodone propionate; and

(b) 89–99.95 wt % of a base formed of white petrolatum and a liquid hydrocarbon,

wherein the white petrolatum is present in an amount of 74–98.95 wt % of (b), and the liquid hydrocarbon is present in an amount of 1–15 wt % of (b).

5,112,817

QUINOLINE DERIVATIVES

Nobuyuki Fukazawa; Makoto Odate; Tsuneji Suzuki, all of Yokohama; Kengo Otsuka, Kamakura; Takashi Tsuruo, and Wakao Sato, both of Tokyo, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

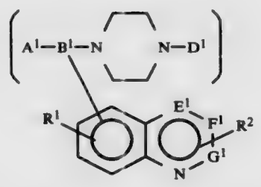
Filed Oct. 6, 1989, Ser. No. 417,780

Claims priority, application Japan, Oct. 6, 1988, 63-250897; Jun. 22, 1989, 1-158315

Int. Cl.[5] C07D *403/12;* **A61K** *31/38*

U.S. Cl. 514—183 **12 Claims**

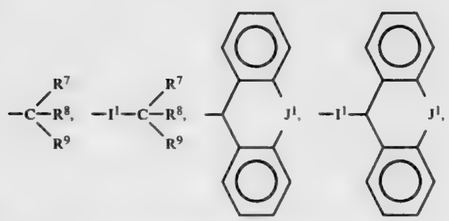
1. A compound of the formula:



(I)

in which A^1 represents an oxygen or sulfur atom, an amino or $—NR^3$ group, which is bound to any available position on the condensed ring; B^1 represents $—(CH_2)_n—$ or

D^1 represents



E^1, F^1 and G^1 each independently represent a carbon or nitrogen atom; R^1 and R^2 each independently represent a hydrogen or halogen atom, a lower alkyl, amino group, substituted amino group, a lower alkoxy, lower alkylthio, lower alkylsulfonyl, trifluoromethyl, cyano, nitro or amide, where R^1 and R^2 may be on any position available on the condensed ring or one each on each of the rings or both on the same ring of which the condensed ring is formed; R^3 represents a lower alkyl or acyl group; R^4 represents a hydroxyl or lower acyloxy group; R^7, R^8 and R^9 each independently represent a hydrogen atom or a phenyl or substituted phenyl group; I^1 represents an oxygen atom, $—(CH_2)_l—$ or



J^1 represents $—(CH_2)_m—$, $—CH=CH—$, $—OCH_2—$ or an oxygen atom; n represents an integer of 2 to 5; l represents an integer of 1 or 2, and m represents an integer 0, 1 or 2, or a pharmaceutically acceptable salt thereof.

5,112,818

2-(2-CYCLOPROPYLPYRROLIDIN-4-YLTHIO)CARBAPENHEM DERIVATIVES

Susumu Nakagawa; Koji Yamada, and Ryosuke Ushijima, all of Okazaki, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

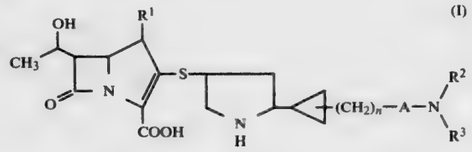
Filed Dec. 28, 1990, Ser. No. 635,218

Claims priority, application Japan, Dec. 29, 1989, 1-342948

Int. Cl.[5] C07D *487/04;* **A61K** *31/40*

U.S. Cl. 514—210 **8 Claims**

1. A compound of the formula:



(I)

wherein R_1 is a hydrogen atom or a methyl group, each of R^2 and R^3 which may be the same or different, is a hydrogen atom or a lower alkyl group, or R^2 and R^3 form together with the adjacent nitrogen atom a heterocyclic group selected from the group consisting of an aziridinyl group, an azetidinyl group, a pyrrolidinyl group, a piperidino group, a piperazinyl group and a morpholino group, A is a carbonyl group or a single bond, and n is an integer of from 0 to 3; or a pharmaceutically acceptable salt or ester thereof.

8. A method for the treatment of infectious diseases caused by pathogenic bacteria which comprises administering an antimicrobially effective amount of the compound of claim 1 to a human being or animal.

5,112,819

IMIDAZOLE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND USE

Barry C. Ross, Luton; Barrie E. Kirk, Ickenham; Michael G. Lester, Rickmansworth; Panayiotis A. Procopiou, Harrow, and Nigel S. Watson, Chalfont St. Giles, all of England, assignors to Glaxo Group Limited, London, England

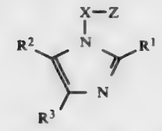
Filed Oct. 9, 1990, Ser. No. 593,954

Claims priority, application United Kingdom, Oct. 10, 1989, 8922767; Mar. 30, 1990, 9007155

Int. Cl.[5] C07D *223/04, 233/64;* **A61K** *31/55, 31/415*

U.S. Cl. 514—212 **13 Claims**

1. A compound of formula (I):



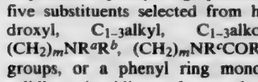
(I)

in which one of the groups R^1 or R^2 represents a C_{1-6}alkyl group optionally substituted by one to three halogen atoms and the other represents a phenyl ring optionally substituted by one to five substituents selected from halogen atoms and hydroxyl, C_{1-3}alkyl, C_{1-3}alkoxy, $S(O)_n$. C_{1-3}alkyl, $(CH_2)_mNR^aR^b$, $(CH_2)_mNR^cCOR^d$ and trifluoromethyl groups, or a phenyl ring monosubstituted by a pyrrolidino, piperidino or hexamethylenimino ring;

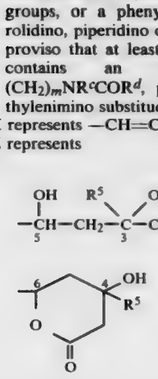
R^3 represents a phenyl ring optionally substituted by one to five substituents selected from halogen atoms and hydroxyl, C_{1-3}alkyl, C_{1-3}alkoxy, $S(O)_nC_{1-3}$alkyl, $(CH_2)_mNR^aR^b$, $(CH_2)_mNR^cCOR^d$ and trifluoromethyl groups, or a phenyl ring monosubstituted by a pyrrolidino, piperidino or hexamethylenimino ring, with the proviso that at least one of the groups R^1, R^2 and R^3 contains an $S(O)_nC_{1-3}$alkyl, $(CH_2)_mNR^aR^b$, $(CH_2)_mNR^cCOR^d$, pyrrolidino, piperidino or hexamethylenimino substituent;

X represents $—CH=CH—$; and

Z represents



(a)



(b)

m represents zero, 1, 2, 3 or 4;

n represents zero, 1 or 2;

R^a and R^b, which may be the same or different, each represent a hydrogen atom, a C_{1-4}alkyl group, or a saturated monocyclic 5 to 7 membered ring;

R^c represents a hydrogen atom or a C_{1-4}alkyl group;

R^d represents a hydrogen atom, a C_{1-4}alkyl group or a C_{1-4}alkoxy group;

R^4 represents a hydrogen atom or a physiologically acceptable cation, or the group $—CO_2R^4$ represents a physiologically acceptable and metabolically labile ester;

R^5 represents a hydrogen atom or a C_{1-3}alkyl group;

or a physiologically acceptable solvate thereof, or a physiologically acceptable acid addition salt thereof when R^4 represents hydrogen or the group $—CO_2R^4$ represents a physiologically acceptable and metabolically labile ester group when Z is (a), or a quaternary ammonium derivative thereof when a group $(CH_2)_mNR^aR^b$ or a pyrrolidino, piperidino or hexamethylenimino group is present.

5,112,820

ANTI-GLAUCOMA COMPOSITIONS CONTAINING 2- AND 3-AMINOMETHYL-6-ARYLCARBONYL- OR 6-PHENYLTHIO-2,3-DIHYDROPYRROLO-(1,2,3-DE)-1,4-BENZOXAZINES AND METHOD OF USE THEREOF

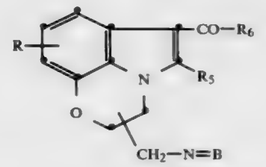
Susan J. Ward, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Mar. 5, 1990, Ser. No. 489,307

Int. Cl.[5] A61K *31/535, 31/55, 31/395*

U.S. Cl. 514—230.2 **5 Claims**

1. A method for the treatment of glaucoma which comprises administering to a patient in need of such treatment a medicament containing an effective intraocular pressure reducing amount of a compound having the formula:



where:

R is hydrogen or from one to two substituents selected from the group consisting of lower-alkyl, lower-alkoxy, hydroxy or halogen in the 7-, 8- or 9- positions;

R_5 is hydrogen or lower-alkyl;

R_6 is phenyl (or phenyl substituted by from one to two substituents selected from the group consisting of chlorine, bromine, fluorine, lower-alkoxy, hydroxy, lower-alkyl, lower-alkylmercapto, lower-alkylsulfinyl or lower-alkylsulfonyl), methylenedioxyphenyl, 1- or 2-naphthyl (or 1- or 2-naphthyl substituted by from one to two substituents selected from the group consisting of lower-alkyl, lower-alkoxy, hydroxy, bromine, chlorine, fluorine, lower-alkylmercapto, lower-alkyl-sulfinyl or lower-alkylsulfonyl) or 2-, 3-, 4-, 5-, 6-, 7- or 8-quinolyl; and

N=B is amino, N-lower-alkylamino, N,N-di-lower-alkylamino, 4-morpholinyl, 4-thiomorpholinyl, 1-piperidinyl, 1-pyrrolidinyl, 1-azetidinyl, 4-lower-alkyl-1-piperazinyl or 1-(hexahydro-4H-1,4-diazepinyl) or an acid-addition salt thereof.

5,112,821

EXCITATORY AMINO ACID ANTAGONISTS WHICH ARE CERTAIN THIENOPYRIDIVES

Boyd L. Harrison, and Bruce M. Baron, Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

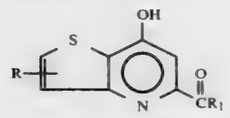
Division of Ser. No. 496,748, Mar. 21, 1990, Pat. No. 5,026,700, which is a continuation-in-part of Ser. No. 352,423, May 16, 1989, abandoned. This application Feb. 14, 1991, Ser. No. 654,997

Int. Cl.[5] A61K *31/435;* **C07D** *495/04*

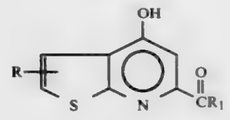
U.S. Cl. 514—233.8 **8 Claims**

1. A compound of the formulae:

Formula II

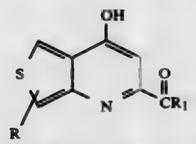


Formula III



-continued

Formula IV



in which R_1 is represented by a substituent selected from the group consisting of $—NR_3R_4$, —OH, $—OR_5$, $—OCH_2OCOR_6$ and, $—O—(CH_2)p\ NR_7R_8$, in which p is an integer from 1–4; R_3 and R_4 are each independently represented by hydrogen or a C_{1-6} alkyl; R_5 nd R_6 are each independently represented by C_{1-6} alkyl, phenyl, substituted phenyl, or an alkylphenyl substituent in which the phenyl ring may be optionally substituted; R_7 and R_8 are independently represented by a C_{1-6} alkyl or together with the adjacent nitrogen atom form a piperidino, morpholino, or pyrrolidinyl group;

R, which is optionally present, represents 1 or 2 substituents selected from the group consisting of OH, halogen, CN, NO_2, C_{1-6} alkyl, C_{1-6} alkoxy, CF_3, OCF_3, $COOR_3$, and $CONR_3R_4$ in which R_3 and R_4 are each independently as defined above; the pharmaceutically acceptable acid addition salts thereof and the pharmaceutically acceptable basic addition salts thereof; with the proviso that in the compounds of Formula IV, R is not $COOR_3$.

5,112,822

(2-IMIDAZOLIN-2-YLAMINO) QUINOXALINE DERIVATIVES AND METHODS FOR USING SAME

Charles Gluchowski, Mission Viejo, Calif., assignor to Allergan, Inc., Irvine, Calif.

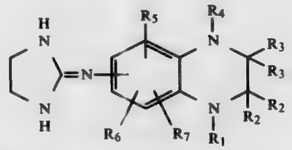
Continuation-in-part of Ser. No. 420,817, Oct. 12, 1989, Pat. No. 5,077,292. This application Jul. 31, 1990, Ser. No. 560,776

The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.

Int. Cl.[5] A61K *31/495;* **C07D** *403/10*

U.S. Cl. 514—249 **37 Claims**

1. A compound selected from the group consisting of those having the formula



and pharmaceutically acceptable acid addition salts thereof, wherein R_1 and R_4 are independently selected from the group consisting of H and alkyl radicals having 1 to 4 carbon atoms; the R_2s are each H or alkyl radicals having 1 to 4 carbon atoms or are, together, oxo; the R_3s are each H or alkyl radicals having 1 to 4 carbon atoms or are, together, oxo, provided that said R_2s or said R_3s are alkyl radicals; the 2-imidazolin-2-ylamino group may be in any of the 5-, 6-, 7- or 8- positions of the quinoxaline nucleus; and R_5, R_6 and R_7 each is located in one of the remaining 5-, 6-, 7- or 8-positions of the quinoxaline nucleus and is independently selected from the group consisting of Cl, Br, H and alkyl radicals having 1 to 3 carbon atoms.

5,112,823

3(2H)-PYRIDAZINONE DERIVATIVES AND THE USE THEREOF FOR CONTROLLING PESTS

Joachim Leyendecker, Ladenburg; Hans-Juergen Neubauer, Muenster-Hiltrup; Uwe Kardorff, Mannheim; Thomas Kuekenhoehner, Frankenthal; Christoph Kuenast, Otterstadt, and Peter Hofmeister, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 12, 1990, Ser. No. 508,206

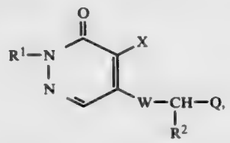
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1989, 3914337

Int. Cl.[5] C07D *237/16*

U.S. Cl. 514—252 **5 Claims**

1. A 3(2H)-pyridazinone compound of the formula I

(I)



where R^1 is C_1–C_8-alkyl, R^2 is hydrogen or C_1–C_4-alkyl, X is halogen, W is oxygen or sulfur, and Q is a 5-membered heterocyclic radical selected from the group consisting of 1,2,4-oxadiazole, 1,3,4-oxadiazole, 1,2,4-thiadiazole, 1,3,4-thiadiazole, 1,2,4-triazole and 1,3,4-triazole, wherein the triazole radicals are linked via a nitrogen atom and the other heterocyclic radicals via a carbon atom, and which is unsubstituted or mono- to trisubstituted by halogen, C_1–C_8-alkyl, C_2–C_6-alkenyl, C_2–C_4-alkynyl, C_1–C_4-haloalkyl, C_1–C_8-alkoxy, C_2–C_8-alkoxyalkyl, C_3–C_8-cycloalkyl, cyano, nitro, phenyl, naphthyl or C_7–C_{12}-phenylalkyl which are unsubstituted or mono- to trisubstituted by halogen, C_1–C_8-alkyl, C_1–C_8-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, cyano or nitro, and plant-tolerated salts thereof.

5,112,824

BENZOFURAN COMPOUNDS AS CLASS III ANTIARRHYTHMIC AGENTS

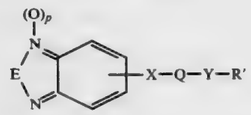
John J. Baldwin, Gwynedd Valley; Harold G. Selnick, Ambler; Gerald S. Ponticello, Lansdale; David C. Remy; David A. Claremon, both of North Wales, and Jason M. Elliott, Blue Bell, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 447,941, Dec. 8, 1989, Pat. No. 5,032,604. This application Jul. 15, 1991, Ser. No. 730,332

Int. Cl.[5] A61K *31/495, 31/445;* **C07D** *403/00, 211/68*

U.S. Cl. 514—253 **6 Claims**

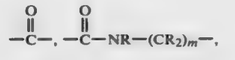
1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein:

Q is piperazine or piperidine;

X and Y are independently:



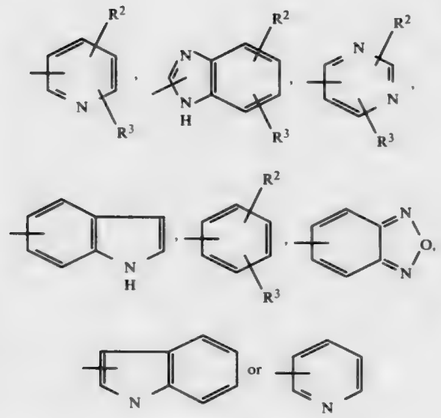
$—(CH_2)—_m$, $—O(CH_2)_m—$, $—(CH_2)_mO—$, $—SO_2—$, $—CH_2NR(CH_2)_m$ or a bond when p is O, and R is H or C_{1-6}-alkyl;

m is 1, 2 or 3;

E is —O— or —S—

p is 0, or 1;

R^1 is hydrogen or a mono- or bicyclic system selected from:



R^2 and R^3 are independently selected from:

1) hydrogen,

2) C_{1-3} alkyl, either unsubstituted or substituted with

a) $—N(R)_2$,

b) $—CON(R)_2$,

c) $—CO(C_{1-6}alkyl)$,

d) $—O(C_{1-6}alkyl)$,

e) —OH, or

f) $—S(O)_n(C_{1-6}alkyl)$ wherein n is 0, 1 or 2;

3) C_{1-3} alkoxy,

4) $—N(R)SO_2C_{1-6}alkyl$,

5) $—N(R)SO_2(CH_2)_nCO_2\ C_{1-6}alkyl$,

6) $—NO_2$,

7) $—N(R)COC_{1-3}alkyl$,

8) $—N(R)SO_2—C_6H_4—R$

9) $—NHCO—C_6H_4—R$,

10) $—N(R)_2$,

11) halo,

12) $—C_{2-6}alkanoyl$,

13) $—CON(R)_2$,

14) —CN,

15) $—CO_2\ C_{1-6}alkyl$

16) benzoyl, either unsubstituted or substituted with C_{1-6}alkyl, C_{1-6}alkoxy, halo or hydroxy

17) $—NRCOO(C_{1-6}alkyl)$,

18) —NRCOO phenyl either unsubstituted or substituted with C_{1-6}alkyl, C_{1-6}alkoxy, hydroxy or halo,

19) $—NR\ CON(R)_2$,

20) $—S(O)_nC_{1-6}alkyl$,

21) $—S(O)_nphenyl$, either unsubstituted or substituted with C_{1-6}alkyl, C_{1-6}alkoxy, hydroxy, or halo,

22) $—CF_3$,

23) —phenyl, either unsubstituted or substituted with C_{1-6}alkyl, C_{1-6}alkoxy, halo, or hydroxy,

24) imidazolyl, or

25) $—SO_2\ N(R)_2$,

R^2 and R^3 taken together may be methylenedioxy or ethylenedioxy.

5,112,825

ANTIRHINOVIRAL HETEROAMINE-SUBSTITUTED PYRIDAZINES

Raymond A. Stokbroekx, Beerse, and Marcel J. M. Van der Aa, Kasterlee, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 351,754, May 15, 1989, abandoned. This application Apr. 30, 1990, Ser. No. 516,485

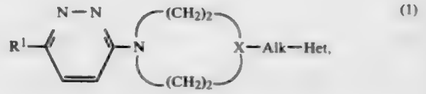
Claims priority, application United Kingdom, May 16, 1989, 8911158

Int. Cl.[5] C07D *237/06*

U.S. Cl. 514—253 **16 Claims**

1. A compound of the formula:

(1)



an addition salt thereof or a stereochemically isomeric form thereof, wherein:

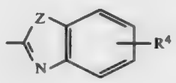
Het is a radical of the formula:

(a-1)



or

(a-2)

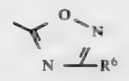


wherein

Z is O, S, SO, or SO_2; and

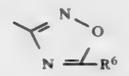
R^4 is a radical of formula $—COOR^5$ wherein R^5 represents C_{1-4}alkyl, C_{3-5}alkenyl, C_{3-5}alkynyl, or C_{1-4}alkyloxyC_{1-4}alkyl, or R^4 represents a radical of the formula:

(b-2)



or

(b-3)



wherein

R^6 represents hydrogen or C_{1-4}alkyl;

R^1 is hydrogen, C_{1-4}alkyl, halo, hydroxy, or C_{1-4}alkyloxy; and

X is CH or N.

5,112,826

VASODILATORY DIHYDRODIBENZOCYCLOHEPTYLIDEN-ETHYLPIPERAZINE DERIVATIVES

Xavier D. Cirera, 271 Avenida Argentina; Romeo R. Andreoli, 6 Calle Roca i Batlle; Pedro P. Lloveras, 94 Calle Viverett; Leonida Bruseghini, 5 Calle Caponata, and Jose P. Irurre, 184 Calle Mayor de Sarria, all of Barcelona, Spain

Filed Apr. 12, 1989, Ser. No. 336,881

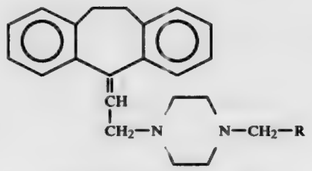
Claims priority, application Spain, Aug. 2, 1983, 524680

Int. Cl.[5] A61K *31/495;* **C07D** *295/00*

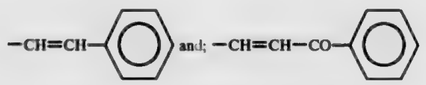
U.S. Cl. 514—255 **5 Claims**

1. A dihydrodibenzocycloheptylidenethylpiperazine compound having a vasodilatory effect of the formula:

I-B



wherein R represents a substituent selected from the group consisting of —CO=CH$_2$; —CH=CH—CO$_2$CH$_3$; —CO$_2$C$_2$H$_5$;



and; —CH=CH—CO—

or a pharmaceutically acceptable salt thereof.

4. A vasodilating pharmaceutical composition containing, as an active ingredient, a therapeutically effective amount of a compound according to claim **6** and a pharmaceutical carrier.

5,112,827

DRUG TO REVERSE FATTY LIVER AND ATHEROMATOUS LESIONS

J. Palmer Saunders, and Errol E. Kalmaz, both of Galveston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed May 18, 1990, Ser. No. 526,132

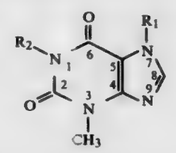
Int. Cl.[5] A61K *31/52*

U.S. Cl. 514—263 **20 Claims**

1. A method for reversing arterial plaque deposits comprising:

identifying a patient having arterial plaque deposits;

administering to the patient a plaque deposit reversing regimen of a methylxanthine compound having the formula:



and;

continuing administration of the methylxanthine compound until there is a reversal of the arterial plaque deposit;

wherein R_1 is hydrogen or methyl and wherein R_2 is hydrogen, a ketone or an alkyl having between 1 and 10 carbon atoms; and wherein R_2 is not hydrogen when R_1 is hydrogen.

5,112,828

PYRIDINE COMPOUNDS WHICH ARE USEFUL AS FUNGICIDES

Bernhard Zipperer, Dirmstein; Hubert Sauter, Mannheim; Eberhard Ammermann, Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

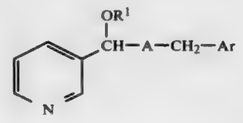
Filed Mar. 30, 1990, Ser. No. 502,401

Claims priority, application Fed. Rep. of Germany, May 5, 1989, 3914820

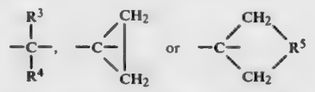
Int. Cl.[5] C07D *213/55, 213/28, 213/30;* **A61K** *31/44*

U.S. Cl. 514—277 **8 Claims**

3. A method for combating fungi, wherein the fungi, or the materials, plants, soils or seed threatened by fungus attack are treated with a fungicidally effective amount of a pyridine compound of the formula



where R^1 is hydrogen; A is one of the groups



where R^3 and R^4 are identical or differ and each is C_1–C_6-alkyl, with the proviso that R^3 and R^4 are not simultaneously methyl; R^5 is one of the groups $(CH_2)_n$, n denoting 1, 2, 3, 4 or 5; Ar is phenyl which is unsubstituted or bears from one to five substituents selected from the group consisting of C_1–C_6-alkyl, phenyl, halogen, C_1–C_6-haloalkyl, C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_6-alkoxyiminocarbyl, phenoxy, halophenoxy and benzyloxy, or the N-oxide or plant-tolerated acid addition salt thereof.

5,112,829

HEXAHYDRO-1H-QUINO[4,3,2-ef][1,4]BENZOXAZEPINES AND RELATED COMPOUNDS

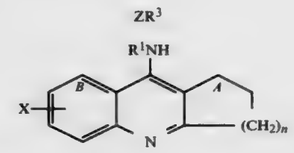
Gregory M. Shutske, Somerset; Kevin J. Kapples, Little York, both of N.J., and John D. Tomer, IV, Perkasie, Pa., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 443,288, Nov. 28, 1989, Pat. No. 4,994,452. This application Aug. 6, 1990, Ser. No. 563,141

Int. Cl.[5] A61K *31/37;* **C07D** *491/052*

U.S. Cl. 514—290 **20 Claims**

1. A compound of the formula



wherein R^1 is H, loweralkyl, or benzyl; R^3 is a group of the formula CH_2CHR^2Hal wherein R^2 is hydrogen, loweralkyl, or phenyl and Hal is chloro, bromo, or iodo, or a group of the formula $CHR^2CO_2R^5$ wherein R^2 is as above and R^5 is H or loweralkyl; Z is O or S; X is H, halogen, loweralkoxy, loweralkyl, or trifluoromethyl; n is 1, 2 or 3; the group ZR^3 is bound to either the A- or B-position of the heteroaromatic nucleus; the pharmaceutically acceptable salts thereof; and the optical isomers thereof.

5,112,830

FUSED HETEROALKYLENE QUINOLINAMINES

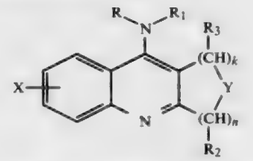
Gregory M. Shutske, Somerset, and Richard C. Effland, Bridgewater, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 337,603, Apr. 13, 1989, Pat. No. 5,002,955, which is a division of Ser. No. 171,103, Apr. 4, 1988, Pat. No. 4,843,079, and a continuation-in-part of Ser. No. 41,562, Apr. 23, 1987, abandoned. This application Jan. 10, 1991, Ser. No. 645,384

Int. Cl.[5] A61K *31/38, 31/435;* **C07D** *491/04*

U.S. Cl. 514—291 **51 Claims**

1. A compound of the formula



wherein R is hydrogen, loweralkyl or loweralkylcarbonyl; R_1 is hydrogen, loweralkyl, loweralkylcarbonyl, aryl, diloweralkylaminoloweralkyl, arylloweralkyl, diarlloweralkyl, oxygen-bridged arylloweralkyl, or oxygen-bridged diarylloweralkyl; k is 0,1,2 or 3; n is 1,2,3 or 4; X is hydrogen, loweralkyl, cycloalkyl, loweralkoxy, halogen, hydroxy, nitro, trifluoromethyl, formyl, loweralkylcarbonyl, arylcarbonyl, —SH, loweralkylthio, —NHCOR$_4$ or —NR$_5$R$_6$, R_4 being hydrogen or loweralkyl, and R_5 and R_6 being independently hydrogen, loweralkyl or cycloalkyl; Y is O or S; and each R_2 and each R_3 are independently hydrogen or loweralkyl, or taken together form a methylene or ethylene bridge constituting a part of a ring of at least five atoms; a stereo, optical or geometrical isomer thereof, or a pharmaceutically acceptable acid addition salt thereof.

5,112,831

Patent Not Issued For This Number

5,112,832

CERTAIN CYCLOPENTA[β]PYRIDINES AND 5,6,7,8-TETRAHYDROQUINOLINES HAVING ANTI-INFLAMMATORY ACTIVITY

Roger Crossley, Reading; Albert Opalko, Maidenhead, and Robin G. Shepherd, Windsor, all of United Kingdom, assignors to John Wyeth & Brother Limited, Maidenhead, England

Division of Ser. No. 367,531, Jun. 16, 1989, Pat. No. 4,975,431. This application Aug. 8, 1990, Ser. No. 564,265

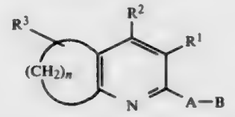
Claims priority, application United Kingdom, Jun. 17, 1988, 8814458

Int. Cl.[5] A61K *31/435;* **C07D** *221/04, 215/14*

U.S. Cl. 514—299 **3 Claims**

1. A compound of formula

(I)



or a salt thereof, wherein R^1 and R^2 each independently represent hydrogen, lower alkyl, lower alkoxy, carboxyloweralkyl, carboxy, hydroxyloweralkyl, halogen, haloloweralkyl, lower alkoxycarbonyl, optionally substituted phenyl or optionally substituted benzyl, n represents an integer of 3 or 4; R^3 optionally represents single or multiple substitution on one or more of the aliphatic carbons by one or more substituents selected from lower alkyl, phenyl, benzyl, or phenyl or benzyl substituted by halogen, lower alkyl or lower alkoxy; A represents a group of formula (i) or (ii) below:

—CR^{4}R^5— (i)

—CX— (ii)

in which R^4 represents hydrogen or lower alkyl R^5 represents OH, and X is =O, and B represents an optionally substituted phenyl, naphthyl, furyl, thienyl, pyrrolyl, pyridinyl, pyrimidinyl, quinolyl, isoquinolyl, benzimidazolyl, thiazolyl or imidazolyl radical and when optionally substituted, R^1, R^2 and B are optionally substituted by one or more substituents selected from the group halogen, loweralkyl, loweralkyloxy, haloloweralkyl, haloloweralkyloxy, nitro, amino, cyano, loweralkylamino, diloweralkylamino, carboxy, loweralkyloxycarbonyl, acyl, acylamino, phenyl or aminoloweralkyl; with the further proviso that when —A—B represents a 2-chloroquinolin-4-oyl group and R^1, R^2 and R^3 are hydrogen, then n is 3.

5,112,833

1-AZAINDOLIZINE DERIVATIVES, SYNTHETIC INTERMEDIATES THEREOF AND ANTIALLERGIC AGENTS CONTAINING 1-AZAINDOLIZINE DERIVATIVES

Muneaki Takase, Tokyo; Toshihiko Komatsu, Saitama; Toshiyuki Matsuno, Saitama; Akihisa Miyakawa, Saitama, and Kenichi Saito, Saitama, all of Japan, assignors to Zenyaku Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP89/01302, § 371 Date Jun. 26, 1991, § 102(e) Date Jun. 26, 1991, PCT Pub. No. WO90/07508, PCT Pub. Date Jul. 12, 1990

PCT Filed Dec. 26, 1989, Ser. No. 688,569

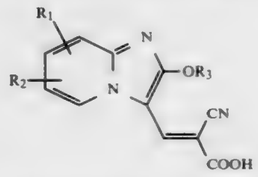
Claims priority, application Japan, Dec. 26, 1988, 63-328669

Int. Cl.[5] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—300 **9 Claims**

1. 1-Azaindolizine derivatives or pharmaceutically acceptable salts thereof represented by formula (I)

(I)



wherein R_1 and R_2 independently represent hydrogen atom, halogen atom, C_{1-4} alkyl group or C_{1-4} alkoxy group; R_3 represents C_{1-6} alkyl group, substituted C_{1-4} alkyl group wherein the substituent is C_{3-5} cycloalkyl group, hydroxyl group, acetylamino group, C_{1-4} alkoxy group or cyano group or C_{2-4} alkenyl group.

5,112,834

IMIDAZOLE PROTECTORANT FOR THE STOMACH AND INTESTINE

Jörg Senn-Bilfinger, Konstanz, Fed. Rep. of Germany, assignor to BYK Gulden Lomberg Chemische Fabrik GmbH, Konstanz, Fed. Rep. of Germany

PCT No. PCT/EP88/00638, § 371 Date Jan. 16, 1990, § 102(e) Date Jan. 16, 1990, PCT Pub. No. WO89/00570, PCT Pub. Date Jan. 26, 1989

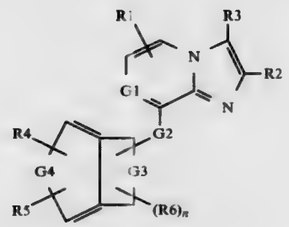
PCT Filed Jul. 14, 1988, Ser. No. 445,611

Claims priority, application Switzerland, Jul. 16, 1987, 02709/87; Feb. 4, 1988, 00390/88

Int. Cl.[5] C07D *471/04, 487/04;* **A61K** *31/435, 31/495*

U.S. Cl. 514—300 **11 Claims**

1. A compound of formula I



(I)

wherein
R1denotes hydrogen (H) or halogen,
R2 denotes hydrogen (H), 1-4C-alkyl, hydroxy-1-4C-alkyl, halo-1-4C-alkyl, cyano-1-4alkyl or 1-4C-alkoxycarbonyl,
R3 denotes hydrogen (H), 1-4C-alkyl, formyl, hydroxy-1-4C-alkyl, halo-1-4C-alkyl, cyano-1-4C-alkyl, amino-1-4C-alkyl, mono- or di-1-4C-alkylamino-1-4C-alkyl, nitroso, nitro, amino, mono- or di-1-4C-alkylamino or 1-4C-alkoxycarbonyl,
R4 denotes hydrogen (H), 1-4C-alkyl, 1-4C-alkoxy, halogen or trifluoromethyl,
R5 denotes hydrogen (H), 1-4C-alkyl, 1-4C-alkoxy, halogen or trifluoromethyl,
R6 denotes hydrogen or 1-4C-alkyl,
n denotes the numbers 1 or 2,
G1 denotes CH or
G2 denotes O (oxygen), NH, N-1-4C-alkyl or 1-4C-alkylene,
G3 denotes 1-hydroxy-trimethylene —CH(OH)—CH$_2$—CH$_2$—), 2-hydroxy-3-methyl-trimethylene (—CH$_2$—CH(OH)—CH(CH$_3$)—), 2-hydroxy-trimethylene (—CH$_2$—CH(OH)—CH$_2$—), 1-hydroxy-tetramethylene (—CH(OH)—CH$_2$—CH$_2$—CH$_2$—), 2-hydroxy-tetramethylene (—CH$_2$—CH(OH)—CH$_2$—CH$_2$—), 1-hydroxy-pentamethylene (—CH(OH)—CH$_2$—CH$_2$—CH$_2$—CH$_2$—) or 2-hydroxy-pentamethylene (—CH$_2$—CH(OH)—CH$_2$—CH$_2$—CH$_2$—) and
G4 denotes S (sulphur), O (oxygen) or vinylene (—CH=CH—), or a salt thereof.

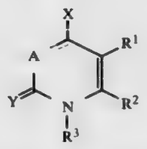
5,112,835

6-SUBSTITUTED ACYCLOPYRIMIDINE NUCLEOSIDE DERIVATIVES AND ANTIVIRAL AGENTS CONTAINING THE SAME AS ACTIVE INGREDIENT THEREOF

Tadashi Miyasaka; Hiromichi Tanaka, both of Yokohama, Japan; Erik D. A. De Clercq, Leuven, Belgium; Masanori Baba, Fukushima, Japan; Richard T. Walker, Birmingham, United Kingdom, and Masaru Ubasawa, Yokohama, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

PCT No. PCT/JP89/00347, § 371 Date Nov. 21, 1989, § 102(e) Date Nov. 21, 1989, PCT Pub. No. WO89/09213, PCT Pub. Date Oct. 5, 1989
PCT Filed Mar. 31, 1989, Ser. No. 449,930
Claims priority, application Japan, Mar. 31, 1988, 63-76677
Int. Cl.^{5} C07D *239/46, 239/47, 239/54, 239/60*
U.S. Cl. 544—302 **18 Claims**

1. A 6-substituted acyclopyrimidine nucleoside compound represented by the formula I:



I

wherein
R^{1}represents a hydrogen or halogen atom or a group of C$_1$ to C$_{10}$ alkyl, C$_2$ to C$_5$ alkenyl, C$_2$ to C$_5$ alkynyl, C$_2$ to C$_5$ alkylcarbonyl, arylcarbonyl, C$_8$ to C$_{12}$ arylcarbonylalkyl, arylthio or C$_7$ to C$_{12}$ aralkyl, the aryl groups thereof optionally being substituted by one or more substituents selected from a halogen atom, C$_1$ to C$_5$ alkyl, C$_1$ to C$_5$ alkoxy, C$_2$ to C$_6$ alkoxycarbonyl, phenyl, naphthyl, carbamoyl, amino, nitro and cyano;
R^2 represents a group of arylthio, C$_1$ to C$_5$ alkylthio, C$_3$ to C$_{10}$ cycloalkylthio, aryl sulfoxide, alkyl sulfoxide, C$_3$ to C$_{10}$ cycloalkyl sulfoxide, alkenyl, alkynyl, aralkyl, arylcarbonyl, arylcarbonylalkyl or aryloxy, the aryl groups thereof optionally being substituted by one or more substituents selected from a halogen atom, C$_1$ to C$_5$ alkyl, C$_1$ to C$_5$ alkoxy, C$_2$ to C$_6$ alkylcarbonyl, halogenated methyl, amino, nitro, cyano and hydroxyl;
R^3 represents a hydroxyalkyl group of which the alkyl portion contains 2 to 6 carbon atoms and may contain an oxygen atom;
X represents an oxygen or sulfur atom or amino group;
Y represents an oxygen or sulfur atom; and
A represents =N— or —NH—, or a pharmaceutically acceptable salt thereof.

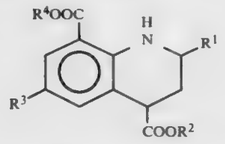
5,112,836

CYCLIC ANTHRANILILC ACID CARBOXYLIC ACID DERIVATIVES AND MEDICAL THERAPEUTIC USE THEREOF

Yasushi Kohno, Oyama, and Eisuke Kojima, Koga, both of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1990, Ser. No. 538,785
Claims priority, application Japan, Jun. 19, 1989, 1-156578
Int. Cl.^{5} C07D *215/12;* A61K *31/47*
U.S. Cl. 514—311 **6 Claims**

1. A compound of the formula (I),



(I)

wherein R^1 is hydrogen atom, carboxyl group, lower alkoxy carbonyl group having 1 to 3 carbon atoms, or phenyl group which may be substituted, R^2 and R^4 are each independently a hydrogen atom, lower alkyl group having 1 to 3 carbon atoms or benzyl group, R^3 is hydrogen atom, halogen atom, nitro group, amino group, cyano group, carbamoyl group, carboxyl group, lower alkanoylamino group having 1 to 4 carbon atoms, benzoylamino group, lower alkylsulfonylamino group having 1 to 3 carbon atoms or phenylsulfonylamino group which may be substituted by methyl group; the acid addition or alkali salts thereof.

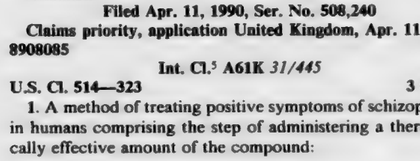
5,112,837

QUINOLINE DERIVATIVES HAVING ANTI-TUMOR ACTIVITY

Kenneth D. Burrows, Warrington; Leslie R. Hughes, Macclesfield, both of United Kingdom, and Peter Warner, Wilmington, Del., assignors to Imperial Chemicals Industries PLC, London, England

Continuation of Ser. No. 271,271, Nov. 15, 1988, abandoned.
This application Sep. 17, 1990, Ser. No. 584,489
Claims priority, application United Kingdom, Nov. 26, 1987, 8727737
Int. Cl.^{5} A61K *31/47;* C07D *215/00*
U.S. Cl. 514—312 **10 Claims**

1. A quinoline of the formula:



wherein each of R^1 and R^2, which may be the same or different, is hydrogen, halogeno, hydroxy, cyano, carbamoyl or amino; alkyl, alkoxy, alkylthio or alkanoylamino each of up to 4 carbon atoms; or each of R^1 and R^2, which may be the same or different, is alkyl of up to 3 carbon atoms which bears one hydroxy substituent or up to three halogeno substituents; provided that both R^1 and R^2 are not hydrogen;
wherein the quinoline ring either bears no further substituent or bears at the 3-, 5-, 7- or 8-position one further substituent selected from halogeno, amino, alkyl of up to 4 carbon atoms and alkyl of up to 3 carbon atoms which bears one hydroxy substituent;
wherein R^3 is hydrogen or alkyl of up to 4 carbon atoms;
wherein R^4 is hydrogen, alkyl, alkenyl or alkynyl each of up to 4 carbon atoms;
wherein Ar is phenylene which is unsubstituted or which bears one or two halogeno substituents, or Ar is thienylene or thiazolylene; and
wherein R^5 is such that R^5—NH$_2$ is Glu or Val;
or a pharmaceutically-acceptable salt or ester thereof.

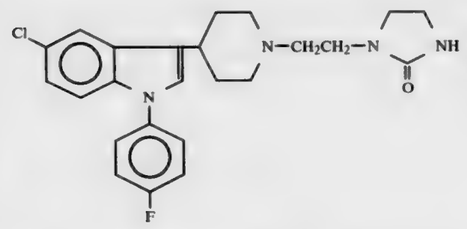
5,112,838

METHOD OF TREATING PSYCHOSES IN HUMAN BEINGS WITH THE ATYPICAL NEUROLEPTIC 5-CHLORO-1-(4-FLUOROPHENYL)-3-(1-(2-(2-IMIDAZOLIDINON-1-YL)ETHYL-4-PIPERIDYL)1H-INDOLE

Jens Perregaard, Jaegerspris, and Torben Skarsfeldt, Broendby Strand, both of Denmark, assignors to H. Lundbeck A/S, Denmark

Filed Apr. 11, 1990, Ser. No. 508,240
Claims priority, application United Kingdom, Apr. 11, 1989, 8908085
Int. Cl.^{5} A61K *31/445*
U.S. Cl. 514—323 **3 Claims**

1. A method of treating positive symptoms of schizophrenia in humans comprising the step of administering a therapeutically effective amount of the compound:



or a pharmaceutically acceptable acid addition salt thereof, to a patient in need thereof.

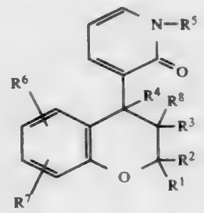
5,112,839

CHROMAN DERIVATIVES

Rolf Gericke, Seeheim; Manfred Baumgarth; Ingeborg Lues, both of Darmstadt; Rolf Bergmann, Reichelsheim, and Jacques De Peyer, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jul. 6, 1990, Ser. No. 549,043
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1989, 3922392
Int. Cl.^{5} A61K *31/44;* C07D *405/04*
U.S. Cl. 514—337 **12 Claims**

1. A chroman derivative of formula I



wherein
R^1 is A,
R^2 and R^8 are each independently H or A,
R^3 is H, OH, OA or OAc,
R^4 is H, or
R^3 and R^4 together are a bond,
R^5 is A or a benzyl radical which is optionally monosubstituted by OA
R^6 and R^7 are each independently H, A, HO, AO, CHO, ACO, ACS, HOOC, AOOC, AO-CS, ACOO, A-CS-O, hydroxyalkyl, mercaptoalkyl, NO$_2$, NH$_2$, NHA, NA$_2$, CN, F, Cl, Br, I, CF$_3$, ASO, ASO$_2$, AO-SO, AO-SO$_2$, AcNH, AO-CO-NH, H$_2$NSO, HANSO, A$_2$NCO, H$_2$NSO$_2$, HANSO$_2$, A$_2$NSO$_2$, H$_2$NCO, HANCO, A$_2$NCO, HANCS, A$_2$ NCS, ASONH, ASO$_2$ NH, AO-SONH, AOSO$_2$ NH, ACO-alkyl, nitroalkyl, cyanoalkyl, A-C(=NOH) or A-C(=NNH$_2$),
A is C$_{1-6}$-alkyl,
-alkyl is alkylene having 1–6 C atoms and
Ac is C$_{1-8}$-alkanoyl or C$_{7-11}$-aroyl
or a salt thereof.

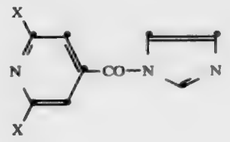
5,112,840

COMPOSITIONS FOR PROTECTING PLANTS AGAINST DISEASE

Helmut Zondler, Bottmingen; Alfred Meyer, Basle, both of Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Walter Kunz, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 319,017, Mar. 3, 1989, Pat. No. 4,980,355.
This application Oct. 9, 1990, Ser. No. 594,889
Claims priority, application Switzerland, Mar. 9, 1988, 887/88
Int. Cl.^{5} A01N *43/50;* C07D *401/06*
U.S. Cl. 514—341 **9 Claims**

1. A compound of formula V



(V)

in which X in ortho/ortho'-position are equal and represent fluorine, chlorine, bromine or iodine.

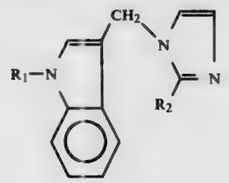
5,112,841

IMIDAZOLE DERIVATIVES AND ANTIEPILEPTICS COMPRISING SAID IMIDAZOLE DERIVATIVES AS EFFECTIVE INGREDIENTS

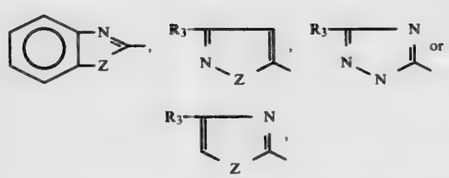
Akira Matsubara, Yokohama; Kazuya Sakai, Mobara; Hideki Tanada, Mobara; Akira Mizuchi, Mobara; Kazutoshi Horikomi, Mobara, and Takuma Ohtsu, Mobara, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Feb. 28, 1991, Ser. No. 661,981
Claims priority, application Japan, Mar. 6, 1990, 2-52799
Int. Cl.[5] C07D *417/14, 413/14;* A61K *31/42, 31/425*
U.S. Cl. 514—361 **2 Claims**

1. An imidazole derivative represented by the formula:



where R_1 is



R_3 is a phenyl group or phenyl group substituted by at least one substituent selected from the group consisting of halogen atoms and lower alkyl, lower alkoxy, trifluoromethyl and cyano groups and Z being a sulfur or oxygen atom, and R_2 denotes a hydrogen atom or a lower alkyl group or a pharmaceutically acceptable salt thereof.

5,112,842

TRANSDERMAL ADMINISTRATION OF 2-AMINO-6-N-PROPYLAMINO-4,5,6,7-TETRAHYDROBENZOTHIAZOLE

Bernd Zierenberg, Bingen; Michael Herschel, Kastrich, and Uwe Rohr, Kreuzweg, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Nov. 8, 1990, Ser. No. 610,870
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1989, 3937271
Int. Cl.[5] A61K *31/425*
U.S. Cl. 514—367 **9 Claims**

1. A method for attenuating the orthostatic side effects of administration of 2-amino-6-n-propylamino-4,5,6,7-tetrahydrobenzothiazole or the (−)-enantiomer thereof, in a patient, which comprises administering the 2-amino-6-n-propylamino-4,5,6,7-tetrahydrobenzothiazole or the (−)-enantiomer thereof, to the patient transdermally.

5,112,843

ARTHROPODICIDAL USE OF 6-METHOXY-2-BENZOXAZOLINONE TO ATTRACT AND CONTROL CORN ROOTWORM (DIABROTICA)

Louis B. Bjostad, III, Bellvue, and Bruce E. Hibbard, Fort Collins, both of Colo., assignors to Colorado State University Research Foundation, Fort Collins, Colo.

Filed Dec. 13, 1990, Ser. No. 626,888
Int. Cl.[5] A01N *43/76;* A61K *31/42*
U.S. Cl. 514—375 **20 Claims**

1. A method for controlling arthropods by applying an effective amount of 6-methoxy-2-benzoxazolinone to soil containing them.

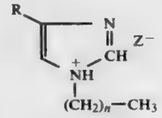
5,112,844

IMIDAZOLE DERIVATIVES AND USE AS ANTI-BACTERIA, ANTI-FUNGAL AND ANTI-VIRAL AGENTS

Henrich H. Paradies, Iserlohn, Fed. Rep. of Germany, assignor to Medice chem.-pharm. Fabrik Putter GmbH & Co. KG, Iserlohn, Fed. Rep. of Germany

Continuation of Ser. No. 593,550, Oct. 2, 1990, abandoned, which is a continuation of Ser. No. 434,543, Oct. 30, 1989, abandoned, which is a continuation of Ser. No. 321,499, Mar. 9, 1989, abandoned, which is a division of Ser. No. 82,891, Aug. 6, 1987, Pat. No. 4,877,883. This application Apr. 3, 1991, Ser. No. 681,445
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626700
Int. Cl.[5] A61K *31/415;* C07D *233/54*
U.S. Cl. 514—398 **2 Claims**

1. A method for the treatment of a human subject suffering from a bacterial, viral or fungal infection, said method comprising administering to said subject a therapeutically effective amount of a micelle formulation comprising a combination of a pharmaceutically active substance and a compound having the formula



in which:

R is a member selected from the group consisting of H, CH_3 and OH;

Z is a member selected from the group consisting of chloride, bromide, iodide, maleate, formate, acetate, propionate, HSO_4^-, malate, fumarate, salicylate, alginate, gluconate, glucoronate, galactoronate, ethylsulfate and $H_2PO_4^-$; and

n is 8 to 20.

5,112,845

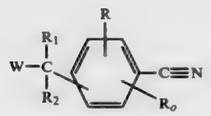
ALPHA-HETEROCYCLE SUBSTITUTED TOLUNITRILES

Robert M. Bowman, Summit; Ronald E. Steele, Long Valley; Leslie J. Browne, Morristown; Bruce H. Ewald, Long Valley, and Robert Diener, Chester, all of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 240,862, Sep. 6, 1988, Pat. No. 4,978,672, which is a continuation-in-part of Ser. No. 164,696, Mar. 7, 1988, Pat. No. 4,937,250, which is a division of Ser. No. 837,489, Mar. 7, 1986, Pat. No. 4,749,713. This application Dec. 17, 1990, Ser. No. 628,732
Int. Cl.[5] A61A *31/415*
U.S. Cl. 514—399 **6 Claims**

1. A method of delaying proestrus and estrus and inhibiting proestrus in the anestrus animal which comprises administering

to a female animal in need thereof an effective amount of a compound of the formula



(I)

wherein R and R_o represent hydrogen or lower alkyl; or R and R_o located on adjacent carbon atoms and together when combined with the benzene ring to which they are attached form a naphthalene or tetrahydronaphthalene ring; R_1 represents hydrogen; R_2 represents hydrogen, lower alkyl, lower alkenyl, aryl, aryl-lower alkyl, C_3–C_6-cycloalkyl, or C_3–C_6-cycloalkyl-lower alkyl; or R_1 and R_2 combined represent lower alkylidene, or mono- or di-aryl-lower alkylidene; R_1 and R_2 combined also represent C_4–C_6-straight chain alkylene, lower alkyl-substituted-C_4–C_6-straight chain alkylene or ortho phenylene bridged-C_2–C_4-straight chain alkylene to form with the carbon atom attached thereto a corresponding unsubstituted or lower alkyl-substituted or benzo-fused 5, 6 or 7-membered ring; W represents 1-imidazolyl or 1-imidazolyl substituted by lower alkyl; aryl within the above definitions represents phenyl or phenyl substituted by one or two substituents selected from lower alkyl, lower alkoxy, hydroxy, lower alkanoyloxy, aroyloxy, nitro, amino, halogen, trifluoromethyl, cyano, carboxy, carboxy functionalized in form of a pharmaceutically acceptable ester or amide, lower alkanoyl, aroyl, lower alkylsulfonyl, sulfamoyl, N-lower alkylsulfamoyl or N,N,-di-lower alkylsulfamoyl; and aryl within the above definitions also represents 2-, 3-, or 4-pyridyl, or a said heterocyclic radical monosubstituted by lower alkyl, lower alkoxy, cyano or halogen; and aroyl within the above definitions represents benzoyl or benzoyl substituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl; or of a veterinarily acceptable salt thereof; or of a veterinary composition comprising a said compound in combination with one or more veterinarily acceptable carriers

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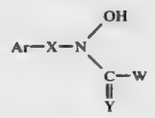
5,112,846

N-HYDROXYAMIDE, N-HYDROXYTHIOAMIDE, HYDROXYUREA, AND N-HYDROXYTHIOUREA DERIVATIVES OF SELECTED NSAIDS AS ANTIINFLAMMATORY AGENTS

Thomas R. Belliotti, Ypsilanti; Wiaczeslaw A. Cetenko; David T. Connor, both of Ann Arbor, all of Mich.; Daniel L. Flynn, Mundelein, Ill.; Catherine R. Kostlan, Saline, Mich.; James B. Kramer, Sylvania, Ohio, and Jagadish C. Sircar, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

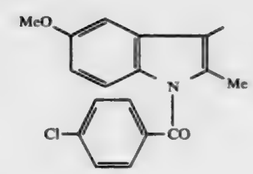
Division of Ser. No. 358,323, May 26, 1989, Pat. No. 4,981,865. This application Oct. 16, 1990, Ser. No. 598,458
Int. Cl.[5] A61K *31/40;* C07D *209/34, 209/26*
U.S. Cl. 514—415 **23 Claims**

1. A compound of the formula (I)

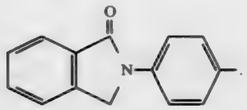


and a pharmaceutically acceptable acid addition or base salt thereof;

wherein Ar is

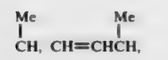


[2)]



[5)]

X is CH_2,



or $CH{=}CHCH_2$;

Y is O or S;

W is lower alkyl, aryl, aralkyl, lower alkoxy, NR_6R_7, $(CH_2)_nCO_2R_7$, $NH(CH_2)_mCO_2R_7$, $NH(CH_2)_pNR_6R_7$, or $NHCH_2CH{=}CH_2$ wherein R_5 is independently as defined above, R_6 and R_7 are independently hydrogen or lower alkyl, n is an integer of from 0 to 3, m is an integer of from 0 to 3; and p is an integer of 2 or 3;

with the proviso that Y cannot be sulfur when n is 0.

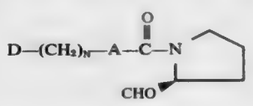
5,112,847

PROLINAL DERIVATIVES HAVING INHIBITORY ACTIVITY ON PROLYL ENDOPEPTIDASE

Masaaki Toda, Osaka; Shuichi Ohuchida, Kyoto, and Hiroyuki Ohno, Shiga, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 139,231, Dec. 29, 1987, Pat. No. 4,983,624. This application Jun. 12, 1990, Ser. No. 536,830
Claims priority, application Japan, Dec. 29, 1986, 61-310151
Int. Cl.[5] C07D *405/06, 405/08;* A61K *31/34, 31/35*
U.S. Cl. 514—422 **7 Claims**

1. Prolinal derivatives of the formula

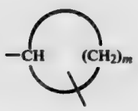


(I)

wherein A is a group of the formula:



wherein one of R^1 and R^2 represents a hydrogen atom and the other represents an alkyl group of from 2 to 5 carbon atoms, an alkoxy group of from 1 to 5 carbon atom(s), phenyl group, benzyl group, a cycloalkyl group of from 4 to 6 carbon atoms or a (cycloalkyl group of from 4 to 6 carbon atoms)-methyl group or R^1 and R^2, which are the same or different, each represents an alkyl group of from 1 to 4 carbon atom(s), or a group of the formula:



wherein m represents an integer of from 3 to 6, n represents an integer of from 3 to 10, D represents a heterocyclic ring selected from the group consisting of furan, pyran, benzofuran, chromene and xanthene, which ring represented by D may be partially or fully saturated and wherein said ring represented by D is unsubstituted or substituted by from one to three of a halogen atom, a nitro group, a trifluoromethyl group, an alkyl or an alkoxy group of from 1 to 4 carbon atom(s).

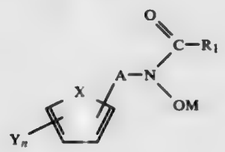
5,112,848

FURAN AND PYRROLE CONTAINING LIPOXYGENASE INHIBITING COMPOUNDS

Dee W. Brooks, Libertyville, Ill.; Bruce P. Gunn, Saraland, Ala.; James H. Holms, Gurnee, and James B. Summers, Libertyville, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

PCT No. PCT/US88/04048, § 371 Date Apr. 19, 1990, § 102(e) Date Apr. 19, 1990
PCT Filed Nov. 14, 1988, Ser. No. 487,982
Int. Cl.[5] A61K *31/40;* **C07D** *307/02, 207/00*
U.S. Cl. 514—424 **10 Claims**

1. A compound of the formula



wherein
R_1 is selected from
C_2 to C_4 alkyl,
C_2 to C_4 alkenyl, and
$—NR_2R_3$ where R_2 and R_3 are independently selected from
hydrogen,
C_1 to C_4 alkyl,
hydroxyl, and
an aryl group selected from substituted or unsubstituted
phenyl,
1- or 2-naphthyl, and
fluorenyl;
the substituents selected from
halo,
nitro,
cyano,
C_1 to C_4 alkyl,
alkoxy,
halosubstituted alkyl,
alkoxycarbonyl,
aminocarbonyl,
alkylaminocarbonyl,
dialkylaminocarbonyl, and
alkylsulfonyl;
with the proviso that R_2 and R_3 are not both hydroxyl;
X is oxygen or NR_4 wherein R_4 is selected from
hydrogen,
C_1 to C_6 alkyl,
C_1 to C_6 alkoxyl,
arylalkyl wherein the aryl portion is as defined above;
A is selected from C_1 to C_6 alkylene ands C_2 to C_6 alkenylene;
n is 0, 1, 2, or 3;
Y is selected independently at each occurrence from
hydrogen,
halogen,
hydroxy,
cyano,
halosubstituted alkyl,
C_1 to C_{12} alkyl,
C_2 to C_{12} alkenyl,
C_1 to C_{12} alkoxyl,
C_3 to C_8 cycloalkyl,
aryl as defined above,
aryloxy wherein the aryl portion is as defined above,
aroyl as defined above;
C_1 to C_{12} arylalkyl wherein the aryl portion is as defined above,
C_1 to C_{12} arylalkoxy wherein the aryl portion is as defined above,
C_1 to C_{12} arylthioalkoxy wherein the aryl portion is as defined above,
alkoxycarbonyl,
arylalkoxycarbonyl wherein the aryl portion is as defined above,
aminocarbonyl,
alkylaminocarbonyl,
dialkylaminocarbonyl,
arylalkylamino or wherein the aryl portion is as defined above,
alkoxyalkoxyalkyl,
arylalkoxyalkyl wherein the aryl portion is as defined above,
arylthioalkoxyalkyl wherein the aryl portion is as defined above,
substituted aryl, aryloxy, aroyl, arylalkyl, arylalkenyl, arylalkoxy, arylthioalkoxy, arylalkoxyalkyl, or arylthioalkoxyalkyl, as defined above,
wherein the substituents are selected from
halo,
nitro,
cyano,
C_1 to C_{12} alkyl, alkoxy, and halosubstituted alkyl;
the groups(s) Y may be substituted from any of the positions on the ring; and
M is hydrogen, a pharmaceutically acceptable cation, aroyl as defined above, or C_1 to C_{12} alkoyl.

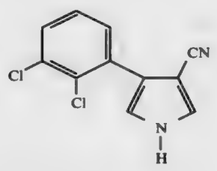
5,112,849

FUNGICIDAL USE OF A CYANOPYRROLE DERIVATIVE AND METHOD FOR PRODUCING SAME

Theodor Staub, Riehen; Heide Dahmen; Robert Nyfeler, both of Basel, and Robert J. Williams, Schönenbuch, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 18,689, Feb. 25, 1987, abandoned. This application May 18, 1990, Ser. No. 526,773
Claims priority, application Switzerland, Mar. 4, 1986, 865/86
Int. Cl.[5] A01N *43/36*
U.S. Cl. 514—427 **14 Claims**

1. The method of controlling phytopathogenic fungi systemically in a plant which comprises applying to the soil at the locus of the plant's growth a liquid or solid composition containing a fungicidally effective amount of a compound of the formula:



and at least one carrier for said compound.

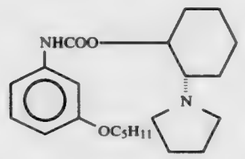
5,112,850

DRUG FOR TREATMENT OF GASTRIC AND DUODENAL PEPTIC ULCER DISEASE

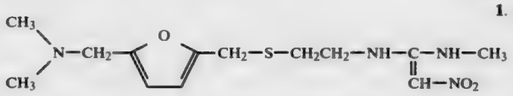
Ludek Benes; Viera Nosálová, and Anna Babulová, all of Bratislava, Czechoslovakia, assignors to Slovenská akadémia vied, Bratislava, Czechoslovakia

Filed May 23, 1990, Ser. No. 527,189
Claims priority, application Czechoslovakia, May 24, 1989, PV3115-89
Int. Cl.[5] A61K *31/40, 31/34*
U.S. Cl. 514—428 **3 Claims**

1. A drug composition for the treatment of gastric and duodenal peptic ulcer disease comprising as effective components the combination of /±/-trans-2/1-pyrrolidinyl/cyklohexylester of 3-/n/-pentyloxycarbanilic acid formula I



and N/2-/5-/dimethylamine/-methyl/furfuryl/thio/ethyl-N'-methyl-2-nitro-1,1-ethendiamine formula II



or their salts with pharmaceutically acceptable acids with the weight ratio of 3:10 up to 10:3, which may contain physiologically harmless vehicle.

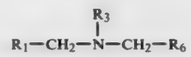
5,112,851

AMINE DERIVATIVES, PROCESSES FOR THEIR PRODUCTION AND THEIR USE

Anton Stütz, Vienna, and Peter Nussbaumer, Maria Enzersdorf, both of Austria, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 8,198, Jan. 29, 1987, Pat. No. 4,939,148. This application May 8, 1990, Ser. No. 520,577
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1986, 3602579; Mar. 19, 1986, 3609123; May 26, 1986, 3617635; May 26, 1986, 3617637
Int. Cl.[5] A61K *31/38;* **C07D** *333/56*
U.S. Cl. 514—443 **4 Claims**

1. A compound of the formula

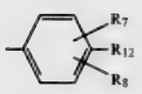


where
R_1 is



IIb

X is sulphur,
R_7 is hydrogen, halogen, trifluoromethyl, lower alkyl, or lower alkoxy,
R_8 is hydrogen,
R_3 is hydrogen or lower alkyl
R_6 is



IIIa

where
R_7 and R_8 are as defined above, and
R_{12} is alkyl or cycloalkyl wherein the alkyl and cycloalkyl are substituted by phenyl, halophenyl, lower alkylphenyl or lower alkoxyphenyl,
in free base form or in pharmaceutically acceptable acid addition salt form.

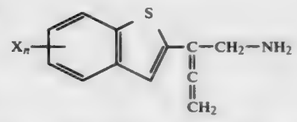
5,112,852

ALLENYL AMINES

James R. McCarthy, West Chester, Ohio; Thomas M. Bargar, Clayton, Calif.; Charlotte L. Barney, Cincinnati; Donald P. Matthews, West Chester, both of Ohio, and Robert J. Broersma, Noblesville, Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 153,106, Feb. 8, 1988, Pat. No. 4,847,288, which is a continuation-in-part of Ser. No. 945,460, Dec. 23, 1986, abandoned. This application Apr. 21, 1989, Ser. No. 341,518
Int. Cl.[5] A61K *31/38;* **C07D** *333/52*
U.S. Cl. 514—443 **11 Claims**

1. A compound of the formula



wherein n is the integer 0, 1 or 2; each X independently is a substituent selected from the group consisting of loweralkyl, halo, —O—(loweralkyl), —S—(loweralkyl), —SO—(loweralkyl), —SO_2—(loweralkyl), CO_2R and CH_2OR, wherein R is loweralkyl and each loweralkyl group is from 1 to about 6 carbon atoms, or a pharmaceutically acceptable addition salt thereof.

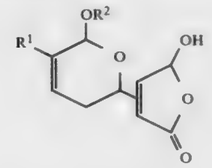
5,112,853

ANTI-INFLAMMATORY FURANONE COMPOUNDS

Michael E. Garst, Newport Beach, and Elizabeth T. Syage, Cypress, both of Calif., assignors to Allergan, Inc., Irvine, Calif.

Continuation of Ser. No. 439,733, Nov. 20, 1989, abandoned. This application Jun. 3, 1991, Ser. No. 709,550
Int. Cl.[5] A61K *31/38;* **C07D** *333/54, 307/32*
U.S. Cl. 514—443 **8 Claims**

1. A compound of the formula:



in which:
R_1 is phenyl (C_{1-17}alkyl or alkenyl having 1–5 unconjugated double bonds), or benzothienyl (C_{1-17}alkyl or alkenyl having 1–5 unconjugated double bonds); and
R_2 is hydrogen or a C_{1-4}alkyl group.

5,112,854

MACROLIDE COMPOUNDS

Michael V. J. Ramsay, South Harrow; Richard Bell, South Ruislip; Peter D. Howes; Edward P. Tiley, both of Pinner, and Derek R. Sutherland, Chalfont St. Giles, all of England, assignors to American Cyanamid Company, Stamford, Conn.

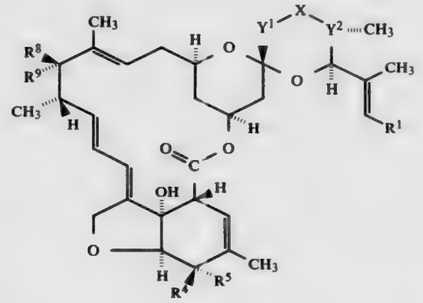
Continuation of Ser. No. 350,333, May 9, 1989, abandoned. This application Apr. 30, 1991, Ser. No. 693,029

Claims priority, application United Kingdom, May 10, 1988, 8811037

Int. Cl.[5] A61K *31/365;* **C07D** *315/00*

U.S. Cl. 514—450 **9 Claims**

1. Compounds of formula (1)



(I)

wherein R^1 represents a methyl, ethyl or isopropyl group; Y^1 is $—CH_2—$, Y^2 is —CH— and X represents



where R^2 and R^3 together with the carbon atom to which they are attached represents $>C{=}NOR^7$, where R^7 represents a hydrogen atom, a C_{1-8} alkyl group or a C_{3-8} alkenyl group and the group $>C{=}NOR^7$ is the E configuration, or $—Y^1—X—Y^2—$ represents $—CH_2—CH{=}C—$;

R^4 represents an hydroxy, methoxy or acyloxy group and R^5 represents a hydrogen atom or R^4 and R^5 together with the carbon atoms to which they are attached represents $>C{=}O$ or $>C{=}NOR^{7a}$, where R^{7a} is as defined above for R^7; and

one of R^8 and R^9 represents C_1–C_6 alkoxy group optionally interrupted by an oxygen atom or a C_1–C_6 alkoxy group and the other represents a hydrogen atom or R^8 and R^9 together with the carbon atom to which they are attached represent $>C{=}NOR^{7b}$, where R^{7b} is as defined above for R^7, and salts thereof.

5,112,855

HYDROGENATED 1-BENZOOXACYCLOALKYLPYRIDINECARBOXYLIC ACID COMPOUNDS AND COMPOSITIONS

Wolfgang Fröstl, and Armin Züst, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

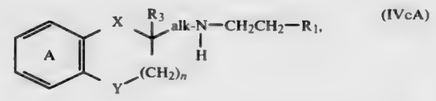
Division of Ser. No. 288,332, Dec. 21, 1988, Pat. No. 4,957,928, which is a continuation-in-part of Ser. No. 63,188, Jun. 16, 1987, abandoned. This application Jun. 20, 1990, Ser. No. 541,227

Claims priority, application Switzerland, Jun. 26, 1986, 2588/86; Dec. 23, 1987, 5008/87

Int. Cl.[5] A61K *31/35;* **C07D** *311/58*

U.S. Cl. 514—456 **9 Claims**

1. A compound of the formula



(IVcA)

in which

R_1 represents a carboxy, lower alkoxycarbonyl, carbamoyl, N-lower alkylcarbamoyl, N,N-di-lower alkylcarbamoyl, hydroxymethyl, lower alkanoyloxymethyl, lower alkanesulphonyloxymethyl, benzoyloxymethyl or pyridoyloxymethyl,

R_3 represents hydrogen or lower alkyl,

alk represents lower alkylene that links the ring system with the NH group shown in formula (IVcA) by up to and including 3 carbon atoms or alk represents lower alkylidene,

the ring A is unsubstituted or is mono-, di- or poly-substituted by substituents selected from the group consisting of hydroxy, lower alkoxy, lower alkanoyloxy, halogen, lower alkyl and trifluoromethyl and either

(a) X represents a methylene group, Y represents an oxygen atom and n represents 1 or

(b) X represents an oxygen atom, Y represents a methylene group and n represents 1 or

(c) X represents a direct bond, Y represents an oxygen atom and n represents 2, or a pharmaceutically acceptable salt thereof.

5,112,856

THERAPEUTIC TREATMENT OF INTESTINAL INFLAMMATION BY ADMINISTRATION OF 3,4-DIHYDRO-2H-1-BENZOPYRAN DERIVATIVES

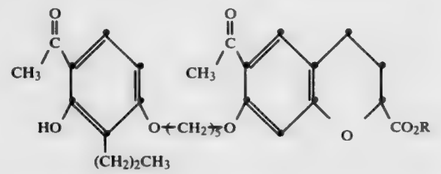
Timothy S. Gaginella, Wayne; Ann F. Welton, West Caldwell, and Peter C. Will, Nutley, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 315,014, Feb. 24, 1989, abandoned, which is a continuation of Ser. No. 897,450, Aug. 15, 1986, abandoned. This application Aug. 16, 1990, Ser. No. 569,241

Int. Cl.[5] A61K *31/35*

U.S. Cl. 514—456 **19 Claims**

1. A method for treating inflammatory bowel disease by inhibiting leukotriene-mediated inflammation in the intestine, which comprises administering to a host requiring such treatment an effective anti-inflammatory leukotriene-inhibiting amount of a compound of the formula



in which R is hydrogen or lower alkyl, or a salt thereof where R is hydrogen, or an enantiomer thereof.

5,112,857

HMG-COA REDUCTASE INHIBITOR METABOLITES

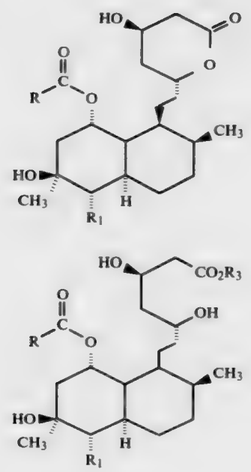
Stanley Vickers, Perkasie, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 4, 1990, Ser. No. 577,184

Int. Cl.[5] A61K *31/35;* **C07D** *309/30*

U.S. Cl. 514—460 **5 Claims**

1. A compound of structural formula (I) or (II):



(I)

wherein:

R is C_{1-10}alkyl;

R_1 is O-R_2;

R_2 is H or C_{1-5}alkyl; and

R_3 is H or C_{1-5}alkyl or a pharmaceutically acceptable salt of a compound of formula (II) wherein R_3 is H,

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5,112,858

ANTIBIOTIC, ARANOROSIN, A MICROBIOLOGICAL PROCESS FOR THE PREPARATION THEREOF, AND THE USE THEREOF AS A PHARMACEUTICAL

Kirity Roy; Triptikumar Mukhopadhyay; Goukanapalli C. S. Reddy; Erra K. S. Vijayakumar; Bimal N. Ganguli, all of Bombay; Richard H. Rupp, Königstein/Taunus, Fed. Rep. of Germany; Hans-Wolfram Fehlhaber, Idstein/Taunus,, Fed. Rep. of Germany, and Herbert Kogler, Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

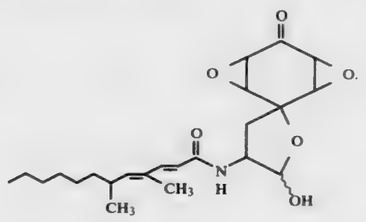
Filed May 11, 1989, Ser. No. 350,288

Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816411

Int. Cl.[5] A61K *31/335;* **C07D** *311/96*

U.S. Cl. 514—462 **3 Claims**

1. A compound of the formula



5,112,859

BIPHENYL AMIDE CHOLESTEROL ESTER HYDROLASE INHIBITORS

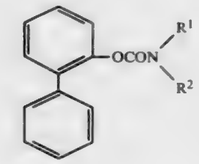
Thomas J. Commons, Wayne; Richard E. Mewshaw, Norristown, and Donald P. Strike, St. Davids, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Sep. 14, 1990, Ser. No. 582,687

Int. Cl.[5] A01N *47, 10;* **A61K** *31/27;* **C07C** *261/00, 269/00*

U.S. Cl. 514—484 **7 Claims**

1. A compound of the formula:



(II)

in which

R^1 is hydrogen or alkyl of 5 to 20 carbon atoms; and

R^2 is alkyl of 5 to 20 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, cycloalkylalkyl of 6 to 10 carbon atoms, phenylalkyl of 7 to 11 carbon atoms or alkylphenylalkyl of 8 to 17 carbon atoms.

5,112,860

THIOCARBOXYLIC ESTERS AND FUNGICIDES CONTAINING THEM

Horst Wingert; Hubert Sauter, both of Mannheim; Siegbert Brand, Birkenheide; Bernd Wenderoth, Lampertheim; Gisela Lorenz, Neustadt, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

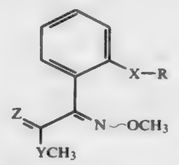
Filed Nov. 2, 1990, Ser. No. 608,351

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1989, 3938054; Sep. 13, 1990, 4029092

Int. Cl.[5] A01N *37/40*

U.S. Cl. 514—513 **6 Claims**

1. Thiocarboxylic esters of the formula I



I

where the substituents have the following meanings:

X is oxygen, sulfur, oxymethylene, methyleneoxy, thiomethylene, methylenethio, ethylene, ethenylene or ethynylene,

Y, Z are each sulfur or oxygen, but Y and Z are not simultaneously oxygen,

R is C_1–C_6-alkyl, mononuclear, dinuclear or trinuclear carbocylic aryl, where aryl may carry the following radicals R^1:

R^1 halogen, cyano, nitro, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_1–C_6-alkoxy, trifluoromethyl, mononuclear or dinuclear aryloxy or mononuclear, dinuclear or trinuclear carbocyclic aryl, and aryloxy and carbocyclic aryl in turn may be substituted by the stated radicals R^1.

5,112,861

METHOD OF TREATING PARKINSON'S DISEASE USING PENTANEDIONE DERIVATIVES

Reijo Bäckström, Helsinki; Kalevi E. Heinola, Järvenpää; Erkki J. Honkanen, Vantaa; Seppo K. Kaakkola, Helsinki; Pekka J. Kairisalo, Helsinki; Inge-Britt Y. Linden, Helsinki; Pekka I. Männistö, Helsinki; Erkki A. O. Nissinen, Espoo; Pentti Pohto, Helsinki; Aino K. Pippuri, and Jarmo Pystynen, both of Espoo, all of Finland, assignors to Orion-yhtymä Oy, Espoo, Finland

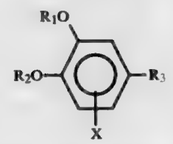
Division of Ser. No. 126,911, Nov. 27, 1987, Pat. No. 4,963,590. This application Sep. 25, 1990, Ser. No. 587,791

Claims priority, application Finland, Nov. 28, 1986, 864875; United Kingdom, May 27, 1987, 8712437

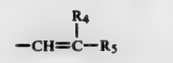
Int. Cl.[5] A01N *37/31, 37/12, 37/44, 35/00*

U.S. Cl. 514—520 **16 Claims**

1. A method for the treatment of Parkinson's Disease, said method comprising administering a catechol-O-methyltransferase inhibiting amount of a compound having the formula I



wherein R_1 and R_2 independently represent hydrogen, alkylcarbamoyl of 2 to 5 carbon atoms or alkylcarbonyl of 2 to 5 carbon atoms, X represents nitro or cyano and R_3 represents



wherein R_4 represents cyano or alkylcarbonyl of 2 to 5 carbon atoms and R_5 represents cyano; alkylcarbonyl of 2 to 5 carbon atoms; or carbamoyl which is unsubstituted or substituted with alkyl of 1 to 8 carbon atoms, or hydroxyalkyl of 1 to 8 carbon atoms or pharmaceutically acceptable salts or esters thereof; and a sufficient amount of levodopa to treat Parkinson's Disease, to a patient in need of such treatment.

5,112,862

3-METHOXIMINOPROPIONIC ESTERS AND FUNGICIDES CONTAINING THEM

Bernd Wenderoth, Lampertheim; Hubert Sauter, Mannheim; Franz Roehl; Eberhard Ammermann, both of Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

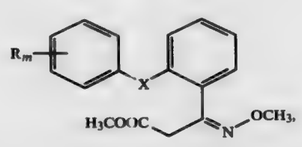
Filed Jul. 2, 1990, Ser. No. 546,880

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 3923093

Int. Cl.[5] A01N *37/34*

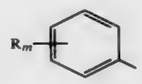
U.S. Cl. 514—522 **8 Claims**

1. A compound of the formula I



(I)

where the radicals R (m=1 to 5) are identical or different and are each hydrogen, halogen, cyano, nitro, C_1–C_{15}-alkyl, C_3–C_6-cycloalkyl, C_3–C_6-alkenyl, C_1–C_4-alkoxy, C_1–C_2-haloalkyl, C_1–C_2-haloalkoxy, phenyl, C_1–C_4-alkylphenyl, halophenyl, phenoxy, C_1–C_4-alkylphenoxy, halophenoxy, benzyl, halobenzyl, benzyloxy, halobenzyloxy, or C_1–C_4-alkylbenzyloxy or the group



is α-naphthyl or β-naphthyl, and X is methyleneoxy, oxymethylene, ethylene, ethenylene, thiomethylene or oxygen.

5,112,863

ANTIPSYCHOTIC DRUG

Atsushi Hashimoto, Tsukuba; Hidehiko Hibino, Tokyo, and Osamu Nakachi, Ushiku, all of Japan, assignors to Nippon Oil & Fats Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1990, Ser. No. 622,608

Claims priority, application Japan, Dec. 5, 1989, 1-314178; May 24, 1990, 2-132665

Int. Cl.[5] A61K *31/24*

U.S. Cl. 514—534 **7 Claims**

1. An antipsychotic drug for oral or intravenous administration which comprises an active amount of an N-acyl amino acid derivative represented by the following general formula:

RCO-A

wherein R represents an alkyl or alkenyl group having 1–25 carbon atoms, and A is an amino acid residue and a pharmaceutically acceptable carrier or vehicle for said administration.

5,112,864

PLA_2 INHIBITORS AS ANTIINFLAMMATORIES

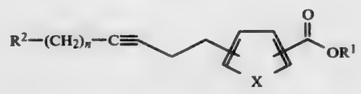
Stevan W. Djuric, Glenview; Stephen H. Docter, Mt. Prospect, and Richard A. Haack, Chicago, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 30, 1991, Ser. No. 707,529

Int. Cl.[5] A61K *31/235, 31/38;* **C07C** *69/78;* **C07D** *333/32*

U.S. Cl. 514—549 **21 Claims**

1. A compound of the formula



wherein X is oxygen, sulfur or —CH=CH—;
wherein R^1 is hydrogen, alkyl of 1 to 6 carbons or a pharmaceutically acceptable cation;
wherein R^2 is phenoxy, trifluoromethyl, phenyl, alkoxy or methyl; and
wherein n is an integer from 1 to 20.

5,112,865

PHARMACEUTICAL COMPOSITIONS CONTAINING A DERIVATIVE OF 3-HYDROXYBUTANOIC ACID CHOSEN FROM OLIGOMERS OF THIS ACID AND ESTERS OF THIS ACID OR OF THESE OLIGOMERS WITH 1,3-BUTANEDIOL

William Nichels, Vilvoorde, and Philippe d'Oultremont, Blicquy, both of Belgium, assignors to Solvay & Cie (Société Anonyme), Brussels, Belgium

Continuation of Ser. No. 269,891, Nov. 9, 1988, abandoned. This application Aug. 15, 1990, Ser. No. 568,546

Claims priority, application Belgium, Nov. 19, 1987, 8701314

Int. Cl.[5] A61K *31/22, 31/19*

U.S. Cl. 514—546 **12 Claims**

1. A dialysis solution consisting essentially of sterile water, formulation additives and an effective osmotic amount of a member selected from the group consisting of a derivative of 3-hydroxybutanoic acid chosen from dimers and/or trimers of 3-hydroxybutanoic acid, an ester of a dimer and/or trimer of 3-hydroxybutanoic acid with 1,3-butanediol, and an ester of 3-hydroxybutanoic acid with 1,3-butanediol.

9. An aqueous dialysis solution of physiological pH consisting essentially of sterile water, formulation additives, physiological salts osmotically compatible with blood, and an effective osmotic amount of a member selected from the group consisting of a derivative of 3-hydroxybutanoic acid chosen from dimers and/or trimers of 3-hydroxybutanoic acid, an ester of a dimer and/or trimer of 3-hydroxybutanoic acid with 1,3-butanediol, and an ester of 3-hydroxybutanoic acid with 1,3-butanediol.

5,112,866

ETHANESULFONAMIDE DERIVATIVES

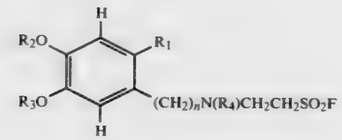
Ronald K. Russell, Titusville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 240,976, Sep. 6, 1988, Pat. No. 4,874,771. This application Aug. 14, 1989, Ser. No. 391,797

Int. Cl.[5] A61K *31/185, 31/445;* **C07C** *211/29;* **C07D** *211/18*

U.S. Cl. 514—576 **7 Claims**

1. A compound of formula:



R_1 is COR_5;
R_2 and R_3 are C_1–C_3 alkyl;
R_4 is hydrogen of C_1–C_5 alkyl;
R_5 is hydrogen or C_1–C_5 alkyl; and
n is 0 or 2
provided that at least one of R_2, R_3 and R_4 is other than hydrogen.

5,112,867

TRIPHENYLMETHANE DERIVATIVES

Iwao Kinoshita; Daisuke Machii; Yasuo Onoda; Haruki Takai; Nobuo Kasaka, all of Shizuoka; Katsuichi Shuto, Mishima; Katsushige Gomi, Shizuoka; Makoto Morimoto, Machida, and Akio Ishii, Shizuoka, all of Japan, assignors to Kyowa Hakko Gogyo Co., Ltd., Tokyo, Japan

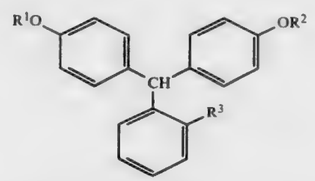
Filed Apr. 27, 1990, Ser. No. 515,873

Claims priority, application Japan, Apr. 28, 1989, 1-110995

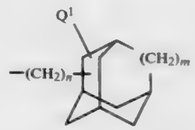
Int. Cl.[5] A61K *31/165;* **C07C** *103/22*

U.S. Cl. 514—617 **8 Claims**

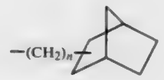
1. A triphenylmethane derivative represented by the following formula:



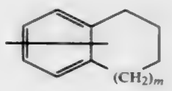
wherein R^1 and R^2 are independently hydrogen, C1–6 alkyl, benzyl, C1–5 alkanoyl or C1–6 alkoxymethyl; R^3 is —$CONR^4R^5$ {wherein R^4 is C3–8 cycloalkyl, allyl, styryl, optionally substituted phenethyl, optionally substituted 1,2-diphenylethyl, optionally substituted benzhydryl, optionally substituted trityl and optionally substituted benzyl, (which may be optionally mono-, di- or tri-substituted by C1–6 alkyl, trifluoromethyl, hydroxyl, C1–6 alkoxy, C1–6 alkylthio, halogen, nitro, amino, C1-5 alkanoyl, aroyl, morpholino, carboxyl or C1–6 alkoxycarbonyl in the aryl moiety), substituted phenyl or substituted naphthyl (which may be mono-, di- or tri-substituted by C1–6 alkyl, trifluoromethyl, C1–6 alkoxy, C1–6 alkylthio, halogen, nitro, C1–5 alkanoyl, aroyl or C1–6 alkoxycarbonyl),



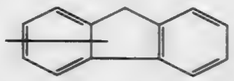
(wherein Q1 is hydrogen or C1–6 alkyl, m is 0 or 1, and n is an integer of 0 to 5),



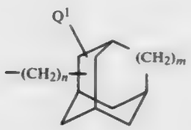
(wherein n is an integer of 0 to 5),



(wherein m is 0 or 1), and



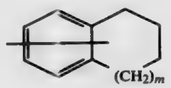
and R^5 is hydrogen, optionally substituted C1–6 alkyl (which may be mono, di- or tri-substituted by C1–6 alkoxy, mono- or di- C1–6 alkyl-substituted amino or halogen, C3–8 cycloalkyl, allyl, styryl), optionally substituted phenethyl, optionally substituted 1,2-diphenylethyl, optionally substituted benzhydryl, optionally substituted trityl or optionally substituted benzyl, (which may be mono, do- or tri-substituted by C1–6 alkyl, trifluoromethyl, hydroxyl, C1–6 alkoxy, C1–6 aklylthio, halogen, nitro, amino, C1–5 alkanoyl, aroyl, morpholino, carboxyl or C1–6 alkoxycarbonyl in the aryl moiety), optionally substituted phenyl or optionally substituted naphthyl, (which may be mono, di- or tri-substituted by C1–6 aklylthio, halogen, nitro, amino, C1–5 alkanoyl, aroyl, morpholino, carboxyl or C1–6 alkoxycarbonyl)



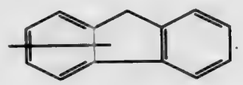
(wherein A^1 is selected from hydrogen and C1–6 alkyl, m is 0 or 1, and n is an integer of 0 to 5),



(wherein n is an integer of 0 to 5),



(wherein m is 0 or 1), and



5,112,868

HYDROXAMATE DERIVATIVES OF SELECTED NONSTEROIDAL ANTIINFLAMMATORY ACYL RESIDUES HAVING CYCLOOXYGENASE AND 5-LIPOXYGENASE INHIBITION

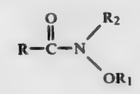
Wiaczeslaw A. Cetenko; David T. Connor; Daniel L. Flynn, and Jagadish C. Sircar, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 196,584, May 19, 1988, Pat. No. 4,943,587. This application May 2, 1990, Ser. No. 518,007

Int. Cl.[5] A61K *31/38, 31/40, 31/495, 31/165, 31/18, 31/325, 31/34;* **C07D** *213/72;* **C07C** *261/04, 233/81*

U.S. Cl. 514—618 **7 Claims**

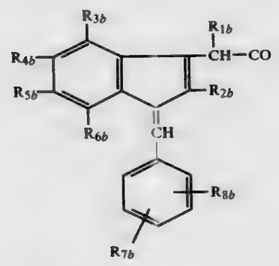
1. A compound of the formula



I

or a pharmaceutically acceptable acid addition or base salt thereof wherein

i) RCO is



I_b

wherein:

R_{1b} is hydrogen, lower alkyl or halogenated lower alkyl;

R_{2b} is hydrogen or alkyl;

R_{3b}, R_{4b}, R_{5b} and R_{6b} each are hydrogen, lower alkyl, lower alkoxy, nitro, amino, lower alkylamino, lower dialkylamino, lower dialkylamino lower alkyl, sulfamyl, lower alkylthio, mercapto, hydroxy, hydroxy lower alkyl, lower alkylsulfonyl, halogen, carboxyl, carbo-lower alkoxy, carbamido, halogenoalkyl, cycloalkyl, or cycloalkoxy;

R_{7b} is lower alkylthio, alkylsulfinyl or alkylsulfonyl;

R_{8b} is hydrogen, halogen, hydroxy, alkoxy or haloalkyl;

ii) R_1 is hydrogen, lower alkyl or acyl;

iii) R_2 is H, lower alkyl, cycloalkyl having a ring of from three to seven carbons which ring is optionally substituted by lower alkyl of from one to five carbons, aryl, arylalkyl or heteroaryl which is pyrrolyl, furanyl, thienyl, pyridinyl, imidazolyl, pyrazinyl, or thioazolyl.

5,112,869

SUBSTITUTED 1-PHENYLNAPHTHALENES

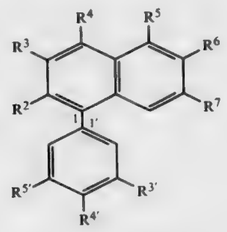
Kyoichi A. Watanabe, Rye Brook; Tsann-Long Su, Somers, and Jai-Tung Huang, Mamaroneck, all of N.Y., assignors to Sloan-Kettering Institute For Cancer Research, New York, N.Y.

Filed Apr. 4, 1989, Ser. No. 332,893

Int. Cl.[5] A61K *31/13;* **C07C** *251/24*

U.S. Cl. 514—641 **13 Claims**

1. A compound having the structure:



wherein each of R^2, R^3, R^5, R^6, R^7, $R^{3'}$, $R^{4'}$, and $R^{5'}$ is independently hydrogen, or a hydroxyl, methyl, methoxy, formyl or phenylazomethynl group and R^4 is a hydroxyl group with the proviso that at least one of R^2, R^3, R^5, R^6, R^7, $R^{3'}$, $R^{4'}$, or $R^{5'}$ is a formyl or a phenylazomethnyl group.

5,112,870

BIS(ALKYL-SUBSTITUTED-4-HYDROXYPHENYLTHIO)ALKANE ANALOGS AS INHIBITORS OF CATARACTOGENESIS

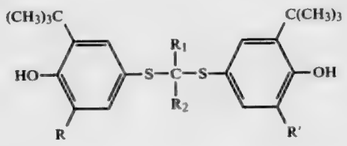
Simon J. T. Mao, Loveland, and Richard L. Jackson, Cincinnati, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 521,293, May 9, 1990, Pat. No. 5,061,734. This application Jul. 22, 1991, Ser. No. 733,505

Int. Cl.[5] A61K *31/10*

U.S. Cl. 514—712 **2 Claims**

1. A method of enhancing ocular catalase activity in a patient in need thereof comprising administering to said patient an effective catalase enhancing amount of a compound of the formula



wherein

R and R′ are each independently hydrogen, or a C_1–C_4 alkyl

R_1 is hydrogen or methyl; and

R_2 is hydrogen or a C_1–C_6 alkyl,

with the proviso that R_1 is methyl when R_2 is hydrogen.

5,112,871

ANTI-MICROBIAL BROMO-NITRO COMPOUNDS

Peter W. Austin, Bury, England, assignor to Imperial Chemical Industries PLC, Millbank, England

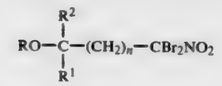
Filed Oct. 31, 1989, Ser. No. 429,629

Claims priority, application United Kingdom, Nov. 30, 1988, 8827899

Int. Cl.[5] A01N *33/20;* **C07C** *205/01*

U.S. Cl. 514—727 **6 Claims**

1. A compound of the formula I:



I

where:

R is hydrogen;

R^1 and R^2 are independently selected from the group consisting of hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl and C_2–C_6 alkynyl; and

n has a value of at least one and not more than eight.

5,112,872

ANTISPASMODIC AGENT

Tatsuya Baba, Kawanishi, and Norio Ogata, Osaka, both of Japan, assignors to Taiko Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 11, 1989, Ser. No. 448,468

Claims priority, application Japan, Jun. 1, 1989, 1-140820; Sep. 21, 1989, 1-247781

Int. Cl.[5] A61K *31/05*

U.S. Cl. 514—731 **8 Claims**

1. A method of treating spasm in a patient in need of such treatment which comprises administering an antispasmodically effective amount of creosote or one or more of its component phenols to said patient.

5,112,873

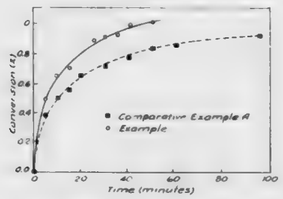
RESINS HAVING IMPROVED EXCHANGE KINETICS

William C. Pike, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1991, Ser. No. 676,916

Int. Cl.[5] B01D *15/04;* **C08F** *26/06*

U.S. Cl. 521—32 **13 Claims**



1. A resin comprising cross-linked copolymer beads having weak-base exchange moieties substituted at haloalkylated sites which are most accessible to diffusion and hydrophilic, strong-base exchange moieties substituted at haloalkylated sites which are least accessible to diffusion.

5,112,874

MOLDED POLYURETHANE PLASTICS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE AS SHOE SOLES

Ottfried Schlak, Cologne, and Dieter Wecker, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 24, 1989, Ser. No. 398,038

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1988, 3829583

Int. Cl.[5] C08L *83/06;* **C08K** *5/54*

U.S. Cl. 521—51 **3 Claims**

1. An cellular molded polyurethane plastic having a density of about 200 to 800 kg/m^3 and a solid surface, characterized by a content of about 0.5 to 4.0% by weight, based on said polyurethane plastic, of a polysiloxane chemically incorporated into the polyurethane structure, wherein said polysiloxane corresponds to the formula

$$HO(RO)_xRO[(R'_2SiO)_yR(OR)_xO]_zH$$

wherein

x denotes an integer between 0 and 50,

y denotes an integer between 5 and 500,

z denotes an integer between 1 and 10,

R represents a straight chain or branched C_2–C_{20}-alkylene group, and

R′ represents an optionally branched or substituted C_1–C_{20}-alkyl group or and optionally substituted aryl group.

5,112,875

POLYSTYRENE HAVING HIGH DEGREE OF EXPANDABILITY, AND FORMULATION HAVING A HIGHLY-EXPANDABLE POLYMER THEREIN

Eugene K. Zimmermann, Hamilton Square; Bernhard Wagner, Cranbury; William E. Volz, Marlboro; William H. Harclerode, Ewing; John V. Wiman, Morristown, and John C. Voss, Trenton, all of N.J., assignors to BASF Corporation, Parsippany, N.J.

Filed Nov. 26, 1990, Ser. No. 617,711

Int. Cl.[5] C08J *9/18, 9/22, 9/224*

U.S. Cl. 521—60 **25 Claims**

1. An expandable polystyrene formulation comprising:

(A) a polystyrene polymer exhibiting:

(1) a polydispersity of from about 1.0 to less than 2.5,

(2) a weight average molecular weight of from greater than about 180,000 to about 300,000, and

(3) an M_z:M_n of from about 2 to about 4.5, wherein the polystyrene polymer is present in an amount of from about 94.5 weight percent to about 98 weight percent, based on the total weight of the formulation,

wherein the polystyrene polymer is branched to from 0 to less than 5 weight percent, and

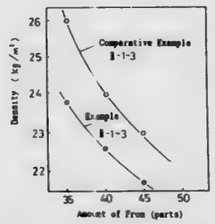
(B) a blowing agent, wherein the blowing agent is present in an amount of from about 2 weight percent to less than 5.5 weight percent, wherein the blowing agent is at least one member selected from the group consisting of:

pentane, cyclopentane, methylcyclopentane, neopentane, isopentane, pentane petroleum distillate fractions, propane, butane, isobutane, hexane, isomers of hexane, 2,2-dimethylbutane, 2,3-dimethylbutane, 2-methyl pentane, 3-methyl pentane, cyclohexane, methylcyclohexane, heptane, propylene, butylene, isobutylene, mixtures of one or more aliphatic hydrocarbons having a molecular weight of at least 42 and a boiling point not higher than 95° C. at 760 millimeters absolute pressure, water, carbon dioxide, ammonium carbonate, and azo compounds that are decomposable to form a gas at a heat-plastifying temperature to which the resin is brought.

5,112,876
POLYETHER POLYOL AND RIGID POLYURETHANE FOAM

Yoshihiko Tairaka, Sakai, and Katsumi Inaoka, Osaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 25, 1989, Ser. No. 426,226
Claims priority, application Japan, Oct. 28, 1988, 63-274145
Int. Cl.[5] C08G *18/14, 18/32*
U.S. Cl. 521—167 **5 Claims**



1. A polyether polyol which is prepared by
(i) reacting 3.0 to 4.0 molecular equivalents of ethylene oxide with one molecular equivalent of 2,3- or 3,4-tolylenediamine, or a mixture thereof in the absence of catalyst, and thereafter,
(ii) reacting 2.8 to 4.8 molecular equivalents of propylene oxide with one molecular equivalent of the reaction product of (i) in the presence of an alkali metal hydroxide in an amount of not more than 0.8% by weight based on the 2,3- or 3,4-tolylenediamine, or the mixture thereof.

5,112,877
POLYISOCYANATE COMPOSITION

Martin C. Barker, Bertem; James P. Brown, Sterrebeek; Anthony Cunningham, Bertem, and David Randall, Erps-Kwerps, all of Belgium, assignors to Imperial Chemical Industries PLC, London, England

Filed Sep. 20, 1989, Ser. No. 409,703
Claims priority, application United Kingdom, Sep. 28, 1988, 8822790
Int. Cl.[5] B01J *13/00*; C08G *18/14*; C08K *3/34*; A61K *31/14*
U.S. Cl. 521—110 **6 Claims**

1. A method for preparing a polyurethane or polyisocyanurate foam which comprises reacting an isocyanate-reactive compound and an isocyanate composition comprising an isocyanate, an organo-clay and a cyclic alkylene carbonate, in the presence of a foaming agent.

5,112,878
CATALYSTS FOR EXTENDING THE SHELF LIFE OF FORMULATIONS FOR PRODUCING RIGID POLYURETHANE FOAMS

Todd W. Wishneski, Cheshire, and Donald E. Margitich, Wallingford, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Sep. 23, 1991, Ser. No. 764,037
Int. Cl.[5] C08J *9/14*
U.S. Cl. 521—131 **8 Claims**

1. An improved process for producing, by means of a portable foaming apparatus having a static mixer, a polyurethane foam by reacting a reaction mixture comprised of a polyol, an organic isocyanate, a foaming/frothing agent, and a reaction catalyst, said reaction mixture being reacted on said portable foaming apparatus comprised of (a) a first supply tank for supplying the isocyanate reactant, (b) a second supply tank for supplying the other foam forming ingredients, (c) a nitrogen pressure hank having a valved outlet in communication, via a distributing valve, with the inlets to the two supply tanks, (d) a static mixer having one outlet and two inlets communicating with the supply tank outlets, and (e) adjustable flow control units interposed in the conduits linking the supply tank with the static mixer, the improvement comprising employing monochlorodifluoromethane as the sole blowing/frothing agent and an acid-blocked amine catalyst as the reaction catalyst in said reaction mixture, and employing a polyol which is a polyether polyol having an average of between four and eight active hydrogens per molecule and a hydroxyl number ranging from about 300 to about 700, in order to produce a CFC-free essentially closed-cell rigid or semi-rigid polyurethane foam.

5,112,879
CHEMICAL BLOWING AGENT

David Randall, Everberg, and Rik De Vos, Gent, both of Belgium, assignors to Imperial Chemical Industries PLC, London, England

Filed Sep. 19, 1990, Ser. No. 584,931
Claims priority, application United Kingdom, Sep. 19, 1989, 8921182.5
Int. Cl.[5] C08G *18/00*; C08V *9/08*
U.S. Cl. 521—155 **9 Claims**

1. A method for the preparation of polymeric foams which comprises reacting an organic polyisocyanate with a cyclic carbonate having at least one isocyanate-reactive substitutent attached to the carbonate ring.

5,112,880
LIGHT-CURABLE ORTHODONTIC BRACKET ADHESIVE

Masayoshi Tsunekawa, Camarillo, and Raymond L. Ramirez, Oxnard, both of Calif., assignors to Gingi-Pak, Camarillo, Calif. and Sankin Kogyo K.K. Industry Ltd., Tokyo, Japan

Filed Mar. 9, 1990, Ser. No. 491,002
Int. Cl.[5] C08F *2.46*; A61K *6/08*
U.S. Cl. 522—81 **1 Claim**

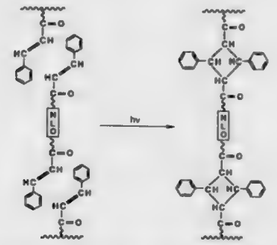
1. A light-curable, orthodontic bracket adhesive composition comprising:
(a) from approximately 60 wt. % to 80 wt. % particulate strontium aluminofluorosilicate filler having an average particle size in the range of about 0.4 to 1 micron;
(b) from approximately 20 wt. % to 40 wt. % of a light-curable resin containing, relative to the total adhesive composition, approximately 5 wt. % to 25 wt. % 2,2-bis p-(2'-hydroxy-3'-methacryloxypropoxy)-phenylene-propane (Bis-GMA), approximately 5 wt. % to 10 wt. % triethyleneglycol dimethacrylate, and approximately 2 wt. % to 3 wt. % 2-hydroxyethyl methacrylate; and
(c) a catalytically effective amount of a photoinitiator composition comprising approximately 2 wt. % to 10 wt. % 2-methacryloxyethyl (p-N,N-dimethyl) aminobenzoate and approximately 0.4 wt. % to 110 wt. % camphorquinone, relative to said resin.

5,112,881
PHOTOCROSSLINKED SECOND ORDER NONLINEAR OPTICAL POLYMERS

Braja K. Mandal, Lowell; Sukant K. Tripathy, Acton; Jan-Chan Huang, and Jayant Kumar, both of Lowell, all of Mass., assignors to University of Lowell, Lowell, Mass.

Filed Aug. 24, 1990, Ser. No. 573,253
Int. Cl.[5] C08J *3/28*; C08F *265/00*; G03C *1/725*
U.S. Cl. 522—117 **14 Claims**

1. A photocrosslinkable nonlinear optical polymer composition, comprising:
a) a nonlinear optical component which includes at least two photosensitive functional groups; and
b) a host polymer component which includes a plurality of photosensitive functional groups, whereby, during exposure of the photocrosslinkable nonlinear optical polymer composition to sufficient electromagnetic radiation, at least two of the photosensitive functional groups of the host polymer component react with at least two of the photosensitive functional groups of the nonlinear optical



component to cause the nonlinear optical component to crosslink with the host polymer component, thereby forming a photocrosslinked nonlinear optical polymer.

5,112,882
RADIATION CURABLE POLYOLEFIN PRESSURE SENSITIVE ADHESIVE

Gaddam N. Babu, Woodbury, Minn.; Susan S. Christopher, Spring Valley, Wis.; Bruce C. Copley, Shoreview, Minn., and Thomas S. Overstreet, Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 6, 1989, Ser. No. 403,662
Int. Cl.[5] C08J *3/28*
U.S. Cl. 522—158 **25 Claims**

20. A method comprising the steps of:
(a) providing an admixture comprising at least one polymer comprising the reaction product of from 85 to 100 mole percent C_6 to C_{10} α-olefins and 15 to 0 mole percent of one or more polyene monomers, and
(c) subjecting said admixture, said admixture being free of sulfur, admixture to electron beam to provide a crosslinked polymer.

5,112,883
MEDIUM INCORPORATING MELANIN AS AN ABSORBING PIGMENT AGAINST ELECTROMAGNETIC RADIATION

James M. Gallas, San Antonio, Tex., assignor to Photoprotective Technologies Incorportaed, San Antonio, Tex.

Continuation of Ser. No. 255,905, Oct. 6, 1988, abandoned, which is a continuation-in-part of Ser. No. 105,632, Oct. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 739,556, May 6, 1985, Pat. No. 4,698,374, which is a continuation-in-part of Ser. No. 618,745, Jun. 8, 1984, abandoned, said Ser. No. 105,632, is a continuation-in-part of Ser. No. 88,029, Aug. 18, 1987, which is a continuation of Ser. No. 837,852, Mar. 6, 1986, abandoned, which is a continuation of Ser. No. 739,756, May 30, 1985, abandoned, which is a continuation of Ser. No. 618,745, Jun. 8, 1984, abandoned. This application Nov. 9, 1990, Ser. No. 614,062
Int. Cl.[5] C08L *89/04*
U.S. Cl. 523—106 **31 Claims**

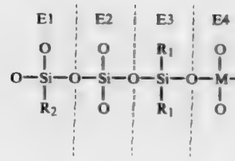
1. An apparatus for absorbing ultraviolet, visible and near-infrared radiation emitted from natural or artificial sources, comprising:
a transparent solid material formed by the polymerization of a monomer;
melanin; and
a reagent being chemically attached to the melanin through a covalent bond to make the melanin derivatized melanin so that the melanin is more soluble in the monomer prior to the polymerization of the monomer, the derivatized melanin being connected to the material.

5,112,884
DENTAL FILLING MATERIAL

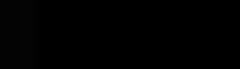
Bernhard Hanke, Schwalbach, Fed. Rep. of Germany, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 2, 1990, Ser. No. 474,413
Int. Cl.[5] A61K *5/01*; C08K *3/22*
U.S. Cl. 523—116 **6 Claims**

1. Dental filling material containing at least one polymerizable (meth)acrylic acid ester, characterized in that it contains 20 to 90% by weight, calculated on the total composition, of a compound consisting of the structural element E2 and at least one of the structural elements E1 and/or E3 and/or E4 of the general formula



where R_1 denotes a methyl, ethyl, n-propyl, isopropyl or an unsubstituted or CH_3—C_3H_7-substituted phenyl radical, R_2 denotes a CH_2=CH—, CH_2=CHCOO$(CH_2)_n$— or R_1,



n denotes 0, 1, 2 or 3, and M denotes titanium or zirconium; and wherein further the molar ratio of the structural element E2 to the structural element E4, if present, is greater than 10:1.

5,112,885
ROOM TEMPERATURE VULCANIZABLE SILICON RUBBER COMPOSITION

Yoshio Inoue; Masatoshi Arai, both of Annaka, and Hironao Fujiki, Takasaki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Apr. 26, 1990, Ser. No. 515,028
Claims priority, application Japan, Apr. 28, 1989, 1-110192
Int. Cl.[5] C08K *9/06*
U.S. Cl. 523—213 **11 Claims**

1. A room temperature vulcanizable silicone rubber composition which comprises:
(1) 100 parts by weight of an organopolysiloxane which is blocked with a hydroxyl group or hydrolyzable group at both ends of a molecular chain thereof;
(2) from 1 to 40 parts by weight of fumed silica which is surface treated with a monoorganosilane of the general formula R^1SiY_3, wherein R^1 represents a monovalent hydrocarbon group having from 1 to 3 carbon atoms, each Y represents a halogen atom and which has a specific area of not less than 50 m^2/g; and
(3) from 0.5 to 30 parts by weight of an organosilicon compound of the general formula, $R^2_bSiZ_{4-b}$ wherein R^2 represents an unsubstituted or substituted monovalent hydrocarbon group having from 1 to 10 carbon atoms, Z represents a hydrolyzable group, and b has a value of 0 or 1, or its partially hydrolyzed product.

5,112,886

ALLANTOIN SALTS OF QUATERNARY NITROGEN CONTAINING POLYMERS FOR USE IN SKIN CONDITIONING, COSMETIC AND PHARMACEUTICAL FORMULATIONS

Charalambos J. Phalangas, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 911,747, Sep. 26, 1986, abandoned. This application Apr. 7, 1989, Ser. No. 334,968

Int. Cl.[5] C08K *0/00*

U.S. Cl. 523—332 **17 Claims**

1. An aqueous dispersion comprising from 0.1–30 percent by weight of a quaternary nitrogen modified polymer which comprises a polyvinyl alcohol base chain having a number average molecular weight of 2,000–1,000,000 having pendant groups of the formula:

$$-RN^{+}R_1R_2R_3A^{-}$$

wherein:

R is selected from the group consisting of alkylene, alkyl substituted alkylene, hydroxy alkylene, oxylinked alkylene, sulfur linked alkylene, and nitrogen linked alkylene radials wherein such total substituent has a formula weight of 14 to about 3,000;

R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen, alkyl and arylakyl radicals having 1–22 carbon atoms;

A^{-} is an anion selected from allantoin anions and derivative thereof.

5,112,887

FORMABLE COATINGS

Ismael Colon, Piscataway, N.J.; Charles N. Merriam, Harvey Cedars, and Philip F. Wolf, Bridgewater, both of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 441,218, Nov. 28, 1989, abandoned, which is a continuation of Ser. No. 850,783, Apr. 11, 1986, abandoned, and a continuation-in-part of Ser. No. 785,385, Oct. 8, 1985, abandoned. This application Aug. 8, 1991, Ser. No. 742,555

Int. Cl.[5] C08L *63/10*

U.S. Cl. 523—400 **14 Claims**

1. A formable coating composition comprising:

(a) a phenoxy resin;

(b) about 1 to about 50 percent by weight of the total resin of a modifier resin which is relatively soft in comparison to the phenoxy resin and has:

(1) a reduced viscosity of about 0.1 to about 2 dL/g in tetrahydrofuran at 20° C.;

(2) a Tg of about −120° to about 30° C.;

(3) a solubility in Cellosolve acetate at 25° C. of at least about 1 g .per 100 g. of solvent; and

(4) a molecular weight of about 2,000 to about 90,000;

(c) a crosslinker; and

(d) optionally, a particulate material.

5,112,888

EPOXY RESIN COMPOSITION CONTAINING LONG CHAIN ALIPHATIC DIACIDS AND/OR DIPHENYLOL DERIVATIVES

Kazufumi Ueji, Kasukabe; Yoshihiro Motoki, Misato, and Akira Shinozuka, Matsudo, all of Japan, assignors to Somar Corporation, Japan

Filed Jul. 12, 1990, Ser. No. 551,810

Int. Cl.[5] C08L *63/00;* **C08F** *283/00;* **C08G** *8/28*

U.S. Cl. 523—443 **1 Claim**

1. An epoxy resin powder composition consisting essentially of:

100 parts by weight of a mixed epoxy resin comprised of a bisphenol A epoxy resin and a novolac epoxy resin and having an average epoxy equivalent of 350–1,000;

30–80 parts by weight of a curing agent, wherein said curing agent is a mixture comprising (a) an aliphatic dicarboxylic acid of the formula:

$$HO—CO—R—CO—OH$$

wherein R represents a divalent, aliphatic hydrocarbyl group containing a divalent, linear skeletal structure having 8–22 carbon atoms, and (b) a diphenylol derivative of the formula:

$$HO—C_6H_4—C(CH_3)_2—C_6H_4—(O—CH(OH)—CH_2—O—C_6H_4—C(CH_3)_2—C_6H_4)_m—OH$$

wherein m is an integer of 0–8, the weight ratio of the diphenylol derivative to the dicarboxylic acid being 3:10 to 15:10;

50–150 parts by weight of silica having an average particle size of 0.5–75 μm;

15–40 parts by weight of a mixture of a brominated aromatic compound and diantimony trioxide, the weight ratio of said brominated aromatic compound to said diantimony trioxide being in the range of 10:3 to 10:7; and

0.5–5 parts by weight of triphenylphosphine.

5,112,889

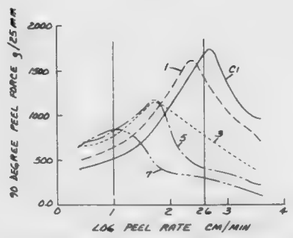
PRESSURE-SENSITIVE ADHESIVE COMPOSITION, TAPE AND DIAPER CLOSURE SYSTEM

John A. Miller, Woodbury, Minn., and Egbert A. von Jakusch, Hilden, Fed. Rep. of Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 437,771, Nov. 15, 1989, Pat. No. 5,028,646, which is a continuation of Ser. No. 227,407, Aug. 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 91,122, Aug. 31, 1987, abandoned. This application Feb. 15, 1991, Ser. No. 657,135

Int. Cl.[5] C08L *93/04*

U.S. Cl. 524—77 **14 Claims**



1. A pressure-sensitive adhesive tape comprising a backing substrate coated on one surface with the pressure-sensitive adhesive composition comprising an elastomer which is an A-B-A block copolymer, wherein the A blocks are derived from styrene or alphamethylstyrene and the B blocks are derived from isoprene, butadiene, or hydrogenated versions thereof or an (AB) block copolymer of the same type of composition in another geometry such as a tapered block copolymer or a radial block copolymer; a solid tackifier resin; a liquid tackifier resin; and an end block reinforcing resin.

5,112,890

STABILIZATION OF ACID CATALYZED THERMOSET RESINS

Rudolf A. Behrens, New Fairfield, Conn.; Roland A. E. Winter, Armonk, N.Y.; Andrew Mar, Norwalk, Conn.; Peter J. Schirmann, Fairfield, Conn.; Raymond Seltzer, New City, N.Y., and Roger F. Malherbe, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 99,411, Sep. 21, 1987, abandoned. This application Oct. 19, 1988, Ser. No. 259,952

The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.

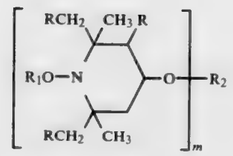
Int. Cl.[5] C08K *34/15, 34/35*

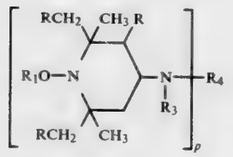
U.S. Cl. 524—95 **27 Claims**

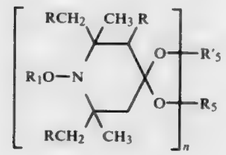
1. A stabilized stoving lacquer composition comprising

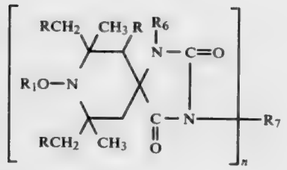
(a) an acid catalyzed thermoset resin based on hot crosslinkable acrylic, polyester, polyurethane, polyamide or alkyd resins, and

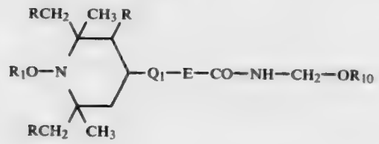
(b) an effective oxidative and light stabilizing amount of a hindered amine derivative corresponding to the formulae A–P

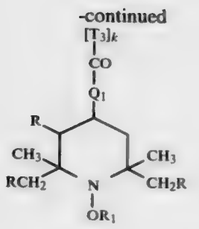

(A)

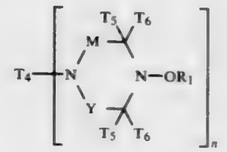

(B)

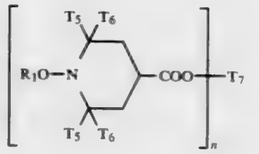

(C)

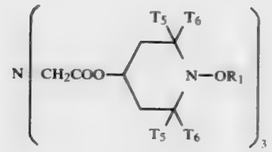

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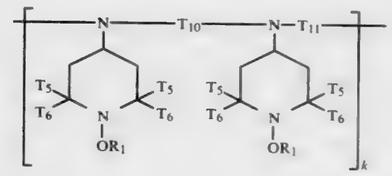

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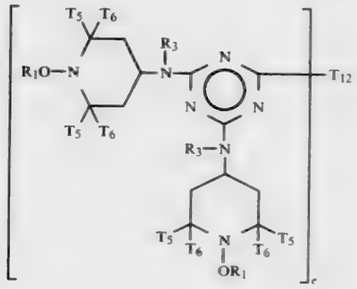

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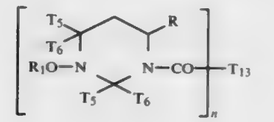

(G)


(H)

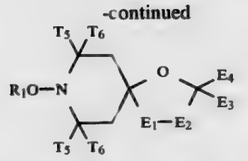

(I)


(J)

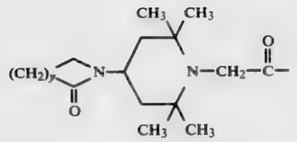

(K)


(L)

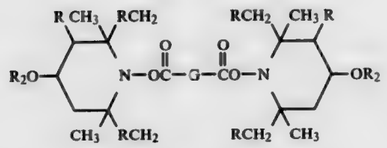
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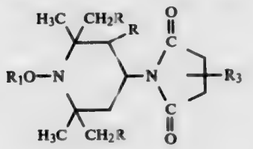
(M)



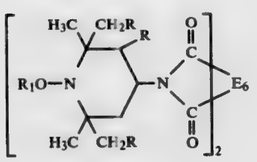
(N)



(O)



(P)



wherein

R is hydrogen or methyl,

R_1 is independently C_1–C_{18} alkyl, C_2–C_{18} alkenyl, C_2–C_{18} alkynyl, C_5–C_{12} cycloalkyl, C_6–C_{10} bicycloalkyl, C_5–C_8 cycloalkenyl C_6–C_{10} aryl, C_7–C_9 aralkyl, C_7–C_9 aralkyl substituted by alkyl or aryl, or

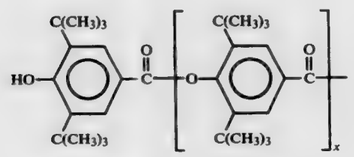


wherein D is C_1–C_{18} alkyl, C_1–C_{18} alkoxy, phenyl, phenyl substituted by hydroxy, alkyl or alkoxy, or amino or amino mono- or disubstituted by alkyl or phenyl;

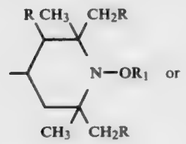
m is 1–4,

when m is 1,

R_2 is hydrogen, C_1–C_{18} alkyl optionally interrupted by one or more oxygen atoms, C_2–C_{12} alkenyl, C_6–C_{10} aryl, C_7–C_{18} aralkyl glycidyl, a monovalent acyl radical of an aliphatic, cycloaliphatic, araliphatic or aromatic carboxylic acid, or of a carbamic acid, or



wherein x is 0 or 1, or



wherein y is 2–4;

when m is 2,

R_2 is C_1–C_{12} alkylene, C_4–C_{12} alkenylene, xylylene, a divalent acyl radical of an aliphatic, cycloaliphatic, araliphatic or aromatic dicarboxylic acid or of a dicarbamic acid;

when m is 3, R_2 is a trivalent acyl radical of an aliphatic, unsaturated aliphatic, cycloaliphatic, or aromatic tricarboxylic acid;

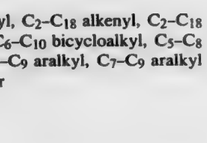
when m is 4, R_2 is a tetravalent acyl radical of a saturated or unsaturated aliphatic or aromatic tetracarboxylic acid;

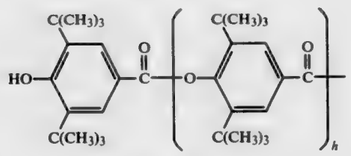
p is 1 2 or 3,

R_3 is hydrogen, C_1–C_{12} alkyl, C_5–C_7 cycloalkyl, C_7–C_9 aralkyl, C_2–C_{18} alkanoyl, C_3–C_5 alkenoyl or benzoyl;

when p is 1,

R_4 is hydrogen, C_1–C_{18} alkyl, C_5–C_7 cycloalkyl, C_2–C_8 alkenyl unsubstituted or substituted by a cyano, carbonyl or carbamide group, aryl, aralkyl, or it is glycidyl, a group of the formula —CH_2—CH(OH)—Z or of the formula —CO—Z or —CONH—Z wherein Z is hydrogen, methyl or phenyl; or a group of the formulae





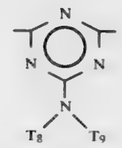
with h as 0 or 1;

or R_3 and R_4 together when p is 1 can be alkylene of 4 to 65 carbon atoms or 2-oxopolyalkylene or the cyclic acyl radical of an aliphatic or aromatic 1,2- or 1,3-dicarboxylic acid,

when p is 2,

R_4 is a direct bond or is C_1–C_{12} alkylene, C_6–C_{12} arylene, xylylene, a —CH_2CH(OH)—CH_2 group, or a group —CH_2—CH(OH)—CH_2—O—X—O—CH_2—CH(OH)—CH_2— wherein X is C_2–C_{10} alkylene, C_6–C_{15} arylene or Chd 6–C_{12} cycloalkylene; or, provided that R_3 is not alkanoyl, alkenoyl or benzoyl, R_4 can also be a divalent acyl radical of an aliphatic, cycloaliphatic or aromatic dicarboxylic acid or dicarbamic acid, or can be the group —CO—; or

R_4 is



where T_8 and T_9 are independently hydrogen, alkyl of 1 to 18 carbon atoms, or T_8 and T_9 together are alkylene of 4 to 6 carbon atoms or 3-oxapentamethylene;

when p is 3,

R_4 is 2,4,6-triazinyl,

n is 1 or 2,

when n is 1,

R_5 and R'$_5$ are independently C_1–C_{12} alkyl, C_2–C_{12} alkenyl, C_7–C_{12} aralkyl, or R_5 is also hydrogen, or R_5 and R'$_5$ together are C_2–C_8 alkylene or hydroxylakylene or C_4–C_{22} acyloxyalkylene;

when n is 2,

R_5 and R'$_5$ together are (—CH_2)$_2$C(CH_2—)$_3$;

R_6 is hydrogen, C_1–C_{12} alkyl, allyl, benzyl, glycidyl or C_2–C_6 alkoxylakyl;

when n is 1,

R_7 is hydrogen, C_1–C_{12} alkyl, C_3–C_5 alkenyl, C_7–C_9 aralkyl, C_6–C_7 cycloalkyl, C_2–C_4 hydroxyalkyl; C_2–C_6 alkoxyalkyl, C_6–C_{10} aryl, glycidyl, a group of the formula —$(CH_2)_t$—COO—Q or of the formula —$(CH_2)_t$—O—CO—Q wherein t is 1 or 2, and Q is C_1–C_4 alkyl or phenyl; or

when n is 2,

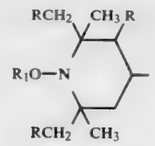
R_7 is C_2–C_{12} alkylene, C_6–C_{12} arylene, a group —CH_2CH(OH)—CH_2O—X—O—CH_2—CH(OH)—CH_2— wherein X is C_2–C_{10} alkylene, C_6–C_{15} arylene or C_6–C_{12} cycloalkylene, or a group —CH_2CHY(OZ')CH_2—(OCH$_2$—CH(OZ')CH_2)$_2$— wherein Z' is hydrogen, C_1–C_{18} alkyl, allyl, benzyl, C_2–C_{12} alkanoyl or benzoyl;

Q_1 is —N(R_8)— or —O—;

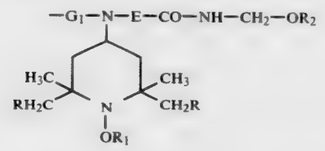
E is C_1–C_3 alkylene, the group —CH_2—CH(R_9)—O— wherein R_9 is hydrogen, methyl or phenyl, the group —$(CH_2)_3$—NH— or a direct bond;

R_{10} is hydrogen or C_1–C_{18} alkyl;

R_8 is hydrogen, C_1–C_{18} alkyl, C_5–C_7 cycloalkyl, C_7–C_{12} aralkyl, cyanoethyl, C_6–C_{10} aryl, the group —CH$_2$—CH(R_9)—OH wherein R_9 has the meaning defined above; a group of the formula



or a group of the formula



wherein

G_1 can be C_2–C_6 alkylene or C_6–C_{12} arylene; or R_8 is a group —E—CO—NH—CH_2—OR_{10};

T_3 is ethylene or 1,2-propylene, or is the repeating structural unit derived from an alpha-olefin copolymer with an alkyl acrylate or methacrylate;

k is 2 to 100;

T_4 has the same meaning as R_4 when p is 1 or 2,

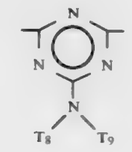
T_5 is methyl,

T_6 is methyl or ethyl, or T_5 and T_6 together are tetramethylene or pentamethylene;

M and Y are independently methylene or carbonyl;

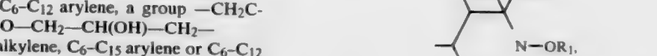
T_7 is the same as R_7;

T_{10} and T_{11} are independently alkylene of 2 to 12 carbon atoms, or T_{11} is



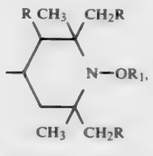
T_{12} is piperazinyl,

$$—NR_{11}—(CH_2)_d—NR_{11}— \quad \text{or}$$



wherein

R_{11} is the same as R_3 or is also



a, b and c are independently 2 or 3, and f is 0 or 1;

e is 2, 3 or 4;

T_{13} is the same as R_2 with the proviso that T_{13} cannot be hydrogen when n is 1;

E_1 and E_2, being different, each are —CO— or —N(E_5)— wherein E_5 is hydrogen, C_1–C_{12} alkyl or C_4–C_{22} alkoxycarbonylalkyl;

E_3 is hydrogen, alkyl of 1 to 30 carbon atoms, phenyl, naphtyl, said phenyl or said naphthyl substituted by chlorine or by alkyl of 1 to 4 carbon atoms, or phenylalkyl of 7 to 12 carbon atoms, or said phenylalkyl substituted by alkyl of 1 to 4 carbon atoms;

E_4 is hydrogen, alkyl of 1 to 30 carbon atoms, phenyl, naphthyl or phenylalkyl of 7 to 12 carbon atoms, or

E_3 and E_4 together are polymethylene of 4 to 17 carbon atoms, or said polymethylene substituted by up to four alkyl groups of 1 to 4 carbon atoms;

R_2 of formula (N) is a previously defined when m is 1;

G is a direct bond, C_1–C_{12} alkylene, phenylene or —N—H—G'-NH wherein G' is C_1–C_{12} alkylene; and

E_6 is an aliphatic or aromatic tetravalent radical.

5,112,891

POLYCARBONATE RESIN COMPOSITION

Tohru Haruna; Masayuki Takahashi, and Toshinori Yukino, all of Saitama, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1990, Ser. No. 573,722

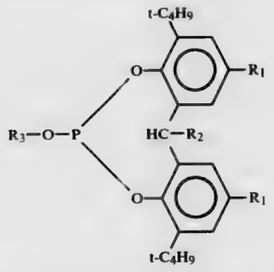
Claims priority, application Japan, Sep. 6, 1989, 1-230779

Int. Cl.[5] **C08K** *5/527*

U.S. Cl. 524—101 **10 Claims**

1. A polycarbonate resin composition comprising 100 parts

by weight of a resin component consisting essentially of an aromatic polycarbonate resin and 0.001 to 5 parts by weight of an organic cyclic phosphite represented by the general formula:



(1)

wherein R_1 represents an alkyl group having 1 to 9 carbon atoms; R_2 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms; and R_3 represents an alkyl group having 1 to 30 carbon atoms.

5,112,892

METHOD FOR THE PRODUCTION OF AN ASYMMETRIC SEMIPERMEABLE MEMBRANE FROM A SOLUTION OF A SULFONATED POLYARYLETHERSULFONE

Peter T. Cardew, Manchester, David R. Holmes, Cheshire; and John W. Smith, Liverpool, all of England, assignors to Imperial Chemical Industries plc, Great Britain

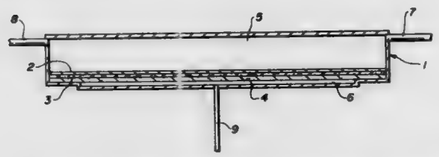
Division of Ser. No. 53,579, May 22, 1987, abandoned, which is a continuation of Ser. No. 865,832, May 22, 1986, abandoned. This application Sep. 6, 1990, Ser. No. 578,294

Claims priority, application United Kingdom, May 23, 1985, 8513113

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.[5] C08J *3/08;* **C08L** *81/06, 71/04;* **C08K** *5/15*

U.S. Cl. 524—108 **20 Claims**



1. A method for the production of an asymmetric semipermeable membrane which method comprises forming a solution of a sulphonated polyarylethersulphone in a solvent mixture, casting the solution on a support to form a film on the support, immersing, in a coagulation bath, the cast film of the solution on the support and recovering a membrane from the coagulation bath, wherein the sulphonated polyarylethersulphone has repeating units of the formula (I):

$$[(Ph—O)_nPh—SO_2] \quad (I)$$

wherein

Ph represents a phenylene residue wherein at least some of the groups Ph are sulphonated; and

n is 1 or 2 and the value of n can differ along the polymer chain; and

wherein the solvent mixture has a delta-H in the range from 3 to 8.5; a delta-P in the range from 4 to 8 and a delta-D in the range from 7.2 to 9.5 and the solvent mixture contains at least three components, each of which component has a melting point of not more than 50° C. and which is a non-solvent or poor solvent for the sulphonated polyarylethersulphone, wherein at least one component (I) of the solvent mixture is a compound which has a delta-H, a delta-P and a delta-D having values such that at least one of conditions (a), (b), (c) and (d) is satisfied:

(a) delta-D is less than 8 when delta-P is not more than 3,

(b) delta-H is greater than 3 when delta-P is at least 8.5;

(c) delta-H is less than 8 when the compound contains at least one hydroxylic group;

(d) delta-P is greater than 3 and less than 8.5 and the compound is free of hydroxylic groups; and at least in the presence of the sulphonated polyarylethersulphone, the solvent mixture forms a single liquid phase and none of the components of the solvent mixture reacts or complexes with another of the components of the solvent mixture or with the sulphonated polyarylethersulphone.

5,112,893

TRIS-(2-ALKYL-4-ALKOXYPHENYL) PHOSPHITES AS PROCESSING STABILIZERS FOR POLYOLEFINS

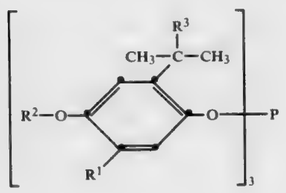
Richard H. S. Wang, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 10, 1990, Ser. No. 596,655

Int. Cl.[5] C08K *5/526*

U.S. Cl. 524—150 **3 Claims**

1. A stabilized composition comprising a poly-α-olefin susceptible to degradation upon exposure to heat and/or radiation containing a stabilizing amount of a compound having the formula



wherein

R^1 is hydrogen, alkyl or aralkyl;

R^2 is alkyl; and

R^3 is alkyl or aryl.

5,112,894

COMPOSITION OF CARBOXYLIC ACID AND SULPHUR-CONTAINING ACIDS OR SALTS SUITABLE FOR INCORPORATION INTO OLEFIN POLYMERS

Colin Bath, Bury, England, assignor to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 328,009, Mar. 23, 1989, Pat. No. 5,013,778, which is a continuation-in-part of Ser. No. 249,876, Sep. 26, 1988, abandoned. This application Oct. 16, 1990, Ser. No. 598,430

Claims priority, application United Kingdom, Mar. 29, 1988, 8807393; Aug. 4, 1988, 8818562

Int. Cl.[5] C08K *5/41*

U.S. Cl. 524—173 **19 Claims**

1. A polymer composition which comprises an olefin polymer,

(a) a carboxylic acid compound which contains at least three carbon atoms; and

(b) an organic sulphur-containing acid or a salt of said acid of the formula I:

$$RSO_nM \quad I$$

wherein:

R is an alkyl group or substituted alkyl group;

M is a hydrogen atom or a cation; and

n is 2, 3 or 4.

5,112,895

WEATHERABLE GRAFT POLYMERS HAVING IMPROVED IMPACT RETENTION AND IMPROVED MELT FLOW

Chuan J. Chen, Amherst, and Fred M. Peng, Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 468,668, Jan. 23, 1990, abandoned. This application May 22, 1991, Ser. No. 704,169

Int. Cl.[5] C08K *5/11*

U.S. Cl. 524—308 **6 Claims**

1. A weatherable graft polymer composition comprising:

(A) a graft polymer component comprising a rubber substrate selected from the group consisting of (i) mixtures of butyl acrylate rubbers and EPDM rubbers and (ii) mixtures of butyl acrylate rubbers and a diene rubber wherein the rubber substrate is grafted with a copolymer of a vinyl aromatic monomer and at least one copolymerizable monomer; and

(B) a rigid copolymer component which is a copolymer of a vinyl aromatic monomer and at least one copolymerizable monomer; and

(C) from 0.5 to 10 parts per hundred parts by weight of the graft polymer composition of one or more aliphatic diesters selected from the group consisting of dibutoxyethoxyethyl adipate or a mixture of dibutoxydiethoxyethyl adipate and dibutoxydiethoxyethyl glutarate.

5,112,896

HIGH-IMPACT POLYSTYRENE CONTAINING LOW MOLECULAR WEIGHT BROMINATED POLYSTYRENE

James L. Dever, North Royalton, and James C. Gill, Maple Heights, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Continuation of Ser. No. 362,129, Jun. 6, 1989, abandoned. This application Dec. 5, 1990, Ser. No. 622,405

Int. Cl.[5] C08K *3/10*

U.S. Cl. 524—412 **4 Claims**

1. A flame retarded, high impact polystyrene composition, comprising:

a blend of a high impact polystyrene and an effective amount of a low molecular weight brominated polystyrene to provide said blend with a flame retardancy of VO at ⅛ inch in the UL-94 test, said low molecular weight brominated polystyrene having a degree of polymerization of from about 3 to 20, and the amount of said bromine in said brominated polystyrene being from about 66 percent to about 76 percent by weight based upon the total weight of said brominated polystyrene.

5,112,897

HIGH IMPACT POLYSTYRENE CONTAINING LOW MOLECULAR WEIGHT BROMINATED POLYSTYRENE

James L. Dever, North Royalton, and James C. Gill, Maple Heights, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 362,129, Jun. 6, 1989. This application Oct. 25, 1990, Ser. No. 603,236

Int. Cl.[5] C08K *3/10*

U.S. Cl. 524—412 **8 Claims**

1. A process for making a flame retarded, high impact polystyrene composition, comprising the steps of:

melt blending a high impact resistant polystyrene with a low molecular weight brominated polystyrene having a degree of polymerization of from about 3 to about 20 and an antimony based synergist, the amount of said antimony based synergist being about 1 part by weight for every about 2 to about 5 parts by weight of said low molecular weight brominated polystyrene, and providing a composition having a flame retardancy of V-O at ⅛ inch in the UL-94 test and good physical retention of Izod, the amount of said low molecular weight brominated polystyrene being from about 3 percent to about 20 percent by weight based upon a total weight of said brominated polystyrene and said high impact resistant polystyrene.

5,112,898

HIGH IMPACT POLYSTYRENE CONTAINING LOW MOLECULAR WEIGHT BROMINATED POLYSTYRENE

James L. Dever, North Royalton, and James C. Gill, Maple Heights, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 362,129, Jun. 6, 1989, abandoned. This application Oct. 25, 1990, Ser. No. 603,146

Int. Cl.[5] C08K *3/10*

U.S. Cl. 524—412 **12 Claims**

1. A frame retarded high impact resistant polystyrene, comprising:

a high impact resistant polystyrene, an antimony based synergist, and

an effective amount of a low molecular weight brominated polystyrene having a degree of polymerization of from about 3 to about 20 to provide physical property retention and a composition having a flame retardancy of V-O at ⅛ inch in the UL-94 test,

said antimony based synergist being present in an amount of about 1 part by weight for every about 2 to about 5 parts by weight of said brominated polystyrene.

5,112,899

THERMOSETTING RESIN COMPOSITION

Norimasa Yamaya; Masahiro Ohta, both of Yokohama, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 183,990, Apr. 20, 1988, abandoned. This application Sep. 18, 1990, Ser. No. 584,362

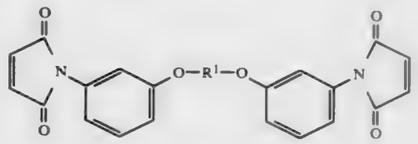
Claims priority, application Japan, May 20, 1987, 62-97415; May 20, 1987, 62-97416

Int. Cl.[5] C08K *3/22*

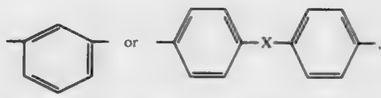
U.S. Cl. 524—413 **12 Claims**

1. A polyaminobismaleimide resin-forming composition consisting essentially of

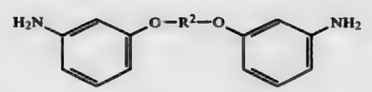
(a) 100 parts by weight of the polyaminobismaleimide resin-forming composition consisting essentially of (i) a bismaleimide compound represented by the following general formula (I):



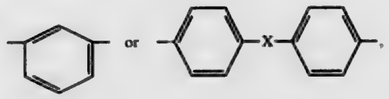
wherein R^1 means a divalent group of



and X denotes a direct bond or a group selected from the group consisting of a divalent hydrocarbon group having 1 to 10 carbon atoms, a hexafluorinated isopropylidene group, a carbonyl group, a thio group, a sulfinyl group, a sulfonyl group and an oxo group, and (ii) a diamine compound represented by the following general formula (II):



wherein R^2 means a divalent group of



and X denotes a direct bond or a group selected from the group consisting of a divalent hydrocarbon group having 1 to 10 carbon atoms, a hexafluorinated isopropylidene group, a carbonyl group, a thio group, a sulfinyl group, a sulfonyl group and an oxo group, and

(b) 10 to 400 parts by weight of a fibrous reinforcing material selected from the group consisting of glass fibers and carbon fibers, wherein the glass fibers have a length of 0.3 mm to 4 mm and the carbon fibers have a diameter of 5 μm to 20 μm and an aspect ratio of from 1 to 600.

5,112,900

ELASTOMERIC TRIBLOCK COPOLYMER COMPOSITIONS AND ARTICLES MADE THEREWITH

Douglas A. Buddenhagen, San Diego; Norman R. Legge, Rancho Palos Verdes, both of Calif., and Günter Zecheuschler, Birkenau, Fed. Rep. of Germany, assignors to Tactyl Technologies, Inc., Vista, Calif.

Filed Nov. 28, 1990, Ser. No. 619,218

Int. Cl.[5] C08K *5/01*

U.S. Cl. 524—484 **21 Claims**

1. An elastomer liquid solution consisting essentially of

a block copolymer component comprising at least two S-EB-S block copolymers having different solution viscosity/copolymer concentration values;

a plasticizer in an amount sufficient to provide tactility in dip formed products made from the composition; and

a solvent in an amount sufficient to form a stable solution of the block copolymer component and the plasticizer and to permit dip forming of products from the liquid solution.

5,112,901

SEALING ELEMENTS AND PLAIN BEARINGS FORMED FROM FIBER-REINFORCED PLASTICS

Hermann Buchert, Bad Durkheim; Juergen Ahlers, Gross-Rohrheim; Werner Kohlhaas, Rimbach; Joerg Vogelsang, Harthausen, and Manfred Neitzel, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 14, 1990, Ser. No. 522,798

Claims priority, application Fed. Rep. of Germany, May 18, 1989, 3916137

Int. Cl.[5] C08L *75/04*

U.S. Cl. 524—494 **11 Claims**

1. A sealing element or plain bearing formed from a fiber-reinforced plastic, wherein the plastic is a thermoplastic polycondensate having a melting point above 180° C. and selected from the group consisting of polycarbonate, polyphenylene sulfide, polyimide, polyether imide, and polyether ketone and the reinforcing fibers are tangentially oriented continuous fibers or staple fibers not less than 20 mm in length.

5,112,902

PROCESS FOR PREPARING PARTICLES OF HIGH WATER-ABSORBENT RESIN

Tetsuo Moriya, Takatsuki; Susumu Kondo, and Shinji Sanuki, both of Kyoto, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1990, Ser. No. 524,771

Claims priority, application Japan, May 24, 1989, 1-131203

Int. Cl.[5] C08J *3/00;* **C08L** *29/04;* **C08G** *63/48;* **C08F** *283/00*

U.S. Cl. 524—503 **6 Claims**

1. A process for preparing particles of a high water-absorbent resin which comprises:

adjusting the water content of a powder of a highly water-absorbent resin to from 10 to 60% by weight, based on the weight of the resin;

mixing said powder of highly water-absorbent resin with 0.01 to 5% by weight, based on the weight of said resin, of a powder of a water-soluble high molecular weight compound to form a mixture consisting essentially of said powders; and

drying said mixture of powders.

5,112,903

ARTICLES MOLDED FROM MOISTURE SHRINKABLE RESINS

Megumu Sakakibara; Keiji Tanaka, and Youji Fujiura, all of Kyoto, Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Jul. 2, 1990, Ser. No. 546,889

Claims priority, application Japan, Jul. 4, 1989, 1-173252; Jul. 4, 1989, 1-173253; Jul. 5, 1989, 1-173707; Dec. 6, 1989, 1-316911

Int. Cl.[5] C08G *63/48, 63/91;* **C08F** *8/00;* **C08L** *51/00*

U.S. Cl. 525—54.2 **9 Claims**

1. A stretched molded articles comprising a moisture shrinkable polymer selected from the group consisting of

(A) a graft copolymer of a thermoplastic polymer having a glass transition temperature of up to 50° C. and a hydrophilic synthetic polymer selected form the group consisting of (1) a nonionic polymer having a functional group selected from the group consisting of a hydroxy group, an amide group, an alkylene oxide group, and ether group, and lactam group, (2) an anionic polymer having a functional selected from the group consisting of a carboxylic group, a sulfonic acid group, a phosphoric acid group and their salts, (3) a cationic group having a functional group selected from the group consisting of a quaternary ammonium group and an acid salt of amino group and (4) an amphoteric polymer having both functional group (anionic and cationic) selected from the functional group described in (2) and (3);

(B) a block copolymer of a thermoplastic polymer having a glass transition temperature of up to 50° C. and a hydrophilic synthetic polymer;

(C) a blend of a thermoplastic polymer having a glass transition temperature of up to 50° C. and a hydrophilic synthetic polymer;

(D) a graft copolymer of a thermoplastic polymer having a glass transition temperature of up to 50° C. and a polysaccharide selected from the group consisting of a plant gum polysaccharide, a seaweed polysaccharide, a plant mucilage polysaccharide of heteroglycan, an animal polysaccharide, and a microbial polysaccharide;

(E) a block copolymer of a thermoplastic polymer having a glass transition temperature of up to 50° C. and a polysaccharide selected from the group consisting of a plant gum polysaccharide, a seaweed polysaccharide, a plant mucilage polysaccharide of heteroglycan, an animal polysaccharide, and a microbial polysaccharide;

(F) a blend of a thermoplastic polymer having a glass transition temperature of up to 50° C. and a polysaccharide selected from the group consisting of a plant gum polysaccharide, a seaweed polysaccharide, a plant mucilage polysaccharide of heteroglycan, an animal polysaccharide, and a microbial polysaccharide.

5,112,904

LIQUID COATING COMPOSITION INCLUDING, AS A CROSSLINKING AGENT, AN UNBLOCKED MONOPRIMARY AMINE

Bernhard Feith, Stuttgart, Fed. Rep. of Germany, assignor to AKZO NV, Arnhem, Netherlands

Filed Jun. 8, 1990, Ser. No. 535,930

Claims priority, application European Pat. Off., Jun. 9, 1989, 89201497.8

Int. Cl.[5] C08F *8/32*

U.S. Cl. 525—59 **12 Claims**

1. A liquid coating composition which comprises. as a binder, a compound containing at least two pendant activated unsaturated groups and a crosslinking agent for the activated unsaturated groups of the binder, wherein the crosslinking agent for the activated unsaturated groups of the binder comprises an unblocked monoprimary amine of the general formula (I)

$$H_2N\text{-}(CH_2)_n\text{-}NRR: \quad (I)$$

wherein

n is a number from 1 to 4;

R is selected from an H atom, a C_1–C_3 alkyl group and monohydroxy substituted C_1–C_3 alkyl group; and

R_1 is selected from a C_1–C_3 alkyl group and a monohydroxy substituted C_1–C_3 alkyl group.

5,112,905

TRANSESTERIFIED COPOLYMERS OF MALEIC ANHYDRIDE, PARTICULARLY USEFUL IN THE FIELD OF DETERGENCY

Paolo Colombo, Saronno; Claudio Troglia, Milan; Santina R. Verzellino, Limbiate, and Giuseppe Muratori, Novara, all of Italy, assignors to Ausidet S.r.L., Milan, Italy

Filed Apr. 4, 1990, Ser. No. 504,019

Claims priority, application Italy, Apr. 5, 1989, 20015 A/89

Int. Cl.[5] C08F *8/14*

U.S. Cl. 525—60 **14 Claims**

1. Transesterified copolymers of maleic anhydride, particularly useful in the field of detergency and as anti-scaling agents, comprising those copolymers obtained from preformed copolymers of maleic anhydride with vinyl acetate, and optionally also with other unsaturated comonomers, by an at least partial transesterification of said preformed copolymers.

5,112,906

ORGANIC NONLINEAR OPTICAL MATERIAL

Naoya Ogata, 29-6, Asagayakita 6-chome, Suginami-ku, Tokyo, and Yasuhiko Yokowo, Ichihara, both of Japan, assignors to Naoya Ogata; Seizo Miyata, both of Tokyo; Ube Industries Ltd., Yamaguchi and Research Development Corporation of Japan, Tokyo, all of, Japan

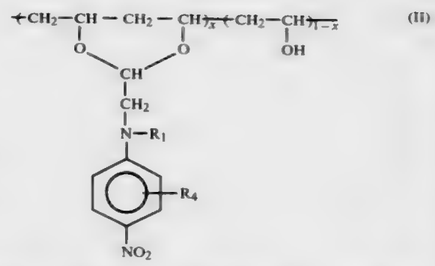
Filed Apr. 5, 1990, Ser. No. 504,921

Claims priority, application Japan, Apr. 28, 1989, 1-110127

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—61 **1 Claim**

1. A polymeric organic nonlinear optical material comprising an acetalized polyvinyl alcohol represented by the following general formula (II):



(II)

wherein R_1 represents a hydrogen atom, or a linear or branched alkyl group having 1 to 6 carbon atoms, R_4 represents a hydrogen atom, a linear or branched alkyl group having 1 to 6 carbon atoms, a linear or branched alkoxy group having 1 to 6 carbon atoms, a hydroxyl group, a nitro group, or a halogen atom, and x is a number of $0<x<1$.

5,112,907

THERMOPLASTIC RESIN COMPOSITION

Taichi Nishio; Hideyuki Kuribayashi, and Takashi Sanada, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

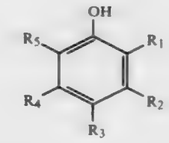
Division of Ser. No. 113,471, Oct. 28, 1987, abandoned. This application Nov. 6, 1989, Ser. No. 431,822

Claims priority, application Japan, Oct. 31, 1986, 61-260985

Int. Cl.[5] C08L *71/12, 77/02*

U.S. Cl. 525—65 **15 Claims**

1. A thermoplastic resin composition which comprises 100 parts by weight of a composition comprising (A) 5–95% by weight of a polyphenylene ether prepared by oxidation polymerization of at least one phenol compound represented by the formula:



wherein R_1, R_2, R_3, R_4 and R_5 which may be identical or different and represent a hydrogen atom, a halogen atom, a substituted or unsubstituted hydrocarbon residue, with a proviso that at least one of them is a hydrogen atom and (B) 95–5% by weight of a polyamide, 5–100 parts by weight of (C) a copolymer of an ethylene-α-olefin copolymer rubber with an alkenyl aromatic compound and an unsaturated carboxylic acid or its anhydride, and 0.01–30 parts by weight of (D) an epoxy compound.

5,112,908

TOUGH POLYAMIDE COMPOSITIONS HAVING HIGH MELT FLOW FOR COMPLEX MOLDINGS

Bennett N. Epstein, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 945,518, Dec. 23, 1986, abandoned. This application Mar. 5, 1990, Ser. No. 489,774

Int. Cl.[5] C08L *77/00*

U.S. Cl. 525—66 **19 Claims**

1. A multiphase thermoplastic blend comprising:

a) 60–90 wt. % of a polyamide matrix wherein at least 50% of the polyamide matrix by weight is composed of aliphatic moieties, wherein the number average molecular weight of the polyamide(s) in the matrix is between 3,000

and 8,000, wherein the polyamide matrix is comprised of polyamide molecules having end groups selected from amine groups, carboxyl groups and capped groups, wherein the difference between the quantity of amine groups and the quantity of carboxyl groups is the imbalance, wherein the total quantity of the capped groups is the capped ends, wherein the ratio of the quantity of the amino groups to the quantity of the carboxyl groups or the ratio of the quantity of the carboxyl groups to the quantity of the amine groups, whichever is larger, is the end group ratio, and further wherein the polyamide matrix is characterized by

1) a total quantity of imbalance plus capped ends of at least 200 equivalents per 10^6 grams of polyamide, or

2) an end group ratio of at least 1.9 and a total quantity of imbalance plus capped ends of at least 100 equivalents per 10^6 grams of polyamide and

b) complementally, 10-40 wt. % of at least one organic polymer toughener having a tensile modulus below 10,000 psi or for a mixture of tougheners an average modulus below 10,000, and having a number average particle size less than about 1,000 nanometers,

and wherein the blend has a notched Izod of over 2 ft. lbs/inch, and a melt flow greater than 200 gm per 10 minutes, and also has a tensile strength and melt flow such that the product of notched Izod in ft. lb/inch, tensile strength in thousands of pounds/in^2 and flow in grams/10 minutes is greater than 5,000, and has 0.5–15 weight % of the polyamide matrix grafted to or entrapped in the toughener.

5,112,909

BLENDS OF POLYMERS PARTICULARLY POLYCARBONATES ACRYLATE-MODIFIED RUBBER COMPOSITIONS AND ADDITIONAL POLYACRYLATES

Daniel D. Zimmerman, Stratford, and Gary Vieiro, West Haven, both of Conn., assignors to Cyro Industries, Mt. Arlington, N.J.

Continuation of Ser. No. 348,451, May 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 220,868, Jul. 18, 1988, abandoned. This application Apr. 16, 1991, Ser. No. 686,294

Int. Cl.[5] C08L *33/12, 69/00, 51/04, 27/06*

U.S. Cl. 525—67 **9 Claims**

1. A polymer blend comprising:

A. polycarbonate polymer;

B. a non-nitrogenous grafted, EPDM or EPTM wherein the graft monomers are selected from the group consisting of styrene, acrylates and mixtures thereof;

C. at least about 19% of the blend being a non-nitrogeneous, single phase polyacrylate polymer.

5,112,910

MIXTURES OF THERMOPLASTIC POLYMERS IN POWDER FORM

Karl-Erwin Piejko, Bergisch-Gladbach; Christian Lindner, Cologne; Ralph Ostarek, Düsseldorf; Hans-Eberhard Braese, Cologne, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer AG, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 543,091, Jun. 25, 1990, abandoned. This application Aug. 12, 1991, Ser. No. 743,678

Int. Cl.[5] C08L *33/06, 9/00, 47/00, 51/04*

U.S. Cl. 525—84 **10 Claims**

1. A process for the preparation of mixtures of thermoplastic polymers in powder form from aqueous emulsions of

a) particulate, partly cross-linked rubber-like copolymers of a C_2–C_8-alkyl acrylate and/or butadiene with (based on the copolymer) up to 40 wt. % acrylonitrile, styrene or C_1–C_4-alkyl methacrylate, which have average particle diameters (d_{50}) of 0.08 to 1.0 μm and gel contents of 40 to 99 wt. % and

b) a thermoplastic resin which is a homo- or co-polymer of styrene α-methylstyrene, methyl methacrylate or acrylonitrile, consisting essentially of:

separately but simultaneously feeding into a single reactor containing a coagulation solution an aqueous emulsion of a) and an aqueous emulsion of b), having polymer contents of 15 to 50 wt. %;

mixing the emulsions a) and b) in the coagulation solution while the coagulates of emulsions a) and b) are forming at 20° to 100° C.; and

separating off the coagulated polymer mixture.

5,112,911

MOISTURE-CROSSLINKABLE PRIMER COMPOSITION

Masahito Mori; Kohske Torii, both of Takatsuki, and Hirokazu Okamoto, Sijonawate, all of Japan, assignors to Sunstar Engineering, Inc., Osaka, Japan

Continuation of Ser. No. 436,712, Nov. 15, 1989, abandoned. This application Feb. 28, 1991, Ser. No. 662,499

Claims priority, application Japan, Nov. 30, 1988, 63-304786

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—100 **3 Claims**

1. A moisture-crosslinkable primer composition comprising a reaction product obtained by reacting a maleic anhydride-modified styrene-ethylene/butene-styrene copolymer with an epoxysilane compound, the anhydride moiety of the copolymer reacting with the glycidyl group of the epoxysilane.

5,112,912

PROCESS FOR MODIFYING ACRYLATE COPOLYMERS

Erwin Nikles, Praroman, Switzerland, assignor to Ciba-Geigy Corp., Ardsley, N.Y.

Continuation of Ser. No. 494,030, Mar. 15, 1990, abandoned. This application Apr. 29, 1991, Ser. No. 697,511

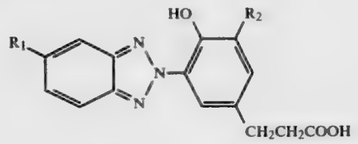
Claims priority, application Switzerland, Mar. 21, 1989, 1035/89

Int. Cl.[5] C08F *8/30*

U.S. Cl. 525—123 **12 Claims**

1. A process for modifying acrylate copolymers by reacting a copolymer of glycidyl acrylate and/or glycidyl methacrylate and one or more alkyl acrylates or methacrylates and, if appropriate, styrene,

(a) with a compound of formula I



(I)

wherein R_1 is hydrogen or chloro and R_2 is C_1–C_{12}alkyl, and in an optional additional step

(b) with a compound which contains an active hydrogen atom.

5,112,913

POLYESTER COMPOSITIONS AND MOLDED ARTICLES THEREFROM

Kenjiro Horiuchi, Aichi; Kiichi Kometani, Nagoya, and Toshihide Inoue, Ichinomiya, all of Japan, assignors to Toray Industries, Inc., Japan

Continuation of Ser. No. 762,075, Oct. 24, 1989, abandoned, which is a continuation of Ser. No. 821,737, Dec. 30, 1985, abandoned. This application Jul. 26, 1990, Ser. No. 561,233

Claims priority, application Japan, May 1, 1984, 59-86091

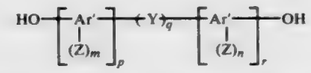
Int. Cl.[5] C08L *69/00, 67/02*

U.S. Cl. 525—133 **14 Claims**

14. An extrusion molded article of a polyester composition consisting of:

(a) an aromatic polyester having a relative viscosity of 1.2 to 1.8,

(b) an aromatic polycarbonate having a number average molecular weight of 15,000 to 80,000, and prepared from a dihydric phenol of the formula



wherein Ar' denotes an aromatic structure selected from the group consisting of phenylene, bisphenylene and naphthylene; Z denotes a functional group selected from the group consisting of an alkyl group, an aryl group, an aralkyl group and an alycyclic group; Y denotes a functional group selected from the group consisting of an alkylene group, an alkylidene group, a tertiary amino group, O, S, SO, SO_2, CO and an amide group; m and n are integers from 0 to 4; p is an integer of at least 1: q is selected from 0 to 1; and r is selected from O and positive integers, and wherein when q is O r is also O, and

(c) a glycidyl-group containing copolymer consisting essentially of α-olefin and glycidyl ester of α, β-ethylenically unsaturated carboxylic acid and having a melt index of 0.1 to 100, wherein components (a) and (b) are present in a weight ratio in the range of between 99/1 and 1/99 and the component (c) is present in an amount of 1 to 80 parts by weight per total 100 parts by weight of components (a) and (b).

5,112,914

RESIN COMPOSITION

Yukio Mizuno, Ehime, and Takashi Maruyama, Ibaraki, both of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Jan. 30, 1990, Ser. No. 472,184

Claims priority, application Japan, Jan. 30, 1989, 1-22241

Int. Cl.[5] C08G *65/48, 61/32, 67/02, 71/12*

U.S. Cl. 525—134 **9 Claims**

1. A resin composition which comprises:

100 parts by weight of a composition comprising (A) 5–95 wt.% of a modified polyphenylene ether resin and (B) 95–5 wt% of a thermoplastic polyester, and

(D) 0.01–10 parts by weight of an amino resin obtained by modifying with an alcohol an addition reaction product of formaldehyde and at least one compound selected from the group consisting of melamine, guanamine and urea.

5,112,915

COPOLYETHERESTER ELASTOMERIC COMPOSITIONS

Thomas A. Morelli, Pittsfield; Warren J. Peascoe, West Stockbrige; Stefan F. Rasch, Chesire, and John A. Tyrell, Dalton, all of Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 279,353, Dec. 2, 1988, abandoned. This application Apr. 16, 1990, Ser. No. 511,923

The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.

Int. Cl.[5] C08L *67/02, 33/08, 25/12, 25/14*

U.S. Cl. 525—166 **19 Claims**

1. A thermoplastic elastomer composition consisting essentially of:

(A) at least one copolyetherester; and

(B) a softness improving amount of a rubbery interpolymer comprising a crosslinked (meth)acrylate rubbery phase and an interpenetrating, crosslinked styrenic phase, said interpolymer being free of any graftlinking; wherein said copolyetherester is the reaction product of monomers consisting of

(i) one or more diols;

(ii) one or more dicarboxylic acids or an ester derivatives thereof;

(iii) one or more long chain ether glycols having a molecular weight of from about 400 to about 12000; and, optionally,

(iv) one or more lactones, wherein the long chain ether glycol and lactone, if any, comprise from about 5 to about 70 weight percent of the copolyetherester.

5,112,916

OLEFIN POLYMER AND A RESIN COMPOSITION CONTAINING THE SAME

Junichi Nakahashi; Itaru Natori; Kenichi Hinoue, and Nobutaka Ochiai, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP89/00235, § 371 Date Nov. 6, 1990, § 102(e) Date Nov. 6, 1989, PCT Pub. No. WO89/08120, PCT Pub. Date Sep. 8, 1989

PCT Filed Mar. 4, 1989, Ser. No. 445,645

Int. Cl.[5] G08F *8/90*

U.S. Cl. 525—183 **2 Claims**

1. A polyamide resin composition consisting essentially of:

(A) an olefin polymer having a number average molecular weight of from 500 to 50,000 and having at least one acid anhydride group, wherein said acid anhydride group is present only at a terminal of the polymer,

(B) a polyamide, and

(C) an olefin-containing polymer other than the olefin polymer (A);

wherein the proportions of components (A), (B), and (C),. satisfy the relationships represented by the formulae: $0.01 \leqq a \leqq 50$, $5 \leqq b \leqq 99.99$, and $0 \leqq c \leqq 94.99$,

wherein a, b and c represent the proportions of components (A), (B) and (C), respectively, expressed in weight % based on the combined weight of components (A), (B) and (C).

5,112,917

BLOCK COPOLYMER OF PERFLUOROETHER AND HYDROCARBON MONOMERS

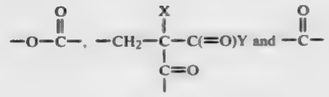
Gordon M. Cohen, Wynnewood, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Aug. 18, 1989, Ser. No. 395,387

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—185 **33 Claims**

1. A block copolymer comprising one or more blocks consisting essentially of polymers made from vinyl monomers selected from acrylic esters, acrylamides and maleimides and one or more blocks consisting essentially of a perfluoroether polymer, wherein the polymer blocks are connected by connecting segments, located between the blocks, each such segment including a group selected from:



wherein X is hydrogen or methyl and Y is dihydrocarbylamino or hydrocarbloxy.

5,112,918

MOISTURE CROSS-LINKING OF POLYMERS

John R. B. Boocock, and David A. Harbourne, both of Kingston, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Aug. 30, 1990, Ser. No. 575,036

Claims priority, application United Kingdom, Sep. 4, 1989, 8919895

Int. Cl.[5] C08L *27/10*

U.S. Cl. 525—209 **15 Claims**

1. A concentrate comprising:

(a) at least one copolymer selected from the group consisting of copolymers of ethylene with at least one comonomer selected from the group consisting of carbon monoxide, vinyl acetate, alkyl acrylates and alkyl methacrylates, in which the alkyl groups have 1–4 carbon atoms, said copolymer being in a particulate form, and said copolymer (i) having a heat of crystallization of less than 70 J/g, and (ii) if said copolymer is ethylene/vinyl acetate copolymer, then the copolymer has a vinyl acetate content of at least 18% by weight; and

(b) 65 to 300% by weight of the copolymer of at least one vinyl silane selected from the group consisting of vinyl trimethoxysilane and vinyl triethoxysilane; said copolymer not dissolving in the vinyl silane; and said concentrate being maintained in a moisture-free environment and being in solid form.

5,112,919

SOLID FEEDING OF SILANE CROSSLINKING AGENTS INTO EXTRUDER

Willy Furrer, Gingins, and Jacques J. F. J. Schombourg, Commugny, both of Switzerland, assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Oct. 30, 1989, Ser. No. 429,206

Int. Cl.[5] C08F *255/00*

U.S. Cl. 525—263 **29 Claims**

1. A process for producing a polymer crosslinkable by exposure to moisture in the presence of a hydrolysis/condensation catalyst comprising:

(a) blending

(i) a thermoplastic base polymer selected from the group consisting of a homopolymer of an alpha-olefin having 2–6 carbon atoms, a copolymer of two alpha-olefins, a copolymer of ethylene and vinyl acetate, a copolymer of ethylene and ethyl acrylate, a copolymer of ethylene and acrylic acid, and mixtures of an ethylene vinyl acetate copolymer, ethylene ethyl acrylate copolymer, or ethylene acrylic acid copolymer with each other or with copolymers of ethylene and 1-butene, 1-hexene, 1-octene, or 4-methyl-1- pentene.

(ii) a solid carrier polymer substantially free of water having contained therein a silane having the formula

$$CH_2{=}C(CO)_x(C_nH_{2n})_ySiR_3$$

(R′O)

wherein R′ represents a hydrogen or a methyl group; x and y are 0 or 1, with the proviso that when x is 1, y equals 1; n is an integer from 1 to 12 inclusive; each R independently represents a hydrolyzable organic group selected from the group consisting of alkoxy, aryloxy, aralkoxy, aliphatic acyloxy, oximo, alkylamino and arylamino, or a lower alkyl group having from 1 to 6 carbon atoms inclusive, with the proviso that no more than one of the three R groups is an alkyl; and

(iii) a free radical generator;

(b) heating and mixing (i), (ii) and (iii) together at a temperature above the crystalline melting point of said base polymer.

5,112,920

AMINE CONTAINING MONOMERS

Anthony P. Haag, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 12, 1990, Ser. No. 492,007

Int. Cl.[5] C08F *4/48, 297/02*

U.S. Cl. 525—294 **7 Claims**

1. A process for the polymerization of an anionically polymerizable mixture comprising an ethylenically unsaturated anionically polymerizable diamine or triamine corresponding to the formula:

$$CH_2{=}CR{-}R'{+}NR''{-}R'{\rightarrow}_nN(R'')_2$$

wherein

R is hydrogen or $C_{1\text{-}4}$ alkyl;

R′ independently each occurrence is a $C_{2\text{-}20}$ difunctional organic group;

R″ independently each occurrence is a $C_{1\text{-}20}$ hydrocarbyl group or an inertly substituted derivative thereof; and

n is one or two;

and a copolymerizable comonomer the steps of the process comprising forming a living polymer anion by contacting the copolymerizable comonomer with a lithium containing organic compound under anionic polymerization conditions, contacting the living polymer anion with the ethylenically unsaturated diamine or triamine compound to generate a polymeric repeating unit corresponding to the formula:

$$-CH_2{-}\underset{\displaystyle R'{+}NR''{-}R'{\rightarrow}_n N(R'')_2}{\overset{|}{C}}{-}$$

terminating the polymerization and recovering the polymer containing pendant diamine or triamine functionality.

5,112,921

IMPACT-RESISTANT THERMOPLASTIC MOLDING MATERIAL AND ITS USE

Hans-Dieter Schwaben, Freisbach; Rainer Schlichtmann; Hubert Kindler, both of Ludwigshafen; Peter Klaerner, Battenberg, and Hans Mittnacht, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 7, 1989, Ser. No. 447,508

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1988, 3844490

Int. Cl.[5] C08F *279/02*; C08L *51/04, 25/06*

U.S. Cl. 525—316 **3 Claims**

1. An impact-resistant thermoplastic molding material, containing, based in each case on A + B, from 80 to 50% by weight of a hard matrix A of polystyrene having a viscosity average molecular weight $\bar{M}\eta$ of from 150,000 to 200,000 and

from 50% to 20% by weight of a soft phase B which is uniformly distributed in the hard matrix and has a median particle diameter d_{50} (volume average) of from 1 to 10 μm, whereby the soft phase B is obtained by polymerizing styrene in the presence of an elastomeric grafting base selected from the group consisting of polybutadiene, polyisoprene, and copolymers of butadiene and/or of isoprene and styrene, wherein the viscosity average molecular weight of grafted branches is from 1.1 to 1.35 times the molecular weight of the hard matrix and the degree of grafting is from 50 to 100%;

wherein the degree of grafting is calculated as follows:

$$\text{Degree of grafting} = \frac{M_2}{M_1 - M_2} \cdot 100\%$$

wherein M_1 is the weight of the soft phase (B) and M_2 is the weight of the dried grafted polystyrene.

5,112,922

POLYSTYRENE ANION EXCHANGE POLYMERS

Albert A. Jaxa-Chamiec, Rickmansworth, and Deirdre M. B. Hickey, Welwyn, both of England, assignors to Smith Kline & French Laboratories, Welwyn Garden City, United Kingdom

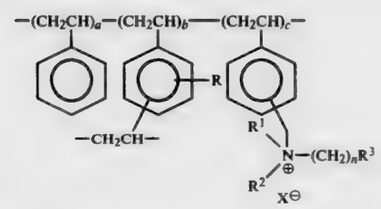
Filed Jun. 12, 1990, Ser. No. 536,838

Claims priority, application United Kingdom, Jun. 14, 1989, 8913700.4

Int. Cl.[5] C08F *8/32*

U.S. Cl. 525—332.2 **16 Claims**

1. A polymer of structure (I)



(I)

in which,

R is hydrogen or $R^1R^2{\oplus}N(CH_2)_nR^3$;

R^1 and R^2 are each $C_{1\text{-}4}$ alkyl;

R^3 is $CONR^4R^5$, NR^4COR^6, a phthalamido group or COR^7;

R^4 and R^5 are the same or different and are each hydrogen or $C_{1\text{-}8}$alkyl;

R^6 is $C_{1\text{-}4}$alkyl, $C_{1\text{-}4}$alkyl$C_{3\text{-}6}$cycloalkyl, CF_3 or NR^4R^5;

R^7 is hydroxy, $C_{1\text{-}4}$alkyl or $C_{1\text{-}4}$alkoxy; n is 2 to 12;

a, b and c are numbers which indicate the relative molar percentages of the units present in said polymer, (b) being from 1 to 10 molar percent, and (c) being from 30 to 98 molar percent;

$X^{\ominus}$ is a counter ion; except compounds in which n is z and R^3 is OH.

5,112,923

IMIDE/ARYLENE ETHER COPOLYMERS

Brian J. Jensen, Williamsburg; Paul M. Hergenrother, Yorktown, and Robert G. Bass, Richmond, all of Va., assignors to Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 21, 1989, Ser. No. 439,317

Int. Cl.[5] C08L *79/08*

U.S. Cl. 525—420 **7 Claims**

1. An imide/arylene ether block copolymer prepared by reacting an anhydride terminated poly(amic acid) and an amine terminated poly(arylene ether) in a polar aprotic solvent selected from the group consisting of N,N-dimethylacetamide, N-methylpyrrolidinone, m-cresol, N,N-dimethylformamide, dimethyl sulfoxide, and ethers, and cyclodehydrating the intermediate poly(amic acid).

5,112,924

BISMALEIMIDE COMPOSITIONS CONTAINING HIGH GLASS TRANSITION TEMPERATURE AND SOLUBLE REACTIVE OLIGOMERS AND COMPOSITES PREPARED THEREFROM

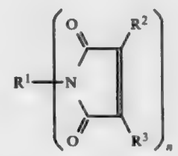
Sung G. Chu, Wilmington; Harold Jabloner, New Castle, and Tuyen T. Nguyen, Wilmington, all of Del., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 73,667, Jul. 15, 1987, Pat. No. 4,946,908. This application Jul. 30, 1990, Ser. No. 559,478

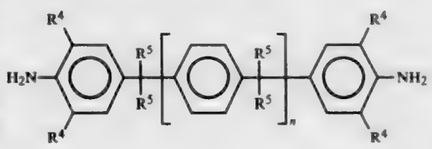
Int. Cl.[5] C08L *77/06, 79/08*

U.S. Cl. 525—426 **15 Claims**

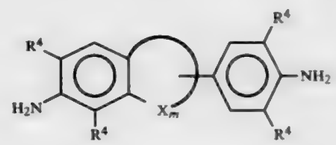
1. A composite comprising about 50 to about 80 percent fiber, tow, whisker, woven fabric or particulate filler and about 20 to about 50 percent of a thermosetting composition and one or more layers wherein if a multilayer structure then said layers of said multilayer structure of said fiber, tow, whisker, woven fabric or particulate filler containing said thermosetting composition are contiguous and in the same or different directions, wherein said thermosetting composition comprises a mono- or multi-functional maleimide, a terminally unsaturated polyimide, polyamide or polyimideamide oligomer and a reactive diluent, said mono- or multi-functional maleimide having the formula



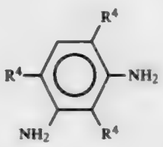
where R^1 is the residium of an aryl, alkylaryl, or alkylamine; R^2 is hydrogen, halogen, aryl, or lower alkyl group of from 1 to about 10 carbon atoms; R^3 is hydrogen, halogen, aryl or lower alkyl group of from 1 to about 10 carbon atoms; and n is an integer of from 1 to about 10; said terminally unsaturated polyimide, polyamide or polyimideamide oligomer prepared by reaction of (a) a diamine or mixture thereof selected from the group consisting of the formulae



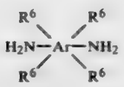
II



III



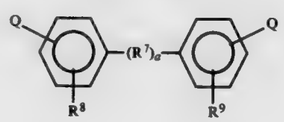
IV



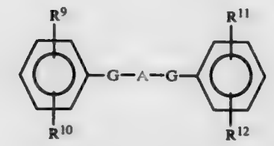
V

where R^4 is an alkyl, aryl, alkylaryl, halogen or hydrogen; R^5 is methyl or lower alkyl; n is 0 to 4; x is methylene and m is 3 to 6; Ar is aryl or alkylaryl; and R^6 is alkyl, aryl, arylalkyl, or halogen and the four R^6 groups are on adjacent carbon atoms to the two amine groups and such R^6 groups may be the same or different; (b) a dicarboxylic acid or reactive derivative thereof or mixture thereof and (c) and unsaturated organic compound having a group reactive with whichever of (a) or (b) is used in excess wherein if (a) is used in excess then said unsaturated organic compound is selected from maleic anhydride, its halide, alkyl, alkylaryl or aryl derivative; unsaturated alkyl halide; unsaturated acid chloride; unsaturated phosphonic halide; unsaturated isocyanate and unsaturated sulfonyl chloride; and if (b) is used in excess then said unsaturated organic compound is selected from unsaturated primary or secondary amine, unsaturated alcohol and unsaturated sulfide;

and said reactive diluent being soluble in the mixture of said oligomer and said maleimide and selected from the materials having formula VI or VII, below:



VI



VII

wherein in formula VI R^7 represents one of the radicals CH_2—,



—SO_2—, —SO—, —S— and —O—; a is 0 to 1; and each Q is independently —OH, —NH_2, —SH, or hydrogen, and are the same or different and R^8 and R^9 are unsaturated alkyl groups having one to eight carbon atoms and may be the same or different, and wherein in Formula VII, R^9 and R^{11} are unsaturated alkyl or aryl groups and may be the same or different, R^{10} and R^{12} are hydrogen, or alkyl or aryl ether groups; each Q is independently —OH, —NH_2, —SH or hydrogen and G is —O— or —S— or —NH—, and A is the residium of a dihalide, said composition being a liquid at 60° to 100° C. with a viscosity of between about 10,000 and 100,000 centipoises (cps) at 100° C.

5,112,925

SPECIAL DIORGANOSILOXANE BLOCK COPOLYCARBONATES

Peter Horlacher, Senden; Heinrich Hähnsen, Duisberg; Ulrich Grigo, Kempen; William C. Bushong, Krefeld, and Ottfried Schlak, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

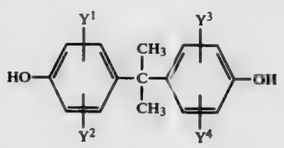
Continuation of Ser. No. 557,429, Jul. 23, 1990, abandoned. This application Apr. 1. 1991, Ser. No. 678,468

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1989, 3924992

Int. Cl.[5] C08F *283/00;* **C08G** *77/04*

U.S. Cl. 525—474 **4 Claims**

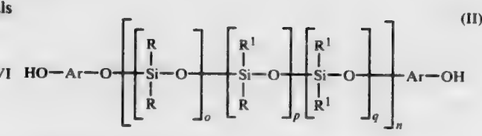
1. A polydiorganosiloxane block copolycarbonate resin prepared under the reaction conditions of the phase boundary polycondensation process from reactants comprising (i) diphenols of formula (I)



(I)

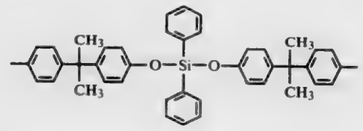
where Y^1 to Y^4 denote hydrogen, and (ii) α,ω-bishydroxyaryloxypoly-diorganosiloxane of formula (II)

(II)



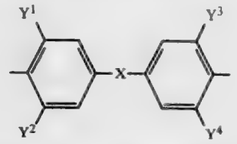
wherein R and R^1 independently are selected from the group consisting of methyl, ethyl, propyl, n-butyl, tert-butyl, vinyl, phenyl, naphthyl, chloromethyl, trifluropropyl, perflurorobutyl and perflurorooctyl, and wherein n is the number of diorganosiloxy units such that n=o+p+q=5 to 200, and wherein o, p and q are integers of 0 to 200 and —Ar— is either a divalent radical conforming to

(III)

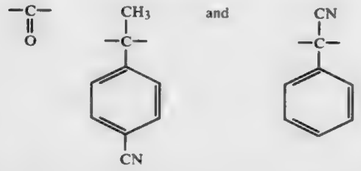


or a divalent radical conforming to (IV)

(IV)



wherein Y^1 to Y^4 denote hydrogen, and wherein —X— is a divalent radical selected from the group consisting of



and

and at least one carbonate donor wherein said (i) is present in an amount of 80 to 99.95 mol % and said (ii) is present in an amount of 0.05 to 20 mole %, the molar sum of said (i)+said (ii) being 100 mol %.

5,112,926

THERMAL-RESISTANT RESIN COMPOSITION FOR PRINTED CIRCUIT BOARDS BASED ON TRIAZINE MODIFIED EPOXY RESIN BLENDS

Tzong-Ming Lee, and Ker-Ming Chen, both of Hsin Chu Hsien, China, assignors to Industrial Technology Research Institute, Hsin Chu Hsien, Taiwan

Continuation of Ser. No. 294,792, Jan. 9, 1989, abandoned. This application Apr. 8, 1991, Ser. No. 682,407

Int. Cl.[5] C08G *59/32*

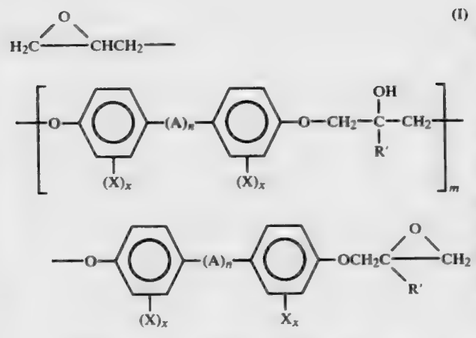
U.S. Cl. 525—526 **14 Claims**

1. A thermal-resistant resin for printed circuit boards comprising:

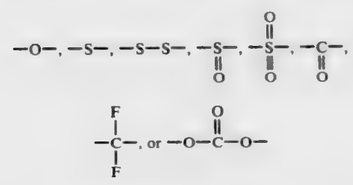
(a) a modified bisphenol epoxy resin comprising:

(i) at least one bisphenol epoxy resin having at least two reactive epoxide groups, said bisphenol epoxy resin having formula:

(I)

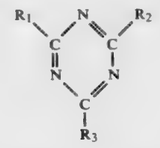


wherein A is a divalent alkylene group with 1 to 10 carbons, or a functional group selected from



X is a monovalent alkyl group having 1 to 10 carbons, or a halogen, m is a number from 0 to 10, n is 0 or 1, x is 0 to 4, and R′ is a hydrogen or an alkyl group with 1 to 4 carbon atoms;

(ii) at least one chain extender having a triazine ring and at least three active hydrogen groups per molecule, represented by the following formula:



wherein, R_1, R_2 and R_3 can be —OH or —NH_2, or R_1 and R_2 are —NH_2, and R_3 is a hydrogen atom, a monovalent alkyl with 1–10 carbon atoms; or R_3 is a tertiary or secondary amino group;

(iii) optionally, one more catalysts for promoting a reaction between (i) and (ii) above, wherein the weight ratio between said modified epoxy resin and the total weight of the thermal-resistant resin is about 10–100%:

(b) at least one brominated epoxy resin containing 10–50% of bromine based on weight, wherein the weight ratio between said brominated epoxy resin and the total weight of thermal-resistant resin is about 10–50%;

(c) at least one multifunctional epoxy resin, wherein the multifunctional epoxy resin has at least three epoxide groups, and wherein the weight ratio between said multifunctional epoxy resin and said modified epoxy resin is about 0.5–5.0; and

(d) at least one curing agent, wherein the ratio between the equivalent of the active group in said curing agent and the equivalent of the epoxide groups of said epoxy resins used is about 0.5–1.5.

5,112,927

METHOD FOR PRODUCING A STEREOREGULAR POLYOLEFIN

Daiji Hara, Yokkaichi; Mitsuhiro Mori, Aichi, and Yozo Kondo, Yokkaichi, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Filed Dec. 21, 1989, Ser. No. 454,401

Claims priority, application Japan, Dec. 26, 1988, 63-326199; Jun. 27, 1989, 1-162584

Int. Cl.[5] C08F *4/654, 4/656, 10/04*

U.S. Cl. 526—124 **17 Claims**

1. A method for producing a stereoregular polyolefin by homopolymerizing an α-olefin having at least 3 carbon atoms or by copolymerizing said olefin with a different α-olefin in the presence of a catalyst comprising a transition metal compound and an organometallic compound, wherein a catalyst system is employed which comprises:

(A) a solid catalyst component obtained by reacting to a uniform solution reactants free of oxygen containing organic titanium compound and consisting essentially of (i), (ii) and (iii):

(i) at least one member selected from the group consisting of (a) metallic magnesium and an organic hydroxide compound which is an alcohol, phenol or silanol and (b) an oxygen-containing organic magnesium compound selected from the group consisting of a magnesium alkoxide, a magnesium alkyl alkoxide, a magnesium hydroalkoxide, a magnesium phenoxide, a magnesium carboxylate, a magnesium oximate, a magnesium hydroxamic salt, a magnesium hydroxylamine salt, a magnesium enolate and a magnesium silanolate,

(ii) a compound of Group IIIB of the Periodic Table which is a boron compound or an aluminum compound, and

(iii) an oxygen-containing organic silicon compound, with reactant,

(iv) at least one aluminum halide, to obtain a solid product, and reacting the solid product with reactants,

(v) an electron donative compound and

(vi) a titanium halide compound;

(B) at least one member selected from the group consisting of organometallic compounds of metals of Groups IA, IIA, IIB, IIIB and IVB of the Periodic Table; and

(C) an electron donative compound, wherein the boron compound of reactant (ii) is represented by the formula $R^2_mB(OR^1)_nX_{3-(m+n)}$ wherein each of R^1 and R^2 is a hydrocarbon group having from 1 to 10 carbon atoms which is a straight chain or branched chain alkyl group, a cycloalkyl group, an arylalkyl group, an aryl group or an alkylaryl group, a halogenated hydrocarbon group, an amino-substituted hydrocarbon group or a hydrogen atom, and may contain a carbonyl group in its chain, and m and n are numbers satisfying $0 \leqq m \leqq 3$, $0 \leqq n \leqq 3$ and $0 \leqq m+n \leqq 3$, and X is a halogen atom,

wherein the aluminum compound of reactant (ii) is represented by the formula $Al(OR^1)_iX_{3-i}$ wherein R^1 is a hydrocarbon group having from 1 to 10 carbon atoms which is a straight chain or branched chain alkyl group, a cycloalkyl group, an arylalkyl group, an aryl group or an alkylaryl group, a halogenated hydrocarbon group, an amino-substituted hydrocarbon group or a hydrogen atom and may contain a carbonyl group in its chain, i is a number satisfying $0 < i \leqq 3$, and X is a halogen atom,

wherein the oxygen-containing organic silicon compound reactant (iii) is represented by the formula $R^3_pSi(OR^4)_qX_{4-(p+q)}$ wherein each of R^3 and R^4 is a hydrocarbon group having from 1 to 10 carbon atoms which si a straight chain or branched chain alkyl group, a cycloalkyl group, an arylalkyl group, an aryl group or an alkylaryl group, a halogenated hydrocarbon group, or a hydrogen atom, p and q are numbers satisfying $0 \leqq p \leqq 3$, $1 \leqq q \leqq 4$, and $1 \leqq p+q \leqq 4$, and X is a halogen atom,

wherein the electron donative compound of the reactant (v) is an ether, an ester, a ketone, a phenol, an amine, an

amide, an imine, a nitrile, a phosphine, a phosphite, a stinbine, an arsine, a phosphorylamide or an alkolate,

and wherein the electron donative compound of component (C) is an organic acid ester, an oxygen-containing organic silicon compound or a nitrogen-containing organic compound, the oxygen-containing organic silicon compound having the same general form as that of reactant (iii).

5,112,928

PREPARATION OF HOMOPOLYMERS OF ETHENE AND COPOLYMERS OF ETHENE WITH HIGH α-MONOOLEFINS USING A ZIEGLER CATALYST SYSTEM

Roland Saive, Ludwigshafen; Guido Funk, and Robert Bachl, both of Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 3, 1989, Ser. No. 416,410

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1988, 3834130

Int. Cl.[5] C08F *4/68, 10/02*

U.S. Cl. 526—128 **2 Claims**

1. A process for the preparation of homopolymers of ethene and copolymers of ethene with minor amounts of C_3—C_8-α-monoolefins by polymerization of the monomer or monomers at from 30° to 200° C. and under from 0.1 to 200 bar using a Ziegler catalyst system consisting of

(1) a transition metal catalyst component and

(2) an organoaluminum catalyst component of the formula AlR_mX_{3-m}, where X is a radical OR, chlorine, bromine or hydrogen, R is a C_1–C_{18}-hydrocarbon radical, and m is from 1 to 3, and

(3) an organohalogen catalyst component, with the provisos that the atomic ratio of the transition metal from the catalyst component (1) to aluminum from catalyst component (2) is from 1:0.1 to 1:500, and the molar ratio of organoaluminum catalyst component (2) to organohalogen catalyst component (3) is from 1:0.0001 to 1:10,

wherein the transition metal catalyst component (1) used is the solid-phase product (VI) which has been obtained by a method in which

(1.1) first

(1.1.1) a finely divided, porous, inorganic oxidic substance (I) which has a particle diameter of from 1 to 1000 μm, a pore volume of from 0.3 to 3 cm^3/g and a specific surface area of from 100 to 1000 m^2/g and is of the formula $SiO_2.aAl_2O_3$, where a is from 0 to 2, and

(1.1.2) a solution (II), as obtained on combining

(IIa) 100 parts by weight of a saturated aliphatic or partly saturated aliphatic and partly aromatic oxahydrocarbon which has 1 or 2 oxaoxygen atoms and more than 3 but less than 19 carbon atoms and

(IIb) from 0.01 to 50 parts by weight of a vanadium trihalide/alcohol complex of the formula $VY_3.nZ$-OH, where Y is chlorine or bromine, n is from 1 to 6 and Z is a monovalent saturated aliphatic or partly saturated aliphatic and partly aromatic hydrocarbon radical of not more than 10 carbon atoms and

(IIc) from 1 to 200 parts by weight of a compound of the type BXnYmRp or SiXnYmRq, where X is a radical OR, Y is chlorine, bromine or hydrogen and R is a C_1–C_{18}-hydrocarbon radical, with the proviso that n is >O and n+m+p=3 or n+m +q=4,

are brought into contact with one another with formation of a suspension (III), with the proviso that the weight ratio of inorganic oxidic substance (I) to transition metal composition (IIb) is from 1:0.01 to 1:2, and the suspension (III) is evaporated to dryness at a temperature which is below 200° C. and above the melting point of the oxahydrocarbon (IIa) used, with formation of a solid-phase intermediate (IV), and

(1.2) then

(1.2.1) the solid-phase intermediate (IV) obtained in stage (1.1) and

(1.2.2) an aluminum compound (V) which is dissolved in an organic solvent and is of the formula AlR_mX_{3-m}, where X is a radical OR, chlorine, bromine or hydrogen, R is a C_1–C_{18}-hydrocarbon radical and m is from 1 to 3,

are brought into contact with one another with formation of a suspension, with the proviso that the weight ratio of solid-phase intermediate (IV) to aluminum compound (V) is from 1:0.05 to 1:2,2, the solid-phase product (VI) obtained as the suspended substance being the transition metal catalyst component (1).

5,112,929

OXOLANYL CYCLIC ACETALS AS ANIONIC POLYMERIZATION MODIFIERS

James E. Hall, Mogadore, Ohio, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 5, 1991, Ser. No. 680,878

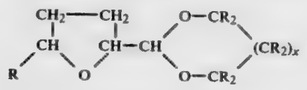
Int. Cl.[5] C08F *4/48*

U.S. Cl. 526—181 **19 Claims**

1. A method for preparing a diene polymer or copolymer having increased amounts of 1,2-microstructure which comprises polymerizing a diene monomer or a mixture of a diene monomer and a vinyl aromatic hydrocarbon monomer in a hydrocarbon solvent in the presence of a catalytically effective amount of a catalyst composition comprising:

(a) an organolithium initiator; and

(b) an oxolanyl cyclic acetal having the structural formula:



wherein R is selected from the group consisting of hydrogen and alkyl groups containing from 1 to 4 carbon atoms and X is 0 or 1.

5,112,930

MODIFIED POLYURETHANES CONTAINING PERFLUOROALIPHATIC GROUPS AND USE THEREOF

Simpert Lüdemann, Bobingen; Michael Bernheim, Aystetten; Bernhard Sundner, Diedorf; Erich Rössler, Stadtbergen-Leitersbofen, and Hans-Burkhardt Vogel, Brombach, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 301,681, Jan. 25, 1989, Pat. No. 5,019,428. This application Mar. 11, 1991, Ser. No. 667,721

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802633; Sep. 16, 1988, 3831452

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—28 **11 Claims**

1. A modified polyurethane obtained by reacting a first compound and a second compound at elevated temperature, the first compound being an oligourethane or a polyurethane containing free hydroxyl or isocyanate groups and perfluoroaliphatic groups and the second compound being a polysiloxane containing at least two functional groups capable of reacting with the free hydroxyl or isocyanate groups of the first compound, the first and second compounds being reacted in an amount such that all of the free hydroxyl or isocyanate groups of the first compound react with a functional group of the second compound.

5,112,931

BLOCKED POLYISOCYANATES FOR THE PRODUCTION OF POWDER COATINGS WITH FLAT FINISHES

Terry A. Potter, New Martinsville, W. Va., and Hugh C. Grubbs, Cannonsburg, Pa., assignors to Miles Inc., Pittsburgh, Pa.

Division of Ser. No. 380,956, Jul. 17, 1989. This application Sep. 4, 1991, Ser. No. 754,773

Int. Cl.[5] C08G *18/32, 18/80;* **C07C** *263/16, 265/00*

U.S. Cl. 528—45 **5 Claims**

1. A blocked polyisocyanate having a content of isocyanate groups blocked by blocking agents of about 10 to 35% by weight and about 0.5 to 10.0% by weight (calculated as —CO—NH—NH—CO—, MW 86) of structural corresponding to the formula

—CO—NH—NH—CO—Q—

wherein

Q represents NH—NH—CO— or the group R—(CO—NH—NH—CO—)$_n$

R is an n+1 valent hydrocarbon radical and

n has a value from 1 to 3.

5,112,932

EPOXY-TERMINATED POLYOXAZOLIDONES AND PROCESS FOR THE PREPARATION THEREOF

Raymond A. Koenig, Vendenheim, and Joseph Gan, Strasbourg, both of France, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 1, 1990, Ser. No. 531,963

Claims priority, application United Kingdom, Jun. 6, 1989, 8912952

Int. Cl.[5] C08G *18/58*

U.S. Cl. 528—51 **24 Claims**

1. A process for the preparation of an epoxy-terminated polyoxazolidone having, when cured, glass transition temperature greater than about 135° C. and N-methylpyrrolidone pick-up of less than about 0.5 percent which process comprises reacting a polyepoxide compound with a polyisocyanate compound in the presence of a catalyst for the reaction of the epoxy and isocyanate groups at an elevated temperature, said process being characterized by

(A) adding (1) from about 5 to about 30 weight percent of the polyisocyanate compound within a period of time of from about 3 to about 90 minutes to (2) a mixture comprising (a) from about 70 to about 95 weight percent of the polyepoxide compound and (b) from about 0.01 to about 2 weight percent of the catalyst, said weight percentages being based on the combined weight of the polyepoxide compound and polyisocyanate compound; and

(B) heating the reaction mixture obtained in step A to a temperature of from about 110° C. to about 200° C., for a period of time from about 5 to about 180 minutes; so as to obtain an epoxy-terminated polyoxazolidone having from about 50 to about 100 percent of the original isocyanate groups converted to oxazolidone rings and from about 0 to about 50 percent of the original isocyanate groups converted to isocyanurate rings.

5,112,933

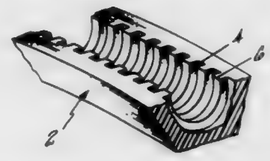
ETHER-BASED POLYURETHANE ELEVATOR SHEAVE LINER-POLYURETHANE-UREA MADE FROM POLYETHER URETHANE PREPOLYMER CHAIN EXTENDED WITH POLYESTER/DIAMINE BLEND

Hugh J. O'Donnell, Longmeadow, Mass.; Vincent J. Gajewski, Cheshire, Conn.; Knizley James B., Woodbury, Conn.; Richard L. Palinkas, Northfield, Conn., and Ronald O. Rosenberg, Shelton, Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 16, 1991, Ser. No. 686,102

Int. Cl.[5] C08G *18/10*

U.S. Cl. 528—61 **30 Claims**



1. An ether-based polyurethane article, comprising a toluene diisocyanate-terminated polyether polyol prepolymer cured with a blended polyester polyol/diamine curative.

5,112,934

EPOXY POLYMERIC NONOLINEAR OPTICAL MATERIALS BASED ON GLYCIDYL AMINES

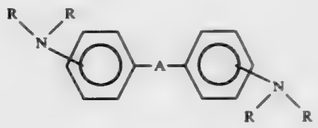
John J. Kester, and H. Craig Silvis, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 27, 1989, Ser. No. 441,805

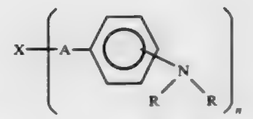
Int. Cl.[5] B05D *3/06;* **C08G** *59/00, 65/00*

U.S. Cl. 528—99 **6 Claims**

1. A process for producing a non-linear optical material comprising applying an external field to an epoxy-containing composition exhibiting non-linear optical properties, represented by the formula:



or



where A is a divalent electron-withdrawing group; n is 2 or 3; each R is independently an epoxy-containing group or an aliphatic or aromatic hydrocarbon having from 1 to about 12 carbon atoms with the proviso that at least two R groups each on different nitrogen atoms must be epoxy-containing groups; and X is a divalent or trivalent unsubstituted organic hydrocarbon, hetero-interrupted hydrocarbon, or substituted hydrocarbon radical or



5,112,935

POLYESTER USEFUL IN MULTIACTIVE ELECTROPHOTOGRAPHIC ELEMENT

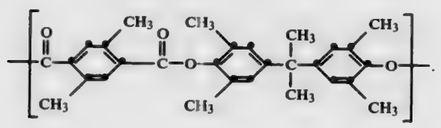
Paul D. Yacobucci, Rochester; Hsinjin Yang, Fairport, and David S. Weiss, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

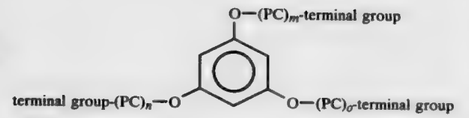
Filed Aug. 22, 1991, Ser. No. 748,364

Int. Cl.[5] C08G *63/00, 63/02*

U.S. Cl. 528—176 **3 Claims**

1. A polyester containing recurring units having the structure





wherein o, m and n are integers and PC is a polycarbonate chain, said polycarbonate having a viscosity average molecular weight of 15,000 to 40,000,a nd an acetone-soluble matter of not more than 3.5% by weight.

5,112,936

BRANCHED CHAIN STOPPED POLYCARBONATE AND PROCESS FOR PRODUCTION

Masaya Okamoto, Ichihara, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00916, § 371 Date Mar. 7, 1990, § 102(e) Date Mar. 7, 1990, PCT Pub. No. WO90/02769, PCT Pub. Date Mar. 22, 1990

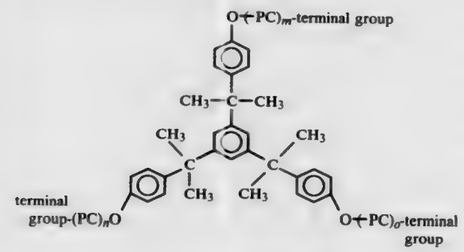
PCT Filed Sep. 6, 1989, Ser. No. 465,212

Claims priority, application Japan, Sep. 6, 1988, 63-221285

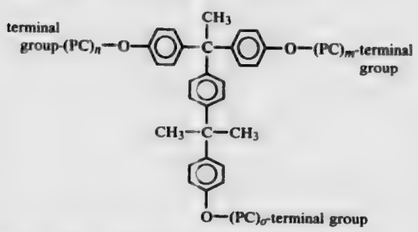
Int. Cl.[5] C08G *64/14*

U.S. Cl. 528—204 **19 Claims**

1. A branched polycarbonate comprising a branched nucleus structure which is derived from at least one compound selected from the group consisting of (a) α,α′, α″-tris(4-hydroxyphenyl)-1,3,5-triisopropylbenzene of the formula



(b) 1-{α-methyl-α-(4′-hydroxy-phenyl)ethyl}-4-{α′,α′-bis(4″-hydroxyphenyl)-ethyl}benzene of the formula



and (c) phloroglucinol of the formula

5,112,937

POLYMERS DERIVED FROM UNSATURATED POLYESTERS BY ADDITION OF COMPOUNDS WITH A THIOL FUNCTION AND THEIR USE AS ADDITIVES MODIFYING THE PROPERTIES OF PETROLEUM MIDDLE DISTILLATES WHEN COLD

Jacques Garapon, Lyons; Rémi Touet, Saint-Egreve; Bernard Damin, Oullins, and Béatrice Debled, Villeurbanne, all of France, assignors to Institut Francai du Petrole, Rueil-Malmaison and Elf France, Courbevoie, both of, France

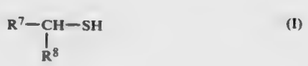
Division of Ser. No. 306,174, Feb. 6, 1989, Pat. No. 5,037,945. This application May 10, 1991, Ser. No. 698,023

Claims priority, application France, Feb. 4, 1988, 88/01424

Int. Cl.[5] C08G *63/688*

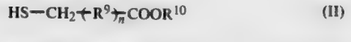
U.S. Cl. 528—272 **15 Claims**

1. A petroleum middle distillate composition comprising a major proportion of middle distillate having a distillation range between 150° and 450° C. and a minor proportion, sufficient for simultaneous decrease in the chill point and flow point, of at least one polymer of average molecular weight of 400 to 20,000 having thiosubstituted groups, and resulting from the reaction, in the presence of an addition catalyst, of at least one compound with a thiol function having one of the general formulae:



(I)

or



(II)

in which R^7 represents a hydrogen atom or an alkyl group having 1 to 59 carbon atoms, R^8 represents a hydrogen atom or a lower alkyl group, R^9 represents an alkylene group having 1 to 57 carbon atoms, n is zero or one and R^{10} represents an alkyl group having 1 to 58 carbon atoms, with an unsaturated polyester resulting from the condensation of at least one unsaturated dicarboxylic compound having at least one ethylenic unsaturation in the alpha position of one of the carboxyl groups with at least one aliphatic epoxidated compound having 2 to 62 carbon atoms in its molecule, the epoxidated compound/dicarboxylic compound molar ratio being about 0.4:1 to 1.8:1, and the compound with a thiol function/dicarboxylic compound molar ratio being about 0.2:1 to 1.5:1.

5,112,938

CYANO- AND CARBOXY-SUBSTITUTED SPIRODILACTAMS

Pen-Chung Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 567,484, Aug. 18, 1990, Pat. No. 5,037,948, which is a continuation-in-part of Ser. No. 503,416, Mar. 30, 1990, abandoned. This application Feb. 26, 1991, Ser. No. 660,835

Int. Cl.[5] C08G *63/20*

U.S. Cl. 525—272 **26 Claims**

1. A polyester obtained by condensing a dicarboxyaryl-substituted spirodilactam with a dihydroxy compound, said polyester comprising (a) moieties derived from a spirodilactam compound, said compound having nitrogen atoms in the 1- and 6-positions of the spiro ring system and having a carboxy- or carboxyalkylaryl substituent on each spiro ring nitogen atom, alternating with (b) moieties derived from a dihydroxy compound or a diepoxide compound.

5,112,939

OLIGOMERS HAVING PYRIMIDINYL END CAPS

Hyman R. Lubowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 167,597, Mar. 14, 1988, Pat. No. 4,980,481, which is a continuation-in-part of Ser. No. 816,489, Jan. 6, 1986, Pat. No. 4,739,030, which is a continuation-in-part of Ser. No. 704,475, Feb. 22, 1985, abandoned, which is a division of Ser. No. 505,348, Jun. 17, 1983, Pat. No. 4,536,559. This application Jul. 10, 1990, Ser. No. 578,525

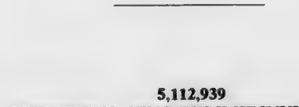
Int. Cl.[5] C08G *69/44*

U.S. Cl. 528—289 **12 Claims**

1. An oligomer useful for preparing high performance, advanced composites, comprising:

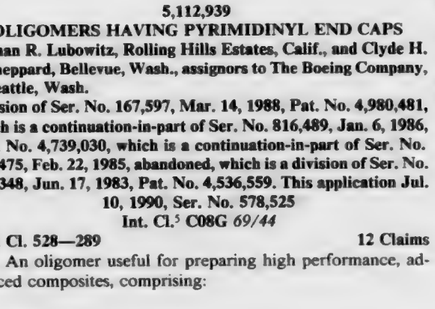
E—R_3—E

wherein E=

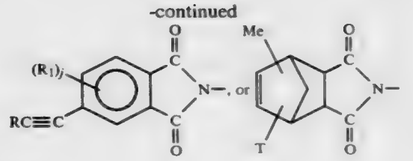


R_3=an aromatic, aliphatic, or aromatic and aliphatic, divalent hydrocarbon radical;

Y=



-continued



wherein

R_1=lower alkyl, lower alkoxy, aryl, aryloxy, substituted alkyl, substituted aryl, halogen, or mixtures thereof;

j=0, 1, or 2:

G=—CH_2—, —O—, —S—, —SO—, —CO—, —CHR—, —CR_2—, or —SO_2—;

T=methallyl or allyl;

Me=methyl; and

R=hydrogen, lower alkyl or phenyl.

5,112,940

POLYETHERESTERS, THEIR PRODUCTION AND USE

Klaus Körte, Ettingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jun. 14, 1991, Ser. No. 715,938

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1990, 4019412

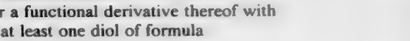
Int. Cl.[5] C08G *63/672*

U.S. Cl. 528—301 **20 Claims**

1. A polyetherester or polyetherester mixture (P) with average molecular weight $\overline{M}w$ in the range of 1200 to 500,000 obtainable by

α) copolycondensation of

(A) at least one acid of formula



(I),

in which

R_1 signifies a bivalent hydrocarbon radical with 1 to 8 carbon atoms,

or a functional derivative thereof with

(B) at least one diol of formula



(II)

wherein

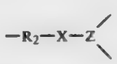
X signifies —O—, —CO— or a direct bond,

Z signifies an aliphatic hydrocarbon radical with 3 to 6 carbon atoms which is either unsubstituted or is substituted by a further hydroxy group or a phosphonic acid group, and, if X signifies —CO—, is optionally interrupted by a nitrogen bound to this CO—group or is optionally bound to this CO—group through an —NH—group,

R_2 signifies a bivalent aliphatic hydrocarbon radical with 1 to 4 carbon atoms or if X≠—O—, also the direct bond to X, and

M signifies a cation

and the group Z contains at least two carbon atoms of distance between the two hydroxy groups to which it is bound, with the proviso that the group



(III)

contains at least one heteroatom and

(C) ethyleneglycol

to a polymer (P') and capping the end groups of (P') at least in part with

(D) at least one polyethyleneglycolmonoalkylether of the formula

$$R_3(O—CH_2CH_2)_mOH \quad (IV),$$

in which

R_3 signifies C_{1-6}-alkyl and

m signifies on average a number from 5 to 120 or

β) polycondensation of (A) with (C) to a prepolymer (P_1), polycondensation of (A) with (B) to a prepolymer (P_2), polycondensation of (P_1) with (P_2) to a polymer (P_3) and at least partially capping of the end groups of (P_3) with (D).

5,112,941

AROMATIC POLYMIDE SEPARATION MEMBRANE

Tetsuo Kasai, Machida, and Yoshiteru Kobayashi, Kitakyushu, both of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 544,841

Int. Cl.[5] C08G *8/02, 63/00, 2/00, 69/26*

U.S. Cl. 528—353 **7 Claims**

1. An aromatic polyimide separation membrane prepared by subjecting an aromatic polyimide membrane to fluorine treatment with an active fluorine.

5,112,942

POLYMIDE COMPOSITIONS

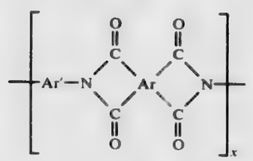
Wesley C. Blocker, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 26, 1990, Ser. No. 588,280

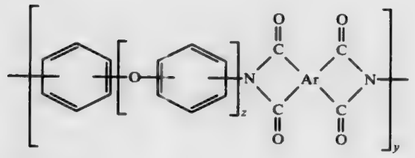
Int. Cl.[5] C08G *69/26, 69/28, 8/02, 14/00*

U.S. Cl. 528—353 **19 Claims**

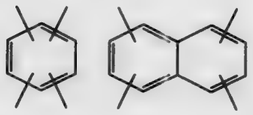
1. A polyimide resin composition comprising randomly distributed units of the formula



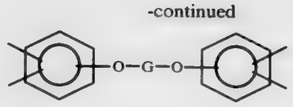
and



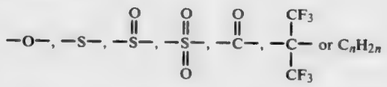
wherein Ar is



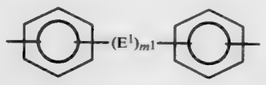
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where E is

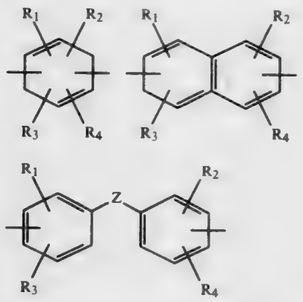


where n is an integer from about 1–8, and G is phenylene or

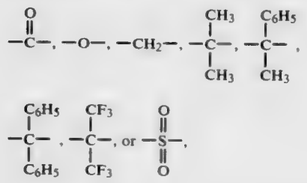


where M^1 is 0 or 1 and E^1 is the same as E as previously defined; and

wherein Ar' is



where R_1, R_2, R_3 and R_4 are the same or different and are hydrogen or C_1 to C_6 linear or branched alkyl with the proviso that R_1, R_2, R_3 and R_4 cannot simultaneously be hydrogen and where Z is a chemical bond,



and the mole ratio of x:y is from about 1:99 to about 49:51, and z is 0–5.

5,112,943

PREPARATION OF HIGH PURITY POLYMERS OF TETRAHYDROFURAN

Herbert Mueller, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 1, 1990, Ser. No. 591,061

Int. Cl.[5] C08G *65/20*

U.S. Cl. 528—483 **5 Claims**

1. A process for the preparation of a high purity polymer or copolymer obtained by cationic polymerization of tetrahydrofuran and, if desired, an alkylene oxide, in which the polymer is treated with hydrogen in the presence of a hydrogenation catalyst in order to reduce the color index, which comprises passing the hydrogen into the polymer with a bubble diameter of less than 50 μm.

5,112,944

CYCLIC TETRAPEPTIDE AND PROCESS FOR PREPARING THE SAME

Kenji Sugita, Kobe; Hiroshi Itazaki, Takarazuka; Koichi Matsumoto, Toyonaka, and Yoshimi Kawamura, Mino, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jun. 12, 1990, Ser. No. 536,764

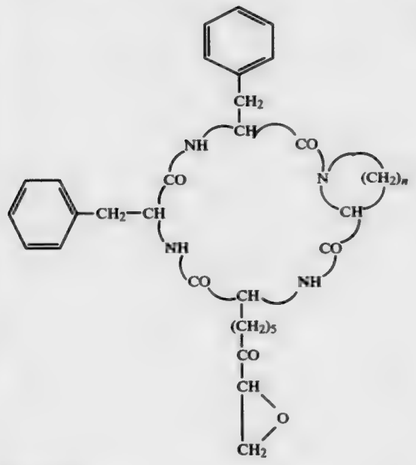
Claims priority, application Japan, Jun. 30, 1989, 1-170930

Int. Cl.[5] C07K *5/12*

U.S. Cl. 530—321 **3 Claims**

1. A cyclic tetrapeptide having the formula (I):

(I)



wherein n is 4 or 3.

5,112,945

PREPARATION OF ISLET AMYLOID POLYPEPTIDES (IAPP) AND ANTIBODIES TO IAPP

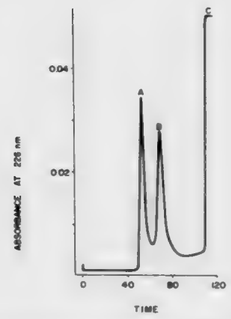
Per Westermark, Dalinge, Sweden, and Kenneth H. Johnson, Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 105,267, Oct. 7, 1987, abandoned. This application Feb. 21, 1991, Ser. No. 658,442

Claims priority, application Sweden, Oct. 8, 1986, 8604270

Int. Cl.[5] C07K *7/40, 7/10*

U.S. Cl. 530—324 **4 Claims**



1. A polypeptide consisting essentially of: Asn-Thr-Ala-Thr-Cys-Ala-Thr-Gln-Arg-Leu-Ala-Asn-Phe-Leu-Val-His-Ser-Ser-Asn-Asn-Phe-Gly-Ala-Ile-Leu-Ser-Ser-Thr-Asn-Val-Gly-Ser-Asn.

5,112,946

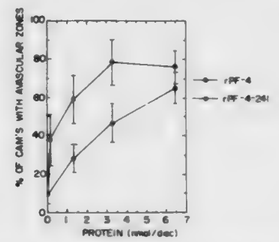
MODIFIED PF4 COMPOSITIONS AND METHODS OF USE

Theodore Maione, Wakefield, Mass., assignor to Repligen Corporation, Cambridge, Mass.

Filed Jul. 6, 1989, Ser. No. 376,333

Int. Cl.[5] A61K *7/02, 37/36;* **C07K** *7/00, 7/08*

U.S. Cl. 530—324 **18 Claims**



1. A substantially pure polypeptide conjugate free of other platelet proteins comprising:

(a) a mutant polypeptide of native PF4, comprising the sequence Gln-Glu-Ile-Ile-Gln-Glu-Leu-Leu-Glu-Ser wherein said mutant polypeptide has angiogenic inhibitory activity; and

(b) an entity which is conjugated to said mutant polypeptide, wherein said conjugate retains angiogenic inhibitory activity.

5,112,947

PEPTIDES, AND ANTIDEMENTIA AGENTS CONTAINING THE SAME

Mitsuo Masaki, Chiba; Masaki Uehara; Kenji Hirate, both of Saitama; Yoshikazu Isowa, Tokyo; Yoshiaki Sato, Tokyo, and Yoshiharu Nakashima, Tokyo, all of Japan, assignors to Nippon Chemiphar Co., Ltd. and Fujirebio Kabushiki Kaisha, both of Tokyo, Japan

Filed Apr. 16, 1990, Ser. No. 509,950

Claims priority, application Japan, Apr. 15, 1989, 1-95917; Apr. 15, 1989, 1-95918; Apr. 15, 1989, 1-95919; Apr. 15, 1989, 1-95920; Apr. 15, 1989, 1-95921; Apr. 15, 1989, 1-95922

Int. Cl.[5] **A61K** *37/02;* **C07K** *37/04, 37/06*

U.S. Cl. 530—329 **2 Claims**

1. A peptide having the formula (VII):

pGlu-Asn-Ser-A-B-(Gly)$_n$ (VII)

wherein A is Aze, D- or L-Pro, Pip or Sar, B represents D- or L-Arg, Cit, Har, Lys or Orn, n is 1 or 0, its functional derivatives, and a pharmaceutically acceptable salt thereof.

5,112,948

METHODS AND COMPOSITIONS FOR INDUCING MONOCYTE CYTOTOXICITY

C. Michael Jones, 6324 Mercer St., Houston, Tex. 77005

Continuation-in-part of Ser. No. 917,983, Oct. 10, 1986, Pat. No. 4,977,245. This application Oct. 4, 1989, Ser. No. 417,162

Int. Cl.[5] **C07K** *15/00;* **A61K** *37/02, 37/43*

U.S. Cl. 530—351 **4 Claims**

1. A substantially purified human monocyte cytotoxicity inducing factor (MCF) characterized by the following properties:

(a) capability of inducing human monocytes to a cytotoxic state;

(b) an apparent molecular weight of 29 kilodaltons as determined by SDS-polyacrylamide gel electrophoresis after production under serum-free conditions;

(c) retention of biological activity following treatment at pH 2 for one hour;

(d) retention of biological activity following treatment at 60° C. for one hour;

(e) ability to bind to Matrex Gel Red A under low-salt conditions and elute from Matrex Gel Red A under high-salt conditions; and

(f) retention of biological activity in the presence of antiserum to interferon gamma, interferon alpha, or a combination of anti-sera to interferon alpha and gamma.

5,112,949

METHOD OF AND APPARATUS FOR SEPARATING PROTEINS

Thomas Vukovich, 1080 Vienna Langegasse 70, Austria

Filed Mar. 17, 1987, Ser. No. 26,868

Claims priority, application Austria, Mar. 27, 1986, A827/86

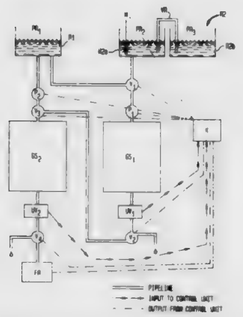
Int. Cl.[5] **A61K** *35/14;* **C07K** *3/02, 3/20, 3/28*

U.S. Cl. 530—380 **21 Claims**

1. A method of separating proteins from human plasma, from residues of human plasma cryoproteins or from residues of cell cultures, with the proteins having been adsorbed on an anion-exchanging gel; comprising in succession the steps of:

gradient-eluting the proteins adsorbed on the gel in a chromatographic column with a buffer solution as eluant defined by two parameters one of which being gradually changed while the other one is maintained at a substantially constant level so as to gradually desorb the proteins from the gel, said parameters being ionic strength and pH value;

purifying the desorbed proteins by adsorbing the proteins immediately after being desorbed from the anion-exchanging gel on protein-free and equilibrated gel and subsequently desorbing the proteins by changing the buffer solution through further increase of the one parameter so



as to obtain an eluate at increased sharpness of separation of the proteins; and

fractionating the eluate into separate protein fractions.

5,112,950

FACTOR VIII ANALOG, PREPARATION PROCESS, AND PHARMACEUTICAL COMPOSITION CONTAINING IT

Pierre Meulien, and Andrea Pavirani, both of Strasbourg, France, assignors to Transgene S.A., Courbevoie, France

Continuation of Ser. No. 228,265, Aug. 4, 1988, abandoned. This application Jun. 26, 1991, Ser. No. 723,666

Claims priority, application France, Aug. 11, 1987, 87 11415

Int. Cl.[5] **C07K** *13/00;* **A61K** *37/00*

U.S. Cl. 530—383 **6 Claims**

1. A human factor VIII analog consisting essentially of the amino acid sequence alanine-1 through aspartate-770 followed by threonine-1667 through tyrosine-2332, wherein aspartate-770 is covalently bonded by a peptide bond to threonine-1667.

5,112,951

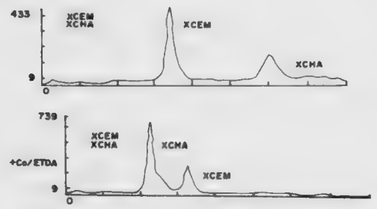
SEPARATION OF ANTI-METAL CHELATE ANTIBODIES

Daniel E. Beidler, Poway, and Rodney A. Jue, San Diego, both of Calif., assignors to Hybritech Incorporated, San Diego, Calif.

Continuation-in-part of Ser. No. 386,428, Jul. 28, 1989, abandoned. This application Jul. 31, 1989, Ser. No. 388,333

Int. Cl.[5] **C07K** *3/18, 15/28*

U.S. Cl. 530—387.3 **24 Claims**



1. A method for obtaining eluant fractions enriched in anti-metal chelate antibodies from a preparation containing said anti-metal chelate antibodies and non-specific proteins, comprising the steps of:

a. applying said preparation to a sulfopropyl derivatized solid support equilibrated in a starting solution;

b. adding an elution solution containing a salt in a concentration sufficient to elute non-specific proteins from said support;

c. adding a further elution solution containing a salt in an increased concentration sufficient to eluate said anti-chelate antibodies from said support; and

d. collecting the eluant fraction released in step c.

5,112,952

COMPOSITION AND METHOD FOR ISOLATION AND PURIFICATION OF IMMUNOGLOBULIN M

A. Krishna Mallia, Rockford, Ill., and Marten W. Wendt, Perstorp, Sweden, assignors to Pierce Chemical Company, Rockford, Ill.

Filed Sep. 28, 1990, Ser. No. 589,409

Int. Cl.[5] **C07K** *3/20, 17/10*

U.S. Cl. 530—387.1 **10 Claims**

1. A composite, X—Y, wherein X is a water insoluble particle and Y is the protein, mannan binding protein (MBP) covalently attached to X.

5. A method for isolation and purification of Immunoglobulin M (IgM) from an aqueous sample containing IgM together with various impurities comprising the steps of:

a) mixing said sample with the composite of claim 1,2,3, or 4 in the presence of a divalent metal ion to effect binding of IgM in the sample to the mannan binding protein (MBP) of the composite;

b) washing the composite containing the bound IgM with an aqueous buffer thereby removing unbound impurities; and

c) releasing the IgM from the composite and recovering IgM.

5,112,953

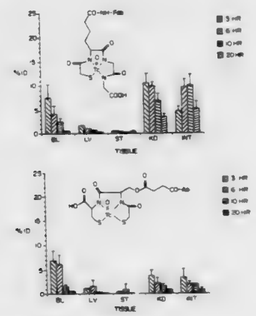
RADIOLABELED PROTEINS FOR DIAGNOSTIC OR THERAPEUTIC USE

Linda M. Gustavson, Seattle; Ananthachari Srinivasan; Sudhakar Kasina, both of Kirkland; John M. Reno, Brier; Jeffrey N. Fitzner, and David S. Jones, both of Seattle, all of Wash., assignors to NeoRx Corporation, Seattle, Wash.

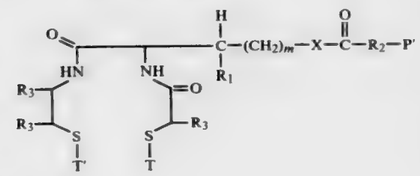
Filed Dec. 29, 1989, Ser. No. 457,480

Int. Cl.[5] **C07K** *17/06, 5/08;* **A16K** *49/02, 39/44*

U.S. Cl. 530—391.5 **40 Claims**



1. A compound of the formula:



wherein:

m is 0 or 1;

R represents H or CH_3;

X represents O or S;

each R_3 is independently selected from H, CH_2OH, CH_3, and $—(CH_2)_n—COOH$, wherein n is 0–2, with at least one R_3 substituent being $—(CH_2)_n—COOH$;

T' and T each represent hydrogen or a sulfur protecting group;

R_2 represents a spacer; and

P' represents a targeting molecule or a conjugation group.

5,112,954

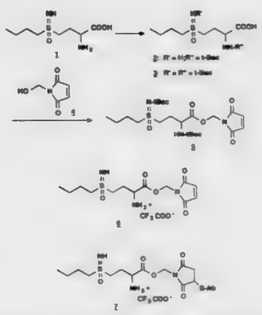
METHOD OF ENHANCING THE EFFECT OF CYTOTOXIC AGENTS

Paul G. Abrams, Seattle; Ananthachari Srinivasan, Kirkland, and Vivekananda M. Vrudhula, Mountlake Terrace, all of Wash., assignors to NeoRx Corporation, Seattle, Wash.

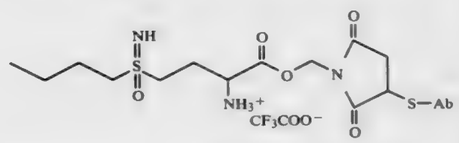
Continuation-in-part of Ser. No. 161,174, Feb. 26, 1988, abandoned. This application Apr. 4, 1988, Ser. No. 176,851

Int. Cl.[5] **C07K** *17/02;* **A61K** *39/44*

U.S. Cl. 530—391.9 **9 Claims**



1. A conjugate represented by the following formula:



wherein Ab represents an antibody or antibody fragment.

5,112,955

METHOD OF STABILIZING PLASMINOGEN ACTIVATOR INHIBITOR BY TREATMENT WITH VITRONECTIN

Tze-Chein Wun, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 532,410, Jun. 4, 1990, Pat. No. 5,073,626, which is a continuation-in-part of Ser. No. 268,916, Nov. 9, 1988, abandoned. This application Apr. 8, 1991, Ser. No. 681,304

Int. Cl.[5] **A61K** *37/64;* **C07K** *3/04*

U.S. Cl. 530—409 **1 Claim**

1. The method of stabilizing or activating purified PAI-1 comprising incubating said purified PAI-1 in vitro with about an equimolar amount of vitronectin in the presence of L-arginine and a carrier protein of bovine serum albumin or bovine gamma globulin.

5,112,956

METHOD FOR EXTRACTION OF LIPIDS AND CHOLESTEROL

Pamela S. Tang, Palatine; Norman S. Singer, Highland Park, and Hsien-Hsin Chang, Lake Zurich, all of Ill.,'assignors to The NutraSweet Company, Deerfield, Ill.

Continuation-in-part of Ser. No. 127,402, Dec. 2, 1987, abandoned. This application Mar. 17, 1989, Ser. No. 326,467

Int. Cl.[5] C07K *3/12, 15/06*

U.S. Cl. 530—424 **9 Claims**

1. A method for the removal of lipids and cholesterol from a protein material selected from the group consisting of egg and whey proteins comprising the steps of;

(A) treating the protein with a polar extraction solvent comprising essentially of from 90% to 97% of a lower alcohol, from 3% to 10% water and from 0.010% to 1.0% of a food grade acid in concentrations selected to extract cholesterol and lipids from the protein and

(B) removing the extraction solvent from the protein.

5,112,957

METHOD AND APPARATUS FOR WASHING SOLID MEDIA

Harvey B. Pollard, 11008 Lamplighter La., Potomac, Md. 20854

Filed Dec. 19, 1985, Ser. No. 810,503

Int. Cl.[5] C07K *3/00;* **C12M** *3/00;* **B01D** *24/46*

U.S. Cl. 530—387.1 **15 Claims**

1. A method of washing biological or other macromolecules comprising the steps of:

(1) placing a gel, sheet or film containing biological or other macromolecules onto a surface within a container,

(2) pouring a wash solution into the container onto said gel, sheet or film,

(3) interacting the wash solution with the macromolecules in said gel, sheet or film, and

(4) decanting said wash solution in a substantially horizontal direction which is generally parallel to said surface by slightly tipping the container at a small angle which is sufficient to cause said wash solution to flow out of said container in said direction, such that the washed gel, sheet or film remains within said container in the absence of external means to hold down said gel, sheet or film while said solution is being decanted.

5,112,958

FIBRE-REACTIVE FORMAZAN DYES CONTAINING β-CHLOROETHYLSULFONYL OR VINYLSULFONYL BONDED VIA PHENYLAMINOTRIAZINYLAMINO

Urs Lehmann, Basel, and Josef Koller, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

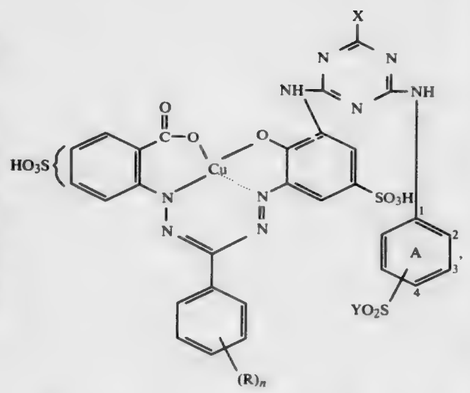
Filed Jul. 19, 1990, Ser. No. 555,335

Claims priority, application Switzerland, Jul. 24, 1989, 2761/89

Int. Cl.[5] C09B *62/503;* **D06P** *1/384*

U.S. Cl. 534—618 **3 Claims**

1. A fibre-reactive formazan dye of the formula



in which X is fluorine or chlorine, and in which a radical $-SO_2Y$ is bonded to the phenyl ring A in 3- or 4-position and Y is β-chloroethyl.

5,112,959

POLYAZO DYE COMPOUNDS HAVING PLURAL VINYLSULFONE TYPE FIBER REACTIVE GROUPS IN ONE MOLECULE

Tetsuya Miyamoto, Takatsuki; Kazufumi Yokogawa, Minoo; Yutaka Kayane, Ikoma; Takashi Omura, Kobe; Takeshi Washimi, Toyonaka; Naoki Harada, Ibaraki, and Kingo Akahori, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

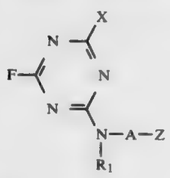
Filed May 22, 1990, Ser. No. 526,708

Claims priority, application Japan, Jun. 1, 1989, 1-141856; Jan. 12, 1990, 2-005226; Jan. 18, 1990, 2-009962; Feb. 16, 1990, 2-036891; Feb. 16, 1990, 2-036894

Int. Cl.[5] C04B *62/513;* **D06P** *1/382*

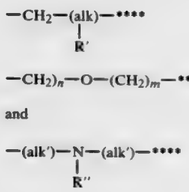
U.S. Cl. 534—642 **17 Claims**

1. A polyazo compound of the following formula,



wherein

A is phenylene which is unsubstituted or substituted once or twice by methyl, ethyl, methoxy, ethoxy, chloro, bromo or sulfo, naphthylene which is unsubstituted or substituted by sulfo, or alkylene which is selected from the group consisting of:



(a)

(b)

and

(c)

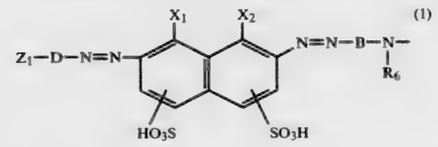
wherein the linkage **** bonds to the —N—, alk is polymethylene having 1 to 6 carbon atoms or its branched isomer, R' is hydrogen, chloro, bromo, fluoro, hydroxy, sulfato, C_1–C_4 acyloxy, cyano, carboxy, C_1–C_5 alkoxycarbonyl or carbamoyl, R'' is hydrogen or C_1–C_6 alkyl, each alk' is independently polymethylene having 2 to 6 carbon atoms or its branched isomer, or each alk' is taken together with R'' to form a ring through methylene, and m and n are each independently an integer of 1to 6,

X is $-NR_2R_3$, $-OR_4$ or $-SR_5$ in which R_2, R_3, R_4 and R_5 independently of one another are each hydrogen, C_1–C_4 alkyl which is unsubstituted or substituted once or twice by C_1–C_4 alkoxy, sulfo, carboxy, hydroxy, chloro, phenyl or sulfato, phenyl which is unsubstituted or substituted once or twice by C_1–C_4 alkyl, C_1–C_4 alkoxy, sulfo, carboxy, chloro or bromo, naphthyl which is unsubstituted or substituted once, twice or thrice by hydroxy, carboxy, sulfo, C_1–C_4 alkyl, C_1–C_4 alkoxy or chloro or benzyl which is unsubstituted or substituted once or twice by C_1–C_4 alkyl, C_1–C_4 alkoxy, sulfo or chloro,

Z is $-SO_2CH{=}CH_2$ or $-SO_2CH_2CH_2Z'$ in which Z' is a group capable of being split by the action of an alkali,

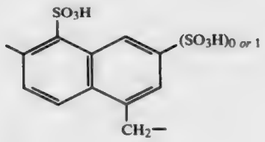
R_1 is hydrogen or C_1–C_4 alkyl which is unsubstituted or substituted by hydroxy, cyano, C_1–C_4 alkoxy, halogen, carboxy, carbamoyl, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbanoyloxy, sulfo or sulfamoyl, and

F is a polyazo dye moiety selected from the group consisting of those represented by the following formulas (1), (2), (3) and (4) each in free acid form, the formula (1) being

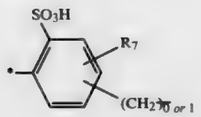


(1)

wherein B is



or



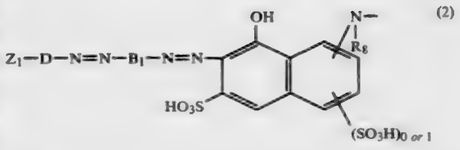
in which the asterisked linkage bonds to the azo group, and R_7 is hydrogen, methyl, methoxy or sulfo,

D is phenylene which is unsubstituted or substituted once or twice by methyl, ethyl, methoxy, ethoxy, chloro, bromo or sulfo or naphthalene which is unsubstituted or substituted by sulfo,

R_6 is hydrogen or C_1–C_4 alkyl which is unsubstituted or substituted by hydroxy, cyano, C_1–C_4 alkoxy, halogen, carboxy, carbamoyl, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, sulfo or sulfamoyl,

any one of X_1 and X_2 is $-NH_2$ and the other is —OH, and Z_1 is $-SO_2CH{=}CH_2$ or $-SO_2CH_2CH_2Z_1'$ in which Z_1' is a group capable of being split by the action of an alkali,

the formula (2) being

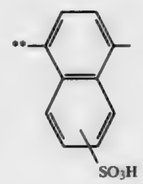


(2)

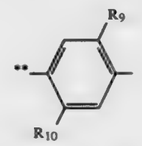
wherein D and Z_1 are as defined above,

R_8 is hydrogen or C_1–C_4 alkyl which is unsubstituted or substituted by hydroxy, cyano, C_1–C_4 alkoxy, halogen, carboxy, carbamoyl, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, sulfur or sulfamoyl,

B_1 is

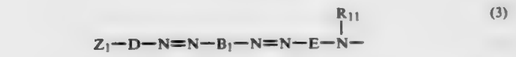


or



in which the linkage marked as ** bonds to the group —N=N—D, R_9 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or sulfo, and R_{10} is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylsulfonylamino, C_1–C_4 acylamino or ureido,

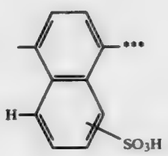
the formula (3) being



(3)

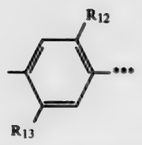
wherein B_1, D and Z_1 are as defined above, R_{11} is hydrogen or C_1–C_4 alkyl which is unsubstituted or substituted by hydroxy, cyano, C_1–C_4 alkoxy, halogen, carboxy, carbamoyl, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, sulfo or sulfamoyl,

E is



or

-continued

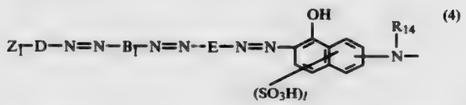


in which the linkage marked with *** bonds to the group



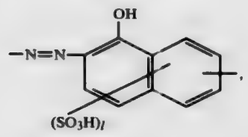
R_{12} is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or sulfo, and R_{13} is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkylsulfonylamino, C_1–C_4 alkoxy, C_1–C_4 acylamino or uriedo,

and the formula (4) being



(4)

wherein B_1, D and Z_1 are as defined above, and E is as defined above, provided that the linkage marked with *** bonds to the azo group of



R_{14} is hydrogen, C_1–C_4 alkyl which is unsubstituted or substituted by hydroxy, cyano, C_1–C_4 alkoxy, halogen, carboxy, carbamoyl, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, sulfo or sulfamoyl, and l is 1 or 2,

provided that R_4 is alkyl, phenyl, naphthyl or benzyl as defined above, when F is a polyazo dye moiety of formula (1) or (2).

5,112,960

CHEMILUMINESCENT 3-(SUBSTITUTED ADAMANT-2'-YLIDENE) 1,2-DIOXETANES

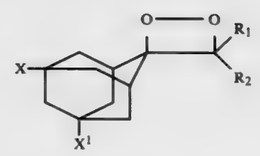
Irena Y. Bronstein, 11 Ivanhoe St., Newton, Mass. 02158; Brooks Edwards, 269 Huron Ave., Cambridge, Mass. 02138, and Rouh-Rong Juo, 28 Holman St., Alston, all of Mass. 02134

Continuation-in-part of Ser. No. 559,152, Jul. 24, 1990, which is a division of Ser. No. 367,772, Jul. 17, 1989, abandoned. This application Aug. 30, 1990, Ser. No. 574,786

Int. Cl.[5] C07H *15/24;* **C07F** *9/06*

U.S. Cl. 536—18.1 **17 Claims**

1. An enzymatically cleavable chemiluminescent 1,2-dioxetane compound capable of producing light energy when decomposed, substantially stable at room temperature before a bond by which an enzymatically cleavable labile substituent thereof is intentionally cleaved, represented by the formula:



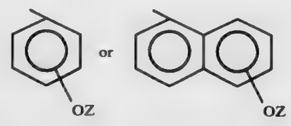
wherein:

X and X^1 each represent individually, hydrogen, a hydroxyl group, a halo substituent, a hydroxy (lower) alkyl group, a halo (lower) alkyl group, a phenyl group, a halophenyl group, an alkoxyphenyl group, a hydroxyalkoxy group, a cyano group or an amide group, with at least one of X and X^1 being other than hydrogen; and

wherein:

R_1 is $-O(CH_2)_nCH_3$, n=0–and

R_2 is



wherein Z is a moiety selected from the group consisting of a phosphate, galactoside, acetate, 1-phospho-2,3-diacylglyceride, 1-thio-D-glucoside, adenosine triphosphate, adenosine diphosphate, adenosine monophosphate, adenosine, α-D-glucoside, β-D-glucoside, α-D-mannoside, β-D-mannoside, β-D-fructofuranoside, β-D-glucosiduronate, p-toluenesulfonyl-L-arginine ester, and p-toluenesulfonyl-l-arginine amide.

5,112,961

DNA ENCODING SUBUNITS OF A HIGH AFFINITY GM-CSF RECEPTOR

Kazuhiro Hayashida; Toshio Kitamura, and Atsushi Miyajima, all of Palo Alto, Calif., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jul. 18, 1990, Ser. No. 554,745

Int. Cl.[5] C07H *17/00;* **C12P** *21/06;* **C07K** *13/00, 15/00*

U.S. Cl. 536—27 **4 Claims**

1. An isolated and purified nucleic acid as shown in FIG. 1 which encodes a polypeptide capable of forming a high affinity receptor having a binding constant less than 200 pM for human granulocyte-macrophage colony stimulating factor when operably associated with the α chain of a human granulocyte-macrophage colony stimulating factor receptor and an isolated and purified nucleic acid sequence which hybridizes to the nucleic acid sequence shown in FIG. 1 and which encodes a polypeptide capable of forming a high affinity receptor having a binding constant less than 200 pM for human granulocyte macrophage colony stimulating factor when operably associated with the α chain of a human granulocyte-macrophage colony stimulating factor receptor.

5,112,962

LABILE ANCHORS FOR SOLID PHASE POLYNUCLEOTIDE SYNTHESIS

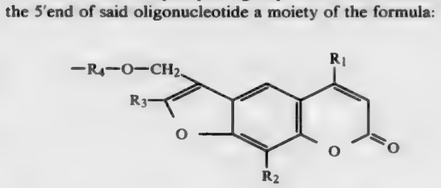
Robert L. Letsinger, Wilmette, Ill., and Charles N. Singman, Teaneck, N.J., assignors to Northwestern University, Evanston, Ill.

Continuation-in-part of Ser. No. 340,347, Apr. 19, 1989, abandoned. This application Nov. 9, 1990, Ser. No. 612,216

Int. Cl.[5] C07H *15/12, 17/00;* **G01N** *33/00, 33/552*

U.S. Cl. 536—27 **15 Claims**

1. A linker arm for solid support oligonucleotide synthesis comprising:



5,112,963

MODIFIED OLIGONUCLEOTIDES

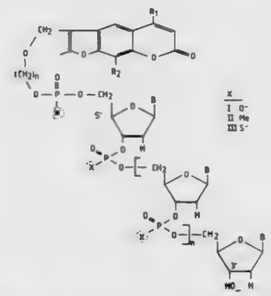
Uwe Pieles; Uwe Englisch, and Friedrich Cramer, all of Göttingen, Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Gottingen, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,243

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738460

Int. Cl.[5] C12Q *1/68;* **C07H** *15/12*

U.S. Cl. 536—27 **5 Claims**



1. A modified oligonucleotide characterized by having a base sequence AT or TA among the first two bases on its 5'-end and further characterized by having bound to one of the O^- radicals of the 5'-phosphate group of the first nucleotide at the 5'end of said oligonucleotide a moiety of the formula:

wherein R_4 is an ethylene spacer group and R_1, R_2, and R_3, which may be the same or different are hydrogen or C_1–C_3 alkyl or C_1–C_3 alkoxy with the proviso that not every phosphate moiety of said oligonucleotide is substituted by a methyl group.

5,112,964

WATER-SOLUBLE HEMICELLULOSE

Seiichiro Aoe; Taishi Oda, both of Kawagoe; Masanori Nakaoka, Nagareyama, and Seiji Kurosawa, Sayama, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan

Filed Nov. 29, 1989, Ser. No. 442,656

Claims priority, application Japan, Dec. 7, 1988, 63-307719; Aug. 10, 1989, 1-205697

Int. Cl.[5] C08B *15/08*

U.S. Cl. 536—56 **8 Claims**

1. A process of producing a water-soluble hemicellulose comprising the steps of:

a) adding hot water and thermostable amylase to a raw material selected from the group consisting of rice bran, wheat bran and grain husk to remove starch contained in the raw material, whereby the amylase breaks down the raw material and the starch becomes dissolved in the water and thereby forms a gelatinized starch solution;

b) removing the gelatinized starch solution of step a), wherein the amylase remaining in the gelatinized solution breaks down the starch into dextrin or smaller carbohydrates;

c) separating the gelatinized solution of step b) into solid and liquid phases; wherein the solid phase contains a water-soluble hemicellulose, cellulose, lignin, protein and minerals, and the liquid phase contains the starch and smaller carbohydrates which are not broken down;

d) dissolving the solid phase of step c) with a solvent having an acidic pH of at most 5 or an alkaline pH of at least 10 which forms a second solid and liquid phase, wherein the liquid phase contains the water-soluble hemicellulose;

e) separating the liquid phase of step d) from the solid phase; and

f) neutralizing and desalting the separated liquid phase of step e) to obtain the water-soluble hemicellulose.

5,112,965

THICKNER COMPOSITION AND A METHOD FOR THE PREPARATION THEREOF

Shoei Fujishige; Rikio Numajiri, both of Ibaraki, and Hideyuki Aragane, Tokyo, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology and Kashima Oil Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 161,332, Feb. 18, 1988, abandoned, which is a continuation of Ser. No. 20,146, Feb. 25, 1987, abandoned, which is a continuation of Ser. No. 718,286, Apr. 1, 1985, abandoned. This application Dec. 5, 1988, Ser. No. 282,950

The portion of the term of this patent subsequent to Dec. 18, 2003, has been disclaimed.

Int. Cl.[5] C08B *37/00*

U.S. Cl. 536—114 **9 Claims**

1. A thickener composition which comprises:

(a) water as a solvent; and

(b) a thermally stable high molecular weight polysaccharide reacted with low molecular weight aliphatic aldehyde in water in the presence of an inorganic salt at a neutral or acidic pH.

5,112,966

BETA-LACTAMS

Makoto Sunagawa, Toyonaka; Haruki Matsumura, Nara; Tsuneo Yano, Toyonaka; Akira Sasaki, Ibaraki, and Shinzi Takata, Nishinomiya, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

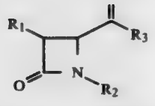
Filed Oct. 31, 1985, Ser. No. 793,290

Claims priority, application Japan, Oct. 31, 1984, 59-230790; Jan. 18, 1985, 60-5912

Int. Cl.[5] C07D *205/08*

U.S. Cl. 540—200 **1 Claim**

1. A compound of the formula



wherein R_1 is a hydrogen atom, a lower alkyl group or a 1-hydroxy(lower)alkyl group wherein the hydroxyl group is optionally protected, R_2 is a hydrogen atom or a protective group for the nitrogen atom and R_3 is a halomethyl or a formyl group.

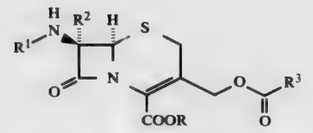
5,112,967

PROCESS FOR SYNTHESIZING ANTIBACTERIAL CEPHALOSPORIN COMPOUNDS

Dennis D. Keith, Montclair; Chung-Chen Wei, Cedar Knolls, both of N.J., and Kevin F. West, Clifton Park, N.Y., assignors to Hoffmann-La Roches Inc., Nutley, N.J.

Filed Apr. 27, 1990, Ser. No. 515,966
Int. Cl.[5] C07D 501/00, 501/14
U.S. Cl. 540—215 28 Claims

1. A process for synthesizing an antibacterial cephalosporin compound of formula



wherein R is hydrogen or a carboxylic acid protecting group; R^1 is hydrogen or an acyl group; R^2 is hydrogen or lower alkoxy; and R^3 is carbocyclic aryl substituted on the ring with one or more members selected from the group consisting of hydroxy, lower alkyl, amino, cyano, lower alkoxy, halogen and alkylcarboxy,

as well as the corresponding readily hydrolyzable esters, pharmaceutically acceptable salts and hydrates of these compounds where R is hydrogen, said process comprising the steps of:

a) treating a 3-hydroxymethyl Δ^3-cephalosporin compound, having a carboxylic acid moiety in the 2-position, with an organic base selected from the group consisting of a tertiary amine and a quaternary ammonium hydroxide to form an organic salt therewith;

b) acylating the 3-hydroxymethyl substituent of the organic salt of the cephalosporin compound which is produced in step a) with an acylating agent which is selected to provide the desired 3-acyloxymethyl substituent on the cephalosporing compound, said reaction being carried out in a non-aqueous organic solvent; and

c) converting the compound formed in step b) to the compound of formula I.

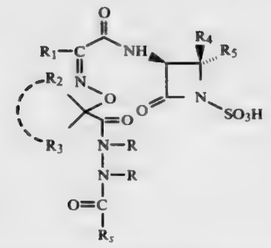
5,112,968

MONOBACTAM HYDRAZIDE DERIVATIVES

Uwe D. Treuner, Etterzhausen, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 28, 1989, Ser. No. 386,070
Int. Cl.[5] C07D 205/00, 491/08
U.S. Cl. 540—355 45 Claims

1. Compounds of the formula

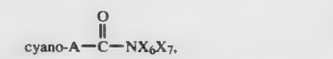


I

and pharmaceutically acceptable salts thereof wherein;

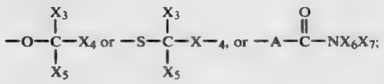
R_4 and R_5 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered hetereocycle or one of R_4 and R_5 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, carboxyl, $—CH_2X_1$, —S—X_2 or —O—X_2,

X_1 is azido, amino, hydroxy, carboxyl, alkoxycarbonyl, alkanoylamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, alkylsulfonyloxy, phenyl-sulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl,



—S—X_2, or —O—X_2 (wherein A, X_2, X_6 and X_7 are as hereinafter defined);

X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, substituted alkanoyl, phenylalkanoyl, (substituted phenyl)alkanoyl, phenylcarbonyl, (substituted phenyl)carbony, or heteroarylcarbonyl, and in the case of when X_1 is O—X_2 then X_2 can also be alkylideneamino, alkanoylamino, carboxyalkylideneamino, alkylsulphonylamino, alkoxycarbonylalkylsulphonylamino or N,N-cyclodialkanoylamino,



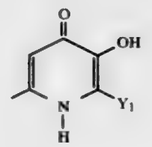
one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group; and X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl (substituted amino)carbonyl, or cyano (—C≡N),

A is —CH=CH—, $—CH_2)_m—$, $—CH_2)_m—O—$, $—(CH_2)_m—NH—$, or $—CH_2—S—CH_2—$, m is 0, 1 or 2, and X_6 and X_7 are the same or different and each is hydrogen, alkyl, phenyl or substituted phenyl, or X_6 is hydrogen and X_7 is amino, substituted amino, alkanoylamino or alkoxy, or X_6 and X_7 when taken together with the nitrogen atom to which they are attached form a 4, 5, 6 or 7-membered heterocycle;

R_2 and R_3 are the same or different and each is hydrogen or alkyl or R_2 and R_3 together with the carbon atom to which they are attached are a 3,4,5 or 6-membered cycloalkyl group

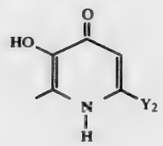
R is hydrogen or methyl;

R_s is a substituted hydroxy pyridone of the formulae:



II

and

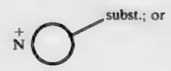


III

R_1 is phenyl, substituted phenyl, a 5 or 6-membered heterocycle containing one or two nitrogen, oxygen or sulfur atoms, substituted heterocycle;

Y_1 is CH_2X; $COOR_6$; $CONR_7R_8$; OH; OCH_2R_9; CHF_2; CHO; CH=N—OR_{10}; CH=CH—R_{11}; CN; CH=N—NHR_{12};

X is hydrogen; halogen; OR_{13}; SR_{14}; SO_2R_{15} NHR_{16}; NR_{17} R_{18}; N_3; CN; SCH; $COOR_{19}$ $CONH_2$; $CSNH_2$; CH_2R_{20};





R_6 is hydrogen; ion$^+$; lower alkyl; substituted lower alkyl; aralkyl;

R_7 and R_8 is hydrogen; one of R_7 and R_8 is hydrogen and the other lower alkyl; substituted lower alkyl; aralkyl; aryl or a 5 or 6 membered heterocycle; R_7 and R_8 may also be both lower alkyl or together form a saturated heterocycle;

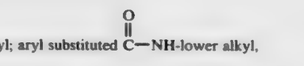
R_9 is hydrogen; lower alkyl; aryl; COOH; COO-lower alkyl; $CONH_2$;

R_{10} is hydrogen or lower alkyl

R_{11} is hydrogen; CN; COOH; COO-lower alkyl; O-lower alkyl; S-lower alkyl; halogen;

R_{12} is hydrogen; lower alkyl; CO-lower alkyl; aryl; heterocycle; CO-aryl or CO-heterocycle;

R_{13} is hydrogen; lower alkyl; CH_2—COO lower alkyl; CH_2COOH; $CONH_2$; CH_2—$CONH_2$;



substituted aryl; CO-lower alkyl; CO-substituted lower alkyl; CO-aryl; CO-substituted aryl;

R_{14} is hydrogen; lower alkyl; $—CH_2COO$-lower alkyl; CH_2COOH; CH $CONH_2$; heterocycle; substituted heterocycle;

R_{15} is hydrogen; lower alkyl; CH_2COO-lower alkyl; CH_2COOH; CH_2CONH_2;

R_{16} is hydrogen; lower alkyl; $CONH_2$; CONH-lower alkyl; CONH-aryl; CONH substituted lower alkyl; CH=NH

$CSNH_2$; CSNH lower alkyl; CSNH aryl; CSNH-heterocycle; n—1-3; CH_2—COOH; CH_2—COO-lower alkyl; $CH_2CH_2NH_2$; CH_2—CH_2NH—CO lower alkyl;

R_{17} and R_{18} is hydrogen and the other lower alkyl or together form a saturated heterocycle;

R_{19} is hydrogen; lower alkyl;

R_{20} is hydrogen; COOH; COO lower alkyl; CN; OH;

Y_2 is hydrogen; COOH, $CONH_2$; CN; $CSNH_2$; COO lower alkyl; $CONR_7R_8$;

wherein the term "substituted alkyl" refers to alkyl groups substituted with azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl, or alkylsulfonyl groups;

the term "substituted alkanoyl" refers to alkyl groups substituted with azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl or alkylsulfonyl groups;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl (of 1 to 4 carbon atoms), alkoxy (of 1 to 4 carbon atoms), alkanoyloxy, aminocarbonyl, or carboxy groups;

the term "a 4,5,6, or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetidinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolylidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl or hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino, or substituted alkyl wherein the alkyl groups has 1 to 4 carbon atoms;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, and tetrazolyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl (of 1 to 4 carbon atoms), alkoxy (of 1 to 4 carbon atoms), alkylsulfonyl, phenyl, substituted phenyl, 2furfurylideneamino, benzylideneamino, or substituted alkyl wherein the alkyl group has 1 to 4 carbon atoms;

the term "substituted amino" refers to a group having the formula $—NX_8X_9$ wherein X_8 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and X_9 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy, or amino.

5,112,969

CYANO ESTERS AND AZEPINONES

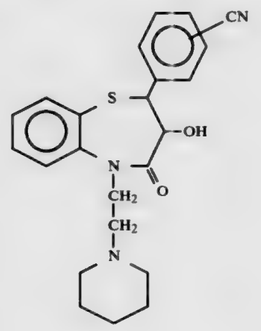
Daniel E. Martin, Lee's Summit, Mo., assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 502,619, Apr. 2, 1990, which is a division of Ser. No. 440,377, Nov. 22, 1989, which is a continuation-in-part of Ser. No. 400,658, Aug. 31, 1989. This application May 30, 1991, Ser. No. 707,486

Int. Cl.[5] **C07D** *281/10*

U.S. Cl. 540—491 **4 Claims**

1. A compound, or a pharmaceutically acceptable salt thereof, of the formula:



5,112,970

WATER-SOLUBLE TRIPHENDIOXAZINE COMPOUNDS AND PRECURSORS THEREOF CONTAINING SULFONYL GROUPS, PROCESSES FOR THEIR PREPARATION AND THE USE OF THE TRIPHENDIOXAZINES AS DYESTUFFS

Holger M. Büch, Hofheim am Taunus, and Hartmut Springer, Königstein/Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

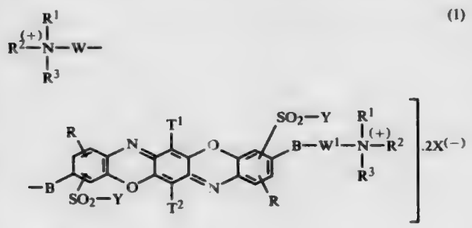
Filed Aug. 23, 1989, Ser. No. 397,526

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 3828824

Int. Cl.[5] **C09B** *19/02*; **D06P** *3/58*; **C07D** *265/38*

U.S. Cl. 544—75 **15 Claims**

1. A water soluble, fiber-reactive triphendioxazine compound having quaternary ammonium groups, of the formula



(1)

in which:

B is oxygen or sulfur or an amino group of the formula —NH— or —N(R')—, in which R' is alkyl of 1 to 4 carbon atoms which can be substituted by sulfo, sulfato, phosphato, or carboxy or lower alkoxy or alkanoylamino of 2 to 4 carbon atoms or phenyl or sulfophenyl, or has one of the meanings of the group $X^{(-)}[R^3,R^2,R^1]N^{(+)}$—W— or —W-1—$^{(+)}N[R^1,R^2,R^3]X^{(-)}$, where W, W^1, R^1, R^2, R^3 and $X^{(-)}$ have the definition given below, or, together with R^1, forms an alkylene having 2 to 4 carbon atoms;

R^1 is a straight-chain or branched alkyl group having 1 to 6 carbon atoms which is unsubstituted or substituted by 1 to 2 substituents which are selected from the group consisting of carboxy, sulfo, sulfato, phosphato, alkoxy having 1 to 4 carbon atoms, alkanoyloxy having 2 to 5 carbon atoms, phenyl and phenyl which is substituted by 1 or 2 sulfo groups;

R^2 has one of the meanings of R^1 and

R^3 has one of the meanings of R^1 or

R^2 and R^3, together with the positively charged nitrogen atom, form the trimethylene-iminium, pyrrolidinium, morpholinium, piperidinium or piperazinium or benzopyrrolidinium radical

$X^{(-)}$ is the molar equivalent of a colorless anion, but in the case where one of the substituents of R^1, R^2 and R^3 contains an acid group which is capable of forming an inner salt with the ammonium nitrogen, so that in this case $X^{(-)}$ is without any meaning;

W is an alkylene group having 2 to 6 carbon atoms, unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of sulfato, phosphato, carboxy, sulfo, phenyl, monosulfophenyl or disulfophenyl, or is an alkylene group having 4 to 12 carbon atoms, interrupted by at least 1 hetero group selected from the group consisting of —O—, —S—, $—SO_2—$, —CO—, 1,4-piperidino, —NH— and —N(R^0)—, in which R^0 is alkyl of 1 to 6 carbon atoms unsubstituted or substituted by substituents selected from the group consisting of sulfo, sulfato, carboxy, phosphato, phenyl, monosulfophenyl or disulfophenyl, or is alkanoyl having 2 to 5 carbon atoms, and the alkylene moieties of W are unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of sulfato, phosphato, carboxy, sulfo, phenyl, monosulfophenyl and disulfophenyl;

W^1 has one of the meanings of W;

Y is the vinyl group, or an ethyl group which contains in the β-position a substituent which can be eliminated by an alkali;

R is a hydrogen atom or a sulfo group;

T^1 is a hydrogen atom or a halogen atom, a cycloalkyl group having 5 to 8 carbon atoms, phenylalkoxy, an alkoxy group having 1 to 4 carbon atoms, phenoxy, an alkyl group having 1 to 4 carbon atoms, phenyl, a cyano group, a carboxy group, a carbalkoxy group having 2 to 5 carbon atoms, a carbamoyl group, an N-alkylcarbamoyl group with an alkyl radical of 1 to 4 carbon atoms or an N,N-dialkyl-carbamoyl group with alkyl radicals having in each case 1 to 4 carbon atoms, N-phenyl-carbamoyl, an alkanoylamino group having 2 to 5 carbon atoms, or benzoylamino, the benzene moieties in the above-mentioned substituents being unsubstituted or substituted by 1 or 2 substituents from the group consisting of halogen, nitro, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, carboxy and sulfo;

T^2 has one of the meanings given for T^1; and the individual members of the formula, including those which appear twice, can have meanings which are identical to one another or different from one another.

5,112,971

ANTHRAQUINONE DYE COMPOUNDS HAVING FIBERS REACTIVE GROUP

Kingo Akahori, Toyonaka; Naoki Harada, Suita; Yutaka Kayane, Ibaraki, and Takashi Omura, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

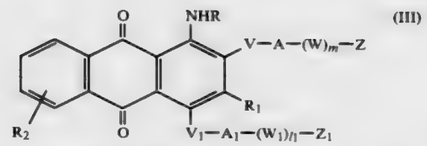
Filed Jul. 31, 1989, Ser. No. 386,699

Claims priority, application Japan, Aug. 10, 1988, 63-200793; Sep. 1, 1988, 63-219516; Sep. 2, 1988, 63-220844

Int. Cl.[5] **C07D** *251/50, 251/70, 261/44*

U.S. Cl. 544—189 **2 Claims**

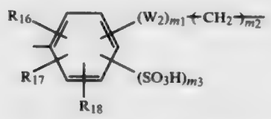
1. A compound of the formula:



(III)

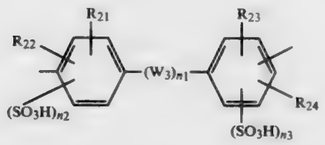
wherein R_1 is hydrogen; R_2 is hydrogen or sulfo; R is hydrogen, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, carboxymethyl, 2-carboxyethyl, 2-sulfoethyl, 2-methoxyethyl, 2-ethoxyethyl, 2-hydroxyethyl, 2-sulfatoethyl, cyclohexyl, phenyl, 2-, 3- or 4-sulfophenyl, 2-, 3-, or 4-methylphenyl, 2-, 3- or 4-chlorophenyl, 2-, 3-, or 4-methoxyphenyl, 2-, 3-, or 4-carboxyphenyl, acetyl, propionyl, benzoyl, 2-, 3- or 4-sulfonbenzyl, 2-, 3- or 4-carboxybenzoyl, 2-, 3- or 4-chlorobenzoyl, 2-, 3-, or 4-methoxybenzoyl, 2-, 3- or 4methoxybenzoyl, methylsulfonyl, ethylsulfonyl, phenylsulfonyl, 2-, 3-, or 4-methylphenylsulfonyl, 2-, 3-, or 4-chlorophenylsulfonyl, 2-, 3- or 4-sulfophenylsulfonyl, 2-, 3- or 4- carboxyphenylsulfonyl, or 2-, 3- or 4-methoxyphenylsulfonyl; V is divalent group of —O— or —S—; W is the divalent group $—NR_3—$ in which R_3 is hydrogen or C_1–C_4 alkyl which is unsubstituted or substituted hydroxy, cyano, C_1–C_4 alkoxy, chloro, bromo, carboxy, carbamoyl, C_1 –C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, sulfo or sulfamoyl; Z is hydrogen or a fiber-reactive group; V_1 is the divalent group —S—; W_1 is the divalent group $—NR_5—$ in which R_5 is hydrogen or C_1–C_4 alkyl which is unsubstituted or substituted by hydroxy, cyano, C_1–C_4 alkoxy, chloro, bromo, carboxy, carbamoyl, C_1 –C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, sulfo or sulfamoyl; l_1 is 0 or 1; m is 0 or 1; Z_1 is hydrogen or a fiber-reactive group; A and A_1 independently of one another are each a group of one of the following formulae (9), (10), (11), or (12),

the formula (9) being



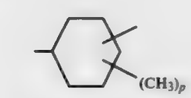
wherein R_{16}, R_{17} and R_{18} independently of one another are each hydrogen, methyl, ethyl, methoxy, ethoxy, chloro, bromo or carboxy, W_2 is a divalent group selected from the group consisting of —O—, —S—, $—NR_{19}—$ and $—NR_{20}CO—$ in which R_{19} and R_{20} are each hydrogen, m_1 is 0 or 1, m_2 is 0, 1, 2, 3 or 4, and m_3 is 0, 1, or 2,

the formula (10) being



wherein R_{21}, R_{22}, R_{23} and R_{24} independently of one another are each hydrogen, methyl, ethyl, methoxy, ethoxy, chloro, bromo or carboxy, W_3 is a bridging group selected from the group consisting of —O—, —S—, $—NR_{25}—$ or $—NR_{26}CO—$ in which R_{25} and R_{26} are each hydrogen, n_1 is 0 or 1, and n_2 and n_3 are each 0, 1 or 2,

the formula (11) being



wherein p is 0, 1, 2 or 3, and

the formula (12) being $(CH_2)_q$ wherein q is an integer of 2 to 6,

with the proviso that:

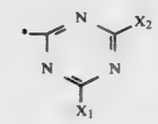
at least one of Z and Z_1 is a fiber-reactive group;

when Z is hydrogen, m is 0, and when Z_1 is hydrogen, l_1 is 0; and

at least one of R, A and A_1 is a sulfo-containing group;

wherein the fiber-reactive group represented by Z or Z_1 is any one of those represented by the following formulae (13) to (17),

the formula (13) being

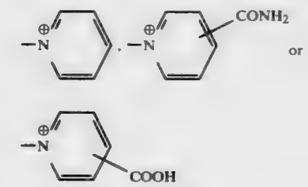


(13)

wherein X_1 and X_2 independently of each other are each chloro, fluoro,

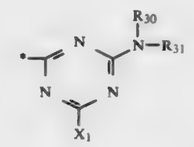


in which R_{27}, R_{28} and R_{29} independently of each other are each C_1–C_4 alkyl,



and the asterisked linkage bonds to W or W_1,

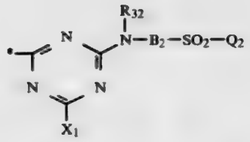
the formula (14) being



(14)

wherein R_{30} is hydrogen or C_1–C_4 alkyl, R_{31} is hydrogen or C_1–C_4 alkyl, phenyl or naphthyl, and X_1 and the asterisked linkage are as defined above,

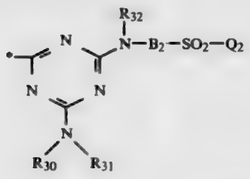
the formula (15) being



(15)

wherein R_{32} is hydrogen or C_1–C_4 alkyl, B_2 is phenylene which is unsubstituted or substituted once or twice by methyl, ethyl, methoxy, ethoxy, chloro, bromo, sulfo, carboxy or nitro, Q_2 is vinyl or $—CH_2CH_2L_2$ in which L_2 is a group capable of being split by the action of an alkali; and the asterisked linkage are as defined above;

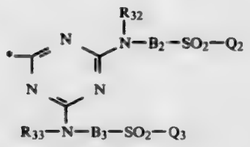
the formula (16) being



(16)

wherein R_{30}, R_{31}, R_{32}, B_2, Q_2 and the asterisked linkage are as defined above, and

the formula (17) being



(17)

wherein R_{33} is hydrogen or C_1–C_4 alkyl, B_3 is phenylene which is unsubstituted or substituted once or twice by methyl, ethyl, methoxy, ethoxy, chloro, bromo, sulfo, carboxy or nitro, Q_3 is vinyl or $—CH_2CH_2L_3$ in which L_3 is a group capable of being split by the action of an alkali; and R_{32}, B_2, Q_2 and the asterisked linkage are as defined above.

5,112,972

SYNTHESIS OF CHROMAN DERIVATIVES

Rolf Gericke, Seeheim; Manfred Baumgarth; Ingeborg Lues, both of Darmstadt; Rolf Bergmann, Reichelsheim, all of Fed. Rep. of Germany, and De Peyer, Bern, Switzerland, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

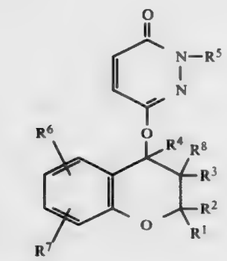
Filed May 31, 1990, Ser. No. 531,490

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1989, 3918041

Int. Cl.[5] **C07D** *237/00*

U.S. Cl. 544—230 **3 Claims**

1. A process for the preparation of chroman derivative of formula I



I

in which

R^1 is A,

R^2 and R^8 are each independently H or A, or

R^1 and R^2 together are C_{3-6}-alkylene,

R^3 is OH, OA or OAc,

R^4 is H, or

R^3 and R^4 together are a bond,

R^5 is Ar or C_nH_{2n}-R^9,

R^9 is C_{2-4}-alkenyl or C_{2-4}-alkynyl, OH, OA, CHO, CO-A, CS-A, COOH, COOA, COO-alkyl-Ar, CS-OA, NO_2, NH_2, NHA, NA_2, CN, F, Cl, Br, I, CF_3, SA, SO-A, SO_2-A or Ar,

Ar is a phenyl group which is unsubstituted or substituted once or twice by R^{10},

R^6, R^7 and R^{10} are each independently H, A, HO, AO, CHO, ACO, CF_3CO, ACS, HOOC, AOOC, AO-CS, ACOO, A-CS-O, hydroxy-alkyl, mercapto-alkyl, NO_2, NH_2, NHA, NA_2, CN, F, Cl, Br, I, CF_3, AS, ASO, ASO_2, AO-SO, AO-SO_2, AcNH, AO-CO-NH, H_2NSO, HANSO, A_2NSO, H_2NSO_2, $NANSO_2$, A_2NSO_2, H_2NCO, HANCO, A_2NCO, H_2NCS, HANCS, A_2NCS, ASONH, ASO_2NH, AOSONH, $AOSO_2NH$, ACO-alkyl, nitro-alkyl, cyanoalkyl, A-C(=NOH), A-C(=NNH_2), H_2PO_3 or A_2PO_3,

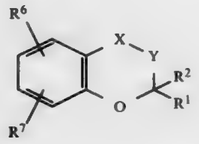
n is 1, 2 or 3,

A is C_{1-6}-alkyl,

-alkyl is C_{1-6}-alkylene, and

Ac is C_{1-8}-alkanoyl or C_{7-11}-aroyl,

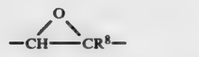
or a salt thereof, comprising reacting a chroman of formula II



II

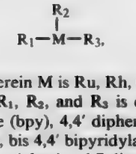
in which

X-Y is



or —CHE-CR^3R^8— and

E is Cl, Br, I or a reactive esterified OH group, with a compound of the formula III



III

or with one of the reactive derivatives thereof and optionally further the compound of the formula I is converted into one of its acid addition salts by treatment with an acid.

5,112,973

FLUORINE-CONTAINING ACRYLIC ACID DERIVATIVE AND POLYMER THEREOF

Shigeru Morita, Osaka, and Masahiko Oka, Shiga, both of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

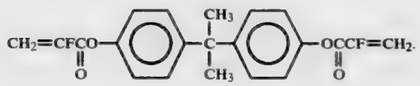
Division of Ser. No. 20,133, Feb. 26, 1987, which is a continuation of Ser. No. 751,724, Jul. 3, 1985, abandoned. This application Sep. 13, 1989, Ser. No. 406,545

Claims priority, application Japan, Jul. 9, 1984, 59-142986

Int. Cl.[5] **C07D** *241/04;* **C07C** *69/62*

U.S. Cl. 544—387 **3 Claims**

3. A polymer comprising repeating units which are derived from a fluorine-containing acrylic acid derivative of the formula



5,112,974

MIXED LIGAND COMPLEXES AND USES THEREOF AS BINDING AGENTS TO DNA

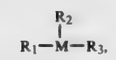
Jacqueline K. Barton, New York, N.Y., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation-in-part of Ser. No. 905,295, Sep. 8, 1986, which is a continuation-in-part of Ser. No. 693,023, Jan. 18, 1985, Pat. No. 4,721,669. This application Nov. 7, 1988, Ser. No. 268,247

Int. Cl.[5] **C07F** *15/00;* **C07D** *471.04;* **A61K** *33/24, 31/555*

U.S. Cl. 546—4 **25 Claims**

1. A coordination complex of salt thereof which is spectroscopically or photoactively determinable when bound to DNA having the formula



wherein M is Ru, Rh, Co, Fe, Cr, Cu, Zn, Cd, or Pb, and each of R_1, R_2, and R_3 is ethylenediamine, bipyridine, 2,2'-bipyridine (bpy), 4,4' diphenyl bipyridine, bis 4,4' methyl bipyridylate, bis 4,4' bipyridylamide, phenanthroline, 1,10-phenanthroline (phen), 4,7-diamino-1,10-phenanthroline, 3,8-diamino-1,10-phenanthroline, 4,7-diethylenediamine-1,10-phenanthroline, 3,8-diethylenediamine-1,10-phenanthroline, 4,7-dihydroxyl-1,10-phenanthroline, 3,8-dihydroxyl-1,10-phenanthroline, 4,7-dinitro-1,10-phenanthroline, 3,8-dinitro-1,10-phenanthroline, 4,7-diphenyl-1,10-phenanthroline (DIP), 3,8-diphenyl-1,10-phenanthroline, 4,7-dispermine-1,10-phenanthroline, 3,8-dispermine-1,10-phenanthroline, 5-nitro-phenanthroline, (5-NO_2phen), 3,4,7,8-tetramethyl-phenanthroline (TMP), diazafluorene-9-one, 4,5-diazafluorene-9-one (flone), phenanthrenequinonediimine, or 9,10-phenanthrenequinonediimine (phi); wherein R_1, R_2, and R_3 are bound to M by coordination bonds and wherein R_1 and R_2 are the same or different and both are different from R_3.

5,112,975

PREPARATION OF NOROXYMORPHONE FROM MORPHINE

Rebecca A. Wallace, Manchester, Mo., assignor to Mallinckrodt Specialty Chemicals Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 196,539, Jul. 18, 1988, abandoned, which is a continuation of Ser. No. 863,209, May 14, 1986, abandoned, which is a continuation of Ser. No. 713,932, Mar. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 593,744, Mar. 27, 1984, abandoned. This application Sep. 14, 1989, Ser. No. 406,988

Int. Cl.[5] **C07D** *489/08, 489/02*

U.S. Cl. 546—45 **18 Claims**

1. A process for preparing noroxymorphone from morphine comprising:

(1) reacting morphine in a single step with a haloformate ester of the formula X—C(=O)OR_1, wherein X is halogen and R_1 is alkyl, so as to form 3,17-(di-R_1-oxycarbonyl)normorphine;

(2) oxidizing the hydroxyl group of the 3,17-(di-R_1-oxycarbonyl)normophine with an oxidizing agent, under acidic conditions at a pH of less than 1.0, so as to form 3,17-(di-R_1-oxycarbonyl)normorphinone;

(3) acylating the 3,17-(di-R_1-oxycarbonyl) normophinone with an acylating agent so as to form 3,17-(di-R_1-oxycarbonyl)normorphinone dienol acylate;

(4) contacting the dienol acylate with a peroxy oxidation agent so as to introduce a beta-oriented hydroxyl group in position 14 of said dienol acylate, so as to form 14-hydroxy 3,17-(di-R_1-oxycarbonyl)normorphinone;

(5) hydrogenating the 14-hydroxy-3,17-(di-R_1-oxycarbonyl)normorphinone in a reduction reaction so as to form 3,17-(di-R_1-oxycarbonyl)noroxymorphinone; and

(6) hydrolysing the 3,17-(di-R_1-oxycarbonyl) noroxymorphinone under hydrolytic conditions, so as to form noroxymorphone.

5,112,976

PREPARATION OF 2,6-DIOXOPIPERIDINE DERIVATIVES

Derek W. Clissold, Wokingham; John Mann, and Christopher P. Thickitt, both of Reading, all of England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB89/00308, § 371 Date Sep. 20, 1990, § 102(e) Date Sep. 20, 1990, PCT Pub. No. WO89/09216, PCT Pub. Date Oct. 5, 1989

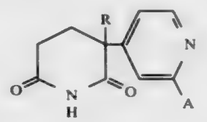
Continuation of Ser. No. 572,942, Sep. 20, 1990, abandoned. This PCT application May 15, 1991, Ser. No. 701,641

Claims priority, application United Kingdom, Nov. 1, 1985, 8825501; Mar. 22, 1988, 8806751

Int. Cl.[5] **C07D** *213/72*

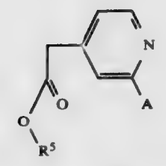
U.S. Cl. 546—193 **11 Claims**

1. A process for the preparation of 3-alkyl- or fluoroalkyl-3-(4-pyridyl)piperdine-2,6-diones of formula (1):



(1)

wherein R represents an alkyl group having 2 to 10 atoms or a fluoroalkyl group having 2 to 5 carbon atoms and A represents hydrogen or an alkyl group having 1 to 4 carbon atoms, said process comprising alkylating a 4-pyridylacetic acid alkyl ester of formula (4):



(4)

wherein R^5 represents an alkyl group and A is defined above, with an alkyl or fluoroalkyl halide of formula RX, X being iodo, bromo or chloro, in the presence of a sterically bulky base of a sodium, potassium or ammonium cation, and reacting the product of said alkylation reaction with acrylamide, in the presence of a sodium or potassium branched chain alkoxide, until cyclisation occurs.

5,112,977

SUBSTITUTED NAPHTHACENE-5,12-DIONES

Walter Fischer, Reinach; Marcus Baumann, Basel, both of Switzerland; Jürgen Finter, Freiburg, Fed. Rep. of Germany; Vratislav Kvita, Reinach; Carl W. Mayer, Riehen, both of Switzerland, and Wolfgang Wernet, Freiburg, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 24, 1989, Ser. No. 356,830

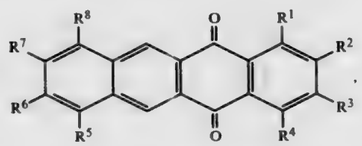
Claims priority, application Switzerland, May 27, 1988, 2008/88; Jul. 19, 1988, 2757/88

The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.

Int. Cl.[5] **C07D** *24/06;* **C07C** *50/72, 103/19*

U.S. Cl. 546—195 **9 Claims**

1. A compound of the formula I



(I)

wherein

(a) R^1, R^2, R^3 and R^4 are H and R^5 to R^6 are each H and at least one of the radicals R^5 to R^8, independently of one another, is a substituent selected from the group consisting of C_1–C_{20}alkyl-$(X)_p$—, with the exception of methyl and methoxy, C_2–C_{18}alkenyl-$(X)_p$—, C_2–C_{18}alkynyl-$(X)_p$—, C_3–C_8cycloalkyl-$(X)_p$—, (C_1–C_{12}alkyl)-C_3–C_8cycloalkyl-C_rH_{2r}—$(X)_p$—, phenyl-$(X)_p$—, (C_1–C_{12}alkyl)phenyl-$(X)_p$—, phenyl-C_rH_{2r}—$(X)_p$— and (C_1–C_{12}alkyl)phenyl-C_rH_{2r}—$(X)_p$—, which are unsubstituted or substituted by halogen, —CN, furfuryl, —NR^9R^{10}, —OR^9, —SR or —$COOR^9$ wherein r is 1 or 2, p is 0 or 1 and X is —O—, —SO— or —SO_2— wherein X is also —S— for R^1 to R^4, R^5 and R^8; or R^1 to R^8 are a substituent selected from the group consisting of halogen, —NO_2, —CF_3, —CN, —NR^9R^{10}, —$COOR^9$, —$CONR^9R^{10}$, —COCl, —SH, —$Si(C_1$–$C_4alkyl)_3$ and —O—$(C_mH_{2m}$—O—$)_nR^{11}$ or R^5 to R^8 are a pair of adjacent substituents which are —CO—O—CO— or —CO—NR^9—CO—; R^9 and R^{10} independently of one another are H, C_1–C_{12}alkyl, phenyl or $(—C_mH_{2m}—O—)_qR^{11}$, or R^9 and R^{10} together are tetramethylene, pentamethylene, 3-oxapentylene or —$CH_2CH_2NR^9CH_2CH_2$—, R^{11} is H or C_1–C_{12}alkyl, m is a number from 2 to 4, n is a number from 2 to 20 and q is a number from 1 to 20, wherein at least one of R^1 to R^4 and R^5 to R^8 is a substituent, provided that R^2 and R^6 or R^7 are not F and that 2-ethoxy-7-methoxyanthracen-5,12-dione and 2-ethoxy-10-methoxyanthracen-5,12-dione are excluded.

5,112,978

PROCESS FOR PREPARING ALPHA (ALKYL PHENYL)-4(HYDROXY-DIPHENYLMETHYL)-1-PIPERIDINYL BUTANOL

Egidio Molinari, Longoneal Segrino, Italy, assignor to Erregierre Industria Chimica S.p.A., Italy

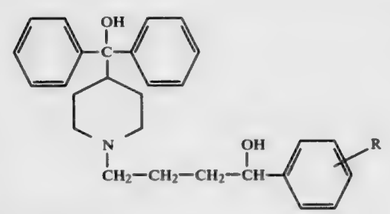
Continuation-in-part of Ser. No. 188,919, May 2, 1988, abandoned. This application Sep. 22, 1989, Ser. No. 411,021

Claims priority, application Italy, May 26, 1987, 20674 A/87

Int. Cl.[5] **C07D** *211/22*

U.S. Cl. 546—240 **9 Claims**

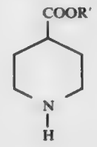
1. A process for preparing alpha-(alkylphenyl)-4-(hydroxydiphenylmethyl)1piperidine butanol of formula (I)



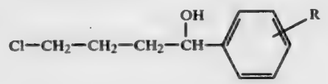
(I)

in which R is a C_1–C_5 alkyl, comprising:

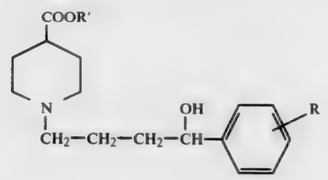
a) reacting an alkyl isonipecotate of formula II



in which R′ is a C_1–C_5 alkyl or benzyl, with 1-(alkylphenyl)-4-chloro-butanol IX:



wherein R has the above mentioned meanings, to obtain the compound of formula V′:



(V′)

b) reacting the compound (V′) with phenyl magnesium halide to obtain the compound of formula (I).

5,112,979

POLYOXYALKYLENEAMINES CONTAINING TETRAALKYLPIPERIDINE FUNCTIONALITY AND THEIR USE AS LIGHT, HEAT AND OXIDATION STABILIZERS

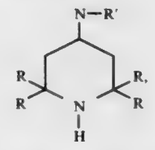
Jiang-Jen Lin, Houston; Michael Cuscurida, and Harold G. Waddill, both of Austin, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Nov. 29, 1990, Ser. No. 619,535

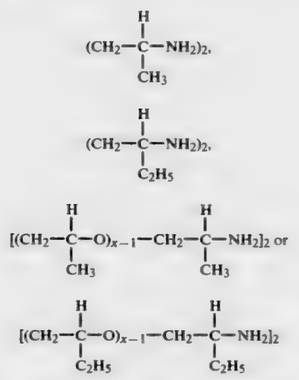
Int. Cl.[5] **C07D** *211/58*

U.S. Cl. 546—244 **8 Claims**

1. A compound of the formula:



where each of the R groups are the same and R is a C_1 to C_4 alkyl and R′ is either



where x is a number from 2 to 10.

5,112,980

PROCESS OF PREPARING SUBSTITUTED PYRIDINE COMPOUNDS

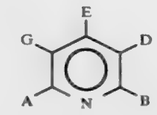
Shridhar G. Hegde, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 661,156, Feb. 27, 1991, abandoned, which is a continuation of Ser. No. 457,680, Dec. 27, 1989, abandoned. This application May 20, 1991, Ser. No. 702,573

Int. Cl.[5] **C07D** *405/12*

U.S. Cl. 546—283 **12 Claims**

1. A process for cyclizing a compound of the formula



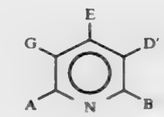
wherein:

one of A and B is selected from the group consisting of fluorinated methyl and chlorofluorinated methyl radicals, and the other is selected from the group consisting of fluorinated methyl, chlorofluorinated methyl and lower alkyl radicals;

E is selected from the group consisting of alkyl, alkenyl, cycloalkyl, cycloalkylalkyl, haloalkyl, and alkylthioalkyl radicals;

G is selected from the group consisting of hydroxycarbonyl, alkoxycarbonyl, haloalkoxycarbonyl, alkylthiocarbonyl, alkenyloxycarbonyl, alkynloxycarbonyl, cyano, pyridylthiocarbonyl, aminocarbonyl, disubstituted aminocarbonyl, and monosubstituted aminocarbonyl or is the same as D; and

D is —NHR in which R is selected from the group consisting of 3-halopropylcarbonyl, 4-halobutylcarbonyl, and 2-haloethoxycarbonyl groups, each member of which is optionally substituted with one or more groups selected from alkyl, fluoro, chloro, bromo, iodo, alkylidene, alkoxy, alkylthio, and haloalkyl radicals, to form a compound of the formula



wherein:

one of A, B, G and E are defined as above, and

D′ is selected from the group consisting of (tetrahydro-2(H)-pyran-2-ylidene)amino, (dihydro-2(3H)-furanylidene)amino, and (1,3-dioxolan-2-ylidene)amino groups, each member of which is optionally substituted on the ring portion with one or more groups selected from alkyl, fluoro, chloro, bromo, iodo, alkylidene, alkoxy, alkylthio, and haloalkyl, which comprises cyclizing the starting compound in the liquid phase under cyclizing conditions in the presence of a Lewis acid catalyst.

5,112,981

5-(1-AMINOCYCLOHEXYL)-2(1H)-PYRIDINONE AND RELATED COMPOUNDS

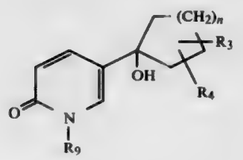
Richard C. Effland, Bridgewater, N.J., and David M. Fink, Doylestown, Pa., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 594,496, Oct. 9, 1990, Pat. No. 5,039,809, which is a division of Ser. No. 394,448, Aug. 16, 1989, Pat. No. 4,978,663. This application Jun. 5, 1991, Ser. No. 710,472

Int. Cl.[5] C07D *211/00*

U.S. Cl. 546—301 **8 Claims**

1. A compound having the formula,



where

n is 1, 2 or 3;

R_3 is hydrogen or loweralkyl;

R_4 is hydrogen or loweralkyl; and

R_9 is hydrogen, loweralkyl or aryloweralkyl.

5,112,982

PROCESS FOR PREPARING 2,6-DICHLOROPYRIDINE

Noboru Kamei, Arai, Japan, assignor to Daicel Chemical Industries Ltd., Osaka, Japan

Continuation of Ser. No. 221,821, Jul. 20, 1988, abandoned. This application May 31, 1990, Ser. No. 530,507

Claims priority, application Japan, Jul. 20, 1987, 62-180714

Int. Cl.[5] C07D *213/61, 213/28*

U.S. Cl. 546—345 **2 Claims**

1. A process for preparing 2,6-dichloropyridine, which comprises reacting 2-chloropyridine with chlorine in a liquid phase in the absence of a catalyst and in the absence of light at a temperature between 195° C. and 200° C. and at elevated pressure.

5,112,983

PROCESS FOR PRODUCING 1,2,4-TRIAZOL-5-ONE USING ORGANIC SULFONIC ACIDS AND POLYMERS THEREOF AS A CATALYST

Max M. Boudakian, Pittsford, and Delmer A. Fidler, Rochester, both of N.Y., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 101,465, Sep. 28, 1987, Pat. No. 4,999,434. This application Jul. 2, 1990, Ser. No. 546,977

Int. Cl.[5] C07D *249/12*

U.S. Cl. 548—263.2 **20 Claims**

1. A process for producing 1,2,4-triazol-5-one which comprises reacting a semicarbazide compound with a formic acid compound in the presence of a catalytic amount of a sulfonic acid catalyst selected from the group consisting of alkyl sulfonic acids and a sulfonic acid-containing polymer selected from the group consisting of perfluorosulfonic acid resins, sulfonated co-polymers of styrene and divinylbenzene, poly(vinyl sulfonic acid), co-polymers of vinyl sulfonic acid and mixtures thereof to produce a reaction mixture containing 1,2,4-triazol-5-one.

5,112,984

PROCESSES FOR THE PREPARATION OF CYCLIC NITROGEN-CONTAINING COMPOUNDS

Forrest A. Richey, Jr., and Arthur R. Doumaux, Jr., both of Charleston, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 20, 1990, Ser. No. 585,458

Int. Cl.[5] C07D *233/34*

U.S. Cl. 548—320 **1 Claim**

1. A process for preparing N-(2-hydroxyethyl)ethyleneurea and ethylene glycol which comprises contacting aminoethylethanolamine with ethylene carbonate at an elevated temperature for a period of time sufficient to produce N-(2-hydroxyethyl)ethyleneurea and ethylene glycol.

5,112,985

PREPARATION OF 1-HYDROXYIMIDAZOLE

Ulf Baus, Dossenheim, and Wolfgang Reuther, Heidelberg-Ziegelhausen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

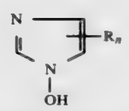
Filed Sep. 24, 1990, Ser. No. 586,947

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1989, 3932552

Int. Cl.[5] C07D *233/56, 235/02, 235/08, 235/18*

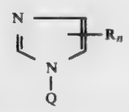
U.S. Cl. 548—337 **7 Claims**

1. A process for preparing a 1-hydroxyimidazole of the formula I



(I)

where the R radicals can be identical or different and are each hydrogen, C_1–C_{20}-alkyl, halogen the unsubstituted aryl groups phenyl, naphthyl and anthryl and the same aryl groups substituted once to three times by said alkyl and/or said halogen, it also being possible for two vicinal radicals R to be connected to form an essentially carbocyclic aromatic or nonaromatic ring of from 3 to 12 carbon atoms, and n is from 0 to 3, which comprises reacting an imidazole of the formula II



(II)

where Q is hydrogen or, provided that R is not halogen, an alkali metal or alkaline earth metal cation, with an organic peroxide.

5,112,986

1-BENZYL-3-HYDROXYMETHYL-INDAZOLE COMPOUNDS AND DERIVATIVES

Leandro Baiocchi, and Bruno Silvestrini, both of Rome, Italy, assignors to Aziende Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A., Rome, Italy

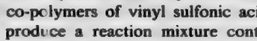
Division of Ser. No. 470,118, Jan. 24, 1990, Pat. No. 4,999,367. This application Dec. 20, 1990, Ser. No. 632,117

Claims priority, application Italy, Feb. 7, 1989, 47620 A/89

Int. Cl.[5] C07D *231/56*

U.S. Cl. 548—372 **2 Claims**

1. An intermediate compound of the formula



(II)

wherein A is a 1-benzyl-indazol-3-yl nucleus, and W is OH,

OMe (where Me is an alkali metal atom) or a leaving group selected from the halogens.

5,112,987

PROCESS FOR THE PREPARATION OF INDIGO COMPOUNDS

Yoshihiro Yamamoto, Yokohama; Usaji Takaki, Fujisawa; Shinobu Aoki, and Isao Hara, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 314,021, Feb. 23, 1989, Pat. No. 4,992,556, and a continuation-in-part of Ser. No. 324,503, Mar. 16, 1989, Pat. No. 4,966,977, and a continuation-in-part of Ser. No. 343,459, Apr. 25, 1989, Pat. No. 4,973,706. This application Oct. 25, 1989, Ser. No. 426,375

Claims priority, application Japan, Apr. 25, 1988, 63-100214; Nov. 10, 1988, 63-282515; Nov. 11, 1988, 63-283750

Int. Cl.[5] C07D *403/04*

U.S. Cl. 548—457 **28 Claims**

1. A process for the preparation of an indigo compound which comprises reacting a corresponding indole compound having no substituent at 2- and 3-positions with a percarboxylic acid in a solvent consisting essentially of an alcohol solvent or with heating to over 60° C. in an aprotic solvent.

5,112,988

ISOINDOLONE DERIVATIVES

Marie-Christine Dubroeucq, Enghien les Bains; Claude Moutonnier, le Plessis Robinson; Jean-Francois Peyronel, Palaiseau; Michel Tabart, Paris, and Alain Truchon, Lyon, all of France, assignors to Rhone-Poulenc Sante, France

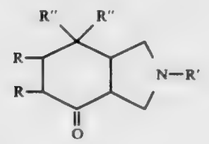
Filed Nov. 20, 1990, Ser. No. 616,044

Claims priority, application France, Nov. 23, 1989, 89 15407

Int. Cl.[5] C07D *209/44*

U.S. Cl. 548—470 **8 Claims**

1. A isoindolone derivative of formula:



in which the radicals R represent hydrogen atoms or, together, form a bond, the symbol R′ represents a hydrogen atom or an allyl radical or a radical of structure:



in which R_a and R_b are hydrogen atoms or phenyl radicals, optionally substituted, with a halogen atom or an alkyl, alkyloxy or nitro radical, and R_c is defined as R_a and R_b or represents an alkyl or alkyloxyalkyl radical, at least one R_a, R_b and R_c being a substituted or unsubstituted phenyl radical, and the symbols R″ are identical and represent phenyl radicals which can be substituted with a halogen atom or a methyl radical at the ortho or meta position, in the (3aR,7aR) form or in the form of a mixture of the (3aRS,7aRS) forms, or an acid addition salt.

5,112,989

PROCESS FOR PRODUCING UNSATURATED MONO AND DICARBOXYLIC ACID IMIDE COMPOUND

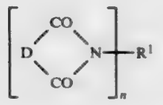
Tatsuo Yonemoto, Hyogo; Eiichiro Saito, and Masahiro Matsumura, both of Osaka, all of Japan, assignors to Matsushita Electric Works Ltd., Osaka, Japan

Filed Mar. 20, 1989, Ser. No. 325,807

Int. Cl.[5] C07D *403/06, 207/40, 207/478, 207/452*

U.S. Cl. 548—548 **12 Claims**

1. A process for producing an unsaturated dicarboxylic acid imide compound of formula (I):



(I)

wherein D represents a group of the following formula:



where Z represents hydrogen, an alkyl group, a halogen atom or a group obtained by a Diels-Alder reaction of said group with a cyclodiene;

R^1 represents

(1) a straight or branched chain alkylene group having less than 13 carbon atoms;

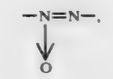
(2) a cyclic alkylene group whose ring has 5 or 6 carbon atoms;

(3) a heterocyclic group containing at least one of an oxygen, nitrogen, or sulfur atom;

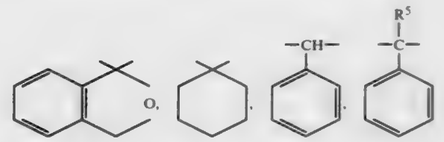
(4) a phenylene or polyacyclic aromatic group;

(5) derivatives of the aforesaid groups enumerated in (1) to (4), which do not adversely affect the reaction;

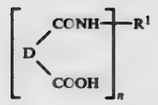
(6) groups in which a plurality of the phenylene or polycyclic aromatic groups described above in (4) are connected to each other either directly or via a divalent atom or one of the groups enumerated below: —NR^4, —$P(O)R^5$—, —N=N—,



—CO—O, —SO_2, —SiR^4R^5—, —CONH—, —NY—CO—X—CO—NY—, —O—CO—X—CO—O—,



wherein R^4, R^5, and Y each represents an alkyl group having from 1 to 4 carbon atoms, a cyclic alkyl group whose ring has 5 or 6 carbon atoms, or a phenyl or polycyclic aromatic group; and X represents a straight chain alkylene group having less than 13 carbon atoms, a cyclic alkylene group having 6 carbon atoms, or a monocyclic or polycyclic arylene group; and n is an integer of 1 to 4, which comprises reacting an unsaturated amide acid compound of formula (II):

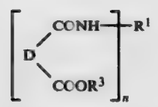


(II)

wherein D, R^1, and n are as defined above, with an orthoester of formula (III):

$$R^2—C(—OR^3)_3 \quad \text{(III)}$$

wherein R^2 and R^3, which may be the same or different, each represents an alkyl group having from 1 to 4 carbon atoms to form an unsaturated dicarboxylic acid amide acid ester compound of formula (IV):



(IV)

wherein D, R^1, R^3, and n are as defined above, and then imidating the compound of formula (IV), wherein said unsaturated dicarboxylic acid amide acid ester compound of formula (IV) is imidated in a non-polar solvent, and in the presence of a basic catalyst, wherein said non-polar solvent is used in an amount of from about 100 to 2000 parts by weight based on 100 parts by weight of said unsaturated dicarboxylic acid amide acid ester compound of formula (IV) and wherein said basic catalyst is used in an amount of from about 0.01 to 20 parts by weight based on 100 parts by weight of said unsaturated dicarboxylic acid amide ester compound of formula (IV).

5,112,990

RUTHENIUM-CATALYZED PRODUCTION OF CYCLIC SULFATES

K. Barry Sharpless, Brookline, Mass., and Yun Gao, Menlo Park, Calif., assignors to Massachusetts Institute of Technology, Mass.

Continuation-in-part of Ser. No. 199,157, May 26, 1988. This application Jun. 21, 1989, Ser. No. 369,189

Int. Cl.[5] C07D *327/10*

U.S. Cl. 549—34 **7 Claims**

1. A ruthenium-catalyzed method of converting cyclic sulfite compounds to the corresponding cyclic sulfate compounds comprising the steps of:

a. combining the cyclic sulfite compound with a catalytic amount of from about 0.001 to about 0.02 equivalents of a ruthenium-containing compound, an oxidizing agent and an organic solvent or solvent mixture; and

b. stirring the combination formed in (a) at room temperature for a time sufficient for conversion of the cyclic sulfite to the cyclic sulfate to occur.

5,112,991

PROCESS FOR THE PREPARATION OF AN ORGANO-SUBSTITUTED SODIUM ALUMINUM HYDRIDE

Tetsuya Iwao; Shuichi Osaka; Takao Sakaki; Tadao Nishida; Kiyoshi Yamamura; Seijiro Koga, all of Osaka; Reiji Hirai, and Haruo Nakagawa, both of Aichi, all of Japan, assignors to Misui Toatsu Chemicals Incorporated, Tokyo, Japan

PCT No. PCT/JP89/01116, § 371 Date Feb. 16, 1990, § 102(e) Date Feb. 16, 1990, PCT Pub. No. WO90/05128, PCT Pub. Date May 17, 1990

PCT Filed Oct. 30, 1989, Ser. No. 465,160

Claims priority, application Japan, Oct. 31, 1988, 63-273282; Dec. 9, 1988, 63-310052; Jan. 27, 1989, 1-16246

Int. Cl.[5] C07C *29/00, 29/94, 31/44, 41/60*

U.S. Cl. 549—206 **13 Claims**

1. A process for the preparation of an organo-substituted sodium aluminum hydride represented by the formula:

$$NaAlHXZ_{4-x}$$

wherein X is an integer of 1 of 3, and Z is an organic group obtained by eliminating an active hydrogen atom from an organic compound selected from the group consisting of:

(1) an alcohol or a phenol;

(2) a tetrahydrofurfuryl alcohol,

(3) an ether alcohol obtained by alkylating one hydroxyl group of a diol,

(4) a polyether alcohol obtained by condensation of an ether alcohol and diol so as to remove one mole of water,

(5) a tetrahydropyranyl alcohol, and

(6) a compound having the formula:

$$(R)_2=N(—CH_2)nOH$$

wherein R is the same or different and is selected from the group consisting of an alkyl group having from 1 to 4 carbon atoms, an alkoxy alkyl group and an aryl group having from 6 to 8 carbon atoms and n is an integer of 2 to 4, which comprises reacting in a solvent therefor an organic compound selected from the above group sodium, hydrogen and aluminum is in the form of an alloy containing an element belong to Group IVa or Group Va of the Periodic Table.

5,112,992

PRODUCTION OF POLYCARBOXYLIC ACIDS WITH HAFNIUM-ACTIVATED COBALT CATALYST

Frank G. Belmonte, Norwood Park; Kristi A. Fjare, and Walter Partenheimer, both of Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 6, 1991, Ser. No. 710,973

Int. Cl.[5] C07C *51/265*

U.S. Cl. 549—245 **15 Claims**

1. A process for oxidizing polymethylbenzenes with molecular oxygen to benzene polycarboxylic acids in a reaction solvent comprising a C_2–C_6 aliphatic carboxylic acid or a mixture of a C_2–C_6 aliphatic carboxylic acid and water under liquid phase conditions at temperatures in the range of 100° to 275° C., which comprises conducting said oxidation in the presence of a catalyst consisting essentially of a source of soluble hafnium and a catalyst system selected from the group consisting of cobalt-manganese-bromine, manganese-bromine, and cobalt-bromine wherein said soluble hafnium is present in an amount equal to or less than 250 parts per million by weight of total mother liquor content and said catalyst system contains for each gram mole of such methylbenzene from 1.0 to 20.0 milligram atoms of the transition metal manganese or cobalt or total of cobalt and manganese and from 0.2 to 10.0 milligram atoms of bromine, and reactor product cake of said process contains less than 0.3 ppmw of said hafnium after an acetic acid wash or a water wash or an acetic acid-water wash.

5,112,993

PROCESS FOR THE PREPARATION OF DIFLUOROMALEIC ANHYDRIDE

Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 14, 1989, Ser. No. 436,466

Int. Cl.[5] C07D *307/60*

U.S. Cl. 549—254 **22 Claims**

1. A process for the production of difluoromaleic anhydride, comprising, reacting sulfur trioxide with a fluorinated precursor selected from the group consisting of hexafluoro-2,5-dihydrofuran, hexafluoro-2,5-dihydrothiophene, difluoro-2,5-dihydrothiophene-2,5-dione and tetrafluoro-2,5-dihydrothiophene-2-one.

5,112,994

METHOD OF PRODUCING (S)-4-HYDROXYMETHYL-γ-LACTONE

Koshi Koseki; Takashi Ebata; Hiroshi Kawakami; Hajime Matsushita, all of Yokohama; Kazuo Itoh, and Yoshitake Naoi, both of Tokyo, all of Japan, assignors to Japan Tobacco Inc. and Yuki Gosei Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1990, Ser. No. 583,647

Claims priority, application Japan, Sep. 22, 1989, 1-244945

The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.

Int. Cl.[5] C07D *307/78*

U.S. Cl. 549—323 **11 Claims**

1. A method of producing (S)-4-hydroxymethyl-γ-lactone comprising a step of oxidizing dihydrolevoglucosenone with a peracid in an organic solvent, thereby obtaining (S)-4-hydroxymethyl-γ-lactone.

5,112,995

PREPARATION OF SUBSTITUTED ETHENES

James I. Grayson; Graham Heyes, both of Durham City; Arthur Jackson, Washington, and Paul E. Rowney, Acklam, all of England, assignors to Glaxo Group Limited, London, England

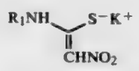
Filed Apr. 4, 1990, Ser. No. 503,987

Claims priority, application United Kingdom, Apr. 5, 1989, 8907700

Int. Cl.[5] C07C *319/22, 323/27*

U.S. Cl. 549—493 **14 Claims**

1. A method for the production of a potassium salt of formula (I)



(I)

which comprises reacting a primary alkylamine which is R_1NH_2, in which R_1 represents a straight chain C_{1-4} alkyl group or a substituted straight chain alkyl group containing a heteroatom in the chain, with the dipotassium salt of nitrodithioacetic acid.

5,112,996

METHOD FOR ALKYLATING GUANIDINO GROUPS

Valerio Caciagli, Rome, Italy, assignor to Sclavo S.p.A., Siena, Italy

Filed Aug. 28, 1990, Ser. No. 573,812

Claims priority, application Italy, Sep. 4, 1989, 21612 A/89

Int. Cl.[5] C07C *271/22*

U.S. Cl. 552—104 **11 Claims**

1. A method for substituting at least one hydrogen atom originally present in the guanidino group of a compound of the formula (I)

(I)

wherein R is any substituted or unsubstituted hydrocarbon residue, by a group R_1 wherein R_1 is an unsubstituted or substituted trityl group, comprising:

a) silylating the guanidino group and other silylatable functional groups possibly present within the R group by treating the guanidine compound of formula (I) in an aprotic organic solvent with an N,O-bis(tri-alkyl-silyl-)acetamide alone or optionally mixed with a tri-alkyl-silyl chloride and an organic base containing a tertiary nitrogen; and

b) alkylating the product obtained in step a) with a mixture consisting of an optionally substituted trityl halide R_1—X wherein X is a halide anion, and an organic base containing a tertiary nitrogen.

5,112,997

PRODUCTION OF AROMATIC AMINES

Kotohiro Nomura, and Masaru Ishino, both of Ibaraki, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Oct. 29, 1990, Ser. No. 604,520

Claims priority, application Japan, Oct. 31, 1989, 2-285571; May 31, 1990, 2-143377; Aug. 24, 1990, 2-222770

Int. Cl.[5] C07C *97/24*

U.S. Cl. 552—238 **30 Claims**

1. A process for preparing aminoanthraquinoes which comprises reacting nitroanthraquinones, in a liquid phase, with cabon monoxide and water inthe presence of a homogeneous catalyst comprising rhodium compounds or ruthenium compounds and solvents therefor.

5,112,998

PREGNANE DERIVATIVES AND PROCESSES FOR PRODUCTION THEREOF

Jiro Tsuji, Okayama; Takashi Takahashi, Tokyo; Masao Tsuji, Okayama; Naoshi Nakagawa, Okayama, and Tetsuo Takigawa, Okayama, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

PCT No. PCT/JP88/00313, § 371 Date Nov. 30, 1987, § 102(e) Date Nov. 30, 1987, PCT Pub. No. WO88/07545, PCT Pub. Date Oct. 6, 1988

Continuation of Ser. No. 283,927, Nov. 30, 1988, abandoned.

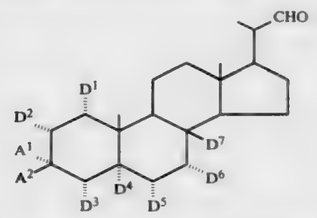
This PCT application Mar. 29, 1988, Ser. No. 545,120

Claims priority, application Japan, Mar. 30, 1987, 62-77849; Mar. 30, 1987, 62-77850; Mar. 30, 1987, 62-77851; Mar. 31, 1987, 62-80588; Mar. 31, 1987, 62-80589

Int. Cl.[5] C07J *21/00, 9/00*

U.S. Cl. 552—559 **10 Claims**

1. A pregnane derivative of the formula



wherein A^1 is in the α-configuration and represents a hydrogen atom or a hydroxyl group, and A^2 is such that where A^1 is in the α-configuration and represents a hydrogen atom, A^2 is in the β-configuration and represents a hydroxyl group, an acyloxy group, a lower alkoxycarbonyloxy group, and N-

lower alkylcarbamoyloxy group, an N-arylcarbamoyloxy group, and N,N-di(lower alkyl)carbamoyloxy group, a tri-lower alkyl or phenyl substituted silyloxy group, an alkoxymethoxy group or an alkoxymethoxy group substituted by methoxy and that where A^1 is in the α-configuration and represents a hydroxyl group, A^2 is in the β-configuration and represents a hydrogen atom, or A^1 and A^2 jointly represent an oxo group (=O); D^1 is in the α-configuration and represents a hydroxyl group, an acyloxy group, a lower alkoxycarbonyloxy group, and N-lower alkylcarbamoyloxy group, an N-arylcarbamoyloxy group, an N,N-di(lower alkyl)carbamoyloxy group, a tri-lower alkyl or phenyl substituted silyloxy group, an alkoxymethoxy group or an alkoxymethoxy group substituted by methoxy, and D^2 is in the α-configuration and represents a hydrogen atom, or D^1 and D^2 jointly represent an epoxy group (—O—) which is in the α-configuration or a single bond; D^3 is in the α-configuration and represents a hydrogen atom, D^4 is in the α-configuration and represents a hydroxyl group, D^5 is in the α-configuration and represents a hydrogen atom, D^6 is in the α-configuration and represents a hydroxyl group, a lower alkoxycarbonyloxy group, an acyloxy group, an N-lower alkylcarbamoyloxy group, an N-arylcarbamoyloxy group or an N,N-di(lower alkyl)carbamoyloxy group, D^7 is in the β-configuration and represents a hydrogen atom; provided that D^3 and D^4 may jointly represent an epoxy group (—O—) which is in the α-configuration or a single bond, D^4 and D^5 may jointly represent a single bond, D^5 and D^6 may jointly represent an epoxy group (—O—) which is int he α-configuration or a single bond, and D^6 and D^7 may jointly represent a single bond.

5,112,999

IRIDIUM COMPLEXES, PROCESS FOR THEIR PREPARATION AND THEIR USE

John A. Osborn; You P. N. C. Chan, both of Strasbourg, France; Hans-Ulrich Blaser, Ettingen, and Felix Spindler, Starrkirch-Wil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

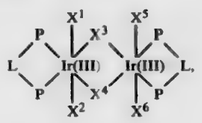
Filed Sep. 11, 1990, Ser. No. 580,711

Claims priority, application Switzerland, Sep. 18, 1989, 3387/89

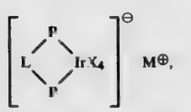
Int. Cl.[5] C07F *15/00, 17/02*

U.S. Cl. 556—23 **18 Claims**

1. A compound of formula I or Ia



(I)



(Ia)

or mixtures thereof, wherein the groups P-L-P are a ligand selected from the group consisting of diphosphine and diphosphinite, in which the secondary phosphine groups or phosphinite groups P are coupled via 2 to 4 C atoms, and which form a 5-, 6- or 7-membered ring with the Ir atoms, X, X^1, X^2, X^3, X^4, X^5 and X^6 independently of the others are Cl, Br or I, or X^1 and X^6 are H and X^2, X^3, X^4 and X^5 independently of the others are Cl, Br or I, or X^1 and X^5 are H and X^2, X^3, X^4 and X^6 independently of the others are Cl, Br or I, and $M^{\oplus}$ is an alkali metal cation or quaternary ammonium.

5,113,000

ORGANOSILICON COMPOUND AND ACRYL COMPOUND

Hisao Motegi; Takeshi Sunaga, and Michio Zembayashi, all of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Japan

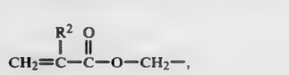
Filed Dec. 5, 1990, Ser. No. 622,663

Claims priority, application Japan, Dec. 13, 1989, 1-323390; Dec. 13, 1989, 1-323391; Dec. 18, 1989, 1-326156; Dec. 22, 1989, 1-331040

Int. Cl.[5] C07F *7/08, 7/10, 7/12*

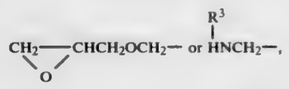
U.S. Cl. 556—413 **6 Claims**

1. An organosilicon compound represented by the general formula:



(1)

R^1 represents a substituted or non-substituted monovalent hydrocarbon group, X represents $ClCH_2$-,



Y represents a hydrolyzable group or a hydroxyl group, n represents a number of 1, 2 or 3, R^2 represents a hydrogen atom or a methyl group and R^3 represents a hydrogen atom or a substituted or non-substituted monovalent hydrocarbon group.

5,113,001

PROCESS FOR PREPARING SULFOPHENYLALKYLSILOXANES OR SULFONAPHTHYLALKYLSILOXANES

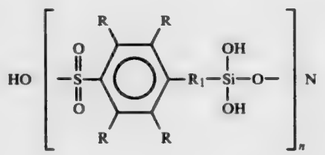
Michael C. Welch, Woodhaven; Rudolph E. Lisa, Grosse Ile, and Joe C. Wilson, Woodhaven, all of Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Aug. 8, 1991, Ser. No. 742,774

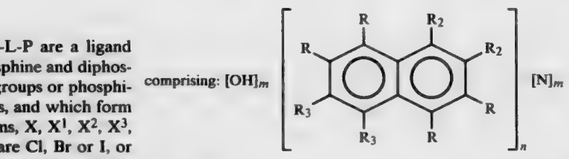
Int. Cl.[5] C07F *7/08*

U.S. Cl. 556—428 **15 Claims**

1. A process for preparing a sulfophenylalkylsiloxane or a sulfonaphthylalkylsiloxane having either of the following formulae:



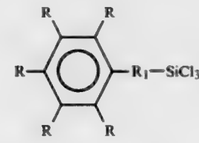
(I)



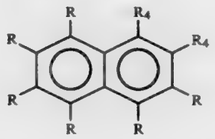
(II)

comprising: $[OH]_m$

(a) adding an essentially equimolar ratio of chlorosulfonic acid to a phenylalkyltrichlorosilane or a naphthylalkyltrichlorosilane having either of the following formulae:

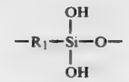


(III)

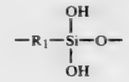


(IV)

wherein R of formulae I, II, III, and IV is individually hydrogen halogen, or an alkyl radical having 1 to 4 carbon atoms; R_1 is an alkylene radical having 2 to 5 carbon atoms; R_2 is R or



with he proviso that at least one R_2 be



R_3 is —H or



with the proviso that at least one R_3 be



R_4 is R or $—R_1SiCl_3$ with the proviso that at least one R_4 be $—R_1SiCl_3$ and

n is at least 1,

m is 1 or 2,

in the presence of thionyl chloride at a temperature of from about 0° to about 100° C.;

(b) reacting the reaction mixture at said temperature until the evolution of hydrogen chloride is substantially complete;

(c) removing the volatiles to form a liquid intermediate; and

(d) hydrolyzing said intermediate with water.

5,113,002

POLYSILANE COPOLYMERS AND METHOD FOR PREPARING SAME

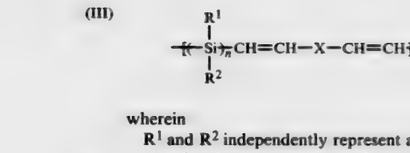
Yoshitaka Hamada, Annaka, Japan, and Robert West, Madison, Wis., assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1990, Ser. No. 629,630

Int. Cl.[5] C07F *7/08*

U.S. Cl. 556—431 **6 Claims**

1. A polysilane copolymer of the general formula:



(I)

wherein

R^1 and R^2 independently represent an alkyl group having 1 to 6 carbon atoms or an aryl group having 6 to 12 carbon atoms,

X represents an alkylene group having 1 to 6 carbon atoms, an arylene group having 6 to 12 carbon atoms or a silanylene group having 1 to 6 silicon atoms,

letter n is an integer of at least 1, and

m is an integer of at least 1.

5,113,003

SILICON-CONTAINING PHENOXY ETHERS, POLYMERS THEREOF, AND USE OF SUCH POLYMERS

John G. Woods, Farmington, Conn., and Pauline Coakley, County Kilkenny, Ireland, assignors to Loctite (Ireland) Limited, Dublin, Ireland

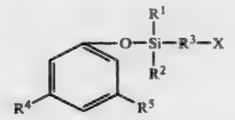
Filed Mar. 20, 1991, Ser. No. 672,221

Claims priority, application Ireland, Mar. 20, 1990, 1013/90

Int. Cl.[5] C07F *7/18*

U.S. Cl. 556—432 **6 Claims**

1. Compounds of the formula III:



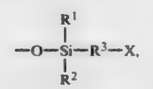
III

wherein

R^1 and R^2 which may be the same or different are selected from H, $—R^3—X$, aliphatic hydrocarbyl having 1–6 carbon atoms or aryl, or substituted derivatives thereof, provided that not more than one of R^1 and R^2 is H;

R^3 is a divalent C_1–C_{30} aliphatic and/or hydrocarbyl group which may optionally be substituted, or interrupted, by a hetero atom;

R^4 and R^5 which may be the same or different are H,



or an ortho para directing activating group for aromatic electrophilic substitution, other than an amine;

and X is a reactive functional group capable of undergoing an acid-catalysed electrophilic aromatic substitution reaction with a phenol.

5,113,004

ORGANOSILICON COMPOUNDS

Hideyoshi Yanagisawa, Gunma, and Masaaki Yamaya, Annaka, both of Japan, assignors to Shin-Etsu Chemical Company, Limited, Tokyo, Japan

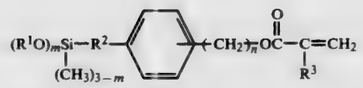
Filed Jun. 17, 1991, Ser. No. 716,449

Claims priority, application Japan, Jun. 18, 1990, 1-160487

Int. Cl.[5] C07F *7/08*

U.S. Cl. 556—440 **9 Claims**

1. Organosilicon compounds represented by the following general formula;



(wherein R^1 represents a monovalent hydrocarbon residue containing one or two carbon atoms, R^2 represents a divalent hydrocarbon residue containing two or three carbon atoms, R^3 represents a hydrogen atom or a methyl group, m represents an integer from 1 to 3, and n represents 0 or 1).

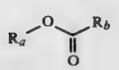
5,113,005

PROCESS FOR SYNTHESIS OF SILYL ALCOHOLS

Joseph E. Celebuski, Gurnee, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Jun. 7, 1991, Ser. No. 712,020
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—449 **18 Claims**

1. A process for synthesis of silyl alcohols, comprising:
a) hydrosilation of an vinylic ester of the formula



wherein R_a, is a straight or branched alkenyl group having from 2 to about 20 carbons and R_b is H or lower alkyl, with a silane of the formula



wherein R_5, R_6 and R_7 are independently selected from the group consisting of H, alkyl, aryl, substituted alkyl, substituted aryl, oxa and thia analogs of alkyl, aryl, substituted alkyl and substituted aryl, and halogen, in the presence of a metal catalyst capable of catalyzing the addition of H and a silyl group across the double bond of the alkenyl group to form a silyl substituted ester; and
b) hydrolyzing the silyl substituted ester to an alcohol in the presence of mild base.

5,113,006

ORGANOSILICON COMPOUNDS CONTAINING ALKENYL GROUPS, A PROCESS FOR PREPARING THE SAME, AND THE USE OF THESE ORGANOSILICON COMPOUNDS

Christian Herzig, Taching, Fed. Rep. of Germany, assignor to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

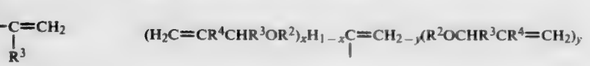
Filed Oct. 9, 1990, Ser. No. 594,791
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1989, 3935775
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—453 **11 Claims**

1. An organosilicon compound containing alkenyl groups comprising units of the average formula



(I)

wherein R is an identical or different monovalent, hydrocarbon radical having from 1 to 18 carbon atom(s) or a monovalent halogenated hydrocarbon radical having from 1 to 18 carbon atom(s) per radical, R^1 are identical or different alkyl radicals having 1 to 8 carbon atom(s) or an alkyl radical containing 1 to 8 carbon atoms containing an ether oxygen atom, and A is a radical of the formula



in which R^2 is an alkylene radical having 1 to 4 carbon atom(s); R^3 is a hydrogen atom or a methyl radical,; R^4 is a hydrogen atom, a methyl or ethyl radical; x is 0 or 1, y is 0 or 1, with the proviso that the sum x+y is 1 or 2; a is 0 or 1, with an average value of 0.003 to 1.0; b is 0, 1, 2 or 3, with an average value of 0.0 to 3.0; c is 0, 1, 2 or 3, with an average value of 0.0 to 3.0; and the sum $a+b+c \leqq 4$, with an average value of from 1.5 to 4, with the proviso that each molecule contains at least one radical A.

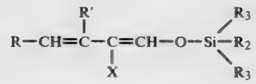
5,113,007

DIENOXYSILANES

Jean-Claude Combret, Rouen; Jean-Louis Klein, Mont Saint-Aignan, and Joël Le Gaillard, Rouen, all of France, assignors to Universite de Rouen, France

Filed Nov. 8, 1990, Ser. No. 610,827
Claims priority, application France, Nov. 9, 1989, 89 14882
Int. Cl.[5] C07F 7/08, 7/12, 7/10
U.S. Cl. 556—482 **10 Claims**

1. New dienoxysilanes having the general formula



in which R designates a hydrogen atom, or a linear alkyl radical containing 1 to 4 carbon atoms, R′ is a hydrogen atom or a methyl radical, each of R_1, R_2, R_3 designates an alkyl radical containing 1 to 4 carbon atoms or an aryl radical and X is a halogen atom, a dialkylamino radical each of the alkyl groups of which contains 1 to 4 carbon atoms, or a pyrrolidino, piperidino or morpholino radical, with the condition that R′ can be a methyl radical only when R is a hydrogen atom.

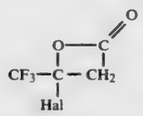
5,113,008

PROCESS FOR PRODUCING HEMIKETALS AND HEMITHIOKETALS

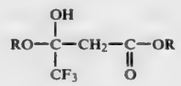
Mark J. Pozzo, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 22, 1991, Ser. No. 643,294
Int. Cl.[5] C07C 327/00, 69/66
U.S. Cl. 558—252 **18 Claims**

1. A process for producing a hemiketal comprising bringing into reactive contact an oxetan-2-one compound having the formula:

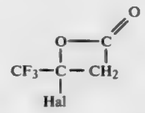


wherein Hal is a halogen with an alcohol to produce a hemiketal having the formula:

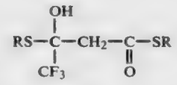


wherein R is a lower alkyl radical.

9. A process for producing a hemithioketal comprising bringing into reactive contact in the presence of a catalytic amount of a tertiary amine an oxetan-2-one compound having the formula:



wherein Hal is a halogen with a mercaptan to produce a hemithioketal having the formula:



wherein R is a lower alkyl radical.

5,113,009

PREPARATION AND ISOLATION OF MINERAL ACID SALT OF AN AMINO ACID METHYL ESTER

Masanobu Ajioka; Chojiro Higuchi; Takeshi Oura; Toshio Katoh, and Akihiro Yamaguchi, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated

Filed Dec. 26, 1989, Ser. No. 457,076
Claims priority, application Japan, Dec. 27, 1988, 63-327868
Int. Cl.[5] C07C 103/32, 101/02, 101/26, 101/30
U.S. Cl. 560—40 **13 Claims**

1. A cyclical process for producing and isolating in high purity and in high yield a mineral acid salt of an amino acid methyl ester from a reaction solution produced by esterifying an amino acid, in the presence of a mineral acid, with methanol in methanol with the total amount of methanol being 0.5–2 times the weight of the amino acid, which comprises the steps of:
(a) precipitating the esterified amino acid from the reaction solution obtained from the esterification reaction by cooling without additional of additional methanol;
(b) separating the precipitated crystals form the supernatant liquid at a water concentration in the supernatant of less than 20% by weight;
(c) removing methanol and water from the separated crystals, either by evaporation or washing with organic solvent; and
(d) recycling the supernatant liquid or only the solids in the supernatant liquid, after separation of the solids therefrom, for reuse in the esterification reaction.

5,113,010

PROCESS FOR SYNTHESIZING 4,4′-BIS(CARBOALKOXYSTILBENE) DERIVATIVES

Matthew E. Langer, New City, N.Y., and Ferial Khorshahi, Leonia, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

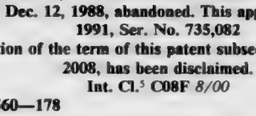
Filed Dec. 11, 1990, Ser. No. 626,086
Int. Cl.[5] C07C 67/343
U.S. Cl. 560—96 **8 Claims**

1. A process for the preparation of 4,4′-bis(carboalkoxystilbene) derivatives comprising
(a) reacting compound I



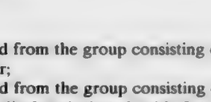
(I)

wherein X is halogen atom; and R is an alkyl group having 1–5 carbons;
in the presence of a first solvent compound selected from the group of solvents consisting of toluene, benzene, xylene, chloroform, tetrahydrofuran, dioxane, diethyl ether, diphenyl ether and mixtures thereof;
and in the presence of ϕ_3P;
to form compound II



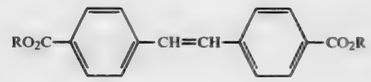
(II)

wherein X and R are defined as above;
(b) further reacting compound II with compound III



(III)

wherein R is defined as above in the presence of a base and a second solvent;
wherein said base is selected from the group of bases consisting of alkali metal alkoxides having 1 to 5 carbons, phenoxides, hydrides, alkylates, phenylates, amides and disilazides;
and wherein said second solvent is selected from the group consisting of ROH wherein R is a C_1–C_5 alkyl group, DMSO, DMF, DMAC, NMP, diethyl ether, dioxane, THF, hexane, benzene, toluene, xylene and mixtures thereof;
in order to form an aliphatic stilbene of formula IV



(IV)

wherein R is defined as above.

5,113,011

METHOD OF FUNCTIONALIZATION OF NUCLEOPHILES

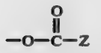
J. Stewart Witzeman, and W. Dell Nottingham, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 620,388, Nov. 30, 1990, Pat. No. 5,051,529, which is a continuation of Ser. No. 484,595, Feb. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 283,353, Dec. 12, 1988, abandoned. This application Jul. 24, 1991, Ser. No. 735,082
The portion of the term of this patent subsequent to Sep. 24, 2008, has been disclaimed.
Int. Cl.[5] C08F 8/00
U.S. Cl. 560—178 **2 Claims**

1. Method for the functionalization of nucleophiles having the structural formula:

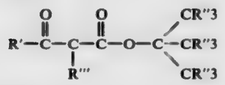


wherein
Y is selected from the group consisting of nitrogen, oxygen and sulfur;
R is selected from the group consisting of C_1 to C_{12} hydrocarbyl radicals substituted with 0 to 3 hydroxyl units, formyl, nitro, chlorine atoms, bromine atoms, ester moieties of the structure:



wherein Z is a hydrocarbyl moiety having 1 to 6 carbon atoms, and alkoxy moieties of the structure, —OZ, wherein Z is as defined above; and wherein R can also be H when Y is N; and

x is 1 when Y is O or S, and x is 2 when Y is N; said process comprising contacting said nucleophile with a compound having the structure

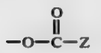


wherein

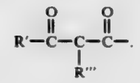
R′ is a C_1 to C_8 alkyl, aryl or halide substituted alkyl or aryl moiety,

each R″ is independently selected from H, a C_1 to C_8 alkyl moiety, or a halogen, and

R‴ is selected from H, C_1 to C_4 alkyl moieties, C_4 to C_{10} aromatic, heteroaromatic and substituted aromatic moieties, or halogens; wherein said contacting is carried out in the essential absence of a tetraalkyl titanate and at a temperature and for a time sufficient to produce the desired produce wherein at least one hydroxy, mercapto, amino or



moiety of said nucleophile has been transacylated by the acyl moiety



5,113,012

PROCESS FOR THE PRODUCTION OF 1,3-CYCLOPENTANEDIONE

Rudolf Fuchs, Sion, and John McGarrity, Visp, all of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

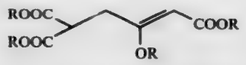
Division of Ser. No. 460,658, Jan. 3, 1990, Pat. No. 5,087,760. This application Aug. 26, 1991, Ser. No. 749,984

Claims priority, application Switzerland, Jan. 6, 1989, 00041/89

Int. Cl.[5] **C07C** *69/73*

U.S. Cl. 560—181 **4 Claims**

1. 5,5-bis-(alkoxycarbonyl)-3-alkoxy-2E-pentenoic acid ester of the formula:



wherein R is the same or different and are alkyl having 1 to 4 C atoms.

5,113,013

PROCESS FOR PREPARING FLUORINE-CONTAINING ORGANIC COMPOUNDS

Richard L. Powell, and Charles A. Heaton, both of Cheshire, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 26, 1990, Ser. No. 515,509

Claims priority, application United Kingdom, Apr. 26, 1989, 8909574

Int. Cl.[5] **C07C** *63/04*

U.S. Cl. 562—493 **5 Claims**

1. A method for the preparation of a fluorine-containing organic compound which comprises reacting

(a) a sulphonyl halide of the formula Rf SO_2X wherein Rf represents a perfluoroalkyl group or a perfluoroaryl group or a group of the formula QCF_2 where Q is an alkyl radical optionally containing one or more fluorine atoms and X is a halogen atom with

(b) a reactive organic halide which is an activated aromatic halide containing at least one halogen atom and at least one electron withdrawing group

in the presence of a metal known to complex with fluorinated organic radicals selected from the group consisting of cadmium, zinc, mercury, silver and copper.

5,113,014

PROCESSES FOR PREPARING PROSTAGLANDINS

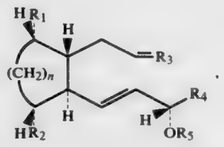
Samuel J. Danishefsky; Ken H. Chow, and Carmen M. P. C. Naves, all of New Haven, Conn., assignors to Yale University, New Haven, Conn.

Filed Dec. 13, 1989, Ser. No. 450,099

Int. Cl.[5] **C07C** *177/00*

U.S. Cl. 562—503 **35 Claims**

1. A process for the preparation of a prosstaglandin of the formula



wherein n is 1, 2, 3 or 4,

R_1 and R_2, independently of each other are alkyl having 1 to 10 carbon atoms, OH, alkoxy having 1 to 10 carbon atoms, a ketone having 2 to 10 carbon atoms, a halogen, hydrogen, nitro, an amino or an ether having up to 10 carbon atoms,

R_3 is hydrogen, alkyl having 1 to 10 carbon atoms, haloalkyl having 1 to 10 carbon atoms or carboxyalkyl having 1 to 10 carbon atoms in the alkyl moiety.

R_4 is hydrogen, alkyl having 1 to 10 carbon atoms or haloalkyl having 1 to 10 carbon atoms,

R_5 is hydrogen, alkyl having 1 to 10 carbon atoms or haloalkyl having 1 to 10 carbon atoms, comprising

(a) reacting an S-enone of the formula



in the presence of a Lewis acid, wherein n is 1, 2, 3 or 4,

R_6, R_7 and R_8 combined having up to 16 carbon atoms, R_6, R_7 and R_8, independently of each other, are alkyl having 1 to 6 carbon atoms or wherein a combination of any two or three of R_6, R_7 and R_8 form an aryl having 6 to 10 carbon atoms or a cycloalkyl having 3 to 10 carbon atoms, R_9, R_{10} and R_{11} combined having up to 16 carbon atoms, R_9, R_{10} and R_{11}, independently of each other are alkyl having 1 to 6 carbon atoms or wherein a combination of any two or three of R_9, R_{10} and R_{11} form an aryl having 6 to 10 carbon atoms or a cycloalkyl having 3 to 10 carbon atoms, R_{12} is hydrogen or an alkyl having 1 to 10 carbon atoms, (b) reacting the compound produced from (a) with an α,β-unsaturated aldehyde of the formula

wherein R_{13} is an alkyl having 1 to 10 carbon atoms or an aryl having 6 to 10 carbon atoms in the presence of $TiCl_4$,

(c) acetylating the compound produced from (b),

(d) subjecting the compound produced from (c) to allylic transportation by reaction with Pd $(MeCN_2)Cl_2$,

(e) reducing the compound produced from (d),

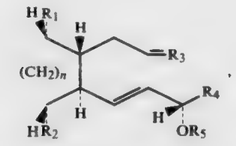
(f) acetylating the compound produced from (e),

(g) subjecting the compound produced from (f) to a cleaving of $OSiR_6R_7R_8$ and a lactonization,

(h) subjecting the compound produced from (g) to a deacylation and

(i) reacting the compound produced from (h) with a Wittig reagent.

12. A process for the preparation of a prostaglandin of the formula



wherein n is 1, 2, 3 or 4,

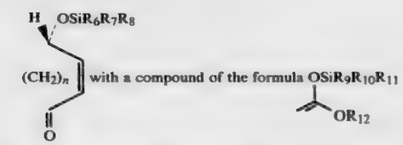
R_1 and R_2, independently of each other, are alkyl having 1 to 10 carbon atoms, OH, alkoxy having 1 to 10 carbon atoms, a ketone having 2 to 10 carbon atoms, a halogen, hydrogen, nitro, an amino or an ether having up to 10 carbon atoms,

R_3 is hydrogen, alkyl having 1 to 10 carbon atoms, haloalkyl having 1 to 10 carbon atoms or carboxyalkyl having 1 to 10 carbon atoms in the alkyl moiety,

R_4 is hydrogen, alkyl having 1 to 10 carbon atoms or haloalkyl having 1 to 10 carbon atoms,

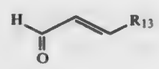
R_5 is hydrogen, alkyl having 1 to 10 carbon atoms or haloalkyl having 1 to 10 carbon atoms, comprising

(a) reacting an S-enone of the formula



in the presence of a Lewis acid, wherein n is 1, 2, 3 or 4,

R_6, R_7 and R_8 combined having up to 16 carbon atoms, R_6, R_7 and R_8, independently of each other, are alkyl having 1 to 6 carbon atoms or wherein a combination of any two or three of R_6, R_7 and R_8 form an aryl having 6 to 10 carbon atoms or a cycloalkyl having 3 to 10 carbon atoms, R_9, R_{10} and R_{11} combined having up to 16 carbon atoms, R_9, R_{10} and R_{11}, independently of each other are alkyl having 1 to 6 carbon atoms or wherein a combination of any two or three of R_9, R_{10} and R_{11} form an aryl having 6 to 10 carbon atoms or a cycloalkyl having 3 to 10 carbon atoms, R_{12} is hydrogen or an alkyl having 1 to 10 carbon atoms, (b) reacting the compound produced from (a) with an α,β-unsaturated aldehyde of the formula



wherein R_{13} is an alkyl having 1 to 10 carbon atoms or an aryl having 6 to 10 carbon atoms in the presence of $TiCl_4$,

(c) desilylating the compound produced from (b),

(d) acetylating the compound produced from (c),

(e) subjecting the compound produced from (d) to allylic transposition by reaction with Pd $(MeCN_2)Cl_2$,

(f) reducing the compound produced from (e),

(g) protecting the compound produced from (f) with a tetrahydropyranyl protecting group,

(h) reacting the compound produced from (g) to desilylation and lactonization,

(i) deacylating the compound produced from (h),

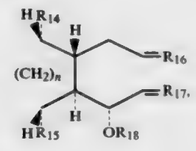
(j) subjecting the compound produced from (i) to a Mitsunobu reaction,

(k) deacylating the compound produced from (j),

(l) reacting the compound produced from (k) with a Wittig reagent and

(m) reacting the compound produced from (l) with a weak aqueous, organic acid, pyridinium p-toluenesulfonate or toluenesulfonic acid.

23. A process for the preparation of a prostaglandin of the formula



wherein n is 1, 2, 3 or 4,

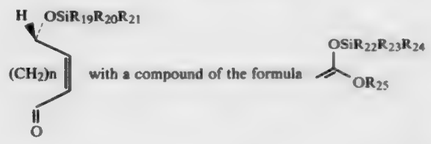
R_{14} and R_{15}, independently of each other, are alkyl having 1 to 10 carbon atoms, OH, alkoxy having 1 to 10 carbon atoms, a ketone having 2 to 10 carbon atoms, a halogen, hydrogen, nitro, an amino or an ether having up to 10 carbon atoms,

R_{16} is hydrogen, alkyl having 1 to 10 carbon atoms, haloalkyl having 1 to 10 carbon atoms or carboxyalkyl having 1 to 10 carbon atoms in the alkyl moiety,

R_{17} is hydrogen, alkyl having 1 to 10 carbon atoms or haloalkyl having 1 to 10 carbon atoms,

R_{18} is hydrogen, alkyl having 1 to 10 carbon atoms or haloalkyl having 1 to 10 carbon atoms, comprising

(a) reacting an S-enone of the formula



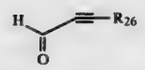
in the presence of a Lewis acid, wherein n is 1, 2, 3 or 4,

R_{19}, R_{20} and R_{21} combined having up to 16 carbon atoms, R_{19}, R_{20} and R_{21}, independently of each other, are alkyl having 1 to 6 carbon atoms or wherein a combination of any two or three of R_{19}, R_{20} and R_{21} form an aryl having 6 to 10 carbon atoms or a cycloalkyl having 3 to 10 carbon atoms,

R_{22}, R_{23} and R_{24} combined having up to 16 carbon atoms, R_{22}, R_{23} and R_{24}, independently of each other, are alkyl having 1 to 6 carbon atoms or wherein a combination of any two or three of R_{22}, R_{23} and R_{24} form an aryl having 6 to 10 carbon atoms or a cycloalkyl having 3 to 10 carbon atoms,

R_{25} is hydrogen or an alkyl having 1 to 10 carbon atoms,

(b) reacting the compound produced from (a) with a compound of the formula



wherein R_{26} is an alkyl having 1 to 10 carbon atoms in the presence of $TiCl_4$,

(c) hydrogenating the compound produced from (b) with hydrogen and a hydrogenation catalyst,

(d) acetylating the compound produced from (c),

(e) reducing the compound produced from (d),

(f) acetylating the compound produced from (e),

(g) subjecting the compound produced from (f) to cleavage of $OsiR_{19}R_{20}R_{21}$ and a lactonization,

(h) reductively deacetylating the compound produced from (g), and

(i) reacting the produced from (h) with a Wittig reactant.

5,113,015

RECOVERY OF ACETIC ACID FROM METHYL ACETATE

David A. Palmer, Naperville; Keith D. Larson, Chicago, and Kristi A. Fjare, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 20, 1990, Ser. No. 616,213

Int. Cl.[5] C07C *51/42, 51/215, 51/265*

U.S. Cl. 562—608 **40 Claims**

1. A process for recovering acetic acid from methyl acetate, by hydrolyzing said methyl acetate to acetic acid and methanol and simultaneously separating said acetic acid and said methanol, which process comprises contacting counter-currently in a separation column a stream comprising methyl acetate with water in the presence of a catalyst-packing material comprising a hydrolysis catalyst to produce less volatile acetic acid and more volatile methanol, separating said acetic acid from said methanol in said separation column by said volatility, said acetic acid being withdrawn from said separation column as a bottoms stream, said methanol being carried up and out of said separation column, said contacting and said separating being carried out coextensively in said column, and recovering said acetic acid.

5,113,016

MANUFACTURE OF PHTHALOYL CHLORIDES

Robert L. Seagraves, Pennsville, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 80,501, Jul. 31, 1987, abandoned. This application Aug. 20, 1990, Ser. No. 570,311

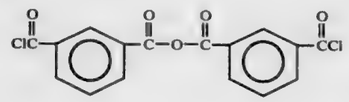
Int. Cl.[5] C07C *51/60, 51/083*

U.S. Cl. 562—856 **24 Claims**

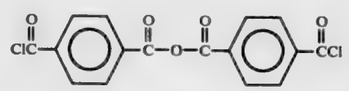
1. A process for preparing phthaloyl chlorides having reduced content of formylbenzoyl chlorides and dichlorotoluoyl chlorides which comprises

(a) reacting to less than completion terephthalic acid or isophthalic acid in excess of the stoichiometric amount with phosgene/dimethylformamide complex at a temperature in the range between about 80° and about 120° C. to form, respectively, terephthaloyl chloride or isophthaloyl chloride;

(b) in the presence of terephthaloyl chloride or isophthaloyl-chloride and at a temperature in the rand between about 180° and about 240° C., oxidizing by-product 4-formylbenzoyl chloride or 3-formylbenzoyl chloride to an anhydride which can be represented, respectively, by the formula:



or



and (c) recovering as a final product terephthaloyl chloride or isophthaloyl chloride containing respectively less than about 100 pppm of either (i) 4-formylbenzoyl chloride, 3-formylbenzoyl chloride, alpha,alpha-dichloro-4-toluoyl chloride, or alpha,alpha-dichloro-3-toluoyl chloride, or (ii) a mixture of 4-formylbenzoyl chloride and alpha,alpha-dichloro-4-toluoyl chloride, or (iii) a mixture of 3-formylbenzoyl chloride and alpha,alpha-dichloro-3-toluoyl chloride.

5,113,017

PROCESS FOR TREATING TERTIARY AMINES

Kim R. Smith; James E. Borland, and Joe D. Sauer, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 18, 1991, Ser. No. 670,724

Int. Cl.[5] C07C *209/90*

U.S. Cl. 564—2 **10 Claims**

1. A process for treating a tert-amine that contains an acid-activated color body precursor so as to prevent pink coloration of the tert-amine or a derivative thereof when exposed to acidic conditions, which process comprises contacting the tert-amine with an inorganic sulfite selected from alkali metal sulfites and bisulfites at a temperature above 100° C.

5,113,018

METHOD OF PRODUCING N-ALKYLAMINOPHENOLS

Yoshito Kurano, Yamaguchi; Masato Kawamura, Osaka; Masahiro Kondo, Yamaguchi; Michio Tanaka, Yamaguchi, and Sanehiro Yamamoto, Yamaguchi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jun. 15, 1990, Ser. No. 538,719

Claims priority, application Japan, Jun. 16, 1989, 1-153899; Jun. 16, 1989, 10-153900

Int. Cl.[5] C07C *209/18*

U.S. Cl. 564—403 **14 Claims**

1. In the production of an N-alkylaminophenol by the reaction of a divalent phenol with an alkylamine to provide a reaction mixture and recovering the N-alkylaminophenol from the reaction mixture, the improvement comprising:

(a) adding an aqueous solution of an acid to the reaction mixture in a molar ratio of the acid to the N-alkylaminophenol of 0.5 to 2 to provide a two-phase mixture composed of an aqueous phase which contains a water soluble acid salt of the resultant N-alkylaminophenol and an organic phase which contains an unreacted divalent phenol;

(b) separating the unreacted divalent phenol as an organic solution by extraction of the two-phase mixture with an organic solvent, to leave an aqueous solution;

(c) neutralizing the water soluble acid salt of N-alkylaminophenol in the aqueous solution with an aqueous solution of an alkali to provide an oily phase of N-alkylaminophenol; and

(d) separating the oily phase and distilling it to recover the N-alkylaminophenol.

5,113,019

PROCESS FOR PHENOL ALKYLTHIOLATION AND ITS APPLICATION TO THE SYNTHESIS OF 4-ACYL-2-ALKYLTHIOPHENOLS

Catherine Vottero, Provins; Yves Labat, Pau, and Jean-Marie Poirier, Saint-Martin Du Vivier, all of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Continuation of Ser. No. 281,023, Dec. 7, 1988, abandoned. This application Nov. 5, 1990, Ser. No. 607,224

Claims priority, application France, Nov. 27, 1987, 87 16508; Nov. 27, 1987, 87 16509

Int. Cl.[5] C07C *319/12, 45/41*

U.S. Cl. 568—42 **5 Claims**

1. Process for the preparation of 4-acyl-2-alkylthiophenols, comprising reacting a 2-alkylthiophenol at a temperature ranging from 40° to 100° C. with a complex BF_3:2RCOOH in which R denotes a linear alkyl radical containing from 1 to 12 carbon atoms or a 1-propenyl radical, in a proportion of 10 to 15 moles of complex per mole of 2-alkylthiophenol.

5,113,020

PROCESS FOR PRODUCING P-HALOGENOBENZOPHENONE DERIVATIVES

Kazuhiko Sunagawa, and Nobuyuki Kusano, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

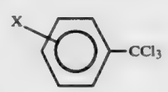
Filed Aug. 28, 1991, Ser. No. 751,000

Claims priority, application Japan, Sep. 6, 1990, 2-234347; Apr. 12, 1991, 3-106486

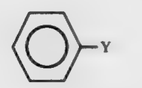
Int. Cl.[5] C07C *45/43*

U.S. Cl. 568—323 **3 Claims**

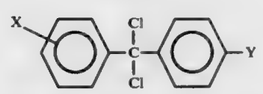
1. A process for producing a p-halogenobenzophenone derivative characterized by reacting an (un)substituted benzotrichloride of the following formula (I) with a halogenobenzene of the following formula (II) in the presence of a catalyst selected from the group consisting of alumina, nickel sulfate, zirconium oxide, amorphous silica/alumina and a mixture of two or more of them or a catalyst obtained by treating these compounds with an acid and hydrolyzing the resulting bisphenyldichloromethane of the following formula (III):



(I)



(II)



(III)

wherein X represents a halogen atom or a hydrogen atom and Y represents a halogen atom.

5,113,021

PROCESS FOR THE MANUFACTURE OF A MIXTURE OF α- AND β-IRONE

Georg Fráter, Uster, and Daniel Helmlinger, Gockhausen, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Sep. 6, 1990, Ser. No. 578,371

Claims priority, application Switzerland, Sep. 21, 1989, 3430/89

Int. Cl.[5] C07C *45/67*

U.S. Cl. 568—341 **10 Claims**

1. A process for the manufacture of 4-(2,5,6,6-tetramethyl-2-cyclohexen-1-yl)-3-buten-2-one and 4-(2,5,6,6-tetramethyl-1-cyclohexen-1-yl-3-buten-2-one which process comprises isomerizing 8-(2',2'-dimethylcyclopropyl)-6-methyl-4,5-octadien-2-one in the presence of a base or an acid to form 8-(2',2'-dimethylcyclopropyl)-6-methyl-3,5-octadien-2-one and cyclizing said 8-(2',2'-dimethylcyclopropyl)-6-methyl-3,5-ocatadien-2-one.

5,113,022

IONIC PHOSPHITES USED IN HOMOGENEOUS TRANSITION METAL CATALYZED PROCESSES

Anthony G. Abatjoglou, Charleston, and David R. Bryant, South Charleston, both of W. Va., assignors to Union Carbice Chemicals & Plastics Technology Corporation, Danbury, Conn.

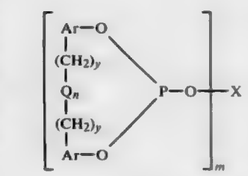
Continuation of Ser. No. 228,507, Aug. 5, 1988, Pat. No. 5,059,710. This application Aug. 8, 1991, Ser. No. 742,012

Int. Cl.[5] C07F *9/141*

U.S. Cl. 568—454 **14 Claims**

2. In a non-aqueous hydroformylation process for producing aldehydes which comprises reacting an olefinically unsaturated organic compound with carbon monoxide and hydrogen, in a non-aqueous hydroformylation reaction medium containing an organic solubilized Group VIII transition metal-phosphorus ligand complex catalyst and free phosphorus ligand, the improvement comprising employing as the phosphorus ligand of said complex catalyst and as said free phosphorus ligand, a low-volatile, organic solubilized ionic phosphite ligand selected from the group consisting of

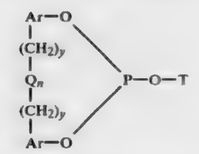
(i) poly-phosphites having the formula



(I)

wherein each Ar group represents an identical or different aryl radical; wherein X represents a m-valent hydrocarbon radical selected from the group consisting of alkylene, alkylene-oxy-alkylene, aryl, and aryl-$(CH_2)y$—$(Q-)_n$—$(CH_2)_y$-aryl; wherein each y individually has a value of 0 or 1; wherein each Q individually represents a divalent bridging group selected from the class consisting of $—CR^1R^2—$, —O—, —S—, NR^3, $—SiR^4R^5$, and —CO—, wherein R^1 and R^2 each individually represents a radical selected from the group consisting of hydrogen, alkyl of 1 to 12 carbon atoms, phenyl, tolyl and anisyl, wherein R^3, R^4, and R^5 each individually represents —H or $—CH_3$; wherein each n individually has a value of 0 to 1; wherein m has a value of 2 to 6; and wherein the poly-phosphites of formula (I) contain at least one ionic moiety selected from the group consisting of salts of carboxylic acid and of sulfonic acid substituted on an aryl moiety of Ar or X;

(ii) diorganophosphites having the formula

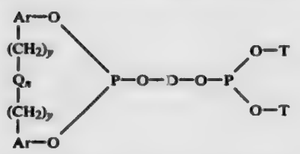


(II)

wherein T represents a monovalent hydrocarbon radical; wherein Ar, Q, n and y are as defined above; and wherein the diorganophosphites of formula (II) contain at least one ionic moiety selected from the group consisting of salts of

carboxylic acid and of sulfonic acid, substituted on any aryl moiety of Ar or T; and

(iii) open-ended bis-phosphites having the formula



(III)

wherein D represents a divalent bridging group selected from the group consisting of alkylene, aryl, and aryl-$(CH_2)_y$—Q_n—$(CH_2)_y$-aryl; wherein Ar, Q, n, y, and T are as defined above and each T may be identical or different; and wherein the bisphosphites of formula (III) contain at least one ionic moiety selected from the group consisting of salts of carboxylic acid and of sulfonic acid substituted on an aryl moiety of Ar, D or T; and

wherein said salts contain that number of cations needed to balance the charge of the acid anions substituted onto the phosphite ligand, said cations being selected from the group consisting of alkali metals, alkaline earth metals, and quaternary ammonium cations.

5,113,023

REMOVAL OF LINEAR INTERNAL OLEFINS FROM STEAM ACTIVE DEHYDROGENATION RECYCLE STREAM

Richard L. Anderson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 16, 1990, Ser. No. 552,868
Int. Cl.[5] C07C *41/06*
U.S. Cl. 568—697 **16 Claims**

1. In a process for dehydrogenating a stream which comprises a major amount of isobutane and a minor amount of n-butane to yield an effluent which consist essentially of isobutylene, unreacted isobutane, butene-1, butene-2, n-butane and butadiene, then reacting the effluent product of the dehydrogenation with a C_1–C_3 lower alkanol to consume isobutylene and yield as an effluent, a mixture which comprises unreacted isobutane, butene-1, butene-2, butadiene and an alkyltertiarybutyl ether, the improvement which comprises:

separating the alkyltertiarybutyl ether from the reminder of the last-mentioned effluent mixture;

hydroisomerizing said remainder of the last-mentioned effluent mixture to convert butadiene therein to linear monounsaturated butenes and n-butane, and to isomerize the butene-1 in said remainder of the last-mentioned effluent mixture to butene-2 and n-butane; then

fractionating the hydroisomerized remainder of the last-mentioned effluent mixture to separate butene-2 and n-butane from relatively lower boiling components, including isobutane, in an overhead stream; and

recycling at least a major portion of the separated overhead stream, including isobutane, to dehydrogenation.

5,113,024

PROCESS FOR PRODUCT SEPARATION IN THE PRODUCTION OF DI-ISOPROPYL ETHER

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

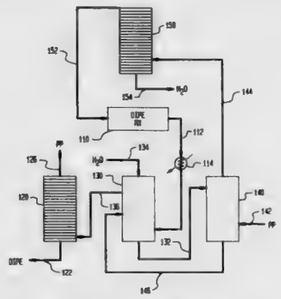
Filed Jun. 7, 1991, Ser. No. 711,768
Int. Cl.[5] C07C *41/05, 41/38*
U.S. Cl. 568—697 **14 Claims**

1. A process for the production of diisopropyl ether comprising;

(a) contacting a feedstream comprising C_3 hydrocarbons rich in propene, isopropanol and water with acidic olefin hydration and etherification catalyst under etherification conditions at elevated pressure in an etherification zone to produce an effluent stream containing diisopropyl ether, isopropanol, unreacted water, unreacted C_3 hydrocarbons and higher olefinic hydrocarbons;

(b) extracting said effluent stream with water in a first extraction zone to produce a first organic phase comprising diisopropyl ether and unreacted C_3 hydrocarbons and a first aqueous phase comprising isopropanol and water;

(c) extracting said first aqueous phase with fresh C_3 hydrocarbon feedstock rich in propene in a second extraction



zone to produce a second aqueous phase containing a minor portion of said first aqueous phase isopropanol and second extraction organic phase comprising a major portion of said isopropanol, said fresh C_3 hydrocarbons and water;

(d) recycling said second aqueous phase to said first extraction zone;

(e) distilling said second extraction organic phase in a fractionator to provide a bottom stream comprising water and an overhead stream comprising step (a) feedstream.

5,113,025

SELECTIVE REDUCING AGENTS

Won S. Park, and Everett M. Marlett, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 416,148, Oct. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 337,085, Apr. 12, 1989, abandoned. This application Mar. 5, 1991, Ser. No. 664,637
Int. Cl.[5] C07C *29/136, 29/159, 209/048*
U.S. Cl. 568—814 **15 Claims**

1. In a process for preparing alcohols or amines by selective reduction which process comprises reacting a reducible compound that is an aliphatic monocarboxylic acid having the aliphatic group selected from the group consisting essentially of alkyl, cycloalkyl, haloalkyl, hydroxyalkyl, alkoxyalkyl, alkylthioalkyl, phenylalkyl, naphthylalkyl, substituted phenylalkyl, substituted naphthylalkyl, heteroarylalkyl, substituted heteroarylalkyl and cycloalkylalkyl;

aromatic monocarboxylic acid having the carbon atom of the carboxylic acid group attached to an aromatic group selected from the group consisting essentially of phenyl, naphthyl, substituted phenyl, substituted naphthyl, heteroaryl, and substituted heteroaryl;

the aliphatic esters of said aliphatic or aromatic monocarboxylic acid, the ester group selected from the group consisting essentially of alkyl, cycloalkyl, haloalkyl, hydroxyalkyl, alkoxyalkyl, alkylthioalkyl, phenylalkyl, naphthylalkyl, substituted phenylalkyl, substituted naphthylalkyl, heteroarylalkyl, substituted heteroarylalkyl and cycloalkylalkyl;

the aromatic esters of said aliphatic or aromatic monocarboxylic acid, the ester group selected from the group consisting essentially of phenyl, naphthyl, substituted phenyl, substituted naphthyl, heteroaryl esters;

a compound where the carboxylic acid group of said aliphatic monocarboxylic acid or said aromatic monocarboxylic acid is replaced with a functional group selected from the group consisting essentially of acid chloride, amide, aldehyde, nitrile, β-lactone, γ-lactone, symmetrical epoxide, unsymmetrical epoxide and ketone wherein the other valency of said ketone is an aliphatic group or an aromatic group as previously defined;

an aliphatic monocarboxylic acid salt selected from the group consisting essentially of the metallic salts, salts with organic bases and salts with amino acids;

or an aromatic monocarboxylic acid salt, said salt selected from the group consisting essentially of the metallic salt, salt with an organic base and salt with an amino acid said reducible compound also containing at least one other reducible functional group or functionality selected from the group consisting essentially of halide, nitro and double bond, the improvement comprising treating said reducible compound with a tertiary amine alane having from 3 to about 8 carbon atoms.

5,113,026

PROCESS FOR PREPARATION OF SUBSTANTIALLY FLUORINATED ALKYL BROMIDES

Klaus Raab, Burgkirchen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 11, 1991, Ser. No. 713,962
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1990, 4018913
The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.
Int. Cl.[5] C07C *17/20*
U.S. Cl. 570—170 **8 Claims**

1. A process of the preparation of substantially fluorinated alkyl bromides from compounds of the formula

$$X—(CF_2)_n—I \quad (I)$$

in which X is H, F, Cl, Br, I or $(CF_3)_2CF$— and n is 2 to 16, which comprises reacting, with good mixing, 1 mole of bound iodine atom in the compound of the formula (I) with 1 to 6 mol of bromide ions which are present in the form of at least one anhydrous salt selected from the group composed of: bromides of metals of groups I a, I b, II a or II b or the periodic table of the elements, $CsBr_3$, $MnBr_2$, $FeBr_2$, $FeBr_3$, $CoBr_2$, $NiBr_2$, $SnBr_2$, $PbBr_2$, TlBr, IrBr, $IrBr_2$, $PtBr_2$ or $PtBr_4$, at 80° to 450° under atmospheric pressure or the autogenous pressure of the reaction mixture so that the iodine in the compound of formula (I) is replaced partly by bromine.

5,113,027

OXYCHLORINATION PROCESS USING A CATALYST WHICH COMPRISES COPPER CHLORIDE SUPPORTED ON RARE-EARTH MODIFIED ALUMINA

Eric L. Mainz, Colwich; William Q. Beard, Jr.; Robert P. Hirschmann, both of Wichita, all of Kans.; Barry M. Little, Castlewood, S. Dak., and Earl B. Smith, Newton, Kans., assignors to Vulcan Materials Company, Wichita, Kans.

Continuation-in-part of Ser. No. 451,303, Dec. 15, 1989. This application Jun. 5, 1990, Ser. No. 533,513
Int. Cl.[5] C07C *17/152, 17/151*
U.S. Cl. 570—224 **6 Claims**

1. In a process for the production of at least one chlorinated hydrocarbon product selected from the group consisting of trichloroethylene and perchloroethylene by catalytic oxychlorination of a feedstock comprising a C_2 Hydrocarbon containing at least one less chlorine atom than the desired product, the catalytic oxychlorination being conducted in contact with a fluidized bed of particles of a copper chloride-containing catalyst composition in a reaction zone maintained at a temperature between 250° and 470° C. and at a pressure between 1 and 10 atmospheres, the improvement which comprises using as the catalyst a composition comprising copper chloride and alkali metal chloride deposited in catalytically active amounts on microspheroidal particles of a support which has a surface area in excess of 20 and less than 100 m^2/g and comprises at least 90% alumina having from 0.2 to 10% of a Lanthanide Oxide selected from the group consisting of the oxides of lanthanum, enodymium, praseodymium and yttrium and mixtures comprising at least two of said Lanthanide oxides, intrinsically incorporated therein by heat treatment of the alumina at a temperature of at least 800° C. and up to 1500° C. after incorporation of a salt of the Lanthanide in the alumina.

5,113,028

PROCESS FOR MIXING ETHANE AND CHLORINE GASES

Hang-Chang B. Chen, 138 Daven Dr., Getzville, N.Y. 14068, and Gerald F. Achee, 5775 Glenwood Dr., Baton Rouge, La. 70806

Filed Aug. 1, 1991, Ser. No. 739,042
Int. Cl.[5] C07C *17/00*
U.S. Cl. 570—255 **19 Claims**

1. A process for mixing hot ethane with chlorine which comprises the steps of

A. conducting hot ethane at a velocity less than the speed of sound, such that the Reynolds number for said ethane stream is at least 10,000, to a mixer that consists essentially of a main pipe of substantially circular cross section through which said hot ethane flows, pierced by four or more evenly spaced jets, through which said chlorine flows into said main pipe, said jets being directed in a manner such that the angle between the axis of each jet and a line from the center point of the main pipe to the point where the axis of each jet makes contact with the inside surface of the main pipe is between about 30° and about 45°, and the axis of each jet is substantially perpendicular to the axis of said main pipe;

B. introducing said chlorine gas into said mixer through said jets at a velocity less than the speed of sound, such that the Reynolds number of said chlorine gas is at least 10,000;

C. allowing said chlorine and ethane gases to flow through a smooth conduit of the same diameter as said main pipe, with a length at least 10 times the diameter of said main pipe, at a velocity less than the speed of sound, provided that said ratio of said main pipe diameter to said jet diameter is about 21:1 to 8:1, and further provided that the ratio of said chlorine velocity to said ethane velocity is approximately 1.5:1 to 3.5:1.

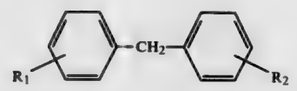
5,113,029

ELECTRIC INSULATING OIL COMPOSITION

Atsushi Sato, Tokyo; Shigenobu Kawakami, Ichikawa; Keiji Endo, Yokosuka, and Hideyuki Dohi, Yokohama, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Sep. 4, 1987, Ser. No. 93,793
Claims priority, application Japan, Sep. 4, 1986, 61-208542
Int. Cl.[5] H01B 3/24
U.S. Cl. 585—6.3 4 Claims

1. An oil-filled electrical capacitor which is impregnated with an electrical insulating oil composition having improved low temperature characteristics with a composition comprising a mixture of 40% by weight or more of benzyltoluene and the remainder of alkyl substituted diphenylmethane having 15 to 17 carbon atoms which is represented by the following general formula:



wherein R_1 and R_2 are hydrogen or C_1 to C_4 alkyl groups and the total number of carbon atoms in R_1 and R_2 is 2 to 4, with the proviso that R_1 and R_2 may not simultaneously be methyl groups; and the proportion of the total quantity of solid phase calculated according to the following general solid-liquid equilibrium equation is 45% by weight or less relative to the total quantity of said composition at −40° C:

$$X_i = \exp\left[\frac{\Delta Hf}{R}\left(\frac{1}{Tf} - \frac{1}{T}\right)\right]$$

wherein X_i is the equilibrium mole fraction of a component i in the liquid phase of said composition,

ΔHf is the heat of fusion cal.mol^{-1}) of said component i as a pure substance,

Tf is the melting point (K) of said component i as a pure substance,

T is the temperature (K) of the system, and

R is the gas constant (cal.mol^{-1}.K^{-1}).

5,113,030

HIGH VISCOSITY INDEX LUBRICANT COMPOSITIONS

Catherine S. H. Chen, Berkeley Heights, and Margaret M. Wu, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 480,709, Feb. 15, 1990, Pat. No. 4,962,249, which is a continuation-in-part of Ser. No. 210,436, Jun. 23, 1988, Pat. No. 4,990,711. This application Aug. 22, 1990, Ser. No. 570,745
Int. Cl.[5] C07C 2/08, 9/22
U.S. Cl. 585—10 2 Claims

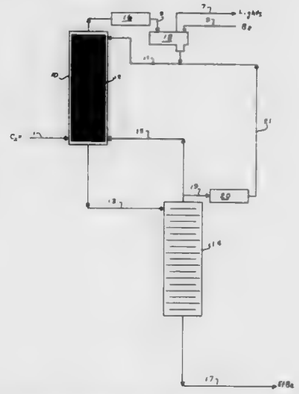
1. A hydrocarbon lubricant fluid composition having viscosity index made by the steps comprising; contacting a mixture comprising slightly branched and linear C_9–C_{18} alpha olefins under oligomerization conditions with CO reduced chromium catalyst on silica support; wherein said alpha olefins comprise the olefin metathesis reaction product of slightly branched higher olefinic hydrocarbons wherein said olefinic hydrocarbons comprise C_{11}+ hydrocarbons having about 1–2 methyl branches per 12 carbon atoms with the C_2–C_4 1-alkenes in contact with metathesis catalyst, and said higher olefinic hydrocarbons comprise the oligomerization product of lower alkene oligomerized in contact with surface deactivated, acidic, medium pore, shape selective metallosilicate catalyst under oligomerization conditions; and separating the higher alpha olefins oligomerization reaction product to provide said lubricant having a branch index above 0.20, a viscosity index greater than 130 and a pour point less than −15° C.

5,113,031

AROMATIC ALKYLATION PROCESS

Angel Sy, 1510 Mission Spring Dr., Katy, Tex. 77450

Filed Nov. 9, 1990, Ser. No. 611,104
The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.
Int. Cl.[5] C07C 2/68
U.S. Cl. 585—467 2 Claims



1. In a catalytic distillation process for the alkylation of organic aromatic compounds with olefins over a particulate acidic catalytic distillation structure comprising the steps of feeding a stream containing olefins and a stream containing organic aromatic compounds to a distillation column reactor and concurrently reacting the olefins and organic aromatic compounds and separating the resulting reaction product by fractional distillation, the improvement comprising the increasing the olefin partial pressure through out the catalyst bed while maintaining a constant olefin feed rate and maintaining a constant aromatic compound to olefin ratio, wherein the effective olefin partial pressure is increased by dividing the olefin feed into at least two separate streams and feeding said separate streams at different locations along said catalyst bed.

5,113,032

PROCESS FOR PRODUCING OLEFINS FROM NATURAL GAS

Charles Cameron, Paris; Hubert Mimoun, Rueil-Malmaison; Alain Robine, Rueil-Malmaison; Serge Bonnaudet, Rueil-Malmaison; Patrick Chaumette, Bougival, and Quang Dang Vu, Neuilly, all of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Jan. 8, 1990, Ser. No. 461,874
Claims priority, application France, Jan. 6, 1989, 89 00188
Int. Cl.[5] C07C 2/00
U.S. Cl. 585—500 23 Claims

1. A process for producing olefins from natural gas containing methane, ethane and propane, comprising:

(1) separating the natural gas into two fractions, a first gas fraction enriched in methane and a second gas fraction enriched in hydrocarbons higher than methane,

(2) selectively oxidizing the first gas fraction enriched in methane with molecular oxygen, in the presence of a contact mass, to form an effluent containing C_2 hydrocarbons and water as products,

(3) separating the second gas fraction enriched with hydrocarbons higher than methane into two new fractions, a first gas fraction enriched in propane and a second gas fraction enriched in ethane,

(4) admixing the second ethane-enriched gas fraction from stage (3) with the effluent from stage (2) after at least about 80% by volume of the molecular oxygen has been consumed in stage (2),

(5) pyrolyzing the mixture resulting from stage (4) to form an olefins/C_2+ alkanes ratio of at least 0.5,

(6) admixing the first propane-enriched gas fraction from stage (3) with the effluent from stage (5), and

(7) pyrolyzing the mixture resulting from stage (6) to form an olefin-rich gaseous mixture.

5,113,033

RUTHENIUM SALT AND ALUMINUM HALIDE CATALYST SYSTEM FOR CODIMERIZATION OF ALPHA MONOOLEFINS AND CONJUGATED DIOLEFINS

Richard S. Myers, Kutztown, Pa.; Daniel R. Mills, Somerville, and Robert C. Michaelson, Kinnelon, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jan. 12, 1990, Ser. No. 464,088
Int. Cl.[5] C07C 2/02
U.S. Cl. 585—506 45 Claims

1. A process for preparing a 1,4-diene, said process comprising reacting an alpha-monoolefin and a conjugated diolefin in the presence of a catalyst system comprising a ruthenium salt and an aluminum halide.

5,113,034

DIMERIZATION CATALYST AND PROCESS THEREFOR

Stuart L. Soled, Pittstown; Nicholas C. Dispenziere, Jr., Wall; Ramzi Y. Saleh, Flemington, and Sabato Miseo, Pittstown, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Aug. 5, 1991, Ser. No. 740,251
Int. Cl.[5] C07C 2/04
U.S. Cl. 585—510 7 Claims

1. A process for dimerizing C_3 or C_4 olefins comprising reacting a feed stream containing C_3 or C_4 olefins or mixtures thereof in the liquid phase with a catalyst consisting essentially of an anion modified Group IVB oxide, wherein the anion is a sulfate or a tungstate.

5,113,035

DEVICE FOR THE PRODUCTION OF AN OPTICAL WAVEGUIDE PREFORM

Manfred Wittmann, Stuttgart, and Robert Günther, Elzach, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Feb. 20, 1991, Ser. No. 658,175
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1990, 4005730
Int. Cl.[5] C03B 37/012
U.S. Cl. 65—11.1 8 Claims



1. A device for the production of an optical waveguide preform from a crude preform rod of quartz glass and at least one quartz glass tube fused onto the preform rod, said device comprising:

a glass lathe having separate rotatable jaw chucks (2, 6) at one end for supporting the crude preform rod (1) and the quartz glass tube (4), and another rotatable jaw chuck (3), for supporting the other end of the crude preform rod (1), at the other end of the lathe; and

means for heating said quartz glass tube.

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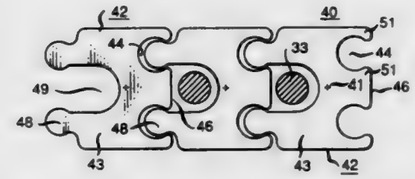
MODULAR CABLE

Candido J. Arroyo, Lithonia, and Manfred R. Gotthardt, Lawrenceville, both of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 25, 1990, Ser. No. 514,068

Int. Cl.[5] G02B *6/44;* H01B *7/04, 7/08*

U.S. Cl. 385—100 **18 Claims**



1. A modular cable, which comprises:

an assembly of a plurality of longitudinally extending segments each of which is made of a plastic material and each of which has a longitudinal axis with axes of the segments of said assembly lying in a plane and with adjacent ones of said segments being interlocked in a manner which allows relative longitudinal movement between adjacent ones of the segments, said assembly being capable of being turned in an arcuate path which lies in said plane; and

at least one transmission medium which extends coextensively longitudinally with said segments and which is disposed within an outer periphery of adjacent segments at least when said adjacent segments are interlocked together, said at least one transmission medium being capable of movement independently of said segments should said assembly be turned in an arcuate path which lies in said plane.

5,113,037

WATERPROOF WIRE CONNECTOR

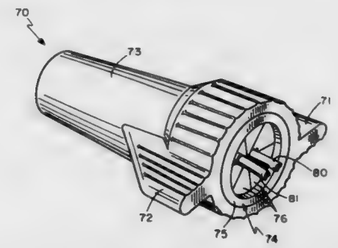
Lloyd H. King, Jr., Town & Country, and Thomas A. King, Chesterfield, both of Mo., assignors to King Technology of Missouri, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 450,156, Dec. 13, 1989, abandoned, and a continuation-in-part of Ser. No. 478,687, Feb. 12, 1990, Pat. No. 5,023,402. This application Aug. 30, 1990, Ser. No. 574,808

The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.

Int. Cl.[5] H01R *4/22, 43/00*

U.S. Cl. 174—87 **12 Claims**



2. A twist-on wire connector for simultaneously encapsulating and securing the end of an electrical wire in a moisture-proof relationship within the wire connector comprising:

a housing, said housing having a closed end and an open end, said housing including an exterior surface for a user to grasp, said housing including an interior surface, said interior surface forming a compartment therein for receiving a sealant for encapsulating and moisture-proofing the end of an electrical wire;

a wire engaging member located on at least a portion of said interior surface of said housing; said wire engaging member having a tapered thread-like projection extending into said compartment for gripping and securing an electrical wire therein when an electrical wire is twisted into engagement with said wire engaging member; and

a sealant located in said compartment of said housing, said sealant filling a portion of said compartment and covering at least a portion of said wire engaging member located in said housing, said compartment containing sufficient sealant so that when an end of an electrical wire having an insulating covering is inserted into the open end of the housing and into the sealant in said compartment one can cover the end of the electrical wire with sealant so that when the electrical wire is held with one hand and the housing is held with the other hand the user can twist the housing with the tapered thread-like projections about the sealant covered end of the electrical wire to form a mechanical connection between the wire engaging member and the sealant covered end of the electrical wire to hold the electrical wire in the wire engaging member while at the same time forming a moisture proof covering encapsulating the end of the electrical wire with said sealant extending onto the insulating covering on the electrical wire to thereby encapsulate the end of the electrical wire in the sealant in said compartment of said housing to prevent moisture from contacting the end of the electrical wire located in the sealant with said sealant being sufficiently viscous to maintain sealant properties while allowing said sealant to flow around and encapsulate the end of the electrical wire even if the electrical wire is mechanically disengaged and reengaged with the wire engagement member.

10. The method of first forming a waterproof mechanical connection to the sealant covered ends of electrical wires comprising the steps of:

placing the ends of electrical wires proximate one another;

inserting the ends of electrical wires into a twist-on wire connector having a compartment with an interior surface having thread-like projections and a viscous sealant for maintaining sealing properties located in the compartment until the ends of electrical wires engage the viscous sealant and continuing the insertion of the ends of electrical wires into the viscous sealant until the ends of the electrical wires are mechanically engaging or reengaging the thread-like projections and the ends of electrical wires are encapsulated by the sealant; and

then twisting the twist-on wire connector while holding the wires so that the sealant covered ends of electrical wires are simultaneously forced into a sealant covered mechanical connection with the twist-on wire connector while the sealant covered ends of electrical wires remain surrounded by the sealant to thereby form a waterproof covering around the sealant covered ends of the electrical wires located in a low resistance electrical connection in the twist-on wire connector.

5,113,038

CABLE SPLICE ASSEMBLY FOR CONNECTING AND BRANCHING CABLES, PARTICULARLY TELECOMMUNICATION CABLES

Helmut Dehling, Dorsten, Fed. Rep. of Germany, assignor to Stewing Kunststoffbetrieb GmbH, Dorsten, Fed. Rep. of Germany

Filed Sep. 28, 1990, Ser. No. 590,348

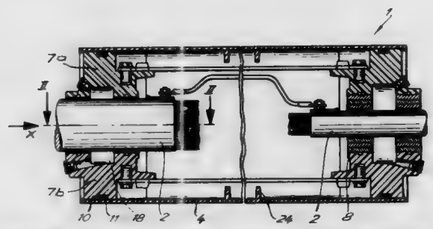
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1989, 3932734; Dec. 14, 1989, 3941268

Int. Cl.[5] H02G *15/13*

U.S. Cl. 174—92 **9 Claims**

1. In a cable splice assembly for connecting and branching

cables, particularly telecommunication cables, of different diameters, the cable splice assembly including a pipe sleeve having ends, the pipe sleeve being longitudinally divided along abutting edges, a longitudinal sealing element being pressed between the abutting edges of the longitudinally divided pipe sleeve, sealing members surrounded by the pipe sleeve being mounted at the ends of the pipe sleeve, the sealing members being transversely divided along an abutting area, the sealing members having cable passage openings adaptable to different cable diameters, circumferential sealing elements being pressed in circumferential locking grooves between the pipe sleeve and



the sealing members, the improvement comprising the circumferential sealing elements being O-type sealing rings which are divided forming loose ends, the O-type sealing rings having sealing tongues which overlap at the ends, each O-type sealing ring having two sealing projections which engage in the abutting area of the sealing member halves, the sealing projections having locking recesses, at least one of the sealing member halves having at the locking groove a bearing bed for receiving the overlapping sealing tongues, and at least one of the sealing members having at the abutting edge thereof a bearing recess with a locking nose which engages the locking recess of the sealing projection which is inserted in the bearing recess.

5,113,039

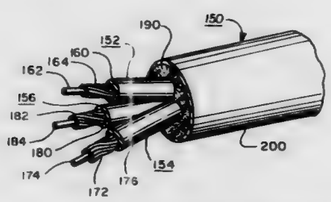
FLEXIBLE CORD WITH HIGH MODULUS ORGANIC FIBER STRENGTH MEMBER

Richard A. Guipe; Shakil U. Qureshi, and Larry W. Oden, all of Richmond, Ind., assignors to Cooper Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 347,416, May 4, 1989, abandoned. This application Jan. 9, 1991, Ser. No. 639,041

Int. Cl.[5] H01B *7/02, 13/14*

U.S. Cl. 174—113 C **16 Claims**



10. A method of making an electrical cable having a plurality of leads with strength members, surrounded by a foam filler layer and a non-porous outer jacket, comprising the steps of:

helically winding plurality of metallic conductors about each of a plurality of single yarn strength members;

extruding an inner jacket over each of said single yarn strength members would with metallic conductors in the winding step;

extruding a foam filler layer over said inner jackets; and

extruding a non-porous jacket over said foam filler layer.

11. An electrical cable comprising:

at least one insulated cord comprised of:

a single yarn tensile strength member;

a plurality of conductors helically wound about and in contact with the single yarn tensile strength member of each said at least one insulated cord;

an inner insulating jacket surrounding the helically wound conductors and the single yarn tensile strength member of said at least one insulated cord;

a foam filler layer surrounding said at least one insulated cord; and

an outer insulating jacket surrounding said foam filler layer.

5,113,040

FLEXIBLE ELECTRICAL CABLE HAVING TWO STRANDED CONDUCTORS

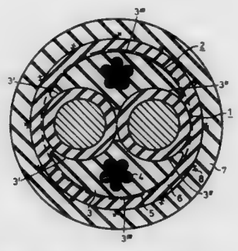
Fritz Hose, Ahorn, and Thomas Reuss, Coburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 13, 1991, Ser. No. 654,787

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1990, 9001823[U]

Int. Cl.[5] H01B *7/02*

U.S. Cl. 174—116 **6 Claims**



1. A flexible electrical cable comprising:

two stranded, rubber-insulated conductors;

a rubber sheathing surrounding said conductors, said rubber sheathing including an inner and outer sheathing, said rubber sheathing and said two conductors forming interstices therebetween;

a wide-meshed textile braid arranged between said inner sheathing and said outer sheathing;

cable fillers arranged in said interstices, said cable fillers each having a section-forming rubber strand with a tension-proof element embedded therein; and

a spun covering of a open mesh tape surrounding said conductors and said cable fillers.

5,113,041

INFORMATION PROCESSING

Greg E. Blonder, Summit, and Robert A. Boie, Westfield, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

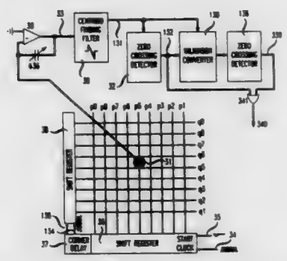
Filed Dec. 28, 1990, Ser. No. 635,086

Int. Cl.[5] G08C *21/00*

U.S. Cl. 178—18 **32 Claims**

1. Apparatus for information processing comprising an inputting implement, together with a tablet which includes a free surface inputting region accessible to the implement, an initial signal generator including said implement or said region, an initial signal detector including the other of said implement or said region, in which positioning of the implement within the inputting region is determinative of at least part of the information to be processed, together with provision for generation of a final signal including such positioning information, said region being electrically segmented into at least five segments in at least one direction within the said region, each such segment being at least ten times coarser than the resolution of positioning information included in the final signal, together with means for interpolating position of the inputting element

within a segment thereby resulting in positioning information of such resolution, further including means for electrical pulsing of the said initial signal generator for producing a corresponding time-dependent initial signal in the said initial signal detector, whereby the said final signal is yielded and is transmitted to an associated unit of the said information processing apparatus



characterized in that the said initial signal comprises time-dependent, undigitized, analog initial positioning information, and in that the said initial signal detector includes a time domain, centroid-finding filter for interpolating position to yield positioning information of such resolution for inclusion in the final signal.

5,113,042

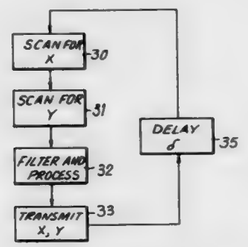
DIGITIZER TABLET WITH REDUCED RADIATION SUSCEPTIBILITY

Alfred E. Mietzko, Woodbury, Conn., assignor to Summagraphics Corporation, Seymour, Conn.

Filed Nov. 20, 1990, Ser. No. 615,981

Int. Cl.[5] G08C *21/00*

U.S. Cl. 178—19 **16 Claims**



1. A method of operating a digitizer tablet employing an electrode array adjacent a working surface and a pointing device wherein the electrode array is scanned at a given scan rate to obtain signals representative of the position of the pointing device over the working surface, said signals after processing including filtering being outputted for use by a controlled display to produce on the display objects representative of the pointing device position, said display objects exhibiting undesired wobble, the steps comprising:

(a) introducing controlled delay to modify the tablet scan rate to reduce or eliminate the wobble.

5,113,043

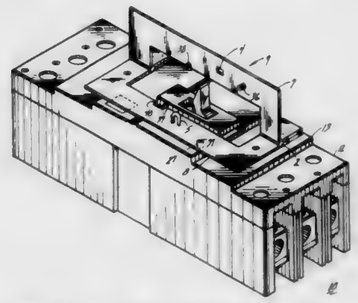
CIRCUIT BREAKER SAFETY INTERLOCK UNIT

Robert A. Morris, Burlington, Conn., assignor to General Electric Company, New York, N.Y.

Filed Feb. 25, 1991, Ser. No. 660,754

Int. Cl.[5] H01H *7/08*

U.S. Cl. 200—43.01 **11 Claims**



1. A circuit breaker safety interlock comprising;

a circuit breaker case and cover;

a pair of separable contacts within said case;

an operating mechanism within said case arranged for turning said contacts between OPEN and CLOSED conditions upon occurrence of an overcurrent condition within a protected circuit;

a trip-test button on said circuit breaker cover quiescent current conditions through said protected circuit;

a movable paddle within said circuit breaker cover arranged for automatic movement between a first position when said circuit breaker contacts are OPEN and a second position when said contacts are CLOSED; and

locking means on said circuit breaker cover interacting with said paddle whereby said locking means accepts a lock when said paddle is in said first position and said locking means rejects said lock when said paddle is in said second position.

5,113,044

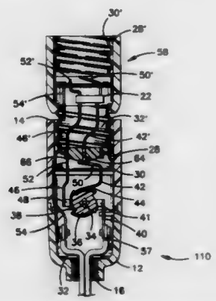
ONE-WAY/THREE-WAY LIGHT SOCKET

Rand K. Tomberlin, 4017 N. Bennington, Apt. 104, Kansas City, Mo. 64117

Filed Jun. 17, 1991, Ser. No. 716,138

Int. Cl.[5] H01R *19/00*

U.S. Cl. 200—51.04 **6 Claims**



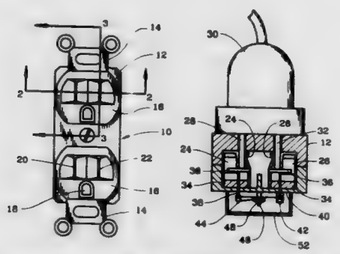
1. A socket for an incandescent light bulb and selectable between use with one-way and three-way bulbs, comprising:

an outer casing having a first open end;

a screw shell mounted within said casing and having a wall

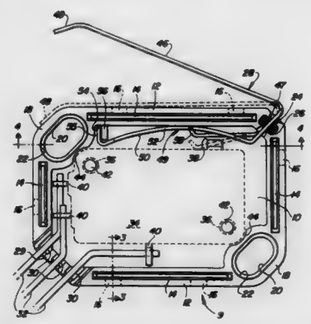
adapted to releasably retain, and make electrical contact with, a screw contact of the light bulb therein;
a central terminal mounted within, and electrically insulated from, said screw shell and adapted to make electrical contact with a central contact of the bulb;
an outer terminal mounted within said screw shell at a position intermediate said central terminal and said wall, said outer terminal being electrically insulated from said screw shell and adapted to make electrical contact with an annular ring contact of the bulb; and
mode switch means operatively mounted to said socket for modifying the electrical outputs of said central and outer terminals such that in a first position of said switch a one-way bulb in said socket will have an off/on/off/on operational sequence, and in a second position of said switch a three way bulb will have a normal operational sequence.

5,113,045
SAFETY OUTLET
Patrick L. Crofton, c/o Aramco, Box 2654, Dhahran 31311, Saudi Arabia
Filed Apr. 16. 1991, Ser. No. 686,031
Int. Cl.[5] H01R *33/96, 31/08*
U.S. Cl. 200—51.09 **18 Claims**



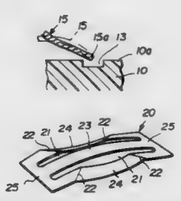
1. A safety electrical outlet comprising a housing formed of an insulating material and at least one socket for receiving an electrical plug having prongs for making electrical contact, said socket comprising at least two openings adapted to receive the prongs of the plug, and each of said openings having wipers means for making electrical contact with one of the prongs, said wiper means each comprising a metal contactor strip and defining a channel portion, a plunger member having a T-shaped configuration associated with each of said openings and adapted to e contacted by one of the prongs of a plug and to move in response to contact by a prong, means for independent guiding movement for each of said plunger members, said plunger member each having a leg portion extending toward the rear of said housing and a top portion having a major dimension essentially transverse to said openings and to the prong of a plug contact means positioned so as to be actuatable by said leg portion when said plunger member is moved by a prong of a plug, said contact means being in series connection with means for conducting electric current to one of said wiper means, whereby the prongs of the lug depress each of said plunger members for closing each of said contact means and supplying electric current to said wiper means upon insertion of a plug into said outlet, and preventing supply of current to aid outlet upon insertion of a different object into said receptacle.

5,113,046
HOUSING FOR A MICRO-SWITCH UNIT
Klaus Hauk, Altrip, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.
Filed Dec. 3, 1990, Ser. No. 620,820
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1990, 4002371
Int. Cl.[5] H01H *3/04*
U.S. Cl. 200—332 **4 Claims**



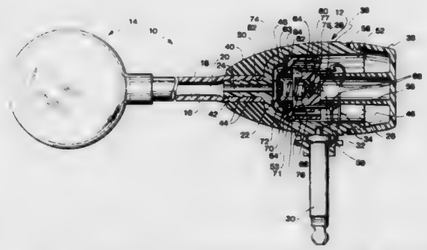
1. An enclosure for a micro-switch unit, the enclosure comprising a housing for enclosing the micro-switch unit therein and an actuator element extending through an aperture in the housing and operatively engaging the micro-switch unit, the actuator element comprising a generally U-shaped plate spring having an outer leg extending outside the housing, an inner leg extending inside the housing an operatively engaging the micro-switch unit, and a base portion connecting the inner leg to the outer leg, the base portion extending through the aperture, characterized by:
an inner portion of the housing forming a slot which opens towards the interior of the housing; and
the inner leg of the actuator element having a free end which is bent towards the housing and is received by the slot.

5,113,047
PUSHBUTTON SWITCH WITH WEAR PREVENTING GROOVE
Jyoji Tsutsumi, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 282,541, Dec. 9, 1988, abandoned. This application Mar. 7, 1990, Ser. No. 492,273
Claims priority, application Japan, Feb. 8, 1988, 63-14656[U]
Int. Cl.[5] H01H *5/18*
U.S. Cl. 200—407 **1 Claim**



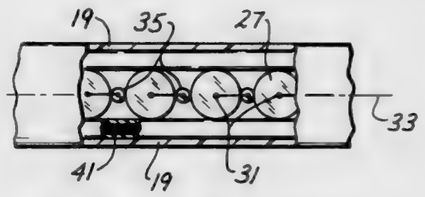
1. In a pushbutton switch including a case having a closed bottom wall, said closed bottom wall having an inside surface located inside said case, said case also having one or more side walls adjacent and substantially perpendicular to said bottom wall, at least one first stationary contact located on the inside surface of said bottom wall, a second stationary contact located on the inside surface of said bottom wall, said second stationary contact not adjoining said first stationary contact, a movable contact having a peripheral supporting edge having a first section adjacent the inside surface of said bottom wall and a second section abutting said first stationary contact, said movable contact also having a central portion capable of contacting said second stationary contact by resilient deformation, an improvement comprising:
the inside surface of said bottom wall defining at least one groove located directly adjacent said first section of said peripheral supporting edge such that said first section is suspended in or over said groove, thereby preventing said peripheral supporting edge from scraping along said inside surface of said bottom wall, the prevention of said scraping resulting in the prevention of a production of dust when said movable contact is deformed; wherein said movable contact comprises:
a flat rectangular leaf spring, wherein said peripheral supporting edge is divided into a pair of substantially parallel long edges defining a length and a pair of substantially parallel short edges defining a width,
said leaf spring bent along said length to form an arc,
said leaf spring defining a pair of substantially parallel slits disposed parallel to said long edges having ends adjacent said short edges, said pair of slits sectioning said leaf spring into a central fragment and a pair of side fragments, said central fragment capable of being deformed to contact said second stationary contact, and at least one of said side fragments being in contact with said first stationary contact;
wherein said short edges are disposed over said groove and said short edges do not contact said inside surface of said bottom wall.

5,113,048
PNEUMATICALLY ACTUATED HOSPITAL SIGNALING DEVICE
William G. Lafferty, Deephaven, Minn., assignor to Crest Electronics, Dassel, Minn.
Filed Dec. 15, 1989, Ser. No. 451,336
Int. Cl.[5] H01H *35/24*
U.S. Cl. 200—83 Z **5 Claims**



1. A pneumatically actuated, electrical contact signaling device, comprising:
a body defining an internal liquid tight chamber, said body including a switch casing generally defining a switching portion of said chamber, said switch casing including a central portion, a removable cap and means for connecting said cap to said central portion in a fluid tight fit, whereby said connected cap and central portion form a cavity means for compensating for said pneumatic actuation of said signaling device;
first and second electrical contact means received within a switching portion of said camber, said electrical contact means being shiftable between a first, mutually engaging, circuit closed position and a second mutually clearing, circuit open position;
biasing means for biasing said first and second electrical contact means into a predetermined one of said first or second positions;
pneumatic actuating means comprising an actuating portion of aid chamber, for selectively shifting said first and second electrical contact means against the urging of said biasing means, said pneumatic acting means including a deformable bulb operably coupled to said switch casing in fluid communicating relationship by pneumatic tubing; and
a flexible diaphragm means for isolating said switching portion of said chamber from said actuating portion, said diaphragm means comprising a gas permeable membrane that allows for equalization of pressure between said actuating portion and said switching portion of said chamber over time.

5,113,049
FLEXIBLE INDUCTION HEATING COIL
John Border, Sandia Park; Rik Salas, Los Lunas, and Marc Black, Albuquerque, all of N. Mex., assignors to PDA Engineering, Costa Mesa, Calif.
Filed Feb. 14, 1991, Ser. No. 655,544
Int. Cl.[5] H05B *6/36*
U.S. Cl. 219—10.79 **20 Claims**

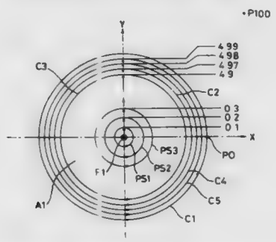


12. A flexible induction heating coil comprising:
an elongated flexible core having proximal and distal ends, said core including a plurality of core segments flexibly interconnected to make the core more flexible than an individual core segment; and
an elongated flexible inductor having a first length which extends along the core from a first location adjacent the proximal end of the core to a second location adjacent the distal end of the core and a second length which extends back toward the first location, said inductor being usable to create a magnetic field, said core providing a path for the magnetic field and concentrating the magnetic field along an elongated heating region whereby the flexibility of the core and the inductor enable configuration of the elongated heating region to be changed.

5,113,050
METHOD OF CREATING CORELESS-MACHINING NC DATA FOR WIRE CUT ELECTRIC DISCHARGE MACHINING
Masaki Seki, Suginami; Takashi Takegahara, Hachioji, and Toru Matsunaka, Yanai, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan
PCT No. PCT/JP90/01185, § 371 Date May 9, 1991, § 102(e) Date May 9, 1991, PCT Pub. No. WO91/04121, PCT Pub. Date Apr. 4, 1991
PCT Filed Sep. 17, 1990, Ser. No. 700,167
Claims priority, application Japan, Sep. 21, 1989, 64-243515
Int. Cl.[5] B23H *7/06, 7/20*
U.S. Cl. 219—69.12 **11 Claims**

1. A method of creating NC data for coreless-matchining comprising the steps of:
(a) defining a coreless-matching area beforehand;
(b) automatically determining a central position of the coreless-matchining area as a machining starting position;
(c) automatically determining a spiral wire locus starting

from the machining starting position and reaching a contour of the coreless-machining area; and



(d) automatically creating an NC data part used for moving a wire along the wire locus while performing electric discharge machining.

5,113,051

METHOD OF RETURNING A WIRE ELECTRODE WHEN BROKEN IN A WIRE CUT ELECTRIC DISCHARGING MACHINE

Makoto Sakaue, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

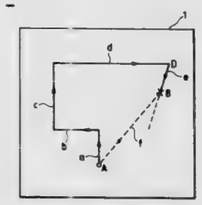
PCT No. PCT/JP89/00630, § 371 Date Mar. 28, 1990, § 102(e) Date Mar. 28, 1990, PCT Pub. No. WO90/02013, PCT Pub. Date Aug. 3, 1990

PCT Filed Jun. 26, 1989, Ser. No. 474,784

Claims priority, application Japan, Aug. 19, 1988, 63-205984; Aug. 22, 1988, 63-207715; Dec. 9, 1988, 63-311555; Mar. 17, 1989, 1-63833

Int. Cl.[5] B23H *7/06, 7/18, 7/20*

U.S. Cl. 219—69.12 **19 Claims**



1. A method of returning a wire electrode, when broken, in a wire cut electric discharge machine, comprising:

returning said wire electrode from a wire electrode break point where said wire electrode has been broken during machining to a machining start point together with first and second wire guides which support the wire electrode;

automatically reconnecting, at said machining start point, said wire electrode and setting said wire electrode thus reconnected out along a wire electrode supplying path, thus allowing the machining operation to start again; wherein

in returning said wire electrode from said wire electrode break point to said machining start point, a cleaning material is jetted to portions of said first and second guide members which are confronted with said workpiece, and to at least some portion of the machined portion of said workpiece.

5,113,052

PROCESS FOR THE OVEN BRAZING OF TWO PIECES IN RARIFIED OR CONTROLLED ATMOSPHERE

Marcel Gabriel, Neuilly En Thelle, France

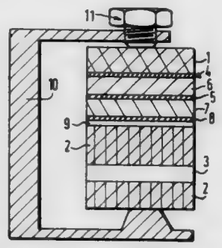
Filed Jun. 17, 1988, Ser. No. 221,385

Claims priority, application France, Jun. 17, 1987, 87 08434

The portion of the term of this patent subsequent to Dec. 12, 2008, has been disclaimed.

Int. Cl.[5] B23K *31/02*

U.S. Cl. 219—85.22 **10 Claims**



1. Process for brazing first and second pieces, said first piece having a coefficient of expansion lower than that of the second piece, so as to obtain a brazed structure wherein the first piece can be heated at a high temperature while the second piece is constantly cooled, said process comprising the following steps of

i—interposing between the pieces an assembly comprising at least a first plaque of brazing compound, a plaque of refractory metal, a second plaque of brazing compound, a plaque of thermally conducting metal and a third plaque of brazing compound, the plaque of refractory metal being placed between the first piece and the plaque of thermally conducting metal;

ii—pre-assembling and holding the assembly pressed between the pieces;

iii—placing the pieces and the assembly, once pre-assembled, in a thermic treatment oven under vacuum conditions;

iv—effecting in the oven a thermic cycle which comprises a heating phase which is continued until the pieces and the assembly are elevated to a temperature which corresponds to a fusion point of the brazing compound, a diffusion phase wherein the temperature is maintained substantially constant, and a cooling phase;

v—extracting the pieces from the oven after the cooling phase.

5,113,053

WELDING GUN FOR ROBOT

Shigeru Umeda, and Tsuyoshi Takatori, both of Tokyo, Japan, assignors to Obara Corporation, Tokyo, Japan

Filed Mar. 22, 1991, Ser. No. 674,557

Claims priority, application Japan, May 9, 1990, 2-47708[U]

Int. Cl.[5] B23K *11/31, 11/24;* **B25J** *11/00*

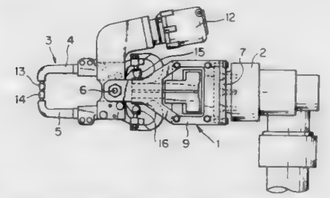
U.S. Cl. 219—116 **9 Claims**

1. A welding gun for a robot, comprising:

a cradle including a pivotal mounting portion at one end thereof, an attachment base portion at the other end thereof for facilitating attachment of said cradle to a robot wrist, and a pair of generally opposed side plates extending between said pivotal mounting portion and said attachment base portion, said side plates being disposed in generally parallel spaced relationship;

a pair of welding gun arms pivotally mounted on said pivotal mounting portion of said cradle, each said welding gun arm having a stopper mounted thereon and disposed between said pivotal mounting portion and said attachment base portion of said cradle;

means for effecting pivotal movement of said welding gun arms and said stoppers about a pivot axis defined by said pivotal mounting portion of said cradle; and



means for causing said stoppers to travel along respective paths of pivotal movement which each intersect with and terminate at one of said side plates of said cradle.

5,113,054

METHOD FOR JOINT WELDING OF SMALL STRUCTURAL COMPONENT PARTS

Paul Hund, Schwieberdingen; Lothar Langer, Bissingen, and Wolfgang Jenner, Erdmannhausen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

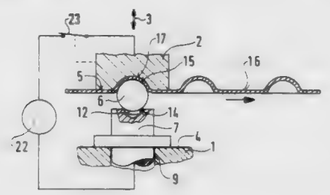
PCT No. PCT/DE89/00060, § 371 Date Oct. 27, 1989, § 102(e) Date Oct. 27, 1989, PCT Pub. No. WO89/08001, PCT Pub. Date Sep. 8, 1989

PCT Filed Feb. 1, 1989, Ser. No. 432,736

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1988, 3806309

Int. Cl.[5] B23K *11/00*

U.S. Cl. 219—117.1 **11 Claims**



8. A method of resistance welding of two structural parts, comprising the steps of providing two electrodes for applying pressure and heat to the two structural parts, providing a layer of a pressure-deformable transmitting material between one of the two electrodes and one of the two structural parts; deforming the pressure-deformable transmitting material by removing the one of the two electrodes toward the other of the two electrodes to press the two structural parts together; and communicating welding current to the two electrodes to weld the two structural parts after deformation of the pressure-deformable transmitting material has been substantially finished.

5,113,055

LASER BEAM OPTICAL SYSTEM AND LASER BEAM MACHINING METHOD USING THE SAME

Katsuhiro Kuriyama, Takarazuka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 25, 1990, Ser. No. 602,093

Claims priority, application Japan, Oct. 25, 1989, 1-278858

Int. Cl.[5] B23K *26/00*

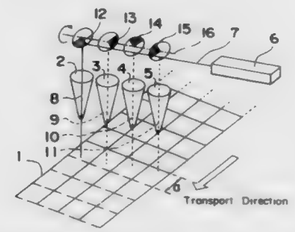
U.S. Cl. 219—121.67 **3 Claims**

1. An apparatus for cutting a sheet of metal material along parallel cutting lines into elongated strips, comprising:

means for transporting a sheet of metal material in a transport direction;

a laser beam generator for generating a single laser beam directed transversely of a sheet of metal being transported;

a rotatable shaft parallel to said laser beam and having a plurality of rotating reflectors mounted on said shaft at distances corresponding to the spacing of cutting lines on the sheet of metal material, each reflector having a reflection surface extending around said shaft for only a portion of the circumferential distance around said shaft and the remainder of each reflector being transparent, and each reflection surface being circumferentially offset from the other reflection surfaces on said shaft and being at an angle to the angle of said shaft, and being positioned for being moved through the laser beam during each revolution of said shaft for causing said laser beam to be selectively reflected from successive reflection surfaces toward corresponding cutting lines on the sheet of metal material;



drive means for rotating said shaft through one revolution each time a length of the sheet corresponding to a desired length of a piece to be cut from the strips passes the position of the laser beam; and

metal cutting gas nozzles along the respective paths of the reflected laser beam and adjacent the position of the metal sheet being transported and means for feeding a metal cutting gas to said nozzles during the time the laser beam is not being reflected along the path on which the respective nozzle is positioned.

5,113,056

STORED-SPRING-ENERGY ACTUATOR MECHANISM FOR A HIGH-VOLTAGE CIRCUIT BREAKER

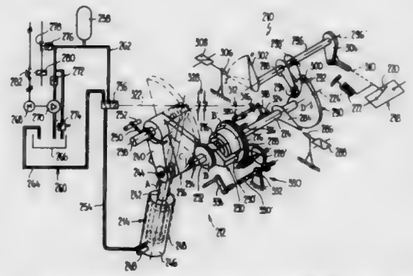
Max Kuhn, Unterentfelden, Switzerland, assignor to Sprecher Energie AG, Oberentfelden, Switzerland

Continuation-in-part of Ser. No. 283,869, Dec. 13, 1988, Pat. No. 4,968,861. This application Jul. 10, 1990, Ser. No. 550,759

Claims priority, application Switzerland, Dec. 14, 1987, 861/87

Int. Cl.[5] H01H *5/00, 35/38*

U.S. Cl. 200—400 **11 Claims**



1. A stored-spring-energy actuator mechanism for a high-voltage circuit breaker, comprising a spring-energy accumulator (**216**) which can be charged by means of a loading device (**212**) having a fluid-drive element (**214**), means adapted to

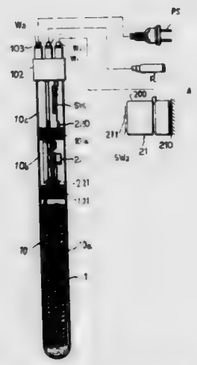
connect said spring-energy accumulator to said high voltage circuit breaker, the energy of the spring-energy accumulator (216) being sufficient for switching the high-voltage circuit breaker on and off once, and a controlled valve arrangement (256) for connecting the fluid-drive element (214) to a pressurized fluid-pressure accumulator (258) whose storable energy content corresponds at least to the stored energy of the spring-energy accumulator (216), wherein the fluid-drive element has a cylinder-piston unit (214) which performs a single working stroke for charging the spring-energy accumulator (216).

5,113,057

DOUBLY-CONTROLLED AQUARIUM SAFETY HEATER

Hsien-Tang Tsai, P.O. Box 55-1670, Taipei (10477), Taiwan

Filed Dec. 24, 1990, Ser. No. 633,123
Int. Cl.[5] H05B *3/80, 1/02*
U.S. Cl. 219—523 **2 Claims**



1. An aquarium safety heater comprising:

a glass tube submerged in an aquarium filled with water having a heating coil formed in a lower section of said glass tube;

an electric controller including a thermostat having a bidirectional triode thyristor operatively triggered by a voltage comparator integrated circuit formed in said glass tube insulatively partitioned from said heating coil for activating said heating coil for warming water in the aquarium, an adjusting knob formed in a casing adhered on the aquarium for adjusting a pre-determined resistance of a variable resistor input into a first input pin of the voltage comparator integrated circuit, a thermo-sensitive resistor distantly connected to said thermostat by a wire for poking the thermo-sensitive resistor into any area in the aquarium for sensing a voltage signal of water temperature in the aquarium to be input into a second input pin of said comparator integrated circuit for comparing two different input voltage signals for operatively outputing a voltage signal for triggering said triode thyristor for heating said coil, and a thermal type circuit breaker operatively switching off said thermostat when said thermostat is out of order; and

a power source electrically connected to said electric controller through an adapter formed on a cap sealably formed on a top portion of said glass tube for powering said electric controller, said triode thyristor operatively deactivated for switching off said heating coil which is electrically connected between two poles of said power source through said thermostat when said thermo-sensitive resistor senses a voltage signal of a water temperature equal to a predetermined value of said variable resistor as compared by said comparator integrated circuit,

the improvement which comprises:

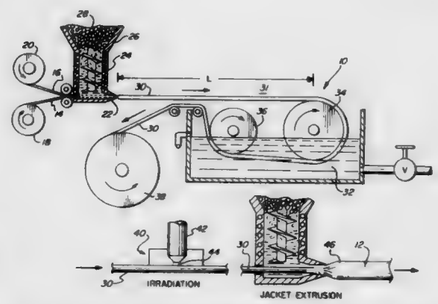
said thermal type circuit breaker including a bimetallic element normally resiliently connected between a first pole of said power source and a first terminal of said thermostat, of which a second terminal of said thermostat is connected to a second pole of said power source, said bimetallic element thermally biased due to an increasing temperature in the aquarium when the thermostat is out of order to disconnect said first terminal of said thermostat from said first pole of said power source to disconnect said power source to said heating coil for safety purpose.

5,113,058

PCT HEATER CABLE COMPOSITION AND METHOD FOR MAKING SAME

Robert C. Srubas, Granby, Conn., and William M. Rowe, Jr., DeKalb, Miss., assignors to Specialty Cable Corp., Wallingford, Conn.

Filed Jun. 1, 1990, Ser. No. 531,883
Int. Cl.[5] H05B *3/10*
U.S. Cl. 219—548 **22 Claims**



8. In a method of manufacturing an electrically conductive, self-regulating heater cable formed with a conductors that are connected to each other by an elongate extruded layer of self-regulating semiconductive composition exhibiting a positive temperature coefficient (PTC) of electrical resistance, the improvement comprising the steps of:

extruding a said layer of semiconductive PTC composition containing a carbon black having a low resistivity, is non-surface treated and has a low surface area A in m^2/gram and a low structure x in cc/100 grams of DBP oil absorption such that $0.6 \leqq A/x \leqq 1.75$, and further containing

a polymeric matrix formed with a low density polyethylene polymer with a crystallinity that is greater than about twenty percent (20%) as determined by x-ray diffraction and which, without an addition of polyethylene having a number-average molecular weight of less than about 30,000, has less than about eight percent (8%) of total polymer weight formed of molecules whose molecular weight does not exceed about 23,000, over an electrical conductor at an elevated extrusion temperature; and

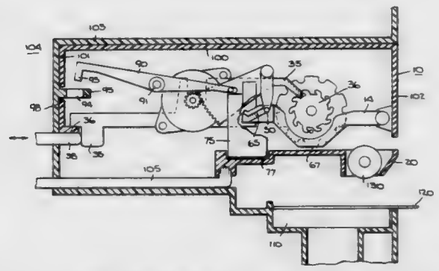
exposing the conductor with said extruded layer as they emerge from the extrusion step to a gaseous medium that is at a temperature below the extrusion temperature and for a time selected less than about 20 seconds to enable residual heat within the extruded layer to reduce its resistance per unit length of the extruded layer to a desired value.

5,113,059

POSTAGE METER SECURITY SYSTEM

William H. Brewster, Jr., Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 24, 1990, Ser. No. 633,541
Int. Cl.[5] G07G *1/00*
U.S. Cl. 235—101 **16 Claims**



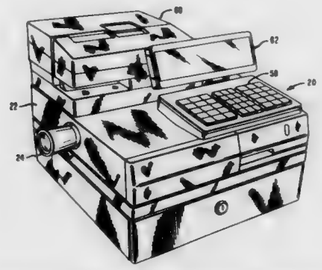
1. In a postage meter having a value printing die arranged with a surface extending through a window in a housing, a die protector movable between a first position at which said die protector extends through said window a greater distance than said surface and a second position at which said surface extends through said window a greater distance than said die protector, and a die shield mounted to be movable between a first position aligned with and adjacent said window and a second position that is not in alignment with said window, the improvement comprising a rotatable mounted yoke rotatable between a first and second position, first cam means coupling said yoke and die protector for positively moving said die protector between said first and second positions, said die shield having a recess, a dead bolt aligned with said recess at said first position of said die shield, and second cam means coupling said yoke and dead bolt for positively moving said dead bolt from said recess simultaneously with movement of said die protector from said first position thereof.

5,113,060

SCANNING POINT-OF-SALE TERMINAL

Charles K. Wike, Jr., Ithaca, N.Y.; Richard E. Anderson, Norcross, and Jerry A. McGaha, Gainesville, both of Ga., assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 29, 1989, Ser. No. 414,808
Int. Cl.[5] G06K *15/00*
U.S. Cl. 235—383 **2 Claims**



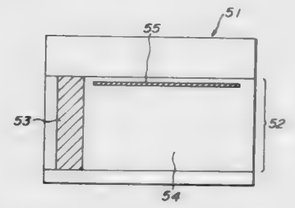
1. In combination, a data terminal device for processing data having a top horizontal surface on which is mounted a keyboard and a display, a pair of opposed vertical wall portions and an optical scanning apparatus mounted in each of said horizontal surface and said vertical wall portions for projecting scanning light beams outwardly from said terminal device in a plurality of scanning directions, each of said scanning apparatuses comprising a support member in which is mounted an optical scanning device for projecting scanning light beams, said support member being rotatably mounted in said associated surface and vertical wall portions enabling the support member to be orientated in a plurality of scanning positions about an axis perpendicular to the associated horizontal surface and vertical wall portions of the data terminal device.

5,113,061

OPTICAL CARD HAVING AN IDENTIFIER FOR IDENTIFYING TRACK CONSTRUCTION AND APPARATUS FOR WRITING AND/OR READING DATA ON AND/OR FROM THE OPTICAL CARD

Hisakatsu Tanaka, Chofu, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Feb. 4, 1988, Ser. No. 152,324
Claims priority, application Japan, Feb. 13, 1987, 62-31086; Feb. 13, 1987, 62-31087
Int. Cl.[5] G06K *7/10;* **G11B** *7/013*
U.S. Cl. 235—454 **6 Claims**



1. An optical card for storing data in an optically readable manner, comprising:

a substrate in the form of a sheet;

a data record layer on one surface of the substrate, said record layer including a plurality of rectilinear tracks arranged parallel with each other and having the same length, each of said plurality of tracks being divided into a data record area for recording data therein and an address record area in which at least address data of one or more selected tracks has been recorded, said plurality of tracks comprising a plurality of data tracks and a single management track, said plurality of data tracks being arranged in data track groups of different construction, each of said plurality of data tracks belonging to a single data track group having the same construction, said construction being defined by a number of sectors in each of said plurality of data tracks, said number of sectors in each of said plurality of data tracks being a value selected from at least two different whole numbers; and

a plurality of identifiers for identifying the construction of said plurality of data tracks, said plurality of identifiers being recorded seriatim in said management track, wherein said management track is automatically readable by scanning said management track in its length direction, said identifiers including track numbers of a first and last data track in each of said data track groups and a number corresponding to the number of sectors in each of said plurality of data tracks in each of said data track groups.

5,113,062

MAGNETIC CARD HAVING THERMAL RECORDING LAYER AND ARRANGEMENT OF MAGNETIC BARS FOR RECORDING SECURITY INFORMATION

Minoru Fujita, and Yoshihiko Nakahara, both of Tokyo, Japan, assignors to Kyodo Printing Co., Ltd., Tokyo, Japan

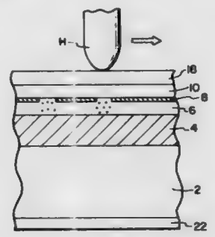
PCT No. PCT/JP90/00420, § 371 Date Dec. 4, 1990, § 102(e) Date Dec. 4, 1990, PCT Pub. No. WO90/13114, PCT Pub. Date Nov. 1, 1990

PCT Filed Mar. 29, 1990, Ser. No. 613,768

Claims priority, application Japan, Apr. 26, 1989, 1-104514

Int. Cl.[5] G06K *19/06*; B05D *5/12*; B42D *15/00*

U.S. Cl. 235—493 **7 Claims**



1. A magnetic card wherein visible patterns are written, in which a magnetic recording layer is formed on a substrate, a sensitizing layer is formed on the magnetic recording layer, a metallic thin layer is formed on the sensitizing layer, a protective layer is formed on the metallic thin layer, an arrangement of magnetic bars is formed on the protective layer at one region of the magnetic card, and at least one information track is formed in the magnetic recording layer at the other region of the magnetic card, the metallic thin layer and the sensitizing layer being configured such that, upon application of heat by a localized source, the heated portions of the metallic thin layer are dispersed into the sensitizing layer to produce the visible patterns.

5,113,063

METHOD OF MONITORING FOCUSING CONDITION USING RATE OF CHANGE SIGNAL AT A BORDER IN A SEMICONDUCTOR IMAGE POSITION SENSITIVE DEVICE

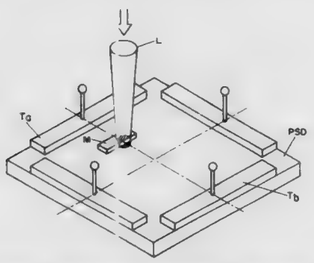
Masanori Idesawa, Wako, Japan, assignor to Rikagaku Kenkyusho, Japan

Filed Oct. 24, 1990, Ser. No. 604,773

Claims priority, application Japan, Oct. 26, 1989, 1-279284

Int. Cl.[5] G01J *1/20*; G01N *21/86*

U.S. Cl. 250—201.4 **2 Claims**



1. A method of monitoring the state of focusing of an image on a semiconductor image position sensitive device of the type having a photosensitive layer having a detection surface, a resistance layer provided on said photosensitive layer and output terminals provided on said resistance layer, said method comprising:

moving a bright spot image across a border between a light-insensitive or non-sensitive zone formed on said detection surface of said position sensitive device and a light-sensitive zone of said detection surface of said position sensitive device; and detecting the rate of change in the level of an output signal obtained when said bright spot image moves across said border, whereby the state of focusing of said bright spot image is detected.

5,113,064

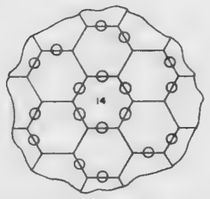
METHOD AND APPARATUS FOR PHASING SEGMENTED MIRROR ARRAYS

Paul K. Manhart, North Hollywood, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 6, 1991, Ser. No. 665,509

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.9 **6 Claims**



1. A method for phase adjusting edges of an array of segments in a segmented primary telescope mirror of known geometric configuration having an open central position, and rings of segments surrounding said central position, comprising the steps of

providing a reference surface in said central position, said reference surface conforming to said geometric configuration extended across said central position,

edge phasing with said reference surface inside edges of a first ring of segments in said central portion to align said inside edges of said first ring of segments with said reference surface,

edge phasing one edge of each segment surrounding said first ring of segments, and of subsequent rings of segments in sequence, with respect to adjacent edges of segments in an inner ring of segments, wherein each edge phasing of a segment with said reference surface and each edge phasing of a segment with adjacent segment is carried out by

illuminating said segmented primary mirror and reference surface in said central position and a reference mirror simultaneously with white light from a far field source,

combining reflected light from adjacent edges of segments of a first ring of segments of said primary mirror and said reference surface through a set of lenslets, one lenslet for each segment straddling the projected edge of said reference surface, and at an image detector plane, detecting white-light interference contour signatures separately from each of said set of lenslets, each lenslet being positioned to receive reflected light from an area straddling an edge of a segment, one lenslet for each edge adjacent to said reference surface,

adjusting each of said segments surrounding said reference surface to a position where its interference contour signature is indicative of zero piston and tilt error with respect to said reference surface,

combining reflected light from adjacent edges of segments of said first ring of segments and a second ring of segments of said primary mirror through a set of lenslets, one lenslet straddling one projected edge of each segment of said second ring of segments and a projected edge of an adjacent segment of said first ring of segments,

adjusting each of said segments surrounding said first ring of segments to a position where its interference contour signature is indicative of zero piston and tilt error with respect to said reference surface,

combining reflected light from adjacent edges of segments of each successive ring of segments and a next ring of segments of said primary mirror through a separate set of lenslets, one lenslet for each segment in the next ring of segments and one adjacent edge of the preceding ring of segments, and

adjusting each segment of said next ring of segments to a position where its interference contour signature is indicative of zero piston and tilt error with respect to said adjacent segment of said preceding ring of segments.

5,113,065

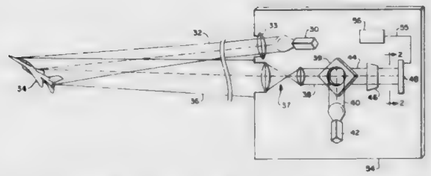
HETERODYNE CIRCULAR PHOTODETECTOR ARRAY IN A TRACKING SYSTEM

Hans A. Heynau, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 10, 1990, Ser. No. 580,068

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—203.2 **19 Claims**



1. Apparatus for angular tracking of an object, comprising:

source means, for producing a source beam which is impinged on the object, said source beam is reflected off of the object in the form a return beam;

detector means, having a center photodetector cell disposed in the center of an array, said array having a plurality of outer photodetector cells surrounding said center cell, said center cell and said outer cells comprising means for converting photon energy from said return beam into one or more electrical signals indicative of a positional shift of said return beam on said array; and

direct means, responsive to said electrical signals, for maintaining a predetermined directional relationship between said source means and the object.

5,113,066

INTEGRATED OPTICAL SENSOR ARRANGEMENT WITH DETECTING MEANS, AND MEANS FOR CONTROLLING THE OPTICAL EMISSION WAVELENGTH OF THE LIGHT BEAM SOURCE

Dieter Michel, Traunstein, and Andreas Franz, Kienberg, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Apr. 8, 1991, Ser. No. 681,883

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1990, 401178

Int. Cl.[5] G01J *1/32*

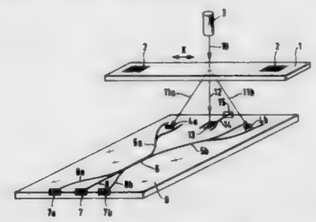
U.S. Cl. 250—205 **13 Claims**

1. An integrated optical sensor arrangement for controlling the optimal emission wavelength of a light beam source comprising:

a graduation scale for diffracting a light beam from said source into diffraction beam bundles;

means for coupling at least one diffracted beam to a waveguide coupler;

means for coupling an additional diffraction beam bundle to said integrated optical sensor; and



means for detecting and generating a control signal for controlling the optimal emission wavelength of said light beam source.

5,113,067

IMAGE READING APPARATUS HAVING A BLAZED DIFFRACTION GRATING

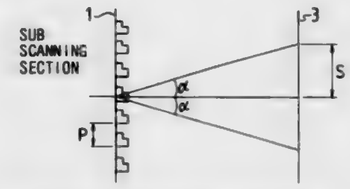
Takehiko Nakai, Yamato, and Michitaka Setani, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1990, Ser. No. 479,606

Claims priority, application Japan, Feb. 15, 1989, 1-35694; Feb. 23, 1989, 1-44390

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **27 Claims**



1. An image reading apparatus comprising:

a multiline sensor having a plurality of linear sensor arrays arranged on a single substrate;

a focusing optical system for focuing on object image on said multiline sensor; and

a blazed diffraction grating, disposed in an optical path between said focusing optical system and said multiline sensor, for color-separating light from the object into a plurality of light components, and for guiding the color-separated light components to corresponding sensor arrays, a grating thickness of said blazed diffraction grating varying in correspondence with an angle of light incident on said blazed diffraction grating from said focusing optical system.

5,113,068

PHOTOELECTRICAL SENSOR WITH MULTISTAGED, FILTERED AMPLIFIER CIRCUIT

George E. Burke, Jr., Raleigh, N.C., assignor to Square D Company, Palatine, Ill.

Filed Dec. 28, 1990, Ser. No. 635,031

Int. Cl.[5] H01J *40/14*

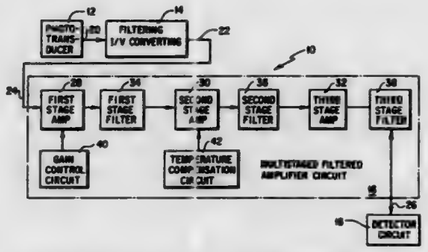
U.S. Cl. 250—214 B **18 Claims**

1. In a photoelectrical sensor subject to ambient, artificial AC powered light fluctuations having a detector circuit for discriminating voltage pulses of a selected width and repetition rate, a phototransducer for converting light pulses to current pulses and a filtering current to voltage converter for converting the current pulses to filtered voltage pulses, the improvement being a high gain, multistaged, filtered amplifier circuit

for amplifying the filtered voltage pulses to a level for optimum response thereto by the detector circuit, comprising:

a plurality of voltage amplifier stages; and

means for interconnecting the plurality of voltage amplifier stages in cascade between the filtering current to voltage



converter and the detector circuit including a plurality of filters respectively associated with the plurality of amplifier stages, each of the plurality of filters substantially attenuating the response of the amplifier stage associated therewith to signals at the frequency of said AC powered light fluctuations.

5,113,069

RADIATION DETECTOR HAVING A DEFINED FIELD OF VIEW HAVING A BAFFLE ARRANGEMENT CONTAINING A DIFFUSING ELEMENT

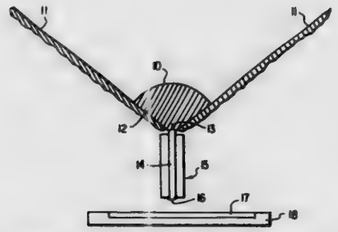
John C. Parker, deceased, late of Edinburgh by Jean Andrews Cumming Parker, executor ; by David Francis, executor, Kirkcaldy, and by James I. H. Smith, executor, Edinburgh, all of United Kingdom, assignors to GEC-Ferranti Defence Systems Limited, Stanmore, United Kingdom

Filed Nov. 14, 1990, Ser. No. 612,388

Claims priority, application United Kingdom, Nov. 14, 1989, 8925736

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.11 **14 Claims**



1. A radiation detector having a defined field of view in relation to a receiving surface provided within the detector, comprises an electro-optic device with a radiation sensitive layer separate from the receiving surface, there being an optical transmission path between the receiving surface and the radiation sensitive layer, and a baffle arrangement defining the field of view of the detector each internal surface of the baffle arrangement being reflective, the receiving surface being provided by a layer of optical diffusing material contiguous with the reflective baffle arrangement and having a shape conforming to a part of the volume defined by a portion of each reflective surface of the baffle arrangement adjacent to the apex of that volume.

5,113,070

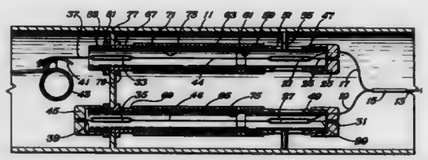
TEMPERATURE COMPENSATOR FOR AN OPTIC FIBER PRESSURE TRANSDUCER

John Douglas Smith, Houston, Tex., assignor to ABB Vetco Gray Inc., Houston, Tex.

Filed Mar. 29, 1991, Ser. No. 677,714

Int. Cl.[5] H01J *5/16, 40/14*

U.S. Cl. 250—227.21 **17 Claims**



1. In an instrument for measuring pressure of a type having a pair of optic fibers located in the housing, one of the optic fibers being a sensing leg and the other of the optic fibers being a reference leg, the sensing leg being connected to a pressure transducer for changing the length of the leg in response to pressure changes, each leg having a reflective end and being connected on an opposite end to an optical coupler/splitter for receiving and reflecting back light which is processed to determine the pressure sensed, the improvement comprising in combination:

means including an elongated reference compensating member extending parallel to the reference leg for applying selected tension to and selectively varying the length of the reference leg;

means including an elongated sensing compensating member extending parallel to the sensing leg for applying selected tension to and selectively varying the length of the sensing leg; and

the reference and sensing compensating members being expansible in response to temperature change to change said lengths of the reference and sensing legs, respectively, in response to temperature change, to nullify the effect of movement of the pressure transducer in response to temperature changes.

5,113,071

ENCODER IN WHICH SINGLE LIGHT SOURCE PROJECTS DUAL BEAMS ONTO GRATING

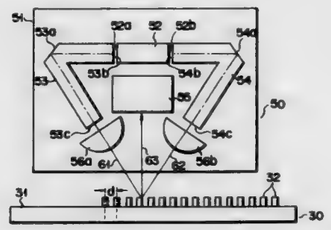
Renshi Sawada, Sayama; Hidenao Tanaka, Tokyo; Osamu Ohguchi, Kawasaki, and Junichi Shimada, Iruma, all of Japan, assignors to Nippon Telegraph & Telephone Corporation, Tokyo, Japan

Filed Apr. 8, 1991, Ser. No. 682,144

Claims priority, application Japan, Apr. 9, 1990, 2-93514

Int. Cl.[5] G01D *5/34*

U.S. Cl. 250—237 G **5 Claims**



1. An encoder comprising:

semiconductor laser means for emitting two coherent light beams from two end faces thereof, said end faces being arranged such that the two coherent light beams intersect each other;

scale means, having a plurality of gratings, for diffracting the two coherent light beams emitted from the end faces of the semiconductor laser and for causing interference between diffracted light beams, to thereby obtain an interference light beam; and

detector means for receiving the interference light beam and detecting an intensity change of the interference light beam, said detector means outputting a signal corresponding to the intensity change which is proportional to a relative moving distance between the detector means and the scale means.

5,113,072

DEVICE HAVING SUPERLATTICE STRUCTURE, AND METHOD OF AND APPARATUS FOR MANUFACTURING THE SAME

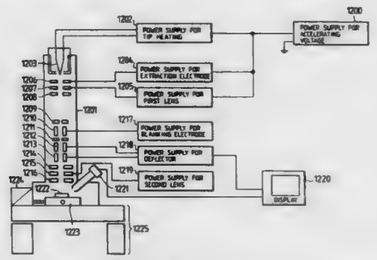
Hiroshi Yamaguchi, Fujisawa; Keiya Saito, Yokohama; Fumikazu Itoh, Fujisawa; Koji Ishida, Musashino; Shinji Sakano, Hachiouji; Masao Tamura, Tokorozawa; Shoji Shukuri, Koganei; Tohru Ishitani, Sayama, and Tsuneo Ichiguchi, Hachiouji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 273,012, Nov. 18, 1988, Pat. No. 4,983,540. This application Oct. 10, 1990, Ser. No. 597,354

Claims priority, application Japan, Nov. 24, 1987, 62-294061

Int. Cl.[5] H01J *37/30*

U.S. Cl. 250—309 **33 Claims**



1. An apparatus for manufacturing a fine structure device, comprising:

a specimen chamber formed inside a vacuum vessel;

a table for mounting a specimen thereon, disposed inside said specimen chamber;

a high intensity ion source;

ion beam extraction electrodes for extracting a high intensity ion beam out of said high intensity ion source;

a charged particle optical system for focusing said high intensity ion beam onto the specimen;

a beam blanking means for serving to turn ON/OFF radiation of said high intensity ion beam on the specimen;

deflection electrodes for scanning the focused high intensity ion beam on the specimen by deflecting the focused high intensity ion beam;

secondary charged-particle detection means for detecting secondary charged-particles generated from a surface of said specimen;

display means for visually observing said specimen by displaying the secondary charged-particle image detected by said secondary charged-particle detection means; and

reactive gas assist etching means for forming a groove of sharp sectional shape having no redeposition material by reactive gas-assist-ion beam etching by projecting said focused ion beam scanned by said deflection electrodes on the surface of the specimen, said reactive gas assist etching means including means for supplying reactive gas onto the surface of the specimen in accordance with said secondary charged-particle image displayed on the display means.

5,113,073

METHOD AND APPARATUS FOR SPECTROSCOPIC QUANTITATIVE ANALYSIS OF GASES IN GAS MIXTURES

Reiner Szepan, Electrastrasse 26a, Munich D-8000, Fed. Rep. of Germany

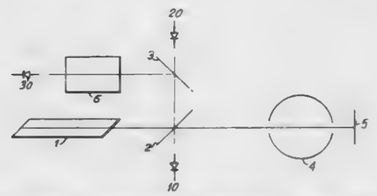
PCT No. PCT/EP89/00596, § 371 Date Mar. 20, 1990, § 102(e) Date Mar. 20, 1990, PCT Pub. No. WO89/12222, PCT Pub. Date Dec. 14, 1989

PCT Filed May 31, 1989, Ser. No. 460,935

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1988, 3819531

Int. Cl.[5] G01N *21/59;* **G01J** *3/433*

U.S. Cl. 250—343 **18 Claims**



1. A method of spectroscopic quantitative analysis of gases in gas mixtures with which monochromatic light of at least two wavelengths is used in periodically alternating fashion, the light of at least one wavelength being characteristic and the light of at least one other wavelength being uncharacteristic of the transmission of the gas to be determined, wherein this transmission generates electrical signals which comprise harmonic components of at least one uneven Fourier frequency of an emission period the amplitude of which is proportional to the concentration of the gas to be determined in the gas mixture and which vanishes together with the concentration.

5,113,074

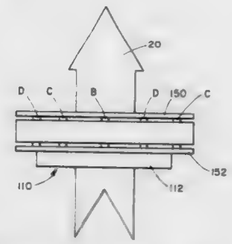
ION BEAM POTENTIAL DETECTION PROBE

Piero Sferlazzo, Linnfield, Mass., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 29, 1991, Ser. No. 647,509

Int. Cl.[5] H01J *37/317*

U.S. Cl. 250—492.2 **11 Claims**



1. An ion implanter comprising:

a) an ion source for providing an ion beam which treats one or more semiconductor wafers positioned at an ion implantation station;

b) a beam analyzer for analyzing ions within the ion beam and directing ions of an appropriate mass to a travel path impacting one or more semiconductor wafers at the implantation station;

c) a beam neutralizer for injecting neutralizing particles into the ion beam prior to the ion beam reaching the wafer implantation station;

d) a sensor positioned relative the ion beam travel path for monitoring ion beam potential during ion beam calibration and/or implantation comprising a first electrode biased at

a control potential to repulse low energy ions leaving the ion beam and further comprising a second electrode for sensing ion current exiting the ion beam as a function of the control potential on the first electrode to determine the ion beam potential;

e) wafer support structure for positioning the one or more semi-conductor wafers at the implantation station; and

f) an electronic control for adjusting the rate neutralizing particles are injected into the ion beam based on sensed ion beam potential.

5,113,075

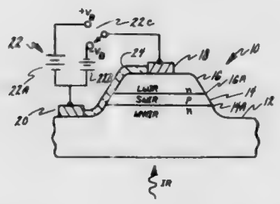
Patent Not Issued For This Number

5,113,076

TWO TERMINAL MULTI-BAND INFRARED RADIATION DETECTOR

Eric F. Schulte, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Dec. 19, 1989, Ser. No. 452,891
Int. Cl.[5] G01J *1/00*; G01T *1/24*; H01L *25/00, 31/00*
U.S. Cl. 250—370.06 **22 Claims**



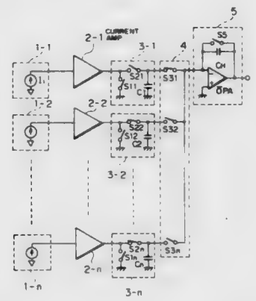
1. A radiation detector comprising a first region of semiconductor material having a first type of electrical conductivity and an energy bandgap responsive to radiation in a first spectral region, a second region of semiconductor material in contact with the first region of semiconductor material, the second region of semiconductor material having a second type of electrical conductivity, and a third region of semiconductor material in contact with the second region of semiconductor material, the third region of semiconductor material having the first type of electrical conductivity and an energy bandgap responsive to radiation in a second spectral region of longer wavelength than that of said first region, and further comprising first and second electrical contacts between which said first, second and third regions form first and second p-n junctions electrically coupled back-to-back in series.

5,113,077

RADIATION DETECTION CIRCUIT HAVING A SIGNAL INTEGRATING CAPACITOR, AND A DATA AQUISITION SYSTEM FOR AN X-RAY SCANNER INCLUDING SUCH CIRCUIT

Toshihiko Shimizu, Hachioji; Masao Hotta, Hanno, and Atsushi Moritani, Yokohama, all of Japan, assignors to Hitachi Medical Corporation, Chiyoda, Japan

Filed Sep. 27, 1990, Ser. No. 588,718
Claims priority, application Japan, Oct. 5, 1989, 1-261017
Int. Cl.[5] G01T *1/24*
U.S. Cl. 250—370.11 **14 Claims**



1. A radiation detection circuit comprising:

a radiation detector having a first terminal for connection to a power supply voltage and a second terminal for providing a current output in response to a radiation signal;

a current amplifier including (i) an operational amplifier having an inverting input terminal directly connected to the second terminal of said radiation detector to amplify the current output, a non-inverting input terminal for connection to the power support voltage, and an output terminal, and (ii) a PNP transistor having its base connected to the output terminal of said operational amplifier, a feedback resistor connected between the emitter of said PNP transistor and the inverting input terminal of said operational amplifier, an amplifying resistor for connection between the emitter of said PNP transistor and the power supply voltage, and means connecting the collector of said PNP transistor as the current amplifier output terminal; and

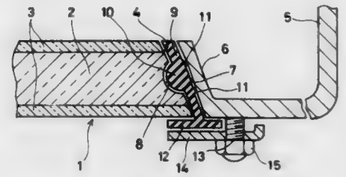
an integrator connected to the current amplifier output terminal for integrating the output of said current amplifier for a predetermined time period to produce charge information.

5,113,078

RADIATION SHIELDING STRUCTURE

Yoshiharu Takashi, and Yoshiyuki Kihara, both of Ibaraki, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Nov. 29, 1990, Ser. No. 619,580
Claims priority, application Japan, Jan. 12, 1989, 1-310517
Int. Cl.[5] G21F *7/03*
U.S. Cl. 250—515.1 **3 Claims**



1. A radiation shielding structure comprising:

a radiation shielding panel including a lead transparent plate and a nonlead transparent plate which is laminated on at least one side of said lead transparent plate; and

a gasket which is fitted to the outer peripheral edge of said radiation shielding panel to hermetically seal the area between said radiation shielding panel and a panel mounting portion,

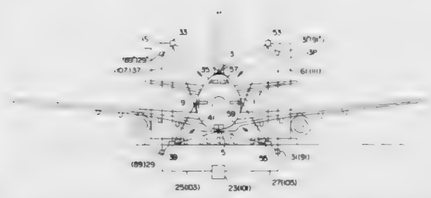
wherein the outer peripheral edge of said radiation shielding panel is formed with a gasket fitting recess which is fitted with a positioning projection that is integrally formed on the inner peripheral edge of said gasket.

5,113,079

NON-DESTRUCTIVE TESTING OF AIRCRAFT FOR STRUCTURAL INTEGRITY USING HOLOGRAPHIC MOIRE PATTERNS

Robert D. Matulka, 3531 Half Moon Cir., Falls Church, Va. 22044-1311

Filed Sep. 5, 1990, Ser. No. 577,509
Int. Cl.[5] G02B *27/42*
U.S. Cl. 250—550 **19 Claims**



1. A method of non-destructively testing an object to determine the presence of areas of non-uniform strain, comprising:

(a) projecting a reference interference pattern on a surface of an object to be non-destructively tested for areas of non-uniform strain, said object being in a first stressed condition;

(b) recording a first hologram of said surface, with said reference interference pattern projected thereon, at a first time in said first stressed condition on a first holographic recording medium;

(c) recording a second hologram of said surface, with said references interference pattern projected thereon, at a second time in said first stressed condition on a second holographic recording medium;

(d) inducing a second state of stress in said object to put said object into a second stressed condition;

(e) recording at least one additional hologram of said surface, with said reference interference pattern projected thereon, in said second stressed condition;

(f) holographically reconstucting the surface by superposing said first and second holograms to generate a moire pattern revealing normal surface irregularities of said surface of the object in said first stressed condition; and

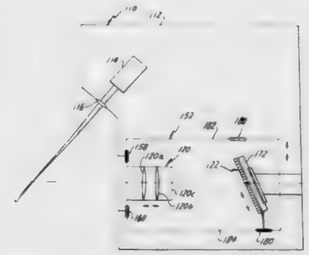
(g) superposing one of said first and second holograms and one of said at least one additional hologram to generate a moire pattern revealing non-uniform areas of stress-induced strain on said surface o said object.

5,113,080

NON-LINEAR DISPLACEMENT SENSOR BASED ON OPTICAL TRIANGULATION PRINCIPLE

Ming C. Leu, Pinebrook, and Zhiming Ji, Kearny, both of N.J., assignors to New Jersey Institute of Technology, Newark, N.J.

Filed Jul. 10, 1990, Ser. No. 550,628
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 **18 Claims**



1. An optical displacement measuring apparatus utilizing triangulation, comprising:

projecting means for projecting a light beam with a first optical axis onto a surface of an object whose displacement is to be measured;

detector means for receiving light reflected from the object and for generating a positional signal as an image displacement δ;

light receiving means for receiving the light reflected from the object and for supplying said reflected light to said detector means along a second optical axis intersecting said first optical axis at angle θ, said detector means being inclined at angle ϕ with respect to said second optical axis;

determining means for non-linearly determining surface displacement as a function of said image displacement δ and said angles ϕ and θ, with the relationship between said image displacement δ, said surface displacement and said angles ϕ and θ always being identical, regardless of the angle ϕ.

5,113,081

WEB INSPECTION SYSTEM AND METHOD WITH EXPOSURE, DETECTION AND SAMPLING MEANS

Steven M. Bryant, Holley, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1990, Ser. No. 634,982
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—571 **8 Claims**

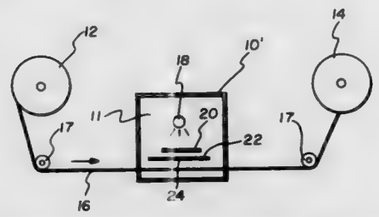
1. A process for measuring a radiation sensitive optical property of a web of material comprising the steps of:

providing a strip of indeterminate length of such web material;

sequentially exposing longitudinally spaced transverse bands of said strip to first radiation for brief periods of time to thereby fix said optical property in each of the transverse bands while transporting said strip longitudinally at a predetermined nominal speed selected so that said strip

moves only a minor fraction of the width of each band during the exposure of each band;

subsequently exposing the strip to second radiation and sensing the amount of transmitted or reflected radiation to produce a pulsed signal waveform having peak amplitudes proportional to such transmitted or reflected radiation at each of said bands;



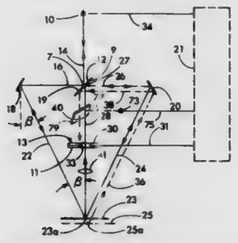
sequentially sampling the peak amplitudes of said pulsed signal waveform to generate an output signal having components thereof which are representative of the optical property of the web material independent of variations from the predetermined nominal speed at which the strip is transported during exposure to said first radiation.

5,113,082

ELECTRO-OPTICAL INSTRUMENT WITH SELF-CONTAINED PHOTOMETER

Moshe Golberstein, 2100 Drew Ave. South, Minneapolis, Minn. 55416

Filed Sep. 11, 1990, Ser. No. 580,824
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—571 **29 Claims**



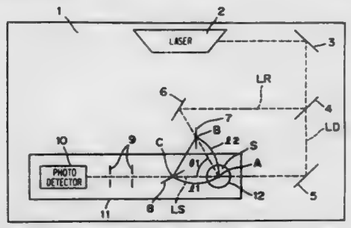
1. An optical instrument for measuring characteristics of a specimen comprising, a light source, an axial reflective member spaced from the light source to define an optical axis for the instrument along a line between the light source and the reflective member, a non-axial reflector positioned laterally of the reflective member and laterally of the optical axis to receive a beam reflected from the axial reflective member, said non-axial reflector being oriented to reflect the beam onto the specimen, a photosensor, a second non-axial reflector to receive the beam reflected from the specimen and reflect it onto the photosensor, said photosensor being positioned in the instrument to receive the beam from the second non-axial reflector, and means for carrying signals from the photosensor to signal conditioning hardware means to provide information concerning the specimen responsive to said signals from said photosensor.

5,113,083

LIGHT SCATTERING MEASURING APPARATUS UTILIZING A PHOTODETECTOR MOUNTED ON A ROTARY STAND

Koichi Oka, Otsu; William Otani, Koga; Yasuhiro Kubo, Koga; yasushi Zasu, Koga, and Motonobu Akagi, Koga, all of Japan, assignors to Otsuka Electronics Co., Ltd., Osaka, Japan

PCT No. JP89/00717, § 371 Date Mar. 26, 1990, § 102(e) Date Mar. 26, 1990
PCT Filed Jul. 17, 1989
Claims priority, application Japan, Jul. 25, 1988, 63-185142
Int. Cl.[5] G01N *15/06*
U.S. Cl. 250—574 **11 Claims**



1. A light scattering measuring apparatus comprising:

splitting means for splitting a coherent light into a direct light which is to be incident upon a sample and a reference light which is not to be incident upon said sample;

a half-mirror upon which is incident the scattered light emitted from said sample upon which said direct light has been incident;

a photodetector for receiving the light transmitted through said half-mirror;

reference light guiding means for guiding said reference light,

said half-mirror and said photodetector being integrally rotatable around a first rotary shaft passing through said sample, said reference light guiding means being disposed such that the light emitting direction thereof is rotatable around a second rotary shaft, said half-mirror being rotatable about its own axis around a third rotary shaft, said first, second and third rotary shafts being parallel to one another, said direct, reference and scattering lights being transmitted on the same plane defined perpendicularly to said first, second and third rotary shafts; and

synchronized rotating mechanism adapted to change, according to the rotation angle around said first rotary shaft, the rotation angle of said second rotary shaft being such that said reference light emitted from said reference light guiding means is incident upon said half-mirror, and the rotation angle of said third rotary shaft being such that the optical path of said reference light is identical with that of said scattering light at the light emitting side of said half mirror,

whereby the light resulting from the spatial mixing of aid scattered light emitted from said sample and said reference light, is observed.

5,113,084

PLANETARY GEAR FOR STARTER MOTOR

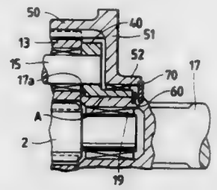
Shuzou Isozumi, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jun. 21, 1991, Ser. No. 718,516
Claims priority, application Japan, Jul. 10, 1990, 2-183276
Int. Cl.[5] F02N *15/06*
U.S. Cl. 290—48 **8 Claims**

1. A planet gear speed-reducing starter in which the rotation of an armature rotary shaft (**2**) is applied through a planet gear speed-reducing mechanism (**13**) to an output rotary shaft (**17**) coupled to said planet gear speed-reducing mechanism (**13**), which comprises:

a carrier (**40**) fitted on the rear end portion of said output rotary shaft (**17**), said carrier (**40**) embedding support pins (**15**) supporting the planetary gears of said planet gear speed-reducing mechanism (**13**);

a first positioning means (**20, 53, 70, 80**) for preventing the movement of said output shaft in an axial direction thereof; and



a second positioning means (**17***a*, **53**, **60**, **80**) for preventing the movement of said carrier in an axial direction thereof;

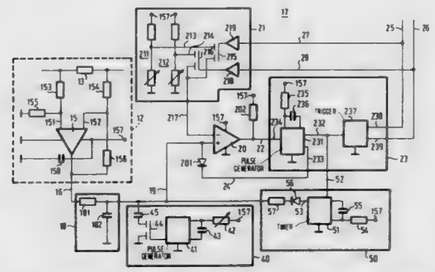
in which said carrier (**40**) and said output rotary shaft (**17**) being slidable with a predetermined torque.

5,113,085

CIRCUIT ARRANGEMENT FOR SUPPLYING A LOAD

Ralf Schäfer, and Armin Wegener, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 23, 1990, Ser. No. 573,523
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1989, 3928809
Int. Cl.[5] H03K *17/51, 17/56;* **H02M** *7/53*
U.S. Cl. 307—239 **5 Claims**



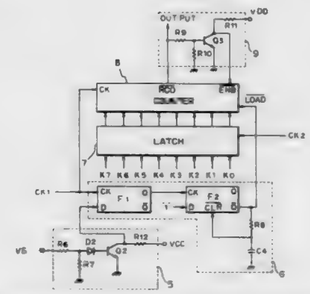
1. A circuit arrangement for supplying a load (**1**) from a direct voltage source (**14**) through a switch bridge (**3** to **6**), by which the direct voltage source (**14**) can be connected in alternating polarity to the load (**1**), comprising a control circuit (**17**) for controlling the switch bridge (**3** to **6**), characterized by a device (**12**) for measuring a current (**11**) through the load (**1**) and supplying a corresponding measurement value and in that the control circuit (**17**) comprises an integration stage (**18**) for integrating the measurement value, a comparison stage (**20**) for comparing the integrated measurement value with a reference value and for supplying a switching signal when these values correspond to each other and a signal-producing stage (**23**) for resetting the integration stage (**18**) to an initial state and for reversing the polarity of the current (**11**) through the load (**1**) upon the occurrence of the switching signal and wherein a half wave lengthening stage (**40**) is provided for enlarging the time interval of the occurrence of the switching signal in a time period that can be chosen immediately after the circuit arrangement has been put into operation.

5,113,086

POLAROTATOR PULSE GENERATOR CIRCUIT FOR A RECEIVER OF SATELLITE BROADCASTING

Seong-Jae Cho, Anyang, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 18, 1990, Ser. No. 524,916
Claims priority, application Rep. of Korea, Dec. 20, 1989, 89-19361
Int. Cl.[5] H03K *4/00, 5/13, 5/59, 21/00*
U.S. Cl. 307—260 **14 Claims**



1. A polarotator control signal generator circuit for a satellite broadcasting receiver, comprising:

a sine-to-square converter for converting a sine wave of an AC power supply to a square wave;

a clock synchronizer for synchronizing the square wave of said sine-to-square converter with a high frequency clock signal and providing a loading instance control signal;

a latch for receiving data representative of a desired pulse width and for providing said data to a counter in response to a first clock signal;

said counter for counting said high frequency clock signal from a start value determined by the data provided from said latch and loaded in said counter in response to said loading instance control signal and for generating polarotator control signals until said counter reaches a predetermined final count; and

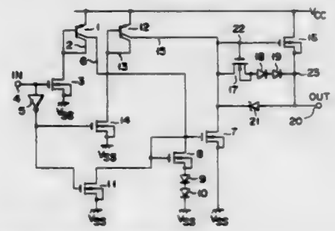
a counter disable means for stopping the count, until a next loading instance control signal is received by said counter, when said counter reaches said predetermined final count.

5,113,087

OUTPUT CIRCUIT

Masaji Ueno, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 382,384, Jul. 20, 1989, abandoned. This application Jun. 26, 1991, Ser. No. 723,662
Claims priority, application Japan, Jul. 22, 1988, 63-182943
Int. Cl.[5] H03K *5/12*
U.S. Cl. 307—263 **9 Claims**



1. An output circuit comprising:

input signal supply means for simultaneously outputting first

and second signals from two output nodes, said first and second signals having different levels which change in a complementary manner;

first and second switching means which are turned on and off in a complementary manner upon receipt of the first and second signals, respectively, supplied from said input signal supply means;

first level shift means connected between said first switching means, and a high potential level, for outputting a first drive signal when said first switching means is turned on upon receipt of the first signal;

first MOS transistor having a drain coupled to said high potential level, and a gate coupled to receive the first drive signal supplied from said first level shift means;

an output terminal coupled to a source of said first MOS transistor;

first drain-current control means connected between said gate-source path of said first MOS transistor, for maintaining a drain current of said first MOS transistor at a predetermined value;

second level shift means connected between said second switching means and said high potential level, for outputting a second drive signal when said second switching means is turned on upon receipt of the second signal;

second MOS transistor having a gate coupled to receive the second drive signal supplied from said second level shift means, and having a drain and source respectively connected to said output terminal and a ground level; and

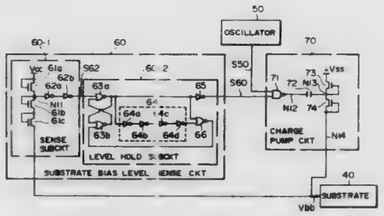
second drain current control means connected between said gate-source of said second MOS transistor, for maintaining a drain current of said second MOS transistor at a predetermined value.

5,113,088

SUBSTRATE BIAS GENERATING CIRCUITRY STABLE AGAINST SOURCE VOLTAGE CHANGES

Takayuki Yamamoto, and Sampei Miyamoto, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 433,213, Nov. 7, 1989, abandoned. This application May 7, 1990, Ser. No. 519,572
Claims priority, application Japan, Nov. 9, 1988, 63-283448
Int. Cl.[5] H03K *3/01*
U.S. Cl. 307—296.2 **6 Claims**



1. Substrate bias generating circuitry for biasing a voltage level on a substrate, comprising:

a level sensing circuit means for sensing the voltage level and producing a control signal associated with the sensed voltage level;

level holding circuit means, including a delay circuit coupled to an ouput of said level sensing circuit means, for holding the control signal in an enable state for at least a predetermined duration determined by said delay circuit, the predetermined duration being at least four times as long as a given minimum completion duration;

an oscillator for generating oscillator pulses; and

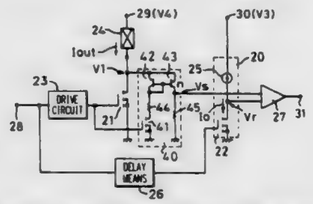
a charge pump circuit for pumping the voltage level of the substrate in a pumping operation of a duration at least as long as the given minimum completion duration, said charge pump circuit including means for storing charges and being responsive to the oscillator pulses and the control signal to charge said storing means when the control signal is in the enable state, and to discharge the charges from said storing means to the substrate.

5,113,089

CURRENT SENSING CIRCUIT

Yasuo Osawa, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Aug. 29, 1990, Ser. No. 574,098
Claims priority, application Japan, Sep. 20, 1989, 1-242024
Int. Cl.[5] H03K *5/153, 5/24, 17/08, 17/18*
U.S. Cl. 307—350 **5 Claims**



1. A current sensing circuit for sensing a load current flowing through a load, comprising:

a first MOS transistor having a gate electrode and having a source-to-drain path connected in series with the load to carry the load current with a corresponding source-to-drain voltage;

means for supplying an input signal;

reference voltage generating means including a second MOS transistor and a constant current source serially connected with the source-drain path of the second MOS transistor, for generating a reference voltage;

means for coupling the input signal to the gate electrodes of said MOS transistors;

circuit means for producing an output voltage proportional to the source-to-drain voltage of the first MOS transistor; and

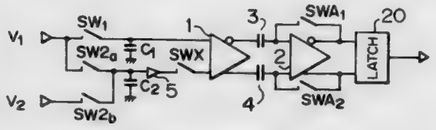
comparing means for comparing the output voltage of the circuit means with the reference voltage to indicate whether the load current is above a predetermined current value corresponding to the reference voltage.

5,113,090

VOLTAGE COMPARATOR

Eiki Imaizumi, Akishima; Kunihiko Usui, Asaka; Tatsuji Matsuura, Kokubunji; Toshiro Tsukada, Hachioji; Seiichi Ueda, and Hiroshi Sato, both of Takasaki, all of Japan, assignors to Hitachi Ltd., Chiyoda and Hitachi VLSI Engineering Corporation, Kodaira, both of, Japan

Filed Aug. 29, 1990, Ser. No. 574,087
Claims priority, application Japan, Aug. 30, 1989, 1-221457
Int. Cl.[5] H03K *5/24*
U.S. Cl. 307—355 **9 Claims**



1. A voltage comparator comprising:

a differential amplifier having one and another inputs;

a first switch connected between a sample-and-hold capacitor for said one input of said differential amplifier and a first input node;

a second switch connected between a sample-and-hold capacitor for said another input of said differential amplifier and said first input node;

a third switch connected between said sample-and-hold capacitor for said another input of the differential amplifier and a second input node; and

a fourth switch connected between the sample-and-hold capacitor for said another input and said another input of said differential amplifier;

wherein, by turning said first switch and said second switch on, the voltage of said sample-and-hold capacitor for said one input of said differential amplifier and the voltage of the sample-and-hold capacitor for said another input are set to a voltage responsive to the voltage of said first input node;

wherein, in turn by turning said second switch off, said third switch on, and said fourth switch off thereafter, the voltage of the sample-and-hold capacitor for said another input is set to a voltage responsive to the voltage of said second input node, and said another input of said differential amplifier is made non-responsive to the voltage of said second input node; and

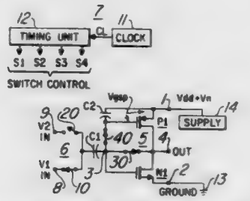
wherein, then, by further turning said third switch off and said fourth switch on thereafter, said another input of said differential amplifier is set to the voltage of the sample-and-hold capacitor for said another input.

5,113,091

APPARATUS AND METHOD FOR COMPARING SIGNALS

Wei-chan Hsu, Plano, and William R. Krenik, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 560,259, Jul. 27, 1990, abandoned, which is a continuation of Ser. No. 196,596, May 20, 1988, abandoned. This application Mar. 19, 1991, Ser. No. 672,146
Int. Cl.[5] H03K *5/24*
U.S. Cl. 307—355 **14 Claims**



1. A method of comparing plural input signals, comprising the steps of:

selectively applying said input signals to an amplifier having an input node and an output node;

coupling said input node and said output node together to produce a self-bias voltage for said amplifier during a first time interval when one of said input signals is applied;

coupling a storage capacitor to said input node and to said output node during a portion of said first time interval to store said self-bias voltage in said storage capacitor;

decoupling said storage capacitor from said input node and said output node during a second portion of said first time interval, said input node and said output node continuing to be coupled together during said second portion of said first time interval; and

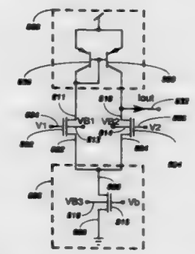
applying said stored voltage to a selected transistor of said amplifier for controlling the conduction thereof.

5,113,092

DIFFERENTIAL VOLTAGE COMPARATOR

Barry W. Herold, Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1990, Ser. No. 576,041
Int. Cl.[5] H03K *5/153*
U.S. Cl. 307—356 **25 Claims**



18. A voltage comparator circuit, comprising:

a biasing network for providing a bias current;

a loading network for regulating a load current;

a differentially coupled transistor pair, each transistor of the differentially coupled transistor pair having a drain coupled to the loading network, a source coupled to the biasing network, a body coupled to a body effect voltage potential, and a gate, the differentially coupled transistor pair being arranged such that a first and second input signals are respectively received by the gates of the transistors, and each transistor body of the differentially coupled transistor pair being coupled to a different body effect voltage potential; and

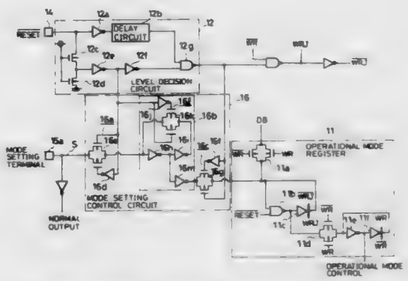
an output port coupled to one of the drains of the transistor pair.

5,113,093

SEMICONDUCTOR INTEGRATED CIRCUIT WITH MULTIPLE OPERATION

Tetsu Tashiro; Minoru Takeuchi; Yoshiyuki Ishimaru; Shinichi Hirose, and Kazuo Hayashi, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1990, Ser. No. 550,604
Claims priority, application Japan, Jul. 11, 1989, 1-178417
Int. Cl.[5] H03K *19/094*
U.S. Cl. 307—465 **4 Claims**

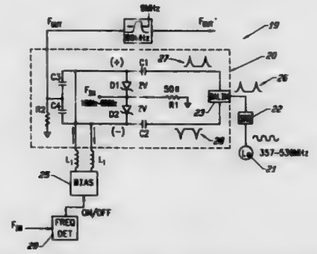


1. A semiconductor integrated circuit responsive to operational mode control information set in an operational mode setting unit to set a plurality of operational modes such as user and test modes, characterized by

operational mode control means for setting a predetermined operational mode control information in said operational mode setting unit at a transitional edge of a reset input when said reset input takes a first level change and opera-

tional mode control information inputted at a predetermined terminal of an input/output terminal in said operation mode setting unit when said reset input takes a second level change.

5,113,094
METHOD AND APPARATUS FOR INCREASING THE HIGH FREQUENCY SENSITIVITY RESPONSE OF A SAMPLER FREQUENCY CONVERTER
Martin I. Grace, San Jose; Peter M. Kapetanic, Morgan Hill, and Eric C. Liu, Milpitas, all of Calif., assignors to Wiltron Company, Morgan Hill, Calif.
Filed Mar. 13, 1990, Ser. No. 492,763
Int. Cl.[5] G06G *7/00*; H03B *19/00*
U.S. Cl. 307—529 **14 Claims**



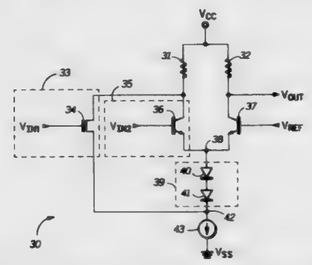
1. A sampler frequency converter having a first and a second diode, each of said diodes having an anode and a cathode, comprising:
means for applying an input signal having a frequency F_{IN} to a node located between said cathode of said first diode and said anode of said second diode;
means for providing positive and negative pulses having identical pulse repetition rates F_{LO} to said anode of said first diode and said cathode of said second diode, respectively;
means for coupling said anode of said first diode and said cathode of said second diode to a signal line so as to provide on said signal line an output signal having a frequency F_{OUT} which is defined by the relationship

$$F_{OUT}=|F_{IN}\pm N\times F_{LO}|$$

where N is an integer harmonic number, 1, 2, 3 . . . , and an amplitude which varies as a function of (sin x)/x where $x=F_{IN}$;
means for filtering said output signal having said frequency F_{OUT} so as to provide an output signal having a frequency $F_{OUT'}$ which comprises a predetermined band of frequencies; and
means for forward biasing said diodes when the frequency F_{IN} of said input signal is above a predetermined frequency whereby the nulls which occur in said (sin x)/x relationship occur at a lower frequency after said biasing than before said biasing.

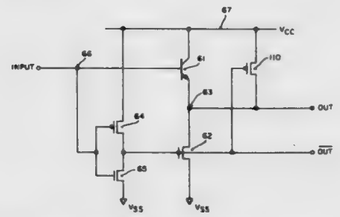
5,113,095
BICMOS LOGIC CIRCUIT WITH A CML OUTPUT
Karl J. Hueske, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.
Continuation-in-part of Ser. No. 574,178, Aug. 29, 1990, abandoned. This application Mar. 25, 1991, Ser. No. 675,042
Int. Cl.[5] H03K *19/02, 19/0175*
U.S. Cl. 307—446 **19 Claims**

1. A logic circuit comprising:
a first resistor having a first terminal coupled to a first power supply voltage terminal, and a second terminal;
a second resistor having a first terminal coupled to said first power supply voltage terminal, and a second terminal;
a reference bipolar transistor having a collector coupled to said second terminal of said second resistor for providing an output signal, a base for receiving a reference voltage, and an emitter;
a second bipolar transistor having a collector coupled to said second terminal of said first resistor, a base for receiving a first input voltage of a predetermined logic level, and an emitter coupled to said emitter of said reference bipolar transistor;



a current source coupled to a second power supply voltage terminal;
means coupled to said current source for providing a voltage differential between said emitter of said reference bipolar transistor and said current source; and
at least one MOS transistor, each of said at least one MOS transistor having a first current electrode coupled to said second terminal of said first resistor, a gate for receiving a second input voltage characterized as being a CMOS-level signal, and a second current electrode coupled to said current source.

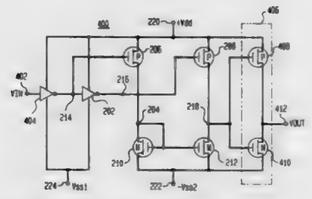
5,113,096
BICMOS CIRCUIT
Lavi A. Lev, San Jose, Calif.; Ian A. Young, and Jeffrey K. Greason, both of Portland, Oreg., assignors to Intel Corporation, Santa Clara, Calif.
Continuation-in-part of Ser. No. 540,342, Jun. 19, 1990, Pat. No. 5,049,765. This application Apr. 2, 1991, Ser. No. 679,637
Int. Cl.[5] H03K *19/02*
U.S. Cl. 307—446 **12 Claims**



1. A BiCMOS logic gate providing both inverting and non-inverting output signals comprising:
a bipolar transistor having its collector coupled to a first operating potential, its base connected to an input node and its emitter coupled to a non-inverting output node;
a first field-effect device coupled between said non-inverting output node and a second operating potential;
second and third field-effect coupled as a CMOS inverter connected between said first and second operating potentials, the inverting output node of said inverter being coupled to the gate of said first field-effect device and also providing said inverting output signal of said circuit;

a fourth field-effect connected between said first operating potential and said non-inverting output node, the gate of said fourth field-effect device being driven by said inverting output node;
the gates of said second and third field-effect devices being connected to said input node such that when a logical high signal is applied to said input node said non-inverting output node is driven to a high logic state approximately equal to said first operating potential and said inverting output node is driven to a low logic state approximately equal to said second operating potential, and when a logic low signal is applied to said input node said non-inverting output node is driven to said low logic state and said inverting output node is driven to said high logic state.

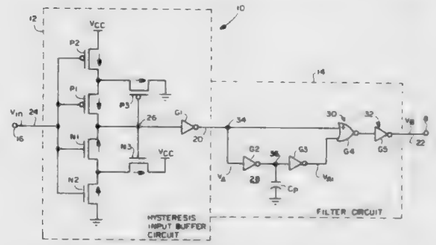
5,113,097
CMOS LEVEL SHIFTER CIRCUIT
Sywe N. Lee, Lawrenceville, N.J., assignor to David Sarnoff Research Center, Inc., Princeton, N.J.
Continuation of Ser. No. 470,274, Jan. 25, 1990, abandoned. This application May 2, 1991, Ser. No. 696,981
Int. Cl.[5] H03K *19/0175, 19/20*
U.S. Cl. 307—475 **10 Claims**



8. A level shifter circuit comprising:
a pair of voltage buses;
first and second p-channel MOS transistors and third and fourth n-channel MOS transistors;
each transistor having a gate to control conduction therethrough;
the first and third transistors being connected in series between the pair of voltage buses;
the second and fourth transistors being connected in series between the pair of voltage buses;
a node between the first and third transistors being connected to the gates of the third and fourth transistors;
means for applying an input signal having one of first and second levels to the gate of the first transistor; and
means for applying the inverse of the input signal to the gate of the second transistor; and
a node between the second and fourth transistors being coupled to one of the voltage buses through one of the second and fourth transistors in response to the first level signal and to the other of the voltage buses through the other of the second and fourth transistors in response to the second level input signal;
each of the field effect transistors being a thin field effect transistor which is formed on a non-semiconductor substrate.

5,113,098
GLITCH REMOVER CIRCUIT FOR TRANSMISSION LINKS
Sassan Teymouri, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Mar. 29, 1991, Ser. No. 677,550
Int. Cl.[5] H03B *1/00*; H03K *5/00*
U.S. Cl. 307—520 **6 Claims**

1. A glitch remover circuit for removing glitches and spikes from control signals received on a SCSI bus line that is coupled from a transmission line, comprising:
input buffer means (**12**) being responsive to control signals received at its input fore removing noise spikes around the threshold point of its input on both the rising and falling edges of said control signals so as to provide a pulsed output voltage;
said input buffer means including a Schmitt trigger type circuit having a transfer characteristic with hysteresis;
said Schmitt trigger type circuit being formed of first through third N-channel MOS transistors (**N1–N3**), first through third P-channel MOS transistors (**P1–P3**), and an inverter gate (**G1**);
said first N-channel transistor (**N1**) having its gates connected to the gate of said first P-channel transistor (**P2**) and its drain connected to the drain of said first P-channel transistor (**P1**), said first N-channel and P-channel transistors having their gates connected together and to receive said control signals and having their drains connected together and to the input of said inverter gate (**G1**);
said second N-channel transistor (**N2**) having its drain connected to the source of said first N-channel transistor (**N1**), its gate connected to the gate of said first N-channel transistor (**N1**), and its source connected to a ground

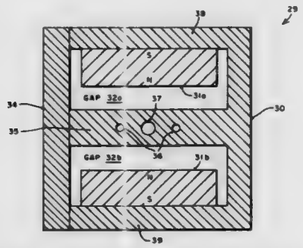


potential, said third N-channel transistor (**N3**) having its drain connected to a supply potential, its gate connected to the input of said inverter gate (**G1**), and its source connected to the drain of said second N-channel transistor (**N2**);
said first P-channel transistor (**P1**) having its gate connected to the gate of said second P-channel transistor (**P2**) and its source connected to the drain of said second P-channel transistor (**P2**);
said second P-channel transistor (**P2**) having its source connected to the supply potential, said third P-channel transistor (**P3**) having its source connected to the drain of said second P-channel transistor (**P2**), its gate connected to the input of said inverter gate (**G1**), and its drain connected to the ground potential, the output of said inverter gate (**G1**) providing the pulsed output voltage;
filtering means (**14**) responsive to said pulsed output voltage for generating a filtered pulsed signal at an output terminal only when said pulsed output voltage has a pulse width which is longer than a predetermined time; and
said filtering means being formed of delay means (**28**), gating means (**30**) and inverter means (**32**).

5,113,099
ROTARY ACTUATOR FOR MAGNETIC RECORDING
King L. Wong, Cupertino, and Frank Morris, San Jose, both of Calif., assignors to Maxtor Corporation, San Jose, Calif.
Filed Jul. 16, 1991, Ser. No. 730,633
Int. Cl.[5] H02K *41/00*
U.S. Cl. 310—13 **15 Claims**

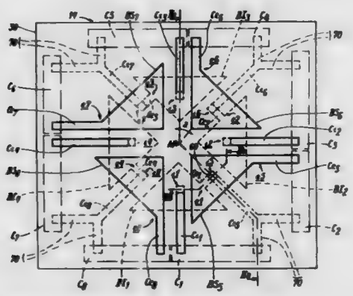
1. A centerpole member mounted along the radial line of movement of a moveable coil within a rotary actuator assem-

bly, comprising a piece of solid material highly conductive to magnetic flux, said member having a centrally-located void



which increases the response time of said actuator without significantly reducing the flux density within said member.

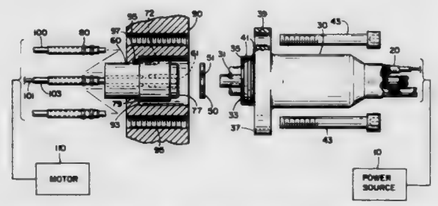
5,113,100
ENERGIZATION COIL DEVICE, A METHOD OF MAKING SUCH A DEVICE AND AN ELECTROMAGNETIC MICROMOTOR FITTED THEREWITH
Daho Taghezout, Lausanne, Switzerland, assignor to Eta SA Fabriques d'Ebauches, Switzerland
Filed Feb. 28, 1991, Ser. No. 664,002
Claims priority, application France, Mar. 2, 1990, 90 02772
Int. Cl.[5] H02K *11/00;* **H01L** *23/48*
U.S. Cl. 310—40 MM **11 Claims**



1. An energization coil device comprising:
a substantially planar support element (30) consisting of a semi-conductive substrate;
at least one first planar electromagnetic coil (BI) produced by metallization to form a first layer (CI) in the vicinity of one surface (F1) of the semi-conductive substrate (30);
at least one second planar coil electromagnetic (BS) forming a second layer (CS) superposed on the first layer (CI) in the vicinity of said surface (F1) of the semi-conductive substrate (30), said coil layers (CI, CS) forming a monolithic and integrated electromagnetic arrangement of upper and lower adjacent layers on a common substrate.

5,113,101
WATERTIGHT SEAL FOR PLUG-IN TYPE POTHEAD
Joseph C. Liu, and Brown L. Wilson, both of Tulsa, Okla., assignors to Oil Dynamics, Inc., Tulsa, Okla.
Filed Feb. 11, 1991, Ser. No. 653,699
Int. Cl.[5] H02K *5/132;* **H01R** *13/426;* **F04D** *13/08*
U.S. Cl. 310—87 **17 Claims**

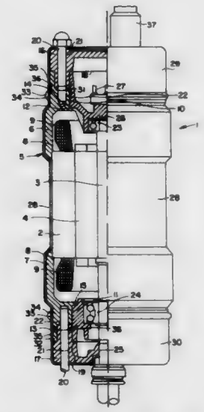
1. In combination, a submersible motor, a water impervious terminal block, leads in water impervious sheaths electrically connecting said motor to said terminal block, a water impervious plug-in-type pothead electrically connecting said terminal block to a source of electrical power, means for providing a watertight seal between said terminal block and said pothead and means for providing a watertight seal between said terminal block and each of said leads whereby the electrical paths defined by said leads, said block and said pothead are sealed against penetration by water.



5,113,102
ROTARY MOTION TRANSMITTER AND HEAT TREATMENT METHOD FOR SEALED CHAMBER
William Gilmore, Livermore, Calif., assignor to Huntington Mechanical Laboratories, Inc., Mountain View, Calif.
Filed May 9, 1991, Ser. No. 697,581
Int. Cl.[5] H02K *5/00;* **H01J** *35/10*
U.S. Cl. 310—88 **14 Claims**

13. A rotary motion for transmitting rotary motion to a sealed chamber, comprising,
a sealed chamber for treating a specimen;
a capsule, the interior of which communicates with the interior of said chamber;
a rotor hermetically sealed within said capsule and having means for rotatingly supporting said rotor in said capsule;
a removable stator positioned to electromagnetically interact with said seled rotor to transmit rotation motion to said rotor;
an output shaft which is rigidly connected to said rotor and extends into said sealed chamber for supporting and positioned an object to be treated in said chamber;
said sealed chamber being maintained under vacuum,
said rotor having permanent magnets, and said means rotatingly supporting said rotor comprising at least one bearing located within said capsule, the interior of said rotor being evacuated and sealed against the vacuum of said capsule and said chamber.

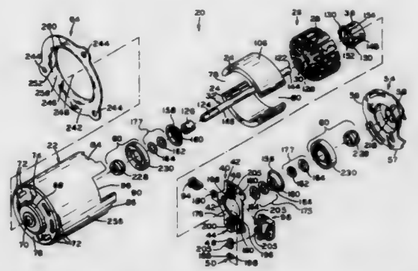
5,113,103
ELECTRIC MOTOR
Albert Blum, Scheiderhöhe, 5204 Lohmar 1, and Günter Krämer, Lothar-Irle-Str. 18, 5900 Siegen 1 (Kaan), both of Fed. Rep. of Germany
PCT No. PCT/DE88/00631, § 371 Date Apr. 5, 1990, § 102(e) Date Apr. 5, 1990, PCT Pub. No. WO89/04079, PCT Pub. Date May 5, 1989
PCT Filed Oct. 13, 1988, Ser. No. 466,251
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1987, 3736159
Int. Cl.[5] H02K *5/00*
U.S. Cl. 310—89 **13 Claims**



1. Electric motor (1; 38; 44) having two end faces and having a housing which embraces the motor tightly and consists of a sheet metal jacket (28), a stator (2) maintained fixedly in the housing (5), a shaft (3), at least one end of which passes out of the housing (5), and two centering pieces (6, 7; 45, 46) arranged on both sides of the stator (2), which have an outside diameter on a side facing the stator (2) which is greater than the stator (2), which embrace the stator (2) positively at its end faces, which abut a stop at the end faces of the stator (2) and which are formed for mounting the shaft, characterized in that the sheet metal jacket (28) consists of stainless steel, that the centering pieces (6, 7; 45, 46) are of thick-walled construction and include outer end sections remote from the stator (2) and which exhibit at least one constriction, that the sheet metal jacket (28) closely abuts a region of the stator (2) which is exposed between the two centering pieces, and the two centering pieces (6, 7; 45, 46), and that the sheet metal jacket tightly, and bearing brackets are inserted into the centering pieces to mount the shaft engages the constriction, and that the two end faces of the motor (1; 38; 44) are sealed by end caps (29, 30) made of stainless steel which embrace the sheet metal jacket (28) tightly.

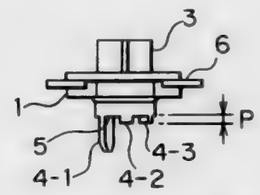
5,113,104
STRUCTURED PRODUCT DYNAMOELECTRIC MACHINE
Harald E. Blaettner, Hendersonville, Tenn.; Richard F. Uhen; Robert E. Ellis; Eldon R. Cunningham; Michael J. Usher, and Joseph E. Miller, all of Ft. Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.
Filed Oct. 19, 1989, Ser. No. 423,827
Int. Cl.[5] H02K *5/16*
U.S. Cl. 310—90 **29 Claims**

1. A structured product dynamoelectric machine utilizing a minimum number of components for a plurality of applications, the Machine comprising:
a unitary frame having an open end, a closed end with a first bearing receiving means therein, and at least two magnet means adhesively retained therein;
end shield means having second bearing receiving means therein and secured to the frame at its open end thereby to enclose the machine;
armature means, including a shaft and commutator means having slots, rotatably associated with the frame and the end shield means for interacting with the magnet means;
brush plate assembly means connected in mounting engagement between the end shield means and the open end of the frame for precisely locating at least two brush means relative to the commutator means;
conductor means secured in mounting engagement between the end shield means and the open end of the frame adjacent the brush plate assembly means and connected to the brush means for conducting electricity thereto;



at least one freely aligning bearing means including a bearing and a retainer having predetermined conditions preset and positioned in the second bearing receiving means for freely aligning the shaft;
bracket means circumferentially disposed about the frame for operatively connecting the machine to any one of the plurality of applications; and
adhesive cured in place between the retainer and the second bearing receiving means for securing the at least one freely aligning bearing means in the second bearing receiving means thereby to maintain the predetermined conditions preset, and adhesive cured in place between the bracket means and the frame for securing the bracket means in its circumferential engagement about the frame.

5,113,105
ROTOR FOR MINIATURE MOTORS
Masakazu Ikegami, and Ryouichi Someya, both of Matsudo, Japan, assignors to Mabuchi Motor Co., Ltd., Chiba, Japan
Filed Oct. 26, 1990, Ser. No. 605,228
Claims priority, application Japan, Oct. 30, 1989, 1-126882[U]
Int. Cl.[5] H02K *13/00*
U.S. Cl. 310—233 **6 Claims**



1. A rotor for miniature motors having a shaft serving as a rotating shaft, a commutator having commutator terminals mounted on a commutator body, said commutator body being

fixedly fitted to said shaft, a rotor core fixedly fitted to said shaft and having rotor windings wound thereon, a plurality of positioning bosses formed in such a manner as to protrude toward a side surface of said rotor core on said commutator body, and a positioning groove, formed on the side surface of said rotor core, into which at least one of said positioning bosses is inserted; said commutator being fixedly fitted by press-fitting said at least one of said positioning bosses into said positioning groove,

said plurality of positioning bosses including a long positioning boss, having a sufficient length to be press-fitted into said positioning groove,

said plurality of positioning bosses including short positioning bosses having a length at least equal to a thickness of an insulating core which may be fitted to the side surface of said rotor core;

said long positioning boss being press-fitted into said positioning groove, and said commutator is fixedly fitted to said shaft in a state where tips of said short positioning bosses are brought into contact with the side surface of said rotor core.

5,113,106

BRUSH HOLDER FOR AN ELECTRICAL COMMUTATING MACHINE

Hans-Dieter Schmid, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

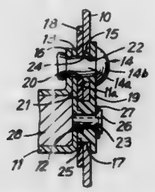
PCT No. PCT/DE89/00352, § 371 Date Oct. 26, 1990, § 102(e) Date Oct. 26, 1990, PCT Pub. No. WO89/12924, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 1, 1989, Ser. No. 603,768

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1988, 8807881[U]

Int. Cl.[5] H02K *13/00*

U.S. Cl. 310—239 **6 Claims**



1. A brush holder for an electrical commutating machine, in particular for a DC machine for vehicles, comprising a brush plate adapted to be supported in a frame of the commutating machine and having first and second brush plate openings spaced from one another; a brush mount fastened in an insulating fashion on said brush plate and adapted to support a carbon brush, said brush mount having a bearing side which faces said brush plate and carrying a pull-through pin coaxial with one of said brush plate openings and a supporting web having a web opening; a fastening element extending through another one of said brush plate openings and through said web opening; an insulating plate located between said brush plate and said brush mount and having two insulating plate openings so that said pull-through pin projects into one of said insulating plate openings; an insulating part located at a side of said brush plate which is opposite to said brush mount and having two insulating part openings and fastened by said fastening element which passes through one of said insulating part openings, said insulating part having annular webs which surround said insulating part openings and project axially toward said brush plate so as to be of one piece with said insulating part, one of said annular webs projecting through said another brush plate opening while a other of said annular webs engages through said one brush plate opening and through said one insulating plate opening in a form-fitting manner, said pull-through pin engaging in said other annular web in a form-fitting fashion.

5,113,107

ROTARY ACTUATOR

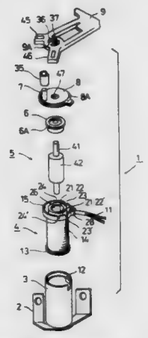
Masaaki Atsumi, Shizuoka, and Haruhiko Uchiyama, Toyohashi, both of Japan, assignors to Asmo Co., Ltd., Kosai, Japan

Filed Mar. 28, 1991, Ser. No. 676,793

Claims priority, application Japan, Apr. 20, 1990, 2-106263

Int. Cl.[5] H02K *1/12, 5/00*

U.S. Cl. 310—256 **16 Claims**



1. A rotary actuator comprising:

a cylindrical coil bobbin formed of a non-magnetic material:

a stator coil circumferentially wound about the coil bobbin;

a pair of poles provided within the coil bobbin;

a housing for receiving the coil bobbin, the housing having an upper opening, the housing being spaced apart from a first one of said poles and being magnetically connected to a second one of said poles;

a cover plate covering the upper opening of the housing, the housing and cover plate cooperating to encase the coil bobbin;

a rotary shaft arranged to pass through the coil bobbin;

a bearing for rotatably supporting the rotary shaft; and

a cylindrical magnet carried by and integrally rotatable with the rotary shaft, the magnet being diametrically magnetized,

the first pole, the cover plate, the housing, the second pole and the cylindrical magnet cooperating to form a closed magnetic path about said stator coil.

5,113,108

HERMETICALLY SEALED ELECTROSTRICTIVE ACTUATOR

Osamu Yamashita; Eiji Takahashi; Takeshi Nishizawa; Hidekazu Takada, and Tetsuo Shirasu, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

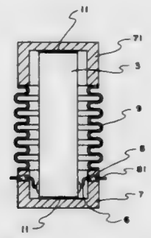
Filed Nov. 6, 1989, Ser. No. 432,809

Claims priority, application Japan, Nov. 4, 1988, 63-279741; Nov. 4, 1988, 63-279772; Nov. 15, 1988, 63-149158[U]; Nov. 17, 1988, 63-150230[U]; Nov. 17, 1988, 63-291322[U]

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—328 **7 Claims**

1. A hermetically sealed electrostrictive actuator comprising: a metal case having an opening and a bottom, an electrostrictive element housed in said metal case and having a pair of lead wires, one end of said electrostrictive element being fixed to said bottom of said metal case, and a metal cap member fixed to the other end of said electrostrictive element, said metal cap member and said metal case being welded to seal said opening of said metal case in an airtight manner a pair of glass sealing terminals associated with said metal cap member so that said pair of lead wires are led out from a side wall portion of said metal cap member via said glass sealing terminals, and said metal case having a flexible region so as to follow the expansion and contraction of said electrostrictive element.



5,113,109

OPTICAL INTERFERENCE FILM AND LAMP HAVING THE SAME

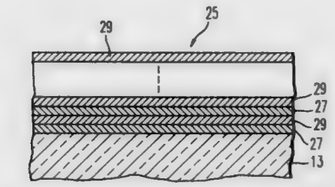
Akira Kawakatsu; Akiko Saito, and Yoji Yuge, all of Kanagawa, Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan

Filed Nov. 15, 1990, Ser. No. 613,054

Claims priority, application Japan, Nov. 24, 1989, 1-305545

Int. Cl.[5] H01K *1/32*

U.S. Cl. 313—112 **7 Claims**



1. An optical interference film for reflecting light from the optical spectrum in a prescribed wavelength range, the film comprising:

a transparent substrate;

at least two refractive layers of different refractive indices on the substrate, one of the at least two refractive layers having a higher refractive index and including a metal oxide; and

at least one additive selected from the group consisting of antimony (Sb), silicon (Si) and tantalum (Ta) whose quantity in relation to said metal oxide is in the range from 0.1% to 30% in terms of the metal atomic ratio in the one of the at least two refractive layers.

5,113,110

DISPENSER CATHODE STRUCTURE FOR USE IN ELECTRON GUN

Dong-Gil Jang, Seoul, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea

Filed Dec. 31, 1990, Ser. No. 633,529

Claims priority, application Rep. of Korea, Dec. 31, 1989, 89-20770

Int. Cl.[5] H01J *29/04, 19/22*

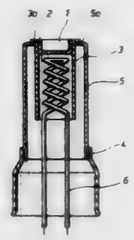
U.S. Cl. 313—270 **6 Claims**

1. A frame structure for a dispenser cathode having a thermoelectron emissive material and a heater for use in an electron gun comprising:

a cup-shaped reservoir for holding thermoelectron emissive material;

a sleeve having an outward flange at an upper sleeve portion thereof, an inner surface of said upper sleeve portion enclosing said reservoir;

a heat shielding tube having an inward flange at an upper shield portion thereof, said outward flange of said sleeve



connectedly overlapping said inward flange of said heat shielding tube; and

means for securing said heat shielding tube to an outer wall surface of said outward flange.

5,113,111

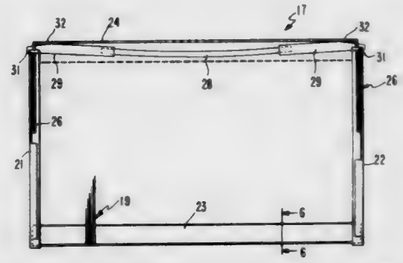
TENSIONED SHAWOD MASK/FRAME ASSEMBLY FOR A COLOR PICTURE TUBE

David W. Fairbanks, Monmouth Junction, N.J., assignor to RCA Thomson Licensing Corporation, Princeton, N.J.

Filed Aug. 12, 1991, Ser. No. 743,624

Int. Cl.[5] H01J *29/80, 29/81*

U.S. Cl. 313—404 **15 Claims**



1. An improved tensioned shadow mask/frame assembly for a color picture tube having a horizontal axis, said picture tube having a screen and including means for supporting said shadow mask/frame assembly at a fixed distance from said screen, said shadow mask/frame assembly comprising:

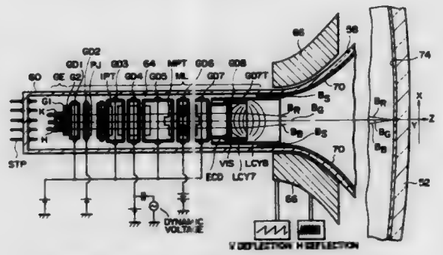
a plurality of substantially parallel side members;

first and second substantially parallel horizontal members, said first horizontal member being permanently fixed to said side members and said second horizontal member including means for slideably supporting said second horizontal member on said side members;

a shadow mask attached to said horizontal members and including a plurality of slits extending substantially parallel to said side members and substantially the full distance between said first and second horizontal members; and

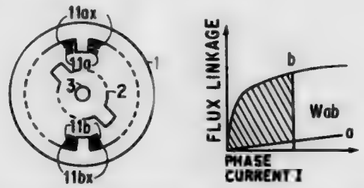
means for biasing said first and second horizontal members apart to place said shadow mask under tension.

5,113,112
COLOR CATHODE RAY TUBE APPARATUS
Taketoshi Shimoma, Isesaki; Eiji Kamohara, and Jiro Shimokobe, both of Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 25, 1990, Ser. No. 603,326
Claims priority, application Japan, Oct. 25, 1989, 1-275952
Int. Cl.[5] H01J *29/51, 29/62*
U.S. Cl. 313—412 **8 Claims**



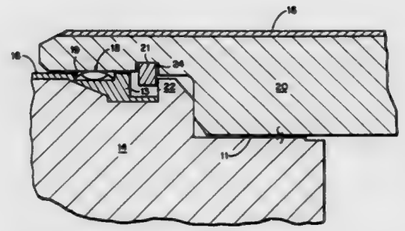
1. A color cathode ray tube apparatus comprising:
an envelope having a panel, a funnel, and a neck;
a screen formed on an inner surface of said panel;
an electron gun, accommodated in said neck, for outputting a plurality of electron beams; and
deflection means, arranged to extend from said neck to an outer surface of said funnel, for deflecting the electron beams in horizontal and vertical directions,
wherein said deflection means comprises at least saddle-type horizontal and vertical deflection coils, the electron beams ar deflected by said deflection means to have a maximum diagonal deflection angle of not less than 100°, said electron gun comprises at least an electron beam forming unit having three cathodes, and a main electron lens unit for focusing and converging the electron beams, said electron beam forming unit outputs adjacent electron beams at an interval of 3.5 to 6.0 mm, a ratio of an inner diameter of said neck to the interval between the adjacent electron beams is not less than 5.1, and said main electron lens unit comprises a large-aperture electron lens formed by a substantially cylindrical first electrode for allowing three electron beams to pass therethrough, and a substantially cylindrical second electrode in which most of said first electrode is arranged.

5,113,113
CONSTANT CURRENT RELUCTANCE MOTOR DRIVE SYSTEMS
Brane Tepavcevic, Jahorinska 24, 71 212 Hrasnica, Yugoslavia
Filed Mar. 7, 1990, Ser. No. 489,693
Int. Cl.[5] H02K *19/24*
U.S. Cl. 318—701 **10 Claims**



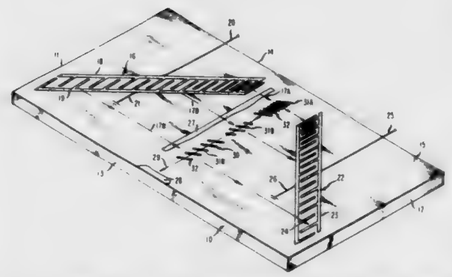
1. A method of establishing an induced flux in a phase of a variable reluctance motor comprising the steps of:
(1) applying a source voltage to a main winding carrying no current at a rotor position switch-on point by connecting, respectively, source terminals of the source voltage to main winding terminals;
said switch-on point being predetermined in such a way that a winding inductance remains substantially unchanged, with no current in the main winding prior to applying the source voltage to it, causing essentially instantaneous increasing of the source voltage after its application to the main winding, said increase of the source voltage causes increases of the induced voltage between terminals of an auxiliary winding magnetically coupled to said main winding, said increase of the induced voltage between the terminals of the auxiliary winding magnetically coupled to said main winding, said increase of the induced voltage between the terminals of the auxiliary winding causes essentially instantaneous establishment of the auxiliary winding current as well as essentially instantaneous establishment of the current in the main winding compensating said auxiliary winding current, said change of the source voltage at the switch-on position causes the main winding current to have said predetermined magnitude; and
(2) maintaining the connection between the source terminals and respective main winding terminals with no brakes until the auxiliary winding current decreases to zero;
said source voltage applied to the main winding corresponding to the increase of an induced flux produced by the fraction of the main winding current called exciting current, said increase of the induced flux corresponding to the voltage between the terminals of the auxiliary winding and said source voltage applied to the main winding causing the increase of the exciting current from zero at step (1) of the method to a predetermined magnitude, said increase of the exciting current causing the tendency towards the increase of the current in the main winding and causing the decrease of the source voltage and further causing the decrease of the induced voltage between the terminals of the auxiliary winding and also causing the decrease of the auxiliary winding current from the value compensating the predetermined magnitude at step (1) to zero, said decrease of the auxiliary main winding current compensated by the auxiliary winding current from the value equal to said predetermined magnitude at step (1) to zero with the decrease of the source voltage causing the main winding current to have said predetermined magnitude during the establishment of the flux.

5,113,114
MULTILAM OR BELLEVILLE SPRING CONTACT FOR RETAINING RINGS ON DYNAMOELECTRIC MACHINE
True T. Shih, Schenectady; Manoj R. Shah, Albany, and James B. Archibald, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Dec. 18, 1990, Ser. No. 628,900
Int. Cl.[5] H02K *3/46*
U.S. Cl. 310—270 **8 Claims**



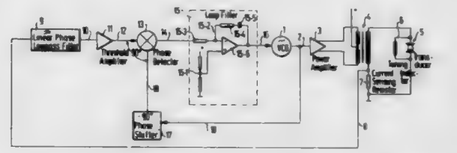
1. A dynamoelectric machine comprising:
a rotor body having a plurality of longitudinal rotor slots in its outer surface;
electrically-conductive windings having longitudinal sections located in said rotor slots and end turn sections connecting said longitudinal sections at the axial end of said rotor body, said end turn sections extending axially out from the rotor body;
wedges in said rotor slots above the longitudinal sections of said windings and confining these longitudinal sections in said slots;
a retaining ring attached to an end of said rotor body, said retaining ring enclosing said end turn sections to restrain radial outward movement of said end turn sections, said retaining ring overlapping said wedges; and
an electrically-conductive spring between an outer surface of said wedges and an overlapping portion of said retaining ring such that said spring is biased against the wedges and retaining ring.

5,113,115
SAW SLANTED ARRAY CORRELATOR WITH AMPLITUDE ERROR COMPENSATING POLYMER REFLECTIVE ARRAY GRATING
Elio A. Mariani, Hamilton Square, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jun. 19, 1991, Ser. No. 717,576
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—313 D **7 Claims**



1. An amplitude error compensated SAW slanted array correlator comprising:
a piezoelectric crystal substrate having a pair of oppositely disposed ends, a pair of oppositely disposed sides and a planar surface between said ends and between said sides;
input interdigital slanted array dispersive transducer means disposed on said substrate surface adjacent one of said pair of substrate ends for propagating SAW signals along a plurality of frequency dispersed first paths on said substrate surface toward the other of said pair of substrate ends in response to an input RF signal applied to said transducer means;
output interdigital slanted array dispersive transducer means disposed on said substrate surface adjacent said other substrate end for converting the SAW signals travelling along said plurality of first paths on said substrate surface from said input transducer means into an output RF signal, said output RF signal containing known amplitude errors at known frequencies;
acoustic absorber means disposed on said substrate surface adjacent one of said pair of substrate sides between said input transducer means and said output transducer means for acoustically absorbing SAW signals travelling along a second path on said substrate surface from the other of said pair of substrate sides toward said one substrate side, said second path being disposed between said input transducer means and said output transducer means and being substantially perpendicular to and traversing said plurality of first paths; and
dispersive reflective array grating means having a frequency and amplitude selective configuration disposed along said second path on said substrate surface for reflecting along said second path toward said acoustic absorber means amplitude error compensation SAW signals selected from said SAW signals travelling along said plurality of first paths from said input transducer means toward said output transducer means, said amplitude error compensation SAW signals having amplitudes and frequencies which correct for said known amplitude errors at said known frequencies in said output RF signal when said amplitude error compensation SAW signals travelling along said second path are deleted from said SAW signals travelling along said plurality of first paths toward said output transducer means and fed to said acoustic absorber means, said reflective array grating means being a dispersive reflective array grating comprising a plurality of strip reflectors disposed on said surface of said substrate, each of said plurality of strip reflectors being fabricated of a photosensitive polymer material.

5,113,116
CIRCUIT ARRANGEMENT FOR ACCURATELY AND EFFECTIVELY DRIVING AN ULTRASONIC TRANSDUCER
Robert F. Wilson, Vancouver, Canada, assignor to Firma J. Eberspacher, Esslingen, Fed. Rep. of Germany
Filed Oct. 5, 1989, Ser. No. 417,295
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—316 **35 Claims**

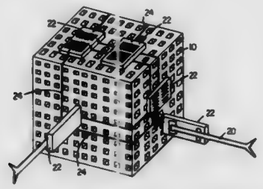


1. A method for driving an ultrasonic transducer, intended for use in atomization of liquids, at a selected one of its resonance frequencies, comprising:
parallely tuning out, at the selected resonance frequency, an intrinsic capacitance of said ultrasonic transducer by shunting said transducer by a tuning impedance by connecting said tuning impedance in parallel with said transducer;
applying a driving voltage signal to the transducer;
sensing a resulting current signal through the transducer;
comparing the phases of the driving voltage and the resulting current signals;
and changing the frequency of the driving voltage signal until said driving voltage and resulting current signals are in phase.

5,113,117
MINIATURE ELECTRICAL AND MECHANICAL STRUCTURES USEFUL FOR CONSTRUCTING MINIATURE ROBOTS
Rodney A. Brooks, Lincoln; Lee S. Tavrow, Somerville, and Anita M. Flynn, Arlington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Sep. 8, 1989, Ser. No. 404,741
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—328 **16 Claims**

1. A semiconductor die for attachment to a supportive structure, comprising
a base of crystalline semiconductor material,
microcircuitry formed integrally within said base and com-

prising dopants in selected regions of said base and conductive material electrically connecting the doped regions,



at least one appendage of crystalline semiconductor material integral to said base and extending outwardly therefrom, said appendage being sized for insertion into a socket formed in said supportive structure.

5,113,118

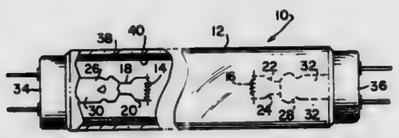
PHOSPHORS WITH IMPROVED LUMEN OUTPUT AND LAMPS MADE THEREFROM

A. Gary Sigai, Lexington, and Keith A. Klinedinst, Marlboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 11, 1991, Ser. No. 667,772

Int. Cl.[5] H01J *1/62, 63/04*

U.S. Cl. 313—486 **5 Claims**



1. A fluorescent lamp comprising a hermetically sealed tubular glass envelop coated with a phosphor, bases at each end of said tubular glass envelope, electrodes, support electrical leads connected to said electrodes, said electrodes coated with an electron-emission promoting material, and a mercury droplet within said tubular glass envelope; said phosphor having a bi-layer coating comprising a coating of alumina surrounding a coating of silica which surrounds the phosphor.

5,113,119

HIGH PRESSURE GAS DISCHARGE LAMP

Ulrich Niemann; Stephan Offermanns, both of Aachen, and Bernhard Weber, Hilden, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

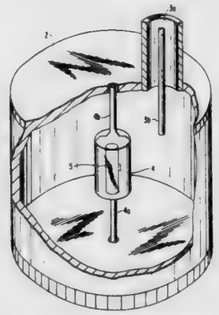
Filed Aug. 29, 1990, Ser. No. 576,322

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1989, 3932030

Int. Cl.[5] H01J *17/20;* **H05B** *41/24*

U.S. Cl. 313—638 **8 Claims**

1. A high pressure gas discharge lamp having a bulb enclosing a volume and a filling in said bulb which contains a starting gas and a metal compound in such a quantity that in the operational condition of the lamp condensed metal particles are formed which generate light by incandescent emission, characterized in that: (no underlining) the lamp has no electrodes and contains a metal compound chosen from the group consisting of halides of tungsten, rhenium and tantalum, oxihalides of tungsten, rhenium, and tantalum, and rhenium oxide, the quantity of metal in said bulb being at least 0.002mg/cm^3 of bulb



volume in the case of a tungsten or rhenium compound, and at least 0.4 mg/cm^3 in the case of a tantalum compound.

5,113,120

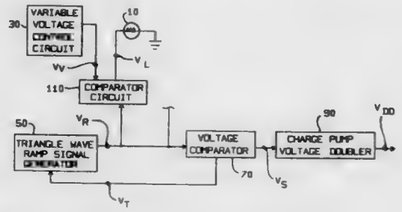
DIMMER CIRCUIT

James D. Scott, 118 Moffet Ave., Joplin, Mo. 64801, and Keith G. Kropf, Rte. 2, Box 152, Seneca, Mo. 64865

Filed Jun. 11, 1991, Ser. No. 713,954

Int. Cl.[5] H05B *37/00*

U.S. Cl. 315—77 **12 Claims**



1. An illumination level controller for incandescent lamps powered by a low voltage dc source comprising:

means for generating a positively and negatively linear voltage triangle wave signal; and

at least one output means each comprising:

an input variable voltage source;

comparator means for receiving a voltage from said input variable voltage source and said linear triangle wave signal and for producing as an output signal:

a constant dc voltage when said received voltage is at a predetermined minimum;

a zero voltage when said received voltage is at a predetermined maximum; and

a variable duty cycle high pulse train when said received voltage is less than said maximum and greater than said minimum; and

an N channel field effect transistor in a source follower mode for connection in series between a grounded incandescent lamp load and a dc source, for receiving said output signal to control the operation of said transistor in response thereto whereby , when said output signal is:

a constant dc voltage, said transistor is saturated and the load is fully 'on';

a zero voltage, said transistor and the load are fully 'off'; and

a variable, said transistor is in a switching mode to inversely vary the brightness of the load in response to the level of said variable output.

5,113,121

ELECTRODELESS HID LAMP WITH LAMP CAPSULE

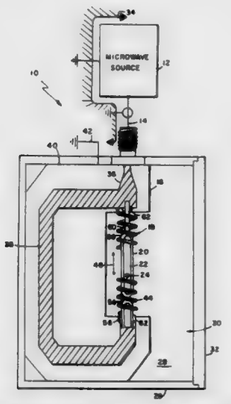
Walter P. Lapatovich, Marlboro; Joseph M. Proud, Wellesley Hills, and Timothy Fohl, Carlisle, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 15, 1990, Ser. No. 523,761

The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.

Int. Cl.[5] H05B *41/16*

U.S. Cl. 315—248 **22 Claims**



1. A gas capsule for an electrodeless lamp comprising:

a radiant energy transmissive material defining an enclosed volume having an internal length approximately one quarter of the compressed, guide wavelength of the input power, an internal diameter narrow enough to suppress radial turbulence at the temperature and pressure of operation, with the enclosed volume filled with a lamp fill excitable by a high frequency electromagnetic field to produce radiant energy, the gas capsule adapted to be coupled to radio frequency energy by evanescent waves thereby exciting the lamp fill and causing the emission of visible light.

5,113,122

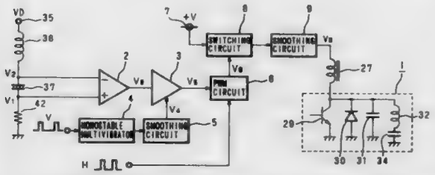
HORIZONTAL DEFLECTOR APPARATUS

Takahiro Bando, and Noriyuki Tomimatsu, both of Nagasaki, Japan, assignors to Mitsubishi Kenki Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1991, Ser. No. 699,580

Int. Cl.[5] H01J *29/56*

U.S. Cl. 315—371 **3 Claims**



1. A horizontal deflection apparatus which deflects an electron beam in a horizontal direction for scanning a picture tube that is scanned by said electron beam in synchronization with a horizontal synchronizing signal in the horizontal direction as the main scanning direction and is scanned by said electron beam in synchronization with a vertical synchronizing signal in a vertical direction as the subscanning direction comprising:

a correction voltage generating means for generating a correction voltage of parabolic form with an amplitude corresponding to the vertical frequency of said vertical synchronizing signal so as to correct a crosswise pincushion distortion;

a vertical frequency detecting means for detecting said vertical frequency;

an automatic gain control circuit which controls gain of the correction voltage generated by said correction voltage generating means in response to the vertical frequency detected by said vertical frequency detecting means and outputs a signal of parabolic form with a predetermined constant amplitude irrespective of changes of said vertical frequency;

a pulse width modulating circuit which modulates a pulse signal synchronized with said horizontal synchronizing signal in response to the output signal with the predetermined amplitude of said automatic gain control circuit;

a chopper power circuit which chops a power voltage with the output pulse of said pulse width modulating circuit; and

a horizontal output circuit which is operated with the output voltage of said chopper power circuit.

5,113,123

RING SPINNING MACHINE

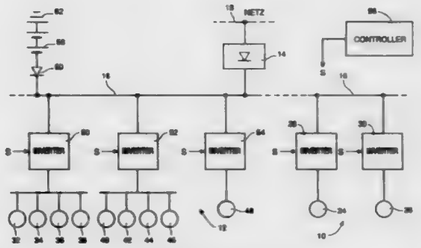
Hans Noser, Neftenbach, and Markus Erni, Winterthur, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Mar. 28, 1991, Ser. No. 676,882

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1990, 4011598

Int. Cl.[5] H02P *5/00*

U.S. Cl. 318—106 **20 Claims**



1. A ring spinning machine comprising

a first driving system having at least one motor for driving at least one spindle;

a second driving system having at least one motor for driving a cylinder of a drafting arrangement;

a D.C. line connected in common to each said driving system;

a rectifier connected to said D.C. line for connecting said line to an electrical supply mains;

an electronic control for controlling the speed of each motor independently of each other, said control being responsive to a power failure to slow the speed of each motor below a preselected minimum value;

a buffer battery; and

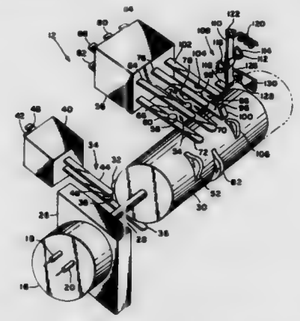
means for selectively connecting said battery to said D.C. line in response to said speed of said motors falling below said preselected minimum value.

5,113,124

PROGRAMMABLE APPLIANCE CONTROLLER

Martin W. Hamilton, Arlington Heights, Ill.; Michael Baran, Wauwatosa; Todd King, Cedarburg; Denis Leveque, Milwaukee, all of Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 4, 1990, Ser. No. 576,756
Int. Cl.[5] G05B *19/06*
U.S. Cl. 318—578 **13 Claims**



1. A programmable controller for an appliance comprising:
(a) base structure adapted for attachment to an appliance to be controlled;
(b) cam means mounted for cyclic movement on said base structure;
(c) motor means operative upon energization to effect said cyclic movement;
(d) a line power switch series connected with said motor means having a movable contact blade means disposed for movement by said cam means to effect opening and closing of said switch;
(e) at least one program function switch having a movable contact blade means disposed for movement from an unactuated to an actuated condition by said cam means independently of said movement of said line power switch blade means;
(f) latching means operative to maintain said program switch blade means in said actuated position;
(g) actuator means operative upon electrical energization to release said latching means to enable said program switch blade means to return to the unactuated condition;
(h) circuit means including microcomputer means connected to said actuator means and operable to selectively energize said actuator means in accordance with a selected program; and,
(i) input means operable for user programming for said microprocessor.

5,113,125

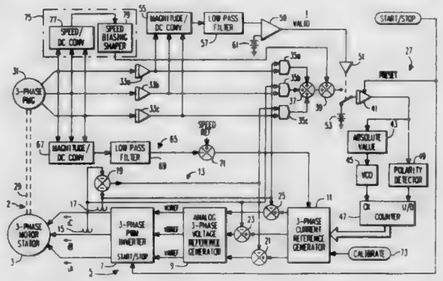
AC DRIVE WITH OPTIMIZED TORQUE

Eric J. Stacey, Penn Hills Township, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1991, Ser. No. 694,323
Int. Cl.[5] H02P *5/28*
U.S. Cl. 318—721 **11 Claims**

1. Apparatus for optimizing torque in an electric motor having a rotor and a multi-phase stator winding, said apparatus comprising:
position sensing means generating a position signal representative of instantaneous rotor angular position;
reference signal generating means responsive to said position signal generated by said position sensing means to generate a set of multi-phase reference signals having a predetermined phase angle with respect to said instantaneous rotor angular position;
power converter means responsive to said set of multi-phase reference signals generated by said reference signal generating means for generating a multi-phase stator current in said multi-phase stator winding at said predetermined phase angle with respect to said instantaneous rotor position;
speed signal generating means generating a speed signal representative of rotational speed of said rotor; and
the improvement comprising phase angle adjusting means responsive to said speed signal generated by said speed signal generating means for adjusting said predetermined phase angle of the set of multi-phase reference signals generated by said reference signal generating means with respect to said instantaneous rotor angular position, to adjust torque generated by said motor;
wherein said phase angle adjusting means includes means adjusting said predetermined phase angle to optimize said torque as a function of said rotational speed of said rotor; and
wherein said power converter means generates said multi-phase stator current at a predetermined magnitude and at a voltage which increases with increasing rotational speed of said rotor until a maximum voltage is reached, and wherein said phase angle adjusting means maintains said predetermined phase angle at a fixed value until said maximum voltage is reached, and then advances said predetermined phase angle relative to said fixed value for higher rotational speeds of said rotor.

3. Apparatus for optimizing torque in an electric motor having a rotor and a multi-phase stator winding, said apparatus comprising:
position sensing means generating a position signal representative of instantaneous rotor angular position;



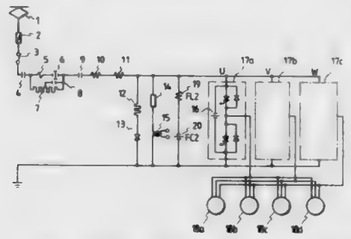
reference signal generating means responsive to said position signal generated by said position sensing means to generate a set of multi-phase reference signal having a predetermined phase angle with respect to said instantaneous rotor angular position;
power converter means responsive to said set of multi-phase reference signals generated by said reference signal generating means for generating a multi-phase stator current in said multi-phase stator winding at said predetermined phase angle with respect to said instantaneous rotor position;
speed signal generating means generating a speed signal representative of rotational speed of said rotor; and
the improvement comprising phase angle adjusting means responsive to said speed signal generated by said speed signal generating means for adjusting said predetermined phase angle of the set of multi-phase reference signals generated by said reference signal generating means with respect to said instantaneous rotor angular position, to adjust torque generated by said motor;
wherein said position sensing means generates a multi-phase position signal, wherein said reference signal generating means comprises a phase locked loop generating said set of multi-phase reference signals phase locked to said multi-phase position signal at said predetermined phase angle, and wherein said phase angle adjusting means comprises means applying a bias to said phase locked loop to adjust said predetermined phase angle.

5,113,126

CONTROL DEVICE FOR ELECTRIC CAR

Tatsusuke Nanzan; Hideo Obi; Masahiko Nakamoto; Noriaki Nakamoto, and Mikio Ohta, all of Hyogo, Japan, assignors to Mitsubishi Danki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 299,422, Jan. 23, 1989, abandoned. This application Aug. 13, 1990, Ser. No. 566,319
Claims priority, application Japan, Jan. 21, 1988, 63-11216
Int. Cl.[5] H02P *5/40*
U.S. Cl. 318—809 **1 Claim**



1. An electric vehicle control device for controlling an operation of an electric vehicle to be driven by at least one a.c. motor through an associated control means, comprising:
a reverse L-type first filter circuit comprised of a first filter reactor and a first filter capacitor, located between a current collector and said control means;
a second filter circuit comprised of a second filter reactor and a second filter capacitor connected in series, said second filter reactor and said second filter capacitor being connected in parallel to said first filter capacitor;
said second filter circuit having circuit constants such that a total impedance value of the second filter circuit ad the first filter capacitor, is minimized at a frequency of six times a system operating frequency to reduce high frequency current;
and wherein a total impedance of the first filter reactor is given as Z_1;
the total impedance of the second filter circuit is given as Z_2;
the current flowing from the associated control means and generated by said at least one a.c. motor is given as I;
a current flowing through said first filter reactor is given as I_1; and

$$I_1 = I\,Z_2/(Z_1+Z_2);$$

Z_2 being minimized for the frequency of the current generated by said at least one a.c. motor so as to minimize I_1 and reduce high frequency current.

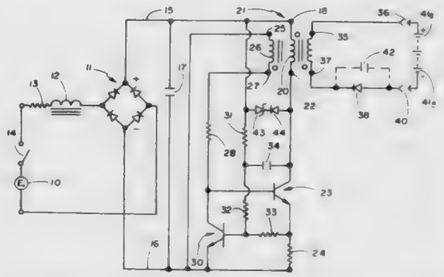
5,113,127

UNIVERSAL BATTERY CHARGER

Philip K. Hoffman, Wilmington, Vt., and Douglas R. Frey, Bethlehem, Pa., assignors to Solid State Chargers, Inc., Cockeysville, Md.

Filed Apr. 11, 1989, Ser. No. 336,065
Int. Cl.[5] H02J *7/10*; H02M *3/335*
U.S. Cl. 320—21 **33 Claims**

1. In a battery charger of the driven blocking oscillator type which includes a blocking oscillator and means for delivering charging current pulses from the blocking oscillator to one or more series connected batteries, an improvement comprising means responsive to initial application of power to the blocking oscillator for producing a first one of the charging current pulses and means responsive to current flow from the battery



or batteries for driving the blocking oscillator to produce subsequent charging current pulses.

5,113,128

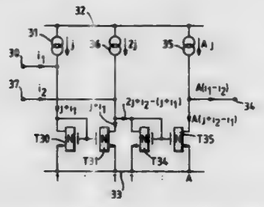
BATTERY CHARGER AND CHARGING METHOD

Takeji Ohara, and Yuuichi Yuasa, both of Fuchu, Japan, assignors to Ryobi Limited, Hiroshima, Japan

Filed Oct. 15, 1990, Ser. No. 597,584
Claims priority, application Japan, Oct. 18, 1989, 1-272052
Int. Cl.[5] H02J *7/00*
U.S. Cl. 320—21 **3 Claims**

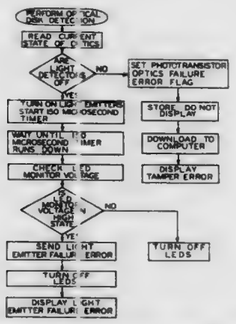
1. A charger for a rechargeable battery comprising:
switching regulator means for producing regulated output voltage at a high frequency and which stops producing the regulated output voltage in response to an interrupting signal,
cut-off means between said switching regulator and the rechargeable battery being charged which cuts off the voltage supplied to the battery in response to a cut-off signal,
analog to digital convertor means for converting the measured voltage of the rechargeable battery into digital data,
control means for producing at predetermined intervals the interrupting signal having a predetermined time length for the switching regulator said control means responsive to the output of the analog to digital convertor when the interrupting signal is produced for judging whether the charging is completed or not according to the output of the analog to digital convertor, and which issues the cut-off signal to the cut-off means when the charging is completed,
detection means coupled to the battery for producing a detection signal when a charging voltage to the battery is larger than a predetermined threshold value, and
timer means which is set by receiving the detection signal from the detection means, and which produces the cut-off signal for the cut-off means at a predetermined time after the setting of the timer means and is reset by stopping the charging voltage, said predetermined timer time being longer than the predetermined interval of the interrupting signal of the control means.

5,113,129
APPARATUS FOR PROCESSING SAMPLE ANALOG ELECTRICAL SIGNALS
John B. Hughes, Hove, England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 6, 1989, Ser. No. 446,821
Claims priority, application United Kingdom, Dec. 8, 1988, 8828667.9
Int. Cl.[5] G05F *3/24*
U.S. Cl. 323—316 **20 Claims**



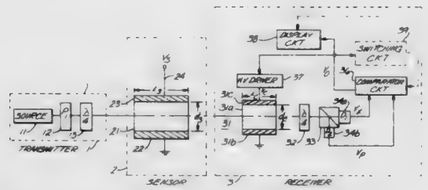
1. A circuit arrangement for processing sampled analogue electrical signals, each sample being in the form of a current, the circuit arrangement comprising; means for combining, in predetermined proportions, an input sample current in a present sample period with current(s) derived from input sample current(s) in one or more preceding sample periods, and means for deriving a processed output signal from a combined current produced by the combining means in successive sample periods, wherein the circuit arrangement comprises transistors and all of the transistors which conduct signal currents comprise devices of the same polarity.

5,113,130
TESTING OPERATION OF ELECTRIC ENERGY METER OPTICS SYSTEM
Richard A. Balch, North Hampton, N.H., assignor to General Electric Company, Somersworth, N.H.
Continuation of Ser. No. 505,199, Apr. 5, 1990, abandoned. This application Apr. 22, 1991, Ser. No. 687,788
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—74 **26 Claims**



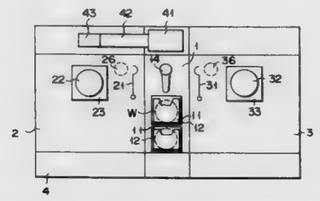
1. Apparatus for monitoring operation of a meter, the meter including signaling means and signal receiving means for providing an indication of a quantum of energy consumption, the signaling means comprising means for emitting a first light signal and the signal receiving means comprising means for detecting the presence of the first light signal, said apparatus comprising:
means for determining that said signal receiving means is receiving a light signal other than the first light signal from said signaling means; and
means for generating an error signal in response to said determining.

5,113,131
VOLTAGE MEASURING DEVICE HAVING ELECTRO-OPTIC SENSOR AND COMPENSATOR
David E. Cooper, Glendora, and Thomas J. Houy, Claremont, both of Calif., assignors to Southern California Edison Company, Rosemead, Calif.
Filed Feb. 16, 1990, Ser. No. 482,004
Int. Cl.[5] G01R *19/00, 31/00;* G02F *1/09*
U.S. Cl. 324—96 **57 Claims**



1. A device for measuring voltage, comprising:
transmitter means for providing an electromagnetic beam having a first beam component in one plane, and a second beam component in another plane transverse to the one plane;
sensor means, including an electro-optic material subjected to an electric field having an unknown voltage, for receiving the beam, and for creating a first relative phase difference between the first and second beam components; and
receiver means for receiving the beam emitted from the sensor and determining the unknown voltage, the receiver means comprising compensator means, including an electro-optic material receiving the beam from the sensor means, for causing by means of an electro-optic response a second relative phase difference in the first and second beam components which when combined with the first relative phase difference caused by the sensor means achieves a third relative phase difference; and driving means receiving the first and second beam components for generating a difference signal indicative of the third relative phase difference and for driving the electro-optic material in the compensator means on the basis of the difference signal.

5,113,132
PROBING METHOD
Seiichi Hoshi, Kofu, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan
Filed Apr. 19, 1991, Ser. No. 687,553
Claims priority, application Japan, May 17, 1990, 2-127584
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—158 F **8 Claims**



1. A probing method of measuring the electric characteristic of an object to be measured, while keeping measuring probes

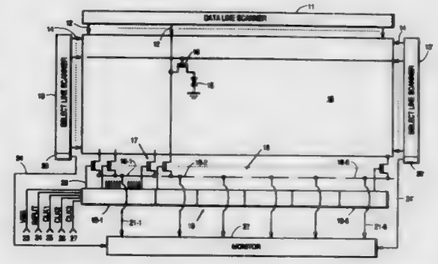
contacted with electrode pads of each of the objects arranged on a substrate comprising the steps of:
mounting the substrate on a mount rotatable and movable in directions X and Y which are perpendicular to each other on a plane;
moving the substrate-mounted mount to an alignment position;
positioning the mount at the alignment position to align the directions X and Y in which the mount is moved with the array direction of the objects on the substrate;
storing, as first data, information needed to carry out the positioning at the alignment position;
moving the substrate-mounted mount to a measuring position where the measuring probes are arranged;
positioning the mount at the measuring position to align the electrode pads of each of the objects with their corresponding measuring probes; and
storing, as second data, information needed to conduct the positioning at the measuring position;
said probing method further selectively including, after the positioning at the measuring position,
a first step of carrying out measurement relative to the substrate;
a second step of again automatically conducting the positionings of the substrate at the alignment and measuring positions in response to the first and second data stored; and
a third step of again conducting the positionings of the substrate at the alignment and measuring positions and storing first and second new data resulted from these re-positionings at the alignment and measuring positions.

5,113,133
CIRCUIT BOARD TEST PROBE
Joseph A. Conti, Whitestone, and James Liantonio, Huntington, both of N.Y., assignors to Integri-Test Corporation, Commack, N.Y.
Filed Dec. 20, 1990, Ser. No. 630,585
Int. Cl.[5] G01R *31/02, 1/06*
U.S. Cl. 324—158 P **28 Claims**



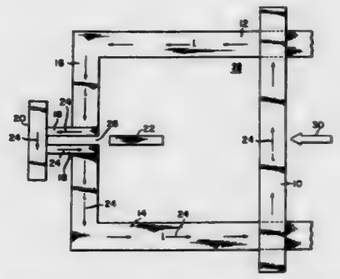
1. A circuit test probe apparatus for testing and measuring electrical integrity of circuit boards, comprising:
driving means for providing rotary driving motion;
translating means connected to said driving means for translating said rotary motion into linear motion;
means defining a test probe translational movement axis;
a test probe operatively connected to said translating means and being driven in a linear direction along said test probe translational movement axis toward impact with a circuit board to be tested; and
recoil means operatively connected with said translating means and disposed along said test probe translational movement axis for absorbing the impact of said test probe with said circuit board, whereby said test probe will attain a soft landing upon said circuit board.

5,113,134
INTEGRATED TEST CIRCUIT FOR DISPLAY DEVICES SUCH AS LCD'S
Dora Pius, South Bound Brook, N.J., and Bruno B. Mourey, Voiron, France, assignors to Thomson, S.A., Courbevoie, France
Filed Feb. 28, 1991, Ser. No. 660,275
Int. Cl.[5] G01R *31/28, 31/02*
U.S. Cl. 324—158 R **9 Claims**



1. In a liquid crystal display having a matrix of cells arranged in rows and columns, a plurality of data lines for applying data signals from a data line scanner to said columns of cells and a plurality of select lines for applying select signals from a select line scanner to said rows of cells, a test circuit for continuity testing said data lines, for identifying defective stages of said data line scanner, and for detecting shorts between said data lines and said select lines, said test circuit comprising:
an output bus having at least one test line;
a plurality of solid state devices having conduction paths individually connecting said data lines to said output bus, each of said solid state devices having a control electrode;
means for sequentially actuating said control electrodes to transfer said data signals from said data lines to said test line; and
means for monitoring said test line to identify open data lines, defective data line stages, and shorted select lines.

5,113,135
CRITICAL FIELD AND CONTINUITY TESTING METHOD AND DEVICE FOR SUPERCONDUCTING MATERIALS USING THE CHANGE IN INTERNAL AREA OF A SUPERCONDUCTING LOOP
Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Mar. 22, 1991, Ser. No. 673,422
Int. Cl.[5] G01R *33/12;* G01N *27/72*
U.S. Cl. 324—228 **3 Claims**



1. An apparatus for testing the superconducting magnetic

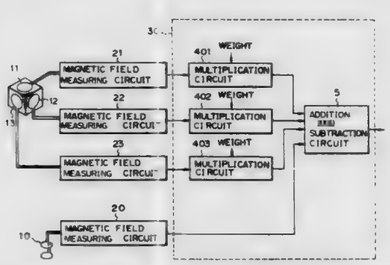
critical field of material having superconducting properties comprising:
- a loop of superconducting material, the loop forming an internal area and having a gap formed therein, the gap being of a predetermined size;
- a plug of superconducting material having a predetermined size so as to fit within the gap and complete the loop;
- means for connecting a superconducting test piece across the gap to complete the loop when the plug is removed;
- means for changing the internal area formed by the loop; and
- means for generating a persistent current within the loop while the superconducting plug is inserted in the gap;
- wherein a persistent current is generated within the loop while the plug is inserted in the gap, whereby a magnetic field is generated in the internal area of the loop normal to the direction of the persistent current;
- wherein the test piece is connected to the loop and the plug is removed; and
- wherein the internal area of the loop is decreased by the means for changing the internal area thereby increasing the magnitude of the magnetic field in the internal area, the internal area of the loop being decreased until the persistent current and the magnetic field within the internal of the loop no longer exists, the superconducting magnetic critical field of the test piece being determined from the amount of force required to decrease the internal area of the loop.

5,113,136

GRADIOMETER APPARATUS WITH COMPENSATION COILS FOR MEASURING MAGNETIC FIELDS

Hajime Hayashi, Yamato; Yutaka Igarashi, Yokohama; Takehiko Hayashi, Kawasaki; Takaki Shimura, Machida, and Kenji Kawabe, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 22, 1990, Ser. No. 468,360
Claims priority, application Japan, Jan. 20, 1989, 1-12890; Feb. 14, 1989, 1-32824
Int. Cl.[5] G01R *33/022, 33/025, 33/035*
U.S. Cl. 324—247 **17 Claims**



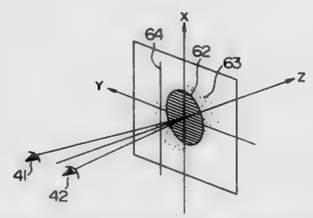
1. An apparatus for measuring a very weak magnetic field such as that generated by a human body, comprising:
- a gradiometer for sensing the magnetic field;
- a gradiometric field measuring circuit, operatively connected to said gradiometer, for outputting a signal indicative of the magnetic field sensed by said gradiometer;
- at least three compensation coils for detecting uniform magnetic fields existing around said gradiometer, said three compensation coils being oriented in three different directions that are not in parallel with any one plane;
- at least three magnetic field measuring circuits having sensitivity characteristics, operatively connected to said compensation coils, respectively, for outputting signals indicative of the uniform magnetic fields in the three different directions detected by said compensation coils; and
- a magnetic noise eliminating circuit, operatively connected to said gradiometric and magnetic field measuring circuits, for eliminating magnetic noise in the signal indicative of the magnetic field output from said gradiometric field measuring circuit using scalar products of weight vectors containing weight factors predetermined by the sensitivity characteristics of said magnetic field measuring circuits and measured vectors containing, as vector components, magnetic fields previously measured by said magnetic field measuring circuits and said gradiometric field measuring circuit.

5,113,137

METHOD AND APPARATUS FOR REDUCING IMAGE NOISES

Hideaki Koizumi, Katsuta; Koichi Sano, Sagamihara; Tetsuo Yokoyama, Tokyo, and Kazuya Sukegawa, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 10, 1990, Ser. No. 579,581
Claims priority, application Japan, Sep. 12, 1989, 1-236515
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—307 **5 Claims**



1. An image noise reduction method comprising the steps of:
- a) taking a first measurement to obtain an image signal from a subject;
- b) taking a second measurement to obtain an image signal of the same kind as that of said image signal from said subject;
- c) deriving a first image having at least one sheet for an identical region and an identical visual point from the image signal obtained by said first measurement;
- d) deriving a second image having at least one sheet for said identical region and said identical visual point from the image signal obtained by said second measurement;
- e) displaying said first image and said second image on an identical plane side by side; and
- f) observing said first image and said second image with parallax changed, whereby the effective signal component of said images is focused on said plane whereas the noise component is dispersed in a direction perpendicular to said plane, resulting in an improved signal-to-noise ratio of said images when observed.

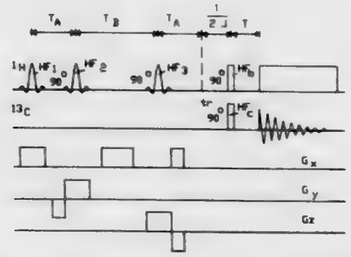
5,113,138

CARBON MR SPECTROSCOPY METHOD AND DEVICE FOR PERFORMING THE METHOD

Hartwin Bomsdorf, Hamburg, Fed. Rep. of Germany; Graeme C. McKinnon, Zurich, and Peter Bosiger, Ennetbaden, both of Switzerland, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 10, 1990, Ser. No. 507,941
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1989, 3912142
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—307 **6 Claims**

1. A carbon MR spectrocopy method in which a number of sequences is applied to an examination zone in the presence of a uniform, steady magnetic field, each sequence involving the excitation of the protons so that their nuclear magnetization has been rotated through 90° at a reference instant (t_r), after which the nuclear magnetization of hydrogen and carbon is excited by further rf pulses (HF_b, HF_c) at a defined distance in time from the reference instant, after which the carbon spin resonance signal thus generated is subjected to a frequency analysis, for the localization at least three slice-selective rf pulses (HF_1...HF_3) having the Larmor frequency of water are generated, which pulses are used to produce an echo signal at the reference instant in the zone of intersection of the slices influenced by the three slice-selective rf pulses, two groups of



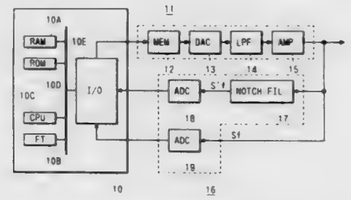
sequences comprising the same number of sequences being applied, the sequences of one group being modified with respect to those of the other group so that the echo signals of one group generated at the reference instant have the opposite phase in relation to the echo signals of the other group the differences between the carbon spin resonance signals of the two groups being summed.

5,113,139

LOW-DISTORTION WAVEFORM GENERATING METHOD AND WAVEFORM GENERATOR USING THE SAME

Yasuo Furukawa, Gyoda, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Apr. 11, 1991, Ser. No. 683,789
Claims priority, application Japan, Apr. 13, 1990, 2-98552
Int. Cl.[5] G11C *27/02*
U.S. Cl. 324—623 **4 Claims**



1. A waveform generator comprising:
- a waveform generating part including:
  - memory means into which waveform data can be written and from which said data can be read out;
  - D/A converter means for D/A converting said waveform data read out from said memory means; and
  - amplifier means for amplifying the output signal of said D/A converter means;
- a distortion measuring part including:
  - filter means for attenuating a particular frequency component from the output signal of said amplifier means; and
  - A/D converter means for A/D converting the output signal of said filter means; and
- a computation and control part, operatively connected to said distortion measuring part, and said waveform generating part, which performs a Fourier transform analysis of the output data of said A/D converter means, decides, based on the analyzed result, distortion canceling harmonic components for canceling distortion components which are produced in said waveform generating part, writes into said memory means waveform data composed of a waveform component to be generated and said distortion canceling harmonic components, and reads out said waveform data from said memory means during waveform generation, said computation and control part comprising:

temporary storage means; and

Fourier transform analysis means, said computation and control part fetching thereinto via said distortion measuring part a waveform signal provided from said waveform generating part when reading out a reference signal waveform from said memory means, determining amplitudes and phases of distortion components in the output waveform signal of said waveform generating part by performing a Fourier transform analysis of said fetched waveform signal with said Fourier transform analysis means and write said amplitudes and phases of said distortion components into said memory means, fetching thereinto said output waveform signal of said waveform generating part via said A/D converter means without passing through said filter means, determining an amplitude and a phase of a fundamental frequency component of said reference signal waveform by performing a Fourier transform analysis of said fetched output waveform signal with said Fourier transform analysis means and writing said amplitude and phase of said fundamental frequency component into said temporary storage means, fetching thereinto via said distortion measuring part an output waveform signal of said waveform generating part when a composite waveform is read out of said memory means and composed of harmonic components each having a predetermined amplitude and phase and the frequency of a corresponding one of said distortion components, determining amplitude/phase characteristics of said waveform generating part with respect to each of said harmonic components by performing a Fourier transform analysis of said fetched output waveform signal with said Fourier transform analysis means, and writing said amplitude/phase characteristics into said temporary storage means, computing amplitudes and phases of said distortion canceling harmonic components for canceling said distortion components, based on said determined amplitudes and phases of said distortion components, said determined amplitude and phase of said fundamental frequency component and said determined amplitude/phase characteristic written in said temporary storage means, and writing into said memory means waveform data composed of said canceling harmonic waveform components determined by said computed amplitudes and phases and said reference signal waveform.

5,113,140

MICROPROCESSOR-CONTROLLED HIGH-VOLTAGE CAPACITANCE BRIDGE

Eddy So, Gloucester, Canada, assignor to National Research Council of Canada, Ottawa, Canada

Filed Jun. 20, 1990, Ser. No. 540,772
Int. Cl.[5] G01R *27/26*
U.S. Cl. 324—680 **3 Claims**

1. In a current comparator bridge for measuring values of an unknown impedance, said bridge comprising
- (a) a current comparator having a pair of ratio windings (N_S, N_X) and a detection winding (N_D) for detecting an ampere turns unbalance in the comparator,
- (b) means for varying the number of turns on a first one (N_S) of said ratio windings,
- (c) a standard capacitor (C_S) having a first side connected to a first end of said first ratio winding,
- (d) means for connecting a first side of an unknown impedance to a first end of the second ratio winding,
- (e) means connecting the second end of the second ratio winding to ground,
- (f) means for connecting the second side of the standard

capacitor and the second side of the unknown impedance to an alternating voltage input (E),

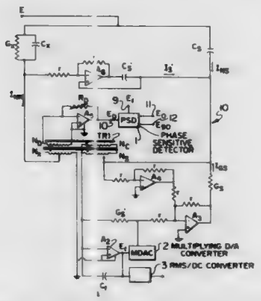
(g) means connected between the second end of the first ratio winding and ground for generating a voltage replica (E_f) of the high voltage input,

(h) converter means connected to receive said replica voltage for providing a current (I_{GS}) proportional to and in phase with the high voltage input,

(i) means for varying the value of said proportional current, and

(j) means connecting said converter means to the first end of the first ratio winding for passing said proportional current therethrough in phase with the voltage input, the improvement comprising

(k) phase sensitive detecting means connected to said detection winding and to said replica voltage for generating a first output signal (E_{90}) proportional to an ampere-turn unbalance in the comparator in phase with a reference current (I_{NS}) passing through the standard capacitor, and a second output signal (E_{90}) proportional to an ampere-



turn unbalance in the comparator in quadrature with said reference current,

(l) an RMS/DC converter connected to the second end of the first ratio winding for generating a third output signal (E_{INS}) proportional to the RMS value of the voltage input and hence proportional to the value of said reference current in the standard capacitor, and

(m) a microprocessor connected to receive said first, second and third output signals for controlling said means (b) for varying the number of turns on the first ratio winding and said means (i) for varying the value of said proportional current to bring the bridge towards ampere-turn balance with the number of turns on the first ratio winding proportional to the ratio ($E_{\mathcal{O}}/E_{INS}$) between said first and third signals providing a measure of the value of the reactance of the unknown impedance, said third signal (E_{INS}) providing a measure of the value of the reference current (I_{NS}), and the ratio (E_{90}/E_{INS}) between the second and third signals providing a measure of the value of the dissipation factor of the unknown impedance.

5,113,141

FOUR-FINGERS RFQ LINAC STRUCTURE

Donald A. Swenson, San Diego, Calif., assignor to Science Applications International Corporation, San Diego, Calif.

Filed Jul. 18, 1990, Ser. No. 554,797

Int. Cl.[5] H01J *25/10*

U.S. Cl. 328—233 **16 Claims**

1. A four-finger RFQ linac comprising:

a plurality of increasingly longer accelerating cells, each of said plurality of accelerating cells including

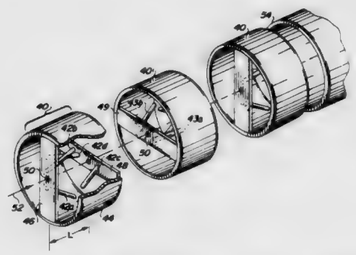
a first pair of spaced-apart fingers protruding into the center of the cell from a first end of the cell, said first pair of spaced-apart fingers lying in a first plane,

a second pair of spaced-apart fingers protruding into the center of the cell from the other end of the cell, said second pair of spaced-apart fingers lying in a second plane, said second plane being perpendicular to said first plane,

a cylindrical shell having a first crossbar structure attached to one end of said shell and a second crossbar structure attached to the other end of said shell, said crossbar structures having an aperture through their center, said first pair of spaced-apart fingers being secured to said first crossbar structure, said second pair of spaced-apart fingers being secured to said second crossbar structure.

means for aligning said plurality of cells so that a charged particle beam may pass uninterrupted through all of said accelerating cells along a beam axis, said beam axis passing through the aperture of said crossbar structures; and

means for selectively applying an alternating electric potential of a first frequency to said pairs of spaced-apart fingers



so that the first pair of fingers in each cell assumes an opposite potential as the second pair of fingers, whereby a quadrupole electric field is established in a region surrounding said pairs of fingers, said quadrupole electric field having a polarity that varies at ar ate determined by said first frequency, said quadrupole electric field serving to accelerate said charged particles through said accelerating cells in accordance with an inherent acceleration periodicity, and to focus said charged particle beam towards the center of said aperture;

said fingers being oriented in a prescribed pattern from cell to cell so as to provide a specified focusing periodicity, said focusing periodicity being independent of said acceleration periodicity, the specified focusing periodicity of said finger orientation from cell to cell thereby providing an additional degree of freedom in the design of said four-finger linac.

5,113,142

QAM DEMODULATOR HAVING AUTOMATIC ADAPTIVE EQUALIZER

Syuuichi Yoshikawa, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Okaka, Japan

Filed Dec. 19, 1990, Ser. No. 630,231

Claims priority, application Japan, Dec. 29, 1989, 1-341887

Int. Cl.[5] H03D *3/00*

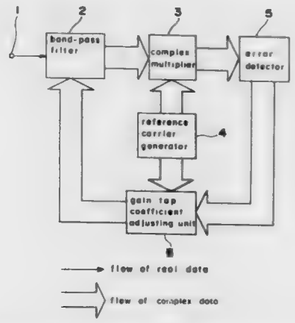
U.S. Cl. 329—306 **9 Claims**

1. An automatic equalizer comprising:

transversal filter means of a band-pass filter type including adjustable complex gain tap coefficients, and input means for receiving input data to be demodulated to produce a filtered signal;

reference carrier generating means for generating a complex reference carrier including a pair of real and imaginary parts, both said real and imaginary parts being in quadrature to each other; and

gain tap coefficient adjusting means for adjusting the complex gain tap coefficients using the complex reference carrier data transmitted from the reference carrier gener-



ating means and the input data applied to said transversal filter means.

5,113,143

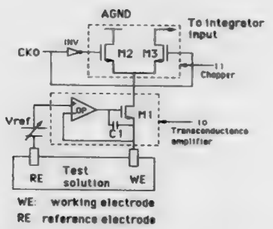
CHOPPER AMPLIFIER FOR MEASURING LOW DC CURRENT

Sen-Jung Wei, Hyattsville, Md., assignor to University of Maryland, College Park, Md.

Filed Apr. 8, 1991, Ser. No. 681,941

Int. Cl.[5] H03F *3/38*

U.S. Cl. 330—10 **11 Claims**



1. An amplifier circuit for measuring dc current through a resistance in which said current does not flow through a voltage source applied across said resistance, comprising:

a transconductance amplifier having inverting and non-inverting input terminals, high input impedance, and nearly zero input offset voltage between said input terminals,

said transductance amplifier having an output current equal to said current to be measured,

said voltage source voltage applied between said non-inverting input terminal and the negative terminal of a dc power supply,

said transconductance amplifer also serving as a voltage follower to apply said voltage across said resistance connected between said inverting input terminal and said negative terminal of said dc power supply.

5,113,144

FEED-BACK TYPE EMPHASIS CIRCUIT

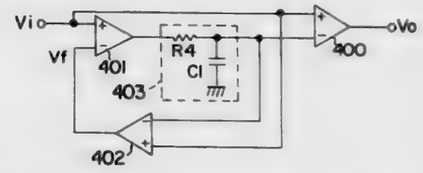
Young W. Song, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Chungcheongbuk, Rep. of Korea

Filed Oct. 22, 1990, Ser. No. 601,870

Claims priority, application Rep. of Korea, Oct. 23, 1989, 89-15410

Int. Cl.[5] H03F *1/34, 3/68*

U.S. Cl. 330—85 **1 Claim**



1. A feed-back type emphasis circuit comprising: an input providing input signal V_i, an input amplifier having two input terminals and an output terminal, a low pass filter having an input and an output, an output amplifier having two input terminals and an output terminal and a feed-back amplifier having two input terminals and an output terminal,

said input amplifier receiving said input V_i through a first one of said input terminals;

the input of said low pass filter connected to the output terminal of said input amplifier, and the output of the low pass filter connected both to a first one of said input terminals of said output amplifier and to a first one of said input terminals of said feed-back amplifier;

said output amplifier connected to said input signal V_i through the second of its said two input terminals;

said feed-back amplifier connected to said input signal V_i through the second of its said two input terminals; and

said feed-back amplifier further comprising a differential amplifier with adjustable gain and balance between two inputs to said differential amplifier,

whereby the feedback amplifier can be adjusted to obtain a specified transfer function for the emphasis circuit.

5,113,145

POWER AMPLIFIER FOR FEEDING AN INDUCTANCE WITH SWITCHED TRANSISTORS

Karl-Heniz Ideler, Spardorf; Stefan Nowak, Kalchreuth, and Gunter Petzold, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 27, 1991, Ser. No. 661,219

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1990, 4007566

Int. Cl.[5] H03F *3/217*

U.S. Cl. 330—251 **18 Claims**

1. A power amplifier for feeding an inductance, comprising:

first, second, third, and fourth transistor means for switching arranged in a bridge circuit in a diagonal of which the inductance is connected at first and second load terminals;

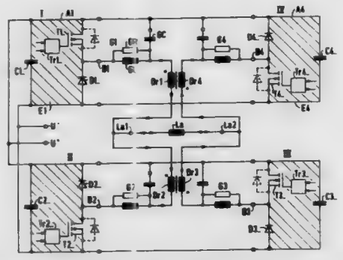
each of the first through fourth switching transistor means having a respective first through fourth freewheeling diode means connected thereto for assuming current flow of the respective switching transistor means when the transistor means is turned off;

the first through fourth switching transistor means each being respectively provided in a respective bridge branch of the bridge circuit;

thermally and electrically conductive first rings;

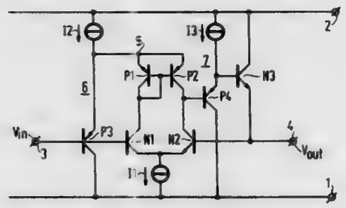
the first through fourth switching transistors means each comprising a plurality of individual transistors connected

in parallel and secured in a uniformly distributed manner on the respective four first rings;
a respective terminal for each individual transistor electrically connecting the individual transistors to the respective first rings; and



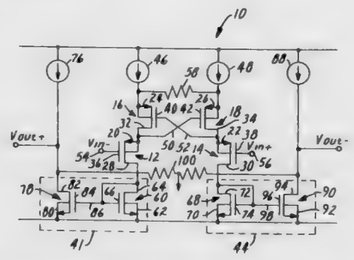
large-area printed circuit board means for connecting to further terminals of the individual transistors in substantially rotational symmetric fashion.

5,113,146
AMPLIFIER ARRANGEMENT
Willem de Jager, and Eetze A. de Boer, both of Enschede, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Mar. 12, 1991, Ser. No. 667,845
Claims priority, application Netherlands, Mar. 21, 1990, 9000656
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—252 **12 Claims**



1. An amplifier arrangement comprising; a differential pair including at least a first and a second transistor of a first conductivity type, means for mutually coupling a first main electrode of the first transistor and a first main electrode of the second transistor to a first supply terminal by means of a current source, a control electrode of the first transistor being coupled to an input terminal and a control electrode of the second transistor being coupled to an output terminal, a current mirror comprising at least a third and a fourth transistor of a second conductivity type with a first main electrode of the third transistor and a first main electrode of the fourth transistor mutually coupled to a second supply terminal by means of a common terminal, a second main electrode of the third transistor being coupled to a second main electrode of the first transistor and a second main electrode of the fourth transistor being coupled to a second main electrode of the second transistor, a buffer stage comprising at least a fifth transistor of the first conductivity type, a control electrode of the fifth transistor being coupled to the second main electrode of the second transistor, a first main electrode of the fifth transistor being coupled to the output terminal and a second main electrode of the fifth transistor being coupled to the second supply terminal, and means coupling the control electrode of the first transistor to the common terminal by means of a first level shifting circuit.

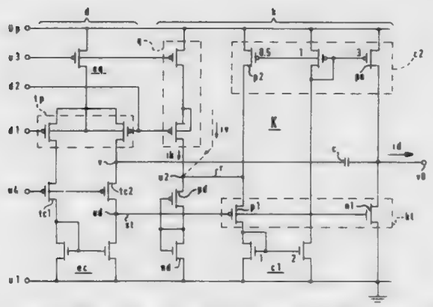
5,113,147
WIDE-BAND DIFFERENTIAL AMPLIFIER USING GM-CANCELLATION
Hans W. Klein, Pleasanton, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sep. 26, 1990, Ser. No. 588,981
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—253 **1 Claim**



1. A wide-band differential amplifier comprising:
first, second, third and fourth MOS transistors (**12**, **14**, **16**, and **18**) each having a source, a drain, and a gate,
a first current mirror having a fifth MOS transistor having a source, drain, and gate connected to the drain of said first transistor,
a second current mirror having a sixth MOS transistor having a source, drain, and gate connected to the drain of said second transistor,
a first current source serially connected with said third transistor, said first transistor and said first current mirror,
a second current source serially connected with said fourth transistor, said second transistor, and said second current mirror,
means connecting said gate of said third transistor to said source of said second transistor, and means connecting said gate of said fourth transistor to said source of said first transistor,
means for applying a first input ($-V_{in}$) to said gate of said first transistor and means for applying a second input ($+V_{in}$) to said gate of said second transistor,
a first resistor **Rd1**, connected between said source of said third transistor and said source of said fourth transistor,
a third current source serially connected with a seventh MOS transistor having a source, drain, and gate, and which forms a part of said first current mirror,
means connecting said gates of said fifth and seventh transistors of said first current mirror,
a fourth current source serially connected with an eighth MOS transistor having a source, drain, and gate, and which forms a part of said second current mirror,
means connecting said gates of said sixth and eighth transistors of said second current mirror, and
a second resistor, **Rd2**, connected between said drains of said seventh and eighth transistors, the outputs of said amplifier being taken at said drains of said seventh and eighth transistors.

5,113,148
LINEAR CMOS OUTPUT STAGE
Ulrich Theus, Gundelfingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany
Filed May 28, 1991, Ser. No. 705,971
Claims priority, application European Pat. Off., Jun. 7, 1990, 90110765.6
Int. Cl.[5] H03F *3/45, 3/16*
U.S. Cl. 330—253 **8 Claims**

1. A class-AB push-pull CMOS output stage for an amplifier having an input stage, said output stage driven with a drive potential from said input stage via a control line, said output stage comprising:
a complementary transistor pair comprising a first transistor and a second transistor, each having a gate terminal, a source terminal and a drain terminal, said control line feeding said gate terminals of said complementary transistor pair, said first transistor serving as a first push-pull output transistor;
a second push-pull output transistor having the same conductivity type as said second transistor of said complementary transistor pair, said second push-pull transistor having a gate terminal, a source terminal and a drain terminal;
a current mirror arrangement that interconnects said gate terminal of said second push-pull transistor and said drain terminal of said second transistor of said complementary transistor pair;
a first fixed potential connected to said source terminal of said first transistor in said complementary transistor pair;
a second fixed potential connected to said source terminal of said second transistor in said complementary transistor pair;
an output terminal connected to said drain terminal of said first transistor in said complementary transistor pair and said drain terminal of said second push-pull transistor to form a high-impedance current-difference stage providing

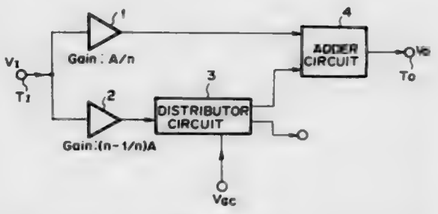


a differential output current wherein the drain current of said second push-pull transistor is proportional to the drain current of said second transistor in said complementary transistor pair, and wherein throughout the range of said drive potential both said first transistor and said second transistor of said complementary transistor pair remain in the range of their respective square-law current-voltage characteristics:

$$I_{DS}=\beta(U_{GS}-U_T)^2,$$

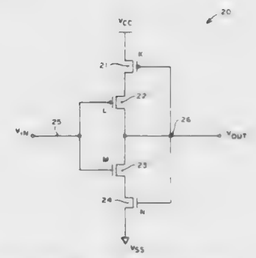
and
at zero drive level, the differential output current has a value of zero,
said output stage further comprising:
an active compensation circuit having an output terminal;
a constant current source; and
a reference-voltage source comprising a series combination of a diode-connected n-channel transistor and a diode-connected p-channel transistor, wherein:
one terminal of said reference-voltage source is connected to said first fixed reference potential; and
an input terminal of said reference-voltage source is connected to said constant-current source and provides said second fixed potent- said input terminal being connected to said output terminal of said compensation circuit.

5,113,149
VARIABLE GAIN AMPLIFIER
Norio Terada, and Kazuo Tokuda, both of Kanagawa, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed May 17, 1991, Ser. No. 702,628
Claims priority, application Japan, May 18, 1990, 2-129832
Int. Cl.[5] H03F *3/45, 3/68;* H03G *3/30*
U.S. Cl. 330—254 **6 Claims**



1. A variable gain amplifier comprising:
a first amplifier circuit for amplifying an input signal with a gain of A/n times (A being a real number excepting "0", and n being a real number larger than 1: the same hereinafter);
a second amplifier circuit for amplifiying said input signal with a gain of A(n−1/n) times;
level converting means receiving an output signal from said second amplifier circuit for converting a level of said output signal at a ratio corresponding to a level of a gain control signal having a predetermined level controllable range and at a ratio of 1/(+1) at a level of a central value of the level controllable range of this gain control signal; and
an adder circuit for adding together an output signal from said level converting means and an output signal from said first amplifier circuit at the ratio of 1:1.

5,113,150
UNITY GAIN INVERTING AMPLIFIER PROVIDING LINEAR TRANSFER CHARACTERISTICS
Alex Waizman, Haifa, Israel, assignor to Intel Corporation, Santa Clara, Calif.
Filed May 31, 1991, Ser. No. 708,687
Int. Cl.[5] H03F *3/26, 3/16*
U.S. Cl. 330—264 **4 Claims**



1. A CMOS amplifier circuit comprising:
first and second p-channel MOS transistors coupled in series between a first supply potential and an output node;
first and second n-channel MOS transistors coupled in series between said output node and a second supply potential;
wherein the gates of said first p-channel and n-channel transistors are commonly coupled to said output node, and the gates of said second p-channel and n-channel transistors are commonly coupled to an input node, and further wherein each of said transistor has a relative device size

such that the voltage at said output node varies in a substantially linear manner in response to the voltage applied to said input node, and;

wherein the device size between second p-channel and said first p-channel transistors have a ratio approximately 4:1.

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5 113,151

EQUALIZING AND AMPLIFYING CIRCUIT IN AN OPTICAL SIGNAL RECEIVING APPARATUS

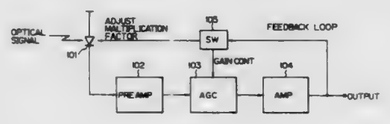
Takuji Yamamoto; Hiroshi Hamano, both of Kawasaki; Izumi Amemiya, Yokohama; Yasunari Arai, Tokyo, and Takeshi Ihara, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

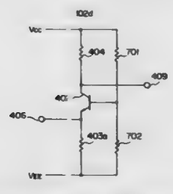
Filed Jul. 19, 1990, Ser. No. 554,375

Claims priority, application Japan, Jul. 21, 1989, 1-189190; Aug. 10, 1989, 1-207571

Int. Cl.[5] H03F *17/00*

U.S. Cl. 330—308 **11 Claims**





3. An equalizing and amplifying circuit in an optical signal receiving apparatus including a first power supply pad and a second power supply pad, comprising:

a preamplifier circuit having an input terminal, operatively connected to the output of a light receiving element, for converting an optical signal into an electrical signal, and having an output terminal, said preamplifier circuit amplifying said electrical signal to output an amplified signal to said output terminal;

an automatic gain control circuit, operatively connected to said output terminal of said preamplifier circuit, for amplifying the output amplified signal of said preamplifier circuit to a predetermined level;

said preamplifier circuit comprising:

a first transistor having a common-base, having an emitter operatively connected to said input terminal, and having a collector operatively connected to said output terminal;

a first current source, having a resistor directly connected between the emitter of said first transistor and the second power supply pad, for supplying a bias current to said first transistor and for suppressing an influence of an inductance of a bonding wire connected between said second power supply pad and a second power supply; and

a load resistor connected to the collector of said first transistor; and

a bias voltage source, the base of said first transistor being connected through said bias voltage source to the first power supply pad, the collector of said first transistor being connected through said load resistor to the first power supply pad, and the emitter of said first transistor being connected through said first current source to the second power supply pad, said bias voltage source comprising:

a first resistor connected between the base of said first transistor and the first power supply pad; and

a second resistor connected between the base of said first transistor and the second power supply pad, for determining the operating point of said first transistor.

5,113,152

PLL FREQUENCY SYNTHESIZER WITH CIRCUIT FOR CHANGING LOOP FILTER TIME CONSTANT

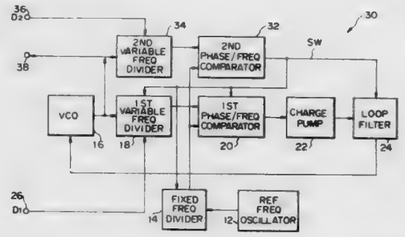
Hidehiko Norimatsu, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 18, 1991, Ser. No. 687,329

Claims priority, application Japan, Apr. 19, 1990, 2-103414

Int. Cl.[5] H03L *7/087, 7/093*

U.S. Cl. 331—11 **6 Claims**



6. A method of generating an oscillation signal in response to a divisor signal, comprising the steps of:

(a) generating a first oscillation signal;

(b) generating a second oscillation signal whose frequency changes in response to a control signal;

(c) responsive to first and second divisor signals, frequency dividing said second oscillation signal to produce first and second divided signals, respectively;

(d) frequency and phase comparing said first oscillation signal with said first and second divided signals to produce first and second comparison signals, respectively; and

(e) filtering said first comparison signal to produce a filtered signal and supplying said filtered signal to the generating step (b) as said control signal, the time constant of the filtering step (e) being changed in response to said second comparison signal.

5,113,153

HIGH-FREQUENCY MONOLITHIC OSCILLATOR STRUCTURE FOR THIRD-OVERTONE CRYSTALS

Mehmet Soyuer, Mohegan Lake, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 20, 1991, Ser. No. 703,232

Int. Cl.[5] H03B *5/36*

U.S. Cl. 331—61 **4 Claims**

1. A crystal controlled oscillator circuit comprising first and second transistor devices, said first and second transistor devices having emitter, collector and base electrodes, said emitter electrodes of said first and second transistor devices being connected together to a current source which in turn is connected to a source of ground potential,

first and second resistors,

a voltage source V_{cc} connected to one side of each of said first and second resistors, said other sides of each of said first and second resistors being connected respectively to separate ones of said collector electrodes of said first and second transistor device,

a crystal device having a first side connected to said collector electrode of said second transistor device, and a second side of said crystal device connected to said base electrode of said second transistor device,

a first capacitor device having one side thereof connected to the junction of said crystal device and said collector electrode of said second transistor device, and a second side of said first capacitor device connected to said source of ground potential,

a second capacitor device having one side thereof connected to the junction of said crystal device and said base electrode of said second transistor device and a second side of said second capacitor device connected to said source of ground potential,

said crystal device, said first and second capacitor devices and said first and second transistor devices forming an oscillator circuit for producing signals having third-overtone frequencies and fundamental mode suppression.

5,113,154

MICROWAVE GENERATOR DEVICE WITH VIRTUAL CATHODE

Guy Convert, Vincennes, and Jean-Pierre Brasile, Gif Sur Yvette, both of France, assignors to Thomson-CSF, Puteaux, France

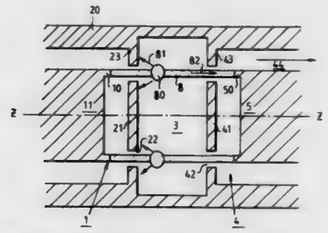
PCT No. PCT/FR90/00112, § 371 Date Oct. 17, 1990, § 102(e) Date Oct. 17, 1990, PCT Pub. No. WO90/09675, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 16, 1990, Ser. No. 582,913

Claims priority, application France, Feb. 17, 1989, 89 02081

Int. Cl.[5] H01J *25/74;* **H03B** *9/01*

U.S. Cl. 331—79 **10 Claims**



1. A microwave generator device comprising:

an electron gun producing an electron beam in a region of injection wherein a current carried in said region is sufficient to form a virtual cathode;

an output microwave circuit for converting the kinetic energy of the electrons into microwave energy wherein said output microwave circuit includes a means for separating the electrons transmitted from the electrons reflected by said virtual cathode so that said output microwave circuit receives substantially in-phase energy.

5,113,155

OSCILLATOR EMPLOYING A STRIP LINE OF TRI-PLATE STRUCTURE AS A RESONANT ELEMENT

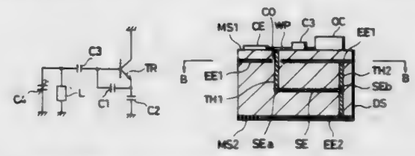
Yo Funada, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Aug. 13, 1991, Ser. No. 744,582

Claims priority, application Japan, Aug. 15, 1990, 2-216425

Int. Cl.[5] H05B *7/00*

U.S. Cl. 331—107 SL **8 Claims**



1. An oscillator employing a strip line of tri-plate structure as a resonant element comprising:

a substrate having a strip line electrode embedded therein and a pair of grounding electrodes opposed to each other with the strip line electrode therebetween, neither of the pair of grounding electrodes being exposed on an upper main surface of said substrate;

an oscillation circuit portion provided on the upper main surface of said substrate; and

a capacitor electrode provided on the upper main surface of said substrate, said capacitor electrode being opposed to the embedded grounding electrode;

wherein one end of the strip line electrode is connected to said capacitor electrode and said oscillation circuit portion through a first connecting electrode extending from the above one end of the strip line electrode to the upper main surface of said substrate and wherein the other end of the strip line electrode is connected to at least one of the pair of grounding electrodes through a second connecting electrode.

5,113,156

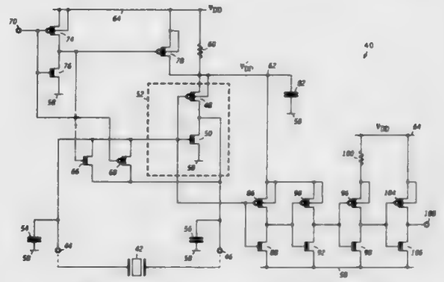
LOW POWER CRYSTAL OSCILLATOR WITH AUTOMATIC GAIN CONTROL

John K. Mahabadi, Tempe, Ariz., and Kenneth R. Burch, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 22, 1991, Ser. No. 688,729

Int. Cl.[5] H03B *5/36;* **H03L** *1/00*

U.S. Cl. 331—109 **10 Claims**



1. An oscillator circuit for providing an output signal, comprising:

a crystal having first and second terminals;

an amplifier circuit having an output coupled to said first terminal of said crystal and having an input coupled to said second terminal of said crystal for providing the

output signal of the oscillator circuit, said amplifier circuit including,

(a) a first transistor having a gate a drain and a source, said gate being coupled to said input of said amplifier circuit, said drain being coupled to said output of said amplifier circuit, said source being directly connected to a first source of operating potential, and

(b) a second transistor having a gate, a drain and a source, said gate being coupled to said output of said amplifier circuit, said drain being coupled to said output of said amplifier circuit;

circuit means coupled between said source of said second transistor at a first node and a second source of operating potential for controlling the operating potential of said amplifier circuit, said circuit means including a resistor coupled between said first node and said second source of operating potential;

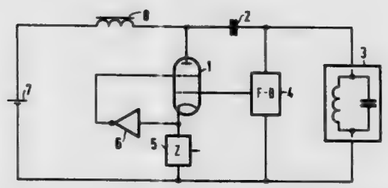
feedback means coupled between said input and output of said amplifier circuit for biasing said amplifier circuit; and

a first capacitor coupled between said first node and either said first source of operating potential or said second source of operating potential.

5,113,157
HIGH-FREQUENCY ELECTRON TUBE POWER OSCILLATOR

Christian S. A. E. Patron, and Eugene J. Sowinski, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1991, Ser. No. 693,977
Claims priority, application Netherlands, May 3, 1990, 9001060
Int. Cl.[5] H03B *1/00*
U.S. Cl. 331—167 **11 Claims**



1. A high-frequency electron tube power oscillator comprising: an adjustable impedance element connected in series with the cathode of the electron tube, characterized in that the electron tube comprises a multigrid electron tube including at least one control grid and an additional grid, and an inverting amplifier having its input coupled to a side of the impedance element which is coupled to the cathode and whose output is coupled to the additional grid of the electron tube.

5,113,158
PULSE WIDTH MODULATION CIRCUIT

Kimitoshi Tsuji, and Yorikiyo Nobuhara, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 1, 1991, Ser. No. 723,972
Int. Cl.[5] H03K *7/08*; G05B *11/28*
U.S. Cl. 332—109 **13 Claims**

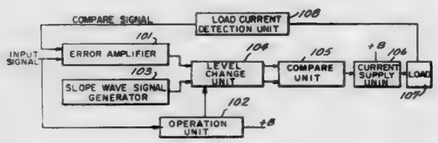
1. A pulse width modulation circuit comprising:

error amplifier means for generating an error signal corresponding to a difference between an input signal and a compare signal;

operation means for generating a compensation signal based on a product of a deviation of said input signal from a first reference value and a deviation of a power supply voltage from a second reference value;

reference wave signal generating means for generating a reference wave signal having a fixed period and a fixed amplitude;

level change means, operatively coupled to said error amplifier means and said reference wave signal generating means, for changing a level of at least one of said error signal and said reference wave signal in accordance with said compensation signal so that a relative level defined by a level difference between said error signal and said reference wave signal changes in accordance with said compensation signal;



compare means, operatively coupled to said level change means, for comparing the level of the error signal and the level of said reference wave signal having a changed relative level with each other and for generating a pulse width modulated signal based on a comparison result;

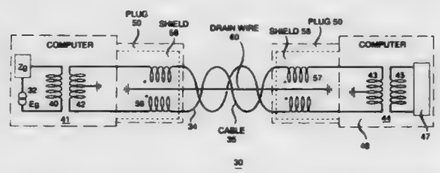
current supply means, coupled to said compare means, for supplying a load current based on a duty ratio of said pulse width modulated signal to a load; and

load current detection means, operatively coupled to said error amplifier means, for detecting said load current passing through said load and for generating said compare signal based on a detected load current.

5,113,159
COMMUNICATIONS TRANSMISSION SYSTEM INCLUDING FACILITIES FOR SUPPRESSING ELECTROMAGNETIC INTERFERENCE

Luc W. Adriaenssens; Harold W. Friesen; Wendell G. Nutt, all of Dunwoody, and Kenneth B. Parks, Lilburn, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 22, 1990, Ser. No. 483,152
Int. Cl.[5] H04B *3/30*
U.S. Cl. 333—12 **27 Claims**



1. A communications system for transmitting communication signals and including means for suppressing electromagnetic interference, said system comprising:

means for generating a communications signal;

means for receiving the generated signal;

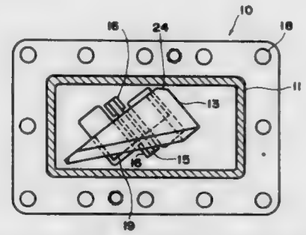
unshielded means for carrying the generated signal in a balanced mode from said means for generating a signal to said means for receiving the generated signal; and

voltage divider means coupled to said unshielded means and including a longitudinally extending metallic conductor and means which is substantially transparent to the balanced mode and which has a relatively high impedance to a longitudinal mode of the generated signal for decreasing substantially a longitudinal voltage of the generated signal on said unshielded means for carrying the generated signal.

5,113,160
WIDE BAND CRYOGENIC ULTRA-HIGH VACUUM MICROWAVE ABSORBER

Isidoro E. Campisi, Newport News, Va., assignor to Southeastern Universities Research Association, Newport News, Va.

Filed May 11, 1990, Ser. No. 522,131
Int. Cl.[5] H01P *1/26*
U.S. Cl. 333—22 R **20 Claims**



1. A mode absorber for absorbing unwanted higher order modes of microwave energy from rectangular wave guides, comprising:

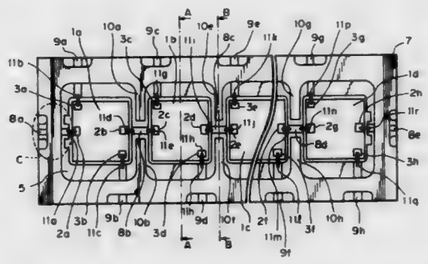
an absorber having a leading end and a trailing end capable of absorbing unwanted higher order modes of microwave energy over a wide frequency range having a cross section area as measured transverse to the centerline of the wave guide in which it is to be mounted that varies from a very small area at the said leading end of said absorber to a maximum cross section area towards said trailing end of said absorber, and

said absorber being shaped so said leading end is positioned in one corner of the rectangular wave guide and tapering downstream to said maximum cross section area with the center of said maximum cross section being located in the approximate vicinity of the longitudinal center line of the wave guide in which the absorber will be mounted.

5,113,161
CASE FOR HOUSING INTEGRATED MICROWAVE CIRCUITS

Kazuyoshi Inami, and Hajime Kawano, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1991, Ser. No. 661,527
Claims priority, application Japan, Mar. 1, 1990, 2-50711
Int. Cl.[5] H01P *1/00, 3/08*
U.S. Cl. 333—246 **13 Claims**



1. A case for housing integrated microwave circuits comprising:

a metal conductor body for carrying said integrated microwave circuits on the upper surface thereof;

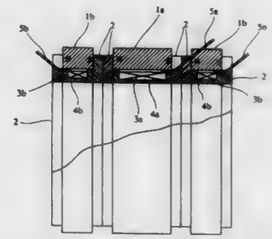
a first dielectric substrate stack-joined on said upper surface of said metal conductor body, and having a plurality of holes for receiving said integrated circuits respectively, signal strip line patterns on the upper surface thereof for connecting high-frequency signal input/output pads of said integrated circuits to each other and to external signal terminals, and shielding openings each filled with a conductive metal material connected to said metal conductor body for effecting electromagnetic shielding, said shielding openings being provided at interval(s) equal to or less than $\lambda/4$, where λ is a wavelength of a high-frequency signal within a frequency band to be used; and

a second dielectric substrate stack-joined on said first dielectric substrate, and having a plurality of holes associated with those in said first dielectric substrate for receiving said integrated circuits, a conductive metal plate for hermetical sealing and electromagnetic shielding on the upper surface thereof, shielding openings each filled with said conductive metal material connected between said conductive metal plate and said conductive metal material in each of said shielding openings of said first dielectric substrate, and electromagnetic shielding partitions between the adjacent holes for receiving said integrated circuits to provide an isolation of a wave guide mode between said integrated circuits.

5,113,162
FOCUS MAGNET WITH SEPARATE STATIC AND DYNAMIC CONTROL COILS

Teruo Umehara, Hanyu, and Fumihiko Takahashi, Menuma, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed May 23, 1991, Ser. No. 704,875
Int. Cl.[5] H01F *3/12, 7/00*; H01J *23/08*
U.S. Cl. 335—210 **4 Claims**



1. A focus magnet comprising (a) three axially magnetized hollow cylindrical permanent magnets disposed concentrically along a center axis of a cathode ray tube such that their opposite magnetic poles face each other; (b) yokes in the form of hollow discs disposed on both end surfaces of permanent magnet; (c) a static control coil disposed inside a center permanent magnet; (d) a horizontal dynamic control coil disposed inside one of side permanent magnets; and (e) a vertical dynamic control coil disposed inside the other side permanent magnet, whereby electron beams passing in said cathode ray tube are converged to a small spot diameter.

5,113,163
ADJUSTABLE MAGNETIC FIELD SUPERCONDUCTING SOLENOID

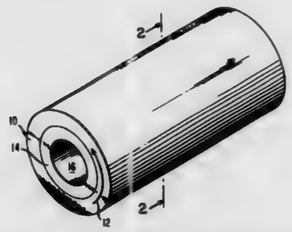
Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 13, 1990, Ser. No. 612,281
Int. Cl.[5] H01F *7/22, 1/00*
U.S. Cl. 335—216 **7 Claims**

1. A superconducting solenoid with an adjustable magnetic field comprising:

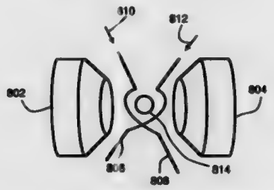
a cylinder having a bore extending along the longitudinal axis of the cylinder, the cylinder being made of superconducting material capable of producing a magnetic field within the cylinder; and

an insert having a diameter adapted to fit within the bore of the cylinder and being made of a ferromagnetic material,



whereby the insert absorbs a portion of the magnetic field produced by the cylinder when the insert is placed within the bore of the cylinder.

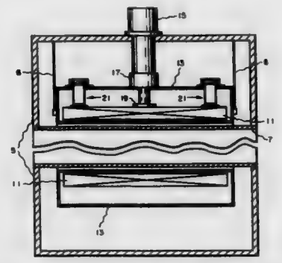
5,113,164
SUPERCONDUCTORS WITH SWITCHABLE MAGNETIC DOMAINS
Roger E. De Wames; Ira B. Goldberg; Peter E. D. Morgan; Joseph J. Ratto; David B. Marshall, and William F. Hall, all of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Jan. 27, 1989, Ser. No. 303,708
Int. Cl.[5] H01F *1/00, 5/00*
U.S. Cl. 335—216 **1 Claim**



1. A tunable electromagnetic filter, comprising:
a type II superconducting medium which exhibits a permanent ferromagnetic component after exposure to a magnetic field;
a means for providing a magnetic field passing through the medium in a first direction;
an input conductor for receiving an input signal wound around the medium in a second direction perpendicular to the first direction;
an output conductor wound around the medium in a third direction perpendicular to the first and second directions,
such that at resonance of the medium, an alternating field magnetic component perpendicular to both the incoming signal and the magnetic field is created to induce a current of the resonant frequency in the output conductor.

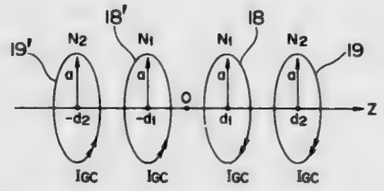
5,113,165
SUPERCONDUCTIVE MAGNET WITH THERMAL DIODE
Robert A. Ackermann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Aug. 3, 1990, Ser. No. 562,351
Int. Cl.[5] H01F *7/22*
U.S. Cl. 335—216 **16 Claims**

1. A superconductive magnet comprising:
at least one superconductive coil;
a vacuum vessel;
a thermal radiation shield situated inside said vacuum vessel and enclosing said superconductive coil; and
thermal diode means substantially enclosing a cryogenic gas means for thermally lining said superconductive coil and



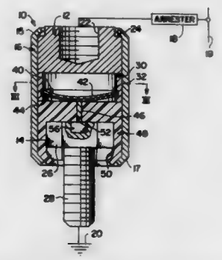
the thermal radiation shield when said thermal radiation shield is colder than the superconductive coil.

5,113,166
MAGNETIC FIELD GRADIENT COIL SYSTEM
Goh Miyajima, Katsuta; Takao Takahashi, Hitachi; Tuyosi Shudo, Katsuta, and Shohei Suzuki, Takahagi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 8, 1989, Ser. No. 447,863
Claims priority, application Japan, Dec. 14, 1988, 63-313874
Int. Cl.[5] H01F *5/00*
U.S. Cl. 335—299 **5 Claims**



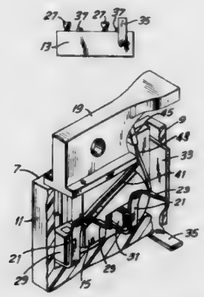
1. A magnetic field gradient coil system for use in a magnetic resonance imaging apparatus for forming a magnetic field gradient in a direction of a Z-axis of an X, Y, Z orthogonal coordinate system having its origin at a selected fixed position of the imaging apparatus, comprising:
one pair of first coils and one pair of second coils having their centers on the Z-axis and having the same radius, the coils of each coil pair being disposed symmetrically with respect to an XY plane including said origin, the coils of said second coil pair being located more distant from said origin than the coils of said first coil pair, the coils of said first and second coil pairs disposed on one side of said origin being supplied with current flowing in the same direction, while the coils disposed on the other side of said origin being supplied with current flowing in a direction opposite to the direction of current flow in said coils disposed on said one side of said origin;
each of the coils of said first coil pair being disposed at such a position where the value of the Z-axis magnetic field component of first order at a selected position on the Z-axis becomes substantially maximum when the current is supplied to said first coil pair to provide a predetermined ampere-turn; and
each of the coils of said second coil pair being disposed at such a position where the Z-axis magnetic field components of third and fifth orders provided by said second coil pair at said selected position have values which can substantially cancel the Z-axis magnetic field components of third and fifth orders provided by said first coil pair at said selected position when the current is supplied to said second coil pair to provide an ampere-turn having a selected ratio between it and the ampere-turn provided by the current supplied to said first coil pair.

5,113,167
LIGHTNING ARRESTER ISOLATOR
Donald E. Raudabaugh, Wadsworth, Ohio, assignor to Hubbell Incorporated, Orange, Conn.
Filed Feb. 15, 1991, Ser. No. 656,002
Int. Cl.[5] H01H *39/00, 83/10*
U.S. Cl. 337—30 **18 Claims**



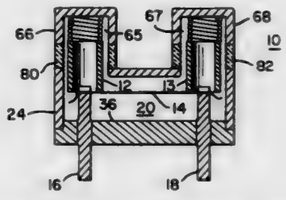
1. A device for connecting and isolating an arrester between a power line and ground, comprising:
a first electrical terminal;
a second electrical terminal;
casing means for mechanically connecting said first and second terminals;
electrical means for electrically connecting said first and second terminals, said electrical means including interrupting means for automatically interrupting said electrical means and creating a spark gap; and
gas generating means, adjacent said interrupting means, for physically and electrically separating said first and second terminals subsequent to creation of said spark gap.

5,113,168
SINGLE POSITION FLAT MOUNT FUSE HOLDER
Carl E. Lindquist, Bridgewater, N.J., assignor to San-O Industrial Corporation, Holbrook, N.Y.
Filed Jun. 26, 1991, Ser. No. 722,610
Int. Cl.[5] H01H *85/02, 85/30*
U.S. Cl. 337—187 **4 Claims**



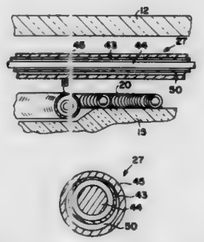
1. A single position fuse holder for flat mounting on an edge surface of a printed circuit board, said fuse holder comprising a fuse holder body portion made of an electrically insulative material and formed of two spaced apart, opposed parallel front side wall and rear side wall; two spaced apart, opposed parallel side edge walls, and a bottom closure wall thereby defining a compartment in said fuse holder body for receiving a fuse assembly having a fuse element with spaced contact terminals and an alarm spring normally attached to the fuse element; a pair of generally U-shaped members in said fuse holder compartment, one at one end of said compartment and the other near the other end thereof, a metallic alarm contact plate in said fuse holder compartment abutting the inside surface of the side edge wall at said other end of said compartment, each of said generally U-shaped members having a laterally extending arm portion which protrudes through corresponding rectangular apertures in said front side wall forming respective side contact pins and twisted from about 45 to about 90 degrees to lock said pins in position, and wherein said metallic alarm contact plate protrudes through a corresponding rectangular aperture in said bottom wall closure forming an alarm contact pin which is twisted from about 45 to about 90 degrees to lock said pin in position, and thereafter bent approximately 90 degrees relative to said bottom closure wall.

5,113,169
INDICATING FUSE ASSEMBLY
William E. Ruehl, Elgin; Bjarne Frederiksen, Villa Park, and E. Grant Swick, Bartlett, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.
Filed Jun. 1, 1990, Ser. No. 532,393
Int. Cl.[5] H01H *85/30*
U.S. Cl. 337—265 **40 Claims**



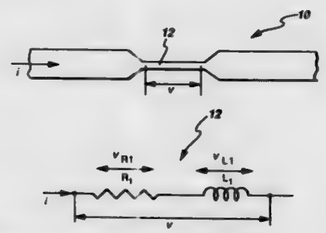
1. A fuse assembly for an electrical circuit, comprising:
a housing having a chamber and a wall with an external surface;
a fuse element rupturable at an electric current level above a predetermined current level;
a first conducting post and a second conducting post, each of said conducting posts having a first end and a second end, at least one of said first and second ends of each of said posts having means for securing said fuse element thereto;
said first and second conducting posts extending through said wall with said fuse-securing-means end positioned within said chamber and the other one of said ends operable to couple said fuse assembly within said circuit;
said fuse element, disposed within said chamber and secured between said first and second posts by said fuse-securing means at a fuse-operable condition, being rupturable at an overcurrent condition above said predetermined current level into a first segment and a second segment at each of said respective first and second posts, which segments are separable within said chamber so as to inhibit arcing between said fuse element segments; and
indicating snubber means movable within said housing between a first position at which said snubber means is disposed in contact with said fuse element when said fuse element is in a nonruptured intact condition, and a second position at which said snubber means envelops at least one of said first and second conducting posts when said fuse element is in said ruptured condition so as to separate said ruptured segments of said fuse element so as to prevent said arcing between said fuse element segments.

5,113,170
TEMPERATURE SWITCH
Gerhard Goessler, Oberderdingen, and Eugen Wilde, Knittlingen, both of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany
Filed Sep. 6, 1990, Ser. No. 578,354
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1989, 3929965
Int. Cl.[5] H01H *37/48*
U.S. Cl. 337—394 20 Claims



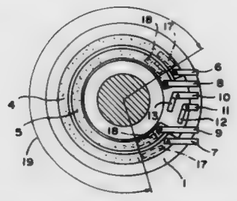
1. A temperature switch for a radiant heating means having at least one radiation source for emitting radiation, said temperature switch comprising:
at least one switching contact;
at least one temperature sensor comprising temperature responsive bodies including a rod and a temperature sensor surrounding said rod, said rod and said sensor tube having different thermal expansion coefficients, and said sensor tube being made from a conductive material, and
an electically insulating outer tube enveloping said sensor tube, wherein said outer tube is formed with a ceramic material for protecting at least one of said temperature responsive bodies against a substantial amount of said radiation source by at least one characteristic provided by a radiation absorbing characteristic and a radiation reflecting characteristic.

5,113,171
HIGH-FREQUENCY CURRENT-VIEWING RESISTOR
Sayed-Amr A. El-Hamamsy, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Dec. 21, 1990, Ser. No. 632,213
Int. Cl.[5] H01C *3/02*
U.S. Cl. 338—61 1 Claim



1. A current-viewing resistor, comprising:
a first resistance having a parasitic inductance in series therewith; and
a second resistance connected in series with a second inductance, the series combination of said second resistance and said second inductance being connected in parallel with the series combination of said first resistance and said parasitic inductance, said second resistance being relatively large as compared with said first resistance, and said second inductance being relatively large as compared with said parasitic inductance, the ratio of said parasitic inductance to said first resistance being substantially equal to the ratio of said second inductance to said second resistance;
whereby the voltage across said second resistance is substantially equal to the voltage across said first resistance, and the current through said first resistance is substantially equal to the current through the parallel combination of said resistances and said inductances.

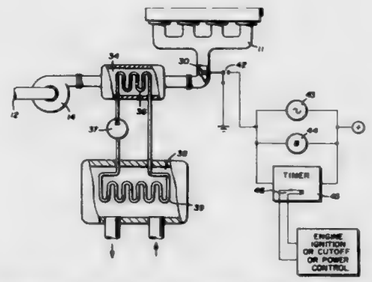
5,113,172
ANGLE OF ROTATION POTENTIOMETER
Armin Lang, Schwäbisch Gmünd, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany
PCT No. PCT/EP88/00579, § 371 Date Nov. 27, 1989, § 102(e) Date Nov. 27, 1989, PCT Pub. No. WO89/00331, PCT Pub. Date Jan. 12, 1989
PCT Filed Jun. 30, 1988, Ser. No. 444,129
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722389
Int. Cl.[5] H01C *10/32, 10/16, 10/26*
U.S. Cl. 338—171 4 Claims



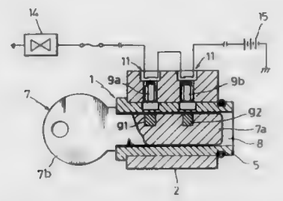
1. In a potentiometer for measuring the angle of rotation of a shaft relative to a fixed disk having at least one resistance path in the shape of a circular arc mounted thereon, the shaft having at least one collector path in the shape of a circular arc associated therewith, a first slide contact means in contact with the resistance path and a second slide contact means in contact with the collector path for tapping the current therein, the improvement which comprises
(a) a disk connected with the shaft for rotation therewith, the rotating disk being arranged in spaced parallel relation relative to the fixed disk and the at least one collector path associated with the shaft comprising two collector paths being mounted on the rotating disk in the shape of concentric circles;
(b) the first slide pair of slide contacts connected with the fixed disk and are in contact with the two collector paths, respectively, of the rotating disk; and
(c) a second pair of slide contacts connected with the rotating disk at least one of which is in contact with one of said collector paths for contact with a resistance path of the fixed disk.

5,113,173
AUDIBLE WARNING ARRANGEMENT FOR SUPERCHARGED INTERNAL COMBUSTION ENGINE
William Lawson, 1815 N. U.S. 1, Ormond Beach, Fla. 32174
Continuation-in-part of Ser. No. 374,835, Jul. 3, 1989, abandoned. This application Nov. 21, 1990, Ser. No. 616,833
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—449 3 Claims

1. On an internal combustion engine having a supercharger and an air intake manifold conducting pressurized air from the supercharger to the engine, the improvement which comprises:
an air-operated alarm device;
and a normally-closed thermostat valve connected between said intake manifold and said alarm device and having temperature-sensing means exposed the pressurized air in said intake manifold to sense the temperature of said air, said valve being operative in response to an abnormally high temperature in said intake manifold to open and pass pressurized air from said manifold to said alarm device to cause said alarm device to produce an alarm signal; further including a visual alarm coupled to said temperature-sensing means; a timer coupled to said temperature-sensing means, and engine cut-off means coupled to said timer; and engine power reduction means coupled to said timer.

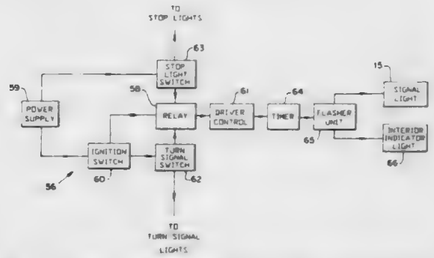


5,113,174
DEVICE FOR GIVING ALARM FOR FAILURE TO DRAW OUT KEY FOR VEHICLE
Kiyoyasu Wake, No. 57-1, 3-chome, Utsukushigaoka, Midori-ku, Yokohama-shi, Kanagawa-ken, Japan
Continuation of Ser. No. 542,123, Jun. 22, 1990, abandoned. This application Jul. 16, 1991, Ser. No. 730,400
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—457 1 Claim



1. A device for giving an alarm for failure to draw out a key for a vehicle, comprising:
a key cylinder lock for the vehicle including an outer tubular member having axially spaced penetrating holes (3, 4) therein, and an inner tubular member rotatably provided within said outer tubular member and having grooves (6) therein corresponding with said holes (3, 4) in said outer tubular member,
a plurality of magnet pin tumbler inserts each serving as a movable obstruction element accommodated within both the holes (3, 4) of the outer tubular member and the grooves (6) of the inner tubular member,
a switch member provided in each hole (3, 4) in said outer tubular member, which switch member is turned on by said magnet tumbler inserts when a magnet key is inserted into a keyhole (8) in said inner tubular member in which the turned on switch member completes an electrical circuit with a power supply delivered from a battery mounted in said vehicle,
a door switch in said electrical circuit which is turned on when a door of said vehicle is opened, and
an alarm unit connected to both said door switch and said switch member in each hole and operative to produce an alarm when the door of the vehicle is opened under a condition where the magnet key is inserted within the key hole at the time the door is opened.

5,113,175
REAR MOTOR VEHICLE ALERTING BRIGHT LIGHT DIMMING SIGNAL AND CONTROL SYSTEM
Robert Adell, 31800 S. Brandingham, Franklin, Mich. 48025
Filed Dec. 17, 1990, Ser. No. 627,951
Int. Cl.[5] B60Q *1/26*
U.S. Cl. 340—468 26 Claims



17. In a motor vehicle of the type having a pair of back-up lights mounted on the rear of the vehicle which are operative when said vehicle is travelling in a reverse direction, turn signal lights and stop lights, the improvement which comprises a means for flashing said back-up lights "on and off" when said vehicle is travelling in a forward direction to request a driver who is operating a vehicle behind the signalling vehicle to dim his vehicle's bright lights, said means being operative only when said signalling vehicle's stop lights and said turn signal lights are inoperative.

5,113,176
LUMBAR ROLL WITH AUDIBLE ALERTING CAPABILITY
Frank W. Harris, Boulder, Colo., assignor to Steodyn, Inc., Longmont, Colo.
Filed Nov. 13, 1990, Ser. No. 612,611
Int. Cl.[5] G05B *21/00*
U.S. Cl. 340—573 19 Claims



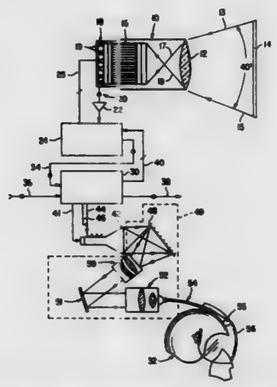
1. A lumbar roll having alerting capability, said lumbar roll comprising:
resilient means adapted to be compressed by a user;
pressure means at said resilient means for sensing pressure exerted by a user on said resilient means, said pressure means providing an output indicative of sensed user applied pressure;
processing means responsive to said output from said power means, providing at least one output indicative of the occurrence of a preselected condition; and
indicating means connected with said processing means for indicating the occurrence of said preselected condition.

5,113,177

APPARATUS FOR A DISPLAY SYSTEM

Ricard L. Cohen, Matawan, assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 4, 1988, Ser. No. 253,175
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—705 **5 Claims**



1. Apparatus for use by a pilot in an aircraft for simultaneous viewing on a display of an image of a scene external to the aircraft and of an image of selected display information, said display being a helmet display having a visor on a helmet, said visor acting as a collimating combiner, comprising:

(a) collecting means mounted on said helmet and collecting light from an external field of view which coincides with the pilot's field of view without interfering with said pilot's field of view for collecting and intensifying light from the external scene and providing a voltage on an output representative of the external scene, said collecting means being an image intensifying tube which is a light intensifying tube from a night vision goggle modified by removing an eyepiece and adding a CCD sensor, said image intensifying tube including (1) an objective lens which collects light from said external scene and forms an inverted image, (2) electron generating means for generating an electron flow, at a plurality of points in said inverted image, as a function of light collected by said objective lens, (3) amplifying means for multiplying said electron flows to generate an amplified electron flow at each of said points, (4) light generating means for generating light from each of said amplified electron flows, (5) the CCD sensor receiving light from said light generating means and having a plurality of photosites, each photosite generating a charge dependent on said photosite's exposure to light, and (6) inverting means for reinverting said inverted image disposed between said light generating means and said CCD sensor, for receiving light from said light generating means and outputting a reinverted image to said CCD sensor,

(b) converting means for converting said voltage to a first video signal,

(c) means for providing at least a second video signal,

(d) combining means for combining said first and second video signals and for providing a combined video signal,

(e) driving means responsive to said combined video signal for driving the display, and

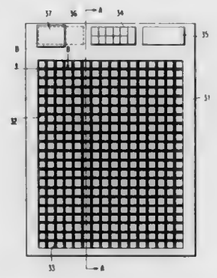
(f) synchronizing means for synchronizing the display so that said converting means converts said voltage to a first video signal for combining with said second video signal by said combining means in time for said driving means to be responsive to said combined signal.

5,113,178

POSITION DISPLAY APPARATUS

Tomio Yasuda, Saitama, and Yuichi Murakami, Kanagawa, both of Japan, assignors to Aisin Seiki K.K., Aichi, Japan

Filed Jan. 30, 1989, Ser. No. 302,879
Claims priority, application Japan, Jan. 29, 1988, 63-020247; Jan. 29, 1988, 63-020248; Jan. 29, 1988, 63-020249; Jan. 29, 1988, 63-020250
Int. Cl.[5] C08G *1/00*
U.S. Cl. 340—709 **10 Claims**



1. A position display apparatus comprising:

a frame having a space for setting a map book;

memory means for storing data on said map book;

position detecting means for detecting a position;

display means provided on said frame; and

control means for selecting a page of said map book in accordance with map data stored in said memory means and position information detected by said position detecting means, and for giving an instruction to said display means to enable said display means to display the data concerning number of the selected page;

wherein said display means includes character display means capable of displaying a map book changing instruction, said control means being capable of judging, on the basis of the position information detected by said position detecting means and the data stored in said memory means, whether the detected position is covered by the maps in said map book and, upon judging that the detected position is not covered by said maps, giving an instruction to said character display means to enable said character display means to display said map book changing instruction,

wherein said display means includes a first group of optical fibers arranged in said frame in the longitudinal direction, a second group of optical fibers arranged in said frame transversely so as to orthogonally cross said optical fibers of said first group, and first and second groups of light-emitting diodes mounted on said frame adjacent respective ends of said first and second groups of optical fibers.

5,113,179

SWITCH JOYSTICK

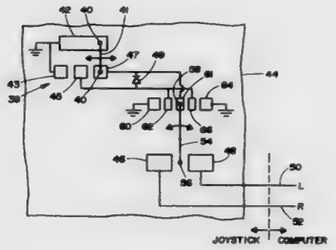
Dennis Scott-Jackson, and Harry Skibbe, both of Burnaby, Canada, assignors to Advanced Gravis Computer Technology Ltd., Burnaby, Canada

Filed Mar. 16, 1990, Ser. No. 494,479
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—709 **13 Claims**

1. A switch joystick, comprising:

(a) a lever pivotal along at least one direction;

(b) a first switch coupled to said lever and actuated in response to deflection of said lever by a selectable amount from a neutral position along said at least one direction; and



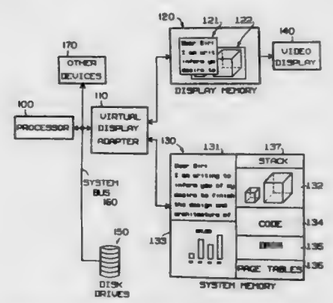
(c) means for adjusting the selectable amount of lever deflection in said at least one direction necessary to actuate said first switch.

5,113,180

VIRTUAL DISPLAY ADAPTER

Satish Gupta, Peekskill; Steven P. Larky, New York; Alan W. Peevers, Peekskill, all of N.Y., and Joe C. St. Clair, Round Rock, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 20, 1988, Ser. No. 183,795
Int. Cl.[5] G09G *1/14*
U.S. Cl. 340—747 **25 Claims**



1. In a computer graphics system which displays information on a video display, the combination comprising:

a processor which provides information signals for running display applications which include advanced display functions for creating display information and virtual memory address signals indicative of where the display information is to be created;

a memory which stores system information at physical addresses, said memory further storing display information at other physical addresses for display on said video display; and

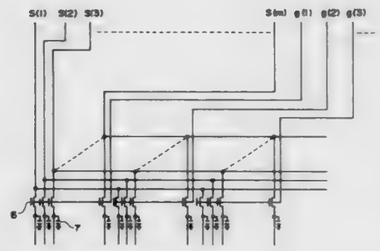
a display control means, including virtual address translation means, which responds to said information signals and virtual memory address signals from said processor to convert said virtual memory addresses to physical memory addresses at which the display information is to be created in said memory.

5,113,181

DISPLAY APPARATUS

Hiroshi Inoue, Yokohama; Atsushi Mizutome, Hayamachi; Hideo Kanno, Kawasaki; Eiji Sakamoto, Hiratsuka, and Yoshiyuki Osada, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 18,333, Feb. 24, 1987, abandoned. This application Feb. 3, 1989, Ser. No. 306,209
Claims priority, application Japan, Feb. 21, 1986, 61-035222; Feb. 26, 1986, 61-041273
Int. Cl.[5] G09G *3/06*
U.S. Cl. 340—783 **12 Claims**



1. A display apparatus, comprising:

a plurality of pixels arranged in pluralities of rows and columns;

a plurality of first control lines each connecting a column of pixels in common, said first control lines being divided into a plurality of blocks;

a plurality of second control lines each connecting a row of pixels in common;

third control lines each branched into a plurality of lead lines so that a corresponding one of said first control lines in each of the blocks are commonly connected by a respective one of said third control lines through a corresponding one of said plurality of lead lines; and

a plurality of multiplexing switching elements, each of said plurality of multiplexing switching elements corresponding to a respective one of said first control lines, and said switching elements being disposed at each connection between said plurality of lead lines and said first control lines, and wherein said multiplexing switching elements are divided into the plurality of blocks;

fourth control lines disposed so that said multiplexing switching elements in each of the blocks are commonly connected by a respective one of said fourth control lines, said fourth control lines supplying control signals to said multiplexing switching elements, wherein a substantially equal number of corresponding lead lines are disposed on each side of said respective one of said fourth control lines for each of the plurality of blocks, and

wherein when similar control signals are applied to adjacent blocks as supplied by said fourth control lines, a difference in voltage between corresponding first control lines of two multiplexing switching elements for the adjacent blocks disposed at a boundary between a neighboring pair of blocks is at most 50 mV.

5,113,182

VEHICLE DOOR LOCKING SYSTEM DETECTING THAT ALL DOORS ARE CLOSED

Michael J. Suman, Holland, and Mark L. Zeinstra, Grandville, both of Mich., assignors to Prince Corporation, Holland, Mich.

Filed Jan. 19, 1990, Ser. No. 467,541
Int. Cl.[5] H04Q *1/00*
U.S. Cl. 340—825.31 **2 Claims**

1. A vehicle door locking system comprising:

a plurality of electrically actuated vehicle door locks for a vehicle;

means for detecting the closure status of the vehicle doors, said means detecting that all the vehicle doors are closed;

input circuit means for controlling said door locks; and

a microcontroller coupled to said door locks, to said detecting means and to said input circuit means, said microcontroller responsive to input signals from said input circuit means for locking all doors of the vehicle, wherein when one of said input signals is received from said input circuit means when at least one of said vehicle doors is open, said microcontroller is responsive to said one of said input signals to lock all doors of the vehicle a predetermined time period after said detecting means detects that all doors have been closed.

5,113,183

REMOTE CODE TRANSMISSION SYSTEM BETWEEN A NAMEPLATE APPARATUS AND A DATA PROCESSING APPARATUS

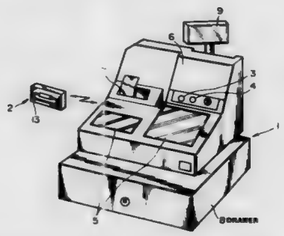
Yutaka Mizuno, Higashiyamato; Hanzo Tsuzuki, Oome; Kazuyoshi Haruhara, Fussa; Shigeki Miyata, Oome; Katsuhiko Motoike; Tooru Sakai, both of Fussa, and Kazuhiro Ooishi, Akishima, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 371,649, Jun. 21, 1989, abandoned, which is a continuation of Ser. No. 204,623, Jun. 9, 1988, abandoned. This application Oct. 31, 1990, Ser. No. 609,115

Claims priority, application Japan, Jun. 16, 1987, 62-147995; Jun. 16, 1987, 62-147996

Int. Cl.[5] G07G *1/00*; G06C *7/00*

U.S. Cl. 340—825.31 **7 Claims**



1. A remote code transmission system between a nameplate apparatus and an electronic cash register, for automatically controlling the cash register, comprising:

(a) a nameplate apparatus for a staff member, including:

a thin-film shaped communication unit built into said nameplate apparatus, and including a transmitting element; transmitter circuit means coupled to said transmitter element for continuously, and repeatedly transmitting an identification coded staff member code allocated to said staff member; and a battery powder supply for supplying power to said transmitter circuit means;

a display plate mounted on one surface of said thin-film shaped communication unit, for displaying information on the identification coded staff member code allocated to said staff member;

holding means mounted on another surface opposite to said one surface of said thin-film shaped communication unit and including means for holding said communication unit on the body of said staff member;

switching means for designating an operation state of said transmitter circuit means; and

said transmitter circuit means including means responsive to operation of said switching means for continuously and repeatedly transmitting said identification coded staff member code while said switching means designates an operation state of said transmitter circuit means; and

(b) an electronic cash register, including:

input means for inputting data;

memory means for storing a plurality of different identification coded staff member codes;

receiver means for receiving the identification coded staff member code which is continuously and repeatedly transmitted from said nameplate apparatus;

detector means coupled to said receiver means and to said memory means, for detecting repeatedly whether or not a coincidence exists between the received identification coded staff member code and one of said plurality of identification coded staff member codes stored in said memory means; and

processor means responsive to said input means and also responsive to said detector means, and including means for performing a data processing operation in response to an input instruction supplied from said input means only when said coincidence is detected by said detector means; means for again causing said detector means to detect whether said coincidence exists after said data processing operation has been accomplished; and means for prohibiting a data processing operation in response to a subsequent input instruction until a coincidence between the received identification coded staff member code and one of said plurality of identification coded staff member codes is detected.

5,113,184

METHOD AND SYSTEM OF COMMUNICATION FOR A NON-CONTACT IC CARD

Yousuke Katayama, Toride, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 247,856, Sep. 22, 1988, abandoned. This application May 20, 1991, Ser. No. 704,841

Claims priority, application Japan, Sep. 22, 1987, 62-238212; Oct. 15, 1987, 62-260425; Nov. 10, 1987, 62-282202

Int. Cl.[5] H04Q *7/00*; G06K *7/00*

U.S. Cl. 340—825.54 **13 Claims**

1. A non-contact, electromagnetically coupled communication system comprising:

a first communicating unit and a second communicating unit coupled electromagnetically in non-contact fashion for communicating signals therebetween,

said first communicating unit comprising,

first electromagnetic transducing means having a single bi-directional transceiving coil for establishing electromagnetic coupling with said second communicating unit for subsequent signal communication; and

carrier wave generating means, connected to said first electromagnetic transducing means, for generating a tone burst signal, including a carrier wave signal of a constant frequency, for data transmission to said second communicating unit,

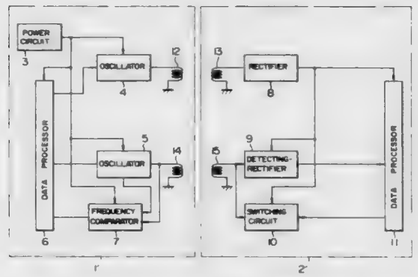
said second communicating unit comprising,

second electromagnetic transducing means having a single bi-directional transceiving coil for establishing electromagnetic coupling with said first electromagnetic transducing means, for receiving said tone burst signal and for transmitting a data signal, and

switching means connected to said second electromagnetic transducing means, for varying the impedance of said second electromagnetic transducing means, when activated in accordance with transmission of a data signal to said first communicating unit from said second communicating unit,

said second electromagnetic transducing means modulating the frequency of said previously constant frequency carrier wave signal, upon said impedance being varied, to transmit the data signal,

said first communicating unit further including detection means, responsive to operation of said switching means, for detecting reception of said data signal by detecting the modulation in the frequency of said previously constant frequency carrier wave, caused by variation of the impedance of said second electromagnetic transducing means.



5,113,185

CURRENT LOCATION INDICATION APPARATUS FOR USE IN AN AUTOMOTIVE VEHICLE

Akira Ichikawa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 460,543, Jan. 3, 1990, abandoned, which is a continuation of Ser. No. 487,589, Apr. 22, 1983, abandoned. This application Oct. 1, 1990, Ser. No. 593,277

Claims priority, application Japan, May 1, 1982, 57-73907

Int. Cl.[5] G08G *1/123*

U.S. Cl. 340—995 **12 Claims**

1. A current location indicating apparatus for use in an automotive vehicle, comprising:

current travel distance detection means for detecting a current cumulated travel distance of said automotive vehicle;

bearing detection means for detecting a current bearing or heading of said vehicle in accordance with a current traveling motion of said vehicle;

signal processing means for obtaining a current location point in terms of two-dimensional coordinates of the moving vehicle in accordance with the outputs from each of said detection means;

path of travel store means for sequentially storing the locational data in terms of the two-dimensional coordinates varying from time to time which are obtained by said signal processing means and holding the contents thereof as current continuous locational information on the moving vehicle;

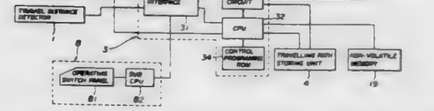
image storing means including a series of photographic images of area maps which are prepared in advance for display use;

image pick-up means for electrically reading desired information on an area map from said image storing means;

display means including a display screen for visually indicating a map in accordance with the current read-out map information and displaying a marking showing the current state of travel motion of said vehicle on said display screen, including a current location of the vehicle, a current travel direction of the vehicle at the current location thereof and a current tracing path of travel up to the current location thereof, in accordance with the locational data stored in said path of travel store means;

manual operating means for selectively specifying an area map desired to be shown on said display screen of said display means and initializing said marking on the display screen;

predetermined portions of said area maps of said image storing means being recorded with different scales so that the map images may selectively be presented on said display screen in a desired sequence in accordance with the recorded map information as read by said image pick-up means, together with the current location indication of said vehicle, and in accordance with said different scales;



means for indicating to a driver when the vehicle is in the vicinity of said predetermined portions of said area maps, and adapted to present a different map scale on said display screen in accordance with a given operating command;

said means for indicating including digital data read by said image pick-up means in said predetermined portions of said area maps when said current location indication of said vehicle is in the vicinity of said predetermined portions;

setting means for setting a starting point and desired destination of said vehicle, respectively, on said display screen from an optional operating command; and

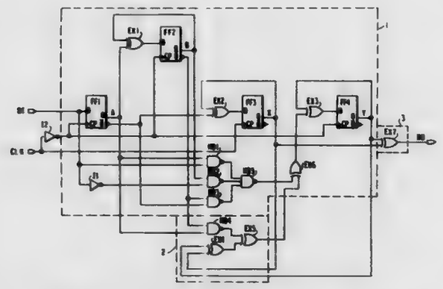
a plurality of sectioned indicating means disposed adjacent to and around substantially the entire periphery of said display screen in a divided frame fashion to indicate the up-and-down, the right-and-left, and the diagonal directions, respectively, and adapted to present an approximated indication of direction of said destination in accordance with a given operating command.

5,113,186
APPARATUS FOR CONVERTING AN ALTERNATE MARK INVERSION SIGNAL TO UNIPOLAR SIGNALS WITH FREQUENCY DEPENDENT AMPLIFICATION
Joseph D. Remson, San Jose, Calif., assignor to ROLM Systems, Santa Clara, Calif.
Filed Dec. 28, 1990, Ser. No. 635,051
Int. Cl.[5] H03M *5/18*
U.S. Cl. 341—68 **17 Claims**



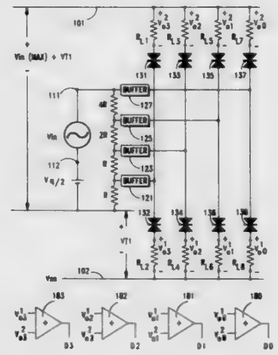
1. Apparatus for converting an AMI signal into a unipolar signal, comprising:
an amplifier having an input and output terminal, a first frequency selective circuit providing a feedback impedance coupled between said input and output terminal for providing an increasing impedance with frequency,
a second frequency selective circuit providing a input impedance coupled to said input to provide a decreasing impedance with frequency, with the gain of said amplifier proportional to the feedback impedance divided by the input impedance whereby said high frequency signal components of said AMI signal are amplified by greater factors for increasing higher frequencies at said amplifier output terminal, and
comparator means responsive to said amplified AMI signal for comparing the same against a reference level to provide at an output at least one unipolar signal indicative of information content in said AMI signal.

5,113,187
CMI ENCODER CIRCUIT
Steven S. Gorshe, Beaverton, Oreg., assignor to NEC America, Inc., Melville, N.Y.
Filed Mar. 25, 1991, Ser. No. 673,912
Int. Cl.[5] H03M *5/14*
U.S. Cl. 341—73 **7 Claims**



1. A CMI encoder comprising:
state machine means responsive to a succession of NRZ data, an illegal state signal, a first clock, and a second clock for producing a plurality of output bits, said plurality of output bits collectively constituting an output having a predetermined number of possible states including a set of legal states and a set of illegal states, wherein said output of said state machine means transitions from one of said illegal states to one of said legal states in response to said illegal state signal;
illegal state detector means responsive to said output for detecting said illegal states and producing said illegal state signal, thereby causing said state machine to transition from said illegal state back to one of said legal states; and
output means for logically combining a first portion of said plurality of output bits and outputting a CMI encoded data bit in response to said first portion of said plurality of output bits.

5,113,188
ANALOG-TO-DIGITAL CONVERTER UTILIZING DEVICES WITH CURRENT VERSUS VOLTAGE CHARACTERISTICS WITH A PLURALITY OF PEAKS AND NEGATIVE RESISTANCE REGIONS BETWEEN PEAKS
Tai-Haur Kuo, Taipei, Taiwan, and Hung C. Lin, Silver Spring, Md., assignors to University of Maryland at College Park, College Park, Md.
Filed Aug. 8, 1989, Ser. No. 391,221
Int. Cl.[5] H03M *1/00*
U.S. Cl. 341—133 **20 Claims**

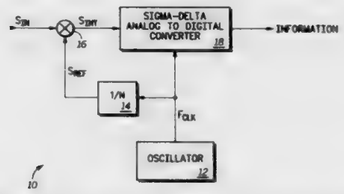


1. An analog-to-digital converter circuit for receiving an analog input signal and producing a digital output having a plurality of binary bits representative of said input signal, comprising:
a number of devices each having current versus voltage characteristics with a plurality of peaks, and negative resistance regions between said peaks;
for each bit to be produced, a pair of subcircuits each including one of said devices coupled in series arrangement with a respective resistive element, said subcircuits for each bit being coupled together at a junction between said devices;
means for applying a respective different predetermined portion of said input signal to said junction of said pair of subcircuits for each respective bit to be produced; and
means for combining signals obtained from the resistive element of both of the pair of subcircuits for each respective bit to be produced;
whereby outputs of said combining means respectively represent produced binary bits.

5,113,189
FREQUENCY TRANSLATING COHERENT ANALOG TO DIGITAL CONVERSION SYSTEM FOR MODULATED SIGNALS
Dion D. Messer, Sangil Park, and Charles D. Thompson, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 21, 1991, Ser. No. 718,891
Int. Cl.[5] H03M *1/12*
U.S. Cl. 341—143 **15 Claims**

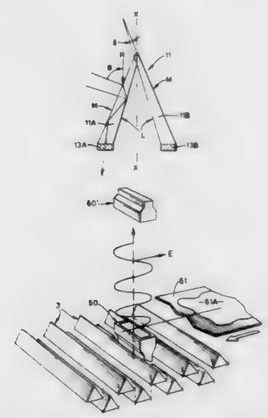
1. A frequency translating coherent analog to digital conversion system for modulated signals, comprising:

an analog signal multiplier having a first input for receiving a modulated input signal, a second input for receiving a down conversion reference frequency signal, and an output for providing an intermediate frequency signal;
an oversampling analog to digital converter having an input for receiving the intermediate frequency signal at a predetermined center frequency, a clock input for receiving a reference clock signal, and an output for providing a filtered output digital signal at a predetermined sampling frequency;



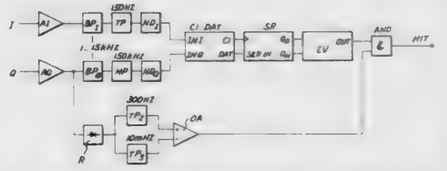
a reference clock means coupled to the clock input of the oversampling analog to digital converter for providing the reference clock signal; and
a frequency divider having an input connected to the reference clock signal, the frequency divider dividing the reference clock signal by a predetermined divisor and having an output connected to the second input of the analog signal multiplier for providing the down conversion reference frequency signal.

5,113,190
DEVICE FOR REDUCING ELECTROMAGNETIC LEAKAGE RADIATION IN THE VICINITY OF RADIATION SYSTEMS
Albert Klein, Wetter, Fed. Rep. of Germany, assignor to Laboratorium Prof. Dr. Rudolf Berthold GmbH & Co., Wildbad, Fed. Rep. of Germany
Filed May 10, 1990, Ser. No. 521,679
Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915280
Int. Cl.[5] H01Q *17/00*; G01B *15/00*; G01R *27/26*; H01P *1/22*
U.S. Cl. 342—4 **8 Claims**



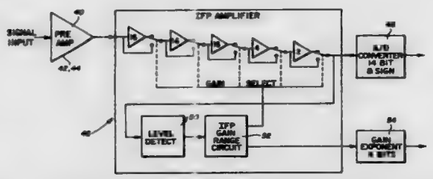
1. A device for reducing electromagnetic leakage radiation in the vicinity of a transmitter or receiver antenna of a system for performing measurements of microwave transmissions through or absorptions in a medium, where the transmitter antenna is arranged to transmit in a main beam direction, and the medium to be measured is disposed therebetween, said device comprising a plurality of absorber elements each having at least one surface portion which is nonperpendicular to the main beam direction of the transmitting antenna, wherein: each said absorber element is an elongate member having a longitudinal dimension and composed of two rib elements, each rib element having an outer lateral surface extending in the direction of the longitudinal dimension; said two lateral surfaces define a wedge having a tip, and enclose an angle α of less than 90°, in a plane perpendicular to the longitudinal dimension; and the value of the angle α is selected such that the angle of incidence of radiation impinging on said lateral surfaces approximately corresponds to the Brewster angle, so that the corresponding polarization components of the impinging radiation are substantially completely absorbed, wherein each said rib element is a lateral plate having an inner surface opposed to said outer lateral surface, with the thickness of each plate increasing with the distance from the tip of the wedge so that a second angle is formed between said inner surface and said outer lateral surface of each said plate, said plates consist of a low-loss material and each said plate has an edge which is remote from the tip of the wedge and extends in the direction of the longitudinal dimension, and further comprising a radiation absorbing layer of material which is more highly radiation absorbent than is the material of said plates and which is disposed along said edge of each said plate.

5,113,191
RADAR SIGNAL PROGESSING
Udo Knepper, Langenargen; Franz Lutz, Friedrichshafen, and Viktor Beyer, Tettnang, all of Fed. Rep. of Germany, assignors to Dornier GmbH, Fed. Rep. of Germany
Filed Dec. 10, 1990, Ser. No. 624,547
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1989, 3940805
Int. Cl.[5] G01S *13/50, 13/56, 7/285*
U.S. Cl. 342—119 **5 Claims**



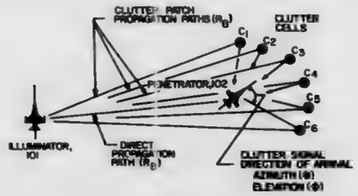
1. A signal processing circuit for use in connection with a radar, sonic or ultrasonic locating ranging and distance measuring equipment, said equipment producing an in-phase Doppler signal and a quadrature phase Doppler signal received by said signal processing circuit comprising:
an I channel and a Q channel;
one of said channels including a low pass filter constructed as an integrator with a near constant 90° phase lag, the other one being a high pass filter constructed as a differentiator with a near constant 90° phase lead, whereby the limit and cut off frequency of the low pass filter is below and the limit and cut off frequency of the high pass frequency is above frequency of the range of Doppler signals; and
means for determining the phase between the filtered I and Q signals being particularly responsive to a 90 degrees phase shift by counting those of the phase changes of I and Q signals zero which have a near 90° phase difference, and including means for determining a resulting count number in relation to a maximum number of possible phase changes for determining the passage of an object.

5,113,192
METHOD FOR USING SEISMIC DATA ACQUISITION TECHNOLOGY FOR ACQUISITION OF GROUND PENETRATING RADAR DATA
Bobby J. Thomas, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.
Filed May 3, 1991, Ser. No. 695,170
Int. Cl.[5] G01S *7/34*; G01V *1/28*
U.S. Cl. 342—22 **11 Claims**



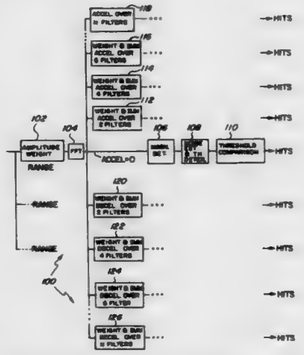
6. A method for processing analog ground penetrating radar signals that have been transmitted through subsurface formations comprising:
receiving the reflected analog radar signals;
selecting an analog signal gain;
converting said analog radar signals to digital signals;
detecing a gain;
receiving and retaining said gain; and
converting said gain to an exponent representing said gain.

5,113,193
AUTONOMOUS SYNCHRONIZATION OF A BISTATIC SYNTHETIC APERTURE RADAR (SAR) SYSTEM
Norman F. Powell, Ellicott City, Md., and Henry G. Mallean, Woodland Hills, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Nov. 12, 1985, Ser. No. 795,571
Int. Cl.[5] G01S *13/90*
U.S. Cl. 342—25 **7 Claims**



3. In combination with an airborne bistatic radar system with a radar transmitter on an illuminator aircraft which transmits radar signals, and a bistatic radar receiver on a penetrator aircraft which receives said radar signals un the form of clutter point echo return signals, target echo return signals, and direct path data signals, a bistatic radar synchronization system, said bistatic radar synchronization system being located on said penetrator aircraft and receiving radar signals from said bistatic radar receiver, said bistatic radar synchronization system being capable of determining the position and velocity of said illuminator aircraft using said clutter point echo return signals, said bistatic radar synchronization system comprising:
an inertial navigation system producing an output signal containing the position and velocity of said penetrator aircraft; and
a doppler estimation means receiving said clutter point echo return signals from said bistatic radar receiver, said clutter point echo return signals indicating a measure of a clutter point target range sum which equals a sum of: illuminator-to-clutter point range plus clutter point-to-receiver range, said doppler estimation means outputting a clutter point range sum rate which represents an amount of change observed in measures of said clutter point target range sum;
a filter means receiving: said clutter point echo return signals from said bistatic radar receiver, said clutter point target range sum rate from said doppler estimation means and said output signal from said inertial navigation system, said filter means, producing an output signal which indicates the position and velocity of said illuminator aircraft.

5,113,194
ACCELERATION COMPENSATION BY MATCHED FILTERING
Kapriel V. Krikorian, Agoura, and Robert A. Rosen, Agoura Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Aug. 29, 1990, Ser. No. 574,614
Int. Cl.[5] G01S *13/60*
U.S. Cl. 342—106 **18 Claims**

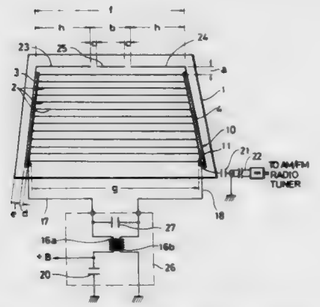


1. A radar processor for compensating for target acceleration, which processor operates using range bins, for each range bin to be processed to provide target data, comprising:
means for amplitude weighting the in-phase and quadrature component of radar signals;
means for transforming the amplitude weighted radar signals into the frequency domain and forming a plurality of Doppler filters;
means for forming a plurality of acceleration filters matched to a predetermined set of target accelrations to process outputs of respective groups of said Doppler filters, each acceleration filter formed as the weighted combination of the outputs of said group of Doppler filters; and
wherein the combination weights of each acceleration filter are precomputed to optimize the signal-to-noise ratio for each predetermined acceleration.

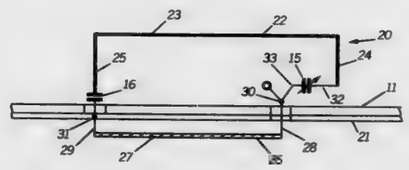
5,113,195
GLASS WINDOW ANTENNA FOR USE IN A MOTOR VEHICLE
Kaoru Sakurai, Kawasaki; Harunori Murakami, Machida; Masaru Maeda, Kawasaki; Hiroshi Iijima, Yokohama, and Shouhei Ohara, Kawasaki, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan
Filed Oct. 26, 1989, Ser. No. 427,587
Claims priority, application Japan, Oct. 31, 1988, 63-142518; Nov. 30, 1988, 63-155642
Int. Cl.[5] H01Q *1/32*
U.S. Cl. 343—704 **18 Claims**

1. A glass window antenna for use in a motor vehicle comprising:
a heating conductor formed on a glass window; and

a plurality of antenna elements arranged on said glass window comprising a first antenna element, a second antenna element and a third antenna element, said first antenna element and said second antenna element being disposed in a substantially symmetrical mirror-image relationship with respect to a vertical center axis of said heating conductor, said first antenna element having one end connected to one end of said heating conductor, a corresponding part of said second antenna element having one end connected to the other end of said heating conductor, said third antenna element being axially aligned with and disposed between said first and said second antenna elements on said glass window, said third antenna element further being spaced from said first and second antenna elements so as to be electrically disconnected therefrom.

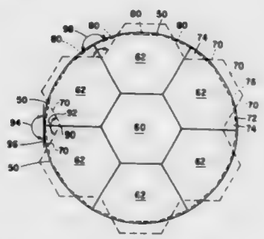


5,113,196
LOOP ANTENNA WITH TRANSMISSION LINE FEED
Lorenzo A. Ponce de Leon, Lake Worth; Kazimierz Siwiak, Coral Springs, and Michael P. Goldenberg, Boynton Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Del.
Filed Jan. 13, 1989, Ser. No. 297,151
Int. Cl.[5] H01Q *7/00*
U.S. Cl. 343—744 **4 Claims**



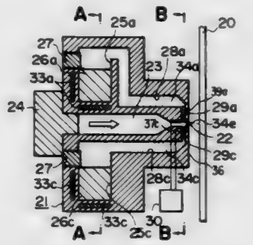
1. A loop antenna comprising:
a ground plane,
a loop portion located on one side of the ground plane and having opposed ends,
a transmission line portion located on the opposite side of the ground plane and having opposed ends,
a first capacitance means interconnecting first ends of the loop portion and the transmission line portion,
a second capacitance means interconnecting second ends of the loop portion and the transmission line portion; and
the transmission line portion being a microstrip formed by the said ground plane and a microstrip line portion.

5,113,197
CONFORMAL APERTURE FEED ARRAY FOR A MULTIPLE BEAM ANTENNA
Howard H. S. Luh, Sunnyvale, Calif., assignor to Space Systems/Loral, Inc., Palo Alto, Calif.
Filed Dec. 28, 1989, Ser. No. 458,104
Int. Cl.[5] H01Q *13/00*
U.S. Cl. 343—776 **3 Claims**



1. A multiple beam antenna feed horn array, comprising:
a plurality of feed horns having end apertures disposed to collectively constitute the aperture of said array; at least two of said feed horns being disposed adjacent to each other and having wall segments which define a portion of the periphery of said aperture of said array;
a wall segment of one said feed horns being disposed adjacent to a wall of another of said feed horns, such that the angle of intersection between said two wall segments is greater than 180 degrees.

5,113,198
METHOD AND APPARATUS FOR IMAGE RECORDING WITH DYE RELEASE NEAR THE ORIFICE AND VIBRATABLE NOZZLES
Hisashi Nishikawa; Yasuo Matsumoto, and Ayumu Makino, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 40,718, Apr. 20, 1987, abandoned, which is a continuation of Ser. No. 823,745, Jan. 29, 1986, abandoned. This application Jul. 23, 1990, Ser. No. 555,781
Claims priority, application Japan, Jan. 30, 1985, 60-16156
Int. Cl.[5] B41J *2/11*
U.S. Cl. 346—1.1 **9 Claims**



1. An image recording method comprising the steps of:
providing a housing having an end wall near a recording member;
producing pressurized carrier gas and transporting said carrier gas through a nozzle;
heating sublimable dyes to produce vaporous dyes;
transporting said vaporous dyes individually by a dye vapor passage, each dye vapor passage having a spout portion, with a surface of the spout portion being formed by an inner surface of said end wall;

releasing said vaporous dyes from the spout portion of said dye vapor passages into an orifice portion arranged at the end of said nozzle and extending through said end wall of said housing and touching the spout portions of said dye vapor passages, according to an input signal indicative of a desired pattern;

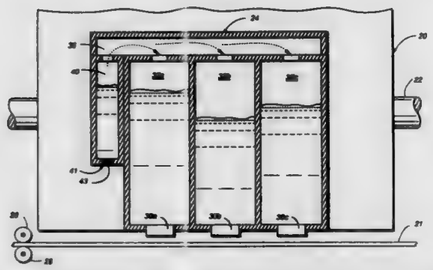
blowing said vaporous dyes from said orifice portion onto said recording member by said carrier gas; said vaporous dyes being carried away completely by the carrier gas due to the proximity of the point of release of the dyes to the orifice portion.

5,113,199

INK DELIVERY SYSTEM FOR INK JET PRINTERS

C. S. Chan, Boise, Id., and Alfred I. Pan, Sunnyvale, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 11, 1991, Ser. No. 667,710
Int. Cl.[5] G01D *15/16*
U.S. Cl. 346—1.1 **26 Claims**



23. A system for regulating back pressure above a free ink surface of a volume of ink in one or a plurality of ink compartments of an ink jet pen having an ink jet printhead mounted in ink flow communication with said volume of ink in each of said one or a plurality of ink containing compartments, said system including a thin pressure regulating element disposed between a body of liquid and an adjacent air space and being operative in response to ink on demand from said ink jet printhead to maintain the back pressure above said free ink surface in each of said one or a plurality of ink containing compartments at a substantially constant value.

5,113,200

HOT MELT INK JET APPARATUS HAVING INTERVENTION MEMBER LOCATED BETWEEN MEMBER AND A PRINTED PRINTING SHEET

Masaaki Deguchi, Okazaki, and Shigeru Mizuno, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

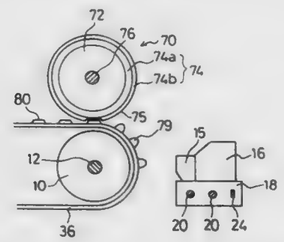
Filed Mar. 23, 1990, Ser. No. 497,707
Claims priority, application Japan, May 16, 1989, 1-121842
Int. Cl.[5] B41J *2/225*
U.S. Cl. 346—25 **18 Claims**

5. A hot melt ink jet apparatus for heating a normally solid ink into a molten state and for ejecting the molten ink toward a printing sheet, the apparatus comprising:

printing means for printing by ejecting molten ink onto a first face of the printing sheet;

supporting means for supporting the printed printing sheet at a second face opposite to the first face;

an intervention member having a deformable layer provided at a side of said supporting means and facing the first face, wherein said deformable layer is softer than lumps of solidified ink on the printing sheet so that said deformable layer is deformed when pressed against the lumps, said deformable layer having a thickness which is thinner than a height of the ink lumps, and being attached to a surface which is harder than said ink lumps; and



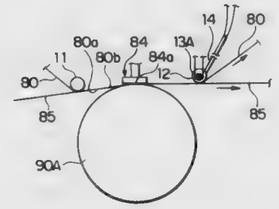
pressing means for pressing the printed printing sheet against said supporting means through said intervention member.

5,113,201

THERMAL TRANSFER RECORDING APPARATUS FOR CONTROLLING PRINTING DENSITY WITH THE TEMPERATURE AT THE POSITION WHERE THE INK RIBBON AND PAPER ARE SEPARATED

Shigeru Mano; Tatsuichi Maehashi; Kunihiro Koshizuka, and Takao Abe, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 25, 1991, Ser. No. 674,572
Claims priority, application Japan, Mar. 30, 1990, 2-85161
Int. Cl.[5] B41J *2/325*
U.S. Cl. 346—76 PH **18 Claims**



1. An apparatus for transferring an ink pattern image from a thermal transfer medium having an ink layer onto an image receiving medium, comprising:

conveying means for pressing said thermal transfer medium against said image receiving means and for conveying said thermal transfer medium in a conveying direction together with said image receiving medium pressed against said thermal transfer medium first to a printing means and then to a separating means;

wherein said printing means applies heat to said thermal transfer medium in positions corresponding to said ink pattern;

heating means for heating said thermal transfer medium as said thermal transfer medium is pressed against said image receiving medium; and

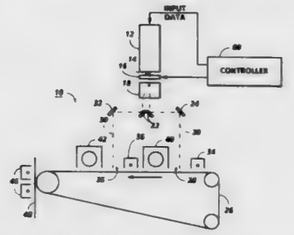
wherein said separating means separates said image receiving medium from said thermal transfer medium so as to transfer said ink pattern image from said thermal transfer medium to said image receiving medium.

5,113,202

ELECTRONIC SINGLE PASS, TWO COLOR PRINTING SYSTEM

Robert P. Loce, Rochester, and James J. Appel, Brighton, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 1, 1990, Ser. No. 561,131
Int. Cl.[5] G01D *9/42*; G03G *15/01*
U.S. Cl. 346—108 **7 Claims**



1. A single pass highlight color printing system for forming images on the surface of a photoreceptor including, in combination,

a single image bar ROS for exposing two separate areas of the photoreceptor at two exposure stations, each exposure occurring during one-half of the on-time of said ROS,

means for applying a charge potential to said separate photoreceptor areas prior to said exposure,

means for developing each exposed area with a developer of a different color, and

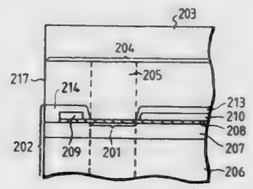
means for transferring each developed image onto a copy substrate to form a two-color output copy.

5,113,203

LIQUID JET HEAD, SUBSTRATE FOR SAID HEAD AND LIQUID JET APPARATUS HAVING SAID HEAD

Hiroshi Takagi, Yokohama, and Atsushi Shiozaki, Isehara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 643,681, Jan. 23, 1991, abandoned, which is a continuation of Ser. No. 512,561, Apr. 25, 1990, abandoned, which is a continuation of Ser. No. 278,492, Dec. 1, 1988, abandoned. This application Aug. 6, 1991, Ser. No. 742,728
Claims priority, application Japan, Dec. 1, 1987, 62-303712
Int. Cl.[5] B41J *2/05*; H01C *1/012*
U.S. Cl. 346—140 R **110 Claims**



1. An ink jet head comprising:

an electrothermal transducer having a heat-generating resistor of an amorphous alloy containing at least one selected from the group consisting of Ti, Zr, Hf, Nb, Ta, W, Fe, Ni and Cr and a pair of electrodes connected electrically to said heat-generating resistor, a heat-generating portion being formed by said heat generating resistor between said pair of electrodes wherein said amorphous alloy is represented by

$$M_x(Fe_{100-y-z}Ni_yCr_z)_{100-x}$$

wherein M is at least one selected from Ti, Zr, Hf, Nb, Ta and W, and x is 10–30;

a support for said electrothermal transducer; and

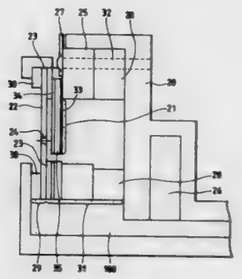
a liquid path formed on said support corresponding to the heat-generating portion of said electrothermal transducer, said liquid path communicating with a discharge opening for discharging liquid.

5,113,204

INK JET HEAD

Yoshinori Miyazawa; Hidenori Omae; Takayuki Ishii; Haruhiko Koto, and Fujio Akahane, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Apr. 19, 1990, Ser. No. 511,259
Claims priority, application Japan, Apr. 19, 1989, 1-99103; Apr. 19, 1989, 1-99104; May 26, 1989, 1-133010
Int. Cl.[5] B41J *2/01, 2/045*
U.S. Cl. 346—140 R **7 Claims**



1. An ink jet head for a recording apparatus, comprising:

a nozzle unit which includes a nozzle-formed member having a plurality of nozzle orifices;

heating means for heating ink which is solid at ambient temperature to liquefy the ink;

a piezoelectric converter spaced apart from said nozzle-formed member for causing liquified ink to be loaded between said piezoelectric converter and said nozzle-formed member and for jetting loaded ink through said nozzle-formed member; and

means for positioning said nozzle unit in said ink jet head for allowing the nozzle unit to be elastically displaced relative to the ink jet head to prevent the nozzle unit from incurring excessive stress due to thermal expansion and contraction.

5,113,205

INK JET HEAD

Hiroyuki Sato, and Hitoshi Yauchi, both of Morioka, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1991, Ser. No. 692,426
Claims priority, application Japan, Jul. 2, 1990, 2-175107
Int. Cl.[5] B41J *2/19*
U.S. Cl. 346—140 R **2 Claims**

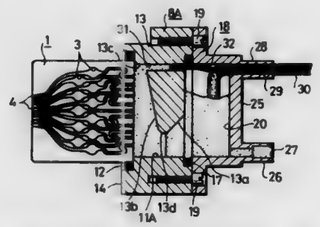
1. An ink jet head having a flat nozzle block in which a plurality of flow passages each having one end formed as a nozzle are formed, and a main tank member which is connected to a base end of said nozzle block and in which a main ink tank for storing ink to be supplied to the flow passages is formed, said ink jet head comprising:

an auxiliary tank member connected to said main tank member, an auxiliary ink tank communicating with said main ink tank being formed in said auxiliary tank member;

a discharge member provided on said auxiliary tank member, said discharge member communicating with an upper section of said auxiliary tank;

a slant surface formed as a part of a lower surface of an upper wall of said main ink tank, said slant surface being down-

wardly inclined from an upstream position to a downstream position with respect to a direction of ink supply; and



another discharge member communicating with an upper section of said main ink tank.

5,113,206

INK TANK AND INK JET RECORDING APPARATUS HAVING THE INK TANK

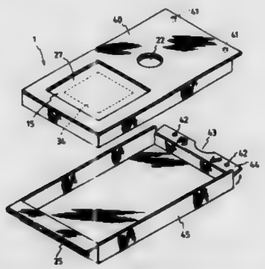
Hideo Fukazawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 291,736, Dec. 29, 1989, abandoned. This application Aug. 7, 1990, Ser. No. 563,933

Claims priority, application Japan, Dec. 29, 1987, 62-335362; Dec. 26, 1988, 63-326068

Int. Cl.[5] B01D *15/18*

U.S. Cl. 346—140 R **43 Claims**



1. A container for containing liquid, comprising:

ink containing means for containing the liquid, said containing means defining an ink introducing section;

a liquid absorbing member disposed in said ink containing means and receiving liquid through the opening; and

a volume expanding member contacting said liquid absorbing member at a predetermined portion thereof, with said volume expanding member expanding due to absorption of the liquid and having a coefficient of volumetric expansion higher than that of said liquid absorbing member.

5,113,207

APPARATUS AND METHOD FOR PHOTOGRAPHING REFLECTIVE OBJECTS

Roger F. Huebner, Arlington, Tex., assignor to Huebner International, Inc., Norman, Okla.

Filed Dec. 4, 1990, Ser. No. 622,042

Int. Cl.[5] G03B *37/00*

U.S. Cl. 354—94 **19 Claims**

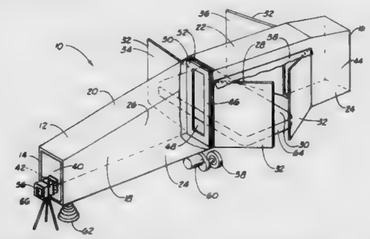
1. An apparatus adapted for use with a camera for photographing a reflective object, comprising:

a camera;

a mask between the camera and the object being photographed;

a slot in the mask providing a view to the camera of only a portion of the object being photographed in any position of the mask; and

means for moving the mask with respect to the object being



photographed during the photographic recording, whereby the slot is moved across the object being photographed and the mask functions as an external camera shutter.

5,113,208

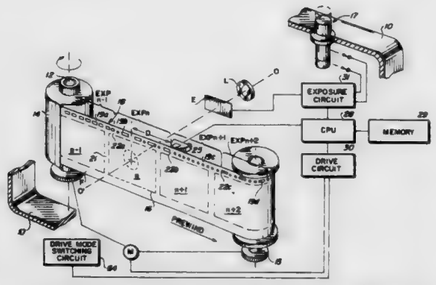
MECHANICAL ADJUNCT FOR ELECTRICAL FILM DRIVE IN MAGNETIC DATA CAMERA

Jeffrey R. Stoneham, Spencerport, and David C. Smart, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 30, 1990, Ser. No. 620,424

Int. Cl.[5] G03B *17/24*

U.S. Cl. 354—105 **20 Claims**



1. A camera having a lightproof body; means defining an exposure plane within said body; means, including an electric drive motor, for transporting a strip of film in a direction along said plane under action of said motor; and magnetic interaction means for reading or writing data magnetically recorded on said film as said film is transported in said direction; said camera being characterized in that:

said means for transporting includes means, responsive to operation of said motor, for storing mechanical energy; and

said camera further comprises means, responsive to actuation of said magnetic interaction means during transport of said film in said direction under action of said motor, for disconnecting said motor and for continuing said transport under action of release of the mechanical energy stored responsive to operation of said motor.

5,113,209

DEVICE FOR DETECTING PHOTOGRAPHIC DISTANCE OR IMAGE MAGNIFICATION AND PHOTOGRAPHIC LENS TO BE ATTACHED THERETO

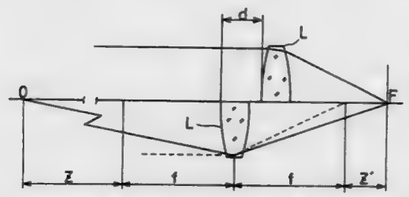
Masayuki Ueyama, and Kenji Tsuji, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 239,285, Sep. 1, 1988, abandoned. This application Jul. 26, 1990, Ser. No. 559,408

Claims priority, application Japan, Sep. 2, 1987, 62-221135; Sep. 2, 1987, 62-221136

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—400 **14 Claims**



1. A device for detecting photographic distance or image magnification comprising:

a photographic lens including a focusing lens having movable scope on the infinity side thereof, said focusing lens being movable beyond an optical infinity position of said focusing lens to a most retracted position;

a position detecting means for detecting an extension amount of said focusing lens from the most retracted position;

means for correcting said extension amount; and

means for issuing a signal corresponding to photographic distance or image magnification based on the corrected extension amount of said focusing lens detected by said position detecting means.

5,113,210

CAMERA WITH POWER ZOOM FUNCTION AND INTERCHANGEABLE LENS WITH POWER ZOOM FUNCTION

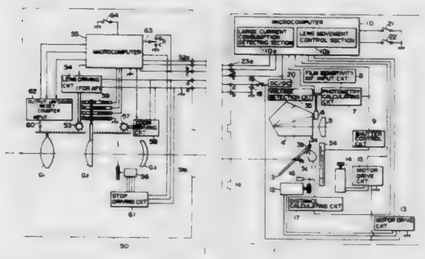
Ritsuo Kashiyama, Kawasaki, and Hiroyuki Kataoka, Ohmiya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 521,664, May 10, 1990, abandoned. This application Sep. 3, 1991, Ser. No. 758,422

Claims priority, application Japan, May 10, 1989, 1-115199; May 10, 1989, 1-115200; May 17, 1989, 1-123456; Jul. 26, 1989, 1-192883

Int. Cl.[5] G03B *7/26, 13/36, 5/00, 9/66*

U.S. Cl. 354—400 **41 Claims**



1. A camera system comprising:

(a) a zoom driving means driven by a battery as a power source, for varying a focal length of a taking lens;

(b) at least one other driving means driven by said battery as a power source;

(c) a detecting means for detecting whether any of said other driving means is being executed or is to be executed; and

(d) a control means for prohibiting the execution of said zoom driving means when said detecting means detects the fact that any of said other driving means is being executed or is to be executed.

5,113,211

IMAGE FORMING APPARATUS USING PHOTOPOLYMERIZATION REACTION

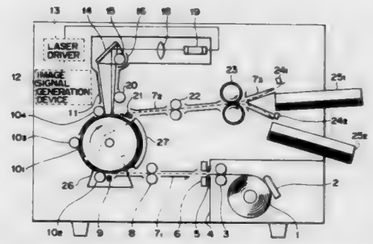
Kenichi Matsumoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1991, Ser. No. 680,372

Claims priority, application Japan, Apr. 6, 1990, 2-90162

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—27 **8 Claims**



1. An image forming apparatus using photopolymerization reaction, comprising:

a photosensitive image forming member having a layer of polymer compound and adapted to be used in a sheet-like fashion during the formation of an image;

an image forming member supporting element for supporting said photosensitive image forming member and adapted to be moved endlessly;

an image forming member supplying means for supplying said photosensitive image forming member to said supporting element;

an exposure means disposed in confronting relation to said image forming member supporting element and adapted to effect image exposure on said image forming member;

a light-shield means for shielding light leaking from said exposure means;

a heating means disposed in confronting relation to said image forming member supporting element at a downstream side of said exposure means with respect to a rotating direction of said supporting element; and

a whole image exposure means arranged in said light-shield means.

5,113,212

METHOD FOR THE FORMATION OF IMAGES AND AN APPARATUS FOR PERFORMING THE SAME

Mitsuru Ogura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 19, 1989, Ser. No. 409,439

Claims priority, application Japan, Sep. 22, 1988, 63-238171

Int. Cl.[5] G03B *27/04, 27/32*

U.S. Cl. 355—27 **4 Claims**

1. An apparatus for the formation of images, comprising:

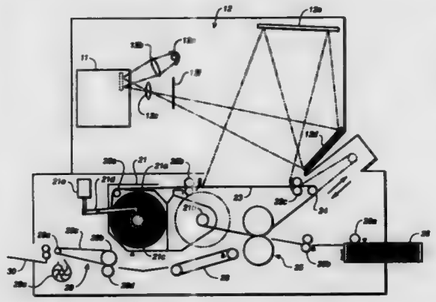
a photosensitive sheet coated with photosensitive and pressure-rupturable capsules on a surface thereof;

an exposure means for directing image-forming light onto an exposure area where an image-forming area of the photosensitive sheet is kept stationary, thereby allowing the capsules on the image-forming area to receive the image-forming light to form a latent image thereon;

a pressure-developing means including pressure rollers for

pressurizing said capsules to rupture them, so as to develop said latent image;

a first transporting roller and a second transporting roller spaced apart from each other for transporting said photosensitive sheet wherein said first transporting roller is located in the vicinity of the upstream end of said exposure area while the second transporting roller is located in the vicinity of the downstream end of said exposure area, in the direction of the photosensitive sheet transportation and further wherein the distance between the first and second transporting rollers is equal to or an integer multiple of the length of the exposure area; and



a buffer roller located between the transporting rollers and the pressure rollers, for conveying the image-forming area of the photosensitive sheet into a buffer section after the image-forming area has been exposed to the image-forming light from the exposure means, said image forming area being temporarily kept stationary in said buffer section;

wherein the buffer roller transport the photosensitive sheet in such a manner that the length of the photosensitive sheet located between the pressure-developing means and the transporting rollers is equal to or an integer multiple of the length of the exposure area when a plurality of latent images are being successively formed on the photosensitive sheet.

5,113,213

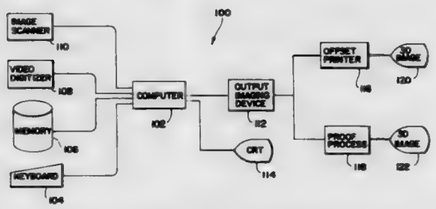
COMPUTER-GENERATED AUTOSTEREOGRAPHY METHOD AND APPARATUS

Ellen R. Sandor, P.O. Box 8396, Chicago, Ill. 60680; Daniel J. Sandin, 1301 N. Astor, Chicago, Ill. 60610; William T. Cunnally, 1010 E. Morris Dr., Palatine, Ill. 60067, and Stephan B. Meyers, 4636 N. Paulina St., Chicago, Ill. 60640

Filed Jan. 13, 1989, Ser. No. 296,775

Int. Cl.[5] G03B *27/32, 35/00*

U.S. Cl. 355—22 **15 Claims**



1. A method of making autostereographic images of an object, comprising the steps of:

inputting to a computer a predetermined number of planar images of the object, each of the planar images being a view of the object from one of the predetermined number of different viewpoints;

interleaving the predetermined number of planar images in the computer;

printing the interleaved images with a high-resolution output imaging device on a spacer, a selected edge of each interleaved image being aligned with a predetermined printing direction;

generating a barrier strip; and

positioning the barrier strip in a spaced relationship with the spacer and in a registration relationship with the spacer.

5,113,214

ZOOM LENS SYSTEM

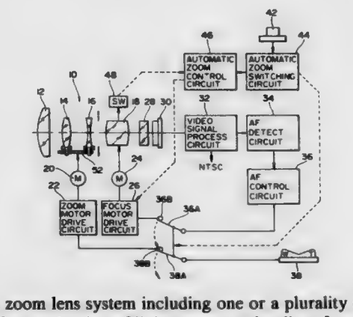
Atsushi Nagata, and Atsushi Misawa, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 6, 1990, Ser. No. 549,513

Claims priority, application Japan, Jul. 17, 1989, 1-184016

Int. Cl.[5] G03B *5/00, 13/36;* **H04N** *5/232*

U.S. Cl. 354—402 **3 Claims**



1. A zoom lens system including one or a plurality of front lenses for condensing of light, one or a plurality of magnification varying lenses for varying the magnification of an image of a subject to be photographed, one or a plurality of compensator lenses, and one or a plurality of focus lenses for focusing, said zoom lens system comprising:

automatic zone switching means for changing operating modes of the zoom lens system;

AF control means for driving said focus lens to a focusing position in accordance with a distance measurement signal;

position restricting means for driving said magnification varying lens and compensator lens along their respective predetermined movement paths;

zoom drive means for said position restricting means; and,

control means, when said automatic zoom switching means is operated, for fixing said focus lens at a given position and for driving said position restricting means through said zoom drive means in accordance with a signal sent from said AF control means to thereby allow said magnification varying lens and compensator lens to perform a focusing operation and change an angle of view for photographing, and photographing said subject in a given size on a photographing screen according to camera-to-subject distances.

5,113,215

IMAGE POSITION DETECTING DEVICE

Takashi Nishibe, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Sep. 24, 1990, Ser. No. 586,981

Claims priority, application Japan, Oct. 27, 1989, 1-280747

Int. Cl.[5] G03B *13/36*

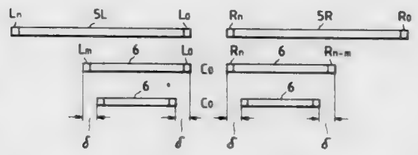
U.S. Cl. 354—408 **15 Claims**

1. An image position detecting device for use in conjunction with an optical instrument having a field angle corresponding

to the width of optical detection, the image position detecting device detecting the relative positions of a first and a second similar images projected onto a first and a second image sensors, respectively, each image sensor producing an electrical signal representing an image data group, comprising:

window size determining means for determining the size of a window in response to the field angle of the optical instrument, said window defining a partial image data group from the image data group;

correlative value calculation means for calculating a correlative value for a combination of partial image data groups,



said combination of partial image data groups including a first partial image data group defined by said window from the image data group of the first image sensor and a second partial image data group defined by said window from the image data group of the second image sensor; and

correlation detecting means for selecting a plurality of said combinations and for detecting the combination from said plurality with a selected correlation and for providing an output signal indicating the relative positions of the first and second images on the first and second image sensors.

5,113,216

CAMERA

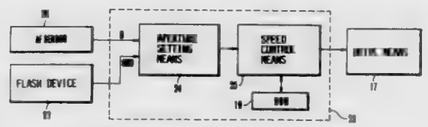
Yoshitaka Murata, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1990, Ser. No. 556,956

Claims priority, application Japan, Jul. 27, 1989, 1-194611

Int. Cl.[5] G03B *15/05*

U.S. Cl. 354—421 **33 Claims**



1. A camera comprising:

(a) a shutter which also serves as a diaphragm;

(b) a flash device;

(c) a distance measuring device;

(d) setting means for setting a size of opening of said shutter for flash photography on the basis of measured distance information obtained from said distance measuring device and a guide number of said flash device, said setting means retaining said size of opening of said shutter under the condition that said flash device is emitting flash light; and

(e) control means for varying the opening speed of said shutter according to said size of opening of said shutter set by said setting means.

5,113,217

DISPLAY DEVICE FOR USE IN A CAMERA

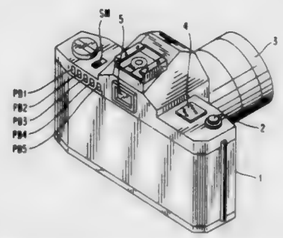
Shuji Izumi, Sakai; Masaaki Nakai, Kawachinagano; Manabu Inoue, Kobe; Akihiko Fujino, Sakai; Kunio Kawamura, Sakai; Yuji Takarabe, Sakai, and Masatake Niwa, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 496,154, Mar. 19, 1990, which is a continuation of Ser. No. 195,896, May 19, 1988, abandoned, which is a division of Ser. No. 808,251, Dec. 12, 1985, Pat. No. 4,847,651. This application Mar. 1, 1991, Ser. No. 663,376

Claims priority, application Japan, Dec. 14, 1984, 59-264940; Apr. 2, 1985, 60-70619; Apr. 2, 1985, 60-70620; Apr. 2, 1985, 60-70621; Apr. 18, 1985, 60-84197; Apr. 18, 1985, 60-84198; Apr. 23, 1985, 60-88304; Apr. 23, 1985, 60-88305; Apr. 24, 1985, 60-89595; Apr. 24, 1985, 60-89596; Apr. 25, 1985, 60-90217; Sep. 6, 1985, 60-198244

Int. Cl.[5] G03B *17/18*

U.S. Cl. 354—471 **18 Claims**



1. A display device for use in a camera which comprises:

first display means for displaying a diaphragm aperture value quantized by 0.5 Ev value;

means for detecting mounting of an exchangeable lens having a full open diaphragm aperture value deviant from the value quantized by 0.5 Ev value; and

second display means for displaying a nominal diaphragm aperture value when the calculated or set aperture diaphragm value of the exchangeable lens is deviant from the value quantized by 0.5 Ev value.

5,113,218

ELECTROPHOTOGRAPHIC MACHINE WITH CONTROL MEANS RESPONSIVE TO SET MAGNIFICATION RATIO AND FOCAL LENGTH

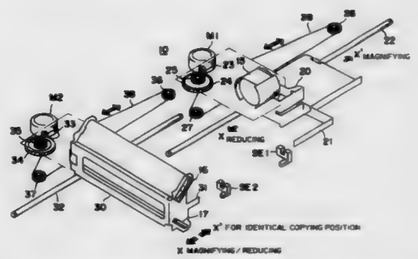
Takeshi Morikawa, Toyokawa, and Shinya Matsuda, Kyoto, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 4, 1990, Ser. No. 624,330

Claims priority, application Japan, Dec. 4, 1989, 1-315579; Dec. 4, 1989, 1-315580

Int. Cl.[5] G03B *27/34*

U.S. Cl. 355—56 **17 Claims**



1. An electrophotographic machine for projecting an image

of an original on a photosensitive medium at a predetermined magnification ratio, comprising:

a reflection member for forming an optical projection path to project an original image on a photosensitive medium, the reflection member being movable to change the length of the optical projection path;

a uni-focus projection lens movable in the optical projection path;

inputting means for inputting the actual focal length of the uni-focus projection lens;

setting means for setting a magnification ratio;

first drive means for moving the projection lens;

second drive means for moving the reflection member; and

control means for independently moving the first drive means and the second drive means according to a set magnification ratio and the input focal length of the projection lens.

5,113,219

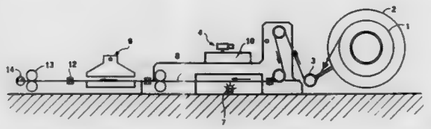
PNEUMATIC PRESSURE PAD FOR CYCLICAL EVEN APPLICATION OF PRESSURE FORCES, PARTICULARLY FOR CONTACT DUPLICATION

James M. Mayfield, San Diego, Calif., assignor to Anacomp, Inc., Atlanta, Ga.

Filed Jun. 4, 1991, Ser. No. 710,502

Int. Cl.[5] G03B *27/20*

U.S. Cl. 355—91 **16 Claims**



1. A machine for duplicating exposed photographic film comprising:

a frame upon which an exposed photographic film is held;

a transport mechanism affixed to the frame for moving an unexposed photographic film proximate to the held exposed film;

a pressuring mechanism for cyclically moving relative to the frame and relative to the exposed and unexposed photographic film in order to cyclically pressure the exposed and unexposed film together into close planar contact, the pressuring mechanism comprising:

a pressure pad presenting a substantially planar precision surface directionally disposed towards a plane of each of the unexposed and exposed films;

a shaft connected to the pressure pad oppositely to its precision surface; and

a pneumatic air cylinder connected to the shaft for cyclically moving the shaft and the pressure pad connected thereto so that the pad's precision surface is reciprocated along an axis that is substantially orthogonal to the plane of each of the unexposed and exposed films; and

an exposure means for exposing the unexposed photographic film from the exposed photographic film while the films are held together in pressured contact.

5,113,220

DRUM CARTRIDGE FOR ELECTROPHOTOGRAPHIC APPARATUS WITH TWO-PIECE PROTECTED SHUTTER COVERING THE DRUM

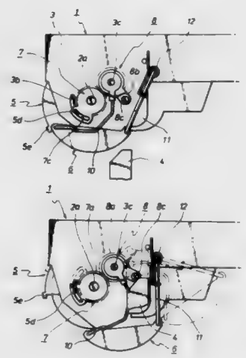
Jin-keun Kwak, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Jan. 15, 1991, Ser. No. 642,220

Claims priority, application Rep. of Korea, Sep. 29, 1990, 90-15368

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—200 **8 Claims**



7. A drum cartridge with a two piece protective shutter for an electrophotographic apparatus comprising:

a main body having an opening;

a photosensitive drum rotatably supported at opposite sides of said main body, at least a part of said photosensitive drum being exposed through the opening;

upper shutter means, movably supported by the drum shaft, for covering a part of the opening;

lower shutter means, movably supported by said main body, for covering the part of the opening not covered by said upper shutter means; and

control means for receiving an external torque for moving said upper and lower shutters in opposite directions to expose said photosensitive drum.

5,113,221

IMAGE FORMING APPARATUS HAVING A PLURALITY OF TONER DEVELOPERS INCLUDING WHITE TONER

Akio Kotani; Kazuhiro Araki, and Toshikazu Kawaguchi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 24, 1988, Ser. No. 261,598

Claims priority, application Japan, Oct. 23, 1987, 62-268888; Oct. 23, 1987, 62-268889

Int. Cl.[5] G03G *21/00, 15/01*

U.S. Cl. 355—208 **7 Claims**

1. An image forming apparatus provided with a plurality of toner developing devices including a white toner developing device, said apparatus comprising:

a photosensitive member;

a means for electrically charging a surface of said photosensitive member;

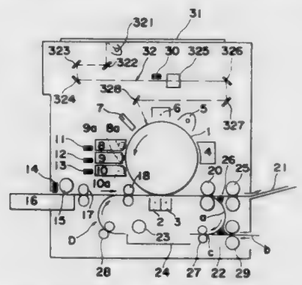
an exposure means for exposing an image of an original so that an electrostatic latent image may be formed on said photosensitive member;

a first developing means for developing the electrostatic latent image formed on said photosensitive member, said first developing means containing toner charged in polarity opposite to the polarity of said charged photosensitive member;

a transfer means for transferring a toner image formed on said photosensitive member onto a copy paper;

a transporting means for transporting the copy paper having thereon the transferred toner image into a transfer region in which said transfer means is provided;

a second developing means for developing the electrostatic latent image formed on said photosensitive member, said second developing means containing white toner charged



in the same polarity as the polarity of said charged photosensitive member;

a white detecting means for detecting the degree of white of the copy paper; and

a control means for transferring a toner image formed by said second developing means onto the copy paper when the degree of white of the copy paper is less than a predetermined value.

5,113,222

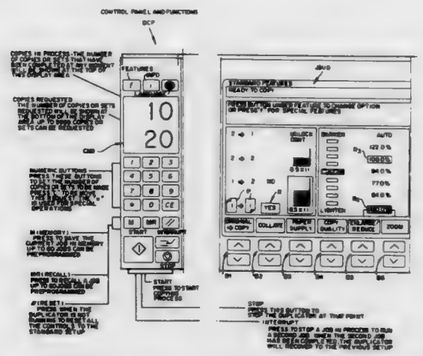
REPRODUCTION APPARATUS WITH IMPROVED DISPLAY FOR USE IN JOB SET-UP

James Wilson, Rochester; LinMarie Stephenson, Brockport, and Kenneth G. Corl, Brighton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 22, 1991, Ser. No. 643,878

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—209 **27 Claims**



1. A reproduction apparatus for producing copy, said apparatus comprising:

an operator control panel, said panel including means including a display screen for indicating on said screen certain standard selectable features for a copying operation including copy format, paper supply source, copy quality, magnification and exit location with plural displayed options for each feature, and first means for altering the display on the screen to indicate a displayed selected option for each and generating a first set of signals representing selected options of the standard features;

means for altering the display on said screen to display various operator selectable special job level features for a copying operation available on a job level basis, and second means for altering the display to indicate displayed special selected job level features for reproducing a job comprising a multisheet document with said special job level features and generating a second set of signals representing selected special job level features;

means for altering the display on said screen to display various operator selectable special page level features for a copying operation specific to reproducing a selected page of the multisheet document job, and third means for altering the display to indicate displayed selected special page level features for reproducing said page with said special page level features and generating a third set of signals representing selection of special page level features; and

means responsive to said first, second and third sets of signals for producing copy comprised of a multisheet document, said multisheet document being produced in accordance with the options selected from the standard features, the job level features and having at least one page produced in accordance with the selected page level features.

5,113,223

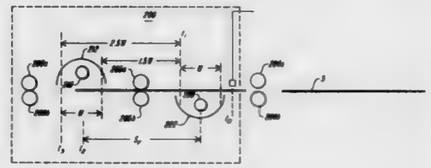
PRINTER FLASH FUSING SYSTEM

Sotos M. Theodoulou, Bramalea; Duncan Gibbons, Rexdale; Christopher W. Thomson, Etobicoke, and Hassan A. Khataan, Mississauga, all of Canada, assignors to Delphax Systems, Canton, Mass., a partnership

Filed Jun. 5, 1990, Ser. No. 533,483

Int. Cl.[5] H05B *1/00, 3/00, 11/00*; G03G *15/20*

U.S. Cl. 219—220 **28 Claims**



1. A flash assembly comprising

a transport which moves an unfixed recording past an exposure window for exposure to flash illumination,

a flash tube positioned over the exposure window to illuminate the recording with direct illumination comprising light travelling along direct ray paths from the flash tube to the recording as it is moved by the transport, and

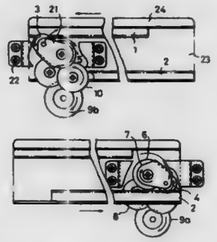
a specular reflector positioned about the flash tube, said reflector having a curvature effective to intercept and specularly reflect to the exposure window light exiting the flash tube that is not directed at the exposure window so as to complement the intensity of direct illumination from the tube with an amount of specularly reflected light effective to produce a substantially uniform level of illumination in the exposure window.

5,113,224

RECIPROCATING DRIVING DEVICE

Tadayuki Tsuda; Kanji Yano; Isao Ikemoto, all of Kawasaki; Kazushi Watanabe, Yokohama; Makoto Tanaka, and Kazuhiko Ishiwata, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 596,070, Oct. 11, 1990, abandoned.
This application Aug. 15, 1991, Ser. No. 746,811
Claims priority, application Japan, Oct. 13, 1989, 1-265109; Mar. 29, 1990, 2-78633; Aug. 10, 1990, 2-213506
Int. Cl.[5] G03G *15/28*
U.S. Cl. 355—234 **29 Claims**



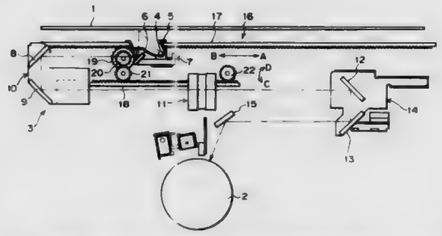
1. A reciprocating driving device comprising:
a reciprocating moving member supported to be movable in a predetermined direction and the opposite direction;
a first rack provided on said reciprocating moving member;
a second rack provided on said reciprocating moving member; and
moving gear means for selectively moving said reciprocating moving member in the predetermined direction or the opposite direction by rotating in a predetermined first rotational direction and selectively meshing with said first rack or said second rack.

5,113,225

OPTICAL SYSTEM DRIVING DEVICE

Masanobu Deguchi, Kita-Katsuragi, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 25, 1991, Ser. No. 645,845
Claims priority, application Japan, Jan. 25, 1990, 2-16602; Feb. 20, 1990, 2-40540
Int. Cl.[5] G03G *15/04*
U.S. Cl. 355—235 **10 Claims**



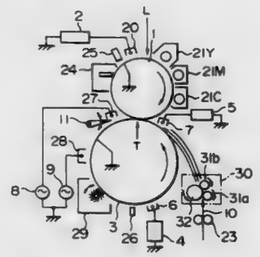
1. An optical system driving device comprising:
a lamp unit which emits an optical beam for scanning an object and moves with respect to said object;
a photosensitive member which receives a reflection light reflected from said object;
a mirror unit which is disposed on an optical path between said lamp unit and said photosensitive member for guiding said reflection light to said photosensitive member and moves at a predetermined speed ratio with respect to said lamp unit; and
a rack-pinion means connected to said lamp unit and said mirror unit to move said units at said predetermined speed ratio,
said rack-pinion means comprising:
a stationary rack gear secured to a device frame;
a movable rack gear attached to said mirror unit;
a first planetary gear which engages with said stationary rack gear;
a second planetary gear which is coaxially secured to and rotates with said first planetary gear and which has a pitch circle diameter ratio corresponding to said speed ratio with respect to said first planetary gear;
an idle gear which is disposed between and engages with said second planetary gear and said movable rack gear;
a first rotary shaft on which said first and second planetary gears are installed; and
a second rotary shaft on which said idle gear is installed, said first and second rotary shafts being secured to said lamp unit as a part thereof.

5,113,226

IMAGE TRANSFER APPARATUS

Hiroyuki Tadokoro; Kazuhiro Wakamatsu, both of Hitachi; Syoji Sagae, Hitachiota, and Akira Shimada, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 4, 1990, Ser. No. 592,663
Claims priority, application Japan, Oct. 12, 1989, 1-264003
Int. Cl.[5] G03G *15/14*
U.S. Cl. 355—273 **4 Claims**



1. An image transfer apparatus in an image recorder in which a toner image is formed on a surface of a photosensitive drum as a primary recording medium by uniform charging, image exposure and development, the toner image is transferred to a secondary recording medium electrostatically drawn to a transfer drum and the secondary recording medium is fixed to obtain an image record, the apparatus comprising:
recording medium heating and curving means for curving the secondary recording medium carried toward the transfer drum along an outer peripheral surface of the transfer drum while heating the secondary recording medium before the same is superimposed on the transfer drum.

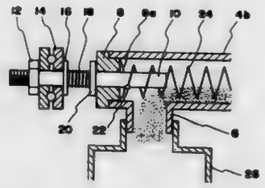
5,113,227

WASTE TONER CONVEYING APPARATUS

Toshiaki Miyasaka, Tokyo, Japan, assignor to Mutoh Industries Ltd., Tokyo, Japan

Filed Jun. 29, 1990, Ser. No. 545,898
Claims priority, application Japan, Dec. 25, 1989, 1-336113
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—298 **4 Claims**

1. A waste toner conveying apparatus comprising: a housing having a waste toner outlet adjacent an end of the housing; a shaft extending longitudinally into said housing at the end thereof adjacent said outlet, the shaft being rotatably and slidably supported by said housing so as to be rotatable and axially reciprocable relative to said housing; a conveyor screw disposed within said housing and fixed to said shaft so as to be movable therewith, rotation of said conveyor screw within said housing causing waste toner within said housing to be conveyed by the screw toward said waste toner outlet; and reciprocation means operatively connected to said shaft for



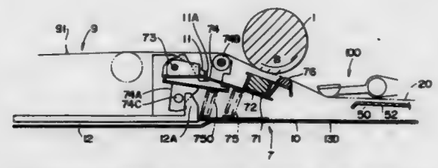
causing said shaft and the screw fixed thereto to reciprocate along the longitudinal axis of said shaft while said screw is rotating within said housing so as to thereby shake off any waste toner adhered to the screw as the screw conveys waste toner towards said waste toner outlet.

5,113,228

SHEET SEPARATING MECHANISM

Yoshio Monma, Oodi, and Hiroyuki Yamaguchi, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1991, Ser. No. 652,608
Claims priority, application Japan, Feb. 9, 1990, 2-30682
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—315 **9 Claims**



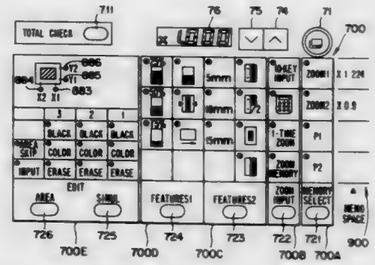
1. A sheet separating mechanism, adapted to be positioned in an electrophotographic printer using a continuous-form sheet on which a visible image, having been formed on a predetermined photoconductive material, is to be transferred by means of a transferring charger unit movable between an operating position, in which said transferring charger unit presses the continuous-form sheet being fed in a predetermined direction on said predetermined photoconductive material, and a retracting position, in which said transferring charger unit is retracted from said operating position, for separating the continuous-form sheet from said predetermined photoconductive material in case that said transferring charger unit is located at said retracting position;
said sheet separating mechanism comprising a rockable tension member arranged to be supported by a shaft member, said rockable tension member being located above the continuous-form sheet and contacting the continuous-form sheet, said shaft member extending in a direction perpendicular to the feeding direction of said continuous-form sheet, whereby said continuous-form sheet is downwardly tensioned by weight of said rockable tension member when said transferring charger unit is located at said retracting position thereof.

5,113,229

MULTI-COLOR COPYING MACHINE HAVING A SIMULTANEOUS COLOR COPY MODE AND AN EDITED AREA COPY MODE

Kimihiko Higashio; Masazumi Ito, and Kadotaro Nishimori, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 25, 1989, Ser. No. 384,732
Claims priority, application Japan, Jul. 26, 1988, 63-186350; Aug. 31, 1988, 63-219541
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—326 **5 Claims**



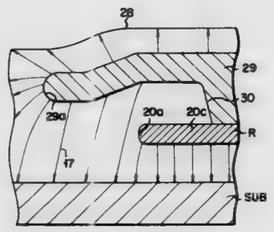
1. A copying machine which comprises:
a photosensitive medium;
a document support for the support thereon of a document to be copied;
an exposure means supported for movement between an exposure start position and an exposure terminating position, said exposure means, when moved from the exposure start position towards the exposure terminating position, scanning an entire surface of the document on the document support for projecting an image of the document onto the photosensitive medium;
a first area specifying means for specifying a particular point through which the scanning means is moved and operable to divide an area of the document support into a first area delimited between the exposure start position to the particular point, and a second area delimited between the particular point and the exposure terminating position;
a second area specifying means including a document coordinate input means and operable to divide the area of the document support into a third area defined by coordinates inputted and a fourth area outside the third area;
an image forming means including an electrostatic latent image forming means for forming an electrostatic latent image on the photosensitive medium in complemental relation with the image of the document, a first developing means accommodating therein a mass of developing material of first color and operable to supply the developing material onto the photosensitive medium to develop the electrostatic latent image into a visible powder image, a second developing means accommodating therein a mass of developing material of second color and operable to supply the developing material onto the photosensitive material to develop the electrostatic latent image into a visible powder image, an erasing means for erasing the electrostatic latent image before the electrostatic latent image is developed by one of the first and second developing means, and a transfer means for transferring the visible powder image from the photosensitive medium onto a copying sheet.
a common mode specifying means for specifying one of a first mode in which the electrostatic latent image on the photosensitive medium is developed into the visible powder image of first color with the use of the first developing means, a second mode in which the electrostatic latent image on the photosensitive medium is developed into the visible powder image of second color with the use of the

second developing means, and a third mode in which the electrostatic latent image on the photosensitive medium is erased with the use of the erasing means;
a selecting means for selecting one of the first and second area specifying means; and
a mode control means operable to utilize the common mode specifying means to specify a mode relative to any one of the first and second areas when the first area specifying means is selected and to utilize the common mode specifying means to specify a mode relative to any one of the third and fourth areas when the second area specifying means is selected.

5,113,230
SEMICONDUCTOR DEVICE HAVING A CONDUCTIVE LAYER FOR PREVENTING INSULATION LAYER DESTRUCTION

Hiroyuki Kinoshita, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushi Kaisha, Kawasaki, Japan

Continuation of Ser. No. 251,979, Sep. 28, 1988, abandoned, which is a continuation of Ser. No. 468,208, Feb. 22, 1983, abandoned. This application Aug. 8, 1990, Ser. No. 565,215
Claims priority, application Japan, Feb. 22, 1982, 57-27023; Apr. 20, 1982, 57-64684
Int. Cl.[5] H01L *27/01, 29/78, 27/02, 29/40*
U.S. Cl. 357—51 **7 Claims**



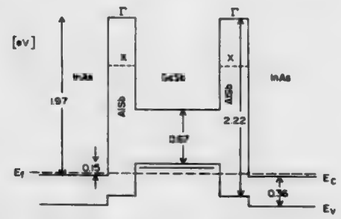
1. A semiconductor device having an insulation layer and a conductive layer for preventing breakdown of the insulation layer comprising:
a semiconductor substrate;
a resistor formed over said semiconductor substrate having a first end for receiving an input signal from an input terminal and having corners and side edges, said resistor disposed within said insulation layer and said insulation layer interposed between said semiconductor substrate and said first end of said resistor so that said first end of said resistor is insulated from said substrate; and
a conductor disposed within said insulating layer and connected to said first end of said resistor through a contact hole arranged such that it covers in an overhang fashion at least the corners of the first end portion of said resistor and the entire length of the side edges so as to mitigate the intensity of an electric field at said corners and side edges.

5,113,231
QUANTUM-EFFECT SEMICONDUCTOR DEVICES

Jan R. Söderström, and Thomas C. McGill, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Sep. 7, 1989, Ser. No. 404,148
Int. Cl.[5] H01L *29/205*
U.S. Cl. 357—16 **21 Claims**

1. A tunneling electronic semiconductor device comprising:
a series of abutting material layers, the electron energy levels of which provide a quantum well layer between adjacent layers, the valence electron energy level of said quantum well layer being higher than the conduction electron energy level of said adjacent layer at a first selected bias voltage across said series of layers and the valence electron energy level of said quantum well layer being lower than the conduction electron energy level of said adjacent layers at a second selected bias voltage across said series of

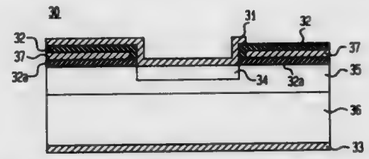


layers, whereby maximum tunneling current flows through said device during application of said first bias voltage and minimum tunneling current flows through said device during application of said second bias voltage.

5,113,232
LED ARRAY CHIPS WITH THERMAL CONDUCTOR

Masahiro Itoh, Tokyo, and Masayuki Kuwabara, Kanagawa, both of Japan, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1991, Ser. No. 719,406
Claims priority, application Japan, Jul. 31, 1990, 2-202849
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 **10 Claims**



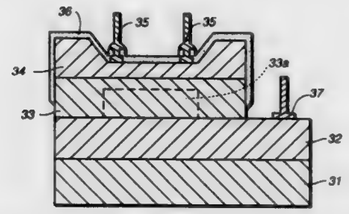
1. A Light Emitting Diode (LED) array chip comprising:
a plurality of LEDs integrated on a major surface of the array chip, each LED comprising a light emitting surface which is substantially aligned with the major surface of the array chip; and
a thermal conductor formed on a surface of the array chip on the same side as the plurality of LEDs and extending to a position adjacent to but not in contact with the light emitting surface of each LED, the thermal conductor being overcoated with an insulator and connected to a radiating member provided outwardly of the array chip.

5,113,233
COMPOUND SEMICONDUCTOR LUMINESCENT DEVICE

Masahiko Kitagawa, and Yoshitaka Tomomura, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 1, 1989, Ser. No. 402,691
Claims priority, application Japan, Sep. 2, 1988, 63-221081
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 **8 Claims**

4. A compound semiconductor luminescent device comprising a ZnS high-resistivity single-crystal substrate, a ZnS conductive layer of a first conductivity formed on said substrate, a ZnS luminescent layer of the first conductivity formed on said

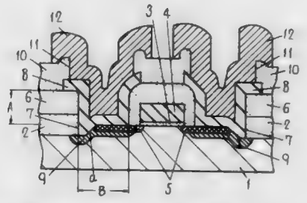


conductive layer, and a ZnS current injection layer of a second conductivity formed on said luminescent layer.

5,113,234
SEMICONDUCTOR DEVICE HAVING REDUCED CONTACT RESISTANCE BETWEEN DIFFUSION REGIONS AND WIRING LAYER

Takashi Furuta, Takatsuki, and Shuichi Nishida, Otsu, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Continuation of Ser. No. 267,283, Nov. 4, 1988, abandoned. This application Feb. 11, 1991, Ser. No. 653,158
Claims priority, application Japan, Nov. 13, 1987, 62-287901
Int. Cl.[5] H01L *29/78, 29/04*
U.S. Cl. 357—33.3 **12 Claims**

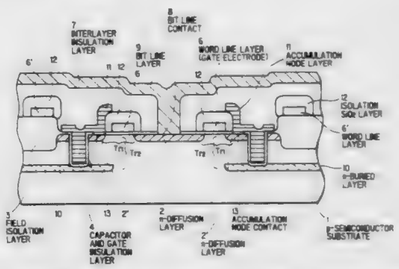


1. A semiconductor device comprising:
a semiconductor substrate of a first type of conductivity;
first and second oxide film regions located respectively at first and second locations on a surface of said semiconductor substrate, said first and second oxide film regions defining a first distance therebetween extending in a first direction;
a first impurity diffusion region of a second type of conductivity extending a second distance in said first direction between said first and second oxide film regions along said surface of said semiconductor substrate, and being spaced from said first and second oxide film regions;
a second impurity diffusion region of said second type of conductivity extending a third distance in said first direction from adjacent said first impurity diffusion region along said surface of said semiconductor substrate, said third distance being substantially greater than said second distance;
a third impurity diffusion region of said second type of conductivity having a first portion extending in said first direction along said surface of said semiconductor substrate from adjacent said second impurity diffusion region to beneath said first oxide film region, and having a second portion extending in said first direction beneath said second impurity diffusion region from said first impurity diffusion region to said first portion;
wherein said first, second and third impurity diffusion regions do not overlap each other;
a first contact hole having a bottom portion defined by almost an entire surface area of said second impurity diffusion region and said first portion of said third impurity diffusion region and a first side wall defined by said first oxide film region and an opposite second side wall located a fourth distance in said first direction from said first side wall;
wherein a distance of said third impurity diffusion region in said first direction is greater than said fourth distance and greater than a sum of said second and third distances;
a conductive film formed along said bottom portion of said first contact hole in contact with said second and third impurity diffusion regions; and,
a wiring layer connected to said conductive film.

5,113,235
DYNAMIC RANDOM ACCESS MEMORY

Akira Tamakoshi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 29, 1991, Ser. No. 693,121
Claims priority, application Japan, Apr. 27, 1990, 2-112403
Int. Cl.[5] H01L *29/10, 29/78*
U.S. Cl. 357—23.4 **4 Claims**



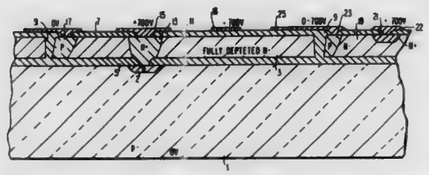
1. A dynamic random access memory cell, comprising:
a semiconductor substrate of a first conduction type;
a transfer transistor formed on said semiconductor substrate, said transfer transistor comprising first and second impurity diffusion layers of a second conduction type separately formed on a surface of said semiconductor substrate with a predetermined distance therebetween, a gate insulation layer covering an area between said first and second impurity diffusion layers, a gate electrode formed on said gate insulation layer;
a trench structure provided into said semiconductor substrate in which a capacitor insulation layer is formed along a wall of said trench structure;
a buried impurity diffusion layer of a second conduction type formed below a bottom of said trench structure to touch said capacitor insulation layer and to have a predetermined vertical distance from said second impurity diffusion layer, a potential level of said buried impurity diffusion layer being fixed at a high level;
an accumulation node layer formed on said trench structure to cover said capacitor insulation layer, said accumulation node layer being connected ohmically with said second impurity diffusion layer;
wherein said second impurity diffusion layer, said buried impurity diffusion layer, said capacitor insulation layer and said accumulation node layer comprise a vertical transistor;
said accumulation node layer accumulates charges transferred from said first impurity diffusion layer through said transfer transistor which has been excited to an ON state; and
said vertical transistor is excited to an ON state when a potential level of said accumulating node layer is high, and an OFF state of said vertical transistor occurs when a potential level of said accumulation node layer is low.

5,113,236

INTEGRATED CIRCUIT DEVICE PARTICULARLY ADAPTED FOR HIGH VOLTAGE APPLICATIONS

Emil Arnold, Chappaqua; Steven L. Merchant, Yorktown Hgts., and Peter W. Shackle, Somers, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 14, 1990, Ser. No. 628,307
Int. Cl.[5] H01L *27/02*
U.S. Cl. 357—41 **14 Claims**



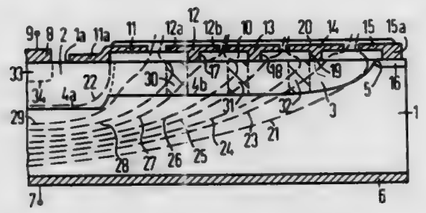
1. An integrated circuit device exhibiting improved voltage breakdown properties, comprising a semiconductor foundational substrate of a resistivity greater than about 100 ohm-cm of a first conductivity type, an insulating layer provided on said substrate, a semiconductor layer provided on said insulating layer, a plurality of laterally separated circuit elements forming parts of subcircuits provided in said semiconductor layer, a diffusion area of a second conductivity type, opposite to said first conductivity type, provided in said substrate, underlying none of said circuit elements and means for contacting and holding said diffusion area at a voltage at least equal to the highest potential of any subcircuit in said circuit device.

5,113,237

PLANAR PN-JUNCTION OF HIGH ELECTRIC STRENGTH

Reinhard Stengl, Stadtbergen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 392,411, Aug. 11, 1989, abandoned. This application May 6, 1991, Ser. No. 698,332
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1988, 3831941
Int. Cl.[5] H01L *29/40*
U.S. Cl. 357—53 **3 Claims**



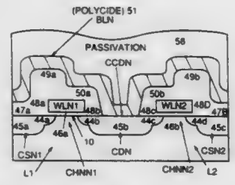
1. A planar pn-junction of high electric strength arranged in a surface of a doped semiconductor body of a first conductivity type, and which separates a semiconductor region of a second conductivity type inserted in the semiconductor body from the rest of the semiconductor body, whereby a plurality of field plates, including an innermost field plate and an outermost field plate, is provided in a border area of the semiconductor region which are separated from the semiconductor body via an electrically insulating layer, and which contact the semiconductor body respectively in the area of a contact hole of the insulating layer, each of said field plates having an inner field plate border and an outer field plate border, comprising, at least for one of the field plates, with the exception of the innermost and outermost field plates, the arrangement of the contact hole being selected such that it is at a first distance from the inner field plate border that corresponds, falls below or over its second distance to the outer field plate border, a difference between the first and second distances being only so large that the contact hole still has a set distance from the inner and the outer field plate borders, the semiconductor region being adjacent a semiconductor zone of the second conductivity type with a planar termination residing below the field plates, the doping concentration of the semiconductor zone being considerably smaller than the semiconductor region, and the doping concentration of the semiconductor zone varying in a lateral direction, whereby the semiconductor zone has local maximas respectively below the field plate parts residing between the contact hole and the inner field plate borders of field plate associated with the contact hole.

5,113,238

CONTACTLESS NON-VOLATILE MEMORY ARRAY CELLS

Chen-Chin Wang, 7880 Creekline Dr., Cupertino, Calif. 95014; Yeun-Ding G. Hong, 1686 Hadeock Ct., San Jose, Calif. 95132, and Stephen S. Chiao, 20437 Kilbride Ct., Saratoga, Calif. 95070

Filed Jan. 6, 1989, Ser. No. 294,318
Int. Cl.[5] H01L *29/34, 29/68, 27/10*
U.S. Cl. 357—54 **8 Claims**



1. A non-volatile memory array cell structure comprising: a plurality of cells including

a semiconductor substrate of a first conductivity type and having an initial planar upper surface;

a gate dielectric layer disposed on said surface;

a gate electrode, having a top and laterally opposite sidewalls, covering said gate dielectric layer;

a channel region formed in said substrate beneath said gate electrode;

an etch protection dielectric layer disposed on top of an adjacent respective sidewalls of said gate electrode;

a regular source region and a regular drain region both of a second conductivity type formed in said substrate beneath respective areas of said upper surface adjacent portions of said protection dielectric layer on respective sidewalls, each said source region between two adjacent cells being shared by those cells, and each said drain region between two adjacent cells being shared by those cells;

an isolation dielectric layer disposed on said surface over said source region; and

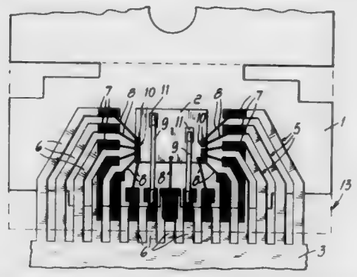
a conductive film disposed over said etch protection dielectric layer above said gate electrode and continuously directly over said isolation dielectric layer above said source region and forming a self-aligned etched buried contact to said surface over each of said regular drain regions; said conductive film running on top of and in parallel to said drain regions and perpendicular to said source regions.

5,113,239

INTEGRATED DEVICE WITH IMPROVED CONNECTIONS BETWEEN THE PINS AND THE SEMICONDUCTOR MATERIAL CHIP

Carlo Cini, Cornaredo; Angelo Massironi, Concorezzo, and Luigi Sisti, Genoa, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Sep. 17, 1990, Ser. No. 583,271
Claims priority, application Italy, Sep. 21, 1989, 21783 A/89
Int. Cl.[5] H01L *23/48, 29/40, 29/44, 29/46*
U.S. Cl. 357—68 **6 Claims**



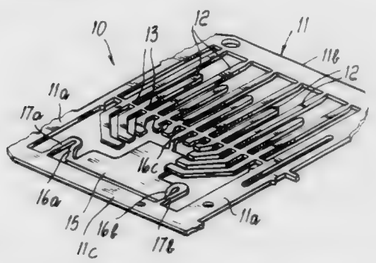
1. Integrated device with improved connections between the pins and the semiconductor material chip, wherein said connections are constituted by wires including wires made of at least a first material for chip power connections and wires made of at least a second material for chip signal connections, said first material comprising aluminium or alloys with a prevalence of aluminium, said second material comprising gold or alloys with prevalence of gold, and wherein said pins are partially coated with a layer of gold.

5,113,240

LEADFRAME WITH HEAT DISSIPATOR CONNECTED TO S-SHAPED FINGERS

Pieramedeo Bozzini, Sedriano, and Giuseppe Marchisi, Milan, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Milan, Italy

Filed Feb. 19, 1991, Ser. No. 656,386
Claims priority, application Italy, Feb. 22, 1990, 19445 A/90
Int. Cl.[5] H01L *23/48, 23/12, 23/34*
U.S. Cl. 357—70 **8 Claims**



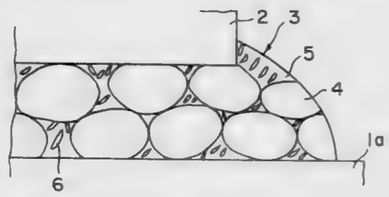
1. Improved leadframe for packages of integrated power device, comprising a monolithic body including a generally rectangular perimetric frame, a plurality of leads, a dissipator and at least one interconnection line supported by said frame, a plurality of leads mutually connected and supported by means of said at least one interconnection line, said dissipator extending in a depressed plane with respect to said frame and being connected to said frame and to said leads in at least three mutually spaced and non-aligned points, said frame being connected to said dissipator by means of s-like shape fingers which extend in three dimensions.

5,113,241

SEMICONDUCTOR DEVICE MOUNTED UPON AN INSULATING ADHESIVE WITH SILICON DIOXIDE AND NICKEL CHROMIUM STEEL FILLING PARTICLES

Satoru Yanagida, Kawasaki; Kouji Araki, Yokohama; Hikaru Okunoyama, and Tetsunori Niimi, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshba, Kawasaki, Japan

Filed Dec. 14, 1990, Ser. No. 627,573
Claims priority, application Japan, Dec. 14, 1989, 1-324753
Int. Cl.[5] H01L *23/28, 23/16, 39/02*
U.S. Cl. 357—72 **5 Claims**



1. A semiconductor device comprising:

a plurality of pellets fixed on a bed by means of a conductive adhesive agent,

an insulating substrate having a junction wiring, fixed on said bed between said semiconductor pellets, and

wires for connecting said plurality of semiconductor pellets and said insulating substrate therebetween,

said insulating substrate being fixed on said bed by an insulating adhesive agent including, as a filling material, particles of silicon dioxide and metal particles of which surfaces are coated with an oxide film.

5,113,242

TWO-LINE MAC HIGH DEFINITION TELEVISION SYSTEM

Mikhail Tsinberg, Riverdale; Carlo Basile, Flushing, and Alan P. Cavallerano, Ossining, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

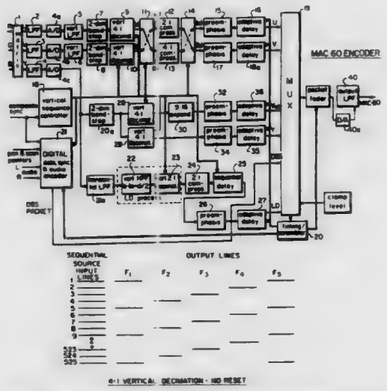
Continuation of Ser. No. 439,060, Nov. 17, 1989, abandoned, which is a continuation of Ser. No. 77,557, Jul. 24, 1987, Pat. No. 4,908,697. This application Mar. 15, 1991, Ser. No. 671,179
The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.
Int. Cl.[5] H04N *11/00*
U.S. Cl. 358—12 **11 Claims**

1. A method for encoding a video signal from a source signal comprising a plurality of frames each comprising a plurality of lines, for transmission or recording over a signal path having a first bandwith, said lines each having a first line period and each comprising a luminance signal having a second bandwith which is wider than said first bandwith, and at least one chrominance signal, said method comprising the steps of:

(a) a subsampling at a plurality of lines of each of a sequence of said frames temporarily and spatially in a diagonal direction so as to derive from said source signal a plurality of video components comprising first and second luminance components, a chrominance component and a plurality of line difference components;

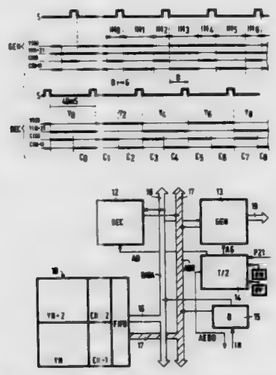
(b) processing said first luminance component at a first com-

pression ratio and said second luminance component at a second compression ratio; and



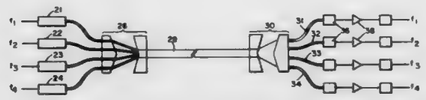
(c) time multiplexing said video components so as to form said video signal with a line period which is longer than said first line period.

5,113,243
METHOD OF AND DEVICE FOR DECODING ANIMATED IMAGES
Thierry Fautier, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 6, 1990, Ser. No. 623,009
Claims priority, application France, Dec. 8, 1989, 89 16253
Int. Cl.[5] H09N *9/64*
U.S. Cl. 358—21 R **8 Claims**



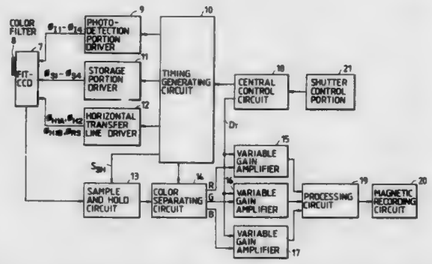
1. A method of decoding animated images, said method comprising the steps:
- decoding digital data relating to the images, said data having been encoded in a compressed form;
- generating images from the decoded data which are luminance and chrominance information components; and
- storing said information components; wherein said step of generating images comprises interpolating pixels of a preceding image and a subsequent image, while the position of the pixels in the preceding or subsequent image may be different from that of the pixel to be generated, characterized in that said interpolating pixels of an image starts before the end of decoding the data of the subsequent image.

5,113,244
FIBER OPTIC COMBINER/SPLITTER
Mark E. Curran, Oceanside, Calif., assignor to General Dynamics Corporation, Electronics Division, San Diego, Calif.
Filed Feb. 6, 1991, Ser. No. 651,635
Int. Cl.[5] G02B *6/28, 6/32*
U.S. Cl. 385—24 **13 Claims**



1. A device for combining (splitting) a plurality of optical beams (to be) carried by a plurality of optical fibers into (from) a solid beam carried by a single optical fiber comprising:
- a first refractive optic having a first flat face and a cone-shaped face, said first flat face adjacent to an end of a bundle comprising said plurality of optical fibers; and
- a second refractive optic having a second flat face and an inverted cone-shaped face, said second flat face adjacent to an end of said single optical fiber;
- whereby said first and second refractive optics are aligned along a continuous optical path with a selected spacing therebetween so that combining of said plurality of optical beams is accomplished by focusing said plurality of optical beams to a focal point by said first refractive optic and directing said plurality of optical beams into said second refractive optic to be combined into said solid beam, and splitting of said solid beam is accomplished by expanding said solid beam by said second refractive optic and directing an expanded said solid beam into said first refractive optic where it is equally distributed to each optical fiber of said plurality.

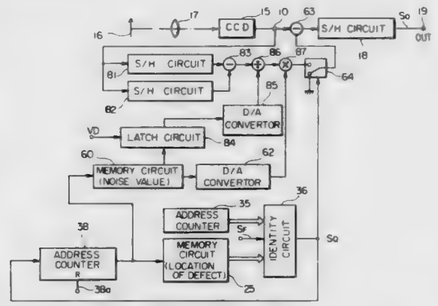
5,113,245
IMAGE PICKUP APPARATUS AND METHOD FOR REDUCING SMEAR
Kazuya Oda, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 4, 1990, Ser. No. 592,805
Claims priority, application Japan, Oct. 6, 1989, 1-260187
Int. Cl.[5] H04N *9/04*
U.S. Cl. 358—41 **22 Claims**



1. An image pickup apparatus in which unnecessary charges produced in picture elements of a charge coupled solid-state image pickup device of a frame interline transfer system are firstly discharged, signal charges corresponding to a first field and signal charges corresponding to a second field are transferred to a storage portion and a vertical charge transfer line of a photo-detection portion, respectively, after lapsing of an

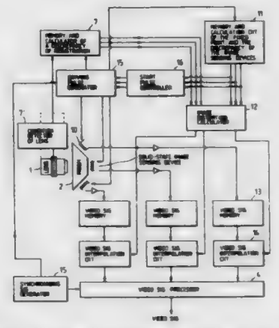
exposure period corresponding to a shutter speed from a point of time of said discharge of unnecessary charges, and said signal charges corresponding to said second field are read out after reading-out said signal charges corresponding to said first field while said signal charges corresponding to said second field are stopped in said vertical charge transfer line of said photo-detection portion, whereby an artificial frame shutter image pickup is carried out, the improvement wherein:
- picture signals of respective colors read-out from a picture element group corresponding to said second field are amplified by an amplifier having amplification factors which correspond to said respective colors, respectively, and which are set so as to have an inverse relationship to characteristics in which a smear component increases as the shutter speed becomes high.

5,113,246
IMAGE SENSING APPARATUS FOR CORRECTING A DEFECT IN COLOR SIGNALS GENERATED BY A CCD
Kunio Ninomiya, Kawasaki, and Akira Suga, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 300,727, Jan. 25, 1989, abandoned, which is a continuation of Ser. No. 917,479, Oct. 10, 1986, abandoned. This application Sep. 24, 1990, Ser. No. 587,554
Claims priority, application Japan, Oct. 11, 1985, 60-224770; Feb. 13, 1986, 61-027859
Int. Cl.[5] H04N *9/093*
U.S. Cl. 358—44 **18 Claims**



1. An image sensing apparatus comprising:
- image sensing means for sensing the image of an object through a color separation optical system of a predetermined color pattern;
- separating means, having a plurality of sample and hold means each for receiving a time-sequential signal obtained from said image sensing means and for separating therefrom and outputting a respective color signal representing a respective predetermined color, thereby separating the time-sequential signal into the respective signals from the plurality of sample and hold means;
- memory means for memorizing defect position information relating to said image sensing means; and
- correction means for correcting a defect in one of said respective color signals with a signal representing the same color by stopping the operation of the sample and hold means which outputs said one color signal, in accordance with said defect position information.

5,113,247
SOLID STATE IMAGE PICKUP APPARATUS FOR CORRECTING DISCREPANCY OF REGISTRATION
Toshiyuki Akiyama, Tokorozawa; Itaru Mimura, Sayama; Naoki Ozawa, Akishima; Kenji Takahashi, Tsukui; Yoshizumi Eto, Sagamihara, and Takahiro Matsumoto, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 11, 1989, Ser. No. 378,399
Claims priority, application Japan, Jul. 13, 1988, 63-172709; Sep. 16, 1988, 63-229964; Oct. 14, 1988, 63-257130
Int. Cl.[5] H04N *9/093, 7/18, 3/223*
U.S. Cl. 358—51 **17 Claims**

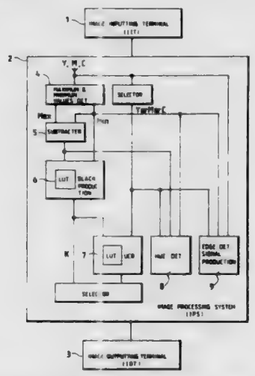


1. An image pickup apparatus including an optical lens and an image pickup element comprised of individual picture elements for transforming an optical ray having passed through said optical lens into electrical signals, comprising:
- means for storing at least one information of a fixing discrepancy of said image pickup element and a chromatic aberration of said optical lens;
- means for calculating a registration discrepancy with the fixing discrepancy and the chromatic aberration; and
- means for anticipating and interpolating video signals obtained from the individual picture elements to generate an output comprising means for guiding the video signals through a two-dimension filter determined by the registration discrepancy calculated.

5,113,248
METHOD AND APPARATUS FOR COLOR REMOVAL IN A PICTURE FORMING APPARATUS
Yoshiharu Hibi, and Masao Seki, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Oct. 27, 1989, Ser. No. 427,706
Claims priority, application Japan, Oct. 28, 1988, 63-273858
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 **15 Claims**

1. A picture forming apparatus for reproducing original images comprising:
- means for separating a signal corresponding to an original image into a plurality of color signals;
- means for converting said plurality of color signals into a plurality of recording signals wherein each of said recording signals corresponds to a different color of coloring material used by the picture forming apparatus to reproduce the original image;
- means for determining a minimum recording signal having a minimum value;
- means for determining a maximum recording signal having a maximum value;
- means for subtracting the minimum recording signal from

the maximum recording signal to produce a difference value; and



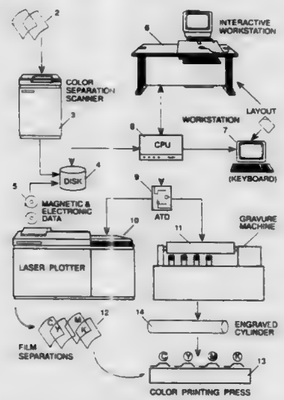
removal means for performing under color removal on a recording signal in accordance with said difference value.

5,113,249

METHOD FOR PREPARING POLYCHROMATIC PRINTING PLATES

Hanan Yosefi, Rishon Lezion, Israel, assignor to Scitex Corporation Ltd., Herzua Bet, Israel

Filed Jun. 29, 1990, Ser. No. 545,805
Claims priority, application Israel, Mar. 2, 1990, 93607
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 **2 Claims**



1. A method of processing a file of recorded color separation values of color elements for use in preparing polychromatic printing plates in order to reduce or eliminate defects caused by misregistration in printing, comprising the steps of:

identifying color pairs where there is a change in color between adjacent color areas;

determining, for each color pair, whether or not to make a frame, based on criteria including luminance of each color of the color pair; and

using said frames to provide polychromatic printing plates having reduced defects due to misregistration.

5,113,250

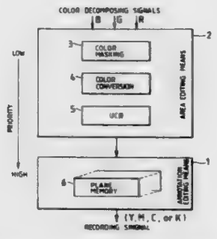
Patent Not Issued For This Number

5,113,251

EDITING CONTROL SYSTEM AND AREA EDITING SYSTEM FOR IMAGE PROCESSING EQUIPMENT

Yoshio Ichiyanagi, and Teruyuki Aoyama, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Japan

Filed Feb. 22, 1990, Ser. No. 482,977
Claims priority, application Japan, Feb. 23, 1989, 1-44174; Feb. 27, 1989, 1-47087
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 **42 Claims**



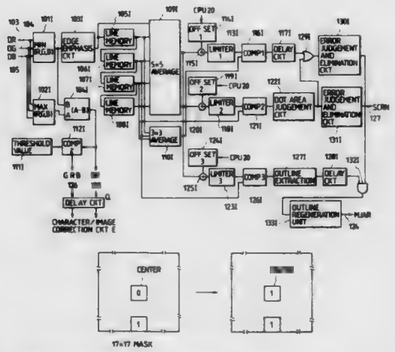
1. In an area editing system for image processing equipment which specifies a plurality of areas on one original and performs editing processes on images in said specified areas, the improvement wherein said editing processes are performed by selecting an area with higher priority in case some of said specified areas are overlapped.

5,113,252

IMAGE PROCESSING APPARATUS INCLUDING MEANS FOR PERFORMING ELECTRICAL THINNING AND FATTENING PROCESSING

Yoshiko Horie; Yoshinori Ikeda, both of Tokyo; Hiroyuki Ichikawa, Kawasaki; Mitsuru Kurita, Tokyo; Kimiyoshi Hayashi, Soka, and Toshio Honma, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1990, Ser. No. 519,500
Claims priority, application Japan, May 10, 1989, 1-117002; May 10, 1989, 1-117006; May 10, 1989, 1-117012
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—77 **42 Claims**



1. An image processing apparatus comprising:

a) first means for calculating an average value in a first block pixel area including an objective pixel;

b) second means for calculating an average value in a second block pixel area including the objective pixel, a size of the second block pixel area being different from a size of the first block pixel area; and

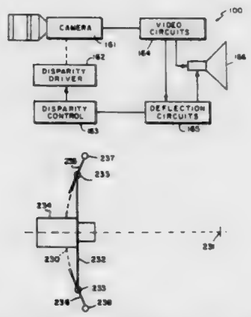
c) binarization means for determining, as a binarization output of the objective pixel, a result obtained by binarizing the average value in the second block pixel area using the average value in the first block pixel area as a threshold value.

5,113,253

SINGLE CAMERA AUTOSTEREOSCOPIC IMAGING SYSTEM

Eric K. Pritchard, Berkeley Springs, W. Va., and Christopher A. Mayhew, McLean, Va., assignors to Vision III Imaging, Inc., Vienna, Va.

Continuation-in-part of Ser. No. 425,232, Oct. 23, 1989, Pat. No. 5,014,126. This application Nov. 29, 1990, Ser. No. 619,512
Int. Cl.[5] H04N *13/00*
U.S. Cl. 358—91 **25 Claims**



1. An autostereoscopic image recorded comprising:

a single recording means for recording images and having a single optical path through a convergent point between a scene and said recording means;

a first rail spaced transverse to said optical path and a second rail displaced from said optical path and at an angle to said first rail;

means for mounting said recording means to said rails whereby said optical path transverses an arcuate scanning path centered at said convergent point; and

driving means for substantially continuously moving said recording means along said scanning path for a plurality of scanning cycles.

5,113,254

ELECTRONIC ENDOSCOPE APPARATUS OUTPUTTING TERNARY DRIVE SIGNAL

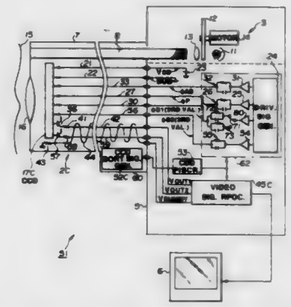
Masahide Kanno; Masao Uehara; Masahiko Sasaki; Katsuyuki Saito; Akinobu Uchikubo, all of Hachioji; Jun Hasegawa, Hino; Katsuyoshi Sasagawa, Shirakawa; Shinji Yamashita, and Takehiro Nakagawa, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1990, Ser. No. 473,260
Claims priority, application Japan, Jun. 4, 1989, 1-87251; Nov. 10, 1989, 1-265924
Int. Cl.[5] H04N *7/18*; A61B *1/4*
U.S. Cl. 358—98 **37 Claims**

1. An electron endoscope apparatus comprising:

an electron endoscope having an elongated portion to be inserted, an objective optical system disposed at the front portion of said portion to be inserted, a solid imaging device constituted by a photo-electrical conversion portion for photo-electrically converting an optical image formed by said objective optical system and a charge detection circuit for converting a signal charge which has been photo-electrically converted by said photo-electrical conversion portion into a voltage level so as to output said voltage level, and light irradiating means disposed at said front portion of said portion to be inserted and for irradiating illumination light for illuminating a subject;

a signal processing circuit having a binary signal generating circuit means for generating a sole binary signal, a multi-valued drive signal generating circuit means for generating a multi-valued drive signal exceeding a trinary value for commonly conducting both a horizontal transfer of said signal charge of said photo-electrical conversion portion and a resetting of said charge detection circuit with said binary signal and for causing said solid imaging



device to output a signal containing a feed-through signal period, a signal extraction circuit for extracting a signal component by making a reference with a signal level in said feed-through signal period with said signal transmitted from said solid imaging device, and a video signal processing circuit for generating a standard video signal by processing a signal transmitted from said signal extraction circuit; and

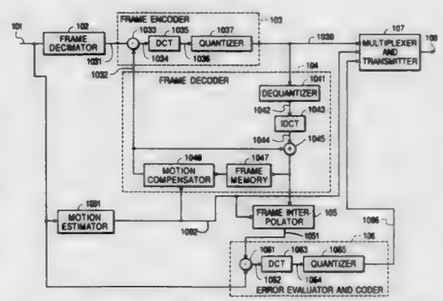
display means for displaying said standard video signal transmitted from said signal processing circuit.

5,113,255

MOVING IMAGE SIGNAL ENCODING APPARATUS AND DECODING APPARATUS

Atsushi Nagata, Hirakata; Kenichi Takahashi, Kyoto, and Nobuyasu Takeguchi, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 11, 1990, Ser. No. 522,121
Claims priority, application Japan, May 11, 1989, 1-118004; Jun. 26, 1989, 1-163059; Jun. 29, 1989, 1-169320
Int. Cl.[5] H04N *7/133, 7/137*
U.S. Cl. 358—136 **9 Claims**



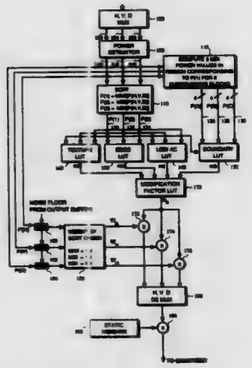
1. A moving image signal encoding apparatus comprising: a frame decimator for extracting the encoded frames from an input moving image signal at specified intervals; a frame encoder for encoding said encoded frames to obtain frame codes; a frame interpolator for producing interpolated frames posi-

tioned between said encoded frames from said frame codes; an error evaluator for evaluating errors of said interpolated frames, and a transmitter for transmitting said frame codes and output signals of said error evaluator as an output of the moving image signal encoding apparatus.

5,113,256
METHOD OF PERCEPTUALLY MODELING A VIDEO IMAGE SIGNAL

Richard W. Citta, Oak Park, and Stephen M. Dicke, Wheeling, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 8, 1991, Ser. No. 653,560
Int. Cl.[5] H04N *7/13*
U.S. Cl. 358—133 **23 Claims**



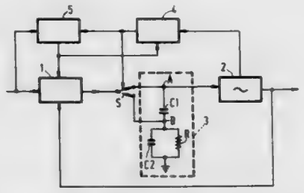
1. A method of modeling a signal, representing a video image comprising the steps of:
deriving a plurality of groups of spectral coefficients each representing a respective spatial portion of said video image;
separating the coefficients of each of said groups into a plurality of subgroups, the coefficients of each of said subgroups representing a series of spatially related frequencies occurring in a selected direction;
estimating the energy characterizing each of said subgroups;
deriving from the subgroup energy estimations of each of said groups a plurality of values each representing the degree to which the corresponding portion of said video image is characterized by a respective image related perceptual characteristic; and
combining said plurality of values to provide an output value corresponding to each of said groups of coefficients.

5,113,257
LINE SYNCHRONISING CIRCUIT

Henricus J. Heerkens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 534,000, Jun. 5, 1990, abandoned, which is a continuation of Ser. No. 249,629, Sep. 26, 1988, abandoned. This application Apr. 30, 1991, Ser. No. 696,324
Claims priority, application Netherlands, Oct. 26, 1987, 8702538
Int. Cl.[5] H04N *5/05*
U.S. Cl. 358—158 **4 Claims**

1. A circuit for the line synchronization in a picture display device, comprising a line oscillator having a control input, a phase discriminator having an output and two inputs, one input for receiving a signal generated by the line oscillator and the other input for receiving an incoming line synchronizing signal, a loop filter for smoothing the signal at the output of the phase discriminator to obtain a control signal, said control signal being applied to the control input of the line oscillator for controlling the frequency and/or the phase of the signal generated by said line oscillator, wherein the loop filter has a first part for supplying a first control signal having a first response time and a second part for supplying a second control

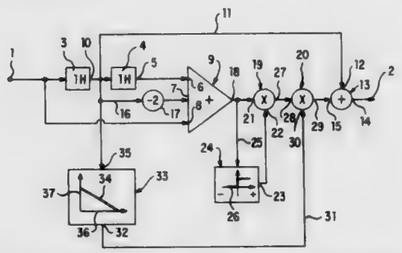


signal having a second response time which is shorter than the first response time, both parts of the loop filter being coupled to the control input of the line oscillator and switching means for alternately coupling the output of the phase discriminator to the control input of said line oscillator or to a node between the first and second parts of said loop filter.

5,113,258
COMPENSATION CIRCUIT FOR THE CORRECTION OF IMAGE DEFECTS OF A TELEVISION IMAGE

Philippe Roth, Dänikon, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Apr. 9, 1990, Ser. No. 506,080
Claims priority, application Switzerland, Apr. 10, 1989, 1352/89
Int. Cl.[5] H04N *5/213, 5/235*
U.S. Cl. 358—167 **10 Claims**

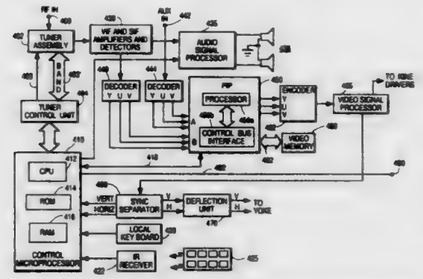


1. A compensation circuit for correcting image defects of a television image, comprising:
means for receiving a video signal;
two line memories for storing lines of the video signal;
at least one coefficient multiplier for multiplying values of the video signal lines;
a first adder for generating a compensation signal of three consecutive lines of the video signal;
a second adder for adding the compensation signal to an intermediate line of said three consecutive lines of the video signal; and
at least one electronic circuit interconnecting said first adder with said second adder, and for further processing said compensation signal to take into account a brightness level of a prevailing image point in the intermediate line of the video signal and/or a difference between the brightness level of the prevailing image point and of vertically adjacent image points of the video signal.

5,113,259
DATA TRANSFER FROM AN EXTERNAL COMPUTER TO A TELEVISION RECEIVER HAVING PICTURE-IN-PICTURE CAPABILITY

Eric D. Romesburg; Kenneth W. Maze; David J. Duffield, all of Indianapolis; Michael S. Deiss, Zionsville; Billy W. Beyers, Jr., Greenfield, and Kevin E. Bridgewater, Indianapolis, all of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Apr. 19, 1990, Ser. No. 511,269
Int. Cl.[5] H04N *5/272*
U.S. Cl. 358—183 **6 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 12 Pages)



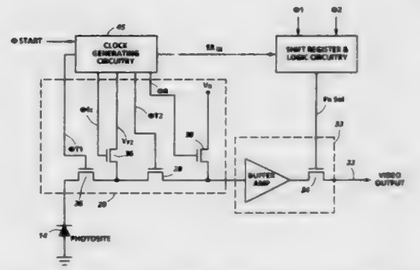
1. A picture-in-picture system for a television receiver, comprising:
data entry means for generating data signals in response to activation by a user, said data entry means including local keyboard means and remote control receiver means;
memory means for storing data;
picture-in-picture processing means for receiving a first video signal, for storing a predetermined amount of said first video signal in said memory means in response to a first control signal, and for producing a display signal for display on a display screen;
an input terminal for receiving digital control signals and digital signals representative of a second video signal from an external source;
said picture-in-picture processing means writing said digital signals representative of said second video signal to said memory means in response to a second control signal; and,
control means for controlling said picture-in-picture processing means, said control means having a first input coupled to said data entry means for receiving said data signals input by said user, having a second input coupled to said input terminal for receiving said digital control signals and digital signals representative of a second video signal, and having an output for developing said first and second control signals in response to one of said data signals input by said user and said digital control signals, said control means applying said digital signals representative of said second video signal received via said input terminal to said memory means;
said display signal being a combination of said first and second video signals.

4. A picture-in-picture system for a television receiver, comprising:
a source of a first video signal corresponding to a first video image;
an input terminal for receiving digital control signals and digital signal corresponding to a second video image from an external computer;
memory means for storing data related to said video signals;
picture-in-picture processing means coupled to said first source of video signals for receiving said video signals, and coupled to said memory means for storing a predetermined amount of said first video signals in response to a first control signal, for writing said digital signals corresponding to said second video image to said memory means in response to a second control signal and for producing a display signal for display on a display screen, said display comprising combination of said first and second images;
control means for controlling said picture-in-picture processing means, said control means having a first input coupled to said input terminal for receiving said digital control signals and said digital signals corresponding to said second video image, and having an output for developing said first and second control signals;
said control means in response to said digital control signals generates said first control signal causing said picture-in-picture processing means to store said predetermined amount of said first video signals, and generates said second control signal causing said picture-in-picture means to write said digital signals corresponding to said second video image to said memory means.

5,113,260
SENSOR ARRAY FOR BOTH SYNCHRONOUS AND ASYNCHRONOUS OPERATION

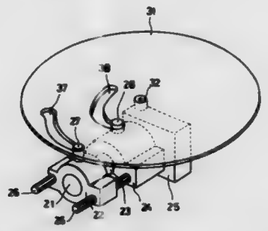
Jagdish C. Tandon, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 24, 1990, Ser. No. 632,816
Int. Cl.[5] H04N *5/335, 3/14*
U.S. Cl. 358—213.11 **6 Claims**



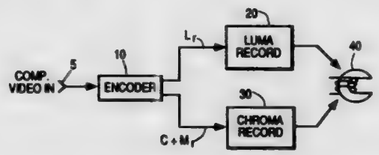
1. A scanning array for both synchronous and asynchronous operation, said array having an array of sensors for converting images viewed by said sensors to image charges, output gates for converting said charges to video image signals, control gates for transferring said charges from said sensors to said output gates, and a source of reset potential for use in resetting said sensor; comprising the combination of:
a) control means for operating said array in a predetermined timing sequence to scan an image line viewed by said array, said control means including
means for injecting a predetermined bias on said sensors over a first timed interval;
means for integrating the image line viewed by said array over a second timed interval;
means for applying said reset potential to said output gates over a third timed interval;
means for transferring charges accumulated on said sensors to said output gates over a fourth timed interval; and
means for sequentially accessing said output gates to read said image signals over a fifth timed interval;
b) said control means repeatedly operating said array through said predetermined timing sequence for each successive scan line for synchronous operation of said array; and
c) means for stopping and starting said array in response to the presence or absence of a demand for image signals for asynchronous operation of said array.

5,113,261
LENS DRIVING APPARATUS USING CAM PLATE
Tahei Morisawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 5, 1990, Ser. No. 548,543
Claims priority, application Japan, Jul. 11, 1989, 1-178269
Int. Cl.[5] H04N 5/225, 5/232
U.S. Cl. 358—225 7 Claims



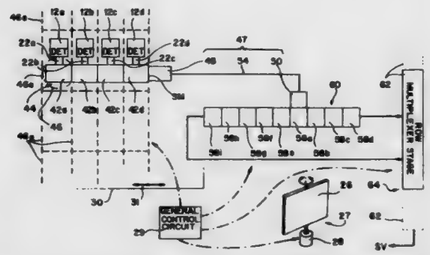
1. A lens driving apparatus adapted to drive a lens attached to a camera body, said lens driving apparatus comprising lens holders which are located along the optical axis of the lenses to hold respective lenses and which are movable in the optical axis direction, a rotatable cam plate provided on one side of said lens holders and in a plane parallel with the optical axis and mounted to rotate about a rotation axis, cam follower pins provided on said lens holders, cam grooves formed in said rotation cam plate, so that said cam follower pins of said lens holders are fitted in said cam grooves, and driving means for rotating said cam plate about the rotation axis, wherein said driving means is contained within the camera body.

5,113,262
VIDEO SIGNAL RECORDING SYSTEM ENABLING LIMITED BANDWIDTH RECORDING AND PLAYBACK
Christopher H. Strolle, Glenside, Pa.; Chandrakant B. Patel, Hopewell; Werner F. Wedam, Lawrenceville, both of N.J.; Jung W. Ko, Suwon, Rep. of Korea; Raymond Schnitzler, Piscataway, N.J., and Jong K. Yun, Kyunggi, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Kyung Ki, Rep. of Korea
Filed Aug. 17, 1990, Ser. No. 569,029
Int. Cl.[5] H04N 9/79
U.S. Cl. 358—310 27 Claims



1. A backward compatible video signal recording system for recording a full bandwidth video signal on a limited bandwidth medium, comprising:
an input terminal for receiving a composite video signal;
encoding means, coupled to said input terminal, for producing a luminance signal having attenuated high frequencies folded into low frequencies and bandwidth limited to said limited bandwidth, and a signal including a chrominance component and a motion component;
means for recording said luminance signal; and
means for recording said signal including chrominance and motion components.

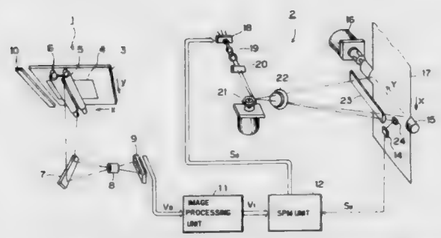
5,113,263
REDUCED SIZE ACCURATE SOLID-STATE CAMERA HAVING LOW POWER CONSUMPTION
Luc Audaire, and Philippe Pantigny, both of Grenoble, France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Dec. 27, 1990, Ser. No. 634,759
Claims priority, application France, Dec. 29, 1989, 89 17448
Int. Cl.[5] H04N 5/335
U.S. Cl. 358—213.11 13 Claims



1. Camera having integrated scanning circuits comprising a plurality of detectors arranged in the form of rows and columns, said detectors supplying an electrical signal proportional to their illumination, N being the number of detectors forming a row; an optical system able to move an image translation passed;
said columns of detectors and perpendicular thereto, said optical system being able to move the image in one or two successive, opposite movement directions; a plurality of reading circuits, each having a charge couple device integrated beneath the detectors and each charge couple device being connected to one detector, respectively, each reading circuit being able to read the electrical signal supplied by its respective detector, in relation with the movement of the image and supplying a reading signal; a row scanning circuit coupled to said reading circuits and including a row multiplexer having a CCD-type structure and having the same number of first stages as there are rows of detectors, each first stage being connected to a column scanning circuit, said row multiplexer supplying a signal representing a column of the image formed by the different signals supplied by column scanning circuits; for each row, one column scanning circuit having a CCD-type structure, said column scanning circuits being able to add the reading signals corresponding to the detection of the same element of the image moving successively passed the detectors of the same row and supplying signals representative of the elements of the image (30) having passed over all the detectors (12) of a row; the column scanning circuits being able to add the reading signals corresponding to the detection of the same element of the image moving successively passed the detectors (12) of a same row and supplying signals representing the elements of the image having passed all the detectors of a same row in one and/or the other direction, one part of each scanning circuit being integrated beneath the detectors of the corresponding row and the other part being integrated next to the said row with a spacing equal to or smaller than the spacing of the detector rows; each column scanning circuit comprising: a column multiplexer have N second stages integrated beneath the detectors of the corresponding row, each second stage being connected to a reading circuit, said column multiplexer being able to record in its different second stages the reading signals formed after a photograph and to supply, on a multiplexing output, integrated next to the detectors of the corresponding row in order to process the signals supplied by said column multiplexer and performing a delay and summation function, said processor supplying, on at least

one output, signals representing elements forming a row of the image, each of these signals being constituted by the sum of the signals corresponding to the same element of the image having moved passed all the detectors of a row; for each processor, a control circuit connected to an output of said column multiplexer and to an input of said processor, said control circuit being able to allow or prevent a transfer of signals between the said column multiplexer and said processor (60).

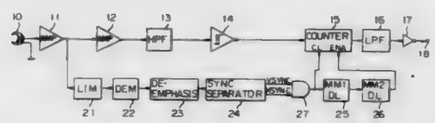
5,113,264
METHOD OF AND APPARATUS FOR FORMING HALFTONE DOTS
Koichi Isono; Masayuki Nakano, and Yoshiyuki Nishigaito, all of Hikone, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan
Filed Dec. 5, 1989, Ser. No. 446,040
Claims priority, application Japan, Dec. 15, 1988, 63-317347
Int. Cl.[5] H04M 1/40
U.S. Cl. 358—298 14 Claims



1. A method of forming halftone dots in a halftone image, comprising the steps of:
(a) preparing image data representing an original image,
(b) preparing plural sets of threshold data, each of which includes a predetermined threshold value assigned to respective pixels in a unit pixel block of a prescribed shape, said plural sets of threshold data each having a different arrangement of said threshold values,
(c) fixing the correspondence of each pixel in said original image to each pixel in said unit pixel block,
(d) randomly selecting one of said plural sets of threshold data with respect to each pixel to thereby pick up one of said threshold values in a selected set of threshold data at each pixel,
(e) comparing said image data with a threshold value picked up by step (d) with respect to each pixel, to thereby produce a dot signal indicating whether or not each pixel is to be solid, and
(f) forming halftone dots as a function of said dot signal;
wherein each of said plural sets of threshold data is so established that a plurality of halftone dots are to be formed in said unit pixel block; and
wherein said threshold values in each of said plural sets of threshold data are different from each other.

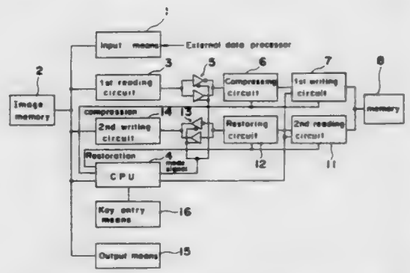
5,113,265
APPARATUS FOR DETERMINING RECORDING MODE OF FREQUENCY-MODULATED VIDEO SIGNAL
Yasuhito Kobayashi, and Junichi Matsuo, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Sep. 14, 1989, Ser. No. 407,309
Claims priority, application Japan, Sep. 28, 1988, 63-240861; Feb. 3, 1989, 1-24033
Int. Cl.[5] H04N 5/78
U.S. Cl. 358—330 12 Claims

1. An apparatus for determining one of a plurality of recording modes of a frequency-modulated video signal which is recorded on a recording medium in one of said plurality of recording modes under frequency modulation, wherein the frequency modulation is different in frequency from each of said plurality of recording modes, comprising:
reader means for reading out the frequency-modulated video signal from the recording medium;
demodulator means for demodulating the frequency-modulated video signal read out from the recording medium;
synchronization signal separator means for extracting pulse signals related to a vertical synchronization signal and a horizontal synchronization signal from the video signal demodulated by said demodulator means;



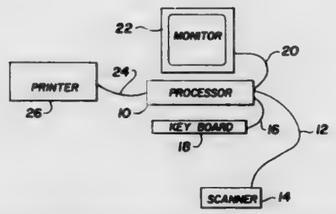
period setting means for setting a first predetermined period on the basis of a period in which the pulse signals are generated;
counter means for counting during said first predetermined period set by said period setting means a signal containing a sync tip frequency component of the frequency-modulated video signal read out by said reader means; and
outputting means for outputting a mode signal representative of the one of said plurality of recording modes based on a resultant count in said counter means.

5,113,266
RUN LENGTH ENCODER
Masamichi Sugiura, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jun. 8, 1988, Ser. No. 203,984
Claims priority, application Japan, Jun. 12, 1987, 62-147337; Jun. 12, 1987, 62-147338
Int. Cl.[5] H04N 1/40
U.S. Cl. 358—426 8 Claims



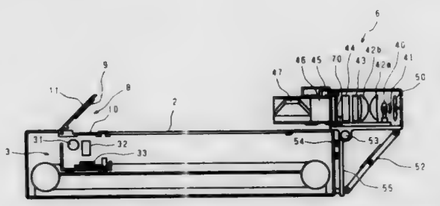
1. A run length encoder for compressing binary image data including black and white picture elements of opposite logic levels, said encoder comprising:
means for detecting whether the number of the black picture elements is larger than the number of the white picture elements in the binary image data to be compressed;
means for reversing each of the logic levels of the binary image data from one to another when said detecting means detects that the number of the black picture elements is larger than the number of the white picture elements; and
means for compressing the binary image data.

5,113,267
APPARATUS FOR AND METHOD OF RECONSTRUCTING A DOCUMENT
Aldric K. Lee, 10132 Monroe Dr., Dallas, Tex. 75229
Filed Nov. 9, 1989, Ser. No. 434,801
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—448 **20 Claims**



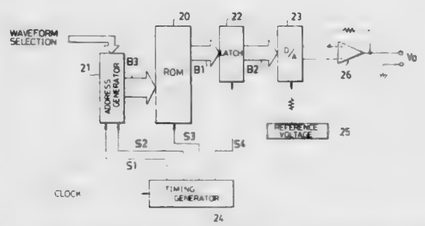
1. Apparatus for reconstructing a single document from data provided by scanning apparatus incapable of reading the entire document, comprising: a calibration sheet adapted to be disposed on the document to be scanned; scanning apparatus means for converting a scanned portion of the document and a scanned portion of the calibration sheet into electronic outputs; and a computer processing unit connected to said scanning apparatus means to receive the electronic outputs, said computer processing unit including storing means for storing a first set of information representing a first scanned portion of the document and calibration sheet, a second set of information representing a second scanned portion of the document and calibration sheet and a third set of information representing a reconstructed single document, and converting means for adjusting the first and second sets of stored information relating to the respective portions of the document scanned into alignment and spacing relative to a standard determined by the respective portions of the scanned calibration sheet and for merging the adjusted first and second sets of information to provide the third set of information.

5,113,268
DUAL OPERATIONAL IMAGE READING APPARATUS
Kazuyuki Yoshida; Nobuo Kanai; Toshikazu Suzuki, and Masamitsu Ishiyama, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jun. 9, 1989, Ser. No. 364,000
Claims priority, application Japan, Jun. 10, 1988, 63-144490; Aug. 2, 1988, 63-193789; Aug. 2, 1988, 63-193790; Aug. 2, 1988, 63-193791; Aug. 2, 1988, 63-193792; Aug. 26, 1988, 63-213397; Aug. 26, 1988, 63-213398
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—474 **16 Claims**



1. An image reading apparatus comprising: a document platen for supporting a document sheet thereon;
reading means including a line image sensor which moves in a subscanning direction in order to scan an image of the document sheet on said document platen;
a projector and a projecting lens for projecting an optical image of a film onto said line image sensor;
means for positioning said image sensor at a predetermined position when the image of the film is read;
supporting means for supporting the film;
means for sequentially scanning strips of the optical image of the film by moving the film with respect to said line image sensor when the image of the film is read and while said line image sensor is at said predetermined position.

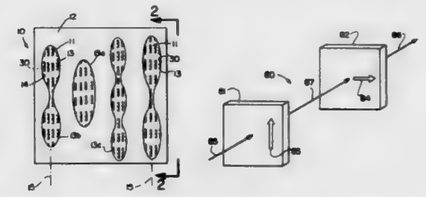
5,113,269
OPTICAL SCANNER
Masunori Kawamura, Hino, Japan, assignor to Kowa Company Ltd., Japan
Filed Jul. 9, 1990, Ser. No. 550,329
Claims priority, application Japan, Jul. 13, 1989, 1-179094
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—474 **9 Claims**



1. An optical scanner for deflecting an optical beam for scanning across a target comprising:
a light source for generating the optical beam;
optical reflecting means for reflecting the optical beam towards the target and being mechanically displaceable to reflect the optical beam for scanning thereacross;
driving means responsive to a driving signal for driving the optical reflecting means to effect the mechanical displacement thereof;
storage means for storing predetermined PCM-encoded data having a driving waveform in addresses is said storage means, said PCM-encoded data dependent on mechanical characteristics of the optical reflecting means and driving means; and
control means comprising reading means for successively reading out the PCM-encoded data from the addresses, the read-out PCM-encoded data forming a digitized signal for driving the optical reflecting means and means for converting the digitized signal into analog signals and applying the analog signals as the driving signal to the driving means.

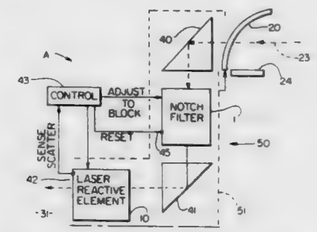
5,113,270
VARIABLE DENSITY LIGHT CONTROL APPARATUS
James L. Fergason, 92 Adam Way, Atherton, Calif. 94025
Continuation of Ser. No. 261,045, Oct. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 259,951, Oct. 19, 1988, abandoned. This application Oct. 19, 1990, Ser. No. 602,056
Int. Cl.[5] G02F *1/133*
U.S. Cl. 359—37 **27 Claims**

1. A variable density light control apparatus, comprising first and second polarizers having at least a partial crossed relation, and wherein at least one of said polarizers comprises a variable optical polarizer, including liquid crystal having low birefringence, containment means for containing said liquid crystal, means for affecting the structural alignment of said liquid crystal, said liquid crystal being responsive to a prescribed input to change such structural alignment, and means in said liquid crystal responsive to such structural alignment



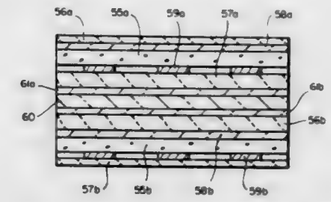
thereof for affecting polarization of light as a function of such alignment.

5,113,271
LIGHT BLOCKING AND VISION RESTORATION APPARATUS WITH GLINT CONTROL
James L. Fergason, 92 Adam Way, Atherton, Calif. 94025
Continuation of Ser. No. 230,622, Aug. 10, 1988, Pat. No. 4,988,167. This application Jan. 25, 1991, Ser. No. 646,160
The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.
Int. Cl.[5] G02F *1/133*
U.S. Cl. 359—38 **26 Claims**



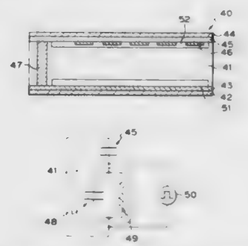
19. A system for controlling electromagnetic radiation, comprising:
an apparatus for responding to electromagnetic radiation, including
a medium through which said electromagnetic radiation may be transmitted;
liquid crystal means positioned with respect to said medium for responding to a characteristic of said electromagnetic radiation to cooperate with said medium to effect refraction of said electromagnetic radiation at an interface of said medium and said liquid crystal means;
a filtering apparatus for filtering a wavelength of said electromagnetic radiation, including a variable polarization rotator means for supplying input electromagnetic radiation at a prescribed angle of polarization, variable dispersion means for rotating the plane of polarization of such input electromagnetic radiation an amount that is a function of the wavelength of such input electromagnetic radiation, and analyzer means for blocking transmission of that electromagnetic radiation which is output by said variable dispersion means and has a plane of polarization which is crossed relative to the axis of polarization of said analyzer means;
control means for activating said filtering apparatus upon said liquid crystal means responding to said characteristic of said electromagnetic radiation; and
wherein said control means comprises a computer and detector means for detecting said reflection and providing a control signal within said control means indicating said refraction is occurring.

5,113,272
THREE DIMENSIONAL SEMICONDUCTOR DISPLAY USING LIQUID CRYSTAL
Robert H. Reamey, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Filed Feb. 12, 1990, Ser. No. 479,005
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—53 **8 Claims**



1. A display presenting a three-dimensional visual effect, comprising (I) a plurality of stacked layers of a display material comprising encapsulated liquid crystal material and containing a plurality of pixels which are each independently switchable from a first visual state to a second visual state, each layer having pixels of the same color or combination of colors: (II) switching means for independently switching each pixel from the first visual state to the second visual state; (III) separating means for providing a separation between adjacent layers of display material; provided that where the number of layers of display material is less than four, the separation between adjacent layers is at least 0.5 mm and (IV) filler material which fills the separation between adjacent layers and has a refractive index substantially equal to that of the adjacent layers.

5,113,273
LIQUID CRYSTAL DISPLAY DEVICE
Akihiro Mochizuki, Atsugi; Hideo Hama, Ichihara, and Mitsuaki Hirose, Tatebayashi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Mar. 20, 1990, Ser. No. 496,030
Claims priority, application Japan, Mar. 20, 1989, 1-67863
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—56 **18 Claims**

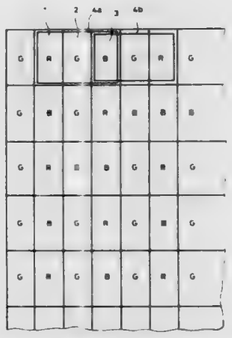


1. A liquid crystal display device which comprises a ferroelectric liquid crystal material sandwiched between a first electrode formed on a first substrate and an opposed second electrode formed through a dielectric layer on a second substrate, the dielectric layer being electrically connected through an electrically conductive connecting means with the first electrode so that the dielectric layer and the liquid crystal material are connected in parallel with regard to an external electric source for applying a pulsed voltage to the display device, and so that the dielectric layer is able to act as a capacitative element for extending a relaxation time of the spontaneous polarization of the liquid crystal material, the capacitative element having a capacitance which is one ofsubstantailly equivalent to and slightly higher than that of the liquid crystal material.

5,113,274
MATRIX-TYPE COLOR LIQUID CRYSTAL DISPLAY DEVICE

Seiki Takahashi, and Hayato Takasago, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 362,942
Claims priority, application Japan, Jun. 13, 1988, 63-146277
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—66 **8 Claims**



1. A matrix-type color liquid crystal display device comprising:

an array of successively repeating color pixel quartets each including one red (R) pixel, two green (G) pixels and one blue (B) pixel arranged in one of the following orders: G, R, G, B; G, B, G, R; R, G, B, G; and B, G, R, G;

signal modifying and processing means for preparing signals for R and B pixels on opposite sides of each of the G pixels by modifying signals to be applied to R and B pixels which belong to the same display unit as that G pixel so as to have an optimum magnitude which is between zero and the magnitude before the modification; and

said signal modifying and processing means includes means for modifying and processing signals applied to a driver section for driving the color pixel array in such a manner as to broaden and delay signals to be applied to the R and B pixels relative to a signal to be applied to the G pixels, and also for optimizing the timing of sampling of said broadened and delayed signals applied to the G, B and R pixels.

5,113,275
TEMPERATURE COMPENSATION OF LIQUID-CRYSTAL ETALON FILTERS

Jayantilal S. Patel, Red Bank, and John R. Wullert, II, Colonia, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

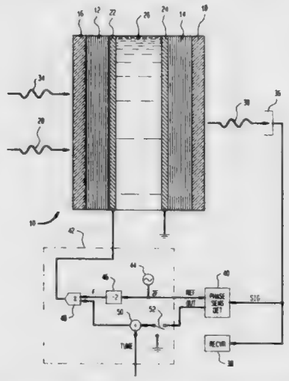
Filed Jul. 3, 1991, Ser. No. 725,340
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—86 **13 Claims**

1. A compensator for a liquid-crystal filter for filtering a beam of light having an optical frequency that is thereafter detected in an optical detector, comprising:

an oscillator circuit providing a first oscillatory electrical signal at a driving frequency f and a second oscillatory electrical signal at a frequency proportionally related to f;

a phase-sensitive detector receiving a detection output from said optical detector and said second oscillatory electrical signal and providing a compensation signal representing an amplitude of a component of said detection output having said related frequency; and

a driving circuit receiving said first electrical signal and said compensation signal and providing a driving signal for

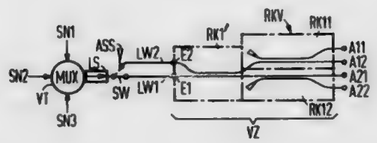


said liquid-crystal filter having said driving frequency and an amplitude related to said compensation signal.

5,113,276
OPTICAL COMMUNICATION NETWORK USING REDUNDANT WAVEGUIDES AND TWO WAY OPERATION

Helmut Pascher, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 24, 1990, Ser. No. 586,868
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1989, 3937360.6
Int. Cl.[5] H04J *14/00*
U.S. Cl. 359—117 **12 Claims**



1. An optical communication network for multiplex operation comprising:

a distributing means for sending a multiplex signal;

a first light waveguide for receiving said multiplex signal from said distributing means at a first end of said first light waveguide;

a branching means, providing a direction coupler having a first input terminal, a second input terminal, and an output, said first light waveguide being optically connected to said first input terminal at a second end of said first light waveguide, said direction coupler arranged and adapted to divide a multiplex signal received by either of said first or second input terminals into at least two sub-signals at said output of said direction coupler;

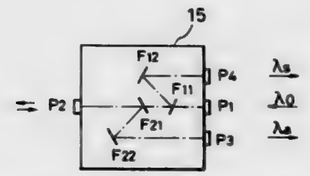
a second light waveguide optically connected between a first end of said distributing means and a second end at said branching means, said second end of said second light waveguide being optically connected to said second input terminal of said direction coupler means; and

a switch-over means for switching the multiplex signal from said distributing means from said first light waveguide to said second light waveguide.

5,113,277
FIBER OPTIC DISTRIBUTED TEMPERATURE SENSOR SYSTEM

Yasuo Ozawa, Odawara; Nobuo Ando, Hitachi; Satoshi Yamamoto, Hitachi; Toshio Fukahori, Hitachi; Hiroyuki Kunugiyama, Hitachi; Kouichi Sugiyama, Takahagi; Teruaki Tsutsui, Hitachi; Keiichi Hashiba, Hitachi; Shigehiro Endoh, Hitachi; Hiroshi Kawakami, Hitachi; Akira Tokushima, Hitachi, and Kaoru Yamazaki, Kita-Ibaraki, all of Japan, assignors to Hitachi Cable Limited and The Tokyo Electric Power Company, Incorporated, both of Tokyo, Japan

Filed Jun. 22, 1990, Ser. No. 542,610
Claims priority, application Japan, Jun. 22, 1989, 1-158256
Int. Cl.[5] H04J *14/02*
U.S. Cl. 359—127 **11 Claims**



1. An optical wavelength demultiplexing apparatus for receiving light having various components and for separating said light components, said apparatus comprising:

(a) first filter means coupled to said received light, for reflecting a first and a second of said light components therefrom, said second light component comprising Stokes light;

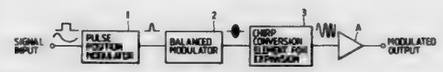
(b) second filter means optically coupled to said first filter means for receiving said reflected first and second components from said first filter means and for reflecting said received first light component while allowing said second received light component to pass therethrough; and

(c) third filter means optically coupled to said second filter means for receiving said second light component passing through said second filter means and for reflecting said second light component, whereby said first and said second light components are separated from said light received by said first filter means.

5,113,278
COMMUNICATION SYSTEM AND APPARATUS USING CHIP SIGNALS

Yasusaburo Degura, Kawasaki; Tetsuo Sakanaka, Sagamihara, and Haruo Imano, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 512,261
Claims priority, application Japan, Apr. 26, 1989, 1-104763
Int. Cl.[5] H04B *10/00*
U.S. Cl. 359—154 **19 Claims**



19. A communication apparatus comprising:

inputting means for inputting a signal to be transmitted;

pulse position modulating means for pulse-position modulating the inputted signal such that a position of a generated pulse signal is different according to the inputted signal;

balance modulating means for balance modulating the signal which was pulse-position modulated by said pulse position modulating means;

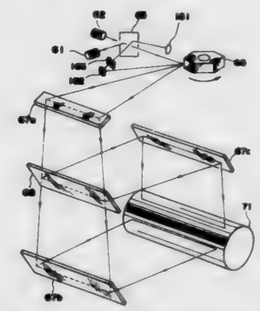
converting means for converting the modulated signal which was modulated by said balance modulating means into a chirp signal; and

outputting means for outputting the chirp signal onto a transmission path.

5,113,279
LASER BEAM SCANNING APPARATUS

Hiroyuki Hanamoto, and Masaaki Oyabu, both of Aichi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 19, 1991, Ser. No. 672,035
Claims priority, application Japan, Mar. 19, 1990, 2-68936; Mar. 20, 1990, 2-71296
Int. Cl.[5] G02B *26/10*
U.S. Cl. 359—196 **23 Claims**



1. A laser beam scanning apparatus comprising:

a plurality of laser beam sources for emitting laser beams modulated by image signals and having different characteristics from each other;

beam composition optical means for composing the beams emitted from said plurality of laser beam sources to form composite laser beam;

beam deflecting means for deflecting the composite laser beam in a main scanning direction thereof;

beam detecting means, arranged near said plurality of laser beam sources, for detecting the deflected laser beam to determine each start timing of the modulation of each laser beam source;

reflecting means for reflecting the deflected laser beam toward said beam detecting means; and

beam splitting optical means for splitting the deflected composite laser beam into a plurality of laser beams on the basis of the characteristics of the laser beams;

wherein each split laser beam is directed to a different part of a photosensitive member.

5,113,280
METHOD FOR MOUNTING AND ADJUSTING A ROTATABLE OPTICAL ELEMENT POLYGON MIRROR OR THE LIKE TO A ROTATION SHAFT AND APPARATUS FOR SUCH METHOD

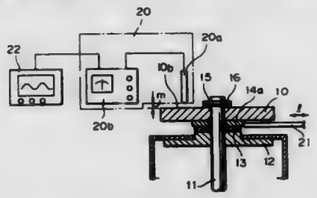
Keiichi Kawasaki, Tokyo, and Kazuhisa Takahashi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 423,582, Oct. 17, 1989, abandoned, which is a continuation of Ser. No. 138,044, Dec. 28, 1982, abandoned.
This application Mar. 18, 1991, Ser. No. 670,737
Claims priority, application Japan, Jan. 14, 1987, 62-6349
Int. Cl.[5] G02B *26/10*
U.S. Cl. 359—196 **28 Claims**

21. An apparatus for mounting and adjusting a rotatable optical element to a rotation shaft, comprising:

an optical element to be fitted to the rotation shaft, said optical element being mounted to said rotation shaft by a spherical seat and a holding member;

detection means for detecting an inclination of said optical element with respect to said rotation shaft; and



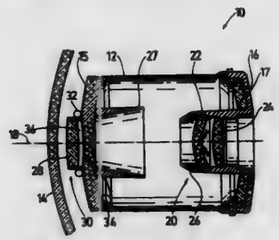
pressing means for shifting said spherical seat by slightly pressing a peripheral portion thereof by a sliding amount corresponding to a detected inclination degree to adjust a mounting alignment of said optical element.

5,113,281

DUAL FIELD OF VIEW OPTICAL SYSTEM

David Mandelboum; Itshak Marom, both of Haifa, and Yitzhak Nevo, Mobile Post Ein Harod, all of Israel, assignors to State of Israel-Ministry of Defence Armg332 Development Authority, Israel

Filed Mar. 22, 1989, Ser. No. 327,325
Claims priority, application Israel, Mar. 29, 1988, 85908
Int. Cl.[5] G02B *26/02, 17/00*
U.S. Cl. 359—236 **17 Claims**



1. An optical system for transmitting light from an object in a dual field of view, said system comprising:

optical means providing alternate optical paths associated with each of a wide and a narrow field of view, at least a portion of the alternate optical paths being in alignment; and

mechanically operable blocking means disposed within said aligned portion of the alternate optical paths and being selectably operable to enable passage of the light from the object which is associated with one of the alternate optical paths while simultaneously blocking passage of the light associated with the other alternate optical path, wherein said blocking means comprises a pivotably movable disc-ring construction of thin opaque material having a central disc fixedly mounted within a circumferential ring in othogonal orientation therewith.

5,113,282

DUAL LIGHT VALVE SYSTEM WITH SELECTIVE DECOUPLING OF LIGHT VALVES

Thomas R. O'Meara, and David M. Pepper, both of Malibu, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

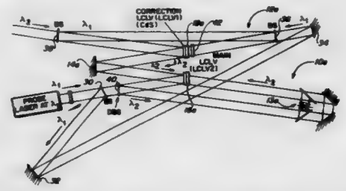
Filed Jul. 10, 1987, Ser. No. 75,693
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] G02F *1/13;* G02B *5/23*
U.S. Cl. 359—241 **24 Claims**

1. Apparatus for preventing undesired correction of an atmospheric reference wavefront in a dual light valve, laser wavefront correcting system comprising:

a main aberration correction system having a first liquid crystal light valve operatively coupled to a feedback portion for causing the liquid crystal light valve to adjust its reflective properties in a manner to drive to zero the atmospheric aberrations in a reference wavefront impinging thereon;

an auxiliary correction system having a second liquid crystal light valve operatively coupled to a second feedback portion for causing the second liquid crystal light valve to adjust its reflective properties in a manner to store a phase correction pattern derived from the first liquid crystal light valve;

a main laser coupled to direct a beam to the first liquid crystal light valve and to the feedback system associated therewith for controlling the first liquid crystal light valve to correct the wavefront of an atmospheric reference beam by driving the phase errors in said wavefront to zero;



means for directing said beam to the first liquid crystal light valve and thereafter by reflection to the second liquid crystal light valve and to the feedback portion of the auxiliary correction system for writing the phase correction pattern corresponding to the first liquid crystal light valve on the second liquid crystal light valve; and

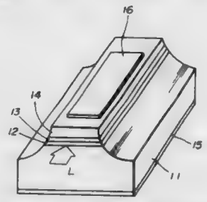
means for selectively decoupling the auxiliary correction system from the main aberration system to prevent the auxiliary correction system from modifying the atmospheric aberration correction performed by the main aberration correction system.

5,113,283

OPTICAL INTENSITY MODULATOR

Mitsuru Sugawara, Sagamihara, Japan, assignor to Fujitsu, Kawasaki, Japan

Filed Nov. 13, 1989, Ser. No. 435,943
Claims priority, application Japan, Nov. 18, 1988, 63-290174
Int. Cl.[5] G02F *1/03, 1/035;* H01L *29/161, 27/14*
U.S. Cl. 359—248 **12 Claims**



1. An optical intensity modulator comprising:

a compound semiconductor substrate of a first conductivity type having first and second surfaces;

a compound semiconductor active layer of the first conductivity type formed on said first surface of the compound semiconductor substrate, an incident laser beam to be intensity-modulated being applied to said compound semiconductor active layer;

a compound semiconductor layer of the first conductivity type formed on said compound semiconductor active layer, wherein said compound semiconductor layer satisfies the following formula:

$$d=[[(2\cdot Er\cdot Eo)/(e\cdot Nd)]\cdot Vd]^{\frac{1}{2}}$$

where d is the width of said compound semiconductor layer, Er is the relative permittivity thereof, Eo is the permittivity thereof, e is the charge of electron, Nd is the carrier density thereof, and Vd is the diffusion potential;

an opposite conductivity type compound semiconductor layer of a second conductivity type opposite to the first conductivity type, said opposite conductivity type compound semiconductor layer being formed on said compound semiconductor layer;

a first electrode formed on said opposite conductivity type compound semiconductor layer; and

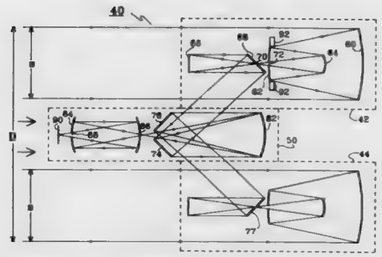
a second electrode formed on said second surface of the compound semiconductor substrate.

5,113,284

PHASED ARRAY OPTICAL TELESCOPE

Tilman W. Stuhlinger, Tucson, Ariz., assignor to Talandic Research Corporation, Azusa, Calif.

Filed Feb. 7, 1991, Ser. No. 652,173
Int. Cl.[5] G02B *23/00, 23/02*
U.S. Cl. 359—419 **14 Claims**



1. A phased array telescope substantially optically phased across its field of view, comprising:

a plurality of afocal subtelescopes having predetermined distortion; and

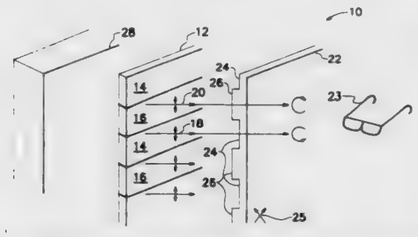
beam combining telescope means for combining the output beams from the subtelescopes to form an image, whereby the predetermined subtelescope distortion improves the resulting image by reducing piston error otherwise caused by distortion-free subtelescopes.

5,113,285

FULL COLOR THREE-DIMENSIONAL FLAT PANEL DISPLAY

Henry E. Franklin, Glendale, Ariz.; Ronald S. Gold, Fullerton, Calif.; Karen E. Jachimowicz, Goodyear, Ariz.; Harold J. Poley, Murrysville, Pa., and J. Robert Trimmier, Glendale, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 28, 1990, Ser. No. 589,733
Int. Cl.[5] G02B *27/26, 5/30*
U.S. Cl. 359—465 **8 Claims**



8. A full color, three-dimensional flat panel display comprising:

a first plurality of display lines for emitting light of a first image, having a first polarization;

a second plurality of display lines for emitting light of a second image, having a first polarization; and

an optical retarder, fixed on said display, for converting the light of the first image to a second polarization and the light of the second image to a thrid polarization, having areas of a fist thickness situated proximate to the first plurality of display lines and having areas of a second thickness situated proximate to the second plurality of display lines; and

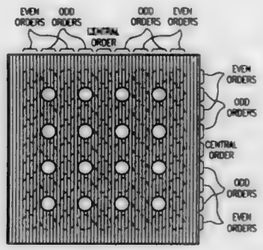
wherein he first an second images are capable of providing a three-dimensional image.

5,113,286

DIFFRACTION GRATING APPARATUS AND METHOD OF FORMING A SURFACE RELIEF PATTERN IN DIFFRACTION GRATING APPARATUS

Rick L. Morrison, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 27, 1990, Ser. No. 589,469
Int. Cl.[5] G02B *5/18. 27/44*
U.S. Cl. 359—569 **35 Claims**



29. Optical spot-generating apparatus comprising

means for generating a monochromatic plane wave of light of wavelength λ,

an objective lens of focal length f, and

a phase diffraction grating responsive to said plane wave of light and having a surface relief pattern comprising a plurality of periods of length P for transmitting light from said surface relief pattern through said lens to form an array of N spots, where N is an even integer and said N spots are substantially equally spaced at a spacing S given by

$$S = 2\frac{\lambda f}{P}.$$

5,113,287

COMPACT ZOOM LENS WITH POSITIVE POWER FRONT LENS GROUP AND NEGATIVE POWER REAR LENS GROUP

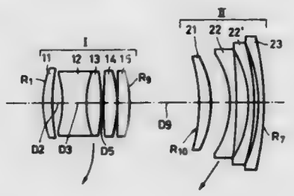
Hiroki Nakayama, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 350,646, May 11, 1989, abandoned.
This application Aug. 28, 1991, Ser. No. 758,284
Claims priority, application Japan, May 16, 1988, 63-119999
Int. Cl.[5] G02B *15/00*
U.S. Cl. 359—676 **10 Claims**

1. In a zoom lens of compact size having a front lens group of positive refractive power and a rear lens group of negative refractive power which are aligned in that order from the object side of said zoom lens, said zoom lens being so arranged that its magnification can be varied by altering the air separation interval between said front lens group and said rear lens group, the improvement comprising a front lens group includ-

ing a first meniscus-shaped lens element of positive refractive power with a convex surface that faces said object side, a second lens element with opposite lens surfaces that are concave, a third lens element with opposite lens surfaces that are convex, a fourth positive lens element with a convex surface that faces the image-surface side of said zoom lens, and a fifth positive lens element with a convex surface that faces said image-surface side, said second lens and said third lens elements constituting a cemented lens, and wherein said front and rear lens groups are construed and arranged to satisfy the following conditions:

$$0.015 < D2/fW < 0.07$$

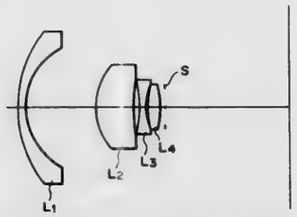


$$0.079 \leqq D3/fW < 0.2$$

$$0.005 < D5/fW < 0.018$$

where D2 represents the air separation interval between said first lens element and said second lens elements; D5 represents the air separation interval between said third lens elements and said fourth lens elements; D3 represents the center thickness of said second lens elements; and fW represents the focal length of the overall zoom lens when it is set at its wide-angle end.

5,113,288
BEHIND STOP WIDE ANGLE LENS SYSTEM
Koichi Ohshita, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Apr. 2, 1991, Ser. No. 679,252
Claims priority, application Japan, Apr. 4, 1990, 2-90008; Apr. 4, 1990, 2-90009
Int. Cl.[5] G02B *9/56, 13/04*
U.S. Cl. 359—739 **15 Claims**



1. A behind stop wide angle lens system, comprising, arranged from the end adjacent an object towards the end adjacent the image, a negative meniscus lens L_1 having a convex surface directed to the object, a positive meniscus lens L_2 having a convex surface directed to said object, a double-side-concave negative lens L_3 having both surfaces concaved, a double-side-convex positive lens L_4 having both surfaces convexed, and a stop S, said lenses satisfying the following conditions (1) to (4):

$$-2.8\,f < f1 < -1.3\,f \quad (1)$$

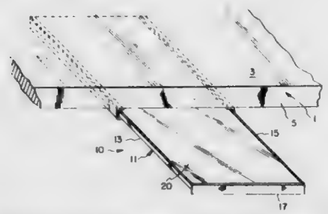
$$0.7\,f < f2 < 0.82\,f \quad (2)$$

$$1.5 < r1/r2 < 2.3 \quad (3)$$

$$0.13 < r3/r4 < 0.4 \quad (4)$$

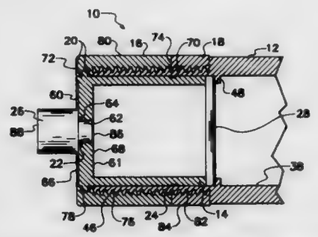
wherein f represents the focal distance of the whole lens system, f1 represents the focal distance of said negative meniscus lens L_1, f2 represents the focal distance of said positive meniscus lens L_2, r1 and r2 respectively represent the radii of curvature of the object-side surface and the image-side surface of said negative meniscus lens L_1, and r3 and r4 respectively represent the radii of curvature of the object-side surface and the image-side surface of said positive meniscus lens L_2.

5,113,289
SHELF-MOUNTED MAGNIFYING GLASS
Sara Soper, 1978 Chester Ave., Abington, Pa. 19001
Filed Jan. 4, 1991, Ser. No. 637,614
Int. Cl.[5] G02B *7/02*
U.S. Cl. 359—811 **7 Claims**



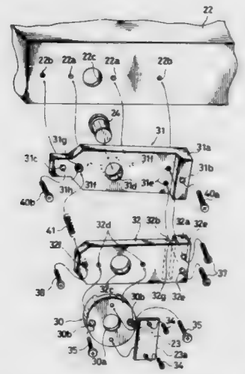
1. A shelf-mounted magnifying glass, comprising:
a) guide means mounted on an undersurface of a shelf;
b) a magnifying glass mounted on said guide means for movements with respect to said shelf;
c) said magnifying glass having a first position located in a stored position under said shelf and moveable on said guide means to a second position exposed to view.

5,113,290
SEALED FOCUSING ASSEMBLY FOR AN INDUSTRIAL VISION SYSTEM
Thomas A. Fletcher, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 13, 1990, Ser. No. 626,840
Int. Cl.[5] G02B *7/02*
U.S. Cl. 359—823 **12 Claims**



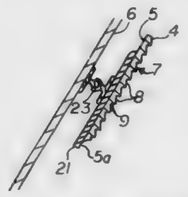
5. A focusing assembly for a vision system, comprising:
a cylindrical housing with an inner cylindrical surface, said cylindrical housing having an externally threaded first portion and a second portion;
a cylindrical lens sleeve which is coaxial with an slidably disposed within said cylindrical housing, said lens sleeve having an outer surface, an open front end and an open rear end, said open rear end being shaped to receive an optical detector in attachment at a detector position proximate thereto;
a lens assembly attached to said lens sleeve proximate said open front end;
means for advancing said lens sleeve axially relative to said detector position; and
means for inhibiting said lens sleeve from rotating relative to said cylindrical housing when said lens sleeve is advanced axially.

5,113,291
OPTICAL AXIS AND FOCUS ADJUSTMENT MECHANISM FOR SEMICONDUCTOR LASER AND COLLIMATOR LENS
Toshio Naiki, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Apr. 7, 1989, Ser. No. 335,042
Claims priority, application Japan, Apr. 8, 1988, 63-87732
Int. Cl.[5] G02B *7/02, 26/08*
U.S. Cl. 359—823 **10 Claims**



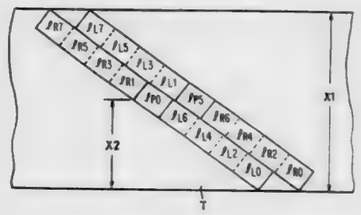
10. A focus and optical axis adjustment mechanism for two optical components comprising:
a first holding member for holding a first optical component;
a second holding member for holding a second optical component;
a flexible intermediate member disposed between said first and second optical components and to which said first holding member is movably attached within a plane vertical to an optical axis of the second optical component for adjustably positioning the first optical component on said optical axis of the second optical component, and which is fixed to said second holding member at a position apart form the position where the first optical component is attached to said intermediate member via the first holding member,
a coil spring, and
a screw member, the intermediate member having a section of a sufficient reduction in thickness to permit a pivotal bending adjustment to enable an adjustment of the distance between the first and second optical components through the movement of the intermediate member along the optical axis, wherein said intermediate member and second holding member are separated from each other by the force of the coil spring and can approach each other by means of movement of the screw member, the coil spring and screw member being mounted between the intermediate member and the second holding member at one end of the intermediate member and the reduced thickness section being positioned closer to the other end.

5,113,292
PANORAMIC REARVIEW MIRROR WITH AN ELONGATED ADJUSTABLE SUPPORT
Anton K. Simson, 13227 Aubrey St., Poway, Calif. 92064
Continuation-in-part of Ser. No. 553,983, Jul. 17, 1990, Pat. No. 5,054,900, which is a continuation of Ser. No. 380,374, Jul. 17, 1989, abandoned. This application Jan. 10, 1991, Ser. No. 639,290
Int. Cl.[5] G02B *5/08, 7/18;* **G02F** *1/13;* **B60R** *1/04*
U.S. Cl. 359—851 **8 Claims**



1. In combination with a vehicle windshield having generally parallel front and back faces, a horizontal radius of curvature, and a vertical slant, a reflective device designed to provide wide scope rearview to an operator of the vehicle, said device comprising:
an elongated support adjustably mounted in a position substantially parallel to and spaced apart from a transversal upper section of the windshield back face, said section substantially spanning the full width of the windshield, said support having a outward face facing said section and an opposite inward face, said inward face being a congruent replica of said section;
a grated substrate having an outer face in contact and congruent with said inward face, and an inner face defining a succession of narrow, elongated reflective panels wherein said panels are oriented to present a composite but linearly reflective surface to light rays emanating from a point in space located inwardly from said windshield, the inner face of each of said panels being flat, reflective and forming varying angles with the outer face of the substrate.

5,113,293
MAGNETIC RECORDER/REPRODUCER
Kazuhito Endo; Masayuki Ishida, and Yoshinobu Ishida, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 486,499, Feb. 27, 1990, which is a continuation of Ser. No. 214,275, Jun. 30, 1988, Pat. No. 4,905,100, which is a continuation of Ser. No. 19,612, Feb. 27, 1987, Pat. No. 4,835,627, which is a continuation of Ser. No. 696,051, Jan. 29, 1985, Pat. No. 4,675,754. This application Nov. 29, 1990, Ser. No. 619,625
Claims priority, application Japan, Feb. 21, 1984, 59-32130; Mar. 16, 1984, 59-51866; Mar. 30, 1984, 59-64584
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—32 **15 Claims**



1. In a magnetic recording/reproducing apparatus converting N (N is an integer no less than 2) channels of analog signals

into digital signals recorded on a plurality of tracks, the apparatus having a rotary head for recording said digital signals on a magnetic tape such that at least N regions including first to N-th regions are formed in each track,

an A-D converter for converting analog signals into digital signals; and

first memory means for storing in a predetermined order digital signals outputted from the A-D converter, the improvement comprising:

first memory address controlling means for reading digital signals stored in the first memory means such that, in recording as a unit on first and second tracks samples of said digital signals outputted in a prescribed time period from said A-D converter for separate ones of a plurality of channels, either even-numbered samples or odd-numbered samples outputted from the first memory means representing a K-th ($1 \leqq K \leqq N$) channel are recorded in a K-th region of the first track and the remaining samples outputted from the first memory means for said Kth channel are recorded on the second track in a region other than the K-th region thereof;

coding means for generating redundant signals for correcting or detecting an error, said coding means generating said redundant signals from the digital signals to be recorded on one track and causing said redundant signals to be recorded on the same one track as the digital signals used for generating the redundant signals;

a plurality of heads for recording the digital signals outputted from said first memory means and the redundant signals generated by said coding means on said magnetic tape or for reproducing signals recorded on said magnetic tape;

second memory means for storing signals reproduced by said heads;

decoding means for correcting or for detecting an error of the signals stored in the second memory means;

second memory address controlling means for controlling addresses of said second memory means such that the samples are read from said second memory means in the same order as the order of samples represented by said digital signals outputted by said A-D converter;

compensating means for replacing an erroneous and uncorrected sample with an approximate value obtained from correct samples outputted from said second memory means before and after the erroneous sample; and

a D-A converter for converting digital signals into analog signals.

5,113,294

AUTOMATIC CONTROL METHOD FOR HOME APPLIANCES USING VIDEO TAPE RECORDER, AND DEVICE THEREOF

Kyung-su Kim, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 21, 1989, Ser. No. 396,104

Claims priority, application Rep. of Korea, Dec. 31, 1988, 88-18093

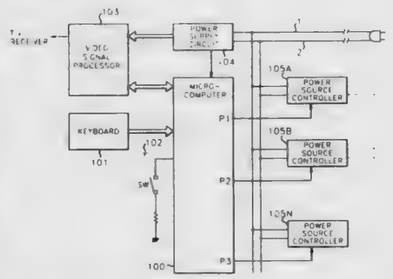
Int. Cl.[5] H04N *5/782*

U.S. Cl. 360—33.1 **4 Claims**

1. An automatic control method for home appliances using a video tape recorder in which television broadcasting programs can be automatically recorded according to a plurality of program numbers at the respective appointed times and for the respective scheduled periods of time, comprising:

a step of appointing power supply starting times and power supply ending times for the home appliances based on the designation of a home automatization mode for the respective program numbers in a setting procedure of programmed recordings;

a step of supplying power from a power source upon arrival of the power supply starting time for a particular home appliance; and



a step of disconnecting the power source upon arrival of the power supply ending time for said particular home appliance.

5,113,295

RECORDING AND REPRODUCING APPARATUS FOR REWRITING DATA ONTO A PREVIOUSLY RECORDED MEDIUM USING A RELAYING OPERATION

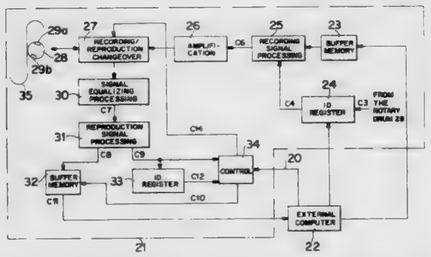
Kengo Sudoh, and Hiroshi Ii, both of Hiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1989, Ser. No. 390,769

Claims priority, application Japan, Aug. 9, 1988, 63-199509

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—49 **19 Claims**



1. A recording and reproducing apparatus for recording data on and for reproducing data from every recording area of a magnetic recording medium comprising:

memory means for temporarily storing reproduced data of each recording area, the data including distinguisher information for distinguishing the recorded areas from each other;

detecting means for detecting distinguisher information of the reproduced data; and

control means for controlling recording and reproducing so that in accordance with an output of said means for detecting, data and distinguisher information can be recorded on a recording area just after a particular recording area to be recorded again during rewriting, wherein data can be outputted during reproduction according to a sequence of reproduction from said memory means when different distinguisher information are detected in sequence during reproduction and data corresponding to originally detected distinguisher information of said particular recording area cannot be outputted from said memory means when a corresponding distinguisher information is continuously detected.

5,113,296

MECHANISM FOR WINDING A TAPE FROM A TAPE CASSETTE ONTO A ROTATABLE CYLINDER OF A VCR

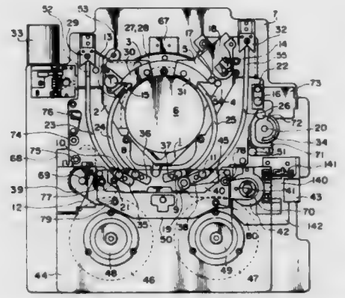
Hisao Kaneko; Kichizaemon Okazaki, both of Yokohama, and Toshimichi Terada, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 2, 1989, Ser. No. 430,416

Claims priority, application Japan, Nov. 7, 1988, 63-279342; Jun. 14, 1989, 1-149582

Int. Cl.[5] G11B *5/027, 5/008*

U.S. Cl. 360—85 **6 Claims**



1. A tape loading mechanism for a VCR of the helical scan type in which a magnetic tape is withdrawn out of a tape cassette and wound round the outer peripheral surface of a rotatable cylinder mounted on a cylinder base, said mechanism comprising:

a plurality of movable tape guide members reciprocable independently and separately from each other between a first position near said tape cassette and a second position located around the outer peripheral surface of said rotatable cylinder and more remote from said tape cassette than said first position, all of or a plural number of said movable members being on a tape running upstream side or a tape running downstream side with respect to said rotatable cylinder around at least the outer peripheral surface of said rotatable cylinder,

said all of or plural number of said movable members being movable along the outer periphery of said rotatable cylinder at respective positions offset from each other in the outward radial direction of said rotatable cylinder,

said movable members each comprising a first movable portion which comes into contact with a face of said magnetic tape, and a second movable portion connected to said first movable portion for supporting said first movable portion, and

said magnetic tape being contacted with said movable members and thereby withdrawn out of said tape cassette when said movable members are operated to move from said first position toward said second position, and said magnetic tape being put back into said tape cassette when said movable members are operated to move from said second position toward said first position; and

guide passage forming means,

said guide passage forming means being fixed to a stationary component side of said mechanism to be arranged along the outer peripheral surface of said rotatable cylinder, and having such size and configuration as to allow connection of said first position and said second position with each other, for forming guide passages along which said movable members are moved round the outer peripheral surface of said rotatable cylinder, said guide passage forming means including:

a plurality of guide portions formed independently of each other between said first position and said second position along respective movement paths along which respective ones of said movable members are moved between said first position and said second position,

each of said plurality of guide portions being engaged with respective ones of said second movable portions of said plurality of movable members and wherein said tape loading mechanism includes stationary tilt guide members fixed to the stationary component side of said mechanism, said stationary tilt guide members each having its surface brought into contact with said magnetic tape withdrawn out of said tape cassette by said movable members for converting the attitude and the running direction of said magnetic tape, and said stationary tilt guide members each being located between respective ones of said plurality of movable members on the tape running path under a condition that said movable members have been moved to at least said second position, wherein

said plurality of movable tape guide members are arranged such that said movable members are disposed in plural number independently and separately from each other for each of the tape running upstream side and the tape running downstream side with respect to said rotatable cylinder respectively around opposite sides of the outer peripheral surface of said rotatable cylinder; and

said guide passage forming means is arranged such that in association with said tape guide members, said guide portions are formed in plural number independently and separately from each other for each of the tape running upstream side and the tape running downstream side with respect to said rotatable cylinder respectively around the opposite sides of the outer peripheral surface of said rotatable cylinder, and wherein said guide passage forming means includes on each of the tape running upstream side and the tape running downstream side at least one guide portion comprising a first rectilinear plane portion which extends between said first position and said second position and has a first tilt angle tilted in the direction from said first position toward said second position with the plane of said tape cassette as a reference, and a second rectilinear plane portion which has a second tilt angle which is similar to a tilt angle of one of said stationary tilt guide members of the mechanism.

5,113,297

MAGNETIC DISK DRIVE HAVING A MECHANISM FOR PREVENTING A DISK CARTRIDGE FROM BEING INSERTED THEREIN WITH WRONG ORIENTATION AND FOR FIXING THE DISK CARTRIDGE INSERTED THEREIN WITH CORRECT ORIENTATION

Kobun Yoshida, Sayama, Japan, assignor to TEAC Corporation, Tokyo, Japan

Filed Nov. 20, 1990, Ser. No. 615,977

Claims priority, application Japan, Nov. 22, 1989, 1-135535[U]

Int. Cl.[5] G11B *5/012, 5/55, 23/03*

U.S. Cl. 360—99.06 **6 Claims**

1. A magnetic disk drive comprising:

a magnetic disk;

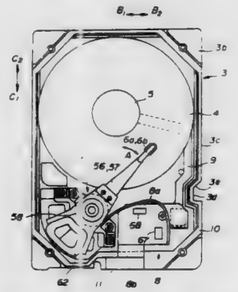
an approximately rectangular parallelepiped disk cartridge, accommodating said magnetic disk therein, which comprises one first corner chamferred with a first shape different from other chamferred corners and a groove at a side thereof;

a housing;

a holder, fixed in said housing, having a load position therein, said disk cartridge adapted to be inserted into said holder into the load position and ejected from said holder, said magnetic disk adapted to be driven when said disk cartridge is inserted with a first orientation into the load position;

a holding member, mounted to be movable from a first position to a second position in said holder, said second position being coplanar with said first position, said holding member having a second shape engageable with the

first corner and the groove of said disk cartridge, said holding member being located at the first position to block the inserting of said disk cartridge into the load position before said disk cartridge is inserted, and, when said disk cartridge is to be inserted with a first orientation, said holding member being engaged with the first corner and then said holding member moving to the second position to allow said disk cartridge to be inserted into the load position, said holding member being engaged with the groove of said disk cartridge to hold said disk cartridge at the load position after said disk cartridge is inserted into



the load position, whereas said holding member stays at the first position to block said disk cartridge from being inserted when said disk cartridge is to be inserted with an orientation different from the first orientation because said holding member is prevented from being engaged with one of the other corners different from the first corner;

a driving device, provided in said housing, for driving said magnetic disk in said disk cartridge at the load position;

said disk cartridge further comprising a disk motor rotating means for rotating said magnetic disk; and

a magnetic head which records information on said magnetic disk and/or reproduces information therefrom.

5,113,298

ROTARY HEAD DRUM APPARATUS WITH RESILIENTLY MOUNTED GROUND PLATE

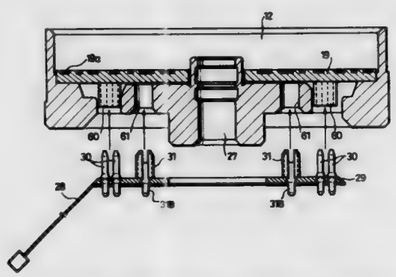
Hideo Fukushima, Tokyo, and Masakazu Kurushima, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 371,293, Jun. 26, 1989, Pat. No. 5,010,432. This application Nov. 13, 1990, Ser. No. 612,415

Claims priority, application Japan, Jun. 28, 1988, 63-59942; Jun. 28, 1988, 63-59943; Jun. 28, 1988, 59944

Int. Cl.[5] G11B *5/52, 15/60*

U.S. Cl. 360—108 **4 Claims**



1. A rotary head drum apparatus comprising a rotary drum member having at least one magnetic head mounted thereon, a stationary drum member carrying a support shaft on which said rotary drum member is rotatable, said rotary and stationary drum members having outer peripheral surfaces defining a guide surface for a recording tape to be scanned by said head, said stationary drum member having an end face with an aperture therein, and ground contact means having a body portion with a circumferentially resilient peripheral surface which is frictionally engaged against an inner surface of said aperture for connecting said stationary drum member to ground.

5,113,299

MAGNETIC HEAD WITH IMPROVED BONDING BETWEEN MAGNETIC CORE HALVES

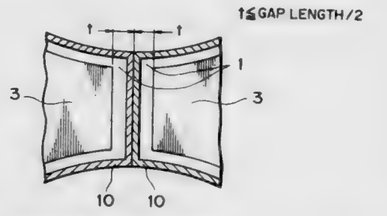
Atsushi Onoe, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 23, 1990, Ser. No. 498,071

Claims priority, application Japan, Jul. 24, 1989, 1-188721

Int. Cl.[5] G11B *5/23, 5/31*

U.S. Cl. 360—120 **7 Claims**



1. A magnetic head comprising:

two magnetic core halves, each having a gap-defining surface and track grooves, wherein said gap-defining surfaces are arranged adjacent to one another,

a gap spacer positioned to form a magnetic gap between said gap-defining surfaces,

a thin film layer within said track grooves,

bonding glass applied upon said thin film layer, wherein said thin film layer improves the wettability characteristic between said bonding glass and said track grooves.

5,113,300

THIN FILM MAGNETIC HEAD

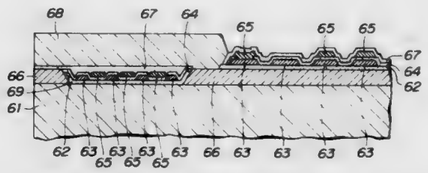
Yoshito Ikeda; Hiroaki Narisawa, and Noboru Wakabayashi, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 590,035, Oct. 1, 1990, abandoned, which is a continuation of Ser. No. 913,495, Sep. 30, 1986, abandoned. This application Aug. 21, 1991, Ser. No. 752,220

Claims priority, application Japan, Oct. 1, 1985, 60-218734; Oct. 1, 1985, 60-218735

Int. Cl.[5] G11B *5/147*

U.S. Cl. 360—126 **1 Claim**



1. A thin film magnetic head comprising: a substrate of magnetic material, a lower magnetic film physically contacting said substrate, said lower magnetic film having a groove formed therein, a coil conductor disposed within the confines of said groove, the top surface of said coil conductor lying below the top surface of said lower magnetic film, the top surface of said lower magnetic film being flat, said lower magnetic film being made of the same material from the bottom of said lower magnetic film to the top surface of said lower magnetic film, an upper magnetic film overlying said lower magnetic film, the thickness of said lower magnetic film measured at the base of said groove being at least 0.3 times the thickness of said upper magnetic film when said substrate is composed of a magnetic material and being at least 0.8 times the thickness of said upper magnetic material film when said substrate is composed of a nonmagnetic material.

5,113,301

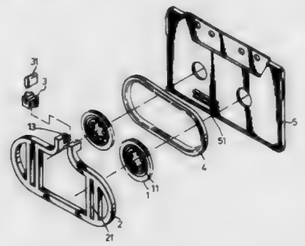
STRUCTURE OF TAPE PLAYER/RECORDER MAGNETIC HEAD CLEANER

Ku-Di Huang, 2 Fl., Alley 44, Lane 148, Pi Hua St., San Chung, Taiwan

Filed Dec. 4, 1990, Ser. No. 621,964

Int. Cl.[5] G11B *5/41*

U.S. Cl. 360—128 **4 Claims**



1. A tape player/recorder magnetic head cleaner comprising a casing having fastened therein:

two driving gear wheels respectively mounted on a tape take-up reel base and a tape supply reel base of a tape player/recorder to be cleaned having each a column disposed at an eccentric position:

an endless belt driven by said driving gear wheels to make a synchronous motion:

an elastic frame being a substantially egg-shaped member having a neck portion at the top of said elastic frame, two elongated slots longitudinally at two opposite ends of said elastic frame for inserting said column:

a cleaning head for holding at least one cleaning element, having side ribs respectively fastened in said neck portion of said elastic frame: and

wherein rotation of said two driving gear wheels drives said column to carry said elastic frame to alternatively stably move left and right by means of the guidance of a locating block made inside said casing, so as to carry said cleaning head to remove dirt from the magnetic head of the tape player/recorder into which the cleaner is inserted.

5,113,302

MAGNETIC RECORDING MEDIUM HAVING A COUPLING AGENT DISPOSED BETWEEN A PROTECTIVE LAYER AND A LUBRICATING LAYER

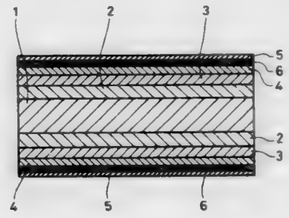
Tomoyasu Shimizu; Yuichi Aoki, both of Tsukuba, and Shinya Kawakita, Yotsukaichi, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Nov. 20, 1989, Ser. No. 438,140

Int. Cl.[5] G11B *5/82, 5/70*

U.S. Cl. 360—135 **6 Claims**

1. In a magnetic recording medium comprising a substrate, a magnetic recording layer, a carbon protective film layer disposed on said recording layer, and a lubricant layer disposed on said carbon film layer; the improvement, whereby to improve the adhesion between said carbon layer and said lubricant layer, which comprises an acetoalkoxyaluminumdiisopro-



pylate coupling agent disposed between said carbon film layer and said lubricant layer.

5,113,303

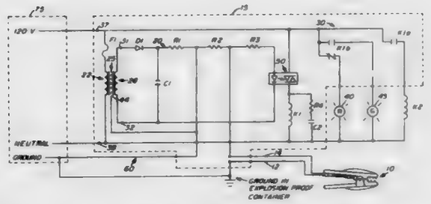
GROUNDING DETECTION CIRCUIT

Donald C. Herres, Fayetteville, N.Y., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 29, 1990, Ser. No. 501,033

Int. Cl.[5] H02H *3/16*

U.S. Cl. 361—45 **14 Claims**



1. A grounding detection circuit for grounding containers, comprising:

a control panel including means for supplying a-c power at a first voltage level and at a second voltage level;

indicating circuit means connected to said power supplying means and receiving power at said first voltage level;

grounding circuit means connected to said power supplying means and receiving power at said second voltage level;

a grounding clip, electrically connected to said grounding circuit means, for clamping to the containers;

an optoisolator connected to said grounding circuit means and to said indicating circuit means, for receiving a signal from said grounding circuit means that the container is grounded, and for transmitting an output signal to said indicating circuit means;

wherein said indicating circuit means includes a relay coil, which is energized by the output signal transmitted from the optoisolator to provide an indication that the container is grounded and a series RC circuit connected in parallel across said relay coil to eliminate the inductive effect of said relay coil on said optoisolator.

5,113,304

DIGITAL PROTECTIVE CIRCUIT BREAKER

Masashi Ozaki, Suzuka, and Katsuhiro Furukawa, Gifu, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 28, 1990, Ser. No. 500,361

Int. Cl.[5] H02H *3/18, 3/26, 3/42*

U.S. Cl. 361—87 **1 Claim**

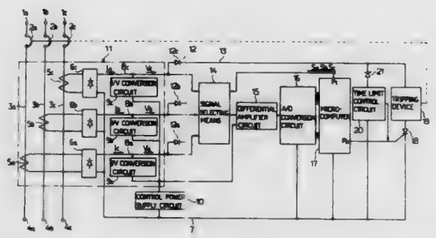
1. A circuit breaker comprising main contacts for closing and opening electrical power supply paths of respective phases

connected between loads and a polyphase AC power supply, current detecting means for detecting load currents flowing through the respective power supply paths, thereby generating analog voltage signals having levels corresponding to the detected load currents, control means for tripping the main contacts in response to the analog voltage signals generated by the current detecting means, thereby opening the power supply paths, said control means comprising:

a) signal selecting means having a gate and repeating a time division selecting operation that one of the analog phase voltage signals generated by the current detecting means is selectively allowed to pass through the gate in a predetermined order;

b) amplification means for amplifying the analog voltage signals passing through the gate of the signal selecting means;

c) analog-to-digital conversion means for selectively converting the analog voltage signals unamplified and amplified by the amplification means to first and second digital voltage signals, respectively; and



d) operation means comprising a microcomputer including drive signal generating means for generating a drive signal for controlling the gate of the signal selecting means and data selecting means for selecting either the first or the second digital voltage signal from the analog-to-digital conversion means, the operation means generating a tripping order when one of the first and second digital voltage signals selected by the data selecting means exceeds a reference value, thereby tripping the main contacts, the data selecting means comparing the second digital voltage data indicative of the amplified analog voltage with a predetermined selection value and selecting the first digital voltage signal when the second digital voltage data exceeds the predetermined selection value, the data selecting means selecting the second digital voltage signal when the second digital voltage data is below the predetermined selection value.

5,113,305

PROTECTION DEVICE AGAINST THE BREAKDOWN OF BIPOLAR TRANSISTORS IN AN INTEGRATED DRIVING CIRCUIT FOR A POWER DEVICE WITH A RESONANT LOAD

Salvatore Raciti, Belpasso, and Sergio Palara, Acicastello, both of Italy, assignors to SGS-THOMSON MICROELECTRONICS s.r.l., Milan, Italy

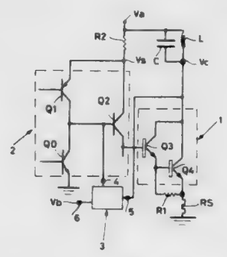
Filed Apr. 19, 1990, Ser. No. 511,408

Claims priority, application Italy, May 2, 1989, 20346 A/89

Int. Cl.[5] H02H *3/24*

U.S. Cl. 361—92 **17 Claims**

1. Protection device against the breakdown of bipolar transistors in an integrated driving circuit for a power device with a resonant load on the collector, comprising automatic commutating means interposed between a base of a transistor to be protected and a collector of a power device to cause a flow of current having a low voltage drop between said base and said collector when the collector voltage falls below a predetermined value, said flow of current causing the transistor to be protected to operate with a base/emitter voltage which is lower than a firing threshold of the transistor to be protected.



5,113,306

NON-FRAGMENTING ARRESTER WITH STAGED PRESSURE RELIEF MECHANISM

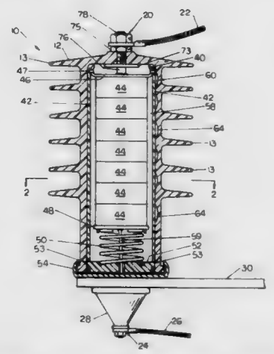
Edward F. Veverka; Gary L. Goedde, both of Racine; John F. Baranowski, Franklin, all of Wis., and Stanley S. Kershaw, Jr., Portville, N.Y., assignors to Cooper Power Systems, Inc., Coraopolis, Pa.

Continuation-in-part of Ser. No. 339,577, Apr. 18, 1989, Pat. No. 4,930,039. This application Nov. 14, 1989, Ser. No. 436,352

The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.

Int. Cl.[5] H02H *9/04*

U.S. Cl. 361—127 **44 Claims**



1. An electrical assembly for retaining a plurality of electrical components in electrical connection between a voltage and ground, comprising:

a liner for containing said electrical components;

an insulative housing having side walls enclosing said liner; and

means for venting gas through said liner and through said side walls of said housing.

5,113,307

CURRENT CONTROLLED SOLENOID DRIVER

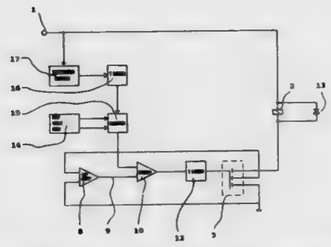
Herbert Meyer; Zoltan Gilday, both of Neumünster, and Thomas Balow, Brokstedt, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed Mar. 6, 1990, Ser. No. 487,897

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1989, 3908192

Int. Cl.[5] H01H *47/32, 47/22*

U.S. Cl. 361—154 **1 Claim**



1. In an electronic contactor controller for regulating the direct current feed in a circuit with a fluctuating supply voltage, and handling a variety of different driving coil winding resistances or loads, by means of current switching, and having a free-running circuit connected to the coil for holding the contactor during the current turn-off phases, a control circuit comprising:

(a) a power circuit means for switching current through a load, formed as an integrated power semiconductor circuit which includes a plurality of parallel connected FET's of which at least one serves to provide a measuring output signal for indicating load current;

(b) an operation al amplifier current to voltage converting means, operatively connected to receive said measuring output signal, for converting said measuring output signal into a first voltage output signal;

(c) reference voltage providing means for providing at least one reference voltage output signal;

(d) comparator means, operatively connected to receive said first voltage output signal and said at least one reference output voltage signal, for providing a first control signal as an output indicative of a comparison of said first and said at least one reference voltage output signals;

(e) first timer means responsive to said first control signal for controlling the turning on and off said power circuit means; and

wherein said reference voltage providing means comprises:

(1) dual reference voltage generator means for producing at least two reference voltage levels;

(2) threshold switch means, connected to monitor a source voltage signal, for producing a second control signal indicative of whether the source voltage has reached a certain threshold level;

(3) second timer means, connected to receive said second control signal from said threshold switch means, for outputting, responsive to said second control signal, a third control signal; and

(4) voltage switching means, connected to receive said third control signal, for switching, responsive to said third control signal, said at least one reference output voltage signal between said at least two reference voltage levels, a first of the voltage levels being for controlling a short-term turn-on current of the load, and a second of the voltage levels being for controlling a holding current of the load.

5,113,308

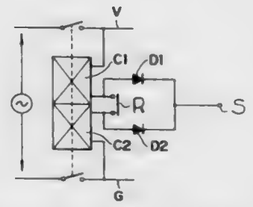
ACTUATOR WITH A BUILT-IN REED SWITCH

Hideaki Takeda, Misato, Japan, assignor to Uchiya Thermostat Co., Misato, Japan

Filed Aug. 31, 1990, Ser. No. 575,891

Int. Cl.[5] H01H *47/04*

U.S. Cl. 361—178 **3 Claims**



1. An actuator with a built-in reed switch comprising a solenoid having a coil,

a plunger made of magnetic material and movable within the coil of said solenoid,

a plunger receiver made of magnetic material in said solenoid coil and spaced from said plunger by a gap,

a magnetic responsive reed switch connected in series with said solenoid coil and disposed near the gap between said plunger and said plunger receiver, and

a sensor terminal between said solenoid coil and said reed switch,

said reed switch being positioned to close in response to a magnetic field generated when a current flows through said sensor terminal in said solenoid coil,

said solenoid coil including two coils connected in series with each other through said reed switch,

a pair of diodes having anodes and cathodes,

said solenoid coil having ends connected to the anodes of said diodes, said diodes having the cathodes connected to each other and further connected to said sensor terminal.

5,113,309

HIGH-VOLTAGE THROUGH-TYPE CERAMIC CAPACITOR

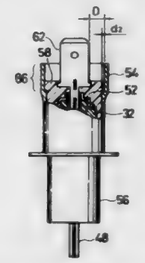
Setsuo Sasaki, Nikahomachi; Teruo Taguchi, Honjou, and Isao Fujiwara, Nikahomachi, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Division of Ser. No. 360,521, Jun. 2, 1989, Pat. No. 5,032,949. This application Jun. 27, 1991, Ser. No. 722,019

Claims priority, application Japan, Jun. 7, 1988, 63-74739[U]; Aug. 22, 1988, 63-109046[U]; Aug. 22, 1988, 63-109047[U]

Int. Cl.[5] H01G *4/42*

U.S. Cl. 361—302 **9 Claims**



1. In an improved high-voltage through-type ceramic capacitor, the improvement comprising:

an insulation case;

an insulation cover, the respective insulation case and cover

extending over and jointly forming a housing unit for the capacitor, the insulation case having an upper outer perimeter of a size greater than any outer perimeter of the insulation cover;

a ground fitment interposedly arranged between said insulation case and said insulation cover;

a ceramic dielectric having earth electrode means connected to said ground fitment;

a pair of central conductors each including a fastening tab arranged in said insulation case, and

an insulating resin material poured in said insulation case so as to surround said ceramic dielectric, said insulation case being formed at a portion thereof surrounding said fastening tabs into an enlarged section.

5,113,310

DIELECTRIC FILTER

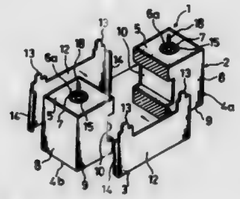
Hiroshi Kuroki; Yoshifumi Yamagata, both of Kagoshima, and Youichi Yamashita, Shiga, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Sep. 28, 1990, Ser. No. 590,150

Claims priority, application Japan, Sep. 30, 1989, 1-115078[U]; Sep. 30, 1989, 1-115079[U]; Dec. 28, 1989, 1-153151[U]

Int. Cl.[5] H01P *1/205*; H01G *1/14, 4/42, 7/00*

U.S. Cl. 361—302 **34 Claims**



1. A dielectric filter comprising:

a first resonator including a first dielectric block having a first through-hole, a first inner conductive layer coating the inner surface of said first through-hole, and a first outer conductive layer coating the outer surface of said first dielectric block; and

a second resonator being in contact with said first resonator, including a second dielectric block having a second through-hole, a second inner conductive layer coating the inner surface of said second through-hole, and a second outer conductive layer coating the outer surface of said second dielectric block; wherein

each of said resonators has opposed upper and bottom surfaces between which the associated through-hole extends, the pair of resonators have a coupling hole extending transversely to said through-holes through parts at which said resonators face each other, said coupling hole extends into at least one of said dielectric blocks, and said coupling hole is spaced from said upper and bottom surfaces of said resonators.

5,113,311

ELECTRICAL PANEL ASSEMBLY

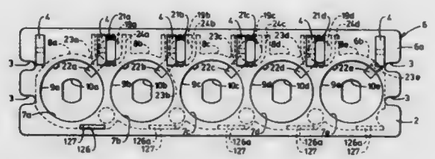
David C. Kamp, and William H. Hanks, both of Cincinnati, Ohio, assignors to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 18, 1989, Ser. No. 452,845

Int. Cl.[5] H02B *1/01*; H01H *47/00*; H01R *13/44*

U.S. Cl. 361—346 **8 Claims**

1. An electrical panel assembly for use with cable connectors, said electrical panel assembly comprising a front panel element and at least three receptacles, a housing element for each receptacle to mount said receptacles behind said front panel element arranged in a side-by-side row, said front panel element and said housing elements comprising an integral, one-piece molding, said front panel element having an opening therethrough for each receptacle and coaxial therewith through which a cable connector can extend for mating with said receptacle, a cover for each of said front panel element openings mounted on a hinge pin supported by a plurality of hinge elements comprising integral, one-piece parts of said molding, the receptacle at one end of said row, its front panel element opening and cover comprising the first receptacle, first front panel element opening and first cover, respectively, the-receptacle at the other end of said row, its front panel element opening, and its cover comprising the last receptacle, last front panel element opening and last cover, respectively, each of said covers being swingable between a closed position and an open position, each of said covers, except said first cover, having a locking lug, each receptacle housing element having a cylindrical chamber coaxial with its respective front panel element opening, each receptacle being non-rotatively mounted on the rear surface of its respective receptacle housing element with its forward end extending into and coaxial with said receptacle housing element cylindrical chamber, locking means being provided in association with each receptacle housing element except said receptacle housing element for said last receptacle, each said locking means comprising a locking pin slidably mounted in a bore formed in each receptacle housing except said receptacle housing for said last receptacle, each locking pin bore terminating in an opening in said front panel element located behind said locking lug of said cover for the next adjacent front panel element opening, each of said locking pins having a forward nose portion, compression spring means in said locking pin bores to urge said locking pins forwardly to their normal locking positions wherein each of said nose portions of said locking pins extends through its



respective opening in said front panel element and abuts said lug of said cover covering the front panel opening for the next adjacent receptacle in a direction away from said first receptacle, each locking pin being shiftable to an unlocking position, releasing its respective cover locking lug, each locking pin having a radially extending lug located in a slot which intersects its respective cylindrical chamber, each locking pin lug having a portion extending into its respective cylindrical chamber, a cable connector for each of said receptacles, each of said cable connectors and its respective receptacle having a contact, each of said cable connectors being insertable into its respective receptacle and rotatable a partial clockwise turn to lock the contacts thereof together, each of said connectors having an insulative housing comprising a polarizing shell about its respective contact and a cable insulator, each polarizing shell having a forward portion with polarizing elements thereon, polarizing means, with polarizing elements thereon in association with each receptacle, said polarizing shells and said receptacle polarizing means being so configured that each polarizing shell will cooperate only with a receptacle polarizing means having corresponding polarizing elements thereon, so that each connector can be mated only with a predetermined receptacle, each said polarizing means in association with said receptacle comprising a ring rotatively mounted on the forward end of its respective receptacle within said cylindrical chamber of its respective receptacle housing element, said ring being coaxial with its respective cylindrical chamber, said ring being configured to be engaged by the forward portion of said polarizing shell of its respective connector only, said ring having an arcuate lug extending radially from its peripheral surface and part way thereabout at the rearward end of said ring, a latch means comprising a member for each

ring slidably received in a peripheral slot in its respective ring, said slot in each ring extending part way across said ring in a direction parallel to the axis of said ring, said latch means being shiftable in said slot in directions parallel to the axis of said ring between a forward latching position and a rearward unlatching position, spring means biasing said latch to its latching position, said ring being rotatable between a maximum counterclockwise position determined by a stop formed in its respective cylindrical chamber, and a maximum clockwise position determined by said locking of said contacts of said connector and receptacle, when said locking pin is in its locking position, said latch is in its latching position and said ring is in its maximum counterclockwise position, said lug portion of said locking pin lies in front of said lug of said ring precluding shifting of said locking pin to its unlocking position and precluding rotation of said ring from said maximum counterclockwise position to said maximum clockwise position by abutment of said locking pin lug portion against said latch, said latch means having a notch formed therein, said latch means being shiftable to its unlatching position by said forward portion of the polarizing shell when its respective receptacle is mated with its respective connector, aligning said latch notch with said locking pin lug portion, whereby, when the cover of said first receptacle is opened and the proper cable connector is mated with said first receptacle, and said polarizing shell of said last mentioned cable connector is engaged with said ring of said first receptacle, said latch means is shifted to said unlatching position in alignment with said locking pin lug portion permitting said cable connector, its polarizing shell and said ring to be rotated clockwise to lock said connector and receptacle contacts and to remove said ring arcuate lug from behind the locking pin lug portion and causing it to pass through the latch means notch enabling opening of the cover of the next adjacent receptacle for mating with its respective connector, the mating of each receptacle with its respective connector thus unlocking the cover of the next succeeding receptacle until the last receptacle is mated with its respective connector, thereby assuring that the receptacles must be mated with their respective connectors in order from said first receptacle to said last receptacle, and whereby when the connector is disconnected from said last receptacle and the cover therefor is closed, the locking pin of the preceding receptacle housing is shifted to its normal locking position locking the cover of said last receptacle and permitting counterclockwise rotation of the connector of the preceding receptacle and disconnection therefrom such that the disconnection of each cable connector from its respective receptacle will permit disconnection of the preceding connector from its receptacle until the cable connector is disconnected from the first receptacle, thereby assuring that the cable connectors must be disconnected from their respective receptacles in the order of from last receptacle to first receptacle.

5,113,312

ELECTRIC POWER DISTRIBUTION PANELBOARD-SWITCHBOARD BUS BAR INSULATION SHIELD

James R. Pratt, Wolcott; Dean A. Robarge, New Britain; Robert G. Markowski, East Haven; Denis A. Perzan, Plainville, and John A. Morby, Farmington, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Mar. 22, 1991, Ser. No. 673,702

Int. Cl.[5] H02B *1/20*

U.S. Cl. 361—361 **11 Claims**

1. An interior for an electric switch or circuit breaker enclosure comprising:

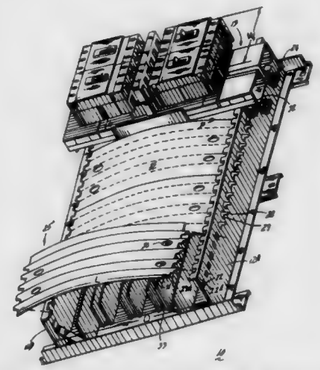
a pair of support rails having a plurality of slots through said support rails;

support means arranged on said support rails supporting a plurality of electric switches or circuit breakers having first and second widths;

a plurality of electric bus bars extending along said support rails and arranged for connecting with electric switches or circuit breakers having first and second widths;

an electrically insulating shield arranged over a part of said bus bars thereby preventing access to said bus bars; and

a plurality of first and second tabs extending from opposite ends of said insulating shield, said first tabs being inserted within said slots to thereby attach said insulating shield to



said support rails when said insulating shield is used with electric switches or circuit breakers of first widths and said second tabs being inserted within said slots when said insulating shield is used with electric switches or circuit breakers of second widths.

5,113,313

OPTICAL ELEMENT CARRYING PRINTED SUBSTRATE AND OPTICAL HEAD DEVICE USING THE SUBSTRATE

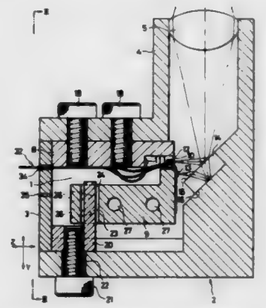
Takashi Ujihara, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 390,581, Aug. 4, 1989, abandoned, which is a continuation of Ser. No. 80,290, Jul. 31, 1987, abandoned. This application Nov. 14, 1990, Ser. No. 614,061

Claims priority, application Japan, Jul. 31, 1986, 61-180965; Jul. 31, 1986, 61-180966

Int. Cl.[5] H02B *1/00*

U.S. Cl. 361—380 **1 Claim**



1. An electrical wiring device in combination with an optical head device of the type capable of emitting light toward an receiving light reflected from a target, and having an interior space, comprising:

a flexible substrate substantially mounted within the interior space of said optical head device and having printed wiring patterns thereon, said substrate including a plurality of carrier portions for supporting electrical components thereon, said carrier portions being independently flexibly

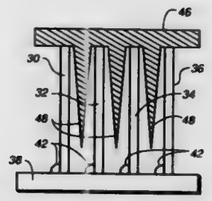
bendable so that said electrical components may be set in a predetermined physical relationship with respect to one another, a first of said carrier portions supporting a first electrical component comprising a semiconductor laser, and a second of said carrier portions supporting a second electrical component comprising a quartering photodiode within said interior space of said device, said first and second carrier portions being independently flexibly bendable after said semiconductor laser and said quartering photodiode have been attached thereto so as to permit selective relative spatial positioning of said semiconductor laser and said quartering photodiode, so that the light reception condition of said quartering photodiode can be set by positionally adjusting said quartering photodiode with respect to a beam of light emitted from said semiconductor laser and reflected from said target toward said quartering photodiode.

5,113,314

HIGH-SPEED, HIGH-DENSITY CHIP MOUNTING

Richard L. Wheeler, San Jose, and Voddarahalli K. Nagesh, Cupertino, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 24, 1991, Ser. No. 645,913
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—384 **12 Claims**



1. An assembly of electronic components comprising;
a dielectric substrate having a plurality of patterns of electrically conductive contacts on a planar surface thereof, and
a plurality of electronic components mounted to said planar substrate surface, each having opposed major faces and opposed minor edges, the dimension between said major faces being substantially less than the dimension between said opposed minor edges, one of said major faces of each component being an active surface having a pattern of signal pads proximate to a first of said minor edges, said first minor edge of each component fixed in contact with said planar substrate surface, said pattern of signal pads directly affixed to one of said patterns of contacts on said planar substrate surface,
said first minor edge of each component having an edge coating of a passivation material, thereby providing an oxidation-resistant, electrically insulating layer at said first minor edge of each component.

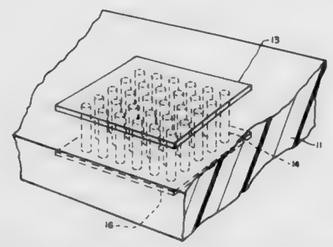
5,113,315

HEAT-CONDUCTIVE METAL CERAMIC COMPOSITE MATERIAL PANEL SYSTEM FOR IMPROVED HEAT DISSIPATION

Capp, Michael L., and Arthur O. Capp, Jr., both of Zion, Ill., assignors to Cirqon Technologies Corporation, Gurnee, Ill.

Filed Aug. 7, 1990, Ser. No. 563,491
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 **26 Claims**

1. In a ceramic panel suitable as a substrate for a heat generating microelectronic integrated circuit, which said ceramic panel is of relatively smaller thickness as compared to its length and breadth, has a major surface for accommodating the circuit and is composed of a ceramic substrate material having dielectric properties, the improvement comprising a layer of heat conductive metal on the surface of said ceramic panel opposite the circuit accommodating surface and a plurality of closely spaced, small cross-section extensions of said heat



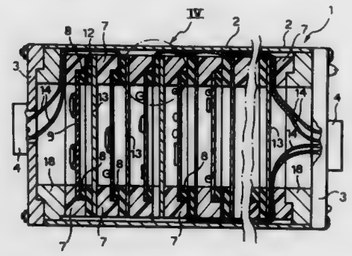
conductive metal layer, integral therewith and extending into said ceramic substrate material to a depth of at least about one fifth of its thickness but not beyond its thickness.

5,113,316

SYSTEM FOR THE ASSEMBLY AND CONNECTION OF ELECTRONIC CIRCUIT BOARDS, PARTICULARLY FOR USE IN MOTOR VEHICLES

Jean L. Navarro, Paris, France, and Carlo Maggioni, Cambiano, Italy, assignors to Marelli Autronica SPA, Milan, Italy

Filed Nov. 7, 1990, Ser. No. 609,955
Claims priority, application Italy, Nov. 7, 1990, 67974A/89
Int. Cl.[5] H05K *7/00*
U.S. Cl. 361—396 **3 Claims**



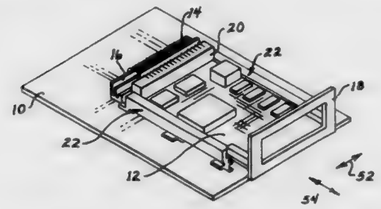
1. A system for the assembly and connection of electronic circuits, wherein
the electronic circuits are formed on a plurality of substrates or boards of identical size with connection terminals in the same predetermined positions on at least one edge region of one face of each board;
each board is mounted in a respective module comprising:
first and second elements of resilient, electrically-insulating material between which the board is disposed, at least one edge region of the second resilient element carrying electrically-conductive elements which are arranged in relative positions corresponding to those of the terminals of the board and which extend from one face of the second resilient element to the other; and
at least one multicore ribbon cable comprising a plurality of insulated conductors whose relative spacing corresponds to that of the conductive elements of the second resilient element and which are bare at one end of the cable, that end of the cable being clamped between the second resilient element of the module and the first resilient element of an adjacent module with the bare end of each conductor in contact with a corresponding conductive element of the second resilient element wherein
the modules are arranged next to each other in sequence and are clamped by tie means adapted to compress their resilient elements to a predetermined extent, the pack of modules thus formed being disposed in a housing, preferably of metal, carrying at least one multiple electrical connector to which at least some of the cables are connected so that the circuits carried by the boards can be connected to external devices and/or circuits; and
wherein the electrically-conductive elements of the second resilient element of each module are constituted by alternate layers of conductive and insulating elastomeric material.

5,113,317

SUPPORT FOR AUXILIARY CIRCUIT CARD

Joseph A. Howe, Ann Arbor, Mich., assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Feb. 20, 1990, Ser. No. 481,581
Int. Cl.[5] H01R *23/68*
U.S. Cl. 361—413 **6 Claims**



1. An auxiliary card system for holding a generally rectangular auxiliary printed circuit card parallel to a host circuit card, the host card including slots, comprising:
guide means extending parallel to a first and second opposed edge of the auxiliary circuit card for slideably receiving the first and second edges of the auxiliary circuit card along an insertion axis and including hook means for attaching the guide means to the host circuit card the hook means for engaging the slots by extending through the slots and capturing the host circuit card between the upper surface of the hook means and a lower surface of the guide means when the guide means is moved along the insertion axis;
connector means attached to and extending along a third edge of the auxiliary circuit card for electrically connecting the auxiliary circuit card to the host circuit card by means of conductors received by the host circuit card; and
connector support extending parallel to the third edge of the auxiliary circuit card for receiving and supporting the connector means the connector support attached to the guide means to prevent relative motion along the insertion axis therebetween, and the connector support interfitting with the conductors to prevent motion of the conductor support along the insertion axis when the conductors are received by the host circuit board.

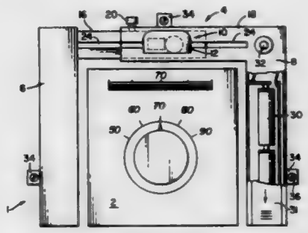
5,113,318

THERMOSTAT LIGHT

David Conley, P.O. Box 450, Stillwater, N.Y. 12170

Filed Aug. 9, 1990, Ser. No. 565,280
Int. Cl.[5] F21V *21/14*
U.S. Cl. 362—23 **20 Claims**

1. A lighting device comprising:
a base structure having a front face;
a light means movably attached to said base structure wherein said light means is capable of being moved in a linear path along a portion of said front face;
a hood means attached to said light means in a position wherein it partially covers said light means and is capable of directing at least a portion of any light emitted from said light means in a direction substantially parallel to said front face;
a power source means comprising at least one battery mounted to said base structure and connected to said light means;
a switch means attached to said base structure and connected to said light means wherein said switch means is operable to allow energy from said power source means to reach said light means and thereby cause said light means to emit light energy; and
attachment means connected to said base structure for attaching said base structure to a support surface proximate an instrument.

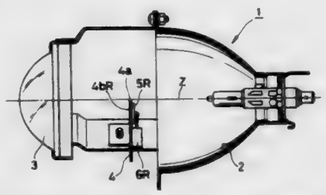


5,113,319

HEAD LAMP FOR CORNERING OPERATION

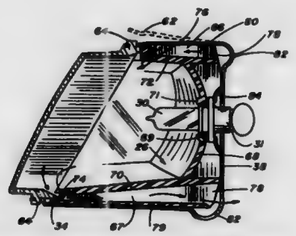
Tsuneo Sekiguchi; Koichi Nagano, both of Tokyo, and Satoru Suzuki, Ichikawa, all of Japan, assignors to Stanley Electric Co. Ltd., Tokyo, Japan

Filed Nov. 27, 1990, Ser. No. 618,409
Claims priority, application Japan, Nov. 28, 1989, 1-308024; Nov. 28, 1989, 1-308025
Int. Cl.[5] B62J *6/02*
U.S. Cl. 362—61 **3 Claims**



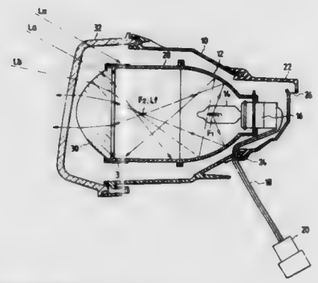
1. A projector type headlamp for a cornering operation including inclination detecting means for detecting inclination of a vehicle body relative to the road surface and correcting means for correcting variation of a property of light orientation induced by said inclination of said vehicle body relative to said road surface, wherein said correcting means is constructed such that a pair of opening portions each having a substantially rectangular shape of which upper and lower long sides extend in the substantially horizontal direction are formed adjacent to a boundary edge of a light shielding plate disposed in said head lamp and said opening portions are opened or closed by actuating opening/closing means in response to an output from said inclination detecting means, wherein said opening/closing means comprises a pair of shutters and a pair of solenoids for opening or closing said shutters in response to said output from said inclination detecting means.

5,113,320
SPHERICALLY ADJUSTABLE HEADLAMP MOUNTING SYSTEM
Bartley A. Haydu, Anderson, Ind., assignor to Robart Enterprises, Inc., Anderson, Ind.
Filed Aug. 16, 1990, Ser. No. 568,233
Int. Cl.[5] B60Q *1/06*
U.S. Cl. 362—61 **40 Claims**



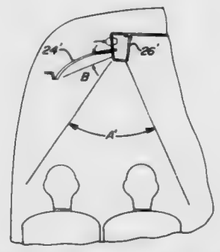
1. A motor vehicle headlamp assembly comprising:
a housing including an interior reflective surface bounded by an edge defining a perimeter,
a lens mounted to the perimeter edge of the housing,
a housing bracket coupled to the housing having an outside surface including at least one spherical segment having a defining radius centered on a point situated forward of the reflective surface,
a mounting bracket having an inside surface contiguous to the at least one spherical segment for spherical positioning over a range of relative sliding movement with respect to the housing bracket, and
fixing means for releasably fixing the position of the housing bracket with respect to the mounting bracket at any selected position within the range of movement to permit redirection of the light emitted from the assembly in any selected direction.

5,113,321
VEHICULAR LAMP
Yoshinobu Suzuki, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed Sep. 13, 1990, Ser. No. 582,032
Claims priority, application Japan, Sep. 13, 1989, 1-235597
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—61 **11 Claims**



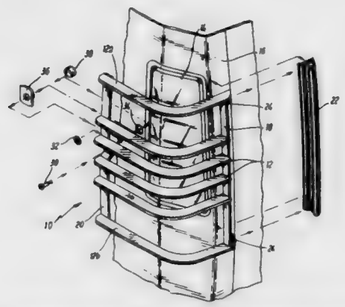
1. A vehicular lamp comprising:
a lamp body;
an elliptic reflector accommodated in said lamp body, said elliptic reflector having a first and a second focal areas;
a light source provided within said first focal area of said elliptic reflector;
a bracket fixed to said elliptic reflector;
a projection lens mounted on said bracket, said projection lens having a focal point positioned within said second focal area of said elliptic reflector, said projection lens producing substantially parallel light; and
a substantially transparent outer cover provided over said projection lens, and attached at a peripheral edge portion thereof to a forward open end of said lamp body,
a gap being formed between a forward edge of said bracket and said outer cover and said lamp body through which a substantial portion of an outer surface of said bracket and an inner surface of said lamp body is visible through said outer cover,
wherein at least one of said inner surface of said lamp body and said outer surface of said bracket is dark colored, whereby said lamp has a dark appearance when said light source is off.

5,113,322
TRANSIT VEHICLE LIGHTING FIXTURE
Liudas K. Mikalonis, Northville, Mich., assignor to Transmatic, Inc., Waterford, Mich.
Continuation-in-part of Ser. No. 400,426, Aug. 30, 1989, Pat. No. 5,006,966. This application Apr. 8, 1991, Ser. No. 681,888
Int. Cl.[5] B60Q *3/02*
U.S. Cl. 362—74 **7 Claims**



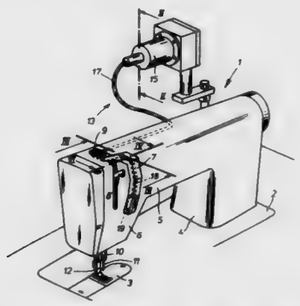
1. In a public transit vehicle having side windows, an aisle extending along the longitudinal axis of the vehicle and a passenger seating area on either side of the aisle, a lighting fixture arrangement for preferentially illuminating the seating area and minimizing the illumination of the aisle and side windows, comprising:
a lighting fixture above a passenger seating area,
said fixture having an elongated light housing extending generally parallel to the aisle, the housing comprising an upper surface, an adjacent side surface, and a translucent cover having a first side wall spaced from the said side surface and a bottom wall spaced from the upper surface to define a cavity,
a plurality of spaced incandescent lamps for producing spaced light sources within the housing, and
first optical means positioned in the housing adjacent each light source to receive light from the adjacent light source for preferentially directing light from the light sources through the bottom wall of the translucent cover to the seating area, said first optical means adjacent each light source comprising a reflective panel of transparent material having grooves extending longitudinaliy of the light housing on the side opposite the incident light from the light sources for reflecting the light in a controlled pattern,
said panel being formed as a channel extending longitudinally of the light housing and opening toward said bottom wall, whereby the seating area is illuminated at a higher level than the aisle and side windows.

5,113,323
VEHICLE LAMP GUARDS
Peter N. Allman, Derbyshire, and Keith J. Riley, Derby, both of England, assignors to ASG (Accessories) Limited, Derby, England
Filed Sep. 11, 1990, Ser. No. 581,523
Claims priority, application United Kingdom, Sep. 12, 1989, 8920563
Int. Cl.[5] B60Q *1/00*; **F21V** *15/00*
U.S. Cl. 362—80 **7 Claims**



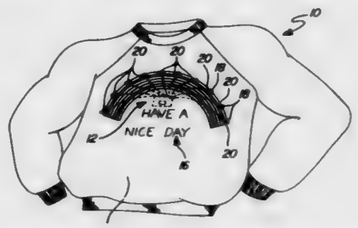
1. A vehicle lamp guard having at least a pair of spaced-apart straps and a plurality of spaced-apart bars spanning said straps, at least a pair of said bars extending over and past at least one of said straps to define bar extensions, a pair of spaced-apart projections on said bar extensions and extending generally toward one another for cooperation with a locating member attachable to a vehicle body for releasably mounting said guard to a vehicle body.

5,113,324
SEWING MACHINE WITH A LAMP
Albert Dusch, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Kaiserslautern, Fed. Rep. of Germany
PCT No. PCT/EP89/00346, § 371 Date Dec. 19, 1990, § 102(e) Date Dec. 19, 1990, PCT Pub. No. WO89/10994, PCT Pub. Date Nov. 16, 1989
PCT Filed Mar. 31, 1989, Ser. No. 598,734
Claims priority, application Fed. Rep. of Germany, May 5, 1988, 8805970[U]
Int. Cl.[5] D05B *79/00*
U.S. Cl. 362—90 **7 Claims**



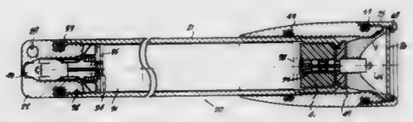
1. A sewing machine and lamp arrangement, comprising: a light source and a fiber-optic guide, an end piece of the fiber-optic guide projecting from a housing of the sewing machine, an attaching part mounted on the housing of the sewing machine to project extending spaced away from a surface of the housing of the sewing machine, said end piece being formed to the shape of said housing part and positioned on the attaching part on a side of the attaching part facing said housing.

5,113,325
LIGHT ASSEMBLY KIT FOR ILLUMINATING AN ARTICLE OF CLOTHING
Kenneth D. Eisenbraun, 1047 Pilgrim, Birmingham, Mich. 48009
Filed Aug. 1, 1991, Ser. No. 739,299
Int. Cl.[5] F21L *15/08*
U.S. Cl. 362—103 **12 Claims**



1. A light illuminating kit for use with an article of clothing having a plurality of apertures formed therein by a user of said kit, said apertures forming a pattern preselected by said user, said kit comprising:
a plurality of light emitting elements constructed to protrude through respective apertures in said article of clothing;
a plurality of securement elements for securing said light elements to said article of clothing;
a central electronic control unit for controlling the actuation of each of said light elements;
a plurality of flexible wire pairs, each of a predetermined length and each independently wiring only one of said light elements to said central electronic control unit such that said one light element may be moved independently of one of any other of said plurality of light elements such that said any one light element is interchangeably insertable through any one of said plurality of apertures to illuminate said user preselected pattern when said plurality of light elements is actuated.

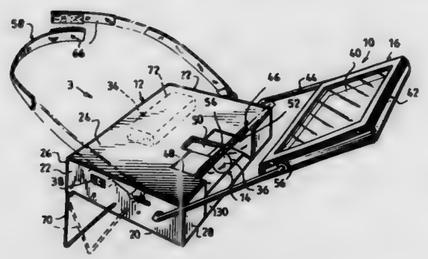
5,113,326
MINIATURE FLASHLIGHT
Anthony Maglica, Anaheim, Calif., assignor to Mag Instrument, Inc., Ontario, Calif.
Continuation-in-part of Ser. No. 553,977, Jul. 16, 1990, which is a continuation of Ser. No. 356,361, May 23, 1989, Pat. No. 4,942,505, which is a continuation of Ser. No. 222,378, Jul. 19, 1988, Pat. No. 4,899,265, which is a continuation of Ser. No. 34,918, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 828,729, Feb. 11, 1986, Pat. No. 4,658,336, which is a continuation of Ser. No. 648,032, Sep. 6, 1984, Pat. No. 4,577,263. This application Jun. 21, 1991, Ser. No. 719,156
Int. Cl.[5] F21V *31/00*
U.S. Cl. 362—158 **15 Claims**



1. A flashlight comprising
a battery housing having a first opening;
a lamp bulb;

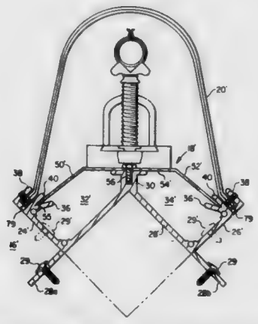
an electrical circuit extending from said battery housing to said lamp bulb;
a lens positioned adjacent said lamp bulb;
a reflector positioned about said lamp bulb to reflect light through said lens;
a closure for said first opening of said battery housing, said battery housing and said closure forming a closed internal volume having a passage extending to atmosphere from said closed internal volume;
a one-way valve in said passage oriented to permit gas flow from said closed internal volume to atmosphere.

5,113,327
LIGHTED MAGNIFIER DEVICE
Robert Levy, 6 Glenhollow Dr., Apt. A14, Holtsville, N.Y. 11742
Filed Jun. 21, 1991, Ser. No. 718,800
Int. Cl.[5] F21L *1/00*
U.S. Cl. 362—157 **7 Claims**



1. An improved lighted magnifier device which comprises:
a housing, said housing is box shaped and includes a bottom wall, a pair of side walls, a top wall, a rear wall and a front wall having an aperture therein, so that light from a light source producing means within said housing can be transmitted out from said housing through the aperture in the front wall of said housing;
b) said light source producing means includes a socket carried within said housing proximate the aperture in the front wall thereof, a power source carried within said housing, electrically connected to said socket, and a light bulb mounted in said socket, said light bulb is a halogen type light bulb, said light source producing means further includes a switch mounted to said housing electrically connected between said socket and said power source, so that manual operation of said switch can turn said light bulb on and off when needed; and
c) means adjustably mounted to said housing, for enlarging an image of an object being illuminated by the light from said light source, said image enlarging means includes a magnification lens for enlarging the image of the object, a frame in which said magnification lens is mounted into, and a pair of arms, each pivotally mounted to one side of said frame and the side wall of said housing, so that said frame with said magnification lens can be adjustably positioned over the object being illuminated, wherein said housing further includes means for angularly positioning said socket with said light bulb within the aperture in the front wall, so that the light can be properly directed at the object below said magnification lens.

5,113,328
NEON TUBE LIGHTING SYSTEM, SUPPORT ASSEMBLY AND EXTRUSION THEREFOR
Ronald A. Foster, 1330 Deer Ridge, Duncanville, Tex. 75135, and Ruben A. Reyes, 3527 Rio Grande Cir., Dallas, Tex. 75233
Continuation-in-part of Ser. No. 550,614, Jul. 10, 1990, Pat. No. 5,001,613. This application Mar. 18, 1991, Ser. No. 671,254
Int. Cl.[5] F21S *3/00*
U.S. Cl. 362—223 **12 Claims**

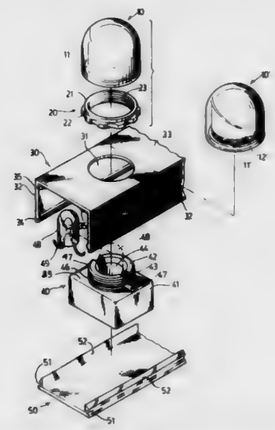


1. An assembly for supporting a neon tubing along a corner of a support structure, comprising:
an extrusion having first and second wall members, and a angled base member interconnecting the first and second wall members and including support means, wherein the wall members and the angled base member form an enclosure having an opening therein between the first and second wall members;
wherein each of said first and second wall members includes an angular member extending towards the angled base member to form a support surface;
a reflector having first and second angular wall members and an intermediate wall member interconnecting the first and second angular wall members, wherein each of the first and second angular wall members includes an edge cooperating with the respective support surface of the angular member when the reflector is secured to the support means to secure the reflector in the enclosure; and
an elongate lens member supported by the first and second side wall members over said opening.

5,113,329
TUBE LIGHT
Tak-Huei Lin, P.O. Box 79-65, Taipei, Taiwan
Continuation-in-part of Ser. No. 535,397, Jun. 7, 1990, Pat. No. 4,999,755. This application Nov. 1, 1990, Ser. No. 609,534
Int. Cl.[5] F21S *1/02*
U.S. Cl. 362—238 **10 Claims**

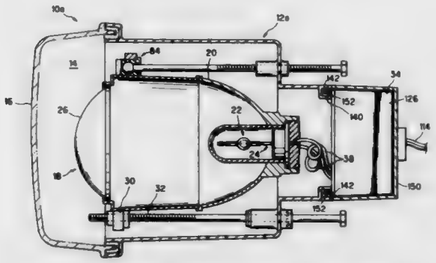
1. A tube light comprising:
a length of insulating tube having an internal cross-section of substantially constant, rectangular configuration with a bottom side open, where a top surface is provided with a plurality of round perforations spaced appropriately from one another, two continuous conductor strips are each provided underneath the top surface and adjacent to left and right sides of the tube,
a plurality of light units each having substantially the same size and general structure, and wherein each light unit includes a socket suitable to be located in the tube, the socket extends upward an appropriate distance to form a column which is provided at its center with an opening for receiving a bulb and a pair of recesses are each oppositely provided on the column, the column being sized to just pass through the perforation provided on the top surface

of the tube, a pair of metal contacts each extend from inside of the recesses and lay on an upper surface of the socket for engaging the respective conductor strips, the metal contacts engage leads of the bulb when the bulb is disposed in the opening of the column, the circumference of the column is provided with an external thread, and



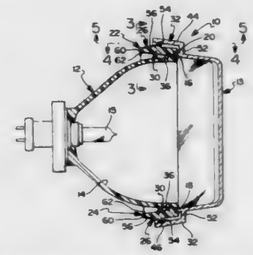
a cylindrical fastener for each light unit and having an internal thread which can engage the external thread of the column when the column has passed through the perforation on the top surface of the tube so as to secure the light unit on the tube.

5,113,330
AIMABLE HEADLAMP HAVING A DISCHARGE LAMP BULB AND A LIGHTING CIRCUIT THEREFOR
Hiroyuki Makita, Shimizu, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed May 15, 1991, Ser. No. 700,272
Claims priority, application Japan, May 18, 1990, 2-128337
Int. Cl.[5] F21K *7/00*
U.S. Cl. 362—265 **6 Claims**



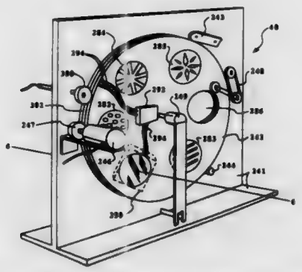
1. An aimable vehicle headlamp system comprising:
(a) a lamp housing having an open end;
(b) a lens closing the open end of the lamp housing and defining a lamp chamber in combination with the lamp housing;
(c) a discharge lamp assembly disposed in the lamp chamber and comprising:
(1) a reflector;
(2) a discharge lamp bulb subassembly including a discharge lamp bulb; and
(3) a bulb carrier subassembly coupled, both mechanically and electrically, to the discharge lamp bulb subassembly and mounted to the reflector for supporting the discharge lamp bulb subassembly in position with respect to the reflector;
(d) aiming means for mounting the discharge lamp assembly to the lamp housing in order to aim and retain the discharge lamp assembly in position with respect to the lamp housing; and
(e) a lighting circuit assembly comprising:
(1) an electric lighting circuit comprising ballast means providing an alternating voltage, and igniter means for electrically connected between the ballast means and the bulb carrier subassembly of the discharge lamp assembly for causing the discharge lamp bulb to glow by an electric discharge; and
(2) a circuit enclosure enclosing at least the igniter means of the electric lighting circuit and mounted to the lamp housing;
(f) flexible electric conductor means connecting the igniter means of the lighting circuit of the lighting circuit assembly to the bulb carrier subassembly of the discharge lamp assembly, the flexible electric conductor means being wholly disposed within the lamp housing.

5,113,331
VEHICLE HEADLAMP ASSEMBLY
William E. Nagengast, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 9, 1991, Ser. No. 742,816
Int. Cl.[5] F21V *29/00*
U.S. Cl. 362—267 **3 Claims**



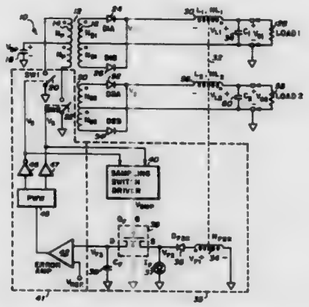
1. A vehicle headlamp comprising a reflector housing member provided with at least one concave parabolic reflecting surface and having a front open face surrounded by a connector portion around the entire margin of the open face of the reflector housing member, a lens member closing the open face of the reflector housing member and having a connector portion complementary and conforming to the connector portion of the reflector housing member, an elastomeric adhesive located between said connector portions of the reflector housing member and the lens member, a tongue integrally formed with the reflector housing member and projecting rearwardly from the connector portion thereof, a flange integrally formed with and projecting rearwardly from the lens member beyond the connector portion of the reflector housing member and surrounding the entire periphery of the lens member so as to cause the flange to overlap a portion of the tongue, and a clip having one end connected to the inner surface of the flange and the other end connected to the tongue for locking the members together so that the fastener means is not visible from the front of the headlamp.

5,113,332
SELECTABLE MECHANICAL AND ELECTRONIC PATTERN GENERATING APERTURE MODULE
Brain E. Richardson, San Jose, Calif., assignor to Morpheus Lights, Inc., San Jose, Calif.
Filed May 24, 1989, Ser. No. 356,105
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[5] F21V *11/00*
U.S. Cl. 362—282 **23 Claims**



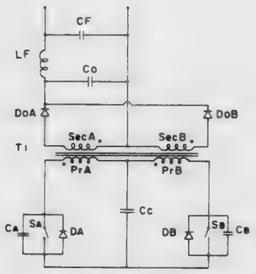
1. A selectable aperture apparatus for use in a stage lighting system or the like, comprising:
base means;
means for movably supporting said base means and having formed therein a first opening and a second opening;
an electronic pattern aperture means disposed within said first opening in said supporting means for selectively forming a plurality of opaque patterns for modifying a beam of light travelling along an optical axis passed through said electronic pattern aperture means, said second opening being capable of allowing the transmission of a beam of light at substantially full intensity, with no significant attenuation therein; and
drive means for controllably moving said supporting means in such a manner so that said first and second openings are selectively intersected by said optical axis.

5,113,333
MAGNETIC DC-TO-DC CONVERTER
Niann-Gwo L. Ou, Daly City, Calif., assignor to Intech, Inc., Santa Clara, Calif.
Filed Jan. 8, 1990, Ser. No. 462,100
Int. Cl.[5] H02M *3/337*
U.S. Cl. 363—25 **18 Claims**



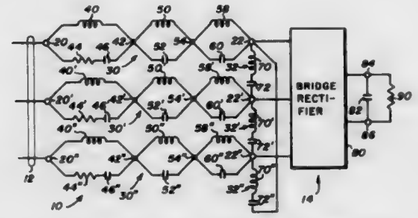
1. A direct current to direct current converter comprising, in combination:
a power transformer with a primary winding and a secondary winding, said primary winding having a first connection means for receiving a direct current supply source and a second connection means for connection to a first ground reference, and said secondary winding being connected to a second ground reference;
a primary control circuit including a switching means connected to said primary winding for controlling the duty cycle of power delivered to said primary winding from said source, and a comparator means for receiving and comparing a reference signal and a feedback signal and generating an error signal relative to a comparison and in turn generating responsive control signals to said switching means; and
a feedback network including a first inductive means connected to sense a electrical load connected to said secondary winding, a feedback inductor magnetically coupled to said first inductive means, said first inductive means connected in series with a first unidirectional conductive valve and a second unidirectional conductive valve, said first and second unidirectional conductive valves being connected to opposing ends of said secondary winding, said feedback inductor connected in series with a third unidirectional conductive valve, a sampling switch connected to said third unidirectional conductive gate and to said comparator means to control current flow intermediate said third unidirectional conductive gate and said comparator means, said sampling switch including a control gate for controlling conduction through said sampling switch, and gate control means connected to said gate and to the primary control circuit to control said sampling switch responsive to the status of said error signal.

5,113,334
HIGH EFFICIENCY CONVERTER
Rodney R. Tuson, Wahroonga, and Isaac Dimanstein, Hornsby, both of Australia, assignors to Rifala Pty. Ltd., Australia
PCT No. PCT/AU88/00419, § 371 Date Jun. 14, 1990, § 102(e) Date Jun. 14, 1990, PCT Pub. No. WO89/04082, PCT Pub. Date May 5, 1989
PCT Filed Oct. 28, 1988, Ser. No. 477,978
Claims priority, application Australia, Oct. 29, 1987, PI5168
Int. Cl.[5] H02M *7/538*
U.S. Cl. 363—25 **6 Claims**



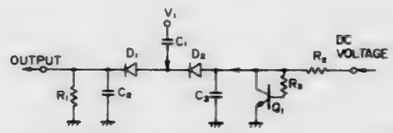
1. A zero voltage switching DC to AC inverter comprises:
transformer means having a given primary inductance,
two or more switching means having adjunct capacitance, and optionally further capacitance means,
said switching means combined with said transformer means to form two switching paths,
said adjunct capacitance means and optional further capacitance means forming a resonant circuit with said primary inductance of said transformer,
drive signals from a circuit or signal generator for controlling said switching means resulting in substantially symmetrically switching of the said switching paths and
means to ensure that the said transformer is not loaded during the time when neither of the said symmetrical switching paths is conducting,
wherein the said drive signals are controlled to switch on the switching means in one of the switching paths after a period of time when the switching means in the other switching path is switched off, sufficient to allow the phase of the voltage across said transformer to be inverted by said resonant circuit.

5,113,335
HARMONIC CURRENTS ISOLATING NETWORK
Steve Smith, 5100 Channel Ave., Richmond, Calif. 94804
Filed Jul. 23, 1986, Ser. No. 888,137
Int. Cl.[5] H02M *1/12*
U.S. Cl. 363—44 **5 Claims**



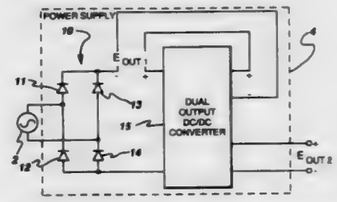
1. A power supply system comprising in combination:
an AC power line including a predetermined power line frequency;
a power supply including an input that generates on said line currents at predetermined harmonics of said power line frequency when directly connected thereto; and
a network connected between said input and said line to isolate therefrom said harmonic currents, said network including,
a first terminal,
a second terminal,
a third terminal connected with said first and said second terminals to said line,
a fourth terminal,
a fifth terminal,
a sixth terminal connected with said fourth and said fifth terminals to said input,
a first reflector having
an inductor coupled between said first and said fourth terminals and
a capacitor connected in parallel with said first reflector inductor, a second reflector having
an inductor coupled between said second and said fifth terminals and
a capacitor connected in parallel with said second reflector inductor, a third reflector having
an inductor coupled between said third and said sixth terminals and
a capacitor connected in parallel with said third reflector inductor,
a first resonator having
an inductor and
a capacitor coupled in series with said first resonator inductor between said fourth and said fifth terminals,
a second resonator having
an inductor and
a capacitor coupled in series with said second resonator inductor between said fifth and said sixth terminals, and
a third resonator having
an inductor and
a capacitor coupled in series with said third resonator inductor between said sixth and said fourth terminals.

5,113,336
TEMPERATURE COMPENSATED LEVEL DETECTOR
Sunao Takahashi, Sendai, and Mikio Takano, Ohme, both of Japan, assignors to Kokusai Electric Co., Ltd., Tokyo, Japan
Filed Jun. 11, 1991, Ser. No. 713,667
Claims priority, application Japan, Jun. 20, 1990, 2-161936
Int. Cl.[5] H02M *7/00*
U.S. Cl. 363—61 **3 Claims**



1. A temperature compensated level detector, comprising: a voltage multiplying rectifier for rectifying and smoothing a high-frequency input voltage to obtain a DC output and a bias voltage generator added to said voltage multiplying rectifier, for providing a forward bias voltage, said bias voltage generator having a temperature compensating function;
said voltage multiplying rectifier comprising: a first diode having a cathode terminal and an anode terminal to which said high-frequency input voltage is applied; a second diode having its cathode terminal connected to said anode terminal of said first diode; a first capacitor connected between the anode terminal of said second diode and the ground; and a second capacitor and a first resistor connected in parallel between said cathode of said first diode and the ground, for obtaining said DC output by smoothing a voltage which appears between said cathode terminal of said first diode and a grounding terminal of said first capacitor; and
said bias voltage generator comprising: a transistor having its collector and emitter terminals connected between said anode terminal of said second diode and the ground; a second resistor connected between base and collector terminals of said transistor; and a third resistor connected between said anode terminal of said second diode and a DC power source.

5,113,337
HIGH POWER FACTOR POWER SUPPLY
Robert L. Steigerwald, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Feb. 8, 1991, Ser. No. 652,831
Int. Cl.[5] H02M *3/335, 1/12*
U.S. Cl. 363—98 **18 Claims**



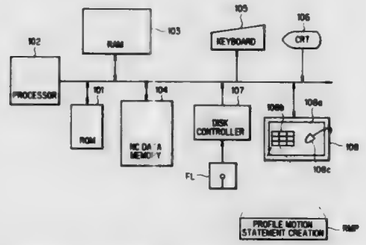
1. A high power factor power supply for providing a dc output voltage, comprising:
ac rectifying means for providing a rectified ac voltage when coupled to an ac power line;
a dual-output power converter having an input, said dual-output power converter providing first and second output voltages, said output voltages being decoupled from each other so as to be independently controllable, said first output voltage being coupled in series between said ac rectifying means and the input of said dual-output power converter, said second output voltage comprising the

power supply dc output voltage, said first output voltage being dynamically variable so as to draw substantially sinusoidal current from said ac power line.

5,113,338
SIMILAR SHAPE PART PROGRAM CREATION METHOD

Masaki Seki; Takashi Takegahara, both of Tokyo, and Takeshi Arakaki, Yamanashi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP89/00111, § 371 Date Sep. 29, 1989, § 102(e) Date Sep. 29, 1989, PCT Pub. No. WO89/07292, PCT Pub. Date Aug. 10, 1989
PCT Filed Feb. 3, 1989, Ser. No. 423,466
Claims priority, application Japan, Feb. 5, 1988, 63-25359
Int. Cl.[5] G05B *19/403*; G06F *3/04*
U.S. Cl. 364—191 **12 Claims**



5. A method for creating a part program for machining a part having a plurality of shapes, the plurality of shapes including a reference shape and at least one similar shape, said method comprising the steps of:

(a) defining a profile of the part;

(b) identifying the reference shape from the plurality of shapes;

(c) producing a reference part program for machining the reference shape;

(d) automatically identifying at least one similar shape to be machined under machining conditions substantially identical to machining conditions of the reference part program for the reference shape; and

(e) producing a similar part program for machining the at least one similar shape identified in step (d) based on the reference part program.

5,113,339
DATA PROCESSOR FOR DETECTING IDENTICAL DATA SIMULTANEOUSLY COEXISTING IN A PLURALITY OF DATA SECTIONS OF DATA TRANSMISSION PATHS

Koji Komatsu, Tenri; Shinichi Yoshida, Kashihara; Souichi Miyata, Nara, and Daisuke Azuma, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1988, Ser. No. 260,061
Claims priority, application Japan, Oct. 20, 1987, 62-265734; Oct. 20, 1987, 62-265736; Oct. 20, 1987, 62-265737; Oct. 20, 1987, 62-265741; Oct. 29, 1987, 62-265735
Int. Cl.[5] G06F *7/04, 7/20, 13/00*
U.S. Cl. 395—200 **2 Claims**

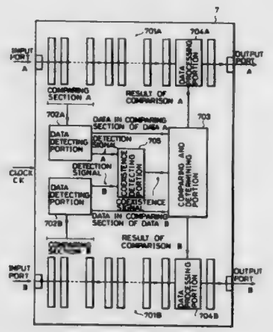
1. A data processor comprising:

data detecting portion having a plurality of parallel input ports and a plurality of data transmission paths subsequent to the input ports for detecting data existing in a finite section on each of the data transmission paths with respect to data transmitted through each of the data transmission paths and further including a plurality of latches, each said latch having a plurality of stages;

coexistence detecting portion for detecting data simultaneously coexisting in said data detecting section of at least three set of said data transmission paths based upon the detection of the data detecting portion;

comparing and determining portion for extracting identifiers for identifiers data from each of said data transmission paths, each said identifier including at least a portion of the data detected by said data detecting portion, and for comparing and determining the relationship between the identifiers;

data processing portion for processing the detected data by adding a signal indicating the determined relationship to



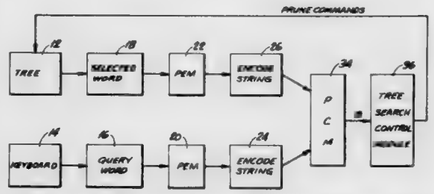
the detected data and for changing at least a portion of the detected data; and

output ports, subsequent to the data transmission paths, for outputting a plurality of data from the plurality of latches, wherein the plurality of data is detected and compared during data transmission with respect to inputs of at least three parallel sets of said data transmission paths, the plurality of data being processed based on the result of the comparison and detection without disturbing said data transmission.

5,113,340
SEARCH IMPROVEMENTS FOR ELECTRONIC SPELLING MACHINE

David McWherter, Bensalem, Pa., assignor to Franklin Electronic Publishers, Incorporated, Mt. Holly, N.J.

Filed May 25, 1988, Ser. No. 199,060
Int. Cl.[5] G06F *15/40*
U.S. Cl. 364—419 **9 Claims**
MICROFICHE APPENDIX INCLUDED
(5 Microfiche, 320 Pages)



1. In a machine spelling dictionary having a memory containing a dictionary of words arranged in a tree format, a keyboard to input a query word composed of a set of characters, and encode means to encode each input character string from said tree and from said keyboard into coded strings for purposes of comparing query and tree coded strings, the encoding improvement comprising:

a look up table to encode word segments from said tree having N or fewer characters into a corresponding coded string, and

algorithm means for encoding word segments from said tree having more than N characters into a corresponding coded string,

the word segments encoded by said look up table and by said algorithm means constituting the words in branch segments of the tree.

3. In a machine spelling dictionary having a memory containing a dictionary of words arranged in a tree format, a keyboard to input a query word composed of a set of characters, an encode means to encode each input characteristic string into a coded string, means for pruning the tree as a function of a similarity characteristic between the coded string of the query word and the coded string of a memory word from the tree, the pruning occurring when the similarity characteristic falls below a predetermined threshold, the improvement comprising:

means responsive to the similarity characteristic at a node at a tree level N to provide an automatic termination function where said similarity characteristic is greater than a predetermined threshold,

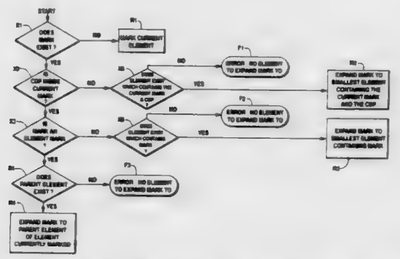
means responsive to said automatic termination function to omit the calculation of said similarity function at said tree level N for all branches that stem from the node at level N-1 that precedes said node at level N,

whereby pruning is avoided for all branches so affected.

5,113,341
TECHNIQUE FOR CREATING AND EXPANDING ELEMENT MARKS IN A STRUCTURED DOCUMENT

Michael Kozol, Gaithersburg; Chan Lim, Potomac; Willard L. Strong, Jr., Silver Spring, and William Tracey, Germantown, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1989, Ser. No. 315,375
Int. Cl.[5] G06F *7/28*
U.S. Cl. 364—419 **18 Claims**



1. In a document processing system including a central processing unit, a random access memory and a display device, a method for hierarchically expanding a stream mark to an element mark about a reference point, in a structured document, in said random access memory in a database form, comprising the steps of:

determining whether said reference point is inside an element which also contains all of said structured document contained in said stream mark;

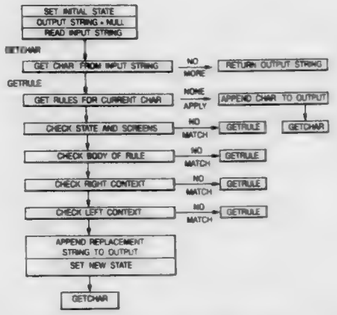
expanding said stream mark to mark a smallest element containing said reference point and said corresponding portion of said structured document to produce an element mark; and

displaying said structured document on said display device emphasizing said element mark.

5,113,342
COMPUTER METHOD FOR EXECUTING TRANSFORMATION RULES

Antonio Zamora, Chevy Chase, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1989, Ser. No. 344,344
Int. Cl.[5] G06F *15/21*
U.S. Cl. 364—419 **8 Claims**



1. A process for executing transformation rules within a computer system with an input and an output which sequentially, for each input character, comprises the steps of:

looking up the current input character in an index which identifies the rules applicable to that character;

attempting to match a portion of the rule identified as the "body" of the rule having a string of one or more characters against the input string, starting at the current input character;

attempting to match a portion of the rule identified as the "right context" of the rule having a sequence of strings or identifiers representing sets of strings against the input string to the right of said matching "body;"

attempting to match a portion of the rule identified as the "left context" of the rule having a sequence of strings or identifiers representing sets of strings against the input string to the left of said matching "body;"

outputting a replacement string associated with the matching rule when all portions of the rule match against the input string, and skipping the portion of the input string corresponding to the body to continue the transformation process;

outputting the input character in the event that the current input character does not have any applicable rules, to continue the transformation process.

5,113,343
SEQUENCED CONTROL OF DOUBLE TRANSITION POWERED DOWNSHIFTING IN AN AUTOMATIC TRANSMISSION

Joseph H. Hunter, and Peter E. Swingler, both of Carmel, Ind., assignors to General Motors Corporation, Detroit, Mich.

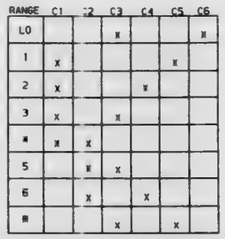
Filed Aug. 2, 1990, Ser. No. 562,063
Int. Cl.[5] B60K *41/22*; F16H *59/46*
U.S. Cl. 364—424.1 **9 Claims**

1. In a vehicular automatic transmission having input and output shafts, a turbine connected to the input shaft to couple driving torque thereto, in which a downshift from a first speed ratio to a second speed ratio lower than said first speed ratio is carried out through concurrent disengagement of first and second off-going fluid pressure operated torque transmitting devices and engagement of first and second on-coming fluid pressure operated torque transmitting devices, wherein the engagement of said second off-going torque transmitting device and said first on-coming torque transmitting device establishes a third speed ratio lower than said second speed ratio,

and further having turbine and output speed sensing means, a method of controlling said torque transmitting devices to carry out a downshift from said first speed ratio to said second speed ratio comprising the steps of:

gradually releasing said first off-going torque transmitting device,

gradually engaging said first on-coming torque transmitting device in response to a detected slip of said first off-going



torque transmitting device while said second off-going torque transmitting device is still engaged, thereby to begin a shift to said third speed ratio, and

releasing said second off-going torque transmitting device and gradually engaging said second on-coming torque transmitting device in response to a detected pulldown of said turbine, thereby to complete a shift to said second speed ratio.

5,113,344

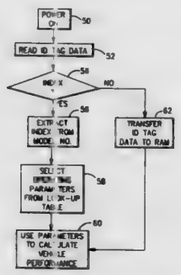
MATERIAL HANDLING VEHICLE IDENTIFICATION TAG

David L. Kellogg, Greene; James M. Simmons, Jr., Newark Valley; Michael S. Bachman, Port Crane, and Isaac Avitan, Vestal, all of N.Y., assignors to Raymond Corporation, Greene, N.Y.

Filed Jul. 27, 1990, Ser. No. 558,938

Int. Cl.[5] G06G *7/00*

U.S. Cl. 364—424.04 **20 Claims**



20. A method of customizing a material handling vehicle to perform system operations specific to that particular material handling vehicle, comprising the steps of:

a) installing a universal-type system processor in said material handling vehicle, said universal-type processor being operative to process data and information for a plurality of different material handling vehicles; and

b) installing and operatively connecting an identification tag to said universal-type processor for identifying the specific vehicle to which it is installed, said identification tag containing information and data specific to the operation of said vehicle, whereby said universal-type processor will only operate in a manner consistant with the vehicle in which it is installed.

5,113,345

SYSTEM FOR CONTROLLING ACTIVE SUSPENSIONS OF A VEHICLE

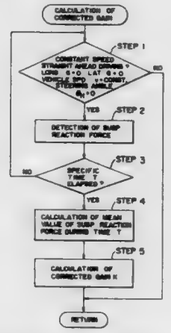
Atsushi Mine, Gunma; Katsuyoshi Kamimura, Tochigi, and Yutaka Hiwatashi, Gunma, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1990, Ser. No. 526,908

Claims priority, application Japan, May 29, 1989, 1-135368

Int. Cl.[5] B60G *17/00*

U.S. Cl. 364—424.05 **12 Claims**



1. An active suspension control system for a motor vehicle having a plurality of wheels and having a fluid suspension provided between a body of said motor vehicle and each wheel for supporting said body, control means for charging and discharging a fluid into and out of said fluid suspension in order to extend and contract said suspension respectively, a plurality of sensors for sensing behavior of the motor vehicle and for producing sensor signals indicative thereof, said sensors including G-sensor means mounted on said motor vehicle for detecting acceleration of the vehicle and for generating an acceleration signal indicative thereof and a vehicle speed sensor for detecting vehicle speed and for generating a vehicle speed signal indicative thereof, and a controller for calculating a control quantity based on said acceleration signal and a standard vehicle weight and for producing a control quantity signal to the control means to adjust an amount of the fluid so as to maintain an attitude of the motor vehicle, the system comprising:

suspension reaction force detection means for detecting reaction force applied to each suspension;

determining means responsive to said sensor signals for determining a constant-speed and straight-ahead driving state of the motor vehicle and for generating a driving state signal indicating said state when said vehicle is at constant speed and straight-ahead driving state;

first calculating means for calculating a mean value, as the load on the motor vehicle, of said reaction force on each suspension during a predetermined time period when said driving state signal is generated by said determining means and for producing a mean value signal for each suspension indicative thereof;

correcting means responsive to each of said mean value signals for correcting said control quantity for each suspension so as to maintain the attitude of the motor vehicle under a transitional condition in an optimum state even when the vehicle weight changes from said standard vehicle weight;

said correcting means including second calculating means responsive to the magnitude of each of said mean value signals for calculating a corrected gain to be applied to the control quantity for correction thereof, first computing means responsive to a signal from said G-sensor means and said corrected gain for calculating a load shift quantity corresponding to the change of the load applying to the suspension due to the acceleration or deceleration of the vehicle and second computing means responsive to said load shift quantity for calculating the control quantity.

5,113,346

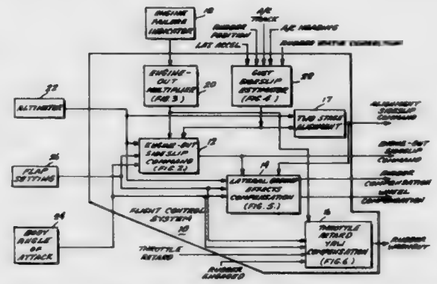
AIRCRAFT AUTOMATIC LANDING SYSTEM WITH ENGINE OUT PROVISIONS

Munir Organ, Woodinville; Timothy C. McRoberts, Bothell, and Arvinder S. Virdee, Kirkland, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 26, 1990, Ser. No. 470,647

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—428 **28 Claims**



19. An aircraft flight control system for automatically landing multi-engine aircraft having an inoperative engine, said flight control system comprising:

engine-out detection means for determining that an engine of said aircraft is inoperative and for indentifying said inoperative engine relative to the mounting location of said inoperative engine, said engine-out detection means supplying a signal representative of said mounting location of said inoperative engine;

signal processing means responsive to said signal supplied by said engine-out detection means and responsive to signals representative of the angle of attack of said aircraft and the landing flap setting of said aircraft during an automatic landing procedure; said signal processing means being operable during said automatic landing procedure to detect crosswind conditions under which the wind is from the same side of said aircraft as said mounting location of said inoperative engine and, upon detection of said crosswind location, being operable for supplying to the flight control surfaces of said aircraft an engine out sideslip command signal representative of the amount of sideslip required to lower the upwind wing of said aircraft to a position in which said upwind wing is not higher than the downwind wing of said aircraft.

5,113,347

INTERNAL COMBUSTION ENGINE SPEED CONTROLLER FOR CONTROLLING A THROTTLE VALVE BYPASS WITH RESPECT TO THE ATMOSPHERIC PRESSURE

Hirofumi Ohuchi, and Hajime Kako, both of Himeji, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jul. 20, 1990, Ser. No. 555,009

Claims priority, application Japan, Aug. 19, 1989, 1-213626

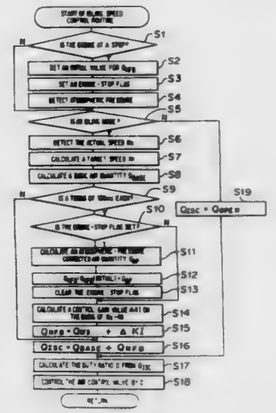
Int. Cl.[5] F02D *41/06*

U.S. Cl. 364—431.1 **4 Claims**

1. An engine speed control apparatus for an internal combustion engine which comprises:

an air control valve which controls the cross-sectional area of a bypass passage provided so as to bypass the throttle value of the engine;

a control unit which controls a degree of opening of said air control valve on the basis of a synthesized quantity which is obtained by synthesizing a basic air quantity for maintaining a target engine speed and an engine speed feedback correction quantity which effects to eliminate an error between the target speed and an actual engine speed;



an atmospheric pressure detecting means to detect an atmospheric pressure, and

a correction means for correcting said synthesized quantity based upon the detected atmospheric pressure every time the engine is started and only during an engine starting operation.

5,113,348

PAINT-OUT SHAPE DISPLAY METHOD AND AN APPARATUS USED IN A NUMERICAL CONTROL APPARATUS

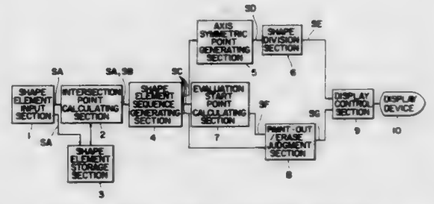
Hiroki Tomita, and Tomohiro Suzuki, both of Ooguchi, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Filed Jan. 26, 1990, Ser. No. 471,957

Claims priority, application Japan, Jan. 26, 1989, 1-17257

Int. Cl.[5] G06F *15/46*; G06G *7/64, 7/66*; G05B *19/42*

U.S. Cl. 364—474.26 **2 Claims**



2. A paint-out shape display apparatus by which the cross sectional shape of a rotating body is pained out and displayed in a numerical control apparatus, comprising;

a means for generating a series of shape element sequences in which an end point of one shape element showing said cross sectional shape is a start point of the next shape element;

a means for generating a shape symmetric with respect to a specific axis for each of said shape elements;

a means for calculating an evaluation start point from a set of points whose coordinate values in said shape element sequence are a maximum or a minimum;

a means for judging whether the inside of said symmetric

shape should be painted out or erased by comparing the coordinate value of the start point on said specific axis of each of said shape elements with the coordinate value of the end point on said specific axis which is disposed in a predetermined direction from the calculated evaluation start point; and

a means for painting out said cross sectional shape and displaying it by combining all of said symmetric shapes processed according to the judging step.

5,113,349

METHOD AND SYSTEM FOR STORING/REMOVING AND DISTRIBUTING ARTICLES OF MANUFACTURE

Katsunari Nakamura; Keiichiro Ueda; Yoshiro Irie; Toyokazu Hoshi, and Motozou Kawakami, all of Kanagawa, Japan, assignors to Fuji Electric Co. Ltd., Japan

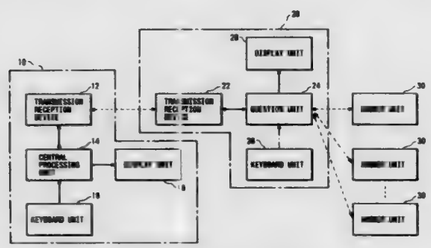
Continuation-in-part of Ser. No. 326,130, Mar. 20, 1989, Pat. No. 5,006,996. This application Jul. 12, 1989, Ser. No. 378,978

Claims priority, application Japan, Mar. 26, 1988, 63-72793; Jun. 17, 1988, 63-149771; Jul. 12, 1988, 63-173443

The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.

Int. Cl.[5] G06F *15/46*; B65G *63/00*

U.S. Cl. 364—478 **5 Claims**



1. An article storage/removal and distribution system, comprising:

a shelf unit for storing at least one article;

a conveying unit for conveying said article to and from said shelf unit;

a terminal unit provided on said conveying unit for transmitting and receiving data signals, said data signals comprising, article data and address data, said address data corresponding to a location of said shelf unit;

a data processing unit remotely provided from said shelf unit and said conveying unit for transmitting data signals to and receiving said signals from said terminal unit;

a memory unit, mounted on said shelf unit and responsive to a call signal transmitted by said terminal unit, for transmitting to and receiving data signals from said terminal unit;

said terminal unit comparing data signals from said memory unit to data signals from said data processing unit.

5,113,350

COMPUTERIZED SYSTEM FOR DISPLAY AND STORAGE OF MATERIALS BATCHING INFORMATION

Michael P. Sargent, Huntsville, Ala., assignor to Beowulf Corporation, Huntsville, Ala.

Filed Aug. 25, 1989, Ser. No. 398,448

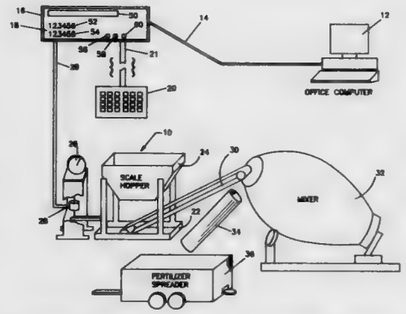
Int. Cl.[5] G06F *15/46*; G01T *7/58*; B01F *11/00*

U.S. Cl. 364—478 **7 Claims**

1. A computerized system for directing the manual loading, batching and mixing of a plurality of materials, said system comprising:

a computer station having means for reception, storage, processing and dissemination of information relating to predetermined requirements for the loading and batching of said materials and for receiving signals relating to actual loading and batching data;

a loading station remotely located from and connected to said computer station, said loading station having means for manual access and automated sequential reception and



display of selected information from said computer station, for transmitting said actual loading and batching data to said computer station and for display of said actual loading and batching data in the area of said loading station, and wherein said computer station and said loading station are operated independently of said manual loading.

5,113,351

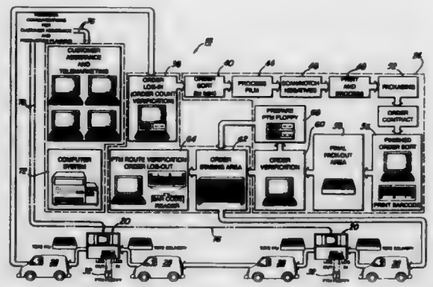
AUTOMATED, INTERACTIVE VENDING SYSTEM FOR PRODUCTS WHICH MUST BE PROCESSED

Steve Bostic, Atlanta, Ga., assignor to Delphi Technology, Inc., Atlanta, Ga.

Filed Mar. 29, 1989, Ser. No. 330,112

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—479 **17 Claims**



1. An automated, human responsive apparatus for receiving, storing, retrieving and dispensing an item which must be processed comprising:

a. means for providing instructions concerning processing of the item;

b. means for entering into the apparatus information responsive to the instructions provided;

c. means for receiving the item to be processed;

d. means for storing the item received;

e. means for allowing collection of the item stored for processing;

f. means for retrieving the item processed; and

g. means for dispensing the item retrieved.

5,113,352

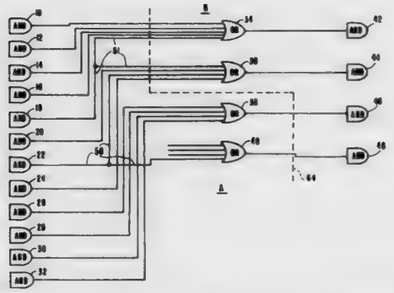
INTEGRATING THE LOGICAL AND PHYSICAL DESIGN OF ELECTRONICALLY LINKED OBJECTS

James L. Finnerty, Lexington, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 20, 1989, Ser. No. 372,715

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—490 **4 Claims**



1. The computer implemented method of automatically integrating a logical design process and a physical design process for models forming an electronic circuit to minimize an overall design time, the computer implemented method comprising the following steps:

a) analyzing timing of an initial logic design of said electronic circuit to estimate a timing debt available to interconnect the models within performance limitations;

b) coarsely placing the models of said logic design based upon the estimate of the timing debt and partitioning the models to form a cut-set having connections such that a weighted sum of the connections in the cut-set is minimized;

c) determining whether an additional time delay incurred by including the connections in the cut-set causes the timing debt not to meet predetermined performance limitations; and

d) dynamically weighing connections that exceed the performance limitations such that connections that do not exceed the predetermined performance limitations are non-weighted and preferred in said cut-set.

5,113,353

RHEOMETRICS AND VISCOELASTICITY MEASUREMENT

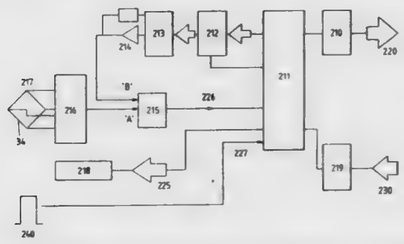
Alan George, 238 Alwyn Road, Bilton, Rugby, Warwickshire, England

Filed Oct. 5, 1988, Ser. No. 253,544

Claims priority, application United Kingdom, Oct. 9, 1987, 8723796

Int. Cl.[5] G01N *11/08*

U.S. Cl. 364—508 **18 Claims**



1. A viscoelastic measurement device comprising a measurement chamber (10) to receive a sample whose viscoelasticity is to be measured, a displacement member (11) located in said chamber, displacement means (34) for displacing the displacement member within the measurement chamber in such a way as to apply a rotary oscillatory deformatory stress to a sample located therein, measurement transducer means (35) for detecting the input deformatory displacement, measurement transducer means (35) for detecting the output or reaction deformatory movement or action of the sample, calculator means (211) for calculating the viscoelasticity from the input and output data.

5,113,354

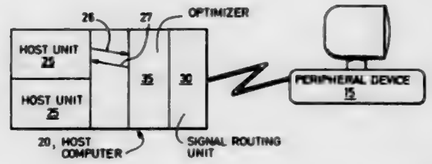
SYSTEM FOR OPTIMIZING DATA TRANSMISSIONS ASSOCIATED WITH ADDRESSABLE BUFFER DEVICES

Thomas A. Harper, and Carol R. Harper, both of Sugarland, Tex., assignors to BMC Software, Inc., Tex.

Filed Nov. 22, 1989, Ser. No. 443,793

Int. Cl.[5] G06K *15/00*; H04L *11/00*

U.S. Cl. 364—514 **9 Claims**



1. A method for optimizing a transmission of an outgoing signal generated by a host unit for processing by a peripheral unit,

(A) said peripheral unit having a control unit,

(B) said peripheral unit further having an addressable peripheral unit buffer, said peripheral unit buffer having information contents selectively divisible into one or more fields,

(C) each field being associated with a modified data tag, referred to as an MDT, whose status is used by said control unit as an indicator whether the corresponding field should be transmitted to the host unit, wherein a set MDT indicates a field whose contents should be transmitted and a cleared MDT indicates a field whose contents should not be transmitted,

(D) said outgoing signal including a pre-setting command that, when processed by the peripheral unit, results in the setting of the MDT of a field in the peripheral unit buffer specified in the pre-setting command,

said method comprising the steps of:

(a) maintaining a present-state map of the information contents of the peripheral unit buffer;

(b) accessing said outgoing signal;

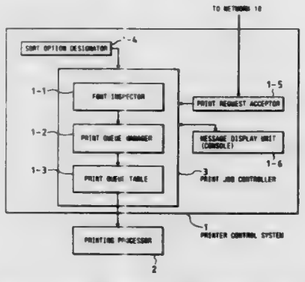
(c) generating an updated-state map of the information contents of said peripheral unit buffer that is expected to exist after receipt of said outgoing signal;

(d) determining a difference location which comprises a location in the updated-state map at which the information contents of the updated-state map differs from the information contents of the present-state map; and

(e) transmitting to the peripheral unit a substitute outgoing signal that contains a command to write, to a location in the peripheral unit buffer corresponding to the difference location, a change to the peripheral unit buffer representing the information contents of the updated-state map at the difference location;

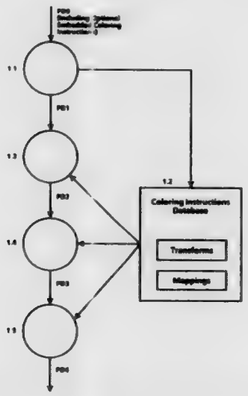
(f) said substitute outgoing signal not including said pre-setting command.

5,113,355
PRINTER CONTROL SYSTEM
Hideki Nomura, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Oct. 10, 1990, Ser. No. 595,849
Int. Cl.[5] G06A *15/00*
U.S. Cl. 395—109 **14 Claims**



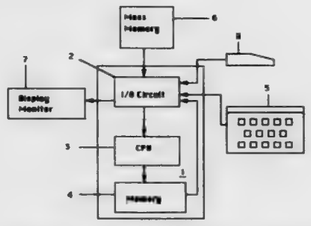
1. A printer control system for enabling print jobs transferred from workstations of a network to be processed for printout in the order determined in accordance with a preliminarily designated sort option, comprising:
a print queue table having queue identifiers that designate the order of executing said print jobs;
a font inspector which checks as to whether all of the fonts used in the job content of each of said print jobs are loaded in the printer control system; and
a print queue manager which adjusts the positional layout of queue identifiers on said print queue table based upon the results of checking by said font inspector.

5,113,356
COLORIZING BLACK AND WHITE DOCUMENTS
Eric S. Nickell, Batangas, Philippines; Robert R. Buckley; David E. Rumph, and Robert M. Coleman, all of Pasadena, Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 24, 1990, Ser. No. 632,818
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—108 **8 Claims**



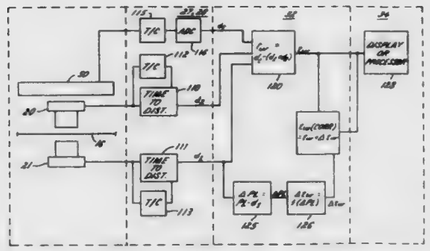
1. The method of generating a color print comprising the steps of:
at a user's terminal, generating page description language commands describing a page of patterns, graphics, and text,
allowing a user to add to said language, instructions which command the colors that certain specified patterns, graphics, and text are to be printed in,
transmitting said language and instructions to a color printer,
at the printer, changing said original page description language commands into new page description language commands which describe a page with a different set of patterns, graphics, test, and colors,
deleting said instructions from the page description language commands, and
printing the final print by printing each item of patterns, graphics, and text as specified by the new page description language commands.

5,113,357
METHOD AND APPARATUS FOR RENDERING OF GEOMETRIC VOLUMES
Elizabeth R. Johnson, Raleigh, and Charles E. Mosher, Jr., Chapel Hill, both of N.C., assignors to Sun Microsystems, Inc., Mountain View, Calif.
Continuation of Ser. No. 353,449, May 18, 1989, abandoned. This application May 22, 1991, Ser. No. 707,985
Int. Cl.[5] G06F *15/72*
U.S. Cl. 395—124 **48 Claims**



25. An apparatus for rendering volume objects on a computer graphics display, said apparatus comprising:
means for storing volume data representative of at least a portion of a volume object in memory, said volume object being represented in a (u,v,w) volume space;
means for generating at least one geometric primitive to correspond to the volume object, said corresponding geometric primitive being represented as a plurality of geometry coordinates including a plurality of boundary coordinates, said plurality of boundary coordinates defining the corresponding geometric primitive, said corresponding geometric primitive being represented in an {x,y,z} geometry coordinate space having a reference frame, said geometry coordinates being defined as a function of the reference frame, said geometry coordinates representing a plurality of pixels on a computer graphics display;
means for aligning the volume object to the corresponding geometric primitive;
means for generating a mapping function which maps said volume data to said geometry coordinates of said corresponding geometric primitive using the boundary coordinates;
means for performing geometric operations on the corresponding geometric primitive the volume object is mapped to thereby resulting in a modified geometric primitive; and
means for displaying the volume data according to the geometry coordinates of the modified geometric primitive using the mapping function determined whereby the volume object displayed is modified according to the geometric operations performed on the corresponding geometric primitive.

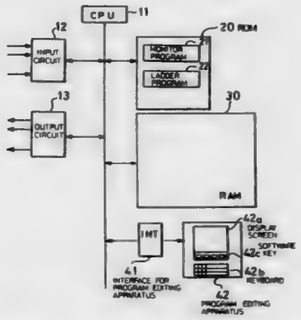
5,113,358
WEB CALIPER MEASURING SYSTEM
Eric J. Reber, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.
Filed Mar. 28, 1990, Ser. No. 500,805
Int. Cl.[5] G01B *17/00, 15/00*
U.S. Cl. 364—563 **23 Claims**



20. A non-contact, non-nuclear caliper-type gauge for measuring thickness of a running web, and comprising, in combination:
first and second scanning heads, traverse means for mounting the scanning heads in opposed relationship to define a gap between the heads for the running web and traversing the heads across the width of the running web,
an ultrasonic transducer mounted in each of the heads for directing ultrasonic energy at the web, measuring reflected ultrasonic energy from the surface of the web facing the associated head and producing a measure of the distance between a reference in the head and the facing surface of the web,
a second transducer mounted in one of the heads and responsive to energy transmitted through the web for producing a running measure of the distance between the reference points of the two heads as the heads are traversed across the web, and
means for computing the web thickness based on the ultrasonically determined distances of the respective references to the opposed surfaces of the web, and the distance as determined by the second transducer between the references, thereby to produce a web thickness measurement by detecting both web surfaces while compensating for local variations in the distance between the ultrasonic transducers.

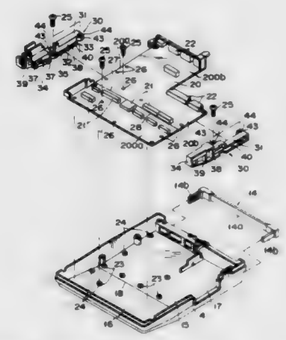
5,113,359
METHOD FOR SELECTING INPUTS FOR A PC IN WHICH A LADDER PROGRAM IS SIMULATED
Nobuyuki Kiya; Kimio Maeda, both of Hachioji, and Yoshiharu Saiki, Minamitsuru, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP89/00008, § 371 Date Aug. 21, 1989, § 102(e) Date Aug. 21, 1989, PCT Pub. No. WO89/06388, PCT Pub. Date Jul. 13, 1989
PCT Filed Jan. 6, 1989, Ser. No. 397,464
Claims priority, application Japan, Jan. 8, 1988, 63-002147
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—578 **2 Claims**

1. A method for selecting inputs for a programmable controller (PC) in which a ladder program is simulated, the PC being connected to a machine, said method comprising the steps of:
a) displaying a ladder program on a display screen;
b) setting a cursor at a relay contact on the screen to change an input signal to the ladder program;
c) inputting machining signals supplied by the machine for performing a simulation;
d) inputting input signals from the display screen when the machining signals are incomplete, for performing a simulation; and
c) selecting the machining signals and the input signals for performing a simulation of the ladder program, said step e) comprising the substeps of:
i) selecting an input signal when a machining signal is not supplied;



ii) selecting the machining signal when a machining signal is supplied by the machine;
iii) performing an AND operation on the machining signal and input signal when the machining signal is supplied and is to be employed; and
iv) performing an OR operation on the machining signal and input signal when both the machining signal and input signal are employed in the simulation.

5,113,360
PORTABLE APPARATUS WITH A STRUCTURE TO SECURE A PRINTED CIRCUIT BOARD TO A BASE UNIT
Youji Satou, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 5, 1990, Ser. No. 577,550
Claims priority, application Japan, Oct. 31, 1989, 1-283723
Int. Cl.[5] G06F *1/00*
U.S. Cl. 364—708 **15 Claims**



1. A portable apparatus comprising:
a flat printed circuit board having a front portion and a rear portion;
a base unit for receiving said printed circuit board, including a bottom plate having a shape defined by a front bottom portion and a rear bottom portion angled relative to said front bottom portion, said printed circuit board being placed over said front bottom portion and said rear bottom portion;

holding means attached to said printed circuit board, said holding means including means for bending said printed circuit board into a shape such that the front portion is angled relative to the rear portion, for holding said printed circuit board in the shape corresponding to the shape of said angled bottom plate, said holding means further including means for locating the front portion of said circuit board on the front bottom portion of said bottom plate, and the rear portion of said circuit board on the rear bottom portion of said bottom plate; and

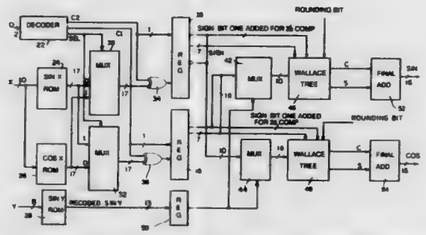
fixing means for fixing said holding means and said printed circuit board to said bottom plate of said base unit.

5,113,361

SIN/COS GENERATOR IMPLEMENTATION

David H. Damerow; William R. Young, both of Palm Bay, and Denis W. Faas, West Melbourne, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Aug. 2, 1990, Ser. No. 561,821
Int. Cl.[5] G06F *1/02*
U.S. Cl. 364—721 **28 Claims**



1. A function generator for generating generally sinusoidal shaped signals in accordance with the equations:

$$\sin(X+Y)=\sin X+\sin Y\cos X$$

$$\cos(X+Y)=\cos X-\sin Y\sin X$$

comprising:

first sin storage means for storing values of sin X;

cos storage means for storing values of cos X;

second sin storage means for storing values of sin Y multiplying means for receiving sin X and sin Y from said first and second sin storage means and cos X from said cos storage means and for producing products $-\sin Y \sin X$ and $\sin Y \cos X$; and

adder means for adding said products $\sin Y \cos X$ to $\sin x$ and adding said products $-\sin Y \sin X$ to $\cos X$ to produce $\sin(X+Y)$ and $\cos(X+Y)$.

5,113,362

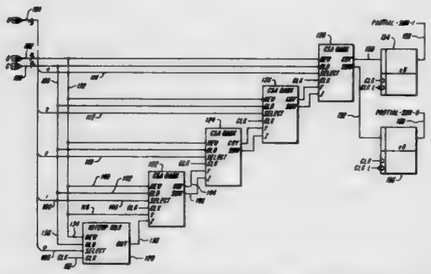
INTEGRATED INTERPOLATOR AND METHOD OF OPERATION

Stephen W. Harston, Newbury, Great Britain, and Judson S. Leonard, Waban, Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Filed May 11, 1990, Ser. No. 521,904
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—723 **15 Claims**

1. A circuit for generating a multi-bit output value from a first multi-bit binary value and a second multi-bit binary value wherein the ratio of the said first binary value to said second binary value is determined in accordance with a third multi-bit binary value, said circuit comprising:

a plurality of circuit stages, each of said plurality of circuit stages having a first input, a second input and an output, said plurality of circuit stages being connected in cascade from a first stage to a last stage by means of an output of each circuit stage being connected to a first input of a succeeding circuit stage, each of said circuit stages comprising means responsive to one bit of said third binary value for generating an output value by dividing said first stage input by two and adding thereto said first binary value when said one bit is a binary "one" and said second binary value when said one bit is a binary "zero";



means for applying said second multi-bit binary value to a first input of said first circuit stage; and

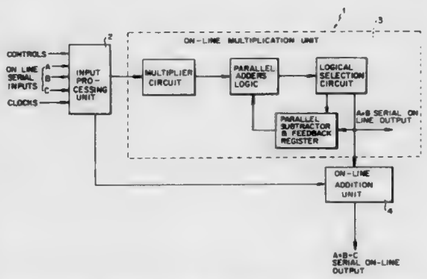
means responsive to another bit of said third binary value for applying to a second input of the first circuit stage said first binary value when said other bit is a binary "one" and said second binary value when the said other bit is a binary "zero".

5,113,363

METHOD AND APPARATUS FOR COMPUTING ARITHMETIC EXPRESSIONS USING ON-LINE OPERANDS AND BIT-SERIAL PROCESSING

Francesco Orsino, North Babylon, and Chung-Tao D. Wang, Melville, both of N.Y., assignors to AIL Systems, Inc., Deer Park, N.Y.

Continuation of Ser. No. 458,778, Dec. 29, 1989, abandoned. This application Mar. 5, 1991, Ser. No. 664,525
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—736 **8 Claims**



3. A signal processing logic circuit for processing input logic signals representing operands A, B and C to produce an output logic signal representing the arithmetic expressions $S=(A\times B)+C$, the input signals representing operands A, B and C having a sequence of logic states corresponding to logic data bits represented by $(a_0, a_1, \ldots a_n \ldots, a_{N-1})$, $(b_0, b_1, \ldots b_n \ldots, b_{N-1})$ and $(c_0, c_1, \ldots c_n \ldots, c_{N-1})$, respectively, with the most significant logic data bit a_0, b_0, and c_0 of each operand-representing input signal entering the signal processing logic circuit first, and where N is an integer, said signal processing logic circuit comprising:

an input processing circuit responsive to the input logic signals for sequentially introducing said logic data bits of the input signals representing operands A, B and C into said signal processing logic circuit, wherein said logic data bits are arranged in a redundant binary number format;

an on-line multiplication circuit coupled to the input processing circuit for multiplying said logic data bits of said input logic signals representing operands A and B to produce an n-th logic data bit p_n of a product signal representing the product $P=A\times B$, the product signal including a sequence of logic states corresponding to logic data bits represented by $(p_0, p_1, \ldots p_n)$ with a most significant digit p_0 being computed first by the multiplication circuit; and

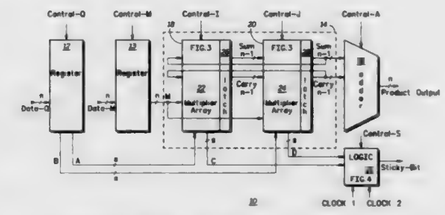
an on-line addition circuit coupled to the multiplication circuit for adding the n-th product logic data bit p_n to an n-th logic data bit of the input logic signal representing operand C, so as to produce an n-th logic data bit s_n of an output logic signal representing the arithmetic expression $S=(A\times B)+C$, the output logic signal including a sequence of logic states corresponding to logic data bits represented by $(s_0, s_1, \ldots s_n)$, a most significant logic data bit s_0 of the output logic signal being produced first.

5,113,364

CONCURRENT STICKY-BIT DETECTION AND MULTIPLICATION IN A MULTIPLIER CIRCUIT

Ying-Wai Ho, Austin, Tex.; Peter L. Harrod, Cherry Hinton, England, and Ashok H. Someshwar, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 29, 1990, Ser. No. 604,854
Int. Cl.[5] G06F *7/52*
U.S. Cl. 364—757 **11 Claims**



1. A multiplier circuit, comprising:

multiplier array means having first and second inputs, the first input receiving a first input number and the second input successively receiving predetermined segmented portions of a second input number during a plurality of multiply cycles, a feedback input, a first and a second output for respectively providing intermediate sum and intermediate carry bits resulting from a multiplication of the first and second input numbers, the feedback input receiving the intermediate sum and carry bits generated from a previous multiply cycle except during a first multiply cycle of the plurality of multiply cycles, and a third output for providing a portion of a final product for each of the plurality of multiply cycles for determining Sticky-Bit information concurrent with providing the intermediate sum and carry bits;

first storage means for receiving and storing the second input number, the first storage means having an output coupled to the second input of the multiplier array means for successively providing the predetermined segmented portions of the second input number to the multiplier array means;

second storage means for receiving and storing the first input number, the second storage means having an output coupled to the multiplier array means for providing the first input number to the multiplier array means;

adder means coupled to the first and second outputs of the multiplier array means to accumulate the intermediate sum bits and intermediate carry bits from each of the plurality of multiply cycles to provide a completed accumulation of the final product; and

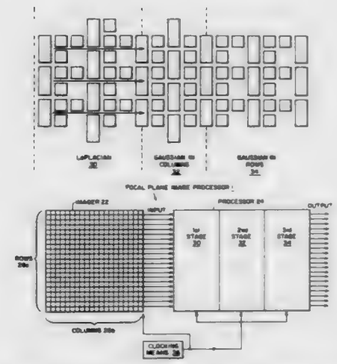
detection means coupled to the third output of the multiplier array means for receiving the portion of the final product for each of the plurality of multiply cycles and generating a Sticky-Bit which provides operand rounding precision information concurrent with providing the intermediate sum and carry bits of the multiplication to generate the Sticky-Bit before the final product is generated.

5,113,365

METHOD AND CHARGE COUPLED APPARATUS FOR ALGORITHMIC COMPUTATIONS

Woodward Yang, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 16, 1989, Ser. No. 352,765
Int. Cl.[5] G06G *7/00*; H01L *29/78*; H04N *3/14*
U.S. Cl. 364—807 **58 Claims**



1. A method of performing algorithmic computations on a set of data comprising the steps of:

a. inputting the set of data into a plurality of inputs as column vectors of a charge coupled device (CCD) array so that each piece of data in the set of data is encoded as a quantity of electric charge on the inputs; and

b. dividing, combining and delaying in sequential stages of the array of quantities of electric charge that encode adjacent pieces of data to produce data encoded as quantities of charge at outputs of the array.

5,113,366

FUZZY MEMBERSHIP FUNCTION CIRCUIT

Takeshi Yamakawa, Kumamoto, Japan, assignor to Omron Tateisi Electronics Co., Nagaokakyo, Japan

Division of Ser. No. 917,952, Oct. 14, 1986, Pat. No. 4,837,725. This application Mar. 14, 1989, Ser. No. 313,722
Claims priority, application Japan, Oct. 22, 1985, 60-234644
Int. Cl.[5] G06G *7/12*
U.S. Cl. 395—3 **6 Claims**

1. A fuzzy membership Z function circuit comprising:

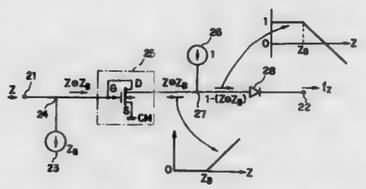
a first current source for producing current of a value relative to a break point,

a bounded-difference circuit for calculating a bounded difference by subtracting the output current of the first current source from an input current,

a second current source for giving a current representing a specified grade in fuzzy logic,

a subtraction circuit for subtracting the output current of the

bounded-difference circuit from the output current of the second current source. and



a diode function device for blocking a negative-direction current included in output currents from the subtraction circuit.

5,113,367

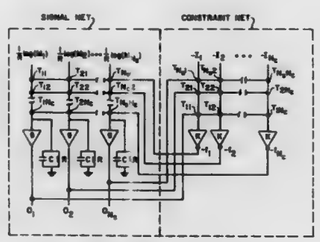
CROSS ENTROPY DECONVOLVER CIRCUIT ADAPTABLE TO CHANGING CONVOLUTION FUNCTIONS

Christie R. K. Marrian, Marbury, and Martin C. Peckerar, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 374,815, Jul. 3, 1989, abandoned. This application Jan. 31, 1990, Ser. No. 472,936

Int. Cl.[5] G06G *7/19, 9/00*

U.S. Cl. 364—819 **5 Claims**



1. A neural net comprising:

a signal net and a constraint net; wherein

said signal net comprises:

a plurality N_s of signal net legs, said signal net legs being numbered, respectively, from i=1 to N_S;

each of said signal net legs comprises an exponential amplifier of transfer function g;

the output of the ith of said signal net legs is O_i; and

wherein said constraint net comprises:

a plurality N_c of constraint net legs, said constraint net legs being numbered, respectively, from j=1 to N_C;

each of said constraint net legs comprising an amplifier of gain K;

the input of each of said signal net legs has a shunt impedance having a real component R,

wherein said neural net comprises feedback means for causing the output of the jth of said constraint net legs to be fed to the input of the ith of said signal net legs via a series transconductance $-T_{ij}$, and for causing O_j to be fed to the input of the jth of said constraint net legs via series transconductance T_{ij}, and

wherein said neural net further comprises means for causing an input to the ith of said signal net legs to be $(1/R)\log(M_i)$, M_i being the ith element of a preselected data set.

5,113,368

CIRCUIT FOR DELAYING AT LEAST ONE HIGH BIT RATE BINARY DATA TRAIN

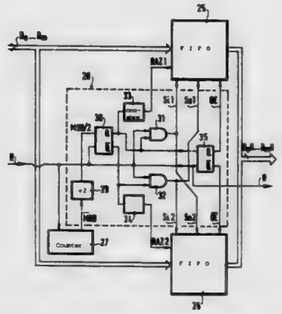
Michel Le Calvez, Boulogne Billancourt, and Michel Peruyero, Paris, both of France, assignors to Alcatel Thomson Faisceaux Hertziens, Paris, France

Filed Nov. 17, 1988, Ser. No. 273,469

Claims priority, application France, Nov. 18, 1987, 87 15945

Int. Cl.[5] G06F *5/06*

U.S. Cl. 395—250 **6 Claims**



1. A circuit for delaying at least one high bit rate data train for a delay period of T bit periods, said circuit comprising:

first and second mxn first-in-first-out (FIFO) registers, each said FIFO register capable of storing up to "n" "m"-bit input words and comprising:

a "reset" terminal responsive to a register initialization (RAZ) signal,

an "m" bit input terminal,

an "m" bit output terminal,

an output enable terminal responsive to an output enable (OE) signal,

a shift-in terminal for causing the m-bit input word currently appearing at said input terminal to be input to the FIFO register in response to m shift-in pulses (SI) appearing at said shift-in terminal, and

a shift-out terminal for causing the first m-bit word remaining in the FIFO register to be output from the "m" bit output terminal of the register in response to m shift-out (SO) pulses appearing at said shift-out terminal while said output enable signal is applied to said output enable terminal;

a common data input directly coupled to the input terminals of both the first and second FIFO registers;

a common data output directly coupled to the output terminals of both the first and second FIFO registers;

counter means response to a clock signal for delivering a synchronization (MSB/2) signal having a period equal to twice said delay period T, with T≦n bit periods, said clock signal operating at a bit rate substantially equal to that of the data input; and

a write/read control circuit responsive to said synchronization signal and to said clock signal for controlling input (writing) to and output (reading) from said FIFO registers and comprising

a first circuit for

alternatively supplying a sequence of m pulses derived from said clock signal

(a) to both the shift-in terminal of a first said FIFO register and the shift-out terminal of a second said FIFO register and

(b) to both the shift-out terminal of the first FIFO register and to the shift-in terminal of the second FIFO register, in order to thereby write in one of the two FIFO registers during a write stage of said one FIFO register while simultaneously reading from the other of the two FIFO registers during a read stage of said other register, and vice versa,

the first circuit comprising

shift-in timing logic responsive to the synchronization signal and the lock signal for alternately generating a first sequence of shift-in pulses Si1 at a first timing logic output and a second sequence of shift-in pulses Si2 at a second timing logic output with each of said sequences being delayed relative to said synchronization signal by one bit period of said clock signal, said first timing logic output being directly coupled both to the shift-in terminal of the first FIFO register and to the shift-out terminal of the second FIFO register and said second timing logic output being directly coupled both to the shift-out terminal of the first FIFO register and to the shift-in terminal of the second FIFO register,

whereby only one of said FIFO registers is in its write stage in which it is responsive to any input data words appearing at said common data input,

a second circuit for dynamically resetting an alternately selected one of said FIFO registers to zero after the synchronization signal changes state and immediately prior to the generation of a respective one of said delayed sequences of shift-in pulses by said fist circuit during a respective write stage, the second circuit comprising

initialization logic responsive to said synchronization signal for applying an initialization pulse to the reset terminal of the selected FIFO register immediately prior to the application of said respective sequence of shift-in pulses to the shift-in terminal of said selected FIFO register,

whereby each FIFO register is cleared of all data still remaining in the FIFO register at the end of its respective write stage, and

a third circuit for supplying a respective said output enable signal only to the non-selected one of said FIFO registers to enable data stored therein to be output therefrom during a "T" clock period read stage following a delay of "T" clock periods since the beginning of the write stage of said non-selected FIFO register, the third circuit comprising

output selection logic responsive to the clock signal and to the synchronization signal for alternately generating a first output enable signal associated with the first FIFO register and a second output enable signal associated with the second FIFO register, in synchronism with the generation of the respective sequences of shift-out pulses by said first circuit.

whereby only the FIFO register in which data delayed by said delay period T had been stored during an immediately prior read stage is enabled to output its thus-stored and delayed data onto said common data output free from interference from any data remaining in the other FIFO register.

5,113,369

32-BIT PERSONAL COMPUTER USING A BUS WIDTH CONVERTER AND A LATCH FOR INTERFACING WITH 8-BIT AND 16-BIT MICROPROCESSORS

Tsuneo Kinoshita, Kokubunji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 889,196, Jul. 25, 1986, abandoned. This application Sep. 6, 1989, Ser. No. 402,967

Claims priority, application Japan, Jul. 26, 1985, 60-165374

Int. Cl.[5] G06F *13/40, 13/00*

U.S. Cl. 395—325 **15 Claims**

3. A personal computer comprising:

a thirty-two-bit microprocessor;

a thirty-two-bit microprocessor bus;

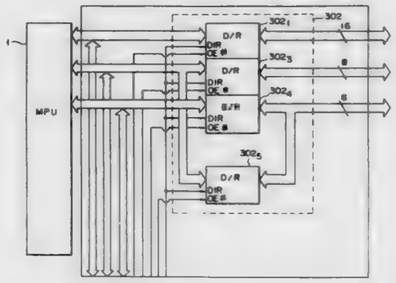
internal bus means for transferring data and addresses;

latch means, coupled to the microprocessor bus and to the internal bus means, for latching thirty-two-bit data from the microprocessor bus in the form of four right-bit data units;

a peripheral device;

I/O interface means, coupled to the internal bus means and to the peripheral device, for receiving data from the internal bus means and for controlling the peripheral device;

bus width converter means, coupled to the latch means and to the I/O interface means via the internal bus means, for



receiving data from the latch means, for selecting for output one of the four eight-bit data units received from the latch means to convert the bus width to eight bits, for selecting for output two of the four eight-bit data units received from the latch means to convert the bus width to sixteen bits, and for outputting the selected eight-bit data units to the I/O interface means;

wherein the microprocessor is compatible with eight- and sixteen-bit microprocessor software.

5,113,370

INSTRUCTION BUFFER CONTROL SYSTEM USING BUFFER PARTITIONS AND SELECTIVE INSTRUCTION REPLACEMENT FOR PROCESSING LARGE INSTRUCTION LOOPS

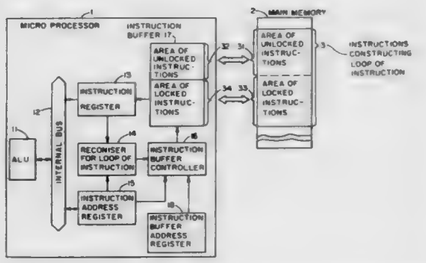
Hiroshi Tomita, Kanagawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 289,564

Claims priority, application Japan, Dec. 25, 1987, 62-327132

Int. Cl.[5] G06F *9/312, 9/40*

U.S. Cl. 395—375 **5 Claims**



1. An information processor connected to a main memory for storing instructions, comprising:

a buffer memory connected to said main memory for storing a part of said instructions stored in said main memory;

an execution unit connected to said buffer memory for executing said part of instructions stored in said main memory;

a buffer controller connected to said buffer memory and said execution unit, including:

recognizing means connected to said execution unit for recognizing particular instruction words forming a loop of instructions and estimating the loop of instructions by using the instruction words, said recognizing means further recognizing a result that the loop of instructions are to be executed repeatedly by said execution unit and comprise a range greater than a size of said buffer memory;

dividing means connected to said recognizing means and said buffer memory for dividing said buffer memory into a first portion and a second portion, responsive to the recognizing means; and,

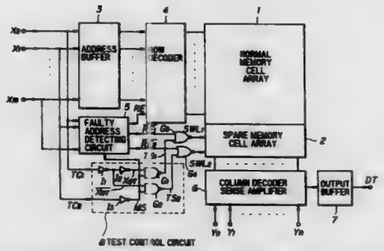
control means connected to said recognizing means, said dividing means and said buffer memory, for controlling said first portion so that said first portion locks against replacement a first part of the instructions in said loop recognized by said recognizing means during the execution of said loop by said execution unit, and for controlling said second portion so that said second portion stores a second part of the instructions in said loop exclusive of said instructions stored in said first portion.

5,113,371

SEMICONDUCTOR MEMORY APPARATUS WITH A SPARE MEMORY CELL ARRAY

Mitsuhiro Hamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 26, 1990, Ser. No. 557,841
Claims priority, application Japan, Jul. 26, 1989, 1-194948
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—200 **3 Claims**



1. A semiconductor memory apparatus with a spare memory cell array, comprising:

a normal memory cell array including normal memory cells arranged in a predetermined pattern, data being written into said normal memory cells and read therefrom;

a spare memory cell array including spare memory cells arranged in a predetermined pattern, data being written into at least one of said spare memory cells and read therefrom, when at least one of said normal memory cells is faulty;

terminals for supplying an address signal to an address signal decoder for said normal memory cell array;

an address buffer for holding said address signal to be supplied to said decoder;

a faulty address detecting circuit for generating a selecting signal to select said at least one of said spare memory cells, when said address signal held by said address buffer is an address of a faulty normal memory cell; and

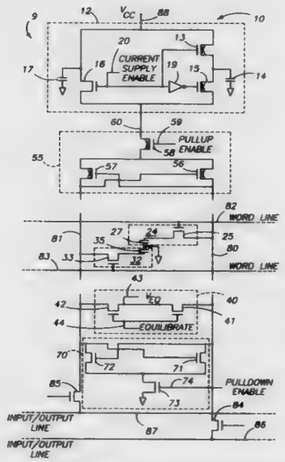
a test control circuit for selecting said spare memory cells to be enabled for writing and reading of data, and inhibiting said normal memory cells to be enabled by receiving a test control signal supplied from said terminals, said test control signal being of a logic level different from that of said address signal.

5,113,372

ACTIVELY CONTROLLED TRANSIENT REDUCING CURRENT SUPPLY AND REGULATION CIRCUITS FOR RANDOM ACCESS MEMORY INTEGRATED CIRCUITS

Gary M. Johnson, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jun. 6, 1990, Ser. No. 533,887
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—205 **25 Claims**



19. A random access memory integrated circuit, comprising:

an array of memory cells each having an access switch which controls current flow to and from a storage capacitor; said memory cells being arranged on rows and columns;

a plurality of electrically conductive word lines, the word lines being connected to a control terminal of the access switch of a plurality of memory cells in a row;

a plurality of electrically conductive bit lines which are controllably connected by the access switches of a plurality of memory cells to the storage capacitors of such memory cells;

a plurality of sense amplifiers each connected to at least one bit line to provide current thereto; said sense amplifiers being operated to demand current during a sense amplifier current demand period which forms a limited part of an operational cycle period of the random access memory integrated circuit;

an electrical supply for providing electrical current used by the sense amplifiers;

a plurality of current supply circuits for controlling current demanded from the electrical supply and for controllably supplying current to the sense amplifiers; said current supply circuits each including:

at least one first energy storage device connected to receive charging current from the electrical supply, and to discharge sense amplifier operating current to the sense amplifier during at least portions of the sense amplifier current demand period;

at least one first current control device for controlling discharge of sense amplifier operating current from the at least one first energy storage device to the sense amplifier; and

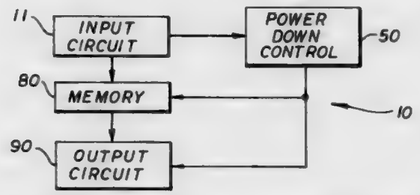
at least one current limiting device connected between the first energy storage device and the electrical supply to limit current demanded from the electrical supply.

5,113,373

POWER CONTROL CIRCUIT

Douglas J. Lee, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 6, 1990, Ser. No. 563,061
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—227 **12 Claims**



1. A power control circuit for a device having a latching circuit comprising:

sensing means for detecting an address transition signal to said device and providing a first signal in response thereto and

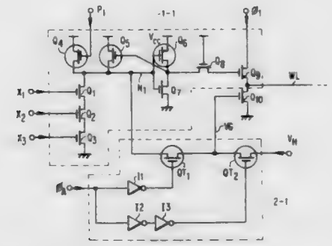
sequencer means in communication with said sensing means for providing a plurality of control signals in response to said first signal including an equalization signal for equalizing signals within said device, a charge signal for enabling said latching circuit and a latch signal for commanding said latching circuit to latch, whereby said plurality of control signals minimize power consumption within said device.

5,113,374

MOS TYPE SEMICONDUCTOR MEMORY DEVICE HAVING A WORD LINE RESETTING CIRCUIT

Yoshinori Matsui, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 30, 1990, Ser. No. 574,729
Claims priority, application Japan, Aug. 30, 1989, 2-226080
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—227 **6 Claims**



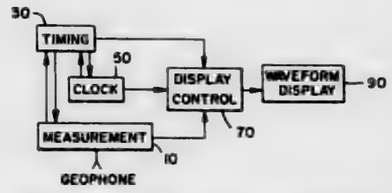
1. A MOS type semiconductor memory device comprising a word line; a plurality of digit lines; a plurality of memory cells coupled to said word line and digit lines; precharge means for precharging said digit lines during a precharge period; a logic decoding circuit having a first output end generating a first logic signal and a second output end generating a second logic signal complementary to said first logic signal, said first and second logic signals swinging between a first voltage and a reference voltage; a drive MOS transistor having a source-drain current path coupled between said word line and a first node to which a driving voltage is applied during an active period; first means for supplying a gate of said drive transistor with said first logic signal; a reset MOS transistor having a source-drain current path coupled between said word line and a second node to which said reference voltage is applied; and a control circuit for controlling said reset MOS transistor, said control circuit including a first switch element coupled between a gate of said reset MOS transistor and a third node to which a second voltage is applied, said second voltage having an intermediate voltage between said first voltage and said reference voltage, a second switch element coupled between the gate of said reset MOS transistor and said second output end of said logic decoding circuit, second means for rendering said first switch element conductive during said precharge period and non-conductive during said active period, and third means for rendering said second switch element conductive during said active period and non-conductive during said precharge period.

5,113,375

METHOD AND APPARATUS FOR TESTING GEOPHONES

Leslie Jones, Jr., Houston, Tex., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 525,369, May 17, 1990, abandoned, which is a continuation of Ser. No. 666,950, Oct. 31, 1984, abandoned. This application Nov. 19, 1990, Ser. No. 615,564
Int. Cl.[5] G01V *13/00*
U.S. Cl. 367—13 **3 Claims**



1. Apparatus for testing the polarity of a geophone having a top and a bottom comprising:

means for measuring the response of a geophone to an applied electrical stimulus and a mechanical impulse to the top or the bottom of the geophone;

means, coupled to said means for measuring and to a means for controlling the display of a waveform representation of geophone response data, for timing the measurement and display of geophone response data;

means, coupled to said means for measuring, for storing geophone response data for the extruded or delayed display thereof;

a waveform display coupled to said means for storing;

means for adjusting a left to right spread; and

means for adjusting an amplitude operably connected to said waveform display, so that it can be determined whether the displayed waveform has a first break that is negative going or is positive going.

5,113,376

METHOD FOR CONDUCTING SEISMIC SURVEYS IN WATERS COVERED WITH ICE

Rolf Bjerkoy, Melsomvik, Norway, assignor to Geco A.S., Stavanger, Norway

Filed Feb. 15, 1991, Ser. No. 657,062
Claims priority, application Norway, Apr. 9, 1990, 901616
Int. Cl.[5] G01V *1/38*
U.S. Cl. 367—15 **3 Claims**

1. A method for conducting seismic surveys in waters covered with ice, wherein seismic impulses are actuated under water and seismic signals are detected by a streamer cable towed behind a vessel having a screw propulsion system, comprising:

stopping said vessel to eliminate noise produced by the vessel breaking up ice while carrying out the seismic survey;

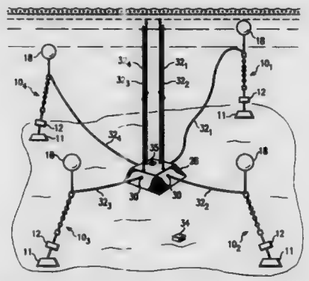
hauling in said streamer cable onto said vessel at a speed

corresponding to a predetermined advancing speed for carrying out the detection of the seismic signals;
operating said vessel to resume normal speed; and



paying out said streamer cable from said vessel at a speed for maintaining said predetermined advancing speed.

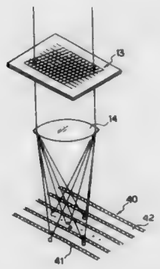
5,113,377
RECEIVER ARRAY SYSTEM FOR MARINE SEISMIC SURVEYING
Peter C. Johnson, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed May 8, 1991, Ser. No. 697,637
Int. Cl.[5] G01V *1/38*
U.S. Cl. 367—20 **20 Claims**



1. A system for receiving seismic energy in a marine seismic survey, comprising:
a first sensor array, comprising:
a cable, having first and second ends;
a plurality of hydrophones, each coupled to said cable along its length;
a floatation device coupled to the first end of said cable; and
an anchor, coupled to the second end of said cable; and
a positioning anchor;
a first tensioning cable, extending from said positioning anchor and connected to said first end of said cable, for defining the angle of said first sensor array relative to the vertical according to the length of said tensioning cable between the positioning anchor and said first sensor array.

5,113,378
OPTICAL TRACKING SYSTEM FOR AN OPTICAL RECORDING ARRANGEMENT WITH PLURALITY OF BEAMS
Fumio Kimura, Tokyo, Japan, assignor to Kabushiki Kaisha CSK, Tokyo, Japan
PCT No.: PCT/JP89/00403 § 371 Date: Jan. 2, 1990 § 102(e) Date: Jan. 2, 1990
PCT filed Apr. 20, 1989, Ser. No. 474,087
Claims priority, application Japan, Apr. 20, 1988, 63-97822
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.37 **4 Claims**

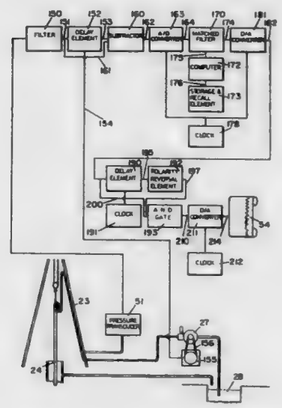
1. A tracking system for an optical recording arrangement with means for selected recording and reading data by directing laser beams to an optical recording medium with at least two sets of track guides, comprising: an optical head for generating a main laser beam directed to said recording medium for said selected recording and writing of data, said optical head generating also at least two sets of tracking beams; means for positioning a first set of said tracking beams on a first set of said track guides; means for positioning a second set of said tracking beams on a second set of said track guides for increasing reliability of operation of said tracking system; tracking detection means having an output with a tracking error signal when said first set of track guides have a defect detected by said tracking detection means; and switching means in said tracking detection means for switching from a tracking error signal detected from the first set of tracking beams to a tracking error signal detected from the second set of tracking beams when



said first set of track guides have a defect determined from a change in reflected light of the first tracking beams; a tracking error signal detected from said second set of tracking beams becoming operative only after said tracking detection means detects a defect on said first set of track guides; a tracking error signal detected from said first set of tracking beams becoming inoperative after switching to a tracking error signal detected from said second set of tracking beams for making a tracking error signal detected from said second set of tracking beams operative.

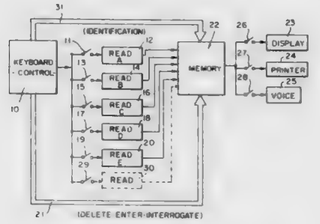
5,113,379
METHOD AND APPARATUS FOR COMMUNICATING BETWEEN SPACED LOCATIONS IN A BOREHOLE
Serge A. Scherbatskoy, 3921 Clayton Rd. E, Fort Worth, Tex. 76116
Continuation of Ser. No. 148,091, Jan. 26, 1988, abandoned, which is a continuation of Ser. No. 38,309, Apr. 14, 1987, abandoned, which is a division of Ser. No. 858,161, Apr. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 383,269, May 28, 1982, Pat. No. 4,520,468, which is a continuation of Ser. No. 68,526, Aug. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 857,677, Dec. 5, 1977, abandoned. This application Feb. 16, 1990, Ser. No. 383,285
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—83 **11 Claims**

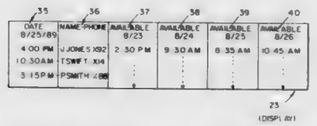
1. In a borehole drilling arrangement employing a fluid circulation system and drill pipe containing a column of fluid, the method of controlling from a surface location the operation of a downhole apparatus by transmitting pressure signals through a signal transmission channel formed by the column of fluid comprising the steps of:
using a source of independent energy which is independent of the flow of fluid in said circulation system for generating at a surface location in the column of fluid and transmitting to the downhole apparatus a succession of code formatted fluid pressure changes;
receiving said pressure changes at the downhole apparatus and producing electrical signals responsively thereto; and
utilizing said electrical signals to control the downhole apparatus said pressure changes being generated in the column of fluid by said source of independent energy



irrespective of the circulation of fluid through the drill pipe.

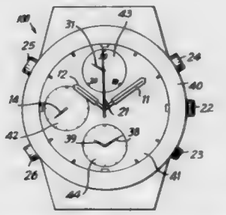
5,113,380
MULTIPLE OPTION ELECTRONIC SCHEDULER AND RESCHEDULER
Alfred B. Levine, P.O. Box 15968, Chevy Chase, Md. 20815
Filed Aug. 24, 1989, Ser. No. 397,914
Int. Cl.[5] G04B *47/00, 19/24;* H04M *1/64*
U.S. Cl. 368—10 **18 Claims**





1. An electronic rescheduler for more efficiently rescheduling a prior appointment to a new appointment time comprising:
a memory for storing plural daily time appointments each day for a multiday time period,
multiple differently configured interrogating circuits for the memory,
manually operated switching means for independently selecting different ones of said interrogating circuits,
each such interrogating circuit accessing the memory for a different unequal, fractional portion of a selected time period than the other interrogating circuits, and excluding the accessing of the memory for other periods within the selected daily time period, thereby to more efficiently locate a new time-of-day for a rescheduled appointment,
means entering into the rescheduler the prior appointment to be rescheduled,
read-out means responsive to the selected interrogating circuit for reading-out and communicating the free time slots that are available for a rescheduled appointment, from the accessed portion of the memory,
cancelling means for cancelling the prior appointment and entering a new rescheduled appointment into the memory chosen from the free time slots that are communicated as being available.

5,113,381
MULTIFUNCTION ELECTRONIC ANALOG TIMEPIECE
Kenji Sakamoto; Akihiko Maruyama; Tatsuo Moriya; Hiroshi Yabe; Takashi Kawaguchi, and Masato Yoshino, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Division of Ser. No. 368,545, Jun. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 340,620, Apr. 19, 1989, Pat. No. 5,016,231. This application May 31, 1991, Ser. No. 710,189
Int. Cl.[5] G04B *23/02, 19/04*
U.S. Cl. 368—74 **7 Claims**

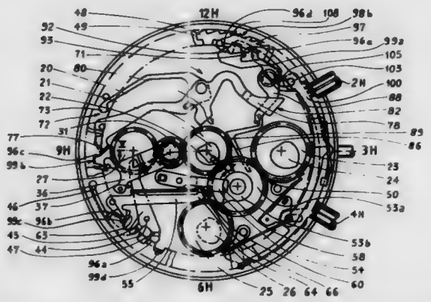


1. A multifunction electronic analog timepiece comprising at least one indicator for displaying at least two time keeping functions, means for driving at least one indicator, an alarm means, said time keeping functions including at least ordinary 12 hour time and an alarm, said at least one indicator indicating both an alarm set time and ordinary 12 hour time, and alarm controlling means for causing said indicator to indicate current 12 hour time when an alarm time is not set, indicate the alarm set time once the alarm time is set, and indicate the current 12 hour time and release the alarm time from being set once the alarm means has been activated.

5,113,382
CHRONOGRAPH WATCH
Alphonse Bron, Bassecourt, Switzerland, assignor to Eta SA Fabriques d'Ebauches, Granges, Switzerland
Filed Apr. 15, 1991, Ser. No. 684,780
Claims priority, application Switzerland, Apr. 12, 1990, 1261/90
Int. Cl.[5] G04F *7/00, 8/00*
U.S. Cl. 368—106 **8 Claims**

1. A chronograph watch having a chronograph mechanism comprising gears, a first push button controlling the starting and stopping of the chronograph and acting on a start and stop lever, a second push button controlling the reset to zero of the chronograph and acting on a reset-to-zero lever, a start and stop cam and a reset-to-zero cam, both such cams being constituted by superposed concentric rings arranged at the periphery of the watch movement, both such cams respectively exhibiting ratchet teeth or notches on their outer periphery on which

act two levers to drive such cams in rotation, and both such cams respectively exhibiting teeth or notches on their inner



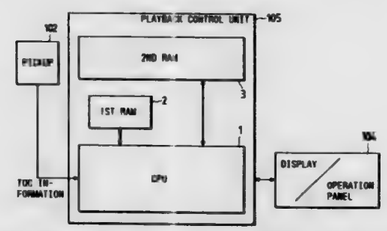
periphery acting on control levers for the gearing constituting the chronograph mechanism.

5,113,383

INFORMATION REPRODUCING SYSTEM AND METHOD

Naomi Amemiya; Koji Yamagishi; Kunio Matsumoto, and Naoki Masaki, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 13, 1990, Ser. No. 479,808
Claims priority, application Japan, Feb. 13, 1989, 1-34297
Int. Cl.[5] G11B *17/22, 17/26*
U.S. Cl. 369—33 **3 Claims**



1. An information reproducing system for playing back a group of recording mediums according to programmed information, each recording medium having recorded information to be reproduced and Table of Contents (TOC) information with respect to the recorded information, said information reproducing system comprising:

means for reading the TOC information of the recording mediums before the recorded information is reproduced;

information storing means for storing the TOC information and programmed information which indicates a sequence according to which the recorded information of the recording mediums is to be reproduced, wherein said storing means comprises a first RAM having a play area in which reproducing data are stored and a second RAM having a current magazine memory area for storing playback control information corresponding to said group of recording mediums;

recording medium group checking means for determining the group of recording mediums based on the TOC information;

program reading means for reading the programmed information from said information storing means corresponding to the group determined by said recording medium group checking means; and

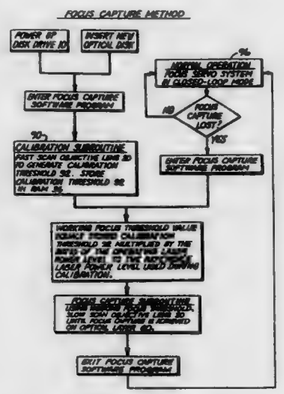
playback control means for controlling playback operation of the recording mediums based on the read programmed information, said playback control means comprising programmed information checking means for determining whether there is new programmed information in said play area corresponding to said group of recording mediums, and, if there is new programmed information, for controlling the playback operation of the recording mediums based on the new programmed information stored in said play area, wherein said first RAM has a plurality of registering memory areas having the same structure as that of the current magazine memory area, end each of said play area, current magazine memory area and registering memory areas has a condition checking data area for checking conditions of said second RAM and reproducing process, a magazine indentification data, a TOC information registering area and a program area.

5,113,384

FOCUS CAPTURE METHOD FOR MAGNETO-OPTIC DISK DRIVES

James C. McDonald, Black Forest, and Gregory V. Hofer, Colorado Springs, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 25, 1989, Ser. No. 411,706
Int. Cl.[5] G11B *7/95*
U.S. Cl. 369—44.29 **25 Claims**



1. A method for obtaining focus capture in an optical disk drive having a focus servo system with a servo loop and operable in open and closed loop modes, including:

opening the servo loop and operating the servo system in the open-loop mode;

scanning an objective lens about a focus axis with respect to an optical disk at a calibration velocity;

peak detecting focus error signals produced while the lens is scanned at the calibration velocity to determine a peak focus error signal value;

storing a calibration threshold value as a function of the peak focus error signal value;

scanning the objective lens about the focus axis at a focus capture velocity;

comparing the focus error signal values produced while the lens is scanned at the focus capture velocity to the calibration threshold value; and

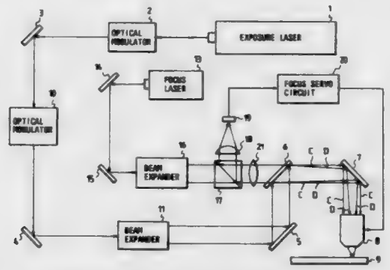
closing the servo loop and operating the focus servo system in the closed-loop mode when the focus error signal values reach the calibration threshold value.

5,113,385

OPTICAL DISK CUTTING APPARATUS

Seichi Osawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 3, 1990, Ser. No. 547,356
Claims priority, application Japan, Nov. 10, 1989, 1-293721
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.37 **7 Claims**



1. An optical disk cutting apparats comprising:

an exposure optical system including means for expanding an exposure laser beam radiated from an exposure laser generating means so as to make the expanded exposure laser beam incident to an objective lens and means for modulating said exposure laser beam in response to a signal to be recorded onto a master recording disk, said laser beam being modulated prior to contacting said objective lens, and

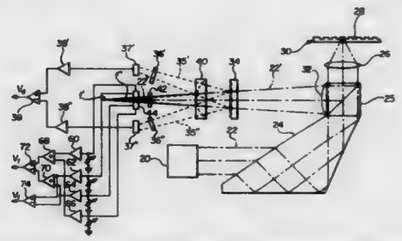
a focus servo optical system including means for expanding a focus servo laser beam radiated form a focus servo laser generating means so as to make the expanded focus servo laser beam incident to said objective lens and means for detecting said focus servo laser beam reflected from said master recording disk through a polarizing means, wherein the one of said exposure and focus-servo optical systems having a laser beam wave length longer than that of the other system includes a focusing means provided in a stage preceding said objective lens.

5,113,386

FOCUS AND TRACKING ERROR DETECTOR APPARATUS FOR OPTICAL AND MAGNETO-OPTICAL INFORMATION STORAGE SYSTEMS

Frank R. Whitehead, Orangevale, and Alan B. Marchant, San Jose, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 30, 1989, Ser. No. 428,806
Int. Cl.[5] G11B *13/04*
U.S. Cl. 369—44.41 **6 Claims**



1. Focus and tracking error detector apparatus for an optical information storage system comprising:

means for scanning a focused optical beam on information tracks of an optical recording element to produce a read-out beam comprised of a zeroth order beam and plus and minus first order cross-track diffracted beams;

means for shaping the readout beam into an elongated beam having a major axis aligned with the first order diffracted beams in the direction of cross-track diffraction on the recording element and a minor axis orthogonal thereto;

photosensitive detector means positioned in the far field of the readout beam and centered on the central axis of the readout beam, said detector means comprised of two elongated side detector elements, the elongated dimensions of which are parallel with the major axis of the readout beam, said side detector elements being separated in the direction of the minor axis of the readout beam by two elongated central detector elements, the elongated center lines of which are aligned with the major axis of the readout beam, said detector elements all lying in a common plane orthogonal to the propagation direction of the readout beam;

first electronic circuit means coupled to said detectors for deriving a focus error signal equal to the sum of the outputs of the two side detector elements minus the sum of the outputs of the two central detector elements;

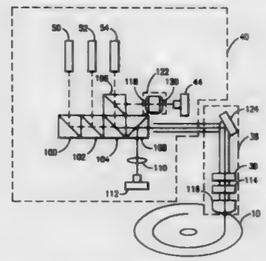
and second electronic circuit means coupled to said central detector elements for deriving a tracking error signal equal to the difference between the outputs of the two central detector elements.

5,113,387

THREE LASER OPTICAL DISK DRIVE SYSTEM

Paul Goldsmith, Bethesda, and William R. A. Ziegler, Germantown, both of Md., assignors to Optex Corporation, Rockville, Md.

Filed Dec. 12, 1989, Ser. No. 449,002
Int. Cl.[5] G11B *7/095*
U.S. Cl. 369—44.38 **18 Claims**



1. An erasable optical disk drive system utilizing a storage media and a plurality of lasers for use in performing the read, write, focus and tracking functions of said erasable optical disk drive system, comprising:

a. an erasable optical disk utilizing photoluminescent material for the storage media;

b. a first laser generating a first laser beam having a peak at a first wavelength for reading data from said storage media;

c. a second laser generating a second laser beam having a peak at a second and different wavelength for writing data to said storage media; and

d. a third laser generating a third laser beam having a peak at a third and different wavelength for use in performing the focus and tracking functions of said erasable optical disk drive system.

5,113,388

CENTERING MECHANISM FOR AUTOMOTIVE DISK PLAYER

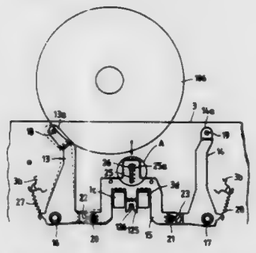
Yoshinori Yamada; Kiyoshi Morikawa; Masakazu Kurumada; Kazuo Kobayashi, and Masanori Sugihara, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 15. 1990, Ser. No. 480,457

Claims priority, application Japan, Feb. 16, 1989, 1-34972; Feb. 21, 1989, 1-41129; Feb. 27, 1989, 1-46100; Mar. 3, 1989, 1-52604; Mar. 3, 1989, 1-52605

Int. Cl.[5] G11B *25/04, 17/04*

U.S. Cl. 369—270 **2 Claims**



1. A vehicle disk player in which a disk is inserted through a disk inserting opening, said disk being fixedly mounted on a turntable by a clamper arm when conveyed to a predetermined position in said player, said turntable being rotated for reproduction of data recorded in said disk, said vehicle disk player comprising reproducing means including said clamper arm and said turntable, and damper means for supporting said reproducing means in a floating manner, said vehicle disk player further comprising: a centering mechanism for positioning said disk at the middle of said disk inserting opening in a lengthwise direction of said disk inserting opening with two centering arms, said centering arms being arranged out of range of vibration of said disk which is fixedly mounted on said turntable supported in a floating manner; said centering mechanism further comprising a centering lever directly coupled to and disposed between said two centering arms, said centering lever being disposed for movement in a direction toward and away from said disk inserting opening, so as to permit a rocking motion of said two centering arms when a periphery of said disk inserted into said disk inserting opening abuts against abutting portions of said two centering arms simultaneously to rock said centering arms to move the abutting portions away from each other, and to lock, when the periphery of said disk inserted into said disk inserting opening abuts against the abutting portion of only one of said centering arms, the rocking motion of said one centering arm.

5,113,389

NOISE CANCELLATION

Simon A. Cox, Woodbridge, England, assignor to British Telecommunications public limited company, London, United Kingdom

Continuation of Ser. No. 508,536, Apr. 11, 1990, abandoned, which is a continuation of Ser. No. 257,166, Oct. 11, 1980, abandoned, which is a continuation of Ser. No. 823,259, Jan. 28, 1986, abandoned. This application Mar. 18, 1991, Ser. No. 673,151

Claims priority, application United Kingdom, Jan. 29, 1985, 8502182; Jun. 18, 1985, 8515371

Int. Cl.[5] H04J *3/00*

U.S. Cl. 370—32.1 **86 Claims**

1. Noise cancellation apparatus in a system for cancelling noise in an input signal comprising:

a signal processor arranged to receive from a noise source a signal related to noise present in said input signal,

said signal processor including means to produce a cancellation signal substantially corresponding to said noise and means for subtractively combining said cancellation signal with said input signal,

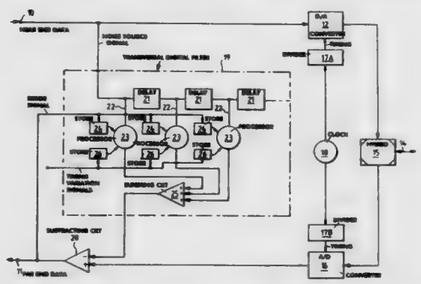
said noise source including:

a signal converter,

means for timing the operation of the signal converter by recurring timing pulses, and

means connected to said timing means for incrementally changing the phase of said timing pulses and for producing a shift signal indicative of each of said incremental phase changes and for applying said shift signal to said processor so as to provide said processor with a shift signal indicative of each timing variation occurring in said source,

said processor including means responsive to each said shift signal for effecting a compensatory variation in said cancellation signal corresponding to said incremental phase changes.



5,113,390

DATA TRANSFER NETWORK SUITABLE FOR USE IN A PARALLEL COMPUTER

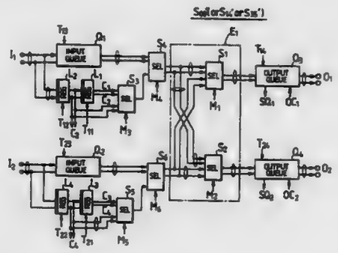
Takehisa Hayashi, B7-1, 1473, Jousuihoncho, Kodaira-shi, Tokyo; Koichiro Omoda, 4-15-3 Fuchinobehoncho, Sagamihara-shi, Kanagawa; Teruo Tanaka, D408, 2-32, Koyasucho, Hachioji-shi, Tokyo; Naoki Hamanaka, 3-19-18 Minamiohizumi, Nerima-ku, Tokyo, and Shigeo Nagashima, 1200-13, Katakuracho, Hachioji-shi, Tokyo, all of Japan

Continuation of Ser. No. 224,894, Jul. 27, 1988, Pat. No. 4,918,686. This application Apr. 10, 1990, Ser. No. 508,065

Claims priority, application Japan, Jul. 27, 1987, 62-185479

Int. Cl.[5] H04Q *11/04*

U.S. Cl. 370—65 **42 Claims**



1. A computer system, comprising:

(a) a plurality of processors each being assigned an address having first and second address portions the plurality of processors arranged into processor groups, each group being of a first kind, and the plurality of processors further arranged into processor groups, each group being of a second kind;

(b) a plurality of switch circuits each provided for and connected to a corresponding one of the plurality of processors;

(c) a first group of transfer networks each connected to a corresponding first group of switch circuits within the plurality of switch circuits, each transfer network concurrently transferring different data, provided respectively by plural switch circuits of the first group of switch circuits, to other ones of the first group of switch circuits,

wherein the first switch circuit group comprises part of the plurality of the switch circuits provided for processors belonging to a corresponding processor group of a first kind, and

wherein each processor group of the first kind includes processors having addresses which have mutually different values for first address portions thereof and a mutually same value for second address portions thereof;

(d) a second group of transfer networks each connected to a corresponding second group of switch circuits within the plurality of switch circuits, each transfer network concurrently transferring different data provided respectively by plural switch circuits of the second group of switch circuits, to other ones of the second group of switch circuits,

wherein the second switch circuit group comprises part of the plurality of the switch circuits, provided to a corresponding processor group of a second kind, and

wherein each processor group of the second kind includes processors having addresses which have a mutually same value for first address portions thereof and mutually different values for second address portions thereof; and

(e) each of the plurality of switch circuits transferring data provided by an arbitrary one of a plurality of members connected to the switch circuit to an arbitrary another member thereof, wherein the members are defined as, (1) one of the plurality of the processors to which the switch circuit is connected, (2) one of the first group of transfer networks, connected to the switch circuit, and (3) one of the second group of transfer networks, connected to the switch circuit.

5,113,391

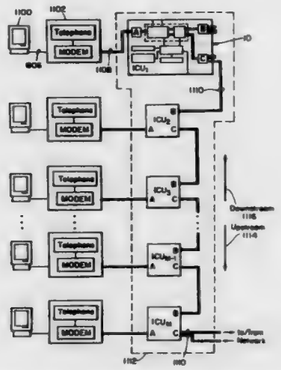
INTELLIGENT CHANNEL UNIT

Dev V. Gupta, Flemington; Y. Brian Chen, Somerville, and Joel T. Tarantino, Kendell Park, all of N.J., assignors to Integrated Network Corporation, Bridgewater, N.J.

Filed Jul. 20, 1990, Ser. No. 556,010

Int. Cl.[5] H04J *3/22, 1/16, 3/14*

U.S. Cl. 370—84 **44 Claims**



1. A communication system wherein a plurality of end user stations are each coupled by communication lines to a communication port of one of a plurality of intelligent channel units that processes data from either a first data stream carrying data bytes in one direction or a second data stream carrying data bytes in the reverse direction, each said channel units comprising:

a) first, second and third communication ports wherein end user equipment is coupled to said first port and the remaining ports of said unit are coupled in a chain to ports of other such units to form a cascade connection ending with a remote end unit, such that the third port of a first unit is coupled to the second port of a second unit, and so on, with the exception of units located at ends of this cascade, said remote end unit having one of said second port or said third port coupled to a less remote unit; and

b) data processing circuitry for interconnecting said ports and for processing data on said streams, comprising a programmable processing circuit, a controller means and a memory device, in which the controller means reads data bits stored in the memory device to program the programmable processing circuit with a desired interconnection circuit configuration and directs the functional operation of the programmable processing circuit.

5,113,392

COMMUNICATION APPARATUS FOR REASSEMBLING PACKETS RECEIVED FROM NETWORK INTO MESSAGE

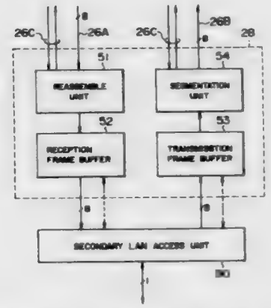
Yoshihiro Takiyasu, Higashimurayama; Mitsuhiro Yamaga, Kawasaki; Kazunori Nakamura, Hadano; Eiichi Amada, Tokyo; Hidehiko Jusa, Higashimurayama; Naoya Kobayashi, Hachiuji; Osamu Takada, Sagamihara; Satoru Hirayama, Yokohama, and Tatsuhito Iiyama, Hadano, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Jun. 18, 1990, Ser. No. 539,961

Claims priority, application Japan, Jun. 19, 1989, 1-154599

Int. Cl.[5] H04J *3/26*

U.S. Cl. 370—85.15 **8 Claims**



1. A communication apparatus for receiving a plurality of fixed length packets transmitted from a plurality of transmission source apparatus, and reassembling a communication message from a plurality of packets having the same transmission source address, each packet having a header field including a transmission source address and a message information field including an information block obtained by segmenting a message, comprising:

a buffer memory divided into a plurality of memory blocks for storing packet data;

first memory means for storing addresses each indicating a vacant memory block within said buffer memory;

second memory means for storing next address pointers correspondingly with each transmission source address, each next address pointer indicating a memory block in which the data of a packet to be received next are stored;

third memory means for storing addresses correspondingly with each transmission source address, each address indi-

cating a memory block in which the packet data including the first information block of a message are stored;

fourth memory means for storing addresses correspondingly with each transmission source address, each address indicating a memory block stored in which are the packet data including the first information block of a message allowed to be reassembled;

write control means which operates such that when there is received a packet including the first information block of a message transmitted upon segmentation into a plurality of information blocks, an address read from said first memory means is stored in said third memory means, the data of said received packet are stored in a vacant memory block indicated by said address, and another address read from said first memory means is stored in said second memory means and in said memory block storing said packet data; and

that when there is received a packet including one of the second and following information blocks of said message, the data of said received packet are stored in a memory block indicated by an address read from said second memory means, if said received packet does not include the last information block of said message, an address read from said first memory means is stored in said second memory means and in said memory block storing the data of said received packet, and if said received packet includes the last information block of said message, an address read from said third memory means is stored in said fourth memory means; and

read control means which operates such that the first information block of a message is read from the memory block indicated by an address read from said fourth memory means, and the second and following information blocks of said message are sequentially read in accordance with next address pointers read from respective memory blocks.

5,113,393

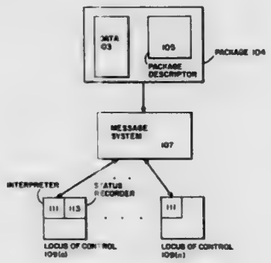
APPARATUS FOR DISTRIBUTING DATA PROCESSING

John Kam, Concord; Lee M. Truchon, Andover; Thomas C. Goodale, Reading, and John T. Dalton, Chelmsford, all of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Continuation-in-part of Ser. No. 944,500, Dec. 19, 1986, Pat. No. 4,932,026. This application Apr. 3, 1990, Ser. No. 504,145

Int. Cl.[5] H04J *3/24*

U.S. Cl. 370—94.1 **18 Claims**



1. In a digital data processing system having a first plurality of loci of control, apparatus for distributing the processing of data across the loci comprising;

a package having (i) data to be processed, and (ii) a processing descriptor including an indication of a type of the package independent of the data to be processed;

means for routing the package to a second plurality of the first plurality of loci according to the type of the package; and

interpreter means in each locus of the second plurality of loci for processing the data according to the type of the package as indicated by the processing descriptor of the package.

5,113,394

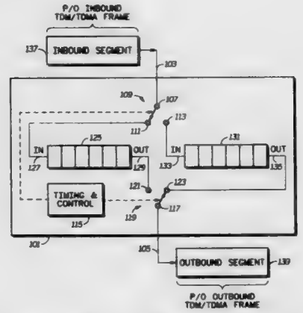
METHOD FOR REPEATING TDM/TDMA FRAMES

Michael D. Kotzin, Buffalo Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 26, 1989, Ser. No. 371,476

Int. Cl.[5] H04J *3/06*

U.S. Cl. 370—97 **24 Claims**



1. A TDM/TDMA radio repeater for repeating TDM/TDMA radio frames utilizing consecutive TDM/TDMA radio frames, said radio repeater having means for repeating an inbound TDM/TDMA radio frame based at least in part on the inbound TDM/TDMA radio frame immediately preceding, each inbound TDM/TDMA radio frame comprising p inbound slots, each inbound slot comprising k inbound message segments i_1–i_k, i_1 the first, i_k the last, said means comprising:

means for transmitting an outbound TDM/TDMA radio frame comprising p outbound slots, each outbound slot generally synchronized or coincident with the corresponding inbound slot,

each outbound slot comprising k outbound message segments o_1–o_k, o_1 the first, o_k the last,

each outbound slot outbound message segment o_2–o_k based at least in part on the corresponding inbound slot inbound message segment i_1–i_{k-1} of like order so that o_2 is based on i_1, o_3 is based on i_2, and so forth, with o_k based on i_{k-1},

each outbound slot outbound message segment o_1 based at least in part on the corresponding inbound slot inbound message segment i_k of said inbound TDM/TDMA radio frame immediately preceding.

5,113,395

FRAME PHASE ALIGNING SYSTEM USING A BUFFER MEMORY WITH A REDUCED CAPACITY

Kurenai Murakami, and Tutomu Murase, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 14, 1990, Ser. No. 582,567

Claims priority, application Japan, Sep. 14, 1989, 238502

Int. Cl.[5] H04J *3/06*

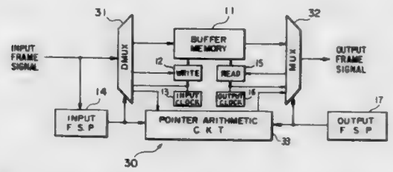
U.S. Cl. 370—102 **6 Claims**

1. A method for phase-aligning a time-division multiplexed signal as an input frame signal to an output frame synchronous signal to produce an output frame signal, a frame format of said input frame signal consisting of an input subframe portion carrying a plurality of channel signals and an input overhead portion carrying a transport overhead signal for controlling transport of said channel signals, said input overhead portion

comprising an input frame synchronous signal, said method comprising steps of:

separating said input overhead portion as a separated overhead portion from said input frame signal, said channel signals of said input subframe portion being sequentially stored in a buffer memory as stored channel signals;

making an output overhead portion determined by as phase difference between said input and said output frame synchronous signals in response to said separated overhead portion;



delivering said output overhead portion into a portion in said output frame signal in response to said output frame synchronous signal; and

reading said stored channel signals from said buffer memory as read channel signals to deliver said read channel signals into the remaining portion in said output frame signal, so that said output frame signal consists of said output overhead portion and an output subframe portion carrying said read channel signals.

5,113,396

INTERFACE FOR ISDN CHANNELS

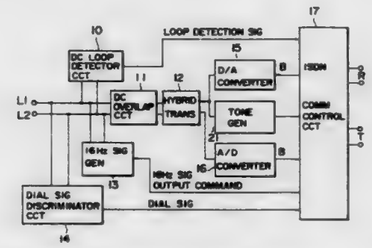
Naoto Kagami, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 192,542, May 11, 1988, abandoned. This application Dec. 6, 1990, Ser. No. 622,281

Claims priority, application Japan, May 15, 1987, 62-118513

Int. Cl.[5] H04J *3/12;* **H04M** *11/00*

U.S. Cl. 370—110.2 **13 Claims**



1. An interface for ISDN channels, comprising:

means for converting an analog signal from an analog communication line connected to an analog communication terminal into digital data and sending the digital data to a B-channel of ISDN;

means for converting digital data from the B-channel of ISDN into an analog signal and sending the analog signal to said analog communication line;

means for detecting a DC loop on the analog communication line;

means for receiving a dial signal from the analog communication terminal; and

means for controlling connection to the B-channel of ISDN in response to both formation of the DC loop on the analog communication line and the dial signal from the analog communication terminal and for controlling release of the B-channel of ISDN in response to release of the DC loop on the analog communication line.

5,113,397

APPARATUS RELATING TO THE REPRODUCTION OF ERROR ENCODED DIGITALLY RECORDED SIGNALS

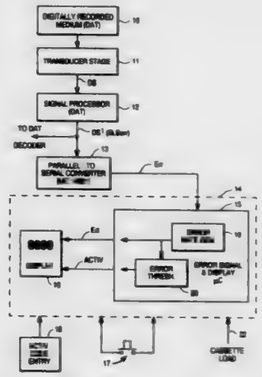
Jürgen Kaaden, VS-Pfaffenweiler; Dietmar Uhde, Königsfeld, and Franz Bigge, VS-Villingen, all of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Feb. 2, 1990, Ser. No. 473,671

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1989, 3903163; Feb. 3, 1989, 3903165

Int. Cl.[5] G11B *5/035*

U.S. Cl. 371—5.1 **18 Claims**



1. Apparatus comprising:

a plurality of transducer channels, each having a playback output, defining a source of a digital signal during playback from a recorded medium, said signal including a first component relating to information content in said signal and a second component providing error code information relating to errors introduced into said information content;

at least one gain adjustable signal amplifier stage for adjusting at least one of said playback outputs to equalize playback between said plurality of transducer channels;

a signal processor coupled to said source for deriving in accordance with said second component an error signal representative of said errors;

means responsive to said error signal for generating an error rate signal representative of the rate of occurrence of said errors;

means for controlling said adjustable signal amplifier stage responsive to said error rate signal; and,

means responsive to said error rate signal for displaying said error rate.

5,113,398

SELF-HEALING DATA NETWORK AND NETWORK NODE CONTROLLER

Nicholas J. Howes, Reston, Va., assignor to Shackleton System Drives Corporation, Reston, Va.

Filed Aug. 1, 1989, Ser. No. 360,024

Int. Cl.[5] G06F *11/20*

U.S. Cl. 371—11.2 **27 Claims**

27. In a data network, self-healing network switching apparatus comprising:

a. forward decoder means for decoding first data signals,

b. reverse decoder means for decoding second data signals,

c. forward timer means for determining the time interval between receipt of first data signals by said forward decoder means,

d. reverse timer means for determining the time interval

between receipt of second data signals by said reverse decoder means,

e. inswitch means for switching between said first data and second data signals, said inswitch means communicating with said forward decoder means and said reverse decoder means,

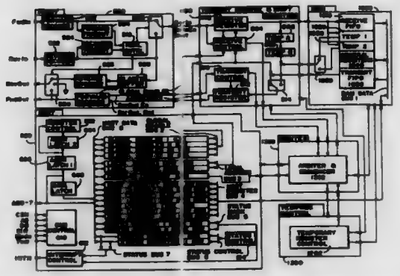
f. elastic buffer means for asynchronous storage of said second data signals, said elastic buffer means communicating with said reverse decoder means,

g. reverse encoder means for encoding said second data signals, said reverse encoder means communicating with said elastic buffer means,

h. forward encoder means for encoding processed data signals,

i. outswitch means for switching between said processed and said second data signals,

j. heal control means for altering the positions of said inswitch means and said outswitch means, said heal control means communicating with said forward timer means and said reverse timer means,



k. said inswitch positioned to communicate solely with said forward decoder means and pass said first data signals therethrough if said forward timer means time interval does not exceed a preset value,

l. said outswitch positioned to communicate solely with said reverse decoder means and pass said second data signals therethrough if said forward timer means time interval does not exceed a preset value,

m. said inswitch positioned by said heal control means with said reverse decoder to communicate with said reverse decoder means, and said outswitch means positioned by said heal control means to communicate with ground, if said forward timer time interval exceeds a preset value,

n. said outswitch positioned by said heal control means to communicate with said forward encoder means, if said reverse timer time interval exceeds a preset value,

o. said inswitch positioned by said heal control means to communicate with said reverse decoder means and said outswitch means positioned by said heal control means to communicate with ground, if said forward timer time interval and said reverse timer time interval each exceed their respective preset values.

5,113,399

MEMORY TEST METHODOLOGY

Ralf D. Woods, Corona; Michael P. Slack, Tustin, and Kenneth M. Gerst, Pasadena, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Continuation-in-part of Ser. No. 422,317, Oct. 16, 1989, Pat. No. 4,985,674. This application Apr. 17, 1990, Ser. No. 510,365

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—21.3 **14 Claims**

1. A method for testing a memory, comprising:

(a) checkerboarding the memory;

(b) assaulting the memory;

(c) selecting a cell in a time-test block;

(d) reading the bit in a scrambled cell corresponding to said cell;

(e) comparing the bit as read with a respective reference bit, and noting any error:

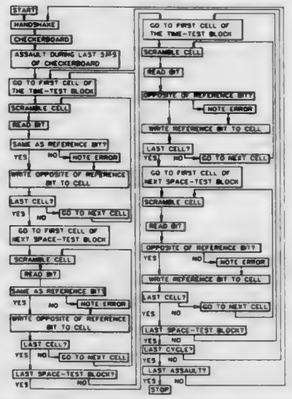
(f) writing the opposite of the reference bit to the scrambled cell;

(g) repeating steps (c) through (f) until every cell in the time-test block has been subjected to such steps;

(h) selecting a cell in a space-test block;

(i) reading the bit in a scrambled cell corresponding to said cell;

(j) comparing the bit as read with a respective reference bit, and noting any error;



(k) writing the opposite of the reference bit to the scrambled cell;

(l) repeating steps (c) through (f) until every cell in the space-test block has been subjected to such steps;

(m) re-subjecting the cells of the time-test block to steps (c) through (g);

(n) selecting a next space-test block;

(o) subjecting the cells of said next space-test block to steps (h) through (l);

(p) repeating steps (m) through (o) until every space-test block has been subjected to such steps;

(q) repeating steps (c) through (p) a plurality of times;

(r) repeating steps (a) through (q) a plurality of times.

5,113,400

ERROR DETECTION SYSTEM

Adam F. Gould, Palatine, and Phillip D. Rasky, Buffalo Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 21, 1990, Ser. No. 616,517

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—43 **19 Claims**

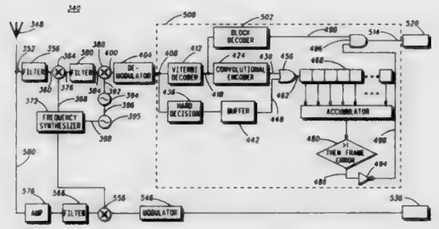
18. An error detection system for a receiver constructed to receive a discretely-encoded signal, said error detection system operative to detect when a sequence of the discretely-encoded signal received by the receiver is comprised of excessive numbers of invalid signal portions, said error detection system comprising:

means forming a Viterbi decoder for decoding said discretely-encoded signal received by the receiver and applied thereto, and for generating a decoded signal responsive to values of the discretely-encoded signal;

means forming a coder for re-encoding the decoded signal generated by the Viterbi decoder and for generating a discrete, receiver-encoded signal responsive to values of the decoded signal;

means forming a comparator for comparing the discrete, receiver-encoded signal generated by the coder with the discretely-encoded signal received by the receiver; and

means for generating an error signal responsive to times in which values of signal portions of a sequence of the discretely-encoded signal received by the receiver differ with values of a corresponding sequence of the discrete, receiver-encoded signal in a density in excess of a predetermined value.



5,113,401

BLOCK CODING SCHEME FOR FRACTIONAL-BIT TRANSMISSION

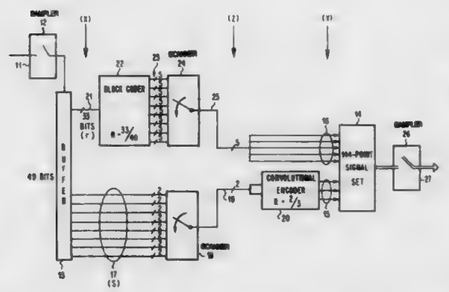
Pierre R. Chevillat, Kilchberg; Evangelos S. Eleftheriou, Zarich, and Dietrich G. U. Maiwald, Wadenswil, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1989, Ser. No. 400,415

Claims priority, application European Pat. Off., Jul. 7, 1989, 89810516

Int. Cl.[5] G06F *11/10*; H03M *13/12*

U.S. Cl. 371—43 **11 Claims**



7. Apparatus for encoding data by converting a bit stream representing the data into symbols of a two-dimensional expanded symbol set, which is not a power of two, said apparatus comprising:

buffer storage means (13) for receiving a block of bits of the data stream to be encoded, the number of bits of said block of bits being not an integer multiple of a given number m;

first scanning means (18) for selecting, in successive time intervals, each one of w separate p-bit subgroups of a first portion (17; s) of the bits stored in said buffer storage means;

convolutional encoding means (20) for receiving the bits of each p-bit subgroup (19) selected by said first scanning means, and for furnishing for each said p-bit subgroup an expanded bit group from the output of said convolutional encoding means to the first bit group of inputs of a symbol selection means (14);

block encoding means (22) connected to said buffer storage means for receiving a second portion (21; r) of the bits stored in said buffer storage means, and for furnishing a resulting expanded bit group (23) in w separate q-bit subgroups to

second scanning means (24) for selecting, in successive time intervals, each one of said w q-bit output bit groups of said block encoding means, and for each of said w q-bit groups, furnishing a bit subgroup (25) to the second group of inputs of said symbol selection means, and

said symbol selection means (14) for selecting one symbol of said two-dimensional expanded symbol set in response to first and second bit groups furnished to two groups of inputs of said symbol selection means; said first bit group being furnished to a first group (15) of said inputs specifying one of t disjunct subsets of symbols, each said t disjunct symbol subset comprising a number of symbols which is not an integer power of two; and said second bit group being furnished to a second group (16) of said inputs selecting one particular symbol of a specified said t disjunct symbol subset.

5,113,402

SOLID STATE LASER DEVICE FOR LITHOGRAPHY LIGHT SOURCE AND SEMICONDUCTOR LITHOGRAPHY METHOD

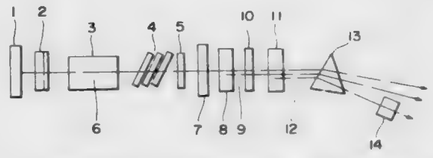
Akira Itani, and Kazuo Shimazaki, both of Chiyoda, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 21, 1990, Ser. No. 585,925

Claims priority, application Japan, Sep. 21, 1989, 1-245860

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—22 **9 Claims**



1. A solid state laser device useful as a light source for lithography: comprising:

a solid state laser emitting ray of light,

a nonlinear optical material for converting a wavelength of the ray of light into a short wavelength in the range between about 200 nm and about 300 nm, and

an integrator changing said ray of light having the short wavelength into an uniform ray of light useful as a light source for lithography.

5,113,403

BIDIRECTIONAL FREE-SPACE OPTICAL BUS FOR ELECTRONICS SYSTEMS

Timothy R. Block, and Tong Lu, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 15, 1990, Ser. No. 597,230

Int. Cl.[5] H01S *3/13*

U.S. Cl. 359—152 **9 Claims**

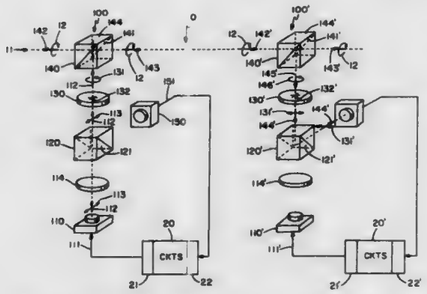
1. A system, comprising:

an enclosure;

a plurality of subsystems each including function means for performing a designated function within said system, and for producing signals for and accepting signals from others of said subsystems;

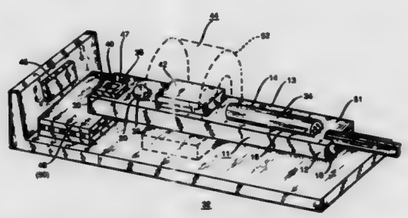
a plurality of optical interface units mounted on respective ones of said subsystems, each said interface unit being coupled to its respective function means for transmitting at least one signal from said function means as a pair of outgoing beams of free-space radiation, said pair of outgoing beams traveling in different directions along a single

line, and for receiving an incoming beam of radiation from either of said two directions along the same line;
a plurality of mounting means for positioning respective



ones of said subsystems with respect to said enclosure such that said line of each of said subsystems lies along a single axis, so as to form a free-space optical bus interconnecting all of said subsystems.

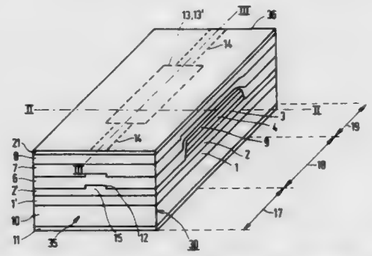
5,113,404
SILICON-BASED OPTICAL SUBASSEMBLY
Carl F. Gaebe, Fleetwood, and Xian-Li Yeh, Macungie Township, Lehigh County both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jul. 5, 1990, Ser. No. 548,694
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—36 **24 Claims**



1. An optical subassembly comprising:
a plurality of optical devices;
a silicon substrate defined as including a major top surface, said silicon substrate including a plurality of openings formed in the top surface thereof, the plurality of openings for placement of said plurality of optical devices and disposed so as to provide optical alignment therebetween; and
a support member disposed with respect to said silicon substrate so as to form a cantilever arrangement therewith.

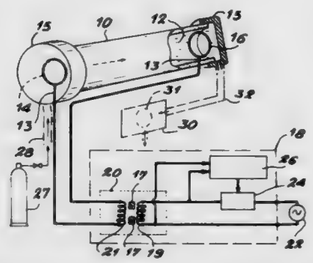
5,113,405
SEMICONDUCTOR DIODE LASER HAVING A STEPPED EFFECTIVE REFRACTIVE INDEX
Jan Opschoor, and Hubertus P. M. M. Ambrosius, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Dec. 12, 1990, Ser. No. 627,074
Claims priority, application Netherlands, Dec. 12, 1989, 8903046
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—46 **14 Claims**

1. A semiconductor diode laser comprising a semiconductor body (30) having a semiconductor substrate (10) of a first conductivity type, on which are successively disposed at least a first cladding layer (1) of the first conductivity type, an active radiation-emitting layer (3) a second cladding layer (4) of the second conductivity type, the semiconductor substrate (10) and the second cladding layer (4) being provided with current supply means (8, 11, 21) within an active region (13'), which forms part of the active layer (3), is located under a strip-shaped region (13), and whose longitudinal direction is substantially perpendicular to a mirror surface (35, 36) located outside the active region (13'), in which coherent electromagnetic radiation is produced with a sufficiently high current intensity in the forward direction, and in which in an intermediate region (17, 19) located between the mirror surface (35,



36) and the active region (13') a radiation guide (15) is disposed, which optically couples the active region (13') to the mirror surface (35, 36) and is present in a radiation-guiding layer (2') located between a third cladding layer (1') and a fourth cladding layer (6), characterized in that the radiation guide (15) is defined in lateral direction with the aid of means (12) arranged in the radiation-guiding layer (2'), for forming a step in the effective refractive index on either side of the radiation guide (15), and the parts of the layers (1', 2', 6) located within the amplification profile of the radiation guide (15) all having a larger band gap than the active layer (3).

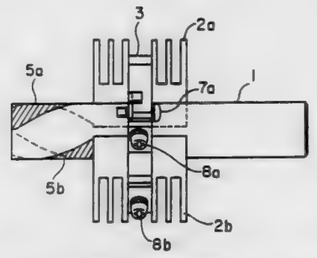
5,113,406
HIGH TEMPERATURE HEATING DEVICE
Bernard Chaudanson, Lagarde Adhemar, France, assignor to Commissariat A L'Energie Atomique, Paris, France
PCT No. PCT/FR89/00490, § 371 Date May 14, 1990, § 102(e) Date May 14, 1990, PCT Pub. No. WO90/03673, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 26, 1989, Ser. No. 487,957
Claims priority, application France, Sep. 27, 1988, 88 12613
Int. Cl.[5] H01S *3/22*
U.S. Cl. 372—56 **13 Claims**



12. An alternating current electric discharge heating device for producing high temperatures, which comprises:
a refractory insulating container having a contained region;
a buffer gas contained in said contained region;
said contained region inside said container being bounded by colinear inner and outer cylindrical surfaces of the container and first and second end surfaces that are connected to and at the ends of the cylindrical surfaces;

first and second electrodes which consist of refractory conducting material and are within the contained region and are fixed to said container by attachments near the end surfaces;
a leakage field transformer having first and second primary winding terminals and first and second secondary winding terminals, said first and second secondary winding terminals being connected to said first and second electrodes, respectively; and
an alternating current power supply having first and second power supply terminals which are coupled to said first and second primary winding terminals, respectively.

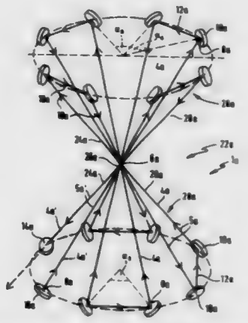
5,113,407
DISCHARGE TUBE FOR LASER OSCILLATOR
Eiji Kobayashi, and Akira Egawa, both of Minamitsuru, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP90/00616, § 371 Date Jan. 8, 1990, § 102(e) Date Jan. 8, 1990, PCT Pub. No. WO90/15456, PCT Pub. Date Dec. 13, 1990
PCT Filed May 15, 1990, Ser. No. 635,596
Claims priority, application Japan, May 29, 1989, 1-135447
Int. Cl.[5] H01S *3/03*
U.S. Cl. 372—61 **9 Claims**



1. A discharge tube for a laser oscillator, comprising:
at least one pair of electrodes formed on a surface of a dielectric discharge tube; and
radiating fins attached to respective end portions of said electrodes, said radiating fins each having a recessed portion in the center, said recessed portion being fixed to said discharge tube by a clamp and a tenacious backup plate.

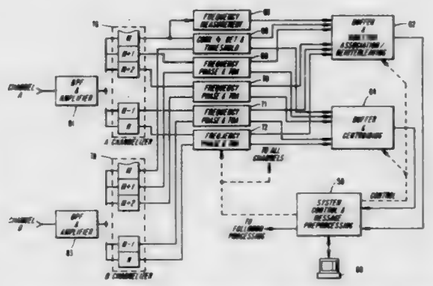
5,113,408
LASER
Otto Bihler, Schleiferweg 2, 8959 Halblech, Fed. Rep. of Germany
Filed Nov. 8, 1990, Ser. No. 611,986
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1989, 3937370
Int. Cl.[5] H01S *3/081*
U.S. Cl. 372—93 **26 Claims**

1. A laser comprising a resonator having end mirrors such that an optical stimulating path for stimulation of a laser medium resides therebetween, the stimulating path being subdivided into a plurality of partial paths (4) and a plurality of optical connecting paths (12) connecting the partial paths (4) to one another, said partial paths (4) being disposed solely radially in relation to a common centre point (6) located within the resonator, wherein the partial paths (4) are disposed to form individual groups in at least one common plane along radii extending from the centre point (6), and the partial paths (4) of the individual groups are disposed at equal angular intervals from one another, with each partial path (4) having each the same length and being the same radial distance from the centre point (6), and each partial path (4) having radially outer and inner ends, the radially outer ends being connected optically to one another via mirrors (10) disposed in pairs for each individual group and via optical connecting paths (12) which extend



between the mirrors (10) and transversely to the partial paths (4).

5,113,409
SPREAD SPECTRUM INTERCEPT APPARATUS AND METHOD
Clarence H. Stewart, 7805 Karen Forest Dr., McLean, Va. 22102
Division of Ser. No. 422,838, Oct. 17, 1989, Pat. No. 5,016,256.
This application Sep. 12, 1990, Ser. No. 581,336
Int. Cl.[5] H04L *27/30*
U.S. Cl. 375—1 **4 Claims**



1. An apparatus for processing an intercepted signal having spread spectrum modulation, comprising:
a first antenna for receiving a first sample signal of the intercepted signal;
a second antenna for receiving a second sample signal of the intercepted signal;
a first channelizer for channelizing the first sample signal of the intercepted signal into a first segment signal;
a second channelizer for channelizing the second sample signal of the intercepted signal into a second segment signal;
first means coupled to said first channelizer and said second channelizer for multiplying the first segment signal with the second segment signal;
first means coupled to said first multiplying means for low-pass-frequency filtering components of the output of said first multiplying means;
means coupled to said second channelizer for shifting by ninety degrees the phase of the second segment signal;
second means coupled to said first channelizer and said shifting means for multiplying the first segment signal with the output of said shifting means;
second means coupled to said second multiplying means for

low-pass-frequency filtering components of the output of said second multiplying means; and

means coupled to said first filtering means and said second filtering means for generating a correlation function phase signal from the output of said first filtering means and the output of said second filtering means.

5,113,410

DATA TRANSMISSION SYSTEM

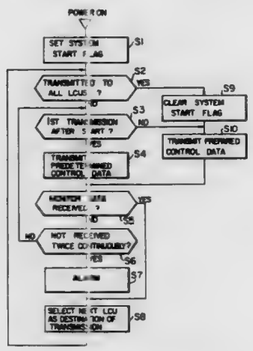
Fumio Hamano, Katsuta; Shigeru Oho, Hitachi; Takeshi Hirayama, Mito, and Akira Hasegawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 16,518, Feb. 17, 1987, abandoned, which is a continuation of Ser. No. 619,998, Jun. 12, 1984, abandoned. This application Jan. 26, 1990, Ser. No. 470,776

Claims priority, application Japan, Jun. 16, 1983, 58-106666

Int. Cl.[5] H04L *5/16*

U.S. Cl. 375—7 **13 Claims**



1. In a data transmission system including a central control unit having a data processing unit and a communication control unit, and a plurality of local control units, wherein data transmission is effected between said central control unit and the local control units via a communication medium, a method of initializing the system when power is turned on, comprising the steps of:

(a) setting a system start flag in the central control unit in response to turning on the power of the system;

(b) transmitting predetermined control data from said communication control unit to a local control unit;

(c) detecting reception of monitor data from the local unit in response to reception of said control data;

(d) retransmitting said control data to the local control unit when the monitor data is not received;

(e) generating an alarm when monitor data is not received from the local unit in response to the retransmission of said control data;

(f) repeating steps (b) to (e) for every other local control unit;

(g) clearing said system start flag after having transmitted the control data to all local control units; and

(h) transmitting other prepared control data to each of the local control units.

5,113,411

MODULATOR AND DEMODULATOR FOR DATA TRANSMISSION SYSTEMS

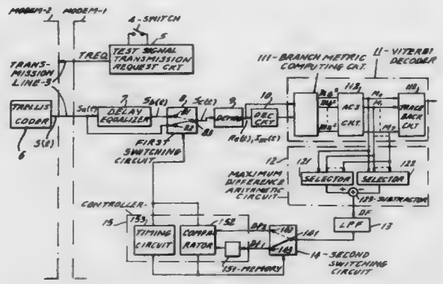
Atsushi Yoshida, Tokyo, and Hisashi Oishi, Shizuoka, both of Japan, assignors to NEC Corporation, Japan

Filed Jul. 31, 1990, Ser. No. 560,389

Claims priority, application Japan, Jul. 31, 1989, 1-196681

Int. Cl.[5] H03H *7/30;* **H04L** *27/00*

U.S. Cl. 375—13 **9 Claims**



1. A modulating and demodulating device (MODEM) for data transmission systems, comprising:

delay equalizing means for receiving via a transmission path a trellis-coded test signal transmitted from an opposite MODEM and compensating for delay distortion on said transmission path of said test signal;

first switching means which can take either a first state wherein said test signal is supplied not via said delay equalizing means or a second state wherein the output signal of said delay equalizing means is supplied;

demodulating means for demodulating the output signals of said first switching means;

decision means for assigning the output signals of said demodulating means to predetermined signal point coordinates;

Viterbi decoding means for computing branch metrics representing the distance between each assigned point and each receive signal point from the output signals of said decision means and said demodulating means, and figuring out pass metrics of accumulated values based on the computed branch metrics;

arithmetic processing means for selecting the maximum and the minimum of said pass metrics from said viterbi decoding means, and determining and outputting the difference between said selected maximum and minimum as a difference signal;

second switching means for supplying said difference signal determined by said arithmetic processing means as a first difference signal when said first switching means is in said first state and as a second difference signal when said first switching means is in said second state; and

control means for comparing said first and second difference signals supplied by said second switching means, and holding said first switching means in said first state when said first difference signal is greater than said second difference signal, or holding said first switching means in said second state when said second difference signal is greater than said first difference signal.

5,113,412

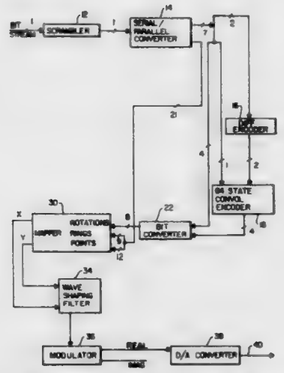
METHOD AND APPARATUS FOR MAPPING AN EIGHT DIMENSIONAL CONSTELLATION OF A CONVOLUTIONALLY CODED COMMUNICATION SYSTEM

Yuri Goldstein, Southbury, Conn., assignor to General Data-Comm, Inc., Middlebury, Conn.

Continuation-in-part of Ser. No. 535,329, Jun. 8, 1990, Pat. No. 5,048,056. This application Jan. 11, 1991, Ser. No. 640,260

Int. Cl.[5] H04L *5/12*

U.S. Cl. 375—39 **11 Claims**



7. An apparatus for transmitting a stream of 28 information bits by sending corresponding signals over a channel in 4 signaling slots, comprising:

a) means for encoding at least some of the 28 information bits that appear during a block of said four signaling slots by adding one redundant bit, to form a set of 29 signal point selection bits for said block;

b) means for selecting, for said set of 29 signal point selection bits, an 8D signal point drawn from an 8D constellation for said block, said 8D signal point selected for a particular said block being dependent on the 8D signal point selected for at least one other said block, said means for selecting being connected to be responsive to said means for encoding.

wherein said means for selecting includes a mapping means for establishing a correspondence between each possible combination of said 29 signal point selection bits and the coordinates of the 8D signal points in said 8D constellation,

wherein said means for encoding and said means for selecting define a dividing of said 8D constellation into five hundred twelve 8D groups out of a possible one thousand two hundred twelve 8D groupings out of a possible one thousand two hundred ninety-six 8D groupings, each 8D grouping having at most 32^4 points, each 8D grouping being a concatenation of four 2D groups, one from each of four 2D constellations, such that said 8D constellation is a subset of a concatenation of said four 2D constellations,

wherein each 2D group is comprised of thirty-two 2D points of its respective 2D constellation, and each said 2D constellation is divided into six 2D groups, each 2D group having a substantially different average energy relative to the others,

wherein said means for encoding and said means for selecting further define a dividing of each of said five hundred twelve 8D groupings into four subgroups of at most eight points, three of the subgroups representing ninety, one hundred eighty, and two hundred seventy degree rotations of the first subgroup; and

c) means for modulating at least one carrier for transmission over said channel in accordance with the coordinates represented by each selected said 8signal point, said means for modulating being connected to be responsive to said means for encoding.

5,113,413

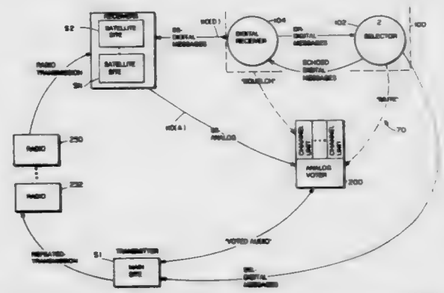
VOTER ARRANGEMENT FOR MULTIPLE SITE PST RF TRUNKING SYSTEM

Thomas A. Brown; Charles L. Dereage; Houston H. Hughes, III, all of Lynchburg; Craig Szczutkowski, Forest; Vicki J. Teel, Goode, and Marcella M. Tucker, Amherst, all of Va., assignors to Ericsson GE Mobile Communications Inc., Lynchburg, Va.

Continuation-in-part of Ser. No. 363,980, Jun. 9, 1989. This application Mar. 30, 1990, Ser. No. 501,940

Int. Cl.[5] H04B *7/10;* **H04L** *1/02*

U.S. Cl. 375—40 **12 Claims**



6. In a trunked digital radio communications system of the type including plural geographically separated digital radio frequency (RF) transceivers each for receiving digital radio frequency signals transmitted over a common radio frequency channel, an improved digital voting system comprising:

a first digital receiver means for receiving a first digital message responsive to an RF message transmitted over said RF channel;

a second digital receiver means for receiving a second digital message responsive to an RF message transmitted over said RF channel;

message selecting means coupled to said first and second digital receiver means for selecting said first digital message or said second digital message and for echoing the selected digital message to both of said first and second digital receiver means; and

comparison means operatively coupled to said first digital receiver means and connected to receive said echoed selected message, for inhibiting said message selecting means from selecting said first digital message if said first digital message is substantially identical to said echoed selected message.

5,113,414

PREDISTORTION ARRANGEMENT FOR A DIGITAL TRANSMISSION SYSTEM

Georges Karam, and Saïd Moridi, both of Paris, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1990, Ser. No. 595,346

Claims priority, application France, Oct. 6, 1989, 89 13092

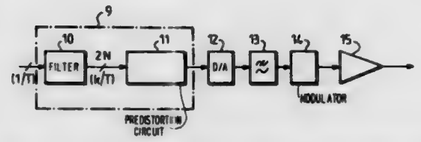
Int. Cl.[5] H04K *1/02;* **H04L** *25/03*

U.S. Cl. 375—60 **12 Claims**

1. A predistortion arrangement for a digital transmission system which transmits complex input data at a rate defined by a clock having a period T, comprising a power amplifier which introduces nonlinear distortion into data signals being transmitted, a modulator driving the power amplifier, and a predistortion circuit for predistorting input data signals in a sense oppo-

site to distortion introduced in the power amplifier, and providing the predistorted signals to the modulator,

characterized in that the predistortion circuit comprises a transmit filter means, responsive to receiving input data, for providing in-phase and quadrature channels of filtered, oversampled data encoded with 2N bits (N bits per channel), at a rate k/T, where k is an integer greater than 1,



encoder means for receiving said filtered, oversampled data, and transforming the filtered data encoded with 2N bits into data encoded with 2M bits, where M<N,

a memory addressed by the 2M bits, for storing 2^{2M} complex predistortion coefficients,

a complex multiplier, for multiplying the 2N bits of each data element by a selected predistortion coefficient, to produce predistorted input data (F_I, F_Q).

5,113,415

DETECTION OF A PARTICULAR SIGNAL SEQUENCE WITH NO ADVERSE INFLUENCE OF MULTIPATH TRANSMISSION

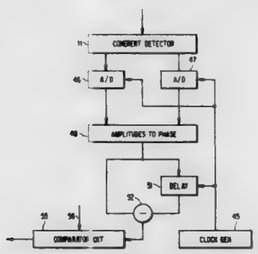
Hiroyasu Muto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 21, 1990, Ser. No. 541,690

Claims priority, application Japan, Jun. 21, 1989, 1-156856; Jun. 21, 1989, 1-156857

Int. Cl.[5] H04L *7/04*

U.S. Cl. 375—83 **15 Claims**



8. A device for detecting a particular signal sequence in a received signal produced by angular modulation of a modulating signal including symbols representative of binary one and zero at a predetermined symbol interval and comprising a particular symbol pattern of a predetermined number of symbols, said particular signal sequence being the particular symbol pattern subjected to said angular modulation, said device being connected to a coherent detector for subjecting said received signal to coherent demodulation to produce a vector signal representative of a signal vector having a phase variable in accordance with said modulating signal, said device comprising:

sampling means supplied with said vector signal for sampling said phase at a sampling interval to produce a sample signal representative of phase samples, said sampling interval being substantially equal to said symbol interval;

calculating means response to said sample signal for calculating phase differences between two consecutive ones of said phase samples to produce a difference signal representative of said calculated phase differences;

detecting means supplied with said difference signal for detecting consecutive instances of coincidence of each of said calculated phase differences substantially with a predetermined phase difference to produce a coincidence signal representative of said instances of coincidence; and

determining means supplied with said coincidence signal for determining presence of said particular signal sequence in said received signal when said instances of coincidence reach in number substantially to said predetermined number, said determining means thereby producing a result signal indicating that said particular signal sequence is present in said received signal.

5,113,416

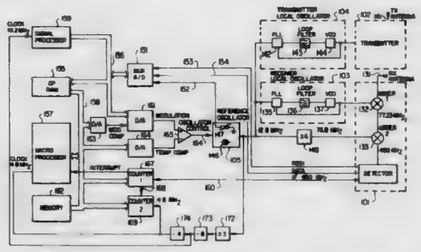
DIGITAL RADIO FREQUENCY COMPENSATION

Karl B. Lindell, Lidingo, Sweden, assignor to Ericsson GE Mobile Communications Holding, Inc., Paramus, N.J.

Filed Oct. 26, 1990, Ser. No. 604,141

Int. Cl.[5] H03B *5/32*

U.S. Cl. 375—97 **22 Claims**



1. A system for generating a frequency compensation voltage for a crystal controlled reference oscillator within a mobile station of a packet data radio system, comprising:

first means for storing a sequence of voltage values each of which corresponds to the temperature compensation voltage to be applied to the reference oscillator at a particular temperature to produce a reference frequency signal at a particular frequency;

means for measuring the current temperature of the reference oscillator;

means for selecting the temperature compensation voltage corresponding to the measured temperature from said first storage means and applying said voltage to the reference oscillator;

means for receiving a burst of transmitted data from a base station;

means for comparing the frequency of the signal received from the base station with the frequency of the signal output from the reference oscillator and producing a difference signal;

second means for storing a crystal aging compensation value indicative of the difference between the frequency of the reference oscillator output signal and the frequency of the signal received from the base station;

means for determining whether the burst of transmitted data received was transmitted by the current base station of the mobile station; and

means responsive to a determination that the base station from which the signal was received was the current base of the mobile for modifying said selected temperature compensation voltage in accordance with the aging compensation value in said second storage means and applying the modified voltage to the reference oscillator to produce the same frequency as that received from said base station.

5,113,417

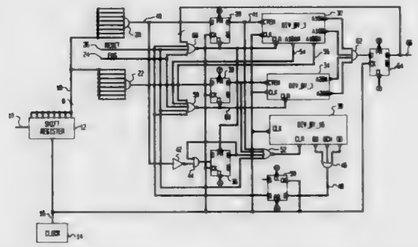
FRAME DETECTION SYSTEM

John B. McNesby, Mesa, Ariz., assignor to Siemens Communication Systems, Inc., Boca Raton, Fla.

Filed Sep. 27, 1990, Ser. No. 589,234

Int. Cl.[5] H04L *7/06*

U.S. Cl. 375—116 **8 Claims**



1. In a digital communications system wherein data is serially transmitted in frames of multi-bit bytes at a fixed clock rate and framing is defined by a framing pattern at the start of each frame, the framing pattern comprising a predetermined number of bytes of a first digital pattern followed by said predetermined number of bytes of a second digital pattern, an arrangement for detecting said framing pattern in transmitted data and providing a frame signal when said framing pattern is detected comprising:

clock means for providing clock pulses at said fixed clock rate;

means for receiving said data;

first detection means for examining the received data bits and providing a first signal when N sequentially received data bits form said first digital pattern, where N is an integral number equal to the number of bits in a byte;

second detection means for examining the received data bits and providing a second signal when N sequentially received data bits form said second digital pattern;

first counter means responsive to the occurrence of said first signal for incrementing an internal count;

means responsive to the internal count of said first counter means reaching said predetermined number for providing an enabling signal;

second counter means enabled by said enabling signal for incrementing an internal count in response to the occurrence of said second signal;

reset means utilizing said clock pulses and responsive to a first occurrence of said first signal or said second signal for resetting the internal counts of said first and second counter means in the event there is not another occurrence of said first signal or said second signal after N clock pulses; and

output means responsive to the internal count of said second counter means reaching said predetermined number after the internal count of said first counter means reached said predetermined number for generating said frame signal.

5,113,418

ELASTIC BUFFER FOR LOCAL AREA NETWORK

Andre Szczepanek, Bedford, and George Buchanan, Sherington, both of England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 808,149, Dec. 12, 1985, Pat. No. 4,884,286. This application Oct. 6, 1989, Ser. No. 417,997

Int. Cl.[5] H04L *7/00*

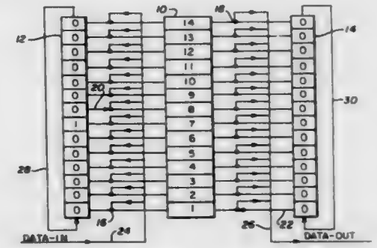
U.S. Cl. 375—118 **11 Claims**

1. A circuit for absorbing frequency jitter of data bits incoming on an input data line, comprising:

a serial connected loop stack of data register cells;

circuitry for storing each incoming data bit in a selected one of said cells within said serial connected loop stack wherein each bit is stored at a first frequency in a cell adjacent a cell in which is stored a next earlier bit; and

circuitry for directing stored data from a selected one of said



cells within said serial connected loop stacked onto an output data line at a second frequency, wherein said circuitry for directing is operable to direct data bits simultaneously with said circuitry for storing.

5,113,419

DIGITAL SHIFT REGISTER

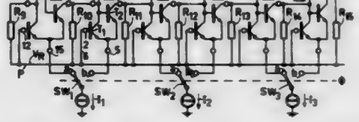
Wolfdietrich G. Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 381,088, May 24, 1982, abandoned. This application Jan. 13, 1989, Ser. No. 298,211

Claims priority, application Netherlands, Jun. 11, 1981, 8102808

Int. Cl.[5] G11C *19/00*

U.S. Cl. 377—75 **10 Claims**



1. A digital shift register having a series of substantially identical bistable circuits, each comprising a signal input, a reference level input, an output, and a clock signal input; the signal inputs of the second and subsequent bistable circuits of the series each being connected to the output of the preceding bistable circuit, the signal input of the first bistable circuit being an input for said digital shift register, and the reference level inputs each being coupled to a common node, the digital shift register also including means for driving the clock signal inputs of each pair of adjacent bistable circuits in the series alternately with current pulses under the influence of a clock signal, characterized in that the output of the bistable circuits are each connected to the common node via a respective resistance in order to generate a reference potential at said common node.

5,113,420

METHOD AND APPARATUS FOR POSITIONING A SAMPLE WITH REPEATABLE ACCURACY

Lorne A. Davis, Jr., Houston; Gregory P. Pepin, Sugar Land, and David L. Gebert, Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 24, 1990, Ser. No. 632,561

Int. Cl.[5] H05G *1/60;* **A61B** *6/04*

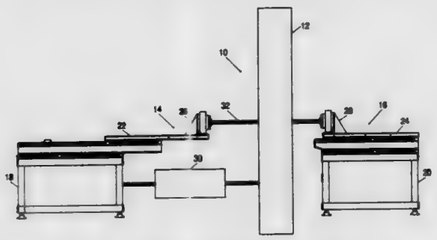
U.S. Cl. 378—20 **8 Claims**

1. An apparatus for repeatedly positioning a sample accu-

rately and for moving said sample relative to an associated device, said apparatus comprising:

a driver table assembly and a follower table assembly in spaced and aligned condition relative to said associated device to move a sample axially relative to said device;

each said table assembly having a base portion with means to fixedly position it relative to said device, movable sample positioning means supported by said base and having a



positioning table moveably mounted on said base with means on said positioning table to fix it relative to said base for initially positioning said sample relative to said device, means on said sample positioning table to engage one end of said sample;

said drive table assembly further comprising drive means to drive said sample positioning means of said drive table assembly relative to said drive table assembly whereby said sample is moved relative to said device.

5,113,421

METHOD AND APPARATUS FOR MEASURING THE THICKNESS OF A COATING ON A SUBSTRATE

Dominique Gignoux, Bethesda, and Roland Gouel, Gaithersburg, both of Md., assignors to Data Measurement Corporation, Gaithersburg, Md.

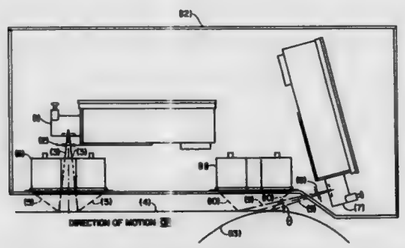
PCT No. PCT/GB89/00518, § 371 Date Nov. 13, 1990, § 102(e) Date Nov. 13, 1990, PCT Pub. No. WO89/11095, PCT Pub. Date Nov. 16, 1989

PCT Filed May 12, 1989, Ser. No. 602,272

Claims priority, application United Kingdom, May 13, 1988, 8811459

Int. Cl.[5] G01B *15/02*; G01N *23/223*

U.S. Cl. 378—50 **16 Claims**



3. An apparatus for measuring simultaneously the thickness and the composition of a coating on a metal substrate, comprising the steps:

means for directing a first beam of radiation producing a first primary beam of photons substantially perpendicularly to the surface of the coating;

a first detector positioned substantially perpendicularly to the surface of the coating to receive a first fluoresced beam, said first detector selecting from said first fluoresced beam the photons having a first energy level representing a higher concentration element of the coating, and providing a first electrical signal which is a function of the intensity of the photons having the first energy level;

means for directing a second beam of radiation producing a second primary beam of photons at an acute angle to the surface of the coating;

a second detector positioned substantially perpendicularly to the surface of the coating to receive a second fluoresced beam and selecting from said second fluoresced beam the photons having a second energy level representing a lower concentration element of the coating, and providing a second electrical signal which is a function of the intensity of the photons having the second energy level; and

means for simultaneously calculating from the first and second electrical signals the relative composition of the elements of the coating and the thickness of the coating.

5,113,422

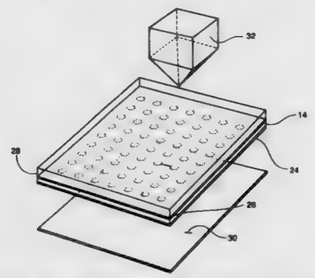
RADIOGRAPHIC INTERPRETATION TRAINER/TEST SYSTEM

Hansel M. Pinder, Houston, Del., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 1, 1991, Ser. No. 724,253

Int. Cl.[5] G01B *15/06*

U.S. Cl. 378—58 **8 Claims**



7. A plate for radiographically simulating an aluminum structural component having a crack, comprising:

(a) a sheet of vinyl composition floor tile having a top and bottom;

(b) a plurality of drilled holes through the floor tile sheet;

(c) at least one crack in the floor tile sheet extending between two drilled holes;

(d) a sheet of plastic attached to the bottom of the sheet of floor tile for support; and,

(e) a sheet of plastic attached to the top of the sheet of floor tile for support.

5,113,423

APPARATUS AND METHOD FOR IMPROVING RADIATION COHERENCE AND REDUCING BEAM EMITTANCE

Paul L. Csonka, 105 E. 39th Ave., Eugene, Oreg. 97405

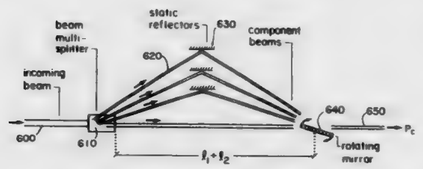
Filed Oct. 20, 1988, Ser. No. 260,347

Int. Cl.[5] G21K *1/06, 1/00*; H01S *3/30*

U.S. Cl. 378—145 **4 Claims**

1. A method for improving the coherence of a pulse of X-ray radiation comprising the steps of: longitudinally splitting said pulse into a plurality of pulses;

delaying at least one of said pulses with respect to at least one other of said pulses; and



combining said pulses in serial fashion to form a output beam longer than said pulse.

5,113,424

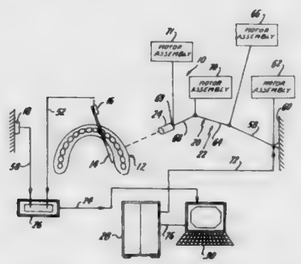
APPARATUS FOR TAKING RADIOGRAPHS USED IN PERFORMING DENTAL SUBTRACTION RADIOGRAPHY WITH A SENSORIZED DENTAL MOUTHPIECE AND A ROBOTIC SYSTEM

Grigore C. Burdea, Highland Park; Stanley M. Dunn, Belle Mead, and Paul J. Desjardins, Maplewood, all of N.J., assignors to University of Medicine & Dentistry of New Jersey, Newark and Rutgers University, Piscataway, both of, N.J.

Filed Feb. 4, 1991, Ser. No. 650,611

Int. Cl.[5] A61B *6/14*

U.S. Cl. 378—170 **19 Claims**



1. Apparatus for taking radiographs, comprising:

appliance means for holding a radiographic film at a fixed position with respect to a body part;

magnetic source means for producing a magnetic field, the magnetic source means being mounted at a fixed position in a room;

magnetic sensor means for sensing said magnetic field and for producing an output signal in response thereto, said magnetic sensor means being fixed in position relative to said appliance means;

radiography means for exposing the radiographic film;

robot means for moving said radiography means in relation to the radiographic film; and

control means for controlling said robot means in response to the output signal from said magnetic sensor means so that said radiography means is in a fixed position with respect to said radiographic film, regardless of movement of said radiographic film.

5,113,425

X-RAY INSPECTION SYSTEM FOR ELECTRONIC COMPONENTS

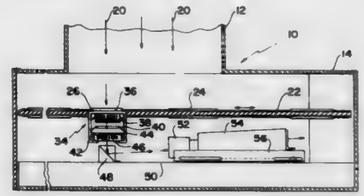
Gilbert Zweig, Morris Plains, N.J., assignor to Glenbrook Technologies, Inc., Victory Gardens, N.J.

Continuation of Ser. No. 360,461, Jun. 2, 1989, Pat. No. 4,974,249. This application Jul. 25, 1990, Ser. No. 557,101

The portion of the term of this patent subsequent to Nov. 27, 2007, has been disclaimed.

Int. Cl.[5] G21K *4/00*

U.S. Cl. 378—190 **5 Claims**



1. An X-ray inspection system for electronic components including printed circuit boards, comprising:

a shielded X-ray cabinet including an X-ray exposure chamber providing for the passage of an X-ray beam thereto,

said exposure chamber including a support member separating an upper portion and a lower portion thereof, said upper portion receiving said X-ray beam from an overhead X-ray source, said support member further having a top and bottom surface and including at least one region of substantially complete X-ray transparency, said top surface facing said X-ray source and acting as a surface for the placement of electronic components to be inspected thereon during either an X-ray filming procedure or a real time fluoroscopic procedure;

fluoroscopic imaging means located under said support member within said one region for generating a visible image of an electronic component placed on the top surface of said support member and over said fluoroscopic imaging means, said imaging means comprising radioluminescent phosphor means including a phosphor screen having a predetermined thickness and image intensifier means including a microchannel plate multiplier coupled to said phosphor means for converting an X-ray image of said electronic component to a visible image for providing a visible image of said electronic component;

video camera means located in said lower portion of said exposure chamber;

optical coupling means located in the lower portion of the exposure chamber for coupling the visible image from said fluoroscopic imaging means to said video camera means; and

a video monitor located externally of said exposure chamber for viewing said electronic component in real time during a fluoroscopic inspection procedure.

5,113,426

GROUND FAULT DETECTOR

Kazumi Kinoshita; Kenji Takato, both of Kawasaki, and Toshiro Tojo, Machida, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP90/00036, § 371 Date Sep. 19, 1990, § 102(e) Date Sep. 19, 1990, PCT Pub. No. WO90/08441, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 12, 1990, Ser. No. 573,130

Claims priority, application Japan, Jan. 19, 1989, 1-12612

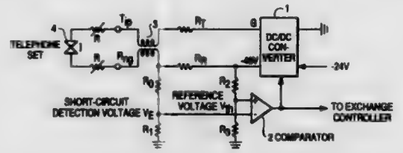
Int. Cl.[5] H04M *3/22, 19/00*

U.S. Cl. 379—33 **6 Claims**

1. In a ground fault detector for long distance subscriber lines accommodated in a digital electronic exchange, including

a battery and an exchange controller, said ground fault detector comprises:

a DC/DC converter for selectively converting a low voltage to one of a high voltage and a lower voltage, to be applied to the subscriber line as a battery feed voltage in response to a DC/DC converter stop signal; and

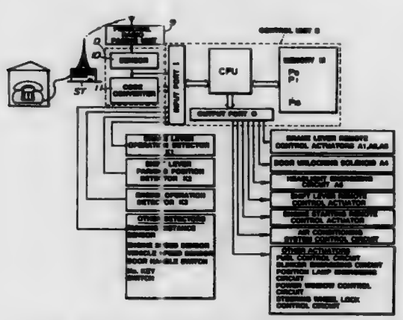


comparator means for detecting a ground fault by comparing a reference voltage obtained by dividing the battery feed voltage with a voltage obtained by dividing a ground fault detect voltage and for sending a ground fault supervisory signal to the exchange controller, said comparator means includes means for generating the DC/DC converter stop signal based on said comparing.

5,113,427
RADIO-SIGNAL-RESPONSIVE VEHICLE DEVICE CONTROL SYSTEM

Kimura Ryoichi; Hattori Noriaki, both of Saitama, and Watabe Kazuharu, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 283,928, Nov. 21, 1988. This application Aug. 24, 1990, Ser. No. 572,686
Claims priority, application Japan, Mar. 31, 1987, 62-47914; Apr. 1, 1987, 62-79895; PCT Int'l Appl., Mar. 31, 1988, PCT/JP88/00330
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—57 **12 Claims**



1. A radio-signal-responsive vehicle device control system comprising:

a personal paging unit in a paging system for receiving a radio signal generated based on a signal transmitted from a calling telephone unit and containing a sound transducer which is activated based on the received radio signal to generate sounds said personal paging unit being of the type for emitting when it receives a signal initiated by a calling telephone unit a small number of distinct detectable sounds for sensing by a user, such sounds including a calling sound followed by a message sound;

personal paging unit storage means mounted in a motor vehicle for storing said personal paging unit;

detector means located in relation to said personal paging unit storage means for detecting activation of the transducer and producing detected signals including the calling detected signal and a message detected signal corresponding to the detectable sounds form the transducer of said personal paging unit;

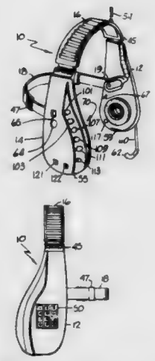
control means which is activated by a calling detected signal from said detector means and operative for producing a control signal based on at least the message detected signal; and

actuator means for controlling at least one device in the motor vehicle based on the control signal from said control means.

5,113,428
CORDLESS TELEPHONE HEADSET

Robert Fitzgerald, 12055 B. E. 49th Ave., Denver, Colo. 80239

Filed Sep. 4, 1990, Ser. No. 578,884
Int. Cl.[5] H04M *11/00*; H04B *1/38*
U.S. Cl. 379—61 **1 Claim**



1. A portable cordless telephone headset for use with a base station operatively connected to a telephone line and including a base station transceiver and base station antenna, the portable cordless telephone headset comprising:

(a) a curved housing for attachment to the user's head;

(b) an RF transceiver including a receiver and a transmitter, in tune with the base station RF transceiver, and contained within said housing, for transmitting and receiving signals to and from the base station;

(c) an RF antenna connected to said RF transceiver and attached to and extending outside of said housing;

(d) control means contained within said housing and operatively connected to said RF transceiver for controlling said RF transceiver;

(e) power means contained within said housing and operatively connected to said RF transceiver for powering said RF transmitter;

(f) a microphone attached to said housing and operatively connected to said transmitter;

(g) an amplifier contained within said housing and operatively connected to said receiver for amplifying the signal received by the receiver;

(h) a volume control means operatively connected to said amplifier for controlling the amplification of the signal received by the receiver;

(i) a left earphone attached to said housing in a position whereby said left earphone at least partially covers the user's left ear to reduce the audibility of noise external to the headset;

(j) a left speaker contained in said left earphone and operatively connected to said amplifier;

(k) a right earphone attached to said housing in a position whereby said right earphone at least partially covers the user's right ear to reduce the audibility of noise external to the headset; and

(l) a right speaker contained in said right earphone and operatively connected to said amplifier

wherein said housing includes a left housing and a separate right housing, and further comprising:

a curved top headband to extend over the top of the user's head, the left end of the top head band being attached to the left housing and the right end of the top headband being attached to the right housing, said top headband including adjusting means to adjust the length of the top headband to fit the user's head size; and

a curved back headband to extend around the back of the user's head, said back headband including adjusting means to adjust the length of the back headband to fit the user's head size;

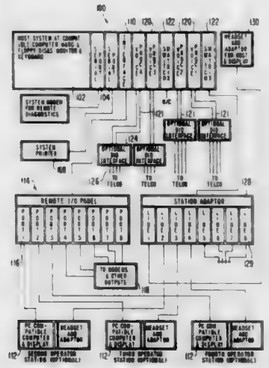
left back headband pivotal attached means to pivotally attach the left end of said back headband to said left housing; and

right back headband pivotal attachment means to pivotally attach the right end of said back headband to said right housing.

5,113,429
TELEPHONE ANSWERING SERVICE WITH INTEGRATED VOICE AND TEXTUAL MESSAGE STORAGE

John F. Morley, Jr., and Kent D. Anderson, both of Madison, Wis., assignors to American Tel-A-System, Inc., McFarland, Wis.

Continuation of Ser. No. 251,140, Sep. 29, 1988, Pat. No. 4,916,726. This application Feb. 23, 1990, Ser. No. 484,235
The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.
Int. Cl.[5] H04M *1/64, 3/50*
U.S. Cl. 379—88 **19 Claims**
MICROFICHE APPENDIX INCLUDED
(4 Microfiche, 296 Pages)



1. A telephone answering system for providing textural messages produced from operators answering telephone calls received by the answering system and voice messages produced by the answering of telephone calls received by the telephone answering system comprising:

at least one operator station which is operated by an operator in answering telephone calls, an operator station including a display device for displaying information to be utilized by the operator in answering telephone calls at the operator station and a textual message generating device used by the operator during answering telephone calls for composing textual messages recording information from telephone calls answered by the operator;

a voice message recording system for recording the voice messages, from telephone calls answered by the answering system, in a memory of the answering system;

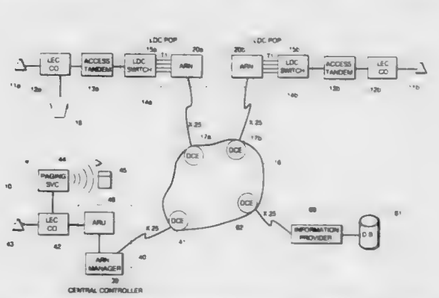
a textual message recording system for recording the textual messages, composed by an operator using the textual message generating device at one of the at least one operator station in answering a telephone call, in the memory of the answering system; and

a programmed controller for controlling the voice message recording system and the textual message recording system under the control of programming stored in the memory of the answering system, the programmed controller determining telephone number digits of each telephone call received by the answering system to be answered by the answering system, the digits being used by the controller to identify stored information, the stored information being used for controlling whether the received telephone call is to be answered either by the voice message recording system which records information from the answered telephone call in the memory of the answering system or by an operator at one of the at least one operator station who utilizes the information displayed on the display device obtained from the stored information to answer the received telephone call and who composes a textual message from answering the received telephone call which is recorded by the textual message recording system in the memory of the answering system, and controlling the reproduction of messages recorded by the recording system.

5,113,430
ENHANCED WIDE AREA AUDIO RESPONSE NETWORK

Charles T. Richardson, Jr., Gwinnett County, and Kevin L. Austin, Fulton County, both of Ga., assignors to United States Advanced Network, Inc., Norcross, Ga.

Filed Oct. 1, 1990, Ser. No. 591,047
Int. Cl.[5] H04M *1/64, 11/00, 3/42*
U.S. Cl. 379—88 **17 Claims**



1. Method of providing video messaging services to callers from a wide area network system, the method comprising the steps of:

providing a plurality of locationally diverse audio peripherals connected to user telephone lines and a central controller connected through a network to each of the plurality of audio peripherals to control the operation of each of the plurality of audio peripherals;

receiving a call from a caller through a telephone line at an audio peripheral;

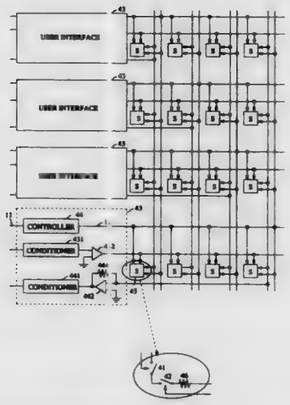
reproducing to the caller audio prompts from digital representations of the audio prompts stored in the audio peripheral in response to control signals received from the central controller;

receiving a caller audio message and a destination number from the caller in response to the reproduced audio prompts;

converting the caller audio message and the destination

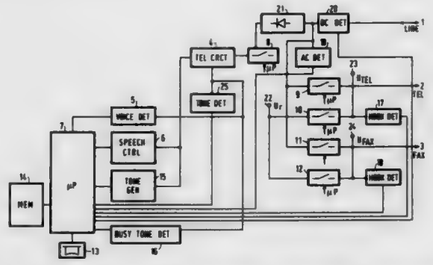
number into a digital representations of the caller audio message and the destination number;
storing the digital representations of the caller audio message and the destination number in the audio peripheral;
calling the destination number to access a message recipient;
reproducing to the message recipient the caller audio message from the digital representation of the caller audio message.

5,113,431
DISTRIBUTED CONTROL TELECONFERENCING VOICE BRIDGE
David N. Horn, Runson, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Oct. 31, 1989, Ser. No. 429,579
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—94 **13 Claims**



1. An apparatus comprising:
M row signal lines and M column signal lines;
a plurality of crosspoint circuits, each connected to one of said row signal lines and to one of said column signal lines;
a row control bus associated with each of said row signal lines for controlling signal flow into those of said crosspoint circuits that are connected to each of said row signal lines;
a column control bus associated with each of said column signal lines for controlling signal flow from those of said crosspoints that are connected to each of said column signal lines; and
M user interface circuits, each user interface circuit associated with a user apparatus supporting bidirectional communication each connected to one of said row signal lines and its associated row control bus, and to one of said column signal lines and its associated column control bus, for applying signals to its row, for controlling the signal flow through the crosspoints connected to its row and to its column and for receiving signals from its column
wherein each of said crosspoint circuits comprises a series connection of two switches connected between a row signal line and a column signal line.

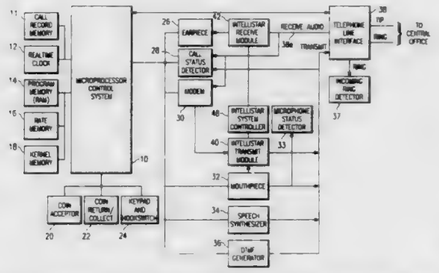
5,113,432
ARRANGEMENT FOR CONNECTING A TELEFAX DEVICE OR A TELEPHONE SET TO A TELECOMMUNICATION LINE
Ronald B. Van Santbrink, Muiden, and Willem H. M. De Vries, Rhenen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 2, 1990, Ser. No. 608,404
Claims priority, application Netherlands, Nov. 7, 1989, 8902743
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—100 **3 Claims**



1. A selector circuit for optionally connecting a facsimile device or a telephone set to a telecommunication subscriber line, comprising a line input for connecting the subscriber line, a telephone output for connecting the telephone set and comprising a telefax output for connecting the facsimile device, characterized in that said selector circuit comprises:
a line seizing circuit for seizing the subscriber line in response to a call signal from the subscriber line;
first detection means for detecting voice signals or predetermined tone signals, said first detection means producing a first connection control signal on detection of said voice signals or said predetermined tone signals and producing a second connection control signal in all further cases;
second detection means for detecting voice signals, said second detection means producing said second connection control signal on detection of voice signals and producing said first connection control signal in all further cases;
connection means connected to the two detection means, for establishing a connection between the line input and the telefax output in response to said first connection control signal and for establishing a connection between the line input and the telephone output in response to said second connection control signal; and
selection means for activating said first or second detection means as desired by the user.

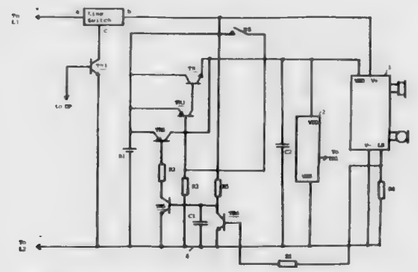
5,113,433
METHOD AND APPARATUS FOR ALTERING THE ACCESS FORMAT OF TELEPHONE CALLS
John A. Hird, Dallas; Lindsey D. Owen, and Michael R. Rice, both of Carrollton, all of Tex., assignors to Intellicall, Inc., Carrollton, Tex.
Continuation of Ser. No. 410,976, Sep. 22, 1989, abandoned, which is a continuation of Ser. No. 300,796, Jan. 23, 1989, Pat. No. 4,908,852. This application Aug. 29, 1990, Ser. No. 577,096
The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.
Int. Cl.[5] H04M *15/30, 17/02*
U.S. Cl. 379—130 **6 Claims**

1. A localized telecommunications device used by a patron placing a telephone call through a telecommunications network, the device comprising:
a single input means at the device accessible to the patron and operable to receive an initial access format, a destination telephone number and a billing account number from the patron, the initial access format indicating a call which is to be billed to an account not associated with the localized telecommunications device;
conversion circuitry at the device for changing the access format received from the patron to an altered access format indicating a call to be billed to an account associated with the localized telecommunications device; and



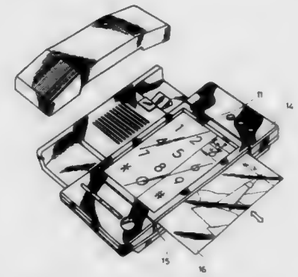
call completion circuitry at the device for placing the call through the telecommunications network using the destination telephone number received from the patron and the altered access format such that the call will be billed to an account associated with the localized telecommunications device.

5,113,434
BATTERY BOOSTED DIAL MEMORY
Ronald C. S. Fox, Randwick, Australia, assignor to Alcatel N.V., Amsterdam, Netherlands
Filed Feb. 1, 1990, Ser. No. 473,444
Claims priority, application Australia, Feb. 2, 1989, PJ2526
Int. Cl.[5] H04M *19/00*
U.S. Cl. 379—413 **9 Claims**



1. A telephone subset arrangement including
first and second line terminals to attach the subset to an exchange line;
a controllable semiconductor line switch coupled between said line terminals;
a transmission circuit in series with the line switch and also coupled between said line terminals;
a voltage regulator means also in series with the line switch and also coupled between the line terminals for providing a regulated voltage derived from the exchange line at a regulated voltage output;
a dialler circuit including a dialler memory connected to the regulated voltage output of the regulator means;
a battery;
a first controllable electronic switch coupled between the dial memory and the battery;
hook switch means for detecting an ON-HOOK state in which the transmission circuit and the voltage regulator means are disconnected from the exchange line by the line switch, for switching the first controllable electronic switch ON when the subset is in said ON-HOOK state, whereby the dial circuit arrangement is powered by the battery when the subset is in said ON-HOOK state and the battery may be isolated from the output of the voltage regulator means when the subset is not in the ON-HOOK state;
first current sensor means in series with the transmission circuit; and
a second controllable electronic switch in parallel with the first controllable electronic switch and responsive to the first current sensor means such that the second controllable electronic switch is switched OFF when the current in the transmission circuit is above a predetermined current threshold and ON when said current is below said predetermined current threshold.

5,113,435
STRUCTURE OF TELEPHONE KEYBOARD
Yung-Huei Chen, Kaohsiung, , assignor to Zeny Corporation, Kaohsiung, Taiwan
Filed Dec. 11, 1989, Ser. No. 448,631
Int. Cl.[5] H04M *1/00; G09F 3/00*
U.S. Cl. 379—441 **2 Claims**



1. A telephone apparatus, including a housing having thereon a keyboard, said keyboard comprising a key pad, which is used for making connections automatically through at least one control selected from the group consisting of static induction or touch induction control, and a transparent face plate, which has printed key numerals and signs thereon and is mounted on said key pad, defining therebetween a thin slot, said housing comprising an elongated opening at its one lateral side communicating with said thin slot, and through which a card which is printed with patterns or letters can be inserted into said thin slot.

5,113,436
TELEPHONE HANG-UP CUP HAVING RECTRACTABLE LATCH MEMBER OPERATIVE RESPONSIVE TO ACTUATION FORCE APPLIED AT EITHER SIDE THEREOF
John P. Jarvela, Wheeling, and Michael F. Spence, Arlington-Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 30, 1990, Ser. No. 516,371
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—455 **3 Claims**

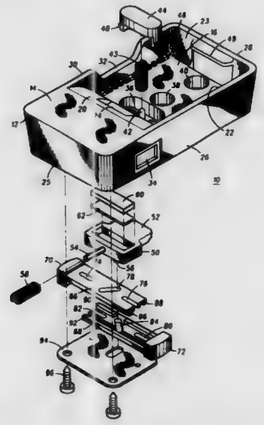
1. A telephone receptacle for receiving a portion of a telephone handset, the portion of the telephone handset having first and second handset latching surfaces formed thereupon, said telephone receptacle comprising:
a receptacle housing formed of first and second sidewalls, respectively, and a face surface interconnecting the first and second sidewalls, both said first and said second side-

wall, respectively, having means forming openings extending therethrough;

means forming a recessed area extending into the face surface of the receptacle housing, the recessed area formed thereby defined by a recessed surface disposed beneath a plane defined by the face surface, and recessed area sidewalls interconnecting the recessed surface and the face surface, said recessed surface for receiving the portion of the telephone handset thereupon, at least one of said recessed area sidewalls having a fixed latch member formed to project therebeyond for engaging with the first handset latching surface formed upon the telephone handset, and at least one of said recessed area sidewalls having means forming an opening extending therethrough;

means forming a retractable latch member for extending through the opening extending through the at least one recessed area sidewall, the retractable latch member formed thereby movable to permit positioning thereof at either a latch position or a release position such that, when positioned at the latch position, the retractable latch member is operative to engage with the second handset latching surface formed upon the telephone handset;

means including a spring, engaging with the retractable latch member and capable of exerting a spring force thereupon, for maintaining the retractable latch member in the latch position;



a first plate member housed within the receptacle housing and having: an end portion thereof forming a force receiving surface, and a rail formed to extend along the length of the first plate member; said end portion of the first plate member extending through the opening formed to extend through the first sidewall of the receptacle housing;

a second plate member housed within the receptacle housing and having: an end portion thereof forming a force receiving surface, and a track formed to extend along the length of the second plate member; said end portion of the second plate member extending through the opening formed to extend through the second sidewall of the receptacle housing, wherein said track formed along the second plate member and the rail formed along the first plate are aligned theretogether in confronting engagement to permit sliding engagement therebetween such that application of an actuation force to the force receiving surfaces of either, or both, of the first or the second plate members, respectively, causes translation of the first and the second plate members whereby translation of the plate members causes positioning of the retractable latch member at the release position to release the telephone handset from the receptacle housing thereby permitting movement of the telephone handset thereaway.

5,113,437

SIGNAL IDENTIFICATION SYSTEM

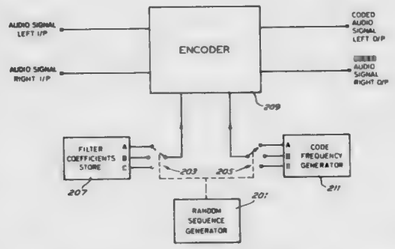
Stuart J. Best, Harlington; Nigel Johnson, Windlesham, and Adrian M. Sandford, Hayes, all of England, assignors to Thorn EMI plc, London, England

Filed Oct. 25, 1989, Ser. No. 426,284

Claims priority, application United Kingdom, Oct. 25, 1988, 8824969

Int. Cl.[5] G11B *23/28*

U.S. Cl. 380—3 **10 Claims**



1. A signal identification system comprising: encoding means comprising means for choosing a variable sequence of frequency bands from a plurality of different predetermined frequency bands in the bandwidth of a given signal; means for eliminating the chosen sequence of frequency bands from the given signal to form a sequence of corresponding notches in the given signal; and means for inserting a sequence of code signals into the notches, each code signal comprising frequencies within the bandwidth of the notch or notches into which it is inserted; and decoding means including delay means adapted to delay the insertion of the code signals into the notches until the decoding means ascertains that the amplitude of the code signal is sufficient to be detectable within the given signal, and to determine whether the code signal is present in the given signal.

5,113,438

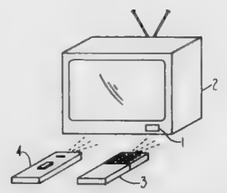
METHOD AND APPARATUS FOR JAMMING INFRARED REMOTE CONTROLS

Johan F. Blokker, Jr., Overland Park, and Eric B. Randall, Lenexa, both of Kans., assignors to CableSoft, Inc., Lenexa, Kans.

Filed Jun. 25, 1990, Ser. No. 543,453

Int. Cl.[5] H04K *1/00*

U.S. Cl. 380—6 **2 Claims**



1. A device for jamming an infrared receiver comprising:

(a) a television viewing system having an infrared receiver and circuitry for passing intelligence signals from said receiver and causing channel changes of said television viewing system;

(b) a first portable light transmitter emitting signal pulses and determining operation of said television viewing system;

(c) a second portable light transmitter having circuitry emitting, substantially simultaneously with said first light transmitter, a second light pulse pattern having pulses in the range of 30–60 kHz, pulse bursts having a repetition rate of less than 30 ms, and a pulse burst length of at least 0.2 ms;

(d) said pulses from said first portable light transmitter and said second portable light transmitter reaching said receiver and causing disfunction of said circuitry causing channel changes.

5,113,439

CATV TERMINAL AND VIDEO APPARATUS HAVING A NOISE ELIMINATING CIRCUIT

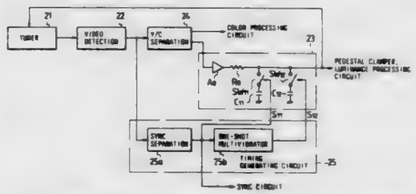
Takashi Hashimoto, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 5, 1990, Ser. No. 489,293

Claims priority, application Japan, Sep. 28, 1989, 1-250627; Sep. 28, 1989, 1-250628

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—7 **21 Claims**



1. In a CATV terminal apparatus detecting a radio frequency video signal transmitted through a transmission line, converting the detected signal into a baseband video signal, and modulating the converted signal into an output radio frequency video signal, the improvement comprising:

first noise eliminating means for eliminating a noise superimposed on a DC part of a horizontal synchronizing signal portion of the baseband video signal by integrating the DC part.

5,113,440

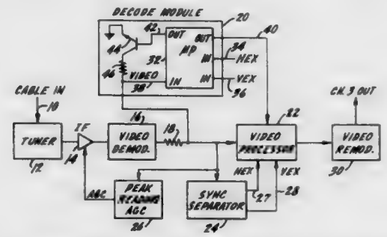
UNIVERSAL DECODER

Ralph P. Harney, Poway; Michael L. Hightower, San Diego, and Anthony J. Wechselberger, Escondido, all of Calif., assignors to OCI Communcations, Inc., San Diego, Calif.

Continuation of Ser. No. 382,899, Jul. 21, 1989, abandoned. This application May 15, 1991, Ser. No. 702,159

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—15 **17 Claims**



1. A decoder for decoding suppressed sync encoded television video signals in which horizontal sync pulses are suppressed during picture video,

said decoder including a microprocessor programmed to determine horizontal sync timing from timing signals in the vertical blanking interval (VBI), means for providing the timing signals in the VBI to the microprocessor, a sync restoration circuit connected to said microprocessor, said microprocessor being further programmed to provide a horizontal sync gate signal, based on the timing signals in the VBI, to said sync restoration circuit whereby said sync restoration circuit restores the suppressed horizontal sync pulses.

5,113,441

METHOD FOR SCRAMBLING A TELEVISION SIGNAL AND METHOD AND APPARATUS FOR DESCRAMBLING A SCRAMBLED TELEVISION SIGNAL

Kimihito Harada, Tokyo, Japan, assignor to Pioneer Electronics Corporation, Tokyo, Japan

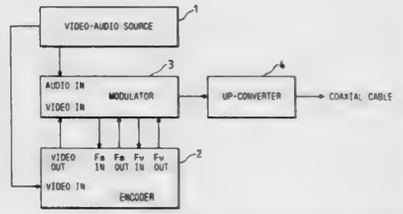
Filed Feb. 20, 1990, Ser. No. 481,270

Claims priority, application Japan, Apr. 21, 1989, 1-100298; Apr. 28, 1989, 1-107874

The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—15 **15 Claims**



1. A method for scrambling a television signal in which a television signal is compressed in a horizontal blanking interval and in a vertical blanking interval, and a key signal containing information concerning the compression is superimposed on an audio signal during said horizontal blanking interval, said method comprising the steps of:

superimposing a pseudo-key signal, which is a pulse signal similar to said key signal, on said audio signal during said vertical blanking interval; and

making said key signal contain information concerning a position of said vertical blanking interval.

5,113,442

METHOD AND APPARATUS FOR PROVIDING ACCESS CONTROL IN A SECURE OPERATING SYSTEM

Dale A. Moir, Naperville, Ill., assignor to Lachman Associates, Inc., Naperville, Ill.

Filed Mar. 6, 1989, Ser. No. 319,345

Int. Cl.[5] H04L *9/32*

U.S. Cl. 380—25 **23 Claims**

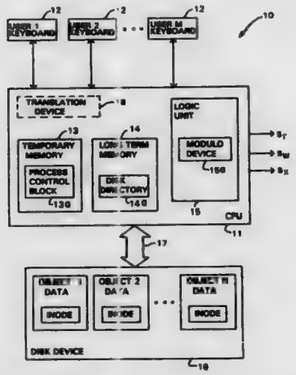
12. An operating system having a plurality of secure objects wherein access rights among a plurality of users to the secure objects are selectively controlled, the system comprising the combination of:

identification means for providing each user a user identification number which is prime;

at least one access code provided for each secure object, each access code comprising a value which is a product of the user identification numbers of all users having the same access rights to that secure object;

means for responding to a request by a particular user for access to a particular secure object by dividing the access

code for that secure object by the user identification number of the requesting user; and



means for determining access rights of the requesting user to the particular secure object based on whether the result of the division yields a zero remainder.

5,113,443

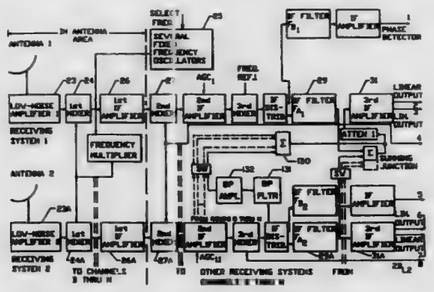
METHOD FOR SCRAMBLING SATELLITE COMMUNICATIONS

Milton H. Brockman, 912 Begonia Ct., Carlsbad, Calif. 92009

Division of Ser. No. 74,954, Jul. 17, 1987, Pat. No. 4,956,864. This application Jul. 9, 1990, Ser. No. 555,842

Int. Cl.[5] H04L *27/10*

U.S. Cl. 380—34 **4 Claims**



1. The method of frequency diversity encryption for scrambling communications of information signals radiated on a plurality of carriers, between authorized multi-channel stations, each channel having a different carrier frequency, the radiated information signals being modulation-method independent and encoding-method independent, the method of frequency diversity encryption comprising the steps of:

splitting up the encoded information signals into segments for multi-channel transmission;

encrypting the encoded information signal segments by multiplex modulating the segments onto the plurality of separate carrier frequencies in a sequence according to an algorithm having a key;

transmitting the multiplex modulated encoded information signal segments modulated onto the plurality of separate carrier frequencies to provide multichannel scrambled transmission;

receiving the scrambled multichannel transmission and amplifying, coherently heterodyning, and summing the separate carrier frequencies:

demodulating and summing the multiplex modulated encoded information signal segments of the encoded information signals on the separate carrier frequencies;

demultiplexing the summed multiplexed segments according to said algorithm using said key, and distributing the summed demultiplexed encoded information signals to authorized users of each encoded information signal.

5,113,444

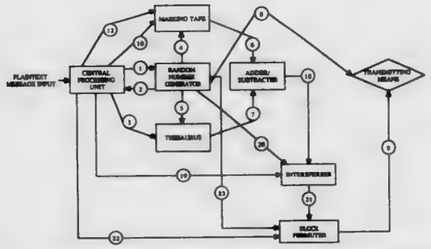
RANDOM CHOICE CIPHER SYSTEM AND METHOD

Arnold Vobach, 11114 Ashcroft, Houston, Tex. 77096

Filed Sep. 5, 1990, Ser. No. 577,936

Int. Cl.[5] H04L *9/02*

U.S. Cl. 380—47 **20 Claims**



1. A cipher system for use by a sender and a receiver comprising:

(a) a plaintext alphabet, each character of which is coded by a collection of numerical synonyms comprising nonnegative integers of a common fixed length such that:

(i) the fraction, of all the numerical synonyms, for all the plaintext alphabet characters, corresponding to a given plaintext alphabet character is substantially equal to the relative frequency of use of that plaintext alphabet character in constructing meaningful plaintext messages;

(ii) the numerical synonyms for each plaintext alphabet character are randomly distributed in the collection of all nonnegative integers, in their natural ordering, which have the common fixed length of the numerical synonyms; and

(iii) the choice of a numerical synonym to represent a plaintext alphabet character is randomly made from the collection of numerical synonyms corresponding to that plaintext alphabet character;

(b) a concatenation of the numerical synonyms comprising a plaintext message string integer corresponding to a plaintext message; and

(c) a masking tape string comprising a sequence of random digits added to the plaintext message string to form a ciphertext string.

5,113,445

SYSTEM FOR ENCODING DATA IN MACHINE READABLE GRAPHIC FORM

Yajiun P. Wang, Port Jefferson Station, N.Y., assignor to Symbol Technologies Inc., Bohemia, N.Y.

Continuation of Ser. No. 550,023, Jul. 9, 1990, abandoned. This application Feb. 11, 1991, Ser. No. 653,822

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—51 **27 Claims**

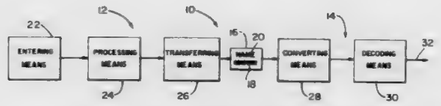
1. A system for representing and recognizing data on a record carrier in the form of a machine readable two-dimensional bar code structure comprising:

(a) encoding means including:

(i) means for entering data in said encoding means;

(ii) processing means for encoding said data into a two-dimensional bar code structure, said bar code structure including a plurality of ordered, adjacent rows of codewords of bar-coded information, each of said codewords representing at least one information-bearing character, and for generating first transfer drive signals;

(iii) means for transferring an image of the two-dimensional bar code structure onto a portable record carrier in response to said first transfer drive signals; and



(b) recognition means including:

(i) means for scanning the image of the two-dimensional bar code structure and for converting the codewords into electrical signals representative of the information-bearing characters; and

(ii) means for decoding the electrical signals into output signals representative of said data.

5,113,446

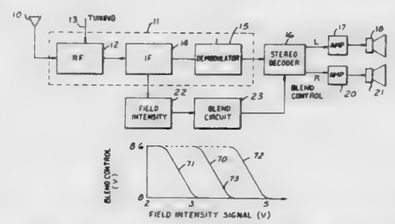
STEREO BLEND CONTROLLER FOR FM RECEIVERS

John F. Kennedy, Garden City, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 17, 1990, Ser. No. 631,305

Int. Cl.[5] H04H *5/00*

U.S. Cl. 381—10 **18 Claims**



1. A stereo blend controller for a stereo radio receiver which converts stereo broadcast signals to blended-stereo audio signals, said controller comprising:

level detecting means for generating a field intensity signal indicative of the intensity at which a stereo broadcast signal is received;

blend curve generator means coupled to said level detecting means for generating a blend control signal according to a blend curve and said field intensity signal; and

curve shift means coupled to said level detecting means and said blend curve generator means for substantially maintaining the average magnitude of said blend control signal at a predetermined magnitude if said field intensity signal is above a threshold.

5,113,447

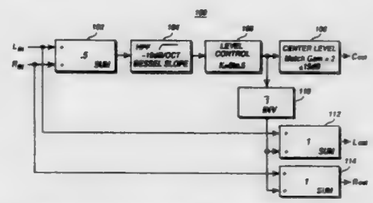
METHOD AND SYSTEM FOR OPTIMIZING AUDIO IMAGING IN AN AUTOMOTIVE LISTENING ENVIRONMENT

Brian J. Hatley, Lynnwood, and Richard A. Chinn, Redmond, both of Wash., assignors to Electronic Engineering and Manufacturing, Inc., Mountlake Terrace, Wash.

Filed Jan. 5, 1990, Ser. No. 461,186

Int. Cl.[5] H04S *3/00*

U.S. Cl. 381—27 **9 Claims**



1. An improved audio system comprising:

input means for inputting first and second audio signals;

first summing means for generating a sum signal comprising the sum of said first and second audio signals and for generating a first output signal;

inverting means coupled to said first summing means for generating a phase inverted sum signal;

second summing means coupled to said first audio signal and said phase inverted sum signal for generating a second output signal corresponding to the difference between said first audio signal and said sum signal;

third summing means coupled to said second audio signal and said phase inverted sum signal for generating a third output signal corresponding to the difference between said second audio signal and said sum signal; and means for limiting the gain of said sum signal to 0.5 to preserve substantially all perceptible directional information in said second and third output signals.

5,113,448

SPEECH CODING/DECODING SYSTEM WITH REDUCED QUANTIZATION NOISE

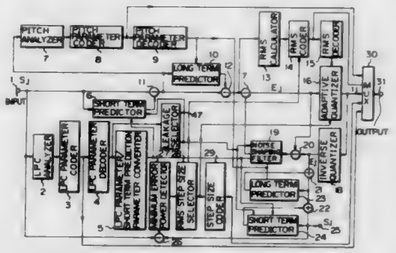
Takahiro Nomura, Tokyo; Yohtaro Yatsuzuka, Kanagawa; Shigeru Iizuka, Saitama, and Hideki Honma, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1989, Ser. No. 463,280

Claims priority, application Japan, Dec. 22, 1988, 63-322167

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—47 **13 Claims**



1. A speech coding/decoding system comprising:

a coding side including

a predictor providing a predicted signal of a digital input speech signal based upon a) a prediction parameter

which is output by a prediction parameter means and b) a first leakage coefficient,

a quantizer quantizing a residual signal input thereto, said residual signal is a function of said digital input speech signal and said predicted signal,

a multiplexer multiplexing an output of said quantizer as coded signals of the residual signal, and multiplexing said prediction parameter and multiplexing other information for sending to a decoding side;

said decoding side including

a demultiplexer separating said coded signals of said residual signal, said prediction parameter and the other information from said coding side,

an inverse quantizer for inverse quantization and decoding of said coded signals of said residual signal from said demultiplexer,

a prediction parameter decoder, coupled with an output of said demultiplexer, decoding said prediction parameter from said coding side,

a synthesis filter reproducing said digital input signal by adding an output of said inverse quantizer and a reproduced predicted signal, said reproduced prediction signal based upon a) said decoded prediction parameter and b) a second leakage coefficient, and

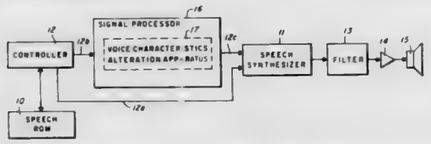
means for providing said second leakage coefficient of said synthesis filter in said decoding side so that said second leakage coefficient differs from said first leakage coefficient of said predictor in said coding side, wherein a value of each respective leakage coefficient is larger than 0 and smaller than 1.

5,113,449

METHOD AND APPARATUS FOR ALTERING VOICE CHARACTERISTICS OF SYNTHESIZED SPEECH

Keith A. Blanton, and Ramon E. Helms, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 9, 1988, Ser. No. 231,620
Continuation of Ser. No. 408,535 Aug. 16, 1982, abandoned.
Int. Cl.[5] G10L 5/00
U.S. Cl. 381—51 **19 Claims**



1. A method of altering the voice characteristics of synthesized speech to obtain modified synthesized speech of any one of a plurality of voice sounds from a single applies source of synthesized speech, said method comprising:

providing a source of synthesized speech in the form of digital speech data corresponding to respective samples of an analog speech signal obtained at time intervals defined by a predetermined sampling period and from which synthesized speech is derivable, said digital speech data comprising frames of speech parameters provided at a predetermined speech rate, wherein each speech parameter frame has a predetermined pitch period and a predetermined vocal tract model defined by a plurality of predictor coefficients;

adding a predetermined number of null values to the plurality of predictor coefficients defining the predetermined vocal tract model for each frame of digital speech data;

changing the digital speech data from a first phase in the time domain to a second phase in the frequency domain by a first Fourier transform operation in which the added predetermined number of null values are absorbed into the digital speech data signal sequence and defining a synthetic speech spectrum;

inverting the digital speech values of the plurality of predictor coefficients defining the predetermined vocal tract model for each frame of digital speech data in the frequency domain;

establishing a first reference factor P as a first integer equal to a selected number of predetermined points spanning the speech spectrum as determined by the type of voice desired to be made in a Fourier transform operation;

establishing a second reference factor O as a second integer of unequal magnitude with respect to said first integer providing said first reference factor P, said second integer being an even number corresponding to an arbitrary number of points spanning the extent of the speech spectrum;

simulating an adjustment in the sampling period related to the digital speech data from said source of synthesized speech based upon the inequality between said first and second reference factors P and O, wherein said second integer providing said second reference factor O=the nearest even integer to the product of

$P \times F_{NEW}/F_{OLD}$, where

F_{NEW}=the desired apparent sampling frequency of the simulated adjusted sampling period; and

F_{OLD}=the implied sampling frequency of the predetermined sampling period;

altering the predetermined vocal tract model of the digital speech data in response to the simulated adjustment in the sampling period by compressing the synthesized speech spectrum if said first integer providing said first reference factor P is greater in magnitude than said second integer providing said second reference factor O, or by expanding the synthesized speech spectrum if said first integer providing said first reference factor P is of lesser magnitude than said second integer providing said second reference factor O;

producing modified digital speech data as a digitized speech waveform providing an impulse response from which the predetermined pitch period and amplitude data have been deleted by returning the compressed or expanded synthesized speech spectrum to said first phase in the time domain from said second phase in the frequency domain by a second Fourier transform operation;

analyzing said digitized speech waveform in providing the modified digital speech data having an altered vocal tract model as a plurality of predictor coefficients;

converting said plurality of predictor coefficients defining said altered vocal tract model to reflection coefficients;

generating audio signals representative of human speech from the modified digital speech data as represented by reflection coefficients; and

converting said audio signals into audible synthesized speech having altered voice characteristics from the synthesized speech which would have been obtained from said source of synthesized speech.

5,113,450

Patent Not Issued For This Number

5,113,451

METHOD FOR LABELLING POLYGONS

David C. Chapman, and Herve G. Duprez, both of Campbell, Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Oct. 16, 1989, Ser. No. 422,332
Int. Cl.[5] G06K 9/00, 9/34, 9/46, 9/20
U.S. Cl. 382—8 **26 Claims**

26. An integrated circuit fabricated using a process for labelling polygons which includes the steps of:

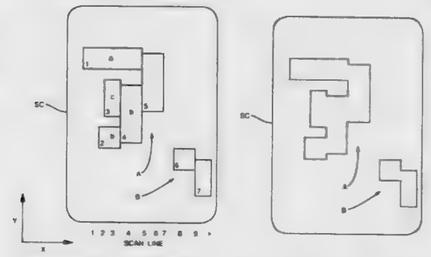
scanning the geometric layout during a first scan line pass to detect objects which form a polygon;

processing the scan line at each occurrence of an event to detect the objects which contact the scan line;

assigning temporary numbers and root designators to the objects which contact the scan line in accordance with a sorting criterion;

updating the temporary numbers assigned to the objects to keep the temporary number associated with the earliest root designator of each separately detected polygon; and,

renaming each object which forms a part of the same polygon with a common label, said step of updating including the steps of:



numbering each object in a polygon with a temporary number previously assigned to the root object of the polygon; and,

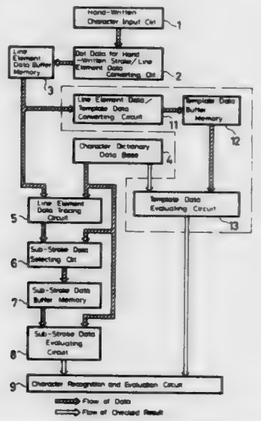
storing, in a sorted order, root objects which lose their status as root objects during the step of updating.

5,113,452

HAND-WRITTEN CHARACTER RECOGNITION APPARATUS AND METHOD

Masayuki Chatani; Kimiyoshi Yoshida, both of Kanagawa; Akio Sakano, Ibaraki, and Hirofumi Tamori, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 18, 1989, Ser. No. 395,740
Claims priority, application Japan, Aug. 23, 1988, 63-209094
Int. Cl.[5] G06K 9/18
U.S. Cl. 382—13 **8 Claims**



1. A hand-written character recognition apparatus comprising:

means for receiving dot data obtained when writing a character and for generating corresponding line element data therefrom;

character dictionary data base means which stores character data as command instruction sets each expressing the configuration of a different character, the character data including tracing commands for extracting sub-stroke data from the line element data, sub-stroke data selecting commands for selecting one or more sub-stroke data for later evaluation processing, and checking commands for partially evaluating the thus selected one or more sub-stroke data by making a comparison to a partial shape of a standard character, and for totally evaluating the hand-written character by comparing it to the standard character;

sub-stroke data generating means connected to the character dictionary data base means for receiving the tracing commands and generating sub-stroke data by tracing the line element data based on the tracing commands inherent to each standard character derived from the character dictionary data base means;

sub-stroke data selecting means connected to the character dictionary data base means for receiving the character selection commands and supplied with the thus generated sub-stroke data for selecting sub-stroke data inherent to each standard character based on the sub-stroke data selecting commands; and

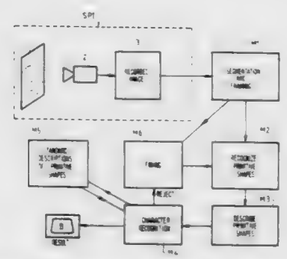
sub-stroke data evaluating means connected to the sub-stroke data selecting means and the character dictionary data means, so as to receive character checking commands, for evaluating partial similarity of the selected sub-stroke data compared to a partial sub-stroke data of the standard character, and for evaluating the total similarity of the hand-written character based on the results of the evaluation of the partial similarity.

5,113,453

CHARACTER RECOGNITION METHOD AND APPARATUS

Jean-Claude Simon, Paris, France, assignor to Etat Francais Represente par le Ministre des postes et Telecommunications Centre National d'Etudes des Tellecommunications, Issy Les Moulineaux, France

Continuation of Ser. No. 131,890, Dec. 11, 1987, abandoned.
This application May 14, 1990, Ser. No. 523,257
Claims priority, application France, Dec. 12, 1986, 86 17436
Int. Cl.[5] G06K 9/46
U.S. Cl. 382—24 **14 Claims**



1. A method of processing digital signals representative of image lines, and in particular of characters, the method comprising the steps of:

a) isolating each elementary shape and character, and framing said each shape and character in a matrix having a predetermined configuration, in particular a rectangular configuration; and

b) performing a search inside the matrix for primitive shapes of predetermined types, said primitive shapes being referred to as first level primitive shapes;

wherein operation b) comprises:

b11) searching inside the matrix for quanta, with each quantum being defined as a homogeneous block having a minimum number of pixels having intensity greater than a local threshold;

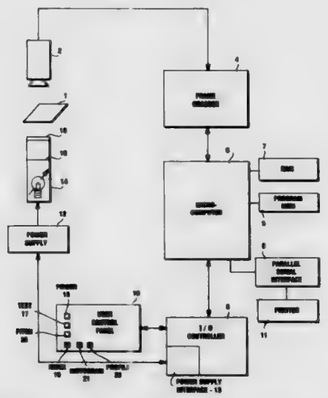
b12) detecting a plurality of sequences of overlapping quanta, with each sequence being representative of a stroke; and

wherein adjacent strokes recognized in this way are subtracted from the matrix, thereby leaving characteristic zones containing said primitive shapes, wherein the first level primitive shapes comprises:

the ends of strokes;

changes in direction;
cusps;
crosses or branching points having at least three branches; and
closed loops.

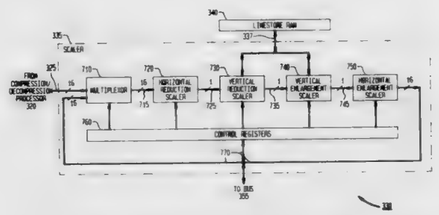
5,113,454
FORMATION TESTING WITH DIGITAL IMAGE ANALYSIS
Jeffrey J. Marcantonio, and Christopher W. Jones, both of South Glens Falls, N.Y., assignors to Kajaani Electronics Ltd., Kajaani, Finland
Filed Aug. 19, 1988, Ser. No. 234,478
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—27 **32 Claims**



1. A method for determining the uniformity of a medium comprising the steps of:
illuminating said medium by transmitting light through the medium;
generating digital data corresponding to the intensity level of data points in a two dimensional array of data points on said illuminated medium;
dividing said digital data into a plurality of relatively large two dimensional windows;
subdividing each of said large windows into a plurality of smaller windows;
determining the average intensity of the data points in at least one large window;
determining the average intensity of he data points in at least one of the smaller windows within the associated large window;
determining the difference in the average intensity level between at least one smaller window and its associated large window; and
generating an index representing the uniformity of said data as a function of the difference in intensity levels between data points in said at least one of the smaller windows and its associated large window.

5,113,455
DIGITAL IMAGE SCALING BY STEPWISE PIXEL MOVEMENT
Kevin C. Scott, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 27, 1990, Ser. No. 486,645
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—47 **20 Claims**

1. A method for scaling a digitized source image of a first size to yield a digitized output image of a second size; said method comprising the steps of:
(a) initializing first and second coordinate addresses to corresponding first and second starting pixel addresses in respectively digitized source and output images;
(b) incrementing the first coordinate address horizontally by a first pre-defined horizontal increment to yield a new value of the first coordinate address, said first coordinate address representing a position in the source image;
(c) incrementing the second coordinate address horizontally by a second pre-defined horizontal increment to yield a new value of the second coordinate address, said second coordinate address representing a position in the output image;
(d) setting, in response to the new values of said first and second coordinate addresses, a value of a specific pixel in the bit map of said output image equal to a specific pixel in a bit map of said source image, wherein said specific pixels

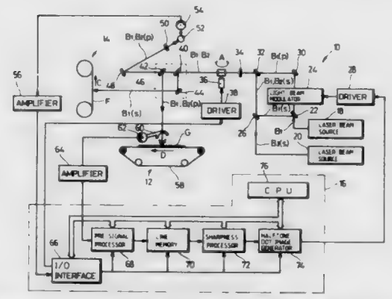


in the bit maps of said source and output images are respectively defined by integer portions of the new values of said first and second coordinate addresses;
(e) repeating steps (b)–(d) until a pre-defined horizontal end condition is reached in the bit map of either said source or output images at which both the first and second coordinate addresses are reset to starting horizontal coordinate locations of said first and second starting pixel addresses and are incremented by first and second pre-defined vertical increments, respectively; and
(f) repeating steps (b)–(e) until a pre-defined vertical end condition is reached in the bit map of the source image whereby a desired bit map for the output image is generated, and
wherein said first and second pre-defined horizontal increments are respectively one and less than one in value so that horizontal reduction scaling is produced in the output image.

5,113,456
METHOD OF AND APPARATUS FOR RECORDING IMAGE
Hideaki Kimura, and Osamu Shimazaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 3, 1989, Ser. No. 318,406
Claims priority, application Japan, Mar. 4, 1988, 63-52452
Int. Cl.[5] G06K *9/40*
U.S. Cl. 382—54 **4 Claims**

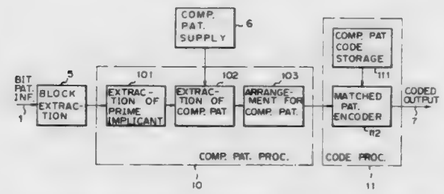
1. A method of recording an image on a recording medium based on image signals produced from an original by scanning the original at a predetermined sampling pitch for scanning in a main scanning direction and also scanning the original in an auxiliary scanning direction transverse to said main scanning direction, said method comprising the steps of:
reading image information from said original at a sampling pitch which is N times (N is a positive integer greater than or equal to two) larger than said predetermined sampling pitch for scanning in said main scanning direction, and reading image information from said original on at least every Nth scanning line across said auxiliary scanning direction, to produce image signals;

storing said image signals in a memory means;
reading said image signals form said memory means at a read pitch which is N times larger than said predetermined sampling pitch for scanning;
processing said image signals in an image processing mode for enhancing image sharpness;



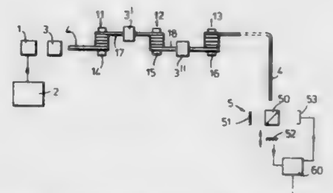
extracting the processed image signals repeatedly N times to record the processed image signals on the recording medium in a main scanning direction thereof; and
extracting the processed image signals on N scanning lines including at least the processed image signals corresponding to an Nth scanning line to record the image signals on the recording medium in an auxiliary scanning direction thereof.

5,113,457
IMAGE INFORMATION CODE PROCESSING SYSTEM
Hajime Enomoto, Funabashi, Japan, and Ming-Kou Chou, Taipei Hsien, Taiwan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Mar. 25, 1988, Ser. No. 173,726
Claims priority, application Japan, Mar. 25, 1987, 62-70727
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—56 **16 Claims**



1. An image information code processing system for receiving bit pattern information including 2-valued image information and for encoding the 2-valued image information, the 2-valued image information including a plurality of expanded blocks each comprising a predetermined number of unit blocks with predetermined dimensions, each of the expanded blocks having a bit pattern, said system comprising:
component pattern supply means for supplying a plurality of component patterns constituting the bit pattern of each of the expanded blocks;
component pattern processor means for selecting the component patterns, one of the unit blocks located at a predetermined position in the expanded block being an object block, a set of the component patterns having a set of bits with a predetermined value in the bit pattern of the expanded block, and the selecting is performed based on a set of bits not expressed by the component patterns already selected for other unit blocks in the bit pattern of the object block belonging to the set of the component patterns, and for outputting matched codewords corresponding to the component patterns selected;
code processing means for encoding the 2-valued image information corresponding to the object block with a codeword train comprising the matched codewords from said component pattern processor means; and
wherein said component pattern processor means selects component patterns determined to correspond to prime implicants in response to a set of bits including bits having a predetermined value in the bit pattern of the object block, the prime implicants being such that when each bit the bit pattern of the expanded block corresponds to a different combination with each bit being a predetermined logical variable value, a set of bits corresponding to a combination of the predetermined logic variable value making a predetermined logical equation including prime implicants true coincides with the set of bits having the predetermined value of the bit pattern of the expanded block.

5,113,458
OPTICAL MULTIPLEXING
Robert M. Taylor, Cheltenham, England, assignor to Smiths Industries Public Limited Company, London, England
Filed Apr. 11, 1991, Ser. No. 674,909
Claims priority, application United Kingdom, Apr. 4, 1990, 9007615
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—11 **11 Claims**

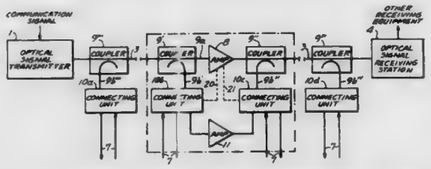


1. An optical multiplexing system comprising: a length of a substantially non-birefringent optical fiber; a source of partially coherent depolarized optical radiation at one end of the fiber; a plurality of devices for inducing birefringence in the fiber at respective points along its length separated by non-birefringent portions of the fiber, such that the radiation is superimposed onto two polarization modes which results in each incoming wave train producing two output wave trains separated in time from one another, the time separation between output wave trains from each device differing from one another; and means for measuring the time separation between output wave trains and providing an output in accordance therewith.

5,113,459
OPTICAL FIBER TELECOMMUNICATION LINE WITH SEPARATE, OPTICALLY TRANSMITTED SERVICE CHANNELS
Giorgio Grasso, Monza, and Mario Tamburello, Vimercate, both of Italy, assignors to Pirelli Cavi S.p.A., Milan, Italy
Continuation-in-part of Ser. No. 555,941, Jul. 20, 1990, Pat. No. 5,054,876, and a continuation-in-part of Ser. No. 605,558, Oct. 29, 1990. This application Jan. 29, 1991, Ser. No. 647,141
Claims priority, application Italy, Jan. 30, 1990, 19186 A/90
Int. Cl.[5] G02B *6/28*
U.S. Cl. 385—24 **12 Claims**

7. An optical fiber transmission system for the transmission of communication and service signals, said system comprising:
an optical communication signal transmitter for transmitting optical communication signals of a first predetermined wavelength;
an optical communication signal receiver for receiving opti-

cal communication signals at said predetermined wavelength;
at least one optical amplifier comprising an active fiber doped with a fluorescent substance and having an input and an output and means for injecting pumping energy at a wavelength which is different from said first predetermined wavelength and which causes said fluorescent substance to fluoresce into at least said input of said active fiber;
a first optical coupler having an input, an input/output and an output and having its output coupled to the input of each active fiber;
a first section of optical fiber line connecting said optical communication signal transmitter to said optical coupler input;
means including a second section of optical fiber line and a second optical coupler connecting said output of each



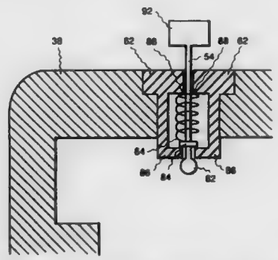
active fiber with one of said communication signal receiver and said input of an active fiber of another said optical amplifier;
a connecting unit connected to said optical coupler input-/output, said connecting unit comprising at least one of an optical service signal receiver for receiving optical service signals from said first optical coupler at a second predetermined wavelength different from said first predetermined wavelength and of an optical service signal emitter for supplying optical service signals at said second wavelength to said first optical coupler, said optical service signal receiver having converting means for converting optical service signals to electrical signals and said optical service signal emitter having converting means for converting electrical signals to optical service signals; and
a further said connecting unit connected to each said second optical coupler.

5,113,460
OPTICAL DEVICE HAVING AN INTEGRATED OPTICAL COMPONENT, AND METHOD OF MANUFACTURE
Roland Hakoun, Domont, and Eric Tanguy, Paris, both of France, assignors to Alcatel Fibres Optiques, Cedex, France
Filed Apr. 22, 1991, Ser. No. 688,792
Claims priority, application France, Apr. 27, 1990, 90 05407
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—39 **7 Claims**



1. An optical device including an integrated optical component having a substantially rectangular glass substrate including integrated optical waveguides, and defining between them a coupler having first ends of said waveguides on one of the end faces of the substrate and at least one second end of the waveguides on the opposite end face of the substrate, and further including a first jointing component for joining first optical fibers to first ends of the waveguides, and a second jointing component for joining a second optical fiber to each second end, each of the jointing components being bonded to said glass plates holding said first fibers therebetween, with the spacing of said first fibers being substantially equal to the spacing of the first ends of the waveguides, wherein the spacing of the waveguides, at least at said first ends, is substantially equal to the diameter of said first fibers when covered, wherein said covered first fibers form a sheet of touching fibers in said first jointing component, wherein the inside faces of the plates of said first jointing component are plane, wherein said optical device further includes a support piece having a central flat on which said substrate is mounted, and two ends on which said optical fibers are supported and bonded beyond said first and second jointing components, and said second jointing component is constituted by a slab or tube of glass having a channel passing therethrough in which the stripped end of the single second fiber is threaded and held, and is bonded against the substrate during alignment of said second fiber with the corresponding second end of the waveguides.

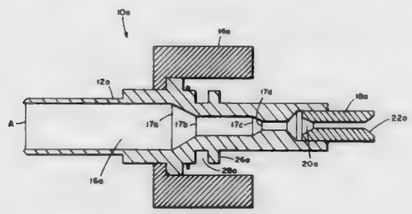
5,113,461
OPTICAL FIBER QUICK CONNECT/DISCONNECT HAVING ELECTRICAL CONTACTS
Angel L. Ortiz, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Mar. 11, 1991, Ser. No. 666,976
Int. Cl.[5] G02B *6/00, 6/26*
U.S. Cl. 385—53 **8 Claims**



1. An optical fiber connect/disconnect for a power laser which is comprised of:
a main body means having a first electrical contact means secured to said main body means and adapted to releasably secure an optical fiber means;
a main body receiver means having a second electrical contact means;
a slidable coupler means secured to said receiver means; and
said main body means lockably engages said receiver means in order to electrically interconnect said first and second contacts and to fiber optically interconnect said main body means, said receiver means and said coupler means.

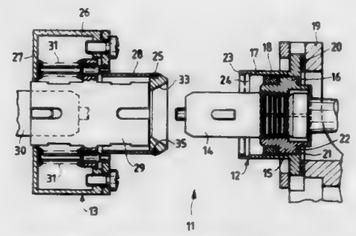
5,113,462
HIGH ENERGY FIBER OPTICA COUPLER
Michael G. Clancy, Westford, and Gary W. Jaegle, Auburn, both of Mass., assignors to Candela Laser Corporation, Wayland, Mass.
Continuation-in-part of Ser. No. 531,934, Jun. 1, 1990, abandoned. This application Apr. 8, 1991, Ser. No. 682,872
Int. Cl.[5] G02B *6/36*
U.S. Cl. 385—53 **14 Claims**

1. An optical coupler for optically coupling optical fibers, comprising:
a) an adapter;
b) a first optical connector for connecting a first optical fiber to the adapter, said first optical connector including a ferrule for positioning and aligning the first optical connector wherein said ferrule includes a bevelled end, the first ferrule being made of a material with an optical energy damage threshold at least at high as that of the first optical fiber; and
c) a second optical connector for connecting a second optical fiber to the adapter such that the second optical fiber is positioned to create optical couping between the first optical fiber and the second optical fiber, wherein the second optical connector also includes a second ferrule with a bevelled end that faces the bevelled end of the ferrule of the first optical connector to create space about



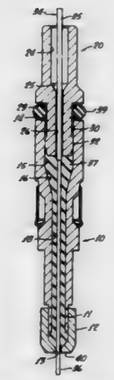
an interface between the optical fibers, the interface between the fibers comprising a gap between the fiber ends in the range of 0.001 to 0.005 inches, the second ferrule being made of a material with an optical energy damage threshold at least as high as that of the second optical fiber;
wherein the material of each ferrule is capable of resisting damage when optical energies are passed through the fibers in excess of 20 Megawatts per square centimeter.

5,113,463
CONNECTOR FOR FIBRE OPTIC CABLES
Abramo Nodari, Cassina De' Pecchi, Italy, assignor to Sirti S.p.A., Milan, Italy
Filed Mar. 20, 1991, Ser. No. 672,449
Claims priority, application Italy, Mar. 20, 1990, 20865/90[U]
Int. Cl.[5] G02B *6/38*
U.S. Cl. 385—60 **7 Claims**



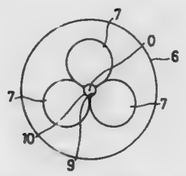
1. A connector for fiber optic cables comprising a female element with which a first terminal element of a fiber optic cable is associated and a male element with which there is associated a first sleeve into which a second terminal element is inserted, said female element being of the type which can be associated with a fixed assembly and comprising a base and a flanged sleeve free to position itself relative to said base by moving only in a plane perpendicular to the jointing axis of the connector, any rotation of said flanged sleeve about said connector jointing axis or about axes parallel thereto being prevented, characterized in that said male element consists of a hollow body closed by a flanged tubular element and provided with a bored end plate, said male element receiving said first sleeve in such a manner as to prevent its rotation and also receiving elastic means engaged with said end plate and with said first sleeve, said tubular element being lockably insertable into said female element, characterized in that said female element is provided within said flange sleeve with two half-collars and suitable fixing means able to render said first terminal element rigid with said flanged sleeve to prevent its rotation.

5,113,464
METHOD OF PRODUCING AN OPTICAL FIBER TERMINUS FOR HIGH TEMPERATURE USE
Stephen W. Wall, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jun. 24, 1991, Ser. No. 720,045
Int. Cl.[5] G02B *6/36*
U.S. Cl. 385—81 **11 Claims**



7. The method of producing an optical fiber terminus comprising the steps of
forming a front optical terminus body having a passageway therethrough from a rearward end to a forward end of said body,
said passageway for the major part of its length having a greater diameter than the diameter of an optical fiber to be associated with the optical fiber terminus to be produced,
said passageway adjacent said forward end being substantially complementary to said fiber,
introducing into said passageway a quantity of liquid which can cure to a solid deformable material,
forming a rear optical terminus body having a passageway therethrough from a rearward end to a forward end of said rear body,
said rear body being formed so that its forward end can be forced into the rearward portion of said passageway in said front body with a press fit,
extending said optical fiber through said passageway in said rear body and through said passageway in said front body,
then so forcing said forward end portion of said rear body into said rearward end of said passageway in said front body to a first position longitudinally of said passageway in said front body,
then curing said liquid so as to form said solid deformable material, and
then so forcing said rear body into said rearward end of said passageway in said front body to a second position further within said passageway in said front body,
thereby to exert a compressive force on said material so that said material frictionally grips said fiber along the major portion of the length of said passageway in said front body.

5,113,465
OPTICAL FIBER CONNECTOR TERMINAL AND METHOD OF MAKING SAME
Norihide Kawanami; Kinjiro Okada, both of Tokyo, and Yoshikazu Kozu, Ueda, all of Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Feb. 22, 1991, Ser. No. 659,078
Claims priority, application Japan, May 16, 1990, 2-124014
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—82 **19 Claims**

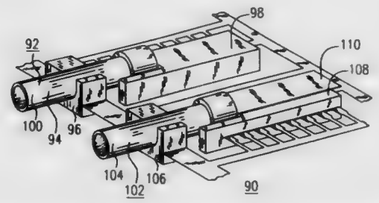


1. An optical fiber connector terminal comprising:
a sleeve made from a metal having an opening of a predetermined diameter;
a plurality of pins made from hardened steel and disposed equidistance from a center within said sleeve to define a receiving aperture;
an optical fiber inserted into and bonded to said receiving aperture,
said metal being softer than said hardened steel; and
said sleeve being subjected to a force to be reduced in diameter so that said metal collapses and fills spaces between said sleeve and said pins while said pins are disposed equidistance from a center, thereby placing said optical fiber at said center.

6. A method of making an optical fiber connector terminal, which comprises the steps of:
boring an opening of a predetermined diameter in a metal sleeve;
placing a plurality of hardened steel pins within said metal sleeve such that said pins are disposed around a center of said metal sleeve;
reducing a diameter of said metal sleeve so that a material of said metal sleeve fills spaces between said sleeve and said pins, thereby disposing said pins equidistance from said center to form a long, fine receiving aperture at said center; and
securing an optical fiber in said receiving aperture to provide an optical fiber connector terminal.

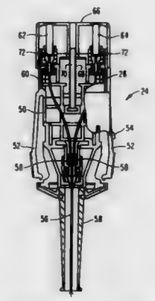
5,113,466
MOLDED OPTICAL PACKAGING ARRANGEMENT
Muvaffak S. Acarlar, Allentown, Pa.; Louis T. Manzione, Summit, N.J.; Steven D. Robinson, Lower Macungie Township, Lehigh County, and Dennis Stefanik, Weisenberg Township, Lehigh County, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Apr. 25, 1991, Ser. No. 691,649
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—88 **26 Claims**

1. An optical communication arrangement comprising:
a leadframe section;
optical means, including an active semiconductor optical device and a base member, said base member for facilitating coupling between said optical device and an optical fiber;
electronic circuitry for the operation of said active optical device, attached to said leadframe section;
first molded packaging disposed to encapsulate said electronic circuitry and further comprising a molded support member, the optical means base member disposed to rest upon said molded support member and the active optical device coupled to the encapsulated electronic circuitry; and



second molded packaging disposed to cover both the encapsulated electronic circuitry and the optical means attached thereto.

5,113,467
LASER TRANSMITTER INTERLOCK
Gerald W. Peterson, Poughkeepsie, and Bert W. Weidle, Ulster Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 13, 1990, Ser. No. 612,300
Int. Cl.[5] G02B *6/42*
U.S. Cl. 385—88 **5 Claims**

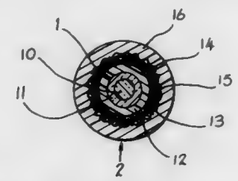


1. An interlock system for a laser transmitter module adapted to be coupled to a fiber-optic connector having means associated therewith for generating a magnetic field, said interlock system comprising:
a laser light source mounted on said module;
a Hall effect sensor mounted on said module, said sensor producing a first signal in the absence of said magnetic field and a second signal in the presence of said magnetic field; and
means for disabling energization of said laser source in response to said first signal and for enabling energization of said laser in response to said second signal.

5,113,468
FIBRE-OPTIC CABLE ASSEMBLIES
Peter D. Baker, Basingstoke, England, assignor to Smiths Industries Public Limited Company, London, England
Filed Mar. 8, 1991, Ser. No. 666,636
Claims priority, application United Kingdom, Mar. 14, 1990, 9005741
Int. Cl.[5] G02B *5/14, 6/44*
U.S. Cl. 385—100 **11 Claims**

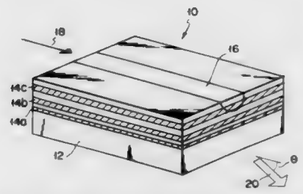
1. A fibre-optic cable assembly comprising: at least one optical fibre; a sheath, the optical fibre extending internally along a major part of the length of the sheath; a termination at each end of the assembly to which the optical fibre extends; and means securing the sheath to the terminations at each end; the sheath including a braided sleeve and at least one filament

of a material having substantially the same coefficient of thermal expansion as the optical fibre, said filament extending



along and within a wall of the sheath and being operative to restrain thermal expansion of the sheath to an expansion closely matched to that of the optical fibre.

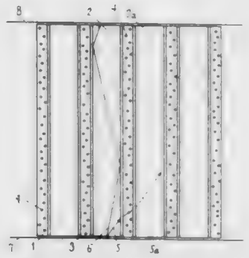
5,113,469
OPTICAL WAVELENGTH-CONVERTING DEVICE FOR GUIDED-WAVE SECOND-HARMONIC GENERATION IN CERENKOV RADIATION MODE
Genichi Hatakoshi, Yokohama; Kazutaka Terashima, Ebina; Masaru Kawachi, and Yutaka Uematsu, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 1, 1991, Ser. No. 663,311
Claims priority, application Japan, Mar. 2, 1990, 2-49462; Aug. 24, 1990, 2-221282
Int. Cl.[5] G02B *6/10;* G02F *1/37*
U.S. Cl. 385—122 **15 Claims**



1. An optical device for wavelength conversion comprising:
a substrate comprising optical crystal;
a waveguide section formed in said substrate with its refractive index higher than that of said substrate;
at least one of said substrate and said waveguide section having a nonlinear optical material region made from nonlinear optical crystal material; and
compensating means for changing a nonlinear coefficient in at least part of said nonlinear optical material region to compensate for phase mismatching between a fundamental wave and a second-harmonic radiation wave.

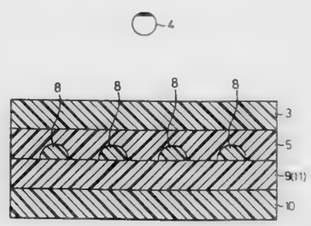
5,113,470
OPTICAL WAVE GUIDE SHEET COMPRISING PLURALITY OF DOUBLY-CLAD CORE MEMBERS WITH LIGHT SCATTERERS IN OUTER CLADDING
Tetsuo Fukushima, Hirakata; Kenichiro Suetsugu, Amagasaki; Munekazu Nishihara, Neyagawa, and Junji Ikeda, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 8, 1989, Ser. No. 433,209
Int. Cl.[5] G02B *6/22*
U.S. Cl. 385—126 **2 Claims**

1. An optical waveguide device comprising a plurality of optical waveguides extending parallel and adjacent each other in a sheet-like form, each of said plurality of waveguides comprising;
a core portion;
an inner cladding layer formed on a periphery of said core portion, said inner cladding layer being devoid of light scatterers disposed therein; and,



an outer cladding layer, having light scatterers disposed therein, formed on a periphery of said inner cladding layer.

5,113,471
OPTICAL WAVEGUIDE ARRAY AND METHOD OF MANUFACTURING SAME
Kouji Inaishi, Okazaki; Chisato Yoshimura, Nagoya, and Yuji Shinkai, Handa, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Apr. 5, 1991, Ser. No. 680,754
Claims priority, application Japan, Aug. 28, 1990, 2-225978
Int. Cl.[5] G02B *5/14*
U.S. Cl. 385—126 **19 Claims**



1. An optical waveguide array comprising:
a clad portion comprising a first layer and a second layer, said first layer having a plurality of grooves therein;
a core formed in each of said plurality of grooves in said first layer of said clad portion; and
two reinforcing members sandwiching said clad portion, at least one of said reinforcing members having a light transmitting characteristic, wherein said first and second layers of said clad portion comprise a first photocurable resin and said cores comprise a second photocurable resin.

5,113,472
OPTICAL WAVEGUIDES OF ALUMINUM GARNET
Devlin M. Gualtieri, and Robert C. Morris, both of Ledgewood, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.Y.
Filed May 28, 1991, Ser. No. 706,492
Int. Cl.[5] G02B *1/37*
U.S. Cl. 385—130 **20 Claims**

1. An optical waveguide comprising, in combination, a waveguiding body composed of a first crystalline aluminum garnet, and a cladding comprising an epitaxially deposited layer of a second crystalline aluminum garnet, wherein said second crystalline aluminum garnet has a lower refractive index than said first crystalline aluminum garnet, and wherein the aluminum garnets for the higher refractive index body of

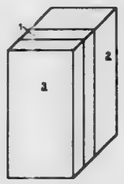
the waveguide and for the epitaxial cladding layer are selected from aluminum garnets of the composition

$$R_3(Al,T)_5O_{12}—$$

wherein

R represents one or more of the elements selected from the group consisting of calcium, magnesium, sodium, strontium, yttrium, lanthanum, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium; and

T represents one or more of the 3-valent elements selected



from the group consisting of gallium, indium, and scandium;

with the provisos that

(1) the molar ratio of the combined concentration of indium plus scandium to aluminum does not exceed 2:3; and that

(2) if R is one or more of Na^{+1}, Ca^{+2}, Mg^{+2} or Sr^{+2}, then T must include one or more charge-compensating ions selected from the group consisting of Fe^{+4}, Ge^{+4}, Hf^{+4}, Ir^{+4}, Mo^{+4}, Nb^{+4}, Os^{+4}, Pb^{+4}, Pt^{+4}, Re^{+4}, Rh^{+4}, Ru^{+4}, Si^{+4}, Sn^{+4}, Ta^{+4}, Ti^{+4}, Zr^{+4}, V^{+4}, W^{+4}, As^{+5}, Mo^{+5}, Nb^{+5}, Re^{+5}, Sb^{+5}, Ta^{+5}, U^{+5}, V^{+5}, Mo^{+6}, Re^{+6}, W^{+6}, and Re^{+7}, in proportions sufficient to achieve an average cation charge of three in the crystal.

5,113,473

NONLINEAR, OPTICAL THIN-FILMS AND MANUFACTURING METHOD THEREOF

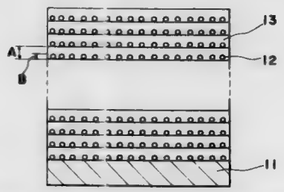
Masaru Yoshida, Hyogo; Yoshio Manabe, Katano; Tsuneo Mitsuyu, Hirakata, and Ichiro Tanahashi, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 617,885, Nov. 26, 1990, abandoned. This application Sep. 3, 1991, Ser. No. 752,988

Claims priority, application Japan, Nov. 24, 1989, 1-305441

Int. Cl.[5] G02B *6/10;* **H03F** *7/00;* **H01L** *21/225;* **C23C** *14/00*

U.S. Cl. 385—131 **9 Claims**



1. Nonlinear, optical thin-films comprising a plurality of island structures of semiconductor ultra-fine particles and a plurality of continuous films of an optically transparent material, said island structures and said continuous films being applied alternately on a substrate.

4. A method for manufacturing nonlinear, optical thin-films comprising the steps of:

(a) providing a substrate;

(b) depositing an island structure of semiconductor ultra-fine particles on the substrate or a continuous film; and

(c) depositing the continuous film of optically transparent substance on the island structure;

(d) the steps (b) and (c) of depositing an island structure and the continuous film being performed alternately.

5,113,474

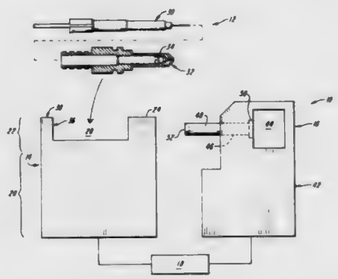
METHOD AND APPARATUS FOR MECHANICAL CONNECTOR ASSEMBLY

Paul Slaney, Groton, Mass., and Soren Grinderslev, Shelton, Conn., assignors to Optical Fiber Technologies, Inc., Westford, Mass.

Continuation-in-part of Ser. No. 492,933, Mar. 13, 1990, and a continuation-in-part of Ser. No. 3,964, Jul. 11, 1990, and a continuation-in-part of Ser. No. 467,915, Jan. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 378,930, Jul. 12, 1989. This application Feb. 19, 1991, Ser. No. 657,676

Int. Cl.[5] G02B *6/36*

U.S. Cl. 385—136 **14 Claims**



1. Apparatus for assembling a fiber optic termination having first and second workpieces that interfit, said apparatus comprising

A. holder means for removeably and replaceably holding the first workpiece in a selected position along a path, the first workpiece having a central bore in which an optical fiber is supportingly seated extending along said path and the first work piece being arranged mechanically to hold the optical fiber securely upon selected telescopic assembly with the second workpiece, said holder means holding the first workpiece oriented to telescopically engage with the second workpiece,

B. drive means for removeably and replaceably engaging the second workpiece that is partially telescopically assembled with the first workpiece held in said holder means, and for displacing the partially telescopically assembled second workpiece along said path relative to the first workpiece held in said holder means for further telescopical interfitting assembly of the two workpieces, for thereby securely holding the optical fiber in the first workpiece central bore, said drive means including a drive element arranged for providing a force of selected maximal value for said relative displacement of the workpieces, and

C. means for maintaining said holder means and said drive means in selected disposition relative to said path during said engagement for providing said relative displacement of the work pieces.

5,113,475

FIBRE-OPTIC ENTRY TO AN ENCLOSURE

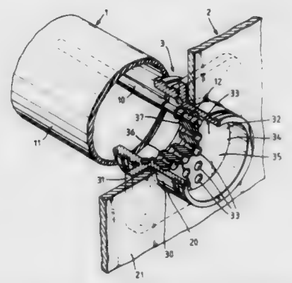
Peter D. Baker, Basingstoke, England, assignor to Smiths Industries Public Limited Co., London, England

Filed Mar. 8, 1991, Ser. No. 666,748

Claims priority, application United Kingdom, Mar. 14, 1990, 9005744

Int. Cl.[5] G02B *6/36*

U.S. Cl. 385—138 **8 Claims**



1. In an entry for an optical fibre to an enclosure of the kind in which the entry is located in an aperture in a wall of the enclosure, the improvement wherein the entry includes a resilient insert of a first insulative material loaded with a second material different from the first material, wherein the optical fibre extends in a hole through the insert, and wherein the insert is absorptive of microwave energy at wavelengths similar to the size of the aperture in the wall.

5,113,477

PLASTIC OPTICAL FIBERS FROM POLYMERS DERIVED FROM METALLIC SALTS OF ETHYLENIC CARBOXYL MONOMERS

Shuji Eguchi; Noriaki Taketani; Seikichi Tanno; Yoshiaki Okabe; Hiromu Terao, all of Hitachi; Hideki Asano, Mito; Motoyo Wajima, Hadano, and Tomiya Abe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 265,558, Nov. 1, 1988, abandoned, which is a continuation of Ser. No. 927,940, Nov. 7, 1986, abandoned. This application Feb. 20, 1990, Ser. No. 483,294

Claims priority, application Japan, Nov. 8, 1985, 60-248734

Int. Cl.[5] G02B *6/02;* **C08F** *220/04*

U.S. Cl. 385—143 **11 Claims**

1. A plastic optical fiber comprising a core and a clad, said core being formed by an amorphous and optically transparent polymer and said clad being formed by a polymer having a refractive index lower than that of the core by at least 0.3%, at least one of the core and the clad being formed by an amorphous and transparent polymer containing metal elements and halogen atoms, wherein the polymer containing metal elements and halogen atoms has constituting units of the formula:



wherein R_1 is a hydrogen or a methyl group; R_2 is an aliphatic hydrocarbon group, containing one or more halogens selected from the group consisting of bromine, fluorine and chlorine; M is a metal element; and n is a valence of the metal element M, said amorphous and transparent polymer containing metal elements and halogen atoms having a light transmittance of at least 80%.

5,113,478

LIQUID FUEL VAPORIZING APPARATUS

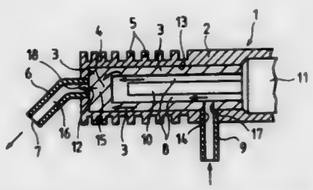
Kenro Nakashima, Yokohama; Kazuhiro Hatanaka, Tokyo, and Hideo Ohta, Ebina, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Aug. 8, 1990, Ser. No. 564,509

Claims priority, application Japan, Aug. 29, 1989, 1-220257

Int. Cl.[5] H05B *1/00*

U.S. Cl. 392—395 **5 Claims**



1. A liquid fuel vaporizing apparatus comprising a hollow tubular body having at its periphery a fin for receiving external heat to vaporize liquid fuel, said tubular body having a fuel outlet at one end and a fuel feed port at another end;

a fuel injection pipe of which one end communicates with said fuel outlet of said tubular body and of which another end is provided with an injection port;

a heating plug disposed in the hollow part of said tubular body to vaporize the liquid fuel, said heating plug having a heating part in said hollow part of said tubular body;

a fuel passage formed between an outer surface of said heating plug and an inner surface of said tubular body; and

a fuel feed pipe which communicates with said fuel food port

5,113,476

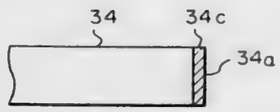
LIGHT ATTENUATOR AND PROCESS FOR FABRICATION THEREOF

Hiroshi Okada, Tokyo; Shingo Suzuki, Zama; Manabu Kagami, Kawasaki, and Chiaki Suematsu, Tokyo, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Nov. 8, 1990, Ser. No. 610,697

Int. Cl.[5] G02B *6/36*

U.S. Cl. 385—140 **8 Claims**



1. A light attenuator comprising a stick or rod composed of a light-transmitting material of polymethylmethacrylate, polystyrene or polycarbonate, and a light-attenuating layer composed of a thermoplastic resin and formed on at least one end face of the stick or rod, wherein finely divided particles having a light-absorbing or light-scattering property are uniformly incorporated in the thermoplastic resin.

to feed the liquid fuel into said fuel passage formed in said tubular body;

said liquid fuel vaporizing apparatus further comprising:

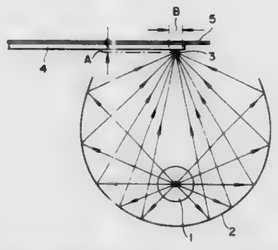
an open-cellular member having intercommunicating porosity and made of a sintered metal is disposed in the fuel outlet of said tubular body, said open-cellular member having numerous intercommunicating pores; said member defining an open-cellular material made of metal and being integrally continuous so as to not prevent thermal conductivity therein, and being spaced from the heating plug, and wherein said open-cellular member having intercommunicating porosity made of sintered metals is formed of a blind end part disposed in contact with said fuel outlet of said tubular body, and a hollow tubular part is disposed in contact with the inner surface of said tubular body, and said heating part of said heating plug is disposed extended in a longitudinal direction in said hollow tubular part.

5,113,479

METHOD OF INFRARED HEATING A RESTRICTED AREA ON A CONTINUOUS THERMOPLASTIC LAMINATED WEB

Anders Anderson, Staffanstorp, and Tom Kjelgaard, Löddekö pinge, both of Sweden, assignors to Tetra Pak Holdings SA, Pully, Switzerland

Filed Jan. 4, 1991, Ser. No. 637,553
Claims priority, application Sweden, Jan. 16, 1990, 9000154
Int. Cl.[5] B31B *1/66*; **F26B** *13/10*; **D02J** *13/00*
U.S. Cl. 392—417 **11 Claims**



1. A method of processing a continuous web that is used in the formation of packages for packaging products, comprising: providing a continuous web which includes a thermoplastic layer provided on a paper or cardboard layer and a projecting thermoplastic edge that extends beyond the paper or cardboard layer so that the projecting thermoplastic edge is thinner than portions of the web located adjacent the projecting thermoplastic edge; and heating a restricted area on a surface of the thermoplastic layer through the use of an IR lamp provided with radiation-concentrating reflectors, said step of heating including energizing the IR lamp and directing IR energy at the restricted area which is located inwardly of the projecting thermoplastic edge so as to heat the thermoplastic surface in the restricted area while avoiding heating of the projecting thermoplastic edge.

5,113,480

FLUID HEATER UTILIZING DUAL HEATING ELEMENTS INTERCONNECTED WITH CONDUCTIVE JUMPER

Robert A. Murphy; Rodney R. Syler, both of Franklin, and William H. Slattery, Spring Hill, all of Tenn., assignors to Apcom, Inc., Franklin, Tenn.

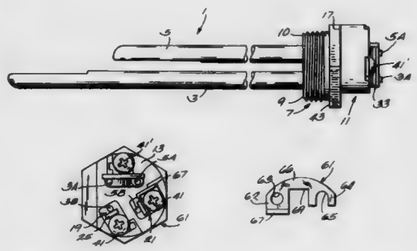
Filed Jun. 7, 1990, Ser. No. 534,815
Int. Cl.[5] H05B *3/82*; **H01R** *31/08*; **F24H** *9/12*
U.S. Cl. 392—501 **7 Claims**

4. In combination with a vessel containing a fluid, a dual element useful for controlling the temperature of the fluid comprising:

a. flange means for removably assembling to the vessel;

b. first and second heating elements received in the flange means and in contact with the fluid in the vessel, each heating element having respective first and second terminals that extend outside of the flange means;

c. first and second clip means secured to the first terminals of the respective first and second heating elements;



d. third clip means secured to the second terminals of the first and second heating elements;

e. an electrically insulative block interposed between the first, second, and third clip means and the flange means, the block defining holes through which the terminals of the first and second heating elements pass; and

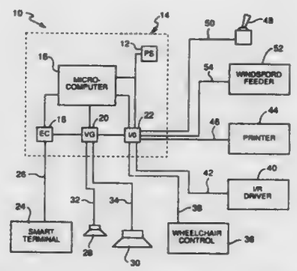
f. jumper means for selectively installing between the first and second clip means to electrically connect the first terminals of the first and second heating elements to each other.

5,113,481

AUGMENTIVE COMMUNICATIONS SYSTEM AND METHOD

John M. Smallwood, and William A. Custer, both of Northville, Mich., assignors to The Detroit Institute for Children, Detroit, Mich.

Continuation of Ser. No. 387,961, Jul. 31, 1989, Pat. No. 5,047,953. This application Sep. 9, 1991, Ser. No. 756,901
Int. Cl.[5] G10L *5/00*
U.S. Cl. 395—2 **5 Claims**



1. A programmable augmentive communications system for enabling an individual user with multiple handicaps to communicate auditorily, publicly or privately by actuating a single switch, the system comprising:

microcomputer means for controlling the system, including nonvolatile memory means for storing at least one user applications program;

means for generating synthetic voice signals;

speaker means;

switch means actuable by said user;

means; coupled to said switch under control of the user, for sending the synthetic voice signals to said speaker

software means for directing the operation of the system, including an interpreter program for interpreting instructions in a user program stored in the nonvolatile memory means, said interpreter program including means for recognizing and executing automatic branching functions embedded within selected instructions of the users program; and

said interpreter program further including:

means for recognizing a first command in an instruction of the user program to send a selected word in an instruction to a message buffer,

means for recognizing a second command in an instruction of the user program for directing words stored in the message buffer to the means for generating such that the synthetic voice signals corresponding thereto are generated, and

means for recognizing a third command in an instruction of the user program for directing the operation of the means for sending such that upon user command via the signal switch words stored in the message buffer go to said speaker,

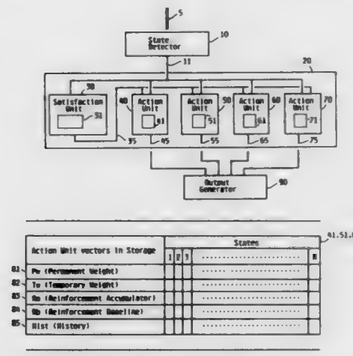
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5,113,482

NEURAL NETWORK MODEL FOR REACHING A GOAL STATE

Kenton J. Lynne, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 21, 1990, Ser. No. 541,570
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—23 **6 Claims**



1. A neural network model having an input line for receiving state information for a plurality of states, and an output generator for controlling the movement of an object along a path of selected states among said plurality of states, said neural network model comprising:

a satisfaction unit, comprising:

a satisfaction index;

means for detecting a first state, wherein said first state is a current state;

first determining means for determining that said current state is a non-goal state;

first modifying means, responsive to said first determining means, for modifying said satisfaction index to indicate a reduced level of satisfaction;

second determining means for determining that said current state is a goal state;

second modifying means, responsive to said second determining means, for modifying said satisfaction index to indicate an increased level of satisfaction;

at least three action units corresponding to at least three directions of movement, each of said action units comprising:

means for increasing a randomness factor if said satisfaction index indicates a low level of satisfaction;

means for decreasing said randomness factor if said satisfaction index indicates a high level of satisfaction;

means for randomly selecting by said randomness factor a temporary weight from a temporary weight range;

means for adding a permanent weight to said temporary weight to achieve an effective weight; and

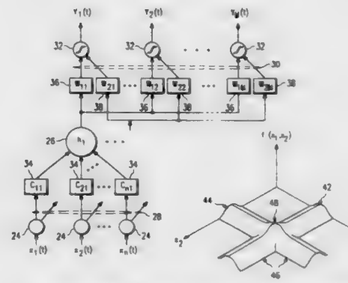
sending means for sending an indication to move said object in the direction of movement that corresponds to said action unit to said output generator if said effective weight exceeds a predetermined value.

5,113,483

NEURAL NETWORK WITH SEMI-LOCALIZED NON-LINEAR MAPPING OF THE INPUT SPACE

James D. Keeler, and Eric J. Hartman, both of Austin, Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Jun. 15, 1990, Ser. No. 538,833
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—23 **17 Claims**



1. A neural network for effecting non-linear mapping of an input space, comprising:

an input layer for receiving a multi-dimensional input vector x_i, for i ranging from 1 to n, n being an integer;

a hidden layer, having m hidden units, m being an integer, each of said hidden units receiving a plurality of inputs and providing a single output and having an activation function:

$$a_h = \sum_{i=1}^{n} C_{hi} f_{hi}(x_i - \mu_{hi}, \{P_{hi}\})$$

where:

h is the number of the associated one of said hidden units,

μ_{hi} is the center of a_h,

f_{hi} is a localized function in the x_i dimension and non-localized in at least one other of said x_i dimensions,

C_{hi} is a constant and $\{P_{hi}\}$ is a set of parameters for f_{hi};

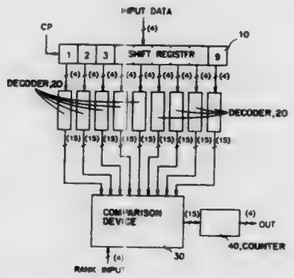
a connection matrix for interconnecting the output of select ones of the input vectors x_i to the inputs of said hidden units in accordance with an interconnection scheme;

an output layer comprising M output units, M being an integer, each of said output units for providing a single output Y_i for i ranging from 1 to M, each of said output units having a predetermined transfer function g for i ranging from 1 to M; and

an output interconnection matrix for interconnecting the output of select ones of said hidden units to the inputs of select ones of said M output units in accordance with an interconnection scheme, each of said interconnections between the output of said hidden units and the associated

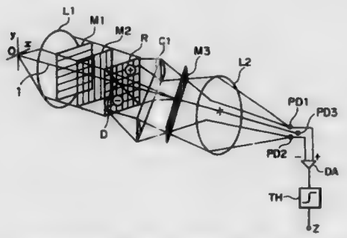
one of said M output units having an output weight associated therewith.

5,113,484
RANK FILTER USING NEURAL NEWWORK
Ho-sun Jeong, Taegu, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungg, Rep. of Korea
Filed Jul. 9, 1990, Ser. No. 549,306
Claims priority, application Rep. of Korea, Apr. 3, 1990, 90-4510
Int. Cl.[5] G06F *15/31*
U.S. Cl. 395—24 **8 Claims**



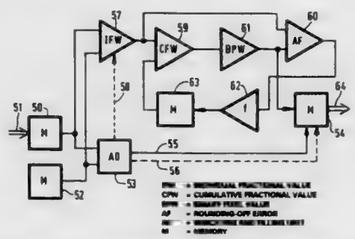
1. A rank filter for extracting a data value corresponding to a predetermined rank among M kinds of N-bit data, according to the magnitude order of the data value, comprising:
M means for decoding each N-bit input data into an excited state for all levels equal to or below the corresponding magnitude and a ground state for the other levels, said M means having 2^N-1 levels;
a comparison means for outputting the data value corresponding to said predetermined rank which is decoded into an excited state for the level of which the number of ground states is greater than or equal to the value of said predetermined rank, and for outputting a ground state for the other levels of respective level outputs of said M means, said comparison means having 2^N-1 levels and
a counter for outputting the data value corresponding to a predetermined rank by counting the number of ground states among the outputs of said comparison means.

5,113,485
OPTICAL NEURAL NETWORK SYSTEM
Paul Horan, Dublin, Ireland, and Akira Arimoto, Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 19, 1990, Ser. No. 615,081
Claims priority, application Japan, Nov. 22, 1989, 1-302129
Int. Cl.[5] G03H *1/12*; G06G *7/16*
U.S. Cl. 395—25 **6 Claims**



1. An optical system for a second-order neural network comprising:
first modulation units for modulating light in accordance with an input signal and producing an auto-correlation matrix symmetric with respect to a main diagonal;
a second modulation unit including a focus optical system for focusing an output light of the first modulation units in a direction perpendicular to the main diagonal and a one-dimensional modulation array for modulating the light focused at the focus optical system in accordance with weights; and
detection units for receiving an output light of the second modulation unit on both sides of the main diagonal and converting the output light of the second modulation unit into a plurality of electrical signals.

5,113,486
METHOD AND APPARATUS FOR REPRODUCING IMAGE INFORMATION IN VECTOR FORM ONTO A RASTER PATTERN OF PIXELS
Maurice L. M. Luttmer, Venlo, Netherlands, assignor to Oce-Nederland B.V., Netherlands
Filed Jul. 2, 1990, Ser. No. 547,601
Claims priority, application Netherlands, Jul. 3, 1989, 8901684
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—100 **18 Claims**

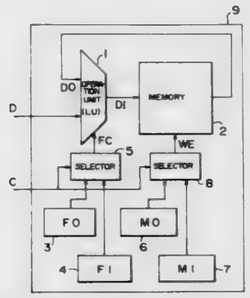


1. A method of reproducing image information in vector form onto a raster pattern of binary pixels, comprising allocating binary values to the pixels dependent upon the position of said pixels with respect to colored and uncolored image areas contained in the image information, said method including
successively processing pixels intersected by a boundary line between image areas along said following that boundary line, by allocating to each pixel a binary value in accordance with the sum of the ratio of the parts into which that pixel is divided by said boundary line and a correction value calculated from any error made by allocating a binary value to the previously processed pixel; said correction value being calculated by processing said error made by allocating a binary value to an immediate previously processed pixel with a prevention function for preventing allocating such binary values to pixels that those pixels form bulges on the boundary of a reproduced image area that are separated from each other by more than a predetermined number of pixels.

5,113,487
MEMORY CIRCUIT WITH LOGIC FUNCTIONS
Toshihiko Ogura, Ebina; Hiroaki Aotsu; Koichi Kimura, both of Yokohama; Hiromichi Enomoto, Hadano, and Tadashi Kyoda, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 864,502, May 19, 1986, abandoned.
This application Feb. 22, 1989, Ser. No. 314,238
Claims priority, application Japan, May 20, 1985, 60-105844; May 20, 1985, 60-105845
Int. Cl.[5] G06F *12/00, 13/00*
U.S. Cl. 395—100 **26 Claims**

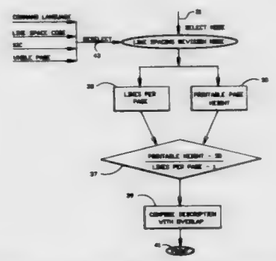
1. A memory circuit, comprising:
a memory device for reading, writing and holding data arbitrarily;

an operation unit coupled to said memory device and including means for performing a computation in accordance with a specified operation mode utilizing data read out from the memory device and first data supplied from an external processor;
means coupled to said operation unit for specifying an operation mode to said operation unit by using second data supplied from said external processor; and
write control means coupled to said memory device for implementing write control in bit units by using third data supplied from outside said memory circuit when the computation result in said operation unit is to be stored in said memory device;



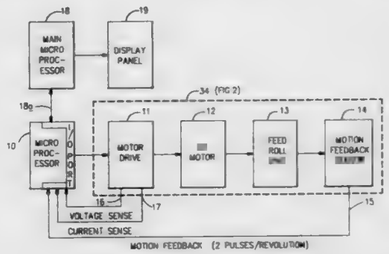
said means for specifying an operation mode comprising first means for storing a plurality of second data supplied from said external processor and a first selector for selecting one of a plurality of stored second data in said first storing means in response to a first selection control signal from said external processor;
said write control means comprising second means for storing a plurality of third data supplied from said external processor and a second selector for selecting one of a plurality of stored third data in said second storing means in response to a second selection control signal supplied from said external processor.

5,113,488
PAGE PRINTER COMPOSITION LINE SPACING REVISION
Patrick O. Bischel; John K. Brown, III; Carl P. Cole, and Donald G. Fitch, all of Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.
Filed Nov. 26, 1990, Ser. No. 617,747
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—112 **16 Claims**



1. A controller for a page printer which composes mapped descriptions based on fixed-height character boxes of unique pel information for each pel position in an area printable by said printer comprising means to receive text data in a form defining lines, data processing apparatus: to determine a specified number of lines per page of a page of text to be printed; to determine at least approximately a revised line spacing constituting said lines per page less one divided into the height of said printable area less one full said character box height, and to compose a mapped description of all of said page of text with lines separated at least approximately by said revised line spacing, and print control apparatus to control printing by said printer by said composed mapped description with lines spaced along the height of said page.

5,113,489
ONLINE PERFORMANCE MONITORING AND FAULT DIAGNOSIS TECHNIQUE FOR DIRECT CURRENT MOTORS AS USED IN PRINTER MECHANISMS
Philip K. Cihiwsky, Binghamton, and Andrew C. Jaw, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 303,715, Jan. 27, 1989. This application Nov. 7, 1990, Ser. No. 610,071
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—113 **15 Claims**



1. In a control system for controlling mechanical equipment having, in combination, at least one direct current electrical motor and at least one operating component connected for functional operation thereby, said control system having a routine for monitoring in real time preselected conditions in said equipment, a method of performing real time diagnosis of a fault condition comprising the steps of:
selecting conditions of operation corresponding to acceptable equipment functions;
monitoring said conditions during the operation of said equipment;
initiating a fault diagnosis subroutine in real time, while said equipment operation is continuing, when a monitored condition deviates from a condition selected as being acceptable;
identifying which of said selected conditions from which said monitored condition deviates; and
establishing an error message to indicate the identified condition while said equipment is operating.

5,113,490
METHOD FOR FORMING A COMPUTER MODEL FROM AN INTERSECTION OF A CUTTING SURFACE WITH A BOUNDED VOLUME
James M. Winget, Mountain View, Calif., assignor to Silicon Graphics, Inc., Mountain View, Calif.
Filed Jun. 19, 1989, Ser. No. 369,063
Int. Cl.[5] G06F *5/72*
U.S. Cl. 395—119 **29 Claims**

1. A method for forming a computer model of a modified bounded volume representing a portion of a bounded volume on a cutting surface and to a first side of the cutting surface, wherein the bounded volume is comprised of a plurality of faces, edges, and vertices, comprising the steps of:
(a) calculating a first signed distance between (1) a first vertex on a first edge of a first face of the bounded volume

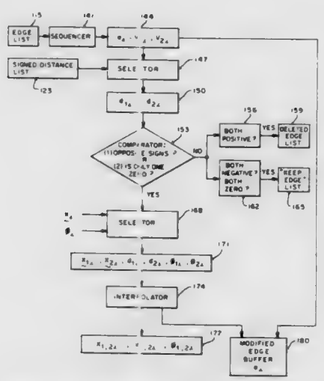
and (2) the cutting surface, wherein the first signed distance is positive if the first vertex does not reside on the cutting surface and does not reside on the first side of the cutting surface, wherein the first signed distance is negative if the first vertex resides on the first side of the cutting surface, and wherein the first signed distance is zero if the first vertex resides on the cutting surface;

(b) calculating a second signed distance between (1) a second vertex on the first edge of the first face of the bounded volume and (2) the cutting surface, wherein the second signed distance is positive if the second vertex does not reside on the cutting surface and does not reside on the first side of the cutting surface, wherein the second signed distance is negative if the second vertex resides on the first side of the cutting surface, and wherein the second signed distance is zero if the second vertex resides on the cutting surface;

(c) if both the first signed distance and the second signed distance are positive, then modifying the first face by deleting the first edge from the first face;

(d) if both the first signed distance and the second signed distance are negative, then retaining the first edge on the first face;

(e) if both the first signed distance and the second signed distance are zero, then retaining the first edge on the first face;



(f) if the first signed distance is of a different sign that the second signed distance, then modifying the first face by modifying the first edge of the first face by interpolation;

(g) if one and only one of the first and second signed distances is zero, then:

(i) modifying the first face by deleting the first edge from the first face if the first signed distance is zero and the second signed distance is positive:

(ii) modifying the first face by retaining the first edge on the first face if the first signed distance is zero and the second signed distance is negative:

(iii) modifying the first face by deleting the first edge from the first face if the second signed distance is zero and the first signed distance is positive:

(iv) modifying the first face by retaining the first edge on the first face if the second signed distance is zero and the first signed distance is negative:

(h) repeating steps (a) through (g) for each of the remaining edges of the first face, wherein each next edge of the remaining edges becomes the first edge upon each repetition of steps (a) through (g);

(i) if the first face has been modified and is missing an edge, then:

(1) generating a first cut-face edge for the first face;

(2) storing the first cut-face edge; and

(3) modifying the first face by adding the first cut-face edge to the first face;

(j) if the first face has been modified, then storing the first face as modified;

(k) if the first face has not been modified, then storing the unmodified first face;

(l) repeating steps (a) through (k) for each of the remaining faces of the bounded volume, wherein upon each repetition of steps (a) through (k), (1) each next face of the remaining faces becomes the first face and (2) each next cut-face edge becomes the first cut-face edge;

(m) forming a cut face from the stored cut-face edges;

(n) adding the cut face to the stored faces of the bounded volume to form the modified bounded volume.

5,113,491

PATTERN DRAWING SYSTEM HAVING A PROCESSOR FOR DRAWING THE PROFILE OF THE PATTERN AND A PROCESSOR FOR PAINTING THE DRAWN PROFILE

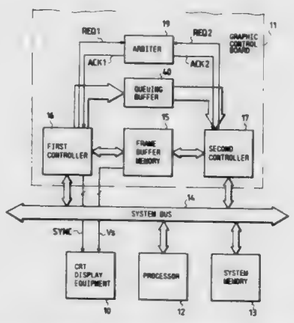
Takanaga Yamazaki, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 24, 1989, Ser. No. 384,322

Claims priority, application Japan, Jul. 27, 1988, 63-187888

Int. Cl.[5] G06F *15/62*

U.S. Cl. 395—141 **4 Claims**



1. A pattern drawing system comprising;

a memory to store a large amount of outline font data;

a processor to instruct a pattern drawing operation based on the outline font data;

a first data processing means to read, in response to an instruction from the processor, the outline font data for a desired pattern, develop the outline font data thus read in, calculate first profile coordinates of the pattern and, according to the calculated first profile coordinates, draw a first profile of the desired pattern on a bit map memory;

a second data processing means to paint an interior of the first profile drawn by the first data processing means concurrently with the calculation by the first data processing means of second profile coordinates; and,

an arbiter means to give a priority to the first data processing means over the second data processing means in accessing the bit map memory when the first data processing means and the second data processing means contend for a right to access the bit map memory.

5,113,492

APPARATUS FOR PROCESSING CHARACTER AND IMAGE DATA

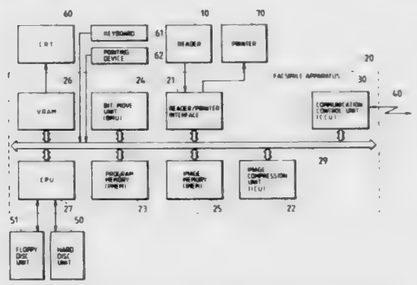
Yumi Ariki, Kagoshima, and Katsuhito Takezawa, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1988, Ser. No. 243,791

Claims priority, application Japan, Sep. 16, 1987, 62-229827; Oct. 19, 1987, 62-264631

Int. Cl.[5] G06F *15/63*

U.S. Cl. 395—147 **56 Claims**



1. A mixed data processing apparatus comprising:

memory means for storing mixed data having character blocks consisting of character codes and image blocks consisting of image data;

discriminating means for discriminating whether or not a number of character blocks and image blocks stored in said memory means exceeds a predetermined number of blocks; and

conversion means for converting, when the number of character blocks and image blocks exceed the predetermined number of blocks, the image blocks into one image block by combining the image blocks.

5,113,493

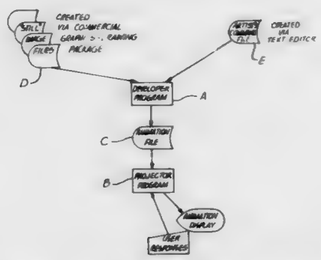
FULL SPEED ANIMATION SYSTEM FOR LOW-SPEED COMPUTERS AND METHOD

C. Scott Crosby, Greer, S.C., assignor to Liberty Life Insurance Co., Greenville, S.C.

Filed May 11, 1987, Ser. No. 48,553

Int. Cl.[5] G06F *3/14*

U.S. Cl. 395—152 **47 Claims**



1. A method of producing an animated display on a bit-mapped display screen of a personal computer system and the like comprising:

(a) creating a set of successive serial still images which successively make up said animated display wherein each next successive still image contains slight differences from the previous still image;

(b) creating individual still image files which contain binary digit data for each of said successive still images in said set and storing said still image files in a computer accessible memory;

(c) inputting an artist's command file written in a computer programming language into said computer which contains commands and command parameters for processing said still image data files, and executing said artist command file in said computer as a stored computer program;

(d) developing an animation data file by processing said still image files in response to said commands and command parameters of said artist's command file to generate in said animation data file a plurality of set-pixel records containing binary digit data which represents the differences in pixels between said successive still image files and sets pixel colors at prescribed pixel locations in accordance with said differences between said successive still images, and a plurality of projection records containing binary digit data for timing and sequencing said pixel color changes for projecting said set-pixel records of said animation data file on said display screen in a prescribed sequence;

(e) storing said animation data file in computer accessible memory; and

(f) reading said animation data file and changing said locations and colors of pixels to produce said animated display in accordance with said animation data file.

5,113,494

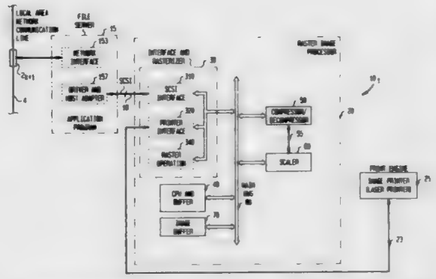
HIGH SPEED RASTER IMAGE PROCESSOR PARTICULARLY SUITED FOR USE IN AN IMAGE MANAGEMENT SYSTEM

Juan G. Menendez, Dublin, Ireland; William P. Caterisano, and John Ball, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 20,047, Feb. 27, 1987, abandoned. This application Nov. 9, 1990, Ser. No. 614,047

Int. Cl.[5] G06F *3/14*

U.S. Cl. 395—163 **40 Claims**



1. Apparatus for a raster image processor for use in processing a bit-mapped image, said apparatus comprising:

an internal bus;

a plurality of application specific image processing components for undertaking a corresponding plurality of specific bit-mapped image processing tasks, wherein each of the components is connected to the internal bus and capable of undertaking a respective associated one of the bit-mapped image processing tasks in parallel with respective ones of said bit-mapped image processing tasks undertaken by and associated with other ones of said components; and

arbiter means, connected to said bus and operating at a lower processing speed than that of any of said image processing components, for arbitrating transfers that are to occur over said bus and between individual ones of said components, wherein said arbiter means receives a request from a first one of said components for service from a second

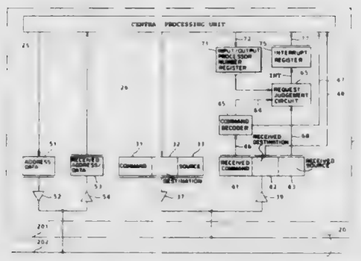
one of said components and, in response thereto, both defines a data path over said internal bus and between said first and second components and initiates an information transfer over said internal bus and between said first and second components, wherein once said transfer is complete said second component undertakes the respective one of said bit-mapped image processing tasks associated with the second component independent of both the arbiter means and said first component so as to isolate the respective bit-mapped image processing task undertaken by said second component from the arbiter means and, while said second component is undertaking the respective bit-mapped image processing task associated with the second component, to permit both said arbiter means to arbitrate a subsequent one of said transfers and the first component to subsequently undertake the respective one of said image processing tasks associated with the first component for a remaining one of said components other than said second component so as to provide pipelined operation, whereby through isolating the bit-mapped image processing tasks from executing within the arbiter means and operating the image processing components to undertake multiple bit-mapped tasks on a pipelined basis the raster image processor provides an increased throughput of processed bit-mapped images.

5,113,495

INTERCOMMUNICATING AMONG A PLURALITY OF PROCESSORS BASED UPON THE IDENTIFICATION OF THE SOURCE WITHOUT USING THE IDENTIFICATION OF THE DESTINATION

Izushi Uehara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 5, 1989, Ser. No. 361,559
Claims priority, application Japan, Jun. 3, 1988, 63-135725
Int. Cl.[5] G06F *13/14, 13/18*
U.S. Cl. 395—200 **4 Claims**



1. An intercommunication network for use in carrying out communication among a plurality of processors, said processors being connected to one another through a system bus and comprising transmission and destination processors which are identified by first and second preassigned processor numbers, respectively, and which are operable as a transmission source on transmission of a transmission request and as a destination end for receiving said transmission request, respectively, wherein said transmission processor comprises:

producing means for producing said preassigned processor number assigned to said transmission processor; and

sending means coupled to said producing means for sending said first preassigned processor number as a transmission source number to said system bus on transmission of said transmission request with said second preassigned processor number not being sent to identify said destination end;

said destination processor comprising:

holding means for holding a communicable processor number which is given to said destination processor and which corresponds to said first preassigned processor number;

processing unit means for carrying out processing in response to an interruption request signal;

detecting means coupled to said system bus and said holding means for detecting whether or not said transmission source number indicates said transmission processor by checking correspondence between said transmission source and said communicable processor number; and

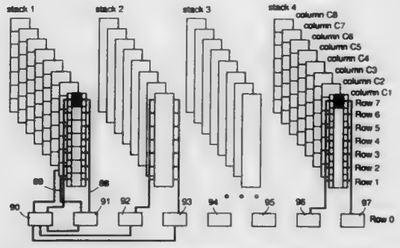
means for supplying said interruption request signal to said processing unit means when both said transmission source number and said communicable processor number indicate said transmission processor.

5,113,496

BUS INTERCONNECTION STRUCTURE WITH REDUNDANCY LINKING PLURALITY OF GROUPS OF PROCESSORS, WITH SERVERS FOR EACH GROUP MOUNTED ON CHASSIS

Karl W. McCalley, 24 Polo Dr., South Barrington, Ill. 60010; Steven D. Wilson, 1834 N. Fremont St., Chicago, Ill. 60614, and Victor J. Szeplaki, 518 B Reese St., East Dundee, Ill. 60118

Division of Ser. No. 271,086, Nov. 14, 1988, which is a continuation-in-part of Ser. No. 81,189, Aug. 4, 1987, Pat. No. 4,792,849. This application Mar. 8, 1989, Ser. No. 320,502
Int. Cl.[5] H04L *12/28*; G06F *13/38*
U.S. Cl. 395—200 **20 Claims**



1. An interchassis communications system which minimizes the number of interconnections while also minimizing the number of hops required to communicate data between any two processors of a plurality of processors contained in a plurality of chassis, said plurality of chassis including a plurality of first groups each having a maximum number of chassis, and a second group having one or more chassis, said interchassis communications system comprising:

(a) first means for communicating data between processors located on the same chassis,

(b) second means for interconnecting the chassis within each of the first groups to each other and to one of the chassis in the second group for communicating data therebetween, and

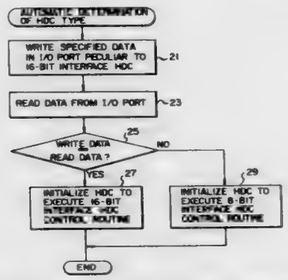
(c) third means for interconnecting, in a point-to-point two terminal manner, each of said chassis of said second group to every other chassis of said second group for communicating data therebetween, said system thereby communicating data between any two processors of said system in no more than three hops.

5,113,497

I/O CONTROL SYSTEM FOR A PLURALITY OF PERIPHERAL DEVICES

Koichi Dewa, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 326,857, Mar. 21, 1989, abandoned. This application Mar. 5, 1991, Ser. No. 664,520
Claims priority, application Japan, Mar. 30, 1988, 63-74538
Int. Cl.[5] G06F *13/10*
U.S. Cl. 395—275 **13 Claims**



1. A method for determining the kind of input-output controller means, to control an input-output device means, connected to a personal computer system, from which the input-output controller means and the input-output device means are removable, the personal computer system including input-output address port means for assigning an address space to communicate with the input-output controller means, including the steps of:

outputting specified data to the input-output controller means through the input-output address port means at power-on of the personal computer system;

reading data from the input-output controller means through the input-output address port means;

comparing the data read out from the input-output controller means with the specified data to obtain a comparison result; and

determining the kind of the input-output controller means connected to the personal computer system in accordance with the comparison result.

5,113,498

INPUT/OUTPUT SECTION FOR AN INTELLIGENT CELL WHICH PROVIDES SENSING, BIDIRECTIONAL COMMUNICATIONS AND CONTROL

Shabtai Evan, Saratoga, and Wendell B. Sander, Los Gatos, both of Calif., assignors to Echelon Corporation, Palo Alto, Calif.

Continuation of Ser. No. 119,383, Nov. 10, 1987, abandoned. This application Jun. 4, 1990, Ser. No. 533,200
Int. Cl.[5] G06F *15/16, 3/00*
U.S. Cl. 395—275 **21 Claims**

1. In a network for sensing, communicating and controlling which includes a plaurilty of cells, a cell comprising:

a processor;

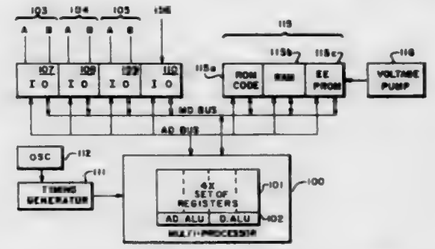
an input/output section for providing coupling between said processor and said network, said input/output section comprising:

a plurality of circuit elements comprising, a state machine for providing control signals for said input/output section event sensing means for sensing predetermined electrical changes, timing means for measuring time intervals, and multiplexing means for directing said sensed electrical changes to said state machine;

first register means coupled to receive signals from said processor, said first register means for automatically electrically configuring and reconfiguring said circuit elements based on said signals from said processor to provide a plurality of input/output functions;

second register means coupled to said processor for storing input/output status information and for coupling this information to said processor, said second register means being coupled to said timing means;

said state machining being coupled to said event sensing means and at least one of said and second register means;



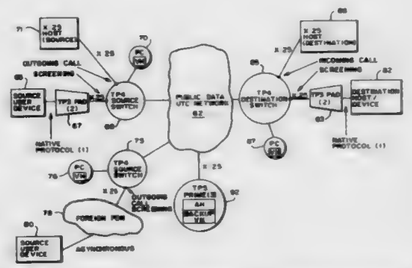
whereby said input/output section can be configured and reconfigured to perform a plurality of input/output functions.

5,113,499

TELECOMMUNICATION ACCESS MANAGEMENT SYSTEM FOR A PACKET SWITCHING NETWORK

Richard C. Ankney, Chantilly; Ronald P. Bonica, Falls Church, both of Va.; Douglas E. Kay, Chevy Chase, Md.; Patricia A. Pashayan, Herndon, and Roy L. Spitzer, Vienna, both of Va., assignors to Sprint International Communications Corp., Reston, Va.

Filed Apr. 28, 1989, Ser. No. 344,905
Int. Cl.[5] G06F *13/14*
U.S. Cl. 395—325 **12 Claims**



1. A system for managing access to data among users and host computers in a public data communications network applied to provide data communications paths between and among the users and the host computers via communication links and transmit nodes of the network, in which the nature and degree of access by or to each user and host computer is designated in advance by respective ones of the plurality of network customers who maintain the host computers and who allow authorized user access thereto, said system comprising

a multiplicity of potential user stations,

a multiplicity of host computers for compiling and furnishing data on request of users and other host computers,

a multiplicity of switch means operatively associated with respective ones of said user stations and said host computers, and located at points of entry to said data communications paths of said network remote from said respective ones of said user stations and said host computers, for establishing and disconnecting a communication path through the network between a user station and a host

computer to which access is requested by said user station for a communication session therewith, and

access management means operatively associated with each of said switch means for examining requests for establishing a data communications path through said network between a user station and a host computer received by the associated one of said switch means for validation of said requests and for granting and denying the respective requests by issuance of corresponding instruction signals to said switch means, according to the nature and degree of access designated by the respective network customer.

5,113,500

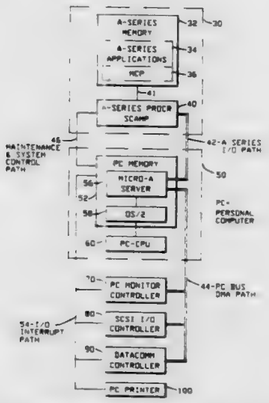
MULTIPLE COOPERATING AND CONCURRENTLY OPERATING PROCESSORS USING INDIVIDUALLY DEDICATED MEMORIES

Jefferson F. Talbott, Orange; Richard A. Cowgill, El Toro; Chris R. Cummings, Mission Viejo; James A. Fontana, Mission Viejo, and Anthony R. Pitchford, Mission Viejo, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 23, 1989, Ser. No. 397,620

Int. Cl.[5] G06F *15/16, 13/14*

U.S. Cl. 395—325 **5 Claims**



1. A desktop computer system having mainframe capability and enabling concurrent operation of multiple computer means comprising:

(a) a first computer means acting as a host and having a first dedicated memory means and first central processing unit and operating on a first operating system, said first dedicated memory means provided program storage for said first operating system and for application programs applicable to said first computer means and for storing I/O commands from a second computer means, said first computer means including:

(a1) server means for emulating the I/O commands transmitted from said second computer means into said first dedicated memory means so that said I/O commands are translated into a compatible format for said first computer means to enable data transfer operations between said second computer means and peripheral devices;

(b) said second computer means acting as an auxiliary concurrently operating computer having a second dedicated memory means and second processing unit and operating on a second operating system, said second dedicated memory means providing program storage for said second operating system and for application programs using said second operating system, said second computer means including:

(b2) means for writing into or reading out of said first dedicated memory means.

5,113,501

SYSTEM FOR CHECKING THE ACTIVITY AND ACTIVITY RATIO OF MICROPROGRAM UNDER TEST

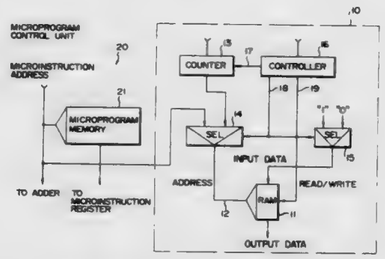
Tadashi Ishikawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 41,332, Apr. 22, 1987, abandoned. This application May 16, 1989, Ser. No. 353,196

Claims priority, application Japan, Apr. 30, 1986, 61-100747

Int. Cl.[5] G06F *9/22, 11/00*

U.S. Cl. 395—375 **12 Claims**



1. A microprogram checking apparatus for checking whether or not each one of a plurality of microinstructions of a microprogram has been activated when the microprogram is executed by an input microprogram execution command provided by an external circuit, each microinstruction of the microprogram being stored at a respective address of a microprogram memory coupled to said microprogram checking apparatus, comprising:

storage means having addresses for storing activation data which each represents whether or not each respective microinstruction of the microprogram has been activated during the execution of the microprogram;

means for setting the content of each one of the addresses of said storage means to a common state in response to the input microprogram execution command provided from the external circuit before the execution of the microprogram commences;

generating means for sequentially generating a plurality of addresses at times when the content of each of the addresses of said storage means is set to the common state and other times when the activation data is read out after the execution of the microprogram is completed;

first selecting means for selectively outputting one of the sequentially generated addresses at times when the content of each of the addresses of said storage means is set to the common state and other times when the activation data is read out after the execution of the microprogram is completed, and the addresses of the microprogram memory at times when the microprogram is executed to said storage means;

second selecting means for selectively outputting a first value at times when the content of each of the addresses of said storage means is set to the common state and other times when the activation data is read out after the execution of the microprogram is completed, and a second value at time when one of the plurality of microinstructions is activated, the first value being different from the second value;

means for writing a predetermined logic value representing that the microinstruction has been activated at a respective one of said addresses of said storage means for each respective microinstruction when said each respective microinstruction is activated during the execution of the microprogram, said respective one of said addresses of said storage means corresponding to said address of the microprogram memory where said each respective microinstruction is stored, said predetermined logic value being different from the common state; and

means for reading out stored activation data from said storage means after the execution of the microprogram is completed.

5,113,502

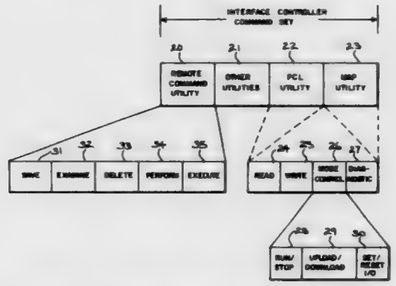
METHOD AND APPARATUS FOR SAVING AND PERFORMING INDUSTRIAL CONTROL COMMANDS

Richard A. Merrill, Ann Arbor; Bruce L. Crockett, Pinckney, and Robert C. Strader, Saline, all of Mich., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Division of Ser. No. 932,987, Nov. 20, 1986, Pat. No. 4,942,552. This application May 31, 1990, Ser. No. 531,277

Int. Cl.[5] G06F *3/00, 15/16*

U.S. Cl. 395—375 **5 Claims**



1. A method for operating a first network station connected to a communication network interconnecting a plurality of other network stations, with each of said other network stations implementing a predetermined set of command messages, the method comprising the steps of:

(a) formatting an embedded command comprising one command message from said predetermined set of command messages, the embedded command including a first destination field which indicates the address of a target network station and is assigned as if the embedded command were to be sent from a second network station to the target network station;

(b) formatting a first remote command message by including in the first remote command message (i) a second destination field which indicates the address of the second network station, (ii) a first field containing a code identifying the first remote command message as a SAVE type remote command message, (iii) the embedded command, and (iv) a second field which includes a first ID specifying an identity under which the embedded command is to be stored in a remote command table in the second network station; and

(c) transmitting the first remote command message to the second network station.

5,113,503

DATA PROCESSOR PROVIDING PLURAL DECODERS FOR EFFECTING FAST REGISTER SELECTION

Hisao Sasaki, Tachikawa; Hideo Maejima, and Takashi Hotta, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 24, 1986, Ser. No. 888,937

Claims priority, application Japan, Jul. 24, 1985, 60-161885

Int. Cl.[5] G06F *9/30, 9/308*

U.S. Cl. 395—375 **13 Claims**

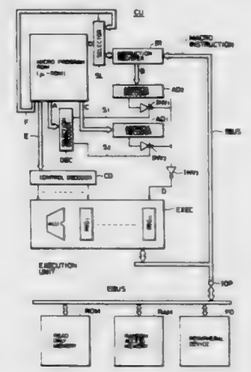
1. In a data processor having a control unit for controlling an execution unit, said control unit comprising:

first decoder means for decoding first control data in a macroinstruction;

storage means for storing second control data and a selection signal, and including read-out means for reading out said second control data and said selection signal in response to said macroinstruction;

second decoder means connected to said storage means for decoding second control data read out of said storage means by said read-out means; and

selection means, responsive to information, obtained during an operation coextensive with the decoding by said first and second decoding means from said selection signal read out by said read-out means, for selecting an output of either said first decoder means or said second decoder means to be supplied to said execution unit.



5,113,504

MONITORING APPARATUS FOR CONTROL SYSTEM WITH MICROCOMPUTER

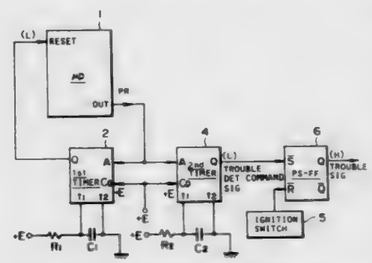
Toshiro Matsuda, Zama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 40,721, Apr. 20, 1987, abandoned, which is a continuation of Ser. No. 485,019, Apr. 14, 1983, abandoned. This application Apr. 7, 1989, Ser. No. 334,804

Claims priority, application Japan, May 19, 1982, 57-83232

Int. Cl.[5] G06F *11/28*

U.S. Cl. 395—575 **2 Claims**



1. A microcomputer monitoring apparatus, comprising:

a microcomputer for storing a predetermined program and for executing said predetermined program,

said microcomputer generating and outputting a cyclic signal, having a substantially cyclic oscillation period, indicating execution of said predetermined program,

said microcomputer being resettable upon receipt of a reset

signal for restarting said predetermined program and for generating said cyclic signal;

first means for monitoring said cyclic signal and for outputting said reset signal for resetting said microcomputer upon an absence of said cyclic signal for a first predetermined period of time;

second means for monitoring said cyclic signal and for outputting a warning signal upon an absence of said cyclic signal for a second predetermined period of time, said second predetermined period of time being longer than said first predetermined period of time so that said reset signal is input to said microcomputer at least once;

third means, responsive to said warning signal for indicating occurrence of a type of error not correctable by resetting said microcomputer;

oscillator means for generating a plurality of pulse signals starting at a third predetermined period of time after said microcomputer has been activated;

constant level means for outputting a constant voltage level signal starting at a fourth predetermined period of time after said microcomputer has been activated, said fourth predetermined period of time being shorter than said third predetermined period of time;

a first NOR gate having one input terminal connected to said first means, another input terminal connected to said oscillating means, and a NOR output for outputting a first NOR gate pulse signal when said first means outputs said reset signal and when said oscillator means is generating said pulse signals; and

a second NOR gate having one input terminal connected to said NOR output of said first NOR gate and another input terminal connected to said constant level means, for outputting said reset signal to said microcomputer when said first NOR gate outputs said first NOR gate pulse signal and when said constant level means outputs said constant voltage level signal.

5,113,505

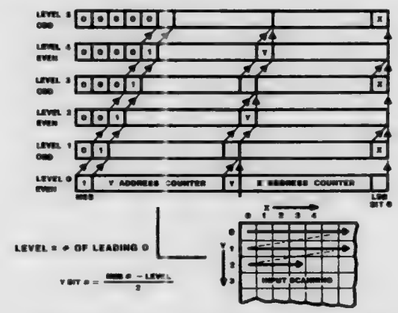
COMPUTER MEMORY PYRAMIDAL ADDRESSING METHOD

Klaus Holtz, 631 O'Farrell #710, San Francisco, Calif. 94109

Division of Ser. No. 316,925, Feb. 28, 1989, Pat. No. 4,992,868. This application Dec. 4, 1989, Ser. No. 446,296

Int. Cl.[5] G06F *12/02*

U.S. Cl. 395—400 **4 Claims**



1. A method in a data processing system for generating at least one higher level node address of a multi-level pyramidal data structure from at least one lower level node address of the multi-level pyramidal data structure, the method comprising the steps of;

(a) inputting the plurality of the lower level node addresses into a buffer means;

(b) inputting one of the plurality of lower or higher level node addresses into a register means from the buffer means, the one lower or higher level node address not having been processed;

(c) determining if a level of the one lower or higher level node address is an odd level or an even level based on the number of leading zeroes of the one lower or higher level node address;

(d) if the level is an even level then

(1) generating matching node addresses, matching node addresses being those node addresses having a common parent node, by

(I) selecting Y address bits in the one lower or higher level node address, the Y address bits being at least one of a plurality of bits of a Y address portion of the one lower or higher level node address;

(II) generating at least one of the matching node addresses, each matching node address including a respective one of all combinations of Y address bits;

(2) generating a next higher level node address from at least one of the matching node addresses by right shifting a Y address portion of the at least one matching node address by the number of Y address bits;

(3) storing the next higher level node address in the buffer means if the number of leading zeroes does not indicate that the highest level node address has been generated, the highest level node address being indicated by a preset number of leading zeroes in the next higher level node address;

(4) if there are more lower or higher level node addresses in the buffer means which have not been processed or determined to be matching node addresses then returning to step (b);

(e) if the level is an odd level then

(1) generating matching node addresses, matching node addresses being those node addresses having a common parent node, by

(I) selecting X address bits in the one lower or higher level node address, the X address bits being at least one of a plurality of bits of a X address portion of the one lower or higher level node address;

(II) generating at least one of the matching node addresses, each matching node address including a respective one of all combinations of the X address bits;

(2) generating a next higher level node address from at least one of the matching node addresses by right shifting the entire address of the matching node address by the number of X address bits;

(3) storing the next higher level node address in the buffer means if the number of leading zeroes does not indicate that the highest level node address has been generated, the highest level node address being indicated by a preset number of leading zeroes in the next higher level node address;

(4) if there are more lower or higher level node addresses in the buffer means which have not been processed or determined to be matching node addresses then returning to step (b).

5,113,506

SYSTEM HAVING AN ADDRESS GENERATING UNIT AND A LOG COMPARATOR PACKAGED AS AN INTEGRATED CIRCUIT SEPERATE FROM CACHE LOG MEMORY AND CACHE DATA MEMORY

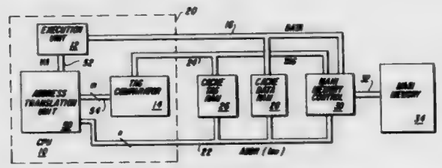
John P. Moussouris, Palo Alto; Lester M. Crudele, San Jose, and Steven A. Przybylski, Menlo Park, all of Calif., assignors to MIPS Computer Systems, Inc., Mountain View, Calif.

Continuation of Ser. No. 827,269, Feb. 6, 1986, Pat. No. 4,953,073. This application Mar. 9, 1990, Ser. No. 491,114

The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.

Int. Cl.[5] G06F *9/34, 12/10, 13/16*

U.S. Cl. 395—400 **8 Claims**



1. A computer system comprising:

an integrated chip having an address generating unit for generating address signals, a tag comparator unit and a first connection means coupled to the address generating unit and including a first group of address leads connected to said tag comparator unit, and a second group of address leads for outside connection;

first cache memory means including a first cache data memory and a first cache tag memory each disposed externally to the integrated chip;

data bus means in communication with said first cache data memory and said address generating unit;

tag bus means in communication with said tag comparator and said first cache tag memory; and

address bus means coupling said first cache tag memory and said first cache data memory to said second group of address leads.

5,113,507

METHOD AND APPARATUS FOR A SPARSE DISTRIBUTED MEMORY SYSTEM

Louis A. Jaeckel, Ukiah, Calif., assignor to Universities Space Research Association, Columbia, Md.

Continuation-in-part of Ser. No. 260,256, Oct. 20, 1988, abandoned. This application May 3, 1989, Ser. No. 353,179

Int. Cl.[5] G06F *12/00*

U.S. Cl. 395—425 **58 Claims**

1. A computer memory system comprising:

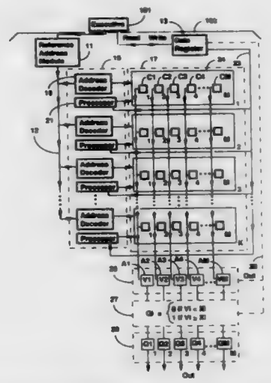
a plurality of hard memory locations in number equal to K, where K is an integer greater than one, each hard memory location comprising M counters, C1 through CM, where M is an integer greater than zero;

reference address means for storing a reference address received from a source external to said memory system, said reference address being a sequence of N bits, where N is an integer greater than zero;

data register means for storing data as a sequence of M integers;

processor means coupled to said reference address means, to said hard memory locations, and to said data register means, for determining for each reference address a subset of hard memory locations to be made available during read operations and during write operations, each such hard memory location that is made available hereinafter called an activated hard memory location, and for reading from and writing to said activated hard memory locations, said processor means coupled to said reference address means such that for each hard memory location said processor means receives a subset of said reference address bits equal in number to q, where q is an integer related to the proportion of the number of hard memory locations in said memory system that are to be accessed relative to the total number of hard memory locations in the memory system; said subset of reference address bits chosen by selecting for each hard memory location, q integers between 1 and N as selected coordinates, each selected coordinate corresponding to a bit position within said reference address, and for each selected coordinate for each hard memory location, assigning a zero or one, as an assigned value for that selected coordinate;

said processor means for receiving said selected coordinates and said assigned values and in response to receiving said subset of reference address bits, for each of said selected coordinates for each of said hard memory locations, comparing the assigned value for the selected coordinate with the value of the corresponding bit in the subset of the reference address bits;



said activated hard memory locations comprising those hard memory locations for which the assigned values for all selected coordinates are identical with the corresponding bits in the subset of the reference address bits; and

said processor means during a write operation for combining data in said data register means with any data already located in said M counters in each of said activated hard memory locations, said M counters in each of said activated hard memory locations for storing said combined data; and

accumulator means comprising a set of M accumulators, A1 through AM, with the ith accumulator, Ai, coupled to receive data from the ith counter, Ci, for each activated hard memory location, where i=1 through M, so that during a read operation each of said accumulators accumulates integers from said counters, the ith accumulator, Ai, receiving one integer from the ith counter for each activated hard memory location, thereby obtaining a value Vi in the ith accumulator, Ai.

5,113,508

DATA CACHE INITIALIZATION

Randall D. Groves, and David P. Tuttle, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 165,219, Mar. 8, 1988, abandoned. This application Mar. 29, 1991, Ser. No. 681,616

Int. Cl.[5] G06F *13/00, 12/00*

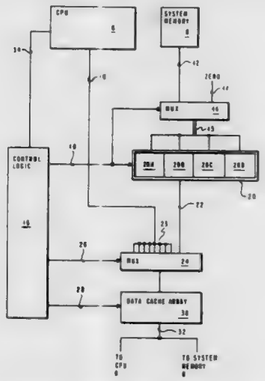
U.S. Cl. 395—425 **15 Claims**

1. A storing device connected to a central processor, said storing device comprising:

a storing means for storing words, each in addressable locations and connected to a first bus means for parallel trans-

fer of a single word to an addressable location and said storing means connected to a second bus means for parallel transfer of at least two words;

a control means connected to said storing means and said central processor for directing information from said first bus into one of the addressable locations upon receiving a first processor signal or, in response to a second processor



signal, for directing said storing means to store a predetermined constant value from said second bus means in at least two addressable locations concurrently; and

a multiplexer means for providing information either from said first bus means or said second bus means to said storing means in response to control signals from said control means.

5,113,509

METHOD OF CHANGING DATA ON DISK

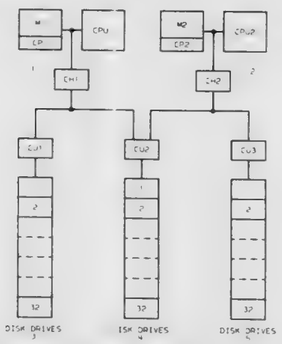
Henricus M. Pennings, BD Hilversum, and Hubertus F. Wijnen, GL Linschoten, both of Netherlands, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 26. 1987, Ser. No. 30,398

Claims priority, application European Pat. Off., Apr. 4, 1986, 86200577

Int. Cl.[5] G06F *12/02*

U.S. Cl. 395—425 **14 Claims**



1. A method for changing a specified part of a target-record, said target-record being one of a plurality of data records, stored on a Direct Access Storage Device (DASD), through an uninterrupted input/output (I/O) operation of a peripheral control system, said method comprising the steps of:

receiving, at said peripheral control system, a request for changing said specified part;

reading said target-record from said DASD into memory to form a copy thereof;

reading one of said data records denoted as a set-record from said DASD, said set-record having a change-value;

overlaying said change-value upon said copy where said specified part is to be changed to form a changed-record; and

writing said changed-record onto said DASD, overlaying said target-record.

5,113,510

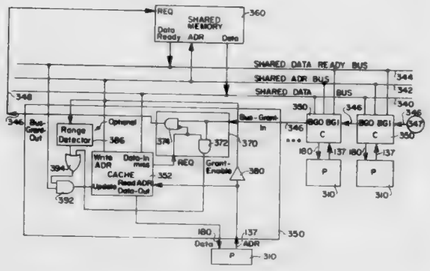
METHOD AND APPARATUS FOR OPERATING A CACHE MEMORY IN A MULTI-PROCESSOR

W. Daniel Hillis, Brookline, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

Filed Dec. 22, 1987, Ser. No. 136,580

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—425 **15 Claims**



1. A method of operating a multiprocessor computer system having a plurality of cache memories and a common memory which supplies data to said cache memories, each processor having a cache memory associated therewith, said method comprising the steps of:

accessing a first cache memory from a first processor in order to determine whether referenced data exists in said first cache memory;

reading said referenced data from said first cache memory upon determining that said referenced data exists in said first cache memory; and

upon determining that said referenced data does not exist in said first cache memory, updating each cache memory of said plurality of cache memories with an identical block of data obtained from said common memory.

5,113,511

SYSTEM FOR DYNAMICALLY PROVIDING PREDICTED HIGH/SLOW SPEED ACCESSING MEMORY TO A PROCESSING UNIT BASED ON INSTRUCTIONS

Craig Nelson, Redwood City; Javier Solis, Santa Clara, and David L. Needle, Alameda, all of Calif., assignors to Atari Corporation, Sunnyvale, Calif.

Filed Jun. 2, 1989, Ser. No. 360,357

Int. Cl.[5] G06F *12/02, 12/00*

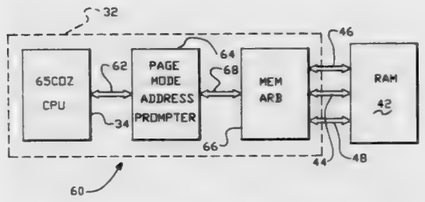
U.S. Cl. 395—425 **15 Claims**

10. A system for dynamically providing selective high speed memory addressing, the system comprising;

a processing unit;

a random access memory connected to supply instructions to said processing unit in response to memory accesses from said processing unit, said random access memory being operable in a high speed mode for predetermined sequences of addresses and otherwise operable in a low speed mode;

predicting means coupled to receive instructions supplied to said processing unit for providing a first signal in response



to received instructions if the next memory access is to an address that accessible in the high speed mode; and

mode selection means for accessing said random access memory in the high speed mode in response to the first signal and in the low speed mode otherwise.

5,113,512

SYSTEM FOR MANAGING A STORAGE MEDIUM REDUCING PHYSICAL SPACE NEEDED

Tadashi Miki, Osaka; Masayuki Kozuka, Moriguchi, and Hirotoshi Uehara, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

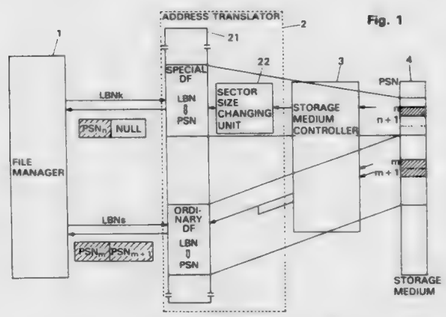
Filed Jun. 20, 1989, Ser. No. 369,585

Claims priority, application Japan, Jun. 21, 1988, 63-153246; Jun. 21, 1988, 63-153247

Int. Cl.[5] G06F *3/06, 13/04, 13/08*

U.S. Cl. 395—425 **6 Claims**

Fig. 1



1. A system for managing a storage medium in which a storage area is identified by a plurality of virtual logical blocks, each of said logical blocks being of a size which is n times of a physical sector where n is an integer equal to or greater than one, and said storage area being divided into a plurality of subregions, each subregion containing a plurality of said logical blocks, the logical block contained in each subregion having different physical sectors, said system comprising:

medium control means for recording and reproducing data on and from addresses associated with said physical sectors;

data management means for instructing record and reproduction of data in terms of addresses associated with said logical blocks;

address translation means for preparing a translation table, said translation table defining a relationship between the addresses associated with said logical blocks and the addresses associated with said physical sectors, and also defining a number m of physical sectors where m is an integer, and $1 \leqq m \leqq n$, which are subjected to record or reproduction by said medium control means in response to the instruction of recording or reproducing by one said logical blocks designated by said data management means;

record means for referring to said translation table to obtain the address of a physical sector and the physical sector numbers m, in response to the instruction of recording data into the address of a given logical block from said data management means, and for, when the total of the physical sector numbers m coincides with the size of said given logical block, recording the whole of the data, and for, when the total of the physical sector numbers m is smaller than the size of said given logical block, recording a portion of the data by said medium control means, the size of said recorded portion corresponding to said total of the physical sector numbers m; and

reproduction means for referring to said translation table to obtain the address of a physical sector and the physical sector numbers m, in response to the instruction for reproducing data from the address associated with a given logical block address designated by said data management means, and for, when the total of the physical sector numbers m is smaller than the size of said given logical block, reproducing data of the m number of said physical sectors of said address of said physical sector by said medium control means and then adding predetermined data to the reproduced data, the size of said added data corresponding to the shortage of said the physical sector numbers m with respect to the size of said logical block.

5,113,513

APPARATUS AND METHOD FOR LOADING A PROGRAM IN AN EXTERNAL STORAGE DEVICE CONNECTED TO ONE BUS INTO A MEMORY CONNECTED TO A DIFFERENT BUS

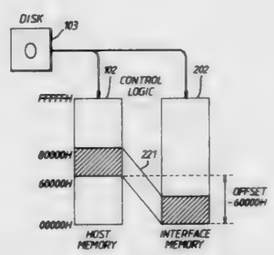
Kazumasa Kawai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1988, Ser. No. 290,474

Claims priority, application Japan, Dec. 28, 1987, 62-334689

Int. Cl.[5] G06F *12/08*

U.S. Cl. 395—425 **17 Claims**



1. A data transfer apparatus for simultaneously writing data from an external storage device connected to a first bus in a first memory connected to said first bus and a second memory connected to a second bus, comprising:

control means, connected to said first bus, for reading out data from said external storage device and sending a first address of said first memory;

simultaneous write control means, connected to said first and second buses, for: 1) fetching said first address from said control means, 2) converting the fetched address into a corresponding second address of said second memory, and 3) simultaneously enabling writing in said first and second memories; and

bus connecting means, connected to said first and second buses, for controlling connection and disconnection of a data line of said first bus and a data line of said second bus under the simultaneous write enabling of said simultaneous write control means,

wherein said control means writes the data read out from said external storage device at the first address of said first memory, and

when the data line of said first bus and the data line of the second bus are connected by said bus connecting means, said simultaneous write control means writes the data read out from said external storage device by said control means at the converted second address of said second memory.

5,113,514

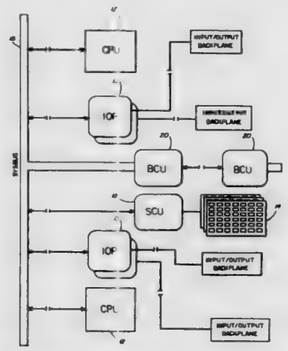
SYSTEM BUS FOR MULTIPROCESSOR COMPUTER SYSTEM

David H. Albonesi, Hudson; Brian K. Langendorf, Shrewsbury, both of Mass.; John Chang, Morton Grove, Ill.; John G. Fasse, Palo Alto, Calif., and Michael J. Homberg, Grafton, Mass., assignors to Prime Computer, Inc., Framingham, Mass.

Continuation of Ser. No. 397,124, Aug. 22, 1989, abandoned. This application Feb. 20, 1990, Ser. No. 482,288

Int. Cl.[5] **G06F** *12/00, 13/00*

U.S. Cl. 395—425 **28 Claims**



1. A method of maintaining coherence amongst a plurality of devices including a main memory and a plurality of caches in a multiprocessor computer system having a system bus and a plurality of processors, each processor having a cache associated therewith, said system bus being coupled between all devices in said multiprocessor computer system, and said caches containing copies of data blocks stored in said main memory, and comprising the steps of:

appending to each data block stored in a cache, tag bits which indicate the condition of the associated data block in relation to other copies of the data block in the multiprocessor system, said condition of said data block may comprise one of the group of conditions comprising: (1) invalid, (2) shared, (3) private and (4) modified, wherein shared, private and modified are valid states, and wherein

(1) invalid indicates that the associated copy of the data block may be incorrect,

(2) shared indicates that the associated copy of the data block is correct and equivalent to the copy in main memory and that other caches may contain a correct copy of the data block,

(3) private indicates that the associated data block is correct and equivalent to the copy in main memory and that no other cache contains a valid copy of the data block, and

(4) modified indicates that the associated data block is not equivalent to the corresponding copy in main memory and no other cache contains a valid copy of the data block;

when a first processor having an associated first cache is to operate on a data block in such a manner as to possibly alter its condition as indicated by the tag bits in one or more caches in the computer system, said first cache issuing over said system bus to all other devices an instruction identifying said data block and the type of operation,

each cache other than said first cache responding to said instruction by issuing over said system bus a response message indicating if it received the instruction properly, if it has a copy of said data block, and, when the instruction includes a READ operation, whether the cache is the only cache having a copy of the data,

assimilating the response messages of all caches to produce a collective response message which indicates to said first cache the condition in which the data block will be in said first cache after the instruction is executed,

executing said instruction, and

updating the tag bits in said first cache in accordance with said collective response message,

updating the tag bits in each of said caches responding to said instruction in accordance with said instruction,

when said instruction is a READ, the method including the additional steps of,

said READ instruction requesting that another device send a valid copy of said data block to said first cache,

if said data block is marked as shared in any cache, said main memory writing said data block back to said first cache and instructing said first cache to update said tag bits to mark said data block as shared in said first cache,

if said data block is marked as private in any one cache, the cache having the data block writing it to said first cache, said one cache updating said tag bits in said one cache to mark said data block as shared and instructing said first cache to update said tag bits of said data block in said first cache to mark said data block as shared,

if said data block is marked as modified in any one cache, the cache having the data block writing it to said first cache and said main memory, the processor associated with said one cache updating the tag bits in said one cache to mark said data block as shared and instructing said first cache to update said tag bits of said data block in said first cache to mark said data block as shared, and

if said data block is not valid in any cache, said main memory providing said data block to said first cache and instructing said first cache to update said tag bits to marks said data block as private in said first cache.

5,113,515

VIRTUAL INSTRUCTION CACHE SYSTEM USING LENGTH RESPONSIVE DECODED INSTRUCTION SHIFTING AND MERGING WITH PREFETCH BUFFER OUTPUTS TO FILL INSTRUCTION BUFFER

David B. Fite; Ricky C. Hetherington, both of Northboro; Michael M. McKeon, Grafton; Dwight P. Manley, Holliston, and John E. Murray, Acton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 3, 1989, Ser. No. 306,831

Int. Cl.[5] **G06F** *9/30*

U.S. Cl. 395—425 **9 Claims**

1. An instruction buffer system for a digital computer for controlling the delivery of instruction stream bytes between a memory and an instruction decoder, said instruction stream bytes being grouped together into variable length instructions, and said instruction decoder for decoding each of said bytes within said variable length instruction, the instruction buffer system comprising:

an instruction buffer coupled between said memory and said instruction decoder and having multiple byte locations for receiving a first series of said instruction bytes, at least a portion of said first series of instruction bytes forming a variable length instruction to be decoded by said decoder

first and second prefetch buffers for storing a preselected number of a second, subsequent series of bytes of instruction stream,

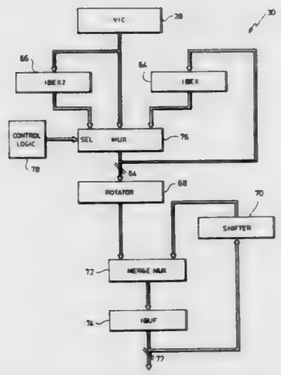
means for delivering a shift signal responsive to the number of bytes of instruction stream contained in the variable length instruction currently being decoded by said decoder,

a shifter for receiving said shift signal and shifting the contents of said instruction buffer by a preselected number of bytes responsive to said number of decoded bytes of instruction stream indicated by said shift signal,

means for merging said shifted bytes with at least a portion of the contents of one of said first and second prefetch buffers, and delivering said merged bytes to said instruction buffer,

means for refilling said first prefetch buffer with sequential bytes of said instruction stream when said first prefetch buffer is emptied, and

means for refilling said second prefetch buffer with sequential bytes of said instruction stream when said second prefetch buffer is emptied.



5,113,516

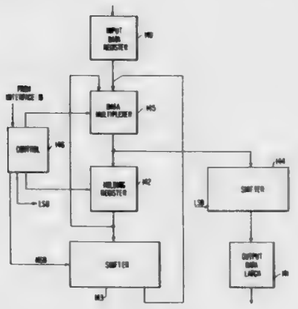
DATA REPACKER HAVING CONTROLLED FEEDBACK SHIFTERS AND REGISTERS FOR CHANGING DATA FORMAT

Brian C. Johnson, Stamford, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Jul. 31, 1989, Ser. No. 388,281

Int. Cl.[5] **G06F** *3/00, 5/01;* **H03M** *7/00, 7/30*

U.S. Cl. 395—500 **12 Claims**



1. A data repacker, comprising:

an intermediate register for holding intermediate results;

a data multiplexer having two inputs and an output connected to said register;

a circuit path for providing the output of said register to one of said inputs;

means for providing input data to the other of said inputs;

a first shifter for shifting the output of said register and having an output connected to said other of said inputs, for concatenation with said input data;

means, utilizing the output of said data multiplexer, for providing an output of the data repacker, and

control means for controlling said data multiplexer, intermediate register and first shifter, to maintain the contents of said intermediate register until an amount of valid data remaining in the intermediate register leaves room for concatenation of new data with the output of said first shifter.

5,113,517

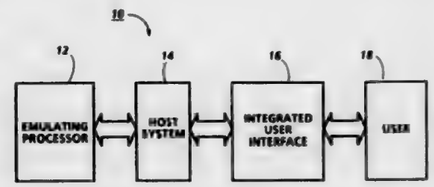
CONCURRENT DISPLAY OF DATA FROM TWO DIFFERENT PROCESSORS EACH HAVING DIFFERENT DISPLAY FONT AND USER INTERFACE FOR CONTROLLING TRANSFER OF CONVERTED FONT DATA THEREBETWEEN

Marian H. Beard, Sunnyvale; Perry A. Caro, Palo Alto; Jennifer B. Hsiao, San Jose; Kevin J. Mackey; James G. Sandman, Jr., both of Palo Alto; Gary R. Steinbach, Mountain View, and Donald R. Woods, Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 170,958, Mar. 24, 1988, abandoned, Division of Ser. No. 856,525, Apr. 28, 1986, Pat. No. 4,899,136. This application Jan. 24, 1990, Ser. No. 469,722

Int. Cl.[5] **G06F** *3/153, 15/16, 5/00*

U.S. Cl. 364—200 **27 Claims**



1. In a multiprocessor environment wherein at least two display processor means for independently and concurrently operating to display data as separate images on a single display screen of a display, comprising

a first display processor means having a first operating environment for processing and displaying images on said display screen,

main memory means for said first display processor means including memory allocated for storing information representative of said first display processor means images,

memory controller means under the control of said first display processor means to store and update said information in said memory means,

display memory means having a storage configuration with point-to-point address to pixel configuration for said display screen,

display controller means under the control of said first display processor means to periodically scan said display memory and display the information therein onto said display screen,

at least one other display processor means having a second operating environment which is different from said first operating environment for processing information for display on said display screen, said other display processing means having allocated memory in said main memory means of said first display processor means for storing information representative of the output from said other display processor means,

window manager means in said first display processor means for creating and tracking window ports in said display memory, one of said window ports being designated for

emulating the screen display of the output from said other display processor means,

said display controller means causing the simultaneous display on said display screen of both the displayed information of said first display processor means and the displayed information of said other display processor means via said designated window port,

said environment including a user interface on said display screen including metaphoric objects with which a user can interact by using input means,

means to change the input focus for said input means to either said designated window port or to the remaining area of said display screen of said first display processor means prior to interaction with a metaphoric object present in a selected screen portion and

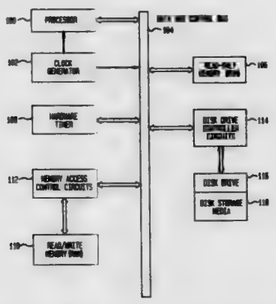
means to transfer information displayed relative to one of said display processor means to the display screen or window port of the other one of said display processor means, said transfer accomplished through said input means to translate said information into from the operating environment of the one of said display processor means the operating environment of the other one of said display processor means.

5,113,518

METHOD AND SYSTEM FOR PREVENTING UNAUTHORIZED USE OF SOFTWARE

Robert T. Durst, Jr., 212 Shelton Rd., Monroe, Conn. 06468, and Kevin D. Hunter, 440 Allyndale Dr., Stratford, Conn. 06497

Filed Jun. 3, 1988, Ser. No. 201,983
Int. Cl.[5] G06F *12/00, 12/14*
U.S. Cl. 395—550 **17 Claims**



1. A system for reducing unauthorized use by data processing apparatus of a software program having, as a portion thereof, predetermined values of selected inherent, system independent characteristics of authorized data processing apparatus, said system comprising:

means for determining actual values of said selected characteristics for operating data processing apparatus attempting to run said software program;

means, response to said means for determining, for comparing said determined actual values with said predetermined values;

means, responsive to said means for comparing, for selectively running said software program;

wherein said data processing apparatus includes a read only memory (ROM), and said predetermined values include an identification value for said ROM, and said identification value for said ROM comprises a cyclic redundancy check (CRC) value of contents of said ROM; and

wherein said data processing apparatus includes a processor having at least one register, and wherein said means for determining further comprises:

means for multiplying a value contained in said register by a first constant (C);

addressing means for addressing successive locations of said ROM;

means, responsive to said successive locations, for then successively adding to said register values contained in said successive locations;

means for then dividing said values contained in said register by a second constant (D) to produce a quotient and a remainder value;

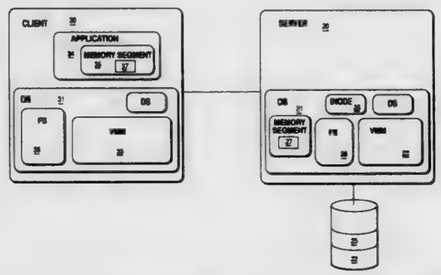
and means for loading said register with said remainder value, whereby said register then contains said CRC value.

5,113,519

INTENANCE OF FILE ATTRIBUTES IN A DISTRIBUTED DATA PROCESSING SYSTEM

Donavon W. Johnson, Georgetown, Tex.; Stephen P. Morgan, Mahopac, N.Y., and Todd A. Smith, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 15, 1989, Ser. No. 352,090
Int. Cl.[5] G06F *15/16*
U.S. Cl. 395—600 **25 Claims**



1. A method of maintaining a first file size of a file residing at a server data processing system, said server data processing system connected to at least one client data processing system through a means of communication, said method comprising:

maintaining a second file size in association with an ability to change said second file size at said at least one client data processing system;

changing said second file size by said at least one client data processing system; and

combining, by the server data processing system, said second file size from said client data processing system with said first file size at the server data processing system to determine a latest file size value.

5,113,520

DATA PROCESSOR ENABLING PRIORITIZING OF CONCURRENT TASKS

Keiichi Hirata, Kuwana; Tomohiro Ban, Iwakura; Atsuko Kawasumi, Nagoya; Kazuko Nakagawa, Chita; Yukimi Mizutani, Ichinomiya, and Satoru Tsuruki, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 122,365, Nov. 18, 1987, abandoned.
This application Oct. 24, 1989, Ser. No. 427,911
Claims priority, application Japan, Nov. 20, 1986, 61-277172
Int. Cl.[5] G06F *13/14, 13/26*
U.S. Cl. 395—650 **18 Claims**

1. A data processor for processing of key input data comprising:

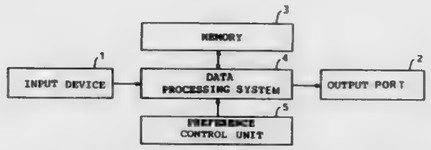
a keyboard for inputting data;

a printing device;

a data memory for storing data inputted from the keyboard;

data processing means connected to the keyboard, the data memory and the printing device for executing at least a data store process and a data delivery process, said data store process storing data inputted from the keyboard in the data memory and said data delivery process delivering data stored in the data memory to the printing device; and

preference means connected to the data processing means for selecting between a first mode and a second mode,



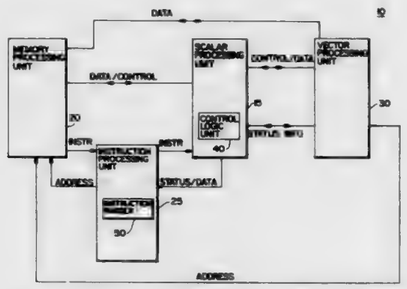
wherein in the first mode the data processing means executes the data store process in preference to the data delivery process by suspending the data delivery process upon detecting a predetermined input condition, and in the second mode the data processing means continuously executes the data delivery process in preference to the data store process upon detecting said predetermined input condition.

5,113,521

METHOD AND APPARATUS FOR HANDLING FAULTS OF VECTOR INSTRUCTIONS CAUSING MEMORY MANAGEMENT EXCEPTIONS

Francis X. McKeen, Westborough; Tryggve Fossum, Northboro; Dileep P. Bhandarkar, Shrewsbury, and Cheryl A. Wiecek, Westford, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 170,367, Mar. 18, 1988, abandoned.
This application Jan. 9, 1991, Ser. No. 638,149
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—650 **25 Claims**



1. A data processing system for processing vector instructions and scalar instructions, said vector instructions involving data processing operations on vector quantities and accesses to a memory, and said scalar instructions involving data processing operations on non-vector quantities, said data processing system comprising:

scalar processing means for executing a series of said scalar instructions;

vector processing means for executing a series of said vector instructions simultaneously with the execution of said series of said scalar instructions by said scalar processing means, said vector processing means executing each of said vector instructions by performing corresponding data processing suboperations, and said vector processing means including

exception detecting means for indicating that a memory management exception has occurred during an interrupted one of said suboperations corresponding to a faulting one of said vector instructions called a faulting vector processing instruction,

state means for holding vector state information representing an execution state of said vector processing means, said vector state information including information identifying an interrupted one of said data processing suboperations,

vector halt means, coupled to said exception detecting means, for stopping said vector processing means from executing said faulting vector processing instruction, without stopping said scalar processing means from executing said scalar instructions, when said exception detecting means indicates that said memory management exception has occurred, and

processing resumption means, coupled to said state means, for allowing said vector processing means to resume executing said series of vector processing operations at the interrupted one of said data processing suboperations in said vector state information; and

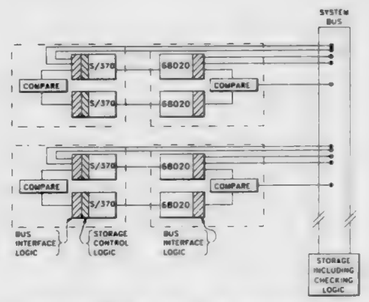
exception record means, coupled to said vector processing means, for recording into said state means as part of said vector state information an indication that said memory management exception has occurred and said information identifying the interrupted one of said data processing suboperations which said processing resumption means uses to allow said vector processing means to resume execution at the interrupted one of said data processing suboperation.

5,113,522

DATA PROCESSING SYSTEM WITH SYSTEM RESOURCE MANAGEMENT FOR ITSELF AND FOR AN ASSOCIATED ALIEN PROCESSOR

John M. Diawiddie, Jr., West Palm Beach; Bobby J. Freeman, Boynton Beach; Lonnie E. Grice, Boca Raton; John M. Loffredo, Deerfield Beach; Kenneth R. Sanderson, West Palm Beach, and Gustavo A. Suarez, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 17, 1989, Ser. No. 353,112
Int. Cl.[5] G06F *15/16*
U.S. Cl. 395—700 **8 Claims**



1. In a data processing system of the type in which system initialization routines control the self testing and initialization of each of a first pair and a second partner pair of processors and their respective associated hardware, in which each pair of processors and its associated hardware is kicked off into lock step operation with the other pair upon satisfactory self testing and initialization, and in which the pairs of processors and their hardware thereafter perform identical operations in lock step under control of a first operating system and programs having a first instruction architecture, the improvement comprising

an additional first pair of processors and an additional partner pair of processors each pair adapted to perform identi-

cal operations under control of a second operating system and programs having a second instruction architecture,

means for directly coupling each processor of the additional pairs to a respective processor of the first and second partner pair,

logic means controlled by application program instructions running on the first and second partner pairs of processors for uncoupling the first and second partner pairs of processors from their associated hardware and concurrently coupling the first and second partner pairs of processors to respective processors in the additional pairs via said direct coupling means for the transfer of commands and data therebetween,

application program controlled means associated with the first and second partner pairs of processors for initiating and controlling the self testing and initialization of the additional pairs of processors via commands and data applied to said direct coupling means while the first pair of processors are uncoupled from their hardware,

second logic means effective during system initialization for inhibiting the kick off of the first and second partner pairs of processors into lock step operation until the additional pairs of processors are self tested and initialized in a manner indiscernible to the first operating system, and

means initiating the concurrent kick off of the first and second partner pairs of processors and the kick off of said additional first and partner pairs of processors in lock step operation upon completion of all self testing and initializing in a manner indiscernible to the first operating system.

5,113,523

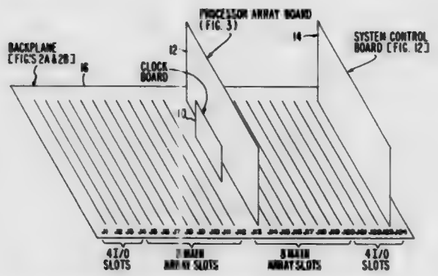
HIGH PERFORMANCE COMPUTER SYSTEM

Stephen R. Colley, Salinas, Calif.; David W. Jurasek, Banks, Oreg.; John F. Palmer, Tempe, Ariz.; William S. Richardson, and Doran K. Wilde, both of Beaverton, Oreg., assignors to NCUBE Corporation, Belmont, Calif.

Filed May 6, 1985, Ser. No. 731,170

Int. Cl.[5] G06F *9/28*

U.S. Cl. 395—800 **12 Claims**



1. A parallel processor comprising in combination:

a plurality of first processing nodes;

a single oscillator clock common to all of said first processing nodes; each of said first processing nodes including a processor and a memory, said memory having data and instructions stored therein, said processor including

(1) executing means for executing said instructions,

(2) fetching means connected to said execution means and to said memory for fetching said instructions from said memory, and,

(3) internode communication means connected to said execution means and to said memory;

said internode communication means comprising an asynchronous I/O channel for fetching data from said memory at an address supplied by said I/O channel and for sending said data to another one of said plurality of first processing nodes, said asynchronous I/O channel being connected to and driven by said single oscillator clock; and,

first means, connected to each of said internode communication means of said first nodes, for interconnecting said first nodes in the structure of a first array of processing nodes, said first array having a hypercube topology.

5,113,524

QUANTUM STATE CONTROL APPARATUS, OPTICAL RECEIVER AND OPTICAL COMMUNICATION SYSTEM

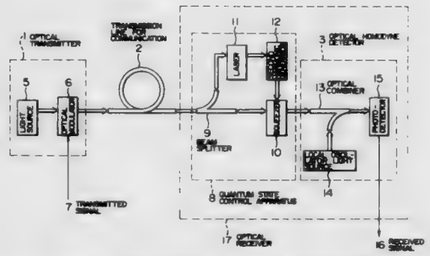
Osamu Hirota, 22-13, Gontazaka-1-chome, Hodogaya-ku, Yokohama; Hideaki Tsushima, Hachioji; Shinya Sasaki, Kodaira; Yoshitaka Takasaki, Tokorozawa, and Minoru Maeda, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo and Osamu Hirota, Yokohama, both of, Japan

Filed Sep. 27, 1989, Ser. No. 412,510

Claims priority, application Japan, Sep. 30, 1988, 63-244100; Apr. 28, 1989, 1-107673

Int. Cl.[5] H04B *10/00;* **H04J** *14/00*

U.S. Cl. 359—115 **17 Claims**



14. An optical communication system comprising:

an optical transmitter including a light source for emitting a lightwave with a single frequency, and an optical modulator carrying out phase shift keying for the lightwave which is emitted from the light source;

a transmission line for transmitting the signal lightwave outputted from the optical transmitter, to serve as a communication line; and

an optical receiver including at least a squeezer, a slave laser and an optical homodyne detector, the squeezer changing the quantum state of the signal lightwave outputted from the transmission line to a squeezed state, the slave laser being put in an injection locking state by the signal lightwave outputted from the squeezer, the optical homodyne detector carrying out optical homodyne detection for the signal lightwave outputted from the slave laser.

5,113,525

LINEAR-MODULATION TYPE RADIO TRANSMITTER

Akira Andoh, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1990, Ser. No. 600,379

Claims priority, application Japan, Nov. 6, 1989, 1-28818; Nov. 10, 1989, 1-29383

Int. Cl.[5] H04B *1/04*

U.S. Cl. 455—127 **12 Claims**

1. A linear-modulation type radio transmitter, comprising:

a linear modulator for producing a carrier wave linearly modulated based on a modulation signal;

a transmission power amplifier capable of adjusting its transmission gain and for amplifying said linearly-modulated carrier wave;

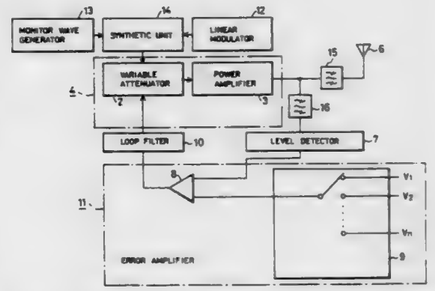
a transmit antenna for radiating, as an electromagnetic radio wave, an amplified signal output from said transmission power amplifier into space;

a monitor wave generator for generating a monitor wave at a predetermined amplitude having frequencies other than

those within the transmission band of said carrier wave,

and means of combining said monitor wave together with said linearly-modulated carrier wave and for inputting the combined monitor wave and linearly-modulated wave to said transmission power amplifier;

a level detector for detecting the level of components of said monitor wave out of output signal waves from said transmission power amplifier and for converting the same into a detection voltage corresponding to the level of the components of said monitor wave; and



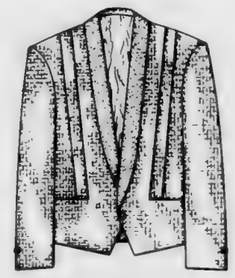
an error amplifier for producing a control signal for adjusting the gain of said transmission power amplifier based on the detection voltage from said level detector.

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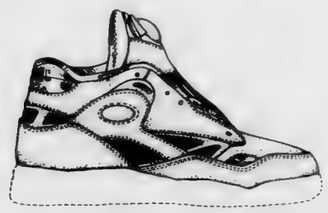
326,009
JACKET
Elizabeth Deuschle, Rohrbach, Fed. Rep. of Germany, assignor to Rob J. Nani, Birmingham, Mich.
Filed Mar. 5, 1990, Ser. No. 487,816
Term of patent 14 years
U.S. Cl. D2—184



326,010
FORMAL JACKET
Noel Feldman, West Chester, Pa., assignor to After Six, Inc., Philadelphia, Pa.
Filed Mar. 18, 1991, Ser. No. 672,720
Term of patent 14 years
U.S. Cl. D2—187



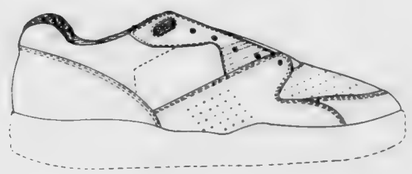
326,011
SHOE UPPER
Steven F. Smith, Taunton, and Ralph Serna, Hingham, both of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Apr. 12, 1991, Ser. No. 684,346
Term of patent 14 years
U.S. Cl. D2—314



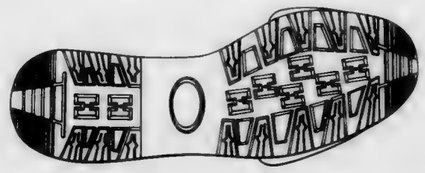
326,012
SHOE UPPER
Christopher J. Kittle, Cohasset, and Fiona J. Adams, North Quincy, both of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Jun. 11, 1991, Ser. No. 713,322
Term of patent 14 years
U.S. Cl. D2—314



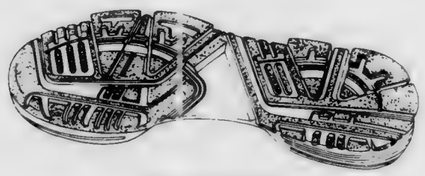
326,013
SHOE UPPER
John S. Earle, Portland, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.
Filed Jun. 24, 1991, Ser. No. 719,549
Term of patent 14 years
U.S. Cl. D2—314



326,014
SHOE SOLE
James E. Issler, Westport, Conn., assignor to H. H. Brown Shoe Company, Inc., New York, N.Y.
Filed Sep. 1, 1989, Ser. No. 402,145
Term of patent 14 years
U.S. Cl. D2—320



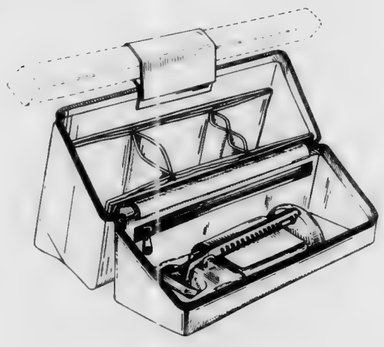
326,015
SHOE SOLE
Toshikazu Kayano, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan
Filed Nov. 5, 1990, Ser. No. 608,967
Term of patent 14 years
U.S. Cl. D2—320



326,016
GOLF ACCESSORY BAG
Jean-Pierre J. Guaresi, Le Raincy, France, assignor to Sportset Comfort, Le Raincy, France
Filed Nov. 29, 1989, Ser. No. 443,965
Claims priority, application Hague, Jul. 24, 1989, DM/014163
Term of patent 14 years
U.S. Cl. D3—36



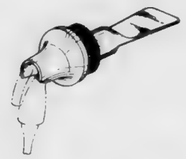
326,017
TRAVEL RAZOR SET
Gary D. J. Orosy, Franklin, Mass.; Frederick B. Hadtke, New Providence, N.J., and Paul D. Miller, New York, N.Y., assignors to The Gillette Company, Boston, Mass.
Filed Oct. 22, 1990, Ser. No. 602,192
Term of patent 14 years
U.S. Cl. D3—39



326,018
SHOULDER BAG
Jocelyne Imbert, Marseille, France, assignor to Louis Vuitton Malletier, Paris, France
Filed Nov. 9, 1989, Ser. No. 434,822
Claims priority, application Hague, Nov. 9, 1989, DMA/01007
Term of patent 14 years
U.S. Cl. D3—42

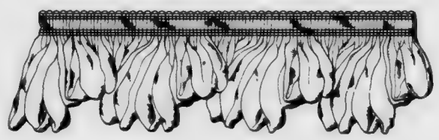


326,019
COMBINED BRUSH AND SCRAPER ATTACHMENT FOR A FAUCET SPRAY HANDLE
Spangler Anthony G., Sheridan, and Garry R. Marty, Noblesville, both of Ind., assignors to Masco Corporation of Indiana, Indianapolis, Ind.
Filed Sep. 23, 1987, Ser. No. 99,985
Term of patent 14 years
U.S. Cl. D4—118

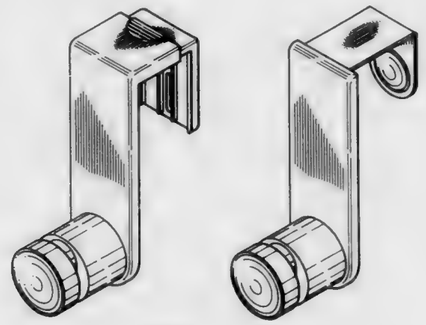




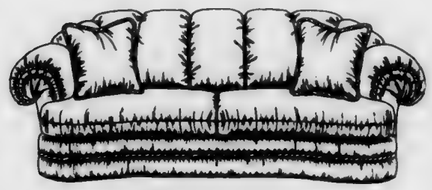
326,020
RIBBON FRINGE
Hildegard Kleinen, 327 Sixth Ave., San Francisco, Calif. 94118
Filed Nov. 6, 1989, Ser. No. 432,186
Term of patent 14 years
U.S. Cl. D5—18



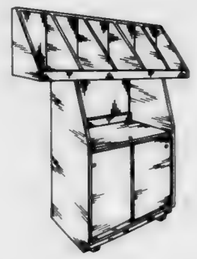
326,021
OVER-DOOR HOOK
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Nov. 28, 1990, Ser. No. 619,333
Term of patent 14 years
U.S. Cl. D6—323



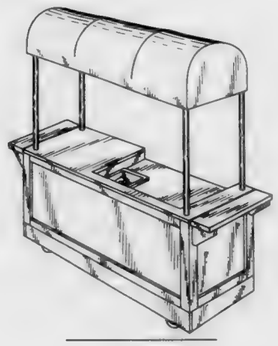
326,022
SOFA
Robert A. Gera, Glencoe, Ill., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Dec. 28, 1989, Ser. No. 458,799
Term of patent 14 years
U.S. Cl. D6—381



326,023
LAUNDRY CENTER
Loyd Hurn, 5606 N. Kramm Rd., Brimfield, Ill. 61517
Filed Feb. 7, 1990, Ser. No. 476,622
Term of patent 14 years
U.S. Cl. D6—438



326,024
PORTABLE BEVERAGE PREPARATION CABINET
David D. Boyd, Portland, and Michael W. Johnson, St. Helens, both of Oreg., assignors to Boyd Coffee Company, Portland, Oreg.
Filed Sep. 29, 1989, Ser. No. 415,187
Term of patent 14 years
U.S. Cl. D6—480



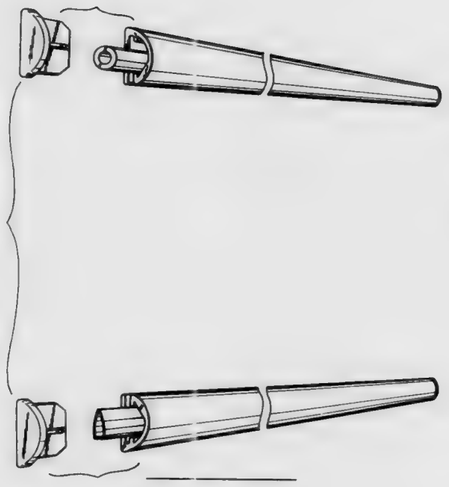
326,025
TABLE
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex Sarl, Oyonnax, France
Filed Dec. 11, 1989, Ser. No. 448,589
Claims priority, application World Int. Prop. O., Sep. 6, 1989, 014249
Term of patent 14 years
U.S. Cl. D6—480



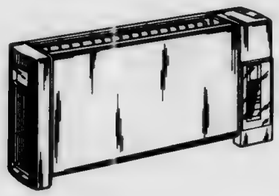
326,026
TABLE
Calvin L. Morgan, New York, N.Y., assignor to Steelcase, Inc., Grand Rapids, Mich.
Continuation-in-part of Ser. No. 150,094, Jan. 29, 1988. This application Sep. 5, 1989, Ser. No. 402,259
Term of patent 14 years
U.S. Cl. D6—484



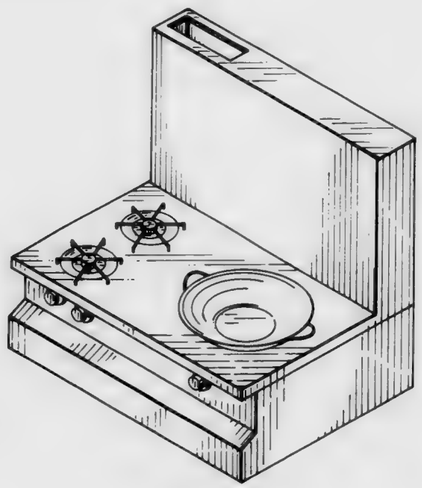
326,027
POSTER WALL HANGER ASSEMBLY OR THE LIKE
Maude H. Estes, Jacksonville, Fla., assignor to Grip-A-Strip, Inc., Jacksonville, Fla.
Filed Aug. 14, 1989, Ser. No. 394,174
Term of patent 14 years
U.S. Cl. D6—553



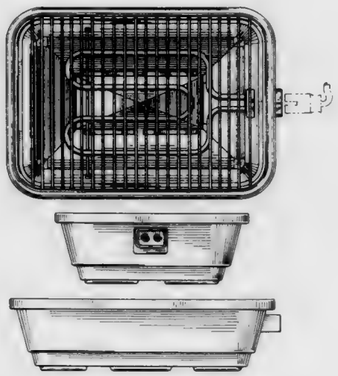
326,028
TOASTER
Jean-Marie Balandier, Vagney, France, assignor to SEB, Selongey, France
Filed Jan. 19, 1990, Ser. No. 467,767
Claims priority, application France, Jul. 21, 1989, 894714
Term of patent 14 years
U.S. Cl. D7—330



326,029
STOVE FOR WOK COOKING
Yuk L. Lok, 33-39 73rd St., Jackson Heights, Queens, N.Y. 11372
Filed Feb. 22, 1990, Ser. No. 482,915
Term of patent 14 years
U.S. Cl. D7—346



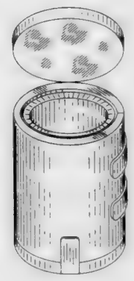
326,030
ELECTRIC BARBECUE GRILL
Michael P. Silver, Manalapan, N.J., assignor to Harris & Mallow, Inc., Lakewood, N.J.
Filed Jun. 25, 1990, Ser. No. 543,179
Term of patent 14 years
U.S. Cl. D7—362



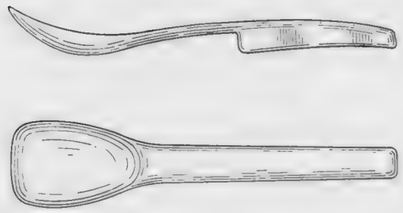
326,031
ADJUSTABLE GAS TUBE
Jon S. Walters, Chesterfield, Mo., and Neil Boatwright, Newburgh, Ind., assignors to American General Products, Inc., Maryland Heights, Mo.
Continuation-in-part of Ser. No. 127,425, Dec. 2, 1987, Pat. No. 482,799. This application May 9, 1989, Ser. No. 349,502
Term of patent 14 years
U.S. Cl. D7—402



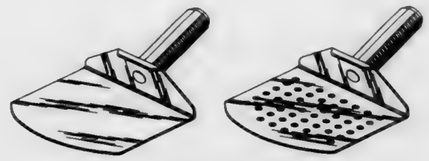
326,032
CAN COOLER
Terence S. Leach, 2259 Severhill Dr., Dublin, Ohio 43017
Filed Jun. 27, 1990, Ser. No. 544,366
Term of patent 14 years
U.S. Cl. D7—608



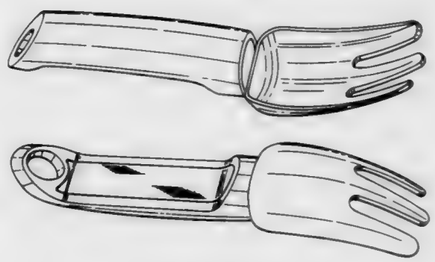
326,033
SPOON
Gary L. Friederichs, Cedarburg, Wis., assignor to The Vollrath Company, Inc., Sheboygan, Wis.
Filed Jan. 25, 1989, Ser. No. 302,311
Term of patent 14 years
U.S. Cl. D7—653



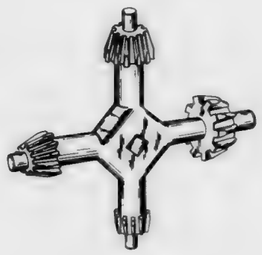
326,034
SPATULA
Joseph M. Kluesner, 1750 New Madrid, Cape Girardeau, Mo. 63701
Filed Jan. 26, 1990, Ser. No. 470,545
Term of patent 14 years
U.S. Cl. D7—688



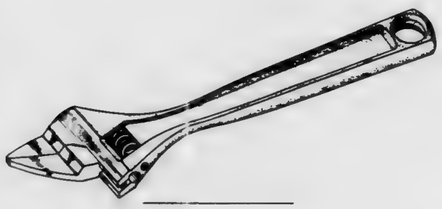
326,035
GARDEN RAKE
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini, S.p.A., Recanati, Italy
Filed Jul. 5, 1990, Ser. No. 548,757
Claims priority, application Italy, Jan. 9, 1990, 20 4188/90
Term of patent 14 years
U.S. Cl. D8—13



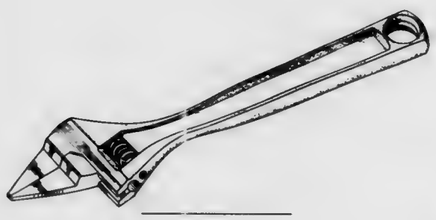
326,036
CHUCK KEY
Steven P. Anderson, 6666 Reseda Blvd., #204, Reseda, Calif. 91335
Filed Jun. 25, 1990, Ser. No. 543,063
Term of patent 14 years
U.S. Cl. D8—21



326,037
ADJUSTABLE WRENCH
Yasusuke Murayama, Sanjo, Japan, assignor to Top Kogyo Co., Ltd., Sanjo, Japan
Filed Mar. 1, 1989, Ser. No. 318,351
Claims priority, application Japan, Dec. 27, 1988, 68-50926
The portion of the term of this patent subsequent to May 12, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—22



326,038
ADJUSTABLE WRENCH
Yasusuke Murayama, Sanjo, Japan, assignor to Top Kogyo Co., Ltd., Sanjo, Japan
Filed Mar. 1, 1989, Ser. No. 318,352
Claims priority, application Japan, Dec. 27, 1988, 63-50925
The portion of the term of this patent subsequent to May 12, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—22



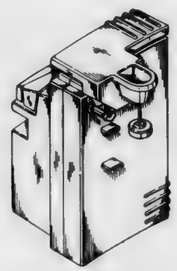
326,039
CAN OPENER
Tucker Viemeister, New York, N.Y., assignor to Oxo International L.P., New York, N.Y.
Filed Jul. 23, 1990, Ser. No. 556,207
Term of patent 14 years
U.S. Cl. D8—33



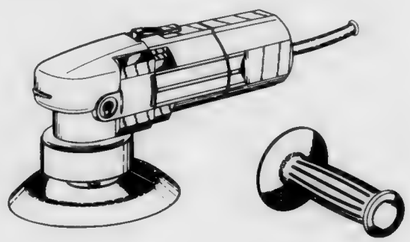
326,040
BOTTLE OPENER
James S. Wysopal, 401 Ave. Salvador, San Clemente, Calif. 92672
Filed Jul. 16, 1990, Ser. No. 552,591
Term of patent 14 years
U.S. Cl. D8—34



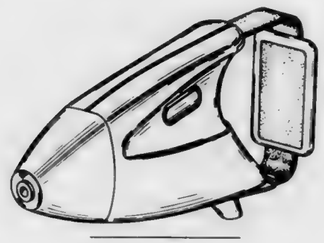
326,041
CAN OPENER
David S. Rowley, Smyrna, Ga., assignor to Hamilton Beach/-Proctor-Silex, Inc., Glen Allen, Va.
Filed Aug. 7, 1990, Ser. No. 563,970
Term of patent 14 years
U.S. Cl. D8—35



326,042
ORBITAL SANDER
John R. Kriaski; Donald R. Bosten, and James P. Nichols, Jr., all of Jackson, Tenn., assignors to Porter-Cable Corporation, Jackson, Tenn.
Filed Aug. 16, 1989, Ser. No. 394,438
Term of patent 14 years
U.S. Cl. D8—62



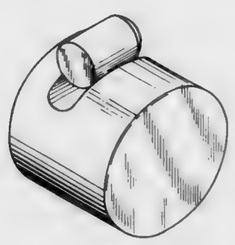
326,043
ELECTRIC SCREW DRIVER
Hideaki Hasegawa; Fumio Tashimo, both of Katsuta; Shigehisa Hagura, Tokyo; Kazuyuki Tuburaya, Tokyo, and Masaru Oda, Tokyo, all of Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan
Filed May 19, 1989, Ser. No. 354,334
Term of patent 14 years
U.S. Cl. D8—68



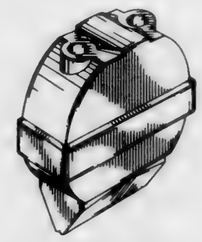
326,044
SHARPENING TOOL
Steven P. Anderson, 6666 Reseda Blvd., #204, Reseda, Calif. 91335
Filed Jun. 22, 1990, Ser. No. 542,403
Term of patent 14 years
U.S. Cl. D8—91



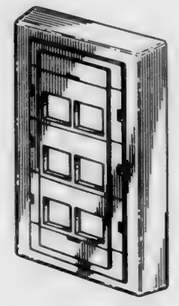
326,045
VEHICLE IGNITION PROTECTIVE COVER
Joseph S. Barrett, 15011 NE. 11th Ave., North Miami, Fla. 33161
Filed Feb. 14, 1990, Ser. No. 480,039
Term of patent 14 years
U.S. Cl. D8—346



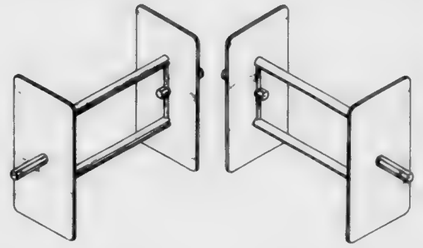
326,046
PROTECTIVE COVER FOR A PADLOCK
Charles J. Heald, 137 River Village Cir., Dayton, Nev. 89403
Filed Sep. 4, 1990, Ser. No. 585,851
Term of patent 14 years
U.S. Cl. D8—346



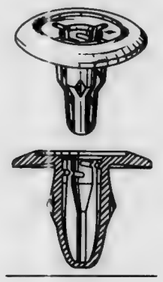
326,047
COVER PLATE FOR OUTLET
Clifford A. Bodenweiser, Berlin, and Neil J. Woodward, Aver, both of Mass., assignors to MOD TAP W. Corp., Harvard, Mass.
Filed Sep. 28, 1990, Ser. No. 590,282
Term of patent 14 years
U.S. Cl. D8—353



326,048
KITE LINE SPOOL FOR A PORTABLE POWER DRIVE
Murray Adler, 2536 Seamist Crt., Port Hueneme, Calif. 93041
Continuation-in-part of Ser. No. 391,365, Aug. 8, 1989. This application Feb. 16, 1990, Ser. No. 482,325
Term of patent 14 years
U.S. Cl. D8—359



326,049
PANEL FASTENER OR THE LIKE
Kazumasa Kurihara, and Yoshio Kaneko, both of Yokohama, Japan, assignors to Nifco Inc., Yokohama, Japan
Continuation of Ser. No. 158,990, Feb. 19, 1988, abandoned. This application Oct. 29, 1990, Ser. No. 604,440
Claims priority, application Japan, Aug. 27, 1987, 62-34619
Term of patent 14 years
U.S. Cl. D8—385



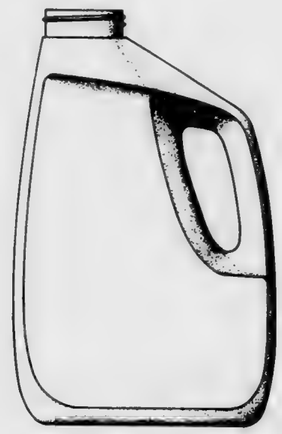
326,050
GASOLINE AND MOTOR OIL CONTAINER
Daniel H. Stockstill, Box 14, Circleville, Kans. 66416
Filed Jan. 16, 1990, Ser. No. 464,776
Term of patent 14 years
U.S. Cl. D9—524



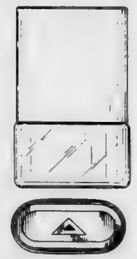
326,051
BOTTLE
Carl E. Frahm, Arcadia, Calif., assignor to Reid Plastics, Inc., Arcadia, Calif.
Filed Jun. 13, 1988, Ser. No. 205,907
Term of patent 14 years
U.S. Cl. D9—558



326,052
BOTTLE
Timothy J. Beechuk, Cincinnati, Ohio; Ronald J. Zamorski, Southgate, Ky.; Robert F. Thomas, and William M. Hart, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Aug. 29, 1989, Ser. No. 400,238
The portion of the term of this patent subsequent to Sep. 6, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—528



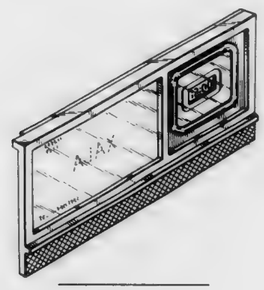
326,053
COMBINED BOTTLE AND CAP
Matthew R. Waine, Twickenham, United Kingdom, and Michel Brunet, La Commanderie, France, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 19, 1990, Ser. No. 495,538
Claims priority, application United Kingdom, Sep. 20, 1989, 1001138
Term of patent 14 years
U.S. Cl. D9—529



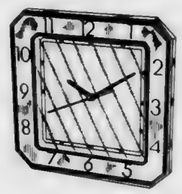
326,054
BOTTLE
Everett C. Beeman, Wallington, Conn., assignor to Silgan Plastics Corporation, Chesterfield, Mo.
Filed Dec. 21, 1990, Ser. No. 631,788
Term of patent 14 years
U.S. Cl. D9—539



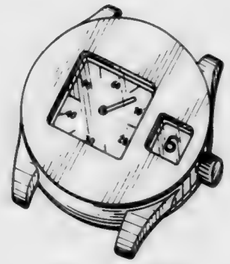
326,055
COMBINED DIGITAL CLOCK AND CARD HOLDER
Sol Africk, 3723 Maple Leaf Dr., Glenview, Ill. 60025
Filed Jun. 14, 1990, Ser. No. 538,923
Term of patent 14 years
U.S. Cl. D10—2



326,056
CLOCK
Masahiro Aikawa, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Sep. 26, 1989, Ser. No. 412,868
Term of patent 14 years
U.S. Cl. D10—24



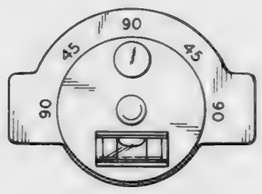
326,057
WRISTWATCH
Gianni Bulgari, Rome, Italy, assignor to Gianni Bulgari S.p.A., Rome, Italy
Filed Jan. 31, 1989, Ser. No. 304,376
Claims priority, application Italy, Nov. 29, 1988, 53573/88[U]
The portion of the term of this patent subsequent to Apr. 21, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—39



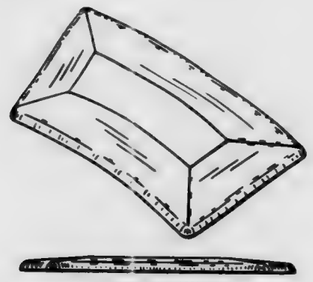
326,058
WRIST-WATCH
Ernest Schneider, Evilard, Switzerland, assignor to Breitling Montres S.A., Grenchen, Switzerland
Filed Sep. 8, 1989, Ser. No. 405,356
Claims priority, application Hague, Mar. 9, 1989, DM/013049
Term of patent 14 years
U.S. Cl. D10—39



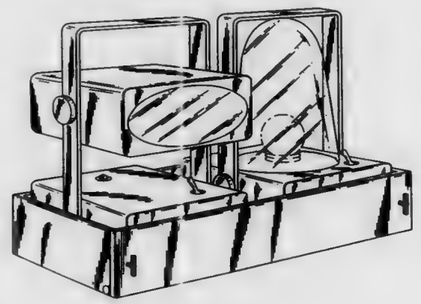
326,059
LEVEL
Gary E. Clark, 240 E. Kathleen, Sikeston, Mo. 63801
Filed Jul. 7, 1989, Ser. No. 376,582
Term of patent 14 years
U.S. Cl. D10—69



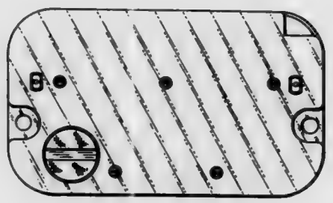
326,060
PAVEMENT MARKER
Michael W. Sakko, P.O. Box 2501, Winter Haven, Fla. 33883
Filed Dec. 22, 1989, Ser. No. 455,742
Term of patent 14 years
U.S. Cl. D10—113



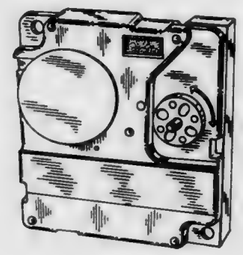
326,061
COMBINED PORTABLE EMERGENCY LIGHTS AND CONTAINER THEREFOR
Steven R. Hopper, 1552 Tarbox St., San Diego, Calif. 92114
Filed Oct. 21, 1988, Ser. No. 260,894
Term of patent 14 years
U.S. Cl. D10—114



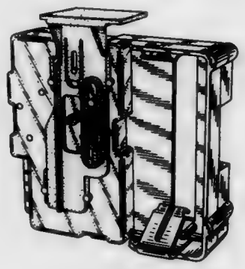
326,062
CLOCK MOVEMENT
Susumu Ikuma, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Aug. 18, 1989, Ser. No. 396,604
Term of patent 14 years
U.S. Cl. D10—129



326,063
CLOCK MOVEMENT
Katsuhiro Hatano, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Feb. 23, 1990, Ser. No. 484,619
Term of patent 14 years
U.S. Cl. D10—129



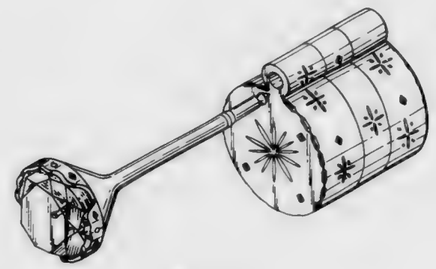
326,064
CLOCK MOVEMENT
Takumi Matsuda, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jun. 21, 1990, Ser. No. 541,410
Term of patent 14 years
U.S. Cl. D10—129



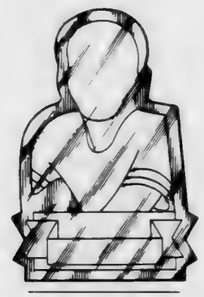
326,065
JEWELRY CHAIN
Caterina Borgogni, Ponticino, Italy, assignor to Cento Group S.p.A., Arezzo, Italy
Division of Ser. No. 325,700, Mar. 17, 1989. This application May 15, 1990, Ser. No. 523,658
Claims priority, application Benelux, Sep. 19, 1988, DM/011754
Term of patent 14 years
U.S. Cl. D11—13



326,066
ILLUMINATING EARRING
Christopher Sprague, P.O. Box 159, Machias, Me. 04654
Filed Feb. 7, 1990, Ser. No. 476,286
Term of patent 14 years
U.S. Cl. D11—41



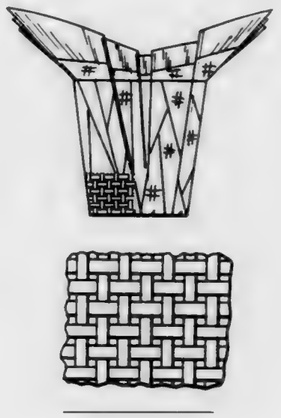
326,067
JEWELRY PIN
Benjamin H. Mayers, Mercer Island, Wash., assignor to Ace Novelty Co., Inc., Bellevue, Wash.
Filed Mar. 12, 1990, Ser. No. 492,868
Term of patent 14 years
U.S. Cl. D11—55



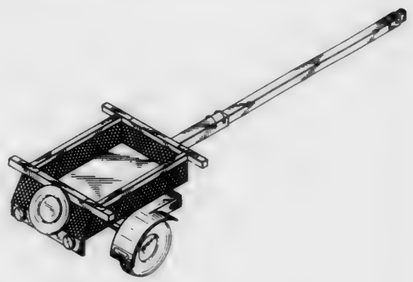
326,068
BADGE
Ian Pierce, 648 Sir Richard's Road, Mississauga, Ontario, Canada L5C 1A4
Filed Dec. 13, 1990, Ser. No. 626,854
Term of patent 14 years
U.S. Cl. D11—99



326,069
FLOWER POT COVER
Donald E. Weder; Erwin H. Weder, both of Highland, Ill. Wanda M. Weder, Highland, Calif.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly, Highland, Ill.; Phyllis J. Bolk, Highland, Ill.; John W. Bergstrand, Highland, Ill., and Robert C. Abrams, Edwardsville, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Division of Ser. No. 108,316, Oct. 13, 1987, Pat. No. Des. 316,838, which is a continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. Des. 293,224. This application Jan. 16, 1991, Ser. No. 642,091
Term of patent 14 years
U.S. Cl. D11—164



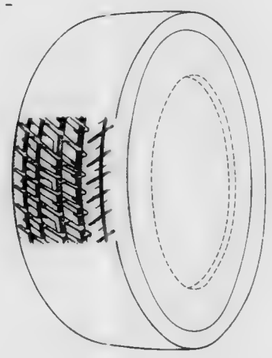
326,070
BOAT OR CAMPING TRAILER
Jack Hollingworth, Jr., Big Sugar Creek Farm, Powell, Mo. 65730
Filed Jan. 22, 1990, Ser. No. 468,828
Term of patent 14 years
U.S. Cl. D12—101



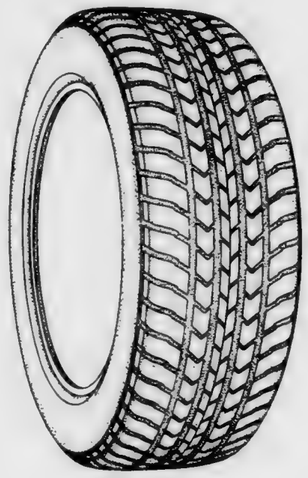
326,071
AUTOMOBILE TIRE
Yasutaka Enoki, and Akihito Goto, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 8, 1989, Ser. No. 448,188
Claims priority, application Japan, Dec. 8, 1989, 1-20943
Term of patent 14 years
U.S. Cl. D12—146



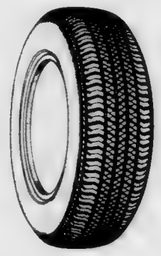
326,072
TIRE TREAD AND BUTTRESS
Paul B. Maxwell, Akron; Philip S. Hammond, Mogadore, and Darrell E. Covert, Uniontown, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 30, 1989, Ser. No. 429,248
The portion of the term of this patent subsequent to Sep. 25, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147



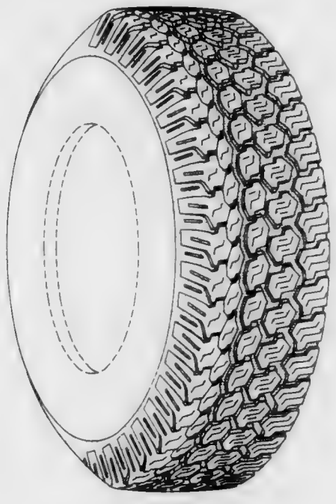
326,073
AUTOMOBILE TIRE
Toshio Hayakawa; Yasuo Himuro, and Teruyuki Tominaga, all of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Oct. 24, 1989, Ser. No. 425,885
Claims priority, application Japan, Apr. 24, 1989, 1-14865
Term of patent 14 years
U.S. Cl. D12—147



326,074
AUTOMOBILE TIRE
Yasuo Himuro; Toru Tsuda, and Toru Sasagawa, all of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Jan. 4, 1990, Ser. No. 461,484
Claims priority, application Japan, Jul. 4, 1989, 1-24490
Term of patent 14 years
U.S. Cl. D12—147



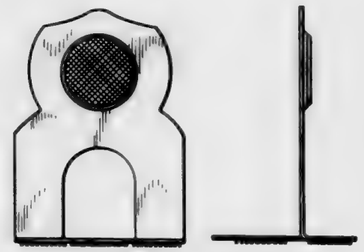
326,075
TIRE TREAD AND BUTTRESS
Darrell E. Covert, Uniontown; Paul B. Maxwell, Akron; Frederick W. Miller, Akron; Richard L. Galante, Akron; Michael A. Kolowski, Mogadore; William M. Hopkins, Hudson; Anthony J. Scarpitti, Uniontown, and Andrew N. Hoang, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation-in-part of Ser. No. 436,866, Nov. 15, 1989. This application Apr. 4, 1990, Ser. No. 504,787
The portion of the term of this patent subsequent to Mar. 31, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147



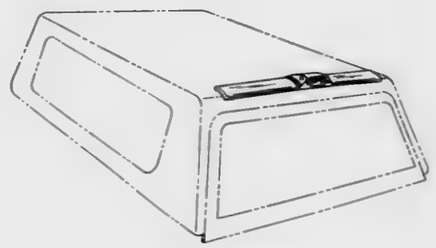
326,076
ANIMAL BARRIER FOR VEHICLES
Andreas Wiese, 2254 Rd. E, Redwood Valley, Calif. 95470
Filed Mar. 24, 1989, Ser. No. 328,139
Term of patent 14 years
U.S. Cl. D12—155



326,077
CARGO STORAGE RESTRAINT
Shahid J. Rana, 25800 Industrial Blvd. #I 179, Hayward, Calif. 94545
Filed Oct. 16, 1990, Ser. No. 598,345
Term of patent 14 years
U.S. Cl. D12—155



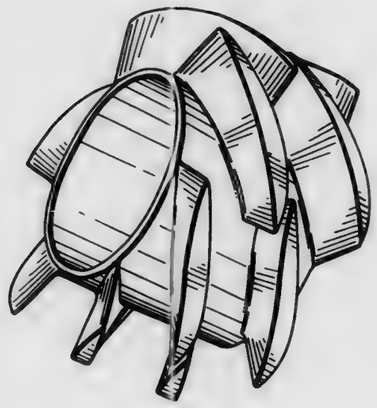
326,078
SPOILER FOR A TRUCK CAP
Charles R. Rogers, 8696 Spinnaker Way, Apt. C1, Ypsilanti, Mich. 48197
Filed Jun. 21, 1990, Ser. No. 541,353
Term of patent 14 years
U.S. Cl. D12—181



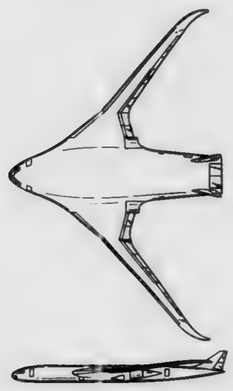
326,079
LICENSE PLATE FRAME
Del Schmitz, Chatsworth, and Jonathan Shook, Thousand Oaks, both of Calif., assignors to Superior Industries International Inc., Van Nuys, Calif.
Filed Jul. 31, 1990, Ser. No. 560,310
Term of patent 14 years
U.S. Cl. D12—193



326,080
PROPELLER
Heikki Vartiala, Helsinki, Finland, assignor to Teknovent Oy, Martinniemi, Finland, a part interest
Filed Nov. 2, 1989, Ser. No. 430,788
Claims priority, application Finland, May 2, 1989, 417/89; May 2, 1989, 418/89; May 2, 1989, 419/89
Term of patent 14 years
U.S. Cl. D12—214



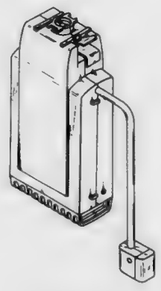
326,081
AIRPLANE
Richard T. Cathers, Fullerton, and Derek MacWilkinson, Costa Mesa, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Mar. 16, 1990, Ser. No. 494,495
Term of patent 14 years
U.S. Cl. D12—333



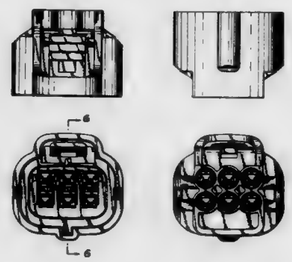
326,082
BOMB RACK FOR AIRPLANES
John F. Finlay, DSTO Contractors Area Salisbury, Penfield, Salisbury, South Australia, Australia 5108
Filed Sep. 27, 1989, Ser. No. 413,552
Term of patent 14 years
U.S. Cl. D12—345



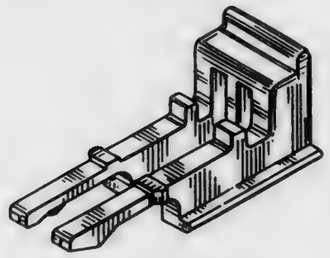
326,083
ELECTRIC MOTOR FOR DRIVING A CURTAIN
Kazuyuki Miyamoto; Ryozo Hioki, and Hoji Tanaka, all of Okazaki, Japan, assignors to Kabushiki Kaisha Makitadenkiseisakusho, Aichi, Japan
Filed Dec. 20, 1989, Ser. No. 454,862
Claims priority, application Japan, Oct. 31, 1989, 1-40034
Term of patent 14 years
U.S. Cl. D13—112



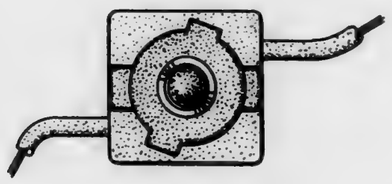
326,084
ELECTRICAL CONNECTOR HOUSING
Yasuhiro Nagasaka; Yasuo Hirayama; Ichiro Shibata, all of Toyota; Tadahiro Sueyoshi, Shizuoka; Masanori Tsuji, Shizuoka; Yoshihiro Murakami, Shizuoka; Takayuki Yamamoto, Shizuoka, and Masaru Fukuda, Shizuoka, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jul. 3, 1989, Ser. No. 374,857
Claims priority, application Japan, Jan. 6, 1989, 64-000057
Term of patent 14 years
U.S. Cl. D13—147



326,085
LOCK CHECK PIECE FOR THE COUPLING OF A MALE AND FEMALE ELECTRICAL CONNECTOR
Kenji Takenouchi; Toshihiko Makita, and Teruhisa Norizuki, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jan. 17, 1989, Ser. No. 297,515
Claims priority, application Japan, Jul. 15, 1988, 63-028048
Term of patent 14 years
U.S. Cl. D13—154



326,086
SWITCH HOUSING
David B. Balaban, Haupauge, N.Y., assignor to Leviton Manufacturing Company, Inc., Little Neck, N.Y.
Filed Jun. 8, 1990, Ser. No. 535,452
Term of patent 14 years
U.S. Cl. D13—171



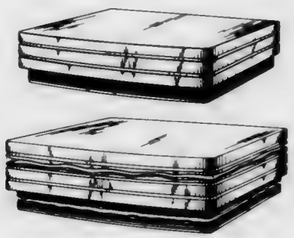
326,087
SWITCH HOUSING
David B. Balaban, Hauppauge, N.Y., assignor to Leviton Manufacturing Company, Inc., Little Neck, N.Y.
Filed Jul. 26, 1990, Ser. No. 560,963
Term of patent 14 years
U.S. Cl. D13—171



326,088
MULTI-PURPOSE EXCLOSURE FOR CONTROL MODULES OR DEVICES
Hugh F. Hudson, Wauwatosa, Wis.; Joseph F. Munsch, Boulder Creek, and Joseph A. McArdle, Mountain View, both of Calif., assignors to Johnson Service Company, Milwaukee, Wis.
Filed Nov. 30, 1989, Ser. No. 443,968
The portion of the term of this patent subsequent to Aug. 27, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—184



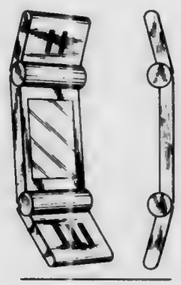
326,089
COMPUTER HOUSING
Hanumaiah L. Gowda, Lakewood; John Kowalik, Jr., Freehold, both of N.J.; Henry J. Mack, Jr., Levittown, Pa.; David J. Mayer, New York, N.Y., and Stephen G. Miggels, Wyckoff, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Mar. 21, 1990, Ser. No. 496,824
Term of patent 14 years
U.S. Cl. D14—100



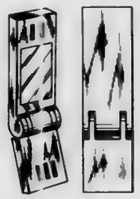
326,090
TELEPHONE
Nobuo Kikuchi, and Tamao Ikuta, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 20, 1990, Ser. No. 630,931
Claims priority, application Japan, Jun. 27, 1990, 2-21885
Term of patent 14 years
U.S. Cl. D14—138



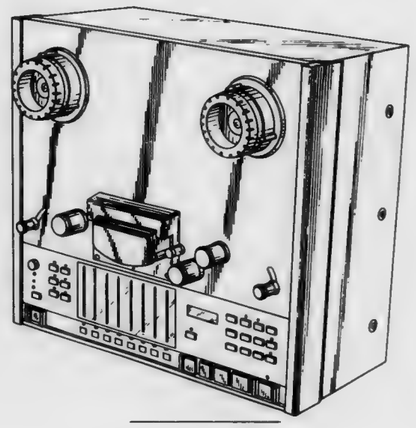
326,091
FOLDING HANDSET TELEPHONE OR SIMILAR ARTICLE
Nobuo Kikuchi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 20, 1990, Ser. No. 630,932
Claims priority, application Japan, Jun. 27, 1990, 2-21884
Term of patent 14 years
U.S. Cl. D14—138



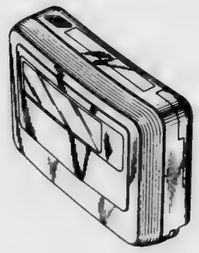
326,092
TELEPHONE
Nobuo Kikuchi, and Tamao Ikuta, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 20, 1990, Ser. No. 630,933
Claims priority, application Japan, Jun. 27, 1990, 2-21883
Term of patent 14 years
U.S. Cl. D14—138



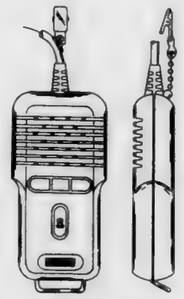
326,093
OPEN REEL TYPE TAPE RECORDER DECK
Masafumi Ito, Tokyo; Koji Suzuki, Tokorozawa; Shigeru Hasegawa, Kodaira, and Minoru Sube, Hachioji, all of Japan, assignors to TEAC Corporation, Japan
Filed Oct. 25, 1989, Ser. No. 426,949
Claims priority, application Japan, Apr. 28, 1989, 1-16152
Term of patent 14 years
U.S. Cl. D14—166



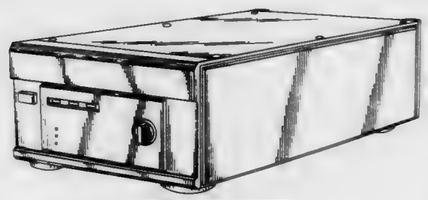
326,094
DISPLAY PAGER
Yoshiya Muraki, and Hiroyuki Koike, both of Tokyo, Japan, assignors to Fukuda Denshi Co., Ltd., Tokyo, Japan
Filed Apr. 17, 1990, Ser. No. 510,788
Claims priority, application Japan, Oct. 21, 1989, 1-38510
Term of patent 14 years
U.S. Cl. D14—191



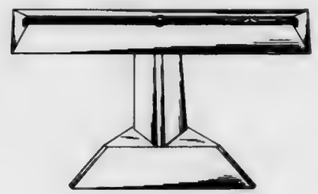
326,095
PILLOW SPEAKER
Harold S. Terk, and George L. Schick, both of Stamford, Conn., assignors to Curbell, Inc., Buffalo, N.Y.
Filed May 5, 1989, Ser. No. 347,782
Term of patent 14 years
U.S. Cl. D14—204



326,096
DIGITAL-ANALOG CONVERTER
Masafumi Ito, Tokyo; Shigeru Hasegawa, Kodaira; Minoru Sube, Hachioji, and Katsuhiro Takashima, Yokohama, all of Japan, assignors to TEAC Corporation, Japan
Filed Jul. 25, 1989, Ser. No. 385,294
Term of patent 14 years
U.S. Cl. D14—217



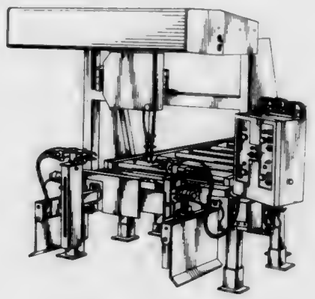
326,097
ANTENNA
Giancarlo Ferrario, Saronno, Italy, assignor to TCI Telecommunications Italia S.r.L., Italy
Filed Jun. 7, 1989, Ser. No. 362,598
Term of patent 14 years
U.S. Cl. D14—230



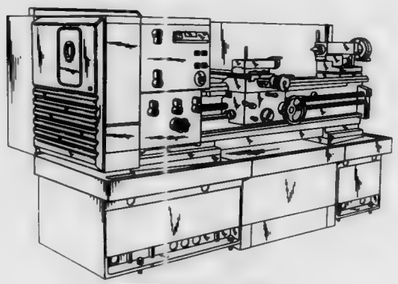
326,098
COMMUNICATIONS SYSTEM APPARATUS ENCLOSURE FOR HOUSING CELLULAR MOBILE RADIO TRANSMISSION AND SIMILAR EQUIPMENT
Tor A. Alden, Bernardsville; Gerard M. Cafferty, Boonton Township, Morris County; Ginhyun Cho, West Patterson; William Minko, Clifton, and John H. Schaffeld, Morristown, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Feb. 5, 1990, Ser. No. 475,475
Term of patent 14 years
U.S. Cl. D14—240



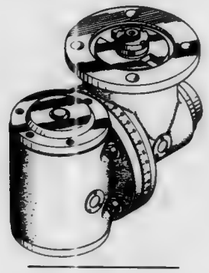
326,099
BEAM PROFILE MACHINE
Clyde W. Creech, 2243 W. South Mountain Ave., Phoenix, Ariz. 85041
Filed May 4, 1989, Ser. No. 347,442
Term of patent 14 years
U.S. Cl. D15—127



326,100
ENGINE LATHE
Roger W. Marriott, Clacton-on-Sea, England, assignor to The Colchester Lathe Company, Limited, Colchester, United Kingdom
Filed Jul. 6, 1989, Ser. No. 376,260
Claims priority, application United Kingdom, Mar. 31, 1989, 1058310
Term of patent 14 years
U.S. Cl. D15—130



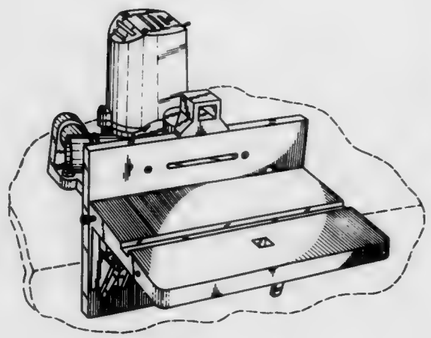
326,101
TOOL REST FOR MILLING PLANER
Han-Tsun Tsay, 33, Lane 85, Tzu Yu I Rd., San Min District, Kao Hsiung, Taiwan
Filed Feb. 13, 1990, Ser. No. 479,590
Term of patent 14 years
U.S. Cl. D15—131



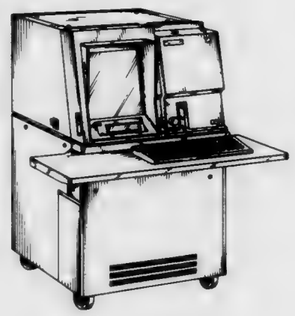
326,102
COLLET
Haruki Mizoguchi, Ikoma, Japan, assignor to Mizoguchi Iron Works & Co., Ltd., Nara, Japan
Filed Jun. 15, 1989, Ser. No. 366,420
Term of patent 14 years
U.S. Cl. D15—140



326,103
BENCH MOUNTABLE PLATE JOINING MACHINE
Robert M. Hempy, 1295 Washington Rd., Pittsburgh, Pa. 15228; Charles J. Baird, 421 Regency Dr., Pittsburgh, Pa. 15239, and Jeffrey L. Haffely, 3721 Wesleyann Dr., Gibsonia, Pa. 15044
Filed Aug. 19, 1988, Ser. No. 233,490
Term of patent 14 years
U.S. Cl. D15—141



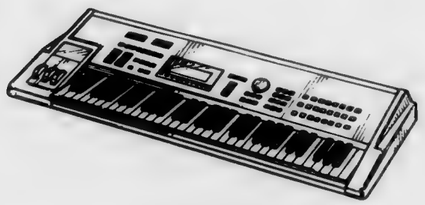
326,104
MICROFILM READER/PRINTER
Angelo LaBarbera, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 10, 1989, Ser. No. 419,363
Term of patent 14 years
U.S. Cl. D16—223



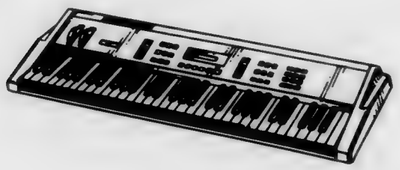
326,105
TRIPOD FOR CAMERA
Katsumi Doi, 10-31, Tamakushimotomachi 1-chome, Higashi-osaka-shi, Osaka, Japan
Filed Aug. 29, 1989, Ser. No. 400,051
Term of patent 14 years
U.S. Cl. D16—244



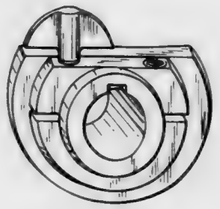
326,106
ELECTRONIC KEYBOARD MUSICAL INSTRUMENT
Keizo Tatshumi, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan
Filed Jan. 25, 1990, Ser. No. 470,058
Claims priority, application Japan, Aug. 5, 1989, 1-28928
Term of patent 14 years
U.S. Cl. D17—1



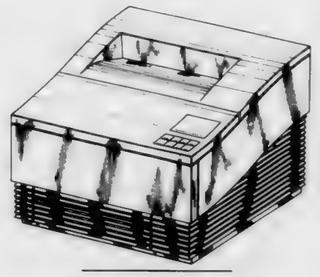
326,107
ELECTRONIC KEYBOARD MUSICAL INSTRUMENT
Eizo Amiya, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan
Filed Jan. 25, 1990, Ser. No. 470,512
Claims priority, application Japan, Aug. 5, 1989, 1-28929
Term of patent 14 years
U.S. Cl. D17—1



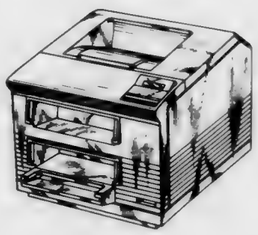
326,108
SUPPORT UNIT FOR TOM-TOM DRUMS
Werner Sassmannshausen, Bad Berleburg, Fed. Rep. of Germany, assignor to Johs. Link GmbH & Co. KG, Bad Berleburg, Fed. Rep. of Germany
Filed Dec. 19, 1989, Ser. No. 452,953
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1989, M 89 04 321.9; Jun. 19, 1989, M 89 04 322.7
Term of patent 14 years
U.S. Cl. D17—22



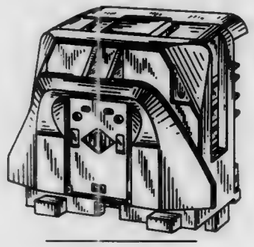
326,109
LASER BEAM PRINTER
Hiroyuki Tokuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 10, 1990, Ser. No. 624,678
Claims priority, application Japan, Jun. 12, 1990, 2-19971
Term of patent 14 years
U.S. Cl. D18—55



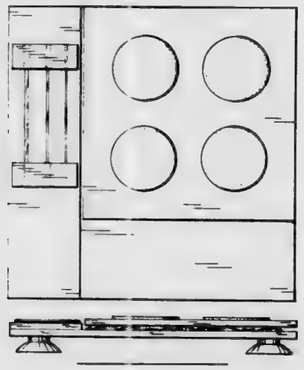
326,110
LASER BEAM PRINTER FOR ELECTRONIC COMPUTER
Naoki Tashiro, Tokyo, and Hiroyuki Tokuda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 23, 1990, Ser. No. 468,966
Claims priority, application Japan, Jul. 25, 1989, 1-27612
Term of patent 14 years
U.S. Cl. D18—55



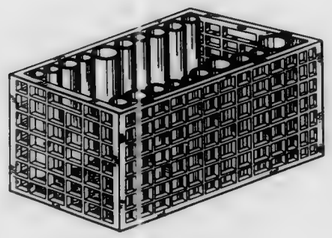
326,111
PRINTING HEAD FOR A PRINTER
Fumio Otsuka, and Yoshihiro Ohno, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan
Filed May 8, 1990, Ser. No. 521,465
Claims priority, application Japan, Nov. 8, 1989, 1-40769
Term of patent 14 years
U.S. Cl. D18—56



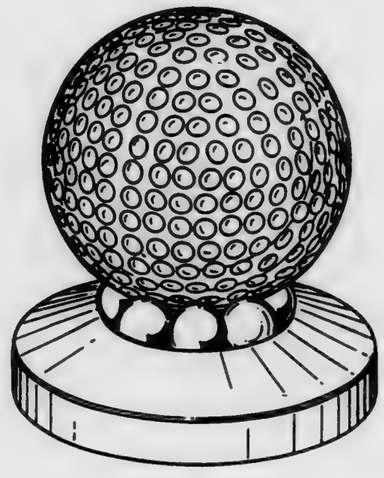
326,112
SUTURE TRAINING BOARD FOR MICROSURGERY
J. Dean Zikria, 196 Millbrook Cir., Norwood, N.J. 07640
Filed Oct. 12, 1989, Ser. No. 420,236
Term of patent 14 years
U.S. Cl. D19—62



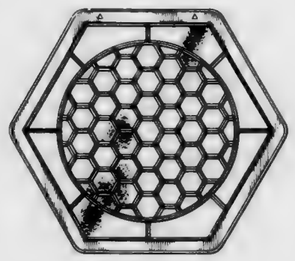
326,113
MULTIPURPOSE ORGANIZER
Carl J. Galante, P.O. Box 1359, Sanibell, Fla. 33957
Filed Jun. 17, 1988, Ser. No. 208,025
Term of patent 14 years
U.S. Cl. D19—78



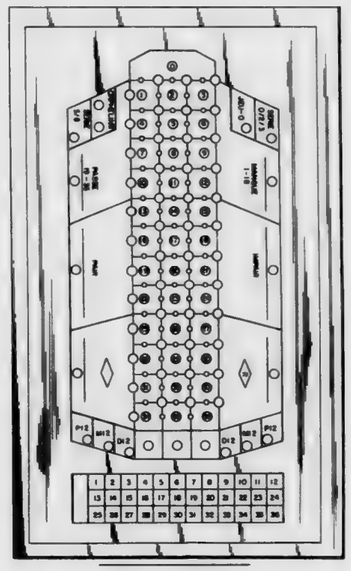
326,114
PAPER WEIGHT
William O. Murtagh, Toledo, Ohio, assignor to Gerity Products, Inc., Toledo, Ohio
Filed Sep. 7, 1989, Ser. No. 404,253
Term of patent 14 years
U.S. Cl. D19—97



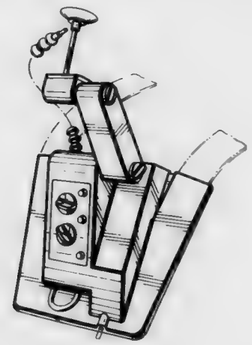
326,115
DARTBOARD SOCCER GAME
Irving H. Franklin, Brockton; Larry J. Franklin, Chestnut Hill, and Kurt M. Gluck, North Easton, all of Mass., assignors to Franklin Sports Industries, Inc., Stoughton, Mass.
Filed Apr. 5, 1990, Ser. No. 505,646
Term of patent 14 years
U.S. Cl. D21—6



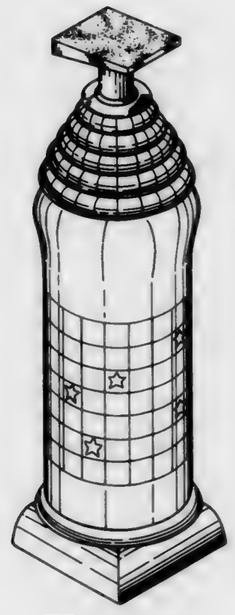
326,116
GAME LAYOUT MAT
Johannes C. van Wirst, Lagendijk 21, 1911 MT Uitgeest, Netherlands
Filed Oct. 5, 1989, Ser. No. 417,663
Claims priority, application Hague, Apr. 6, 1989, 18696-00
Term of patent 14 years
U.S. Cl. D21—37



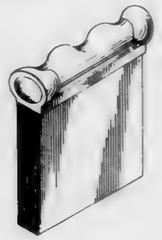
326,117
HANDS FREE CONTROLLER FOR VIDEO GAMES
Lance Barr, and John Cordell, both of Redmond, Wash., assignors to Nintendo of America Inc., Redmond, Wash.
Filed Jun. 20, 1989, Ser. No. 369,098
Term of patent 14 years
U.S. Cl. D21—48



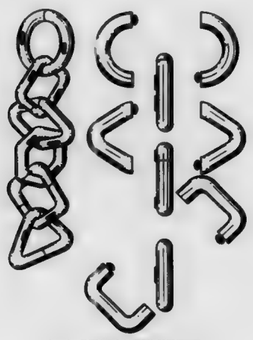
326,118
SQUARE DABBER
Mildred Black, Rte. #2, Box 1507, Matthews Rd., Atlanta, Mich. 49709
Filed Jul. 25, 1989, Ser. No. 384,682
Term of patent 14 years
U.S. Cl. D21—51



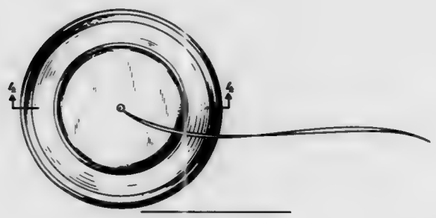
326,119
COMBINED CARD PACK AND HAND GRIP THEREFOR
Hoite C. Caston, 3589 Multiview Dr., Hollywood, Calif. 90068
Filed Nov. 1, 1989, Ser. No. 430,198
Term of patent 14 years
U.S. Cl. D21—54



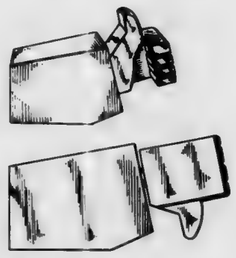
326,120
TOY CHAIN OR THE LIKE
Howard W. Michaelson, Coram, N.Y., and Douglas M. Laib, Blackstone, Mass., assignors to Dart Industries Inc., Deerfield, Ill.
Filed Jul. 26, 1989, Ser. No. 386,463
Term of patent 14 years
U.S. Cl. D21—65



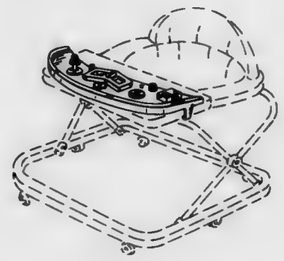
326,121
AERIAL TOY
Jerome L. Asner, 501 SW. 9th, Oklahoma City, Okla. 73109
Filed Oct. 9, 1990, Ser. No. 594,239
Term of patent 14 years
U.S. Cl. D21—86



326,122
HAND SIGNAL
Paul M. Wilson, Forest Park, Ill., assignor to Frederick E. Gilbert, Aurora, Ill.
Filed Jun. 19, 1990, Ser. No. 540,527
Term of patent 14 years
U.S. Cl. D21—100



326,123
TOY COCKPIT TRAY
Dana W. Connon, St. Louis, Mo., assignor to Welsh Company, St. Louis, Mo.
Filed Feb. 2, 1990, Ser. No. 473,717
Term of patent 14 years
U.S. Cl. D21—142



326,124
TOY WATCH
Harry S. Thomson, Richmond; David M. Raffo, Gildern Sutton; John A. Pape, and Shaun M. Woodward, both of Hitchin, all of Great Britain, assignors to Kiddicraft Limited, Bristol, Great Britain
Filed May 8, 1990, Ser. No. 520,386
Claims priority, application United Kingdom, Nov. 8, 1989, 1002259
Term of patent 14 years
U.S. Cl. D21—144



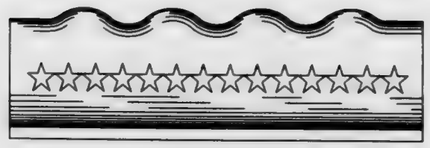
326,125
TOY ANIMAL
Vicki L. McCourtney, 3035 120th Ave., N. W., Coon Rapids, Minn. 55433
Filed Mar. 12, 1990, Ser. No. 491,626
Term of patent 14 years
U.S. Cl. D21—148



326,126
TOY BIRD FIGURE
Maryann Finiw, New York, and Lois Kelly, Brooklyn, both of N.Y., assignors to Grüner & Jahr Printing & Publishing Co., New York, N.Y.
Filed Feb. 19, 1991, Ser. No. 657,554
Term of patent 14 years
U.S. Cl. D21—160



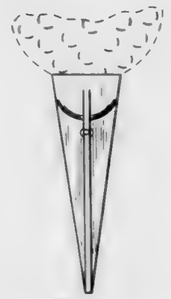
326,127
GRIP FOR EXERCISER OR SIMILAR ARTICLE
Arthur B. Rink, 13482 Fox Lease Ct., Herndon, Va. 22071
Filed Aug. 15, 1990, Ser. No. 567,667
Term of patent 14 years
U.S. Cl. D21—198



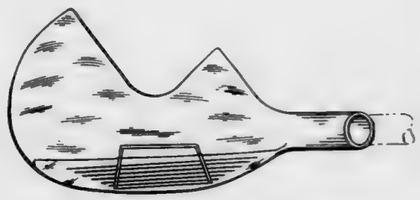
326,128
COMBINED BASKETBALL GOAL AND RETURN NET
Max D. Smith, Evansville, Ind., assignor to Indian Industries, Evansville, Ind.
Filed Aug. 4, 1989, Ser. No. 389,568
Term of patent 14 years
U.S. Cl. D21—201



326,129
GOLF TEE
Aaron L. Hirschmann, 311 E. South St., 0190 4, Lake Geneva, Wis. 53147-2400
Filed Oct. 30, 1989, Ser. No. 428,654
Term of patent 14 years
U.S. Cl. D21—208



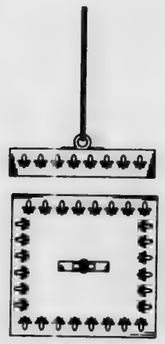
326,130
GOLF CLUB HEAD
Robert Chorne, 99 Russel Pl., Freeport, N.Y. 11520
Filed Jan. 24, 1990, Ser. No. 469,825
Term of patent 14 years
U.S. Cl. D21—214



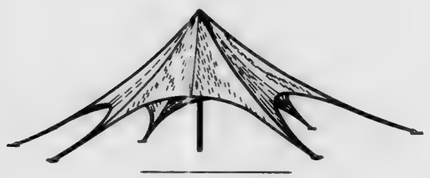
326,131
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Mar. 2, 1989, Ser. No. 317,802
The portion of the term of this patent subsequent to Apr. 7, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—217



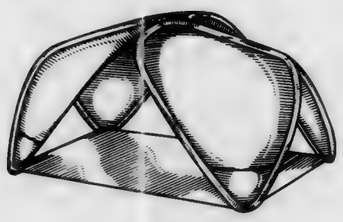
326,132
SWIMMING POOL FLOAT OR THE LIKE
Mindy S. Barnes, 696 W. Highland Ave., Hermiston, Oreg. 97838
Filed Mar. 22, 1990, Ser. No. 497,243
Term of patent 14 years
U.S. Cl. D21—237



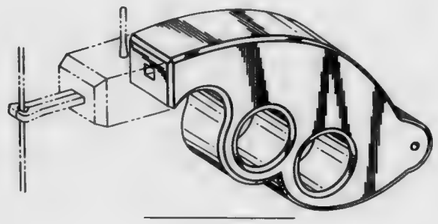
326,133
PORTABLE SHELTER
James P. Lynch, 13 South Field, Lakewood, Colo. 80226
Filed Jun. 6, 1989, Ser. No. 363,105
Term of patent 14 years
U.S. Cl. D21—253



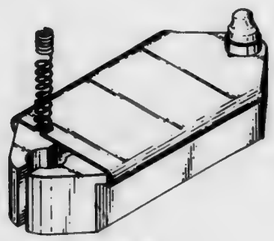
326,134
SHELTER
Lowell R. Norman, La Canada, Calif., assignor to Spring Form, Inc., La Canada, Calif.
Filed Nov. 30, 1989, Ser. No. 440,492
Term of patent 14 years
U.S. Cl. D21—253



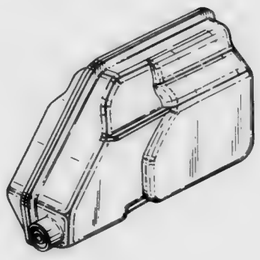
326,135
ARCHERY BOWSTRING GRIP
Edward Mortimer, 347 Golf Dr., Brookfield, Ohio 44403
Filed Feb. 1, 1990, Ser. No. 473,382
Term of patent 14 years
U.S. Cl. D22—107



326,136
ICE FISHING LINE MOVEMENT INDICATOR
Kenneth C. Hochstetler, Box 57A, Rte. 2, Luck, Wis. 54853; Michael J. Gilles, 79 E. Main, and Kevin D. Hughes, Box 289, both of Milltown, all of Wis. 54858
Filed Jan. 23, 1989, Ser. No. 301,252
Term of patent 14 years
U.S. Cl. D22—134



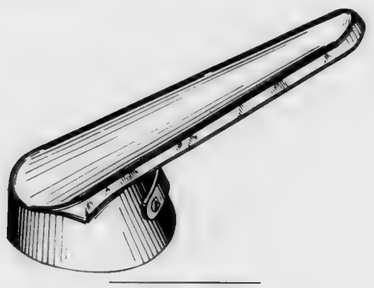
326,137
CONTAINER FOR ATTACHMENT TO AN HERBICIDE SPRAYER
Eren Ali, Bristol, United Kingdom, assignor to Nomix Manufacturing Company Limited, Bristol, United Kingdom
Filed Dec. 27, 1989, Ser. No. 457,537
Claims priority, application United Kingdom, Jun. 30, 1989, 1060563
Term of patent 14 years
U.S. Cl. D23—225



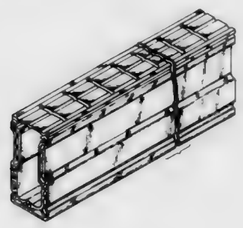
326,138
SPRAYER
Franco Clivio, Zurich, Switzerland, assignor to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany
Filed Aug. 7, 1989, Ser. No. 390,674
Term of patent 14 years
U.S. Cl. D23—226



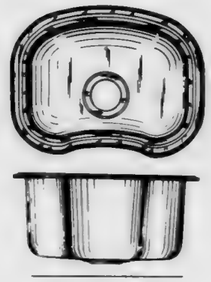
326,139
PLUMBING FITTING HANDLE OR THE LIKE
Christian M. Ragonot, Paris, France, assignor to Jacob Delafon, Paris, France
Filed Jul. 3, 1989, Ser. No. 375,313
Term of patent 14 years
U.S. Cl. D23—252



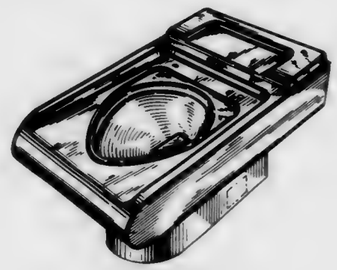
326,140
GUTTER DRAIN
Joseph Dekel, 4532 Jubilo Dr., Tarzana, Calif. 91356
Filed Apr. 21, 1989, Ser. No. 341,587
Term of patent 14 years
U.S. Cl. D23—267



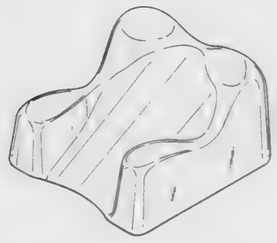
326,141
SINK
Michaela Evatt, Annandale; Reynolds P. Monaghan, Castle Hill, and Alan E. Kay, Moorebank, all of Australia, assignors to McIlwraith-Davey Pty Ltd., Waterloo, Australia
Filed Apr. 27, 1989, Ser. No. 344,118
Term of patent 14 years
U.S. Cl. D23—294



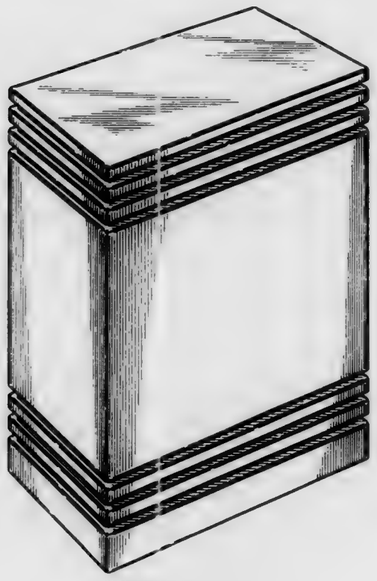
326,142
WATER CLOSET
Herbert V. Kohler, Jr., Kohler, and Mary J. Reid, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Nov. 6, 1989, Ser. No. 432,274
The portion of the term of this patent subsequent to Aug. 21, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—295



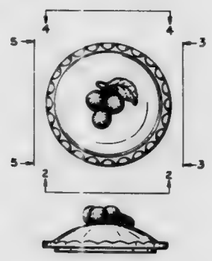
326,143
COMBINED HEAD & BACK SUPPORT TO FACILITATE WASHING HAIR IN A BATHTUB
Cynthia N. Stites, 9011 W. Swan Cir., Brentwood, Mo. 63144
Filed Mar. 13, 1989, Ser. No. 322,226
Term of patent 14 years
U.S. Cl. D23—304



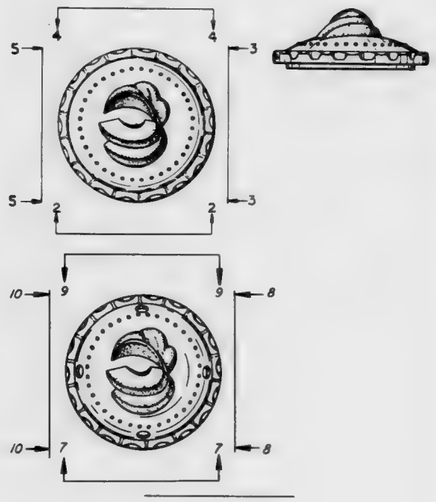
326,144
ROOM AIR FILTER
George S. Havrilla, 566 Saw Creek Estates, Bushkill, Pa. 18324
Filed Dec. 6, 1990, Ser. No. 624,278
Term of patent 14 years
U.S. Cl. D23—365



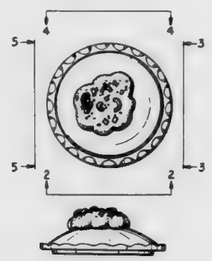
326,145
FRAGRANCE DISH COVER
Howard J. Borakove, Chesterfield, and Cindy L. Morrell, St. Louis, both of Mo., assignors to Willert Home Products, Inc., St. Louis, Mo.
Filed Apr. 25, 1990, Ser. No. 514,652
Term of patent 14 years
U.S. Cl. D23—367



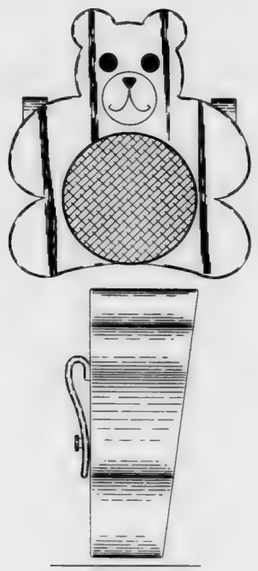
326,146
FRAGRANCE DISH COVER
Howard J. Borakove, Chesterfield, and Cindy L. Morrell, St. Louis, both of Mo., assignors to Willert Home Products, Inc., St. Louis, Mo.
Filed Apr. 25, 1990, Ser. No. 514,653
Term of patent 14 years
U.S. Cl. D23—367



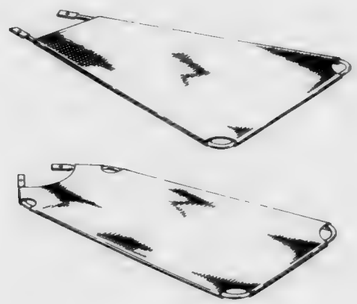
326,147
FRAGRANCE DISH COVER
Howard J. Borakove, Chesterfield, and Cindy L. Morrell, St. Louis, both of Mo., assignors to Willert Home Products, Inc., St. Louis, Mo.
Filed Apr. 25, 1990, Ser. No. 514,656
Term of patent 14 years
U.S. Cl. D23—367



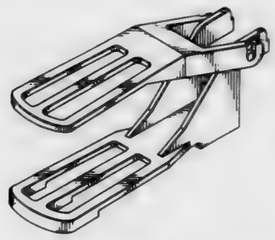
326,148
FAN FOR INFANTS AND CHILDREN
Lisa J. Lawlor, 2207 Oney Rd., Lakeland, Fla. 73801
Filed Jul. 22, 1991, Ser. No. 733,270
Term of patent 14 years
U.S. Cl. D23—382



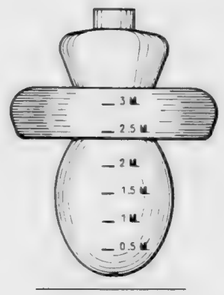
326,149
CEILING FAN BLADE
William N. Taylor, III, P.O. Box 810121, Dallas, Tex. 75381-0121
Continuation-in-part of Ser. No. 490,950, Mar. 9, 1990. This application Sep. 26, 1990, Ser. No. 588,415
The portion of the term of this patent subsequent to Mar. 13, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—413



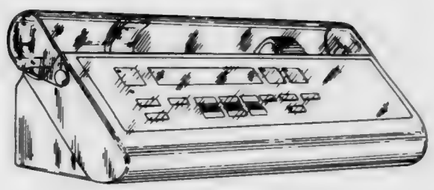
326,150
ARTICULATOR
Diab H. Jakoub, 112 Richardson Heights Village, Richardson, Tex. 75080
Filed Oct. 25, 1985, Ser. No. 794,045
The portion of the term of this patent subsequent to Dec. 12, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—182



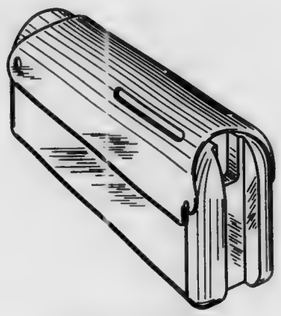
326,151
MEDICINE DISPENSING PACIFIER
Tanya L. Wallace, and Howard L. Wallace, both of 901 Cheswold Ct., Bel Air, Md. 21014
Filed Jan. 25, 1989, Ser. No. 301,743
Term of patent 14 years
U.S. Cl. D24—194



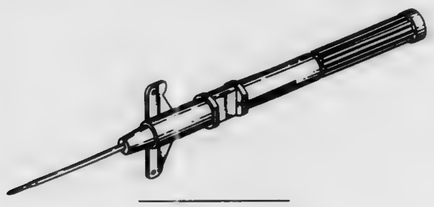
326,152
MEDICAL SYRINGE PUMP FOR INFUSION
Paul Rutter, Warwick, England, assignor to Graseby Medical Limited, Cambridge, England
Filed May 5, 1989, Ser. No. 347,796
Claims priority, application United Kingdom, Nov. 24, 1988, 1055197
The portion of the term of this patent subsequent to May 19, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—111



326,153
HOUSING FOR AN AMBULATORY INFUSION PUMP
William J. Eastman, St. Louis Park, and Samuel K. Yue, Bloomington, both of Minn., assignors to PMT Corporation, Chanhassen, Minn.
Filed Nov. 13, 1989, Ser. No. 435,784
Term of patent 14 years
U.S. Cl. D24—111



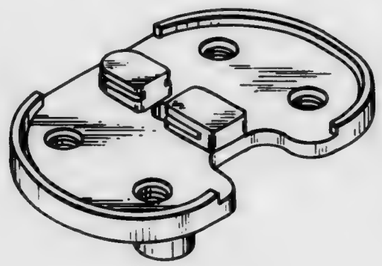
326,154
INTRA-VASCULAR CATHETER ASSEMBLY
Hiromi Deguchi, Fujinomiya, and Masashi Yoshikawa, Tokyo, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 27, 1989, Ser. No. 457,546
Claims priority, application Japan, Jul. 4, 1989, 1-24497
Term of patent 14 years
U.S. Cl. D24—112



326,155
MEDICAL FLUID CONNECTOR FITTING
John R. Boehringer, Wynnewood, and John Karpowicz, Glenmoore, both of Pa., assignors to Boehringer Laboratories, Norristown, Pa.
Filed Dec. 20, 1989, Ser. No. 453,482
Term of patent 14 years
U.S. Cl. D24—129



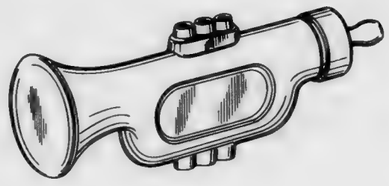
326,156
KNEE JOINT FOR PROSTHETIC SYSTEM
David M. Martinez, Camarillo, Calif., assignor to Techmedica, Inc., Carmarillo, Calif.
Filed Oct. 11, 1988, Ser. No. 255,425
Term of patent 14 years
U.S. Cl. D24—155



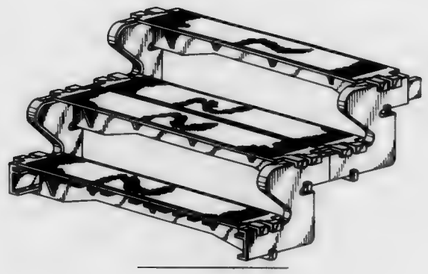
326,157
CHIN IMPLANT
Stephen X. Giunta, 4600 King St., Alexandria, Va. 22302
Filed Apr. 5, 1989, Ser. No. 333,697
Term of patent 14 years
U.S. Cl. D24—155



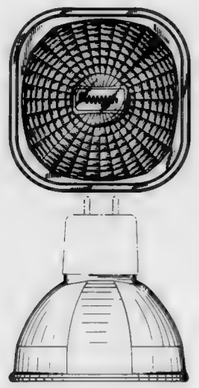
326,158
BABY BOTTLE
Martha L. Katz, and Richard M. Katz, both of 4323 Randolph Ter., San Diego, Calif. 92103
Filed Mar. 20, 1990, Ser. No. 495,942
Term of patent 14 years
U.S. Cl. D24—198



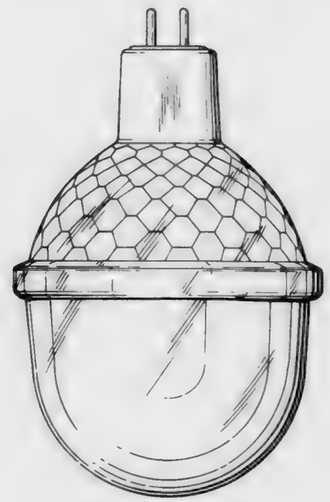
326,159
STAIR STEP FOR A PLATFORM
Jon H. Eickhoff, Kalamazoo, Mich., assignor to Ronningen Research & Development Company, Vicksburg, Mich.
Filed Dec. 6, 1989, Ser. No. 446,916
Term of patent 14 years
U.S. Cl. D25—69



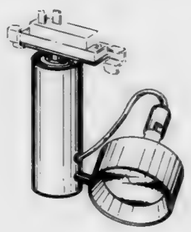
326,160
REFLECTOR LAMP
Albert J. Vrancart, East Brunswick, and Dennis M. Priscandaro, Forked River, both of N.J., assignors to North American Philips Corporation, New York, N.Y.
Filed Dec. 28, 1989, Ser. No. 459,106
Term of patent 14 years
U.S. Cl. D26—2



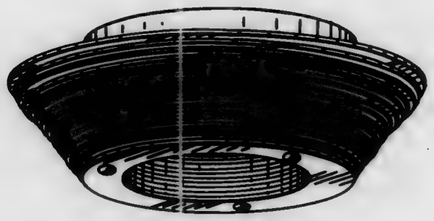
326,161
LAMP
Roger A. Hume, 2 Dorset Drive, Melton Mowbray Leicestershire, LE13 OJN; Richard A. Felstead, 44 Main Street, Burrough on the Hill, Melton Mowbray, Leicestershire, LE14 2JQ, and Luciano Zucchi, 47 Rudall Cresent, London NW3 1RR, all of England
Filed Oct. 31, 1990, Ser. No. 607,075
Claims priority, application United Kingdom, May 1, 1990, D2006500
Term of patent 14 years
U.S. Cl. D26—2



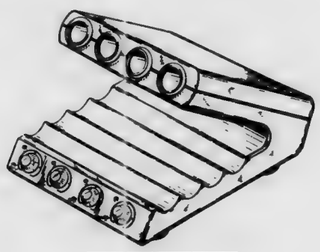
326,162
LIGHT FIXTURE
Edison A. Price, New York, N.Y., assignor to Edison Price Incorporated, New York, N.Y.
Filed Mar. 20, 1990, Ser. No. 496,499
Term of patent 14 years
U.S. Cl. D26—63



326,163
TRIM FOR RECESSED LIGHTING FIXTURE OR THE LIKE
Robert A. Sonneman, New York, N.Y., assignor to Sonneman Design Group Inc., Long Island City, N.Y.
Filed Sep. 6, 1989, Ser. No. 403,729
Term of patent 14 years
U.S. Cl. D26—152



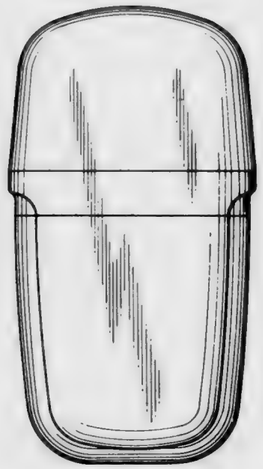
326,164
CURLING IRON HEATER
Herbert A. Taylor, 8392-0 Roswell Rd., Dunwoody, Ga. 30350
Filed Sep. 11, 1990, Ser. No. 580,516
Term of patent 14 years
U.S. Cl. D28—38



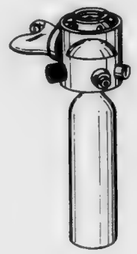
326,165
NAIL NIPPERS
Ottomar Leihe, Solingen, Fed. Rep. of Germany, assignor to The W.E. Bassett Company, Shelton, Conn.
Filed Jan. 26, 1990, Ser. No. 470,542
Term of patent 14 years
U.S. Cl. D28—60



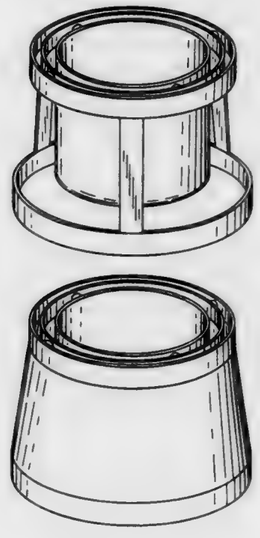
326,166
ELECTRIC SHAVER
Takako Yanagida, Matsudo; Yoshio Mizobata, Chiba, and Katsunori Someya, Yokohama, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Jun. 19, 1990, Ser. No. 540,565
Claims priority, application Japan, Dec. 22, 1989, 1-47144
Term of patent 14 years
U.S. Cl. D28—49



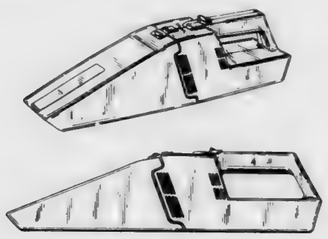
326,167
EMERGENCY BREATHING UNIT
Larry H. Williamson, Huntington Beach, Calif., assignor to Submersible Systems, Inc., Huntington Beach, Calif.
Division of Ser. No. 343,515, Apr. 25, 1989, Pat. No. D. 321,956.
This application Aug. 19, 1991, Ser. No. 747,096
Term of patent 14 years
U.S. Cl. D29—7



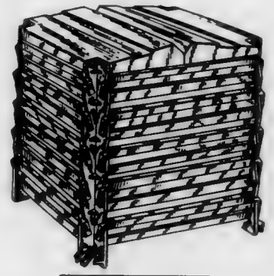
326,168
GIMBALED PET BOWL
Billy J. Smith, 8666 Hwy. 20, Toledo, Oreg. 97391
Filed Oct. 16, 1990, Ser. No. 598,333
Term of patent 14 years
U.S. Cl. D30—129



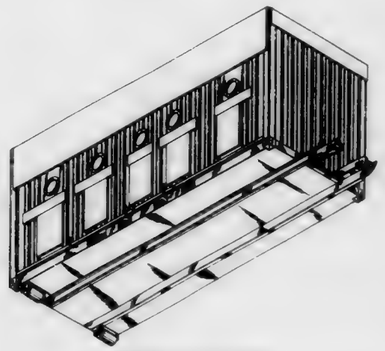
326,169
VACUUM CLEANER
Franz A. Stützer, Offenbach am Main, and Eduard Rohner, Hammelburg, both of Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Fed. Rep. of Germany
Filed Nov. 15, 1990, Ser. No. 614,735
Claims priority, application Fed. Rep. of Germany, May 18, 1990, 9003459
Term of patent 14 years
U.S. Cl. D32—18



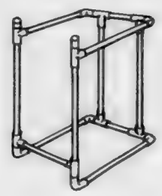
326,170
COMPOST BIN
Sal G. De Yoreo, Andover, Mass.; David H. Masury, Kittery Point, and Thomas H. Stevens, Cape Neddick, both of Me., assignors to Armatron International, Inc., Melrose, Mass.
Filed Oct. 31, 1990, Ser. No. 606,341
Term of patent 14 years
U.S. Cl. D34—1



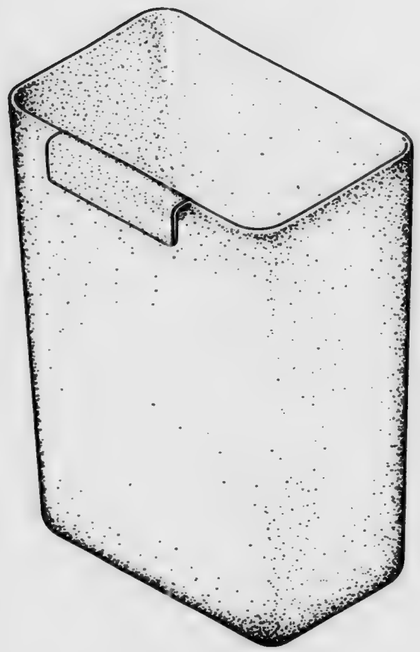
326,171
RECYCLABLE MATERIAL RECEIVING CONTAINER
Bruce Brenner, and R. Wayne Bernardo, both of Roanoke, Va., assignors to Cycle Systems, Inc., Roanoke, Va.
Filed Feb. 24, 1990, Ser. No. 514,329
Term of patent 14 years
U.S. Cl. D34—3



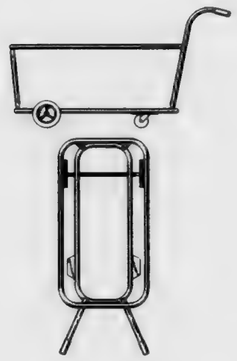
326,172
COMBINED BAG HOLDER AND BAGS THEREFOR
Zelita Biesele; Ron Packhan, and Kurt Schminke, 927 Brassway, all of Encinias, Calif. 92024
Filed Oct. 22, 1990, Ser. No. 601,057
Term of patent 14 years
U.S. Cl. D34—5



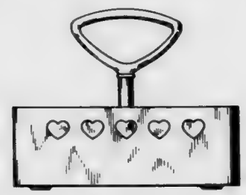
326,173
WASTE RECEPTACLE
Dixon Newbold, 56 Winchester Dr., Glocester, R.I. 02857
Filed Sep. 27. 1990, Ser. No. 588,972
Term of patent 14 years
U.S. Cl. D34—6



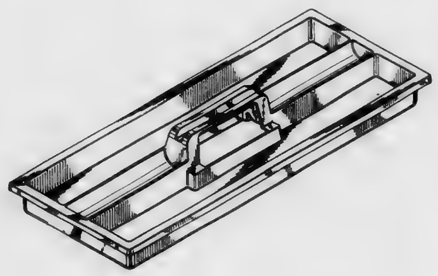
326,174
TRASH CONTAINER CART
Kenneth A. McDonald, Rte. 3, Box 145-A, Gainesville, Tex. 76240
Filed Jul. 24, 1989, Ser. No. 383,987
Term of patent 14 years
U.S. Cl. D34—17



326,175
BABY BOTTLE CARRIER
Paul T. Homan, 7311 E. 89th Place S., Tulsa, Okla. 74133
Filed Dec. 18, 1989, Ser. No. 466,833
Term of patent 14 years
U.S. Cl. D34—44



326,176
TOOL CARRYING TRAY
Keith Brightbill, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Mar. 13, 1990, Ser. No. 492,566
Term of patent 14 years
U.S. Cl. D34—45



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TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF MAY, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Henricson, Kaj; and Pikka, Olavi, 5,112,444, Cl. 162-55.000.

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Gombos, John M.; and Leashno, Moshe, 5,111,931, Cl. 206-83.500.

Abadia, Auguste. Retractable ladder apparatus. 5,111,906, Cl. 182-19.000.

Abatjoglou, Anthony G.; and Bryant, David R., to Union Carbide Chemicals & Plastics Technology Corporation. Ionic phosphites used in homogeneous transition metal catalyzed processes. 5,113,022, Cl. 568-454.000.

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Douglas, John, 5,113,070, Cl. 250-227.210.

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Bertaud, Francois X.; Grabenkort, Richard W.; Magrane, Beverly A.; and Vurek, Gerald G., 5,112,309, Cl. 604-171.000.
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Celebuski, Joseph E., 5,113,005, Cl. 556-449.000.
Grabenkort, Richard W., 5,111,836, Cl. 137-68.100.

Abe, Hayao: *See*—
Nagai, Yoshitaka; Abe, Hayao; and Arita, Masanobu, 5,112,810, Cl. 514-15.000.

Abe, Takao: *See*—
Mano, Shigeru; Maehashi, Tatsuichi; Koshizuka, Kunihiro; and Abe, Takao, 5,113,201, Cl. 346-76.0PH.

Abe, Tomiya: *See*—
Eguchi, Shuji; Taketani, Noriaki; Tanno, Seikichi; Okabe, Yoshiaki; Terao, Hiromu; Asano, Hideki; Wajima, Motoyo; and Abe, Tomiya, 5,113,477, Cl. 385-143.000.

Abraham, George: *See*—
Hron, Robert J., Sr.; Abraham, George; Kuk, Myong S.; and Fisher, Gordon S., 5,112,637, Cl. 426-629.000.

Abramowsky, Heinz; Muller, Helmut; and Roth, Roland, to Carl-Zeiss-Stiftung. Protective arrangement for a longitudinally extendible machine component. 5,111,591, Cl. 33-503.000.

Abrams, Paul G.; Srinivasan, Ananthachari; and Vrudhula, Vivekananda M., to NeoRx Corporation. Method of enhancing the effect of cytotoxic agents. 5,112,954, Cl. 530-391.900.

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Chen, Hang-Chang B.; and Achee, Gerald F., 5,113,028, Cl. 570-255.000.

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Adachi, Hideki: *See*—
Umaba, Takayuki; Ono, Jiro; Takagi, Syunsuke; Sawada, Makoto; Adachi, Hideki; Shimizu, Hirofumi; Hashimoto, Mokuhei; and Takahashi, Tetsu, 5,111,743, Cl. 101-127.000.

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Addington, Larry C.; Addington, Robert R.; Addington, Larry M.; Lynch, Albert E.; Susla, John; Conley, David L.; Sartaine, John J.; and Price, David E., 5,112,111, Cl. 299-18.000.

Adell, Robert. Rear motor vehicle alerting bright light dimming signal and control system. 5,113,175, Cl. 340-468.000.

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Scott-Jackson, Dennis; and Skibbe, Harry, 5,113,179, Cl. 340-709.000.

Advanced Micro Devices, Inc.: *See*—
Lee, Douglas J., 5,113,373, Cl. 365-227.000.
Teymouri, Sassan, 5,113,098, Cl. 307-520.000.

Advanced Products Inc.: *See*—
Frentzel, Richard L.; and Chen, Andrew, 5,112,687, Cl. 428-402.000.

Advantest Corporation: *See*—
Furukawa, Yasuo, 5,113,139, Cl. 324-623.000.

Advent Tool and Manufacturing, Inc.: *See*—
Hartford, James T.; and Freeska, Laszlo, 5,112,162, Cl. 407-49.000.

Aehnelt, Peter; and Enderle, Eckhard, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Probe head of the switching type. 5,111,592, Cl. 33-561.000.

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Andre, Joel R., 5,111,652, Cl. 51-424.000.

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Ahlers, Juergen: *See*—
Buchert, Hermann; Ahlers, Juergen; Kohlhaas, Werner; Vogelsang, Joerg; and Neitzel, Manfred, 5,112,901, Cl. 524-494.000.

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Orsino, Francesco; and Wang, Chung-Tao D., 5,113,363, Cl. 364-736.000.

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Vaccaro, Robert K., 5,112,293, Cl. 600-22.000.

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Allen, Peter W., 5,111,594, Cl. 34-1.00X.

Airfoil Textron Inc.: *See*—
Spain, Raymond G.; and DeGrood, Susan M., 5,112,545, Cl. 264-103.000.

Aisin Seiki K.K.: *See*—
Yasuda, Tomio; and Murakami, Yuichi, 5,113,178, Cl. 340-709.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Hoshihara, Naoaki, 5,112,005, Cl. 242-107.000.

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Itoh, Hiroyuki; Kono, Yoshitsugu; Kikuchi, Isao; Takenaka, Shinji; and Ajioka, Masanobu, 5,112,593, Cl. 423-502.000

Akademiet For De Tekniske Videnskaber, Svejsecentralen: *See*—
Lund, Svend A.; and Nielsen, Bent E., 5,111,696, Cl. 73-627.000.

Akagi, Motonobu: *See*—
Oka, Koichi; Otani, William; Kubo, Yasuhiro; Zasu, Yasushi; and Akagi, Motonobu, 5,113,083, Cl. 250-574.000.

Akahane, Fujio: *See*—
Miyazawa, Yoshinori; Omae, Hidenori; Ishii, Takayuki; Koto, Haruhiko; and Akahane, Fujio, 5,113,204, Cl. 346-140.00R.

Akahori, Kingo; Harada, Naoki; Kayane, Yutaka; and Omura, Takashi, to Sumitomo Chemical Company, Limited. Anthraquinone dye compounds having fibers reactive group. 5,112,971, Cl. 544-189.000.

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Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washimi, Takeshi; Harada, Naoki; and Akahori, Kingo, 5,112,959, Cl. 534-642.000.

Akai, Hiroshi: *See*—
Sakai, Shuzo; Akai, Hiroshi; and Miyake, Toshio, 5,112,407, Cl. 127-58.000.

Akamatsu, Teruaki: *See*—
Oshima, Saburo; Nakazeki, Tsugito; Akamatsu, Teruaki; and Niki, Motoharu, 5,112,202, Cl. 417-423.700.

Akins, Edward A. Squeeze chute. 5,111,773, Cl. 119-99.000.
Akiyama, Toshiyuki; Mimura, Itaru; Ozawa, Naoki; Takahashi, Kenji; Eto, Yoshizumi; and Matsumoto, Takahiro, to Hitachi, Ltd. Solid state image pickup apparatus for correcting discrepancy of registration. 5,113,247, Cl. 358-51.000.
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AKZO NV: *See*—
Feith, Bernhard, 5,112,904, Cl. 525-59.000.
Albertini, Richard J., to University of Vermont. Detection of lymphocyte amplification. 5,112,735, Cl. 435-6.000.
Albonesi, David H.; Langendorf, Brian K.; Chang, John; Faase, John G.; and Homberg, Michael J., to Prime Computer, Inc. System bus for multiprocessor computer system. 5,113,514, Cl. 395-425.000.
Alcan International Limited: *See*—
Jin, Iljoon; Kenny, Lorne D.; and Sang, Harry, 5,112,697, Cl. 428-613.000.
Jozefowicz, Mark A.; and Rosenfeld, Aron M., 5,112,449, Cl. 205-175.000.
Alcatel Fibres Optiques: *See*—
Hakoun, Roland; and Tanguy, Eric, 5,113,460, Cl. 385-39.000.
Alcatel N.V.: *See*—
Fox, Ronald C. S., 5,113,434, Cl. 379-413.000.
Wittmann, Manfred; and Gunther, Robert, 5,113,035, Cl. 65-11.100.
Alcatel Thomson Faisceaux Hertziens: *See*—
Le Calvez, Michel; and Peruyero, Michel, 5,113,368, Cl. 395-250.000.
Alchermes, Stephen L.; and Lombardo, Mark A. Surgical instrument for facilitating accurate osteotomy cuts in bone and method for utilizing same. 5,112,334, Cl. 606-87.000.
Alcon Surgical, Inc.: *See*—
Ureche, Alexander, 5,112,300, Cl. 604-22.000.
Aldus, Anita L.: *See*—
Aldus, Richard E.; and Aldus, Anita L., 5,112,069, Cl. 280-42.000.
Aldus, Richard E.; and Aldus, Anita L. Travel-air chair. 5,112,069, Cl. 280-42.000.
Alexander, Clyde W.: *See*—
Rashbrook, Robert B.; Alexander, Clyde W.; and Bland, Edward C., 5,112,685, Cl. 428-364.000.
Alexander, William, to American Colloid Company. Water barrier of water-swellable clay sandwiched between interconnected layers of flexible fabric. 5,112,665, Cl. 428-102.000.
Alfred Teves GmbH: *See*—
Klein, Hans-Christof, 5,111,659, Cl. 60-413.000.
Thiel, Rudolf; Klimt, Ulrich; and Halasy-Wimmer, Georg, 5,111,914, Cl. 188-73.30.
Alkaitis, Saulius A.: *See*—
Pinsky, Naum; and Alkaitis, Saulius A., 5,112,706, Cl. 429-233.000.
Alkermes, Inc.: *See*—
Malfroy-Camine, Bernard, 5,112,596, Cl. 424-2.000.
All-State Legal Supply Co.: *See*—
Morrone, Ross, 5,112,083, Cl. 281-47.000.
Allen-Bradley Company, Inc : *See*—
Howe, Joseph A., 5,113,317, Cl. 361-413.000.
Merrill, Richard A.; Crockett, Bruce L.; and Strader, Robert C., 5,113,502, Cl. 395-375.000.
Allen, David J.: *See*—
McQueen, Malcolm M.; and Allen, David J., 5,111,692, Cl. 73-295.000.
Allen, Melvin L. Game call holder. 5,111,981, Cl. 224-202.000.
Allen, Peter W., to Airdri Limited. Hand drier having a plurality of transmitters and at least one receiver located in the vicinity of the outlet. 5,111,594, Cl. 34-1.00X.
Allen, Terry W., to Eastman Kodak Company. Liquid aspirating pipette and dispensing system. 5,111,703, Cl. 73-864.110.
Allen, Terry W.; and Pioch, James J., to Eastman Kodak Company. Apparatus for feeding pipette tips. 5,111,965, Cl. 221-281.000.
Allergan, Inc.: *See*—
Garst, Michael E.; and Syage, Elizabeth T., 5,112,853, Cl. 514-443.000.
Gluchowski, Charles, 5,112,822, Cl. 514-249.000.
Allied Colloids Limited: *See*—
Jones, Graham, 5,112,500, Cl. 210-728.000.
Allied-Signal Inc.: *See*—
Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Fuchs, Gerhard H., 5,111,629, Cl. 52-171.000.
Brownell, Peter, 5,112,369, Cl. 55-97.000.
Cohen, Ricard L., 5,113,177, Cl. 340-705.000.
Cote, Edmond H.; and Prendergast, Matthew B., 5,112,476, Cl. 210-85.000.
Gualtieri, Devlin M.; and Morris, Robert C., 5,113,472, Cl. 385-130.000.
Li, H. L.; and Prevorsek, D. C., 5,112,667, Cl. 428-113.000.
Muggeridge, David; Ryan, William F.; and Haase, Dieter, 5,111,553, Cl. 244-3.220.
Allman, Peter N.; and Riley, Keith J., to ASG (Accessories) Limited. Vehicle lamp guards. 5,113,323, Cl. 362-80.000.
Allsopp, Mary F.: *See*—
Chan, Wai-Kwong; Allsopp, Mary F.; McGuire, Kevin T.; Nonnemann, Robert W.; Obrecht, Gordon A.; Saluski, Ronald B.; Trchka, James A.; Viebach, Hans J.; Brandt, Peter A.; Butler, Robert R.; Shircliff, Michael W.; Walker, Samuel A.; and Miller, Thomas R., 5,112,179, Cl. 412-1.000.
Alps Electric Co., Ltd.: *See*—
Sato, Hiroyuki; and Yauchi, Hitoshi, 5,113,205, Cl. 346-140.00R.
Tsutsumi, Jyoji, 5,113,047, Cl. 200-407.000.
Altilio, Michael T.: *See*—
Blucher, Steven L.; and Altilio, Michael T., 5,111,728, Cl. 84-726.000.
Altmann, Rainer; Lauer, Rainer; Schmidt, Guenther; Stromski, Kasimir; van Zanten, Anton; Hellmann, Harald; Veil, Karl; Fees, Hans-Joerg; Jonner, Wolf-Dieter; and Gutzeit, Reinhard, to Robert Bosch GmbH. Vehicle brake system with anti-skid apparatus. 5,112,117, Cl. 303-116.00R.
Alusuisse-Lonza Services Ltd.: *See*—
Plata, Miroslaw; and Theler, Jean-Jaques, 5,112,412, Cl. 148-688.000.
Aluweld S.A.: *See*—
Reimann, Jean, 5,111,899, Cl. 180-65.100.
Alvarez de Toledo, Fernando, to Boston Scientific Corporation. Steerable highly elongated guidewire. 5,111,829, Cl. 128-772.000.
Alza Corporation: *See*—
Magruder, Judy A.; Eckenhoff, James B.; and Wright, Jeremy C., 5,112,614, Cl. 424-422.000.
Amada, Eiichi: *See*—
Takiyasu, Yoshihiro; Yamaga, Mitsuhiro; Nakamura, Kazunori; Amada, Eiichi; Jusa, Hidehiko; Kobayashi, Naoya; Takada, Osamu; Hirayama, Satoru; and Iiyama, Tatsuhito, 5,113,392, Cl. 370-85.150.
Ambrosi, Jacques; and Odet, Philippe, to Astra Plastique. Stoppering device with rotating cap. 5,111,949, Cl. 215-313.000.
Ambrosius, Hubertus P. M. M.: *See*—
Opschoor, Jan; and Ambrosius, Hubertus P. M. M., 5,113,405, Cl. 372-46.000.
Ambrus, Gabor; Maderspach, Andrea; Jekkel, Antalne; Javor, Andras; Ilkoy, Eva; Hajos, Gyorgy; Szporny, Laszlo; Nagy, Jozsef; Horvath, Gyula; and Moravcsik, Imre, to Richer Gedeon Vegyeszet. 9α-hydroxy-3-oxo-4,24(25)-stigmastadien-26-oic acid derivatives, a process for preparing same and pharmaceutical compositions containing same. 5,112,815, Cl. 514-178.000.
Ameiss, Michael S.: *See*—
Metzler, Michael E.; Ameiss, Michael S.; and Baum, James P., 5,112,019, Cl. 248-405.000.
Amemiya, Izumi: *See*—
Yamamoto, Takuji; Hamano, Hiroshi; Amemiya, Izumi; Arai, Yasunari; and Ihara, Takeshi, 5,113,151, Cl. 330-308.000.
Amemiya, Naomi; Yamagishi, Koji; Matsumoto, Kunio; and Masaki, Naoki, to Pioneer Electronic Corporation. Information reproducing system and method. 5,113,383, Cl. 369-33.000.
American Biomed, Inc.: *See*—
Hwang, Ned H. C.; and Summers, David P., 5,112,292, Cl. 600-16.000.
Summers, David P.; and Nixon, Jeddy D., 5,112,349, Cl. 623-3.000.
American Colloid Company: *See*—
Alexander, William, 5,112,665, Cl. 428-102.000.
American Crystal Sugar Company: *See*—
Cagley, Paul M.; Kysilka, James O.; and McGillivray, Terry D., 5,112,638, Cl. 426-640.000.
American Cyanamid Company: *See*—
Coy, David H.; and Murphy, William A., 5,112,808, Cl. 514-12.000.
Ramsay, Michael V. J.; Bell, Richard; Howes, Peter D.; Tiley, Edward P.; and Sutherland, Derek R., 5,112,854, Cl. 514-450.000.
American Home Products Corporation: *See*—
Commons, Thomas J.; Mewshaw, Richard E.; and Strike, Donald P., 5,112,859, Cl. 514-484.000.
American Medical Systems, Inc.: *See*—
Burton, John H.; Berg, Eric P.; Staehle, Bradford G.; and Scott, Frank B., 5,112,306, Cl. 604-101.000.
American Tel-A-System, Inc.: *See*—
Morley, John F., Jr.; and Anderson, Kent D., 5,113,429, Cl. 379-88.000.
Amhil Enterprises Ltd.: *See*—
Van Melle, Hubert, 5,111,961, Cl. 220-712.000.
Ammermann, Eberhard: *See*—
Wenderoth, Bernd; Sauter, Hubert; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,112,862, Cl. 514-522.000.
Wingert, Horst; Sauter, Hubert; Brand, Siegbert; Wenderoth, Bernd; Lorenz, Gisela; and Ammermann, Eberhard, 5,112,860, Cl. 514-513.000.
Zipperer, Bernhard; Sauter, Hubert; Ammermann, Eberhard; and Lorenz, Gisela, 5,112,828, Cl. 514-277.000.
Amoco Corporation: *See*—
Belmonte, Frank G.; Fjare, Kristi A.; and Partenheimer, Walter, 5,112,992, Cl. 549-245.000.
Kobylinski, Thaddeus P., 5,112,527, Cl. 252-373.000.
Kruse, Larry W., 5,112,576, Cl. 422-144.000.
Palmer, David A.; Larson, Keith D.; and Fjare, Kristi A., 5,113,015, Cl. 562-608.000.
AMP Incorporated: *See*—
Henry, Randall R.; and Sneed, Michael R., 5,112,249, Cl. 439-581.000.
Rudy, William J., Jr.; and Shaffer, Howard R., 5,112,247, Cl. 439-571.000.
Amphenol Corporation: *See*—
Harris, Paul, 5,112,252, Cl. 439-610.000.
Swift, Peter R., 5,112,253, Cl. 439-620.000.
Amsler, Heinrich. Apparatus for mounting a casting pipe to an outlet of a metallurgical vessel. 5,111,980, Cl. 222-600.000.
Amsted Industries Incorporated: *See*—
Zigler, Herbert L.; Wronkiewicz, Robert D.; McKeown, Franklin, Jr.; and Wachter, William A., 5,111,753, Cl. 105-230.000.

Amtrol Inc.: *See*—
Jozwiak, Terry H.; and Hunley, Eugene C., Jr., 5,111,879, Cl. 166-82.000.
Anacomp, Inc.: *See*—
Mayfield, James M., 5,113,219, Cl. 355-91.000.
Analog Devices, Inc.: *See*—
Harston, Stephen W.; and Leonard, Judson S., 5,113,362, Cl. 364-723.000.
Andersen, Borge C., to Nutridan Engineering A/S. Method for providing a cut around the anus of an animal, which is suspended from its back feet, to free the rectum from the carcass, and apparatus for performing said method. 5,112,272, Cl. 452-122.000.
Andersen, Carl W., to Steelcase Inc. Method for making a frameless acoustic cover panel. 5,111,579, Cl. 29-897.320.
Anderson, Anders; and Kjelgaard, Tom, to Tetra Pak Holdings SA. Method of infrared heating a restricted area on a continuous thermoplastic laminated web. 5,113,479, Cl. 392-417.000.
Anderson, Charles E.: *See*—
Wuest, Isabelle; Anderson, Charles E.; and Tabare, Jacques, 5,112,675, Cl. 428-216.000.
Anderson, Dirk N.; McKee, William R.; and Chung, Gishi. High angle implant around top of trench to reduce gated diode leakage. 5,112,762, Cl. 437-35.000.
Anderson, John D., to Enviro-Klean Soils, Inc. Apparatus for cleaning contaminated soil. 5,111,756, Cl. 110-240.000.
Anderson, Kent D.: *See*—
Morley, John F., Jr.; and Anderson, Kent D., 5,113,429, Cl. 379-88.000.
Anderson, Richard E.: *See*—
Wike, Charles K., Jr.; Anderson, Richard E.; and McGaha, Jerry A., 5,113,060, Cl. 235-383.000.
Anderson, Richard L., to Phillips Petroleum Company. Removal of linear internal olefins from steam active dehydrogenation recycle stream. 5,113,023, Cl. 568-697.000.
Anderson, Roger W.; and Neff, Wayne A., to Martin Marietta Energy Systems, Inc. Recovery process for electroless plating baths. 5,112,392, Cl. 106-1.220.
Anderton, Kenneth: *See*—
Vivienne, Anthony; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Crowley, Patrick J.; and Anderton, Kenneth, 5,112,386, Cl. 71-94.000.
Ando, Nobuo: *See*—
Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.
Andoh, Akira, to Mitsubishi Denki Kabushiki Kaisha. Linear-modulation type radio transmitter. 5,113,525, Cl. 455-127.000.
Andre, Joel R., to Aerospatiale Societe Nationale Industrielle. Cutting jet receptacle for a fluid jet cutting machine. 5,111,652, Cl. 51-424.000.
Andreoli, Romeo R.: *See*—
Cirera, Xavier D.; Andreoli, Romeo R.; Lloveras, Pedro P.; Bruseghini, Leonida; and Irurre, Jose P., 5,112,826, Cl. 514-255.000.
Andrusch, Franz; Beerhalter, Siegfried; Mueller, Wolfgang F.; and Zykoff, Felix B., to International Business Machines Corp. Punch apparatus with positive slug removal. 5,111,723, Cl. 83-24.000.
Angeion Corporation: *See*—
Barlow, Edward A.; and Brucker, Gregory G., 5,112,304, Cl. 604-96.000.
Angione, Robert A.: *See*—
Soprano, Toby L.; Scolavino, Benjamin J.; Caro, Albert N.; and Angione, Robert A., 5,111,938, Cl. 206-386.000.
Ankney, Richard C.; Bonica, Ronald P.; Kay, Douglas E.; Pashayan, Patricia A.; and Spitzer, Roy L., to Sprint International Communications Corp. Telecommunication access management system for a packet switching network. 5,113,499, Cl. 395-325.000.
Ansaldo S.p.A.: *See*—
Cinotti, Luciano, 5,112,569, Cl. 376-282.000.
Anspach, William E., III. Surgical instrument for removing artificial acetabular cups. 5,112,338, Cl. 606-99.000.
Antkowiak, Joseph H., to Hottinger Baldwin Measurements, Inc. Torsion ring transducer. 5,111,702, Cl. 73-862.650.
Antonini, Michael. Method for automatic coffee brewing. 5,112,629, Cl. 426-231.000.
Aoe, Seiichiro; Oda, Taishi; Nakaoka, Masanori; and Kurosawa, Seiji, to Snow Brand Milk Products Co., Ltd. Water-soluble hemicellulose. 5,112,964, Cl. 536-56.000.
Aoki, Shinobu: *See*—
Yamamoto, Yoshihiro; Takaki, Usaji; Aoki, Shinobu; and Hara, Isao, 5,112,987, Cl. 548-457.000.
Aoki, Yuichi: *See*—
Shimizu, Tomoyasu; Aoki, Yuichi; and Kawakita, Shinya, 5,113,302, Cl. 360-135.000.
Aotsu, Hiroaki: *See*—
Ogura, Toshihiko; Aotsu, Hiroaki; Kimura, Koichi; Enomoto, Hiromichi; and Kyoda, Tadashi, 5,113,487, Cl. 395-100.000.
Aoyama, Teruyuki: *See*—
Ichiyanagi, Yoshio; and Aoyama, Teruyuki, 5,113,251, Cl. 358-75.000.
Apcom, Inc.: *See*—
Murphy, Robert A.; Syler, Rodney R.; and Slattery, William H., 5,113,480, Cl. 392-501.000.
Appel, James J.: *See*—
Loce, Robert P.; and Appel, James J., 5,113,202, Cl. 346-108.000.
Applied bioTechnology, Inc.: *See*—
Carney, Walter P., 5,112,737, Cl. 435-7.920.
Applied Materials, Inc.: *See*—
Marks, Jeffrey; Law, Kam S.; Wang, David N.; and Mayden, Dan, 5,112,776, Cl. 437-228.000.
Wang, David N.; Cheng, Mei; and Leong, Toung K., deceased, 5,112,435, Cl. 156-643.000.
Applied Power Inc.: *See*—
Miller, Douglas P.; Arters, Edward H.; and Morgenson, Ronald J., 5,111,840, Cl. 137-270.000.
Aquafine Corporation: *See*—
Iannicelli, Joseph, 5,112,796, Cl. 502-402.000.
Aragane, Hideyuki: *See*—
Fujishige, Shoei; Numajiri, Rikio; and Aragane, Hideyuki, 5,112,965, Cl. 536-114.000.
Aragon, Steven B.; and Heller, James W. Hypodermic needle recapping device. 5,112,314, Cl. 604-192.000.
Arai, Masatoshi: *See*—
Inoue, Yoshio; Arai, Masatoshi; and Fujiki, Hironao, 5,112,885, Cl. 523-213.000.
Arai, Yasunari: *See*—
Yamamoto, Takuji; Hamano, Hiroshi; Amemiya, Izumi; Arai, Yasunari; and Ihara, Takeshi, 5,113,151, Cl. 330-308.000.
Arai, Yoichiro: *See*—
Honda, Shinkichi; Arai, Yoichiro; and Toida, Hiroshi, 5,112,613, Cl. 424-400.000.
Arakaki, Takeshi: *See*—
Seki, Masaki; Takegahara, Takashi; and Arakaki, Takeshi, 5,113,338, Cl. 364-191.000.
Arakawa, Shinichiro: *See*—
Kajiwara, Kenichi; Mori, Kikuichi; Ikeda, Hideo; and Arakawa, Shinichiro, 5,112,190, Cl. 415-215.100.
Araki, Kazuhiro: *See*—
Kotani, Akio; Araki, Kazuhiro; and Kawaguchi, Toshikazu, 5,113,221, Cl. 355-208.000.
Araki, Kouji: *See*—
Yanagida, Satoru; Araki, Kouji; Okunoyama, Hikaru; and Niimi, Tetsunori, 5,113,241, Cl. 357-72.000.
Aratani, Shin-ichi, to Central Glass Company, Limited. Method of toughening glass sheet by quenching. 5,112,377, Cl. 65-114.000.
Archibald, James B.: *See*—
Shih, True T.; Shah, Manoj R.; and Archibald, James B., 5,113,114, Cl. 310-270.000.
Ardco, Inc.: *See*—
Kaspar, Melvin; Kostos, Jeffrey; Rolek, Matthew; and Artwohl, Paul, 5,111,618, Cl. 49-501.000.
Argouarc'h, Jean R., to Compagnie Generale d'Electricite. Variable configuration intervention vehicle for rough ground. 5,111,898, Cl. 180-9.520.
Arixi, Yumi; and Takezawa, Katsuhito, to Canon Kabushiki Kaisha. Apparatus for processing character and image data. 5,113,492, Cl. 395-147.000.
Arima, Masaki: *See*—
Obata, Masao; Arima, Masaki; and Taniguchi, Kouki, 5,112,262, Cl. 445-24.000.
Arimoto, Akira: *See*—
Horan, Paul; and Arimoto, Akira, 5,113,485, Cl. 395-25.000.
Arita, Masanobu: *See*—
Nagai, Yoshitaka; Abe, Hayao; and Arita, Masanobu, 5,112,810, Cl. 514-15.000.
Armstrong World Industries, Inc.: *See*—
Diamond, Ivan; Lawson, James J.; Lewicki, Walter J., Jr.; and Stavrinou, Stavros C., 5,112,671, Cl. 428-156.000.
Arnold, Emil; Merchant, Steven L.; and Shackle, Peter W., to North American Philips Corporation. Integrated circuit device particularly adapted for high voltage applications. 5,113,236, Cl. 357-41.000.
Arnold, Francoise: *See*—
Stevens, Howard; Chariot, Maryvonne; Arnold, Francoise; and Lewis, Gareth, 5,112,621, Cl. 424-497.000.
Arroyo, Candido J.; and Gotthardt, Manfred R., to AT&T Bell Laboratories. Modular cable. 5,113,036, Cl. 385-100.000.
Arters, Edward H.: *See*—
Miller, Douglas P.; Arters, Edward H.; and Morgenson, Ronald J., 5,111,840, Cl. 137-270.000.
Artwohl, Paul: *See*—
Kaspar, Melvin; Kostos, Jeffrey; Rolek, Matthew; and Artwohl, Paul, 5,111,618, Cl. 49-501.000.
Aruga, Keiji: *See*—
Imamura, Takahiro; Mizoshita, Yoshifumi; and Aruga, Keiji, 5,112,147, Cl. 384-605.000.
Arvedson, Marsha M.: *See*—
German, Paul M.; and Arvedson, Marsha M., 5,112,674, Cl. 428-216.000.
Asada, Takafumi; Morimoto, Masato; and Sonoda, Takashi, to Matsushita Electric Industrial Co., Ltd. Disk driving apparatus. 5,112,141, Cl. 384-100.000.
Asahi Denka Kogyo Kabushiki Kaisha: *See*—
Haruna, Tohru; Takahashi, Masayuki; and Yukino, Toshinori, 5,112,891, Cl. 524-101.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Monma, Yoshio; and Yamaguchi, Hiroyuki, 5,113,228, Cl. 355-315.000.
Morisawa, Tahei, 5,113,261, Cl. 358-225.000.
Asama Chemical Co., Ltd.: *See*—
Tanaka, Hideo; Matsumura, Masatoshi; Harada, Satoru; and Yajima, Mizuo, 5,112,750, Cl. 435-177.000.

VOL
1138
ISS
2
MY
12
1992
UMI

Asano, Hideki: *See—*
Eguchi, Shuji; Taketani, Noriaki; Tanno, Seikichi; Okabe, Yoshiaki; Terao, Hiromu; Asano, Hideki; Wajima, Motoyo; and Abe, Tomiya, 5,113,477, Cl. 385-143.000.

Asberg, Bengt A.: *See—*
Hedlund, Jan-Gunnar; and Asberg, Bengt A., 5,112,165, Cl. 407-118.000.

Asbjornsen, Svein; and Lade, Jan, to Svein Asbjornsen & Jan Lade A/S. Arrangement in connection with an adjustable back rest cushion of a chair. 5,112,106, Cl. 297-284.00F.

Asea Brown Boveri Ltd.: *See—*
Nicolin, Curt; Frutschi, Hans-Ulrich; and Bolis, Giacomo, 5,111,662, Cl. 60-655.000.

ASG (Accessories) Limited: *See—*
Allman, Peter N.; and Riley, Keith J., 5,113,323, Cl. 362-80.000.

Aslam, Muhammad: *See—*
Baxter, Carlton D.; and Aslam, Muhammad, 5,112,717, Cl. 430-124.000.

Asmo Co., Ltd.: *See—*
Atsumi, Masaaki; and Uchiyama, Haruhiko, 5,113,107, Cl. 310-256.000.

Astra Plastique: *See—*
Ambrosi, Jacques; and Odet, Philippe, 5,111,949, Cl. 215-313.000.

AT&T Bell Laboratories: *See—*
Acarlar, Muvaffak S.; Manzione, Louis T.; Robinson, Steven D.; and Stefanik, Dennis, 5,113,466, Cl. 385-88.000.
Adriaenssens, Luc W.; Fresen, Harold W.; Nutt, Wendell G.; and Parks, Kenneth B., 5,113,159, Cl. 333-12.000.
Arroyo, Candido J.; and Gotthardt, Manfred R., 5,113,036, Cl. 385-100.000.
Blonder, Greg E.; and Boie, Robert A., 5,113,041, Cl. 178-18.000.
Cizin, Miguel, 5,112,238, Cl. 439-188.000.
Gaebe, Carl F.; and Yeh, Xian-Li, 5,113,404, Cl. 372-36.000.
Horn, David N., 5,113,431, Cl. 379-94.000.
Morrison, Rick L., 5,113,286, Cl. 359-569.000.

Atari Corporation: *See—*
Nelson, Craig; Solis, Javier; and Needle, David L., 5,113,511, Cl. 395-425.000.

ATD Corporation: *See—*
Sheridan, William M.; and Ragland, Raymond E., 5,111,577, Cl. 29-890.039.

Athar, Ali. Fluid dispensing container. 5,111,979, Cl. 222-568.000.

Atkins, Martin P.; Jones, William; and Chibwe, Malama, to British Petroleum Company p.l.c., The. Process for the preparation of catalysts. 5,112,784, Cl. 502-80.000.

Atlantic Richfield Company: *See—*
Johnson, Peter C., 5,113,077, Cl. 367-20.000.
Reiter, John T.; Ellis, David M.; Smith, Rick D.; and Leach, Roger D., 5,111,908, Cl. 182-2.000.

Atlas Copco Construction & Mining Technique: *See—*
Wagner, Edwin R.; and Forsyth, Allen P., 5,112,113, Cl. 303-71.000.

Atlas Roofing Corporation: *See—*
Gay, William M.; Blanpied, Robert H.; Bush, Philip W.; Donald, Richard L.; Williams, James L.; and Williams, James H., 5,112,678, Cl. 428-268.000.

Atochem: *See—*
Brun, Claude; Cheux, Auguste; and Barthel, Eric, 5,112,785, Cl. 502-108.000.
Strassel, Albert; and Duperray, Gilbert, 5,112,692, Cl. 428-421.000.

Atsugi Unisia Corporation: *See—*
Otaki, Mizuo; and Hamao, Miyoko, 5,112,199, Cl. 417-310.000.

Atsumi, Masaaki; and Uchiyama, Haruhiko, to Asmo Co., Ltd. Rotary actuator. 5,113,107, Cl. 310-256.000.

Audaire, Luc; and Pantigny, Philippe, to Commissariat a l'Energie Atomique. Reduced size accurate solid-state camera having low power consumption. 5,113,263, Cl. 358-213.110.

Audi AG: *See—*
Hannibal, Wilhelm, 5,111,780, Cl. 123-90.170.
Leitermann, Wulf, 5,111,900, Cl. 180-69.400.

Auergesellschaft GmbH: *See—*
Hunnebeck, Volker, 5,111,536, Cl. 2-428.000.

Ausidet S.r.l.: *See—*
Colombo, Paolo; Troglia, Claudio; Verzellino, Santina R.; and Muratori, Giuseppe, 5,112,905, Cl. 525-60.000.

Austin, Kevin L.: *See—*
Richardson, Charles T., Jr.; and Austin, Kevin L., 5,113,430, Cl. 379-88.000.

Austin, Peter W., to Imperial Chemical Industries PLC. Anti-microbial bromo-nitro compounds. 5,112,871, Cl. 514-727.000.

Austria Metall Aktiengesellschaft: *See—*
Haiml, Gottfried; and Langgartner, Johann, 5,111,572, Cl. 29-469.500.

Automobiles Citroen: *See—*
Richard, Denis, 5,112,089, Cl. 285-321.000.

Automobiles Peugeot: *See—*
Richard, Denis, 5,112,089, Cl. 285-321.000.

Avitan, Isaac: *See—*
Kellogg, David L.; Simmons, James M., Jr.; Bachman, Michael S.; and Avitan, Isaac, 5,113,344, Cl. 364-424.040.

Avstar Aerospace Corporation: *See—*
Gamble, Bruce B.; and Snowdon, Douglas A., 5,111,809, Cl. 128-204.180.

Axel, Leon; and Dougherty, Lawrence, to University of Pennsylvania, The Trustees of the. System and method for magnetic resonance imaging of 3-dimensional heart wall motion with spatial modulation of magnetization. 5,111,820, Cl. 128-653.00A.

Aziende Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A.: *See—*
Baiocchi, Leandro; and Silvestrini, Bruno, 5,112,986, Cl. 548-372.000.

Azuma, Daisuke: *See—*
Komatsu, Koji; Yoshida, Shinichi; Miyata, Souichi; and Azuma, Daisuke, 5,113,339, Cl. 395-200.000.

B. F. Goodrich Company, The: *See—*
Magistro, Angelo J., 5,112,793, Cl. 502-303.000.
Sharaby, Zaev, 5,112,522, Cl. 252-182.300.
Weisend, Norbert A., Jr.; Trares, Bernard F.; and Leffel, Kevin L., 5,112,011, Cl. 244-134.00A.

Baba, Masanori: *See—*
Miyasaka, Tadashi; Tanaka, Hiromichi; De Clercq, Erik D. A.; Baba, Masanori; Walker, Richard T.; and Ubasawa, Masaru, 5,112,835, Cl. 544-302.000.

Baba, Tatsuya; and Ogata, Norio, to Taiko Pharmaceutical Co., Ltd. Antispasmodic agent. 5,112,872, Cl. 514-731.000.

Baba, Yuko, to Hashimoto Forming Industry Co., Ltd. Center hub cap for vehicle wheels. 5,112,112, Cl. 301-108.00A.

Babu, Gaddam N.; Christopher, Susan S.; Copley, Bruce C.; and Overstreet, Thomas S., to Minnesota Mining and Manufacturing Company. Radiation curable polyolefin pressure sensitive adhesive. 5,112,882, Cl. 522-158.000.

Babulova, Anna: *See—*
Benes, Ludek; NosaLova, Viera; and Babulova, Anna, 5,112,850, Cl. 514-428.000.

Bachhuber, Anthony A.; and Verhoff, Donald H., to Oshkosh Truck Company. All wheel steering system. 5,111,901, Cl. 180-140.000.

Bachl, Robert: *See—*
Saive, Roland; Funk, Guido; and Bachl, Robert, 5,112,928, Cl. 526-128.000.

Bachman, Michael S.: *See—*
Kellogg, David L.; Simmons, James M., Jr.; Bachman, Michael S.; and Avitan, Isaac, 5,113,344, Cl. 364-424.040.

Backstrom, Reijo; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka I.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo, to Orion-yhtyma Oy. Method of treating Parkinson's Disease using pentanedione derivatives. 5,112,861, Cl. 514-520.000.

Bader, Herbert I.: *See—*
Lemon, J. Robert; Evans, William T.; Christian, Robert E.; and Bader, Herbert I., 5,112,226, Cl. 433-72.000.

Baiocchi, Leandro; and Silvestrini, Bruno, to Aziende Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A. 1-benzyl-3-hydroxymethylindazole compounds and derivatives. 5,112,986, Cl. 548-372.000.

Baker, Daniel C., to Shell Oil Company. Process for purification of synthesis gas. 5,112,586, Cl. 423-220.000.

Baker Hughes Incorporated: *See—*
Johnson, Bruce R., 5,112,504, Cl. 210-792.000.
Porcari, Vincenzo; and Riva, Gianluigi, 5,111,896, Cl. 177-16.000.

Baker, Paul J., to Quaker Oats Company, The. Water sprinkler. 5,111,993, Cl. 239-211.000.

Baker, Peter D., to Smiths Industries Public Limited Company. Fibre-optic cable assemblies. 5,113,468, Cl. 385-100.000.

Baker, Peter D., to Smiths Industries Public Limited Co. Fibre-optic entry to an enclosure. 5,113,475, Cl. 385-138.000.

Baker, Robert L.; Billingsley, Larry D.; and Stegemoeller, Calvin L., to Halliburton Company. Non-metallic acid hatch. 5,111,955, Cl. 220-303.000.

Bako, Laszlo; and Klein, Helmut, to S. Franzen Sohne (GmbH & Co.). Rollable suitcase. 5,111,918, Cl. 190-18.00A.

Balch, Richard A., to General Electric Company. Testing operation of electric energy meter optics system. 5,113,130, Cl. 324-74.000.

Baldwin, John J.; Selnick, Harold G.; Ponticello, Gerald S.; Remy, David C.; Claremon, David A.; and Elliott, Jason M., to Merck & Co., Inc. Benzofuran compounds as class III antiarrhythmic agents. 5,112,824, Cl. 514-253.000.

Ball, Garry L.; Johnson, Russell I.; and Radke, Daniel D., to Ford New Holland, Inc. Method of manufacturing a backhoe boom. 5,111,578, Cl. 29-891.000.

Ball, John: *See—*
Menendez, Juan G.; Caterisano, William P.; and Ball, John, 5,113,494, Cl. 395-163.000.

Ball, Russell M.; and Madaras, John J. Nuclear reactor multi-state digital control using digital topology. 5,112,565, Cl. 376-216.000.

Ballard, James G.; and Wisner, Craig A., to Hein-Werner Corporation. Free floating tower assembly for a work place. 5,111,680, Cl. 72-447.000.

Balow, Thomas: *See—*
Meyer, Herbert; Giday, Zoltan; and Balow, Thomas, 5,113,307, Cl. 361-154.000.

Bamberg, Alfred: *See—*
Gruber, Ernst; and Bamberg, Alfred, 5,112,086, Cl. 285-86.000.

Bamford, Charles R.: *See—*
Cheng, J. Joseph; Snow, Richard R.; Evans, Geoffrey; Bamford, Charles R.; and Milnes, Harold B., 5,112,778, Cl. 501-31.000.

Ban, Tomohiro: *See—*
Hirata, Keiichi; Ban, Tomohiro; Kawasumi, Atsuko; Nakagawa, Kazuko; Mizutani, Yukimi; and Tsuruki, Satoru, 5,113,520, Cl. 395-650.000.

Ban, Yutaka, to Canon Kabushiki Kaisha. Powder developer container with a sealing member having specific hardness, compressive set, friction coefficient and compression. 5,111,976, Cl. 222-485.000.

Bando Chemical Industries, Ltd.: *See—*
Miyata, Hirofumi; and Furukawa, Yutaka, 5,112,283, Cl. 475-211.000.

Bando, Takahiro; and Tomimatsu, Noriyuki, to Mitsubishi Kenki Kabushiki Kaisha. Horizontal deflector apparatus. 5,113,122, Cl. 315-371.000.

Banholzer, Karlheinz; Gerst, Peter; and Jung, Peter, to Endress u. Hauser GmbH u. Co. Differential pressure measuring apparatus. 5,111,698, Cl. 73-708.000.

Banks, Christopher P.; and Irving, Edward, to Ciba-Geigy Corporation. Method for making metallic patterns. 5,112,440, Cl. 156-659.100.

Banks, George: *See—*
Suzuki, Arata; Suzuki, Marcia; Tyberg, William T.; and Banks, George, 5,111,818, Cl. 128-644.000.

Banks, Rodney H.: *See—*
Wetegrove, Robert L.; and Banks, Rodney H., 5,112,132, Cl. 356-381.000.

Banner, Verdell M.: *See—*
Beard, John; Banner, Verdell M.; Khan, Mushahid; and Leonard, Norman J., 5,112,296, Cl. 602-28.000.

Banyu Pharmaceutical Co., Ltd.: *See—*
Nakagawa, Susumu; Yamada, Koji; and Ushijima, Ryosuke, 5,112,818, Cl. 514-210.000.

Baralle, Denis L., to Societe Europeenne de Propulsion. Tank having a shell capillary effect. 5,111,856, Cl. 141-230.000.

Baraniak, Robert, to PPM. Multiple stage hydraulic jack for use with telescopic jib. 5,111,733, Cl. 91-167.00R.

Baranowski, John F.: *See—*
Veverka, Edward F.; Goedde, Gary L.; Baranowski, John F.; and Kershaw, Stanley S., Jr., 5,113,306, Cl. 361-127.000.

Barath, Peter; and Denes, Ferenc, to Cedars-Sinai Medical Center. Catheter device for intramural delivery of therapeutic agents. 5,112,305, Cl. 604-96.000.

Barbecue Innovations Incorporated: *See—*
Barker, James; and Maller, Vern, 5,111,803, Cl. 126-41.00R.

Barber-Colman Company: *See—*
Reber, Eric J., 5,113,358, Cl. 364-563.000.

Barcza, William K., to United Technologies Corporation. Variable throat convergent/divergent nozzle. 5,111,992, Cl. 239-127.300.

Bargar, Thomas M.: *See—*
McCarthy, James R.; Bargar, Thomas M.; Barney, Charlotte L.; Matthews, Donald P.; and Broersma, Robert J., 5,112,852, Cl. 514-443.000.

Barke, Oscar A.: *See—*
Ahmad, Mohammad R.; and Barke, Oscar A., 5,112,611, Cl. 424-195.100.

Barker, James; and Maller, Vern, to Barbecue Innovations Incorporated. Flare reduction buffer for gas barbecues. 5,111,803, Cl. 126-41.00R.

Barker, Martin C.; Brown, James P.; Cunningham, Anthony; and Randall, David, to Imperial Chemical Industries PLC. Polyisocyanate composition. 5,112,877, Cl. 521-110.000.

Barlow, Edward A.; and Brucker, Gregory G., to Angeion Corporation. Balloon catheter. 5,112,304, Cl. 604-96.000.

Barnes, Wayne M. Geltrans, a device for transfer of gel to paper. 5,112,461, Cl. 204-182.800.

Barnetche-Gonzalez, Eduardo. Multiple stage drag and dynamic turbine downhole motor. 5,112,188, Cl. 415-198.100.

Barnett, Paul: *See—*
Jackson, Robert J.; Duke, Susan A.; and Barnett, Paul, 5,112,600, Cl. 424-55.000.

Barney, Charlotte L.: *See—*
McCarthy, James R.; Bargar, Thomas M.; Barney, Charlotte L.; Matthews, Donald P.; and Broersma, Robert J., 5,112,852, Cl. 514-443.000.

Barnhill, William R. Golf ball including sound emitting means. 5,112,055, Cl. 273-213.000.

Baron, Bruce M.: *See—*
Harrison, Boyd L.; and Baron, Bruce M., 5,112,821, Cl. 514-233.800.

Barrier, William A.: *See—*
Huang, Victor T.; Barrier, William A.; Leake, Luther H.; and Wittinger, Sharon G., 5,112,626, Cl. 426-43.000.

Bartha, John; and Csapo, Gyorgy. Method of cleaning up petroleum oil spills. 5,112,495, Cl. 210-691.000.

Barthalow, Henry D.: *See—*
Hull, William E.; and Barthalow, Henry D., 5,111,945, Cl. 212-168.000.

Barthel, Eric: *See—*
Brun, Claude; Cheux, Auguste; and Barthel, Eric, 5,112,785, Cl. 502-108.000.

Barton, Jacqueline K., to Columbia University in the City of New York, The Trustees of. Mixed ligand complexes and uses thereof as binding agents to DNA. 5,112,974, Cl. 546-4.000.

BASF Aktiengesellschaft: *See—*
Baur, Richard; Gousetis, Charalampos; Birnbach, Stefan; Kneip, Michael; and Oftring, Alfred, 5,112,530, Cl. 252-548.000.
Baus, Ulf; and Reuther, Wolfgang, 5,112,985, Cl. 548-337.000.
Buchert, Hermann; Ahlers, Juergen; Kohlhaas, Werner; Vogelsang, Joerg; and Neitzel, Manfred, 5,112,901, Cl. 524-494.000.
Hahn, Erwin; Hansen, Guenter; Lamm, Gunther; Reichelt, Helmut; and Wagenblast, Gerhard, 5,112,362, Cl. 8-639.000.
Huemmer, Wolfgang; Dobler, Walter; and Littmann, Dieter, 5,112,723, Cl. 430-287.000.
Kurtz, Karl-Rudolf; Koch, Horst; and Schulz, Guenther, 5,112,725, Cl. 430-306.000.
Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuekenhoehner, Thomas; Kuenast, Christoph; and Hofmeister, Peter, 5,112,823, Cl. 514-252.000.
Mueller, Herbert, 5,112,943, Cl. 528-483.000.
Rath, Hans P.; Mach, Helmut; Oppenlaender, Knut; Schoenleben, Willibald; and Vogel, Hans-Henning, 5,112,364, Cl. 44-418.000.
Rueb, Lothar; Eicken, Karl; Plath, Peter; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,112,383, Cl. 71-92.000.
Saive, Roland; Funk, Guido; and Bachl, Robert, 5,112,928, Cl. 526-128.000.
Schwaben, Hans-Dieter; Schlichtmann, Rainer; Kindler, Hubert; Klaerner, Peter; and Mittnacht, Hans, 5,112,921, Cl. 525-316.000.
Wenderoth, Bernd; Sauter, Hubert; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,112,862, Cl. 514-522.000.
Wingert, Horst; Sauter, Hubert; Brand, Siegbert; Wenderoth, Bernd; Lorenz, Gisela; and Ammermann, Eberhard, 5,112,860, Cl. 514-513.000.
Zipperer, Bernhard; Sauter, Hubert; Ammermann, Eberhard; and Lorenz, Gisela, 5,112,828, Cl. 514-277.000.

BASF Corporation: *See—*
Welch, Michael C.; Lisa, Rudolph E.; and Wilson, Joe C., 5,113,001, Cl. 556-428.000.
Zimmermann, Eugene K.; Wagner, Bernhard; Volz, William E.; Harclerode, William H.; Wiman, John V.; and Voss, John C., 5,112,875, Cl. 521-60.000.

Basile, Carlo: *See—*
Tsinberg, Mikhail; Basile, Carlo; and Cavallerano, Alan P., 5,113,242, Cl. 358-12.000.

Bass, Robert G.: *See—*
Jensen, Brian J.; Hergenrother, Paul M.; and Bass, Robert G., 5,112,923, Cl. 525-420.000.

Bates, Brian L.: *See—*
Olsen, Douglas O.; Bates, Brian L.; and Osborne, Thomas A., 5,112,308, Cl. 604-164.000.

Bath, Colin, to Imperial Chemical Industries PLC. Composition of carboxylic acid and sulphur-containing acids or salts suitable for incorporation into olefin polymers. 5,112,894, Cl. 524-173.000.

Batsch, Ortwin: *See—*
Dirks, Friedrich; Batsch, Ortwin; Hempelmann, Wilhelm; and Leibold, Hans, 5,112,585, Cl. 423-210.000.

Battelle Memorial Institute: *See—*
Dawson, William J.; and Swartz, Scott L., 5,112,433, Cl. 156-623.00R.

Bauer, Steven X. S.: *See—*
Wood, Richard M.; and Bauer, Steven X. S., 5,112,120, Cl. 244-35.00R.

Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Fuchs, Gerhard H., to Allied-Signal Inc. Dual-pane thermal window with liquid crystal shade. 5,111,629, Cl. 52-171.000.

Baum, Heinz O.; and Reindl, Johann, to Emhart Inc. Metal weld stud and plastic clip. 5,111,557, Cl. 24-662.000.

Baum, James P.: *See—*
Metzler, Michael E.; Ameiss, Michael S.; and Baum, James P., 5,112,019, Cl. 248-405.000.

Baumann, Hanne M.: *See—*
Mejdell, Glor T.; Baumann, Hanne M.; and Tveten, Kjell W., 5,112,584, Cl. 423-161.000.

Baumann, Marcus: *See—*
Fischer, Walter; Baumann, Marcus; Finter, Jurgen; Kvita, Vratislav; Mayer, Carl W.; and Wernet, Wolfgang, 5,112,977, Cl. 546-195.000.

Baumgarten, Robert W.; and Robertson, John M., to United Technologies Corporation. Forge joining repair technique. 5,111,570, Cl. 29-402.130.

Baumgarth, Manfred: *See—*
Gericke, Rolf; Baumgarth, Manfred; Lues, Ingeborg; Bergmann, Rolf; and De Peyer, Jacques, 5,112,839, Cl. 514-337.000
Gericke, Rolf; Baumgarth, Manfred; Lues, Ingeborg; Bergmann, Rolf; and Peyer, De, 5,112,972, Cl. 544-230.000.

Baumgartner, Mark F.; Tolbert, William R.; and Shanahan, John, to Centocor, Incorporated. Mass transfer membrane for oxygenation of animal cell reactors. 5,112,760, Cl. 435-240.242.

Baur, Richard; Gousetis, Charalampos; Birnbach, Stefan; Kneip, Michael; and Oftring, Alfred, to BASF Aktiengesellschaft. Use of 2-hydroxy-3-aminopropionic acid derivatives as complexing agents, bleach stabilizers and builders in detergent compositions. 5,112,530, Cl. 252-548.000.

Baus, Ulf; and Reuther, Wolfgang, to BASF Aktiengesellschaft. Preparation of 1-hydroxyimidazole. 5,112,985, Cl. 548-337.000.

Baxi, Indra R., to Nitrojection Corporation. Process of injection molding with pressurized gas assist. 5,112,563, Cl. 264-572.000.

Baxter, Carlton D.; and Aslam, Muhammad, to Eastman Kodak Company. Method and apparatus for treating toner image bearing receiving sheets. 5,112,717, Cl. 430-124.000.

Baxter International Inc.: *See—*
Prince, Paul R.; Miller, William; and Benjamin, Grant S., 5,112,298, Cl. 604-6.000.

Bayer AG: *See—*
Piejko, Karl-Erwin; Lindner, Christian; Ostarek, Ralph; Braese, Hans-Eberhard; and Ott, Karl-Heinz, 5,112,910, Cl. 525-84.000.

Bayer Aktiengesellschaft: *See—*
Horlacher, Peter; Hahnsen, Heinrich; Grigo, Ulrich; Bushong, William C.; and Schlak, Ottfried, 5,112,925, Cl. 525-474.000.
Schlak, Ottfried; and Wecker, Dieter, 5,112,874, Cl. 521-51.000.

Bayerische Motoren Werke AG: *See—*
Steinberg, Peter; and Kinninger, Peter, 5,111,777, Cl. 123-41.540.

Beard, John; Banner, Verdell M.; Khan, Mushahid; and Leonard, Norman J., to Board of Supervisors of Louisiana State University, The. Biofeedback activated orthosis for foot-drop rehabilitation. 5,112,296, Cl. 602-28.000.

Beard, Marian H.; Caro, Perry A.; Hsiao, Jennifer B.; Mackey, Kevin J.; Sandman, James G., Jr.; Steinbach, Gary R.; and Woods, Donald R., to Xerox Corporation. Concurrent display of data from two different processors each having different display font and user interface for controlling transfer of converted font data therebetween. 5,113,517, Cl. 364-200.000.

Beard, William Q., Jr.: *See—*
Mainz, Eric L.; Beard, William Q., Jr.; Hirschmann, Robert P.; Little, Barry M.; and Smith, Earl B., 5,113,027, Cl. 570-224.000.

Beaudreault, James J.; and Gallant, James O., to S.W. Industries, Inc. Compensating roll assembly for flexible web material. 5,111,565, Cl. 29-116.200.

Beaurline, Joseph M.; Berge, Stephen M.; and Schultz, Robert K., to Riker Laboratories, Inc. Oral suspension formulation. 5,112,604, Cl. 424-490.000.

Beck, Robert L.: *See—*
Nienhuis, James H.; Clark, Jeffrey L.; De Pree, Michael L.; and Beck, Robert L., 5,112,240, Cl. 439-215.000.

Becker, Wilfried: *See—*
Pahnke, Klaus-Dieter; and Becker, Wilfried, 5,112,008, Cl. 244-3.240.

Becker, Willard C.: *See—*
Senger, Phillip L.; and Becker, Willard C., 5,111,799, Cl. 128-738.000.

Becquerel, Michel, to Valeo Thermique Habitacle. Air blower unit for a motor vehicle heating and ventilating system. 5,111,738, Cl. 454-159.000.

Beecham Group p.l.c.: *See—*
Jackson, Robert J.; Duke, Susan A.; and Barnett, Paul, 5,112,600, Cl. 424-55.000.

Beer, Johann, to Grammer AG. Process and apparatus for the production of a component comprising a support element and foam portions on respective sides thereof. 5,112,542, Cl. 264-46.700.

Beerhalter, Siegfried: *See—*
Andrusch, Franz; Beerhalter, Siegfried; Mueller, Wolfgang F.; and Zykoff, Felix B., 5,111,723, Cl. 83-24.000.

Begley, Brendan J.; and Cheruvu, Subrahmanyam, to Mobil Oil Corporation. Particle movement system with control of dust. 5,111,854, Cl. 141-65.000.

Behr, Marion R.: *See—*
Behr, Omri M.; and Behr, Marion R., 5,112,453, Cl. 204-129.200.

Behr, Omri M.; and Behr, Marion R. Method and apparatus for producing etched plates for graphic printing. 5,112,453, Cl. 204-129.200.

Behrens, Rudolf A.; Winter, Roland A. E.; Mar, Andrew; Schirmann, Peter J.; Seltzer, Raymond and Malherbe, Roger F., to Ciba-Geigy Corporation. Stabilization of acid catalyzed thermoset resins. 5,112,890, Cl. 524-95.000.

Beidler, Daniel E.; and Jue, Rodney A., to Hybritech Incorporated. Separation of anti-metal chelate antibodies. 5,112,951, Cl. 530-387.300.

Bekker-Madsen, Per, to Dennison Systems Denmark. Method and device for dispensing of labels. 5,112,427, Cl. 156-259.000.

Belenky, Garry: *See—*
Epshetsky, Yefim; Belenky, Garry; and Khlevner, Boris, 5,111,543, Cl. 5-424.000.

Bell Communications Research, Inc.: *See—*
Patel, Jayantilal S.; and Wullert, John R., II, 5,113,275, Cl. 359-86.000.

Bell, James A. E.: *See—*
Eerkes, Thijs; Bell, James A. E.; and Diaz, Carlos M., 5,112,572, Cl. 419-30.000.

Bell, Richard: *See—*
Ramsay, Michael V. J.; Bell, Richard; Howes, Peter D.; Tiley, Edward P.; and Sutherland, Derek R., 5,112,854, Cl. 514-450.000.

Belliotti, Thomas R.; Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; Kramer, James B.; and Sircar, Jagadish C., to Warner-Lambert Company. N-hydroxyamide, N-hydroxythioamide, hydroxyurea, and N-hydroxythiourea derivatives of selected nsaids as antiinflammatory agents. 5,112,846, Cl. 514-415.000.

Belmonte, Frank G.; Fjare, Kristi A.; and Partenheimer, Walter, to Amoco Corporation. Production of polycarboxylic acids with hafnium-activated cobalt catalyst. 5,112,992, Cl. 549-245.000.

Beloit Corporation: *See—*
Brown, Dale A.; and Roerig, Arnold J., 5,111,563, Cl. 29-116.200.
Johnson, Noel R., 5,111,735, Cl. 91-433.000.

Beltec International: *See—*
Liebermann, Benno E., 5,112,635, Cl. 426-518.000.

Bemurat, Marc. Pacemaker lead with auxiliary stimulation pole. 5,111,830, Cl. 128-786.000

Benes, Ludek; NosaLova, Viera; and Babulova, Anna, to Slovenska akademia vied. Drug for treatment of gastric and duodenal peptic ulcer disease. 5,112,850, Cl. 514-428.000.

Benjamin, Grant S.: *See—*
Prince, Paul R.; Miller, William; and Benjamin, Grant S., 5,112,298, Cl. 604-6.000.

Benkan Corporation: *See—*
Hanyu, Takaomi; and Tada, Kouki, 5,112,027, Cl. 251-331.000.

Benson, Clark K.; and Caridis, Andrew A., to Heat and Control, Inc. Automatic stirring of batch fried food products. 5,112,633, Cl. 426-438.000.

Beowulf Corporation: *See—*
Sargent, Michael P., 5,113,350, Cl. 364-478.000.

Berchtold, Lorenz: *See—*
Weigert, Martin; Berchtold, Lorenz; and Schittny, Stephan U., 5,112,468, Cl. 204-298.130.

Berg, Eric P.: *See—*
Burton, John H.; Berg, Eric P.; Staehle, Bradford G.; and Scott, Frank B., 5,112,306, Cl. 604-101.000.

Berg, Richard A.: *See—*
Scott, Randy W.; and Berg, Richard A., 5,112,608, Cl. 424-94.640.

Berge, Gary L.: *See—*
Hylak, Peter J.; and Berge, Gary L., 5,112,551, Cl. 264-219.000.

Berge, Stephen M.: *See—*
Beaurline, Joseph M.; Berge, Stephen M.; and Schultz, Robert K., 5,112,604, Cl. 424-490.000.

Berger, Henry: *See—*
Johnston, Michael D.; and Berger, Henry, 5,112,609, Cl. 424-94.640.

Bergmann, Gerhard: *See—*
Gille, Friedrich; Naumann, Rolf; and Bergmann, Gerhard, 5,111,672, Cl. 66-84.00A.

Bergmann, Rolf: *See—*
Gericke, Rolf; Baumgarth, Manfred; Lues, Ingeborg; Bergmann, Rolf; and De Peyer, Jacques, 5,112,839, Cl. 514-337.000.
Gericke, Rolf; Baumgarth, Manfred; Lues, Ingeborg; Bergmann, Rolf; and Peyer, De, 5,112,972, Cl. 544-230.000.

Bernard, Chaudanson, to Commissariat a l'Energie Atomique. High temperature heating device. 5,113,406, Cl. 372-56.000.

Bernardet, Henri; Godechot, Xavier L. M.; and Lejeune, Claude A., to U.S. Philips Corporation. Ion extraction and acceleration device for reducing the re-acceleration of secondary electrons in a high-flux neutron tube. 5,112,564, Cl. 376-116.000.

Bernardin, Didier. Display tray for aligned articles. 5,111,942, Cl. 211-59.300.

Bernheim, Michael: *See—*
Ludemann, Simpert; Bernheim, Michael; Sandner, Bernhard; Rossler, Erich; and Vogel, Hans-Burkhardt, 5,112,930, Cl. 528-28.000.

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Koenig, Albert, 5,112,703, Cl. 429-103.000.

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Carey, William S.; Chen, Fu; and Reichgott, David W., 5,112,413, Cl. 148-251.000.
Polizzotti, David M., 5,112,582, Cl. 423-27.000.

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Nusbaum, Howard G.; and Bevan, James A., 5,112,183, Cl. 414-544.000.

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Knepper, Udo; Lutz, Franz; and Beyer, Viktor, 5,113,191, Cl. 342-119.000.

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Kanaga, Bob C.; and Beyerle, Ronald R., 5,111,724, Cl. 83-58.000.

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Melchior, Bernd, 5,112,408, Cl. 136-251.000.

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Harper, Thomas A.; and Harper, Carol R., 5,113,354, Cl. 364-514.000.

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Mobashery, Shahriar, 5,112,751, Cl. 435-184.000.

Board of Regents, The University of Texas System: *See—*
Saunders, J. Palmer; and Kalmaz, Errol E., 5,112,827, Cl. 514-263.000.

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Beard, John; Banner, Verdell M.; Khan, Mushahid; and Leonard, Norman J., 5,112,296, Cl. 602-28.000.

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Zierenberg, Bernd; Herschel, Michael; and Rohr, Uwe, 5,112,842, Cl. 514-367.000.

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Chakravorty, Kishore K., 5,112,448, Cl. 205-118.000.
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Blonder, Greg E.; and Boie, Robert A., 5,113,041, Cl. 178-18.000.

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Stubbs, John L., Jr.; Bolick, Roger E., II; and Hauser, Everett F., Jr., 5,112,452, Cl. 204-92.000.

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Nicolin, Curt; Frutschi, Hans-Ulrich; and Bolis, Giacomo, 5,111,662, Cl. 60-655.000.

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Farbood, Mohamad I.; McLean, Lynda B.; Morris, James A.; and Bondarovich, Henry A., 5,112,803, Cl. 512-11.000.

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Frish, Michael B.; Morency, Joseph; Johnson, Stephen A.; and Boni, Arthur A., 5,112,215, Cl. 431-3.000.

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Ankney, Richard C.; Bonica, Ronald P.; Kay, Douglas E.; Pashayan, Patricia A.; and Spitzer, Roy L., 5,113,499, Cl. 395-325.000.

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Owen, David O.; and Bonin, Jacqueline J., 5,112,391, Cl. 75-772.000.

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Cameron, Charles; Mimoun, Hubert; Robine, Alain; Bonnaudet, Serge; Chaumette, Patrick; and Dang Vu, Quang, 5,113,032, Cl. 585-500.000.

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Smith, Kim R.; Borland, James E.; and Sauer, Joe D., 5,113,017, Cl. 564-2.000.

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Alvarez de Toledo, Fernando, 5,111,829, Cl. 128-772.000.

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Guguen-Guillouzo, Christiane; Guillouzo, Andre; and Bourel, Michel, 5,112,757, Cl. 435-240.200.

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D'Ettorre, Jean-Marie, 5,111,764, Cl. 114-259.000.

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Engel, James F.; and Boyer, Gerald E., 5,112,393, Cl. 106-2.000.

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Bozzini, Pieramedeo; and Marchisi, Giuseppe, to SGS-Thomson Microelectronics S.r.l. Leadframe with heat dissipator connected to S-shaped fingers. 5,113,240, Cl. 357-70.000.

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Buchwald, Hans; Brackmann, Andreas; and Raschkowski, Boleslaus, 5,112,517, Cl. 252-171.000.

Bradshaw, Keith, to Texas Instruments Incorporated. Lithographic method. 5,112,724, Cl. 430-296.000.

Braese, Hans-Eberhard: *See—*
Piejko, Karl-Erwin; Lindner, Christian; Ostarek, Ralph; Braese, Hans-Eberhard; and Ott, Karl-Heinz, 5,112,910, Cl. 525-84.000.

Braid, Thomas C. Apparatus for salvaging and removing marine oil spills. 5,112,497, Cl. 210-701.000.

Brand, Siegbert: *See—*
Wingert, Horst; Sauter Hubert; Brand, Siegbert; Wenderoth, Bernd; Lorenz, Gisela; and Ammermann, Eberhard, 5,112,860, Cl. 514-513.000.

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Brannan, James R.: *See—*
Gestaut, Lawrence J.; Brannan, James R.; Vaccaro, Anthony J.; and Groszek, Donald J., 5,112,447, Cl. 205-148.000.

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Convert, Guy; and Brasile, Jean-Pierre, 5,113,154, Cl. 331-79.000.

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Mason, Jeffrey T.; Mason, Bradley R.; and Howard, Mark E., 5,112,045, Cl. 482-9.000.

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Snyder, Richard E.; Moses, Fred; Burke, Bryan E.; and Kennedy, Dean A., 5,111,897, Cl. 177-132.000.

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Hall, James E., 5,112,929, Cl. 526-181.000.
Nakano, Minoru; Goto, Akihito; and Nakamura, Yoichi, 5,111,864, Cl. 152-527.000.
Tada, Shigeru; Nagano, Jun; and Fukamachi, Yoshihiro, 5,111,722, Cl. 83-23.000.

Bridgewater, Kevin E.: *See—*
Romesburg, Eric D.; Maze, Kenneth W.; Duffield, David J.; Deiss, Michael S.; Beyers, Billy W., Jr.; and Bridgewater, Kevin E., 5,113,259, Cl. 358-183.000.

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Skutnik, Bolesh J.; and Brielmann, Harry L., Jr., 5,112,658, Cl. 428-34.600.

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Caldwell, Karin D.; Chu, Tun-Jen; and Pitt, William G., 5,112,736, Cl. 435-6.000.

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Gloyer, Walter W.; and Bright, Frederick G., 5,112,315, Cl. 604-195.000.

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Atkins, Martin P.; Jones, William; and Chibwe, Malama, 5,112,784, Cl. 502-80.000.

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Cox, Simon A., 5,113,389, Cl. 370-32.100.

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Nakagawa, Yukihiro; and Brittingham, Alan L., 5,111,561, Cl. 29-4.550.

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Bolkan, Steven A.; Brodbeck, Kelly J.; Brodbeck, Kevin J.; Deleeuw, David L.; Steichen, Dale S.; Strand, Bruce B.; Suk, Richard J. V.; Szuch, Kathleen D.; and Zielske, Alfred G., 5,112,514, Cl. 252-99.000.

Brodbeck, Kevin J.: *See—*
Bolkan, Steven A.; Brodbeck, Kelly J.; Brodbeck, Kevin J.; Deleeuw, David L.; Steichen, Dale S.; Strand, Bruce B.; Suk, Richard J. V.; Szuch, Kathleen D.; and Zielske, Alfred G., 5,112,514, Cl. 252-99.000.

Broersma, Robert J.: *See—*
McCarthy, James R.; Bargar, Thomas M.; Barney, Charlotte L.; Matthews, Donald P.; and Broersma, Robert J., 5,112,852, Cl. 514-443.000.

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Freeman, Gary M.; and Broome, Thad T., 5,112,402, Cl. 106-416.000.

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Deguchi, Masaaki; and Mizuno, Shigeru, 5,113,200, Cl. 346-25.000.
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Nozaki, Yoshihisa; and Inden, Takashi, 5,111,750, Cl. 104-88.000.
Shibata, Eiji; and Ono, Mototsugu, 5,112,002, Cl. 242-57.000.

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Tilles, David J.; Wakamiya, Stanley K.; Krein, Bruce A.; Brown, Dale H.; Duggan, Sharon A.; and Schroeder, Mark S., 5,112,042, Cl. 271-297.000.

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Brown, James P.: *See—*
Barker, Martin C.; Brown, James P.; Cunningham, Anthony; and Randall, David, 5,112,877, Cl. 521-110.000.

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Bischel, Patrick O.; Brown, John K., III; Cole, Carl P.; and Fitch, Donald G., 5,113,488, Cl. 395-112.000.

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Doughty, Fred C., 5,112,107, Cl. 297-288.000.

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Schad, Robert D.; and Brown, Paul, 5,112,558, Cl. 264-297.200.

Brown, Steven A.; and Sennett, Paul, to Engelhard Corporation. Cationically processed calcined kaolin clay. 5,112,782, Cl. 501-144.000.

Brown, Steven G.: *See—*
Krevolin, Janet L.; and Brown, Steven G., 5,112,336, Cl. 606-96.000.

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Shaub, Harold; Brownawell, Darrell W.; and DiBenedetto, Arthur, 5,112,482, Cl. 210-209.000.

Browne, Leslie J.: *See—*
Bowman, Robert M.; Steele, Ronald E.; Browne, Leslie J.; Ewald, Bruce H.; and Diener, Robert, 5,112,845, Cl. 514-399.000.

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Brucker, Gregory G.: *See—*
Barlow, Edward A.; and Brucker, Gregory G., 5,112,304, Cl. 604-96.000.

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Corbett, William D.; and Sheaffer, Benjamin L., 5,111,869, Cl. 164-45.000.

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Bruseghini, Leonida: *See—*
Cirera, Xavier D.; Andreoli, Romeo R.; Lloveras, Pedro P.; Bruseghini, Leonida; and Irurre, Jose P., 5,112,826, Cl. 514-255.000.

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Bryan, Philip S.: *See—*
Lambert, Patrick M.; Bryan, Philip S.; Jarrold, Gregory S.; and Towers, Christine M., 5,112,700, Cl. 428-690.000.

Bryant, David R.: *See—*
Abatjoglou, Anthony G.; and Bryant, David R., 5,113,022, Cl. 568-454.000.

Bryant, Steven M., to Eastman Kodak Company. Web inspection system and method with exposure, detection and sampling means. 5,113,081, Cl. 250-571.000.

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Meli, Vincent A.; Matharani, Michael A.; Brzezinski, Ted A.; Shaft, David L.; and Urmanski, James L., 5,112,632, Cl. 426-392.000.

Buch, Holger M.; and Springer, Hartmut, to Hoechst Aktiengesellschaft. Water-soluble triphendioxazine compounds and precursors thereof containing sulfonyl groups, processes for their preparation and the use of the triphendioxazines as dyestuffs. 5,112,970, Cl. 544-75.000.

Buchanan, George: *See—*
Szczepanek, Andre; and Buchanan, George, 5,113,418, Cl. 375-118.000.

Buchanan, William J.; and Wasse, Siegfried A., to General Motors Corporation. Multi-tube heat exchanger with mechanically interlocked tubes formed from mechanically interlocked plates. 5,111,877, Cl. 165-153.000.

Buchberger, Anton H.; Tremoulet, Olivier L., Jr.; and Mordre, Sigurd C. Vented static seal assembly. 5,111,736, Cl. 92-168.000.

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Bucher-Guyer AG Maschinenfabrik: *See—*
Hartmann, Eduard, 5,112,489, Cl. 210-637.000.

Buchert, Hermann; Ahlers, Juergen; Kohlhaas, Werner; Vogelsang, Joerg; and Neitzel, Manfred, to BASF Aktiengesellschaft. Sealing elements and plain bearings formed from fiber-reinforced plastics. 5,112,901, Cl. 524-494.000.

Buchwald, Hans; Brackmann, Andreas; and Raschkowski, Boleslaus, to Kalie-Chemie AG. Cleaning compositions comprising dichlorotrifluoroethanes and alkanols. 5,112,517, Cl. 252-171.000.

Buckler, Robert T.; Dailey, Frank A.; Ficalora, John A.; Gavin, John J.; and Plunkett, Gregory A., to Miles Inc. Histamine derivatives, immunogen conjugates and antibodies raised thereto. 5,112,738, Cl. 435-7.930.

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Nickell, Eric S.; Buckley, Robert R.; Rumph, David E.; and Coleman, Robert M., 5,113,356, Cl. 395-108.000.

Buddenhagen, Douglas A.; Legge, Norman R.; and Zscheuschler, Gunter, to Tactyl Technologies, Inc. Elastomeric triblock copolymer compositions and articles made therewith. 5,112,900, Cl. 524-484.000.

Buff, Ernest D.: *See—*
Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Fuchs, Gerhard H., 5,111,629, Cl. 52-171.000.

Build-A-Mold Limited: *See—*
Pinsonneault, Alec, 5,112,207, Cl. 425-192.00R.

Bull, Charles L. Material holding apparatus with integrated finger mount. 5,112,227, Cl. 433-163.000.

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Cesar, Charles, 5,112,251, Cl. 439-607.000.

Bunn-O-Matic Corporation: *See—*
Knepler, John T., 5,111,969, Cl. 222-54.000.

Burch, Kenneth R.: *See—*
Mahabadi, John K.; and Burch, Kenneth R., 5,113,156, Cl. 331-109.000.

Burdea, Grigore C.; Dunn, Stanley M.; and Desjardins, Paul J., to University of Medicine & Dentistry of New Jersey; and Rutgers University. Apparatus for taking radiographs used in performing dental subtraction radiography with a sensorized dental mouthpiece and a robotic system. 5,113,424, Cl. 378-170.000.

Burka, Eric S., to Versa Tech Engineering. Spindle apparatus for holding a workpiece. 5,111,562, Cl. 29-37.00R.

Burke, Bryan E.: *See—*
Snyder, Richard E.; Moses, Fred; Burke, Bryan E.; and Kennedy, Dean A., 5,111,897, Cl. 177-132.000.

Burke, George E., Jr., to Square D Company. Photoelectrical sensor with multistaged, filtered amplifier circuit. 5,113,068, Cl. 250-214.00B.

Burney, Harry S., Jr.: *See—*
Tsou, Yu-Min; Hicks, Roy L.; and Burney, Harry S., Jr., 5,112,464, Cl. 204-265.000.

Burns, Gary T.; and Zank, Gregg A., to Dow Corning Corporation. High density silicon carbide sintered bodies from borosiloxanes. 5,112,779, Cl. 501-90.000.

Burris, Darryl L.: *See—*
Sundeen, Arthur R.; Burris, Darryl L.; Cook, Roger A.; and Lombardo, Dennis M., 5,111,902, Cl. 180-281.000.

Burroughs Wellcome Co.: *See—*
Johnston, Michael D.; and Berger, Henry, 5,112,609, Cl. 424-94.640.

Burrows, Kenneth D.; Hughes, Leslie R.; and Warner, Peter, to Imperial Chemical Industries PLC. Quinoline derivatives having anti-tumor activity. 5,112,837, Cl. 514-312.000.

Burton, John H.; Berg, Eric P.; Staehle, Bradford G.; and Scott, Frank B., to American Medical Systems, Inc. Method and apparatus for valving body fluids. 5,112,306, Cl. 604-101.000.

Busch, John; and Potter, William E., to Ford Motor Company. Tube coupling with combination retainer and disassembly tool. 5,112,085, Cl. 285-39.000.

Bush, Philip W.: *See—*
Gay, William M.; Blanpied, Robert H.; Bush, Philip W.; Donald, Richard L.; Williams, James L.; and Williams, James H., 5,112,678, Cl. 428-268.000.

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Horlacher, Peter; Hahnsen, Heinrich; Grigo, Ulrich; Bushong, William C.; and Schlak, Ottfried, 5,112,925, Cl. 525-474.000.

Butler, George W.: *See—*
Simon, Mark A.; and Butler, George W., 5,111,656, Cl. 60-203.100.

Butler, Robert R.: *See—*
Chan, Wai-Kwong; Allsopp, Mary F.; McGuire, Kevin T.; Nonnemann, Robert W.; Obrecht, Gordon A.; Saluski, Ronald B.; Trchka, James A.; Viebach, Hans J.; Brandt, Peter A.; Butler, Robert R.; Shircliff, Michael W.; Walker, Samuel A.; and Miller, Thomas R., 5,112,179, Cl. 412-1.000.

Butzin, Donald F.; Meeka, Edward W.; Tunnell, George W.; and Salvo, Edgar E., Jr., to General Electric Company. Device for dimensionally characterizing elongate components. 5,112,566, Cl. 376-245.000.

Buxton, Ian R.; Malkowska, Sandra T. A.; Prater, Derek A.; Singh, Deborah L.; Leslie, Stewart T.; and Miller, Ronald B., to Eurocelitique, S.A. Phenothrin shampoo. 5,112,515, Cl. 252-106.000.

BYK Gulden Lomberg Chemische Fabrik GmbH: *See—*
Senn-Bilfinger, Jorg, 5,112,834, Cl. 514-300.000.

C. Siempelkamp GmbH & Co.: *See—*
Gerhardt, Klaus; and Sitzler, Hans-Dietrich, 5,112,431, Cl. 156-583.500.

C-Tec, Inc.: *See—*
Munsey, R. Jack; and Rose, Todd N., 5,111,630, Cl. 52-508.000.

C. van der Lely N.V.: *See—*
van der Lely, Ary, 5,111,644, Cl. 56-13.600.

CableSoft, Inc.: *See—*
Blokker, Johan F., Jr.; and Randall, Eric B., 5,113,438, Cl. 380-6.000.

Caciagli, Valerio, to Sclavo S.p.A. Method for alkylating guanidino groups. 5,112,996, Cl. 552-104.000.

Cagley, Paul M.; Kysilka, James O.; and McGillivray, Terry D., to American Crystal Sugar Company. Process for the improvement of edible fiber and product. 5,112,638, Cl. 426-640.000.

Calabrese, Anthony R. Weatherseal apparatus for double hung windows. 5,111,616, Cl. 49-406.000.

Caldirola, Arnaldo J.: *See—*
Criscuolo, Pascual A.; and Caldirola, Arnaldo J., 5,112,617, Cl. 424-434.000.

Caldwell, Karin D.; Chu, Tun-Jen; and Pitt, William G., to University of Utah; and Brigham Young University. DNA sequencing using fluorescence background electroblotting membrane. 5,112,736, Cl. 435-6.000.

Calemma, Vincenzo: *See—*
Rausa, Riccardo; Calemma, Vincenzo; and Menicagli, Roberto, 5,112,501, Cl. 210-730.000.

California Institute of Technology: *See—*
Soderstrom, Jan R.; and McGill, Thomas C., 5,113,231, Cl. 357-16.000.

Cameron, Charles; Mimoun, Hubert; Robine, Alain; Bonnaudet, Serge; Chaumette, Patrick; and Dang Vu, Quang, to Institut Francais du Petrole. Process for producing olefins from natural gas. 5,113,032, Cl. 585-500.000.

Cameron, T. Jay; Erickson, Elwyn G.; and Hemphill, Cornelius H., to International Business Machines Corporation. Dynamically balanced rotary unit. 5,111,713, Cl. 74-573.00R.

Campanell, Ronald J.: *See—*
Liu, Dexter C.; Campanell, Ronald J.; and Kotowski, Paul J., 5,112,267, Cl. 446-470.000.

Campbell, Donald B.: *See—*
Diehl, Rodney A.; Uhrman, Robert L., Jr.; Bishop, Robert G.; and Campbell, Donald B., 5,111,872, Cl. 164-98.000.

Campbell, Rolf W. J., to Land O'Lakes, Inc. Spreadable material package with spreader. 5,111,932, Cl. 206-216.000.

Campisi, Isidoro E., to Southeastern Universities Research Association. Wide band cryogenic ultra-high vacuum microwave absorber 5,113,160, Cl. 333-22.00R.

Camps, Didier: *See—*
Evreux, Gerard; and Camps, Didier, 5,111,925, Cl. 192-141.000.

Canadian Patents and Development Limited: *See—*
Bouillant, Alain M. P.; Nielsen, Klaus; Ruckerbauer, Gerda M.; Samagh, Bakhshish S.; and Hare, William C. D., 5,112,756, Cl. 435-235.100.

Candela Laser Corporation: *See*—
Clancy, Michael G.; and Jaegle, Gary W., 5,113,462, Cl. 385-53.000.

Canon Kabushiki Kaisha: *See*—
Ariki, Yumi; and Takezawa, Katsuhito, 5,113,492, Cl. 395-147.000.
Ban, Yutaka, 5,111,976, Cl. 222-485.000.
Degura, Yasusaburo; Sakanaka, Tetsuo; and Imano, Haruo, 5,113,278, Cl. 359-154.000.
Fukazawa, Hideo, 5,113,206, Cl. 346-140.00R.
Horie, Yoshiko; Ikeda, Yoshinori; Ichikawa, Hiroyuki; Kurita, Mitsuru; Hayashi, Kimiyoshi; and Honma, Toshio, 5,113,252, Cl. 358-77.000.
Imai, Eiichi; Sakashita, Kiichiro; Takagi, Seiichi; and Kukimoto, Tsutomu, 5,112,714, Cl. 430-106.600.
Inoue, Hiroshi; Mizutome, Atsushi; Kanno, Hideo; Sakamoto, Eiji; and Osada, Yoshiyuki, 5,113,181, Cl. 340-783.000.
Kagami, Naoto, 5,113,396, Cl. 370-110.200.
Kanda, Hitoshi; Yamada, Yusuke; Kato, Masayoshi; Goseki, Yasuhide; and Mitsumura, Satoshi, 5,111,998, Cl. 241-5.000.
Kashiyama, Ritsuo; and Kataoka, Hiroyuki, 5,113,210, Cl. 354-400.000.
Kato, Hideo; Shibata, Hirohumi; Matsushita, Keiko; and Takamatsu, Osamu, 5,112,707, Cl. 430-5.000.
Kawasaki, Keiichi; and Takahashi, Kazuhisa, 5,113,280, Cl. 359-196.000.
Koike, Atsushi, 5,112,185 Cl. 414-786.000.
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Ebinuma, Ryuichi; and Kariya, Takao, 5,112,133, Cl. 356-401.000.
Matsumoto, Kenichi, 5,113,211, Cl. 355-27.000.
Murata, Yoshitaka, 5,113,216, Cl. 354-421.000.
Nakai, Takehiko; and Setani, Michitaka, 5,113,067, Cl. 250-208.100.
Nakamura, Kazushige; Honda, Mitsuru; Toma, Hitoshi; Tanaka, Shigemori; Murai, Keiichi; Unno, Akira; and Takemura, Ako, 5,112,656, Cl. 427-425.000.
Nakayama, Hiroki, 5,113,287, Cl. 359-676.000.
Ninomiya, Kunio; and Suga, Akira, 5,113,246, Cl. 358-44.000.
Okunuki, Masami; Tanaka, Hisami; Ohmori, Hiroyuki; and Hisamura, Masafumi, 5,112,708, Cl. 430-31.000.
Senoo, Akihiro; Iuchi, Kazushi; Miyazaki, Hajime; Go, Shintetsu; and Miyaji, Toshie, 5,112,759, Cl. 430-58.000.
Takabayashi, Akiharu, 5,112,647, Cl. 427-53.100.
Takagi, Hiroshi; and Shiozaki, Atsushi, 5,113,203, Cl. 346-140.00R.
Tsuda, Tadayuki; Yano, Kanji; Ikemoto, Isao; Watanabe, Kazushi; Tanaka, Makoto; and Ishiwata, Kazuhiko, 5,113,224, Cl. 355-234.000.
Uto, Nobutaka; and Honjo, Takeshi, 5,112,034, Cl. 270-53.000.
Yamazaki, Koji; Ueda, Shigenori; and Ehara, Toshiyuki, 5,112,709, Cl. 430-46.000.

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Carimentrand, Jean-Paul, 5,111,752, Cl. 105-18.000.

Capintec, Inc.: *See*—
Suzuki, Arata; Suzuki, Marcia; Tyberg, William T.; and Banks, George, 5,111,818, Cl. 128-644.000.

Capp, Arthur O., Jr.: *See*—
Capp, Michael L.; and Capp, Arthur O., Jr., 5,113,315, Cl. 361-386.000.

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Johansson, Ole H.; and Capriotti, Robert J., 5,112,353, Cl. 623-10.000.

Carbonell, Ruben G.; Guzman, Roberto; and Kilpatrick, Peter K., to North Carolina State University. Precipitation of multivalent antiligands with affinity surfactants. 5,112,770, Cl. 436-501.000.

Cardas, Alberto T., to Colis Internacional, S.A. Frame hanger. 5,112,022, Cl. 248-493.000.

Cardew, Peter T.; and Smith, John W., to Imperial Chemical Industries plc. Method for the production of an asymmetric semipermeable membrane from a solution of a sulfonated polyarylethersulfone. 5,112,892, Cl. 524-108.000.

Cardiac Pacemakers, Inc.: *See*—
Mower, Morton M., 5,111,815, Cl. 128-419.0PG.
Swanson, David K.; Dahl, Roger W.; and Lang, Douglas J., 5,111,812, Cl. 128-419.00D.

Carey, William S.; Chen, Fu; and Reichgott, David W., to Betz Laboratories, Inc. Method for treating metal surfaces with a polymer solution. 5,112,413, Cl. 148-251.000.

Caridis, Andrew A.: *See*—
Benson, Clark K.; and Caridis, Andrew A., 5,112,633, Cl. 426-438.000.

Carimentrand, Jean-Paul, to Caoutchouc Manufacture at Plastiques, S.A. Membrane system for connecting successive railway or roadway vehicles. 5,111,752, Cl. 105-18.000.

Carl-Zeiss-Stiftung: *See*—
Abramowsky, Heinz; Muller, Helmut; and Roth, Roland, 5,111,591, Cl. 33-503.000.
Plank, Frank, 5,111,587, Cl. 33-247.000.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See*—
Aehnelt, Peter; and Enderle, Eckhard, 5,111,592, Cl. 33-561.000.

Carman, Richard A.: *See*—
Wimberger, Richard J.; and Carman, Richard A., 5,112,220, Cl. 432-8.000.

Carney, Walter P., to Applied bioTechnology, Inc. Monoclonal antibodies against activated ras proteins with amino acid mutations at position 13 of the protein. 5,112,737, Cl. 435-7.920.

Caro, Albert N.: *See*—
Soprano, Toby L.; Scolavino, Benjamin J.; Caro, Albert N.; and Angione, Robert A., 5,111,938, Cl. 206-386.000.

Caro, Perry A.: *See*—
Beard, Marian H.; Caro, Perry A.; Hsiao, Jennifer B.; Mackey, Kevin J.; Sandman, James G., Jr.; Steinbach, Gary R.; and Woods, Donald R., 5,113,517, Cl. 364-200.000.

Carrabba, Michael M.; and Rauh, R. David, to EIC Laboratories, Inc. Apparatus for measuring Raman spectra over optical fibers. 5,112,127, Cl. 356-301.000.

Carrier Corporation: *See*—
Dormer, Michael J.; Fraser, Bruce A.; and Nelson, Timothy V., 5,111,737, Cl. 92-187.000.
Evans, Arthur; and McManus, John R., 5,111,678, Cl. 72-134.000.
Kassouf, Thomas L.; Fraser, Howard H., Jr.; Etemad, Shahrokh; and Lane, William R., 5,111,712, Cl. 74-570.000.
Nash, Eric J., 5,111,876, Cl. 165-151.000.
Ripka, Chester D.; and Clark, Daniel R., 5,112,217, Cl. 431-12.000.

Carrington, Andrew N.; Green, Bernard J.; and Jones, Francis, deceased (by Jones, Jean, Legal Representative), to Thorn EMI plc. Method of manufacturing color filters for liquid crystal cells. 5,112,361, Cl. 8-471.000.

Carron, Edward A.: *See*—
Darling, Richard; Carron, Edward A.; and Darling, David, 5,112,051, Cl. 273-148.00B.

Cartmell, James V.; Sturtevant, Wayne R.; Valadez, Manuel; and Wolf, Michael L., to NDM Acquisition Corp. Hydrogel wound dressing product. 5,112,618, Cl. 424-443.000.

Carver, Patricia T. Real-time passive detection of humidity using vanillin. 5,112,768, Cl. 436-39.000.

Casagrande, Bruno, to Casagrande SpA. Excavation device with rotary cutter having a horizontal axis. 5,111,601, Cl. 37-91.000.

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Casagrande, Bruno, 5,111,601, Cl. 37-91.000.

Case Western Reserve University: *See*—
Marchant, Roger E., 5,112,457, Cl. 204-165.000.

Casio Computer Co., Ltd.: *See*—
Mizuno, Yutaka; Tsuzuki, Hanzo; Haruhara, Kazuyoshi; Miyata, Shigeki; Motoike, Katsuhiko; Sakai, Tooru; and Ooishi, Kazuhiro, 5,113,183, Cl. 340-825.310.
Suenaga, Takashi, 5,112,149, Cl. 400-88.000.

Castelli, Renato; Van Hoye, Willibald; Miles, Richard; and Green, Stephen T., to Samsonite Corporation. Luggage case with recessed latches. 5,111,920, Cl. 190-120.000.

Caterisano, William P.: *See*—
Menendez, Juan G.; Caterisano, William P.; and Ball, John, 5,113,494, Cl. 395-163.000.

Caterpillar Inc.: *See*—
Lukavich, Paul J.; and Puckett, Joseph W., 5,111,600, Cl. 37-141.00T.

Cavallerano, Alan P.: *See*—
Tsinberg, Mikhail; Basile, Carlo; and Cavallerano, Alan P., 5,113,242, Cl. 358-12.000.

Caya, Mario. Bunk bed. 5,111,540, Cl. 5-9.100.

Cazenave, Alain: *See*—
Laboureau, Jacques-Philippe; and Cazenave, Alain, 5,112,335, Cl. 606-88.000.

CBS LENS, a California general partnership: *See*—
Civerchia, Linda; and Shepard, Dennis D., 5,112,350, Cl. 623-5.000.

Ceca S.A.: *See*—
Wittmann, Claude; and Lambert, Jean-Patrick, 5,112,552, Cl. 264-255.000.

Cedarapids, Inc.: *See*—
Ostergaard, David A., 5,111,569, Cl. 29-407.000.

Cedars-Sinai Medical Center: *See*—
Barath, Peter; and Denes, Ferenc, 5,112,305, Cl. 604-96.000.

Cederbaum, Carl; Chanclou, Roland; Combes, Myriam; Mone, Patrick; and Vallet, Vincent, to International Business Machines Corporation. Method of forming stacked tungsten gate PFET devices and structures resulting therefrom. 5,112,765, Cl. 437-41.000.

Celebuski, Joseph E., to Abbott Laboratories. Process for synthesis of silyl alcohols. 5,113,005, Cl. 556-449.000.

Centocor, Incorporated: *See*—
Baumgartner, Mark F.; Tolbert, William R.; and Shanahan, John, 5,112,760, Cl. 435-240.242.

Central Glass Company, Limited: *See*—
Aratani, Shin-ichi, 5,112,377, Cl. 65-114.000.

Centre National de la Recherche Scientifique 'CNRS: *See*—
Cot, Louis; Rouviere, Jacques C.; Guizard, Christian G.; and Larbot, Andre, 5,112,676, Cl. 427-226.000.

Cesar, Charles, to Bull S.A. Electrical connector for connecting a shielded multiconductor cable to an electrical assembly located inside a chassis. 5,112,251, Cl. 439-607.000.

Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; and Sircar, Jagadish C., to Warner-Lambert Company. Hydroxamate derivatives of selected nonsteroidal antiinflammatory acyl residues having cyclooxygenase and 5-lipoxygenase inhibition. 5,112,868, Cl. 514-618.000.

Cetenko, Wiaczeslaw A.: *See*—
Belliotti, Thomas R.; Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; Kramer, James B.; and Sircar, Jagadish C., 5,112,846, Cl. 514-415.000.

Chakravorty, Kishore K., to Boeing Company, The. Self-aligned process for fabrication of interconnect structures in semiconductor applications. 5,112,448, Cl. 205-118.000.

Chamberlin, James B.: *See*—
Gunn, Gary R.; Colcord, Wallace T.; Wood, Tommy G.; Weber, Gary; Lovendoski, Stan J.; and Chamberlin, James B., 5,112,153, Cl. 403-7.000.

Chamings, Antony W. Flexible fastener. 5,112,177, Cl. 411-447.000.

Champion Ergonomics, Inc.: *See*—
Travis, Jack M., 5,111,806, Cl. 602-19.000.

Chan, C. S.; and Pan, Alfred I., to Hewlett-Packard Company. Ink delivery system for ink jet printers. 5,113,199, Cl. 346-1.100.

Chan, Wai-Kwong; Allsopp, Mary F.; McGuire, Kevin T.; Nonnemann, Robert W.; Obrecht, Gordon A.; Saluski, Ronald B.; Trchka, James A.; Viebach, Hans J.; Brandt, Peter A.; Butler, Robert R.; Shircliff, Michael W.; Walker, Samuel A.; and Miller, Thomas R., to R.R. Donnelley & Sons Company. Binding line book tracking system and method. 5,112,179, Cl. 412-1.000.

Chan, You P. N. C.: *See*—
Osborn, John A.; Chan, You P. N. C.; Blaser, Hans-Ulrich; and Spindler, Felix, 5,112,999, Cl. 556-23.000.

Chanclou, Roland: *See*—
Cederbaum, Carl; Chanclou, Roland; Combes, Myriam; Mone, Patrick; and Vallet, Vincent, 5,112,765, Cl. 437-41.000.

Chang, Chin-An, to International Business Machines Corporation. Metal-metal epitaxy on substrates and method of making. 5,112,699, Cl. 428-641.000.

Chang, David B.; Moise, Norton L.; and Shih, I-Fu. Display system for multiviewer training simulators. 5,112,121, Cl. 359-15.000.

Chang, Hsien-Hsin: *See*—
Tang, Pamela S.; Singer, Norman S.; and Chang, Hsien-Hsin, 5,112,956, Cl. 530-424.000.

Chang, John: *See*—
Albonesi, David H.; Langendorf, Brian K.; Chang, John; Faase, John G.; and Homberg, Michael J., 5,113,514, Cl. 395-425.000.

Chapman, David C.; and Duprez, Herve G., to VLSI Technology, Inc. Method for labelling polygons. 5,113,451, Cl. 382-8.000.

Chapman, Donald L. Knockdown portable hotwater shower and shower head therefor. 5,111,538, Cl. 4-599.000.

Charbonnier, Francis M.; and Rockwell, Martin G., to Hewlett-Packard Company. Defibrillation employing an impedance-corrected delivered energy. 5,111,813, Cl. 128-419.00D.

Charcoal Cloth Limited: *See*—
Langston, Richard D., 5,112,666, Cl. 428-104.000.

Chariot, Maryvonne: *See*—
Stevens, Howard; Chariot, Maryvonne; Arnold, Francoise; and Lewis, Gareth, 5,112,621, Cl. 424-497.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Greiff, Paul, 5,111,693, Cl. 73-514.000.

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Harris, Graham J.; and Woolnough, Victor J., 5,112,356, Cl. 623-49.000.

Chatani, Masayuki; Yoshida, Kimiyoshi; Sakano, Akio; and Tamori, Hirofumi, to Sony Corporation. Hand-written character recognition apparatus and method. 5,113,452, Cl. 382-13.000.

Chatterjee, Deepak K.: *See*—
Chatterjee, Sukumar; Chatterjee, Sugata; Ganguli, Bimal N.; Chatterjee, Deepak K.; Jani, Rajendra K. H.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; Kogler, Herbert; Seibert, Gerhard; and Teetz, Volker, 5,112,806, Cl. 514-9.000.

Chatterjee, Sugata: *See*—
Chatterjee, Sukumar; Chatterjee, Sugata; Ganguli, Bimal N.; Chatterjee, Deepak K.; Jani, Rajendra K. H.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; Kogler, Herbert; Seibert, Gerhard; and Teetz, Volker, 5,112,806, Cl. 514-9.000.

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Checker Machine, Inc.: *See*—
Pierick, Richard L.; and Hoium, Ross A., 5,111,929, Cl. 198-495.000.

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Tenn, Trevor I., 5,112,216, Cl. 431-5.000.

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Jones, Leslie, Jr., 5,113,375, Cl. 367-13.000.

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Graebner, Peter, 5,112,126, Cl. 356-152.000.
Harrison, James J., 5,112,507, Cl. 252-51.50A.

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Chow, Hsiu-Shen; and Ellentuch, Leonard, 5,112,243, Cl. 439-352.000.

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Wang, Chen-Chin; Hong, Yeun-Ding G.; and Chiao, Stephen S., 5,113,238, Cl. 357-54.000.

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Atkins, Martin P.; Jones, William; and Chibwe, Malama, 5,112,784, Cl. 502-80.000.

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Greer, John; Chijiiwa, Haruhisa; and Dowhan, Michael J., 5,112,193, Cl. 416-220.00R.

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Hatley, Brian J.; and Chinn, Richard A., 5,113,447, Cl. 381-27.000.

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Matsushiro, Ryuichi; Kosuda, Toru; Sasao, Shigeo; Ikeya, Taro; Chino, Yoshiharu; and Uekawa, Yasuaki, 5,111,776, Cl. 123-41.540.

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Konotsune, Shiro; Yano, Hitoshi; Hiraki, Souichiro; and Kikuta, Kazutsune, 5,112,694, Cl. 428-457.000.
Yoshida, Naoyuki; Kitano, Kisei; and Ogawa, Tetsuya, 5,112,523, Cl. 252-299.610.

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Johansen, Eivind, 5,112,683, Cl. 428-354.000.
Chong, Yong-Bo: *See—*
Watanabe, Nobuatsu; Chong, Yong-Bo; Tatsuno, Toshio; Okada, Tomoyoshi; Izumi, Akira; and Toei, Keiji, 5,112,437, Cl. 156-646.000.
Chou, Ming-Kou: *See—*
Enomoto, Hajime; and Chou, Ming-Kou, 5,113,457, Cl. 382-56.000.
Chow, Calvin Y. H.; Humphries, Gillian M.; Kung, Viola T.; and Lacy, Michael M., to Molecular Devices Corporation. Single source multi-site photometric measurement system. 5,112,134, Cl. 356-427.000.
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Chow, Ken H.: *See—*
Danishefsky, Samuel J.; Chow, Ken H.; and Naves, Carmen M. P. C., 5,113,014, Cl. 562-503.000.
Choy, Conrad Y.; and Yu, Jack, to Foxconn International, Inc. Durable latch for memory module board. 5,112,242, Cl. 439-326.000.
Christian, Robert E.: *See—*
Lemon, J. Robert; Evans, William T.; Christian, Robert E.; and Bader, Herbert I., 5,112,226, Cl. 433-72.000.
Christie, Bruce; and Gupta, Amitava, to Ioptex Research Inc. Multifocal intraocular lenses. 5,112,351, Cl. 623-6.000.
Christopher, Susan S.: *See—*
Babu, Gaddam N.; Christopher, Susan S.; Copley, Bruce C.; and Overstreet, Thomas S., 5,112,882, Cl. 522-158.000.
Christophliemk, Peter: *See—*
Brands, Karl-Dieter; Endres, Helmut; Christophliemk, Peter; and Roland, Wolf-Achim, 5,112,414, Cl. 148-254.000.
Chrysler Corporation: *See—*
Tolbert, Robert J.; and DeGrendel, Glen A., 5,112,013, Cl. 248-74.300.
Chu, Sung G.; Jabloner, Harold; and Nguyen, Tuyen T., to Hercules Incorporated. Bismaleimide compositions containing high glass transition temperature and soluble reactive oligomers and composites prepared therefrom. 5,112,924, Cl. 525-426.000.
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Caldwell, Karin D.; Chu, Tun-Jen; and Pitt, William G., 5,112,736, Cl. 435-6.000.
Chung, Gishi: *See—*
Anderson, Dirk N.; McKee, William R.; and Chung, Gishi, 5,112,762, Cl. 437-35.000.
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Kurtz, Andrew D., 5,112,592, Cl. 423-419.00R.
Lajoie, Michael S.; and Kirschner, Lawrence, 5,112,406, Cl. 134-7.000.
Ciba-Geigy Corporation: *See—*
Banks, Christopher P.; and Irving, Edward, 5,112,440, Cl. 156-659.100.
Behrens, Rudolf A.; Winter, Roland A. E.; Mar, Andrew; Schirmann, Peter J.; Seltzer, Raymond; and Malherbe, Roger F., 5,112,890, Cl. 524-95.000.
Bowman, Robert M.; Steele, Ronald E.; Browne, Leslie J.; Ewald, Bruce H.; and Diener, Robert, 5,112,845, Cl. 514-399.000.
Fischer, Walter; Baumann, Marcus; Finter, Jurgen; Kvita, Vratislav; Mayer, Carl W.; and Wernet, Wolfgang, 5,112,977, Cl. 546-195.000.
Frostl, Wolfgang; and Zust, Armin, 5,112,855, Cl. 514-456.000.
Lehmann, Urs; and Koller, Josef, 5,112,958, Cl. 534-618.000.
Ludemann, Simpert; Bernheim, Michael; Sandner, Bernhard; Rossler, Erich; and Vogel, Hans-Burkhardt, 5,112,930, Cl. 528-28.000.
Nikles, Erwin, 5,112,912, Cl. 525-123.000.
Osborn, John A.; Chan, Yau P. N. C.; Blaser, Hans-Ulrich; and Spindler, Felix, 5,112,999, Cl. 556-23.000.
Staub, Theodor; Dahmen, Heide; Nyfeler, Robert; and Williams, Robert J., 5,112,849, Cl. 514-427.000.
Zondler, Helmut; Meyer, Alfred; Eckhardt, Wolfgang; and Kunz, Walter, 5,112,840, Cl. 514-341.000.
Ciboldi, Moreno; and Maregatti, Ugo, to Societa' Cavi Pirelli S.p.A. Method for manufacturing a body with a surface of revolution at its end with the axis thereof aligned with an axis of the body. 5,111,571, Cl. 29-407.000.
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Cirera, Xavier D.; Andreoli, Romeo R.; Lloveras, Pedro P.; Bruseghini, Leonida; and Irurre, Jose P. Vasodilatory dihydrodibenzocycloheptyliden-ethylpiperazine derivatives. 5,112,826, Cl. 514-255.000.
Cirqon Technologies Corporation: *See—*
Capp, Michael L.; and Capp, Arthur O., Jr., 5,113,315, Cl. 361-386.000.
Citta, Richard W.; and Dicke, Stephen M., to Zenith Electronics Corporation. Method of perceptually modeling a video image signal. 5,113,256, Cl. 358-133.000.
Civerchia, Linda; and Shepard, Dennis D., to CBS LENS, a California general partnership. Method for locating on a cornea an artificial lens fabricated from a collagen-hydrogel for promoting epithelial cell growth and regeneration of the stroma. 5,112,350, Cl. 623-5.000.
Cizin, Miguel, to AT&T Bell Laboratories. Electrical connector. 5,112,238, Cl. 439-188.000.
Claar, Terry D., to Lanxide Technology Company, LP. Method for forming a surface coating. 5,112,654, Cl. 427-376.600.
Clairol, Inc.: *See—*
Murphy, Bryan P.; and Wis-Surel, Gabriella, 5,112,359, Cl. 8-405.000.
Clancy, Michael G.; and Jaegle, Gary W., to Candela Laser Corporation. High energy fiber optica coupler. 5,113,462, Cl. 385-53.000.
Clare, Kenneth: *See—*
Winston, Philip E., Jr.; Dial, Harold D.; Clare, Kenneth; and Ortega, Theresa M., 5,112,445, Cl. 162-178.000.
Claremon, David A.: *See—*
Baldwin, John J.; Selnick, Harold G.; Ponticello, Gerald S.; Remy, David C.; Claremon, David A.; and Elliott, Jason M., 5,112,824, Cl. 514-253.000.
Clark, Daniel R.: *See—*
Ripka, Chester D.; and Clark, Daniel R., 5,112,217, Cl. 431-12.000.
Clark, Jeffrey L.: *See—*
Nienhuis, James H.; Clark, Jeffrey L.; De Pree, Michael L.; and Beck, Robert L., 5,112,240, Cl. 439-215.000.
Clark, Justin S.; and Wallace, William D., to Medical Physics, Inc. Noninvasive system and method for enhanced arterial oxygen saturation determination and arterial blood pressure monitoring. 5,111,817, Cl. 128-633.000.
Clawson, Robert A.; and Thome, John R., to Motorola, Inc. Method of soldering components to printed circuit boards. 5,111,991, Cl. 228-180.100.
Clelland, William F., to Ryder Truck Rental, Inc. Low profile vehicle construction. 5,112,082, Cl. 280-783.000.
Clement, Tim, to Zebco Corporation. Gear train of a servo-controlled trolling motor. 5,112,256, Cl. 440-7.000.
Clissold, Derek W.; Mann, John; and Thickitt, Christopher P., to National Research Development Corporation. Preparation of 2,6-dioxopiperidine derivatives. 5,112,976, Cl. 546-193.000.
Clorox Company, The: *See—*
Bolkan, Steven A.; Brodbeck, Kelly J.; Brodbeck, Kevin J.; Deleeuw, David L.; Steichen, Dale S.; Strand, Bruce B.; Suk, Richard J. V.; Szuch, Kathleen D.; and Zielske, Alfred G., 5,112,514, Cl. 252-99.000.
Clough, John M.: *See—*
Vivienne, Anthony; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Crowley, Patrick J.; and Anderton, Kenneth, 5,112,386, Cl. 71-94.000.
Cluff, C. Brent. Slow sand/nanofiltration water treatment system. 5,112,483, Cl. 210-223.000.
Co.E.P.T.E. Costruzioni Elettromec-Caniche per Trazione Elettrica S.r.l.: *See—*
Bossi, Daniele, 5,111,605, Cl. 40-316.000.
Coakley, Pauline: *See—*
Woods, John G.; and Coakley, Pauline, 5,113,003, Cl. 556-432.000.
Coffre, Eric: *See—*
Bridenne, Martine; Coffre, Eric; Hutton, Robert; and Marot, Yves, 5,113,075, Cl. 250-282.000.
Cogswell, James A., II; and Coulter, James L., to General Motors Corporation. Anti-spin hydraulic brake system. 5,112,114, Cl. 303-113.0TR.
Coha, Timothy F.: *See—*
Emmert, Dan H.; Creager, John E.; and Coha, Timothy F., 5,111,844, Cl. 137-567.000.
Cohen, Abraham B.; Fan, Roxy N.; and Quinn, John A., to Du Pont de Nemours, E. I., and Company. Embedded catalyst receptors for metallization of dielectrics. 5,112,726, Cl. 430-315.000.
Cohen, Aharon S.: *See—*
Karger, Barry L.; and Cohen, Aharon S., 5,112,460, Cl. 204-182.800.
Cohen, Bernard; and Morman, Michael T., to Kimberly-Clark Corporation. Low hydrohead fibrous porous web with improved retentive wettability. 5,112,690, Cl. 428-411.100.
Cohen, Gordon M., to Du Pont de Nemours, E. I., and Company. Block copolymer of perfluoroether and hydrocarbon monomers. 5,112,917, Cl. 525-185.000.
Cohen, Nathan, to National Fertility Institute. Apparatus and method for generating echographic images. 5,111,823, Cl. 128-660.070.
Cohen, Ricard L., to Allied-Signal Inc. Apparatus for a display system 5,113,177, Cl. 340-705.000.
Colby, Mark J.: *See—*
Dix, Gary E.; Crowther, Russell L.; Colby, Mark J.; Matzner, Bruce; and Elkins, Robert B., 5,112,570, Cl. 376-370.000.
Colcord, Wallace T.: *See—*
Gunn, Gary R.; Colcord, Wallace T.; Wood, Tommy G.; Weber, Gary; Lovendoski, Stan J.; and Chamberlin, James B., 5,112,153, Cl. 403-7.000.
Cole, Carl P.: *See—*
Bischel, Patrick O.; Brown, John K., III; Cole, Carl P.; and Fitch, Donald G., 5,113,488, Cl. 395-112.000.
Coleman, Robert M.: *See—*
Nickell, Eric S.; Buckley, Robert R.; Rumph, David E.; and Coleman, Robert M., 5,113,356, Cl. 395-108.000.
Coleno, Raymond: *See—*
Hivert, Michel; and Coleno, Raymond, 5,111,657, Cl. 60-224.000.
Colgate-Palmolive Company: *See—*
Straw, Alan; and Ellis, Roger D., 5,112,525, Cl. 252-315.300.

Colis Internacional, S.A.: *See—*
Cardas, Alberto T., 5,112,022, Cl. 248-493.000.
Collareda, Bruno: *See—*
Perletti, Fabio; Collareda, Erminio; and Collareda, Bruno, 5,112,627, Cl. 426-50.000.
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Perletti, Fabio; Collareda, Erminio; and Collareda, Bruno, 5,112,627, Cl. 426-50.000.
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Collignon, Theresa, to Ofrex Group Holdings, PLC. Cover for artist's pastel. 5,112,151, Cl. 401-96.000.
Collins, Joel C.: *See—*
Hollingsworth, John D.; Garrison, Joe K.; Collins, Joel C.; Warnock, William A., deceased; Weiskel, Lillith M., legal representative; Nyberg, Muriel R., legal representative; Warnock, Charles F., legal representative; and Pergande, Lorraine, legal representative, 5,111,551, Cl. 19-150.000.
Collins, Walter W. Bolt operated locking mechanism for folding knife. 5,111,581, Cl. 30-161.000.
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Colon, Ismael; Merriam, Charles N.; and Wolf, Philip F., to Union Carbide Chemicals & Plastics Technology Corporation. Formable coatings. 5,112,887, Cl. 523-400.000.
Color Custom, Inc.: *See—*
Roberts, Edward; Greatorex, James H.; and Spittal, Douglas W., 5,112,549, Cl. 264-174.000.
Roberts, Edward A., 5,112,278, Cl. 98-365.000.
Roberts, Edward A.; Spittal, Douglas W.; and Kisiel, Stanley T., 5,112,548, Cl. 264-171.000.
Colorado State University Research Foundation: *See—*
Bjostad, Louis B., III; and Hibbard, Bruce E., 5,112,843, Cl. 514-375.000.
Columbia University in the City of New York, The Trustees of: *See—*
Barton, Jacqueline K., 5,112,974, Cl. 546-4.000.
Combes, Myriam: *See—*
Cederbaum, Carl; Chanclou, Roland; Combes, Myriam; Mone, Patrick; and Vallet, Vincent, 5,112,765, Cl. 437-41.000.
Combret, Jean-Claude; Klein, Jean-Louis; and Le Gaillard, Joel, to Universite de Rouen. Dienoxysilanes. 5,113,007, Cl. 556-482.000.
Comfort, Gordon A. Method of controlling thickness of thermoplastic extruded profile. 5,112,546, Cl. 264-167.000.
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Audaire, Luc; and Pantigny, Philippe, 5,113,263, Cl. 358-213.110.
Bernard, Chaudanson, 5,113,406, Cl. 372-56.000.
Cruz, Didier; and Daval, Jacques, 5,112,277, Cl. 454-195.000.
Moussavi, Mehdi, 5,112,597, Cl. 424-9.000.
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Commonwealth Scientific and Industrial Research Organisation: *See—*
Wingate-Hill, Robin; and MacArthur, Ian J., 5,111,860, Cl. 144-208.00F.
Compagnie Generale d'Electricite : *See—*
Argouarc'h, Jean R., 5,111,898, Cl. 180-9.520.
Comstock, Robert J.: *See—*
Foster, John P.; Comstock, Robert J.; Worcester, Samuel A.; and Sabol, George P., 5,112,573, Cl. 420-422.000.
Confederated Tribes of the Colville Reservation, The: *See—*
Trujillo, Eduardo E., 5,112,381, Cl. 71-79.000.
Conley, David. Thermostat light. 5,113,318, Cl. 362-23.000.
Conley, David L.: *See—*
Addington, Larry C.; Addington, Robert R.; Addington, Larry M.; Lynch, Albert E.; Susla, John; Conley, David L.; Sartaine, John J.; and Price, David E., 5,112,111, Cl. 299-18.000.
Conn-Weld Industries, Inc.: *See—*
Henry, Robert E., Jr., 5,112,475, Cl. 209-399.000.
Connor, David T.: *See—*
Belliotti, Thomas R.; Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; Kramer, James B.; and Sircar, Jagadish C., 5,112,846, Cl. 514-415.000.
Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; and Sircar, Jagadish C., 5,112,868, Cl. 514-618.000.
Conoco Inc.: *See—*
Thomas, Bobby J., 5,113,192, Cl. 342-22.000.
Conrad, George R., to General Electric Company. Nipple fitment with safety overcap. 5,112,628, Cl. 426-117.000.
Consolidated Papers, Inc.: *See—*
Damrau, Wayne A.; and Mayer, Michael A., 5,112,653, Cl. 427-356.000.
Container Graphics Corporation: *See—*
Simpson, Jack R.; and Geer, Jeffrey A., 5,111,725, Cl. 83-117.000.
Conti, Joseph A.; and Liantonio, James, to Integri-Test Corporation. Circuit board test probe. 5,113,133, Cl. 324-158.00P.
Continental Plastics, Inc.: *See—*
Mengeu, Gary L., 5,111,978, Cl. 222-545.000.
Convert, Guy; and Brasile, Jean-Pierre, to Thomson-CSF. Microwave generator device with virtual cathode. 5,113,154, Cl. 331-79.000.
Cook, Arnold J., to PCast Equipment Corporation. Top fill casting. 5,111,870, Cl. 164-61.000.
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Cook Incorporated: *See—*
Olsen, Douglas O.; Bates, Brian L.; and Osborne, Thomas A., 5,112,308, Cl. 604-164.000.
Cook, John W., to Eastman Kodak Company. Low temperature multilayer extrusion coating process. 5,112,424, Cl. 156-243.000.
Cook, Roger A.: *See—*
Sundeen, Arthur R.; Burris, Darryl L.; Cook, Roger A.; and Lombardo, Dennis M., 5,111,902, Cl. 180-281.000.
Cooke, Kevin K.; and Dewitt, John R., to International Business Machines Corp. Support structure for devices in a computer apparatus. 5,112,119, Cl. 312-283.000.
Coolen, Richard B.: *See—*
Nealon, Daniel A.; and Coolen, Richard B., 5,112,740, Cl. 435-15.000.
Cooper, David E.; and Houy, Thomas J., to Southern California Edison Company. Voltage measuring device having electro-optic sensor and compensator. 5,113,131, Cl. 324-96.000.
Cooper Industries: *See—*
Haarer, Steven R., 5,112,157, Cl. 403-292.000.
Cooper Industries, Inc.: *See—*
Guipe, Richard A.; Qureshi, Shakil U.; and Oden, Larry W., 5,113,039, Cl. 174-113.00C.
Herres, Donald C., 5,113,303, Cl. 361-45.000.
Kamp, David C.; and Hanks, William H., 5,113,311, Cl. 361-346.000.
Cooper, Michael D.: *See—*
Chesnut, Paul B.; Cooper, Michael D.; and Neas, Jerry A., 5,112,241, Cl. 439-273.000.
Cooper Power Systems, Inc.: *See—*
Veverka, Edward F.; Goedde, Gary L.; Baranowski, John F.; and Kershaw, Stanley S., Jr., 5,113,306, Cl. 361-127.000.
Copley, Bruce C.: *See—*
Babu, Gaddam N.; Christopher, Susan S.; Copley, Bruce C.; and Overstreet, Thomas S., 5,112,882, Cl. 522-158.000.
Corbett, William D.; and Sheaffer, Benjamin L., to Brunswick Corporation. Evaporable foam pattern for casting a cylinder block of a two-cycle engine. 5,111,869, Cl. 164-45.000.
Cordova, Jackie: *See—*
Titcomb, Forrest; and Cordova, Jackie, 5,112,142, Cl. 384-107.000.
Corl, Kenneth G.: *See—*
Wilson, James; Stephenson, LinMarie; and Corl, Kenneth G., 5,113,222, Cl. 355-209.000.
Corning Incorporated: *See—*
MacDowell, John F., 5,112,777, Cl. 501-32.000.
Correa, Jose L.; Stumpf, Robert C.; Farnum, Charles L.; and Roos, Leo, to Morton International, Inc. Wet lamination process and apparatus. 5,112,428, Cl. 156-324.000.
Costas, Dan N. Labeling apparatus. 5,112,429, Cl. 156-542.000.
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Cote, Edmond H.; and Prendergast, Matthew B., to Allied-Signal Inc. Liquid filter assembly. 5,112,476, Cl. 210-85.000.
Coulson, Bryony E., to Chesebrough-Pond's USA Co., division of Conopco, Inc. Oral compositions. 5,112,599, Cl. 424-52.000.
Coulter, James L.: *See—*
Cogswell, James A., II; and Coulter, James L., 5,112,114, Cl. 303-113.0TR.
Couper, John R. Device for holding articles and permitting the removal thereof. 5,111,964, Cl. 221-111.000.
Courty, Philippe: *See—*
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Covington, Roger G.; and Pagano, Daniel M., to Eastman Kodak Company. Film cassette with shutter light-lock. 5,112,003, Cl. 242-71.100.
Cowgill, Richard A.: *See—*
Talbott, Jefferson F.; Cowgill, Richard A.; Cummings, Chris R.; Fontana, James A.; and Pitchford, Anthony R., 5,113,500, Cl. 395-325.000.
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Cox, Simon A., to British Telecommunications public limited company. Noise cancellation. 5,113,389, Cl. 370-32.100.
Coy, David H.; and Murphy, William A., to American Cyanamid Company. Alkylated hormone-releasing peptides and method of treatig mammals therewith. 5,112,808, Cl. 514-12.000.
Cozad, Trent E.; Lozier, Antony J.; Lower, Jerry L.; and Tencer, Allan F., to Zimmer, Inc. Method of performing spinal surgery. 5,112,332, Cl. 606-61.000.
Cozzette, Stephen N.; Davis, Graham; Holleritter, Lisa A.; Lauks, Imants R.; Piznik, Sylvia; Smit, Nicolaas J.; Tirinato, Jody A.; Wieck, Henry J.; and Zelin, Michael P., to I Stat Corporation. Method for analytically utilizing microfabricated sensors during wet-up. 5,112,455, Cl. 204-153.120.
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Weder, Donald E.; Craig, Franklin J.; Straeter, William F.; and Straeter, Joseph G., 5,111,637, Cl. 53-397.000.
Cramer, Friedrich: *See—*
Pieles, Uwe; Englisch, Uwe; and Cramer, Friedrich, 5,112,963, Cl. 536-27.000.
Cray Computer Corporation: *See—*
Cray, Seymour R.; and Krajewski, Nicholas J., 5,112,232, Cl. 439-75.000.

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Emmert, Dan H.; Creager, John E.; and Coha, Timothy F., 5,111,844, Cl. 137-567.000.

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Thary, Christian, 5,112,543, Cl. 264-51.000.

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Lafferty, William G., 5,113,048, Cl. 200-83.00Z.

Criscuolo, Pascual A.; and Caldarola, Arnaldo J. Method for controlling cold symptoms. 5,112,617, Cl. 424-434.000.

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Crosby, C. Scott, to Liberty Life Insurance Co. Full speed animation system for low-speed computers and method. 5,113,493, Cl. 395-152.000.

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Vivienne, Anthony; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Crowley, Patrick J.; and Anderton, Kenneth, 5,112,386, Cl. 71-94.000.

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Dix, Gary E.; Crowther, Russell L.; Colby, Mark J.; Matzner, Bruce; and Elkins, Robert B., 5,112,570, Cl. 376-370.000.

Crudele, Lester M.: *See*—
Moussouris, John P.; Crudele, Lester M.; and Przybylski, Steven A., 5,113,506, Cl. 395-400.000.

Cruz, Didier; and Daval, Jacques, to Commissariat a l'Energie Atomique. Blowing door for ultra-clean confinement container. 5,112,277, Cl. 454-195.000.

Csapo, Gyorgy: *See*—
Bartha, John; and Csapo, Gyorgy, 5,112,495, Cl. 210-691.000.

Csonka, Paul L. Apparatus and method for improving radiation coherence and reducing beam emittance. 5,113,423, Cl. 378-145.000.

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Culp, James M.: *See*—
Pless, Benjamin; Ryan, John G.; and Culp, James M., 5,111,816, Cl. 128-419.0PG.

Cummings, Chris R.: *See*—
Talbott, Jefferson F.; Cowgill, Richard A.; Cummings, Chris R.; Fontana, James A.; and Pitchford, Anthony R., 5,113,500, Cl. 395-325.000.

Cunnally, William T.: *See*—
Sandor, Ellen R.; Sandin, Daniel J.; Cunnally, William T.; and Meyers, Stephan B., 5,113,213, Cl. 355-22.000.

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Barker, Martin C.; Brown, James P.; Cunningham, Anthony; and Randall, David, 5,112,87[illegible], Cl. 521-110.000.

Cunningham, Eldon R.: *See*—
Blaettner, Harald E.; Uhen, Richard F.; Ellis, Robert E.; Cunningham, Eldon R.; Usher, Michael J.; and Miller, Joseph E., 5,113,104, Cl. 310-90.000.

Curran, Mark E., to General Dynamics Corporation, Electronics Division. Fiber optic combiner/splitter. 5,113,244, Cl. 385-24.000.

Cuscurida, Michael: *See*—
Lin, Jiang-Jen; Cuscurida, Michael; and Waddill, Harold G., 5,112,979, Cl. 546-244.000.

Custer, William A.: *See*—
Smallwood, John M.; and Custer, William A., 5,113,481, Cl. 395-2.000.

Cyro Industries: *See*—
Zimmerman, Daniel D.; and Vieiro, Gary, 5,112,909, Cl. 525-67.000.

Cyrus, William L., Jr.: *See*—
Johnson, Mark A.; Pokora, Alexander R.; and Cyrus, William L., Jr., 5,112,752, Cl. 435-192.000.

Daetwyler, Max, to MDC Max Daetwyler Bleienbach AG. Milling head for the fine machining of workpieces, in particular gravure cylinders. 5,112,171, Cl. 409-131.000.

Dahl, Roger W.: *See*—
Swanson, David K.; Dahl, Roger W.; and Lang, Douglas J., 5,111,812, Cl. 128-419.00D.

Dahmen, Heide: *See*—
Staub, Theodor; Dahmen, Heide; Nyfeler, Robert; and Williams, Robert J., 5,112,849, Cl. 514-427.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Egashira, Noritaka; and Nakamura, Yoshinori, 5,112,799, Cl. 503-227.000.

Dai, Pei-Shing E.; and Sherwood, David E., Jr., to Texaco Inc. Hydrotreating or cracking process employing an acidified dealuminated Y-zeolite. 5,112,473, Cl. 208-120.000.

Daicel Chemical Industries Ltd.: *See*—
Kamei, Noboru, 5,112,982, Cl. 546-345.000.

Daido Metal Company Ltd.: *See*—
Tanaka, Tadashi; Sakamoto, Masaaki; Sato, Yoshiaki; and Kato, Tohru, 5,112,416, Cl. 148-437.000.

Daidousanso Co., Ltd.: *See*—
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; and Minato, Teruo, 5,112,030, Cl. 266-256.000.

Daikin Industries Ltd.: *See*—
Morita, Shigeru; and Oka, Masahiko, 5,112,973, Cl. 544-387.000.

Dailey, Frank A.: *See*—
Buckler, Robert T.; Dailey, Frank A.; Ficalora, John A.; Gavin, John J.; and Plunkett, Gregory A., 5,112,738, Cl. 435-7.930.

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Sugise, Ryoji; Daimon, Hiroshi; Gujii, Itsuhiro; Ihara, Hideo; Terada, Norio; Jo, Masatoshi; and Hirabayashi, Masayuki, 5,112,783, Cl. 501-126.000.

Dainic Iseika Color & Chemicals Mfg. Co. Ltd: *See*—
Okura, Ken; Matsuzaki, Satoru; Katamoto, Tsutomu; and Horiishi, Nanao, 5,112,403, Cl. 106-418.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Isono, Koichi; Nakano, Masayuki; and Nishigaito, Yoshiyuki, 5,113,264, Cl. 358-298.000.
Umaba, Takayuki; Ono, Jiro; Takagi, Syunsuke; Sawada, Makoto; Adachi, Hideki; Shimizu, Hirofumi; Hashimoto, Mokuhei; and Takahashi, Tetsu, 5,111,743, Cl. 101-127.000.
Watanabe, Nobuatsu; Chong, Yong-Bo; Tatsuno, Toshio; Okada, Tomoyoshi; Izumi, Akira; and Toei, Keiji, 5,112,437, Cl. 156-646.000.

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Walle, Warren R.; Ross, Jack B.; Hamilton, Jesse A.; and Martinez, Delfin C., 5,112,223, Cl. 432-241.000.

Daley, Eugene E., Jr., to United Technologies Automotive. Joiner and method of joining terminal strip segments. 5,112,255, Cl. 439-885.000.

Dalton, John T.: *See*—
Kam, John; Truchon, Lee M.; Goodale, Thomas C.; and Dalton, John T., 5,113,393, Cl. 370-94.100.

Damerow, David H.; Young, William R.; and Faas, Denis W., to Harris Corporation. Sin/cos generator implementation. 5,113,361, Cl. 364-721.000.

Damin, Bernard: *See*—
Garapon, Jacques; Touet, Remi; Damin, Bernard; and Debled, Beatrice, 5,112,937, Cl. 528-272.000.

Damrau, Wayne A.; and Mayer, Michael A., to Consolidated Papers, Inc. Method of and apparatus for coating high speed traveling webs. 5,112,653, Cl. 427-356.000.

Daneshy, A. Ali: *See*—
Soliman, Mohamed Y.; Venditto, James J.; and Daneshy, A. Ali, 5,111,881, Cl. 166-250.000.

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Cameron, Charles; Mimoun, Hubert; Robine, Alain; Bonnaudet, Serge; Chaumette, Patrick; and Dang Vu, Quang, 5,113,032, Cl. 585-500.000.

Daniels Manufacturing Corporation: *See*—
Scruggs, Michael G., 5,111,853, Cl. 140-123.600.

Danielson, George. Electrodeposition apparatus. 5,112,465, Cl. 204-278.000.

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Simpfendorfer, Dieter; Weil, Walter; and Dao-Xuan, Phon, 5,111,625, Cl. 51-267.000.

Darling, David: *See*—
Darling, Richard; Carron, Edward A.; and Darling, David, 5,112,051, Cl. 273-148.00B.

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Gignoux, Dominique; and Gouel, Roland, 5,113,421, Cl. 378-50.000.

Daubney, Stephan D.: *See*—
Palmer, John L.; Timmerman, Marsha W.; and Daubney, Stephan D., 5,112,741, Cl. 435-25.000.

Daum, Hermann: *See*—
Johna, Josef; Rasthofer, Lothar; and Daum, Hermann, 5,112,624, Cl. 426-2.000.

Daval, Jacques: *See*—
Cruz, Didier; and Daval, Jacques, 5,112,277, Cl. 454-195.000.

D'Avanzo, Donald C.: *See*—
Taylor, Thomas W.; and D'Avanzo, Donald C., 5,112,763, Cl. 437-39.000.

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Lee, Sywe N., 5,113,097, Cl. 307-475.000.

Davids, Joseph; and Silvestri, George J., Jr., to Westinghouse Electric Corp. Erosion control through reduction of moisture transport by secondary flow. 5,112,187, Cl. 415-169.300.

Davidson, Mark; Kaufman, Kalman; and Mazor, Isaac, to KLA Instruments Corporation. Method of image enhancement for the coherence probe microscope with applications to integrated circuit metrology. 5,112,129, Cl. 356-359.000.

Davies, Simon R. H., to Orkney Water Test Centre Limited. Method of coalescing a disperse phase within a continous phrase of a fluid mixture. 5,112,498, Cl. 210-708.000.

Davis, Graham: *See*—
Cozzette, Stephen N.; Davis, Graham; Holleritter, Lisa A.; Lauks, Imants R.; Piznik, Sylvia; Smit, Nicolaas J.; Tirinato, Jody A.; Wieck, Henry J.; and Zelin, Michael P., 5,112,455, Cl. 204-153.120.

Davis, Lorne A., Jr.; Pepin, Gregory P.; and Gebert, David L., to Texaco Inc. Method and apparatus for positioning a sample with repeatable accuracy. 5,113,420, Cl. 378-20.000.

Dawson, William J.; and Swartz, Scott L., to Battelle Memorial Institute. Process for producing sub-micron ceramic powders of perovskite compounds with controlled stoichiometry and particle size. 5,112,433, Cl. 156-623.00R.

Deal, James F., III, to Paradigm Technology Co., Inc. Method of cleaning heavily soiled textiles. 5,112,358, Cl. 8-137.000.

Debled, Beatrice: *See*—
Garapon, Jacques; Touet, Remi; Damin, Bernard; and Debled, Beatrice, 5,112,937, Cl. 528-272.000.

de Boer, Eetze A.: *See*—
de Jager, Willem; and de Boer, Eetze A., 5,113,146, Cl. 330-252.000.

De Clercq, Erik D. A.: *See*—
Miyasaka, Tadashi; Tanaka, Hiromichi; De Clercq, Erik D. A.; Baba, Masanori; Walker, Richard T.; and Ubasawa, Masaru, 5,112,835, Cl. 544-302.000.

Deeds, Ted D., to Mallory, Inc. Fuel pump regulator. 5,111,793, Cl. 123-457.000.

Deere & Company: *See*—
Hauk, Klaus, 5,113,046, Cl. 200-332.000.
Jensen, Roderick J.; and Weber, Jerry L., 5,112,279, Cl. 460-69.000.
Marks, Jeffrey C.; and Delaney, Jon R., 5,111,921, Cl. 192-4.00A.

deFraine, Paul: *See*—
Vivienne, Anthony; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Crowley, Patrick J.; and Anderton, Kenneth, 5,112,386, Cl. 71-94.000.

De Giacomi, Giancarlo. Car seat cover having the appearance of animals. 5,112,104, Cl. 297-229.000.

DeGrace, Louis G., Jr., to Siemens Automotive L.P. Fuel rail for bottom and side fed injectors. 5,111,794, Cl. 123-470.000.

DeGrendel, Glen A.: *See*—
Tolbert, Robert J.; and DeGrendel, Glen A., 5,112,013, Cl. 248-74.300.

DeGrood, Susan M.: *See*—
Spain, Raymond G.; and DeGrood, Susan M., 5,112,545, Cl. 264-103.000.

Deguchi, Masaaki; and Mizuno, Shigeru, to Brother Kogyo Kabushiki Kaisha. Hot melt ink jet apparatus having intervention member located between member and a printed printing sheet. 5,113,200, Cl. 346-25.000.

Deguchi, Masanobu, to Sharp Kabushiki Kaisha. Optical system driving device. 5,113,225, Cl. 355-235.000.

Degura, Yasusaburo; Sakanaka, Tetsuo; and Imano, Haruo, to Canon Kabushiki Kaisha. Communication system and apparatus using chip signals. 5,113,278, Cl. 359-154.000.

Degussa AG: *See*—
von Wedel, Wedigo; Senff, Elke; and Helmling, Oswald, 5,112,587, Cl. 423-235.000.
Weigert, Martin; Berchtold, Lorenz; and Schittny, Stephan U., 5,112,468, Cl. 204-298.130.

Dehling, Helmut, to Stewing Kunststoffbetrieb GmbH. Arrangement for closing a cable socket for connecting and branching cables, particularly telecommunication cables. 5,111,556, Cl. 24-270.000.

Dehling, Helmut, to Stewing Kunststoffbetrieb GmbH. Cable splice assembly for connecting and branching cables, particularly telecommunication cables. 5,113,038, Cl. 174-92.000.

Deiss, Michael S.: *See*—
Romesburg, Eric D.; Maze, Kenneth W.; Duffield, David J.; Deiss, Michael S.; Beyers, Billy W., Jr.; and Bridgewater, Kevin E., 5,113,259, Cl. 358-183.000.

de Jager, Willem; and de Boer, Eetze A., to U.S. Philips Corp. Amplifier arrangement. 5,113,146, Cl. 330-252.000.

Delaney, Jon R.: *See*—
Marks, Jeffrey C.; and Delaney, Jon R., 5,111,921, Cl. 192-4.00A.

Delatte, Daniel: *See*—
Klok, Cornelis; and Delatte, Daniel, 5,111,666, Cl. 62-48.100.

Deleeuw, David L.: *See*—
Bolkan, Steven A.; Brodbeck, Kelly J.; Brodbeck, Kevin J.; Deleeuw, David L.; Steichen, Dale S.; Strand, Bruce B.; Suk, Richard J. V.; Szuch, Kathleen D.; and Zielske, Alfred G., 5,112,514, Cl. 252-99.000.

Del Fabro, Giorgio: *See*—
Del Fabro, Marcello; and Del Fabro, Giorgio, 5,111,677, Cl. 72-164.000.

Del Fabro, Marcello; and Del Fabro, Giorgio, to MEP Macchine Elettroniche Piegatrici SpA. Orthogonal adjustment unit for straightening bars. 5,111,677, Cl. 72-164.000.

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Jensen, Erik D.; and Wood, Richard R., 5,112,160, Cl. 405-259.500.

Delphax Systems: *See*—
Theodoulou, Sotos M.; Gibbons, Duncan; Thomson, Christopher W.; and Khataan, Hassan A., 5,113,223, Cl. 219-220.000.

Delphi Technology, Inc.: *See*—
Bostic, Steve, 5,113,351, Cl. 364-479.000.

DeMejo, Lawrence P.; McCabe, John M.; and Wilson, John C., to Eastman Kodak Company. Toner compositions containing a multipurpose additive. 5,112,715, Cl. 430-109.000.

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Horvei, Knut; and Sandved, Jonas S., 5,112,698, Cl. 428-632.000.

Denes, Ferenc: *See*—
Barath, Peter; and Denes, Ferenc, 5,112,305, Cl. 604-96.000.

Dennison Systems Denmark: *See*—
Bekker-Madsen, Per, 5,112,427, Cl. 156-259.000.

De Peyer, Jacques: *See*—
Gericke, Rolf; Baumgarth, Manfred; Lues, Ingeborg; Bergmann, Rolf; and De Peyer, Jacques, 5,112,839, Cl. 514-337.000.

De Pree, Michael L.: *See*—
Nienhuis, James H.; Clark, Jeffrey L.; De Pree, Michael L.; and Beck, Robert L., 5,112,240, Cl. 439-215.000.

DePuy Du Pont Orthopaedics: *See*—
Paulos, Lonnie E.; France, E. Paul; and Ellingson, Richard L., 5,112,337, Cl. 606-96.000.

Derenge, Charles L.: *See*—
Brown, Thomas A.; Derenge, Charles L.; Hughes, Houston H., III; Szczutkowski, Craig; Teel, Vicki J.; and Tucker, Marcella M., 5,113,413, Cl. 375-40.000.

Derichs, Josef; and Hermanns, Ferdinand-Josef, to W. Schlafhorst AG & Co. Apparatus for controlling the contact pressure and/or relative motion between a bobbin cylinder and a bobbin. 5,112,000, Cl. 242-18.0DD.

DeRosa, Thomas F.; Von Allmen, Ronald W.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., to Texaco, Inc. VI improver, dispersant, and antioxidant additive and lubricating oil composition. 5,112,508, Cl. 252-51.50A.

DeRoyal Industries, Inc.: *See*—
Zachry, Kathy W., 5,112,325, Cl. 604-362.000.

DeSalvo, Stanley A.; and Scissons, Diane. Brush clearing implement. 5,111,599, Cl. 37-2.00R.

DeSesa, Michael A.: *See*—
Nae, Hemi N.; Cheng, Wei M.; and DeSesa, Michael A., 5,112,400, Cl. 106-197.100.

DeSimone, Michael J., to Motorola, Inc. Reconfigurable substrate for electric circuit connections. 5,112,230, Cl. 439-55.000.

Desjardins, Paul J.: *See*—
Burdea, Grigore C.; Dunn, Stanley M.; and Desjardins, Paul J., 5,113,424, Cl. 378-170.000.

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Desjoyaux, J. L.; Desjoyaux, P. L.; and Desjoyaux Epouse Jandros, C., 5,111,628, Cl. 52-169.700.

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Detroit Diesel Corporation: *See*—
MacGregor, James W., 5,112,145, Cl. 384-286.000.

Detroit Institute for Children, The: *See*—
Smallwood, John M.; and Custer, William A., 5,113,481, Cl. 395-2.000.

D'Ettorre, Jean-Marie, to Bouygues Offshore. Method and apparatus for recovering the substructure of an offshore platform. 5,111,764, Cl. 114-259.000.

Deutsch, Edward A.: *See*—
Woulfe, Steven R.; Deutsch, Edward A.; Dyszlewski, Mary M.; and Neumann, William L., 5,112,594, Cl. 424-1.100.
Woulfe, Steven R.; Deutsch, Edward A.; Dyszlewski, Mary M.; and Neumann, William L., 5,112,595, Cl. 424-1.100.

Deutsche Airbus GmbH: *See*—
Eilenstein, Wilfried; and Vogg, Guenter, 5,112,173, Cl. 410-79.000.

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Theus, Ulrich, 5,113,148, Cl. 330-253.000.

Deutsche Perrot-Bremse GmbH: *See*—
Rupprecht, Bernd, 5,111,915, Cl. 188-73.450.

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Kaaden, Jurgen; Uhde, Dietmar; and Bigge, Franz, 5,113,397, Cl. 371-5.100.

Dever, James L.; and Gill, James C., to Ferro Corporation. High-impact polystyrene containing low molecular weight brominated polystyrene. 5,112,896, Cl. 524-412.000.

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Randall, David; and De Vos, Rik, 5,112,879, Cl. 521-155.000.

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Van Santbrink, Ronald B.; and De Vries, Willem H. M., 5,113,432, Cl. 379-100.000.

Devtex: *See*—
Isoard, Bernard, 5,111,648, Cl. 57-261.000.

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De Wames, Roger E.; Goldberg, Ira B.; Morgan, Peter E. D.; Ratto, Joseph J.; Marshall, David B.; and Hall, William F., to Rockwell International Corporation. Superconductors with switchable magnetic domains. 5,113,164, Cl. 335-216.000.

Dewitt, John R.: *See*—
Cooke, Kevin K.; and Dewitt, John R., 5,112,119, Cl. 312-283.000.

Dhawan, Balram; Redmore, Derek; and Przybylinski, John L., to Petrolite Corporation. Methods for inhibition of scale in high brine environments. 5,112,496, Cl. 210-700.000.

Dial, Harold D.: *See*—
Winston, Philip E., Jr.; Dial, Harold D.; Clare, Kenneth; and Ortega, Theresa M., 5,112,445, Cl. 162-178.000.

Diamond, Ivan; Lawson, James J.; Lewicki, Walter J., Jr.; and Stavrinou, Stavros C., to Armstrong World Industries, Inc. Tile product having multiple levels of height, multiple levels of gloss and mortar-line surround. 5,112,671, Cl. 428-156.000.

Diaz, Carlos M.: *See—*
Eerkes, Thijs; Bell, James A. E.; and Diaz, Carlos M., 5,112,572, Cl. 419-30.000.

DiBenedetto, Arthur: *See—*
Shaub, Harold; Brownawell, Darrell W.; and DiBenedetto, Arthur, 5,112,482, Cl. 210-209.000.

Di Biasi, Daniel J.; and Schwab, Frederick C., to Mobil Oil Corporation. Kit providing thermally degradable compost bag. 5,111,933, Cl. 206-223.000.

Dicke, Stephen M.: *See—*
Citta, Richard W.; and Dicke, Stephen M., 5,113,256, Cl. 358-133.000.

Dickinson, Albert B., to Robbins, Edward S., III. Blow-molding methods for fabricating hollow articles from an open-ended tubular body of thermoplastic material. 5,112,561, Cl. 264-531.000.

DiDonato, Russell; and Sirvet, Enn, to Sequa Corporation. Mandrel trip subassembly for continuous motion can decorators. 5,111,742, Cl. 101-40.000.

Diehl GmbH & Co.: *See—*
Engel, Michael; Pepping, Karl-Heinz; and Gebhardt, Gunther, 5,111,711, Cl. 74-473.00R.
Thurner, Gunther; and Hammer, Helmut, 5,111,748, Cl. 102-387.000.

Diehl, Rodney A.; Uhrman, Robert L., Jr.; Bishop, Robert G.; and Campbell, Donald B., to Saturn Corporation. Transmission casing cover with tubular mechanically crimped conduit cast in situ. 5,111,872, Cl. 164-98.000.

Diener, Robert: *See—*
Bowman, Robert M.; Steele, Ronald E.; Browne, Leslie J.; Ewald, Bruce H.; and Diener, Robert, 5,112,845, Cl. 514-399.000.

Diesner, Willi, to Vaupel Textilmaschinen KG. Method of making textile labels to be applied to garments. 5,112,420, Cl. 156-88.000.

Diesso, Michael. Custom dental tray. 5,112,225, Cl. 433-48.000.

Dietl, Steffen, to Schott Glaswerke. Process and apparatus for the outer calibration of sections of glass tube. 5,112,376, Cl. 65-29.000.

Dietz, Erwin: *See—*
Sommer, Andreas; Dietz, Erwin; and Urban, Manfred, 5,112,404, Cl. 106-506.000.

Dietz, Hans, to Wurster u. Dietz GmbH u. Co. Maschinenfabrik. Method for flattening logs. 5,111,862, Cl. 144-357.000.

Diffracto, Ltd.: *See—*
Pryor, Timothy R., 5,112,131, Cl. 356-376.000.

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Finnerty, James L., 5,113,352, Cl. 364-490.000.
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Tuson, Rodney R.; and Dimanstein, Isaac, 5,113,334, Cl. 363-25.000.

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Blucher, Steven L.; and Altilio, Michael T., 5,111,728, Cl. 84-726.000.

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Umphries, Donald V., 5,111,885, Cl. 166-297.000.

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Simpfendorfer, Dieter; Weil, Walter; and Dao-Xuan, Phon, 5,111,625, Cl. 51-267.000.

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Huemmer, Wolfgang; Dobler, Walter; and Littmann, Dieter, 5,112,723, Cl. 430-287.000

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Mezger, Hans, 5,111,782, Cl. 123-90.310.
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Michel, Dieter; and Franz, Andreas, 5,113,066, Cl. 250-205.000.

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Knepper, Udo; Lutz, Franz; and Beyer, Viktor, 5,113,191, Cl. 342-119.000.

Dory, Jacques, to EDAP International, S.A. Piezoelectric article. 5,111,822, Cl. 128-660.030.

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Ohuchi, Jin; Kondoh, Isao; and Okada, Takashi, 5,112,581, Cl. 423-3.000.
Takashi, Yoshiharu; and Kihara, Yoshiyuki, 5,113,078, Cl. 250-515.100.

Doty, James H.: *See—*
SooHoo, Kie L.; Doty, James H.; and Ito, Paul H., 5,112,128, Cl. 356-350.000.

Dougherty, Lawrence: *See—*
Axel, Leon; and Dougherty, Lawrence, 5,111,820, Cl. 128-653.00A.

Doughty, Fred C., to Brown Jordan Company. Spring-action chair. 5,112,107, Cl. 297-288.000.

Douglas, John, to ABB Vetco Gray Inc. Temperature compensator for an optic fiber pressure transducer. 5,113,070, Cl. 250-227.210.

Douglas, Patrick J. Screening apparatus with tiltable vibratory screen. 5,112,474, Cl. 209-240.000.

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Nichels, William; and d'Oultremont, Philippe, 5,112,865, Cl. 514-546.000.

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Richey, Forrest A., Jr.; and Doumaux, Arthur R., Jr., 5,112,984, Cl. 548-320.000.

Dovan, Hoai T.; and Hutchins, Richard D., to Union Oil Company of California. Crosslinked hydroxyethylcellulose and its uses. 5,111,886, Cl. 166-300.000.

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Dunn, David A.; Paquette, Michael S.; Easter, Henry; and Pihlaja, Roger K., 5,112,579, Cl. 422-198.000.
Haag, Anthony P., 5,112,920, Cl. 525-294.000.
Heaton, Duane E., 5,112,451, Cl. 204-86.000.
Kester, John J.; and Silvis, H. Craig, 5,112,934, Cl. 528-99.000.
Koenig, Raymond A.; and Gan, Joseph, 5,112,932, Cl. 528-51.000.
Krupp, Stephen P.; Bieser, John O.; and Knickerbocker, Edward N., 5,112,686, Cl. 428-401.000.
Malone, Bruce A., 5,112,528, Cl. 252-500.000.
Pike, William C., 5,112,873, Cl. 521-32.000.
Tsou, Yu-Min; Hicks, Roy L.; and Burney, Harry S., Jr., 5,112,464, Cl. 204-265.000.

Dow Corning Corporation: *See—*
Burns, Gary T.; and Zank, Gregg A., 5,112,779, Cl. 501-90.000.

Dow Corning Toray Silicone Company, Ltd.: *See—*
Nakamura, Takashi, 5,112,512, Cl. 252-62.200.

Dowhan, Michael J.: *See—*
Greer, John; Chijiiwa, Haruhisa; and Dowhan, Michael J., 5,112,193, Cl. 416-220.00R.

Downer, Stephen H. Pedestaled seat. 5,112,103, Cl. 297-270.000.

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Rabiet, Jacques; Gimenez, Philippe; Guillou, Remi; and Drapier, Claude, 5,112,668, Cl. 428-137.000.

Dreifert, Karl-Heinz: *See—*
Kuhnt, Erhard; and Dreifert, Karl-Heinz, 5,111,615, Cl. 49-279.000.

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Eckstein, Gershon, 5,111,996, Cl. 239-542.000.

Drori, Mordeki. Filter system having multiple filter elements and backflushing assemblies. 5,112,481, Cl. 210-193.000.

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Besso, Erica M., 5,112,425, Cl. 156-247.000.
Boocock, John R. B.; and Harbourne, David A., 5,112,918, Cl. 525-209.000.

Dubats, Barbara A. Perambulating therapeutic support. 5,112,044, Cl. 482-68.000.

DuBois, Edmund H.: *See—*
McElroy, Kennedy K., Jr.; and DuBois, Edmund H., 5,112,259, Cl. 440-83.000.

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Wittrisch, Christian; and DuBois, Jean-Claude, 5,111,880, Cl. 166-250.000.

Dubroeucq, Marie-Christine; Moutonnier, Claude; Peyronel, Jean-Francois; Tabart, Michel; and Truchon, Alain, to Rhone-Poulenc Sante. Isoindolone derivatives. 5,112,988, Cl. 548-470.000.

Duff, Winslow K., to Westinghouse Electric Corp. Valve stem load monitoring system with means for monitoring changes in the valve yoke elongation. 5,111,690, Cl. 73-168.000.

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Romesburg, Eric D.; Maze, Kenneth W.; Duffield, David J.; Deiss, Michael S.; Beyers, Billy W., Jr.; and Bridgewater, Kevin E., 5,113,259, Cl. 358-183.000.

Duggan, Sharon A.: *See—*
Tilles, David J.; Wakamiya, Stanley K.; Krein, Bruce A.; Brown, Dale H.; Duggan, Sharon A.; and Schroeder, Mark S., 5,112,042, Cl. 271-297.000.

Duke, Susan A.: *See—*
Jackson, Robert J.; Duke, Susan A.; and Barnett, Paul, 5,112,600, Cl. 424-55.000.

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Dunaway, David L., to Eastman Kodak Company. Feedback control for receiver member in-track registration in an electrostatographic reproduction apparatus or the like. 5,112,038, Cl. 271-10.000.

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Burdea, Grigore C.; Dunn, Stanley M.; and Desjardins, Paul J., 5,113,424, Cl. 378-170.000.

Duperray, Gilbert: *See—*
Strassel, Albert; and Duperray, Gilbert, 5,112,692, Cl. 428-421.000.

Du Pont de Nemours, E. I., and Company: *See—*
Berzins, Talvildis; and Gosser, Lawrence W., 5,112,702, Cl. 429-17.000.
Cohen, Abraham B.; Fan, Roxy N.; and Quinn, John A., 5,112,726, Cl. 430-315.000.
Cohen, Gordon M., 5,112,917, Cl. 525-185.000.
Epstein, Bennett N., 5,112,908, Cl. 525-66.000.
Halm, Walter B.; Jones, William J., Jr.; Kirkbride, James F.; Marcus, Ilan; and Snyder, Adrian C., 5,112,684, Cl. 428-357.000.
Krespan, Carl G., 5,112,993, Cl. 549-254.000.
Kuchta, August D., 5,112,721, Cl. 430-281.000.
Roberts, Richard K., 5,112,696, Cl. 428-516.000.
Seagraves, Robert L., 5,113,016, Cl. 562-856.000.
Strantz, John W., Jr., 5,112,491, Cl. 210-651.000.

Duprez, Herve G.: *See—*
Chapman, David C.; and Duprez, Herve G., 5,113,451, Cl. 382-8.000.

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Ulrich, Lawrence W.; and Walker, Conrad, 5,112,288, Cl. 493-27.000.

Durst, Robert T., Jr.; and Hunter, Kevin D. Method and system for preventing unauthorized use of software. 5,113,518, Cl. 395-550.000.

Dusch, Albert, to Pfaff Industriemaschinen GmbH. Sewing machine with a lamp. 5,113,324, Cl. 362-90.000.

Dutton, Christopher J.; Gibson, Stephen P.; and Walshe, Nigel D. A., to Pfizer Inc. Method for making antiparasitic agents. 5,112,746, Cl. 435-100.000.

Dye, James S., to Zexel-Gleason USA, Inc. Rocker-mounting for differential gear. 5,112,284, Cl. 475-228.000.

Dynamit Nobel AG: *See—*
Blaser, Horst, 5,111,607, Cl. 42-44.000.

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Woulfe, Steven R.; Deutsch, Edward A.; Dyszlewski, Mary M.; and Neumann, William L., 5,112,594, Cl. 424-1.100.
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E.G.O. Elektro-Gerate Blanc u. Fischer: *See—*
Goessler, Gerhard; and Wilde, Eugen, 5,113,170, Cl. 337-394.000.

E & H Plastics, Inc.: *See—*
Hylak, Peter J.; and Berge, Gary L., 5,112,551, Cl. 264-219.000.

E-mu Systems, Inc.: *See—*
Rossum, David P., 5,111,727, Cl. 84-603.000.

E. R. Squibb & Sons, Inc.: *See—*
Treuner, Uwe D., 5,112,968, Cl. 540-355.000.

East Central Wax Company, Inc.: *See—*
Greene, Jack T., 5,112,652, Cl. 427-342.000.

East, Gary P.: *See—*
Pudenz, Robert H.; and East, Gary P., 5,112,303, Cl. 604-49.000.

Easter, Henry: *See—*
Dunn, David A.; Paquette, Michael S.; Easter, Henry; and Pihlaja, Roger K., 5,112,579, Cl. 422-198.000.

Eastman Kodak Company: *See—*
Allen, Terry W., 5,111,703, Cl. 73-864.110.
Allen, Terry W.; and Pioch, James J., 5,111,965, Cl. 221-281.000.
Baxter, Carlton D.; and Aslam, Muhammad, 5,112,717, Cl. 430-124.000.
Bryant, Steven M., 5,113,081, Cl. 250-571.000.
Cook, John W., 5,112,424, Cl. 156-243.000.
Covington, Roger G.; and Pagano, Daniel M., 5,112,003, Cl. 242-71.100.
DeMejo, Lawrence P.; McCabe, John M.; and Wilson, John C., 5,112,715, Cl. 430-109.000.
Dunaway, David L., 5,112,038, Cl. 271-10.000.
Itoh, Masahiro; and Kuwabara, Masayuki, 5,113,232, Cl. 357-17.000.
Lambert, Patrick M.; Bryan, Philip S.; Jarrold, Gregory S.; and Towers, Christine M., 5,112,700, Cl. 428-690.000.
Menendez, Juan G.; Caterisano, William P.; and Ball, John, 5,113,494, Cl. 395-163.000.
Nealon, Daniel A.; and Coolen, Richard B., 5,112,740, Cl. 435-15.000.
Nguyen, Khe C.; and Klose, Thomas R., 5,112,711, Cl. 430-58.000.
Scott, Kevin C., 5,113,455, Cl. 382-47.000.
Stoneham, Jeffrey R.; and Smart, David C., 5,113,208, Cl. 354-105.000.
Wang, Richard H. S., 5,112,893, Cl. 524-150.000.
Whitehead, Frank R.; and Marchant, Alan B., 5,113,386, Cl. 369-44.410.
Whitehouse, Craig M.; Whitehouse, Glenn P.; and Sesholtz, Debra A., 5,112,575, Cl. 422-116.000.
Wilson, James; Stephenson, LinMarie; and Corl, Kenneth G., 5,113,222, Cl. 355-209.000.
Witzeman, J. Stewart; and Nottingham, W. Dell, 5,113,011, Cl. 560-178.000.
Yacobucci, Paul D.; Yang, Hsinjin; and Weiss, David S., 5,112,935, Cl. 528-176.000.

Eastman Machine Company: *See—*
Pieroni, Robert J., 5,111,582, Cl. 30-225.000.

Eaton Corporation: *See—*
Hamilton, Martin W., 5,113,124, Cl. 318-578.000.
Reynolds, Joseph D., 5,111,922, Cl. 192-53.00E.
Sferlazzo, Piero, 5,113,074, Cl. 250-492.200.

Ebara Corporation: *See—*
Kajiwara, Kenichi; Mori, Kikuichi; Ikeda, Hideo; and Arakawa, Shinichiro, 5,112,190, Cl. 415-215.100.

Ebata, Takashi: *See—*
Koseki, Koshi; Ebata, Takashi; Kawakami, Hiroshi; Matsushita, Hajime; Itoh, Kazuo; and Naoi, Yoshitake, 5,112,994, Cl. 549-323.000.

Ebinuma, Ryuichi: *See—*
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Ebinuma, Ryuichi; and Kariya, Takao, 5,112,133, Cl. 356-401.000.

Echelon Corporation: *See—*
Evan, Shabtai; and Sander, Wendell B., 5,113,498, Cl. 395-275.000.

Eckenhoff, James B.: *See—*
Magruder, Judy A.; Eckenhoff, James B.; and Wright, Jeremy C., 5,112,614, Cl. 424-422.000.

Eckhardt, Helmut: *See—*
Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Fuchs, Gerhard H., 5,111,629, Cl. 52-171.000.

Eckhardt, Wolfgang: *See—*
Zondler, Helmut; Meyer, Alfred; Eckhardt, Wolfgang; and Kunz, Walter, 5,112,840, Cl. 514-341.000.

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Ed. Scharwachter GmbH & Co. KG: *See—*
Kluting, Bernd A., 5,112,091, Cl. 292-262.000.

EDAP International, S.A.: *See—*
Dory, Jacques, 5,111,822, Cl. 128-660.030.

Eduard Kusters Maschinenfabrik GmbH & Co KG: *See—*
Ahrweiler, Karl-Heinz; and Heimes, Bernd, 5,112,209, Cl. 425-371.000.

Edward Weck Incorporated: *See—*
Thornton, Curtis W., 5,112,343, Cl. 606-143.000.

Edwards, Brooks: *See—*
Bronstein, Irena Y.; Edwards, Brooks; and Juo, Rouh-Rong, 5,112,960, Cl. 536-18.100.

Eerkes, Thijs; Bell, James A. E.; and Diaz, Carlos M., to Inco Limited. Deoxidation treatment for consolidated atomized metal powder. 5,112,572, Cl. 419-30.000.

Effland, Richard C.; and Fink, David M., to Hoechst-Roussel Pharmaceuticals Inc. 5-(1-aminocyclohexyl)-2(1H)-pyridinone and related compounds. 5,112,981, Cl. 546-301.000.

Effland, Richard C.: *See—*
Shutske, Gregory M.; and Effland, Richard C., 5,112,830, Cl. 514-291.000.

Egashira, Noritaka; and Nakamura, Yoshinori, to Dai Nippon Insatsu Kabushiki Kaisha. Heat transfer image-receiving sheet. 5,112,799, Cl. 503-227.000.

Egawa, Akira: *See—*
Kobayashi, Eiji; and Egawa, Akira, 5,113,407, Cl. 372-61.000.

Eguchi, Shuji; Taketani, Noriaki; Tanno, Seikichi; Okabe, Yoshiaki; Terao, Hiromu; Asano, Hideki; Wajima, Motoyo; and Abe, Tomiya, to Hitachi, Ltd. Plastic optical fibers from polymers derived from metallic salts of ethylenic carboxyl monomers. 5,113,477, Cl. 385-143.000.

Eguchi, Yoshio: *See—*
Ueno, Tasaburo; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Yabuuchi, Naoya, 5,112,689, Cl. 428-407.000.

Ehara, Toshiyuki: *See—*
Yamazaki, Koji; Ueda, Shigenori; and Ehara, Toshiyuki, 5,112,709, Cl. 430-46.000.

EHOB Inc.: *See—*
Spahn, James G.; Langley, Steven P.; and Jacobs, Michael L., 5,111,807, Cl. 606-244.000.

EIC Laboratories, Inc.: *See—*
Carrabba, Michael M.; and Rauh, R. David, 5,112,127, Cl. 356-301.000.

Eicken, Karl: *See—*
Rueb, Lothar; Eicken, Karl; Plath, Peter; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,112,383, Cl. 71-92.000.

Eilenstein, Wilfried; and Vogt, Guenter, to Deutsche Airbus GmbH. Locking mechanism for latching a cargo piece to a loading floor. 5,112,173, Cl. 410-79.000.

Eisenbraun, Kenneth D. Light assembly kit for illuminating an article of clothing. 5,113,325, Cl. 362-103.000.

Eke, Alan B.: *See—*
Lund, James R.; and Eke, Alan B., 5,112,095, Cl. 296-91.000.

Elder, Wilson. Christmas tree stand and irrigation device. 5,111,611, Cl. 47-40.500.

Electronic Engineering and Manufacturing, Inc.: *See—*
Hatley, Brian J.; and Chinn, Richard A., 5,113,447, Cl. 381-27.000.

Eleftheriou, Evangelos S.: *See—*
Chevillat, Pierre R.; Eleftheriou, Evangelos S.; and Maiwald, Dietrich G. U., 5,113,401, Cl. 371-43.000.

Elf France: *See—*
Garapon, Jacques; Touet, Remi; Damin, Bernard; and Debled, Beatrice, 5,112,937, Cl. 528-272.000.

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Eli Lilly and Company: *See—*
Thakkar, Arvind L.; and Gibson, Lowell L., 5,112,619, Cl. 424-456.000.

Elison, Hans-Dieter: *See—*
Reik, Wolfgang; and Elison, Hans-Dieter, 5,111,924, Cl. 192-70.170.

Elkins, Robert B.: *See—*
Dix, Gary E.; Crowther, Russell L.; Colby, Mark J.; Matzner, Bruce; and Elkins, Robert B., 5,112,570, Cl. 376-370.000.

Ellentuch, Leonard: *See—*
Chow, Hsiu-Shen; and Ellentuch, Leonard, 5,112,243, Cl. 439-352.000.

Ellingson, Richard L.: *See—*
Paulos, Lonnie E.; France, E. Paul; and Ellingson, Richard L., 5,112,337, Cl. 606-96.000.

Elliott, Jason M.: *See—*
Baldwin, John J.; Selnick, Harold G.; Ponticello, Gerald S.; Remy, David C.; Claremon, David A.; and Elliott, Jason M., 5,112,824, Cl. 514-253.000.

Ellis, David M.: *See—*
Reiter, John T.; Ellis, David M.; Smith, Rick D.; and Leach, Roger D., 5,111,908, Cl. 182-92.000.

Ellis, Robert E.: *See—*
Blaettner, Harald E.; Uhen, Richard F.; Ellis, Robert E.; Cunningham, Eldon R.; Usher, Michael J.; and Miller, Joseph E., 5,113,104, Cl. 310-90.000.

Ellis, Roger D.: *See—*
Straw, Alan; and Ellis, Roger D., 5,112,525, Cl. 252-315.300.

ELTECH Systems Corporation: *See—*
Gestaut, Lawrence J.; Brannan, James R.; Vaccaro, Anthony J.; and Groszek, Donald J., 5,112,447, Cl. 205-148.000.

Emhart Inc.: *See—*
Baum, Heinz O.; and Reindl, Johann, 5,111,557, Cl. 24-662.000.
Gonzalez, Teodoro J., 5,111,994, Cl. 239-428.500.

Emmert, Dan H.; Creager, John E.; and Coha, Timothy F., to General Motors Corporation. Automotive fuel system. 5,111,844, Cl. 137-567.000.

EMS-Inventa AG: *See—*
Zeh, Bernhard, 5,111,849, Cl. 138-118.000.

Emuge-Werk Richard Glimpel Fabrik fur Prazisionswerkzeuge Vormals Moschkau & Glimpel: *See—*
Glimpel, Helmut, 5,112,168, Cl. 408-220.000.

Enderle, Eckhard: *See—*
Aehnelt, Peter; and Enderle, Eckhard, 5,111,592, Cl. 33-561.000.

Endo, Hiroshi, to Japan Aviation Electronics Industry, Ltd. Electrical contacts. 5,112,254, Cl. 439-852.000.

Endo, Kazuhito; Ishida, Masayuki; and Ishida, Yoshinobu, to Mitsubishi Denki Kabushiki Kaisha. Magnetic recorder/reproducer. 5,113,293, Cl. 360-32.000.

Endo, Keiji: *See—*
Sato, Atsushi; Kawakami, Shigenobu; Endo, Keiji; and Dohi, Hideyuki, 5,113,029, Cl. 385-6.300.

Endo Kogyo Co., Ltd.: *See—*
Sasaki, Hitoshi, 5,112,170, Cl. 409-124.000.

Endoh, Shigehiro: *See—*
Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.

Endres, Helmut: *See—*
Brands, Karl-Dieter; Endres, Helmut; Christophliemk, Peter; and Roland, Wolf-Achim, 5,112,414, Cl. 148-254.000.

Endress u. Hauser GmbH u. Co.: *See—*
Banholzer, Karlheinz; Gerst, Peter; and Jung, Peter, 5,111,698, Cl. 73-708.000.

Energy Absorption Systems, Inc.: *See—*
Laturner, John F., 5,112,028, Cl. 256-13.100.

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Engel, Michael; Pepping, Karl-Heinz; and Gebhardt, Gunther, to Diehl GmbH & Co. Coupling device for the gearshift linkage of motor vehicles. 5,111,711, Cl. 74-473.00R.

Engeler, William E.; O'Donnell, Matthew; Pedicone, John T.; and Bloomer, John J., to General Electric Company. Dynamic phase focus for coherent imaging beam formation. 5,111,695, Cl. 73-626.000.

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Brown, Steven A.; and Sennett, Paul, 5,112,782, Cl. 501-144.000.

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Platone, Edoardo; Prevedello, Aldo; and Rausa, Riccardo, 5,112,363, Cl. 44-280.000.
Rausa, Riccardo; Calemma, Vincenzo; and Menicagli, Roberto, 5,112,501, Cl. 210-730.000.

Enlund, Ernest E.: *See—*
Tapper, Glen D.; Raymond, Timothy J.; and Enlund, Ernest E., 5,112,184, Cl. 414-728.000.

Enomoto, Hajime; and Chou, Ming-Kou, to Fujitsu Limited. Image information code processing system. 5,113,457, Cl. 382-56.000.

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Ogura, Toshihiko; Aotsu, Hiroaki; Kimura, Koichi; Enomoto, Hiromichi; and Kyoda, Tadashi, 5,113,487, Cl. 395-100.000.

Enomoto, Masahiro; and Fukushima, Minoru, to Molex Incorporated. Electrical connector. 5,112,235, Cl. 439-83.000.

Ensci, Inc.: *See—*
Pinsky, Naum; and Alkaitis, Saulius A., 5,112,706, Cl. 429-233.000.

Ensign-Bickford Optics Company: *See—*
Skutnik, Bolesh J.; and Brielmann, Harry L., Jr., 5,112,658, Cl. 428-34.600.

Enviro-Klean Soils, Inc.: *See—*
Anderson, John D., 5,111,756, Cl. 110-240.000.

Enzymatics, Inc.: *See—*
Palmer, John L.; Timmerman, Marsha W.; and Daubney, Stephan D., 5,112,741, Cl. 435-25.000.

Epitope, Inc.: *See—*
Fellman, Jack H.; and Goldstein, Andrew S., 5,112,758, Cl. 436-8.000.

Epshetsky, Yefim; Belenky, Garry; and Khlevner, Boris, to Shkolnik, Alexander, a part interest. Bed with foldable earthquake protective cover. 5,111,543, Cl. 5-424.000.

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Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, to Merck Patent Gesellschaft mit beschrankter Haftung. Organometallic compounds. 5,112,432, Cl. 156-610.000.

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Niemann, Heinrich, 5,111,986, Cl. 226-21.000.

Erickson, Elwyn G.: *See—*
Cameron, T. Jay; Erickson, Elwyn G.; and Hemphill, Cornelius H., 5,111,713, Cl. 74-573.00R.

Ericsson GE Mobile Communications Holding, Inc.: *See—*
Lindell, Karl B., 5,113,416, Cl. 375-97.000.

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Brown, Thomas A.; Derenge, Charles L.; Hughes, Houston H., III; Szczutkowski, Craig; Teel, Vicki J.; and Tucker, Marcella M., 5,113,413, Cl. 375-40.000.

Erni, Markus: *See—*
Noser, Hans; and Erni, Markus, 5,113,123, Cl. 318-106.000.

Erregierre Industria Chimica S.p.A.: *See—*
Molinari, Egidio, 5,112,978, Cl. 546-240.000.

ESM International Inc.: *See—*
Long, William C., 5,111,926, Cl. 193-46.000.

Eta SA Fabriques d'Ebauches: *See—*
Bron, Alphonse, 5,113,382, Cl. 368-106.000.
Taghezout, Daho, 5,113,100, Cl. 310-40.0MM.

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Kassouf, Thomas L.; Fraser, Howard H., Jr.; Etemad, Shahrokh; and Lane, William R., 5,111,712, Cl. 74-570.000.

Ethyl Corporation: *See—*
Blocker, Wesley C., 5,112,942, Cl. 528-353.000.
Park, Won S.; and Marlett, Everett M., 5,113,025, Cl. 568-814.000.
Smith, Kim R.; Borland, James E.; and Sauer, Joe D., 5,113,017, Cl. 564-2.000.

Eto, Yoshizumi: *See—*
Akiyama, Toshiyuki; Mimura, Itaru; Ozawa, Naoki; Takahashi, Kenji; Eto, Yoshizumi; and Matsumoto, Takahiro, 5,113,247, Cl. 358-51.000.

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Buxton, Ian R.; Malkowska, Sandra T. A.; Prater, Derek A.; Singh, Deborah L.; Leslie, Stewart T.; and Miller, Ronald B., 5,112,515, Cl. 252-106.000.

Evan, Shabtai; and Sander, Wendell B., to Echelon Corporation. Input-/output section for an intelligent cell which provides sensing, bidirectional communications and control. 5,113,498, Cl. 395-275.000.

Evans, Arthur; and McManus, John R., to Carrier Corporation. Electric heater coil transferring and forming apparatus and method of use. 5,111,678, Cl. 72-134.000.

Evans, Geoffrey: *See—*
Cheng, J. Joseph; Snow, Richard R.; Evans, Geoffrey; Bamford, Charles R.; and Milnes, Harold B., 5,112,778, Cl. 501-31.000.

Evans, William T.: *See—*
Lemon, J. Robert; Evans, William T.; Christian, Robert E.; and Bader, Herbert I., 5,112,226, Cl. 433-72.000.

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Hunter, James C.; Nardi, John C.; Russell, Edwin T.; and Scarr, Robert F., 5,112,705, Cl. 429-206.000.

Evreux, Gerard; and Camps, Didier, to Somfy. Device for automatically halting an electric motor after a certain number of revolutions. 5,111,925, Cl. 192-141.000.

Ewald, Bruce H.: *See—*
Bowman, Robert M.; Steele, Ronald E.; Browne, Leslie J.; Ewald, Bruce H.; and Diener, Robert, 5,112,845, Cl. 514-399.000.

Exxon Chemical Company Inc.: *See—*
German, Paul M.; and Arvedson, Marsha M., 5,112,674, Cl. 428-216.000.

Exxon Chemical Patents Inc.: *See—*
Marsh, John F.; Vernet, Marc R. M.; and Hamey, Graham W., 5,112,506, Cl. 252-33.400.
Myers, Richard S.; Mills, Daniel R.; and Michaelson, Robert C., 5,113,033, Cl. 585-506.000.
Rossi, Albert, 5,112,510, Cl. 252-56.00R.

Exxon Production Research Company: *See—*
Tang, Joseph S.; and Harker, Bradford C., 5,111,882, Cl. 166-252.000.

Exxon Research and Engineering Company: *See—*
Shaub, Harold; Brownawell, Darrell W.; and DiBenedetto, Arthur, 5,112,482, Cl. 210-209.000.
Soled, Stuart L.; Dispenziere, Nicholas C., Jr.; Saleh, Ramzi Y.; and Miseo, Sabato, 5,113,034, Cl. 585-510.000.

Faas, Denis W.: *See—*
Damerow, David H.; Young, William R.; and Faas, Denis W., 5,113,361, Cl. 364-721.000.

Faase, John G.: *See—*
Albonesi, David H.; Langendorf, Brian K.; Chang, John; Faase, John G.; and Homberg, Michael J., 5,113,514, Cl. 395-425.000.

Facet Quantek, Inc.: *See—*
Mohr, Kirby S., 5,112,478, Cl. 210-96.100.

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Fagan, Robert, deceased; and Fagan, Ellen, personal administrator, 5,112,123, Cl. 353-97.000.

Fagan, Robert, deceased; and by Fagan, Ellen, personal administrator. Masking device for overhead projector. 5,112,123, Cl. 353-97.000.

Fairbanks, David W., to RCA Thomson Licensing Corporation. Tensioned shawod mask/frame assembly for a color picture tube. 5,113,111, Cl. 313-404.000.

Fairbanks, Gary G.: *See—*
Pentel, Jerry; and Fairbanks, Gary G., 5,111,746, Cl. 102-308.000.

Fairley, Frank E.: *See—*
Gore, Charles E.; Fairley, Frank E.; Hardee, Edward; and Medeen, Carl T., 5,111,861, Cl. 144-256.100.

Falcon, Randy E. Dual pitched melodeon. 5,111,726, Cl. 84-375.000.

Falk, Ernst: *See—*
Hiltebrandt, Siegfried; Dingler, Andreas; Falk, Ernst; and Fischmeister, Martin F., 5,112,346, Cl. 606-170.000.

Falke, Holger; and Strauss, Guenther, to GUTEC, Gesellschaft zur Entwicklung von Umweltschutztechnologie mbH. Supported catalyst for oxidizing carbon monoxide. 5,112,787, Cl. 502-159.000.

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Cohen, Abraham B.; Fan, Roxy N.; and Quinn, John A., 5,112,726, Cl. 430-315.000.

Fanuc Ltd.: *See—*
Kiya, Nobuyuki; Maeda, Kimio; and Saiki, Yoshiharu, 5,113,359, Cl. 364-578.000.
Kobayashi, Eiji; and Egawa, Akira, 5,113,407, Cl. 372-61.000.
Seki, Masaki; Takegahara, Takashi; and Matsunaka, Toru, 5,113,050, Cl. 219-69.120.
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Torii, Nobutoshi; Ito, Susumu; Hamura, Masayuki; and Tanaka, Akira, 5,111,709, Cl. 74-89.150.

Farbood, Mohamad I.; McLean, Lynda B.; Morris, James A.; and Bondarovich, Henry A., to International Flavors & Fragrances Inc. Octalactone-containing composition, fermentation process for producing same and organoleptic uses thereof. 5,112,803, Cl. 512-11.000.

Farineau, Jacques, to Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle. Pitch control system for aircraft. 5,112,009, Cl. 244-75.00R.

Farley, David L. Anatomically conformable foam support pad. 5,111,542, Cl. 5-464.000.

Farmer, Douglas A., Jr.; Hani, Rahim; and Waldron, Craig, to Olin Corporation. Process for stabilizing zinc pyrithione plus cuprous oxide in paint. 5,112,397, Cl. 106-18.330.

Farnum, Charles L.: *See—*
Correa, Jose L.; Stumpf, Robert C.; Farnum, Charles L.; and Roos, Leo, 5,112,428, Cl. 156-324.000.

Farr, Andrew F., to InterVentional Technologies. Atherectomy cutter with arcuate blades. 5,112,345, Cl. 606-159.000.

Farris, Timothy M., to General Motors Corporation. Window motor attachment to vehicle door. 5,111,715, Cl. 74-606.00R.

Faust, Michael C.; Pinckney, Keith T.; and Wong, Janelle K., to Minnesota Mining and Manufacturing Company. Seal system and method for containers. 5,111,953, Cl. 220-214.000.

Fautier, Thierry, to U.S. Philips Corporation. Method of and device for decoding animated images. 5,113,243, Cl. 358-21.00R.

Fees, Hans-Joerg: *See—*
Altmann, Rainer; Lauer, Rainer; Schmidt, Guenther; Stromski, Kasimir; van Zanten, Anton; Hellmann, Harald; Veil, Karl; Fees, Hans-Joerg; Jonner, Wolf-Dieter; and Gutzeit, Reinhard, 5,112,117, Cl. 303-116.00R.

Fehlhaber, Hans-Wolfram: *See—*
Chatterjee, Sukumar; Chatterjee, Sugata; Ganguli, Bimal N.; Chatterjee, Deepak K.; Jani, Rajendra K. H.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; Kogler, Herbert; Seibert, Gerhard; and Teetz, Volker, 5,112,806, Cl. 514-9.000.
Roy, Kirity; Mukhopadhyay, Triptikumar; Reddy, Goukanapalli C. S.; Vijayakumar, Erra K. S.; Ganguli, Bimal N.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; and Kogler, Herbert, 5,112,858, Cl. 514-462.000.

Fehn, Norbert: *See—*
Strenzke, Hilmar; and Fehn, Norbert, 5,111,658, Cl. 60-327.000.

Feith, Bernhard, to AKZO NV. Liquid coating composition including, as a crosslinking agent, an unblocked monoprimary amine. 5,112,904, Cl. 525-59.000.

Feld, Kenneth M.: *See—*
Luber, Joseph R.; Feld, Kenneth M.; Harwood, Richard J.; and Grim, Wayne M., 5,112,813, Cl. 514-54.000.

Felix Wopfner KG: *See—*
Zlotek, Rudolf, 5,111,751, Cl. 104-209.000.

Fellman, Jack H.; and Goldstein, Andrew S., to Epitope, Inc. Treating body fluids for diagnostic testing. 5,112,758, Cl. 436-8.000.

Fenton, Paul V., Jr.; Young, Thomas M.; and Gorman, William J., to Strato Medical Corporation. Bidirectional check valve catheter 5,112,301, Cl. 604-30.000.

Ferag AG: *See—*
Honegger, Werner, 5,112,041, Cl. 271-286.000.

Fergason, James L. Variable density light control apparatus. 5,113,270, Cl. 359-37.000.

Fergason, James L. Light blocking and vision restoration apparatus with glint control. 5,113,271, Cl. 359-38.000.

Ferguson, John R.: *See—*
Koza, John R.; Ferguson, John R.; and Torneros, Maximiano D., 5,112,050, Cl. 273-139.000.

Ferrand, Guy: *See—*
Marcon, Joel; Montet, Evelyne; Gobet, Didier; Ferrand, Guy; Pochard, Patrick; and Simon, Georges, 5,111,732, Cl. 89-135.000.

Ferranti International plc: *See—*
O'Connor, Raymond J.; and Henly, Nicholas C., 5,112,026, Cl. 251-63.000.

Ferro Corporation: *See—*
Dever, James L.; and Gill, James C., 5,112,896, Cl. 524-412.000.
Dever, James L.; and Gill, James C., 5,112,897, Cl. 524-412.000.
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Feurgard, Rene , to Framatome. Device for shutting off a vertical conduit for supporting and guiding an element of elongate shape. 5,112,567, Cl. 376-245.000.

Ficalora, John A.: *See—*
Buckler, Robert T.; Dailey, Frank A.; Ficalora, John A.; Gavin, John J.; and Plunkett, Gregory A., 5,112,738, Cl. 435-7.930.

Fidler, Delmer A.: *See—*
Boudakian, Max M.; and Fidler, Delmer A., 5,112,983, Cl. 548-263.200.

Fink, David M.: *See—*
Effland, Richard C.; and Fink, David M., 5,112,981, Cl. 546-301.000.

Finnerty, James L., to Digital Equipment Corporation. Integrating the logical and physical design of electronically linked objects. 5,113,352, Cl. 364-490.000.

Finter, Jurgen: *See—*
Fischer, Walter; Baumann, Marcus; Finter, Jurgen; Kvita, Vratislav; Mayer, Carl W.; and Wernet, Wolfgang, 5,112,977, Cl. 546-195.000.
Fischer, Walter; Baumann, Marcus; Finter, Jurgen; Kvita, Vratislav; Mayer, Carl W.; and Wernet, Wolfgang, to Ciba-Geigy Corporation. Substituted naphthacene-5,12-diones. 5,112,977, Cl. 546-195.000.

Fischmeister, Martin F.: *See—*
Hiltebrandt, Siegfried; Dingler, Andreas; Falk, Ernst; and Fischmeister, Martin F., 5,112,346, Cl. 606-170.000.

Fisher, Gordon S.: *See—*
Hron, Robert J., Sr.; Abraham, George; Kuk, Myong S.; and Fisher, Gordon S., 5,112,637, Cl. 426-629.000.

Fitch, Donald G.: *See—*
Bischel, Patrick O.; Brown, John K., III; Cole, Carl P.; and Fitch, Donald G., 5,113,488, Cl. 395-112.000.

Fite, David B.; Hetherington, Ricky C.; McKeon, Michael M.; Manley, Dwight P.; and Murray, John E., to Digital Equipment Corporation. Virtual instruction cache system using length responsive decoded instruction shifting and merging with prefetch buffer outputs to fill instruction buffer. 5,113,515, Cl. 395-425.000.

Fitzgerald, Robert. Cordless telephone headset. 5,113,428, Cl. 379-61.000.
Fitzner, Jeffrey N.: *See*—
Gustavson, Linda M.; Srinivasan, Ananthachari; Kasina, Sudhakar; Reno, John M.; Fitzner, Jeffrey N.; and Jones, David S., 5,112,953, Cl. 530-391.500.
Fixel, Irving E. Intramedullary nail. 5,112,333, Cl. 606-62.000.
Fjare, Kristi A.: *See*—
Belmonte, Frank G.; Fjare, Kristi A.; and Partenheimer, Walter, 5,112,992, Cl. 549-245.000.
Palmer, David A.; Larson, Keith D.; and Fjare, Kristi A., 5,113,015, Cl. 562-608.000.
Flading, Donald P.; and Mavretish, Robert S., to Westinghouse Electric Corporation. Debris tolerant seal. 5,112,222, Cl. 432-115.000.
Fletcher, Thomas A., to Honeywell Inc. Sealed focusing assembly for an industrial vision system. 5,113,290, Cl. 359-823.000.
FLEXA GmbH & Co. Produktion und Vertrieb KG: *See*—
Gruber, Ernst; and Bamberg, Alfred, 5,112,086, Cl. 285-86.000.
Flo, Larry D. Bait moving fishing bobber. 5,111,609, Cl. 43-26.100.
Flood, Ronald; and Young, Kenneth. Modular display construction system. 5,111,631, Cl. 52-646.000.
Floris, Pier-Luigi; and O'Toole, Yvonne. Method and apparatus for obtaining electrical signals correlated with the position of a mass of mercury in instruments and the like. 5,111,700, Cl. 73-749.000.
Floss Products Corporation: *See*—
Ahmad, Mohammad R.; and Barke, Oscar A., 5,112,611, Cl. 424-195.100.
Flow Technology, Inc.: *See*—
Halpin, Michael W., 5,111,682, Cl. 73-3.000.
Floyd, Louis C.: *See*—
Striech, Steven G.; Jacobs, Ricky D.; Herndon. Daniel C.; and Floyd, Louis C., 5,111,884, Cl. 166-382.000.
Fluid Components, Inc.: *See*—
McQueen, Malcolm M.; and Allen, David J., 5,111,692, Cl. 73-295.000.
Fluoroware: *See*—
Kos, Robert D., 5,111,936, Cl. 206-334.000.
Flynn, Anita M.: *See*—
Brooks, Rodney A.; Tavrow, Lee S.; and Flynn, Anita M., 5,113,117, Cl. 310-328.000.
Flynn, Daniel L.: *See*—
Belliotti, Thomas R.; Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; Kramer, James B.; and Sircar, Jagadish C., 5,112,846, Cl. 514-415.000.
Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; and Sircar, Jagadish C., 5,112,868, Cl. 514-618.000.
Foerster, Gerhard R. H.; Kramer, Foppe; Munnig Schmidt, Robert H.; and Van Roemburg, Franciscus M. J., to U.S. Philips Corp. Depilator. 5,112,342, Cl. 606-133.000.
Foggia, David J. Scrotum supporting condom with retention means. 5,111,831, Cl. 128-842.000.
Fohl, Timothy: *See*—
Lapatovich, Walter P.; Proud, Joseph M.; and Fohl, Timothy, 5,113,121, Cl. 315-248.000.
Folsom, Richard R. Apparatus for raising and lowering a trolling motor. 5,112,258, Cl. 440-63.000.
Fond, Andre, to HOSPAL Industrie. Calibration method for a pulse response flowmeter. 5,111,683, Cl. 73-3.000.
Fontana, James A.: *See*—
Talbott, Jefferson F.; Cowgill, Richard A.; Cummings, Chris R.; Fontana, James A.; and Pitchford, Anthony R., 5,113,500, Cl. 395-325.000.
Fontichiaro, Dominic; and Kabat, Daniel M., to Ford Motor Company. Air cell for an internal combustion engine. 5,111,786, Cl. 123-256.000.
Foote, Steven A., to Sundstrand Corporation. Accelerometer with rebalance coil stress isolation. 5,111,694, Cl. 73-497.000.
Ford Motor Company: *See*—
Aittama, Robert W.; and Noggle, Francis E., 5,111,858, Cl. 141-312.000.
Busch, John; and Potter, William E., 5,112,085, Cl. 285-39.000.
Fontichiaro, Dominic; and Kabat, Daniel M., 5,111,786, Cl. 123-256.000.
Gettel, Roger W., 5,111,660, Cl. 60-468.000.
Kennedy, John F., 5,113,446, Cl. 381-10.000.
Niedbala, Patrick J., 5,111,984, Cl. 225-1.000.
Thompson, Robert H., 5,111,795, Cl. 123-519.000.
Ford New Holland, Inc.: *See*—
Ball, Garry L.; Johnson, Russell I.; and Radke, Daniel D., 5,111,578, Cl. 29-891.000.
Forgnone, Frederick: *See*—
Bolejack, Kevin J.; and Forgnone, Frederick, 5,111,639, Cl. 53-408.000.
Forsyth, Allen P.: *See*—
Wagner, Edwin R.; and Forsyth, Allen P., 5,112,113, Cl. 303-71.000.
Forsythe, Alan K.: *See*—
Morris, John M.; Stephens, Charles E.; and Forsythe, Alan K., 5,111,837, Cl. 137-72.000.
Fortney, Donald. Therapeutic thermal wrap kit. 5,111,810, Cl. 128-402.000.
Fortune, Jeffrey L. Self-contained modular unit. 5,111,626, Cl. 52-79.100.
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McKeen, Francis X.; Fossum, Tryggve; Bhandarkar, Dileep P.; and Wiecek, Cheryl A., 5,113,521, Cl. 395-650.000.
Foster, Clark B.: *See*—
Haber, Terry M.; and Foster, Clark B., 5,112,307, Cl. 604-110.000.
Foster, John P.; Comstock, Robert J.; Worcester, Samuel A.; and Sabol, George P., to Westinghouse Electric Corp. Zirlo material for light water reactor applications. 5,112,573, Cl. 420-422.000.
Foster, Ronald A.; and Reyes, Ruben A. Neon tube lighting system, support assembly and extrusion therefor. 5,113,328, Cl. 362-223.000.
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LeDoux, Patrick; and Fourgaut, Luc, 5,112,211, Cl. 425-384.000.
Fox, Ronald C. S., to Alcatel N.V. Battery boosted dial memory. 5,113,434, Cl. 379-413.000.
Foxconn International, Inc.: *See*—
Choy, Conrad Y.; and Yu, Jack, 5,112,242, Cl. 439-326.000.
Framatome: *See*—
Feurgarg, Rene , 5,112,567, Cl. 376-245.000.
France, E. Paul: *See*—
Paulos, Lonnie E.; France, E. Paul; and Ellingson, Richard L., 5,112,337, Cl. 606-96.000.
Francis, David, executor: *See*—
Parker, John C., deceased; Francis, David, executor; and Smith, James I. H., executor, 5,113,069, Cl. 250-227.110.
Frangiamore, George P. Method and apparatus for cleaning marine equipment including boats, engines and trailers therefor. 5,111,762, Cl. 114-222.000.
Franklin Electronic Publishers, Incorporated: *See*—
McWherter, David, 5,113,340, Cl. 364-419.000.
Franklin, Henry E.; Gold, Ronald S.; Jachimowicz, Karen E.; Poley, Harold J.; and Trimmier, J. Robert, to Honeywell Inc. Full color three-dimensional flat panel display. 5,113,285, Cl. 359-465.000.
Franz, Andreas: *See*—
Michel, Dieter; and Franz, Andreas, 5,113,066, Cl. 250-205.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef; and Praschl, Wilhelm, 5,111,749, Cl. 104-2.000.
Franzen, Robert E.: *See*—
Grunze, Mark R.; and Franzen, Robert E., 5,111,575, Cl. 29-725.000.
Frase, Roland J., to General Motors Corporation. Engine protector with non-override reset. 5,111,785, Cl. 123-198.00D.
Fraser, Bruce A.: *See*—
Dormer, Michael J.; Fraser, Bruce A.; and Nelson, Timothy V., 5,111,737, Cl. 92-187.000.
Fraser, Howard H., Jr.: *See*—
Kassouf, Thomas L.; Fraser, Howard H., Jr.; Etemad, Shahrokh; and Lane, William R., 5,111,712, Cl. 74-570.000.
Frater, Georg; and Helmlinger, Daniel, to Givaudan Corporation. Process for the manufacture of a mixture of α- and β-irone. 5,113,021, Cl. 568-341.000.
Frecska, Laszlo: *See*—
Hartford, James T.; and Frecska, Laszlo, 5,112,162, Cl. 407-49.000.
Frederiksen, Bjarne: *See*—
Ruehl, William E.; Frederiksen, Bjarne; and Swick, E. Grant, 5,113,169, Cl. 337-265.000.
Freeman, Bobby J.: *See*—
Dinwiddie, John M., Jr.; Freeman, Bobby J.; Grice, Lonnie E.; Loffredo, John M.; Sanderson, Kenneth R.; and Suarez, Gustavo A., 5,113,522, Cl. 395-700.000.
Freeman, Gary M.; and Broome, Thad T., to J. M. Huber Corporation. Pigment system for paints. 5,112,402, Cl. 106-416.000.
Freeport-McMoran Resource Partners, Limited Partnership: *See*—
Murray, Michael A.; and Weston, Charles W., 5,112,499, Cl. 210-713.000.
Frentzel, Richard L.; and Chen, Andrew, to Advanced Products Inc. Highly conductive polymer thick film compositions. 5,112,687, Cl. 428-402.000.
Frey, Douglas R.: *See*—
Hoffman, Philip K.; and Frey, Douglas R., 5,113,127, Cl. 320-21.000.
Fridman, Jerome Y., to Kelco Water Engineering, Inc. Water dispenser. 5,111,966, Cl. 222-1.000.
Friend, David R., to Idemitsu Kosan Company, Ltd. Microencapsulated lubricating fluids and additives and method of making same. 5,112,541, Cl. 264-4.700.
Friesen, Harold W.: *See*—
Adriaenssens, Luc W.; Friesen, Harold W.; Nutt, Wendell G.; and Parks, Kenneth B., 5,113,159, Cl. 333-12.000.
Frish, Michael B.; Morency, Joseph; Johnson, Stephen A.; and Boni, Arthur A., to Physical Sciences, Inc. Apparatus for combustion, pollution and chemical process control. 5,112,215, Cl. 431-3.000.
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Nufer, Karl; and Reber, Lorenz, 5,111,758, Cl. 112-266.100.
Frostl, Wolfgang; and Zust, Armin, to Ciba-Geigy Corporation. Hydrogenated 1-benzooxacycloalkylpyridinecarboxylic acid compounds and compositions. 5,112,855, Cl. 514-456.000.
Frutschi, Hans-Ulrich: *See*—
Nicolin, Curt; Frutschi, Hans-Ulrich; and Bolis, Giacomo, 5,111,662, Cl. 60-655.000.
Fuchs, Gerhard H.: *See*—
Baughman, Ray H.; Buff, Ernest D.; Eckhardt, Helmut; and Fuchs, Gerhard H., 5,111,629, Cl. 52-171.000.
Fuchs, Lucie: *See*—
Howard, Johannes; and Fuchs, Lucie, 5,112,270, Cl. 452-66.000.
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Nakamura, Katsunari; Ueda, Keiichiro; Irie, Yoshiro; Hoshi, Toyokazu; and Kawakami, Motozou, 5,113,349, Cl. 364-478.000.
Nishibe, Takashi, 5,113,215, Cl. 354-408.000.
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Mine, Atsushi; Kamimura, Katsuyoshi; and Hiwatashi, Yutaka, 5,113,345, Cl. 364-424.050.
Sato, Keiji, 5,112,280, Cl. 474-18.000.
Fuji Photo Film Co., Ltd.: *See*—
Hayashi, Kazunori, deceased; Hayashi, Masahiro, heir; and Hayashi, Masako, heir, 5,112,732, Cl. 430-596.000.
Ihama, Mikio, 5,112,733, Cl. 430-603.000.
Inaba, Hiroo; Kakuta, Takeshi; Yamauchi, Koichi; and Matsufuji, Akihiro, 5,112,680, Cl. 428-329.000.
Inukai, Yuzo, 5,111,848, Cl. 138-30.000.
Kamiya, Akihiko; Koike, Akinobu; and Imai, Masanori, 5,112,743, Cl. 430-175.000.
Karino, Yukio, 5,112,720, Cl. 430-213.000.
Kasai, Seishi; Ishii, Kazuo; and Kato, Eiichi, 5,112,712, Cl. 430-95.000.
Kato, Eiichi; and Ishii, Kazuo, 5,112,713, Cl. 430-96.000.
Kato, Eiichi; and Hattori, Hideyuki, 5,112,716, Cl. 430-114.000.
Kato, Eiichi; and Hattori, Hideyuki, 5,112,718, Cl. 430-114.000.
Kimura, Hideaki; and Shimazaki, Osamu, 5,113,456, Cl. 382-54.000.
Kobayashi, Yasuhito; and Matsuo, Junichi, 5,113,265, Cl. 358-330.000.
Mihayashi, Keiji, 5,112,729, Cl. 430-546.000.
Miyasaka, Nobuaki, 5,112,731, Cl. 430-567.000.
Nagata, Atsushi; and Misawa, Atsushi, 5,113,214, Cl. 354-402.000.
Nakagawa, Jun; Kawamata, Toshio; and Sano, Kunihiko, 5,112,679, Cl. 428-323.000.
Oda, Kazuya, 5,113,245, Cl. 358-41.000.
Ohkawa, Atsuhiro; Kamio, Takayoshi; Motoki, Masuzi; and Mihayashi, Keiji, 5,112,730, Cl. 430-553.000.
Watanabe, Toshihiro; Ishiyama, Masashi; and Masuda, Noriaki, 5,112,651, Cl. 427-339.000.
Yoden, Kenichi; and Yasunaga, Tadashi, 5,112,669, Cl. 428-141.000.
Fuji Seiko Corporation: *See*—
Shiga, Kiyotaka; Fukui, Akio; Ryu, Akiomi; and Okuno, Katsumi, 5,112,167, Cl. 408-211.000.
Fuji Xerox Co.: *See*—
Ichiyanagi, Yoshio; and Aoyama, Teruyuki, 5,113,251, Cl. 358-75.000.
Fuji Xerox Co., Ltd.: *See*—
Hibi, Yoshiharu; and Seki, Masao, 5,113,248, Cl. 358-75.000.
Nomura, Hideki, 5,113,355, Cl. 395-109.000.
Fujii, Hiroshi: *See*—
Kawashima, Tsunenori; Shimada, Morihiro; and Fujii, Hiroshi, 5,111,585, Cl. 33-203.120.
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Honda, Yuzuru; Fujii, Tateo; and Watanabe, Koji, 5,112,421, Cl. 156-148.000.
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Saruwatari, Masumi; Ohta, Yasuhiko; Fujii, Yasuhiro; and Honji, Yasuko, 5,112,557, Cl. 264-289.300.
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Inoue, Yoshio; Arai, Masatoshi; and Fujiki, Hironao, 5,112,885, Cl. 523-213.000.
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Kobayashi, Tomomi; Kobayashi, Akira; Fujimoto, Hiroshi; Saiki, Norihiko; and Imazu, Katsuhiro, 5,111,679, Cl. 72-348.000.
Fujino, Akihiko: *See*—
Izumi, Shuji; Nakai, Masaaki; Inoue, Manabu; Fujino, Akihiko; Kawamura, Kunio; Takarabe, Yuji; and Niwa, Masatake, 5,113,217, Cl. 354-471.000.
Fujirebio Kabushiki Kaisha: *See*—
Masaki, Mitsuo; Uehara, Masaki; Hirate, Kenji; Isowa, Yoshikazu; Sato, Yoshiaki; and Nakashima, Yoshiharu, 5,112,947, Cl. 530-329.000.
Fujishige, Shoei; Numajiri, Rikio; and Aragane, Hideyuki, to Director-General of the Agency of Industrial Science and Technology; and Kashima Oil Co., Ltd. Thickner composition and a method for the preparation thereof. 5,112,965, Cl. 536-114.000.
Fujita, Minoru; and Nakahara, Yoshihiko, to Kyodo Printing Co., Ltd. Magnetic card having thermal recording layer and arrangement of magnetic bars for recording security information. 5,113,062, Cl. 235-493.000.
Fujita, Takashi, to Mitsubishi Petrochemical Company Limited. Catalyst for polymerization of olefin monomers. 5,112,786, Cl. 502-119.000.
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Sugawara, Mitsuru, 5,113,283, Cl. 359-248.000.
Fujitsu Limited: *See*—
Enomoto, Hajime; and Chou, Ming-Kou, 5,113,457, Cl. 382-56.000.
Hayashi, Hajime; Igarashi, Yutaka; Hayashi, Takehiko; Shimura, Takaki; and Kawabe, Kenji, 5,113,136, Cl. 324-247.000.
Imamura, Takahiro; Mizoshita, Yoshifumi; and Aruga, Keiji, 5,112,147, Cl. 384-605.000.
Kinoshita, Kazumi; Takato, Kenji; and Tojo, Toshiro, 5,113,426, Cl. 379-33.000.
Mochizuki, Akihiro; Hama, Hideo; and Hirose, Mitsuaki, 5,113,273, Cl. 359-56.000.
Yamamoto, Takuji; Hamano, Hiroshi; Amemiya, Izumi; Arai, Yasunari; and Ihara, Takeshi, 5,113,151, Cl. 330-308.000.
Fujiura, Youji: *See*—
Sakakibara, Megumu; Tanaka, Keiji; and Fujiura, Youji, 5,112,903, Cl. 525-54.200.
Fujiwara, Goro; Masuda, Mitsunobu; Shiraishi, Masanori; and Matsumoto, Nobuya, to Takuma Co., Ltd.; Suntory Limited; and Shinanen New Ceramic Corporation. Machine element for use in liquid treating system. 5,112,486, Cl. 210-416.100.
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Sasaki, Setsuo; Taguchi, Teruo; and Fujiwara, Isao, 5,113,309, Cl. 361-302.000.
Fukahori, Toshio: *See*—
Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.
Fukamachi, Yoshihiro: *See*—
Tada, Shigeru; Nagano, Jun; and Fukamachi, Yoshihiro, 5,111,722, Cl. 83-23.000.
Fukazawa, Hideo, to Canon Kabushiki Kaisha. Ink tank and ink jet recording apparatus having the ink tank. 5,113,206, Cl. 346-140.00R.
Fukazawa, Nobuyuki; Odate, Makoto; Suzuki, Tsuneji; Otsuka, Kengo; Tsuruo, Takashi; and Sato, Wakao, to Mitsui Toatsu Chemicals, Incorporated. Quinoline derivatives. 5,112,817, Cl. 514-183.000.
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Shiga, Kiyotaka; Fukui, Akio; Ryu, Akiomi; and Okuno, Katsumi, 5,112,167, Cl. 408-211.000.
Fukushima, Hideo; and Kurushima, Masakazu, to Sony Corporation. Rotary head drum apparatus with resiliently mounted ground plate. 5,113,298, Cl. 360-108.000.
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Kuriyama, Shigeru; Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,111,784, Cl. 123-192.100.
Fukushima, Minoru: *See*—
Enomoto, Masahiro; and Fukushima, Minoru, 5,112,235, Cl. 439-83.000.
Fukushima, Tetsuo; Suetsugu, Kenichiro; Nishihara, Munekazu; and Ikeda, Junji, to Matsushita Electric Industrial Co., Ltd. Optical wave guide sheet comprising plurality of doubly-clad core members with light scatterers in outer cladding. 5,113,470, Cl. 385-126.000.
Funada, Yo, to Murata Manufacturing Co., Ltd. Oscillator employing a strip line of tri-plate structure as a resonant element. 5,113,155, Cl. 331-107.0SL.
Funakoshi, Toshio, to Kabushiki Kaisha Toshiba. Electronic endoscope. 5,111,804, Cl. 128-6.000.
Funk, Guido: *See*—
Saive, Roland; Funk, Guido; and Bachl, Robert, 5,112,928, Cl. 526-128.000.
Furrer, Willy; and Schombourg, Jacques J. F. J., to Union Carbide Chemicals & Plastics Technology Corporation. Solid feeding of silane crosslinking agents into extruder. 5,112,919, Cl. 525-263.000.
Furukawa, Masahiro; Yoshii, Kazuhiro; and Oonou, Masayuki, to Sanyo Electric Co., Ltd. Absorption refrigeration system. 5,111,670, Cl. 62-475.000.
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Ozaki, Masashi; and Furukawa, Matsuhiro, 5,113,304, Cl. 361-87.000.
Furukawa, Nobuhiro; Yoshimura, Seiji; and Takahashi, Masatoshi, to Sanyo Electric Co., Ltd. Non-aqueous electrolyte cell. 5,112,704, Cl. 429-194.000.
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Yamamoto, Kazuhiro; Yoshioka, Noriko; and Furukawa, Tadayasu, 5,112,380, Cl. 426-321.000.
Furukawa, Yasuo, to Advantest Corporation. Low-distortion waveform generating method and waveform generator using the same. 5,113,139, Cl. 324-623.000.
Furukawa, Yutaka: *See*—
Miyata, Hirofumi; and Furukawa, Yutaka, 5,112,283, Cl. 475-211.000.
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Furuya, Kouhei: *See*—
Hamano, Kiyoshi; Furuya, Kouhei; Tanzawa, Kazuhiko; Kagasaki, Takeshi; Miyamoto, Masaaki; and Kinoshita, Takeshi, 5,112,807, Cl. 514-11.000.
G. D. Searle & Co.: *See*—
Djuric, Stevan W.; Docter, Stephen H.; and Hauck, Richard A., 5,112,864, Cl. 514-549.000.
G. D. Societa per Azioni: *See*—
Draghetti, Fiorenzo, 5,111,633, Cl. 53-136.100.
Gabalda, Carlos M., to ICBT Lyon. Twisting spindle driven by an individual electric motor. 5,111,647, Cl. 57-100.000.
Gabriel, Marcel. Process for the oven brazing of two pieces in rarified or controlled atmosphere. 5,113,052, Cl. 219-85.220.
Gaebe, Carl F.; and Yeh, Xian-Li, to AT&T Bell Laboratories. Silicon-based optical subassembly. 5,113,404, Cl. 372-36.000.
Gaginella, Timothy S.; Welton, Ann F.; and Will, Peter C., to Hoffmann-La Roche Inc. Therapeutic treatment of intestinal inflammation by administration of 3,4-dihydro-2H-1-benzopyran derivatives. 5,112,856, Cl. 514-456.000.

Gajewski, Vincent J.: *See—*
O'Donnell, Hugh J.; Gajewski, Vincent J.; Knizley James B.; Palinkas, Richard L.; and Rosenberg, Ronald O., 5,112,933, Cl. 528-61.000.
Galazin, Gregory T.; and Pierce, William C., to Neway Corp. Axle mounting assembly. 5,112,078, Cl. 280-711.000.
Gallant, James O.: *See—*
Beaudreault, James J.; and Gallant, James O., 5,111,565, Cl. 29-116.200.
Gallas, James M., to Photoprotective Technologies Incorporated. Medium incorporating melanin as an absorbing pigment against electromagnetic radiation. 5,112,883, Cl. 523-106.000.
Gamble, Bruce B.; and Snowdon, Douglas A., to Avstar Aerospace Corporation. Breathing system. 5,111,809, Cl. 128-204.180.
Gan, Joseph: *See—*
Koenig, Raymond A.; and Gan, Joseph, 5,112,932, Cl. 528-51.000.
Ganguli, Bimal N.: *See—*
Chatterjee, Sukumar; Chatterjee, Sugata; Ganguli, Bimal N.; Chatterjee, Deepak K.; Jani, Rajendra K. H.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; Kogler, Herbert; Seibert, Gerhard; and Teetz, Volker, 5,112,806, Cl. 514-9.000.
Roy, Kirity; Mukhopadhyay, Triptikumar; Reddy, Goukanapalli C. S.; Vijayakumar, Erra K. S.; Ganguli, Bimal N.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; and Kogler, Herbert, 5,112,858, Cl. 514-462.000.
GAO Gesellschaft fur Automation und Organisation mbH: *See—*
Kaule, Wittich; Ilgmann, Wilhelm; Schwenk, Gerhard; and Stenzel, Gerhard, 5,112,672 Cl. 428-209.000.
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Sharpless, K. Barry; and Gao, Yun, 5,112,990, Cl. 549-34.000.
Garapon, Jacques; Touet, Remi; Damin, Bernard; and Debled, Beatrice, to Institut Francais du Petrole; and Elf France. Polymers derived from unsaturated polyesters by addition of compounds with a thiol function and their use as additives modifying the properties of petroleum middle distillates when cold. 5,112,937, Cl. 528-272.000.
Gardner, Thomas H.: *See—*
Mikhaeil-Boules, Naila; Hammersmith, Robert J.; Leppek, Kevin G.; Wilkey, Paul D.; Gardner, Thomas H.; Ricker, Dennis J.; and Kowalik, James J., 5,112,116, Cl. 303-115.0EC.
Garoche, Didier; and Grollier, Jean F., to L'Oreal. Processes for dyeing keratinous fibres based on 5,6 dihydroxyindole or an indole derivative and at least one rare earth salt and compositions for implementation thereof. 5,112,360, Cl. 8-406.000.
Garrison, Brevard S., to Millipore Corporation. Partition valve for fluid delivery system. 5,111,845, Cl. 137-567.000.
Garrison, Joe K.: *See—*
Hollingsworth, John D.; Garrison, Joe K.; Collins, Joel C.; Warnock, William A., deceased; Weiskel, Lillith M., legal representative; Nyberg, Muriel R., legal representative; Warnock, Charles F., legal representative and Pergande, Lorraine, legal representative, 5,111,551, Cl. 19-150.000.
Garrison, Linn C.: *See—*
Bond, Robert H.; Olla, Michael A.; Morrison, Barry; and Garrison, Linn C., 5,111,935, Cl. 206-329.000.
Garst, Michael E.; and Syage Elizabeth T., to Allergan, Inc. Anti-inflammatory furanone compounds. 5,112,853, Cl. 514-443.000.
Garvey, Michael J.; Griffiths, Ian C.; and Rennie, John H. S., to Unilever Patent Holdings B.V. Spheroidal silica. 5,112,612, Cl. 424-400.000.
Garzone, Raymond G., Jr. Double-embroidered lace. 5,111,760, Cl. 112-439.000.
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Patterson, Philip M., 5,112,282, Cl. 474-260.000.
Gaudreault, Mario, to IPL Inc. Tamper evident container. 5,111,954, Cl. 220-266.000.
Gavin, John J.: *See—*
Buckler, Robert T.; Dailey, Frank A.; Ficalora, John A.; Gavin, John J.; and Plunkett, Gregory A., 5,112,738, Cl. 435-7.930.
Gay, William M.; Blanpied, Robert H.; Bush, Philip W.; Donald, Richard L.; Williams, James L.; and Williams, James H., to Atlas Roofing Corporation. Method and composition for coating mat and articles produced therewith. 5,112,678, Cl. 428-268.000.
Gazzano, Michele. Device for sterilizing a forced air flow by means of ultraviolet radiations. 5,112,370, Cl. 55-102.000.
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Gebert, David L.: *See—*
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Engel, Michael; Pepping, Karl-Heinz; and Gebhardt, Gunther, 5,111,711, Cl. 74-473.00R.
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Parker, John C., deceased; Francis, David, executor; and Smith, James I. H., executor, 5,113,069, Cl. 250-227.110.
Geco A.S.: *See—*
Bjerkoy, Rolf, 5,113,376, Cl. 367-15.000.
Geer, Jeffrey A.: *See—*
Simpson, Jack R.; and Geer, Jeffrey A., 5,111,725, Cl. 83-117.000.
Gehen, Patrick K., Sr. Template for positioning outlet boxes. 5,111,593, Cl. 33-613.000.
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Kramer, Fred R.; and Lizardi, Paul M., 5,112,734, Cl. 435-6.000.
Genentech, Inc.: *See—*
Heyneker, Herbert L.; Holmes, William E.; and Vehar, Gordon A., 5,112,755, Cl. 435-215.000.
Jardieu, Paula, 5,112,605, Cl. 424-85.500.
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Goldstein, Yuri, 5,113,412, Cl. 375-39.000.
General Dynamics Corporation, Convair Division: *See—*
Morenz, Paul W.; and Knox, Charles E., 5,112,663, Cl. 428-71.000.
General Dynamics Corporation, Electronics Division: *See—*
Curran, Mark E., 5,113,244, Cl. 385-24.000.
General Electric: *See—*
Hurd, Ralph E., 5,111,819, Cl. 128-653.200.
General Electric Company: *See—*
Ackermann, Robert A., 5,111,665, Cl. 62-6.000.
Ackermann, Robert A., 5,113,165, Cl. 335-216.000.
Balch, Richard A., 5,113,130, Cl. 324-74.000.
Blaettner, Harald E.; Uhen, Richard F.; Ellis, Robert E.; Cunningham, Eldon R.; Usher, Michael J.; and Miller, Joseph E., 5,113,104, Cl. 310-90.000.
Butzin, Donald F.; Meeka, Edward W.; Tunnell, George W.; and Salvo, Edgar E., Jr., 5,112,566, Cl. 376-245.000.
Conrad, George R., 5,112,628, Cl. 426-117.000.
El-Hamamsy, Sayed-Amr A., 5,113,171, Cl. 338-61.000.
Engeler, William E.; O'Donnell, Matthew; Pedicone, John T.; and Bloomer, John J., 5,111,695, Cl. 73-626.000.
Morelli, Thomas A.; Peascoe, Warren J.; Rasch, Stefan F.; and Tyrell, John A., 5,112,915, Cl. 525-166.000.
Morris, Robert A., 5,113,043, Cl. 200-43.010.
Ortiz, Angel L., Jr., 5,113,461, Cl. 385-53.000.
Pratt, James R.; Robarge, Dean A.; Markowski, Robert G.; Perzan, Denis A.; and Morby, John A., 5,113,312, Cl. 361-361.000.
Shih, True T.; Shah, Manoj R.; and Archibald, James B., 5,113,114, Cl. 310-270.000.
Steigerwald, Robert L., 5,113,337, Cl. 363-98.000.
Strock, William J.; Wakeman, Thomas G.; and Hauser, Ambrose A., 5,112,191, Cl. 416-94.000.
Tassie, Douglas P., 5,111,729, Cl. 89-33.020.
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Haland, Lars Y.; and Skanberg, Enar T., 5,112,079, Cl. 280-730.000.
General Motors Corporation: *See—*
Billin, Martin P.; Wedow, Christopher G.; and Nedwick, Dan M., 5,111,619, Cl. 49-502.000.
Buchanan, William J.; and Wasse, Siegfried A., 5,111,877, Cl. 165-153.000.
Cogswell, James A., II; and Coulter, James L., 5,112,114, Cl. 303-113.0TR.
Emmert, Dan H.; Creager, John E.; and Coha, Timothy F., 5,111,844, Cl. 137-567.000.
Farris, Timothy M., 5,111,715, Cl. 74-606.00R.
Frase, Roland J., 5,111,785, Cl. 123-198.00D.
Hall, Arthur, III, 5,112,285, Cl. 475-280.000.
Hunter, Joseph H.; and Swingler, Peter E., 5,113,343, Cl. 364-424.100.
Hynds, Ernest J.; and Stowe, Keith A., 5,112,031, Cl. 267-276.000.
Kadle, Prasad S., 5,111,671, Cl. 62-515.000.
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Katcherian, Ricky V.; and Roddy, Stephen R., 5,112,101, Cl. 296-201.000.
Kennedy, Lawrence C., 5,111,923, Cl. 192-58.00B.
Klein, Robert R.; and Hoying, John F., 5,112,032, Cl. 267-140.10A.
Kordovski, Mile A.; and Read, Donald R., 5,111,873, Cl. 164-312.000.
Lau, Ian V.; and Welch, Jeffrey A., 5,111,620, Cl. 49-502.000.
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Nagengast, William E., 5,113,331, Cl. 362-267.000.
Skinner, Timothy J., 5,112,198, Cl. 417-269.000.
Sundeen, Arthur R.; Burris, Darryl L.; Cook, Roger A.; and Lombardo, Dennis M., 5,111,902, Cl. 180-281.000.
Swain, James C.; Wilcox, John P.; and Thomas, David L., 5,112,197, Cl. 417-222.00R.
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Savidan, Henri; and Vachet, Andre, 5,111,661, Cl. 60-562.000.
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Weetman, Ronald J., 5,112,192, Cl. 416-201.00A.
George, Alan. Rheometrics and viscoelasticity measurement. 5,113,353, Cl. 364-508.000.
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Wiehle, Franz, 5,112,118, Cl. 312-116.000.
Gerding, Thomas G.: *See—*
Repka, Michael A.; and Gerding, Thomas G., 5,112,620, Cl. 514-180.000.
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Gerhardt, Klaus; and Sitzler, Hans-Dietrich, to C. Siempelkamp GmbH & Co. Press for making pressed board. 5,112,431, Cl. 156-583.500.
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Woods, Ralf D.; Slack, Michael P.; and Gerst, Kenneth M., 5,113,399, Cl. 371-21.300.

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Banholzer, Karlheinz; Gerst, Peter; and Jung, Peter, 5,111,698, Cl. 73-708.000.
Gestaut, Lawrence J.; Brannan, James R.; Vaccaro, Anthony J.; and Groszek, Donald J., to ELTECH Systems Corporation. Process for electroplating. 5,112,447, Cl. 205-148.000.
Gettel, Roger W., to Ford Motor Company. Parallel flow electronically variable orifice for variable assist power steering system. 5,111,660, Cl. 60-468.000.
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Knapp, Alfons, 5,111,842, Cl. 137-454.600.
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Gilmore, William, to Huntington Mechanical Laboratories, Inc. Rotary motion transmitter and heat treatment method for sealed chamber. 5,113,102, Cl. 310-88.000.
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Tsunekawa, Masayoshi; and Ramirez, Raymond L., 5,112,880, Cl. 522-81.000.
Ginsberg, Jacob J. Keyboard stand. 5,112,020, Cl. 248-456.000.
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Girsh, Leonard S., to Immunopath Profile, Inc. Hypoallergenic butter and process of making. 5,112,636, Cl. 426-581.000.
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Glanz, Elliot. Safety bottle. 5,111,946, Cl. 215-247.000.
Glass, Thomas R.; and Hudson, Weldon R. Expansible chamber device having variably restrained valve systems. 5,111,843, Cl. 137-513.000.
Glassman, Jacob A. Tampon construction. 5,112,348, Cl. 604-358.000.
Glatt, Edward W., Jr. Locator ring for injection mold and composition therefor. 5,112,214, Cl. 425-567.000.
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Grayson, James I.; Heyes, Graham; Jackson, Arthur; and Rowney, Paul E., 5,112,995, Cl. 549-493.000.
Ross, Barry C.; Kirk, Barrie E.; Lester, Michael G.; Procopiou, Panayiotis A.; and Watson, Nigel S., 5,112,819, Cl. 514-212.000.
Glenbrook Technologies, Inc.: *See—*
Zweig, Gilbert, 5,113,425, Cl. 378-190.000.
Glickman, Joel I., to Magic Mold Corporation. Injection molded follow block for file drawer. 5,111,959, Cl. 220-544.000.
Glimpel, Helmut, to Emuge-Werk Richard Glimpel Fabrik fur Prazisionswerkzeuge Vormals Moschkau & Glimpel. Tap with tapered thread. 5,112,168, Cl. 408-220.000.
Gloyer, Walter W.; and Bright, Frederick G., to Retrax, Inc. Retractable syringe. 5,112,315, Cl. 604-195.000.
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Golberstein, Moshe. Electro-optical instrument with self-contained photometer. 5,113,082, Cl. 250-571.000.
Gold, Ronald S.: *See—*
Franklin, Henry E.; Gold, Ronald S.; Jachimowicz, Karen E.; Poley, Harold J.; and Trimmier, J. Robert, 5,113,285, Cl. 359-465.000.
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Goldberg, Robert L., to Shipley Company Inc. Method for patterning electroless metal on a substrate followed by reactive ion etching. 5,112,434, Cl. 156-628.000.
Goldenberg, Michael P.: *See—*
Ponce de Leon, Lorenzo A.; Siwiak, Kazimierz; and Goldenberg, Michael P., 5,113,196, Cl. 343-744.000.
Goldfarb, David, to Thomas Jefferson University. Laryngeal pacemaker. 5,111,814, Cl. 128-419.00R.
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Song, Young W., 5,113,144, Cl. 330-85.000.
Goldstein, Andrew S.: *See—*
Fellman, Jack H.; and Goldstein, Andrew S., 5,112,758, Cl. 436-8.000.
Goldstein, Yuri, to General DataComm, Inc. Method and apparatus for mapping an eight dimensional constellation of a convolutionally coded communication system. 5,113,412, Cl. 375-39.000.
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Gombos, John M.; and Leashno, Moshe, to A.C.X., Inc. Unitized palletless multiple bale cargo unit. 5,111,931, Cl. 206-83.500.
Gomi, Katsushige: *See—*
Kinoshita, Iwao; Machii, Daisuke; Onoda, Yasuo; Takai, Haruki; Kasaka, Nobuo; Shuto, Katsuichi; Gomi, Katsushige; Morimoto, Makoto; and Ishii, Akio, 5,112,867, Cl. 514-617.000.
Gonzalez, Teodoro J., to Emhart Inc. Flow booster apparatus. 5,111,994, Cl. 239-428.500.
Goodale, Thomas C.: *See—*
Kam, John; Truchon, Lee M.; Goodale, Thomas C.; and Dalton, John T., 5,113,393, Cl. 370-94.100.
Goodson, Forrest R., to United Technologies Corporation. Liquid vaporizing process for manufacturing iron oxide. 5,112,442, Cl. 159-49.000.
Gore, Charles E.; Fairley, Frank E.; Hardee, Edward; and Medeen, Carl T., to Truswal Systems Corporation. Apparatus for cambering wood trusses. 5,111,861, Cl. 144-256.100.
Gorecki, Marian: *See—*
Oppenheim, Amos B.; Levanon, Avigdor; Locker-Galadi, Hilla; and Gorecki, Marian, 5,112,744, Cl. 435-189.000.
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Fenton, Paul V., Jr.; Young, Thomas M.; and Gorman, William J., 5,112,301, Cl. 604-30.000.
Gorshe, Steven S., to NEC America, Inc. CMI encoder circuit. 5,113,187, Cl. 341-73.000.
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Kanda, Hitoshi; Yamada, Yusuke; Kato, Masayoshi; Goseki, Yasuhide; and Mitsumura, Satoshi, 5,111,998, Cl. 241-5.000.
Gosiewski, Donald E.: *See—*
Briggs, Paul C.; and Gosiewski, Donald E., 5,112,691, Cl. 428-412.000.
Goss, John D.: *See—*
Houghton, Paul J.; Goss, John D.; and Boissevain, Mathew G., 5,111,688, Cl. 73-159.000.
Gosselin, Gerard, to Biothermica International Inc. Process for removing dust from high temperature gas streams. 5,112,368, Cl. 55-97.000.
Gosselink, Johan W.; Groeneveld, Lucas R.; and Schaper, Hennie, to Shell Oil Company. Process for converting hydrocarbon oils. 5,112,472, Cl. 208-59.000.
Gosser, Lawrence W.: *See—*
Berzins, Talvildis; and Gosser, Lawrence W., 5,112,702, Cl. 429-17.000.
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Nakano, Minoru; Goto, Akihito; and Nakamura, Yoichi, 5,111,864, Cl. 152-527.000.
Goto, Hirokazu: *See—*
Ohtsuka, Koji; and Goto, Hirokazu, 5,112,774, Cl. 437-175.000.
Goto, Yasuhiro; Yonezawa, Takeyuki; Tsuge, Akihiko; and Komatsu, Michiyasu, to Kabushiki Kaisha Toshiba. Sialon based composite and method of manufacturing the same. 5,112,780, Cl. 501-95.000.
Gotoh, Masumi; and Sakurai, Tadayosi, to Toyo Boseki Kabushiki Kaisha. Process and apparatus for producing superfine fibers. 5,112,550, Cl. 264-211.140.

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Arroyo, Candido J.; and Gotthardt, Manfred R., 5,113,036, Cl. 385-100.000.

Gouel, Roland: *See—*
Gignoux, Dominique; and Gouel, Roland, 5,113,421, Cl. 378-50.000.

Gould, Adam F.; and Rasky, Phillip D., to Motorola, Inc. Error detection system. 5,113,400, Cl. 371-43.000.

Gould Inc.: *See—*
Kanaga, Bob C.; and Beyerle, Ronald R., 5,111,724, Cl. 83-58.000.

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Baur, Richard; Gousetis, Charalampos; Birnbach, Stefan; Kneip, Michael; and Oftring, Alfred, 5,112,530, Cl. 252-548.000.

Grabenkort, Richard W., to Abbott Laboratories. Frangible element valve usable in an improved packaging system for a sterilizable calibratable medical device. 5,111,836, Cl. 137-68.100.

Grabenkort, Richard W.: *See—*
Bertaud, Francois X.; Grabenkort, Richard W.; Magrane, Beverly A.; and Vurek, Gerald G., 5,112,309, Cl. 604-171.000.

Grabner, Dieter, to Rheinmetall GmbH. Apportioning apparatus for loading a loading tray with a variable number of propelling charge modules. 5,111,730, Cl. 89-45.000.

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Grace, Robert W., Sr., to Stingel, Frederick J. Container storage and dispensing apparatus. 5,111,563, Cl. 221-75.000.

Graebe, Robert H. Cover with elastic top and frictional bottom for a cushion. 5,111,544, Cl. 5-470.000.

Graebner, Peter, to Chevron Research & Technology Company. Apparatuses and methods for making geophysical measurements useful in determining the deflection of the vertical. 5,112,126, Cl. 356-152.000.

Graf, Herbert: *See—*
Pelz, Horst; Klier, Armin; and Graf, Herbert, 5,112,389, Cl. 75-401.000.

Grammer AG: *See—*
Beer, Johann, 5,112,542, Cl. 264-46.700.

Granbom, Bo. Braking arrangement in operating devices for linear motion. 5,111,913, Cl. 188-67.000.

Grandy, Mark E., to Prestolite Wire Corporation. Direct fire ignition system having individual knock detection sensor. 5,111,790, Cl. 123-425.000.

Grantham, LeRoy F.: *See—*
Guon, Jerold; Grantham, LeRoy F.; and Specht, Eugene R., 5,112,534, Cl. 252-640.000.

Grapentin, Hans-Joachim: *See—*
Bressel, Burkhard; Grapentin, Hans-Joachim; and Tessmann, Detlef, 5,112,513, Cl. 252-79.100.

Graphic Management Associates, Inc.: *See—*
Hatt, Walter, 5,112,036, Cl. 270-54.000.

Grasso, Giorgio; and Tamburello, Mario, to Pirelli Cavi S.p.A. Optical fiber telecommunication line with separate, optically transmitted service channels. 5,113,459, Cl. 385-24.000.

Grayson, James I.; Heyes, Graham; Jackson, Arthur; and Rowney, Paul E., to Glaxo Group Limited. Preparation of substituted ethenes. 5,112,995, Cl. 549-493.000.

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Lev, Lavi A.; Young, Ian A.; and Greason, Jeffrey K., 5,113,096, Cl. 307-446.000.

Greatorex, James H.: *See—*
Roberts, Edward; Greatorex, James H.; and Spittal, Douglas W., 5,112,549, Cl. 264-174.000.

Green, Bernard J.: *See—*
Carrington, Andrew N.; Green, Bernard J.; and Jones, Francis, deceased, 5,112,361, Cl. 8-471.000.

Green, James A.; and Young, Donald C., to Union Oil Company of California. Fumigation methods using a thiocarbonate/urea aqueous composition. 5,112,623, Cl. 424-713.000.

Green, Stephen T.: *See—*
Castelli, Renato; Van Hoye, Willibald; Miles, Richard; and Green, Stephen T., 5,111,920, Cl. 190-120.000.

Greene, Jack T., to East Central Wax Company, Inc. Formaldehyde scavenging process useful in manufacturing durable press finished fabric. 5,112,652, Cl. 427-342.000.

Greene, Philip D. Bookholder. 5,112,021, Cl. 248-444.100.

Greenfield, Mark S., to Kennametal Inc. Process of making mining/construction tool bit body fabricated from MN/B steel alloy composition. 5,112,411, Cl. 148-528.000.

Greer, John; Chijiiwa, Haruhisa; and Dowhan, Michael J., to Pratt & Whitney Canada. Fan blade axial retention device. 5,112,193, Cl. 416-220.00R.

Greiff, Paul, to Charles Stark Draper Laboratory, Inc., The. Motion restraints for micromechanical devices. 5,111,693, Cl. 73-514.000.

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Roth, Philippe, 5,113,258, Cl. 358-167.000.

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Dinwiddie, John M., Jr.; Freeman, Bobby J.; Grice, Lonnie E.; Loffredo, John M.; Sanderson, Kenneth R.; and Suarez, Gustavo A., 5,113,522, Cl. 395-700.000.

Griffin, Nigel D. Cutting elements for rotary drill bits. 5,111,895, Cl. 175-425.000.

Griffiths, Ian C.: *See—*
Garvey, Michael J.; Griffiths, Ian C.; and Rennie, John H. S., 5,112,612, Cl. 424-400.000.

Grigo, Ulrich: *See—*
Horlacher, Peter; Hahnsen, Heinrich; Grigo, Ulrich; Bushong, William C.; and Schlak, Ottfried, 5,112,925, Cl. 525-474.000.

Grim, Wayne M.: *See—*
Luber, Joseph R.; Feld, Kenneth M.; Harwood, Richard J.; and Grim, Wayne M., 5,112,813, Cl. 514-54.000.

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Slaney, Paul; and Grinderslev, Soren, 5,113,474, Cl. 385-136.000.

Grise, Frederick J. Multi-use vehicle. 5,112,257, Cl. 440-37.000.

Grobe, James L. Apparatus and methods for percutaneous endoscopic gastrostomy. 5,112,310, Cl. 604-175.000.

Groeneveld, Lucas R.: *See—*
Gosselink, Johan W.; Groeneveld, Lucas R.; and Schaper, Hennie, 5,112,472, Cl. 208-59.000.

Grollier, Jean F.: *See—*
Garoche, Didier; and Grollier, Jean F., 5,112,360, Cl. 8-406.000.

Groninger & Co. GmbH, Firma: *See—*
Neber, Fritz, 5,111,635, Cl. 53-334.000.

Groszek, Donald J.: *See—*
Gestaut, Lawrence J.; Brannan, James R.; Vaccaro, Anthony J.; and Groszek, Donald J., 5,112,447, Cl. 205-148.000.

Groves, Randall D.; and Tuttle, David P., to International Business Machines Corporation. Data cache initialization. 5,113,508, Cl. 395-425.000.

Grubbs, Hugh C.: *See—*
Potter, Terry A.; and Grubbs, Hugh C., 5,112,931, Cl. 528-45.000.

Gruber, Ernst; and Bamberg, Alfred, to FLEXA GmbH & Co. Produktion und Vertrieb KG. Coupling device for a corrugated pipe or hose. 5,112,086, Cl. 285-86.000.

Grumman Aerospace Corporation: *See—*
Kosson, Robert L., 5,111,874, Cl. 165-32.000.

Grunewald, Wolfgang: *See—*
Weisenburger, Siegfried; Grunewald, Wolfgang; and Seiffert, Hartmut, 5,112,378, Cl. 65-327.000.

Grunze, Mark R.; and Franzen, Robert E., to Rexnord Corporation. Swaging tool for bearing installation. 5,111,575, Cl. 29-725.000.

GT Development Corporation: *See—*
Morris, John M.; Stephens, Charles E.; and Forsythe, Alan K., 5,111,837, Cl. 137-72.000.

GTE Laboratories Incorporated: *See—*
Lapatovich, Walter P.; Proud, Joseph M.; and Fohl, Timothy, 5,113,121, Cl. 315-248.000.
Sigai, A. Gary; and Klinedinst, Keith A., 5,113,118, Cl. 313-486.000.

GTE Products Corporation: *See—*
Reddy, Vaddi B.; and Cheung, Ha K., 5,112,524, Cl. 252-301.40R.

Gualtieri, Devlin M.; and Morris, Robert C., to Allied-Signal Inc. Optical waveguides of aluminum garnet. 5,113,472, Cl. 385-130.000.

Guguen-Guillouzo, Christiane; Guillouzo, Andre; and Bourel, Michel, to Institut National de la Sante et de la Recherche. Method for obtaining human hepatocyte cultures. 5,112,757, Cl. 435-240.200.

Guillou, Remi: *See—*
Rabiet, Jacques; Gimenez, Philippe; Guillou, Remi; and Drapier, Claude, 5,112,668, Cl. 428-137.000.

Guillouzo, Andre: *See—*
Guguen-Guillouzo, Christiane; Guillouzo, Andre; and Bourel, Michel, 5,112,757, Cl. 435-240.200.

Guipe, Richard A.; Qureshi, Shakil U.; and Oden, Larry W., to Cooper Industries, Inc. Flexible cord with high modulus organic fiber strength member. 5,113,039, Cl. 174-113.00C.

Guizard, Christian G.: *See—*
Cot, Louis; Rouviere, Jacques C.; Guizard, Christian G.; and Larbot, Andre, 5,112,676, Cl. 427-226.000.

Gujii, Itsuhiro: *See—*
Sugise, Ryoji; Daimon, Hiroshi; Gujii, Itsuhiro; Ihara, Hideo; Terada, Norio; Jo, Masatoshi; and Hirabayashi, Masayuki, 5,112,783, Cl. 501-126.000.

Gunn, Bruce P.: *See—*
Brooks, Dee W.; Gunn, Bruce P.; Holms, James H.; and Summers, James B., 5,112,848, Cl. 514-424.000.

Gunn, Gary R.; Colcord, Wallace T.; Wood, Tommy G.; Weber, Gary; Lovendoski, Stan J.; and Chamberlin, James B., to Maremont Corporation. End connector assembly with ball held captive in socket bearing and shell housing and method of assembly. 5,112,153, Cl. 403-7.000.

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Wittmann, Manfred; and Gunther, Robert, 5,113,035, Cl. 65-11.100.

Guon, Jerold; Grantham, LeRoy F.; and Specht, Eugene R., to United States of America, Energy. Yttrium and rare earth stabilized fast reactor metal fuel. 5,112,534, Cl. 252-640.000.

Gupta, Amitava: *See—*
Christie, Bruce; and Gupta, Amitava, 5,112,351, Cl. 623-6.000.

Gupta, Dev V.; Chen, Y. Brian; and Tarantino, Joel T., to Integrated Network Corporation. Intelligent channel unit. 5,113,391, Cl. 370-84.000.

Gupta, Satish; Larky, Steven P.; Peevers, Alan W.; and St. Clair, Joe C., to International Business Machines Corporation. Virtual display adapter. 5,113,180, Cl. 340-747.000.

Gurosh, Jeffrey A.: *See—*
Moeinzadeh, Manssour H.; Kaplan, Lawrence M.; and Gurosh, Jeffrey A., 5,111,987, Cl. 227-180.000.

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Falke, Holger; and Strauss, Guenther, 5,112,787, Cl. 502-159.000.

Gutzeit, Reinhard: *See—*
Altmann, Rainer; Lauer, Rainer; Schmidt, Guenther; Stromski, Kasimir; van Zanten, Anton; Hellmann, Harald; Veil, Karl; Fees, Hans-Joerg; Jonner, Wolf-Dieter; and Gutzeit, Reinhard, 5,112,117, Cl. 303-116.00R.

Guzman, Roberto: *See—*
Carbonell, Ruben G.; Guzman, Roberto; and Kilpatrick, Peter K., 5,112,770, Cl. 436-501.000.

H. Lundbeck A/S: *See—*
Perregaard, Jens; and Skarsfeldt, Torben, 5,112,838, Cl. 514-323.000.

Haack, Richard A.: *See—*
Djuric, Stevan W.; Docter, Stephen H.; and Haack, Richard A., 5,112,864, Cl. 514-549.000.

Haag, Anthony P., to Dow Chemical Company, The. Amine containing monomers. 5,112,920, Cl. 525-294.000.

Haarer, Steven R., to Cooper Industries. Flexible connector for curtain rods. 5,112,157, Cl. 403-292.000.

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Muggeridge, David; Ryan, William F.; and Haase, Dieter, 5,111,553, Cl. 244-3.220.

Haber, Terry M.; and Foster, Clark B., to Habley Medical Technology Corp. Dental syringe having a medication filled carpule and an automatically-detaching piston stem. 5,112,307, Cl. 604-110.000.

Habermann, Helmut; and Jolivet, Jean, to Societe de Mecanique Magnetique S.A. Large-amplitude low-frequency vibrator. 5,111,697, Cl. 73-668.000.

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Haber, Terry M.; and Foster, Clark B., 5,112,307, Cl. 604-110.000.

Hafner, Hans-Ulrich; Klein, Hans-Hermann; and Timm, Uwe, to Leybold AG. Two-stage cryopump. 5,111,667, Cl. 62-55.500.

Hahn, Erwin; Hansen, Guenter; Lamm, Gunther; Reichelt, Helmut; and Wagenblast, Gerhard, to BASF Aktiengesellschaft. Navy dye mixtures of azo disperse dyes for polyester. 5,112,362, Cl. 8-639.000.

Hahn, Kevin C. Dual wheel puller/dolly. 5,112,070, Cl. 280-79.400.

Hahn, Norbert; and Naegeli, Robert W., to Rite Hite Corporation. Dock leveler lift assembly and method for operation. 5,111,546, Cl. 14-7.300.

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Horlacher, Peter; Hahnsen, Heinrich; Grigo, Ulrich; Bushong, William C.; and Schlak, Ottfried, 5,112,925, Cl. 525-474.000.

Haiml, Gottfried; and Langgartner, Johann, to Austria Metall Aktiengesellschaft. Method of mechanical surface treatment of a blank metal sheet. 5,111,572, Cl. 29-469.500.

Haines, John S. Boat hulls. 5,111,767, Cl. 114-288.000.

Hajos, Gyorgy: *See—*
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Haland, Lars Y.; and Skanberg, Enar T., to General Engineering (Netherlands) B.V. Arrangement for protecting an occupant of a vehicle. 5,112,079, Cl. 280-730.000.

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Thiel, Rudolf; Klimt, Ulrich; and Halasy-Wimmer, Georg, 5,111,914, Cl. 188-73.340.

Halek, Werner, to Schmetz GmbH & Co KG Unternehmensverwaltung. Arrangement for connecting blower wheel. 5,112,189, Cl. 415-200.000.

Hall, Arthur, III, to General Motors Corporation. Transmission gear arrangement. 5,112,285, Cl. 475-280.000.

Hall, James E., to Bridgestone Corporation. Oxolanyl cyclic acetals as anionic polymerization modifiers. 5,112,929, Cl. 526-181.000.

Hall, James F. Air flow control system. 5,111,739, Cl. 454-306.000.

Hall, Shirl F. Noise making device. 5,112,266, Cl. 446-422.000.

Hall Surgical Division of Zimmer, Inc.: *See—*
Pascaloff, John, 5,112,299, Cl. 604-22.000.

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De Wames, Roger E.; Goldberg, Ira B.; Morgan, Peter E. D.; Ratto, Joseph J.; Marshall, David B.; and Hall, William F., 5,113,164, Cl. 335-216.000.

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Baker, Robert L.; Billingsley, Larry D.; and Stegemoeller, Calvin L., 5,111,955, Cl. 220-303.000.
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Katoh, Hideo; Hosoi, Masahiro; Hamano, Hisashi; and Saito, Yasuhiko, 5,112,659, Cl. 428-35.700.

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Hansen, Mindy L.; and Hansen, Mandy L., 5,111,597, Cl. 36-8.300.

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Tanaka, Hideo; Matsumura, Masatoshi; Harada, Satoru; and Yajima, Mizuo, 5,112,750, Cl. 435-177.000.

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Boocock, John R. B.; and Harbourne, David A., 5,112,918, Cl. 525-209.000.
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Gore, Charles E.; Fairley, Frank E.; Hardee, Edward; and Medeen, Carl T., 5,111,861, Cl. 144-256.100.
Hardeman, Homer: *See—*
Iero, David A.; and Hardeman, Homer, 5,111,584, Cl. 30-489.000.
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Bouillant, Alain M. P.; Nielsen, Klaus; Ruckerbauer, Gerda M.; Samagh, Bakhshish S.; and Hare, William C. D., 5,112,756, Cl. 435-235.100.
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Tang, Joseph S.; and Harker, Bradford C., 5,111,882, Cl. 166-252.000.
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Harper, Thomas A.; and Harper, Carol R., 5,113,354, Cl. 364-514.000.
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Hartman, Eric J.: *See—*
Keeler, James D.; and Hartman, Eric J., 5,113,483, Cl. 395-23.000.
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Haruhara, Kazuyoshi: *See—*
Mizuno, Yutaka; Tsuzuki, Hanzo; Haruhara, Kazuyoshi; Miyata, Shigeki; Motoike, Katsuhiko; Sakai, Tooru; and Ooishi, Kazuhiro, 5,113,183, Cl. 340-825.310.
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Harwood, Richard J.: *See—*
Luber, Joseph R.; Feld, Kenneth M.; Harwood, Richard J.; and Grim, Wayne M., 5,112,813, Cl. 514-54.000.
Hasegawa, Akira: *See—*
Hamano, Fumio; Oho, Shigeru; Hirayama, Takeshi; and Hasegawa, Akira, 5,113,410, Cl. 370-7.000.
Hasegawa, Jun: *See—*
Kanno, Masahide; Uehara, Masao; Sasaki, Masahiko; Saito, Katsuyuki; Uchikubo, Akinobu; Hasegawa, Jun; Sasagawa, Katsuyoshi; Yamashita, Shinji; and Nakagawa, Takehiro, 5,113,254, Cl. 358-98.000.
Hashiba, Keiichi: *See—*
Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.
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Hashimoto Forming Industry Co., Ltd.: *See—*
Baba, Yuko, 5,112,112, Cl. 301-108.00A.
Nakashima, Tukasa; Hotta, Tetsuo; and Tamura, Tatsuya, 5,112,547, Cl. 264-167.000.
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Hashimoto, Masashi: *See—*
Sumida, Mamoru; Hashimoto, Masashi; and Matsumoto, Osamu, 5,111,775, Cl. 123-41.100.
Hashimoto, Mokuhei: *See—*
Umaba, Takayuki; Ono, Jiro; Takagi, Syunsuke; Sawada, Makoto; Adachi, Hideki; Shimizu, Hirofumi; Hashimoto, Mokuhei; and Takahashi, Tetsu, 5,111,743, Cl. 101-127.000.
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Kato, Eiichi; and Hattori, Hideyuki, 5,112,716, Cl. 430-114.000.
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Hauk, Klaus, to Deere & Company. Housing for a micro-switch unit. 5,113,046, Cl. 200-332.000.
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Strock, William J.; Wakeman, Thomas G.; and Hauser, Ambrose A., 5,112,191, Cl. 416-94.000.
Hauser, Charles F.: *See—*
McCain, James H.; King, Stephen W.; Knopf, Robert J.; Smith, Charles A.; and Hauser, Charles F., 5,112,789, Cl. 502-162.000.
Hauser, Everett F., Jr.: *See—*
Stubbs, John L., Jr.; Bolick, Roger E., II; and Hauser, Everett F., Jr., 5,112,452, Cl. 204-92.000.
Haven, Anders E. E.: *See—*
Virving, Nils; and Haven, Anders E. E., 5,112,443, Cl. 162-23.000.
Hayashi, Hajime; Igarashi, Yutaka; Hayashi, Takehiko; Shimura, Takaki; and Kawabe, Kenji, to Fujitsu Limited. Gradiometer apparatus with compensation coils for measuring magnetic fields. 5,113,136, Cl. 324-247.000.
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Hayashi, Kazuo: *See—*
Tashiro, Tetsu; Takeuchi, Minoru; Ishimaru, Yoshiyuki; Hirose, Shinichi; and Hayashi, Kazuo, 5,113,093, Cl. 307-465.000.
Hayashi, Kimiyoshi: *See—*
Horie, Yoshiko; Ikeda, Yoshinori; Ichikawa, Hiroyuki; Kurita, Mitsuru; Hayashi, Kimiyoshi; and Honma, Toshio, 5,113,252, Cl. 358-77.000.
Hayashi, Masahiro, heir: *See—*
Hayashi, Kazunori, deceased; Hayashi, Masahiro, heir; and Hayashi, Masako, heir, 5,112,732, Cl. 430-596.000.
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Hayashi, Kazunori, deceased; Hayashi, Masahiro, heir; and Hayashi, Masako, heir, 5,112,732, Cl. 430-596.000.
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Takano, Satoshi; Takahashi, Kenichi; Miyazaki, Kenji; Yoshida, Noriyuki; Inazawa, Shinji; and Hayashi, Noriki, 5,112,802, Cl. 505-1.000.
Hayashi, Takehiko: *See—*
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Potter, William R., 5,111,821, Cl. 128-654.000.
Heat and Control, Inc.: *See—*
Benson, Clark K.; and Caridis, Andrew A., 5,112,633, Cl. 426-438.000.
Heaton, Charles A.: *See—*
Powell, Richard L.; and Heaton, Charles A., 5,113,013, Cl. 562-493.000.

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Hegde, Shridhar G., to Monsanto Company. Process of preparing substituted pyridine compounds. 5,112,980, Cl. 546-283.000.
Heimes, Bernd: *See—*
Ahrweiler, Karl-Heinz; and Heimes, Bernd, 5,112,209, Cl. 425-371.000.
Hein-Werner Corporation: *See—*
Ballard, James G.; and Wisner, Craig A., 5,111,680, Cl. 72-447.000.
Heinola, Kalevi E.: *See—*
Backstrom, Reijo; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka I.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo, 5,112,861, Cl. 514-520.000.
Hellbach, Manfred: *See—*
Ranger, Ulrich; Wanner, Karl; Kaltenecker, Johann; Hellbach, Manfred; and Meixner, Gerhard, 5,111,890, Cl. 173-104.000.
Heller, James W.: *See—*
Aragon, Steven B.; and Heller, James W., 5,112,314, Cl. 604-192.000.
Hellmann, Harald: *See—*
Altmann, Rainer; Lauer, Rainer; Schmidt, Guenther; Stromski, Kasimir; van Zanten, Anton; Hellmann, Harald; Veil, Karl; Fees, Hans-Joerg; Jonner, Wolf-Dieter; and Gutzeit, Reinhard, 5,112,117, Cl. 303-116.00R.
Helmling, Oswald: *See—*
von Wedel, Wedigo; Senff, Elke; and Helmling, Oswald, 5,112,587, Cl. 423-235.000.
Helmlinger, Daniel: *See—*
Frater, Georg; and Helmlinger, Daniel, 5,113,021, Cl. 568-341.000.
Helms, Ramon E.: *See—*
Blanton, Keith A.; and Helms, Ramon E., 5,113,449, Cl. 381-51.000.
Hempelmann, Wilhelm: *See—*
Dirks, Friedrich; Batsch, Ortwin; Hempelmann, Wilhelm; and Leibold, Hans, 5,112,585, Cl. 423-210.000.
Hemphill, Cornelius H.: *See—*
Cameron, T. Jay; Erickson, Elwyn G.; and Hemphill, Cornelius H., 5,111,713, Cl. 74-573.00R.
Henderson, Clifton C.: *See—*
Brink, Edward C., Jr.; Henderson, Clifton C.; Whiteman, James R.; and Sowers, Henry K., 5,112,509, Cl. 252-56.00R.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Boeck, Alexander; Niebaum, Eckhard; Sommer, Walter; and Sparenberg, Guenter, 5,111,855, Cl. 141-83.000.
Brands, Karl-Dieter; Endres, Helmut; Christophliemk, Peter; and Roland, Wolf-Achim, 5,112,414, Cl. 148-254.000.
Henly, Nicholas C.: *See—*
O'Connor, Raymond J.; and Henly, Nicholas C., 5,112,026, Cl. 251-63.000.
Henricson, Kaj; and Pikka, Olavi, to A. Ahlstrom Corporation. Method for treating pulp. 5,112,444, Cl. 162-55.000.
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Henry, Robert E., Jr., to Conn-Weld Industries, Inc. Panel mounting system. 5,112,475, Cl. 209-399.000.
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Chu, Sung G.; Jabloner, Harold; and Nguyen, Tuyen T., 5,112,924, Cl. 525-426.000.
Hergenrother, Paul M.: *See—*
Jensen, Brian J.; Hergenrother, Paul M.; and Bass, Robert G., 5,112,923, Cl. 525-420.000.
Herman Miller, Inc.: *See—*
Nienhuis, James H.; Clark, Jeffrey L.; De Pree, Michael L.; and Beck, Robert L., 5,112,240, Cl. 439-215.000.
Herman, Warren N.: *See—*
Sperling, Leslie H.; Murphy, Clarence J.; Rosen, Warren A.; Jain, Himanshu; and Herman, Warren N., 5,112,531, Cl. 252-582.000.
Hermann, Allen M.; and Sheng, Zhengzhi, to University of Arkansas, The. Preparation of superconducting Tl-Ba-Ca-Cu-O thin films by Tl_2O_3 vapor processing. 5,112,800, Cl. 505-1.000.
Hermanns, Ferdinand-Josef: *See—*
Derichs, Josef; and Hermanns, Ferdinand-Josef, 5,112,000, Cl. 242-18.0DD.
Hermes Fabrik Pharmazeutischer Preparate Franz Gradinger GmbH & Co. KG: *See—*
Biesalski, Hans K., 5,112,598, Cl. 424-46.000.
Hernandez-Ruiz, Jose E.: *See—*
Lazcano-Navarro, Arturo; Vargas-Gutierrez, Gregorio; Hernandez-Ruiz, Jose E.; and Maroto-Cabrera, Carlos, 5,112,029, Cl. 266-47.000.
Herndon, Daniel C.: *See—*
Striech, Steven G.; Jacobi, Ricky D.; Herndon, Daniel C.; and Floyd, Louis C., 5,111,884, Cl. 166-382.000.
Herold, Barry W., to Motorola, Inc. Differential voltage comparator. 5,113,092, Cl. 307-356.000.
Herres, Donald C., to Cooper Industries, Inc. Grounding detection circuit. 5,113,303, Cl. 361-45.000.
Herschel, Michael: *See—*
Zierenberg, Bernd; Herschel, Michael; and Rohr, Uwe, 5,112,842, Cl. 514-367.000.
Herzig, Christian, to Wacker-Chemie GmbH. Organosilicon compounds containing alkenyl groups, a process for preparing the same, and the use of these organosilicon compounds. 5,113,006, Cl. 556-453.000.
Heshiki, Yoshikazu: *See—*
Tanaka, Koki; Heshiki, Yoshikazu; and Nakayama, Takeshi, 5,112,148, Cl. 400-63.000.
Hetherington, Ricky C.: *See—*
Fite, David B.; Hetherington, Ricky C.; McKeon, Michael M.; Manley, Dwight P.; and Murray, John E., 5,113,515, Cl. 395-425.000.
Hewlett-Packard Company: *See—*
Chan, C. S.; and Pan, Alfred I., 5,113,199, Cl. 346-1.100.
Charbonnier, Francis M.; and Rockwell, Martin G., 5,111,813, Cl. 128-419.00D.
Dix, Gary E.; Crowther, Russell L.; Colby, Mark J.; Matzner, Bruce; and Elkins, Robert B., 5,112,570, Cl. 376-370.000.
McDonald, James C.; and Hofer, Gregory V., 5,113,384, Cl. 369-44.290.
Slevin, Leonard; and Hickman, Mark S., 5,112,399, Cl. 106-22.000.
Taylor, Thomas W.; and D'Avanzo, Donald C., 5,112,763, Cl. 437-39.000.
Wheeler, Richard L.; and Nagesh, Voddarahalli K., 5,113,314, Cl. 361-384.000.
Heyen, Meino: *See—*
Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, 5,112,432, Cl. 156-610.000.
Heyes, Graham: *See—*
Grayson, James I.; Heyes, Graham; Jackson, Arthur; and Rowney, Paul E., 5,112,995, Cl. 549-493.000.
Heynau, Hans A., to United Technologies Corporation. Heterodyne circular photodetector array in a tracking system. 5,113,065, Cl. 250-203.200.
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Hibbard, Bruce E.: *See—*
Bjostad, Louis B., III; and Hibbard, Bruce E., 5,112,843, Cl. 514-375.000.
Hibi, Yoshiharu; and Seki, Masao, to Fuji Xerox Co., Ltd. Method and apparatus for color removal in a picture forming apparatus. 5,113,248, Cl. 358-75.000.
Hibino, Hidehiko: *See—*
Hashimoto, Atsushi; Hibino, Hidehiko; and Nakachi, Osamu, 5,112,863, Cl. 514-534.000.
Hibsch, Susan, to Lehigh Press, Inc., The. Pop-out slide and method of making same. 5,112,290, Cl. 493-325.000.
Hickey, Deirdre M. B.: *See—*
Jaxa-Chamiec, Albert A.; and Hickey, Deirdre M. B., 5,112,922, Cl. 525-332.200.
Hickman, Mark S.: *See—*
Slevin, Leonard; and Hickman, Mark S., 5,112,399, Cl. 106-22.000.
Hicks, Roy L.: *See—*
Tsou, Yu-Min; Hicks, Roy L.; and Burney, Harry S., Jr., 5,112,464, Cl. 204-265.000.
Hiemstra, Scott, to Rocky Mountain Emprise, Inc. Dual mixing gas burner. 5,112,219, Cl. 431-354.000.
Higashio, Kanji: *See—*
Suzuki, Akira; Itagaki, Yasuharu; and Higashio, Kanji, 5,112,754, Cl. 435-212.000.
Higashio, Kimihiko; Ito, Masazumi; and Nishimori, Kadotaro, to Minolta Camera Kabushiki Kaisha. Multi-color copying machine having a simultaneous color copy mode and an edited area copy mode. 5,113,229, Cl. 355-326.000.
Highland Supply Corporation: *See—*
Weder, Donald E.; and Straeter, Joseph G., 5,111,613, Cl. 47-72.000.
Weder, Donald E.; Craig, Franklin J.; Straeter, William F.; and Straeter, Joseph G., 5,111,637, Cl. 53-397.000.
Weder, Donald E., 5,111,638, Cl. 53-397.000.
Weder, Donald E.; and Weder, Erin H., 5,111,741, Cl. 100-45.000.
Hightower, Michael L.: *See—*
Harney, Ralph P.; Hightower, Michael L.; and Wechselberger, Anthony J., 5,113,440, Cl. 380-15.000.
Higuchi, Chojiro: *See—*
Ajioka, Masanobu; Higuchi, Chojiro; Oura, Takeshi; Katoh, Toshio; and Yamaguchi, Akihiro, 5,113,009, Cl. 560-40.000.
Hill, Charles C. Fluid fractionator. 5,112,367, Cl. 55-26.000.
Hill, Charles F., to Standards Testing Laboratories, Inc. Roadwheel for tire testing apparatus. 5,111,687, Cl. 73-146.000.
Hill, Peter D., to Westinghouse Electric Corp. Apparatus and method for simulating blade pass sensor signals. 5,111,704, Cl. 73-866.400.
Hillestad, Jerome. Self locking folder hanger structure. 5,111,941, Cl. 211-46.000.
Hillis, W. Daniel, to Thinking Machines Corporation. Method and apparatus for operating a cache memory in a multi-processor. 5,113,510, Cl. 395-425.000.
Hiltebrandt, Siegfried, to Richard Wolf GmbH. Trocar sleeve having manual closure. 5,112,321, Cl. 604-264.000.
Hiltebrandt, Siegfried; Dingler, Andreas; Falk, Ernst; and Fischmeister, Martin F., to Richard Wolf GmbH. Retrograde cutting hook punch. 5,112,346, Cl. 606-170.000.

Hilti Aktiengesellschaft: *See—*
Neumaier, Anton, 5,111,889, Cl. 173-48.000.

Himeshima, Yoshio; Tanisugi, Hideaki; Watanabe, Tetsuo; Uemura, Tadahiro; and Kurihara, Masaru, to Toray Industries, Inc. Porous membrane and production process thereof. 5,112,487, Cl. 210-490.000.

Hinoue, Kenichi: *See—*
Nakahashi, Junichi; Natori, Itaru; Hinoue, Kenichi; and Ochiai, Nobutaka, 5,112,916, Cl. 525-183.000.

Hirabayashi, Masayuki: *See—*
Sugise, Ryoji; Daimon, Hiroshi; Gujii, Itsuhiro; Ihara, Hideo; Terada, Norio; Jo, Masatoshi; and Hirabayashi, Masayuki, 5,112,783, Cl. 501-126.000.

Hirai, Reiji: *See—*
Iwao, Tetsuya; Osaka, Shuichi; Sakaki, Takao; Nishida, Tadao; Yamamura, Kiyoshi; Koga, Seijiro; Hirai, Reiji; and Nakagawa, Haruo, 5,112,991, Cl. 549-206.000.

Hiraki, Souichiro: *See—*
Konotsune, Shiro; Yano, Hitoshi; Hiraki, Souichiro; and Kikuta, Kazutsune, 5,112,694, Cl. 428-457.000.

Hiramatsu, Nobuaki: *See—*
Miki, Yoshiaki; Toyonaka, Koji; Ueda, Tsunehisa; and Hiramatsu, Nobuaki, 5,112,602, Cl. 424-76.300.

Hiramatsu, Toru; and Urano, Akiyoshi, to Juki Corporation. Inconstant-thickness workpiece feeding apparatus. 5,111,759, Cl. 112-322.000.

Hiramoto, Nobuo; Nanba, Seiji; Ogawa, Soichiro; and Nozaki, Osamu, to Mazda Motor Corporation. Engine cooling system. 5,111,774, Cl. 123-41.100.

Hirata, Keiichi; Ban, Tomohiro; Kawasumi, Atsuko; Nakagawa, Kazuko; Mizutani, Yukimi; and Tsuruki, Satoru, to Brother Kogyo Kabushiki Kaisha. Data processor enabling prioritizing of concurrent tasks. 5,113,520, Cl. 395-650.000.

Hirate, Kenji: *See—*
Masaki, Mitsuo; Uehara, Masaki; Hirate, Kenji; Isowa, Yoshikazu; Sato, Yoshiaki; and Nakashima, Yoshiharu, 5,112,947, Cl. 530-329.000.

Hirayama, Satoru: *See—*
Takiyasu, Yoshihiro; Yamaga, Mitsuhiro; Nakamura, Kazunori; Amada, Eiichi; Jusa, Hidehiko; Kobayashi, Naoya; Takada, Osamu; Hirayama, Satoru; and Iiyama, Tatsuhito, 5,113,392, Cl. 370-85.150.

Hirayama, Takeshi: *See—*
Hamano, Fumio; Oho, Shigeru; Hirayama, Takeshi; and Hasegawa, Akira, 5,113,410, Cl. 375-7.000.

Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., to Intellicall, Inc. Method and apparatus for altering the access format of telephone calls. 5,113,433, Cl. 379-130.000.

Hirokane, Junji: *See—*
Inui, Tetsuya; Hirokane, Junji; Shibata, Akira; Nagahara, Yoshiyuki; and Ohta, Kenji, 5,112,727, Cl. 430-321.000.

Hirosawa, Yuji: *See—*
Takishima, Seiji; Hirosawa, Yuji; Takada, Hiromitsu; and Takagi, Fumito, 5,111,612, Cl. 47-60.000.

Hirose Electric Co., Ltd.: *See—*
Kawanami, Norihide; Okada, Kinjiro; and Kozu, Yoshikazu, 5,113,465, Cl. 385-82.000.

Hirose, Mitsuaki: *See—*
Mochizuki, Akihiro; Hama, Hideo; and Hirose, Mitsuaki, 5,113,273, Cl. 359-56.000.

Hirose, Shinichi: *See—*
Tashiro, Tetsu; Takeuchi, Minoru; Ishimaru, Yoshiyuki; Hirose, Shinichi; and Hayashi, Kazuo, 5,113,093, Cl. 307-465.000.

Hirota, Osamu; Tsushima, Hideaki; Sasaki, Shinya; Takasaki, Yoshitaka; and Maeda, Minoru, to Hitachi, Ltd.; and Hirota, Osamu. Quantum state control apparatus, optical receiver and optical communication system. 5,113,524, Cl. 359-115.000.

Hirs, Gene. Drum filter. 5,112,485, Cl. 210-387.000.

Hirschmann, Robert P.: *See—*
Mainz, Eric L.; Beard, William Q., Jr.; Hirschmann, Robert P.; Little, Barry M.; and Smith, Earl B., 5,113,027, Cl. 570-224.000.

Hiruta, Yoshiki; Tsukamura, Naoki; Uchimura, Yoshinobu; Shigematsu, Toshifumi; Yamasaki, Hironori; and Yamaguchi, Toshio, to Toto Ltd. Toilet device with system for inspecting health conditions. 5,111,539, Cl. 4-661.000.

Hisamura, Masafumi: *See—*
Okunuki, Masami; Tanaka, Hisami; Ohmori, Hiroyuki; and Hisamura, Masafumi, 5,112,708, Cl. 430-31.000.

Hitachi Cable Limited: *See—*
Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.

Hitachi, Ltd.: *See—*
Akiyama, Toshiyuki; Mimura, Itaru; Ozawa, Naoki; Takahashi, Kenji; Eto, Yoshizumi; and Matsumoto, Takahiro, 5,113,247, Cl. 358-51.000.
Eguchi, Shuji; Taketani, Noriaki; Tanno, Seikichi; Okabe, Yoshiaki; Terao, Hiromu; Asano, Hideki; Wajima, Motoyo; and Abe, Tomiya, 5,113,477, Cl. 385-143.000.
Hamano, Fumio; Oho, Shigeru; Hirayama, Takeshi; and Hasegawa, Akira, 5,113,410, Cl. 375-7.000.
Hirota, Osamu; Tsushima, Hideaki; Sasaki, Shinya; Takasaki, Yoshitaka; and Maeda, Minoru, 5,113,524, Cl. 359-115.000.
Horan, Paul; and Arimoto, Akira, 5,113,485, Cl. 395-25.000.
Imaizumi, Eiki; Usui, Kunihiko; Matsuura, Tatsuji; Tsukada, Toshiro; Ueda, Seiichi; and Sato, Hiroshi, 5,113,090, Cl. 307-355.000.
Kaneko, Hisao; Okazaki, Kichizaemon; and Terada, Toshimichi, 5,113,296, Cl. 360-85.000.
Koizumi, Hideaki; Sano, Koichi; Yokoyama, Tetsuo; and Sukegawa, Kazuya, 5,113,137, Cl. 324-307.000.
Koshi, Hiroyuki; and Owada, Minoru, 5,112,646, Cl. 422-52.000.
Kuriyama, Shigeru; Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,111,784, Cl. 123-192.100.
Miyajima, Goh; Takahashi, Takao; Shudo, Tuyosi; and Suzuki, Shohei, 5,113,166, Cl. 335-299.000.
Ogura, Toshihiko; Aotsu, Hiroaki; Kimura, Koichi; Enomoto, Hiromichi; and Kyoda, Tadashi, 5,113,487, Cl. 395-100.000.
Orii, Akihito; Yokomizo, Osamu; Masuhara, Yasuhiro; Nishida, Koji; Murata, Shigeto; Kashiwai, Shin-ichi; Inoue, Kotaro; and Yoshimoto, Yuichiro, 5,112,571, Cl. 376-439.000.
Sasaki, Hisao; Maejima, Hideo; and Hotta, Takashi, 5,113,503, Cl. 395-375.000.
Shibata, Yasuhisa; Oki, Naoto; Ozawa, Satoshi; and Miyagi, Hiroyuki, 5,112,471, Cl. 204-418.000.
Tadokoro, Hiroyuki; Wakamatsu, Kazuhiro; Sagae, Syoji; and Shimada, Akira, 5,113,226, Cl. 355-273.000.
Takiyasu, Yoshihiro; Yamaga, Mitsuhiro; Nakamura, Kazunori; Amada, Eiichi; Jusa, Hidehiko; Kobayashi, Naoya; Takada, Osamu; Hirayama, Satoru; and Iiyama, Tatsuhito, 5,113,392, Cl. 370-85.150.
Tamura, Takahiro; and Sakurai, Kazuo, 5,112,201, Cl. 417-366.000.
Tomita, Hiroshi, 5,113,370, Cl. 395-375.000.
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 5,113,072, Cl. 250-309.000.
Yamazaki, Takanaga, 5,113,491, Cl. 395-141.000.

Hitachi Maxell, Ltd.: *See—*
Katayama, Yousuke, 5,113,184, Cl. 340-825.540.

Hitachi Medical Corporation: *See—*
Nishiyama, Hisashi; Ogawa, Toshio; and Katakura, Kageyoshi, 5,111,825, Cl. 128-661.090.
Shimizu, Toshihiko; Hotta, Masao; and Moritani, Atsushi, 5,113,077, Cl. 250-370.110.

Hitachi Metals, Ltd.: *See—*
Umehara, Teruo; and Takahashi, Fumihiko, 5,113,162, Cl. 335-210.000.

Hitachi Microcomputer Engineering Ltd.: *See—*
Takiyasu, Yoshihiro; Yamaga, Mitsuhiro; Nakamura, Kazunori; Amada, Eiichi; Jusa, Hidehiko; Kobayashi, Naoya; Takada, Osamu; Hirayama, Satoru; and Iiyama, Tatsuhito, 5,113,392, Cl. 370-85.150.

Hitachi Seiko Ltd.: *See—*
Ito, Yasushi; Otani, Tamio; Dobashi, Tadanori; Irie, Akira; and Matsuya, Akihiro, 5,111,573, Cl. 483-1.000.

Hitachi VLSI Engineering Corporation: *See—*
Imaizumi, Eiki; Usui, Kunihiko; Matsuura, Tatsuji; Tsukada, Toshiro; Ueda, Seiichi; and Sato, Hiroshi, 5,113,090, Cl. 307-355.000.

Hivert, Michel; and Coleno, Raymond, to Societe Nationale des Poudres et Explosifs. Propulsion device comprising a block of propellant provided with a central duct of variable section. 5,111,657, Cl. 60-224.000.

Hiwatashi, Yutaka: *See—*
Mine, Atsushi; Kamimura, Katsuyoshi; and Hiwatashi, Yutaka, 5,113,345, Cl. 364-424.050.

Ho, Ying-Wai; Harrod, Peter L.; and Someshwar, Ashok H., to Motorola, Inc. Concurrent sticky-bit detection and multiplication in a multiplier circuit. 5,113,364, Cl. 364-757.000.

Hobock, Edgar G., to Sun-Maid Growers of California. Apparatus and fastener supply strip for attaching reclosable fastener to plastic bags. 5,111,643, Cl. 53-551.000.

Hochstrasser, Ferdinand; and Oesterle, Helmut, to KWC AG. Electrically controlled fitting. 5,111,846, Cl. 137-607.000.

Hockmeyer, Wayne T.: *See—*
Brey, Robert N., III; Majarian, William R.; Pillai, Subramonia; and Hockmeyer, Wayne T., 5,112,749, Cl. 435-172.300.

Hoechst Aktiengesellschaft: *See—*
Buch, Holger M.; and Springer, Hartmut, 5,112,970, Cl. 544-75.000.
Chatterjee, Sukumar; Chatterjee, Sugata; Ganguli, Bimal N.; Chatterjee, Deepak K.; Jani, Rajendra K. H.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; Kogler, Herbert; Seibert, Gerhard; and Teetz, Volker, 5,112,806, Cl. 514-9.000.
Raab, Klaus, 5,113,026, Cl. 570-170.000.
Roy, Kirity; Mukhopadhyay, Triptikumar; Reddy, Goukanapalli C. S.; Vijayakumar, Erra K. S.; Ganguli, Bimal N.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; and Kogler, Herbert, 5,112,858, Cl. 514-462.000.
Sommer, Andreas; Dietz, Erwin; and Urban, Manfred, 5,112,404, Cl. 106-506.000.

Hoechst Celanese Corporation: *See—*
Rashbrook, Robert B.; Alexander, Clyde W.; and Bland, Edward C., 5,112,685, Cl. 428-364.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See—*
Effland, Richard C.; and Fink, David M., 5,112,981, Cl. 546-301.000.
Shutske, Gregory M.; Kapples, Kevin J.; and Tomer, John D., IV, 5,112,829, Cl. 514-290.000.

Shutske, Gregory M.; and Effland, Richard C., 5,112,830, Cl. 514-291.000.

Hofer, Gregory V.: *See—*
McDonald, James C.; and Hofer, Gregory V., 5,113,384, Cl. 369-44.290.

Hoffman, Philip K.; and Frey, Douglas R., to Solid State Chargers, Inc. Universal battery charger. 5,113,127, Cl. 320-21.000.

Hoffmann-La Roche Inc.: *See—*
Gaginella, Timothy S.; Welton, Ann F.; and Will, Peter C., 5,112,856, Cl. 514-456.000.

Hoffmann-La Roches Inc.: *See—*
Keith, Dennis D.; Wei, Chung-Chen; and West, Kevin F., 5,112,967, Cl. 540-215.000.

Hofmeister, Peter: *See—*
Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuekenhoehner, Thomas; Kuenast, Christoph; and Hofmeister, Peter, 5,112,823, Cl. 514-252.000.

Hogan Mfg., Inc.: *See—*
Kempf, Dale, 5,111,912, Cl. 187-17.000.

Hoium, Ross A.: *See—*
Pierick, Richard L.; and Hoium, Ross A., 5,111,929, Cl. 198-495.000.

Holbrook, Russell W., to Pitney Bowes Inc. Front feeder for large size mail handling machine. 5,112,037, Cl. 271-2.000.

Holdgrafer, William J.; Sheaffer, Michael J.; and Levine, Lee R., to Kulicke and Soffa Investments, Inc. Method of making low profile fine wire interconnections. 5,111,989, Cl. 228-110.000.

Hollander, David S.; and Rubenstein, Mark S., to Transtech Service Network, Inc. Method and apparatus for packaging refrigerated goods. 5,111,957, Cl. 220-408.000.

Holleritter, Lisa A.: *See—*
Cozzette, Stephen N.; Davis, Graham; Holleritter, Lisa A.; Lauks, Imants R.; Piznik, Sylvia; Smit, Nicolaas J.; Tirinato, Jody A.; Wieck, Henry J.; and Zelin, Michael P., 5,112,455, Cl. 204-153.120.

Hollingsworth, John D.; Garrison, Joe K.; Collins, Joel C.; Warnock, William A., deceased; by Weiskel, Lillith M., legal representative; by Nyberg, Muriel R., legal representative; by Warnock, Charles F., legal representative; and by Pergande, Lorraine, legal representative, to John D. Hollingsworth on Wheels, Inc., a part interest. Compact carding apparatus with sliver thread-up and method. 5,111,551, Cl. 19-150.000.

Holmes, William E.: *See—*
Heyneker, Herbert L.; Holmes, William E.; and Vehar, Gordon A., 5,112,755, Cl. 435-215.000.

Holms, James H.: *See—*
Brooks, Dee W.; Gunn, Bruce P.; Holms, James H.; and Summers, James B., 5,112,848, Cl. 514-424.000.

Holtkamp, Reinhold, Sr. Plant watering container. 5,111,614, Cl. 47-81.000.

Holtz, Klaus. Computer memory pyramidal addressing method. 5,113,505, Cl. 395-400.000.

Homberg, Michael J.: *See—*
Albonesi, David H.; Langendorf, Brian K.; Chang, John; Faase, John G.; and Homberg, Michael J., 5,113,514, Cl. 395-425.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Ichikawa, Akira, 5,113,185, Cl. 340-995.000.
Ryoichi, Kimura; Noriaki, Hattori; and Kazuharu, Watabe, 5,113,427, Cl. 379-57.000.

Honda, Masakazu: *See—*
Kamiya, Kenji; Ina, Hiroyuki; Nakamura, Akimasa; and Honda, Masakazu, 5,111,686, Cl. 73-117.300.

Honda, Mitsuru: *See—*
Nakamura, Kazushige; Honda, Mitsuru; Toma, Hitoshi; Tanaka, Shigemori; Murai, Keiichi; Unno, Akira; and Takemura, Ako, 5,112,656, Cl. 427-425.000.

Honda, Shinkichi; Arai, Yoichiro; and Toida, Hiroshi, to Kyowa Hakko Kogyo Co., Ltd. Cosmetic composition. 5,112,613, Cl. 424-400.000.

Honda, Yuzuru; Fujii, Tateo; and Watanabe, Koji, to Toray Industries, Inc. Method for the production of a composite sheet for artificial leather. 5,112,421, Cl. 156-148.000.

Honegger, Werner, to Ferag AG. Process and apparatus for transporting printing products arriving in imbricated formation. 5,112,041, Cl. 271-286.000.

Honeywell Inc.: *See—*
Fletcher, Thomas A., 5,113,290, Cl. 359-823.000.
Franklin, Henry E.; Gold, Ronald S.; Jachimowicz, Karen E.; Poley, Harold J.; and Trimmier, J. Robert, 5,113,285, Cl. 359-465.000.
Simison, Paul, 5,112,010, Cl. 244-129.100.

Hong, Yeun-Ding G.: *See—*
Wang, Chen-Chin; Hong, Yeun-Ding G.; and Chiao, Stephen S., 5,113,238, Cl. 357-54.000.

Honji, Yasuko: *See—*
Saruwatari, Masumi; Ohta, Yasuhiko; Fujii, Yasuhiro; and Honji, Yasuko, 5,112,557, Cl. 264-289.300.

Honjo, Takeshi: *See—*
Uto, Nobutaka; and Honjo, Takeshi, 5,112,034, Cl. 270-53.000.

Honkanen, Erkki J.: *See—*
Backstrom, Reijo; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka I.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo, 5,112,861, Cl. 514-520.000.

Honma, Hideki: *See—*
Nomura, Takahiro; Yatsuzuka, Yohtaro; Iizuka, Shigeru; and Honma, Hideki, 5,113,448, Cl. 381-47.000.

Honma, Toshio: *See—*
Horie, Yoshiko; Ikeda, Yoshinori; Ichikawa, Hiroyuki; Kurita, Mitsuru; Hayashi, Kimiyoshi; and Honma, Toshio, 5,113,252, Cl. 358-77.000.

Honoki, Shinji; Kobayashi, Katsuyuki; Umeyama, Mitsuhiro; and Ootake, Toshihiro, to Toyota Jidosha Kabushiki Kaisha. Torsional damper type flywheel device. 5,111,714, Cl. 74-574.000.

Hoover Company, The: *See—*
Houston, William S.; McKnight, Darwin T.; and Bilek, Greg A., 5,111,841, Cl. 137-360.000.

Horan, Paul; and Arimoto, Akira, to Hitachi, Ltd. Optical neural network system. 5,113,485, Cl. 395-25.000.

Horie, Yoshiko; Ikeda, Yoshinori; Ichikawa, Hiroyuki; Kurita, Mitsuru; Hayashi, Kimiyoshi; and Honma, Toshio, to Canon Kabushiki Kaisha. Image processing apparatus including means for performing electrical thinning and fattening processing. 5,113,252, Cl. 358-77.000.

Horiike, Yasuhiro: *See—*
Sekine, Makoto; Okano, Haruo; and Horiike, Yasuhiro, 5,112,645, Cl. 427-43.100.

Horiishi, Nanao: *See—*
Okura, Ken; Matsuzaki, Satoru; Katamoto, Tsutomu; and Horiishi, Nanao, 5,112,403, Cl. 106-418.000.

Horikomi, Kazutoshi: *See—*
Matsubara, Akira; Sakai, Kazuya; Tanada, Hideki; Mizuchi, Akira; Horikomi, Kazutoshi; and Ohtsu, Takuma, 5,112,841, Cl. 514-361.000.

Horiuchi, Kenjiro; Kometani, Kiichi; and Inoue, Toshihide, to Toray Industries, Inc. Polyester compositions and molded articles therefrom. 5,112,913, Cl. 525-133.000.

Horlacher, Peter; Hahnsen, Heinrich; Grigo, Ulrich; Bushong, William C.; and Schlak, Ottfried, to Bayer Aktiengesellschaft. Special diorganosiloxane block copolycarbonates. 5,112,925, Cl. 525-474.000.

Horn, David N., to AT&T Bell Laboratories. Distributed control teleconferencing voice bridge. 5,113,431, Cl. 379-94.000.

Horton, Nikki, to Imanigation, Ltd. Multititer stopper array for multititer plate or tray. 5,112,574, Cl. 422-102.000.

Horton, Terry F.; and Ross, Steve A., to Utility Trailer Manufacturing Co. Heavy curtain support roller device. 5,111,867, Cl. 160-330.000.

Horvath, Gyula: *See—*
Ambrus, Gabor; Maderspach, Andrea; Jekkel, Antalne ; Javor, Andras; Ilkoy, Eva; Hajos, Gyorgy; Szporny, Laszlo ; Nagy, Jozsef; Horvath, Gyula; and Moravcsik, Imre, 5,112,815, Cl. 514-178.000.

Horvei, Knut; and Sandved, Jonas S., to Den norske stats oljeselskap a.s. Ceramic coating. 5,112,698, Cl. 428-632.000.

Hose, Fritz; and Reuss, Thomas, to Siemens Aktiengesellschaft. Flexible electrical cable having two stranded conductors. 5,113,040, Cl. 174-116.000.

Hoshi, Seiichi, to Tokyo Electron Limited. Probing method. 5,113,132, Cl. 324-158.00F.

Hoshi, Toyokazu: *See—*
Nakamura, Katsunari; Ueda, Keiichiro; Irie, Yoshiro; Hoshi, Toyokazu; and Kawakami, Motozou, 5,113,349, Cl. 364-478.000.

Hoshihara, Naoaki, to Aisin Seiki Kabushiki Kaisha. Seat belt retractor. 5,112,005, Cl. 242-107.000.

Hosoi, Masahiro: *See—*
Katoh, Hideo; Hosoi, Masahiro; Hamano, Hisashi; and Saito, Yasuhiko, 5,112,659, Cl. 428-35.700.

HOSPAL Industrie: *See—*
Fond, Andre, 5,111,683, Cl. 73-3.000.

Hotta, Masao: *See—*
Shimizu, Toshihiko; Hotta, Masao; and Moritani, Atsushi, 5,113,077, Cl. 250-370.110.

Hotta, Takashi: *See—*
Sasaki, Hisao; Maejima, Hideo; and Hotta, Takashi, 5,113,503, Cl. 395-375.000.

Hotta, Tetsuo: *See—*
Nakashima, Tukasa; Hotta, Tetsuo; and Tamura, Tatsuya, 5,112,547, Cl. 264-167.000.

Hottinger Baldwin Measurements, Inc.: *See—*
Antkowiak, Joseph H., 5,111,702, Cl. 73-862.650.

Hough International, Inc.: *See—*
Hough, Richard M., 5,112,180, Cl. 414-305.000.

Hough, Richard M., to Hough International, Inc. Silo top unloader. 5,112,180, Cl. 414-305.000.

Houghton, Paul J.; Goss, John D.; and Boissevain, Mathew G., to Measurex Corporation. Device and method for calibrating a nondestructive sheet strength measuring system. 5,111,688, Cl. 73-159.000.

Houser, William E.: *See—*
Simmons, Elex M.; and Houser, William E., 5,111,983, Cl. 224-258.000.

Houssais, Jean-Francois: *See—*
Chenciner, Nicole; and Houssais, Jean-Francois, 5,112,748, Cl. 435-172.200.

Houston, William S.; McKnight, Darwin T.; and Bilek, Greg A., to Hoover Company, The. Central vacuum system wall valve. 5,111,841, Cl. 137-360.000.

Houy, Thomas J.: *See—*
Cooper, David E.; and Houy, Thomas J., 5,113,131, Cl. 324-96.000.

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Mason, Jeffrey T.; Mason, Bradley R.; and Howard, Mark E., 5,112,045, Cl. 482-9.000.

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Klein, Robert R.; and Hoying, John F., 5,112,032, Cl. 267-140.10A.

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Hu, Fang-Quan; Page, Michael; and Watson, John M., to Norgren Martonair Limited. Pneumatic actuator. 5,111,847, Cl. 137-828.000.

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Ning, Sun Y.; and Huan, Fan L., 5,112,264, Cl. 446-108.000.

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Raudabaugh, Donald E., 5,113,167, Cl. 337-30.000.

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Hudson, Thomas H.; and King, Michael A., to United States of America, Army. Potentiation of immunotoxin action by Brefeldin A. 5,112,607, Cl. 424-85.910.

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Glass, Thomas R.; and Hudson, Weldon R., 5,111,843, Cl. 137-513.000.

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Huebner, Roger F., 5,113,207, Cl. 354-94.000.

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Bowers, Harold C., 5,112,418, Cl. 156-655.000.
Krikorian, Kapriel V.; and Rosen, Robert A., 5,113,194, Cl. 342-106.000.
O'Meara, Thomas R.; and Pepper, David M., 5,113,282, Cl. 359-241.000.
Wall, Stephen W., 5,113,464, Cl. 385-81.000.

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Brown, Thomas A.; Derenge, Charles L.; Hughes, Houston H., III; Szczutkowski, Craig; Teel, Vicki J.; and Tucker, Marcella M., 5,113,413, Cl. 375-40.000.

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Burrows, Kenneth D.; Hughes, Leslie R.; and Warner, Peter, 5,112,837, Cl. 514-312.000.

Hukasawa, Hiromichi, to Terumo Kabushiki Kaisha. Blood reservoir. 5,112,480, Cl. 210-188.000.

Hull, William E.; and Barthalow, Henry D., to Kidde Industries, Inc. Boom extension alignment device. 5,111,945, Cl. 212-168.000.

Humphrey, James A. Reverse boat oars. 5,112,261, Cl. 440-103.000.

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Chow, Calvin Y. H.; Humphries, Gillian M.; Kung, Viola T.; and Lacy, Michael M., 5,112,134, Cl. 356-427.000.

Hums, Erich; and Spitznagel, Gunther, to Siemens Aktiengesellschaft. Arsenic-resistant mixed oxide catalyst and process for producing the same. 5,112,794, Cl. 502-309.000.

Hund, Paul; Langer, Lothar; and Jenner, Wolfgang, to Robert Bosch GmbH. Method for joint welding of small structural component parts. 5,113,054, Cl. 219-117.100.

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Jozwiak, Terry H.; and Hunley, Eugene C., Jr., 5,111,879, Cl. 166-82.000.

Hunnebeck, Volker, to Auergesellschaft GmbH. Eyeglasses protective against gases. 5,111,536, Cl. 2-428.000.

Hunter, James C.; Nardi, John C.; Russell, Edwin T.; and Scarr, Robert F., to Eveready Battery Company, Inc. Coated anode current collector for alkaline cells. 5,112,705, Cl. 429-206.000.

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Hunter, Kevin D.: *See—*
Durst, Robert T., Jr.; and Hunter, Kevin D., 5,113,518, Cl. 395-550.000.

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Gilmore, William, 5,113,102, Cl. 310-88.000.

Huot, Jean-Yves: *See—*
Schulz, Robert; Huot, Jean-Yves; and Trudeau, Michel, 5,112,388, Cl. 75-255.000.

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Akselrud, Vitaly; and von Buren, Stefan, 5,112,212, Cl. 425-557.000.
Schad, Robert D.; and Brown, Paul, 5,112,558, Cl. 264-297.200.

Hutchins, Richard D.: *See—*
Dovan, Hoai T.; and Hutchins, Richard D., 5,111,886, Cl. 166-300.000.

Hutton, Robert: *See—*
Bridenne, Martine; Coffre, Eric; Hutton, Robert; and Marot, Yves, 5,113,075, Cl. 250-282.000.

Huynh, Nichol C. Vehicle wheel alignment tools. 5,111,586, Cl. 33-203.180.

Hwang, Ned H. C.; and Summers, David P., to American Biomed, Inc., a part interest. Heliifoil pump. 5,112,292, Cl. 600-16.000.

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Beidler, Daniel E.; and Jue, Rodney A., 5,112,951, Cl. 530-387.300.

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Schulz, Robert; Huot, Jean-Yves; and Trudeau, Michel, 5,112,388, Cl. 75-255.000.

Hylak, Peter J.; and Berge, Gary L., to E & H Plastics, Inc. Method of molding an improved linkage lever. 5,112,551, Cl. 264-219.000.

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Ruohola, Tuomo; Saiha, Erik; Kuukkanen, Kari; and Hyoty, Paavo, 5,112,441, Cl. 159-47.300.

I Stat Corporation: *See—*
Cozzette, Stephen N.; Davis, Graham; Holleritter, Lisa A.; Lauks, Imants R.; Piznik, Sylvia; Smit, Nicolaas J.; Tirinato, Jody A.; Wieck, Henry J.; and Zelin, Michael P., 5,112,455, Cl. 204-153.120.

Iannicelli, Joseph, to Aquafine Corporation. Manganese dioxide impregnated filter. 5,112,796, Cl. 502-402.000.

ICBT Lyon: *See—*
Gabalda, Carlos M., 5,111,647, Cl. 57-100.000.

Ichiguchi, Tsuneo: *See—*
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 5,113,072, Cl. 250-309.000.

Ichikawa, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Current location indication apparatus for use in an automotive vehicle. 5,113,185, Cl. 340-995.000.

Ichikawa, Hiroyuki: *See—*
Horie, Yoshiko; Ikeda, Yoshinori; Ichikawa, Hiroyuki; Kurita, Mitsuru; Hayashi, Kimiyoshi; and Honma, Toshio, 5,113,252, Cl. 358-77.000.

Ichikawa, Junichi: *See—*
Okonogi, Hirotaka; Nikaido, Katsutomo; Ichikawa, Junichi; and Nishiyama, Yoshio, 5,112,648, Cl. 427-96.000.

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Phalangas, Charalambos J., 5,112,886, Cl. 523-332.000.

Ide, Russell D. Beam mounted bearing pad and methods of making same. 5,112,143, Cl. 384-117.000.

Ideler, Karl-Heniz; Nowak, Stefan; and Petzold, Gunter, to Siemens Aktiengesellschaft. Power amplifier for feeding an inductance with switched transistors. 5,113,145, Cl. 330-251.000.

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Friend, David R., 5,112,541, Cl. 264-4.700.

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Okamoto, Masaya, 5,112,936, Cl. 528-204.000.

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Sakurai, Yoshihumi; Ideshita, Yuzi; and Sugiyama, Takashi, 5,111,972, Cl. 222-135.000.

Iero, David A.; and Hardeman, Homer. Crown planing tool. 5,111,584, Cl. 30-489.000.

Igarashi, Yutaka: *See—*
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Ihama, Mikio, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 5,112,733, Cl. 430-603.000.

Ihara, Hideo: *See—*
Sugise, Ryoji; Daimon, Hiroshi; Gujii, Itsuhiro; Ihara, Hideo; Terada, Norio; Jo, Masatoshi; and Hirabayashi, Masayuki, 5,112,783, Cl. 501-126.000.

Ihara, Takeshi: *See—*
Yamamoto, Takuji; Hamano, Hiroshi; Amemiya, Izumi; Arai, Yasunari; and Ihara, Takeshi, 5,113,151, Cl. 330-308.000.

Ii, Hiroshi: *See—*
Sudoh, Kengo; and Ii, Hiroshi, 5,113,295, Cl. 360-49.000.

Iida, Masahiro: *See—*
Takeuchi, Jun; Shibayama, Takashi; and Iida, Masahiro, 5,111,717, Cl. 74-866.000.

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Sakurai, Kaoru; Murakami, Harunori; Maeda, Masaru; Iijima, Hiroshi; and Ohara, Shouhei, 5,113,195, Cl. 343-704.000.

Iinuma, Mitsuhisa; Yamada, Hideo; Matsushima, Hiroaki; and Tobiki, Hisao, to Nihon Medi-Physics Co., Ltd. Double-sided needle assembly. 5,112,327, Cl. 604-413.000.

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Takiyasu, Yoshihiro; Yamaga, Mitsuhiro; Nakamura, Kazunori; Amada, Eiichi; Jusa, Hidehiko; Kobayashi, Naoya; Takada, Osamu; Hirayama, Satoru; and Iiyama, Tatsuhito, 5,113,392, Cl. 370-85.150.

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Iizuka, Shigeru: *See—*
Nomura, Takahiro; Yatsuzuka, Yohtaro; Iizuka, Shigeru; and Honma, Hideki, 5,113,448, Cl. 381-47.000.

Ikeda Bussan Co., Ltd.: *See—*
Takada, Naoyuki; and Murakami, Hironobu, 5,112,109, Cl. 297-343.000.

Ikeda, Hideo: *See—*
Kajiwara, Kenichi; Mori, Kikuichi; Ikeda, Hideo; and Arakawa, Shinichiro, 5,112,190, Cl. 415-215.100.

Ikeda, Junji: *See—*
Fukushima, Tetsuo; Suetsugu, Kenichiro; Nishihara, Munekazu; and Ikeda, Junji, 5,113,470, Cl. 385-126.000.

Ikeda, Yoshinori: *See—*
Horie, Yoshiko; Ikeda, Yoshinori; Ichikawa, Hiroyuki; Kurita, Mitsuru; Hayashi, Kimiyoshi; and Honma, Toshio, 5,113,252, Cl. 358-77.000.

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Yamamoto, Hiroshi; and Tobita, Hiroshi, 5,112,035, Cl. 270-53.000.

Ikegaya, Akihiko; and Tobioka, Masaaki, to Sumitomo Electric Industries, Ltd. Gaseous phase synthesized diamond and method for synthesizing same. 5,112,643, Cl. 427-38.000.

Ikemoto, Isao: *See—*
Tsuda, Tadayuki; Yano, Kanji; Ikemoto, Isao; Watanabe, Kazushi; Tanaka, Makoto; and Ishiwata, Kazuhiko, 5,113,224, Cl. 355-234.000.

Ikeuchi, Takashi: *See—*
Yamamoto, Shigeru; Ogiso, Tutomu; and Ikeuchi, Takashi, 5,112,001, Cl. 242-43.00R.

Ikeya, Taro: *See—*
Matsushiro, Ryuichi; Kosuda, Toru; Sasao, Shigeo; Ikeya, Taro; Chino, Yoshiharu; and Uekawa, Yasuaki, 5,111,776, Cl. 123-41.540.

Ikuta, Shizuo; Okuda, Masaharu; and Sakamoto, Takashi, to Taikisha, Ltd. Automatic spray painting machine. 5,111,997, Cl. 239-750.000.

Ilgmann, Wilhelm: *See—*
Kaule, Wittich; Ilgmann, Wilhelm; Schwenk, Gerhard; and Stenzel, Gerhard, 5,112,672, Cl. 428-209.000.

Ilkoy, Eva: *See—*
Ambrus, Gabor; Maderspach, Andrea; Jekkel, Antalne ; Javor, Andras; Ilkoy, Eva; Hajos, Gyorgy; Szporny, Laszlo ; Nagy, Jozsef; Horvath, Gyula; and Moravcsik, Imre, 5,112,815, Cl. 514-178.000.

Illinois Tool Works, Inc.: *See—*
Briggs, Paul C.; and Gosiewski, Donald E., 5,112,691, Cl. 428-412.000.
Ruehl, William E.; Frederiksen, Bjarne; and Swick, E. Grant, 5,113,169, Cl. 337-265.000.
Tipton, Allison D., 5,112,004, Cl. 242-75.510.

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Imai, Masanori: *See—*
Kamiya, Akihiko; Koike, Akinobu; and Imai, Masanori, 5,112,743, Cl. 430-175.000.

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Narui, Takashi; Kaneko, Tetsuo; Imamori, Katsumi; and Iwasa, Akira, 5,112,816, Cl. 514-179.000.

Imamura, Takahiro; Mizoshita, Yoshifumi; and Aruga, Keiji, to Fujitsu Limited. Rotating support apparatus in disk storage device. 5,112,147, Cl. 384-605.000.

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Horton, Nikki, 5,112,574, Cl. 422-102.000.

Imano, Haruo: *See—*
Degura, Yasusaburo; Sakanaka, Tetsuo; and Imano, Haruo, 5,113,278, Cl. 359-154.000.

Imazu, Katsuhiro: *See—*
Kobayashi, Tomomi; Kobayashi, Akira; Fujimoto, Hiroshi; Saiki, Norihiko; and Imazu, Katsuhiro, 5,111,679, Cl. 72-348.000.

Immunopath Profile, Inc.: *See—*
Girsh, Leonard S., 5,112,636, Cl. 426-581.000.

Imperial Chemical Industries PLC: *See—*
Austin, Peter W., 5,112,871, Cl. 514-727.000.
Barker, Martin C.; Brown, James P.; Cunningham, Anthony; and Randall, David, 5,112,877, Cl. 521-110.000.
Bath, Colin, 5,112,894, Cl. 524-173.000.
Burrows, Kenneth D.; Hughes, Leslie R.; and Warner, Peter, 5,112,837, Cl. 514-312.000.
Cardew, Peter T.; and Smith, John W., 5,112,892, Cl. 524-108.000.
Powell, Richard L.; and Heaton, Charles A., 5,113,013, Cl. 562-493.000.
Randall, David; and De Vos, Rik, 5,112,879, Cl. 521-155.000.
Vivienne, Anthony; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Crowley, Patrick J.; and Anderton, Kenneth, 5,112,386, Cl. 71-94.000.

Ina, Hiroyuki: *See—*
Kamiya, Kenji; Ina, Hiroyuki; Nakamura, Akimasa; and Honda, Masakazu, 5,111,686, Cl. 73-117.300.

Inaba, Hiroo; Kakuta, Takeshi; Yamauchi, Koichi; and Matsufuji, Akihiro, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 5,112,680, Cl. 428-329.000.

Inaishi, Kouji; Yoshimura, Chisato; and Shinkai, Yuji, to Brother Kogyo Kabushiki Kaisha. Optical waveguide array and method of manufacturing same. 5,113,471, Cl. 385-126.000.

Inami, Kazuyoshi; and Kawano, Hajime, to Mitsubishi Denki Kabushiki Kaisha. Case for housing integrated microwave circuits. 5,113,161, Cl. 333-246.000.

Inaoka, Katsumi: *See—*
Tairaka, Yoshihiko; and Inaoka, Katsumi, 5,112,876, Cl. 521-167.000.

Inazawa, Shinji: *See—*
Takano, Satoshi; Takahashi, Kenichi; Miyazaki, Kenji; Yoshida, Noriyuki; Inazawa, Shinji; and Hayashi, Noriki, 5,112,802, Cl. 505-1.000.

Inco Limited: *See—*
Eerkes, Thijs; Bell, James A. E.; and Diaz, Carlos M., 5,112,572, Cl. 419-30.000.

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Chesnut, Paul B.; Cooper, Michael D.; and Neas, Jerry A., 5,112,241, Cl. 439-273.000.

Incyte Pharmaceuticals: *See—*
Scott, Randy W.; and Berg, Richard A., 5,112,608, Cl. 424-94.640.

Inden, Takashi: *See—*
Nozaki, Yoshihisa; and Inden, Takashi, 5,111,750, Cl. 104-88.000.

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Huang, Huei-Huay, 5,111,778, Cl. 123-65.0PE
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Inoue, Kotaro: *See—*
Orii, Akihito; Yokomizo, Osamu; Masuhara, Yasuhiro; Nishida, Koji; Murata, Shigeto; Kashiwai, Shin-ichi; Inoue, Kotaro; and Yoshimoto, Yuichiro, 5,112,571, Cl. 376-439.000.

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Izumi, Shuji; Nakai, Masaaki; Inoue, Manabu; Fujino, Akihiko; Kawamura, Kunio; Takarabe, Yuji; and Niwa, Masatake, 5,113,217, Cl. 354-471.000.

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Inouye, Yoshio; Inoue, Takeo; Shimizu, Toshihide; and Kaneko, Ichiro, 5,112,682, Cl. 428-353.000.

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Horiuchi, Kenjiro; Kometani, Kiichi; and Inoue, Toshihide, 5,112,913, Cl. 525-133.000.

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Lazcano-Navarro, Arturo; Vargas-Gutierrez, Gregorio; Hernandez-Ruiz, Jose E.; and Maroto-Cabrera, Carlos, 5,112,029, Cl. 266-47.000.

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Cameron, Charles; Mimoun, Hubert; Robine, Alain; Bonnaudet, Serge; Chaumette, Patrick; and Dang Vu, Quang, 5,113,032, Cl. 585-500.000.
Chaumette, Patrick; Le Peltier, Fabienne; Szymanski, Raymond F.; Courty, Philippe; and Verdon, Catherine, 5,112,591, Cl. 423-415.00A.

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Meynier, Patrick, 5,111,903, Cl. 181-102.000.
Wittrisch, Christian; and DuBois, Jean-Claude, 5,111,880, Cl. 166-250.000.

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Guguen-Guillouzo, Christiane; Guillouzo, Andre; and Bourel, Michel, 5,112,757, Cl. 435-240.200.

Institut Pasteur and Centre National de la Recherche Scientifique: *See—*
Chenciner, Nicole; and Houssais, Jean-Francois, 5,112,748, Cl. 435-172.200.

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Lazcano-Navarro, Arturo, 5,112,387, Cl. 75-10.420.

Instrumentarium Corp.: *See—*
Rantala, Borje, 5,111,827, Cl. 128-719.000.

Intech, Inc.: *See—*
Ou, Niann-Gwo L., 5,113,133, Cl. 363-25.000.

Integrated Network Corporation: *See—*
Gupta, Dev V.; Chen, Y. Brian; and Tarantino, Joel T., 5,113,391, Cl. 370-84.000.

Integri-Test Corporation: *See—*
Conti, Joseph A.; and Liantonio, James, 5,113,133, Cl. 324-158.00P.

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Lev, Lavi A.; Young, Ian A.; and Greason, Jeffrey K., 5,113,096, Cl. 307-446.000.
Waizman, Alex, 5,113,150, Cl. 330-264.000.

Intellicall, Inc.: *See—*
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., 5,113,433, Cl. 379-130.000.

Interlego A.G.: *See—*
Penillard, Philippe; and Penillard, Aimee, 5,112,263, Cl. 446-89.000.

Intermedics Orthopedics, Inc.: *See—*
Krevolin, Janet L.; and Brown, Steven G., 5,112,336, Cl. 606-96.000.

International Business Machines Corp.: *See—*
Andrusch, Franz; Beerhalter, Siegfried; Mueller, Wolfgang F.; and Zykoff, Felix B., 5,111,723, Cl. 83-24.000.
Block, Timothy R.; and Liu, Tong, 5,113,403, Cl. 359-152.000.
Cameron, T. Jay; Erickson, Elwyn G.; and Hemphill, Cornelius H., 5,111,713, Cl. 74-573.00R.
Cederbaum, Carl; Chanclou, Roland; Combes, Myriam; Mone, Patrick; and Vallet, Vincent, 5,112,765, Cl. 437-41.000.
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Cihiwsky, Philip K.; and Jaw, Andrew C., 5,113,489, Cl. 395-113.000.
Cooke, Kevin K.; and Dewitt, John R., 5,112,119, Cl. 312-283.000.
Dinwiddie, John M., Jr.; Freeman, Bobby J.; Grice, Lonnie E.; Loffredo, John M.; Sanderson, Kenneth R.; and Suarez, Gustavo A., 5,113,522, Cl. 395-700.000.
Groves, Randall D.; and Tuttle, David P., 5,113,508, Cl. 395-425.000.
Gupta, Satish; Larky, Steven P.; Peevers, Alan W.; and St. Clair, Joe C., 5,113,180, Cl. 340-747.000.
Johnson, Donavon W.; Morgan, Stephen P.; and Smith, Todd A., 5,113,519, Cl. 395-600.000.
Kozol, Michael; Lim, Chan; Strong, Willard L., Jr.; and Tracey, William, 5,113,341, Cl. 364-419.000.
Lynne, Kenton J., 5,113,482, Cl. 395-23.000.
Pennings, Henricus M.; and Wijnen, Hubertus F., 5,113,509, Cl. 395-425.000.
Peterson, Gerald W.; and Weidle, Bert W., 5,113,467, Cl. 385-88.000.
Soyuer, Mehmet, 5,113,152, Cl. 331-61.000.
Zamora, Antonio, 5,113,342, Cl. 364-419.000.

International Flavors & Fragrances Inc.: *See—*
Farbood, Mohamad I.; McLean, Lynda B.; Morris, James A.; and Bondarovich, Henry A., 5,112,803, Cl. 512-11.000.

International Rolling Mill Consultants, Inc.: *See—*
Ginzburg, Vladimir B.; and Vidil, F. Ronald, 5,111,930, Cl. 198-780.000.

InterVentional Technologies: *See—*
Farr, Andrew F., 5,112,345, Cl. 606-159.000.

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Christie, Bruce; and Gupta, Amitava, 5,112,351, Cl. 623-6.000.

IPL Inc.: *See—*
Gaudreault, Mario, 5,111,954, Cl. 220-266.000.

Irie, Akira: *See—*
Ito, Yasushi; Otani, Tamio; Dobashi, Tadanori; Irie, Akira; and Matsuya, Akihiro, 5,111,573, Cl. 483-1.000.

Irie, Yoshiro: *See—*
Nakamura, Katsunari; Ueda, Keiichiro; Irie, Yoshiro; Hoshi, Toyokazu; and Kawakami, Motozou, 5,113,349, Cl. 364-478.000.

Irurre, Jose P.: *See—*
Cirera, Xavier D.; Andreoli, Romeo R.; Lloveras, Pedro P.; Bruseghini, Leonida; and Irurre, Jose P., 5,112,826, Cl. 514-255.000.

Irving, Edward: *See—*
Banks, Christopher P.; and Irving, Edward, 5,112,440, Cl. 156-659.100.

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Iscar Ltd.: *See—*
Pano, Joseph, 5,112,164, Cl. 407-110.000.

Ishida, Koji: *See—*
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 5,113,072, Cl. 250-309.000.

Ishida, Masayuki: *See—*
Endo, Kazuhito; Ishida, Masayuki; and Ishida, Yoshinobu, 5,113,293, Cl. 360-32.000.

Ishida, Tatsuyodihi: *See—*
Hashimoto, Isao; Ishida, Tatsuyodihi; Tsuru, Kazutaka; Yamada, Yuji; Miyazawa, Takeshige; Nakamura, Yasuo; Katou, Susumu; and Takahashi, Katsuya, 5,112,385, Cl. 71-94.000.

Ishida, Toshihiko: *See—*
Nakayama, Masatoshi; Ueda, Kunihiro; Ishida, Toshihiko; and Tanabe, Hiroshi, 5,112,025, Cl. 249-115.000.

Ishida, Yoshinobu: *See—*
Endo, Kazuhito; Ishida, Masayuki; and Ishida, Yoshinobu, 5,113,293, Cl. 360-32.000.

Ishii, Akio: *See—*
Kinoshita, Iwao; Machii, Daisuke; Onoda, Yasuo; Takai, Haruki; Kasaka, Nobuo; Shuto, Katsuichi; Gomi, Katsushige; Morimoto, Makoto; and Ishii, Akio, 5,112,867, Cl. 514-617.000.

Ishii, Kazuo: *See—*
Kasai, Seishi; Ishii, Kazuo; and Kato, Eiichi, 5,112,712, Cl. 430-95.000.
Kato, Eiichi; and Ishii, Kazuo, 5,112,713, Cl. 430-96.000.

Ishii, Takayuki: *See—*
Miyazawa, Yoshinori; Omae, Hidenori; Ishii, Takayuki; Koto, Haruhiko; and Akahane, Fujio, 5,113,204, Cl. 346-140.00R.

Ishii, Tatsuya; Mashiko, Yoji; Nagatomo, Masao; and Yamada, Michihiro, to Mitsubishi Denki Kabushiki Kaisha. Method of fibricating a semiconductor device having a trench. 5,112,771, Cl. 437-67.000.

Ishikawa, Tadashi, to Kabushiki Kaisha Toshiba. System for checking the activity and activity ratio of microprogram under test. 5,113,501, Cl. 395-375.000.

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Tashiro, Tetsu; Takeuchi, Minoru; Ishimaru, Yoshiyuki; Hirose, Shinichi; and Hayashi, Kazuo, 5,113,093, Cl. 307-465.000.

Ishino, Masaru: *See—*
Nomura, Kotohiro; and Ishino, Masaru, 5,112,997, Cl. 552-238.000.

Ishitani, Tohru: *See—*
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 5,113,072, Cl. 250-309.000.

Ishiwata, Kazuhiko: *See—*
Tsuda, Tadayuki; Yano, Kanji; Ikemoto, Isao; Watanabe, Kazushi; Tanaka, Makoto; and Ishiwata, Kazuhiko, 5,113,224, Cl. 355-234.000.

Ishiyama, Masamitsu: *See—*
Yoshida, Kazuyuki; Kanai, Nobuo; Suzuki, Toshikazu; and Ishiyama, Masamitsu, 5,113,268, Cl. 358-474.000.

Ishiyama, Masashi: *See—*
Watanabe, Toshihiro; Ishiyama, Masashi; and Masuda, Noriaki, 5,112,651, Cl. 427-339.000.

Ishizuka, Satoshi: *See—*
Tsujino, Toshifumi; Maeda, Koichi; Ishizuka, Satoshi; Yamamoto, Hiroaki; Kitayama, Shinichiro; and Hozumi, Shigeo, 5,112,722, Cl. 430-290.000.

Ishizuka, Shigeo: *See—*
Kuzuno, Katsutoshi; Ishizuka, Shigeo; and Yamamoto, Masayuki, 5,112,244, Cl. 439-395.000.

Isoard, Bernard, to Devtex. Apparatus for initiating the feed of yarn in a yarn processing machine. 5,111,648, Cl. 57-261.000.

Isono, Koichi; Nakano, Masayuki; and Nishigaito, Yoshiyuki, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for forming halftone dots. 5,113,264, Cl. 358-298.000.

Isowa, Yoshikazu: *See—*
Masaki, Mitsuo; Uehara, Masaki; Hirate, Kenji; Isowa, Yoshikazu; Sato, Yoshiaki; and Nakashima, Yoshiharu, 5,112,947, Cl. 530-329.000.

Isozaki, Wataru: *See—*
Tokunaga, Mareo; and Isozaki, Wataru, 5,111,640, Cl. 53-449.000.

Isozumi, Shuzou, to Mitsubishi Denki Kabushiki Kaisha. Starter motor. 5,111,705, Cl. 74-6.000.

Isozumi, Shuzou, to Mitsubishi Denki K.K. Planetary gear for starter motor. 5,113,084, Cl. 290-48.000.

Isuzu Ceramics Research Institute Co., Ltd.: *See—*
Kawamura, Hideo, 5,111,779, Cl. 123-90.110.

Isuzu Motors Limited: *See—*
Nakashima, Kenro; Hatanaka, Kazuhiro; and Ohta, Hideo, 5,113,478, Cl. 392-395.000.

Itagaki, Yasuharu: *See—*
Suzuki, Akira; Itagaki, Yasuharu; and Higashio, Kanji, 5,112,754, Cl. 435-212.000.

Itani, Akira; and Shimazaki, Kazuo, to Mitsui Petrochemical Industries, Ltd. Solid state laser device for lithography light source and semiconductor lithography method. 5,113,402, Cl. 372-22.000.

Itazaki, Hiroshi: *See—*
Sugita, Kenji; Itazaki, Hiroshi; Matsumoto, Koichi; and Kawamura, Yoshimi, 5,112,944, Cl. 530-321.000.

Ito, Hiroshi: *See—*
Shimura, Hidetsugu; and Ito, Hiroshi, 5,112,710, Cl. 430-46.000.

Ito, Kenji: *See—*
Ryoki, Masato; and Ito, Kenji, 5,112,169, Cl. 409-66.000.

Ito, Masazumi: *See—*
Higashio, Kimihiko; Ito, Masazumi; and Nishimori, Kadotaro, 5,113,229, Cl. 355-326.000.

Ito, Paul H.: *See—*
SooHoo, Kie L.; Doty, James H.; and Ito, Paul H., 5,112,128, Cl. 356-350.000.

Ito, Ralph K.; and LoGerfo, Frank W., to New England Deaconess Hospital Corporation. Soluble hirudin conjugates. 5,112,615, Cl. 424-426.000.

Ito, Susumu: *See—*
Torii, Nobutoshi; Ito, Susumu; Hamura, Masayuki; and Tanaka, Akira, 5,111,709, Cl. 74-89.150.

Ito, Yasushi; Otani, Tamio; Dobashi, Tadanori; Irie, Akira; and Matsuya, Akihiro, to Hitachi Seiko Ltd. Device and method of exchanging tools. 5,111,573, Cl. 483-1.000.

Itoh, Fumikazu: *See—*
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 5,113,072, Cl. 250-309.000.

Itoh, Hiroyuki; Kono, Yoshitsugu; Kikuchi, Isao; Takenaka, Shinji; and Ajioka, Masanobu, to Mitsui Toatsu Chemicals, Incorporated. Production process of chlorine. 5,112,593, Cl. 423-502.000.

Itoh, Hiroyuki: *See—*
Ajioka, Masanobu; Takenaka, Shinji; Itoh, Hiroyuki; Kataita, Masafumi; and Kohno, Yoshitsugu, 5,112,580, Cl. 422-241.000.

Itoh, Kazuo: *See—*
Koseki, Koshi; Ebata, Takashi; Kawakami, Hiroshi; Matsushita, Hajime; Itoh, Kazuo; and Naoi, Yoshitake, 5,112,994, Cl. 549-323.000.

Itoh, Masahiro; and Kuwabara, Masayuki, to Eastman Kodak Company. LED array chips with thermal conductor. 5,113,232, Cl. 357-17.000.

ITT Corporation: *See—*
John, Robert S.; and Piper, Jack R., 5,111,691, Cl. 73-292.000.
Wahls, Robert J., 5,112,018, Cl. 248-394.000.

Iuchi, Kazushi: *See—*
Senoo, Akihiro; Iuchi, Kazushi; Miyazaki, Hajime; Go, Shintetsu; and Miyaji, Toshie, 5,112,759, Cl. 430-58.000.

Iwao, Tetsuya; Osaka, Shuichi; Sakaki, Takao; Nishida, Tadao; Yamamura, Kiyoshi; Koga, Seijiro; Hirai, Reiji; and Nakagawa, Haruo, to Misui Toatsu Chemicals Incorporated. Process for the preparation of an organo-substituted sodium aluminum hydride. 5,112,991, Cl. 549-206.000.

Iwasa, Akira: *See—*
Narui, Takashi; Kaneko, Tetsuo; Imamori, Katsumi; and Iwasa, Akira, 5,112,816, Cl. 514-179.000.

Iwata, Kiyohide, to Star Seimitsu Kabushiki Kaisha. Serial type color printer with ink ribbon cassette position sensor. 5,112,150, Cl. 400-216.100.

Iyasaka Seiki Co., Ltd.: *See—*
Kawashima, Tsunenori; Shimada, Morihiro; and Fujii, Hiroshi, 5,111,585, Cl. 33-203.120.

Izumi, Akira: *See—*
Watanabe, Nobuatsu; Chong, Yong-Bo; Tatsuno, Toshio; Okada, Tomoyoshi; Izumi, Akira; and Toei, Keiji, 5,112,437, Cl. 156-646.000.

Izumi Products Co.: *See—*
Yasui, Tadashi; and Kobayashi, Masayuki, 5,111,681, Cl. 72-453.030.

Izumi, Shoichiro: *See—*
Harada, Yasuhiro; Karino, Toshikazu; Saito, Ryoji; Tometsuka, Koji; and Izumi, Shoichiro, 5,112,641, Cl. 427-8.000.

Izumi, Shuji; Nakai, Masaaki; Inoue, Manabu; Fujino, Akihiko; Kawamura, Kunio; Takarabe, Yuji; and Niwa, Masatake, to Minolta Camera Kabushiki Kaisha. Display device for use in a camera. 5,113,217, Cl. 354-471.000.

J. Eberspacher, Firma: *See—*
Wilson, Robert F., 5,113,116, Cl. 310-316.000.

J. L. Prescott Company: *See—*
Perez, Ricardo R.; and Ulatowski, George S., 5,112,554, Cl. 264-262.000.

J. M. Huber Corporation: *See—*
Freeman, Gary M.; and Broome, Thad T., 5,112,402, Cl. 106-416.000.

Jabloner, Harold: *See—*
Chu, Sung G.; Jabloner, Harold; and Nguyen, Tuyen T., 5,112,924, Cl. 525-426.000.

Jachimowicz, Karen E.: *See—*
Franklin, Henry E.; Gold, Ronald S.; Jachimowicz, Karen E.; Poley, Harold J.; and Trimmier, J. Robert, 5,113,285, Cl. 359-465.000.

Jackson, Arthur: *See—*
Grayson, James I.; Heyes, Graham; Jackson, Arthur; and Rowney, Paul E., 5,112,995, Cl. 549-493.000.

Jackson, George W. Connector for assembling components of scaffolding. 5,112,155, Cl. 403-49.000.

Jackson, Richard L.: *See—*
Mao, Simon J. T.; and Jackson, Richard L., 5,112,870, Cl. 514-712.000.

Jackson, Robert J.; Duke, Susan A.; and Barnett, Paul, to Beecham Group p.l.c. Compositions. 5,112,600, Cl. 424-55.000.

Jacobi, Ricky D.: *See—*
Striech, Steven G.; Jacobi, Ricky D.; Herndon, Daniel C.; and Floyd, Louis C., 5,111,884, Cl. 166-382.000.

Jacobs, Irwin C.; and Thompson, Neil E. S., to Petrolite Corporation. Certain dithiocarbamates and method of use for reducing asphaltene precipitation in asphaltenic reservoirs. 5,112,505, Cl. 252-8.552.

Jacobs, Michael L.: *See—*
Spahn, James G.; Langley, Steven P.; and Jacobs, Michael L., 5,111,807, Cl. 606-244.000.

Jada, Sivananda S., to Manville Corporation. Process for producing zirconium based granules and zirconium oxide fibers. 5,112,781, Cl. 501-95.000.

Jaeckel, Louis A., to Universities Space Research Association. Method and apparatus for a sparse distributed memory system. 5,113,507, Cl. 395-425.000.

Jaegle, Gary W.: *See—*
Clancy, Michael G.; and Jaegle, Gary W., 5,113,462, Cl. 385-53.000.

Jaggy, Peter; Krauss, Werner; Schafer, Dagobert; and Wurster, Helmut, to Richard Wolf GmbH. Piezoelectric transducer. 5,111,805, Cl. 128-24.0EL.

Jaguar Cars Limited: *See—*
Parsons, Bryan N. V., 5,112,204, Cl. 418-36.000.

Jahnke, David D.: *See—*
Mundle, Craig M.; Jahnke, David D.; Rickert, Michael T.; and Robertson, William N., 5,112,059, Cl. 273-292.000.

Jain, Himanshu: *See—*
Sperling, Leslie H.; Murphy, Clarence J.; Rosen, Warren A.; Jain, Himanshu; and Herman, Warren N., 5,112,531, Cl. 252-582.000.

Janetatos, Jack P.: *See—*
Moore, Richard G., 5,111,783, Cl. 123-190.400.

Jang, Dong-Gil, to Samsung Electron Devices Co., Ltd. Dispenser cathode structure for use in electron gun. 5,113,110, Cl. 313-270.000.

Jani, Rajendra K. H.: *See—*
Chatterjee, Sukumar; Chatterjee, Sugata; Ganguli, Bimal N.; Chatterjee, Deepak K.; Jani, Rajendra K. H.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; Kogler, Herbert; Seibert, Gerhard; and Teetz, Volker, 5,112,806, Cl. 514-9.000.

Janssen Pharmaceutica N.V.: *See—*
Stokbroekx, Raymond A.; and Van der Aa, Marcel J. M., 5,112,825, Cl. 514-253.000.

Japan Aviation Electronics Industry, Ltd.: *See—*
Endo, Hiroshi, 5,112,254, Cl. 439-852.000.

Japan International Development Organization Ltd.: *See—*
Shikanai, Yasushi, 5,111,797, Cl. 123-539.000.

Japan Storage Battery Co., Ltd.: *See—*
Yasui, Tadashi; and Kobayashi, Masayuki, 5,111,681, Cl. 72-453.030.

Japan Tobacco Inc.: *See—*
Koseki, Koshi; Ebata, Takashi; Kawakami, Hiroshi; Matsushita, Hajime; Itoh, Kazuo; and Naoi, Yoshitake, 5,112,994, Cl. 549-323.000.

Japanic Corporation: *See—*
Kishi, Mitsuhiro, 5,111,907, Cl. 182-63.000.

Jardieu, Paula, to Genentech, Inc. Temporal gamma-interferon administration for allergies. 5,112,605, Cl. 424-85.500.

Jarrold, Gregory S.: *See—*
Lambert, Patrick M.; Bryan, Philip S.; Jarrold, Gregory S.; and Towers, Christine M., 5,112,700, Cl. 428-690.000.

Jarvela, John P.; and Spence, Michael F., to Motorola, Inc. Telephone hang-up cup having rectractable latch member operative responsive to actuation force applied at either side thereof. 5,113,436, Cl. 379-455.000.

Jasne, Stanley J., to Polaroid Corporation. Processable conductive polymers. 5,112,450, Cl. 204-59.00R.

Jatco Corporation: *See—*
Iizuka, Naonori, 5,111,718, Cl. 74-866.000.

Javor, Andras: *See—*
Ambrus, Gabor; Maderspach, Andrea; Jekkel, Antalne ; Javor, Andras; Ilkoy, Eva; Hajos, Gyorgy; Szporny, Laszlo ; Nagy, Jozsef; Horvath, Gyula; and Moravcsik, Imre, 5,112,815, Cl. 514-178.000.

Jaw, Andrew C.: *See—*
Cihiwsky, Philip K.; and Jaw, Andrew C., 5,113,489, Cl. 395-113.000.

Jaxa-Chamiec, Albert A.; and Hickey, Deirdre M. B., to Smith Kline & French Laboratories. Polystyrene anion exchange polymers. 5,112,922, Cl. 525-332.200.

Jekkel, Antalne : *See—*
Ambrus, Gabor; Maderspach, Andrea; Jekkel, Antalne ; Javor, Andras; Ilkoy, Eva; Hajos, Gyorgy; Szporny, Laszlo ; Nagy, Jozsef; Horvath, Gyula; and Moravcsik, Imre, 5,112,815, Cl. 514-178.000.

Jennejahn, Rosemary J.: *See—*
DeRosa, Thomas F.; Von Allmen, Ronald W.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., 5,112,508, Cl. 252-51.50A.

Jenner, Wolfgang: *See—*
Hund, Paul; Langer, Lothar; and Jenner, Wolfgang, 5,113,054, Cl. 219-117.100.

Jensen, Brian J.; Hergenrother, Paul M.; and Bass, Robert G., to United States of America, National Aeronautics and Space Administration. Imide/arylene ether copolymers. 5,112,923, Cl. 525-420.000.

Jensen, Erik D.; and Wood, Richard R., to Delkor Technik Limited. Rock anchor. 5,112,160, Cl. 405-259.500.

VOL
1138
ISS
2
MY
12
1992
UMI

Jensen, Roderick J.; and Weber, Jerry L., to Deere & Company. Discharge structure for an axial separator. 5,112,279, Cl. 460-69.000.
Jeong, Ho-sun, to Samsung Electronics Co., Ltd. Rank filter using neural newwork. 5,113,484, Cl. 395-24.000.
Ji, Quingyan: *See—*
Zhang, XueMing; Zhang, Shucheng; Zhang, Shuxia; Liu, Congshan; Zhang, Haibuo; Li, Wenrong; Ji, Quingyan; Zhang, Shufang; and Zhang, Shuwei, 5,112,463, Cl. 204-237.000.
Ji, Zhiming: *See—*
Leu, Ming C.; and Ji, Zhiming, 5,113,080, Cl. 250-561.000.
Jidosha Kiki Co., Ltd.: *See—*
Suzuki, Haruo, 5,111,734, Cl. 91-376.00R.
Jin, Iljoon; Kenny, Lorne D.; and Sang, Harry, to Alcan International Limited. Stabilized metal foam body. 5,112,697, Cl. 428-613.000.
Jo, Masatoshi: *See—*
Sugise, Ryoji; Daimon, Hiroshi; Gujii, Itsuhiro; Ihara, Hideo; Terada, Norio; Jo, Masatoshi; and Hirabayashi, Masayuki, 5,112,783, Cl. 501-126.000.
Johansen, Eivind, to Chomerics, Inc. High temperature resistance mask. 5,112,683, Cl. 428-354.000.
Johansson, Ole H.; and Capriotti, Robert J. Contour nasal implant. 5,112,353, Cl. 623-10.000.
John D. Hollingsworth on Wheels, Inc.: *See—*
Hollingsworth, John D.; Garrison, Joe K.; Collins, Joel C.; Warnock, William A., deceased; Weiskel, Lillith M., legal representative; Nyberg, Muriel R., legal representative; Warnock, Charles F., legal representative; and Pergande, Lorraine, legal representative, 5,111,551, Cl. 19-150.000.
John, Robert S.; and Piper, Jack R., to ITT Corporation. Conductance/thermal limit control apparatus and method. 5,111,691, Cl. 73-292.000.
John, Thomas: *See—*
Kobler, Ingo; John, Thomas; Gollinger, Franz X.; and Bock, Georg, 5,111,747, Cl. 101-365.000.
John Wyeth & Brother Limited: *See—*
Crossley, Roger; Opalko, Albert; and Shepherd, Robin G., 5,112,832, Cl. 514-299.000.
Johna, Josef; Rasthofer, Lothar; and Daum, Hermann, to Knoll AG. Prevention of digestive disturbances in herbivores. 5,112,624, Cl. 426-2.000.
Johnson, Brian C., to North American Philips Corporation. Data repacker having controlled feedback shifters and registers for changing data format. 5,113,516, Cl. 395-500.000.
Johnson, Bruce R., to Baker Hughes Incorporated. System and method of decreasing waste fluid in continuous backwash filtration. 5,112,504, Cl. 210-792.000.
Johnson, Donavon W.; Morgan, Stephen P.; and Smith, Todd A., to International Business Machines Corporation. Maintenance of file attributes in a distributed data processing system. 5,113,519, Cl. 395-600.000.
Johnson, Elizabeth R.; and Mosher, Charles E., Jr., to Sun Microsystems, Inc. Method and apparatus for rendering of geometric volumes. 5,113,357, Cl. 395-124.000.
Johnson, Gary M., to Micron Technology, Inc. Actively controlled transient reducing current supply and regulation circuits for random access memory integrated circuits. 5,113,372, Cl. 365-205.000.
Johnson, Ivy D.; and McWilliams, John P., to Mobil Oil Corp. Method for synthesizing mesoporous crystalline material using acid. 5,112,589, Cl. 423-328.000.
Johnson, Kenneth H.: *See—*
Westermark, Per; and Johnson, Kenneth H., 5,112,945, Cl. 530-324.000.
Johnson, Larry A., to L. E. Johnson Products, Inc. Hanger wheel mount. 5,111,549, Cl. 16-97.000.
Johnson, Larry K.; and O'Malley, Austin S., to Texas Instruments Incorporated. Printed circuit connector apparatus and method of making same. 5,112,234, Cl. 439-79.000.
Johnson, Mark A.; Pokora, Alexander R.; and Cyrus, William L., Jr., to Mead Corporation, The. Biocatalytic oxidation using soybean and other legume peroxidases. 5,112,752, Cl. 435-192.000.
Johnson, Nigel: *See—*
Best, Stuart J.; Johnson, Nigel; and Sandford, Adrian M., 5,113,437, Cl. 380-3.000.
Johnson, Noel R., to Beloit Corporation. Air spring with quick release valve. 5,111,735, Cl. 91-433.000.
Johnson, Peter C., to Atlantic Richfield Company. Receiver array system for marine seismic surveying. 5,113,377, Cl. 367-20.000.
Johnson, Russell I.: *See—*
Ball, Garry L.; Johnson, Russell I.; and Radke, Daniel D., 5,111,578, Cl. 29-891.000.
Johnson, Stephen A.: *See—*
Frish, Michael B.; Morency, Joseph; Johnson, Stephen A.; and Boni, Arthur A., 5,112,215, Cl. 431-3.000.
Johnston, Adam J. L.; and Doig, James N. T., to NCR Corporation. Sheet separating apparatus. 5,112,040, Cl. 271-11.000.
Johnston, Michael D.; and Berger, Henry, to Burroughs Wellcome Co. Acidic formulations of t-PA. 5,112,609, Cl. 424-94.640.
Joint Medical Products Corporation: *See—*
Noiles, Douglas G., 5,112,355, Cl. 623-22.000.
Jolivet, Jean: *See—*
Habermann, Helmut; and Jolivet, Jean, 5,111,697, Cl. 73-668.000.
Jones, Arthur A. Method of testing and/or exercising the cervical muscles of the human body. 5,112,286, Cl. 482-100.000.
Jones, C. Michael. Methods and compositions for inducing monocyte cytotoxicity. 5,112,948, Cl. 530-351.000.
Jones, Christopher W.: *See—*
Marcantonio, Jeffrey J.; and Jones, Christopher W., 5,113,454, Cl. 382-27.000.
Jones, Daniel A. Gaming table apparatus. 5,112,060, Cl. 273-309.000.
Jones, David S.: *See—*
Gustavson, Linda M.; Srinivasan, Anasthachari; Kasina, Sudhakar; Reno, John M.; Fitzner, Jeffrey N.; and Jones, David S., 5,112,953, Cl. 530-391.500.
Jones, Francis, deceased: *See—*
Carrington, Andrew N.; Green, Bernard J.; and Jones, Francis, deceased, 5,112,361, Cl. 8-471.000.
Jones, Gary W.: *See—*
Reisman, Arnold; and Jones, Gary W., 5,112,439, Cl. 156-656.000.
Jones, Graham, to Allied Colloids Limited. Purification of aqueous liquor. 5,112,500, Cl. 210-728.000.
Jones, Jean, Legal Representative: *See—*
Carrington, Andrew N.; Green, Bernard J.; and Jones, Francis, deceased, 5,112,361, Cl. 8-471.000.
Jones, Leslie, Jr., to Chevron Research Company. Method and apparatus for testing geophones. 5,113,375, Cl. 367-13.000.
Jones, Richard J. Attachment assembly for a bicycle mudguard. 5,112,071, Cl. 280-152.300.
Jones, William: *See—*
Atkins, Martin P.; Jones, William; and Chibwe, Malama, 5,112,784, Cl. 502-80.000.
Jones, William J., Jr.: *See—*
Halm, Walter B.; Jones, William J., Jr.; Kirkbride, James F.; Marcus, Ilan; and Snyder, Adrian C., 5,112,684, Cl. 428-357.000.
Jonner, Wolf-Dieter: *See—*
Altmann, Rainer; Lauer, Rainer; Schmidt, Guenther; Stromski, Kasimir; van Zanten, Anton; Hellmann, Harald; Veil, Karl; Fees, Hans-Joerg; Jonner, Wolf-Dieter; and Gutzeit, Reinhard, 5,112,117, Cl. 303-116.00R.
Willmann, Karl-Heinz; Rischen, Dietmar; and Jonner, Wolf-Dieter, 5,112,115, Cl. 303-114.00R.
Jow, Warren. Food cover for providing both a full closed position and a quasi-open, sneeze guard position and including side panels, a segmented hinge and mirror image front and back panels. 5,111,956, Cl. 220-338.000.
Jozefowicz, Mark A.; and Rosenfeld, Aron M., to Alcan International Limited. Two phase metal/oxide films. 5,112,449, Cl. 205-175.000.
Jozwiak, Terry H.; and Hunley, Eugene C., Jr., to Amtrol Inc. Sanitary locking lip split well seal. 5,111,879, Cl. 166-82.000.
Jue, Rodney A.: *See—*
Beidler, Daniel E.; and Jue, Rodney A., 5,112,951, Cl. 530-387.300.
Juki Corporation: *See—*
Hiramatsu, Toru; and Urano, Akiyoshi, 5,111,759, Cl. 112-322.000.
Jung, Peter: *See—*
Banholzer, Karlheinz; Gerst, Peter; and Jung, Peter, 5,111,698, Cl. 73-708.000.
Juo, Rouh-Rong: *See—*
Bronstein, Irena Y.; Edwards, Brooks; and Juo, Rouh-Rong, 5,112,960, Cl. 536-18.100.
Jurasek, David W.: *See—*
Colley, Stephen R.; Jurasek, David W.; Palmer, John F.; Richardson, William S.; and Wilde, Doran K., 5,113,523, Cl. 395-800.000.
Jurgensen, Holger: *See—*
Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, 5,112,432, Cl. 156-610.000.
Jusa, Hidehiko: *See—*
Takiyasu, Yoshihiro; Yamaga, Mitsuhiro; Nakamura, Kazunori; Amada, Eiichi; Jusa, Hidehiko; Kobayashi, Naoya; Takada, Osamu; Hirayama, Satoru; and Iiyama, Tatsuhito, 5,113,392, Cl. 370-85.150.
Kaaden, Jurgen; Uhde, Dietmar; and Bigge, Franz, to Deutsche Thomson-Brandt GmbH. Apparatus relating to the reproduction of error encoded digitally recorded signals. 5,113,397, Cl. 371-5.100.
Kaakkola, Seppo K.: *See—*
Backstrom, Reijo; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka I.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo, 5,112,861, Cl. 514-520.000.
Kabat, Daniel M.: *See—*
Fontichiaro, Dominic; and Kabat, Daniel M., 5,111,786, Cl. 123-256.000.
Kabushiki Kaisha CSK: *See—*
Kimura, Fumio, 5,113,378, Cl. 369-44.370.
Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See—*
Sakai, Shuzo; Akai, Hiroshi; and Miyake, Toshio, 5,112,407, Cl. 127-58.000.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Sato, Masayuki; and Matsuda, Haruyuki, 5,111,716, Cl. 74-733.100.
Kabushiki Kaisha Nishiki: *See—*
Sato, Takumi, 5,111,560, Cl. 28-204.000.
Kabushiki Kaisha Okuma Tekkosho: *See—*
Ryoki, Masato; and Ito, Kenji, 5,112,169, Cl. 409-66.000.
Tomita, Hiroki; and Suzuki, Tomohiro, 5,113,348, Cl. 364-474.260.
Kabushiki Kaisha Topcon: *See—*
Isawa, Nobuo, 5,112,130, Cl. 356-373.000.
Kabushiki Kaisha Toshiba: *See—*
Dewa, Koichi, 5,113,497, Cl. 395-275.000.
Funakoshi, Toshio, 5,111,804, Cl. 128-6.000.
Goto, Yasuhiro; Yonezawa, Takeyuki; Tsuge, Akihiko; and Komatsu, Michiyasu, 5,112,780, Cl. 501-95.000.

Hatakoshi, Genichi; Terashima, Kazutaka; Kawachi, Masaru; and Uematsu, Yutaka, 5,113,469, Cl. 385-122.000.
Ishikawa, Tadashi, 5,113,501, Cl. 395-375.000.
Kawai, Kazumasa, 5,113,513, Cl. 395-425.000.
Kinoshita, Tsuneo, 5,113,369, Cl. 395-325.000.
Osawa, Yasuo, 5,113,089, Cl. 307-350.000.
Ozaki, Masashi; and Furukawa, Matsuhiro, 5,113,304, Cl. 361-87.000.
Satou, Youji, 5,113,360, Cl. 364-708.000.
Sekine, Makoto; Okano, Haruo; and Horiike, Yasuhiro, 5,112,645, Cl. 427-43.100.
Shimoma, Taketoshi; Kamohara, Eiji; and Shimokobe, Jiro, 5,113,112, Cl. 313-412.000.
Tanaka, Yasuji; and Tanaka, Akiko, 5,112,454, Cl. 204-153.100.
Ueno, Masaji, 5,113,087, Cl. 307-263.000.
Yanagida, Satoru; Araki, Kouji; Okunoyama, Hikaru; and Niimi, Tetsunori, 5,113,241, Cl. 357-72.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Watanabe, Yoshihide; Kimura, Mareo; and Matsumoto, Shinichi, 5,112,790, Cl. 502-213.000.
Kadle, Prasad S., to General Motors Corporation. Evaporator with expanding and contracting passes for improving uniformity of air temperature distribution. 5,111,671, Cl. 62-515.000.
Kadle, Prasad S., to General Motors Corporation. U-flow heat exchanger tubing with improved fluid flow distribution. 5,111,878, Cl. 165-176.000.
Kadomukai, Yuzo: *See—*
Kuriyama, Shigeru; Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,111,784, Cl. 123-192.100.
Kadoya, Katsuhiko; Omichi, Yukinobu; Matsuda, Eiji; and Takenaka, Kenji, to Matsushita Electric Industrial Co. Ltd. Washing-drying machine. 5,111,673, Cl. 68-12.040.
Kagami, Manabu: *See—*
Okada, Hiroshi; Suzuki, Shingo; Kagami, Manabu; and Suematsu, Chiaki, 5,113,476, Cl. 385-140.000.
Kagami, Naoto, to Canon Kabushiki Kaisha. Interface for ISDN channels. 5,113,396, Cl. 370-110.200.
Kagasaki, Takeshi: *See—*
Hamano, Kiyoshi; Furuya, Kouhei; Tanzawa, Kazuhiko; Kagasaki, Takeshi; Miyamoto, Masaaki; and Kinoshita, Takeshi, 5,112,807, Cl. 514-11.000.
Kairisalo, Pekka J.: *See—*
Backstrom, Reijo; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka I.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo, 5,112,861, Cl. 514-520.000.
Kajaani Electronics Ltd.: *See—*
Marcantonio, Jeffrey J.; and Jones, Christopher W., 5,113,454, Cl. 382-27.000.
Kaji, Masayoshi: *See—*
Sakuma, Kiyoshi; and Kaji, Masayoshi, 5,112,136, Cl. 374-44.000.
Kajiwara, Kenichi; Mori, Kikuichi; Ikeda, Hideo; and Arakawa, Shinichiro, to Ebara Corporation. Sheet-metal centrifugal pump casing. 5,112,190, Cl. 415-215.100.
Kakisada, Kou: *See—*
Satoh, Kazuo; Sekine, Koichiro; Kakisada, Kou; and Morita, Minoru, 5,112,502, Cl. 210-770.000.
Kako, Hajime: *See—*
Ohuchi, Hirofumi; and Kako, Hajime, 5,113,347, Cl. 364-431.100.
Kaku, Shinji; and Shinkai, Tatsuya, to Suzuki Kabushiki Kaisha. Valve actuating mechanism in four-stroke cycle engine. 5,111,781, Cl. 123-90.160.
Kakuta, Takeshi: *See—*
Inaba, Hiroo; Kakuta, Takeshi; Yamauchi, Koichi; and Matsufuji, Akihiro, 5,112,680, Cl. 428-329.000.
Kalie-Chemie AG: *See—*
Buchwald, Hans; Brackmann, Andreas; and Raschkowski, Boleslaus, 5,112,517, Cl. 252-171.000.
Kallevig, Bruce E.: *See—*
Shoenhair, John J.; and Kallevig, Bruce E., 5,111,624, Cl. 51-178.000.
Kalmaz, Errol E.: *See—*
Saunders, J. Palmer; and Kalmaz, Errol E., 5,112,827, Cl. 514-263.000.
Kalnoski, Arvid L.: *See—*
Doeden, Douglas D.; and Kalnoski, Arvid L., 5,112,166, Cl. 408-1.00R.
Kaltenecker, Johann: *See—*
Ranger, Ulrich; Wanner, Karl; Kaltenecker, Johann; Hellbach, Manfred; and Meixner, Gerhard, 5,111,890, Cl. 173-104.000.
Kam, John; Truchon, Lee M.; Goodale, Thomas C.; and Dalton, John T., to Wang Laboratories, Inc. Apparatus for distributing data processing. 5,113,393, Cl. 370-94.100.
Kamei, Noboru, to Daicel Chemical Industries Ltd. Process for preparing 2,6-dichloropyridine. 5,112,982, Cl. 546-345.000.
Kamimura, Katsuyoshi: *See—*
Mine, Atsushi; Kamimura, Katsuyoshi; and Hiwatashi, Yutaka, 5,113,345, Cl. 364-424.050.
Kamio, Takayoshi: *See—*
Ohkawa, Atsuhiro; Kamio, Takayoshi; Motoki, Masuzi; and Mihayashi, Keiji, 5,112,730, Cl. 430-553.000.
Kamiya, Akihiko; Koike, Akinobu; and Imai, Masanori, to Fuji Photo Film Co., Ltd. Light-sensitive composition and presensitized plate for use in making lithographic printing plates. 5,112,743, Cl. 430-175.000.
Kamiya, Kenji; Ina, Hiroyuki; Nakamura, Akimasa; and Honda, Masakazu, to Nippondenso Co., Ltd. Fault diagnosis apparatus for mounting on a vehicle. 5,111,686, Cl. 73-117.300.
Kamohara, Eiji: *See—*
Shimoma, Taketoshi; Kamohara, Eiji; and Shimokobe, Jiro, 5,113,112, Cl. 313-412.000.
Kamp, David C.; and Hanks, William H., to Cooper Industries, Inc. Electrical panel assembly. 5,113,311, Cl. 361-346.000.
Kanaga, Bob C.; and Beyerle, Ronald R., to Gould Inc. Slitter knife arrangement. 5,111,724, Cl. 83-58.000.
Kanai, Nobuo: *See—*
Yoshida, Kazuyuki; Kanai, Nobuo; Suzuki, Toshikazu; and Ishiyama, Masamitsu, 5,113,268, Cl. 358-474.000.
Kanda, Hitoshi; Yamada, Yusuke; Kato, Masayoshi; Goseki, Yasuhide; and Mitsumura, Satoshi, to Canon Kabushiki Kaisha. Process for producing toner for developing electrostatic image and apparatus system therefor. 5,111,998, Cl. 241-5.000.
Kane, Michael H.: *See—*
Mohr, Jacob G.; Kane, Michael H.; and Le Riche, Etienne, 5,111,559, Cl. 27-4.000.
Kaneko, Hisao; Okazaki, Kichizaemon; and Terada, Toshimichi, to Hitachi, Ltd. Mechanism for winding a tape from a tape cassette onto a rotatable cylinder of a VCR. 5,113,296, Cl. 360-85.000.
Kaneko, Ichiro: *See—*
Inouye, Yoshio; Inoue, Takeo; Shimizu, Toshihide; and Kaneko, Ichiro, 5,112,682, Cl. 428-353.000.
Kaneko, Tetsuo: *See—*
Narui, Takashi; Kaneko, Tetsuo; Imamori, Katsumi; and Iwasa, Akira, 5,112,816, Cl. 514-179.000.
Kanno, Hideo: *See—*
Inoue, Hiroshi; Mizutome, Atsushi; Kanno, Hideo; Sakamoto, Eiji; and Osada, Yoshiyuki, 5,113,181, Cl. 340-783.000.
Kanno, Masahide; Uehara, Masao; Sasaki, Masahiko; Saito, Katsuyuki; Uchikubo, Akinobu; Hasegawa, Jun; Sasagawa, Katsuyoshi; Yamashita, Shinji; and Nakagawa, Takehiro, to Olympus Optical Co., Ltd. Electronic endoscope apparatus outputting ternary drive signal. 5,113,254, Cl. 358-98.000.
Kanto Yakin Kogyo K.K.: *See—*
Takahashi, Susumu, 5,112,422, Cl. 156-175.000.
Kantola, James C.: *See—*
Bland, Gerald F.; Kantola, James C.; and Mondek, Martin J., 5,112,260, Cl. 440-88.000.
Kapetanic, Peter M.: *See—*
Grace, Martin I.; Kapetanic, Peter M.; and Liu, Eric C., 5,113,094, Cl. 307-529.000.
Kaplan, Lawrence M.: *See—*
Moeinzadeh, Manssour H.; Kaplan, Lawrence M.; and Gurosh, Jeffrey A., 5,111,987, Cl. 227-180.000.
Kapples, Kevin J.: *See—*
Shutske, Gregory M.; Kapples, Kevin J.; and Tomer, John D., IV, 5,112,829, Cl. 514-290.000.
Karam, Georges; and Moridi, Said, to U.S. Philips Corporation. Predistortion arrangement for a digital transmission system. 5,113,414, Cl. 375-60.000.
Kardorff, Uwe: *See—*
Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuekenhoehner, Thomas; Kuenast, Christoph; and Hofmeister, Peter, 5,112,823, Cl. 514-252.000.
Karger, Barry L.; and Cohen, Aharon S., to Northeastern University. High performance microcapillary gel electrophoresis. 5,112,460, Cl. 204-182.800.
Karino, Toshikazu: *See—*
Harada, Yasuhiro; Karino, Toshikazu; Saito, Ryoji; Tometsuka, Koji; and Izumi, Shoichiro, 5,112,641, Cl. 427-8.000.
Karino, Yukio, to Fuji Photo Film Co., Ltd. Color diffusion transfer photographic film unit with dye trapping layer. 5,112,720, Cl. 430-213.000.
Kariya, Takao: *See—*
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Ebinuma, Ryuichi; and Kariya, Takao, 5,112,133, Cl. 356-401.000.
Karl Mayer Textilmaschinenfabrik GmbH: *See—*
Gille, Friedrich; Naumann, Rolf; and Bergmann, Gerhard, 5,111,672, Cl. 66-84.00A.
Kasai, Seishi; Ishii, Kazuo; and Kato, Eiichi, to Fuji Photo Film Co., Ltd. Electrophotographic photosensitive materials comprising an inorganic photoconductor and N-hydroxyimide compounds. 5,112,712, Cl. 430-95.000.
Kasai, Tetsuo; and Kobayashi, Yoshiteru, to Mitsubishi Kasei Corporation. Aromatic polymide separation membrane. 5,112,941, Cl. 528-353.000.
Kasaka, Nobuo: *See—*
Kinoshita, Iwao; Machii, Daisuke; Onoda, Yasuo; Takai, Haruki; Kasaka, Nobuo; Shuto, Katsuichi; Gomi, Katsushige; Morimoto, Makoto; and Ishii, Akio, 5,112,867, Cl. 514-617.000.
Kasei Kogyo Kabushiki Kaisha: *See—*
Nakahashi, Junichi; Natori, Itaru; Hinoue, Kenichi; and Ochiai, Nobutaka, 5,112,916, Cl. 525-183.000.
Kashima Oil Co., Ltd.: *See—*
Fujishige, Shoei; Numajiri, Rikio; and Aragane, Hideyuki, 5,112,965, Cl. 536-114.000.
Kashiwai, Shin-ichi: *See—*
Orii, Akihito; Yokomizo, Osamu; Masuhara, Yasuhiro; Nishida, Koji; Murata, Shigeto; Kashiwai, Shin-ichi; Inoue, Kotaro; and Yoshimoto, Yuichiro, 5,112,571, Cl. 376-439.000.

Kashiyama, Ritsuo; and Kataoka, Hiroyuki, to Canon Kabushiki Kaisha. Camera with power zoom function and interchangeable lens with power zoom function. 5,113,210, Cl. 354-400.000.
Kasina, Sudhakar: *See*—
Gustavson, Linda M.; Srinivasan, Ananthachari; Kasina, Sudhakar; Reno, John M.; Fitzner, Jeffrey N.; and Jones, David S., 5,112,953, Cl. 530-391.500.
Kaspar, Melvin; Kostos, Jeffrey; Rolek, Matthew; and Artwohl, Paul, to Ardco, Inc. Refrigerator door assembly with stylized substantially all glass front. 5,111,618, Cl. 49-501.000.
Kasperkovitz, Wolfdietrich G., to U.S. Philips Corporation. Digital shift register. 5,113,419, Cl. 377-75.000.
Kassouf, Thomas L.; Fraser, Howard H., Jr.; Etemad, Shahrokh; and Lane, William R., to Carrier Corporation. Rolling element radial compliancy mechanism. 5,111,712, Cl. 74-570.000.
Kataita, Masafumi: *See*—
Ajioka, Masanobu; Takenaka, Shinji; Itoh, Hiroyuki; Kataita, Masafumi; and Kohno, Yoshitsugu, 5,112,580, Cl. 422-241.000.
Katakura, Kageyoshi: *See*—
Nishiyama, Hisashi; Ogawa, Toshio; and Katakura, Kageyoshi, 5,111,825, Cl. 128-661.090.
Katamoto, Tsutomu: *See*—
Okura, Ken; Matsuzaki, Satoru; Katamoto, Tsutomu; and Horiishi, Nanao, 5,112,403, Cl. 106-418.000.
Kataoka, Hiroyuki: *See*—
Kashiyama, Ritsuo; and Kataoka, Hiroyuki, 5,113,210, Cl. 354-400.000.
Katayama, Yousuke, to Hitachi Maxell, Ltd. Method and system of communication for a non-contact IC card. 5,113,184, Cl. 340-825.540.
Katcherian, Ricky V.; and Roddy, Stephen R., to General Motors Corporation. Window reveal molding. 5,112,101, Cl. 296-201.000.
Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Electrophotographic photoreceptor with polar group containing comb-type resin binder. 5,112,713, Cl. 430-96.000.
Kato, Eiichi; and Hattori, Hideyuki, to Fuji Photo Film Co., Ltd. Liquid developer for electrostatic photography. 5,112,716, Cl. 430-114.000.
Kato, Eiichi; and Hattori, Hideyuki, to Fuji Photo Film Co., Ltd. Liquid developer for electrostatic photography. 5,112,718, Cl. 430-114.000.
Kato, Eiichi: *See*—
Kasai, Seishi; Ishii, Kazuo; and Kato, Eiichi, 5,112,712, Cl. 430-95.000.
Kato, Hideo; Shibata, Hirohumi; Matsushita, Keiko; and Takamatsu, Osamu, to Canon Kabushiki Kaisha. Mask structure for lithography. 5,112,707, Cl. 430-5.000.
Kato, Masayoshi: *See*—
Kanda, Hitoshi; Yamada, Yusuke; Kato, Masayoshi; Goseki, Yasuhide; and Mitsumura, Satoshi, 5,111,998, Cl. 241-5.000.
Kato, Tohru: *See*—
Tanaka, Tadashi; Sakamoto, Masaaki; Sato, Yoshiaki; and Kato, Tohru, 5,112,416, Cl. 148-437.000.
Katoh, Hideo; Hosoi, Masahiro; Hamano, Hisashi; and Saito, Yasuhiko, to Teijin Limited. Rabbit for radiation. 5,112,659, Cl. 428-35.700.
Katoh, Toshio: *See*—
Ajioka, Masanobu; Higuchi, Chojiro; Oura, Takeshi; Katoh, Toshio; and Yamaguchi, Akihiro, 5,113,009, Cl. 560-40.000.
Katoh, Yutaka. Apparatus for forming slit in rock and concrete surface. 5,111,801, Cl. 125-23.010.
Katou, Susumu: *See*—
Hashimoto, Isao; Ishida, Tatsuyodihi; Tsuru, Kazutaka; Yamada, Yuji; Miyazawa, Takeshige; Nakamura, Yasuo; Katou, Susumu; and Takahashi, Katsuya, 5,112,385, Cl. 71-94.000.
Katsuragawa, Tadao, to Ricoh Company, Ltd. Magneto-optic recording media and process for producing the same. 5,112,701, Cl. 428-694.000.
Katsuragawa, Tadao: *See*—
Ohta, Wasaburo; Kinoshita, Mikio; and Katsuragawa, Tadao, 5,112,466, Cl. 204-298.050.
Katz, Edward R. Method of leveling a laterial file cabinet. 5,112,186, Cl. 414-786.000.
Kaufman, Benjamin J.: *See*—
DeRosa, Thomas F.; Von Allmen, Ronald W.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., 5,112,508, Cl. 252-51.50A.
Kaufman, Kalman: *See*—
Davidson, Mark; Kaufman, Kalman; and Mazor, Isaac, 5,112,129, Cl. 356-359.000.
Kaule, Wittich; Ilgmann, Wilhelm; Schwenk, Gerhard; and Stenzel, Gerhard, to GAO Gesellschaft fur Automation und Organisation mbH. Security document having an electrically conductive security element embedded therein. 5,112,672, Cl. 428-209.000.
Kawabe, Kenji: *See*—
Hayashi, Hajime; Igarashi, Yutaka; Hayashi, Takehiko; Shimura, Takaki; and Kawabe, Kenji, 5,113,136, Cl. 324-247.000.
Kawachi, Masaru: *See*—
Hatakoshi, Genichi; Terashima, Kazutaka; Kawachi, Masaru; and Uematsu, Yutaka, 5,113,469, Cl. 385-122.000.
Kawaguchi, Takashi: *See*—
Sakamoto, Kenji; Maruyama, Akihiko; Moriya, Tatsuo; Yabe, Hiroshi; Kawaguchi, Takashi; and Yoshino, Masato, 5,113,381, Cl. 368-74.000.
Kawaguchi, Toshikazu: *See*—
Kotani, Akio; Araki, Kazuhiro; and Kawaguchi, Toshikazu, 5,113,221, Cl. 355-208.000.
Kawai, Kazumasa, to Kabushiki Kaisha Toshiba. Apparatus and method for loading a program in an external storage device connected to one bus into a memory connected to a different bus. 5,113,513, Cl. 395-425.000.
Kawakami, Hiroshi: *See*—
Koseki, Koshi; Ebata, Takashi; Kawakami, Hiroshi; Matsushita, Hajime; Itoh, Kazuo; and Naoi, Yoshitake, 5,112,994, Cl. 549-323.000.
Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.
Kawakami, Motozou: *See*—
Nakamura, Katsunari; Ueda, Keiichiro; Irie, Yoshiro; Hoshi, Toyokazu; and Kawakami, Motozou, 5,113,349, Cl. 364-478.000.
Kawakami, Shigenobu: *See*—
Sato, Atsushi; Kawakami, Shigenobu; Endo, Keiji; and Dohi, Hideyuki, 5,113,029, Cl. 585-6.300.
Kawakatsu, Akira; Saito, Akiko; and Yuge, Yoji, to Toshiba Lighting & Technology Corporation. Optical interference film and lamp having the same. 5,113,109, Cl. 313-112.000.
Kawakita, Shinya: *See*—
Shimizu, Tomoyasu; Aoki, Yuichi; and Kawakita, Shinya, 5,113,302, Cl. 360-135.000.
Kawamata, Toshio: *See*—
Nakagawa, Jun; Kawamata, Toshio; and Sano, Kunihiko, 5,112,679, Cl. 428-323.000.
Kawamura, Hideo, to Isuzu Ceramics Research Institute Co., Ltd. Electromagnetic valve actuating system. 5,111,779, Cl. 123-90.110.
Kawamura, Kunio: *See*—
Izumi, Shuji; Nakai, Masaaki; Inoue, Manabu; Fujino, Akihiko; Kawamura, Kunio; Takarabe, Yuji; and Niwa, Masatake, 5,113,217, Cl. 354-471.000.
Kawamura, Masato: *See*—
Kurano, Yoshito; Kawamura, Masato; Kondo, Masahiro; Tanaka, Michio; and Yamamoto, Sanehiro, 5,113,018, Cl. 564-403.000.
Kawamura, Masunori, to Kowa Company Ltd. Optical scanner. 5,113,269, Cl. 358-474.000.
Kawamura, Yoshimi: *See*—
Sugita, Kenji; Itazaki, Hiroshi; Matsumoto, Koichi; and Kawamura, Yoshimi, 5,112,944, Cl. 530-321.000.
Kawanami, Norihide; Okada, Kinjiro; and Kozu, Yoshikazu, to Hirose Electric Co., Ltd. Optical fiber connector terminal and method of making same. 5,113,465, Cl. 385-82.000.
Kawano, Hajime: *See*—
Inami, Kazuyoshi; and Kawano, Hajime, 5,113,161, Cl. 333-246.000.
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Ankney, Richard C.; Bonica, Ronald P.; Kay, Douglas E.; Pashayan, Patricia A.; and Spitzer, Roy L., 5,113,499, Cl. 395-325.000.
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Greenfield, Mark S., 5,112,411, Cl. 148-528.000.
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Jin, Iljoon; Kenny, Lorne D.; and Sang, Harry, 5,112,697, Cl. 428-613.000.
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VanNoord, Andrew J., 5,111,940, Cl. 211-41.000.
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Dirks, Friedrich; Batsch, Ortwin; Hempelmann, Wilhelm; and Leibold, Hans, 5,112,585, Cl. 423-210.000.
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Theodoulou, Sotos M.; Gibbons, Duncan; Thomson, Christopher W.; and Khataan, Hassan A., 5,113,223, Cl. 219-220.000.
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Epshetsky, Yefim; Belenky, Garry; and Khlevner, Boris, 5,111,543, Cl. 5-424.000.
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Langer, Matthew E.; and Khorshahi, Ferial, 5,113,010, Cl. 560-96.000.
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Hull, William E.; and Barthalow, Henry D., 5,111,945, Cl. 212-168.000.
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Itoh, Hiroyuki; Kono, Yoshitsugu; Kikuchi, Isao; Takenaka, Shinji; and Ajioka, Masanobu, 5,112,593, Cl. 423-502.000.
Kikuta, Kazutsune: *See*—
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Carbonell, Ruben G.; Guzman, Roberto; and Kilpatrick, Peter K., 5,112,770, Cl. 436-501.000.
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Cohen, Bernard; and Morman, Michael T., 5,112,690, Cl. 428-411.100.
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Kimura, Kiyomi: *See*—
Minato, Norio; Kishida, Makoto; Yamada, Yumi; Watanabe, Izumi; and Kimura, Kiyomi, 5,112,281, Cl. 474-84.000.
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Ogura, Toshihiko; Aotsu, Hiroaki; Kimura, Koichi; Enomoto, Hiromichi; and Kyoda, Tadashi, 5,113,487, Cl. 395-100.000.
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Watanabe, Yoshihide; Kimura, Mareo; and Matsumoto, Shinichi, 5,112,790, Cl. 502-213.000.
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Hudson, Thomas H.; and King, Michael A., 5,112,607, Cl. 424-85.910.
King, Stephen W., to Union Carbide Chemicals & Plastics Technology Corporation. Alkoxylation using modified group IIA metal-containing bimetallic or polymetallic catalysts. 5,112,788, Cl. 502-162.000.
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Kinnan, Frank R., to Underground Technologies. Boring head for a subsurface soil-boring apparatus. 5,111,891, Cl. 175-21.000.
Kinney, Ohler L., Jr., to Marley Cooling Tower Company, The. Perforated arch-shaped fill bar for splash type water cooling tower. 5,112,537, Cl. 261-111.000.
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Kinoshita, Iwao; Machii, Daisuke; Onoda, Yasuo; Takai, Haruki; Kasaka, Nobuo; Shuto, Katsuichi; Gomi, Katsushige; Morimoto, Makoto; and Ishii, Akio, to Kyowa Hakko Gogyo Co., Ltd. Triphenylmethane derivatives. 5,112,867, Cl. 514-617.000.
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Hamano, Kiyoshi; Furuya, Kouhei; Tanzawa, Kazuhiko; Kagasaki, Takeshi; Miyamoto, Masaaki; and Kinoshita, Takeshi, 5,112,807, Cl. 514-11.000.
Kinoshita, Tsuneo, to Kabushiki Kaisha Toshiba. 32-bit personal computer using a bus width converter and a latch for interfacing with 8-bit and 16-bit microprocessors. 5,113,369, Cl. 395-325.000.
Kinugawa Rubber Industrial Co., Ltd.: *See*—
Saiga, Shinji, 5,111,617, Cl. 49-494.000.
Kirk, Barrie E.: *See*—
Ross, Barry C.; Kirk, Barrie E.; Lester, Michael G.; Procopiou, Panayiotis A.; and Watson, Nigel S., 5,112,819, Cl. 514-212.000.
Kirkbride, James F.: *See*—
Halm, Walter B.; Jones, William J., Jr.; Kirkbride, James F.; Marcus, Ilan; and Snyder, Adrian C., 5,112,684, Cl. 428-357.000.
Kirschner, Lawrence: *See*—
Lajoie, Michael S.; and Kirschner, Lawrence, 5,112,406, Cl. 134-7.000.
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Roberts, Edward A.; Spittal, Douglas W.; and Kisiel, Stanley T., 5,112,548, Cl. 264-171.000.
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Nakagawa, Asaharu, 5,112,419, Cl. 156-51.000.
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Hayashida, Kazuhiro; Kitamura, Toshio; and Miyajima, Atsushi, 5,112,961, Cl. 536-27.000.
Kitano, Kenzo: *See*—
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; and Minato, Teruo, 5,112,030, Cl. 266-256.000.
Kitano, Kisei: *See*—
Yoshida, Naoyuki; Kitano, Kisei; and Ogawa, Tetsuya, 5,112,523, Cl. 252-299.610.
Kitayama, Shinichiro: *See*—
Tsujino, Toshifumi; Maeda, Koichi; Ishizuka, Satoshi; Yamamoto, Hiroaki; Kitayama, Shinichiro; and Hozumi, Shigeo, 5,112,722, Cl. 430-290.000.
Kiya, Nobuyuki; Maeda, Kimio; and Saiki, Yoshiharu, to Fanuc Ltd. Method for selecting inputs for a PC in which a ladder program is simulated. 5,113,359, Cl. 364-578.000.
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Shiosaka, Sadao; Kohno, Johji; Kiyama, Hiroshi; Tohyama, Masaya; and Shiotani, Yahe, 5,112,606, Cl. 530-389.200.
Kjelgaard, Tom: *See*—
Anderson, Anders; and Kjelgaard, Tom, 5,113,479, Cl. 392-417.000.
KLA Instruments Corporation: *See*—
Davidson, Mark; Kaufman, Kalman; and Mazor, Isaac, 5,112,129, Cl. 356-359.000.
Klaerner, Peter: *See*—
Schwaben, Hans-Dieter; Schlichtmann, Rainer; Kindler, Hubert; Klaerner, Peter; and Mittnacht, Hans, 5,112,921, Cl. 525-316.000.
Klages, Claus-Peter: *See*—
Bringmann, Udo; Klages, Claus-Peter; Six, Rolf; and Schafer, Lothar, 5,112,649, Cl. 427-249.000.
Klaus, Kathy. Beads and wire frame toy. 5,112,268, Cl. 446-489.000.
Klein, Albert, to Laboratorium Prof. Dr. Rudolf Berthold GmbH & Co. Device for reducing electromagnetic leakage radiation in the vicinity of radiation systems. 5,113,190, Cl. 342-4.000.
Klein, Gregory N. Container corner section glue bond tester. 5,111,701, Cl. 73-827.000.

Klein, Hans-Christof, to Alfred Teves GmbH. Device for adapting the characteristic curve of a hydraulic accumulator to the characteristic curve of a consumer. 5,111,639, Cl. 60-413.000.

Klein, Hans-Hermann: *See—*
Hafner, Hans-Ulrich; Klein, Hans-Hermann; and Timm, Uwe, 5,111,667, Cl. 62-55.500.

Klein, Hans W., to Minnesota Mining and Manufacturing Company. Wide-band differential amplifier using gm-cancellation. 5,113,147, Cl. 330-253.000.

Klein, Helmut: *See—*
Bako, Laszlo; and Klein, Helmut, 5,111,918, Cl. 190-18.00A.

Klein, Jean-Louis: *See—*
Combret, Jean-Claude; Klein, Jean-Louis; and Le Gaillard, Joel, 5,113,007, Cl. 556-482.000.

Klein, Peter. Electrical apparatus useful to prepare a hot beverage. 5,111,740, Cl. 99-295.000.

Klein, Robert R.; and Hoying, John F., to General Motors Corporation. Hydraulic mount with triple decouplers. 5,112,032, Cl. 267-140.10A.

Kleinewefers GmbH: *See—*
Pav, Josef; Wenzel, Reinhard; Bresser, Hans; and Vossmerbaumer, Rudolf, 5,111,564, Cl. 29-116.200.

Klier, Armin: *See—*
Pelz, Horst; Klier, Armin; and Graf, Herbert, 5,112,389, Cl. 75-401.000.

Klimt, Ulrich: *See—*
Thiel, Rudolf; Klimt, Ulrich; and Halasy-Wimmer, Georg, 5,111,914, Cl. 188-73.340.

Klinedinst, Keith A.: *See—*
Sigai, A. Gary; and Klinedinst, Keith A., 5,113,118, Cl. 313-486.000.

Klinner, Wilfred E., to National Research Development Corporation. Crop harvesting apparatus and methods. 5,111,645, Cl. 56-364.000.

Klok, Cornelis; and Delatte, Daniel, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Holding container for cryogenic liquid. 5,111,666, Cl. 62-48.100.

Klose, Thomas R.: *See—*
Nguyen, Khe C.; and Klose, Thomas R., 5,112,711, Cl. 430-58.000.

Klugkist, Jan; and Van Dijk, Willem R., to Lever Brothers Company, division of Conopco, Inc. Enzymatic dishwashing composition containing a chlorine-type bleaching agent. 5,112,518, Cl. 252-174.120.

Kluting, Bernd A., to Ed. Scharwachter GmbH & Co. KG. Door holding device for motor vehicle door. 5,112,091, Cl. 292-262.000.

Knapp, Alfons, to Gevipi A.G. Cartridge for a valve with hard material plates, having means for retaining the fixed plate in constraint state. 5,111,842, Cl. 137-454.600.

Kneip, Michael: *See—*
Baur, Richard; Gousetis, Charalampos; Birnbach, Stefan; Kneip, Michael; and Oftring, Alfred, 5,112,530, Cl. 252-548.000.

Knepler, John T., to Bunn-O-Matic Corporation. Hot water dispenser with electronic control. 5,111,969, Cl. 222-54.000.

Knepper, Udo; Lutz, Franz; and Beyer, Viktor, to Dornier GmbH. Radar signal progessing. 5,113,191, Cl. 342-119.000.

Knickerbocker, Edward N.: *See—*
Krupp, Stephen P.; Bieser, John O.; and Knickerbocker, Edward N., 5,112,686, Cl. 428-401.000.

Knizley James B.: *See—*
O'Donnell, Hugh J.; Gajewski, Vincent J.; Knizley James B.; Palinkas, Richard L.; and Rosenberg, Ronald O., 5,112,933, Cl. 528-61.000.

Knoll AG: *See—*
Johna, Josef; Rasthofer, Lothar; and Daum, Hermann, 5,112,624, Cl. 426-2.000.

Knopf, Robert J.: *See—*
McCain, James H.; King, Stephen W.; Knopf, Robert J.; Smith, Charles A.; and Hauser, Charles F., 5,112,789, Cl. 502-162.000.

Knorr Brake Holding Corporation: *See—*
Engle, Thomas H., 5,112,172, Cl. 410-59.000.

Knowlton, Kirk A.: *See—*
Knowlton, Leland P.; and Knowlton, Kirk A., 5,111,603, Cl. 37-231.000.

Knowlton, Leland P.; and Knowlton, Kirk A. Coupling for a snow plow. 5,111,603, Cl. 37-231.000.

Knox, Charles E.: *See—*
Morenz, Paul W.; and Knox, Charles E., 5,112,663, Cl. 428-71.000.

Ko, Jung W.: *See—*
Strolle, Christopher H.; Patel, Chandrakant B.; Wedam, Werner F.; Ko, Jung W.; Schnitzler, Raymond; and Yun, Jong K., 5,113,262, Cl. 358-310.000.

Kobayashi, Akira: *See—*
Kobayashi, Tomomi; Kobayashi, Akira; Fujimoto, Hiroshi; Saiki, Norihiko; and Imazu, Katsuhiro, 5,111,679, Cl. 72-348.000.

Kobayashi, Eiji; and Egawa, Akira, to Fanuc Ltd. Discharge tube for laser oscillator. 5,113,407, Cl. 372-61.000.

Kobayashi, Katsuyuki: *See—*
Honoki, Shinji; Kobayashi, Katsuyuki; Umeyama, Mitsuhiro; and Ootake, Toshihiro, 5,111,714, Cl. 74-574.000.

Kobayashi, Kazuo: *See—*
Yamada, Yoshinori; Morikawa, Kiyoshi; Kurumada, Masakazu; Kobayashi, Kazuo; and Sugihara, Masanori, 5,113,388, Cl. 369-270.000.

Kobayashi, Masayuki: *See—*
Yasui, Tadashi; and Kobayashi, Masayuki, 5,111,681, Cl. 72-453.030.

Kobayashi, Naoya: *See—*
Takiyasu, Yoshihiro; Yamaga, Mitsuhiro; Nakamura, Kazunori; Amada, Eiichi; Jusa, Hidehiko; Kobayashi, Naoya; Takada, Osamu; Hirayama, Satoru; and Iiyama, Tatsuhito, 5,113,392, Cl. 370-85.150.

Kobayashi, Noboru, to Yamaha Hatsudoki Kabushiki Kaisha. Hull construction for small watercraft. 5,111,765, Cl. 114-270.000.

Kobayashi, Tomomi; Kobayashi, Akira; Fujimoto, Hiroshi; Saiki, Norihiko; and Imazu, Katsuhiro, to Toyo Seikan Kaisha, Ltd. Method for forming barrel for two-piece can. 5,111,679, Cl. 72-348.000.

Kobayashi, Yasuhito; and Matsuo, Junichi, to Fuji Photo Film Co., Ltd. Apparatus for determining recording mode of frequency-modulated video signal. 5,113,265, Cl. 358-330.000.

Kobayashi, Yoshiteru: *See—*
Kasai, Tetsuo; and Kobayashi, Yoshiteru, 5,112,941, Cl. 528-353.000.

Kobler, Ingo; John, Thomas; Gollinger, Franz X.; and Bock, Georg, to MAN Roland Druckmaschinen AG. Chambered doctor blade inker system. 5,111,747, Cl. 101-365.000.

Kobylinski, Thaddeus P., to Amoco Corporation. Process for converting natural gas to synthesis gas. 5,112,527, Cl. 252-373.000.

Koch Engineering Company, Inc.: *See—*
McNulty, Kenneth J.; Yeoman, Neil; and Li-Hsieh, Chang, 5,112,536, Cl. 261-94.000.

Koch, Horst: *See—*
Kurtz, Karl-Rudolf; Koch, Horst; and Schulz, Guenther, 5,112,725, Cl. 430-306.000.

Koenig, Albert, to Beta Power, Inc. Electrochemical battery cell having a monolithic bipolar flat plate beta" alumina separator. 5,112,703, Cl. 429-103.000.

Koenig & Bauer Aktiengesellschaft: *See—*
Wieland, Erich G., 5,111,744, Cl. 101-216.000.

Koenig, Raymond A.; and Gan, Joseph, to Dow Chemical Company, The. Epoxy-terminated polyoxazolidones and process for the preparation thereof. 5,112,932, Cl. 528-51.000.

Koetzle, A. Richard, to Sheldon, William D., III. High temperature flashpoint, stable cleaning composition. 5,112,516, Cl. 252-162.000.

Koga, Seijiro: *See—*
Iwao, Tetsuya; Osaka, Shuichi; Sakaki, Takao; Nishida, Tadao; Yamamura, Kiyoshi; Koga, Seijiro; Hirai, Reiji; and Nakagawa, Haruo, 5,112,991, Cl. 549-206.000.

Kogler, Herbert: *See—*
Chatterjee, Sukumar; Chatterjee, Sugata; Ganguli, Bimal N.; Chatterjee, Deepak K.; Jani, Rajendra K. H.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; Kogler, Herbert; Seibert, Gerhard; and Teetz, Volker, 5,112,806, Cl. 514-9.000.
Roy, Kirity; Mukhopadhyay, Triptikumar; Reddy, Goukanapalli C. S.; Vijayakumar, Erra K. S.; Ganguli, Bimal N.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; and Kogler, Herbert, 5,112,858, Cl. 514-462.000.

Kohlhaas, Werner: *See—*
Buchert, Hermann; Ahlers, Juergen; Kohlhaas, Werner; Vogelsang, Joerg; and Neitzel, Manfred, 5,112,901, Cl. 524-494.000.

Kohn, Uwe, to Windmoller & Holscher. Device for transverse cutting and welding of webs. 5,112,289, Cl. 493-194.000.

Kohno, Johji: *See—*
Shiosaka, Sadao; Kohno, Johji; Kiyama, Hiroshi; Tohyama, Masaya; and Shiotani, Yahe, 5,112,606, Cl. 530-389.200.

Kohno, Yasushi; and Kojima, Eisuke, to Kyorin Pharmaceutical Co., Ltd. Cyclic anthranililc acid carboxylic acid derivatives and medical therapeutic use thereof. 5,112,836, Cl. 514-311.000.

Kohno, Yoshitsugu: *See—*
Ajioka, Masanobu; Takenaka, Shinji; Itoh, Hiroyuki; Kataita, Masafumi; and Kohno, Yoshitsugu, 5,112,580, Cl. 422-241.000.

Koike, Akinobu: *See—*
Kamiya, Akihiko; Koike, Akinobu; and Imai, Masanori, 5,112,743, Cl. 430-175.000.

Koike, Atsushi, to Canon Kabushiki Kaisha. Method for replacing a deposit shield in an evacuated film forming chamber. 5,112,185, Cl. 414-786.000.

Koito Manufacturing Co., Ltd.: *See—*
Makita, Hiroyuki, 5,113,330, Cl. 362-265.000.
Suzuki, Yoshinobu, 5,113,321, Cl. 362-61.000.

Koizumi, Hideaki; Sano, Koichi; Yokoyama, Tetsuo; and Sukegawa, Kazuya, to Hitachi, Ltd. Method and apparatus for reducing image noises. 5,113,137, Cl. 324-307.000.

Kojima, Eisuke: *See—*
Kohno, Yasushi; and Kojima, Eisuke, 5,112,836, Cl. 514-311.000.

Kokoku Wire Steel Ltd.: *See—*
Watakabe, Hidenori, 5,111,649, Cl. 57-311.000.

Kokusai Denshin Denwa Co., Ltd.: *See—*
Nomura, Takahiro; Yatsuzuka, Yohtaro; Iizuka, Shigeru; and Honma, Hideki, 5,113,448, Cl. 381-47.000.

Kokusai Electric Co., Ltd.: *See—*
Harada, Yasuhiro; Karino, Toshikazu; Saito, Ryoji; Tometsuka, Koji; and Izumi, Shoichiro, 5,112,641, Cl. 427-8.000.
Takahashi, Sunao; and Takano, Mikio, 5,113,336, Cl. 363-61.000.

Kole, Richard P.: *See—*
Meyer, Jeffry R.; and Kole, Richard P., 5,112,065, Cl. 277-167.500.

Koller, Josef: *See—*
Lehmann, Urs; and Koller, Josef, 5,112,958, Cl. 534-618.000.

Koller, Max: *See—*
Muller, Walter; and Koller, Max, 5,111,916, Cl. 188-165.000.

Kolling, Arie J.: *See—*
Walstra, Hidde; and Kolling, Arie J., 5,111,699, Cl. 73-754.000.

Komatsu, Ikuo: *See—*
Watanabe, Toshiaki; Shibue, Masatsune; Matsubayashi, Hiroshi; and Komatsu, Ikuo, 5,112,695, Cl. 428-458.000.

Komatsu, Koji; Yoshida, Shinichi; Miyata, Souichi; and Azuma, Daisuke, to Sharp Kabushiki Kaisha. Data processor for detecting identical data simultaneously coexisting in a plurality of data sections of data transmission paths. 5,113,339, Cl. 395-200.000.

Komatsu, Michiyasu: *See—*
Goto, Yasuhiro; Yonezawa, Takeyuki; Tsuge, Akihiko, and Komatsu, Michiyasu, 5,112,780, Cl. 501-95.000.

Komatsu, Toshihiko: *See—*
Takase, Muneaki; Komatsu, Toshihiko; Matsuno, Toshiyuki; Miyakawa, Akihisa; and Saito, Kenichi, 5,112,833, Cl. 514-300.000.

Kometani, Kiichi: *See—*
Horiuchi, Kenjiro; Kometani, Kiichi; and Inoue, Toshihide, 5,112,913, Cl. 525-133.000.

Kompare, Anton J.: *See—*
Ruzicka, Harry L., Jr.; and Kompare, Anton J., 5,111,676, Cl. 72-34.000.

Kondo, Katsuhiko, to Mitsubishi Denki K.K. Electronic control device for motor vehicle use. 5,111,787, Cl. 123-339.000.

Kondo, Masahiro: *See—*
Kurano, Yoshito; Kawamura, Masato; Kondo, Masahiro; Tanaka, Michio; and Yamamoto, Sanehiro, 5,113,018, Cl. 564-403.000.

Kondo, Susumu: *See—*
Moriya, Tetsuo; Kondo, Susumu; and Sanuki, Shinji, 5,112,902, Cl. 524-503.000.

Kondo, Yozo: *See—*
Hara, Daiji; Mori, Mitsuhiro; and Kondo, Yozo, 5,112,927, Cl. 526-124.000.

Kondoh, Isao: *See—*
Ohuchi, Jin; Kondoh, Isao; and Okada, Takashi, 5,112,581, Cl. 423-3.000.

Konica Corporation: *See—*
Mano, Shigeru; Maehashi, Tatsuichi; Koshizuka, Kunihiro; and Abe, Takao, 5,113,201, Cl. 346-76.0PH.
Ninomiya, Hidetaka; Nakayama, Noritaka; Masukawa, Toyoaki; and Morita, Miki, 5,112,532, Cl. 252-587.000.
Tanji, Masaki; Nishijima, Toyoki; Ogawa, Takahiro; Takada, Shun; and Murai, Kazuhiro, 5,112,728, Cl. 430-507.000.

Kono, Yoshitsugu: *See—*
Itoh, Hiroyuki; Kono, Yoshitsugu; Kikuchi, Isao; Takenaka, Shinji; and Ajioka, Masanobu, 5,112,593, Cl. 423-502.000.

Konotsune, Shiro; Yano, Hitoshi; Hiraki, Souichiro; and Kikuta, Kazutsune, to Chisso Corporation. Flexible printed-circuit base board and process for producing the same. 5,112,694, Cl. 428-457.000.

Kopp, Klaus F. Intravenous solutions for influencing renal function and for maintenance therapy. 5,112,622, Cl. 424-663.000.

Kordovski, Mile A.; and Read, Donald R., to General Motors Corporation. Die casting frame. 5,111,873, Cl. 164-312.000.

Kornberg, Elliot; and Tarello, William R., to PEB Biopsy Corporation. Device for percutaneous excisional breast biopsy. 5,111,828, Cl. 128-754.000.

Korosue, Akira. Wheelchair for single-hand operation. 5,112,072, Cl. 280-240.000.

Korte, Klaus, to Sandoz Ltd. Polyetheresters, their production and use. 5,112,940, Cl. 528-301.000.

Kos, Robert D., to Fluoroware. Wafer carrier. 5,111,936, Cl. 206-334.000.

Koseki, Koshi; Ebata, Takashi; Kawakami, Hiroshi; Matsushita, Hajime; Itoh, Kazuo; and Naoi, Yoshitake, to Japan Tobacco Inc.; and Yuki Gosei Kogyo Co., Ltd. Method of producing (S)-4-hydroxymethyl-γ-lactone. 5,112,994, Cl. 549-323.000.

Koshi, Hiroyuki; and Owada, Minoru, to Hitachi, Ltd. Apparatus for bioluminescence measurement. 5,112,646, Cl. 422-52.000.

Koshizuka, Kunihiro: *See—*
Mano, Shigeru; Maehashi, Tatsuichi; Koshizuka, Kunihiro; and Abe, Takao, 5,113,201, Cl. 346-76.0PH.

Kosson, Robert L., to Grumman Aerospace Corporation. Heat pipe switch. 5,111,874, Cl. 165-32.000.

Kostlan, Catherine R.: *See—*
Belliotti, Thomas R.; Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; Kramer, James B.; and Sircar, Jagadish C., 5,112,846, Cl. 514-415.000.

Kostos, Jeffrey: *See—*
Kaspar, Melvin; Kostos, Jeffrey; Rolek, Matthew; and Artwohl, Paul, 5,111,618, Cl. 49-501.000.

Kosuda, Toru: *See—*
Matsushiro, Ryuichi; Kosuda, Toru; Sasao, Shigeo; Ikeya, Taro; Chino, Yoshiharu; and Uekawa, Yasuaki, 5,111,776, Cl. 123-41.540.

Kotani, Akio; Araki, Kazuhiro; and Kawaguchi, Toshikazu, to Minolta Camera Kabushiki Kaisha. Image forming apparatus having a plurality of toner developers including white toner. 5,113,221, Cl. 355-208.000.

Koto, Haruhiko: *See—*
Miyazawa, Yoshinori; Omae, Hidenori; Ishii, Takayuki; Koto, Haruhiko; and Akahane, Fujio, 5,113,204, Cl. 346-140.00R.

Kotowski, Paul J.: *See—*
Liu, Dexter C.; Campanell, Ronald J.; and Kotowski, Paul J., 5,112,267, Cl. 446-470.000.

Kotzin, Michael D., to Motorola, Inc. Method for repeating TDM/TDMA frames. 5,113,394, Cl. 370-97.000.

Kovacs, Kerry: *See—*
Chen, Jing-Den; Kovacs, Kerry; Thomas, Margaret T.; and Liang, Rong-Chang, 5,112,540, Cl. 264-4.700.

Kovens, Murray R., to Parkway Machine Corporation. Universal coin receiving mechanism. 5,111,928, Cl. 194-292.000.

Kowa Company Ltd.: *See—*
Kawamura, Masunori, 5,113,269, Cl. 358-474.000.

Kowalik, James J.: *See—*
Mikhaeil-Boules, Naila; Hammersmith, Robert J.; Leppek, Kevin G.; Wilkey, Paul D.; Gardner, Thomas H.; Ricker, Dennis J.; and Kowalik, James J., 5,112,116, Cl. 303-115.0EC.

Kowarski, Hanna R., to Temple University of the Commonwealth System of Higher Education. Pharmaceutical composition and method of intranasal administration. 5,112,804, Cl. 514-3.000.

Koza, John R.; Ferguson, John R.; and Torneros, Maximiano D., to Koza, John R. Broadcast lottery. 5,112,050, Cl. 273-139.000.

Kozol, Michael; Lim, Chan; Strong, Willard L., Jr.; and Tracey, William, to International Business Machines Corporation. Technique for creating and expanding element marks in a structured document. 5,113,341, Cl. 364-419.000.

Kozu, Yoshikazu: *See—*
Kawanami, Norihide; Okada, Kinjiro; and Kozu, Yoshikazu, 5,113,465, Cl. 385-82.000.

Kozuka, Masayuki: *See—*
Miki, Tadashi; Kozuka, Masayuki; and Uehara, Hirotoshi, 5,113,512, Cl. 395-425.000.

Krajewski, Nicholas J.: *See—*
Cray, Seymour R.; and Krajewski, Nicholas J., 5,112,232, Cl. 439-75.000.

Kramer, Foppe: *See—*
Foerster, Gerhard R. H.; Kramer, Foppe; Munnig Schmidt, Robert H.; and Van Roemburg, Franciscus M. J., 5,112,342, Cl. 606-133.000.

Kramer, Fred R.; and Lizardi, Paul M., to Gene-Trak Systems. Target-dependent synthesis of an artificial gene for the synthesis of a replicatable RNA. 5,112,734, Cl. 435-6.000.

Kramer, Gunter: *See—*
Blum, Albert; and Kramer, Gunter, 5,113,103, Cl. 310-89.000.

Kramer, James B.: *See—*
Belliotti, Thomas R.; Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; Kramer, James B.; and Sircar, Jagadish C., 5,112,846, Cl. 514-415.000.

Krammer, Gernot: *See—*
Staudinger, Gernot; and Krammer, Gernot, 5,112,588, Cl. 423-244.000.

Krauss, Werner: *See—*
Jaggy, Peter; Krauss, Werner; Schafer, Dagobert; and Wurster, Helmut, 5,111,805, Cl. 128-24.0EL.

Krein, Bruce A.: *See—*
Tilles, David J.; Wakamiya, Stanley K.; Krein, Bruce A.; Brown, Dale H.; Duggan, Sharon A.; and Schroeder, Mark S., 5,112,042, Cl. 271-297.000.

Krenik, William R.: *See—*
Hsu, Wei-chan; and Krenik, William R., 5,113,091, Cl. 307-355.000.

Krenkel, Christian; and Lixl, Georg. Fixation device with frame members and pins. 5,112,340, Cl. 606-130.000.

Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Process for the preparation of difluoromaleic anhydride. 5,112,993, Cl. 549-254.000.

Krevolin, Janet L.; and Brown, Steven G., to Intermedics Orthopedics, Inc. Drill guide and template for prosthetic devices. 5,112,336, Cl. 606-96.000.

Kribs, David E. Vehicle arm rest. 5,112,094, Cl. 296-37.800.

Krikorian, Kapriel V.; and Rosen, Robert A., to Hughes Aircraft Company. Acceleration compensation by matched filtering. 5,113,194, Cl. 342-106.000.

Krinski, Thomas L.; and Tran, Tam H., to Protein Technologies International, Inc. Method for improving the soil anti-redeposition properties of washing detergents and product. 5,112,520, Cl. 252-174.230.

Krishnamurthy, Ramachandran; Lerner, Steven L.; Shukla, Yagya; and Stokley, Alan G., to BOC Group plc, The. Separation of gas mixtures including hydrogen. 5,112,590, Cl. 423-415.00A.

Krolow, Reiner: *See—*
Overhues, Egon; and Krolow, Reiner, 5,112,178, Cl. 411-544.000.

Kropf, Keith G.: *See—*
Scott, James D.; and Kropf, Keith G., 5,113,120, Cl. 315-77.000.

Krozal, Diana J. Holster mount. 5,111,545, Cl. 5-503.100.

Krupp, Stephen P.; Bieser, John O.; and Knickerbocker, Edward N., to Dow Chemical Company, The. Linear ethylene polymer staple fibers. 5,112,686, Cl. 428-401.000.

Kruse, Jurgen M., to Xaar Limited. Jet printing ink. 5,112,398, Cl. 106-20.000.

Kruse, Larry W., to Amoco Corporation. Catalytic cracking unit with combined catalyst separator and stripper. 5,112,576, Cl. 422-144.000.

Ksenic, George A.: *See—*
Giacobbe, Thomas J.; and Ksenic, George A., 5,112,519, Cl. 252-174.210.

Kubo, Yasuhiro: *See—*
Oka, Koichi; Otani, William; Kubo, Yasuhiro; Zasu, Yasushi; and Akagi, Motonobu, 5,113,083, Cl. 250-574.000.

Kuchta, August D., to Du Pont de Nemours, E. I., and Company. Photopolymerizable compositions containing sensitizer mixtures. 5,112,721, Cl. 430-281.000.

Kuekenhoehner, Thomas: *See—*
Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuekenhoehner, Thomas; Kuenast, Christoph; and Hofmeister, Peter, 5,112,823, Cl. 514-252.000.

Kuenast, Christoph: *See—*
Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuekenhoehner, Thomas; Kuenast, Christoph; and Hofmeister, Peter, 5,112,823, Cl. 514-252.000.

Kuhn, Max, to Sprecher Energie AG. Stored-spring-energy actuator mechanism for a high-voltage circuit breaker. 5,113,056, Cl. 200-400.000.

Kuhn S.A.: *See—*
Quirin, Michel, 5,111,636, Cl. 56-367.000.

Kuhnle, William G.; and Murnane, James F., II, to United States of America, Army. Method of making a flexprop. 5,111,576, Cl. 29-889.230.

Kuhnt, Erhard; and Dreifert, Karl-Heinz, to Wilhelm Weidtmann GmbH & Co. KG. Window with pivotable sash and mechanism for locking the sash in closed position. 5,111,615, Cl. 49-279.000.

Kuk, Myong S.: *See—*
Hron, Robert J., Sr.; Abraham, George; Kuk, Myong S.; and Fisher, Gordon S., 5,112,637, Cl. 426-629.000.

Kukimoto, Tsutomu: *See—*
Imai, Eiichi; Sakashita, Kiichiro; Takagi, Seiichi; and Kukimoto, Tsutomu, 5,112,714, Cl. 430-106.600.

Kulicke and Soffa Investments, Inc.: *See—*
Holdgrafer, William J.; Sheaffer, Michael J.; and Levine, Lee R., 5,111,989, Cl. 228-110.000.

Kumar, Jayant: *See—*
Mandel, Braja K.; Tripathy, Sukant K.; Huang, Jan-Chan; and Kumar, Jayant, 5,112,881, Cl. 522-117.000.

Kumiai Chemical Industry Co., Ltd.: *See—*
Hashimoto, Isao; Ishida, Tatsuyodihi; Tsuru, Kazutaka; Yamada, Yuji; Miyazawa, Takeshige; Nakamura, Yasuo; Katou, Susumu; and Takahashi, Katsuya, 5,112,385, Cl. 71-94.000.

Kung, Viola T.: *See—*
Chow, Calvin Y. H.; Humphries, Gillian M.; Kung, Viola T.; and Lacy, Michael M., 5,112,134, Cl. 356-427.000.

Kunofsky, Morris I. Body restraining device. 5,111,850, Cl. 128-873.000.

Kunugiyama, Hiroyuki: *See—*
Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.

Kunz, Walter: *See—*
Zondler, Helmut; Meyer, Alfred; Eckhardt, Wolfgang; and Kunz, Walter, 5,112,840, Cl. 514-341.000.

Kuo, Tai-Haur; and Lin, Hung C., to University of Maryland at College Park. Analog-to-digital converter utilizing devices with current versus voltage characteristics with a plurality of peaks and negative resistance regions between peaks. 5,113,188, Cl. 341-133.000.

Kurano, Yoshito; Kawamura, Masato; Kondo, Masahiro; Tanaka, Michio; and Yamamoto, Sanehiro, to Mitsui Petrochemical Industries, Ltd. Method of producing N-alkylaminophenols. 5,113,018, Cl. 564-403.000.

Kuraray Co., Ltd.: *See—*
Tsuji, Jiro; Takahashi, Takashi; Tsuji, Masao; Nakagawa, Naoshi; and Takigawa, Tetsuo, 5,112,998, Cl. 552-559.000.

Kureha Kagaku Kogyo K.K.: *See—*
Sunagawa, Kazuhiko; and Kusano, Nobuyuki, 5,113,020, Cl. 568-323.000.

Kuribayashi, Hideyuki: *See—*
Nishio, Taichi; Kuribayashi, Hideyuki; and Sanada, Takashi, 5,112,907, Cl. 525-65.000.

Kurihara, Masaru: *See—*
Himeshima, Yoshio; Tanisugi, Hideaki; Watanabe, Tetsuo; Uemura, Tadahiro; and Kurihara, Masaru, 5,112,487, Cl. 210-490.000.

Kurita, Mitsuru: *See—*
Horie, Yoshiko; Ikeda, Yoshinori; Ichikawa, Hiroyuki; Kurita, Mitsuru; Hayashi, Kimiyoshi; and Honma, Toshio, 5,113,252, Cl. 358-77.000.

Kuriyama, Katsuhiro, to Matsushita Electric Industrial Co., Ltd. Laser beam optical system and laser beam machining method using the same. 5,113,055, Cl. 219-121.670.

Kuriyama, Shigeru; Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, to Hitachi, Ltd.; and Nissan Motor Co., Ltd. Apparatus for reducing vibrations of the body of a vehicle. 5,111,784, Cl. 123-192.100.

Kuroda, Jyuzo, to 501 Sakura Color Products Corporation. Method for modifying the surface of microcapsule. 5,112,526, Cl. 252-363.500.

Kuroki, Hiroshi; Yamagata, Yoshifumi; and Yamashita, Youichi, to Kyocera Corporation. Dielectric filter. 5,113,310, Cl. 361-302.000.

Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Ebinuma, Ryuichi; and Kariya, Takao, to Canon Kabushiki Kaisha. Alignment system. 5,112,135, Cl. 356-401.000.

Kurosawa, Seiji: *See—*
Aoe, Seiichiro; Oda, Taishi; Nakaoka, Masanori; and Kurosawa, Seiji, 5,112,964, Cl. 536-56.000.

Kurosu, Tateki: *See—*
Iida, Masamori; Kurosu, Tateki; and Okano, Ken, 5,112,775, Cl. 437-225.000.

Kurtz, Andrew D., to Church & Dwight Co., Inc. Process for curing bicarbonates. 5,112,592, Cl. 423-419.00R.

Kurtz, Karl-Rudolf; Koch, Horst; and Schulz, Guenther, to BASF Aktiengesellschaft. Preparation of recording layers and their use for the production of flexographic printing plates. 5,112,725, Cl. 430-306.000.

Kurumada, Masakazu: *See—*
Yamada, Yoshinori; Morikawa, Kiyoshi; Kurumada, Masakazu; Kobayashi, Kazuo; and Sugihara, Masanori, 5,113,388, Cl. 369-270.000.

Kurushima, Masakazu: *See—*
Fukushima, Hideo; and Kurushima, Masakazu, 5,113,298, Cl. 360-108.000.

Kusano, Nobuyuki: *See—*
Sunagawa, Kazuhiko; and Kusano, Nobuyuki, 5,113,020, Cl. 568-323.000.

Kuukkanen, Kari: *See—*
Ruohola, Tuomo; Saiha, Erik; Kuukkanen, Kari; and Hyoty, Paavo, 5,112,441, Cl. 159-47.300.

Kuwabara, Masayuki: *See—*
Itoh, Masahiro; and Kuwabara, Masayuki, 5,113,232, Cl. 357-17.000.

Kuzuno, Katsutoshi; Ishizuka, Shigeo; and Yamamoto, Masayuki, to Yazaki Corporation. Terminal connector. 5,112,244, Cl. 439-395.000.

Kvello-Aune, Alf G. Device for drilling in and/or lining holes in earth. 5,111,893, Cl. 175-258.000.

Kvita, Vratislav: *See—*
Fischer, Walter; Baumann, Marcus; Finter, Jurgen; Kvita, Vratislav; Mayer, Carl W.; and Wernet, Wolfgang, 5,112,977, Cl. 546-195.000.

Kwak, Jin-keun, to Samsung Electronics Co., Ltd. Drum cartridge for electrophotographic apparatus with two-piece protected shutter covering the drum. 5,113,220, Cl. 355-200.000.

KWC AG: *See—*
Hochstrasser, Ferdinand; and Oesterle, Helmut, 5,111,846, Cl. 137-607.000.

Kyocera Corporation: *See—*
Kuroki, Hiroshi; Yamagata, Yoshifumi; and Yamashita, Youichi, 5,113,310, Cl. 361-302.000.

Kyoda, Tadashi: *See—*
Ogura, Toshihiko; Aotsu, Hiroaki; Kimura, Koichi; Enomoto, Hiromichi; and Kyoda, Tadashi, 5,113,487, Cl. 395-100.000.

Kyodo Printing Co., Ltd.: *See—*
Fujita, Minoru; and Nakahara, Yoshihiko, 5,113,062, Cl. 235-493.000.

Kyorin Pharmaceutical Co., Ltd.: *See—*
Kohno, Yasushi; and Kojima, Eisuke, 5,112,836, Cl. 514-311.000.

Kyowa Hakko Gogyo Co., Ltd.: *See—*
Kinoshita, Iwao; Machii, Daisuke; Onoda, Yasuo; Takai, Haruki; Kasaka, Nobuo; Shuto, Katsuichi; Gomi, Katsushige; Morimoto, Makoto; and Ishii, Akio, 5,112,867, Cl. 514-617.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Honda, Shinkichi; Arai, Yoichiro; and Toida, Hiroshi, 5,112,613, Cl. 424-400.000.

Kyowa Kakko Kogyo Co., Ltd.: *See—*
Yamamoto, Kazuhiro; Yoshioka, Noriko; and Furukawa, Tadayasu, 5,112,380, Cl. 426-321.000.

Kysilka, James O.: *See—*
Cagley, Paul M.; Kysilka, James O.; and McGillivray, Terry D., 5,112,638, Cl. 426-640.000.

L. E. Johnson Products, Inc.: *See—*
Johnson, Larry A., 5,111,549, Cl. 16-97.000.

Labat, Yves: *See—*
Vottero, Catherine; Labat, Yves; and Poirier, Jean-Marie, 5,113,019, Cl. 568-42.000.

Laboratorium Prof. Dr. Rudolf Berthold GmbH & Co.: *See—*
Klein, Albert, 5,113,190, Cl. 342-4.000.

Laboureau, Jacques-Philippe; and Cazenave, Alain. Instrument for marking and drilling femoral and tibial insertion tunnels. 5,112,335, Cl. 606-88.000.

Labsystems, Oy: *See—*
Salonen, Eeva-Marjatta, 5,112,805, Cl. 514-8.000.

Lachman Associates, Inc.: *See—*
Moir, Dale A., 5,113,442, Cl. 380-25.000.

Lacy, Michael M.: *See—*
Chow, Calvin Y. H.; Humphries, Gillian M.; Kung, Viola T.; and Lacy, Michael M., 5,112,134, Cl. 356-427.000.

Ladd Furniture: *See—*
Perkins, Landon E., 5,112,110, Cl. 297-440.000.

Lade, Jan: *See—*
Asbjornsen, Svein; and Lade, Jan, 5,112,106, Cl. 297-284.00F.

Lafferty, William G., to Crest Electronics. Pneumatically actuated hospital signaling device. 5,113,048, Cl. 200-83.00Z.

Lahomme S.A.: *See—*
Languillat, Jean-Paul, 5,111,721, Cl. 82-47.000.

Lai, Eric. Infusion alarm system. 5,112,319, Cl. 604-246.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Bridenne, Martine; Coffre, Eric; Hutton, Robert; and Marot, Yves, 5,113,075, Cl. 250-282.000.
Klok, Cornelis; and Delatte, Daniel, 5,111,666, Cl. 62-48.100.

Lajoie, Michael S.; and Kirschner, Lawrence, to Church & Dwight Co., Inc. Process for removing coatings from sensitive substrates, and sodium sulfate-containing blasting media useful therein. 5,112,406, Cl. 134-7.000.

Lambert, Jean-Patrick: *See—*
Wittmann, Claude; and Lambert, Jean-Patrick, 5,112,552, Cl. 264-255.000.

Lambert, Patrick M.; Bryan, Philip S.; Jarrold, Gregory S.; and Towers, Christine M., to Eastman Kodak Company. Phosphor composition and X-ray intensifying screen capable of emitting principally in the spectral region of native silver halide sensitivity. 5,112,700, Cl. 428-690.000.

Lamle, Stuart. Court game set and projectile therefor. 5,112,061, Cl. 273-411.000.

Lamm, Gunther: *See—*
Hahn, Erwin; Hansen, Guenter; Lamm, Gunther; Reichelt, Helmut; and Wagenblast, Gerhard, 5,112,362, Cl. 8-639.000.

Land O'Lakes, Inc.: *See—*
Campbell, Rolf W. J., 5,111,932, Cl. 206-216.000.

Lane, William R.: *See—*
Kassouf, Thomas L.; Fraser, Howard H., Jr.; Etemad, Shahrokh; and Lane, William R., 5,111,712, Cl. 74-570.000.

Lang, Armin, to Zahnradfabrik Friedrichshafen, AG. Angle of rotation potentiometer. 5,113,172, Cl. 338-171.000.

Lang, Douglas J.: *See—*
Swanson, David K.; Dahl, Roger W.; and Lang, Douglas J., 5,111,812, Cl. 128-419.00D.

Lange, Rudiger, to Stolberger Maschinenfabrik GmbH & Co. KG. Tape wrapping device with plural independently rotatable spool carriers. 5,111,646, Cl. 57-15.000.

Langendorf, Brian K.: *See—*
Albonesi, David H.; Langendorf, Brian K.; Chang, John; Faase, John G.; and Homberg, Michael J., 5,113,514, Cl. 395-425.000.

Langer, Lothar: *See—*
Hund, Paul; Langer, Lothar; and Jenner, Wolfgang, 5,113,054, Cl. 219-117.100.

Langer, Matthew E.; and Khorshahi, Ferial, to Lever Brothers Company, division of Conopco, Inc. Process for synthesizing 4,4'-bis(carboalkoxystilbene) derivatives. 5,113,010, Cl. 560-96.000.

Langer, William J., to MTS Systems Corporation. Roadway simulator restraint. 5,111,685, Cl. 73-117.000.

Langford, Gordon B.: *See—*
Gilano, Michael A.; and Langford, Gordon B., 5,112,229, Cl. 434-409.000.

Langgartner, Johann: *See—*
Haiml, Gottfried; and Langgartner, Johann, 5,111,572, Cl. 29-469.500.

Langley, Steven P.: *See—*
Spahn, James G.; Langley, Steven P.; and Jacobs, Michael L., 5,111,807, Cl. 606-244.000.

Langston, Lonnie W., to Shipping Systems, Inc. Dunnage bag air valve and coupling. 5,111,838, Cl. 137-223.000.

Langston, Richard D., to Charcoal Cloth Limited. CBW protective clothing. 5,112,666, Cl. 428-104.000.

Languillat, Jean-Paul, to Lahomme S.A. Tube truncation apparatus and method. 5,111,721, Cl. 82-47.000.

Lanxide Technology Company, LP: *See—*
Claar, Terry D., 5,112,654, Cl. 427-376.600.

Lapatovich, Walter P.; Proud, Joseph M.; and Fohl, Timothy, to GTE Laboratories Incorporated. Electrodeless HID lamp with lamp capsule. 5,113,121, Cl. 315-248.000.

Lapeyre, Fernard S. Receptacle for dispensing a continuous web of paper from a roll. 5,111,985, Cl. 225-51.000.

Larbot, Andre: *See—*
Cot, Louis; Rouviere, Jacques C.; Guizard, Christian G.; and Larbot, Andre, 5,112,676, Cl. 427-226.000.

Larky, Steven P.: *See—*
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Palmer, David A.; Larson, Keith D.; and Fjare, Kristi A., 5,113,015, Cl. 562-608.000.

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LaWarre, Robert W., Sr., 5,111,857, Cl. 141-234.000.

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Gombos, John M.; and Leashno, Moshe, 5,111,931, Cl. 206-83.500.

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Weisend, Norbert A., Jr.; Trares, Bernard F.; and Leffel, Kevin L., 5,112,011, Cl. 244-134.00A.

Le Gaillard, Joel: *See—*
Combret, Jean-Claude; Klein, Jean-Louis; and Le Gaillard, Joel, 5,113,007, Cl. 556-482.000.

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Buddenhagen, Douglas A.; Legge, Norman R.; and Zscheuschler, Gunter, 5,112,900, Cl. 524-484.000.

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Hibscii, Susan, 5,112,290, Cl. 493-325.000.

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Schnyder, Eugen; and Lehmann, Rolf, 5,111,566, Cl. 29-116.200.

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Bernardet, Henri; Godechot, Xavier L. M.; and Lejeune, Claude A., 5,112,564, Cl. 376-116.000.

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Harston, Stephen W.; and Leonard, Judson S., 5,113,362, Cl. 364-723.000.

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Beard, John; Banner, Verdell M.; Khan, Mushahid; and Leonard, Norman J., 5,112,296, Cl. 602-28.000.

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Wang, David N.; Cheng, Mei; and Leong, Toung K., deceased, 5,112,435, Cl. 156-643.000.
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Le Peltier, Fabienne: *See—*
Chaumette, Patrick; Le Peltier, Fabienne; Szymanski, Raymond F.; Courty, Philippe; and Verdon, Catherine, 5,112,591, Cl. 423-415.00A.
Leppek, Kevin G.: *See—*
Mikhaeil-Boules, Naila; Hammersmith, Robert J.; Leppek, Kevin G.; Wilkey, Paul D.; Gardner, Thomas H.; Ricker, Dennis J.; and Kowalik, James J., 5,112,116, Cl. 303-115.0EC.
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Mohr, Jacob G.; Kane, Michael H.; and Le Riche, Etienne, 5,111,559, Cl. 27-4.000.
Lerner, Steven L.: *See—*
Krishnamurthy, Ramachandran; Lerner, Steven L.; Shukla, Yagya; and Stokley, Alan G., 5,112,590, Cl. 423-415.00A.
Leslie, Stewart T.: *See—*
Buxton, Ian R.; Malkowska, Sandra T. A.; Prater, Derek A.; Singh, Deborah L.; Leslie, Stewart T.; and Miller, Ronald B., 5,112,515, Cl. 252-106.000.
Lester, Michael G.: *See—*
Ross, Barry C.; Kirk, Barrie E.; Lester, Michael G.; Procopiou, Panayiotis A.; and Watson, Nigel S., 5,112,819, Cl. 514-212.000.
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Marcon, Joel; Montet, Evelyne; Gobet, Didier; Ferrand, Guy; Pochard, Patrick; and Simon, Georges, 5,111,732, Cl. 89-135.000.
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Simon, Jean-Claude, 5,113,453, Cl. 382-24.000.
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Oppenheim, Amos B.; Levanon, Avigdor; Locker-Galadi, Hilla; and Gorecki, Marian, 5,112,744, Cl. 435-189.000.
Levendusky, George T.: *See—*
Larsson, Raymond P.; and Levendusky, George T., 5,111,768, Cl. 116-216.000.
Lever Brothers Company, division of Conopco, Inc.: *See—*
Klugkist, Jan; and Van Dijk, Willem R., 5,112,518, Cl. 252-174.120.
Langer, Matthew E.; and Khorshahi, Ferial, 5,113,010, Cl. 560-96.000.
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Holdgrafer, William J.; Sheaffer, Michael J.; and Levine, Lee R., 5,111,989, Cl. 228-110.000.
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Diamond, Ivan; Lawson, James J.; Lewicki, Walter J., Jr.; and Stavrinou, Stavros C., 5,112,671, Cl. 428-156.000.
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Stevens, Howard; Chariot, Maryvonne; Arnold, Francoise; and Lewis, Gareth, 5,112,621, Cl. 424-497.000.
Lewkebandara, T. Suren: *See—*
Winter, Charles H.; and Lewkebandara, T. Suren, 5,112,650, Cl. 427-255.200.
Lexmark International, Inc.: *See—*
Bischel, Patrick O.; Brown, John K., III; Cole, Carl P.; and Fitch, Donald G., 5,113,488, Cl. 395-112.000.
Leybold AG: *See—*
Hafner, Hans-Ulrich; Klein, Hans-Hermann; and Timm, Uwe, 5,111,667, Cl. 62-55.500.
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Kempf, Stefan; and Zejda, Jaroslav, 5,112,469, Cl. 204-298.250.
Zejda, Jaroslav, 5,112,467, Cl. 204-298.120.
Leybold Inficon, Inc.: *See—*
Wajid, Abdul, 5,112,642, Cl. 427-10.000.
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Zhang, XueMing; Zhang, Shucheng; Zhang, Shuxia; Liu, Congshan; Zhang, Haibuo; Li, Wenrong; Ji, Quingyan; Zhang, Shufang; and Zhang, Shuwei, 5,112,463, Cl. 204-237.000.
Liang, Han-Bin K.: *See—*
Wilson, Syd R.; Liang, Han-Bin K.; Zirkle, Thomas; and See, Yee-Chaung, 5,112,772, Cl. 437-67.000.
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Chen, Jing-Den; Kovacs, Kerry; Thomas, Margaret T.; and Liang, Rong-Chang, 5,112,540, Cl. 264-4.700.
Liantonio, James: *See—*
Conti, Joseph A.; and Liantonio, James, 5,113,133, Cl. 324-158.00P.
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Liao, Meishin A.: *See—*
Liao, Henry H.; and Liao, Meishin A., 5,112,068, Cl. 280-30.000.
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Cheng, J. Joseph; Snow, Richard R.; Evans, Geoffrey; Bamford, Charles R.; and Milnes, Harold B., 5,112,778, Cl. 501-31.000.
Liberty Life Insurance Co.: *See—*
Crosby, C. Scott, 5,113,493, Cl. 395-152.000.
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Meyer, Herbert; Giday, Zoltan; and Balow, Thomas, 5,113,307, Cl. 361-154.000.
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McNulty, Kenneth J.; Yeoman, Neil; and Li-Hsieh, Chang, 5,112,536, Cl. 261-94.000.
Lim, Chan: *See—*
Kozol, Michael; Lim, Chan; Strong, Willard L., Jr.; and Tracey, William, 5,113,341, Cl. 364-419.000.
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Lin, Hung C.: *See—*
Kuo, Tai-Haur; and Lin, Hung C., 5,113,188, Cl. 341-133.000.
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Strenzke, Hilmar; and Fehn, Norbert, 5,111,658, Cl. 60-327.000.
Lindell, Karl B., to Ericsson GE Mobile Communications Holding, Inc. Digital radio frequency compensation. 5,113,416, Cl. 375-97.000.
Linden, Inge-Britt Y.: *See—*
Backstrom, Reijo; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka I.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo, 5,112,861, Cl. 514-520.000.
Lindner, Christian: *See—*
Piejko, Karl-Erwin; Lindner, Christian; Ostarek, Ralph; Braese, Hans-Eberhard; and Ott, Karl-Heinz, 5,112,910, Cl. 525-84.000.
Lindquist, Carl E., to San-O Industrial Corporation. Single position flat mount fuse holder. 5,113,168, Cl. 337-187.000.
Lioi, Anthony P.: *See—*
Isaacson, Milton S.; and Lioi, Anthony P., 5,112,200, Cl. 417-356.000.
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Lisa, Rudolph E.: *See—*
Welch, Michael C.; Lisa, Rudolph E.; and Wilson, Joe C., 5,113,001, Cl. 556-428.000.
Little, Barry M.: *See—*
Mainz, Eric L.; Beard, William Q., Jr.; Hirschmann, Robert P.; Little, Barry M.; and Smith, Earl B., 5,113,027, Cl. 570-224.000.
Littmann, Dieter: *See—*
Huemmer, Wolfgang; Dobler, Walter; and Littmann, Dieter, 5,112,723, Cl. 430-287.000.
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Minahan, David M.; Thorsteinson, Erlind M.; and Liu, Albert C., 5,112,795, Cl. 502-324.000.
Liu, Chih-hsiung F., to Shell Oil Company. Slag deposition detection. 5,112,366, Cl. 48-210.000.
Liu, Congshan: *See—*
Zhang, XueMing; Zhang, Shucheng; Zhang, Shuxia; Liu, Congshan; Zhang, Haibuo; Li, Wenrong; Ji, Quingyan; Zhang, Shufang; and Zhang, Shuwei, 5,112,463, Cl. 204-237.000.
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Liu, Eric C.: *See—*
Grace, Martin I.; Kapetanic, Peter M.; and Liu, Eric C., 5,113,094, Cl. 307-529.000.
Liu, Joseph C.; and Wilson, Brown L., to Oil Dynamics, Inc. Watertight seal for plug-in type pothead. 5,113,101, Cl. 310-87.000.
Liu, Qingguo: *See—*
Worrell, Wayne; Liu, Qingguo; and Tang, Yuhua, 5,112,456, Cl. 204-153.180.
Liu, Steve. Step for attachment to a wheel. 5,111,909, Cl. 182-150.000.
Lixl, Georg: *See—*
Krenkel, Christian; and Lixl, Georg, 5,112,340, Cl. 606-130.000.
Lizardi, Paul M.: *See—*
Kramer, Fred R.; and Lizardi, Paul M., 5,112,734, Cl. 435-6.000.

Lloveras, Pedro P.: *See—*
Cirera, Xavier D.; Andreoli, Romeo R.; Lloveras, Pedro P.; Bruseghini, Leonida; and Irurre, Jose P., 5,112,826, Cl. 514-255.000.
Loce, Robert P.; and Appel, James J., to Xerox Corporation. Electronic single pass, two color printing system. 5,113,202, Cl. 346-108.000.
Locker-Galadi, Hilla: *See—*
Oppenheim, Amos B.; Levanon, Avigdor; Locker-Galadi, Hilla; and Gorecki, Marian, 5,112,744, Cl. 435-189.000.
Loctite (Ireland) Limited: *See—*
Woods, John G.; and Coakley, Pauline, 5,113,003, Cl. 556-432.000.
Loffredo, John M.: *See—*
Dinwiddie, John M., Jr.; Freeman, Bobby J.; Grice, Lonnie E.; Loffredo, John M.; Sanderson, Kenneth R.; and Suarez, Gustavo A., 5,113,522, Cl. 395-700.000.
LoGerfo, Frank W.: *See—*
Ito, Ralph K.; and LoGerfo, Frank W., 5,112,615, Cl. 424-426.000.
Lok, Cornelis M. Nickel/silica catalyst and the preparation and use thereof. 5,112,792, Cl. 502-250.000.
Lombardo, Dennis M.: *See—*
Sundeen, Arthur R.; Burris, Darryl L.; Cook, Roger A.; and Lombardo, Dennis M., 5,111,902, Cl. 180-281.000.
Lombardo, Mark A.: *See—*
Alchermes, Stephen L.; and Lombardo, Mark A., 5,112,334, Cl. 606-87.000.
Long, William C., to ESM International Inc. Singulating and orienting slide conveyor. 5,111,926, Cl. 193-46.000.
Lonza Ltd.: *See—*
Fuchs, Rudolf; and McGarrity, John, 5,113,012, Cl. 560-181.000.
Loram Maintenance of Way, Inc.: *See—*
Shoenhair, John J.; and Kallevig, Bruce E., 5,111,624, Cl. 51-178.000.
Lord Corporation: *See—*
Law, Thomas R., 5,112,144, Cl. 384-215.000.
L'Oreal: *See—*
Garoche, Didier; and Grollier, Jean F., 5,112,360, Cl. 8-406.000.
Sebag, Henri; and Semeria, Didier, 5,112,601, Cl. 424-61.000.
Lorenz, Gisela: *See—*
Wenderoth, Bernd; Sauter, Hubert; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,112,862, Cl. 514-522.000.
Wingert, Horst; Sauter, Hubert; Brand, Siegbert; Wenderoth, Bernd; Lorenz, Gisela; and Ammermann, Eberhard, 5,112,860, Cl. 514-513.000.
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Lovendoski, Stan J.: *See—*
Gunn, Gary R.; Colcord, Wallace T.; Wood, Tommy G.; Weber, Gary; Lovendoski, Stan J.; and Chamberlin, James B., 5,112,153, Cl. 403-7.000.
Lower, Jerry L.: *See—*
Cozad, Trent E.; Lozier, Antony J.; Lower, Jerry L.; and Tencer, Allan F., 5,112,332, Cl. 606-61.000.
Lown, John M.: *See—*
Maguire, Paul R.; and Lown, John M., 5,111,977, Cl. 222-521.000.
Lozier, Antony J.: *See—*
Cozad, Trent E.; Lozier, Antony J.; Lower, Jerry L.; and Tencer, Allan F., 5,112,332, Cl. 606-61.000.
Lu, Tong: *See—*
Block, Timothy R.; and Lu, Tong, 5,113,403, Cl. 359-152.000.
Lubbs, Eugene K.: *See—*
Morelli, Harold A.; and Lubbs, Eugene K., 5,112,555, Cl. 264-271.100.
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Lues, Ingeborg: *See—*
Gericke, Rolf; Baumgarth, Manfred; Lues, Ingeborg; Bergmann, Rolf; and De Peyer, Jacques, 5,112,839, Cl. 514-337.000.
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Luh, Howard H. S., to Space Systems/Loral, Inc. Conformal aperture feed array for a multiple beam antenna. 5,113,197, Cl. 343-776.000.
Luigi Stoppani S.p.A.: *See—*
Bruzzone, Giuseppe; Ghelli, Giovanni; and Perrone, Diego, 5,112,583, Cl. 423-55.000.
Luk Lamellen und Kupplungsbau GmbH: *See—*
Reik, Wolfgang; and Elison, Hans-Dieter, 5,111,924, Cl. 192-70.170.
Lukavich, Paul J.; and Puckett, Joseph W., to Caterpillar Inc. Tooth with hard material applied to selected surfaces. 5,111,600, Cl. 37-141.00T.
Lund Industries, Incorporated: *See—*
Lund, James R.; and Eke, Alan B., 5,112,095, Cl. 296-91.000.
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Luther, Ronald B., 5,112,312, Cl. 604-177.000.
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Lutz, Franz: *See—*
Knepper, Udo; Lutz, Franz; and Beyer, Viktor, 5,113,191, Cl. 342-119.000.
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Wickersheim, Kenneth A.; and Adams, Bruce E., 5,112,137, Cl. 374-131.000.
Lybrand, Brent B., to Thomas & Betts Corporation. Electrical connector having contact retention means. 5,112,233, Cl. 439-79.000.
Lynch, Albert E.: *See—*
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Lynne, Kenton J., to International Business Machines Corporation. Neural network model for reaching a goal state. 5,113,482, Cl. 395-23.000.
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Ikegami, Masakazu; and Someya, Ryouichi, 5,113,105, Cl. 310-233.000.
Mabuchi, Tsutomu: *See—*
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MacArthur, Ian J.: *See—*
Wingate-Hill, Robin; and MacArthur, Ian J., 5,111,860, Cl. 144-208.00F.
MacDowell, John F., to Corning Incorporated. Glass-ceramic-bonded ceramic composites. 5,112,777, Cl. 501-32.000.
MacGregor, James W., to Detroit Diesel Corporation. Piston and bearing assemblies. 5,112,145, Cl. 384-286.000.
Mach, Helmut: *See—*
Rath, Hans P.; Mach, Helmut; Oppenlaender, Knut; Schoenleben, Willibald; and Vogel, Hans-Henning, 5,112,364, Cl. 44-418.000.
Machii, Daisuke: *See—*
Kinoshita, Iwao; Machii, Daisuke; Onoda, Yasuo; Takai, Haruki; Kasaka, Nobuo; Shuto, Katsuichi; Gomi, Katsushige; Morimoto, Makoto; and Ishii, Akio, 5,112,867, Cl. 514-617.000.
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MacIsaac, John E.; and MacIsaac, Mark K., 5,112,365, Cl. 44-576.000.
MacKay, Michael T., to Pioneer Refining Services, Inc. Replaceable core silver recovery equipment and method of making and using. 5,112,390, Cl. 75-733.000.
Mackey, Kevin J.: *See—*
Beard, Marian H.; Caro, Perry A.; Hsiao, Jennifer B.; Mackey, Kevin J.; Sandman, James G., Jr.; Steinbach, Gary R.; and Woods, Donald R., 5,113,517, Cl. 364-200.000.
Macofar S.p.A.: *See—*
Chiari, Franco, 5,111,642, Cl. 53-529.000.
Madaras, John J.: *See—*
Ball, Russell M.; and Madaras, John J., 5,112,565, Cl. 376-216.000.
Maderspach, Andrea: *See—*
Ambrus, Gabor; Maderspach, Andrea; Jekkel, Antalne ; Javor, Andras; Ilkoy, Eva; Hajos, Gyorgy; Szporny, Laszlo ; Nagy, Jozsef; Horvath, Gyula; and Moravcsik, Imre, 5,112,815, Cl. 514-178.000.
Mae, Yoshiharu, to Mitsubishi Materials Corporation. Engine valve stem as well as head portion of titanium alloy. 5,112,415, Cl. 148-421.000.
Maeda, Kimio: *See—*
Kiya, Nobuyuki; Maeda, Kimio; and Saiki, Yoshiharu, 5,113,359, Cl. 364-578.000.
Maeda, Koichi: *See—*
Tsujino, Toshifumi; Maeda, Koichi; Ishizuka, Satoshi; Yamamoto, Hiroaki; Kitayama, Shinichiro; and Hozumi, Shigeo, 5,112,722, Cl. 430-290.000.
Maeda, Masaru: *See—*
Sakurai, Kaoru; Murakami, Harunori; Maeda, Masaru; Iijima, Hiroshi; and Ohara, Shouhei, 5,113,195, Cl. 343-704.000.
Maeda, Minoru: *See—*
Hirota, Osamu; Tsushima, Hideaki; Sasaki, Shinya; Takasaki, Yoshitaka; and Maeda, Minoru, 5,113,524, Cl. 359-115.000.
Maeda, Yuji: *See—*
Kuriyama, Shigeru; Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,111,784, Cl. 123-192.100.
Maehashi, Tatsuichi: *See—*
Mano, Shigeru; Machashi, Tatsuichi; Koshizuka, Kunihiro; and Abe, Takao, 5,113,201, Cl. 346-76.0PH.
Maejima, Hideo: *See—*
Sasaki, Hisao; Maejima, Hideo; and Hotta, Takashi, 5,113,503, Cl. 395-375.000.

Mag Instrument, Inc.: *See*—
Maglica, Anthony, 5,113,326, Cl. 362-158.000.

Maggioni, Carlo: *See*—
Navarro, Jean L.; and Maggioni, Carlo, 5,113,316, Cl. 361-396.000.

Magic Mold Corporation: *See*—
Glickman, Joel I., 5,111,959, Cl. 220-544.000.

Magistro, Angelo J., to B. F. Goodrich Company, The. Catalyst composition for the preparation of ethylene from ethane. 5,112,793, Cl. 502-303.000.

Maglica, Anthony, to Mag Instrument, Inc. Miniature flashlight. 5,113,326, Cl. 362-158.000.

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Bertaud, Francois X.; Grabenkort, Richard W.; Magrane, Beverly A.; and Vurek, Gerald G., 5,112,309, Cl. 604-171.000.

Magruder, Judy A.; Eckenhoff, James B.; and Wright, Jeremy C., to Alza Corporation. Implantable delivery dispenser. 5,112,614, Cl. 424-422.000.

Maguire, Paul R.; and Lown, John M. Sealable and dispensing pouring spout. 5,111,977, Cl. 222-521.000.

Mahabadi, John K.; and Burch, Kenneth R., to Motorola, Inc. Low power crystal oscillator with automatic gain control. 5,113,156, Cl. 331-109.000.

Mainstream Engineering Corp.: *See*—
Parrish, Clyde F.; and Scaringe, Robert P., 5,111,668, Cl. 62-259.300.

Mainz, Eric L.; Beard, William Q., Jr.; Hirschmann, Robert P.; Little, Barry M.; and Smith, Earl B., to Vulcan Materials Company. Oxychlorination process using a catalyst which comprises copper chloride supported on rare-earth modified alumina. 5,113,027, Cl. 570-224.000.

Maione, Theodore, to Repligen Corporation. Modified PF4 compositions and methods of use. 5,112,946, Cl. 530-324.000.

Maiwald, Dietrich G. U.: *See*—
Chevillat, Pierre R.; Eleftheriou, Evangelos S.; and Maiwald, Dietrich G. U., 5,113,401, Cl. 371-43.000.

Maizuru Kogyo Co., Ltd.: *See*—
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; and Minato, Teruo, 5,112,030, Cl. 266-256.000.

Majarian, William R.: *See*—
Brey, Robert N., III; Majarian, William R.; Pillai, Subramonia; and Hockmeyer, Wayne T., 5,112,749, Cl. 435-172.300.

Makino, Ayumu: *See*—
Nishikawa, Hisashi; Matsumoto, Yasuo; and Makino, Ayumu, 5,113,198, Cl. 346-1.100.

Makita, Hiroyuki, to Koito Manufacturing Co., Ltd. Aimable headlamp having a discharge lamp bulb and a lighting circuit therefor. 5,113,330, Cl. 362-265.000.

Makita, Naoki, to Tokico Ltd. Suspension system. 5,112,077, Cl. 280-673.000.

Malfroy-Camine, Bernard, to Alkermes, Inc. Method for increasing blood-brain barrier permeability by administering a bradykinin agonist of blood-brain barrier permeability. 5,112,596, Cl. 424-2.000.

Malherbe, Roger F.: *See*—
Behrens, Rudolf A.; Winter, Roland A. E.; Mar, Andrew; Schirmann, Peter J.; Seltzer, Raymond; and Malherbe, Roger F., 5,112,890, Cl. 524-95.000.

Malinowski, Stanley J.: *See*—
Brown, David L.; and Malinowski, Stanley J., 5,111,641, Cl. 53-477.000.

Malkowska, Sandra T. A.: *See*—
Buxton, Ian R.; Malkowska, Sandra T. A.; Prater, Derek A.; Singh, Deborah L.; Leslie, Stewart T.; and Miller, Ronald B., 5,112,515, Cl. 252-106.000.

Mallean, Henry G.: *See*—
Powell, Norman F.; and Mallean, Henry G., 5,113,193, Cl. 342-25.000.

Maller, Vern: *See*—
Barker, James; and Maller, Vern, 5,111,803, Cl. 126-41.00R.

Mallia, A. Krishna; and Wendt, Marten W., to Pierce Chemical Company. Composition and method for isolation and purification of Immunoglobulin M. 5,112,932, Cl. 530-387.100.

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Woulfe, Steven R.; Deutsch, Edward A.; Dyszlewski, Mary M.; and Neumann, William L., 5,112,594, Cl. 424-1.100.
Woulfe, Steven R.; Deutsch, Edward A.; Dyszlewski, Mary M.; and Neumann, William L., 5,112,595, Cl. 424-1.100.

Mallinckrodt Specialty Chemicals Company: *See*—
Wallace, Rebecca A., 5,112,975, Cl. 546-45.000.

Mallory, Inc.: *See*—
Deeds, Ted D., 5,111,793, Cl. 123-457.000.

Malone, Bruce A., to Dow Chemical Company, The. Antistatic polyolefin foams and films and method of making the foam and antistatic composition. 5,112,528, Cl. 252-500.000.

MAN Roland Druckmaschinen AG: *See*—
Kobler, Ingo; John, Thomas; Gollinger, Franz X.; and Bock, Georg, 5,111,747, Cl. 101-165.000.

Manabe, Yoshio: *See*—
Yoshida, Masaru; Manabe, Yoshio; Mitsuyu, Tsuneo; and Tanahashi, Ichiro, 5,113,473, Cl. 385-131.000.

Mandel, Braja K.; Tripathy, Sukant K.; Huang, Jan-Chan; and Kumar, Jayant, to University of Lowell. Photocrosslinked second order nonlinear optical polymers. 5,112,881, Cl. 522-117.000.

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Manhart, Paul K., to United States of America, National Aeronautics and Space Administration. Method and apparatus for phasing segmented mirror arrays. 5,113,064, Cl. 250-201.900.

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Fite, David B.; Hetherington, Ricky C.; McKeon, Michael M.; Manley, Dwight P.; and Murray, John E., 5,113,515, Cl. 395-425.000.

Mann, John: *See*—
Clissold, Derek W.; Mann, John; and Thickitt, Christopher P., 5,112,976, Cl. 546-193.000.

Mannesmann Aktiengesellschaft: *See*—
Lehmann, Peter, 5,111,623, Cl. 51-165.930.

Mannisto, Pekka I.: *See*—
Backstrom, Reijo; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka I.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo, 5,112,861, Cl. 514-520.000.

Mano, Shigeru; Maehashi, Tatsuichi; Koshizuka, Kunihiro; and Abe, Takao, to Konica Corporation. Thermal transfer recording apparatus for controlling printing density with the temperature at the position where the ink ribbon and paper are separated. 5,113,201, Cl. 346-76.0PH.

Manville Corporation: *See*—
Jada, Sivananda S., 5,112,781, Cl. 501-95.000.

Manzione, Louis T.: *See*—
Acarlar, Muvaffak S.; Manzione, Louis T.; Robinson, Steven D.; and Stefanik, Dennis, 5,113,466, Cl. 385-88.000.

Mao, Simon J. T.; and Jackson, Richard L., to Merrell Dow Pharmaceuticals Inc. Bis(alkyl-substituted-4-hydroxyphenylthio)alkane analogs as inhibitors of cataractogenesis. 5,112,870, Cl. 514-712.000.

Maple, M. Brian: *See*—
Nellis, William J.; and Maple, M. Brian, 5,112,801, Cl. 505-1.000.

Mar, Andrew: *See*—
Behrens, Rudolf A.; Winter, Roland A. E.; Mar, Andrew; Schirmann, Peter J.; Seltzer, Raymond; and Malherbe, Roger F., 5,112,890, Cl. 524-95.000.

Marcantonio, Jeffrey J.; and Jones, Christopher W., to Kajaani Electronics Ltd. Formation testing with digital image analysis. 5,113,454, Cl. 382-27.000.

Marchant, Alan B.: *See*—
Whitehead, Frank R.; and Marchant, Alan B., 5,113,386, Cl. 369-44.410.

Marchant, Roger E., to Case Western Reserve University. Process for producing hydroxylated plasma-polymerized films and the use of the films for enhancing the compatiblity of biomedical implants. 5,112,457, Cl. 204-165.000.

Marchisi, Giuseppe: *See*—
Bozzini, Pieramedeo; and Marchisi, Giuseppe, 5,113,240, Cl. 357-70.000.

Marcon, Joel; Montet, Evelyne; Gobet, Didier; Ferrand, Guy; Pochard, Patrick; and Simon, Georges, to L'Etat Francais. Automatic weapon with small barrel for rapid firing. 5,111,732, Cl. 89-135.000.

Marcus, Ilan: *See*—
Halm, Walter B.; Jones, William J., Jr.; Kirkbride, James F.; Marcus, Ilan; and Snyder, Adrian C., 5,112,684, Cl. 428-357.000.

Maregatti, Ugo: *See*—
Ciboldi, Moreno; and Maregatti, Ugo, 5,111,571, Cl. 29-407.000.

Marelli Autronica SpA: *See*—
Navarro, Jean L.; and Maggioni, Carlo, 5,113,316, Cl. 361-396.000.

Maremont Corporation: *See*—
Gunn, Gary R.; Colcord, Wallace T.; Wood, Tommy G.; Weber, Gary; Lovendoski, Stan J.; and Chamberlin, James B., 5,112,153, Cl. 403-7.000.
Rotharmel, John; and Smeltzer, Paul, 5,111,917, Cl. 188-319.000.

Margitich, Donald E.: *See*—
Wishneski, Todd W.; and Margitich, Donald E., 5,112,878, Cl. 521-131.000.

Mariani, Elio A., to United States of America, Army. Saw slanted array correlator with amplitude error compensating polymer reflective array grating. 5,113,115, Cl. 310-313.00D.

Markowski, Robert G.: *See*—
Pratt, James R.; Robarge, Dean A.; Markowski, Robert G.; Perzan, Denis A.; and Morby, John A., 5,113,312, Cl. 361-361.000.

Marks, Allen P.: *See*—
Larson, Gary R.; and Marks, Allen P., 5,112,655, Cl. 427-407.100.

Marks, Jeffrey; Law, Kam S.; Wang, David N.; and Mayden, Dan, to Applied Materials, Inc. Method for planarizing an integrated circuit structure using low melting inorganic material and flowing while depositing. 5,112,776, Cl. 437-228.000.

Marks, Jeffrey C.; and Delaney, Jon R., to Deere & Company. Park brake sensor and transmission override. 5,111,921, Cl. 192-4.00A.

Marlett, Everett M.: *See*—
Park, Won S.; and Marlett, Everett M., 5,113,025, Cl. 568-814.000.

Marley Cooling Tower Company, The: *See*—
Kinney, Ohler L., Jr., 5,112,537, Cl. 261-111.000.

Marley Mouldings Inc.: *See*—
Ramey, Arthur J., 5,111,943, Cl. 211-59.400.

Marom, Itshak: *See*—
Mandelboum, David; Marom, Itshak; and Nevo, Yitzhak, 5,113,281, Cl. 359-236.000.

Marot, Yves: *See*—
Bridenne, Martine; Coffre, Eric; Hutton, Robert; and Marot, Yves, 5,113,075, Cl. 250-282.000.

Maroto-Cabrera, Carlos: *See*—
Lazcano-Navarro, Arturo; Vargas-Gutierrez, Gregorio; Hernandez-Ruiz, Jose E.; and Maroto-Cabrera, Carlos, 5,112,029, Cl. 266-47.000.

Marrian, Christie R. K.; and Peckerar, Martin C., to United States of America, Navy. Cross entropy deconvolver circuit adaptable to changing convolution functions. 5,113,367, Cl. 364-819.000.

Marsh, John F.; Vernet, Marc R. M.; and Hamey, Graham W., to Exxon Chemical Patents Inc. Overbased metal sulphonate composition. 5,112,506, Cl. 252-33.400.

Marshall, David B.: *See*—
De Wames, Roger E.; Goldberg, Ira B.; Morgan, Peter E. D.; Ratto, Joseph J.; Marshall, David B.; and Hall, William F., 5,113,164, Cl. 335-216.000.

Martin, Daniel E., to Merrell Dow Pharmaceuticals Inc. Cyano esters and azepinones. 5,112,969, Cl. 540-491.000.

Martin, Jean-Paul; and Moisand, Jean-Claude, to Societe Cetra S.a.r.l. Electrical contact. 5,112,236, Cl. 439-86.000.

Martin Marietta Energy Systems, Inc.: *See*—
Anderson, Roger W.; and Neff, Wayne A., 5,112,392, Cl. 106-1.220.

Martinez Alcala, Jose M. Bladed implement. 5,111,583, Cl. 30-346.000.

Martinez, Delfin C.: *See*—
Walle, Warren R.; Ross, Jack B.; Hamilton, Jesse A.; and Martinez, Delfin C., 5,112,223, Cl. 432-241.000.

Maruyama, Akihiko: *See*—
Sakamoto, Kenji; Maruyama, Akihiko; Moriya, Tatsuo; Yabe, Hiroshi; Kawaguchi, Takashi; and Yoshino, Masato, 5,113,381, Cl. 368-74.000.

Maruyama, Takashi: *See*—
Mizuno, Yukio; and Maruyama, Takashi, 5,112,914, Cl. 525-134.000.

Masaki, Mitsuo; Uehara, Masaki; Hirate, Kenji; Isowa, Yoshikazu; Sato, Yoshiaki; and Nakashima, Yoshiharu, to Nippon Chemiphar Co., Ltd.; and Fujirebio Kabushiki Kaisha. Peptides, and antidementia agents containing the same. 5,112,947, Cl. 530-329.000.

Masaki, Naoki: *See*—
Amemiya, Naomi; Yamagishi, Koji; Matsumoto, Kunio; and Masaki, Naoki, 5,113,383, Cl. 369-33.000.

Mashiko, Yoji: *See*—
Ishii, Tatsuya; Mashiko, Yoji; Nagatomo, Masao; and Yamada, Michihiro, 5,112,771, Cl. 437-67.000.

Mashino, Keiichi: *See*—
Kuriyama, Shigeru; Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,111,784, Cl. 123-192.100.

Mason, Bradley R.: *See*—
Mason, Jeffrey T.; Mason, Bradley R.; and Howard, Mark E., 5,112,045, Cl. 482-9.000.

Mason, Jeffrey T.; Mason, Bradley R.; and Howard, Mark E., to Breg, Inc. Kinesthetic diagnostic and rehabilitation device. 5,112,045, Cl. 482-9.000.

Massachusetts Institute of Technology: *See*—
Brooks, Rodney A.; Tavrow, Lee S.; and Flynn, Anita M., 5,113,117, Cl. 310-328.000.
Sharpless, K. Barry; and Gao, Yun, 5,112,990, Cl. 549-34.000.
Yang, Woodward, 5,113,365, Cl. 364-807.000.

Massironi, Angelo: *See*—
Cini, Carlo; Massironi, Angelo; and Sisti, Luigi, 5,113,239, Cl. 357-68.000.

Masuda, Mitsunobu: *See*—
Fujiwara, Goro; Masuda, Mitsunobu; Shiraishi, Masanori; and Matsumoto, Nobuya, 5,112,486, Cl. 210-416.100.

Masuda, Noriaki: *See*—
Watanabe, Toshihiro; Ishiyama, Masashi; and Masuda, Noriaki, 5,112,651, Cl. 427-339.000.

Masuhara, Yasuhiro: *See*—
Orii, Akihito; Yokomizo, Osamu; Masuhara, Yasuhiro; Nishida, Koji; Murata, Shigeto; Kashiwai, Shin-ichi; Inoue, Kotaro; and Yoshimoto, Yuichiro, 5,112,571, Cl. 376-439.000.

Masukawa, Toyoaki: *See*—
Ninomiya, Hidetaka; Nakayama, Noritaka; Masukawa, Toyoaki; and Morita, Miki, 5,112,532, Cl. 252-587.000.

Matharani, Michael A.: *See*—
Meli, Vincent A.; Matharani, Michael A.; Brzezinski, Ted A.; Shaft, David L.; and Urmanski, James L., 5,112,632, Cl. 426-392.000.

Mathews, Steven W. Exercise and amusement device for pets. 5,111,771, Cl. 119-29.000.

Matsubara, Akira; Sakai, Kazuya; Tanada, Hideki; Mizuchi, Akira; Horikomi, Kazutoshi; and Ohtsu, Takuma, to Mitsui Toatsu Chemicals, Incorporated. Imidazole derivatives and antiepileptics comprising said imidazole derivatives as effective ingredients. 5,112,841, Cl. 514-361.000.

Matsubayashi, Hiroshi: *See*—
Watanabe, Toshiaki; Shibue, Masatsune; Matsubayashi, Hiroshi; and Komatsu, Ikuo, 5,112,695, Cl. 428-458.000.

Matsuda, Eiji: *See*—
Kadoya, Katsuhiko; Omichi, Yukinobu; Matsuda, Eiji; and Takenaka, Kenji, 5,111,673, Cl. 68-12.040.

Matsuda, Haruyuki: *See*—
Sato, Masayuki; and Matsuda, Haruyuki, 5,111,716, Cl. 74-733.100.

Matsuda, Shinya: *See*—
Morikawa, Takeshi; and Matsuda, Shinya, 5,113,218, Cl. 355-56.000.

Matsuda, Toshiro, to Nissan Motor Company, Limited. Monitoring apparatus for control system with microcomputer. 5,113,504, Cl. 395-575.000.

Matsufuji, Akihiro: *See*—
Inaba, Hiroo; Kakuta, Takeshi; Yamauchi, Koichi; and Matsufuji, Akihiro, 5,112,680, Cl. 428-329.000.

Matsui, Yoshinori, to NEC Corporation. MOS type semiconductor memory device having a word line resetting circuit. 5,113,374, Cl. 365-227.000.

Matsumoto, Kenichi, to Canon Kabushiki Kaisha. Image forming apparatus using photopolymerization reaction. 5,113,211, Cl. 355-27.000.

Matsumoto, Koichi: *See*—
Sugita, Kenji; Itazaki, Hiroshi; Matsumoto, Koichi; and Kawamura, Yoshimi, 5,112,944, Cl. 530-321.000.

Matsumoto, Kunio: *See*—
Amemiya, Naomi; Yamagishi, Koji; Matsumoto, Kunio; and Masaki, Naoki, 5,113,383, Cl. 369-33.000.

Matsumoto, Nobuya: *See*—
Fujiwara, Goro; Masuda, Mitsunobu; Shiraishi, Masanori; and Matsumoto, Nobuya, 5,112,486, Cl. 210-416.100.

Matsumoto, Osamu: *See*—
Sumida, Mamoru; Hashimoto, Masashi; and Matsumoto, Osamu, 5,111,775, Cl. 123-41.100.

Matsumoto, Shinichi: *See*—
Watanabe, Yoshihide; Kimura, Mareo; and Matsumoto, Shinichi, 5,112,790, Cl. 502-213.000.

Matsumoto, Takahiro: *See*—
Akiyama, Toshiyuki; Mimura, Itaru; Ozawa, Naoki; Takahashi, Kenji; Eto, Yoshizumi; and Matsumoto, Takahiro, 5,113,247, Cl. 358-51.000.

Matsumoto, Yasuo: *See*—
Nishikawa, Hisashi; Matsumoto, Yasuo; and Makino, Ayumu, 5,113,198, Cl. 346-1.100.

Matsumura, Haruki: *See*—
Sunagawa, Makoto; Matsumura, Haruki; Yano, Tsuneo; Sasaki, Akira; and Takata, Shinzi, 5,112,966, Cl. 540-200.000.

Matsumura, Masahiro: *See*—
Yonemoto, Tatsuo; Saito, Eiichiro; and Matsumura, Masahiro, 5,112,989, Cl. 548-548.000.

Matsumura, Masatoshi: *See*—
Tanaka, Hideo; Matsumura, Masatoshi; Harada, Satoru; and Yajima, Mizuo, 5,112,750, Cl. 435-177.000.

Matsunaka, Toru: *See*—
Seki, Masaki; Takegahara, Takashi; and Matsunaka, Toru, 5,113,050, Cl. 219-69.120.

Matsuno, Toshiyuki: *See*—
Takase, Muneaki; Komatsu, Toshihiko; Matsuno, Toshiyuki; Miyakawa, Akihisa; and Saito, Kenichi, 5,112,833, Cl. 514-300.000.

Matsuo, Junichi: *See*—
Kobayashi, Yasuhito; and Matsuo, Junichi, 5,113,265, Cl. 358-330.000.

Matsushima, Hiroaki: *See*—
Iinuma, Mitsuhisa; Yamada, Hideo; Matsushima, Hiroaki; and Tobiki, Hisao, 5,112,327, Cl. 604-413.000.

Matsushiro, Ryuichi; Kosuda, Toru; Sasao, Shigeo; Ikeya, Taro; Chino, Yoshiharu; and Uekawa, Yasuaki, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Cooling system for an internal combustion engine. 5,111,776, Cl. 123-41.540.

Matsushita Electric Industrial Co., Ltd.: *See*—
Asada, Takafumi; Morimoto, Masato; and Sonoda, Takashi, 5,112,141, Cl. 384-100.000.
Fukushima, Tetsuo; Suetsugu, Kenichiro; Nishihara, Munekazu; and Ikeda, Junji, 5,113,470, Cl. 385-126.000.
Kadoya, Katsuhiko; Omichi, Yukinobu; Matsuda, Eiji; and Takenaka, Kenji, 5,111,673, Cl. 68-12.040.
Kuriyama, Katsuhiro, 5,113,055, Cl. 219-121.670.
Miki, Tadashi; Kozuka, Masayuki; and Uehara, Hirotoshi, 5,113,512, Cl. 395-425.000.
Nagata, Atsushi; Takahashi, Kenichi; and Takeguchi, Nobuyasu, 5,113,255, Cl. 358-136.000.
Yoshida, Masaru; Manabe, Yoshio; Mitsuyu, Tsuneo; and Tanahashi, Ichiro, 5,113,473, Cl. 385-131.000.

Matsushita Electric Works Ltd.: *See*—
Yonemoto, Tatsuo; Saito, Eiichiro; and Matsumura, Masahiro, 5,112,989, Cl. 548-548.000.

Matsushita Electronics Corporation: *See*—
Furuta, Takashi; and Nishida, Shuichi, 5,113,234, Cl. 357-33.300.

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Soderstrom, Jan R.; and McGill, Thomas C., 5,113,231, Cl. 357-16.000.

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Cagley, Paul M.; Kysilka, James O.; and McGillivray, Terry D., 5,112,638, Cl. 426-640.000.

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Frank, Thomas P.; and Patzer, Charles R., 5,112,320, Cl. 604-256.000.

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Arnold, Emil; Merchant, Steven L.; and Shackle, Peter W., 5,113,236, Cl. 357-41.000.

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Johnson, Gary M., 5,113,372, Cl. 365-205.000.
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Wijnschenk, Ronald J. C., 5,111,948, Cl. 215-306.000.

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Prince, Paul R.; Miller, William; and Benjamin, Grant S., 5,112,298, Cl. 604-6.000.

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Myers, Richard S.; Mills, Daniel R.; and Michaelson, Robert C., 5,113,033, Cl. 585-506.000.

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Hanamoto, Hiroyuki; and Oyabu, Masaaki, 5,113,279, Cl. 359-196.000.
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Morikawa, Takeshi; and Matsuda, Shinya, 5,113,218, Cl. 355-56.000.
Naiki, Toshio, 5,113,291, Cl. 359-823.000.
Sugiura, Masamichi, 5,113,266, Cl. 358-426.000.
Ueyama, Masayuki; and Tsuji, Kenji, 5,113,209, Cl. 354-400.000.
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Moussouris, John P.; Crudele, Lester M.; and Przybylski, Steven A., 5,113,506, Cl. 395-400.000.

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Nadolsky, Richard J.; and Laryea, Joseph M., 5,112,603, Cl. 514-772.300.

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Soled, Stuart L.; Dispenziere, Nicholas C., Jr.; Saleh, Ramzi Y.; and Miseo, Sabato, 5,113,034, Cl. 585-510.000.

Misui Toatsu Chemicals Incorporated: *See—*
Iwao, Tetsuya; Osaka, Shuichi; Sakaki, Takao; Nishida, Tadao; Yamamura, Kiyoshi; Koga, Seijiro; Hirai, Reiji; and Nakagawa, Haruo, 5,112,991, Cl. 549-206.000.

Mitra, Udayanath; and Venkatesan, Mahalingam, to North American Philips Corporation. Method for the fabrication of low leakage polysilicon thin film transistors. 5,112,764, Cl. 437-40.000.

Mitsubishi Denki K.K.: *See—*
Isozumi, Shuzou, 5,113,084, Cl. 290-48.000.
Kondo, Katsuhiko, 5,111,787, Cl. 123-339.000.
Ohuchi, Hirofumi; and Kako, Hajime, 5,113,347, Cl. 364-431.100.
Sakaue, Makoto, 5,113,051, Cl. 219-69.120.
Sugiyama, Takeshi, 5,111,707, Cl. 74-7.00E.
Sumida, Mamoru; Hashimoto, Masashi; and Matsumoto, Osamu, 5,111,775, Cl. 123-41.100.
Washino, Shoichi, 5,111,788, Cl. 123-339.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Andoh, Akira, 5,113,525 Cl. 455-127.000.
Endo, Kazuhito; Ishida, Masayuki; and Ishida, Yoshinobu, 5,113,293, Cl. 360-32.000.
Fujii, Takayuki; and Nakatani, Mitsunori, 5,112,766, Cl. 437-41.000.
Inami, Kazuyoshi; and Kawano, Hajime, 5,113,161, Cl. 333-246.000.
Ishii, Tatsuya; Mashiko, Yoji; Nagatomo, Masao; and Yamada, Michihiro, 5,112,771, Cl. 437-67.000.
Isozumi, Shuzou, 5,111,705, Cl. 74-6.000.
Nanzan, Tatsusuke; Obi, Hideo; Nakamoto, Masahiko; Nakamoto, Noriaki; and Ohta, Mikio, 5,113,126, Cl. 318-809.000.
Takahashi, Seiki; and Takasago, Hayato, 5,113,274, Cl. 359-66.000.
Tashiro, Tetsu; Takeuchi, Minoru; Ishimaru, Yoshiyuki; Hirose, Shinichi; and Hayashi Kazuo, 5,113,093, Cl. 307-465.000.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Murayama, Katsutoshi; Yamaguchi, Masatoshi; and Nakamura, Tooru, 5,112,578, Cl. 422-197.000.

Mitsubishi Kasei Corporation: *See—*
Kasai, Tetsuo; and Kobayashi, Yoshiteru, 5,112,941, Cl. 528-353.000.
Miyasaka, Tadashi; Tanaka, Hiromichi; De Clercq, Erik D. A.; Baba, Masanori; Walker, Richard T.; and Ubasawa, Masaru, 5,112,835, Cl. 544-302.000.

Mitsubishi Kasei Polytec Company: *See—*
Sawada, Tsutomu; Ohhasi, Shinichi; and Yoshida, Shigenobu, 5,112,673, Cl. 428-216.000.

Mitsubishi Kenki Kabushiki Kaisha: *See—*
Bando, Takahiro; and Tomimatsu, Noriyuki, 5,113,122, Cl. 315-371.000.

Mitsubishi Materials Corporation: *See—*
Mae, Yoshiharu, 5,112,415, Cl. 148-421.000.

Mitsubishi Paper Mills Limited: *See—*
Miyauchi, Masahiro, 5,112,798, Cl. 503-209.000.
Takahashi, Shunsuke; and Tsukahara, Hirokazu, 5,112,797, Cl. 503-200.000.

Mitsubishi Petrochemical Company Limited: *See—*
Fujita, Takashi, 5,112,786, Cl. 502-119.000.

Mitsubishi Rayon Company Ltd.: *See—*
Okada, Hiroshi; Suzuki, Shingo; Kagami, Manabu; and Suematsu, Chiaki, 5,113,476, Cl. 385-140.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Hashimoto, Isao; Ishida, Tatsuyodihi; Tsuru, Kazutaka; Yamada, Yuji; Miyazawa, Takeshige; Nakamura, Yasuo; Katou, Susumu; and Takahashi, Katsuya, 5,112,385, Cl. 71-94.000.
Itani, Akira; and Shimazaki, Kazuo, 5,113,402, Cl. 372-22.000.
Kurano, Yoshito; Kawamura, Masato; Kondo, Masahiro; Tanaka, Michio; and Yamamoto, Sanehiro, 5,113,018, Cl. 564-403.000.
Mende, Takayuki, 5,112,562, Cl. 264-555.000.

Mitsui Pharmaceuticals, Inc.: *See—*
Nagai, Yoshitaka; Abe, Hayao; and Arita, Masanobu, 5,112,810, Cl. 514-15.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Ajioka, Masanobu; Takenaka, Shinji; Itoh, Hiroyuki; Kataita, Masafumi; and Kohno, Yoshitsugu, 5,112,580, Cl. 422-241.000.
Ajioka, Masanobu; Higuchi, Chojiro; Oura, Takeshi; Katoh, Toshio; and Yamaguchi, Akihiro, 5,113,009, Cl. 560-40.000.
Fukazawa, Nobuyuki; Odate, Makoto; Suzuki, Tsuneji; Otsuka, Kengo; Tsuruo, Takashi; and Sato, Wakao, 5,112,817, Cl. 514-183.000.
Itoh, Hiroyuki; Kono, Yoshitsugu; Kikuchi, Isao; Takenaka, Shinji; and Ajioka, Masanobu, 5,112,593, Cl. 423-502.000.
Matsubara, Akira; Sakai, Kazuya; Tanada, Hideki; Mizuchi, Akira; Horikomi, Kazutoshi; and Ohtsu, Takuma, 5,112,841, Cl. 514-361.000.
Saruwatari, Masumi; Ohta, Yasuhiko; Fujii, Yasuhiro; and Honji, Yasuko, 5,112,557, Cl. 264-289.300.
Tokunaga, Mareo; and Isozaki, Wataru, 5,111,640, Cl. 53-449.000.
Yamamoto, Yoshihiro; Takaki, Usaji; Aoki, Shinobu; and Hara, Isao, 5,112,987, Cl. 548-457.000.
Yamaya, Norimasa; Ohta, Masahiro; and Yamaguchi, Akihiro, 5,112,899, Cl. 524-413.000.

Mitsumura, Satoshi: *See—*
Kanda, Hitoshi; Yamada, Yusuke; Kato, Masayoshi; Goseki, Yasuhide; and Mitsumura, Satoshi, 5,111,998, Cl. 241-5.000.

Mitsuyu, Tsuneo: *See—*
Yoshida, Masaru; Manabe, Yoshio; Mitsuyu, Tsuneo; and Tanahashi, Ichiro, 5,113,473, Cl. 385-131.000.

Mittnacht, Hans: *See—*
Schwaben, Hans-Dieter; Schlichtmann, Rainer; Kindler, Hubert; Klaerner, Peter; and Mittnacht, Hans, 5,112,921, Cl. 525-316.000.

Miura, Yuzo; Ohnishi, Masanobu; Mabuchi, Tsutomu; and Yanai, Isao, to Nihon Nohyaku Co., Ltd. 3-(substituted phenyl) pyrazole derivatives herbicidal composition containing the same and method of controlling weeds using said composition. 5,112,384, Cl. 71-92.000.

Miyagi, Hiroyuki: *See—*
Shibata, Yasuhisa; Oki, Naoto; Ozawa, Satoshi; and Miyagi, Hiroyuki, 5,112,471, Cl. 204-418.000.

Miyaji, Toshie: *See—*
Senoo, Akihiro; Iuchi, Kazushi; Miyazaki, Hajime; Go, Shintetsu; and Miyaji, Toshie, 5,112,759, Cl. 430-58.000.

Miyajima, Atsushi: *See—*
Hayashida, Kazuhiro; Kitamura, Toshio; and Miyajima, Atsushi, 5,112,961, Cl. 536-27.000.

Miyajima, Goh; Takahashi, Takao; Shudo, Tuyosi; and Suzuki, Shohei, to Hitachi, Ltd. Magnetic field gradient coil system. 5,113,166, Cl. 335-299.000.

Miyakawa, Akihisa: *See—*
Takase, Muneaki; Komatsu, Toshihiko; Matsuno, Toshiyuki; Miyakawa, Akihisa; and Saito, Kenichi, 5,112,833, Cl. 514-300.000.

Miyake, Toshio: *See—*
Sakai, Shuzo; Akai, Hiroshi; and Miyake, Toshio, 5,112,407, Cl. 127-58.000.

Miyamoto, Masaaki: *See—*
Hamano, Kiyoshi; Furuya, Kouhei; Tanzawa, Kazuhiko; Kagasaki, Takeshi; Miyamoto, Masaaki; and Kinoshita, Takeshi, 5,112,807, Cl. 514-11.000.

Miyamoto, Sampei: *See—*
Yamamoto, Takayuki; and Miyamoto, Sampei, 5,113,088, Cl. 307-296.200.

Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washimi, Takeshi; Harada, Naoki; and Akahori, Kingo, to Sumitomo Chemical Company, Limited. Polyazo dye compounds having plural vinylsulfone type fiber reactive groups in one molecule. 5,112,959, Cl. 534-642.000.

Miyasaka, Nobuaki, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,112,731, Cl. 430-567.000.

Miyasaka, Tadashi; Tanaka, Hiromichi; De Clercq, Erik D. A.; Baba, Masanori; Walker, Richard T.; and Ubasawa, Masaru, to Mitsubishi Kasei Corporation. 6-substituted acyclopyrimidine nucleoside derivatives and antiviral agents containing the same as active ingredient thereof. 5,112,835, Cl. 544-302.000.

Miyasaka, Toshiaki, to Mutoh Industries Ltd. Waste toner conveying apparatus. 5,113,227, Cl. 355-298.000.

Miyata, Hirofumi; and Furukawa, Yutaka, to Bando Chemical Industries, Ltd. Continuous speed-shifting device. 5,112,283, Cl. 475-211.000.

Miyata, Seizo: *See—*
Ogata, Naoya; and Yokowo, Yasuhiko, 5,112,906, Cl. 525-61.000.

Miyata, Shigeki: *See—*
Mizuno, Yutaka; Tsuzuki, Hanzo; Haruhara, Kazuyoshi; Miyata, Shigeki; Motoike, Katsuhiko; Sakai, Tooru; and Ooishi, Kazuhiro, 5,113,183, Cl. 340-825.310.

Miyata, Souichi: *See—*
Komatsu, Koji; Yoshida, Shinichi; Miyata, Souichi; and Azuma, Daisuke, 5,113,339, Cl. 395-200.000.

Miyauchi, Masahiro, to Mitsubishi Paper Mills Limited. Heat-sensitive recording sheet. 5,112,798, Cl. 503-209.000.

Miyazaki, Hajime: *See—*
Senoo, Akihiro; Iuchi, Kazushi; Miyazaki, Hajime; Go, Shintetsu; and Miyaji, Toshie, 5,112,759, Cl. 430-58.000.

Miyazaki, Kenji: *See—*
Takano, Satoshi; Takahashi, Kenichi; Miyazaki, Kenji; Yoshida, Noriyuki; Inazawa, Shinji; and Hayashi, Noriki, 5,112,802, Cl. 505-1.000.

Miyazawa, Takeshige: *See—*
Hashimoto, Isao; Ishida, Tatsuyodihi; Tsuru, Kazutaka; Yamada, Yuji; Miyazawa, Takeshige; Nakamura, Yasuo; Katou, Susumu; and Takahashi, Katsuya, 5,112,385, Cl. 71-94.000.

Miyazawa, Yoshinori; Omae, Hidenori; Ishii, Takayuki; Koto, Haruhiko; and Akahane, Fujio, to Seiko Epson Corporation. Ink jet head. 5,113,204, Cl. 346-140.00R.

Mizoshita, Yoshifumi: *See—*
Imamura, Takahiro; Mizoshita, Yoshifumi; and Aruga, Keiji, 5,112,147, Cl. 384-605.000.

Mizuchi, Akira: *See—*
Matsubara, Akira; Sakai, Kazuya; Tanada, Hideki; Mizuchi, Akira; Horikomi, Kazutoshi; and Ohtsu, Takuma, 5,112,841, Cl. 514-361.000.

Mizuno, Shigeru: *See—*
Deguchi, Masaaki; and Mizuno, Shigeru, 5,113,200, Cl. 346-25.000.

Mizuno, Yukio; and Maruyama, Takashi, to Sumitomo Chemical Co., Ltd. Resin composition. 5,112,914, Cl. 525-134.000.

Mizuno, Yutaka; Tsuzuki, Hanzo; Haruhara, Kazuyoshi; Miyata, Shigeki; Motoike, Katsuhiko; Sakai, Tooru; and Ooishi, Kazuhiro, to Casio Computer Co., Ltd. Remote code transmission system between a nameplate apparatus and a data processing apparatus. 5,113,183, Cl. 340-825.310.

Mizutani, Yukimi: *See—*
Hirata, Keiichi; Ban, Tomohiro; Kawasumi, Atsuko; Nakagawa, Kazuko; Mizutani, Yukimi; and Tsuruki, Satoru, 5,113,520, Cl. 395-650.000.

Mizutome, Atsushi: *See—*
Inoue, Hiroshi; Mizutome, Atsushi; Kanno, Hideo; Sakamoto, Eiji; and Osada, Yoshiyuki, 5,113,181, Cl. 340-783.000.

Mletzko, Alfred E., to Summagraphics Corporation. Digitizer tablet with reduced radiation susceptibility. 5,113,042, Cl. 178-19.000.

Mobashery, Shahriar, to Board of Governors of Wayne State University. Method for inactivating dehydropepidase activity irreversibly with alkenoic acid compounds. 5,112,751, Cl. 435-184.000.

Mobil Oil Corporation: *See—*
Begley, Brendan J.; and Cheruvu, Subrahmanyam, 5,111,854, Cl. 141-65.000.
Chen, Catherine S. H.; and Wu, Margaret M., 5,113,030, Cl. 585-10.000.
Di Biasi, Daniel J.; and Schwab, Frederick C., 5,111,933, Cl. 206-223.000.
Giacobbe, Thomas J.; and Ksenic, George A., 5,112,519, Cl. 252-174.210.
Harandi, Mohsen N.; and Owen, Hartley, 5,113,024, Cl. 568-697.000.
Johnson, Ivy D.; and McWilliams, John P., 5,112,589, Cl. 423-328.000.
Morris, Richard L.; and Paul, James M., 5,111,887, Cl. 166-312.000.
Yan, Tsoung Y., 5,112,494, Cl. 210-668.000.

Mochizuki, Akihiro; Hama, Hideo; and Hirose, Mitsuaki, to Fujitsu Limited. Liquid crystal display device. 5,113,273, Cl. 359-56.000.

Modrovich, Ivan E. Stable single liquid reagent for determination of direct bilirubin in sera and method of forming same. 5,112,769, Cl. 436-97.000.

Moeinzadeh, Manssour H.; Kaplan, Lawrence M.; and Gurosh, Jeffrey A. Semi-disposable surgical stapler. 5,111,987, Cl. 227-180.000.

Moerbe, Ronald C. Steering unit for barges. 5,111,763, Cl. 114-246.000.

Mohr, Jacob G.; Kane, Michael H.; and Le Riche, Etienne, to Timbalyte Close Corporation. Coffins. 5,111,559, Cl. 27-4.000.

Mohr, Kirby S., to Facet Quantek, Inc. Fuel filter for preventing water and particulate contamination. 5,112,478, Cl. 210-96.100.

Moir, Dale A., to Lachman Associates, Inc. Method and apparatus for providing access control in a secure operating system. 5,113,442, Cl. 380-25.000.

Moisala, Tapio O.: *See—*
Lauren, Henning J. E.; Nurmi, Tom E. E.; and Moisala, Tapio O., 5,111,552, Cl. 19-308.000.

Moisand, Jean-Claude: *See—*
Martin, Jean-Paul; and Moisand, Jean-Claude, 5,112,236, Cl. 439-86.000.

Moise, Norton L.: *See—*
Chang, David B.; Moise, Norton L.; and Shih, I-Fu, 5,112,121, Cl. 359-15.000.

Molecular Devices Corporation: *See—*
Chow, Calvin Y. H.; Humphries, Gillian M.; Kung, Viola T.; and Lacy, Michael M., 5,112,134, Cl. 356-427.000.

Molex Incorporated: *See—*
Enomoto, Masahiro; and Fukushima, Minoru, 5,112,235, Cl. 439-83.000.
Harwath, Frank A.; Regnier, Kent E.; and Scheer, Dennis, 5,112,231, Cl. 439-60.000.

Molinari, Egidio, to Erregierre Industria Chimica S.p.A. Process for preparing alpha (alkyl phenyl)-4(hydroxy-diphenylmethyl)-1-piperidinyl butanol. 5,112,978, Cl. 546-240.000.

Mondek, Martin J.: *See—*
Bland, Gerald F.; Kantola, James C.; and Mondek, Martin J., 5,112,260, Cl. 440-88.000.

Mone, Patrick: *See—*
Cederbaum, Carl; Chanclou, Roland; Combes, Myriam; Mone, Patrick; and Vallet, Vincent, 5,112,765, Cl. 437-41.000.

Monma, Yoshio; and Yamaguchi, Hiroyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Sheet separating mechanism. 5,113,228, Cl. 355-315.000.

Monneret, Alain, to Monneret Jouets. Table football machine. 5,112,047, Cl. 273-85.00D.

Monneret Jouets: *See—*
Monneret, Alain, 5,112,047, Cl. 273-85.00D.

Monsanto Company: *See—*
Chen, Chuan J.; and Peng, Fred M., 5,112,895, Cl. 524-308.000.
Hegde, Shridhar G., 5,112,980, Cl. 546-283.000.
Ngo, Toan M., 5,112,395, Cl. 106-14.120.
Pozzo, Mark J., 5,113,008, Cl. 558-252.000.
Wun, Tze-Chein, 5,112,955, Cl. 530-409.000.

Montero, Enrique E.: *See—*
Thrower, Jack S.; Stewart, Dennis C.; and Montero, Enrique E., 5,111,990, Cl. 228-113.000.

Montet, Evelyne: *See—*
Marcon, Joel; Montet, Evelyne; Gobet, Didier; Ferrand, Guy; Pochard, Patrick; and Simon, Georges, 5,111,732, Cl. 89-135.000.

Moore, Arthur L.; Wolff, Peter; Ruther, Leon H.; and Pike, Walter E., to Stainless Steel Products, Inc. Duct joint link assembly. 5,112,088, Cl. 285-114.000.

Moore, Boyd B., to Shell Oil Company. Method for forming precision liquid/vapor separating bristle assembly. 5,111,547, Cl. 15-187.000.

Moore, Richard G., to Janetatos, Jack P., a part interest. Rotary valve system for internal combustion engines. 5,111,783, Cl. 123-190.400.

Moravcsik, Imre: *See—*
Ambrus, Gabor; Maderspach, Andrea; Jekkel, Antalne ; Javor, Andras; Ilkoy, Eva; Hajos, Gyorgy; Szporny, Laszlo ; Nagy, Jozsef; Horvath, Gyula; and Moravcsik, Imre, 5,112,815, Cl. 514-178.000.

Morby, John A.: *See—*
Pratt, James R.; Robarge, Dean A.; Markowski, Robert G.; Perzan, Denis A.; and Morby, John A., 5,113,312, Cl. 361-361.000.

Mordre, Sigurd C.: *See—*
Buchberger, Anton H.; Tremoulet, Olivier L., Jr.; and Mordre, Sigurd C., 5,111,736, Cl. 92-168.000.

More, Edwin R., to United Technologies Corporation. Composite blade having wear resistant tip. 5,112,194, Cl. 416-230.000.

Morelli, Harold A.; and Lubbs, Eugene K., to Schmid Laboratories, Inc. Method of forming banded condoms. 5,112,555, Cl. 264-271.100.

Morelli, Thomas A.; Peascoe, Warren J.; Rasch, Stefan F.; and Tyrell, John A., to General Electric Company. Copolyetherester elastomeric compositions. 5,112,915, Cl. 525-166.000.

Morency, Joseph: *See—*
Frish, Michael B.; Morency, Joseph; Johnson, Stephen A.; and Boni, Arthur A., 5,112,215, Cl. 431-3.000.

Morenz, Paul W.; and Knox, Charles E., to General Dynamics Corporation, Convair Division. Method of manufacturing composite structures. 5,112,663, Cl. 428-71.000.

Morgan, Peter E. D.: *See—*
De Wames, Roger E.; Goldberg, Ira B.; Morgan, Peter E. D.; Ratto, Joseph J.; Marshall, David B.; and Hall, William F., 5,113,164, Cl. 335-216.000.

Morgan, Stephen P.: *See—*
Johnson, Donavon W.; Morgan, Stephen P.; and Smith, Todd A., 5,113,519, Cl. 395-600.000.

Morgenson, Ronald J.: *See—*
Miller, Douglas P.; Arters, Edward H.; and Morgenson, Ronald J., 5,111,840, Cl. 137-270.000.

Mori, Kikuichi: *See—*
Kajiwara, Kenichi; Mori, Kikuichi; Ikeda, Hideo; and Arakawa, Shinichiro, 5,112,190, Cl. 415-215.100.

Mori, Masahito; Torii, Kohske; and Okamoto, Hirokazu, to Sunstar Engineering, Inc. Moisture-crosslinkable primer composition. 5,112,911, Cl. 525-100.000.

Mori, Mitsuhiro: *See—*
Hara, Daiji; Mori, Mitsuhiro; and Kondo, Yozo, 5,112,927, Cl. 526-124.000.

Moridi, Said: *See*—
Karam, Georges; and Moridi, Said, 5,113,414, Cl. 375-60.000.

Morikawa, Kiyoshi: *See*—
Yamada, Yoshinori; Morikawa, Kiyoshi; Kurumada, Masakazu; Kobayashi, Kazuo; and Sugihara, Masanori, 5,113,388, Cl. 369-270.000.

Morikawa, Takeshi; and Matsuda, Shinya, to Minolta Camera Kabushiki Kaisha. Electrophotographic machine with control means responsive to set magnification ratio and focal length. 5,113,218, Cl. 355-56.000.

Morimoto, Makoto: *See*—
Kinoshita, Iwao; Machii Daisuke; Onoda, Yasuo; Takai, Haruki; Kasaka, Nobuo; Shuto Katsuichi; Gomi, Katsushige; Morimoto, Makoto; and Ishii, Akio, 5,112,867, Cl. 514-617.000.

Morimoto, Masato: *See*—
Asada, Takafumi; Morimoto, Masato; and Sonoda, Takashi, 5,112,141, Cl. 384-100.000.

Morin, Eugene. Portable cleaning kit. 5,111,934, Cl. 206-229.000.

Morisawa, Tahei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens driving apparatus using cam plate. 5,113,261, Cl. 358-225.000.

Morisset, Bernard G. Insect-killing device. 5,111,610, Cl. 43-132.100.

Morita Kagaku Co., Ltd.: *See*—
Watanabe, Nobuatsu; Chong, Yong-Bo; Tatsuno, Toshio; Okada, Tomoyoshi; Izumi, Akira; and Toei, Keiji, 5,112,437, Cl. 156-646.000.

Morita, Miki: *See*—
Ninomiya, Hidetaka; Nakayama, Noritaka; Masukawa, Toyoaki; and Morita, Miki, 5,112,532, Cl. 252-587.000.

Morita, Minoru: *See*—
Satoh, Kazuo; Sekine, Koichiro; Kakisada, Kou; and Morita, Minoru, 5,112,502, Cl. 210-770.000.

Morita, Shigeru; and Oka, Masahiko, to Daikin Industries Ltd. Fluorine-containing acrylic acid derivative and polymer thereof. 5,112,973, Cl. 544-387.000.

Moritani, Atsushi: *See*—
Shimizu, Toshihiko; Hotta, Masao; and Moritani, Atsushi, 5,113,077, Cl. 250-370.110.

Moriya, Naoyuki; and Sameshima, Makoto, to Shin Caterpillar Mitsubishi Ltd. Method for controlling torque of a pump. 5,111,789, Cl. 123-357.000.

Moriya, Tatsuo: *See*—
Sakamoto, Kenji; Maruyama, Akihiko; Moriya, Tatsuo; Yabe, Hiroshi; Kawaguchi, Takashi; and Yoshino, Masato, 5,113,381, Cl. 368-74.000.

Moriya, Tetsuo; Kondo, Susumu; and Sanuki, Shinji, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing particles of high water-absorbent resin 5,112,902, Cl. 524-503.000.

Morley, John F., Jr.; and Anderson, Kent D., to American Tel-A-System, Inc. Telephone answering service with integrated voice and textual message storage. 5,113,429, Cl. 379-88.000.

Morman, Michael T.: *See*—
Cohen, Bernard; and Morman, Michael T., 5,112,690, Cl. 428-411.100.

Morpheus Lights, Inc.: *See*—
Richardson, Brain E., 5,113,332, Cl. 362-282.000.

Morris, Frank: *See*—
Wong, King L.; and Morris, Frank, 5,113,099, Cl. 310-13.000.

Morris, James A.: *See*—
Farbood, Mohamad I.; McLean, Lynda B.; Morris, James A.; and Bondarovich, Henry A., 5,112,803, Cl. 512-11.000.

Morris, John M.; Stephens, Charles E.; and Forsythe, Alan K., to GT Development Corporation. Pressure/thermal relief valve for fuel tank. 5,111,837, Cl. 137-72.000.

Morris, Richard L.; and Paul, James M., to Mobil Oil Corporation. Method for reducing radioactivity of oilfield tubular goods contaminated with radioactive scale. 5,111,887, Cl. 166-312.000.

Morris, Robert A., to General Electric Company. Circuit breaker safety interlock unit. 5,113,043, Cl. 200-43.010.

Morris, Robert C.: *See*—
Gualtieri, Devlin M.; and Morris, Robert C., 5,113,472, Cl. 385-130.000.

Morrison, Barry: *See*—
Bond, Robert H.; Olla, Michael A.; Morrison, Barry; and Garrison, Linn C., 5,111,935, Cl. 206-329.000.

Morrison, Rick L., to AT&T Bell Laboratories. Diffraction grating apparatus and method of forming a surface relief pattern in diffraction grating apparatus. 5,113,286, Cl. 359-569.000.

Morrone, Ross, to All-State Legal Supply Co. Paper pad construction and clip means therefor. 5,112,083, Cl. 281-47.000.

Morton International, Inc.: *See*—
Correa, Jose L.; Stumpf, Robert C.; Farnum, Charles L.; and Roos, Leo, 5,112,428, Cl. 156-324.000.

Moses, Fred: *See*—
Snyder, Richard E.; Moses, Fred; Burke, Bryan E.; and Kennedy, Dean A., 5,111,897, Cl. 177-132.000.

Mosher, Charles E., Jr.: *See*—
Johnson, Elizabeth R.; and Mosher, Charles E., Jr., 5,113,357, Cl. 395-124.000.

Motegi, Hisao; Sunaga, Takeshi; and Zembayashi, Michio, to Toshiba Silicone Co., Ltd. Organosilicon compound and acryl compound. 5,113,000, Cl. 556-413.000.

Motoike, Katsuhiko: *See*—
Mizuno, Yutaka; Tsuzuki, Hanzo; Haruhara, Kazuyoshi; Miyata, Shigeki; Motoike, Katsuhiko; Sakai, Tooru; and Ooishi, Kazuhiro, 5,113,183, Cl. 340-825.310.

Motoki, Masuzi: *See*—
Ohkawa, Atsuhiro; Kamio, Takayoshi; Motoki, Masuzi; and Mihayashi, Keiji, 5,112,730, Cl. 430-553.000.

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Clawson, Robert A.; and Thome, John R., 5,111,991, Cl. 228-180.100.
DeSimone, Michael J., 5,112,230, Cl. 439-55.000.
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Ho, Ying-Wai; Harrod, Peter L.; and Someshwar, Ashok H., 5,113,364, Cl. 364-757.000.
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Kotzin, Michael D., 5,113,394, Cl. 370-97.000.
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Messer, Dion D.; Park, Sangil; and Thompson, Charles D., 5,113,189, Cl. 341-143.000.
Ponce de Leon, Lorenzo A.; Siwiak, Kazimierz; and Goldenberg, Michael P., 5,113,196, Cl. 343-744.000.
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Mourey, Bruno B.: *See*—
Plus, Dora; and Mourey, Bruno B., 5,113,134, Cl. 324-158.00R.

Moussavi, Mehdi, to Commissariat a l'Energie Atomique. Radical lithium phthalocyanine crystals, their preparation process and their use for the in vivo determination of molecular oxygen. 5,112,597, Cl. 424-9.000.

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Mower, Morton M., to Cardiac Pacemakers, Inc. Method and apparatus for cardioverter/pacer utilizing neurosensing. 5,111,815, Cl. 128-419.0PG.

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Langer, William J., 5,111,685, Cl. 73-117.000.

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Pelz, Horst; Klier, Armin; and Graf, Herbert, 5,112,389, Cl. 75-401.000.

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Andrusch, Franz; Beerhalter, Siegfried; Mueller, Wolfgang F.; and Zykoff, Felix B., 5,111,723, Cl. 83-24.000.

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Munsey, R. Jack; and Rose, Todd N., to C-Tec, Inc. Access floor panel with peripheral trim. 5,111,630, Cl. 52-508.000.

Munters Corporation: *See*—
Thomas, Patricia T., 5,112,538, Cl. 261-112.200.

Murai, Kazuhiro: *See*—
Tanji, Masaki; Nishijima, Toyoki; Ogawa, Takahiro; Takada, Shun; and Murai, Kazuhiro, 5,112,728, Cl. 430-507.000.

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Nakamura, Kazushige; Honda, Mitsuru; Toma, Hitoshi; Tanaka, Shigemori; Murai, Keiichi; Unno, Akira; and Takemura, Ako, 5,112,656, Cl. 427-425.000.

Murakami, Harunori: *See*—
Sakurai, Kaoru; Murakami, Harunori; Maeda, Masaru; Iijima, Hiroshi; and Ohara, Shouhei, 5,113,195, Cl. 343-704.000.

Murakami, Hironobu: *See*—
Takada, Naoyuki; and Murakami, Hironobu, 5,112,109, Cl. 297-343.000.

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Kuriyama, Shigeru; Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,111,784, Cl. 123-192.100.

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Yasuda, Tomio; and Murakami, Yuichi, 5,113,178, Cl. 340-709.000.

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Murata, Makoto, to Nissin Seiki Kabushiki Kaisha. Penetration bending method and penetration bending machine therefor. 5,111,675, Cl. 72-7.000.

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Funada, Yo, 5,113,155, Cl. 331-107.0SL.

Murata, Shigeto: *See*—
Orii, Akihito; Yokomizo, Osamu; Masuhara, Yasuhiro; Nishida, Koji; Murata, Shigeto; Kashiwai, Shin-ichi; Inoue, Kotaro; and Yoshimoto, Yuichiro, 5,112,571, Cl. 376-439.000.

Murata, Yoshitaka, to Canon Kabushiki Kaisha. Camera. 5,113,216, Cl. 354-421.000.

Muratori, Giuseppe: *See*—
Colombo, Paolo; Troglia, Claudio; Verzellino, Santina R.; and Muratori, Giuseppe, 5,112,905, Cl. 525-60.000.

Murayama, Katsutoshi; Yamaguchi, Masatoshi; and Nakamura, Tooru, to Mitsubishi Gas Chemical Company, Inc. Reactor for reforming hydrocarbon and process for reforming hydrocarbon. 5,112,578, Cl. 422-197.000.

Murkett, Stephen; and Schreiber, Reinhold, to Dr. Ing. h.c.F. Porsche AG. Passenger car, particularly a sports car. 5,112,100, Cl. 296-186.000.

Murnane, James F., II: *See*—
Kuhnle, William G.; and Murnane, James F., II, 5,111,576, Cl. 29-889.230.

Murphy, Bryan P.; and Wis-Surel, Gabriella, to Clairol, Inc. Hair colorants. 5,112,359, Cl. 8-405.000.

Murphy, Clarence J.: *See*—
Sperling, Leslie H.; Murphy, Clarence J.; Rosen, Warren A.; Jain, Himanshu; and Herman, Warren N., 5,112,531, Cl. 252-582.000.

Murphy, Robert A.; Syler, Rodney R.; and Slattery, William H., to Apcom, Inc. Fluid heater utilizing dual heating elements interconnected with conductive jumper. 5,113,480, Cl. 392-501.000.

Murphy, William A.: *See*—
Coy, David H.; and Murphy, William A., 5,112,808, Cl. 514-12.000.

Murray, John E.: *See*—
Fite, David B.; Hetherington, Ricky C.; McKeon, Michael M.; Manley, Dwight P.; and Murray, John E., 5,113,515, Cl. 395-425.000.

Murray, Michael A.; and Weston, Charles W., to Freeport-McMoran Resource Partners, Limited Partnership. Process for treating pond water. 5,112,499, Cl. 210-713.000.

Muto, Hiroyasu, to NEC Corporation. Detection of a particular signal sequence with no adverse influence of multipath transmission. 5,113,415, Cl. 375-83.000.

Mutoh Industries Ltd.: *See*—
Miyasaka, Toshiaki, 5,113,227, Cl. 355-298.000.

Myers, Richard S.; Mills, Daniel R.; and Michaelson, Robert C., to Exxon Chemical Patents Inc. Ruthenium salt and aluminum halide catalyst system for codimerization of alpha monoolefins and conjugated diolefins. 5,113,033, Cl. 585-506.000.

Myojo, Koji; and Uohashi, Hiromichi, to GE Plastics Japan, Ltd. Method for treating a polyphenylene ether-polyamide material, and articles made by such a method. 5,112,681, Cl. 428-335.000.

Nadolsky, Richard J.; and Laryea, Joseph M., to Miranol Inc. Thickening agents for aqueous systems. 5,112,603, Cl. 514-772.300.

Nae, Hemi N.; Cheng, Wei M.; and DeSesa, Michael A., to Rheox, Inc. Clay thickener for use in water-based systems and joint compounds containing such compositions. 5,112,400, Cl. 106-197.100.

Naegeli, Robert W.: *See*—
Hahn, Norbert; and Naegeli, Robert W., 5,111,546, Cl. 14-7.300.

Nagahara, Yoshiyuki: *See*—
Inui, Tetsuya; Hirokane, Junji; Shibata, Akira; Nagahara, Yoshiyuki; and Ohta, Kenji, 5,112,727, Cl. 430-321.000.

Nagai, Toshinari; Tanaka, Hiroshi; and Suzuki, Makoto, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling heater for oxygen sensor and fuel control apparatus using the same. 5,111,792, Cl. 123-440.000.

Nagai, Yoshitaka; Abe, Hayao; and Arita, Masanobu, to Mitsui Pharmaceuticals, Inc. Method for treating multiple sclerosis. 5,112,810, Cl. 514-15.000.

Nagano, Jun: *See*—
Tada, Shigeru; Nagano, Jun; and Fukamachi, Yoshihiro, 5,111,722, Cl. 83-23.000.

Nagano, Koichi: *See*—
Sekiguchi, Tsuneo; Nagano, Koichi; and Suzuki, Satoru, 5,113,319, Cl. 362-61.000.

Nagashima, Shigeo: *See*—
Hayashi, Takehisa; Omoda, Koichiro; Tanaka, Teruo; Hamanka, Naoki; and Nagashima, Shigeo, 5,113,390, Cl. 370-65.000.

Nagata, Atsushi; and Misawa, Atsushi, to Fuji Photo Film Co., Ltd. Zoom lens system. 5,113,214, Cl. 354-402.000.

Nagata, Atsushi; Takahashi, Kenichi; and Takeguchi, Nobuyasu, to Matsushita Electric Industrial Co., Ltd. Moving image signal encoding apparatus and decoding apparatus. 5,113,255, Cl. 358-136.000.

Nagatomo, Masao: *See*—
Ishii, Tatsuya; Mashiko, Yoji; Nagatomo, Masao; and Yamada, Michihiro, 5,112,771, Cl. 437-67.000.

Nagengast, William E., to General Motors Corporation. Vehicle headlamp assembly. 5,113,331, Cl. 362-267.000.

Nagesh, Voddarahalli K.: *See*—
Wheeler, Richard L.; and Nagesh, Voddarahalli K., 5,113,314, Cl. 361-384.000.

Nagy, Jozsef: *See*—
Ambrus, Gabor; Maderspach, Andrea; Jekkel, Antalne ; Javor, Andras; Ilkoy, Eva; Hajos, Gyorgy; Szporny, Laszlo ; Nagy, Jozsef; Horvath, Gyula; and Moravcsik, Imre, 5,112,815, Cl. 514-178.000.

Naiki, Toshio, to Minolta Camera Kabushiki Kaisha. Optical axis and focus adjustment mechanism for semiconductor laser and collimator lens. 5,113,291, Cl. 359-823.000.

Nakachi, Osamu: *See*—
Hashimoto, Atsushi; Hibino, Hidehiko; and Nakachi, Osamu, 5,112,863, Cl. 514-534.000.

Nakagawa, Asaharu, to Kitagawa Industries Co., Ltd. Method for producting strip cable. 5,112,419, Cl. 156-51.000.

Nakagawa, Haruo: *See*—
Iwao, Tetsuya; Osaka, Shuichi; Sakaki, Takao; Nishida, Tadao; Yamamura, Kiyoshi; Koga, Seijiro; Hirai, Reiji; and Nakagawa, Haruo, 5,112,991, Cl. 549-206.000.

Nakagawa, Jun; Kawamata, Toshio; and Sano, Kunihiko, to Fuji Photo Film Co., Ltd. Magnetic disk. 5,112,679, Cl. 428-323.000.

Nakagawa, Kazuko: *See*—
Hirata, Keiichi; Ban, Tomohiro; Kawasumi, Atsuko; Nakagawa, Kazuko; Mizutani, Yukimi; and Tsuruki, Satoru, 5,113,520, Cl. 395-650.000.

Nakagawa, Naoshi: *See*—
Tsuji, Jiro; Takahashi, Takashi; Tsuji, Masao; Nakagawa, Naoshi; and Takigawa, Tetsuo, 5,112,998, Cl. 552-559.000.

Nakagawa, Susumu; Yamada, Koji; and Ushijima, Ryosuke, to Banyu Pharmaceutical Co., Ltd. 2-(2-cyclopropylpyrrolidin-4-ylthio)carbapenhem derivatives. 5,112,818, Cl. 514-210.000.

Nakagawa, Takehiro: *See*—
Kanno, Masahide; Uehara, Masao; Sasaki, Masahiko; Saito, Katsuyuki; Uchikubo, Akinobu; Hasegawa, Jun; Sasagawa, Katsuyoshi; Yamashita, Shinji; and Nakagawa, Takehiro, 5,113,254, Cl. 358-98.000.

Nakagawa, Yukihiro; and Brittingham, Alan L. Method of forming spacing ring for tubes in high temperature environment. 5,111,561, Cl. 29-4.550.

Nakahara, Yoshihiko: *See*—
Fujita, Minoru; and Nakahara, Yoshihiko, 5,113,062, Cl. 235-493.000.

Nakahashi, Junichi; Natori, Itaru; Hinoue, Kenichi; and Ochiai, Nobutaka, to Kasei Kogyo Kabushiki Kaisha. Olefin polymer and a resin composition containing the same. 5,112,916, Cl. 525-183.000.

Nakai, Masaaki: *See*—
Izumi, Shuji; Nakai, Masaaki; Inoue, Manabu; Fujino, Akihiko; Kawamura, Kunio; Takarabe, Yuji; and Niwa, Masatake, 5,113,217, Cl. 354-471.000.

Nakai, Takehiko; and Setani, Michitaka, to Canon Kabushiki Kaisha. Image reading apparatus having a blazed diffraction grating. 5,113,067, Cl. 250-208.100.

Nakajima, Tamotu; and Yoshida, Shusuke, to Toray Industries, Inc. Method of preparing three dimensional fabric having a unique structure. 5,112,426, Cl. 156-250.000.

Nakamoto, Masahiko: *See*—
Nanzan, Tatsusuke; Obi, Hideo; Nakamoto, Masahiko; Nakamoto, Noriaki; and Ohta, Mikio, 5,113,126, Cl. 318-809.000.

Nakamoto, Noriaki: *See*—
Nanzan, Tatsusuke; Obi, Hideo; Nakamoto, Masahiko; Nakamoto, Noriaki; and Ohta, Mikio, 5,113,126, Cl. 318-809.000.

Nakamura, Akimasa: *See*—
Kamiya, Kenji; Ina, Hiroyuki; Nakamura, Akimasa; and Honda, Masakazu, 5,111,686, Cl. 73-117.300.

Nakamura, Katsunari; Ueda, Keiichiro; Irie, Yoshiro; Hoshi, Toyokazu; and Kawakami, Motozou, to Fuji Electric Co. Ltd. Method and system for storing/removing and distributing articles of manufacture. 5,113,349, Cl. 364-478.000.

Nakamura, Kazunori: *See*—
Takiyasu, Yoshihiro; Yamaga, Mitsuhiro; Nakamura, Kazunori; Amada, Eiichi; Jusa, Hidehiko; Kobayashi, Naoya; Takada, Osamu; Hirayama, Satoru; and Iiyama, Tatsuhito, 5,113,392, Cl. 370-85.150.

Nakamura, Kazushige; Honda, Mitsuru; Toma, Hitoshi; Tanaka, Shigemori; Murai, Keiichi; Unno, Akira; and Takemura, Ako, to Canon Kabushiki Kaisha. Coating method suitable for use in production of photosensitive member for electrophotography. 5,112,656, Cl. 427-425.000.

Nakamura, Kenichi: *See*—
Kuriyama, Shigeru; Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,111,784, Cl. 123-192.100.

Nakamura, Takashi, to Dow Corning Toray Silicone Company, Ltd. Solid polymer electrolyte of an organopolysiloxane crosslinked with polyalkylene oxide. 5,112,512, Cl. 252-62.200.

Nakamura, Tooru: *See—*
Murayama, Katsutoshi Yamaguchi, Masatoshi; and Nakamura, Tooru, 5,112,578, Cl. 422-197.000.

Nakamura, Yasuhiro, to Rheon Automatic Machinery Co., Ltd. Method of continuously producing strudels containing cake or cake and a filling. 5,112,631, Cl. 426-297.000.

Nakamura, Yasuo: *See—*
Hashimoto, Isao; Ishida, Tatsuyodihi; Tsuru, Kazutaka; Yamada, Yuji; Miyazawa, Takeshige; Nakamura, Yasuo; Katou, Susumu; and Takahashi, Katsuya, 5,112,385, Cl. 71-94.000.

Nakamura, Yoichi: *See—*
Nakano, Minoru; Goto, Akihito; and Nakamura, Yoichi, 5,111,864, Cl. 152-527.000.

Nakamura, Yoshinori: *See—*
Egashira, Noritaka; and Nakamura, Yoshinori, 5,112,799, Cl. 503-227.000.

Nakamura, Yozo: *See—*
Kuriyama, Shigeru; Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,111,784, Cl. 123-192.100.

Nakano, Masayuki: *See—*
Isono, Koichi; Nakano, Masayuki; and Nishigaito, Yoshiyuki, 5,113,264, Cl. 358-298.000.

Nakano, Minoru; Goto, Akihito; and Nakamura, Yoichi, to Bridgestone Corporation. Heavy duty pneumatic radial tires whose belt includes a pair of narrow-width auxiliary protective strips. 5,111,864, Cl. 152-527.000.

Nakaoka, Masanori: *See—*
Aoe, Seiichiro; Oda, Taishi; Nakaoka, Masanori; and Kurosawa, Seiji, 5,112,964, Cl. 536-56.000.

Nakasaki, Eiji, to Sumitomo Rubber Industries, Ltd. Pneumatic tire including divided belt plies. 5,111,863, Cl. 152-526.000.

Nakashima, Kenro; Hatanaka, Kazuhiro; and Ohta, Hideo, to Isuzu Motors Limited. Liquid fuel vaporizing apparatus. 5,113,478, Cl. 392-395.000.

Nakashima, Tukasa; Hotta, Tetsuo; and Tamura, Tatsuya, to Hashimoto Forming Industry Co., Ltd. Method of making an elongate article. 5,112,547, Cl. 264-167.000.

Nakashima, Yoshiharu: *See—*
Masaki, Mitsuo; Uehara, Masaki; Hirate, Kenji; Isowa, Yoshikazu; Sato, Yoshiaki; and Nakashima, Yoshiharu, 5,112,947, Cl. 530-329.000.

Nakatani, Mitsunori: *See—*
Fujii, Takayuki; and Nakatani, Mitsunori, 5,112,766, Cl. 437-41.000.

Nakayama, Hiroki, to Canon Kabushiki Kaisha. Compact zoom lens with positive power front lens group and negative power rear lens group. 5,113,287, Cl. 359-676.000.

Nakayama, Masatoshi; Ueda, Kunihiro; Ishida, Toshihiko; and Tanabe, Hiroshi, to TDK Corporation. Molds having wear resistant release coatings. 5,112,025, Cl. 249-115.000.

Nakayama, Masatoshi; and Ueda, Kunihiro, to TDK Corporation. Process for producing diamond-like films and apparatus therefor. 5,112,458, Cl. 204-173.000.

Nakayama, Noritaka: *See—*
Ninomiya, Hidetaka; Nakayama, Noritaka; Masukawa, Toyoaki; and Morita, Miki, 5,112,532, Cl. 252-587.000.

Nakayama, Takeshi: *See—*
Tanaka, Koki; Heshiki, Yoshikazu; and Nakayama, Takeshi, 5,112,148, Cl. 400-63.000.

Nakazeki, Tsugito: *See—*
Oshima, Saburo; Nakazeki, Tsugito; Akamatsu, Teruaki; and Niki, Motoharu, 5,112,202, Cl. 417-423.700.

Nalco Chemical Company: *See—*
Owen, David O.; and Bonin, Jacqueline J., 5,112,391, Cl. 75-772.000.

Nanba, Seiji: *See—*
Hiramoto, Nobuo; Nanba, Seiji; Ogawa, Soichiro; and Nozaki, Osamu, 5,111,774, Cl. 123-41.100.

Nanjing Jingcheng Patent Technique Development Company: *See—*
Ning, Sun Y.; and Huan, Fan L., 5,112,264, Cl. 446-108.000.

Nanzan, Tatsusuke; Obi, Hideo; Nakamoto, Masahiko; Nakamoto, Noriaki; and Ohta, Mikio, to Mitsubishi Denki Kabushiki Kaisha. Control device for electric car. 5,113,126, Cl. 318-809.000.

Naoi, Yoshitake: *See—*
Koseki, Koshi; Ebata, Takashi; Kawakami, Hiroshi; Matsushita, Hajime; Itoh, Kazuo; and Naoi, Yoshitake, 5,112,994, Cl. 549-323.000.

Nardi, John C.: *See—*
Hunter, James C.; Nardi, John C.; Russell, Edwin T.; and Scarr, Robert F., 5,112,705, Cl. 429-206.000.

Narisawa, Hiroaki: *See—*
Ikeda, Yoshito; Narisawa, Hiroaki; and Wakabayashi, Noboru, 5,113,300, Cl. 360-126.000.

Narui, Takashi; Kaneko, Tetsuo; Imamori, Katsumi; and Iwasa, Akira, to SS Pharmaceutical Co., Ltd. Corticorsteroid-containing ointments. 5,112,816, Cl. 514-179.000.

Nash, Eric J., to Carrier Corporation. Heat exchanger plate fin. 5,111,876, Cl. 165-151.000.

Nasiff, Roger E. Indirect continuous blood pressure method. 5,111,826, Cl. 128-672.000.

Natco: *See—*
Brown, Michael R., 5,112,375, Cl. 55-440.000.

National Fertility Institute: *See—*
Cohen, Nathan, 5,111,823, Cl. 128-660.070.

National Research Council of Canada: *See—*
So, Eddy, 5,113,140, Cl. 324-680.000.

National Research Development Corporation: *See—*
Clissold, Derek W.; Mann, John; and Thickitt, Christopher P., 5,112,976, Cl. 546-193.000.
Klinner, Wilfred E., 5,111,645, Cl. 56-364.000.

Natori, Itaru: *See—*
Nakahashi, Junichi; Natori, Itaru; Hinoue, Kenichi; and Ochiai, Nobutaka, 5,112,916, Cl. 525-183.000.

Naum, Elena D. Toy animal having oscillating parts. 5,112,265, Cl. 446-384.000.

Naumann, Rolf: *See—*
Gille, Friedrich; Naumann, Rolf; and Bergmann, Gerhard, 5,111,672, Cl. 66-84.00A.

Navarro, Jean L.; and Maggioni, Carlo, to Marelli Autronica SpA. System for the assembly and connection of electronic circuit boards, particularly for use in motor vehicles. 5,113,316, Cl. 361-396.000.

Naves, Carmen M. P. C.: *See—*
Danishefsky, Samuel J.; Chow, Ken H.; and Naves, Carmen M. P. C., 5,113,014, Cl. 562-503.000.

NCR Corporation: *See—*
Johnston, Adam J. L.; and Doig, James N. T., 5,112,040, Cl. 271-11.000.
Wike, Charles K., Jr.; Anderson, Richard E.; and McGaha, Jerry A., 5,113,060, Cl. 235-383.000.

NCUBE Corporation: *See—*
Colley, Stephen R.; Jurasek, David W.; Palmer, John F.; Richardson, William S.; and Wilde, Doran K., 5,113,523, Cl. 395-800.000.

NDM Acquisition Corp.: *See—*
Cartmell, James V.; Sturtevant, Wayne R.; Valadez, Manuel; and Wolf, Michael L., 5,112,618, Cl. 424-443.000.

Nealon, Daniel A.; and Coolen, Richard B., to Eastman Kodak Company. Carbon dioxide assay for body fluids comprising carbonic anhydrase. 5,112,740, Cl. 435-15.000.

Neas, Jerry A.: *See—*
Chesnut, Paul B.; Cooper, Michael D.; and Neas, Jerry A., 5,112,241, Cl. 439-273.000.

Neber, Fritz, to Groninger & Co. GmbH, Firma. Arrangement for closing bottles. 5,111,635, Cl. 53-334.000.

NEC America, Inc.: *See—*
Gorshe, Steven S., 5,113,187, Cl. 341-73.000.

NEC Corporation: *See—*
Hamada, Mitsuhiro, 5,113,371, Cl. 365-200.000.
Matsui, Yoshinori, 5,113,374, Cl. 365-227.000.
Murakami, Kurenai; and Murase, Tutomu, 5,113,395, Cl. 370-102.000.
Muto, Hiroyasu, 5,113,415, Cl. 375-83.000.
Norimatsu, Hidehiko, 5,113,152, Cl. 331-11.000.
Tamakoshi, Akira, 5,113,235, Cl. 357-23.400.
Terada, Norio; and Tokuda, Kazuo, 5,113,149, Cl. 330-254.000.
Uehara, Izushi, 5,113,495, Cl. 395-200.000.
Yamashita, Osamu; Takahashi, Eiji; Nishizawa, Takeshi; Takada, Hidekazu; and Shirasu, Tetsuo, 5,113,108, Cl. 310-328.000.
Yoshida, Atsushi; and Oishi, Hisashi, 5,113,411, Cl. 375-13.000.

Nedwick, Dan M.: *See—*
Billin, Martin P.; Wedow, Christopher G.; and Nedwick, Dan M., 5,111,619, Cl. 49-502.000.

Nedzu, Shigeru, to Polyplastics Co., Ltd. Improvement in injection molded articles having three dimensional surfaces. 5,112,553, Cl. 264-259.000.

Needle, David L.: *See—*
Nelson, Craig; Solis, Javier; and Needle, David L., 5,113,511, Cl. 395-425.000.

Neff, Wayne A.: *See—*
Anderson, Roger W.; and Neff, Wayne A., 5,112,392, Cl. 106-1.220.

Neitzel, Manfred: *See—*
Buchert, Hermann; Ahlers, Juergen; Kohlhaas, Werner; Vogelsang, Joerg; and Neitzel, Manfred, 5,112,901, Cl. 524-494.000.

Nellis, William J.; and Maple, M. Brian, to United States of America, Energy. Mechanical alignment of particles for use in fabricating superconducting and permanent magnetic materials. 5,112,801, Cl. 505-1.000.

Nelson, Craig; Solis, Javier; and Needle, David L., to Atari Corporation. System for dynamically providing predicted high/slow speed accessing memory to a processing unit based on instructions. 5,113,511, Cl. 395-425.000.

Nelson, Timothy V.: *See—*
Dormer, Michael J.; Fraser, Bruce A.; and Nelson, Timothy V., 5,111,737, Cl. 92-187.000.

NeoRx Corporation: *See—*
Abrams, Paul G.; Srinivasan, Ananthachari; and Vrudhula, Vivekananda M., 5,112,954, Cl. 530-391.900.
Gustavson, Linda M.; Srinivasan, Ananthachari; Kasina, Sudhakar; Reno, John M.; Fitzner, Jeffrey N.; and Jones, David S., 5,112,953, Cl. 530-391.500.

Nepsund, Larry R.: *See—*
Boeckermann, Thomas A.; Nepsund, Larry R.; and Sandkamp, John D., 5,112,372, Cl. 55-276.000.

Netzer, Philip E.: *See—*
Bessinger, Daniel J.; and Netzer, Philip E., 5,111,595, Cl. 34-18.000.

Neubauer, Hans-Juergen: *See—*
Leyendecker, Joachim; Neubauer, Hans-Juergen; Kardorff, Uwe; Kuekenhoehner, Thomas; Kuenast, Christoph; and Hofmeister, Peter, 5,112,823, Cl. 514-252.000.

Neumaier, Anton, to Hilti Aktiengesellschaft. Drilling tool speed shifting unit. 5,111,889, Cl. 173-48.000.

Neumann, Burkhard, to Wild Leitz, GmbH. Spectral microscope with a photometer. 5,112,125, Cl. 356-73.000.

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Woulfe, Steven R.; Deutsch, Edward A.; Dyszlewski, Mary M.; and Neumann, William L., 5,112,594, Cl. 424-1.100.
Woulfe, Steven R.; Deutsch, Edward A.; Dyszlewski, Mary M.; and Neumann, William L., 5,112,595, Cl. 424-1.100.

Nevo, Yitzhak: *See—*
Mandelboum, David; Marom, Itshak; and Nevo, Yitzhak, 5,113,281, Cl. 359-236.000.

New England Deaconess Hospital Corporation: *See—*
Ito, Ralph K.; and LoGerfo, Frank W., 5,112,615, Cl. 424-426.000.

New Jersey Institute of Technology: *See—*
Leu, Ming C.; and Ji, Zhiming, 5,113,080, Cl. 250-561.000.

Neward, Theodore C. Vessel vacuum release. 5,112,203, Cl. 417-440.000.

Neway Corp.: *See—*
Galazin, Gregory T.; and Pierce, William C., 5,112,078, Cl. 280-711.000.

Ng, Quock Y., to Digital Equipment Corporation. Method for providing a lubricant coating on the surface of a magneto-optical disk and resulting optical disk. 5,112,662, Cl. 428-64.000.

NGK Insulators, Ltd.: *See—*
Misawa, Hidenobu; and Yamada, Satoru, 5,112,544, Cl. 264-67.000.

Ngo, Toan M., to Monsanto Company. Compositions and process for metal treatment. 5,112,395, Cl. 106-14.120.

Nguyen, Khe C.; and Klose, Thomas R., to Eastman Kodak Company. Electrophotographic recording elements containing a combination of titanyl phthalocyanine-type pigments. 5,112,711, Cl. 430-58.000.

Nguyen, Tuyen T.: *See—*
Chu, Sung G.; Jabloner, Harold; and Nguyen, Tuyen T., 5,112,924, Cl. 525-426.000.

Nichels, William; and d'Oultremont, Philippe, to Solvay & Cie (Societe Anonyme). Pharmaceutical compositions containing a derivative of 3-hydroxybutanoic acid chosen from oligomers of this acid and esters of this acid or of these oligomers with 1,3-butanediol. 5,112,865, Cl. 514-546.000.

Nichols, Byron. Peg board hangers and retainers. 5,112,014, Cl. 248-220.300.

Nickell, Eric S.; Buckley, Robert R.; Rumph, David E.; and Coleman, Robert M., to Xerox Corporation. Colorizing black and white documents. 5,113,356, Cl. 395-108.000.

Nicolin, Curt; Frutschi, Hans-Ulrich; and Bolis, Giacomo, to Asea Brown Boveri Ltd. Gas/steam power station plant. 5,111,662, Cl. 60-655.000.

Niebaum, Eckhard: *See—*
Boeck, Alexander; Niebaum, Eckhard; Sommer, Walter; and Sparenberg, Guenter, 5,111,855, Cl. 141-83.000.

Niedbala, Patrick J., to Ford Motor Company. Method of cutting workpieces having low thermal conductivity. 5,111,984, Cl. 225-1.000.

Nielsen, Bent E.: *See—*
Lund, Svend A.; and Nielsen, Bent E., 5,111,696, Cl. 73-627.000.

Nielsen, Klaus: *See—*
Bouillant, Alain M. P.; Nielsen, Klaus; Ruckerbauer, Gerda M.; Samagh, Bakhshish S.; and Hare, William C. D., 5,112,756, Cl. 435-235.100.

Niemann, Heinrich, to Erhard & Leimer GmbH. Web-motion controller. 5,111,986, Cl. 226-21.000.

Niemann, Ulrich; Offermanns, Stephan; and Weber, Bernhard, to U.S. Philips Corporation. High pressure gas discharge lamp. 5,113,119, Cl. 313-638.000.

Nienhuis, James H.; Clark, Jeffrey L.; De Pree, Michael L.; and Beck, Robert L., to Herman Miller, Inc. Electrified wall panel system. 5,112,240, Cl. 439-215.000.

Nihon Medi-Physics Co., Ltd.: *See—*
Iinuma, Mitsuhisa; Yamada, Hideo; Matsushima, Hiroaki; and Tobiki, Hisao, 5,112,327, Cl. 604-413.000.

Nihon Nohyaku Co., Ltd.: *See—*
Miura, Yuzo; Ohnishi, Masanobu; Mabuchi, Tsutomu; and Yanai, Isao, 5,112,384, Cl. 71-92.000.

Niimi, Tetsunori: *See—*
Yanagida, Satoru; Araki, Kouji; Okunoyama, Hikaru; and Niimi, Tetsunori, 5,113,241, Cl. 357-72.000.

Nikaido, Katsutomo: *See—*
Okonogi, Hirotaka; Nikaido, Katsutomo; Ichikawa, Junichi; and Nishiyama, Yoshio, 5,112,648, Cl. 427-96.000.

Niki, Motoharu: *See—*
Oshima, Saburo; Nakazeki, Tsugito; Akamatsu, Teruaki; and Niki, Motoharu, 5,112,202, Cl. 417-423.700.

Nikken Chemical Laboratory Co., Ltd.: *See—*
Yoshida, Hajime, 5,112,401, Cl. 106-287.190.

Nikles, Erwin, to Ciba-Geigy Corp. Process for modifying acrylate copolymers. 5,112,912, Cl. 525-123.000.

Nikon Corporation: *See—*
Ohshita, Koichi, 5,113,288, Cl. 359-739.000.

Ning, Sun Y.; and Huan, Fan L., to Nanjing Jingcheng Patent Technique Development Company. Insert connecting toy. 5,112,264, Cl. 446-108.000.

Ninomiya, Hidetaka; Nakayama, Noritaka; Masukawa, Toyoaki; and Morita, Miki, to Konica Corporation. Non-linear optical material and non-linear optical device employing it. 5,112,532, Cl. 252-587.000.

Ninomiya, Kunio; and Suga, Akira, to Canon Kabushiki Kaisha. Image sensing apparatus for correcting a defect in color signals generated by a CCD. 5,113,246, Cl. 358-44.000.

Nippon Chemi-Con Corporation: *See—*
Shinozaki, Fumihiko; and Yokoyama, Yutaka, 5,112,511, Cl. 252-62.200.

Nippon Chemiphar Co., Ltd.: *See—*
Masaki, Mitsuo; Uehara, Masaki; Hirate, Kenji; Isowa, Yoshikazu; Sato, Yoshiaki; and Nakashima, Yoshiharu, 5,112,947, Cl. 530-329.000.

Nippon CMK Corp.: *See—*
Okonogi, Hirotaka; Nikaido, Katsutomo; Ichikawa, Junichi; and Nishiyama, Yoshio, 5,112,648, Cl. 427-96.000.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Moriya, Tetsuo; Kondo, Susumu; and Sanuki, Shinji, 5,112,902, Cl. 524-503.000.

Nippon Oil & Fats Co., Ltd.: *See—*
Hashimoto, Atsushi; Hibino, Hidehiko; and Nakachi, Osamu, 5,112,863, Cl. 514-534.000.

Nippon Paint Co., Ltd.: *See—*
Ueno, Tasaburo; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Yabuuchi, Naoya, 5,112,689, Cl. 428-407.000.

Nippon Petrochemicals Company, Limited: *See—*
Sato, Atsushi; Kawakami, Shigenobu; Endo, Keiji; and Dohi, Hideyuki, 5,113,029, Cl. 585-6.300.

Nippon Seiko Kabushiki Kaisha: *See—*
Tsukada, Toru, 5,112,139, Cl. 384-15.000.

Nippon Sheet Glass Co., Ltd.: *See—*
Sakurai, Kaoru; Murakami, Harunori; Maeda, Masaru; Iijima, Hiroshi; and Ohara, Shouhei, 5,113,195, Cl. 343-704.000.
Shimizu, Tomoyasu; Aoki, Yuichi; and Kawakita, Shinya, 5,113,302, Cl. 360-135.000.
Tsujino, Toshifumi; Maeda, Koichi; Ishizuka, Satoshi; Yamamoto, Hiroaki; Kitayama, Shinichiro; and Hozumi, Shigeo, 5,112,722, Cl. 430-290.000.

Nippon Soken, Inc.: *See—*
Matsushiro, Ryuichi; Kosuda, Toru; Sasao, Shigeo; Ikeya, Taro; Chino, Yoshiharu; and Uekawa, Yasuaki, 5,111,776, Cl. 123-41.540.

Nippon Telegraph & Telephone Corporation: *See—*
Sawada, Renshi; Tanaka, Hidenao; Ohguchi, Osamu; and Shimada, Junichi, 5,113,071, Cl. 250-237.00G.

Nippon Zeon Co., Ltd.: *See—*
Miki, Yoshiaki; Toyonaka, Koji; Ueda, Tsunehisa; and Hiramatsu, Nobuaki, 5,112,602, Cl. 424-76.300.
Yamada, Takamasa; Kawata, Shoji; and Oie, Masayuki, 5,112,719, Cl. 430-191.000.

Nippondenso Co., Ltd.: *See—*
Kamiya, Kenji; Ina, Hiroyuki; Nakamura, Akimasa; and Honda, Masakazu, 5,111,686, Cl. 73-117.300.

Nishibe, Takashi, to Fuji Electric Co., Ltd. Image position detecting device. 5,113,215, Cl. 354-408.000.

Nishida, Koji: *See—*
Orii, Akihito; Yokomizo, Osamu; Masuhara, Yasuhiro; Nishida, Koji; Murata, Shigeto; Kashiwai, Shin-ichi; Inoue, Kotaro; and Yoshimoto, Yuichiro, 5,112,571, Cl. 376-439.000.

Nishida, Shuichi: *See—*
Furuta, Takashi; and Nishida, Shuichi, 5,113,234, Cl. 357-33.300.

Nishida, Tadao: *See—*
Iwao, Tetsuya; Osaka, Shuichi; Sakaki, Takao; Nishida, Tadao; Yamamura, Kiyoshi; Koga, Seijiro; Hirai, Reiji; and Nakagawa, Haruo, 5,112,991, Cl. 549-206.000.

Nishigaito, Yoshiyuki: *See—*
Isono, Koichi; Nakano, Masayuki; and Nishigaito, Yoshiyuki, 5,113,264, Cl. 358-298.000.

Nishigaki, Shinichi; and Bito, Shiro, to Olympus Optical Co., Ltd. Resectoscope apparatus. 5,112,330, Cl. 606-46.000.

Nishihara, Munekazu: *See—*
Fukushima, Tetsuo; Suetsugu, Kenichiro; Nishihara, Munekazu; and Ikeda, Junji, 5,113,470, Cl. 385-126.000.

Nishijima, Toyoki: *See—*
Tanji, Masaki; Nishijima, Toyoki; Ogawa, Takahiro; Takada, Shun; and Murai, Kazuhiro, 5,112,728, Cl. 430-507.000.

Nishikawa, Hisashi; Matsumoto, Yasuo; and Makino, Ayumu, to Tokyo Electric Co., Ltd. Method and apparatus for image recording with dye release near the orifice and vibratable nozzles. 5,113,198, Cl. 346-1.100.

Nishimori, Kadotaro: *See—*
Higashio, Kimihiko; Ito, Masazumi; and Nishimori, Kadotaro, 5,113,229, Cl. 355-326.000.

Nishio, Hiroaki, to NKK Corporation. Apparatus for removing dispersion medium in metal or ceramic molded body. 5,112,577, Cl. 422-187.000.

Nishio, Taichi; Kuribayashi, Hideyuki; and Sanada, Takashi, to Sumitomo Chemical Co., Ltd. Thermoplastic resin composition. 5,112,907, Cl. 525-65.000.

Nishiya, Kyosuke, to Towa Chemical Industry Co. Ltd. Process and apparatus for separating fine bones from fish flakes. 5,112,273, Cl. 452-135.000.

Nishiyama, Hisashi; Ogawa, Toshio; and Katakura, Kageyoshi, to Hitachi Medical Corporation. Ultrasonic Doppler flow meter. 5,111,825, Cl. 128-661.090.

Nishiyama, Yoshio: *See—*
Okonogi, Hirotaka; Nikaido, Katsutomo; Ichikawa, Junichi; and Nishiyama, Yoshio, 5,112,648, Cl. 427-96.000.

Nishizawa, Takeshi: *See—*
Yamashita, Osamu; Takahashi, Eiji; Nishizawa, Takeshi; Takada, Hidekazu; and Shirasu, Tetsuo, 5,113,108, Cl. 310-328.000.

Nissan Motor Co., Ltd.: *See—*
Kuriyama, Shigeru; Maeda, Yuji; Nakamura, Yozo; Nakamura, Kenichi; Mashino, Keiichi; Kadomukai, Yuzo; Fukushima, Masao; and Murakami, Kei, 5,111,784, Cl. 123-192.100.
Matsuda, Toshiro, 5,113,504, Cl. 395-575.000.
Okahara, Hirofumi, 5,111,719, Cl. 74-867.000.
Takeuchi, Jun; Shibayama, Takashi; and Iida, Masahiro, 5,111,717, Cl. 74-866.000.
Nisshinbo Industries, Inc.: *See—*
Saito, Kazuo, 5,112,529, Cl. 252-500.000.
Nissin Seiki Kabushiki Kaisha: *See—*
Murata, Makoto, 5,111,675, Cl. 72-7.000.
Nissinen, Erkki A. O.: *See—*
Backstrom, Reijo; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka I.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo, 5,112,861, Cl. 514-520.000.
Nitrojection Corporation: *See—*
Baxi, Indra R., 5,112,563, Cl. 264-572.000.
Nitta-Moore Co., Ltd.: *See—*
Haruki, Shimade, 5,112,087, Cl. 285-101.000.
Niwa, Masatake: *See—*
Izumi, Shuji; Nakai, Masaaki; Inoue, Manabu; Fujino, Akihiko; Kawamura, Kunio; Takarabe, Yuji; and Niwa, Masatake, 5,113,217, Cl. 354-471.000.
Nixon, Jeddy D.: *See—*
Summers, David P.; and Nixon, Jeddy D., 5,112,349, Cl. 623-3.000.
NKK Corporation: *See—*
Nishio, Hiroaki, 5,112,577, Cl. 422-187.000.
Nobuhara, Yorikiyo: *See—*
Tsuji, Kimitoshi; and Nobuhara, Yorikiyo, 5,113,158, Cl. 332-109.000.
Nodari, Abramo, to Sirti S.p.A. Connector for fibre optic cables. 5,113,463, Cl. 385-60.000.
Noggle, Francis E.: *See—*
Aittama, Robert W.; and Noggle, Francis E., 5,111,858, Cl. 141-312.000.
Nomura, Hideki, to Fuji Xerox Co., Ltd. Printer control system. 5,113,355, Cl. 395-109.000.
Nomura, Kotohiro; and Ishino, Masaru, to Sumitomo Chemical Co., Ltd. Production of aromatic amines. 5,112,997, Cl. 552-238.000.
Nomura, Takahiro; Yatsuzuka, Yohtaro; Iizuka, Shigeru; and Honma, Hideki, to Kokusai Denshin Denwa Co., Ltd. Speech coding/decoding system with reduced quantization noise. 5,113,448, Cl. 381-47.000.
Nonnemann, Robert W.: *See—*
Chan, Wai-Kwong; Allsopp, Mary F.; McGuire, Kevin T.; Nonnemann, Robert W.; Obrecht, Gordon A.; Saluski, Ronald B.; Trchka, James A.; Viebach, Hans J.; Brandt, Peter A.; Butler, Robert R.; Shircliff, Michael W.; Walker, Samuel A.; and Miller, Thomas R., 5,112,179, Cl. 412-1.000.
Nordica S.p.A.: *See—*
Sartor, Mariano; and Tonel, Valerio, 5,111,598, Cl. 36-117.000.
Norgren Martonair Limited: *See—*
Hu, Fang-Quan; Page, Michael; and Watson, John M., 5,111,847, Cl. 137-828.000.
Noriaki, Hattori: *See—*
Ryoichi, Kimura; Noriaki, Hattori; and Kazuharu, Watabe, 5,113,427, Cl. 379-57.000.
Norimatsu, Hidehiko, to NEC Corporation. PLL frequency synthesizer with circuit for changing loop filter time constant. 5,113,152, Cl. 331-11.000.
Norsk Hydro a.s.: *See—*
Mejdell, Glor T.; Baumann, Hanne M.; and Tveten, Kjell W., 5,112,584, Cl. 423-161.000.
North American Philips Corporation: *See—*
Arnold, Emil; Merchant, Steven L.; and Shackle, Peter W., 5,113,236, Cl. 357-41.000.
Johnson, Brian C., 5,113,516, Cl. 395-500.000.
Mitra, Udayanath; and Venkatesan, Mahalingam, 5,112,764, Cl. 437-40.000.
Tsinberg, Mikhail; Basile, Carlo; and Cavallerano, Alan P., 5,113,242, Cl. 358-12.000.
North Carolina State University: *See—*
Carbonell, Ruben G.; Guzman, Roberto; and Kilpatrick, Peter K., 5,112,770, Cl. 436-501.000.
Northeastern University: *See—*
Karger, Barry L.; and Cohen, Aharon S., 5,112,460, Cl. 204-182.800.
Northwestern University: *See—*
Letsinger, Robert L.; and Singman, Charles N., 5,112,962, Cl. 536-27.000.
Sires, Bryan S., 5,112,354, Cl. 623-16.000.
NosaLova, Viera: *See—*
Benes, Ludek; NosaLova, Viera; and Babulova, Anna, 5,112,850, Cl. 514-428.000.
Noser, Hans; and Erni, Markus, to Rieter Machine Works, Ltd. Ring spinning machine. 5,113,123, Cl. 318-106.000.
Nosta AG: *See—*
Michel, Peter, 5,112,317 Cl. 604-208.000.
Notaras, Angelo L.: *See—*
Notaras, John A.; and Notaras, Angelo L., 5,111,798, Cl. 123-637.000.
Notaras, John A.; and Notaras, Angelo L. Transistor ignition circuit. 5,111,798, Cl. 123-637.000.
Notardonato, Gino: *See—*
Bjerklund, Gunnar; Notardonato, Gino; and Pulawski, Casimir, 5,112,357, Cl. 55-53.000.
Nottingham, W. Dell: *See—*
Witzeman, J. Stewart; and Nottingham, W. Dell, 5,113,011, Cl. 560-178.000.
Novacek, Laurel A.; Sharp, Fraser R.; and McLean, Donald A., to Patco Ventures Ltd. Safety syringe needle device with interchangeable and retractable needle platform. 5,112,318, Cl. 604-240.000.
Novack, Brian. Pectoral implant and method for implanting the same. 5,112,352, Cl. 623-8.000.
Nowak, Stefan: *See—*
Ideler, Karl-Heniz; Nowak, Stefan; and Petzold, Gunter, 5,113,145, Cl. 330-251.000.
Nozaki, Osamu: *See—*
Hiramoto, Nobuo; Nanba, Seiji; Ogawa, Soichiro; and Nozaki, Osamu, 5,111,774, Cl. 123-41.100.
Nozaki, Yoshihisa; and Inden, Takashi, to Brother Kogyo Kabushiki Kaisha. Conveyer system. 5,111,750, Cl. 104-88.000.
NTN Corporation: *See—*
Oshima, Saburo; Nakazeki, Tsugito; Akamatsu, Teruaki; and Niki, Motoharu, 5,112,202, Cl. 417-423.700.
Nu-Tech Industries, Inc.: *See—*
Isaacson, Milton S.; and Lioi, Anthony P., 5,112,200, Cl. 417-356.000.
Nufer, Karl; and Reber, Lorenz, to Fritz Gegauf Aktiengesellschaft Bernina Nahmaschinenfabrik. Method of making groups of sewn patterns with zig-zag sewing machines. 5,111,758, Cl. 112-266.100.
Numajiri, Rikio: *See—*
Fujishige, Shoei; Numajiri, Rikio; and Aragane, Hideyuki, 5,112,965, Cl. 536-114.000.
Nurmi, Tom E. E.: *See—*
Lauren, Henning J. E.; Nurmi, Tom E. E.; and Moisala, Tapio O., 5,111,552, Cl. 19-308.000.
Nusbaum, Howard G.; and Bevan, James A., to Nusbaum, Howard G. Side-loading fork lift vehicle. 5,112,183, Cl. 414-544.000.
Nussbaumer, Peter: *See—*
Stutz, Anton; and Nussbaumer, Peter, 5,112,851, Cl. 514-443.000.
NutraSweet Company, The: *See—*
Tang, Pamela S.; Singer, Norman S.; and Chang, Hsien-Hsin, 5,112,956, Cl. 530-424.000.
Nutridan Engineering A/S: *See—*
Andersen, Borge C., 5,112,272, Cl. 452-122.000.
Nutt, Wendell G.: *See—*
Adriaenssens, Luc W.; Friesen, Harold W.; Nutt, Wendell G.; and Parks, Kenneth B., 5,113,159, Cl. 333-12.000.
Nuttall, William H. Power activated drop-nose trailer. 5,112,182, Cl. 414-481.000.
Nyberg, Muriel R., legal representative: *See—*
Hollingsworth, John D.; Garrison, Joe K.; Collins, Joel C.; Warnock, William A., deceased; Weiskel, Lillith M., legal representative; Nyberg, Muriel R., legal representative; Warnock, Charles F., legal representative; and Pergande, Lorraine, legal representative, 5,111,551, Cl. 19-150.000.
Nyfeler, Robert: *See—*
Staub, Theodor; Dahmen, Heide; Nyfeler, Robert; and Williams, Robert J., 5,112,849, Cl. 514-427.000.
O.M.C. Officina Meccanica Collareda S.r.l: *See—*
Perletti, Fabio; Collareda, Erminio; and Collareda, Bruno, 5,112,627, Cl. 426-50.000.
Oas, David C., to Van Dorn Company. Driven ring-type non-return valve for injection molding. 5,112,213, Cl. 425-562.000.
O'Bannon, Sean: *See—*
Pope, Penny M.; O'Bannon, Sean; and Pope, Steven R., 5,112,533, Cl. 252-607.000.
Obara Corporation: *See—*
Umeda, Shigeru; and Takatori, Tsuyoshi, 5,113,053, Cl. 219-116.000.
Obata, Masao; Arima, Masaki; and Taniguchi, Kouki, to Sharp Kabushiki Kaisha. Apparatus and method for electrical connections of a display device. 5,112,262, Cl. 445-24.000.
Obi, Hideo: *See—*
Nanzan, Tatsusuke; Obi, Hideo; Nakamoto, Masahiko; Nakamoto, Noriaki; and Ohta, Mikio, 5,113,126, Cl. 318-809.000.
Obrecht, Gordon A.: *See—*
Chan, Wai-Kwong; Allsopp, Mary F.; McGuire, Kevin T.; Nonnemann, Robert W.; Obrecht, Gordon A.; Saluski, Ronald B.; Trchka, James A.; Viebach, Hans J.; Brandt, Peter A.; Butler, Robert R.; Shircliff, Michael W.; Walker, Samuel A.; and Miller, Thomas R., 5,112,179, Cl. 412-1.000.
O'Brien, Gene E. Paint roller flushing stand. 5,111,834, Cl. 134-137.000.
Oce-Nederland B.V.: *See—*
Luttmer, Maurice L. M., 5,113,486, Cl. 395-100.000.
Ochiai, Nobutaka: *See—*
Nakahashi, Junichi; Natori, Itaru; Hinoue, Kenichi; and Ochiai, Nobutaka, 5,112,916, Cl. 525-183.000.
OCI Communcations, Inc.: *See—*
Harney, Ralph P.; Hightower, Michael L.; and Wechselberger, Anthony J., 5,113,440, Cl. 380-15.000.
O'Connor, Raymond J.; and Henly, Nicholas C., to Ferranti International plc. Fluid discharge valve. 5,112,026, Cl. 251-63.000.
Oda, Kazuya, to Fuji Photo Film Co., Ltd. Image pickup apparatus and method for reducing smear. 5,113,245, Cl. 358-41.000.
Oda, Taishi: *See—*
Aoe, Seiichiro; Oda, Taishi; Nakaoka, Masanori; and Kurosawa, Seiji, 5,112,964, Cl. 536-56.000.

Odate, Makoto: *See—*
Fukazawa, Nobuyuki; Odate, Makoto; Suzuki, Tsuneji; Otsuka, Kengo; Tsuruo, Takashi; and Sato, Wakao, 5,112,817, Cl. 514-183.000.
Oden, Kenneth W., to Royal Vendors, Inc. Vending apparatus with intelligent dispensation control. 5,111,962, Cl. 221-1.000.
Oden, Larry W.: *See—*
Guipe, Richard A.; Qureshi, Shakil U.; and Oden, Larry W., 5,113,039, Cl. 174-113.00C.
Odet, Philippe: *See—*
Ambrosi, Jacques; and Odet, Philippe, 5,111,949, Cl. 215-313.000.
ODL, Incorporated: *See—*
Wilkening, Steven R., 5,112,175, Cl. 411-371.000.
O'Donnell, Hugh J.; Gajewski, Vincent J.; Knizley James B.; Palinkas, Richard L.; and Rosenberg, Ronald O., to Otis Elevator Company. Ether-based polyurethane elevator sheave liner-polyurethane-urea made from polyether urethane prepolymer chain extended with polyester/diamine blend. 5,112,933, Cl. 528-61.000.
O'Donnell, Matthew: *See—*
Engeler, William E.; O'Donnell, Matthew; Pedicone, John T.; and Bloomer, John J., 5,111,695, Cl. 73-626.000.
Oerlikon-Knorr Eisenbahntechnik AG: *See—*
Muller, Walter; and Koller, Max, 5,111,916, Cl. 188-165.000.
Oesterle, Helmut: *See—*
Hochstrasser, Ferdinand; and Oesterle, Helmut, 5,111,846, Cl. 137-607.000.
Oetiker, Hans. High strength clamp structure. 5,111,555, Cl. 24-20.00R.
Offermanns, Stephan: *See—*
Niemann, Ulrich; Offermanns, Stephan; and Weber, Bernhard, 5,113,119, Cl. 313-638.000.
Ofrex Group Holdings, PLC: *See—*
Collignon, Theresa, 5,112,151, Cl. 401-96.000.
Oftring, Alfred: *See—*
Baur, Richard; Gousetis, Charalampos; Birnbach, Stefan; Kneip, Michael; and Oftring, Alfred, 5,112,530, Cl. 252-548.000.
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Ogata, Norio: *See—*
Baba, Tatsuya; and Ogata, Norio, 5,112,872, Cl. 514-731.000.
Ogawa, Soichiro: *See—*
Hiramoto, Nobuo; Nanba, Seiji; Ogawa, Soichiro; and Nozaki, Osamu, 5,111,774, Cl. 123-41.100.
Ogawa, Takahiro: *See—*
Tanji, Masaki; Nishijima, Toyoki; Ogawa, Takahiro; Takada, Shun; and Murai, Kazuhiro, 5,112,728, Cl. 430-507.000.
Ogawa, Tetsuya: *See—*
Yoshida, Naoyuki; Kitano, Kisei; and Ogawa, Tetsuya, 5,112,523, Cl. 252-299.610.
Ogawa, Toshio: *See—*
Nishiyama, Hisashi; Ogawa, Toshio; and Katakura, Kageyoshi, 5,111,825, Cl. 128-661.090.
Ogiso, Tutomu: *See—*
Yamamoto, Shigeru; Ogiso, Tutomu; and Ikeuchi, Takashi, 5,112,001, Cl. 242-43.00R.
Ogita, Tamotu, to Toyota Jidosha Kabushiki Kaisha. Evaporative fuel control system. 5,111,796, Cl. 123-520.000.
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Ogura, Toshihiko; Aotsu, Hiroaki; Kimura, Koichi; Enomoto, Hiromichi; and Kyoda, Tadashi, to Hitachi, Ltd. Memory circuit with logic functions. 5,113,487, Cl. 395-100.000.
Ohara, Shouhei: *See—*
Sakurai, Kaoru; Murakami, Harunori; Maeda, Masaru; Iijima, Hiroshi; and Ohara, Shouhei, 5,113,195, Cl. 343-704.000.
Ohara, Takeji; and Yuasa, Yuuichi, to Ryobi Limited. Battery charger and charging method. 5,113,128, Cl. 320-21.000.
Ohguchi, Osamu: *See—*
Sawada, Renshi; Tanaka, Hidenao; Ohguchi, Osamu; and Shimada, Junichi, 5,113,071, Cl. 250-237.00G.
Ohhasi, Shinichi: *See—*
Sawada, Tsutomu; Ohhasi, Shinichi; and Yoshida, Shigenobu, 5,112,673, Cl. 428-216.000.
Ohio Art Company, The: *See—*
Gilano, Michael A.; and Langford, Gordon B., 5,112,229, Cl. 434-409.000.
Ohkawa, Atsuhiro; Kamio, Takayoshi; Motoki, Masuzi; and Mihayashi, Keiji, to Fuji Photo Film Co., Ltd. Silver halide color photographic material comprising a yellow-colored cyan coupler. 5,112,730, Cl. 430-553.000.
Ohmori, Hiroyuki: *See—*
Okunuki, Masami; Tanaka, Hisami; Ohmori, Hiroyuki; and Hisamura, Masafumi, 5,112,708, Cl. 430-31.000.
Ohnishi, Masanobu: *See—*
Miura, Yuzo; Ohnishi, Masanobu; Mabuchi, Tsutomu; and Yanai, Isao, 5,112,384, Cl. 71-92.000.
Ohno, Hiroyuki: *See—*
Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, 5,112,847, Cl. 514-422.000.
Oho, Shigeru: *See—*
Hamano, Fumio; Oho, Shigeru; Hirayama, Takeshi; and Hasegawa, Akira, 5,113,410, Cl. 375-7.000.
Ohshima, Kazuyoshi, to Sugatsune Industrial Co., Ltd. Liquid check and closer. 5,111,548, Cl. 16-51.000.
Ohshita, Koichi, to Nikon Corporation. Behind stop wide angle lens system. 5,113,288, Cl. 359-739.000.
Ohta, Hideo: *See—*
Nakashima, Kenro; Hatanaka, Kazuhiro; and Ohta, Hideo, 5,113,478, Cl. 392-395.000.
Ohta, Kenji: *See—*
Inui, Tetsuya; Hirokane, Junji; Shibata, Akira; Nagahara, Yoshiyuki; and Ohta, Kenji, 5,112,727, Cl. 430-321.000.
Ohta, Masahiro: *See—*
Yamaya, Norimasa; Ohta, Masahiro; and Yamaguchi, Akihiro, 5,112,899, Cl. 524-413.000.
Ohta, Mikio: *See—*
Nanzan, Tatsusuke; Obi, Hideo; Nakamoto, Masahiko; Nakamoto, Noriaki; and Ohta, Mikio, 5,113,126, Cl. 318-809.000.
Ohta, Wasaburo; Kinoshita, Mikio; and Katsuragawa, Tadao, to Ricoh Company, Ltd. Apparatus for forming a thin film. 5,112,466, Cl. 204-298.050.
Ohta, Yasuhiko: *See—*
Saruwatari, Masumi; Ohta, Yasuhiko; Fujii, Yasuhiro; and Honji, Yasuko, 5,112,557, Cl. 264-289.300.
Ohtsu, Takuma: *See—*
Matsubara, Akira; Sakai, Kazuya; Tanada, Hideki; Mizuchi, Akira; Horikomi, Kazutoshi; and Ohtsu, Takuma, 5,112,841, Cl. 514-361.000.
Ohtsuka, Koji; and Goto, Hirokazu, to Sanken Electric Co., Ltd. Method of fabricating a high-voltage semiconductor device having a rectifying barrier. 5,112,774, Cl. 437-175.000.
Ohuchi, Hirofumi; and Kako, Hajime, to Mitsubishi Denki K.K. Internal combustion engine speed controller for controlling a throttle valve bypass with respect to the atmospheric pressure. 5,113,347, Cl. 364-431.100.
Ohuchi, Jin; Kondoh, Isao; and Okada, Takashi, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Method of separating uranium and plutonium from mixed solution containing uranium and plutonium. 5,112,581, Cl. 423-3.000.
Ohuchida, Shuichi: *See—*
Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, 5,112,847, Cl. 514-422.000.
Oie, Masayuki: *See—*
Yamada, Takamasa; Kawata, Shoji; and Oie, Masayuki, 5,112,719, Cl. 430-191.000.
Oil Dynamics, Inc.: *See—*
Liu, Joseph C.; and Wilson, Brown L., 5,113,101, Cl. 310-87.000.
Oishi, Hisashi: *See—*
Yoshida, Atsushi; and Oishi, Hisashi, 5,113,411, Cl. 375-13.000.
Oka, Koichi; Otani, William; Kubo, Yasuhiro; Zasu, Yasushi; and Akagi, Motonobu, to Otsuka Electronics Co., Ltd. Light scattering measuring apparatus utilizing a photodetector mounted on a rotary stand. 5,113,083, Cl. 250-574.000.
Oka, Masahiko: *See—*
Morita, Shigeru; and Oka, Masahiko, 5,112,973, Cl. 544-387.000.
Okabe, Yoshiaki: *See—*
Eguchi, Shuji; Taketani, Noriaki; Tanno, Seikichi; Okabe, Yoshiaki; Terao, Hiromu; Asano, Hideki; Wajima, Motoyo; and Abe, Tomiya, 5,113,477, Cl. 385-143.000.
Okada, Hiroshi; Suzuki, Shingo; Kagami, Manabu; and Suematsu, Chiaki, to Mitsubishi Rayon Company Ltd. Light attenuator and process for fabrication thereof. 5,113,476, Cl. 385-140.000.
Okada, Kinjiro: *See—*
Kawanami, Norihide; Okada, Kinjiro; and Kozu, Yoshikazu, 5,113,465, Cl. 385-82.000.
Okada, Takashi: *See—*
Ohuchi, Jin; Kondoh, Isao; and Okada, Takashi, 5,112,581, Cl. 423-3.000.
Okada, Tomoyoshi: *See—*
Watanabe, Nobuatsu; Chong, Yong-Bo; Tatsuno, Toshio; Okada, Tomoyoshi; Izumi, Akira; and Toei, Keiji, 5,112,437, Cl. 156-646.000.
Okahara, Hirofumi, to Nissan Motor Co., Ltd. Shift control to engine braking or reverse drive. 5,111,719, Cl. 74-867.000.
Okamoto, Hirokazu: *See—*
Mori, Masahito; Torii, Kohske; and Okamoto, Hirokazu, 5,112,911, Cl. 525-100.000.
Okamoto, Masaya, to Idemitsu Petrochemical Co., Ltd. Branched chain stopped polycarbonate and process for production. 5,112,936, Cl. 528-204.000.
Okamoto, Sota: *See—*
Chikuma, Kiyofumi; and Okamoto, Sota, 5,112,122, Cl. 359-332.000.
Okano, Haruo: *See—*
Sekine, Makoto; Okano, Haruo; and Horiike, Yasuhiro, 5,112,645, Cl. 427-43.100.
Okano, Ken: *See—*
Iida, Masamori; Kurosu, Tateki; and Okano, Ken, 5,112,775, Cl. 437-225.000.
Okano, Masami, to Zexel Corporation. Sensor control circuit. 5,112,080, Cl. 280-735.000.
Okazaki, Kichizaemon: *See—*
Kaneko, Hisao; Okazaki, Kichizaemon; and Terada, Toshimichi, 5,113,296, Cl. 360-85.000.
Oki Electric Industry Co., Ltd.: *See—*
Yamamoto, Takayuki; and Miyamoto, Sampei, 5,113,088, Cl. 307-296.200.
Oki, Naoto: *See—*
Shibata, Yasuhisa; Oki, Naoto; Ozawa, Satoshi; and Miyagi, Hiroyuki, 5,112,471, Cl. 204-418.000.

Okonogi, Hirotaka; Nikaido, Katsutomo; Ichikawa, Junichi; and Nishiyama, Yoshio, to Nippon CMK Corp. Method of manufacturing a printed circuit board. 5,112,648, Cl. 427-96.000.

Okuda, Masaharu: *See—*
Ikuta, Shizuo; Okuda, Masaharu; and Sakamoto, Takashi, 5,111,997, Cl. 239-750.000.

Okuno, Katsumi: *See—*
Shiga, Kiyotaka; Fukui, Akio; Ryu, Akiomi; and Okuno, Katsumi, 5,112,167, Cl. 408-211.000.

Okunoyama, Hikaru: *See—*
Yanagida, Satoru; Araki, Kouji; Okunoyama, Hikaru; and Niimi, Tetsunori, 5,113,241, Cl. 357-72.000.

Okunuki, Masami; Tanaka, Hisami; Ohmori, Hiroyuki; and Hisamura, Masafumi, to Canon Kabushiki Kaisha. Member for charging with surface layer of N-alkoxymethylated nylon effecting charging at lower voltage. 5,112,708, Cl. 430-31.000.

Okura, Ken; Matsuzaki, Satoru; Katamoto, Tsutomu; and Horiishi, Nanao, to Toda Kogyo Corp.; and Dainic Iseika Color & Chemicals Mfg. Co. Ltd. Coating composition. 5,112,403, Cl. 106-418.000.

Olin Corporation: *See—*
Boudakian, Max M.; and Fidler, Delmer A., 5,112,983, Cl. 548-263.200.
Farmer, Douglas A., Jr.; Hani, Rahim; and Waldron, Craig, 5,112,397, Cl. 106-18.300.
Mullins, Richard M.; Wood, Richard B.; and Wojtowicz, John A., 5,112,521, Cl. 252-180.000.
Simon, Mark A.; and Butler, George W., 5,111,656, Cl. 60-203.100.
Stubbs, John L., Jr.; Bolick, Roger E., II; and Hauser, Everett F., Jr., 5,112,452, Cl. 204-92.000.
Wishneski, Todd W.; and Margitich, Donald E., 5,112,878, Cl. 521-131.000.

Olla, Michael A.: *See—*
Bond, Robert H.; Olla, Michael A.; Morrison, Barry; and Garrison, Linn C., 5,111,935, Cl. 206-329.000.

Olsen, Douglas O.; Bates, Brian L.; and Osborne, Thomas A., to Cook Incorporated. Medical device for and a method of endoscopic surgery. 5,112,308, Cl. 604-164.000.

Olson, Daniel H.: *See—*
Winkler, Duane K.; and Olson, Daniel H., 5,112,323, Cl. 604-319.000.

Olympus Optical Co., Ltd.: *See—*
Kanno, Masahide; Uehara, Masao; Sasaki, Masahiko; Saito, Katsuyuki; Uchikubo, Akinobu; Hasegawa, Jun; Sasagawa, Katsuyoshi; Yamashita, Shinji; and Nakagawa, Takehiro, 5,113,254, Cl. 358-98.000.
Nishigaki, Shinichi; and Bito, Shiro, 5,112,330, Cl. 606-46.000.
Tanaka, Hisakatsu, 5,113,061, Cl. 235-454.000.

Omae, Hidenori: *See—*
Miyazawa, Yoshinori; Omae, Hidenori; Ishii, Takayuki; Koto, Haruhiko; and Akahane, Fujio, 5,113,204, Cl. 346-140.00R.

O'Malley, Austin S.: *See—*
Johnson, Larry K.; and O'Malley, Austin S., 5,112,234, Cl. 439-79.000.

O'Meara, Thomas R.; and Pepper, David M., to Hughes Aircraft Company. Dual light valve system with selective decoupling of light valves. 5,113,282, Cl. 359-241.000.

Omichi, Yukinobu: *See—*
Kadoya, Katsuhiko; Omichi, Yukinobu; Matsuda, Eiji; and Takenaka, Kenji, 5,111,673, Cl. 68-12.040.

Omoda, Koichiro: *See—*
Hayashi, Takehisa; Omoda, Koichiro; Tanaka, Teruo; Hamanka, Naoki; and Nagashima, Shigeo, 5,113,390, Cl. 370-65.000.

Omron Tateisi Electronics Co.: *See—*
Yamakawa, Takeshi, 5,113,366, Cl. 395-3.000.

Omura, Takashi: *See—*
Akahori, Kingo; Harada, Naoki; Kayane, Yutaka; and Omura, Takashi, 5,112,971, Cl. 544-189.000.
Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washimi, Takeshi; Harada, Naoki; and Akahori, Kingo, 5,112,959, Cl. 534-642.000.

Ono, Jiro: *See—*
Umaba, Takayuki; Ono, Jiro; Takagi, Syunsuke; Sawada, Makoto; Adachi, Hideki; Shimizu, Hirofumi; Hashimoto, Mokuhei; and Takahashi, Tetsu, 5,111,743, Cl. 101-127.000.

Ono, Mototsugu: *See—*
Shibata, Eiji; and Ono, Mototsugu, 5,112,002, Cl. 242-57.000.

Ono Pharmaceutical Co., Ltd.: *See—*
Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, 5,112,847, Cl. 514-422.000.

Onoda, Yasuo: *See—*
Kinoshita, Iwao; Machii, Daisuke; Onoda, Yasuo; Takai, Haruki; Kasaka, Nobuo; Shute, Katsuichi; Gomi, Katsushige; Morimoto, Makoto; and Ishii, Akio, 5,112,867, Cl. 514-617.000.

Onodera, Hiroki, to Yamaha Hatsudoki Kabushiki Kaisha. Cylinder head and valve train arrangement for multiple valve engine. 5,111,791, Cl. 123-432.000

Onoe, Atsushi, to Pioneer Electronic Corporation. Magnetic head with improved bonding between magnetic core halves. 5,113,299, Cl. 360-120.000.

Ooishi, Kazuhiro: *See—*
Mizuno, Yutaka; Tsuzuki, Hanzo; Haruhara, Kazuyoshi; Miyata, Shigeki; Motoike, Katsuhiko; Sakai, Tooru; and Ooishi, Kazuhiro, 5,113,183, Cl. 340-825.310.

Oonou, Masayuki: *See—*
Furukawa, Masahiro; Yoshii, Kazuhiro; and Oonou, Masayuki, 5,111,670, Cl. 62-475.000.

Ootake, Toshihiro: *See—*
Honoki, Shinji; Kobayashi, Katsuyuki; Umeyama, Mitsuhiro; and Ootake, Toshihiro, 5,111,714, Cl. 74-574.000.

Opalko, Albert: *See—*
Crossley, Roger; Opalko, Albert; and Shepherd, Robin G., 5,112,832, Cl. 514-299.000.

Ophthalmocare, Inc.: *See—*
Zelman, Jerry, 5,112,339, Cl. 606-107.000.

Oppenheim, Amos B.; Levanon, Avigdor; Locker-Galadi, Hilla; and Gorecki, Marian, to Bio-Technology General Corp. Plasmids for the production of human Cu-Zn superoxide dismutase, bacterial hosts containing the plasmids and methods for production and recovery of such superoxide dismutase. 5,112,744, Cl. 435-189.000.

Oppenlaender, Knut: *See—*
Rath, Hans P.; Mach, Helmut; Oppenlaender, Knut; Schoenleben, Willibald; and Vogel, Hans-Henning, 5,112,364, Cl. 44-418.000.

Opschoor, Jan; and Ambrosius, Hubertus P. M. M., to U.S. Philips Corp. Semiconductor diode laser having a stepped effective refractive index. 5,113,405, Cl. 372-46.000.

Optex Corporation: *See—*
Goldsmith, Paul; and Ziegler, William R. A., 5,113,387, Cl. 369-44.380.

Optical Coating Laboratory, Inc.: *See—*
Seddon, Richard I.; and Temple, Michael D., 5,112,644, Cl. 427-38.000.

Optical Fiber Technologies, Inc.: *See—*
Slaney, Paul; and Grinderslev, Soren, 5,113,474, Cl. 385-136.000.

Orgun, Munir; McRoberts, Timothy C.; and Virdee, Arvinder S., to Boeing Company, The. Aircraft automatic landing system with engine out provisions. 5,113,346, Cl. 364-428.000.

Orii, Akihito; Yokomizo, Osamu; Masuhara, Yasuhiro; Nishida, Koji; Murata, Shigeto; Kashiwai, Shin-ichi; Inoue, Kotaro; and Yoshimoto, Yuichiro, to Hitachi, Ltd. Fuel assembly and fuel spacer. 5,112,571, Cl. 376-439.000.

Orion-yhtyma Oy: *See—*
Backstrom, Reijo; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka I.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo, 5,112,861, Cl. 514-520.000.

Orkney Water Test Centre Limited: *See—*
Davies, Simon R. H., 5,112,498, Cl. 210-708.000.

Orsino, Francesco; and Wang, Chung-Tao D., to AIL Systems, Inc. Method and apparatus for computing arithmetic expressions using on-line operands and bit-serial processing. 5,113,363, Cl. 364-736.000.

Ortega, Theresa M.: *See—*
Winston, Philip E., Jr.; Dial, Harold D.; Clare, Kenneth; and Ortega, Theresa M., 5,112,445, Cl. 162-178.000.

Ortemond, Leon D. Sea wing. 5,111,766, Cl. 114-273.000.

Ortho Pharmaceutical Corporation: *See—*
Russell, Ronald K., 5,112,866, Cl. 514-576.000.

Ortiz, Angel L., Jr., to General Electric Company. Optical fiber quick connect/disconnect having electrical contacts. 5,113,461, Cl. 385-53.000.

Osada, Yoshiyuki: *See—*
Inoue, Hiroshi; Mizutome, Atsushi; Kanno, Hideo; Sakamoto, Eiji; and Osada, Yoshiyuki, 5,113,181, Cl. 340-783.000.

Osaka, Shuichi: *See—*
Iwao, Tetsuya; Osaka, Shuichi; Sakaki, Takao; Nishida, Tadao; Yamamura, Kiyoshi; Koga, Seijiro; Hirai, Reiji; and Nakagawa, Haruo, 5,112,991, Cl. 549-206.000.

Osawa, Seichi, to Pioneer Electronic Corporation. Optical disk cutting apparatus. 5,113,385, Cl. 369-44.370.

Osawa, Yasuo, to Kabushiki Kaisha Toshiba. Current sensing circuit. 5,113,089, Cl. 307-350.000.

Osborn, John A.; Chan, You P. N. C.; Blaser, Hans-Ulrich; and Spindler, Felix, to Ciba-Geigy Corporation. Iridium complexes, process for their preparation and their use. 5,112,999, Cl. 556-23.000.

Osborne, Thomas A.: *See—*
Olsen, Douglas O.; Bates, Brian L.; and Osborne, Thomas A., 5,112,308, Cl. 604-164.000.

Oshima, Saburo; Nakazeki, Tsugito; Akamatsu, Teruaki; and Niki, Motoharu, to NTN Corporation. Turbo pump with magnetically supported impeller. 5,112,202, Cl. 417-423.700.

Oshkosh Truck Company: *See—*
Bachhuber, Anthony A.; and Verhoff, Donald H., 5,111,901, Cl. 180-140.000.

Ostarek, Ralph: *See—*
Piejko, Karl-Erwin; Lindner, Christian; Ostarek, Ralph; Braese, Hans-Eberhard; and Ott, Karl-Heinz, 5,112,910, Cl. 525-84.000.

Ostergaard, David A., to Cedarapids, Inc. Method of locking an impeller bar against a seat. 5,111,569, Cl. 29-407.000.

Ostermeyer, Walter H. Container station. 5,111,944, Cl. 211-133.000.

Oswald, Gordon. Golf park. 5,112,054, Cl. 273-176.00A.

Otaki, Mizuo; and Hamao, Miyoko, to Atsugi Unisia Corporation. Fluid pump unit with flow control valve. 5,112,199, Cl. 417-310.000.

Otani, Tamio: *See—*
Ito, Yasushi; Otani, Tamio; Dobashi, Tadanori; Irie, Akira; and Matsuya, Akihiro, 5,111,573, Cl. 483-1.000.

Otani, William: *See—*
Oka, Koichi; Otani, William; Kubo, Yasuhiro; Zasu, Yasushi; and Akagi, Motonobu, 5,113,083, Cl. 250-574.000.

Otis Elevator Company: *See—*
O'Donnell, Hugh J.; Gajewski, Vincent J.; Knizley James B.; Palinkas, Richard L.; and Rosenberg, Ronald O., 5,112,933, Cl. 528-61.000.

O'Toole, Yvonne: *See—*
Floris, Pier-Luigi; and O'Toole, Yvonne, 5,111,700, Cl. 73-749.000.

Otsuka Electronics Co., Ltd.: *See—*
Oka, Koichi; Otani, William; Kubo, Yasuhiro; Zasu, Yasushi; and Akagi, Motonobu, 5,113,083, Cl. 250-574.000.

Otsuka, Kengo: *See—*
Fukazawa, Nobuyuki; Odate, Makoto; Suzuki, Tsuneji; Otsuka, Kengo; Tsuruo, Takashi; and Sato, Wakao, 5,112,817, Cl. 514-183.000.

Ott, Karl-Heinz: *See—*
Piejko, Karl-Erwin; Lindner, Christian; Ostarek, Ralph; Braese, Hans-Eberhard; and Ott, Karl-Heinz, 5,112,910, Cl. 525-84.000.

Ou, Niann-Gwo L., to Intech, Inc. Magnetic DC-to-DC converter. 5,113,333, Cl. 363-25.000.

Oura, Takeshi: *See—*
Ajioka, Masanobu; Higuchi, Chojiro; Oura, Takeshi; Katoh, Toshio; and Yamaguchi, Akihiro, 5,113,009, Cl. 560-40.000.

Outboard Marine Corporation: *See—*
Bland, Gerald F.; Kantola, James C.; and Mondek, Martin J., 5,112,260, Cl. 440-88.000.
McElroy, Kennedy K., Jr.; and DuBois, Edmund H., 5,112,259, Cl. 440-83.000.

Overhues, Egon; and Krolow, Reiner, to Teckentrup GmbH & Co. KG. Spring washer for securing screws, nuts or the like. 5,112,178, Cl. 411-544.000.

Overstreet, Thomas S.: *See—*
Babu, Gaddam N.; Christopher, Susan S.; Copley, Bruce C.; and Overstreet, Thomas S., 5,112,882, Cl. 522-158.000.

Owada, Minoru: *See—*
Koshi, Hiroyuki; and Owada, Minoru, 5,112,646, Cl. 422-52.000.

Owen, David O.; and Bonin, Jacqueline J., to Nalco Chemical Company. Method of forming ore pellets with superabsorbent polymer. 5,112,391, Cl. 75-772.000.

Owen, Hartley: *See—*
Harandi, Mohsen N.; and Owen, Hartley, 5,113,024, Cl. 568-697.000.

Owen, Lindsey D.: *See—*
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., 5,113,433, Cl. 379-130.000.

Oy Partek AB: *See—*
Lauren, Henning J. E.; Nurmi, Tom E. E.; and Moisala, Tapio O., 5,111,552, Cl. 19-308.000.

Oy Tampella AB: *See—*
Pessa, Raimo, 5,111,999, Cl. 241-293.000.
Ruohola, Tuomo; Saiha, Erik; Kuukkanen, Kari; and Hyoty, Paavo, 5,112,441, Cl. 159-47.300.

Oyabu, Masaaki: *See—*
Hanamoto, Hiroyuki; and Oyabu, Masaaki, 5,113,279, Cl. 359-196.000.

Ozaki, Masashi; and Furukawa, Matsuhiro, to Kabushiki Kaisha Toshiba. Digital protective circuit breaker. 5,113,304, Cl. 361-87.000.

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Ozawa, Naoki: *See—*
Akiyama, Toshiyuki; Mimura, Itaru; Ozawa, Naoki; Takahashi, Kenji; Eto, Yoshizumi; and Matsumoto, Takahiro, 5,113,247, Cl. 358-51.000.

Ozawa, Satoshi: *See—*
Shibata, Yasuhisa; Oki, Naoto; Ozawa, Satoshi; and Miyagi, Hiroyuki, 5,112,471, Cl. 204-418.000.

Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, to Hitachi Cable Limited; and Tokyo Electric Power Company, Incorporated, The. Fiber optic distributed temperature sensor system. 5,113,277, Cl. 359-127.000.

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Stauffer, Anton; and Wolf, Heinz, 5,111,684, Cl. 73-49.300.

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Pagano, Daniel M.: *See—*
Covington, Roger G.; and Pagano, Daniel M., 5,112,003, Cl. 242-71.100.

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Hu, Fang-Quan; Page, Michael; and Watson, John M., 5,111,847, Cl. 137-828.000.

Pahnke, Klaus-Dieter; and Becker, Wilfried, to Rheinmetall GmbH. Fin stabilized projectile having heat resistant fins. 5,112,008, Cl. 244-3.240.

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Raciti, Salvatore; and Palara, Sergio, 5,113,305, Cl. 361-92.000.

Palinkas, Richard L.: *See—*
O'Donnell, Hugh J.; Gajewski, Vincent J.; Knizley James B.; Palinkas, Richard L.; and Rosenberg, Ronald O., 5,112,933, Cl. 528-61.000.

Palitex Project Company GmbH: *See—*
Lossa, Ulrich; and Stenmans, Heinz, 5,111,650, Cl. 57-296.000.

Palmer, David A.; Larson, Keith D.; and Fjare, Kristi A., to Amoco Corporation. Recovery of acetic acid from methyl acetate. 5,113,015, Cl. 562-608.000.

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Colley, Stephen R.; Jurasek, David W.; Palmer, John F.; Richardson, William S.; and Wilde, Doran K., 5,113,523, Cl. 395-800.000.

Palmer, John L.; Timmerman, Marsha W.; and Daubney, Stephan D., to Enzymatics, Inc. Acetaldehyde trapping system. 5,112,741, Cl. 435-25.000.

Palmer, John P., to Boeing Company, The. Self defense missile. 5,112,006, Cl. 244-3.160.

Palumbo, Paul S.: *See—*
Meneghini, Frank A.; and Palumbo, Paul S., 5,112,739, Cl. 435-14.000.

Pan, Alfred I.: *See—*
Chan, C. S.; and Pan, Alfred I., 5,113,199, Cl. 346-1.100.

Pang, Hian S. Holder for a beaker containing a drink. 5,112,017, Cl. 248-311.200.

Pano, Joseph, to Iscar Ltd. Cutting tool system having an exchangeable adaptor. 5,112,164, Cl. 407-110.000.

Pantigny, Philippe: *See—*
Audaire, Luc; and Pantigny, Philippe, 5,113,263, Cl. 358-213.110.

Paquette, Michael S.: *See—*
Dunn, David A.; Paquette, Michael S.; Easter, Henry; and Pihlaja, Roger K., 5,112,579, Cl. 422-198.000.

Paradies, Henrich H., to Medice chem.-pharm. Fabrik Putter GmbH & Co. KG. Imidazole derivatives and use as anti-bacteria, anti-fungal and anti-viral agents. 5,112,844, Cl. 514-398.000.

Paradigm Technology Co., Inc.: *See—*
Deal, James F., III, 5,112,358, Cl. 8-137.000.

Paramount Packaging Corporation: *See—*
Peppiatt, Harry R., 5,112,138, Cl. 383-29.000.

Park, Joon-ho. Measuring method of machine tool accuracy using a computer aided kinematic transducer link and its apparatus. 5,111,590, Cl. 33-502.000.

Park, Sangil: *See—*
Messer, Dion D.; Park, Sangil; and Thompson, Charles D., 5,113,189, Cl. 341-143.000.

Park, Won S.; and Marlett, Everett M., to Ethyl Corporation. Selective reducing agents. 5,113,025, Cl. 568-814.000.

Parker, Alan, to Reed Pakaging Limited. Dispensers for gasified beverages. 5,111,974, Cl. 222-399.000.

Parker, Jean Andrews Cumming, executor: *See—*
Parker, John C., deceased; Francis, David, executor; and Smith, James I. H., executor, 5,113,069, Cl. 250-227.110.

Parker, John C., deceased (by Parker, Jean Andrews Cumming, executor); by Francis, David, executor; and by Smith, James I. H., executor, to GEC-Ferranti Defence Systems Limited. Radiation detector having a defined field of view having a baffle arrangement containing a diffusing element. 5,113,069, Cl. 250-227.110.

Parks, Kenneth B.: *See—*
Adriaenssens, Luc W.; Friesen, Harold W.; Nutt, Wendell G.; and Parks, Kenneth B., 5,113,159, Cl. 333-12.000.

Parkway Machine Corporation: *See—*
Kovens, Murray R., 5,111,928, Cl. 194-292.000.

Parnet, Dietmar. Beverage carbonating, cooling and dispensing system. 5,112,539, Cl. 261-128.000.

Parrish, Clyde F.; and Scaringe, Robert P., to Mainstream Engineering Corp. Cooling device and method for hazardous materials suits. 5,111,668, Cl. 62-259.300.

Parsons, Bryan N. V., to Jaguar Cars Limited. Oscillatory rotating engines with rotor speed control. 5,112,204, Cl. 418-36.000.

Partenheimer, Walter: *See—*
Belmonte, Frank G.; Fjare, Kristi A.; and Partenheimer, Walter, 5,112,992, Cl. 549-245.000.

Pascaloff, John, to Hall Surgical Division of Zimmer, Inc. Arthroscopic surgical apparatus and method. 5,112,299, Cl. 604-22.000.

Pascher, Helmut, to Siemens Aktiengesellschaft. Optical communication network using redundant waveguides and two way operation. 5,113,276, Cl. 359-117.000.

Pashayan, Patricia A.: *See—*
Ankney, Richard C.; Bonica, Ronald P.; Kay, Douglas E.; Pashayan, Patricia A.; and Spitzer, Roy L., 5,113,499, Cl. 395-325.000.

Pasma, Andries C.: *See—*
Bosscha, Geert J.; and Pasma, Andries C., 5,111,580, Cl. 30-41.700.

Patco Ventures Ltd.: *See—*
Novacek, Laurel A.; Sharp, Fraser R.; and McLean, Donald A., 5,112,318, Cl. 604-240.000.

Patel, Chandrakant B.: *See—*
Strolle, Christopher H.; Patel, Chandrakant B.; Wedam, Werner F.; Ko, Jung W.; Schnitzler, Raymond; and Yun, Jong K., 5,113,262, Cl. 358-310.000.

Patel, Jayantilal S.; and Wullert, John R., II, to Bell Communications Research, Inc. Temperature compensation of liquid-crystal etalon filters. 5,113,275, Cl. 359-86.000.

Patron, Christian S. A. E.; and Sowinski, Eugene J., to U.S. Philips Corporation. High-frequency electron tube power oscillator. 5,113,157, Cl. 331-167.000.

Patterson, Michael C. Tamper proof cap and container. 5,111,947, Cl. 215-256.000.

Patterson, Philip M., to Gates Rubber Company, The. High temperature polyurethane belt. 5,112,282, Cl. 474-260.000.

Patzer, Charles R.: *See—*
Frank, Thomas P.; and Patzer, Charles R., 5,112,320, Cl. 604-256.000.

Paul, James M.: *See—*
Morris, Richard L.; and Paul, James M., 5,111,887, Cl. 166-312.000.

Paulos, Lonnie E.; France, E. Paul; and Ellingson, Richard L., to DePuy Du Pont Orthopaedics. Variable angle, selective length tibial drill guide. 5,112,337, Cl. 606-96.000.

Pav, Josef; Wenzel, Reinhard; Bresser, Hans; and Vossmerbaumer, Rudolf, to Kleinewefers GmbH. Heatable roll for use in calenders and the like. 5,111,564, Cl. 29-116.200.

Pavirani, Andrea: *See—*
Meulien, Pierre; and Pavirani, Andrea, 5,112,950, Cl. 530-383.000.

PCast Equipment Corporation: *See—*
Cook, Arnold J., 5,111 870, Cl. 164-61.000.
Cook, Arnold J., 5,111,871, Cl. 164-63.000.

PDA Engineering: *See—*
Border, John; Salas, Rik; and Black, Marc, 5,113,049, Cl. 219-10.790.

Peascoe, Warren J.: *See—*
Morelli, Thomas A.; Peascoe, Warren J.; Rasch, Stefan F.; and Tyrell, John A., 5,112,915, Cl. 525-166.000.

PEB Biopsy Corporation: *See—*
Kornberg, Elliot; and Tarello, William R., 5,111,828, Cl. 128-754.000.

Pechiney Recherche: *See—*
Rabiet, Jacques; Gimenez, Philippe; Guillou, Remi; and Drapier, Claude, 5,112,668, Cl. 428-137.000.

Peckerar, Martin C.: *See—*
Marrian, Christie R. K.; and Peckerar, Martin C., 5,113,367, Cl. 364-819.000.

Pedicone, John T.: *See—*
Engeler, William E.; O'Donnell, Matthew; Pedicone, John T.; and Bloomer, John J., 5,111,695, Cl. 73-626.000.

Peevers, Alan W.: *See—*
Gupta, Satish; Larky, Steven P.; Peevers, Alan W.; and St. Clair, Joe C., 5,113,180, Cl 340-747.000.

Pelz, Horst; Klier, Armin; and Graf, Herbert, to MTU Motoren und Turbinen-Union Muchen GmbH. Process for the removal of an embedding body from the embedded component. 5,112,389, Cl. 75-401.000.

Pendelton, Lowell K.: *See—*
McGhie, James R.; and Pendelton, Lowell K., 5,112,073, Cl. 280-404.000.

Pendergraft, Gordon M.; Pendergraft, John R.; and Sherrill, Dan. Machine insulation jacket assembly. 5,112,661, Cl. 428-36.910.

Pendergraft, John R.: *See—*
Pendergraft, Gordon M.; Pendergraft, John R.; and Sherrill, Dan, 5,112,661, Cl. 428-36 910.

Peng, Fred M.: *See—*
Chen, Chuan J.; and Peng, Fred M., 5,112,895, Cl. 524-308.000.

Penillard, Aimee: *See—*
Penillard, Philippe; and Penillard, Aimee, 5,112,263, Cl. 446-89.000.

Penillard, Philippe; and Penillard, Aimee, to Interlego A.G. Modular liquid flow device, in particular a water construction kit. 5,112,263, Cl. 446-89.000.

Pennings, Henricus M.; and Wijnen, Hubertus F., to International Business Machines Corporation. Method of changing data on disk. 5,113,509, Cl. 395-425.000.

Pentel, Jerry; and Fairbanks, Gary G., to United States of America, Army. Multiple stage munition. 5,111,746, Cl. 102-308.000.

Pepin, Gregory P.: *See—*
Davis, Lorne A., Jr.; Pepin, Gregory P.; and Gebert, David L., 5,113,420, Cl. 378-20 000.

Pepper, David M.: *See—*
O'Meara, Thomas R.; and Pepper, David M., 5,113,282, Cl. 359-241.000.

Peppiatt, Harry R., to Paramount Packaging Corporation. Resealable reusable flexible plastic bag with loop handle. 5,112,138, Cl. 383-29.000.

Pepping, Karl-Heinz: *See—*
Engel, Michael; Pepping, Karl-Heinz; and Gebhardt, Gunther, 5,111,711, Cl. 74-473 00R.

Perez, Ricardo R.; and Ulatowski, George S., to J. L. Prescott Company. Process of sealing a top element to a container using hot melt material. 5,112,554, Cl. 264-262.000.

Pergande, Lorraine, legal representative: *See—*
Hollingsworth, John D.; Garrison, Joe K.; Collins, Joel C.; Warnock, William A., deceased; Weiskel, Lillith M., legal representative; Nyberg, Muriel R., legal representative; Warnock, Charles F., legal representative; and Pergande, Lorraine, legal representative, 5,111,551, Cl. 19-150.000.

Perkins, Landon E., to Ladd Furniture. Seating unit having lockable cushions. 5,112,110, Cl. 297-440.000.

Perletti, Fabio; Collareda, Erminio; and Collareda, Bruno, to O.M.C. Officina Meccanica Collareda S.r.l; and Perletti, Fabio. Stabilization process particularly for grape must. 5,112,627, Cl. 426-50.000.

Perregaard, Jens; and Skarsfeldt, Torben, to H. Lundbeck A/S. Method of treating psychoses in human beings with the atypical neuroleptic 5-chloro-1-(4-fluorophenyl)-3-(1-(2-(2-imidazolidinon-1-yl)ethyl-4-piperidyl)1H-indole. 5,112,838, Cl. 514-323.000.

Perrone, Diego: *See—*
Bruzzone, Giuseppe; Ghelli, Giovanni; and Perrone, Diego, 5,112,583, Cl. 423-55 000.

Perry, Forbes G. Toroidal race rolling traction transmission units. 5,111,710, Cl. 74-200.000.

Peruyero, Michel: *See—*
Le Calvez, Michel; and Peruyero, Michel, 5,113,368, Cl. 395-250.000.

Perzan, Denis A.: *See—*
Pratt, James R.; Robarge, Dean A.; Markowski, Robert G.; Perzan, Denis A.; and Morby, John A., 5,113,312, Cl. 361-361.000.

Pessa, Raimo, to Oy Tampella AB. Arrangement for fastening the grindstone of a pulp grinder to a rotary shaft. 5,111,999, Cl. 241-293.000.

Peters, Alfons L. J.: *See—*
Van Grinsven, Adrianus M.; Peters, Alfons L. J.; and Roos, Robert, 5,112,747, Cl. 435-121.000.

Petersen, Frede H., deceased; and Sorensen, Kaj A. Procedure for shelling of crustaceous shellfish, especially shrimps, and apparatus for performance of the procedure. 5,112,269, Cl. 452-5.000.

Peterson, Gerald W.; and Weidle, Bert W., to International Business Machines Corporation. Laser transmitter interlock. 5,113,467, Cl. 385-88.000.

Petrolite Corporation: *See—*
Dhawan, Balram; Redmore, Derek; and Przybylinski, John L., 5,112,496, Cl. 210-700.000.
Jacobs, Irwin C.; and Thompson, Neil E. S., 5,112,505, Cl. 252-8.552.

Petros, Peter E. Surgical instrument and method of utilization of such. 5,112,344, Cl. 606-148.000.

Petzold, Gunter: *See—*
Ideler, Karl-Heniz; Nowak, Stefan; and Petzold, Gunter, 5,113,145, Cl. 330-251.000.

Peura, Robert A.: *See—*
Harjunmaa, Hannu; Peura, Robert A.; and Mendelson, Yitzhak, 5,112,124, Cl. 356-39.000.

Peyer, De: *See—*
Gericke, Rolf; Baumgarth, Manfred; Lues, Ingeborg; Bergmann, Rolf; and Peyer, De, 5,112,972, Cl. 544-230.000.

Peyronel, Jean-Francois: *See—*
Dubroeucq, Marie-Christine; Moutonnier, Claude; Peyronel, Jean-Francois; Tabart, Michel; and Truchon, Alain, 5,112,988, Cl. 548-470.000.

Pfaff Industriemaschinen GmbH: *See—*
Dusch, Albert, 5,113,324, Cl. 362-90.000.

Pfizer Inc.: *See—*
Dutton, Christopher J.; Gibson, Stephen P.; and Walshe, Nigel D. A., 5,112,746, Cl. 435-100.000.

Phalangas, Charalambos J., to ICI Americas Inc. Allantoin salts of quaternary nitrogen containing polymers for use in skin conditioning, cosmetic and pharmaceutical formulations. 5,112,886, Cl. 523-332.000.

Pham, Hung. Apparatus for controlling and eliminating vapor emissions at a manicure work station. 5,112,373, Cl. 55-316.000.

Phillips Petroleum Company: *See—*
Anderson, Richard L., 5,113,023, Cl. 568-697.000.
Drake, Charles A., 5,112,791, Cl. 502-243.000.

Photoprotective Technologies Incorporated: *See—*
Gallas, James M., 5,112,883, Cl. 523-106.000.

Physical Sciences, Inc.: *See—*
Frish, Michael B.; Morency, Joseph; Johnson, Stephen A.; and Boni, Arthur A., 5,112,215, Cl. 431-3.000.

Picanol N.V.: *See—*
Verhulst, Jozef, 5,111,852, Cl. 139-435.400.

Piejko, Karl-Erwin; Lindner, Christian; Ostarek, Ralph; Braese, Hans-Eberhard; and Ott, Karl-Heinz, to Bayer AG. Mixtures of thermoplastic polymers in powder form. 5,112,910, Cl. 525-84.000.

Pieles, Uwe; Englisch, Uwe; and Cramer, Friedrich, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Modified oligonucleotides. 5,112,963, Cl. 536-27.000.

Pierce Chemical Company: *See—*
Mallia, A. Krishna; and Wendt, Marten W., 5,112,952, Cl. 530-387.100.

Pierce & Stevens Corporation: *See—*
Melber, George E., 5,112,657, Cl. 428-15.000.

Pierce, William C.: *See—*
Galazin, Gregory T.; and Pierce, William C., 5,112,078, Cl. 280-711.000.

Pierick, Richard L.; and Hoium, Ross A., to Checker Machine, Inc. Spiral conveyor cleaning system. 5,111,929, Cl. 198-495.000.

Pieroni, Robert J., to Eastman Machine Company. Ergonomic handle for cutting machine. 5,111,582, Cl. 30-225.000.

Pihlaja, Roger K.: *See—*
Dunn, David A.; Paquette, Michael S.; Easter, Henry; and Pihlaja, Roger K., 5,112,579, Cl. 422-198.000.

Pike, Roscoe A., to United Technologies Corporation. Method for bonding joints with an organic adhesive using a water soluble silane modified amorphous hydrated metal oxide primer. 5,112,418, Cl. 156-319.000.

Pike, Walter E.: *See—*
Moore, Arthur L.; Wolff, Peter; Ruther, Leon H.; and Pike, Walter E., 5,112,088, Cl. 285-114.000.

Pike, William C., to Dow Chemical Company, The. Resins having improved exchange kinetics. 5,112,873, Cl. 521-32.000.

Pikka, Olavi: *See—*
Henricson, Kaj; and Pikka, Olavi, 5,112,444, Cl. 162-55.000.

Pillai, Subramonia: *See—*
Brey, Robert N., III; Majarian, William R.; Pillai, Subramonia; and Hockmeyer, Wayne T., 5,112,749, Cl. 435-172.300.

Pillsbury Company, The: *See—*
Huang, Victor T.; Barrier, William A.; Leake, Luther H.; and Wittinger, Sharon G., 5,112,626, Cl. 426-43.000.

Pinckney, Keith T.: *See—*
Faust, Michael C.; Pinckney, Keith T.; and Wong, Janelle K., 5,111,953, Cl. 220-214.000.

Pinder, Hansel M., to United States of America, Air Force. Radiographic interpretation trainer/test system. 5,113,422, Cl. 378-58.000.

Pinsky, Naum; and Alkaitis, Saulius A., to Ensci, Inc. Coated substrates. 5,112,706, Cl. 429-233.000.

Pinsonneault, Alec, to Build-A-Mold Limited. Self-releasing mold. 5,112,207, Cl. 425-192.00R.

Pioch, James J.: *See—*
Allen, Terry W.; and Pioch, James J., 5,111,965, Cl. 221-281.000.

Pioneer Electronic Corporation: *See—*
Amemiya, Naomi; Yamagishi, Koji; Matsumoto, Kunio; and Masaki, Naoki, 5,113,383, Cl. 369-33.000.
Chikuma, Kiyofumi; and Okamoto, Sota, 5,112,122, Cl. 359-332.000.
Hashimoto, Takashi, 5,113,439, Cl. 380-7.000.
Onoe, Atsushi, 5,113,299, Cl. 360-120.000.
Osawa, Seichi, 5,113,385, Cl. 369-44.370.
Ujihara, Takashi, 5,113,313, Cl. 361-380.000.
Yamada, Yoshinori; Morikawa, Kiyoshi; Kurumada, Masakazu; Kobayashi, Kazuo; and Sugihara, Masanori, 5,113,388, Cl. 369-270.000.

Pioneer Electronics Corporation: *See—*
Harada, Kimihito, 5,113,441, Cl. 380-15.000.

Pioneer Refining Services, Inc.: *See—*
MacKay, Michael T., 5,112,390, Cl. 75-733.000.

Pipe Liners, Inc.: *See—*
LeDoux, Patrick; and Fourgaut, Luc, 5,112,211, Cl. 425-384.000.

Piper, Jack R.: *See—*
John, Robert S.; and Piper, Jack R., 5,111,691, Cl. 73-292.000.

Pippuri, Aino K.: *See—*
Backstrom, Reijo; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka I.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo, 5,112,861, Cl. 514-520.000.

Pirelli Cavi S.p.A.: *See—*
Grasso, Giorgio; and Tamburello, Mario, 5,113,459, Cl. 385-24.000.

Pitchford, Anthony R.: *See—*
Talbott, Jefferson F.; Cowgill, Richard A.; Cummings, Chris R.; Fontana, James A.; and Pitchford, Anthony R., 5,113,500, Cl. 395-325.000.

Pitney Bowes Inc.: *See—*
Brewster, William H., Jr., 5,113,059, Cl. 235-101.000.
Holbrook, Russell W., 5,112,037, Cl. 271-2.000.

Pitt, William G.: *See—*
Caldwell, Karin D.; Chu, Tun-Jen; and Pitt, William G., 5,112,736, Cl. 435-6.000.

Piznik, Sylvia: *See—*
Cozzette, Stephen N.; Davis, Graham; Holleritter, Lisa A.; Lauks, Imants R.; Piznik, Sylvia; Smit, Nicolaas J.; Tirinato, Jody A.; Wieck, Henry J.; and Zelin, Michael P., 5,112,455, Cl. 204-153.120.

Plank, Frank, to Carl-Zeiss-Stiftung. Adaptor for releasably attaching a sighting telescope to a weapon. 5,111,587, Cl. 33-247.000.

Plata, Miroslaw; and Theler, Jean-Jaques, to Alusuisse-Lonza Services Ltd. Cooling of cast billets. 5,112,412, Cl. 148-688.000.

Plath, Peter: *See—*
Rueb, Lothar; Eicken, Karl; Plath, Peter; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,112,383, Cl. 71-92.000.

Platone, Edoardo; Prevedello, Aldo; and Rausa, Riccardo, to Eniricerche S.p.A. Fluidizing and dispersing additives for coal-water dispersions. 5,112,363, Cl. 44-280.000.

Pless, Benjamin; Ryan, John G.; and Culp, James M., to Ventritex. System configuration for combined defibrillator/pacemaker. 5,111,816, Cl. 128-419.0PG.

Plunkett, Gregory A.: *See—*
Buckler, Robert T.; Dailey, Frank A.; Ficalora, John A.; Gavin, John J.; and Plunkett, Gregory A., 5,112,738, Cl. 435-7.930.

Plus, Dora; and Mourey, Bruno B., to Thomson, S.A. Integrated test circuit for display devices such as LCD's. 5,113,134, Cl. 324-158.00R.

Pochard, Patrick: *See—*
Marcon, Joel; Montet, Evelyne; Gobet, Didier; Ferrand, Guy; Pochard, Patrick; and Simon, Georges, 5,111,732, Cl. 89-135.000.

Podkanski, Tadeusz: *See—*
Schroepfer, David J.; and Podkanski, Tadeusz, 5,111,839, Cl. 137-242.000.

Pohl, Ludwig: *See—*
Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, 5,112,432, Cl. 156-610.000.

Pohn, Johann; and Pohn, Romeo. Open-end spinning device. 5,111,651, Cl. 57-413.000.

Pohn, Romeo: *See—*
Pohn, Johann; and Pohn, Romeo, 5,111,651, Cl. 57-413.000.

Pohto, Pentti: *See—*
Backstrom, Reijo; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka I.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo, 5,112,861, Cl. 514-520.000.

Poirier, Jean-Marie: *See—*
Vottero, Catherine; Labat, Yves; and Poirier, Jean-Marie, 5,113,019, Cl. 568-42.000.

Poirier, Robert H.: *See—*
Taboada, John; and Poirier, Robert H., 5,112,328, Cl. 606-4.000.

Pokora, Alexander R.: *See—*
Johnson, Mark A.; Pokora, Alexander R.; and Cyrus, William L., Jr., 5,112,752, Cl. 435-192.000.

Pola Chemical Industries Inc.: *See—*
Sakurai, Yoshihumi; Ideshita, Yuzi; and Sugiyama, Takashi, 5,111,972, Cl. 222-135.000.

Polaroid Corporation: *See—*
Jasne, Stanley J., 5,112,450, Cl. 204-59.00R.
Meneghini, Frank A.; and Palumbo, Paul S., 5,112,739, Cl. 435-14.000.

Poley, Harold J.: *See—*
Franklin, Henry E.; Gold, Ronald S.; Jachimowicz, Karen E.; Poley, Harold J.; and Trimmier, J. Robert, 5,113,285, Cl. 359-465.000.

Polizzotti, David M., to Betz Laboratories, Inc. Agglomerating agents for clay containing ores. 5,112,582, Cl. 423-27.000.

Pollard, Harvey B. Method and apparatus for washing solid media. 5,112,957, Cl. 530-387.100.

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Nedzu, Shigeru, 5,112,553, Cl. 264-259.000.

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Baldwin, John J.; Selnick, Harold G.; Ponticello, Gerald S.; Remy, David C.; Claremon, David A.; and Elliott, Jason M., 5,112,824, Cl. 514-253.000.

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Pope, Penny M.; O'Bannon, Sean; and Pope, Steven R., 5,112,533, Cl. 252-607.000.

Popovic, Nenad. Apparatus for playing a game. 5,112,057, Cl. 273-243.000.

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Busch, John; and Potter, William E., 5,112,085, Cl. 285-39.000.

Potter, William R., to Health Research, Inc. Fluorometric method for detecting abnormal tissue using dual long-wavelength excitation. 5,111,821, Cl. 128-654.000.

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Pozzo, Mark J., to Monsanto Company. Process for producing hemiketals and hemithioketals. 5,113,008, Cl. 558-252.000.

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Gillery, Frank H., 5,112,693, Cl. 428-432.000.

PPM: *See—*
Baraniak, Robert, 5,111,733, Cl. 91-167.00R.

Praschl, Wilhelm: *See—*
Theurer, Josef; and Praschl, Wilhelm, 5,111,749, Cl. 104-2.000.

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Buxton, Ian R.; Malkowska, Sandra T. A.; Prater, Derek A.; Singh, Deborah L.; Leslie, Stewart T.; and Miller, Ronald B., 5,112,515, Cl. 252-106.000.

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Pratt, Kenneth W., to Seneca Sports Inc. Safety lawn dart. 5,112,062, Cl. 273-420.000.

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Greer, John; Chijiiwa, Haruhisa; and Dowhan, Michael J., 5,112,193, Cl. 416-220.00R.

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Brey, Robert N., III; Majarian, William R.; Pillai, Subramonia; and Hockmeyer, Wayne T., 5,112,749, Cl. 435-172.300.

Premier Technology: *See—*
Borg, John D., 5,112,049, Cl. 273-127.00D.

Prendergast, Matthew B.: *See—*
Cote, Edmond H.; and Prendergast, Matthew B., 5,112,476, Cl. 210-85.000.

Prestolite Wire Corporation: *See—*
Grandy, Mark E., 5,111,790, Cl. 123-425.000.

Prevedello, Aldo: *See—*
Platone, Edoardo; Prevedello, Aldo; and Rausa, Riccardo, 5,112,363, Cl. 44-280.000.

Prevorsek, D. C.: *See—*
Li, H. L.; and Prevorsek, D. C., 5,112,667, Cl. 428-113.000.

Price, David E.: *See—*
Addington, Larry C.; Addington, Robert R.; Addington, Larry M.; Lynch, Albert E.; Susla, John; Conley, David L.; Sartaine, John J.; and Price, David E., 5,112,111, Cl. 299-18.000.

Prime Computer, Inc.: *See—*
Albonesi, David H.; Langendorf, Brian K.; Chang, John; Faase, John G.; and Homberg, Michael J., 5,113,514, Cl. 395-425.000.

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Suman, Michael J.; and Zeinstra, Mark L., 5,113,182, Cl. 340-825.310.

Prince, Paul R.; Miller, William; and Benjamin, Grant S., to Baxter International Inc. Apheresis method and device. 5,112,298, Cl. 604-6.000.

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Procopiou, Panayiotis A.: *See*—
Ross, Barry C.; Kirk, Barrie E.; Lester, Michael G.; Procopiou, Panayiotis A.; and Watson, Nigel S., 5,112,819, Cl. 514-212.000.
Procter & Gamble Company, The: *See*—
Hanke, Bernhard, 5,112,884, Cl. 523-116.000.
Michael, Daniel W., 5,112,688, Cl. 428-402.200.
Proctor, Keith. Farrowing crates. 5,111,769, Cl. 119-20.000.
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Lemon, J. Robert; Evans, William T.; Christian, Robert E.; and Bader, Herbert I., 5,112,226, Cl. 433-72.000.
ProSoCo, Inc.: *See*—
Engel, James F.; and Boyer, Gerald E., 5,112,393, Cl. 106-2.000.
Prostko, Robert N. Movable shade system. 5,111,866, Cl. 160-90.000.
Protein Technologies International, Inc.: *See*—
Krinski, Thomas L.; and Tran, Tam H., 5,112,520, Cl. 252-174.230.
Proud, Joseph M.: *See*—
Lapatovich, Walter P.; Proud, Joseph M.; and Fohl, Timothy, 5,113,121, Cl. 315-248.000.
Pryor, Timothy R., to Diffracto, Ltd. Controlled machining of combustion chambers, gears and other surfaces. 5,112,131, Cl. 356-376.000.
Przybylinski, John L.: *See*—
Dhawan, Balram; Redmore, Derek; and Przybylinski, John L., 5,112,496, Cl. 210-700.000.
Przybylski, Steven A.: *See*—
Moussouris, John P.; Crudele, Lester M.; and Przybylski, Steven A., 5,113,506, Cl. 395-400.000.
Pucci, Ricco D. Apparatus for elmination of vehicle door dents. 5,112,092, Cl. 293-128.000.
Puckett, Joseph W.: *See*—
Lukavich, Paul J.; and Puckett, Joseph W., 5,111,600, Cl. 37-141.00T.
Puckett, Riley, to Pucketts Blood Trailers Broadhead, Inc. Tubular restraint for broadhead with deployable cutting blades. 5,112,063, Cl. 273-421.000.
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Puckett, Riley, 5,112,063, Cl. 273-421.000.
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Pudenz, Robert H.; and East, Gary P., 5,112,303, Cl. 604-49.000.
Pulawski, Casimir: *See*—
Bjerklund, Gunnar; Notardonato, Gino; and Pulawski, Casimir, 5,112,357, Cl. 55-53.000.
Pull, Mark. Parking pass-card handling device. 5,112,016, Cl. 248-309.100.
Pymah Corporation: *See*—
Larsson, Raymond P.; and Levendusky, George T., 5,111,768, Cl. 116-216.000.
Pystynen, Jarmo: *See*—
Backstrom, Reijo; Heinola, Kalevi E.; Honkanen, Erkki J.; Kaakkola, Seppo K.; Kairisalo, Pekka J.; Linden, Inge-Britt Y.; Mannisto, Pekka I.; Nissinen, Erkki A. O.; Pohto, Pentti; Pippuri, Aino K.; and Pystynen, Jarmo, 5,112,861, Cl. 514-520.000.
Quackenbush, James H.: *See*—
Packard, Thomas J.; and Quackenbush, James H., 5,111,904, Cl. 181-131.000.
Quadrini, Giuseppe. Adjustable diaper. 5,112,326, Cl. 604-391.000.
Quaker Oats Company, The: *See*—
Baker, Paul J., 5,111,993, Cl. 239-211.000.
Quantum Medical Systems, Incorporated: *See*—
Lazenby, John C.; and Riley, James, 5,111,824, Cl. 128-661.010.
Quashnick, Terry: *See*—
Rutter, Christopher C.; and Quashnick, Terry, 5,111,970, Cl. 222-83.000.
Quinn, John A.: *See*—
Cohen, Abraham B.; Fan, Roxy N.; and Quinn, John A., 5,112,726, Cl. 430-315.000.
Quirin, Michel, to Kuhn S.A. Haymaking machine having multiple rotors. 5,111,636, Cl. 56-367.000.
Qureshi, Shakil U.: *See*—
Guipe, Richard A.; Qureshi, Shakil U.; and Oden, Larry W., 5,113,039, Cl. 174-113.00C.
R.G.B. S.p.A.: *See*—
Brusasco, Enzo, 5,111,708, Cl. 74-89.150.
R.R. Donnelley & Sons Company: *See*—
Chan, Wai-Kwong; Allsopp, Mary F.; McGuire, Kevin T.; Nonnemann, Robert W.; Obrecht, Gordon A.; Saluski, Ronald B.; Trchka, James A.; Viebach, Hans J.; Brandt, Peter A.; Butler, Robert R.; Shircliff, Michael W.; Walker, Samuel A.; and Miller, Thomas R., 5,112,179, Cl. 412-1.000.
Raab, Klaus, to Hoechst Aktiengesellschaft. Process for preparation of substantially fluorinated alkyl bromides. 5,113,026, Cl. 570-170.000.
Rabiet, Jacques; Gimenez, Philippe; Guillou, Remi; and Drapier, Claude, to Pechiney Recherche. Insulated metal substrates and process for the production thereof. 5,112,668, Cl. 428-137.000.
Raciti, Salvatore; and Palara, Sergio, to SGS-Thomson Microelectronics S.r.l. Protection device against the breakdown of bipolar transistors in an integrated driving circuit for a power device with a resonant load. 5,113,305, Cl. 361-92.000.
Radke, Daniel D.: *See*—
Ball, Garry L.; Johnson, Russell I.; and Radke, Daniel D., 5,111,578, Cl. 29-891.000.
Ragland, Raymond E.: *See*—
Sheridan, William M.; and Ragland, Raymond E., 5,111,577, Cl. 29-890.039.
Raifman, Stuart M., to Systems Engineering and Manufacturing Corp. Modular filter assembly. 5,112,503, Cl. 210-777.000.
Rain Bird Sprinkler Mfg. Corp.: *See*—
Dumitrascu, Octavian P.; and McMillen, Charles A., 5,111,995, Cl. 239-542.000.
Ramey, Arthur J., to Marley Mouldings Inc. Method and apparatus for displaying a plurality of articles. 5,111,943, Cl. 211-59.400.
Ramirez, Raymond L.: *See*—
Tsunekawa, Masayoshi; and Ramirez, Raymond L., 5,112,880, Cl. 522-81.000.
Ramsay, Michael V. J.; Bell, Richard; Howes, Peter D.; Tiley, Edward P.; and Sutherland, Derek R., to American Cyanamid Company. Macrolide compounds. 5,112,854, Cl. 514-450.000.
Randall, David; and De Vos, Rik, to Imperial Chemical Industries PLC. Chemical blowing agent. 5,112,879, Cl. 521-155.000.
Randall, David: *See*—
Barker, Martin C.; Brown, James P.; Cunningham, Anthony; and Randall, David, 5,112,877, Cl. 521-110.000.
Randall, Eric B.: *See*—
Blokker, Johan F., Jr.; and Randall, Eric B., 5,113,438, Cl. 380-6.000.
Ranger, Ulrich; Wanner, Karl; Kaltenecker, Johann; Hellbach, Manfred; and Meixner, Gerhard, to Robert Bosch GmbH. Hammer drill. 5,111,890, Cl. 173-104.000.
Ransohoff, Thomas C., to Biotage Inc. Automated bubble trap. 5,112,492, Cl. 210-656.000.
Rantala, Borje, to Instrumentarium Corp. Respiratory sampling device. 5,111,827, Cl. 128-719.000.
Rapak, Inc.: *See*—
Rutter, Christopher C.; and Quashnick, Terry, 5,111,970, Cl. 222-83.000.
Rasch, Stefan F.: *See*—
Morelli, Thomas A.; Peascoe, Warren J.; Rasch, Stefan F.; and Tyrell, John A., 5,112,915, Cl. 525-166.000.
Raschkowski, Boleslaus: *See*—
Buchwald, Hans; Brackmann, Andreas; and Raschkowski, Boleslaus, 5,112,517, Cl. 252-171.000.
Rashbrook, Robert B.; Alexander, Clyde W.; and Bland, Edward C., to Hoechst Celanese Corporation. Dryer screen made from poly(2-methyl-1,5-pentylene) terephthalamide. 5,112,685, Cl. 428-364.000.
Rasky, Phillip D.: *See*—
Gould, Adam F.; and Rasky, Phillip D., 5,113,400, Cl. 371-43.000.
Rasmussen, Hans K. L., to Sanovo Engineering A/S. Feeding apparatus for transferring eggs. 5,112,181, Cl. 414-416.000.
Rasthofer, Lothar: *See*—
Johna, Josef; Rasthofer, Lothar; and Daum, Hermann, 5,112,624, Cl. 426-2.000.
Rath, Hans P.; Mach, Helmut; Oppenlaender, Knut; Schoenleben, Willibald; and Vogel, Hans-Henning, to BASF Aktiengesellschaft. Gasoline-engine fuels containing polyetheramines or polyetheramine derivatives. 5,112,364, Cl. 44-418.000.
Ratto, Joseph J.: *See*—
De Wames, Roger E.; Goldberg, Ira B.; Morgan, Peter E. D.; Ratto, Joseph J.; Marshall, David B.; and Hall, William F., 5,113,164, Cl. 335-216.000.
Rauch, Wilhelm, to SMB Schwede Maschinenbau. Packaging station for a packaging machine, in which a stack of goods is hooped with a packaging tape. 5,111,634, Cl. 53-176.000.
Raudabaugh, Donald E., to Hubbell Incorporated. Lightning arrester isolator. 5,113,167, Cl. 337-30.000.
Rauh, R. David: *See*—
Carrabba, Michael M.; and Rauh, R. David, 5,112,127, Cl. 356-301.000.
Rausa, Riccardo; Calemma, Vincenzo; and Menicagli, Roberto, to Enitricerche S.p.A. Method for reducing industrial or urban effluent COD. 5,112,501, Cl. 210-730.000.
Rausa, Riccardo: *See*—
Platone, Edoardo; Prevedello, Aldo; and Rausa, Riccardo, 5,112,363, Cl. 44-280.000.
Raychem Corporation: *See*—
Reamey, Robert H., 5,113,272, Cl. 359-53.000.
Shimirak, Gerald L.; and Messner, Darcey L., 5,112,245, Cl. 439-412.000.
Raymond Corporation: *See*—
Kellogg, David L.; Simmons, James M., Jr.; Bachman, Michael S.; and Avitan, Isaac, 5,113,344, Cl. 364-424.040.
Raymond, Timothy J.: *See*—
Tapper, Glen D.; Raymond, Timothy J.; and Enlund, Ernest E., 5,112,184, Cl. 414-728.000.
RCA Thomson Licensing Corporation: *See*—
Fairbanks, David W., 5,113,111, Cl. 313-404.000.
Reach All: *See*—
Tapper, Glen D.; Raymond, Timothy J.; and Enlund, Ernest E., 5,112,184, Cl. 414-728.000.
Read, Donald R.: *See*—
Kordovski, Mile A.; and Read, Donald R., 5,111,873, Cl. 164-312.000.
Reamey, Robert H., to Raychem Corporation. Three dimensional semiconductor display using liquid crystal. 5,113,272, Cl. 359-53.000.
Reber, Eric J., to Barber-Colman Company. Web caliper measuring system. 5,113,358, Cl. 364-563.000.
Reber, Lorenz: *See*—
Nufer, Karl; and Reber, Lorenz, 5,111,758, Cl. 112-266.100.

Reddy, Goukanapalli C. S.: *See*—
Roy, Kirity; Mukhopadhyay, Triptikumar; Reddy, Goukanapalli C. S.; Vijayakumar, Erra K. S.; Ganguli, Bimal N.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; and Kogler, Herbert, 5,112,858, Cl. 514-462.000.
Reddy, Vaddi B.; and Cheung, Ha K., to GTE Products Corporation. Unactivated yttrium tantalate phosphor. 5,112,524, Cl. 252-301.40R.
Redmore, Derek: *See*—
Dhawan, Balram; Redmore, Derek; and Przybylinski, John L., 5,112,496, Cl. 210-700.000.
Reed Pakaging Limited: *See*—
Parker, Alan, 5,111,974, Cl. 222-399.000.
Refractive Laser Research & Development Program, Ltd.: *See*—
Taboada, John; and Poirier, Robert H., 5,112,328, Cl. 606-4.000.
Regnier, Kent E.: *See*—
Harwath, Frank A.; Regnier, Kent E.; and Scheer, Dennis, 5,112,231, Cl. 439-60.000.
Rehrig, Houston, to Rehrig International, Inc. Basket wall and placard display assembly. 5,111,604, Cl. 40-308.000.
Rehrig International, Inc.: *See*—
Rehrig, Houston, 5,111,604, Cl. 40-308.000.
Reichelt, Helmut: *See*—
Hahn, Erwin; Hansen, Guenter; Lamm, Gunther; Reichelt, Helmut; and Wagenblast, Gerhard, 5,112,362, Cl. 8-639.000.
Reichgott, David W.: *See*—
Carey, William S.; Chen, Fu; and Reichgott, David W., 5,112,413, Cl. 148-251.000.
Reid, Kenneth J.: *See*—
Reindl, Wilhelm J.; and Reid, Kenneth J., 5,111,757, Cl. 110-264.000.
Reik, Wolfgang; and Elison, Hans-Dieter, to Luk Lamellen und Kupplungsbau GmbH. Torque transmitting and torsion damping apparatus for use in motor vehicles. 5,111,924, Cl. 192-70.170.
Reimann, Jean, to Aluweld S.A. Motorized rolling-chair. 5,111,899, Cl. 180-65.100.
Reindl, Johann: *See*—
Baum, Heinz O.; and Reindl, Johann, 5,111,557, Cl. 24-662.000.
Reindl, Wilhelm J.; and Reid, Kenneth J., to University of Minnesota, Regents of the. Dynamic containment vessel. 5,111,757, Cl. 110-264.000.
Reisman, Arnold; and Jones, Gary W., to MCNC. Method for selectively depositing material on substrates. 5,112,439, Cl. 156-656.000.
Reiter, John T.; Ellis, David M.; Smith, Rick D.; and Leach, Roger D., to Atlantic Richfield Company. Pipe step. 5,111,908, Cl. 182-92.000.
Remmerfelt, Arne. Resilient sealing ring. 5,112,066, Cl. 277-236.000.
Remson, Joseph D., to ROLM Systems. Apparatus for converting an alternate mark inversion signal to unipolar signals with frequency dependent amplification. 5,113,186, Cl. 341-68.000.
Remy, David C.: *See*—
Baldwin, John J.; Selnick, Harold G.; Ponticello, Gerald S.; Remy, David C.; Claremon, David A.; and Elliott, Jason M., 5,112,824, Cl. 514-253.000.
Renard, Andre J. J., to Societe Europeen de Biotechnologie; and Rhone Merieux. Method of identification and preparation of probes for pestiviruses, oligonucleotides and probes thus obtained and a method of detection of pestiviruses. 5,112,753, Cl. 435-5.000.
Rennie, John H. S.: *See*—
Garvey, Michael J.; Griffiths, Ian C.; and Rennie, John H. S., 5,112,612, Cl. 424-400.000.
Reno, John M.: *See*—
Gustavson, Linda M.; Srinivasan, Ananthachari; Kasina, Sudhakar; Reno, John M.; Fitzner, Jeffrey N.; and Jones, David S., 5,112,953, Cl. 530-391.500.
Repka, Michael A.; and Gerding, Thomas G., to Mikkur, Inc. Polyethylene glycol ointment for apthous ulcers. 5,112,620, Cl. 514-180.000.
Repligen Corporation: *See*—
Maione, Theodore, 5,112,946, Cl. 530-324.000.
Resco, Inc.: *See*—
Chow, Hsiu-Shen; and Ellentuch, Leonard, 5,112,243, Cl. 439-352.000.
Research Development Corporation of Japan: *See*—
Ogata, Naoya; and Yokowo, Yasuhiko, 5,112,906, Cl. 525-61.000.
Research Foundation of State University of New York University at Buffalo, The: *See*—
Warunek, Stephen P.; and Sorensen, Soren E., 5,112,640, Cl. 427-2.000.
Retrax, Inc.: *See*—
Gloyer, Walter W.; and Bright, Frederick G., 5,112,315, Cl. 604-195.000.
Reuss, Thomas: *See*—
Hose, Fritz; and Reuss, Thomas, 5,113,040, Cl. 174-116.000.
Reuther, Wolfgang: *See*—
Baus, Ulf; and Reuther, Wolfgang, 5,112,985, Cl. 548-337.000.
Rexnord Corporation: *See*—
Grunze, Mark R.; and Franzen, Robert E., 5,111,575, Cl. 29-725.000.
Reyes, Ruben A.: *See*—
Foster, Ronald A.; and Reyes, Ruben A., 5,113,328, Cl. 362-223.000.
Reynolds, Gary E. Bowhunter's ground bow holder. 5,111,800, Cl. 124-88.000.
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Reynolds, Randy B. At-shelf lighted merchandising display. 5,111,606, Cl. 40-642.000.
Rheinmetall GmbH: *See*—
Buchele-Buecher, Sigfrid, 5,112,007, Cl. 244-3.220.
Grabner, Dieter, 5,111,730, Cl. 89-45.000.
Grabner, Dieter, 5,111,731, Cl. 89-46.000.
Pahnke, Klaus-Dieter; and Becker, Wilfried, 5,112,008, Cl. 244-3.240.
Rheon Automatic Machinery Co., Ltd.: *See*—
Nakamura, Yasuhiro, 5,112,631, Cl. 426-297.000.
Rheox, Inc.: *See*—
Nae, Hemi N.; Cheng, Wei M.; and DeSesa, Michael A., 5,112,400, Cl. 106-197.100.
Rhone Merieux: *See*—
Renard, Andre J. J., 5,112,753, Cl. 435-5.000.
Rhone-Poulenc Rorer Pharmaceuticals Inc.: *See*—
Luber, Joseph R.; Feld, Kenneth M.; Harwood, Richard J.; and Grim, Wayne M., 5,112,813, Cl. 514-54.000.
Rhone-Poulenc Sante: *See*—
Dubroeucq, Marie-Christine; Moutonnier, Claude; Peyronel, Jean-Francois; Tabart, Michel; and Truchon, Alain, 5,112,988, Cl. 548-470.000.
Rice, Michael R.: *See*—
Hird, John A.; Owen, Lindsey D.; and Rice, Michael R., 5,113,433, Cl. 379-130.000.
Richard, Denis, to Automobiles Peugeot; and Automobiles Citroen. Rapid assembly connector. 5,112,089, Cl. 285-321.000.
Richard Wolf GmbH: *See*—
Hiltebrandt, Siegfried, 5,112,321, Cl. 604-264.000.
Hiltebrandt, Siegfried; Dingler, Andreas; Falk, Ernst; and Fischmeister, Martin F., 5,112,346, Cl. 606-170.000.
Jaggy, Peter; Krauss, Werner; Schafer, Dagobert; and Wurster, Helmut, 5,111,805, Cl. 128-24.0EL.
Richardson, Brain E., to Morpheus Lights, Inc. Selectable mechanical and electronic pattern generating aperture module. 5,113,332, Cl. 362-282.000.
Richardson, Charles T., Jr.; and Austin, Kevin L., to United States Advanced Network, Inc. Enhanced wide area audio response network. 5,113,430, Cl. 379-88.000.
Richardson, William S.: *See*—
Colley, Stephen R.; Jurasek, David W.; Palmer, John F.; Richardson, William S.; and Wilde, Doran K., 5,113,523, Cl. 395-800.000.
Richer Gedeon Vegyeszet: *See*—
Ambrus, Gabor; Maderspach, Andrea; Jekkel, Antalne ; Javor, Andras; Ilkoy, Eva; Hajos, Gyorgy; Szporny, Laszlo ; Nagy, Jozsef; Horvath, Gyula; and Moravcsik, Imre, 5,112,815, Cl. 514-178.000.
Richey, Forrest A., Jr.; and Doumaux, Arthur R., Jr., to Union Carbide Chemicals & Plastics Technology Corporation. Processes for the preparation of cyclic nitrogen-containing compounds. 5,112,984, Cl. 548-320.000.
Ricker, Dennis J.: *See*—
Mikhaeil-Boules, Naila; Hammersmith, Robert J.; Leppek, Kevin G.; Wilkey, Paul D.; Gardner, Thomas H.; Ricker, Dennis J.; and Kowalik, James J., 5,112,116, Cl. 303-115.0EC.
Rickert, Michael T.: *See*—
Mundle, Craig M.; Jahnke, David D.; Rickert, Michael T.; and Robertson, William N., 5,112,059, Cl. 273-292.000.
Ricoh Company, Ltd.: *See*—
Katsuragawa, Tadao, 5,112,701, Cl. 428-694.000.
Ohta, Wasaburo; Kinoshita, Mikio; and Katsuragawa, Tadao, 5,112,466, Cl. 204-298.050.
Ridley, Stephen F.; and Sicotte, Louis T. Durable elastic lace for athletic shoes. 5,111,558, Cl. 24-715.300.
Rieter Machine Works, Ltd.: *See*—
Noser, Hans; and Erni, Markus, 5,113,123, Cl. 318-106.000.
Rifala Pty. Ltd.: *See*—
Tuson, Rodney R.; and Dimanstein, Isaac, 5,113,334, Cl. 363-25.000.
Rikagaku Kenkyusho: *See*—
Idesawa, Masanori, 5,113,063, Cl. 250-201.400.
Riker Laboratories, Inc.: *See*—
Beaurline, Joseph M.; Berge, Stephen M.; and Schultz, Robert K., 5,112,604, Cl. 424-490.000.
Riley, James: *See*—
Lazenby, John C.; and Riley, James, 5,111,824, Cl. 128-661.010.
Riley, Keith J.: *See*—
Allman, Peter N.; and Riley, Keith J., 5,113,323, Cl. 362-80.000.
Rinchak, Albert D. Universally adaptable boregrinding chuck assembly. 5,112,067, Cl. 279-151.000.
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Rischen, Dietmar: *See*—
Willmann, Karl-Heinz; Rischen, Dietmar; and Jonner, Wolf-Dieter, 5,112,115, Cl. 303-114.00R.
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Hahn, Norbert; and Naegeli, Robert W., 5,111,546, Cl. 14-7.300.
Riverwood International Corporation: *See*—
Hudson, Donald R., 5,112,430, Cl. 156-556.000.
Riva, Gianluigi: *See*—
Porcari, Vincenzo; and Riva, Gianluigi, 5,111,896, Cl. 177-16.000.
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Pratt, James R.; Robarge, Dean A.; Markowski, Robert G.; Perzan, Denis A.; and Morby, John A., 5,113,312, Cl. 361-361.000.

Robart Enterprises, Inc.: *See—*
Haydu, Bartley A., 5,111,320, Cl. 362-61.000.
Robbins, Edward S., III: *See—*
Dickinson, Albert B., 5,112,561, Cl. 264-531.000.
Roberson, Joe E. Vehicle having a cooling system. 5,112,535, Cl. 261-27.000.
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Ranger, Ulrich; Wanner, Karl; Kaltenecker, Johann; Hellbach, Manfred; and Meixner, Gerhard, 5,111,890, Cl. 173-104.000.
Schmid, Hans-Dieter, 5,113,106, Cl. 310-239.000.
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Sigler, Kent K., 5,112,218, Cl. 431-266.000.
Robertson, John M.: *See—*
Baumgarten, Robert W., and Robertson, John M., 5,111,570, Cl. 29-402.130.
Robertson, William N.: *See—*
Mundle, Craig M.; Jahnke, David D.; Rickert, Michael T.; and Robertson, William N., 5,112,059, Cl. 273-292.000.
Robine, Alain: *See—*
Cameron, Charles; Mimoun, Hubert; Robine, Alain; Bonnaudet, Serge; Chaumette, Patrick; and Dang Vu, Quang, 5,113,032, Cl. 585-500.000.
Robinson, Steven D.: *See—*
Acarlar, Muvaffak S.; Manzione, Louis T.; Robinson, Steven D.; and Stefanik, Dennis, 5,113,466, Cl. 385-88.000.
Rockwell International Corporation: *See—*
De Wames, Roger E.; Goldberg, Ira B.; Morgan, Peter E. D.; Ratto, Joseph J.; Marshall, David B.; and Hall, William F., 5,113,164, Cl. 335-216.000.
SooHoo, Kie L.; Doty, James H.; and Ito, Paul H., 5,112,128, Cl. 356-350.000.
Stangeland, Maynard L., 5,112,146, Cl. 384-492.000.
Woods, Ralf D.; Slack, Michael P.; and Gerst, Kenneth M., 5,113,399, Cl. 371-21.300.
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Charbonnier, Francis M.; and Rockwell, Martin G., 5,111,813, Cl. 128-419.00D.
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Hiemstra, Scott, 5,112,219, Cl. 431-354.000.
Roddy, Stephen R.: *See—*
Katcherian, Ricky V.; and Roddy, Stephen R., 5,112,101, Cl. 296-201.000.
Rodgers, Howard, to Rogersound Labs, Inc. Speaker enclosure. 5,111,905, Cl. 181-152.000.
Roehl, Franz: *See—*
Wenderoth, Bernd; Sauter, Hubert; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,112,862, Cl. 514-522.000.
Roerig, Arnold J.: *See—*
Brown, Dale A.; and Roerig, Arnold J., 5,111,563, Cl. 29-116.200.
Rogerson Aircraft Corporation: *See—*
Schroepfer, David J.; and Podkanski, Tadeusz, 5,111,839, Cl. 137-242.000.
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Rodgers, Howard, 5,111,905, Cl. 181-152.000.
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Hegarty, Bryan, 5,112,306, Cl. 106-15.050.
Hsu, Adam C., 5,112,382, Cl. 71-88.000.
Larson, Gary R.; and Marks, Allen P., 5,112,655, Cl. 427-407.100.
Rohr, Uwe: *See—*
Zierenberg, Bernd; Herschel, Michael; and Rohr, Uwe, 5,112,842, Cl. 514-367.000.
Roland, Wolf-Achim: *See—*
Brands, Karl-Dieter; Endres, Helmut; Christophliemk, Peter; and Roland, Wolf-Achim, 5,112,414, Cl. 148-254.000.
Rolek, Matthew: *See—*
Kaspar, Melvin; Kostos, Jeffrey; Rolek, Matthew; and Artwohl, Paul, 5,111,618, Cl. 49-501.000.
Roll and Go AG: *See—*
Howard, Johannes; and Fuchs, Lucie, 5,112,270, Cl. 452-66.000.
Rolls-Royce plc: *See—*
Cox, John C., 5,112,195, Cl. 416-223.00B.
ROLM Systems: *See—*
Remson, Joseph D., 5,113,186, Cl. 341-68.000.
Romesburg, Eric D.; Maze, Kenneth W.; Duffield, David J.; Deiss, Michael S.; Beyers, Billy W., Jr.; and Bridgewater, Kevin E., to Thomson Consumer Electronics, Inc. Data transfer from an external computer to a television receiver having picture-in-picture capability. 5,113,259, Cl. 358-183.000.
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Correa, Jose L.; Stumpf, Robert C.; Farnum, Charles L.; and Roos, Leo, 5,112,428, Cl. 156-324.000.
Roos, Robert: *See—*
Van Grinsven, Adrianus M.; Peters, Alfons L. J.; and Roos, Robert, 5,112,747, Cl. 435-121.000.
Rosby Corporation: *See—*
Yurgevich, Howard J.; and Mavoczynski, Stanley J., 5,112,099, Cl. 296-181.000.
Rose, Todd N.: *See—*
Munsey, R. Jack; and Rose, Todd N., 5,111,630, Cl. 52-508.000.
Rosen, Robert A.: *See—*
Krikorian, Kapriel V.; and Rosen, Robert A., 5,113,194, Cl. 342-106.000.
Rosen, Warren A.: *See—*
Sperling, Leslie H.; Murphy, Clarence J.; Rosen, Warren A.; Jain, Himanshu; and Herman, Warren N., 5,112,531, Cl. 252-582.000.
Rosenberg, Ronald O.: *See—*
O'Donnell, Hugh J.; Gajewski, Vincent J.; Knizley James B.; Palinkas, Richard L.; and Rosenberg, Ronald O., 5,112,933, Cl. 528-61.000.
Rosenfeld, Aron M.: *See—*
Jozefowicz, Mark A.; and Rosenfeld, Aron M., 5,112,449, Cl. 205-175.000.
Ross, Barry C.; Kirk, Barrie E.; Lester, Michael G.; Procopiou, Panayiotis A.; and Watson, Nigel S., to Glaxo Group Limited. Imidazole derivatives, pharmaceutical compositions and use. 5,112,819, Cl. 514-212.000.
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Walle, Warren R.; Ross, Jack B.; Hamilton, Jesse A.; and Martinez, Delfin C., 5,112,223, Cl. 432-241.000.
Ross, Steve A.: *See—*
Horton, Terry F.; and Ross, Steve A., 5,111,867, Cl. 160-330.000.
Rossi, Albert, to Exxon Chemical Patents Inc. Carboxylate polymer and viscosity index improver containing oleaginous compositions. 5,112,510, Cl. 252-56.00R.
Rossler, Erich: *See—*
Ludemann, Simpert; Bernheim, Michael; Sandner, Bernhard; Rossler, Erich; and Vogel, Hans-Burkhardt, 5,112,930, Cl. 528-28.000.
Rossum, David P., to E-mu Systems, Inc. Digital sampling instrument for digital audio data. 5,111,727, Cl. 84-603.000.
Roth, Philippe, to Gretag Aktiengesellschaft. Compensation circuit for the correction of image defects of a television image. 5,113,258, Cl. 358-167.000.
Roth, Roland: *See—*
Abramowsky, Heinz; Muller, Helmut; and Roth, Roland, 5,111,591, Cl. 33-503.000.
Rotharmel, John; and Smeltzer, Paul, to Maremont Corporation. Dampener valving control mechanism. 5,111,917, Cl. 188-319.000.
Rouse, Mark J. Safe gun storage apparatus. 5,111,755, Cl. 109-25.000.
Rouviere, Jacques C.: *See—*
Cot, Louis; Rouviere, Jacques C.; Guizard, Christian G.; and Larbot, Andre, 5,112,676, Cl. 427-226.000.
Rowe, William M., Jr.: *See—*
Srubas, Robert C.; and Rowe, William M., Jr., 5,113,058, Cl. 219-548.000.
Rowney, Paul E.: *See—*
Grayson, James I.; Heyes, Graham; Jackson, Arthur; and Rowney, Paul E., 5,112,995, Cl. 549-493.000.
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Roy, Kirity; Mukhopadhyay, Triptikumar; Reddy, Goukanapalli C. S.; Vijayakumar, Erra K. S.; Ganguli, Bimal N.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; and Kogler, Herbert, to Hoechst Aktiengesellschaft. Antibiotic, aranorosin, a microbiological process for the preparation thereof, and the use thereof as a pharmaceutical. 5,112,858, Cl. 514-462.000.
Royal Vendors, Inc.: *See—*
Oden, Kenneth W., 5,111,962, Cl. 221-1.000.
Rubbermaid Office Products Group, Inc.: *See—*
Breen, John D.; and Scherer, Thomas, 5,111,951, Cl. 220-23.400.
Rubenstein, Mark S.: *See—*
Hollander, David S.; and Rubenstein, Mark S., 5,111,957, Cl. 220-408.000.
Ruckerbauer, Gerda M.: *See—*
Bouillant, Alain M. P.; Nielsen, Klaus; Ruckerbauer, Gerda M.; Samagh, Bakhshish S.; and Hare, William C. D., 5,112,756, Cl. 435-235.100.
Rudy, William J., Jr.; and Shaffer, Howard R., to AMP Incorporated. Mounting means. 5,112,247, Cl. 439-571.000.
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Rumph, David E.: *See—*
Nickell, Eric S.; Buckley, Robert R.; Rumph, David E.; and Coleman, Robert M., 5,113,356, Cl. 395-108.000.
Ruohola, Tuomo; Saiha, Erik; Kuukkanen, Kari; and Hyoty, Paavo, to Oy Tampella AB. Process for the recovery of heat and chemicals from spent liquor. 5,112,441, Cl. 159-47.300.

Rupp, Carl A. Mixer. 5,112,135, Cl. 366-197.000.
Rupp, Richard H.: *See—*
Chatterjee, Sukumar; Chatterjee, Sugata; Ganguli, Bimal N.; Chatterjee, Deepak K.; Jani, Rajendra K. H.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; Kogler, Herbert; Seibert, Gerhard; and Teetz, Volker, 5,112,806, Cl. 514-9.000.
Roy, Kirity; Mukhopadhyay, Triptikumar; Reddy, Goukanapalli C. S.; Vijayakumar, Erra K. S.; Ganguli, Bimal N.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; and Kogler, Herbert, 5,112,858, Cl. 514-462.000.
Rupprecht, Bernd, to Deutsche Perrot-Bremse GmbH. Sliding saddle disk brake. 5,111,915, Cl. 188-73.450.
Russell, Edwin T.: *See—*
Hunter, James C.; Nardi, John C.; Russell, Edwin T.; and Scarr, Robert F., 5,112,705, Cl. 429-206.000.
Russell, Ronald K., to Ortho Pharmaceutical Corporation. Ethanesulfonamide derivatives. 5,112,866, Cl. 514-576.000.
Rutgers University: *See—*
Burdea, Grigore C.; Dunn, Stanley M.; and Desjardins, Paul J., 5,113,424, Cl. 378-170.000.
Ruther, Leon H.: *See—*
Moore, Arthur L.; Wolff, Peter; Ruther, Leon H.; and Pike, Walter E., 5,112,088, Cl. 285-114.000.
Rutter, Christopher C.; and Quashnick, Terry, to Rapak, Inc. Fluid dispenser having a removable sealing diaphragm. 5,111,970, Cl. 222-83.000.
Ruzicka, Harry L., Jr.; and Kompare, Anton J., to United Technologies Corporation. Tool for selectively bending the trailing edge tab of a helicopter blade while simultaneously measuring the true degree of tab bending. 5,111,676, Cl. 72-34.000.
Ryan, John G.: *See—*
Pless, Benjamin; Ryan, John G.; and Culp, James M., 5,111,816, Cl. 128-419.0PG.
Ryan, William F.: *See—*
Muggeridge, David; Ryan, William F.; and Haase, Dieter, 5,111,553, Cl. 244-3.220.
Ryder Truck Rental, Inc.: *See—*
Clelland, William F., 5,112,082, Cl. 280-783.000.
Ryobi Limited: *See—*
Ohara, Takeji; and Yuasa, Yuuichi, 5,113,128, Cl. 320-21.000.
Ryoichi, Kimura; Noriaki, Hattori; and Kazuharu, Watabe, to Honda Giken Kogyo Kabushiki Kaisha. Radio-signal-responsive vehicle device control system. 5,113,427, Cl. 379-57.000.
Ryoki, Masato; and Ito, Kenji, to Kabushiki Kaisha Okuma Tekkosho. Thread cutting method and apparatus. 5,112,169, Cl. 409-66.000.
Ryu, Akiomi: *See—*
Shiga, Kiyotaka; Fukui, Akio; Ryu, Akiomi; and Okuno, Katsumi, 5,112,167, Cl. 408-211.000.
S.C. Johnson & Son, Inc.: *See—*
Miller, Eric J., 5,112,394, Cl. 106-3.000.
S. Franzen Sohne (GmbH & Co.): *See—*
Bako, Laszlo; and Klein, Helmut, 5,111,918, Cl. 190-18.00A.
S.W. Industries, Inc.: *See—*
Beaudreault, James J.; and Gallant, James O., 5,111,565, Cl. 29-116.200.
Sabin, Robert. Method of treatment of Parkinson's disease using phytic acid. 5,112,814, Cl. 514-75.000.
Sabol, George P.: *See—*
Foster, John P.; Comstock, Robert J.; Worcester, Samuel A.; and Sabol, George P., 5,112,573, Cl. 420-422.000.
Sagae, Syoji: *See—*
Tadokoro, Hiroyuki; Wakamatsu, Kazuhiro; Sagae, Syoji; and Shimada, Akira, 5,113,226, Cl. 355-273.000.
Saiga, Shinji, to Kinugawa Rubber Industrial Co., Ltd. End structure of weather-strip. 5,111,617, Cl. 49-494.000.
Saiha, Erik: *See—*
Ruohola, Tuomo; Saiha, Erik; Kuukkanen, Kari; and Hyoty, Paavo, 5,112,441, Cl. 159-47.300.
Saiki, Norihiko: *See—*
Kobayashi, Tomomi; Kobayashi, Akira; Fujimoto, Hiroshi; Saiki, Norihiko; and Imazu, Katsuhiro, 5,111,679, Cl. 72-348.000.
Saiki, Yoshiharu: *See—*
Kiya, Nobuyuki; Maeda, Kimio; and Saiki, Yoshiharu, 5,113,359, Cl. 364-578.000.
St. Clair, Joe C.: *See—*
Gupta, Satish; Larky, Steven P.; Peevers, Alan W.; and St. Clair, Joe C., 5,113,180, Cl. 340-747.000.
Saint-Gobain Vitrage International: *See—*
Wuest, Isabelle; Anderson, Charles E.; and Tabare, Jacques, 5,112,675, Cl. 428-216.000.
Saito, Akiko: *See—*
Kawakatsu, Akira; Saito, Akiko; and Yuge, Yoji, 5,113,109, Cl. 313-112.000.
Saito, Eiichiro: *See—*
Yonemoto, Tatsuo; Saito, Eiichiro; and Matsumura, Masahiro, 5,112,989, Cl. 548-548.000.
Saito, Katsuyuki: *See—*
Kanno, Masahide; Uehara, Masao; Sasaki, Masahiko; Saito, Katsuyuki; Uchikubo, Akinobu; Hasegawa, Jun; Sasagawa, Katsuyoshi; Yamashita, Shinji; and Nakagawa, Takehiro, 5,113,254, Cl. 358-98.000.
Saito, Kazuo, to Nisshinbo Industries, Inc. Conductive material and process for producing the same. 5,112,529, Cl. 252-500.000.
Saito, Keiya: *See—*
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 5,113,072, Cl. 250-309.000.
Saito, Kenichi: *See—*
Takase, Muneaki; Komatsu, Toshihiko; Matsuno, Toshiyuki; Miyakawa, Akihisa; and Saito, Kenichi, 5,112,833, Cl. 514-300.000.
Saito, Ryoji: *See—*
Harada, Yasuhiro; Karino, Toshikazu; Saito, Ryoji; Tometsuka, Koji; and Izumi, Shoichiro, 5,112,641, Cl. 427-8.000.
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Saito, Yasuhiko: *See—*
Katoh, Hideo; Hosoi, Masahiro; Hamano, Hisashi; and Saito, Yasuhiko, 5,112,659, Cl. 428-35.700.
Saive, Roland; Funk, Guido; and Bachl, Robert, to BASF Aktiengesellschaft. Preparation of homopolymers of ethene and copolymers of ethene with high α-monoolefins using a Ziegler catalyst system. 5,112,928, Cl. 526-128.000.
Sakai, Kazuya: *See—*
Matsubara, Akira; Sakai, Kazuya; Tanada, Hideki; Mizuchi, Akira; Horikomi, Kazutoshi; and Ohtsu, Takuma, 5,112,841, Cl. 514-361.000.
Sakai, Shuzo; Akai, Hiroshi; and Miyake, Toshio, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Process to prepare maltose powder. 5,112,407, Cl. 127-58.000.
Sakai, Tooru: *See—*
Mizuno, Yutaka; Tsuzuki, Hanzo; Haruhara, Kazuyoshi; Miyata, Shigeki; Motoike, Katsuhiko; Sakai, Tooru; and Ooishi, Kazuhiro, 5,113,183, Cl. 340-825.310.
Sakaki, Takao: *See—*
Iwao, Tetsuya; Osaka, Shuichi; Sakaki, Takao; Nishida, Tadao; Yamamura, Kiyoshi; Koga, Seijiro; Hirai, Reiji; and Nakagawa, Haruo, 5,112,991, Cl. 549-206.000.
Sakakibara, Megumu; Tanaka, Keiji; and Fujiura, Youji, to Sanyo Chemical Industries, Ltd. Articles molded from moisture shrinkable resins. 5,112,903, Cl. 525-54.200.
Sakamoto, Eiji: *See—*
Inoue, Hiroshi; Mizutome, Atsushi; Kanno, Hideo; Sakamoto, Eiji; and Osada, Yoshiyuki, 5,113,181, Cl. 340-783.000.
Sakamoto, Kenji; Maruyama, Akihiko; Moriya, Tatsuo; Yabe, Hiroshi; Kawaguchi, Takashi; and Yoshino, Masato, to Seiko Epson Corporation. Multifunction electronic analog timepiece. 5,113,381, Cl. 368-74.000.
Sakamoto, Masaaki: *See—*
Tanaka, Tadashi; Sakamoto, Masaaki; Sato, Yoshiaki; and Kato, Tohru, 5,112,416, Cl. 148-437.000.
Sakamoto, Takashi: *See—*
Ikuta, Shizuo; Okuda, Masaharu; and Sakamoto, Takashi, 5,111,997, Cl. 239-750.000.
Sakanaka, Tetsuo: *See—*
Degura, Yasusaburo; Sakanaka, Tetsuo; and Imano, Haruo, 5,113,278, Cl. 359-154.000.
Sakano, Akio: *See—*
Chatani, Masayuki; Yoshida, Kimiyoshi; Sakano, Akio; and Tamori, Hirofumi, 5,113,452, Cl. 382-13.000.
Sakano, Shinji: *See—*
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 5,113,072, Cl. 250-309.000.
Sakashita, Kiichiro: *See—*
Imai, Eiichi; Sakashita, Kiichiro; Takagi, Seiichi; and Kukimoto, Tsutomu, 5,112,714, Cl. 430-106.600.
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Sakurai, Kaoru; Murakami, Harunori; Maeda, Masaru; Iijima, Hiroshi; and Ohara, Shouhei, to Nippon Sheet Glass Co., Ltd. Glass window antenna for use in a motor vehicle. 5,113,195, Cl. 343-704.000.
Sakurai, Kazuo: *See—*
Tamura, Takahiro; and Sakurai, Kazuo, 5,112,201, Cl. 417-366.000.
Sakurai, Tadayosi: *See—*
Gotoh, Masumi; and Sakurai, Tadayosi, 5,112,550, Cl. 264-211.140.
Sakurai, Yoshihumi; Ideshita, Yuzi; and Sugiyama, Takashi, to Pola Chemical Industries Inc.; and Yoshida Industry Co., Ltd. Creamy substance container. 5,111,972, Cl. 222-135.000.
Salas, Rik: *See—*
Border, John; Salas, Rik; and Black, Marc, 5,113,049, Cl. 219-10.790.
Saleh, Ramzi Y.: *See—*
Soled, Stuart L.; Dispenziere, Nicholas C., Jr.; Saleh, Ramzi Y.; and Miseo, Sabato, 5,113,034, Cl. 585-510.000.
Salk Institute for Biological Studies, The: *See—*
Rivier, Jean E. F.; and Vale, Wylie W., Jr., 5,112,809, Cl. 514-12.000.
Sallee, Patricia L. IV cover/protector. 5,112,313, Cl. 604-180.000.
Salo, Jukka: *See—*
Leino, Jorma; Vestola, Juhani; Salo, Jukka; and Telama, Ari, 5,111,567, Cl. 29-132.000.

Salonen, Eeva-Marjatta, to Labsystems, Oy. Pharmaceutical preparation for promoting epithelial healing and prevention of epithelial destruction. 5,112,805, Cl. 514-8.000.

Saluski, Ronald B.: *See—*
Chan, Wai-Kwong; Allsopp, Mary F.; McGuire, Kevin T.; Nonnemann, Robert W.; Oprecht, Gordon A.; Saluski, Ronald B.; Trchka, James A.; Viebach, Hans J.; Brandt, Peter A.; Butler, Robert R.; Shircliff, Michael W.; Walker, Samuel A.; and Miller, Thomas R., 5,112,179, Cl. 412-1.000.

Salvo, Edgar E., Jr.: *See—*
Butzin, Donald F.; Meeks, Edward W.; Tunnell, George W.; and Salvo, Edgar E., Jr., 5,112,566, Cl. 376-245.000.

Samagh, Bakhshish S.: *See—*
Bouillant, Alain M. P.; Nielsen, Klaus; Ruckerbauer, Gerda M.; Samagh, Bakhshish S.; and Hare, William C. D., 5,112,756, Cl. 435-235.100.

Sameshima, Makoto: *See—*
Moriya, Naoyuki; and Sameshima, Makoto, 5,111,789, Cl. 123-357.000.

Samsonite Corporation: *See—*
Castelli, Renato; Van Hoye, Willibald; Miles, Richard; and Green, Stephen T., 5,111,920, Cl. 190-120.000.

Samsung Electron Devices Co., Ltd.: *See—*
Jang, Dong-Gil, 5,113,110, Cl. 313-270.000.

SamSung Electronics Co., Ltd.: *See—*
Cho, Seong-Jae, 5,113,086, Cl. 307-260.000.
Jeong, Ho-sun, 5,113,484, Cl. 395-24.000.
Kim, Kyung-su, 5,113,294, Cl. 360-33.100.
Kwak, Jin-keun, 5,113,220, Cl. 355-200.000.
Strolle, Christopher H.; Patel, Chandrakant B.; Wedam, Werner F.; Ko, Jung W.; Schnitzler, Raymond; and Yun, Jong K., 5,113,262, Cl. 358-310.000.
Yang, Kun M., 5,111,664, Cl. 62-3.620.

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San-O Industrial Corporation: *See—*
Lindquist, Carl E., 5,113,968, Cl. 337-187.000.

Sanada, Takashi: *See—*
Nishio, Taichi; Kuribayashi, Hideyuki; and Sanada, Takashi, 5,112,907, Cl. 525-65.000.

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Sanderson, Kenneth R.: *See—*
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Sandman, James G., Jr.: *See—*
Beard, Marian H.; Caro, Perry A.; Hsiao, Jennifer B.; Mackey, Kevin J.; Sandman, James G., Jr.; Steinbach, Gary R.; and Woods, Donald R., 5,113,517, Cl. 364-200.000.

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Korte, Klaus, 5,112,940, Cl. 528-301.000.
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Sandved, Jonas S.: *See—*
Horvei, Knut; and Sandved, Jonas S., 5,112,698, Cl. 428-632.000.

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Hedlund, Jan-Gunnar; and Asberg, Bengt A., 5,112,165, Cl. 407-118.000.

Sang, Harry: *See—*
Jin, Iljoon; Kenny, Lorne D.; and Sang, Harry, 5,112,697, Cl. 428-613.000.

Sanken Electric Co., Ltd.: *See—*
Ohtsuka, Koji; and Goto, Hirokazu, 5,112,774, Cl. 437-175.000.

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Tsunekawa, Masayoshi; and Ramirez, Raymond L., 5,112,880, Cl. 522-81.000.

Sankyo Company, Limited: *See—*
Hamano, Kiyoshi; Furuya, Kouhei; Tanzawa, Kazuhiko; Kagasaki, Takeshi; Miyamoto, Masaaki; and Kinoshita, Takeshi, 5,112,807, Cl. 514-11.000.

Sano, Koichi: *See—*
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Nakagawa, Jun; Kawamata, Toshio; and Sano, Kunihiko, 5,112,679, Cl. 428-323.000.

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Rasmussen, Hans K. L., 5,112,181, Cl. 414-416.000.

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Schulte, Eric F., 5,113,076, Cl. 250-370.060.

Sanuki, Shinji: *See—*
Moriya, Tetsuo; Kondo, Susumu; and Sanuki, Shinji, 5,112,902, Cl. 524-503.000.

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Sakakibara, Megumu; Tanaka, Keiji; and Fujiura, Youji, 5,112,903, Cl. 525-54.200.

Sanyo Electric Co., Ltd.: *See—*
Furukawa, Masahiro; Yoshii, Kazuhiro; and Oonou, Masayuki, 5,111,670, Cl. 62-475.000.
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Addington, Larry C.; Addington, Robert R.; Addington, Larry M.; Lynch, Albert E.; Susla, John; Conley, David L.; Sartaine, John J.; and Price, David E., 5,112,111, Cl. 299-18.000.

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Sasaki, Akira: *See—*
Sunagawa, Makoto; Matsumura, Haruki; Yano, Tsuneo; Sasaki, Akira; and Takata, Shinzi, 5,112,966, Cl. 540-200.000.

Sasaki, Hisao; Maejima, Hideo; and Hotta, Takashi, to Hitachi, Ltd. Data processor providing plural decoders for effecting fast register selection. 5,113,503, Cl. 395-375.000.

Sasaki, Hitoshi, to Endo Kogyo Co., Ltd. Casting fin removing apparatus for aluminum wheel. 5,112,170, Cl. 409-124.000.

Sasaki, Masahiko: *See—*
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Hirota, Osamu; Tsushima, Hideaki; Sasaki, Shinya; Takasaki, Yoshitaka; and Maeda, Minoru, 5,113,524, Cl. 359-115.000.

Sasao, Shigeo: *See—*
Matsushiro, Ryuichi; Kosuda, Toru; Sasao, Shigeo; Ikeya, Taro; Chino, Yoshiharu; and Uekawa, Yasuaki, 5,111,776, Cl. 123-41.540.

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Saito, Tomoji; and Sato, Akira, 5,112,660, Cl. 428-36.800.

Sato, Atsushi; Kawakami, Shigenobu; Endo, Keiji; and Dohi, Hideyuki, to Nippon Petrochemicals Company, Limited. Electric insulating oil composition. 5,113,029, Cl. 585-6.300.

Sato, Hiroshi: *See—*
Imaizumi, Eiki; Usui, Kunihiko; Matsuura, Tatsuji; Tsukada, Toshiro; Ueda, Seiichi; and Sato, Hiroshi, 5,113,090, Cl. 307-355.000.

Sato, Hiroyuki; and Yauchi, Hitoshi, to Alps Electric Co., Ltd. Ink jet head. 5,113,205, Cl. 346-140.00R.

Sato, Keiji, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a continuously variable transmission. 5,112,280, Cl. 474-18.000.

Sato, Masayuki; and Matsuda, Haruyuki, to Kabushiki Kaisha Komatsu Seisakusho. Automatic transmission for hydraulic drive auxiliary speed change gear. 5,111,716, Cl. 74-733.100.

Sato, Naoto, to Sanden Corporation. Coin separator with means for detecting an erroneously separated coin. 5,112,275, Cl. 453-5.000.

Sato, Takumi, to Kabushiki Kaisha Nishiki. Automatic warp threading apparatus. 5,111,560, Cl. 28-204.000.

Sato, Wakao: *See—*
Fukazawa, Nobuyuki; Odate, Makoto; Suzuki, Tsuneji; Otsuka, Kengo; Tsuruo, Takashi; and Sato, Wakao, 5,112,817, Cl. 514-183.000.

Sato, Yoshiaki: *See—*
Masaki, Mitsuo; Uehara, Masaki; Hirate, Kenji; Isowa, Yoshikazu; Sato, Yoshiaki; and Nakashima, Yoshiharu, 5,112,947, Cl. 530-329.000.
Tanaka, Tadashi; Sakamoto, Masaaki; Sato, Yoshiaki; and Kato, Tohru, 5,112,416, Cl. 148-437.000.

Satoh, Kazuo; Sekine, Koichiro; Kakisada, Kou; and Morita, Minoru, to Tsukishima Kikai Co., Ltd. Homogeneous substitution method and apparatus for cake using filter press. 5,112,502, Cl. 210-770.000.

Satou, Youji, to Kabushiki Kaisha Toshiba. Portable apparatus with a structure to secure a printed circuit board to a base unit. 5,113,360, Cl. 364-708.000.

Saturn Corporation: *See—*
Diehl, Rodney A.; Uhrman, Robert L., Jr.; Bishop, Robert G.; and Campbell, Donald B., 5,111,872, Cl. 164-98.000.
Strickland, William W., 5,111,988, Cl. 228-102.000.

Sauer, Joe D.: *See—*
Smith, Kim R.; Borland, James E.; and Sauer, Joe D., 5,113,017, Cl. 564-2.000.

Saunders, J. Palmer; and Kalmaz, Errol E., to Board of Regents, The University of Texas System. Drug to reverse fatty liver and atheromatous lesions. 5,112,827, Cl. 514-263.000.

Sauter, Hubert: *See—*
Wenderoth, Bernd; Sauter, Hubert; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,112,862, Cl. 514-522.000.
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Savery, Winsor. Vacuum apparatus and process for in-situ removing underground liquids and vapors. 5,111,883, Cl. 166-269.000.

Savidan, Henri; and Vachet, Andre, to General Motors France. Dual master cylinder. 5,111,661, Cl. 60-562.000.

Sawada, Makoto: *See—*
Umaba, Takayuki; Ono, Jiro; Takagi, Syunsuke; Sawada, Makoto; Adachi, Hideki; Shimizu, Hirofumi; Hashimoto, Mokuhei; and Takahashi, Tetsu, 5,111,743, Cl. 101-127.000.

Sawada, Renshi; Tanaka, Hidenao; Ohguchi, Osamu; and Shimada, Junichi, to Nippon Telegraph & Telephone Corporation. Encoder in which single light source projects dual beams onto grating. 5,113,071, Cl. 250-237.00G.

Sawada, Tsutomu; Ohhasi, Shinichi; and Yoshida, Shigenobu, to Mitsubishi Kasei Polytec Company. Laminated moistureproof film with silicon oxide core layer. 5,112,673, Cl. 428-216.000.

Sawaya, Frederick J. Replacement eyelet for flexible curtains. 5,111,868, Cl. 160-330.000.

Sayles, David C., to United States of America, America. Method of controlling the increase in potlife of propellants during processing. 5,112,417, Cl. 149-109.600.

Scaringe, Robert P.: *See—*
Parrish, Clyde F.; and Scaringe, Robert P., 5,111,668, Cl. 62-259.300.

Scarr, Robert F.: *See—*
Hunter, James C.; Nardi, John C.; Russell, Edwin T.; and Scarr, Robert F., 5,112,705, Cl. 429-206.000.

Schad, Robert D.; and Brown, Paul, to Husky Injection Molding Systems Ltd. Injection molding process. 5,112,558, Cl. 264-297.200.

Schafer, Christopher E. Self-supporting stacked display and dispenser structure. 5,111,939, Cl. 206-503.000.

Schafer, Dagobert: *See—*
Jaggy, Peter; Krauss, Werner; Schafer, Dagobert; and Wurster, Helmut, 5,111,805, Cl. 128-24.0EL.

Schafer, Lothar: *See—*
Bringmann, Udo; Klages, Claus-Peter; Six, Rolf; and Schafer, Lothar, 5,112,649, Cl. 427-249.000.

Schafer, Ralf; and Wegener, Armin, to U.S. Philips Corporation. Circuit arrangement for supplying a load. 5,113,085, Cl. 307-239.000.

Schaper, Hennie: *See—*
Gosselink, Johan W.; Groeneveld, Lucas R.; and Schaper, Hennie, 5,112,472, Cl. 208-59.000.

Scheer, Dennis: *See—*
Harwath, Frank A.; Regnier, Kent E.; and Scheer, Dennis, 5,112,231, Cl. 439-60.000.

Scherbatskoy, Serge A. Method and apparatus for communicating between spaced locations in a borehole. 5,113,379, Cl. 367-83.000.

Scherer, Thomas: *See—*
Breen, John D.; and Scherer, Thomas, 5,111,951, Cl. 220-23.400.

Schering AG: *See—*
Bressel, Burkhard; Grapentin, Hans-Joachim; and Tessmann, Detlef, 5,112,513, Cl. 252-79.100.

Schering Corporation: *See—*
Hayashida, Kazuhiro; Kitamura, Toshio; and Miyajima, Atsushi, 5,112,961, Cl. 536-27.000.
McCarty, John A., 5,112,616, Cl. 424-435.000.

Schirmann, Peter J.: *See—*
Behrens, Rudolf A.; Winter, Roland A. E.; Mar, Andrew; Schirmann, Peter J.; Seltzer, Raymond; and Malherbe, Roger F., 5,112,890, Cl. 524-95.000.

Schittny, Stephan U.: *See—*
Weigert, Martin; Berchtold, Lorenz; and Schittny, Stephan U., 5,112,468, Cl. 204-298.130.

Schlak, Ottfried; and Wecker, Dieter, to Bayer Aktiengesellschaft. Molded polyurethane plastics, a process for their production and their use as shoe soles. 5,112,874, Cl. 521-51.000.

Schlak, Ottfried: *See—*
Horlacher, Peter; Hahnsen, Heinrich; Grigo, Ulrich; Bushong, William C.; and Schlak, Ottfried, 5,112,925, Cl. 525-474.000.

Schlichtmann, Rainer: *See—*
Schwaben, Hans-Dieter; Schlichtmann, Rainer; Kindler, Hubert; Klaerner, Peter; and Mittnacht, Hans, 5,112,921, Cl. 525-316.000.

Schmetz GmbH & Co KG Unternehmensverwaltung: *See—*
Halek, Werner, 5,112,189, Cl. 415-200.000.

Schmid, Hans-Dieter, to Robert Bosch GmbH. Brush holder for an electrical commutating machine. 5,113,106, Cl. 310-239.000.

Schmid Laboratories, Inc.: *See—*
Morelli, Harold A.; and Lubbs, Eugene K., 5,112,555, Cl. 264-271.100.

Schmidt, Guenther: *See—*
Altmann, Rainer; Lauer, Rainer; Schmidt, Guenther; Stromski, Kasimir; van Zanten, Anton; Hellmann, Harald; Veil, Karl; Fees, Hans-Joerg; Jonner, Wolf-Dieter; and Gutzeit, Reinhard, 5,112,117, Cl. 303-116.00R.

Schmitt, Marcella H. Safety play chair with antipinch handle. 5,112,105, Cl. 297-270.000.

Schnitzler, Raymond: *See—*
Strolle, Christopher H.; Patel, Chandrakant B.; Wedam, Werner F.; Ko, Jung W.; Schnitzler, Raymond; and Yun, Jong K., 5,113,262, Cl. 358-310.000.

Schnyder, Eugen; and Lehmann, Rolf, to Sulzer Escher Wyss AG. Controlled deflection roll. 5,111,566, Cl. 29-116.200.

Schoenleben, Willibald: *See—*
Rath, Hans P.; Mach, Helmut; Oppenlaender, Knut; Schoenleben, Willibald; and Vogel, Hans-Henning, 5,112,364, Cl. 44-418.000.

Schombourg, Jacques J. F. J.: *See—*
Furrer, Willy; and Schombourg, Jacques J. F. J., 5,112,919, Cl. 525-263.000.

Schott Glaswerke: *See—*
Dietl, Steffen, 5,112,376, Cl. 65-29.000.

Schreiber, Alexander R. Dispensing closure for a container. 5,111,967, Cl. 222-39.000.

Schreiber Foods, Inc.: *See—*
Meli, Vincent A.; Matharani, Michael A.; Brzezinski, Ted A.; Shaft, David L.; and Urmanski, James L., 5,112,632, Cl. 426-392.000.

Schreiber, Reinhold: *See—*
Murkett, Stephen; and Schreiber, Reinhold, 5,112,100, Cl. 296-186.000.

Schroeder, Mark S.: *See—*
Tilles, David J.; Wakamiya, Stanley K.; Krein, Bruce A.; Brown, Dale H.; Duggan, Sharon A.; and Schroeder, Mark S., 5,112,042, Cl. 271-297.000.

Schroepfer, David J.; and Podkanski, Tadeusz, to Rogerson Aircraft Corporation. Airplane toilet drain valve assembly. 5,111,839, Cl. 137-242.000.

Schuh, David N., to Beta Machinery Analysis Ltd. Method and apparatus for analyzing the operating condition of a machine. 5,112,196, Cl. 417-63.000.

Schulte, Eric F., to Santa Barbara Research Center. Two terminal multi-band infrared radiation detector. 5,113,076, Cl. 250-370.060.

Schultz, Robert K.: *See—*
Beaurline, Joseph M.; Berge, Stephen M.; and Schultz, Robert K., 5,112,604, Cl. 424-490.000.

Schulz, Guenther: *See—*
Kurtz, Karl-Rudolf; Koch, Horst; and Schulz, Guenther, 5,112,725, Cl. 430-306.000.

Schulz, Robert; Huot, Jean-Yves; and Trudeau, Michel, to Hydro-Quebec. Process for making nanocrystalline metallic alloy powders by high energy mechanical alloying. 5,112,388, Cl. 75-255.000.

Schulze, Everett E., Jr. Automated recycling machine. 5,111,927, Cl. 194-209.000.

Schumann, Herbert: *See—*
Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, 5,112,432, Cl. 156-610.000.

Schutz, Udo. Pallet container. 5,111,937, Cl. 206-386.000.

Schwab, Frederick C.: *See—*
Di Biasi, Daniel J.; and Schwab, Frederick C., 5,111,933, Cl. 206-223.000.

Schwaben, Hans-Dieter; Schlichtmann, Rainer; Kindler, Hubert; Klaerner, Peter; and Mittnacht, Hans, to BASF Aktiengesellschaft. Impact-resistant thermoplastic molding material and its use. 5,112,921, Cl. 525-316.000.

Schwenk, Gerhard: *See—*
Kaule, Wittich; Ilgmann, Wilhelm; Schwenk, Gerhard; and Stenzel, Gerhard, 5,112,672, Cl. 428-209.000.

Science Applications International Corporation: *See—*
Swenson, Donald A., 5,113,141, Cl. 328-233.000.

Scissons, Diane: *See—*
DeSalvo, Stanley A.; and Scissons, Diane, 5,111,599, Cl. 37-2.00R.

Scitex Corporation Ltd.: *See—*
Yosefi, Hanan, 5,113,249, Cl. 358-75.000.

Sclavo S.p.A.: *See—*
Caciagli, Valerio, 5,112,996, Cl. 552-104.000.

Scolavino, Benjamin J.: *See—*
Soprano, Toby L.; Scolavino, Benjamin J.; Caro, Albert N.; and Angione, Robert A., 5,111,938, Cl. 206-386.000.

Scott, Arthur C. Pizza pager signaling process. 5,112,630, Cl. 426-233.000.

Scott, Frank B.: *See—*
Burton, John H.; Berg, Eric P.; Staehle, Bradford G.; and Scott, Frank B., 5,112,306, Cl. 604-101.000.

Scott-Jackson, Dennis; and Skibbe, Harry, to Advanced Gravis Computer Technology Ltd. Switch joystick. 5,113,179, Cl. 340-709.000.

Scott, James D.; and Kropf, Keith G. Dimmer circuit. 5,113,120, Cl. 315-77.000.

Scott, Kevin C., to Eastman Kodak Company. Digital image scaling by stepwise pixel movement. 5,113,455, Cl. 382-47.000.

Scott, Randy W.; and Berg, Richard A., to Incyte Pharmaceuticals. Use of protease nexin-I to mediate wound healing. 5,112,608, Cl. 424-94.640.

Scruggs, Michael G., to Daniels Manufacturing Corporation. Banding tool. 5,111,853, Cl. 140-123.600.

Seagraves, Robert L., to Du Pont de Nemours, E. I., and Company. Manufacture of phthaloyl chlorides. 5,113,016, Cl. 562-856.000.
Sebag, Henri; and Semeria, Didier, to L'Oreal. Alkyl esters of N-carboalkyloxy amino-11-undecanoic acids, their use as thickening agents. 5,112,601, Cl. 424-61.000.
Sebring Forest Industries, Inc.: *See*—
MacIsaac, John E.; and MacIsaac, Mark K., 5,112,365, Cl. 44-576.000.
Seddon, Richard I.; and Temple, Michael D., to Optical Coating Laboratory, Inc. Horizontal precession tooling and method for tube rotation. 5,112,644, Cl. 427-38.000.
See, Yee-Chaung: *See*—
Wilson, Syd R.; Liang, Han-Bin K.; Zirkle, Thomas; and See, Yee-Chaung, 5,112,772, Cl. 437-67.000.
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Soprano, Toby L.; Scolavino, Benjamin J.; Caro, Albert N.; and Angione, Robert A., 5,111,938, Cl. 206-386.000.
Seibert, Gerhard: *See*—
Chatterjee, Sukumar; Chatterjee, Sugata; Ganguli, Bimal N.; Chatterjee, Deepak K.; Jani, Rajendra K. H.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; Kogler, Herbert; Seibert, Gerhard; and Teetz, Volker, 5,112,806, Cl. 514-9.000.
Seiffert, Hartmut: *See*—
Weisenburger, Siegfried; Grunewald, Wolfgang; and Seiffert, Hartmut, 5,112,378, Cl. 65-327.000.
Seiko Epson Corporation: *See*—
Miyazawa, Yoshinori; Omae, Hidenori; Ishii, Takayuki; Koto, Haruhiko; and Akahane, Fujio, 5,113,204, Cl. 346-140.00R.
Sakamoto, Kenji; Maruyama, Akihiko; Moriya, Tatsuo; Yabe, Hiroshi; Kawaguchi, Takashi; and Yoshino, Masato, 5,113,381, Cl. 368-74.000.
Shimura, Hidetsugu; and Ito, Hiroshi, 5,112,710, Cl. 430-46.000.
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Hibi, Yoshiharu; and Seki, Masao, 5,113,248, Cl. 358-75.000.
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Satoh, Kazuo; Sekine, Koichiro; Kakisada, Kou; and Morita, Minoru, 5,112,502, Cl. 210-770.000.
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Selnick, Harold G.: *See*—
Baldwin, John J.; Selnick, Harold G.; Ponticello, Gerald S.; Remy, David C.; Claremon, David A.; and Elliott, Jason M., 5,112,824, Cl. 514-253.000.
Seltzer, Raymond: *See*—
Behrens, Rudolf A.; Winter, Roland A. E.; Mar, Andrew; Schirmann, Peter J.; Seltzer, Raymond; and Malherbe, Roger F., 5,112,890, Cl. 524-95.000.
Semeria, Didier: *See*—
Sebag, Henri; and Semeria, Didier, 5,112,601, Cl. 424-61.000.
Senbokuya, Haruo: *See*—
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; and Minato, Teruo, 5,112,030, Cl. 266-256.000.
Seneca Sports Inc.: *See*—
Pratt, Kenneth W., 5,112,062, Cl. 273-420.000.
Senff, Elke: *See*—
von Wedel, Wedigo; Senff, Elke; and Helmling, Oswald, 5,112,587, Cl. 423-235.000.
Senger, Phillip L.; and Becker, Willard C., to Washington State University Research Foundation, Inc. Estrous detection systems. 5,111,799, Cl. 128-738.000.
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Sennett, Paul: *See*—
Brown, Steven A.; and Sennett, Paul, 5,112,782, Cl. 501-144.000.
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DiDonato, Russell; and Servet, Enn, 5,111,742, Cl. 101-40.000.
Sertich, Anthony T. Motive force combustion products generator and method. 5,111,654, Cl. 60-39.800.
Sesholtz, Debra A.: *See*—
Whitehouse, Craig M.; Whitehouse, Glenn P.; and Sesholtz, Debra A., 5,112,575, Cl. 422-116.000.
Setani, Michitaka: *See*—
Nakai, Takehiko; and Setani, Michitaka, 5,113,067, Cl. 250-208.100.
Sewon, Pentti K. Reusable brine for conserving cucumber. 5,112,639, Cl. 426-654.000.
Sferlazzo, Piero, to Eaton Corporation. Ion beam potential detection probe. 5,113,074, Cl. 250-492.200.
SGS-Thomson Microelectronics, Inc.: *See*—
Bond, Robert H.; Olla, Michael A.; Morrison, Barry; and Garrison, Linn C., 5,111,935, Cl. 206-329.000.
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Bozzini, Pieramedeo; and Marchisi, Giuseppe, 5,113,240, Cl. 357-70.000.
Cini, Carlo; Massironi, Angelo; and Sisti, Luigi, 5,113,239, Cl. 357-68.000.
Raciti, Salvatore; and Palara, Sergio, 5,113,305, Cl. 361-92.000.
Shackle, Peter W.: *See*—
Arnold, Emil; Merchant, Steven L.; and Shackle, Peter W., 5,113,236, Cl. 357-41.000.
Shackleton System Drives Corporation: *See*—
Howes, Nicholas J., 5,113,398, Cl. 371-11.200.
Shaffer, Howard R.: *See*—
Rudy, William J., Jr.; and Shaffer, Howard R., 5,112,247, Cl. 439-571.000.
Shaft, David L.: *See*—
Meli, Vincent A.; Matharani, Michael A.; Brzezinski, Ted A.; Shaft, David L.; and Urmanski, James L., 5,112,632, Cl. 426-392.000.
Shah, Manoj R.: *See*—
Shih, True T.; Shah, Manoj R.; and Archibald, James B., 5,113,114, Cl. 310-270.000.
Shanahan, John: *See*—
Baumgartner, Mark F.; Tolbert, William R.; and Shanahan, John, 5,112,760, Cl. 435-240.242.
Sharaby, Zaev, to B. F. Goodrich Company, The. Mercaptan chain transfer agent compositions useful in aqueous polymerizations. 5,112,522, Cl. 252-182.300.
Sharp, Fraser R.: *See*—
Novacek, Laurel A.; Sharp, Fraser R.; and McLean, Donald A., 5,112,318, Cl. 604-240.000.
Sharp Kabushiki Kaisha: *See*—
Deguchi, Masanobu, 5,113,225, Cl. 355-235.000.
Inui, Tetsuya; Hirokane, Junji; Shibata, Akira; Nagahara, Yoshiyuki; and Ohta, Kenji, 5,112,727, Cl. 430-321.000.
Kitagawa, Masahiko; and Tomomura, Yoshitaka, 5,113,233, Cl. 357-17.000.
Komatsu, Koji; Yoshida, Shinichi; Miyata, Souichi; and Azuma, Daisuke, 5,113,339, Cl. 395-200.000.
Obata, Masao; Arima, Masaki; and Taniguchi, Kouki, 5,112,262, Cl. 445-24.000.
Ogura, Mitsuru, 5,113,212, Cl. 355-27.000.
Sudoh, Kengo; and Ii, Hiroshi, 5,113,295, Cl. 360-49.000.
Yoshikawa, Syuuichi, 5,113,142, Cl. 329-306.000.
Sharpless, K. Barry; and Gao, Yun, to Massachusetts Institute of Technology. Ruthenium-catalyzed production of cyclic sulfates. 5,112,990, Cl. 549-34.000.
Shaub, Harold; Brownawell, Darrell W.; and DiBenedetto, Arthur, to Exxon Research and Engineering Company. Filter for removing hydroperoxides from lubricating oils. 5,112,482, Cl. 210-209.000.
Sheaffer, Benjamin L.: *See*—
Corbett, William D.; and Sheaffer, Benjamin L., 5,111,869, Cl. 164-45.000.
Sheaffer, Michael J.: *See*—
Holdgrafer, William J.; Sheaffer, Michael J.; and Levine, Lee R., 5,111,989, Cl. 228-110.000.
Sheehan, Neil J.: *See*—
Utterberg, David S.; and Sheehan, Neil J., 5,112,311, Cl. 604-177.000.
Shekleton, Jack R., to Sundstrand Corporation. Single wall combustor assembly. 5,111,655, Cl. 60-39.360.
Sheldahl Inc.: *See*—
Swisher, Richard L., 5,112,462, Cl. 205-165.000.
Sheldon, William D., III: *See*—
Koetzle, A. Richard, 5,112,516, Cl. 252-162.000.
Shell Oil Company: *See*—
Baker, Daniel C., 5,112,586, Cl. 423-220.000.
Gosselink, Johan W.; Groeneveld, Lucas R.; and Schaper, Hennie, 5,112,472, Cl. 208-59.000.
Liu, Chih-hsiung F., 5,112,366, Cl. 48-210.000.
Moore, Boyd B., 5,111,547, Cl. 15-187.000.
Stewart, Steven L., 5,112,206, Cl. 425-114.000.
Wang, Pen-Chung, 5,112,938, Cl. 525-272.000.
Sheng, Zhengzhi: *See*—
Hermann, Allen M.; and Sheng, Zhengzhi, 5,112,800, Cl. 505-1.000.
Shepard, Dennis D.: *See*—
Civerchia, Linda; and Shepard, Dennis D., 5,112,350, Cl. 623-5.000.
Shepherd, Robin G.: *See*—
Crossley, Roger; Opalko, Albert; and Shepherd, Robin G., 5,112,832, Cl. 514-299.000.
Sheppard, Clyde H.: *See*—
Lubowitz, Hyman R.; and Sheppard, Clyde H., 5,112,939, Cl. 528-289.000.
Sheppard, William A., Jr. Oil fill tube insert. 5,111,910, Cl. 184-1.500.
Sheridan, William M.; and Ragland, Raymond E., to ATD Corporation. Pad including heat sink and thermal insulation areas. 5,111,577, Cl. 29-890.039.
Sherrill, Dan: *See*—
Pendergraft, Gordon M.; Pendergraft, John R.; and Sherrill, Dan, 5,112,661, Cl. 428-36.910.
Sherwood, David E., Jr.: *See*—
Dai, Pei-Shing E.; and Sherwood, David E., Jr., 5,112,473, Cl. 208-120.000.
Shibata, Akira: *See*—
Inui, Tetsuya; Hirokane, Junji; Shibata, Akira; Nagahara, Yoshiyuki; and Ohta, Kenji, 5,112,727, Cl. 430-321.000.

Shibata, Eiji; and Ono, Mototsugu, to Brother Kogyo Kabushiki Kaisha. Automatic winding mechanism for a continuous sheet and the like. 5,112,002, Cl. 242-57.000.
Shibata, Hirohumi: *See*—
Kato, Hideo; Shibata, Hirohumi; Matsushita, Keiko; and Takamatsu, Osamu, 5,112,707, Cl. 430-5.000.
Shibata, Yasuhisa; Oki, Naoto; Ozawa, Satoshi; and Miyagi, Hiroyuki, to Hitachi, Ltd. Ion selective electrode. 5,112,471, Cl. 204-418.000.
Shibayama, Takashi: *See*—
Takeuchi, Jun; Shibayama, Takashi; and Iida, Masahiro, 5,111,717, Cl. 74-866.000.
Shibue, Masatsune: *See*—
Watanabe, Toshiaki; Shibue, Masatsune; Matsubayashi, Hiroshi; and Komatsu, Ikuo, 5,112,695, Cl. 428-458.000.
Shiga, Kiyotaka; Fukui, Akio; Ryu, Akiomi; and Okuno, Katsumi, to Fuji Seiko Corporation. High speed burnishing drill. 5,112,167, Cl. 408-211.000.
Shigematsu, Toshifumi: *See*—
Hiruta, Yoshiki; Tsukamura, Naoki; Uchimura, Yoshinobu; Shigematsu, Toshifumi; Yamasaki, Hironori; and Yamaguchi, Toshio, 5,111,539, Cl. 4-661.000.
Shih, I-Fu: *See*—
Chang, David B.; Moise, Norton L.; and Shih, I-Fu, 5,112,121, Cl. 359-15.000.
Shih, True T.; Shah, Manoj R.; and Archibald, James B., to General Electric Company. Multilam or belleville spring contact for retaining rings on dynamoelectric machine. 5,113,114, Cl. 310-270.000.
Shikanai, Yasushi, to Shikanai, Yasushi; Toho Seisakusho Co., Ltd.; and Japan International Development Organization Ltd. Process and device for improving combustion efficiency of a combustion machine. 5,111,797, Cl. 123-539.000.
Shimada, Akira: *See*—
Tadokoro, Hiroyuki; Wakamatsu, Kazuhiro; Sagae, Syoji; and Shimada, Akira, 5,113,226, Cl. 355-273.000.
Shimada, Junichi: *See*—
Sawada, Renshi; Tanaka, Hidenao; Ohguchi, Osamu; and Shimada, Junichi, 5,113,071, Cl. 250-237.00G.
Shimada, Morihiro: *See*—
Kawashima, Tsunenori; Shimada, Morihiro; and Fujii, Hiroshi, 5,111,585, Cl. 33-203.120.
Shimazaki, Kazuo: *See*—
Itani, Akira; and Shimazaki, Kazuo, 5,113,402, Cl. 372-22.000.
Shimazaki, Osamu: *See*—
Kimura, Hideaki; and Shimazaki, Osamu, 5,113,456, Cl. 382-54.000.
Shimirak, Gerald L.; and Messner, Darcey L., to Raychem Corporation. Telecommunications terminal block and terminal. 5,112,245, Cl. 439-412.000.
Shimizu Construction Co., Ltd.: *See*—
Takishima, Seiji; Hirosawa, Yuji; Takada, Hiromitsu; and Takagi, Fumito, 5,111,612, Cl. 47-60.000.
Shimizu, Hirofumi: *See*—
Umaba, Takayuki; Ono, Jiro; Takagi, Syunsuke; Sawada, Makoto; Adachi, Hideki; Shimizu, Hirofumi; Hashimoto, Mokuhei; and Takahashi, Tetsu, 5,111,743, Cl. 101-127.000.
Shimizu, Tomoyasu; Aoki, Yuichi; and Kawakita, Shinya, to Nippon Sheet Glass Co., Ltd. Magnetic recording medium having a coupling agent disposed between a protective layer and a lubricating layer. 5,113,302, Cl. 360-135.000.
Shimizu, Toshihide: *See*—
Inouye, Yoshio; Inoue, Takeo; Shimizu, Toshihide; and Kaneko, Ichiro, 5,112,682, Cl. 428-353.000.
Shimizu, Toshihiko; Hotta, Masao; and Moritani, Atsushi, to Hitachi Medical Corporation. Radiation detection circuit having a signal integrating capacitor, and a data aquisition system for an X-ray scanner including such circuit. 5,113,077, Cl. 250-370.110.
Shimokobe, Jiro: *See*—
Shimoma, Taketoshi; Kamohara, Eiji; and Shimokobe, Jiro, 5,113,112, Cl. 313-412.000.
Shimoma, Taketoshi; Kamohara, Eiji; and Shimokobe, Jiro, to Kabushiki Kaisha Toshiba. Color cathode ray tube apparatus. 5,113,112, Cl. 313-412.000.
Shimura, Hidetsugu; and Ito, Hiroshi, to Seiko Epson Corporation. Electrophotographic image forming method. 5,112,710, Cl. 430-46.000.
Shimura, Takaki: *See*—
Hayashi, Hajime; Igarashi, Yutaka; Hayashi, Takehiko; Shimura, Takaki; and Kawabe, Kenji, 5,113,136, Cl. 324-247.000.
Shin Caterpillar Mitsubishi Ltd.: *See*—
Moriya, Naoyuki; and Sameshima, Makoto, 5,111,789, Cl. 123-357.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Hamada, Yoshitaka; and West, Robert, 5,113,002, Cl. 556-431.000.
Inoue, Yoshio; Arai, Masatoshi; and Fujiki, Hironao, 5,112,885, Cl. 523-213.000.
Inouye, Yoshio; Inoue, Takeo; Shimizu, Toshihide; and Kaneko, Ichiro, 5,112,682, Cl. 428-353.000.
Yanagisawa, Hideyoshi; and Yamaya, Masaaki, 5,113,004, Cl. 556-440.000.
Shinanen New Ceramic Corporation: *See*—
Fujiwara, Goro; Masuda, Mitsunobu; Shiraishi, Masanori; and Matsumoto, Nobuya, 5,112,486, Cl. 210-416.100.
Shinkai, Tatsuya: *See*—
Kaku, Shinji; and Shinkai, Tatsuya, 5,111,781, Cl. 123-90.160.
Shinkai, Yuji: *See*—
Inaishi, Kouji; Yoshimura, Chisato; and Shinkai, Yuji, 5,113,471, Cl. 385-126.000.
Shinmura, Yasushi, to Sumitomo Rubber Industries, Ltd. Tire and rim combination. 5,111,865, Cl. 152-542.000.
Shinozaki, Fumihiko; and Yokoyama, Yutaka, to Nippon Chemi-Con Corporation. Electrolyte for electrolytic capacitor. 5,112,511, Cl. 252-62.200.
Shinozuka, Akira: *See*—
Ueji, Kazufumi; Motoki, Yoshihiro; and Shinozuka, Akira, 5,112,888, Cl. 523-443.000.
Shionogi & Co., Ltd.: *See*—
Sugita, Kenji; Itazaki, Hiroshi; Matsumoto, Koichi; and Kawamura, Yoshimi, 5,112,944, Cl. 530-321.000.
Shiosaka, Sadao; Kohno, Johji; Kiyama, Hiroshi; Tohyama, Masaya; and Shiotani, Yahe. Method of producing antibodies using colloidal metal as carrier. 5,112,606, Cl. 530-389.200.
Shiotani, Yahe: *See*—
Shiosaka, Sadao; Kohno, Johji; Kiyama, Hiroshi; Tohyama, Masaya; and Shiotani, Yahe, 5,112,606, Cl. 530-389.200.
Shiozaki, Atsushi: *See*—
Takagi, Hiroshi; and Shiozaki, Atsushi, 5,113,203, Cl. 346-140.00R.
Shipley Company Inc.: *See*—
Goldberg, Robert L., 5,112,434, Cl. 156-628.000.
Shipping Systems, Inc.: *See*—
Langston, Lonnie W., 5,111,838, Cl. 137-223.000.
Shiraishi, Masanori: *See*—
Fujiwara, Goro; Masuda, Mitsunobu; Shiraishi, Masanori; and Matsumoto, Nobuya, 5,112,486, Cl. 210-416.100.
Shirasu, Tetsuo: *See*—
Yamashita, Osamu; Takahashi, Eiji; Nishizawa, Takeshi; Takada, Hidekazu; and Shirasu, Tetsuo, 5,113,108, Cl. 310-328.000.
Shircliff, Michael W.: *See*—
Chan, Wai-Kwong; Allsopp, Mary F.; McGuire, Kevin T.; Nonnemann, Robert W.; Obrecht, Gordon A.; Saluski, Ronald B.; Trchka, James A.; Viebach, Hans J.; Brandt, Peter A.; Butler, Robert R.; Shircliff, Michael W.; Walker, Samuel A.; and Miller, Thomas R., 5,112,179, Cl. 412-1.000.
Shirota Denki Rozai Kabushiik Kaisha: *See*—
Shirota, Kazunari, 5,112,224, Cl. 433-27.000.
Shirota, Kazunari, to Shirota Denki Rozai Kabushiik Kaisha. Dental detection apparatus for position of root apex. 5,112,224, Cl. 433-27.000.
Shkolnik, Alexander: *See*—
Epshetsky, Yefim; Belenky, Garry; and Khlevner, Boris, 5,111,543, Cl. 5-424.000.
Shoenhair, John J.; and Kallevig, Bruce E., to Loram Maintenance of Way, Inc. Method and apparatus for limiting the dispersion of rail grinding machine spark and dust residue. 5,111,624, Cl. 51-178.000.
Shudo, Tuyosi: *See*—
Miyajima, Goh; Takahashi, Takao; Shudo, Tuyosi; and Suzuki, Shohei, 5,113,166, Cl. 335-299.000.
Shukla, Yagya: *See*—
Krishnamurthy, Ramachandran; Lerner, Steven L.; Shukla, Yagya; and Stokley, Alan G., 5,112,590, Cl. 423-415.00A.
Shukuri, Shoji: *See*—
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, 5,113,072, Cl. 250-309.000.
Shuto, Katsuichi: *See*—
Kinoshita, Iwao; Machii, Daisuke; Onoda, Yasuo; Takai, Haruki; Kasaka, Nobuo; Shuto, Katsuichi; Gomi, Katsushige; Morimoto, Makoto; and Ishii, Akio, 5,112,867, Cl. 514-617.000.
Shutske, Gregory M.; Kapples, Kevin J.; and Tomer, John D., IV, to Hoechst-Roussel Pharmaceuticals Inc. Hexahydro-1H-quino[4,3,2-ef][1,4]benzoxazepines and related compounds. 5,112,829, Cl. 514-290.000.
Shutske, Gregory M.; and Effland, Richard C., to Hoechst-Roussel Pharmaceuticals Inc. Fused heteroalkylene quinolinamines. 5,112,830, Cl. 514-291.000.
Sicotte, Louis T.: *See*—
Ridley, Stephen F.; and Sicotte, Louis T., 5,111,558, Cl. 24-715.300.
Siemens Aktiengesellschaft: *See*—
Hose, Fritz; and Reuss, Thomas, 5,113,040, Cl. 174-116.000.
Hums, Erich; and Spitznagel, Gunther, 5,112,794, Cl. 502-309.000.
Ideler, Karl-Heinz; Nowak, Stefan; and Petzold, Gunter, 5,113,145, Cl. 330-251.000.
Pascher, Helmut, 5,113,276, Cl. 359-117.000.
Stengl, Reinhard, 5,113,237, Cl. 357-53.000.
Siemens Automotive L.P.: *See*—
DeGrace, Louis G., Jr., 5,111,794, Cl. 123-470.000.
Siemens Communication Systems, Inc.: *See*—
McNesby, John B., 5,113,417, Cl. 375-116.000.
Sigai, A. Gary; and Klinedinst, Keith A., to GTE Laboratories Incorporated. Phosphors with improved lumen output and lamps made therefrom. 5,113,118, Cl. 313-486.000.
Sigler, Kent K., to RobertShaw Controls Company. Burner construction, igniter assembly therefor and methods of making the same. 5,112,218, Cl. 431-266.000.
Silicon Graphics, Inc.: *See*—
Winget, James M., 5,113,490, Cl. 395-119.000.
Silicon Technology Corporation: *See*—
Steere, Robert E., Jr., 5,111,622, Cl. 51-5.00C.
Silver, Jerry: *See*—
Warfield, Donald; and Silver, Jerry, 5,112,409, Cl. 136-256.000.
Silvestri, George J., Jr.: *See*—
Davids, Joseph; and Silvestri, George J., Jr., 5,112,187, Cl. 415-169.300.

Silvestrini, Bruno: *See—*
Baiocchi, Leandro; and Silvestrini, Bruno, 5,112,986, Cl. 548-372.000.
Silvis, H. Craig: *See—*
Kester, John J.; and Silvis, H. Craig, 5,112,934, Cl. 528-99.000.
Simison, Paul, to Honeywell Inc. Air dryer using ambient cold. 5,112,010, Cl. 244-129.100.
Simmons, Elex M.; and Houser, William E. Camera stabilizing device. 5,111,983, Cl. 224-258.000.
Simmons, James M., Jr.: *See—*
Kellogg, David L.; Simmons, James M., Jr.; Bachman, Michael S.; and Avitan, Isaac, 5,113,344, Cl. 364-424.040.
Simon, Georges: *See—*
Marcon, Joel; Montet, Evelyne; Gobet, Didier; Ferrand, Guy; Pochard, Patrick; and Simon, Georges, 5,111,732, Cl. 89-135.000.
Simon, Jean-Claude, to L'Etat Francais represente par le Ministre des Postes et Telecommunications Centre National d'Etudes des Telecommunications. Character recognition method and apparatus. 5,113,453, Cl. 382-24.000.
Simon, Mark A.; and Butler, George W., to Olin Corporation. Arcjet nozzle having improved electrical-to-thrust conversion efficiency and high voltage operation. 5,111,656, Cl. 60-203.100.
Simpfendorfer, Dieter; Weil, Walter; and Dao-Xuan, Phon, to Diskus Werke Frankfurt am Main Aktiengesellschaft. Machine for contour grinding outside peripheral surfaces of workpieces. 5,111,625, Cl. 51-267.000.
Simpson, Jack R.; and Geer, Jeffrey A., to Container Graphics Corporation. Scrap ejector for rotary die cutting apparatus. 5,111,725, Cl. 83-117.000.
Simson, Anton K. Panoramic rearview mirror with an elongated adjustable support. 5,113,292, Cl. 359-851.000.
Singer, Norman S.: *See—*
Tang, Pamela S.; Singer, Norman S.; and Chang, Hsien-Hsin, 5,112,956, Cl. 530-424.000.
Singh, Deborah L.: *See—*
Buxton, Ian R.; Malkowska, Sandra T. A.; Prater, Derek A.; Singh, Deborah L.; Leslie, Stewart T.; and Miller, Ronald B., 5,112,515, Cl. 252-106.000.
Singman, Charles N.: *See—*
Letsinger, Robert L.; and Singman, Charles N., 5,112,962, Cl. 536-27.000.
Sinor, L. Allen; and Warren, Tommy M. Imbalance compensated drill bit with hydrostatic bearing. 5,111,892, Cl. 175-65.000.
Sircar, Jagadish C.: *See—*
Belliotti, Thomas R.; Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; Kramer, James B.; and Sircar, Jagadish C., 5,112,846, Cl. 514-415.000.
Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; and Sircar, Jagadish C., 5,112,868, Cl. 514-618.000.
Sires, Bryan S., to Northwestern University. Bone allograft material and method. 5,112,354, Cl. 623-16.000.
Sirti S.p.A.: *See—*
Nodari, Abramo, 5,113,463, Cl. 385-60.000.
Sirvet, Enn: *See—*
DiDonato, Russell; and Sirvet, Enn, 5,111,742, Cl. 101-40.000.
Sisti, Luigi: *See—*
Cini, Carlo; Massironi, Angelo; and Sisti, Luigi, 5,113,239, Cl. 357-68.000.
Sitzler, Hans-Dietrich: *See—*
Gerhardt, Klaus; and Sitzler, Hans-Dietrich, 5,112,431, Cl. 156-583.500.
Siwiak, Kazimierz: *See—*
Ponce de Leon, Lorenzo A.; Siwiak, Kazimierz; and Goldenberg, Michael P., 5,113,196, Cl. 343-744.000.
Six, Rolf: *See—*
Bringmann, Udo; Klages, Claus-Peter; Six, Rolf; and Schafer, Lothar, 5,112,649, Cl. 427-249.000.
Skanberg, Enar T.: *See—*
Haland, Lars Y.; and Skanberg, Enar T., 5,112,079, Cl. 280-730.000.
Skarsfeldt, Torben: *See—*
Perregaard, Jens; and Skarsfeldt, Torben, 5,112,838, Cl. 514-323.000.
Skibbe, Harry: *See—*
Scott-Jackson, Dennis; and Skibbe, Harry, 5,113,179, Cl. 340-709.000.
Skinner, Timothy J., to General Motors Corporation. Refrigerant compressor having variable restriction pressure pulsation attenuator. 5,112,198, Cl. 417-269.000.
Skutnik, Bolesh J.; and Brielmann, Harry L., Jr., to Ensign-Bickford Optics Company. Coating compositions for glass containers. 5,112,658, Cl. 428-34.600.
Slack, Michael P.: *See—*
Woods, Ralf D.; Slack, Michael P.; and Gerst, Kenneth M., 5,113,399, Cl. 371-21.300.
Slaney, Paul; and Grinderslev, Soren, to Optical Fiber Technologies, Inc. Method and apparatus for mechanical connector assembly. 5,113,474, Cl. 385-136.000.
Slattery, William H.: *See—*
Murphy, Robert A.; Syler, Rodney R.; and Slattery, William H., 5,113,480, Cl. 392-501.000.
Slevin, Leonard; and Hickman, Mark S., to Hewlett-Packard Company. Plain paper inks. 5,112,399, Cl. 106-22.000.
Sloan-Kettering Institute For Cancer Research: *See—*
Watanabe, Kyoichi A.; Su, Tsann-Long; and Huang, Jai-Tung, 5,112,869, Cl. 514-641.000.
Slovenska akademia vied: *See—*
Benes, Ludek; NosaLova, Viera; and Babulova, Anna, 5,112,850, Cl. 514-428.000.
Smallwood, John M.; and Custer, William A., to Detroit Institute for Children, The. Augmentive communications system and method. 5,113,481, Cl. 395-2.000.
Smart, David C.: *See—*
Stoneham, Jeffrey R.; and Smart, David C., 5,113,208, Cl. 354-105.000.
Smathers, David B., to Teledyne Industries, Inc. Method and apparatus for producing superconducting joints. 5,111,574, Cl. 29-599.000.
SMB Schwede Maschinenbau: *See—*
Rauch, Wilhelm, 5,111,634, Cl. 53-176.000.
Smeltzer, Paul: *See—*
Rothermel, John; and Smeltzer, Paul, 5,111,917, Cl. 188-319.000.
Smit, Nicolaas J.: *See—*
Cozzette, Stephen N.; Davis, Graham; Holleritter, Lisa A.; Lauks, Imants R.; Piznik, Sylvia; Smit, Nicolaas J.; Tirinato, Jody A.; Wieck, Henry J.; and Zelin, Michael P., 5,112,455, Cl. 204-153.120.
Smith, Charles A.: *See—*
McCain, James H.; King, Stephen W.; Knopf, Robert J.; Smith, Charles A.; and Hauser, Charles F., 5,112,789, Cl. 502-162.000.
Smith, Earl B.: *See—*
Mainz, Eric L.; Beard, William Q., Jr.; Hirschmann, Robert P.; Little, Barry M.; and Smith, Earl B., 5,113,027, Cl. 570-224.000.
Smith, James I. H., executor: *See—*
Parker, John C., deceased; Francis, David, executor; and Smith, James I. H., executor, 5,113,069, Cl. 250-227.110.
Smith, John W.: *See—*
Cardew, Peter T.; and Smith, John W., 5,112,892, Cl. 524-108.000.
Smith, Kim R.; Borland, James E.; and Sauer, Joe D., to Ethyl Corporation. Process for treating tertiary amines. 5,113,017, Cl. 564-2.000.
Smith Kline & French Laboratories: *See—*
Jaxa-Chamiec, Albert A.; and Hickey, Deirdre M. B., 5,112,922, Cl. 525-332.200.
Smith, Rick D.: *See—*
Reiter, John T.; Ellis, David M.; Smith, Rick D.; and Leach, Roger D., 5,111,908, Cl. 182-92.000.
Smith, Roger R., to United States of America, Army. Tow bar assembly. 5,112,074, Cl. 280-483.000.
Smith, Steve. Harmonic currents isolating network. 5,113,335, Cl. 363-44.000.
Smith, Todd A.: *See—*
Johnson, Donavon W.; Morgan, Stephen P.; and Smith, Todd A., 5,113,519, Cl. 395-600.000.
Smiths Industries Public Limited Company: *See—*
Baker, Peter D., 5,113,468, Cl. 385-100.000.
Baker, Peter D., 5,113,475, Cl. 385-138.000.
Taylor, Robert M., 5,113,458, Cl. 385-11.000.
Smits, Karel F. A. A., to Medtronic, Inc. Cardioversion and defibrillation lead system with electrode extension into the coronary sinus and great vein. 5,111,811, Cl. 128-419.00D.
Sneed, Michael R.: *See—*
Henry, Randall R.; and Sneed, Michael R., 5,112,249, Cl. 439-581.000.
Snow Brand Milk Products Co., Ltd.: *See—*
Aoe, Seiichiro; Oda, Taishi; Nakaoka, Masanori; and Kurosawa, Seiji, 5,112,964, Cl. 536-56.000.
Suzuki, Akira; Itagaki, Yasuharu; and Higashio, Kanji, 5,112,754, Cl. 435-212.000.
Snow, Richard R.: *See—*
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Winkler, Duane K.; and Olson, Daniel H., 5,112,323, Cl. 604-319.000.
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Ciboldi, Moreno; and Maregatti, Ugo, 5,111,571, Cl. 29-407.000.
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Farineau, Jacques, 5,112,009, Cl. 244-75.00R.
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Martin, Jean-Paul; and Moisand, Jean-Claude, 5,112,236, Cl. 439-86.000.
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Lenfant, Maryse; and Thierry, Josiane, 5,112,811, Cl. 514-17.000.
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Habermann, Helmut; and Jolivet, Jean, 5,111,697, Cl. 73-668.000.

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Renard, Andre J. J., 5,112,753, Cl. 435-5.000.
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Baralle, Denis L., 5,111,856, Cl. 141-230.000.
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Hivert, Michel; and Coleno, Raymond, 5,111,657, Cl. 60-224.000.
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Soderstrom, Jan R.; and McGill, Thomas C., to California Institute of Technology. Quantum-effect semiconductor devices. 5,113,231, Cl. 357-16.000.
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Warfield, Donald; and Silver, Jerry, 5,112,409, Cl. 136-256.000.
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Hoffman, Philip K.; and Frey, Douglas R., 5,113,127, Cl. 320-21.000.
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Nichels, William; and d'Oultremont, Philippe, 5,112,865, Cl. 514-546.000.
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Ueji, Kazufumi; Motoki, Yoshihiro; and Shinozuka, Akira, 5,112,888, Cl. 523-443.000.
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Ho, Ying-Wai; Harrod, Peter L.; and Someshwar, Ashok H., 5,113,364, Cl. 364-757.000.
Someya, Ryouichi: *See—*
Ikegami, Masakazu; and Someya, Ryouichi, 5,113,105, Cl. 310-233.000.
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Evreux, Gerard; and Camps, Didier, 5,111,925, Cl. 192-141.000.
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Boeck, Alexander; Niebaum, Eckhard; Sommer, Walter; and Sparenberg, Guenter, 5,111,855, Cl. 141-83.000.
Song, Young W., to Goldstar Electron Co., Ltd. Feed-back type emphasis circuit. 5,113,144, Cl. 330-85.000.
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Asada, Takafumi; Morimoto, Masato; and Sonoda, Takashi, 5,112,141, Cl. 384-100.000.
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Chatani, Masayuki; Yoshida, Kimiyoshi; Sakano, Akio; and Tamori, Hirofumi, 5,113,452, Cl. 382-13.000.
Fukushima, Hideo; and Kurushima, Masakazu, 5,113,298, Cl. 360-108.000.
Ikeda, Yoshito; Narisawa, Hiroaki; and Wakabayashi, Noboru, 5,113,300, Cl. 360-126.000.
Watanabe, Hidetoshi; Suzuki, Hirotsugu; and Yamamoto, Masanobu, 5,112,205, Cl. 425-111.000.
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Soper, Sara. Shelf-mounted magnifying glass. 5,113,289, Cl. 359-811.000.
Soprano, Toby L.; Scolavino, Benjamin J.; Caro, Albert N.; and Angione, Robert A., to Segri-Gator Associates L.P. Solid waste container. 5,111,938, Cl. 206-386.000.
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Petersen, Frede H., deceased; and Sorensen, Kaj A., 5,112,269, Cl. 452-5.000.
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Warunek, Stephen P.; and Sorensen, Soren E., 5,112,640, Cl. 427-2.000.
Sorge, Joseph A.; and Sylvester, Keith V., to Stratagene Cloning Systems. Apparatus and method for transfer of macromolecules. 5,112,459, Cl. 204-180.100.
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Campisi, Isidoro E., 5,113,160, Cl. 333-22.00R.
Southern California Edison Company: *See—*
Cooper, David E.; and Houy, Thomas J., 5,113,131, Cl. 324-96.000.
Sowers, Henry K.: *See—*
Brink, Edward C., Jr.; Henderson, Clifton C.; Whiteman, James R.; and Sowers, Henry K., 5,112,509, Cl. 252-56.00R.
Sowers, Ricky R. Pole support apparatus having tank base. 5,112,023, Cl. 248-519.000.
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Patron, Christian S. A. E.; and Sowinski, Eugene J., 5,113,157, Cl. 331-167.000.
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Lorr, David, 5,112,745, Cl. 435-38.000.
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Luh, Howard H. S., 5,113,197, Cl. 343-776.000.
Spaeth, Ronald A. Combination coin and mileage minder. 5,112,276, Cl. 453-54.000.
Spahn, James G.; Langley, Steven P.; and Jacobs, Michael L., to EHOB Inc. Back belt. 5,111,807, Cl. 606-244.000.
Spain, Raymond G.; and DeGrood, Susan M., to Airfoil Textron Inc. Composite preforms and articles and methods for their manufacture. 5,112,545, Cl. 264-103.000.
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Guon, Jerold; Grantham, LeRoy F.; and Specht, Eugene R., 5,112,534, Cl. 252-640.000.
Specialty Cable Corp.: *See—*
Srubas, Robert C.; and Rowe, William M., Jr., 5,113,058, Cl. 219-548.000.
Specialty Equipment Companies, Inc.: *See—*
Roberts, Melvin F., 5,111,975, Cl. 222-475.100.
Spence, Michael F.: *See—*
Jarvela, John P.; and Spence, Michael F., 5,113,436, Cl. 379-455.000.
Sperling, Leslie H.; Murphy, Clarence J.; Rosen, Warren A.; Jain, Himanshu; and Herman, Warren N., to United States of America, Navy. Optoelectronic devices. 5,112,531, Cl. 252-582.000.
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Osborn, John A.; Chan, You P. N. C.; Blaser, Hans-Ulrich; and Spindler, Felix, 5,112,999, Cl. 556-23.000.
Spittal, Douglas W.: *See—*
Roberts, Edward; Greatorex, James H.; and Spittal, Douglas W., 5,112,549, Cl. 264-174.000.
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Spitzer, Roy L.: *See—*
Ankney, Richard C.; Bonica, Ronald P.; Kay, Douglas E.; Pashayan, Patricia A.; and Spitzer, Roy L., 5,113,499, Cl. 395-325.000.
Spitznagel, Gunther: *See—*
Hums, Erich; and Spitznagel, Gunther, 5,112,794, Cl. 502-309.000.
Spodick, David A.: *See—*
Roy-Burman, Pradip; and Spodick, David A., 5,112,767, Cl. 435-320.100.
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Kuhn, Max, 5,113,056, Cl. 200-400.000.
Springer, Hartmut: *See—*
Buch, Holger M.; and Springer, Hartmut, 5,112,970, Cl. 544-75.000.
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Ankney, Richard C.; Bonica, Ronald P.; Kay, Douglas E.; Pashayan, Patricia A.; and Spitzer, Roy L., 5,113,499, Cl. 395-325.000.
SPS Technologies, Inc.: *See—*
Kibblewhite, Ian E.; and Strunk, Robert H., 5,112,248, Cl. 439-577.000.
Square D Company: *See—*
Burke, George E., Jr., 5,113,068, Cl. 250-214.00B.
Srimongkolkul, Vichai, to Micropure Filtration, Inc. Oil purification unit with cyclonic reservoir section and filtration section. 5,112,479, Cl. 210-149.000.
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Abrams, Paul G.; Srinivasan, Ananthachari; and Vrudhula, Vivekananda M., 5,112,954, Cl. 530-391.900.
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Srubas, Robert C.; and Rowe, William M., Jr., to Specialty Cable Corp. PCT heater cable composition and method for making same. 5,113,058, Cl. 219-548.000.
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Narui, Takashi; Kaneko, Tetsuo; Imamori, Katsumi; and Iwasa, Akira, 5,112,816, Cl. 514-179.000.
Stacey, Eric J., to Westinghouse Electric Corp. AC drive with optimized torque. 5,113,125, Cl. 318-721.000.
Staehle, Bradford G.: *See—*
Burton, John H.; Berg, Eric P.; Staehle, Bradford G.; and Scott, Frank B., 5,112,306, Cl. 604-101.000.
Stainless Steel Products, Inc.: *See—*
Moore, Arthur L.; Wolff, Peter; Ruther, Leon H.; and Pike, Walter E., 5,112,088, Cl. 285-114.000.
Stalcup, Robert W.; and McCall, Robert G. Topical anesthetic applicator, dispenser system, and method. 5,112,297, Cl. 604-1.000.
Standards Testing Laboratories, Inc.: *See—*
Hill, Charles F., 5,111,687, Cl. 73-146.000.
Stangeland, Maynard L., to Rockwell International Corporation. Functionally gradated rolling element bearing races. 5,112,146, Cl. 384-492.000.
Stanko, John, to White Consolidated Industries, Inc. Modular room air conditioner and method for making same. 5,112,024, Cl. 248-603.000.
Stanley Electric Co. Ltd.: *See—*
Sekiguchi, Tsuneo; Nagano, Koichi; and Suzuki, Satoru, 5,113,319, Cl. 362-61.000.
Staodyn, Inc.: *See—*
Harris, Frank W., 5,113,176, Cl. 340-573.000.
Star Seimitsu Kabushiki Kaisha: *See—*
Iwata, Kiyohide, 5,112,150, Cl. 400-216.100.

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Mandelboum, David; Marom, Itshak; and Nevo, Yitzhak, 5,113,281, Cl. 359-236.000.
State University of New York: *See—*
Lazaroff, Norman, 5,112,742, Cl. 435-32.000.
Staub, Theodor; Dahmen, Heide; Nyfeler, Robert; and Williams, Robert J., to Ciba-Geigy Corporation. Fungicidal use of a cyanopyrrole derivative and method for producing same. 5,112,849, Cl. 514-427.000.
Staudinger, Gernot; and Krammer, Gernot. Method of and apparatus for the removal of gaseous contaminants from flue gas or reduction of the content of gaseous contaminants in a flue gas. 5,112,588, Cl. 423-244.000.
Stauffer, Anton; and Wolf, Heinz, to Pack Systems. Method and apparatus for leak testing packages. 5,111,684, Cl. 73-49.300.
Stavrinou, Stavros C.: *See—*
Diamond, Ivan; Lawson, James J.; Lewicki, Walter J., Jr.; and Stavrinou, Stavros C., 5,112,671, Cl. 428-156.000.
Steelcase Inc.: *See—*
Andersen, Carl W., 5,111,579, Cl. 29-897.320.
Steele, Ronald E.: *See—*
Bowman, Robert M.; Steele, Ronald E.; Browne, Leslie J.; Ewald, Bruce H.; and Diener, Robert, 5,112,845, Cl. 514-399.000.
Steere, Robert E., Jr., to Silicon Technology Corporation. Slicing and grinding system for a wafer slicing machine. 5,111,622, Cl. 51-5.00C.
Stefanik, Dennis: *See—*
Acarlar, Muvaffak S.; Manzione, Louis T.; Robinson, Steven D.; and Stefanik, Dennis, 5,113,466, Cl. 385-88.000.
Stegemoeller, Calvin L.: *See—*
Baker, Robert L.; Billingsley, Larry D.; and Stegemoeller, Calvin L., 5,111,955, Cl. 220-303.000.
Steichen, Dale S.: *See—*
Bolkan, Steven A.; Brodbeck, Kelly J.; Brodbeck, Kevin J.; Deleeuw, David L.; Steichen, Dale S.; Strand, Bruce B.; Suk, Richard J. V.; Szuch, Kathleen D.; and Zielske, Alfred G., 5,112,514, Cl. 252-99.000.
Steigerwald, Robert L., to General Electric Company. High power factor power supply. 5,113,337, Cl. 363-98.000.
Steinbach, Gary R.: *See—*
Beard, Marian H.; Caro, Perry A.; Hsiao, Jennifer B.; Mackey, Kevin J.; Sandman, James G., Jr.; Steinbach, Gary R.; and Woods, Donald R., 5,113,517, Cl. 364-200.000.
Steinberg, Peter; and Kinninger, Peter, to Bayerische Motoren Werke AG. Evaporation cooling system for a liquid-cooled internal-combustion engine. 5,111,777, Cl. 123-41.540.
Stengl, Reinhard, to Siemens Aktiengesellschaft. Planar pn-junction of high electric strength. 5,113,237, Cl. 357-53.000.
Stenmans, Heinz: *See—*
Lossa, Ulrich; and Stenmans, Heinz, 5,111,650, Cl. 57-296.000.
Stenzel, Gerhard: *See—*
Kaule, Wittich; Ilgmann, Wilhelm; Schwenk, Gerhard; and Stenzel, Gerhard, 5,112,672, Cl. 428-209.000.
Stepan, Jiri. Rotary wire stripper. 5,111,720, Cl. 81-9.510.
Stephens, Charles E.: *See—*
Morris, John M.; Stephens, Charles E.; and Forsythe, Alan K., 5,111,837, Cl. 137-72.000.
Stephenson, LinMarie: *See—*
Wilson, James; Stephenson, LinMarie; and Corl, Kenneth G., 5,113,222, Cl. 355-209.000.
Sterling, Arthur M.: *See—*
Zinner, Norman R.; and Sterling, Arthur M., 5,112,295, Cl. 600-40.000.
Sterling Drug Inc.: *See—*
Ward, Susan J., 5,112,820, Cl. 514-230.200.
Stevens, Howard; Chariot, Maryvonne; Arnold, Francoise; and Lewis, Gareth, to Synthelabo. Sustained release pharmaceutical composition of diltiazem. 5,112,621, Cl. 424-497.000.
Stewart, Clarence H. Spread spectrum intercept apparatus and method. 5,113,409, Cl. 375-1.000.
Stewart, Dennis C.: *See—*
Thrower, Jack S.; Stewart, Dennis C.; and Montero, Enrique E., 5,111,990, Cl. 228-113.000.
Stewart, Steven L., to Shell Oil Company. Apparatus for the resin-impregnation of fibers. 5,112,206, Cl. 425-114.000.
Stewing Kunststoffbetrieb GmbH: *See—*
Dehling, Helmut, 5,111,556, Cl. 24-270.000.
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Stingel, Frederick J.: *See—*
Grace, Robert W., Sr., 5,111,963, Cl. 221-75.000.
Stocchiero, Olimpio. Lid with a handle for containers of accumulators. 5,111,952, Cl. 220-94.00R.
Stogsdill, Voyd E. Security lock apparatus. 5,112,090, Cl. 292-258.000.
Stokbroekx, Raymond A.; and Van der Aa, Marcel J. M., to Janssen Pharmaceutica N.V. Antirhinoviral heteroamine-substituted pyridazines. 5,112,825, Cl. 514-253.000.
Stokley, Alan G.: *See—*
Krishnamurthy, Ramachandran; Lerner, Steven L.; Shukla, Yagya; and Stokley, Alan G., 5,112,590, Cl. 423-415.00A.
Stolberger Maschinenfabrik GmbH & Co. KG: *See—*
Lange, Rudiger, 5,111,645, Cl. 57-15.000.
Stoneham, Jeffrey R.; and Smart, David C., to Eastman Kodak Company. Mechanical adjunct for electrical film drive in magnetic data camera. 5,113,208, Cl. 354-105.000.
Storz Instrument Company: *See—*
Metzler, Michael E.; Ameiss, Michael S.; and Baum, James P., 5,112,019, Cl. 248-405.000.
Storz, Karl. Four joint medical instrument with an endoscope. 5,112,329, Cl. 606-46.000.
Stowe, Keith A.: *See—*
Hynds, Ernest J.; and Stowe, Keith A., 5,112,031, Cl. 267-276.000.
Strader, Robert C.: *See—*
Merrill, Richard A.; Crockett, Bruce L.; and Strader, Robert C., 5,113,502, Cl. 395-375.000.
Straeter, Joseph G.: *See—*
Weder, Donald E.; and Straeter, Joseph G., 5,111,613, Cl. 47-72.000.
Weder, Donald E.; Craig, Franklin J.; Straeter, William F.; and Straeter, Joseph G., 5,111,637, Cl. 53-397.000.
Straeter, William F.: *See—*
Weder, Donald E.; Craig, Franklin J.; Straeter, William F.; and Straeter, Joseph G., 5,111,637, Cl. 53-397.000.
Strand, Bruce B.: *See—*
Bolkan, Steven A.; Brodbeck, Kelly J.; Brodbeck, Kevin J.; Deleeuw, David L.; Steichen, Dale S.; Strand, Bruce B.; Suk, Richard J. V.; Szuch, Kathleen D.; and Zielske, Alfred G., 5,112,514, Cl. 252-99.000.
Strantz, John W., Jr., to Du Pont de Nemours, E. I., and Company. Management of waste solution containing photoresist materials. 5,112,491, Cl. 210-651.000.
Strassel, Albert; and Duperray, Gilbert, to Atochem. Polyvinylidene fluoride composite and method. 5,112,692, Cl. 428-421.000.
Stratagene: *See—*
Sylvester, Keith V., 5,112,470, Cl. 204-299.00R.
Stratagene Cloning Systems: *See—*
Sorge, Joseph A.; and Sylvester, Keith V., 5,112,459, Cl. 204-180.100.
Strato Medical Corporation: *See—*
Fenton, Paul V., Jr.; Young, Thomas M.; and Gorman, William J., 5,112,301, Cl. 604-30.000.
Strauss, Guenther: *See—*
Falke, Holger; and Strauss, Guenther, 5,112,787, Cl. 502-159.000.
Straw, Alan; and Ellis, Roger D., to Colgate-Palmolive Company. Method for making a post-foaming gel. 5,112,525, Cl. 252-315.300.
Strenzke, Hilmar; and Fehn, Norbert, to Linde Aktiengesellschaft. Method of braking a vehicle. 5,111,658, Cl. 60-327.000.
Strickland, William W., to Saturn Corporation. Flexible automated body assembly system and method. 5,111,988, Cl. 228-102.000.
Striech, Steven G.; Jacobi, Ricky D.; Herndon, Daniel C.; and Floyd, Louis C., to Halliburton Company. Method and apparatus for reworking wells. 5,111,884, Cl. 166-382.000.
Strike, Donald P.: *See—*
Commons, Thomas J.; Mewshaw, Richard E.; and Strike, Donald P., 5,112,859, Cl. 514-484.000.
Strock, William J.; Wakeman, Thomas G.; and Hauser, Ambrose A., to General Electric Company. Rotating cowling. 5,112,191, Cl. 416-94.000.
Strolle, Christopher H.; Patel, Chandrakant B.; Wedam, Werner F.; Ko, Jung W.; Schnitzler, Raymond; and Yun, Jong K., to SamSung Electronics Co., Ltd. Video signal recording system enabling limited bandwidth recording and playback. 5,113,262, Cl. 358-310.000.
Stromski, Kasimir: *See—*
Altmann, Rainer; Lauer, Rainer; Schmidt, Guenther; Stromski, Kasimir; van Zanten, Anton; Hellmann, Harald; Veil, Karl; Fees, Hans-Joerg; Jonner, Wolf-Dieter; and Gutzeit, Reinhard, 5,112,117, Cl. 303-116.00R.
Strong, Willard L., Jr.: *See—*
Kozol, Michael; Lim, Chan; Strong, Willard L., Jr.; and Tracey, William, 5,113,341, Cl. 364-419.000.
Strunk, Robert H.: *See—*
Kibblewhite, Ian E.; and Strunk, Robert H., 5,112,248, Cl. 439-577.000.
Stubbs, John L., Jr.; Bolick, Roger E., II; and Hauser, Everett F., Jr., to Olin Corporation. Removal of thiosulfate from hydrosulfite solutions. 5,112,452, Cl. 204-92.000.
Stuhlinger, Tilman W., to Talandic Research Corporation. Phased array optical telescope. 5,113,284, Cl. 359-419.000.
Stumpf, Robert C.: *See—*
Correa, Jose L.; Stumpf, Robert C.; Farnum, Charles L.; and Roos, Leo, 5,112,428, Cl. 156-324.000.
Sturtevant, Wayne R.: *See—*
Cartmell, James V.; Sturtevant, Wayne R.; Valadez, Manuel; and Wolf, Michael L., 5,112,618, Cl. 424-443.000.
Stutz, Anton; and Nussbaumer, Peter, to Sandoz Ltd. Amine derivatives, processes for their production and their use. 5,112,851, Cl. 514-443.000.
Su, Tsann-Long: *See—*
Watanabe, Kyoichi A.; Su, Tsann-Long; and Huang, Jai-Tung, 5,112,869, Cl. 514-641.000.
Suarez, Gustavo A.: *See—*
Dinwiddie, John M., Jr.; Freeman, Bobby J.; Grice, Lonnie E.; Loffredo, John M.; Sanderson, Kenneth R.; and Suarez, Gustavo A., 5,113,522, Cl. 395-700.000.
Sudoh, Kengo; and Ii, Hiroshi, to Sharp Kabushiki Kaisha. Recording and reproducing apparatus for rewriting data onto a previously recorded medium using a relaying operation. 5,113,295, Cl. 360-49.000.
Suematsu, Chiaki: *See—*
Okada, Hiroshi; Suzuki, Shingo; Kagami, Manabu; and Suematsu, Chiaki, 5,113,476, Cl. 385-140.000.

Suenaga, Takashi, to Casio Computer Co., Ltd. Velocity responsive head driving control apparatus of manual sweeping printer. 5,112,149, Cl. 400-88.000.
Suetsugu, Kenichiro: *See—*
Fukushima, Tetsuo; Suetsugu, Kenichiro; Nishihara, Munekazu; and Ikeda, Junji, 5,113,470, Cl. 385-126.000.
Suga, Akira: *See—*
Ninomiya, Kunio; and Suga, Akira, 5,113,246, Cl. 358-44.000.
Sugatsune Industrial Co., Ltd.: *See—*
Ohshima, Kazuyoshi, 5,111,548, Cl. 16-51.000.
Sugawara, Mitsuru, to Fujitsu. Optical intensity modulator. 5,113,283, Cl. 359-248.000.
Sugihara, Masanori: *See—*
Yamada, Yoshinori; Morikawa, Kiyoshi; Kurumada, Masakazu; Kobayashi, Kazuo; and Sugihara, Masanori, 5,113,388, Cl. 369-270.000.
Sugise, Ryoji; Daimon, Hiroshi; Gujii, Itsuhiro; Ihara, Hideo; Terada, Norio; Jo, Masatoshi; and Hirabayashi, Masayuki, to Ube Industries, Ltd.; and Agency of Industrial Science and Technology. Conductive copper oxide ceramics and process for producing same. 5,112,783, Cl. 501-126.000.
Sugita, Kenji; Itazaki, Hiroshi; Matsumoto, Koichi; and Kawamura, Yoshimi, to Shionogi & Co., Ltd. Cyclic tetrapeptide and process for preparing the same. 5,112,944, Cl. 530-321.000.
Sugiura, Masamichi, to Minolta Camera Kabushiki Kaisha. Run length encoder. 5,113,266, Cl. 358-426.000.
Sugiyama, Kouichi: *See—*
Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.
Sugiyama, Takashi: *See—*
Sakurai, Yoshihumi; Ideshita, Yuzi; and Sugiyama, Takashi, 5,111,972, Cl. 222-135.000.
Sugiyama, Takeshi, to Mitsubishi Denki K.K. Engine starter apparatus. 5,111,707, Cl. 74-7.00E.
Suk, Richard J. V.: *See—*
Bolkan, Steven A.; Brodbeck, Kelly J.; Brodbeck, Kevin J.; Deleeuw, David L.; Steichen, Dale S.; Strand, Bruce B.; Suk, Richard J. V.; Szuch, Kathleen D.; and Zielske, Alfred G., 5,112,514, Cl. 252-99.000.
Sukegawa, Kazuya: *See—*
Koizumi, Hideaki; Sano, Koichi; Yokoyama, Tetsuo; and Sukegawa, Kazuya, 5,113,137, Cl. 324-307.000.
Sullivan, Jeffrey R.: *See—*
McCauley, Peter L.; and Sullivan, Jeffrey R., 5,112,176, Cl. 411-432.000.
Sulzer Escher Wyss AG: *See—*
Schnyder, Eugen; and Lehmann, Rolf, 5,111,566, Cl. 29-116.200.
Suman, Michael J.; and Zeinstra, Mark L., to Prince Corporation. Vehicle door locking system detecting that all doors are closed. 5,113,182, Cl. 340-825.310.
Sumida, Mamoru; Hashimoto, Masashi; and Matsumoto, Osamu, to Mitsubishi Denki K.K. Cooling water temperature controlling apparatus. 5,111,775, Cl. 123-41.100.
Sumitomo Chemical Company, Limited: *See—*
Akahori, Kingo; Harada, Naoki; Kayane, Yutaka; and Omura, Takashi, 5,112,971, Cl. 544-189.000.
Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washimi, Takeshi; Harada, Naoki; and Akahori, Kingo, 5,112,959, Cl. 534-642.000.
Mizuno, Yukio; and Maruyama, Takashi, 5,112,914, Cl. 525-134.000.
Nishio, Taichi; Kuribayashi, Hideyuki; and Sanada, Takashi, 5,112,907, Cl. 525-65.000.
Nomura, Kotohiro; and Ishino, Masaru, 5,112,997, Cl. 552-238.000.
Tsujino, Toshifumi; Maeda, Koichi; Ishizuka, Satoshi; Yamamoto, Hiroaki; Kitayama, Shinichiro; and Hozumi, Shigeo, 5,112,722, Cl. 430-290.000.
Sumitomo Electric Co., Ltd.: *See—*
Takano, Satoshi; Takahashi, Kenichi; Miyazaki, Kenji; Yoshida, Noriyuki; Inazawa, Shinji; and Hayashi, Noriki, 5,112,802, Cl. 505-1.000.
Sumitomo Electric Industries, Ltd.: *See—*
Ikegaya, Akihiko; and Tobioka, Masaaki, 5,112,643, Cl. 427-38.000.
Sumitomo Pharmaceuticals Company, Limited: *See—*
Sunagawa, Makoto; Matsumura, Haruki; Yano, Tsuneo; Sasaki, Akira; and Takata, Shinzi, 5,112,966, Cl. 540-200.000.
Sumitomo Rubber Industries, Ltd.: *See—*
Nakasaki, Eiji, 5,111,863, Cl. 152-526.000.
Shinmura, Yasushi, 5,111,865, Cl. 152-542.000.
Sumitomo Wiring System, Ltd.: *See—*
Kawase, Hajime; and Kawasumi, Takeshi, 5,112,246, Cl. 439-489.000.
Summagraphics Corporation: *See—*
Mletzko, Alfred E., 5,113,042, Cl. 178-19.000.
Summers, David P.; and Nixon, Jeddy D., to American BioMed, Inc. Heart assist pump. 5,112,349, Cl. 623-3.000.
Summers, David P.: *See—*
Hwang, Ned H. C.; and Summers, David P., 5,112,292, Cl. 600-16.000.
Summers, James B.: *See—*
Brooks, Dee W.; Gunn, Bruce P.; Holms, James H.; and Summers, James B., 5,112,848, Cl. 514-424.000.
Sun-Maid Growers of California: *See—*
Hobock, Edgar G., 5,111,643, Cl. 53-551.000.
Sun Microsystems, Inc.: *See—*
Johnson, Elizabeth R.; and Mosher, Charles E., Jr., 5,113,357, Cl. 395-124.000.
Sunaga, Takeshi: *See—*
Motegi, Hisao; Sunaga, Takeshi; and Zembayashi, Michio, 5,113,000, Cl. 556-413.000.
Sunagawa, Kazuhiko; and Kusano, Nobuyuki, to Kureha Kagaku Kogyo K.K. Process for producing p-halogenobenzophenone derivatives. 5,113,020, Cl. 568-323.000.
Sunagawa, Makoto; Matsumura, Haruki; Yano, Tsuneo; Sasaki, Akira; and Takata, Shinzi, to Sumitomo Pharmaceuticals Company, Limited. Beta-lactams. 5,112,966, Cl. 540-200.000.
Sundeen, Arthur R.; Burris, Darryl L.; Cook, Roger A.; and Lombardo, Dennis M., to General Motors Corporation. Automatic power door lock system. 5,111,902, Cl. 180-281.000.
Sunds Defibrator Industries Aktiebolag: *See—*
Virving, Nils; and Haven, Anders E. E., 5,112,443, Cl. 162-23.000.
Sunds Defibrator Rauma Woodhandling Oy: *See—*
Tohkala, Antti; and Unkuri, Esko, 5,111,859, Cl. 144-373.000.
Sundstrand Corporation: *See—*
Foote, Steven A., 5,111,694, Cl. 73-497.000.
Shekleton, Jack R., 5,111,655, Cl. 60-39.360.
Sunstar Engineering, Inc.: *See—*
Mori, Masahito; Torii, Kohske; and Okamoto, Hirokazu, 5,112,911, Cl. 525-100.000.
Suntory Limited: *See—*
Fujiwara, Goro; Masuda, Mitsunobu; Shiraishi, Masanori; and Matsumoto, Nobuya, 5,112,486, Cl. 210-416.100.
Susla, John: *See—*
Addington, Larry C.; Addington, Robert R.; Addington, Larry M.; Lynch, Albert E.; Susla, John; Conley, David L.; Sartaine, John J.; and Price, David E., 5,112,111, Cl. 299-18.000.
Sutherland, Derek R.: *See—*
Ramsay, Michael V. J.; Bell, Richard; Howes, Peter D.; Tiley, Edward P.; and Sutherland, Derek R., 5,112,854, Cl. 514-450.000.
Suzuki, Akira; Itagaki, Yasuharu; and Higashio, Kanji, to Snow Brand Milk Products Co., Ltd. Tissue plasminogen-activating factor and nonoclonal antibody. 5,112,754, Cl. 435-212.000.
Suzuki, Arata; Suzuki, Marcia; Tyberg, William T.; and Banks, George, to Capintec, Inc. Ambulatory physiological evaluation system including cardiac monitoring. 5,111,818, Cl. 128-644.000.
Suzuki, Haruo, to Jidosha Kiki Co., Ltd. Booster. 5,111,734, Cl. 91-376.00R.
Suzuki, Hirotsugu: *See—*
Watanabe, Hidetoshi; Suzuki, Hirotsugu; and Yamamoto, Masanobu, 5,112,205, Cl. 425-111.000.
Suzuki Kabushiki Kaisha: *See—*
Kaku, Shinji; and Shinkai, Tatsuya, 5,111,781, Cl. 123-90.160.
Suzuki, Makoto: *See—*
Nagai, Toshinari; Tanaka, Hiroshi; and Suzuki, Makoto, 5,111,792, Cl. 123-440.000.
Suzuki, Marcia: *See—*
Suzuki, Arata; Suzuki, Marcia; Tyberg, William T.; and Banks, George, 5,111,818, Cl. 128-644.000.
Suzuki, Satoru: *See—*
Sekiguchi, Tsuneo; Nagano, Koichi; and Suzuki, Satoru, 5,113,319, Cl. 362-61.000.
Suzuki, Shingo: *See—*
Okada, Hiroshi; Suzuki, Shingo; Kagami, Manabu; and Suematsu, Chiaki, 5,113,476, Cl. 385-140.000.
Suzuki, Shohei: *See—*
Miyajima, Goh; Takahashi, Takao; Shudo, Tuyosi; and Suzuki, Shohei, 5,113,166, Cl. 335-299.000.
Suzuki, Tomohiro: *See—*
Tomita, Hiroki; and Suzuki, Tomohiro, 5,113,348, Cl. 364-474.260.
Suzuki, Toshikazu: *See—*
Yoshida, Kazuyuki; Kanai, Nobuo; Suzuki, Toshikazu; and Ishiyama, Masamitsu, 5,113,268, Cl. 358-474.000.
Suzuki, Tsuneji: *See—*
Fukazawa, Nobuyuki; Odate, Makoto; Suzuki, Tsuneji; Otsuka, Kengo; Tsuruo, Takashi; and Sato, Wakao, 5,112,817, Cl. 514-183.000.
Suzuki, Yoshinobu, to Koito Manufacturing Co., Ltd. Vehicular lamp. 5,113,321, Cl. 362-61.000.
Svein Asbjornsen & Jan Lade A/S: *See—*
Asbjornsen, Svein; and Lade, Jan, 5,112,106, Cl. 297-284.00F.
Swain, James C.; Wilcox, John P.; and Thomas, David L., to General Motors Corporation. Cross groove joint socket plate torque restraint assembly for a variable displacement compressor. 5,112,197, Cl. 417-222.00R.
Swanson, David K.; Dahl, Roger W.; and Lang, Douglas J., to Cardiac Pacemakers, Inc. Defilbrillation electrode having smooth current distribution. 5,111,812, Cl. 128-419.00D.
Swartz, Scott L.: *See—*
Dawson, William J.; and Swartz, Scott L., 5,112,433, Cl. 156-623.00R.
Swearingen, Ralph M. Method and apparatus for making ground meat patties. 5,112,634, Cl. 426-513.000.
Sweers, Ronald L. Hold-down strap for a tarp. 5,111,554, Cl. 24-16.00R.
Swenson, Donald A., to Science Applications International Corporation. Four-fingers RFQ linac structure. 5,113,141, Cl. 328-233.000.
Swick, E. Grant: *See—*
Ruehl, William E.; Frederiksen, Bjarne; and Swick, E. Grant, 5,113,169, Cl. 337-265.000.

Swift, Peter R., to Amphenol Corporation. Arrangement for removably mounting a transient suppression or electrical filter device in an electrical connector. 5,112,253, Cl. 439-620.000.
Swingler, Peter E.: *See*—
Hunter, Joseph H.; and Swingler, Peter E., 5,113,343, Cl. 364-424.100.
Swisher, Richard L., to Shelcahl Inc. Method of making metal-film laminate resistant to delamination. 5,112,462, Cl. 205-165.000.
Sy, Angel. Aromatic alkylation process. 5,113,031, Cl. 585-467.000.
Syage, Elizabeth T.: *See*—
Garst, Michael E.; and Syage, Elizabeth T., 5,112,853, Cl. 514-443.000.
Syers, Charles S. Method and system for facilitating chamber-type medical procedures. 5,112,254, Cl. 600-27.000.
Syler, Rodney R.: *See*—
Murphy, Robert A.; Syler, Rodney R.; and Slattery, William H., 5,113,480, Cl. 392-501.000.
Sylvester, Keith V., to Stratagene. Electrophoresis apparatus. 5,112,470, Cl. 204-299.00R.
Sylvester, Keith V.: *See*—
Sorge, Joseph A.; and Sylvester, Keith V., 5,112,459, Cl. 204-180.100.
Symbol Technologies Inc.: *See*—
Wang, Ynjiun P., 5,113,445, Cl. 380-51.000.
Synthelabo: *See*—
Stevens, Howard; Charion, Maryvonne; Arnold, Francoise; and Lewis, Gareth, 5,112,62[illegible], Cl. 424-497.000.
Systems Engineering and Manufacturing Corp.: *See*—
Raifman, Stuart M., 5,112,503, Cl. 210-777.000.
Szczepanek, Andre; and Buchanan, George, to Texas Instruments Incorporated. Elastic buffer for local area network. 5,113,418, Cl. 375-118.000.
Szczutkowski, Craig: *See*—
Brown, Thomas A.; Derenge, Charles L.; Hughes, Houston H., III; Szczutkowski, Craig; Tisel, Vicki J.; and Tucker, Marcella M., 5,113,413, Cl. 375-40.000.
Szepan, Reiner. Method and apparatus for spectroscopic quantitative analysis of gases in gas mixtures. 5,113,073, Cl. 250-343.000.
Szeplaki, Victor J.: *See*—
McCalley, Karl W.; Wilson, Steven D.; and Szeplaki, Victor J., 5,113,496, Cl. 395-200.000.
Szporny, Laszlo : *See*—
Ambrus, Gabor; Maderspach, Andrea; Jekkel, Antalne ; Javor, Andras; Ilkoy, Eva; Hajos, Gyorgy; Szporny, Laszlo ; Nagy, Jozsef; Horvath, Gyula; and Moravcsik, Imre, 5,112,815, Cl. 514-178.000.
Szuch, Kathleen D.: *See*—
Bolkan, Steven A.; Brodbeck, Kelly J.; Brodbeck, Kevin J.; Deleeuw, David L.; Steichen, Dale S.; Strand, Bruce B.; Suk, Richard J. V.; Szuch, Kathleen D.; and Zielske, Alfred G., 5,112,514, Cl. 252-99.000.
Szymanski, Raymond F.: *See*—
Chaumette, Patrick; Le Peltier, Fabienne; Szymanski, Raymond F.; Courty, Philippe; and Verdon, Catherine, 5,112,591, Cl. 423-415.00A.
Tabare, Jacques: *See*—
Wuest, Isabelle; Anderson, Charles E.; and Tabare, Jacques, 5,112,675, Cl. 428-216.000.
Tabart, Michel: *See*—
Dubroeucq, Marie-Christine; Moutonnier, Claude; Peyronel, Jean-Francois; Tabart, Michel; and Truchon, Alain, 5,112,988, Cl. 548-470.000.
Taboada, John; and Poirier, Robert H., to Refractive Laser Research & Development Program, Ltd. Method and apparatus for laser surgery. 5,112,328, Cl. 606-4.000.
Tactyl Technologies, Inc.: *See*—
Buddenhagen, Douglas A.; Legge, Norman R.; and Zscheuschler, Gunter, 5,112,900, Cl. 524-484.000.
Tada, Kouki: *See*—
Hanyu, Takaomi; and Tada, Kouki, 5,112,027, Cl. 251-331.000.
Tada, Shigeru; Nagano, Jun; and Fukamachi, Yoshihiro, to Bridgestone Corporation. Belt-shaped member supplying method and apparatus. 5,111,722, Cl. 83-23.000.
Tadokoro, Hiroyuki; Wakamatsu, Kazuhiro; Sagae, Syoji; and Shimada, Akira, to Hitachi, Ltd. Image transfer apparatus. 5,113,226, Cl. 355-273.000.
Taghezout, Daho, to Eta SA Fabriques d'Ebauches. Energization coil device, a method of making such a device and an electromagnetic micromotor fitted therewith 5,113,100, Cl. 310-40.0MM.
Taguchi, Teruo: *See*—
Sasaki, Setsuo; Taguchi, Teruo; and Fujiwara, Isao, 5,113,309, Cl. 361-302.000.
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; and Minato, Teruo, to Daidousanso Co., Ltd.; and Maizuru Kogyo Co., Ltd. Heat treat furnace for fluorinating steel material. 5,112,030, Cl. 266-256.000.
Taheri, Syde A. Embolectomy catheter, and method of operating same. 5,112,347, Cl. 606-200.000.
Taikisha, Ltd.: *See*—
Ikuta, Shizuo; Okuda, Masaharu; and Sakamoto, Takashi, 5,111,997, Cl. 239-750.000.
Taiko Pharmaceutical Co., Ltd.: *See*—
Baba, Tatsuya; and Ogata, Norio, 5,112,872, Cl. 514-731.000.
Tairaka, Yoshihiko; and Inaoka, Katsumi, to Takeda Chemical Industries, Ltd. Polyether polyol and rigid polyurethane foam. 5,112,876, Cl. 521-167.000.
Taiyo Fishery Co., Ltd.: *See*—
Urushibara, Seiichi; and Yusa, Kuniya, 5,112,271, Cl. 452-108.000.
Takabayashi, Akiharu, to Canon Kabushiki Kaisha. Apparatus for the preparation of a functional deposited film by means of photochemical vapor deposition process. 5,112,647, Cl. 427-53.100.
Takada, Hidekazu: *See*—
Yamashita, Osamu; Takahashi, Eiji; Nishizawa, Takeshi; Takada, Hidekazu; and Shirasu, Tetsuo, 5,113,108, Cl. 310-328.000.
Takada, Hiromitsu: *See*—
Takishima, Seiji; Hirosawa, Yuji; Takada, Hiromitsu; and Takagi, Fumito, 5,111,612, Cl. 47-60.000.
Takada, Naoyuki; and Murakami, Hironobu, to Ikeda Bussan Co., Ltd. Sliding seat bottom interconnected with back having hinged upper and lower seat backs. 5,112,109, Cl. 297-343.000.
Takada, Osamu: *See*—
Takiyasu, Yoshihiro; Yamaga, Mitsuhiro; Nakamura, Kazunori; Amada, Eiichi; Jusa, Hidehiko; Kobayashi, Naoya; Takada, Osamu; Hirayama, Satoru; and Iiyama, Tatsuhito, 5,113,392, Cl. 370-85.150.
Takada, Shun: *See*—
Tanji, Masaki; Nishijima, Toyoki; Ogawa, Takahiro; Takada, Shun; and Murai, Kazuhiro, 5,112,728, Cl. 430-507.000.
Takagawa, Ryozo: *See*—
Ueno, Tasaburo; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Yabuuchi, Naoya, 5,112,689, Cl. 428-407.000.
Takagi, Fumito: *See*—
Takishima, Seiji; Hirosawa, Yuji; Takada, Hiromitsu; and Takagi, Fumito, 5,111,612, Cl. 47-60.000.
Takagi, Hiroshi; and Shiozaki, Atsushi, to Canon Kabushiki Kaisha. Liquid jet head, substrate for said head and liquid jet apparatus having said head. 5,113,203, Cl. 346-140.00R.
Takagi, Seiichi: *See*—
Imai, Eiichi; Sakashita, Kiichiro; Takagi, Seiichi; and Kukimoto, Tsutomu, 5,112,714, Cl. 430-106.600.
Takagi, Syunsuke: *See*—
Umaba, Takayuki; Ono, Jiro; Takagi, Syunsuke; Sawada, Makoto; Adachi, Hideki; Shimizu, Hirofumi; Hashimoto, Mokuhei; and Takahashi, Tetsu, 5,111,743, Cl. 101-127.000.
Takahashi, Eiji: *See*—
Yamashita, Osamu; Takahashi, Eiji; Nishizawa, Takeshi; Takada, Hidekazu; and Shirasu, Tetsuo, 5,113,108, Cl. 310-328.000.
Takahashi, Fumihiko: *See*—
Umehara, Teruo; and Takahashi, Fumihiko, 5,113,162, Cl. 335-210.000.
Takahashi, Katsuya: *See*—
Hashimoto, Isao; Ishida, Tatsuyodihi; Tsuru, Kazutaka; Yamada, Yuji; Miyazawa, Takeshige; Nakamura, Yasuo; Katou, Susumu; and Takahashi, Katsuya, 5,112,385, Cl. 71-94.000.
Takahashi, Kazuhisa: *See*—
Kawasaki, Keiichi; and Takahashi, Kazuhisa, 5,113,280, Cl. 359-196.000.
Takahashi, Kenichi: *See*—
Nagata, Atsushi; Takahashi, Kenichi; and Takeguchi, Nobuyasu, 5,113,255, Cl. 358-136.000.
Takahashi, Kenichi: *See*—
Nagata, Atsushi; Takahashi, Kenichi; and Takeguchi, Nobuyasu, 5,113,255, Cl. 358-136.000.
Takano, Satoshi; Takahashi, Kenichi; Miyazaki, Kenji; Yoshida, Noriyuki; Inazawa, Shinji; and Hayashi, Noriki, 5,112,802, Cl. 505-1.000.
Takahashi, Kenji: *See*—
Akiyama, Toshiyuki; Mimura, Itaru; Ozawa, Naoki; Takahashi, Kenji; Eto, Yoshizumi; and Matsumoto, Takahiro, 5,113,247, Cl. 358-51.000.
Takahashi, Masatoshi: *See*—
Furukawa, Nobuhiro; Yoshimura, Seiji; and Takahashi, Masatoshi, 5,112,704, Cl. 429-194.000.
Takahashi, Masayuki: *See*—
Haruna, Tohru; Takahashi, Masayuki; and Yukino, Toshinori, 5,112,891, Cl. 524-101.000.
Takahashi, Seiki; and Takasago, Hayato, to Mitsubishi Denki Kabushiki Kaisha. Matrix-type color liquid crystal display device. 5,113,274, Cl. 359-66.000.
Takahashi, Shunsuke; and Tsukahara, Hirokazu, to Mitsubishi Paper Mills Limited. Donor sheet for pressure-sensitive image recording. 5,112,797, Cl. 503-200.000.
Takahashi, Sunao; and Takano, Mikio, to Kokusai Electric Co., Ltd. Temperature compensated level detector. 5,113,336, Cl. 363-61.000.
Takahashi, Susumu, to Kanto Yakin Kogyo K.K. Method of manufacturing carbon fibre-reinforced carbon elongated structural components. 5,112,422, Cl. 156-175.000.
Takahashi, Takao: *See*—
Miyajima, Goh; Takahashi, Takao; Shudo, Tuyosi; and Suzuki, Shohei, 5,113,166, Cl. 335-299.000.
Takahashi, Takashi: *See*—
Tsuji, Jiro; Takahashi, Takashi; Tsuji, Masao; Nakagawa, Naoshi; and Takigawa, Tetsuo, 5,112,998, Cl. 552-559.000.
Takahashi, Tetsu: *See*—
Umaba, Takayuki; Ono, Jiro; Takagi, Syunsuke; Sawada, Makoto; Adachi, Hideki; Shimizu, Hirofumi; Hashimoto, Mokuhei; and Takahashi, Tetsu, 5,111,743, Cl. 101-127.000.
Takai, Haruki: *See*—
Kinoshita, Iwao; Machii, Daisuke; Onoda, Yasuo; Takai, Haruki; Kasaka, Nobuo; Shuto, Katsuichi; Gomi, Katsushige; Morimoto, Makoto; and Ishii, Akio, 5,112,867, Cl. 514-617.000.
Takaki, Usaji: *See*—
Yamamoto, Yoshihiro; Takaki, Usaji; Aoki, Shinobu; and Hara, Isao, 5,112,987, Cl. 548-457.000.

Takamatsu, Osamu: *See*—
Kato, Hideo; Shibata, Hirohumi; Matsushita, Keiko; and Takamatsu, Osamu, 5,112,707, Cl. 430-5.000.
Takano, Mikio: *See*—
Takahashi, Sunao; and Takano, Mikio, 5,113,336, Cl. 363-61.000.
Takano, Satoshi; Takahashi, Kenichi; Miyazaki, Kenji; Yoshida, Noriyuki; Inazawa, Shinji; and Hayashi, Noriki, to Sumitomo Electric Co., Ltd. Superconducting ceramics elongated body and method of manufacturing the same. 5,112,802, Cl. 505-1.000.
Takarabe, Yuji: *See*—
Izumi, Shuji; Nakai, Masaki; Inoue, Manabu; Fujino, Akihiko; Kawamura, Kunio; Takarabe, Yuji; and Niwa, Masatake, 5,113,217, Cl. 354-471.000.
Takasago, Hayato: *See*—
Takahashi, Seiki; and Takasago, Hayato, 5,113,274, Cl. 359-66.000.
Takasaki, Yoshitaka: *See*—
Hirota, Osamu; Tsushima, Hideaki; Sasaki, Shinya; Takasaki, Yoshitaka; and Maeda, Minoru, 5,113,524, Cl. 359-115.000.
Takase, Muneaki; Komatsu, Toshihiko; Matsuno, Toshiyuki; Miyakawa, Akihisa; and Saito, Kenichi, to Zenyaku Kogyo Kabushiki Kaisha. 1-azaindolizine derivatives, synthetic intermediates thereof and antiallergic agents containing 1-azaindolizine derivatives. 5,112,833, Cl. 514-300.000.
Takase, Satoshi: *See*—
Tani, Yatsuhiro; and Takase, Satoshi, 5,112,677, Cl. 428-240.000.
Takashi, Yoshiharu; and Kihara, Yoshiyuki, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Radiation shielding structure. 5,113,078, Cl. 250-515.100.
Takata, Shinzi: *See*—
Sunagawa, Makoto; Matsumura, Haruki; Yano, Tsuneo; Sasaki, Akira; and Takata, Shinzi, 5,112,966, Cl. 540-200.000.
Takato, Kenji: *See*—
Kinoshita, Kazumi; Takato, Kenji; and Tojo, Toshiro, 5,113,426, Cl. 379-33.000.
Takatori, Tsuyoshi: *See*—
Umeda, Shigeru; and Takatori, Tsuyoshi, 5,113,053, Cl. 219-116.000.
Takeda Chemical Industries, Ltd.: *See*—
Tairaka, Yoshihiko; and Inaoka, Katsumi, 5,112,876, Cl. 521-167.000.
Takeda, Hideaki, to Uchiya Thermostat Co. Actuator with a built-in reed switch. 5,113,308, Cl. 361-178.000.
Takegahara, Takashi: *See*—
Seki, Masaki; Takegahara, Takashi; and Matsunaka, Toru, 5,113,050, Cl. 219-69.120.
Seki, Masaki; Takegahara, Takashi; and Arakaki, Takeshi, 5,113,338, Cl. 364-191.000.
Takegawa, Yujiro, to Tsudakoma Corp. Method of restoring a broken warp after mending the same. 5,111,851, Cl. 139-1.00R.
Takeguchi, Nobuyasu: *See*—
Nagata, Atsushi; Takahashi, Kenichi; and Takeguchi, Nobuyasu, 5,113,255, Cl. 358-136.000.
Takemura, Ako: *See*—
Nakamura, Kazushige; Honda, Mitsuru; Toma, Hitoshi: Tanaka, Shigemori; Murai, Keiichi; Unno, Akira; and Takemura, Ako, 5,112,656, Cl. 427-425.000.
Takenaka, Kenji: *See*—
Kadoya, Katsuhiko; Omichi, Yukinobu; Matsuda, Eiji; and Takenaka, Kenji, 5,111,673, Cl. 68-12.040.
Takenaka, Shinji: *See*—
Ajioka, Masanobu; Takenaka, Shinji; Itoh, Hiroyuki; Kataita, Masafumi; and Kohno, Yoshitsugu, 5,112,580, Cl. 422-241.000.
Itoh, Hiroyuki; Kono, Yoshitsugu; Kikuchi, Isao; Takenaka, Shinji; and Ajioka, Masanobu, 5,112,593, Cl. 423-502.000.
Taketani, Noriaki: *See*—
Eguchi, Shuji; Taketani, Noriaki; Tanno, Seikichi; Okabe, Yoshiaki; Terao, Hiromu; Asano, Hideki; Wajima, Motoyo; and Abe, Tomiya, 5,113,477, Cl. 385-143.000.
Takeuchi, Jun; Shibayama, Takashi; and Iida, Masahiro, to Nissan Motor Co., Ltd. Closed loop downshift quality control for an automatic transmisson. 5,111,717, Cl. 74-866.000.
Takeuchi, Minoru: *See*—
Tashiro, Tetsu; Takeuchi, Minoru; Ishimaru, Yoshiyuki; Hirose, Shinichi; and Hayashi, Kazuo, 5,113,093, Cl. 307-465.000.
Takezawa, Katsuhito: *See*—
Ariki, Yumi; and Takezawa, Katsuhito, 5,113,492, Cl. 395-147.000.
Takigawa, Tetsuo: *See*—
Tsuji, Jiro; Takahashi, Takashi; Tsuji, Masao; Nakagawa, Naoshi; and Takigawa, Tetsuo, 5,112,998, Cl. 552-559.000.
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Talandic Research Corporation: *See*—
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Yoshida, Masaru; Manabe, Yoshio; Mitsuyu, Tsuneo; and Tanahashi, Ichiro, 5,113,473, Cl. 385-131.000.
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Tanaka, Hiroshi: *See*—
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Kurano, Yoshito; Kawamura, Masato; Kondo, Masahiro; Tanaka, Michio; and Yamamoto, Sanehiro, 5,113,018, Cl. 564-403.000.
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Nakamura, Kazushige; Honda, Mitsuru; Toma, Hitoshi; Tanaka, Shigemori; Murai, Keiichi; Unno, Akira; and Takemura, Ako, 5,112,656, Cl. 427-425.000.
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Hakoun, Roland; and Tanguy, Eric, 5,113,460, Cl. 385-39.000.

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Obata, Masao; Arima, Masaki; and Taniguchi, Kouki, 5,112,262, Cl. 445-24.000.
Tanisugi, Hideaki: *See*—
Himeshima, Yoshio; Tanisugi, Hideaki; Watanabe, Tetsuo; Uemura, Tadahiro; and Kurihara, Masaru, 5,112,487, Cl. 210-490.000.
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Tanzawa, Kazuhiko: *See*—
Hamano, Kiyoshi; Furuya, Kouhei; Tanzawa, Kazuhiko; Kagasaki, Takeshi; Miyamoto, Masaaki; and Kinoshita, Takeshi, 5,112,807, Cl. 514-11.000.
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Gupta, Dev V.; Chen, Y. Brian; and Tarantino, Joel T., 5,113,391, Cl. 370-84.000.
Tarello, William R.: *See*—
Kornberg, Elliot; and Tarello, William R., 5,111,828, Cl. 128-754.000.
Tashiro, Tetsu; Takeuchi, Minoru; Ishimaru, Yoshiyuki; Hirose, Shinichi; and Hayashi, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit with multiple operation. 5,113,093, Cl. 307-465.000.
Tassie, Douglas P., to General Electric Company. Ammunition storage system. 5,111,729, Cl. 89-33.020.
Tate, Edwin M. Adjustable plumb/level. 5,111,589, Cl. 33-385.000.
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Watanabe, Nobuatsu; Chong, Yong-Bo; Tatsuno, Toshio; Okada, Tomoyoshi; Izumi, Akira; and Toei, Keiji, 5,112,437, Cl. 156-646.000.
Tavrow, Lee S.: *See*—
Brooks, Rodney A.; Tavrow, Lee S.; and Flynn, Anita M., 5,113,117, Cl. 310-328.000.
Taylor, Robert M., to Smiths Industries Public Limited Company. Optical multiplexing. 5,113,458, Cl. 385-11.000.
Taylor, Thomas W.; and D'Avanzo, Donald C., to Hewlett-Packard Company. Process for forming a Schottky barrier gate. 5,112,763, Cl. 437-39.000.
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Sasaki, Setsuo; Taguchi, Teruo; and Fujiwara, Isao, 5,113,309, Cl. 361-302.000.
TEAC Corporation: *See*—
Yoshida, Kobun, 5,113,297, Cl. 360-99.060.
Teckentrup GmbH & Co. KG: *See*—
Overhues, Egon; and Krolow, Reiner, 5,112,178, Cl. 411-544.000.
Teel, Vicki J.: *See*—
Brown, Thomas A.; Derenge, Charles L.; Hughes, Houston H., III; Szczutkowski, Craig; Teel, Vicki J.; and Tucker, Marcella M., 5,113,413, Cl. 375-40.000.
Teetz, Volker: *See*—
Chatterjee, Sukumar; Chatterjee, Sugata; Ganguli, Bimal N.; Chatterjee, Deepak K.; Jani, Rajendra K. H.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; Kogler, Herbert; Seibert, Gerhard; and Teetz, Volker, 5,112,806, Cl. 514-9.000.
Teijin Limited: *See*—
Katoh, Hideo; Hosoi, Masahiro; Hamano, Hisashi; and Saito, Yasuhiko, 5,112,659, Cl. 428-35.700.
Teijin Seiki Co., Ltd.: *See*—
Yamamoto, Shigeru; Ogiso, Tutomu; and Ikeuchi, Takashi, 5,112,001, Cl. 242-43.00R.
Telama, Ari, to Valmet Paper Machinery Inc. Paper machine roll. 5,111,568, Cl. 29-132.000.
Telama, Ari: *See*—
Leino, Jorma; Vestola, Juhani; Salo, Jukka; and Telama, Ari, 5,111,567, Cl. 29-132.000.
Teledyne Industries, Inc.: *See*—
Smathers, David B., 5,111,574, Cl. 29-599.000.
Temple, Michael D.: *See*—
Seddon, Richard I.; and Temple, Michael D., 5,112,644, Cl. 427-38.000.
Temple University of the Commonwealth System of Higher Education: *See*—
Kowarski, Hanna R., 5,112,804, Cl. 514-3.000.
Tencer, Allan F.: *See*—
Cozad, Trent E.; Lozier, Antony J.; Lower, Jerry L.; and Tencer, Allan F., 5,112,332, Cl. 606-61.000.
Tenn, Trevor I., to Chemetics International Company Inc. Pulp mill gas combustion process. 5,112,216, Cl. 431-5.000.
Tepavcevic, Brane. Constant current reluctance motor drive systems. 5,113,113, Cl. 318-701.000.
Terada, Norio; and Tokuda, Kazuo, to NEC Corporation. Variable gain amplifier. 5,113,149, Cl. 330-254.000.
Terada, Norio: *See*—
Sugise, Ryoji; Daimon, Hiroshi; Gujii, Itsuhiro; Ihara, Hideo; Terada, Norio; Jo, Masatoshi; and Hirabayashi, Masayuki, 5,112,783, Cl. 501-126.000.
Terada, Toshimichi: *See*—
Kaneko, Hisao; Okazaki, Kichizaemon; and Terada, Toshimichi, 5,113,296, Cl. 360-85.000.
Terao, Hiromu: *See*—
Eguchi, Shuji; Taketani, Noriaki; Tanno, Seikichi; Okabe, Yoshiaki; Terao, Hiromu; Asano, Hideki; Wajima, Motoyo; and Abe, Tomiya, 5,113,477, Cl. 385-143.000.
Terashima, Kazutaka: *See*—
Hatakoshi, Genichi; Terashima, Kazutaka; Kawachi, Masaru; and Uematsu, Yutaka, 5,113,469, Cl. 385-122.000.
Terry, Sally J. Extrusion spring arm. 5,112,221, Cl. 433-21.000.
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Hukasawa, Hiromichi, 5,112,480, Cl. 210-188.000.
Tessmann, Detlef: *See*—
Bressel, Burkhard; Grapentin, Hans-Joachim; and Tessmann, Detlef, 5,112,513, Cl. 252-79.100.
Tetra Pak Holdings SA: *See*—
Anderson, Anders; and Kjelgaard, Tom, 5,113,479, Cl. 392-417.000.
Texaco Chemical Company: *See*—
Lin, Jiang-Jen; Cuscurida, Michael; and Waddill, Harold G., 5,112,979, Cl. 546-244.000.
Texaco, Inc.: *See*—
Brink, Edward C., Jr.; Henderson, Clifton C.; Whiteman, James R.; and Sowers, Henry K., 5,112,509, Cl. 252-56.00R.
Dai, Pei-Shing E.; and Sherwood, David E., Jr., 5,112,473, Cl. 208-120.000.
Davis, Lorne A., Jr.; Pepin, Gregory P.; and Gebert, David L., 5,113,420, Cl. 378-20.000.
DeRosa, Thomas F.; Von Allmen, Ronald W.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., 5,112,508, Cl. 252-51.50A.
Verret, Allen J., 5,112,159, Cl. 405-195.100.
Texas Instruments Incorporated: *See*—
Blanton, Keith A.; and Helms, Ramon E., 5,113,449, Cl. 381-51.000.
Bradshaw, Keith, 5,112,724, Cl. 430-296.000.
Hsu, Wei-chan; and Krenik, William R., 5,113,091, Cl. 307-355.000.
Johnson, Larry K.; and O'Malley, Austin S., 5,112,234, Cl. 439-79.000.
Szczepanek, Andre; and Buchanan, George, 5,113,418, Cl. 375-118.000.
Walstra, Hidde; and Kolling, Arie J., 5,111,699, Cl. 73-754.000.
Teymouri, Sassan, to Advanced Micro Devices, Inc. Glitch remover circuit for transmission links. 5,113,098, Cl. 307-520.000.
Thakkar, Arvind L.; and Gibson, Lowell L., to Eli Lilly and Company. Orally administerable sustained release pharmaceutical formulation. 5,112,619, Cl. 424-456.000.
Thary, Christian, to Creme Art Corporation. Molding of open cell soft polyurethane foam utilizing release agent. 5,112,543, Cl. 264-51.000.
Theler, Jean-Jaques: *See*—
Piata, Miroslaw; and Theler, Jean-Jaques, 5,112,412, Cl. 148-688.000.
Theodoulou, Sotos M.; Gibbons, Duncan; Thomson, Christopher W.; and Khataan, Hassan A., to Delphax Systems, a partnership. Printer flash fusing system. 5,113,223, Cl. 219-220.000.
Theurer, Josef; and Praschl, Wilhelm, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Apparatus for placing a carriage on a track. 5,111,749, Cl. 104-2.000.
Theus, Ulrich, to Deutsche ITT Industries GmbH. Linear CMOS output stage. 5,113,148, Cl. 330-253.000.
Thickitt, Christopher P.: *See*—
Clissold, Derek W.; Mann, John; and Thickitt, Christopher P., 5,112,976, Cl. 546-193.000.
Thiel, Rudolf; Klimt, Ulrich; and Halasy-Wimmer, Georg, to Alfred Teves GmbH. Spot-type disc brake. 5,111,914, Cl. 188-73.340.
Thierry, Josiane: *See*—
Lenfant, Maryse; and Thierry, Josiane, 5,112,811, Cl. 514-17.000.
Thinking Machines Corporation: *See*—
Hillis, W. Daniel, 5,113,510, Cl. 395-425.000.
Thomas & Betts Corporation: *See*—
Lybrand, Brent B., 5,112,233, Cl. 439-79.000.
Thomas, Bobby J., to Conoco Inc. Method for using seismic data acquisition technology for acquisition of ground penetrating radar data. 5,113,192, Cl. 342-22.000.
Thomas, David L.: *See*—
Swain, James C.; Wilcox, John P.; and Thomas, David L., 5,112,197, Cl. 417-222.00R.
Thomas Jefferson University: *See*—
Goldfarb, David, 5,111,814, Cl. 128-419.00R.
Thomas, Margaret T.: *See*—
Chen, Jing-Den; Kovacs, Kerry; Thomas, Margaret T.; and Liang, Rong-Chang, 5,112,540, Cl. 264-4.700.
Thomas, Patricia T., to Munters Corporation. Apparatus for concentrating bleed-off water for evaporating coolers. 5,112,538, Cl. 261-112.200.
Thome, John R.: *See*—
Clawson, Robert A.; and Thome, John R., 5,111,991, Cl. 228-180.100.
Thompson, Charles D.: *See*—
Messer, Dion D.; Park, Sangil; and Thompson, Charles D., 5,113,189, Cl. 341-143.000.
Thompson, Neil E. S.: *See*—
Jacobs, Irwin C.; and Thompson, Neil E. S., 5,112,505, Cl. 252-8.552.

Thompson, Robert H., to Ford Motor Company. Fluidic controller for automotive fuel tank vapor collection system. 5,111,795, Cl. 123-519.000.
Thomson, Christopher W.: *See*—
Theodoulou, Sotos M.; Gibbons, Duncan; Thomson, Christopher W.; and Khataan, Hassan A., 5,113,223, Cl. 219-220.000.
Thomson Consumer Electronics, Inc.: *See*—
Romesburg, Eric D.; Maze, Kenneth W.; Duffield, David J.; Deiss, Michael S.; Beyers, Billy W., Jr.; and Bridgewater, Kevin E., 5,113,259, Cl. 358-183.000.
Thomson-CSF: *See*—
Convert, Guy; and Brasile, Jean-Pierre, 5,113,154, Cl. 331-79.000.
Thomson, S.A.: *See*—
Plus, Dora; and Mourey, Bruno B., 5,113,134, Cl. 324-158.00R.
Thorn EMI plc: *See*—
Best, Stuart J.; Johnson, Nigel; and Sandford, Adrian M., 5,113,437, Cl. 380-3.000.
Carrington, Andrew N.; Green, Bernard J.; and Jones, Francis, deceased, 5,112,361, Cl. 8-471.000.
Thornton, Curtis W., to Edward Weck Incorporated. Endoscopic clip appliers. 5,112,343, Cl. 606-143.000.
Thorpe, James F. Billiard cue device. 5,112,046, Cl. 273-68.000.
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Minahan, David M.; Thorsteinson, Erlind M.; and Liu, Albert C., 5,112,795, Cl. 502-324.000.
Thrower, Jack S.; Stewart, Dennis C.; and Montero, Enrique E., to United Technologies Corporation. Inertia weld notch control through the use of differential wall thicknesses. 5,111,990, Cl. 228-113.000.
Thurner, Gunther; and Hammer, Helmut, to DIEHL GmbH & Co. Submunition deployable through an artillery projectile. 5,111,748, Cl. 102-387.000.
Tiley, Edward P.: *See*—
Ramsay, Michael V. J.; Bell, Richard; Howes, Peter D.; Tiley, Edward P.; and Sutherland, Derek R., 5,112,854, Cl. 514-450.000.
Tilles, David J.; Wakamiya, Stanley K.; Krein, Bruce A.; Brown, Dale H.; Duggan, Sharon A.; and Schroeder, Mark S., to Westinghouse Electric Corp. Document transfer device for multiple pass document sorting machine. 5,112,042, Cl. 271-297.000.
Timbalyte Close Corporation: *See*—
Mohr, Jacob G.; Kane, Michael H.; and Le Riche, Etienne, 5,111,559, Cl. 27-4.000.
Timm, Uwe: *See*—
Hafner, Hans-Ulrich; Klein, Hans-Hermann; and Timm, Uwe, 5,111,667, Cl. 62-55.500.
Timmerman, Marsha W.: *See*—
Palmer, John L.; Timmerman, Marsha W.; and Daubney, Stephan D., 5,112,741, Cl. 435-25.000.
Tippmann, Joseph R.; and Tippmann, Vincent P. Radial flow cooling tower. 5,112,371, Cl. 55-233.000.
Tippmann, Vincent P.: *See*—
Tippmann, Joseph R.; and Tippmann, Vincent P., 5,112,371, Cl. 55-233.000.
Tipton, Allison D., to Illinois Tool Works Inc. Strap dispensing and accumulating apparatus and combination of same with strapping machine. 5,112,004, Cl. 242-75.510.
Tirinato, Jody A.: *See*—
Cozzette, Stephen N.; Davis, Graham; Holleritter, Lisa A.; Lauks, Imants R.; Piznik, Sylvia; Smit, Nicolaas J.; Tirinato, Jody A.; Wieck, Henry J.; and Zelin, Michael P., 5,112,455, Cl. 204-153.120.
Titcomb, Forrest; and Cordova, Jackie, to Digital Equipment Corporation. Hydrodynamic bearing. 5,112,142, Cl. 384-107.000.
Tobiki, Hisao: *See*—
Iinuma, Mitsuhisa; Yamada, Hideo; Matsushima, Hiroaki; and Tobiki, Hisao, 5,112,327, Cl. 604-413.000.
Tobioka, Masaaki: *See*—
Ikegaya, Akihiko; and Tobioka, Masaaki, 5,112,643, Cl. 427-38.000.
Tobita, Hiroshi: *See*—
Yamamoto, Hiroshi; and Tobita, Hiroshi, 5,112,035, Cl. 270-53.000.
Toda Kogyo Corp.: *See*—
Okura, Ken; Matsuzaki, Satoru; Katamoto, Tsutomu; and Horiishi, Nanao, 5,112,403, Cl. 106-418.000.
Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, to Ono Pharmaceutical Co., Ltd. Prolinal derivatives having inhibitory activity on prolyl endopeptidase. 5,112,847, Cl. 514-422.000.
Toei, Keiji: *See*—
Watanabe, Nobuatsu; Chong, Yong-Bo; Tatsuno, Toshio; Okada, Tomoyoshi; Izumi, Akira; and Toei, Keiji, 5,112,437, Cl. 156-646.000.
"Toge-Dubel" A Gerhard GmbH: *See*—
Gerhard, Anton, 5,112,174, Cl. 411-53.000.
Tohkala, Antti; and Unkuri, Esko, to Sunds Defibrator Rauma Woodhandling Oy. Chipping method and device. 5,111,859, Cl. 144-373.000.
Toho Seisakusho Co., Ltd.: *See*—
Shikanai, Yasushi, 5,111,797, Cl. 123-539.000.
Tohyama, Masaya: *See*—
Shiosaka, Sadao; Kohno, Johji; Kiyama, Hiroshi; Tohyama, Masaya; and Shiotani, Yahe, 5,112,606, Cl. 530-389.200.
Toida, Hiroshi: *See*—
Honda, Shinkichi; Arai, Yoichiro; and Toida, Hiroshi, 5,112,613, Cl. 424-400.000.
Tojo, Toshiro: *See*—
Kinoshita, Kazumi; Takato, Kenji; and Tojo, Toshiro, 5,113,426, Cl. 379-33.000.
Tokai University Juridical Foundation, The: *See*—
Iida, Masamori; Kurosu, Tateki; and Okano, Ken, 5,112,775, Cl. 437-225.000.
Tokico Ltd.: *See*—
Makita, Naoki, 5,112,077, Cl. 280-673.000.
Tokuda, Kazuo: *See*—
Terada, Norio; and Tokuda, Kazuo, 5,113,149, Cl. 330-254.000.
Tokunaga, Mareo; and Isozaki, Wataru, to Mitsui Toatsu Chemicals, Inc. Packaging container and packaging method of acrylamide crystal. 5,111,640, Cl. 53-449.000.
Tokushima, Akira: *See*—
Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.
Tokyo Electric Co., Ltd.: *See*—
Nishikawa, Hisashi; Matsumoto, Yasuo; and Makino, Ayumu, 5,113,198, Cl. 346-1.100.
Tanaka, Koki; Heshiki, Yoshikazu; and Nakayama, Takeshi, 5,112,148, Cl. 400-63.000.
Tokyo Electric Power Company, Incorporated, The: *See*—
Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.
Tokyo Electron Limited: *See*—
Hoshi, Seiichi, 5,113,132, Cl. 324-158.00F.
Tokyo Shibaura Denki Kabushi Kaisha: *See*—
Kinoshita, Hiroyuki, 5,113,230, Cl. 357-51.000.
Tolbert, Robert J.; and DeGrendel, Glen A., to Chrysler Corporation. Tie strap structure for electric wiring. 5,112,013, Cl. 248-74.300.
Tolbert, William R.: *See*—
Baumgartner, Mark F.; Tolbert, William R.; and Shanahan, John, 5,112,760, Cl. 435-240.242.
Toma, Hitoshi: *See*—
Nakamura, Kazushige; Honda, Mitsuru; Toma, Hitoshi; Tanaka, Shigemori; Murai, Keiichi; Unno, Akira; and Takemura, Ako, 5,112,656, Cl. 427-425.000.
Tomberlin, Rand K. One-way/three-way light socket. 5,113,044, Cl. 200-51.040.
Tomer, John D., IV: *See*—
Shutske, Gregory M.; Kapples, Kevin J.; and Tomer, John D., IV, 5,112,829, Cl. 514-290.000.
Tometsuka, Koji: *See*—
Harada, Yasuhiro; Karino, Toshikazu; Saito, Ryoji; Tometsuka, Koji; and Izumi, Shoichiro, 5,112,641, Cl. 427-8.000.
Tomimatsu, Noriyuki: *See*—
Bando, Takahiro; and Tomimatsu, Noriyuki, 5,113,122, Cl. 315-371.000.
Tomita, Hiroki; and Suzuki, Tomohiro, to Kabushiki Kaisha Okuma Tekkosho. Paint-out shape display method and an apparatus used in a numerical control apparatus. 5,113,348, Cl. 364-474.260.
Tomita, Hiroshi, to Hitachi, Ltd. Instruction buffer control system using buffer partitions and selective instruction replacement for processing large instruction loops. 5,113,370, Cl. 395-375.000.
Tomita, Seihei: *See*—
Hamatani, Tsutomu; and Tomita, Seihei, 5,111,919, Cl. 190-109.000.
Tomomura, Yoshitaka: *See*—
Kitagawa, Masahiko; and Tomomura, Yoshitaka, 5,113,233, Cl. 357-17.000.
Tomse, John A. Vehicular towing system. 5,112,075, Cl. 280-503.000.
Tonel, Valerio: *See*—
Sartor, Mariano; and Tonel, Valerio, 5,111,598, Cl. 36-117.000.
Toray Industries, Inc.: *See*—
Himeshima, Yoshio; Tanisugi, Hideaki; Watanabe, Tetsuo; Uemura, Tadahiro; and Kurihara, Masaru, 5,112,487, Cl. 210-490.000.
Honda, Yuzuru; Fujii, Tateo; and Watanabe, Koji, 5,112,421, Cl. 156-148.000.
Horiuchi, Kenjiro; Kometani, Kiichi; and Inoue, Toshihide, 5,112,913, Cl. 525-133.000.
Nakajima, Tamotu; and Yoshida, Shusuke, 5,112,426, Cl. 156-250.000.
Torii, Kohske: *See*—
Mori, Masahito; Torii, Kohske; and Okamoto, Hirokazu, 5,112,911, Cl. 525-100.000.
Torii, Nobutoshi; Ito, Susumu; Hamura, Masayuki; and Tanaka, Akira, to Fanuc, Ltd. Industrial robot with a telescopic horizontal arm. 5,111,709, Cl. 74-89.150.
Torneros, Maximiano D.: *See*—
Koza, John R.; Ferguson, John R.; and Torneros, Maximiano D., 5,112,050, Cl. 273-139.000.
Toshiba Lighting & Technology Corporation: *See*—
Kawakatsu, Akira; Saito, Akiko; and Yuge, Yoji, 5,113,109, Cl. 313-112.000.
Toshiba Silicone Co., Ltd.: *See*—
Motegi, Hisao; Sunaga, Takeshi; and Zembayashi, Michio, 5,113,000, Cl. 556-413.000.
Tosoh Corporation: *See*—
Hara, Daiji; Mori, Mitsuhiro; and Kondo, Yozo, 5,112,927, Cl. 526-124.000.
Toto Ltd.: *See*—
Hiruta, Yoshiki; Tsukamura, Naoki; Uchimura, Yoshinobu; Shigematsu, Toshifumi; Yamasaki, Hironori; and Yamaguchi, Toshio, 5,111,539, Cl. 4-661.000.

VOL 1138 ISS 2 MY 12 1992 UMI

Touet, Remi: *See—*
Garapon, Jacques; Touet, Remi; Damin, Bernard; and Debled, Beatrice, 5,112,937, Cl. 528-272.000.

Towa Chemical Industry Co. Ltd.: *See—*
Nishiya, Kyosuke, 5,112,273, Cl. 452-135.000.

Towers, Christine M.: *See—*
Lambert, Patrick M.; Bryan, Philip S.; Jarrold, Gregory S.; and Towers, Christine M., 5,112,700, Cl. 428-690.000.

Towry, Elisa R., to United States of America, Army. Background illumination simulator. 5,111,689, Cl. 73-167.000.

Toyo Boseki Kabushiki Kaisha: *See—*
Gotoh, Masumi; and Sakurai, Tadayosi, 5,112,550, Cl. 264-211.140.
Tani, Yatsuhiro; and Takase, Satoshi, 5,112,677, Cl. 428-240.000.

Toyo Seikan Kaisha, Ltd.: *See—*
Kobayashi, Tomomi; Kobayashi, Akira; Fujimoto, Hiroshi; Saiki, Norihiko; and Imazu, Katsuhiro, 5,111,679, Cl. 72-348.000.
Watanabe, Toshiaki; Shibue, Masatsune; Matsubayashi, Hiroshi; and Komatsu, Ikuo, 5,112,695, Cl. 428-458.000.

Toyonaka, Koji: *See—*
Miki, Yoshiaki; Toyonaka, Koji; Ueda, Tsunehisa; and Hiramatsu, Nobuaki, 5,112,602, Cl. 424-76.300.

Toyota Jidosha Kabushiki Kaisha: *See—*
Honoki, Shinji; Kobayashi, Katsuyuki; Umeyama, Mitsuhiro; and Ootake, Toshihiro, 5,111,714, Cl. 74-574.000.
Matsushiro, Ryuichi; Kosuda, Toru; Sasao, Shigeo; Ikeya, Taro; Chino, Yoshiharu; and Uekawa, Yasuaki, 5,111,776, Cl. 123-41.540.
Nagai, Toshinari; Tanaka, Hiroshi; and Suzuki, Makoto, 5,111,792, Cl. 123-440.000.
Ogita, Tamotu, 5,111,796, Cl. 123-520.000.
Tsuji, Kimitoshi; and Nobuhara, Yorikiyo, 5,113,158, Cl. 332-109.000.
Watanabe, Yoshihide; Kimura, Mareo; and Matsumoto, Shinichi, 5,112,790, Cl. 502-213.000.

Tracey, William: *See—*
Kozol, Michael; Lim, Chan; Strong, Willard L., Jr.; and Tracey, William, 5,113,341, Cl. 364-419.000.

Tran, Tam H.: *See—*
Krinski, Thomas L.; and Tran, Tam H., 5,112,520, Cl. 252-174.230.

Trans World Crane, Inc.: *See—*
McGhie, James R.; and Pendelton, Lowell K., 5,112,073, Cl. 280-404.000.

Transfresh Corporation: *See—*
Bolejack, Kevin J.; and Forgnone, Frederick, 5,111,639, Cl. 53-408.000.

Transgene S.A.: *See—*
Meulien, Pierre; and Pavirani, Andrea, 5,112,950, Cl. 530-383.000.

Transmatic, Inc.: *See—*
Mikalonis, Liudas K., 5,113,322, Cl. 362-74.000.

Transtech Service Network, Inc.: *See—*
Hollander, David S.; and Rubenstein, Mark S., 5,111,957, Cl. 220-408.000.

Trares, Bernard F.: *See—*
Weisend, Norbert A., Jr.; Trares, Bernard F.; and Leffel, Kevin L., 5,112,011, Cl. 244-134.00A.

Travis, Jack M., to Champion Ergonomics, Inc. Support belt with color indicator. 5,111,806, Cl. 602-19.000.

Trchka, James A.: *See—*
Chan, Wai-Kwong; Allsopp, Mary F.; McGuire, Kevin T.; Nonnemann, Robert W.; Obrecht, Gordon A.; Saluski, Ronald B.; Trchka, James A.; Viebach, Hans J.; Brandt, Peter A.; Butler, Robert R.; Shircliff, Michael W.; Walker, Samuel A.; and Miller, Thomas R., 5,112,179, Cl. 412-1.000.

Tremoulet, Olivier L., Jr.: *See—*
Buchberger, Anton H.; Tremoulet, Olivier L., Jr.; and Mordre, Sigurd C., 5,111,736, Cl. 92-168.000.

Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Monobactam hydrazide derivatives. 5,112,968, Cl. 540-355.000.

Trevi S.p.A.: *See—*
Trevisani, Davide, 5,112,161, Cl. 405-267.000.

Trevisani, Davide, to Trevi S.p.A. Method for excavating and constructing monolithic continuous straight or circular structural walls and a machine for realizing such a method. 5,112,161, Cl. 405-267.000.

Trimmier, J. Robert: *See—*
Franklin, Henry E.; Gold, Ronald S.; Jachimowicz, Karen E.; Poley, Harold J.; and Trimmier, J. Robert, 5,113,285, Cl. 359-465.000.

Tripathy, Sukant K.: *See—*
Mandel, Braja K.; Tripathy, Sukant K.; Huang, Jan-Chan; and Kumar, Jayant, 5,112,881, Cl. 522-117.000.

Troglia, Claudio: *See—*
Colombo, Paolo; Troglia, Claudio; Verzellino, Santina R.; and Muratori, Giuseppe, 5,112,905, Cl. 525-60.000.

Truchon, Alain: *See—*
Dubroeucq, Marie-Christine; Moutonnier, Claude; Peyronel, Jean-Francois; Tabart, Michel; and Truchon, Alain, 5,112,988, Cl. 548-470.000.

Truchon, Lee M.: *See—*
Kam, John; Truchon, Lee M.; Goodale, Thomas C.; and Dalton, John T., 5,113,393, Cl. 370-94.100.

Trudeau, Michel: *See—*
Schulz, Robert; Huot, Jean-Yves; and Trudeau, Michel, 5,112,388, Cl. 75-255.000.

Trujillo, Eduardo E., to Confederated Tribes of the Colville Reservation, The. Biological control of knapweed by *Pythium rostratum*. 5,112,381, Cl. 71-79.000.

Truswal Systems Corporation: *See—*
Gore, Charles E.; Fairley, Frank E.; Hardee, Edward; and Medeen, Carl T., 5,111,861, Cl. 144-256.100.

Tsai, Hsien-Tang. Doubly-controlled aquarium safety heater. 5,113,057, Cl. 219-523.000.

Tsinberg, Mikhail; Basile, Carlo; and Cavallerano, Alan P., to North American Philips Corporation. Two-line MAC high definition television system. 5,113,242, Cl. 358-12.000.

Tsou, Yu-Min; Hicks, Roy L.; and Burney, Harry S., Jr., to Dow Chemical Company, The. Apparatus to control reverse current flow in membrane electrolytic cells. 5,112,464, Cl. 204-265.000.

Tsuda, Tadayuki; Yano, Kanji; Ikemoto, Isao; Watanabe, Kazushi; Tanaka, Makoto; and Ishiwata, Kazuhiko, to Canon Kabushiki Kaisha. Reciprocating driving device. 5,113,224, Cl. 355-234.000.

Tsudakoma Corp.: *See—*
Takegawa, Yujiro, 5,111,851, Cl. 139-1.00R.

Tsuge, Akihiko: *See—*
Goto, Yasuhiro; Yonezawa, Takeyuki; Tsuge, Akihiko; and Komatsu, Michiyasu, 5,112,780, Cl. 501-95.000.

Tsuji, Jiro; Takahashi, Takashi; Tsuji, Masao; Nakagawa, Naoshi; and Takigawa, Tetsuo, to Kuraray Co., Ltd. Pregnane derivatives and processes for production thereof. 5,112,998, Cl. 552-559.000.

Tsuji, Kenji: *See—*
Ueyama, Masayuki; and Tsuji, Kenji, 5,113,209, Cl. 354-400.000.

Tsuji, Kimitoshi; and Nobuhara, Yorikiyo, to Toyota Jidosha Kabushiki Kaisha. Pulse width modulation circuit. 5,113,158, Cl. 332-109.000.

Tsuji, Masanori: *See—*
Yagi, Sakai; and Tsuji, Masanori, 5,112,239, Cl. 439-189.000.

Tsuji, Masao: *See—*
Tsuji, Jiro; Takahashi, Takashi; Tsuji, Masao; Nakagawa, Naoshi; and Takigawa, Tetsuo, 5,112,998, Cl. 552-559.000.

Tsujino, Toshifumi; Maeda, Koichi; Ishizuka, Satoshi; Yamamoto, Hiroaki; Kitayama, Shinichiro; and Hozumi, Shigeo, to Nippon Sheet Glass Co., Ltd.; and Sumitomo Chemical Company, Limited. Method of producing light control plate which induces scattering of light at different angles. 5,112,722, Cl. 430-290.000.

Tsukada, Toru, to Nippon Seiko Kabushiki Kaisha. Roller type linear movement guide bearing. 5,112,139, Cl. 384-15.000.

Tsukada, Toshiro: *See—*
Imaizumi, Eiki; Usui, Kunihiko; Matsuura, Tatsuji; Tsukada, Toshiro; Ueda, Seiichi; and Sato, Hiroshi, 5,113,090, Cl. 307-355.000.

Tsukahara, Hirokazu: *See—*
Takahashi, Shunsuke; and Tsukahara, Hirokazu, 5,112,797, Cl. 503-200.000.

Tsukamura, Naoki: *See—*
Hiruta, Yoshiki; Tsukamura, Naoki; Uchimura, Yoshinobu; Shigematsu, Toshifumi; Yamasaki, Hironori; and Yamaguchi, Toshio, 5,111,539, Cl. 4-661.000.

Tsukishima Kikai Co., Ltd.: *See—*
Satoh, Kazuo; Sekine, Koichiro; Kakisada, Kou; and Morita, Minoru, 5,112,502, Cl. 210-770.000.

Tsunekawa, Masayoshi; and Ramirez, Raymond L., to Gingi-Pak; and Sankin Kogyo K.K. Industry Ltd. Light-curable orthodontic bracket adhesive. 5,112,880, Cl. 522-81.000.

Tsuru, Kazutaka: *See—*
Hashimoto, Isao; Ishida, Tatsuyodihi; Tsuru, Kazutaka; Yamada, Yuji; Miyazawa, Takeshige; Nakamura, Yasuo; Katou, Susumu; and Takahashi, Katsuya, 5,112,385, Cl. 71-94.000.

Tsuruki, Satoru: *See—*
Hirata, Keiichi; Ban, Tomohiro; Kawasumi, Atsuko; Nakagawa, Kazuko; Mizutani, Yukimi; and Tsuruki, Satoru, 5,113,520, Cl. 395-650.000.

Tsuruo, Takashi: *See—*
Fukazawa, Nobuyuki; Odate, Makoto; Suzuki, Tsuneji; Otsuka, Kengo; Tsuruo, Takashi; and Sato, Wakao, 5,112,817, Cl. 514-183.000.

Tsushima, Hideaki: *See—*
Hirota, Osamu; Tsushima, Hideaki; Sasaki, Shinya; Takasaki, Yoshitaka; and Maeda, Minoru, 5,113,524, Cl. 359-115.000.

Tsutsui, Koichi: *See—*
Ueno, Tasaburo; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Yabuuchi, Naoya, 5,112,689, Cl. 428-407.000.

Tsutsui, Teruaki: *See—*
Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.

Tsutsumi, Jyoji, to Alps Electric Co., Ltd. Pushbutton switch with wear preventing groove. 5,113,047, Cl. 200-407.000.

Tsuzuki, Hanzo: *See—*
Mizuno, Yutaka; Tsuzuki, Hanzo; Haruhara, Kazuyoshi; Miyata, Shigeki; Motoike, Katsuhiko; Sakai, Tooru; and Ooishi, Kazuhiro, 5,113,183, Cl. 340-825.310.

Tucker, Marcella M.: *See—*
Brown, Thomas A.; Derenge, Charles L.; Hughes, Houston H., III; Szczutkowski, Craig; Teel, Vicki J.; and Tucker, Marcella M., 5,113,413, Cl. 375-40.000.

Tunnell, George W.: *See—*
Butzin, Donald F.; Meeka, Edward W.; Tunnell, George W.; and Salvo, Edgar E., Jr., 5,112,566, Cl. 376-245.000.

Turner, Arthur R. Expandable joist hanger. 5,111,632, Cl. 52-702.000.

Turner, Frederick, Jr. Truck trailer cover. 5,112,097, Cl. 296-100.000.

Turpen, Jon. Sample filtration, separation and dispensing device. 5,112,490, Cl. 210-645.000.

Tuson, Rodney R.; and Dimanstein, Isaac, to Rifala Pty. Ltd. High efficiency converter. 5,113,334, Cl. 363-25.000.

Tuttle, David P.: *See—*
Groves, Randall D.; and Tuttle, David P., 5,113,508, Cl. 395-425.000.

Tuttle, Mark E., to Micron Technology, Inc. Methods for texturizing polysilicon utilizing gas phase nucleation. 5,112,773, Cl. 437-109.000.

Tveten, Kjell W.: *See—*
Mejdell, Glor T.; Baumann, Hanne M.; and Tveten, Kjell W., 5,112,584, Cl. 423-161.000.

Tyberg, William T.: *See—*
Suzuki, Arata; Suzuki, Marcia; Tyberg, William T.; and Banks, George, 5,111,818, Cl. 128-644.000.

Tyrell, John A.: *See—*
Morelli, Thomas A.; Peascoe, Warren J.; Rasch, Stefan F.; and Tyrell, John A., 5,112,915, Cl. 525-166.000.

Tyrpin, Henry T.: *See—*
Zibell, Steven E.; Yatka, Robert J.; and Tyrpin, Henry T., 5,112,625, Cl. 426-5.000.

Ubasawa, Masaru: *See—*
Miyasaka, Tadashi; Tanaka, Hiromichi; De Clercq, Erik D. A.; Baba, Masanori; Walker, Richard T.; and Ubasawa, Masaru, 5,112,835, Cl. 544-302.000.

Ube Industries Ltd.: *See—*
Ogata, Naoya; and Yokowo, Yasuhiko, 5,112,906, Cl. 525-61.000.
Sugise, Ryoji; Daimon, Hiroshi; Gujii, Itsuhiro; Ihara, Hideo; Terada, Norio; Jo, Masatoshi; and Hirabayashi, Masayuki, 5,112,783, Cl. 501-126.000.

Uchikubo, Akinobu: *See—*
Kanno, Masahide; Uehara, Masao; Sasaki, Masahiko; Saito, Katsuyuki; Uchikubo, Akinobu; Hasegawa, Jun; Sasagawa, Katsuyoshi; Yamashita, Shinji; and Nakagawa, Takehiro, 5,113,254, Cl. 358-98.000.

Uchimura, Yoshinobu: *See—*
Hiruta, Yoshiki; Tsukamura, Naoki; Uchimura, Yoshinobu; Shigematsu, Toshifumi; Yamasaki, Hironori; and Yamaguchi, Toshio, 5,111,539, Cl. 4-661.000.

Uchiya Thermostat Co.: *See—*
Takeda, Hideaki, 5,113,308, Cl. 361-178.000.

Uchiyama, Haruhiko: *See—*
Atsumi, Masaaki; and Uchiyama, Haruhiko, 5,113,107, Cl. 310-256.000.

Uda, Koji: *See—*
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Ebinuma, Ryuichi; and Kariya, Takao, 5,112,133, Cl. 356-401.000.

Ueda, Keiichiro: *See—*
Nakamura, Katsunari; Ueda, Keiichiro; Irie, Yoshiro; Hoshi, Toyokazu; and Kawakami, Motozou, 5,113,349, Cl. 364-478.000.

Ueda, Kunihiro: *See—*
Nakayama, Masatoshi; Ueda, Kunihiro; Ishida, Toshihiko; and Tanabe, Hiroshi, 5,112,025, Cl. 249-115.000.
Nakayama, Masatoshi; and Ueda, Kunihiro, 5,112,458, Cl. 204-173.000.

Ueda, Seiichi: *See—*
Imaizumi, Eiki; Usui, Kunihiko; Matsuura, Tatsuji; Tsukada, Toshiro; Ueda, Seiichi; and Sato, Hiroshi, 5,113,090, Cl. 307-355.000.

Ueda, Shigenori: *See—*
Yamazaki, Koji; Ueda, Shigenori; and Ehara, Toshiyuki, 5,112,709, Cl. 430-46.000.

Ueda, Tsunehisa: *See—*
Miki, Yoshiaki; Toyonaka, Koji; Ueda, Tsunehisa; and Hiramatsu, Nobuaki, 5,112,602, Cl. 424-76.300.

Uehara, Hirotoshi: *See—*
Miki, Tadashi; Kozuka, Masayuki; and Uehara, Hirotoshi, 5,113,512, Cl. 395-425.000.

Uehara, Izushi, to NEC Corporation. Intercommunicating among a plurality of processors based upon the identification of the source without using the identification of the destination. 5,113,495, Cl. 395-200.000.

Uehara, Masaki: *See—*
Masaki, Mitsuo; Uehara, Masaki; Hirate, Kenji; Isowa, Yoshikazu; Sato, Yoshiaki; and Nakashima, Yoshiharu, 5,112,947, Cl. 530-329.000.

Uehara, Masao: *See—*
Kanno, Masahide; Uehara, Masao; Sasaki, Masahiko; Saito, Katsuyuki; Uchikubo, Akinobu; Hasegawa, Jun; Sasagawa, Katsuyoshi; Yamashita, Shinji; and Nakagawa, Takehiro, 5,113,254, Cl. 358-98.000.

Ueji, Kazufumi; Motoki, Yoshihiro; and Shinozuka, Akira, to Somar Corporation. Epoxy resin composition containing long chain aliphatic diacids and/or diphenylol derivatives. 5,112,888, Cl. 523-443.000.

Uekawa, Yasuaki: *See—*
Matsushiro, Ryuichi; Kosuda, Toru; Sasao, Shigeo; Ikeya, Taro; Chino, Yoshiharu; and Uekawa, Yasuaki, 5,111,776, Cl. 123-41.540.

Uematsu, Yutaka: *See—*
Hatakoshi, Genichi; Terashima, Kazutaka; Kawachi, Masaru; and Uematsu, Yutaka, 5,113,469, Cl. 385-122.000.

Uemura, Tadahiro: *See—*
Himeshima, Yoshio; Tanisugi, Hideaki; Watanabe, Tetsuo; Uemura, Tadahiro; and Kurihara, Masaru, 5,112,487, Cl. 210-490.000.

Ueno, Masaji, to Kabushiki Kaisha Toshiba. Output circuit. 5,113,087, Cl. 307-263.000.

Ueno, Tasaburo; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Yabuuchi, Naoya, to Nippon Paint Co., Ltd. Composite particle. 5,112,689, Cl. 428-407.000.

Ueyama, Masayuki; and Tsuji, Kenji, to Minolta Camera Kabushiki Kaisha. Device for detecting photographic distance or image magnification and photographic lens to be attached thereto. 5,113,209, Cl. 354-400.000.

Uhde, Dietmar: *See—*
Kaaden, Jurgen; Uhde, Dietmar; and Bigge, Franz, 5,113,397, Cl. 371-5.100.

Uhen, Richard F.: *See—*
Blaettner, Harald E.; Uhen, Richard F.; Ellis, Robert E.; Cunningham, Eldon R.; Usher, Michael J.; and Miller, Joseph E., 5,113,104, Cl. 310-90.000.

Uhrman, Robert L., Jr.: *See—*
Diehl, Rodney A.; Uhrman, Robert L., Jr.; Bishop, Robert G.; and Campbell, Donald B., 5,111,872, Cl. 164-98.000.

Ujihara, Takashi, to Pioneer Electronic Corporation. Optical element carrying printed substrate and optical head device using the substrate. 5,113,313, Cl. 361-380.000.

Ulatowski, George S.: *See—*
Perez, Ricardo R.; and Ulatowski, George S., 5,112,554, Cl. 264-262.000.

Ulrich, Lawrence W.; and Walker, Conrad, to Durable Packaging Corp. Carton erector apparatus. 5,112,288, Cl. 493-27.000.

Umaba, Takayuki; Ono, Jiro; Takagi, Syunsuke; Sawada, Makoto; Adachi, Hideki; Shimizu, Hirofumi; Hashimoto, Mokuhei; and Takahashi, Tetsu, to Dainippon Screen Mfg. Co., Ltd. Screen process printing plate for printing with high precision. 5,111,743, Cl. 101-127.000.

Umeda, Shigeru; and Takatori, Tsuyoshi, to Obara Corporation. Welding gun for robot. 5,113,053, Cl. 219-116.000.

Umehara, Teruo; and Takahashi, Fumihiko, to Hitachi Metals, Ltd. Focus magnet with separate static and dynamic control coils. 5,113,162, Cl. 335-210.000.

Umeyama, Mitsuhiro: *See—*
Honoki, Shinji; Kobayashi, Katsuyuki; Umeyama, Mitsuhiro; and Ootake, Toshihiro, 5,111,714, Cl. 74-574.000.

Umphries, Donald V., to Directional Wireline Service, Inc. Decentralized casing hole puncher. 5,111,885, Cl. 166-297.000.

Underground Technologies: *See—*
Kinnan, Frank R., 5,111,891, Cl. 175-21.000.

Unilever Patent Holdings B.V.: *See—*
Garvey, Michael J.; Griffiths, Ian C.; and Rennie, John H. S., 5,112,612, Cl. 424-400.000.
Van Grinsven, Adrianus M.; Peters, Alfons L. J.; and Roos, Robert, 5,112,747, Cl. 435-121.000.

Union Carbide Chemicals & Plastics Technology Corporation: *See—*
Abatjoglou, Anthony G.; and Bryant, David R., 5,113,022, Cl. 568-454.000.
Colon, Ismael; Merriam, Charles N.; and Wolf, Philip F., 5,112,887, Cl. 523-400.000.
Furrer, Willy; and Schombourg, Jacques J. F. J., 5,112,919, Cl. 525-263.000.
King, Stephen W., 5,112,788, Cl. 502-162.000.
McCain, James H.; King, Stephen W.; Knopf, Robert J.; Smith, Charles A.; and Hauser, Charles F., 5,112,789, Cl. 502-162.000.
Minahan, David M.; Thorsteinson, Erlind M.; and Liu, Albert C., 5,112,795, Cl. 502-324.000.
Richey, Forrest A., Jr.; and Doumaux, Arthur R., Jr., 5,112,984, Cl. 548-320.000.

Union Oil Company of California: *See—*
Dovan, Hoai T.; and Hutchins, Richard D., 5,111,886, Cl. 166-300.000.
Green, James A.; and Young, Donald C., 5,112,623, Cl. 424-713.000.
Young, Donald C., 5,112,379, Cl. 71-31.000.

Unisys Corporation: *See—*
Talbott, Jefferson F.; Cowgill, Richard A.; Cummings, Chris R.; Fontana, James A.; and Pitchford, Anthony R., 5,113,500, Cl. 395-325.000.

United Engineering, Inc.: *See—*
Ginzburg, Vladimir B.; and Vidil, F. Ronald, 5,111,930, Cl. 198-780.000.

United States Advanced Network, Inc.: *See—*
Richardson, Charles T., Jr.; and Austin, Kevin L., 5,113,430, Cl. 379-88.000.

United States of America
Administrator, National Aeronautics and Space Administration: *See—*
Milam, Malcolm B., 5,112,154, Cl. 403-13.000.
Agriculture: *See—*
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Air Force: *See—*
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Smith, Roger R., 5,112,074, Cl. 280-483.000.
Towry, Elisa R., 5,111,689, Cl. 73-167.000.

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Guon, Jerold; Grantham, LeRoy F.; and Specht, Eugene R., 5,112,534, Cl. 252-640.000.
Nellis, William J.; and Maple, M. Brian, 5,112,801, Cl. 505-1.000.

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Jensen, Brian J.; Hergenrother, Paul M.; and Bass, Robert G., 5,112,923, Cl. 525-420.000.
Manhart, Paul K., 5,113,064, Cl. 250-201.900.
Wood, Richard M.; and Bauer, Steven X. S., 5,112,120, Cl. 244-35.00R.

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Marrian, Christie R. K; and Peckerar, Martin C., 5,113,367, Cl. 364-819.000.
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Bernardet, Henri; Godechot, Xavier L. M.; and Lejeune, Claude A., 5,112,564, Cl. 376-116.000.
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Fautier, Thierry, 5,113,243, Cl. 358-21.00R.
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Heerkens, Henricus J., 5,113,257, Cl. 358-158.000.
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Karam, Georges; and Moridi, Said, 5,113,414, Cl. 375-60.000.
Kasperkovitz, Wolfdietrich G., 5,113,419, Cl. 377-75.000.
Niemann, Ulrich; Offermanns, Stephan; and Weber, Bernhard, 5,113,119, Cl. 313-638.000.
Opschoor, Jan; and Ambrosius, Hubertus P. M. M., 5,113,405, Cl. 372-46.000.
Patron, Christian S. A. E; and Sowinski, Eugene J., 5,113,157, Cl. 331-167.000.
Schafer, Ralf; and Wegener, Armin, 5,113,085, Cl. 307-239.000.
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Brown, David L.; and Malinowski, Stanley J., 5,111,641, Cl. 53-477.000.

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Daley, Eugene E., Jr., 5,112,255, Cl. 439-885.000.

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Goodson, Forrest R., 5,112,442, Cl. 159-49.000.
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Thrower, Jack S.; Stewart, Dennis C.; and Montero, Enrique E., 5,111,990, Cl. 228-113.000.

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McMillen, Bobby E., 5,111,706, Cl. 74-7.00C.

Universal Beverage Equipment, Inc.: *See—*
Bjerklund, Gunnar; Notardonato, Gino; and Pulawski, Casimir, 5,112,357, Cl. 55-53.000.

Universite de Rouen: *See—*
Combret, Jean-Claude; Klein, Jean-Louis; and Le Gaillard, Joel, 5,113,007, Cl. 556-482.000.

Universities Space Research Association: *See—*
Jaeckel, Louis A., 5,113,507, Cl. 395-425.000.

University of Arkansas, The: *See—*
Hermann, Allen M.; and Sheng, Zhengzhi, 5,112,800, Cl. 505-1.000.

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Mandel, Braja K.; Tripathy, Sukant K.; Huang, Jan-Chan; and Kumar, Jayant, 5,112,841, Cl. 522-117.000.

University of Maryland: *See—*
Wei, Sen-Jung, 5,113,143, Cl. 330-10.000.

University of Maryland at College Park: *See—*
Kuo, Tai-Haur; and Lin, Hung C., 5,113,188, Cl. 341-133.000.

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Reindl, Wilhelm J.; and Reid, Kenneth J., 5,111,757, Cl. 110-264.000.
Westermark, Per; and Johnson, Kenneth H., 5,112,945, Cl. 530-324.000.

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Axel, Leon; and Dougherty, Lawrence, 5,111,820, Cl. 128-653.00A.
Worrell, Wayne; Liu, Qingguo; and Tang, Yuhua, 5,112,456, Cl. 204-153.180.

University of Southern California: *See—*
Roy-Burman, Pradip; and Spodick, David A., 5,112,767, Cl. 435-320.100.

University of Utah: *See—*
Caldwell, Karin D.; Chu, Tun-Jen; and Pitt, William G., 5,112,736, Cl. 435-6.000.

University of Vermont: *See—*
Albertini, Richard J., 5,112,735, Cl. 435-6.000.

Unkuri, Esko: *See—*
Tohkala, Antti; and Unkuri, Esko, 5,111,859, Cl. 144-373.000.

Unno, Akira: *See—*
Nakamura, Kazushige; Honda, Mitsuru; Toma, Hitoshi; Tanaka, Shigemori; Murai, Keiichi; Unno, Akira; and Takemura, Ako, 5,112,656, Cl. 427-425.000.

Uohashi, Hiromichi: *See—*
Myojo, Koji; and Uohashi, Hiromichi, 5,112,681, Cl. 428-335.000.

Urano, Akiyoshi: *See—*
Hiramatsu, Toru; and Urano, Akiyoshi, 5,111,759, Cl. 112-322.000.

Urban, Manfred: *See—*
Sommer, Andreas; Dietz, Erwin; and Urban, Manfred, 5,112,404, Cl. 106-506.000.

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Meli, Vincent A.; Matharani, Michael A.; Brzezinski, Ted A.; Shaft, David L.; and Urmanski, James L., 5,112,632, Cl. 426-392.000.

Urushibara, Seiichi; and Yusa, Kuniya, to Taiyo Fishery Co., Ltd. Method and apparatus for gutting fish. 5,112,271, Cl. 452-108.000.

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Blaettner, Harald E.; Uhen, Richard F.; Ellis, Robert E.; Cunningham, Eldon R.; Usher, Michael J.; and Miller, Joseph E., 5,113,104, Cl. 310-90.000.

Ushijima, Ryosuke: *See—*
Nakagawa, Susumu; Yamada, Koji; and Ushijima, Ryosuke, 5,112,818, Cl. 514-210.000.

Usui Kokusai Sangyo Kaisha, Ltd.: *See—*
Washizu, Katsushi, 5,112,084, Cl. 285-24.000.

Usui, Kunihiko: *See—*
Imaizumi, Eiki; Usui, Kunihiko; Matsuura, Tatsuji; Tsukada, Toshiro; Ueda, Seiichi; and Sato, Hiroshi, 5,113,090, Cl. 307-355.000.

Utility Trailer Manufacturing Co.: *See—*
Horton, Terry F.; and Ross, Steve A., 5,111,867, Cl. 160-330.000.

Uto, Nobutaka; and Honjo, Takeshi, to Canon Kabushiki Kaisha. Sheet handling apparatus. 5,112,034, Cl. 270-53.000.

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Uzawa, Shunichi: *See—*
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Ebinuma, Ryuichi; and Kariya, Takao, 5,112,133, Cl. 356-401.000.

V.G. Elemental Limited: *See—*
Bridenne, Martine; Coffre, Eric; Hutton, Robert; and Marot, Yves, 5,113,075, Cl. 250-282.000.

Vaccaro, Anthony J.: *See—*
Gestaut, Lawrence J.; Brannan, James R.; Vaccaro, Anthony J.; and Groszek, Donald J., 5,112,447, Cl. 205-148.000.

Vaccaro, Robert K., to Air-Shields, Inc. Door assembly. 5,112,293, Cl. 600-22.000.

Vachet, Andre: *See—*
Savidan, Henri; and Vachet, Andre, 5,111,661, Cl. 60-562.000.

Valadez, Manuel: *See—*
Cartmell, James V.; Sturtevant, Wayne R.; Valadez, Manuel; and Wolf, Michael L., 5,112,618, Cl. 424-443.000.

Vale, Wylie W., Jr.: *See—*
Rivier, Jean E. F.; and Vale, Wylie W., Jr., 5,112,809, Cl. 514-12.000.

Valeo Thermique Habitacle: *See—*
Becquerel, Michel, 5,111,738, Cl. 454-159.000.

Vallet, Vincent: *See—*
Cederbaum, Carl; Chanclou, Roland; Combes, Myriam; Monc, Patrick; and Vallet, Vincent, 5,112,765, Cl. 437-41.000.

Vallon, Roger. Device for producing fresh water by solar energy-driven sea water desalting means. 5,112,446, Cl. 202-185.200.

Valmet Paper Machinery Inc.: *See—*
Leino, Jorma; Vestola, Juhani; Salo, Jukka; and Telama, Ari, 5,111,567, Cl. 29-132.000.
Telama, Ari, 5,111,568, Cl. 29-132.000.

Van Dorn Company: *See—*
Oas, David C., 5,112,213, Cl. 425-562.000.

Van der Aa, Marcel J. M.: *See—*
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Klugkist, Jan; and Van Dijk, Willem R., 5,112,518, Cl. 252-174.120.

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Erdmann, Dietrich; Van Ghemen, Max E.; Pohl, Ludwig; Schumann, Herbert; Hartmann, Uwe; Wassermann, Wilfried; Heyen, Meino; and Jurgensen, Holger, 5,112,432, Cl. 156-610.000.

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Van Hoye, Willibald: *See—*
Castelli, Renato; Van Hoye, Willibald; Miles, Richard; and Green, Stephen T., 5,111,920, Cl. 190-120.000.

Van Melle, Hubert, to Amhil Enterprises Ltd. Cup lid. 5,111,961, Cl. 220-712.000.

VanNoord, Andrew J., to Kent Design & Manufacturing, Inc. Storage rack assembly. 5,111,940, Cl. 211-41.000.

Van Roemburg, Franciscus M. J.: *See—*
Foerster, Gerhard R. H.; Kramer, Foppe; Munnig Schmidt, Robert H.; and Van Roemburg, Franciscus M. J., 5,112,342, Cl. 606-133.000.

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Altmann, Rainer; Lauer, Rainer; Schmidt, Guenther; Stromski, Kasimir; van Zanten, Anton; Hellmann, Harald; Veil, Karl; Fees, Hans-Joerg; Jonner, Wolf-Dieter; and Gutzeit, Reinhard, 5,112,117, Cl. 303-116.00R.

Vargas-Gutierrez, Gregorio: *See—*
Lazcano-Navarro, Arturo; Vargas-Gutierrez, Gregorio; Hernandez-Ruiz, Jose E.; and Maroto-Cabrera, Carlos, 5,112,029, Cl. 266-47.000.

Vastor Inc.: *See—*
Ure, Michael J., 5,112,670, Cl. 428-156.000.

Vaupel Textilmaschinen KG: *See—*
Diesner, Willi, 5,112,420, Cl. 156-88.000.

Vehar, Gordon A.: *See—*
Heyneker, Herbert L.; Holmes, William E.; and Vehar, Gordon A., 5,112,755, Cl. 435-215.000.

Veil, Karl: *See—*
Altmann, Rainer; Lauer, Rainer; Schmidt, Guenther; Stromski, Kasimir; van Zanten, Anton; Hellmann, Harald; Veil, Karl; Fees, Hans-Joerg; Jonner, Wolf-Dieter; and Gutzeit, Reinhard, 5,112,117, Cl. 303-116.00R.

Veilleux, Thomas. Variable tool bit holder. 5,112,163, Cl. 407-101.000.

Venditto, James J.: *See—*
Soliman, Mohamed Y.; Venditto, James J.; and Daneshy, A. Ali, 5,111,881, Cl. 166-250.000.

Venkatesan, Mahalingam: *See—*
Mitra, Udayanath; and Venkatesan, Mahalingam, 5,112,764, Cl. 437-40.000.

Ventritex: *See—*
Pless, Benjamin; Ryan, John G.; and Culp, James M., 5,111,816, Cl. 128-419.0PG.

Venturini, Aldo. Disposable safety syringe. 5,112,316, Cl. 604-195.000.

Verdon, Catherine: *See—*
Chaumette, Patrick; Le Peltier, Fabienne; Szymanski, Raymond F.; Courty, Philippe; and Verdon, Catherine, 5,112,591, Cl. 423-415.00A.

Verhoff, Donald H.: *See—*
Bachhuber, Anthony A.; and Verhoff, Donald H., 5,111,901, Cl. 180-140.000.

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VerMehren, H. Richard. Overbending device. 5,112,291, Cl. 493-409.000.

Vernet, Marc R. M.: *See—*
Marsh, John F.; Vernet, Marc R. M.; and Hamey, Graham W., 5,112,506, Cl. 252-33.400.

Verret, Allen J., to Texaco, Inc. Stairway guard for offshore marine structure. 5,112,159, Cl. 405-195.100.

Versa Tech Engineering: *See—*
Burka, Eric S., 5,111,562, Cl. 29-37.00R.

Verzellino, Santina R.: *See—*
Colombo, Paolo; Troglia, Claudio; Verzellino, Santina R.; and Muratori, Giuseppe, 5,112,905, Cl. 525-60.000.

Vestola, Juhani: *See—*
Leino, Jorma; Vestola, Juhani; Salo, Jukka; and Telama, Ari, 5,111,567, Cl. 29-132.000.

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Vickers, Stanley, to Merck & Co., Inc. HMG-CoA reductase inhibitor metabolites. 5,112,857, Cl. 514-460.000.

Vidil, F. Ronald: *See—*
Ginzburg, Vladimir B.; and Vidil, F. Ronald, 5,111,930, Cl. 198-780.000.

Viebach, Hans J.: *See—*
Chan, Wai-Kwong; Allsopp, Mary F.; McGuire, Kevin T.; Nonnemann, Robert W.; Obrecht, Gordon A.; Saluski, Ronald B.; Trchka, James A.; Viebach, Hans J.; Brandt, Peter A.; Butler, Robert R.; Shircliff, Michael W.; Walker, Samuel A.; and Miller, Thomas R., 5,112,179, Cl. 412-1.000.

Vieiro, Gary: *See—*
Zimmerman, Daniel D.; and Vieiro, Gary, 5,112,909, Cl. 525-67.000.

Vijayakumar, Erra K. S.: *See—*
Roy, Kirity; Mukhopadhyay, Triptikumar; Reddy, Goukanapalli C. S.; Vijayakumar, Erra K. S.; Ganguli, Bimal N.; Rupp, Richard H.; Fehlhaber, Hans-Wolfram; and Kogler, Herbert, 5,112,858, Cl. 514-462.000.

Virdee, Arvinder S.: *See—*
Orgun, Munir; McRoberts, Timothy C.; and Virdee, Arvinder S., 5,113,346, Cl. 364-428.000.

Virving, Nils; and Haven, Anders E. E., to Sunds Defibrator Industries Aktiebolag. Method and apparatus for the manufacture of fibre pulp. 5,112,443, Cl. 162-23.000.

Vision III Imaging, Inc.: *See—*
Pritchard, Eric K.; and Mayhew, Christopher A., 5,113,253, Cl. 358-91.000.

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VLSI Technology, Inc.: *See—*
Chapman, David C.; and Duprez, Herve G., 5,113,451, Cl. 382-8.000.

Vobach, Arnold. Random choice cipher system and method. 5,113,444, Cl. 380-47.000.

Vogel, Hans-Burkhardt: *See—*
Ludemann, Simpert; Bernheim, Michael; Sandner, Bernhard; Rossler, Erich; and Vogel, Hans-Burkhardt, 5,112,930, Cl. 528-28.000.

Vogel, Hans-Henning: *See—*
Rath, Hans P.; Mach, Helmut; Oppenlaender, Knut; Schoenleben, Willibald; and Vogel, Hans-Henning, 5,112,364, Cl. 44-418.000.

Vogelsang, Joerg: *See—*
Buchert, Hermann; Ahlers, Juergen; Kohlhaas, Werner; Vogelsang, Joerg; and Neitzel, Manfred, 5,112,901, Cl. 524-494.000.

Vogg, Guenter: *See—*
Eilenstein, Wilfried; and Vogg, Guenter, 5,112,173, Cl. 410-79.000.

Volk, Henry J. Ankle strap poultry trussing device. 5,112,274, Cl. 452-174.000.

Volz, William E.: *See—*
Zimmermann, Eugene K.; Wagner, Bernhard; Volz, William E.; Harclerode, William H.; Wiman, John V.; and Voss, John C., 5,112,875, Cl. 521-60.000.

Von Allmen, Ronald W.: *See—*
DeRosa, Thomas F.; Von Allmen, Ronald W.; Kaufman, Benjamin J.; and Jennejahn, Rosemary J., 5,112,508, Cl. 252-51.50A.

von Buren, Stefan: *See—*
Akselrud, Vitaly; and von Buren, Stefan, 5,112,212, Cl. 425-557.000.

von Jakusch, Egbert A.: *See—*
Miller, John A.; and von Jakusch, Egbert A., 5,112,889, Cl. 524-77.000.

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Zimmermann, Eugene K.; Wagner, Bernhard; Volz, William E.; Harclerode, William H.; Wiman, John V.; and Voss, John C., 5,112,875, Cl. 521-60.000.

Vossmerbaumer, Rudolf: *See—*
Pav, Josef; Wenzel, Reinhard; Bresser, Hans; and Vossmerbaumer, Rudolf, 5,111,564, Cl. 29-116.200.

Voth, Dean. Pizza dough roller machine. 5,112,208, Cl. 425-367.000.

Vottero, Catherine; Labat, Yves; and Poirier, Jean-Marie, to Societe Nationale Elf Aquitaine (Production). Process for phenol alkylthiolation and its application to the synthesis of 4-acyl-2-alkylthiophenols. 5,113,019, Cl. 568-42.000.

Vrudhula, Vivekananda M.: *See—*
Abrams, Paul G.; Srinivasan, Ananthachari; and Vrudhula, Vivekananda M., 5,112,954, Cl. 530-391.900.

Vukovich, Thomas. Method of and apparatus for separating proteins. 5,112,949, Cl. 530-380.000.

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Mainz, Eric L.; Beard, William Q., Jr.; Hirschmann, Robert P.; Little, Barry M.; and Smith, Earl B., 5,113,027, Cl. 570-224.000.

Vurek, Gerald G.: *See—*
Bertaud, Francois X.; Grabenkort, Richard W.; Magrane, Beverly A.; and Vurek, Gerald G., 5,112,309, Cl. 604-171.000.

W. L. Gore & Associates, Inc.: *See—*
Waterland, Alfred F., III, 5,112,664, Cl. 428-76.000.

W. R. Grace & Co.-Conn.: *See—*
Bessinger, Daniel J.; and Netzer, Philip E., 5,111,595, Cl. 34-18.000.
Wimberger, Richard J.; and Carman, Richard A., 5,112,220, Cl. 432-8.000.

W. Schlafhorst AG & Co.: *See—*
Derichs, Josef; and Hermanns, Ferdinand-Josef, 5,112,000, Cl. 242-18.0DD.

Wachter, William A.: *See—*
Zigler, Herbert L.; Wronkiewicz, Robert D.; McKeown, Franklin, Jr.; and Wachter, William A., 5,111,753, Cl. 105-230.000.

Wacker-Chemie GmbH: *See—*
Herzig, Christian, 5,113,006, Cl. 556-453.000.

Waddill, Harold G.: *See—*
Lin, Jiang-Jen; Cuscurida, Michael; and Waddill, Harold G., 5,112,979, Cl. 546-244.000.

Wagenblast, Gerhard: *See—*
Hahn, Erwin; Hansen, Guenter; Lamm, Gunther; Reichelt, Helmut; and Wagenblast, Gerhard, 5,112,362, Cl. 8-639.000.

Wagner, Bernhard: *See—*
Zimmermann, Eugene K.; Wagner, Bernhard; Volz, William E.; Harclerode, William H.; Wiman, John V.; and Voss, John C., 5,112,875, Cl. 521-60.000.

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Waizman, Alex, to Intel Corporation. Unity gain inverting amplifier providing linear transfer characteristics. 5,113,150, Cl. 330-264.000.

Wajid, Abdul, to Leybold Inficon, Inc. Measuring and controlling deposition on a piezoelectric monitor crystal. 5,112,642, Cl. 427-10.000.

Wajima, Motoyo: *See—*
Eguchi, Shuji; Taketani, Noriaki; Tanno, Seikichi; Okabe, Yoshiaki; Terao, Hiromu; Asano, Hideki; Wajima, Motoyo; and Abe, Tomiya, 5,113,477, Cl. 385-143.000.

Wakabayashi, Noboru: *See—*
Ikeda, Yoshito; Narisawa, Hiroaki; and Wakabayashi, Noboru, 5,113,300, Cl. 360-126.000.

Wakamatsu, Kazuhiro: *See—*
Tadokoro, Hiroyuki; Wakamatsu, Kazuhiro; Sagae, Syoji; and Shimada, Akira, 5,113,226, Cl. 355-273.000.

Wakamiya, Stanley K.: *See—*
Tilles, David J.; Wakamiya, Stanley K.; Krein, Bruce A.; Brown, Dale H.; Duggan, Sharon A.; and Schroeder, Mark S., 5,112,042, Cl. 271-297.000.

Wake, Kiyoyasu. Device for giving alarm for failure to draw out key for vehicle. 5,113,174, Cl. 340-457.000.

Wakeman, Thomas G.: *See—*
Strock, William J.; Wakeman, Thomas G.; and Hauser, Ambrose A., 5,112,191, Cl. 416-94.000.

Waldron, Craig: *See—*
Farmer, Douglas A., Jr.; Hani, Rahim; and Waldron, Craig, 5,112,397, Cl. 106-18.300.

Walker, Conrad: *See—*
Ulrich, Lawrence W.; and Walker, Conrad, 5,112,288, Cl. 493-27.000.

Walker, Craig I., to Warman International Limited. Annular elastomeric slurry seal. 5,112,039, Cl. 277-81.00R.

Walker, Richard T.: *See—*
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Lebrun, Jean C., 5,112,559, Cl. 264-297.800.

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Buchanan, William J.; and Wasse, Siegfried A., 5,111,877, Cl. 165-153.000.

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Hu, Fang-Quan; Page, Michael; and Watson, John M., 5,111,847, Cl. 137-828.000.

Watson, Nigel S.: *See—*
Ross, Barry C.; Kirk, Barrie E.; Lester, Michael G.; Procopiou, Panayiotis A.; and Watson, Nigel S., 5,112,819, Cl. 514-212.000.

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Winter, Charles H.; and Lewkebandara, T. Suren, 5,112,650, Cl. 427-255.200.

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Niemann, Ulrich; Offermanns, Stephan; and Weber, Bernhard, 5,113,119, Cl. 313-638.000.

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Jensen, Roderick J.; and Weber, Jerry L., 5,112,279, Cl. 460-69.000.

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Harney, Ralph P.; Hightower, Michael L.; and Wechselberger, Anthony J., 5,113,440, Cl. 380-15.000.

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Schlak, Ottfried; and Wecker, Dieter, 5,112,874, Cl. 521-51.000.

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Strolle, Christopher H.; Patel, Chandrakant B.; Wedam, Werner F.; Ko, Jung W.; Schnitzler, Raymond; and Yun, Jong K., 5,113,262, Cl. 358-310.000.

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Weder, Donald E.; and Weder, Erin H., 5,111,741, Cl. 100-45.000.

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Billin, Martin P.; Wedow, Christopher G.; and Nedwick, Dan M., 5,111,619, Cl. 49-502.000.

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Schafer, Ralf; and Wegener, Armin, 5,113,085, Cl. 307-239.000.

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Weissfloch, Rinhard, 5,112,210, Cl. 425-383.000.

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Keith, Dennis D.; Wei, Chung-Chen; and West, Kevin F., 5,112,967, Cl. 540-215.000.

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Peterson, Gerald W.; and Weidle, Bert W., 5,113,467, Cl. 385-88.000.

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Weil, Walter: *See—*
Simpfendorfer, Dieter; Weil, Walter; and Dao-Xuan, Phon, 5,111,625, Cl. 51-267.000.

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Yacobucci, Paul D.; Yang, Hsinjin; and Weiss, David S., 5,112,935, Cl. 528-176.000.

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Welch, Jeffrey A.: *See—*
Lau, Ian V.; and Welch, Jeffrey A., 5,111,620, Cl. 49-502.000.

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Gaginella, Timothy S.; Welton, Ann F.; and Will, Peter C., 5,112,856, Cl. 514-456.000.

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Wingert, Horst; Sauter, Hubert; Brand, Siegbert; Wenderoth, Bernd; Lorenz, Gisela; and Ammermann, Eberhard, 5,112,860, Cl. 514-513.000.

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Mallia, A. Krishna; and Wendt, Marten W., 5,112,952, Cl. 530-387.100.

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Pav, Josef; Wenzel, Reinhard; Bresser, Hans; and Vossmerbaumer, Rudolf, 5,111,564, Cl. 29-116.200.

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Fischer, Walter; Baumann, Marcus; Finter, Jurgen; Kvita, Vratislav; Mayer, Carl W.; and Wernet, Wolfgang, 5,112,977, Cl. 546-195.000.

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Keith, Dennis D.; Wei, Chung-Chen; and West, Kevin F., 5,112,967, Cl. 540-215.000.

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Hamada, Yoshitaka; and West, Robert, 5,113,002, Cl. 556-431.000.

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Davids, Joseph; and Silvestri, George J., Jr., 5,112,187, Cl. 415-169.300.
Duff, Winslow K., 5,111,690, Cl. 73-168.000.
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Foster, John P.; Comstock, Robert J.; Worcester, Samuel A.; and Sabol, George P., 5,112,573, Cl. 420-422.000.
Hill, Peter D., 5,111,704, Cl. 73-866.400.
Meyer, Jeffry R.; and Kole, Richard P., 5,112,065, Cl. 277-167.500.
Snyder, Thomas S.; and Lee, Ernest D., 5,112,493, Cl. 210-656.000.
Stacey, Eric J., 5,113,125, Cl. 318-721.000.
Tilles, David J.; Wakamiya, Stanley K.; Krein, Bruce A.; Brown, Dale H.; Duggan, Sharon A.; and Schroeder, Mark S., 5,112,042, Cl. 271-297.000.

Weston, Charles W.: *See—*
Murray, Michael A.; and Weston, Charles W., 5,112,499, Cl. 210-713.000.

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Rueb, Lothar; Eicken, Karl; Plath, Peter; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,112,383, Cl. 71-92.000.

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Stanko, John, 5,112,024, Cl. 248-603.000.

Whitehead, Frank R.; and Marchant, Alan B., to Eastman Kodak Company. Focus and tracking error detector apparatus for optical and magneto-optical information storage systems. 5,113,386, Cl. 369-44.410.

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Brink, Edward C., Jr.; Henderson, Clifton C.; Whiteman, James R.; and Sowers, Henry K., 5,112,509, Cl. 252-56.00R.

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McKeen, Francis X.; Fossum, Tryggve; Bhandarkar, Dileep P.; and Wiecek, Cheryl A., 5,113,521, Cl. 395-650.000.

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Cozzette, Stephen N.; Davis, Graham; Holleritter, Lisa A.; Lauks, Imants R.; Piznik, Sylvia; Smit, Nicolaas J.; Tirinato, Jody A.; Wieck, Henry J.; and Zelin, Michael P., 5,112,455, Cl. 204-153.120.

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Pennings, Henricus M.; and Wijnen, Hubertus F., 5,113,509, Cl. 395-425.000.

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Swain, James C.; Wilcox, John P.; and Thomas, David L., 5,112,197, Cl. 417-222.00R.
Wild Leitz, GmbH: *See—*
Neumann, Burkhard, 5,112,125, Cl. 356-73.000.
Wilde, Doran K.: *See—*
Colley, Stephen R.; Jurasek, David W.; Palmer, John F.; Richardson, William S.; and Wilde, Doran K., 5,113,523, Cl. 395-800.000.
Wilde, Eugen: *See—*
Goessler, Gerhard; and Wilde, Eugen, 5,113,170, Cl. 337-394.000.
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Kuhnt, Erhard; and Dreifert, Karl-Heinz, 5,111,615, Cl. 49-279.000.
Wilkening, Steven R., to ODL, Incorporated. Screw hole plug. 5,112,175, Cl. 411-371.000.
Wilkerson, William E. Canisters for pressurized gas and personal security devices utilizing same. 5,111,968, Cl. 222-47.000.
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Mikhaeil-Boules, Naila; Hammersmith, Robert J.; Leppek, Kevin G.; Wilkey, Paul D.; Gardner, Thomas H.; Ricker, Dennis J.; and Kowalik, James J., 5,112,116, Cl. 303-115.0EC.
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Gaginella, Timothy S.; Welton, Ann F.; and Will, Peter C., 5,112,856, Cl. 514-456.000.
Wm. Wrigley Jr. Company: *See—*
Zibell, Steven E.; Yatka, Robert J.; and Tyrpin, Henry T., 5,112,625, Cl. 426-5.000.
Williams, Chris. Air conditioner bracket assembly. 5,112,015, Cl. 248-236.000.
Williams, Edward B., Jr., to Williams, Sybil J. Uninterrupted drill bit. 5,111,894, Cl. 175-373.000.
Williams, James H.: *See—*
Gay, William M.; Blanpied, Robert H.; Bush, Philip W.; Donald, Richard L.; Williams, James L.; and Williams, James H., 5,112,678, Cl. 428-268.000.
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Gay, William M.; Blanpied, Robert H.; Bush, Philip W.; Donald, Richard L.; Williams, James L.; and Williams, James H., 5,112,678, Cl. 428-268.000.
Williams, Robert J.: *See—*
Staub, Theodor; Dahmen, Heide; Nyfeler, Robert; and Williams, Robert J., 5,112,849, Cl. 514-427.000.
Williams, Sybil J.: *See—*
Williams, Edward B., Jr., 5,111,894, Cl. 175-373.000.
Willmann, Karl-Heinz; Rischen, Dietmar; and Jonner, Wolf-Dieter, to Robert Bosch GmbH. Anti-skid brake control system. 5,112,115, Cl. 303-114.00R.
Wilson, Brown L.: *See—*
Liu, Joseph C.; and Wilson, Brown L., 5,113,101, Cl. 310-87.000.
Wilson, Harold R. Wheelchair with removable seat. 5,112,076, Cl. 280-657.000.
Wilson, James; Stephenson, LinMarie; and Corl, Kenneth G., to Eastman Kodak Company. Reproduction apparatus with improved display for use in job set-up. 5,113,222, Cl. 355-209.000.
Wilson, Joe C.: *See—*
Welch, Michael C.; Lisa, Rudolph E.; and Wilson, Joe C., 5,113,001, Cl. 556-428.000.
Wilson, John C.: *See—*
DeMejo, Lawrence P.; McCabe, John M.; and Wilson, John C., 5,112,715, Cl. 430-109.000.
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Wilson, Steven D.: *See—*
McCalley, Karl W.; Wilson, Steven D.; and Szeplaki, Victor J., 5,113,496, Cl. 395-200.000.
Wilson, Syd R.; Liang, Han-Bin K.; Zirkle, Thomas; and See, Yee-Chaung, to Motorola, Inc. Method of fabricating a trench structure. 5,112,772, Cl. 437-67.000.
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Wiltron Company: *See—*
Grace, Martin I.; Kapetanic, Peter M.; and Liu, Eric C., 5,113,094, Cl. 307-529.000.
Wiman, John V.: *See—*
Zimmermann, Eugene K.; Wagner, Bernhard; Volz, William E.; Harclerode, William H.; Wiman, John V.; and Voss, John C., 5,112,875, Cl. 521-60.000.
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Kohn, Uwe, 5,112,289, Cl. 493-194.000.
Winer, Robert. Self-pressurized container having a convoluted liner and an elastomeric sleeve. 5,111,971, Cl. 222-95.000.
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Winget, James M., to Silicon Graphics, Inc. Method for forming a computer model from an intersection of a cutting surface with a bounded volume. 5,113,490, Cl. 395-119.000.
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Winston, Philip E., Jr.; Dial, Harold D.; Clare, Kenneth; and Ortega, Theresa M., to Merck & Co., Inc. Gellan gum sizing. 5,112,445, Cl. 162-178.000.
Winter, Charles H.; and Lewkebandara, T. Suren, to Wayne State University. Chemical vapor deposition of metal chalcogenide films. 5,112,650, Cl. 427-255.200.
Winter, Roland A. E.: *See—*
Behrens, Rudolf A.; Winter, Roland A. E.; Mar, Andrew; Schirmann, Peter J.; Seltzer, Raymond; and Malherbe, Roger F., 5,112,890, Cl. 524-95.000.
Wis-Surel, Gabriella: *See—*
Murphy, Bryan P.; and Wis-Surel, Gabriella, 5,112,359, Cl. 8-405.000.
Wishneski, Todd W.; and Margitich, Donald E., to Olin Corporation. Catalysts for extending the shelf life of formulations for producing rigid polyurethane foams. 5,112,878, Cl. 521-131.000.
Wisner, Craig A.: *See—*
Ballard, James G.; and Wisner, Craig A., 5,111,680, Cl. 72-447.000.
Witthoeft, Carol A. Compartmentalized refuse collection unit. 5,111,958, Cl. 220-524.000.
Wittinger, Sharon G.: *See—*
Huang, Victor T.; Barrier, William A.; Leake, Luther H.; and Wittinger, Sharon G., 5,112,626, Cl. 426-43.000.
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Stauffer, Anton; and Wolf, Heinz, 5,111,684, Cl. 73-49.300.
Wolf, Michael L.: *See—*
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Moore, Arthur L.; Wolff, Peter; Ruther, Leon H.; and Pike, Walter E., 5,112,088, Cl. 285-114.000.
Wong, Janelle K.: *See—*
Faust, Michael C.; Pinckney, Keith T.; and Wong, Janelle K., 5,111,953, Cl. 220-214.000.
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Harris, Graham J.; and Woolnough, Victor J., 5,112,356, Cl. 623-49.000.
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Harjunmaa, Hannu; Peura, Robert A.; and Mendelson, Yitzhak, 5,112,124, Cl. 356-39.000.
Worcester, Samuel A.: *See—*
Foster, John P.; Comstock, Robert J.; Worcester, Samuel A.; and Sabol, George P., 5,112,573, Cl. 420-422.000.
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Wung, Wen-Pin; and Worng, Wen-Jenn, 5,111,588, Cl. 33-367.000.

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Zigler, Herbert L.; Wronkiewicz, Robert D.; McKeown, Franklin, Jr.; and Wachter, William A., 5,111,753, Cl. 105-230.000.
Wu, Margaret M.: *See—*
Chen, Catherine S. H.; and Wu, Margaret M., 5,113,030, Cl. 585-10.000.
Wuerzer, Bruno: *See—*
Rueb, Lothar; Eicken, Karl; Plath, Peter; Westphalen, Karl-Otto; and Wuerzer, Bruno, 5,112,383, Cl. 71-92.000.
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Patel, Jayantilal S.; and Wullert, John R., II, 5,113,275, Cl. 359-86.000.
Wun, Tze-Chein, to Monsanto Company. Method of stabilizing plasminogen activator inhibitor by treatment with vitronectin. 5,112,955, Cl. 530-409.000.
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Dietz, Hans, 5,111,862, Cl. 144-357.000.
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Xaar Limited: *See—*
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Tandon, Jagdish C., 5,113,260, Cl. 358-213.110.
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Sakamoto, Kenji; Maruyama, Akihiko; Moriya, Tatsuo; Yabe, Hiroshi; Kawaguchi, Takashi; and Yoshino, Masato, 5,113,381, Cl. 368-74.000.
Yabuuchi, Naoya: *See—*
Ueno, Tasaburo; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Yabuuchi, Naoya, 5,112,689, Cl. 428-407.000.
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Yale University: *See—*
Danishefsky, Samuel J.; Chow, Ken H.; and Naves, Carmen M. P. C., 5,113,014, Cl. 562-503.000.
Yamada, Hideo: *See—*
Iinuma, Mitsuhisa; Yamada, Hideo; Matsushima, Hiroaki; and Tobiki, Hisao, 5,112,327, Cl. 604-413.000.
Yamada, Koji: *See—*
Nakagawa, Susumu; Yamada, Koji; and Ushijima, Ryosuke, 5,112,818, Cl. 514-210.000.
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Ishii, Tatsuya; Mashiko, Yoji; Nagatomo, Masao; and Yamada, Michihiro, 5,112,771, Cl. 437-67.000.
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Misawa, Hidenobu; and Yamada, Satoru, 5,112,544, Cl. 264-67.000.
Yamada, Takamasa; Kawata, Shoji; and Oie, Masayuki, to Nippon Zeon Co., Ltd. Positive resist composition containing alkali-soluble phenolic resin, quinonediazide sulfonic acid ester photosensitive agent and polyhydroxy sensitizer. 5,112,719, Cl. 430-191.000.
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Yamada, Yumi: *See—*
Minato, Norio; Kishida, Makoto; Yamada, Yumi; Watanabe, Izumi; and Kimura, Kiyomi, 5,112,281, Cl. 474-84.000.
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Kanda, Hitoshi; Yamada, Yusuke; Kato, Masayoshi; Goseki, Yasuhide; and Mitsumura, Satoshi, 5,111,998, Cl. 241-5.000.
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Takiyasu, Yoshihiro; Yamaga, Mitsuhiro; Nakamura, Kazunori; Amada, Eiichi; Jusa, Hidehiko; Kobayashi, Naoya; Takada, Osamu; Hirayama, Satoru; and Iiyama, Tatsuhito, 5,113,392, Cl. 370-85.150.
Yamagata, Yoshifumi: *See—*
Kuroki, Hiroshi; Yamagata, Yoshifumi; and Yamashita, Youichi, 5,113,310, Cl. 361-302.000.
Yamagishi, Koji: *See—*
Amemiya, Naomi; Yamagishi, Koji; Matsumoto, Kunio; and Masaki, Naoki, 5,113,383, Cl. 369-33.000.
Yamaguchi, Akihiro: *See—*
Ajioka, Masanobu; Higuchi, Chojiro; Oura, Takeshi; Katoh, Toshio; and Yamaguchi, Akihiro, 5,113,009, Cl. 560-40.000.
Yamaya, Norimasa; Ohta, Masahiro; and Yamaguchi, Akihiro, 5,112,899, Cl. 524-413.000.
Yamaguchi, Hiroshi; Saito, Keiya; Itoh, Fumikazu; Ishida, Koji; Sakano, Shinji; Tamura, Masao; Shukuri, Shoji; Ishitani, Tohru; and Ichiguchi, Tsuneo, to Hitachi, Ltd. Device having superlattice structure, and method of and apparatus for manufacturing the same. 5,113,072, Cl. 250-309.000.
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Monma, Yoshio; and Yamaguchi, Hiroyuki, 5,113,228, Cl. 355-315.000.
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Murayama, Katsutoshi; Yamaguchi, Masatoshi; and Nakamura, Tooru, 5,112,578, Cl. 422-197.000.
Yamaguchi, Toshio: *See—*
Hiruta, Yoshiki; Tsukamura, Naoki; Uchimura, Yoshinobu; Shigematsu, Toshifumi; Yamasaki, Hironori; and Yamaguchi, Toshio, 5,111,539, Cl. 4-661.000.
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Kobayashi, Noboru, 5,111,765, Cl. 114-270.000.
Onodera, Hiroki, 5,111,791, Cl. 123-432.000.
Yamakawa, Takeshi, to Omron Tateisi Electronics Co. Fuzzy membership function circuit. 5,113,366, Cl. 395-3.000.
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Tsujino, Toshifumi; Maeda, Koichi; Ishizuka, Satoshi; Yamamoto, Hiroaki; Kitayama, Shinichiro; and Hozumi, Shigeo, 5,112,722, Cl. 430-290.000.
Yamamoto, Hiroshi; and Tobita, Hiroshi, to Ikegami Tsushinki Co., Ltd. Sorter. 5,112,035, Cl. 270-53.000.
Yamamoto, Kazuhiro; Yoshioka, Noriko; and Furukawa, Tadayasu, to Kyowa Kakko Kogyo Co., Ltd. Preservative for plants comprising alkenylphosphonic acids and, optionally, dipicolinic acid. 5,112,380, Cl. 426-321.000.
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Watanabe, Hidetoshi; Suzuki, Hirotsugu; and Yamamoto, Masanobu, 5,112,205, Cl. 425-111.000.
Yamamoto, Masayuki: *See—*
Kuzuno, Katsutoshi; Ishizuka, Shigeo; and Yamamoto, Masayuki, 5,112,244, Cl. 439-395.000.
Yamamoto, Sanehiro: *See—*
Kurano, Yoshito; Kawamura, Masato; Kondo, Masahiro; Tanaka, Michio; and Yamamoto, Sanehiro, 5,113,018, Cl. 564-403.000.
Yamamoto, Satoshi: *See—*
Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.
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Yamamoto, Takuji; Hamano, Hiroshi; Amemiya, Izumi; Arai, Yasunari; and Ihara, Takeshi, to Fujitsu Limited. Equalizing and amplifying circuit in an optical signal receiving apparatus. 5,113,151, Cl. 330-308.000.
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Iwao, Tetsuya; Osaka, Shuichi; Sakaki, Takao; Nishida, Tadao; Yamamura, Kiyoshi; Koga, Seijiro; Hirai, Reiji; and Nakagawa, Haruo, 5,112,991, Cl. 549-206.000.
Yamasaki, Hironori: *See—*
Hiruta, Yoshiki; Tsukamura, Naoki; Uchimura, Yoshinobu; Shigematsu, Toshifumi; Yamasaki, Hironori; and Yamaguchi, Toshio, 5,111,539, Cl. 4-661.000.
Yamashita, Osamu; Takahashi, Eiji; Nishizawa, Takeshi; Takada, Hidekazu; and Shirasu, Tetsuo, to NEC Corporation. Hermetically sealed electrostrictive actuator. 5,113,108, Cl. 310-328.000.

Yamashita, Shinji: *See*—
Kanno, Masahide; Uehara, Masao; Sasaki, Masahiko; Saito, Katsuyuki; Uchikubo, Akinobu; Hasegawa, Jun; Sasagawa, Katsuyoshi; Yamashita, Shinji; and Nakagawa, Takehiro, 5,113,254, Cl. 358-98.000.

Yamashita, Youichi: *See*—
Kuroki, Hiroshi; Yamagata, Yoshifumi; and Yamashita, Youichi, 5,113,310, Cl. 361-302.000.

Yamauchi, Koichi: *See*—
Inaba, Hiroo; Kakuta, Takeshi; Yamauchi, Koichi; and Matsufuji, Akihiro, 5,112,680, Cl. 428-329.000.

Yamaura, Toranosuke, to Yonezawa Corporation; and Yamaura, Toranosuke. Grooved game board having magnetic surface projectile and puzzle overlay. 5,112,052, Cl. 273-153.00R.

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Yanagisawa, Hideyoshi; and Yamaya, Masaaki, 5,113,004, Cl. 556-440.000.

Yamaya, Norimasa; Ohta, Masahiro; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Incorporated. Thermosetting resin composition. 5,112,899, Cl. 524-413.000.

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Ozawa, Yasuo; Ando, Nobuo; Yamamoto, Satoshi; Fukahori, Toshio; Kunugiyama, Hiroyuki; Sugiyama, Kouichi; Tsutsui, Teruaki; Hashiba, Keiichi; Endoh, Shigehiro; Kawakami, Hiroshi; Tokushima, Akira; and Yamazaki, Kaoru, 5,113,277, Cl. 359-127.000.

Yamazaki, Koji; Ueda, Shigenori; and Ehara, Toshiyuki, to Canon Kabushiki Kaisha. Red reproduction-improving electrophotographic image-forming method using an amorphous silicon photosensitive member having a surface layer composed of a hydrogenated amorphous silicon carbide. 5,112,709, Cl. 430-46.000.

Yamazaki, Takanaga, to Hitachi, Ltd. Pattern drawing system having a processor for drawing the profile of the pattern and a processor for painting the drawn profile. 5,113,491, Cl. 395-141.000.

Yan, Tsoung Y., to Mobil Oil Corporation. Removal of cyanide from water. 5,112,494, Cl. 210-668.000.

Yanagida, Satoru; Araki, Kouji; Okunoyama, Hikaru; and Niimi, Tetsunori, to Kabushiki Kaisha Toshiba. Semiconductor device mounted upon an insulating adhesive with silicon dioxide and nickel chromium steel filling particles. 5,113,241, Cl. 357-72.000.

Yanagisawa, Hideyoshi; and Yamaya, Masaaki, to Shin-Etsu Chemical Company, Limited. Organosilicon compounds. 5,113,004, Cl. 556-440.000.

Yanai, Isao: *See*—
Miura, Yuzo; Ohnishi, Masanobu; Mabuchi, Tsutomu; and Yanai, Isao, 5,112,384, Cl. 71-91.000.

Yang, Chung-Chieh. Safety plug receptacle. 5,112,237, Cl. 439-188.000.

Yang, Hsinjin: *See*—
Yacobucci, Paul D.; Yang, Hsinjin; and Weiss, David S., 5,112,935, Cl. 528-176.000.

Yang, Kun M., to SamSung Electronics Co., Ltd. Portable refrigerating/heating apparatus. 5,111,664, Cl. 62-3.620.

Yang, Woodward, to Massachusetts Institute of Technology. Method and charge coupled apparatus for algorithmic computations. 5,113,365, Cl. 364-807.000.

Yano, Hitoshi: *See*—
Konotsune, Shiro; Yano, Hitoshi; Hiraki, Souichiro; and Kikuta, Kazutsune, 5,112,694, Cl. 428-457.000.

Yano, Kanji: *See*—
Tsuda, Tadayuki; Yano, Kanji; Ikemoto, Isao; Watanabe, Kazushi; Tanaka, Makoto; and Ishiwata, Kazuhiko, 5,113,224, Cl. 355-234.000.

Yano, Tsuneo: *See*—
Sunagawa, Makoto; Matsumura, Haruki; Yano, Tsuneo; Sasaki, Akira; and Takata, Shinji, 5,112,966, Cl. 540-200.000.

Yasuda, Tomio; and Murakami, Yuichi, to Aisin Seiki K.K. Position display apparatus. 5,113,178, Cl. 340-709.000.

Yasui, Tadashi; and Kobayashi, Masayuki, to Japan Storage Battery Co., Ltd.; and Izumi Products Co. Motor driven hydraulic tool. 5,111,681, Cl. 72-453.030.

Yasunaga, Tadashi: *See*—
Yoden, Kenichi; and Yasunaga, Tadashi, 5,112,669, Cl. 428-141.000.

Yatka, Robert J.: *See*—
Zibell, Steven E.; Yatka, Robert J.; and Tyrpin, Henry T., 5,112,625, Cl. 426-5.000.

Yatsuzuka, Yohtaro: *See*—
Nomura, Takahiro; Yatsuzuka, Yohtaro; Iizuka, Shigeru; and Honma, Hideki, 5,113,448, Cl. 381-47.000.

Yauchi, Hitoshi: *See*—
Sato, Hiroyuki; and Yauchi, Hitoshi, 5,113,205, Cl. 346-140.00R.

Yazaki Corporation: *See*—
Kuzuno, Katsutoshi; Ishizuka, Shigeo; and Yamamoto, Masayuki, 5,112,244, Cl. 439-395.000.
Yagi, Sakai; and Tsuji, Masanori, 5,112,239, Cl. 439-189.000.

Yeh, Xian-Li: *See*—
Gaebe, Carl F.; and Yeh, Xian-Li, 5,113,404, Cl. 372-36.000.

Yeoman, Neil: *See*—
McNulty, Kenneth J.; Yeoman, Neil; and Li-Hsieh, Chang, 5,112,536, Cl. 261-94.000.

Yoden, Kenichi; and Yasunaga, Tadashi, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 5,112,669, Cl. 428-141.000.

Yokogawa, Kazufumi: *See*—
Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washimi, Takeshi; Harada, Naoki; and Akahori, Kingo, 5,112,959, Cl. 534-642.000.

Yokohama Rubber Co., Inc., The: *See*—
Saito, Tomoji; and Sato, Akira, 5,112,660, Cl. 428-36.800.

Yokomizo, Osamu: *See*—
Orii, Akihito; Yokomizo, Osamu; Masuhara, Yasuhiro; Nishida, Koji; Murata, Shigeto; Kashiwai, Shin-ichi; Inoue, Kotaro; and Yoshimoto, Yuichiro, 5,112,571, Cl. 376-439.000.

Yokowo, Yasuhiko: *See*—
Ogata, Naoya; and Yokowo, Yasuhiko, 5,112,906, Cl. 525-61.000.

Yokoyama, Tetsuo: *See*—
Koizumi, Hideaki; Sano, Koichi; Yokoyama, Tetsuo; and Sukegawa, Kazuya, 5,113,137, Cl. 324-307.000.

Yokoyama, Yutaka: *See*—
Shinozaki, Fumihiko; and Yokoyama, Yutaka, 5,112,511, Cl. 252-62.200.

Yonemoto, Tatsuo; Saito, Eiichiro; and Matsumura, Masahiro, to Matsushita Electric Works Ltd. Process for producing unsaturated mono and dicarboxylic acid imide compound. 5,112,989, Cl. 548-548.000.

Yonezawa Corporation: *See*—
Yamaura, Toranosuke, 5,112,052, Cl. 273-153.00R.

Yonezawa, Takeyuki: *See*—
Goto, Yasuhiro; Yonezawa, Takeyuki; Tsuge, Akihiko; and Komatsu, Michiyasu, 5,112,780, Cl. 501-95.000.

Yosefi, Hanan, to Scitex Corporation Ltd. Method for preparing polychromatic printing plates. 5,113,249, Cl. 358-75.000.

Yoshida, Atsushi; and Oishi, Hisashi, to NEC Corporation. Modulator and demodulator for data transmission systems. 5,113,411, Cl. 375-13.000.

Yoshida, Hajime, to Nikken Chemical Laboratory Co., Ltd. Correction fluid for electrophoto plates for offset printing. 5,112,401, Cl. 106-287.190.

Yoshida Industry Co., Ltd.: *See*—
Sakurai, Yoshihumi; Ideshita, Yuzi; and Sugiyama, Takashi, 5,111,972, Cl. 222-135.000.

Yoshida, Kazuyuki; Kanai, Nobuo; Suzuki, Toshikazu; and Ishiyama, Masamitsu, to Minolta Camera Kabushiki Kaisha. Dual operational image reading apparatus. 5,113,268, Cl. 358-474.000.

Yoshida, Kimiyoshi: *See*—
Chatani, Masayuki; Yoshida, Kimiyoshi; Sakano, Akio; and Tamori, Hirofumi, 5,113,452, Cl. 382-13.000.

Yoshida, Kobun, to TEAC Corporation. Magnetic disk drive having a mechanism for preventing a disk cartridge from being inserted therein with wrong orientation and for fixing the disk cartridge inserted therein with correct orientation. 5,113,297, Cl. 360-99.060.

Yoshida Kogyo K.K.: *See*—
Hamatani, Tsutomu; and Tomita, Seihei, 5,111,919, Cl. 190-109.000.

Yoshida, Masaru; Manabe, Yoshio; Mitsuyu, Tsuneo; and Tanahashi, Ichiro, to Matsushita Electric Industrial Co., Ltd. Nonlinear, optical thin-films and manufacturing method thereof. 5,113,473, Cl. 385-131.000.

Yoshida, Naoyuki; Kitano, Kisei; and Ogawa, Tetsuya, to Chisso Corporation. Phenylpyrimidinecarboxylate derivative. 5,112,523, Cl. 252-299.610.

Yoshida, Noriyuki: *See*—
Takano, Satoshi; Takahashi, Kenichi; Miyazaki, Kenji; Yoshida, Noriyuki; Inazawa, Shinji; and Hayashi, Noriki, 5,112,802, Cl. 505-1.000.

Yoshida, Shigenobu: *See*—
Sawada, Tsutomu; Ohhasi, Shinichi; and Yoshida, Shigenobu, 5,112,673, Cl. 428-216.000.

Yoshida, Shinichi: *See*—
Komatsu, Koji; Yoshida, Shinichi; Miyata, Souichi; and Azuma, Daisuke, 5,113,339, Cl. 395-200.000.

Yoshida, Shusuke: *See*—
Nakajima, Tamotu; and Yoshida, Shusuke, 5,112,426, Cl. 156-250.000.

Yoshii, Kazuhiro: *See*—
Furukawa, Masahiro; Yoshii, Kazuhiro; and Oonou, Masayuki, 5,111,670, Cl. 62-475.000.

Yoshikawa, Syuuichi, to Sharp Kabushiki Kaisha. QAM demodulator having automatic adaptive equalizer. 5,113,142, Cl. 329-306.000.

Yoshimoto, Yuichiro: *See*—
Orii, Akihito; Yokomizo, Osamu; Masuhara, Yasuhiro; Nishida, Koji; Murata, Shigeto; Kashiwai, Shin-ichi; Inoue, Kotaro; and Yoshimoto, Yuichiro, 5,112,571, Cl. 376-439.000.

Yoshimura, Chisato: *See*—
Inaishi, Kouji; Yoshimura, Chisato; and Shinkai, Yuji, 5,113,471, Cl. 385-126.000.

Yoshimura, Seiji: *See*—
Furukawa, Nobuhiro; Yoshimura, Seiji; and Takahashi, Masatoshi, 5,112,704, Cl. 429-194.000.

Yoshino, Masato: *See*—
Sakamoto, Kenji; Maruyama, Akihiko; Moriya, Tatsuo; Yabe, Hiroshi; Kawaguchi, Takashi; and Yoshino, Masato, 5,113,381, Cl. 368-74.000.

Yoshioka, Noriko: *See*—
Yamamoto, Kazuhiro; Yoshioka, Noriko; and Furukawa, Tadayasu, 5,112,380, Cl. 426-321.000.

Young, Donald C., to Union Oil Company of California. Multicomponent soil supplement. 5,112,379, Cl. 71-31.000.

Young, Donald C.: *See*—
Green, James A.; and Young, Donald C., 5,112,623, Cl. 424-713.000.

Young, Ian A.: *See*—
Lev, Lavi A.; Young, Ian A.; and Greason, Jeffrey K., 5,113,096, Cl. 307-446.000.

Young, Kenneth: *See*—
Flood, Ronald; and Young, Kenneth, 5,111,631, Cl. 52-646.000.

Young, Thomas M.: *See*—
Fenton, Paul V., Jr.; Young, Thomas M.; and Gorman, William J., 5,112,301, Cl. 604-30.000.

Young, William R.: *See*—
Damerow, David H.; Young, William R.; and Faas, Denis W., 5,113,361, Cl. 364-721.000.

Yu, Jack: *See*—
Choy, Conrad Y.; and Yu, Jack, 5,112,242, Cl. 439-326.000.

Yuan, Mark S.; and Wittmann, Alois. Tilting momentum wheel for spacecraft. 5,112,012, Cl. 244-165.000.

Yuasa, Yuuichi: *See*—
Ohara, Takeji; and Yuasa, Yuuichi, 5,113,128, Cl. 320-21.000.

Yuge, Yoji: *See*—
Kawakatsu, Akira; Saito, Akiko; and Yuge, Yoji, 5,113,109, Cl. 313-112.000.

Yuki Gosei Kogyo Co., Ltd.: *See*—
Koseki, Koshi; Ebata, Takashi; Kawakami, Hiroshi; Matsushita, Hajime; Itoh, Kazuo; and Naoi, Yoshitake, 5,112,994, Cl. 549-323.000.

Yukino, Toshinori: *See*—
Haruna, Tohru; Takahashi, Masayuki; and Yukino, Toshinori, 5,112,891, Cl. 524-101.000.

Yun, Jong K.: *See*—
Strolle, Christopher H.; Patel, Chandrakant B.; Wedam, Werner F.; Ko, Jung W.; Schnitzler, Raymond; and Yun, Jong K., 5,113,262, Cl. 358-310.000.

Yurgevich, Howard J.; and Mavoczynski, Stanley J., to Rosby Corporation. Plate trailer joints. 5,112,099, Cl. 296-181.000.

Yusa, Kuniya: *See*—
Urushibara, Seiichi; and Yusa, Kuniya, 5,112,271, Cl. 452-108.000.

Zachry, Kathy W., to DeRoyal Industries, Inc. Surgical sponge with plurality of radiopaque monofilaments. 5,112,325, Cl. 604-362.000.

Zahnradfabrik Friedrichshafen, AG: *See*—
Lang, Armin, 5,113,172, Cl. 338-171.000.

Zamora, Antonio, to International Business Machines Corporation. Computer method for executing transformation rules. 5,113,342, Cl. 364-419.000.

Zank, Gregg A.: *See*—
Burns, Gary T.; and Zank, Gregg A., 5,112,779, Cl. 501-90.000.

Zapf, Otto. Seating furniture. 5,112,108, Cl. 297-291.000.

Zaruba, Wenzel. Toilet apparatus. 5,111,537, Cl. 4-324.000.

Zasu, Yasushi: *See*—
Oka, Koichi; Otani, William; Kubo, Yasuhiro; Zasu, Yasushi; and Akagi, Motonobu, 5,113,083, Cl. 250-574.000.

Zebco Corporation: *See*—
Clement, Tim, 5,112,256, Cl. 440-7.000.

Zeh, Bernhard, to EMS-Inventa AG. Helical pipes and method of manufacture thereof. 5,111,849, Cl. 138-118.000.

Zeinstra, Mark L.: *See*—
Suman, Michael J.; and Zeinstra, Mark L., 5,113,182, Cl. 340-825.310.

Zejda, Jaroslav, to Leybold Aktiengesellschaft. Cathode sputtering apparatus. 5,112,467, Cl. 204-298.120.

Zejda, Jaroslav: *See*—
Kempf, Stefan; and Zejda, Jaroslav, 5,112,469, Cl. 204-298.250.

Zelin, Michael P.: *See*—
Cozzette, Stephen N.; Davis, Graham; Holleritter, Lisa A.; Lauks, Imants R.; Piznik, Sylvia; Smit, Nicolaas J.; Tirinato, Jody A.; Wieck, Henry J.; and Zelin, Michael P., 5,112,455, Cl. 204-153.120.

Zelman, Jerry, to Ophthalmocare, Inc. Apparatus for extracting cataractous tissue. 5,112,339, Cl. 606-107.000.

Zembayashi, Michio: *See*—
Motegi, Hisao; Sunaga, Takeshi; and Zembayashi, Michio, 5,113,000, Cl. 556-413.000.

Zenith Electronics Corporation: *See*—
Citta, Richard W.; and Dicke, Stephen M., 5,113,256, Cl. 358-133.000.

Zeny Corporation: *See*—
Chen, Yung-Huei, 5,113,435, Cl. 379-441.000.

Zenyaku Kogyo Kabushiki Kaisha: *See*—
Takase, Muneaki; Komatsu, Toshihiko; Matsuno, Toshiyuki; Miyakawa, Akihisa; and Saito, Kenichi, 5,112,833, Cl. 514-300.000.

Zexel Corporation: *See*—
Okano, Masami, 5,112,080, Cl. 280-735.000.

Zexel-Gleason USA, Inc.: *See*—
Dye, James S., 5,112,284, Cl. 475-228.000.

Zhang, Haibuo: *See*—
Zhang, XueMing; Zhang, Shucheng; Zhang, Shuxia; Liu, Congshan; Zhang, Haibuo; Li, Wenrong; Ji, Quingyan; Zhang, Shufang; and Zhang, Shuwei, 5,112,463, Cl. 204-237.000.

Zhang, Shucheng: *See*—
Zhang, XueMing; Zhang, Shucheng; Zhang, Shuxia; Liu, Congshan; Zhang, Haibuo; Li, Wenrong; Ji, Quingyan; Zhang, Shufang; and Zhang, Shuwei, 5,112,463, Cl. 204-237.000.

Zhang, Shufang: *See*—
Zhang, XueMing; Zhang, Shucheng; Zhang, Shuxia; Liu, Congshan; Zhang, Haibuo; Li, Wenrong; Ji, Quingyan; Zhang, Shufang; and Zhang, Shuwei, 5,112,463, Cl. 204-237.000.

Zhang, Shuwei: *See*—
Zhang, XueMing; Zhang, Shucheng; Zhang, Shuxia; Liu, Congshan; Zhang, Haibuo; Li, Wenrong; Ji, Quingyan; Zhang, Shufang; and Zhang, Shuwei, 5,112,463, Cl. 204-237.000.

Zhang, Shuxia: *See*—
Zhang, XueMing; Zhang, Shucheng; Zhang, Shuxia; Liu, Congshan; Zhang, Haibuo; Li, Wenrong; Ji, Quingyan; Zhang, Shufang; and Zhang, Shuwei, 5,112,463, Cl. 204-237.000.

Zhang, XueMing; Zhang, Shucheng; Zhang, Shuxia; Liu, Congshan; Zhang, Haibuo; Li, Wenrong; Ji, Quingyan; Zhang, Shufang; and Zhang, Shuwei, to Zhang, XueMing. Apparatus for water electrolysis. 5,112,463, Cl. 204-237.000.

Zibell, Steven E.; Yatka, Robert J.; and Tyrpin, Henry T., to Wm. Wrigley Jr. Company. Aqueous zein coated sweeteners and other ingredients for chewing gum. 5,112,625, Cl. 426-5.000.

Ziegler, William R. A.: *See*—
Goldsmith, Paul; and Ziegler, William R. A., 5,113,387, Cl. 369-44.380.

Zielske, Alfred G.: *See*—
Bolkan, Steven A.; Brodbeck, Kelly J.; Brodbeck, Kevin J.; Deleeuw, David L.; Steichen, Dale S.; Strand, Bruce B.; Suk, Richard J. V.; Szuch, Kathleen D.; and Zielske, Alfred G., 5,112,514, Cl. 252-99.000.

Zierenberg, Bernd; Herschel, Michael; and Rohr, Uwe, to Boehringer Ingelheim KG. Transdermal administration of 2-amino-6-n-propylamino-4,5,6,7-tetrahydrobenzothiazole. 5,112,842, Cl. 514-367.000.

Zigler, Herbert L.; Wronkiewicz, Robert D.; McKeown, Franklin, Jr.; and Wachter, William A., to Amsted Industries Incorporated. Light weight fatigue resistant railcar truck bolster. 5,111,753, Cl. 105-230.000.

Zilliox, Kent. Interlocking plate and cup set. 5,111,960, Cl. 220-575.000.

Zimmer, Inc.: *See*—
Cozad, Trent E.; Lozier, Antony J.; Lower, Jerry L.; and Tencer, Allan F., 5,112,332, Cl. 606-61.000.

Zimmerman, Daniel D.; and Vieiro, Gary, to Cyro Industries. Blends of polymers particularly polycarbonates acrylate-modified rubber compositions and additional polyacrylates. 5,112,909, Cl. 525-67.000.

Zimmermann, Eugene K.; Wagner, Bernhard; Volz, William E.; Harclerode, William H.; Wiman, John V.; and Voss, John C., to BASF Corporation. Polystyrene having high degree of expandability, and formulation having a highly-expandable polymer therein. 5,112,875, Cl. 521-60.000.

Zinner, Norman R.; and Sterling, Arthur M. Penile prosthesis and method. 5,112,295, Cl. 600-40.000.

Zipperer, Bernhard; Sauter, Hubert; Ammermann, Eberhard; and Lorenz, Gisela, to BASF Aktiengesellschaft. Pyridine compounds which are useful as fungicides. 5,112,828, Cl. 514-277.000.

Zirkle, Thomas: *See*—
Wilson, Syd R.; Liang, Han-Bin K.; Zirkle, Thomas; and See, Yee-Chaung, 5,112,772, Cl. 437-67.000.

Zlotek, Rudolf, to Felix Wopfner KG. Linkable clamping device for the coupling of transport means to a mobile cable. 5,111,751, Cl. 104-209.000.

Zondler, Helmut; Meyer, Alfred; Eckhardt, Wolfgang; and Kunz, Walter, to Ciba-Geigy Corporation. Compositions for protecting plants against disease. 5,112,840, Cl. 514-341.000.

Zouras, Sally V., to Advanced Cardiovascular Systems, Inc. Vascular model. 5,112,228, Cl. 434-272.000.

Zscheuschler, Gunter: *See*—
Buddenhagen, Douglas A.; Legge, Norman R.; and Zscheuschler, Gunter, 5,112,900, Cl. 524-484.000.

Zuk, Inc.: *See*—
Zuk, Peter, Jr., 5,112,484, Cl. 210-247.000.

Zuk, Peter, Jr., to Zuk, Inc. Filtration apparatus. 5,112,484, Cl. 210-247.000.

Zust, Armin: *See*—
Frostl, Wolfgang; and Zust, Armin, 5,112,855, Cl. 514-456.000.

Zweig, Gilbert, to Glenbrook Technologies, Inc. X-ray inspection system for electronic components. 5,113,425, Cl. 378-190.000.

Zykoff, Felix B.: *See*—
Andrusch, Franz; Beerhalter, Siegfried; Mueller, Wolfgang F.; and Zykoff, Felix B., 5,111,723, Cl. 83-24.000.

501 Sakura Color Products Corporation: *See*—
Kuroda, Jyuzo, 5,112,526, Cl. 252-363.500.

VOL
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF MAY, 1992

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aotsu, Hiroaki: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyouda, Tadashi, Re. 33,922, Cl. 395-425.000.

Autologous Bloold Corp.: *See*—
Valeri, Cesare R., Re. 33,924, Cl. 604-6.000.

Bales, Thomas O.; and Smith, Kevin W., to Cordis Corporation. Electrosurgical catheter aned method for vascular applications. Re. 33,925, Cl. 606-48.000.

Biedermann, Kurt: *See*—
Bottger, Wolfgang; Biedermann, Kurt; and Pensel, Werner, Re. 33,923, Cl. 428-112.000.

Bottger, Wolfgang; Biedermann, Kurt; and Pensel, Werner, to Vorwerk & Co. Interholding GmbH. Structural element formed of a resin-hardened velour fabric and fabrication method. Re. 33,923, Cl. 428-112.000.

Cordis Corporation: *See*—
Bales, Thomas O.; and Smith, Kevin W., Re. 33,925, Cl. 606-48.000.

Elwer, Michael: *See*—
Kristoff, John J.; and Elwer, Michael, Re. 33,919, Cl. 123-179.310.

Enomoto, Hiromichi: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyouda, Tadashi, Re. 33,922, Cl. 395-425.000.

Fergason, James L.: *See*—
McLaughlin, Charles W.; Fergason, James L.; and Parker, Robert, Re. 33,921, Cl. 359-85.000.

Hitachi, Ltd.: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyouda, Tadashi, Re. 33,922, Cl. 395-425.000.

Ikegami, Mitsuru: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyouda, Tadashi, Re. 33,922, Cl. 395-425.000.

Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyouda, Tadashi, to Hitachi, Ltd. Memory circuit for graphic images. Re. 33,922, Cl. 395-425.000.

Kristoff, John J.; and Elwer, Michael, to Sycon Corporation. Pneumatic starter for internal combustion engine. Re. 33,919, Cl. 123-179.310.

Kuwabara, Tadashi: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyouda, Tadashi, Re. 33,922, Cl. 395-425.000.

Kyouda, Tadashi: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyouda, Tadashi, Re. 33,922, Cl. 395-425.000.

Lear Siegler Seymour Corp.: *See*—
Simpson, Danny, Re. 33,918, Cl. 29-437.000.

McCrink, James: *See*—
Tanguay, William P.; and McCrink, James, Re. 33,920, Cl. 340-628.000.

McLaughlin, Charles W.; Fergason, James L.; and Parker, Robert, to Taliq Corporation. NCAP liquid crystal apparatus incorporating a control means and electrode means thereof incorporating a circuit means. Re. 33,921, Cl. 359-85.000.

Ogura, Toshihiko: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; Kuwabara, Tadashi; Enomoto, Hiromichi; and Kyouda, Tadashi, Re. 33,922, Cl. 395-425.000.

Parker, Robert: *See*—
McLaughlin, Charles W.; Fergason, James L.; and Parker, Robert, Re. 33,921, Cl. 359-85.000.

Pensel, Werner: *See*—
Bottger, Wolfgang; Biedermann, Kurt; and Pensel, Werner, Re. 33,923, Cl. 428-112.000.

Seatt Corporation: *See*—
Tanguay, William P.; and McCrink, James, Re. 33,920, Cl. 340-628.000.

Simpson, Danny, to Lear Siegler Seymour Corp. Ironing board. Re. 33,918, Cl. 29-437.000.

Smith, Kevin W.: *See*—
Bales, Thomas O.; and Smith, Kevin W., Re. 33,925, Cl. 606-48.000.

Sycon Corporation: *See*—
Kristoff, John J.; and Elwer, Michael, Re. 33,919, Cl. 123-179.310.

Taliq Corporation: *See*—
McLaughlin, Charles W.; Fergason, James L.; and Parker, Robert, Re. 33,921, Cl. 359-85.000.

Tanguay, William P.; and McCrink, James, to Seatt Corporation. Smoke detector having variable level sensitivity. Re. 33,920, Cl. 340-628.000.

Valeri, Cesare R., to Autologous Bloold Corp. Apparatus and method for storing and processing blood. Re. 33,924, Cl. 604-6.000.

Vorwerk & Co. Interholding GmbH: *See*—
Bottger, Wolfgang; Biedermann, Kurt; and Pensel, Werner, Re. 33,923, Cl. 428-112.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Allington, William B., deceased (by Emery, Richard T., executor); Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., to Instrumentation Specialties Co. Sample concentrator. B1 4,159,933, 5-12-92, Cl. 204-182.300.

Allington, William B., deceased (by Emery, Richard T., executor); Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., to Instrumentation Specialties Co. Sample concentrator. B1 4,164,464, 5-12-92, Cl. 204-299.00R.

Amethyst Investment Group, Inc.: *See*—
Williams, Barry W.; and Daniels, Pamela M., B1 4,883,657, Cl. 424-72.000.

Baxter Travenol Laboratores, Inc.: *See*—
Smith, Dale A., B1 4,222,379, Cl. 604-410.000.

Cordry, Arthur L.: *See*—
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., B1 4,159,933, Cl. 204-182.300.
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., B1 4,164,464, Cl. 204-299.00R.

Daniels, John R.: *See*—
Engelson, Erick T.; and Daniels, John R., B1 4,813,934, Cl. 604-99.000.

Daniels, Pamela M.: *See*—
Williams, Barry W.; and Daniels, Pamela M., B1 4,883,657, Cl. 424-72.000.

Emery, Richard T., executor: *See*—
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., B1 4,159,933, Cl. 204-182.300.
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., B1 4,164,464, Cl. 204-299.00R.

Engelson, Erick T.; and Daniels, John R., to Target Therapeutics. Valved catheter device and method. B1 4,813,934, 5-12-92, Cl. 604-99.000.

General Electric Company: *See*—
Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., B1 4,842,820, Cl. 420-418.000.

Gigliotti, Michael F. X., Jr.: *See—*
Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., B1 4,842,820, Cl. 420-418.000.
Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., to General Electric Company. Boron-modified titanium aluminum alloys and method of preparation. B1 4,842,820, 5-12-92, Cl. 420-418.000.
Instrumentation Specialties Co.: *See—*
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., B1 4,159,933, Cl. 204-182.300.
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., B1 4,164,464, Cl. 204-299.00R.
Kohmoto, Osamu: *See—*
Yajima, Kohichi; Kohmoto, Osamu; and Yoneyama, Tetsuhito, B1 4,836,868, Cl. 148-302.000.
McCullough, Gail A.: *See—*
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., B1 4,159,933, Cl. 204-182.300.
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., B1 4,164,464, Cl. 204-299.00R.
Mitchell, Don E.: *See—*
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., B1 4,159,933, Cl. 204-182.300.
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., B1 4,164,464, Cl. 204-299.00R.
Nelson, James W.: *See—*
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., B1 4,159,933, Cl. 204-182.300.
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., B1 4,164,464, Cl. 204-299.00R.
Smith, Dale A., to Baxter Travenol Laboratores, Inc. Multiple blood bag having plasticizer-free portions high blood component survival rate. B1 4,222,379, 5-12-92, Cl. 604-410.000.
Strada, Antonio. Thermostatically controlled electric immersion heater for quariums. B1 4,812,626, 5-12-92, Cl. 219-523.000.
Stubben, David R. Apparatus for scrolling a video display. B1 4,445,114, 5-12-92, Cl. 340-726.000.
Target Therapeutics: *See—*
Engelson, Erick T.; and Daniels, John R., B1 4,813,934, Cl. 604-99.000.
TDK Corporation: *See—*
Yajima, Kohichi; Kohmoto, Osamu; and Yoneyama, Tetsuhito, B1 4,836,868, Cl. 148-302.000.
Williams, Barry W.; and Daniels, Pamela M., to Amethyst Investment Group, Inc. Rearranger process and composition for permanent waving process. B1 4,883,657, 5-12-92, Cl. 424-72.000.
Yajima, Kohichi; Kohmoto, Osamu; and Yoneyama, Tetsuhito, to TDK Corporation. Permanent magnet and method of producing same. B1 4,836,868, 5-12-92, Cl. 148-302.000.
Yoneyama, Tetsuhito: *See—*
Yajima, Kohichi; Kohmoto, Osamu; and Yoneyama, Tetsuhito, B1 4,836,868, Cl. 148-302.000.

LIST OF DESIGN PATENTEES

Abrams, Robert C.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 326,069, Cl. D11-164.000.
Ace Novelty Co., Inc.: *See—*
Mayers, Benjamin H., 326,067, Cl. D11-55.000.
Adams, Fiona J.: *See—*
Kittle, Christopher J.; and Adams, Fiona J., 326,012, Cl. D2-314.000.
Adler, Murray. Kite line spool for a portable power drive. 326,048, 5-12-92, Cl. D8-359.000.
Africk, Sol. Combined digital clock and card holder. 326,055, 5-12-92, Cl. D10-2.000.
After Six, Inc.: *See—*
Feldman, Noel, 326,010, Cl. D2-187.000.
Aikawa, Masahiro, to Seikosha Co., Ltd. Clock. 326,056, 5-12-92, Cl. D10-24.000.
Alden, Tor A.; Cafferty, Gerard M.; Cho, Ginhyun; Minko, William; and Schaffeld, John H., to AT&T Bell Laboratories. Communications system apparatus enclosure for housing cellular mobile radio transmission and similar equipment. 326,098, 5-12-92, Cl. D14-240.000.
Ali, Eren, to Nomix Manufacturing Company Limited. Container for attachment to an herbicide sprayer. 326,137, 5-12-92, Cl. D23-225.000.
American General Products, Inc.: *See—*
Walters, Jon S.; and Boatwright, Neil, 326,031, Cl. D7-402.000.
Amiya, Eizo, to Yamaha Corporation. Electronic keyboard musical instrument. 326,107, 5-12-92, Cl. D17-1.000.
Anderson, Steven P. Chuck key. 326,036, 5-12-92, Cl. D8-21.000.
Anderson, Steven P. Sharpening tool. 326,044, 5-12-92, Cl. D8-91.000.
Antonious, Anthony J. Golf club head. 326,131, 5-12-92, Cl. D21-217.000.
Armatron International, Inc.: *See—*
De Yoreo, Sal G.; Masury, David H.; and Stevens, Thomas H., 326,170, Cl. D34-1.000
Asics Corporation: *See—*
Kayano, Toshikazu, 326,015, Cl. D2-320.000.
Asner, Jerome L. Aerial toy. 326,121, 5-12-92, Cl. D21-86.000.
AT&T Bell Laboratories: *See—*
Alden, Tor A.; Cafferty, Gerard M.; Cho, Ginhyun; Minko, William; and Schaffeld, John H., 326,098, Cl. D14-240.000.
Gowda, Hanumaiah L.; Kowalik, John, Jr.; Mack, Henry J., Jr.; Mayer, David J.; and Miggels, Stephen G., 326,089, Cl. D14-100.000.
Avia Group International, Inc.: *See—*
Earle, John S., 326,013, Cl. D2-314.000.
Baird, Charles J.: *See—*
Hempy, Robert M.; Baird, Charles J.; and Haffely, Jeffrey L., 326,103, Cl. D15-141.000.
Balaban, David B., to Leviton Manufacturing Company, Inc. Switch housing. 326,086, 5-12-92, Cl. D13-171.000.
Balaban, David B., to Leviton Manufacturing Company, Inc. Switch housing. 326,087, 5-12-92, Cl. D13-171.000.
Balandier, Jean-Marie, to SEB. Toaster. 326,028, 5-12-92, Cl. D7-330.000.
Barnes, Mindy S. Swimming pool float or the like. 326,132, 5-12-92, Cl. D21-237.000.
Barr, Lance; and Cordell, John, to Nintendo of America Inc. Hands free controller for video games. 326,117, 5-12-92, Cl. D21-48.000.
Barrett, Joseph S. Vehicle ignition protective cover. 326,045, 5-12-92, Cl. D8-346.000.
Beechuk, Timothy J.; Zamorski, Ronald J.; Thomas, Robert F.; and Hart, William M., to Procter & Gamble Company, The. Bottle. 326,052, 5-12-92, Cl. D9-528.000.
Beeman, Everett C., to Silgan Plastics Corporation. Bottle. 326,054, 5-12-92, Cl. D9-539.000.
Bergstrand, John W.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 326,069, Cl. D11-164.000.
Bernardo, R. Wayne: *See—*
Brenner, Bruce; and Bernardo, R. Wayne, 326,171, Cl. D34-3.000.
Biesele, Zelita; Packhan, Ron; and Schminke, Kurt. Combined bag holder and bags therefor. 326,172, 5-12-92, Cl. D34-5.000.
Black, Mildred. Square dabber. 326,118, 5-12-92, Cl. D21-51.000.
Boatwright, Neil: *See—*
Walters, Jon S.; and Boatwright, Neil, 326,031, Cl. D7-402.000.
Bodenweiser, Clifford A.; and Woodward, Neil J., to MOD TAP W. Corp. Cover plate for outlet. 326,047, 5-12-92, Cl. D8-353.000.
Boehringer, John R.; and Karpowicz, John, to Boehringer Laboratories. Medical fluid connector fitting. 326,155, 5-12-92, Cl. D24-129.000.
Boehringer Laboratories: *See—*
Boehringer, John R.; and Karpowicz, John, 326,155, Cl. D24-129.000.
Bolk, Phyllis J.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 326,069, Cl. D11-164.000.
Borakove, Howard J.; and Morrell, Cindy L., to Willert Home Products, Inc. Fragrance dish cover. 326,145, 5-12-92, Cl. D23-367.000.
Borakove, Howard J.; and Morrell, Cindy L., to Willert Home Products, Inc. Fragrance dish cover. 326,146, 5-12-92, Cl. D23-367.000.
Borakove, Howard J.; and Morrell, Cindy L., to Willert Home Products, Inc. Fragrance dish cover. 326,147, 5-12-92, Cl. D23-367.000.
Borgogni, Caterina, to Cento Group S.p.A. Jewelry chain. 326,065, 5-12-92, Cl. D11-13.000.
Bosten, Donald R.: *See—*
Kriaski, John R.; Bosten, Donald R.; and Nichols, James P., Jr., 326,042, Cl. D8-62.000.
Boyd Coffee Company: *See—*
Boyd, David D.; and Johnson, Michael W., 326,024, Cl. D6-480.000.

Boyd, David D.; and Johnson, Michael W., to Boyd Coffee Company. Portable beverage preparation cabinet. 326,024, 5-12-92, Cl. D6-480.000.
Breitling Montres S.A.: *See—*
Schneider, Ernest, 326,058, Cl. D10-39.000.
Brenner, Bruce; and Bernardo, R. Wayne, to Cycle Systems, Inc. Recyclable material receiving container. 326,171, 5-12-92, Cl. D34-3.000.
Bridgestone Corporation: *See—*
Enoki, Yasutaka; and Goto, Akihito, 326,071, Cl. D12-146.000.
Hayakawa, Toshio; Himuro, Yasuo; and Tominaga, Teruyuki, 326,073, Cl. D12-147.000.
Himuro, Yasuo; Tsuda, Toru; and Sasagawa, Toru, 326,074, Cl. D12-147.000.
Brightbill, Keith, to Rubbermaid Incorporated. Tool carrying tray. 326,176, 5-12-92, Cl. D34-45.000.
Brunet, Michel: *See—*
Waine, Matthew R.; and Brunet, Michel, 326,053, Cl. D9-529.000.
Bulgari, Gianni, to Gianni Bulgari S.p.A. Wristwatch. 326,057, 5-12-92, Cl. D10-39.000.
Cafferty, Gerard M.: *See—*
Alden, Tor A.; Cafferty, Gerard M.; Cho, Ginhyun; Minko, William; and Schaffeld, John H., 326,098, Cl. D14-240.000.
Canon Kabushiki Kaisha: *See—*
Kikuchi, Nobuo; and Ikuta, Tamao, 326,090, Cl. D14-138.000.
Kikuchi, Nobuo, 326,091, Cl. D14-138.000.
Kikuchi, Nobuo; and Ikuta, Tamao, 326,092, Cl. D14-138.000.
Tashiro, Naoki; and Tokuda, Hiroyuki, 326,110, Cl. D18-55.000.
Tokuda, Hiroyuki, 326,109, Cl. D18-55.000.
Caston, Hoite C. Combined card pack and hand grip therefor. 326,119, 5-12-92, Cl. D21-54.000.
Cathers, Richard T.; and MacWilkinson, Derek, to McDonnell Douglas Corporation. Airplane. 326,081, 5-12-92, Cl. D12-333.000.
Cento Group S.p.A.: *See—*
Borgogni, Caterina, 326,065, Cl. D11-13.000.
Cho, Ginhyun: *See—*
Alden, Tor A.; Cafferty, Gerard M.; Cho, Ginhyun; Minko, William; and Schaffeld, John H., 326,098, Cl. D14-240.000.
Chorne, Robert. Golf club head. 326,130, 5-12-92, Cl. D21-214.000.
Clark, Gary E. Level. 326,059, 5-12-92, Cl. D10-69.000.
Clivio, Franco, to Gardena Kress & Kastner GmbH. Sprayer. 326,138, 5-12-92, Cl. D23-226.000.
Colchester Lathe Company, Limited, The: *See—*
Marriott, Roger W., 326,100, Cl. D15-130.000.
Connon, Dana W., to Welsh Company. Toy cockpit tray. 326,123, 5-12-92, Cl. D21-142.000.
Cordell, John: *See—*
Barr, Lance; and Cordell, John, 326,117, Cl. D21-48.000.
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; and Hoang, Andrew N., to Goodyear Tire & Rubber Company, The. Tire tread and buttress. 326,075, 5-12-92, Cl. D12-147.000.
Covert, Darrell E.: *See—*
Maxwell, Paul B.; Hammond, Philip S.; and Covert, Darrell E., 326,072, Cl. D12-147.000.
Craig, Franklin J.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 326,069, Cl. D11-164.000.
Creech, Clyde W. Beam profile machine. 326,099, 5-12-92, Cl. D15-127.000.
Curbell, Inc.: *See—*
Terk, Harold S.; and Schick, George L., 326,095, Cl. D14-204.000.
Cycle Systems, Inc.: *See—*
Brenner, Bruce; and Bernardo, R. Wayne, 326,171, Cl. D34-3.000.
Dart Industries Inc.: *See—*
Michaelson, Howard W.; and Laib, Douglas M., 326,120, Cl. D21-65.000.
Deguchi, Hiromi; and Yoshikawa, Masashi, to Terumo Kabushiki Kaisha. Intra-vascular catheter assembly. 326,154, 5-12-92, Cl. D24-112.000.
Dekel, Joseph. Gutter drain. 326,140, 5-12-92, Cl. D23-267.000.
Delafon, Jacob: *See—*
Ragonot, Christian M., 326,139, Cl. D23-252.000.
Deuschle, Elizabeth, to Nani, Rob J. Jacket. 326,009, 5-12-92, Cl. D2-184.000.
De Yoreo, Sal G.; Masury, David H.; and Stevens, Thomas H., to Armatron International, Inc. Compost bin. 326,170, 5-12-92, Cl. D34-1.000.
Doi, Katsumi. Tripod for camera. 326,105, 5-12-92, Cl. D16-244.000.
Donnelly, Wilma M.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 326,069, Cl. D11-164.000.
Earle, John S., to Avia Group International, Inc. Shoe upper. 326,013, 5-12-92, Cl. D2-314.000.
Eastman Kodak Company: *See—*
LaBarbera, Angelo, 326,104, Cl. D16-223.000.
Eastman, William J.; and Yue, Samuel K., to PMT Corporation. Housing for an ambulatory infusion pump. 326,153, 5-12-92, Cl. D24-111.000.
Edison Price Incorporated: *See—*
Price, Edison A., 326,162, Cl. D26-63.000.
Eickhoff, Jon H., to Ronningen Research & Development Company. Stair step for a platform. 326,159, 5-12-92, Cl. D25-69.000.
Eldon Industries, Inc.: *See—*
Evenson, Mel, 326,021, Cl. D6-323.000.
Enoki, Yasutaka; and Goto, Akihito, to Bridgestone Corporation. Automobile tire. 326,071, 5-12-92, Cl. D12-146.000.
Estes, Maude H., to Grip-A-Strip, Inc. Poster wall hanger assembly or the like. 326,027, 5-12-92, Cl. D6-553.000.
Evatt, Michaela; Monaghan, Reynolds P.; and Kay, Alan E., to McIlwraith-Davey Pty Ltd. Sink. 326,141, 5-12-92, Cl. D23-294.000.
Evenson, Mel, to Eldon Industries, Inc. Over-door hook. 326,021, 5-12-92, Cl. D6-323.000.
Feldman, Noel, to After Six, Inc. Formal jacket. 326,010, 5-12-92, Cl. D2-187.000.
Felstead, Richard A.: *See—*
Hume, Roger A.; Felstead, Richard A.; and Zucchi, Luciano, 326,161, Cl. D26-2.000.
Ferrario, Giancarlo, to TCI Telecommunications Italia S.r.l. Antenna. 326,097, 5-12-92, Cl. D14-230.000.
Finiw, Maryann; and Kelly, Lois, to Gruner & Jahr Printing & Publishing Co. Toy bird figure. 326,126, 5-12-92, Cl. D21-160.000.
Finlay, John F. Bomb rack for airplanes. 326,082, 5-12-92, Cl. D12-345.000.
Frahm, Carl E., to Reid Plastics, Inc. Bottle. 326,051, 5-12-92, Cl. D9-558.000.
Franklin, Irving H.; Franklin, Larry J.; and Gluck, Kurt M., to Franklin Sports Industries, Inc. Dartboard soccer game. 326,115, 5-12-92, Cl. D21-6.000.
Franklin, Larry J.: *See—*
Franklin, Irving H.; Franklin, Larry J.; and Gluck, Kurt M., 326,115, Cl. D21-6.000.
Franklin Sports Industries, Inc.: *See—*
Franklin, Irving H.; Franklin, Larry J.; and Gluck, Kurt M., 326,115, Cl. D21-6.000.
Fratelli Guzzini, S.p.A.: *See—*
Gecchelin, Bruno, 326,035, Cl. D8-13.000.
Friederichs, Gary L., to Vollrath Company, Inc., The. Spoon. 326,033, 5-12-92, Cl. D7-653.000.
Fukuda Denshi Co., Ltd.: *See—*
Muraki, Yoshiya; and Koike, Hiroyuki, 326,094, Cl. D14-191.000.
Fukuda, Masaru: *See—*
Nagasaka, Yasuhiro; Hirayama, Yasuo; Shibata, Ichiro; Sueyoshi, Tadahiro; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; and Fukuda, Masaru, 326,084, Cl. D13-147.000.
Galante, Carl J. Multipurpose organizer. 326,113, 5-12-92, Cl. D19-78.000.
Galante, Richard L.: *See—*
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; and Hoang, Andrew N., 326,075, Cl. D12-147.000.
Gardena Kress & Kastner GmbH: *See—*
Clivio, Franco, 326,138, Cl. D23-226.000.
Gecchelin, Bruno, to Fratelli Guzzini, S.p.A. Garden rake. 326,035, 5-12-92, Cl. D8-13.000.
Gera, Robert A., to Universal Furniture Industries, Inc. Sofa. 326,022, 5-12-92, Cl. D6-381.000.
Gerity Products, Inc.: *See—*
Murtagh, William O., 326,114, Cl. D19-97.000.
Gianni Bulgari S.p.A.: *See—*
Bulgari, Gianni, 326,057, Cl. D10-39.000.
Gilbert, Frederick E.: *See—*
Wilson, Paul M., 326,122, Cl. D21-100.000.
Gilles, Michael J.: *See—*
Hochstetler, Kenneth C.; Gilles, Michael J.; and Hughes, Kevin D., 326,136, Cl. D22-134.000.
Gillette Company, The: *See—*
Orosy, Gary D. J.; Hadtke, Frederick B.; and Miller, Paul D., 326,017, Cl. D3-39.000.
Giunta, Stephen X. Chin implant. 326,157, 5-12-92, Cl. D24-155.000.
Gluck, Kurt M.: *See—*
Franklin, Irving H.; Franklin, Larry J.; and Gluck, Kurt M., 326,115, Cl. D21-6.000.
Goodyear Tire & Rubber Company, The: *See—*
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; and Hoang, Andrew N., 326,075, Cl. D12-147.000.
Maxwell, Paul B.; Hammond, Philip S.; and Covert, Darrell E., 326,072, Cl. D12-147.000.
Goto, Akihito: *See—*
Enoki, Yasutaka; and Goto, Akihito, 326,071, Cl. D12-146.000.
Gowda, Hanumaiah L.; Kowalik, John, Jr.; Mack, Henry J., Jr.; Mayer, David J.; and Miggels, Stephen G., to AT&T Bell Laboratories. Computer housing. 326,089, 5-12-92, Cl. D14-100.000.
Graseby Medical Limited: *See—*
Rutter, Paul, 326,152, Cl. D24-111.000.
Grip-A-Strip, Inc.: *See—*
Estes, Maude H., 326,027, Cl. D6-553.000.
Grosfillex, Raymond, to Grosfillex Sarl. Table. 326,025, 5-12-92, Cl. D6-480.000.
Grosfillex Sarl: *See—*
Grosfillex, Raymond, 326,025, Cl. D6-480.000.
Gruner & Jahr Printing & Publishing Co.: *See—*
Finiw, Maryann; and Kelly, Lois, 326,126, Cl. D21-160.000.
Guaresi, Jean-Pierre J., to Sportset Comfort. Golf accessory bag. 326,016, 5-12-92, Cl. D3-36.000.

H. H. Brown Shoe Company, Inc.: *See*—
Issler, James E., 326,014. Cl. D2-320.000.

Hadtke, Frederick B.: *See*—
Orosy, Gary D. J.; Hadtke, Frederick B.; and Miller, Paul D., 326,017, Cl. D3-39.000.

Haffely, Jeffrey L.: *See*—
Hempy, Robert M.; Baird, Charles J.; and Haffely, Jeffrey L., 326,103, Cl. D15-141.000.

Hagura, Shigehisa: *See*—
Hasegawa, Hideaki; Tashimo, Fumio; Hagura, Shigehisa; Tuburaya, Kazuyuki; and Oda, Masaru, 326,043, Cl. D8-68.000.

Hamilton Beach/Proctor-Silex, Inc.: *See*—
Rowley, David S., 326,041, Cl. D8-35.000.

Hammond, Philip S.: *See*—
Maxwell, Paul B.; Hammond, Philip S.; and Covert, Darrell E., 326,072, Cl. D12-147.000.

Harris & Mallow, Inc.: *See*—
Silver, Michael P., 326,030, Cl. D7-362.000.

Hart, William M.: *See*—
Beechuk, Timothy J.; Zamorski, Ronald J.; Thomas, Robert F.; and Hart, William M., 326,052, Cl. D9-528.000.

Hasegawa, Hideaki; Tashimo, Fumio; Hagura, Shigehisa; Tuburaya, Kazuyuki; and Oda, Masaru, to Hitachi Koki Company, Limited. Electric screw driver. 326,043, 5-12-92, Cl. D8-68.000.

Hasegawa, Shigeru: *See*—
Ito, Masafumi; Suzuki, Koji; Hasegawa, Shigeru; and Sube, Minoru, 326,093, Cl. D14-166.000.
Ito, Masafumi; Hasegawa, Shigeru; Sube, Minoru; and Takashima, Katsuhiro, 326,096, Cl. D14-217.000.

Hatano, Katsuhiro, to Seikosha Co., Ltd. Clock movement. 326,063, 5-12-92, Cl. D10-129.000.

Havrilla, George S. Room air filter. 326,144, 5-12-92, Cl. D23-365.000.

Hayakawa, Toshio; Himuro, Yasuo; and Tominaga, Teruyuki, to Bridgestone Corporation. Automobile tire. 326,073, 5-12-92, Cl. D12-147.000.

Heald, Charles J. Protective cover for a padlock. 326,046, 5-12-92, Cl. D8-346.000.

Hempy, Robert M.; Baird, Charles J.; and Haffely, Jeffrey L. Bench mountable plate joining machine. 326,103, 5-12-92, Cl. D15-141.000.

Highland Supply Corporation: *See*—
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 326,069, Cl. D11-164.000.

Hildegard, Kleinen. Ribbon fringe. 326,020, 5-12-92, Cl. D5-18.000.

Himuro, Yasuo; Tsuda, Toru; and Sasagawa, Toru, to Bridgestone Corporation. Automobile tire. 326,074, 5-12-92, Cl. D12-147.000.

Himuro, Yasuo: *See*—
Hayakawa, Toshio; Himuro, Yasuo; and Tominaga, Teruyuki, 326,073, Cl. D12-147.000.

Hioki, Ryozo: *See*—
Miyamoto, Kazuyuki; Hioki, Ryozo; and Tanaka, Hoji, 326,083, Cl. D13-112.000.

Hirayama, Yasuo: *See*—
Nagasaka, Yasuhiro; Hirayama, Yasuo; Shibata, Ichiro; Sueyoshi, Tadahiro; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; and Fukuda, Masaru, 326,084, Cl. D13-147.000.

Hirschmann, Aaron L. Golf tee. 326,129, 5-12-92, Cl. D21-208.000.

Hitachi Koki Company, Limited: *See*—
Hasegawa, Hideaki; Tashimo, Fumio; Hagura, Shigehisa; Tuburaya, Kazuyuki; and Oda, Masaru, 326,043, Cl. D8-68.000.

Hoang, Andrew N.: *See*—
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; and Hoang, Andrew N., 326,075, Cl. D12-147.000.

Hochstetler, Kenneth C.; Gilles, Michael J.; and Hughes, Kevin D. Ice fishing line movement indicator. 326,136, 5-12-92, Cl. D22-134.000.

Hollingworth, Jack, Jr. Boat or camping trailer. 326,070, 5-12-92, Cl. D12-101.000.

Homan, Paul T. Baby bottle carrier. 326,175, 5-12-92, Cl. D34-44.000.

Hopkins, William M.: *See*—
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; and Hoang, Andrew N., 326,075, Cl. D12-147.000.

Hopper, Steven R. Combined portable emergency lights and container therefor. 326,061, 5-12-92, Cl. D10-114.000.

Hudson, Hugh F.; Munsch, Joseph F.; and McArdle, Joseh A., to Johnson Service Company. Multi-purpose exclosure for control modules or devices. 326,088, 5-12-92, Cl. D13-184.000.

Hughes, Kevin D.: *See*—
Hochstetler, Kenneth C.; Gilles, Michael J.; and Hughes, Kevin D., 326,136, Cl. D22-134.000.

Hume, Roger A.; Felstead, Richard A.; and Zucchi, Luciano. Lamp. 326,161, 5-12-92, Cl. D26-2.000.

Hurn, Loyd. Laundry center 326,023, 5-12-92, Cl. D6-438.000.

Ikuma, Susumu, to Seikosha Co., Ltd. Clock movement. 326,062, 5-12-92, Cl. D10-129.000.

Ikuta, Tamao: *See*—
Kikuchi, Nobuo; and Ikuta, Tamao, 326,090, Cl. D14-138.000.
Kikuchi, Nobuo; and Ikuta, Tamao, 326,092, Cl. D14-138.000.

Imbert, Jocelyne, to Louis Vuitton Malletier. Shoulder bag. 326,018, 5-12-92, Cl. D3-42.000.

Indian Industries: *See*—
Smith, Max D., 326,128, Cl. D21-201.000.

Issler, James E., to H. H. Brown Shoe Company, Inc. Shoe sole. 326,014, 5-12-92, Cl. D2-320.000.

Ito, Masafumi; Suzuki, Koji; Hasegawa, Shigeru; and Sube, Minoru, to TEAC Corporation. Open reel type tape recorder deck. 326,093, 5-12-92, Cl. D14-166.000.

Ito, Masafumi; Hasegawa, Shigeru; Sube, Minoru; and Takashima, Katsuhiro, to TEAC Corporation. Digital-analog converter. 326,096, 5-12-92, Cl. D14-217.000.

Jakoub, Diab H. Articulator. 326,150, 5-12-92, Cl. D24-182.000.

Johnson, Michael W.: *See*—
Boyd, David D.; and Johnson, Michael W., 326,024, Cl. D6-480.000.

Johnson Service Company: *See*—
Hudson, Hugh F.; Munsch, Joseph F.; and McArdle, Joseh A., 326,088, Cl. D13-184.000.

Johs. Link GmbH & Co. KG: *See*—
Sassmannshausen, Werner, 326,108, Cl. D17-22.000.

Kabushiki Kaisha Makitadenkiseisakusho: *See*—
Miyamoto, Kazuyuki; Hioki, Ryozo; and Tanaka, Hoji, 326,083, Cl. D13-112.000.

Kaneko, Yoshio: *See*—
Kurihara, Kazumasa; and Kaneko, Yoshio, 326,049, Cl. D8-385.000.

Karpowicz, John: *See*—
Boehringer, John R.; and Karpowicz, John, 326,155, Cl. D24-129.000.

Katz, Martha L.; and Katz, Richard M. Baby bottle. 326,158, 5-12-92, Cl. D24-198.000.

Katz, Richard M.: *See*—
Katz, Martha L.; and Katz, Richard M., 326,158, Cl. D24-198.000.

Kay, Alan E.: *See*—
Evatt, Michaela; Monaghan, Reynolds P.; and Kay, Alan E., 326,141, Cl. D23-294.000.

Kayano, Toshikazu, to Asics Corporation. Shoe sole. 326,015, 5-12-92, Cl. D2-320.000.

Kelly, Lois: *See*—
Finiw, Maryann; and Kelly, Lois, 326,126, Cl. D21-160.000.

Kiddicraft Limited: *See*—
Thomson, Harry S.; Raffo, David M.; Pape, John A.; and Woodward, Shaun M., 326,124, Cl. D21-144.000.

Kikuchi, Nobuo; and Ikuta, Tamao, to Canon Kabushiki Kaisha. Telephone. 326,090, 5-12-92, Cl. D14-138.000.

Kikuchi, Nobuo, to Canon Kabushiki Kaisha. Folding handset telephone or similar article. 326,091, 5-12-92, Cl. D14-138.000.

Kikuchi, Nobuo; and Ikuta, Tamao, to Canon Kabushiki Kaisha. Telephone. 326,092, 5-12-92, Cl. D14-138.000.

Kittle, Christopher J.; and Adams, Fiona J., to Reebok International Ltd. Shoe upper. 326,012, 5-12-92, Cl. D2-314.000.

Kluesner, Joseph M. Spatula. 326,034, 5-12-92, Cl. D7-688.000.

Kohler Co.: *See*—
Kohler, Herbert V., Jr.; and Reid, Mary J., 326,142, Cl. D23-295.000.

Kohler, Herbert V., Jr.; and Reid, Mary J., to Kohler Co. Water closet. 326,142, 5-12-92, Cl. D23-295.000.

Koike, Hiroyuki: *See*—
Muraki, Yoshiya; and Koike, Hiroyuki, 326,094, Cl. D14-191.000.

Kolowski, Michael A.: *See*—
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; and Hoang, Andrew N., 326,075, Cl. D12-147.000.

Kowalik, John, Jr.: *See*—
Gowda, Hanumaiah L.; Kowalik, John, Jr.; Mack, Henry J., Jr.; Mayer, David J.; and Miggels, Stephen G., 326,089, Cl. D14-100.000.

Kriaski, John R.; Bosten, Donald R.; and Nichols, James P., Jr., to Porter-Cable Corporation. Orbital sander. 326,042, 5-12-92, Cl. D8-62.000.

Kurihara, Kazumasa; and Kaneko, Yoshio, to Nifco Inc. Panel fastener or the like. 326,049, 5-12-92, Cl. D8-385.000.

LaBarbera, Angelo, to Eastman Kodak Company. Microfilm reader/-printer. 326,104, 5-12-92, Cl. D16-223.000.

Laib, Douglas M.: *See*—
Michaelson, Howard W.; and Laib, Douglas M., 326,120, Cl. D21-65.000.

Lawlor, Lisa J. Fan for infants and children. 326,148, 5-12-92, Cl. D23-382.000.

Leach, Terence S. Can cooler. 326,032, 5-12-92, Cl. D7-608.000.

Leibe, Ottomar, to W.E. Bassett Company, The. Nail nippers. 326,165, 5-12-92, Cl. D28-60.000.

Leviton Manufacturing Company, Inc.: *See*—
Balaban, David B., 326,086, Cl. D13-171.000.
Balaban, David B., 326,087, Cl. D13-171.000.

Lok, Yuk L. Stove for wok cooking. 326,029, 5-12-92, Cl. D7-346.000.

Louis Vuitton Malletier: *See*—
Imbert, Jocelyne, 326,018, Cl. D3-42.000.

Lynch, James P. Portable shelter. 326,133, 5-12-92, Cl. D21-253.000.

Mack, Henry J., Jr.: *See*—
Gowda, Hanumaiah L.; Kowalik, John, Jr.; Mack, Henry J., Jr.; Mayer, David J.; and Miggels, Stephen G., 326,089, Cl. D14-100.000.

MacWilkinson, Derek: *See*—
Cathers, Richard T.; and MacWilkinson, Derek, 326,081, Cl. D12-333.000.

Makita, Toshihiko: *See*—
Takenouchi, Kenji; Makita, Toshihiko; and Norizuki, Teruhisa, 326,085, Cl. D13-154.000.

Marriott, Roger W., to Colchester Lathe Company, Limited, The. Engine lathe. 326,100, 5-12-92, Cl. D15-130.000.

Martinez, David M., to Techmedica, Inc. Knee joint for prosthetic system. 326,156, 5-12-92, Cl. D24-155.000.

Marty, Garry R.: *See*—
Spangler Anthony G.; and Marty, Garry R., 326,019, Cl. D4-118.000.

Masco Corporation of Indiana: *See*—
Spangler Anthony G.; and Marty, Garry R., 326,019, Cl. D4-118.000.

Masury, David H.: *See*—
De Yoreo, Sal G.; Masury, David H.; and Stevens, Thomas H., 326,170, Cl. D34-1.000.

Matsuda, Takumi, to Seikosha Co., Ltd. Clock movement. 326,064, 5-12-92, Cl. D10-129.000.

Matsushita Electric Works, Ltd.: *See*—
Yanagida, Takako; Mizobata, Yoshio; and Someya, Katsunori, 326,166, Cl. D28-49.000.

Maxwell, Paul B.; Hammond, Philip S.; and Covert, Darrell E., to Goodyear Tire & Rubber Company, The. Tire tread and buttress. 326,072, 5-12-92, Cl. D12-147.000.

Maxwell, Paul B.: *See*—
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; and Hoang, Andrew N., 326,075, Cl. D12-147.000.

Mayer, David J.: *See*—
Gowda, Hanumaiah L.; Kowalik, John, Jr.; Mack, Henry J., Jr.; Mayer, David J.; and Miggels, Stephen G., 326,089, Cl. D14-100.000.

Mayers, Benjamin H., to Ace Novelty Co., Inc. Jewelry pin. 326,067, 5-12-92, Cl. D11-55.000.

McArdle, Joseh A.: *See*—
Hudson, Hugh F.; Munsch, Joseph F.; and McArdle, Joseh A., 326,088, Cl. D13-184.000.

McCourtney, Vicki L. Toy animal. 326,125, 5-12-92, Cl. D21-148.000.

McDonald, Kenneth A. Trash container cart. 326,174, 5-12-92, Cl. D34-17.000.

McDonnell Douglas Corporation: *See*—
Cathers, Richard T.; and MacWilkinson, Derek, 326,081, Cl. D12-333.000.

McIlwraith-Davey Pty Ltd.: *See*—
Evatt, Michaela; Monaghan, Reynolds P.; and Kay, Alan E., 326,141, Cl. D23-294.000.

Michaelson, Howard W.; and Laib, Douglas M., to Dart Industries Inc. Toy chain or the like. 326,120, 5-12-92, Cl. D21-65.000.

Miggels, Stephen G.: *See*—
Gowda, Hanumaiah L.; Kowalik, John, Jr.; Mack, Henry J., Jr.; Mayer, David J.; and Miggels, Stephen G., 326,089, Cl. D14-100.000.

Miller, Frederick W.: *See*—
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; and Hoang, Andrew N., 326,075, Cl. D12-147.000.

Miller, Paul D.: *See*—
Orosy, Gary D. J.; Hadtke, Frederick B.; and Miller, Paul D., 326,017, Cl. D3-39.000.

Minko, William: *See*—
Alden, Tor A.; Cafferty, Gerard M.; Cho, Ginhyun; Minko, William; and Schaffeld, John H., 326,098, Cl. D14-240.000.

Miyamoto, Kazuyuki; Hioki, Ryozo; and Tanaka, Hoji, to Kabushiki Kaisha Makitadenkiseisakusho. Electric motor for driving a curtain. 326,083, 5-12-92, Cl. D13-112.000.

Mizobata, Yoshio: *See*—
Yanagida, Takako; Mizobata, Yoshio; and Someya, Katsunori, 326,166, Cl. D28-49.000.

Mizoguchi, Haruki, to Mizoguchi Iron Works & Co., Ltd. Collet. 326,102, 5-12-92, Cl. D15-140.000.

Mizoguchi Iron Works & Co., Ltd.: *See*—
Mizoguchi, Haruki, 326,102, Cl. D15-140.000.

MOD TAP W. Corp.: *See*—
Bodenweiser, Clifford A.; and Woodward, Neil J., 326,047, Cl. D8-353.000.

Monaghan, Reynolds P.: *See*—
Evatt, Michaela; Monaghan, Reynolds P.; and Kay, Alan E., 326,141, Cl. D23-294.000.

Morgan, Calvin L., to Steelcase, Inc. Table. 326,026, 5-12-92, Cl. D6-484.000.

Morrell, Cindy L.: *See*—
Borakove, Howard J.; and Morrell, Cindy L., 326,145, Cl. D23-367.000.
Borakove, Howard J.; and Morrell, Cindy L., 326,146, Cl. D23-367.000.
Borakove, Howard J.; and Morrell, Cindy L., 326,147, Cl. D23-367.000.

Mortimer, Edward. Archery bowstring grip. 326,135, 5-12-92, Cl. D22-107.000.

Munsch, Joseph F.: *See*—
Hudson, Hugh F.; Munsch, Joseph F.; and McArdle, Joseh A., 326,088, Cl. D13-184.000.

Murakami, Yoshihiro: *See*—
Nagasaka, Yasuhiro; Hirayama, Yasuo; Shibata, Ichiro; Sueyoshi, Tadahiro; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; and Fukuda, Masaru, 326,084, Cl. D13-147.000.

Muraki, Yoshiya; and Koike, Hiroyuki, to Fukuda Denshi Co., Ltd. Display pager. 326,094, 5-12-92, Cl. D14-191.000.

Murayama, Yasusuke, to Top Kogyo Co., Ltd. Adjustable wrench. 326,037, 5-12-92, Cl. D8-22.000.

Murayama, Yasusuke, to Top Kogyo Co., Ltd. Adjustable wrench. 326,038, 5-12-92, Cl. D8-22.000.

Murtagh, William O., to Gerity Products, Inc. Paper weight. 326,114, 5-12-92, Cl. D19-97.000.

Nagasaka, Yasuhiro; Hirayama, Yasuo; Shibata, Ichiro; Sueyoshi, Tadahiro; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; and Fukuda, Masaru, to Yazaki Corporation. Electrical connector housing. 326,084, 5-12-92, Cl. D13-147.000.

Nani, Rob J.: *See*—
Deuschle, Elizabeth, 326,009, Cl. D2-184.000.

Newbold, Dixon. Waste receptacle. 326,173, 5-12-92, Cl. D34-6.000.

Nichols, James P., Jr.: *See*—
Kriaski, John R.; Bosten, Donald R.; and Nichols, James P., Jr., 326,042, Cl. D8-62.000.

Nifco Inc.: *See*—
Kurihara, Kazumasa; and Kaneko, Yoshio, 326,049, Cl. D8-385.000.

Nintendo of America Inc.: *See*—
Barr, Lance; and Cordell, John, 326,117, Cl. D21-48.000.

Nomix Manufacturing Company Limited: *See*—
Ali, Eren, 326,137, Cl. D23-225.000.

Norizuki, Teruhisa: *See*—
Takenouchi, Kenji; Makita, Toshihiko; and Norizuki, Teruhisa, 326,085, Cl. D13-154.000.

Norman, Lowell R., to Spring Form, Inc. Shelter. 326,134, 5-12-92, Cl. D21-253.000.

North American Philips Corporation: *See*—
Vrancart, Albert J.; and Priscandaro, Dennis M., 326,160, Cl. D26-2.000.

Oda, Masaru: *See*—
Hasegawa, Hideaki; Tashimo, Fumio; Hagura, Shigehisa; Tuburaya, Kazuyuki; and Oda, Masaru, 326,043, Cl. D8-68.000.

Ohno, Yoshihiro: *See*—
Otsuka, Fumio; and Ohno, Yoshihiro, 326,111, Cl. D18-56.000.

Orosy, Gary D. J.; Hadtke, Frederick B.; and Miller, Paul D., to Gillette Company, The. Travel razor set. 326,017, 5-12-92, Cl. D3-39.000.

Otsuka, Fumio; and Ohno, Yoshihiro, to Seikosha Co., Ltd. Printing head for a printer. 326,111, 5-12-92, Cl. D18-56.000.

Oxo International L.P.: *See*—
Viemeister, Tucker, 326,039, Cl. D8-33.000.

Packhan, Ron: *See*—
Biesele, Zelita; Packhan, Ron; and Schminke, Kurt, 326,172, Cl. D34-5.000.

Pape, John A.: *See*—
Thomson, Harry S.; Raffo, David M.; Pape, John A.; and Woodward, Shaun M., 326,124, Cl. D21-144.000.

Pierce, Ian. Badge. 326,068, 5-12-92, Cl. D11-99.000.

PMT Corporation: *See*—
Eastman, William J.; and Yue, Samuel K., 326,153, Cl. D24-111.000.

Porter-Cable Corporation: *See*—
Kriaski, John R.; Bosten, Donald R.; and Nichols, James P., Jr., 326,042, Cl. D8-62.000.

Price, Edison A., to Edison Price Incorporated. Light fixture. 326,162, 5-12-92, Cl. D26-63.000.

Priscandaro, Dennis M.: *See*—
Vrancart, Albert J.; and Priscandaro, Dennis M., 326,160, Cl. D26-2.000.

Procter & Gamble Company, The: *See*—
Beechuk, Timothy J.; Zamorski, Ronald J.; Thomas, Robert F.; and Hart, William M., 326,052, Cl. D9-528.000.
Waine, Matthew R.; and Brunet, Michel, 326,053, Cl. D9-529.000.

Raffo, David M.: *See*—
Thomson, Harry S.; Raffo, David M.; Pape, John A.; and Woodward, Shaun M., 326,124, Cl. D21-144.000.

Ragonot, Christian M., to Delafon, Jacob. Plumbing fitting handle or the like. 326,139, 5-12-92, Cl. D23-252.000.

Rana, Shahid J. Cargo storage restraint. 326,077, 5-12-92, Cl. D12-155.000.

Reebok International Ltd.: *See*—
Kittle, Christopher J.; and Adams, Fiona J., 326,012, Cl. D2-314.000.
Smith, Steven F.; and Serna, Ralph, 326,011, Cl. D2-314.000.

Reid, Mary J.: *See*—
Kohler, Herbert V., Jr.; and Reid, Mary J., 326,142, Cl. D23-295.000.

Reid Plastics, Inc.: *See*—
Frahm, Carl E., 326,051, Cl. D9-558.000.

Rink, Arthur B. Grip for exerciser or similar article. 326,127, 5-12-92, Cl. D21-198.000.

Rogers, Charles R. Spoiler for a truck cap. 326,078, 5-12-92, Cl. D12-181.000.

Rohner, Eduard: *See*—
Stutzer, Franz A.; and Rohner, Eduard, 326,169, Cl. D32-18.000.

Ronningen Research & Development Company: *See*—
Eickhoff, Jon H., 326,159, Cl. D25-69.000.

Rowenta-Werke GmbH: *See*—
Stutzer, Franz A.; and Rohner, Eduard, 326,169, Cl. D32-18.000.

Rowley, David S., to Hamilton Beach/Proctor-Silex, Inc. Can opener. 326,041, 5-12-92, Cl. D8-35.000.

Rubbermaid Incorporated: *See*—
Brightbill, Keith, 326,176, Cl. D34-45.000.

Rutter, Paul, to Graseby Medical Limited. Medical syringe pump for infusion. 326,152, 5-12-92, Cl. D24-111.000.
Sakko, Michael W. Pavement marker. 326,060, 5-12-92, Cl. D10-113.000.
Sasagawa, Toru: *See—*
Himuro, Yasuo; Tsuda, Toru; and Sasagawa, Toru, 326,074, Cl. D12-147.000.
Sassmannshausen, Werner, to Johs. Link GmbH & Co. KG. Support unit for tom-tom drums. 326,108, 5-12-92, Cl. D17-22.000.
Scarpitti, Anthony J.: *See—*
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; and Hoang, Andrew N., 326,075, Cl. D12-147.000.
Schaffeld, John H.: *See—*
Alden, Tor A.; Cafferty, Gerard M.; Cho, Ginhyun; Minko, William; and Schaffeld, John H., 326,098, Cl. D14-240.000.
Schick, George L.: *See—*
Terk, Harold S.; and Schick, George L., 326,095, Cl. D14-204.000.
Schminke, Kurt: *See—*
Biesele, Zelita; Packhan, Ron; and Schminke, Kurt, 326,172, Cl. D34-5.000.
Schmitz, Del; and Shook, Jonathan, to Superior Industries International Inc. License plate frame. 326,079, 5-12-92, Cl. D12-193.000.
Schneider, Ernest, to Breitling Montres S.A. Wrist-watch. 326,058, 5-12-92, Cl. D10-39.000.
SEB: *See—*
Balandier, Jean-Marie, 326,028, Cl. D7-330.000.
Seikosha Co., Ltd.: *See—*
Aikawa, Masahiro, 326,054, Cl. D10-24.000.
Hatano, Katsuhiro, 326,063, Cl. D10-129.000.
Ikuma, Susumu, 326,062, Cl. D10-129.000.
Matsuda, Takumi, 326,064, Cl. D10-129.000.
Otsuka, Fumio; and Ohno, Yoshihiro, 326,111, Cl. D18-56.000.
Serna, Ralph: *See—*
Smith, Steven F.; and Serna, Ralph, 326,011, Cl. D2-314.000.
Shibata, Ichiro: *See—*
Nagasaka, Yasuhiro; Hirayama, Yasuo; Shibata, Ichiro; Sueyoshi, Tadahiro; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; and Fukuda, Masaru, 326,084, Cl. D13-147.000.
Shook, Jonathan: *See—*
Schmitz, Del; and Shook, Jonathan, 326,079, Cl. D12-193.000.
Silgan Plastics Corporation: *See—*
Beeman, Everett C., 326,054, Cl. D9-539.000.
Silver, Michael P., to Harris & Mallow, Inc. Electric barbecue grill. 326,030, 5-12-92, Cl. D7-362.000.
Smith, Billy J. Gimbaled pet bowl. 326,168, 5-12-92, Cl. D30-129.000.
Smith, Max D., to Indian Industries. Combined basketball goal and return net. 326,128, 5-12-92, Cl. D21-201.000.
Smith, Steven F.; and Serna, Ralph, to Reebok International Ltd. Shoe upper. 326,011, 5-12-92, Cl. D2-314.000.
Someya, Katsunori: *See—*
Yanagida, Takako; Mizobata, Yoshio; and Someya, Katsunori, 326,166, Cl. D28-49.000
Sonneman Design Group Inc. *See—*
Sonneman, Robert A., 326,163, Cl. D26-152.000.
Sonneman, Robert A., to Sonneman Design Group Inc. Trim for recessed lighting fixture or the like. 326,163, 5-12-92, Cl. D26-152.000.
Spangler Anthony G.; and Marty, Garry R., to Masco Corporation of Indiana. Combined brush and scraper attachment for a faucet spray handle. 326,019, 5-12-92, Cl. D4-118.000.
Sportset Comfort: *See—*
Guaresi, Jean-Pierre J., 326,016, Cl. D3-36.000.
Sprague, Christopher. Illuminating earring. 326,066, 5-12-92, Cl. D11-41.000.
Spring Form, Inc.: *See—*
Norman, Lowell R., 326,134, Cl. D21-253.000.
Steelcase, Inc.: *See—*
Morgan, Calvin L., 326,026, Cl. D6-484.000.
Stevens, Thomas H.: *See—*
De Yoreo, Sal G.; Masury, David H.; and Stevens, Thomas H., 326,170, Cl. D34-1.000.
Stites, Cynthia N. Combined head and back support to facilitate washing hair in a bathtub. 326,143, 5-12-92, Cl. D23-304.000.
Stockstill, Daniel H. Gasoline and motor oil container. 326,050, 5-12-92, Cl. D9-524.000.
Stutzer, Franz A.; and Rohner, Eduard, to Rowenta-Werke GmbH. Vacuum cleaner. 326,169, 5-12-92, Cl. D32-18.000.
Sube, Minoru: *See—*
Ito, Masafumi; Suzuki, Koji; Hasegawa, Shigeru; and Sube, Minoru, 326,093, Cl. D14-166.000.
Ito, Masafumi; Hasegawa, Shigeru; Sube, Minoru; and Takashima, Katsuhiro, 326,096, Cl. D14-217.000.
Submersible Systems, Inc.: *See—*
Williamson, Larry H., 326,167, Cl. D29-7.000.
Sueyoshi, Tadahiro: *See—*
Nagasaka, Yasuhiro; Hirayama, Yasuo; Shibata, Ichiro; Sueyoshi, Tadahiro; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; and Fukuda, Masaru, 326,084, Cl. D13-147.000.
Superior Industries International Inc.: *See—*
Schmitz, Del; and Shook, Jonathan, 326,079, Cl. D12-193.000.
Suzuki, Koji: *See—*
Ito, Masafumi; Suzuki, Koji; Hasegawa, Shigeru; and Sube, Minoru, 326,093, Cl. D14-166.000.
Takashima, Katsuhiro: *See—*
Ito, Masafumi; Hasegawa, Shigeru; Sube, Minoru; and Takashima, Katsuhiro, 326,096, Cl. D14-217.000.
Takenouchi, Kenji; Makita, Toshihiko; and Norizuki, Teruhisa, to Yazaki Corporation. Lock check piece for the coupling of a male and female electrical connector. 326,085, 5-12-92, Cl. D13-154.000.
Tanaka, Hoji: *See—*
Miyamoto, Kazuyuki; Hioki, Ryozo; and Tanaka, Hoji, 326,083, Cl. D13-112.000.
Tashimo, Fumio: *See—*
Hasegawa, Hideaki; Tashimo, Fumio; Hagura, Shigehisa; Tuburaya, Kazuyuki; and Oda, Masaru, 326,043, Cl. D8-68.000.
Tashiro, Naoki; and Tokuda, Hiroyuki, to Canon Kabushiki Kaisha. Laser beam printer for electronic computer. 326,110, 5-12-92, Cl. D18-55.000.
Tatshumi, Keizo, to Yamaha Corporation. Electronic keyboard musical instrument. 326,106, 5-12-92, Cl. D17-1.000.
Taylor, Herbert A. Curling iron heater. 326,164, 5-12-92, Cl. D28-38.000.
Taylor, William N., III. Ceiling fan blade. 326,149, 5-12-92, Cl. D23-413.000.
TCI Telecommunications Italia S.r.l.: *See—*
Ferrario, Giancarlo, 326,097, Cl. D14-230.000.
TEAC Corporation: *See—*
Ito, Masafumi; Suzuki, Koji; Hasegawa, Shigeru; and Sube, Minoru, 326,093, Cl. D14-166.000.
Ito, Masafumi; Hasegawa, Shigeru; Sube, Minoru; and Takashima, Katsuhiro, 326,096, Cl. D14-217.000.
Techmedica, Inc.: *See—*
Martinez, David M., 326,156, Cl. D24-155.000.
Teknovent Oy: *See—*
Vartiala, Heikki, 326,080, Cl. D12-214.000.
Terk, Harold S.; and Schick, George L., to Curbell, Inc. Pillow speaker. 326,095, 5-12-92, Cl. D14-204.000.
Terumo Kabushiki Kaisha: *See—*
Deguchi, Hiromi; and Yoshikawa, Masashi, 326,154, Cl. D24-112.000.
Thomas, Robert F.: *See—*
Beechuk, Timothy J.; Zamorski, Ronald J.; Thomas, Robert F.; and Hart, William M., 326,052, Cl. D9-528.000.
Thomson, Harry S.; Raffo, David M.; Pape, John A.; and Woodward, Shaun M., to Kiddicraft Limited. Toy watch. 326,124, 5-12-92, Cl. D21-144.000.
Tokuda, Hiroyuki, to Canon Kabushiki Kaisha. Laser beam printer. 326,109, 5-12-92, Cl. D18-55.000.
Tokuda, Hiroyuki: *See—*
Tashiro, Naoki; and Tokuda, Hiroyuki, 326,110, Cl. D18-55.000.
Tominaga, Teruyuki: *See—*
Hayakawa, Toshio; Himuro, Yasuo; and Tominaga, Teruyuki, 326,073, Cl. D12-147.000.
Top Kogyo Co., Ltd.: *See—*
Murayama, Yasusuke, 326,037, Cl. D8-22.000.
Murayama, Yasusuke, 326,038, Cl. D8-22.000.
Tsay, Han-Tsun. Tool rest for milling planer. 326,101, 5-12-92, Cl. D15-131.000.
Tsuda, Toru: *See—*
Himuro, Yasuo; Tsuda, Toru; and Sasagawa, Toru, 326,074, Cl. D12-147.000.
Tsuji, Masanori: *See—*
Nagasaka, Yasuhiro; Hirayama, Yasuo; Shibata, Ichiro; Sueyoshi, Tadahiro; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; and Fukuda, Masaru, 326,084, Cl. D13-147.000.
Tuburaya, Kazuyuki: *See—*
Hasegawa, Hideaki; Tashimo, Fumio; Hagura, Shigehisa; Tuburaya, Kazuyuki; and Oda, Masaru, 326,043, Cl. D8-68.000.
Universal Furniture Industries, Inc.: *See—*
Gera, Robert A., 326,022, Cl. D6-381.000.
van Wirst, Johannes C. Game layout mat. 326,116, 5-12-92, Cl. D21-37.000.
Vartiala, Heikki, to Teknovent Oy, a part interest. Propeller. 326,080, 5-12-92, Cl. D12-214.000.
Viemeister, Tucker, to Oxo International L.P. Can opener. 326,039, 5-12-92, Cl. D8-33.000.
Vollrath Company, Inc., The: *See—*
Friederichs, Gary L., 326,033, Cl. D7-653.000.
Vrancart, Albert J.; and Priscandaro, Dennis M., to North American Philips Corporation. Reflector lamp. 326,160, 5-12-92, Cl. D26-2.000.
W.E. Bassett Company, The: *See—*
Leihe, Ottomar, 326,165, Cl. D28-60.000.
Waine, Matthew R.; and Brunet, Michel, to Procter & Gamble Company, The. Combined bottle and cap. 326,053, 5-12-92, Cl. D9-529.000.
Wallace, Howard L.: *See—*
Wallace, Tanya L.; and Wallace, Howard L., 326,151, Cl. D24-194.000.
Wallace, Tanya L.; and Wallace, Howard L. Medicine dispensing pacifier. 326,151, 5-12-92, Cl. D24-194.000.
Walters, Jon S.; and Boatwright, Neil, to American General Products, Inc. Adjustable gas tube. 326,031, 5-12-92, Cl. D7-402.000.
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., to Highland Supply Corporation. Flower pot cover. 326,069, 5-12-92, Cl. D11-164.000.

Weder, Erwin H.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 326,069, Cl. D11-164.000.
Weder, Wanda M.: *See—*
Weder, Donald E.; Weder, Erwin H.; Weder, Wanda M.; Craig, Franklin J.; Donnelly, Wilma M.; Bolk, Phyllis J.; Bergstrand, John W.; and Abrams, Robert C., 326,069, Cl. D11-164.000.
Welsh Company: *See—*
Connon, Dana W., 326,123, Cl. D21-142.000.
Wiese, Andreas. Animal barrier for vehicles. 326,076, 5-12-92, Cl. D12-155.000.
Willert Home Products, Inc.: *See—*
Borakove, Howard J.; and Morrell, Cindy L., 326,145, Cl. D23-367.000.
Borakove, Howard J.; and Morrell, Cindy L., 326,146, Cl. D23-367.000.
Borakove, Howard J.; and Morrell, Cindy L., 326,147, Cl. D23-367.000.
Williamson, Larry H., to Submersible Systems, Inc. Emergency breathing unit. 326,167, 5-12-92, Cl. D29-7.000.
Wilson, Paul M., to Gilbert, Frederick E. Hand signal. 326,122, 5-12-92, Cl. D21-100.000.
Woodward, Neil J.: *See—*
Bodenweiser, Clifford A.; and Woodward, Neil J., 326,047, Cl. D8-353.000.
Woodward, Shaun M.: *See—*
Thomson, Harry S.; Raffo, David M.; Pape, John A.; and Woodward, Shaun M., 326,124, Cl. D21-144.000.
Wysopal, James S. Bottle opener. 326,040, 5-12-92, Cl. D8-34.000.
Yamaha Corporation: *See—*
Amiya, Eizo, 326,107, Cl. D17-1.000.
Tatshumi, Keizo, 326,106, Cl. D17-1.000.
Yamamoto, Takayuki: *See—*
Nagasaka, Yasuhiro; Hirayama, Yasuo; Shibata, Ichiro; Sueyoshi, Tadahiro; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; and Fukuda, Masaru, 326,084, Cl. D13-147.000.
Yanagida, Takako; Mizobata, Yoshio; and Someya, Katsunori, to Matsushita Electric Works, Ltd. Electric shaver. 326,166, 5-12-92, Cl. D28-49.000.
Yazaki Corporation: *See—*
Nagasaka, Yasuhiro; Hirayama, Yasuo; Shibata, Ichiro; Sueyoshi, Tadahiro; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; and Fukuda, Masaru, 326,084, Cl. D13-147.000.
Takenouchi, Kenji; Makita, Toshihiko; and Norizuki, Teruhisa, 326,085, Cl. D13-154.000.
Yoshikawa, Masashi: *See—*
Deguchi, Hiromi; and Yoshikawa, Masashi, 326,154, Cl. D24-112.000.
Yue, Samuel K.: *See—*
Eastman, William J.; and Yue, Samuel K., 326,153, Cl. D24-111.000.
Zamorski, Ronald J.: *See—*
Beechuk, Timothy J.; Zamorski, Ronald J.; Thomas, Robert F.; and Hart, William M., 326,052, Cl. D9-528.000.
Zikria, J. Dean. Suture training board for microsurgery. 326,112, 5-12-92, Cl. D19-62.000.
Zucchi, Luciano: *See—*
Hume, Roger A.; Felstead, Richard A.; and Zucchi, Luciano, 326,161, Cl. D26-2.000.

LIST OF PLANT PATENTEES

de Jong, John M. F. Bouvardia named Stephanie. 7,866, 5-12-92, Cl. 68.000.
de Jong, John M. F. Bouvardia named Redrox. 7,867, 5-12-92, Cl. 68.000.
Izhar, Shamai: *See—*
Izsak, Eva; and Izhar, Shamai, 7,865, Cl. 48.000.
Izsak, Eva; and Izhar, Shamai, to State of Israel, Ministry of Agriculture. Strawberry plant Smadar. 7,865, 5-12-92, Cl. 48.000.
Lopez, Jose M. A., to Plantas de Navarra S.A. Strawberry plant named Milsei. 7,864, 5-12-92, Cl. 48.000.
Plantas de Navarra S.A.: *See—*
Lopez, Jose M. A., 7,864, Cl. 48.000.
State of Israel, Ministry of Agriculture: *See—*
Izsak, Eva; and Izhar, Shamai, 7,865, Cl. 48.000.

VOL
1138
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CLASSIFICATION OF PATENTS

ISSUED MAY 12, 1992

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
428 5,111,536

CLASS 4
324 5,111,537
599 5,111,538
661 5,111,539

CLASS 5
9.1 5,111,540
81.1 5,111,541
424 5,111,543
464 5,111,542
470 5,111,544
503.1 5,111,545

CLASS 8
137 5,112,358
405 5,112,359
406 5,112,360
471 5,112,361
639 5,112,362

CLASS 14
7.3 5,111,546

CLASS 15
187 5,111,547

CLASS 16
51 5,111,548
97 5,111,549
356 5,111,550

CLASS 19
150 5,111,551
308 5,111,552

CLASS 24
16 R 5,111,554
20 R 5,111,555
270 5,111,556
662 5,111,557
715.3 5,111,558

CLASS 27
4 5,111,559

CLASS 28
204 5,111,560

CLASS 29
4.55 5,111,561
37 R 5,111,562
116.2 5,111,563
5,111,564
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132 5,111,567
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402.13 5,111,570
407 5,111,569
5,111,571
437 Re.33,918
469.5 5,111,572
599 5,111,574
725 5,111,575
889.23 5,111,576
890.039 5,111,577
891 5,111,578
897.32 5,111,579

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161 5,111,581
225 5,111,582
346 5,111,583
489 5,111,584

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203.12 5,111,585
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247 5,111,587
367 5,111,588
385 5,111,589
502 5,111,590
503 5,111,591
561 5,111,592
613 5,111,593

CLASS 34
1 X 5,111,594
18 5,111,595
57 A 5,111,596

CLASS 36
8.3 5,111,597
117 5,111,598

CLASS 37
2 R 5,111,599
91 5,111,601
117.5 5,111,602
141 T 5,111,600
231 5,111,603

CLASS 40
308 5,111,604
316 5,111,605
642 5,111,606

CLASS 42
44 5,111,607
90 5,111,608

CLASS 43
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132.1 5,111,610

CLASS 44
280 5,112,363
418 5,112,364
576 5,112,365

CLASS 47
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60 5,111,612
72 5,111,613
81 5,111,614

CLASS 48
210 5,112,366

CLASS 49
279 5,111,615
406 5,111,616
494 5,111,617
501 5,111,618
502 5,111,619
5,111,620
504 5,111,621

CLASS 51
5 C 5,111,622
165.93 5,111,623
178 5,111,624
267 5,111,625
424 5,111,652

CLASS 52
79.1 5,111,626
126.5 5,111,627
169.7 5,111,628
171 5,111,629
508 5,111,630
646 5,111,631
702 5,111,632

CLASS 53
136.1 5,111,633
176 5,111,634
334 5,111,635
397 5,111,637
5,111,638
408 5,111,639
449 5,111,640
477 5,111,641
529 5,111,642
551 5,111,643

CLASS 55
26 5,112,367
53 5,112,357
97 5,112,368
5,112,369
102 5,112,370
233 5,112,371
276 5,112,372
316 5,112,373
385.1 5,112,374
440 5,112,375

CLASS 56
13.6 5,111,644
364 5,111,645
367 5,111,636

CLASS 57
15 5,111,646
100 5,111,647
261 5,111,648
296 5,111,650
311 5,111,649
413 5,111,651

CLASS 60
39.02 5,111,653
39.36 5,111,655
39.8 5,111,654
203.1 5,111,656
224 5,111,657
327 5,111,658
413 5,111,659
468 5,111,660
562 5,111,661
655 5,111,662
656 5,111,663

CLASS 62
3.62 5,111,664
6 5,111,665
48.1 5,111,666
55.5 5,111,667
259.3 5,111,668
475 5,111,670
515 5,111,671

CLASS 65
11.1 5,113,035
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114 5,112,377
327 5,112,378

CLASS 66
84 A 5,111,672

CLASS 68
12.04 5,111,673

CLASS 70
118 5,111,674

CLASS 71
31 5,112,379
79 5,112,381
88 5,112,382
92 5,112,383
5,112,384
94 5,112,385
5,112,386

CLASS 72
7 5,111,675
34 5,111,676
134 5,111,678
164 5,111,677
348 5,111,679
447 5,111,680
453.03 5,111,681

CLASS 73
3 5,111,682
5,111,683
49.3 5,111,684
117 5,111,685
117.3 5,111,686
146 5,111,687
159 5,111,688
167 5,111,689
168 5,111,690
292 5,111,691
295 5,111,692
497 5,111,694
514 5,111,693
626 5,111,695
627 5,111,696
668 5,111,697
708 5,111,698
749 5,111,700
754 5,111,699
827 5,111,701
862.65 5,111,702
864.11 5,111,703
866.4 5,111,704

CLASS 74
6 5,111,705
7 C 5,111,706
7 E 5,111,707
89.15 5,111,708
5,111,709
200 5,111,710
473 R 5,111,711
570 5,111,712
573 R 5,111,713
574 5,111,714
600 R 5,111,715
733.1 5,111,716
866 5,111,717
5,111,718
867 5,111,719

CLASS 75
10.42 5,112,387
255 5,112,388
401 5,112,389
733 5,112,390
772 5,112,391

CLASS 81
9.51 5,111,720

CLASS 82
47 5,111,721

CLASS 83
23 5,111,722
24 5,111,723
58 5,111,724
117 5,111,725

CLASS 84
375 5,111,726
603 5,111,727
726 5,111,728

CLASS 89
33.02 5,111,729
45 5,111,730
46 5,111,731
135 5,111,732

CLASS 91
167 R 5,111,733
376 R 5,111,734
433 5,111,735

CLASS 92
168 5,111,736
187 5,111,737

CLASS 98
365 5,112,278

CLASS 99
295 5,111,740

CLASS 100
45 5,111,741

CLASS 101
40 5,111,742
127 5,111,743
216 5,111,744
333 5,111,745
365 5,111,747

CLASS 102
308 5,111,746
387 5,111,748

CLASS 104
2 5,111,749
88 5,111,750
209 5,111,751

CLASS 105
18 5,111,752
230 5,111,753

CLASS 106
1.22 5,112,392
2 5,112,393
3 5,112,394
14.12 5,112,395
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18.33 5,112,397
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22 5,112,399
197.1 5,112,400
287.19 5,112,401
416 5,112,402
418 5,112,403
506 5,112,404
608 5,112,405

CLASS 108
51.3 5,111,754

CLASS 109
25 5,111,755

CLASS 110
240 5,111,756
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CLASS 112
266.1 5,111,758
322 5,111,759
439 5,111,760

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160 5,111,761
222 5,111,762
246 5,111,763
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273 5,111,766
288 5,111,767

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216 5,111,768

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29 5,111,771
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519 5,111,795
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539 5,111,797
637 5,111,798

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CLASS 126
25 R 5,111,802
41 R 5,111,803

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CLASS 128
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204.18 5,111,809
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419 D 5,111,811
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5,111,813
419 PG 5,111,815
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419 R 5,111,814
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661.01 5,111,824
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738 5,111,799
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772 5,111,829
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873 5,111,850
898 5,111,832

CLASS 131
231 5,111,833

CLASS 134
7 5,112,406
137 5,111,834

CLASS 135
34.2 5,111,835

CLASS 136
251 5,112,408
256 5,112,409
260 5,112,410

CLASS 137
68.1 5,111,836
72 5,111,837
223 5,111,838
242 5,111,839
270 5,111,840
360 5,111,841
454.6 5,111,842
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567 5,111,844
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607 5,111,846
828 5,111,847

CLASS 138
30 5,111,848
118 5,111,849

CLASS 139
1 R 5,111,851
435.4 5,111,852

CLASS 140
123.6 5,111,853

CLASS 141
65 5,111,854
83 5,111,855
230 5,111,856
234 5,111,857
312 5,111,858

CLASS 144
208 F 5,111,860
256.1 5,111,861
357 5,111,862
373 5,111,859

CLASS 148
251 5,112,413
254 5,112,414
302 B1 4,836,868
421 5,112,415
437 5,112,416
528 5,112,411
688 5,112,412

CLASS 149
109.6 5,112,417

CLASS 152
526 5,111,863
527 5,111,864
542 5,111,865

CLASS 156
51 5,112,419
88 5,112,420
148 5,112,421
175 5,112,422
234 5,112,423
243 5,112,424
247 5,112,425
250 5,112,426
259 5,112,427
319 5,112,418
324 5,112,428
542 5,112,429
556 5,112,430
583.5 5,112,431
610 5,112,432

623 R 5,112,433
628 5,112,434
643 5,112,435
5,112,436
646 5,112,437
655 5,112,438
656 5,112,439
659.1 5,112,440

CLASS 159

47.3 5,112,441
49 5,112,442

CLASS 160

90 5,111,866
330 5,111,867
5,111,868

CLASS 162

23 5,112,443
55 5,112,444
178 5,112,445

CLASS 164

45 5,111,869
61 5,111,870
63 5,111,871
98 5,111,872
312 5,111,873

CLASS 165

32 5,111,874
50 5,111,875
151 5,111,876
153 5,111,877
176 5,111,878

CLASS 166

82 5,111,879
250 5,111,880
5,111,881
252 5,111,882
269 5,111,883
297 5,111,885
300 5,111,886
312 5,111,887
382 5,111,884

CLASS 173

42 5,111,888
48 5,111,889
104 5,111,890

CLASS 174

87 5,113,037
92 5,113,038
113 C 5,113,039
116 5,113,040

CLASS 175

21 5,111,891
65 5,111,892
258 5,111,893
373 5,111,894
425 5,111,895

CLASS 177

16 5,111,896
132 5,111,897

CLASS 178

18 5,113,041
19 5,113,042

CLASS 180

9.52 5,111,898
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69.4 5,111,900
140 5,111,901
281 5,111,902

CLASS 181

102 5,111,903
131 5,111,904
152 5,111,905

CLASS 182

19 5,111,906
63 5,111,907
92 5,111,908
150 5,111,909

CLASS 184

1.5 5,111,910
15.1 5,111,911

CLASS 187

17 5,111,912

CLASS 188

67 5,111,913
73.34 5,111,914
73.45 5,111,915
165 5,111,916
319 5,111,917

CLASS 190

18 A 5,111,918
109 5,111,919
120 5,111,920

CLASS 192

4 A 5,111,921
53 E 5,111,922
58 B 5,111,923
70.17 5,111,924
141 5,111,925

CLASS 193

46 5,111,926

CLASS 194

209 5,111,927
292 5,111,928

CLASS 198

495 5,111,929
780 5,111,930

CLASS 200

43.01 5,113,043
51.04 5,113,044
51.09 5,113,045
83 Z 5,113,048
332 5,113,046
400 5,113,056
407 5,113,047

CLASS 202

185.2 5,112,446

CLASS 204

59 R 5,112,450
86 5,112,451
92 5,112,452
129.2 5,112,453
153.1 5,112,454
153.12 5,112,455
153.18 5,112,456
165 5,112,457
173 5,112,458
180.1 5,112,459
182.3 B1 4,159,933
182 8 5,112,460
5,112,461
237 5,112,463
265 5,112,464
278 5,112,465
298.05 5,112,466
298.12 5,112,467
298.13 5,112,468
298.25 5,112,469
299 R 5,112,470
B1 4,164,464
418 5,112,471

CLASS 205

118 5,112,448
148 5,112,447
165 5,112,462
175 5,112,449

CLASS 206

83.5 5,111,931
216 5,111,932
223 5,111,933
229 5,111,934
329 5,111,935
334 5,111,936
186 5,111,937
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503 5,111,939

CLASS 208

59 5,112,472
120 5,112,473

CLASS 209

240 5,112,474
399 5,112,475

CLASS 210

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5,112,477
96.1 5,112,478
149 5,112,479
188 5,112,480
193 5,112,481
209 5,112,482
223 5,112,483
247 5,112,484
387 5,112,485
416.1 5,112,486
490 5,112,487
541 5,112,488
637 5,112,489
645 5,112,490
651 5,112,491
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668 5,112,494
691 5,112,495
700 5,112,496
708 5,112,497
5,112,498
713 5,112,499
728 5,112,500
730 5,112,501
770 5,112,502
777 5,112,503
792 5,112,504

CLASS 211

41 5,111,940
46 5,111,941
59.3 5,111,942
59.4 5,111,943
133 5,111,944

CLASS 212

168 5,111,945

CLASS 215

247 5,111,946
256 5,111,947
306 5,111,948
313 5,111,949

CLASS 219

10.79 5,113,049
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5,113,051
85.22 5,113,052
116 5,113,053
117.1 5,113,054
121.67 5,113,055
220 5,113,223
523 5,113,057
B1 4,812,626
548 5,113,058

CLASS 220

1.5 5,111,950
23.4 5,111,951
94 R 5,111,952
214 5,111,953
266 5,111,954
303 5,111,955
338 5,111,956
408 5,111,957
524 5,111,958
544 5,111,959
575 5,111,960
712 5,111,961

CLASS 221

1 5,111,962
75 5,111,963
111 5,111,964
281 5,111,965

CLASS 222

1 5,111,966
39 5,111,967
47 5,111,968
54 5,111,969
83 5,111,970
95 5,111,971
135 5,111,972
386 5,111,973
399 5,111,974
475.1 5,111,975
485 5,111,976
521 5,111,977
545 5,111,978
568 5,111,979
600 5,111,980

CLASS 224

202 5,111,981
258 5,111,983

CLASS 225

1 5,111,984
51 5,111,985

CLASS 226

21 5,111,986

CLASS 227

180 5,111,987

CLASS 228

102 5,111,988
110 5,111,989
113 5,111,990
180.1 5,111,991

CLASS 235

101 5,113,059
383 5,113,060
454 5,113,061
493 5,113,062

CLASS 239

127.3 5,111,992
211 5,111,993
428.5 5,111,994
542 5,111,995
5,111,996
750 5,111,997

CLASS 241

5 5,111,998
293 5,111,999

CLASS 242

18 DD 5,112,000
43 R 5,112,001
57 5,112,002
71.1 5,112,003
75.51 5,112,004
107 5,112,005

CLASS 244

3.16 5,112,006
3.22 5,111,553
5,112,007
3.24 5,112,008
35 R 5,112,120
75 R 5,112,009
129.1 5,112,010
134 A 5,112,011
165 5,112,012

CLASS 248

74.3 5,112,013
220.3 5,112,014
236 5,112,015
309.1 5,112,016
311.2 5,112,017
394 5,112,018
405 5,112,019
444.1 5,112,021
456 5,112,020
493 5,112,022
519 5,112,023
603 5,112,024

CLASS 249

115 5,112,025

CLASS 250

201.4 5,113,063
201.9 5,113,064
203.2 5,113,065
205 5,113,066
208.1 5,113,067
214 B 5,113,068
227.11 5,113,069
227.21 5,113,070
237 G 5,113,071
282 5,113,075
309 5,113,072
343 5,113,073
370.06 5,113,076
370.11 5,113,077
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550 5,113,079
561 5,113,080
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5,113,082
574 5,113,083

CLASS 251

63 5,112,026
331 5,112,027

CLASS 252

8.552 5,112,505
33.4 5,112,506
51.5 A 5,112,507
5,112,508
56 R 5,112,509
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5,112,512
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174.12 5,112,518
174.21 5,112,519
174.23 5,112,520
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182.3 5,112,522
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301.4 R 5,112,524
315.3 5,112,525
363.5 5,112,526
373 5,112,527
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5,112,529
548 5,112,530
382 5,112,531
587 5,112,532
607 5,112,533
640 5,112,534

CLASS 256

13.1 5,112,028

CLASS 261

27 5,112,535
94 5,112,536
111 5,112,537
112.2 5,112,538
128 5,112,539

CLASS 264

4.7 5,112,540
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46.7 5,112,542
51 5,112,543
67 5,112,544
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167 5,112,546
5,112,547
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211.14 5,112,550
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255 5,112,552
259 5,112,553
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279 5,112,556
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297.2 5,112,558
297.8 5,112,559
516 5,112,560
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555 5,112,562
572 5,112,563

CLASS 266

47 5,112,029
256 5,112,030

CLASS 267

140.1 A 5,112,032
276 5,112,031

CLASS 270

47 5,112,033
53 5,112,034
5,112,035
54 5,112,036

CLASS 271

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10 5,112,038
11 5,112,040
286 5,112,041
297 5,112,042

CLASS 273

68 5,112,046
85 D 5,112,047
121 R 5,112,048
127 D 5,112,049
139 5,112,050
148 B 5,112,051
153 R 5,112,052
162 B 5,112,053
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421 5,112,063
429 5,112,064

CLASS 277

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151 5,112,067

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CLASS 281

47 5,112,083

CLASS 285

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321 5,112,089

CLASS 290

48 5,113,084

CLASS 292

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262 5,112,091

CLASS 293

128 5,112,092

CLASS 294

19.2 5,112,093

CLASS 296

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204 5,112,102

CLASS 297

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291 5,112,108
343 5,112,109
440 5,112,110

CLASS 299

18 5,112,111

CLASS 301

108 A 5,112,112

CLASS 303

71 5,112,113
113 TR 5,112,114
114 R 5,112,115
115 EC 5,112,116
116 R 5,112,117

CLASS 307

239 5,113,085
260 5,113,086
263 5,113,087
296.2 5,113,088
350 5,113,089
355 5,113,090
5,113,091
356 5,113,092
446 5,113,095
5,113,096
465 5,113,093
475 5,113,097
520 5,113,098
529 5,113,094

CLASS 310

13 5,113,099
40 MM 5,113,100
87 5,113,101
88 5,113,102
89 5,113,103
90 5,113,104
233 5,113,105
239 5,113,106
256 5,113,107
270 5,113,114
313 D 5,113,115
316 5,113,116
328 5,113,108
5,113,117

CLASS 312

116 5,112,118
283 5,112,119

CLASS 313

112 5,113,109
270 5,113,110
404 5,113,111
412 5,113,112
486 5,113,118
638 5,113,119

CLASS 315

77 5,113,120
248 5,113,121
371 5,113,122

CLASS 318

106 5,113,123
578 5,113,124
701 5,113,113
721 5,113,125
809 5,113,126

CLASS 320

21 5,113,127
5,113,128

CLASS 323

316 5,113,129

CLASS 324

74 5,113,130
96 5,113,131

158 F 5,113,132
158 P 5,113,133
158 R 5,113,134
228 5,113,135
247 5,113,136
307 5,113,137
5,113,138
623 5,113,139
680 5,113,140

CLASS 328

233 5,113,141

CLASS 329

306 5,113,142

CLASS 330

10 5,113,143
85 5,113,144
251 5,113,145
252 5,113,146
253 5,113,147
5,113,148
254 5,113,149
264 5,113,150
308 5,113,151

CLASS 331

11 5,113,152
61 5,113,153
79 5,113,154
107 SL 5,113,155
109 5,113,156
167 5,113,157

CLASS 332

109 5,113,158

CLASS 333

12 5,113,159
22 R 5,113,160
246 5,113,161

CLASS 335

210 5,113,162
216 5,113,163
5,113,164
5,113,165
299 5,113,166

CLASS 337

30 5,113,167
187 5,113,168
265 5,113,169
394 5,113,170

CLASS 338

61 5,113,171
171 5,113,172

CLASS 340

449 5,113,173
457 5,113,174
468 5,113,175
573 5,113,176
628 Re.33,920
705 5,113,177
709 5,113,178
5,113,179
726 B1 4,445,114
747 5,113,180
783 5,113,181
825.31 5,113,182
5,113,183
825.54 5,113,184
995 5,113,185

CLASS 341

68 5,113,186
73 5,113,187
133 5,113,188
143 5,113,189

CLASS 342

4 5,113,190
22 5,113,192
25 5,113,193
106 5,113,194
119 5,113,191

CLASS 343

704 5,113,195
744 5,113,196
776 5,113,197

CLASS 346

1.1 5,113,198
5,113,199
25 5,113,200
76 PH 5,113,201
108 5,113,202
140 R 5,113,203
5,113,204
5,113,205
5,113,206

CLASS 353

97 5,112,123

CLASS 354

54 5,113,207
105 5,113,208
400 5,113,209
5,113,210
402 5,113,214
408 5,113,215
421 5,113,216
471 5,113,217

CLASS 355

22 5,113,213
27 5,113,211
5,113,212
5,113,218
56 5,113,219
91 5,113,220
200 5,113,221
208 5,113,222
209 5,113,224
234 5,113,225
235 5,113,226
273 5,113,227
298 5,113,228
315 5,113,229
326

CLASS 356

39 5,112,124
73 5,112,125
152 5,112,126
301 5,112,127
350 5,112,128
359 5,112,129
373 5,112,130
376 5,112,131
381 5,112,132
401 5,112,133
427 5,112,134

CLASS 357

16 5,113,231
17 5,113,232
5,113,233
23.4 5,113,235
33.3 5,113,234
41 5,113,236
51 5,113,230
53 5,113,237
54 5,113,238
68 5,113,239
70 5,113,240
72 5,113,241

CLASS 358

12 5,113,242
21 R 5,113,243
41 5,113,245
44 5,113,246
51 5,113,247
75 5,113,248
5,113,249
5,113,251
77 5,113,252
91 5,113,253
98 5,113,254
133 5,113,256
136 5,113,255
158 5,113,257
167 5,113,258
183 5,113,259
213.11 5,113,260
5,113,263
225 5,113,261
298 5,113,264
310 5,113,262
330 5,113,265
426 5,113,266
448 5,113,267
474 5,113,268
5,113,269

CLASS 359

15 5,112,121
37 5,113,270
38 5,113,271
53 5,113,272
56 5,113,273
66 5,113,274
85 Re.33,921
86 5,113,275
115 5,113,524
117 5,113,276
127 5,113,277
152 5,113,403
154 5,113,278
196 5,113,279
5,113,280
236 5,113,281
241 5,113,282
248 5,113,283
332 5,112,122
419 5,113,284
465 5,113,285
569 5,113,286
676 5,113,287
739 5,113,288
811 5,113,289
823 5,113,290
5,113,291
851 5,113,292

CLASS 360

32 5,113,293
33.1 5,113,294
49 5,113,295
85 5,113,296
99.06 5,113,297
108 5,113,298
120 5,113,299
126 5,113,300
128 5,113,301
135 5,113,302

CLASS 361

45 5,113,303
87 5,113,304
92 5,113,305
127 5,113,306
154 5,113,307
178 5,113,308
302 5,113,309
5,113,310
346 5,113,311
361 5,113,312
380 5,113,313
384 5,113,314
386 5,113,315
396 5,113,316
413 5,113,317

CLASS 362

23 5,113,318
61 5,113,319
5,113,320
5,113,321
74 5,113,322
80 5,113,323
90 5,113,324
103 5,113,325
157 5,113,327
158 5,113,326
223 5,113,328
238 5,113,329
265 5,113,330
267 5,113,331
282 5,113,332

CLASS 363

25 5,113,333
5,113,334
44 5,113,335
61 5,113,336
98 5,113,337

CLASS 364

191 5,113,338
200 5,113,517
419 5,113,340
5,113,341
5,113,342
424.04 5,113,344
424.05 5,113,345
424.1 5,113,343
428 5,113,346
431.1 5,113,347
474.26 5,113,348
478 5,113,349
5,113,350
5,113,351
490 5,113,352
508 5,113,353
514 5,113,354
563 5,113,358
578 5,113,359
708 5,113,360
721 5,113,361
723 5,113,362
736 5,113,363
757 5,113,364
807 5,113,365
819 5,113,367

CLASS 365

200 5,113,371
205 5,113,372
227 5,113,373
5,113,374

CLASS 366

197 5,112,135

CLASS 367

13 5,113,375
15 5,113,376
20 5,113,377
83 5,113,379

CLASS 368

10 5,113,380
74 5,113,381
106 5,113,382

CLASS 369

33 5,113,383
44.29 5,113,384
44.37 5,113,378
5,113,385
44.38 5,113,387
44.41 5,113,386
270 5,113,388

CLASS 370

32.1 5,113,389
65 5,113,390
84 5,113,391
85.15 5,113,392
94.1 5,113,393
97 5,113,394
102 5,113,395
110.2 5,113,396

CLASS 371

5.1 5,113,397
11.2 5,113,398
21.3 5,113,399
43 5,113,400
5,113,401

CLASS 372

22 5,113,402
36 5,113,404
46 5,113,405
56 5,113,406
61 5,113,407
93 5,113,408

CLASS 374

44 5,112,136
131 5,112,137

CLASS 375

1 5,113,409
7 5,113,410
13 5,113,411
39 5,113,412
40 5,113,413
60 5,113,414
83 5,113,415
97 5,113,416
116 5,113,417
118 5,113,418

CLASS 376

116 5,112,564
216 5,112,565
245 5,112,566
5,112,567
282 5,112,569
370 5,112,570
439 5,112,571

CLASS 377

75 5,113,419

CLASS 378

20 5,113,420
50 5,113,421
58 5,113,422
145 5,113,423
170 5,113,424
190 5,113,425

CLASS 379

33 5,113,426
57 5,113,427
61 5,113,428
88 5,113,429
5,113,430
94 5,113,431
100 5,113,432
130 5,113,433
413 5,113,434
441 5,113,435
455 5,113,436

CLASS 380

3 5,113,437
6 5,113,438
7 5,113,439
15 5,113,440
5,113,441
25 5,113,442
34 5,113,443
47 5,113,444
51 5,113,445

CLASS 381

10 5,113,446
27 5,113,447
47 5,113,448
51 5,113,449

CLASS 382

8 5,113,451
13 5,113,452
24 5,113,453
27 5,113,454
47 5,113,455
54 5,113,456
56 5,113,457

CLASS 383

29 5,112,138

CLASS 384

15 5,112,139
16 5,112,140
100 5,112,141
107 5,112,142
117 5,112,143
215 5,112,144
286 5,112,145
492 5,112,146
605 5,112,147

CLASS 385

11 5,113,458
24 5,113,244
5,113,459
39 5,113,460
53 5,113,461
5,113,462
60 5,113,463
81 5,113,464
82 5,113,465
88 5,113,466
5,113,467
100 5,113,036
5,113,468
122 5,113,469
126 5,113,470
5,113,471
130 5,113,472
131 5,113,473
136 5,113,474
138 5,113,475
140 5,113,476
143 5,113,477

CLASS 392

395 5,113,478
417 5,113,479
501 5,113,480

CLASS 395

2 5,113,481
3 5,113,366
23 5,113,482
5,113,483
24 5,113,484
25 5,113,485
100 5,113,486
5,113,487
108 5,113,356
109 5,113,355
112 5,113,488
113 5,113,489
119 5,113,490
124 5,113,357
141 5,113,491
147 5,113,492
152 5,113,493
163 5,113,494
200 5,113,339
5,113,495
5,113,496
250 5,113,368
275 5,113,497
5,113,498
325 5,113,369
5,113,499
5,113,500
375 5,113,370
5,113,501
5,113,502
5,113,503
400 5,113,505
5,113,506
425 Re.33,922
5,113,507
5,113,508
5,113,509
5,113,510
5,113,511
5,113,512
5,113,513
5,113,514
5,113,515
500 5,113,516
550 5,113,518
575 5,113,504
600 5,113,519
650 5,113,520
5,113,521
700 5,113,522
800 5,113,523

CLASS 400

63 5,112,148
88 5,112,149
216.1 5,112,150

CLASS 601

96 5,112,151
132 5,112,152

CLASS 403

7 5,112,153
13 5,112,154
49 5,112,155
287 5,112,156
292 5,112,157

CLASS 405

154 5,112,158
195.1 5,112,159
259.5 5,112,160
267 5,112,161

CLASS 407

49 5,112,162
101 5,112,163
110 5,112,164
118 5,112,165

CLASS 408

1 R 5,112,166
211 5,112,167
220 5,112,168

CLASS 409

66 5,112,169
124 5,112,170
131 5,112,171

CLASS 410

59 5,112,172
79 5,112,173

CLASS 411

53 5,112,174
371 5,112,175
432 5,112,176
447 5,112,177
544 5,112,178

CLASS 412

1 5,112,179

CLASS 414

305 5,112,180
416 5,112,181
481 5,112,182
544 5,112,183
728 5,112,184
786 5,112,185
5,112,186

CLASS 415

169.3 5,112,187
198.1 5,112,188
200 5,112,189
215.1 5,112,190

CLASS 416

94 5,112,191
201 A 5,112,192
220 R 5,112,193
223 B 5,112,195
230 5,112,194

CLASS 417

63 5,112,196
222 R 5,112,197
269 5,112,198
310 5,112,199
356 5,112,200
366 5,112,201
423.7 5,112,202
440 5,112,203

CLASS 418

36 5,112,204

CLASS 419

30 5,112,572

CLASS 420

418 B1 4,842,820
422 5,112,573

CLASS 422

52 5,112,646
102 5,112,574
116 5,112,575
144 5,112,576
187 5,112,577
197 5,112,578
198 5,112,579
241 5,112,580

CLASS 423

3 5,112,581
27 5,112,582
55 5,112,583
161 5,112,584
210 5,112,585
220 5,112,586
235 5,112,587
244 5,112,588
328 5,112,589
415 A 5,112,590
5,112,591
419 R 5,112,592
502 5,112,593

CLASS 424

1.1	5,112,594
	5,112,595
2	5,112,596
9	5,112,597
46	5,112,598
52	5,112,599
55	5,112,600
61	5,112,601
72	B1 4,883,657
76.3	5,112,602
85.5	5,112,605
85.91	5,112,607
94.64	5,112,608
	5,112,609
195.1	5,112,610
	5,112,611
400	5,112,612
	5,112,613
422	5,112,614
426	5,112,615
434	5,112,617
435	5,112,616
443	5,112,618
456	5,112,619
490	5,112,604
497	5,112,621
663	5,112,622
713	5,112,623

CLASS 425

111	5,112,205
114	5,112,206
192 R	5,112,207
367	5,112,208
371	5,112,209
383	5,112,210
384	5,112,211
557	5,112,212
562	5,112,213
567	5,112,214

CLASS 426

2	5,112,624
5	5,112,625
43	5,112,626
50	5,112,627
117	5,112,628
231	5,112,629
233	5,112,630
297	5,112,631
321	5,112,380
392	5,112,632
438	5,112,633
513	5,112,634
518	5,112,635
581	5,112,636
629	5,112,637
640	5,112,638
654	5,112,639

CLASS 427

2	5,112,640
8	5,112,641
10	5,112,642
38	5,112,643
	5,112,644
43.1	5,112,645
53.1	5,112,647
96	5,112,648
226	5,112,676
249	5,112,649
255.2	5,112,650
339	5,112,651
342	5,112,652
356	5,112,653
376.6	5,112,654
407.1	5,112,655
425	5,112,656

CLASS 428

15	5,112,657
34.6	5,112,658
35.7	5,112,659
36.8	5,112,660
36.91	5,112,661
64	5,112,662
71	5,112,663
76	5,112,664
102	5,112,665
104	5,112,666
112	Re.33,923
113	5,112,667
137	5,112,668
141	5,112,669
156	5,112,670
	5,112,671
209	5,112,672
216	5,112,673
	5,112,674
	5,112,675
240	5,112,677
268	5,112,678
323	5,112,679
329	5,112,680
335	5,112,681
353	5,112,682
354	5,112,683
357	5,112,684
364	5,112,685
401	5,112,686
402	5,112,687
402.2	5,112,688
407	5,112,689
411.1	5,112,690
412	5,112,691
421	5,112,692
432	5,112,693
457	5,112,694
458	5,112,695
516	5,112,696
613	5,112,697
632	5,112,698
641	5,112,699
690	5,112,700
694	5,112,701

CLASS 429

17	5,112,702
103	5,112,703
194	5,112,704
206	5,112,705
233	5,112,706

CLASS 430

5	5,112,707
31	5,112,708
46	5,112,709
	5,112,710
58	5,112,711
	5,112,759
95	5,112,712
96	5,112,713
106.6	5,112,714
109	5,112,715
114	5,112,716
	5,112,718
124	5,112,717
175	5,112,743
191	5,112,719
213	5,112,720
281	5,112,721
287	5,112,723
290	5,112,722
296	5,112,724
306	5,112,725
315	5,112,726
321	5,112,727
507	5,112,728
546	5,112,729
553	5,112,730
567	5,112,731
596	5,112,732
603	5,112,733

CLASS 431

3	5,112,215
5	5,112,216
12	5,112,217
266	5,112,218
354	5,112,219

CLASS 432

8	5,112,220
115	5,112,222
241	5,112,223

CLASS 433

21	5,112,221
27	5,112,224
48	5,112,225
72	5,112,226
163	5,112,227

CLASS 434

272	5,112,228
409	5,112,229

CLASS 435

5	5,112,753
6	5,112,734
	5,112,735
	5,112,736
7.92	5,112,737
7.93	5,112,738
14	5,112,739
15	5,112,740
25	5,112,741
32	5,112,742
38	5,112,745
100	5,112,746
121	5,112,747
172.2	5,112,748
172.3	5,112,749
177	5,112,750
184	5,112,751
189	5,112,744
192	5,112,752
212	5,112,754
215	5,112,755
235.1	5,112,756
240.2	5,112,757
240.242	5,112,760
320.1	5,112,767

CLASS 436

8	5,112,758
39	5,112,768
97	5,112,769
501	5,112,770

CLASS 437

31	5,112,761
35	5,112,762
39	5,112,763
40	5,112,764
41	5,112,765
	5,112,766
67	5,112,771
	5,112,772
109	5,112,773
175	5,112,774
225	5,112,775
228	5,112,776

CLASS 439

55	5,112,230
60	5,112,231
75	5,112,232
79	5,112,233
	5,112,234
83	5,112,235
86	5,112,236
188	5,112,237
	5,112,238
189	5,112,239
215	5,112,240
273	5,112,241
326	5,112,242
352	5,112,243
395	5,112,244
412	5,112,245
489	5,112,246
571	5,112,247
577	5,112,248
581	5,112,249
582	5,112,250
607	5,112,251
610	5,112,252
620	5,112,253
852	5,112,254
885	5,112,255

CLASS 440

7	5,112,256
37	5,112,257
63	5,112,258
83	5,112,259
88	5,112,260
103	5,112,261

CLASS 445

24	5,112,262

CLASS 446

89	5,112,263
108	5,112,264
384	5,112,265
422	5,112,266
470	5,112,267
489	5,112,268

CLASS 452

5	5,112,269
66	5,112,270
108	5,112,271
122	5,112,272
135	5,112,273
174	5,112,274

CLASS 453

5	5,112,275
54	5,112,276

CLASS 454

159	5,111,738
195	5,112,277
306	5,111,739

CLASS 455

127	5,113,525

CLASS 469

69	5,112,279

CLASS 474

18	5,112,280
84	5,112,281
260	5,112,282

CLASS 475

211	5,112,283
228	5,112,284
280	5,112,285

CLASS 482

9	5,112,045
53	5,112,043
68	5,112,044
100	5,112,286
130	5,112,287

CLASS 483

1	5,111,573

CLASS 493

27	5,112,288
194	5,112,289
325	5,112,290
409	5,112,291

CLASS 501

31	5,112,778
32	5,112,777
90	5,112,779
95	5,112,780
	5,112,781
126	5,112,783
144	5,112,782

CLASS 502

80	5,112,784
108	5,112,785
119	5,112,786
159	5,112,787
162	5,112,788
	5,112,789
213	5,112,790
243	5,112,791
250	5,112,792
303	5,112,793
309	5,112,794
324	5,112,795
402	5,112,796

CLASS 503

200	5,112,797
209	5,112,798
227	5,112,799

CLASS 505

1	5,112,800
	5,112,801
	5,112,802

CLASS 512

11	5,112,803

CLASS 514

3	5,112,804
8	5,112,805
9	5,112,806
11	5,112,807
12	5,112,808
	5,112,809
15	5,112,810
17	5,112,811
21	5,112,812
54	5,112,813
75	5,112,814
178	5,112,815
179	5,112,816
180	5,112,620
183	5,112,817
210	5,112,818
212	5,112,819
230.2	5,112,820
233.8	5,112,821
249	5,112,822
252	5,112,823
253	5,112,824
	5,112,825
255	5,112,826
263	5,112,827
277	5,112,828
290	5,112,829
291	5,112,830
299	5,112,832
300	5,112,833
	5,112,834
	5,112,836
	5,112,837
311	5,112,838
312	5,112,839
323	5,112,840
337	5,112,841
341	5,112,842
361	5,112,843
367	5,112,844
375	5,112,845
398	5,112,846
399	5,112,847
415	5,112,848
422	5,112,849
424	5,112,850
427	5,112,851
428	5,112,852
443	5,112,853
	5,112,854
450	5,112,855
456	5,112,856
	5,112,857
460	5,112,858
462	5,112,859
484	5,112,860
513	5,112,861
520	5,112,862
522	5,112,863
534	5,112,865
546	5,112,864
549	5,112,866
576	5,112,867
617	5,112,868
618	5,112,869
641	5,112,870
712	5,112,871
727	5,112,872
731	5,112,603
772.3	

CLASS 521

32	5,112,873
51	5,112,874
60	5,112,875
110	5,112,877
131	5,112,878
155	5,112,879
167	5,112,876

CLASS 522

81	5,112,880
117	5,112,881
158	5,112,882

CLASS 523

106	5,112,883
116	5,112,884
213	5,112,885
332	5,112,886
400	5,112,887
443	5,112,888

CLASS 524

77	5,112,889
95	5,112,890
101	5,112,891
108	5,112,892
150	5,112,893
173	5,112,894
308	5,112,895
412	5,112,896
	5,112,897
	5,112,898
413	5,112,899
484	5,112,900
494	5,112,901
503	5,112,902

CLASS 525

54.2	5,112,903
59	5,112,904
60	5,112,905
61	5,112,906
65	5,112,907
66	5,112,908
67	5,112,909
84	5,112,910
100	5,112,911
123	5,112,912
133	5,112,913
134	5,112,914
166	5,112,915
183	5,112,916
185	5,112,917
209	5,112,918
263	5,112,919
272	5,112,938
294	5,112,920
316	5,112,921
332.2	5,112,922
420	5,112,923
426	5,112,924
474	5,112,925
526	5,112,926

CLASS 526

124	5,112,927
128	5,112,928
181	5,112,929

CLASS 528

28	5,112,930
45	5,112,931
51	5,112,932
61	5,112,933
99	5,112,934
176	5,112,935
204	5,112,936
272	5,112,937
289	5,112,939
301	5,112,940
353	5,112,941
	5,112,942
483	5,112,943

CLASS 530

321	5,112,944
324	5,112,945
	5,112,946
329	5,112,947
351	5,112,948
383	5,112,949
383	5,112,950
387.1	5,112,952
	5,112,957
387.3	5,112,951
389.2	5,112,606
391.5	5,112,953
391.9	5,112,954
409	5,112,955
424	5,112,956

CLASS 534

618	5,112,958
642	5,112,959

CLASS 536

18.1	5,112,960
27	5,112,961
	5,112,962
	5,112,963
56	5,112,964
114	5,112,965

CLASS 548

200	5,112,966
215	5,112,967
355	5,112,968
491	5,112,969

CLASS 544

75	5,112,970
189	5,112,971
230	5,112,972
302	5,112,835
387	5,112,973

CLASS 546

4	5,112,974
45	5,112,975
193	5,112,976
195	5,112,977
240	5,112,978
244	5,112,979
283	5,112,980
301	5,112,981
345	5,112,982

CLASS 548

263.2	5,112,983
320	5,112,984
337	5,112,985
372	5,112,986
457	5,112,987
470	5,112,988
548	5,112,989

CLASS 549

34	5,112,990
206	5,112,991
245	5,112,992
254	5,112,993
323	5,112,994
493	5,112,995

CLASS 552

104	5,112,996
238	5,112,997
559	5,112,998

CLASS 556

23	5,112,999
413	5,113,000
428	5,113,001
431	5,113,002
432	5,113,003
440	5,113,004
449	5,113,005
453	5,113,006
482	5,113,007

CLASS 558

252	5,113,008

CLASS 560

40	5,113,009
96	5,113,010
178	5,113,011
181	5,113,012

CLASS 562

493	5,113,013
503	5,113,014
608	5,113,015
856	5,113,016

CLASS 564

2	5,113,017
403	5,113,018

CLASS 568

41	5,113,019
323	5,113,020
341	5,113,021
454	5,113,022
697	5,113,023
	5,113,024
814	5,113,025

CLASS 570

170	5,113,026
224	5,113,027
255	5,113,028

CLASS 585

6.3	5,113,029
10	5,113,030
467	5,113,031
500	5,113,032
506	5,113,033
510	5,113,034

CLASS 600

16	5,112,292
22	5,112,293
27	5,112,294
40	5,112,295

CLASS 601

19	5,111,806
23	5,111,808
28	5,112,296

CLASS 604

1	5,112,297
6	Re.33,924
	5,112,298
22	5,112,299
	5,112,300
30	5,112,301
35	5,112,302
49	5,112,303
96	5,112,304
98	5,112,305
	B1 4,813,934
101	5,112,306
110	5,112,307
164	5,112,308
171	5,112,309
175	5,112,310
177	5,112,311
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180	5,112,313
192	5,112,314
195	5,112,315
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208	5,112,317
240	5,112,318
246	5,112,319
256	5,112,320
264	5,112,321
317	5,112,322
319	5,112,323
349	5,112,324
358	5,112,348
362	5,112,325
391	5,112,326
410	B1 4,222,379
413	5,112,327

CLASS 606

4	5,112,328
46	5,112,329
	5,112,330
48	Re.33,925
53	5,112,331
61	5,112,332
62	5,112,333
87	5,112,334
88	5,112,335
96	5,112,336
	5,112,337
99	5,112,338
107	5,112,339
130	5,112,340
133	5,112,341
	5,112,342
143	5,112,343
148	5,112,344
159	5,112,345
170	5,112,346
200	5,112,347
244	5,111,807

CLASS 623

3	5,112,349
5	5,112,350
6	5,112,351
8	5,112,352
10	5,112,353
16	5,112,354
22	5,112,355
49	5,112,356

CLASSIFICATION OF DESIGNS

D2—	181	326,009		22	326,037	D11—	13	326,065		166	326,093		86	326,121		413	326,149
	187	326,010			326,038		41	326,066		191	326,094		100	326,122	D24—	111	326,152
	314	326,011		33	326,039		55	326,067		204	326,095		142	326,123			326,153
		326,012		34	326,040		99	326,068		217	326,096		144	326,124		112	326,154
		326,013		35	326,041		164	326,069		230	326,097		148	326,125		129	326,155
	320	326,014		62	326,042	D12—	101	326,070		240	326,098		160	326,126		155	326,156
		326,015		68	326,043		146	326,071	D15—	127	326,099		198	326,127			326,157
D3—	36	326,016		91	326,044		147	326,072		130	326,100		201	326,128		182	326,150
	39	326,017		346	326,045			326,073		131	326,101		208	326,129		194	326,151
	42	326,018			326,046			326,074		140	326,102		214	326,130		198	326,158
D4—	118	326,019		353	326,047			326,075		141	326,103		217	326,131	D25—	66	326,159
D5—	18	326,020		359	326,048		155	326,076	D16—	223	326,104		237	326,132	D26—	2	326,160
D6—	323	326,021		385	326,049			326,077		244	326,105		253	326,133			326,161
	381	326,022	D9—	524	326,050		181	326,078	D17—	1	326,106			326,134		63	326,162
	438	326,023		528	326,052		193	326,079			326,107	D22—	107	326,135		152	326,163
	480	326,024		529	326,053		214	326,080		22	326,108		134	326,136	D28—	38	326,164
		326,025		539	326,054		333	326,081	D18—	55	326,109	D23—	225	326,137		49	326,166
	484	326,026		558	326,051		345	326,082			326,110		226	326,138		80	326,165
	553	326,027	D10—	2	326,055	D13—	112	326,083		56	326,111		252	326,139	D29—	7	326,167
D7—	330	326,028		24	326,056		147	326,084	D19—	62	326,112		267	326,140	D30—	129	326,168
	346	326,029		39	326,057		154	326,085		78	326,113		294	326,141	D32—	18	326,169
	362	326,030			326,058		171	326,086		97	326,114		295	326,142	D34—	1	326,170
	402	326,031		69	326,059			326,087	D21—	6	326,115		304	326,143		3	326,171
	608	326,032		113	326,060		184	326,088		37	326,116		365	326,144		5	326,172
	653	326,033		114	326,061	D14—	100	326,089		48	326,117		367	326,145		6	326,173
	688	326,034		129	326,062		138	326,090		51	326,118			326,146		17	326,174
D8—	13	326,035			326,063			326,091		54	326,119			326,147		44	326,175
	21	326,036			326,064			326,092		65	326,120		382	326,148		45	326,176

CLASSIFICATION OF PLANTS

P.—	48	7,864		7,865		68	7,866		7,867		

VOL 1138 ISS 2 MY 12 1992 UMI

VOL
1138
ISS
2
MY
12
1992
UMI

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 5,112,417	5,112,021	5,112,438	5,113,238	5,112,398	5,112,538
5,112,561	5,112,028	5,112,442	5,113,244	5,112,418	5,112,616
5,113,350	5,112,045	5,112,445	5,113,270	5,112,492	5,113,065
04 : 5,111,553	5,112,046	5,112,459	5,113,271	5,112,521	5,113,092
5,111,682	5,112,050	5,112,465	5,113,272	5,112,575	5,113,173
5,111,724	5,112,054	5,112,470	5,113,282	5,112,658	5,113,196
5,111,966	5,112,068	5,112,495	5,113,292	5,112,878	5,113,361
5,112,010	5,112,075	5,112,507	5,113,314	5,112,890	5,113,522
5,112,023	5,112,088	5,112,514	5,113,326	5,112,909	13 : 5,111,584
5,112,477	5,112,090	5,112,534	5,113,332	5,113,003	5,111,611
5,112,483	5,112,098	5,112,535	5,113,333	5,113,014	5,111,783
5,112,533	5,112,107	5,112,541	5,113,335	5,113,042	5,111,979
5,112,662	5,112,121	5,112,570	5,113,373	5,113,043	5,112,186
5,112,772	5,112,126	5,112,605	5,113,386	5,113,058	5,112,402
5,113,156	5,112,128	5,112,608	5,113,399	5,113,059	5,112,628
5,113,284	5,112,129	5,112,614	5,113,440	5,113,312	5,112,652
5,113,285	5,112,134	5,112,623	5,113,443	5,113,412	5,112,690
5,113,417	5,112,137	5,112,633	5,113,451	5,113,516	5,112,796
05 : 5,111,838	5,112,146	5,112,644	5,113,464	5,113,518	5,113,036
5,111,879	5,112,203	5,112,663	5,113,490	10 : 5,112,491	5,113,159
5,112,226	5,112,228	5,112,687	5,113,498	5,112,654	5,113,351
5,112,800	5,112,229	5,112,706	5,113,500	5,112,886	5,113,430
06 : Re.33,921	5,112,242	5,112,755	5,113,505	5,112,908	15 : 5,112,056
5,111,538	5,112,245	5,112,761	5,113,506	5,112,924	5,112,310
5,111,542	5,112,261	5,112,763	5,113,507	5,112,993	5,112,381
5,111,543	5,112,274	5,112,767	5,113,511	5,113,422	16 : 5,112,773
5,111,602	5,112,287	5,112,769	5,113,517	12 : Re.33,925	5,113,199
5,111,639	5,112,294	5,112,776	5,113,523	5,111,550	5,113,372
5,111,643	5,112,295	5,112,801	4,445,114	5,111,570	17 : Re.33,920
5,111,655	5,112,297	5,112,809	4,813,934	5,111,626	5,111,544
5,111,688	5,112,298	5,112,822	08 : 5,111,558	5,111,668	5,111,575
5,111,692	5,112,299	5,112,853	5,111,927	5,111,755	5,111,600
5,111,713	5,112,300	5,112,880	5,111,964	5,111,771	5,111,613
5,111,727	5,112,303	5,112,900	5,112,142	5,111,828	5,111,618
5,111,808	5,112,305	5,112,939	5,112,156	5,111,853	5,111,627
5,111,816	5,112,307	5,112,951	5,112,219	5,111,857	5,111,637
5,111,819	5,112,311	5,112,961	5,112,282	5,111,911	5,111,638
5,111,839	5,112,312	5,113,064	5,112,314	5,111,963	5,111,653
5,111,867	5,112,324	5,113,076	5,112,781	5,111,990	5,111,691
5,111,886	5,112,331	5,113,094	5,112,843	5,111,992	5,111,701
5,111,905	5,112,345	5,113,096	5,113,176	5,112,044	5,111,741
5,111,906	5,112,351	5,113,098	5,113,384	5,112,069	5,111,785
5,111,912	5,112,352	5,113,099	5,113,428	5,112,094	5,111,800
5,111,931	5,112,353	5,113,102	09 : 5,111,641	5,112,119	5,111,836
5,111,956	5,112,367	5,113,131	5,111,676	5,112,187	5,111,917
5,111,960	5,112,373	5,113,141	5,111,809	5,112,286	5,111,958
5,111,967	5,112,379	5,113,147	5,111,866	5,112,322	5,111,969
5,111,970	5,112,399	5,113,164	5,112,037	5,112,333	5,111,973
5,111,977	5,112,405	5,113,186	5,112,183	5,112,338	5,111,975
5,111,994	5,112,428	5,113,194	5,112,355	5,112,339	5,111,987
5,111,995	5,112,429	5,113,197	5,112,359	5,112,348	5,112,004
5,111,996	5,112,435	5,113,219	5,112,374	5,112,350	5,112,049
5,112,012	5,112,436	5,113,231	5,112,397	5,112,358	5,112,097

5,112,105
5,112,132
5,112,162
5,112,179
5,112,214
5,112,231
5,112,259
5,112,260
5,112,279
5,112,288
5,112,290
5,112,309
5,112,357
5,112,391
5,112,479
5,112,520
5,112,527
5,112,551
5,112,554
5,112,576
5,112,611
5,112,625
5,112,630
5,112,665
5,112,848
5,112,864
5,112,952
5,112,956
5,112,962
5,112,992
5,113,005
5,113,015
5,113,124
5,113,169
5,113,213
5,113,256
5,113,286
5,113,290
5,113,315
5,113,358
5,113,394
5,113,400
5,113,436
5,113,442
5,113,496
4,222,379
4,883,657
18 : Re.33,918
5,111,549
5,111,608
5,111,807
5,111,944
5,111,991
5,112,055
5,112,064
5,112,067
5,112,099
5,112,255
5,112,285
5,112,332
5,112,619
5,113,039
5,113,259
5,113,320
5,113,331
5,113,343
19 : 5,111,569
5,111,921
5,111,939
5,112,696
20 : 5,111,609
5,112,537
5,112,661
5,113,027
5,113,438
21 : 5,111,562
5,112,111
5,112,241
5,112,635
5,113,488
22 : 5,111,726
5,111,766
5,111,885
5,111,981
5,111,985
5,112,159
5,112,211
5,112,296
5,112,430
5,112,499
5,112,637
5,112,808
5,112,942
5,113,017
5,113,025
24 : 5,111,810
5,111,928
5,112,042
5,112,123
5,112,154
5,112,409
5,112,607
5,112,664
5,112,745
5,112,804
5,112,957

5,113,143
5,113,193
5,113,341
5,113,342
5,113,367
5,113,380
5,113,387
5,113,421
25 : Re.33,924
5,111,603
5,111,616
5,111,693
5,111,702
5,111,823
5,111,829
5,111,845
5,112,020
5,112,062
5,112,127
5,112,163
5,112,194
5,112,215
5,112,225
5,112,234
5,112,301
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5,112,960
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5,113,074
5,113,117
5,113,118
5,113,121
5,113,352
5,113,365
5,113,393
5,113,462
5,113,474
5,113,510
5,113,514
5,113,515
5,113,521
26 : 5,111,554
5,111,579
5,111,619
5,111,620
5,111,630
5,111,660
5,111,715
5,111,739
5,111,786
5,111,790
5,111,795
5,111,844
5,111,858
5,111,868
5,111,902
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5,111,940
5,111,984
5,111,988
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5,112,014
5,112,018
5,112,031
5,112,048
5,112,074
5,112,076
5,112,078
5,112,085
5,112,101
5,112,114
5,112,116
5,112,145
5,112,157
5,112,175
5,112,177
5,112,180
5,112,240
5,112,276
5,112,278
5,112,291
5,112,485
5,112,543
5,112,545
5,112,546
5,112,548
5,112,549
5,112,563
5,112,579
5,112,650
5,112,738
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5,112,779
5,112,846
5,112,868
5,112,873
5,112,920
5,112,934
5,113,001
5,113,175
5,113,182
5,113,317
5,113,322
5,113,325
5,113,446
5,113,481
5,113,502
27 : 5,111,624
5,111,685
5,111,757
5,111,812
5,111,815
5,111,929
5,111,932
5,111,936
5,111,941
5,111,953
5,112,058
5,112,073
5,112,095
5,112,184
5,112,304
5,112,306
5,112,372
5,112,462
5,112,604
5,112,626
5,112,882
5,112,889
5,113,048
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28 : 5,111,706
5,112,256
5,112,678
29 : 5,111,577
5,111,834
5,112,019
5,112,059
5,112,082
5,112,152
5,112,208
5,112,227
5,112,393
5,112,395
5,112,423
5,112,461
5,112,496
5,112,505
5,112,594
5,112,595
5,112,760
5,112,955
5,112,969
5,112,975
5,112,980
5,113,008
5,113,037
5,113,044
5,113,120
31 : 4,159,933
4,164,464
32 : 5,111,793
5,112,060
33 : 5,112,033
5,112,536
5,112,683
5,113,130
34 : 5,111,537
5,111,576
5,111,622
5,111,629
5,111,654
5,111,742
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5,111,989
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5,113,024
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5,113,034
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5,113,080
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5,113,134
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5,113,163
5,113,168
5,113,177
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36 : 5,111,582
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4,842,820
37 : 5,111,725
5,111,806
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5,111,892
5,111,955
5,112,182
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41 : 5,111,574
5,111,813
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42 : 5,111,578
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5,113,289
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44 : 5,111,565
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45 : 5,111,551
5,111,581
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5,112,233
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46 : 5,112,371
47 : 5,111,589
5,111,689
5,111,872
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48 : 5,111,545
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5,111,843
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5,111,861
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5,111,887
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5,112,043
5,112,092
5,112,158
5,112,206
5,112,230
5,112,258
5,112,292
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5,112,336
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5,112,451
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5,112,724
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5,112,938
5,112,948
5,112,979
5,113,031
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5,113,095
5,113,189
5,113,207
5,113,267
5,113,328
5,113,354
5,113,364
5,113,375
5,113,377
5,113,379

5,113,420
5,113,433
5,113,444
5,113,449
5,113,483
5,113,508
5,113,519
49 : 5,111,606
5,111,817
5,112,135
5,112,337
5,112,390
5,112,504
5,112,736
50 : 5,111,729
5,112,735

51 : 5,111,604
5,111,794
5,111,910
5,111,943
5,112,063
5,112,103
5,112,110
5,112,120
5,112,565
5,112,574
5,112,670
5,112,923
5,113,079
5,113,160
5,113,398

5,113,409
5,113,413
5,113,499
53 : 5,111,656
5,111,674
5,111,694
5,111,736
5,111,754
5,111,756
5,111,799
5,111,824
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5,112,006
5,112,354
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5,112,448
5,112,953
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5,113,346
5,113,447
54 : 5,111,962
5,111,978
5,112,475
5,112,788
5,112,789
5,112,795
5,112,931
5,112,984
5,113,022
5,113,253
55 : 5,111,546

5,111,563
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5,111,680
5,111,735
5,111,761
5,111,840
5,111,869
5,111,901
5,111,904
5,112,220
5,112,232
5,112,394
5,112,632
5,112,653
5,113,306
5,113,429

DESIGN PATENTS

04 : 326,099
06 : 326,020
326,021
326,036
326,040
326,044
326,048
326,051
326,061
326,076
326,077
326,079
326,081
326,119
326,134
326,140
326,156
326,158
326,167

08 : 326,133
09 : 326,014
326,054
326,095
12 : 326,027
326,045
326,060
326,113
326,148
326,041
326,164
17 : 326,022
326,023
326,055
326,069
326,122
18 : 326,019
326,128

20 : 326,050
23 : 326,066
24 : 326,131
326,151
25 : 326,011
326,012
326,017
326,047
326,115
326,170
326,078
326,118
326,159
27 : 326,125
326,153
29 : 326,031
326,034
326,059
326,070

326,123
326,143
326,145
326,146
326,147
32 : 326,046
34 : 326,030
326,089
326,098
326,112
326,144
326,160
36 : 326,026
326,029
326,039
326,086
326,087
326,104

326,120
326,126
326,130
326,162
326,163
39 : 326,032
326,052
326,072
326,075
326,114
326,135
326,176
40 : 326,121
326,175
41 : 326,013
326,024
326,132
326,168

42 : 326,010
326,103
326,155
44 : 326,173
47 : 326,042
48 : 326,149
326,150
326,174
51 : 326,127
326,157
326,171
53 : 326,067
326,117
55 : 326,033
326,088
326,129
326,136
326,142

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12
1992
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VOL

1138

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Vol. 1138 Number 3

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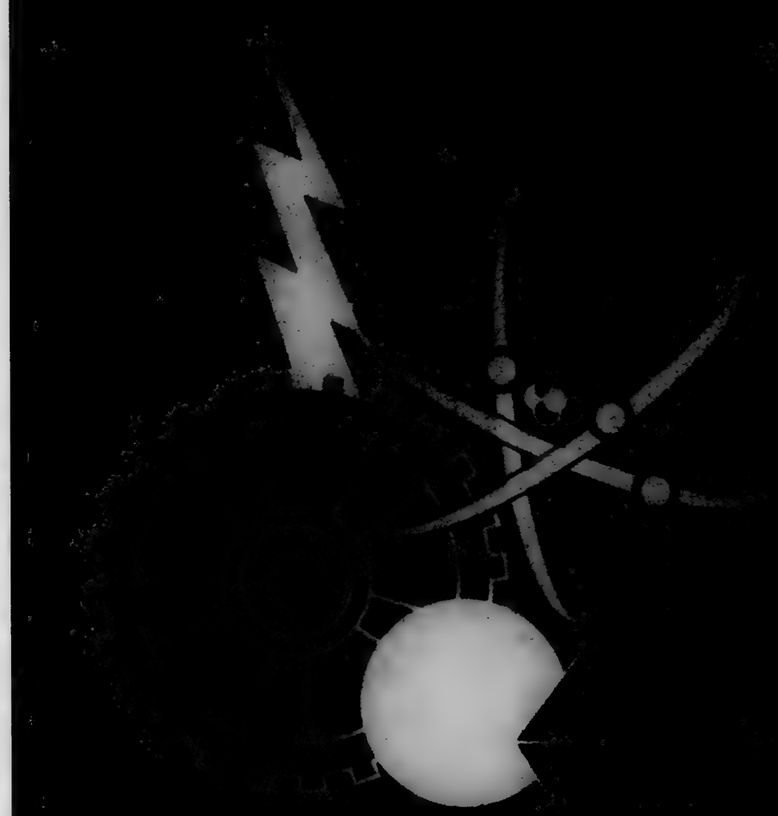
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PATENTS

May 19, 1992



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VOL
1138
ISS
3
MY
19
1992
UMI

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UNITED STATES PATENT AND TRADEMARK OFFICE
May 19, 1992 Volume 1138 Number 3

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1138 OG 30
Notice of Maintenance Fees Payable	1138 OG 30
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1138 OG 31
Notification of Acceptance of Delayed Payment of Maintenance Fee	1138 OG 35
Errata	1138 OG 35
Reissue Applications Filed	1138 OG 35
CD-ROM Patent Images by Technology	1138 OG 35
Service by Publication	1138 OG 36
Patent Information in CD-ROM and Diskette Format	1138 OG 36
Service by Publication	1138 OG 37
Implementation of Rules on Information Disclosure Statements	1138 OG 37
Patents Certificates of Correction	1138 OG 42
Special Boxes for Mail	1138 OG 43
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1138 OG 44
Patent Examining Corps	1138 OG 46
Reexaminations	1393
Reissue Patents Granted (33,926)	1397
Plant Patents Granted (7,868)	1401
Patents Granted	
General and Mechanical (5,113,526)	1403
Chemical (5,114,426)	1717
Electrical (5,115,103)	1911
Design Patents Granted (326,177)	2053
Index of Patentees	PI 1
Indices of Reissue, Reexaminations, Design, and Plant Patents	PI 84
Classification of	
Patents (Including Reissues and Reexaminations)	PI 91
Designs, and Plants Applications	PI 95
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 97
Designs and Plant Applications	PI 99
Change of Address Form	PI 101
Subscription Order Form	PI 103

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1138
ISS
3
MY
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1992
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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	600.00
—Corresponding prior U.S. national application filed	400.00
—Supplemental search fee, per additional invention	160.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	440.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	650.00
—Additional examination fee, per additional invention	220.00
International fees	
Basic fee	525.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	127.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	161.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	310.00	620.00
USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA	460.00	920.00
Filing with an EPO or JPO search report	400.	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on May 16, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,829,599 through 4,831,663
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 14, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,516,273 through 4,517,684
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9f)	$450.00
By other than a small entity	$900.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9f)	$905.00
By other than a small entity	$1,810.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§1.9(f))	$1,365.00
By other than a small entity	$2,730.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§1.9f)	$65.00
By other than a small entity	$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable $600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 15, 1992
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,796	06/636,644	12/06/88
(4,436,907)	(06/344,261)	(3/13/84)
4,435,856	06/368,409	3/13/84
4,435,857	06/364,786	3/13/84
4,435,860	06/231,619	3/13/84
4,435,861	06/352,348	3/13/84
4,435,867	06/369,663	3/13/84
4,435,874	06/519,075	3/13/84
4,435,880	06/453,275	3/13/84
4,435,883	06/306,463	3/13/84
4,435,886	06/316,123	3/13/84
4,435,902	06/216,910	3/13/84
4,435,903	06/295,707	3/13/84
4,435,907	06/338,511	3/13/84
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Patent Number	Serial Number	Issue Date
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Patent Number	Serial Number	Issue Date
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VOL
1138
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Patent Number	Serial Number	Issue Date
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4,730,919	06/782,705	3/15/88
4,730,926	06/891,467	3/15/88
4,730,928	06/705,469	3/15/88
4,730,936	06/917,573	3/15/88
4,730,937	06/883,745	3/15/88
4,730,940	06/903,784	3/15/88
4,730,942	06/897,194	3/15/88
4,730,943	06/928,202	3/15/88
4,730,944	07/016,765	3/15/88
4,730,946	07/040,605	3/15/88
4,730,960	06/941,776	3/15/88
4,730,971	06/779,283	3/15/88
4,730,980	06/758,059	3/15/88
4,730,990	07/037,189	3/15/88
4,730,992	07/030,205	3/15/88
4,730,994	06/940,852	3/15/88
4,730,999	06/893,251	3/15/88
4,731,001	06/898,023	3/15/88
4,731,003	06/926,957	3/15/88
4,731,012	06/926,115	3/15/88
4,731,024	07/039,266	3/15/88
4,731,025	06/886,609	3/15/88
4,731,027	06/920,695	3/15/88
4,731,029	06/922,534	3/15/88
4,731,034	07/026,031	3/15/88
4,731,035	06/864,084	3/15/88
4,731,036	06/852,247	3/15/88
4,731,037	07/009,482	3/15/88
4,731,042	06/928,016	3/15/88
4,731,046	06/801,875	3/15/88
4,731,052	07/003,133	3/15/88
4,731,063	06/766,242	3/15/88
4,731,064	07/048,993	3/15/88
4,731,074	06/832,914	3/15/88
4,731,076	06/944,100	3/15/88
4,731,082	07/077,121	3/15/88
4,731,087	07/000,662	3/15/88
4,731,093	06/788,803	3/15/88
4,731,099	06/925,881	3/15/88
4,731,105	06/895,921	3/15/88
4,731,108	06/837,229	3/15/88
4,731,112	06/875,126	3/15/88
4,731,113	06/896,823	3/15/88
4,731,114	07/007,581	3/15/88
4,731,123	06/792,405	3/15/88
4,731,127	06/933,308	3/15/88
4,731,129	06/899,142	3/15/88
4,731,145	06/755,569	3/15/88
4,731,152	06/851,841	3/15/88
4,731,160	06/841,236	3/15/88
4,731,175	06/882,576	3/15/88
4,731,189	06/912,413	3/15/88
4,731,194	06/894,516	3/15/88
4,731,205	06/904,986	3/15/88
4,731,227	06/931,983	3/15/88
4,731,238	06/558,538	3/15/88
4,731,246	06/793,174	3/15/88
4,731,248	06/829,886	3/15/88
4,731,252	06/921,382	3/15/88
4,731,258	06/930,516	3/15/88
4,731,277	06/879,815	3/15/88
4,731,294	06/859,708	3/15/88
4,731,328	06/516,088	3/15/88
4,731,339	06/899,574	3/15/88
4,731,343	07/080,197	3/15/88
4,731,345	06/948,387	3/15/88
4,731,348	06/800,596	3/15/88
4,731,363	06/819,319	3/15/88
4,731,373	06/679,734	3/15/88
4,731,379	06/741,431	3/15/88
47,31,385	06/921,294	3/15/88
4,731,388	07/004,487	3/15/88
4,731,394	06/873,566	3/15/88
4,731,398	06/928,530	3/15/88
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4,731,410	06/881,244	3/15/88
4,731,412	06/851,444	3/15/88
4,731,421	06/816,805	3/15/88
47,31,434	06/628,537	3/15/88
4,731,442	06/914,695	3/15/88
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4,731,450	06/865,346	3/15/88
4,731,468	06/645,360	3/15/88
47,31,474	06/820,410	3/15/88
4,731,477	07/018,304	3/15/88
4,731,482	06/920,265	3/15/88
4,731,507	06/853,895	3/15/88
47,31,510	06/882,001	3/15/88
4,731,515	06/921,708	3/15/88
4,731,521	07/037,044	3/15/88
4,731,525	06/827,257	3/15/88
4,731,526	06/821,560	3/15/88
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4,731,540	06/844,303	3/15/88
4,731,545	06/840,430	3/15/88
4,731,546	06/937,469	3/15/88
4,731,549	06/661,063	3/15/88
4,731,550	06/767,816	3/15/88
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4,731,594	06/646,101	3/15/88
4,731,605	07/017,132	3/15/88
4,731,608	06/753,113	3/15/88
4,731,616	06/740,876	3/15/88
4,731,617	06/897,879	3/15/88
4,731,645	06/873,875	3/15/88
4,731,650	06/891,953	3/15/88
4,731,653	06/924,608	3/15/88
4,731,676	06/808,861	3/15/88
4,731,690	06/938,702	3/15/88
4,731,694	07/040,239	3/15/88
4,731,698	06/743,610	3/15/88
4,731,700	07/013,959	3/15/88
4,731,708	06/909,890	3/15/88
4,731,715	06/412,495	3/15/88
4,731,716	07/008,761	3/15/88
4,731,722	07/055,569	3/15/88
4,731,724	06/799,854	3/15/88
4,731,729	06/923,369	3/15/88
4,731,741	06/791,449	3/15/88
4,731,745	06/677,599	3/15/88
4,731,810	06/832,697	3/15/88
4,731,824	06/836,639	3/15/88
4,731,825	06/822,389	3/15/88
4,731,828	06/742,352	3/15/88
4,731,832	06/833,056	3/15/88
4,731,834	06/876,737	3/15/88
4,731,856	07/018,869	3/15/88
4,731,858	06/726,763	3/15/88
4,731,865	06/844,842	3/15/88
4,731,869	06/830,771	3/15/88
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Patent Number	Serial Number	Issue Date
4,731,765	06/900,327	3/15/88
4,731,766	06/882,284	3/15/88
4,731,775	06/803,722	3/15/88
4,731,796	07/064,240	3/15/88
4,731,802	06/846,285	3/15/88
4,731,803	06/915,673	3/15/88
4,731,804	07/006,323	3/15/88
4,731,805	06/829,650	3/15/88
4,731,807	06/913,126	3/15/88
4,731,808	06/873,985	3/15/88

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,394,089	06/304,765	7/19/83	9/23/81	12/02/91
4,404,301	06/370,900	9/13/93	4/22/82	2/28/92
4,621,372	06/674,419	11/04/86	11/23/84	10/17/91
4,649,319	06/657,414	3/10/87	10/03/84	1/16/92

Errata

In the list of patent which expired on July 7, 1991, due to failure to pay mainitenance fees, in the O.G. of Sept. 17, 1991, the Following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
4,678,874	06/847,960	7/07/87	4/03/86

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,765,526, Re. S.N. 07/865,846, Filed Apr. 9, 1992, Cl. 482/108, EXERCISE DEVICE, Robert Broussard, Owner of Record: *Progressive Health and Fitness, Los Angeles, Calif.*, Attorney or Agent: Robert A. Seldon, Ex. Gp.: 3302

4,781,650, Re. S.N. 07/865,897, Filed Apr. 9, 1992, Cl. 450/055, PROSTHETIC GARMENT FOR BILLATERIAL MASTECTOMY, Isabelle A. Budd, Owner of Record: *Inventor*, Attorney or Agent: Stewart L. Gitler, Ex. Gp.: 2407

4,915,303, Re. S.N. 07/864,484, Filed Apr. 7, 1992, Cl. 239/300, IMPROVED PAINT SPRAY GUN, John W. Hufgard, Owner of Record: *Accuspray, Inc., Cleveland, Ohio*, Attorney or Agent: Linn J. Raney, Ex. Gp.: 3104

4,915,516, Re. S.N. 07/865,022, Filed Apr. 7, 1992, Cl. 400/120, THERMAL TRANSFER RECORDING APPARATUS WITH INK PAPER CASSETTE, Hiroshi Shimizu, et. al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: William I. Solomon, Ex. Gp.: 3307

4,915,540, Re. S.N. 07/862,195, Filed Apr. 2, 1992, Cl. 405/132, CONTRACTIBLE MINE STOPPING AND CONTRACTIBLE BLOCK MEMBER FOR USE THEREIN, William R. Kennedy, et. al., Owner of Record: *Jack Kennedy Metal Products and Buildings, Inc., Taylorville, Ill.*, Attorney or Agent: Kurt F. James, Ex. Gp.: 3501

4,921,013, Re. S.N. 07/867,263, Filed Apr. 10, 1992, Cl. 137/614.05, COUPLING ADAPTER, Robert D. Spalink, et. al., Owner of Record: Aeroquip Corp., Jackson, Mich., Attorney or Agent: Phillip M. Rice, Ex. Gp.: 3407

4,923,734, Re. S.N. 07/866,818, Filed Apr. 9, 1992, Cl. 428/209, LAMINATES OF POLYNORBORNENE AND POLOLEFINS DERIVED FROM C2—C4 MONOMERS, George Benedikt, Owner of Record: *The B. F. Goodrich Co., Akron, Ohio*, Attorney or Agent: Frank E. Robbins, Ex. Gp.: 1513

Commissioner Ordered Requests

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

5,025,335, Reexam. No. 90/002,643, Requested Feb. 26, 1992, Cl. 360/097.010, ARCHITECTURE FOR 2 1/2 INCH DIAMETER SINGLE DISK DRIVE, Frederick M. Stefansky, Owner of Record: *Conner Peripherals, Inc., San Jose, Calif.*, Attorney or Agent: Martin C. Fliesler, Fliesler, Dubb, Meyer & Lovejoy, San Francisco, Calif., Ex. Gp.: 2303, Requester: Commissioner of Patents and Trademarks, Washington, D.C.

CD-ROM Patent Images by Technology

The U.S. Patent and Trademark Office announces the implementation of a demonstration project to provide classified sets of patent images in CD-ROM format. The classified sets are collections of U.S. patents which, by virtue of their placement in the

U.S. Patent Classification System, represent meaningful technological groupings.

The two classified sets selected for this project are: Genetic Engineering, as defined by Class 935 and Class 435, subclass 172.3; and Acid Rain, as defined by Class 55, subclass 73 and Class 423, subclasses 220-234 and 242-244.

The sets will contain:

1) current classification information
2) full images for all patents in the set, and
3) full text for those patents in the set where the text is available in electronic format, i.e., since 1971

All available text and classification information will be indexed and searchable, thus allowing all patents in the set to be retrieved by their associated classification information, and/or by words in the text. Images of all patents in the set will be stored in numeric sequence on the discs and may be located on a disc other than the disc where the text and indexes are stored. Images may be retrieved by patent number after loading the appropriate image disc.

It is anticipated that the demonstration CD-ROM sets will be available July 1992. Each set will consist of approximately three discs. They are available for order now by the public for $150 per set. This price represents the marginal cost to the U.S. Patent and Trademark Office to produce and distribute these discs based upon the volume of orders anticipated.

Purchasers will be invited to participate in a voluntary survey to be conducted in October 1992 to assess the usefulness of this demonstration product.

For further information, or to request an order form, please write or call:

U.S. Patent and Trademark Office
Office of Electronic Products and Service
Crystal Mall 2, Room 304
Washington, D C. 20231
(703) 305-5652

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Acton Foodservices Corp., Los Angeles, Calif., Reg. No. 1,074,381, for the mark "INTERNATIONAL FOODSERVICE AND DESIGN", Canc. No. 20,210

Prophecy Development Corp., Boston, Mass., Reg. No. 1,418,714, for the mark "PROPHECY", Canc. No. 20,222

Consider It Done, Inc., Dallas, Tex., Reg. No. 1,464,975, for the mark "CONSIDER IT DONE", Canc. No. 19,700

Woolcombers Ltd., Washington, D.C., Reg. Nos. 625,603 and 625,604, for the mark "GOLDEN FLEECE", Canc. No. 19,761

Arthur L. Brumberger, Winter Park, Fla., Reg. No. 1,434,067, for the mark "MARKET MANIA", Canc. No. 20,309

JEAN BROWN
Administrator, Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Patent Information in CD-ROM and Diskette Format

The Patent and Trademark Office is currently making available to the public four CD-ROM patent information products: CASSIS/BIB, CASSIS/CLASS, CASSIS/ASSIGN, and ASIST.

These patent search tools were originally developed by the Patent and Trademark Office for use in the network of Patent and Trademark Depository Libraries, and replaced the Classification and Search Support Information System (CASSIS) on-line system used at these libraries. They are now available to anyone on a subscription basis.

CASSIS/BIB features bibliographic information for utility patents issued from 1969 to the present, and for other types of patent documents issued from 1977 to the present. That information includes year of issue, state/country of first listed inventor's residence, assignee at time of issue, status (i.e., withdrawn or expired for failure to pay maintenance fees), current classification, patent title, and patent abstracts (through the most recent three-year period, as disc space allows).

CASSIS/CLASS contains current classification information for all utility, design, plant, reissue and X-numbered patents as well as Defensive Publications and Statutory Invention Registrations issued from 1790 to present (over 5 million documents). Indexing of classification information has been optimized for rapid retrieval.

CASSIS/ASIGN includes assignments recorded at the Patent and Trademark Office after Aug. 1980 to the present. The entire assignment record for patents may be searched, including assignments recorded before and after a patent issued.

ASIST is a compilation of many patent and classification search tools, previously available only in paper or microfiche format, and includes:

Manual of Classification
Index to the U.S. Patent Classification
Manual of Patent Examining Procedure
IPC-USPC Concordance
Attorneys and Agents Registered to Practice Before the U.S. Patent and Trademark Office

In addition, Classification Definitions, a Patentee-Assignee file, and a Classification Orders Index are included. The Patentee-Assignee file shows assignments at time of issue for utility patents 1969 to present; for other patent types, 1977 to present; and for inventors, 1975 to present. The Classification Orders Index is a list of subclass numbers abolished and established since 1976 with corresponding Classification Order number and effective date.

In addition to the word-searching capabilities inherent in CD-ROM, subscribers receive information updated more frequently than in paper or fiche format.

CD-ROM products in the CASSIS series are updated and mailed approximately six times per year. ASIST is updated and forwarded approximately four times per year.

CASSIS/BIB, CASSIS/CLASS, AND CASSIS/ASIGN are currently offered at a subscription price of $210/year to the U.S., Mexico and Canada, or $252/year to all other addresses. The current subscription price for ASIST is $161/year to the U.S., Mexico and Canada or $193/year to all other addresses.

Included with a subscription are manuals for installation and use of the retrieval software, which are the only user support available from the Patent and Trademark Office.

In addition to the accessibility of the *Manual of Patent Examining Procedure* on CD-ROM, the *Manual* is now also available on diskette, allowing users to print, view or search the *Manual* on an AT class IBM compatible PC (or better) with 512K RAM, hard drive and floppy disk drive. **MPEP on Disk** may be ordered on 5.25" or 3.5" diskettes for $50 (U.S. Canada and Mexico), or $60 (all other addresses). *FolioViews* search software allows the user to navigate through the text by use of hyperlinks, Boolean and proximity searches.

For further information, please write or call:

U.S. Patent and Trademark Office
Office of Electronic Information
Products and Services
Crystal Mall 2, Room 304
Washington, DC 20231
(703) 305-5652

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Sun South Food Systems, Inc., Sunrise, Fla., Reg. No. 1,377,712, for the mark "SCARLETT O'HARA'S" and design, Canc. No. 19,937

Rapid-Fit Enterprises, Inc., Bell Gardens, Calif., Reg. No. 1,467,195 for the mark "FINISHING TOUCHES", Canc. No. 20,150

Rosscomp Corp., Santa Ana, Calif., Reg. No. 1,412,078 for the mark "BACKPAC", Canc. No. 20,135

College Satellite Network, Inc., Dallas, Tex., Reg. No. 1,471,093 for the mark "COLLEGE SATELLITE NETWORK", Canc. No. 20,121

Financial Audit Systems, Inc., Raleigh, N.C., Reg. No. 1,531,725 for the mark "TAXLINK", Canc. No. 20,066

JEAN BROWN
Administrator, Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Implementation of Rules on Information Disclosure Statements

New rules on the duty of disclosure and information disclosure statements, effective March 16, 1992, were published in the *Federal Register* at 57 FR 2021 (Jan. 17, 1992) and in the *Official Gazette* at 1135 Off. Gaz. Pat. Office 13 (Feb. 4, 1992).

The procedures for handling information disclosure statements (37 CFR 1.97 and 1.98) will be set forth in Section 609 of the Manual of Patent Examining Procedure (MPEP). A copy of the instructions being given to examiners for handling information disclosure statements under the new rules is being published for the benefit of the public. Also being published is a sample declaration form which incorporates language conforming to the amendment to 37 CFR 1.63 contained in the new rules. Declaration forms acceptable under the rules in effect prior to the change effective March 16, 1992, will continue to be acceptable under the new rules.

The Office is considering changing its policy regarding the printing on patents of citations of information considered in patent applications. The proposed change will not affect consideration by the examiner of information submitted to the Office in compliance with 37 CFR 1.97(b)-(d) and 1.98. The proposed change affects only the information printed on the patent. Presently, as set forth in the last paragraph of the instructions which follow, information properly submitted by applicant and considered by the examiner will be printed on the patent along with the references cited by the examiner in Office actions. It has been suggested that it would be more helpful to the Office and to the public in using a patent for future search purposes if only the references cited and/or relied upon by the examiner in Office actions were listed on the printed patent. Alternatively, it has been suggested that the references listed on a patent be differentiated as to whether they were cited and/or relied on by the examiner or cited by applicant but not relied on by the examiner. The Office has a preference for the option that lists only the information cited and/or relied on by the examiner because it reduces printing costs (some citations by applicants now add several additional pages to the patent grant) and minimizes processing problems associated with correcting incomplete or inaccurate citations before the patent is printed. Public comment on these proposals is welcomed and should be directed to J. Michael Thesz (703-305-9384) or by mail directed to Mr. Thesz in the Office of the Assistant Commissioner for Patents. Comments should be received before May 29, 1992.

April 20, 1992 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

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Processing of Information Disclosure Statements Under the New Rules Effective March 16, 1992

Applicants and other individuals substantively involved with the preparation and/or prosecution of a patent application have a duty to submit to the Office information which is material to patentability as defined in 37 CFR 1.56. These individuals also may want the Office to consider information for a variety of other reasons, e.g., without first determining whether the information meets any particular standard of materiality, or because another patent office considered the information to be relevant in a counterpart or related patent application filed in another country, or to make sure that the examiner has an opportunity to consider the same information that was considered by the individuals that were substantively involved with the preparation or prosecution of a patent application.

An information disclosure statement filed in accordance with the provisions of 37 CFR 1.97 and 1.98 provides the procedure available to an applicant to submit information to the Office so that information will be considered by the examiner assigned to the application. The requirements for the content of a statement have been simplified in the new rules effective March 16, 1992, to encourage individuals associated in a substantive way with the filing and prosecution of a patent application to submit information to the Office so the examiner can determine its relevance to the claimed invention. The procedure for submitting an information disclosure statement under the new rules are designed to encourage individuals to submit information to the Office promptly.

In order to have information considered by the Office during the pendency of a patent application, an information disclosure statement in compliance with 37 CFR 1.98 as to content must be filed in accordance with the procedural requirements of 37 CFR 1.97. The requirements as to content are discussed in A below. The requirements based on the time of filing the statement are discussed in B below. Examiner handling of information disclosure statement is discussed in C below.

The Office has set forth the minimum requirements for information to be considered in 37 CFR 1.97 and 1.98. Once the minimum requirements are met, the examiner has an obligation to consider the information. These rules provide certainty for the public by defining what the requirements are, when the Office will consider information and when the Office will not consider information.

The filing of an information disclosure statement shall not be construed as a representation that a search has been made. 37 CFR 1.97(g). There is no requirement that an application for a patent make a patentability search. Further, the filing of an information disclosure statement shall not be construed to be an admission that the information cited in the statement is, or is considered to be, material to patentability as defined in 37 CFR 1.56(b). 37 CFR 1.97(h). See MPEP 706.02(b) regarding admissions by applicant.

Multiple information disclosure statements may be filed in a single application, and they will be considered, provided each is in compliance with the appropriate requirements. Use of form PTO-1449, "Information Disclosure Citation," is encouraged as a means providing the required list of information. See C(2) below.

Information which is cited or submitted to the Office in the parent application of a file wrapper continuing application under 37 CFR 1.62 will be part of the file before the examiner and need not be resubmitted in the continuing application. Likewise, the examiner will consider information cited or submitted to the Office in a parent application when examining a continuing application and thus this information need not be resubmitted unless applicant desires the information to be printed on the patent.

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A. Content

An information disclosure statement must comply with the provisions of 37 CFR 1.98 as to content in order to be considered by the Office. Each information disclosure statement must comply with the applicable provisions of A(1), A(2) and A(3) below.

A(1) Each information disclosure statement must include a list of all patents, publications, or other information submitted for consideration by the Office.

Paragraph (b) of 37 CFR 1.98 requires that each U.S. patent listed in an information disclosure statement be identified by patentee, patent number and issue date. Each foreign patent or published foreign patent application must be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application. Each publication must be identified by author (if any), title, relevant pages of the publication, date (at least month and year) and place of publication. The place of publication refers to the name of the journal, magazine or other publication in which the information being submitted was published.

The list may not be incorporated into the specification but must be submitted in a separate paper. A separate list is required so that it is easy to confirm that applicant intends to submit an information disclosure statement, and because it provides a readily available checklist for the examiner to indicate which identified documents have been considered. A copy of a separate list will also provide a simple means of communication to applicant to indicate the listed documents that have been considered and those listed documents that have not been considered. Use of form PTO-1449, "Information Disclosure Citation," is encouraged. See C(2) below.

A(2) In addition to the list, each information disclosure statement must also include a legible copy of:

(i) Each U.S. and foreign patent;

(ii) Each publication or that portion which caused it to be listed; and

(iii) All other information or that portion which caused it to be listed, except that no copy of a U.S. patent application need be included.

There are exceptions to this general rule that a copy must be provided. First, paragraph (d) of 37 CFR 1.98 states that a copy of any patent, publication or other information listed in an information disclosure statement is not required to be provided if it was previously cited by or submitted to the Office in a prior application, provided that the prior application is properly identified in the statement and relied upon for an earlier filing date under 35 U.S.C. 120. The examiner will consider information cited or submitted to the Office in a prior application relied on under 35 U.S.C. 120. This exception to the requirement for copies of information does not apply to information which was cited in an international application under the Patent Cooperation Treaty.

Second, paragraph (c) of 37 CFR 1.98 states that when the disclosures of two or more patents or publications listed in an information disclosure statement are substantively cumulative, a copy of the one of the patents or publications may be submitted without copies of the other patents or publications provided that a statement is made that these other patents or publications are cumulative. The examiner will then consider only the patent or publication of which a copy is submitted and will so indicate on the list or form PTO-1449 submitted, e.g., by crossing-out the listing of the cumulative information.

Paragraph (c) of 37 CFR 1.98 further states that if a written English language translation of a non-English language document, or portion thereof, is within the possession, custody or control of, or is readily available to any individual designated in 37 CFR 1.56(c), a copy of the translation shall accompany the statement. Translations are not required to be filed unless they have been reduced to writing and are actually translations of what is contained in the non-English language information. If no translation is submitted, the examiner will consider the information in view of the concise explanation and insofar as it is understood on its face, e.g., drawings, chemical formulas, English language abstracts, in the same manner that non-English language information in Office search files is considered by examiners in conducting searches.

A(3) Each information disclosure statement must further include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is *not in the English language*. The concise explanation may be either separate from the specification or incorporated therein.

The requirement for a concise explanation of relevance is limited to information that is not in the English language. The explanation required is limited to the relevance as understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information at the time the information is submitted to the Office. If a translation of the information into English is submitted with the foreign language information, no concise explanation is required. There is no requirement for the translation to be verified. Where the information listed is not in the English language, but was cited in a search report by a foreign patent office in a counterpart foreign application, the requirement for a concise explanation of relevance can be satisfied by submitting an English language version of the search report which indicates the degree of relevance found by the foreign office. The requirement for a concise explanation of non-English language information would not be satisfied by a statement that a reference was cited in the prosecution of a parent, related, or copending United States application.

The concise explanation may indicate that a particular figure or paragraph of the patent or publication is relevant to the claimed invention. It might be a simple statement pointing to similarities between the item of information and the claimed invention. It is permissible but not necessary to discuss differences between the cited information and the claims.

Applicants may, if they wish, provide a concise explanation of why English-language information is being submitted and how it is understood to be relevant. Concise explanations are helpful to the Office, particularly where documents are lengthy and complex and applicant is aware of a section that is highly relevant to patentablilty or where a large number of documents are submitted and applicant is aware that one or more are highly relevant to patentability.

B. Time for Filing

The procedure and requirements for submitting an information disclosure statement are linked to four stages in the processing of a patent application: (1) within three months of filing, or before first Office action, whichever is later; (2) after the period in (1), but before final Office action or a Notice of Allowance, whichever is earlier; (3) after the period in (2) but on or before the issue fee is paid; and (4) after the period in (3) and up to the time the patent application can be effectively withdrawn from issue. The procedures and requirements apply to applications filed under 35 U.S.C. 111 (utility), 161 (plants), 171 (designs), and 251 (reissue), as well as international applications entering the national stage under 35 U.S.C. 371.

The requirements based on the time when the information disclosure statement is filed are summarized as follows:

Time when IDS is filed	37 CFR 1.97 Requirements
(1) Within 3 months of filing or before first Office action on the merits, whichever is later.	None (always considered).
(2) After (1) but before final action or notice of allowance.	Certification or 1.17(p) fee.
(3) After final action or notice of allowance and before payment of issue fee.	Certification, petition, and petition fee.

B(1) Statement filed BEFORE first action on the merits or within three (3) months of actual filing date (37 CFR 1.97(b)).

An information disclosure statement will be considered by the examiner if filed:

(i) within three months of the filing date of a national application;

(ii) within three months of the date of entry of the national stage as set forth in 37 CFR 1.491 in an international application; or

(iii) before the mailing date of a first Office action on the merits,

whichever event occurs last. A statement filed within this period requires neither a fee nor a certification of prompt filing.

The term "national application" includes continuing applications (continuations, divisions, continuations-in-part) so three-months will be measured from the actual filing date of an application as apposed to the effective date of a continuing application.

All information disclosure statements that comply with the content requirements of 37 CFR 1.98 and are filed within three months of the filing date will be considered by the examiner, regardless of whatever else has occurred in the examination process up to that point in time. Thus, in the rare instance that a final Office action or a notice of allowance is prepared and mailed prior to a date which is three months from the filing date, any information contained in a complete information disclosure statement filed within that three-month window will be considered by the examiner.

Likewise, an information disclosure statement will be considered if it is filed later than three months after the filing date but before the mailing date of a first Office action on the merits. An action on the merits means an action which treats the patentability of the claims in an application, as opposed to only formal or procedural requirements. An action on the merits would, for example, contain a rejection or indication of allowability of a claim or claims rather than just a restriction requirement (37 CFR 1.142) or just a requirement for additional fees to have a claim considered (37 CFR 1.16(d)). Thus, if an application was filed on Jan. 1 and the first Office action on the merits was not mailed until six months later on July 1, the examiner would be required to consider any proper information disclosure statement filed prior to July 1.

An information disclosure statement will be considered to have been filed on the day it was received in the Office, or on an earlier date of mailing if accompanied by a properly executed certificate of mailing under 37 CFR 1.8, or Express Mail certificate under 37 CFR 1.10. An Office action is mailed on the date indicated in the Office action..

B(2) Statement filed after B(1), but BEFORE mailing of final action or Notice of Allowance (37 CFR 1.97(c)).

An information disclosure statement will be considered by the examiner if filed after the period specified in B(1) above, but before the mailing date of either

a final action under 37 CFR 1.113 or
a notice of allowance under 37 CFR 1.311,

whichever occurs first, provided: (1) the statement is accompanied by either a certification as specified in 37 CFR 1.97(e) or (2) the fee set forth in 37 CFR 1.17(p). If a final action or notice of allowance is mailed in an application and later withdrawn, the application will be considered as not having had a final action or notice of allowance mailed for purposes of considering an information disclosure statement.

(i) If information submitted during the period set forth in 37 CFR 1.97(c) with a certification is used in a new ground of rejection on unamended claims, the next Office action will not be made final since in this situation it is clear that applicant has submitted the information to the Office promptly after it has become known and the information is being submitted prior to a final determination on patentability by the Office. However, the information submitted with a certification can be used in a new ground of rejection and the next Office action made final,. If the new ground of rejection was necessitated by amendment of the application by applicant. Where the information is submitted during this period with a fee, the examiner may use the information submitted, e.g., printed publication or evidence of public use, and make the next Office action final whether or not the claims have been amended, provided that no other new ground of rejection which was not necessitated by amendment to the claims is introduced by the examiner. See MPEP 706.07(a). If a new ground of rejection is introduced that is neither necessitated by an amendment to the claims nor based on the information submitted with the fee set forth in 37 CFR 1.17(p), the Office action shall not be made final.

(ii) A certification under 37 CFR 1.97(e) must state either

(a) that each item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the statement, or

(b) that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the person signing the certification after making reasonable inquiry, was known to any individual designated in 37 CFR 1.56(c). more than three months prior to the filing of the statement.

A certification can contain either of two statements. One statement is that each item of information in an information disclosure statement was cited in a communication, such as a search report, from a patent office outside the U.S. in a counterpart foreign application not more than three months prior to the filing date of the statement. Under this certification, it does not matter whether any individual with a duty of disclosure actually knew about any of the information cited before receiving the search report. The date on the communication by the foreign patent office begins the three-month period in the same manner as the mailing of an Office action starts a three-month shortened statutory period for response. The date starting the three-month period is not the date the communication was received by a foreign associate or the date it was received by a U.S. registered practitioner. Likewise, the statement will be considered to have been filed on the date the statement was received in the Office, or on an earlier date of mailing if accompanied by a properly executed certificate of mailing under 37 CFR 1.8, or Express Mail certificate under 37 CFR 1.10.

The term counterpart foreign patent application means that a claim for priority has been made in either the U.S. application or a foreign application based on the other, or that the disclosures of the U.S. and foreign patent applications are substantively identical (e.g., an application filed in the European Patent Office claiming the same U.K. priority as claimed in the U.S. application).

In the alternative, a certification can be made if no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing the certification after making reasonable inquiry, neither was it known to any individual having a duty to disclose more than three months prior to the filing of the statement.

The phrase "after making reasonable inquiry" makes it clear that the individual making the certification has a duty to make reasonable inquiry regarding the facts that are being certified. The certification can be made by a registered practitioner who represents a foreign client and who relies on statements made by the foreign client as to the date the information first became known. A registered practitioner who receives information from a client without being informed whether the information was known for more than three months, however, cannot make the certification without making reasonable inquiry. For example, if an inventor gave a publication to the attorney prosecuting an application with the intent that it be cited to the Office, the attorney should inquire as to when that inventor became aware of the publication and should not submit a certification under 37 CFR 1.97(e)(2) to the Office until a satisfactory response is received. The certification can be based on present, good faith knowledge about when information became known without a search of files being made.

Certification need not be in the form of an oath or a declaration under 37 CFR 1.68. Certification by a registered practitioner or

any other individual that the statement was filed within the three-month period of either first citation by a foreign patent office or first discovery of the information will be accepted as dispositive of compliance with this provision in the absence of evidence to the contrary. For example, a certification could read as follows:

"I hereby certify that each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.", or

"I hereby certify that no item of information in the Information Disclosure Statement filed herewith was cited in a communication from a foreign patent office in a counterpart foreign application or, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of this Information Disclosure Statement."

An information disclosure statement may include two list and two certifications, similar to the above examples, in situations where some of the information listed was cited in a communication from a foreign patent office not more than three months prior to filing the statement and some was not, but was not known more than three months prior to filing the statement.

A copy of the foreign search report need not be submitted with the certification, but an individual may wish to submit an English-language version of the search report to satisfy the requirement for a concise explanation where non-English language information is cited. The time at which information "was known to any individual designated in 37 CFR 1.56(c)" is the time when the information was discovered in association with the application even if awareness of the materiality came later. The Office wishes to encourage prompt evaluation of the relevance of information and to have a date certain for determining if a certification can properly be made. A statement on information and belief would not be sufficient. Examiners should not remind or otherwise make any comment about an individual's duty of candor and good faith, but questions about the adequacy of any certification received in writing by the Office should be directed to the Office of the Assistant Commissioner for Patents.

B(3) Statement filed after B(2), but Prior to Payment of Issue Fee (37 CFR 1.97(d)).

An information disclosure statement will be considered by the examiner if filed after the mailing date of either a final action under 37 CFR 1.113 or a notice of allowance under 37 CFR 1.311, whichever occurs first, but before or simultaneous with payment of the issue fee, provided the statement is accompanied by:

(i) a certification as specified in 37 CFR 1.97(e) (see the discussion in B(2)(ii) above),
(ii) a petition requesting consideration of the information disclosure statement, and
(iii) the petition fee set forth in 37 CFR 1.17(i)(1).

These requirements are appropriate in view of the late stage of prosecution when the information is being submitted, i.e., after the examiner has reached a final determination on the patentability of the claims presented for examination. The petition should be directed to the Group Director of the examining group handling the application. The petition need do nothing more than request consideration of the information being submitted. Payment of the petition fee (37 CFR 1.17(i)(1)) *and* submission of the appropriate certification (37 CFR 1.97(e)) are the essential elements for having information considered at this advanced stage of prosecution.

The requirements of 37 CFR 1.97 provide for consideration by the Office of information which is submitted within a reasonable time, i.e., within 3 months after an individual designated in 37 CFR 1.56(c) becomes aware of the information or within 3 months of the information being cited in a communication from a foreign patent office in a counterpart foreign application. This undertaking by the Office to consider information would be available throughout the pendency of the application until the point where the patent issue fee was paid. If an applicant chose not to comply, or could not comply, with the requirements of 37 CFR 1.97(d), a continuing application could be filed to have the information considered by the examiner. The parent application could be permitted to become abandoned by not paying the issue fee required in the Notice of Allowance, for example, or by the filing of a file wrapper continuing application under 37 CFR 1.62. It would not be proper to make final a first Office action in the continuing application if the information submitted is used in a new ground of rejection.

B(4) Statement filed after Payment of Issue Fee.

After the issue fee has been paid on an application, it is impractical for the Office to attempt to consider newly submitted information. Information disclosure statements filed after payment of the issue fee in an application will not be considered but will merely be placed in the application file. See C below. The application may be withdrawn from issue at this point, however, pursuant to 37 CFR 1.313(b)(5) so that the information can be considered in a continuing application. In this situation, a file wrapper continuing application under 37 CFR 1.62 could be filed even though the issue fee had already been paid. The Office will consider the filing of a petition under 37 CFR 1.313(b)(5) as sufficient grounds to waive the requirement that an application under 37 CFR 1.62 be filed before payment of the issue fee. Alternatively, for example, a petition pursuant to 37 CFR 1.313(b)(3) could be filed if applicant states that one or more claims are unpatentable. This statement that one or more claims are unpatentable over the information must be unequivocable. A statement that a serious question as to patentability of a claim has been raised, for example, would not be acceptable to withdraw an application from issue under 37 CFR 1.313(b)(3).

If an application has been withdrawn from issue under one of the provisions of 37 CFR 1.313(b)(1)-(4), it will be treated as though no notice of allowance had been mailed and the issue fee had not yet been paid with regard to the time for filing information disclosure statements. Petitions under 37 CFR 1.313(b) should be directed to the Office of Petitions in the Office of the Assistant Commissioner for Patents.

B(5) Extensions of Time (37 CFR 1.97(f))

No extensions of time for filing an information disclosure statement are permitted under 37 CFR 1.136(a) or (b). If a bona fide attempt is made to comply with the content requirements of 37 CFR 1.98, but part of the required content is inadvertently omitted, additional time may be given to enable full compliance.

C. Examiner Handling of Information Disclosure Statements

Information disclosure statements will be reviewed for compliance with the requirements of 37 CFR 1.97 and 1.98 as discussed in A and B above. Applicant will be notified of compliance and non-compliance with the rules as discussed below.

C(1) Non-complying statements

Pursuant to 37 CFR 1.97(i), submitted information, filed before the grant of a patent, which does not comply with 37 CFR 1.97 and 1.98 will be placed in the file, but will not be considered by the Office. Information submitted after the grant of a patent must comply with 37 CFR 1.501.

(i) If an information disclosure statement does not comply with the requirement based on the time of filing the statement as discussed in B above, including the requirements for fees and/or certification, the statement will be placed in the application file, but none of the information will be considered by the examiner. The examiner may use form paragraph 6.49 which is reproduced below to inform applicant that the information has not been considered. Applicant may then file a new information disclosure statement or correct the deficiency in the previously filed statement but the date of that the sdtatement or correction is filed will be the date of the statement for purposes of determining whether the requirements based on the time of filing the statement (37 CFR 1.97) have been complied with.

The examiner should write "not considered" on an information disclosure statement where none of the information listed complies with the requirements, e.g., no copies of listed items submitted. The paper containing the disclosure statement or list will be placed in the record in the application file. The examiner will inform applicant that the information has not been considered and the reasons why by using form paragraph 6.49. If the improper citation appears as part of another paper, e.g., an amendment, which may be properly entered and considered, the portion of the paper which is proper for consideration will be considered.

6.49 Information Disclosure Statement Not Considered

The information disclosure statement filed [1] fails to comply with the provisions of MPEP 609 because [2]. It has been placed in the application file, but the information referred to therein has not been considered as to the merits.

Examiner Note:
See MPEP 609 for situations where use of this paragraph would be appropriate.

(ii) If an information disclosure statement complies with the requirements based on the time of filing the statement as discussed in B above, including the requirements for fees and/or certification, but part of the content requirements as discussed in A above has been inadvertently omitted, the examiner may set a one-month time period to correct the omission. Form paragraph 6.51 may be used for this purpose.

6.51 Time Limit for Completing Information Disclosure Statement

The Information Disclosure Statement filed on [1] does not comply with the requirements of 37 CFR 1.98 because [2]. Since the submission appears to be bona fide, but through an apparent oversight or inadvertence failed to comply with the necessary requirements, applicant is required to complete the statement within a time limit of one month from the date of this letter. NO EXTENSION OF THIS TIME LIMIT MAY BE GRANTED UNDER EITHER 37 CFR 1.136(a) OR (b). Failure to comply with this notice will result in the Information Disclosure Statement being placed in the application file with the non-complying information not being considered.

Examiner Note:
This practice does not apply where there has been a deliberate omission of some necessary part of an information disclosure statement or where the requirements based on the time of filing the statement as set forth in 37 CFR 1.97 have not been complied with.

If a statement fails to comply with requirements as discussed in this section for an item of information, that item of information in the statement will not be considered and a line should be drawn through the citation to show that it has not been considered. However, other items of information that do comply with all the requirements will be considered by the examiner.

If information is listed in the specification rather than in a separate paper, or if the other content requirements as discussed in A above are not complied with, the examiner will notify applicant in the next Office action that the information has not been considered. It should be noted, however, that no copy of a U.S. patent application is required to be submitted. See A(2)(iii) above. Where a U.S. patent application is properly cited, the examiner should obtain access to that file within the Office.

C(2) Complying Statements

The information contained in information disclosure statements which comply with both the content requirements as discussed in A above and the requirements based on the time of filing the statement as discussed in B above will be considered by the examiner.

Applicants, patent owners, reexamination requesters, protesters and others are encouraged to use form PTO-1449, "Information Disclosure Citation," when preparing an information disclosure statement. A copy of this form is reproduced in this section to indicate how the form should be completed. This form will enable persons to comply with the requirements to list each item of information being submitted and to provide the Office with a uniform listing of citations and with a ready way to indicate that information has been considered.

Examiners must consider all citations submitted in conformance with the rules and this section and place their initials adjacent the citations on a list or in the boxes provided on a form PTO-1449. If the citations are submitted on a list other than on a form PTO-1449, the examiner may write "all considered" and his or her initials to indicate that all citations have been considered. If any of the citations are considered, a copy of the submitted list or form, as reviewed by the examiner, will be returned to the applicant with the next communication. The original copy of the form will be entered into the application file. The copy returned to applicant will serve both as acknowledgement of receipt of the information disclosure statement and as an indication that the references were considered by the examiner. Forms PTO-326 and PTOL-37 include a box to indicate the attachment of form PTO-1449.

Information which complies with requirements as discussed in this section but which is in a non-English language will be considered in view of the concise explanation submitted (A(3) above) and insofar as it is understood on its face, e.g., drawings, chemical formulas, in the same manner that non-English language information in Office search files is considered by examiners in conducting searches. The examiner need not have the information translated unless it appears to be necessary to do so. The examiner will indicate that the non-English language information has been considered in the same manner as consideration is indicated for information submitted in English. The examiner should not require that a translation be filed by applicant. The examiner should not make any comment such as that the non-English language information has only been considered to the extent understood, since this fact is inherent.

Since information is required to be listed in a separate paper rather than in the specification, there is no need to mark "All checked" or "Checked" in the margin of a specification containing citations.

If a statement fails to comply with the requirements as discussed in this section for an item of information, a line should be drawn through the citation to show that it has not been considered. The other items of information listed that do comply with the rules and this section will be considered by the examiner and will be appropriately initialed.

D. Information Printed on Patent

A citation listed on form PTO-1449 and considered by the examiner in accordance with this section will be printed on the patent. A citation listed in a separate paper, equivalent to but not on form PTO-1449, and considered by the examiner in accordance with this section will be printed on the patent if the list is on a separate sheet which is clearly identified as an information disclosure statement and the list lends itself to easy capture of the necessary information by the Office printing contractor, i.e., each item of information is listed on a single line, the lines are at least double-spaced from each other, the information is uniform in format for each listed item, the list includes a column for the examiner's initials to indicate that the information was considered. If a citation is not printed on the patent but has been considered by the examiner in accordance with this section, the patented file will reflect that fact as noted in C(2) above.

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PATENT NOTICES

Certificates of Correction For Week of May 19, 1992

D. 312,435	4,921,404	4,964,857	4,976,859
D. 318,018	4,922,245	4,965,034	4,976,899
D. 317,814	4,923,492	4,965,043	4,977,001
Re. 33,314	4,926,372	4,965,123	4,977,008
4,607,250	4,928,453	4,965,414	4,977,082
4,683,010	4,928,885	4,965,490	4,977,148
4,700,516	4,929,414	4,966,251	4,977,236
4,752,133	4,931,214	4,966,301	4,977,265
4,781,425	4,932,901	4,966,548	4,977,390
4,786,559	4,935,096	4,966,744	4,977,471
4,786,576	4,935,371	4,966,817	4,977,954
4,794,606	4,937,255	4,966,901	4,978,218
4,801,542	4,937,342	4,966,963	4,978,255
4,814,622	4,937,621	4,967,073	4,978,408
4,814,907	4,937,653	4,967,254	4,978,668
4,820,405	4,938,278	4,967,509	4,978,819
4,820,572	4,938,827	4,967,629	4,978,989
4,827,831	4,939,527	4,967,938	4,979,416
4,836,656	4,940,170	4,967,949	4,979,804
4,838,126	4,940,510	4,968,122	4,979,819
4,840,966	4,940,518	4,968,401	4,979,944
4,841,828	4,941,956	4,968,486	4,980,193
4,844,272	4,942,172	4,968,682	4,980,444
4,847,848	4,942,561	4,968,705	4,980,453
4,850,750	4,943,369	4,968,814	4,980,550
4,851,560	4,944,358	4,968,944	4,981,058
4,855,784	4,945,631	4,968,972	4,981,131
4,858,923	4,946,196	4,969,155	4,981,231
4,860,676	4,946,665	4,969,168	4,981,262
4,865,116	4,946,962	4,969,436	4,981,583
4,865,350	4,947,111	4,969,828	4,981,980
4,866,243	4,947,579	4,970,311	4,982,006
4,868,264	4,949,024	4,970,335	4,982,234
4,869,124	4,949,057	4,970,685	4,982,368
4,871,996	4,949,302	4,970,898	4,982,404
4,872,661	4,949,649	4,971,258	4,982,526
4,873,111	4,951,550	4,971,327	4,982,988
4,875,741	4,952,774	4,971,348	4,983,213
4,876,296	4,953,115	4,971,498	4,983,620
4,877,651	4,953,181	4,971,602	4,983,645
4,877,888	4,954,037	4,971,724	4,983,701
4,879,050	4,954,080	4,971,798	4,983,721
4,883,986	4,954,165	4,971,813	4,983,817
4,886,574	4,954,411	4,972,023	4,984,301
4,888,353	4,954,468	4,972,153	4,984,474
4,888,426	4,954,558	4,972,154	4,984,543
4,888,579	4,955,096	4,972,375	4,984,551
4,888,798	4,955,380	4,972,439	4,984,585
4,890,609	4,955,781	4,972,462	4,984,869
4,891,395	4,955,893	4,972,571	4,984,892
4,896,294	4,955,918	4,973,230	4,985,000
4,901,198	4,956,396	4,973,372	4,985,240
4,901,529	4,957,950	4,973,535	4,985,275
4,902,269	4,958,310	4,973,657	4,985,388
4,902,740	4,958,714	4,973,717	4,985,931
4,905,164	4,959,072	4,973,745	4,986,436
4,907,533	4,959,129	4,974,053	4,986,615
4,909,314	4,959,223	4,974,076	4,987,102
4,911,489	4,959,679	4,974,333	4,990,466
4,914,619	4,960,221	4,974,888	4,990,631
4,915,407	4,960,650	4,975,105	4,991,182
4,915,854	4,961,593	4,975,257	4,991,848
4,915,954	4,961,883	4,975,260	4,997,143
4,916,595	4,962,168	4,975,519	5,008,927
4,918,002	4,962,959	4,975,551	5,018,586
4,918,170	4,963,212	4,975,974	5,023,495
4,918,177	4,963,279	4,976,142	5,026,562
4,918,713	4,963,611	4,976,307	5,043,011
4,919,653	4,963,891	4,976,422	5,070,640
4,919,846	4,964,016	4,976,426	5,083,231
4,919,885	4,964,231	4,976,513	
4,921,108	4,964,693	4,976,666	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

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Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel for NFC
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No Fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation*; papers relating to pending litigation shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Va. 22215
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents except: trademark registrations and assignments.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Invoices directed to the Office of Finance.
Box 15	Mail for the Advisory Commission on Patent Law Reform.
Box 16	Deposit Account Replenishment Checks
Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions to revive, petitions to accept late payment of fees, petitions to defer issue, and petitions to withdraw an application from issue.
Box Assignment	All assignment documents except those filed with new applications.
Box DD	Mail related to Disclosure Documents.
Box EEO	Mail for the Office of Equal Employment Programs.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62)
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All Communications following the receipt of a PTOL-85. "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box ITU	All intent to use documents, excluding the initial application and amendments to allege use.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box OED	Mail for the Office of Enrollment and Discipline
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box TRADEMARK	New trademark application and associated papers and APPLICATION fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
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Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
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Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PDTLs have both the patent and trademark sections of the *Official Gazette of the U. S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services and hours in order to avert possible inconvience.

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	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8847
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
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	Tampa: Tampa Campus Library, University of South Florida	(813) 974-2726
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	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette: Purdue University Libraries	(317) 494-2873
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 561-8617
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Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
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Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 5923602
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Misssissippi	Jackson: Mississippi Library Commission	Not Yet Operational
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada-Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
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	Buffalo and Erie County Public Library	(716) 858-7101
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	Columbus: Ohio State University Libraries	(614) 292-6175
Ohio	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library,Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-4510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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PATENT EXAMINING CORPS

VACANT, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110 — D. E. TALBERT, Director	308-0661	1/11/91
ORGANIC CHEMISTRY, GROUP 120 — JOHN F. TERAPANE, JR., Director	308-1235	6/02/91
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130 — DONALD CZAJA, Acting Director	308-0651	3/13/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150 — J. O. THOMAS, Director	308-2351	10/24/90
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INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230 — GERALD GOLDBERG, Director	308-0754	12/23/89
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DESIGN, GROUP 290 — ROBERT E. GARRETT, Director	308-0511	10/09/89
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MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320 — N. GODICI, Director	308-1148	4/23/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330 — J. J. LOVE, Director	308-0858	1/09/91
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340 — JOHN KITTLE, Director	308-0861	4/13/91
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 350 — A.L. SMITH, Director	308-0651	1/20/91

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during April 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,873,996 to 3,881,195 inclusive
Plant Patents ..... P. 3,697 to 3,712

REEXAMINATIONS

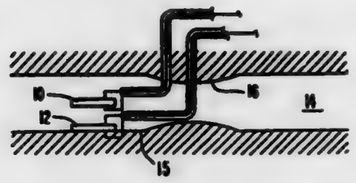
MAY 19, 1992

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,166,388 (1703rd)
RF ADMITTANCE MEASURING METHOD AND APPARATUS FOR DETERMINING THE LEVEL OF A CONDUCTIVE LIQUID

Robert J. Sun, Bala Cynwyd, and Frederick L. Maltby, Jenkintown, both of Pa., assignors to Drexelbrook Controls, Inc., Horsham, Pa.

Reexamination Request No. 90/002,407, Aug. 21, 1991.
Reexamination Certificate for Patent No. 4,166,388, issued Sep. 4, 1979, Ser. No. 859,475, Dec. 12, 1977.
Division of Ser. No. 532,208, Dec. 12, 1974, Pat. No. 4,064,753
Int. Cl.[5] G01F *23/26*
U.S. Cl. 73—304 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–8** is confirmed.

1. A probe system for measuring the level of a liquid comprising:

a vessel having a wall;

a probe including a conductive probe electrode extending longitudinally along the probe and insulation covering said probe electrode;

track means in the vessel adapted to removably receive the probe; and

a groove associated with said track means and said probe for guiding the probe along a predetermined path.

B1 4,701,486 (1704th)
STABILIZER COMPOSITIONS FOR PVC RESINS

Robert E. Bresser, Sharonville, and Karl R. Wursthorn, Cincinnati, both of Ohio, assignors to Thiokol Corporation

Reexamination Request No. 90/002,342, May 8, 1991.
Reexamination Certificate for Patent No. 4,701,486, issued Oct. 20, 1987, Ser. No. 568,532, Jan. 5, 1984.
Reexamination Certificate B0 4,701,486, issued May 19, 1992. Continuation of Ser. No. 382,822, May 27, 1982, abandoned, which is a continuation of Ser. No. 238,298, Feb. 26, 1981, abandoned
Int. Cl.[5] C08K *5/58*
U.S. Cl. 524—182

AS A RESULT OF REEXAMINATION IT HAS BEEN DETERMINED THAT:

Claims **1, 44, 45, 49** and **51** are determined to be patentable as amended.

Claims **2–43, 46–48, 50, 52** and **53**, dependent on an amended claim, are determined to be patentable.

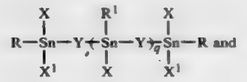
New claims **54–60** are added and determined to be patentable.

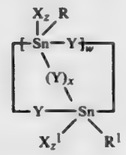
1. A composition capable of stabilizing halogen-containing organic polymers against the deterioration effects of heat, said composition consisting essentially of the product produced by blending:

A. a mono-organotin compound or mixture of mono-organotin compounds selected from compounds having the formulas:


(II)


(III)


(IV)

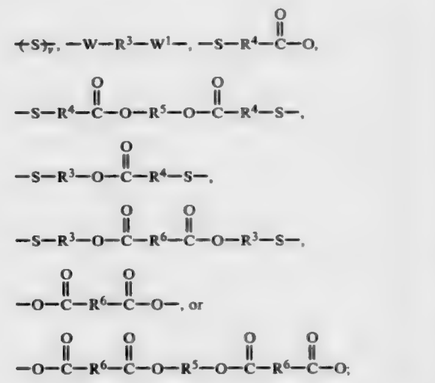

(V)

wherein

X and X^1 are the same or different and are selected from $-SR^2$;

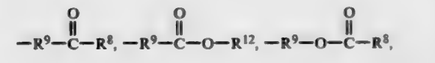
and $O-R^8$ in formula (V) when z=1 and in formulas (III) and (IV) at least one X or X^1 is $-SR^2$;

Y is

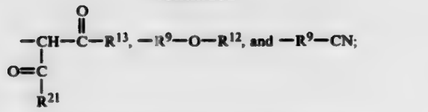


W and W^1 are the same or different and are oxygen or sulfur;

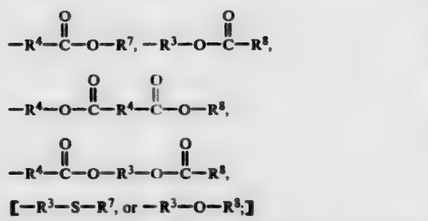
R and R^1 are the same or different and are selected from alkyl, aryl, alkenyl, aralkyl, alkaryl, cycloalkyl, cycloalkenyl,



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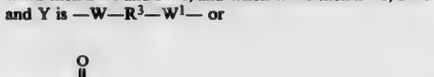


R^2 is [alkyl, alkenyl, aryl cycloalkyl, cycloalkenyl,]



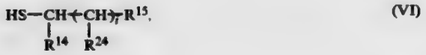
[$-R^3-S-R^7$, or $-R^3-O-R^8$;]

R^3 is alkylene of at least 2 carbon atoms, arylene, alkenylene of at least 2 carbon atoms, cycloalkylene, or cycloalkenylene;
R^4 is alkylene, arylene, alkenylene of at least 2 carbon atoms, cycloalkylene, or cycloalkenylene;
R^5 is R^3;
R^6 is nothing or R^4;
R^7 is —H or R^8;
R^8 is alkyl, alkenyl, aryl, aralkyl, alkaryl, cycloalkyl, or cycloalkenyl;
R^9 is C_1 to C_4 alkylene;
R^{12} is —H or a monovalent C_1 to C_{20} hydrocarbon radical;
R^{13} and R^{21} are the same or different and are each C_1 to C_{20} alkyl or C_1 to C_{20} alkoxy;
q=0 or an integer from 1 to 4 inclusive;
v=an integer from 1 to 8 inclusive; and
w=0, 1 or 2, x=0 or 1, z=0 or 1 with the proviso that when x=0 then z=1, when x=1 then z=0 and w=1, when w=2 then x=0 and z=1, and when w=0 then x=0, z=1 and Y is —W—R^3—W^1— or

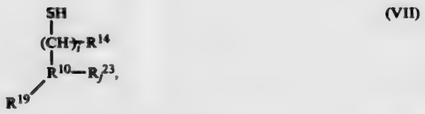


and

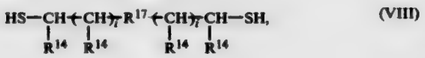
B. in a synergistically effective amount, a mercaptan-containing organic compound or mixture or mercaptan-containing organic compounds selected from compounds having the formula:



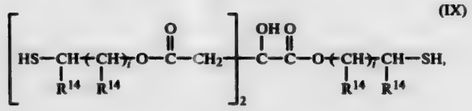
(VI)



(VII)

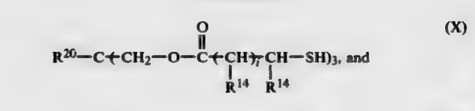


(VIII)

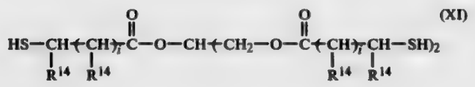


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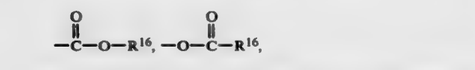
(X)



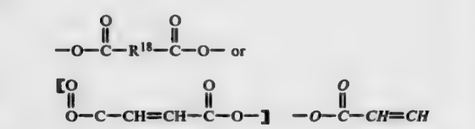
(XI)

where

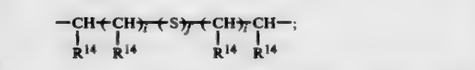
R^{10} is cycloalkyl, cycloalkenyl or phenyl;
R^{14} is —H, aryl, or C_1 to C_{18} alkyl;
R^{15} and R^{24} are the same or different and are



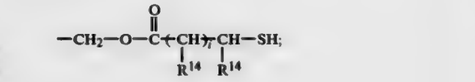
—OH, —SH, [aryl, C_1 to C_{18} alkyl] or —H; *provided that either R^{15} or in R^{24} is other than —H*
R^{16} is —H or R^8;
R^{17} is



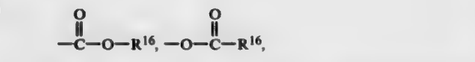
R^{18} is arylene, C_1 to C_8 alkylene, or



R^{19} is —H or when R^{10} is phenyl may be a divalent group which may contain halogen, hydroxy, mercapto or alkyl substituents and which combines with the phenyl to form a napthalene ring
R^{20} is $—CH_3$, $—CH_2CH_3$, or



R^{23} is



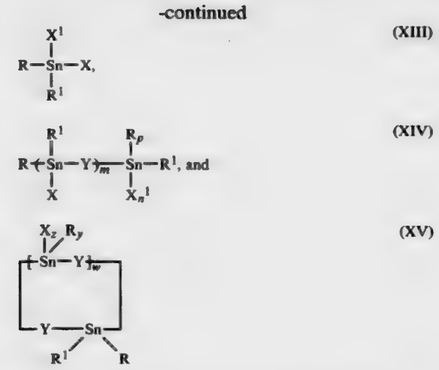
—SH, aryl, C_1 to C_{18} alkyl, —OH or —H with the proviso that in formula (VII) when R^{10} is phenyl,
R^{23} is —OH and i=0, then the —OH and —SH groups are on non-adjacent carbon atoms;
i=0 or an integer from 1 to 6 inclusive;
j=0, 1, 2 or 3; and
f=1 or 2; and

C. in a synergistically effective amount, a diorganotin compound or mixture of diorganotin compounds selected from compounds having the formulas:



(XII)

-continued



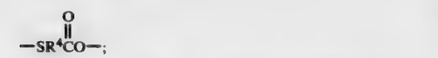
(XIII)

(XIV)

(XV)

wherein

R, R^1, W,X, X^1,Y, w and z are as previously defined;
n=0, 1 or p=0, 1 or 2 with the proviso that n+p=2, and m=1 to 5;
y=1 or 2, y+z=2 with the proviso that when w=0 then Y is —W—R^3—W^1—, or



and in formula (XV) when z=1 and in formulas (XIII) and (XIV) at least one X or X^1 is $—SR^2$.

41. A polymer composition comprising a halogen-containing organic polymer and a stabilizingly effective amount of a stabilizer composition according to claim **1**.

B1 4,772,269 (1705th)
PERITONEAL DIALYSIS CATHETER
Zbylut J. Twardowski, and Karl D. Nolph, both of Columbia, Mo., assignors to Curators of the University of Missouri, The
Reexamination Request No. 90/002,408, Aug. 19, 1991.
Reexamination Certificate for Patent No. 4,772,269, issued Sep. 20, 1988, Ser. No. 14,161, Feb. 11, 1987.
Continuation of Ser. No. 729,185, May 1, 1985, abandoned
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—175

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** is confirmed.

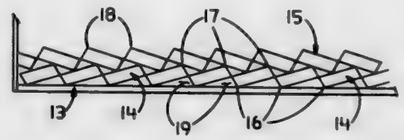
1. A peritoneal catheter which comprises a flexible catheter tube having a proximal and a distal end portion, said distal end portion defining flow port means for fluid communication between the bore of the catheter tube and the peritoneal cavity, said catheter carrying spaced porous cuff means to facilitate permanent securance of the catheter to the abdominal wall, the improvement comprising, in combination:

said catheter tube defining, in its natural, unstressed condition, a bent segment forming an arc in a range of 100° to 180° between said porous cuff means, said bent segment, in use, extending in a tunnel formed through the abdominal wall in its relatively unstressed configuration to direct the distal end portion toward a caudel direction within the



peritoneal cavity of the patient while the proximal end also projects, when viewed by an onlooker, downwardly.

B1 4,832,228 (1706th)
POULTRY TRAY LINER
David J. Hickey, 1311 Wakefield Pl., Greensboro, N.C. 27410
Reexamination Request No. 90/002,276, Feb. 11, 1991.
Reexamination Certificate for Patent No. 4,832,228, issued May 23, 1989, Ser. No. 94,323, Sep. 8, 1987.
Int. Cl.[5] A01K *31/00*
U.S. Cl. 220—408



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4–6** is confirmed.

Claim **1** is determined to be patentable as amended.

Claims **2** and **3**, dependent on an amended claim, are determined to be patentable.

New claims **7–14** are added and determined to be patentable.

1. A container for live poultry or the like including a tray having a bottom and side walls, the improvement comprising: a tray liner, said liner formed from an expanded material, said expanded material consisting of a thin paper-like sheet which has been longitudinally slit and laterally stressed to form a plurality of biased oval-like openings therein, and a base sheet, said expanded material attached to said base sheet, *said base sheet for contacting said bottom of said tray.*

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,926

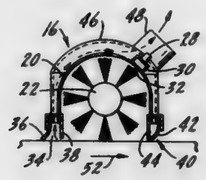
SCRUBBER SQUEEGEES FOR SCRUBBING FORWARD AND BACKWARD

Steven J. A. Waldhauser, Niagara Falls, N.Y., assignor to Tennant Company, Minneapolis, Minn.

Original No. 4,817,233, dated Apr. 4, 1989, Ser. No. 185,064, Apr. 22, 1988. Application for reissue Apr. 3, 1991, Ser. No. 679,588

Int. Cl.[5] **A47L** *11/202*

U.S. Cl. 15—320 **14 Claims**



9. In a scrubber, a mobile frame, at least one scrub brush attached to the frame to engage and work on a surface to be cleaned, an enclosure over the brush having a defined periphery approaching and opposing the surface to be cleaned, means for supplying a cleaning solution to the brush, front and rear squeegees engaging the surface on the front and rear portions of the periphery of the enclosure, a vacuum chamber associated with the enclosure in communication with the squeegees and a source of vacuum, the front and rear squeegees each including paired outer and inner elongated flexible generally parallel spaced part rubber-like blades, the blades being generally rectilinear and further including a corrugated outer surface on at least the outer blade of each pair so that liquid on the surface will pass under the outer squeegee blade when it is flexed inwardly, and means sealing the ends of the outer and inner squeegee blades in both the front and rear squeegees to provide an enclosed compartment between *each pair of* blades.

Re. 33,927

AIR CLEANER

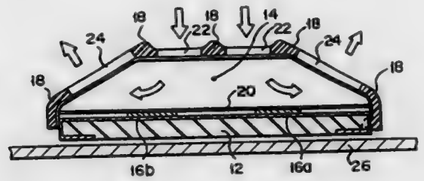
Yasuyuki Fuzimura, Zushi, Japan, assignor to Kankyo Company Limited, Kanagawa, Japan

Original No. 4,693,733, dated Sep. 15, 1987, Ser. No. 905,152, Sep. 9, 1986. Application for reissue Sep. 15, 1989, Ser. No. 407,613

Claims priority, application Japan, Nov. 8, 1985, 60-170871; Nov. 11, 1985, 60-172384

Int. Cl.[5] **B03C** *3/36*

U.S. Cl. 55—129 **9 Claims**



1. An air cleaner comprising:
a substrate;
a pair of anodes mounted on the substrate;
a cathode mounted on the substrate and interposed between the pair of anodes, the cathode being insulated from the pair of anodes; and
a cover mounted on the substrate which covers the pair of anodes and the cathode, the cover having an inlet formed in the region of the cover, which is near from the cathode, and the cover having a pair of outlets formed in the region of the cover, which are near from the pair of anodes, respectively;
the inlet and the pair of outlets being arranged such that when a negative and positive voltage is applied to the cathode and the pair of anodes, respectively, air is inhaled into the cavity defined by the cover and the substrate from the inlet and is vented from the cavity through the pair of outlets.

Re. 33,928

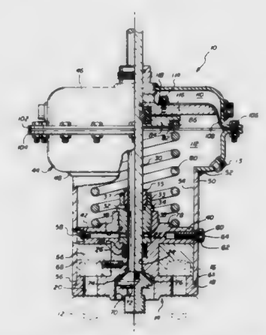
FIRE-SAFE VALVE ACTUATOR

Billy R. Bruton; Jerome E. Corneillie, both of Longview, and Marion W. Perkins, White Oak, all of Tex., assignors to U.S. Industries, Inc., Longview, Tex.

Original No. 4,354,425, dated Oct. 19, 1982, Ser. No. 148,385, May 9, 1980. Continuation of Ser. No. 326,394, Mar. 20, 1989, abandoned, which is a continuation of Ser. No. 106,994, Oct. 5, 1987, abandoned, which is a continuation of Ser. No. 662,368, Oct. 18, 1984, abandoned. Application for reissue Aug. 28, 1990, Ser. No. 574,514

Int. Cl.[5] **F01B** *19/00, 29/00;* **F16J** *3/00*

U.S. Cl. 92—94 **18 Claims**



13. A bonnet and actuator assembly for use with a valve adapted for handling fluids under pressure and which includes a valve body and a valve member within the valve body for controlling pressurized fluid flow through the valve and that is serviceable while the valve remains in a pressurized state, said assembly comprising:
a bonnet adapted to be connected to the valve body;
an actuator housing adapted to be connected to said bonnet in a fluid pressure isolation relation to the valve;
an actuator stem within said housing and adapted to transmit valve opening and closing forces to said valve member through said bonnet;
stem actuator means within said actuator housing for moving said actuator stem inwardly with respect to said bonnet;
resilient means for urging said actuator stem outwardly with respect to said bonnet;
stop means for limiting movement of said actuator stem outwardly with respect to said bonnet;

means for releasably connecting said actuator housing to said bonnet;

and means for releasably connecting said actuator housing to said actuator stem such that when said actuator housing is released form said bonnet, said stem actuator means is removable with said actuator housing from said bonnet and actuator stem while the flowpath of the valve remains in the pressurized state, said stop means limiting the outward movement of said actuator stem under the influence of said resilient means.

Re. 33,929

CENTRAL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

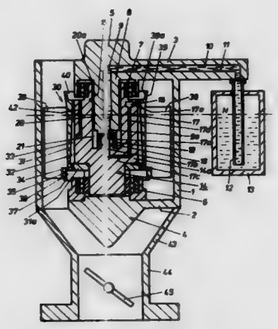
Rudolph Dieser, Zurich, Switzerland, assignor to Kwik Products International Corporation, Vancouver, Canada

Original No. 4,474,712, dated Oct. 2, 1984, Ser. No. 426,648, Sep. 29, 1982. Continuation of Ser. No. 906,339, Sep. 11, 1986, abandoned. Application for reissue May 12, 1988, Ser. No. 195,350

Claims priority, application Switzerland, May 28, 1982, 426648

Int. Cl.[5] F02M *29/02*

U.S. Cl. 261—88 **20 Claims**



9. A central injection device for an internal combustion engine, comprising:

(a) a hollow housing;

(b) a rotor having a bladed impeller thereon and being mounted in said housing for rotation in response to an air flow through said housing;

(c) passage means in said rotor for receiving fuel from a source thereof and discharging the received fuel in response to rotation of said rotor, said passage means having a fuel level established by fuel in said rotor when said rotor is at rest, said passage means further having:

an upstream section for flowing fuel downwardly across said fuel level,

an intermediate section for receiving fuel from said upstream section below said fuel level and flowing the received fuel upwardly across said fuel level to a downstream end portion of said intermediate section disposed above said fuel level, and

a downstream section communicating with said downstream portion of said intermediate section and extending downwardly therefrom to a level below said fuel level and the impeller blades;

(d) orifice means, disposed in said downstream end portion of said intermediate section of said passage means above said fuel level, for metering fuel flow through said passage means; and

(e) spray edge means, positioned downstream from the impeller blades, for intercepting fuel discharged from said downstream section of said passage means and converting the fuel to a fine mist.

Re. 33,930

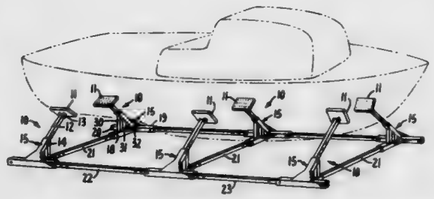
ADJUSTABLE SUPPORT SYSTEM FOR MARINE CRAFT

John C. Ardent, 840 Wedgewood Dr., Pittsburg, Calif. 94565

Original No. 4,792,130, dated Dec. 20, 1988, Ser. No. 2,946, Jan. 13, 1987. Continuation-in-part of Ser. No. 852,579, Apr. 16, 1986, abandoned, which is a continuation of Ser. No. 638,254, Aug. 6, 1984, abandoned. Application for reissue Dec. 10, 1990, Ser. No. 628,717

Int. Cl.[5] B23Q *3/00*

U.S. Cl. 269—296 **10 Claims**



1. A system to support marine craft comprising a plurality of support apparatus each in turn comprising:

(a) an essentially flat surface pad member for contact with the hull of the marine craft;

(b) a longitudinally adjustable extension member, said extension member being adjustably engaged at one end to a T-shaped base and connected pivotally at the other end to the surface pad member; and

(c) said T-shaped base in turn comprising:

(i) a *plurality of base members defining the plane of the T-shaped base,* (*ii*) *a* receptacle member disposed at an acute angle relative to the plane of the T-shaped base which telescopically engages said extension member at the end of said extension member remote from the end pivotally connected to said surface pad member, and characterized as fixedly engaging and retaining said extension member at a given orientation;

[(ii)] (*iii*) at least one strut capable of engaging with at least [an] *one* opposing T-shaped base; and

[(iii)] (*iv*) at least one brace member [vertically] disposed between [said strut] *at least one base member of said T-shaped base* and said receptacle member, said brace *member* being capable of [bearing vertical loads,] fixedly engaging and supporting said receptacle member,

said plurality of support apparatus arranged such that *a* marine craft which contacts the surfaces of said support [device] *system* is supported in a stationary manner.

Re. 33,931

LASER PATTERN GENERATING SYSTEM

Theodore R. Whitney, Reseda, Calif., assignor to American Semiconductor Equipment Technologies, Woodland Hills, Calif.

Original No. 4,541,712, dated Sep. 17, 1985, Ser. No. 332,832, Dec. 21, 1981. Application for reissue Jul. 20, 1987, Ser. No. 75,175

Int. Cl.[5] G03B *27/42*

U.S. Cl. 355—53 **46 Claims**

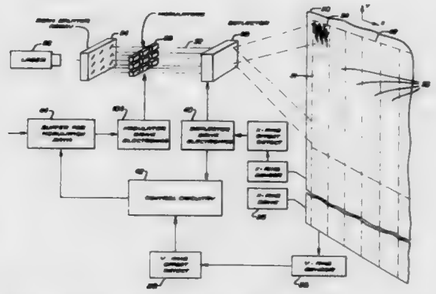
2. [A] *In a* laser pattern generating system [according to claim 1 further], *the improvement* comprising:

laser source means for providing a plurality of coaligned laser beams impinging in noninterfering, mutually closely spaced relationhip on the surface of a target;

deflector means for simultaneously deflecting said plurality of coaligned laser beams through a controllable range of angles across a portion of said surface while maintaining said closely spaced relationship; and

modulation means, independent of said providing means for selectively, independently modulating said beams during said deflection so that said modulated, deflected beams form an image on said surface;

target movement means for moving said target in a direction lateral to the direction of beam deflection across said surface; and



offset detection means, cooperating with said target movement means, for detecting offset of said target in said direction of beam deflection during lateral movement of said target, said modulation means advancing or delaying the initiation of modulation during said deflection in response to the amount of offset determined by said offset detection means, whereby the formed image begins at a uniform reference line on said surface regardless of target offset during said lateral movement.

Re. 33,932

HOLLOW FIBER-TYPE ARTIFICIAL LUNG

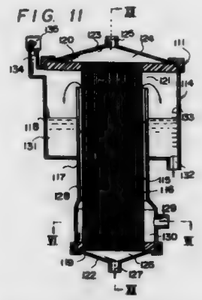
Hiromichi Fukasawa, Funabashi, and Takashi Monzen, Tama, both of Japan, assignors to Terumo Corporation, Tokyo, Japan

Original No. 4,620,965, dated Nov. 4, 1986, Ser. No. 533,496, Sep. 16, 1983. Continuation of Ser. No. 262,462, Oct. 25, 1988, abandoned. Application for reissue Feb. 20, 1990, Ser. No. 481,807

Claims priority, application Japan, Sep. 22, 1982, 57-163975; Sep. 29, 1982, 57-168407; Oct. 12, 1982, 57-177506

Int. Cl.[5] A61M *1/03*

U.S. Cl. 422—46 **37 Claims**



1. A hollow fiber-type artificial lung, comprising:

an axially extended housing;

a hollow fiber bundle including a multiplicity of hollow fibers accommodated within and along the axial direction of said housing, said hollow fibers forming blood channels between outer wall surfaces of neighboring ones of said fibers, and being arranged within said housing in such a manner that neighboring blood channels are brought into substantial communication;

first and second walls [each having cylindrically concave faces] for liquid-tightly supporting said hollow fibers at both end portions of aid fibers within said housing;

gas inlet means provided on an outer side of at least one of said first and said second walls for communicating with the hollow interior of said hollow fibers [the concave faces of] *at one of said end portions;*

gas outlet means provided on the other of said first and second walls communicating with the hollow interior of said hollow fibers at the other end portion of said fibers; said first and second walls, the inner wall of said housing and the outer wall surfaces of said hollow fibers defining a blood chamber, [wherein the centers of the cylindrically concave faces of said first and second walls define extreme axial end locations of said blood chamber];

blood inlet and outlet means communicating with said blood chamber;

the inner surface of said housing in the vicinity of said blood inlet means being flared outwardly relative to the inner surface of the intermediate portion of the housing, for forming a first annular blood flow passage in said blood chamber at a portion adjacent to said first wall between the outer periphery of said hollow fiber bundle and the inner surface of the flared housing, wherein the flared inner surface of said housing in the vicinity of said blood inlet means is off-centered with respect to said hollow fiber [hundle] *bundle* to increase the distance between said blood inlet means and said hollow fiber bundle and thus enlarge the flow area of said first blood flow passage facing said blood inlet means while gradually diminishing the flow area of said first blood flow passage with increasing distance from said blood inlet means, so that the amount of blood entering said first blood flow passage from said inlet means is substantially uniform circumferentially of said hollow fiber bundle and the flow rate of blood traveling axially of the housing within aid blood chamber tends to be made uniform, said first blood flow passage communicates with said blood inlet means and surrounds said hollow fiber bundle circumferentially at the end portion retained by said first wall, and said housing forming a second blood flow passage at a portion adjacent to said second wall, said second flow passage communicating with said blood outlet means and surrounding said hollow fiber bundle circumferentially at the end portion retained by said second wall[; the inner surface of said housing in the vicinity of said blood outlet means being flared outwardly relative to the inner surface of the intermediate portion of said housing, for forming said second blood flow passage in an annular shape between the outer periphery of said hollow fiber bundle and the inner surface of said housing: the flared inner surface of said housing in the vicinity of said blood outlet means is off-centered with respect to said hollow fiber bundle to increase the distance between said blood outlet means and said hollow fiber bundle and thus enlarge the flow area of said second blood flow passage facing said blood outlet means while gradually diminishing the flow area of said second blood flow passage with increasing distance from said blood outlet means so that the amount of blood entering said second blood flow passage is substantially uniform circumferentially of said hollow fiber bundle and the flow rate of blood traveling axially of said housing becomes uniform in relation to the circumferential direction of said hollow fiber bundle;

said housing having an inner diameter of minimum value at the vicinity of the central region of said housing axially thereof for constricting said hollow fiber bundle, and a gradually larger value in the direction toward the ends of the housing for varying the cross-sectional area of said blood channels formed between neighboring fibers to

narrow said blood channels toward the axial center region of said hollow fiber bundle from both of its ends;] and gas venting means communicating with the interior of said blood chamber in the vicinity of [the center of the concave face of] said second wall so that said gas venting means can be situated at substantially the highest location of said blood chamber when said housing is vertically oriented when the artificial lung is in use.

Re. 33,933

TOY MUSIC ROCKING CHAIR

Jack Hou, 8F No. 185 Yung Chi Road, Taipei, Taiwan

Original No. 4,708,689, dated Nov. 24, 1987, Ser. No. 914,146, Oct. 1, 1986. Application for reissue Jul. 11, 1989, Ser. No. 378,401

Int. Cl.[5] G10K *1/06*

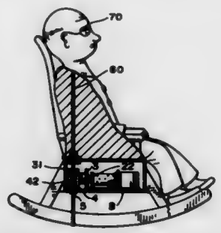
U.S. Cl. 446—301 **8 Claims**

3. A toy device adapted for movement comprising:

a) a music box supported on the toy device, the musix box including a rotatable driving shaft having a protruding end, the music box comprising a power source for causing movement of the toy device;

b) a transmission system including a rotatable element secured to the protruding end of the driving shaft so as to rotate therewith;

c) a stub extending from the rotatable element so as to rotate therewith; and,



d) a reciprocating plate defining a follower surface in contact with the stub such that rotary motion of the rotatable driving shaft of the music box causes rotary motion of the rotatable element which, in turn, causes rectilinear reciprocating motion of the plate whereby such rectilinear motion of the plate imparts movement to the toy device.

PLANT PATENTS

GRANTED MAY 19, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,868

ROSE PLANT NAMED TWOFREE

Jerry Twomey, Leucadid, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Nov. 13, 1990, Ser. No. 611,508

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. The new and distinct rose variety substantially as herein shown and described, characterized by its continuous and profuse production of medium sized blossoms having a solid Union Jack Red color on all of its petals; the plant having a vigorous, upright and free branching growth habit with abundant foliage.

7,869

STRAWBERRY PLANT DORIT

Eva Izsak, and Shamai Izhar, both of Rehovot, Israel, assignors to State of Israel, Ministry of Agriculture, The Volcani Center, Bet Dagan, Israel

Continuation of Ser. No. 489,440, Mar. 6, 1990, abandoned. This application Jul. 25, 1991, Ser. No. 735,968

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—48 **1 Claim**

1. A new distinct variety of strawberry substantially as illustrated and described and distinguished as being able to grow in September and produce fruit starting in November and lasting until summer, with fruit having a good taste and shape and a long shelf life.

7,870

STRAWBERRY PLANT SAAID

Eva Izsak, and Shamai Izhar, both of Rehovot, Israel, assignors to State of Israel, Ministry of Agriculture, The Volcani Center, Bet Dagan, Israel

Continuation of Ser. No. 491,758, Mar. 6, 1990, abandoned. This application Jul. 25, 1991, Ser. No. 735,970

Claims priority, application Israel, Mar. 17, 1989, 1432/89

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—48 **1 Claim**

1. A new distinct variety of strawberry substantially as illustrated and described and distinguished as being able to grow in September and produce fruit starting in early December and lasting until summer, with fruit having a good taste and shape and a long shelf life.

7,871

AFRICAN VIOLET PLANT NAMED MARIA ANTONIA

Reinhold Holtkamp, Sr., Blumenstrasse 28, D 4242 Rees-Haffen, Fed. Rep. of Germany

Filed Jul. 12, 1990, Ser. No. 551,445

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Maria Antonia, as described and illustrated, and particularly characterized by its single violet-shaped, pearl-color flowers with frill ededges; strong, upright flower stems that curve slightly toward the center to form a bouquet above the leaves; dark green, oval to heart-shaped leaves; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

VOL
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PATENTS

GRANTED May 19, 1992

ERRATA

028-115	5,113,563
028-218	5,113,564
036-088	5,113,599
040-634	5,113,602
042-007	5,113,603
042-050	5,113,604
042-050	5,113,605
043-042	5,113,606
043-042	5,113,607
043-042	5,113,608
053-513	5,113,633
099-421	5,113,699
089-036	5,113,700
118-058	5,113,701
114-219	5,113,702
454-127	5,113,748
454-193	5,113,749
454-063	5,113,750
114-362	5,113,791
172-311	5,113,956
172-010	5,113,956
248-141	5,113,972
194-206	5,113,990
229-216	5,114,013
222-082	5,114,033
239-428	5,114,072
241-019	5,114,131
472-075	5,114,140
359-216	5,114,217
285-319	5,114,250
404-095	5,114,284
205-152	5,114,543
251-346	5,114,583
507-126	5,114,597
507-126	5,114,598
554-162	5,114,624
514-716	5,114,708
427-038	5,114,770
530-387	5,114,856
525-474	5,115,095
178-018	5,115,107
250-572	5,115,144
373-074	5,115,148
324-207	5,115,186
385-100	5,115,260
315-247	5,115,347
395-650	5,115,392
395-425	5,115,393
395-141	5,115,402
395-143	5,115,404
395-650	5,115,410
318-616	5,115,418
377-058	5,115,458
395-400	5,115,490

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PATENTS

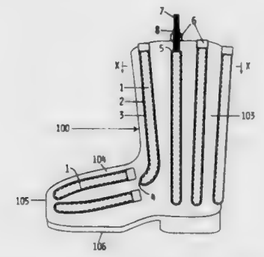
GRANTED MAY 19, 1992

GENERAL AND MECHANICAL

5,113,526
PROTECTIVE CLOTHING INCORPORATING COIL SPRINGS

Enoch Y. S. Wang, and Solomon H. Wang, both of Unit #1, 3111 Beckman Place, Richmond, British Columbia, Canada V6X 3R2

Continuation-in-part of Ser. No. 573,371, Aug. 27, 1990, abandoned. This application Feb. 19, 1991, Ser. No. 657,121
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—2 **27 Claims**

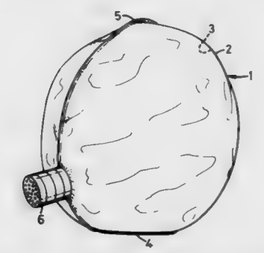


1. An article of protective clothing comprising a flexible supporting material and a plurality of elongated coil springs held in close proximity to the surface of said supporting material in elongated pockets formed adjacent to the surface of said supporting material at spaced locations wherein said coil springs are free to rotate within said pockets in relation to said supporting material.

5,113,527
FIRE AND SMOKE PROTECTIVE HOOD

Noel Robertson-McKenzie, Tudor House, Castle Way, Hanworth, Middlesex TW13 7QG, England, assignor to Noel Robertson-McKenzie, Hanworth, England

Continuation of Ser. No. 576,869, Sep. 4, 1990, abandoned, which is a continuation of Ser. No. 356,914, May 23, 1989, abandoned. This application Jul. 15, 1991, Ser. No. 729,893
Int. Cl.[5] A42B *3/00*
U.S. Cl. 2—7 **23 Claims**



1. A protective hood for protecting an individual from the effects of smoke and fire in a fire related emergency, comprising:

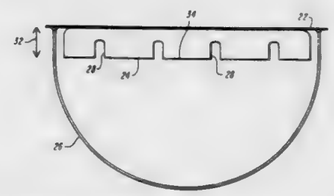
a high temperature resistance flexible plastics material having an outer surface; and

a layer of titanium on at least a part of said outer surface.

5,113,528
FACE SHIELD

John W. Burke, Jr., 36 E. Wyoming Ave., Melrose, Mass. 02176, and Peter J. Gazzara, 8 Woodbine St., Reading, Mass. 01867

Filed Jan. 12, 1990, Ser. No. 464,297
Int. Cl.[5] A42B *1/06;* **A61F** *9/04*
U.S. Cl. 2—9 **5 Claims**



1. Face shield comprising:

a flexible, fluid impervious, transparent member sized to cover a human face;

a flexible barrier and spacer member affixed to a top portion of the transparent member, the barrier and spacer member substantially spanning the full extent of the transparent member and including

a foam plastic material,

a forehead engaging surface,

a plurality of scallops extending into the barrier and spacer member from the forehead engaging surface; and

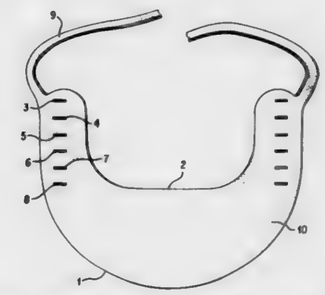
apparatus for securing the transparent member/barrier and spacer member combination to the human face so that the forehead engaging surface of the barrier and spacer member contacts the forehead of the face,

whereby when the transparent member/barrier and spacer combination is secured to the face, the scallops close so that the barrier and spacer member creates an air previous and a substantially liquid impervious barrier between the forehead and the transparent member.

5,113,529
EYEGLASSES VISOR AND RETAINER

J. Scott Carr, 6011-201 Winterpointe Dr., Raleigh, N.C. 27606

Continuation-in-part of Ser. No. 502,249, Mar. 30, 1990. This application Nov. 28, 1990, Ser. No. 619,088
Int. Cl.[5] G02C *5/00, 11/00;* **A61F** *9/00*
U.S. Cl. 2—13 **5 Claims**

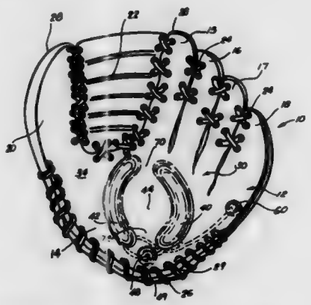


1. A sun visor for attaching to the temples of eyeglasses comprising:

a) a cresent shaped bill member having a concave edge

forming a back side for placing adjacent to the forehead of an individual and a convex edge forming a front side for extending away from the forehead and wherein the concave and convex edges meet to form right and left sides;
b) said right side and said left side having slots formed therein that form attachment means that enable the temples to be weaved through the slots so as to secure the temples to the bill member; and
c) wherein said bill member includes first and second outer exposed panels secured together and wherein said first panel is formed of a material having a relatively low friction surface while the second panel is formed of a different material having a relatively high friction surface such that as the temples are weaved through the slots the first panel with the relatively low friction surface facilitates the weaving process since the temples can easily be moved adjacent the material of the first panel and wherein the relatively high friction material of the second panel tends to grip, retain and secure the temples within the slots once the temples have been weaved into the sun visor.

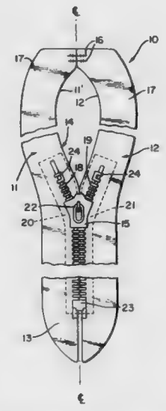
5,113,530
FIELDER'S GLOVE WITH INFLATABLE CHAMBERS
Flynn K. Smith, 307 Brockenbraugh Ct., Metairie, La. 70005
Filed May 20, 1991, Ser. No. 702,834
Int. Cl.[5] A41D *13/10, 19/00*
U.S. Cl. 2—19 **14 Claims**



1. A baseball glove, comprising:
a) a hand receiving portion, further comprising a palm portion, a plurality of finger portions, and a thumb portion;
b) a web portion extending between the thumb portion and the finger portions;
c) chamber means in the palm portion for receiving a quantity of fluid therein, to define an inflated area of the palm portion;
d) means positioned on the glove for manually pumping the fluid into the chamber means in the palm portion; and
e) means activated by the impact of an airborn ball striking at least a portion of the chamber means for allowing fluid contained within the chamber means to be released therefrom when the airborn ball makes contact with at least a portion of the palm portion of the glove positioned above the chamber means.

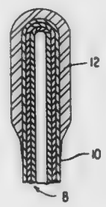
5,113,531
ZIPPERED DECORATIVE NECKTIE
Jacqueline Castro, 357 N. Broadway, Yonkers, N.Y. 10701
Filed Apr. 23, 1991, Ser. No. 690,000
Int. Cl.[5] A41D *25/00*
U.S. Cl. 2—144 **1 Claim**

1. A necktie comprising:
(a) a pair of independent strips constituting elongated fabric elements of substantially identical shapes adapted to be joined at lower portions to establish a predetermined center line for said tie of selectively adjustable length, each of said elements having uppermost portions;
(b) a zipper having tapes connected to said fabric elements adjacent said center line;
(c) said uppermost portions of said fabric elements being connected by a line of stitching; and



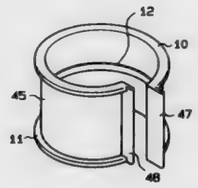
(d) predetermined portions of said fabric elements being disposed between said connected uppermost portions and said joined lower portions and defining a neck-engaging collar band of adjustable size.

5,113,532
METHOD OF MAKING GARMENT, GARMENT AND STRAND MATERIAL
Roger I. Sutton, Bermuda Run, N.C., assignor to Golden Needles Knitting & Glove Co., Inc., Wilkesboro, N.C.
Continuation of Ser. No. 285,402, Dec. 16, 1988, abandoned. This application Mar. 8, 1991, Ser. No. 668,812
Int. Cl.[5] A41D *19/02*
U.S. Cl. 2—167 **20 Claims**



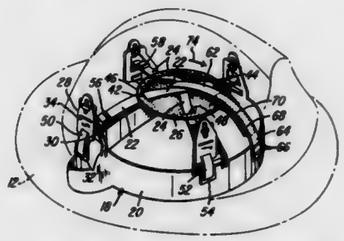
1. A method of making a protective garment comprising the steps of:
providing a strand material by extrusion coating a cut resistant core material with a fluid impervious and stain resistant material, wherein said strand material is cut resistant and stain resistant and fluid impervious; and
manipulating the resulting strand material into a fabric from which a garment is made.

5,113,533
ARM BAND
Toshiyuki Takada, 207 Yamanote, 2-chome, Meito-ku, Nagoya-shi, Aichi-ken, Japan
Filed Jan. 10, 1991, Ser. No. 639,552
Claims priority, application Japan, Oct. 16, 1990, 2-278554
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—170 **20 Claims**



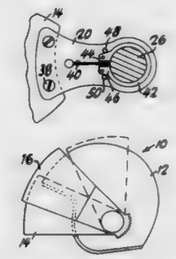
1. An arm band comprising:
a split ring band having interior and outer surfaces; and
a plurality of ribs for reinforcing the resiliency of the band, said ribs protruding from said band and including:
at least one outer rib protruding outward from the band for reinforcing the resiliency of the band; and
at least one inner rib protruding inward from the interior surface of the band for reinforcing the resiliency of the band and preventing slippage when the arm band is worn.

5,113,534
FIREFIGHTER'S HELMET HAVING TILT ADJUSTMENT
Abbott A. Lane, Dayton, and John M. Hetzel, Jr., Kettering, both of Ohio, assignors to Firequip Helmets, Inc., Dayton, Ohio
Filed Feb. 19, 1991, Ser. No. 656,843
Int. Cl.[5] A42B *3/00*
U.S. Cl. 2—416 **12 Claims**



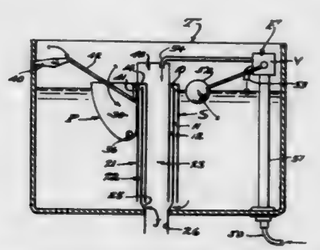
1. In a firefighter's helmet having an outer shell and an inwardly disposed crown support assembly wherein the weight of the shell and of any accessories associated therewith are unevenly distributed, the improvement in which the drawn support assembly comprises tilting means for tilting the heavier portion of the outer shell upwardly as the helmet is positioned upon the head of a firefighter, whereby the helmet is balanced upon the head of the firefighter, and whereby stress upon the firefighter which involves the helmet is minimal the crown support assembly comprising intersecting crisscrossing crown straps and said tilting means also comprising locating means for adjusting the point of intersection of the drawn straps, the locating means comprising an adjustment strap, one end of which is looped around the crown straps at the point of intersection thereof and the other end of the adjustment strap being fixed relative to said crown support assembly.

5,113,535
SIMPLIFIED DUAL VISOR OPERATING MECHANISM
George D. Hedges, Lake Ariel, and Francis J. Kuna, Carbondale, both of Pa., assignors to Gentex Corporation, Carbondale, Pa.
Continuation of Ser. No. 588,686, Sep. 26, 1990, abandoned. This application Jul. 31, 1991, Ser. No. 740,864
Int. Cl.[5] A42B *1/08*
U.S. Cl. 2—424 **23 Claims**



1. A helmet and visor assembly including in combination a helmet shell, a first arbor secured to said shell at one side thereof, a second arbor secured to said shell at the opposite side thereof, a visor mounted on said arbors for movement between operative and inoperative positions, means for clamping said visor to one of said arbors with a predetermined force, and manually operable means for releasing said clamping force and moving said visor between said positions, said clamping means comprising a C-ring on said one arbor and means coupling said C-ring to said visor for rotary movement therewith around said one arbor.

5,113,536
JET ACTIVATED TOILET FLUSHING APPARATUS
John S. Osmond, 731 Cedar St., Santa Monica, Calif. 90405
Filed Jul. 10, 1990, Ser. No. 550,555
Int. Cl.[5] E03D *1/06, 1/07*
U.S. Cl. 4—368 **10 Claims**



1. A flushing apparatus for toilets having a flush tank and a flush pipe opening therefrom and into a toilet bowl, and having a water level control means responsive to depletion of water in said tank to refill said tank to a predetermined water level, said apparatus including;
a syphon adapted to be mounted within the flush tank and comprised of a suction leg having an inlet opening adjacent to the bottom of said tank and extending upward to a bridging section at the aforesaid predetermined water level, and a discharge leg contiguous with the suction leg and extending downward from the bridging section to a discharge opening adjacent the bottom of said tank and which is directed toward the aforesaid flush pipe of the toilet,
a flush tube adapted to be mounted within the flush tank and having an open upper end above the predetermined water

level and an open lower end at said discharge opening of the syphon discharge leg communicating with the interior of the lower end of the flush tube,

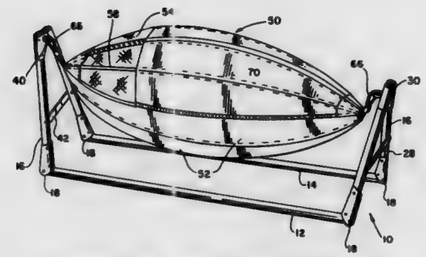
and a primer means comprised of a bucket adapted to be mounted in said tank to turn from a water storage position to a discharge position for dumping a charge of water into the upper end of the flush tube and over the discharge opening of the discharge leg for inducing a suction effect in the discharge leg, whereby water from the suction leg is drawn over the bridging section and into the discharge leg to initiate a syphon to flush the tolet.

5,113,537

PORTABLE SLEEPING UNIT FOR CHILDREN

Sandra L. Turk, 2442 Jackson SE., Albany, Oreg. 97321

Filed Dec. 21, 1990, Ser. No. 631,897
Int. Cl.[5] A45F *3/22*
U.S. Cl. 5—121 **11 Claims**



1. A portable sleeping unit for children comprising

a hammock comprising a plurality of lenticular fabric panels laterally interconnected by seams so as to form a substantially closed surface, a plurality of stays extending generally along said seams, means for interconnecting the ends of the stays at either end of the hammock, and at least one strap connected to the fabric at either end of the hammock, and

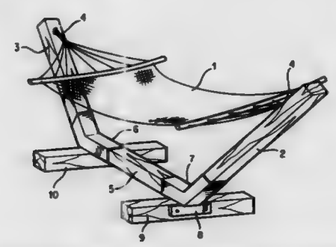
a collapsible frame including spaced uprights having means for suspending the hammock, whereby, when the hammock is suspended from said uprights and a child is placed in the hammock, the stays are bowed outward by the weight of the child, expanding the hammock.

5,113,538

HAMMOCK STAND AND BRACKETS FOR ASSEMBLING SAME

Jesse A. Branch, III, P.O. Box 1602, Greenville, N.C. 27834

Filed Sep. 20, 1991, Ser. No. 763,205
Int. Cl.[5] A45F *3/24*
U.S. Cl. 5—127 **3 Claims**



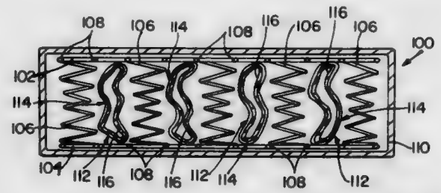
1. A hammock support stand comprising an elongated base member having an elongated upright support member attached by means of a bracket at an oblique angle to each of its ends, said bracket comprising two tubular members jointed axially at an oblique angel to form an elbow having two open opposing ends to receive respectively an end of said base member and an end of a support member; means for attaching an additional elongated member transversely to the axis of said elbow, said means being attached to one of said tubular members proximate the point at which said tubular members are joined opposite the interior angle of said elbow; and a pair of elongated members each attached transversely to said base member by said attachment means for maintaining said stand in an upright position.

5,113,539

ADJUSTABLE FIRMNESS COIL SPRING MATTRESS WITH INFLATABLE TUBES

Brian M. Strell, 454 Prospect Ave., West Orange, N.J. 07052

Filed Jul. 31, 1991, Ser. No. 738,574
Int. Cl.[5] A47C *27/10, 27/04*
U.S. Cl. 5—464 **20 Claims**



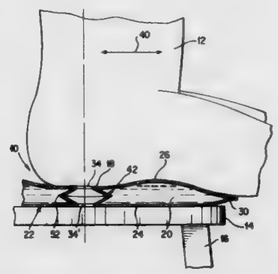
1. An adjustable firmness body supporting device comprising a plurality of coil springs arranged in a matrix of a plurality of rows and columns, said matrix providing a body supporting portion of said device, a cover extending about said matrix, at least one elongated pneumatic member extending between adjacent coil springs within said matrix, said member being located within interstices formed between upper, lower and peripheral portions of adjacent coil springs within said matrix, said member acting on at least said adjacent coil springs to effect the firmness of said body supporting portion provided by at least said adjacent coil springs.

5,113,540

FLUID CUSHION WITH PASSAGES FOR ISCHIAL SPINES

Joel L. Sereboff, 2215 Millridge Rd., Owings Mills, Md. 21117

Filed Jul. 3, 1991, Ser. No. 725,512
Int. Cl.[5] A47C *27/08*
U.S. Cl. 5—449 **17 Claims**



1. A fluid cushion including at least two spaced apart openings adapted to interface with the ischial spines of a sitting user of the cushion, said cushion comprising:

a fluid tight closed housing having an upper surface member and a lower surface member, each of said upper and lower surface members having at least two openings formed

therethrough, said openings formed through said upper surface member being substantially vertically aligned with said openings formed through said lower surface member; and,

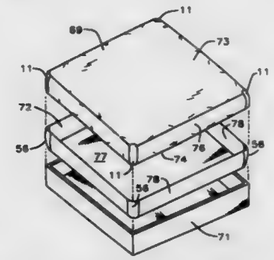
tubular means for joining said upper and lower surface member openings in fluid tight relation defining a pair of vertically directed through passages having tubular sidewall members of varying cross-sectional diameters when taken with respect to a vertical direction, said housing and said tubular means defining an internal chamber containing a fluid medium wherein the tubular sidewall members define an apex diameter having a greater dimension than a diameter of said upper and lower surface member openings at a predetermined vertical position between said upper and lower surface members.

5,113,541

WATERBED CORNER STRUCTURE

John B. Johenning, Beverly Hills, Calif., assignor to Strata Flotation, Inc., Torrance, Calif.

Continuation-in-part of Ser. No. 470,163, Jan. 25, 1990, which is a division of Ser. No. 395,715, Aug. 18, 1989, Pat. No. 4,930,172.
This application Aug. 17, 1990, Ser. No. 569,095
Int. Cl.[5] A47C *27/08*
U.S. Cl. 5—451 **14 Claims**



1. In a safety liner for containing water from the mattress of a waterbed: a base plate having generally planar front and rear surfaces and a peripheral sealing area attached to bottom and side panels of the liner, and a plurality of cleats projecting from the front surface for engagement with a bedsheet tucked between the mattress and the liner to help retain the bedsheet in position on the mattress.

5,113,542

CENTRIFUGAL SOFTENER SPRAY DISPENSER

Jim J. Pastryk, Weesaw Township, Berrien County, and Sheryl L. Farrington, St. Joseph Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation-in-part of Ser. No. 461,404, Jan. 5, 1990, Pat. No. 4,987,627. This application Dec. 28, 1990, Ser. No. 635,481
Int. Cl.[5] D06F *39/02*
U.S. Cl. 8—158 **20 Claims**

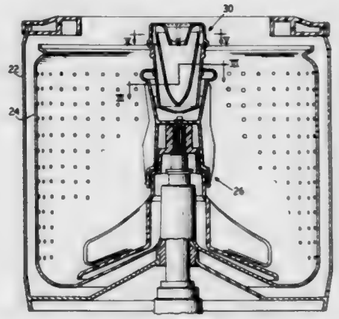
1. In an automatic washer including a wash tub, wash tub, a wash additive dispenser, and drive means for selectively rotating said dispenser at a first angular speed and a second, greater angular speed, a dispensing cup associated with said wash additive dispenser, said dispensing cup comprising:

first passage means, formed in said dispensing cup, for permitting liquid flow from said dispenser into said tub when said dispenser is rotated at least as fast as said first angular speed;

second passage means, formed in said dispensing cup, for permitting centrifugal liquid flow from said dispenser into said tub when said dispenser is rotated at least as said second angular speed; and

said dispensing cup including a frustoconical portion having a sidewall diverging upwardly from a bottom wall to an upper end of said frustoconical portion, and a radially outwardly-extending toroidal portion disposed at said upper end of said frustoconical portion.

16. In an automatic washer including a tub, and a dispenser mounted for selective rotation in an agitation cycle and at least one spin cycle, said dispenser having a sidewall with at least a portion of said sidewall extending upwardly from a bottom of said dispenser, and a plurality of dispensing passages extending



through said portion of said sidewall, a method of dispensing wash additive fluid from said dispenser, said method comprising the following steps:

retaining a major portion of said wash additive fluid in said dispenser during said agitation cycle; and

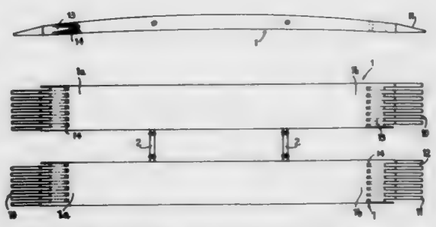
centrifugally dispensing said major portion of said wash additive fluid into said tub from said dispensing passages in said dispenser wall during said at least one spin cycle.

5,113,543

SYSTEM FOR ASSEMBLING A CROSSING STRUCTURE FOR THE BRIDGING OF GAPS

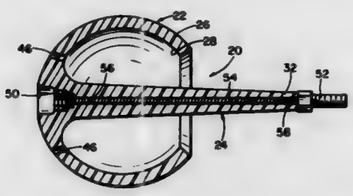
Jacques Sevenet, Le Breuil, France, assignor to Framatome, Courbevoie, France

Filed Dec. 20, 1990, Ser. No. 631,167
Claims priority, application France, Dec. 26, 1989, 8917191
Int. Cl.[5] E01D *1/00*
U.S. Cl. 14—24 **10 Claims**



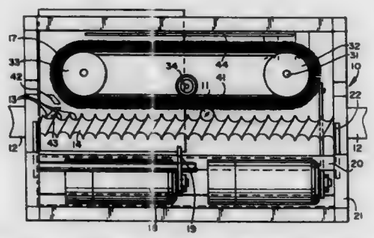
1. System for assembling a crossing structure for the bridging of gaps, comprising at least two sections to be joined end to end to form at least one runway and having mutually opposite ends provided with interlocking members of complementary shape formed at a corresponding end of each section by a succession of projecting parts and of recesses offset relative to the respective projecting parts and recesses of the end of the other section.

5,113,544
PIPELINE PIG
Brian C. Webb, 9814 E. 28th Street, Tulsa, Okla. 74129
Filed Feb. 8, 1990, Ser. No. 477,602
Int. Cl.[5] B08B *9/04*
U.S. Cl. 15—104.061 **14 Claims**



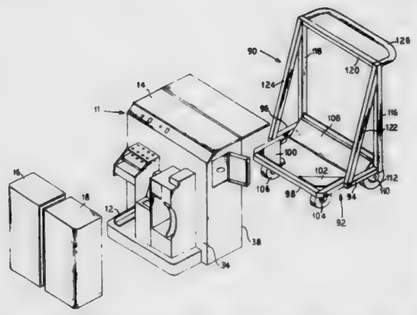
8. A pig which may be propelled by fluid flow through a conduit, such as a pipeline, comprising:
- a truncated hollow spherical head having an opening to an inside for facing upstream and receiving fluid flow in the pipeline, the head having an outside for facing downstream and for contacting the inside walls of the pipeline;
- an elongate tail having a first end connected to the inside of the head and a second end extending out of the opening, the tail and the second end of the tail being of smaller diameter than the opening so that the second end of the tail is free to move laterally in the pipeline;
- a first fastener connected to the outside of the head for fastening objects to the outside of the head;
- a second fastener connected to the second end of the tail for fastening objects to the second end of the tail; and
- a tensile member having a first end connected to the first fastener and a second end connected to the second fastener.

5,113,545
BOTTLE DUSTER WITH BELT BRUSHES
Julian P. Avelis, Crete, Ill., assignor to McBrady Engineering, Inc., East Hazel Crest, Ill.
Filed Jul. 19, 1989, Ser. No. 383,181
Int. Cl.[5] B08B *1/02*
U.S. Cl. 15—308 **23 Claims**



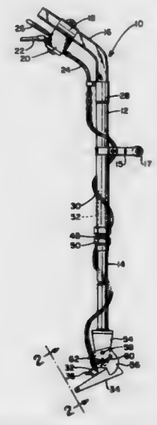
1. In a machine for cleaning bottles moving on a conveyor having a longitudinal axis, said machine including:
(1) a frame;
(2) rubbing means, coupled to said frame, for rubbing the surface of said bottles; and
(3) motive means, coupled to said rubbing means and to said frame, for imparting to said rubbing means motion relative to said bottles,
the improvement:
(A) wherein said rubbing means comprises an endless, continuous belt having a substantially elongated length in a particular direction while out of contact with said bottles;
(B) wherein said motive means moves said belt, while in contact with said bottles, in a direction substantially parallel to said axis;
(C) further comprising cleaning means, coupled to said frame in the vicinity of said belt, for removing particulate matter from said belt, said cleaning means having a location remote from said bottles and extending over a substantial length in said particular direction for a prolonged period of cleaning of each portion of said belt while out of contact with said bottles.

5,113,546
COMPUTER SERVICING CART WITH STRUCTURAL FRAME
Richard Parent, Lake Bluff, Ill., assignor to Alternative Resources Corporation, Lincolnshire, Ill.
Filed Oct. 19, 1990, Ser. No. 599,986
Int. Cl.[5] A47L *5/00*
U.S. Cl. 15—315 **8 Claims**



1. A cart for use in servicing a computer and carrying items for use in servicing a computer, said cart including:
structural frame means for cooperation in carrying items for servicing and for rollably supporting housing forming means, said frame having:
a base for generally horizontal positioning which defines a front, back and sides;
a pair of uprights each connected to the back of the base at an end and extending upwardly therefrom;
a pair of strut members connecting each of said uprights to the base;
a cross member connected to the uprights;
a handle secured to the uprights; rolling means secured to said base by which
said cart is rollable; and housing forming means integrally formed with and surrounding said frame means for cooperation therewith, said housing forming means having top, bottom, side, front and back panels so as to define an enclosed space,
said bottom panel having a floor-like section and a depressed well-like section centered and extending below the floor-like section between the sides and extending between the front and back, and
said back panel including door means for access to the interior of the housing forming means;
wherein said housing forming means also includes a rearward section and forward retaining means secured to said rearward section for carrying various items and at least one front door member hingedly secured to said rearward section and constructed to enclose the forward retaining means; and wherein in the rearward section there is provided a vacuum tank on on side, a cleaning gas cylinder on the other side and a generally vertically oriented hose reel in the center between the tank and cylinder which extends into the welllike section, said reel in communication with the cylinder and a gas nozzle.

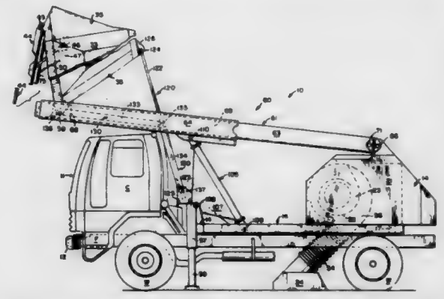
5,113,547
ADJUSTABLE WAND FOR CARPET SOIL EXTRACTORS
William H. Mayhew, 2229 Larchdale Dr., Cuyahoga Falls, Ohio 44221
Filed Apr. 29, 1991, Ser. No. 692,592
Int. Cl.[5] A47L *7/00*
U.S. Cl. 15—322 **16 Claims**



1. A wand for a carpet soil extractor, comprising:
a sleeve;
a tube telescopically and rotationally received within said sleeve;
a vacuum nozzle;
first connecting means interposed between said sleeve and said tube for locking interengagement of said sleeve and said tube at selected extensions and relative rotational positions of said sleeve and tube with respect to each other; and
second connection means interposed between said tube and said vacuum nozzle for locking interengagement of said nozzle with said tube at selected angles therebetween.

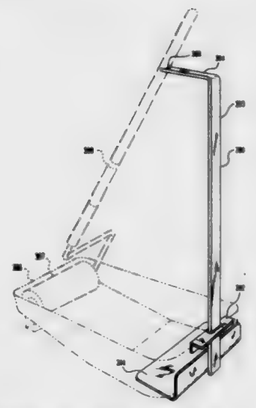
5,113,548
SURFACE SWEEPING MACHINE WITH OVER-THE-CAB HOPPER DUMPING
Gary B. Young, Waco; Albert L. Hanel, Eddy, and Kenneth R. Veselka, Axtell, all of Tex., assignors to Tymco, Inc., Waco, Tex.
Continuation-in-part of Ser. No. 188,521, Apr. 29, 1988. This application Oct. 17, 1989, Ser. No. 422,725
Int. Cl.[5] E01H *1/08*
U.S. Cl. 15—346 **40 Claims**

1. A dump vehicle comprising a frame having a longitudinal axis, a hopper carried by said frame, a cab carried by said frame, means for moving said hopper substantially linearly from a first position substantially contiguous said frame to a second position substantially elevated and remote from said first position along a substantially linear longitudinal path of travel in a first direction and along the same substantially linear longitudinal path of travel in a second opposite direction for moving said hopper from said second position to said first position, said second position being generally above said cab, said moving means including first and second elongated substantially linearly extendable and retractable members, said elongated members each having a longitudinal axis, said elongated member longitudinal axes each being in substantial parallel relationship to said substantially linear longitudinal path of travel, means for connecting said hopper to said first member, means for connecting said second member to said frame, means for selectively extending and retracting said members relative to each other to respectively move said hopper from said first position to said second position and vice versa, a control arm,



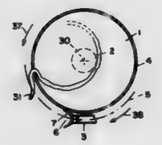
and means for coupling said control arm between one of said members and said frame thereby imparting a substantially arcuate component of movement to said hopper moving means during movement of said hopper moving means along said substantially linear longitudinal path of travel.

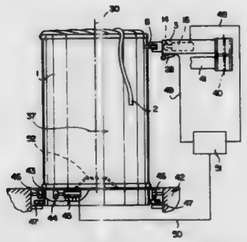
5,113,549
DETACHABLE HANDLE FOR PAINT ROLLER PAN
Mark J. Villiano, 327 Falcone Ave., Roseto, Pa. 18013
Filed Mar. 19, 1991, Ser. No. 671,465
Int. Cl.[5] B65D *25/28*
U.S. Cl. 96—114 R **15 Claims**



1. A detachable paint roller pan lifter for moving a paint roller pan or tray, comprising:
handle means for carrying said lifter, said handle means comprising a single vertical rod terminating in a free distal end;
roller pan support means for engaging a major portion of the exterior horizontal bottom portion of said pan, said support means connected to a proximal or bottom portion of said vertical rod in a generally horizontal position;
roller pan rim engaging means for releasably engaging a major portion of a side edge of said rim and retaining said support means in contact with said pan bottom, said engaging means slidably connected to said rod for vertical movement.

5,113,550
SLIVER CLAMP AND METHOD FOR RETRIEVING SLIVER CANS FOR FURTHER PROCESSING
Marcel Siegenthaler, Effretikon, Switzerland, assignor to Maschinenfabrik Rieter AG, Winterthur, Switzerland
Filed Oct. 30, 1990, Ser. No. 605,823
Claims priority, application Switzerland, Nov. 7, 1989, 04012/89
Int. Cl.[5] D01G *23/00*; D01H *15/00*
U.S. Cl. 19—159 A **21 Claims**

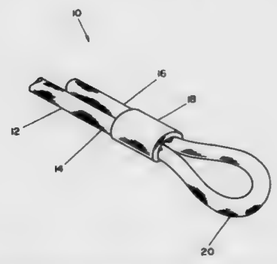




1. An apparatus for locating and clamping an end of a fiber sliver along an outer surface of a sliver can, said sliver can having a longitudinal axis, comprising:
(a) clamping means having two opposed clamping elements, one of which is disposed adjacent to said outer surface of said sliver can wherein said clamping elements are spaced apart in an opened position, and rotating cam means for closing said clamping means;
(b) means for supporting said sliver can;
(c) means for moving said clamping means and said sliver can support means relative to each other in such a way that said outer surface of said sliver cam moves past said clamping elements;
(d) sensing means for detecting a fiber sliver disposed between said opposed clamping elements and for generating a signal indicative of the position of said fiber sliver between said opposed clamping elements;
(e) drive means for rotating said cam means to move said clamping elements into a closed position; and
(f) control means for activating said drive means for rotating said cam means to close said clamping elements when said fiber sliver reaches a predetermined length, to clamp and fix said fiber sliver in a predetermined position and to stop the relative movement between said clamping means and said sliver can wherein said clamping elements move to clamp said sliver.

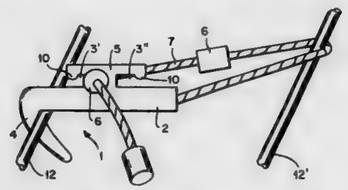
5,113,551
VERIFIABLE SWAGED FITTING
John D. Roberts, York, Pa., assignor to Lift-All Company, Inc., Manheim, Pa.
Filed Mar. 23, 1990, Ser. No. 498,271
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—115 A **4 Claims**

1. A swage fitting comprising:
a body which is deformable so that an interior cross section dimension is reduced when the body is subjected to external pressure; and
a coating located on an outside surface of the body, the coating being of such a nature that it changes at least one of its visual characteristics when the body is subjected to external pressure sufficient to reduce the interior cross section of the body, wherein the visual characteristic of



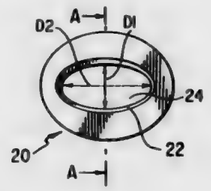
the coating which changes when it is subjected to pressure is color.

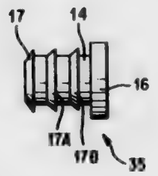
5,113,552
FASTENING STRAP
Hermann Payer, Seidlgasse 29/9, A-1030 Vienna, Austria
PCT No. PCT/AT88/00094, § 371 Date May 10, 1990, § 102(e) Date May 10, 1990, PCT Pub. No. WO89/04281, PCT Pub. Date May 18, 1989
PCT Filed Nov. 11, 1988, Ser. No. 474,790
Claims priority, application Austria, Nov. 13, 1987, 3013/87
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—300 **11 Claims**



1. A releasable fastening strap for fastening, bundling and strapping at least one article, comprising
a head element having a longitudinally extending shaft and article-clasping means;
an elongated elastic strap coupled to said shaft having at least one enlarged locking element mounted thereon, which strap is capable of being looped about said at least one article; and
a locking member mounted on said shaft, which in cooperation with said shaft defines at least one insertion groove in which said elastic strap is releasably insertable when it is looped around said at least one article with said at least one locking element thereof abutting and being anchored against said locking member, and said locking member further defines two oppositely aligned grooves which are arranged parallel and adjacent to said shaft, said at least one enlarged locking element having a width greater than the grooves which prevents said locking element from passing through said locking member.

5,113,553
FASTENING DEVICE
T. Gordon Hutchinson, P.O. Box 250, Dublin, N.H. 03444
Continuation-in-part of Ser. No. 584,196, Sep. 18, 1990, Pat. No. 5,075,938, which is a continuation-in-part of Ser. No. 535,872, Jun. 11, 1990. This application Jul. 22, 1991, Ser. No. 734,214
Int. Cl.[5] A44B *17/00*; A41F *1/00*
U.S. Cl. 24—464 **18 Claims**

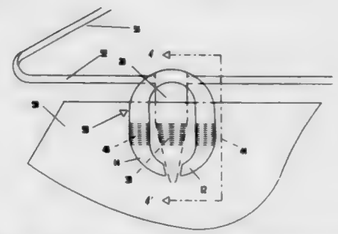




1. A fastening device comprising:
a stud component;
a socket component fabricated using material which is resilient but form retaining having a dimensionally deformable substantially elliptical shape aperture therein adapted to receive and interengage said stud component when said stud component is inserted into said socket component and when said socket component is placed onto said stud component;
said stud component comprising a body portion, a substantially cylindrical shaped stud member projecting therefrom said aperture to receive and interengage said stud component when said stud member is inserted into said aperture of said socket component and when said socket component is placed onto said stud component thereby interengaging said stud and said socket component;
a plurality of interengaging means integral with an positioned along said stud member, each adapted to cooperate with said socket component to interengage said stud and said socket components; and
said socket component aperture having interior walls, a major axis dimension and a minor axis dimension, said major axis dimension being greater than said minor axis dimension, said aperture axes dimensions deformable so that said minor axis dimension increases as said major axis dimension decreases upon inserting and extracting of said stud component into and from said socket component and upon squeezing of said socket component along a direction parallel to said major axis and perpendicular to said minor axis of said elliptical shaped aperture, said interengagement of said socket component with said stud component being only at both ends of said minor axis when said stud component is in interengagement with said socket component.

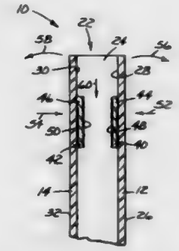
5,113,554
CLOTHING HANGER CLIP
Christine A. Gallo, 32 Esperanza, Ste. H., Sierrra Madre, 91204, and Bianca M. Giglio, 900 W. Sierra Madre Ave. #66, Azusa, Calif.
Filed Apr. 26, 1991, Ser. No. 691,790
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—545 **20 Claims**

1. A clip, garment hanger and sheet material which comprise:
a. a U-shaped clip body having opposite coincident legs dependent from a bight section;
b. an integral clip prong centrally dependent from said bight section and a base leg projecting out of said body plane;
c. a first reverse bend in said prong adjacent said base leg to provide a return section inclined towards and intersecting said body plane of said U-shaped body; and
d. a second reverse bend in said prong to provide a prong end that also projects out of said body plane;
e. said garment hanger having a straight horizontal bar slidably received between said first reverse bend and said bight section of said U-shaped clip body; and



f. said sheet material received and secured between said prong and said legs and supported by said clip beneath said bar and out of contact with said hanger.

5,113,555
CONTAINER WITH INTERMESHABLE CLOSURE MEMBERS
Shari J. Wilson, Minneapolis; Roger H. Appeldorn, White Bear Lake, and Robert N. Hamlin, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 325,272, Mar. 22, 1989, which is a continuation-in-part of Ser. No. 172,631, Mar. 24, 1988, Pat. No. 4,875,259, which is a continuation of Ser. No. 904,358, Sep. 8, 1986, abandoned. This application Nov. 26, 1990, Ser. No. 618,084
Int. Cl.[5] B65D *33/16*
U.S. Cl. 24—576 **9 Claims**



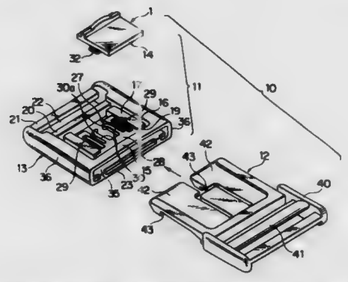
1. A receptacle having an opening providing access to an interior of the receptacle and including a first receptacle portion and a second receptacle portion that enclose the opening when joined together, said receptacle further including a closure for securing said first receptacle portion and said second receptacle portion together, said closure comprising a first closure member adapted for mounting on said first receptacle portion and a second closure member adapted for mounting on said second receptacle portion; wherein said first closure member and said second closure member each have a structured surface and a back surface behind said structured surface having no greater extent than said structured surface with said structured surfaces being brought into contact with each other when said first and second receptacle portions are brought together, said structured surfaces including a plurality of solid elements arranged to form grooves extending in a direction along said opening, and the back surface of each of said first and second closure members is provided with an offset strip that extends along a portion of the back surface, the offset strip each having a raised surface, and the raised surfaces are

mounted to said first and second receptacle portions, respectively, in the direction of said grooves while another portion of the back surface of each of said first and second closure members is free from connection to and spaced from said first and second receptacle portions, respectively, so that said first and second closure members are relatively movably connected to said first and second receptacle portions to be pivotal about an axis of connection along the direction of said grooves and to effectively change a separation mode of the closure from that which occurs when such relative movement is not permitted.

5,113,556
BUCKLE

Ryukichi Murai, Toyama, Japan, and Masaaki Endo, Dietzenbach, Fed. Rep. of Germany, assignors to Yoshida Kogyo, K.K., Tokyo, Japan

Filed Nov. 5, 1990, Ser. No. 608,698
Claims priority, application Japan, Nov. 10, 1989, 1-131426[U]; Apr. 27, 1990, 2-45427[U]
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—633 **5 Claims**



1. A buckle having a hollow socket-body and a plug resiliently engaging to and disengaging to be removed from said socket-body, said buckle comprising;

said socket-body, which is built up with an inlet, a front shell, a rear shell, a bottom shell and side shells, which has a resilient pressuring member formed along the peripheral portion of said front shell of said hollow socket-body so as to form a U-shaped slit and which has a resilient engaged member projected from the inlet-side of said rear shell toward said bottom shell to be extended in a hollow chamber in said socket-body and provided with an engaged portion at its fore end portion;

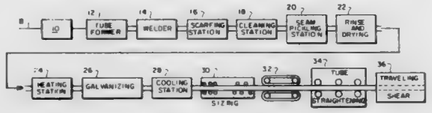
said plug, which is built up with a plug-body and a pair of engaging members extended from said plug-body toward said socket-body and provided with engaging portions at their fore end portions respectively; and

a locking device which comprises of a locking-plate and a thick pressuring projection projected from the center of the bottom shell-side end portion of the rear face of said locking-plate and which is attached to said resilient pressuring member to make a socket so that, when said pressuring projection is located at the bottom shell-side, even if said locking-plate is pressured toward said resilient engaged member, said pressuring projection can not be brought into contact with said resilient engaged member, and only when said locking-plate is slid to the inlet-side and is pressured toward said resilient pressuring member, said pressuring projection can be brought into contact with said resilient engaged member to deform resiliently said resilient engaged member toward said rear shell for removing said plug from said socket.

5,113,557
APPARATUS FOR PRODUCING GALVANIZED TUBING

Kalyan K. Maitra, Matteson, and Vijay B. Patel, Orland Park, both of Ill., assignors to Allied Tube & Conduit Corporation, Harvey, Ill.

Division of Ser. No. 438,780, Nov. 17, 1989, Pat. No. 5,035,042. This application Mar. 19, 1991, Ser. No. 672,097
Int. Cl.[5] B23P *11/00*; B21K *31/06*
U.S. Cl. 29—33 D **5 Claims**



1. A seam-pickling station for use in a continuous roll-forming mill tubing production line, which line includes a welding station which joins the edges of a strip by forming a welded seam and a scarfing station for removing irregularities resulting from the welding to produce a scarfed area substantially along the welded seam, said seam pickling station comprising:

an acid reservoir;

a wick applicator suitably sized to contact substantially only said scarfed area;

an acid line for connecting said reservoir to said wick applicator;

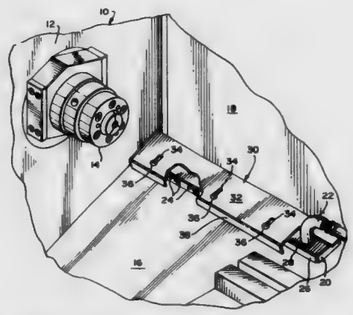
pressurizing means for maintaining pressure within said acid line;

biasing means for maintaining said wick applicator in frictional contact with the scarfed seam area of the advancing tubing.

5,113,558
BED COOLER AND CHIP FLUSHER FOR A MACHINE TOOL

Daniel P. Soroka, Horseheads; Terrence M. Sheehan, Elmira, both of N.Y.; Gary L. Comstock, Gillett, Pa., and Glenn E. Greenall, Horseheads, N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Jul. 18, 1991, Ser. No. 732,105
Int. Cl.[5] B23Q *11/10*; B24B *55/02*
U.S. Cl. 29—57 **12 Claims**



1. A chip flushing device for use with a machine tool, comprising:

a) fluid supply means for delivering a flushing fluid to a chip receiving area of the machine tool;

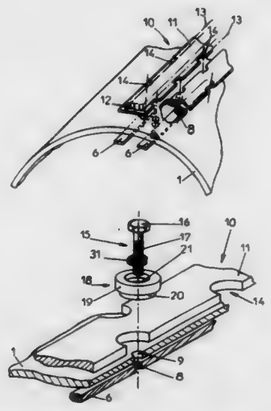
b) said fluid supply means including at least one fluid outlet means adjacent the receiving area for dispensing a stream of fluid to the receiving area; and,

c) fluid deflection means mounted adjacent said fluid outlet means for converting said stream to a laminar flow of fluid.

5,113,559
ROTARY DRUM WITH POINTS FOR A TEXTILE MACHINE, AN OPENER, A DESINTEGRATOR, A TEARER

Robert LaRoche, and Andre Morel, both of Cours-la-Ville, France, assignors to Constructions Mechaniques F. LaRoche & Fils, Cours la Ville, France

PCT No. PCT/FR88/00432, § 371 Date Jul. 5, 1989, § 102(e) Date Jul. 5, 1989, PCT Pub. No. WO89/02000, PCT Pub. Date Mar. 9, 1989
PCT Filed Sep. 1, 1988, Ser. No. 364,435
Claims priority, application France, Sep. 2, 1987, 87 12706
Int. Cl.[5] B02C *18/00*; D01G *15/12*
U.S. Cl. 29—121.1 **7 Claims**



1. A drum for a textile machine, comprising:

a cylinder having an interior and an exterior periphery;

a plurality of apertures formed in the cylinder;

a plurality of longitudinal staves, each having a base plate and a plurality of points, the staves being distributed on the exterior periphery of the cylinder;

a plurality of apertures formed in the base plate;

a plurality of longitudinal bars distributed against the interior periphery of the cylinder;

a plurality of threaded apertures formed in the bars;

means, removably receivable through the base plate apertures, the cylinder apertures and the threaded bar apertures, respectively, for securing the staves to the cylinder, wherein the securing means comprises a plurality of screws, each having a head and threaded shaft;

a plurality of collars, each having a central bore for receiving one of the plurality of screws, the collar further having an enlarged flange for surrounding the head of the screw;

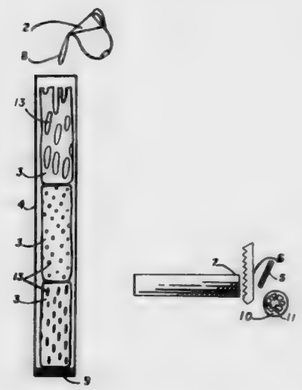
two, parallel spaced flat portions formed on the flange, the width between the flat portions having a width narrower than the diameter of the flange; and

a plurality of exterior half openings cut on two adjacent base plates, the openings having an approximately rectangular form, the length of the half openings being greater than or equal to the diameter of the flange, and the width of the half openings being equal to the width of the flange between the two flat portions.

5,113,560
PROCESS OF PRODUCING CACTUS JEWELRY

Terry A. Bird, R.F.D. 1, Box 1183, Payson, Utah 84651, assignor to Terry Anthony Bird, Payson, Utah

Continuation of Ser. No. 251,301, Sep. 30, 1988, abandoned. This application Jun. 4, 1990, Ser. No. 533,099
Int. Cl.[5] B21F *43/00*; B23P *13/00*
U.S. Cl. 29—160.6 **9 Claims**

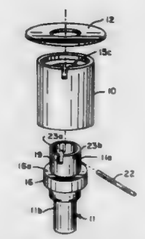


1. A process of producing articles of jewelry from the trunk and stems of the chola cactus which comprises; providing a piece of trunk or stem of chola cactus; removing bark and pith from the piece; placing the piece in a mold having an internal diameter greater than the piece's transverse cross section; pouring molten encapsulating material into the mold to encapsulate the piece; allowing the encapsulating material to solidify; then forming disks containing a plurality of cactus pieces from the encapsulated piece.

5,113,561
STARTER SPRING REWINDER

Wayne A. Scott, Rte. 1, Box 48, Saunemin, Ill. 61769

Division of Ser. No. 455,037, Dec. 22, 1989, Pat. No. 5,072,499, which is a continuation of Ser. No. 272,489, Nov. 16, 1988, abandoned. This application Jun. 11, 1990, Ser. No. 536,296
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—228 **4 Claims**



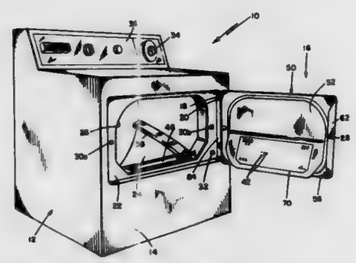
1. A spring rewinder for compressibly rewinding a ribbon-type spring of concentric coils, comprising:

a housing having an interior chamber defined by at least one interior sidewall, said chamber extending through said housing and open at a top and a bottom end;

a ledge formed within said chamber having a generally planar top surface extending around said chamber interior sidewall in a plane generally perpendicular to a longitudinal axis of said chamber, and a bottom surface;

a winder rotatably received within said interior chamber having a handle extending out of said chamber bottom end which is adapted to be grasped and rotated, and a stem extending through and beyond said ledge toward said housing top;
said winder stem, ledge top surface and interior sidewall combining to form a generally annular rewinding compartment;
means formed on said winder stem for receiving and holding an inboard spring end;
an aperture formed through said housing sidewall at about the level of said ledge top surface through which the spring passes in rewinding; and
means for adjusting the effective diameter of said rewinding compartment wherein said means extends into said compartment from said housing sidewall.

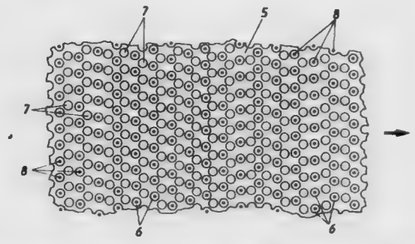
5,113,562
METHOD FOR REVERSING MOUNTING SIDE OF CLOTHES DRYER DOOR ASSEMBLY
Timothy K. Studt, Ripon, Wis., assignor to Speed Queen Company, Lexington, Mass.
Filed Mar. 29, 1991, Ser. No. 677,216
Int. Cl.[5] B21K *21/16;* **B23P** *17/04, 23/00*
U.S. Cl. 29—401.1 **6 Claims**



1. A method comprising the steps of:
disconnecting a door assembly comprising a door panel and an inner liner from one side of a clothes dryer;
inverting the door panel of the door assembly with respect to the inner liner to reverse the respective sides of a handle and hinges of the door assembly while leaving the inner liner in its original orientation; and
reconnecting the door assembly to the clothes dryer so that the door assembly opens from the opposite side.

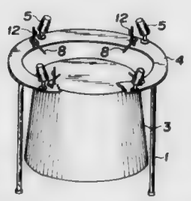
5,113,563
APPARATUS FOR NEEDLING A WEB
Günther Feyerl, Traun, and Franz König, Linz, both of Austria, assignors to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft, Leonding, Austria
Filed Jan. 16, 1991, Ser. No. 642,020
Claims priority, application Austria, Jan. 18, 1990, 102/90
Int. Cl.[5] D04H *18/00*
U.S. Cl. 28—115 **4 Claims**

1. In an apparatus for needling a web, comprising
a needle board extending over a predetermined working width and formed with a multiplicity of holes, the holes being arranged in rows extending over said working width and being adapted to hold needles, the needles being detachably fixed to said needle board and protruding therefrom on one side thereof,
a backing facing and spaced from said needle board on said one side thereof and extending over said working width,
a perforate stripper plate extending between said needle board and said backing over said working width and formed with a multiplicity of holes in register with holes of said needle board,
wherein said needle board is reciprocable transversely to itself to move said needles held in holes of said needle board through holes in said stripper plate to said backing,
the improvement residing in that
said holes of said needle board and said holes of said stripper plate are arranged in a number of at least two groups of said rows, differing groups of said rows alternating with each other,



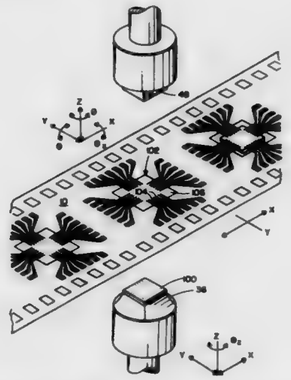
the holes of each row of each group of rows have a uniform hole pitch along said row over said working width, and
the holes of each of said rows of one of said groups of rows are offset along said row from the holes of each of the rows of another of said groups of rows by a distance differing from said hole pitch of the holes of the rows of said one group.

5,113,564
DEVICE FOR UNDOING YARN FROM TUBULAR KNITTED FABRIC
Seiichi Suzuki, Ohta, Japan, assignor to Daisuzu Kogyo Co., Ltd., Gunma, Japan
Filed Jul. 31, 1991, Ser. No. 738,035
Claims priority, application Japan, Jul. 31, 1990, 2-203499
Int. Cl.[5] D02G *1/00*
U.S. Cl. 28—218 **1 Claim**



1. A device for undoing yarn of tubular knitted fabric comprising a rotary trunk for mounting the tubular knitted fabric, a plurality of yarn winding rotary members disposed at a proper distance at an outer extended position upward of the rotary trunk, a drive device for rotating the rotary trunk in a direction opposite to a direction of which the yarn of the tubular knitted fabric mounted on the rotary trunk is undone a device for driving the yarn winding rotary members, a clutch provided on the yarn winding rotary members a device for detecting an amount of length of the yarn to be drawn from the tubular knitted fabric provided on the rotary trunk, and a device for performing the engaging and disengaging operation of the clutch of the yarn winding rotary members and means for intermittent driving operation of the drive device of the rotary trunk on the basis of the amount of the length of the yarn detected by the detecting device.

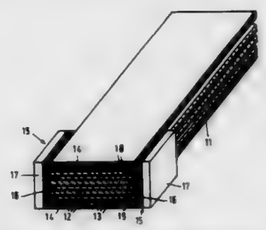
5,113,565
APPARATUS AND METHOD FOR INSPECTION AND ALIGNMENT OF SEMICONDUCTOR CHIPS AND CONDUCTIVE LEAD FRAMES
Thomas M. Cipolla, Junction; Paul W. Coteus; Glen W. Johnson, both of Yorktown Heights, all of N.Y.; Philip Murphy, New Fairfield, Conn., and Christopher W. Oden, Brooklyn, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Jul. 6, 1990, Ser. No. 549,577
Int. Cl.[5] H01L *21/60, 21/58*
U.S. Cl. 29—25.01 **22 Claims**



1. A method for aligning a contact pattern on an electronic device held by a first movable support, with a bond site pattern on a lead frame held by a second movable support, comprising the steps of:
a. creating and storing precise models of contact and bond site patterns;
b. deriving images of said electronic device contact pattern and said lead frame, said electronic device and lead frame to be hereafter moved by said first and second movable supports into a bonding position to enable said electronic device contact pattern to be bonded to bond sites on said lead frame;
c. determining the position of contacts in said imaged contact pattern, and reorienting said contact pattern model to a best fit with said determined contact positions;
d. determining the position of bond sites on said imaged lead frame, and reorienting said bond site model to a best fit with said determined bond site positions;
e. finding positional differences between said reoriented bond site and contact pattern models; and
f. generating signals to reorient said first and second movable supports to minimize said positional differences when said first and second supports are moved into said bonding position.

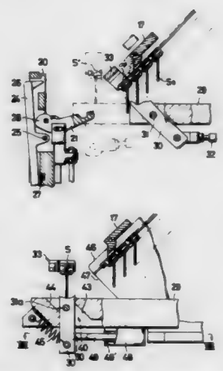
5,113,566
METHOD OF PRODUCING A MULTILAYER PIEZOELECTRIC ELEMENT
Johannes W. Weekamp, and Harry W. J. Pront, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 6, 1991, Ser. No. 651,896
Claims priority, application Netherlands, Feb. 7, 1990, 9000291
Int. Cl.[5] H01L *41/22*
U.S. Cl. 29—25.35 **5 Claims**

1. A method of producing a piezoelectric element said method comprising:
a) depositing an electrically conducting metal electrode layer on a piezoelectric synthetic resin material layer;
b) stacking a number of the resultant metal layer coated piezoelectric synthetic resin material layers in such a manner that alternate edges of the metal electrode layers extend out of two facing sides of the resultant stacked multilayer and the metal electrode layers are separated



from one another by the piezoelectric synthetic resin material layers;
c) subjecting the resultant stacked multi-layer to elevated heat and pressure and then
d) providing the two facing sides with planar electrodes in such a manner that the metal electrode layers are alternatively electrically contacted by one or the other of the planar electrodes.

5,113,567
METHOD OF AND APPARATUS FOR FEEDING AN ARRAY OF SLIDERS
Akio Yunoki, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Aug. 7, 1991, Ser. No. 741,732
Claims priority, application Japan, Aug. 8, 1990, 2-210590; Apr. 11, 1991, 3-108763
Int. Cl.[5] A41H *37/06*
U.S. Cl. 29—408 **4 Claims**



1. A method of feeding an array of sliders one at a time for application onto a stringer chain which comprises the steps of:
(a) holding said array of sliders linearly in a tilted position at an acute angle relative to a horizontal path of travel of said stringer chain;
(b) receiving a leading slider while held in said tilted position and orienting the same to lie flush with said horizontal path of said stringer chain; and
(c) moving said leading slider horizontally forward and transferring the same to a slider applying station for application onto said stringer chain.

2. An apparatus for feeding an array of sliders one at a time for application onto a stringer chain which comprises:

(i) a slider supply chute extending linearly in a tilted position at an acute angle relative to a horizontal path of travel of said stringer chain;

(ii) a slider applying holder having a primary nest for receiving a leading slider for application onto said stringer chain; and

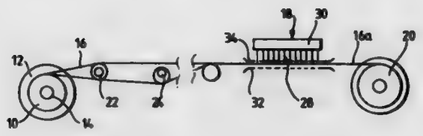
(iii) a transfer carriage unit movable reciprocally horizontally toward and away from said holder and having an arm pivotally connected thereto and a head extending horizontally from said arm, said head having a secondary nest for receiving said sliders one at a time from said chute, said arm being rotatable between a first position in which said secondary nest is held in registry with said chute and a second position in which said secondary nest is oriented horizontally to lie flush with said primary nest.

5,113,568

PRODUCTION OF A SHAPED FILAMENTARY STRUCTURE

Peter G. Lawton, West Hadlow, Albert Promenade, Halifax, West Yorkshire HX2 6AD, and Norman Smith, 5 Badby Leys, Rugby, Warwickshire CV22 5RB, both of England

Division of Ser. No. 6,899, Jan. 27, 1987, Pat. No. 4,955,123.
This application Aug. 24, 1990, Ser. No. 573,552
Claims priority, application United Kingdom, Jan. 28, 1986, 8602003
Int. Cl.[5] B22D *19/14*
U.S. Cl. 29—419.1 **5 Claims**



1. A method of assembling a multiplicity of filaments to form a filamentary sheet in which the filaments are drawn under tension applied to all the filaments, comprising the steps of:

(a) orienting a banana-shaped spreader having a convex and a concave surface to present either the convex or concave surface of the spreader in filament-receiving relation to the multiplicity of filaments;

(b) stretching the filaments over and in engagement with the convex or concave side that is in filament-receiving relation to the filaments to thereby;

(c) spread the filaments across the convex side of the spreader; or

(d) compress the filaments across the concave side of the spreader dependent on the orientation of the convex or concave surface of the spreader relatively to the path of the filaments engaging with it.

5,113,569

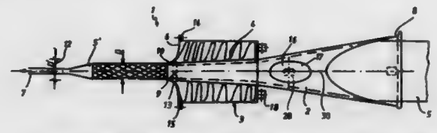
Patent Not Issued For This Number

5,113,570

METHOD AND APPARATUS FOR SHAPING BELT STRAPS TO ENABLE THEM TO BE PULLED THROUGH SUPPORT ROLLER STATIONS

Franz-Albert Steinkötter, Walberberg, Fed. Rep. of Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

PCT No. PCT/EP88/00511, § 371 Date Dec. 11, 1989, § 102(e) Date Dec. 11, 1989, PCT Pub. No. WO88/09760, PCT Pub. Date Dec. 15, 1988
PCT Filed Jun. 9, 1988, Ser. No. 445,717
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719454; Jul. 10, 1987, 3722838
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—433 **20 Claims**



1. A method of pulling a roller belt through a plurality of support roller stations disposed along a tubular roller belt conveying path, each support roller station defining an operating diameter of the tubular roller belt along the conveying path, said method comprising the steps of:

shaping the roller belt into a tubular roller belt having a smaller diameter than the operating diameter of the tubular roller belt, said shaping being performed before the roller belt is pulled through the plurality of support roller stations; and

maintaining the smaller diameter of the tubular roller belt while the tubular roller belt is being pulled through the plurality of support roller stations.

7. An apparatus for drawing a roller belt in a pulling direction through a support roller station arranged along a tubular roller belt conveying path, comprising:

a nozzle for forming a substantially flat roller belt into a tubular roller belt, said nozzle having a decreasing diameter when seen in the pulling direction;

a chamber disposed adjacent to and cooperating with said nozzle; and

a tensioning means disposed in said chamber for tensioning a tubular roller belt in the circumferential direction, wherein said nozzle is disposed in front of and in axial alignment with said support roller station, with its smallest diameter portion nearest said support roller station, when said roller belt is drawn through said support roller station.

5,113,571

METHOD OF MANUFACTURING A CONNECTOR FOR MEDICAL DEVICES

Wayne E. Manska, 1921 Kellogg Dr., Anaheim, Calif. 92807

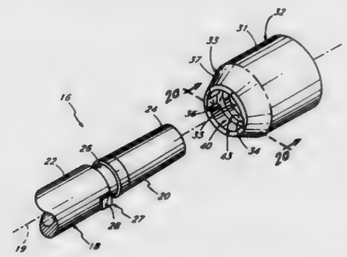
Filed Jan. 29, 1990, Ser. No. 471,549
Int. Cl.[5] B23P *11/02*
U.S. Cl. 29—453 **2 Claims**

1. A method of manufacturing a connector for a medical device, comprising:

(a) providing a first housing having an interlock member and a male luer fitting;

(b) providing first and second types of luer nuts, said first type of luer nut having an interlock member which is complementary to that of said interlock member on said first housing for engaging with said interlock member on said housing to prevent said first type of luer nut from rotating relative to said first housing, said second type of luer nut lacking a complementary interlock member so as to allow relative rotation between said second type of luer nut and the housing;

(c) mounting a luer nut of said first type on the first housing such that said interlock member on the first type of luer nut engages the interlock member on the first housing to prevent relative rotation therebetween;



(d) providing a second housing having an interlock member and a male luer fitting identical to that of said first housing; and

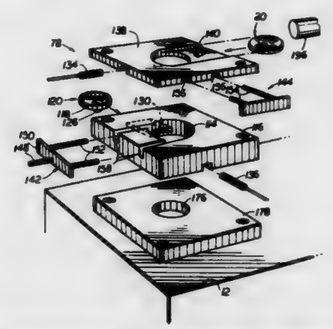
(e) mounting a luer nut of the second type on the second housing without engaging the interlock member on the second housing, such that said second type of luer nut is rotatable with respect to said housing.

5,113,572

MACHINE AND METHOD FOR AUTOMATICALLY ASSEMBLING BUTTONS

Gary M. Trocola, Prospect, Conn., assignor to The Ball and Socket Manufacturing Company of Delaware, Inc., Cheshire, Conn.

Filed Oct. 17, 1990, Ser. No. 599,671
Int. Cl.[5] B23P *19/00*; B23Q *7/10*
U.S. Cl. 29—509 **35 Claims**



1. In a machine having a frame and work station mounted thereon for receiving a series of button shells and a succession of button backs to be assembled with the shells, an assembly apparatus comprising

first and second feeders mounted on the frame for respectively advancing button shells and button backs along first and second feed paths in intermittent feeding movements to the work station,

a locating jig positioning a shell and a button back in nested relation with one another in the work station, the locating jig including a closing die,

a locating head having a shell locating die cooperating with the closing die of the jig, the locating head and jig being relatively movable toward and away from one another for closing the shell about the button back, and

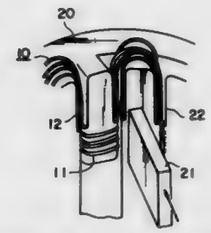
power means for effecting relative movement of the locating head and jig to close the shell about the button back during dwells between feeding movements of the button shells and button backs.

5,113,573

STATOR MANUFACTURING METHOD

Ryoichi Taji, and Takashi Takizawa, both of Himeji, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Apr. 24, 1991, Ser. No. 690,248
Claims priority, application Japan, Apr. 26, 1990, 2-108640
Int. Cl.[5] H02K *15/06*
U.S. Cl. 29—596 **6 Claims**



1. A stator manufacturing method in which a coil is wound on a ring-shaped core having a plurality of axially oriented teeth with coil accommodating slots defined therebetween, comprising the steps of:

preforming said coil into a chevron-shape before mounting on said core, said chevron-shaped coil comprising lower coil portions (11) positioned within an inner diameter of said core, leg coil portions (12) positioned at the diameter of said slots and having substantially the same configuration as said slots, upper coil portions (13) positioned between said leg coil portions, and transition coil portions (14) positioned between said lower coil portions and said leg coil portions;

axially inserting said preformed coil into an upper face of the core, such that lower ends of said leg coil portions axially enter corresponding front ends of the slots and traverse a length of said slots until said upper coil portions contact upper ends of corresponding teeth; and

bending said lower coil portions around lower end portions of the teeth of said core.

5,113,574

PROCESS AND DEVICE FOR THE CONNECTION OF ARMATURE COIL WIRES WITH THE LAMELLAS OF A HOOK-COLLECTING DEVICE

Lothar Nuss, Offenbach, Fed. Rep. of Germany, assignor to Stapla Ultraschall-Technik GmbH, Fed. Rep. of Germany

PCT No. PCT/DE89/00668, § 371 Date Jun. 19, 1990, § 102(e) Date Jun. 19, 1990, PCT Pub. No. WO90/04864, PCT Pub. Date May 3, 1990
PCT Filed Oct. 19, 1989, Ser. No. 477,930
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1988, 3835818
Int. Cl.[5] H01R *43/04*
U.S. Cl. 29—597 **10 Claims**

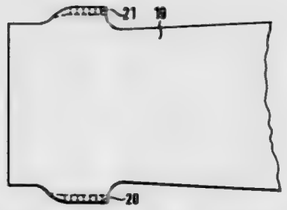
1. A method for producing an electrically-conducting and mechanically solid connection between insulated armature winding wires and wire-engaging hooks on the lamellas of a commutator comprising

engaging said insulated winding wires with said hooks,

before bending the hooks to engage the commutator, at least partially destroying the insulation on the winding wires in the area of engagement with the hooks, thereby producing insulation residue,

bending the hooks to bring the ends of the hooks into contact with the commutator while removing any residue

of insulation from the engaging surfaces by ultrasonic oscillations, and



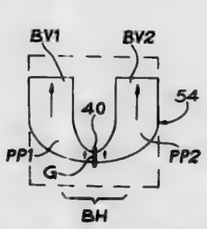
ultrasonically welding said hook ends to the lamellas of the commutator.

5,113,575

PROCESS FOR PRODUCING A MAGNETIC HEAD WITH AN APPROPRIATELY ORIENTED EASY AXIS OF MAGNETIZATION

Jean-Marc Fedeli, Beaucroissant; Hubert Moriceau, St. Egreve; Viviane Muffato, Vif, and Marie-Hélène Vaudaine, Seyssins, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 23, 1990, Ser. No. 571,112
Claims priority, application France, Sep. 6, 1989, 89 11643
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—603 **6 Claims**



1. A process for producing a magnetic reading and/or writing head comprising a magnetic circuit formed on a substrate having a first part comprised by two pole pieces forming a U-shaped structure with two wide vertical branches and a narrow horizontal branch interrupted by a gap, and a second magnetic flux closure part connecting said two vertical branches of the U-shaped structure, and means for the detection and/or creation of a variation of said magnetic flux, said process comprising the steps of:

forming a nonmagnetic spacer on said substrate, said spacer having a thickness equal to a length of said gap and oriented in a first direction;

depositing over said spacer a magnetic layer while applying a magnetic field having a second direction oriented parallel to said first direction, thereby obtaining an easy axis of magnetization in said magnetic layer parallel to said first direction;

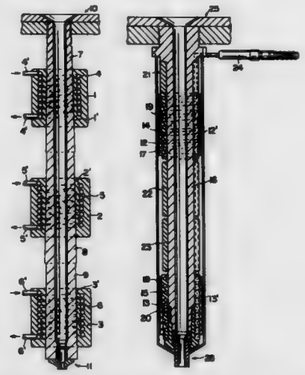
etching said magnetic layer to form said two pole pieces forming said U-shape structure with said two wide vertical branches and said narrow horizontal branch.

5,113,576

PROCESS FOR THE PRODUCTION OF AN INJECTION NOZZLE FOR USE IN AN INJECTION MOLDING DEVICE

Franciscus A. J. van Boekel, Rotterdam, and Anthonie van den Brink, Westmaas, both of Netherlands, assignors to Eurotool B.V., 's-Gravendeel, Netherlands

Filed Feb. 28, 1991, Ser. No. 662,244
Claims priority, application Netherlands, Mar. 1, 1990, 9000485
Int. Cl.[5] H05B *3/00*
U.S. Cl. 29—611 **6 Claims**



1. Process for the production of an injection nozzle for use in a device for molding an object of a thermoplastic material in an injection mold, which nozzle comprises an essentially tubular inner part forming a feed channel for the thermoplastic material, and at least one essentially wire-type heating element which is situated at a distance from the tubular inner part and which is fitted extending over a certain length of the inner part and running several times essentially around the inner part, and which is embedded entirely inside a solid metal tubular body lying in a close-fitting manner around the inner part, said body being obtained by placing the heating element and said metal in a molten state in a mold, so that the heating element is completely enclosed by the molten metal, and subsequently allowing the metal to set, thereafter, removing the essentially tubular metal body thus formed from the mold, and sliding over the tubular inner part up to a particular point, one thusly obtained tubular metal body having a heating element embedded therein, said body having a fully open axially running slit formed in its wall, while the wire-type heating element extends in curved loops running zigzag through the body and extending to the slit.

5,113,577

METHOD FOR PRODUCING A RESISTOR ELEMENT

Andreas Wildgen, Nittendorf/Haugenried, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

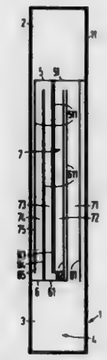
Filed Mar. 28, 1991, Ser. No. 676,570
Claims priority, application European Pat. Off., Mar. 30, 1990, 90106138.2
Int. Cl.[5] H01C *17/06*
U.S. Cl. 29—620 **3 Claims**

1. In a method for producing a resistor element having a substrate, end regions, a resistor layer applied to the substrate, a resistor array formed by cutting the resistor layer, and the resistor array having a resistance with a set-point value between the end regions, the improvement which comprises:

cutting apart the resistor layer according to a predetermined cut structure;

forming the resistor array between the end regions on the substrate in the form of at least one resistor track having a substantially constant width and constant cross section;

forming two comb-like cut configurations each having a main cut and a plurality of secondary cuts originating at the respective main cut and extending in a direction towards the other main cut;



disposing the secondary cuts of the comb-like cut configurations intermeshed with one another and spaced apart from one another;

setting the resistance of the resistor array below the set-point value;

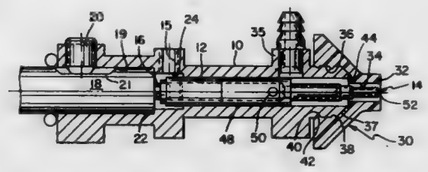
calibrating the resistor element to the set-point value by making a trimming cut in the resistor layer originating in the vicinity of a free end of the secondary cut and extending parallel to the secondary cut as far as the main cut.

5,113,578

TOOL TIP ASSEMBLY FOR SURFACE MOUNT MACHINE

Rodney P. Jackson, Auburn, N.H., and Mark E. Rossmeisl, Beverly, Mass., assignors to Emhart Inc., Newark, Del.

Filed Nov. 29, 1990, Ser. No. 620,147
Int. Cl.[5] H05K *13/04*; **B25J** *15/06*
U.S. Cl. 29—743 **2 Claims**



1. A tool tip assembly for a machine for mounting electronic components comprising

a fixed tool having coaxial front and enlarged rear bores,

a housing having a cylindrical forward portion and a bore extending rearwardly from the front thereof,

means for removably securing said fixed tool on said cylindrical housing portion with said cylindrical forward housing portion in said enlarged rear tool bore,

a displaceable tool having a rear cylindrical portion slidably received within said housing bore and a reduced diameter cylindrical forward portion,

means for stopping the rearward displacement of said displaceable tool at a selected rear position and

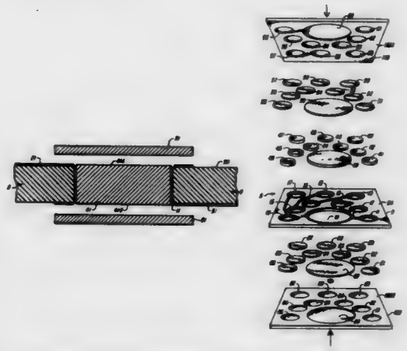
said fixed tool including rearwardly projecting annular bumper means for engaging and stopping the forward displacement of said rear cylindrical housing portion of said displaceable tool at a selected forward position so that when said fixed tool is removed the displaceable tool can be removed from said housing.

5,113,579

METHOD OF MANUFACTURING HYBRID INTEGRATED CIRCUIT

Raymond DiBugnara, Bolton, Mass., assignor to Semicon Components, Inc., Burlington, Mass.

Division of Ser. No. 375,033, Jun. 30, 1989, Pat. No. 4,979,076.
This application Aug. 29, 1990, Ser. No. 575,144
Int. Cl.[5] H05K *3/34*
U.S. Cl. 29—840 **7 Claims**



1. In a method of mechanically and electrically coupling an electrical component within an aperture extending through a circuit board, said circuit board having at least one circuit element adjacent said aperture, said method including the steps of placing said electrical component within said aperture, the improvement comprising:

placing a preformed disk comprising a fusible material over the aperture in said circuit board so as to completely cover said aperture and at least partially contact said circuit element adjacent said aperture;

applying a mold to said disk and activating said mold so that said disk is at least partially melted and reformed in place, said disk being fused to and hermetically sealed at said electrical component and said circuit element of said circuit board.

5,113,580

AUTOMATED CHIP TO BOARD PROCESS

Jon M. Schroeder, 14301 Bagdad Rd., Leander, Tex, 78641; Joseph F. Long, 1335 Loe Creek Blvd., Austin, Tex. 78746, and Randall J. Hartgrove, 390 2ad St., San Jose, Calif. 95112

Filed Nov. 19, 1990, Ser. No. 617,011
Int. Cl.[5] H05K *3/34*
U.S. Cl. 29—840 **13 Claims**

1. An automated chip to circuit board process comprising:

1) placing ribbed packaged chip means with solid output-input means on a multiple circuitry layer integrated circuit means on a circuit board;

2) pressuring said ribbed packaged chip means to contact pads on said multiple circuitry layer integrated circuit means;

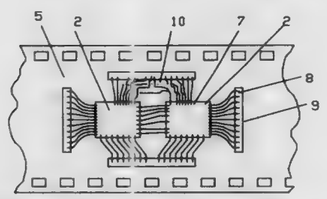
3) soldering an electrically conductive connector means on each rib of said ribbed packaged chip means to pads in said multiple circuitry layer integrated circuit means;

4) feeding multiple component means to proper locations on said circuit board and soldering said multiple component

means to said multiple circuitry layer integrated circuit means.

11. An automated chip to circuit board process comprising:

a) forming a tape for mounting one or more chips in a ribbed chip package means with leads that may cross over each other with a first end of said metal leads being positioned to be bonded to pads on said one or more chip in one



operation and a second end of said metal leads being positioned to be bonded to connectors on said ribbed chip package means in a second operation;

b) mounting chips in said ribbed chip package means using said tape;

c) forming an integrated circuit board and soldering said connectors on said ribbed chip package means to pads connecting with circuitry on said integrated circuit board.

5,113,581

OUTER LEAD BONDING HEAD AND METHOD OF BONDING OUTER LEAD

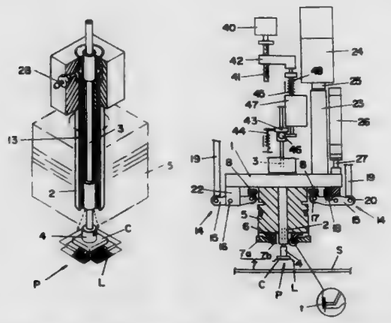
Wataru Hidese, Chikushino, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 13, 1990, Ser. No. 626,060

Claims priority, application Japan, Dec. 19, 1989, 1-330755; Dec. 19, 1989, 1-330756

Int. Cl.[5] H05K *3/30, 3/34*

U.S. Cl. 29—840 **7 Claims**



3. An outer lead bonding head comprising a nozzle shaft having a suction unit to hold a semiconductor or chip semiconductor at a lower end thereof, heating means, and a thermally press-bonding member separate from said heating means at the lower portion of said heating means and movable with respect to said heating means for control of heating of said thermal press-bonding member, said thermal press-bonding member for thermally press-bonding to the circuit board outer leads of the semiconductor or chip placed on a circuit board by said suction unit.

4. A method of bonding outer leads comprising the steps of moving down a nozzle shaft, placing a semiconductor chip suctioned to the lower end of said nozzle shaft on a circuit board, preheating a thermally press-bonding member, then moving down the thermally press-bonding member, pressing the outer leads of the semiconductor chip to the circuit board, using a weak force then further pressing the thermally press-bonding member using a stronger force to strongly press the outer leads to the circuit board, then moving up the thermally press-bonding member to release the pressing state, thereby providing thermally press-bonding of the outer leads to the circuit board.

7. A method of bonding outer leads, comprising the steps of moving down a nozzle shaft, placing the outer leads of a semiconductor chip suctioned to a suction portion at the lower end of said nozzle shaft onto electrodes of a circuit board, then moving down a thermally press-bonding member heated by a heating means, pressing said press-bonding member onto the outer leads, thereby to melt said electrodes, subsequently blowing a chilled gas to said press-bonding member to cool the press-bonding member and the electrodes, and raising the press-bonding member to release the pressure, thereby providing thermally press-bonding of the outer leads onto the electrodes formed on the circuit board.

5,113,582

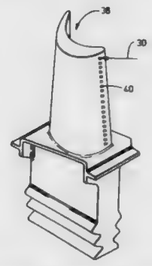
METHOD FOR MAKING A GAS TURBINE ENGINE COMPONENT

Paul J. E. Monson, Loveland; Todd J. Rockstroh, Maineville; Seetha R. Mannava, Cincinnati, and Robert E. Baeumel, West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 13, 1990, Ser. No. 614,367

Int. Cl.[5] B23K *20/08*

U.S. Cl. 29—889.2 **13 Claims**



8. A method for bonding a layer of material to a surface of a gas turbine engine component, comprising the steps of:

(a) providing a gas turbine engine component made of a composite material with a multiplicity of fibers contained therein;

(b) applying a laser beam on a selected area of the component surface;

(c) ablatively removing a layer of composite material from the selected area to expose at least a portion of the multiplicity of fibers nearest the component surface in the selected area by directing the laser beam on the selected area for a chosen duration; and

(d) bonding a layer of material to the selected area.

5,113,583

INTEGRALLY BLADED ROTOR FABRICATION

Steven D. Jenkel, Royal Palm Beach; Donald G. MacNitt, Jr., Singer Island, and Bryant H. Walker, Palm City, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 14, 1990, Ser. No. 582,278

Int. Cl.[5] B23P *15/04*

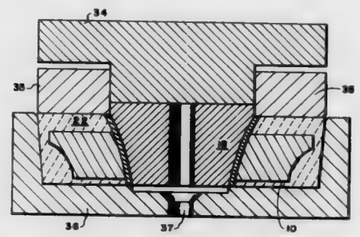
U.S. Cl. 29—889.21 **24 Claims**

1. A method for fabricating an integrally bladed rotor having blades made from a first material having a predetermined desired crystallographic grain orientation, said blades being integral with a disk made from a superalloy having different properties than said first material, wherein said blades are bonded directly to said disk, said method including the steps of:

fabricating said disk by processing a disk preform made of said superalloy material in such a manner that said disk preform becomes superplastic at elevated temperatures, including forming a radially outwardly facing first bonding surface thereupon;

fabricating a blade ring assembly comprising a ring provided with an annular array of radially extending blades of said first material, such that said blade ring assembly has a radially inwardly facing second bonding surface adapted to mate with said first bonding surface of said disk preform;

positioning said blade ring assembly accurately about the periphery of said disk preform with the inwardly facing second bonding surface of said blade ring assembly in mating contact with the first bonding surface of said disk preform;



encasing said blade ring assembly in a protective shell of a ceramic material, and disposing said blade ring assembly, protective shell, and disk preform within a supporting forging die set;

heating said blade ring assembly, protective shell, and disk preform within said forging die set and simultaneously applying pressure thereto to obtain:

a. superplastic deformation of said disk preform at the interface of said first and second bonding surfaces and

b. a solid state diffusion bond at said interface to form an integral assembly;

removing said integral assembly from said forging die set, and removing said ceramic material;

machining said integral assembly so as to obtain the desired configuration; and

heat treating said integral assembly to obtain the desired strength and hardness in the materials thereof.

5,113,584

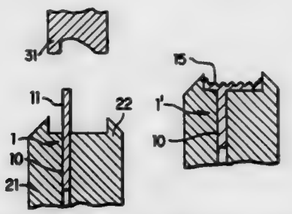
PROCESS FOR MANUFACTURING AN ASYMMETRIC PULLEY FROM A METAL DISK

Helmut Wenzel, Beckum, Fed. Rep. of Germany, assignor to Leifeld GmbH & Co., Ahlen, Fed. Rep. of Germany

Filed Feb. 4, 1991, Ser. No. 621,243

Int. Cl.[5] B21K *1/42*

U.S. Cl. 29—892 **2 Claims**



1. Process for manufacturing a pulley having a circumferential area for guiding a belt and a disk-like hub part which is axially off center with respect to said circumferential area, comprising

providing a flat disk having a central hub part with an axis perpendicular thereto and a radially external circumferential part, said disk made of a formable material,

clamping said hub part in chuck means so that said circumferential part protrudes from said chuck means,

compressing said circumferential part without splitting the material so that the material of said circumferential part is distributed axially off-center with respect to said hub part,

further compressing to flatten the material of said circumferential part to form a cylindrical preform for the circumferential area of the pulley, said cylindrical preform being axially off-center with respect to said hub part, and

forming a final profile for guiding said belt into said preform.

5,113,585

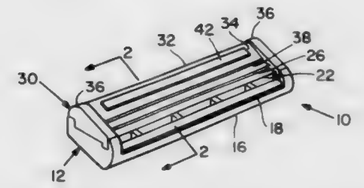
SHAVING SYSTEM

Brian A. Rogers, South Boston, and Mingchih M. Tseng, Hingham, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Sep. 28, 1990, Ser. No. 589,678

Int. Cl.[5] B26B *19/40, 21/14, 21/40*

U.S. Cl. 30—41 **12 Claims**



1. A shaving system of the wet shave type comprising a blade member, and structure defining an external skin engaging portion adjacent the shaving edge of the said blade member,

said skin engaging portion including a shaving aid composite of extrusion-oriented material that includes a matrix of water-insoluble polymeric material selected from the group consisting of polyethylene, polypropylene, polystyrene, and polyacetyl, an effective amount of a water-leachable shaving aid material selected from the group consisting of polyethylene oxide, polyvinyl pyrrolidone, polyacrylamide, hydroxypropyl cellulose, polyvinyl imidazonline, polyhydroxyethylmethacrylate, silicone polymers, sucrose stearate, vitamin E, Panthenol, aloe, and essential oils, and a low molecular weight release-enhancing agent selected from the group consisting of polyethylene glycol, methoxypolyethylene glycol, methylcellulose, and carboxypolymethylene.

5,113,586

DISPENSER COVER FOR CARTRIDGE

Daniel B. Lazarchik, Boston, and Jill M. Shurtleff, South Boston, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Sep. 30, 1991, Ser. No. 768,992

Int. Cl.[5] B26B *21/40*

U.S. Cl. 30—90 **6 Claims**

1. In combination with a razor having a substantially planar body member forming a handle with a concave surface provided with a plurality of sinuous recesses formed therein,

a cover for receiving and retaining a dispenser containing a plurality of safety razor blade cartridges,

said cover comprising wall structure forming a substantially rectangular opening on the bottom thereof for receiving a dispenser therein,

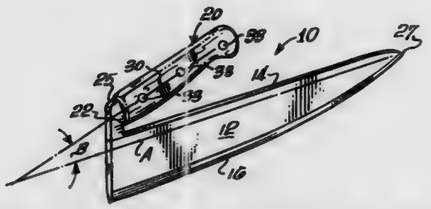
a top wall having an outer surface of convex configuration for mating engagement with the handle concave surface,

and a pair of sinuous upwardly projecting ribs for interfitting engagement with a selected pair of recesses, whereby



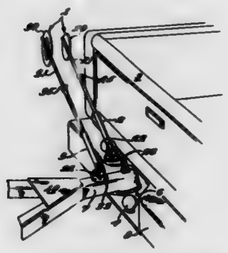
to locate and retain said combination razor and dispenser cover for storage and packaging.

5,113,587
CUTTING INSTRUMENT
Stephen A. Loomis, 12956 Ave. 240, Tulare, Calif. 93274
Filed Feb. 11, 1991, Ser. No. 654,285
Int. Cl.[5] B25G *1/00*; B26B *3/00, 13/26*
U.S. Cl. 30—340 **6 Claims**



1. In a cutting instrument, having a blade member with an edge thereof terminating in a nose portion, said edge being sharpened, means defining an upstanding finger attached to a flat portion of said blade at one end thereof, a handle attached to said finger, said handle extending upwardly toward said nose portion within the plane of said blade member at an acute angle of less than 45 degrees with respect to the upper edge of blade member such that downward force applied to said handle is transmitted directly to said sharpened edge.

5,113,588
ISOMORPHIC TRAILER HITCH ALIGNMENT GUIDE DEVICE
Bob E. Walston, Rt. 8, Box 348, Jacksonville, Tex. 75766, assignor to Bob Walston and Charles Walters, both of Jacksonville, Tex.
Filed Dec. 26, 1991, Ser. No. 813,486
Int. Cl.[5] G02B *5/06*
U.S. Cl. 33—264 **5 Claims**

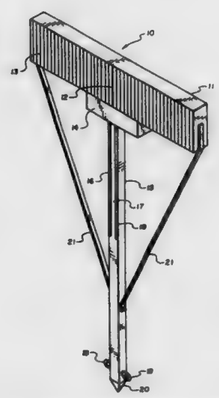


1. A device for facilitating the alignment and subsequent coupling of a towing vehicle to a towed vehicle, wherein the towing vehicle is equipped with a hitch having a hitch ball, and the towed vehicle is equipped with a tongue having a socket, wherein said device consists of:

a) a ball guide having a mounting base, an extension rod, and a male sighting element that is emblematic of a hitch ball; wherein said mounting base has a fastening means for attaching the ball guide to the towing vehicle, and a pivoting-locking means for seating the extension rod and setting an angle of projection of the same; wherein said extension rod has a telescoping-rotating-locking means, which enables the extension rod, which is affixed to the mounting base, to be extended to a desired length, rotated such that the male sighting element is clearly visible to a driver, and locked in position; wherein said male sighting element, which is a fitted on the end of the extension rod, has crossing lines on a frontal portion of the sighting element, wherein said crossing lines act as a visual amplification of deviations from alignment;

b) a socket guide having a mounting base, an extension rod, and a female sighting element that is emblematic of a socket; wherein said mounting base has a fastening means for attaching the socket guide to the towed vehicle, and a pivoting-locking means for seating the extension rod and setting an angle of projection of the same; wherein said extension rod has a telescoping-rotating-locking means, which enables the extension rod, which is affixed to the mounting base, to be extended to a desired length, rotated such that when the hitch ball of the towing vehicle is aligned with the socket of the towed vehicle, the female sighting element is substantially overlaid and aligned with the male sighting element; wherein said female sighting element, which is a fitted on the end of the extension rod, has crossing lines on a frontal portion of the sighting element, wherein said crossing lines, which are substantially co-extensive with the crossing lines on the male sighting element, act as a visual amplification of deviations from alignment.

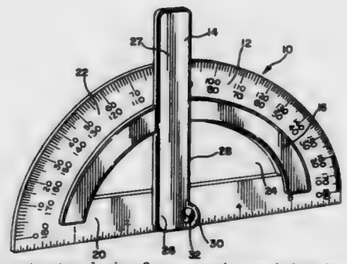
5,113,589
FOOTBALL EXACT YARD MARKER AND METHOD FOR USE
Philip Randolph, 530 E. 115 Noerh, Salem, Utah 84653
Filed Feb. 11, 1991, Ser. No. 653,297
Int. Cl.[5] G01C *15/00*; A63B *67/00*
U.S. Cl. 33—289 **6 Claims**



1. A device for marking the location of a football on a football field comprising a 36 inch view container having two opposite sides containing see through material and having a vertical line on both sides of the see through material lined up exactly opposite each other, said see through material having additional vertical lines about 1 inch apart to aid in locating the

container on the yard side markers and thus keeping it straight, a spirit level under the container to indicate the levelness of the container in relation to the field, a vertical stand which holds up and is attached to the said container, and said stand having a vertical white line existing at least two feet down the center of the standing facing toward the field which can be seen from the opposite side of the field, and black marker lines along both sides of the white line, said stand also containing at the bottom a pointed end for sticking in the ground and chain connecting means on both sidesof the stand for attaching chains thereon.

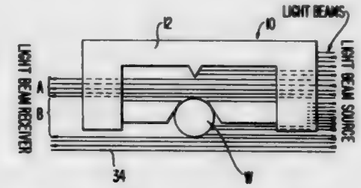
5,113,590
PROTRACTOR
Bruce Shapiro, Northbrook, and Gunar Narubin, Chicago, both of Ill., assignors to Creative Works L.P., Northbrook, Ill.
Filed Jun. 18, 1991, Ser. No. 716,963
Int. Cl.[5] B43L *7/10*
U.S. Cl. 33—471 **5 Claims**



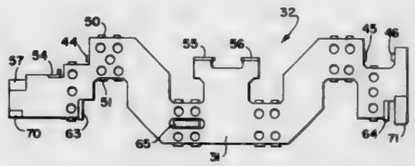
1. A protractor device for measuring and drawing angles, comprising: a generally flat disc having a straight edge portion and a semi-circular portion each having a front surface, said semi-circular portion extends between the respective ends of said straight edge portion so as to define an open area therebetween, said semi-circular portion having angle indicia provided on a first portion of the front surface thereof; an arm member having a first end portion pivotally secured to a central section of said straight edge portion and a second end portion that overlies the front surface of said semi-circular portion, said arm member having a straight drawing edge that aligns with said angle indicia and extends across said open area to form an angle with said straight edge portion; and an arcuate member extending outwardly from a second portion of the front surface of said semi-circular portion, said arm member having a recess formed in a rear surface thereof that receives said arcuate member therein so as to space said second end portion of said arm member from the first portion of the front surface of semi-circular portion during pivotal movement of said arm member.

5,113,591
DEVICE FOR MEASURING OUT-OF-ROUNDNESS
Eugene B. Connelly, Pittsburgh, Pa., assignor to Crucible Materials Corporation, Syracuse, N.Y.
Filed Mar. 20, 1991, Ser. No. 672,683
Int. Cl.[5] G01B *11/30*
U.S. Cl. 33—550 **3 Claims**

1. An apparatus for measuring the out-of-roundness of a cylindrical object comprising, means for projecting a plurality of parallel light beams perpendicular to a plane of a longitudinal axis of said cylindrical object, with said cylindrical object intersecting a first portion of said light beams, means for obstructing a second portion of said light beams positioned centrally along a plane of said longitudinal axis and in spaced apart relation to a surface of said cylindrical object, with a third portion of said light beams passing between said cylindrical object and said obstructing means and a fourth portion of said light beams passing beyond a surface of said cylindrical object opposite the surface in spaced apart relation with respect to said obstructing means, means for rotating said cylindrical object about the longitudinal axis thereof, means for providing a first electrical signal representing a dimension of said first portion of said light beams intersected by said cylindrical object during rotation thereof, means for providing a second electrical signal representing a dimension of said third portion of said light beams passing between said cylindrical object and said obstructing means during rotation of said cylindrical object, means for summing said first and said second electrical signals to provide a third continuous electrical signal representing the difference between said first and said second electrical signals and means for providing a fourth, continuous electrical signal representing a magnitude of any change in said third electrical signal, whereby said fourth electrical signal indicates the magnitude of any out-of-roundness of said cylindrical object.



5,113,592
MASTER PART AND RELEVANT MANUFACTURING PROCESS
Mario Possati, Bologna, Italy, assignor to Marposs Societa' per Azioni, S. Marino di Bentivoglio, Italy
PCT No. PCT/EP89/00314, § 371 Date Jul. 24, 1990, § 102(e) Date Jul. 24, 1990, PCT Pub. No. WO89/10530, PCT Pub. Date Nov. 2, 1989
PCT Filed Mar. 22, 1989, Ser. No. 548,875
Claims priority, application Italy, Apr. 21, 1988, 3423A/88
Int. Cl.[5] G01B *3/30*
U.S. Cl. 33—567.1 **15 Claims**



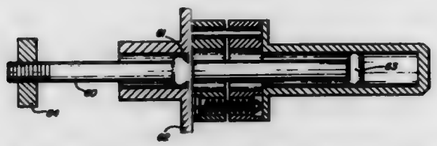
1. A master part for determined workpieces (**30**) defining a plurality of critical features, such as linear dimensions, and shape and geometry features, relating to a three dimensional space, comprising:

a substantially three dimensional support structure (**1**; **31**) in ordinary material, the support structure defining a multiplicity of seats (**4**; **33–38**; **58–60**);

a multiplicity of individual reference elements (**7**, **8**; **41–46**, **50**, **51**, **54–57**, **63**, **70**, **71**) in special material for master parts, the reference elements defining a corresponding multiplicity of precision machined surfaces (**11–13**) and being adjustably arranged in said seats along directions corresponding to variations of said critical features; and

locking devices (**14**, **15**, **17**, **18**, **23–35**) for locking the reference elements in the seats to determine a three dimensional arrangement of said precision machined surfaces corresponding to a determined spatial arrangement of said critical features.

5,113,593
PRECISION PARALLEL MECHANICAL FLOAT
Robert F. Cusack, Grosse Pointe Park, Mich., assignor to GTE Valenite Corporation, Troy, Mich.
Continuation of Ser. No. 624,502, Dec. 7, 1990, Pat. No. 5,068,975, which is a continuation of Ser. No. 269,047, Nov. 9, 1988, abandoned, which is a division of Ser. No. 941,679, Dec. 15, 1986, Pat. No. 4,803,786. This application Sep. 23, 1991, Ser. No. 764,276
Int. Cl.[5] G01B 5/25
U.S. Cl. 33—644 1 Claim



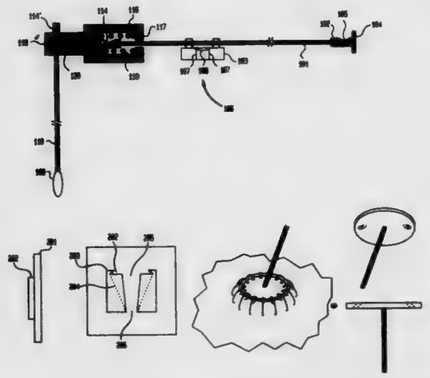
1. Precision parallel float mechanism comprising a base including three substantially spaced registration surfaces in a fixed plane of reference, a relatively displaceable member having three directly opposed corresponding registration surfaces in a substantially spaced parallel plane of reference, three columns each having a pair of peripheral contact surfaces engaging respectively a pair of opposed surfaces, wherein the peripheral contact surfaces of each column tilt with respect to the registration surfaces in response to a predetermined force couple imposed on the parallel planes of reference of said base and displaceable member, lever means with a fulcrum engaging said base, a lever extremity engaging said displaceable member at its center of gravity, and lever extension couterbalance means to support the weight of said displaceable member in any nonvertical orientation of said columns.

5,113,594
OIL LEVEL GAUGE
Yoshimi Ishihara, Aajo, and Kazutaka Otsubo, Okazaki, both of Japan, assignors to Aisin AW Co., Ltd., Japan
Filed May 1, 1991, Ser. No. 693,308
Claims priority, application Japan, May 2, 1990, 2-116382
Int. Cl.[5] G01F 23/04
U.S. Cl. 33—722 8 Claims



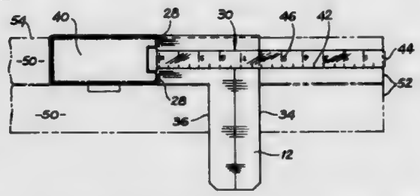
1. An elongated liquid level gauge for use in combination with a tube having an open top for receiving the gauge and an open bottom providing access to an engine fluid, the tube being provided with a flexible clamp for holding the gauge within the tube, said gauge comprising:
a dipstick portion insertable into the tube for contact with the engine fluid;
a tube cover, having a lower surface fixed to one end of said dipstick portion, for engaging the top of the tube and thereby limiting the extent to which said dipstick portion may be inserted into the tube, said cover having an upper surface engageable by said clamping member;
tool engaging means extending from said upper surface for engaging a tool for lifting said gauge out of said tube; and
gauge insertion guide means, carried by said dipstick portion, for engaging the interior of the tube and thereby centering the gauge within the tube.

5,113,595
DART BOARD POSITIONING DEVICE
Ronald W. Emus, Jr., 86 Concord Rd., Billerica, Mass. 01821
Filed Dec. 18, 1990, Ser. No. 629,435
Int. Cl.[5] G01B 5/02
U.S. Cl. 33—759 19 Claims



1. A method for positioning a dart board and a throwing line on a floor by reference to a board elevation and a throwing line distance, comprising the steps of:
a. locating a first line level from the front surface of the board extending to a free end;
b. locating a second line vertically downward from the free end;
wherein the length of the first line is equal to the throwing distance, the length of the second line is equal to the board elevation, the (virtual) junction of the first and second lines forming a right angle; and the junction of the second line and the floor identifying the throwing line; and optionally
c. adjusting the board height; and then optionally
d. performing any or all of the foregoing steps as necessary to properly position the board with reference to the throwing line and the board elevation.

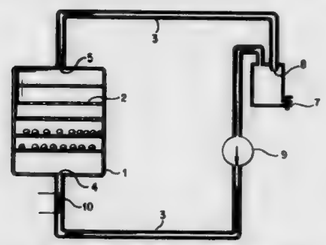
5,113,596
T-SQUARE ACCESSORY FOR TAPE MEASURE
Jack G. Meyers, P.O. Box 537, Tombstone, Ariz. 85638
Filed Jun. 11, 1991, Ser. No. 713,301
Int. Cl.[5] G01B 3/10
U.S. Cl. 33—770 5 Claims



1. A T-square attachment for use in combination with a retractable tape measure, comprising:
(a) a T-square structure, consisting of a ruler portion and a

head portion, wherein said head portion includes a lip to provide a support for sliding and holding said T-structure in firm position against the edge of a straight surface, with a notch placed at the top of and along the centerline of said ruler portion in order to provide a reference mark; and
(b) means located on said head portion for receiving and holding in place a retractable tape measure;
wherein the blade of said tape measure can be extracted perpendicularly to said ruler portion to a desired distance from a given point, as measured by matching the tape marks with said notch, and corresponding parallel lines can be marked along the edges of said ruler on said straight surface;
wherein said means located on said head portion for receiving and holding in place a retractable tape measure consists of a receptacle comprising a left side, a back side, and a right side, of shapes and dimensions suitable for housing a conventional tape measure snugly; and
wherein said left and right sides include curved portions that form hooks for snapping and holding said tape measure in place.

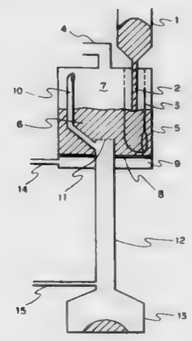
5,113,597
PROCESS FOR DRYING OF PLANT OR ANIMAL MATERIAL
Klaus F. Sylla, Bremen, Fed. Rep. of Germany, assignor to Kohlensaeurewerk Deutschland GmbH, Bad Hoenningen, Fed. Rep. of Germany
Continuation of Ser. No. 328,590, filed as PCT/EP87/00349, Jun. 27, 1987, abandoned. This application Jul. 24, 1990, Ser. No. 556,854
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1986, 3622847; Feb. 16, 1987, 3704773
Int. Cl.[5] F26B 3/00
U.S. Cl. 34—22 13 Claims



1. A process for drying plant or animal material comprising contacting the material in a closed pressurized container with a gas stream which carries away the water to be separated at a temperature between 30° and 80° C. and an elevated pressure ranging from greater than 1 up to 30 bar for from 1 to 48 hours until the material is substantially dry, wherein said gas stream consists of carbon dioxide or a carbon dioxide nitrogen mixture in which the proportion of nitrogen is not greater than 50%.

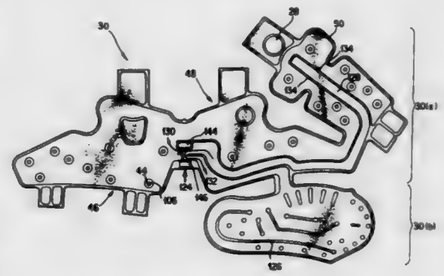
5,113,598
APPARATUS FOR POWDER FALLING GAS-SOLID CONTACTING OPERATION
Shun Wachi, Takasago, Japan, and John G. Yates, London, England, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Oct. 16, 1990, Ser. No. 598,306
Claims priority, application United Kingdom, Aug. 7, 1990, 9017307
Int. Cl.[5] F26B 17/00
U.S. Cl. 34—57 A 4 Claims

1. An apparatus for powder falling type gas-solid contacting operation which comprises a hopper for feeding solid particles, a fluidizing bunker wherein the fed particles are fluidized by introduction of a fluidizing gas, a standpipe for feeding the particles from said hopper to said bunker, the upper end of said standpipe being connected to the bottom of said hopper and the lower end being located in said bunker, and a vertical gas-solid contacting column which is connected to the bottom of said bunker and in which the particles falling down from the bottom of said bunker are brought into contact with a contacting gas fed from the lower part of said column, said apparatus



being characterized in that a vertical tube having a larger diameter than said standpipe is provided in said bunker so as to surround the periphery of said standpipe, said vertical tube extending to a position lower than the lower end of said standpipe, having an opening at the side of its lower end part, with the vertical tube communicating with the space over the fluidized particle layer in said bunker.

5,113,599
ATHLETIC SHOE HAVING INFLATABLE BLADDER
Eric D. Cohen, Belmont; Andrew R. Jones, Roslindale; Jose T. de Castro, Brookline; Paul Litchfield, Worcester, and Steven F. Smith, Taunton, all of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Continuation of Ser. No. 530,854, May 30, 1990, which is a continuation-in-part of Ser. No. 307,566, Feb. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 89,749, Aug. 27, 1987, abandoned. This application Sep. 27, 1990, Ser. No. 588,828
Int. Cl.[5] A43B 7/06, 7/14
U.S. Cl. 36—88 14 Claims



1. An athletic shoe, comprising:
(a) a bladder, said bladder comprising a first sheet of flexible

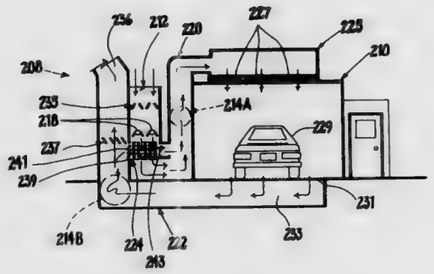
material and a second sheet of flexible material attached together to form said bladder therebetween wherein said bladder includes a first bladder chamber for providing cushioning to a wearer and a second bladder chamber for providing cushioning to the wearer, wherein said first bladder chamber and said second bladder chamber are both formed substantially by said first flexible sheet and said second flexible sheet;

(b) a pump for selectively introducing air to said first bladder chamber and said second bladder chamber;

(c) a channel disposed between said pump and said bladder, said channel providing a substantial portion of a conduit to at least one of said first and second bladder chambers and being formed by said first flexible sheet and said second flexible sheet such that said channel, said first bladder chamber and said second bladder chamber are all formed substantially from said first sheet of flexible material and said second sheet of flexible material; and

(d) a valve disposed between said pump and said bladder for selectively preventing air from being introduced into one of said first and second bladder chambers wherein said valve includes a backer plate having a projection and a backer plate surface, said projection defining a circular opening, and a cam device rotatable disposed within the circular opening, wherein said bladder is disposed between said backer plate surface and said cam device, whereby said backer plate and said cam device pinch selective areas of said bladder to restrict the flow of air in said areas.

5,113,600
COMBINATION PAINT SPRAY BOOTH-DRYING OVEN WITH SINGLE AIR FAN
Steve E. Teichuk, Buffalo Grove, Ill., assignor to Binks Manufacturing Company, Franklin Park, Ill.
Filed Sep. 14, 1989, Ser. No. 407,409
Int. Cl.[5] F26B *19/00*
U.S. Cl. 34—90 **26 Claims**

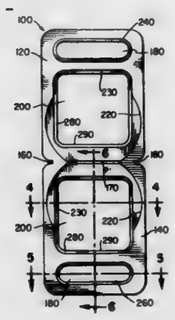


1. A paint spray booth-paint baking oven unit in which an article may be first paint sprayed and then the newly painted article subsequently baked, comprising a single enclosure generally isolated from the environment which functions both as a paint spray booth and subsequently as a paint baking oven, an inlet air supply for said single enclosure, a separate air heater outside of said single enclosure for heating the air supplied to said single enclosure from said inlet air supply when said single enclosure is used as a paint baking oven, and a single air moving fan for moving the air from said inlet supply through and out said enclosure when said single enclosure is used as a paint spray booth and also through said air heater when said single enclosure is used as a paint baking oven, whereby only a single fan is used to supply air to said single enclosure when it functions both as a paint spray booth and also to supply heated air when it subsequently functions as a paint baking oven.

5,113,601

Patent Not Issued For This Number

5,113,602
SNAP-ON KEY COVER
Mark Levine, Plainview, N.Y.; George Bellwoar, Laurel Springs, N.J., and Douglas A. Murphy, Prattville, Ala., assignors to General Automotive Specialty Co., Inc., North Brunswick, N.J.
Filed Nov. 16, 1990, Ser. No. 614,631
Int. Cl.[5] G09F *3/06*
U.S. Cl. 40—634 **7 Claims**



1. A cover for the head of a key, comprising:

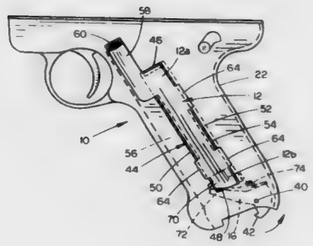
a frame, said frame having two halves connected by a hinge arrangement having a central opening, so that a key blade may fit therein but sufficiently small so that the key head cannot pass through it, each of said halves having a key-ring-receiving opening, said key ring receiving openings being aligned when said frame is folded over onto itself, whereby a key blade may be inserted into said opening and the frame folded over onto itself and locked into position so that the head of the key is covered;

at least one insertable insignia plate comprising a face for bearing an insignia, said face being mounted on a base which is wider than said face, said base also having a back;

at least one of said halves having an insignia-plate-receiving opening, said opening having a lip causing said insignia-plate-receiving opening to be narrower than said base;

said insignia plate being removably insertable into said insignia-plate-receiving opening, said plate prevented from passing through said insignia-plate-receiving opening by said lip.

5,113,603
THUMB RELEASE FOR PISTOL MAGAZINE
John F. Buegel, P.O. Box 1252, Grand Forks, N. Dak. 58206-1252
Filed Oct. 17, 1991, Ser. No. 777,996
Int. Cl.[5] F41A *9/61*
U.S. Cl. 42—7 **5 Claims**



1. A thumb release for the modification of a conventional automatic pistol of the type having a releasable magazine selectively held in position by an operable magazine catch, a hollow handle frame with a generally vertically oriented rectangular opening through a first side thereof, a magazine well within the handle, removable grip plates on the sides of said handle frame and covering said rectangular opening, said magazine catch pivotally mounted on a removable pivot pin, comprising:

a generally planar release lever adapted for slidable mounting in said rectangular opening, to slide vertically therealong;

said release lever having a thumb rest portion projecting generally perpendicularly outwardly from the upper end thereof;

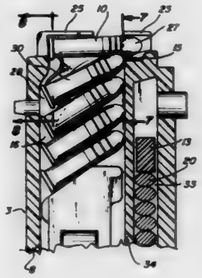
a modified magazine catch adapted for pivotal mounting on said pivot pin, said modified magazine catch comprising:

a hook-shaped lip for retaining said magazine in the magazine well when the catch is pivoted to a locked position, and which pivots rearwardly away from the magazine to release the magazine when the catch is pivoted to a release position;

a lever projecting from said catch of a length to be positioned immediately adjacent and below the lower end of said release lever, such that the release lever will contact the projecting lever to pivot the catch from the locked position to the release position when the release lever is moved downwardly;

a modified grip plate for covering the side of said handle frame with said rectangular opening, having a notch formed therein through which said thumb rest will project when mounted on a pistol handle.

5,113,604
CARTRIDGE MAGAZINE
Emil Vyprachticky, 7713 Webster Way, Arvada, Colo. 80003
Filed Nov. 2, 1990, Ser. No. 608,580
Int. Cl.[5] F41A *9/67*
U.S. Cl. 42—50 **7 Claims**



1. A magazine having a casing for housing cartridges comprising;

a first cartridge holding compartment having a main body portion with sides and end walls and a first dimension between the end walls less than the length of the cartridge to be housed therein wherein the cartridges assume an inclined position to the horizontal when placed lengthwise between the end walls,

a top portion attached to said main body portion, said top portion having a shelf,

said shelf having a second dimension greater than said first dimension for holding the cartridge next to be dispensed on said shelf in a substantially level horizontal position,

an opening in one end of said top portion for receiving and discharging cartridges, guide means for orienting a cartridge from said inclined position to said substantially horizontal level position as a cartridge passes from said main body portion to said top portion, said guide means including partial cover means located above said shelf;

movable follower means disposed in said compartment,

bias means operatively connecting the follower means to a

side of the compartment for urging the follower means in a first direction towards said opening in said compartment,

means carried by said casing for overriding said bias means and for allowing said follower means to move in a second direction away from said opening.

5,113,605

LENGTH-VARIABLE MAGAZINE

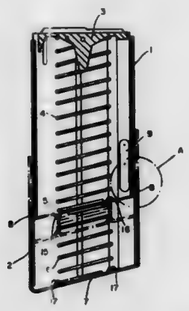
Kwang M. Kim, Kyunggi-Do, Rep. of Korea, assignor to Dae Sam Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 13, 1990, Ser. No. 552,123

Claims priority, application Rep. of Korea, Feb. 6, 1990, 90-1310[U]

Int. Cl.[5] F41A *9/71*

U.S. Cl. 42—50 **3 Claims**



1. A length-variable magazine comprising:

an upper magazine member provided with a pair of projecting members disposed at the bottom portions of both outer end walls thereof and a pair of flat springs disposed at the lower portions of both inner walls, each of said flat springs being provided with a ball projection,

a lower magazine member provided with guide grooves vertically disposed at inner end walls thereof for slidably receiving said projecting members and a pair of securing through-holes disposed at the upper portions of side walls thereof for slidably receiving said ball projections,

a cartridge pad and an upper spring disposed within said upper magazine member for loading cartridges thereon, and

an intermediate pad, a lower spring, and a lower pad disposed within said lower magazine member for supporting the upper spring, whereby upon coupling the upper and lower magazine members, the length-variable magazine can be variably extended or contracted accordingly such that the projecting members are engaged with the guide grooves and the ball projections are engaged with the securing through-holes.

5,113,606

SCENTED LURE

David E. Rinker, P.O. Box 5206, Cottonwood, Calif. 96022

Continuation-in-part of Ser. No. 449,601, Dec. 12, 1989, abandoned. This application Nov. 23, 1990, Ser. No. 617,965

Int. Cl.[5] A01K *85/00*

U.S. Cl. 43—42.19 **8 Claims**

1. A scented lure, comprising:

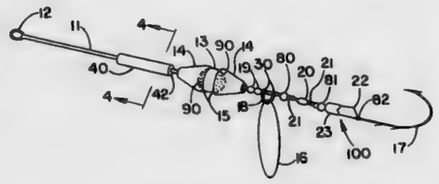
a shaft having a first end and a second end;

first connecting means positioned at said first end of said shaft for connecting said shaft to a fishing line;

second connecting means positioned at said second end of said shaft for connecting said shaft to other fishing equipment;

a slidable bead having a hole therein through which said shaft passes, positioned between said first and second ends of said shaft;

a first bearing positioned between said slidable bead and said first end of said shaft, having a first surface which faces said slidable bead, said first surface having a first recess into which scenting material is inserted and which substantially conforms to said bead,



a second bearing positioned between said slidable bead and said second end of said shaft, having a second surface which faces said slidable bead, said second surface having a second recess into which scenting material is inserted and which substantially conforms to said bead; and,

a spoon lure attached to said shaft between said second bearing and said second end of said shaft.

5,113,607

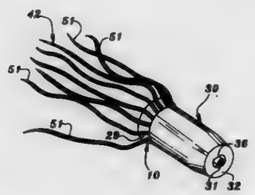
SEGMENTAL FISHING LURE AND METHOD

Wallace F. Pate, P.O. Drawer 458, Georgetown, S.C. 29442

Filed Dec. 26, 1989, Ser. No. 456,527

Int. Cl.[5] A01K *85/00*

U.S. Cl. 43—42.28 **7 Claims**



3. A segmental fishing lure for use with a leader having a loop at one end for releasable attachment to a snap fastener on a fishing line, said fishing lure comprising a core, a shell having a passage large enough to pass over the loop on the leader, a plurality of skirt assemblies, each skirt assembly including a preformed circular skirt ring having a passage large enough to pass over the loop on the leader, said plurality of skirt assemblies being releasably clamped in abutting relation to each other between the core and the shell, each skirt assembly comprising a skirt ring, a band, skirt material extending from the band, means fastening the band to the skirt ring, the passage through each of the skirt rings being of a uniform diameter and each skirt ring including a front wall and a rear wall, and said rear wall being thicker than the front wall, whereby the rear wall of a first skirt assembly extends above the thinner front wall of a succeeding skirt assembly.

5,113,608

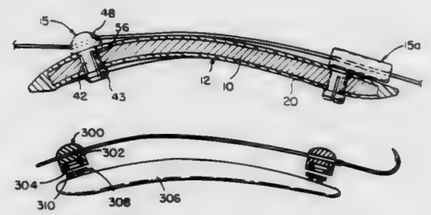
FISHING LINE CONNECTING SYSTEM AND METHOD OF CONNECTING A FISHING LINE TO A LURE OR WEIGHT TO BE MOVED THROUGH THE WATER AND COMPONENTS OF SUCH A SYSTEM

Dan L. Hook, Seattle, Wash., assignor to Just One Good Idea, Seattle, Wash.

Division of Ser. No. 123,046, Nov. 19, 1987, Pat. No. 4,914,849. This application Feb. 9, 1990, Ser. No. 477,721

Int. Cl.[5] A01K *83/06*

U.S. Cl. 43—42.49 **32 Claims**



17. A fishing system for a body such as a weight of the type that is pulled beneath the surface of the water and which system enables the body to be changed on a fishing line coupled to a fishing rod, comprising:

a body, such as a weight;

line-holding connector means releasably joined to the body and joined to said fishing line, said line-holding connector being the only point of attachment between the line and the body;

means for securing the line to the body by securing the connector means to the body by pushing the connector means and body toward one another and for removing the line in its entirety from the body with the connector means remaining on the line by separating the connector means from the body by pulling the connector means and body away from one another so that the body is completely separated from the line and the connector means whereby another body can be attached to the line;

one of said securing means and said body having a permanently opened aperture and the other having a protrusion, the aperture and protrusion having an interference fit, the moving of the connector means and body toward one another obtained said interference fit and the separating of the connector means from the body overcomes said interference fit; and

wherein the fishing line remains on the connector means both when the connector means and body are secured together and when the body and connector means are separated.

5,113,609

PROPULSION APPARATUS

Paul Camilleri, Queensland, Australia, assignor to Foundation Technology Limited, Queensland, Australia

Division of Ser. No. 338,010, Apr. 14, 1989, which is a division of Ser. No. 59,745, Jun. 8, 1987, Pat. No. 4,843,742. This application Dec. 13, 1989, Ser. No. 449,191

Claims priority, application Australia, Jan. 13, 1986, PH6409; Jan. 27, 1989, PJ2467

Int. Cl.[5] E02F *5/06*

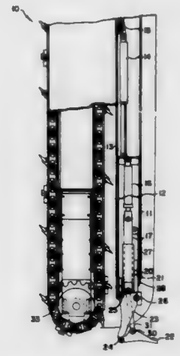
U.S. Cl. 37—87 **22 Claims**

1. Continuously-operable propulsion apparatus for a trenching arm including:

a propulsion element frame;

a continuous propulsion element movable about said propulsion element frame and having an endless propulsion surface engageable between said propulsion element frame and the base wall of a trench;

preload apparatus connected between the trenching arm and said propulsion support frame for urging said propulsion element into engagement with the base wall; and



drive apparatus for moving said continuous propulsion element about said propulsion element frame.

5,113,610

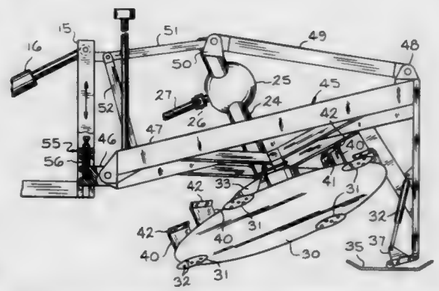
ROTATING DISK TYPE DITCHER

Sylvester Liebrecht, Jr., Rte. #2, 17771, Continental, Ohio 45831

Filed Oct. 31, 1991, Ser. No. 785,533

Int. Cl.[5] E02F *5/08*

U.S. Cl. 37—94 **24 Claims**



1. A ditcher assembly for forming longitudinal soil depressions comprising

a prime mover for moving said assembly in a line of travel corresponding to the longitudinal depression desired,

a rotary ground cutting disk mounted in said assembly,

said disk having a planar orientation generally transverse to said line of travel and leaning opposite to the forward direction of travel of said assembly such that the under face of said disk forms an acute angle with the ground to be cut,

the lower edge of said inclined disk providing the leading cutting edge of said disk,

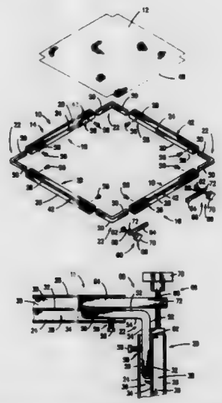
power supply means for rotationally driving said cutting disk,

means for selectively setting the depth of said disk relative to ground to establish a cutting action into the soil at said leading edge,

at least one cutter at the edge of said disk arranged to cut into and loosen the ground with each rotation of said disk, and

means on said disk for throwing the cut soil to one side of the line of travel of said assembly.

5,113,611
EXPANDABLE SCREEN TENSIONING FRAME WITH EXPANSION DEVICES
Gene T. Rosson, 742 E. Lowell St., Lakeland, Polk County, Fla. 33805
Filed May 11, 1991, Ser. No. 694,097
Int. Cl.[5] D06C *3/08*; B05C *17/08*
U.S. Cl. 38—102.7 **14 Claims**

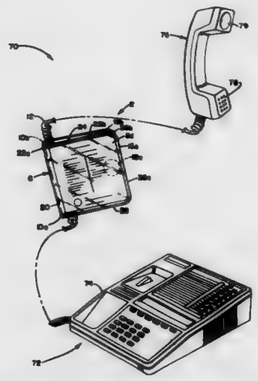


1. A tensioning apparatus for stretching screen fabric comprising an expandable tensioning frame formed by a plurality of cooperative frame members having means for gripping said fabric and a plurality of corner members cooperating with said frame members to operatively support the screen fabric thereon, each frame member includes a first channel having a frictional surface therein, each corner member includes first and second legs, each leg being telescopically disposed within a corresponding first channel of an adjacent end of an adjacent frame member to slidingly engage said frictional surface formed in said corresponding first channel, a plurality of securing means, each securing means secures each leg to said corresponding channel, and each said securing means is movable between a first and second position to selectively engage or disengage said legs to or from said corresponding channels each leg includes a first and second surface, said first surface being held against said corresponding frictional surface by engaging said second surface with said securing means such that engagement between said first surfaces and said corresponding frictional surfaces prevents relative movement between said corner members and said frame members against an inward compression force of the stretched screen fabric when said securing means is in said first position.

5,113,612
METHOD OF PROVIDING A SET OF INSTRUCTIONS
James A. Machen, Plymouth, Minn., assignor to Jamco International, Inc., Eden Prairie, Minn.
Continuation of Ser. No. 393,529, Aug. 11, 1989, which is a continuation-in-part of Ser. No. 51,522, Oct. 20, 1987, Pat. No. 4,856,214. This application Aug. 31, 1990, Ser. No. 576,227
The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.
Int. Cl.[5] G09F *3/00*
U.S. Cl. 40—336 **9 Claims**

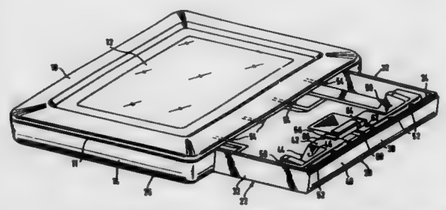
1. A method of providing a user of a telephone with a set of instructions respecting the use and function of the telephone, the telephone having a handset and a telephone base interconnected by an extensible, coiled telephone cord, said method comprising the steps of:

(a) providing an attachable information providing device, said information providing device including a housing having at least one pocket, a card which fits within said pocket and means for attaching said attachable information providing device to the extensible, coiled telephone cord, said card including a set of instructions respective the use and function of the telephone, wherein said set of instructions are readable when the card is located in said pocket; and



(b) attaching said attachable information providing device to the telephone cord so that the set of instructions respecting the use and function of the telephone is readily readable by the user thereof.

5,113,613
STORAGE CONTAINER FOR A PILE OF SHEETS
Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland
PCT No. PCT/EP88/01040, § 371 Date Jul. 6, 1989, § 102(e) Date Jul. 6, 1989, PCT Pub. No. WO89/04990, PCT Pub. Date Jun. 1, 1989
PCT Filed Nov. 15, 1987, Ser. No. 392,979
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1987, 3739498
Int. Cl.[5] G09F *11/30*
U.S. Cl. 40—513 **42 Claims**



1. A storage container for a pile of sheets, said container comprising:

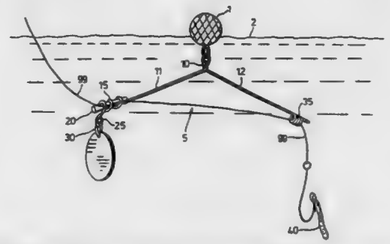
a housing having a top wall, a bottom wall and side walls and a viewing window in said top wall, and having an opening in one of said side walls;

a drawer for holding said pile of sheets, said drawer being reciprocable through said opening relative to said housing in a reciprocation direction parallel to said window between an inner end position and an outer end position, said drawer having a front wall coincident with said opening when said drawer is in said inner end position, said front wall having a substantially straight first edge facing said top wall of said housing; wherein:

said housing comprises a top shell and a bottom shell, said top shell including said top wall and said window and said bottom shell including said bottom wall; and

said shells are assembled along a first plane which lies flush with said first edge of said front wall of said drawer.

5,113,614
FISHING LINE DEVICE
Toshio Morita, 177 Donlands Avenue, Toronto, Ontario, M4J 3P3, Canada
Continuation-in-part of Ser. No. 136,605, Dec. 22, 1987, Pat. No. 4,870,777. This application Jul. 3, 1989, Ser. No. 374,708
Int. Cl.[5] A01K *91/06*
U.S. Cl. 43—42.74 **6 Claims**



6. A hanger for a lure and a continuous fishing line, comprising:

an elongate member with a first arm and a second arm, wherein said first arm has securing means adapted for securing a first portion of the fishing line to said first arm so as to lock said first portion against movement, and said second arm has guide means adapted for guiding a second continuous portion of said fishing line leading to said lure; and

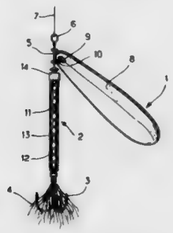
first fish enticing means connected to said first arm:

wherein said securing means includes:

(a) a pin;

(b) a central U-shaped member having first and second arms, said first arm continuing tangentially into a first helical member which turns in a first direction, and said second arm continuing into a second helical member which turns in a second direction opposite to said first direction, said first and said second helical members being coaxial and profiled to accept snugly said pin.

5,113,615
SPINNING SPOON FOR FISHING CARNIVOROUS FISH
Albert Drachkovitch, 58150 Garchy, France, assignor to Astucit, Guerigny, France
Filed May 29, 1991, Ser. No. 707,100
Claims priority, application France, May 29, 1990, 90 06657
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.19 **8 Claims**



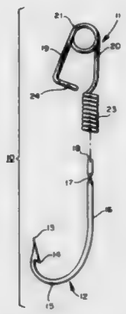
1. A spinning spoon (1, 20) for fishing carnivorous fish, comprising:

a shaft (2) having a hook (3) mounted at one end thereof and having an eye (6) at its opposite end for fixing to a fishing line (7);

a blade (8) able to rotate about said shaft under the effect of the resistance of the water through which the spoon moves;

wherein said shaft (2) comprises, on the side of said eye, a rod (5) about which can rotate a yoke (or swivel 10) connecting one end of said blade (8) to said shaft, and, on the side of said hook, a succession of small masses (11, 17) hinged together in pairs and disposed in a sheath (13) of flexible material fitting loosely over said masses, so that, for the major portion of its length, said shaft is simultaneously heavy, flexible and rectilinear.

5,113,616
FISH LINE TO HOOK SHANK SNAP ON AND RELEASE CONNECTOR
Phillip W. McManus, 1701 Hardy Rd., Grand Prairie, Tex. 75051
Filed Jul. 11, 1990, Ser. No. 551,014
Int. Cl.[5] A01K *91/04*
U.S. Cl. 43—44.83 **10 Claims**



1. A fish line to hook shank snap on and release connector comprising:

an easy connect and disconnect two piece fishhook structure including;

a hook portion having a stem shank and a curved hook section terminating in a pointed and barbed end,

said stem shank being formed with an annular depression adjacent the free end of said stem shank,

a spring biased connect member comprising a coil spring loop having;

a first side forming a spring leg the end of which is formed into a resiliently deflectable stem engaging hook, and

a second side forming an anchoring leg the end of which is formed into a coiled anchor for insertion of said stem shank,

said annular depression held by said stem engaging hook with the force of said coil spring loop.

5,113,617
CHEMICAL HYBRIDIZING AGENTS
Robert G. McDaniel, Tucson, Ariz., assignor to Arizona Board of Regents on behalf of University of Arizona, Tucson, Ariz.
Division of Ser. No. 902,289, Aug. 29, 1986, Pat. No. 4,925,477. This application Mar. 27, 1990, Ser. No. 499,792
Int. Cl.[5] A01H *1/00*; A01N *43/60*; C07F *5/02*
U.S. Cl. 47—58 **10 Claims**

1. A method of producing hybrid seed which comprises:

(a) treating seeds of a plant receptive to said treatment by application of an effective amount of a compound of the formula:



wherein

R and R^2 are hydrogen, alkyl, alkenyl, alkynyl, benzyl, phenyl, halogen or boron and may be the same or different and said alkyl. alkenyl and alkynyl have no more than six carbon atoms;

X and X^1 are fluorine, chlorine, bromine or iodine; nitrate, sulfate, sulfonate, phosphate, citrate, or maleate;

n and n^1 are the integers 0 or 1 and may be the same or different;

m and m^1 are integers from 0 to 4 and may be the same or different;

for a period of time and under conditions sufficient to induce male sterility in adult plants which develop from said treated seeds,

(b) planting the treated seeds and

(c) cross-fertilizing the resulting male-sterile plants with male fertile plants of a different genotype.

5,113,618

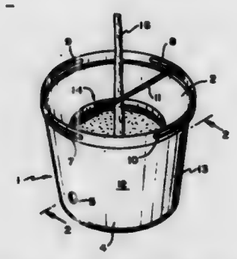
PROTECTOR FOR PLANT GROWING RECEPTACLE

Robert Rigsby, P.O. Box 05865, Fort Myers, Fla. 33905

Filed May 14, 1991, Ser. No. 699,654

Int. Cl.[5] A01G *9/02, 27/00*

U.S. Cl. 47—71 **6 Claims**



1. A protector for a plant growing receptacle comprising a container having an open top, a closed bottom wall and a side wall, a plant growing receptacle having a bottom wall and a drain opening in said bottom wall placed in said container with the bottom wall of the receptacle resting on the closed bottom wall of the container, the container having a greater height and width than the receptacle, whereby the top edge of the container extends a substantial distance above the top edge of the receptacle, to thereby protect the plant from the summer heat, winter cold and blowing winds and a space is provided between the side walls of the container and the receptacle, to thereby form a combined water reservoir and catch basin for collecting run-off rain and irrigation water, and fertilizer leach run-off from the receptacle.

5,113,619

METHOD OF ADHERING BACTERIA TO SEED AND COMPOSITION THEREFOR

Walter T. Leps, 3943 - 55 Street, T6L 1C1 Edmonton, Alberta, Canada, and Bradley G. Thompson, 39 - 3115 - 119 Street, T6J 5N5 Edmonton, Alberta, Canada

Continuation of Ser. No. 303,968, Jan. 30, 1989, abandoned, which is a continuation of Ser. No. 942,460, Dec. 16, 1988, abandoned. This application Oct. 5, 1990, Ser. No. 593,565

Int. Cl.[5] A01C *1/06*

U.S. Cl. 47—57.6 **13 Claims**

1. A method of coating seed with bacteria which comprises applying to seed an inoculant composition comprising a population of bacteria and a concentrated biopolymer naturally secreted by a bacterium, said concentrated biopolymer prepared by providing a medium suitable to support the growth of the bacterium, growing the bacterium, and recovering the biopolymer from the medium, said concentrated biopolymer being substantially unmodified and forming a seed coat in which the population of bacteria is able to survive at least until the germination of the seed; and drying said coated seed.

5,113,620

DEVICE FOR CONNECTING A WINDOW-BOTTOM SECTION OF A VEHICAL DOOR TO A SLIDING SECTION OF A WINDOW LIFT, AND VEHICLE DOOR EQUIPPED WITH THIS DEVICE

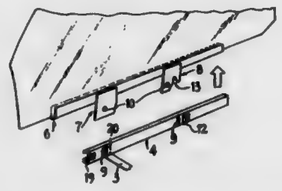
Nicolas Guillaume, Orleans, and Philippe Becerril, Darvoy, both of France, assignors to Rockwell-CIM, France

Filed Apr. 1, 1991, Ser. No. 678,505

Claims priority, application France, Apr. 2, 1990, 90 04189

Int. Cl.[5] E05F *11/38*

U.S. Cl. 49—375 **3 Claims**



1. Device for connecting a window-bottom section (6) of a vehicle door to a sliding section (4) of a window lift (1), possessing means for fastening the second section (4) to the first (6), characterised in that it comprises means (12, 13) for the automatic centering of the sliding section (4) on the window-bottom section (6), said centering means possess a male part (12) integral with the sliding section (4) and a female part (8) integral with the window-bottom section (6), the female part bearing ramps (13*a*, 13*b*) for guiding the penetration of the male part (12) into the female part (8) when joining the sliding section to the window-bottom section, said female part is a plate (8), in which a notch (13) having substantially a V-shaped profile is made, the edges (13*a*, 13*b*) of which notch form the said guiding ramps for the male part (12), which is formed, for example, by a tab cut out of the sliding section (4) and projecting laterally from the latter, in order to be able to slide on one (13*a* or 13*b*) of the ramps of the downwardly open V-shaped notch (13) when the sliding section (4) is put in place.

5,113,621

ACCUSET MICROMETER LATHE

David B. Grimes, Greenfield, Mass., assignor to Montague Industries, Inc., Turners Falls, Mass.

Filed Aug. 22, 1989, Ser. No. 396,657

Int. Cl.[5] B24B *53/04*

U.S. Cl. 51—5 D **5 Claims**

3. In a pulp-grinding machine of the type having a rotatable, cylindrical grinding stone for breaking down logs and grinding them into fibers, wherein the stone has a series of helical grooves in its grinding surface and the machine has a movable plunger within a cylindrical carriage that allows the plunger to be lowered so that a burr on the plunger fits into the grooves to resharpen them as the carriage and plunger make an axial pass across the stone, the improvement comprising an electronic apparatus for positioning the burr in contact with the grinding stone, said apparatus comprising:

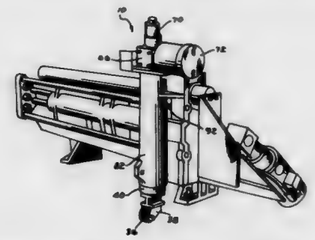
a. a variable speed, reversible electric motor coupled to the plunger, wherein the motor moves the plunger toward or away from the grinding stone;

b. a transducer, affixed to the plunger, that generates electric signals in response to vibrations created as a result of contact between the burr and the rotating grinding stone;

c. an electric signal processing means wired to the transducer and motor for processing the signal from the transducer to control the electric motor in moving the plunger;

d. an electric measuring means engaging a shaft affixed to the plunger and wired to the signal processing means for electronically identifying the position of the plunger relative to the grinding stone and for transmitting the position identity to the electric signal processing means;

e. a worm-gear assembly mounted between the plunger and electric motor so that an end of the worm gear receives a



shaft from the motor that rotates in an axis that is not perpendicular to the axis of rotation of the grinding stone and an other end of the worm gear engages a top end of a ball screw, affixed to the plunger, rotating it in an axis that is perpendicular to the axis of rotation of the grinding stone;

f. a ball screw and nut assembly, that includes the ball screw, coupled to the plunger and worm-gear assembly for movement of the plunger in an axis that is perpendicular to the axis of rotation of the grinding stone via the electric motor; and

g. a proximity switch located within a wall of the carriage for electro-mechanically stopping the electric motor, and therefore the movement of the plunger, when the plunger contacts the proximity switch.

5,113,622

APPARATUS FOR GRINDING SEMICONDUCTOR WAFER

Masanori Nishiguchi, and Noboru Gotoh, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 496,516, Mar. 20, 1990, abandoned. This application Aug. 19, 1991, Ser. No. 747,494

Claims priority, application Japan, Mar. 24, 1989, 1-72906; Apr. 10, 1989, 1-90386; Apr. 10, 1989, 1-90387

Int. Cl.[5] B24B *49/00*

U.S. Cl. 51—165.73 **23 Claims**

1. An apparatus for grinding a semiconductor wafer, comprising:

a rotary table having a work stage capable of rotating about a rotation axis;

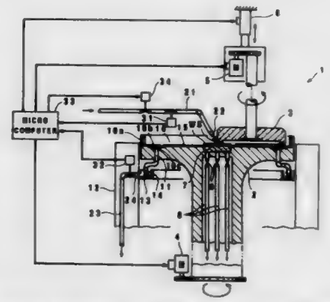
a grinding wheel which is movable in a predetermined direction relative to said work stage while being rotated about an axis parallel to said rotation axis of said work stage;

an inlet flow path for guiding cooling liquid directly on to a grinding surface of said grinding wheel;

an outlet flow path for collecting cooling liquid which flows onto said work stage from said grinding wheel; and

first and second temperature detecting means, disposed respectively in said outlet flow path and said inlet flow path, for detecting a temperature of the cooling liquid in said outlet flow path and said inlet flow path;

circulation enabling means for enabling fluid communication between an upstream side portion of said inlet flow path and a downstream portion of said outlet flow path to circulate said cooling liquid between said inlet flow path and said outlet flow path; and



flow control means disposed in said circulation means, for controlling a flow rate of said cooling liquid based on said temperatures detected by said first and second temperature detection means.

5,113,623

METHOD AND APPARATUS FOR GRINDING THE WORK ROLLS OF A PLANETARY ROLLING MILL

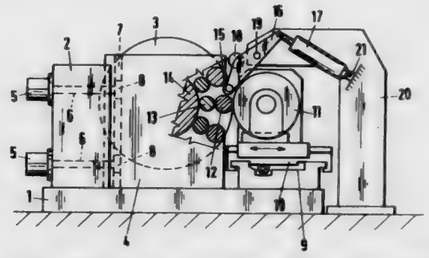
Dieter Figge, and Peter Fink, both of Essen, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 8, 1990, Ser. No. 490,741

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1989, 3907730

Int. Cl.[5] B24B *1/00*

U.S. Cl. 51—289 R **10 Claims**



1. A method of grinding work rolls of a planetary rolling mill, comprising the steps of:

removing a complete planet roll having work rolls, cages and chocks from a roll stand, and clamping the same in a grinding device having a grinding wheel;

grinding the work rolls in an installed condition, one after the other, in a manner wherein (i) cages of the work rolls are in each case held fast in a grinding position for a specific work roll, (ii) the corresponding work roll is moved radially outward so far that it can turn freely with respect to a corresponding intermediate roll, and (iii) the work roll is machined by a corresponding multiple infeed and longitudinal movements of the grinding wheel; and

reinstalling the complete planet roll in the roll stand after grinding.

5,113,624

GRINDING NON-METALLIC HARD MATERIALS

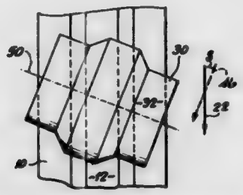
Derek J. Dawson, Bradford, England, assignor to T&N Technology Limited, England

Filed Oct. 5, 1990, Ser. No. 593,731

Claims priority, application United Kingdom, Oct. 7, 1989, 8922640

Int. Cl.[5] B24B *1/00*

U.S. Cl. 51—325 **9 Claims**



1. A method of grinding a required non-planar surface configuration on to a workpiece made of non-metallic material and having a Vickers hardness value up to 5000, the method comprising a first and a second grinding step in each of which a grinding wheel, having a working surface of particles of a material selected from the group of gemstone and synthetic diamond, is applied to the workpiece-with the grinding wheel having a rotational axis which is traversed along a predetermined linear axis relative to the workpiece;

in the first grinding step, the grinding wheel being traversed with the predetermined axis lying in a radially extending plane of the grinding wheel, and the grinding wheel having a working surface shaped such that the workpiece is ground to be intermediate non-planar surface configuration with ridges thereon caused by said particles; and

in the second grinding step, the grinding wheel having a working surface which has been shaped by a tool, the tool having a shaping surface which, if the tool were presented with an axis of traverse of the wheel relative to the tool lying in said radially extending plane of the wheel, would shape the workpiece to said intermediate non-planar surface configuration, the tool, however, being presented with said radially extending plane of the grinding wheel inclined at a selected angle in the range 1 degree to 20 degrees to said linear axis of traverse of the wheel relative to the tool, and, in the second grinding step, said radially extending plane of the wheel being inclined at said selected angle to the inclination of said radially extending plane of the grinding wheel, to thereby shape the workpiece to said required non-planar surface configuration.

5,113,625

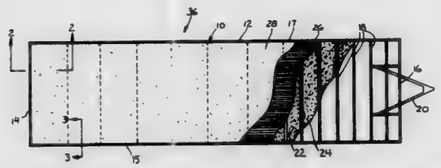
NON-CUMBUSTIBLE MODULAR BUILDING

John M. Davis, Elkhart, Ind., assignor to Miller Structures, Inc., Elkhart, Ind.

Filed Dec. 3, 1990, Ser. No. 622,819

Int. Cl.[5] E04B *1/00*

U.S. Cl. 52—143 **4 Claims**



1. In a modular building including a support framework, said framework including a sub-floor frame means defined by intersecting beams for supporting a floor, side walls and end wall frame means for supporting walls, and a roof frame means for supporting a roof, the improvement wherein said sub-floor frame means includes an integral pan fixedly connected to said side wall means and overlying said intersecting beams corrugated metal sheet overlying said pan a quantity of concrete poured over said metal sheet to define a floor surface substantially flush with an upper edge of said beams.

5,113,626

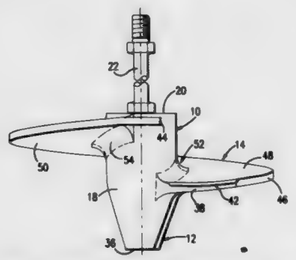
EARTH ANCHOR APPARATUS HAVING IMPROVED LOAD BEARING ELEMENT

Gary L. Seider, and Daniel V. Hamilton, both of Centralia, Mo., assignors to A.B. Chance Company, Centralia, Mo.

Filed Jun. 11, 1990, Ser. No. 535,765

Int. Cl.[5] C02D *5/80*

U.S. Cl. 52—157 **4 Claims**



1. In an earth anchor apparatus including a hub having a longitudinal axis and first and second axial ends, and a load-bearing helix affixed to the hub, the load-bearing helix including a generally radially extending leading edge adjacent the first end of the hub, a generally radially extending trailing edge adjacent the second end of the hub, an inner circumferential section connected to the hub, an outer circumferential section extending radially outward from the inner circumferential section and having an outer circumferential edge separated from the inner section, and a pair of opposed surfaces extending between the inner section and the outer edge and defining a thickness of the helix, the improvement comprising:

the outer circumferential section of the helix including a thickened region adjacent the point of intersection between the trailing edge of the helix and the inner circumferential section of the helix, the thickness of the outer circumferential section of the helix decreasing in all directions away from the thickened region, the thickness of the outer circumferential section decreasing substantially continuosly in the radial direction between the thickened region and the outer circumferential edge, and circumferentially within a region extending at least 90° around the hub from the thickened region toward the leading edge; and

the inner circumferential section including a generally curved surface extending between the hub and each of the opposed surfaces, each of the curved surfaces defining a first radius adjacent the trailing edge of the helix and a second radius adjacent the leading edge of the helix, the first radius being greater than the second radius.

5,113,627

SIGN AND ANCHOR APPARATUS

Robert L. Jarrett, Sr., 930 Stafford Dr. NW, Christiansburg, Va. 24073

Filed Feb. 19, 1991, Ser. No. 657,414

Int. Cl.[5] E02D *5/74*

U.S. Cl. 52—157 **3 Claims**

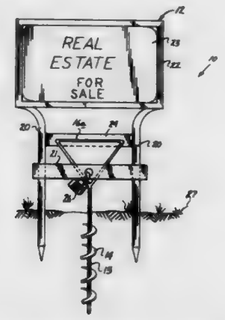
1. A sign and anchor apparatus comprising, in combination,

an anchor member in operative securement with a sign member, and

a lock member to selectively secure the anchor member and sign member together, wherein the anchor member includes a central shaft, with the central shaft including a screw flight mounted adjacent to a lower terminal end of the central shaft, with the central shaft including an upper terminal end, and

a framework member mounted fixedly to the central shaft upper terminal end, and

a plate mounted within the framework member, and



a lock opening directed through the plate, and

the sign member including a plurality of spaced legs including a lower bridge plate mounted orthogonally and fixedly between the spaced legs, each of said spaced legs including a ground penetrating lower pointed end, and the lower bridge plate including a lower bridge plate opening, with the lower bridge plate opening selectively aligned with the lock opening of the plate, and

the lock member selectively mounted to the lock opening and the lower plate opening to secure the anchor member and sign member together.

5,113,628

RAILLESS REFRIGERATOR DISPLAY DOOR

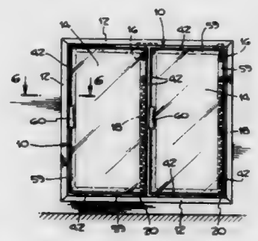
Richard J. Richardson, Simi Valley, and Bennie R. Downing, Thousand Oaks, both of Calif., assignors to Anthony's Manufacturing Company, Inc., San Fernando, Calif.

Continuation-in-part of Ser. No. 585,602, Sep. 20, 1990. This application Jan. 18, 1991, Ser. No. 644,072

The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.

Int. Cl.[5] E06B *3/00*

U.S. Cl. 52—171 **19 Claims**



1. A railless refrigerator display door comprising:

an outside glass panel and an inside glass panel;

a hollow spacer disposed between said glass panels, said spacer extending peripherally adjacent peripheral edges of said panels;

elongated structures disposed between said glass panels, said elongated structures extending peripherally adjacent said peripheral edges of said panels and peripherally about an outer periphery of said spacer;

a door frame extending peripherally about said elongated structures; and

sealant disposed between said panels, said sealant holding together said panels, said spacer, said elongated structures, and said door frame, said door frame having elongated extensions extending inwardly into said sealant adjacent said elongate structures.

5,113,629

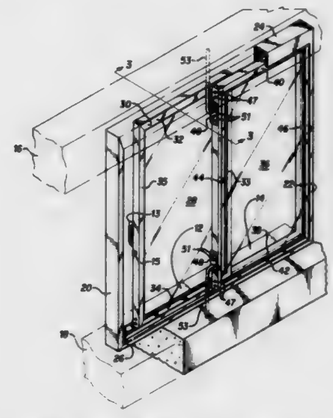
GLASS PANE REMOVAL PREVENTION DEVICE

Arthur W. Carrick, 6300 Stevenson Ave., Alexandria, Va. 22304

Filed Jul. 25, 1991, Ser. No. 735,802

Int. Cl.[5] E06B *1/04*

U.S. Cl. 52—207 **8 Claims**



1. In a dual panel assembly for enclosing an opening bounded by top and bottom sills in a building wall wherein one of a pair of panels is normally adapted for rectilinear horizontal sliding displacement and the other is normally fixed in place, the improvement comprising,

a peripheral channel defining an inwardly facing cavity within said opening and including first and second side channels, a top guide channel and a bottom support channel, said top guide channel and bottom support channel respectively secured relative said top and bottom sills,

said pair of panels comprising sliding and fixed panels each including a frame having inner and outer frame portions and top and bottom frame portions, said second panel inner frame portion having top and bottom edges,

said frame portions are secured together by panel frame securing means,

said panels disposed within said opening with said top and bottom frame portions respectively contained within said cavity of said top guide channel and bottom support channel with said sliding panel normally slideably displaceable between said first and second side channels,

fixation means secured to said fixed panel inner frame portion by tamperproof means and including a vertically disposed leg having an end tip projecting beyond an edge of said inner frame portion of said fixed panel,

one said sill provided with a vertical bore to closely receive and permanently secure said fixation means leg,

said fixed panel having a height intermediate the distance between said top and bottom sills and the distance between said top guide channel and bottom support channel, and

said fixation means located as to obstruct access to said panel frame securing means, whereby

said panel frame securing means are obstructed so as to preclude their removal.

5,113,630

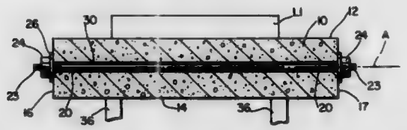
ADJUSTABLE STONE FORMED WORK SUPPORT AND METHOD OF PROVIDING SAME

Donald C. Murray, Graniteville, Vt., assignor to Rock of Ages Corporation, Barre, Vt.

Filed Sep. 5, 1990, Ser. No. 577,574

Int. Cl.[5] E04C *3/10*

U.S. Cl. 52—223 R **21 Claims**



1. A method of increasing the strength of a first stone member for such applications as load bearing, the method comprising the steps of:

(a) providing a first bore hole through the stone member, the bore hole extending through and between first and second outer surfaces of the stone member so as to define first and second openings respectively provided in said first and second outer surfaces;

(b) providing a tendon extending along the length of the bore hole so that said tendon extends through the bore hole and protrudes at each end outwardly beyond one of said openings; and

(c) causing force exerting means on one end of the tendon to react with the stone surface adjacent said one end to exert outward force on the tendon while restraining the other end of the tendon against movement to place the tendon in tension, and thereby cause compressional stress to the stone member in the area surrounding said bore hole so as to increase the resistance of the stone member to a load.

5,113,631

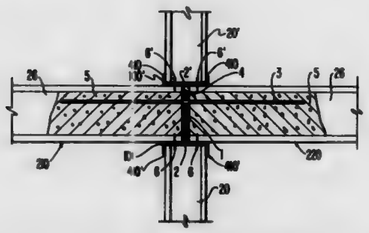
STRUCTURAL SYSTEM FOR SUPPORTING A BUILDING UTILIZING LIGHT WEIGHT STEEL FRAMING FOR WALLS AND HOLLOW CORE CONCRETE SLABS FOR FLOORS AND METHOD OF MAKING SAME

Edward R. diGirolamo, #8 Stengle Pl., Smithtown, N.Y. 11787; Thomas Colasanto, 40 Pinewood Dr., Commack, N.Y. 11725, and Jonathan C. Rothstein, 155 E. 29 St., Apt. 17B, New York, N.Y. 10016

Filed Mar. 15, 1990, Ser. No. 493,794

Int. Cl.[5] E04C *3/294*

U.S. Cl. 52—236.8 **27 Claims**



1. A structural system for supporting a building comprising:

(a) a first level of light weight steel framed, bearing wall panels, each having a bottom end attached to a foundation and a top end for supporting a floor, said bearing wall panels being spaced at predetermined intervals in a first direction along the foundation;

(b) a first level of prefabricated, hollow core concrete floor slabs having top and bottom surfaces, longitudinal sides, and transverse ends, said bottom surfaces of the floor slabs being positioned upon the top ends of adjacent bearing wall panels such that the longitudinal sides of longitudinally adjacent slabs form keyways extending parallel to the first direction and the transverse ends of transversely adjacent slabs for butt joints extending perpendicular to the keyways;

(c) a plurality of connection members including first parts having bottom ends attached to the top ends of the bearing wall panels and extending upwardly to a position below the top surfaces of the floor slabs, said connection members including second parts connected between the first parts and the floor slabs to positively interlock the bearing walls to the slabs thereby forming a unitary structure in which the floor slabs and bearing are interlocked and bearing loads are transmitted via a load path that includes the hollow core concrete floor slabs.

5,113,632

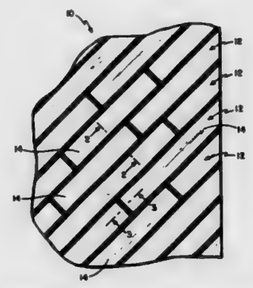
SOLID WOOD PANELING SYSTEM

Ronald A. Hanson, Eveleth, Minn., assignor to Woodline Manufacturing, Inc., Eveleth, Minn.

Filed Nov. 7, 1990, Ser. No. 610,850

Int. Cl.[5] E04B *2/00*

U.S. Cl. 52—385 **6 Claims**



1. A wood paneling kit comprising a plurality of elongated solid wood planks of generally uniform length and width, each plank having a face, opposing sides, and opposing ends, the sides and ends being beveled adjacent the face; at least some of the planks being comprised of two or more elongated boards each having opposing ends beveled adjacent their respective faces, such boards being structurally joined end-to end so that when the planks are assembled side-to side and end-to-end, the joints between boards of a plank have generally the same appearance as the joints between adjacent planks said elongated boards being substantially the same in width however non-uniform in length.

5,113,633

ASSEMBLY FOR PREPARING BUSHY PLANTS FOR PACKING

Bernd Helms, Offenseth-Sparrieshoop; Reiner Peters, Ellerhoop, and Peter Hoppe, Offenseth-Sparrieshoop, all of Fed. Rep. of Germany, assignors to W. Kordes' Sohne Rosenschulen GmbH & Co. KG, Offenseth-Sparrieshoop, Fed. Rep. of Germany

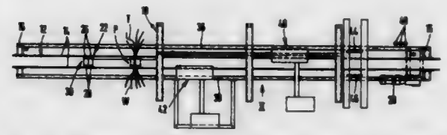
PCT No. PCT/EP90/00214, § 371 Date Oct. 4, 1990, § 102(e) Date Oct. 4, 1990, PCT Pub. No. WO90/09317, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 9, 1990, Ser. No. 585,146

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 3904045

Int. Cl.[5] B65B *27/10, 63/00*

U.S. Cl. 53—513 **8 Claims**



1. An assembly for preparing bushy plants for packing, comprising

a conveyor (**12**) which includes a plurality of retainers (**30**), each retainer (**30**) acting to retain one plant (P), and comprising at least one upwardly open fork (**26, 28**) in which the plant (P) can be placed and at least one bow (**64**) to press down the plant (P), each bow (**64**) being pivotable about a transverse axis, biased by a spring (**73**) in the sense of an opening movement, and adapted to be locked in different closing positions by a ratchet mechanism (**66, 68**), with each bow (**64**) connected to a control member (**72**), and an actuating member (**74**) being disposed in a starting range of the conveyor (**12**) and acting on the control member (**72**) to pivot the corresponding bow (**64**) in a closing direction,

at least one binder means (**40, 42**) for tying together projecting parts (T, W) of each plant (P) held in a retainer (**30**), and

at least one cutter means (**44, 46**) for shortening projecting parts (T, W) of each plant (P) held in a retainer (**30**).

5,113,634

METHOD OF PRODUCING A TENSION PART ANCHORABLE IN THE EARTH

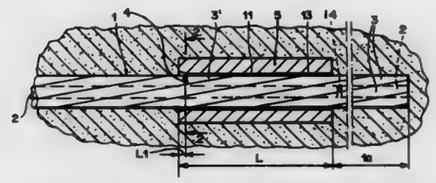
Kurt Lüthi, Gwatt, Switzerland, assignor to VSL International AG, Bern, Switzerland

Filed Jun. 23, 1989, Ser. No. 370,771

Claims priority, application Switzerland, Jul. 6, 1988, 2581

Int. Cl.[5] E04G *21/00;* **E04C** *5/08*

U.S. Cl. 52—741 **3 Claims**



1. A method of producing a tension part anchorable in the earth or in a structure, capable of being stressed, having a central member about which outer members are disposed, a first end and a second end, said second end intended to be inserted into said earth or structure, said tension part intended to be removed for the most part from the earth or the structure after use, comprising the steps of:

completely severing at least one of the outer members of the tension part at a first pre-determined point,

completely severing the central member of said tension part at a second pre-determined point, and

pressing a support element, having a first and second end, said ends corresponding to the respective first and second ends of said tension part, substantially radially about the tension part and in such way that the first predetermined point of severance lies within a range of approximately ½ the length of said supporting element on either side of said first end of said supporting element and said second predetermined point of severance lies beyond said second end of said supporting element.

5,113,635

APPARATUS FOR AUTOMATICALLY FEEDING AND PACKING SURIMI OF FISH OR SHELLFISH

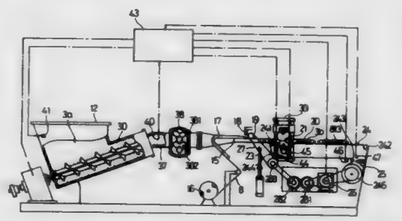
Hiroshi Takai, Tokyo, and Sachio Ishida, Shizuoka, both of Japan, assignors to Nippon Suisan Kaisha Ltd., Tokyo and Ishida Iron Works, Co., Ltd., Shizuoka, both of, Japan

Filed Dec. 24, 1990, Ser. No. 632,682

Claims priority, application Japan, Dec. 28, 1989, 1-343415

Int. Cl.[5] B65B *3/08, 3/26*

U.S. Cl. 53—52 **8 Claims**



1. An apparatus for automatically feeding and packing surimi of fish or shellfish, comprising: a feed hopper having a top inlet for feeding said surimi therefrom and a bottom outlet for discharging said surimi therefrom, a screw feeder connected to said bottom outlet of said feed hopper, said screw feeder having two screws serving to pass said surimi through said screw feeder, a feed pump for feeding a predetermined quantity of said surimi flowing from an exit of said screw feeder, a forming tube for forming into a desired shape said surimi flowing out of said feed pump, a wrapping tube forming means for forming a plastic film into a continuous wrapping tube to be packed with said surimi,

a communication chamber disposed between said screw feeder and said feed pump;

a pressure gauge, disposed at said communication chamber, for detecting a surimi pressure prevailing in said communication chamber;

a level gauge, disposed at said feed hopper, for detecting a level of said surimi in said hopper;

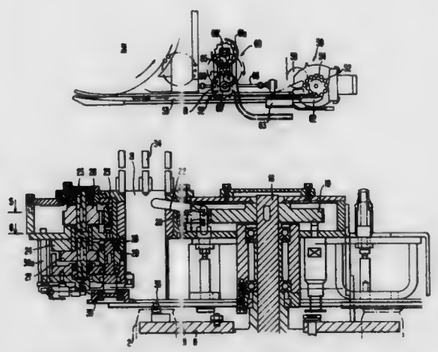
control means for supplying a driving signal to said feed pump only when said level gauge detects said level greater than or equal to a reference level and said pressure gauge detects said surimi pressure in excess of a reference pressure; and

a return path formed between said two screws of said screw feeder.

5,113,636
CAN LID FEEDER

Hirokata Mihara, Tokyo; Koichi Takagi; Teruo Shimizu, both of Nagoya; Katsunori Tashiro, and Hideo Takahashi, both of Sunto, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 291,790, Dec. 29, 1988, abandoned.
This application Jan. 23, 1991, Ser. No. 645,341
Claims priority, application Japan, Dec. 29, 1987, 62-334108; Mar. 25, 1988, 63-39326[U]; Mar. 28, 1988, 63-73658
Int. Cl.[5] B65B *7/28*; B65H *3/32*
U.S. Cl. 53—308 4 Claims

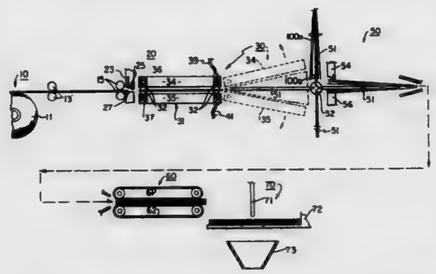


2. A machine for making canned goods, comprising:
a filler for filling can bodies with goods to be packaged therein;
a seaming turret, disposed downstream of said filler in the machine, for securing can lids to can bodies that have been filled by said filler;
a feed conveyor extending between said filler and said seaming turret for conveying can bodies filled by said filler toward said seaming turret; and
a can lid feeder, disposed midway of said feed conveyor between said filler and said seaming turret, for placing can lids on can bodies over openings thereof after the can bodies have been filled by said filler and prior to said can bodies reaching said seaming turret,
said can lid feeder comprising a cylindrical body defining a drop hole therein for accommodating a stack of can lids, a gear box including a housing, a shaft rotatably supported in the housing, a separator fixed to said shaft and capable of separating stacked can lids one by one from the bottom of a stack of such lids when the separator is rotated, and meshing gears operatively connected to the shaft so as to rotate said shaft when the gears are driven, mounting means for supporting said gear box in the feeder so as to be swingable, relative to said cylindrical body about a pivot axis of the gear box spaced from said shaft, between a first position at which said separator is disposed at a location adjacent the bottom of said drop hole while a side surface of the gear box contacts the outer circumferential surface of said cylindrical body and a second position at which said separator is disposed radially outward of said location with respect to said cylindrical body, and fixing means for releasably fixing said gear box relative to said cylindrical body said separator including a rotary body rotatably supported in the can lid feeder and positioned at one side of said cylindrical body adjacent the bottom of the drop hole defined therein, said rotary body having two spaced-apart thread-like grooves extending therein.

5,113,637
NESTED PLASTIC BAGS AND METHOD OF MANUFACTURE

Edward S. Gelbard, 11 av. Princesse Grace, Monte Carlo, Monaco 98000

Division of Ser. No. 322,651, Mar. 13, 1999, Pat. No. 4,989,994.
This application Jul. 25, 1990, Ser. No. 557,926
Int. Cl.[5] B65B *63/00*; B31B *7/74*
U.S. Cl. 53—429 17 Claims

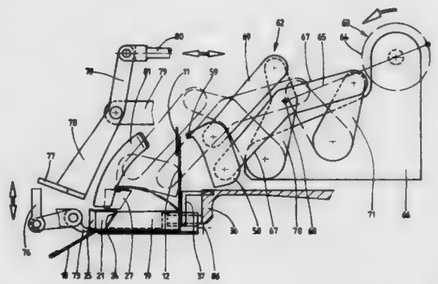


10. An apparatus for manufacturing an article of manufacture comprising a plurality of nested plastic bags for use in lining containers such as waste paper baskets comprising:
means for opening, transporting and successively stacking plastic bags inside one another to form a plurality of nested bags;
means for sealing the upper edges of the plurality of nested plastic bags to each other to form a peripheral bond between contiguous bags, with none of the nested bags adhering to itself, and
means for transferring the plurality of nested plastic bags with sealed upper edges to a packing station.

5,113,638
PROCESS AND APPARATUS FOR PRODUCING (CIGARETTE) PACKS

Heinz Focke, Verden, and Kurt Liedtke, deceased, late of Verden, both of Fed. Rep. of Germany by Ruth Liedtke, legal representative , assignors to Focke & Co., (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Dec. 19, 1990, Ser. No. 629,888
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1989, 3941844
Int. Cl.[5] B65B *7/22, 7/24, 19/20*; B31B *3/00*
U.S. Cl. 53—462 16 Claims

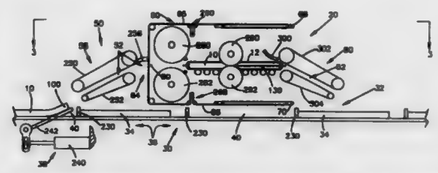


1. In a process for producing hinge lid packs made of a pack blank of cardboard and a collar blank connected therewith, with folding blank tabs being in succession folded to a finished pack position, the improvement comprising the step of temporarily deforming blank portions in an arched shape, during the folding process, such that the effective length of the respective blank portions is shortened.

5,113,639
SELECTIVE ARTICLE WRAPPING

Robert A. Bryson, Huber Heights, Ohio, assignor to AM International Incorporated, Chicago, Ill.

Filed Feb. 19, 1991, Ser. No. 657,680
Int. Cl.[5] B65B *11/48*
U.S. Cl. 53—466 44 Claims

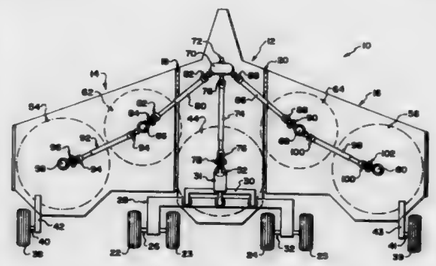


1. A method for wrapping selected articles of a plurality of articles, said method comprising the steps of:
continuously moving a stream of the plurality of articles along a first path;
sequentially moving selected articles from the stream of articles to a second path which extends through a wrapping station, said step of moving selected articles from the stream of articles includes sequentially forming gaps in the stream of articles at locations where the selected articles are sequentially moved from the stream of articles;
sequentially moving the selected articles along the second path, and
wrapping each of the selected articles in turn with wrapping material at the wrapping station,
said step of sequentially moving selected articles along the second path includes sequentially moving the wrapped articles from the wrapping station along the second path back to the gaps in the stream of articles moving along the first path.

5,113,640
ROTARY MOWER WITH FIVE BLADE SETS

Vincent A. Colistro, Humboldt, Canada, assignor to Schulte Industries Ltd., Saskatchewan, Canada

Filed May 13, 1991, Ser. No. 698,966
Int. Cl.[5] A01D *34/66, 50/00*
U.S. Cl. 56—6 11 Claims

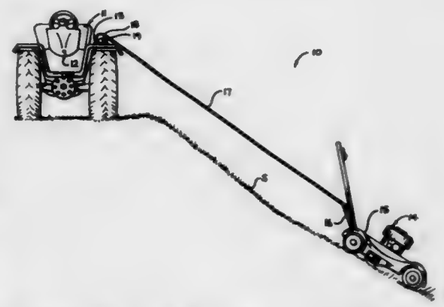


1. A rotary mower for cutting vegetation as the mower advances in a forward direction, the mower comprising:
a centre mower section;
two wing mower sections;
hinge means pivotally mounting the wing sections on opposite sides of the centre section;
a centre cutter mounted on the centre section;
two wing cutters mounted on each wing section, the wing cutters on each wing section including an inner cutter mounted on the wing at a position offset forwardly with respect to the centre cutter, and an outer cutter mounted on the wing laterally outwardly of and to the rear of the inner cutter.

5,113,641
LAWN MOWER CONTROL APPARATUS

Lewis W. Cook, Rte. 66 Box 4-A, and Warren K. Cregger, Box 247, both of Ghent, W. Va. 25843

Filed Mar. 12, 1991, Ser. No. 668,224
Int. Cl.[5] A01D *34/64, 34/86*
U.S. Cl. 56—10.5 7 Claims



1. A lawn mower control apparatus comprising, in combination,
a self-propelled tractor vehicle, the tractor vehicle defined by a longitudinal axis, and
a support member mounted on the tractor vehicle, and
at least a first reversing motor mounted on a top surface of the support member, and
a first spool mounted on the support member, with the first reversing motor coaxially aligned with the first spool defining a further longitudinal axis, and
a first cable wound about the first spool, and
a lawn mower member, the lawm mower member including a housing, and the housing including a rear terminal edge, and
a mounting plate fixedly mounted to the housing contiguously with the mounting plate, and
a first forward end of the first cable mounted to the mounting plate, and
a second reversing motor and a second spool mounted to the second reversing motor, the second spool coaxially aligned with the second reversing motor, and the first reversing motor, the second reversing motor, the first spool, and the second spool coaxially aligned about the further longitudinal axis, and the further longitudinal axis oriented parallel to the longitudinal axis of the tractor vehicle.

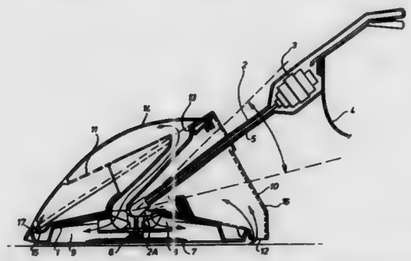
5,113,642
LAWN MOWERS

Ken Dunn, Darlington, United Kingdom, assignor to Electrolux Northern Limited, Newton Aycliffe, England

Filed Apr. 17, 1991, Ser. No. 686,584
Claims priority, application United Kingdom, Apr. 17, 1990, 9008569
Int. Cl.[5] A01D *53/00*
U.S. Cl. 56—12.8 14 Claims

1. A lawn mower comprising a hood, a cutting member mounted for rotation in a substantially horizontal plane within the hood,
a handle for controlling directional movement of the appliance during a cutting operation,

a power source disposed remotely from the cutting member and supported from the handle, and



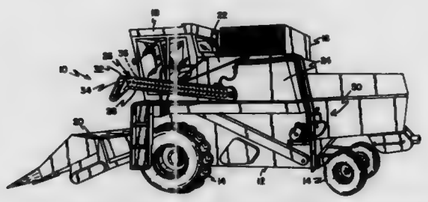
a drive line for drivingly connecting the power source and the cutting member.

5,113,643

DUST SUPPRESSION SYSTEM

Robert C. Peterson, Granite Falls; Kelly B. Pauling, and Russell J. Tepfer, both of Maynard, all of Minn., assignors to KRP Enterprises, Inc., Granite Falls, Minn.

Filed Sep. 12, 1990, Ser. No. 579,996
Int. Cl.[5] A01D *57/00*
U.S. Cl. 56—153 **5 Claims**



1. A mobile combine harvester apparatus for harvesting grains and suppressing dust associated with the harvested grains, the mobile combine harvester apparatus comprising:

a combine vehicle body;

means mounted to the combine vehicle body for harvesting the grains and supplying the grains to an accumulator bin on the combine vehicle body;

an accumulator bin mounted to the combine vehicle body receiving the harvested grains; and

a grain discharge apparatus mounted to the combine vehicle body including:

an elongated housing extending from the accumulator bin and terminating at a discharge opening, the elongated housing having a tubular inner passageway connecting the accumulator bin to the discharge opening;

an elongated auger rotatably mounted within the tubular passageway about a longitudinal axis, the auger transporting the grains from the accumulator bin to the discharge opening during rotation of the auger;

a nozzle mounted to the elongated housing, the nozzle terminating in a spray opening located in the tubular passageway; and

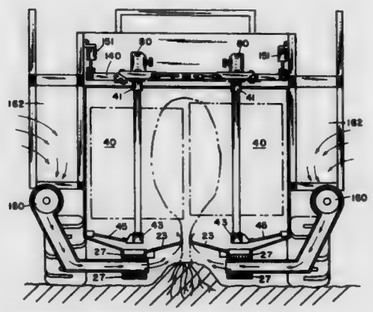
means mounted to the combine vehicle body for supplying dust suppressing fluid to the spray opening of the nozzle, the fluid applied to the grains being transported through the elongated housing to exit the combine harvester apparatus at the discharge opening wherein dust associated with the harvested grains is suppressed, the means for supplying dust suppressing fluid including a pump, a fluid reservoir, a first hose connecting the pump to the nozzle, and a second hose connecting the fluid reservoir to the pump.

5,113,644

BLUEBERRY PICKING MACHINE

Donald Windemuller, 15410 Greenly St., Holland, Mich. 49424, and Wayne A. Vogel, 1291 Maple Island Rd., Fremont, both of Mich. 49412

Filed Jul. 30, 1991, Ser. No. 738,215
Int. Cl.[5] A01D *46/26*
U.S. Cl. 56—330 **34 Claims**



33. A harvesting machine comprising:

a frame for straddling a plant to be harvested;

a pair of spaced, resiliently mounted shaker assemblies depending from said, frame on either side of the area to be occupied by said plant;

means for individually causing said shaker assemblies to reciprocate vertically;

means for catching the picked produce;

continuous conveyor means for receiving said produce from said catching means, said conveyor means having a plurality of apertures therein;

first air source means for supplying a large volume of air under and up through said catching means to assist in gathering the picked produce and through said conveyor means for cleaning said produce, and secondary air source means on each side of said harvesting machine for further cleaning said produce.

5,113,645

TEXTILE MACHINE SERVICE UNIT HAVING A ROVING END EXTENDING APPARATUS

Manfred Hauers, Viersen, and Dieter Vits, Neuss, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

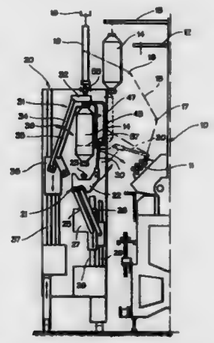
Filed Apr. 11, 1990, Ser. No. 508,054
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1989, 3911765
Int. Cl.[5] D01H *9/10, 9/14*
U.S. Cl. 57—269 **15 Claims**

1. In a traveling service unit of a textile spinning machine, the textile spinning machine being of the type having a bobbin holder for holding a bobbin during the drawing of roving therefrom by a drafting apparatus and a spare bobbin frame for supporting thereon a full bobbin having an axis, an apparatus on the traveling service unit for exchanging a full bobbin supported on the spare bobbin frame for a bobbin supported on the bobbin holder, comprising:

means for temporarily supporting a bobbin, said temporarily supporting means including means for rotating a bobbin supported thereon about an axis of the bobbin in the same respective angular direction relative to the bobbin axis in which roving is unwound from the bobbin;

means for sequentially transferring a bobbin between the bobbin holder, the spare bobbin frame and said temporarily supporting means, said sequentially transferring means being operable to sequentially transfer a full bobbin from the spare bobbin frame to said temporarily supporting means, a bobbin from the bobbin holder to the spare bobbin frame and the full bobbin supported on said temporarily supporting means to the bobbin holder;

means for positioning an end of the roving of the full bobbin in a preferred gripping ready position, said preferred gripping ready position being a linear path along which said roving end extends linearly for ready gripping of said roving end thereat in preparation for subsequent feeding engagement of said roving end, said positioning means including means for applying a suction to said roving end during unwinding rotation of the full bobbin by said temporarily supporting means, said suction applying means having a suction opening positionable at a location outward of said full bobbin for entry of said roving end therein, and a roving end intermediate engaging member positionable for engaging said roving end at a location intermediate the full bobbin and said suction opening of said suction applying means, said suction applying means and said roving end intermediate engaging member being operable in coordination with one another to support said roving end portion as it is extending linearly in said linear path between said roving end intermediate engaging member and said suction opening of said suction applying



means, said suction applying means being movably mounted to the traveling service unit for movement between an initial position in which said suction applying means applies suction to the full bobbin to engage said roving end thereof and a feeding engagement position in which said suction applying means is disposed relative to said initial position of said suction applying means such that said roving end, when it has been engaged by said suction applying means, is moved from the full bobbin in the unwinding direction during movement of said suction applying means from said initial position to said feeding engagement position, said roving end intermediate engaging member being movable between a start position and a finish position, said start position of said roving end intermediate engaging member being at a greater angular displacement from said initial position of said suction applying means than the angular displacement of said finish position of said roving end intermediate engaging member from said initial position of said suction applying means, as measured relative to the axis of the full bobbin, and synchronous movement means for synchronously moving said suction applying means from said initial position to said feeding engagement position and said roving end intermediate engaging member from said start position to said finish position to effect coordinated engagement of said roving end of the full bobbin by said suction applying means and said roving end intermediate engaging member; and

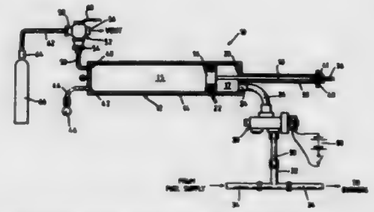
means for gripping said roving end at said preferred gripping ready position for manipulating said roving end into feeding engagement with a bobbin supported on the bobbin holder.

5,113,646

METHOD FOR EVALUATING THE WORKING LINE CHARACTERISTICS OF A COMPRESSOR OF A GAS TURBINE ENGINE

Michael J. Cox, Derby, England, assignor to Rolls-Royce plc, London, England

Continuation of Ser. No. 359,144, May 31, 1989, Pat. No. 5,010,727. This application Dec. 31, 1990, Ser. No. 636,117
Claims priority, application United Kingdom, Mar. 23, 1987, 8706878
Int. Cl.[5] F02C *7/00*
U.S. Cl. 60—39.06 **7 Claims**



1. A method of determining working line characteristics of a compressor of a gas turbine engine of a specific type for which the conditions where the engine will normally surge are known, comprising the steps of:

(a) supplying a transient increase in the flow rate of fuel to the combustion chamber of the gas turbine engine to increase the pressure in the combustion chamber, the transient increase having a predetermined duration and the transient increase having a predetermined peak flow rate of fuel;

(b) detecting whether a surge occurs in said engine during said transient increase in the flow rate of fuel; and

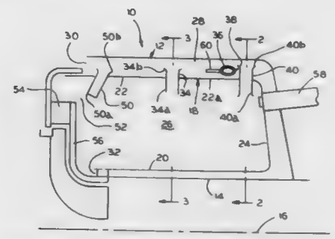
(c) in the event a surge occurs in the engine, comparing the magnitude of the supplied transient increase in the flow rate of fuel to the known conditions for the specific engine to determine the working line characteristics of the compressor of said engine.

5,113,647

GAS TURBINE ANNULAR COMBUSTOR

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

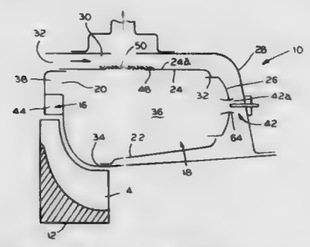
Filed Dec. 22, 1989, Ser. No. 455,588
Int. Cl.[5] F02C *7/22, 3/04*
U.S. Cl. 60—39.36 **15 Claims**



1. An annular combustor for a gas turbine, comprising:

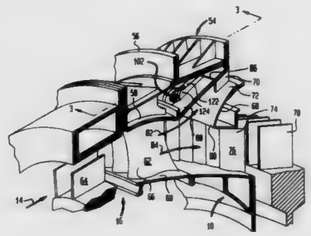
a combustor housing including an axially extending sleeve having an axis;
an annular liner disposed within said housing and about said sleeve and having concentric inner and outer axially elongated walls, said inner and outer walls of said liner being spaced from said sleeve and said housing, respectively, said liner also having a radially extending wall spaced from said housing and interconnecting said inner and outer walls at one end to define a combustion chamber;
said liner being spaced from said housing and said sleeve to define a compressed air flow path, said compressed air flow path extending rom a radially outer compressed air inlet in communication with a source of compressed air to a radially inner compressed air outlet in communication with said combustion chamber, said compressed air outlet being axially remote from said radially extending wall;
means for injecting a liquid fuel to be burned into said liner in a generally tangential direction adjacent said radially extending wall to impact liquid fuel directly onto an inner surface of said outer wall adjacent thereto;
means for centrifuging liquid fuel onto said inner surface of said outer wall to cause an at least partially stabilized stratification of an inner cold air layer, a hot flame layer, a gaseous fuel layer and an outer liquid fuel layer; and
means for igniting a mixture of fuel and air within said combustion chamber.

5,113,648
COMBUSTOR CARBON SCREEN
Jack R. Shekleton, and Ray C. Ramirez, both of San Diego, Calif., assignors to Sundstrand Corporation, Rockford, Ill.
Filed Feb. 28, 1990, Ser. No. 486,132
Int. Cl.[5] F02C *7/05*
U.S. Cl. 60—39.091 **15 Claims**



1. A gas turbine engine, comprising:
a rotor including turbine blades and a nozzle adjacent said turbine blades, said nozzle being adapted to direct hot gases of combustion to said turbine blades to cause rotation of said rotor;
an annular combustor about said rotor and having an outlet to said nozzle, said annular combustor having spaced inner and outer walls interconnected by a generally radially extending wall, said annular combustor also including a combustion annulus defined by said inner, outer and radially extending walls upstream of said outlet;
a housing substantially surrounding said annular combustor in spaced relation to said inner, outer, and radially extending walls thereof, said housing defining a dilution air flow path including a compressed air inlet in communication with a source of compressed air supplying dilution air at one end thereof, said dilution air flow path extending at least part way about said annular combustor;
at least one fuel injector having an air passageway positioned to inject air and fuel into said combustion annulus, said fuel injector extending through one of said walls of said combustor in fluid communication with said dilution air flow path;
at least one dilution air hole in said outer wall of said combustor at a point in said dilution flow air path upstream of said fuel injector, said dilution air hole accommodating communication of said dilution air flow path with said combustion annulus; and
means associated with said dilution air hole for preventing potentially obstructive matter from said combustion annulus from passing through said dilution air hole into said dilution air flow path, said matter preventing means being in contact with said outer wall of said combustor about said dilution air hole in a manner accommodating substantially unimpeded air flow through said dilution air flow path.

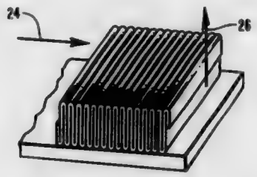
5,113,649
PASSIVE BYPASS VALVE ASSEMBLY
Walter F. Siedlecki, Jr., West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed May 11, 1990, Ser. No. 522,346
Int. Cl.[5] F02K *3/04*
U.S. Cl. 60—226.3 **20 Claims**



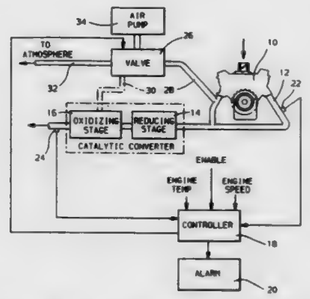
1. A bypass valve assembly for controlling fluid flow in a gas turbine engine comprising:
an annular frame including an outer casing, an inner casing spaced from said outer casing to define a channel for channeling fluid flow and said outer casing including an annular opening therein;
a plurality of circumferentially juxtaposed bypass valve doors disposed in said annular opening, each of said valve doors having an inner surface for facing said fluid flowable in said channel, an outer surface, a first end pivotally connected to said fame, and a second end, said doors being positionable in a first position generally parallel to said outer casing, and in a second position inclined relative to said outer casing, said fluid flow flowable against said door inner surface being effective for generating a fluid force on said door; and
means for automatically positioning said doors in first and second positions in response to differential pressure across said door, said positioning means providing a torque on said doors for moving said door from said first to said second positions and including torque adjustment means for reducing said torque for at least a portion of travel of said doors from said second to said first positions.

5,113,650
REORIENTING GRAIN DIRECTION OF CALENDERED INSULATION SHEET STOCK PERPENDICULAR TO GAS FLOW IN SOLID PROPELLANT ROCKET MOTORS
Kenneth E. Junior, Madison, and James D. Byrd, Huntsville, both of Ala., assignors to Thiokol Corporation, Ogden, Utah
Filed Sep. 18, 1989, Ser. No. 408,233
Int. Cl.[5] F02K *9/32*
U.S. Cl. 60—253 **10 Claims**

1. A method of improving the resistance of fiber filled elastomeric insulation to erosion from combustion gas flow in a solid propellant rocket motor comprising orienting the fiber direction of the grain of the fibers in the elastomeric insulation to a direction in which the direction of the fiber grain is substantially perpendicular to the direction of the flow of combustion gas in the rocket motor.

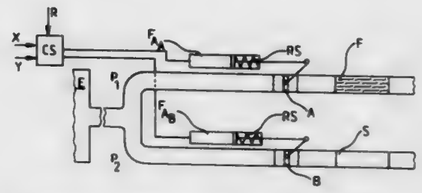


5,113,651
AIR INJECTION SYSTEM DIAGNOSTIC
Joseph M. Kotzan, Clarkston, and Gregory E. Labus, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Apr. 1, 1991, Ser. No. 678,373
Int. Cl.[5] F01N *3/22*
U.S. Cl. 60—274 **3 Claims**



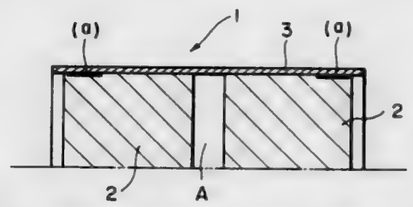
1. A method for diagnosing failures in an air control system that controls a quantity of air admitted into an exhaust path of an internal combustion engine, comprising the steps of:
sensing the oxygen content of the exhaust gas of the engine at predetermined time intervals at a first predetermined point in the exhaust path of the engine, the oxygen content normally oscillating between a rich oxygen condition and a lean oxygen condition in the absence of air injected into the exhaust path above the first predetermined point;
injecting a quantity of air into the exhaust path of the engine at a second predetermined point in the exhaust path, the second predetermined point being above the first predetermined point;
counting the number of intervals at which the sensed oxygen content indicates a rich oxygen condition over a predetermined period of time;
comparing the counted number of rich oxygen intervals to a predetermined threshold value, the threshold value being greater than a counted number of rich oxygen intervals over the predetermined period of time resulting from the normal oscillations between rich and lean oxygen conditions in the absence of air injected into the exhaust path;
indicating the existence of a fault in the air control system when the number of rich oxygen intervals does not exceed the predetermined threshold value.

5,113,652
DIESEL ENGINE EXHAUST SYSTEM
Robert G. Baines, Stowe; Colm M. P. Keegan, Nettleham, and Ralph Coupland, Sudbrooke, all of United Kingdom, assignors to WABCO Clayton Dewandre Aftermarket Limited, Leeds, United Kingdom
Filed Oct. 19, 1990, Ser. No. 600,410
Claims priority, application United Kingdom, Oct. 19, 1989, 8923615
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—288 **8 Claims**



1. An exhaust system comprising a plurality of branched lines for connection to an engine, a valve in each of said branch lines, each of the valves being movable between an open and a closed position wherein the flow of exhaust gas through the respective branch line is at least restricted, a particulate filter in at least one of said branches downstream of said valve, and means for controlling opening and closing of the valves to route exhaust gas flow through a selected one of said branch lines, said control means being responsive to an exhaust braking demand signal to close any open valve and maintain the valves closed.

5,113,653
EXHAUST GAS CLEANING APPARATUS
Masayoshi Usui, Numazu, and Haruo Serizawa, Shizuoka, both of Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka, Japan
Filed Nov. 30, 1989, Ser. No. 443,531
Claims priority, application Japan, Dec. 16, 1988, 63-162401[U]
Int. Cl.[5] F01N *3/28*
U.S. Cl. 60—299 **6 Claims**



1. An exhaust gas cleaning apparatus comprising:
two honeycomb core bodies arranged in flow series and adapted for carrying thereon an exhaust gas cleaning catalyst each of said two honeycomb core bodies having an outer peripheral surface and each of said two honeycomb core bodies being composed of a sheet-like band made of a thin metal sheet and a corrugated band made from another thin metal sheet, said sheet-like band and said corrugated band being superposed one over the other so as to have areas of contact therebetween and so as to define many network-patterned gas flow passages along the central axis thereof;
a metal casing having two opposite ends and being opened at said two opposite ends, said two honeycomb core bodies

being inserted in and fixed to said metal casing with an axial space provided between said two honeycomb core bodies; and

said outer peripheral surfaces of each of said two honeycomb core bodies and an inner surface of said metal casing being fixed together only at both opposite ends of said metal casing continuously around the entire circumference of said outer peripheral surfaces of each of said two honeycomb core bodies, so as to permit thermal expansion of said honeycomb core bodies in said axial space.

5,113,654

SECURING STRUCTURE AND METHOD OF BLADE FOR TORQUE CONVERTER

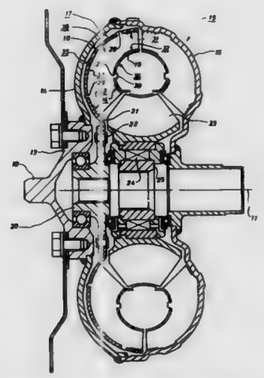
Masayoshi Sakashi, Osaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Continuation of Ser. No. 408,338, Sep. 18, 1989, abandoned. This application Apr. 16, 1991, Ser. No. 686,291

Claims priority, application Japan, Sep. 29, 1988, 63-127660[U]

Int. Cl.[5] F16D *33/00*

U.S. Cl. 60—330 **4 Claims**



1. A securing blade structure for a torque converter including plural blades having a convex outer periphery and a concave inner periphery and each secured at its convex outer periphery to a concave inner surface of a shell with spaces on said shell between said blades, a core ring having a convex outer surface secured to said concave inner peripheries of each of said blades, a tab formed integrally on said convex periphery of each said blade and fitted into a slot in said shell, and a tab formed integrally on said concave inner periphery of said blade and fitted into a slot in said core ring; said blades each having ribs extending in the circumferential direction of said shell and formed integrally on opposite ends of said convex outer periphery and said concave inner periphery of each said blade respectively, said ribs extending along and in contact with said concave inner surface of said shell and said convex outer surface of said core ring, respectively, and being brazed to said shell and said core ring respectively, said ribs formed integrally on opposite ends of said convex outer periphery of said blades are so formed as to extend in the opposite direction to said ribs formed integrally on opposite ends of said concave inner periphery of said blades, and to extend to the concave inner periphery surface side and the convex outer periphery side of said blade.

5,113,655

APPARATUS AND METHOD FOR REMOVING LIQUID CONDENSATE FROM A COMPRESSED-AIR SYSTEM

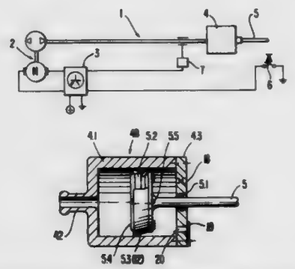
Josef Schumacher, Reutlingen, and Claus Töpfer, Sindelfingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Jun. 4, 1990, Ser. No. 532,570

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1989, 3917964

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—408 **39 Claims**



34. Apparatus for performing mechanical work comprising:

a compressed-air system of the type which is operable to effect a mechanical work performing operation only when subjected to pneumatic positive pressure and is vented to ambient atmospheric pressure when not performing mechanical work,

vacuum pressure applying means for applying vacuum pressure to the compressed-air system which is below ambient atmospheric pressure,

and pressure control means for controlling the vacuum pressure applying means to apply vacuum pressure following application of work performing positive pressure to thereby cause condensation in the compressed-air system to vaporize,

wherein said compressed-air system includes a pressure consumer at which the pneumatic positive pressure is applied to a movable member which performs the mechanical work in response to the subjection thereof to the pneumatic positive pressure,

wherein said movable member is part of a pneumatically operated automotive vehicle door closing system,

and wherein said apparatus includes:

a positive pressure generator,

a vacuum generator,

at least one consumer connectable both to the positive pressure generator and to the vacuum generator and drivable by subjection to positive pressure so as to perform the mechanical work,

a control circuit for the mutually independent electric activation both of the positive pressure generator and of the vacuum generator,

a switching device electrically controllable by the control circuit for alternately connecting the compressed-air system to the positive pressure generator and to the vacuum generator and

a pressure switching device in the compressor-air system electrically connected to the control circuit, for generating electric pressure threshold signals which are fed to the control circuit to trigger:

the switching off of the positive pressure generator, the switching over of the switching device,

the switching on of the vacuum generator when certain positive pressure threshold values are reached and

the switching off of the vacuum generator when certain vacuum threshold values are reached.

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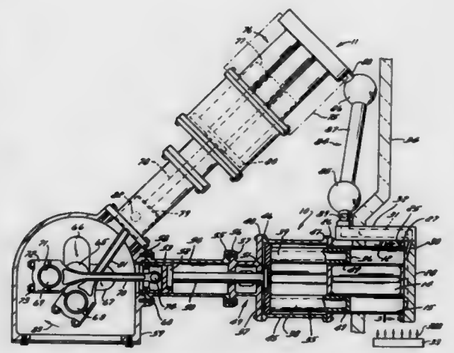
EXTERNAL COMBUSTION ENGINE AND HEAT PUMP

Theodore L. Swansen, 4424 Pleasant Lake Rd., East Troy, Wis. 53120

Filed Feb. 4, 1991, Ser. No. 650,182

Int. Cl.[5] F02G *1/044*

U.S. Cl. 60—525 **8 Claims**



1. An external combustion machine comprising:

a first cluster of cylinders, each having a hollow interior for accommodating a working gas, said cylinders being arranged in parallelism and spaced apart to provide passageways for a fluid heat transfer medium to contact the exterior surfaces of the cylinders,

first header means containing a passageway to which corresponding ends of said cylinders are coupled for communicating said cylinders with each other,

a piston in each cylinder in the first cluster and connecting means for connecting all of said pistons together for being reciprocated together in said cylinders,

a second cluster of cylinders, each having a hollow interior for accommodating said working gas, said cylinders in the second cluster being arranged in parallelism and spaced apart to provide passageways for a fluid heat transfer medium to contact the exterior surfaces of spaced cylinders,

a piston in each cylinder in the second cluster and connecting means connecting said pistons together for being reciprocated together in said cylinders,

second header means containing a passageway to which corresponding ends of said cylinders in the second cluster are coupled for communicating said cylinders with each other,

mechanical means for coupling said connecting means of the first and second clusters of pistons together in a manner which provides for one cluster of pistons to lead the other when reciprocating in said cylinders, and

conduit means interconnecting said passageways in the headers to provide for transferring said working gas back and forth between said first and second clusters of cylinders during a machine operating cycle.

5,113,657

MODULAR HYDRAULIC CONTROL APPARATUS

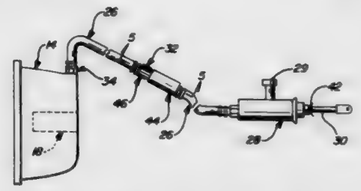
David J. Compton, Troy; Richard A. Nix, Utica, and Keith V. Leigh-Monstevens, Troy, all of Mich., assignors to Automotive Products plc, Warwickshire, England

Continuation of Ser. No. 243,148, Sep. 9, 1988, Pat. No. 5,018,352, which is a continuation of Ser. No. 797,405, Nov. 12, 1985, abandoned, which is a division of Ser. No. 607,020, Apr. 30, 1984, Pat. No. 4,607,670, which is a continuation-in-part of Ser. No. 555,667, Nov. 28, 1983, Pat. No. 4,624,290. This application May 24, 1991, Ser. No. 705,312

The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.

Int. Cl.[5] F16D *25/08;* **B60T** *11/16*

U.S. Cl. 60—533 **18 Claims**



1. A hydraulic apparatus for controlling a utilization device, said apparatus including:

a master cylinder having an outlet and an input member adapted to be connected to a control member of the utilization device;

a slave cylinder having an inlet and an output member adapted to be connected to a controlled member of the utilization device;

a conduit adapted to extend between said master cylinder outlet and said slave cylinder inlet; and

a quick connect leakproof connector mounted at a predetermined location between said master cylinder outlet and slave cylinder inlet to define a first modular unit including said master cylinder and a second modular unit including said slave cylinder, each of said modular units adapted to be filled with hydraulic fluid, said quick connector including two engageable members each associated with a respective modular unit, said members acting to hydraulically seal the respective modular units when not engaged and allowing the establishment of hydraulic fluid communication between said modular units when engaged.

5,113,658

HYDRAULIC ASSIST TURBOCHARGER SYSTEM

Robert J. Kobayashi, Rancho Palos Verdes, Calif., assignor to Allied-Signal, Inc., Morris County, N.J.

Filed May 21, 1990, Ser. No. 525,967

Int. Cl.[5] F02B *37/10*

U.S. Cl. 60—608 **22 Claims**

4. A turbocharger system for supplying charge air to a combustion engine, said system comprising:

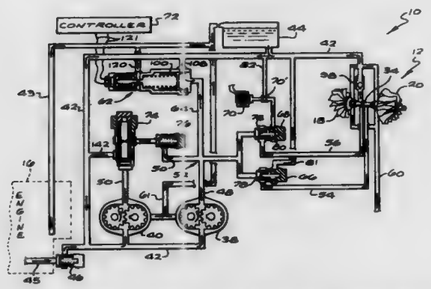
a pair of turbochargers each having a first turbine and compressor mounted on a common shaft for concurrent rotation, said first turbine being adapted to be rotatably driven by exhaust gases from the combustion engine to rotatably drive said compressor to produce charge air for supply to the engine, said turbocharger further including a second turbine mounted on said shaft, said second turbine comprising an hydraulic turbine for rotatably driving said common shaft to rotatably drive said compressor;

pump means for producing a supply of hydraulic fluid under pressure;

conduit means for delivering said hydraulic fluid under pressure to said second turbine to rotatably drive said second turbine;

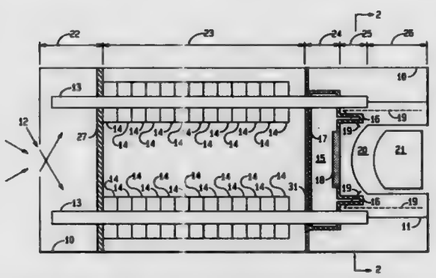
electrohydraulic control valve means for regulating passage

of the hydraulic fluid through said conduit means to selectively control rotatable driving of said shaft by said second turbine in accordance with engine operating parameters; and



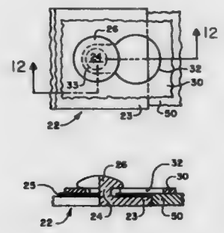
a common support frame having said pair of turbochargers and said control valve means and said pump means mounted thereon to define a substantially unitary package adapted for facilitated mounting onto the engine.

5,113,659
SOLAR THERMAL ENERGY RECEIVER
Karl W. Baker, Akron, and Miles O. Dustin, North Olmsted, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Mar. 27, 1991, Ser. No. 676,910
Int. Cl.[5] F03G *6/00*
U.S. Cl. 60—641.8 **19 Claims**



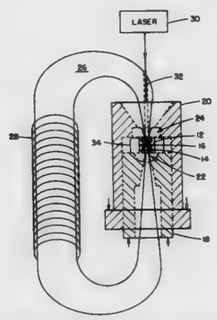
1. A solar powered thermal management system for collecting and storing solar energy and transferring it uniformly to a heat utilization device, said system comprising:
an insulated containment shell having a first end including an aperture for receiving concentrated sunlight and a second end engaging a heat utilization device;
a plurality of heat pipes extending from within said heat utilization device toward said first end of said shell to be subjected to concentrated sunlight, said heat pipes being connected to said heat utilization device in heat transferring relationship;
thermal energy storage means disposed on said heat pipes to transfer heat stored therein to said heat pipes when the solar energy received is less than a predetermined amount; and
heat pipe coupling means disposed between said thermal energy storage means and said heat utilization device said heat pipe coupling means enclosing at least a portion of the length of each heat pipe, to transfer heat from hotter to cooler heat pipes whereby heat input to said heat utilization device is evenly distributed.

5,113,660
HIGH TEMPERATURE COMBUSTOR LINER
Edward C. Able, Tolland, and Martin J. Gibler, Manchester, both of Conn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jun. 27, 1990, Ser. No. 545,326
Int. Cl.[5] F23R *3/60*
U.S. Cl. 60—752 **10 Claims**



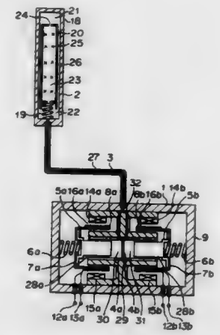
1. A combustor liner comprising a support panel having a plurality of apertures therein, which apertures each have a wide portion and a narrow portion, a plurality of ceramic tiles, each tile having a knob upstanding on a neck from a face of such tile, each of said knobs being sized to fit through the larger end of said apertures but not the smaller end thereof, said knobs being inserted through the larger end of said apertures and shifted over the smaller end thereof and over said support panel, said necks passing therethrough and supporting said tiles below said support panel, holding means to secure said knobs proximate the smaller ends of said apertures and means to mount said support panel to said combustor liner so as to mount said tiles before said liner as a heat shield therefor.

5,113,661
ENERGY STORAGE ARRANGEMENT
Daniel H. Deeks, 231 Franklin Ave., Sea Cliff, N.Y. 11579
Filed May 23, 1990, Ser. No. 528,039
Int. Cl.[5] F25B *21/00*
U.S. Cl. 62—3.1 **12 Claims**



8. A method for energy storage in which energy is stored by compression of a metastable degenerate Fermi electron gas subjected to a magnetic field, comprising subjecting a material to a very high pressure in a diamond anvil high pressure cell to form a metallic state of the material containing a metastable degenerate Fermi electron gas, and applying a magnetic field to the metastable degenerate Fermi electron gas to produce a compression of the metastable degenerate Fermi electron gas therein.

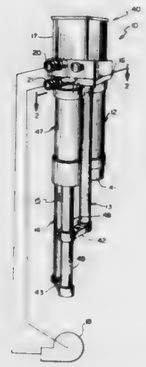
5,113,662
CRYOGENIC REFRIGERATOR
Nobuo Fujii; Hiroyuki Kiyota; Yoshihiro Katagishi, and Takeshi Miyazawa, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 5, 1991, Ser. No. 664,817
Int. Cl.[5] F25B *9/00*
U.S. Cl. 62—6 **4 Claims**



1. A refrigerator comprising:
a first cylinder and a second cylinder which are coaxially arranged;
a first movable coil and a second movable coil which are oppositely arranged in a magnetic flux produced by a magnet, and which can be reciprocated by applying an a.c. current thereto;
a first piston which is coupled to the first movable coil, and which can reciprocate in the first cylinder;
a second piston which is coupled to the second movable coil, and which can reciprocate in the second cylinder;
a compression space which is defined by the first cylinder, the second cylinder, the first piston and the second piston;
a cold cylinder;
a displacer which divides the inside of the cold cylinder into a cold space and a hot space, and which can slidably reciprocate in the cold cylinder;
a regenerator which is arranged in the displacer; a partition wall which is arranged between the first cylinder and the second cylinder to divide the second compression space; and
communicating means for communicating between the first compression space and the second compression space.

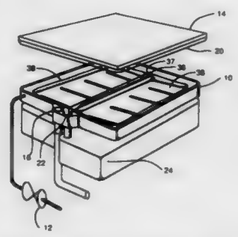
5,113,663
MULTI-STAGE CRYOGENIC REFRIGERATOR
Peter E. Gifford, Syracuse, N.Y., assignor to Cryomech, Inc., Syracuse, N.Y.
Filed Mar. 11, 1991, Ser. No. 680,806
Int. Cl.[5] F25B *9/00*
U.S. Cl. 62—6 **5 Claims**

1. A cryogenic refrigerator using the Gifford-McMahon cycle that includes
three spaced-apart, vertically disposed displacer stages with the cold end of each displacer stage located at the bottom section of each stage,
an external regenerator means having three regenerator units stacked vertically one above the other adjacent to said displacer stages,
a heat exchanger for placing the cold end of each displacer stage in fluid flow communication with the lower end of one of said regenerator units whereby refrigerant is freely exchanged therebetween,
control means for passing a high pressure refrigerant from a compressor means downward in series through the regenerator units whereby refrigerant enters each of the displacer stages, and then exposing the regenerator units to the suction side of the compressor so that the refrigerant



expands rapidly to about atmospheric pressure as it moves upwardly through said stacked regenerators.

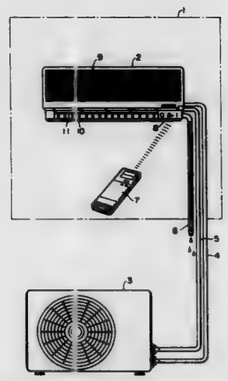
5,113,664
MELT SYSTEM FOR LIQUID PURIFICATION BY BATCH CRYSTALLIZATION
William M. Conlon, and Donald M. Hendricks, both of Palo Alto, Calif., assignors to Polar Spring Corporation, Menlo Park, Calif.
Filed Jan. 18, 1991, Ser. No. 643,465
Int. Cl.[5] C02F *1/22*
U.S. Cl. 62—124 **10 Claims**



1. A system for purifying liquids comprising:
a vessel, said vessel having substantially vertical sides for containing the liquid to be purified and a bottom side, the inside surface of said bottom side being inclined toward draining means provided with said vessel,
means for filling said vessel with liquid,
cooling means thermally coupled to the upper surface of said liquid to form a horizontal, sheet of ice that grows in thickness downward from the upper surface of said liquid,
first means for draining the unfrozen portion of the fluid from the vessel;
heating means disposed within the vessel, said heating means protruding above the bottom side of the vessel a distance approximately equal to the thickness of the horizontal sheet of ice, and said heating means having a length substantially equal to the length of the horizontal sheet of ice measured parallel to the heating means,
means for inducing the horizontal sheet of ice to slide against the heating means;
second means for draining the melted portion of the fluid from the vessel as the horizontal sheet of ice is melted; and
means for operating the filling means, cooling means, first

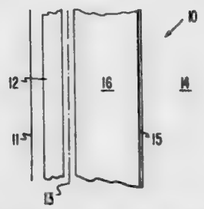
draining means, heating means and second draining means in sequence.

5,113,665
CONTROL DEVICE FOR AIR CONDITIONER
Hikaru Katsuki, Gunma, Japan, assignor to Sanyo Electric Company, Ltd., Osaka, Japan
Filed May 6, 1991, Ser. No. 695,342
Claims priority, application Japan, May 29, 1990, 2-141149
Int. Cl.[5] F25B *49/00*
U.S. Cl. 62—126 **2 Claims**



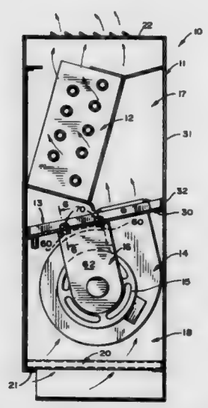
1. A control device for operating a test run of an air conditioner, with a wireless remote controller for transmitting operating data to said air conditioner, having:
a receiving circuit for receiving the operating data;
a switching means having at least two switching positions;
a microprocessor for operating said air conditioner in response to the operating data received by said receiving circuit;
a power source for supplying electrical power to said microprocessor;
said microprocessor scanning a position of said switching means and thereafter inputting the operating data from said receiving circuit during the time when the electrical power is supplied to said microprocessor;
wherein said microprocessor comprises:
a first means for starting an operation of said air conditioner in response to the operating data when said switching means is in a first position;
a second means for maintaining the operation of said air conditioner in a forced stopping state so as to ignore the operating data when said switching means is in a second position;
a third means for starting said test run of said air conditioner when said switching means is changed first from the second position to the first position after said switching means is placed in the second position thereof by an initial and effective scanning of said microprocessor; and
a fourth means for changing from the test run and carrying out the operation of said air conditioner in response to the operating date when said receiving circuit receives the operating data from said wireless remote controller during the test run of said air conditioner.

5,113,666
COOLING DEVICE FOR HAZARDOUS MATERIALS SUITS
Clyde F. Parrish, Melbourne, and Robert P. Scaringe, Rockledge, both of Fla., assignors to Mainstream Engineering Corp., Rockledge, Fla.
Filed Oct. 5, 1990, Ser. No. 593,044
Int. Cl.[5] F25D *23/12*
U.S. Cl. 62—259.3 **22 Claims**



21. A cooling device, comprising means for permitting transfer of water vapor from a first surface;
means for adsorbing the water vapor and transferring heat of adsorption toward a second surface; and
means for resisting flow of the heat of adsorption toward the first surface, wherein the transfer permitting means is an open cell material.

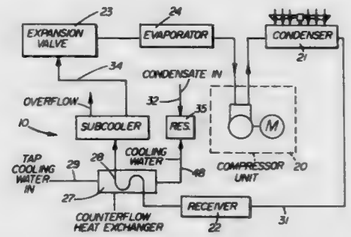
5,113,667
FAN COIL UNIT
John T. Sullivan, 3910 Madison St., Hyattsville, Md. 20781
Filed Jan. 18, 1991, Ser. No. 642,767
Int. Cl.[5] F25D *21/14*
U.S. Cl. 62—291 **32 Claims**



1. A fan coil unit comprising a housing defining a chamber, a primary pan in said chamber and setting-off with said housing opposite first and second chamber portions, said primary pan having a bottom wall defined in part by an interior surface, bosses projecting above said bottom wall interior surface, each boss having a recess opening in a direction away from said bottom wall interior surface and through a top face of each boss, a condensation coil in said first chamber portion, a fan in said second chamber portion, an air passage in said primary pan through which air is directed by said fan from said second chamber portion into said first chamber portion whereby condensation formed upon said coil will collect in said primary pan, means for fastening said fan to said primary pan, said fastening means including fasteners passing through openings

in said bottom wall which each opens into one of said openings, end portions of said fasteners in said primary pan which would otherwise be subject to collected condensation being each seated in one of said recesses and being covered by a cover, and means for bonding and sealing each cover to the primary pan.

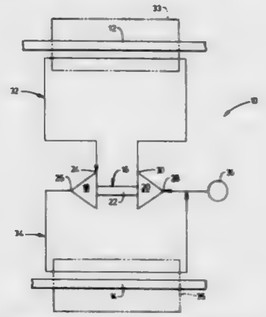
5,113,668
REFRIGERATION SYSTEM WITH EVAPORATIVE SUBCOOLING
Fred B. Wachs, III, Lexington, and Roy W. Abbott, Louisville, both of Ky., assignors to Advanced Cooling Technology, Inc., Lexington, Ky.
Continuation of Ser. No. 376,432, Jul. 7, 1989, Pat. No. 5,069,043. This application Feb. 12, 1991, Ser. No. 654,792
The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.
Int. Cl.[5] F28D *5/00*
U.S. Cl. 62—305 **9 Claims**



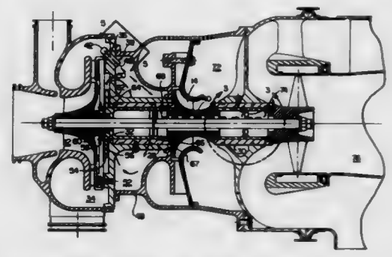
1. A refrigeration system or the like having a compressor, condenser, expansion means and an evaporator connected in series, the compressor providing compressed refrigerant gas to the condenser, the outlet of the condenser conducting liquid refrigerant back to the expansion means/evaporator, and
an evaporative subcooler in said system connected downstream of the condenser so as not to act on the section of the system having superheated gas exiting said compressor, and upstream of said expansion means/evaporator to act by the evaporative process to reduce the temperature of the refrigerant liquid, whereby to provide a greater cooling effect of the refrigerant in the evaporator to increase the refrigeration system efficiency and substantially reduce the mineral deposits and prevent scale build-up on said subcooler.

5,113,669
SELF-POWERED HEAT EXCHANGE SYSTEM
George A. Coffinberry, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Nov. 19, 1990, Ser. No. 615,757
Int. Cl.[5] F25D *9/00*
U.S. Cl. 62—401 **19 Claims**

1. A system for exchanging heat between a hotter temperature region and a colder temperature region, said system comprising:
(a) a gas compressor having a gas entrance and a gas exit;
(b) means for driving said compressor, said driving means including gas-driven means for applying drive power to said compressor, said gas-driven means having a gas inlet and a gas outlet;
(c) a first conduit connecting said gas exit of said compressor to said gas inlet of said gas-driven means, at least a portion of said first conduit disposable proximate said hotter temperature region; and
(d) a second conduit connecting said gas outlet of said gas-driven means to said gas entrance of said compressor, at least a portion of said second conduit disposable proximate said colder temperature region, wherein said compressor, said first conduit, said gas-driven means, and said second conduit together define a gas coolant loop.



5,113,670
BEARING COOLING ARRANGEMENT FOR AIR CYCLE MACHINE
Christopher McAuliffe, Windsor, and Paul J. Dziorny, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Aug. 3, 1990, Ser. No. 562,162
Int. Cl.[5] F25D *9/00*; F04B *17/00*
U.S. Cl. 62—402 **4 Claims**



1. An air cycle machine comprising:
a. an axially extending hollow shaft;
b. a compressor mounted to a central portion of the shaft and having inlet means for receiving a pressurized fluid to be compressed therein;
c. a turbine mounted to an first end portion of the shaft and having inlet means for receiving a pressurized fluid to be expanded therein, said turbine operatively connected to said compressor by a shaft extending therethrough whereby said compressor is driven through the shaft by said turbine;
d. a fan mounted to a second end portion of the shaft;
e. first hydrodynamic bearing means for supporting the shaft disposed about the shaft at a location between said compressor and said turbine;
f. second hydrodynamic bearing means for supporting the shaft disposed about the shaft at a location between said compressor and said fan; and
g. a bearing cooling circuit having an inlet for receiving a portion of the compressed fluid to be expanded from the inlet means of said turbine as a coolant, an outlet for discharging said coolant directly into the inlet means of said compressor means, and a coolant flowpath therebetween traversed by said coolant, the cooling flowpath having a first portion extending from the inlet to said

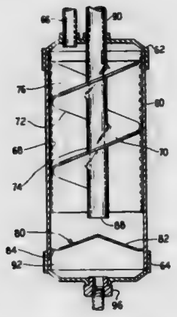
cooling circuit through said first hydrodynamic bearing means, a second portion extending within the hollow shaft, and a third portion extending through said second hydrodynamic bearing means to the outlet of said cooling circuit, the coolant passing in series through the first portion, thence the second portion, and thence the third portion of the cooling flowpath of said cooling circuit.

5,113,671

OIL SEPARATOR

Gary W. Westermeyer, Bluffs, Ill., assignor to AC&R Components Components, Inc., Chatham, Ill.

Filed Nov. 26, 1990, Ser. No. 617,773
Int. Cl.[5] F25B *43/02*; B01D *45/12*
U.S. Cl. 62—468 **18 Claims**



1. A device for separating oil from a gas comprising:
a cylindrical vertical axis housing forming a peripheral wall of said device;
a top end cap;
a bottom end cap;
an inlet parallel to said axis of said cylindrical housing extending through said top end cap;
a gas outlet formed by a cylindrical wall forming a central passage aligned with said axis;
a helical wall formed within said cylindrical housing between said peripheral wall and said cylindrical wall;
a conical baffle having a downwardly and outwardly sloping wall spaced below said helical wall;
a plurality of apertures extending through an outer rim area of said baffle adjacent to said peripheral wall;
an oil collection zone below said baffle; and
an oil outlet in said oil collection zone extending through said bottom end cap controlled by a valve.

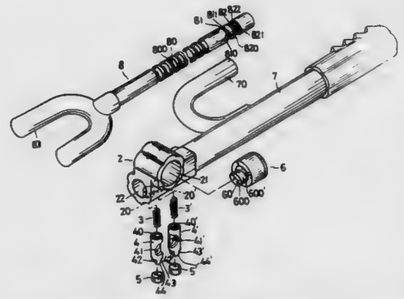
5,113,672

AUTOMOBILE STEERING LOCK

Ching-Rong Wang, No. 27, Alley 74, Lane 313, Wen-Hsien Road, Tainan, Taiwan

Continuation-in-part of Ser. No. 664,802, Mar. 5, 1991. This application Jul. 8, 1991, Ser. No. 726,694
Int. Cl.[5] B60R *25/02*
U.S. Cl. 70—209 **1 Claim**

1. An automobile steering lock comprising:
a) an elongate tubular member including an inner end, an outer end and an elongate passageway extending longitudinally therethrough and a first U-shaped hook secured to the tubular member substantially midway between the inner and outer ends;
b) a housing secured around the inner end of the tubular member, the housing including two vertical bores extending through a bottom of the housing and a transverse bore communicating with the elongate passageway of the tubular member;
c) a locking mechanism disposed in the transverse bore of the housing and including a locking member and first and second locating means disposed in the vertical bores, each locating means including a rod-like bearing provided with a tenon at a bottom end thereof and a spring biasing the bearing towards the elongate passageway of the tubular member;
d) each bearing including a semi-circular groove and each tenon being provided with an inclined face and a pair of opposed vertical faces, wherein the locking member is engaged within the semi-circular grooves;
e) an elongate rod member having an inner end and an outer end, the inner end of the rod member being receivable within the elongate passageway of the tubular member to permit the rod member to extend and retract in a telescopic manner within the passageway, and a second U-shaped hook secured to the outer end of the rod member;
f) the rod member further including a plurality of first annular grooves longitudinally spaced along the rod member and circumferentially formed therein, each first annular groove being defined by a vertical wall positioned closer to the second U-shaped hook and a sloping sidewall positioned farther from the second U-shaped hook, and second and third annular grooves circumferentially formed in the rod member adjacent the inner end thereof, the third annular groove being positioned between the second annular groove and the inner end of the rod member, the second annular groove being defined in sequence by a downwardly sloping wall, a vertical wall, a flat bottom wall and an upwardly sloping wall, and the third annular groove being defined in sequence by a downwardly sloping wall, a first vertical wall, a flat bottom wall, an upwardly sloping wall and a second vertical wall; and
g) when the rod member is extended outwardly of the tubular member for a sufficient distance, the tenons of the bearings are disposed into engagement within the second and third annular grooves such that the inclined face of the tenon in the third annular groove engages the upwardly sloping wall of the third annular groove and a vertical face of the tenon engages the second vertical wall of the third annular groove, thereby preventing the rod member from being entirely removed from the tubular member.



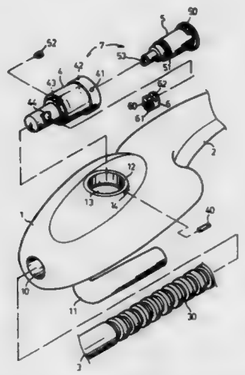
5,113,673

LOCK FOR A STEERING WHEEL OF AN AUTOMOBILE

Alice Shen, 68-1, Hsien Jen Road. Ta Chia Chen, Tai Chung Hsien, Taiwan

Filed Jun. 12, 1991, Ser. No. 713,992
Int. Cl.[5] B60R *25/02*
U.S. Cl. 70—209 **2 Claims**

1. A lock for a steering wheel of an automobile comprising:
a movable latch having a plurality of annular grooves and a hook at one end;
a body portion provided with a longitudinal hole for passage of said movable latch, a hook formed on a bottom surface of said body portion and a seat formed on a top surface thereof, said seat being formed with a hole in open communication with the longitudinal hole, said longitudinal hole being provided at a bottom portion thereof with a positioning member and a resilient member which are kept in place by a cover for fixedly positioning said movable latch;
a fixed latch extending from one end of said body portion; and
a core including an axle sleeve received in the hole of said seat and kept in position by a pin extending through said seat and said axle sleeve, said axle sleeve being formed with a chamber which is in open communication with a hole formed at the bottom of said axle sleeve and a slot of said axle sleeve for receiving an axle block, said axle block having a stop portion at the upper end, an annular groove at the intermediate portion and an eccentric pin at the other end, the slot of said axle sleeve being used to receive a locking member which has a curved surface formed at a bottom end thereof and two shoulders at two sides and a slot formed near an upper end thereof.

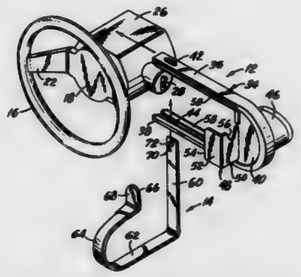


5,113,674

ANTI-THEFT DEVICE ADAPTED TO BE MOUNTED TO THE STEERING WHEEL OF A VEHICLE

Anthony LiCausi, 78-23 67th Rd., Middle Village, N.Y. 11379

Filed Apr. 24, 1991, Ser. No. 690,603
Int. Cl.[5] B60R *25/02*
U.S. Cl. 70—209 **24 Claims**



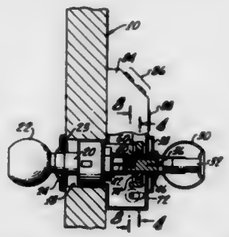
1. An anti-theft device adapted to be mounted to a steering wheel of a vehicle wherein the wheel has a hub, a spoke extending radially out from the hub, a steering column extending axially back from the hub, and a key housing on the steering column, the device comprising:
a yoke member adapted to be positioned on the steering column; and
a bent bracket member having a first portion adapted to be mounted to said yoke member and having a second portion adapted to engage with the spoke of the wheel;
said yoke member including a U-band segment having upper and lower legs and a base, said upper and lower legs extending respectively across upper and lower surfaces of the steering column;
said yoke member further including a positioning bracket adapted to be received in a space between the hub and the steering column to provide axial positioning of said device on the steering wheel to which said device is mounted;
said bracket member having a vertical leg that includes said first portion of said member and having a foot that includes said second portion of said member; and
said bracket member further having a segment connected said foot and said vertical leg, said connecting segment having a forwardly extending portion adapted to be engaged by the spoke to prevent rotation of the steering wheel in a predetermined direction.

5,113,675

INTERMEDIATE DOOR LOCKING MECHANISM

Alan K. Uyeda, 8939 Gallatin Rd., #25, Pico Rivera, Calif. 90660

Filed Jan. 7, 1991, Ser. No. 638,056
Int. Cl.[5] E05B *13/10, 47/06*
U.S. Cl. 70—477 **21 Claims**



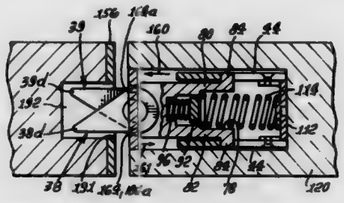
1. An intermediate locking mechanism for a door interposed between an existing door bolt and an associated door knob having a lock cylinder, said locking mechanism being unlockable by either a key or by entry of a combination code, said locking mechanism comprising:
a camshaft axially connected between said lock cylinder and said door bolt, said camshaft having a cam surface;
a sleeve enclosing said camshaft and axially connecting said door knob to said door bolt;
a ring rigidly surrounding said sleeve, said ring having an external notch and a radial bore centered within said notch;
a movable locking plate having an oblong opening, a radially depending tooth normally positioned to engage said notch, and a contacting surface, said locking plate encompassing said ring within said oblong opening;
a pin having a first end and a second end, said pin being movable within said radial bore, said first end of said pin contacting said cam surface and said second end of said pin contacting said tooth; and
an actuator and associated cam adjacent to said contacting surface;
whereby rotation of said key within said lock cylinder rotates said camshaft which urges said pin upwardly relative said ring to disengage said tooth from said notch, enabling unimpeded rotation of said sleeve, and entry of said combination code energizes said actuator causing said cam to engage said contacting surface and manipulate said locking plate upwardly to disengage said tooth from said notch, also enabling unimpeded rotation of said sleeve.

5,113,676

DOUBLE ACTING DEAD LATCH MECHANISM

Misak Panossian, 421 E. Lorraine St., Glendale, Calif. 91207

Filed Dec. 31, 1990, Ser. No. 636,434
Int. Cl.[5] E05B *15/10*
U.S. Cl. 70—418 9 Claims



1. A lock mechanism comprising, in combination:

a) a casing,

b) a bolt housing and two latch bolts carried by the housing to be individually rotatable about a common vertical axis in response to engagement with a strikeplate, one latch bolt vertically offset relative to the other, and pin means carried by the housing and receivable in openings in said latch bolts, whereby the latch bolts are rotatable about the pin means, the pin means defining said vertical axis,

c) the bolt housing and latch bolts movable as a unit horizontally forwardly and rearwardly within and relative to the casing.

d) one latch bolt having a shoulder engageable with one surface on the casing in response to said rotation of said one latch bolt in a clockwise direction to displace the housing and the two latch bolts as a unit horizontally rearwardly by a first increment relative to the casing, whereby the two latch bolts are then positioned to be further engaged in camming relation by the strikeplate, traveling relatively in a first direction to displace both latch bolts and the housing horizontally rearwardly by a second increment relative to the casing, the other latch bolt having a shoulder engageable with another surface on the casing in response to said rotation of the other latch bolt in a counterclockwise direction, thereby to displace the housing and the two latch bolts as a unit horizontally rearwardly by a third increment relative to the casing, whereby the two latch bolts are then positioned to be further engaged in camming relation by the strikeplate, traveling relatively in a second direction, to displace both latch bolts and the housing horizontally rearwardly by a fourth increment relative to the casing,

e) said bolts having enlarged hubs forming said pin receiving openings, said latch bolts having hub extensions forming said shoulders, which define fulcrums, said extensions projecting axially oppositely.

5,113,677

APPARATUS AND METHOD FOR SELECTIVELY FORMING A THICKENED EDGE ON A PLATE OF FORMABLE MATERIAL

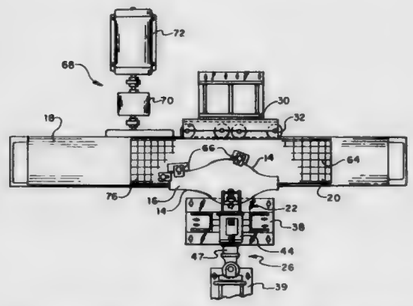
Dennis L. Blunier, Danvers, Ill.; Phillip J. Shankwitz, Raleigh, N.C.; Maurice L. Caudill, Peoria, Ill.; Paul D. Andreson, Mishawaka, Ind.; Richard R. Kazmierzak, South Bend, Ind., and Joel C. Schweisberger, Granger, Ind., assignors to Caterpillar Inc., Peoria, Ill.

Continuation-in-part of Ser. No. 354,187, May 19, 1989. This application May 9, 1991, Ser. No. 698,009
The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.
Int. Cl.[5] B21B *37/14, 39/34;* B23C *1/12;* G06F *15/46*
U.S. Cl. 72—7 34 Claims

1. A method of selectively forming a thickened edge on a plate of formable metallic material by working an edge of the plate into a prescribed thickness and shape with a forming apparatus, said forming apparatus being movably carried on a support and said plate being held on a table located adjacent the forming apparatus, said forming apparatus and plate being automatically controllably movable relative to each other; comprising the steps of:

moving one of the forming apparatus and table in a direction transverse the plate edge to a preselected transverse coordinate position;

moving one of the forming apparatus and table in a direction crosswise of said transverse direction and forming said thickened edge on said plate;



sensing a crosswise coordinate position of the forming apparatus at said one of the forming apparatus and table move in the crosswise direction;

determining a transverse coordinate position of the forming apparatus corresponding to the sensed crosswise coordinate position of said one of the forming apparatus and table; and

moving said one of the forming apparatus and table transversely to the determined transverse coordinate position during relative crosswise movement of the forming apparatus and plate.

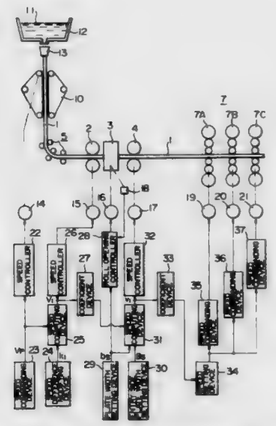
5,113,678

METHOD FOR CONTROLLING PLATE MATERIAL HOT ROLLING EQUIPMENT

Toshio Mannaka, Katsuta; Tomoaki Kimura, and Mitsuru Koyama, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 254,586, Oct. 7, 1988. This application Mar. 27, 1991, Ser. No. 675,959
Claims priority, application Japan, Oct. 9, 1987, 62-253697
Int. Cl.[5] B21B *1/46, 37/06;* B22D *11/16*
U.S. Cl. 72—8 23 Claims

1. A control device for a plate material hot rolling equipment comprising a vertical mill for rolling a plate-like rolled material fed thereto for width control, pairs of first and second horizontal rolls disposed one pair on each of the entry side and the delivery side of said vertical mill, and speed control means for controlling said pairs of horizontal rolls to produce a difference between roll speeds of said pair of first and second horizontal rolls for imparting a predetermined tensile force to said rolled material between said pairs of horizontal rolls, said pairs of first and second horizontal rolls being controlled to impart the predetermined tensile force to said rolled material con-



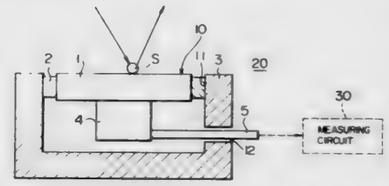
trolled in width by said vertical mill without effecting thickness control of said width-controlled rolled material thereby.

5,113,680

APPARATUS FOR DETECTING INTENSITY AND/OR DENSITY OF SHOT BLASTING

Makoto Matsuura; Hironobu Amano, and Kunio Ohta, all of Toyokawa, Japan, assignors to Sintokogio Ltd., Nagoya, Japan

Filed May 8, 1991, Ser. No. 696,888
Claims priority, application Japan, May 10, 1990, 2-120507
Int. Cl.[5] B24C *1/10;* G01L *5/00*
U.S. Cl. 72—53 15 Claims



1. An apparatus for detecting at least one of an intensity and a density of shot blasting during shot treatment, comprising:

shot bombardment and propagation means including a first part to be bombarded by a shot stream for generating elastic waves when bombarded by the shot stream and a second part for propagating said elastic waves therethrough;

transducer means receiving said elastic waves from said shot bombardment and propagation means for transducing said elastic waves into a high-frequency electrical signal; and

measuring means for detecting at least one of the number of times of shot bombardment and an intensity of shot bombardment on the basis of said high-frequency electrical signal;

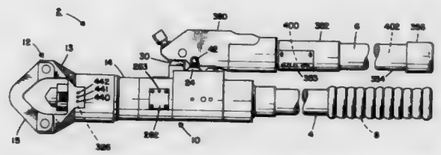
wherein said measuring means includes a counter circuit detecting the number of times of appearance of single-waves in said high-frequency electrical signal.

5,113,679

APPARATUS FOR CRIMPING ARTICLES

Neil P. Ferraro, Merrimack; Urs F. Nager, Jr., Hudson, both of N.H.; Raymond C. Logue, Somers, N.Y.; Edward J. Chen, and Patrick S. Lee, both of Poughkeepsie, N.Y., assignors to Burndy Corporation, Norwalk, Conn.

Filed Jun. 27, 1990, Ser. No. 545,478
Int. Cl.[5] B21D *7/06*
U.S. Cl. 72—21 13 Claims



1. An apparatus for crimping an article, the apparatus comprising:

a frame having an anvil;

a ram movably connected to said frame;

a ram drive for moving said ram relative to said anvil;

an electrical ram position sensor for sensing the position of said ram; and

a computer connected to said ram drive and said sensor for, at least partially, controlling movement of said ram relative to said anvil based upon signals received from said sensor.

5,113,681

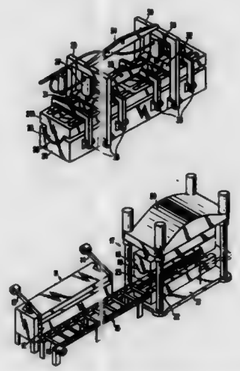
METHOD AND APPARATUS FOR FORMING A TITANIUM OR TITANIUM ALLOY SHEET ELEMENT WITH A CONTOURED SURFACE

Jean Guesnon, Chatou; Andre Laurencin, Lyons, and Claude Klopfeinstein, Giromagny, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Continuation of PCT/FR88/00479 Sep. 29,1988. This application Jul. 31, 1989, Ser. No. 415,974
Claims priority, application France, Sep. 29, 1987, 87 13467
Int. Cl.[5] B21B *45/02;* B21D *37/16*
U.S. Cl. 72—53 17 Claims

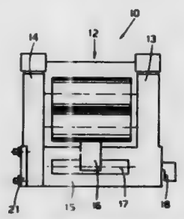
1. A method of forming a sheet element with a contoured surface from a plane titanium or titanium alloy sheet element by a hot deep-drawing operation in a press, the method comprising the steps of preheating the sheet element to a temperature of at least 730° C., transferring the preheated sheet element to non-preheated deep-drawing tool means, placed in the press for a period of time sufficient for the temperature of the sheet element to be at least equal to 700° C. at the end of the deep-drawing operation thereby forming a deep-drawn element, transferring the deep-drawn element to a calibration tool

means and heating the deep-drawn element in the calibration means to at least 650° C. for a sufficient time to assume a final



shape, then allowing the deep-drawn element to cool to room temperature.

5,113,682
CARTRIDGE ROLLING STAND
Alfredo Poloni, Fogliano di Redipuglia, Italy, assignor to Danieli & C. Officine Meccaniche S.p.A., Buttrio, Italy
Filed Apr. 10, 1990, Ser. No. 506,820
Claims priority, application Italy, Apr. 28, 1989, 83391 A/89
Int. Cl.[5] B21B *31/02, 31/08*
U.S. Cl. 72—237 **5 Claims**



1. Two-high horizontal cartridge rolling stand which comprises an assembly including rolls, chocks and adjustment means arranged between an L-shaped first end structure and a second end structure of the stand and is characterized in that a position of the L-shaped first end structure forms a central stiffening body positioned laterally below the rolls for connection with the second end structure by releasable fixture means which provide momentary rigid and substantially stable connection of the second end structure to the central body, the first end structure of the stand also constraining the chocks in a direction lengthwise to the rolling rolls.

5,113,683
PIPE BENDING MACHINE HAVING TWO BENDING HEADS
Jean Lafrasse, Dardilly, France, assignor to Eaton Leonard Picot S.A., Tassin la Demi Lune, France
Filed Jan. 25, 1991, Ser. No. 645,974
Claims priority, application France, Jan. 26, 1990, 90 01574
Int. Cl.[5] B21D *7/022*
U.S. Cl. 72—306 **7 Claims**

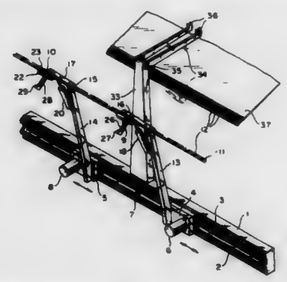
1. A pipe bending machine for bending a pipe (12) loaded on said machine along a longitudinal axis (11) of said machine which is coaxial to the initial longitudinal axis of said pipe (12) loaded on said machine, said machine comprising,

two bending heads (9, 10) mounted on track means (1–8, 13, 14) for moving said heads along a direction parallel to said longitudinal axis (11) of said machine,

each of said two bending heads having hold and bending means (22, 23, 24) for selectively holding and bending said pipe (12) loaded on said machine while holding said pipe in said longitudinal axis (11),

control means (25) associated with said holding and bending means (22, 23, 24) for actuating said holding and bending means (22, 23, 24),

each of said two bending heads (1, 10) having rotating means (15, 16, 17, 18, 20) engaged to said track means for selectively rotating each of said two bending heads about said



longitudinal (11) axis in a plane (19) perpendicular to said longitudinal axis (11),

each of said two bending heads (9, 10) having clamping means (26, 27, 28, 29) offset from said two bending heads (9, 10) for selectively engaging said pipe (12) loaded on said machine for bending after one of said rotating means (15, 16, 17, 18, 20) has moved a corresponding one of said two bending heads in a direction transverse to said longitudinal axis (11) of said machine and in a direction away from both said pipe (12) loaded on said machine and said longitudinal axis (11),

and a remaining one of said two bending heads bends said pipe (12) loaded on said machine after one of said clamping means (26, 27, 28, 29) on said corresponding one of said two bending heads has engaged said pipe (12) loaded on said machine.

5,113,684
ELECTRONIC BRAKING SYSTEM FOR POWER PRESS DIE CHANGE CARRIERS
Eugene A. Oster, Chicago, Ill., assignor to Connell Limited Partnership, Boston, Mass.
Filed Oct. 22, 1990, Ser. No. 601,338
Int. Cl.[5] B21J *13/08*
U.S. Cl. 72—448 **17 Claims**

1. An automatic die changing system for a power press comprising:

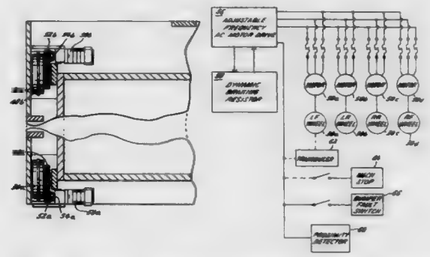
at least one carrier for transporting dies to and from a selected location in the press,

a set of wheels supporting the carrier for horizontal movement to position the dies horizontally,

at least one AC induction motor for driving the wheels,

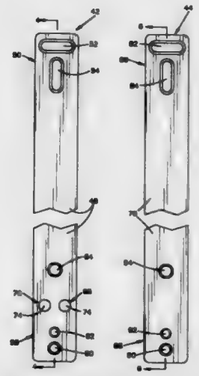
an adjustable frequency AC motor drive for supplying an

AC frequency and voltage to the AC induction motor to control the speed of the motor whereby the speed of the



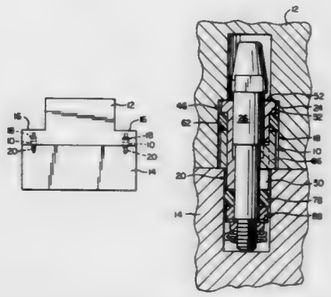
wheels and the horizontal movement of the carrier is determined by the AC frequency supplied to the motor.

5,113,685
APPARATUS FOR CONTOURING SPINE PLATES AND/OR RODS
Marc A. Asher, Prairie Village, Kans.; Walter E. Strippgen, Golden, Colo.; Charles F. Heinig, Charlotte, N.C., and William L. Carson, Columbus, Mo., assignors to AcroMed Corporation, Cleveland, Ohio
Filed Jan. 28, 1991, Ser. No. 646,835
Int. Cl.[5] B21J *13/08*
U.S. Cl. 72—458 **3 Claims**



1. An apparatus for use in bending rods and plates to be connected to a spinal column, said apparatus comprising a first longitudinally extending flat bender, said first flat bender having first and second parallel major side surfaces and a first end portion with first surface means for defining a first elongated slot extending through said first flat bender between said first and second major side surfaces to receive a first portion of a plate, said first elongated slot having a longitudinal central axis extending perpendicular to a longitudinal central axis of said first flat bender, said first surface means including a first end surface defining a first end portion of said first elongated slot, a second end surface defining a second end portion of said first elongated slot, and a pair of parallel side surfaces extending between said first and second end portions of said first elongated slot, said first flat bender having a second end portion with second surface means for defining a first circular opening extending through said first flat bender between said first and second major side surfaces to receive a first portion of a rod, said first circular opening having a central axis which intersects and extends perpendicular to a longitudinal central axis of said first flat bender, a second longitudinally extending flat bender, said second flat bender having third and fourth parallel major side surfaces and a first end portion with third surface means for defining a first elongated slot extending through said second flat bender between said third and fourth major side surfaces to receive a second portion of a plate having a first portion received by the first elongated slot in said first flat bender, said second elongated slot having a longitudinal central axis extending perpendicular to a longitudinal central axis of said second flat bender, said third surface means including a first end surface defining a first end portion of said first elongated slot in said second flat bender, a second end surface defining a second end portion of said first elongated slot in said second flat bender, and a pair of parallel side surfaces extending between said first and second end portions of said first elongated slot in said second flat bender, said second flat bender having a second end portion with fourth surface means for defining a first circular opening extending through said second flat bender between said third and fourth major side surfaces to receive a second portion of a rod having a first portion received by an opening in said first flat bender, said first circular opening in said second flat bender having a central axis which intersects and extends perpendicular to a longitudinal central axis of said second flat bender, said first and second flat benders being movable relative to each other under the influence of force manually applied to end portions of said first and second flat benders to plastically deform a plate extending through the first slots in said fist and second flat benders, said first and second flat benders being movable relative to each other under the influence of force manually applied to end portions of said first and second flat benders to plastically deform a rod extending through openings in said first and second flat benders.

5,113,686
ZERO-TOLERANCE DIE LOCATION PIN
Tsutomu Kawahara, Southgate, Mich., assignor to Mazda Motor Mfg. (USA) Corp., Flat Rock, Mich.
Filed Dec. 14, 1990, Ser. No. 628,508
Int. Cl.[5] B21D *37/14*
U.S. Cl. 72—462 **17 Claims**



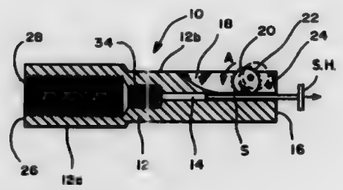
1. For use with a die of the type having a location pin recess and shaped to be mounted on an associated bolster having a complementary location pin recess, a zero-tolerance location pin comprising:

an upper portion shaped to fit within said location pin recess with a first predetermined amount of clearance;

a lower portion shaped to fit within said complementary location pin recess with a second predetermined amount of clearance; and

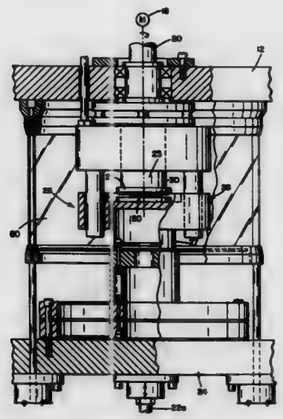
means responsive to and actuated by juxtaposition of said die and said bolster for expanding effective diameter of at least one of said upper and lower portions such that said clearances thereof are eliminated, whereby location of said die with respect to said bolster is made more precise.

5,113,687
STUD PULLER
Carl T. Palmgren, Petaluma, Calif., assignor to Morgan Manufacturing Inc., Petaluma, Calif.
Filed May 4, 1990, Ser. No. 519,093
Int. Cl.[5] B21D *01/12*
U.S. Cl. 72—479 **2 Claims**



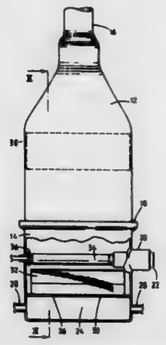
1. A stud puller comprising:
a body;
a small passageway opening from one end of said body and extending longitudinally tehreof;
a tapped bore extending longitudinally of said body from the other end thereof to receive the head of a slide hammer;
a coaxial tapped counterbore in said body to receive the end of a hand puller;
a slot in one side of said body opening into said passageway;
a knurled wheel in said slot and eccentrically mounted to rotate therein between an active position wherein the periphery thereof extends into said passageway and a loading position wherein the periphery thereof is clear of said passageway; and
stop means to prevent rotation of said wheel from said loading position to said active position in the direction in which a stud is inserted into said pasageway.

5,113,688
LABORATORY TRACTION TEST
Joel J. Lazeration, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Mar. 19, 1991, Ser. No. 671,557
Int. Cl.[5] G01N *19/02*
U.S. Cl. 73—8 **13 Claims**



1. A method of predicting tire traction characteristics of tread compounds comprising the steps of;
(a) preparing a sample of tread compound in a form suitable for traction testing;
(b) placing said sample in a testing apparatus opposite a testing surface, said apparatus being capable of causing a rotating relationship between said sample and test surface and measuring the torque therebetween;
(c) contacting said sample with said test surface and initiating a rotating relationship;
(d) measuring the peak torque and establishing a torque v. time curve for said sample (slide traction); and
(e) correlating said torque v. time curve with established curves for desired traction characteristics.

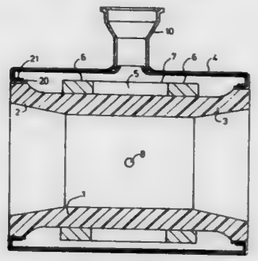
5,113,689
CIGARETTE SIDESTREAM SMOKE COLLECTION APPARATUS
Jean-Jacques Pisdé, Neuchâtel, and Gregor Nicholas, Saint-Blaise, both of Switzerland, assignors to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland
Filed Sep. 6, 1990, Ser. No. 578,187
Claims priority, application United Kingdom, Sep. 11, 1989, 8920496
Int. Cl.[5] G01M *3/36*
U.S. Cl. 73—23.31 **9 Claims**



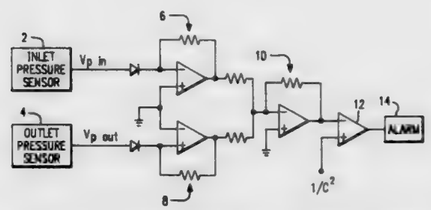
1. Apparatus (10) of collecting sidestream smoke from a smoking article (34) such as a cigarette, comprising:
a housing (12, 14) having a holder (22) extending into the housing from outside for holding a smoking article allowing the smoking article to be smoked from outside the housing and an air inlet (24, 28) to the lower portion of the housing below the holder;
a lower air deflector (32) within the housing below the holder (22) to deflect air from the inlet (24, 28) around a smoking article in the housing;
an outlet (16) from the upper portion of the housing above the holder (22) for the withdrawal of air and smoke therefrom, and an upper air deflector (38) within the housing above the holder (22) being so disposed as to deflect air and smoke into the exhaust.

5,113,690
ELECTROMAGNETIC FLOWMETER
Petrus N. J. van Nistelrooij, Oss, and Aart J. van Bekkum, Hoornaar, both of Netherlands, assignors to Krohne AG, Basle, Switzerland
PCT No. PCT/EP90/00018, § 371 Date Sep. 14, 1990, § 102(e) Date Sep. 14, 1990, PCT Pub. No. WO90/07694, PCT Pub. Date Jul. 12, 1990
PCT Filed Jan. 4, 1990, Ser. No. 572,984
Claims priority, application Netherlands, Jan. 5, 1989, 8900021
Int. Cl.[5] G01F *1/58*
U.S. Cl. 73—861.12 **7 Claims**

1. An electromagnetic flowmeter with a compression-resistant measurement tube (1) made of a heat-resistant material and a casing (4) made of stainless steel and surrounding the measurement tube (1), a sealed space being defined between them, a magnetic device disposed in the sealed space having at least pole pieces (5) and windings (6), and one or more measuring electrodes (8) applied to the measurement tube (1), characterized in that at least one end of the casing (4) made of stainless steel is bent to form a concentric inner ring (20), and a compensating ring (21) surrounding and fixedly engaging the inner ring (20), the compensating ring (21) being made of steel having a thermal coefficient of expansion which is between the thermal coefficient of expansion of the material for the measurement tube (1) and the thermal coefficient of expansion for the stainless steel of the casing (4).



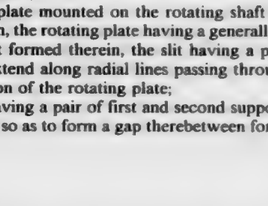
5,113,691
TURBINE-MEDIUM FLOW MONITOR
James A. Martin, and Andrew S. Braytenbah, both of Winter Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 26, 1989, Ser. No. 488,816
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—116 **12 Claims**



1. A method for monitoring the flow of fluid for driving a turbine, the fluid flowing through a turbine blade path between a fluid inlet and a fluid outlet, and the blade path being associated with a maximum desired flow rate, comprising: sensing the value of the pressure of the fluid at the fluid inlet and fluid outlet; electronically calculating the fluid flow rate on the basis of the sensed pressure values; electronically comparing the calculated flow rate with the maximum desired flow rate; and automatically issuing an indication when the calculated flow rate exceeds the maximum desired flow rate.

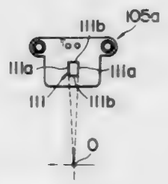
5,113,692
THROTTLE VALVE POSITION SIGNAL CORRECTING APPARATUS
Joji Kouta, Shizuoka, Japan, assignor to Jatco Corporation, Japan
Filed Jun. 24, 1991, Ser. No. 720,207
Claims priority, application Japan, Jun. 26, 1990, 2-167761
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—117.3 **8 Claims**

1. For use with an automotive vehicle including a transmission, an internal combustion engine having engine cylinders, a throttle valve located within an engine induction passage for controlling the amount of air permitted to enter the engine cylinders, a throttle position sensor sensitive to a position of the throttle valve for producing a signal indicative of a sensed throttle valve position, and at least one accessory operable on power from the engine, an apparatus for correcting the throttle valve position signal, comprising:
first means for producing an engine idling signal when the engine is idling;
second means for producing an accessory operation signal when the accessory is operating;
third means responsive to the engine idling signal for setting the sensed throttle valve position for an idle position value;



fourth means for calculating a first error or the idle position value from a first reference value in the absence of the accessory operation signal, the first reference value corresponding to a throttle valve idle position designed for the accessory being not operating, the fourth means including means for calcuating a second error of the idle position value from a second reference value in the presence of the accessory operation signal, the second reference value corresponding to a throttle valve idle position designed for the accessory being operating; and
fifth means for correcting a sensed throttle valve position based upon the calculated first error in the absence of the accessory operation signal, the fifth means including means for correcting a sensed throttle valve position based upon the calculated second error in the presence of the accessory operation signal.

5,113,693
ROTATIONAL POSITION DETECTING APPARATUS WITH A SIGNAL GENERATOR
Toshiaki Hata, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 20, 1990, Ser. No. 585,470
Claims priority, application Japan, Sep. 22, 1989, 1-110334[U]
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.1 **12 Claims**



1. A signal generator comprising:
a rotating shaft;
a rotating plate mounted on the rotating shaft for rotation therewith, the rotating plate having a generally circumferential slit formed therein, the slit having a pair of edges which extend along radial lines passing through a center of rotation of the rotating plate;
a holder having a pair of first and second support members disposed so as to form a gap therebetween for receiving a

portion of the rotating plate, each of the first and second support members having a recess and a window adjacent the recess, the windows in the first and second support members being disposed in alignment with each other at locations on an orbital circle of the slit which is formed by the slit during rotation of the rotating plate, the window in the second support member having a pair of edges which extend along radial lines passing through the center of rotation of the rotating plate;

a light emitting element received in the recess in the first support member for emitting light toward a light sensor through the window in the first support member; and

a light sensor received in the recess in the second support member for generating an electric signal when it receives the light from the light emitting element through the slit in the rotating plate and the window in the second support member.

5,113,694

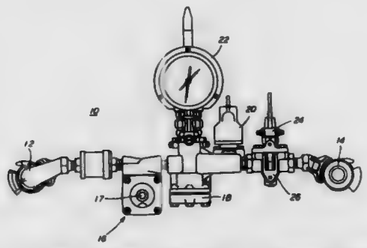
MODIFIED PRESSURE REGULATOR VALVE FOR SINGLE CAR TESTING DEVICE

Gary M. Sich, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 23, 1991, Ser. No. 705,053

Int. Cl.[5] G01M *3/02*

U.S. Cl. 73—121 **4 Claims**



1. A conversion kit for modifying an air pressure regulator valve in a single car testing device to enable said regulator valve to selectively deliver a second pre-set test operating pressure in addition to a first pre-set test operating pressure, wherein said test device further includes an operator's rotary valve for charging and venting air under pressure to the brake pipe of a railway car at different flow rates, said regulator valve being connected between a source of air under pressure and said operator's rotary valve and having a self-lapping valve assembly and an adjustable helical regulating spring acting thereon to supply air under pressure from said source to said operator's rotary valve at the selected one of said first and second pre-set test operating pressures, said conversion kit comprising:

(a) a support bracket fixed to the body of said regulator valve;

(b) a handle mounting bracket adjustably fixed to said support bracket and having a bore therein coaxially aligned with said regulating spring;

(c) a handle member pivotally connected to said handle mounting bracket for pivotal rotation between an active position and an inactive position, said handle member comprising:

1. an operating end having a cam surface;

2. a pair of limit stops each engageable with said handle mounting bracket in a respective one of said active and inactive handle positions to define said handle positions;

(d) a pusher pin disposed in said bore of said handle mounting bracket for axial displacement therein, said pusher pin having one end engageable with said cam surface of said handle member and another end engageable with said self-lapping valve assembly, said cam surface of said handle member in said inactive position thereof being spaced apart from said one end of said pusher pin, whereby said self-lapping valve assembly assumes a first axial position in which said regulating spring is adjusted to provide and maintain said pre-set second test operating pressure at a predetermined value of generally 10 pounds per square inch less than said first pre-set test operating pressure;

(e) threaded means for adjusting the fixed position of said handle mounting bracket relative to said support bracket to vary said displacement of said pusher pin by said cam surface, said cam surface in said active handle position displacing said pusher pin to re-position said self-lapping valve assembly from said first axial position thereof to a second axial position in which the force of said regulating spring acting on said self-lapping valve assembly is increased to provide said first pre-set test operating pressure.

5,113,695

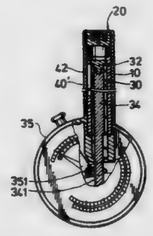
PRESSURE GAUGE

Tien-Tsai Huang, No. 4, Lane 30, Wu-Chang St., Pan-Chiao City, Taiwan

Filed Dec. 11, 1990, Ser. No. 625,878

Int. Cl.[5] B60C *73/02*; G01L *7/18*

U.S. Cl. 73—146.8 **6 Claims**



1. A pressure gauge comprising:

an elongated tubular member having a top end and a bottom end, a longitudinal groove being formed in said elongated tubular member which extends from the vicinity of said top end to the vicinity of said bottom end, said longitudinal groove having a predetermined width, a stop member being extended inwardly from the internal wall of said elongated tubular member adjacent to said top end of the same;

means for blocking said bottom end;

a sleeve member having a plurality of holes staggered axially and circumferentially along said sleeve member, each of said holes being spaced by a predetermined arc length, said sleeve member rotatably and sealingly sleeved around said elongated tubular member, each of said holes indicating a pre-arranged pressure value, the angular distance between adjacent said holes measured circumferentially being greater than said predetermined width of said longitudinal groove of said elongated tubular member, only one of said holes being aligned with said longitudinal groove of said elongated tubular member indicating said pre-arranged pressure value when said sleeve member is rotated to a position;

a piston member provided in said elongated tubular member between said blocking means of said bottom end and said stop member adjacent to said top end, said piston member having a nose extended into said longitudinal groove and sealingly in touch with the internal wall of said sleeve member and sealingly engaged along said longitudinal groove of said elongated tubular member, said piston member movable axially in said elongated tubular member while sealingly engaging the internal wall of said elongated tubular member;

a spring member disposed in said elongated tubular member between said blocking means and said piston member urging said piston member to abut said stop member;

a valve means for allowing a pressurized gas to enter said elongated tubular member through said top end of the same, said valve means being mounted on said top end of said elongated tubular member; and

a pair of retaining members, respectively connected to said top end and said bottom end of said elongated tubular member, preventing said sleeve member from disengaging said elongated tubular member;

whereby when said pressurized gas enters said elongated tubular member through said valve means, said piston member can be pushed downward against the compression force of said spring member in said elongated tubular member towards said pre-arranged hole indicating said pre-arranged pressure value of the same by said pressurized gas, and allowing said pressurized gas to escape through said pre-arranged hole when said pressurized gas is under higher than said pre-arranged pressure value of said pre-arranged hole.

5,113,696

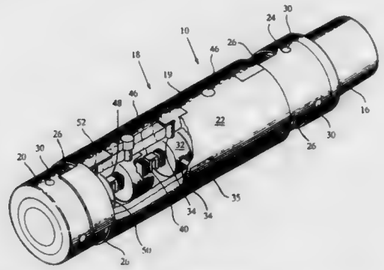
WIND TUNNEL VARIABLE RANGE BALANCE

Philip J. Mole, San Diego, Calif., assignor to General Drawings Corporation, Convair Division, San Diego, Calif.

Filed Dec. 26, 1990, Ser. No. 633,857

Int. Cl.[5] G01M *9/00*

U.S. Cl. 73—147 **6 Claims**



1. A wind tunnel balance comprising:

an elongated inner tubular rod having a front end, rear end, an inner surface and outer surface;

the rear end of said inner tubular rod having structure for detachably connecting to a sting;

a model attachment assembly formed of an outer shell which is fixedly attached to said model, a forward sleeve portion, a central sleeve portion, and an aft sleeve portion, a plurality of web gage elements connecting said aft sleeve portion to said central sleeve portion;

said inner tubular rod being inserted into said assembly;

means for rigidly securing said aft sleeve portion to said inner tubular rod;

the inner diameter of said central sleeve portion being greater than the other diameter of said inner tubular rod so that said central sleeve portion is free to move axially, laterally and rotationally;

a free motion central disk member positioned inside said tubular rod at the balance moment of center;

means for rigidly connecting said central disk member to the central sleeve portion of said outer shell assembly so that they may move as a single unit;

a forward plug member positioned a predetermined axial distance in front of the central disk member inside said tubular rod and means for rigidly connecting said forward plug member to said inner tubular rod; and

a longitudinal extending low load axial force gage element connected between said forward plug member and said central disk member.

5,113,697

PROCESS AND APPARATUS FOR DETECTING DISCONTINUITIES ON LONG WORKPIECES

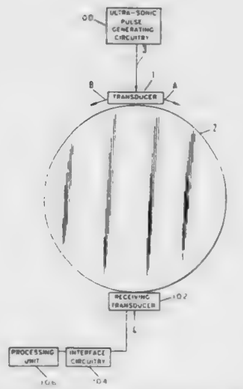
Friedheim Schlawne, Kerben, Fed. Rep. of Germany, assignor to Mannesmann AG, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 12, 1990, Ser. No. 463,609

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1989, 3901238; Dec. 22, 1989, 3943226

Int. Cl.[5] G01N *29/04*

U.S. Cl. 73—602 **19 Claims**



1. A process for the detection of vibrationally determinable discontinuities in elongated workpieces, said process comprising the steps of:

positioning the workpiece in relationship to a vibrational transducer transmitting means;

generating at least two vibrational signals with the vibrational transducer transmitting means and directing the generated vibrational signals at least around a peripheral portion of the elongated workpiece on which detection of discontinuities is being conducted;

projecting the vibrational signals generated by the vibrational transducer means at least as two transmitted signals in substantially different directions about the workpiece;

disposing at least one receiving transducer means at its corresponding at least one predetermined position around the workpiece;

said at least one predetermined position being located to receive signals where at least two of the signals transmitted by said transducer means in a workpiece substantially free of any substantial discontinuities would produce at least partial destructive interference between the at least two transmitted signals;

said transmitted signals comprising pulses;

said transmitted signals having a cycle period of time between pulses which is substantially longer than the time corresponding to the pulse widths;

choosing the time from the beginning of one pulse to the beginning of the next pulse of a cycle period of time of said transmitted signals as being a time less than one quarter of the time for a pulse to traverse around a peripheral portion of the elongated workpiece for a workpiece being substantially free of any substantial discontinuities;

choosing the length of time of the pulse width of the transmitted signal to be in correspondence with the decay time of a pulse propagating in a workpiece which workpiece is substantially free of any substantial discontinuities;

receiving said transmitted at least two generated vibrational signals at said at least one receiving transducer means which receiving transducer means is disposed at said at least one predetermined position;

processing at least the received signals to indicate deviations

from signals received from a substantially equivalent workpiece being substantially free of any substantial discontinuities in a processing unit; and

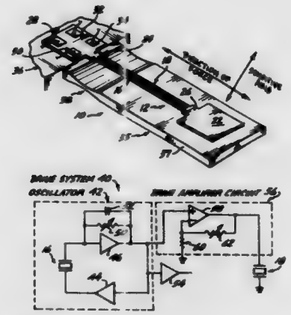
determining at least the presence of any substantial discontinuities in the workpiece being tested in said processing unit.

5,113,698

VIBRATING BEAM TRANSDUCER DRIVE SYSTEM

Steven F. Grij, Bellevue, and Craig J. Cornelius, Redmond, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Feb. 26, 1990, Ser. No. 485,188
Int. Cl.[5] G01L *1/10*
U.S. Cl. 73—862.59 **15 Claims**



1. A sensor assembly comprising:

(a) a vibrating transducer having two mechanically coupled vibrating beams, each of said beams having a separate isolated resonant frequency; and

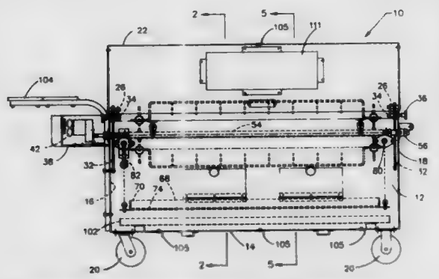
(b) a drive system for applying different drive signals to said beams so that when said different drive signals are applied, said transducer has a quality factor greater than when the same drive signal is applied to both beams.

5,113,699

BARBECUE APPARATUS

Eligio L. Soriano, 869 Las Lomas Dr., Milpitas, Calif. 95035

Filed Jul. 31, 1991, Ser. No. 738,433
Int. Cl.[5] A47J *37/04*
U.S. Cl. 99—421 H **12 Claims**



1. Barbecue apparatus comprising, in combination:

a housing defining an interior, said housing including a bottom wall and first and second opposed end walls projecting upwardly from said bottom wall;

drive means including a motor having a rotatable output shaft mounted adjacent to said first end wall, said output shaft passing through an aperture formed in said first end wall;

a support shaft having first and second ends, said support shaft extending over said bottom wall for insertion into and to provide support for meat over said bottom wall;

first interconnect means for selectively releasably interconnecting said first support shaft end to said output shaft at a location within said housing above said bottom wall;

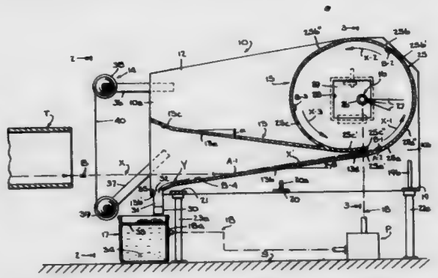
second interconnect means for selectively releasably interconnecting said support shaft second end to said second end wall and retaining said support shaft adjacent to said second end wall above said bottom wall, said second interconnect means including a bearing mounted on said second end wall, a stud shaft rotatable within and axially slidable relative to said bearing and said support shaft to bring said stud shaft into operative engagement with said support shaft second end, and fastener means for selectively fastening together said support shaft second end and said stud shaft to allow joint rotation thereof.

5,113,700

BULLET TRAP

Ronald Coburn, Westfield, Mass., assignor to Passive Bullet Traps Limited, Douglas, Isle of Man

Continuation-in-part of Ser. No. 627,705, Dec. 14, 1990, Pat. No. 5,070,763. This application Sep. 16, 1991, Ser. No. 760,750
The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.
Int. Cl.[5] F41J *1/14*
U.S. Cl. 89—36.02 **26 Claims**



1. A bullet trap for catching and deenergizing projectiles fired along a substantially horizontal path of flight into the trap from manual firearms not more powerful than a 0.44 Magnum handgun, which trap includes a first pair spaced flat plates located on opposite sides of said path of flight and a second pair of spaced flat plates arranged transverse to said first plates on opposite sides of said path of flight, with said plates defining the respective sides of a passageway having at its front end an entrance opening and at its rear end a throat through which the projectiles can pass, and a spent projectile decelerating and energy-dissipating chamber the circumferential boundary wall of which is of generally spiral configuration and the opposite end walls of which are constituted by portions of said second plates, with said passageway communicating with said chamber substantially tangentially of the latter through said throat; the improvement comprising that:

(a) said first plates (i) are located, respectively, above and below said path of flight and (ii) are oriented at respective angles of inclination of between 0° and about 15° to the horizontal; and

(b) said decelerating and energy-dissipating chamber has a substantially horizontal axis between said opposite end walls, and said circumferential boundary wall of said chamber is defined by a curved extension of the lower one of said first plates, (i) an initial part of said circumferential boundary wall extending from said throat generally rearwardly of said passageway first at an inclination to the horizontal substantially the same as that of said lower first plate and then arcuately upwardly relative thereto, (ii) a middle part of said circumferential boundary wall extending arcuately from said initial part generally frontwardly of said passageway first upwardly and then downwardly, and (iii) a terminal part of said circumferential boundary wall extending arcuately from said middle part downwardly and generally rearwardly of said passageway into substantially coplanar relation with the upper one of said first plates and having an end edge overlying the region of said initial part of said circumferential boundary wall contiguous to said lower first plate;

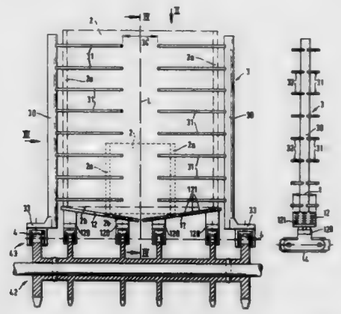
whereby a projectile fired into said passageway through said entrance opening along said path of flight and coming into contact with one of said first plates is deflected thereby through a small angle into a flight path running generally along the contacted first plate but out of contact therewith and ultimately passes through said throat of said passageway and impacts against said initial part of said circumferential boundary wall of said chamber at a relatively low angle so as not to be shattered thereby nor to damage the same, and the projectile then circumnavigates the chamber with gradually decreasing speed while in contact with said circumferential boundary wall until the energy of the projectile has been substantially dissipated, so that the spent projectile ultimately falls from said thermal part of said circumferential boundary wall over said end edge thereof onto said initial part of said circumferential boundary wall just rearwardly of said throat of said passageway and moves through said throat back into said passageway and along said lower first plate for removal from the trap.

5,113,701

TRANSPORT DEVICE FOR BOARDS HAVING A SENSITIVE SURFACE, ESPECIALLY FOR WET-COATED CIRCUIT BOARDS

Peter Martin, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 29, 1991, Ser. No. 647,322
Claims priority, application Switzerland, Feb. 5, 1990, 362/90
Int. Cl.[5] B05C *1/02*
U.S. Cl. 118—58 **35 Claims**



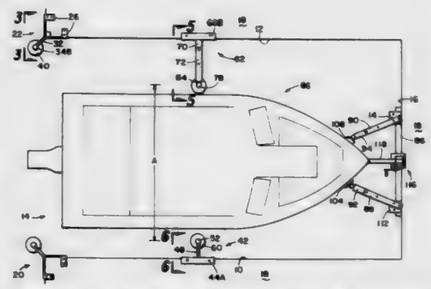
1. A transport device for boards or board-shaped workpieces, which are wet-coated with plastics material, and then dried, said device having holders for taking hold of said boards at the edges thereof when handling them and advancing means for transporting them to and through processing stations, said holder having at least two parallel bars on each of which there are provided two rows of prongs arranged in the form of a rake, said prongs of one row of a bar forming an acute angle with those of a second row of said bar, thus being arranged in a "V" shape with respect to each other when viewed in cross-section, and free ends of said prongs of the one bar pointing in the direction of free ends of said prongs of said other bar, and wherein, at least over part of a region located between said bars, a gap between said rows of prongs has a width which increases towards a longitudinal middle plane between said two parallel bars and is greater than a thickness of said board to be held, wherein said holders have open bottom ends to form a loading and unloading opening for said boards, and said transport device further has a supporting device for said boards which is arranged in a region of said bottom ends of said holders and is movable synchronously with said holders.

5,113,702

BOAT AND DOCK GUARD

Lloyd O. Capps, Rte. 5, Box 338, Claremore, Okla. 74017

Filed Apr. 30, 1990, Ser. No. 515,851
Int. Cl.[5] B63B *59/02*
U.S. Cl. 114—219 **5 Claims**



1. A boat dock for use to store a boat therein, the boat dock comprising:

a boat slip having an open entry, opposed sidewalls and a front, the entry being open to receive a boat therein between the opposed sidewalls, the dock being floated on or supported above a body of water;

a dock guard secured to and extending laterally from each said sidewall to which it is attached and forwardly of said entry, each dock guard having a vertical cylindrical member and a thick walled tube formed of elastomeric material received on said cylindrical member;

a first intermediate guard affixed on one of said dock sidewalls and extending a short distance from such sidewall, the first intermediate guard having a resilient surface thereon;

a second intermediate guard affixed on the other of said dock sidewalls opposite to said first intermediate guard, the second intermediate guard having a resilient surface thereon;

means to adjustably select the spacing between said second intermediate guard with respect to said sidewall to which it is affixed whereby spacing between the first and second intermediate guards can be adjusted to that which is slightly greater than the width of the boat which the dock is adapted to receive;

a pair of padded stop members secured to said dock front, the stop members being spaced apart and positioned to receive the forward portion of a boat bow therebetween; and means to releasably secure a boat within said boat slip.

5,113,703

TUBING END LOCATING APPARATUS FOR WELLBORES

David D. Hearn, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

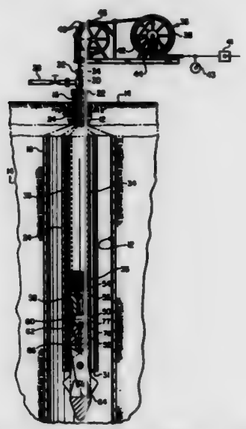
Filed Aug. 9, 1990, Ser. No. 564,932
Int. Cl.[5] E21B *43/00*
U.S. Cl. 73—151 **16 Claims**

15. A method for determining the location of a reference point on a tubing string with respect to a reference point on a

pipe string disposed in a wellbore, which tubing string is insertable within said pipe string, including the steps of:

providing said tubing string including means for conducting pressure fluid through said tubing string;

providing an apparatus connected to said tubing string, said apparatus comprising a body member including passage means formed therein for receiving pressure fluid from said tubing string and port means in communication with said passage means for conducting pressure fluid therethrough, a closure member disposed on said apparatus and movable between a first position and a second position to substantially close off flow of pressure fluid through said port means, and means connected to said apparatus and engageable with a surface on said pipe string to hold said



closure member in one of said positions, said closure member being movable to the other of said positions in response to said apparatus moving past said reference point on said pipe string to effect a change in fluid flow through said tubing string;

providing means for sensing said change in fluid flow through said tubing string;

inserting said tubing string and said apparatus within said pipe string and moving said apparatus through said pipe string while monitoring said means for sensing; and

determining the location of said apparatus within said pipe string in response to sensing said change of fluid flow in said tubing string in response to said closure member moving to said other position.

5,113,704
GEAR TESTER

Mitsuru Yano, Fukuoka, and Yasuro Yoshihara, Kitakyusyu, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo and Nishinihon Kogyo Co., Ltd., Fukuoka, both of, Japan

Filed Feb. 19, 1991, Ser. No. 656,331
Claims priority, application Japan, Feb. 19, 1990, 2-37860
Int. Cl.[5] G01M *13/02*
U.S. Cl. 73—162 **5 Claims**

1. A gear tester comprising:

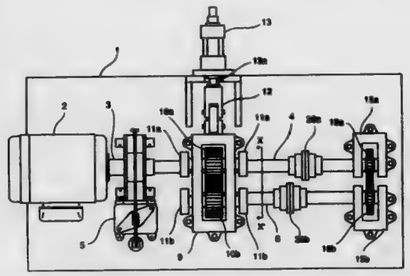
(a) a first driving shaft driven by a motor and having a first driving gear fixed thereto;

(b) a second driving shaft parallel with said first driving shaft and having a second driving gear fixed thereto;

(c) a pair of intermediate gears meshing with each other, via which said first and second driving shafts are operably connected to each other;

(d) a frame rotatably supporting said pair of intermediate gears, said frame being selectively movable horizontally in a transverse direction by a pushing force so that a rotation phase difference is generated between said first and second driving gears depending upon the movement of said frame; and

(e) a pair of test gears meshing with each other, one of which is fixed to said first driving shaft and the other of which is

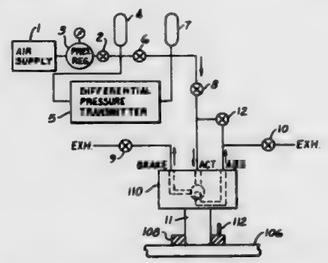


fixed to said second driving shaft, to attendantly apply a torque load to said test gears when said frame is moved by said pushing force to thereby test various properties of said test gears.

5,113,705
FUNCTIONAL TESTING OF SOLENOID VALVES IN AIR

Daniel E. Earnhardt, Seaford, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Dec. 21, 1990, Ser. No. 631,581
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—168 **10 Claims**



1. Test apparatus for testing, using pressurized gas as a test medium, a solenoid valve which, in use, will control the flow of a liquid medium, said apparatus comprising:

a test fixture for suitably supporting such a solenoid valve during testing, including means providing for gas-tight connection of a pneumatic test circuit to ports of the solenoid valve;

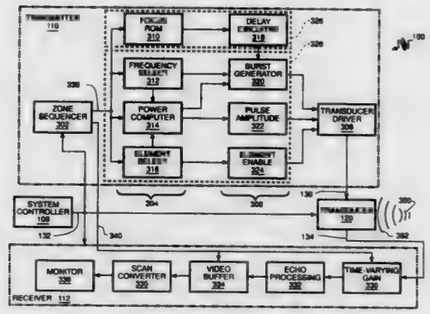
means for causing one or more tests to be conducted on such a solenoid valve supported by said test fixture involving at least one test selected from a group of tests consisting of: leak testing; flow testing; and response testing;

means to compare the result of said one or more tests with a specification that has been previously derived from an established correlation of the results of previously conducting said one or more tests on a number of such solenoid valves using gas as a test medium with the results of previously conducting said one or more tests on a number of such valves using liquid as a test medium.

5,113,706
ULTRASOUND SYSTEM WITH DYNAMIC TRANSMIT FOCUS

Richard J. Pittaro, San Carlos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 3, 1990, Ser. No. 548,162
Int. Cl.[5] G01N *9/24;* **A61B** *8/00*
U.S. Cl. 73—626 **10 Claims**



1. An ultrasound system comprising:

a transducer for converting electrical power bursts into respective acoustic wavefronts;

burst means for generating said power bursts, said burst means being coupled to said transducer so that each of said power bursts generates a respective acoustic wavefront, each of said power bursts being characterized by a transmit power and a focal point at which the resulting wavefront converges, said focal point determining a focal depth for its burst;

sequencer means for cycling through a referent series of n focal zone referents corresponding to a zone series of n focal zones;

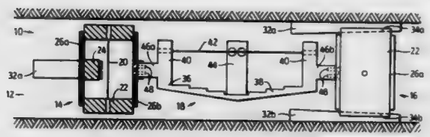
focus means for controlling said focal depths of said bursts so that said respective focal points of a burst series including n of said bursts fall respectively within said n focal zones, said focus means being coupled to said sequencer means for receiving said focal zone referents and coupled to said burst means for controlling said bursts; and

power means for controlling said transmit power of said power bursts as a function of said focal depth, said power means being coupled to said sequencer means for receiving said focal zone referents and to said burst means for controlling said transmit power of said power bursts.

5,113,707
THREE-DIMENSIONAL STRAIN MONITOR FOR ROCK BOREHOLES

Gerhard H. Herget, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada, Ontario, Canada

Filed May 2, 1991, Ser. No. 694,485
Int. Cl.[5] G01B *7/16*
U.S. Cl. 73—784 **20 Claims**



1. A strain monitor for monitoring strain or deformation in a borehole comprising:

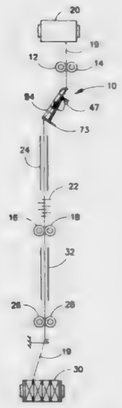
first and second vibrating wire strain monitors for monitoring strain or deformation in first and second radial directions with respect to the borehole axis, said first and second vibrating wire strain monitors each including means for anchoring itself within a borehole; and

a third vibrating wire strain monitor disposed between said first and second vibrating wire strain monitors for monitoring strain or deformation in an axial direction with respect to the borehole axis, wherein said first and second vibrating wire strain monitors act as anchors for said third vibrating wire strain monitor.

5,113,708
APPARATUS TO MEASURE YARN TENSION

Jerry E. Bode, Greer, and Ronnie E. Duckett, Chesnee, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 21, 1990, Ser. No. 616,384
Int. Cl.[5] G01L *5/10*
U.S. Cl. 73—862.41 **19 Claims**



10. An apparatus to measure the tension in a running length of yarn comprising:

(a) a frame;

(b) at least one pair of guide members attached to said frame and longitudinally spaced from one another to guide yarn from end of said frame to the other end of said frame;

(c) a means to supply air under pressure to vibrate the yarn passing between the guide members to cause said yarn to vibrate at its harmonic frequency and includes a first conduit and a second conduit for projecting streams of air therethrough and mounted at a first angle from each other and said first conduit having a substantially oval orifice where said streams are emitted and having a longitudinal axis and said second conduit having a substantially oval orifice where said streams are emitted and having a longitudinal axis with a second angle of intersection between the longitudinal axis of said first conduit and the longitudinal axis of said second conduit; and

(d) a second means mounted in said frame to measure the harmonic frequency of the yarn as it passes through said guide members.

5,113,709
CONVERTIBLE WEB TENSION TRANSDUCER

Kenneth E. Ekola, 574-6th St., Dover, N.H. 03820

Filed May 29, 1990, Ser. No. 529,857
Int. Cl.[5] G01L *5/10*
U.S. Cl. 73—862.48 **6 Claims**

1. A web tension transducer convertible to support a live roll

supporting shaft, a live roll and a stationary shaft supporting a live roll comprising:

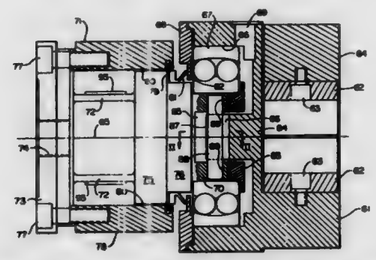
a) a coupling for fixed attachment to one of a shaft and a roll defining a roll axis;

b) a resiliently bendable beam carried by a support member;

c) the coupling being resiliently carried by said beam by way of a self-aligning bearing disposed to permit relative rotation therebetween, wherein said beam is part of a beam structure having mans for supporting one race of the self-aligning bearing;

d) means to provide an output signal representing deflection of said beam; and

e) selectively used means which, when installed in the transducer, prevents said relative rotation only about said roll



axis, the coupling and support member being free for relative rotation about said roll axis when said means is not installed in the transducer, said selectively used means comprising a pivot pin, supported in a bore i one of the beam structure and coupling, extending normal to said roll axis and defining a pin axis intersecting that roll axis, said pin passing through in close proximity to transverse walls of a slot, defined by the other of the beam structure and coupling, extending normal to said axis, the presence of the pin in the slot preventing relative rotation, about said roll axis, between the coupling and the support member when the pin is installed in the transducer, the omission of the pin from the transducer, allowing relative rotation of the coupling relative to the support member about said roll axis.

5,113,710

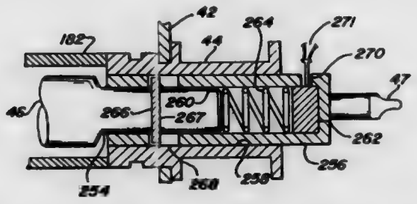
LOAD MEASURING APPARATUS

Michael H. Wolfbauer, III, Roseville, Mich., assignor to Savair Inc, St. Clair Shores, Mich.

Continuation of Ser. No. 408,920, Sep. 18, 1989, Pat. No. 4,961,317. This application Jun. 12, 1990, Ser. No. 539,127

Int. Cl.[5] G01L *5/00*; F01B *31/12*

U.S. Cl. 73—862.54 **10 Claims**



1. A load detection device for monitoring the engagement force between a tool and a workpiece said load detection device comprising:

means for transmitting a force, said means for transmitting a force having a free end, said force being transmitted at said free end;

a load cell having one face juxtaposed said free end of said means for transmitting a force for monitoring said force of said transmitting means;

biasing means mounted between said free end and said one face of said load cell, said biasing means providing a biasing force to urge said load cell monitoring said force away from said free end;

a piston rod adapter having a blind bore at one end and an open end opposite said one end, said opposite end being slidably mounted to said free end of said means for transmitting a force, said biasing means and said load cell being mounted in said blind bore of said piston rod adapter and further being interposed said free end and the bottom of said blind bore; and

means for limiting the movement of said means for transmitting a force relative to said piston rod adapter, said limiting means being mounted to said means for transmitting a force such that the force transmitted at said free end of said means for transmitting a force is counteracted by said biasing means and the net effect of said force is monitored by said load cell to determine the engagement force between said tool and said workpiece.

5,113,711

LIQUID SAMPLING DEVICE

Ramana Davloor, 295 Market Street, Port Elgin, Ontario, N0H 2C0, Canada; Richard Root, R.R. #4,, Paisley, Ontario N0G 2N0, Canada, and Douglas R. Root, 9 Prince Albert Street, Delaware, Ontario, N0L 1E0, Canada

Filed Mar. 19, 1990, Ser. No. 495,485

Claims priority, application Canada, Apr. 4, 1989, 595,605

Int. Cl.[5] G01N *1/12* •

U.S. Cl. 73—864.63 **3 Claims**



1. Liquid sample taking device comprising, in combination:

a) an elongated, hollow cylindric body having a first end and a second end;

b) manipulating means removably secured to said first end of the body;

c) a control rod having a first end portion slidably received in said manipulating means, an intermediate portion freely disposed within said body, and a second end portion freely disposed at the second end of the body, the rod being mounted in said manipulating means to allow reciprocating movement of said intermediate portion within said body generally coaxially therewith;

d) a closure member secured to said rod at the second end thereof and being adapted to sealingly engage said second end of the body to close the body when the device is in a closed state and to be remote from the second end of the body, leaving the second end open, when the device is in an open state;

e) vent means at the first end of the body, the vent means communicating the interior of the body with the atmosphere surrounding the device to allow the flow of a liquid into the body from the second end, when the body is held in a generally vertical position and partly submerged into a body of liquid to be sampled;

f) the inner wall of said body being a smooth cylindric wall devoid of protrusions throughout the entire length of the body between said second end and said vent means;

g) the control rod manipulating means including spring means operatively associated with the control rod to constantly urge the same in an axial direction from the second end to the first end of the body;

h) said manipulating means further including:

i) selectively releasable lock means operatively associated with said rod and with said spring means, to block, when the device is in said open state, the movement of the rod in said direction, in which open state the closing member is remote from the second end of the body, and to release the blocking of the rod to allow its movement, under the force of said spring means, in said direction, to bring the closure member into sealing contact with the second end of the body to provide said closed state; and

ii) a control member fixedly secured to the rod at the first end portion thereof, to allow selectable pushing of the rod to move the same through said manipulating means, against the action of said spring means, to open the lower end of the body, and to turn the rod about a central longitudinal axis thereof to bring the same from a released position to a position in which the movement of the rod is blocked to hold the closure member in an open state; and a rod guide member slidably engaged with the rod at said first end portion, said guide member being threadably secured to the first end of the body by a thread complementary with an inner thread provided at an inner surface of the first end of the body.

5,113,712

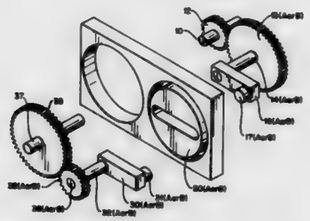
SIMPLE STEPLESS VARIABLE TRANSMISSION

Demitri G. Economou, 1275 Ulupii St., Kailua, Hi. 96734

Filed May 24, 1990, Ser. No. 530,007

Int. Cl.[5] F16H *21/14, 29/04*

U.S. Cl. 74—69 **7 Claims**



1. A stepless variable transmission connecting a rotating input shaft to a rotatable output shaft, comprising:

an input stage arm having an input arm engagement member mounted for circular motion of said input arm engagement member around an input stage center of motion drivably connected to said input shaft, whereby rotation of said input shaft drives said input arm engagement member into circular motion around said input stage center of motion;

an intermediate stage linkage having an elongated slide mounted for rotation of said slide around an intermediate stage center of rotation, said input stage center of motion and said intermediate stage center of rotation defining an input-intermediate center distance, wherein said input arm engagement member is engaged in said slide, whereby circular motion of said input arm engagement member drives said slide into periodic rotational motion around said intermediate stage center of rotation;

an output stage arm having an output arm engagement member mounted for circular motion of said output arm engagement member around an output stage center of motion, said output stage center of motion and said intermediate stage center of rotation defining an intermediate-output center distance, wherein said output arm engagement member is engaged in said slide, whereby said periodic rotational motion of said slide drives said output arm engagement member into periodic circular motion around said output stage center of motion;

an overrunning clutch mounted between said output arm engagement member and said output shaft, drivably connecting said output arm engagement member to said output shaft, whereby a portion of said periodic circular motion of said output arm engagement member drives said output shaft into rotational motion; and

control means for simultaneously controllably varying said input-intermediate center distance and said intermediate-output center distance.

5,113,713

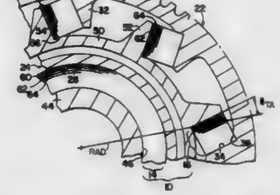
ELASTOMERIC LOAD SHARING DEVICE

Charles J. Isabelle, Winsted; Jules G. Kish, Milford, and Robert A. Stone, Sandy Hook, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 11, 1991, Ser. No. 653,587

Int. Cl.[5] F16H *55/18*

U.S. Cl. 74—410 **8 Claims**



1. In a split power transmission system having torque-splitting gear train assemblies defining load paths for transmitting torque from an engine to an output member, each torque-splitting gear train assembly comprising:

driven gear means for receiving torque from the engine, said driven gear means being further operative for transmitting torque;

central torque drive shaft means disposed in combination with said driven gear means and operative in response to torque transmitted by said driven gear means for transmitting torque from said driven gear means to the output member; and

elastomeric load sharing means interposed in combination with said driven gear means and said central torque drive shaft means for providing balanced torque distribution between respective load paths of each torque-splitting gear train assembly, said elastomeric load sharing means including

first elastomeric bearing means interposed in first combination between said driven gear means and said central torque drive shaft means for radially centering said driven gear means, and

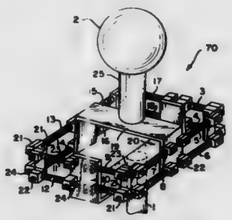
second elastomeric bearing means interposed in second combination between said driven gear means and said central torque drive shaft means for compressively transmitting torque from said driven gear means to said central torque drive shaft means.

5,113,714

USER FRIENDLY JOYSTICK

Wayne D. Eklund, Edgewood, and James J. Kerley, Greenbelt, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Filed Feb. 20, 1991, Ser. No. 657,790
Int. Cl.[5] G05G *9/00*
U.S. Cl. 74—471 XY **7 Claims**



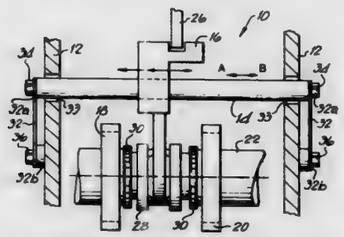
1. A joystick control device comprising:
a lower U-shaped bracket;
an upper U-shaped bracket;
a handle affixed to said upper U-shaped bracket;
said upper U-shaped bracket connected to said lower U-shaped bracket by a compliant joint allowing six degrees of freedom for said joystick;
said compliant joint comprising at least one cable segment affixed between said lower U-shaped bracket and said upper U-shaped bracket; and
at least one input device located between said lower U-shaped bracket and said upper U-shaped bracket.

5,113,715

GEAR CHANGE MECHANISM

Roger M. Weyman, Coventry, United Kingdom, assignor to Massey-Ferguson Services N.V., Netherlands Antilles

Filed Sep. 19, 1990, Ser. No. 584,927
Claims priority, application United Kingdom, Sep. 23, 1989, 8921541
Int. Cl.[5] B60K *20/00*; F16D *11/00*
U.S. Cl. 74—473 R **6 Claims**



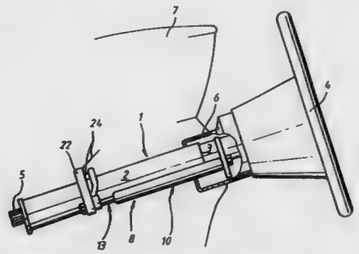
1. A gear change mechanism for a vehicular transmission comprising:
a gearbox casing;
a support rail having two ends;
means for resiliently supporting said support rail on said gearbox casing for limited axial movement;
gear changing means disposed within said gearbox casing; and
a selector fork connected to said gear changing means and slidably mounted on said support rail for axial movement to operate said gear changing means.

5,113,716

RELEASABLE LOCKING DEVICE FOR A VEHICLE STEERING COLUMN ADJUSTABLE IN THE LONGITUDINAL DIRECTION

Rainer Dumschat, Donzdorf, and Gottfried Schremmer, Tamm, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Oct. 18, 1990, Ser. No. 599,515
Int. Cl.[5] B62D *1/18*
U.S. Cl. 74—493 **5 Claims**



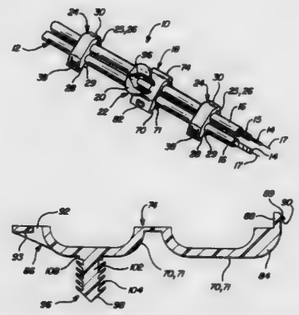
1. Releasable locking device for a vehicle steering column adjustable in the longitudinal direction, having a positionally fixed steering column part, a steering column section displaceable relative to the latter and having at the end a steering wheel, a sealed hydraulic piston-cylinder unit arranged axially parallel to the steering column for fixing the displaceable steering column section and coupled between and outside the positionally fixed steering column part and the displaceable steering column section, and a mechanical actuating member for controlling the displaceable steering column section, wherein the sealed piston-cylinder unit, with a cylinder chamber which, when completely filled and subjected to pressure caused by impact on the steering wheel, can be locked in various supporting positions by a blocking device arranged in an overflow path between two cylinder chambers of the piston-cylinder unit.

5,113,717

MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY WITH A CONDUIT LOCATOR CONNECTING MEANS

Gerhard R. Plamper, Birmingham, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Jan. 30, 1991, Ser. No. 648,126
Int. Cl.[5] F16L *3/00*; F16C *1/26*
U.S. Cl. 74—502.6 **25 Claims**



1. A motion transmitting remote control assembly (**10**) of the type for transmitting motion in a curved path by a motion transmitting core element, said assembly comprising:

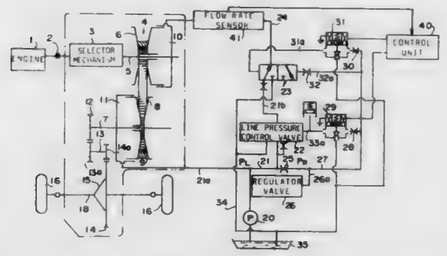
conduit means (**12**) for establishing a path;
a core element (**17**) moveably guided by said conduit (**12**) for transmitting motions in said path,
connecting means (**18**) slideably coupled to said conduit (**12**) for axial movement of said connecting means (**18**) along said conduit (**12**) and for connecting said conduit (**12**) to a support structure (**20**);
characterized by including limiting means (**24**) fixedly disposed on said conduit (**12**) in axially spaced positions on opposite sides of said connecting means (**18**) for limiting said axial movement of said connecting means (**18**) along said conduit (**12**).

5,113,718

TRANSMISSION RATIO CONTROL SYSTEM OF A CONTINUOUSLY VARIABLE TRANSMISSION FOR A MOTOR VEHICLE

Keiji Sato, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1990, Ser. No. 632,967
Claims priority, application Japan, Dec. 28, 1989, 1-343308
Int. Cl.[5] B60K *41/16*
U.S. Cl. 74—846 **3 Claims**



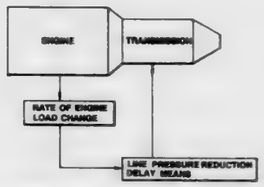
1. A system for controlling transmission ratio of a continuously variable belt-drive transmission connected to an engine mounted on a motor vehicle, having a primary pulley with a hydraulically shiftable disc and a primary hydraulic cylinder for shifting said disc, a secondary pulley including a hydraulically shiftable disc and a secondary hydraulic cylinder for shifting said disc thereof, a belt engaged with both pulleys, a hydraulic circuit for supplying oil from a pump to said cylinders, a transmission ratio control valve for controlling a primary pressure applied to said primary cylinder, a line pressure control valve for controlling a secondary pressure applied to said secondary cylinder, a throttle position sensor for producing a throttle opening degree signal, speed sensors for detecting speeds of said primary pulley and secondary pulley and said engine respectively and for producing respective speed signals, actual transmission ratio calculating means responsive to said primary pulley speed signal and secondary pulley speed signal for calculating an actual transmission ratio and for producing an actual transmission ratio signal, desired transmission ratio calculating means responsive to said secondary pulley speed signal and said throttle opening degree signal for calculating a desired transmission ratio and for producing a desired transmission ratio signal, transmission ratio changing speed calculator means responsive to said actual transmission ratio and said desired transmission ratio for calculating a transmission ratio changing speed, valve operating means responsive to said actual transmission ratio signal and said desired transmission ratio signal for operating said transmission ratio control valve so as to control the transmission ratio to the desired transmission ratio, and an antilock brake system, the system comprising:
a deceleration calculator responsive to a pseudo vehicle speed for calculating a deceleration of said vehicle;
a stop time calculator responsive to the deceleration and to said pseudo vehicle speed for calculating an operation time of said antilock brake system;
a downshifting speed calculator responsive to the time for calculating a downshifting speed necessary to increase the actual transmission ratio to a maximum transmission ratio before said vehicle stops; and
changing means for changing said transmission ratio changing speed to said downshifting speed when the operation of said antilock brake system ends.

5,113,719

ENGINE LOAD RESPONSIVE LINE PRESSURE CONTROL ARRANGEMENT FOR AUTOMATIC AUTOMOTIVE TRANSMISSION

Yutaka Suzuki, Hadano; Masayuki Kobayashi, Isehara, and Tatsuo Wakahara, Kawasaki, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jun. 8, 1989, Ser. No. 363,261
Claims priority, application Japan, Jun. 8, 1988, 63-139232
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—866 **11 Claims**



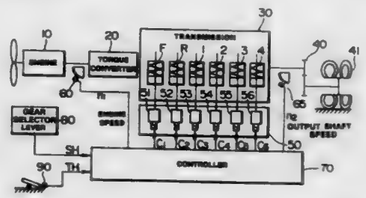
1. In a line pressure control system for an automatic automotive transmission:
means for selectively controlling the level of line pressure in response to changes in the load applied to the engine of an engine operatively connected with said transmission;
means for detecting the rate at which the load on the engine is changing; and
means for delaying the reduction in line pressure in response to rapid reductions in the engine load.

5,113,720

APPARATUS FOR CONTROLLING GEAR BOX

Yoshio Asayama, Chigasaki; Makio Tsubota, Hiratsuka; Yasunori Okura, Hiratsuka, and Takayuki Sato, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

PCT No. PCT/JP88/00631, § 371 Date Dec. 20, 1989, § 102(e) Date Dec. 20, 1989, PCT Pub. No. WO88/10380, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 24, 1988, Ser. No. 449,926
Claims priority, application Japan, Jun. 24, 1987, 62-157088; Aug. 7, 1987, 62-197711
Int. Cl.[5] F16H *61/06*
U.S. Cl. 74—866 **11 Claims**



1. An apparatus for controlling a gear box including a plurality of shift change clutches, a plurality of pressure control valves separately connected to said shift change clutches to

individually control hydraulic pressure in each of said shift change clutches, each of said pressure control valves comprising a first valve including a spool having an orifice formed at an output port thereof which leads to a clutch, said first valve being opened and closed by a differential pressure across said orifice, and a spring, and a second valve in the form of a pressure control valve adapted to be actuated in response to an electric signal, said second valve operating to open said first valve by feeding to the first valve hydraulic oil delivered from a hydraulic pump during the shift change and gradually increasing clutch hydraulic pressure after filling said clutch with oil and a plurality of drive circuits for feeding an electric current to said pressure control valves in response to an input clutch hydraulic pressure command;

a plurality of pressure detecting means disposed corresponding to said shift change clutches to detect hydraulic pressure in each shift change clutch; and

abnormality detecting means for detecting an abnormality with each clutch based on results derived from comparing clutch hydraulic pressure commands to be input into said drive circuits with outputs from said pressure detecting commands.

5,113,721

METHOD AND APPARATUS FOR CONTROLLING A MOTOR VEHICLE DRIVE TRAIN

Johann Polly, Neunkirchen, Austria, assignor to Auto Polly Gesellschaft M.B.H., Neunkirchen, Austria

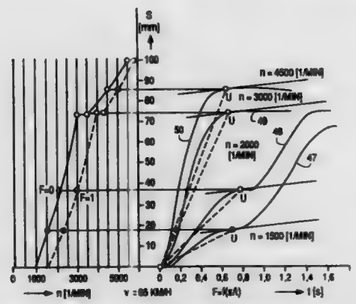
PCT No. PCT/AT88/00030, § 371 Date Apr. 12, 1990, § 102(e) Date Apr. 12, 1990, PCT Pub. No. WO89/03319, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 11, 1988, Ser. No. 474,045

Claims priority, application Austria, Oct. 12, 1987, A2680/87

Int. Cl.[5] B60K *31/04*

U.S. Cl. 74—866 **25 Claims**



1. A method of controlling a device train for motor vehicles equipped with an electronic engine power control which has associated accelerator pedal for the actuation of a throttle valve or control rod, a brake pedal and an automatic transmission on the basis of operating data, and stored driving speeds corresponding to different driving modes, wherein movements of the accelerator pedal and/or the brake pedal are monitored for motion sequences including changes in the direction of movement and certain, predetermined courses of change of the direction of the movements are selectively detected as specific direct and intentional gear selection control instructions from the driver, with the respective gear and its permissibility being calculatively determined and checked on the basis of the operating data and stored driving modes, whereupon a change of gears, if required, including actuation of the clutch, is initiated and, during the gear changing process, the engine power control system brings the engine to the number of engine revolutions resulting for the new gear independently of the position of the accelerator pedal, and wherein, in addition, automatic upshifting processes due to merely a release of the accelerator pedal are suppressed as long as the number of engine revolutions per minute remains below a permissible maximum number of revolutions per minute.

5,113,722

TIMING CONTROL DURING DOWNSHIFT TO ENGINE BRAKING RANGE

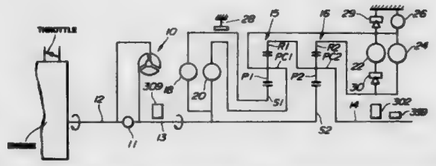
Naonori Iizuka, Shizuoka, Japan, assignor to Jatco Corporation, Fuji, Japan

Filed Jun. 21, 1991, Ser. No. 719,049

Claims priority, application Japan, Jun. 22, 1990, 2-164937

Int. Cl.[5] F16H *61/08*

U.S. Cl. 74—866 **6 Claims**



1. A system for a timing control for an automatic transmission including an input shaft, an output shaft, a one-way clutch which becomes ineffective in transmitting reverse torque from the output shaft to the input shaft, and an overrunning clutch which when engaged becomes effective in transmitting reverse torque from the output shaft to the input shaft, the automatic transmission being shiftable to an engine brake running state when the overrunning clutch is engaged in response to a select operation to an engine braking range, the system comprising:

means for detecting an input revolution speed of the input shaft and generating an input shaft revolution speed indicative signal indicative of said input revolution speed detected;

means for detecting an output revolution speed of the output shaft and generating an output shaft revolution speed indicative signal indicative of said output revolution speed detected;

means for detecting whether the engine braking range is selected or not and generating an engine braking range indicative signal when the engine braking range is selected;

a control unit receiving said input shaft revolution speed indicative signal, said output shaft revolution speed indicative signal and said engine braking range indicative signal,

said control unit including,

means for deriving a predetermined relationship between said input shaft revolution speed indicative signal and said output shaft revolution speed indicative signal;

means for checking whether said engine braking range position indicative signal is generated or not and determining occurrence of the select operation to the engine braking range;

means for setting a target value;

means for determining whether said predetermined relationship reaches said target value or not after the occurrence of the select operation has been determined;

means for generating an output signal when said predetermined relationship reaches said target value; and

means for engaging the overrunning clutch in response to said output signal.

5,113,723

CLUTCH CHANGEOVER CIRCUIT FOR NON-STAGE TRANSMISSION

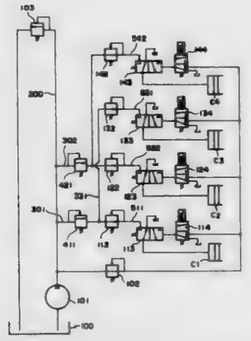
Tsutomu Ishino, Yawati, and Ryoichi Maruyama, Hirakata, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Division of Ser. No. 392,537, Jul. 20, 1989, Pat. No. 5,069,087. This application Mar. 15, 1991, Ser. No. 670,259

Claims priority, application Japan, Feb. 19, 1988, 63-37051; Feb. 19, 1988, 63-37052

Int. Cl.[5] B60K *41/18*

U.S. Cl. 74—867 **14 Claims**



1. A clutch changeover circuit for a multi-stage type stationary mechanical non-stage transmission, said clutch changeover circuit comprising:

a first common oil passage leading from a pump toward a first plurality of clutches provided in correspondence with a first plurality of non-adjacent speed stages, a first pressure regulating valve being provided in said first common oil passage so as to be used jointly for said first plurality of speed stages.

5,113,724

CONTROL SYSTEM FOR AN AUTOMATIC AUTOMOTIVE TRANSMISSION

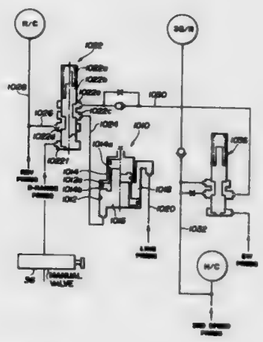
Koichi Hayasaki, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 20, 1990, Ser. No. 512,191

Claims priority, application Japan, Apr. 27, 1989, 1-108153

Int. Cl.[5] B60K *41/12*

U.S. Cl. 74—867 **7 Claims**



1. In a transmission

a first friction element to which line pressure is supplied via a first conduit;

a second friction element to which line pressure is supplied via a second conduit;

an accumulator, said accumulator having a piston and an accumulator chamber to which said piston is exposed;

a manual valve which is arranged to output a D-Range indicative line pressure signal when set in a D-range;

a selection valve which is operatively connected with said manual valve and responsive to the D-Range indicative signal which is output therefrom, said selection valve being operative to selectively establish fluid communication between said first conduit and said accumulator chamber under a first set of operating conditions wherein the D-Range indicative line pressure signal is present and connect said second conduit to said accumulator chamber under a second set of operating conditions wherein the D-Range indicative line pressure signal is absent.

5,113,725

HYDRAULIC CONTROL DEVICE OF AUTOMATIC TRANSMISSION MORE SMOOTH IN LOW COAST UPSHIFTING UNDER UNDER-D MANUAL SHIFT RANGE

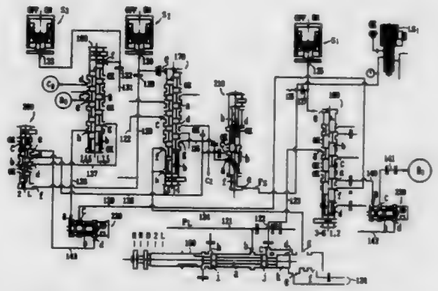
Hideo Tomomatsu, and Yasuo Hojo, both of Nagoya, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 19, 1990, Ser. No. 584,784

Claims priority, application Japan, Sep. 22, 1989, 1-247279; Sep. 22, 1989, 1-247281

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—869 **13 Claims**

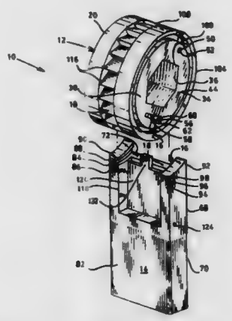


1. A hydraulic control device of an automatic transmission in a vehicle such as an automobile, said automatic transmission comprising a combination of a gear mechanism and friction engaging means adapted to provide a certain first speed stage and a certain second speed stage higher than said certain first speed stage according to selective engagement and disengagement of said friction engaging means when said transmission is in a certain under-D manual shift range, comprising a means for controlling engagement and disengagement of a certain one of said friction engaging means so as not to provide availability of engine braking at said certain first speed stage and to provide availability of engine braking at said certain second speed stage when said transmission is in said certain under-D manual shift range,

wherein said availability of engine braking at said certain second speed stage in said certain under-D manual shift range is obtained by engagement of said certain one friction engaging means, further comprising a means for controlling a speed of engagement of said certain one friction engaging means so that said speed of engagement is substantially lower when said automatic transmission is shifted up from said certain first speed stage under any optional manual shift range to said certain second speed stage when in said certain under-D manual shift range

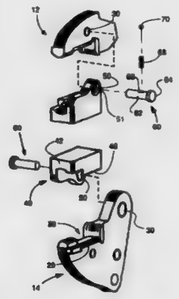
than when said automatic transmission is shifted to said certain second speed stage in said certain under-D manual shift range from any other speed stage and/or manual shift range.

5,113,726
UTILITY TOOL
Richard T. Ethridge, 807 Eagineer St., Corbin, Ky. 40701
Filed Oct. 4, 1990, Ser. No. 592,597
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—60 6 Claims



1. A utility tool for rotating a pipe nut about a pipe, said pipe nut having a selected diameter and a selected peripheral shape, said utility tool comprising:
a nut engaging means for gripping said pipe nut, said nut engaging means having first and second jaw members with a first end of said first jaw member pivotally joined to a first end of said second jaw member, said first and second jaw members each having opposite side faces and each having internal surfaces for closely engaging said selected peripheral shape of said pipe nut, said nut engaging means further having releasable locking means for releasably joining second ends of each of said first and second jaw members whereby said first and second jaw members releasably encircle said pipe nut with said internal surfaces engaging said peripheral shape of said pipe nut;
a lever means for rotating said nut engaging means to effect said rotating of said pipe nut;
a lever engaging means for releasably engaging said lever means with said opposite side faces of said first and second jaw members whereby said lever means is releasably engaged with said nut engaging means, said lever engaging means comprising cooperating semicircular grooves in said opposite side faces of said first and second jaw members, said semicircular grooves forming oppositely disposed circular grooves when said first and second jaw members are engaged with said pipe nut and leg members carried by said first end of said lever means, said leg members releasably engageable with said semicircular grooves of one of said jaw members when said first and second jar members are disengaged from said pipe nut whereby said leg members are movable along said circular grooves when said first and second jaw members are engaged with said pipe during ratcheting movement of said lever means; and
ratchet means cooperatively associated with said lever means and with said nut engaging means whereby ratcheting movement of said lever means in one direction effects rotation of said nut engaging means and ratcheting movement of said lever means in an opposite direction does not effect rotation of said nut engaging means whereby said pipe nut is rotated in a selected direction by said utility tool.

5,113,727
PLIERS WITH REMOVABLE JAW INSERTS
Kenneth L. Foster, Garland, Tex., assignor to Stanley-Bostitch, Inc., New Britain, Conn.
Filed Oct. 28, 1991, Ser. No. 783,510
Int. Cl.[5] B25B *2/02*
U.S. Cl. 81—423 3 Claims

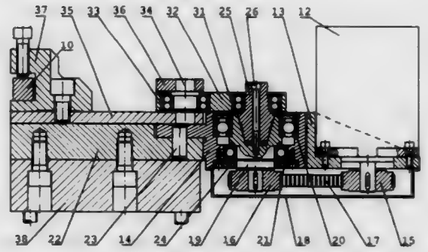


1. A tool comprising:
pliers having mutually opposing, articulating jaws;
means defining a recess in at least one of said jaws;
a flange formed on said at least one of said jaws adjacent said recess;
a jaw insert having a mating portion dimensioned to be received within said recess in said at least one of said jaws, a bearing portion formed transversely to said mating portion, a hook portion projecting from one lateral edge of said bearing portion, and a leg extending perpendicularly from the opposite lateral edge of said bearing portion;
said mating portion of said jaw insert being received within said recess in said at least one of said jaws;
means defining corresponding bores in said leg of said jaw insert and said at least on of said jaws;
said hook portion of said jaw insert engaging said flange formed on said at least one of said jaws to secure said hook portion of said jaw insert to said at least one of said jaws; and
a pin inserted through said corresponding bores in said leg of said jaw insert and said at least one of said jaws for securing said leg of said jaw insert to said at least one of said jaws,
whereby said jaw insert is removably attached to said pliers.

5,113,728
METHOD AND APPARATUS FOR FORMING INTERMITTENT CHIPS WHEN MACHINING A ROTATING WORKPIECE
Ludwik A. Medeksza, 3175 W. 42nd St., Erie, Pa. 16506
Filed Oct. 11, 1990, Ser. No. 596,041
Int. Cl.[5] B23B *3/28, 1/00*
U.S. Cl. 82—1.11 20 Claims

1. A method for generating intermittent chips when machining a rotating workpiece on a machine with a tool having one or more cutting edges and a feed advance path, comprising the steps of:
(I) rotating the workpiece about an axis of rotation coinciding with the centerline of a machined surface to be produced,
(II) causing the tool to achieve strictly determined and controlled positions along its feed advance path in response to angular positions of the rotating workpiece when cutting, so that
(a) a path described by the tool nose on the machined surface of the workpiece is wavy and has a constant wave amplitude A and wave length λ, said wave amplitude A and wave length λ being capable of adjustment,

(b) a distance p between any two consecutive paths described by the tool nose produced during any two consecutive revolutions of the workpiece is constant, said distance p being capable of adjustment, and
(c) a phase ϕ is produced between waves of any two consecutive tool nose path coils produced by a given

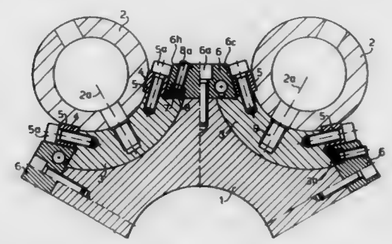


too nose, that is equal to 2π, where N is a selected number of waves of said wavy tool nose path per circumference of the machined surface of said workpiece and I(N) is the integer part of said N,
(III) controlling said amplitude A so that said amplitude A satisfies the inequality

$$A \geqq \left| \frac{p}{2n} \operatorname{cosecant} \left(\frac{N}{n} \pi \right) \right|$$

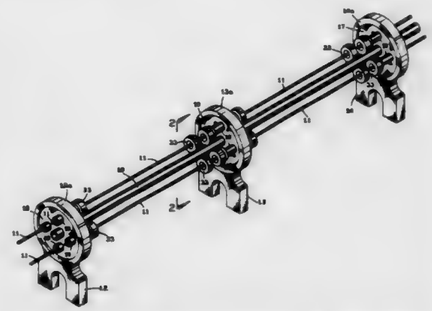
where p is said constant distance, N is said selected number of waves, and n is the number of major cutting edges in the tool, whereby the undeformed chip thickness varies periodically and reduces to zero in each period of its variation, thereby generating intermittent chips, or causing in some materials chip breakage, and
(IV) adjusting said amplitude A and said phase ϕ in any combination which satisfies the inequality defined in step III to achieve a desired surface finish and tool life.

5,113,729
CLAMPING DEVICE FOR FIXING A SPINDLE SLEEVE ON THE PLATFORM OF AN AUTOMATIC MACHINE TOOL
Enrico Ronzoni, Bergamo, Italy, assignor to Gildemeister Italiana S.p.A., Brembate Sopra, Italy
Filed Jul. 23, 1990, Ser. No. 557,404
Claims priority, application Italy, Oct. 20, 1989, 22077 A/89
Int. Cl.[5] B23B *21/00, 29/00*
U.S. Cl. 82—137 6 Claims



1. A device for supporting at least one tool spindle on an automatic machine tool, comprising:
a spindle-carrying sleeve to receive said tool spindle, said sleeve having at least one recess formed along an outer surface of the sleeve;
a receiving chuck having at least one concave seat, formed on an outer portion of said receiving chuck, for supporting each said sleeve;
a spindle-carrying slide arranged between said sleeve and said seat and moveable along a longitudinal axis of said chuck;
at least one presser piece connectable to said chuck by a securing means and being engageable with ends of said slide so as to secure slidingly said slide to said chuck, said presser piece having an adjustment device positioned within a recess in said presser piece, said adjustment device being adjacent at least one end of said slide and actuatable by a drive means to effect movement of the slide;
a clamping strip removeably secured to said end of said slide by locking means and engageable with said recess so as to secure said sleeve to said slide, said clamping strip being positioned between said presser piece and said sleeve; and
attachment means, along a center line of the slide, for securing said sleeve to said slide.

5,113,730
BAR STOCK GUIDE ARRANGEMENT FOR SCREW MACHINES
Paul Ducanis, 17401 NW. 2nd Ave., Miami, Fla. 33169
Filed Jun. 13, 1988, Ser. No. 205,954
Int. Cl.[5] B23B *25/00*
U.S. Cl. 82—162 20 Claims



1. In a bar stock guide arrangement at the inlet side of a screw machine, said guide arrangement comprising:
a plurality of rigid cross plates spaced apart at intervals along the path of the bar stock at the inlet side of the screw machine and having substantially horizontal openings therethrough for passing the bar stock;
a plurality of annular fittings defining a longitudinal passageway for the bar stock;
means rotatably mounting each fitting on a correresponding cross plate at said opening therein for permitting the fitting to rotate in unison with the bar stock when the bar stock is rotated by the screw machine;
a plurality of rollers mounted in each fitting at circumferentially spaced locations around said longitudinal passageway for rolling engagement with the bar stock at different circumferential locations thereon;
a plurality of weights slidably mounted in each fitting at circumferentially spaced locations around said longitudinal passageway for the bar stock to be urged laterally outward by centrifugal force as said fitting rotates;
each of said weights being positioned between a pair of said rollers circumferentially around said longitudinal passageway for the bar stock;
and means acting between said weights and said rollers to hold the rollers laterally inward against the bar stock in response to the urging of said weights outward by centrifugal force comprising:
a holder for each roller slidably mounted in the corre-

sponding fitting for movement laterally of said longitudinal passageway and having rack teeth on its opposite sides circumferentially around said longitudinal passageway;
rack teeth on the opposite sides of each of said weights circumferentially around said longitudinal passageway;
and respective pinion gears engaged between said holders and the neighboring weights and meshing with the rack teeth thereon to force said holders inward when centrifugal force urges said weights outward;
the improvement wherein, for selectively adjusting the position of each holder laterally of said longitudinal passageway in accordance with the cross-sectional size of the bar stock, each of said holders comprises:
an internally screw-threaded outer sleeve slidably mounted in said fitting and having said rack teeth of the holder thereon;
and an externally screw-threaded inner body screw-threadedly adjustable along the inside of said outer sleeve;
said outer sleeve and said inner body having transverse slots therein;
and further comprising:
a retainer member removably mounted on said fitting at each roller holder and extending across said outer sleeve and said inner body through said transverse slots therein to hold said outer sleeve and said inner body against rotation with respect to each other and with respect to said fitting.

5,113,731

METHOD AND APPARATUS FOR CUTTING PRINTED PRODUCTS

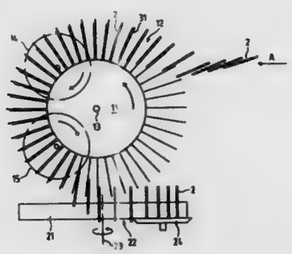
Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Continuation of Ser. No. 407,615, Sep. 15, 1989, abandoned. This application Nov. 6, 1991, Ser. No. 790,026

Claims priority, application Switzerland, Oct. 31, 1988, 04046/88

Int. Cl.[5] B26D *1/22, 9/00*

U.S. Cl. 83—35 **21 Claims**



1. A method for cutting continuously conveyed, multilayer printed products in a substantially continuous process comprising

providing a plurality of first knife parts,
positioning each printed product to be cut against one of the first knife parts,
fixing each printed product and its associated knife part together along a selected edge of the product to be cut,
providing a second knife part,
moving one of the knife parts relative to the other so that the first and second knife parts cuttingly engage each other to cut the product along the selected edge,
repositioning the printed product so that a second selected edge is adjacent a first knife part,
fixing each printed product and its associated knife part together along the second selected edge of the product to be cut, and
again moving one of the knife parts relative to the other so that the first and second knife parts cuttingly engage each other to cut the product along the second selected edge.

5,113,732

APPARATUS FOR PREPARING WIRE PIECES FOR A STAPLING MACHINE

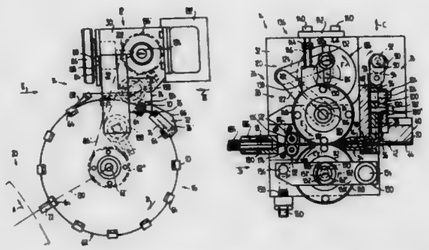
Egon Hänsch, Wetzikon, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Feb. 12, 1991, Ser. No. 654,377

Claims priority, application Switzerland, Feb. 13, 1990, 00460/90

Int. Cl.[5] B25C *5/00*

U.S. Cl. 83—154 **18 Claims**



1. An apparatus for preparing wire pieces from a wire for a stapling device which staples together multi-page printed products, such as newspapers, magazines and the like, the apparatus comprising:

a wire piece dispenser having a supply mechanism and a cutting mechanism, the supply mechanism including a feed mechanism which supplies a wire in a step-wise manner, in a supply direction, to the cutting mechanism, the cutting mechanism performing a cutting operation wherein the supplied wire is cut into wire pieces;
a receiver member disposed downstream of the cutting mechanism, the receiver member receiving a wire piece cut from the wire by the cutting mechanism;
the receiver member including a groove-like recess, the recess aligned with the supply mechanism and configured to surround with tolerance the starting region of the wire piece, the opening of the recess configured to allow the free passage of the wire piece;
a take-over member for taking over and transporting the wire piece from the receiver member, the take-over member adapted to move past the receiver member substantially at right angles to the longitudinal direction of the wire piece and close the opening of the recess as it moves past; and
the movement of the take-over member and the receiver member synchronized such that the take-over member closes the opening of the recess as the takeover member moves past the opening of the recess at the latest by the end of the cutting operation.

5,113,733

ADJUSTABLE ANGULAR SHEARING DEVICE

Arthur Peterson, Grandville; Jerry L. Kozminski, Grand Rapids, both of Mich., assignors to Link, Inc., Grand Rapids, Mich.

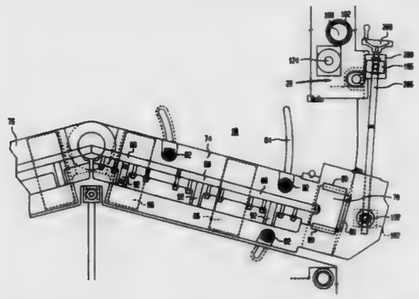
Continuation of Ser. No. 346,070, May 2, 1989, abandoned. This application Apr. 1, 1991, Ser. No. 680,630

Int. Cl.[5] B06D *1/06*

U.S. Cl. 83—169 **25 Claims**

1. A shearing device for rapidly shearing in succession, polygonal pieces, each having more than four edges, from sheet material which passes through said device, said shearing device comprising:

an inlet area at one side of the device for feeding sheet material into said device;
an outlet area at another side of the device opposite from said one side for facilitating the removal of polygonal pieces, said outlet area being generally aligned with said inlet area;
a lower plate having a first lower plate member and a second lower plate member;
a first shaft fixed to said lower plate and having a pivot axis, at least one of said first and second lower plate members being pivotally mounted to said first shaft for limited rotation thereabout to form a cutting angle relative to the other of said lower plate members, and each of said lower plate members having a block which defines a cutting edge, the block abutting the first shaft at its pivot axis;
an upper plate having a first upper plate member and a second upper plate member;
a second shaft fixed to said upper plate and having a pivot axis coaxial with said first shaft, at least one of said first and second upper plate members being pivotally mounted to said second shaft for limited rotation thereabout, and each of said first and second upper plate members having a block which defines a cutting edge, each block abutting the second shaft at its pivot axis, the cutting edges being disposed to cooperate with each of said first and second lower plate member cutting edges, respectively, in shearing action by moving said upper plate downwardly and upwardly with respect to said lower plate;
adjusting means to adjust said cutting angle by causing rotation of said at least one of said first and second plate members and first and second upper plate members; and
biasing means to bias said upper plate away from said lower plate whereby polygonal pieces, each having more than four edges can be sheared rapidly and successively when sheet material is passed through the device and the device is operated in a punch press.



5,113,734

STRAIGHT EDGE RIPPING GUIDE FOR BOARDS WITH TWO UNEVEN EDGES

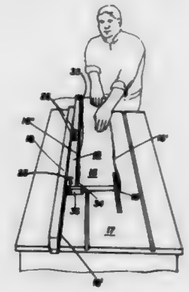
Edward H. Mahler, P.O. Box 137, Harding Rd., Round Pond, Me. 04564

Filed Dec. 3, 1990, Ser. No. 621,742

Int. Cl.[5] B27B *25/10*

U.S. Cl. 83—409 **7 Claims**

1. A straight edge ripping guide for use with boards having two visible uneven side edges to be cut off comprising an elongated guide piece with forward and rear ends and having a straight side face extending therefrom adapted to abut a saw fence of a saw table when the guide with a board together are pushed along the saw fence of the saw table to rip cut the board and having an opposite parallel side face with a continuous groove, laterally-extending projection assemblies adapted to engage spaced high points of one uneven side edge of the board and adjustable along the groove for alignment therewith and a push stop extending laterally from the forward end of the guide piece for receiving one end of the board upon the high points of the one uneven side edge of the board being placed against the laterally-extending projections of the guide piece and upon the guide piece and board being pushed together



along the saw fence of the saw table thereby to effect a straight and square ripping cut upon the other uneven side edge of the board.

5,113,735

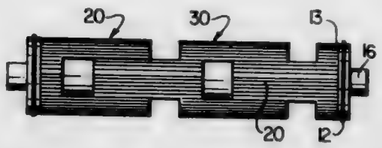
SLITTING APPARATUS

Ronald J. Paquin, Elginburg, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Apr. 23, 1991, Ser. No. 690,003

Int. Cl.[5] B23D *19/06;* **B26D** *1/14*

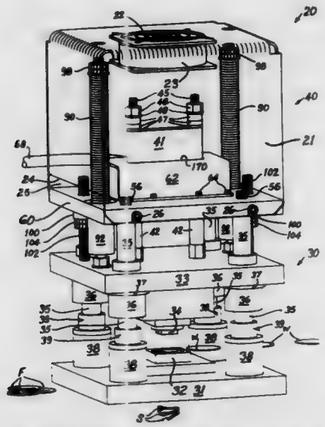
U.S. Cl. 83—508.3 **9 Claims**



1. In an apparatus for slitting sheet metal to a desired width which includes laterally spaced circular slitter knives each fixed to a slitter knife hub mounted on a rotatable shaft, each said slitter knife hub being an hydraulic hub adapted to be expanded to permit axial movement on the shaft by injecting hydraulic fluid into an annular groove in the inside diameter of the slitter knife hub,

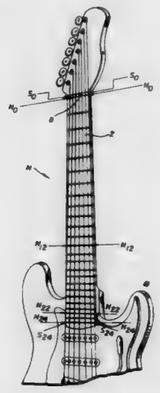
the improvement which comprises spacer rollers between said slitter knives to support the sheet metal, said spacer rollers being arranged in cooperating telescopic pairs with each said spacer roller comprising an annular hub portion mounted on said rotatable shaft with a plurality of equally spaced projections extending longitudinally in an axial direction from at least one annular face of said slitter knife hub, said projections having a radial thickness substantially equal to the radial thickness of the spacer roller hub portion such that each said projection is directly supported by said rotatable shaft and slidably mating with like projections of a said cooperating spacer roller such that at least part of the longitudinally extending mating projections of each cooperating telescopic pair of spacer rollers form therebetween in all operational positions a continuous cylindrical support portion for said sheet metal and each said spacer roller hub portion being adapted to be expanded to permit axial movement thereof on the shaft by injecting hydraulic fluid into an annular groove in the inside diameter of said spacer roller hug portion.

5,113,736
ELECTROMAGNETICALLY DRIVEN PUNCH PRESS WITH MAGNETICALLY ISOLATED REMOVABLE ELECTROMAGNETIC THRUST MOTOR
George M. Meyerle, 17 Lakeview Dr., Brookfield, Conn. 06804
Filed Jun. 26, 1990, Ser. No. 544,123
Int. Cl.[5] B26D *5/08*
U.S. Cl. 83—575 53 Claims



1. In an electromagnetically driven punch press including a base for mounting base tooling and having a plurality of guide pins upstanding from the base in spaced relationship among said guide pins, and a motion member above the base for mounting upper tooling above the base tooling, said motion member being carried by bushings mounted to the motion member, respective bushings being movable downwardly along respective guide pins during a downward stroke of said motion member and being movable upwardly along the respective guide pins during an upward return stroke of said motion member, the invention comprising:
said guide pins extending up through said bushings to upper ends of the guide pins at an elevation at least about two inches (at least about 50 mm) above said motion member when said motion member is at an initial position prior to its downward stroke,
a top mounting member attached to said upper ends of said guide pins,
said top mounting member being ferromagnetic,
said ferromagnetic top mounting member being at an elevation at least about two inches (at least about 50 mm) above said motion member when said motion member is at said initial position,
a solenoid winding mounted above said top mounting member and having a vertical opening surrounded by said winding,
a vertically movable ferromagnetic armature aligned with said winding opening and being movable downwardly and upwardly in said winding opening,
a ferromagnetic enclosure for said winding,
said ferromagnetic enclosure being over a top of the solenoid winding and being mounted to said mounting member,
said ferromagnetic enclosure having an opening positioned near the top of said winding aligned with said winding opening,
said armature extending up through said opening in said ferromagnetic enclosure,
said top mounting member having an opening positioned near the bottom of said winding aligned with said winding opening,
a pair of non-magnetic push rods connected to said armature and extending down through said opening in said top mounting member and being connected to said motion member for driving said motion member downwardly upon electrical energization of said solenoid winding, and return means mounted on said top mounting member and being connected to said motion member for moving said motion member in said upward return stroke.

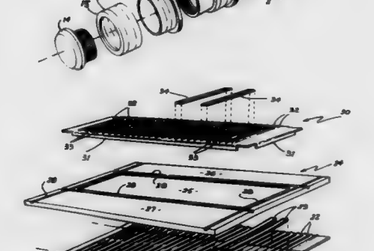
5,113,737
SEVEN STRING ELECTRIC GUITAR
Alex Grerory, 10863 Fruitland Dr., Studio City, Calif. 91604
Continuation-in-part of Ser. No. 436,559, Nov. 14, 1989. This application Dec. 31, 1990, Ser. No. 636,416
Int. Cl.[5] G10D *1/08, 3/06*
U.S. Cl. 84—267 11 Claims



11. A guitar comprising:
seven strings, the strings comprising a top A string, a top E string, a B string, a G string, a D string, a low A string, and a low E string;
a body;
a vibrato bridge unit, said vibrato bridge unit having saddles upon which said strings each are mounted, said saddles adjustably fastened to said vibrato bridge unit by associated screws, each said saddle set at maximum height on said associated screws;
means for mounting said vibrato bridge unit to said body;
a neck attached to said body, said neck having a scale length of 25 ½ inches, a nut and 24 frets, said neck having a width of substantially 1 ⅞ inches at a nut, a width of substantially 2 18/32 inches at a 22nd fret from said nut and a width of 2 21/32 inches at a 24th fret from said nut;
shim means disposed adjacent said neck and said body so that said neck is tilted away from said body at an end of said body furthest from said vibrato bridge unit; and
wherein at said nut, an axis of said top A string is substantially 1 20/32 inch from an axis of said low E string and at said 24th fret from said nut, an axis of said top A string is substantially 2 12/32 inches from an axis of said low E string.

5,113,738
RECORDED MUSIC ENHANCEMENT SYSTEM
Darwin Krucoff, 2820-B Aita View Dr., San Diego, Calif. 92139
Filed May 25, 1988, Ser. No. 198,249
Int. Cl.[5] A63J *17/00;* G10G *3/04*
U.S. Cl. 84—462 8 Claims

1. In a recorded music apparatus having at least one track of a recording medium recorded with music, a recorded music enhancement system for driving at least one secondary stimulus from an additional track on said recording medium, said recorded music enhancement system comprising:
(a) a waveform recorded on said additional track of substantially uniform frequency and having bursts whose time durations and spacing between bursts corespond with the desired rhythm variations of the music recorded on said at least one track of the recording medium, with the waveform signals recorded simultaneously with the recording of the music or subsequently to it;



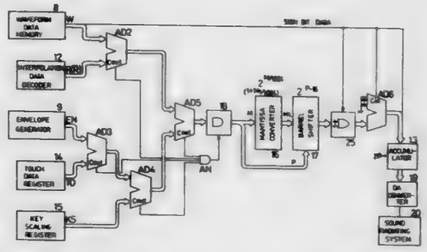
(b) a tone detector inputting said wave form and responding to the waveform by outputting a digital gate signal corresponding to the presence of said waveform during said time durations;
(c) a switch operatively connected to said tone detector to switch between on and off modes responsive to said digital gate signal; and
(d) at least one secondary stimulus controlled by said switch to cause said secondary stimulus to be driven in coordination with said waveform and thus in coordination with music on said at least one track.

5,113,739
MUSICAL CALCULATOR
Pamela J. Thomson, 4/254 Moore Pk Rd., Paddington NSW, Australia 2021
PCT No. PCT/AU87/00200, § 371 Date Mar. 1, 1988, § 102(e) Date Mar. 1, 1988, PCT Pub. No. WO88/00383, PCT Pub. Date Jan. 14, 1988
PCT Filed Jul. 3, 1987, Ser. No. 191,145
Claims priority, application Australia, Jul. 4, 1986, PH06730
Int. Cl.[5] G09B *15/02*
U.S. Cl. 84—473 7 Claims

1. A musical calculator comprising:

a cylindrical base having an outer surface and a first and second end;
a plurality of first cylindrical rings, each of said first cylindrical rings includes an internal and external surface, each said internal surface is adapted for slidable engagement with said outer surface of said cylindrical former, each said external surface includes a plurality of equi-angularly spaced indicia each identifying a particular musical note;
a plurality of second cylindrical rings, each of said second cylindrical rings includes an internal and an external surface, each internal surface is adapted to be slidably engaged with a corresponding one of each of said first cylindrical rings at said outer surface thereof for rotation relative thereto, each of said outer surfaces of said second cylindrical rings include a plurality of windows and opaque sections for exposing and covering a specific note represented by said indicia carried by said corresponding first cylindrical ring, each of said outer surfaces of said second cylindrical rings further include indicia for identifying a particular musical scale or mode related to the indicia disposed on each said corresponding first cylindrical ring.

5,113,740
METHOD AND APPARATUS FOR REPRESENTING MUSICAL TONE INFORMATION
Tsutomu Saito, Sizuoka, Japan, assignor to Kawai Musical Inst. Mfg. Co., Ltd., Sizuoka, Japan
Filed Jan. 26, 1990, Ser. No. 470,626
Claims priority, application Japan, Jan. 26, 1989, 1-16883
Int. Cl.[5] G10H *7/00*
U.S. Cl. 84—607 38 Claims

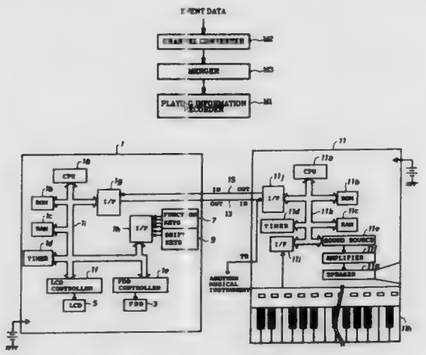


21. In an electronic musical instrument in which musical tone information is represented by using power data and mantissa data with a floating-point representation, a musical tone information representation system, comprising:
keyboard means for responding to depression of one of a plurality of keys by an operator by generating the power data and mantissa data;
generation means for generating an exponent of the mantissa data and an exponent of the power data having the same sign as the exponent of the mantissa data which is used to generate a musical tone;
operation means for obtaining data whose order is higher than an order of an exponent of said mantissa data by shifting an exponent of the power data and for performing one of an addition and a subtraction operation on the exponent of the mantissa data and the obtained data; and
conversion means for inverting the sign of the exponent of the power data by performing an operation on both of the exponent of the power data and the exponent other than the exponents of the power and mantissa data and for converting the power data and the mantissa data into data with a fixed point representation to produce an audio output signal with maximum dynamic range through a sound radiating system.

5,113,741
PERFORMANCE RECORDING APPARATUS FOR RECORDING INFORMATIONS USED TO CONTROL MUSIC GENERATION INSTRUMENTS

Hiroshi Nishikawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 18, 1990, Ser. No. 629,685
Claims priority, application Japan, Dec. 21, 1989, 1-331578
Int. Cl.[5] G10H *3/00*
U.S. Cl. 84—609 19 Claims



1. Performance recording apparatus for recording plural event data including a channel discrimination code for discriminating one type of data from other types of data as separate plural channels of playing information onto a playing information recording means, comprising:

channel conversion means for converting a received channel discrimination code in newly received event data to an alternate channel discrimination code;

merging means for merging event data corresponding to said alternate channel discrimination code with other event data which have already been recorded on the playing information recording means; and

channel assignment mode detection means for detecting channel assignment mode and enabling said channel conversion means upon detection of selection of a channel assignment mode, wherein

said channel conversion means converts the received channel discrimination code in newly received event data into an alternate channel discrimination code corresponding to an unused channel discrimination code, which is different from any discrimination code assigned to event data stored on the playing information recording means and said channel conversion means provides as an output said received channel discrimination code when said channel assignment mode is not detected.

5,113,742
ELECTRONIC STRINGED INSTRUMENT

Naonki Matsumoto, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Division of Ser. No. 464,430, Jan. 12, 1990, which is a division of Ser. No. 171,883, Mar. 21, 1988, Pat. No. 4,919,031. This application Mar. 13, 1991, Ser. No. 668,968
Claims priority, application Japan, Mar. 24, 1987, 62-67919; Mar. 24, 1987, 62-67920; Mar. 30, 1987, 62-47616[U]; Mar. 30, 1987, 62-47617[U]; Mar. 30, 1987, 62-47618[U]; Mar. 30, 1987, 62-47619[U]; Mar. 30, 1987, 62-77257; May 27, 1987, 62-80659[U]; May 27, 1987, 62-80660[U]
Int. Cl.[5] G10H *7/00*
U.S. Cl. 84—615 6 Claims

1. An electronic stringed instrument, comprising:

an instrument body having a fingerboard on which fingering operation is performed;

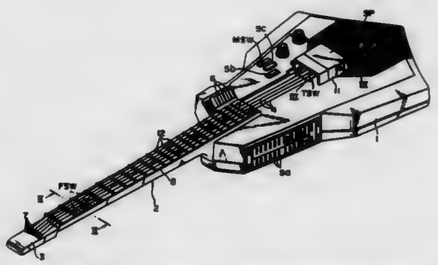
at least one string stretched on the instrument body;

string vibration detecting means for detecting vibration of the string;

position detecting means for detecting a position of the fingering operation performed on said fingerboard;

open-string operation detecting means for detecting an operation of an open string in which the fingering operation is not performed on said fingerboard;

instruction means for responding to the vibration of said string detected by said string vibration detecting means, and for instructing to generate a musical tone having a pitch of the open string corresponding to the operation of said open string, in the condition that the operation of said open string is detected by the open-string operation detecting means, and on the other hand, for responding to the vibration of said string detected by said string vibration detecting means, and for instructing to generate a musical tone having a pitch corresponding to said position of the fingering operation, in the condition that said position of the fingering operation is detected by said position detecting means;



judge means for judging whether the position of said fingering operation detected by said position detecting means is shifted to the other position of the fingering operation except for said position of the fingering operation, or to said open-string operation condition; and

control means for responding to the judgment by said judge means that the position of the fingering operation is shifted to said open string operation condition, during generating the musical tone having the pitch corresponding to the position of the fingering operation detected by said position detecting means, according to the instruction of said instruction means, and for controlling to stop the generated tone, and on the other hand, for responding to the judgment by said judge means that said position of the fingering operation is shifted to said position of the other fingering operation, and for controlling to alter the pitch of the musical tone corresponding to said position of the fingering operation to a pitch corresponding to said other position of the fingering operation, in the condition that the musical tone is being generated.

5,113,743
MUSICAL TONE SYNTHESIZING APPARATUS

Iwao Higashi, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jul. 16, 1990, Ser. No. 553,867
Claims priority, application Japan, Jul. 18, 1989, 1-185196
Int. Cl.[5] G10H *5/07*
U.S. Cl. 84—622 9 Claims

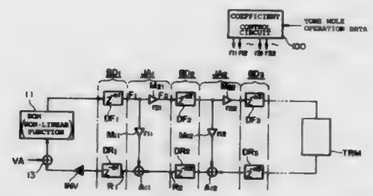
1. A musical tone synthesizing apparatus comprising:

(a) excitation means for outputting an excitation signal based on an input signal applied thereto;

(b) a plurality of bi-directional transmission means for transmitting said excitation signal output away from said excitation means as a progressive wave signal and also feeding back said progressive wave signal toward said excitation means as a reflected wave signal;

(c) tone pitch information generating means for generating first and second coefficients corresponding to tone pitch information representative of the pitch of a musical tone to be generated; and

(d) at least one operation means, each inserted between two

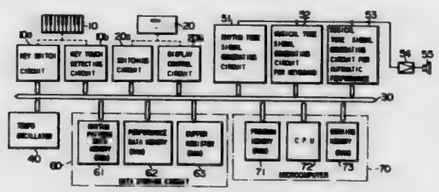


of said bi-directional transmission means, for multiplying said progressive wave signal by said first coefficient, adding the result of the multiplication to said reflected wave signal so that an addition result is transmitted toward said excitation means as a new reflected wave signal, and multiplying said progressive wave signal by said second coefficient so that the multiplication result is transmitted as a new progressive wave signal.

5,113,744
AUTOMATIC PERFORMANCE APPARATUS HAVING PLURAL MEMORY AREAS

So Tanaka; Takashi Hirakata; Shingo Kawasaki; Takuya Nakata; Hitoshi Makita, and Koichi Kozuki, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 370,775, Jun. 23, 1989, abandoned, which is a continuation-in-part of Ser. No. 298,562, Jan. 17, 1989, abandoned. This application Oct. 10, 1991, Ser. No. 776,675
Claims priority, application Japan, Jan. 14, 1988, 63-6416; Feb. 10, 1988, 63-29111; Feb. 10, 1988, 63-29112; Jun. 23, 1988, 63-155628; Jun. 23, 1988, 63-155629
Int. Cl.[5] G10H *1/36, 1/40/7/00*
U.S. Cl. 84—634 8 Claims



6. An automatic performance apparatus comprising:

(a) a plurality of memories each storing performance data, wherein one of said memories stores first performance data representing a first musical tone, while another of said memories stores second performance data representing a second musical tone;

(b) reading means for reading said performance data from said memories;

(c) musical tone signal generating means for generating a musical tone signal based on said performance data read from said memories;

(d) delay time setting means for setting a delay time between a first musical tone signal based on said first performance data stored in one of said memories and a second musical tone signal based on said second performance data stored in another of said memories; and

(e) delay means for delaying generation of the first musical tone signal behind that of a second musical tone signal by the delay time set by said delay time setting means.

5,113,745
STABILIZING DEVICE FOR A GUN

Stephen Allen, Houston, Tex., assignor to David Palmer, Lufkin, Tex., a part interest

Filed Aug. 23, 1990, Ser. No. 571,201
Int. Cl.[5] F41A *35/00*
U.S. Cl. 89—14.05 22 Claims



1. An apparatus comprising:

a gun;

a gyroscope; and

mounting means connected to said gun and to said gyroscope, said mounting means for resiliently connecting said gyroscope to said gun, said mounting means comprising:

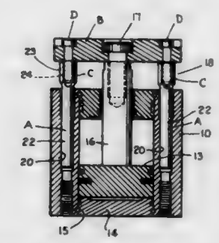
a gyroscope slide carriage; and

a first resilient member connected to said gyroscope slide carriage, said first resilient member for allowing said gyroscope slide carriage to move longitudinally relative to said gun.

5,113,746
CYLINDER WITH ABUTMENTS FORMED ON GUIDE RODS TO PREVENT FINGER ENTRAPMENT

Lawrence F. Yuda, P.O. Box 499, Westminster, S.C. 29693

Filed Sep. 4, 1990, Ser. No. 577,283
Int. Cl.[5] F16J *15/18*
U.S. Cl. 92—165 PR 2 Claims



1. A cylinder having a pair of diagonally opposed guide rods vertically slidable therein and bridged by a yoke, and a piston rod connected to said yoke between said guide rods on one end and fixedly secured to a piston on the other end comprising:

an enlarged elongated aligned abutment made of one piece each of said guide rods at an upper end adjacent said yoke and providing a sufficient space between said yoke and an upper end of said cylinder to avoid finger entrapment;

an axial bore in each of said abutments in alignment with said guide rods;

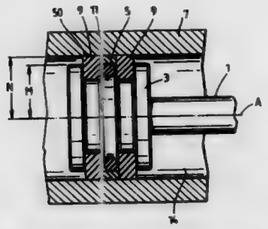
a threaded fastener received in each of said axial bores respectively connecting said yoke to each of said guide rods;

a fastener connecting said piston rod to a medial portion of said yoke; and

a plurality of spaced vertical flats on each of said enlarged aligned abutments;

whereby said guide rods may be held by said flats to facilitate connecting said yoke to said guide rods, said piston rod is protected against turning, and a finger trap is avoided.

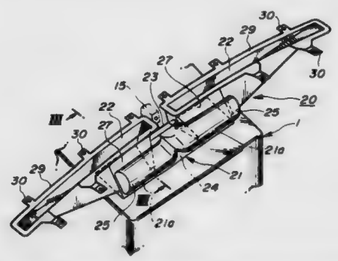
5,113,747
HIGH PRESSURE PISTON SEALING SYSTEM AND METHOD OF ITS ASSEMBLY
Herve Y. Pignerol, 9 Les Adrets Du Pilon - LE Revest, 83 200 Toulon, France
Continuation of Ser. No. 566,327, Aug. 19, 1990, abandoned, which is a continuation of Ser. No. 300,610, Jan. 23, 1989, abandoned. This application May 1, 1991, Ser. No. 697,905
Int. Cl.[5] F16J *9/00*
U.S. Cl. 92—175 **13 Claims**



1. A high pressure sealing system comprising:
a cylinder having a bore of a preselected diameter extending therethrough and defining an axially extending chamber with a slide surface;
a piston having a diameter less than the diameter of said cylinder bore and being adapted for axial movement within said chamber, said piston having a primary annular groove of a diameter less than said diameter of said piston, said primary annular groove having a stepped annular surface of a preselected diameter and axial width located in said primary annular groove to define a raised annular surface disposed between two secondary annular grooves;
an elastic ring disposed in said primary annular groove about and in sealing contact with said raised annular surface;
at least two bearing rings having an outer surface adapted for engagement with said sliding surface of said chamber, said outer surfaces of said bearing rings having a diameter substantially similar to the diameter of said cylinder bore, and said bearing rings having an inner surface of a diameter less than both the diameter of said piston and the diameter of said raised annular surface, whereby said bearing rings are retained in said secondary annular grooves, said bearing rings being disposed immediately adjacent said elastic ring in contacting relation thereto and forming a third annular groove therebetween; and
a cup ring having an inner surface of a diameter greater than the diameter of said piston and an outer surface of a diameter substantially similar to the diameter of said cylinder bore, said cap ring being positioned over said elastic ring and disposed in the third annular groove formed between said bearing rings, said cap ring outer surface being adapted to sealingly contact said slide surface of said chamber and said cap ring inner surface being adapted to sealingly contact said elastic ring.

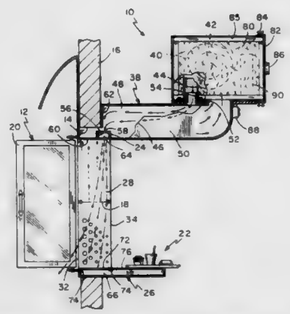
5,113,748
DEFROSTER CONSTRUCTION FOR AUTOMOTIVE AIR CONDITIONER
Naoharu Shibuya, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Aug. 8. 1991, Ser. No. 742,032
Claims priority, application Japan, Aug. 9, 1990, 2-210714
Int. Cl.[5] B60S *1/54*
U.S. Cl. 454—127 **8 Claims**

1. A defroster construction for an automotive air conditioning unit having a defroster side outlet, comprising:
a defroster nozzle main body having a connecting end for connection with the defroster side outlet of the air conditioning unit and elongated in a vehicle width direction;
a plurality of front defroster nozzles integral with said defroster nozzle main body; and
a pair of side ducts integral with said defroster nozzle main body and extending in opposite vehicle width directions;



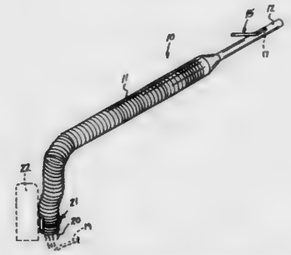
said defroster nozzle main body having substantially at a longitudinal center of said connecting end an air inlet for supplying conditioned air from the air conditioning unit to said side ducts.

5,113,749
AIR CURTAIN PRODUCING AN OUTWARD RAMPING EFFECT FOR USE WITH AN ACCESS WAY OR ENCLOSURE
Kenneth E. Perbix, 2900 Dickens La., Mound, Minn. 55364
Filed Aug. 3, 1990, Ser. No. 562,755
Int. Cl.[5] F24F *9/00*
U.S. Cl. 454—193 **62 Claims**



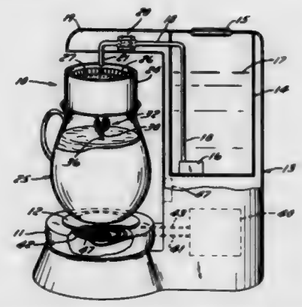
1. An apparatus for producing an air curtain across a central opening, said central opening having a front edge and a rear edge, a top, a bottom, and a pair of opposing sides, said apparatus for producing an air curtain comprising:
a top frame extending along the top side of the central opening substantially between the open sides thereof, said top frame defining a top channel and an air outlet, said air outlet facing generally downward toward the central opening and fluidly communicating with said top channel;
a bottom frame extending along the bottom of the central opening substantially between the opposing sides thereof, said bottom frame having a top surface disposed facing generally upward toward the central opening, said bottom frame defining a bottom channel, said top surface defining a plurality of bottom apertures extending therethrough ad fluidly communicating with said bottom channel, said plurality of apertures being disposed between the front edge and the rear edge of the central opening; and
a blower, said blower having at least one blower outlet and at least one blower intake, said blower being capable of blowing air under pressure from said blower outlet and drawing air into said blower intake, said blower outlet being operatively connected to and fluidly communicating with said air outlet in said top frame such that a stream of air is expelled downwardly from said air outlet in a generally linear direction traversing the central opening, said blower intake being operatively connected to and fluidly communicating with said bottom channel and said plurality of bottom apertures such that said stream of air traversing the central opening is drawn into said bottom channel through said plurality of bottom apertures, said plurality of bottom apertures being arranged such that a greater volume of air per unit time is drawn though a first portion of said plurality of bottom apertures disposed more closely proximate to the front edge of the central opening than is drawn through a second portion of said plurality of bottom apertures disposed more closely proximate to the rear edge of the central opening due to the apertures disposed more closely proximate to the front edge having a greater area and number than the apertures disposed closer to the rear,
whereby the stream of air being expelled through the air outlet in the generally linear direction will ramp or curl forwardly toward the front edge of the central opening as that stream of air traverses the central opening due to the effect of the air being drawn through the plurality of bottom apertures.

5,113,750
AIR AND LIQUID EVACUATION APPARATUS
Larry W. Sherman, Rte. 1, Box 261-A, Lettsworth, La. 70753
Filed Feb. 19, 1991, Ser. No. 657,405
Int. Cl.[5] B08B *15/00*
U.S. Cl. 454—63 **1 Claim**



1. An air and liquid evacuation apparatus comprising, in combination,
an elongate pleated flexible conduit, the pleated flexible conduit defined by a series of parallel cylindrical pleats defining a first diameter, and
the pleated flexible conduit in pneumatic communication with a rigid conduit, wherein the rigid conduit includes an inlet end and an outlet end, with the pleated flexible conduit mounted to the inlet end, and
the rigid conduit defined by a third diameter less than the first diameter, and
reducer means for effecting sealed communication of the pleated flexible conduit to the inlet end of the rigid conduit, and
a pressurized air delivery tube fixedly mounted to and projecting interiorly of the rigid conduit, and
pressurized air directed into the pressurized air delivery tube to effect a negative pressure within the pleated flexible conduit, and
wherein the reducer means includes a first reducer pipe defined by an inlet of the first diameter and an outlet of the second diameter, with the inlet mounted to a rear end portion of the pleated flexible conduit, and the outlet of the first reducer pipe mounted to a further inlet of the second diameter, and the second reducer pipe including a further outlet defined by the third diameter for securement of the inlet and the rigid conduit to the further outlet, and
wherein the pressurized air delivery tube includes a first leg diametrically and fixedly directed into the rigid conduit defining an oblique angle between the first leg and an axis defined by the rigid conduit, and the pressurized air delivery tube further including a second leg positioned within the rigid conduit coaxially aligned with the rigid conduit projecting towards the outlet end of the rigid conduit and spaced from the outlet end, and a pressurized air delivery source in operative communication with the first leg to direct pressurized air through the first leg, and
including a flexible delivery conduit in operative communication between the pressurized air delivery source and the first leg, and including a quick coupling connection mounted to the flexible delivery conduit and the first leg for selective securement between the flexible delivery conduit and the first leg, and
including a mounting band selectively securable about the pleated flexible conduit adjacent the free terminal end of the pleated flexible conduit remote from the rigid conduit, wherein the mounting band includes a flexible strap member, and the flexible strap member includes a first strap end including a first hook and loop fastener and a second strap end including a second hook and loop fastener, wherein the first and second strap ends fasteners are selectively securable relative to one another about the pleated flexible conduit, and the strap member further including a ferromagnet fixedly mounted about the strap member for securement to a ferrous metallic support.

5,113,751
BEVERAGE BREWING SYSTEM
Robert R. Holcomb, Nashville; Edward R. Arnold, and Alexander J. Garrison, both of Selmer, all of Tenn., assignors to Aqua Dynamics Group Corp., Adamsville, Tenn.
Filed May 31, 1990, Ser. No. 531,021
Int. Cl.[5] A47J *31/00*
U.S. Cl. 99—286 **38 Claims**



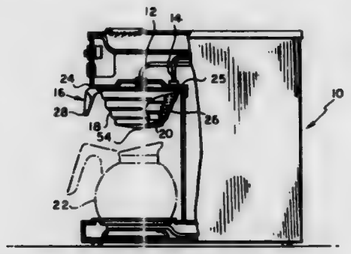
1. In a beverage brewing device of the type which includes a containment means for confining ground material from which a beverage is to be brewed, a conduit for conveying a fluid to said containment means, the improvement comprising a treating device for modifying said fluid prior to the introduction thereof into said containment means, said treating device comprising means for directly injecting into said fluid electromagnetic radiation through a non-insulated conductor, said radiation having a preselected frequency related to the absorption emission profile of said fluid.

5,113,752

BYPASS BASKET STRUCTURE FOR ICED TEA MAKERS

Alan W. Brewer, Diverson, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Dec. 20, 1990, Ser. No. 630,837
Int. Cl.[5] A47J *31/24, 31/02*
U.S. Cl. 99—295 **11 Claims**



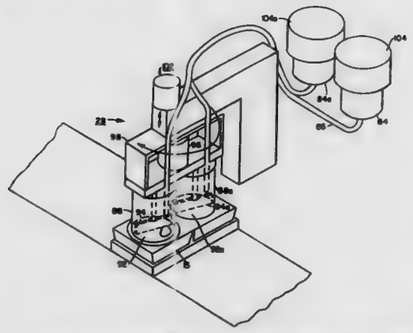
1. A brewing funnel for use with a beverage brewing appliance, such as an iced tea maker and the like, comprising: an outer part having a upper flange; an inner part having an upper portion; the inner part being insertable into the outer part; the upper flange including tabs at certain locations, and notches disposed in proximity to the tabs; the upper portion including laterally projecting tangs at certain locations for removable insertion into the notches; one end of each of the tangs including a tang tab; and the tabs of the outer part, and the tang tabs of the inner part forming a releasable locking connection between the inner part and the outer part.

5,113,753

APPARATUS FOR AUTOMATIC APPLICATION OF CONDIMENTS TO A SANDWICH

Hugh Robinson, Wenham, Mass., assignor to Design Technology Corporation, Billerica, Mass.

Continuation-in-part of Ser. No. 66,733, Jun. 23, 1987, abandoned. This application Apr. 13, 1990, Ser. No. 509,312
Int. Cl.[5] A21C *9/04*; B32B *31/04*
U.S. Cl. 99—326 **6 Claims**



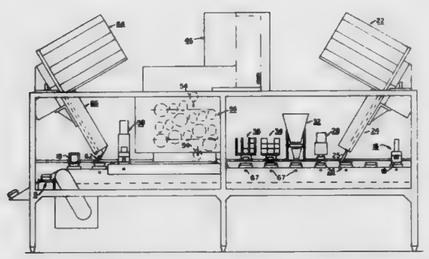
1. A sandwich processing system for assembling and delivering bread, condiments and meat products comprising
conveyor means having a plurality of stations,
a supply of bread having first and second portions,
first storage means for storing a supply of of said first portions of said bread,
second storage means for storing a supply of said second portions of said bread,
means for dispensing said first portions of said bread onto said conveyor means,
condiment dispensing means for storing and dispensing a condiment onto said first portion of said bread at a predetermined station of said conveyor including
a storage chamber for said condiment,
a receptacle having a porous bottom,
pump means for transferring a predetermined amount of said condiment from said storage chamber to said receptacle, and
means for spreading and forcing said condiment through said porous bottom onto said first portion of said bread, and
means for storing, cooking and dispensing meat products onto said first portion of said bread.

5,113,754

APPARATUS FOR PROCESSING SANDWICH INGREDIENTS

Hugh Robinson, Wenham, and Marvin Menzin, Lexington, both of Mass., assignors to Design Technology Corporation, Billerica, Mass.

Continuation-in-part of Ser. No. 66,733, Jun. 23, 1987, abandoned. This application Apr. 6, 1990, Ser. No. 505,610
Int. Cl.[5] A21C *9/04*; B32B *31/04*
U.S. Cl. 99—326 **9 Claims**



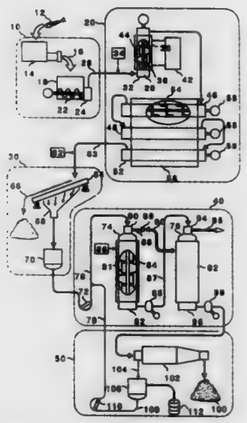
1. An automatic sandwich preparation system including
conveyor means,
a supply of bread rolls having first and second portions,
first storage means for storing a supply of said first portions of said bread rolls,
second storage means for storing a supply of said second portions of said bread rolls,
means for dispensing said first portions of said bread rolls onto said conveyor means,
a meat patty supply comprising
a plurality of pre-formed meat patties,
a first strip of plastic material with said patties in spaced positions therealong, and
positioning means for maintaining said patties in said spaced positions,
means for separating said patties from said plastic strip,
means for cooking said patties, and
means for placing each of the patties on one of said first portions of said bread rolls.

5,113,755

APPARATUSES FOR PRODUCING A PROTEINACEOUS PRODUCT BY DIGESTION OF RAW ANIMAL PARTS

Paul S. Anderson, Astoria; Roger W. Law, Tualatin; Ronald R. Law, and Kenneth Lum, both of Astoria, all of Oreg., assignors to Advanced Hydrolyzing Systems, Inc., Astoria, Oreg.

Division of Ser. No. 535,500, Jun. 8, 1990, Pat. No. 5,053,234, which is a continuation-in-part of Ser. No. 398,326, Aug. 23, 1989, abandoned, which is a continuation of Ser. No. 262,140, Oct. 21, 1988, abandoned, which is a continuation of Ser. No. 148,092, Jan. 26, 1988, abandoned, which is a continuation of Ser. No. 18,848, Feb. 24, 1987, abandoned, which is a continuation of Ser. No. 605,120, Apr. 30, 1984, abandoned. This application Oct. 1, 1991, Ser. No. 770,090
Int. Cl.[5] A23L *1/31*; A23J *1/02, 3/00*; C07K *3/02*
U.S. Cl. 99—483 **25 Claims**



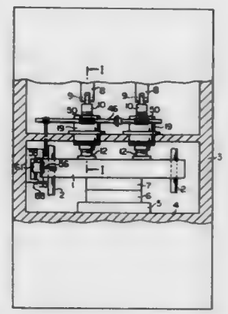
1. An apparatus for preparing a particulate, proteinaceous product from raw protein-comprising animal parts, the apparatus comprising:
mulling means for converting the raw animal parts to ground animal parts, said mulling means having an inlet through which raw animal parts to be ground may be introduced and an outlet through which ground animal parts may be discharged;
hydrolyzing means adapted for enzymatically hydrolyzing proteins in the ground animal parts to form an aqueous suspension of partially hydrolyzed animal parts, said hydrolyzing means having an inlet through which the ground animal parts may be introduced and an outlet through which the aqueous suspension may be discharged;
separating means for removing non-digestible solids from the aqueous suspension of partially hydrolyzed animal parts, said separating means having an inlet through which the aqueous suspension may be introduced and an outlet through which the aqueous suspension, from which the non-digestible solids have been removed, may be discharged;
oil-addition means coupled to the outlet of said separating means for adding oil to the aqueous suspension passing through the outlet of said separating means, thereby forming a protein-oil suspension;
concentrating means for partially dehydrating the protein-oil suspension, thereby forming an oleaginous suspension of partially hydrolyzed protein, said concentrating means having an inlet through which the protein-oil suspension may be introduced and an outlet through which the oleaginous suspension may be discharged after passing through said concentrating means; and
oil-removal means for removing a predetermined portion of the oil in the oleaginous suspension, thereby forming a particulate, proteinaceous product, said oil-removal means having an inlet through which the oleaginous suspension may be introduced, a first outlet through which the proteinaceous product may be discharged after passing through said oil-removal means, and a second outlet through which the predetermined portion of oil removed from the oleaginous suspension may be discharged.

5,113,756

PRESS MACHINE

Yutaka Fujii, Iwakuni, Japan, assignor to Teijin Seiki Company, Limited, Osaka, Japan

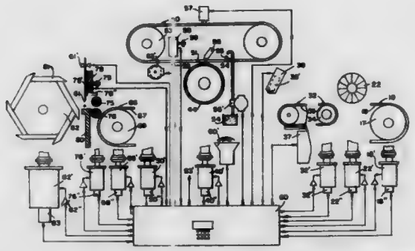
Filed Aug. 30, 1990, Ser. No. 574,769
Claims priority, application Japan, Sep. 20, 1989, 1-245757
Int. Cl.[5] B30B *15/14*
U.S. Cl. 100—48 **8 Claims**



5,113,757
METHOD AND APPARATUS FOR MAKING PRINTED ELASTIC BANDS

Richard R. Spencer, Hot Springs, Ark., assignor to Alliance Rubber Company, Inc., Hot Springs, Ark.

Division of Ser. No. 467,966, Dec. 5, 1989, abandoned, which is a continuation of Ser. No. 164,668, Mar. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 817,657, Jan. 10, 1986, Pat. No. 4,729,305. This application Dec. 5, 1990, Ser. No. 622,484
Int. Cl.[5] B41F 17/10; B26D 7/08
U.S. Cl. 101—35 24 Claims

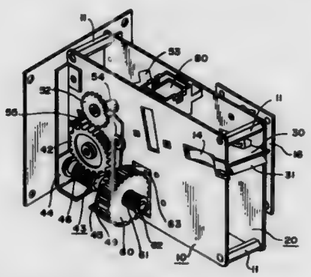


1. A method of making printed elastic bands comprising feeding an elastic tubing into a perforating apparatus, perforating the tubing, exhausting fluid from within the tubing, flattening the tubing, cleaning the tubing, drying the tubing, continuously conveying the tubing, keeping the tubing flat, aligning the tubing, printing the tubing, aligning the printed tubing, driving the tubing, drying and curing the printed image, and cutting off lengths of the printed tubing into printed elastic bands and removing the printed elastic bands, wherein the steps if feeding, perforating, exhausting, flattening, cleaning, conveying, printing, driving and cutting further comprise operating synchronous type servo motors to perform the steps and further comprise coordinating the motors with a processor, further comprising sensing width of the tubing and stopping the printing upon sensing out-of-specification width.

5,113,758
TICKET DISPENSER

Long-Shou Chou, Taipei, Taiwan, assignor to Entropy International Co., Ltd., Taipei, Taiwan

Filed Mar. 1, 1991, Ser. No. 663,013
Int. Cl.[5] B41L 15/02
U.S. Cl. 101—66 5 Claims

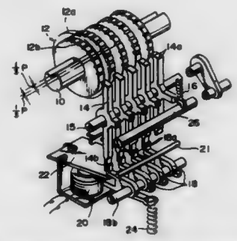


1. A ticket dispenser comprising:
two parallelly spaced side frame plates inclindedly mounting therebetween two opposite guide plates feeding therebetween a ticket strip;
a first shaft rotatably mounted on said side frame plates and securing thereto an active roller and a worm gear having a predetermined spiral-angle and a rotating axis perpendicular to said side plates;
a worm parallelly, spacedly and limitedly axially slidably held attached to one of said side plates, and meshing with said worm gear;
a motor having a spindle;
a belt wheel non-rotatably but slidably fixed to one end of said worm;
a belt mounted between said spindle and said belt wheel; a second shaft rotatably mounted on said side frame plates, and securing thereto a ratchet wheel and a passive roller cooperating with said active roller to clamp therebetween and controlledly feed therethrough said ticket strip;
a first elastic member mounted between said second shaft and said side frame plates for always urging said passive roller and said ticket strip against said active roller; and a stopper pivotally connected to said one said plate, and having a top pawl end capable of engaging with said ratchet wheel and a bottom end connected to said worm in a manner that when one attempts to illegally pull said ticket strip out of said dispenser, said worm gear will tend to translate said worm to the direction of right and causing said stopper engaging with said ratchet and firmly stop said passive roller from rotating by the illegally pull force of the ticket strip, and said active roller will be stopped together with said worm since the worm is limitedly slidably held attached to the one side plate.

5,113,759
LATCH MECHANISM FOR SMALL-SIZE PRINTER

Shohachi Nihira, Tokyo, Japan, assignor to Citizen Watch Co., Ltd. and Astec Inc., both of Tokyo, Japan

Filed May 4, 1990, Ser. No. 518,807
Claims priority, application Japan, May 15, 1989, 1-121223
Int. Cl.[5] B41J 1/32
U.S. Cl. 101—93.21 18 Claims



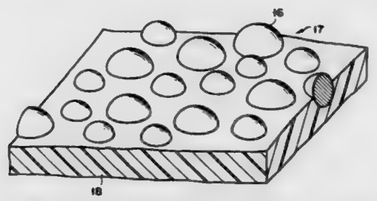
1. A latch mechanism for a small-size printer capable of performing a printing operation with a desired type on a rotatably type drum secured at a print position by impacting a hammer towards the type drum across a recording paper loaded therebetween, said latch mechanism comprising:
a type drum shaft;
a plurality of type drum units, each of which include lock groove wheels and font wheels disposed in spaced relation to each other, said font wheels having a plurality of characters and symbols on their outer peripheral, and rotating with said type drum shaft and means to latch said font wheels to position a desired type for printing;
a plurality of lock lever units, each of which includes a plurality of lock lever means for latching a desired lock groove wheel in the print position when performing an printing operation and for latching a font wheel at said font wheel's initial non-print position, and disposed so as to correspond to each type drum, and movable between a print position and an initial non-print position;
a lock lever spring means for constantly providing a biasing force that biases said lock lever means from said lock lever means initial non-print position toward a print position where said lock lever means latches said type drum;

a plurality of lock lever holding means units, each of which includes a plurality of lock lever holding means with a holding side and a locking side for respectively holding said lock means in their initial non-print positions remote form said font wheels in a non-printing state and for releasing said lock lever means from their initial nonprint positions by being actuated downwardly;
a plurality of vibration plates, each of which is provided so as to correspond to each of said lock lever holding means units for actuating said lock lever holding means;
a plurality of electromagnets, each of which is provided so as to correspond to and activate one of said vibration plates; and
a reset bar means for resetting said plurality of lock levers means from their print positions to the initial non-print positions after a printing operation is completed.

5,113,760
INK ROLLER FOR PRINTING MACHINE

Saburo Sonobe, Toride, and Nobuyuki Ishibashi, Matsudo, both of Japan, assignors to Kinyosha Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/01001, § 371 Date Jan. 31, 1989, § 102(e) Date Jan. 31, 1989, PCT Pub. No. WO89/05732, PCT Pub. Date Jun. 29, 1989
PCT Filed Dec. 21, 1987, Ser. No. 313,966
Int. Cl.[5] B41F 31/26; B41L 27/12
U.S. Cl. 101—348 4 Claims



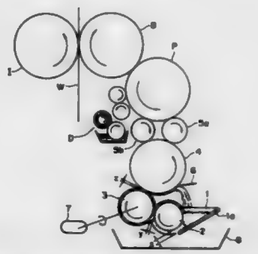
1. An ink metering roller for use in a printing machine comprising a mandrel, an exterior surface layer formed on said mandrel consisting of an ink absorbent matrix material of synthetic resin or rubber and having substantially spherical particles mixed therein, said particles arranged to form independent, partially exposed projections on a surface region of said surface layer, said particles selected from the group consisting of silica, alumina, aluminosilicano, ceramic, glass, stainless steel, epoxy resin, and phenolic resin spherical particles; wherein each of said substantially spherical particles has a grain size of from about 5 to 100 μm; and wherein said substantially spherical particles are embedded in said surface layer to a depth of at least 2.5 μm from said surface region.

5,113,761
INKING DEVICE

Yuichi Okamura, Tokyo, Japan, assignor to Kabushikigaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed Mar. 18, 1991, Ser. No. 670,435
Claims priority, application Japan, Mar. 19, 1990, 2-69053
Int. Cl.[5] B41F 31/00
U.S. Cl. 101—350 4 Claims

1. An inking device including an ink fountain roller by which ink is introduced to ink rollers from an ink pan comprising
an ink transfer roller provided downstream of and near said ink fountain roller with a distance between said ink transfer roller and said ink fountain roller that is smaller than the thickness of the ink film that is led out of an ink pan by said ink fountain roller, and
a roller downstream of said ink transfer roller with a distance between said ink transfer roller and said downstream

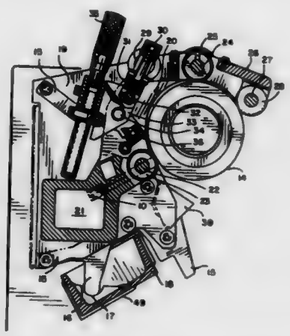


roller smaller than the distance between said ink transfer roller and said ink fountain roller.

5,113,762
INK METERING APPARATUS WITH PIVOTALLY ENGAGEABLE INK DUCT

Paul Abendroth, Offenbach am Main; Joachim Herzel, Frankfurt am Main; Peter Hummel, Offenbach am Main; Robert Ortner, Alzenau; Joachim Steuer, Offenbach am Main; Achim Stoffler, Offenbach am Main, and Janko Despot, Offenbach am Main, all of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Fed. Rep. of Germany

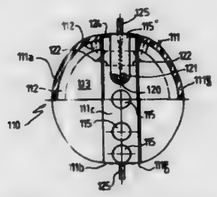
Filed Apr. 24, 1991, Ser. No. 690,854
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1990, 4012949
Int. Cl.[5] B41F 31/04, 31/06; B41G 27/08
U.S. Cl. 101—350 18 Claims



1. A mounting device for an ink duct pivotally movable with respect to a ductor roller in a rotary printing press having a supporting press frame, said mounting device comprising, in combination,
means secured to said ink duct and bearing on said press frame for supporting said ink duct for pivotal movement,
ink metering means disposed in said ink duct and projecting therefrom for engagement with said ductor roller substantially in an upwardly-inclined first radially extending plane,
a first guide roller and means for journalling said first guide roller for engagement with said ductor roller substantially in said first radially extending plane,
a second guide roller and means for journalling said second guide roller for engagement with the upper surface of said ductor roller substantially in a vertical plane intersecting the axis of said ductor roller,
a third guide roller and means for journalling said third guide roller for engagement with said ductor roller sub-

stantially in a downwardly-inclined, second radially extending plane,
said third guide roller being disposed from said first guide roller by at least 180° measured peripherally around said ductor roller through said second guide roller,
means for normally urging said third guide roller into engagement with said ductor roller so as to hold said ductor roller in engagement with said first and second guide rollers,
and means for moving said third guide roller out of engagement with said ductor roller so as to permit pivotal movement of said ink duct and said guide rollers away from said ductor roller.

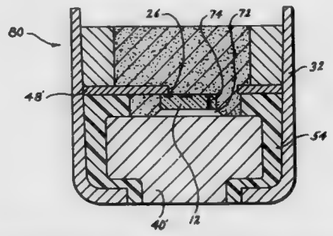
5,113,763
CONSUMABLE IGNITER FOR A SOLID ROCKET MOTOR
Herman F. R. Schoeyer, Noordwijk, Netherlands; Guido Borso, and Salvatore Gibilisco, both of Rome, Italy, assignors to Agence Spatiale Europeenne, Paris, France
Filed Sep. 17, 1990, Ser. No. 583,836
Claims priority, application France, Sep. 19, 1989, 89 12255
Int. Cl.[5] F42B *17/00*
U.S. Cl. 102—202 **2 Claims**



1. A consumable igniter for a solid rocket motor comprising:
a substantially spherical reinforced thin case constructed of two half domes having a substantially hemispherical configuration, each dome comprising an assembly extension in the form of a substantially cylindrical skirt;
a combustible charge in the form of a layer lining the internal surface of said case, said combustible charge and said case defining a combustion chamber;
a plurality of through-holes formed through said skirts and defining respective sonic throats;
at least one small container received in one of said through-holes and projecting inwardly towards said combustion chamber, said small container containing a charge for igniting said combustible charge layer; and
an ignition device penetrating into said small container for igniting the charge contained within said small container.

5,113,764
SEMICONDUCTOR BRIDGE (SCB) PACKAGING SYSTEM
Frank N. Mandigo, North Branford, Conn.; George C. Mei, Creve Coeur, Mo., and Julius C. Fister, Hamden, Conn., assignors to Olin Corporation, New Haven, Conn.
Division of Ser. No. 412,252, Sep. 25, 1989, Pat. No. 5,029,529.
This application May 13, 1991, Ser. No. 699,116
Int. Cl.[5] F42C *19/12*
U.S. Cl. 102—202.9 **25 Claims**

1. A primer housing for a semiconductor bridge device, comprising:
a primer cup having a base and sidewalls with an aperture formed in said base;
a primer button located within said aperture and electrically isolated from said primer cup;
an electrical conductive washer contacting a bonding site on said semiconductor bridge device and being in electrical contact with both said semiconductor bridge device and an interior surface of said sidewalls;
said primer cup, primer button, and electrically conductive washer individually selected from the group consisting of copper, aluminum, copper alloys, aluminum alloys andiron-nickel alloys;



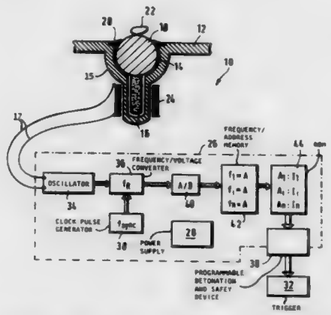
an electrically conductive compliant die attach material both bonding and electrically interconnecting said semiconductor bridge device to said primer button; and
a dielectric material selected from the group consisting of polymers, ceramics and glasses disposed between said primer button and said primer cup.

5,113,765
ABSOLUTE ANTI-ROLL EMERGENCY ROAD FLARE
James Carey, 1325 Barbara Dr., Vista, Calif. 92084; John J. Addario, 1748 Costada Ct., Lemon Grove, Calif. 92045, and Roberto Juarez, 13432 Aubrey St., Poway, Calif. 92064
Continuation-in-part of Ser. No. 502,248, Mar. 30, 1990, abandoned. This application Nov. 29, 1991, Ser. No. 799,949
Int. Cl.[5] F42B *4/26*
U.S. Cl. 102—336 **3 Claims**



1. A road flare comprising:
(a) an elongated body comprising a shell packed with incendiary material which illuminates when burned;
(b) said body having a substantially uniform triangular cross-section to positively prevent rolling of said flare when used on an underlying surface and to permit the substantial flush-packing of said flare in a group of flares for shipping and storage; and
(c) a cap, triangular in cross-section, covering one end of said flare, which cap is removable to permit use of the flare, and is substantially flush with the body of the flare such that said cap does not interfere with flush-packing of said road flare.

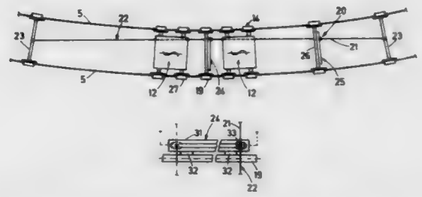
5,113,766
MINE CONTROL DEVICE
Hermann Grosch, Wülfrath, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany
Filed Jun. 3, 1991, Ser. No. 709,366
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1990, 4025680
Int. Cl.[5] F42C *11/04, 17/04*
U.S. Cl. 102—427 **13 Claims**



1. An explosive mine comprising: a mine housing having an exterior wall with an inwardly directed projection provided with a blind bore-like opening extending into said projection from an outer surface of said wall; a programmable detonation and safety control unit disposed in said mine housing; a pin having a predetermined desired magnetic permeability removeably disposed in said opening; and electronic circuit means, disposed within said mine housing and controllable by the magnetic permeability of said pin, for programming said detonation and safety control unit, said circuit means including a read-only memory having its output connected to said detonation and safety control unit and containing a plurality of digital informations, each stored at a fixed different address, for programming said detonation and safety control unit, a variable oscillator having an oscillator resonant frequency determining coil, with said coil surrounding at least a portion of said projection, whereby the induction of said coil is a function of the permeability of said pin, and further circuit means, responsive to the output frequency of said oscillator, for producing an address signal for said read-only memory corresponding to the particular output frequency of said oscillator, and for feeding said address signal to said read-only memory to cause the information stored at the address to be read out and program said detonation and safety control unit.

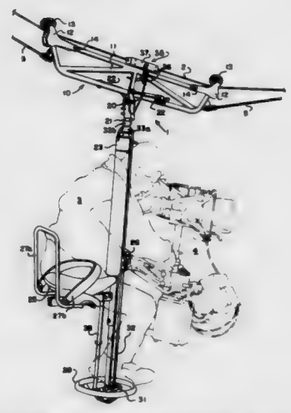
5,113,767
CONTINUOUS ACTION BALLAST COMPACTING MACHINE
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria
Filed Jan. 3, 1991, Ser. No. 637,218
Claims priority, application Austria, Feb. 6, 1990, A249/90
Int. Cl.[5] E01B *33/02*
U.S. Cl. 104—7.2 **12 Claims**

1. A continuously advancing track working machine for compacting ballast supporting a track comprised of two rails fastened to a succession of ties, each rail having a gage side and a field side, which comprises
(a) a self-propelled machine frame supported by undercarriages on the track for mobility in an operating direction,
(b) a track stabilization assembly vertically adjustably mounted on the machine frame between two of said undercarriages, the track stabilization assembly comprising
(1) drive means for vertically adjusting the assembly,
(2) oscillatory rolling tools arranged for engaging the rails for being pressed against the gage sides of the rails, and
(3) vibrating means for oscillating the rolling tools,
(c) lining drives linking the track stabilization assembly to the machine frame for displacing the track engaged by the rolling tools pressed against the track rails in a direction extending transversely to the track,
(d) a lining reference system including a lining reference base having a leading and a trailing end point in the operating direction,



(e) a measuring device arranged on the machine frame adjacent the track stabilization assembly for measuring the transverse track displacement relative to the lining reference base into a desired position,
(f) an elastic bearing supporting the measuring device, and
(g) an electronic filter associated with the measuring device for filtering out any oscillations interfering with the transverse displacement measurements.

5,113,768
CABLE-SUSPENDED APPARATUS FOR SUPPORTING A STABILIZED CAMERA ASSEMBLY
Garrett W. Brown, 515 Addison Ct., Philadelphia, Pa. 19147
Filed Mar. 15, 1991, Ser. No. 670,295
Int. Cl.[5] B61B *7/00*
U.S. Cl. 104—112 **15 Claims**



1. An apparatus for receiving a stabilized camera support for use by a camera operator, the apparatus comprising:
a trolley for traversing a cable attached to and between fixed end points;
a shaft including a connection means for pivotally connecting the shaft to the trolley and for fixing the shaft against rotation relative to the trolley;
a sleeve overlying the shaft and including a seat for the camera operator and a mounting for receiving the stabilized camera support; and
a bearing surface connected to the shaft, at an end opposing the connection means of the shaft, for causing rotation of

the sleeve, seat and mounting relative to the shaft and trolley responsive to forces applied to the bearing surface by the camera operator.

5,113,769

CAR BODY FOR RAILWAY ROLLING STOCK AND METHOD FOR FABRICATING CAR BODY

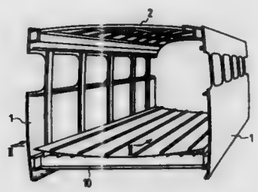
Sumio Okuno; Michifumi Takeichi; Keiji Ohmura; Msato Okazaki; Hitoshi Tsuruda; Hiroyuki Yamada; Morishige Hattori, and Kenji Kimura, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 6, 1989, Ser. No. 362,048

Claims priority, application Japan, Jan. 18, 1988, 1-7802; Jun. 6, 1988, 63-137569; Feb. 1, 1989, 1-20732

Int. Cl.[5] B61F *1/00*

U.S. Cl. 105—422 **22 Claims**



1. A substantially air-tight railway passenger car including a car body comprising an underframe means, a pair of side means disposed on respective lateral sides of said underframe means for forming sides of the car body, means for defining respective longitudinal ends of the car body, and a roof means for forming a roof of the car body, wherein said underframe means comprises a floor means including a curved surface of at least one radius of curvature with respect to a transverse direction of the car body, and wherein said floor means is fashioned of an extruded light alloy material and includes reinforcing means extending in a thickness direction of the floor means and continuously in a longitudinal direction of the car body.

5,113,770

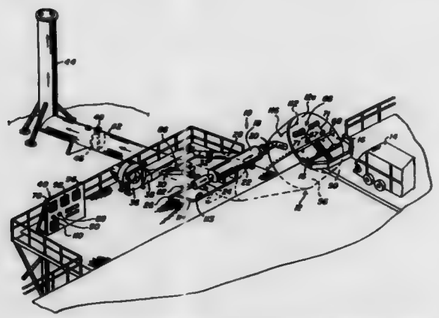
APPARATUS FOR INCINERATING WASTE MATERIALS

Murray C. Godbe, 807 5th Ave., Salt Lake City, Utah 84103, and Howard H. Nichols, 40 Churchill Rd., Pittsburgh, Pa. 15235

Filed Jun. 10, 1991, Ser. No. 712,578

Int. Cl.[5] F23N *5/00*

U.S. Cl. 110—187 **4 Claims**



1. In apparatus for incinerating wastes that include moisture-carrying materials, such as garbage and liquid waste, said apparatus comprising a furnace having an internal incinerating chamber, means for introducing said wastes into said incinerating chamber, means for introducing heat into said incinerating chamber, means for conducting combustion gases from said incinerating chamber, means for discharging non-combustible residual matter from said incinerating chamber, means for controlling rate of feed of said wastes to said incinerating chamber, means for supplying fuel to said means for introducing heat into said incinerating chamber, and means for controlling the rate of feed of fuel to said means for introducing heat into said incinerating chamber, the improvement comprising the provision of radiation sensing means for said incinerating chamber and connected to said means for controlling the rate of feed of fuel, so as to substantially immediately adjust combustion heat in said incinerating chamber in accordance with the intensity of heat radiated by flames within said incinerating chamber, said intensity of heat being affected by variations in the quantity of moisture in wastes being fed to said incinerating chamber from time to time; said means for introducing heat into the incinerating chamber comprising an auxiliary combustion chamber fueled by a burner into which the means for supplying fuel discharges, and further comprising a by-pass line leading directly into said auxiliary combustion chamber from said means for supplying fuel; valve means in said by-pass line; and control means connected with the radiation sensing means for controlling said valve means.

5,113,771

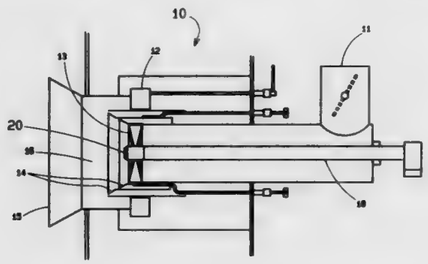
PULVERIZED COAL FUEL INJECTOR

Michael J. Rini, Hebron, and David P. Towle, Windsor, both of Conn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 14, 1991, Ser. No. 744,752

Int. Cl.[5] F23D *1/00*

U.S. Cl. 110—263 **9 Claims**



1. A pulverized coal injector for a coal combustor comprising:

a) a burner tube having a central axis, an upstream end, a downstream end, and a primary burn zone adjacent to the downstream end, and further wherein said tube is capable of carrying a stream of a pulverized coal-air mixture to be burned,

b) an acceleration means located in the tube for improving the uniformity of the coal-air mixture;

c) a converging means connected to the downstream end of the tube for injecting the coal-air mixture into the primary burn zone of the combustor, said converging means including means for splitting the stream of the coal-air mixture into a plurality of separate streams;

d) and further wherein said splitting means directs the separate streams to impinge upon each other upon discharge into the primary burn zone of the combustor.

5,113,772

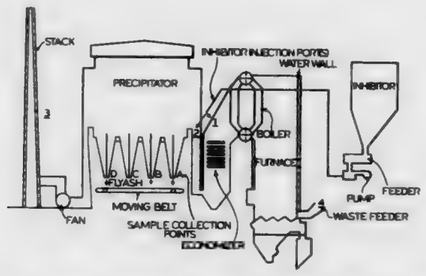
SUPPRESSION OF DIOXIN PRODUCTION IN THE INCINERATION OF WASTE MATERIAL

Karasek' Francis W.; Krishnat P. Naikwadi, both of Waterloo, Canada, and Otto Hutzinger, Bayreuth, Fed. Rep. of Germany, assignors to University of Water of Waterloo, Waterloo, Canada

Filed Jul. 16, 1990, Ser. No. 552,522

Int. Cl.[5] F23J *11/00, 15/00*

U.S. Cl. 110—345 **20 Claims**



1. A method of disposal of organic material which is combustible to form gaseous chlorinated organic compounds, including toxic dioxins and dibenzofurans, which comprises:

incinerating said organic material in an incineration operation to form gaseous products of incineration containing flyash, precursors for the formation of chlorinated organic compounds and acid gases,

passing said gaseous products of incineration to a precipitation step wherein said flyash is precipitated from the gaseous products of incineration,

contacting the surface of said flyash during said passage of said gaseous products of incineration to said precipitation step with a small quantity of at least one inhibitor substance which reacts with catalytically-active sites on the surface of the flyash, so as to inhibit catalytic effects of said flyash towards the formations of chlorinated organic compounds, including toxic dioxins and dibenzofurans, from said precursors during said passage,

reacting said at least one inhibitor substance with chlorinated organic compounds and said acidic gases in said gaseous products of incineration to suppress chlorinated organic compounds and acidic gases in a vented product gas stream, and

venting said product gas stream after said precipitation of flyash from said gaseous products of incineration.

5,113,773

TOP FEEDING DEVICE FOR SEWING MACHINES

Kurt Klundt, Hirschhorn, Fed. Rep. of Germany, assignor to G.M. Pfaff, Kaiserslautern, Fed. Rep. of Germany

PCT No. PCT/EP88/00415, § 371 Date Mar. 14, 1990, § 102(e) Date Mar. 14, 1990, PCT Pub. No. WO89/01068, PCT Pub. Date Feb. 9, 1989

PCT Filed May 13, 1988, Ser. No. 445,617

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1987, 3724788

Int. Cl.[5] D05B *27/04*

U.S. Cl. 112—320 **6 Claims**

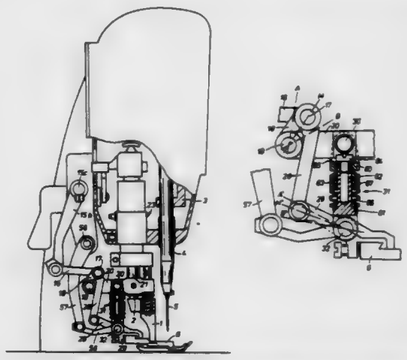
1. Sewing machine with an upper feeding device, comprising:

a support system;

an upper feed foot pivotally connected to said support system by a bar;

a lifting drive mechanism; and

a connecting rod arrangement connected between the lifting drive mechanism and said upper feed foot, said connecting rod arrangement having a lift connecting rod connecting on one end to said upper feed foot and on another end to said lifting drive mechanism, said connecting rod arrangement also having a rocker arm having a first end pivotable on said support system and a second end connected in a hinged manner to said connection between said lift connecting rod and said lift drive mechanism for forming with a direction of a lifting movement of said upper feed foot an angle having a minimum in an area of a touch-down position of said upper feed foot and thus slowing said feed foot as said feed foot approaches touch-down position.



5,113,774

THREAD CUTTING DEVICE ON A SEWING MACHINE

Albert Dusch, Kaiserslautern, and Karl-Heinz Walter, Weilerbach, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Kaiserslautern, Fed. Rep. of Germany

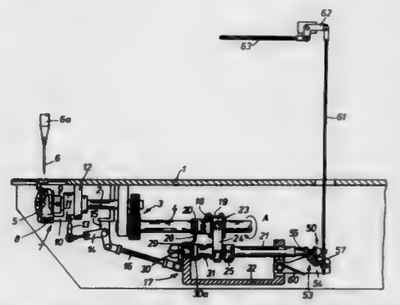
PCT No. PCT/EP89/00452, § 371 Date May 31, 1990, § 102(e) Date May 31, 1990, PCT Pub. No. WO89/12129, PCT Pub. Date Dec. 14, 1989

PCT Filed Apr. 26, 1989, Ser. No. 499,265

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1988, 3819135

Int. Cl.[5] D05B *65/00, 47/00*

U.S. Cl. 112—292 **3 Claims**



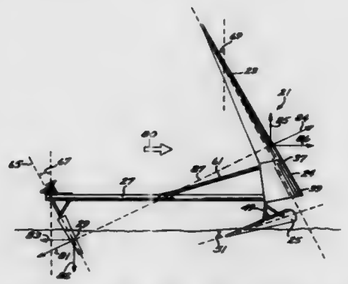
1. A thread cutting arrangement for sewing machines, comprising: an axially moveable drive mechanism; thread catcher means, actuated by said axially moveable drive mechanism, said thread catcher means performing a first movement step catching a needle thread and a shuttle thread, and a second movement step, having a direction which is opposite to said first movement step, in which the needle thread and the shuttle thread are pulled out and fed to a stationary cutting blade; a thread tensioning mechanism for tensioning the needle thread; releasing member means for disengaging the thread tensioning

mechanism to open the thread tensioning mechanism during the thread pull operation; a cam arrangement rigidly attached to the drive mechanism for actuating the releasing mechanism; a one-way coupling for the releasing member, acting during the second movement step of the drive mechanism, said one-way coupling being connected between the drive mechanism and a linkage connected to the releasing member.

5,113,775
AERO HYDROFOIL SAIL BOAT

Robert W. Imhoff, 2062 Hanscom Dr., South Pasadena, Calif. 91030

Continuation-in-part of Ser. No. 345,842, May 1, 1989, abandoned. This application Aug. 30, 1990, Ser. No. 575,227
Int. Cl.[5] B63H *9/04*
U.S. Cl. 114—39.1 **14 Claims**



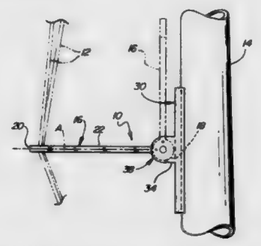
1. A high-speed, ultra stable, wind propelled watercraft, comprising:
an airfoil, having a windward surface and a leeward surface;
buoyant hydrofoil means for supporting said airfoil on a plane of floatation such that said airfoil's windward surface is normally angled toward said plane of floatation to thereby describe an angle of inclination, said hydrofoil means being configured to provide a vertical lift component when moving through water while offering substantially no leeward resistance;
a boom extending substantially horizontally from the windward surface of said airfoil;
a buoyant keel/rudder rotatably affixed to the distal end of said boom, said keel/rudder being symmetrical both side to side as well as edge to edge, having an axis of rotation substantially parallel with the angle of inclination of the airfoil and rotatable through at least a 180° arc; and
control means for controlling the rotational position of said keel/rudder.

5,113,776
FLAGSTAFF ATTACHED HALYARD RETAINER

Hillery Knecht, 1720 Tiverton, Bloomfield Hills, Mich. 48013

Filed May 23, 1991, Ser. No. 704,456
Int. Cl.[5] B63H *9/04*
U.S. Cl. 114—102 **15 Claims**

1. A halyard retaining assembly (10) for eliminating noise produced by a halyard (12) colliding with a pole structure (14), said assembly (10) comprising:
arm means (16) having a base end (18) and a distal end (20) defining a longitudinal axis (A) therebetween for extending the halyard (12) out and away from the pole structure (14), said arm means (16) including halyard restricting means (24) disposed adjacent said distal end (20) of said arm means (16) for removably securing the halyard (12) at said distal end (20) of said arm means (16);
base means (30) fixedly securable to the pole structure (14) for supporting said arm means (16) at said base end (18);
rotating means (38) supporting said arm means (16) at said base end (18) for providing rotational movement of said arm means (16) about said base end (18) relative to said base means (30);
said halyard restricting means (24) including at least one slot (26) having a portion extending substantially parallel to said longitudinal axis (A);

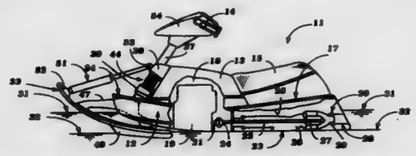


locking means (58) for locking said arm means (16) in any one of a plurality of rotational positions relative to said base means (30),
said assembly (10) characterized by said base means (30) including first receiving means (56) for receiving said locking means (58) therein.

5,113,777
STEERING DEVICE FOR SMALL JET BOAT

Noboru Kobayashi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 452,725, Dec. 18, 1989, abandoned. This application May 3, 1991, Ser. No. 695,102
Claims priority, application Japan, Dec. 19, 1988, 63-321593
Int. Cl.[5] B63H *25/00*
U.S. Cl. 114—144 R **5 Claims**

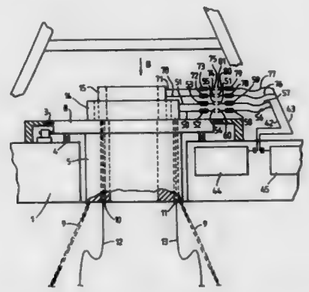


1. A small jet propelled watercraft comprising a hull having a generally flat undersurface, an internal combustion engine carried by said hull, a jet propulsion unit carried by said hull and recessed into said hull above said undersurface at a rear end thereof and positioned rearwardly of and driven by said engine, said jet propulsion unit being at least partially submerged during watercraft operation and a steering ski having a steering rudder on the lower portion thereof supported for steering movement at a front of said hull and extending rearwardly beneath a forward portion of said hull, said steering ski being configured to provide a lift for the front of said hull while the rear of said hull undersurface rises in the water as the speed of the watercraft increases, said steering ski and said hull being configured and arranged so that said steering ski is substantially submerged when said watercraft is stationary in the body of water or traveling at low speeds and wherein said steering ski is substantially raised in the water so that substantially only said steering rudder is submerged when traveling at high speeds.

5,113,778
SYSTEM FOR TRANSFERRING FLUIDS FROM A PIPING SYSTEM IN A SHIP'S HULL TO A TURNING DEVICE, AND VICE VERSA

George W. Paasche, Stjordal, and Ketil Hanssen, Trondheim, both of Norway, assignors to Golar-Nor Offshore AS, Trondheim, Norway

Continuation of Ser. No. 442,099, Nov. 28, 1989, abandoned. This application Apr. 10, 1991, Ser. No. 683,090
Claims priority, application Norway, Nov. 28, 1988, 885306
Int. Cl.[5] B63B *27/34*
U.S. Cl. 114—256 **2 Claims**

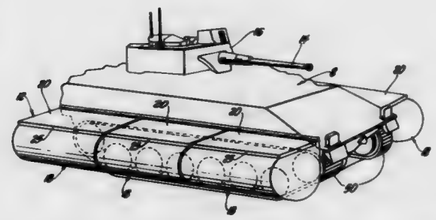


1. An apparatus for transferring fluid from a well to a storage tank contained within a ship having a rotating turntable associated therewith, said apparatus comprising:
a manifold rigidly and non-rotatably connected to said turntable and adapted to receive said fluid from said well;
a plurality of flexible hoses coupled to said storage tank; and
connection means, coupled to said manifold, for allowing a selected one of said plurality of flexible hoses to be coupled to said manifold, said one hose being selected by an amount of said rotation of said turntable.

5,113,779
FLOTATION DEVICE FOR A COMBAT VEHICLE

Bruce E. Amrein, Bel Air; Curtis L. McCoy, Apg; Robert C. Brucksch, Harford County, all of Md., and George Melnik, Newark, Del., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 30, 1990, Ser. No. 502,586
Int. Cl.[5] B63F *3/00*
U.S. Cl. 114—270 **11 Claims**

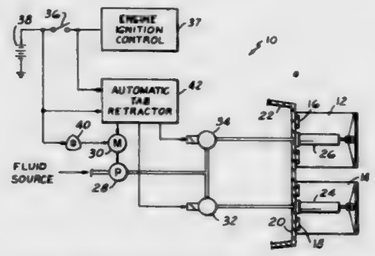


1. A device for enabling a land vehicle to float in a body of water, comprising:
a cover at each of two oppositely racing zones of the exterior of the vehicle, the covers having a first position where the covers face toward the zones and having a second position where the covers extend away from the zones;
a pivotal connection swingably attaching the covers to the zones;
an inflatable bag connected to each cover;
means to connect the bags to the zones;
mechanical means to inflate and deflate the bags such that inflation of the bags places the covers in the second position and deflation of the bags places the covers in the first position, the bags being disposed between the covers and the zones when the covers are in the first position; and
wherein the mechanical means is a pump for positively displacing air, and there is a net transfer of energy from the mechanical means to the air, the pump being a reversible pump, whereby the pump can both inflate and deflate the bags.
wherein the entire volume of the bags displaces water when the vehicle floats and the covers comprises flat walls, the flat walls being disposed along the surface of the water immediately above the bags during the second position of the covers.

5,113,780
AUTOMATIC BOAT TRIM TAB CONTROL

Blake J. Bennett, Boca Raton, Fla., and David A. Hagstrom, Endicott, N.Y., assignors to Bennett Marine, Incorporated, Deerfield Beach, Fla.

Filed Aug. 30, 1990, Ser. No. 575,193
Int. Cl.[5] B63B *39/06*
U.S. Cl. 114—286 **9 Claims**



1. A boat trim control system that comprises:
a boat having a hull and an engine for powering said boat,
means for selectively applying electrical power to said engine for powering the boat,
means movably mounted to said hull for trimming attitude of said boat as said hull is propelled through the water,
means carried by said hull and responsive to a boat operator for selectively adjusting position of said trimming means to maintain desired attitude under varying conditions, and
means coupled to said trimming means and to said engine, and responsive to removal of electrical power from said engine, for automatically moving said trimming means to a predetermined position with respect to said hull upon removal of power at said engine.

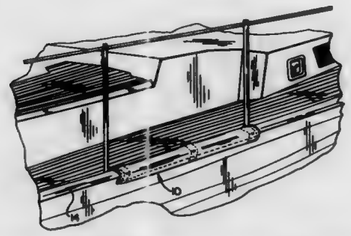
5,113,781
DETACHABLE PROTECTIVE COVER FOR WOODEN RAILS OF BOATS

Terry G. Link, 421 Hempstead Pl., Charlotte, N.C. 28207

Filed Jan. 14, 1991, Ser. No. 640,607
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—361 **8 Claims**

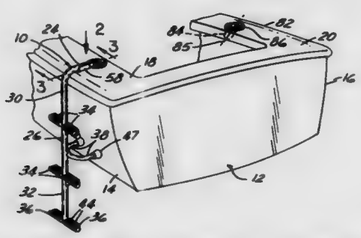
1. A system for protecting the wooden rail of a powerboat or sailboat and which rail has a top and opposite sides, said system comprising a plurality of covers, with each cover comprising
an elongate sheet of generally rectangular fabric material and which defines opposite ends and opposite side edges,
means defining a plurality of longitudinally spaced apart pockets on one side of said fabric sheet, and with said pockets each extending transversely between said opposite side edges of said fabric sheet,
a resilient ring of generally C-shaped cross sectional configu-

ration positioned in each of said pockets, with each of said rings including closely adjacent circumferential ends which are positioned adjacent respective ones of said opposite side edges of said fabric sheet, and such that said rings cause said fabric sheet to assume a conforming C-shaped outline in transverse cross section at each of said pockets, and



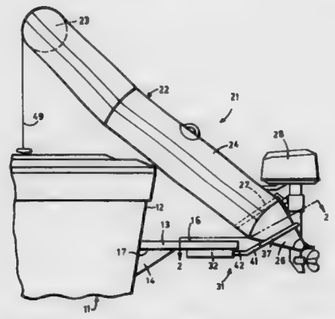
whereby each of the C-shaped rings may be manually expanded to permit the pockets to be disposed about the wooden rail, and so that the pockets then collapse and the sheet encircles the top and both sides of the rail upon the release of the rings.

5,113,782
BOAT BOARDING LADDER
Robert T. McCarty, 227½ Huron Ave., Port Huron, Mich. 48060
Filed Jan. 7, 1991, Ser. No. 638,058
Int. Cl.[5] B63B *29/20*
U.S. Cl. 114—362 **6 Claims**



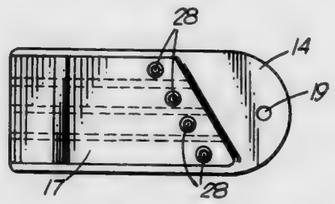
1. A boarding ladder for mounting to a rod holder on the gunnel at either side of a boat, the rod holder having a rod receiving opening whose axis extends angularly downwardly and forwardly of the boat, said ladder comprising, in combination:
an ascending connector portion having a longitudinal axis and adapted to be telescoped into said opening in a rod holder on the gunnel at either side of a boat;
a descending portion to extend downwardly along the outside of a boat and having spaced apart steps and laterally extending stand offs for abutting against the side of the boat;
a transverse portion extending between the connector and descending portions and rigidly secured to the latter; and
means securing together the connector and transverse portions for controlled rotation only about an axis oblique to the longitudinal axis of the connector portion, whereby when the connector portion is rotated into alignment with the rod holder opening and telescoped thereinto the descending portion may be disposed generally vertical and the stand offs may bear against the side of the boat to stabilize the ladder against free swinging movement.

5,113,783
SUPPORT FOR DINGHY
James F. Den Herder, 14364 Woodhaven Ct., Grand Haven, Mich. 49417
Filed Feb. 5, 1991, Ser. No. 650,953
Int. Cl.[5] B63B *23/00*
U.S. Cl. 114—365 **23 Claims**



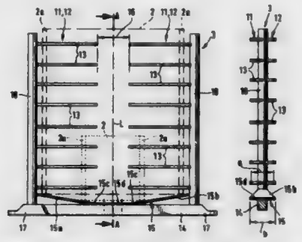
1. In a boat having a rear transom and a horizontally enlarged platform fixed to said rear transom and projecting rearwardly from an outer rear surface thereof, the improvement comprising dinghy support means mounted on said platform for supporting an inflatable dinghy adjacent said transom in generally raised relationship above the water, said dinghy support means including a horizontally and sidewardly spaced pair of enlarged ring means for supportingly engaging tapered rear end portions of the inflatable dinghy, each said ring means having an opening therethrough for permitting insertion of one of the tapered rear end portions partially therethrough, and means for fixedly attaching said pair of ring means to said platform.

5,113,784
MULTI-TONE WHISTLE
Randall A. Forselius, 2767 S. Langley Crt., Denver, Colo. 80210
Filed Dec. 7, 1990, Ser. No. 623,590
Int. Cl.[5] G10K *5/00*
U.S. Cl. 116—137 R **7 Claims**



1. A whistle capable of selectively producing more than one tone comprising a plurality of resonant chambers, a mouthpiece, said plurality of resonant chambers connected to said mouthpiece, said mouthpiece having an air receiving opening and a second opening arranged relative to said mouthpiece such that when the user blows through air receiving opening, the air in said resonating chambers can be caused to produce an audible tone, a single hole in each said chambers positioned such that each said hole can be selectively closed by a digit of the user, said chambers being sized such that when a hole in a chamber is not closed and the user blows so as to normally to cause said chamber to produce said audible tone, the chamber will not produce said audible tone, but when the hole in a chamber is closed, that chamber can produce said audible tone.

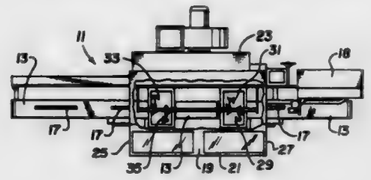
5,113,785
TRANSPORT DEVICE FOR BOARDS, ESPECIALLY THOSE HAVING A SENSITIVE SURFACE
Peter Martin, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Oct. 1, 1990, Ser. No. 590,902
Claims priority, application Switzerland, Oct. 6, 1989, 3650/89
Int. Cl.[5] B05C *1/02*
U.S. Cl. 118—58 **38 Claims**



1. A transport device (1) for boards (2) or board-shaped workpieces, which are coated with plastics material, and then dried, the device having holders (3) for taking hold of the boards (2) at the edges (2*a*) thereof when they are being handled and advancing means for transporting them to and through treatment stations, wherein each holder (3) has at least two parallel bars (10) on each of which there are provided two rows (11, 12) of prongs (13) arranged in the form of a rake, the prongs (13) of the one row (11) of a bar (10) forming an acute angle with those of the second row (12) of that bar (10) and the two rows (11, 12) accordingly being arranged with respect to each other in a "V" shape when viewed in cross-section and the free ends of the prongs (13) of the one bar (10) pointing towards the free ends of the prongs (13) of the other bar (10), and wherein at least over part of the region located between the bars (10) the width of the gap between the rows (11, 12) of prongs (13) which increases towards the longitudinal middle plane (L) between the two parallel bars (10) is greater than the thickness of a board (2) to be held, the two bars (10) have at one of their ends a carrier (14) which holds and connects them and there is arranged on that carrier (14) an end-face stop (15) for boards (2) which has two limbs (15*a*, 15*b*) extending at an obtuse angle to each other from the middle of the carrier (14) towards the bars (10).

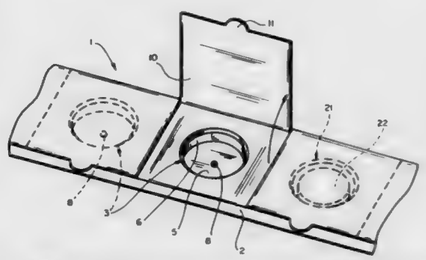
5,113,786
APPARATUS FOR PRODUCING AN IMITATION STONE FINISH
Michael R. Hayslip, Dallas, Tex., assignor to Clark Moulding Co., Inc., Dallas, Tex.
Continuation of Ser. No. 276,871, Nov. 28, 1988, abandoned. This application Aug. 20, 1990, Ser. No. 569,593
Int. Cl.[5] B05B *1/06*
U.S. Cl. 118—314 **4 Claims**

1. An apparatus for placing an imitation stone finish on a workpiece, wherein the apparatus comprises:
conveyor means for moving the workpiece through the apparatus;
a pair of intermediate spray guns, mounted above the conveyor means;
a quantity of pigmented, catalyzed urethane material to be sprayed onto the workpiece through the intermediate spray guns;
a second pair of spray guns, mounted above the conveyor means and spaced longitudinally from the intermediate spray guns at a position where the conveyor means moves the workpiece under the second pair of spray guns before the urethane material dries; and
a quantity of pigmented mixture of solvents to be sprayed onto the workpiece through the second pair of spray guns, wherein the second pair of spray guns further comprises:
a fluid nozzle;
a needle assembly within the fluid nozzle;
an air nozzle, mounted on the fluid nozzle, to mix air with



the fluid flowing through the fluid nozzle, the air nozzle having an opening that is small enough to spray in a series of erratic droplets; and
a core, mounted within the air nozzle, having a plurality of spiral grooves on the outer surface to cause air to spiral and to create turbulence within the air nozzle.

5,113,787
OPTICAL FIBER TERMINATION COATING DISPENSER
Akira Tomita, Redwood City; Stephen H. Diaz, Palo Alto; Robert S. Dubrow, Redwood City, and Michael Feldman, San Carlos, all of Calif., assignors to Raychem Corp., Menlo Park, Calif.
Filed May 20, 1988, Ser. No. 196,924
Int. Cl.[5] B05C *3/00*
U.S. Cl. 118—400 **12 Claims**

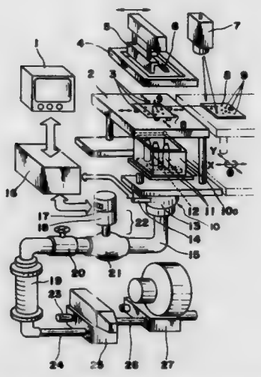


1. A dispenser for dispensing a coating material onto an end of an optical fiber, comprising:
means for dispensing an optical fiber coating material, the dispensing means including a base and sidewalls surrounding the base so as to form an optical fiber coating material dispensing platform; and
an optical fiber end coating material disposed on the platform and separated from the sidewalls.

5,113,788
SCREEN PRINTING MACHINE FOR THROUGH HOLE PRINTING AN ELECTRIC CONDUCTOR
Yasuo Izumi, Ikoma; Syoji Sato, Neyagawa; Kazumi Ishimoto, Katano; Yutaka Makino, Kobe, and Shohzo Ueno, Kofu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 21, 1990, Ser. No. 571,096
Claims priority, application Japan, Aug. 22, 1989, 1-216450
Int. Cl.[5] B05D *5/12*; B05C *11/00*
U.S. Cl. 118—663 **6 Claims**

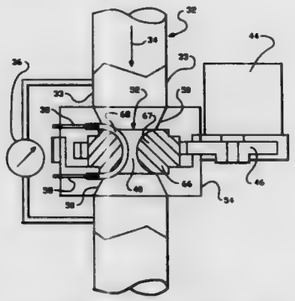
1. A screen printing machine comprising:
a table on which a substrate is to be put;

a substrate adjusting means on said table for adjusting the position of a substrate on the table;
a screen plate movable onto the table over a substrate;
a squeegee movable on the plate for applying a paste to the substrate;
a suction system connected with said table for applying suction to a substrate and through holes in the substrate;
a degree of vacuum measuring means in the suction system for measuring the degree of vacuum in the suction system;



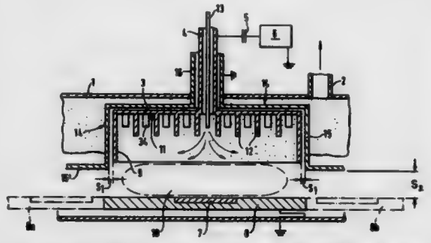
an adjusting means in the suction system downstream of said measuring means for adjusting the degree of vacuum in the system; and
control means connected to said adjusting means for controlling the adjustment of said adjusting means for producing a predetermined pattern of gradual change of suction in said suction system which should produce a predetermined degree of vacuum, said pattern being according to the positions, number and sizes of holes in a substrate to which paste is being applied on said table.

5,113,789
SELF CLEANING FLOW CONTROL ORIFICE
George D. Kamian, Santa Cruz, Calif., assignor to Watkins Johnson Company, Palo Alto, Calif.
Filed Apr. 24, 1990, Ser. No. 513,807
Int. Cl.[5] C23C *16/00, 16/54*
U.S. Cl. 118—715 **17 Claims**



13. In an atmospheric pressure chemical vapor deposition apparatus for depositing films on wafers or substrates, said apparatus including a conveyor belt, a muffle, and a coating chamber with a chemical delivery system and an exhaust system, said coating chamber being positioned within said muffle such that said conveyor belt delivers said wafers or substrates to said coating chamber whereby said chemical delivery system distributes chemical vapors over the surface of said wafer or substrate for reaction and resultant film deposition on the surface of said wafer or substrate, said chemical vapors being subsequently evacuated from said coating chamber by said exhaust system, the improvement comprising an exhaust system which includes:
an exhaust line with tapered walls leading to an orifice restriction area, said orifice restriction area including a toroid with a rounded inner surface, and a spring in intimate contact with said toroid;
a housing externally surrounding said orifice restriction area, said housing rotatably supporting said spring; and
a motor positioned adjacent to said housing, said motor including a gear to drive said toroid such that said toroid rotates and thereby produces cleaning between said spring and said toroid such that debris is removed from said orifice restriction area.

5,113,790
APPARATUS FOR THE PLASMA TREATMENT OF SUBSTRATES
Michael Geisler, Wächtersbach; Michael Jung, Kahl/Main, and Rudolf K. Faulhaber, Karben, all of Fed. Rep. of Germany, assignors to Leybold AG, Hanau, Fed. Rep. of Germany
Filed Jul. 11, 1991, Ser. No. 728,258
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1991, 4109619
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—723 **12 Claims**

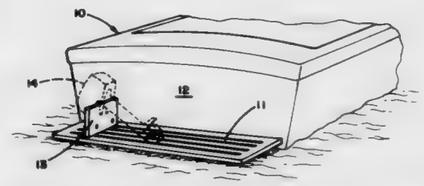


1. Apparatus for the plasma treatment of electrically biased substrates in a plasma discharge having a geometry and pressure, said discharge being excited by radiofrequency power, comprising
a first electrode constructed as a hollow electrode comprising a bottom and a sidewall extending from said bottom to define a hollow space, and a plurality of parallel projections extending from said bottom into said hollow space,
a radiofrequency source connected to said first electrode,
a second electrode opposite said first electrode with said hollow space therebetween,
a dark space shield having a margin surrounding said sidewall and extending toward said second electrode, and
means between said projections for adjusting the substrate bias independently of the discharge geometry, the discharge pressure, and the radiofrequency power.

5,113,791
OUTBOARD MOTOR STOWING BRACKET FOR SLOTTED SWIM PLATFORM
William A. Rottschafer, Holland, Mich., assignor to Kwik Mount, Inc., Grand Rapids, Mich.
Filed Dec. 5, 1990, Ser. No. 622,743
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—362 **9 Claims**

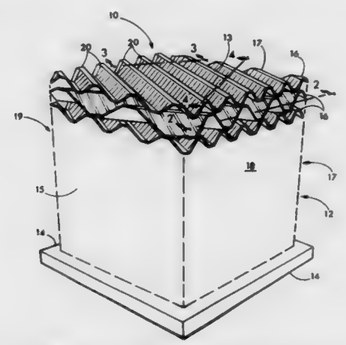
1. A method of stowing an outboard motor on a boat having a stern platform, said motor having a pivoted mounting clamp and a propeller drive housing, comprising:

securing a vertical panel to said platform in a front-rear plane;
mounting said motor on said panel, and securing said mounting clamp thereto; and



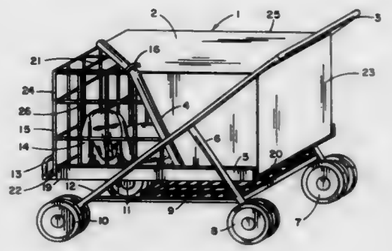
securing a pad to said drive housing in position to engage said platform on lowering said housing to pivot said motor on said clamp.

5,113,792
ARTIFICIAL REEF MODULE
Barton G. Jones, 809 Harbor House Dr. #1, Madison, Wis. 53719; Ray E. Green, 3363 Jackson St., College Park, Ga. 30337, and Eldon C. Blancher, II, 300 Fern Hill Ct., Mobile, Ala. 36608
Filed May 22, 1991, Ser. No. 705,024
Int. Cl.[5] A01K *61/00*
U.S. Cl. 119—3 **7 Claims**



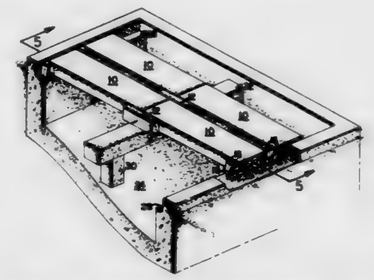
1. An artificial reef module for substantially permanent submergence underwater and for providing forage and shelter for small fish and crustaceans, comprising:
a) a column formed of a plurality of planar sheets, each sheet comprising a plurality of parallel flutes, said sheets being superposed and attached together along their length with the respective flutes of adjacent sheets extending transverse to each other to form a plurality of channels and mixing and redistribution points for microorganisms within a fluid environment, wherein at least one sheet of the column includes flutes having a different height from the flutes of an adjacent sheet; and
b) anchoring means attached to one end of the column for securing the column to the floor of a body of water.

5,113,793
MOBILE PET CARRIER
Harvey G. Leader, and Maureen M. Leader, both of 199 Charles Street, Midland, Ontario L4R 2X6, Canada
Filed Aug. 8, 1991, Ser. No. 742,370
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—19 **8 Claims**



1. A mobile animal carrier comprising:
a cage-like enclosure having front, rear and interconnecting sides with access means for inputting and removing an animal contained in at least one side thereof; and
a carriage for supporting said enclosure, said carriage having wheels on its bottom and a handle, said handle extending angularly upward and backward from the carriage to provide means for pushing the mobile animal carrier, wherein the enclosure is removable from the carriage.

5,113,794
ANIMAL SHELTER FLOORING APPARATUS
Larry Rahm, R.R. #2, Box 92, Truman, Minn. 56088
Filed Sep. 3, 1991, Ser. No. 753,941
Int. Cl.[5] A01J *1/00*
U.S. Cl. 119—28 **3 Claims**

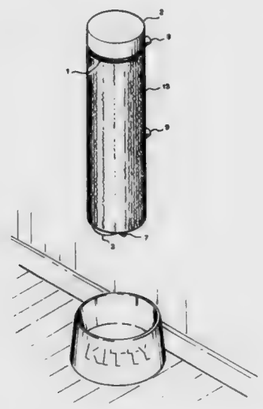


1. Slatted floor apparatus for animal housing for placement upon horizontal supporting surfaces, the apparatus comprising:
a) a plurality of generally wedge shaped floor members having rectangular shaped opposed essentially parallel upper and bottom surfaces, having inwardly and downwardly inclined opposed sides extending between the upper surface and the bottom surface along the major dimension thereof, and having inwardly and downwardly inclined opposed ends extending between the upper surface and the bottom surface along the minor dimension thereof;
b) a plurality of generally wedge shaped center spacers having rectangular shaped opposed essentially parallel upper and bottom surfaces with a major dimension less than the major dimension of the upper surface of the flooring member, said center spacers having outwardly and downwardly inclined opposed sides extending between the upper surface and the bottom surface along the

major dimension thereof, said center spacers having opposed extensions extending outward from each inclined side a predetermined distance, said extensions being generally centered with respect to each respective inclined side, and oriented essentially perpendicular to the major dimension of the upper and bottom surfaces and essentially parallel to said surfaces; said extensions predetermined distance and size being such that with a center spacer and a first pair of floor members supported with their bottom surface planar, with their major dimensions aligned, with one of the inclined ends of the first pair of floor members being contiguous to each other such as to define a generally triangular shaped space within the adjacent inclined ends, with an inclined side of the center spaced contiguous to an inclined side of the floor members and with the major dimension of the center spacers centered with respect to the first pair of floor members, one of said extensions will extend within the triangular shaped spaced defined by the adjacent inclined ends of the first pair of floor members opposite the floor member ends;

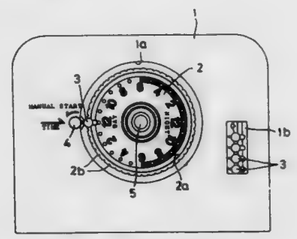
c) a plurality of generally wedge shaped end spacers having rectangular shaped opposed essentially parallel upper and bottom surfaces with a major dimension less than the major dimension of the upper surface of the floor members, said end spacers having outwardly and downwardly inclined opposed sides extending between the upper surface and the bottom surface along the major dimension thereof, and having generally parallel and perpendicular opposed ends extending between the upper surface and the bottom surface along the minor dimension thereof, said end spacers having opposed projections attached to one end which are oriented generally perpendicular to the major dimensions of the upper and bottom surfaces and generally parallel thereto; said projections each extending outward beyond the inclined sides a predetermined distance such that a pair of floor members and an end spacer supported with their bottom surfaces planar, with their major dimensions aligned, with the floor members bracketing, one of said end spacers, with an inclined side of each floor member contiguous with an inclined side of the end spacer, and with the ends of the floor member and the end of the end spacer all being aligned in a direction perpendicular to their major dimensions, then said projections will extend at least partially across the adjacent ends of the floor members.

5,113,795
CAT SCRATCHING POST FEEDER
Robert J. Delzio, P.O. Box 600251, San Diego, Calif. 92160
Continuation-in-part of Ser. No. 549,921, Jul. 9, 1990, abandoned. This application Apr. 5, 1991, Ser. No. 680,933
Int. Cl.[5] A01K *1/10*
U.S. Cl. 119—51.01 **3 Claims**



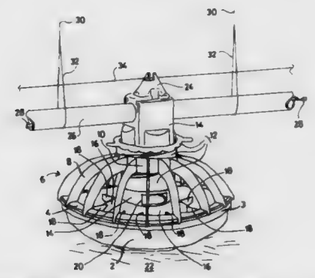
1. A cat scratching post feeder comprising a wall mountable dry food fillable inner cylinder with a spring-loaded hinged lower lid, a steel support rod attached to the bottom of the lower lid, and a carpeted outer cylinder that slides over the inner cylinder and rests upon the steel support rod thereby creating a dual function device, cat scratcher and pet-activated feeder, which will dispense dry cat food whenever a cat exerts downward force on the steel support rod by scratching the carpeted outer cylinder.

5,113,796
FEEDER
Takumi Matsuda, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Mar. 13, 1990, Ser. No. 492,634
Claims priority, application Japan, Mar. 14, 1989, 1-61486
Int. Cl.[5] A01K *5/02*
U.S. Cl. 119—51.11 **5 Claims**



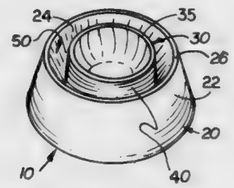
1. A feeder for supplying food automatically at predetermined times each day or manually at any desired time, comprising: a housing; a rotary dial rotatably mounted on the housing and having time indicia thereon; means for rotating the dial as a function of time; a turnable time-indicating member manually turnably mounted on the housing adjacent to the rotary dial and coacting with the time indicia on the rotating dial to indicate time; a food container rotatably mounted on the housing for containing a supply of food during use of the feeder, the food container having an opening through which a given amount of the food is discharged during each rotation of the container; drive means operative when energized to rotate the container through one cycle of rotation; means for automatically energizing the drive means at one or more predetermined times each day; and means responsive to manual turning of the time-indicating member for energizing the drive means at any desired time.

5,113,797
ADJUSTABLE FEEDING DEVICE FOR POULTRY
Antoine A. van Daele, Eeklo, Belgium, assignor to Roxell, N.V., Maldegem, Belgium
Filed Oct. 2, 1990, Ser. No. 591,738
Claims priority, application Netherlands, Oct. 4, 1989, 8902461
Int. Cl.[5] A01K *5/02*
U.S. Cl. 119—53 **8 Claims**



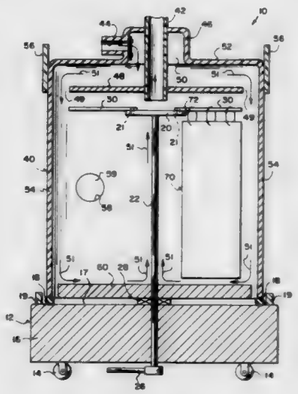
1. A feeding device, in particular for poultry, comprising:
a generally dish-shaped pan having a bottom and an upright peripheral wall in which feed can be presented to the birds, said bottom being provided with a central upright part,
a drop tube for supplying feed to said pan, a lower free end of said drop tube being situated centrally above said bottom of said pan, said drop tube being adapted to be moved over a limited, variable distance relative to said bottom of said pan between a lowered position and a raised position, and with said drop tube in said raised position defining a first feed supply opening between said lower free end of said drop tube and said bottom of said pan, as a result of which feed can pass from said drop tube into said pan, and wherein said drop tube comprises at least one second feed supply opening positioned a distance from said lower free end of said drop tube, wherein with said drop tube in said lowered position said first feed supply opening is closed and said second feed supply opening is open, and with said drop tube in said raised position said first feed supply opening is open and said second feed supply opening is closed, and
wherein said central upright part extends in a bottom part of said drop tube and is configured such that with said drop tube in said lowered position a top side portion of said central upright part reaches to adjacent a bottom edge of said second feed supply opening.

5,113,798
ANIMAL FEEDING DISH
Thomas Rera, P.O. Box 7143, Hollywood, Fla. 33081
Filed Jun. 24, 1991, Ser. No. 720,265
Int. Cl.[5] A01K *5/01, 7/00*
U.S. Cl. 119—61 **3 Claims**



1. An animal feeding dish comprising:
a base,
a surrounding side wall structure extending substantially vertically upward from said base,
said surrounding side wall structure having an inner wall and an outer wall,
said inner wall and said outer wall joined at their upper extremity forming an outer ridge,
said base connected to said surrounding side wall structure at the lower extremity of said outer wall,
a support structure attached to and extending substantially vertically from said base, such that said inner wall surrounds said support structure,
said support structure disposed in a substantially spaced, centered relation from said inner wall of said surrounding side wall structure to form a surrounding channel about said support structure,
said inner wall of said surrounding side wall structure attached at a lower extremity to a lower portion of the outer surface of said support structure to form a bottom of said channel, said channel being adapted to be filled with fluid, thereby defining a surrounding moat, which is sufficiently wide so as to be accessible by an animal for drinking, and
an inner container attached to an upper portion of said support structure so as to be disposed in substantially centered relation within said surrounding moat.

5,113,799
METHOD AND APPARATUS FOR MASS PRODUCING INSECTS ENTOMOPATHOGENS AND ENTOMOPARASITES
Charles W. Carr, Edgewater, and Douglas M. Kolodny-Hirsch, Fells Point, both of Md., assignors to Crop Genetics International Corporation, Hanover, Md.
Filed May 2, 1990, Ser. No. 527,954
Int. Cl.[5] A01K *67/04*
U.S. Cl. 119—6.5 **48 Claims**



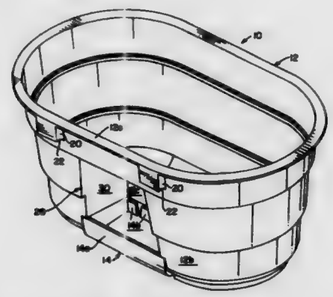
1. An apparatus for producing entomopathogens or entomoparasites comprising,
a base,
a hood mounted on the base,
means for controlling the environment within the hood,
means for positioning leaves inside the hood, and
leaves positioned inside the hood.

5,113,800

NESTABLE LIVESTOCK WATERING TANK WITH REMOVABLE DRINKER TRAY

James L. Van Epps, II, and Lynn Van Epps, both of Portage, Wis., assignors to Freeland Industries, Inc., Portage, Wis.

Filed Jul. 24, 1991, Ser. No. 735,081
Int. Cl.[5] A01K *7/04*
U.S. Cl. 119—78 4 Claims



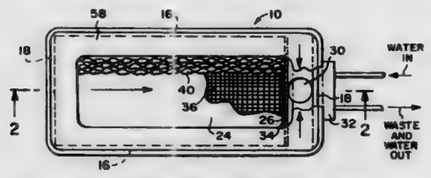
1. A livestock watering tank, comprising:
a) a tank for receiving water for feeding livestock having sidewalls, a top and a bottom, said tank being formed of molded plastic to prevent corrosion;
b) a drinker tray for livestock to drink water from, said drinker tray being formed of molded plastic and removably mounted on the bottom of said tank for quick disassembly and cleaning, said drinker tray having an outer wall substantially coextensive with one of the sidewalls of said tank, said one sidewall of said tank being indented above said drinker tray to form a recessed section for receiving an animal's head to drink from said drinker tray;
c) means for supplying water from said tank to said drinker tray;
d) a float valve for controlling the supply of water from said tank to said drinker tray; and
e) said tank being shaped so as to be nestable with another tank and including nesting means formed on the side of said tank to allow said tank to nest within another tank and to space the tops of the tanks apart a predetermined amount.

5,113,801

SELF-CLEANING CAT LITTER BOX

Rony Rotstein, 99 Hillside Ave., New York, N.Y. 10040, and George Spector, 233 Broadway Rm 3815, New York, N.Y. 10007

Filed Aug. 30, 1991, Ser. No. 753,343
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—163 2 Claims



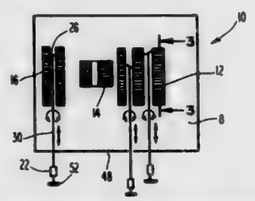
1. A self-cleaning cat liter box which comprises:
a) a housing having a floor, side walls and end walls with an open top, so that a cat can enter;
b) a platform pivotally mounted at one end proximate one of the end walls of said housing, so that the cat can squat thereof and defecate;
c) means located at an opposite end of said platform activated by the weight of said cat one said platform, for activating a lifting mechanism for lifting said platform up on an angle, spraying water upon said platform and lowering said platform back to its original position after the cat leaves said platform;
d) a drain aligned with and located at said one end of said platform to carry the waste water therefrom; and
e) means fluidly connected to said drain for liquefying any solid waste within the waste water so that all of the waste water can be flushed out; further including:
f) said platform having four raised sides thereabout, with the raised side proximate said drain being perforated for drainage;
g) a screen extending across said platform and supported on the four raised sides, so that when the cat urinates the urine will pass directly through said screen and collect in said platform until said platform is lifted up on an angle;
h) a rod mounted to the top edge of said platform oppositely from the perforated raised side; and
i) a plurality of rock shaped stringed beads, each connected at one end to said rod with its free end proximate said drain to remain loose to cover said screen as simulated cat litter, allowing the cat to shuffle said stringed beads on said screen to bury the waste, so that when said platform is lifted and sprayed with water, said stringed beads will be cleaned and returned to their original positions on said screen; wherein said lifting, spraying and lowering means includes:
j) a micro switch mounted to the floor of said housing below a free edge of said platform which will close when the cat is upon said platform;
k) a power source electrically connected to one side of said micro switch;
l) a timer electrically connected to other side of said micro switch;
m) a water pump electrically connected to said timer and fluidly connected to a water supply pipe;
n) said lifting mechanism comprising a hydraulic lift fluidly connected to said water pump and engaging said platform at a point spaced from said one end to lift and lower said platform;
o) a valve fluidly connected to the water supply pipe and electrically connected to said timer; and
p) a plurality of water jets fluidly connected to said valve and extending above and about said platform to flush the waste into said drain.

5,113,802

METHOD AND APPARATUS FOR REMOVING DEPOSIT FROM RECOVERY BOILERS

Joseph V. Le Blanc, Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Mar. 26, 1991, Ser. No. 675,222
Int. Cl.[5] F22B *37/18, 37/48*
U.S. Cl. 122—379 19 Claims



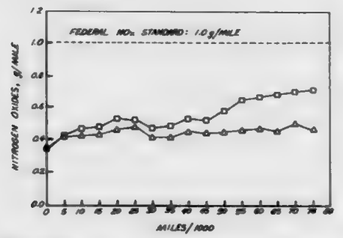
1. In a recovery furnace of the type used in the papermaking industry, wherein "black" liquor is burned to generate heated flue gases which contain a component of inorganic salts, said furnace comprising a heat exchange chamber and a boiler section, which includes a heat exchange section disposed in the upper section of the recovery furnace, wherein the flue gases circulate about the boiler section, thereby forming a salt-cake deposit on the heat exchange section, said deposit having a specific absorption band and insulating the heat exchange section from the heated flue gases, thereby decreasing the operating efficiency of the boiler section; an apparatus for removing the deposit from the heat exchange section of the boiler, comprising:
a. means for producing a high energy beam of coherent light having a transmission wavelength which substantially corresponds to the specific absorption band of the salt-cake deposit; and
b. means for directing the high energy beam, of coherent light, in cooperation with the means for producing a high energy beam of coherent light and the furnace, such that the beam is directed to the heat exchange section to contact the deposits which insulate the heat exchange section and cause a structural change in the salt-cake deposit, such that the deposit is effectively loosened and removed from the heat exchange section.

5,113,803

REDUCTION OF NO_x EMISSIONS FROM GASOLINE ENGINES

Don P. Hollrah, Manchester, and Denis L. Lenane, St. Louis, both of Mo., assignors to Ethyl Petroleum Additives, Inc., St. Louis, Mo.

Filed Apr. 1, 1991, Ser. No. 678,649
Int. Cl.[5] F02M *25/14;* C10L *1/18*
U.S. Cl. 123—1 A 26 Claims



1. In combination, a spark-ignition internal combustion engine, a supply of liquid fuel for the operation of said engine, and an exhaust gas catalyst for controlling the amount of pollutants released to the environment via the engine exhaust after the exhaust has contacted said catalyst, said combination being characterized in that:
a) said fuel contains at least one fuel-soluble cyclopentadienyl manganese tricarbonyl compound in an amount equivalent to up to 1/32 gram of manganese per gallon of fuel; and
b) the NO_x control activity of said catalyst has been enhanced by prior operation of said engine on fuel containing at least one fuel-soluble cyclopentadienyl manganese tricarbonyl compound in an amount equivalent to up to 1/32 gram of manganese per gallon of fuel; such that there is a reduction in the quantity of nitrogen oxides in the exhaust emitted during the operation of said engine.

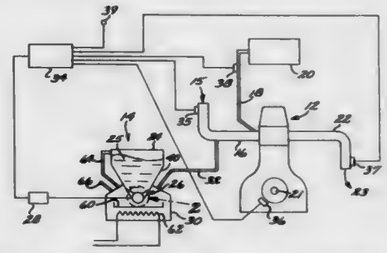
5,113,804

COMBUSTION ENHANCEMENT SYSTEM

Greg A. Kraus, Long Beach; William R. Simmons, Rancho Palos Verdes, and Mark R. J. Wells, Bakersfield, all of Calif., assignors to Advanced Combustion Technology, Inc., Gardena, Calif.

Filed Feb. 4, 1991, Ser. No. 650,766
Int. Cl.[5] F02B *43/04, 47/04*
U.S. Cl. 123—1 A 30 Claims

1. A device for enhancing the efficiency of a combustion process in which a hydrocarbon fuel is consumed in a combustion zone in order to diminish the emission therefrom of undesirable compounds including carbon monoxide and incompletely oxidized hydrocarbons, comprising:
means for storing a preselected combustion enhancing substance in its solid state selected for its stability to significantly enhance said combustion process at ppb-range concentrations and for its convertibility into a highly dispersed, gas-transportable state;



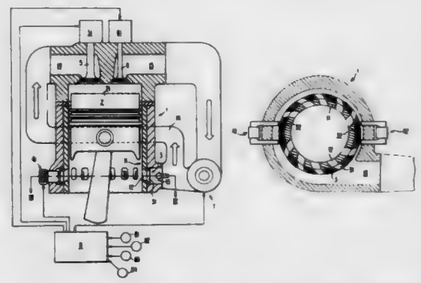
means for variably converting at a controllable rate said combustion enhancing substance directly from its solid state into its highly dispersed, gas-transportable state; and
means for transporting said converted substance, substantially immediately upon its conversion, to said combustion zone.

5,113,805

VARIABLE-CYCLE ENGINE

Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Ceramics Research Institute Co., Ltd., Fujisawa, Japan

Filed Dec. 12, 1990, Ser. No. 626,532
Claims priority, application Japan, Dec. 12, 1989, 1-322425; Dec. 15, 1989, 1-325465
Int. Cl.[5] F02B *69/00*
U.S. Cl. 123—21 5 Claims



1. A variable-cycle engine selectively operable in different cycle modes, comprising:
a cylinder having a first intake port and an exhaust port which are defined in an upper portion thereof, and a second intake port defined in a lower portion thereof;
a cylinder sleeve fitted in said cylinder and having a third intake port defined in a lower portion thereof;
a sleeve valve circumferentially rotatably fitted over said cylinder sleeve, for selectively opening and closing said third intake port into and out of communication with said second intake port, said sleeve valve having an permanent magnet joined thereto;
rotating means for rotating said sleeve valve under electromagnetic forces acting on said permanent magnet.,
intake port opening and closing means for selectively opening and closing said first intake port in the upper portion of said cylinder;

exhaust port opening and closing means for selectively opening and closing said exhaust port in the upper portion of said cylinder;

supercharging means for supplying air under pressure to said first intake port and said second intake port; and

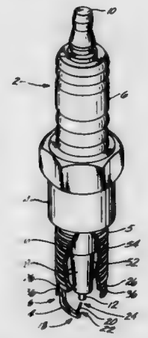
cycle mode selecting means for actuating said rotating means to rotate said sleeve valve to open said third intake port in communication with said second intake port and operating said exhaust port opening and closing means to operate the engine in a two-cycle mode, and for actuating said rotating means to rotate said sleeve valve to close said third intake port out of communication with said second intake port and operating said intake and exhaust port opening and closing means to operate the engine in a four-cycle mode, depending on the rotational speed of the engine and the load on the engine.

5,113,806

BICATALYTIC IGNITER CONVERTER AND PROCESSOR FOR INTERNAL COMBUSTION ENGINES

George H. Rodart, 836 S. Los Robles, Pasadena, Calif. 91106

Filed Mar. 4, 1991, Ser. No. 664,387
Int. Cl.[5] F02B *47/02*
U.S. Cl. 123—25 P **13 Claims**



1. Apparatus for igniting a combustion chamber of an internal combustion engine cylinder, comprising

(a) a spark plug having a grounded shell, a positive electrode, a negative electrode spaced apart from the positive electrode to form a gap, and a catalytic wire element thinner than the negative electrode attached to the negative electrode extending toward the positive electrode to reduce the gap;

(b) additional catalyst means proximate the wire element; and

(c) metered steam injection means proximate the catalyst means to facilitate a catalytic reaction in the combustion chamber;

wherein said wire element comprises pure platinum and wherein said catalyst means comprises plural nickel wire elements secured to said shell, each nickel wire element having a platinum wire loop secured thereon.

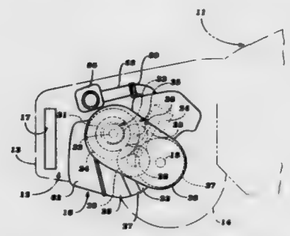
5,113,807

COOLING SYSTEM FOR ENGINE

Manabu Kobayashi, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 17, 1990, Ser. No. 554,256
Claims priority, application Japan, Jul. 19, 1989, 1-186614; Jul. 19, 1989, 1-186616
Int. Cl.[5] F02B *75/18*
U.S. Cl. 123—41.74 **46 Claims**

1. A cooling system for an internal combustion engine having a plurality of aligned cylinders, a heat exchanger disposed parallel to and on one side of said engine, a cooling jacket for said engine, a centrifugal type water pump disposed between the cylinders at the ends of said engine and on the side of said engine adjacent said heat exchanger for circulating coolant through said engine cooling jacket and through said heat exchanger, said coolant pump including a coolant pump drive shaft rotating about an axis parallel to the heat exchanger, and a thermostatic valve for controlling the flow between said engine cooling jacket and the heat exchanger, positioned on the side of said engine adjacent said water pump and between the cylinders at the ends of said engine.

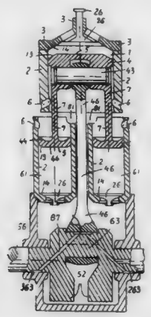


5,113,808

DOUBLE PISTON ENGINE

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 934,523, Nov. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 701,315, Feb. 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 529,254, Sep. 6, 1983, abandoned. This application Nov. 23, 1988, Ser. No. 275,500
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3341718; Nov. 23, 1983, 3342183; Jun. 20, 1986, 3620691
Int. Cl.[5] F02B *25/12*
U.S. Cl. 123—53 BP **3 Claims**



1. A device, comprising, in combination; a first cylinder of a first cross-sectional area with a sealingly reciprocable first piston, inlet means for the entrance of fluid, ignition means for the ignition of said fluid and outlet means for the expulsion of said fluid,

wherein an improvement is provided to improve the power of the device; and said improvement comprises, in combination, in addition to said first cylinder and first piston, a plurality of secondary cylinders each with a sealingly reciprocable secondary piston,

wherein said secondary cylinders are axially opposed to said first cylinder;

wherein the sum of the cross sectional areas of said secondary cylinders and pistons equals substantially the cross sectional area of said first cylinder,

wherein connection means are provided between said first piston and said secondary pistons, and,

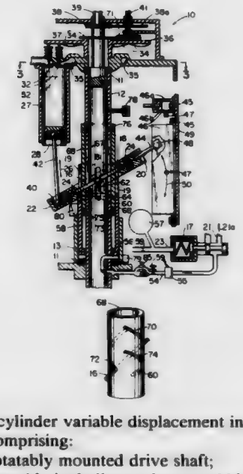
wherein said connection means are rigid portions of said first and secondary pistons wherein said first and secondary pistons form an integral single body.

5,113,809

AXIAL CYLINDER INTERNAL COMBUSTION ENGINE HAVING VARIABLE DISPLACEMENT

George W. Ellenburg, 100 Oakmont La., Apt. #304, Belleair, Fla. 34616

Filed Apr. 26, 1991, Ser. No. 691,921
Int. Cl.[5] F02B *75/26*
U.S. Cl. 123—58 BA **11 Claims**



1. An axial cylinder variable displacement internal combustion engine, comprising:

a hollow, rotatably mounted drive shaft;

a wobble assembly including an inner wobble ring mounted for rotation and a non-rotatably mounted outer wobble ring;

said inner wobble ring being centrally apertured to axially receive said drive shaft;

said inner wobble ring being keyed to said drive shaft for conjoint rotation therewith;

said outer wobble ring being mounted in coplanar relation to said inner wobble ring;

annular low friction means for interconnecting said inner and outer wobble rings;

balanced anti-rotation means for preventing rotation of said outer wobble ring and for permitting wobbling motion of said inner wobble ring;

an odd number of cylinders having their respective axes of symmetry disposed in substantially parallel relation to said drive shaft;

a slidably mounted engine piston being disposed in each of said cylinders;

valve means associated with each of said cylinders for controlling operation of said engine;

a connecting rod interconnecting each of said pistons to said outer wobble ring;

each of said connecting rods having a first end swivelly connected to an associated piston and a second end swivelly connected to said outer wobble ring;

a cylindrical sleeve member axially receiving said drive shaft;

first, second, and third helical slots being formed in said sleeve member;

a first axially extending slot formed in said drive shaft;

a first linear in configuration pin member extending diametrically through said first axially extending slot and said first pin member having opposite ends fixedly secured in said inner wobble ring;

said first pin member opposite ends extending through said first and second helical slots;

a control piston that telescopically receives said drive shaft member and which abuts a preselected end of said cylindrical sleeve member;

hydraulic means for effecting axial travel of said control piston;

a second axially extending slot formed in said drive shaft;

a second pin member having opposite ends extending through said third helical slot;

said second pin member extending through said second axially extending slot;

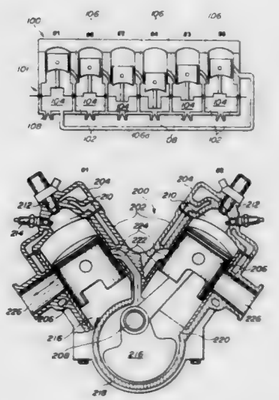
whereby said second pin member is constrained to axial movement by said second axially extending slot, so that when said hydraulic means is activated, said second pin member travels in said third helical slot and rotates said sleeve member, and whereby said first pin member, being constrained to axial movement by said first axially extending slot, rides in said first and second helical slots when said sleeve member is rotated by said second pin member, said first pin member when riding in said first and second helical slots thereby changing the axial and angular position of the wobble ring assembly relative to said drive shaft.

5,113,810

MULTI-CYLINDER TWO-CYCLE ENGINE HAVING IMPROVED TRANSFER PASSAGE STRUCTURE

Mitsunori Ishii, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 1, 1990, Ser. No. 517,657
Claims priority, application Japan, May 2, 1989, 1-112932
Int. Cl. F02B *75/22*
U.S. Cl. 123—73 R **5 Claims**



1. In a two cycle engine

a plurality of cylinders, the cylinders each comprising a bore in which a piston is reciprocatively disposed and which defines a combustion chamber in the bore, said pistons being operatively connected with a crankshaft;

a crankcase which encloses the crankshaft;

means partitioning the crankcase into a plurality of isolated crankchambers, each crankchamber communicating with a cylinder;

a plurality of valves, each of the valves communicating with a crankchamber and permitting air to be inducted thereinto when the piston of the cylinder which communicates with the crankchamber ascends toward a TDC position; and

a plurality of transfer passages, each of the transfer passages being arranged to communicate at an upstream end with the crankchamber of one cylinder and to communicate at a downstream end with a transfer port which is formed in the bore of a different cylinder, and each transfer passage defining the only means via which air is supplied to the combustion chamber defined in the cylinder.

5,113,811

HYDRAULIC VALVE CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINES

Helmut Rembold, Stuttgart, and Ernst Linder, Mühlacker, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

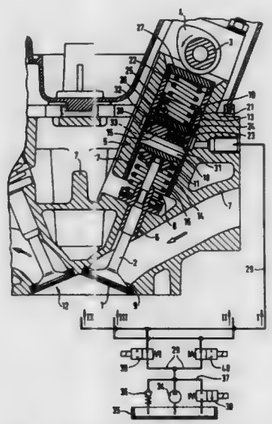
PCT No. PCT/DE90/00807, § 371 Date May 28, 1991, § 102(e) Date May 28, 1991

PCT Filed Oct. 25, 1990, Ser. No. 700,126

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1989, 3939003

Int. Cl.[5] F01L *9/02, 1/12*

U.S. Cl. 123—90.12 **27 Claims**



1. A hydraulic valve control device for internal combustion engines having an engine camshaft, a cam drive and a cam follower,

including an engine valve which is axially driven via said cam follower by the driving cam of said engine camshaft,

a pressure chamber of variable volume, filled with hydraulic oil, which determines an effective length of the cam follower, said pressure chamber is restricted at one end by a cam piston actuated by said driving cam, and at the other end by a valve piston which acts on a valve stem,

a fluid reservoir which is connectable via a pressure channel with the pressure chamber, and which has a spring loaded reservoir piston that restricts said fluid reservoir on a front face of said reservoir piston, and

a control valve that controls fluid pressure to the pressure channel dependent on engine characteristics, said reservoir piston (**21**), reservoir spring (**22**), and reservoir (**25**) are arranged in the cam piston (**13**) which is configured as a hollow piston,

the reservoir piston (**21**) is controlled by hydraulic means which is fed radially to the cam piston (**13**), and

that the reservoir (**25**) is available between a piston floor of the cam piston (**13**) and the reservoir piston (**21**).

5,113,812

VALVE CONTROL APPARATUS WITH MAGNET VALVE FOR INTERNAL COMBUSTION ENGINES

Helmut Rembold, Stuttgart, and Ernst Linder, Mühlacker, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

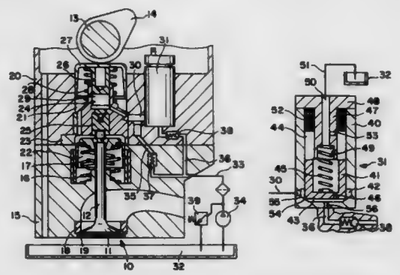
PCT No. PCT/DE90/00585, § 371 Date Mar. 26, 1991, § 102(e) Date Mar. 26, 1991, PCT Pub. No. WO91/03627, PCT Pub. Date Mar. 21, 1991

PCT Filed Jul. 28, 1990, Ser. No. 663,928

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1989, 3929072

Int. Cl.[5] F01L *9/02, 1/12;* **F02D** *13/02*

U.S. Cl. 123—90.12 **26 Claims**



1. A valve control device for controlling a closing and opening time of an engine valve of an internal combustion engine, the valve being actuated by a valve control cam of a camshaft via an axially displaceable valve shaft, comprising a stroke transmission chamber disposed between the valve control cam and the valve shaft, a fluid flow conduit connected with said stroke transmission chamber by which said stroke transmission chamber is filled with fluid for varying its effective axial length between the valve control cam and the valve shaft, a magnet control valve, said fluid flow conduit is controllable by said magnet control valve, for draining and delivering the fluid, to said stroke transmission chamber, said conduit discharges on one end into a fluid reservoir in said magnet control valve, said fluid reservoir is integrated with a reservoir piston in said magnet control valve, said reservoir piston acts in an opening direction beyond a position that uncovers a flow opening from said fluid flow conduit, said reservoir piston of said magnet control valve (**31**) is closed when without current, and said reservoir piston (**41**) is loaded by a reservoir spring (**45**) acting as a closing spring.

5,113,813

VARIABLE TIMING SYSTEM, PARTICULARLY FOR AN INTERNAL COMBUSTION ENGINE

Riccardo Rosa, Maranello, Italy, assignor to Ferrari S.p.A., Via Emilia Est., Italy

Filed Feb. 15, 1991, Ser. No. 655,503

Claims priority, application Italy, Feb. 16, 1990, 67118 A/90

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.16 **7 Claims**

1. A variable timing system, particularly for an internal combustion engine, wherein at least one valve is controlled by a cam on a camshaft via the interposition of a rocker arm; characterized in that:

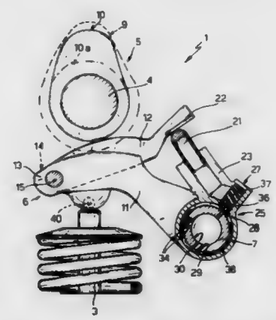
said cam comprises a discrete number of different side by side cam profiles located in the axial direction of the camshaft;

said rocker arm comprises a number of side by side longitudinal elements connected to one another and equal to the number of different cam profiles, each said element being designed to cooperate with a respective said cam profile facing it;

a first of said elements permanently cooperates with a corresponding first of said cam profiles and with said valve, at least one other element being pivotally carried by said first element in scissor formation with respect thereto;

said first element comprises means for selectively displacing said at least one other element between two different operating positions, in a first of which said at least one other element does not cooperate with the cam, and in a second of which said at least one other element cooperates with a respective other cam profile facing it; and,

said other cam profiles being shaped in such a manner that they are able to provide a lift greater than the lift provided by said first cam profile in correspondence with at least some angular position thereof.



5,113,814

VALVE TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH ENHANCED RESPONSE CHARACTERISTICS IN ADJUSTMENT OF VALVE TIMING

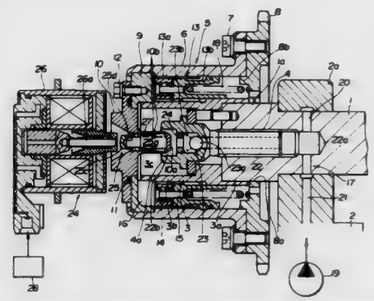
Seiji Suga, and Shoji Morita, both of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Kanagawa, Japan

Filed Jan. 28, 1991, Ser. No. 647,569

Claims priority, application Japan, Jan. 30, 1990, 2-20051

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.17 **5 Claims**



1. A valve timing control system for an automotive vehicle, comprising:

an engine revolution synchronous rotary element rotatingly driven in synchronism with engine revolution;

a camshaft for driving intake and/or exhaust valve of an induction system of the engine;

a camshaft synchronous rotary element rotating in synchronism with engine revolution;

a phase adjusting means disposed between said engine revolution synchronous rotary element and said camshaft synchronous rotary element for adjusting rotational phase relationship between said rotary elements for adjusting rotational phase of said camshaft relative to engine revolution;

a control means associated with said phase adjusting means, for actuating said phase adjusting means, for shifting said phase adjusting means between a minimum advance position corresponding to a predetermined minimum advanced phase of said camshaft relative to the engine revolution cycle and a maximum advance position corresponding to a predetermined maximum advanced phase of said camshaft relative to the engine revolution cycle, said control means including a pressure chamber oriented adjacent said phase adjusting means for exerting fluid force to said phase adjusting means, a fluid pressure source connected to said pressure chamber via a fluid circuit and a valve means disposed within said fluid circuit, said valve means operable for increasing and decreasing fluid pressure in said pressure chamber; and

means positioned at the inlet of said pressure chamber for blocking surge flow of pressurized fluid in said fluid circuit.

5,113,815

IGNITION CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

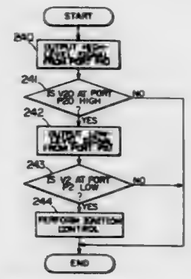
Toru Ikeda, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1991, Ser. No. 690,243

Claims priority, application Japan, May 17, 1990, 2-50751[U]; May 17, 1990, 2-50752[U]

Int. Cl.[5] F02P *1/00*

U.S. Cl. 123—146.5 B **9 Claims**



1. An ignition control security apparatus for an internal combustion engine comprising:

a switch unit including a key switch (**120**; **220**) connected to a power source (**101**; **201**), and a control element (**121**; **221**);

an ignition control unit (**103**; **203**) connected to said switch unit for supplying a signal to an input of said control element when said key switch is turned on, and

feedback circuit means connecting an output of the control element to the ignition control unit such that, based on a feedback output signal from said control element, said ignition control unit decisionally enables or disables ignition control on the engine, and attendantly prevents engine operation when the power source is connected directly to the ignition control unit.

5,113,816

SPIRAL SPRING TYPE STARTER APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

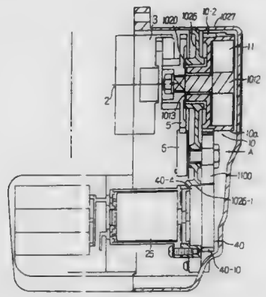
Ryuji Morishima, and Katsutoshi Asai, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 683,171, Apr. 9, 1991, which is a division of Ser. No. 458,374, Dec. 28, 1989, Pat. No. 5,083,534. This application Sep. 17, 1991, Ser. No. 761,246

Claims priority, application Japan, Apr. 5, 1989, 1-184708; Oct. 25, 1989, 1-123981[U]

Int. Cl.[5] F02N *5/02*

U.S. Cl. 123—179.25 **1 Claim**



1. A spiral spring type starter apparatus for an internal combustion engine, having a spring power accumulating chamber in which an inner end of a spiral spring is fixed to a starter shaft and its outer end is fixed to a casing, a motor for rotating a casing of said spring power accumulating chamber via a high reduction ratio speed reduction mechanism, and a magnet wheel assembly for transmitting a torque of the starter shaft of said spring power accumulating chamber to a crank shaft, assembled within a case of the internal combustion engine; which apparatus comprises a plate perpendicularly intersecting with the axis of the crank shaft and disposed within said case, and a bearing rotatably supported by said plate and projected from said casing for rotatably supporting the starter shaft, said motor and said high reduction ratio speed reduction mechanism being fixedly supported by said plate.

5,113,817

PISTON WITH SPECIFIC LAND CHARACTERISTICS

Peter Kemnitz, Kernen i.R.; Michael Ullrich, Ludwigsburg, and Hanspeter Wieland, Ditzingen, all of Fed. Rep. of Germany, assignors to Mahle, GmbH, Stuttgart, Fed. Rep. of Germany

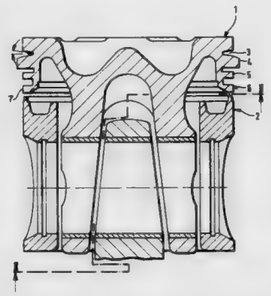
Filed May 1, 1991, Ser. No. 694,413

Claims priority, application Fed. Rep. of Germany, May 8, 1990, 4014704

Int. Cl.[5] F02F *3/00/3/22*

U.S. Cl. 123—193.6 **15 Claims**

1. In an improved piston for an internal combustion engine with a separate head and skirt which are joined by a pin, a ring belt in which three ring grooves are set extends downward from a top portion of the head and terminates above the pin, the ring belt includes a top land, a second land, a third land and a fourth land alternating with the ring grooves, the ring belt defines an outer border of a cooling oil ring space, a section of the head extending from a piston base defines an inner border of the space, the section is located over two hubs being situated opposite each other in a radially outward direction in which the pin is mounted, a bottom free end of the ring belt is detached from the section, a depression is formed in the head and base and is partly defined by the section, the improvement comprising



the second land from the top having a diameter larger than a diameter of the top land, third land or fourth land for exclusively guiding the piston.

5,113,818

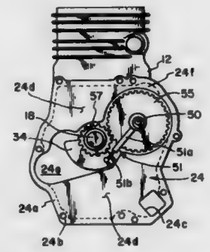
COMBINATION CRANKCASE GASKET/BAFFLE

Kevin G. Bonde, Kiel, and Ronald L. Hall, Appleton, both of Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Apr. 15, 1991, Ser. No. 685,611

Int. Cl.[5] F01M *11/06*

U.S. Cl. 123—196 W **9 Claims**



1. An internal combustion engine comprising:

a crankcase having upper and lower crankcase halves joined together at a pair of mating edges, said lower crankcase half defining an oil sump;

a cylinder having a piston disposed therein, said cylinder and piston being located in an upper portion of said crankcase;

a combination gasket and baffle having a peripheral portion clamped between said mating edges of said crankcase halves, and a web portion integral with said peripheral portion extending over said oil sump for impeding the movement of oil from said sump to the upper portion of said crankcase; and

at least one drive member operably connected to said piston, extending vertically from said lower to said upper crankcase halves, said gasket web portion having an opening therein through which said drive member passes.

5,113,819

COOLING SYSTEM FOR A LIQUID COOLED ENGINE

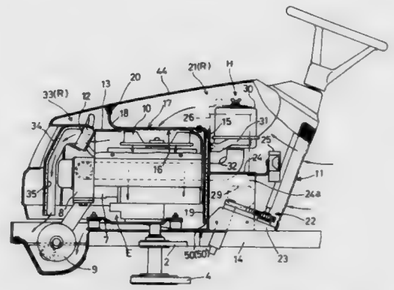
Masatake Murakawa; Ryozo Imanishi, and Yoji Fujiwara, all of Sakai, Japan, assignors to Kubota Corporation, Osaka, Japan

Filed Mar. 12, 1991, Ser. No. 668,028

Claims priority, application Japan, Jul. 4, 1990, 2-178379; Jul. 5, 1990, 2-179202

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 E **11 Claims**



1. In a vehicle having a liquid cooled engine, a cooling system therefor, and a hood extending over the engine, said engine being formed as a vertical engine with a cylinder head disposed forwardly of the vehicle, an improved cooling system comprising;

a cooling fan disposed above said engine,

first passage means for guiding cooling air to said cooling fan,

second passage means for guiding the cooling air drawn by said cooling fan to flow past the engine and to be exhausted forwardly and downwardly of the engine, said second passage means including an air guide cover enveloping said engine and said cooling fan and defining an opening in a region opposed to said cooling fan, and

a liquid cooler for cooling a liquid circulating through said engine disposed between an upper surface of said cylinder head and said air guide cover.

5,113,820

METHOD OF AVOIDING EXCESSIVE ENGINE DRAG TORQUE

Ulrich Flaig, Markgroningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP89/00090, § 371 Date Aug. 28, 1990, § 102(e) Date Aug. 28, 1990, PCT Pub. No. WO89/08776, PCT Pub. Date Sep. 21, 1989

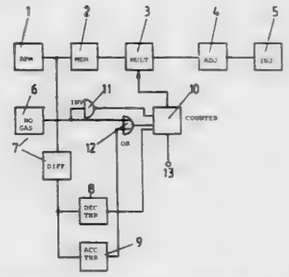
PCT Filed Feb. 2, 1989, Ser. No. 573,028

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1988, 3808692

Int. Cl.[5] F02D *41/12*

U.S. Cl. 123—325 **8 Claims**

1. Method of controlling the residual amount of fuel supplied to an engine after release of the accelerator pedal such that there is no unacceptably high drag torque under any operational conditions, wherein the rotational speed of the engine is monitored for reaching a prescribed deceleration and a prescribed acceleration, and where when the prescribed deceleration is reached, a time ramp increasing the residual amount is



activated and when reaching the prescribed acceleration, a time ramp decreasing the residual amount is activated.

5,113,821

VEHICLE SPEED GOVERNOR

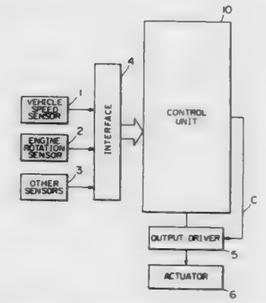
Wataru Fukui; Toshio Iwata; Atsushi Ueda; Masami Matsumura, and Mitsura Koiwa, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1991, Ser. No. 699,113

Claims priority, application Japan, May 15, 1990, 2-122999

Int. Cl.[5] F02P *9/00*

U.S. Cl. 123—335 **20 Claims**



1. A vehicle speed governor for a vehicle equipped with an engine comprising:

sensor for sensing an operating condition of the vehicle indicative of the vehicle speed; and

control means responsive to the sensor for periodically and temporarily interrupting combustion in the engine in a perdetermined, cyclical manner when the vehicle speed indicated by the operating condition exceeds a prescribed speed, and for automatically terminating said combustion interruption when the vehicle speed falls below the prescribed speed.

5,113,822

THROTTLE VALVE CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Yoshiaki Asayama, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jul. 20, 1990, Ser. No. 555,008

Claims priority, application Japan, Aug. 29, 1989, 1-222216

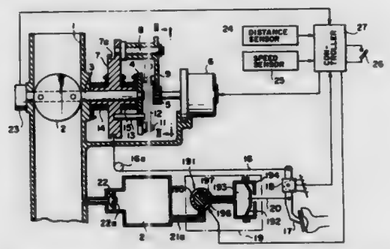
Int. Cl.[5] F02D *11/08, 11/10*

U.S. Cl. 123—360 **15 Claims**

1. A throttle valve control apparatus for an internal combustion engine having a throttle valve disposed in an intake pipe and connected with an accelerator pedal for controlling the

quantity of intake air sucked into the engine through said intake pipe in accordance with the operation of said accelerator pedal by the driver, said throttle valve control apparatus comprising:

a valve shaft fixedly mounting thereon said throttle valve and being rotatably supported by said intake pipe;



first actuator means operatively connected with a first end of said valve shaft for driving said valve shaft to rotate in a direction to open said throttle valve; and

second actuator means operatively coupled with and disposed opposing said first end of said valve shaft for driving said valve shaft to rotate in a direction to open said throttle valve.

5,113,823

THROTTLE VALVE CONTROL APPARATUS FOR USE WITH INTERNAL COMBUSTION ENGINE

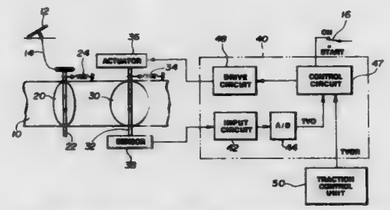
Masahiro Iriyama, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 4, 1991, Ser. No. 678,875

Claims priority, application Japan, Apr. 6, 1990, 2-91614; Apr. 6, 1990, 2-91615; Jun. 29, 1990, 2-170254

Int. Cl.[5] F02D 7/00

U.S. Cl. 123—399 **12 Claims**



1. An apparatus for use with an internal combustion engine having a throttle valve movable between a fully-open position and a fully-closed position within an induction passage for controlling air flow to said engine, and a return spring for urging said throttle valve in an opening direction, said apparatus comprising:

a throttle position sensor sensitive to a position of said throttle valve for generating an electric signal indicative of a sensed position of said throttle valve;

a signal source for generating an electric signal indicative of a required position of said throttle valve;

a throttle actuator operable in response to a control signal for moving said throttle valve to said required position;

a control unit connected to said throttle position sensor, said signal source and said throttle actuator for producing said control signal for said throttle actuator based upon said sensed position and said required position of said throttle valve, said control unit including means for comparing a throttle valve position sensed in the absence of said control signal with a predetermined value to produce a failure signal indicative of a failure of said return spring when said throttle position sensed in the absence of said control signal is less than said predetermined value.

5,113,824

ADJUSTING DEVICE

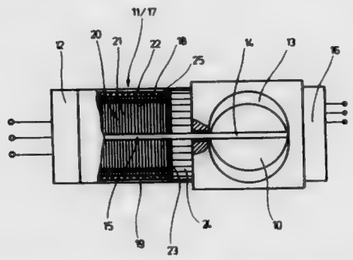
George Haubner, Berg/Oberpf, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 30, 1991, Ser. No. 708,607

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1990, 4026785

Int. Cl.[5] F02D 9/08; H02K 26/00

U.S. Cl. 123—399 **26 Claims**



1. An adjusting device for a throttle valve in a fuel preparation system of an internal combustion engine, a driven shaft connected to said throttle valve, an electric servomotor which has a stator with a multi-phase winding (18) and a rotor, said rotor is coupled in a manner fixed against relative rotation to said driven shaft, a control device that as a function of engine operating parameters applies a control voltage to the multi-phase winding of the stator of the electric servomotor, said electric servomotor is an asynchronous motor (17) and said rotor is a short-circuit rotor (20).

5,113,825

ENGINE CONTROLLER

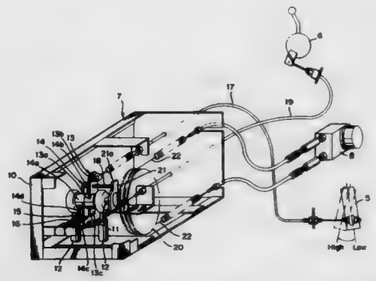
Keiichi Takahashi, Akashi, Japan, assignor to Shin Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Aug. 16, 1991, Ser. No. 745,754

Claims priority, application Japan, Aug. 21, 1990, 2-86760[U]

Int. Cl.[5] F02O 11/04, 11/10; F02M 39/00

U.S. Cl. 123—400 **6 Claims**



1. An engine controller for controlling rotational speed of an engine, comprising:

a governor for adjusting the rotational speed of the engine;

an accelerator means provided in an operator's station;

an actuator adapted to be operated by radio control;

a shaft;

a support means for said shaft;

a first lever means rotatably supported on said shaft;

a first biasing means adapted to bias said first lever means to turn in one direction;

a second lever means rotatably supported on said shaft;

a second biasing means adapted to bias said second lever means to turn in said one direction;

a pulley mounted on said shaft;

a third lever means fixedly secured to said pulley;

a first wire means operatively connecting said first lever means with said governor, said first wire means being linked to said first lever means in such a manner as to increase the engine speed when said first lever means is turned in the opposite direction to said one direction;

a second wire means operatively connecting said second lever means with said accelerator means, said second wire means being linked to said second lever means in such a manner as to turn said second lever means in the opposite direction when said accelerator means is operated in the direction of acceleration;

a third wire means operatively connecting said pulley with said actuator in such a manner as to rotate said pulley in said one direction or in said opposite direction according to the rotation of said actuator; and

a rotation transmitting means adapted to transmit rotation to said first lever means to rotate same in the opposite direction when at least one of said second and third lever means is rotated in the opposite direction.

5,113,826

INTAKE AIR CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

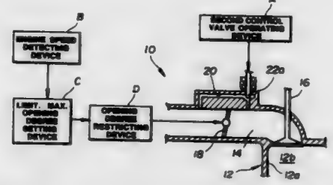
Makoto Anzai, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 24, 1991, Ser. No. 704,527

Claims priority, application Japan, May 30, 1990, 2-138611

Int. Cl.[5] F02B 29/00

U.S. Cl. 123—403 **10 Claims**



1. An intake air control system for an internal combustion engine, comprising:

a plurality of intake air passages which are respectively communicable with a plurality of combustion chambers each defined in an engine cylinder of the engine, intake air flowing through each intake air passage to be supplied to the corresponding combustion chamber;

a plurality of first control valves each of which is movably disposed in each intake air passage to control a flow amount of intake air in each intake air passage;

means defining a plurality of communication passages each of which is connected with said intake air passage upstream of the corresponding first control valve, air flowing through the corresponding communication passage being supplied to each intake air passage;

a plurality of second control valves each of which is disposed in each communication passage to control a flow amount of air flowing in each communication passage;

means for controllably operating each second control valve in accordance with at least one engine operating parameter in connection with the corresponding cylinder;

means for detecting an engine speed of the engine;

means for setting a limited maximum opening degree of each first control valve in accordance with the detected engine speed at which degree a pressure in the corresponding combustion chamber is approximately the maximum at a timing before an expansion stroke in the corresponding cylinder; and

means for restricting a maximum value of opening degree of each first control valve in accordance with said limited maximum opening degree.

5,113,827

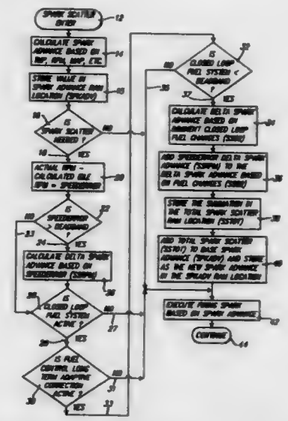
PROGRAMMED SPARK SCATTER FOR IDLE SPEED CONTROL

Michael T. Vincent, Sterling, Mass., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 14, 1990, Ser. No. 523,451

Int. Cl.[5] F02P 5/00

U.S. Cl. 123—417 **4 Claims**



1. An improved method of spark advance control for use in a vehicle having an engine with fuel and air mixing means operative in a closed loop made to vary a fuel-to-air ratio by a multiplier which is derived from monitored oxygen content of the engine exhaust, the vehicle further having controller means for monitoring various engine parameters including revolutions per minute (RPM) and means for firing a spark to an appropriate cylinder, the improved method of spark advance control comprising:

(a) calculating a spark advance valve as a function of the various engine parameters;

(b) determining whether the spark advance value should be altered based on the various engine parameters;

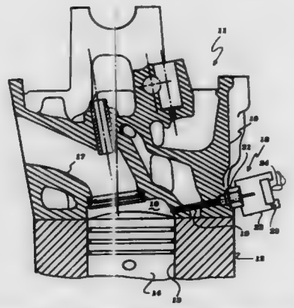
(c) whenever the spark advance value should be altered, calculating a first spark advance change value as a function of actual RPM and ideal idle RPM;

(d) whenever the spark advance value should be altered, calculating a second spark advance change value as a function of actual and ideal fuel-to-air ratio multipliers and adding the first and second change values whenever the fuel and air mixing means is operating in the closed loop mode;

(e) whenever the spark advance value should be altered, altering the spark advance value by adding to it the first and, when calculated, the second change values; and

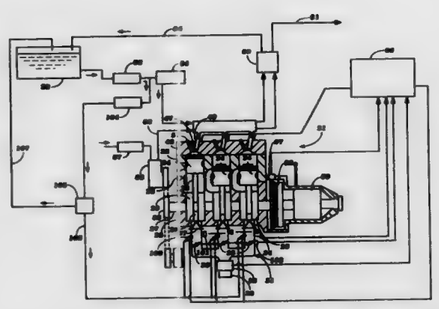
(f) firing a spark to an appropriate engine cylinder in accordance with the spark advance value.

5,113,828
METHOD AND APPARATUS FOR DETERMINING COMBUSTION CONDITIONS AND FOR OPERATING AN ENGINE
Donald J. Remboski; Steven L. Plee, both of Northborough; Jialin Yang, Westboro, and Robert W. Law, Acton, all of Mass., assignors to Barrack Technology Limited, Perth, Australia
Filed Feb. 26, 1990, Ser. No. 485,125
Int. Cl.[5] F02D *41/14;* F02P *5/145;* G01L *23/16*
U.S. Cl. 123—425 24 Claims



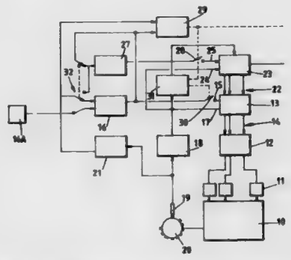
1. A method for operating an internal combustion engine having at least one combustion chamber, means for forming a combustible air/fuel mixture within the combustion chamber, means for detecting the luminosity within the combustion chamber during at least a portion of the combustion cycle, generating a curve based on the detected luminosity, determining the location at which the luminosity is a particular percentage of the peak luminosity so as to determine start of combustion.

5,113,829
TWO CYCLE INTERNAL COMBUSTION ENGINE
Yu Motoyama, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Apr. 12, 1990, Ser. No. 508,924
Claims priority, application Japan, Apr. 13, 1989, 1-91962
Int. Cl.[5] F02B *33/04, 13/00*
U.S. Cl. 123—431 46 Claims



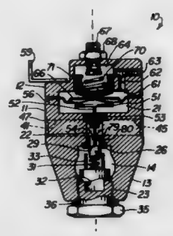
10. In a fuel injection system for an internal combustion engine comprising a fuel injector for injecting at least fuel directly into a combustion chamber of the engine under all running conditions, and an auxiliary fuel injection system for injecting fuel into the engine upstream of the combustion chamber only under high pressure conditions.

5,113,830
CONTROL SYSTEM FOR ENGINE
Steven N. M. Haines, London, England, assignor to Lucas Industries public limited company, England
Filed Jul. 18, 1991, Ser. No. 731,962
Claims priority, application United Kingdom, Jul. 20, 1990, 9015922
Int. Cl.[5] F02D *41/04;* F02M *39/00*
U.S. Cl. 123—436 6 Claims



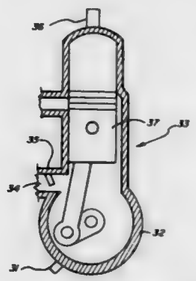
1. A method of operating a control system for the fuel system of a compression ignition engine the fuel system including control means operable by the control system to determine the amount of fuel supplied to the combustion spaces of the engine the method being comprised of causing the control means to halt for a predetermined number of engine cycles the delivery of fuel to the engine combustion chambers in turn, measuring the variation of an engine operating parameter which occurs whilst each combustion chamber is inoperative and comparing the values of variation obtained to provide an indication of the function of the individual engine combustion chambers.

5,113,831
FUEL PRESSURE REGULATOR
Barry Grant, Rte. 1, Box 1900, Dahlonega, Ga. 30533
Filed Dec. 27, 1989, Ser. No. 457,962
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—457 6 Claims



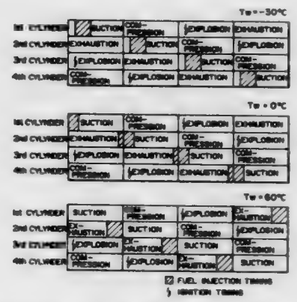
1. A fuel pressure regulator for internal combustion engines of automobiles and the like, comprising:
a body including first, second and third chambers:
a resilient impervious diaphragm separating said second and third chambers;
a fuel inlet communicating with said first chamber;
a fuel outlet communicating with said second chamber;
a passageway for permitting fluid communication between said first and second chambers;
a ball valve means adjacent one end of said passageway, said ball valve means comprising a movable ball and a cylindrical valve seat;
first biasing means for biasing said ball valve means to close one end of said passageway;
actuating means for actuating said ball valve means to open said one end of said passageway, said actuating means comprising a piston positioned in said second chamber in abutment with one side of said resilient impervious diaphragm and a stem extending from said piston with its distal end adapted to bear against the ball of said ball valve means;
second biasing means in said third chamber in abutment with the other side of said resilient impervious diaphragm for biasing said resilient diaphragm to move said piston toward said first chamber;
stem guide means positioned between said first and second chambers along the length of said stem and intermediate the ends of said stem for guiding said stem to limit the motion of said stem to a substantially linear, reciprocating motion while in contact with the ball of said ball valve means;
a plug member removably mounted to said body at said first chamber;
ball guide bars mounted to said plug member in said first chamber for surrounding the ball and first biasing means and for maintaining the ball and the first biasing means aligned with the valve seat,
whereby when the plug member is removed from the body the first biasing means and ball are removed with the plug from the first chamber and the valve seat and stem are exposed.

5,113,832
METHOD FOR AIR DENSITY COMPENSATION OF INTERNAL COMBUSTION ENGINES
Michael E. Heffron, Colorado Springs, Colo., assignor to Pacer Industries, Inc., Pensacola, Fla.
Filed May 23, 1991, Ser. No. 704,605
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—478 11 Claims



1. A method of controlling the air-fuel ration fed to at least one cylinder of an internal combustion engine, said engine having internal engine surfaces, said method comprising:
monitoring the temperature of said internal engine surfaces to produce an output indicative of the internal surface temperature of said engine;
said step of monitoring the temperature comprising placing a temperature sensor on at least one internal engine surface to monitor the temperature of such surface,
feeding said output to an electronic control unit;
adjusting the mixture of air and fuel to be fed to the engine in response to the output of said electronic control unit.

5,113,833
METHOD AND CONTROLLER FOR SUPPLYING FUEL TO CYLINDERS OF MULTICYLINDER INTERNAL COMBUSTION ENGINE
Masami Nagano; Takeshi Atago, and Mamoru Nemoto, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 15, 1990, Ser. No. 538,412
Claims priority, application Japan, Jun. 19, 1989, 1-154578
Int. Cl.[5] F02M *51/00;* F02N *17/00*
U.S. Cl. 123—491 12 Claims

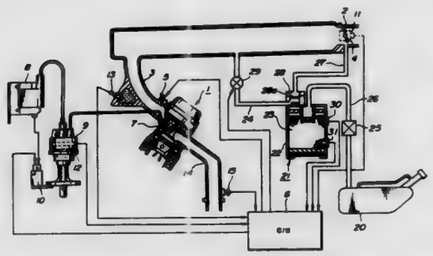


4. A controller for controlling the supply of a fuel to a plurality of cylinders of an internal combustion engine, comprising:
detection means for detecting engine operation conditions including the operating temperature of the engine;
control means for determining the rate at which the fuel is supplied to each of the plurality of engine cylinders and the fuel injection timing be being supplied with a signal from said detection means; and
fuel injection means for successively injecting the fuel to each of the plurality of engine cylinders by controlling valve opening based on a fuel injection control signal supplied from said control means;
wherein said control means is supplied with an engine temperature output signal from said engine condition detection means and shifts the fuel injection timing based on the fuel injection control signal from an exhaust stroke period to a suction period according to the level of the engine temperature output signal, and wherein said controller outputs the fuel injection control signal and a signal for determining a limit of the fuel injection end point, and controls valve opening of said fuel injection means so that the limit of the fuel injection end point is not exceeded.

5,113,834
SELF-DIAGNOSING FUEL-PURGING SYSTEM USED FOR FUEL PROCESSING SYSTEM
Takashi Aramaki, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Filed May 31, 1991, Ser. No. 707,138
Claims priority, application Japan, May 31, 1990, 2-139667
Int. Cl.[5] F02N *33/02;* F02B *77/00*
U.S. Cl. 123—520 6 Claims

1. A diagnosing system for a fuel-purging system which causes a fuel to be introduced from a fuel tank into a fuel processing apparatus packed with an adsorbent for adsorbing the fuel thereon, and which causes the fuel adsorbed onto the adsorbent to be supplied to an engine through a fluid passage which is selectively open and closed, said diagnosing system comprising:
temperature detecting means for detecting the temperature of the adsorbent at a plurality of locations in said fuel processing apparatus; and
discriminating means for determining the state of the fuel adsorbed onto the adsorbent on the basis of the tempera-

tures detected by said temperature detecting means, and for determining abnormality of the fuel-purging system on the basis of temperature drop of the adsorbent detected at



at least one location by said temperature detecting means after the state of the adsorbed fuel assumes a predetermined state.

5,113,835

METHOD OF CONTROLLING EXHAUST GAS RECIRCULATION FOR AN INTERNAL COMBUSTION ENGINE

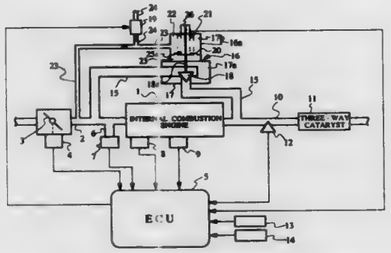
Yasunari Seki; Shigeto Kashiwabara, and Takahiko Kaga, all of Wako, Japan, assignors to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English), Tokyo, Japan

Filed Jul. 29, 1991, Ser. No. 737,306

Claims priority, application Japan, Aug. 21, 1990, 2-220842

Int. Cl.[5] F02M *25/07*

U.S. Cl. 123—571 **3 Claims**



1. In a method of controlling exhaust gas recirculation for an internal combustion engine including an intake passage, an exhaust passage, and an exhaust gas recirculation control system having an exhaust gas recirculation passage connecting said exhaust passage with said intake passage, an exhaust gas recirculation valve arranged in said exhaust gas recirculation passage for controlling an amount of exhaust gases returned from said exhaust passage to said intake passage, and valve-operating means for varying valve opening of said exhaust gas recirculation valve,

said method including the steps of:

detecting an actual value of said valve opening of said exhaust gas recirculation valve;

detecting operating conditions of said engine;

setting a desired value of said valve opening of said exhaust gas recirculation valve in accordance with a detected operating condition of said engine;

calculating a difference between said actual value and said desired value of said valve opening; and

controlling said valve-operating means such that said difference is reduced to zero;

the improvement comprising the step of determining that there is failure in said exhaust gas recirculation control system when said difference between said actual value and said desired value of said valve opening is equal to or larger than a predetermined value which is dependent on operating conditions of said engine.

5,113,836

FILTER FOR LOWERING HARMFUL CRANKCASE EMISSIONS IN AN INTERNAL COMBUSTION ENGINE

Theodore P. Sweeten, Paulden, Ariz., assignor to Ventures Unlimited, Inc., Paulden, Ariz.

Continuation-in-part of Ser. No. 607,586, Nov. 1, 1990, Pat. No. 5,072,713, which is a continuation-in-part of Ser. No. 542,721, Jun. 25, 1990, abandoned. This application Mar. 25, 1991, Ser. No. 674,105

The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.

Int. Cl.[5] F02M *25/00*

U.S. Cl. 123—573 **12 Claims**



1. In combination with a crankcase vent connected to an internal combustion engine, a device for separating emissions, said device comprising:

a housing;

an inlet for taking in crankcase emissions;

filtering material; and

manually adjustable metering means for selectively controlling the discharge of said emissions from said housing.

5,113,837

AIR INDUCTION CONTROL DEVICE

Simon H. Faull, Caracas, Venezuela, assignor to Mike Baitel, Caracas, Venezuela

Filed Jun. 25, 1991, Ser. No. 720,292

Claims priority, application Venezuela, Jun. 25, 1990, FP-01 25087

Int. Cl.[5] F02M *23/00*; F16K *7/00*

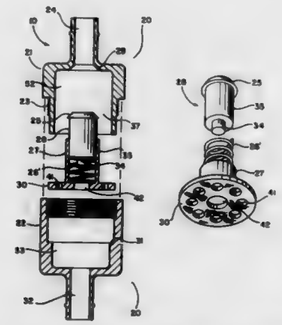
U.S. Cl. 123—587 **16 Claims**

1. An air induction control device for an internal combustion engine including an intake passageway having a throttle valve, comprising:

means defining a communication passageway for communicating between air at atmospheric pressure and the air in the downstream passageway from the throttle valve;

a valve member disposed in said communication passageway and moveable toward the downstream direction thereof to open said communication passageway in response to pressure differential reflecting atmospheric pressure greater than pressure in said downstream passageway;

valve biasing means disposed to apply force to and bias said valve member in the upstream direction to close said communication passageway, said biasing means responding to the pressure differential between atmospheric pressure and the air pressure in the downstream passageway such that the degree of clearance of said valve member from a valve seat disposed in said communication passageway upstream from said valve member varies depending on the pressure differential between the air in said downstream passageway air pressure and atmospheric pressure; and



a flow restriction element positioned downstream of said valve member comprising calibrated openings, said flow restriction element dividing a primary chamber and secondary chamber, wherein the volumetric proportion of the primary chamber: secondary chamber: calibrated openings is about 50–70:25–35:0.8–1.2.

5,113,838

AIR FLOW SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Sei Y. Kim, 221-9 Bongchun 7-Dong, Kwanak-Ku, Seoul, Rep. of Korea

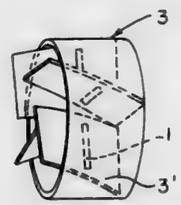
Filed Apr. 10. 1991, Ser. No. 683,037

Claims priority, application France, Jun. 12, 1990, 90-8216

The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.

Int. Cl.[5] F02M *29/02*

U.S. Cl. 123—592 **14 Claims**



1. An air flow system for an internal combustion engine, which comprises:

a cylindrical air cleaner, said cylindrical air cleaner divided into a centrally disposed air swirling zone and a laterally disposed filter zone, and

a swirling device disposed in said air swirling zone, said swirling device including:

a centrally disposed hub member,

a plurality of flexible vane members which extend radially from said hub member toward the filter zone for increasing air flow, and

at least one elongated slit disposed in each of said plurality of vane members, respectively, so as to prevent the generation of negative pressure behind the vane members, whereby when air is introduced through said filter zone and into said air swirling zone, a strong swirling force is generated which is retained by the reduced resistance caused by the air flow of the vane members.

5,113,839

IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

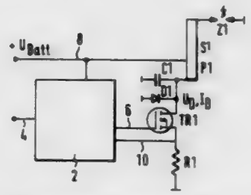
Uwe Hartmann; Udo Mai, both of Untergriesbach, and Roman Schichl, Passau, all of Fed. Rep. of Germany, assignors to Vogt Electronic AG, Erlau, Fed. Rep. of Germany

Filed Aug. 29, 1990, Ser. No. 574,150

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1989, 3928726

Int. Cl.[5] F02P *3/04*

U.S. Cl. 123—606 **23 Claims**



1. An ignition system for an internal combustion engine, comprising:

at least one DC voltage source,

an ignition coil with primary and secondary windings,

a controllable semiconductor switch between the ignition coil and the voltage source,

a spark plug located in a circuit of the secondary winding,

a first resonant circuit including the primary winding, and a capacitor connected in parallel with an energy recovery diode,

a second resonant circuit including the secondary winding with its winding capacitance and the spark plug capacitance, the second resonant circuit including means for generating an alternating ignition current during an ignition phase, and

a triggerable control and regulating circuit including means for controlling the semiconductor switch to interrupt the first resonant circuit in response to current in the first resonant circuit,

wherein the first and second resonant circuits, in the manner of a bandpass filter, are coupled closely if ignition does not occur and coupled loosely if ignition has occurred.

5,113,840

IGNITER FOR AN ENGINE

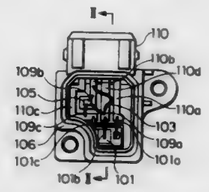
Masaaki Taruya, and Mitsuru Koiwa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1991, Ser. No. 707,546

Claims priority, application Japan, Jun. 14, 1990, 2-62224[U]

Int. Cl.[5] F02P *7/06*; H05K *7/02*

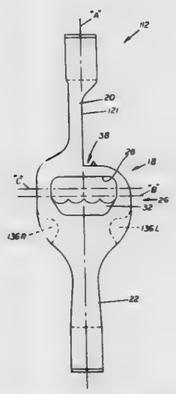
U.S. Cl. 123—644 **5 Claims**



1. An igniter for an internal combustion engine comprising:

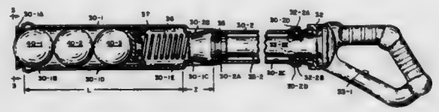
a power transistor circuit for turning on and off the current supply to a primary winding of an ignition coil;
a current detector for detecting a current supplied to the ignition coil primary winding;
a current limiter for controlling the current supplied to the ignition coil primary winding based on the current detected by said current detector;
said current detector comprising a conductor separately formed from said current limiter and connected between ground and a junction between said power transistor circuit and said current limiter;
a casing in which said power transistor circuit, said current detector and said current limiter are housed; and
a connector integrally formed with said casing and having first, second and third connector terminals which extend at their one end into said casing;
said power transistor circuit being fixedly mounted on said casing and having a first lead connected to the first connector terminal, a second lead connected to one end of said current detector which is connected at the other end thereof to the second connector terminal, and a third lead connected to the third connector terminal;
said current limiter comprising an IC chip mounted on the second connector terminal and having three leads which are respectively connected to the second connector terminal, the third connector terminal and a junction between said current detector and the first lead of said power transistor circuit.

5,113,841
ARCHERY BOW AND BOW RISER THEREFOR
William M. Bratcher, 188 W. Shannon La., Shelbyville, Ky. 40165
Filed Oct. 24, 1990, Ser. No. 602,624
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—23.1 **9 Claims**



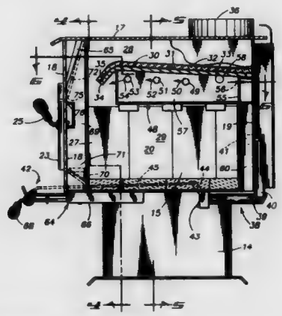
1. An archery bow comprising:
a central interconnecting member having an integral hand-grip means to be gripped by an archer's hand to hold the bow, and integral upper and lower oppositely extending coaxial rigid bow limb attachment arms;
an upper resilient bow limb secured at its proximal end to the distal end of the upper bow limb attachment arm of the central interconnecting member;
a lower resilient bow limb secured at its proximal end to the distal end of the lower bow limb attachment arm;
a bowstring interconnecting the distal ends of the resilient upper and lower bow limbs; and,
the hand-grip means comprising an elongated finger receiving slot for receiving the fingers of the hand of the archer, the elongated slot being formed through the central interconnecting member with the length of the elongated slot being transversely oriented to the longitudinal axis of the bow, and the length of the elongated slot being longitudinally centered on the longitudinal axis of the bow and thereby the elongated slot being transversely oriented to the longitudinal axis of the bowstring and longitudinally centered on the longitudinal axis of the bowstring.

5,113,842
RAPID FIRE BALL LAUNCHER
Randall H. Moormann, Georgetown, Mass., assignor to Tonka Corporation, Minnetonka, Minn.
Filed Apr. 26, 1990, Ser. No. 514,701
Int. Cl.[5] F41B *11/00*
U.S. Cl. 124—65 **1 Claim**



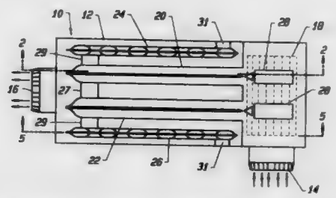
1. A ball launcher comprising a barrel, a plunger positioned in the barrel for slideable motion therein, the front portion of the barrel having a cavity for retaining a plurality of compressible balls therein, said cavity having a rigid constriction at the front of the cavity, a carriage and spring means supported in said barrel and positioned in the front cavity thereof, said carriage positioned to contact one of said balls, said spring means urging said carriage to urge said balls towards said constriction, said carriage having a cuplike portion in the shape of a portion of a ball to be received therein, and a plurality of ears for sliding on the interior of the barrel, said ears being spaced apart about the said carriage and having a curved surface in contact with said barrel inside surface to prevent the carriage from skewing in said barrel and to permit air to flow back and forth between said ears, said plunger back and forth motion towards and away from said carriage and said constriction forcing said balls one at a time to squeeze past said constriction and be launched.

5,113,843
COMBUSTION DEVICE FOR STOVES AND FIREPLACES
Daniel S. Henry, and G. Michael Hoteling, both of Colville, Wash., assignors to Alladin Steel Products, Colville, Wash.
Filed Apr. 1, 1991, Ser. No. 678,860
Int. Cl.[5] F24C *1/14*
U.S. Cl. 126—77 **28 Claims**



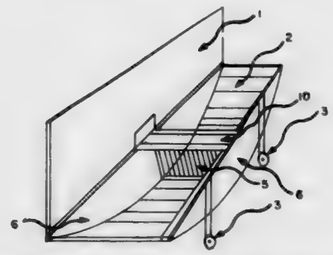
1. A combustor, comprising:
a firebox defined by a base wall, a top wall, a front wall, a rear wall, and side walls extending between the base wall and the top wall;
an opening along the front wall for enabling fuel to be loaded into the firebox;
an upwardly inclined baffle in the firebox, substantially spanning the distance between the side walls, leading forwardly and upwardly from the rear wall, and elevationally dividing the interior of the enclosure into a lower fuel combustion chamber below the baffle and an upper exhaust chamber above the baffle;
wherein the baffle includes a free edge forming an exhaust passage adjacent the front wall of the firebox, the passage openly connecting the fuel combustion chamber and the exhaust chamber;
an insulator on the baffle for reflecting heat within the firebox into the combustion chamber;
a first air supply means for delivering primary combustion air to the combustion chamber;
a second air supply distributor for delivering air to support combustion of unburned gasses within an area under the baffle between the free edge thereof and the back wall of the firebox, including three tertiary air supply tubes spaced apart below the baffle, with two of said tubes including a teritary air delivery opening therein oriented toward the free baffle edge and one of said tubes including an opening angularly oriented toward the free baffle edge and downwardly toward the base wall; and said tertiary chambers at opposed ends of the three tertiary air supply tubes for supplying air to the three tertiary air supply tubes; and
at least one delivery with an end opening outside the firebox and an end opening into the side tertiary chambers.

5,113,844
HEAT EXCHANGER
Robert W. Cook, Mt. Waverley, Australia, assignor to Vulcan Australia Limited, Bayswater, Australia
PCT No. PCT/AU89/00529, § 371 Date Jun. 13, 1991, § 102(e) Date Jun. 13, 1991, PCT Pub. No. WO90/07091, PCT Pub. Date Jun. 28, 1990
PCT Filed Dec. 12, 1989, Ser. No. 689,290
Int. Cl.[5] F24H *3/02*
U.S. Cl. 126—110 R **11 Claims**



1. A heat exchange assembly comprising at least one primary and at least one secondary heat exchange element housed within an outer enclosure, a fan and heating means; said enclosure comprising inlet and outlet openings for respectively receiving air to be heated and delivering heated air drawn into and forced through the said enclosure by the fan; wherein each primary heat exchange element is a metallic substantially planar panel and includes an "S" shaped passage having an opening located proximate the rearward end of the enclosure and an exit orifice proximate the forward end of the enclosure and wherein each secondary heat exchange element is a metallic substantially planar panel and includes an inlet proximate the forward end of the enclosure said secondary heat exchange element connected by a passage or passages to an outlet proximate the rearward end of the enclosure, the said inlet of each secondary heat exchange element communicating with an exit orifice of at least one primary heat exchange element and said outlet of each secondary heat exchange element communicating with an exhaust outlet of the enclosure whereby said heating means is adapted to heat and cause a heat exchange fluid to move sequentially through the primary and secondary heat exchange elements and whereby air to be heated is forced from the rearward end of the enclosure to the forward end of the enclosure in a stream generally parallel to the plane of the said heat exchange elements.

5,113,845
PORTABLE SOLAR HEATING DEVICE AND HEATING PROCESS UTILIZING SOLAR ENERGY
Martin E. Nix, P.O. Box 95173, Seattle, Wash. 98145-2173
Filed Sep. 20, 1990, Ser. No. 585,870
Int. Cl.[5] F24J *2/02*
U.S. Cl. 126—451 **13 Claims**



1. A solar heating device comprising a concave upwardly-opening concentrating reflector trough for reflecting to a line focus extending axially of the upper portion of the trough solar rays striking the concave concentrating reflector, said trough having a rectangular upper opening with a length much greater than its width, the width of said opening extending axially of the trough concavity and the length of said opening extending chordwise of the trough concavity, and an auxiliary flat reflector disposed parallel to the chords of the concave concentrating reflector trough opening extending above and inclined from its lower edge over the trough at an acute angle relative to the line focus for reflecting solar rays striking it downward past the line focus onto the concave concentrating reflector trough for reflection thereby back up to the line focus.

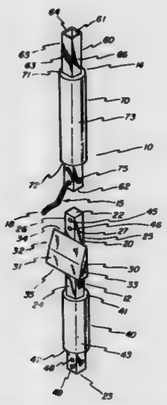
5,113,846
ORGAN MANIPULATOR
Siegfried Hiltebrandt, Knittlingen, and Johann Wolf, Bretten, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany
Filed Jul. 2, 1991, Ser. No. 724,834
Int. Cl.[5] A61B *17/02*
U.S. Cl. 128—20 **5 Claims**



1. A medical instrument for manipulating internal organs of a body, comprising:
a rod, having a retractor body arranged at a distal end of a rod and a handle at a proximal end of the rod;
a rigid flexion resisting shaft, having a proximal end and a distal end, for guiding said rod, said rod being movable with respect to the shaft in an axial direction of said rod;
wherein said retractor body comprises a multi-joint lever

system of articulated arms connected to one another to be pivotably movable, which can be brought into an open position by movement of the rod in a first direction with respect to the shaft, and can be brought into a closed position by movement of the rod in a second direction with respect to the shaft.

5,113,847
DEVICE FOR STIMULATING INTRAMUSCULAR FLUID PRESSURE
Dwight D. Holzworth, 1587 Rosehill Rd., Reynoldsburg, Ohio 43068
Filed Jan. 30, 1991, Ser. No. 647,942
Int. Cl.[5] A61H 7/00
U.S. Cl. 128—24 R **20 Claims**



12. An intramuscular fluid pressure stimulation device, said device comprising

a first tool component comprising a base member, said base member having a top, a bottom, and a cylindrical member, said cylindrical member wrapped about said base member intermediate said top and bottom, said cylindrical member having an outer sidewall surface, said first tool component also comprising a wedge-shaped member having a front face, a rear face, and a bottom surface, said wedge-shaped member attached to said base member intermediate said top and said cylindrical member, and

a second tool component comprising a second base member, said second base member having a top, a bottom and a cylindrical member wrapped about said second base member intermediate the second base member top and bottom, said second base member cylindrical member having an outer sidewall surface, said first tool component attached to said second tool component by a cord.

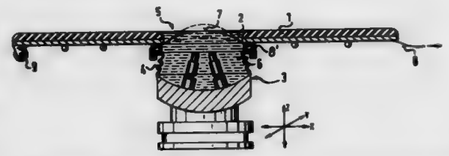
5,113,848
APPARATUS FOR SHOCK WAVE THERAPY
Werner Krauss, Knittlingen; Helmut Wurster, Oberderdingen, and Thomas Belikan, Knittlingen, all of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany
Filed Sep. 5, 1990, Ser. No. 577,968
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1989, 3932840
Int. Cl.[5] A61B 17/22
U.S. Cl. 128—24 EL **15 Claims**

1. Apparatus for shock wave therapy, comprising:

an electroacoustic therapeutic transducer for generating shock waves in the ultrasonic range;

a therapy table for receiving a reclining patient to be treated by means of said shock waves, said table being formed with a porthole therethrough;

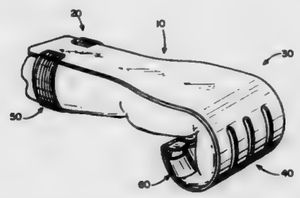
an elastic membrane covering said porthole and having a marginal area surrounding the porthole;



a coupling medium shock wave transmission means located for transmitting shock waves from the transducer to said patient by way of said membrane; and

clamping means for releasably attaching the marginal area of the membrane to said therapy table.

5,113,849
FINGER EXTENDER
Paul A. Kuiken, 104 - 4th St. NW., Aitkin, Minn. 56431, and Michael K. Murray, 504-½ Abrams St., Green Bay, Wis. 54309
Filed Apr. 2, 1991, Ser. No. 679,254
Int. Cl.[5] A61H 1/02
U.S. Cl. 128—26 **8 Claims**



1. A device for exercising an extensor muscle group comprising:

(a) a leaf spring having a generally planar portion and an integrally formed arcuate portion including a plurality of tines;

(b) means for releasably securing said planar portion to the anterior surface of a user's forearm with said arcuate portion surrounding the user's fist; and

(c) tubular, finger tip receiving sleeve portions hinged to said tines, said sleeve portions each having a base plate hinged to a respective tine, an end plate located opposite the hinge and an upper plate extending from the end plate in parallel, spaced relation to the base plate.

5,113,850
MASSAGING SHOE APPARATUS
Derek P. P. Larremore, and Rhoda A. Larremore, both of 630 N. Sartillion, Ajo, Ariz. 85321
Filed Apr. 22, 1991, Ser. No. 688,978
Int. Cl.[5] A61H 1/00
U.S. Cl. 128—32 **1 Claim**

1. A massaging shoe apparatus, comprising,

a shoe upper, the shoe upper mounted coextensively to a shoe sole, and

a battery housing mounted to a rear terminal end of the shoe upper, the battery housing including a lid, and including at least one battery member mounted within the battery housing, and

a switch member mounted within the shoe sole, and

the shoe sole formed of a flexible polymeric material to accommodate vibration and shock, and

a vibratory housing device mounted contiguous to and above the shoe sole within the shoe upper, and

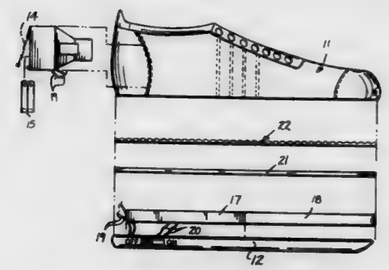
the switch member in electrical communication between the battery housing and the vibratory housing device to effect selective actuation of the vibratory housing device, and

further including a vibratory communication member mounted coextensively with the vibratory housing device in contiguous communication with the shoe sole, wherein the shoe sole is defined by a predetermined interior length interiorly of the shoe upper, and the vibratory housing device with the vibratory communication member positioned adjacent the vibratory housing device defining a predetermined length equal to the predetermined interior length, and

including a vibratory plate mounted contiguous to and coextensively with the vibratory housing device and vibratory communication member and positioned above the vibratory housing device and vibratory communication member, and

further including a plurality of polymeric sole pads, with at least one pad mounted within the shoe upper to coextensively overlie the vibratory plate, and

wherein each of said polymeric pads includes a first pad, the first pad including a memory retentent polymeric pad member, including a plurality of parallel rods directed coextensively through the pad member longitudinally of the shoe sole, and further including a matrix of hemispher-

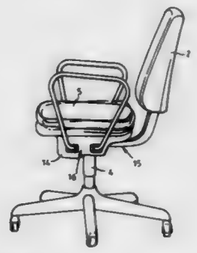


ical projections mounted coextensively to a top surface of the first pad, and a second pad of the plurality of polymeric sole pads including a flexible memory retentent pad member with a plurality of parallel fluid filled tubular cavities directed through the pad member and a matrix of hemispherical projections mounted coextensively to a top surface of the pad member, and a third pad of the plurality of polymeric sole pads including a flexible polymeric pad member including a matrix of hemispherical projections mounted to a top surface of the pad with alternating metallic and fluid filled members directed coextensively and longitudinally of the third pad, and

including a fourth pad, wherein the fourth pad includes a flexible polymeric pad member, the flexible polymeric pad member including a bottom surface, the bottom surface including a series of spaced parallel "V" shaped grooves, and the pad member top surface including a plurality of "V" shaped ribs arranged parallel relative to one another, and

including a fifth pad, wherein the fifth pad includes a flexible polymeric pad member formed of memory retentent material, including a plurality of "V" shaped grooves directed through a bottom surface of the fifth pad member, and a plurality of parallel further "V" shaped ribs mounted to a top surface of the fifth pad, wherein the further ribs include "V" shaped ribs defining projections between the notches to enhance vibratory actuation of discrete portions of a foot.

5,113,851
CHAIR EQUIPPED WITH A SINGING SEAT
Eugenio Gamba, Via Londonio 12, Milano, Italy
Filed Mar. 1, 1990, Ser. No. 487,538
Int. Cl.[5] A01H 1/00
U.S. Cl. 128—33 **24 Claims**



1. A chair comprising

a support shaft;

a backrest attached to the support shaft and stationary relative to the support shaft;

a spring (24) is mounted to the upper end of the support shaft;

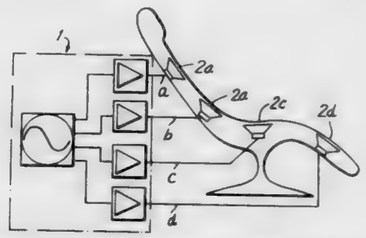
a ball joint connected to the support shaft at an upper end of the support shaft via the spring for providing an elastic support to a ball bearing;

a chair seat (5), which is hingedly mounted on the ball bearing and wherein the tilting and oscillating of said chair seat is performed relative to the stationary backrest;

tilting means attached to the support shaft and engaging the chair seat (5) for swingingly supporting said seat (5);

motor means for furnishing momentum to the tilting means thereby forming a dynamic assembly for actively tilting and oscillating the chair seat in such as way as to change the position of the pelvis of a person seated on the chair and to induce a corresponding vertebral movement of compensation, the immobility and rigidity of the vertebral column of the person seated on the chair seat (5) being thus broken.

5,113,852
PROCEDURE AND DEVICE FOR APPLYING VIBRATION TO THE HUMAN BODY
Salomo Murtonen, Helsinki, Finland, assignor to Next Wave Inc., Kalamazoo, Mich.
Filed Oct. 20, 1989, Ser. No. 424,894
Claims priority, application Finland, Oct. 24, 1988, 884898
Int. Cl.[5] A61H 1/00
U.S. Cl. 128—33 **15 Claims**



6. Device for applying vibration acoustically to the human body by means of vibrating elements to produce a pleasant feeling for the relaxation of the body and/or for therapeutic treatment, said device comprising:

a support structure;

a plurality of vibrating elements, each of said plurality of vibrating elements being vibrated at an audio frequency in the range from 20 Hz to 200 Hz, said plurality of vibrating elements being arranged in a substantially linear array within said support structure;

means for setting the frequency of vibration of each of said plurality of vibrating elements;

means for controlling the intensity of vibration of each of said plurality of vibrating elements and the total intensity of the vibration produced by said plurality of vibrating elements;

means for cyclically and continuously varying the intensity of vibration of each of said plurality of vibrating periodically elements between maximum and minimum values other than zero to generate intensity maxima at a predetermined frequency of occurrence;

means for predetermining the frequency of occurrence of said intensity maxima in the intensity of vibration of each of said plurality of vibrating elements; and

means for setting the phase difference separating the occurrence of the intensity maxima generated by adjacent ones of said plurality of vibrating elements.

5,113,853

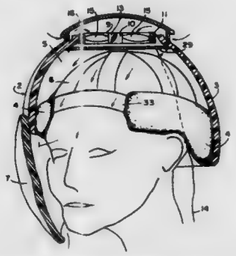
HELMET WITH FILTERED AIR SUPPLY

Jonathan B. Dickey, 4360 NE. 11th Ave., #17, Oakland Park, Fla. 33334

Filed Nov. 7, 1988, Ser. No. 268,474

Int. Cl.[5] A62B *29/00*

U.S. Cl. 128—200.28 **8 Claims**



1. A protective helmet providing filtered respiratory air comprising:

a) a hard headshell which in use extends over and serves to protect the forehead, top, rear and sides of the head of a user;

b) transparent visor means removably mounted on said headshell and providing protection for the eyes and face of said user;

c) aperture means in the upper portion of said headshell for receiving a fan and motor assembly;

d) a fan and motor assembly mounted in said aperture means, said fan and motor assembly including a central electric motor means, having two ends and a substantially cylindrical side wall, and a plurality of fan blades connected to said cylindrical side wall of said motor means and extending radially therefrom, said motor means and said blades arranged in a substantially coplanar relationship with minima thickness for reduced center of gravity;

e) a hard cover shell of a diameter greater than said aperture means covering said aperture means and connected by connecting means to the outer surface of said headshell around said aperture means, said connecting means providing a perimeter space between said cover shell and said headshell for the free passage of intake air to said fan blades;

f) resilient cushion means connected to the inner surface of said headshell for sealably engaging the sides and rear of said head to prevent the passage of air, said cushion means having a lower edge that does not extend below a horizontal plane through the ears of said user when said helmet is in operating position, said cushion means further providing a free air passageway beneath and at the outlet of said fan and motor assembly that extends forward in an opening in said cushion means to the forehead and beneath said visor means for respiration at the nose and mouth of said user; and

g) filter connection means for sealably connecting filter means across the path of the air flow in at least one location for removing harmful materials from said air.

5,113,854

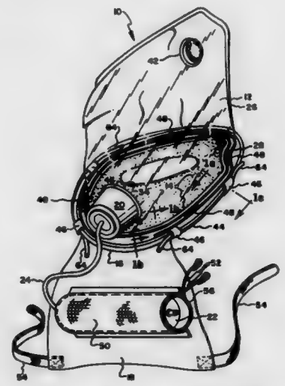
QUICK-DONNING PROTECTIVE HOOD ASSEMBLY

Jeffrey J. Dosch, Buffalo, and James V. Zappa, Williamsville, both of N.Y., assignors to Figgie International, Inc., Willoughby, Ohio

Filed Jan. 25, 1990, Ser. No. 470,066

Int. Cl.[5] A62B *17/04, 18/00, 7/10;* **A61M** *15/00*

U.S. Cl. 128—201.23 **7 Claims**



1. A quick-donning protective hood assembly for respiratory protection from smoke and noxious gases; the hood assembly comprising:

a hood capable of being donned over a head, the hood having an open lower marginal portion;

a neck seal carried by the lower marginal portion of the hood, the neck seal being capable of engaging the neck of a user when the hood is donned over the head of the user;

a springlike neck hoop connected to the lower marginal portion of the hood, the neck hoop being in a collapsed state when stored within a storage container, the neck hoop springing into an open hoop when withdrawn from the storage container to facilitate donning of the hood and neck seal about the head; and

one or more chemiluminescent devices connected to the hood assembly, the operation of said devices being initiated when the protective hood assembly is withdrawn from the storage container.

5,113,855

POWDER INHALER

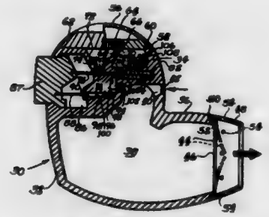
Michael T. Newhouse, 436 Queen Street South, Hamilton, Ontario, Canada L8P 3T9

Filed Feb. 14, 1990, Ser. No. 484,069

Int. Cl.[5] A61M *15/00*

U.S. Cl. 128—203.12 **22 Claims**

1. A powdered medication inhaler comprising a hollow body having a chamber of substantial height for aerosolizing and settling powdered medication, means for admitting air into said chamber, means for connecting said body and said chamber to a living body for inhalation from said chamber into said living body, a storage hopper in said hollow body for storing powdered medication and having a discharge opening therefrom, a powdered medication discharge station opening into said chamber, transfer means having a medication transfer recess therein, said transfer means being in communication with said medication storage hopper through said discharge opening, said transfer means being movable from a position with said recess communicating with said discharge opening for receiving a predetermined quantity of powdered medication in said recess to a position communicating with said dis-



charge station, said discharge station further comprising a pallet positioned beneath said discharge opening for gravitational passage of powdered medication from said recess to said pallet, said pallet being positioned above said living body connecting means, and means adjacent said pallet operatively connected to a source of gas under pressure for positively passing gas past said discharge station and said pallet in timed relation to delivery of powdered medication to said discharge station to carry powdered medication into said aerosolizing and settling chamber for gravitational settling toward said living body connecting means for inhalation of said medication into said living body.

5,113,856

IMPREGNATION FOR RESPIRATOR FILTERS FILLED WITH ACTIVE CARBON

Carl E. van der Smissen, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Apr. 4, 1991, Ser. No. 680,909

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1990, 4011221

Int. Cl.[5] A62B *7/10*

U.S. Cl. 128—205.27 **3 Claims**

1. A sorbent mass for the chemical binding of harmful gases, said sorbent mass including active carbon as a carrier, an impregnation of said sorbent mass comprising at least two components from at least one of a group vanadium, copper, manganese, and zinc compounds, which occur as the vanadate, an oxide, a carbonate, or a chloride; and, an oxo acid as an additive in the form of one of tungstic acid, molybdic acid, permanganic acid, stannic acid and phosphoric acid.

5,113,857

BREATHING GAS DELIVERY SYSTEM AND HOLDING CLIP MEMBER THEREFOR

Stair Dickerman, and JoAnn A. Dickerman, both of 10065 NE. Roberts Rd., Bainbridge Island, Wash. 98110

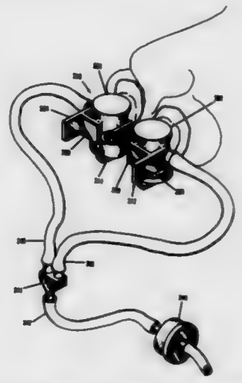
Filed Aug. 27, 1990, Ser. No. 572,395

Int. Cl.[5] A61M *15/08*

U.S. Cl. 128—207.18 **8 Claims**

1. Breathing gas delivery device for gas and air to be breathed by the wearer and for attachment to the nose septum of the wearer, comprising:

a) a frame means including a generally U-shaped clip portion which includes a base and a pair of legs having outer ends and inside surfaces which legs are spring biased toward each other and at said outer end of which legs on said inside surfaces thereof are projection means for engaging the calumella of the wearer's nose septum, said frame means also having a pair of side frame pieces each of which is spaced outwardly of said clip and which are generally parallel to each other and to said pair of legs, said side frame pieces and said legs being interconnected at least in part by cross support frame pieces, said side frame pieces extending away from the wearer's nose so that finger pressure applied on said side frame pieces squeezes said side frame pieces towards each other which thereby separates said legs and said projection means for attachment and removal of the device from the calumella,



b) a pair of spaced apart air intake tubes supported in said frame with one each of said air intake tubes leading to a nasal opening,

c) sealant pad means for each nostril opening attached to said frame means such that an air intake tube for each nostril extends through said sealant pad means whereby said sealant pad means closes the nasal passage opening and permits inhaled air to pass into said air intake tubes and thence into the wearer's nose, and

d) filter holder means connected to said frame means and to said air intake tubes and having air filter material or inhalent cartridge means therein for filtering air breathed in and passing in therethrough into said air intake tubes.

5,113,858

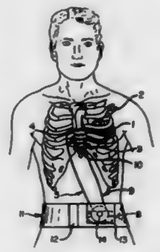
METHOD FOR CONTROL OF OUTPUT OF CARDIOMYOSTIMULATOR

Ignacio Y. Christlieb, Pittsburgh, Pa., assignor to Allegheny-Singer Research Institute, Pittsburgh, Pa.

Filed Apr. 12, 1990, Ser. No. 508,845

Int. Cl.[5] A61N *1/08*

U.S. Cl. 128—419 P **34 Claims**



1. A method for use with the cardiomyoplasty surgical procedure to permit patient control of the simulation and

conditioning of a translocated muscle flap outside of the confines of a health care facility comprising:

a) performing the cardiomyoplasty surgical procedure on a patient;

b) implanting a cardiomyostimulator in the abdomen of said patient as part of said cardiomyoplasty surgical procedure, wherein said cardiomyostimulator provides a continuous output signal of patterned episodes of pulsed stimuli and wherein said cardiomyostimulator includes a means for interrupting said output signal in the presence of a magnetic field;

c) stimulating said muscle flap with said output signal;

d) interrupting, by said patient as said patient desires or requires, said stimulation of said muscle flap by interrupting said output signal by associating a magnet over the external surface of said abdomen with a means for removably securing said magnet over said external surface of said abdomen in close proximity to said cardiomyostimulator, said magnet having a field strength of sufficient intensity to interrupt said output signal generated by said cardiomyostimulator so long as said magnet is maintained in close proximity to said cardiomyostimulator;

e) resuming, by said patient as said patient desires or requires, said stimulation of said muscle flap by resuming said output signal by disassociating said magnet from said surface of said abdomen and said close proximity to said cardiomyostimulator and;

f) controlling said stimulation and conditioning of said muscle flap by said patient by repeating steps (d)–(e) as said patient requires or desires.

5,113,859

ACOUSTIC BODY BUS MEDICAL DEVICE COMMUNICATION SYSTEM

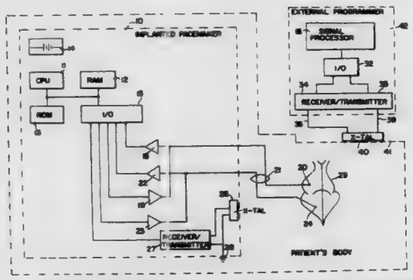
Hermann D. Funke, Boan, Fed. Rep. of Germany, assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 408,811, Sep. 18, 1989, Pat. No. 4,987,897. This application Jun. 25, 1990, Ser. No. 543,611

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1988, 3831809

Int. Cl.[5] A61N *1/362*

U.S. Cl. 128—419 PG **3 Claims**



1. A system for providing pacing, cardioversion and defibrillation staged therapies for bradycardia, tachycardia and fibrillation of a patient's heart, comprising:

(A) a body implantable pacemaker comprising:

(1) pacing energy pulse generator means for applying pacing stimuli to said heart;

(2) pacing lead means bearing at least one electrode means adapted to be placed in contact with or within said heart and coupled to said pulse generator means for applying said pacing stimuli to said heart and receiving electrical signals appearing at the tissue-electrode interface;

(3) sensing means coupled to said electrode means for sensing electrical signals appearing at said electrode means;

(4) detecting means responsive to said sensing means for detecting a bradyarrhythmia, tachyarrhythmia or ventricular fibrillation condition of said heart;

(5) first control means responsive to said detecting means for instructing said pulse generator means to provide;

(a) pacing stimuli to said pacing electrode means in response to the detection of a bradyarrhythmia or tacharrhythmia condition; and

(b) an encoded defibrillation shock control command in response to the detection of a ventricular fibrillation condition, said encoded defibrillation shock command comprising a predetermined modulated first medium frequency signal in the frequency range from 10 to 100 kHz; and

(6) first acoustic transducer means acoustically coupled to the body fluids and tissue of said patient for transducing said encoded defibrillation shock control command into modulated ultrasonic acoustic waves for transmission into said body fluids and tissue as a function of said modulated first medium frequency signal; and

(B) a remotely implanted defibrillator comprising:

(1) defibrillation pulse generator means for generating defibrillation shocks;

(2) defibrillation electrode means adapted to be placed in contact with said heart for providing defibrillation shocks thereto;

(3) second acoustic transducer means acoustically coupled to said body fluids and tissue for transducing said modulated ultrasonic acoustic waves transmitted from said pacemaker into said modulated first medium frequency signal;

(4) receiving means coupled to said second acoustic transducer means for demodulating said modulated first medium frequency signal into a decoded defibrillator shock control command; and

(5) second control means responsive to said decoded shock control command for instructing said defibrillation pulse generator to provide a defibrillation shock across said defibrillation electrode means as a function of said decoded shock control command.

5,113,860

NON-INVASIVE TRANSMUCOSAL DRUG LEVEL MONITORING METHOD

Roy L. McQuinn, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 15, 1991, Ser. No. 669,775

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—632 **30 Claims**

1. A method of measuring the blood level of a drug in a mammal, comprising the steps of:

a) adhering a device to a mucosal surface of a mammal, which device comprises:

(i) a particulate polymeric resin comprising at least about 55% by weight of carboxylic acid moieties based on the total weight of the polymeric resin, and

(ii) about 10 to about 200 parts by weight of a hydrophobic support matrix, based on 100 parts by weight of the resin,

wherein the resin is dispersed substantially throughout the support matrix, and which is substantially free of drug, contains less than about 9% water by weight based on the weight of the polymeric resin, exhibits substantially no instantaneous adhesion to dry skin, and adheres to a mucosal surface;

b) allowing the device to remain adhered for a time sufficient to allow the device to absorb the drug in an amount proportional to the blood level of the drug;

c) removing the device;

d) measuring the amount of the drug in the device; and

e) correlating the amount of the drug in the device to the blood level of the drug.

5,113,861

METHOD FOR PROCESSING SIGNALS, PARTICULARLY FOR OXIMETRIC MEASUREMENTS ON LIVING HUMAN TISSUE

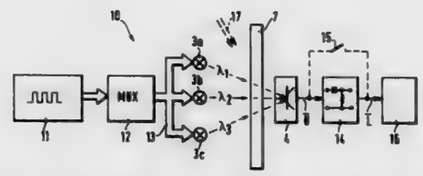
Peter Rother, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 20, 1989, Ser. No. 340,969

Claims priority, application European Pat. Off., May 9, 1988, 88107438.9

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—633 **29 Claims**



1. A method for deriving output signals from spurious signals having a frequency lying in a first frequency range and n multiplexed information signals having a frequency lying in a second frequency range that is different from said first frequency range, said method comprising the steps of:

passing said signals through a filter having an essentially blocking characteristic in said first frequency range and having an essentially transmitting characteristic in said second frequency range so as to produce a column matrix;

providing a first n^2 matrix function representing the deviation of the frequency range from an ideal transmission characteristic;

deriving a second n^2 matrix function inverted with respect to said first matrix function; and

multiplying said column matrix at the output of said filter with said second n^2 matrix function to generate said output signals.

5,113,862

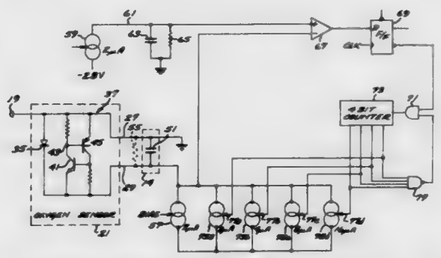
BLOOD OXYGEN SENSOR HAVING LEAKAGE COMPENSATION

Said Mortazavi, Granada Hills, Calif., assignor to Siemens Pacesetter, Inc., Sylmar, Calif.

Filed Sep. 25, 1990, Ser. No. 587,883

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—633 **35 Claims**



8. A blood oxygen sensor apparatus for use with a pacemaker, comprising:

a light-emitting diode positioned such that its emitted light is directed at blood whose oxygen saturation level is to be measured, wherein a capacitor and leakage resistance are arranged in parallel with the light-emitting diode;

a photodetector positioned to detect light emitted by the light-emitting diode and reflected by the blood and to produce a corresponding intensity signal;

detection means responsive to the intensity signal, for determining the blood's oxygen content; and

initialization means for supplying an initialization current during an initialization mode to charge the capacitor substantially linearly to a predetermined voltage that is less than an onset voltage at which the light-emitting diode emits substantial light, wherein the initialization means includes means for controllably increasing the initialization current with time, to compensate for the presence of the leakage resistance, and wherein the charging of the capacitor to the predetermined voltage during the initialization mode facilitates the emission by the light-emitting diode of a well-defined amount of light and the generation by the apparatus of an accurate measurement of blood oxygen saturation and means for driving said LED.

5,113,863

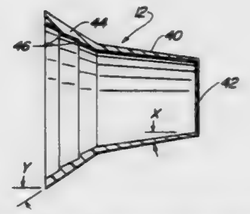
DISPOSABLE OCULAR DIAGNOSIS DEVICE AND METHOD

Wesley K. Herman, 5421 La Sierra Dr., Dallas, Tex. 75231

Filed Apr. 10, 1989, Ser. No. 335,237

Int. Cl.[5] A61B *3/16*

U.S. Cl. 128—652 **2 Claims**



1. A disposable cover for removably mounting on an eye contacting applanation tip, the tip having a generally tapered shape with a larger end and a smaller eye contacting end, a circular optical lens surface formed on the smaller eye contacting end of the tip, and an optical path through the body of the tip and through the circular optical lens surface, the disposable cover comprising:

a unitarily formed body of resilient material;

a circular transparent portion on said body for contacting and for covering the circular optical lens surface of the tip, said circular transparent portion sized to correspond to the smaller eye contacting end of the tip;

a mounting portion means on said body for removably mounting said body in a frictional interference fit on the tip and for retaining said circular transparent portion adjacent the circular optical lens surface of the tip, thereby improving the optical and contact interface between the circular transparent portion of said disposable cover and the circular optical lens surface of the tip so that distortions in the measurement of the pressure within the patient's eye are minimized during use of the tip, said mounting portion means having a generally tapered shape with a larger end and a smaller end, the smaller end of said mounting means integrally formed with said circular transparent portion; and

a handling flange means on said body for handling said disposable cover, installing the disposable cover on the tip, and removing the disposable cover from the tip, said handling flange means flange means being continuous around the larger end of said mounting portion means so that said handling flange means can be grasped from any direction, said handling flange means being generally frustum shaped and tapering at an angle substantially greater than the taper of the tip so that said handling

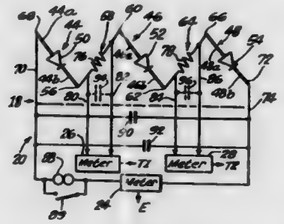
flange means extends away from the tip to provide access to said handling flange during installation on the tip and removal from the tip, and said handling flange means having a plurality of annular stiffening ridges formed therein to assist its rigidity and handling strength.

5,113,864

ELECTRIC FIELD AND TEMPERATURE PROBE

Mark J. Hagmann, Miami, and Tadeusz M. Babij, Fort Lauderdale, both of Fla., assignors to Florida International University, Miami, Fla.

Filed Apr. 29, 1988, Ser. No. 188,043
Int. Cl.[5] A61B 5/05
U.S. Cl. 128—653.1 **25 Claims**



1. An electric field sensing probe for use with a high input impedance voltage meter for measuring the strength of an electric field, said probe comprising:
a triangular prism;
three low resistivity dipoles positioned orthogonal to one another, each of said dipoles being positioned on a different one of the sides of said prism, each of said dipoles including first and second coupling terminals;
high resistivity interconnect lead means for coupling one terminal of a first one of said dipoles to one terminal of a second one of said dipoles and for further coupling the other terminal of said second dipole to one terminal of a third one of said dipoles; and
high resistivity meters lead means for coupling the other terminals of said first and third dipoles to said meter.

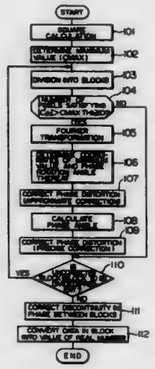
5,113,865

METHOD AND APPARATUS FOR CORRECTION OF PHASE DISTORTION IN MR IMAGING SYSTEM

Akira Maeda, Gardena, Calif.; Takashi Kasama, Yokohama, Japan; Tetsuo Yokoyama, Tokyo, Japan, and Hiroshi Nishimura, Kashiwa, Japan, assignors to Hitachi Medical Corporation, Tokyo; Hitachi Ltd., Kodaira and Hitachi Microcomputer Engineering Ltd., Tokyo, all of, Japan

Filed Apr. 5, 1989, Ser. No. 333,398
Claims priority, application Japan, Apr. 6, 1988, 63-82911; Jul. 11, 1988, 63-170928
Int. Cl.[5] A61B 5/055
U.S. Cl. 128—653.2 **23 Claims**

1. A phase distortion correcting method in a magnetic resonance imaging system, comprising:
a step of generating a static magnetic field, field gradients and an RF magnetic field;
a step of detecting a magnetic resonance signal produced from a desired area of an object to be examined by the generated magnetic fields and field gradients;
a step of reconstructing an image from the detected signal, said image consisting of an array of complex valued pixels;
a step of establishing a plurality of one or more partial regions on the reconstructed complex image, each of said partial regions being a subset of complex valued pixels from said array;
a step of determining a phase distortion contained in the complex valued pixels in each said partial region;



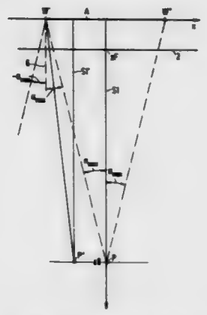
a step of processing said pixels, utilizing said determined phase distortion, to correct said phase distortion of each of said partial regions.

5,113,866

METHOD FOR ULTRASOUND IMAGING

Dietrich Hassler, Uttenreuth, and Klaus Killig, Hoechstadt-/Aisch, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 24, 1990, Ser. No. 632,924
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1990, 90100754
Int. Cl.[5] A61B 8/00
U.S. Cl. 128—661.01 **20 Claims**



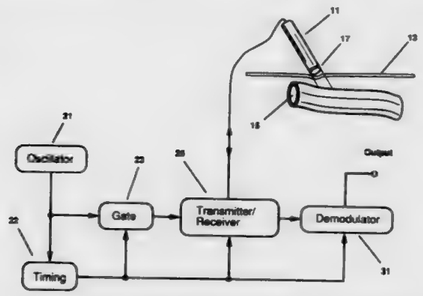
1. A method for ultrasound imaging of an examination subject having a layer having a non-uniform speed of sound distribution, comprising the steps of:
beginning an adaption phase by ultrasonically scanning a plane section of said examination subject including said layer line-by-line using a transducer array consisting of a plurality of side-by-side transducers;
receiving ultrasound echo signals from said examination subject in an aperture of said transducer array, said echo signals having respective signal delays associated therewith and said echo signals being incident on said transducers in said aperture at respective angles of incidence relative to the scan lines;
for each scan line, comparing the signal delays of the received echo signals with signal delays which would focus the transducers of the transducer array on said scan line giving a uniform speed of sound distribution in said layer;
calculating deviating values for the signal delays of the echo signals for a scan line dependent on said comparing and on the angle of incidence of the echo signals on said transducers;
calculating a correction value for each angle of incidence, for focussing each scan line, from said deviating values for the delays in a selected plurality of scan lines;
beginning an imaging phase by ultrasonically scanning said plane section of said examination subject including said layer line-by-line using said transducer array;
receiving further ultrasound echo signals from said examination subject in said aperture of said transducer array, said further echo signals having respective signal delays associated therewith and said further echo signals being incident on said transducers in said aperture at said respective angles of incidence relative to the scan line; and
modifying the signal delays of the further echo signals dependent on the angle of incidence of the echo signals and dependent on the correction value for that angle of incidence calculated in the adaption phase.

5,113,867

FLUID FLOW CHARACTERIZING

David A. Janszen, 82 Park St., Apt. 3, Medford, Mass. 02155

Filed May 16, 1990, Ser. No. 525,189
Int. Cl.[5] A61B 8/06
U.S. Cl. 128—661.09 **5 Claims**



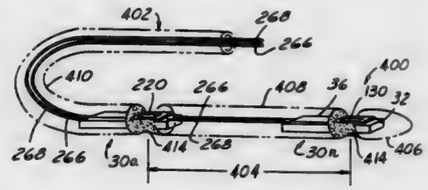
1. Apparatus for characterizing the flow of fluid bearing suspended particles, said apparatus comprising:
a transducer;
driver means for repetitively energizing said transducer to emit an ultrasonic burst;
means for providing a return signal directly corresponding to acoustic energy received by said transducer without demodulation;
means for comparing the amplitude of said return signal with a preselected amplitude threshold at a preselected time interval after each burst which interval corresponds to the distance from said transducer to the sample of fluid flow which is to be characterized;
means for providing a binary output signal which is the result of each comparison and which continues from each comparison to the next at a level corresponding to the result of the comparison, whereby said output signal includes frequency components representative of Doppler shifts occasioned by the movement of blood in said vessel.

5,113,868

ULTRAMINIATURE PRESSURE SENSOR WITH ADDRESSABLE READ-OUT CIRCUIT

Kensall D. Wise, and Hin-Leung Chau, both of Ann Arbor, Mich., assignors to The Regents of The University of Michigan, Ann Arbor, Mich.

Division of Ser. No. 431,627, Nov. 3, 1989, Pat. No. 5,013,396, which is a division of Ser. No. 190,310, May 4, 1988, Pat. No. 4,881,410, which is a division of Ser. No. 57,884, Jun. 1, 1987, Pat. No. 4,815,472. This application Dec. 21, 1990, Ser. No. 631,655
The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.
Int. Cl.[5] A61B 5/0215; G01L 9/12
U.S. Cl. 128—675 **20 Claims**



1. A pressure sensing catheter system, comprising:
(a) a catheter;
(b) a pressure sensor at a predetermined location of the catheter; and
(c) signal conduit means within the catheter for providing a path for signals to be passed between an external monitor and the pressure sensor, the signal conduit means including only two electrical conductors which are connectable to the external monitor,
the pressure sensor including (1) pressure transducer means for converting a sensed pressure into a first electrical signal which is detectable over the signal conduit means by an external monitor, (2) first switching means for selectively controlling when the first electrical signal is generated, and (3) means responsive to at least one command signal from the external monitor for selectively activating the first switching means at a distinct interval of time,
whereby the external monitor may receive separately in time the first electrical signal generated by the pressure sensor.

5,113,869

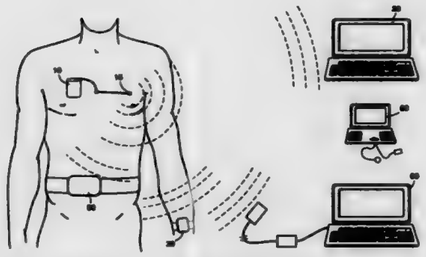
IMPLANTABLE AMBULATORY ELECTROCARDIOGRAM MONITOR

Tibor A. Nappholz, Englewood; William N. Hursta, Littleton; Albert K. Dawson, Denver, and Bruce M. Steinhaus, Parker, all of Colo., assignors to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Aug. 21, 1990, Ser. No. 570,379
Int. Cl.[5] A61N 1/05
U.S. Cl. 128—696 **28 Claims**

1. A chronically and totally implanted heartbeat signal monitor capable of communicating with a message-receiving device, comprising:
subcutaneous sensing means, adapted to be located remote from a patient's heart, for sensing heartbeat signals,

means responsive to sensed heartbeat signals for determining a heart abnormality, and



means responsive to said determining means for communicating with said message-receiving device to report on a heart abnormality.

5,113,870

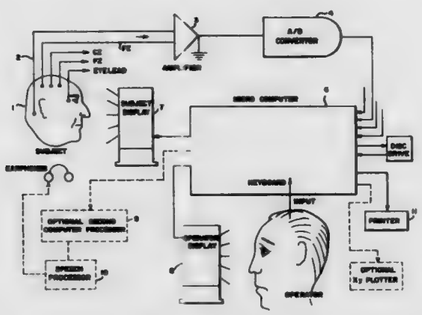
METHOD AND APPARATUS FOR THE ANALYSIS, DISPLAY AND CLASSIFICATION OF EVENT RELATED POTENTIALS BY INTERPRETATION OF P3 RESPONSES

Joel P. Rosenfeld, 2526 Hartzell Ave., Evanston, Ill. 60201

Continuation of Ser. No. 45,069, May 1, 1987, Pat. No. 4,932,416. This application Apr. 6, 1990, Ser. No. 495,284

Int. Cl.[5] A61B *5/0476*

U.S. Cl. 128—731 **3 Claims**



1. A method of determining the cognitive response to personally meaningful information of a subject to a repeatedly presented significant personal knowledge stimulus or stimuli interspersed with nonsignificant stimuli comprising:

(a) formulating a series of stimuli to be presented to the subject, said stimuli to include non-significant stimuli and possibly personally significant stimuli;

(b) providing a source of stimulation to the subject, including said personal knowledge and said nonsignificant stimuli;

(c) providing detection means for detecting event related potentials;

(d) translating event related potentials to P300 brain waves;

(e) obtaining P300 brain wave activity; and

(f) analyzing said P300 brain wave activity for personal knowledge detection.

5,113,871

DEVICE FOR THE DETERMINATION OF INCISIONAL WOUND HEALING ABILITY

Jouko Viljanto, Terkokatu 18, SF-20720 Turku; Rainer Govenius, Eristäjänmutka 29, SF-20310 Turku; Kurt Lönnqvist, Uudenmaankatu 12 B, SF-20500 Turku, and Timo Hurula, Tuureporinkatu 14 B, SF-20110 Turku, all of Finland

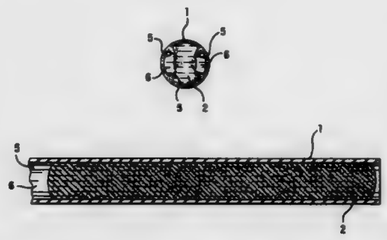
PCT No. PCT/FI88/00113, § 371 Date Mar. 15, 1990, § 102(e) Date Mar. 15, 1990, PCT Pub. No. WO89/00403, PCT Pub. Date Jan. 26, 1989

PCT Filed Jul. 8, 1988, Ser. No. 457,726

Claims priority, application Finland, Jul. 13, 1987, 873075

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—768 **5 Claims**



1. A device for collecting wound exudate from an incisional wound the device comprising a pliable capillary tube (1) to be left inside a wound, the tube end to be placed in a wound being fitted with a sponge (2) intended for the attachment and growth of cells, wherein at least the end of capillary tube (1) to be left in the wound is proved with at least one inner groove (4,6) and that the sponge is a wet-expanding viscose cellulose sponge containing macro- and micropores in communication with each other.

5,113,872

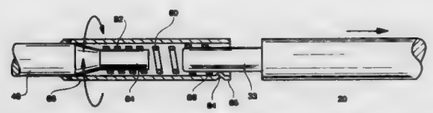
GUIDEWIRE EXTENSION SYSTEM WITH CONNECTORS

Scott L. Jahrmarkt, Fort Lauderdale; Fernando M. Viera, Hialeah, and J. William Box, Maimi, all of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.

Filed Apr. 18, 1990, Ser. No. 510,523

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—772 **15 Claims**



1. A guidewire extension system comprising: an extension guidewire adapted to be releasably but firmly connected to a proximal end of an initial or primary guidewire, said extension guidewire having a distal end and a proximal end, and a connecting assembly mounted at the distal end of said extension guidewire and including a coiled spring constructed and arranged to receive and grippingly engage and lock against a proximal end of the initial or primary guidewire and, a small diameter tube received over said coiled spring and fixed to said distal end of said extension guidewire, said tube having maintaining means within the distal end portion of said tube for maintaining said spring in said tube.

5,113,873

CONTRACEPTION AND PROPHYLAXIS ENHANCEMENT SYSTEM

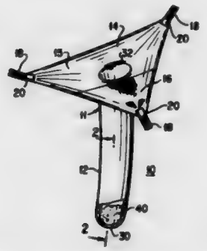
George L. Boarman, 13187 Highland Rd., Highland, Md. 20777

Filed Jun. 4, 1990, Ser. No. 532,568

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[5] A61F *6/06, 6/04*

U.S. Cl. 128—830 **18 Claims**



1. A contraception and prophylaxis enhancement system for use by a female, comprising:

(a) prophylactic means for at least partial insertion into a vaginal cavity of said female and having a dimension sufficient to substantially interface with a wall of said vaginal cavity, said prophylactic means including an extended first tubular member having a closed digital end and an open proximal end;

(b) shield means positionally located contiguous a lower abdominal area of said female and being secured to said prophylactic means;

(c) means for releasably coupling said shield means to said female;

(d) absorbent fluid capturing means disposed within said extended first tubular member for maintaining semen within said first tubular member; and,

(e) means for insertion and placement of said first tubular member within said vaginal cavity, said insertion means being defined by a substantially rigid second tubular member having a closed distal end and being reversibly insertable within said first tubular member, said second tubular member having an axially extended cavity formed therein and being accessible through an open proximal end for storage of at least said prophylactic means, said insertion means further including a releasable closure sealingly coupled to said open proximal of said second tubular member.

5,113,874

MEMBRANES USEFUL IN PREPARING PROPHYLACTIC DEVICES HAVING PATHOGEN RESISTANT BARRIERS, AND FLEXIBLE ELECTRODES

Hovaness H. Maronian, Rochester, N.Y., assignor to Rochester Medical Devices, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 261,050, Oct. 21, 1988, abandoned. This application Oct. 19, 1989, Ser. No. 423,899

The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.

Int. Cl.[5] A71F *6/04*

U.S. Cl. 128—844 **40 Claims**

1. A prophylactic device having an improved barrier to resist the transmission of sexually transmitted virus, including those causing AIDS and HERPES comprising:

a hollow article having a continuous thin elastic membrane wall that is preshaped to anatomically conform to portions of the body and provide a physical barrier which resists the transmission of pathogens,

said membrane wall comprising a material, which is capable of cyclical elastic stretching and relaxing without normally experiencing a permanent set or fracturing or tearing of the membrane,

said material consisting essentially of a matrix having submicroscopically small pores formed therein during manufacture, with said pores tending to enlarge during stretching of the membrane and to contract during relaxation of the membrane from its stretched condition,

a thin layer of ductile metal on an outer surface of the membrane for sealing the pores therein,

said thin ductile metal layer comprising a continuous vacuum deposited vapor of a ductile metal applied directly to the surface of the membrane, and

said ductile metal layer having an undulated or wrinkled appearance when the membrane is in a relaxed state, and the undulated or wrinkled appearance being extended and progressively smoothed out as the membrane is elastically expanded, without breaking or fracturing of the metal layer,

whereby said metal layer improves the barrier resistance of the prophylactic member to the passage of pathogens therethrough, despite cyclically repeated elastic stretching and relaxing of the membrane.

5,113,875

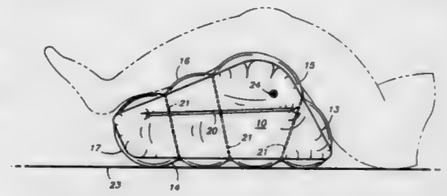
INFLATABLE LEG-SUPPORTING BOLSTER

Trevor S. Bennett, Suite 104 - 3373 Capilano Road, North Vancouver, British Columbia, Canada V7R 4W7

Filed Sep. 24, 1991, Ser. No. 766,666

Int. Cl.[5] A61G *15/10*

U.S. Cl. 128—845 **6 Claims**



1. An inflatable leg-supporting bolster adapted to rest upon a surface for engagement by and support of the legs of a person lying in a supine position on the surface, comprising:

a pair of flexible side panels, each side panel having an identical shape including a plurality of intersecting edges arranged about its periphery;

a flexible sheet having laterally-spaced parallel side edges extending between transverse end edges, the sheet being sealed to itself across its end edges and being sealed to the edges of the side panels along its respective side edges to complete a sealed inflatable structure by forming a circumferential support extending between the side panels, the circumferential support including a base area and two upwardly-inclined areas that intersect one another;

horizontal ribbing means joined across the side panels for defining their lateral separation when the bolster is inflated;

upright ribbing means joined between the base and each of the upwardly-inclined areas of the sheet for defining their vertical separations when the bolster is inflated; and

air valve means for selectively admitting or releasing air within the bolster;

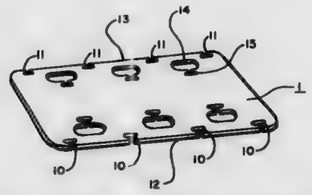
whereby the bolster, when inflated, can rest upon a surface while supported by the base area and with the side panels in spaced parallel positions holding the sheet in a configuration exposing the upwardly-inclined areas of the sheet for engagement by the legs of a supine user.

5,113,876

SKELETAL STABILIZATION APPARATUS FOR USE IN TRANSPORTING AND TREATING PATIENTS AND METHODS THEREFOR

John A. Herman, 16 Hewes St., Port Jefferson Station, N.Y. 11776

Filed Apr. 26, 1990, Ser. No. 514,697
Int. Cl.[5] A61F *5/37*
U.S. Cl. 128—870 **10 Claims**



1. Apparatus for skeletal stabilization of a patient which apparatus comprises in combination a generally planar radiolucent board with a generally rectilinear plan shape and at least one radiolucent strap, the board defining along at least each of two opposite edges at least one slot on each edge, the slot generally having the shape of a T, the strap having first and second ends, the first end being comprised of a section having a width at least equal to the width of the strap at the extreme first end of the strap and being narrower than the width of the strap for a selected distance from the extreme first end, the riser section of the T having a width greater than the thickness of the narrower portion of the strap and the head of the T-slot having a height greater than the thickness of the strap and a length less than the width of the strap, the strap thereby being adapted to be fitted into the head of the T by passing it laterally through the riser section of the T-slot and turning it so that the width of the strap is substantially parallel to the head of the T, the strap thereby being secured from removal from the T so that the strap is secured to the board.

5,113,877

ANKLE SPRAIN MANAGEMENT SYSTEM

Glenn W. Johnson, Jr., Summit, and Henry J. McVicker, Chatham, both of N.J., assignors to Aircast Incorporated, Summit, N.J.

Filed Mar. 6, 1991, Ser. No. 665,604
Int. Cl.[5] A61F *5/01*
U.S. Cl. 128—882 **20 Claims**



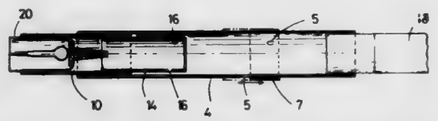
1. An ankle sprain management system comprising:
a U-shaped fluid impervious compartment of flexible material forming a compress, the compress being divided into inner and outer chambers, each chamber having an outer wall and a common inner wall;
said inner chamber receiving a first thermally conductive fluid and adapted for abutting contact with the ankle;
said outer chamber containing a second fluid that freezes before said first liquid and that is in temperature transfer relationship with the first fluid through the common wall;
said outer chamber being subdivided into multiple smaller chambers each coupled to another by a restricted opening sufficiently small to allow the second fluid frozen therein to be easily broken to enable said compress to conform generally to the shape of the ankle;
an open center portion formed between the legs of the U for accommodating the fibular malleolus and providing an unrestricted open channel for the upward passage of edema;
flexible means joining the inner upper ends of the sides of the U-shaped compartment to assist in maintaining the U shape of the compress upon freezing of the second fluid; and
stretchable elastic straps coupled to the top and the bottom of the U-shaped compartment for extension around the leg and foot to hold the compress in place against the ankle.

5,113,878

CIGARETTE-HOLDER INCLUDING A FILTER, SUITABLE TO WEAN SMOKERS FROM THE HABIT OF SMOKING

Pasquale Polese, Via Gramsci, 4, Porto Torres (Sassari), Italy 07046

Filed Jun. 27, 1990, Ser. No. 544,606
Claims priority, application Italy, Jul. 13, 1989, 48186 A/89
Int. Cl.[5] A24D *3/04*
U.S. Cl. 131—198.2 **7 Claims**



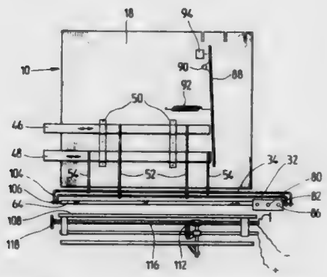
1. A device for progressively reducing, in a programmable way, the inhalation by a smoker of nicotine produced by a cigarette, said device comprising:
a cylindrical pipe having a set of staggered through-holes on the surface thereof, said pipe having first and second ends, said first end being suitable for receiving the unlit end of a cigarette and the smoke therefrom;
an annular member elastically embracing said pipe and a positionable on the surface thereof so as to partially or totally cover said through-holes for varying the amount of air admitted to the pipe and mixed with cigarette smoke inside said pipe;
a holder inserted into said pipe in said second end of said pipe, said holder having an inner passage partially plugged by a bowl-like member, the bottom of which faces said first end of said pipe, said bowl-like member being provided with longitudinal cuts in a wall thereof and a peg-like terminal portion in the bottom thereof; and
a filter member in the shape of a small cylindrical capsule, said capsule-like filter member being internally hollow and open at one end, said capsule-like filter member being arranged in said holder and inside said pipe so as to obstruct the inner passage of said holder, said capsule-like filter member having at least one through-hole in said capsule, the diameter of said capsule being less than the diameter of said pipe for forming an annular space within said pipe in which the cigarette smoke becomes cooled prior to passage through said hole.

5,113,879

LIGHTED CIGARETTE DISPENSING APPARATUS

Alain G. J. M. Alleon, 116, rue des Moines, 75017 Paris, France

Filed Apr. 4, 1985, Ser. No. 719,766
Claims priority, application France, Apr. 16, 1984, 84 05992
Int. Cl.[5] F23Q *2/00, 7/00*; A24F *13/00*
U.S. Cl. 131—329 **17 Claims**



1. A cigarette dispensing apparatus, comprising:
support means;
a magazine supported by said support means and having an open base, an interior, and a plurality of interior walls separating said interior into a plurality of fixed compartments defining parallel longitudinal axes, each of said compartments being adapted to receive a vertically extending stack of cigarettes longitudinally extending parallel to the axis of the compartment;
selection means including, for each of the compartments, a selection device supported by the support means for movement between a normal, closed position, wherein the selection device blocks the cigarettes in the compartment from dropping through the base of the magazine, and an open position, wherein the selection device allows cigarettes in the compartment to pass through the base of the magazine;
a mobile floor supported by the support means for lateral movement across the bottom of the magazine in outward and return directions, including a cell extending parallel to the axes of the compartments for receiving one cigarette at a time;
a reversible motor connected to the mobile floor to move said floor in the outward and return directions;
a fixed housing supported by said support means to receive a cigarette carried to the fixed housing by the cell of the mobile floor, and including a first end forming an opening to discharge a cigarette from said fixed housing;
selection actuation means connected to the selection devices to move the selection devices between the closed and opened positions, and to actuate the motor to move the mobile floor in the outward direction to move the cell of the mobile floor across the bottom of the magazine to receive a selected cigarette from one of the compartments and to carry said selected cigarette to the fixed housing;
a flap supported for movement between a closed position, wherein the flap closes the first end of the fixed housing, and an open position, wherein the first end of the housing is open to discharge a cigarette therethrough;
a guide rod supported adjacent and extending along the fixed housing;
a guide sleeve slidably mounted on the guide rod;
lighting means fixed to said sleeve and extending into the housing to light a cigarette therein;
first control means actuated when the mobile floor moves in the outward direction, to move the lighting means away from the flap for a period of time to provide a space in said housing to receive a cigarette;
spring means connected to said guide sleeve to urge the lighting means against a cigarette in the housing after said period of time, to light the cigarette in the housing and to urge the cigarette out from the housing through the first end thereof; and
second control means actuated when the mobile floor moves in the return direction, to move the flap to the open position thereof to eject a lighted cigarette from the housing under the urging of the spring means.

5,113,880

DENTAL FLOSS AND INTERDENTAL CLEANING TOOL

Narimichi Honda, Yamaguchi, and Kazuo Yagi, Ohtake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 343,419, Apr. 26, 1989, abandoned. This application Jul. 17, 1990, Ser. No. 553,346
Claims priority, application Japan, Apr. 26, 1988, 63-103180; Apr. 26, 1988, 63-103181
Int. Cl.[5] A61C *15/00*
U.S. Cl. 132—321 **30 Claims**



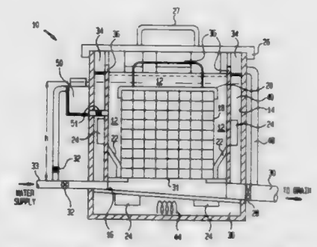
1. A dental floss composed of a drawn multifilament of an ultrahigh-molecular-weight polyolefin having an intrinsic viscosity of at least 5 dl/g.

5,113,881

DYNAMIC ULTRASONIC CLEANING AND DISINFECTING DEVICE AND METHOD

Israel Lin, Kerem Maharal 30840, and David Erel, 8 Mordechai St., Ramat Hasharon 47441, both of Israel

Filed Jun. 22, 1990, Ser. No. 542,033
Claims priority, application Israel, Jun. 25, 1989, 090740
Int. Cl.[5] B08B *3/10*
U.S. Cl. 134—1 **22 Claims**



1. A device for simultaneously cleaning, disinfecting and washing fruit and vegetable items comprising:
a cleaning tank, adapted to contain water in which at least one of cleaning, disinfecting and flotation agents are dissolved;
at least one ultrasonic transducer arranged to provide ultrasonic vibrations through the water contained in said cleaning tank at a predetermined vibration energy level, and with a predetermined frequency, intensity, duration, and direction; and
a basket adapted for placement within said cleaning tank so as to be rotatable by a motor, said basket having disposed

therein a plurality of partitions each shaped as a vane such that during rotation of said basket, the water in said cleaning tank is stirred,

the fruit and vegetable items placed in said basket being maintained therein in submerged fashion and being forced by said stirred water to move and rotate relative to said transducer and around themselves to ensure sufficient exposure of all sides of the fruit and vegetable items directly to a maximal level of vibration intensity regardless of the highly absorptive nature thereof when subjected to said ultrasonic vibrations traveling through the water as part of a cleaning process, to facilitate removal by washing from the surfaces thereof substantially all contaminants such as residual mud, dirt, microbiological flora, mold, worms, bacteria, germs, herbicides, pesticides and fertilizers,

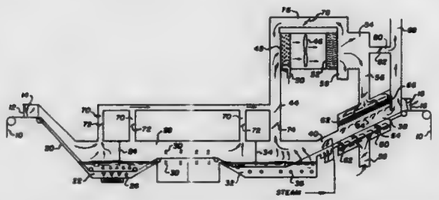
wherein said device further comprises a centrifugal water pump for additionally stirring said fruit and vegetable items by ejecting a portion of the water in said cleaning tank against the internal walls thereof, subjecting said items to a vortex-like movement and exposing all their surfaces to said vibration energy.

5,113,882

METHOD OF CLEANING WORKPIECES WITH A POTENTIALLY FLAMMABLE OR EXPLOSIVE LIQUID AND DRYING IN THE TUNNEL

John Gileta, Chateauguay, Canada, assignor to Electrovert Ltd., La Prairie, Canada

Filed Aug. 28, 1990, Ser. No. 574,342
Int. Cl.[5] B08B *3/10, 5/00*
U.S. Cl. 134—19 **17 Claims**



1. In a method of cleaning workpieces with a potentially flammable or explosive liquid cleaning solvent, wherein workpieces are conveyed on a conveyor in an enclosure through a solvent tank followed by a hot water tank, and then conveyed through an enclosed tunnel to dry the workpieces, the improvement comprising the steps of:

withdrawing vapor and gas from at least above the hot water tank,

dehumidifying the withdrawn vapor and gas,

recirculating the dehumidified gas through the tunnel only in a direction opposite to movement of the workpieces on the conveyor, and

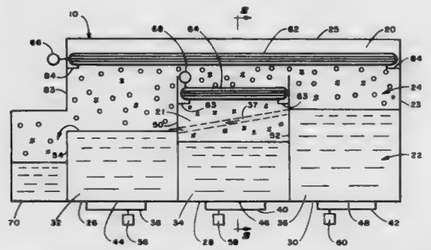
heating the workpieces on the conveyor to assist in drying while in the tunnel.

5,113,883

APPARATUS FOR CLEANING OBJECTS WITH VOLATILE SOLVENTS

Robert M. Sluga, Gurnee; Randolph H. Watkins, Wonder Lake; Jerry D. Fisher, McHenry; Dennis C. Berry, Woodstock, and Milo Eldridge, Ringwood, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 601,229, Oct. 22, 1990. This application Feb. 29, 1991, Ser. No. 659,806
Int. Cl.[5] B08B *3/10*
U.S. Cl. 134—60 **14 Claims**



1. A cleaning apparatus, comprising:

an enclosure having bottom and side walls defining an internal chamber, an access opening, and a pair of spaced partition walls subdividing a lower portion of said internal chamber into first, second and third compartments each for separately containing a supply of solvent, which compartments open onto a common upper space;

heaters associated with said first, second and third compartments for volatilizing solvent from each respective compartment into said upper space;

a first condenser disposed in said second compartment near said common upper space for limiting the amount of volatilized solvent which enters said common upper space from said second compartment;

a second condenser disposed proximate said access opening for limiting the amount of volatilized solvent which leaves said enclosure from said common upper space;

means for collecting condensed solvent from said second condenser and removing such condensed solvent from said enclosure;

means for purifying and recycling said condensed solvent to said first compartment;

means for allowing excess solvent in said first compartment to overflow into said third compartment; and

means for purifying solvent from said third compartment and recycling the purified solvent to said first compartment.

5,113,884

AUTOMATIC HOSE WASHER

Edward L. Melgeorge, R.R. 1, Box 2222H, Nashwauk, Minn. 55769

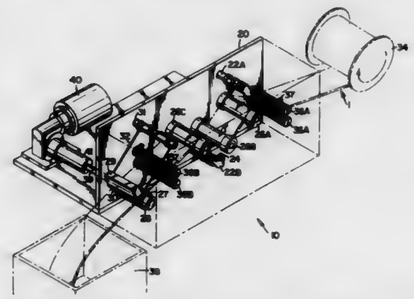
Filed Sep. 13, 1990, Ser. No. 581,741
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—122 R **19 Claims**

15. A high water pressure, fire hose washing apparatus comprising:

(a) a back plate, said back plate comprising a thickness, length, and width sufficient to support the apparatus, said back plate having a generally square shape defined by a top edge, bottom edge, and first and second side edges between which lies a middle area;

(b) a first and second cleaning head, said first cleaning head comprising a perpendicular length passing through and extending outwardly beyond said back plate generally towards said back plate top and first side edges, said first cleaning head comprising at least two nozzles positioned across said first cleaning head length, said nozzles positioned to direct the water generally parallel to the back plate towards said back plate top edge, said second cleaning head comprising a perpendicular length passing through and extending outwardly beyond said back plate generally toward said back plate bottom and second side edges diagonally downward from said first cleaning head, said second cleaning head comprising at least two spray nozzles positioned across said second cleaning head length, said nozzles generally positioned to direct water upward generally parallel to said back plate in an area adjacent said back plate;

(c) a first, second, and third guide roller, said guide rollers each comprising a perpendicular length rotatably attached to said back plate and extending outwardly from said back plate, said guide rollers oriented to direct hose in a generally serpentine pattern, said first guide roller attached to said back plate adjacent said first cleaning head and oriented generally parallel and beneath said first cleaning head in the path of said first cleaning head nozzles, said second guide roller attached to said back plate adjacent said second cleaning head and oriented generally parallel add above said second cleaning head in the path of said second cleaning head nozzles, said third guide roller attached to said back plate adjacent said back plate top edge and second side edge;



(d) a drive roller rotatably attached to said back plate adjacent said back plate second side edge, said drive roller comprising a length extending beyond said back plate, wherein said drive roller is rotatable at various speeds by connection of said drive roller to an external power source; and

(e) a pressure roller positioned in tension contact with said drive roller, said pressure roller rotatably attached to said back plate by a spring, said pressure roller comprising a length generally held perpendicular to said back plate and parallel to said drive roller.

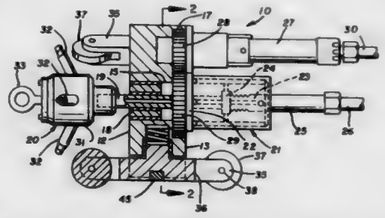
5,113,885

PIPE CLEANING APPARATUS

Donald G. Ramsey, 962 Cornell Ave., Youngstown, Ohio

Filed Apr. 29, 1991, Ser. No. 692,705
Int. Cl.[5] B08B *9/04*
U.S. Cl. 134—167 C **4 Claims**

1. An improvement in an internal pipe cleaning apparatus comprising a main support body, a multiple nozzle assembly extending therefrom, a plurality of nozzles in said nozzle assembly, means for rotating said nozzle assembly relative to said main support body, said improvement comprises guide and wheel assemblies resiliently mounted on said main body member, each of said guide and wheel assemblies comprising a bifurcated support arm having a cylindrical extension extending therefrom, a pair of wheels pivotally secured in spaced oppositely disposed relation to one another on said arm, a plurality of spaced mounting slots in said main body member for receiving said arms, each of said mounting slots having a central bore for registration with said cylindrical extension



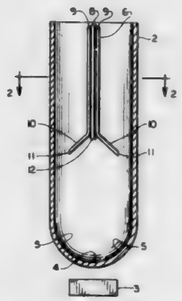
within, a spring positioned in each bore and means for resiliently securing said arm within said bore.

5,113,886

APPARATUS FOR WASHING MAGNETIC PARTICLES IN A VESSEL WITH A BOTTOM PULL

John R. Wells, Culver City, and Jack R. Uren, Jr., Seal Beach, both of Calif., assignors to Source Scientific Systems, Inc., Garden Grove, Calif.

Filed May 8, 1990, Ser. No. 521,246
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—172 **7 Claims**



1. A probe employed in conjunction with an apparatus for washing a pellet of magnetic particles, the pellet being magnetically bound to an apical region at the bottom of a vessel, the bottom of the vessel including a periapical region adjacent to and above the apical region, the probe comprising:

a liquid channel terminating with an outlet for expressing liquid onto the pellet within the vessel, and

a vacuum channel terminating with a forked inlet for aspirating liquid from the vessel,

said liquid channel and said vacuum channel being adjacent to one another and coupled to one another,

said forked inlet having at least two prongs with a configuration for contacting the periapical region of the vessel and for avoiding contact with the apical region of the vessel.

5,113,887

MOBILITY ASSISTING DEVICES

Herman, Jr. Harry H., 3003 Van Ness St., N.W., Suite 204 South, Washington, D.C. 20008

Filed Jul. 27, 1989, Ser. No. 385,420
Int. Cl.[5] A61H *3/00*
U.S. Cl. 135—68 **24 Claims**

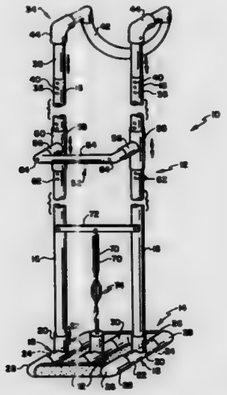
1. A mobility assisting device comprising:

a substantially planer base support structure;

a vertical support structure pivotally coupled to said base support structure;

support means adapted to support at least a portion of an

individual's weight through engagement with the individual's underarm, said support means being pivotally coupled to said vertical support structure whereby, in use, said base support structure and said support means pivot relative to said vertical support structure so as to remain substantially parallel to the ground surface;



said vertical support structure comprising first and second vertical support rods, said vertical support rods having first and second ends, said first ends being pivotally coupled to said substantially planer base support structure, said support means being pivotally coupled at each end thereof to said second ends of said vertical support rods.

5,113,888
PNEUMATIC MOISTURE SENSITIVE VALVE
Robert Beggs, 1633 Truckee Way, Woodland, Calif. 95695
Filed Jan. 23, 1990, Ser. No. 468,841
Int. Cl.[5] E03B *1/00*; F16K *17/36*
U.S. Cl. 137—1 **33 Claims**



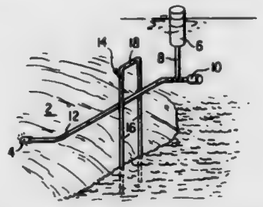
1. A method for controlling irrigation for plant husbandry, the steps including;

forming a water passageway with a removeable obstruction;

placing and removing the obstruction in response to ambient soil moisture conditions;

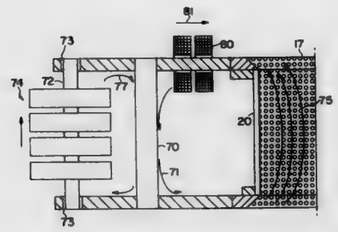
sensing the ambient soil moisture conditions and directly providing a back pressure using air against the obstruction which resists against water pressure used for irrigation, thereby assuring irrigation only when it is needed.

5,113,889
FLOATING INTAKE FOR TRANSPORT OF LIQUID FROM A FIXED DEPTH BELOW THE SURFACE OF A RESERVOIR
Virgil M. McGuire, Jr., Rte. 3, Box 299, Hamilton, Ala. 35570
Filed Feb. 22, 1991, Ser. No. 659,179
Int. Cl.[5] F16K *31/20*, *33/00*
U.S. Cl. 137—2 **11 Claims**



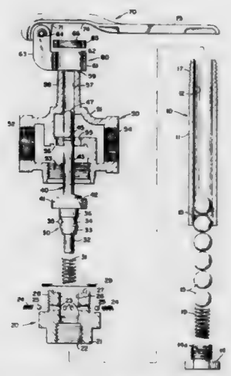
11. A method for supplying water from a selected depth in a body of water comprising providing float means for floating in said body at a predetermined relationship with respect to the surface of said body, providing intake means for receiving said water, and supporting said intake means with stem means connecting said float means to said intake means, wherein said stem means is structured to be of substantial weight and density for ensuring that said intake means is maintained in said body of water at a predetermined depth below the surface of said water and in a predetermined orientation with respect to said float means for withdrawing water from said predetermined depth regardless of changes in the level of said water.

5,113,890
METHOD AND APPARATUS FOR REGULATING THE FLOW OF PARTICULATE FERROMAGNETIC SOLIDS
Cesar Elizondo-Gonzalez; Virgilio Juárez-Mata; Ricardo Viramontes-Brown; Raul Quintero-Flores, and Juan-Jorge Roesch-Dietlen, all of Nuevo León, Mexico, assignors to Hylsa S.A. de C.V., Monterrey, Mexico
Filed Nov. 14, 1990, Ser. No. 613,148
Claims priority, application Mexico, Nov. 14, 1989, 18361
Int. Cl.[5] F17D *1/16*; F15B *21/00*
U.S. Cl. 137—13 **10 Claims**



1. Method of regulating the flow of ferromagnetic particulates which comprises establishing a magnetic flux by means of a permanent magnet along a magnetically conductive loop inclusive of any ferromagnetic particulates in a physically unobstructed particulate flow path which flux is of an intensity sufficient to impede or stop the flow of such particulates through such path, deactivating, diminishing, or deviating such flux from said flow path to at least diminish the impeding effect of such flux on such particles.

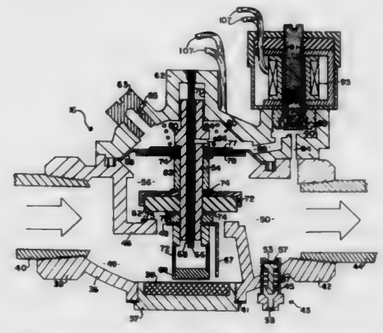
5,113,891
WATER FREEZE GUARD VALVE
Frederick P. Carney, 2006 E. Highland Dr., Hurricane, W. Va. 25526
Filed Oct. 31, 1991, Ser. No. 786,010
Int. Cl.[5] F16K *31/64*; E03B *7/12*
U.S. Cl. 137—60 **19 Claims**



1. A water freeze guard valve that utilizes the volumetric expansion of water as the sole source of power for closing said valve which is line-connected to a water supply system, said valve comprising a valve seat through which water flows from said water supply system, a waterfilled and elongated actuation chamber which contains an expansion sensing means and is disposed approximately vertically, a linkage means, which comprises a detent groove and a poppet disc and extends into said chamber and is operably connected to said expansion sensing means, for transmitting said expansion to said poppet disc when water in said chamber begins to freeze, a latch means for maintaining said poppet disc spaced apart from said valve seat during normal operation of said water supply system, whereby flow of water from said water supply system is unimpeded, a biasing means for forcing said poppet disc into sealing contact with said valve seat when freezing of said water in said chamber occurs and forces said latch means out of said detent groove, whereby said flow through said valve seat is stopped, and a lever means for selectively re-setting said latch means after said freezing and said subsequent thaw have occurred in order to re-set said poppet disc to a normal, open position.

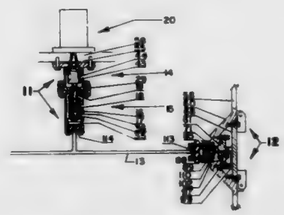
5,113,892
FREEZE CONTROL AND DRAIN VALVE
Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434; Rudolph R. Romo, 833 O'neal, and Donald J. Luschar, 923 Incline Way, both of Incline Village, Nev. 89450
Filed Aug. 19, 1991, Ser. No. 747,283
Int. Cl.[5] E03B *7/12*; F16K *31/64*
U.S. Cl. 137—62 **16 Claims**

1. A pressure, activated diaphragm valve adapted to be installed in a liquid supply line comprising a body member, said body member having means to attach to an up-stream supply line and a down-stream discharge line, a seat mounted within said body member, a plug member co-operable with said seat to form a diaphragm valve control chamber, inlet and outlet passageways connecting said chamber with said liquid supply line, a solenoid valve means to control the amount of said liquid in said control chamber to control the relationship between said plug member and said seat, said plug member having a first and second position, said first position allowing said liquid to flow from said up-stream supply line to said down-stream discharge line, said second position of said plug member not allowing said liquid to flow from said up-stream supply line to said down-stream discharge line, a solenoid valve drain means for draining said liquid from said down-stream discharge side of said body member, said drain means having a first and second position, said last named first position not allowing said liquid to drain from said body member, said ast named second position allowing said liquid to drain from said body member, actuator means for actuating said means to control the electrical amount of said liquid in said control chamber and said drain means, control means for said actuator means, said control means responding lest one sensor, whereby, when said sensor responds automatically to a first predetermined condition, said control means actuates said actuator means to cause said plug member to assume it's said second position and at the same time causes said drain means to



assume it's said second position, thereby shutting off said up-stream supply line when said plug member is seated on said valve seat and draining said liquid in said down-stream discharge line of said body member when said drain means is in its draining position and, when said sensor responds automatically to a second predetermined condition, said control means actuates said actuator means to cause said plug member to assume its said first position and at the same time causes said drain means to assume its said first position, thereby allowing said liquid to flow between said up-stream supply line and said down-stream discharge line when said plug member is unseated from said valve seat and closing said solenoid valve drain means to prevent draining of said liquid flow in said down-stream discharge line.

5,113,893
SAFETY PRESSURE RELIEF VALVE SHUT-OFF
John E. Schwartz, 1642 Buckhorn La., Billings, Mont. 59105
Filed Apr. 30, 1990, Ser. No. 516,343
Int. Cl.[5] F16K *17/40*
U.S. Cl. 137—70 **2 Claims**



1. A safety device consisting of a normally open valve, a blow out safety device, a pressure transmitting conduit, in combination, protecting against an uncontrollable leak from a vessel due to a faulty fixture on the vessel,

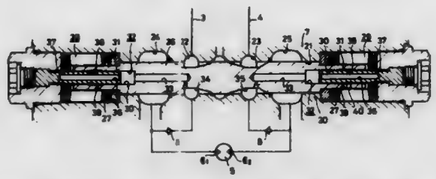
a. wherein a normally open valve is strategically located totally within the vessel, between the product in the vessel and the fixture,
b. wherein a blow out safety device is strategically located in the shell of the vessel, remote from the normally open valve,
c. wherein a pressure transmitting conduit communicates between the normally open valve and the blow out safety device,
d. wherein a fluid under pressure introduced into the blow out safety device, closing the normally open valve,
e. wherein at a preset excess pressure of the product in the vessel, a blow out plug, rupturing, allowing the normally open valve to reopen,
f. wherein the blow out safety device, comprising a flexible partition will further assure that no product is lost due to failure of a part of the said safety device.

5,113,894

COUNTERBALANCE VALVE

Toshiyuki Yoshida, Kasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP90/00516, § 371 Date Dec. 20, 1990, § 102(e) Date Dec. 20, 1990, PCT Pub. No. WO90/12973, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 20, 1990, Ser. No. 635,618
Claims priority, application Japan, Apr. 24, 1989, 1-101708
Int. Cl.[5] F15B *13/02*
U.S. Cl. 137—106 **9 Claims**



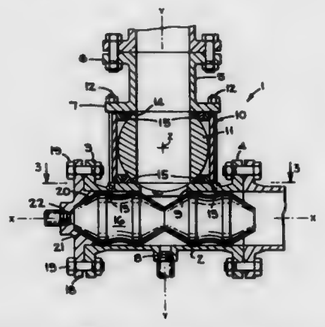
1. A counterbalance valve characterized in that a spool (26) is provided for a valve body (20) so that the spool (26) can slide rightward or leftward, the spool (26) being for connecting a port (22) on a first pump side and a port (23) on a second pump side to a port (24) on a first motor side and a port (25) on a second motor side and for disconnecting these ports (22, 23) on the first and second pump sides from the ports (24, 25) on the first and second motor sides, and characterized in that said spool (26) is constructed in such a way that said spool (26) is retained by springs in a neutral position in which the ports are disconnected from each other, and pressurized oil in a left pressure receiving chamber (28) moves said spool (26) from said neutral position to a first position in which the port (23) on the second pump side is connected to the port (25) on the second motor side while the port (22) on the first pump side is not connected via the spool (26) to the port (24) on the first motor side, whereas pressurized oil in a right pressure receiving chamber (29) moves the said spool (26) from said neutral position to a second position in which the port (22) on the first pump side is connected to the port (24) on the first motor side while the port (23) on the second pump side is not connected via the spool (26) to the port (25) on the second motor side, and characterized in that a first plurality of throttle apertures (37, 38, 39), connected to said left pressure receiving chamber (28) and said port (22) on the first pump side, are arranged between said left pressure receiving chamber (28) and said port (22) on the first pump side with the effective area of said first plurality of throttle apertures (37, 38, 39) varying with the position of said spool, and a second plurality of throttle apertures (37, 38, 39), connected to said right pressure receiving chamber (29) and said port (23) on the second pump side, are also arranged between said right pressure receiving chamber (29) and said port (23) on the second pump side with the effective area of said second plurality of throttle apertures (37, 38, 39) varying with the position of said spool.

5,113,895

THREE WAY VALVE AND DISTRIBUTION PIPE COMPRISING SAME, BOTH ADAPTED TO BE CLEANED BY SCRAPING

Eugene Le Devehat, Saligny, France, assignor to FMC Corporation, Chicago, Ill.

Filed Dec. 20, 1989, Ser. No. 454,103
Claims priority, application France, Dec. 20, 1988, 88 16846
Int. Cl.[5] B08B *9/04*
U.S. Cl. 137—244 **6 Claims**



1. A three-way ball valve adapted for connection to a liquid distribution pipe with a pipe cleaning device therein, said valve comprising:
a) a valve body having a straight flow passage with an inner surface defined by a tubular wall for connecting said body to said distribution pipe, an inlet to and an outlet from said straight flow passage, and a branch flow passage intersecting said straight flow passage through an opening in said tubular wall between said inlet and outlet;
b) a valve closure element housing through which the branch flow passage extends; and
c) a ball valve closure element in said housing for controlling flow through said branch flow passage, said closure element having a spherical external surface and a cylindrical bore, said closure element located such that its spherical external surface is substantially tangential to said inner surface of said straight flow passage at said opening when said closure element is in its closed position to minimize deposition and accumulation of residues in said straight flow passage and to facilitate removal of said residues across said spherical external surface at said opening by movement of said pipe cleaning device through said liquid distribution pipe and said straight flow passage.

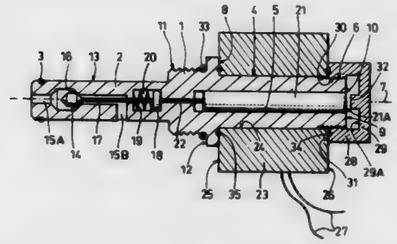
5,113,896

SAFETY VALVE FOR FLUID CIRCUIT

Christian Tortellier, Noyal sur Vilaine, France, assignor to Hydris, Chateaubourg, France

Filed Sep. 30, 1991, Ser. No. 767,517
Claims priority, application France, Oct. 3, 1990, 90 12203
Int. Cl.[5] F16K *13/11*
U.S. Cl. 137—269 **4 Claims**

1. A safety valve for fluid circuit comprising:
a valve body comprising a cylindrical part which itself comprises an axial bore and an end threading;
an obturation member, mobile with respect to said valve body, placed on a conduit which it separates into two parts, and capable of selectively occupying a first position, in which it obturates said conduit, and a second position in which the two parts of said conduit are in mutual communication;
an elastic member for returning the obturation member into its first position;
an electromagnet for electrically controlling opening of the valve, which comprises a solenoid coil presenting an axial cavity allowing passage of the cylindrical part of the valve body, as well as a core coupled to the obturation member and contained inside said bore;
a blind nut which comprises a tapping capable of cooperating with said end threading of said cylindrical part of the valve body in order to maintain said solenoid coil in its configuration of assembly with the valve body, and which comprises a face for clamping and a bottom opposite said clamping face;
wherein:
a) a stud, fast with the nut, projects with respect to the inner



face of the bottom of the nut and opposite the bore of said cylindrical part of the valve body;
b) in the configuration of assembly of the solenoid coil with the valve body (FIG. 1), the clamping face of the nut is in abutment on the solenoid coil, the axial length of said solenoid coil being such that said stud is then out of abutment on the end of the core of electro-magnet, the obturation member being, in addition, disposed in its first position; and,
c) in a configuration in which the solenoid coil is not disposed around said cylindrical part of the valve body (FIG. 2), the fact of screwing the nut on the end threading of said cylindrical part is capable of placing said nut in a position with respect to the valve body in which the stud is in abutment on the end of the core of the electromagnet and has repelled said core and the obturation member coupled thereto, placing this obturation member in its second position.

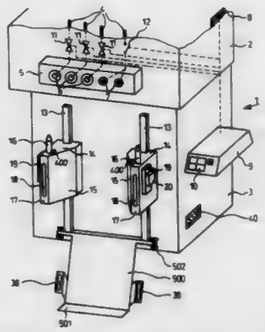
5,113,897

HEIGHT-ADJUSTABLE SUPPLY UNIT FOR RECEIVING WORKING DEVICES, ESPECIALLY MEDICAL DEVICES

Ryszard Kummerfeld, Lübeck-Travemünde; Siegfried Baumgarten; Gerd Holzapfel, both of Lübeck; Wolfgang Falb, Krummesse, and Ulrich Palm, Norderstedt, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Jun. 27, 1991, Ser. No. 721,965
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1990, 4021013
Int. Cl.[5] F16L *5/00*; B42F *13/00*; A61M *5/00*
U.S. Cl. 137—357 **20 Claims**

1. A supply unit for supplying media to working devices, the supply unit comprising:
a connection head moveable into a plurality of positions;
a distributing connection means on said connection head for supplying the working device with the media;
a coupling part mounted on the working device having guide faces;
a receiving part mounted on said connection head, said receiving part having receiving jaws complimentary to said coupling part;
one of said coupling part and said receiving part defining a bore; and



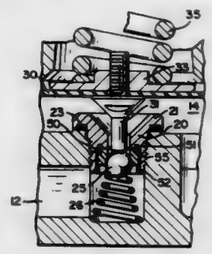
a pin extending from the other of said coupling part and said receiving part, said pin engageable with said bore.

5,113,898

VALVE ASSEMBLY FOR FLUID PRESSURE REGULATION

Lawrence W. White; Gabriel J. Pietrykowski, and Stephen D. Able, all of Bryan, Ohio, assignors to The Aro Corporation, Bryan, Ohio

Filed Jun. 4, 1990, Ser. No. 532,747
Int. Cl.[5] F16K *51/00*; G05D *16/06*
U.S. Cl. 137—454.5 **8 Claims**



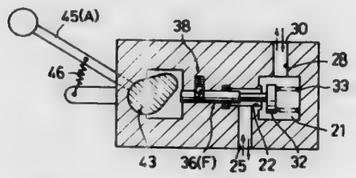
3. A valve assembly for a fluid pressure regulator having a body with a fluid flow passage therethrough, comprising:
a valve seat housing having first and second ends and a central axial bore, said bore having two portions with different diameters and an annular sealing ledge therebetween;
a rigid one-piece valve seat having a central axial bore;
a resilient sealing ring positioned against said annular sealing ledge;
means for positioning said valve seat, in a sealing relationship with said resilient sealing ring and in a floating relationship, coaxial with and adjacent to said annular sealing ledge in said second end of said valve seat housing within said fluid flow passage;
a spherical valve closure element positioned adjacent to one side of said floating valve seat and biased against said valve seat by a spring; and
means, unattached to said valve closure element and responsive to fluid pressure changes in a service outlet, for pushing said valve closure element counter to said bias to vary a pressure drop through said valve assembly in response to said fluid pressure changes.

5,113,899

CHECK VALVE WITH VALVE OPENING DEVICE

Keitaro Yonezawa, Kobe, Japan, assignor to Kabushiki Kaisha Komek, Kobe, Japan

Filed Jan. 23, 1991, Ser. No. 644,784
Claims priority, application Japan, Jan. 31, 1990, 2-23066
Int. Cl.[5] F16K *15/18, 17/28*
U.S. Cl. 137—461 **5 Claims**



1. In a check valve with a valve opening device, including
a valve box (20) having a check valve chamber (21), an inlet port (22) of said check valve chamber (21) and a valve opening member insertion port (23) formed in series therein,
a check valve member (32) inserted into said check valve chamber (21) and resiliently urged for valve closing toward said inlet port (22) by means of a check spring (33),
a valve opening member (36) having a front end portion facing said check valve member (32) and a back end portion facing an actuator shaft (43), being oil-tightly inserted into said valve opening member insertion port (23) so as to be slidably in the fore and back direction, and being adapted to be changed over between a valve opening position (F) on the fore side and a valve opening cancellation position (E) on the back side,
a manipulation lever (45) adapted to turn said actuator shaft (43) as well as to be manipulated for changeover between a valve opening posture (B) for changing over said valve opening member (36) to said valve opening position (F) and a valve opening cancellation posture (A) for allowing said valve opening member (36) to be changed over from said valve opening position (F) to said valve opening cancellation position (E) by means of a hydraulic pressure in said inlet port (22), and
a valve opened state holding means (38) holding said valve opening member (36) at the valve opening position (F),
the improvement comprising:
said valve opened state holding means (38) being arranged in both the valve opening member (36) and the valve box (20),
a manipulation lever return spring (46) being disposed in a manipulation force transmitting system from the manipulation lever (45) to the valve box (20) through the actuator shaft (43), and
said manipulation lever return spring (46) being adapted to allow the manipulation lever (45) to be changed over from the valve opening cancellation posture (A) to the valve opening posture (B) as well as to automatically return the manipulation lever (45) from the valve opening posture (B) to the valve opening cancellation posture (A).

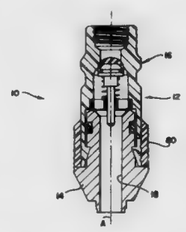
5,113,900

CHECK VALVE WITH QUICK LOCK ATTACHMENT FEATURE

Major H. Gilbert, Gladys, Va., assignor to Bridge Products, Inc., Northbrook, Ill.

Filed Jan. 30, 1991, Ser. No. 648,549
Int. Cl.[5] F16K *15/06*
U.S. Cl. 137—515.5 **22 Claims**

1. A check valve comprising:
first and second valve body parts;
a protruding neck formed on the first valve body part; a receiving flange formed on the second body part and sized to receive the protruding neck in a telescoping
a snap fit retaining mechanism comprising at least one hook element on one of the first and second valve body parts and at least one hook receiving element on the other of the first and second valve body parts, said hook element shaped to engage the hook receiving element to hold the first and second valve body parts together as a valve body assembly, with the neck received in the flange;



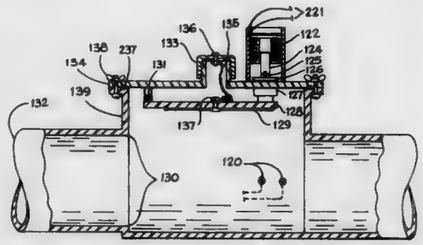
said valve body assembly defining a central passageway extending through the first and second valve body parts;
a valve seat defined around the central passageway of the valve body assembly;
a valve pin mounted in the central passageway to releasably seal against the valve seat; and
a locking element mounted on the flange for selectively locking the hook element in engagement with the hook receiving element.

5,113,901

SEWER RELIEF VALVE

Jack W. Young, 5510 E. 20th St., Tucson, Ariz. 85711

Filed Sep. 9, 1991, Ser. No. 756,582
Int. Cl.[5] F16K *37/00*
U.S. Cl. 137—554 **5 Claims**



1. A device for providing an alarm and for blocking backed-up sewage when the contents of an obstructed sewer line back up into residential and other buildings, comprising:
a valve housing, consisting of a plain T-fitting including a substantially horizontal segment of pipe for connection with a standard sewer-line pipe and including a flanged opening, protruding upwards perpendicularly to said segment of pipe, for access to the interior of said housing;
a cover plate, removably attached to said flanged opening;
a valve seal seat, disposed within said segment of pipe normal to the direction of flow of material passing through said valve housing;
a valve flapper, hinged to said cover plate and capable of assuming a substantially horizontal position, wherein said valve seal seat is open, and a substantially vertical position, wherein the valve flapper seals said valve seal seat and provides blockage for any material backing up the sewage line;

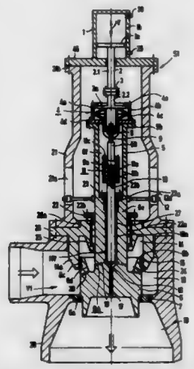
a solenoid, attached to said cover plate, including a removable core consisting of a plunger rod affixed to a first magnet, said solenoid being positioned so as to permit the upward travel of said plunger rod and provide upward motion to said first magnet when the solenoid is energized;
a second magnet, affixed to said valve flapper in a position minimizing its distance from said first magnet when the solenoid is not energized and when the valve flapper is in a substantially horizontal position, so that said first and second magnets exert sufficient attraction force on each other to keep the valve flapper in the substantially horizontal position;
two electrically conductive sensor buttons, penetrating the wall of said segment of pipe at a location above the normal level of the fluid flowing through said valve housing, said sensor buttons providing a normally-open electrical switch that becomes closed when a conductive path between them is established by the presence of fluid produced by the rising level of said fluid flowing through said valve housing;
electrical means, connected to said sensor buttons, for energizing said solenoid and cause said plunger and first magnet to move upward, thus disconnecting the first magnet from said second magnet and permitting the two to become separated, which in turn frees the movement of the valve flapper and permits it to swing downward and meet said valve seal seat to provide blockage for any material backing up the sewage line; and
alarm means, connected to said electrical means for energizing said solenoid, for alerting a user of the device when said solenoid is caused to be energized by the rising level of said fluid flowing through said valve housing.

5,113,902

CONTROL VALVE FOR MEDIA IN VAPOR OR LIQUID FORM

Hermann Dörr, Herzogenaurach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 27, 1991, Ser. No. 768,377
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1990, 4030903; Dec. 19, 1990, 4040701
Int. Cl.[5] F16K *11/22*
U.S. Cl. 137—556 **26 Claims**



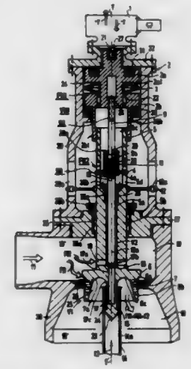
1. A control valve assembly having spindle actuation for media in vapor or liquid form, comprising:
a) a main valve having a main valve seat, a main throttle body cooperating with said main valve seat for opening and closing said main valve, and an associated main spindle for transmitting thrust forces to said main throttle body;
b) an auxiliary valve having an auxiliary valve seat, an auxiliary throttle body cooperating with said auxiliary valve seat for opening and closing said auxiliary valve, and an associated auxiliary spindle for transmitting the thrust forces to said auxiliary throttle body;
c) a common spindle actuator supplying control forces for said main spindle and said auxiliary spindle, first and second spring-elastic couplings for respectively transmitting the control forces to said main and said auxiliary throttle bodies; and
d) said main and auxiliary spindles having means for causing said main throttle body to close before said auxiliary throttle body reaches said auxiliary valve seat in a closing operation, and means for causing said auxiliary throttle body to open before said main throttle body leaves said main valve seat in an opening operation.

5,113,903

STEAM CONVERTING VALVE WITH SPINDLE ACTUATION

Hermann Dörr, Herzogenaurach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 27, 1991, Ser. No. 768,367
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1990, 4030902; Dec. 19, 1990, 4040736
Int. Cl.[5] F16K *11/22*
U.S. Cl. 137—556 **27 Claims**



1. A steam converting valve having spindle actuation, comprising:
a) a main valve having a main valve seat and a main throttle body cooperating with said main valve seat for controlling a main steam flow, a common spindle actuator supplying thrust forces, a main spindle associated with said main valve for transmitting the thrust forces to said main throttle body for opening and closing said main valve;
b) an auxiliary valve having an auxiliary valve seat and an auxiliary throttle body cooperating with said auxiliary valve seat for controlling an atomizer steam flow, an auxiliary spindle associated with said auxiliary valve for transmitting the thrust forces to said auxiliary throttle body for opening and closing said auxiliary valve;
c) first and second spring elastic couplings for respectively transmitting the thrust forces for said main spindle and said auxiliary spindle to said main and said auxiliary throttle bodies; and
d) said main and auxiliary spindles having means for causing said main throttle body to close before said auxiliary throttle body reaches said auxiliary valve seat, so that the main steam flow is blocked off upstream of the atomizer steam flow in a closing operation, and means for causing said auxiliary throttle body to open said auxiliary valve before said main throttle body leaves said main valve seat,

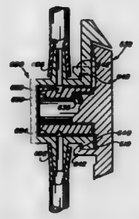
so that the atomizer steam flow develops upstream of the main steam flow in an opening operation.

5,113,904

FLOW CONTROL DEVICE FOR ADMINISTRATION OF INTRAVENOUS FLUIDS

Jerry L. Aslanian, 6210 N. Camelback Manor Dr., Paradise Valley, Ariz. 85253

Continuation of Ser. No. 305,078, Feb. 2, 1989, Pat. No. 5,005,604, which is a continuation of Ser. No. 630,632, Jul. 13, 1984, abandoned. This application Jan. 9, 1991, Ser. No. 639,830
The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.
Int. Cl.[5] F16K *5/10, 37/00*
U.S. Cl. 137—556 **8 Claims**



1. A valve for establishing and maintaining predetermined administration flow rates in an IV system having a source of fluid connected to an administration needle via a flexible tubing line, said valve comprising:

(a) a valve housing of a first material defining a generally cylindrical valving chamber, said housing having an inlet and an outlet communicating with said valving chamber and connectable in said tubing line;

(b) a valving drum having a generally cylindrical outer surface and defining a centrally extending recess, said drum defining a flow path along its outer surface and being rotatable in said chamber to selectively position said flow path to vary the flow rate from the valve inlet to the outlet across said flow path, said drum being of a material which is relatively softer than the material of said housing;

(c) means for manually rotating said valving drum; and

(d) projection means positioned within said recess and internally supporting at least a portion of said valving drum to maintain said drum outer surface and said valving chamber in sealing contact.

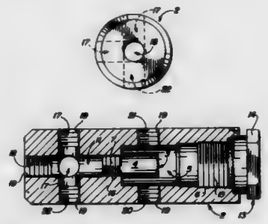
5,113,905

CARBON DIOXIDE FILL MANIFOLD AND METHOD

John E. Pruitt, Weatherford; John A. Pruitt, Perrin, and Jay L. Pruitt, Arlington, all of Tex., assignors to Michael D. Hoyle, Arlington, Tex.

Continuation-in-part of Ser. No. 328,614, Mar. 27, 1989, Pat. No. 4,936,343. This application Mar. 26, 1990, Ser. No. 498,717
The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.
Int. Cl.[5] F17C *7/04*
U.S. Cl. 137—571 **30 Claims**

1. A carbon dioxide fill manifold for storing liquid and gaseous carbon dioxide and dispensing gaseous carbon dioxide, comprising atomizer means; at least one liquid chamber port provided in said atomizer means for liquid communication with a liquid chamber having a selected chamber volume for containing liquid carbon dioxide under pressure; pressure actuated valve means provided in said atomizer means for receiving liquid carbon dioxide from the liquid chamber and vaporizing at least a portion of the liquid carbon dioxide responsive to a selected pressure differential across said pressure actuated valve means; and at least one vapor container port provided in said atomizer means for gaseous communication with a vapor container having a selected container volume and adapted to receive the residual liquid carbon dioxide and gaseous carbon dioxide from said atomizer means and dispense the gaseous carbon dioxide to a user.

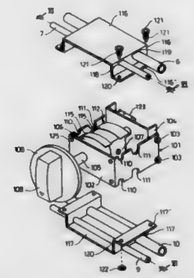


5,113,906

MULTIPLE ROTARY CONTROL VALVE FOR USE WITH A STERILIZING APPARATUS

Marcelo A. Högner, Austria 2353, Buenos Aires, Argentina

Filed Sep. 4, 1990, Ser. No. 576,845
Claims priority, application Argentina, Sep. 7, 1989, 314863
Int. Cl.[5] F16K *11/00, 7/06*
U.S. Cl. 137—595 **5 Claims**



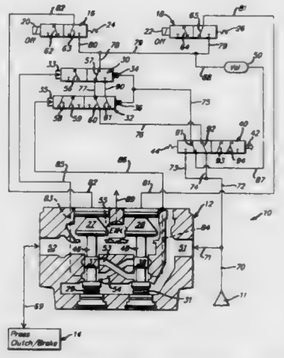
1. A multiple rotary control valve for use in conjunction with a steam sterilizing apparatus comprising a container having a hermetically sealable door, heating means, a steam generating water circuit, a cooling water circuit, a venting circuit and a purging circuit, said circuits comprising conduits made of flexible and elastic material controlled by said valve, said valve comprising a housing having front, rear and side walls, and top and bottom covers, a shaft journaled in said front and rear walls; at least two cams fixedly mounted, side by side on said shaft, each of said cams having a flat chordal portion and a cylindrical portion; the flat chordal portions of said cams being angularly offset; said top and bottom covers having openings aligned in a transverse direction relative to said shaft; at least two substantially parallel flexible conduits trained in the openings of the top cover, and at least two substantially parallel flexible conduits trained in the openings of the bottom cover, whereby each cam is disposed between and adjacent to a pair of opposite conduits; the top and bottom edges of said side walls having notches aligned with the openings of said covers for accommodating said conduits, a flexible wear member attached to one of the side walls and comprising at least two individual, curved, flexible strips, each overlying and partly encircling each cam and disposed between the cam and the respective conduits; means for removably and resiliently attaching said top and bottom covers to each other, whereby rotation of the cams will sequentially compress the adjacent conduits against the respective covers to control the flow of fluid therethrough.

5,113,907

DYNAMIC SELF-MONITORING AIR OPERATING SYSTEM

Neil E. Russell, Bloomfield Hills, Mich., assignor to Ross Operating Valve Company, Troy, Mich.

Filed Jan. 29, 1991, Ser. No. 647,601
Int. Cl.[5] F15B *13/043, 20/00*
U.S. Cl. 137—596.16 **20 Claims**



1. A monitoring system for a pneumatic control system having a control valve assembly, the control valve assembly having an inlet, an outlet, an exhaust, and at least a pair of control valve elements, the control valve elements each being movable between at least two positions for controlling the flow of pressurized air between the inlet and the outlet and between the outlet and the exhaust, the control valve elements being adapted to move together in sequence with one another between their respective positions during normal operation, said monitoring system comprising:

monitoring means for detecting relative movement of the control valve elements out of sequence with one another and for preventing further operation of the control system in response to said detection of said out-of-sequence movement of the control valve elements; and

self-monitoring means for detecting a malfunction of said monitoring means and for preventing further operation of the control system in response to said detection of said malfunction of said monitoring means,

said monitoring means including at least a pair of monitor valve elements each having port means therein, said monitor valve elements being movable together in sequence with one another between at least a pair of respective valving positions during normal operation, said monitoring means including means for moving said monitor valve elements to out-of-sequence positions in response to said detection of said out-of-sequence movement of the control valve elements, and fluid communication means interconnecting said monitor valve elements for preventing further operation of the control system when said monitor valve elements are out of said sequence with one another.

5,113,908

MULTISTEP TRIM DESIGN

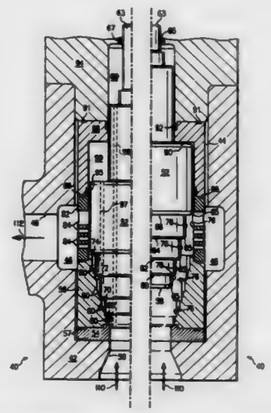
Joseph H. Steinke, Huntington Beach, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 4, 1990, Ser. No. 557,129
Int. Cl.[5] F16K *47/04*
U.S. Cl. 137—625.3 **29 Claims**

1. An improved stepped flow capacity apparatus in a valve of the type having an inlet for receiving fluid and an outlet for discharging fluid, comprising:

a stepped plug having an axial length disposed between the inlet and the outlet; and

a stepped cage dimensioned to telescopically receive said stepped plug, said stepped cage having radial and axial surfaces, said axial surfaces having discrete axial channels formed therein for allowing the passage of the fluid between said cage and said stepped plug from one said radial surface to another said radial surface to adjust flow capacity of the fluid by passing the fluid along a stepped and channeled path from the inlet to the outlet.

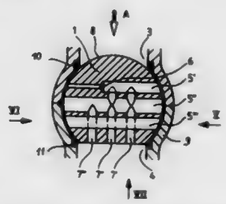


5,113,909

CLOSING MEMBER FOR A VALVE

Seppo Marin, and Jouni Pyötsiä, both of Helsinki, Finland, assignors to Neles Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 282,058, Dec. 9, 1988, abandoned. This application Sep. 26, 1989, Ser. No. 412,593
Claims priority, application Finland, Jan. 4, 1988, 880008
Int. Cl.[5] F16K *47/02, 47/04, 5/10*
U.S. Cl. 137—625.32 **17 Claims**



1. Closing member for a valve, where said closing member can be fitted turnably into a valve housing provided with a through flow duct, the closing member containing a plurality of main ducts and side ducts, each said duct having a center line, wherein said main ducts placed side by side pass through the closing member, said main ducts forming the flow opening in the closing member, wherein at least some of said main ducts in the closing member are in flow communication with each other by means of said side ducts with at least some of said side ducts being disposed eccentrically relative to said main ducts so that the center line of each such side duct is spaced from the center line of an associated main duct with which the said side duct is in communication, wherein each said side duct is in flow communication with at most a portion of the total number of said main ducts, the cross section of each said main duct is concavely curved, said closing member including a mantle surface surrounding said main and said side ducts.

5,113,910

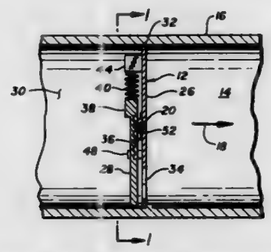
BUTTERFLY VALVE WITH BIASED AREA REDUCTION MEANS

Larry K. Ball, Chandler, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 374,897, Jun. 30, 1989. This application Oct. 16, 1991, Ser. No. 778,429

Int. Cl.[5] F16K *1/22*

U.S. Cl. 137—630.15 **1 Claim**



1. A butterfly valve comprising in combination:

a mounting body forming a flow path extending therethrough;

a shaft defining a longitudinal axis thereof that extends across the flow path, the shaft being supported by the mounting body for rotational movement about the axis,

a valve plate disposed in the flow path and oriented substantially parallel to the axis, the valve plate being supported by the shaft for rotational movement from a first rotational position maximally restricting flow along the path to a second rotational position maximally permitting flow, the valve plate comprising a first plate-like member having a hole formed therethrough and a second plate-like member secured to the first so as to permit translational movement of the second member in directions substantially parallel to the first member, the second member being variably movable from a first translational position at which the second member spans the hole to maximally restrict flow therethrough to a second translational position at which the second member maximally permits flow through the hole;

converting means secured to the shaft and the second member for effecting the translational movement in response to relative rotational movement between the shaft and the valve plate; and

biasing means, secured to the valve plate so as to be carried therewith during rotational movement thereof, for resisting the translational movement and urging the second member toward the position at which it spans the hole,

whereby the converting means and biasing means are cooperative when the second member is between the first and second translational positions to alternatively effect the translational movement of the second member or the rotational movement of the valve plate in response to rotation of the shaft.

5,113,911

PRESSURE ACTUATED ELASTOMERIC VALVE

Robert Hirsh, Philadelphia, Pa., assignor to Advantec Corp., Philadelphia, Pa.

Continuation of Ser. No. 449,275, Dec. 11, 1989, abandoned. This application Jun. 7, 1991, Ser. No. 713,036

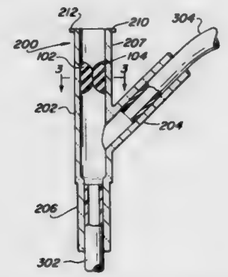
Int. Cl.[5] F16K *15/14*

U.S. Cl. 137—844 **10 Claims**

4. A two-fluid actuated valve comprising:

a first gate comprised of a solid mass of elastomeric material;

a second gate comprised of a solid mass of elastomeric material abutting said first gate and forming a fluid-tight seal at said abutting location; and



said first and second gates being compressible from their abutting position under fluid pressure.

5,113,912

INFLATABLE CUSHION FOR SEALING OFF LEAKS IN CONTAINERS AND PIPES

Manfred Vetter, Burg Langendorf, D-5352 Zülpich, Fed. Rep. of Germany

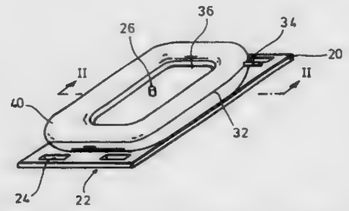
PCT No. PCT/DE89/00264, § 371 Date Nov. 12, 1990, § 102(e) Date Nov. 12, 1990, PCT Pub. No. WO89/11061, PCT Pub. Date Nov. 16, 1989

PCT Filed Apr. 25, 1989, Ser. No. 602,290

Claims priority, application Fed. Rep. of Germany, May 14, 1988, 3816573

Int. Cl.[5] F16L *55/16*

U.S. Cl. 138—99 **13 Claims**



1. Inflatable cushion for sealing off leaks in containers and pipes comprising a flexible counter plate that is provided on opposite edge regions with fastening elements for a clamping device surrounding the container or tube; an inflatable inner space of annular configuration, a nipple, said inflatable inner space is accessible from outside of the counter plate through said nipple, said inflatable inner space is limited by at least one wall made of a rubber-like reinforced material, said inflatable inner space is arranged on the side of the said counter plate facing the leak and assembled with the said counter plate, said inflatable inner space and the said counter plate delimiting a trough that covers the leak; and an access passage in the inflatable cushion for removal of a fluid that collects in the said trough.

5,113,913

TOGGLE TYPE CLAMP FOR COUPLING A HEDDLE FRAME TO A FRAME HOLDER

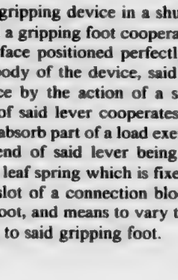
Martin Graf, Horgenberg, Switzerland, assignor to Grob & Co. Aktiengesellschaft, Horgen, Switzerland

Filed Jan. 8, 1991, Ser. No. 638,807

Int. Cl.[5] D03C *9/06*

U.S. Cl. 139—91 **12 Claims**

1. An apparatus for coupling a heddle frame to respective frame holders each extending along the side of side supports of the heddle frame and movable upwards and downwards and arrestable by application of the toggle lever principle, in which a lock pivotably mounted to an end of the frame holder or an edge of the heddle frame includes an operating lever containing a spring and a lever connecting member pivotably mounted to said operating lever and engaging said frame holder, which operating lever and lever connecting member define a lever pair and are pivotable upon tensioning of said spring according to the toggle lever principle into an over-center position in which they keep form locking coupling members that are



present at the frame holder and the side support of the frame stave and that are pressed together by a spring force acting perpendicularly relative to the up and down movement of said frame holder, wherein said operating lever comprises two parts which are guided in each other and are moveable relative to each other against the action of the spring, of which one part is pivotably mounted to said lever connecting member engaging the frame holder and the other part is pressed against the side support of the frame stave with the pressure force of the spring when the operating lever serving an handle is pivoted into the over-center position.

5,113,914

LEAF SPRING TYPE WEFT GRIPPING DEVICE IN A SHUTTLELESS LOOM

Luciano Corain, Vicenza, Italy, assignor to NUOVOPIGNONE-Industrie Meccaniche e Fonderia S.p.A., Florence, Italy

Filed Jan. 15, 1991, Ser. No. 642,204

Claims priority, application Italy, Jan. 26, 1990, 19161 A/90

Int. Cl.[5] D03D *47/20*

U.S. Cl. 139—448 **3 Claims**



1. A weft yarn gripping device in a shuttleless loom, comprising a body and a gripping foot cooperating with an underlying gripping surface positioned perfectly parallel to it and provided on the body of the device, said foot being pressed against said surface by the action of a spring-loaded lever, wherein one end of said lever cooperates with a travel stop block arranged to absorb part of a load exerted by said loading spring, an other end of said lever being connected to said gripping foot by a leaf spring which is fixed on said lever and is inserted into a slot of a connection block which is rigidly connected to the foot, and means to vary the load transmitted by said leaf spring to said gripping foot.

5,113,915

GRID WELDING MACHINE

Gerhard Ritter; Klaus Ritter; Gerhard Schmidt, all of Graz, and Walter Resch, Pichling Nr., all of Austria, assignors to EVG Entwicklungs- u.Verwertungs-Gesellschaft m.b.H., Graz, Austria

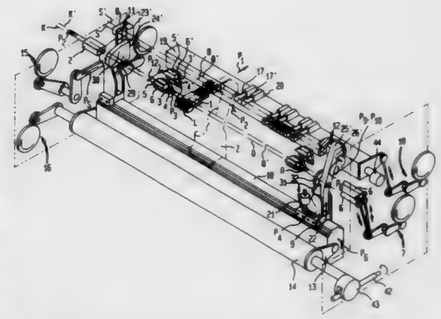
PCT No. PCT/AT90/00049, § 371 Date Jan. 10, 1991, § 102(e) Date Jan. 10, 1991, PCT Pub. No. WO90/14181, PCT Pub. Date Nov. 29, 1990

PCT Filed May 23, 1990, Ser. No. 613,818

Claims priority, application Austria, May 24, 1989, 1269/89

Int. Cl.[5] B21F *27/10*

U.S. Cl. 140—112 **13 Claims**



1. A welding machine for manufacturing grids from longitudinal and transverse wires (Q, Q') intersecting one another at right angles and welded together at the intersection points, having

a device for delivering a plurality of longitudinal wires in a horizontal welding plane;

two feed devices, located on respective feed lines, mutually spaced-apart from each other, for simultaneous feeding of two transverse wires;

a welding electrode arrangement for performing double spot welding in the direction of the longitudinal wires and defining a plurality of welding lines distributed over a range;

two feeder arms (**8**, **9**) for transferring the transverse wires from the feed lines to the welding lines; and

a common feeder arm holder extending at right angles to the longitudinal wire direction;

the feeder arms being located on said common feeder arm holder, movable thereby, disposed outside the outermost longitudinal wires and being movable back and forth on predetermined paths of motion between the feed lines and the welding lines,

characterized in that

the feeder arms (**8**, **9**) are formed for receiving both transverse wires (Q, Q') jointly;

are equipped with clamping devices (**11**, **12**) which are provided on said feeder arms for the transverse wires (Q, Q');

at least one of the feeder arms (**8**, **9**) is movable relative to the other feeder arm in the transverse wire direction for joint prestressing of both transverse wires (Q, Q');

a mechanical drive mechanism (**22**) with adjustable stressing force is provided, coupled to said at least one feeder arm; and

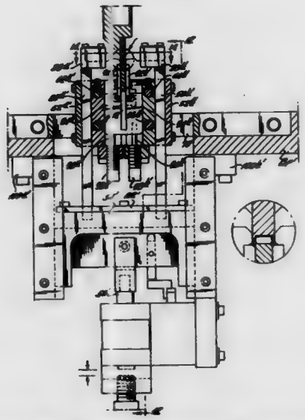
positioning devices (**17**, **17'**) are provided pivotable in the range of the welding lines (S, S') for exact positioning of the transverse wires (Q, Q') in accordance with a predetermined transverse wire spacing.

5,113,916

LEAD STRAIGHTENING METHOD AND APPARATUS

Frank V. Linker, Jr., Broomall, Pa., assignor to American Tech Manufacturing Corporation, Glenolden, Pa.

Filed Aug. 9, 1990, Ser. No. 565,438
Int. Cl.[5] B21F *1/02*
U.S. Cl. 140—147 **21 Claims**



1. Apparatus for aligning the leads of electronic devices having a body portion and plurality of leads extending from the body portion having pads at the free terminal ends comprising:

means for positioning an electronic device at a lead straightening station including a trackway,

at least one lead straightening head comprised of a plurality of fingers engageable between the leads of the electronic device;

means for actuating the heads relative to the electronic device through a straightening cycle; and

pivotally mounted support plates disposed on opposite sides of said trackway at the lead straightening station engageable by the pads of the leads during the straightening cycle to provide a firm but yielding support for the pads, said support plates pivotable outwardly by fingers of the straightening heads during the straightening cycle.

5,113,917

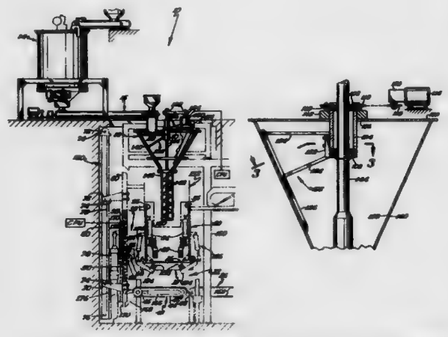
VERTICAL BOTTOM-FILL AUGER ASSEMBLY

Harold R. McGregor, 215 S. Grove, Owatonna, Minn. 55060

Division of Ser. No. 559,629, Jul. 30, 1990, Pat. No. 5,042,539, which is a continuation-in-part of Ser. No. 270,845, Nov. 14, 1988, Pat. No. 4,944,334. This application May 22, 1991, Ser. No. 704,197
Int. Cl.[5] B65B *1/08, 1/12, 1/20*
U.S. Cl. 141—71 **17 Claims**

1. In an apparatus for de-aerating a product and filling said product into a bag, said apparatus including a bottom-fill assembly having a hopper and a fill tube connected to and depending from said hopper, said product being contained initially within said hopper and said fill tube during a bag filling cycle, said hopper having a generally conical inner surface, said fill tube having a length and a bottom end, said apparatus including an agitator or wiper assembly having at least one blade element, at least a portion of said blade element extending into said hopper, the improvement comprising:

a ring member, said ring member being generally circular and having a rim, said ring member being disposed in a generally horizontal orientation, said ring member being rotatably carried on a plurality of support members disposed proximate to and engaging said rim thereof, each of said plurality of support members being connected to the apparatus, the blade element being connected to and depending from said ring member, the blade element rotating within the hopper to mix and de-aerate the product initially contained within the hopper during the bag filling cycle.

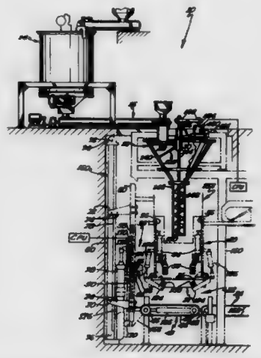


5,113,918

VERTICAL BOTTOM-FILL AUGER ASSEMBLY

Harold R. McGregor, 216 S. Grove, Owatonna, Minn. 55060

Division of Ser. No. 559,629, Jul. 30, 1990, Pat. No. 5,042,539, which is a continuation-in-part of Ser. No. 270,845, Nov. 14, 1988, Pat. No. 4,944,334. This application May 23, 1991, Ser. No. 705,055
The portion of the term of this patent subsequent to Jul. 31, 2007, has been disclaimed.
Int. Cl.[5] B65B *1/08, 1/12, 1/20*
U.S. Cl. 141—114 **8 Claims**



1. A vertical bottom-fill auger assembly for use in de-aerating a product and filling said product into a bag, said bag having an open top and a closed bottom, said vertical bottom-fill auger assembly comprising:

a frame assembly;

a bottom-fill auger assembly, said bottom-fill auger assembly being connected to and supported by said frame assembly, said bottom-fill auger assembly including an auger hopper, a fill tube depending from and connected to said auger hopper and having a bottom end, and an auger shaft having a section of flighting disposed within said fill tube;

a bag handling assembly, said bag handling assembly including a bag gripping mechanism for gripping the bag;

a bag elevator assembly, said bag elevator assembly being connected to said bag gripping mechanism and movable along a vertical path relative to said frame assembly such that the bag may be raised to a raised filling position whereat said fill tube is received through the open top of the bag and the bottom end of the fill tube is proximate to the closed bottom of the bag;

means for controllably lowering said bag elevator assembly from said raised filling position to a lowered filled position whereat the bottom end of the fill tube is proximate to the open top of the bag;

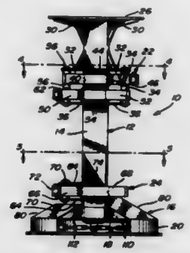
a travelling bag settler assembly for periodically tamping the closed bottom of the bag while the bag is suspended from the bag gripping mechanism and being lowered from said raised filling position to said lowered filled position, said travelling bag settler assembly being connected to and moveable with said bag elevator assembly.

5,113,919

FELLER HEAD

Charles D. MacLennan, 153 Cote St-Charles, Hudson Heights, Quebec, Canada J0P 1J0

Filed Feb. 5, 1991, Ser. No. 650,590
Int. Cl.[5] A01G *23/08*
U.S. Cl. 144—34 R **7 Claims**



1. A feller head comprising an upstanding frame having a base, tree grappling means on the frame, and a circular saw mounted for rotation at the base of the frame in a plane at right angles to the longitudinal axis of the frame, a housing surrounding the circular saw being fixed to the base of the frame, the housing defining an opening exposing the saw at a segment of the periphery thereof to allow the saw to engage a tree to be severed, a saw guard member mounted on the housing for movement between a first position whereby the guard member encloses the opening in the housing, thereby protecting the periphery of the saw, and to a second position clear of the opening to allow exposure of the saw, and means provided on the housing for positively moving the guard between the first and second positions.

5,113,920

WORKBENCH, PARTICULARLY FOR DOORS

Svein Sedeniussen, 270 Ekrhardt Rd., Pearl River, N.Y. 10965

Continuation of Ser. No. 592,332, Oct. 3, 1990, abandoned. This application Jun. 25, 1991, Ser. No. 722,378
Int. Cl.[5] B27H *1/00*
U.S. Cl. 144—286 R **40 Claims**

1. A workbench; comprising:

(a) workbench top means including a first top section and a second top section each such top section including an upper surface, a lower surface, a center edge, an end edge spaced from said center edge and a pair of oppositely disposed side edges which are also spaced from each other;

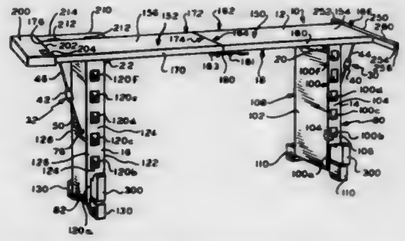
(b) top hinge means connecting said first top section and said second top section along said respective center edges thereof such that in a first disposition of said top hinge means said first top section and said second top section are disposed with their respective center edges in abutting relationship and with their respective upper surfaces in a common plane; and so that in a second disposition of said top hinge means said lower surfaces of said respective first top section and said second top section are disposed in proximity one to the other;

(c) first leg means hingedly secured to said first top section and movable between a folded disposition in proximity to said lower surface thereof and an extended disposition at a predetermined angle with respect thereto;

(d) second leg means hingedly secured to said second top section and movable between a folded disposition in proximity to said lower surface thereof and an extended disposition at a predetermined angle with respect thereto;

(e) each of said first and said second leg means including a first surface and a second surface spaced one from the other and respectfully terminating along first and second edges;

(f) at least one opening formed to extend between said first surface and said second surface of each of said first and



said second leg means and each such opening to extend from said first edges thereof to said second edges thereof, said openings being aligned in substantially the same horizontal plane when said first and said second leg means are disposed in said extended disposition thereof;

(g) a first work support means having a first portion of a size and configuration to be received within said opening of said first leg means and a second portion of a size and configuration to extend from said first portion outside said opening and in proximity to either said first edge or said second edge of said first leg means;

(h) a second work support means having a first portion of a size and configuration to be received within said opening of said second leg means and a second portion of a size and configuration to extend from said first portion outside of said opening and in proximity to either said first edge or said second edge of said second leg means;

(i) said first work support means and said second work support means cooperating to position an article to be worked on in an on-edge disposition along and in proximity to either one side or another side of the workbench.

5,113,921

SHEET MATERIAL FOR MASKING APPARATUS

Dan B. Pool, Phoenix, Ariz., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 330,225, Mar. 29, 1989, abandoned, which is a continuation of Ser. No. 116,508, Nov. 2, 1987, abandoned. This application Jan. 17, 1991, Ser. No. 642,712
Int. Cl.[5] B32B *1/00, 31/00*; B65D *85/00*; E04F *13/00*
U.S. Cl. 156—71 **12 Claims**

1. A roll of masking material having an axis, said roll of masking material comprising a coiled elongate thin flexible sheet having opposite first and second untaped elongate edges, and said roll of masking material having first and second axially spaced ends with said first end of said roll being defined by the first elongate edge of said sheet;

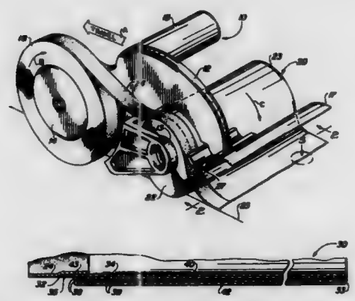
said roll of masking material being adapted to be used in

combination with a tape roll comprising a coiled length of tape having opposite first and second elongate edges and comprising a coating of pressure sensitive adhesive; and a dispensing apparatus comprising:

a frame;

first and second spindles mounted on the frame and having spaced generally parallel axes, the first spindle including means for receiving the tape roll for rotation coaxially about the axis of the first spindle and for positioning the first edge of the length of tape at a first predetermined position axially with respect to the first and second spindles, and the second spindle including means for receiving said roll of masking material for rotation coaxially about the axis of the second spindle and for positioning the first edge of the sheet at a second predetermine position axially with respect to the first and second spindles with the width of the length of tape extending from the first position past the second position and the width of the masking material extending from the second position past the first position so that a portion of the length of tape along the first edge of the length of tape and a portion of the sheet along the first edge of the sheet are both positioned between the first and second positions; and

path defining means on said frame and including said means for locating said first edges of said tape and said sheet material at said first and second positions axially with respect to said spindles, said path defining means defining a path for the length of tape from the tape roll and a path



for said sheet from said roll of making material, the paths including a tape path portion for the tape from the tape roll to the periphery of said roll of masking material and a common path portion beginning along the periphery of said roll of masking material where, in response to the tape and said masking material being pulled from the dispensing apparatus, the pressure sensitive adhesive along the first edge of the length of tape adheres to said portion of the sheet along the first edge of the sheet on the periphery of the roll of masking material to form a tape and sheet composite having opposite edges defined by the second edges of the length of tape and said sheet and an exposed portion of the coating of pressure sensitive adhesive along the second edge of the length of tape;

said coiled elongate thin flexible sheet having a longitudinally extending first fold at the second end of said roll of masking material and between said first and second edges of said sheet, said first fold defining a second edge of a first pleat-like portion of said sheet extending between said first fold and said first edge of said elongate sheet, said first pleat-like portion having opposite inner and outer major surfaces with said outer major surface being disposed radially outwardly on said roll of masking material with respect to said inner major surface, and said first fold defining a first edge of a second pleat-like portion of said sheet extending from said first fold toward the first end of said roll of masking material along the inner major surface of said first pleat-like portion and having a second longitudinally extending edge adjacent the first end of said roll of masking material, said second longitudinally extending edge of said second pleat-like portion being spaced along said first pleat-like portion from said first edge of said sheet by a distance of at least about 0.003 inch to restrict contact of the pressure sensitive adhesive on the tape with the second edge of said second pleat-like portion when the tape is adhered to the outer surface of the first pleat-like portion of the sheet on the roll of masking material, and no greater than about 0.312 inch so that the second pleat-like portion will help to provide support radially of the roll of masking material for the first pleat-like portion of the sheet closely adjacent the first edge of the first to assure firm engagement of the pressure sensitive adhesive with the sheet adjacent said first edge as the tape and sheet are pulled from the dispensing apparatus to form the tape and sheet composite.

5,113,922

VENETIAN BLIND ASSEMBLY FOR A WINDOW IN AN INCLINED ROOF

Per B. Christensen, Puerto Del Carmen, Spain, and Svend A. Sonderby, Videb, Denmark, assignors to V. Kann Rasmussen Industri A/S, Soborg, Denmark

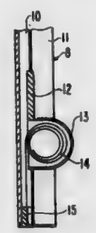
PCT No. PCT/DK89/00186, § 371 Date Jan. 10, 1991, § 102(e) Date Jan. 10, 1991, PCT Pub. No. WO90/01608, PCT Pub. Date Feb. 22, 1990

PCT Filed Aug. 4, 1989, Ser. No. 634,138

Claims priority, application Denmark, Aug. 5, 1988, 4412/88

Int. Cl.[5] E06B *9/30*

U.S. Cl. 160—172 **2 Claims**



1. A shade arrangement for installation on a window in an inclined roof (**1**), said window comprising a sash (**2***a*; **3***a*; **4***a*) having side parts extending in the direction of the roof inclination, said shade arrangement comprising a shade defining a plane and including when installed, inclined profile lists (**8**) mounted on the inner side of said parts (**4***a*), said profile lists (**8**) having slotted tracks (**10**), at least one of which opens transversely to said plane, said tracks (**10**) engaging and guiding lower list (**7**) of the shade at its inclined raising and lowering, the lower list (**7**) being loaded in the direction of the lowering by at least one coil spring (**14**) rotatably seated in a housing (**13**), said housing (**13**) being slidable in the transversely opening track (**10**) and connected to the lower list (**7**), an uncoiled part of the spring extending from the housing (**13**) in the track (**10**) downwards to a lower fixing point (**15**), and the axis of the coiled part of the spring (**14**) seated in the housing being parallel to the longitudinal direction of the lower list.

5,113,923

METHOD FOR THE MELTING OF METALS

Jack C. White, Albany, and Davis E. Traut, Corvallis, both of Oreg., assignors to The United States of America, as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 23, 1990, Ser. No. 618,196

Int. Cl.[5] B22D *2/00*

U.S. Cl. 164—41 **5 Claims**

1. A method of quantitatively determining the molten pool configuration in melting of metals, comprising the steps of:

melting solid metal by application of a melting means to form a molten pool of metal to be received in a cooling crucible;

introducing hafnium metal seeds into the molten metal pool at time intervals as the molten pool solidifies to form an ingot;

removing the ingot from the crucible;

neutron activating the ingot; and

determining the hafnium location in the ingot by radiometric means.

5,113,924

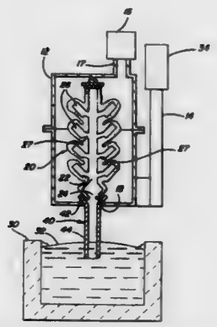
METHOD OF CASTING WEAR-RESISTANT, CAST IRON MACHINE ELEMENT

Keith Green, Amherst, and James W. Cree, Milford, both of N.H., assignors to Hitchiner Manufacturing Co., Inc., Milford, N.H.

Filed Aug. 17, 1990, Ser. No. 569,292

Int. Cl.[5] B22D *18/06*

U.S. Cl. 164—63 **13 Claims**



1. A method of making a wear-resistant, cast iron machine element comprising:

(a) forming a cast iron melt,

(b) forming a mold having at least one element-shaped mold cavity for receiving said melt,

(c) differential pressure, countergravity casting the melt at a selected melt casting temperature upwardly into the mold cavity of the mold with said mold initially at a temperature at least 2000° F. less than the casting temperature, and

(d) solidifying the melt in the mold cavity to produce a cast element having a wear-resistant, as-cast microstructure throughout said element, said as-cast microstructure comprising a dendritic constituent and an interdendritic carbide constituent and said microstructure being substantially free of graphite throughout said element.

5,113,925

INVESTMENT CASTING OF METAL MATRIX COMPOSITES

Arnold J. Cook, Pittsburgh, Pa., assignor to PCast Equipment Corporation, Pittsburgh, Pa.

Filed Oct. 9, 1990, Ser. No. 594,303

Int. Cl.[5] B22D *19/14*

U.S. Cl. 164—35 **7 Claims**

1. A method for forming a metal matrix composite within a mold of investment material comprising the steps of:

forming a preform mixture of liquid flow medium, binding agent and reinforcement into the desired shape of said metal matrix composite;

allowing the preform mixture to solidify into said desired shape;

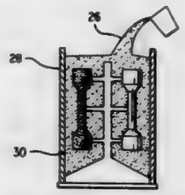
disposing the preform mixture within a container;

encasing said preform mixture within investment material within said container;

heating said preform mixture such that any water evaporates and the flow medium is removed;

sintering the remaining reinforcement material and binder to form a solid preform;

disposing molten metal on top of the investment material within the container such that the molten metal forms a seal with the container;



pressurizing the molten metal such that it is formed into said preform;

solidifying said molten metal to form said metal matrix composite in the shape of said preform; and

removing said investment material from the metal matrix composite.

5,113,926

PRODUCTION PROCESS FOR A BODY FRAME AND APPARATUS THEREOF

Yoshikazu Kanzawa; Yasushi Fujikake; Osami Ito; Shuho Ito; Hironobu Oikawa; Makoto Otsubo; Iwao Morikawa; Yuichi Shiratori, and Kiyoshi Tsukada, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

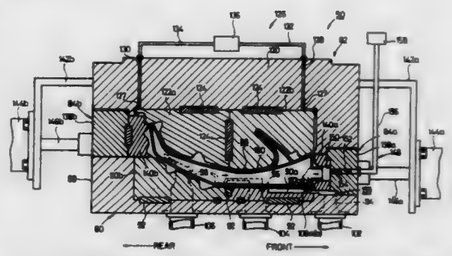
Continuation of Ser. No. 497,890, Mar. 23, 1990, Pat. No. 5,022,456. This application Nov. 5, 1990, Ser. No. 609,698

Claims priority, application Japan, Mar. 25, 1989, 1-72886; Mar. 25, 1989, 1-72887; Apr. 6, 1989, 1-88316

The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.

Int. Cl.[5] B22D *18/04, 18/06*

U.S. Cl. 164—119 **6 Claims**



1. A process for the production of a body frame, comprising the steps of:

positioning a hollow permeable core having a shape similar to that of the body frame into a mold;

evacuating the interior of the core to a first predetermined degree of vacuum;

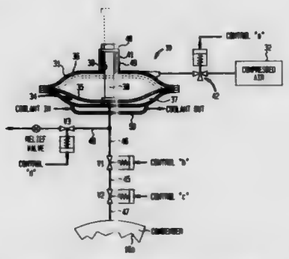
charging a molten metal into a cavity defined between the core and a molding surface of the mold by a low-pressure casting method;

evacuating the interior of said cavity to a second predetermined degree of vacuum, thereby accelerating the run of the molten metal charged into said cavity, wherein said degree of vacuum within the cavity is greater than the degree of vacuum within said core; and

solidifying the molten metal so as to cast the body frame.

5. An apparatus for the production of a body frame, which comprises:
a vertically liftable cope fitted to a vertical casting machine;
a fixed drag disposed beneath said cope;
a plurality of horizontally slidable molds, wherein said cope, said drag and said slidable molds can be juxtaposed relative to each other to define a molding cavity;
means for connecting said slidable molds to the cope and positioning said slidable molds in sliding contact with said cope for horizontally sliding thereagainst when the cope is released from the drag, wherein said slidable molds are vertically liftable with said cope.

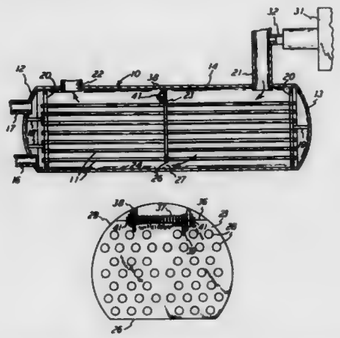
5,113,927
MEANS FOR PURGING NONCONDENSABLE GASES FROM CONDENSERS
Alon Kedar, Nes Ziona, and Obad Zimron, Rishon Lezion, both of Israel, assignors to Ormat Turbines (1965) Ltd., Yavne, Israel
Filed Mar. 27, 1991, Ser. No. 675,865
Int. Cl.[5] F28D *21/00*
U.S. Cl. 165—13 **10 Claims**



1. Apparatus for purging non-condensable gases from a condenser containing vaporized, condensable working fluid, said apparatus comprising:
a) an enclosed chamber located above the condenser;
b) a movable diaphragm in said chamber for dividing the latter into upper and lower portions;
c) two flow control valves serially connected together and located between the said condenser and the lower portion of said chamber;
d) a venting valve connected to said lower portion;
e) each of said valves being selectively operable and having an open and a closed state;
f) means for moving said diaphragm in said chamber for changing the volume of said lower portion; and
g) means for synchronizing the states of the valves with changes in the volume of said lower portion.

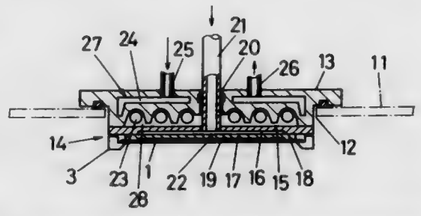
5,113,928
HEAT EXCHANGER WITH FLUID PRESSURE RELIEF MEANS
Austin R. Myers, Racine, Wis., assignor to Thermal Transfer Products, Ltd., Racine, Wash.
Continuation-in-part of Ser. No. 377,257, Jul. 10, 1989, abandoned. This application Nov. 22, 1989, Ser. No. 440,906
Int. Cl.[5] F28F *27/00, 27/02, 9/22*
U.S. Cl. 165—38 **19 Claims**

1. A heat exchanger of the type having an elongated shell and a bank of tubes disposed within said shell and extending aligned with the longitudinal axis of said shell, and a baffle spanning the interior of said shell and with said tubes extending through said baffle and with said baffle having an edge spaced from said shell for the flow of liquid through the space, and a liquid inlet connector and liquid outlet connector on one side of said shell and disposed to opposite faces of said baffle for the flow of liquid around said tubes and through said space, the improvement comprising said baffle having a fluid passageway defined relative to said shell interior and being located at said one side of said shell which is located diametrically opposite said edge, a member anchored on said baffle and extending over said passageway and being movable relative to said baffle and to an opened position and only in the direction from said inlet to said outlet and only in response to fluid pressure differential acting on said member whereby there is the flow of liquid past said baffle in addition to the liquid flow through said



space, and resilient means supported on said baffle and in contact with opposite ends of said member for operatively bearing upon said member to yieldingly urge said member to a closed position and against the force of said fluid pressure differential and thereby have no flow of liquid past said baffle at said member, said baffle and said member presenting an assembly extending in liquid-tight relationship with said interior of said shell when said member is in said closed position, except for the flow through said space.

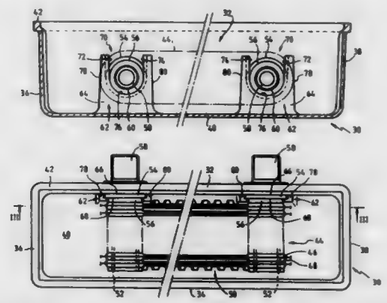
5,113,929
TEMPERATURE CONTROL SYSTEM FOR SEMICONDUCTOR WAFER OR SUBSTRATE
Toshiyuki Nakagawa; Nobuyuki Takahashi, and Takashi Akimoto, all of Fuchu, Japan, assignors to ANELVA Corporation, Tokyo, Japan
Filed Apr. 5, 1991, Ser. No. 680,939
Claims priority, application Japan, Apr. 9, 1990, 2-37890[U]
Int. Cl.[5] F25B *29/00*
U.S. Cl. 165—61 **11 Claims**



1. A temperature control system for controlling the temperature of a substrate to be processed, said system comprising:
a vacuum chamber having a top defining an opening therethrough;
a flanged member covering the opening in the top of said vacuum chamber;
holder means, provided on said flanged member, for supporting a substrate to be processed within said vacuum chamber;
gas delivery conduit means, extending through said flanged member and toward said holder means, for directing gas

onto the back of the substrate when held by said holder means;
radiant heater means, mounted to said flanged member and facing said holder means, for radiating heat to heat gas flowing through said delivery conduit means; and
coolant circulating conduit means, mounted within said flanged member and facing the region where said radiant heater means is located, for directing coolant in a circulating path through said flanged member to cool gas flowing through said delivery conduit means.

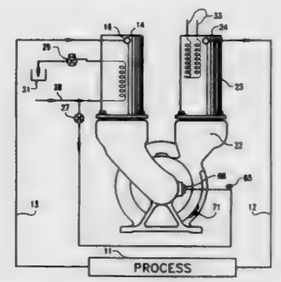
5,113,930
HEAT EXCHANGER APPARATUS FOR A MOTOR VEHICLE, HAVING A MAIN HEAT EXCHANGER COMPRISING A WATER BOX CONTAINING A SECONDARY HEAT EXCHANGER
Philippe le Gauyer, Paris, France, assignor to Valeo Thermique Moteur, Le Mesnil-Saint-Denis, France
Filed Jul. 31, 1991, Ser. No. 738,674
Claims priority, application France, Jul. 31, 1990, 90 09766
Int. Cl.[5] F28F *9/00*
U.S. Cl. 165—78 **9 Claims**



1. Heat exchanger apparatus comprising a main heat exchanger having a water box and a secondary heat exchanger in the water box, the water box having a side wall defining two access orifices therein, and the secondary heat exchanger having two coupling tubes and means defining a seating for receiving each said coupling tube, with each said coupling tube having been fitted thereto by being introduced into the corresponding access orifice and then into the corresponding seating, the apparatus further comprising at least one slide carried by the said side wall of the water box and arranged in the interior of the water box in the region of the two access orifices, the secondary heat exchanger further comprising a sliding element, the or each said slide being arranged to receive the, or a respective, said sliding element whereby to enable the secondary heat exchanger to be displaced in a straight line in sliding movement along the side wall of the water box up to an abutment position in which each said access orifices of the side wall is aligned with the corresponding seating.

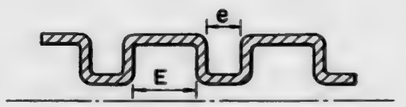
5,113,931
HEAT TRANSFER APPARATUS
Philip D. Oswalt, and Ronald A. Wolfe, both of Indianapolis, Ind., assignors to Advantage Engineering, Inc., Greenwood, Ind.
Continuation-in-part of Ser. No. 626,903, Dec. 13, 1990. This application Mar. 21, 1991, Ser. No. 673,085
The portion of the term of this patent subsequent to Mar. 10, 2009, has been disclaimed.
Int. Cl.[5] F24H *1/12*
U.S. Cl. 165—78 **20 Claims**

1. A heat transfer apparatus comprising:
a pump assembly having a case with a drive member having an axis;
the case having circular tube receivers having centers in a first plane perpendicular to the axis, the centers being on opposite sides of a second plane containing the axis;
a first tube received in one of the receivers and having heater



means therein, the tube having at least one plate projecting outward; and
fastener means mounted to the case and to the plate to secure the tube in the one receiver.

5,113,932
HEAT PIPE AND METHOD OF MANUFACTURING THE SAME
Masuji Sakaya, Narashino; Ryuichi Okiai, Yotsukaido; Masataka Mochizuki, Nagareyama, and Kouichi Mashiko, Tokyo, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan
Division of Ser. No. 365,531, Jun. 13, 1989, Pat. No. 4,953,632, which is a division of Ser. No. 282,025, Dec. 7, 1988, abandoned. This application May 14, 1990, Ser. No. 523,046
Claims priority, application Japan, Dec. 9, 1987, 62-309669; Apr. 27, 1988, 63-102422; Apr. 27, 1988, 63-102423; Apr. 27, 1988, 63-102424
Int. Cl.[5] F28D *15/02*
U.S. Cl. 165—104.26 **2 Claims**

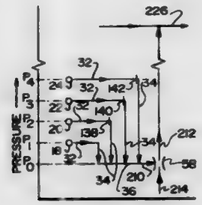


1. A heat pipe comprising:
a pipe having mating edges of a metal tape shaped in the form of a pipe;
a wick layer on an inner surface of said pipe; and
rectangle-like projecting surface portions formed on at least an outer surface portion of said pipe in a predetermined direction, said rectangle-like projecting surface portions being integrally formed and comprising rectangle-shaped portions with rounded corners.

5,113,933
AIR-COOLED VACUUM STEAM CONDENSER BUNDLE ISOLATION
Michael W. Larinoff, 370 Holly Hill Rd., Oldsmar, Fla. 34677
Filed Oct. 10, 1990, Ser. No. 597,485
Int. Cl.[5] F28B *9/10*
U.S. Cl. 165—111 **19 Claims**

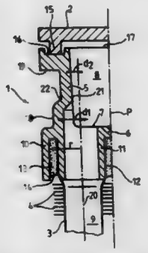
1. A multi fan-cell system for condensing steam vapors contaminated with air and gases, the system being isolated into single fan cells for the removal and discharge of its non-condensable gas/vapors, each fan cell having one fan and a predetermined number of steam condensing bundles which includes a front header, finned tubes and rear header means whose

gas/vapors are extracted and isolated from all other fan cells by a vacuum-producing ejector means directly coupled to the



rear header means by pipe and manifold means all located and installed within the confines of the fan cell they serve.

5,113,934
HEAT EXCHANGER OF REDUCED WIDTH
Michel Potier, Rambouillet, France, assignor to Valeo Thermique Moteur, France
Filed Oct. 15, 1991, Ser. No. 777,665
Claims priority, application France, Oct. 17, 1990, 90 12836
Int. Cl.[5] F28F *9/02*
U.S. Cl. 165—173 **3 Claims**

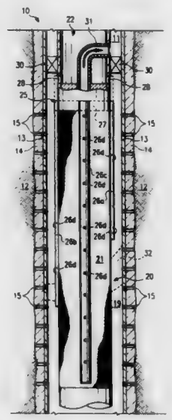


1. A heat exchanger comprising a fluid box in the form of an elongated vessel having two side walls each having an inner face, two end walls, and a base wall with holes formed through the latter; a cover plate overlying the vessel; at least one bank of tubes extending mainly externally of the fluid box and each defining a tube axis, with each tube being aligned with a respective hole in the base wall of the fluid box and having an end portion; and means sealingly joining each said tube end portion to the base wall of the fluid box so as to bring the interior of the latter into communication with the interior of the tube, with the said side walls of the fluid box extending generally parallel to a plane containing the axes of the tubes of one said bank, and with the side walls of the fluid box being formed with an outwardly directed shoulder in the vicinity of the cover plate to serve as a support for welding of the cover plate to the fluid box, wherein the distance, measured in a transverse direction of the fluid box, between the said inner face of each side wall and the axes of the tubes of the bank of tubes closest thereto is, at the level of the said shoulder, smaller than one half of the maximum dimension of the tubes in the transverse direction.

5,113,935
GRAVEL PACKING OF WELLS
Lloyd G. Jones, Dallas, and Charles S. Yeh, Plano, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed May 1, 1991, Ser. No. 694,163
Int. Cl.[5] E21B *43/04, 43/08*
U.S. Cl. 166—51 **8 Claims**

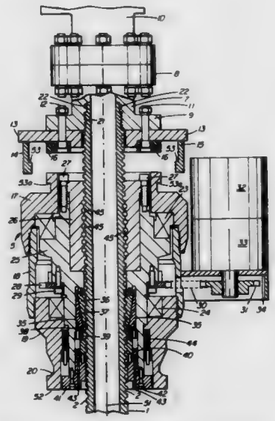
1. Apparatus for gravel packing an interval of a wellbore, said apparatus comprising:

a sand screen adapted to be connected to the lower end of a workstring; and



shunt means on the external surface of said sand screen for selectively delivering a gravel slurry to different levels of said interval when said apparatus is in an operable position within said wellbore.

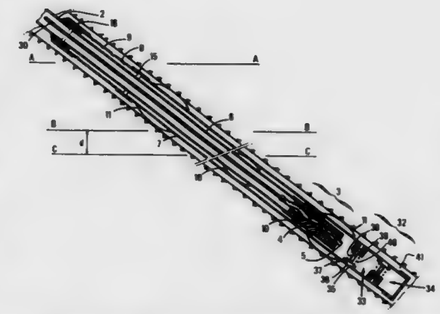
5,113,936
WELLHEAD SEAL PROBE
James M. Sutherland, P.O. Box 2993, Grand Junction, Colo. 81502
Filed May 6, 1991, Ser. No. 695,996
Int. Cl.[5] E21B *23/06, 33/03*
U.S. Cl. 166—85 **6 Claims**



1. An oil wellhead isolation device comprising, in combination:
a) a hollow mandrel having a first end portion adapted to receive a wellhead isolation nipple assembly, and a second end portion fixedly secured to an upper body of the device;
b) mandrel drive means adapted to selectively displace the mandrel relative to said housing, along a longitudinal axis thereof to move the mandrel into or out of an oil well casing;

c) said mandrel drive means including a drive box adapted to be fixedly but removably secured to a respective oil well casing assembly near an upper end of the casing assembly;
d) a displacement nut-and-screw assembly rotatably mounted within said housing in a coaxial arrangement with the mandrel and including an internally threaded sleeve complementary with an outer thread of the mandrel;
e) seal means fixedly secured to said displacement nut assembly for rotation in common with said displacement nut mechanism, said seal means being complementary with said outer thread and being disposed between said displacement nut mechanism and the first end portion of the mandrel; and
f) guide means for preventing relative rotation of said housing and said mandrel, while allowing relative axial movement between the two.

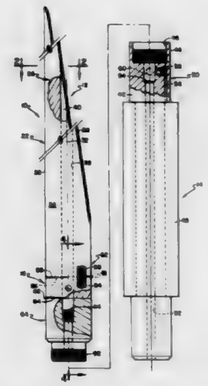
5,113,937
DEVICE FOR SEPARATING A MIXTURE OF FREE GAS AND LIQUID AT THE INTAKE OF A PUMP AT THE BOTTOM OF A DRILLED WELL
Henri Cholet, Le Pecq, France, assignor to Institut Francais de Petrole, Rueil Malmaison, France
Filed Dec. 28, 1990, Ser. No. 635,249
Claims priority, application France, Dec. 28, 1989, 89 17520
Int. Cl.[5] E21B *43/38*
U.S. Cl. 166—105.5 **10 Claims**



1. A separation device for separating a mixture of free gas and liquid at the intake of a pump connected to a bottom end of a tubular column at the bottom of a drilled well, the pump being connected to the tubular column by an intermediate production tube, said separation device comprising a fluid intake device, a bottom end of which is closed and a top end of which comprises fluid introduction orifices, said pump being located inside said fluid intake device close to the bottom end; said fluid intake device further comprising, close to the bottom end, at least one check valve.

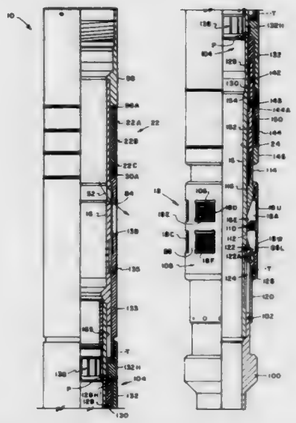
5,113,938
WHIPSTOCK
Charley H. Clayton, P.O. Drawer O, Ingleside, Tex. 78362
Filed May 7, 1991, Ser. No. 696,592
Int. Cl.[5] E21 *7/08*
U.S. Cl. 166—117.6 **16 Claims**

1. A well tool having a vertical axis, comprising
a whipstock providing an elongate wedge shaped body;
a packer;
means pivotally connecting the whipstock and the packer for pivotal movement about an axis transverse to the vertical axis;
means biasing the packer and whipstock about the transverse axis away from a straight line position;
a setting tool having an upper end for connection to a pipe string for running the well tool into a well and a lower end, the lower end including means for holding the packer and whipstock in the straight line position against the force of the biasing means; and



means releasably connecting the setting tool to the well tool and freeing the whipstock and packer for pivotal movement about the transverse axis.

5,113,939
SINGLE BORE PACKER WITH DUAL FLOW CONVERSION FOR GAS LIFT COMPLETION
Colby M. Ross, Carrollton; Richard M. Sproul, Grapevine; Ross M. McCurley, Flower Mound, and Carter R. Young, Dallas, all of Tex., assignors to Otis Engineering Corporation, Carrollton, Tex.
Division of Ser. No. 491,463, Mar. 9, 1990, Pat. No. 5,048,610.
This application Sep. 6, 1990, Ser. No. 579,371
Int. Cl.[5] E21B *23/06*
U.S. Cl. 166—120 **4 Claims**



4. A hydraulic well packer adapted to be set against the bore of a well casing comprising, in combination:
a body mandrel;
an annular seal assembly mounted on said body mandrel including at least one resilient annular seal element movable generally radially between a non-interfering retracted

position to an extended configuration in which said seal element is engagable against a well casing bore;

an anchor slip assembly mounted on said body mandrel including a plurality of anchor slips, said anchor slips being movable generally radially between a retracted, non-interfering position and an extended position in which said anchor slips are engagable against a well casing bore;

a hydraulic actuator mounted on said body mandrel including a setting cylinder movable mounted for slidable, sealing engagement against said body mandrel and engagable with one of said annular seal elements, an annular piston movably mounted for sealing engagement against said body mandrel and against the bore of said setting cylinder, thereby defining a variable volume pressure chamber for receiving hydraulic fluid;

a tubular link member coupling said annular piston to said anchor slip assembly, said tubular link member being radially spaced from said body mandrel, thereby defining a receiver pocket; and,

an internal ratchet slip mounted on said body mandrel for slidable movement, said internal ratchet slip being disposed within said receiver pocket.

5,113,940

WELL APPARATUSES AND ANTI-ROTATION DEVICE FOR WELL APPARATUSES

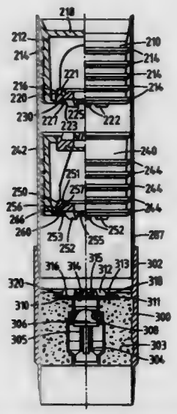
Mark C. Glaser, Houston, Tex., assignor to Weatherford U.S., Inc., Houston, Tex.

Continuation of Ser. No. 517,925, May 2, 1990, Pat. No. 5,025,858. This application May 15, 1991, Ser. No. 700,622

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[5] E21B *33/16*

U.S. Cl. 166—156 **10 Claims**



1. An anti-rotation device for an item used in wellbores for inhibiting relative rotation between the item and an adjacent apparatus having apparatus protrusions, the apparatus protrusions having tips, the anti-rotation device comprising

a cylindrical body member having two circular ends with a projecting lip protruding from one end thereof and extending around that end, the lip having an inner wall,

a recess in the body member, the recess defined by the inner wall of the lip and a bottom surface within the body member, the lip extending above the bottom surface,

a plurality of device protrusions extending from the bottom surface of the recess and beyond the lip,

the device protrusions disposed for engaging the apparatus protrusions of the adjacent apparatus, and

the inner wall of the lip sloping from the lip to the bottom surface of the body member.

5,113,941

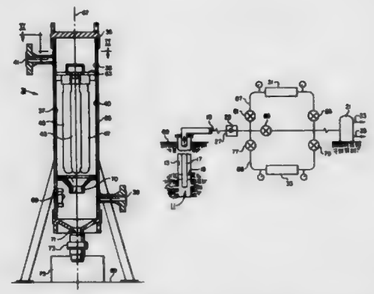
SURFACE SAND DETECTION MONITORING DEVICE AND METHOD

Joseph F. Donovan, Spring, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Nov. 7, 1990, Ser. No. 610,356

Int. Cl.[5] E21B *43/34, 47/00*

U.S. Cl. 166—250 **12 Claims**



1. A method of monitoring the level of particulate matter in a stream of hydrocarbons which are being produced from a well bore, through a production conduit located in the well bore, and through a surface conduit to an oil and gas separator unit located at the well surface, the surface conduit being provided with a flow control regulator for controlling the flow rate of hydrocarbons being produced through the production conduit, the method comprising the steps of:

installing a downstream filter unit within the surface conduit at the well surface upstream of the oil and gas separator unit for trapping particulate matter in the stream of hydrocarbons passing within the surface conduit, the downstream filter unit including a high pressure vessel with an interior, an inlet and an outlet for connection within the surface conduit, and wherein a filter element is located within the interior of the high pressure vessel for filtering particulate matter in the stream of hydrocarbons passing through the surface conduit to the vessel inlet and through the vessel interior to the vessel outlet;

sampling the contents of the downstream filter unit over predetermined intervals by removing trapped particulate matter to determine information regarding the amount of particulate matter trapped;

adjusting the flow control regulator at the well surface to control the production rate of produced hydrocarbons based upon the information gathered regarding the amount of particulate matter trapped.

5,113,942

METHOD OF OPENING CASED WELL PERFORATIONS

David E. McMechan, Marlow, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 5, 1991, Ser. No. 664,708

Int. Cl.[5] E21B *33/3, 43/12, 47/06*

U.S. Cl. 166—250 **9 Claims**

1. A method of opening perforations in a cased well to fluid flow, said cased well having a maximum safe wellhead pressure, using a treating fluid and perforation sealers, comprising the steps of:

(a) determining the number of perforations in said cased well which have already been opened by injection of said treating fluid into said well but have not yet been sealed; and

(b) establishing a treating fluid flow rate such that (i) said treating fluid flows through said already opened perforations which have not yet been sealed determined in step (a) at a velocity which is at least as high as the minimum effective sealing velocity but (ii) said maximum safe well head pressure will not be exceeded when the next of said already opened perforations which have not yet been sealed is sealed.

5,113,943

SPACER FLUIDS

William N. Wilson, Plano; Roger D. Bradshaw, Allen; Bonsall S. Wilton, McKinney, and Robert B. Carpenter, Hurst, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 441,853, Nov. 27, 1989, Pat. No. 5,030,366. This application Apr. 2, 1991, Ser. No. 680,473

Int. Cl.[5] E21B *33/06*

U.S. Cl. 166—291 **2 Claims**

1. A method for cementing a wellbore penetrating an earth formation into which a conduit extends, said wellbore having a space occupied by a drilling fluid, said method comprising the steps of:

a) displacing said drilling fluid from said space with a spacer fluid comprising:

sulfonated styrene-maleic anhydride copolymer, bentonite, welan gum, surfactant and a weighting agent; and

b) displacing said spacer composition and filling said wellbore space with a settable cement composition.

5,113,944

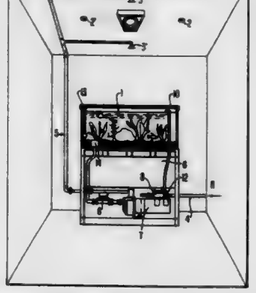
SIMPLE FIRE EXTINGUISHING APPARATUS

Selichi Nakagawa; Yoshiharu Muruyama; Masanori Shiota, all of Osaka; Kando Ishida, Nara; Masayoshi Fujita, Nara, and Shigenobu Yamada, Nara, all of Japan, assignors to Morita Pump Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1990, Ser. No. 631,862

Int. Cl.[5] A62C *35/58, 35/68, 35/00*

U.S. Cl. 169—13 **1 Claim**



1. A simple fire extinguishing apparatus comprising:

a fire sensor and a fire extinguishing water spraying head positioned at required positions,

a water supply source comprising a water tank,

a level switch for detecting a maximum water level in the water tank and a resupply port installed in the water tank, wherein the resupply port is disposed at a level above the maximum water level in the water tank,

a driving pump having a suction side and a delivery side,

a main pipe allowing the suction side of the driving pump to communicate with the water tank and the delivery side to communicate through a three-way cock with the fire extinguishing water spraying head and a drain pipe,

a control valve installed in the main pipe and adapted to be actuated by the fire sensor and the level switch,

a resupply pipe branching from a tap water pipe and extending to communicate with the resupply port, and

a control valve installed in the resupply pipe and adapted to be actuated by the fire sensor and the level switch,

whereby when a fire breaks out, water is fed from the water tank through the main pipe to the fire extinguishing water spraying head and concurrently therewith water is resupplied from the tap water pipe through the resupply pipe and the resupply port to the water tank.

5,113,945

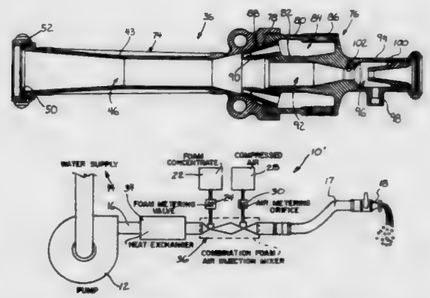
FOAM/WATER/AIR INJECTOR MIXER

Brian Cable, Elkhart, Ind., assignor to Elkhart Brass Mfg. Co., Inc., Elkhart, Ind.

Filed Feb. 7, 1991, Ser. No. 652,064

Int. Cl.[5] A62C *35/00*

U.S. Cl. 169—15 **12 Claims**



1. Firefighting apparatus comprising a conduit, pump means connected to said conduit for delivering a supply of pressurized fluid through said conduit to a discharge nozzle, said pressurized fluid containing a predetermined quantity of a foaming agent, an eductor tube positioned along and in flow communication with said conduit, said eductor tube including an air inlet port in flow communication with a stream of pressurized air, and an air outlet nozzle positioned in the eductor tube in flow communication between said inlet portion and a through passageway of said eductor tube through which said pressurized fluid flows, said air outlet nozzle oriented at an oblique angle relative to a flow path of said fluid through said passageway, and means for introducing air into said flow path through said air outlet nozzle wherein said foaming agent expands into said pressurized fluid prior to discharge through said discharge nozzle.

5,113,946

FIRE-FIGHTING SYSTEM

Grant S. Cooper, P.O. Box 317, Esparto, Calif. 95627

Filed Jan. 2, 1991, Ser. No. 636,762

Int. Cl.[5] A62C *27/00, 3/02, 31/00;* **B05B** *9/03*

U.S. Cl. 169—24 **11 Claims**

1. Fire fighting apparatus comprising, in combination:

a tractor including a tractor body and a pair of spaced endless treads movably mounted relative to said tractor body, said tractor having a predetermined center of mass and said tractor body including a front body portion disposed to the front of said center of mass and a rear body portion disposed to the rear of said center of mass;

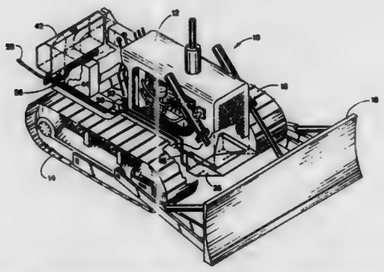
a first tank defining an interior for accommodating water therein, said first tank being attached to said tractor front body portion at a first location between said spaced endless treads and below the elevation of said center of mass;

a second tank defining an interior for accommodating water therein, said second tank being attached to said tractor

rear body portion at a second location above the elevation of said first location;

first conduit means defining a first fluid-flow passageway interconnecting the interiors of said first and second tanks;

second conduit means connected to said first tank and defining a second fluid-flow passageway in communication with the interior of said first tank; and



pump means operatively associated with said second conduit means for pumping water through said second fluid-flow passageway from said first tank to dispense water from said first tank, said first conduit means delivering water from said second tank interior to said first tank interior through said first fluid-flow passageway under the influence of gravity to replenish water dispensed from said first tank.

5,113,947

FIRE EXTINGUISHING METHODS AND COMPOSITIONS UTILIZING 2-CHLORO-1,1,1,2-TETRAFLUOROETHANE

Mark L. Robin, Lafayette, Ind., assignor to Great Lakes Chemical Corporation, W. Lafayette, Ind.

Filed Mar. 2, 1990, Ser. No. 488,295
Int. Cl.[5] A62C *5/00, 39/00*; A62D *1/08*
U.S. Cl. 169—46 **12 Claims**

1. A method for extinguishing a fire which comprises the steps of:

a. introducing to the fire a fire extinguishing concentration of an extinguishant composition consisting of 2-Chloro-1,1,1,2-tetrafluoroethane and a second extinguishant selected from the group consisting of chloropentafluoroethane (CF_3CF_2Cl), heptafluoropropane (CH_3CHFCF_3), 1,1,1,3,3,3-hexafluoropropane ($CH_3CH_2CF_3$), 1,1,1,2,3,3-hexafluoropropane ($CF_3CHFCHF_2$, pentafluoroethane (CF_3CHF_2) and mixtures thereof; and

b. maintaining the concentration of the composition until the fire is extinguished.

5,113,948

OIL WELL FIRE EXTINGUISHER WITH INTERNAL PIPE CRIMPER

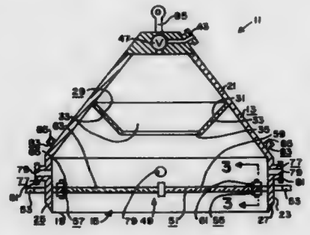
Randel E. Richardson, 4822 Holt Dr., Memphis, Tenn. 38116

Filed Jun. 21, 1991, Ser. No. 718,659
Int. Cl.[5] A62C *3/06, 2/00, 2/04*
U.S. Cl. 169—49 **6 Claims**

1. A fire extinguisher for use to extinguish a fire burning relative to a support surface, said fire emanating from an opened end of a pipe, said fire extinguisher comprising:

a. body means having a downward opening cavity for being dropped over said first to enclose said first within said cavity, said body means having a continuous wall forming a mouth of said cavity;

b. seal means for forming a substantially airtight seal between said continuous wall of said body means and said support surface; and



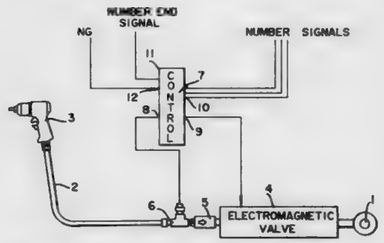
c. crimp means for crimping said opened end of said pipe after said body means is dropped over said fire.

5,113,949

TIGHTENING CONTROL APPARATUS FOR A TORQUE WRENCH

Masaaki Ohkubo, and Ryo Fukada, both of Osaka, Japan, assignors to Fuji Kuuki Kabushiki Kaisha, Osaka, Japan

Filed Jul. 31, 1989, Ser. No. 386,663
Claims priority, application Japan, Oct. 12, 1988, 63-257957
Int. Cl.[5] B23Q *5/00*
U.S. Cl. 173—177 **4 Claims**



1. A tightening control apparatus for a torque wrench comprising:

a pressure detecting means for detecting an admission pressure supplied to a torque wrench;

a pressure change detecting means for detecting a change in admission pressure detected by said pressure detecting means;

a striking signal output means for outputting a striking signal when the change in pressure reaches a reference value, wherein said striking signal output means continuously outputs said striking signal for a predetermined period of time after said change reaches the reference value, and said predetermined period of time is set shorter than a striking interval;

a counter for counting said striking signal and for outputting a tightening end signal when a count value reaches a set value; and

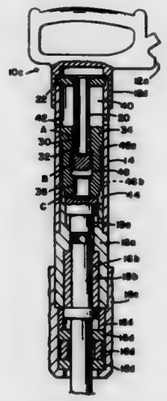
an admission stop means for closing an admission pressure path to said torque wrench upon reception of said tightening end signal.

5,113,950

FOR PERCUSSIVE TOOLS, A HOUSING, A PNEUMATIC DISTRIBUTOR, AND A HAMMER PISTON MEANS THEREFOR

Eugene L. Krasnoff, 107 Kingsway Commons, Princeton, N.J. 08540

Filed Mar. 18, 1991, Ser. No. 670,879
Int. Cl.[5] E21B *1/00*
U.S. Cl. 173—13 **8 Claims**



1. For a percussive tool, a housing, a hammer piston, and a pneumatic distributor, comprising:

a straight, cylindrical housing having a longitudinal axis and an inner, cylindrical surface; and

a hammer piston, reciprocable within said housing;

said hammer piston having but a single straight, longitudinal bore formed axially therewith and centrally thereof; wherein

said housing has means opening therethrough for venting fluid therefrom;

said pneumatic distributor comprises a sole means for admitting compressed air into said housing, and has an elongate tube for conducting air therethrough;

said tube has a mounting end attached to an end of said housing, and a projecting portion in penetration of said hammer piston;

said projecting portion comprises (a) a terminal end which has porting formed therein for admitting compressed air directly into said bore, and which defines a fine, substantially sealing, relatively slidable clearance with said bore, and (b) a shank having a constant, uniform, outside diameter fully therealong; wherein

(a) said distributor, (b) said housing inner, cylindrical surface, and (c) said hammer piston cooperate to define a drive stroke chamber within one end of said housing, and a return stroke chamber within an opposite end of said housing;

said inner, cylindrical surface of said housing has a constant diameter throughout the length thereof which encompasses said drive and return stroke chambers and said hammer piston;

said fluid venting means opens onto both of said chambers; and

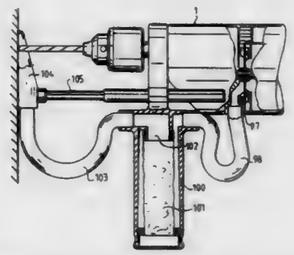
said tube and hammer piston comprise means cooperative, with reciprocation of said hammer piston, for sealingly closing off each said stroke chamber from said fluid venting means and said porting and, consequently, for defining a front cushion, for said hammer piston, wholly within said return stroke chamber, and a rear cushion, for said hammer piston, wholly within said drive stroke chamber.

5,113,951

APPARATUS FOR DRIVING A DRILLING OR PERCUSSION TOOL

J. P. Houben, Breda, and A. J. Moolenaar, Dorst, both of Netherlands, assignors to Emerson Electric Company, St. Louis, Mo.

Division of Ser. No. 360,316, Jun. 2, 1989, Pat. No. 5,052,497. This application Jun. 11, 1991, Ser. No. 713,410
Claims priority, application Netherlands, Jul. 7, 1988, 8801466
Int. Cl.[5] E21C *7/02*; B25D *17/14*
U.S. Cl. 173—075 **3 Claims**



1. In a portable power tool of the type having a housing with a handle portion, said housing containing an electric motor which powers a cooling fan and which also actuates a tool holder for releasably retaining a working tool element, the improvement comprising:

(a) said housing being provided with an intake opening oriented with respect to said cooling fan such that upon energization of the motor air is caused to flow into the tool housing through said opening for cooling said motor;

(b) a drill foot mounted from the tool housing and located adjacent the working end of said tool element, said drill foot defining a chamber with an opening for collecting material dislodged by said tool element;

(c) a substantially cylindrical auxiliary handle secured to said housing, said auxiliary handle being hollow and thereby defining a cavity;

(d) first conduit means having one end thereof in communication with said chamber and the other end thereof in communication with said cavity;

(e) second conduit means having one end thereof in communication with said intake opening and the other end thereof in communication with said cavity; and

(f) a filter mounted in said cavity between said other ends of said first and second conduit means, whereby energization of said motor causes a flow of air from said chamber through said filter and into said tool housing.

5,113,952

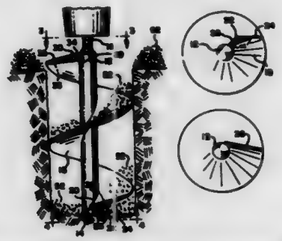
AUGER PLANTER METHOD

D. Wayne Niewold, Lodo, and Richard A. Bradley, Urbana, both of Ill., assignors to Power Planter, Inc., Paxton, Ill.

Division of Ser. No. 388,744, Aug. 1, 1989, Pat. No. 5,067,571, which is a continuation of Ser. No. 178,531, Apr. 7, 1988, abandoned. This application Sep. 16, 1991, Ser. No. 760,883
Int. Cl.[5] E21B *10/44*
U.S. Cl. 175—57 **21 Claims**

1. A method of substantially reducing rotational imbalance during advance into soil of a power driven auger to remove the soil from the earth to form holes therein, and wherein the auger has a central shaft having a leading end, and said shaft is surrounded by a substantially single flighted helical flighting having a leading edge which is rotated in a given direction to advance the auger into the soil, said method of reducing said rotational imbalance in said substantially single flighted auger comprising forming said leading edge of said flighting into a

chord portion extending chordally substantially across said flighting on one side of the shaft and away from said given



direction of advance of said flighting into the soil prior to the advance of said flighting into the soil.

5,113,953

DIRECTIONAL DRILLING APPARATUS AND METHOD

James B. Noble, 17 Blackhouse Terrace, Peterhead, Scotland

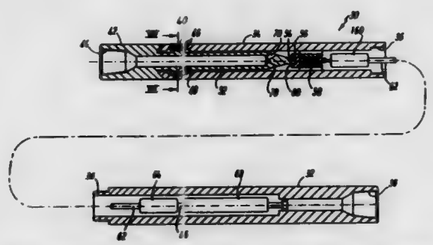
PCT No. PCT/GB89/01318, § 371 Date May 1, 1991, § 102(e) Date May 1, 1991, PCT Pub. No. WO90/05235, PCT Pub. Date May 17, 1990

PCT Filed Nov. 3, 1989, Ser. No. 679,009

Claims priority, application United Kingdom, Feb. 15, 1989, 8903447; Jun. 13, 1989, 8913594; Nov. 3, 1989, 8825771

Int. Cl.[5] E21B *7/08*

U.S. Cl. 175—61 **10 Claims**



10. A method of deviating a drill bit on the lower end of a drill string substantially in a selected direction, characterised in that said method comprises the steps of coupling the drill bit to the lower end of the drill string through force coupling means transmitting torsional and axial forces between the lower end of said drill string and the drill bit while allowing the rotational axis of the drill bit to be omni-directionally deviated with respect to the rotational axis of the lower end of the drill string, and contra-nutating the drill bit with respect to the lower end of the drill string at a substantially equal and opposite rotational speed whereby to deviate the rotational axis of said drill bit in a direction which is spatially substantially invariant.

5,113,954

EXCAVATION TOOL

Takeshi Hayashi; Shigeru Sato; Katsuaki Tsujimoto; Daishiro Miyazaki; Yoneo Hiwasa, all of Gifu, and Toshiki Ishimatsu, Tokyo, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Feb. 25, 1991, Ser. No. 660,546

Claims priority, application Japan, Feb. 28, 1990, 2-48233; Feb. 28, 1990, 2-48234; Mar. 14, 1990, 2-63821; Nov. 2, 1990, 2-297943; Nov. 2, 1990, 2-297946; Nov. 6, 1990, 2-300283

Int. Cl.[5] E21B *10/36*

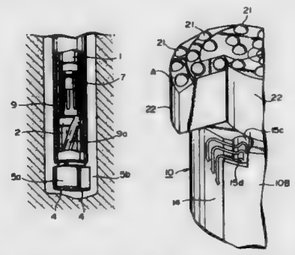
U.S. Cl. 175—415 **13 Claims**

1. An excavation tool, having

a pair of insertion holes placed in a bottom surface of a device, which receives an impact force of a hammer and a rotational force of a hammer cylinder, at positions separated in a radial direction from a center of said device and symmetrical around said center as a center of rotation;

a pair of block axles, one end of each of which is freely rotatably inserted into one of said insertion holes;

a pair of blocks, which have a roughly semicircular shape with a diameter roughly equal to that of said device, into lead end surfaces of which are set bits, and which have straight edge surfaces which are flat surfaces vertical with respect to said lead end surfaces, provided at another end



of said block axles and with said straight edge surfaces in mutual opposition;

in an extended diameter state of which said blocks are moved in opposite directions along a radius of said device by means of rotating said blocks around said block axles; and

in which a distance between centers of said insertion holes provided in said bottom surface of said device and said center of said device is set at from 0.2 times a diameter of said bottom surface of said device to 0.3 times thereof.

5,113,955

PRICE-CALCULATING ELECTRONIC SCALE

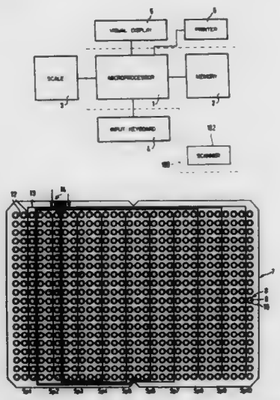
Gebhard Wallisch, Burladingen; Dieter Eismann, MeSstetten; Roland Matthes, Bitz, and Manfred Kammerer, Strasse, all of Fed. Rep. of Germany, assignors to Mettler-Toledo (Albstadt) GmbH, Albstadt, Fed. Rep. of Germany

Filed May 10, 1990, Ser. No. 521,561

Claims priority, application Fed. Rep. of Germany, May 12, 1989, 3915645

Int. Cl.[5] G01G *19/40*; G06K *15/00*; H03K *17/94*; G06F *3/00*

U.S. Cl. 177—25.15 **24 Claims**



1. A price-calculating electronic scale with an input keyboard, said input keyboard comprising:

a switch pad having a plurality of switch contact elements, each of which opens or closes a current path to generate a switch signal representative thereof;

a key pad disposed on top of said switch pad and having a plurality of switch contact activating key fields, each switch contact activity field being positioned above at least one switch contact element; and

a logic device connected to the input keyboard for recognizing the activation of the individual key fields on the basis of said switch signals emitted by the corresponding switch contact elements disposed under the individual activating key fields;

the activating key fields of said key pad being disposed in predetermined patterns to cover particular groupings of the switch contact elements of said switch pad, the logic device being preset to process switch signals generated via said key pad by evaluating the switch signal from every switch contact element disposed under a particular activating key field.

5,113,956

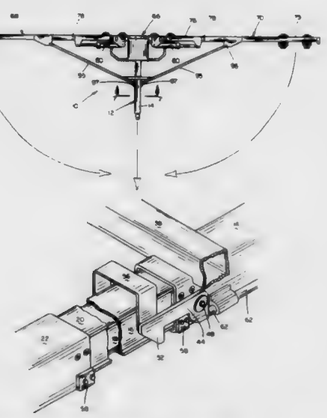
FORWARDLY FOLDING TOOL BAR

Milford E. Friesen, Box 174, Litchfield, Nebr. 68852, and Arlyn E. Friesen, Box 548, Loup City, Nebr. 68853

Filed Jan. 23, 1991, Ser. No. 644,944

Int. Cl.[5] A01B *63/102*

U.S. Cl. 172—311 **7 Claims**



1. A forwardly folding tool bar comprising,

a center tool bar section disposed transversely to the direction of travel of the tool bar and having opposite ends,

an elongated telescoping tongue means operatively secured to said center tool bar section and extending forwardly therefrom for connection to a prime mover, said tongue means being movable from an extended transport position to a retracted field position,

said tongue means including a forward tongue member telescopically connected to a rearward tongue member,

an elongated frame member pivotally connected at a rearward end to said forward tongue member, and having a forward end projecting forwardly past the forward end of said forward tongue member,

a tongue lift means operably connected between said forward tongue member and said elongated frame member, operable to pivot said forward tongue member relative to the elongated frame member from a field position, wherein said elongated frame member and said forward tongue member are generally parallel, to a transport position, wherein the forward end of the forward tongue member is pivoted upwardly away from said elongated frame member,

a first wing tool bar section pivotally secured to one end of said center tool bar section and being selectively movable between a field position, wherein said first wing tool bar section is parallel to said center tool bar section, to a transport position, wherein said first wing tool bar section is substantially parallel to said tongue means,

a second wing tool bar section pivotally secured to the other end of said center tool bar section and being selectively movable between the field position, wherein said second wing tool bar section is parallel to said center tool bar section, to the transport position, wherein said second wing tool bar section is substantially parallel to said tongue means,

at least a first lift wheel assembly selectively pivotally mounted, about a horizontal axis, on said first wing tool bar section,

at least a second lift wheel assembly pivotally mounted, about a horizontal axis on said second wing tool bar section,

at least a pair of spaced apart third lift wheel assemblies pivotally mounted, about horizontally axes, on said center tool bar section,

means for selectively pivoting said first and second lift wheel assemblies relative to said wing tool bar sections,

means for selectively pivotally moving said third lift wheel assemblies relative to said center tool bar section,

means for securing the outer ends of said wing tool bar sections to said tongue means when said wing tool bar sections have been folded to the transport positions,

said lift wheel assemblies being mounted forwardly of their respective tool bar sections,

lock means for selectively maintaining said tongue means in its retracted position,

said lock means including at least one hook member pivotally secured to said forward tongue member and movable between locked and unlocked positions, and receptacle means on said rearward tongue member which receives said hook member when said hook member is in its locked position, and

actuator means mounted on said forward tongue member rearwardly of the pivotal connection of the forward tongue member with said elongated frame member and between said elongated frame member and said at least one hook member,

said actuator means operable to pivot said hook member from the locked position to the unlocked position upon movement of the elongated frame member relative to said forward tongue member.

5,113,957

LIFTING CONTROL DEVICE FOR AN AGRICULTURAL MACHINE

Seishin Tamai; Yoshinori Doi, and Masakatsu Araki, all of Matsuyama, Japan, assignors to Isekinoki Kabushiki Kaisha Gijutsuba, Ehime, Japan

Filed Jun. 23, 1989, Ser. No. 237,791

Claims priority, application Japan, Oct. 30, 1986, 61-259427

Int. Cl.[5] A01B *63/112*

U.S. Cl. 172—10 **1 Claim**

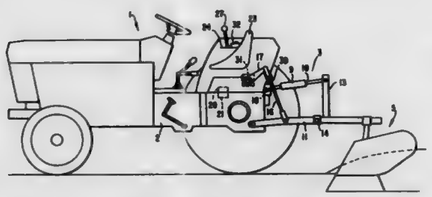
1. A lifting control device for an agricultural machine mounted on a tractor using a hydraulic lifting device, said lifting control device comprising:

a draft sensor for detecting traction resistance;

a tilling depth setter for setting a predetermined tilling depth depending upon said traction resistance detected by said draft sensor; and

a control means (1) for controlling said traction resistance of said agricultural machine by adjusting said predetermined tilling depth (2) for stopping control of said traction resistance for a predetermined time or a predetermined distance when said hydraulic lifting device is changed from a

raised position to a lowered position and (3) for temporarily stopping a plowing-in functoin, which quickly lowers the agricultural machine, when a relationship between (a)



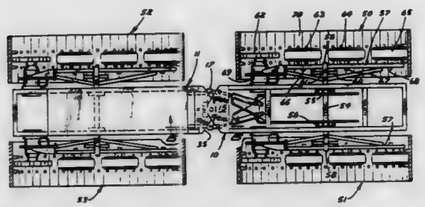
said predetermined tilling depth of said tilling depth setter and (b) a detection value of said draft sensor do not indicate said agricultural machine is being lowered.

5,113,958

SNOW TRAVEL VEHICLE

Thomas R. Holden, Rte. 1, Box 112, Le Center, Minn. 56057

Filed May 23, 1990, Ser. No. 528,049
Int. Cl.[5] B62D *55/065*
U.S. Cl. 180—9.4 **16 Claims**



1. A snow travel vehicle which comprises:

A) a two-part in-line articulated chassis, one of said parts being a forward part and the other of said parts being a rearward part, each of said chassis parts including a frame, said chassis being pivoted about a vertical axis for limited side-to-side relative movement for steering and pivoted about a horizontal axis for limited movement to accommodate ground irregularities,

1) one of said chassis parts including a transverse horizontal crossbar engaging a vertical pivot pin supported by the other of said chassis parts, said crossbar being pivotally connected to the frame of said chassis part by a spaced apart pair of parallel tie rods pivotally connected at their opposite ends to the crossbar and chassis frame, respectively,

2) a pair of generally longitudinally extending hydraulic cylinders being pivotally secured at one end in the other of said chassis parts, said cylinders each including a piston having a free end extending beyond the end of the cylinder, and

3) the free ends of the pistons of said cylinders pivotally connected to said crossbar on opposite sides of the pivot pin,

B) at least one track on each opposite side of each of said chassis parts, each of said tracks being supported by a plurality of longitudinally in-line wheels, one of those wheels being a drive sprocket,

C) a direct drive hydraulic motor connected to each of said drive sprockets,

D) independent beam suspension means for each of said tracks,

E) a hydraulic power system connected to each of said hydraulic motors, and to said cylinders, and

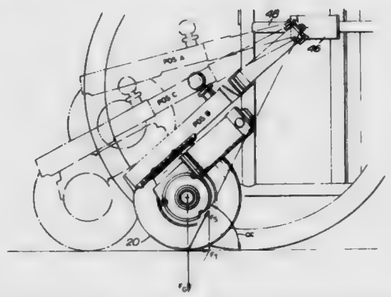
F) an internal combustion power system mounted on one part of said chassis to energize said hydraulic power system.

5,113,959

ELECTRIC DRIVE ATTACHMENT FOR A WHEELCHAIR

Eduard Mastov; Yehezkel Mautner, both of Jerusalem; Zvi Gilad-Smolinsky, Haifa, and Moshe Levy, Kibbutz Tzora, all of Israel, assignors to Propel Partnership 1987, Jerusalem, Israel

Filed Aug. 30, 1990, Ser. No. 575,222
Claims priority, application Israel, Sep. 10, 1989, 91588
Int. Cl.[5] B60K *7/00*
U.S. Cl. 180—11 **8 Claims**



1. An electric drive attachment for a wheelchair comprising: wheelchair comprising:

an electric motor constituting the input member of said drive, a wheel adapted to touch the ground by force of gravity only and to drive said wheelchair by frictional contact with said ground, said wheel constituting the output member of said drive, wherein said input member and said output member constitute an integral unit carried by a sleeve-like member slidably mounted on a carrier arm releasably attachable to a mounting member articulatedly affixable to said wheelchair and downwardly tiltable by gravity, first means being provided to allow said unit to be manually shifted to, and arrested at, at least a first predetermined power-drive position and a second predetermined power-drive position along said carrier arm, in the first of which positions said unit is closer to a reference point on said wheelchair and in the second of which positions said unit is more remote from said reference point, wherein in said first power-drive position, said carrier member includes with said ground a first angle, and in said second power-drive position, said carrier member includes with said ground a second angle, said first angle being the angle at which the ground grip of the ground-touching wheel assumes an optimal value and said second angle being smaller than said first angle.

5,113,960

LIFT TRUCK WITH A DRIVE UNIT PRE-TENSIONED BY SPRING LOADING IN THE VERTICAL DIRECTION

Eugen Prinz, Heilbronner Str. 63, 7410 Reutlingen, Fed. Rep. of Germany

Filed Feb. 16, 1990, Ser. No. 481,507
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1989, 3904798
Int. Cl.[5] B60K *1/00*; B62D *21/18*
U.S. Cl. 180—65.5 **9 Claims**

1. A shaft steered lift truck, comprising:

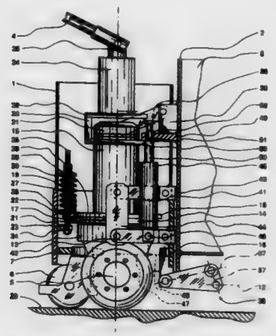
a drive chassis;

a drive unit connected with a drive wheel;

drive unit linkage means pivotally connecting said drive unit to said drive chassis;

a load chassis;

load linkage means pivotally connecting said load chassis to said drive chassis; and



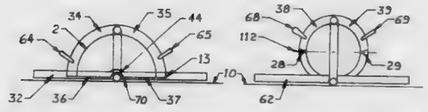
a lifting cylinder having a first end connected to one of said drive unit linkage means and having a second end connected to said load chassis.

5,113,961

TRACTOR AND TRAILER COMBINATION AIR CUSHIONED VEHICLE

John R. Wyss, 4020 148th Ave. NE. Suite F, Redmond, Wash. 98052

Continuation-in-part of Ser. No. 334,727, Apr. 7, 1989, abandoned. This application Jul. 17, 1990, Ser. No. 553,332
Int. Cl.[5] B60V *1/14*
U.S. Cl. 180—116 **4 Claims**



1. A guidance system for an air cushioned vehicle comprising:

an air cushioned platform,

a half torus hub mounted on said platform,

a traction wheel, having a left and a right side, rotatable about said hub, wherein an inner surface of said wheel tilts about an outer surface of said hub,

a closely fitted outer shell mounted on said platform substantially concentric with said hub,

wherein left and right pressurized chambers are defined by said hub, said shell and a respective side of said wheel, and wherein said chambers are pressurized by air pressure generated by said air cushioned platform,

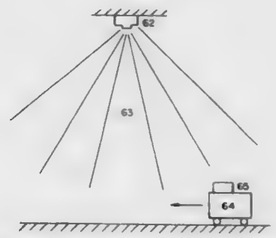
said vehicle further comprising a left and a right pressure relief valve operable with each of said chambers wherein upon opening at least one of said valves, said wheel is drawn to a tilted position resulting from relative pressure differences within said chambers.

5,113,962

LINEAR ENERGY COMMUNICATOR

Frank A. Calabrese, 13294 Old Mill Rd., Waynesboro, Pa. 17268

Continuation of Ser. No. 820,644, Jan. 21, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 94,075
Int. Cl.[5] G05D *1/00*
U.S. Cl. 180—167 **3 Claims**



1. A guidance system for a motorized vehicle to be driven on a floor or the like comprising:

transmitter means including

means for generating an omnidirectional energy signal having a selected frequency,

means for intercepting the energy signal dispersing from said generating means and for dispersing said intercepted omnidirectional energy signal in a plane of energy with the energy continuously present at all positions and times throughout the plane and with the plane of energy floor, said extended line defining the desired path of movement of the motorized vehicle,

control means carried by the motorized vehicle including

receiver means adapted to intersect the plane of energy at any location along the line as the motorized vehicle travels along the linear path,

means for determining the direction of separation between the actual location where the plane of energy intersects said receiver means and the desired location thereof, and

means for continuously correcting the location of the motor vehicle as the motor vehicle moves along the path to maintain the actual plane of energy coincident with the desired location thereof.

5,113,963

DRIVE SLIP CONTROL SYSTEM

Alfred Sigl, Sersheim; Johannes Schmitt, Schwieberdingen, and Thomas Isella, Markgröningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP88/01123, § 371 Date Jun. 20, 1990, § 102(e) Date Jun. 20, 1990, PCT Pub. No. WO89/05743, PCT Pub. Date Jun. 29, 1989
PCT Filed Dec. 8, 1988, Ser. No. 499,521
Int. Cl.[5] B60K *28/16*
U.S. Cl. 180—197 **14 Claims**

1. Drive slip control system for a vehicle having an engine which develops engine torque to drive wheels which exhibit slippage and to impart a velocity and an acceleration to the vehicle, said system comprising

means for determining the slippage of the driven wheels,

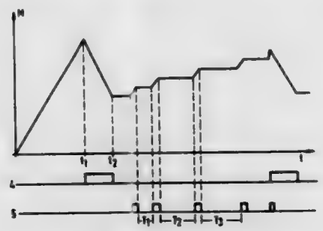
means for determining the speed of the vehicle,

means for reducing the engine torque when the slippage of a driven wheel exceeds a threshold,

means for increasing the engine torque in steps when said slippage again falls below said threshold, the torque being maintained constant for a maintenance time between steps, each reduction in engine torque followed by a stepwise

increase constituting a control cycle, said control cycles being repeated successively in a control procedure,

means for counting the number of control cycles which have already occurred in a control procedure, said steps being of equal height throughout each control cycle,



means for increasing the maintenance time between steps in response to at least one of an increase in the slippage and an increase in the number of control cycles, and

means for decreasing the maintenance time between steps in response to a decrease in the slippage.

5,113,964

FRONT AND REAR WHEEL DRIVE MOTORCYCLE

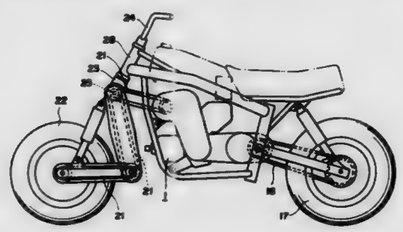
Kosaku Yamauchi, Shizuoka, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jun. 28, 1990, Ser. No. 545,912

Claims priority, application Japan, Jun. 28, 1989, 1-163836; Jun. 28, 1989, 1-163837; Jun. 28, 1989, 1-163838; Jun. 28, 1989, 1-163839; Jun. 28, 1989, 1-163840; Jun. 28, 1989, 1-163841; Jun. 28, 1989, 1-163842

Int. Cl.[5] B62M *7/02*

U.S. Cl. 180—224 **15 Claims**



1. A front and rear wheel drive motorcycle in which the front and rear wheels are driven by an operation of an engine, comprising:

an engine unit including a cylinder assembly and a crank shaft;

first and second speed change belt mechanisms mounted to one end of the crank shaft for driving the front and rear wheels, respectivley, said first and second speed change belt mechanisms being operatively connected to first and second speed change gear mechanisms through first and second driven pulleys respectively provided to the first and second speed change belt mechanisms;

driving pulley means including a stationary driving pulley mounted to one end of the crank shaft and operated in common with the first and second speed change belt mechanisms, the driving pulley means further including a pair of movable driving pulleys mounted to one end of the crank shaft with the stationary driving pulley interposed therebetween; and

first and second centrifugal clutch means disposed in operative association with said first and second driven pulleys for differentially driving the front and rear wheels respectivley.

5,113,965

ENGINE MOUNT

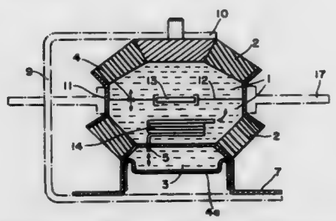
Arno Hamaekers, Gorxheimertal, and Arnold Simuttis, Bad Kreuznach, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Filed Jan. 23, 1990, Ser. No. 468,678

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1989, 3906373

Int. Cl.[5] F16F *13/00*

U.S. Cl. 180—300 **8 Claims**



1. A hydraulically damped engine mount comprising:

two separate working chambers which are filled with liquid;

a resilient wall bounding each of said working chambers at least in a partial area and a rigid wall separating said working chamber, said rigid wall having a damping opening joining said working chambers and a second opening with a disk for controlling the flow of liquid between said working chambers;

a compensating chamber in addition to the working chambers,

a flexible and substantially nonelastic wall for enabling the pressureless reception of additional liquid to the compensating chamber;

the compensating chamber having at least one compensating opening for joining the compensating chamber to at least one working chamber and the compensating opening exhibiting a flow resistance which is substantially greater than that of the damping opening.

5,113,966

DOWNHOLE HYDRAULIC SEISMIC GENERATOR

Danny L. Gregory, Corrales; Harry C. Hardee, and David O. Smallwood, both of Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 19, 1990, Ser. No. 511,372

Int. Cl.[5] G01V *1/40*

U.S. Cl. 181—106 **10 Claims**

1. A downhole seismic source for operation within a borehole to produce seismic energy waves through surrounding earth strata, comprising:

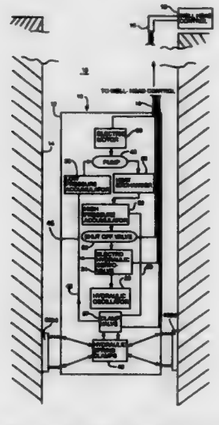
an elongated housing adapted for lowering into the borehole by a cable means;

a hydraulic oscillator means carried by said housing for producing seismic vibrations in said housing;

a hydraulic pressure source carried by said housing for providing a flow of high pressure hydraulic fluid, comprising a pump means for recycling said hydraulic fluid and for recharging the downhole seismic source and an electric motor for driving said pump means, said hydraulic pressure source further comprising a low pressure fluid accumulator which receives spent hydraulic fluid from said hydraulic oscillator means and from said clamp valve means and outputs hydraulic fluid to said pump means which outputs a high pressure hydraulic fluid, a heat exchanger means for receiving the high pressure fluid from said pump means and for dissipating heat produced by said pump means in the hydraulic fluid, and a high pressure accumulator for receiving the high pressure hydraulic fluid from said heat exchanger means and for providing the high pressure fluid as an output to an electro-hydraulic servovalve means, whereby the downhole seismic source is recharged for future operation;

an electro-hydraulic servovalve means operably connected between said hydraulic pressure source and said hydraulic oscillator means for controlling said flow of high pressure hydraulic fluid from said hydraulic pressure source into said hydraulic oscillator means which thus produces said seismic vibrations; and

a clamping means carried by the housing for selectively, rigidly clamping said housing to the wall of said borehole



and for allowing said seismic vibrations to be transmitted from said housing through said clamping means to the earth strata, said clamping means comprising a plurality of shoe members radially-spaced from a longitudinal axis of said housing which are selectively engageable with the wall of the borehole, a piston actuator means for each said shoe member for moving said respective shoe member into engagement with the wall of the borehole when subject to a fluid pressure, a clamp valve means for selectively connecting a flow of high pressure hydraulic fluid from said hydraulic pressure source to activate said piston actuators, and a spring means for each said piston actuator for retracting a respective said shoe member from engagement with the wall of the borehole in the absence of a fluid pressure on said piston actuator.

5,113,967

AUDIBILITY EARPLUG

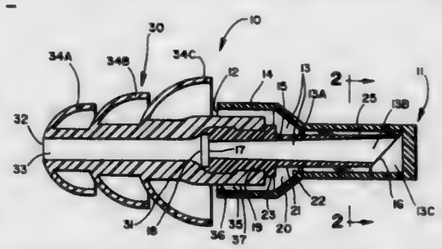
Mead C. Killion, Elk Grove Village; Jonathan K. Stewart, Bensenville, both of Ill.; Robert Falco, and Elliott H. Berger, both of Indianapolis, Ind., assignors to Etymotic Research, Inc., Elk Grove Village, Ill.

Filed May 7, 1990, Ser. No. 519,855

Int. Cl.[5] A61B *7/02*

U.S. Cl. 181—132 **21 Claims**

1. An earplug, comprising: first passage means arranged for positioning with at least an inner end portion thereof in an earcanal to define a first sound passage extending from an inner end within the ear canal to an opposite outer end, and second passage means defining a second sound passage having an inner end coupled to said outer end of said first passage and having an opposite sound-receiving outer end, said second passage including a portion folded back on itself and being operative to enhance the acoustical response characteristics of the earplug while allowing said second passage means to be unobtrusive and compact in size, said sound-receiving outer end of said



second sound passage being arranged as an annular opening around said inner end of said second sound passage.

5,113,968

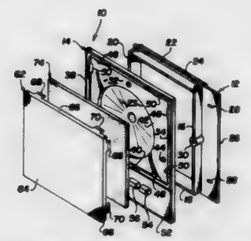
SPEAKER GRILL ASSEMBLY

Harold J. Lemmon, 9884 Monroe Dr., Dallas, Tex. 75220

Filed Oct. 3, 1990, Ser. No. 592,708

Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—148 **5 Claims**



1. A speaker grill assembly, comprising: a grill constructed to support a speaker on a wall, said grill including a body having an opening through which the speaker emits sounds and a passageway through which the body may be connected to the wall; a perforated screen constructed to cover the opening and passageway in the body of said grill detachably connected to said grill; and a pad being constructed to prevent viewing the opening and the passageway in the body of said grill while permitting the sound emitted by the speaker to pass substantially unimpaired therethrough, said pad being disposed between said grill and said perforated screen when said grill and said perforated screen are fastened to one another.

5,113,969

DISPLACEABLE WORKING PLATFORM WITH EXTENSIBLE BOOM

Luc Drolet, Cap-Rouge, and Paul Michaud, Ancienne-Lorette, both of Canada, assignors to Centre de Recherche Industrielle du Quebec, Sainte-Foy, Canada

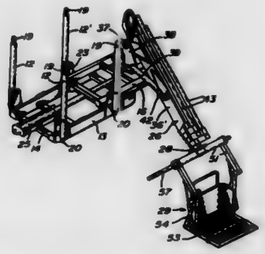
Filed May 10, 1991, Ser. No. 698,113

Int. Cl.[5] B66F *11/04*; E21B *7/00*

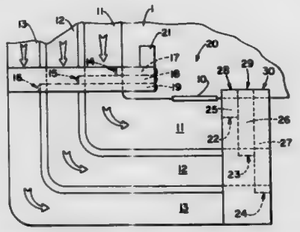
U.S. Cl. 182—2 **15 Claims**

1. A displaceable working platform comprising a main frame having stabilizing means for immovably securing said main frame to at least two opposed surrounding surfaces, a displaceable platform slidingly secured to said main frame, adjustable displacement means for displacing said platform from a storage position to a working position relative to said main frame, an extensible boom secured on a rotating support base secured to said displaceable platform, said boom having a working free

end, a working element secured to said free end, means to rotate said boom on said rotating support base, means to control the extension of said boom and means to regulate the angular position of said boom.

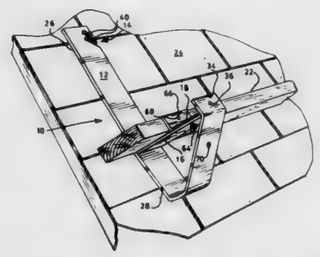


5,113,970
FOOD SERVICE SYSTEM FOR DRIVE-IN RESTAURANTS
Edward F. Bavis, 201 Grandin Rd., Maineville, Ohio 45039
Continuation of Ser. No. 80,494, Jul. 31, 1987, abandoned. This application Nov. 19, 1991, Ser. No. 794,388
Int. Cl.[5] E04H *3/02*
U.S. Cl. 186—41 **17 Claims**



1. A conveyor system for delivering items from a processing station to a remote delivery station,
an opposing pair of spaced apart drive member,
guide means for each of said drive members positioned to define mating paths of travel for said drive members, said corresponding paths of travel extending between said processing station and including a vertical segment at each of said stations interconnected by a horizontal segment, the vertical segments of said guide means at said delivery station including outwardly inclined segments positioned to displace the carrier laterally outwardly as it approaches the discharge station,
reversible drive means operatively connected to said drive members for moving them in unison,
a carrier extending between said opposing drive members in a horizontally disposed upright position, and
means for rotatably mounting said carrier relative to said drive members, whereby said carrier will rotate relative to said drive members and remain in upright position irrespective of whether said drive members are traveling vertically or horizontally in their mating paths of travel,
surrounding housings at the processing station and at the delivery station enclosing said guide members, an access opening in each housing, the access opening at said delivery station being of a length to define a high delivery position and a low delivery position, the outwardly inclined segments of said guide means being positioned to displace said carrier laterally outwardly as it approaches said high delivery position, said guide means including lower vertical segments positioned to move said carrier vertically between the high and low delivery positions, and
first stop means positioned for arresting movement of said carrier in alignment with the access opening at said processing station, and second stop means positioned for selectively arresting movement of said carrier in alignment with either the high or low delivery positions at said delivery station.

5,113,971
ADJUSTABLE ROOFING JACK
Roy L. Violet, Rte. 1, Box B-477, Lake City, Tenn. 37769
Filed Mar. 8, 1991, Ser. No. 666,784
Int. Cl.[5] E04G *3/12*
U.S. Cl. 182—45 **20 Claims**



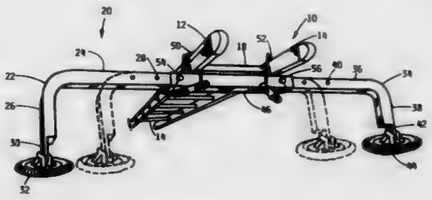
1. An adjustable roofing jack for supporting a scaffold with a selected width, said scaffold for supporting a roofer while working on an inclined roof, said adjustable roofing jack comprising:
a frame for attaching to said roof, said frame having first and second ends;
a securement means carried by said frame proximate said first end for receiving at least one fastener, said securement means preventing said adjustable roof jack from movement in relation to said roof, said fastener engaging said roof;
a scaffold support means connected to said frame for engaging said scaffold;
an adjustment means carried by said scaffold support means for selectively adjusting the effective width of said scaffold support means to a width substantially equal to the width of said scaffold; and
storage means carried by said frame for storing said adjustment means when not deployed.

5,113,972
SCISSOR-TYPE LIFTING DEVICE, PARTICULARLY FOR A WORK PLATFORM
Martin Haak, Sr., G. Schoolmeesterlaan 14, 2015 EM Haarlem, Netherlands
Filed Aug. 10, 1989, Ser. No. 392,063
Claims priority, application PCT Int'l Appl., Aug. 10, 1988, PCT/NL88/00038; Fed. Rep. of Germany, Apr. 3, 1989, 8904060[U]
Int. Cl.[5] E04G *1/22*
U.S. Cl. 248—141 **2 Claims**

1. A work platform comprising:
a lower frame;
an upper frame;
a scissor mechanism that connects said upper frame and said lower frame one above the other; and
a drive means for actuating said scissor mechanism to lift said upper frame with respect to said lower frame;
and scissor mechanism comprising a lower, an upper and at least one intermediate scissor units; wherein
each of said scissor units has a first and a second arm;
each of said arms has a lower and an upper end and a mid point located approximately in the middle between said lower and said upper ends;
said mid points of the first and second arms of each of the scissor units being respectively hingedly connected by a joint defining a horizontal scissor axis;
said lower end of said first arm of said lower scissor unit being hingedly connected to said lower frame by a first lower joint so as to pivot about a lower first axis which extends parallel to said horizontal scissor axis of said lower scissor unit;
said lower end of said second arm of said lower scissor unit being connected to said lower frame by a second lower joint so as to pivot about a lower second axis which extends parallel to said lower first axis and to slide along said lower frame in a direction perpendicular to said lower second axis;
said upper end of said first arm of said upper scissor unit being hingedly connected to said upper frame by a first upper joint so as to pivot about an upper first axis which extends parallel to said horizontal scissor axis of said upper scissor unit;
said upper end of said second arm of said upper scissor unit being hingedly connected to said upper frame by a second upper joint so as to pivot about an upper second axis which extends parallel to said upper first axis and to slide along said upper frame in a direction perpendicular to said upper second axis;

said lower and upper ends of said arms of said intermediate scissor unit being laterally connected, respectively, to said upper ends of said arms of said lower scissor unit and to said lower ends of said arms of said upper scissor unit by joints, so that said horizontal scissor axis of said upper, intermediate and lower scissor units are arranged one above the other;
wherein for each said scissor axis only one of said scissor units is provided for producing moments of torque in said arms of said scissor units, which moments of torque cause prestresses in said joints and thus render said joints free of play; and
the scissor mechanism which connects the upper and lower frame contains only one series of at least three scissor units arranged one above the other wherein one scissor unit contains only two arms hingedly connected one to other;
wherein said drive means connects the lower frame with the lower scissor unit;
wherein the drive means acts on one of the scissor arms of the lowermost scissor unit at a distance from the horizontal scissor axis of said lower scissor unit; and
wherein further the upper and lower ends of the first scissor arm of the lower scissor unit, with which drive means is connected, are provided with connecting mounts to receive connecting bolts, and the mid-point of the first arm of the lower scissor unit is provided with a connecting mount to receive a connecting bolt arranged at a distance (a) above the plane defined by the axes of the connecting bolts at the end of this scissor arm.

5,113,973
ADJUSTABLE STAND-OFF BRACE FOR A LADDER
Don L. Southern, 1918 Euharlee Rd., Kingston, Ga. 30145-2502
Filed Apr. 6, 1990, Ser. No. 505,838
Int. Cl.[5] E06C *7/48*
U.S. Cl. 182—214 **1 Claim**



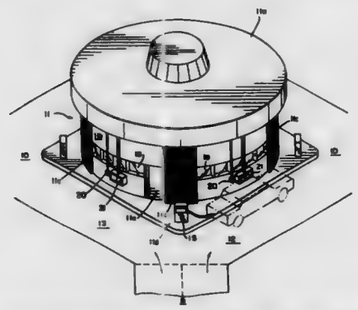
1. An attachment for a ladder having first and second siderails, comprising:
an elongated bar having first and second end portions and a middle portion extending between said end portions, said first and second end portions angularly extending from said middle portion;
a first U-bolt having a size sufficient for encircling said first siderail and attaching said middle portion of said elongated bar to said first siderail, and a second U-bolt having a size sufficient for encircling said second siderail and attaching said middle portion of said elongated bar to said second siderail;
a first extension member connected to said first end portion of said bar;
a first end plug fitted in and connected to said first extension member;
a second extension member connected to said second end portion of said bar;
a second end plug fitted in and connected to said second extension member;
a first resilient pad;
first means for pivotally connecting said first resilient pad to said first end plug;
a second resilient pad; and
second means for pivotally connecting said second resilient pad to said second end plug.

5,113,974
TIMED CYCLE SINGLE STOP SHOPPING FACILITY
Mark Vayda, 8380 Greensboro Dr., Ste. 917, McLean, Va. 22102
Division of Ser. No. 87,288, Aug. 20, 1987, Pat. No. 4,805,738. This application Jan. 23, 1989, Ser. No. 280,922
Int. Cl.[5] E04H *3/04*
U.S. Cl. 186—36 **9 Claims**

1. A facility for vending consumer goods and services with increased efficiently comprising:
a circular building having an inventory of merchandise therein, said building having exterior side walls which are mounted for rotation;
a plurality of customer stations located outside of said building adjacent to and around the exterior of the rotational side walls of said circular building, each exterior customer station including a parking space for a single vehicle;
a plurality of merchandise displays located outside of said building on said rotational side walls of said building for viewing by persons located adjacent to said parking spaces as said displays move in succession past said park-

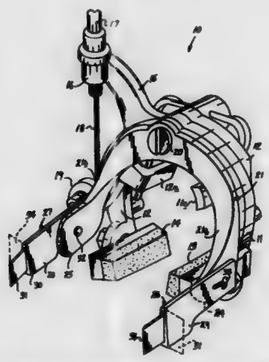
ing spaces with rotation of said building exterior side walls; and

a plurality of ordering devices located outside of said building at said plurality of customer stations respectively, each of said ordering devices being usable by a person at an associated one of said customer stations to order merchandise from the inventory of merchandise within said building;



the rotational exterior side walls of said circular building including at least one moving loading station which moves past said exterior customer stations in sequence as said building side walls rotate, for the delivery of merchandise ordered by use of said ordering devices from the interior of said building to different ones of the vehicles located respectively in different ones of said exterior parking spaces.

5,113,975
BICYCLE RIM WATER REFLECTING APPARATUS
Rocco Zucchero, 10711 5th Ave. Cutoff, Countryside, Ill. 60525
Filed Apr. 3, 1991, Ser. No. 680,126
Int. Cl.[5] B62L *1/02*
U.S. Cl. 188—24.12 **3 Claims**



1. A bicycle rim water deflecting apparatus, comprising in combination,

a first arcuate calliper arm and second calliper arm, wherein each first and second arcuate calliper arms are pivotally mounted relative to one another by a pivot axle, and

the second calliper arm including an extension leg mounting a boss member, with the boss member securing a cable sheath thereto, the cable sheath slidably receiving a cable through the cable sheath, with the cable including a lower cable end mounted to the first calliper arm to effect relative pivotment of the first calliper arm relative to the second calliper arm, and

the first calliper arm mounting a first brake shoe at a lower terminal end thereof, and the second calliper arm mounting a second brake shoe at a lower terminal end thereof, and

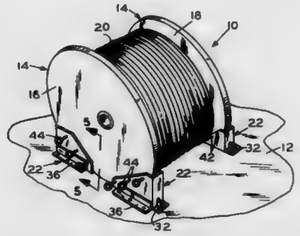
a U shaped support collar, the U shaped support collar including a first collar leg and a second collar leg, with the U shaped support collar mounted to the pivot axle medially of the U shaped support collar, and

the U shaped support collar including a first collar leg foot and a second collar leg foot, with each first and second respective collar leg foot mounted to a lower terminal end of each respective first and second collar leg, and each first and second collar leg foot orthogonally oriented relative to each respective first and second collar leg and

the first and second collar leg foot pivotally mounting a respective first and second mounting leg thereto, and the first mounting leg and the second mounting leg each including a confronting planar interior surface, and

each mounting leg including a planar forward surface, with the planar forward surface orthogonally oriented relative to the planar interior surface and the planar forward surface includes a primary flexible deflector blade mounted within each planar forward surface.

5,113,976
REEL CHOCK WITH SET SCREWS FOR FLANGE ENGAGEMENT
Larry R. Noakes, 21155 SW. Sandra La., Aloha, Oreg. 97006
Filed Oct. 29, 1990, Ser. No. 604,214
Int. Cl.[5] B60T *3/00*
U.S. Cl. 188—32 **3 Claims**



1. A reel clock for releasably securing to a support surface a heavy reel provided with terminal flanges, each having an inner surface and an outer surface and with material mounted thereon, the chock comprising:

(a) an elongated base plate,

(b) an elongated outer side plate on and extending upwardly from the base plate and dimensioned to overlie the outer surface of a reel flange,

(c) an elongated inner side plate on and extending upwardly from the base plate and dimensioned to overlie the inner surface of a reel flange,

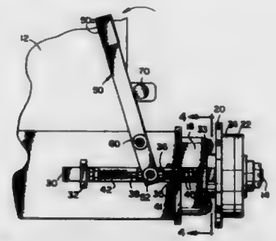
(d) the inner side plate having a portion of its upper surface cut away for accommodating the surface contour of the material mounted on the reel,

(e) the outer one of the side plates having a plurality of longitudinally spaced threaded openings therethrough,

(f) threaded pin means in the threaded openings in the outer side plate for releasable bearing engagement with the adjacent surface of the reel flange, and

(g) chock securing means for releasably securing the chock to a support surface.

5,113,977
LIFT TRUCK PARKING BRAKE
James R. Ridings, Glenmoore, and Anh M. Nguyen, Landisville, both of Pa., assignors to Strato-Lift, Inc., Morgantown, Pa.
Filed Dec. 18, 1990, Ser. No. 629,455
Int. Cl.[5] B62C *7/02*
U.S. Cl. 188—69 **13 Claims**



1. For a lift truck having a chassis with an elevating platform, a wheel supporting said chassis for land travel, an axle carried by said chassis and supporting said wheel on said chassis for rotation, and means to drive the wheel; a parking brake assembly to prevent rotation of said wheel relative to said chassis comprising

a brake disc transverse to said axle and coupled to said wheel and having a series of axial passages disposed in a circle circumferentially of said axle,

a brake slide having a pin portion at one end operable to engage in said any one of said passages,

guide means on said chassis to afford longitudinal sliding displacement of said brake slide parallel to said axle so as to allow said pin portion to move into and out of engagement with a passage in said brake disc when the passage is aligned with said pin, said pin being freely slidable within said passage when it is precisely aligned with said brake slide, and binding with said passage when said passage is out of precise alignment with said slide,

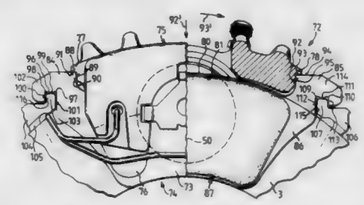
an actuator movable between a "park" limit position and a "release" limit position for displacing said brake slide to actuate said brake pin between an engaged position penetrating a passage in said brake disc and a disengaged position spaced from said brake disc, and

a spring-loaded buffer assembly coupling said actuator to said brake slide to allow a delay in displacement of said brake slide after movement of said actuator to one of its limit positions until said pin portion is freely slidable within one of said passages.

5,113,978
SPOT TYPE DISC BRAKE
Rolf Weiler, Eppstein; Wolfgang Schiel, Frankfurt am Main, and Rainer Bretzler, Eppstein, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany
Continuation of Ser. No. 345,150, Mar. 28, 1990, abandoned. This application Oct. 1, 1990, Ser. No. 593,364
Claims priority, application Fed. Rep. of Germany, May 7, 1988, 3815733
Int. Cl.[5] F16D *65/04*
U.S. Cl. 188—73.31 **4 Claims**

1. A spot-type disc brake for an automotive vehicle having a rotatable brake disc, and a steering knuckle member fixed relative said rotation of said brake disc having a pair of circumferentially spaced apart axially extending arms, said disc brake comprising a U-shaped housing having a pair of legs which straddle said brake disc in a U-shaped manner and are connected by a housing bridge, said pair of housing legs including a first housing leg having a piston-and-cylinder unit including a piston mounted in a cylinder, and a second, external housing leg, a first brake shoe which has a first carrier plate engaging said first, piston-side leg, a second brake shoe which has a second carrier plate engaged by said second, external leg, and with at least two projections oppositely disposed on each side of said first and second carrier plates which support the associated first or second brake shoe in the radial direction and in the circumferential direction, said projections on the carrier plate of each brake shoe being arranged for engaging and being supported by said axially extending arms of said fixed steering knuckle member, means establishing engagement of each of said carrier plates projections with a respective one of said steering knuckle member arms, each of said carrier plate projections including a first radially extending surface, a second projection surface extending circumferentially away from said first, radially extending surface, and a third projection surface circumferentially spaced away from said first projection surface extending radially inwardly from said second projection surface to form a radially inwardly facing groove on either side of said first and second carrier plates so that either end of each of said carrier plates is of hook shape;

said means establishing engagement of each of said steering knuckle arms with a respective projection on each side of said first and second carrier plates comprising a first radially extending arm surface formed on an axially extending portion of each of said arms, juxtaposed and facing said first projection surface of a respective side of each of said first and second carrier plate projections, and a second radially extending surface formed on said axially extending portion of each of said steering knuckle arms circumferentially spaced from said first surface, and facing said second projection surface of a respective side of each of said first and second carrier plates, said steering knuckle arm portions thereby each fit into a respective groove formed on each side of said first and second carrier plates, whereby circumferential braking reaction forces may be transmitted form each of said carrier plates into both of said steering knuckle arm portions by pushing of one of said steering knuckle arm portions by said projection of one side of each of said first and second carrier plates acting through mating of said first projection surface against said arm portion first surface, and by pulling of the other of said steering knuckle arm portions by the other of said projections of said first and second carrier plates acting through mating of said second projection surface of each of said first and second surface.



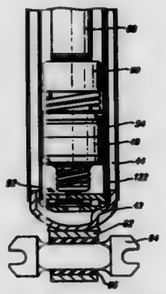
5,113,979
BASE VALVE FOR A SHOCK ABSORBER
Jan Driessen, Hasselt, Belgium, assignor to Monroe Auto Equipment Company, Monroe, Mich.
Filed Feb. 30, 1991, Ser. No. 658,321
Int. Cl.[5] F16F *9/50*
U.S. Cl. 188—280 **29 Claims**

1. A shock absorber for damping the relative movement between the sprung and unsprung portions of an automobile, said shock absorber being able to provide compression and rebound strokes, said shock absorber comprising:

a pressure cylinder forming a working chamber;

a piston disposed in said pressure cylinder operable to divide said working chamber into first and second portions, said piston having first means for controlling the flow of damping fluid between said first and second portions of said

pressure cylinder, said first means being able to selectively generate firm and soft damping characteristics;
a reserve cylinder disposed exteriorly of said pressure cylinder, said reserve cylinder cooperating with said pressure cylinder so as to form a reserve chamber; and
second means for controlling the flow of damping fluid between said second portion of said working chamber and



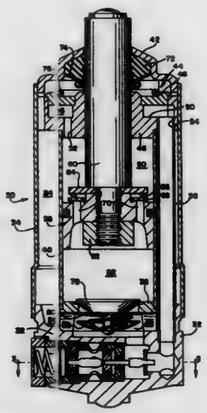
said reserve chamber in response to the flow of damping fluid between said first and second portions of said working chamber controlling by said first means, said second means for controlling the flow of damping fluid between said second portion of said working chamber and said reserve chamber including a valve housing and a valve element slidably disposed within said valve housing.

5,113,980

QUICK RESPONSE ADJUSTABLE SHOCK ABSORBER AND SYSTEM

Fredrick J. Furrer, Wisconsin Dells, Wis., and Charles D. Lemme, Tucson, Ariz., assignors to Hyrad Corporation, Wisconsin Dells, Wis.

Filed Sep. 11, 1990, Ser. No. 580,755
Int. Cl.[5] F16F *9/46*
U.S. Cl. 188—299 **19 Claims**



1. An active shock absorber system for a vehicle suspension system, said shock absorber system comprising:
a control circuit adapted to contain a control fluid;
a shock absorber comprising:
a cylinder;
a piston disposed in the cylinder to define first and second chambers on opposite sides thereof;
at least one passage interconnecting the first and second chambers such that movement of the piston in the cylinder in a selected direction forces a working hydraulic fluid from the first chamber through the passage in a selected direction;
a substantially constant pressure valve disposed in the passage and effective to restrict fluid flow through the passage to determine a damping characteristic of the shock absorber;
a fluid powered actuator responsive to fluid pressure in the control circuit;
a non-compliant rigid link coupling the fluid powered actuator and the substantially constant pressure valve such that forces applied to the fluid powered actuator by the control fluid are applied to the valve by the link, thereby adjusting pressure of the working hydraulic fluid behind the valve and the damping characteristic of the shock absorber; and
a high speed pressure controlling device operative to modulate fluid pressure in the control circuit with a maximum response frequency of at least about 8 Hz, thereby accomplishing high speed adjustment of the damping characteristic of the shock absorber.

5,113,981

SAFETY LINE SHOCK ABSORBER

Michael D. Lantz, 3740 Bouquet Rd., Pacific, Mo. 63069

Filed Oct. 19, 1989, Ser. No. 423,384
Int. Cl.[5] F16F *7/12*
U.S. Cl. 188—371 **6 Claims**



1. A safety line shock absorber comprising:
an elongated strip of flat webbing having a predetermined length and width, said strip having a top surface, a bottom surface, a left end and a right end, said strip of webbing being folded longitudinally upon itself a plurality of times in an accordian type manner to form a plurality of lapped portions;
an elongated bungy cord having a predetermined length, said bungy cord having a left end and a right end;
means for securing the left end of said bungy cord to the left end of said elongated strip of flat webbing;
means for securing the right end of said bungy cord to the right end of said elongated strip of flat webbing; and
a plurality of transverse rows of stitching across said respective lapped portions that will tear apart and allow said webbing to be stretched out to its unfolded length when excessive force is applied to the longitudinal ends of the safety line shock absorber when a workman hooked up to said shock absorber unexpectedly takes a fall.

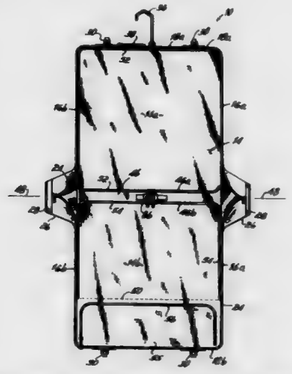
5,113,982

GARMENT BAG WITH WHEELS AND AN INNER PANEL WITH PLURAL ACCESS OPENINGS

John Pulichino, Providence, R.I., and Joy Tong, New York, N.Y., assignors to American Tourister, Inc., Warren, R.I.

Filed Feb. 11, 1991, Ser. No. 653,182
Int. Cl.[5] A45C *5/14, 5/12, 13/10*
U.S. Cl. 190—18 A **5 Claims**

5. A garment bag comprising:
a foldable inner panel,
a foldable outer panel,
a pair of sides and ends joined to said outer panel defining an interior packing space, said inner and outer panels being foldable along an axis extending between said sides generally midway between said ends whereby said bag can be in either a folded position wherein the inner panel is folded on itself or an unfolded position wherein said inner and outer panels lie generally flat,
a hanger hook attached to one of said ends,
means for selectively securing and releasing said hanger hook,
a zipper extending around said sides and ends for closing said bag in the folded position, said sides including side flaps permitting said bag to be laid flat when said zipper is unzipped,
means for securing said side flaps to said sides in the bag folded position,
said outer panel further comprising pockets therein and a handle attached to said outer panel,
wheels attached to said ends permitting rolling of said garment bag in the bag folded position,
said inner panel comprising:
a first section joined to one of said sides of said bag,
a second section joined to the end of said bag opposite said end having said hanger hook,
a central partition attached to and extending between said sides along said axis, said central partition being split in the middle and including latch means for selectively securing and releasing said partition,



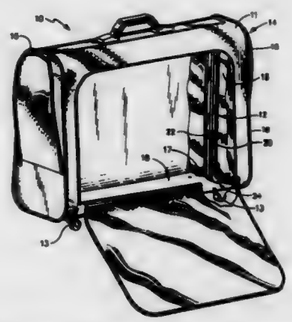
said first and second sections being generally equally dimensioned and separated by said central partition,
first and second zippers extending along opposite sides of said central partition and along said first and second sections, respectively, permitting each of said sections to be opened and closed independently of the other for opening and closing of said interior packing space,
a pair of triangular shaped corner pockets disposed in said interior packing space in the corners between said sides and said end carrying said hanger hook,
latch means attached interiorly to the end of said bag carrying said hanger hook for holding clothes hangers,
a relatively rigid interior panel underlying said second inner panel section and being hinged to permit movement of said interior panel in and out of said interior packing space, said interior panel further comprising an elastic strap for securing clothes thereto,
side straps for securing said interior panel in said interior packing space,
said first inner panel section including pockets on the side thereof facing said interior packing space, and
said second panel section including a pocket on the side thereof facing said interior packing space, said pockets being openable and closable by zippers.

5,113,983

FRAME FOR SOFT LUGGAGE CASE

David E. Workman, Evergreen, Colo., assignor to Samsonite Corporation, Denver, Colo.

Filed Mar. 15, 1991, Ser. No. 670,126
Int. Cl.[5] A45C *3/00, 13/00*
U.S. Cl. 190—127 **12 Claims**



1. A soft luggage case comprising a case body made of fabric and a frame for supporting said body, said case body having at least one end panel, the frame comprising a bottom board extending substantially the length of the body of the luggage case; the bottom board having a first end portion at one end of the bottom board and a second end portion at the other end, the first end portion terminating approximate to said one end panel, and a frame member attached to the bottom board at each said end portion thereof, said frame member including leg members extending upwardly from said bottom board, the lower end of at least a first of said leg members having attachment foot formed at a substantial right angle to the leg member to which it is attached, and fastening means for attaching the attachment foot to the bottom board end portion, the attachment foot being directed outwardly from said frame member towards said one end panel and overlying said first end portion.

5,113,984

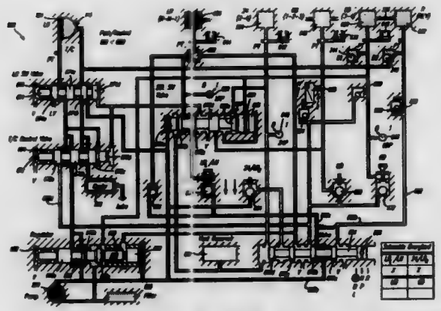
TORQUE CONVERTER CONTROL VALVE IN A FLUID SYSTEM OF AN AUTOMATIC TRANSMISSION

Howard L. Benford, Bloomfield Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 467,319, Jan. 18, 1990, abandoned, which is a continuation of Ser. No. 187,672, Apr. 29, 1988, abandoned. This application Jul. 1, 1991, Ser. No. 723,753
Int. Cl.[5] F16H *45/02*
U.S. Cl. 192—3.3 **8 Claims**

1. In a vehicle transmission having a torque converter assembly for transmitting torque from an output member of a vehicle engine to an input member of the vehicle transmission and having a fluid actuated lock-up device for frictionally engaging a turbine of the torque converter assembly to the output member of the vehicle engine during an engagement operating mode and disengaging the turbine during a disengagement operating mode, a valve assembly in a fluid system of a vehicle transmission for directing fluid flow from a fluid source to the torque converter assembly, said valve assembly comprising:
a regulator valve means for establishing a pressure level of fluid flow from a fluid source in the valve assembly;
a first fluid path communicating with said regulator valve means and one side of the torque converter assembly;
a second fluid path communicating with a second side of the torque converter assembly and a cooler of the transmission fluid; and
control valve means disposed in said first and second paths for regulating inlet fluid pressure to the torque converter

assembly to provide various pressure levels of the pressure level of fluid flow from said regulator valve means to the torque converter assembly during the disengagement operating mode in which fluid flows through said first fluid path to disengage the fluid-actuated lock-up device and fluid exits from the torque converter assembly



through said second fluid path and for restricting fluid flow in said first fluid path by said control valve means during the engagement operating mode while fluid flows through said second fluid path and fluid flow is restricted by the control valve means to the cooler to engage the fluid-actuated lock-up device by providing variable pressure on both sides of said torque converter assembly.

5,113,985

SYNCHRONIZER STRUT GUIDE

Barry L. Frost, DeWitt, N.Y., assignor to New Venture Gear, Inc., Troy, Mich.

Filed Nov. 1, 1990, Ser. No. 607,802
Int. Cl.[5] F16D *23/06*
U.S. Cl. 192—53 F **27 Claims**



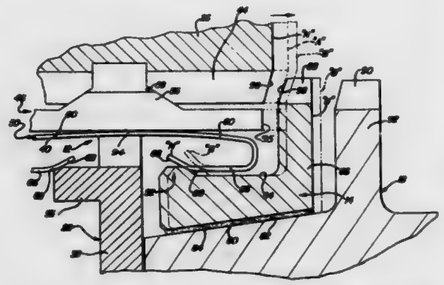
1. In a synchronizer clutch and gear assembly comprising a longitudinally extending shaft having an externally splined hub fixed thereon, said hub having an axially extending guide slot formed in the outer circumference thereof, a first gear journally mounted on said shaft adjacent one axial side of said hub and having an externally splined surface, a shift sleeve having an internally splined surface slidably coupled to said hub external splined surface and being axially slidable thereon in a first direction from a neutral position to a first operative position such that upon said shift sleeve internal splined surface being moved into engagement with said first gear external splines said clutch is operative to couple said first gear in rotation with said shaft, a blocker ring having first friction surface means and defining a clearance with cooperating second friction surface means associated with said first gear, a strut positioned for axial and radial movement within said guide slot, spring means for urging said strut into engagement with said internally splined surface of said shaft sleeve such that said strut moves into engagement with said blocker ring during the axial shifting operation of said shift sleeve toward said first gear to effect frictional engagement of said first and second friction surface means, an improvement wherein said guide slot has tapered inner wall surface means adapted to be slidably engageable with complementary tapered outer surface means formed on said strut for permitting axial and radially inward movement of said start within said guide slot while inhibiting excessive radially outward movement therein for retaining said strut within said guide slot under radially outwardly generated forces and said shaft sleeve has a width dimension which uncovers greater than one-half of said strut when said shift sleeve is moved to said first operative position whereby said cooperative inner and outer tapered wall surface means inhibit said strut from becoming dislodged from said guide slot.

5,113,986

STRUT-TYPE SYNCHRONIZER MECHANISM WITH RETRACTING AND CENTERING STRUT

Barry L. Frost, Dewitt, N.Y., assignor to New Venture Gear, Inc., Troy, Mich.

Filed Apr. 9, 1991, Ser. No. 682,604
Int. Cl.[5] F16D *23/06*
U.S. Cl. 192—53 F **21 Claims**



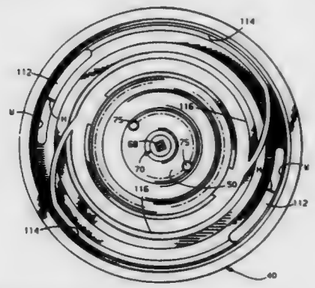
1. In a synchronizer mechanism of the type comprising a longitudinally extending shaft having a clutch hub fixed thereon, said clutch hub having a radial web portion and a longitudinally extending externally splined flange portion, guide slot means formed in said radial web portion and externally splined flange portion of said clutch hub, a gear journally mounted on said shaft adjacent said clutch hub and having an externally splined surface, a clutch sleeve having an internally splined surface meshingly coupled to said clutch hub external splined surface and being axially slidable thereon in a first direction from a neutral position to a first operative position such that upon said clutch sleeve internal splined surface being moved into engagement with said gear external splines said synchronizer mechanism is operative to couple said gear for rotation with said shaft, a blocker ring having first friction surface means and defining a clearance with cooperating second friction surface means associated with said gear, a strut positioned for axial and radial movement within said guide slot means, and spring means for urging said strut into engagement with said internally splined surface of said clutch sleeve such that said strut moves into engagement with said blocker ring upon axial shifting operation of said clutch sleeve toward said gear for energizing said synchronizer mechanism so as to effect frictional engagement of said first and second friction surface means for developing frictional synchronizing torque therebetween, the improvement wherein said spring means is arranged to maintain continuous engagement with said blocker ring for continuously exerting an axially directed retracting force thereon for moving said blocker ring toward said neutral position upon de-energization of said synchronizer mechanism whereby said blocker ring friction surface means is operatively disengaged from said ratio gear friction surface means, said retracting force being operable for retaining said blocker ring in said neutral position for inhibiting self-energization of said synchronizer mechanism due to residual viscous drag between said first and second friction surfaces.

5,113,987

FLUID RETURN CHANNELS FOR A COVER OF A VISCOUS FLUID CLUTCH

David B. Drennen, Bellbrook; Ronald G. Huth, Huber Heights, and David M. Hudson, Kettering, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 7, 1991, Ser. No. 651,875
Int. Cl.[5] F16D *31/02, 43/25*
U.S. Cl. 192—58 B **7 Claims**



1. A viscous fluid clutch comprising:
(a) an input shaft;
(b) a clutch plate driven by the input shaft;
(c) housing means having a hollow interior containing the input shaft and the clutch plate;
(d) a pump plate internally mounted in the housing means to separate a reservoir formed in the housing means from a working chamber;
(e) a predetermined volume of viscous fluid stored in the reservoir which enters the working chamber through controlled fill openings provided in the pump plate and returns to the reservoir through orifices provided in the pump plate radially outbound of the fill openings; and
(f) fluid return channel means formed in the housing means for directing fluid to the reservoir after it passes through the pump plate orifices, the return channel means including
(i) a fluid accumulator formed in an interior surface of the housing means and aligned with a respective orifice; and
(ii) a respective non-radial channel formed in the interior surface of the housing means beginning at each accumulator and terminating at the reservoir, wherein each non-radial channel is radially aligned with a radially outermost dimension of the fluid accumulator and is formed at a constant radius for at least the first 90°.

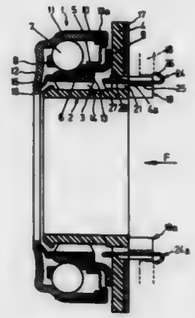
5,113,988

CLUTCH THRUST BEARING COMPRISING MEANS FOR CONNECTION TO THE OPERATING MEMBER

Fabrice Caron, Montigny-le-Bretonneux, France, assignor to SKF France, Clamart Cedex, France

Filed May 29, 1991, Ser. No. 705,951
Claims priority, application France, Jun. 21, 1990, 90 07802
Int. Cl.[5] F16D *23/14*
U.S. Cl. 192—98 **6 Claims**

1. A clutch thrust bearing assembly comprising:
a guide bush having a tubular part, a radial flange which is engageable by an operating member of the thrust bearing, and two mounting support means each provided with a housing having a passage;
a rolling bearing mounted on said guide bush;
two independent metal retaining elements adapted to be inserted in said passages and held by snap-fastening in said mounting support means;
each said retaining element having a cross-shaped plane general shape with one axial arm carrying a hook adapted to cooperate with said operating member and one transverse arm having two main surfaces and an edge portion furthermost in the axial direction from said hook;



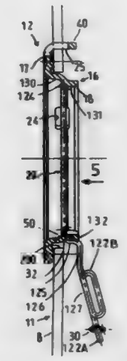
each said housing including two slide channels cooperating with said main surfaces of the transverse arm of said retaining element, and an abutment means which is contacted by said edge portion to limit the insertion of the retaining element into the housing.

5,113,989

ACTUATING ASSEMBLY FOR A CLUTCH RELEASE BEARING, IN PARTICULAR FOR AN AUTOMOTIVE VEHICLE

Jacques Feigler, St. Brice-sous-Forêt, France, assignor to Valeo, Paris, France

Filed Oct. 12, 1990, Ser. No. 597,884
Claims priority, application France, Oct. 13, 1989, 89 13435
Int. Cl.[5] F16D *23/14*
U.S. Cl. 192—98 **6 Claims**



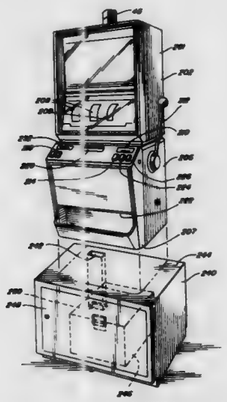
1. An actuating assembly for acting in traction between a clutch release bearing and a diaphragm of a clutch, the diaphragm having a central opening, the actuating assembly comprising: an actuating member including a collar portion for engagement on said diaphragm and further including a flange integral with said collar portion, for extending through said central opening of the diaphragm; and a coupling piece comprising a ring portion arranged inside said flange and resiliently deformable in the radial direction, two arms extending out-

wardly from the ring portion and projecting outwardly with respect to said flange, the arms having means for hooking one over the other, the flange having two distinct openings formed through it with each said arm extending through a respective said opening, and a bridge portion separating said openings from each other, the coupling piece being attachable to said clutch release bearing by simple snap-fitting of the latter, at least in the axial direction going from said collar portion towards said coupling piece, wherein each said arm includes a local deformation comprising loop means for extending its length in a resilient manner, each local deformation being arranged radially inward of said means for hooking an arm over the other arm.

5,113,990
BILL VALIDATION AND CHANGE SYSTEM FOR A SLOT MACHINE

A. J. Gabrius, Carol Streara; Robert C. Mesh, Schiller Park; Arthur Brey, Des Plaines, and Daniel Hartogh, Morton Grove, all of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Continuation of Ser. No. 118,090, Nov. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 829,298, Feb. 12, 1986, abandoned. This application Aug. 15, 1989, Ser. No. 394,258
Int. Cl.[5] G07F *7/04, 17/34*
U.S. Cl. 194—206 **105 Claims**

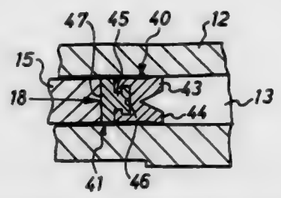


1. In a gaming device having means for accepting coins of only one denomination to play a game, win means for determining a winning game play and coin storage means for storing said coins, said coin storage means being controllable to payout variable numbers of coins, a bill changing system comprising:
means for receiving bills of a plurality of denominations, said receiving means having means for identifying the denomination of a received bill;
acceptance means responsive to said bill receiving means for determining whether a received bill is acceptable, a bill being acceptable if a game is not currently being played; and
means responsive to said win means and said acceptance means for controlling said storage means to payout coins of said one denomination responsive to a winning game or a received bill determined to be acceptable.

5,113,991
RELEASE DEVICE FOR A CLUTCH

Koji Kajitani; Minoru Abe, and Shinpei Fujiwara, all of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

PCT No. PCT/JP89/00400, § 371 Date Nov. 30, 1989, § 102(e) Date Nov. 30, 1989, PCT Pub. No. WO89/10493, PCT Pub. Date Nov. 2, 1989
PCT Filed Apr. 12, 1989, Ser. No. 445,676
Claims priority, application Japan, Apr. 26, 1988, 63-56467[U]; May 6, 1988, 63-60400[U]; May 18, 1988, 63-65367[U]
Int. Cl.[5] F16D *25/063*
U.S. Cl. 192—98 **4 Claims**

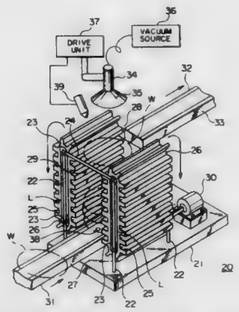


1. A release device for a clutch including a cylinder coaxially aligned with a release bearing, a cylindrical piston fitted in a cylindrical operation chamber of the cylinder, and an annular seal mounted in position adjacent an annular end of the piston within said operation chamber, said operation chamber being connected to an external operating pressure control means through a liquid control passage, an end of said piston outside said operating chamber being axially connected to the release bearing, said annular seal comprising an annular slide member and an annular packing, said annular slide member being fixed at one of its ends to said packing and engagable at its other end with said piston, said slide member being greater in hardness and lower in friction coefficient than said packing.

5,113,992
VERTICAL WAFER CARRYING APPARATUS

Masaaki Sadamori, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 20, 1990, Ser. No. 585,979
Claims priority, application Japan, Sep. 21, 1989, 1-243417
Int. Cl.[5] B65G *1/12*
U.S. Cl. 198—347.3 **5 Claims**

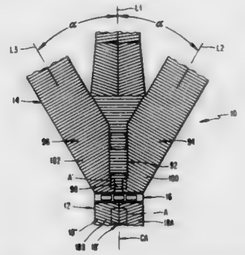


1. A vertical wafer carrying apparatus comprising:
a pair of endless belts, each having a plurality of outward projections forming a plurality of substantially horizontal, parallel shelves;
support means supporting said pair of endless belts is spaced apart relationship with at least some pairs of said projections on said endless belts facing each other for supporting respective semiconductor wafers on said shelves and defining a substantially vertical transfer path having an entrance and an exit between said endless belts, said endless belts being movable along respective endless loops;
drive means for driving each of said endless belts along the endless loops at substantially equal speeds in the same direction along the vertical transfer path;
an entrance conveying unit disposed at the entrance of the vertical transfer path for conveying a semiconductor wafer to the entrance;
an exit conveying unit disposed at the exit of the vertical transfer path for conveying a semiconductor wafer from the exit;
an entrance sensor for sensing semiconductor wafer at the entrance of the vertical transfer path and actuating said drive means in response; and
an exit sensor for sensing a semiconductor wafer at the exit of the vertical transfer path and actuating the exit conveying unit in response.

5,113,993
THREE WAY SPLITTER

Goro Okada, Glen Rock, N.J., assignor to Sandvik Process Systems, Inc., Totowa, N.J.

Filed Apr. 1, 1991, Ser. No. 678,250
Int. Cl.[5] B65G *47/46*
U.S. Cl. 198—369 **15 Claims**

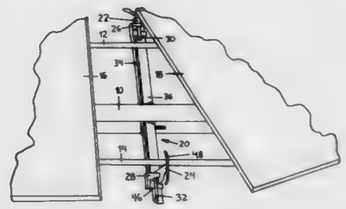


1. A conveying system for conveying articles selectively in three directions, comprising:
an infeed conveyor for conveying articles;
a steering mechanism including:
a plurality of steering rollers situated downstream of said infeed conveyor for receiving articles therefrom, said rollers being rotatable about respective horizontal axes of rotation and turnable about respective vertical axes,
means for rotating said steering rollers about said axes of rotation to advance the articles, and
means for turning said steering rollers simultaneously about said vertical axes between first, second, and third positions for steering the articles in central, rightward and leftward directions, respectively; and
outfeed conveyor means situated downstream of said steering mechanism and defining a transverse mouth for receiving articles from said steering mechanism, said outfeed conveyor means comprising:
a central conveyor defining a first longitudinal outfeed axis and including a first series of driven rollers arranged to convey articles along said first longitudinal outfeed axis,
a right-hand conveyor oriented rightwardly relative to said first longitudinal outfeed axis as viewed in plan, said right-hand conveyor including a second series of driven rollers arranged obliquely relative to said first longitudinal outfeed axis, and
a left-hand conveyor oriented leftwardly relative to said first longitudinal outfeed axis as viewed in plan, said left-hand conveyor including a third series of driven rollers arranged obliquely relatively to said first longitudinal outfeed axis,
said center conveyor occupying less than one-third of the transverse width of said mouth, and each of said right-hand and left-hand conveyors occupying more than one-third of the transverse width of said mouth.

5,113,994
CONVEYER LINE STRAIGHTENER

Edward A. Mueck, Box 326, Rte. 1, Viola, Ill. 61486

Filed Nov. 26, 1990, Ser. No. 617,559
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—395 **3 Claims**



1. A conveyer line straighter for properly aligning items passing along a conveyer line, said straightener comprising: a pair of bumpers laterally spaced apart across said line, each of said bumpers being depressible by said items, each of said bumpers being depressible by said items,
said bumpers having interconnection means whereby an untouched first bumper untouched by said item in place to retain said item until said item also contacts said untouched first bumper at which time both said bumpers release said item for further movement,
said interconnection means including a pair of pivotal latches with said bumpers attached thereto, said latches being pivotally mounted onto latch holders, a connecting rod, said latch holders being connected to the ends of said connecting rod, a mounting bracket, said connecting rod being pivotally attached to said mounting bracket, latch catches fixedly attached to said mounting bracket, said latches being retained by said latch catches and retaining said bumpers in an upright position until released by conveyer items contacting both said bumpers.

5,113,995
CHEESE CONVEYOR SYSTEM

Akira Sakurai, Inazawa, Japan, assignor to Kabushiki Kaisha Murao and Company, Kanazawa, Japan

Filed Dec. 24, 1990, Ser. No. 632,990
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—409 **6 Claims**

1. A cheese conveyor system for conveying cheeses wound by a winder, wherein:
a ceiling conveyor which is opened in front and rear portions in a moving direction and a lower portion and provided with hangers for supporting a lower portion of an outer peripheral surface of a cheese from opposite sides thereof is horizontally extended;
loaders for transferring a cheese to said hanger are disposed, on the winder side, at suitable positions along said ceiling conveyor;
unloaders for removing the cheese from the hanger are provided at suitable positions along said ceiling conveyor;
said loaders and unloaders are formed to have the same construction, and a pair of forks for supporting the lower portion of the outer peripheral surface of the cheese from opposite sides thereof are provided above said loaders and

said unloaders so that said forks can freely pass through lower openings of said hangers;

said loader and said unloader are provided with an elevating device with said forks disposed at the upper portion



thereof and provided with a turning guide for changing the direction of the forks; and

said elevating device is provided with an elevating member connected to a rodless cylinder and having a fork at the upper portion thereof.

5,113,996

ROTARY MULTIPLE POINT DISCHARGE CONVEYER

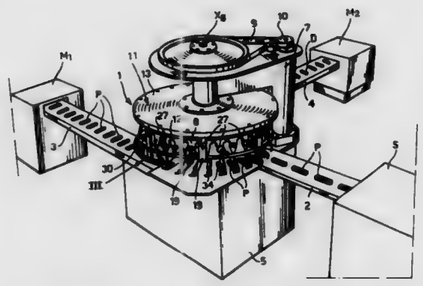
Renzo Francioni, Prato Sesia, Italy, assignor to Cavanna S.p.A., Italy

Filed Mar. 7, 1991, Ser. No. 666,669

Claims priority, application Italy, Mar. 7, 1990, 67160 A/90

Int. Cl.[5] B65G *29/00*

U.S. Cl. 198—441 **20 Claims**



1. A device for transferring a flow of articles from an angular input position to at least one angular output position, comprising;

a surface for the sliding of the articles from the angular input position to the at least one angular output position;

a carousel structure including a plurality of transfer elements movable between the angular input position and the at least one angular output position as a result of the rotation of the structure, said transfer elements being movable between an operative position in close proximity to the slide surface for the entrainment of the articles, and a rest position spaced from the slide surface respectively;

operating means for selectively causing at least some of the transfer elements which arrive at the angular input position in the operative position to move to the rest position upon arrival at said at least one angular output position, said operating means comprising at least one reaction structure for cooperating with the transfer elements to cause them to move to the rest position, said at least one reaction structure being movable selectively to a position in which it is disengaged from the transfer elements so that, when they pass the reaction structure which has been moved to the disengaged position, the transfer elements remain in their operative positions for the entrainment of the articles.

5,113,997

VENEER STRIP CHARGING APPARATUS

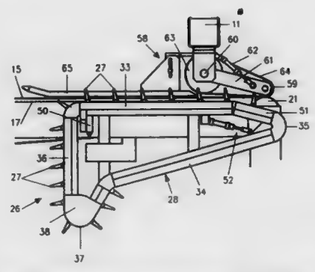
Ernst Hunziker, Othmarsingen, Switzerland, assignor to M & S Brugg AG, Brugg, Switzerland

Filed May 3, 1991, Ser. No. 695,215

Claims priority, application Fed. Rep. of Germany, May 15, 1990, 4015572

Int. Cl.[5] B65G *43/08*

U.S. Cl. 198—460 **18 Claims**



1. A veneer strip charging apparatus for feeding veneer strips into an apparatus for joining the veneer strips to form a veneer sheet by mutually gluing together the individual veneer strips along their longitudinal edges, said charging apparatus comprising:

a conveying means adapted to move the individually delivered veneer strips along a horizontal path in a direction transverse to their longitudinal extension, said conveying means comprising a plurality of conveying units operating in a plurality of parallel tracks uniformly distributed over the width of the veneer strip charging apparatus;

a plurality of spacer means freely movably guided in the direction of movement of said veneer strips and circulating in endless circulation tracks, said spacer means engaging between the individual veneer strips along the conveying path thereof and being located beside said conveying units, said spacer means being forced to a movement along said endless circulation tracks by said veneer strips;

said conveying means comprising a plurality of conveying belts supported by and gliding on a supporting plate, said conveying belts serving as supporting members for a plurality of veneer strips which are thereby moved along said conveying path solely under the influence of static friction between said veneer strips and said conveying belts; and

said endless circulation tracks comprising guiding means for said spacer means which are located below the level of conveyance.

5,113,998

HANGING DEVICE FOR SUPPORTING A CLOTHES-HANGER ON A SUSPENDED CONVEYOR

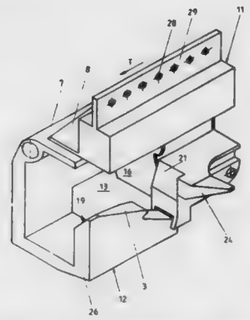
Erwin Grube, Bielefeld; Walter Kuhlmann, Lage, and Ralf Schneuing, Horstel, all of Fed. Rep. of Germany, assignors to Dürkopp Adler AG, Fed. Rep. of Germany

Filed Mar. 15, 1990, Ser. No. 494,125

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1989, 3909002

Int. Cl.[5] B65G *47/34*

U.S. Cl. 198—465.4 **24 Claims**



1. A hanging device for supporting a clothes hanger on a suspended conveyor which moves in a direction of transport (T), comprising:

a base body; a flap which is pivotally mounted on the base body for pivoting about an axis transverse to the direction of transport; the flap having an open position and a closed position; and means for locating the hook of the clothes hanger for being substantially fully supported on a sloping portion of the base body such that gravity holds the hook resting against a portion of the flap alongside said hook, with respect to said direction on transport (T) and not substantially underneath said hook, so as to maintain said hook substantially fully supported on said resting position of the base body, with the flap in its closed position.

5,113,999

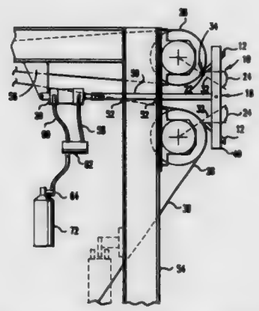
POSITIONABLE DOCTOR BLADE

Reiner Zeppenfeld, Allison Park, Pa., assignor to Roediger Pittsburgh, Inc., Allison Park, Pa.

Filed Jan. 14, 1991, Ser. No. 641,440

Int. Cl.[5] B65G *45/00*

U.S. Cl. 198—497 **9 Claims**



1. An apparatus for scraping material from a pair of moving surfaces comprising:

a pair of scraping means disposed at an angle in relationship to the moving surfaces such that each of said scraping means scrapes material from its respective moving surface without binding the moving surface;

a bracket assembly to which the pair of scraping means are fixedly attached;

positioning means pivotally connected to the bracket assembly for selectively positioning the pair of scraping means in contact and out of contact with the moving surfaces;

wherein the position means moves the bracket assembly in a linear path to position the pair of scraping means in contact with the moving surfaces; and

wherein contact of the pair of scraping means against the moving surfaces essentially balances the bracket assembly about the positioning means.

5,114,000

STRIPPING DEVICE FOR CLEANING CONVEYOR BELTS

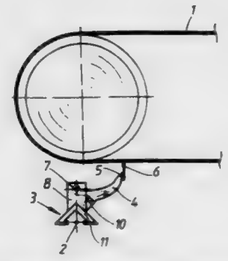
Albert Rappen, Mülheim an der Ruhr, Fed. Rep. of Germany, assignor to VSR Engineering GmbH, Mülheim an der Ruhr, Fed. Rep. of Germany

Filed Sep. 7, 1990, Ser. No. 580,268

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1989, 3930204

Int. Cl.[5] B65G *45/16*

U.S. Cl. 198—499 **17 Claims**



1. A stripping device for cleaning a conveyor belt, the device comprising:

a bearing having a bearing axis;

a holding bracket mounted on said bearing;

a pivot axle positioned between said holding bracket and the conveyor belt, said pivot axle being mounted to said holding bracket;

a stripping arm having a claw means, said claw means having an open end portion substantially equal to or greater than a diameter of said pivot axle, said claw means for surrounding said pivot axle in a positive-locking manner when said stripping arm is in a working position, and said claw means for slideably disengaging said pivot axle when said stripping arm is turned out of a working position; and,

a spring member being mounted between said stripping arm and said holding bracket for biasing said stripping arm against said holding bracket.

5,114,001

SPLICE APPARATUS INCLUDING SPLICE PLATES WITH COMPOUND CURVATURE

William B. Anderson, Oconomowoc, Wis., assignor to Rexnord Corporation, Milwaukee, Wis.

Filed Aug. 5, 1991, Ser. No. 741,070

Int. Cl.[5] B65G *15/30*

U.S. Cl. 198—844.2 **16 Claims**

1. A belt assembly comprising:

a belt member including a pair of end portions and a roller member engaging portion;

a first splice member including a belt engaging surface having a first section engaging one of the end portions, and a

curved section including a first segment and a second segment engageable with the roller member engaging portion, said first and second segments including respective first and second radii of curvature, said second radius of curvature being greater than said first radius of curvature;



a second splice member including a belt engaging surface having a first section engaging the other of the end portions; and

means for fastening said first and second splice members together to secure therebetween the end portions of said belt member.

5,114,002

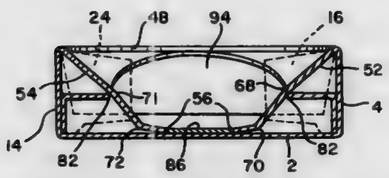
REINFORCED DISPLAY BOX

David M. Warner, Teaneck, N.J., assignor to Universal Folding Box, Inc., Hoboken, N.J.

Filed Jun. 3, 1991, Ser. No. 709,285

Int. Cl.[5] B65D *5/06*

U.S. Cl. 206—45.14 **24 Claims**



1. In a display carton comprising bottom, top and side walls defining between themselves an object-receiving space, said top wall having an opening through which an object received in said space can be viewed, the improvement which comprises shadow panels extending down from said top wall and inclined toward one another, and shadow-panel-securing means on said bottom wall separate from and normally unconnected to said shadow panels, said shadow panels engaging said securing means when said shadow panels are in operative position, whereby said shadow panels are secured in their inclined position and support the top wall and said side walls.

21. In a display carton comprising bottom, top and side walls defining between themselves an object-receiving space, said top wall having an opening through which an object received in said space can be viewed, the improvement which comprises shadow panels extending down from said top wall and inclined toward one another, and shadow-panel-securing means on said bottom wall, said shadow panels engaging said securing means, whereby said shadow panels are secured in their inclined position and support the top wall and said side walls, and a partition located between and spaced from said bottom and top walls and having an object-receiving opening at least in part registering with said top wall opening.

5,114,003

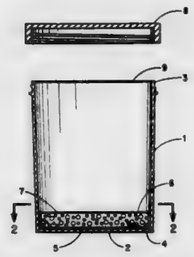
TABLET VIAL WITH DESICCCANT IN BOTTOM

David A. Jackisch; Ralph F. May, both of Wilmington, and Kevin D. Berl, Claymont, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 28, 1991, Ser. No. 677,014

Int. Cl.[5] B65D *81/26*

U.S. Cl. 206—204 **4 Claims**



1. A method of protecting hygroscopic materials, comprising:

a) filling a package with desiccant;

b) sealing the package to prevent the entrance of moisture into the desiccant;

c) placing the sealed package in the base of a container;

d) puncturing the desiccant package immediately prior to placing the hygroscopic material in the container;

e) placing the hygroscopic material in the container;

f) placing a lid over the container such that the container is substantially sealed against moisture.

5,114,004

FILLED AND SEALED, SELF-CONTAINED MIXING CONTAINER

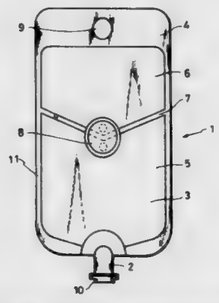
Keinosuke Isono, Kawaguchi; Takao Yoshida, Tama, and Tatsuo Suzuki, Machida, all of Japan, assignors to Material Engineering Technology Laboratory Inc., Tokyo, Japan

Filed Feb. 12, 1991, Ser. No. 654,037

Claims priority, application Japan, Feb. 14, 1990, 2-33515; Feb. 27, 1990, 2-48286

Int. Cl.[5] B65D *25/08;* **B67D** *5/00;* **A61B** *19/00*

U.S. Cl. 206—222 **13 Claims**



1. A flexible, plastic, filled and sealed, self-contained mixing container consisting of plural compartments with contents enclosed therein in a manner mutually isolated from each other, said container comprising:

at least one heat-sealed to a single-plane outer surface of the wall of the container, said at least one side-channel, which is contiguous to at least two compartments, contains a means to destroy a portion of the wall of the container at

at least one location, in order to mix the contents together, and is hollow over the portion of the wall to be destroyed.

5,114,005

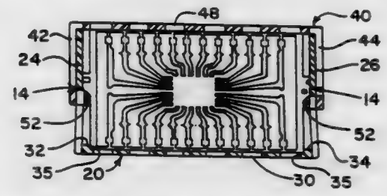
CARTRIDGE WITH PROJECTIONS TO SECURE ARTICLES HELD WITHIN

James H. Cote, and Jurgen M. Ekberg, both of Export, Pa., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 4, 1990, Ser. No. 592,430

Int. Cl.[5] B65D *73/02*

U.S. Cl. 206—328 **2 Claims**



1. An elongated container for receiving a number of individual articles, comprising:

a tray having a generally uniform elongated article receiving area,

said tray formed by generally parallel elongated spaced apart sides joined by a coextensively extending elongated bottom,

a cover formed by generally parallel elongated spaced apart sides joined by a coextensively extending elongated top,

said tray and cover being dimensioned so that said tray and cover tightly fit together to form an integral container,

said tray having a series of spaced apart openings in its said sides formed to pass uniformly through said sides of said tray,

said cover having a series of spaced apart projections in its said sides arranged to cooperate with said openings in said sides of said tray, said projections having portions to engage and restrain the articles from movement relative to said tray and cover,

the articles having projecting tabs at their opposite ends,

said tabs having side portions, and

said projections of said cover having ends constructed to fit between and support adjacent side portions of said tabs.

5,114,006

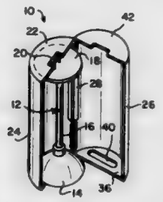
TOOL ASSEMBLY

Peter J. Wilk, 185 W. End Ave., New York, N.Y. 10023

Filed Apr. 5, 1990, Ser. No. 505,064

Int. Cl.[5] B65D *85/00;* **E03D** *9/00*

U.S. Cl. 206—349 **18 Claims**



1. A household implement comprising:

a tool member including an operative element and an extension attached to said operative element;

a first casing member;

a second casing member;

first coupling means for connecting said extension to said first casing member to enable relative rotation between said tool member and said first casing member about a first axis;

second coupling means for connecting said first casing member to said second casing member to enable relative rotation therebetween about a second axis, said first casing member and said second casing member cooperating to at least substantially enclose said tool member in a storage configuration of the household implement; and

gripping means on at least one of said first casing member and said second casing member for enabling a user to manipulate said tool member so as to place said operative element in contact with a surface.

13. A tool assembly comprising:

a tool member including:

(i) an operative element;

(ii) an elongate extension attached to said operative element; and

(iii) a flange connected to said extension at an end thereof opposite said operative element;

a housing large enough to contain said tool member;

closure means operatively connectable to said housing for enclosing said tool member therein;

locking means for locking said flange to said housing so that said operative element is spaced from said housing; and

gripping means on said housing for enabling a user to manipulate said tool member so as to place said operative element in contact with a surface.

5,114,007

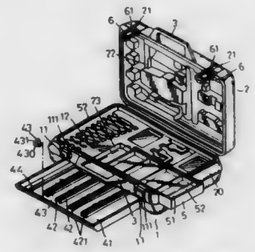
TOOL BOX WITH DRAWER MEMBER

Chang Chen, Taichung Hsien, Taiwan, assignor to Tung I Enterprise Co., Ltd., Taichung Hsien, Taiwan

Filed Mar. 25, 1991, Ser. No. 674,708

Int. Cl.[5] B65D *85/00*

U.S. Cl. 206—373 **4 Claims**



1. A tool box comprising a first casing half, a second casing half hinged to said first casing half, each of said first and said second casing halves having an inner wall provided with at least one tool-receiving recess, a fastening means to fasten said first casing half to said second casing half, and a handle provided on at least one of said first and second casing halves, characterized in that:

said tool box further comprises a rectangular first drawer member;

one of said first and second casing halves has a rectangular cavity to slidably receive said first drawer member,

said first drawer member having a bottom wall provided with a plurality of spaced pairs of substantially L-shaped elongated projections, each said pair of elongated projections defining therebetween an elongated groove which has a narrow upper portion and a wide lower portion, and

a plurality of positioning members each having an enlarged head portion received in said lower portion of one of said elongated grooves and a restricted portion extending upward from said head portion and through said upper portion of said one elongated groove, said positioning members engaging said elongated projections with a de-

gree of tightness sufficient to resist unforced movement of said positioning members along said elongated grooves, whereby said positioning members are used to arrange additional tools inside said first drawer member.

5,114,008

CASSETTE CONTAINER HAVING INNER REINFORCING EDGE

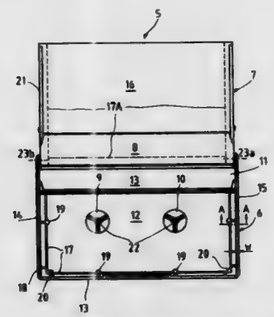
Klaus Schoettle, Heidelberg; Gerald-Wolfgang Borck, Ludwigshafen; Kurt Schmidts, Schwanau, and Bozidar Pavelka, Willstaett, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 400,410, Aug. 30, 1989, abandoned. This application Oct. 22, 1990, Ser. No. 600,162

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1988, 8811110[U]

Int. Cl.[5] B65D *85/672*

U.S. Cl. 206—387 **5 Claims**



1. A container, having a right parallelepiped shape, for a cassette, comprising a bottom part which has a bottom wall, at least one of a back wall and a front wall, and bottom part side walls, and a lid part which consists of at least one lid wall, wherein a reinforcing edge is arranged on the inner surface of the bottom wall substantially paralleling at least one of said back wall and front wall and each of the side walls in nesting fashion on the inside thereof and at a close spacing thereto, the reinforcing edge having a height above the bottom wall which is lower than the height of the walls of said bottom part so that said reinforcing edge serves as a frame-like support for the cassette bottom when the cassette is inserted into the container.

5,114,009

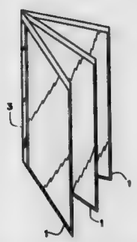
ROAD-MAP HOLDER AND ORGANIZER

Ronald C. Johnston, 115 David Way, Grass Valley, Calif. 95949

Filed Apr. 26, 1991, Ser. No. 691,744

Int. Cl.[5] B65D *85/00;* **A45C** *11/00*

U.S. Cl. 206—425 **13 Claims**



1. A road-map holder for holding folded road maps, comprising:

a) a plurality of planar pages;

b) each page consisting of a leaf and a first pocket;

c) each said leaf being substantially rectangular, said leaf having a first edge and a second edge, said first edge shorter than said second edge, said first edge substantially perpendicular to said second edge, said leaf having a front side and a back side;

d) a first marginal area, said first marginal area positioned on said leaf along said first edge;

e) a second marginal area, said second marginal area positioned on said leaf along said second edge;

f) said first pocket affixed to the front side of said leaf, said first pocket bordered by said first marginal area and said second marginal area, said first pocket being transparent, said first pocket sized to hold a folded road map, said first pocket having one opening, said opening being only along said first marginal area;

g) hinged means defined by the respective second edges of said pages being welded together along a common axis enabling said pages to pivot on said axis.

5,114,010

PROTECTOR FOR STACKED SHEET MATERIAL

Jason R. Smith, Veneta, Oreg., assignor to Industrial Finishes & Systems, Inc., Eugene, Oreg.

Continuation of Ser. No. 646,178, Jan. 28, 1991, abandoned. This application May 28, 1991, Ser. No. 706,029

Int. Cl.[5] B65D *85/48, 6/36*

U.S. Cl. 206—453 **7 Claims**



1. A protector for use on a stack of sheet material to protect the exposed surfaces of the sheet material from a band extending about the stack and fastened by a clamp, said protector comprising,

a strip of a length exceeding the width of the stack,

cuts in said strip extending partially through the strip and forming end segments on said strip, and

webs integral with said end segments resulting from said cuts, said webs being of a flexible nature to permit positioning of the end segments perpendicular to the remaining portion of the strip for abutment with the sides of the stack,

said strip defining an open area into which a clamp on the band may be displaced without contact with the sheet material.

5,114,011

CONTAINER ASSEMBLIES WITH ADDITIVE CUPS

Edward S. Robbins, III, 459 N. Ct., Florence, Ala. 35631

Continuation-in-part of Ser. No. 576,080, Aug. 31, 1990. This application Oct. 18, 1990, Ser. No. 598,385

Int. Cl.[5] B65D *81/32, 21/02, 21/08*

U.S. Cl. 206—499 **31 Claims**

1. A container assembly comprising:

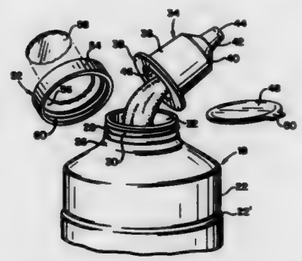
a main container body including a bottom wall, peripheral side wall, an open upper end and a first cap removably securable to said open upper end of said container body;

a cup detachably supported in said open upper end and adapted to hold an additive for mixing with contents of said main container body, said cup having a first dispensing portion for pouring said additive into said main container body, and a second dispensing portion dispensing a mixture of said contents and said additive, wherein said first and second dispensing portions are concentrically arranged and wherein at least said first dispensing portion is closed prior to use by a removable seal accessible from outside said main container body when said first cap is in place on said container body.

9. A stack of collapsed and folded containers, each of which comprises a bottom wall, a peripheral side wall extending from said bottom wall, a tapered shoulder section extending from said peripheral side wall, and a reduced diameter neck portion including an opening extending from said tapered shoulder section, said peripheral side wall including at least one portion folded outwardly and upwardly to form a first concentric folded portion extending upwardly to at least said tapered shoulder section;

a cup detachable supported in said opening and adapted to hold an additive for mixing with contents of said container, said cup having a first dispensing portion for pouring said additive into said container, and a second dispensing portion for dispensing a mixture of said contents and said additive.

14. A collapsed thin wall container for facilitating compact shipment of a plurality of such containers comprising a bottom wall, a peripheral side wall extending from said bottom wall, a shoulder section extending from said peripheral side wall, and a reduced diameter neck portion including an opening extending from said shoulder section, and said peripheral side wall



including at least one portion folded outwardly and upwardly to form a first concentric folded portion extending upwardly at least, to said shoulder section;

a cup detachably supported in said opening and adapted to hold an additive for mixing with contents of said container, said cup having a first dispensing portion for pouring said additive into said container, and a second dispensing portion for dispensing a mixture of said contents and said additive.

17. A container assembly comprising:

a main container body including a bottom wall, a collapsible peripheral side wall, and an upper portion surrounding an opening, said main container body adapted to hold a first material;

a cup having first and second ends, at least one of said first and second ends being temporarily closed by a removable seal, said cup being detachably supported within said opening and said other of said first and second ends located within said main container body; said cup adapted to hold an additive mixable with said first material upon removal of said cup and said removable seal; said cup further having a separate dispensing portion adapted to dispense a mixture of said additive and said first material from said main container body portion upon reattachment of said cup to said main container body, wherein prior to mixing, said cup is supported within said opening in a first position and, after mixing, said cup is supported in said opening in a second position inverted relative to said first position.

5,114,012

INTERLEAVED SPIRAL WRAPPING OF FOAM PRODUCT AND STRETCH FILM FOR PACKAGING CARBONLESS PAPER ROLLS

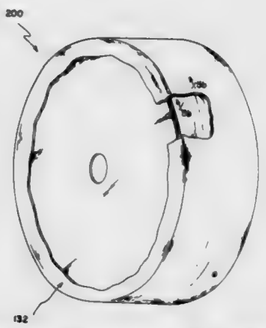
Roger J. Mushinski; Charles E. Lewis, and Lawrence J. Casey, all of Appleton, Wis., assignors to WTA Inc., Wilmington, Del.

Continuation of Ser. No. 21,919, Mar. 4, 1987, Pat. No. 4,884,385, and a continuation of Ser. No. 369,533, Jun. 20, 1989, Pat. No. 5,007,538. This application Oct. 22, 1990, Ser. No. 601,237

The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.

Int. Cl.[5] B65D *81/14, 85/66*

U.S. Cl. 206—523 **4 Claims**



1. A foam wrap package for protecting a roll of carbonless paper, comprising:

interleaved foam and stretch film wrapped under tension around the outer periphery of a roll of paper, said interleaved foam and film overlapping edges of and conforming to said roll, said roll including a leading edge, a plurality of interleaved layers of the foam and film being positioned on said roll of paper with said film overlapping said foam;

means for attaching said leading edge to said roll;

first and second end pieces secured to flat side walls of said roll of paper; and

means for holding said first and second end pieces flush to said flat walls;

whereby said foam wrap package may be handled without damaging said roll of paper.

5,114,013

CARTON WITH COATED RECLOSABLE POURING OPENING

Arnold Brown, Owings Mills, and Edward J. Giblin, Finksburg, both of Md., assignors to Lever Brothers Company, Division of CONOPCO, Inc., New York, N.Y.

Filed Apr. 9, 1990, Ser. No. 506,978

Int. Cl.[5] B65D *5/70*

U.S. Cl. 229—216 **9 Claims**

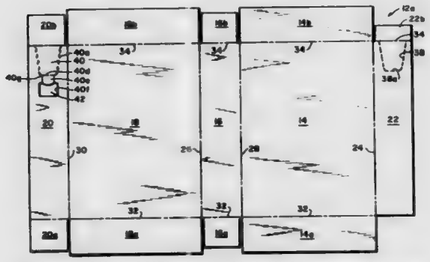
1. A reclosable dispensing package comprising:

a carton comprising integrally connected, alternating rectangular face and side panels and an extended glue flap underlying one of said panels;

a closure flap cut out of material of the side panel overlying the glue flap;

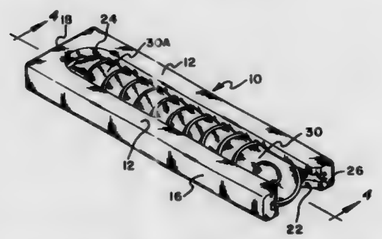
said glue flap having a cut-out adapted to adhesively attach to an underside of the closure flap and to form a reclosable plug having the same shape as the cut-out when the closure flap is lifted;

said closure flap characterized by a coating applied from about 1/32 inch to about ¼ inch from the top and side



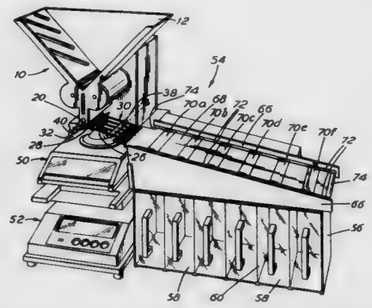
scores of the closure flap in order to provide resistance to wet handling and increased durability.

5,114,014
TOKEN HOLDER
David Ascalon, and Maurice Ascalon, both of 115 Atlantic Ave., Berlin, N.J. 08009
Filed Feb. 19, 1991, Ser. No. 656,747
Int. Cl.[5] A45C *1/00*
U.S. Cl. 206—0.84 **5 Claims**



1. A token holder which readily receives, dependably holds and easily releases coins or tokens comprising: a substantially rigid body having spaced substantially parallel top and bottom walls and opposing side walls connecting said top and bottom walls and cooperating therewith to define a coin or token chamber having an open end to receive coins or tokens to be contained by the holder and to dispense the same, said top wall having an aperture portion extending longitudinally therethrough through which tokens and coins carried thereby may be viewed and manipulated; said holder having token retaining means within said token chamber adapted for dependably retaining a plurality of tokens or coins aligned in a longitudinal array within said token chamber with successive tokens in said array being disposed in a partial overlapping relationship, said retaining means comprising an inclined ramp means disposed in a closed end of the token chamber associated in cooperative relationship with an undulated surface extending along an inner face of the bottom wall and a sawtooth-configured surface extending along an inner face of the top wall opposite the undulated inner face of the bottom wall.

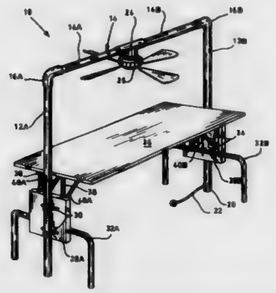
5,114,015
DELIVERY DEVICE AND SORTING MACHINE FOR ROD-LIKE ARTICLES
Gian P. Mussini, St. Imier, Switzerland, assignor to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland
Filed Sep. 14, 1990, Ser. No. 582,087
Claims priority, application United Kingdom, Sep. 25, 1989, 8921629
Int. Cl.[5] B07C *5/18*
U.S. Cl. 209—535 **7 Claims**



1. A delivery device for rod-like articles comprising: a hopper for the articles having at its bottom two parallel rotatable ribbed drums spaced to form a channel between them, the drums being driven for reciprocating rotary movement to feed the articles from the hopper through the channel; a rotatable delivery shaft located beneath and parallel to the channel, and longitudinally grooved to accept rod-like articles, the shaft moving between a first position in which it accepts an article from the channel and a second position in which it ejects the article onto an elongate support shaped to receive a rod-like article; and a first set of lifting arms on one side of the longitudinal axis of the support which extend through the support, and a second set of lifting arms on the opposite side of the longitudinal axis of the support from the first set and interdigitating with the first set, the movement of the arms being in timed relationship with the movement of the delivery shaft so that the arms are lifted after the article has been delivered onto the support, the first set of arms being raised through a greater angle than the second set when in movement, enabling the article to be lifted clear of the support and delivered to collecting means.

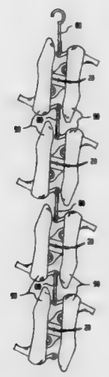
5,114,016
CEILING FAN DISPLAY STAND
Alvin E. Todd, P.O. Box 924, Pigeon Forge, Tenn. 37868-0924
Filed Jul. 9, 1990, Ser. No. 549,607
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—26 **7 Claims**

1. A ceiling fan display stand in combination with a ceiling fan, said stand comprising:
- a substantially planar work surface with first and second ends and front and back edges, said substantially planar work surface being substantially parallel to the ground whereby said substantially planar work surface is readily accessible from said front edge and said back edge, thereby providing a table or a workbench;
- upright support members spatially separated from each other, said upright support members being disposed proximate each of said first and second ends of said substantially planar work surface and is located substantially quidistantly from said front and back edges;
- a horizontal support member for supporting said ceiling fan said horizontal support member being attached to said upright support members and being vertically separated from said substantially planar work surface such that a volume surrounding and proximate to said ceiling fan is unobstructed such that said ceiling fan is unencumbered to operate in a fashion which emulates its natural function;



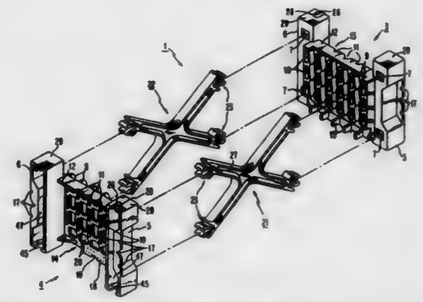
- attaching means carried by said horizontal support member for attaching said ceiling fan to said horizontal support member; and
- a power supply for energizing said ceiling fan whereby said ceiling fan may be operated.

5,114,017
SHOE ORGANIZER
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Mar. 7, 1991, Ser. No. 680,803
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—34 **20 Claims**



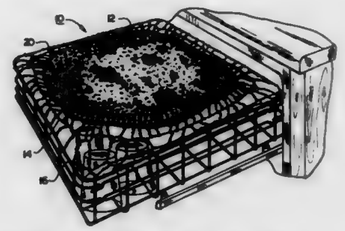
1. A shoe organizer comprising:
- first and second shoe holders, each having a heel piece and a toe piece,
- a cross bridge connected to the shoe holders; and
- first and second retaining means for attachment of a plurality of shoe organizers to each other in self-supporting, string-like hanging fashion, on opposite ends of the shoe organizer.

5,114,018
VERSATILE PRODUCT CARRIER
Ronald E. Bischoff, Wappingers Falls; Mark A. Brandon, Poughkeepsie; John J. Caulfield, Fishkill; Lawrence G. Cook, Poughkeepsie, and George B. Uplinger, Windsor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 410,377, Jul. 20, 1989, Pat. No. 5,042,671. This application Jul. 30, 1991, Ser. No. 737,968
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—41 **38 Claims**



1. A versatile product carrier comprising:
- (a) a first end plate having a plurality of columns linked by a first centerpiece, said first centerpiece having means for accommodating a product,
- (b) two or more linking means having an end, and further having a snapable retaining means at each said end,
- (c) a second end plate having a plurality of columns linked by a second centerpiece, said second centerpiece having means for accommodating a product,
- (d) each of said columns having at least one opening, to accommodate said snapable retaining means of said linking means,
- (e) said first end plate and said second end plate are linked together by said snapable retaining means by inserting said snapable retaining means of said linking means into said openings in said columns.

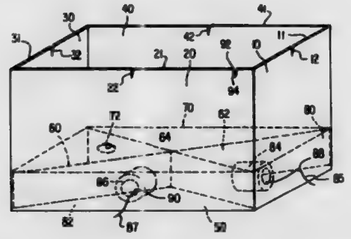
5,114,019
NET FOR DISHWASHER RACK
Mary E. Sandbank, 902 W. Kemp Rd., Greensboro, N.C. 27410
Filed Aug. 20, 1991, Ser. No. 747,680
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—41 **19 Claims**



1. A retaining net for a dishwasher rack, said net comprising:
- (a) a center portion formed of substantially inelastic mesh; and
- (b) an elastic annular band connected along the periphery of said center portion, wherein the edge of said band adjacent to said center portion is substantially equal to the length of the periphery of said center portion and the edge

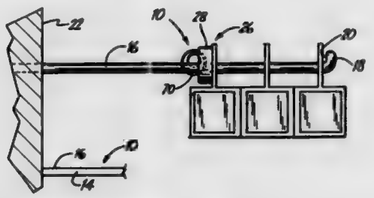
of said band opposite the edge of said band adjacent to said center portion is substantially less than the length of the periphery of said center portion.

5,114,020
CONTAINER FOR COLLECTING AND STORING NEWSPAPERS, MAGAZINES AND OTHER ARTICLES
Thomas Martin, Augsburg, Fed. Rep. of Germany, assignor to Logo! Martin & Partner GmbH, Augsburg, Fed. Rep. of Germany
Filed Aug. 17, 1990, Ser. No. 568,892
Int. Cl.[5] A47F 7/00; B65B 13/02
U.S. Cl. 211—50 21 Claims



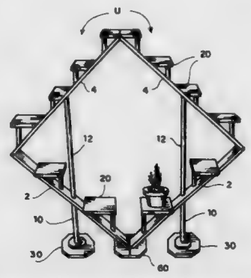
1. A container for collecting and storing newspapers and periodicals comprising four side walls extending upward from a substantially rectangular base, wherein an intermediate base is spaced from said rectangular base by a support structure defining a plurality of compartments between said base and said intermediate base.

5,114,021
SELF FEEDING DISPLAY PEG
Howard J. Fredrickson, Cannon Falls, Minn., assignor to IMI Cornelius Inc., Anoka, Minn.
Filed Jun. 9, 1989, Ser. No. 364,346
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—54.1 10 Claims



1. A self-feeding pegbar comprising
a) support structure for holding at least one level of pegs;
b) at least one double peg mounted in said structure at said level;
c) a goods pusher slideably mounted on said peg;
d) a negator spring having a fixed end secured to a nose of said peg and a coil resiliently engaging said pusher for biasing said pusher and goods upon said peg toward said nose;
e) means in said pusher for holding said negator coil within said double peg; and in which
f) said peg has two side-by-side elongate support members cantilevered from said nose, and a key on a back end of at least one of said members, said key being operatively rotable about an axis of said one member to lock and unlock said peg to and from said support structure.

5,114,022
HOUSE PLANT DISPLAY STRUCTURE
Terry M. Rood, P.O. Box 252, Montague, Calif. 96064
Filed Oct. 16, 1990, Ser. No. 598,204
Int. Cl.[5] A47G 29/00
U.S. Cl. 211—71 11 Claims

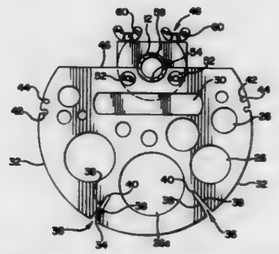


1. A shelf system unit comprising in combination:
a top beam having a top beam upper surface, a top beam lower surface, a top beam upper midpoint on said top beam upper surface, a top beam lower midpoint on said top beam lower surface, a top beam lower end, and a top beam upper end, said top beam disposed at an oblique angle above the horizontal;
a bottom beam, generally equal in dimensions to said top beam, having a bottom beam upper surface, a bottom beam lower surface, a bottom beam upper midpoint on said bottom beam upper surface, a bottom beam upper midpoint on said bottom beam lower surface, a bottom beam lower end, and a bottom beam upper end, said bottom beam disposed at said oblique angle below the horizontal;
a vertical short pole having a short pole upper end and a short pole lower end;
a vertical long pole having a long pole upper end and a long pole lower end, said long pole being twice the length of said short pole;
shelves mountable upon said top beam upper surface and upon said bottom beam upper surface, said shelves including horizontal support surfaces;
first means for selectively attaching said top beam lower end to said bottom beam upper end in a first configuration, said top beam and said bottom beam lying in a vertical plane when attached and forming a doubled angle therebetween, said doubled angle twice said oblique angle;
means for attaching said short pole upper end to said bottom beam lower midpoint in said first configuration;
means for attaching said long pole lower end to said bottom beam upper midpoint in said first configuration;
means for attaching said long pole upper end to said top beam lower midpoint in said first configuration; whereby
the beams may be arranged selectively in a broken line in said first configuration with said bottom beams supported by said short pole between said bottom beam lower midpoint and a floor, with said top beam supported by said long pole between said bottom beam upper midpoint and said top beam lower midpoint, and
objects may be supported on said shelves at various places along said beams.

5,114,023
UTILITY TRAY FOR INTRAVENOUS POLE
Janice A. Lavin, 242 Lake Shore Dr., Crystal Lake, Ill. 60014
Filed Jan. 28, 1991, Ser. No. 646,241
Int. Cl.[5] A47F 5/08
U.S. Cl. 211—107 15 Claims

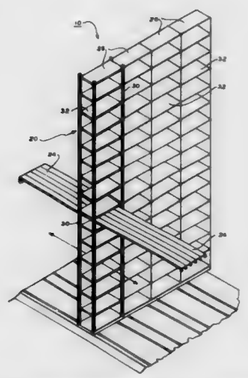
1. A tray and pole combination comprising:
an upstanding vertical pole having top and bottom ends;

roller means attached to the bottom end of the vertical pole for permitting the pole to be easily transportable by rolling along a floor surface;
support arms extending outward from the top end of the vertical pole, the support arms having means for hanging intravenous solution containers;
a utility tray having a planar top surface and perimeter edges;
clamping means disposed along the perimeter edge for attaching the utility tray to an intermediate portion of the vertical pole;



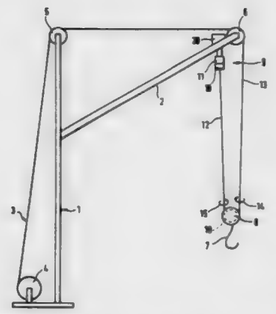
a plurality of varying diameter circular openings in the utility tray for receiving in a supporting relationship cylindrical objects;
a recessed trough portion on the planar top surface of the utility tray for receiving and supporting miscellaneous objects of varying sizes; and
a slot disposed along the perimeter edge, the slot being open at the perimeter edge, the width of the slot gradually diminishing from the open perimeter edge to the base of the slot, the slot adapted for receiving hollow tubes of various diameters and to pinch the tube closed as the tube is moved from the open end towards the base of the slot to stop the flow of fluid through the tube.

5,114,024
FLOATING CATWALK FOR STORAGE RACKS
Ernest H. Meissner, Bernardsville, N.J., assignor to Vital Records Inc, Flagtown, N.J.
Filed Sep. 7, 1990, Ser. No. 578,463
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—175 3 Claims



1. A modular storage system for use in a room, comprising:
(a) a plurality of racks, each rack having vertical stacks of horizontal shelves supported by a plurality of vertical members, a plurality of the stacks extending along a first direction being interconnected to form the rack;
(b) means for supporting the racks on a floor of the room for side-by-side juxtapositioning and for movement together or apart within the room along a second direction perpendicular to the first direction;
(c) horizontal catwalks extending along the second direction, the catwalks being supportable at either end by the walls of the room, each catwalk passing between two selected vertically adjacent shelves of each stack in each rack, the catwalks providing access to shelves thereabove to a person standing thereon between adjacent racks which have been moved apart; and
(d) means on selected racks for vertically supporting the catwalks intermediate their ends while permitting unhindered movement of the selected racks.

5,114,025
SWIVEL FOR USE IN CRANES AND THE LIKE
Roland Verreet, Aachen, Fed. Rep. of Germany, assignor to Drahtseilwerk Saar GmbH, Limbach, Fed. Rep. of Germany
Filed Nov. 8, 1990, Ser. No. 613,106
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1989, 3937631
Int. Cl.[5] B66C 13/06
U.S. Cl. 212—147 8 Claims

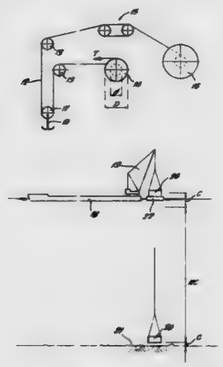


1. A swivel for one end of one of two portions of a single looped crane cable wherein the two portions define a bight for a load-supporting device including a sheave, comprising a first member non-rotatably connectable to a boom of a crane; a second member rotatably connected to said first member and non-rotatably connectable directly with the one end of the one portion of a crane cable; and means for rotating said second member relative to said first member to thereby oppose (a) a change of orientation of the sheave in the bight of the two portions of a crane cable and (b) actual contact between the two portions of such cable intermediate the sheave and the second member while the one end of the one portion is connected to said second member.

5,114,026
HOISTING DEVICES
Van Ketel Hendrik, Maasslius, Netherlands, assignor to Heerema Group Services B.V., Leiden, Netherlands
Continuation of Ser. No. 256,603, Oct. 2, 1988, abandoned. This application Oct. 30, 1990, Ser. No. 608,028
Claims priority, application United Kingdom, Oct. 12, 1987, #723898
Int. Cl.[5] B66C 23/53
U.S. Cl. 212—191 6 Claims

1. A hoisting device for handling a load through a relatively long haul non-critical operating range and a short haul critical operating range, said hoisting device comprising;
a load pick-up tackle;

cable means for suspending the load pick-up tackle;
a first load lifting winch assembly for raising and lowering the load pick-up tackle over the relatively long haul non-critical operating range;
a second load lifting winch assembly for raising and lowering the load pick-up tackle over the short haul critical range;
both load lifting winch assemblies being capable of lifting the load pick-up tackle up to its full load carrying capacity under both the short haul and long haul ranges;
said first winch assembly including a traction winch having multiple drums to reduce cable tension from the loaded pick-up tackle and a separate take-up winch to receive



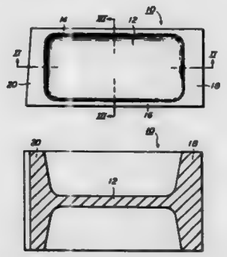
cable at reduced tension from the traction winch and to store a supply of cable thereon to provide for said relatively long haul cable travel and with relatively low acceleration/deceleration; and
said second winch assembly including a drum onto which the cable is wound directly to raise and lower the pick-up tackle when loaded over said relatively short cable travel with high acceleration/deceleration and a fine degree of control;
said cable means being coupled to said first load lifting winch assembly and said second load lifting winch assembly for actuation selectively of said first and second winch assemblies.

5,114,027

CAST BLOCKOUT APPARATUS FOR A DRAFT GEAR POCKET

Peter S. Mautino, Verona, Pa., assignor to McConway & Torley Corporation, Pittsburgh, Pa.

Filed May 20, 1991, Ser. No. 703,015
Int. Cl.[5] B61G *7/10*
U.S. Cl. 213—57 **20 Claims**



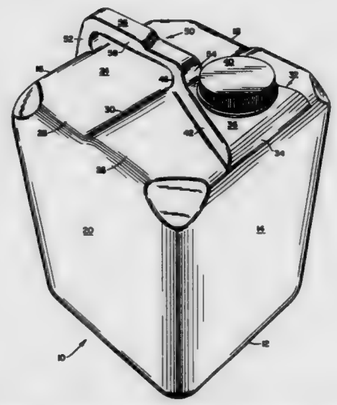
1. A castable draft gear pocket blockout apparatus in a draft gear pocket which is disposed within a center sill member mounted on a railway car body, said blockout apparatus comprising:
(a) a substantially vertically disposed web member having each of a predetermined height, a predetermined thickness, a predetermined configuration, a predetermined length of an upper outer edge and a predetermined length of a lower outer edge;
(b) a substantially horizontally disposed top flange member connected substantially al an entire length of a bottom surface of said top flange members and substantially midway between outer edges of said top flange member to said upper outer edge of said web member, said top flange member having a predetermined thickness and a predetermined width, said length of said bottom surface of said top flange member being substantially equal to said length of said upper outer edge of said web member;
(c) a substantially horizontally disposed bottom flange member connected substantially along an entire length of an upper surface of said bottom flange member and substantially midway between outer edges of said bottom flange member to said lower outer edge of said web member, said bottom flange member having a predetermined thickness and a predetermined width, said length of said upper surface of said bottom flange member being substantially equal to said length of said lower outer edge of said web member;
(d) a first substantially vertically disposed end flange member connected to each of a first outer end of said web member, said top flange member and said bottom flange member adjacent a first end of said blockout apparatus; and vertically disposed end
(e) a second substantially flange member connected to each of a second outer end of said web member, said top flange member and said bottom flange member adjacent a second end of said blockout apparatus.

5,114,028

CONTAINER WITH INTEGRAL HANDLE STRUCTURE

Carl D. Ring, Memphis, Tenn., assignor to Ring Can Corporation, Oakland, Tenn.

Filed Jun. 20, 1990, Ser. No. 540,947
Int. Cl.[5] B65D *1/42, 23/10, 23/42*
U.S. Cl. 215—100 A **3 Claims**



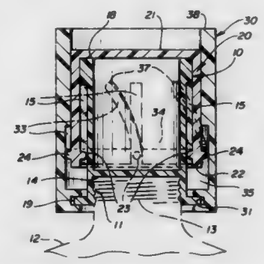
1. A plastic container comprising a bottom wall, front, rear, and side walls extending from said bottom wall defining a chamber having a generally rectangular cross-section, a top wall covering a substantial portion of said chamber, a neck platform extending upwardly from said top wall and having a circular pouring spout formed thereon, said neck platform having a forward wall of a width at least as great as the diameter of said pouring spout, said forward wall extending along and coextensively upwardly from said front wall, said neck platform further including a pair of vertical side walls extending from said forward wall to a location intermediate said front and rear walls, handle means having a rearward section extending upwardly from said rear wall and a forward section joining said neck platform at said intermediate location, said handle means having vertical side surfaces which blend with and form a continuation of said vertical side walls to provide vertical support surfaces substantially spanning the total distance between said front and rear walls.

5,114,029

CHILD RESISTANT BOTTLE CLOSURE ASSEMBLAGE

Kenneth J. Gibilisco, Coopersburg, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 10, 1991, Ser. No. 727,708
Int. Cl.[5] B65D *55/02*
U.S. Cl. 215—220 **8 Claims**



1. A bottle closure assemblage comprising:
(a) an inner cap member having means to be secured to and seal the contents of a bottle, and having an outer circumferential surface, and a lower end, said inner cap member containing a plurality of spaced, external grooves formed about its outer circumferential surface;
(b) an interlocking member having a closed upper end and an open lower end, and having an inner circumferential surface and an outer circumferential surface, said interlocking member containing plurality of inwardly projecting pins spaced about its inner circumferential surface and a plurality of outwardly projecting pins spaced about its outer circumferential surface, said inwardly projecting pins slidably engaging and mating with the external grooves in said inner cap member securing said interlocking member to said inner cap member; and,
(c) an outer cap member having an open upper end and an open lower end, and an inner circumferential surface, and having means at its lower end to rotatably secure said outer cap member to the lower end of said inner cap member with said interlocking member disposed between said inner cap member said outer cap member without engaging said outer cap member, said outer cap member having a plurality of spaced grooves formed about its inner circumferential surface in which said outwardly projecting pins of said interlocking member can become engaged to interlock said outer cap member, said interlocking member and said inner cap member to each other enabling said assemblage to be removed from a bottle to which it is secured.

5,114,030

TIP OFF CONTAINER CAP WITH REMOVABLE STEM

William A. Conard, Harleysville, Pa., assignor to The West Company, Incorporated, Phoenixville, Pa.

Filed Aug. 30, 1990, Ser. No. 574,744
Int. Cl.[5] B65D *41/62*
U.S. Cl. 215—249 **3 Claims**

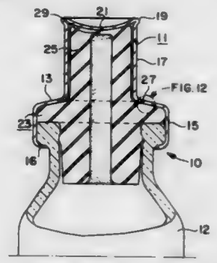


FIG. 12

1. A container cap formed from one piece, comprising:
a cap body having an annular shoulder with an inner and outer terminal edge, said shoulder having skirt means depending from the outer terminal edge of said shoulder;
upper cylinder means attached to said annular shoulder at its inner terminal edge and extending upward for sufficient distance to define an annular flared exposed lip for thumb contact, said cylinder including a concave tip forming said lip; and
said upper cylinder means being attached to said annular shoulder by an annular scoring ring in said shoulder and spaced radially outwardly from said upper cylinder means, thereby having a larger radius than said cylinder means.

5,114,031

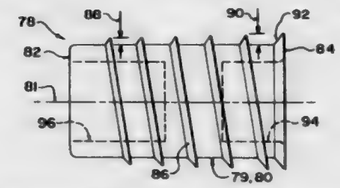
Patent Not Issued For This Number

5,114,032

PLUG FOR SEALING PRESERVATIVE IN WOOD

Willam S. Laidlaw, 975 Milner Avenue, Victoria, British Columbia, Canada V8X 3N5

Filed Feb. 20, 1991, Ser. No. 657,850
Claims priority, application Canada, Oct. 12, 1990, 2027427
Int. Cl.[5] B65D *39/08*
U.S. Cl. 215—356 **26 Claims**



1. A plug comprising:
(a) a body portion having a central longitudinal axis, inner and outer end portions, and a periphery of generally circular cross-section extending between the end portions,
(b) at least one flexible thread portion helically wound around the periphery, the thread portion having a leading face facing towards the inner end portion, and a trailing face facing towards the outer end portion, the leading face and trailing face being inclined to the longitudinal axis at a leading angle and a trailing angle respectively, the leading angle being shallower than the trailing angle, the thread portion having a directional flexibility so as to deflect relatively more easily towards the outer end portion than towards the inner end portion, the thread portion having a root width as measured generally axially

along the periphery within a longitudinal plane containing the longitudinal axis, spacing between adjacent turns of the thread portion within the longitudinal plane being between two and ten times greater than the root width of the thread portion,

the thread portion has a thread depth as measured radially from the periphery to an outermost portion of the thread, the thread depth being greater at the outer end portion of the plug than at the inner end portion, and

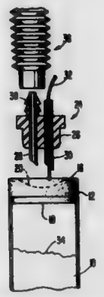
(c) driver engagement means for cooperating with a driver located adjacent the outer end portion.

5,114,033

APPARATUS FOR DISCHARGING CONTENTS OF A SEALED CONTAINER

Tipton L. Golias; Robert J. Sarrine, and Joseph H. Golias; Ronald A. Mayes, all of Beaumont, Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Filed Jul. 21, 1989, Ser. No. 382,760
Int. Cl.[5] B67D *5/00*; A61M *5/178*
U.S. Cl. 222—82 **16 Claims**



1. Apparatus for transferring fluid from a test tube, the test tube having a resilient self-sealing, reusable, repuncturable closure at one end, said apparatus comprising means for puncturing said resilient, self-sealing, reusable closure and for establishing a fluid inlet path and a fluid discharge path, said fluid discharge path having an inside diameter;

delivery means extending through said discharge

a clearance being defined as the region between the outer diameter of the delivery means and the inside diameter of said fluid discharge path; and

means for pressurizing the interior of the test tube for discharging fluid through said delivery means;

said clearance for venting of the interior of the test tube in response to temperature variations and for maintaining the ability to pressurize the interior of the test tube.

5,114,034

UTILITY TOTE CONTAINER WITH UNFASTENABLE AND REFASTENABLE SIDE WALLS AND END WALLS

Leroy Miller, Minneapolis, and Mark S. Stoll, Deephaven, both of Minn., assignors to Liberty Diversified Industries, New Hope, Minn.

Filed Jan. 22, 1991, Ser. No. 643,508
Int. Cl.[5] B65D *8/14*
U.S. Cl. 220—7 **15 Claims**

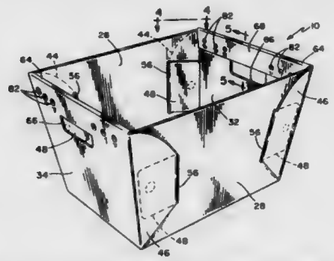
1. A tote container folded from a generally planar blank of sheet material to a generally upright tote container configuration defining an interior receptacle region, said tote container comprising:

a base panel, said base panel having a pair of side edges and a pair of end edges;

a pair of side wall panels, each of said pair of side wall panels extending from and being hingedly connected to said base panel along a one of said pair of side edges thereof, each of said pair of side wall panels having an interior planar surface; a pair of end wall panels, each of said pair of end wall

panels extending from and being hingedly connected to said base panel along a one of said pair of end edges thereof, each of said pair of end wall panels having a pair of opposing side edges;

a plurality of end foldover panels, each of said plurality of end foldover panels extending from and being hingedly connected to a one of said end wall panels along a one of said pair of opposing side edges thereof, each of said plurality of end foldover panels further having an end wall securing flap extending therefrom and hingedly connected thereto, each said end wall securing flap having a height and a leading edge, each of said pair of side wall panels defining at least one slot extending entirely therethrough and positioned so as to be aligned with said leading edge of a corresponding one of said end wall securing flaps



when said corresponding one of said end wall securing flaps is pivoted into close confronting relation to said side wall panel, each said slot having a height equal to or greater than said height of said end wall securing flap such that said corresponding one of said end wall securing flaps may be received through said slot aligned therewith and pivoted into parallel abutting contact with said interior planar surface of said side wall panel; and

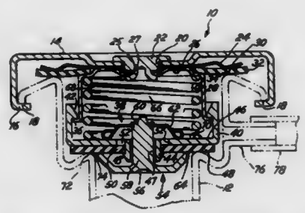
a releasable fastener, said releasable fastener being connected to said interior planar surface of each of said side wall panels or each of said end wall securing flaps or a combination thereof such that each of said end wall securing flaps may be selectively and releasably fastened to said corresponding one of said pair of side wall panels to secure said pair of side wall panels and said pair of end wall panels of the tote container in the generally upright tote container configuration.

5,114,035

VEHICLE RADIATOR CAP

David M. Brown, Oregon, Ill., assignor to Epicor Industries, Inc., Deerfield, Ill.

Filed Oct. 31, 1991, Ser. No. 785,943
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—203 **9 Claims**



1. A radiator cap for closing the filler neck of a radiator fluid reservoir, said filler neck having an annular valve seat, comprising:

a manually manipulable crown covering said filler neck and including means for engaging said crown with said filler neck, said crown having a central aperture;

a discoid spring having a central aperture;

a discoid rubber seal;

a bell housing having a central aperture, an upper shoulder region and a lower radially outwardly extending flange, said upper shoulder region supporting said discoid rubber seal for sealing said filler neck;

a central rivet extending through said apertures and retaining said crown, discoid spring and bell housing;

a pressure-vacuum valve assembly carried by said flange; and

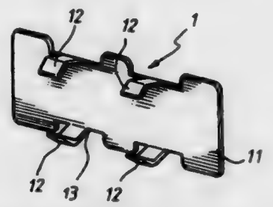
a pressure relief spring nested within said bell housing having an upper turn engaging said upper shoulder region of said bell housing and a lower turn biasing said pressure-vacuum valve assembly against said annular valve seat.

5,114,036

COVERING PLATE FOR A PRESET HOLE ON A COMPUTER HOUSING

Chi Liu, Taoyuan, Taiwan, assignor to Enlight Corporation, Taoyuan, Taiwan

Filed Sep. 14, 1990, Ser. No. 583,724
Int. Cl.[5] B65D *45/22*; H05K *7/00*
U.S. Cl. 220—307 **2 Claims**



1. A covering plate for insertion into an aperture in a computer housing, the aperture being defined by edges of a wall of the housing, the covering plate comprising:

a substantially flat plate having a pair of depressions in each of oppositely disposed sides of the plate, each of said depressions including bottom and side walls lying within the plane of said flat plate; and

four protruding resilient elements each having a leading end and a rear end, said ends extending from the bottom wall of respective ones of said depressions, each of said elements extending in a direction substantially perpendicular to and slightly inclined towards the side walls of the depression from which each said element extends, each of said elements being bent at a point intermediate the leading and rear ends thereof so that leading end portions of the elements extending from depressions in one of said oppositely disposed sides extend in a direction towards the other of said sides;

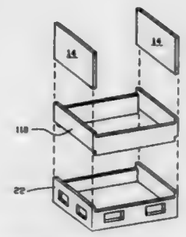
whereby, during the insertion of said covering plate into an aperture, the element leading end portions engage edges of the aperture and are thereby inwardly moved until the point at which the elements are bent is inserted into the aperture beyond the edges thereof whereupon the elements spring outwardly to clamp edges of the covering plate between the rear ends of the elements and the depression side walls.

5,114,037

CONTAINER WITH SIDEWALL EXTENSION

Mark Hillis, and Dixon Freeman, both of Tacoma, Wash., assignors to Perstorp Xytec, Inc., Tacoma, Wash.

Continuation of Ser. No. 540,234, Jun. 19, 1990, abandoned. This application May 14, 1991, Ser. No. 701,602
Int. Cl.[5] B65D *7/24*
U.S. Cl. 220—4.03 **1 Claim**



1. A collapsible container, comprising;

a base, said base having a surface defining a base plane said base having a coupling means with a first configuration;

sidewall extension structure, removably coupled to said base, extending in a direction perpendicular to said base plane;

at least four sidewalls, each sidewall being pivotally attached to said sidewall extension to permit movement of said of said sidewalls between a first collapsed configuration substantially parallel to said base plane and an uncollapsed configuration;

said sidewalls being non-integral with said extension structure and pivotally attached to said sidewall extension to permit movement of said sidewall between a first collapsed configuration, substantially parallel to said base plane and an uncollapsed configuration; and

said sidewall extension structure having first means for attaching to said base, substantially without modification of said base and second means for pivotally attaching to a sidewall, substantially without modification to said sidewall, said second means including the upper edge configuration of said sidewall extension structure, said sidewall pivotal between a first collapsed configuration and a second uncollapsed configuration; said upper edge configuration of said sidewall extension structure being identical to said first configuration of said base coupling means;

means for releasably latching said sidewall in said uncollapsed configuration wherein said sidewall extension structure is a unitary, ring shaped structure having four sides, each side having a substantially planar surface.

5,114,038

TRAY-LIKE CARRIER FOR PLATES AND GLASSES

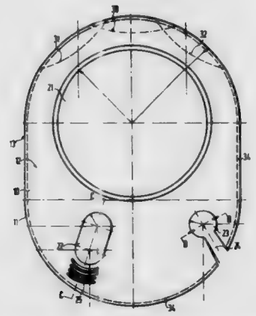
Betina Laumann geb. Quensen, Alfeld, Fed. Rep. of Germany, assignor to Frauenberger & Co., Isernhagen, Fed. Rep. of Germany

Filed May 18, 1990, Ser. No. 524,794
Claims priority, application Fed. Rep. of Germany, May 18, 1989, 3916159
Int. Cl.[5] B65D *1/36*
U.S. Cl. 220—575 **17 Claims**

1. A tray-like carrier for plates and glasses, with an essentially plane, rigid platform, characterized in that

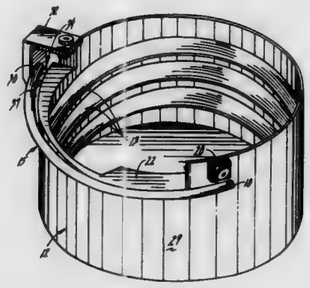
recess means (21) is present to receive a plate is slip-proof manner and further a grip clearance (22) which is oblong-round when seen in top view and serving to pass the user's thumb for gripping and one-hand transporting of the carrier, flutings (25) are present on the top side (12) of the platform (10) near the grip clearance (22), said flutings (25) run parallel to the contour rim of the grip clearance (22).

16. A tray-like carrier for plates and glasses, comprising:
a) an essentially plane, rigid platform;
b) recess means (21) for receiving a plate in slip-proof manner;
c) grip clearance (22) which is oblong-round when seen in top view and serving to pass the user's thumb for gripping and one-hand transporting of the carrier;



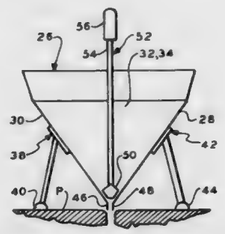
d) flutings (25) being formed on the top side (12) of the platform near the grip clearance (22), said flutings (25) run parallel to the contour of the grip clearance (22); and,
e) a slot (24) starting at a rim (11) and adjoining circular clearance (23) to receive the cup-part of a stemmed drinking glass.

5,114,039
APPARATUS AND METHOD FOR DISCHARGING ARTICLES FROM A VIBRATORY FEEDER
Brendan J. Walshe, Pomfret Center, and Guenter C. Wexler, Danielson, both of Conn., assignors to Spirol International Holding Corporation, Killingly, Conn.
Filed Sep. 28, 1990, Ser. No. 590,341
Int. Cl.[5] B65G *47/24*
U.S. Cl. 221—171 **24 Claims**



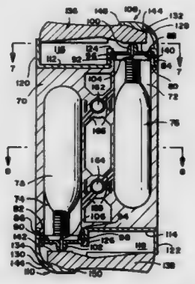
1. Apparatus for transferring flanged articles from a vibratory feeder to a discharge station and comprising generally parallel feed rails, the feed rails being relatively positioned to cooperatively hold each article with its major axis disposed at an angle extending outwardly with respect to a side of the feeder, said angle decreasing as each article moves toward the discharge station.

5,114,040
HOPPER FOR DISPENSING CEMENT OR MORTAR
Michael Brenish, 85 Penningtor Ave., Passaic, N.J. 07055, and Frank Herzig, 64 Douglas Dr., Towaco, N.J. 07082
Filed Jan. 7, 1991, Ser. No. 637,820
Int. Cl.[5] B67B *7/00*
U.S. Cl. 222—1 **27 Claims**



19. A method for dispensing mortar or cement between paving bricks with a plunger and a hopper having an elongated opening, comprising the steps of:
loading mortar or cement in said hopper;
positioning said hopper with its elongated opening between adjacent ones of said paving bricks; and
reciprocating said plunger to force some of said cement or mortar through said elongated opening and between said paving bricks.

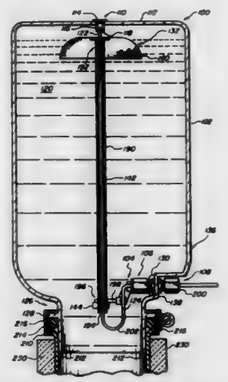
5,114,041
INFLATABLE LIFE BELT
Mario P. DiForte, P.O. Box 8537, Baltimore, Md. 21234
Division of Ser. No. 449,797, Dec. 13, 1989, Pat. No. 5,022,879.
This application Jun. 3, 1991, Ser. No. 709,189
Int. Cl.[5] B67B *7/50*
U.S. Cl. 222—6 **11 Claims**



1. A compressed gas cartridge actuator assembly comprising:
a) a housing comprising a main body portion of elongated rectangular conformation;
b) said main body portion having wells extending in side by side relation longitudinally thereof;
c) compressed gas cartridges each having a top and bottom positioned in said wells with the tops thereof facing in opposite directions;
d) conduits means extending from said main body portion wells to a point exteriorly of said housing;
e) actuating lever housings engaged with opposite ends of said main body portion;
f) a lever movably mounted in each of said lever housings, a portion of each of said levers being selectively movable towards the top of said compressed gas cartridges;
g) disks positioned in each of said wells between said levers and the tops of said compressed gas cartridges;

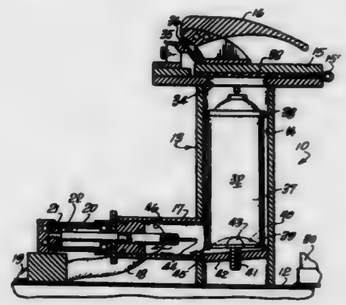
h) piercing means carried by said disks and extending inwardly of said main body portion wells adjacent the tops of said compressed gas cartridges;
i) said disks being selectively moved in the direction of said compressed gas cartridges under urging of said movable portion of one of said levers, upon actuation thereof, to move said piercing means into rupturing engagement with said compressed gas cartridge, whereby gas flows through said conduit means to a point exteriorly of said housing.

5,114,042
SELF-FILLING BOTTLED-WATER COOLER CONVERSION KIT
Carl M. Sutera, 380 Bearhill Rd., North Andover, Mass. 01845
Filed Jun. 21, 1990, Ser. No. 541,775
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—67 **27 Claims**



1. An apparatus for converting a conventional bottled-water cooler having a water tank with an upper open section having a flared edge into a self-filling bottled-water cooler, comprising:
a water bottle having at a lower portion a neck mountable to the water tank such that water freely flows between the water bottle and the water tank;
a water inlet system partially disposed within said water bottle and connected to the water bottle at said lower portion, wherein said inlet system includes a water purifier fluidically connectable to an external water source, and wherein said inlet system supplies pure water to the water bottle and controls the flow of pure water into the water bottle to allow the pure water to fill the water bottle when the pure water within the water bottle is below a desired full level and to stop the flow of pure water into the water bottle when the pure water is at or above the desired full level;
a venting system partially disposed within said water bottle and connected to the water bottle at said lower portion, wherein said venting system prevents change in air pressure within the water bottle when the level of pure water in the bottle changes; and
wherein said neck of the water bottle fits within the upper open section of the water tank and has an annular flange and O-ring seal confronting the flange which cooperate with the flared edge of the water tank to mount the water bottle onto the water tank and to seal the water bottle to the water tank.

5,114,043
AEROSOL CAN EMPTYING DEVICE
Elia E. Collins, Jr., 1065 W. Lomita Blvd., #10, Harbor City, Calif. 90710
Filed Oct. 9, 1990, Ser. No. 594,032
Int. Cl.[5] B65B *31/00*; B67B *7/24*
U.S. Cl. 222—86 **15 Claims**



1. A device for emptying pressurized, liquid-containing aerosol cans or other vessels, comprising:
closed drum means forming a closed storage vessel having vessel walls including vessel sides and a cover;
aerosol can-holding means held by said yessel walls, said can-holding means comprising an aerosol can chamber having chamber side walls, a bottom, and a closable cover; a movable piercing pin including a tip movable into a position adjacent the bottom of the aerosol can chamber; and a liquid passageway leading from said aerosol can chamber to said closed drum means;
means for moving said movable piercing pin from a contracted position to a piercing position which pin moving means is not axially aligned with said aerosol can; and
an aerosol can within said aerosol can chamber, said aerosol can being of the type having an inwardly domed bottom affixed a bottom rim and having a cylindrical side wall terminating at the bottom rim and wherein said movable piercing pin is movable to a position so that the tip thereof passes through the side wall of the aerosol can and through the inwardly domed bottom.

5,114,044
MULTIPLE SLEEVE PASTRY TUBE
George Spanek, Jr., 212 Eaton Rd. #32, San Mateo, Calif. 94402
Filed Jun. 15, 1990, Ser. No. 538,399
Int. Cl.[5] B65D *35/22*
U.S. Cl. 222—94 **15 Claims**



1. In combination a first pastry tube, a second pastry tube,

each said tube having an enlarged upper end and a restricted lower end;

a first nozzle and a second nozzle, each said nozzle being downwardly tapering and having an enlarged upper end and a restricted lower end formed with a dispensing aperture, each said nozzle having a flat wall and an arcuate wall extending from a first edge of said flat wall around to a second edge of said flat wall opposite said first edge, nozzle securing means detachably connecting each said nozzle to the lower end of one said tube with said nozzles projecting out from said lower ends of said tubes, and

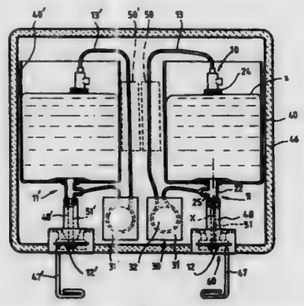
said first and second tubes being side by side and said first and second nozzles being side by side with their flat walls abutting whereby when said tubes are squeezed, ribbons of the contents of both tubes are dispensed through said apertures in close proximity, said nozzle securing means comprising for each said tube a spout having a flared under portion located inside said tube and a lower spout portion, detachable means for securing said lower spout portion to at least one said nozzle, said nozzles converging distally, and which further comprises second means for securing said flared portion to the lower end of at least one said tube.

5,114,045

METHOD AND AN INSTALLATION FOR CONSERVING AND/OR DISPENSING A LIQUID OR SEMI-LIQUID SUBSTANCE

Michel Herpe, Orsay, France, assignor to Bongrain S.A., Guyancourt, France

Filed Oct. 26, 1989, Ser. No. 427,187
Claims priority, application France, Oct. 28, 1988, 8814149
Int. Cl.[5] B65D *35/56*
U.S. Cl. 222—105 **15 Claims**



1. A dispensing installation for conserving and dispensing a liquid of semi-liquid fluid comprising:

a deformable, flexible hygienically and aseptically sealed bag,

a liquid or semi-liquid fluid contained in and substantially filling the bag and being hygienically and aseptically sealed therein,

first and second spaced apart end pieces provided on said bag, each end piece having an orifice communicating with the interior of the bag,

a fluid transport tube extending outside the bag and having opposite ends connected to said end pieces and communicating with the orifices and with the bag interior so as to form a closed liquid and gas tight fluid circuit outside said bag,

a fluid outlet duct provided in said bag, said duct having one end communicating with the interior of the bag and having its opposite end extending from the bag and being sealed prior to any dispensing of the fluid but adapted for being opened for allowing the fluid to be dispensed, and

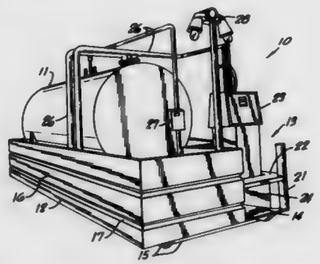
a pump cooperating with said tube for pumping fluid contained in the bag from the bag, through the tube, and then back into the bag, so that the fluid characteristics such as the texture, thickness and organoleptic characteristics of the fluid are preserved.

5,114,046

ABOVE GROUND FUEL STORAGE AND DISPENSING APPARATUS

Billy O. Bryant, 3300 Niles St., Bakersfield, Calif. 93306, assignor to Billy O. Bryant, Calif.

Filed Sep. 28, 1990, Ser. No. 589,986
Int. Cl.[5] B65D *88/06*
U.S. Cl. 222—108 **5 Claims**



1. An above ground fuel storage and dispensing apparatus, comprising, a rectangular support frame having an outer perimeter, said frame including vertical side walls around the perimeter and a bottom forming an open-top containment vessel, a fuel tank having a predetermined volume mounted on said frame within said side walls and bottom, said containment vessel having a volume larger than said volume of the fuel tank for containing all the fuel from the fuel tank in the event of a fuel tank leak, said fuel tank having a horizontal perimeter formed by the maximum horizontal dimensions of the fuel tank, said vertical side walls of the frame being spaced outwardly from the horizontal perimeters of the fuel tank in all horizontal directions and being of a sufficient size and strength for protecting the fuel tank from horizontal external impacts by vehicles and the like against the vertical side walls of the apparatus, portions of said vertical side walls recessed from a maximum horizontal extent of the perimeter of the support frame for forming a recessed compartment outside of the containment vessel and open outwardly toward the perimeter, a fuel line connected to said tank and extending through said portions of said vertical side walls into said recessed compartment, and means for dispensing fuel mounted in said recessed compartment within said frame perimeter and connected to said fuel line.

5,114,047

PUMP AND MIXING DEVICE FOR LIQUIDS

Richard D. Baron, Zephyrhills; Malcolm C. Smith, Dade City; Carl R. Spoeth, Bayonet Point, and Valdemiro M. Quadros, Zephyrhills, all of Fla., assignors to Lykes Pasco Inc., Dade City, Fla.

Filed Aug. 14, 1990, Ser. No. 567,186
Int. Cl.[5] B65D *37/00;* **B67D** *5/56*
U.S. Cl. 222—129.1 **33 Claims**

1. An apparatus for pumping a liquid from a container having container aperture means and for mixing the liquid from the container with a liquid diluent, comprising in combination:

a body member having an input body portion and an output body portion with flexible wall means interconnecting said input body portion and said output body portion;

said flexible wall means defining a pumping chamber between said input body portion and said output body portion;

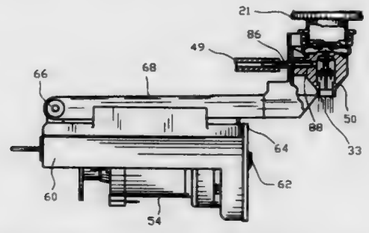
said input body portion having an input aperture communicating with said pumping chamber;

said output body portion having an output aperture communicating with said pumping chamber;

mounting means for mounting said input body portion relative to the container for enabling the liquid from the container to flow through the container aperture means into said input aperture of said input body portion;

input one-way valve means for permitting the flow of liquid only from the container aperture means to said pumping chamber of said body member;

output one-way valve means for permitting the flow of liquid only from said pumping chamber of said body member to said output aperture of said output body portion;



motive means for reciprocating said output body portion relative to said input body portion between a first and a second position for causing liquid to flow from the container aperture means through said input one-way valve means into said pumping chamber when said output body portion is moved into said first position and for causing liquid to flow from said pumping chamber through said output one-way valve means when said output body portion is moved into said second position; and

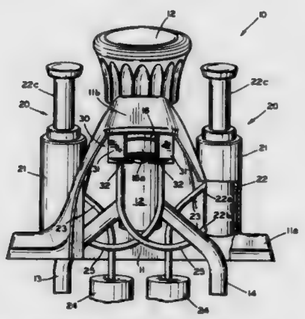
a mixing port cooperating with said body member for introducing the liquid diluent for mixing with the container liquid.

5,114,048

FAUCET ASSEMBLY HAVING INTEGRAL LIQUID PRODUCT DISPENSER

Robert M. Minke, 4043 Rose Garden, Toledo, Ohio 43623

Filed Dec. 17, 1990, Ser. No. 628,103
Int. Cl.[5] B67D *5/52*
U.S. Cl. 222—135 **10 Claims**



1. A faucet assembly adapted to dispense water and a liquid product adjacent one another comprising:

a faucet housing including a base portion adapted to be mounted adjacent a water basin and an arm portion extending from said base portion and adapted to extend over the water basin;

a dispenser housing extending within said faucet housing and mounted on said base portion;

a pump disposed in said dispenser housing, said pump having an inlet port adapted to communicate with a supply of the liquid product and an outlet port;

a spigot mounted on said arm portion and adapted to dispense water therefrom;

means disposed within said arm portion of said faucet housing for dispensing the liquid product adjacent said spigot; and

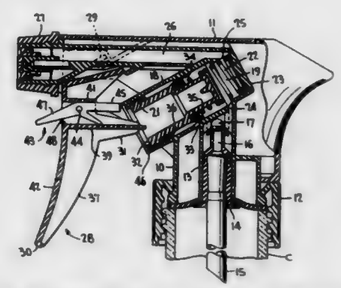
conduit means for providing fluid communication between said outlet port of said pump and said liquid product dispensing means.

5,114,049

CHILD-RESISTANT TRIGGER SPRAYER

Michael G. Knickerbocker, Upland, Calif., assignor to Calmar Inc., City of Industry, Calif.

Filed Oct. 31, 1990, Ser. No. 606,455
Int. Cl.[5] B67B *5/00*
U.S. Cl. 222—153 **12 Claims**



1. A child-resistant trigger operated pump dispenser comprising, a pump body for mounting with a closure cap at the upper end of a container for fluent product, a trigger lever actuator pivotally mounted at an upper end thereof to said body, said actuator having an opposing free end and rearwardly extending means intermediate said ends for actuating said pump dispenser upon manual operation of said lever, said actuator having a forward finger engaging surface extending between said ends, the improvement wherein latch means is supported on said lever for preventing trigger actuation in a first position of said latch means, said latch means having an extension in abutting engagement with a confronting portion of said pump body in said first position and being pivotally mounted on said lever, biasing means acting on said latch means, said latch means having a projection extending forwardly beyond said finger engaging surface for manually pivoting said latch means against the bias of said biasing means from said first position to a second position in which said extension is out of engagement with said pump body to permit trigger actuation, said biasing means automatically returning said latch means to said first position.

5,114,050

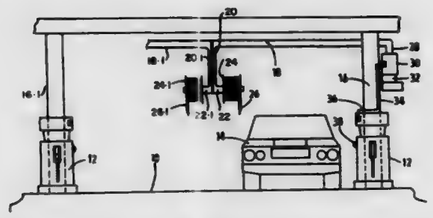
SERVICE STATION FORECOURT INSTALLATIONS

Peter Morris, Cape Town, South Africa, assignor to Vaccar Systems (Proprietary) Limited, Cape Province, South Africa

Filed Jan. 23, 1991, Ser. No. 644,589
Claims priority, application South Africa, Jan. 24, 1990, 90/0494
Int. Cl.[5] B67D *5/06*
U.S. Cl. 222—192 **11 Claims**

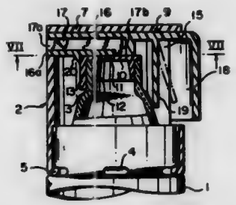
1. A service station forecourt installation which includes electrically driven dispensing means for delivering fuel into the tank of a motor vehicle, a vacuum cleaner nozzle, means for applying a sub-atmospheric pressure to said nozzle, and a

connection between the electrically driven dispensing means and said means for applying a sub-atmospheric pressure to said



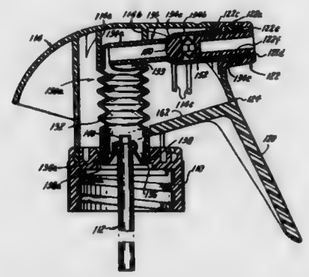
nozzle whereby suction is available at said nozzle only in conjunction with delivery of fuel by said dispensing means.

5,114,051
CLOSING CAPSULE WITH A MOBILE ELEMENT FOR FLASKS AND OTHER CONTAINERS
Patrick Simon, 7 rue Theophile Gautier, 95140 Garges Les Gonesse, Val d'Oise, France
Continuation-in-part of Ser. No. 308,728, Feb. 9, 1989, abandoned. This application Nov. 7, 1990, Ser. No. 610,079
Int. Cl.[5] B67D *1/07*
U.S. Cl. 222—192 **15 Claims**



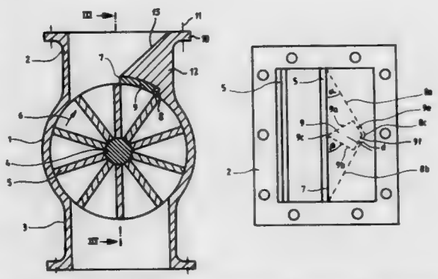
1. A closing capsule for an open-top container which capsule performs the function of selectively opening and closing the open top of the container, said capsule comprising an envelope with means directly removably connectable to the open end of the container where it is immovable relative thereto, said envelope having a discharge passageway having an inlet adapted to be brought into register with an opening in a drawer unit, said envelope having a pair of outer parallel surfaces forming an outer guideway for guiding the horizontal movement of said drawer unit, said envelope also forming an internal generally horizontal guideway, the rigid drawer unit having a pair of outer wings for engaging said parallel wall surfaces which guide the drawer unit for horizontal movement, said drawer unit also having a rigid valve-forming portion having said opening and which is slidably disposed within said internal guideway for horizontal movement therein, said opening in said valve-forming portion of said drawer unit being in register with said inlet to said discharge passageway in a first adjusted position of said drawer unit and being out of register therewith in a second adjusted position thereof, and said envelope having a bottom wall in which is formed a port to communicate with said open end of said container aligned with said drawer unit opening when said drawer unit is in said first adjusted position and to be mis-aligned therewith when said drawer is in a second adjusted position, and said drawer unit being graspable by the user to move said drawer unit between said first and second positions.

5,114,052
MANUALLY ACTUATED TRIGGER SPRAYER
Paolo M. B. Tiramani, New York, N.Y., and Thomas C. Van Dyk, Prospect Park, N.J., assignors to Goody Products, Inc., Kearny, N.J.
Continuation of Ser. No. 441,067, Nov. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 236,592, Aug. 25, 1988, Pat. No. 4,898,307. This application Oct. 23, 1991, Ser. No. 780,824
Int. Cl.[5] B65D *37/00*; B67D *5/40*
U.S. Cl. 222—207 **17 Claims**



1. A spray cap, including a closure for mounting the spray cap on a supply container, a nozzle, a manually operable pump including a pump chamber, and a discharge conduit from the pump chamber to the nozzle, a discharge check-valve seat between said pump chamber and said nozzle, a discharge check-valve body, and at least one resilient element supporting said discharge check-valve body on said nozzle and biasing said discharge check-valve body against said discharge check-valve seat, said nozzle and said biasing means and said discharge check-valve body constituting a single component of molded plastic.

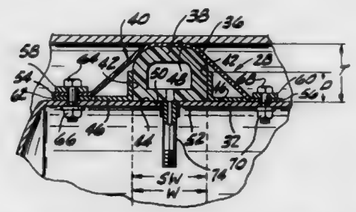
5,114,053
ROTARY FEEDER FOR GRANULATED BULK MATERIAL
Walter Beirle, Ravensburg, Fed. Rep. of Germany, assignor to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany
Filed Nov. 29, 1990, Ser. No. 620,527
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1990, 4004415
Int. Cl.[5] G01F *11/10*
U.S. Cl. 222—345 **9 Claims**



1. A rotary feeder for granulated bulk material; comprising:
a housing including opposing side covers and having a supply well and a discharge well;
rotor means accommodated in said housing and including a plurality of radially extending blades mounted on a shaft

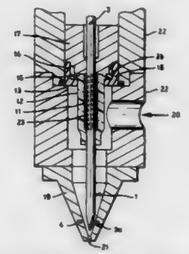
and defining compartments for transporting the bulk material in rotational direction from said supply well to said discharge well, with said supply well ending in a cross-sectional area defined by an edge which is passed last by said rotor means in rotational direction and constitutes a pre-stripping edge which extends above the generated cylindrical surface described by the radial end faces of said blades by a distance of about one to two grain diameters and is followed by a V-shaped stripping edge including two sections extending from said side covers symmetrically to a plane of symmetry which runs perpendicular to said shaft and ending in a tip pointing in rotational direction of said rotor means and lying in said plane of symmetry so that said sections of said stripping edge define a pocket-like recess at the inner wall of said housing, with each section defining with the generatrix of the generated cylindrical surface described by the radial end faces of said blades an angle which at least corresponds to the angle of repose between the bulk material and the material of said rotor means; and
a single deflector plate arranged in said pocket-like, recess in the area of said tip of said stripping edge and extending symmetrically to said plane of symmetry, said deflector being of substantial V-shape configuration and having a tip pointing in opposition to the rotational direction of said rotor means and arranged approximately below said pre-stripping edge, sides converging in this tip and ending at a distance from said sections of said stripping edge in the range of the mean grain diameter of the granulated bulk material so as to allow passage of single grains of bulk material therethrough.

5,114,054
TANK PISTON WITH TEFLON SHEATHED PACKING MEMBER
M. Burnell Watson, Box 34, Dorsey, Ill. 62021
Filed Jul. 19, 1990, Ser. No. 554,682
Int. Cl.[5] B67D *5/42*
U.S. Cl. 222—389 **19 Claims**



1. In an elongate tank for transport or for storage in bulk of semisold and fluid materials, such as grease and oil, said tank having an outlet at one end thereof for the material contained therein, said tank being of generally cylindric internal cross-section, a generally cylindric piston sized to slide in the tank and adapted to be moved in a direction toward said outlet thereby to force material in the tank through the outlet, said piston comprising:
a piston member;
a circumferential channel around the member and adjacent one end thereof;
seal means comprising an elastic annular packing and a circumferential flexible inelastic sheath impermeable to the material overlying the packing and protecting it, said packing being expandable and disposed at least partly within and carried by said channel and projecting outwardly from the outer surface of the cylindric piston in its unexpanded state, the shape of the outer surface of the portion of the packing projecting outwardly from the channel being generally arcuate and the shape and the dimensions of the packing portion within the channel substantially conforming to those of the channel, the packing being at least partly covered by said sheath, said sheath being formed of a substance resistant to bonding to the internal surface of the tank and having at least one preformed circumferential crease therein, said packing being hollow and having pressurizing means for varying the pressure within the packing between atmospheric pressure and a pressure higher than atmospheric wherein the packing expands and presses the sheath against the internal surface of the tank with the pressure such that when the piston member slides in the tank a portion of the sheath is maintained in sliding engagement with the internal surface thereby to wipe the material therefrom and to seal the piston member relative to the tank, said sheath preventing the packing from contacting the tank; and
means extending radially outwardly beyond the periphery of the piston member and spaced axially from the seal for engagement with the internal surface of the tank for holding the piston member against canting in the tank while permitting said piston member to slide freely in said tank.

5,114,055
A REINFORCED TUBULAR SEAL
John N. Worth, Bolnhurst, England, assignor to W. R. Grace & Co.-Conn., New York, N.Y.
Filed Jan. 7, 1991, Ser. No. 638,287
Claims priority, application United Kingdom, Jan. 9, 1990, 9000426
Int. Cl.[5] F16K *41/00*
U.S. Cl. 222—542 **7 Claims**



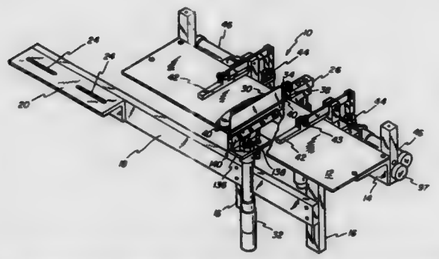
1. A seal for an elongate valve member movable longitudinally relative to a housing, comprising: an elongate annular seal member having an internal bore therealong receiving said elongate valve member; means for clamping a first end of the elongate annular seal member relative to said housing, the elongate seal member having its second end in sealing contact with the exterior of the elongate valve member in said bore thereof; and means within said bore between said first and second ends of the seal member for holding an axially extending portion of said seal member clear of a said elongate valve member even when the exterior of said seal member is subject to a pressure greater than that to which the interior is subjected.

5,114,056
PLEATING METHOD AND APPARATUS
Ricky J. Frye, Miamisburg, Ohio, assignor to MIM Industries, Inc., Miamisburg, Ohio
Filed Sep. 7, 1990, Ser. No. 579,916
Int. Cl.[5] A41H *43/00*
U.S. Cl. 223—30 **20 Claims**

20. An apparatus for forming a selected multiple number of pleats in fabric, the apparatus comprising:
a work platform having an upper support surface, and a slot extending through said work platform and defining a central position of the apparatus;

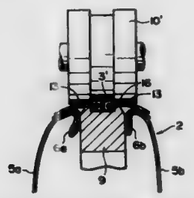
VOL 1138 ISS 3 MAY 19 1992 UMI

a blade positioned below said platform and aligned with said slot;
means for moving said blade upwardly through said slot above said work surface;
a vertically movable head and means supporting said head for movement at said central position toward and away from said surface along a plane coincident with said slot,
said head having three receptacle positions for pressing members, namely a central position aligned with said slot and two positions flanking said slot;
rod-like pressing members insertable into said head into selected receptacle positions, a single pressing member being insertable into said central position and a pair of cooperating pressing members being insertable into said flanking positions, said pair of pressing members in said flanking positions being used for making three pleats and said single pressing member in said central position being used for making two pleats;



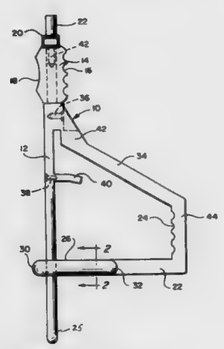
means connected to said head for moving said head between a raised position above said surface and a lowered position at which pressing members received in said head pressing the fabric against said support surface beneath said head,
means for selectively actuating said blade moving means to cause said blade to rise between two pressing members to pull the fabric upwardly beneath and between the two pressing members to form a first pleat,
gripping arms movable towards and away from said upper work surface into gripping arrangement with the fabric on opposite sides of and spaced along said surface from said central position;
means to move said gripping arms laterally towards said central position when said head is located at its lowered pressing position to form two lateral pleats intermediate the gripping arms and the pressing member received in said head.

5,114,057
APPARATUS FOR FEEDING SLIDE FASTENER CHAIN WITH FOLDILNG OF ATTACHED FABRIC STRIPS
Kiichirou Ishikawa, Marietta, Ga., assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Apr. 26, 1991, Ser. No. 691,981
Int. Cl.[5] A41H *33/00*
U.S. Cl. 223—37 **6 Claims**



1. An apparatus for feeding a slide fastener chain which has a pair of interengaged rows of coupling elements ,/ secured on inner edges of respective tapes of a pair of tapes of the slide fastener chain, and strips of fabric secured on outer edges of the tapes at predetermined intervals, at least those of the fabric strips which are attached to one of the tapes having flaps extending over the coupling elements, said apparatus comprising:
(a) an elongate lower guide member having a narrow upper guide surface defining a feed path and a central guide groove extending longitudinally in said guide surface for receiving and guiding the pair of interengaged rows of coupling elements;
(b) a presser roller disposed adjacent to an upstream end of said lower guide member for resiliently urging the slide fastener chain against said upper guide surface to cause the flaps to engage said upstream end of said lower guide member and then turn down away from the coupling elements on one side of said lower guide member as the slide fastener chain is fed longitudinally along the feed path;
(c) an elongate upper guide member disposed immediately downstream of said presser roller and extending over said lower guide member for guiding the slide faster chain between said upper and lower guide members; and
(d) a feed unit associated with said upper and lower guide members and frictionally engageable with a central portion of the slide fastener chain including the interengaged rows of coupling elements for feeding the slide fastener chain longitudinally along the feed path.

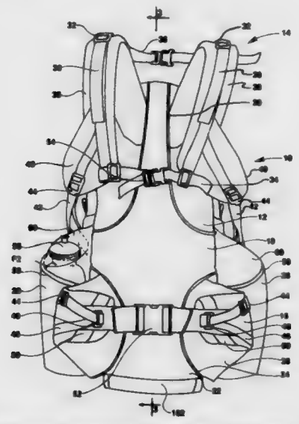
5,114,058
FISH STRINGER WITH HAND-GRIP FOR HORIZONTAL CARRYING
Ronnie D. Davis, 204 Royal Ct., Forest, Va. 24551
Filed May 9, 1991, Ser. No. 697,555
Int. Cl.[5] A01K *65/00*
U.S. Cl. 224—103 **4 Claims**



1. A stringer for fish comprising:
a. a resilient, longitudinally extending stringer arm having a hand-gripping end and a free end; being adapted to receive fish;
b. a handle attached to said hand gripping end and having a rotatable loop secured thereto;
c. a pivoted carrying arm having an upper end and a lower end, said carrying arm being resiliently secured at said upper end to the hand-gripping end of said stringer arm and extending outwardly so as to define an alternate hand-gripping portion and extending inwardly at said lower end to encircle and releasably engage said free end of said stringer arm, said carrying arm defining a C-shaped loop extending from said hand-gripping end to said free end of said stringer arm; and

d. a laterally extending stop positioned upon said stringer arm intermediate said hand-gripping end and said free end.

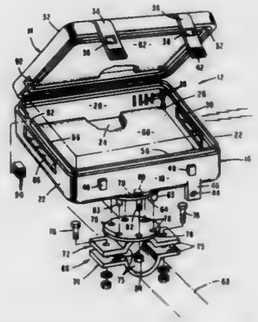
5,114,059
UNIVERSALLY ADJUSTABLE, FRAMELESS BACKPACK
G. Bryce Thatcher, Rexburg, Id., assignor to Ultimate Direction, Inc., Rexburg, Id.
Filed Nov. 30, 1990, Ser. No. 620,018
Int. Cl.[5] A45F *3/04*
U.S. Cl. 224—209 **31 Claims**



1. A universally adjustable backpack comprising:
a pack body having front, side, and back walls defining a plurality of compartments;
a back pad affixed substantially transversely across an upper portion of the back wall to form a substantially transverse shoulder harness slot;
an adjustable shoulder harness pivotally affixed to the body back wall within the shoulder harness slot;
a lumbar pad affixed substantially transversely across a lower portion of the back wall for contacting a lumbar region of a person's body and to form a substantially transverse belt slot; and
an adjustable and detachable belt pivotally inserted within the belt slot between the lumbar pad and body back wall;
whereby the shoulder harness and detachable belt may pivot with respect to the body and the weight of the backpack is supported by the lumbar region of the person's body.

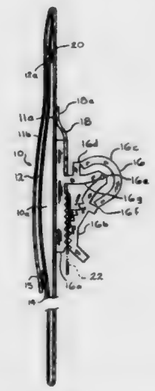
5,114,060
RADAR DETECTOR MOUNTING APPARATUS
Robert Boyer, Box 533, Bisbee, Ariz. 85603
Filed Aug. 10, 1990, Ser. No. 565,146
Int. Cl.[5] B62J *7/00, 7/06*
U.S. Cl. 224—32 R **13 Claims**

1. An apparatus for adjustably mounting on a motorcycle having handlebars an electrically operated, compact radar detector unit, comprising:
(a) a hollow housing for removably receiving the radar detector unit, said housing comprising:
(i) a base portion, including interconnected front, back, side and bottom walls defining an interior chamber, one of said walls having means penetrable by audible signals emitted by the radar detector unit, one of said walls having cord receiving means for receiving the power cord of the radar detector unit, and said front wall having window means for passage of radiation emitted by a remote radar device;
(ii) cover means connected to said base portion for movement between a first open position and a second closed position closing said interior chamber;
(iii) sealing means for sealably interconnecting said base portion and said cover means when said cover means is in said second closed position, whereby said interior chamber is sealed with respect to the atmosphere;
(b) shock absorbing means disposed within said hollow housing for cushioning the radar detector unit against shock and vibration; and



(c) mounting means operably associated with said hollow housing for mounting said hollow housing on the motorcycle, said mounting means comprising:
(i) a first member connected to said base portion of said hollow housing;
(ii) a clamping assembly removably connectable to the handlebars of the motorcycle;
(iii) a second member connected to said clamping assembly; and
(iv) interconnection means for adjustably interconnecting said first and second members.

5,114,061
WATERPROOF POUCH RELEASABLY CLAMPABLE TO WEARING APPAREL
Thomas J. Brady, 6839 Hawkston Rd., Sylvania, Ohio 43560
Continuation of Ser. No. 17,631, Feb. 24, 1987, abandoned. This application Sep. 11, 1989, Ser. No. 405,598
Int. Cl.[5] A45F *5/00, 5/02*
U.S. Cl. 224—252 **4 Claims**



1. A waterproof pouch readily releasably clampable to wear-

ing apparel, said pouchy comprising front and rear walls made of flexible impermeable sheet material and forming a compartment having an open top, first strip means disposed respectively adjacent the tops of said walls and forming a readily openable and recloseable waterproof seal for the open top of said compartment, a closure flap extending from said rear wall and being foldable over said front wall, second strip means disposed respectively on an inner side of said closure flap and on an outer side of said front wall and forming a readily openable and recloseable fastening means for securing the closure flap in a closed position, and a readily openable and closeable one-piece molded plastic over-center snap-acting clamp secured to an outer side of said rear wall for clamping he pouch to swearing apparel, said clamp including a mounting base, an operating lever pivotally connected to said mounting base, said base and said lever being provided with toothed surfaces in facing relationship with one another for securely gripping the wearing apparel, and spring means for biasing said toothed surfaces of said lever into engagement with said toothed surfaces of said base.

5,114,062

ROLL FOR GUIDING WEB TYPE MATERIAL

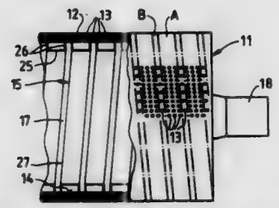
Friedrich Kuhn, Heidenheim; Wolfgang Drefs, Huttlingen; Hans Ruff, Heidenheim, and Siegbert Scheuter, Herbrechtingen, all of Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Dec. 19, 1989, Ser. No. 453,619

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843246

Int. Cl.[5] B65H *20/12*

U.S. Cl. 226—95 **8 Claims**



1. A roll for guiding web type material, comprising:

a roll shell having a multitude of through bores, in which said roll shell has an inner circumference, said bores being disposed in at least two zones, the bores in one of said zones being covered by a covering device contained interiorly of said roll, said covering device comprising channel means defining a ring having a generally U-shaped profile and having sidewalls whose end faces bear on the inner circumference of the roll shell, said channel means being open toward said roll shell, the bores in the other of said zones being subject to suction interiorly of said roll.

5,114,063

WEB OR SHEET GUIDE AND CENTERING MECHANISM

John T. Vukelich, 14 Alamito La., Hot Springs Village, Ark. 71909

Filed Feb. 3, 1989, Ser. No. 306,522

Int. Cl.[5] B65H *17/34, 23/26*

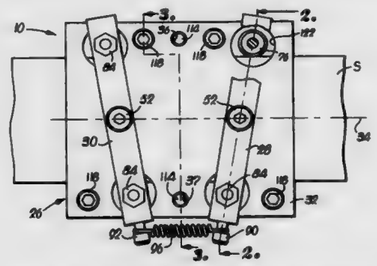
U.S. Cl. 226—199 **19 Claims**

1. A guide apparatus for guiding a strip of material along a predetermined strip travel path and for centering the strip relative to the central axis of the travel path, the apparatus comprising:

a pair of lever arms;

strip engaging means for engaging and guiding a strip traveling along the strip travel path, the strip engaging means including a pair of strip engaging members spaced from one another and mounted on each of the lever arms;

means for supporting the lever arms for pivotal movement about a respective pivot axis centrally located between the strip engaging members and for positioning the pair of lever arms relative to the strip travel path with the pivot axis of each lever arm extending in a direction perpendicular to the strip travel path and intersecting the central axis of the strip travel path; and



lever arm biasing means for biasing the lever arm relative to one another toward a pivoted position in which the strip engaging members mounted on the lever arms are adapted to engage a strip traveling along the strip travel path and center the strip relative to the central axis of the travel path.

5,114,064

POWDER CHARGE OPERATED SETTING TOOL

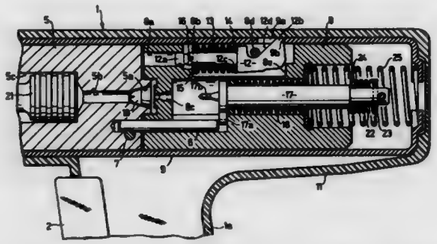
Peter Jochum, Meiningen, Austria, and Martin Müller, Sax, Switzerland, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Jul. 17, 1991, Ser. No. 731,501

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1990, 4022673

Int. Cl.[5] B25C *1/14*

U.S. Cl. 227—9 **6 Claims**



1. Powder charge operated setting tool comprising a housing (1) having a setting direction, a barrel (5) and a closing member (8) axially displaceably located within the housing, the barrel (5) comprises a receptacle (5a) for a propellant charge (19) and the closing member (8) contains a firing pin (17) and abuts the housing (1) through a spring element (25) acting in the setting direction, wherein the improvement comprises a snap-in element (12) within the housing and acting in a ready to fire position between the housing (1) and the closing member (8) and in engagement with the housing, said snap-in element arranged to overcome a predetermined force acting counter to the setting direction due to gas pressure generated after the propellant charge (19) has been ignited, which force disengages said snap-in element from the housing counter to the setting direction, and permits said snap-in element (12) to allow displacement of the closing member (8) counter to the setting direction.

5,114,065

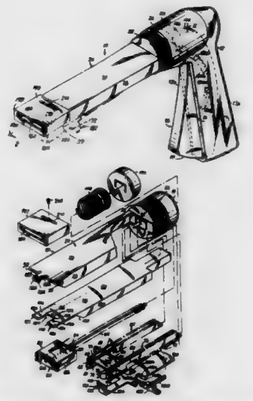
SURGICAL STAPLER

Anthony Storace, Norwalk, Conn., assignor to Technalytics, Inc., Montvale, N.J.

Continuation of Ser. No. 197,618, May 23, 1988, Pat. No. 4,991,763. This application Nov. 26, 1990, Ser. No. 617,576

Int. Cl.[5] A61B *17/068*

U.S. Cl. 227—175 **21 Claims**



1. A stapling device for use in ejecting a single staple to close an incision or wound comprising:

a case including a staple discharge area;

a cartridge assembly adapted to receive a plurality of staples in a generally stacked planar arrangement disposed within said case at a first plane;

a pusher assembly engageable with said stack of staples and movable between a first rearward position and a second forward position to advance said stack of staples;

control means for turning a single staple around an axis generally normal to said stack of staples to form a turned staple, wherein said turned staple is at a second plane other than the first plane of the stack of staples, wherein said control means further comprises:

a first anvil having a staple transport surface and a staple forming surface extending generally upwardly form said staple transport surface;

a second anvil positioned generally above said first anvil;

a former including a pair of arms which impinge upon the legs of the staple and a pair of projections extending upwardly therefrom, said former being displaceable between a start position wherein the legs of the staple are generally perpendicular to the horizontal axis of the former and the crossarm of the staple being reliably retained within an opening defined by the staple transport surface and a step extending upwardly from said pusher assembly, and a first intermediate forward position wherein said legs of said former impinge upon the arms of the staple forcing the staple to rotate generally perpendicular to the stack of staples;

means for moving said turned staple a predetermined distance within the device;

forming means for forming the staple into a closed gripping configuration;

stripping means for disengaging the stale to be ejected from the device; and

loading means for loading a single staple within said stack of staples into a position to be turned.

11. A stapling device for use in ejecting a single staple to close an incision or wound comprising:

a case having a bottom and a top side and a staple discharge area,

a cartridge assembly adapted to receive a plurality of staples in the form of a stack in a generally planar arrangement disposed within said case at a first plane,

a pusher assembly engageable with said stack of staples and movable between a first rearward position and a second forward position to advance said stack of staples,

control means for turning a single staple of the stack of staples from a first position to a second position at a significant angle to said first position to form a turned surface, wherein said turned staple is positioned at a second plane other than the first plane of the stack of staples, wherein said control means comprises,

a first anvil having a staple transport surface upon which said plurality of staples are transported and a staple forming surface extending generally upwardly form said staple transport surface;

a second anvil positioned generally above said first anvil; and

a former engageable with the legs of said staple to be ejected and cooperable with means to restrain said staple and displaceable between a first position wherein said staple is in its initial plane of orientation and a first intermediate forward position wherein said staple is rotated to it plane of ejection;

transporting means for moving a single staple to be ejected within the device such that the staple can be discharged from the device at a significant angle less then 90° from the incision or wound,

forming means for forming the staple into a closed gripping configuration, and

stripping means for disengaging the staple to be ejected form said device and to eject the fully formed staple.

5,114,066

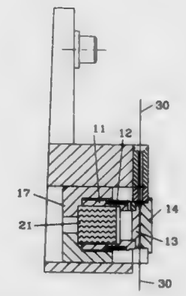
VOICE COIL PROGRAMMABLE WIRE TENSIONER

Gonzalo Amador, Dallas; Randy O. Burrows, Lubbock, and George C. Epp, Van Alstyne, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 20, 1990, Ser. No. 616,035

Int. Cl.[5] B23K *37/00*

U.S. Cl. 228—4.5 **17 Claims**



1. A programmable wire tensioner for a wire bonder, comprising:

a fixed clamp face;

a voice coil mechanism including a movable coil,

a movable clamp face mounted on said movable coil, and adjacent to and spaced from said fixed clamp face; and

wherein when a current is applied to said voice coil mechanism, said movable coil and movable clamp face moves toward said fixed clamp face to engage a bond wire between the movable and fixed clamp faces.

5,114,067

SINGLE SHEET SELF-MAILING FORM WITH IMPROVED FEEDING CHARACTERISTICS

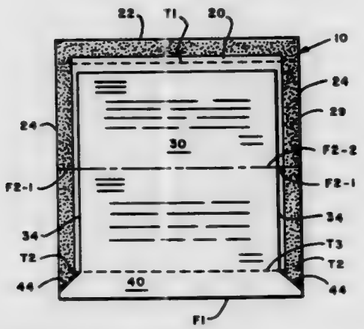
Samuel W. Martin, Martin Rd., Weston, Conn. 06883; Morton Silverberg, 24 Edgewater Commons La., Westport, Conn. 06880, and Kenneth A. Terry, 7 Spring Valley Rd., Weston, Conn. 06883

Continuation of Ser. No. 356,149, May 24, 1989, abandoned. This application Oct. 23, 1990, Ser. No. 601,606

The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.

Int. Cl.[5] B65D *27/34*

U.S. Cl. 229—92.1 **5 Claims**



1. A self-mailer form, comprising:

a) a substantially rectangular upper portion having opposed upper and lower edges and opposed longitudinal edges, said upper portion being weakened along a first transverse line substantially extending between said longitudinal edges substantially parallel to, and spaced from said upper edge of said upper portion by a predetermined distance, and being weakened along a second transverse line substantially co-extensive with and parallel to said first line, said said second line being spaced from said lower edge by said predetermined distance;

b) a substantially rectangular lower, message portion having a width less than said upper portion, and having opposed upper and lower edges and opposed longitudinal edges;

c) a substantially rectangular connecting portion attached along said lower edge of said upper portion and said upper edge of said lower portion, the outer edges of said connecting portion forming an oblique angle with said longitudinal edges of said lower portion and extending from said longitudinal edges of said lower portion substantially to said longitudinal edges of said upper portion, said form being weakened along said upper edge of said lower portions; wherein,

d) the dimensions of said upper portion and said lower portion are chosen so that, after a first folding of said form around said lower edge of said upper portion, a second folding of said form around a transverse fold line substantially bisecting said upper portion, and sealing of said longitudinal edges of said upper portion, and said upper edge of said upper portion and said upper edge of said upper portion to said connecting portion, a mail piece is formed containing said lower portion, said lower portion being attached to said mail piece only be attachment to said connecting portion along said upper edge of said lower portion; and,

e) said form is weakened along said upper edge of said lower portion relatively less than along said transverse lines by an amount selected to allow said form to withstand the stresses of mechanical folding operation.

5,114,068

APPARATUS FOR THE SEPARABLE ATTACHMENT OF TWO SYNTHETIC PLASTICS PARTS AND THE USE OF THE APPARATUS FOR A PACKAGE TO CONTAIN FLOWABLE CONTENTS

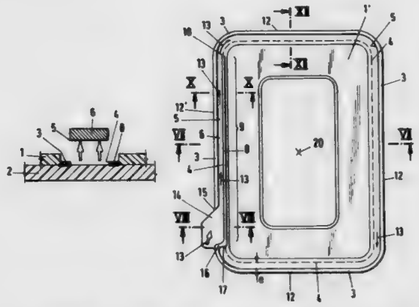
Wilhelm Reil, Bensheim; Ulrich Deutschbein, Mühltal; Gerd Knobloch, Griesheim, and Udo Liebram, Pfungstadt, all of Fed. Rep. of Germany, assignors to Tetra Pak Holdings & Finance S.A., Pully, Switzerland

Filed Oct. 9, 1990, Ser. No. 594,257

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1989, 3935480

Int. Cl.[5] B65D *51/00*

U.S. Cl. 229—123.2 **7 Claims**



1. A packge for containing fluids or solids including a tub-shaped bottom part and a top enclosing said bottom part about an upper sealing edge of the bottom part and at least said upper sealing edge of said bottom part and said top being formed of synthetic plastic material, comprising:

means defining a first welded seam extending generally circumferentially of said top along said upper sealing edge between said upper sealing edge and said top joining said bottom part at said upper sealing edge to said top,

said first welded seam defining a first tear line along a lateral edge of said seam,

means in said top forming a circumferentially extending tear-off strip defining an inner edge and an outer edge, and in which said outer edge of said strip is joined to said upper sealing edge along said first welded seam,

said tear-off strip inner edge being defined, in part, by a line of weakness in said top and part by a second welded seam formed as a continuation of said line of weakness and connecting said top to said upper sealing edge of said bottom part, whereby the removal of said tear strip by separating the same along said first welded seam and along said line of weakness and said second welded seam separates said top from said bottom part along said line of weakness and leaves said top attached to said bottom part along said second welded seam.

5,114,069

PACK

Josef Detzel, Kempten; Jurgen Matzel, Hamburg; Rüdolf Kraüs, Osterreinen, and Dieter Peissl, Mannheim, all of Fed. Rep. of Germany, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Mar. 27, 1991, Ser. No. 676,134

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1990, 4010056

Int. Cl.[5] B65D *5/40*

U.S. Cl. 229—125.15 **1 Claim**

1. A pack made from board which pack comprises:

(1) two side panels (2 and 3);

(2) two end panels, one of which end panels (6) which is

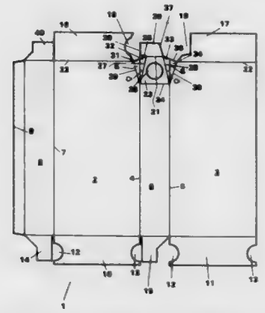
defined by vertical two folding lines (4 and 5) dividing the end panel from the two side panels (2 and 3);

(3) one base panel attached to each of the two side panels and two end panels; and

(4) one lid panel attached to each of the two side panels and two end panels;

wherein one of the lid panels (23) attached to one of the end panels (6) comprises a removal opening (25) and wherein said lid panel (23) comprising the removal opening (25) is divided off from said end panel (6) by a horizontal folding line (24);

wherein two angled folding lines (27, 29; 28, 30) are located at acute angles (α and β), to each of the two vertical folding lines (4, 5) defining end panel 6, one of said two angled folding lines (27, 28) extending from the part where the two vertical folding lines 4 and 5 meet horizontal folding line 24 to the lid panel comprising the removal opening and the other of said two vertical folding lines (29, 30) extending from the part where the two vertical folding lines 4 and 5 meet horizontal folding line 24 to one of the two respective side panels (2, 3);



wherein one of the lid panels (16, 17) which is attached to a side panel (2, 3) does not extend all the way to the end panel (6) which comprises the removal opening (25);

said one of the two angled folding lines which extend from the end panel into the lid panel (27, 28) being at least slightly curved when they start from horizontal folding line 24;

said lid panel comprising the removal opening being folded back along the two angled folding lines forming acute angles α and β to rest against the lid flaps (16, 17) which are attached to the side panels;

wherein in at least the base panels (10, 11) attached to the bottom of the side panels, there are provided cut out sections (12, 13);

wherein the lid panels attached to the side panels are narrower at an end and facing the lid panel (23) comprising the removal opening;

wherein the base panels attached to the side panels are narrower at an end opposite the end the lid panels are narrower at; and

wherein a dust flap is hinged to the top end of the top panel comprising the removal opening.

5,114,070

PNEUMATIC DIRECT DIGITAL CONTROLLER

Philip C. Lilja, Minneapolis; Paul W. Ehrlich, St. Paul, both of Minn., and Allenn E. Martin, Baton Rouge, La., assignors to American Standard Inc., New York, N.Y.

Filed Nov. 6, 1990, Ser. No. 610,497

Int. Cl.[5] G05D *15/00*

U.S. Cl. 236—49.3 **29 Claims**

1. A pneumatic direct digital controller comprising:

an air inlet;

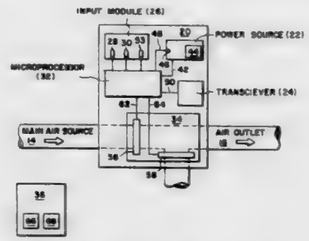
an air outlet;

transducer means for connecting said air inlet and said air outlet and for controlling the pressure of air between the air inlet and the air outlet;

a self-contained internal power supply;

a sensor;

wireless means for receiving and transmitting remote signals; and



a direct digital controller operably connected to the power supply, operably connected to and controlling the transducer means, operably connected to the wireless means, and operably connected to the sensor to receive a signal from the sensor;

whereby the pressure of air in the air outlet is controlled in accordance with the signal received from the sensor.

5,114,071

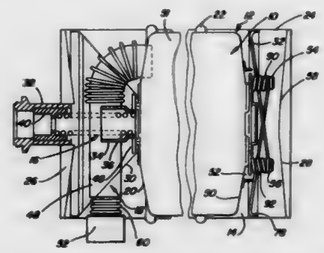
HEAT STORAGE MEANS

Oskar Schatz, Waldpromenade 16, DW-8035 Gauting, Fed. Rep. of Germany

Filed Mar. 5, 1991, Ser. No. 665,308

Int. Cl.[5] B60H *1/02*

U.S. Cl. 237—12.3 C **10 Claims**

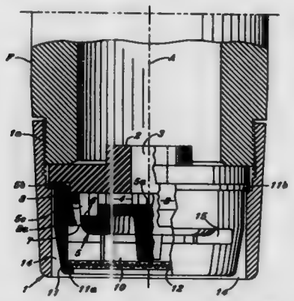


1. A heat storage means for vehicle heating systems run on waste engine heat, comprising:

an inner container accommodating a storage core, an outer container surrounding the inner one with a clearance to constitute a preferably evacuated insulating space, two ducts running from the outside through the insulating space to the inner container, of which one functions as a supply duct for a heat vehicle fluid and the other functions as a return duct therefor, and the inner container is suspended at two end walls, via a respective group of ribs with a low thermal conductivity, on the outer container, between a first end wall of the inner container and the outer container at least one spring is so arranged that it tends to change the distance apart of the opposite end walls of the inner container and of the outer container and between the container wall connecting the two end walls of the inner container and the adjacent container wall of the outer container the insulating space has its minimum thickness, wherein the ribs, which are associated with the other, second end wall of the inner container, are able to

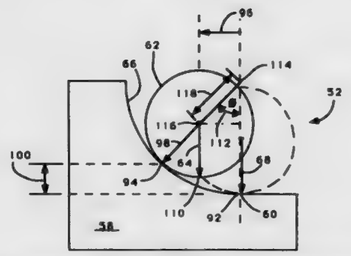
be slid in the direction of the container wall which connects the end walls of the inner container, in relation to the inner container while perpendicularly thereto they are connected in a non-sliding manner with the inner container and between the ends, which are in engagement with the inner container, of these ribs and the inner container at least one spring is arranged, which tends to change the distance between these ends and the second end wall of the inner container and therefore to keep the ribs under tension.

5,114,072
WATER AERATOR
Dirck Barhydt, Sr., Middlebury, Conn., assignor to WPM, Inc., Waterbury, Conn.
Filed Oct. 3, 1991, Ser. No. 770,370
Int. Cl.[5] E03C *1/08*
U.S. Cl. 239—428.5 **2 Claims**



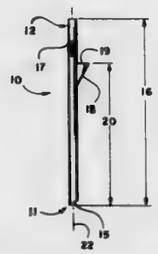
1. In a water aerator for delivering an aerated bubbly stream, the combination of a cylindrical barrel adapted to be removably secured at its upper portion to a source of water under pressure, a basket mounted in the barrel and surrounding a mixing chamber, screen means supported by the basket below said chamber and through which said stream is adapted to be discharged, said barrel and basket having opposing parts forming a passage for flow of atmospheric air into the mixing chamber due to a reduced pressure therein, a diffuser overlying the mixing chamber and forming a diffuser chamber positioned to receive water from said source, the diffuser chamber being open at the top and having peripheral openings for diffusing a flow of water outwardly from the diffuser chamber to the mixing chamber, the diffuser also having at its upper end a seat surrounded by an upward flange, and a resilient flow restrictor plug supported on said diffuser and having a control opening for admitting water from said source to the diffuser chamber, the opening being defined by an enlarged upwardly directed hub contracting inwardly under increased pressure to reduce the diameter of the control opening, said control opening, diffuser chamber, peripheral openings and mixing chamber forming a path through which water is adapted to flow from said source to said screen means for discharge from the aerator, the improvement wherein the flow restrictor plug comprises a wider upper section extending out over the top of the basket, and a lower narrower section defining a head which frictionally squeezes into the upward flange defining a socket on the diffuser to hold the flow-restrictor plug in assembly with the diffuser.

5,114,073
WHEEL AND RAIL ASSEMBLY
John A. Dearien, Jr., 2329 Belmont, Idaho Falls, Id. 83404
Continuation-in-part of Ser. No. 427,781, Oct. 27, 1989, abandoned. This application Nov. 6, 1991, Ser. No. 789,440
Int. Cl.[5] E01B *5/14*; B61F *9/00*; B61K *5/04*
U.S. Cl. 238—15 **1 Claim**



1. In a rail transportation vehicle, a wheel and rail apparatus having a straight rail section and a curved rail section, comprising:
a. said vehicle having at least two pairs of wheels, each pair of wheels having an innermost and outermost wheel laterally disposed at distal ends of and securely affixed to an axle;
b. each of said wheels having a convex rolling surface with a first radius of curvature;
c. a pair of laterally spaced rails cooperating with said wheels, each of said rails having a flat surface and a concave contact surface with a second radius of curvature greater than the first radius of curvature of said rolling surface, and wherein when the vehicle is on the curved rail section, said innermost wheel is adjacent a lesser radius of curvature rail; and
d. wherein when said vehicle is moving on the straight rail section, an effective rolling radius of each wheel in a pair of wheels is essentially identical, and wherein when the vehicle follows the curved rail section, a centrifugal force causes the innermost wheel to have its effective rolling radius decreased thereby preventing slippage of the inner wheel.

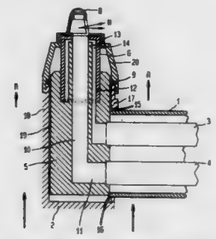
5,114,074
RETRACTION RESISTANT STRAW
Ellen S. Frauenthal, and Leonard A. Silverstein, both of 1084 Bailiff Ct., Atlanta, Ga. 30319
Continuation-in-part of Ser. No. 508,267, Apr. 11, 1990, abandoned. This application Aug. 13, 1990, Ser. No. 566,517
Int. Cl.[5] A47G *21/18*
U.S. Cl. 239—33 **3 Claims**



1. A drinking straw of the type constructed of a cylindrical tube having characteristic first and second ends of said tube and a characteristic longitudinal axis, said first end being

adapted for insertion into an orifice of a substantially predetermined diameter greater than a characteristic diameter of said cylindrical tube, wherein the improvement comprises in combination:
a flexible substantially right triangular tab having one orthogonal side thereof secured to the periphery of said cylindrical tube along a line substantially parallel to said longitudinal axis such that the vertex between said one orthogonal side and the hypotenuse of said triangle is closer to said first end of said cylindrical tube than to said second end and the other orthogonal side of said triangular tab extends substantially radially from said cylindrical tube when in a relaxed position, said right triangular tab being sufficiently resilient to substantially return to said relaxed position after being selectively wrapped about said periphery of said cylindrical tube and inserted through said orifice.

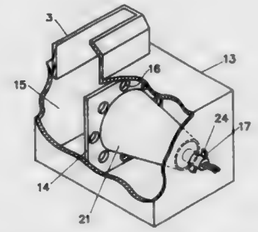
5,114,075
SPRAYING SYSTEM FOR TREATING A FLUE GAS
Hendrik A. Verduyn, Krimpen a/d IJssel, Netherlands, assignor to Seac International B.V., Krimpen a/d IJssel, Netherlands
Filed Apr. 19, 1990, Ser. No. 513,094
Claims priority, application Netherlands, Apr. 20, 1989, 8900993
Int. Cl.[5] B05B *1/24*
U.S. Cl. 239—135 **6 Claims**



1. A spraying system for treating a flue gas, said system comprising a liquid supply pipe, a gas supply pipe, a spray body and a spray head, said spray head being situated on said spray body and in liquid communication through said spray body with said liquid supply pipe and in gas communication with said gas supply pipe, wherein the spray body and the supply pipes are substantially surrounded by a housing and a jacket which thermally insulates the spray body and the supply pipes from the flue gas, and wherein the spray body is fastened to the housing and jacket so as to reduce heat transport occurring between the housing and the spray body such that the housing can remain at a temperature above an acidic dew point of the flue gas and wherein the housing is located near the spray body and substantially at a pre-defined distance therefrom.

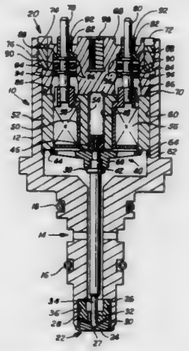
5,114,076
ATOMIZER FOR FORMING A THIN FILM
Mizuho Imai; Atsuo Ito; Mikio Sekiguchi; Hideyo Iida; Kikuji Fukai, and Komei Kato, all of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 543,166, Jun. 25, 1990, abandoned. This application Jun. 27, 1991, Ser. No. 726,622
Claims priority, application Japan, Jun. 30, 1989, 1-170492; Jun. 30, 1989, 1-170493
Int. Cl.[5] A61M *11/00*
U.S. Cl. 239—338 **10 Claims**

1. An atomizer for forming a thin film comprising:
an atomizing box;
a partition wall provided in said atomizing box and dividing said atomizing box into an atomizing solution reservoir and a fluid return passage, said partition wall having a plurality of perforations provided therein providing fluid communication between said atomizing solution reservoir and said fluid return passage;
a guide tube having an open end of small diameter and another open end of large diameter, said guide tube being contained within said fluid return passage and having said open end of small diameter provided at a sidewall of said



atomizing box and said open end of large diameter provided at said partition wall;
a nozzle having an ejection outlet extending through said sidewall and into said guide tube open end of small diameter so as to spray from the open end of small diameter to the open end of large diameter of the guide tube; and
an atomized solution discharger positioned above and connected to said atomizing solution reservoir.

5,114,077
FUEL INJECTOR END CAP
Mark S. Cerny, Sterling Heights, Mich., assignor to Siemens Automotive L.P., Auburn Hills, Mich.
Filed Dec. 12, 1990, Ser. No. 626,505
Int. Cl.[5] F02M *63/00*
U.S. Cl. 239—483 **5 Claims**



2. A fuel injector comprising:
a nonmagnetic tubular housing member having an open end, an outlet end, a fuel inlet proximate said outlet end and a shoulder intermediate the ends;
a valve seat member having an axially aligned orifice, said vale seat member located at said outlet end and swaged in said housing;
a needle valve having spherical seat means for seating in said vale seat member;
a spray generator having an axially aligned bore for guiding said needle valve, said spray generator having fluid passages tangentially aligned with respect to said axially aligned bore for imparting a swirling motion to fluid

passing therethrough and out of said orifice when said needle valve is off said valve seat;

armature means adjacent to the end of said needle valve opposite said spherically seat means, said armature means including an armature member and a damping means for absorbing the moving of said armature member when said needle valve seats on said valve seat;

solenoid means positioned inside said tubular housing member including a core member of two concentric cores connected at one end opposite said armature end and having equal cross sectional areas and a winding positioned between said concentric cores;

a ring spacer means positioned against said shoulder of said tubular housing means for locating said armature end of said solenoid means in said housing means;

terminal means extending from said winding out of said open end of said tubular housing means;

insulating means positioned around said terminal means, said insulating means including sealing means;

end cap means for receiving said insulating means and said terminal means and adapted to bear against said solenoid means, said end cap means being of a metallic material; and

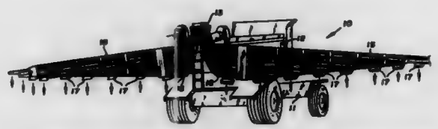
threaded ring means adapted to engage threading means along the inside of said tubular housing member adjacent said open end, said threaded ring means for locating said end cap against said solenoid means against said ring spacer means for making an unitary injector.

5,114,078

BAFFLE SYSTEM FOR PNEUMATIC APPLICATORS OF SOLID PARTICLES

Harry H. Takata, Edina, Minn., assignor to Ag-Chem Equipment Co., Inc., Minnetonka, Minn.

Filed Aug. 31, 1990, Ser. No. 576,375
Int. Cl.[5] A01C *3/06*; B05B *1/30*
U.S. Cl. 239—655 **4 Claims**



1. In combination with a pressurized pneumatic system for substantially uniform distribution of particulate solids upon the soil from a distribution system mounted upon a self-propelled vehicle and including a reservoir with a source of supply of particulate solids to be distributed, a distribution head means for metering and apportioning said supply of particulate solids into a plurality of generally aliquot portions, a plurality of elongated hollow delivery tubes of predetermined and differing lengths, with of said each delivery tubes extending laterally outwardly of said vehicle from a proximal end to a distal discharge end, a source of compressed air for creating a flow of pressurized air through said hollow elongated delivery tubes, a plurality of tubular feed members, each of said feed members extending between said distribution head means and a selected one of said delivery tubes, for delivery of each of said aliquot portions into the proximal end of one of said delivery tubes for movement to and discharge from the distal discharge end of said tube, each one of said tubular feed members intersecting the delivery tube to which it is coupled at a juncture point adjacent the proximal end of the delivery tubes for introducing one of said aliquot portions to the flow of pressurized air moving through each of said delivery tubes; the improvement comprising:

(a) aspiration means mounted within each of said hollow delivery tubes between said juncture point and said proximal end immediately upstream from said juncture point, said aspiration means comprising a blade means having an arcuate distal end defining an arcuate opening with symmetrical tapering tips across the cross-sectional area of said hollow delivery tube;

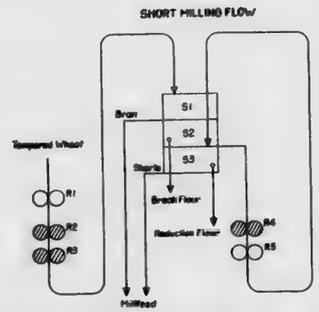
(b) said blade means, including the distal end thereof, extending radially inwardly of said hollow delivery tube at a tube intersecting angle which converges toward the distal end of said tube, and wherein said intersecting angle is from between about 50° and 65° from the axis of said delivery tube.

5,114,079

SIMPLIFIED METHOD AND APPARATUS FOR PRODUCING WHITE FLOUR FROM WHEAT GRAIN

Steven P. Curran, Manhattan, Kans., assignor to Kansas State University Research Foundation, Manhattan, Kans.

Filed Dec. 10, 1990, Ser. No. 625,085
Int. Cl.[5] B02C *9/04*
U.S. Cl. 241—3 **47 Claims**



1. Apparatus for processing wheat to produce white flour by substantially removing the bran layer and germ portion from the endosperm portion of the wheat grains, said apparatus comprising:

means for tempering said wheat to elevate the total moisture content thereof to a level of from about 14.5 to 17% by weight;

a pair of compression rolls for receiving said tempered wheat to be processed therebetween, said compression rolls being spaced apart such that a wheat grain-receiving gap of from about 0.015 to about 0.25 inches is presented therebetween, and the surfaces thereof configured to flatten the individual grains of wheat without substantial comminution thereof;

a pair of corrugated breaking rolls positioned to receive the flattened grains of tempered wheat directly from the compression rolls without intermediate processing of the wheat grains,

said breaking rolls each being provided with at least about 20 surface corrugations per circumferential inch of the outer circumference thereof and oriented with said surface corrugations in dull-to-dull relationship, said breaking rolls being operable to mechanically impact the wheat grains to break the bran outer layer away from the endosperm and germ portions thereof, thus producing a comminuted wheat product;

means operably coupled with said breaking rolls for rotation thereof at respective rotational rates causing one of the breaking rolls to be rotated at a faster rate than the other breaking roll;

a pair of corrugated grinding rolls positioned to receive the comminuted wheat product from said breaking rolls, said grinding rolls each having a greater number of circumferentially arranged corrugations than the number of corrugations in the breaking rolls;

means operably coupled with said grinding rolls for rotation thereof at respective rotational rates causing one of the grinding rolls to be rotated at a faster rate than the other grinding roll; and

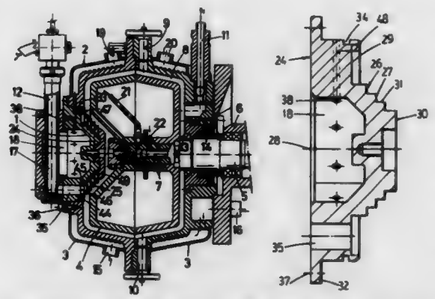
classification means for separating at least a portion of the bran fraction from the endosperm and germ portions of the comminuted and ground wheat product.

5,114,080

GRINDING BODY SEPARATOR IN MILLS FOR TRITURATING AND BREAKING UP SOLIDS PREDISPERSED IN LIQUIDS

Carlos O. Pujol, Badalona, Spain, assignor to Oliver Y Batlle, S.A., Badalona, Spain

Filed Jun. 19, 1991, Ser. No. 718,350
Int. Cl.[5] B02C *17/16*
U.S. Cl. 241—69 **1 Claim**



1. Grinding body separator in mills for triturating and breaking up solids predispersed in liquids, of the type which comprises a frame on which is mounted a fixed element or stator, with a jacket for the cooling or, for the heating of the product in treatment, in the interior of which a rotating element or rotor is disposed fastened to a shaft disposed along the longitudinal axis of the mill and mounted overhung on respective supporting and bearing means attached to the frame of the mill, which shaft has internal lines for rotor cooling or, heating media and is made to rotate by drive means through respective transmission and speed variation means attached to the frame, there being defined between said stator and rotor the grinding chamber, in which grinding bodies are enclosed which are initially introduced into said chamber through a closable entrance of the stator, in whose lower part is located a likewise closable outlet for their evacuation, the grinding chamber being traversed by the product in treatment while the rotor rotates —owing to means of impulsion of said product, which are moved by drive means and through transmission and speed variation means, the stator having an entrance of the product to be treated, communicating with the exit of the impulsion means and an exit of the ground product, in the exit zone of which are disposed separator means which prevent the grinding bodies from coming out but let the ground product pass, seal means being disposed between the stator and the shaft to prevent leakage of the product which circulates continuously and forcedly through the grinding chamber; characterized in that the separator presents a hollow stepped support whose ideal geometric envelope is a truncated cone, whose steps are formed by a series of circular rims superposed along parallel planes, perpendicular to the longitudinal axis of the separator and of decreasing diameter from the major base of the support to its free end, which series alternates with another series of short circular superposed cylinders, whose centers are disposed in said longitudinal axis of the separator and whose diameters are also decreasing in coordination with the respective diameters of said rims, the major base of the support comprising a flange and seal means for its installation in the respective mill, in the exit zone of the ground product; in that it presents a series of circular rings of decreasing diameters from the major base of the support to its free end, each of them made up of an inner collar and an outer collar, both of square cross section and interconnected by bridges which define respective transverse orifices or passages, each ring fitting on a respective step, for which purpose the inside diameter of its inner collar matches the outside diameter of the circular cylinder of the step on which it is mounted; in that the outside diameter of the outer collar of each of the rings that follow the largest of them coincides with the inside diameter of the outer collar of the ring on which it is juxtaposed, and the thickness—measured in the direction of the longitudinal axis of the separator—of the inner collar of a ring is somewhat larger than that of its outer collar, causing a separation between each pair of juxtaposed rings, in axial direction, which is smaller than the smallest thickness or diameter of the grinding bodies to be retained in the grinding chamber; in that the outer collar of each of the rings which follow the largest of them delimits a space, relative to the inner collar of the ring on which it is juxtaposed, which is greater than said separation between each pair of rings; in that, there is removably fastened on the major base of the support a first circular collar of square cross section and of an outside diameter greater than that of the largest of the series of rings, whose inside diameter coincides with the outside diameter of the outer collar of the largest ring, and also there is provided, in coplanar and coaxial arrangement, a second circular collar similar to the first but smaller and practically equal to the inner collar of the largest ring to which it is juxtaposed, the thickness of said second collar, in axial direction, being somewhat greater than that of the outer collar of said largest ring, causing a separation, in axial direction, between the two smaller than the smallest thickness or diameter of the grinding bodies, defining between said first and second circular collars a kind of channel for the passage of the ground product toward the exit of the mill, through at least one longitudinal orifice in the flange of the support; and in that the assembly composed of the series of rings and the second collar is retained and immobilized by means of a disk applied against the smallest ring and removably fastened on the minor base of the stepped support of the separator, the outside diameter of said disk being equal to the inside diameter of the outer collar of the smallest ring, and between the peripheral edge of this disk and the opposite edge of said outer collar of the smallest ring a separation is defined equal to that between each pair of juxtaposed rings.

5,114,081

SYSTEM FOR MECHANICALLY AND BIOLOGICALLY DECOMPOSING GARBAGE

Shintaro Takenaka, Fukuyama, Japan, assignor to Mitsui Home Co., Ltd., Tokyo and Shinyou Sangyo Co., Ltd., Hiroshima, both of, Japan

Filed May 16, 1991, Ser. No. 700,802
Claims priority, application Japan, Nov. 14, 1990, 2-308378
Int. Cl.[5] B02C *21/00*
U.S. Cl. 241—79 **4 Claims**

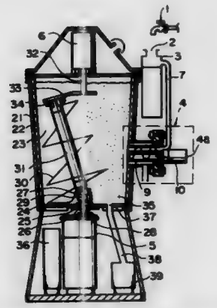
1. A system for mechanically and biologically decomposing a garbage, wherein said system comprises;

a disposer for disintegrating said garbage in a large number of pieces,

a solid/liquid separator arranged downstream of said disposer to receive the garbage which has been disintegrated by the disposer, said solid/liquid separator serving to separate water from the disintegrated garbage, and

garbage decomposing vessel arranged downstream of said solid/liquid separator to receive the solid disintegrated

garbage from the solid/liquid separator, said garbage decomposing vessel serving to biologically dissolve the



solid disintegrated garbage from which water has been substantially separated in the solid/liquid separator.

5,114,082

GRINDING SURFACE OF ROLLING MILLS

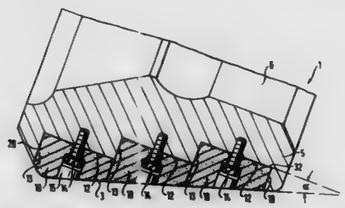
Horst Brundiek, Kaarst, Fed. Rep. of Germany, assignor to Leosche GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 22, 1990, Ser. No. 541,979

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1989, 3921419

Int. Cl.[5] B02C *15/00*

U.S. Cl. 241—121 **12 Claims**



1. Rolling mill comprising grinding rollers and a grinding path each having a fastening body of ferrous material for attaching a grinding surface including a cladding of wear-resistant segments made from a ceramic compound and tightly fixed to said fastening bodies, the segments having outer faces which form the entire grinding surfaces, and in which said fastening bodies of said grinding rollers and said grinding path facing the grinding rollers have a step-like configuration in axial section which support the segments of the cladding for positively fixing said segments against dynamic stressing forces in the radial direction of the grinding surfaces of the rolling mill.

5,114,083

METHOD AND APPATATUS FOR PULVERIZING MATERIAL

Iwao Ikebuchi; Yoshitaka Ihara; Hisashi Takei; Syozo Yamada; Mamoru Nakano, and Akira Ganse, all of Osaka, Japan, assignors to Kubota, Ltd., Osaka, Japan

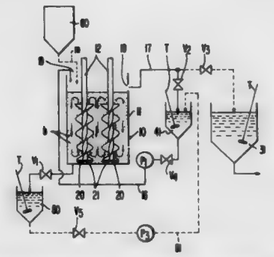
PCT No. PCT/JP89/00584, § 371 Date Feb. 12, 1990, § 102(e) Date Feb. 12, 1990, PCT Pub. No. WO89/11911, PCT Pub. Date Dec. 14, 1989

PCT Filed Jun. 7, 1989, Ser. No. 465,178

Claims priority, application Japan, Jun. 10, 1988, 63-77459; Jun. 16, 1988, 63-150979

Int. Cl.[5] B02C *17/16*

U.S. Cl. 241—153 **10 Claims**



1. An apparatus for pulverizing a material into a particulate product, comprising:

a shell having an inlet port and a discharge port;

a pulverizing medium filling said shell; and

a vertical screw shaft having a screw blade thereon and rotatably mounted in said shell for agitating said pulverizing medium to pulverize the material fed into said shell through said inlet port into fine particles by friction between the particles thereof and with said pulverizing medium, said discharge port being positioned for removing the fine particles out of said shell; said screw shaft having a disk secured to the bottom of said screw shaft, said disk having a diameter substantially equal to the outside diameter of said blade of said screw shaft and a bottom surface in the shape of an inverted cone.

5,114,084

CRUSHING MACHINE

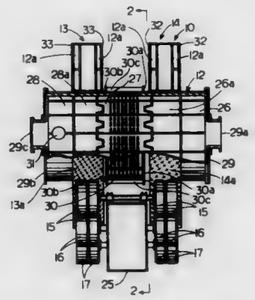
Harumi Yamaguchi; Takeshi Higuchi, both of Kitakyushu, and Kenji Fukuda, Shingu, all of Japan, assignors to Nippon Magnetics USA, Inc., Stamford, Conn.

Filed Jan. 23, 1991, Ser. No. 644,951

Claims priority, application Japan, Jan. 31, 1990, 2-8455

Int. Cl.[5] B02C *17/02, 17/24*

U.S. Cl. 241—178 **9 Claims**



1. A crushing machine comprising:

a rotatable housing having a perimeter of constant diameter, an inlet port and a discharge port, said rotatable housing including a multiplicity of lining plates, one of said multiplicity of lining plates forming a center lining plate and having a number of apertures for discharge of crushed material, said center lining plate thereby forming said discharge port, said rotatable housing further having at least two round plates mounted on both sides of said center lining plate and connected to a multiplicity of rib plates surrounding said rotatable housing,

independent crushing means provided in said rotatable housing which upon rotation of said rotatable housing, crushes materials introduced into said rotatable housing,

support rings circumscribing said rotatable housing and fixed thereto for driving said rotatable housing, and having a diameter over the length thereof of at least 1.8 times larger than that of said rotatable housing, and

driving means arcuately mounted around said support rings respectively to support said support rings and drive said support rings by frictional engagement therewith, said driving means including at least four members having a surface for frictional engagement with said support rings and a motor connector for rotatively driving said members, whereby said support rings distribute the weight of said rotatable housing and its contents, and said support rings and said rotatable housing are consequently rotatably driven.

5,114,085

HAMMER FOR USE IN HAMMER MILL

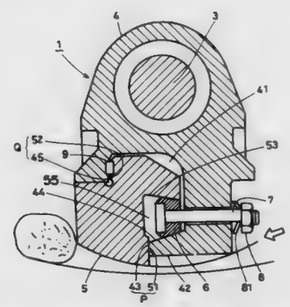
Yasuo Inui, Osaka, Japan, assignor to Kurimoto Ltd., Osaka, Japan

Continuation of Ser. No. 555,597, Jul. 23, 1990, abandoned. This application Jun. 28, 1991, Ser. No. 724,502

Claims priority, application Japan, Apr. 19, 1990, 2-103683

Int. Cl.[5] B02C *13/28*

U.S. Cl. 241—195 **4 Claims**



1. A hammer for use in a hammer mill, comprising:

a hammer body having a substantially square recess formed therein defining front and side openings, said hammer having an upper extending part and a lower extending part which together partly define said recess, each extending part having at least one hammer head engaging surface;

a hammer head received within said recess, such that said hammer head completely closes the front opening of said recess, said hammer head having corresponding surfaces which engage a respective one of the hammer head engaging surfaces of each extending part, said hammer head and the lower extending part of said hammer body defining a notch in said recess defining side openings which coincide with the side openings of said recess, with the lower extending part and said hammer head each defining an inclined surface located in said notch; and

retaining means including a cotter received within said notch and engageable with the inclined surface of said hammer head and the inclined surface of the lower extending part of said hammer body for retaining said hammer head in engagement with said hammer body in said recess.

5,114,086

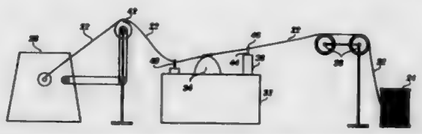
METHOD AND APPARATUS FOR WINDING A LUMPED ELEMENT DELAY LINE

Ronald Ho, Port Townsend, Wash., assignor to Quantum Medical Systems, Inc., Issaquah, Wash.

Filed Aug. 1, 1990, Ser. No. 561,143

Int. Cl.[5] H01F *15/10;* **H05K** *7/02*

U.S. Cl. 242—7.03 **7 Claims**



1. An apparatus for continuously winding wire coated with an insulation from a spool onto an elongated bobbin having a plurality of longitudinally spaced disks; comprising:

winding means for rotating said bobbin;

guide means for guiding the wire onto said bobbin at a controlled pitch; and

removing means through which said wire extends between said spool and said guide means, said removing means having actuating means for causing said removing means to remove said insulation from said wire so that lengths of said wire without insulation overlie respective disks when said wire is wound on said bobbin;

wherein said guide means includes means for moving said guide means along the length of said bobbin when said wire is being wound on said bobbin, thereby altering the length of wire extending between said removing means and said bobbin, and wherein said winding means further includes wire length compensating means for maintaining the length of wire between said removing means and said bobbin constant as said guide means moves along the length of said bobbin.

5,114,087

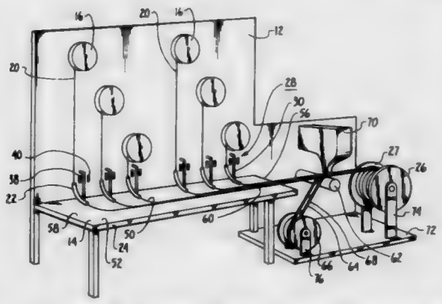
FIBER COMBINER FOR ALIGNING FILAMENTS IN A PLANAR FILAMENT ARRAY

Michael V. Fisher, San Diego; Kurt M. Schaubel, Cardiff, and William A. Raggio, Del Mar, all of Calif., assignors to General Atomics, San Diego, Calif.

Filed Sep. 21, 1990, Ser. No. 586,270

Int. Cl.[5] B65H *54/00, 59/00, 77/00;* **H01B** *12/00*

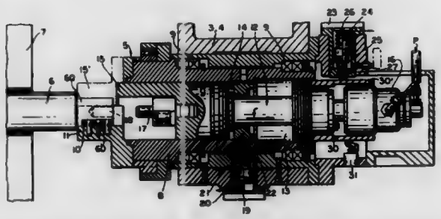
U.S. Cl. 242—42 **13 Claims**



1. A device for aligning a plurality of superconductor filaments in juxtaposition to form a layer of superconductor material which comprises:

a backboard;
a plurality of supply spools rotatably mounted on said backboard, each of said supply spools holding a separate superconductor filament;
a take-up spool for receiving said plurality of filaments;
a plurality of tension controllers, each of said tension controllers being mounted on said backboard and including a curved guide tube to individually receive one of said superconductor filaments from said respectively associated supply spool to generate a signal representative of the difference in speed of said take-up spool and said supply spool;
a combiner board mounted on said backboard and having a plurality of elongated grooves thereon each of said grooves sequentially aligned on said combiner board for individually receiving and feeding said superconductor filaments from said respectively associated guide tube of said tension controller into a guide channel to guide said superconductor filaments into said layer of superconductor material;
a means for receiving said layer of superconductor material from said combiner board; and
a plurality of drive means each electrically connected with a respective said tension controller and operatively connected with a respective said supply spool for rotating said respective supply spool in response to said signal.

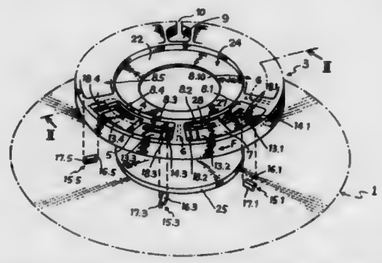
5,114,088
DEVICE FOR THE AUTOMATIC CLAMPING OF A SPOOL OF MATERIAL IN WEB FORM
Mario Cardano, Vercelli, Italy, assignor to Officine Meccaniche Giovanni Cerutti S.P.A., Casale Monferrato, Italy
Filed Jul. 23, 1990, Ser. No. 557,415
Claims priority, application Italy, Aug. 4, 1989, 21444 A/89
Int. Cl.[5] B65H *49/18*
U.S. Cl. 242—68.4 **9 Claims**



1. A device for the automatic locking of a hub projecting from a spool of material in web form, comprising a lower shell-shaped receptacle for supporting a lower circumferential part of the hub, and an upper shell part which is axially displaceable relative to said lower shell-shaped receptacle so that in an extended position said upper shell part surrounds an upper circumferential part of the hub and, in a retracted position, permits the hub to be removed from the device.

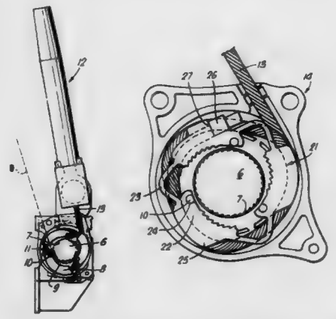
5,114,089
COMPONENT REEL WITH LATCHING DETENTS TO LOCK FLANGES TO HUB
Patrick Posso, Campagne de Pierraz-Portay, CH 1009 Pully, Switzerland, assignor to Patrick Posso, Pully, Switzerland
Filed Jul. 26. 1990, Ser. No. 557,795
Claims priority, application France, Aug. 2, 1989, 89 10446
Int. Cl.[5] B65H *75/22, 75/14*
U.S. Cl. 242—71.8 **6 Claims**

1. A reel for winding a tape, and more particularly a tape having cells containing electronic components, the reel comprising two flanges connected to a winding hub by locking means, wherein:
the hub has flexible latching blades projecting in substantially tangential directions in housings opening out into each of the end faces of the hub, the deflectable free end of each flexible blade being separated from a locking element projecting into the corresponding housing by a gap which is substantially radial; and
the flange to be fixed to an end face under consideration of the hub has as many complementary locking elements as the hub includes locking elements, the complementary locking elements being integral with the flange via shanks of a thickness (ep) no greater than the width (l) of the



gaps, and of a height (d) substantially equal to the distance separating the bearing face of the hub from the locking elements, the complementary locking elements being cantilevered out from the shanks in the same direction as the flexible blades, extending over the locking elements of the hub and being in contact therewith when the flexible blades return resiliently to their rest positions after the hub and the flange have been brought together and rotated relative to each other, thereby latching against the shanks and preventing rotation in the opposite direction.

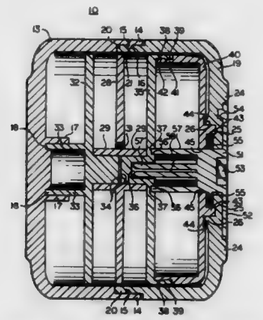
5,114,090
SAFETY BELT ARRANGEMENT
Hans P. Lindblad, Alingsas, Sweden, assignor to Autoliv Development AB, Vargarda, Sweden
Filed Sep. 6, 1989, Ser. No. 402,845
Claims priority, application United Kingdom, Sep. 7, 1988, 8820936
Int. Cl.[5] B60R *22/46, 21/10*; B65H *75/48*
U.S. Cl. 242—107 **10 Claims**



1. A safety belt arrangement, comprising a safety belt mounted on a shaft of a retractor reel adapted to retract part of the safety belt, a pre-tensioner assembly adapted to apply tension to a cable means for transmitting forces, the cable means being wound round a mechanism incorporating a plurality of elements which are mounted for pivotal movement in response to tension being applied to the cable means from an initial position in which the elements are spaced form an extension of the shaft of the retractor reel to an engagement position

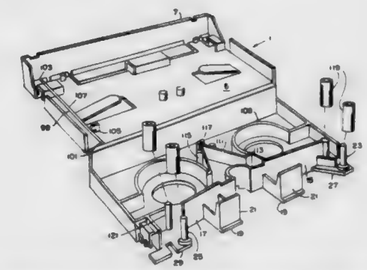
in which the elements engage the extension of the shaft of the retractor reel, continuing tension applied to the cable means causing the elements and the shaft to rotate about the axis of the shaft, means being provided to retain the elements in the initial position, wherein the elements comprise shoes pivotally mounted for rotation about pivot pins which have axes extending parallel with the axis of the shaft of the retractor reel, each shoe having a generally arcuate form with a trailing end, considered in the sense of rotation of the shoes when tension is applied to the cable means, and being pivotably mounted adjacent its trailing end by a respective pivot pin, the pivot pins being mounted on a ring-shaped element, shearable means being provided initially to retain the ring-shaped element in a predetermined position, the cable means being wound round and directly on the outer peripheries of the shoes so that the shoes pivot radially inwardly to engage the shaft extension in response to a radially inwardly acting force applied to the shoes by the cable means when said tension is applied to the cable means.

5,114,091
DUAL REEL CORD TAKE-UP DEVICE
Edwin R. Peterson, 1647 Sendero La., Boise, Id. 83706, and Edwin L. Wheeler, 5105 Tinker St., Boise, Id. 83709
Filed Jun. 4, 1990, Ser. No. 532,648
Int. Cl.[5] B65H *75/48*
U.S. Cl. 242—107.11 **3 Claims**



2. A cord take-up reel device which comprises:
a dual reel spool assembly having a pair of winding hubs axially secured together and separated by a center partition;
cord attachment means for attaching a cord between said winding hubs;
a cord, having a first end and a second end, being centrally attached therebetween by said cord attachment means to define two cord portions, each being wound around one of said hubs;
a main housing encasing and rotatably holding said spool assembly;
said main housing having passage means for receiving and passing said first and second cord portions therethrough; and
spring biasing means for radially biasing said spool assembly about its axis with respect to said main housing, said biasing means comprising:
a flat coil spring having a first inner end and a second outer end, said second outer end being attached to said spool assembly, and said first inner end being attached to a spring locking means, said spring locking means comprising:
a locking key hole in a spring housing;
a locking key receiving bore and a concentric locking key receiving groove in said spool assembly;
a spring locking key comprising:
an annular retaining flange;
a cylindrical spring hub axially attached to the inner surface of said annular retaining flange;
a center axle stub coaxially attached to and extending out from said cylindrical spring hub;
a spring engagement slot disposed diametrically within and through said cylindrical spring hub and center axle stub for receiving and frictionally engaging the first inner end of said flat coil spring; and
said cylindrical spring hub having a cylindrical bearing surface at one and thereof received in and rotationally engaging the concentric locking key receiving groove, the cylindrical spring hub at the other end thereof being received in and in slidable engagement with said locking key hole and the center axle stub being received in and in rotational engagement with said locking key receiving bore.

5,114,092
LOW COST VIDEO CASSETTE
Paul J. Gelardi; John A. Gelardi, and David A. Capotosto, all of Cape Porpoise, Me., assignors to Paul J. Gelardi, Kennebunkport, Me.
Filed Jan. 10, 1991, Ser. No. 639,516
Int. Cl.[5] G11B *23/04, 23/87*
U.S. Cl. 242—199 **19 Claims**



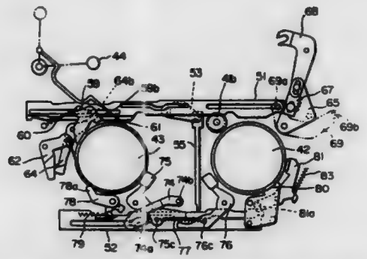
1. A low cost video cassette comprising an integrally molded base, a rear wall connected to the base and extending upward from the base, a cover hinged to the top of the rear wall by an integrally formed living hinge, first and second openings in the cover, first and second springs integrally formed with the cover for extending toward the respective openings in the cover and for pressing tape reels downward toward the base, and first and second elongated flaps integrally formed with the cover and hinged along one edge to the cover and attachable along opposite edges to opposite edges of the respective cover openings for overlying the springs and forcing the springs downward into engagement with the reel hubs.

5,114,093
BRAKE MECHANISM FOR REEL STANDS OF A TAPE RECORDER
Noritaka Kunimaru; Katsuhiro Shiba; Norio Kudo; Gen Inoshita, and Shogo Sato, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Continuation of Ser. No. 343,561, Jul. 17, 1989, abandoned, which is a division of Ser. No. 166,595, Mar. 10, 1988, Pat. No. 4,949,203. This application Mar. 1, 1991, Ser. No. 663,082
Claims priority, application Japan, Mar. 11, 1987, 62-35351[U]; Mar. 11, 1987, 62-35357[U]; Mar. 11, 1987, 62-35359[U]; Mar. 13, 1987, 62-35978[U]
Int. Cl.[5] G11B *15/22*
U.S. Cl. 242—204 **2 Claims**

1. A brake mechanism comprising:
a slider movable in response to a mode switching operation;
a first main brake pivotably supported on a chassis, said first

main brake having one end provided with a pad for contacting a first reel stand, an opposite end provided with an abutting piece and an intermediate portion provided with a pin engageable with a cam of said slider; said first main brake being movable in accordance with the movement of said slider, being movable toward and away from said first reel stand, and being biased so that the pad of said first main brake is brought into contact with said first reel stand; and

a second main brake pivotably supported on said chassis, said second main brake having one end provided with a pad for contacting a second reel stand, an opposite end provided with an abutting piece being abuttable with the abutting piece of said first main brake and an intermediate portion provided with a pin engageable with said cam of said slider, said second main brake being movable in accordance with the movement of aid slider, being movable toward and away form said second reel stand, and being biased so that the pad of said second main brake is brought into contact with said second reel stand, said first main brake being controllable by said movement of said second main brake;



said mode switching operation comprising three modes:

a first mode, which occurs in a tape loading state, wherein the pin of said second main brake is free from said cam of said slider so that the pad of said second main brake contacts said second reel stand to apply a braking force thereon, whereas the pin of said first main brake is restricted by said cam of said slider, so that the pad of said first main brake is away from said first reel stand;

a second mode, which occurs in a fast forward/rewind state, wherein the pin of said second main brake is engaged by said cam to thereby move the pad of said second main brake away from said second reel stand, and the abutting piece of said second main brake pushes the abutting piece of said first main brake to in turn move the pad of said first main brake away from said first reel stand; and

a third mode, which occurs in a stop state, wherein the pins of both said first and second main brakes are free from said cam of said slider, so that the pads of both said first and second main brakes contact said first and second reel stands, respectively.

5,114,094

NAVIGATION METHOD FOR SPINNING BODY AND PROJECTILE USING SAME

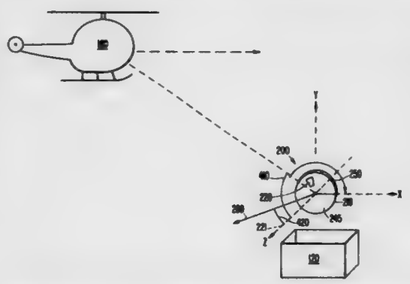
James C. Harris, Vienna, Va., assignor to Alliant Techsystems, Inc., Edina, Minn.

Filed Oct. 23, 1990, Ser. No. 602,179
Int. Cl.[5] F42B *10/28*
U.S. Cl. 244—3.22 **25 Claims**

1. Method of navigating a spinning body for intercepting an object, the body having a spin axis and a resultant angular momentum vector, an axial end face with object sensor means located thereon, and propulsion means including discrete thruster means, the method comprising the steps of:

sensing the angular position of the object with respect to the body spin axis using the sensor means;

correcting the sensed angular position of the object for angular position error due to precession of the body, said correcting step including the step of estimating the angular error between the body spin axis and the angular momentum vector of the body, the estimating step including the substeps of (i) calculating a predetermined precession rate relative to the spin rate, the method including the preliminary step of inducing the body to precess about its angular momentum vector at the predetermined rate, (ii)



determining actual deviation in the body precessional rate and adjusting the calculated angular error based on the determined deviation;

comparing the corrected object angular position with a predetermined object angular position to compute a difference; and

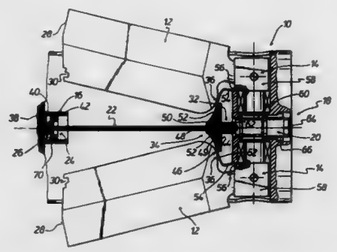
firing the discrete thruster means to provide one or more discrete thrusts in a direction to reduce the difference when the difference exceeds a predetermined limit.

5,114,095

ARRANGEMENT FOR THE UNLATCHING AND EXTENSION OF THE STABILIZING FINS OF A PROJECTILE

Werner Schroppel, Wendelstein, and Thomas Leidenberger, Nurnberg, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jun. 19, 1991, Ser. No. 717,688
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1990, 4020897
Int. Cl.[5] F42B *10/20*
U.S. Cl. 244—3.28 **15 Claims**



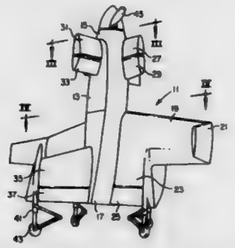
1. Arrangement for effectuating the unlatching and the extension of stabilizing fins of a projectile, including a power element of a driving device operative in the longitudinal axial direction of the projectile; follower means operatively connected to said power element; camming edges located on said stabilizing fins, said power element pressing said follower means against said camming edges upon the release of a latch for the stabilizing fins in the region of free end surfaces of said fins; said latch including a latching crown engaging said free end surfaces of said fins; a spring normally biasing said latching crown towards said end surfaces; and a pusher rod having a longitudinal displacement imparted thereto by said power element to raise said latching crown away from said and surfaces in opposition to the biasing force of said spring prior to said pusher rod extending past said follower means for pressing against said camming edges.

5,114,096

TAIL SITTER AIRPLANE

Kenneth G. Wernicke, 409 Circleview N., Hurst, Tex. 76054

Filed Jul. 27, 1990, Ser. No. 558,612
Int. Cl.[5] B64C *29/02*
U.S. Cl. 244—7 B **15 Claims**



1. In a single engine tail sitter airplane of a type which has a fuselage with a nose section and a tail section, the airplane being capable of taking off and landing on the tail section with the nose section pointed up for vertical flight and also being capable of cruising with the fuselage horizontal for horizontal flight, the improvement comprising in combination:

the airplane having a single driven propeller, the propeller being mounted to the nose section of the fuselage and driven by the engine for creating a slip-stream;

a pair of wings extending from the fuselage;

a first tail airfoil extending from the fuselage transverse to the wings and forming a part of the tail section;

an array of forward airfoils;

control surface means mounted to and forming a part of each of the forward airfoils, the control surface means being movable relative to the fuselage for providing flight control of the airplane;

means for mounting the forward airfoils to the fuselage in positions for controlling pitch and yaw of the airplane with the control surface means, each of the forward airfoils extending from the fuselage at a location between the wings and the propeller so as to be within slip-stream of the propeller for controlling flight during takeoff and transition from vertical to horizontal;

landing gear means located at the tail section for supporting the airplane on the tail section during take-off and landing with the nose of the fuselage pointed up; and

the wings and the forward airfoils having chord dimensions sufficient to remove all of the torque due to the rotating propeller during vertical flight so as to eliminate the need for counter rotating propellers.

5,114,097

AIRCRAFT

Sam B. Williams, Bloomfield Hills, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Apr. 29, 1991, Ser. No. 692,994
Int. Cl.[5] B64C *1/00*
U.S. Cl. 244—119 **12 Claims**

1. A near supersonic aircraft having an airframe configuration that maintains subsonic air flow thereover within the flight envelope of the aircraft comprising

a forward fuselage section comprising a right circular cone having a single axis of generation,

an intermediate fuselage section defining a passenger compartment and comprising a right circular cylinder the central axis of which defines the longitudinal axis of said aircraft, the axis of generation of said forward section being orientated at a small angle forwardly and downwardly relative to the longitudinal axis of the intermediate fuselage section,

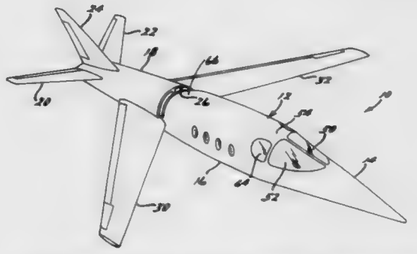
a first transition section between said forward and intermediate fuselage sections comprising a non-developable surface smoothly transcending from a generally elliptical cross section at the aft end of said forward fuselage section to a circular cross section at the forward end of said intermediate fuselage section,

an aft fuselage section having a generally circular frontal cross section and a generally rectangular aft cross section,

a second fuselage transition section between said intermediate fuselage section and said aft fuselage section having a circular frontal cross section complementary to the intermediate fuselage cross section and being necked down at the aft end thereof through an arc of approximately 180° to a diameter less than the diameter, of said intermediate fuselage section,

a semi circular engine air inlet disposed adjacent the junction of said second transition section and said aft fuselage sections at the top thereof, and

a pair of forwardly swept wings having leading edges joined to said fuselage adjacent the circumferentially spaced ends of said air inlet whereby air flow over said fuselage and along the leading edges of said wings is directed into said air inlet at all attitudes of said aircraft within its flight envelope.

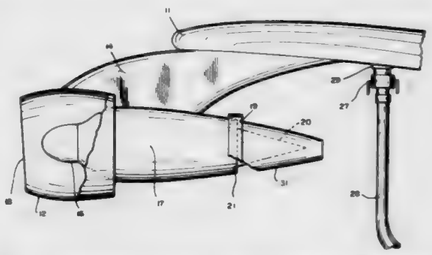


5,114,098

AIRCRAFT ENGINE PROTECTIVE COVER

Teddy G. Campbell, Brookfield, Conn., assignor to Texaco Inc., White Plains, N.Y.

Filed May 11, 1990, Ser. No. 521,868
Int. Cl.[5] B64D *37/32;* **B65D** *65/04*
U.S. Cl. 244—121 **6 Claims**



1. The combination with an aircraft having a wing mounted engine and an elongated nacelle which encloses said engine having a circumferential rim at one end thereof defining a discharge port for engine exhaust gases, of

a flexible shroud removably engaging said elongated nacelle

to define a closure across said discharge port for exhaust gases, and

means forming a collar on said shroud being adjustable to form a tight engagement with said nacelle, and

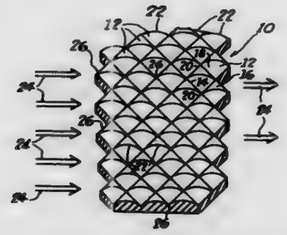
means on said flexible shroud to elevate the shroud a sufficient height to engage said engine nacelle.

5,114,099

SURFACE FOR LOW DRAG IN TURBULENT FLOW

Ge Gao, Boca Raton, Fla., assignor to W. L. Chow, Boca Raton, Fla.

Filed Jan. 4, 1990, Ser. No. 532,864
Int. Cl.[5] B64C *21/10*
U.S. Cl. 244—130 **36 Claims**



1. A low drag element in the presence of a fluid where there is relative fluid flow between said element and said fluid, said element comprising:

a nonsmooth surface, approximating a minimal surface, which satisfies the equation $(V\cdot\nabla)\nabla\Phi=0$, where V is the relative velocity between the fluid and the surface, $\nabla\Phi$ is the velocity of the strain tensor.

5,114,100

ANTI-ICING SYSTEM FOR AIRCRAFT

Peter K. C. Rudolph, Seattle, and Dezso Georgefalvy, Mercer Island, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 29, 1989, Ser. No. 458,847
Int. Cl.[5] B64C *21/04*
U.S. Cl. 244—134 C **23 Claims**

1. An anti-icing apparatus for an aircraft, said apparatus comprising:

a. an aircraft structure comprising a skin section with a leading edge and with a first forwardly facing leading edge surface portion which is that portion of said skin section most susceptible to icing, and a second surface portion which extends rearwardly from the first leading edge surface portion to receive air flow from said first leading edge surface portion and which is less susceptible to icing;

b. said first leading edge surface portion being formed with a plurality of through air openings which are located over a substantial surface area of said first leading edge surface portion and which lead from an inside location of said skin section to an outside location of said skin section;

c. air flow means to deliver pressurized hot air to said inside location to cause said pressurized hot air to flow outwardly through said air openings over said first surface portion, heating said first surface portions and adjacent boundary layer flow to inhibit icing on said first surface portion, said hot air to then flow rearwardly over said second surface portion at a flow volume and temperature sufficient to also inhibit icing on said second surface portion;

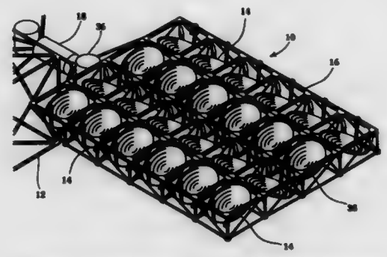
d. said air supply means being also arranged with suction means to create a lower pressure at said inside location in a manner that boundary layer air is drawn inwardly through at least some of said air openings.

5,114,101

MODULAR DISTRIBUTED CONCENTRATING COLLECTOR USING POWER BUS TO ROUTE POWER TO CENTRALIZED CONVERTER

Theodore G. Stern, and Mickey Cornwall, both of San Diego, Calif., assignors to General Dynamics Corporation/Space Systems Division, San Diego, Calif.

Continuation of Ser. No. 414,491, Sep. 28, 1989, abandoned. This application Jan. 22, 1991, Ser. No. 643,707
Int. Cl.[5] B24G *1/44*
U.S. Cl. 244—173 **11 Claims**



1. An arrangement adapted to be carried into space by a launch vehicle and to generate electricity in space, the arrangement comprising:

a plurality of separated solar radiation collection means arranged to concentrate and collect solar radiation:

a first rotational support means for supporting and positioning said plurality of separated solar radiation collection means for coarse tracking of said plurality of separated solar tracking means towards the sun;

separate gathering means positioned remote from each of said solar radiation collection means to gather the solar radiation from each of said plurality of radiation collection means;

means adapted to receive the collected solar radiation from each of said plurality of gathering means and to convert it into electricity;

a plurality of separate supporting means, each of said plurality of support means supporting a plurality of said solar radiation collection means, each of said plurality of separate supporting means being interconnected and adapted to be carried in a accordion folded together space saving configuration within a launch vehicle for transport into space and to support said plurality of collection means when in an unfolded position in a predetermined arrangement in space; and

a combination pivotal supporting means attached to said plurality of separate supporting means for individually supporting and fine tracking for each of said plurality of separated solar radiation collection means to precisely orient each of said separate solar collection radiation means normal to the incident sunlight.

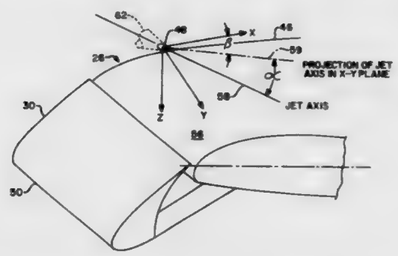
5,114,102

BOUNDARY LAYER CONTROL

Timothy Wang, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 6, 1989, Ser. No. 417,910
Int. Cl.[5] B64C *21/04, 21/00*
U.S. Cl. 244—207 **18 Claims**

1. A method of controlling the separation of a boundary layer from a first surface on which a sufficiently adverse pressure gradient exists in the vicinity of the juncture between that surface and the surface of an adjoining structure, said method comprising the step of so directing a jet of fluid issuing from the surface of the adjoining structure over the first surface and at an angle α between the longitudinal axis of the jet and the first surface and an angle β between the surface of said adjoining structure and the longitudinal axis of the jet that said jet will flatten against said first surface and thereby control the



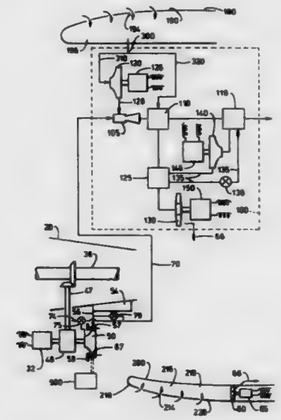
separation of the boundary layer from said first surface by energizing the boundary layer on that surface, where α is in the range of 0° and 30° and β is in the range of 10° and 45°.

5,114,103

AIRCRAFT ENGINE ELECTRICALLY POWERED BOUNDARY LAYER BLEED SYSTEM

George A. Coffinberry, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Aug. 27, 1990, Ser. No. 572,825
Int. Cl.[5] B64C *21/06;* B64D *13/06*
U.S. Cl. 244—209 **10 Claims**



1. An apparatus for bleeding boundary layer air from a portion of the outer surfaces of a gas turbine engine powered aircraft, wherein said apparatus comprises:

an electrically powered bleed air compressor means in fluid supply communication with the aircraft's outer surface and effective for bleeding boundary layer air from the aircraft's outer surface and powered by an aircraft gas turbine engine powered electrical generator,

said bleed air compressor means comprising an electrically powered nacelle compressor means in fluid supply communication with a portion of the aircraft's outer surface on an engine nacelle and effective for bleeding boundary layer air from the nacelle's outer surface, and

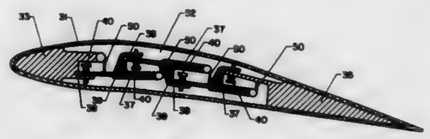
said bleed air compressor means further comprising an electrically powered environmental control system air supply compressor in fluid supply communication with a portion of the aircraft wing's outer surface and effective for bleeding boundary layer air from said portion of the wing's outer surface and for supplying aircraft cabin air.

5,114,104

ARTICULATED CONTROL SURFACE

Manuel Ciacotta, Tiverton, and Richard H. Nadolink, Portsmouth, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1990, Ser. No. 591,532
Int. Cl.[5] B64C *3/44;* B63H *25/06*
U.S. Cl. 244—219 **3 Claims**



1. A control surface system comprising:

a moldable control surface;

a shaping means including at least one Biometal TM fiber for shaping said moldable control surface, said shaping means in mechanical communication with said molding surface wherein said shaping means contracts upon heating and expands upon cooling;

means for heating said shaping means; and

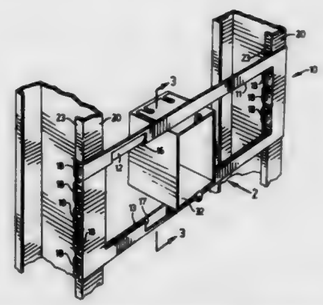
at least one static spring means embedded in said moldable control surface.

5,114,105

ELECTRICAL BOX SUPPORT BRACKET

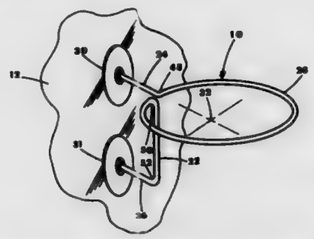
John A. Young, 10988 Woodbine Avenue, Markham, Ontario, Canada L6C 1J5

Filed Nov. 8, 1990, Ser. No. 611,890
Int. Cl.[5] E04G *3/00*
U.S. Cl. 248—27.1 **6 Claims**



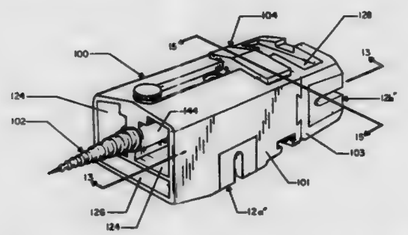
1. An electrical box support bracket for adjustably supporting one or more electrical boxes of the kind having thin parallel mounting flanges on their top and bottom sides, comprising a plate for spanning and attaching to the front sides of wall studs, a rectangular opening in the plate, and means defining thin channels along the upper and lower edges of the opening for snugly and slidably receiving said top and bottom mounting flanges, respectively, of said electrical boxes, whereby said electrical boxes can be slid freely along said rectangular opening to desired positions and wherein each channel has a notch in its front wall through which a respective flange can be pressed rearwardly into or can be withdrawn forwardly from said channel.

5,114,106
UNIVERSAL CONTAINER HOLDING DEVICE
Rodney J. Daugherty; Debbra J. Daugherty, both of 4293 Lake Rd., Sheffield Lake, Ohio 44054
Filed Jun. 7, 1991, Ser. No. 712,060
Int. Cl.[5] F16B *47/00*
U.S. Cl. 248—206.4 **5 Claims**



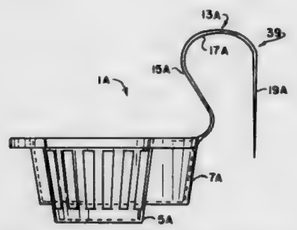
1. A device for holding a container compromising:
first and second spaced apart elongated substantially horizontal legs arranged in a common plane;
a ring section attached to one end of one of said legs and defining an opening for receiving the container;
a third leg interconnecting one end of the other of said spaced apart legs to said ring section;
said third leg being unconnected to and spaced from said one leg but arranged in said common plane with said first and seconds legs and extending substantially, vertically from said second leg to said ring section, and
releasable attachment means on the other end of each of said first and second legs for releasably attaching said device on a surface with said ring section maintained in a horizontal plane.

5,114,107
APPARATUS FOR SUPPORTING ARCHERY EQUIPMENT
Gary Mahn, 9470 Oriole Dr., Coopersville, Mich. 49404, and Gary Bowman, 871 Dolphin, S.W., Wyoming, Mich. 49509
Continuation-in-part of Ser. No. 487,640, Mar. 1, 1990, abandoned. This application Nov. 14, 1990, Ser. No. 614,092
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—217.4 **16 Claims**



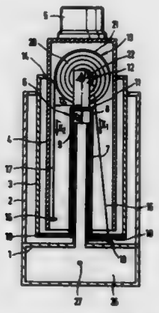
1. An apparatus for supporting a quiver and arrows comprising:
a block;
a mounting screw movably mounted to the block for movement between a first position where a substantial portion of the screw is retracted within the block and a second position where a substantial portion of the screw extends from the block;
an arrow shaft gripping element on the block for releasably frictionally gripping the shaft of a single arrow; and
a quiver support on the block adapted to removably mount a quiver to the block whereby the block can be easily transported to a point of use when the screw is in the first position, and thereafter be securely mounted to a vertical support when the screw is in the second position, adapted to retain a single arrow for easy retrieval, and support a quiver in a fixed position relative to the vertical support.

5,114,108
DETACHABLE CONVENIENCE FOOD TRAY FOR VEHICLES
Craig A. Olschansky, 818 S. Brentwood, St. Louis, Mo. 63105
Continuation-in-part of Ser. No. 193,386, May 12, 1988, abandoned. This application Jan. 25, 1989, Ser. No. 301,645
Int. Cl.[5] B65D *1/34*
U.S. Cl. 248—311.2 **6 Claims**



1. A one-piece molded plastic tray comprising a generally flat surface forming a top level of the tray, a plurality of integrally molded compartments depending from said generally flat surface, at least one of said compartments being generally round in cross section to accept a beverage container and another of said compartments being generally rectangular in cross section to accept a handheld food product, a sandwich receiving area defined on the generally flat surface generally on the top level of the tray, said sandwich receiving area being of a size and shape to receive a handheld sandwich, said sandwich receiving area being disposed adjacent one of said integrally molded compartments, an upstanding peripheral wall section extending circumferentially around at least part of said generally flat surface and the molded compartments thereof, said wall section defining the periphery of at least part of the sandwich receiving area, said tray further including a supporting hook section integrally attached to and supporting said tray along one side thereof, said supporting hook section having a generally U-shaped configuration including an inner wall portion adjacent to and extending upwardly from said tray, a connecting wall portion extending outwardly from said inner wall portion and an outer wall portion extending downwardly from said connecting wall portion in generally parallel relationship to said inner wall portion, said outer wall portion being shaped, configured and dimensioned to be wedgingly and detachably received in the space between a vehicle door frame and associated glass window in order to support said tray in a generally horizontal position while beverage containers and handheld food products are received within the molded compartments of said tray, said inner wall portion being generally S-shaped and being composed of a resilient material which deforms to accommodate vehicle door frames of various sizes yet has enough strength to hold the generally flat surface substantially perpendicular to the vehicle door frame when food items are placed thereon.

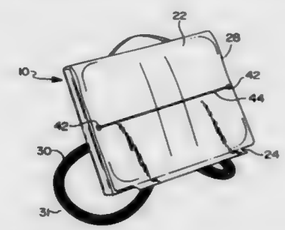
5,114,109
TELESCOPICALLY EXTENSIBLE LIFTING COLUMN, IN PARTICULAR FOR THE HEIGHT ADJUSTMENT OF A CAMERA
Erich Fitz, Vagen, and Klaus Reach, Munich, both of Fed. Rep. of Germany, assignors to HTG High Tech Geratebau GmbH, Oberhaching, Fed. Rep. of Germany
Filed Oct. 2, 1991, Ser. No. 769,816
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1990, 4031105
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—404 **2 Claims**



1. A telescopically extensible lifting column comprising an external column member, a middle column member telescopically extensible from the external column member, and a central column member extensible from the middle column member, a drive device including a piston/cylinder unit by which the middle column member can be pressurized in relation to the external column member, and a traction cable wound over a deflection member mounted rotatably on the middle column member, the cable having an inner end portion connected to the central column member and an outer end portion connected to the external column member wherein the deflection member comprises a section substantially in the form of a first truncated cone with a guide groove extending spirally along an envelope surface of the cone from a region of larger diameter to a region of smaller diameter, to receive the traction cable, the inner end portion of the cable with the lifting column in a retracted state extending from the region of larger diameter to the central column member, and the outer end portion of the cable extending from the region of smaller diameter to the external column member, the deflection member having an additional section with a guide groove extension on which, during extension of the lifting column, the inner end portion of the cable is wound, accompanied by unwinding of the outer end portion of the cable from the deflection member.

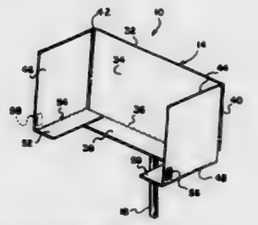
5,114,110
SUPPORT APPARATUS
Ashni K. Vohora, 30, Inglewood Avenue, Heatherside, Camberley, Surrey GU15 1RL, United Kingdom
Continuation-in-part of Ser. No. 933,065, Nov. 20, 1986, abandoned. This application Oct. 19, 1989, Ser. No. 424,656
Int. Cl.[5] A47B *19/00*
U.S. Cl. 248—444 **6 Claims**

1. A support apparatus for retaining a book thereon, comprising:
(a) a carriage member having:
(1) an essentially flat surface upon which a book may be disposed, the flat surface having a forward side and a reverse side, the flat surface further having at least a pair of recesses formed in the reverse side thereof and the flat surface being positionable in an inclined orientation;
(2) a flange disposed along the lower edge of the flat surface of the carriage member;
(3) at least a pair of spaced apart apertures formed in the flat surface; and
(4) an elastic cord extending through the apertures, the cord traversing and retaining the book on a flat forward side of the flat surface;
(b) a flexible support member deformable to enable securement about various regions of the body of a user, the flexible support member having opposed end portions, the



end portions being received into and removably seating in the recesses of the carriage member, the flexible support member being affixed to the carriage member, the flexible support member being readily deformable into a multiplicity of serpentine configurations, the flexible support member being capable of supporting the carriage member and the book placed thereon in a first configuration without deformation, the flexible support member remaining in the first configuration until manual forces are applied to deform the flexible support member into a second configuration.

5,114,111
MUSIC STAND
Kim N. Andrews, 1552 Harvard St. #6, Santa Monica, Calif. 90404
Continuation-in-part of Ser. No. 462,781, Jan. 10, 1990, Pat. No. 5,037,057. This application Mar. 25, 1991, Ser. No. 676,760
Int. Cl.[5] A47B *97/00*
U.S. Cl. 248—460 **3 Claims**



1. A music stand comprising:
a tripod base adapted to be located on a supporting surface, said tripod base having an upper end spaced furthest from the supporting surface;
a substantially rectangular center panel having a backside and a front side, said planar center panel having an upper edge and a lower edge with said lower edge being located nearest said tripod base, said planar center panel having a right side edge and a left side edge, said upper end of said tripod base being connected to said backside;
a right side panel pivotally connected to said right side edge, a left side panel pivotally connected to said left side edge, both said right side panel and said left side panel being independently movable between a position in substantial

planar alignment with said center panel to a position substantially perpendicular to said center panel, both said right side panel and said left side panel having a bottom edge, said bottom edges being misaligned from said lower edge so when said right side panel and said left side panel are in said position substantially perpendicular to said center panel said bottom edges are located nearer said lower edge than said upper edge and actually directly adjacent said lower edge;

a center shelf member being pivotally mounted to said lower edge of said center planar center panel, said center shelf member being constructed of thin sheet material and being capable of assuming a substantially right angled position relative to said front side;

a right side shelf member being pivotally mounted to said bottom edge of said right side panel, said right side panel having a front surface, said right side shelf member capable of assuming a position substantially perpendicular to said front surface, with said right side shelf member in said position substantially perpendicular to said front surface and said right side panel being substantially perpendicular to said center panel a portion of said right side shelf member overrides said center shelf member; and

a left side shelf member being pivotally mounted to said bottom edge of said left side panel, said left side panel having a front surface, said left side shelf member capable of assuming a position substantially perpendicular to said front surface, with said left side shelf member in said position substantially perpendicular to said front surface and said left side panel being substantially perpendicular to said center panel a portion of said left side shelf member overrides said center shelf member.

5,114,112

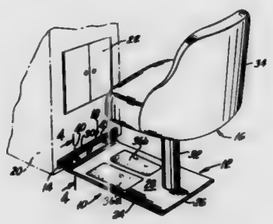
DETACHABLE GAME STOOL ASSEMBLY

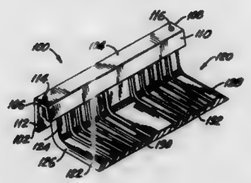
Vittorio Infanti, Matawan, N.J., assignor to Infanti Chair Manufacturing Corp., Staten Island, N.Y.

Continuation-in-part of Ser. No. 676,000, Mar. 26, 1991, Pat. No. 5,083,738. This application Oct. 16, 1991, Ser. No. 778,343

Int. Cl.[5] A47B *97/00*

U.S. Cl. 248—500 **8 Claims**





1. A detachable game stool assembly for releasable connection to a game machine, said assembly comprising:

an elongated base member having opposed front and rear edges, opposed lateral edges, an upper surface, a planar portion extending forwardly from the rear edge, said front edge of said base member being upturned to form an engaging portion generally perpendicular to the planar portion of said base;

an upstanding seat configuration secured to the planar portion of said elongated base member;

an extruded generally inverted J-shaped rigid support member, said support member having a substantially planar upstanding leg fixed to the game machine and having a top and a bottom, an arm extending outwardly from the top of the leg, a rigid front inclined leg extending outwardly downward from said arm to define an engaging channel with a guided entry for receiving the upturned engaging portion of the base member, said rigid inclined leg and said upstanding leg of the support member prohibiting longitudinal movement of the upturned portion of the base member of said assembly relative to said game machine; and

a pair of elongated rigid rods fixed to the arm of the support member and disposed in spaced apart relationship, said rigid rods extending downwardly from said arm within said engaging channel for prohibiting lateral movement of the upturned portion of the base member relative to the game machine.

5,114,113

CHRISTMAS TREE STAND

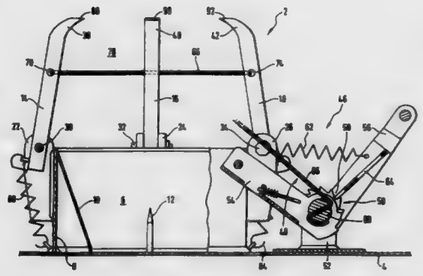
Klaus Krinner, Blumenthal, Fed. Rep. of Germany

Filed Sep. 27, 1990, Ser. No. 589,069

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1989, 3932473

Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—525 **16 Claims**



1. Christmas-tree stand comprising:

one foot-piece;

a plurality of fastening components mounted on said foot-piece, said fastening components having a butt end and a pivotal end arranged symmetrically around a central axis, said components being swingable about a pivot axis proximal to said pivotal end, between an open and a fastening position in planes approximately intersecting at the central axis of symmetry, wherein the butt ends of the fastening components are pressable against a trunk of a tree; and

a single clamping device acting on all of said fastening components simultaneously, said single clamping device including:

a power transmission component mounted on said foot-piece for moving the fastening components into their fastening position with adjustable gripping force, wherein said fastening components are initially applicable to the trunk by said power transmission component basically without force and independently of each other, whereby said gripping force does not act on the trunk until all fastening components have made contact.

5,114,114

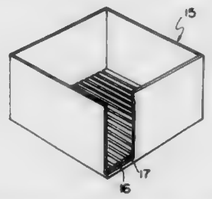
MOLDING CONTAINER FOR MANUFACTURING GLASS ARTICLE

Koichi Hara, Ome, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Mar. 6, 1990, Ser. No. 491,072

Int. Cl.[5] B28B *7/20*; B29C *33/00*

U.S. Cl. 249—60 **4 Claims**



1. A molding container for receiving a wet gel produced in a sol-gel process during drying and contracting, said molding container having a bottom wall and a peripheral wall, said bottom wall having an inner surface thereof formed with a continuous recess;

wherein said continuous recess is formed by a plurality of projections on said inner surface of said bottom wall;

wherein said projections have planar tops each of which has a surface area of approximately 20 mm;

wherein said wet gel in said continuous recess, during drying and shrinking, rises up to said planar tops of said projections on said inner surface of said bottom wall from a bottom of said continuous recess;

wherein said wet gel is dried and contracted to form a gap between said inner surface of the bottom wall of said molding container and the gel during drying and shrinking, said gap communicates with a space which is defined between an inner surface of said peripheral wall and the gel during drying and shrinking; and

wherein a liquid layer, which is generated by the drying and shrinking of said wet gel, between said inner surface of the bottom wall and the gel during drying and shrinking of said wet gel, and which is received in said continuous recess, is vaporized and removed to the ambient atmosphere through said gap and said space, whereby a bottom layer of the gel during drying and shrinking is dried.

5,114,115

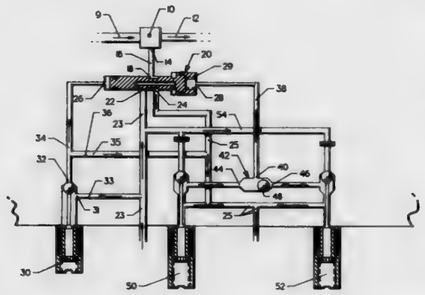
DUAL INDEPENDENT INPUT HYDRAULIC SHUTOFF

Michael A. Gillott, Somers, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 27, 1990, Ser. No. 572,839

Int. Cl.[5] F16K *31/124*; F02C *7/232, 9/26*

U.S. Cl. 251—26 **3 Claims**



1. A flow line shutoff for a hydraulic management system having two independent shutoff command input sources, comprising:

a shutoff valve means disposed in said flow line

a sequencing valve means, having a shutdown port, for controlling flow through said shutoff valve means line, said sequencing valve means operable between a first, open flow state and a second closed flow state in response to a selected pressure signal delivered to said shutdown port;

pressure selector means for selecting the control pressure signal by establishing exclusive fluid communication between the shutdown port and one of two input pressure signals, the selected input pressure signal having a fluid pressure greater than the deselected input pressure signal;

a first shutdown valve, actuatable between a first position and a second position, wherein said first position establishes exclusive fluid communication between a high pressure input signal and the pressure selector, and wherein said second position establishes fluid communication between a low pressure drain line and the pressure selector; and

a second shutdown valve, actuatable between a first position and second position wherein said first position establishes communication between a high pressure input signal and the pressure selector means, and wherein said second position establishes fluid communication between a low pressure drain line and the pressure selector means.

5,114,116

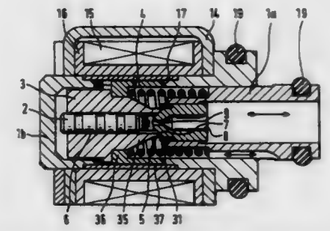
ELECTROMAGNETICALLY ACTUATED QUICK-ACTION SWITCHING VALVE

Heinrich Muller, Bad Laer, and Jens-Peter Wobbe, Schweppenhausen, both of Fed. Rep. of Germany, assignors to Feinmechanische Werke Mainz GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 447,218, Dec. 7, 1989, abandoned. This application Feb. 14, 1991, Ser. No. 656,127

Int. Cl.[5] F16K *31/06*

U.S. Cl. 251—129.15 **7 Claims**



1. A valve comprising a housing having fluid inlet and outlet duct means and providing a chamber therein, a guide member disposed in said chamber in fixed relationship with said housing, an electromagnetic actuator means for actuating said valve including an actuator winding carried by said housing, a sleeve member having a bore therethrough and longitudinally slidably carried on said guide member by means of said bore, said sleeve member constituting an armature of said electromagnetic actuator means and including an annular end surface, and a seating valve configuration adapted to control the fluid flow communication between said inlet and outlet duct means of said housing, said seating valve configuration being defined by the intersection of said annular end surface with said bore which forms an annular edge circumscribing said bore through said sleeve member and a co-operating portion of said guide member having a rigid frustoconical surface which constitutes a valve seat engageable by said annular edge and passage means for balancing the pressure applied to opposite ends of said sleeve member.

5,114,117

CONNECTOR FOR FLUID CARRYING CONDUITS

David E. Appleford, Theydon Bois, Great Britain; Colin G. Millum, Aberdeen, Scotland; Duncan M. Scott, Aberdeen, Scotland, and Michael J. Rimmer, Aberdeen, Scotland, assignors to Scottish Development Agency, Glasgow, Scotland

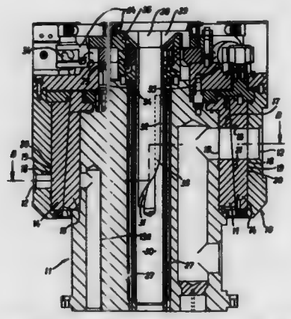
PCT No. PCT/GB88/00702, § 371 Date May 11, 1990, § 102(e) Date May 11, 1990, PCT Pub. No. WO89/03002, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 23, 1988, Ser. No. 469,560

Claims priority, application United Kingdom, Sep. 25, 1987, 8722562

Int. Cl.[5] F16L *37/28*

U.S. Cl. 251—149.9 **13 Claims**



1. A connector for use in connecting and disconnecting fluid-carrying conduits, comprising a first part having a plurality of bores exiting the first part on a first surface which is a surface of revolution about a central axis of the first part; a second part interconnectable with the first part and having a corresponding plurality of bores exiting the second part on a second surface which is a surface of revolution about a central axis of the second part; the central axes of the first and second parts when interconnected being colinear; obturating means for communicating and discommunicating the bores of the first part with respective bores of the second part, said obturating means comprising a first sleeve member mounted on said first surface for rotary motion thereon between a first position communicating said bores and a second position discommunicating said bores; and interlock means preventing disconnection of the first and second parts except when said first sleeve member is in said second position; whereby the first and second means can be disconnected only when said obturating means discommunicates said bores in said first part from the space exterior to said first part.

5,114,118

VERTICAL LIFT DOLLY

V. E. (Bud) Schrader, 12519 Elm Manor, San Antonio, Tex. 78230

Filed Mar. 13, 1991, Ser. No. 668,876

Int. Cl.[5] B60P *1/48*

U.S. Cl. 254—8 R **6 Claims**

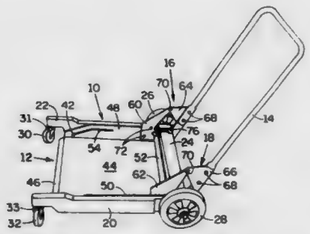
1. A vertical lift dolly for manually lifting and transporting a load, comprising:

a wheeled carriage, said wheeled carriage comprising a left side arm, a right side arm, a plurality of wheels secured to said side arms, a crossmember connecting said left side arm to said right side arm, and a first and a second load support pin, said first load support pin positioned on said left side arm and said second load support pin positioned on said right side arm;

a load platform positioned adjacent said wheeled carriage and being partially surrounded by said wheeled carriage, said load platform being vertically and horizontally movable and slidingly connected to said wheeled carriage at a first side of said load platform to said first load support pin and at second side of said load platform to said second load support pin, for accepting and lifting objects thereon;

a first and a second lever means, each of said lever means comprising:

a load arm, said load arm of said first lever means rigidly attached to said first side of said load platform, and said load arm of said second lever means rigidly attached to said second side of said load platform;



a load arm lifter, said load arm lifter of said first lever means pivotally attached to said load arm of said first lever means, and said load arm lifter of said second lever means pivotally attached to said load arm of said second lever means; and

a handle pivotally attached to said wheeled carriage and rigidly attached to said first and said second lever means at said load arm lifters, such that rotation of said handle with respect to said wheeled carriage lifts and draws back or lowers and direct forward said lever means and thereby acts to raise or lower said load platform.

5,114,119

METHOD FOR LAYING A CATENARY AND/OR A CONTACT WIRE OF AN OVERHEAD LINE

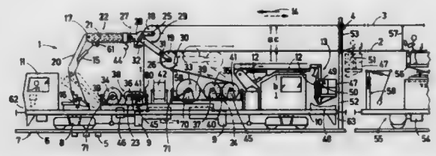
Josef Theurer, Vienna; Friedrich Oellerer, Linz, and Leopold R. Gruber, Scheibbs, all of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Division of Ser. No. 420,159, Oct. 10, 1989, Pat. No. 5,048,797. This application Dec. 3, 1990, Ser. No. 621,631

Claims priority, application United Kingdom, Oct. 14, 1988, 88890258

Int. Cl.[5] B65H *59/00*

U.S. Cl. 254—134.3 R **1 Claim**



1. A method of continuously laying an overhead line comprised of two elongated flexible elements extending above a track and attaching the overhead line to pylons spaced alongside the track, one of the two elongated flexible elements being a catenary cable and the other elongated flexible element being a contact wire, which comprises the steps of

(a) propelling a machine carrying respective storage drums for the catenary cable and the contact wire along the track,

(b) unreeling the catenary cable and the contact wire from respective storage drums while the machine is propelled along the track,

(c) subjecting the unreeled catenary cable and contact wire

to a controlled tension force while they are wound about a guiding and tensioning device mounted on the machine,

(d) supporting and guiding the unreeled, tensioned catenary cable and contact wire by respective support and guide pulleys vertically and laterally adjustably mounted on the machine,

(e) vertically and laterally adjusting the pulleys to maintain the tensioned catenary cable and contact wire at a corresponding vertical and lateral position adjacent a respective one of the pylons at one side of the track,

(f) attaching the overhead line to the respective pylon whereby the catenary cable and the contact wire are fixed in said position,

(g) subsequently laterally adjusting the support and guide pulleys to position them adjacent a succeeding one of the pylons at the opposite side of the track while maintaining the supporting and guide pulleys at a constant vertical adjustment and propelling the machine along the track whereby the overhead line assumes a zig-zag path between succeeding pylons, and the catenary cable and contact wire are centered along said path, and

(h) affixing hangers between the catenary cable and the contact wire of the attached overhead line in a trailing operation immediately following the attachment operation to maintain the catenary cable and the contact wire at the desired vertical position.

5,114,120

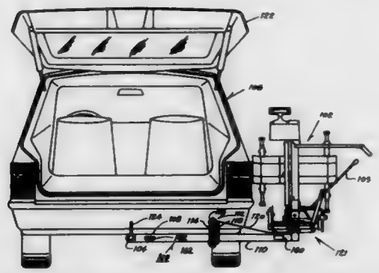
PIVOTABLE EXTRAVEHICULAR EQUIPMENT MOUNTING SYSTEM

Robert D. Bartelt, Merton; William W. Belson, III, Nashotah, both of Wis., and Michael R. Bruno, 3950 Southwood Dr., Oconomowoc, Wis. 53066, assignors to Michael Roman Bruno, Oconomowoc, Wis.

Filed Nov. 16, 1989, Ser. No. 437,791

Int. Cl.[5] B66D *1/00*

U.S. Cl. 254—323 **8 Claims**



1. A system for pivotably mounting power equipment designed to be operated while mounted and locked to the outside of a motor vehicle, said system comprising the combination of:

a fixed leg having a first end rigidly securable to an anchoring point on a vehicle;

a pivotable leg having a first end pivotably attached to the second end of said fixed leg and having a second end securable to the first end of said fixed leg;

wherein said pivotable leg is movable between a closed position and an open position, further wherein when said pivotable leg is in said closed position, said legs form an angle of about 0° and are alongside one another, and further wherein when said pivotable leg is in said open position, said legs form an angle of about 180°;

means for locking said pivotable leg in said closed position;

disabling means permitting operation of said power equipment only when said pivotable leg is locked in said closed position.

5,114,121

CUTTING HEAD WITH OXYGEN JET

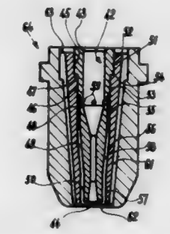
Michel Arnout, Franconville; Didier Lasnier, Cergy, and Richard Soula, Jouy-Le-Moutier, all of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed May 9, 1990, Ser. No. 521,334

Claims priority, application France, May 12, 1989, 89 06247

Int. Cl.[5] B23K *7/00*

U.S. Cl. 266—48 **6 Claims**



1. A nozzle for mounting on a cutting torch body having an inner end face into which opens a central oxygen feeding duct and at least one laterally spaced combustible gas feeding duct, the nozzle comprising an inner part, an outer part having an annular rear face and formed centrally with a transverse bore for receiving the inner part, the inner part having an annular central rear face and being formed centrally with a transverse passage and having longitudinally extending ribs on an external surface thereof, the inner part being force fitted within the bore of the outer part in relative position such that the annular central rear face of the inner part and the annular rear face of the outer part are coplanar for tight contact with the inner end face of the torch body, the ribs of the inner part extending over substantially all of the length of the inner part and each rib having a rear end terminating at a relatively small distance from the annular central rear face, whereby an annular chamber is defined within the outer part at its rear end, adjacent the inner end face of the torch body.

5,114,122

APPARATUS FOR HEAT PROCESSING GLASS BATCH MATERIALS

James G. Hnat, 3774 Lewis Rd., Collegeville, Pa. 19426

Division of Ser. No. 320,737, Mar. 8, 1989. This application Jun. 21, 1990, Ser. No. 541,986

Int. Cl.[5] C21B *7/16*

U.S. Cl. 266—186 **9 Claims**

1. An apparatus for processing materials under reducing conditions, said apparatus comprising:

gasifier means for producing a hot reducing gas;

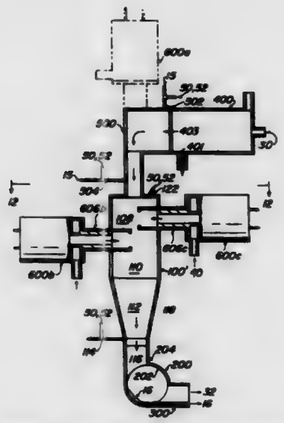
reduction chamber means for receiving and treating said materials to be reduced with reducing gases, said reduction chamber means having an outlet therefrom;

interface means connecting said gasifier means and said reduction chamber means for directing said reducing gas into said chamber means;

enthalpy boost means connected to said reduction chamber means for providing an enthalpy boost and high temperature reducing gas into said reduction chamber means and for creating a well-stirred region within said reducing chamber means;

first means for introducing said material to be reduced into said interface assembly means; and

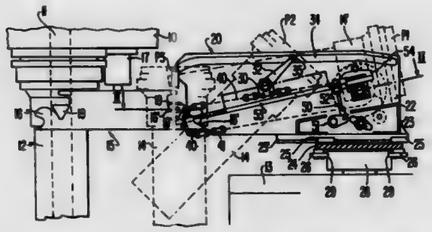
melter means at said outlet of said reduction chamber means for receiving particulate matter from said reduction chamber and for separating and depositing said particulate matter onto the wall thereof.



5,114,123
MANIPULATOR FOR MANIPULATING A POURING PIPE INTO POSITION BENEATH A METALLURGICAL VESSEL

Anton Pfyl, Affoltern, Switzerland, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 25, 1991, Ser. No. 691,331
Claims priority, application Switzerland, Apr. 27, 1990, 1441/90
Int. Cl.[5] B22D *41/50*
U.S. Cl. 266—236 **27 Claims**



1. An apparatus for manipulating a pouring pipe into and out of a predetermined position beneath a metallurgical vessel, comprising:

a supporting structure;

connecting means for detachably connecting the pouring pipe to said supporting structure;

guiding means for forcing said connecting means to move along a guide path from a rearward position toward a forwardly located position adjacent which the metallurgical vessel is adapted to be positioned, while the pouring pipe, when connected to said supporting structure, is transferred from a substantially horizontal position to a substantially vertical position;

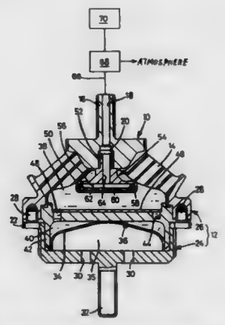
wherein said guiding means comprises an endless element mounted to said supporting structure for rotation relative thereto, said endless element extending along said guide path; and

wherein said connecting means is mounted to said endless element.

5,114,124
FLUID-FILLED ELASTIC MOUNT HAVING MEANS FOR CONTROLLING PRESSURE IN AIR CHAMBER IN RESONANCE MEMBER IN PRESSURE-RECEIVING CHAMBER

Atsushi Muramatsu, Komaki, Japan, assignor to Tokai Rubber Industries, Ltd., Japan

Filed Oct. 16, 1990, Ser. No. 598,193
Claims priority, application Japan, Oct. 21, 1989, 1-123282[U]
Int. Cl.[5] F16M *1/00*
U.S. Cl. 267—140.1 A **6 Claims**



1. A fluid-filled elastic mount comprising:

a first support structure and a second support structure which are spaced apart from each other in a load-receiving direction in which vibrations are applied to the elastic mount, said first support structure having an air passage;

an elastic body interposed between said first and second support structures for elastically connecting the first and second support structures, said elastic body and said second support structure at least partially defining an enclosure between said first and second support structures;

a partition member supported by said second support structure so as to extend in a direction substantially perpendicular to said load-receiving direction, and thereby divide said enclosure into a pressure-receiving chamber on one of opposite sides thereof on the side of said first support structure, and a variable-volume equilibrium chamber on the other side thereof, said pressure-receiving and equilibrium chambers being filled with a non-compressible fluid, a pressure in said pressure-receiving chamber changing due to elastic deformation of said elastic body upon application of the vibrations in said load-receiving direction:

a flexible diaphragm cooperating with said partition wall and said second support structure to define said equilibrium chamber;

means for defining an orifice passage for fluid communication between said pressure-receiving and equilibrium chambers;

a resonance member comprising a stem portion fixed to said first support structure and a head portion which is supported by said stem portion so as to extend in said pressure-receiving chamber in a direction substantially perpendicular to said load-receiving direction, said head portion and a surface defining said pressure-receiving chamber cooperating to define therebetween a restricted portion through which said fluid flows upon application of said vibrations, said head portion including a recess open toward said partition member;

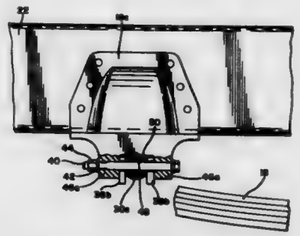
said resonance member further comprising a flexible wall portion which closes said recess to thereby define an air chamber in said head portion, so that a pressure change in said pressure-receiving chamber is transferred to said air chamber by means of elastic displacement of said flexible wall portion said stem portion comprises a connecting passage to connect said air chamber and said air passage; and

pressure control means for changing a pressure in said air chamber.

5,114,125
SUSPENSION ADJUSTMENT

James L. Srch, Clarendon Hills, Ill., and Robert L. Cadden, Parkdale, Australia, assignors to The Boler Company, Itasca, Ill.

Filed Jul. 14, 1989, Ser. No. 380,632
Claims priority, application Australia, Jul. 14, 1988, PI9279
Int. Cl.[5] B60G *11/10*
U.S. Cl. 267—265 **4 Claims**



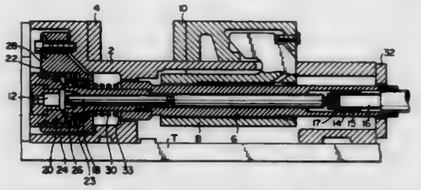
1. A suspension for a vehicle having a chassis frame and at least one pair of opposed transport wheels on opposite sides of the fore-and-aft axis of said vehicle, an axle extending between the wheels of each said pair with the wheels being mounted on the opposite ends of the axle, said suspension including a pair of spring hangers attached to each opposite side of said chassis frame, and a leaf spring assembly on each side of said chassis frame interconnecting the pair of spring hangers on that side in resilient load transfer relationship with the end of said axle on that side, each said leaf spring assembly having a leaf spring with a spring eye at one end and a spring pin extending through said spring eye and through an aperture in an aperture-providing means rigidly secured to the one of said spring hangers to which said end of said leaf with said spring eye is interconnected, and means for adjusting the fore-and-aft position of at least one end of said axle, said axle end adjusting means comprising fastener means adjustably fastening one of said spring hangers associated with one of said adjustable axle ends in a plurality of fore-and-aft positions on said chassis frame, said fastener means comprising at least one lug depending from said associated spring hanger with a first bolt-receiving hole extending fore-and-aft therethrough, said spring pin having a second bolt-receiving hole extending fore-and-aft therethrough aligned in registration with said first bolt-receiving hole, at least one spacer shim positioned between said spring pin and said lug and having a third bolt-receiving hole aligned in registration with said first and second bolt-receiving holes, and nut and bolt means wherein a bolt extends through said aligned bolt-receiving holes and interconnecting each said depending lug, spring pin and spacer shim.

5,114,126
METAL WORKING VISE

Tsutomu Yasue, Kanazawa, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Japan

Filed Jan. 24, 1991, Ser. No. 645,054
Claims priority, application Japan, Jan. 29, 1990, 2-19695
Int. Cl.[5] B23Q *3/08*
U.S. Cl. 269—32 **15 Claims**

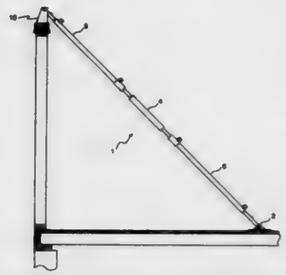
1. A metalworking vise comprising a fixed base; a stationary jaw mounted on said fixed base; a holder shaft having a front end and a rear end slidably mounted to said fixed base for slidable movement along said fixed base in a predetermined axial direction, said front end of said holder shaft having an extension defining a first hydraulic chamber therein; a slidable jaw coupled to said holder shaft for axial movement therewith relative to said stationary jaw; sleeve means surrounding said extension at said front end of said holder shaft, said extension and said sleeve means defining a second hydraulic chamber therebetween, said first and second hydraulic chambers being in fluid communication with each other; and piston means being mounted in said holder shaft for axial movement therein, said piston means having a front end and a rear end, said rear end being adaptable to be coupled to a manual drive unit, and said front end being moveable into said first hydraulic chamber.



5,114,127
PLUMB-ALIGN DEVICE

Alvie E. Everhart, 1100 Schuman La., Petaluma, Calif. 94952

Filed Aug. 29, 1990, Ser. No. 575,341
Int. Cl.[5] B25B *1/20*
U.S. Cl. 269—41 **12 Claims**



1. An apparatus for plumbing a wall comprising:

anchoring means for contacting the ground, adapted to resist movement relative to the ground;

a tubular member having a threaded rod fixed therein, a support means for pivotally connecting said anchoring means to said tubular member so as to position said tubular member at an appropriate height for manual manipulation;

an extender having a threaded end dimensioned to receive an end of the threaded rod, said threaded rod being engaged with said extender end so that rotation of the tubular member causes the threaded rod to screw in or out of the extender depending on the direction of rotation;

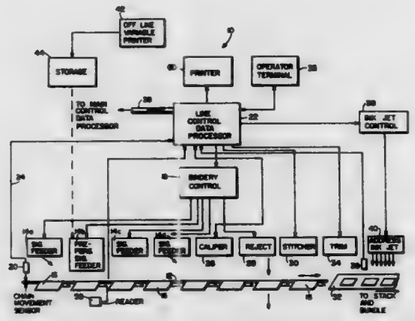
bracket means for clasping the wall, the wall having a top edge, the bracket means being adapted to pivotally connect the top edge of the wall to the end of the apparatus opposite from the grounded end, whereby the total length of the apparatus may be increased by rotating the tubular member in one direction and alternatively the total length of the apparatus may be decreased by reversing the direction of rotation of the tubular member, thereby easily and accurately plumbing the wall.

5,114,128

PROCESS AND APPARATUS FOR PERSONALIZING MAGAZINES, BOOKS AND OTHER PRINT MEDIA

William H. Harris, Jr, New York, N.Y.; William E. Nussbaum, Chevy Chase, Md.; Michael J. Armstrong, Arlington, Va.; Victor H. Deming, Washington, D.C., and John E. Brink, Stamford, Conn., assignors to U.S. News & World Report, L.P., Washington, D.C.

Filed Feb. 27, 1991, Ser. No. 661,298
Int. Cl.[5] B41F *13/54*
U.S. Cl. 270—11 45 Claims



1. In a process for the assembly of magazines in a bindery line wherein individual signatures are deposited on a conveyor from a plurality of hoppers, the improvement comprising the steps of:

a) pre-personalizing off-line signatures with personalization information including machine readable indicia;

b) loading the pre-personalized signatures into at least one of said plurality of hoppers;

c) depositing the pre-personalized signatures on the conveyor between other of said individual signatures from adjacent hoppers;

d) providing a symbol reading device for reading said machine readable indicia and generating address information including recipient name and address matched to said personalization information; and

e) printing on-line said address information on cover signatures of the respective magazines.

5,114,129

SIGNATURE FEEDING APPARATUS

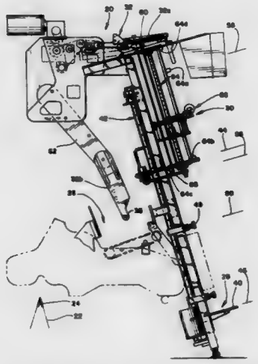
Robert Chang, Westlake Village, and Thomas J. McNicholas, Sr., Fountain Valley, both of Calif., assignors to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Dec. 14, 1990, Ser. No. 628,484
Int. Cl.[5] B41F *13/54*
U.S. Cl. 270—1.1 56 Claims

1. An apparatus for feeding signatures to a binding line, comprising:

a pocket adjacent a binding line for receiving signatures to be delivered to said binding line;

first and second signature feeding means either one of which feeds signatures at any given time from a source to signature transfer means extending to said pocket adjacent said binding line; and



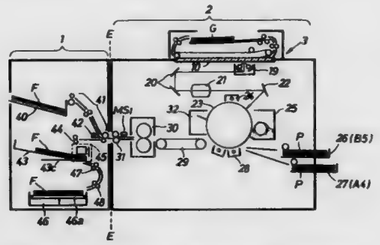
at least one of said feeding means also receiving signatures directly from said source.

5,114,130

RECORDED SHEET HANDLING APPARATUS

Izumi Hamanaka; Yoshikazu Maekawa; Hiroyuki Arai; Akihiko Nishiki, all of Hachioji; Takeshi Muramatsu, Sayama; Toshio Yokoyama, Kiyose, and Shigemi Yukizane, Chofu, all of Japan, assignors to Konica Corporation, Japan

Continuation of Ser. No. 445,110, Dec. 1, 1989, abandoned, which is a continuation of Ser. No. 146,569, Jan. 21, 1988, abandoned. This application Sep. 17, 1990, Ser. No. 584,498
Claims priority, application Japan, Jan. 23, 1987, 62-12201; Jul. 14, 1987, 62-173951; Jul. 14, 1987, 62-173952; Jul. 24, 1987, 62-183431; Aug. 18, 1987, 62-203572; Sep. 14, 1987, 62-228624; Nov. 20, 1987, 62-291712
The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.
Int. Cl.[5] B42B *2/00*
U.S. Cl. 270—53 26 Claims



1. A recorded sheet handling apparatus comprising:

an intermediate holding section for holding and stacking a set of recorded sheets, fed one by one in a feeding order, from an external source,

a handling unit for selectively punching and/or stapling the recorded sheets stacked in said intermediate holding section, a first storage section for storing the handled recorded sheets,

a first conveying means for conveying the recorded sheet from said external source to said intermediate holding section and a second conveying means for conveying the handled recorded sheets from said intermediate holding section to said first storage section, and

a control means for controlling the position at which punching and/or stapling occurs in said intermediate holding section,

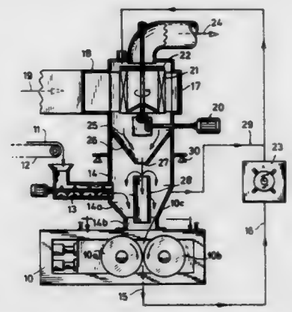
said handling unit comprising at least one stapler movable perpendicular to a recorded sheet feed direction, a punching machine including a punching pin vertically moved by a motor, and means for manually rotating said motor detachably mounted on a rotating shaft of said motor.

5,114,131

CIRCULATION-TYPE GRINDING SYSTEM FOR GRINDING BRITTLE MATERIAL

Siegfried Strasser, Much; Franz Goeddecke, Leverkusen, and Albrecht Wolter, Cologne, all of Fed. Rep. of Germany, assignors to Kloeckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Aug. 1, 1990, Ser. No. 561,733
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1989, 3926882
Int. Cl.[5] B02C *1/00*
U.S. Cl. 241—19 8 Claims



1. A grinding system for grinding brittle material such as used in the preparation of cement comprising in combination:

a pair of rollers having an upwardly facing high pressure grinding nip therebetween forming a particle bed comminution press delivering agglomerates with incipient cracks in the interior of the particles;

a sifter positioned directly and immediately above the nip directly delivering sifter material grits to the press nip;

means delivering a portion of the ground stock emitted from the press to the sifter for recirculation;

a material delivery shaft rectangular in cross-section positioned immediately above the nip, said shaft forming a unitary delivery shaft for grits and for fresh grinding stock;

a distributor member extending down from the sifter carrying grits and extending down into said rectangular shaft;

a lateral stock delivery connected to deliver fresh grinding stock directly above the nip into said delivery shaft filling the shaft to maintain a supply above the roller to be drawn into the nip joining the stream of grits from the sifter so that fresh stock and sifter stock merge together in said rectangular shaft so that a mixture of grits and fresh stock are drawn together into the nip;

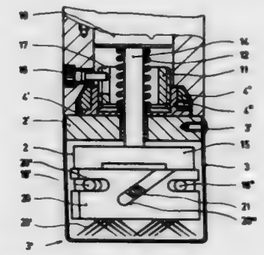
and means for accumulating a predetermined amount of stock and grits from the sifter and fresh stock above the roller nip.

5,114,132

DEVICE FOR TAKING UP, TRANSPORTING, POSITIONING AND ASSEMBLING A FLEXIBLE, PLANE WORKPIECE

Laszlo F. Arato, Seebuchstrasse 19, and Ferenc Schell, Beckenriederstr., Chalet Bergfreund, both of CH-6374 Buochs, Switzerland

PCT No. PCT/CH87/00165, § 371 Date Jul. 19, 1988, § 102(e) Date Jul. 19, 1988, PCT Pub. No. WO88/04271, PCT Pub. Date Jun. 16, 1988
Continuation of Ser. No. 269,908, Jul. 19, 1988, abandoned. This PCT application Dec. 3, 1987, Ser. No. 614,020
Int. Cl.[5] B65H *3/22*
U.S. Cl. 271—18.3 7 Claims



1. A needle-type gripper comprising:

a housing including a base plate;

at least one pair of needle bars arranged in parallel planes and each having needles extending at a downward angle;

an actuating fork capable of motion toward and away from said base plate; and wherein:

each needle bar of said at least one pair of needle bars is provided with an interrupted slot extending substantially parallel to said base plate;

each needle bar of said at least one pair of needle bars is provided with an angled slot extending substantially parallel to said needles thereof;

said needle bars of said at least one pair of needle bars being formed substantially as mutual mirror images and being arranged in mutual sliding relationship;

three guide pins, a first guide pin of said three guide pins being fixed in relation to said housing and engaging said angled slots, a second guide pin and a third guide pin of said three guide pins being fixed in relation to said actuating fork and engaging said slots that are parallel to said base plate;

said base plate being provided with slits for the passage therethrough of said needles when said actuating fork moves toward said base plate.

5,114,133

AUTOMATIC SHEET FEEDING DEVICE

Tokihiro Onada, and Masao Aono, both of Kofu, Japan, assignors to Nippon Seimitsu Kogyo Kabushiki Kaisha, Kofu, Japan

Continuation of Ser. No. 259,530, Oct. 19, 1988, abandoned. This application Oct. 19, 1990, Ser. No. 600,177
Int. Cl.[5] B65H *3/30*
U.S. Cl. 271—22 1 Claim

1. An automatic sheet feeding device for selectively feeding relatively thin first sheets and relatively thick second sheets one by one, comprising:

a guide shaft extending widthwise,

a rotary shaft rotatably retained parallel to said guide shaft,

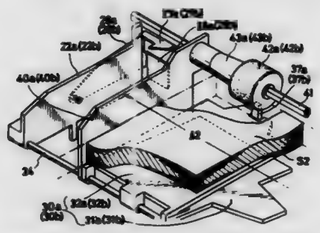
at least one sheet bed comprising at least one bottom plate slidably supported on said guide shaft and at least one base plate slidably supported by said guide shaft in a rockingly movable manner on said bottom plate,

a pair of first stacker forming members disposed opposite to each other with side sheet bed positioned therebetween

for forming a first sheet stacker to hold a stack of said first sheets, at least one of said first stacker forming members being movable laterally along said guide shaft,

a pair of sheet separation claws provided on said first stacker forming members for pressing down forward corners of said first sheets stacked in said first sheet stacker,

a pair of second stacker forming members placed in between the first stacker forming members for forming a second sheet stacker to hold a stack of said second sheets and slidably supported by said side guide shaft and rotary shaft so as to be movable laterally with respect to said first stacker forming member for making said sheet separation claws ineffective to thereby define a second sheet stacker



for holding a stack of said second sheets when said second stacker forming members are separated from said first stacker forming members,

at least one sheet feed roller fixed onto at least one of said second stacker forming members for feeding one of the first and second sheets one by one in one direction, and

at least one sheet pass through gap member extending from said bottom plate toward said sheet fed roller and disposed relative to said sheet feed roller and said second stacker so as to form a gap with said sheet feed roller for permitting one of said second sheets to pass therethrough and preventing two or more of said second sheets lying one upon another from passing therethrough.

5,114,134

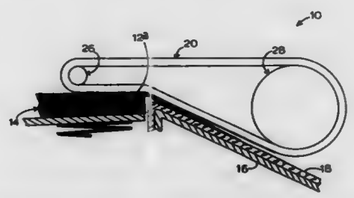
PAPER FEED ARRANGEMENT

Steve O. Rasmussen, and Larry A. Jackson, both of Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 454,661, Dec. 18, 1989, abandoned. This application Jul. 24, 1991, Ser. No. 735,210

Int. Cl.[5] B65H *3/04*

U.S. Cl. 271—34 **6 Claims**



1. For incorporation in a printer and the like, a low-profile, enhanced-reliability paper-feed arrangement comprising:

paper-storage hopper structure including a discharge zone enabling picking of the top sheet of paper in a stack in the hopper, and

a broad-expanse, power driven, traveling pick belt disposed adjacent said discharge zone trained, in two reverse bends, around a drive roller having one diameter displaced laterally downstream from said zone and an idler roller having another diameter which is a small fraction of said one diameter disposed over the zone operable, with paper stored in said hopper structure to pick such paper through the action of generally quadrilinear, broad-area facial contact with the same, said pick belt, where it is trained over said drive roller, vertically spanning an extent which straddles the plane containing such a top sheet, and where it is trained over said idler roller, spanning a vertical extent which is a small fraction of said first-mentioned extent.

5,114,135

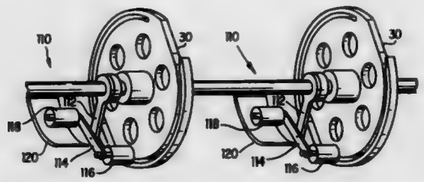
DISK STACKER INCLUDING REGISTRATION ASSIST DEVICE

Donato D. Evangelista, Webster, and John F. Coleman, Hilton, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 17, 1990, Ser. No. 568,757

Int. Cl.[5] B65H *29/40*

U.S. Cl. 271—187 **29 Claims**



1. A disk stacker for receiving and inverting sheets comprising:

a rotatable disk including at least one slot for receiving a sheet therein;

rotating means for rotating said rotatable disk;

feeding means for feeding a sheet from a sheet supply to said slot of said rotatable disk, said rotatable disk being capable of receiving a sheet in said slot when located at an input position and inverting said sheet by rotating;

registration means, located adjacent an output position of said rotatable disk, for stripping the sheet from said slot of said disk after the sheet has been inverted and for registering a lead edge of the sheet in a final position; and

registration assist means, selectively movable into and out of a curved plane defined by said slot, for pressing a sheet in said disk slot against a surface of said slot when moved into said curved plane, so that the sheet will not bounce away from said registration means upon contact therewith, said registration assist means releasing the sheet when moved out of said curved plane a short time period after the leading edge of the sheet contacts said registration means.

5,114,136

DOCUMENT PUSHER PLATE OF AN IMAGE FORMING EQUIPMENT

Jun Miyoshi, Osaka; Mitsugu Shibanaka, Hyogo; Toshikazu Matsui, and Nobukazu Ohtsuka, both of Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 16, 1989, Ser. No. 438,344

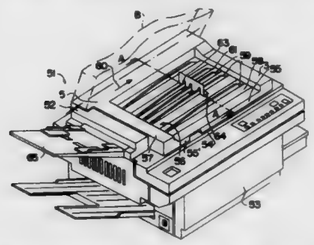
Claims priority, application Japan, Nov. 17, 1988, 63-292010

Int. Cl.[5] B65H *31/20*

U.S. Cl. 271—213 **1 Claim**

1. An image forming equiment in which a document pusher plate that can be freely opened and closed by means of a hinge mechanism is mounted on the upper portion of the document set plate of the image forming equipment proper and a document is fed to the position of exposure on a document set plate and delivered from the position of exposure by a document transfer means arranged at the side of a document feeding device and the document pusher plate is characterized in that

a reinforcement plate is attached to the side of the document transfer means at the rear side of the document pusher plate



and one end of the reinforcement plate is linked with the hinge mechanism.

5,114,137

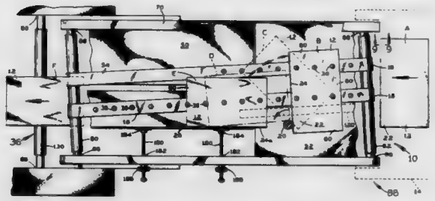
RIGHT ANGLE TURN TABLE AND METHOD

Ray E. Olson, 2200 NW. 32nd St., Ste. 200, Pompano Beach, Fla. 33069

Filed Feb. 11, 1991, Ser. No. 653,372

Int. Cl.[5] B65H *9/04*

U.S. Cl. 271—251 **17 Claims**



1. A device for rotating papers comprising:

conveyer belt means for moving each paper through the device, wherein the conveyer belt means has at least one upper belt segment upon which the papers move, and wherein portions of each paper extend beyond the conveyer belt means,

paper support means which surround the at least one upper belt segment to support the portions of each paper extending beyond the conveyer belt means,

at least one ball for rolling on top of each paper moving on the conveyer belt means for holding the paper in position,

retaining means extending over the conveyer belt means for rotatably retaining the at least one ball,

fulcrum means positioned adjacent to the conveyer belt means for stopping part of each paper while the belt means pulls the paper radially around the fulcrum means, thereby rotating the paper, wherein the fulcrum means comprises a fulcrum ball which rests against the support means for wedging said part of each paper when it makes contact with the fulcrum ball between the fulcrum ball and the support means and bracket means connected to the fulcrum ball for securing the fulcrum ball in the desired location relative to the conveyor belt means and for securing the fulcrum ball against rotation.

5,114,138

METHOD AND APPARATUS FOR MULTIPLE SHEET DETECTION

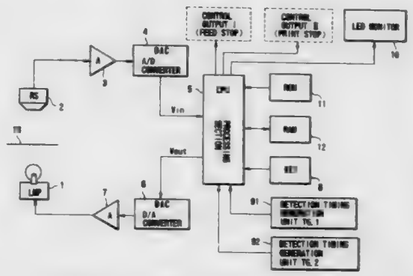
Tadashi Ichinose, Ibaraki, Japan, assignor to Komori Corporation, Tokyo, Japan

Filed Jun. 28, 1991, Ser. No. 722,974

Claims priority, application Japan, Jul. 2, 1990, 2-172747

Int. Cl.[5] B65H *7/14*

U.S. Cl. 271—263 **10 Claims**



1. A method for multiple sheet detection for a sheet in a printing press capable of performing multiple sheet detection at a first feed operation timing which can stop feeding of the sheet to said printing press, comprising:

the step of determining a second feed operation timing immediately before the start of feeding of the sheet;

the step of performing multiple feed detection of the sheet again at the determined second feed operation timing; and

the step of generating a print stop control output to said printing press when multiple sheet feeding is detected at the determined second feed operation timing.

5,114,139

IMAGE-FORMING APPARATUS PROVIDED WITH AUTOMATIC ORIGINAL DELIVERY MECHANISM AND CARRIER SHEET FOR USE IN SAID APPARATUS

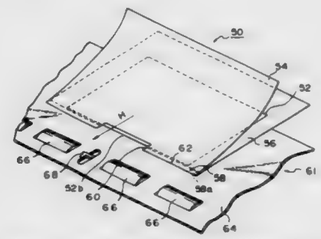
Kiyofumi Kodama, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 17, 1989, Ser. No. 437,689

Claims priority, application Japan, Nov. 18, 1988, 63-151354[U]; Nov. 30, 1988, 63-300865

Int. Cl.[5] B65H *7/02*

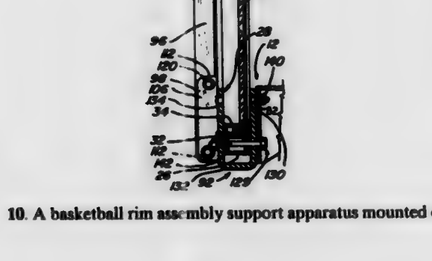
U.S. Cl. 271—265 **4 Claims**



1. An original carrier sheet device comprising two overlapping sheet portions, at least one of which is transparent, and a connecting portion being formed by connecting said two sheet portions at one edge side thereof, said original carrier sheet device being set in an image-forming apparatus provided with at least one original detecting means arranged in the image-forming apparatus and an automatic original delivery mechanism, in a state where the connecting portion is placed on a leading edge side of the carrier sheet device and an original is inserted between said two sheet portions, wherein at least one

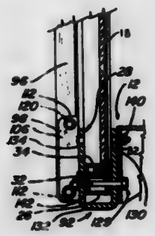
notch is formed on a part of a leading edge side of the connecting portion to extend over the full width of the connecting portion so that an edge portion of the inserted original is exposed to actuate the original detecting means.

5,114,140
EXPLOSION SIMULATOR
Craig K. Barr, Tujunga, Calif., assignor to Universal City Studios, Inc., North Hollywood, Calif.
Filed Feb. 20, 1991, Ser. No. 658,385
Int. Cl.[5] A63J *5/02*
U.S. Cl. 472—75 **13 Claims**



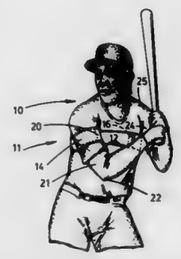
11. A special effects attraction comprising:
a lagoon having a floor and filled with water to an operating level;
a shooter supported on the floor;
a barrel extension on the shooter moveable between a shooting position adjacent the operating level and a loading position below the shooting position;
a barrel extension driver for moving the barrel extension between the shooting and loading positions;
means for projecting a charge of water and prop pieces from the shooter to create a blast spray above the operating level;
a submerged collector surrounding the shooter having inner sections hingedly joined to outer sections;
a winching system for pulling the collector into a loading position; and
a controller for controlling the means for projecting, barrel extension driver and winching system.

5,114,141
BASKETBALL RIM ASSEMBLY SUPPORT APPARATUS
Kenneth J. Mahoney, Dorrance, Kans., assignor to Gared Sports, Inc., St. Louis, Mo.
Filed Aug. 6, 1990, Ser. No. 563,064
Int. Cl.[5] A63B *63/08*
U.S. Cl. 273—1.5 R **10 Claims**



10. A basketball rim assembly support apparatus mounted on a backboard support frame having upper and lower support members enclosing a glass backboard member and connected to a basketball rim assembly, comprising:
a) a frame support and rim connector assembly including a vertical support strut assembly and a basketball rim support assembly;
b) said vertical support strut assembly secured at an upper end to the upper support member of the basketball support frame;
c) said basketball rim support assembly includes a main support plate member secured to a lower end of said vertical support strut assembly, the lower support member of the basketball support frame, and the basketball rim assembly; and
d) said main support plate member of "U" shape in transverse cross section having a front wall secured to the basketball rim assembly and a back wall secured to said vertical support strut assembly and operable to enclose the lower support member of the basketball support frame and secured thereto to provide rigid support to the basketball rim assembly;
whereby forces applied against the basketball rim assembly are transferred to said basketball rim support assembly; said vertical support strut assembly; and the basketball support frame and not to the glass backboard member to prevent breakage thereof.

5,114,142
TRAINING DEVICE FOR BASEBALL HITTERS
Gordon A. Gillespie, 508 North William St., and Joseph A. Delgado, 817 Hobbs Dr., both of Joliet, Ill. 60435
Continuation of Ser. No. 588,160, Mar. 12, 1984, abandoned.
This application Mar. 12, 1987, Ser. No. 25,219
Int. Cl.[5] A63B *71/00*
U.S. Cl. 273—26 C **2 Claims**



1. A training device for baseball hitters using a bat comprising, in combination, (a firm) an inelastic belt for encircling the chest of a hitter, a second (firm) inelastic belt for encircling the upper portion of the lead arm of the hitter, and means for firmly securing said chest and arm belts together in direct contact with each other to thereby bind the hitter's upper lead arm and elbow tightly to his side while leaving his forearm generally free for movement throughout an entire swing of the bat.

5,114,143
Patent Not Issued For This Number

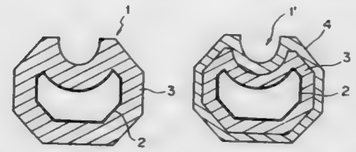
5,114,144
COMPOSITE BASEBALL BAT
Charles S. Baum, Traverse City, Mich., assignor to The Baum Research & Development Company, Inc., Traverse City, Mich.
Filed May 4, 1990, Ser. No. 518,782
Int. Cl.[5] A63B *59/06*
U.S. Cl. 273—72 R **25 Claims**



1. A ball bat having a bulbous end portion tapering to a narrow handle portion comprising:
a substantially rigid, elongated central core, extending substantially the full length of the bat;
an inner tube of fibrous reinforcement fabric impreganted with resin, surrounding the core; and
an outer tube formed of a sheet of wood veneer, said sheet comprising an elongated strip having its length substantially parallel to the longitudinal axis of the bat, said sheet being coated and impregnated with resin, and surrounding said inner tube and adhered thereto by said resin.

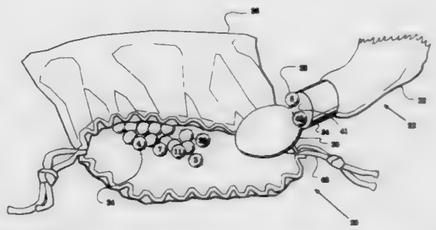
5,114,145
TENNIS RACKET FRAME
Tetsuo Yamaguchi, Nishinomiya; Hiroomi Matsushita, and Kunio Niwa, both of Kobe, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Oct. 10, 1990, Ser. No. 595,365
Claims priority, application Japan, Dec. 5, 1989, 1-315682
Int. Cl.[5] A63B *49/10*
U.S. Cl. 273—73 F **11 Claims**

1. A tennis racket frame having a total weight of 230–300 g, a total length of 52–67 cm, and an improved periodic damping ratio of 0.5–4.0% comprising:
a center core;
a fiber reinforced matrix resin manufactured through monomer casting including a polyamide resin reinforced by a fiber reinforcing material;
an inner resin layer positioned between said center core and said fiber reinforced matrix resin; and
an outer resin layer positioned on an exterior surface of said



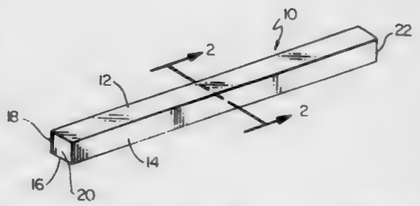
fiber reinforced matrix resin, wherein said inner and outer resin layers contain a non-woven fabric having a fiber content that is 80–98 Vol. % of said fiber reinforced matrix resin and 2–20 Vol. % of the non-woven fabric.

5,114,146
APPARATUS AND METHOD FOR RANDOM SELECTION OF INDICIA
Ernest R. Booker, 1229 ½ 22nd St., Santa Monica, Calif. 90404
Filed Jun. 24, 1991, Ser. No. 719,949
Int. Cl.[5] A63F *3/06;* **A47L** *13/02*
U.S. Cl. 273—144 A **19 Claims**



13. Indicia selection apparatus, comprising:
a plurality of marker means, each bearing one of a plurality of different alphanumeric symbols thereon, for indicating a plurality of alphanumeric symbols for a game, contest, or lottery;
pouch means for containing said marker means; and
magnetic means for attracting, from said pouch means, one or more of said marker means and attaching, thereby, said one or more of said marker means thereto;
said magnetic means and said marker means stored, when not selecting indicia, in said pouch means.

5,114,147
APPARATUS AND METHOD OF PLAYING A GAME WITH MULTI-COLORED STICKS
John Faylo, 726 Cadwell St., Watertown, N.Y. 13601
Filed Sep. 20, 1991, Ser. No. 763,309
Int. Cl.[5] A63F *9/04*
U.S. Cl. 273—146 **9 Claims**



1. A game apparatus comprising a total of n elongated sticks

of substantially square cross-section, each of said sticks having four, laterally adjacent sides, each of said sides being of a different color selected from a predetermined set of n colors, one of said colors appearing on said sticks a total of n times and each of the other said colors appearing on said sticks in descending frequency a total of [n−1, n−2, . . . , n−(n−1)] times with each of said sticks having a unique set of four of said colors.

5,114,148
PUZZLE DEVICE

Ming-Zen Liu, No. 34, Chung-Yung St., San-Min Dist., Kaohsiung City, Taiwan

Filed Jul. 9, 1991, Ser. No. 727,423
Int. Cl.[5] A63F 9/08
U.S. Cl. 273—153 S 3 Claims



1. A puzzle device, comprising:
a spherical body including a circular disc having two opposite circular faces and a circumferential face, said circumferential face having a first retaining groove formed therealong, each of said circular faces having a first and a second diametric groove which are perpendicular to each other, the two crossed diametric grooves on one circular face of said circular disc being respectively parallel with the two crossed diametric grooves on the other circular face of said circular disc, each of said first diametric grooves having a first flat bottom, each of said second diametric grooves having a second flat bottom, a pair of semicircular discs each of which having two opposite semicircular faces, a semicircular circumferential face having a second retaining groove formed therealong, and a first flat face, each of said opposite semicircular faces of said semicircular disc having a radial groove extending perpendicularly to said first flat face and parallel with the radial groove on the other semicircular face of said semicircular disc, each of said radial grooves having a third flat bottom, and four quadrant discs each of which having two opposite sector-shaped faces, a quadrant circumferential face having a third retaining groove formed therealong, and a second and a third flat face connected to each other at a right angle so that when said semicircular discs are respectively fitted in said first diametric grooves of said circular disc and said quadrant discs are respectively fitted in said second diametric grooves of said circular disc and said radial grooves of said semicircular discs, said first flat faces of said semicircular discs being respectively engaged with said first flat bottoms of said first diametric grooves of said circular disc, and said second and third flat faces of each of said quadrant discs being respectively engaged with one of said second flat bottoms of said second diametric grooves of said circular disc and one of said third flat bottoms of said radial grooves of said semicircular discs, said first, second and third retaining grooves cooperatively forming intersecting endless runways having a plurality of intersecting points formed in said intersecting runways; and
a plurality of game pieces slidably retained in said runways, each of said game pieces being movable along said intersecting runways via said intersecting points in different routes to manipulate said game pieces into a desired arrangement.

5,114,149
DISTANCE MARKER WITHIN A GOLF COURSE FAIRWAY

John M. Bailey, 1249 Golfside Dr., Sebring, Fla. 33870

Continuation-in-part of Ser. No. 672,174, Mar. 20, 1991, Pat. No. 5,072,940. This application Oct. 9, 1991, Ser. No. 773,222
Int. Cl.[5] A63B 67/02; G09F 7/22; E01F 9/02
U.S. Cl. 273—176 A 3 Claims

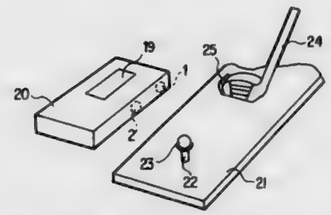


1. A visual distance marker for a golf course which is implanted in an elongated fairway of a golf course and is unaffected by the operation of a reel-type lawn mower passing thereover, said marker comprising:
a very thin, flat, generally straight flexible upstanding marker strip having an upper distal end and a lower end and a uniform generally rectangular cross section along substantially its entire length;
said marker strip lower end connected to an enlarged anchor portion, said anchor portion completely embedded into a grassy area of the golf course fairway;
said anchor portion including an elongated straight tubular member having a length generally in the range of less than half the length of said strip, said strip having a width slightly less than the inside diameter of said tubular member;
said strip and said tubular member connected adjacent their generally aligned lower ends by passing an elongated bolt or pin through aligned holes formed through said tubular member and said strip;
said upper end extending above ground a distance such that said strip may be initially depressed by the leading edge bar of the lawn mower and said strip will be subsequently depressed by the mower and rolling bar of the mower, so that said strip will not be severed when the grassy area of said fairway is being mowed in a direction lengthwise or diagonally across said fairway;
said strip marker being oriented in the fairway so that its width or greatest transverse dimension faces the direction of the tee associated with said fairway, and being sufficiently resilient to return to its original straight and upstanding orientation thereafter;
indicia on the width portion of said marker strip for communicating to a golfer the distance of said strip from said tee associated with said fairway to enable a golfer to determine the distance a golf ball lying along the length of the fairway has been driven from said tee.

5,114,150
GOLF SWING ANALYZER

Yukinobu Matsumura, 746, Honmachi, Shoubara-shi, Hiroshima, Japan

Continuation of Ser. No. 417,544, Oct. 4, 1989, abandoned. This application May 8, 1991, Ser. No. 700,302
Claims priority, application Japan, Oct. 18, 1988, 63-261747
Int. Cl.[5] A63B 69/36
U.S. Cl. 273—186 R 4 Claims



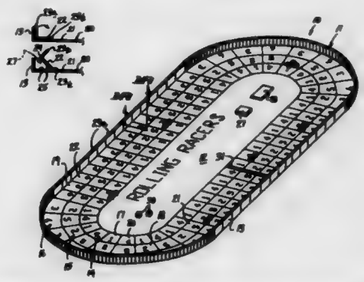
1. A golf swing analyzer comprising
a permanent magnet attached to the head of a golf club;
two magnetic sensors spaced apart from each other horizontally and in parallel relationship with an ideal swing direction of the golf club;
first detecting means for receiving outputs signals from said two sensors for detecting whether the output signals are larger or smaller than a reference potential level Vo plus a predetermined value;
second detecting means adapted to receive output signals from said two sensors for detecting whether the output signals are larger or smaller than a reference potential level Vo minus said predetermined value;
first counter adapted to receive pulse signals response to the detected output signals that are equal to "Vo+said predetermined value" level in order to measure at time interval T1 indicative of the swing motion of the golf club between the two sensors;
second counter adapted to receive pulse signals responsive to the detected output signals that are equal to "Vo−said predetermined value" level in order to measure a time interval T2 indicative of the swing motion of the golf club between the two sensors; and
a calculating means comprised of a central processing unit for calculating the swing speed of the golf club and the deviation of the swing direction of the golf club from its desired direction based on T1 and T2,
wherein the swing speed is calculated by said calculating means by dividing a distance between the first and second sensors by (T1+T2)/2 and wherein the deviation is calculated by the difference between T1 and T2.

5,114,151
RACE GAME APPARATUS

Dana D. Bergerstock, Box 676 Laraway Rd., Cayuga, N.Y. 13034

Filed Oct. 7, 1991, Ser. No. 772,168
Int. Cl.[5] A63F 3/00
U.S. Cl. 273—246 3 Claims

1. A race game apparatus, comprising in combination,
a game board, the game board including a central board area, and
the game board including a continuous outer perimeter wall, and
at least a first, second, and third concentric continuous game paths directed about the game board between the central board area and the perimeter wall, each game path of said first, second, and third game paths including a plurality of spaces, each space having either one of a first, a second, a third, a fourth a fifth, or a sixth distinguishable indicia wherein the spaces of said first game path have alternating first and fourth indicia, wherein the spaces of said second game path have alternating second and fifth indicia, and the spaces of said third game path have alternating third and sixth indicia, and
a plurality of dice, each die having said six distinguishable indicia thereon, wherein the faces of each die having one of said six distinguishable indicia, and
a plurality of pole positions cards contained within the central board area for selection by a predetermined number of players, and

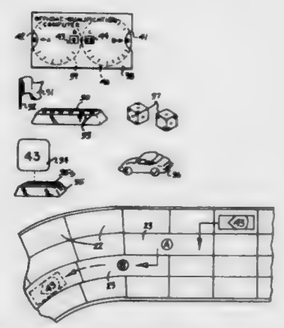


a starting line orthogonally directed across the first, second, and third game paths, and
a first plurality of starting spaces, and a second plurality of starting spaces, wherein the first and second starting spaces are positioned upon opposing sides of the starting line permitting clockwise or counter-clockwise direction of play about the first, second, and third game paths, and
a plurality of tokens positioned selectively within the first or second starting spaces.

5,114,152
AUTOMOTIVE RACING GAME

Jessie L. Rouse, and Jesse L. Rouse, both of 703 Orange St., Elgin, Ill. 60123

Filed Mar. 15, 1991, Ser. No. 670,180
Int. Cl.[5] A63F 3/00
U.S. Cl. 273—246 2 Claims



1. An automotive racing game comprising, in combination,
a game board, the game board including a top surface, wherein the top surface includes a predetermined number of contiguous paths, each path is arranged in contiguous relationship relative to an adjacent path, and
each path including a plurality of spaces of varying lengths, and
each path including a respective starting space, wherein each starting space is aligned relative to one another to define a single row, and
a plurality of tokens, wherein the tokens are provided by a

further predetermined number, wherein the further predetermined number is twice the predetermined number defined by the predetermined number of paths, and

the game board including a single finish space positioned as a single row adjacent the staring spaces, and

the finish space contiguous to and adjacent a victory lane space, the game board including an infield area positioned interiorly of the predetermined number of paths, and the victory lane path projecting into the infield from the finish line space to receive the tokens sequentially upon completion of each respective token about the plurality of paths, and

a plurality of dice to effect movement of the tokens about the predetermined number of paths, and

further including a pit stop path directed from one of said predetermined paths directed into the infield area, wherein the pit stop path includes a predetermined number of pit stop path spaces, and the pit stop path spaces including a plurality of pit stop spaces, and a deck of pit stop cards in association with the pit stop spaces, whereupon a token directed upon a pit stop path is directed to select a pit stop card to effect information for that respective token for movement about the game board, and

wherein each of the plurality of paths include a plurality of risk spaces, and each of the risk spaces is associated with a deck of risk cards, whereupon a player being directed upon a risk space selects a risk card to instruct that respective player to position the player's token to an advantage or disadvantage about the game board, and

wherein each token has associated therewith an identification card, whereupon a player entering the pit stop path returns a pit row identification card, and each pit row identification includes a support block, and each support block includes a groove, wherein the groove complementarily receives the pit row identification card, and

wherein each token has associated therewith a plurality of scoring flags, and each scoring flag includes a scoring flag shaft, and the plurality of scoring flags includes a scoring flag support block, the scoring flag support block includes a plurality of apertures, wherein each aperture receives an associated scoring flag shaft, and each player positions a scoring flag shaft within an associated aperture on completion of a single traverse of the game board, and

further including a calculator member, wherein the calculator member includes respective first and second counter wheels, each counter wheel includes a successive plurality of digits, and the first and second scoring wheels include a respective first and second notch positioned in opposed sides of the calculator to permit visual observation of the periphery of each scoring wheel, and the calculator includes a respective first and second window positioned diametrically opposed to the first and second notch to permit visualization of a further digit to effect counting of a predetermined number of dice rolls of the plurality of dice to determine initial positioning of each token upon the respective plurality of paths.

5,114,153

MECHANICAL CARD DISPENSER AND METHOD OF PLAYING A CARD GAME

Donald A. Rosenwinkel, Oak Park, Ill., and Randall H. Moormann, Georgetown, Mass., assignors to Brealow, Morrison, Terzian & Associates, Inc., Chicago, Ill.

Filed Feb. 8, 1991, Ser. No. 652,945
Int. Cl.[5] A63F *1/14*
U.S. Cl. 273—292 **20 Claims**

1. A game comprising in combination:

a supply of cards;

a housing having a bottom;

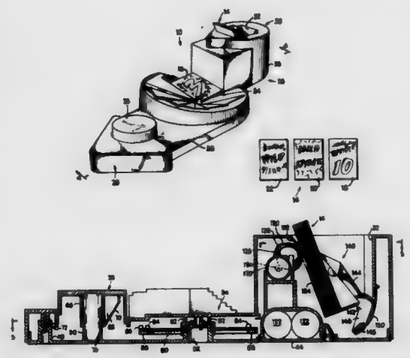
an reservoir in the housing for receiving at least some of the supply of cards;

a motor mounted within the housing;

means driven by the motor for dispensing a bottommost card from the cards in the reservoir;

means for actuating the motor;

a manually depressible actuator carried by the housing; and



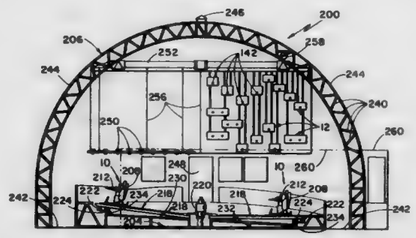
means connecting the actuator and the actuating means such that the motor is actuated in response to some but not all manual depressions of the actuator.

5,114,154

SCORABLE SHOOTING GALLERY AMUSEMENT RIDGE WITH SIMULATED LASER WEAPONS AT MULTIPLE SITATIONS

Bruce A. Sellner, Faribault, Minn., assignor to Sellner productions, Inc., Faribault, Minn.

Division of Ser. No. 896,786, Aug. 15, 1986, Pat. No. 4,830,381.
This application Apr. 21, 1989, Ser. No. 341,552
Int. Cl.[5] A63B *67/00*; A63G *31/00*
U.S. Cl. 273—310 **6 Claims**



1. An amusement park ride for use by a plurality of participants comprising:

a stationary platform;

a power driven turntable mounted to said stationary platform and movable relative to said stationary platform along a path about a first axis;

a plurality of stations, each of said plurality of stations carried on said power driven turntable and movable therewith for carrying at least one of the plurality of participants, at least one of said plurality of stations being mounted on said power driven turntable for rotation about a second axis passing through said one of said plurality of stations to allow rotation of said one of said plurality of stations and at least one of the plurality of participants about said second axis;

a plurality of simulated weapons, at least one of said plurality of simulated weapons being carried on each of said plurality of stations, each of said plurality of simulated weapons being capable of transmitting at least one type of a beam responsive to activation by a one of the plurality of participants, said beam being transmitted in a direction generally determined by said one of the plurality of participants;

a plurality of targets positioned adjacent said path; and

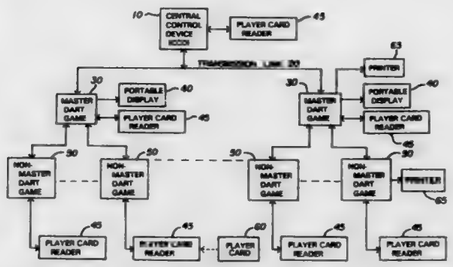
means for registering the contact of said beam with at least one of said plurality of targets and for discriminating the transmission of said beam from the transmission of other beams from said plurality of simulated weapons, thereby making it possible to score a number of contacts between said beam and said plurality of targets when each of said plurality of simulated weapons are being simultaneously activated by each of the plurality of participants.

5,114,155

SYSTEM FOR AUTOMATIC COLLECTION AND DISTRIBUTION OF PLAYER STATISTICS FOR ELECTRONIC DART GAMES

Michael L. Tillery; Eugene G. Harlan; John R. Martin; Samuel N. Zammuto, and Marcio Bonilla, all of Rockford, Ill., assignors to Arachnid, Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 539,020, Jun. 15, 1990, abandoned. This application Feb. 20, 1991, Ser. No. 658,206
Int. Cl.[5] F41J *3/02*
U.S. Cl. 273—371 **30 Claims**



1. A method of conducting dart leagues or tournaments utilizing a plurality of electronic dart games, each dart game having means for receiving, storing and transmitting data, said method further utilizing a central control device (CCD) having means for processing, inputting, storing and outputting data, said method comprising the steps of:

connecting the plurality of the electronic dart games to the central control device via a communication medium;

inputting data on each player into the central control device via the inputting means; and

communicating bidirectionally between the central control device and the plurality of electronic dart games via the communication medium.

5,114,156

ARROW POINT

Charles A. Saunders, Columbus, Nebr., assignor to Saunders Archery Company, Columbus, Nebr.

Filed May 22, 1991, Ser. No. 704,107
Int. Cl.[5] F42B *6/08*
U.S. Cl. 273—419 **6 Claims**

1. A long-tapered, smooth-surface contoured point for archery use, said point being round in transverse cross section, with cross sections of said point defining circles of smoothly varying diameters as measured along a lineal progression of said point, and said diameters increasing progressively in smooth increments in a non-linear mode along a longitudinal axis of said point in a direction from a leading end thereof rearwardly.

said point comprising an elongate head including a generally cylindrical rear section tapering and contoured to define at a forward zone thereof a sharp, elongate, probe-like apex, said head including a forward zone having an accurate peripheral contour progressing lengthwise of said head and exhibiting increased diameters rearwardly along a lineal expanse thereof,

a body of said archery point spaced axially from and extending rearwardly of said lineal expanse of said head, said body being generally cylindrical and having an enlarged diameter as compared with diameters of said head,

a coupler section of said archery point, said coupler section being positioned intermediately between and interconnecting said head with said body of said archery point,



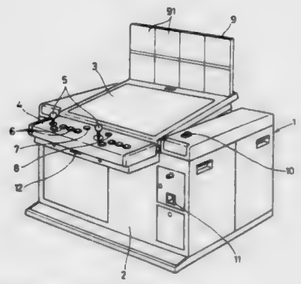
said coupler section including bounding wall means adjacent each of opposed end portions of said coupler section for defining lineally elongated inflection zones constituting spaced junctures including a first juncture of said coupler section with said head, and a second juncture of said coupler section with said body in a unitary composite structure characterized by a capacity forceably yet gently to effect physical parting of fibers in fiber mats on forced entry therewithin, and having enhanced utility as an archery point for hunting practice and for mat target use.

5,114,157

GAME MACHINE HAVING PLURAL DISPLAY PANEL UNITS AND PLURAL MEMORY CARTRIDGES

Toshihiko Kita, Osaka, Japan, assignor to SNK Corporation, Osaka, Japan

Filed Jun. 11, 1990, Ser. No. 535,568
Claims priority, application Japan, Dec. 7, 1989, 1-141943[U]
Int. Cl.[5] A63K *9/22*
U.S. Cl. 273—434 **8 Claims**



1. A game machine comprising:

a display panel comprising N discrete panel units, N being a positive integer greater than one;

N discrete memory cartridges each including memory means for storing respective game data;

wherein said N discrete panel units are provided in one-to-one correspondence with said N discrete memory cartridges and wherein each of the N discrete panel units includes means for displaying a game screen of the game data stored in a corresponding one of said N discrete memory cartridges;

a select switch;

memory cartridge select means, operatively coupled to said select switch and to said N discrete memory cartridges and to said display panel, for selectively accessing one of said N discrete memory cartridges and for selectively illuminating one of said N discrete panel units in response to said select switch; and

processor means for executing the game data of one of said N discrete memory cartridges accessed by said memory cartridge select means;

wherein said display panel includes a front plate and a back plate defining a plurality of grooves therebetween, and wherein each of said N discrete panel units includes an electroluminescence element and a panel insertable in one of said plurality of grooves, said panel including indicia indicative of the game data stored in a corresponding one of said N discrete memory cartridges.

5,114,158

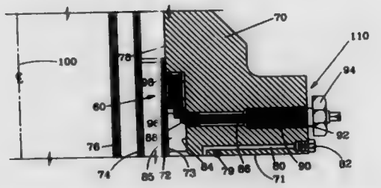
PACKING ASSEMBLY FOR OILFIELD EQUIPMENT AND METHOD

Tri C. Le, 3543 Santa Rosa La., Sugar Land, Tex. 77478

Filed Nov. 19, 1990, Ser. No. 615,585

Int. Cl.[5] F16J *15/06*; F16L *19/06*; E21B *33/04*

U.S. Cl. 277—1 **19 Claims**



1. A packing assembly for hydrocarbon recovery equipment to form a static seal between an outer cylindrical surface on the equipment and a concentric inner cylindrical surface of a conduit passing at least partially through an axial flow path within the equipment for transmitting high pressure fluids, the packing assembly comprising:

an outer seal ring having an upper radially internal first tapered surface and a lower radially internal second tapered surface, the outer seal ring further having an annular outwardly extending projection for substantially line contact static sealing engagement with the outer cylindrical surface on the equipment;

an inner seal ring having an upper radially external third tapered surface and a lower radially external fourth tapered surface, the inner seal ring further having an annular inwardly extending projection for substantially line contact static sealing engagement with the inner cylindrical surface of the conduit;

an upper energizing ring having a radially external fifth tapered surface for sliding engagement with the first tapered surface, and a radially internal sixth tapered surface for sliding engagement with the third tapered surface, the fifth and sixth tapered surfaces each being at substantially the same inclination as the mating first and third tapered surfaces, respectively;

a lower energizing ring axially moveable with respect to the upper energizing ring and having a radially external seventh tapered surface for sliding engagement with the second tapered surface, and a radially internal eighth tapered surface for sliding engagement with the fourth tapered surface, the seventh and eighth tapered surfaces being at substantially the same inclination as the mating second and fourth tapered surfaces, respectively; and

an interconnection member for limiting axial movement of the upper energizing ring with respect to the lower energizing ring, such that each of the outer and inner seal rings are supported between the upper and lower energizing rings, and the outer seal ring moves radially outward into sealing engagement with the outer cylindrical surface as the inner seal ring moves radially inward into sealing engagement with the inner cylindrical surface when one of the upper and lower energizing rings moves axially toward the other of the upper and lower rings.

15. A method of forming, positioning and setting a packing assembly in downhole equipment for static sealing between an outer cylindrical surface on the equipment and an inner cylindrical surface on a tubular member, the method comprising:

forming an outer seal ring having an upper radially internal first tapered surface, a lower radially internal second tapered surface, and at least one outwardly extending annular projection for substantially line contact static sealing engagement with the outer cylindrical surface on the equipment;

forming an inner seal ring having an upper radially external third tapered surface, a lower radially external fourth tapered surface, and at least one inwardly extending annular projection for substantially line contact static sealing engagement with the inner cylindrical surface on the tubular member;

forming an upper energizing ring having a radially external fifth tapered surface and a radially internal sixth tapered surface at substantially the same inclination as the first and third tapered surfaces, respectively;

forming a lower energizing ring having a radially external seventh tapered surface and a radially internal eighth tapered surface at substantially the same inclination as the second and fourth tapered surfaces, respectively;

positioning the outer seal ring with respect to the upper and lower energizing rings such that the first and second tapered surfaces are in sliding engagement with the fifth and seventh tapered surfaces, respectively;

positioning the inner ring with respect to the upper and lower energizing rings such that the third and fourth tapered surfaces are in sliding engagement with the sixth and eighth tapered surfaces, respectively;

mechanically connecting the upper and lower energizing rings for limiting axial movement of the upper energizing ring away from the lower energizing ring, while permitting axial movement of the upper energizing ring toward the lower energizing ring;

lowering the outer seal ring, the inner seal ring, the upper energizing ring, and the lower energizing ring as an assembly downhole to a positionable between the outer cylindrical surface on the equipment and the inner cylindrical surface on the tubular member; and

thereafter axially moving the upper energizing ring with respect to the lower energizing ring to force the outer seal ring radially outward into sealing engagement with the outer cylindrical surface and simultaneously force the inner seal ring radially inward into sealing engagement with the inner cylindrical surface.

5,114,159

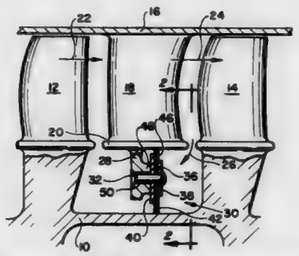
BRUSH SEAL AND DAMPER

Donald J. Baird, Jupiter; Brett D. Rhodes, Palm Beach Gardens, and William W. Griffin, Jr., Jupiter, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 5, 1991, Ser. No. 740,537

Int. Cl.[5] F16J *15/447*

U.S. Cl. 277—53 **8 Claims**



1. A gas turbine engine interstage seal arrangement comprising:

a plurality of stationary vanes annularly disposed around said rotor shaft;

a plurality of vane platforms secured to said vanes and spaced from said rotor shaft;

a plurality of arcuate brush seal assemblies, each brush seal assembly having an arcuate bristle support;

a plurality of inboard resilient bristles, tightly packed, secured to said support, and extending inwardly at an angle to the radial direction, a plurality of outboard resilient bristles, that are tightly packed, secured to said support, and extending outward at an angle to the radial direction; and

each brush seal assembly supported from a vane platform with said inboard bristles in sealing contact with said vane platform, and said outboard bristles in sealing contact with said rotor.

5,114,160

QUENCHING MECHANISM OF SHAFT SEAL FOR SLURRY PUMPS

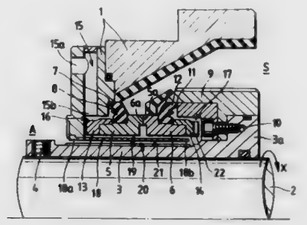
Junji Ootsuka; Youichi Ogata, and Keizaburo Nishi, all of Sakado, Japan, assignors to Eagle Industry Co., Ltd., Japan

Filed Dec. 24, 1990, Ser. No. 633,144

Claims priority, application Japan, Dec. 26, 1989, 1-149577[U]

Int. Cl.[5] F16J *15/16*

U.S. Cl. 277—70 **1 Claim**



1. A mechanical seal apparatus for a slurry pump comprising:

a rotatable shaft;

a non-rotating sealing ring disposed about said shaft;

a non-rotating annular flange disposed about said shaft and said non-rotating sealing ring;

a first annular elastic packing member positioned in sealing relationship between said non-rotating flange and said sealing ring;

a rotatable sealing ring axially spaced from said non-rotating sealing ring along the axis of said rotatable shaft and disposed about said shaft;

an annular sleeve in sealing relationship with said shaft;

a seal cover fixed to and extending laterally from said annular sleeve;

a second annular elastic packing member positioned in sealing relationship between said seal cover and said rotatable sealing ring;

said non-rotating and rotatable sealing rings having opposed sealing surfaces generally perpendicular to the axis of said shaft and in contact with each other to form a seal therebetween;

a baffle sleeve attached to and supported by said non-rotating annular flange in a manner substantially parallel to said shaft, said baffle sleeve being spaced from each said rotatable and non-rotating sealing rings and said annular sleeve, and having an unsupported end forming a first annular space and said a second annular space which together form a quench fluid path;

said first annular space residing between an outer surface of said baffle sleeve and said rotatable and non-rotating sealing rings, and said second annular space residing between an opposing inner surface of said baffle sleeve and said shaft sleeve;

quench fluid inlet means in said non-rotating annular flange in communication with said first annular space;

quench fluid outlet means in communication with said second annular space;

wherein a rearmost end of said rotatable sealing ring includes a plurality of radial grooves, the direction of said grooves being such as to urge quench fluid in the radial direction of said shaft when said shaft is rotated; and

said outer surface of said shaft sleeve including a spiral groove, said groove being oriented to resist the flow of quench fluid in said second annular space.

5,114,161

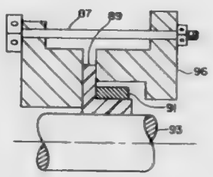
FLUID SEAL

George E. Sgourakes, Millis, and Stanislaw Koziol, Wrentham, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Division of Ser. No. 418,103, Oct. 6, 1989. This application Mar. 20, 1991, Ser. No. 661,782

Int. Cl.[5] F02F *5/00*

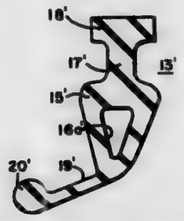
U.S. Cl. 277—138 **2 Claims**



1. A fluid seal construction adapted to seal flow in an axial direction between a cylindrical surface of an outer member and a cylindrical surface of an inner cylindrical member, said outer member comprising a jacket having a L-shaped cross section comprising a first leg having essentially parallel radial surfaces and a second leg having essentially parallel inner axial and outer axial cylindrical surfaces, clamping means to position said L-shaped member against said cylindrical surface of said inner member, said clamping means being positioned against said radial surfaces and a spring comprising a hollow cylinder having a slot extending through the thickness and through the entire axial length of said cylinder, said spring being positioned against said outer axial cylindrical surface to fit and provide

pressure against said inner axial surface of said second leg against said inner cylindrical member.

5,114,162
GASKET FOR USE IN MANHOLE BASES AND THE LIKE
Jack Ditcher, Langhorne, Pa., assignor to A-LOK Products, Inc., Tullytown, Pa.
Filed Nov. 13, 1986, Ser. No. 930,352
Int. Cl.[5] F16J *15/10, 15/32;* **F16L** *21/02*
U.S. Cl. 277—207 A **11 Claims**



1. An annular gasket for providing a fluid-tight seal between a sewer pipe and an annular opening in a wall of cast material through which said sewer pipe passes, said opening having a central axis, said gasket comprising a length of a linear extrusion of elastomeric material having first and second ends and having a cross-sectional configuration comprising a central portion having a substantially pear-shaped cross-section defining a wide and a narrow end and tapered sides extending between said wide and narrow ends; said length being bent into an annular gasket so that said first and second ends are joined to oppose each other; an outer radial embedment portion of substantially T-shaped cross-section defining a cylindrical-shaped flange portion of the annular gasket and defining a web portion integrally joined at one end thereof to the mid region of said flange portion and integrally joined to the mid region of the wide end of said pear-shaped central portion;

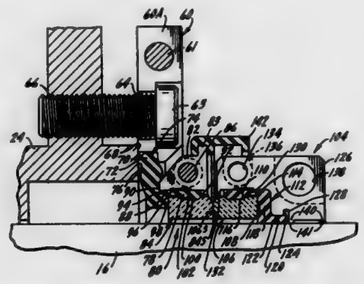
said flange portion and part of the web portion being embedded in said wall when it is cast;

said annular gasket having a radially inwardly end portion remote from said embedment portion comprising an elongated lip having a cross-section defined by an elongated rectangle ending in a bead at the free end thereof, the thickness of said lip except for the bead in cross-section being less than the width of the narrow end of said central portion and having a first end integrally joined to the narrow end of said central portion, said lip extending away from said central portion and terminating in a second free end, said lip extending in a direction diagonal to an imaginary plane passing through said web portion and said central portion when said gasket is in an unstressed state, said imaginary plane being substantially perpendicular to the central axis of said opening;

the web portion and the central portion lying along said imaginary plane when in the unstressed state, the second free end of said lip defining an opening which is smaller in diameter than the outer diameter of a sewer pipe to be inserted into the gasket; and

said lip and at least a portion of one of the tapered surfaces adjacent said narrow end of said central portion being so related as to embrace said sewer pipe when said sewer pipe is forced into the gasket.

5,114,163
SPLIT MECHANICAL FACE SEAL
Jon J. Radosav, Des Plaines; Thomas A. Evans, Schaumburg; David M. Dudek, Palatine; Russell G. Wieser, Vernon Hills; Brian J. Atwater, Chicago, and Robert J. Eisbrenner, Glenview, all of Ill., assignors to John Crane Inc., Morton Grove, Ill.
Filed May 25, 1990, Ser. No. 529,208
Int. Cl.[5] F16J *15/38*
U.S. Cl. 277—81 S **24 Claims**



1. A split mechanical face seal for providing fluid-tight sealing between a housing and a shaft adapted to rotate relative thereto, said split seal comprising:

(a) adjacent, rigid, annular primary and mating rings each defining generally radial opposed sealing faces, each of said rings having a plurality of arcuate ring segments and means for joining and retaining the segments of each said ring, whereby each said opposing sealing face defined by said rings has a smooth surface devoid of discontinuities around the complete circumference of each said annular ring;

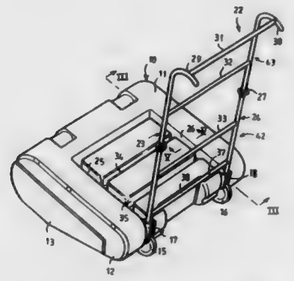
(b) a plurality of resilient split means for positioning and supporting each of said rings in generally coaxial relationship with the shaft and with the other said ring, said positioning means defining the relative positions of said rings so that the sealing face of each said ring is in opposite and facing relationship to the sealing face of the other said ring, one of said postioning means rigidly supporting said primary ring and the other of said positioning means non-rigidly supporting and biasing said mating ring in an axial direction against said primary ring; and

(c) a plurality of split holder means for circumferentially supporting each said means for postioning in a substantially concentric relationship to the respective ring, said split holder means comprising a pair of semicircular holder members releasably attachable to each other and when in an attached condition, sealingly engaging and compressing to a limited degree at least a portion of said respective resilient positioning means, wherein said resilient means for positioning said mating ring and said respective holder member supporting said mating ring are shaped and dimensioned to inhibit translation of said mating ring in the radial and circumferential direction relative to the housing and to provide to the mating ring and to said respective holder member a limited range of translation in the axial direction relative to the housing.

5,114,164
CASE
Peter W. Bothwell, and Roy Bothwell, both of "Meoncote" 114 Shipston Road, Stratford upon Avon, Warwickshire, United Kingdom
Filed Apr. 13, 1989, Ser. No. 337,270
Int. Cl.[5] A45C *5/14*
U.S. Cl. 280—37 **15 Claims**

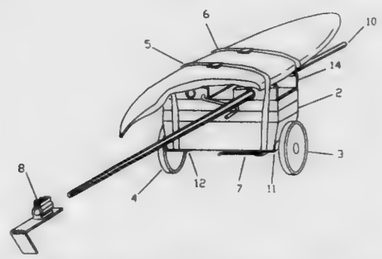
1. A case comprising a hollow body with a pair of opposite, external major faces and minor faces extending between the

major faces, a single mast having a pair of side members, and a pair of wheels mounted on the mast for rotation relative thereto about a common wheel axis, wherein the mast is mounted on the body for pivoting of the mast and wheels together about a pivot axis common to the mast and the wheels between an extended configuration and a contracted configuration, wherein, in the extended configuration the mast extends from the body in a direction from one major face to the other, wherein said pivot axis is transverse to said direction, wherein said one major face has engaging means for engaging a level



floor when the case is in the extended configuration with the mast projecting upwardly from the body and being substantially upright, the other of said major faces is an upper face of the body and is substantially parallel to the floor and the wheels project below said one face of the body into engagement with the floor, wherein the body includes opposed pairs of webs which extend from the pivot axis across said other of the major faces, wherein the body defines a respective recess between the webs of each pair and wherein, when in the contacted configuration, respective portions of the mast are received in said recesses.

5,114,165
STORABLE WHEELED CARGO CARRIER
Monty D. Vogel, 157 Hearthside Rd., Standish, Me. 04084
Filed Jan. 2, 1991, Ser. No. 636,717
Int. Cl.[5] B62B *1//10*
U.S. Cl. 280—47.331 **10 Claims**



1. A storable apparatus for transporting small watercraft of the type including sailboards, canoes, small sailboats, comprising:

a. a storage container, wherein said container comprises a first support rack and a second support rack, wherein each of said support racks comprises a horizontal surface and two vertical legs, wherein said horizontal surfaces of said support racks are detachably affixed to a lid of said container, and wherein said watercraft rests on said vertical legs of said support racks;

b. a first support fixture and a second support fixture, wherein each of said support fixtures comprises a horizontal surface and two vertical legs, and wherein a bottom surface of said storage container is detachably affixed to said horizontal surface of each of said support fixtures;

c. a first retaining strap and a second retaining strap, wherein said first retaining strap is detachably affixed to said first support fixture and said second retaining strap is detachably affixed to said second support fixture, and wherein both of said straps are of sufficient length to surround said watercraft on said support racks;

d. a rotatable carrier axle extending through said vertical legs of each of said support fixtures; and

e. a first wheel and a second wheel, wherein said first wheel is detachably affixed to a first end of said carrier axle and said second wheel is detachably affixed to a second end of said carrier axle,

wherein said support racks, said support fixtures, said retaining straps, said carrier axle, and said wheels are all removable and storable within said storage container, and wherein said storage container is storable within said watercraft.

5,114,166
WHEELED COASTING BOARD
Robert E. McCosker, 24232 Tahoe Ct., Laguna Niguel, Calif. 92677
Filed Mar. 23, 1990, Ser. No. 497,887
Int. Cl.[5] A63C *17/02*
U.S. Cl. 280—87.042 **10 Claims**



1. A wheeled board for riding downhill over the ground, said board comprising:

a generally flat riding board having an upper riding surface and a lower carriage surface, a front, a back and elongated right and left sides;

a front carriage assembly having a front upper plate affixed to the lower carriage surface near the front of said riding board, said front carriage assembly including a front axle supported by said front upper plate through biasing and support means comprising three discreet spring means which directly and largely support the front upper plate and which permit the front axle to move upwardly toward the riding board under load, and said biasing and support means being affixed between said front axle and said front upper plate so that the axle will turn clockwise as viewed from above when the board is tilted to the right and counterclockwise when the board is tilted to the left;

a rear carriage assembly having a rear upper plate affixed to the lower carriage surface near the rear of said riding board, said rear carriage assembly including a rear axle supported by said rear upper plate through biasing and support means comprising three discreet spring means which directly and largely support the rear upper plate which permit the rear axle to move upwardly toward the riding board under load, and said biasing and support means being affixed between said rear axle and said rear upper plate so that the axle will turn counter-clockwise as viewed from above when the board is tilted to the right and clockwise when the board is tilted to the left;

wherein each of said front and biasing and support means comprises a single inner coiled spring surrounding a support rod and a pair of outer coiled springs, each surrounding a support rod, and the support rods being affixed three to the front upper plate and three to the rear upper plate, and the front support rods being affixed to the front axle at their lower ends, and the rear support rods being affixed to the rear axle at their lower ends, and wherein the front

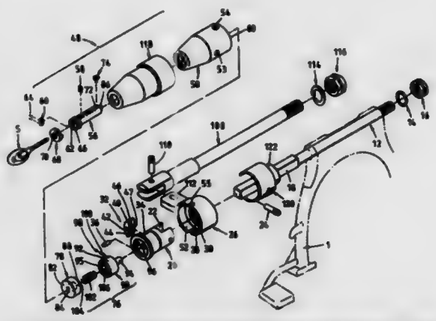
support rods are affixed to the front axle through a lower plate, and said lower plate is held to the front upper plate through both the three support rods and by a support link affixed at the center of the inner edge of the upper and lower plates; and

a right and a left front wheel and a right and a left rear wheel, each wheel being rotatably affixed to an axle, each of said wheels having a diameter of between four and eight inches and a width of between and three and nine inches.

5,114,167
LOCKING APPARATUS FOR USE IN A MOTOR CYCLE STAND

Jin-Ren Shieh, No. 178, Shih Chia Rd., Taichung, Taiwan

Filed Jan. 8, 1991, Ser. No. 638,572
Int. Cl.[5] B62H *00/00*
U.S. Cl. 280—297 **7 Claims**



1. A locking apparatus for use in a motor cycle stand, comprising:

a main shaft pivotally mounted in an axial hole of the motor cycle stand;

a roller connected to one end of said main shaft;

a position lever having means for fastening to a motor cycle body;

a roller jacket fastened to said position lever, said roller jacket having a braking device disposed therein; said braking device connected between said roller and said roller jacket;

a lock body coupled with said roller jacket and a lock core housed in said lock body; and

a clutch means for engaging and disengaging said braking device, said clutch means comprising an activator and a driven member housed in said lock body, and a spring member sandwiched between said activator and said driven member.

5,114,168
BOAT TRAILER OR KIT

Charles W. Kehl, 11466 Irvington, Warren, Mich. 48093

Continuation of Ser. No. 369,609, Jun. 21, 1989, abandoned.
This application Oct. 11, 1991, Ser. No. 776,681
Int. Cl.[5] B60P *3/10*
U.S. Cl. 280—414.1 **9 Claims**

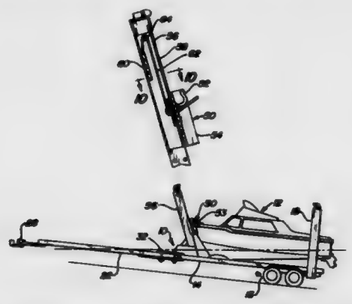
1. A boat trailer for enabling transportation of a boat and adapted to be towed by a motor vehicle comprising:

means for connecting said trailer to said motor vehicle,

channel means at a forward end of said trailer and extending upwardly from said trailer in a substantially vertical direction,

sliding mooring hook means for traveling along said channel means in a substantially vertical direction for connection to said boat said sliding mooring hook means moveable from a first position along said channel means while attached to said boat when said boat is floating over said trailer with the bow of said boat unsupported by said trailer to a displaced downward second position along said channel means while attached to said boat when said boat bow is supported by said trailer

biasing means for biasing said sliding hook means in a position at or above water level wherein during loading of said boat said biasing means allows said sliding hook means to be easily secured to bow of said boat and said sliding mooring hook means allows said boat to settle into desired support position on said trailer and during unloading of said boat said biasing means ensures that sliding hook mooring means allows said boat to float freely while continually maintaining control over position of said boat,

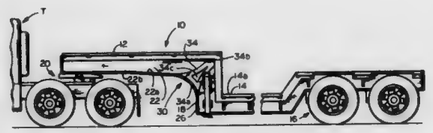


lateral support post means affixed to said trailer for restraining lateral motion of said boat during loading and unloading of said boat, wherein during loading of said boat as said sliding mooring hook means moves downwardly along said channel means from said first to said second position while attached to said boat said lateral support post means guides said boat floating in water into a desired support position on said trailer as the trailer and boat are withdrawn from the water and during unloading of said boat, said lateral support post means restrain said boat as said trailer is moved into the water causing said boat to float in the water as said sliding mooring hook means moves from said second to said first position.

5,114,169
DROP FRAME TRUCK TRAILER

Lawrence A. Botkin, and Mahmud K. Javadi, both of Omaha, Nebr., assignors to Fruehauf Trailer Corporation, Southfield, Mich.

Continuation of Ser. No. 538,186, Jun. 14, 1990, abandoned.
This application Jul. 16, 1991, Ser. No. 731,302
Int. Cl.[5] B62D *53/06*
U.S. Cl. 280—423.1 **42 Claims**



1. A trailer comprising, in combination:

a first generally horizontally extending member having a first end and a second end and a generally vertically extending web, said first generally horizontally extending member further having a bottom flange extending generally transversely of said web, said first end being adapted to be disengageably attached to a fifth wheel of a truck tractor;

a second generally horizontally extending member having a first end and a second end, said second generally horizontally extending member being positioned at a lower elevation than said first generally horizontally extending member and having its first end generally vertically aligned with said second end of said first generally horizontally extending member;

a generally vertically extending member having an upper end secured to said first generally horizontally extending member at a location adjacent said second end of said first generally horizontally extending member, said generally vertically extending member further having a lower end secured to said second generally horizontally extending member at a location adjacent said first end of said second generally horizontally extending member, a generally vertically extending web and a flange extending generally transversely of said web of said generally vertically extending member;

said generally vertically extending member forming a joint with said first generally horizontally extending member, said joint having an inboard side and an outboard side, said generally vertically extending web of said generally vertically extending member being aligned with said generally vertically extending web of said first generally horizontally extending member and said flange of said generally vertically extending member being aligned with said flange of said first generally horizontally extending member;

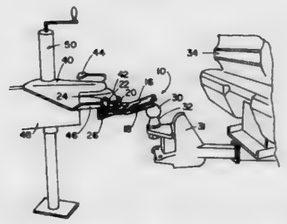
running gear means affixed to said second generally horizontally extending member at a location adjacent said second end thereof, said running gear means permitting said trailer to be drawn over a road or highway when said trailer is affixed to a truck tractor; and

a planar reinforcing element secured to one of said inboard side and said outboard side of said joint in surface to surface engagement with said web of said generally vertically extending member and said web of said first generally horizontally extending member, said reinforcing element having a generally triangular outline and having an edge extending substantially to said flange of said first generally horizontally extending member and substantially to said flange of said generally vertically extending member and serving to reinforce said joint against bending loads resulting from a load imposed on said generally horizontally extending member at a location between the first and seconds ends thereof.

5,114,170
TRAILER COUPLING GUIDE

Joseph Lanni, and Ruth Lanni, both of 9094 Salsbury Dr., Brooksville, Fla. 34613

Filed Jan. 29, 1991, Ser. No. 647,103
Int. Cl.[5] B60D *1/06*
U.S. Cl. 280—477 **8 Claims**



1. A device that facilitates connection of a hitch ball and a socket adapted to receive the hitch ball, comprising:

a generally flat main body plate;

an upwardly angled deflection plate, integral with said main body plate for slideably engaging said hitch ball and driving said hitch ball downwardly;

said deflection plate having a bottom surface that slideably engages an upper surface of said hitch ball;

said deflection plate having a leading end and a trailing end, said leading end having a greater transverse extent than said trailing end;

a pair of guide members depending from laterally opposite edges of said deflection plate, said guide members accordingly being disposed in converging relation to one another;

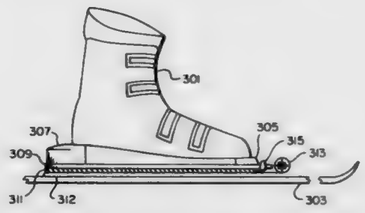
a receptor opening, adapted to receive said hitch ball, formed in said main body plate, adjacent a trailing end of said deflection plate;

whereby said hitch ball is driven downwardly by said deflection plate and is guided into said receptor opening by said guide members when a vehicle, to which said hitch ball is attached, travels in reverse, said deflection plate effecting compression of said vehicle's springs as said hitch ball travels rearwardly, said springs urging said hitch ball upwardly through said receptor opening and into said socket when said hitch ball travels beyond said trailing end of said deflection plate.

5,114,171
MOTION DETECTOR

Nicholas F. D'Antonio, 7695 Admiral Dr., Liverpool, N.Y. 13088

Division of Ser. No. 338,092, Jan. 8, 1982, Pat. No. 4,892,325.
This application Oct. 4, 1989, Ser. No. 417,185
The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.
Int. Cl.[5] A63C *9/088*
U.S. Cl. 280—612 **51 Claims**



1. An electronic motion detector for detecting at least one direction of relative lateral movement of two bodies and the magnitude of that movement, said detector comprising:

source means for activating said detector;

sensing means having a plurality of electrical values occuring at the same time changeable in direct response to the lateral movement of said source means with respect to said sensing means;

measuring means connected to said sensing means for interpreting changes in said electrical values and generating output signals indicating the direction and magnitude of said lateral movement; and

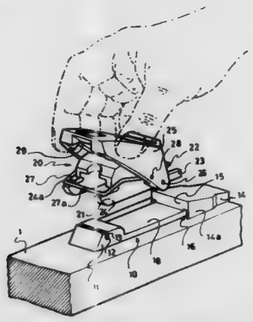
electronic balancing means connected to said measuring means for generating a balancing signal of variable magnitude and adding said balancing signal to one of said output signals when said source means has not moved with respect to said sensing means, to produce a summed output signal having a near zero magnitude.

5,114,172

INTEGRAL BINDING

Didier Rousset, Aix les Bains, and Gerard Grailliat, Annecy, both of France, assignors to Salomon S.A., Chavanod, France

Filed Jan. 5, 1990, Ser. No. 461,593
Claims priority, application France, Jan. 5, 1989, 89 00291
Int. Cl.[5] A63C *9/00*
U.S. Cl. 280—633 **22 Claims**



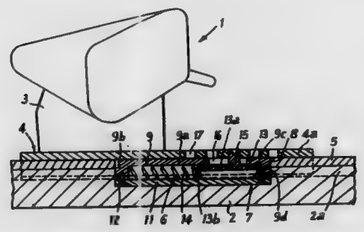
1. Ski for mounting a binding mechanism comprising an assembly component and a swingable element, said ski comprising on an upper surface thereof first and second housing means for rear and front longitudinal ends of said assembly component, respectively, said first housing means comprising a recessed stationary housing receiving said rear longitudinal end of said assembly component, and said second housing means comprising means for receiving said swingable element of said binding mechanism adapted to be pulled down onto said front end of said assembly component of said binding mechanism, and to be locked in position in said receiving means on said upper surface of said ski so as to delimit said recessed housing.

5,114,173

SAFETY SKI BINDING

Gilles R. Goud, Cran Gevrier, and Jean-Claude Brischoux, Annecy le Vieux, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Dec. 12, 1989, Ser. No. 448,911
Claims priority, application France, Dec. 13, 1988, 88 16399
Int. Cl.[5] A63C *9/18*
U.S. Cl. 280—633 **43 Claims**



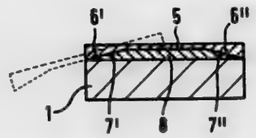
1. A rear binding for an alpine ski, adapted to hold the rear end of a boot on the ski, comprising:
a binding body;
a jaw carried by said body for retention of the rear end of the boot;
an energization mechanism for said jaw, also carried by said body;
a base upon which said body is solidly affixed;
a slide upon which said base is longitudinally slidably mounted;
a housing comprising an opening formed in the upper surface of the ski; and
means for elastically biasing said body forwardly, comprising (i) at least one recoil spring and (ii) means for linking said body and said ski for permitting an adjustment of the longitudinal position of said body, said elastically biasing means being mounted in said housing formed in the upper surface of the ski, said recoil spring being positioned for elastically biasing the linking means with respect to the ski.

5,114,174

BEARING ARRANGEMENT FOR THE LATERALLY MOVABLE VERTICAL SUPPORT OF A SKI BOOT ON A SKI

Martin Bogner, Ostfildern, Fed. Rep. of Germany, assignor to GEZE Sport International GmbH, Fed. Rep. of Germany

Filed Feb. 21, 1991, Ser. No. 658,674
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1990, 4008677
Int. Cl.[5] A63C *9/00*
U.S. Cl. 280—636 **16 Claims**



1. A bearing arrangement for the laterally movable vertical support of a ski boot on a ski, comprising
a bearing part disposed on top of the ski;
a ski boot support part disposed on top of the bearing part, said ski boot support part including an upwardly facing support surface for supporting a ball area of a ski boot sole,
a guiding surface structure on a top surface of the bearing part;
and a counter guiding surface-structure on a bottom surface of the ski boot support part,
wherein said guiding surface structure and said counter guiding surface structure are configured to engage one another and positively guide lateral movement of the ski boot support part such that the ski boot support part exhibits an increasing gradual controlled oblique position with a gradient in the displacement direction with an increasing displacement in the direction of the transverse-axis of the ski.

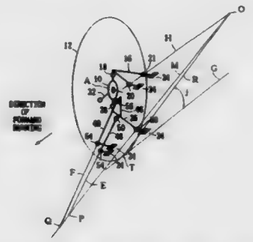
5,114,175

VEHICLE WHEEL SUSPENSION WITH QUADRILATERAL LINK STRUT

Hideki Sakai, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 31, 1991, Ser. No. 708,296
Claims priority, application Japan, Jun. 5, 1990, 2-146602
Int. Cl.[5] B60G *3/20*
U.S. Cl. 280—675 **5 Claims**

1. A suspension device for a vehicle wheel in a vehicle, comprising:
a carrier for supporting said vehicle wheel to be rotatable about a central axis of rotation thereof;
an upper arm connected with an upper portion of said carrier at an outboard end thereof to be pivotable relative to one another about at least one substantially horizontal and longitudinal first axis of revolution and also connected with a body of the vehicle at an inboard end thereof to be pivotable relative to one another about a substantially horizontal and longitudinal axis of revolution;
a lower arm connected with a lower portion of said carrier at an outboard end thereof to be pivotable relative to one another about at least one substantially horizontal and longitudinal axis of revolution and also connected with the body of the vehicle at an inboard end thereof to be pivotable relative to one another about a substantially horizontal and longitudinal axis of revolution and to have a certain small freedom of revolution about a substantially vertical axis of revolution;
a first strut member connected with an outboard portion of said lower arm at a rear end thereof to be pivotable relative to one another in substantially all directions of revolution for at least a certain small amount of revolution about a first point of revolution and also connected with the body of the vehicle at a front end thereof to be pivotable relative to one another in substantially all directions of revolution for at least a certain small amount of revolution about a second point of revolution;



a second strut member connected with an outboard portion of said lower arm at a rear end thereof to be pivotable relative to one another in substantially all directions of revolution for at least a certain small amount of revolution about a third point of revolution and also connected with the body of the vehicle at a front end thereof to be pivotable relative to one another in substantially all directions of revolution for at least a certain small amount of revolution for at least a certain small amount of revolution about a fourth point of revolution;
wherein a first phantom straight line which passes said first point of revolution and said second point of revolution and a second phantom straight line which passes said third point of revolution and said fourth point of revolution substantially traverse a third phantom straight line passing a center of the pivotable connection of said inboard end of said lower arm with the vehicle body on a front side of said lower arm, said third phantom straight line substantially traversing said first axis of revolution on a rear side of said lower arm.

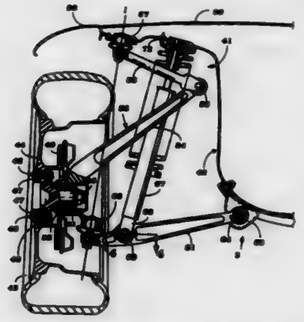
5,114,176

SUSPENSION MECHANISM FOR VEHICLES

Seiji Sawai, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jan. 8, 1991, Ser. No. 638,678
Claims priority, application Japan, Jan. 9, 1990, 2-1062; Aug. 31, 1990, 2-228418
Int. Cl.[5] B60G *3/18*
U.S. Cl. 280—691 **33 Claims**

1. A suspension system for the dirigible wheel of a motor vehicle comprising an axle carrier for rotatably supporting said wheel about an axis, an upper arm having a pivotal connection to said axle carrier at one of it's ends, first ball joint means for connecting the other end of said upper arm to said vehicle for pivotal suspension movement of said upper arm and for steering movement of said upper arm about a generally vertically extending steering axis, a lower arm pivotally connected to said vehicle at one end for suspension movement thereof, and second ball joint means for pivotally connecting the other end



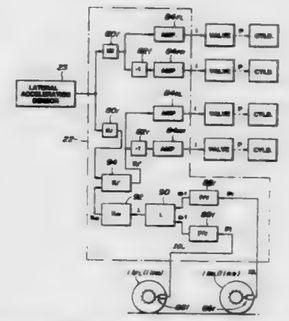
of said lower arm to said axle carrier for suspension and steering movement thereof.

5,114,177

ANTI-ROLLING CONTROLLING SYSTEM FOR AUTOMOTIVE ACTIVE SUSPENSION SYSTEM WITH ROAD FRICTION DEPENDENT VARIABLE CONTROL CHARACTERISTICS

Yukio Fukunaga; Naoto Fukushima; Yohsuke Akatsu; Itaru Fujimura, and Masaharu Satoh, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 12, 1989, Ser. No. 365,468
Claims priority, application Japan, Jun. 10, 1988, 63-142866
Int. Cl.[5] B60G *17/01*
U.S. Cl. 280—707 **22 Claims**



1. An anti-rolling control system for an automotive suspension system comprising:
a front suspension system disposed between a vehicular body and a suspension member rotatably supporting a front wheel, said front suspension system defining a working chamber filled with a working fluid having a variable fluid pressure within said working chamber for adjusting suspension characteristics;
a rear suspension system disposed between a vehicular body and a suspension member rotatably supporting a rear wheel, said suspension system defining a working chamber filled with a working fluid having a variable fluid pressure within said working chamber for adjusting suspension characteristics;
first pressure control valve means associated with said working chamber of said front suspension system for controlling introduction and draining of working fluid into and

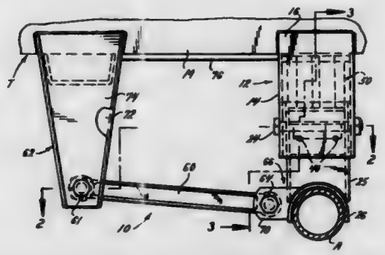
from said working chamber for adjusting the fluid pressure therein;

second pressure control valve means associated with said working chamber of said rear suspension system for controlling introduction and draining of working fluid into and from said working chamber for adjusting the fluid pressure therein;

means for monitoring vehicular rolling magnitude for producing a rolling magnitude indicative signal;

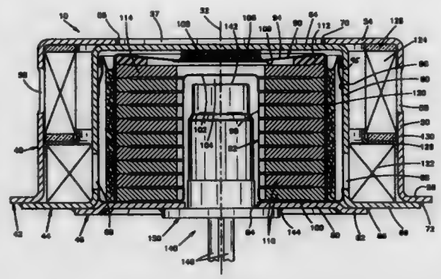
means for deriving first and second control signals on the basis of said rolling magnitude indicative signal in order to control said first and second pressure control valve means for suppressing vehicular rolling, said control signal deriving means deriving said second control signal in such a manner that a smaller lateral load shift is provided at the rear suspension system than at said front suspension system, said control signal deriving means providing the second control signal variation characteristics for varying said control signal at a smaller rate than said first control signal when said road friction representative data indicates a low road friction condition; and means for detecting a road friction representative factor for producing road friction representative data, and said control signal deriving means being responsive to said road friction representative data for varying variation characteristics of said second control signal depending on the value of said road friction representative data.

5,114,178
SUSPENSION APPARATUS
David A. Baxter, Rt. #1, Box 71, Warrenton, Mo. 63383
Continuation of Ser. No. 322,530, Mar. 13, 1989, abandoned. This application Oct. 11, 1990, Ser. No. 596,556
Int. Cl.[5] B60G *11/22*
U.S. Cl. 280—716 **20 Claims**



1. A suspension apparatus for a vehicle having an axle positioned beneath a frame member comprising: a housing means installable between the axle and a frame member, the housing having a first rigid section rigidly attachable to a frame member above the axle and a second rigid section rigidly attachable to an axle member, and the first section and the second section including means telescopically joining the first section and the second section for sliding, telescoping movement of one section within the other section; a plate across the internal end of the inner section, a spring means positioned within the outer section in the form of a resilient spring adapted to be compressed by the plate as the housing sections telescope together, and a housing section travel limiter adapted to restrict travel of the housing sections so that on compression of the spring the outer housing section does not strike the member to which the inner housing section is attached, to restrict travel of the housing sections on spring decompression, and to prevent separation of the housing sections, the rigid housing sections forming means for transmitting side loads between the housing sections and between the axle and a vehicle frame.

5,114,179
SAFETY APPARATUS
Jerome W. Emery, Lakeland, Fla., and John P. O'Loughlin, Mesa, Ariz., assignors to TRW Inc., Lyndhurst, Ohio
Filed Dec. 18, 1990, Ser. No. 629,426
Int. Cl.[5] B60R *21/28*; C06D *5/00*
U.S. Cl. 280—741 **19 Claims**

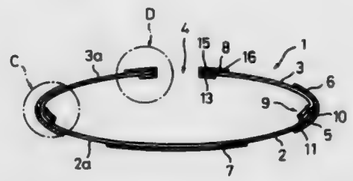


8. An apparatus for use in inflating a restraint for an occupant of a vehicle, said apparatus comprising:

an inflator housing, said inflator housing including first and second end walls which partially define a chamber; and

a canister containing gas generating material, said canister including a first wall, a second wall and a side wall, said side wall of said canister being fixedly attached to said first and second walls of said canister, said first wall of said canister engaging said first wall of said housing, said first wall of said canister being resiliently deformed and pressing against said first wall of said housing, said second wall of said canister engaging said second wall of said housing, said side wall transmitting force from said resiliently deformed first wall of said canister to maintain said second wall of said canister in engagement with said second wall of said housing.

5,114,180
AIR BAG
Yoshinori Kami, Saitama, and Kunihiko Fukumori, Takatsuki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
PCT No. PCT/JP89/00791, § 371 Date Apr. 2, 1990, § 102(e) Date Apr. 2, 1990, PCT Pub. No. WO90/01436, PCT Pub. Date Feb. 22, 1990
PCT Filed Aug. 1, 1989, Ser. No. 465,265
Claims priority, application Japan, Aug. 3, 1988, 63-192829; Aug. 6, 1988, 63-195311; Jun. 14, 1989, 1-149339
Int. Cl.[5] B60R *21/20*
U.S. Cl. 280—743 **23 Claims**



1. An air bag for mounting in a vehicle having, when inflated, a first portion for opposing the vehicle and a second portion for opposing an occupant, the air bag comprising:

at least two pieces of gas permeable fabric, each having a circumferential edge, joined to one another at a continuous seam radially inward from the circumferential edge, forming an air bag having an interior and an exterior surface;

one of the at least two pieces of gas permeable fabric constituting the first portion having an opening therein defined by an internal perimeter edge;

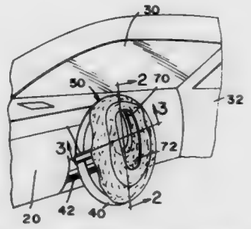
another of the at least two pieces of gas permeable fabric constituting the second portion;

a gas impermeable coating disposed on at least a fraction of the second portion forming a continuous impermeable area for engaging, when inflated, an occupant's torso and head;

a gas generator connected to the first portion adjacent the internal perimeter edge of the opening for inflating the air bag to a predetermined pressure upon impact of the vehicle with another object; and

the at least two pieces of gas permeable fabric having a total gas permeable uncoated area selected as a function of warp and weft density of the gas permeable fabric for uniformly exhausting gas to approximately zero pressure in the air bag in the range from approximately 70 milliseconds to 170 miliseconds from commencement of inflation of the air bag and in response to the predetermined pressure of the gas during inflation of the air bag and external pressure of the occupant against the second portion of the air bag.

5,114,181
CRASH PAD FOR VEHICLE STEERING WHEEL
Richard B. Songer, P.O. Box 17558, Fountain Hills, Ariz. 85269
Filed Aug. 20, 1990, Ser. No. 570,040
Int. Cl.[5] B60R *21/05*
U.S. Cl. 280—750 **4 Claims**



1. A crash pad buffer for vehicle steering wheel which comprises:

(a) a soft annular relatively thick foam pad dimensioned to fit on the operator side of a vehicle steering wheel,

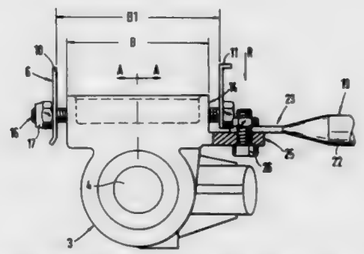
(b) circumferential indentation at spaced areas on the periphery of the pad to provide operator hand access to the steering wheel,

(c) releasable means to secure said buffer pad to the steering wheel,

(d) an opening formed in said pad for visual access to a vehicle instrument panel, the margins of which openings receive and protect the head, eyes, nose, mouth and chin of a driver upon sudden impact of the vehicle,

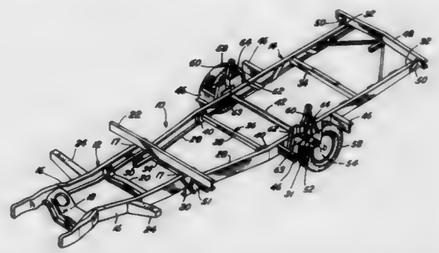
(e) the opening being oval and egg-shaped with the long axis of the oval vertically disposed and the walls of the opening tapering outwardly and the lower surface tapering downwardly to the greater degree.

5,114,182
MOTOR VEHICLE STEERING COLUMN
Wolfram Thull, Korntal-Münchingen, and Hans-Heinrich Kohlmeier, Moensheim, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany
Filed Feb. 1, 1991, Ser. No. 648,817
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1990, 4003942
Int. Cl.[5] B62D *1/18*
U.S. Cl. 280—779 **6 Claims**



1. A steering column for a vehicle and the like, comprising a jacket tube, at which locally at least one bearing section is provided for fastening thereof to a console mounted on the forward structure of the vehicle, wherein the bearing section of the jacket tube, as viewed in the transverse direction, is slidably arranged on the console, and the jacket tube, via a support, is operatively connected to a vehicle body part having a high impedance.

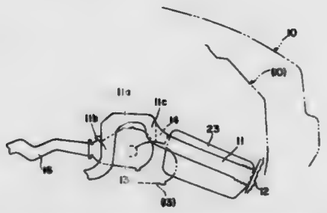
5,114,183
RECREATIONAL VEHICLE FRAME
Raymond Haluda, Elkhart, and Ramon Michen, Mishawaka, both of Ind., assignors to Coachmen Industries, Inc., Elkhart, Ind.
Filed Sep. 19, 1990, Ser. No. 585,320
Int. Cl.[5] B62D *21/00, 21/11*
U.S. Cl. 280—781 **4 Claims**



1. A frame for a recreational vehicle, said frame comprising a front section and a rear section supported by wheels, said front section having a pair of spaced side rails interconnected by cross members, said front sections spaced side rails each having a rearward end, said rear section also including a pair of spaced side rails interconnected by cross members, said rear section side rails each having a forward end, said rearward ends of the front section side rails overlying said forward ends of the rear section side rails, said front and rear section side rails being interconnected at their overlying ends by a plurality of braces connecting said side rails at their overlying locations, wherein said rear section side rails carries an axle assembly, said axle assembly including a pair of pivot arms each interconnected at one end to a torsion bar supporting a said side rail, one of said pivot arms positioned on each side of said frame

adjacent a said side rail, each pivot arm carrying an axle at its other end, a vehicle wheel mounted upon each axle, a shock tower located above and over a said axle, a shock absorber connected between said upper end of each shock tower and a said pivot arm adjacent said axle carried by the pivot arm, each pivot arm being pivotal between a down no-load and an up fully loaded position in which said shock absorber connected to the pivot arm is maintained in a substantially vertical orientation.

5,114,184
AUTOMOBILE REAR BODY STRUCTURE
Takeshi Shimomura; Katumi Sakane; Makoto Tokuda, and Sinpei Egawa, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Jul. 3, 1990, Ser. No. 547,150
Claims priority, application Japan, Jul. 3, 1990, 1-171389
Int. Cl.[5] B62D *21/15*
U.S. Cl. 280—784 **9 Claims**



1. An automobile rear body structure comprising:
a pair of rear side frames extending in directions to be longitudinal of a vehicle body, each said rear side frame having a diagonally upwardly and rearwardly extending kick-up portion to form a bridge for a respective rear wheel zone;
a differential unit disposed substantially between said kick-up portions of said pair of rear side frames;
a fuel tank positioned rearwardly of sad differential unit; and
means for, in the event of a rear end collision with said rear body structure that tends to push said fuel tank forwardly, substantially avoiding damage to said fuel tank due to contact thereof with said differential unit, said means comprising a medial cross member extending transversely between said pair of rear side frames at a location immediately rearwardly of said differential unit and forwardly of said fuel tank, said differential unit being connected to said medial cross member, said medial cross member having opposite ends connected to respective said rear side frames at locations immediately rearwardly of said kick-up portions thereof, and said fuel tank being mounted to said rear frame members rearwardly of said medial cross member, such that in the event of a rear-end collision said medial cross member is pushed forwardly and thereby moves said differential unit forwardly, thus avoiding contact of the forwardly moving fuel tank with said differential unit.

5,114,185
PROTECTIVE CUSHION FOR AUTOMOTIVE VEHICLES
Eddie R. Reedom, 823 W. 89th St., Los Angeles, Calif. 90044
Continuation-in-part of Ser. No. 859,400, May 5, 1986, Pat. No. 5,005,866. This application Feb. 1, 1991, Ser. No. 649,016
Int. Cl.[5] B60R *22/00*
U.S. Cl. 280—801 **19 Claims**

1. A novel seat belt cushion adapted for removable disposition about a seat belt buckle or a portion of a seat belt or both, said seat belt cushion comprising:
a) a main cushion in the shape of a body of a living or fictional creature or an object, said main cushion being comprised of a first body section and a second body section,
b) hinge means connecting said first body section to said second body section,
c) an interior pocket formed between said first and second sections and which interior pocket extends from one peripheral portion of said main cushion to another peripheral portion thereof so that said two sections are openable along said hinge means to expose said pocket and receive



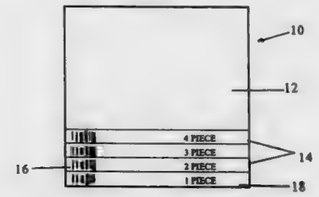
said buckle or seat belt or both and where said sections are closable to enclose said buckle or a portion of the seat belt or both,
d) means to hold said two sections together along edges of said peripheral portions so that said seat belt cushion can be held in place on said seat belt and so that it can be removed therefrom, and
e) padding means in the main cushion and adopted to absorb some of the force of an impact.

5,114,186
SHOCK ABSORBING SKI POLE
Kazuo Sugiyama, 8-20 3-chome, Sakurajosui Setagaya-ku, Tokyo, Japan
Filed May 7, 1991, Ser. No. 695,857
Int. Cl.[5] A63C *11/22*
U.S. Cl. 280—821 **16 Claims**



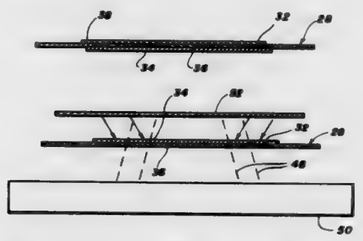
1. A ski pole comprising a grip body, a pipe shaft having two holes for inserting a driven screw pin, and a ring section, wherein the grip section is made of a grip, a pipe shaft retaining section, a first inside concave cavity allowing said pipe shaft to move and holding it, and said pipe shaft having a shaft head inserted therein and held at a head end thereof, said pipe shaft with said shaft head having two holes threaded there through for inserting said driven screw pin, a rubber-like cushion on an upper end of said shaft head, a long compression coil spring, and a short compression coil spring installed over said shaft head, said pipe shaft and shaft head with said compression spring being inserted into said concave cavity to the head end thereof, said retaining shaft including; three dimensional positive motion cam means comprising, two grooves to receive said pin and connect said grip section and said pipe shaft so as to allow their relative movement vertically and rotationally about the ski pole axis.

5,114,187
BAR CODED LAUNDRY TICKET
Thomas R. Branch, 725 Cedar Creek Way, Woodstock, Ga. 30188
Filed Dec. 27, 1990, Ser. No. 634,615
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—81 **1 Claim**



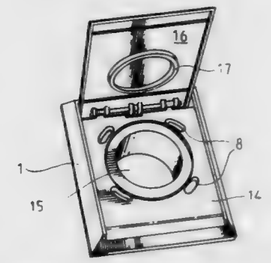
1. A laundry ticket made of a waterproof material and can withstand the water temperatures encountered in commercial washers as well as the chemicals involved in dry cleaning comprising:
a main body; and
at least one separable member detachably connected to said main body and having a front surface with first and second end portions, and a rear surface with first and second end portions, said first end portion of said front surface having identification data imprinted thereon, said second end portion of said front surface having piece data imprinted thereon indicating the number of separable members with said ticket, said first and second end portions of said rear surface of said separable member having an adhesive thereon.

5,114,188
FINGERPRINTING SYSTEM AND METHOD
John J. Koch, 10879 Hematite Mapaville Rd., Festus, Mo. 63028
Filed Nov. 20, 1989, Ser. No. 439,605
Int. Cl.[5] B12D *15/00*
U.S. Cl. 283—68 **5 Claims**



1. A fingerprinting method which comprises:
a) taking a fingerprint on a sheet of transparent material having front and rear sides, said front side coated with a film of adhesive sensitive to record a fingerprint;
b) positioning a reflective surface which will photocopy black on the rear side of the sheet behind the fingerprint; and,
c) making a photocopy of the fingerprint on the front side of the sheet whereby the copy of the fingerprint will be white on a black background.

5,114,189
SUCTION BOX
Pekka Nurmi, Espoo, and Heikki Salo, Turku, both of Finland, assignors to AKP-Tekno Oy, Espoo, Finland
Filed Aug. 30, 1990, Ser. No. 575,292
Claims priority, application Finland, Aug. 31, 1989, 894102
Int. Cl.[5] F16L *21/00*
U.S. Cl. 285—7 **8 Claims**



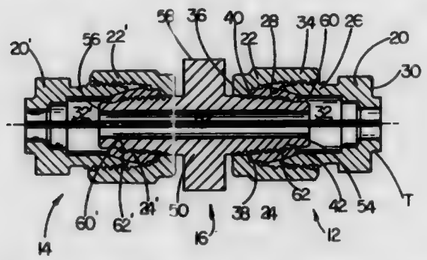
1. Suction box for a central vacuum system to be placed inside a wall between a first and a second wall boards which comprise the wall, and to communicate through a hole in said first wall board, comprising:
a cover part having means defining a hole therethrough to communicate through said hole in said first wall and said cover plate designed to be mounted on the exterior surface of said first wall board over said hole therethrough;
a counterpart of said cover part, said counterpart designed to be mounted inside said wall between said first and second wall boards to communicate through said hole in said first wall board, said counterpart being a solid integral body with a 90° suction bend designed to bend a suction tube inside said wall from a direction perpendicular to said wall to a direction parallel to the plane of said wall, said counterpart further having a supporting surface to be placed against the interior surface of said first wall board around said hole therethrough;
characterized in that said solid integral body of said counterpart comprises:
a round-shaped mounting flange having a hole therethrough communicating with said suction bend and raised from said supporting surface and designed to be placed in said hole in said first wall board and said cover part having means thereon to sealingly communicate with said hole in said round-shaped mounting flange so that said hole in said cover part, said hole in said round-shaped mounting flange and said suction bend provide a continuous suction opening therethrough;
curved and elongated attachment areas on said mounting flange for fastening said cover part to said counterpart, so that said cover part may be mounted on said exterior surface of said first wall board, and said counterpart may be mounted inside said wall by said fastening of said cover part to said counterpart and means for fastening said cover part to said attachment areas; and
intermediate posts extending from said supporting surface to the interior surface of said second wall board, said intermediate posts keeping said counterpart steady between said first and second wall boards when said mounting flange is in said hole in said first wall board.

5,114,190

ELECTRICALLY INSULATED TUBE UNION

Robert C. Chalmers, Huntsville, Ala., assignor to Parker Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 598,299, Oct. 16, 1990, abandoned. This application Aug. 27, 1991, Ser. No. 759,782
Int. Cl.[5] F16L *47/00*
U.S. Cl. 285—53 **2 Claims**



1. An electrically insulated tube union for connecting first and second pieces of electrically conductive tubing and for enabling fluid flow between said pieces, while preventing the conduction of electricity between said pieces, comprising:

a) first and second tube fitting assemblies fixably mounted on said first and second tubing pieces respectively, each assembly having a fitting body, a fitting nut having an outer surface with a maximum diameter, and a ferrule; said fitting nut of each assembly consisting of electrically conductive material, each nut in electrical connection with the tubing piece on which the assembly including the nut is mounted;

b) each fitting body including an externally threaded portion, an internal frusto-conical portion at one end and another end joined to said tubing piece, there being a through bore extending between said ends;

c) each fitting nut internally threaded and mateably with its respective threaded fitting body, and having a radially inward extending flange at one end;

d) each ferrule being captured between its respective fitting nut and body when assembled, with one ferrule end engaging said nut flange and another ferrule tapered end compressed by said body frusto-conical portion;

e) an electrically insulative connector having a body consisting of electrically non-conductive material with a through bore between a first end sized to extend partially into said first fitting body bore through said ferrule, and a second end sized to extend partially into said second fitting body bore through said other ferrule; said connector body having an external flange between said ends; said flange extending radially outward beyond said maximum diameter of each of said fitting nuts;

f) said body of said insulative connector including a first tapered frusto-conical portion, said first frusto-conical portion of said connector including first external threads, said body further including a first unthreaded external surface extending between said first frusto-conical portion and said first end, and a first inboard unthreaded external surface extending between said first frusto-conical portion of said body and said flange;

g) the body of said insulative connector further including a second tapered frusto-conical portion, opposed of said first frusto-conical portion of said body, said second frusto-conical portion including second external threads, said body further including a first unthreaded external surface extending between said second frusto-conical portion and said second end, and a second inboard unthreaded external surface extending between said second frusto-conical portion and said flange;

h) said ferrules each including an internal frusto-conical portion overlying said respective frusto-conical portion of said fitting body, each said ferrule frusto-conical portion being internally threaded and engaging the threads on said respective body frusto-conical portion, said threads being spaced form said ferrule tapered end and from an end opposed of said threaded tapered end; said unthreaded ferrule tapered end of each ferrule gripping said respective unthreaded external surface of said fitting body under force exerted through camming action between said fitting body frusto-conical portion and said ferrule tapered end when said respective fitting body and nut are threadably engaged; said opposed end of each ferrule being disposed from said of said flange of said insulative connector body, whereby the inward extending flange of each respective nut is disposed of said outward extending flange of said insulative connector body when said respective body and nut are threadable engaged;

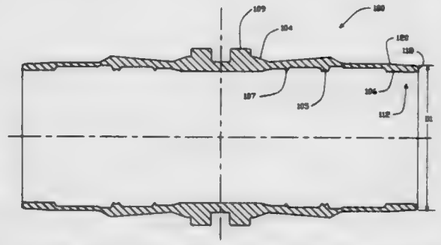
i) whereby said tube union enables fluid tight connection at high fluid pressure between said tubing pieces while electrically isolating said tubing pieces, said flange minimizing risk of electrical connection between said tubing pieces by adjacent conductive surfaces.

5,114,191

PIPE FITTING WITH COUPLING BODY AND IMPROVED ISOLATION TOOTH ARRANGEMENT

Sohel A. Sareshwala, San Leandro, Calif., assignor to Lokring Corporation, Foster City, Calif.

Continuation-in-part of Ser. No. 497,505, Mar. 22, 1990. This application Aug. 24, 1990, Ser. No. 573,345
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—115 **36 Claims**



1. A pipe fitting for making pipe connections comprising:

a coupling body with a body inner surface and a pipe receiving end adapted for receiving a pipe, and a body outer surface;

a swage ring which defines a ring inner surface, which ring inner surface is urgeable over the body outer surface in order to cause at least part of the body inner surface to engage the pipe to create a seal;

said body inner surface defining a main tooth means for biting into the pipe creating a main seal between the coupling body and the pipe as the swage ring is urged over the body outer surface;

said body inner surface defining an isolation tooth means located outboard of the main tooth means and adjacent the pipe receiving end for isolating the main tooth means from bending stresses, wherein said isolation tooth means includes a plurality of gripping teeth for engaging and biting into the pipe as the swage ring is urged over the coupling body; and

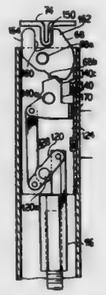
wherein body inner surface defines a groove means between the isolation tooth means and the main tooth means for substantially allowing the original shape of the pipe to be maintained adjacent the groove means with the main tooth means and these isolation tooth means engaging the pipe.

5,114,192

LATCHING SYSTEM

George F. Toledo, Fall Brook, and James A. O'Brien, Burbank, both of Calif., assignors to Thomas Industries, Inc., Louisville, Ky.

Filed Mar. 5, 1991, Ser. No. 664,797
Int. Cl.[5] E06B *7/20*; E05C *3/02*
U.S. Cl. 292—21 **21 Claims**



1. A latch arrangement comprising:

a receiving lug mounted to the door frame and facing toward said door;

a latch rotatably mounted with respect to said door facing said lug, having a cavity arranged and adapted for capturing said receiving lug therein, said latch rotatable from a first position in a first rotational direction toward a second position to release said receiving lug from said cavity, and said latch rotatable from said second position to said first position in a second rotational direction to capture said receiving lug in said cavity;

a latch cam rotatably mounted with respect to said door on a side of said latch opposite said lug, said latch cam selectively and releasably rotatable to position an extending portion of said latch cam to abut an underside portion of said latch to prevent rotation of said latch in said first rotational direction from said first position, said latch cam having a recess adjacent to said extending portion, and said latch having a rounded surface adjacent to said underside portion, said latch cam releasable by rotation in said first rotational direction with said extending portion slidable past said underside portion and said rounded surface slidable into said recess when said latch rotates to said second position; and

wherein said extending portion has a first corner and a second corner, said second corner adjacent to said recess, and said underside portion of said latch has a notch formed therein, said first corner adapted to interfit into said notch to prevent said latch from rotating from said first position in said first rotational direction; and

said second corner slidable along said rounded surface during rotation of said latch to said second position.

5,114,193

SAFETY LATCH MECHANISM

Thomas O. Nass, 14502 La Cuarta, Whittier, Calif. 90605

Filed Dec. 14, 1990, Ser. No. 627,597
Int. Cl.[5] E05C *5/00*
U.S. Cl. 292—67 **22 Claims**

1. A latch mechanism comprising:

a base member adapted to be securable to a generally planar surface of a storage unit, said base member comprising:

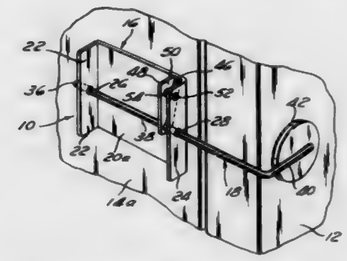
(a) a generally planar center portion having an inner surface and an outer surface;

(b) first flange portion extending perpendicularly from said inner surface of said center portion, said first flange portion including a first aperture extending therethrough; and

(c) a second flange portion extending perpendicularly from said inner surface of said center portion, said second flange portion being substantially parallel to said first flange portion and including a second aperture extending therethrough, said second aperture being in substantial axial alignment with said first aperture;

a latch member connected to said base member, said latch member being movable between a locked position wherein said latch member is operable to maintain said storage unit in a closed configuration, and an unlocked position wherein said storage unit may be opened, said latch member comprising:

(a) an elongate rod having a first end, a middle portion and a second end, said first end and said middle portion



being sized and configured to be slidably receivable into said first aperture and said second aperture of said base member and said second end being formed at approximately a 90 degree angle relative to said first end and said middle portion; and

(b) a disk member having an inner surface and an outer surface, said outer surface of said disk member being attached to said second end of said rod in a manner wherein said inner surface of said disk member has an orientation generally perpendicular to said first end and said middle portion of said rod; and

a cylindrical member attached to and extending outwardly from said middle portion of said rod for maintaining said latch member within said base member in a fixed orientation, said cylindrical member having a diameter not exceeding the diameter of said rod.

5,114,194

SAFETY CLOSURE DEVICE FOR APPLIANCES

Pamela G. Toifl, and Samuel D. Toifl, both of 1847 Pipestone, San Antonio, Tex. 78232

Filed Feb. 15, 1991, Ser. No. 657,168
Int. Cl.[5] F05C *3/14*
U.S. Cl. 292—106 **3 Claims**

1. A safety closure device to prevent young children from independently gaining access into an appliance through a door of said appliance comprising:

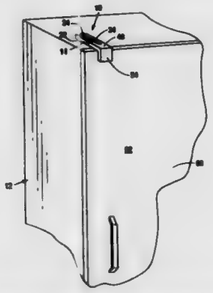
a rigid blocking arm for alternately allowing and blocking the opening of said appliance door;

a rigid mounting plate pivotally connected to said blocking arm;

mounting means connected to said mounting plate for removably attaching said safety closure device to said appliance; and

a retention bar for alternately allowing and preventing the movement of said blocking arm from a blocking position to an open position, said retention bar being movably attached to said mounting plate and positioned so as to be

alternately adjacent to and removed from said blocking arm;



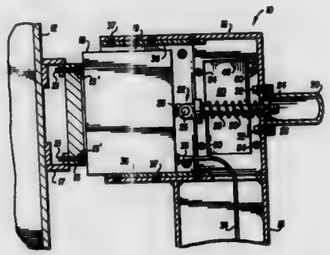
a retention bar housing attached to said mounting plate, said retention.

5,114,195

TAMPER RESISTANT MAGNETIC GATE LOCK

Ronald R. Martin, Carroll County, and James L. Hunter, Coweta County, both of Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Jan. 25, 1990, Ser. No. 469,908
Int. Cl.[5] E05C *19/16*
U.S. Cl. 292—251.5 **7 Claims**



1. A locking device for a door or gate comprising:

a housing having opposite sidewalls, one of said sidewalls having an opening for accessing the interior of the housing;

magnet means comprising a permanent magnet and an electromagnet mounted in said housing for locking and unlocking the door or gate;

contact means on the door or gate for magnetically engaging the permanent magnet to lock the door or gate;

said electromagnet, when energized, having a magnetic field opposing the magnetic field of the permanent magnet to magnetically disengage the permanent magnet from the contact means; and

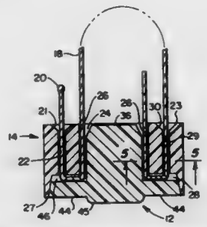
tamper resisting means on said housing for resisting tampering with the locking device, said tamper resisting means comprising a plate covering said opening, at least one operative fastener means for securing said plate to said one sidewall of the housing from the interior thereof, at least one inoperative means for simulating a fastener means for the plate, and means in the other sidewall for accessing said operative fastener means and said inoperative means.

5,114,196

TAMPER DETERRENT LOCKING DEVICE AND METHOD OF USING

Clyde K. Storer, Columbus, Ohio, assignor to The Buckeye Stamping Company, Columbus, Ohio

Filed Aug. 19, 1991, Ser. No. 746,901
Int. Cl.[5] B65D *33/34*
U.S. Cl. 292—307 R **20 Claims**



1. A tamper deterrent locking device comprising a flexible cable and two solid resilient parts wherein,

said cable includes first and second ends,

one part being a partially wedge-shaped member of a size and configuration to penetrate an aperture in the other part,

said aperture including an inwardly extending ridge,

said wedge-shaped member including a groove along one side of a size to receive and hold said ridge upon said wedge-shaped member being forced into said aperture to the extent that said groove slips into place to accommodate said ridge,

a first opening in said other part with said cable projecting through said opening,

said cable being first bent to project through said aperture a second time and then doubled back to pass through said other part a third time to provide a cable loop projecting from said other part,

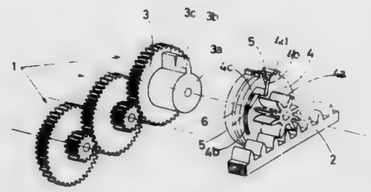
the relative sizes of said wedge-shaped member and said aperture being such that with said wedge-shaped member in place with the ridge in the groove the surfaces of the aperture and wedge-shaped member frictionally engage said cable to lock said cable in said aperture.

5,114,197

MECHANISM DESIGNED TO ENSURE THAT ACTUATORS FOR AUTOMATICALLY LOCKING AND UNLOCKING AUTOMOBILE DOORS HAVE NO LOAD AT THE END OF THEIR MOVEMENT RUN

Luigi Persiani, Osimo, Italy, assignor to SO.GE.MI. - S.P.A., Osimo, Italy

Filed Apr. 12, 1991, Ser. No. 684,241
Claims priority, application Italy, Apr. 13, 1990, 618 A/90
Int. Cl.[5] E05B *53/00*
U.S. Cl. 292—336.3 **2 Claims**



1. Mechanism designed to ensure that, at the limit of their movement run, there is no load on the automatic door locking and unlocking actuators on automobiles, of the type that includes a gear train (1) that drives a rack (2) which requires

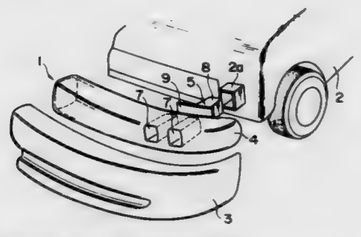
moving in order to lock or unlock the door, characterized by the fact that the rack (2) engages with a pinion (4*a*) moulded in a single piece with a circular cup (4) in whose centre a hub (3*a*) is housed and rotates, this hub (3*a*) being connected to the last gear (3) in the gear train (1); a section (4*c*) of the circular rim of the cup (4) is detached from the base of the cup (4*b*) by a specially shaped cut (5), and its free end has an internal wedge shaped prong (4*d*) that engages with and is rotated by a similarly shaped wedge (3*b*) that projects radially from the external surface of the hub (3*a*) on the last gear wheel (3); there is also an open steel ring (6) that presses against the circular rim of the cup (4) and holds the rim in position.

5,114,198

SYNTHETIC RESIN BUMPER

Noboru Yamashita; Keiji Sugiura, both of Hamamatsu; Kazunori Shimomaki, Hamana, and Toshiaki Takanishi, Kasai, all of Japan, assignors to Suzuki Motor Corporation, Shizuoka, Japan

Filed Oct. 30, 1990, Ser. No. 605,951
Claims priority, application Japan, Dec. 6, 1989, 1-316769
Int. Cl.[5] B60R *19/24*
U.S. Cl. 293—120 **4 Claims**



1. A vehicle bumper, comprising:

front right and front left fitting portions provided on a front end of a vehicle;

a right bracket and a left bracket, each of said right and left bracket including a connection substrate positioned in an associated one of said fitting portions for support of said bracket and a flange portion having a front flange surface area larger than a cross sectional area of said substrate;

a synthetic resin absorber with a continuous front face and a continuous rear face, said synthetic resin absorber including right first and second through holes and a left first and second through holes, each of said through holes being defined by side walls extending from said front face to said rear face, said right first and second through hole being spaced apart a predetermined distance and said left first and second through holes being spaced apart a predetermined distance, said right flange being fixedly connected to said synthetic resin absorber rear face covering openings of said right first and second through holes, said left bracket flange being fixedly connected to said synthetic resin absorber rear face and covering openings of said left first and second through holes.

5,114,199

DEVICE FOR THE GATHERING AND LIFTING OF DEBRIS

William L. Newcomer, P.O. Box 253, New Market, Md. 21774

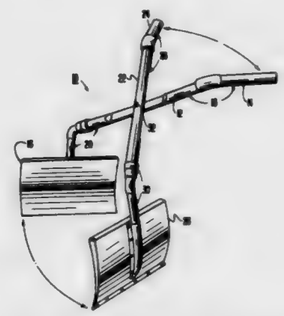
Filed Mar. 12, 1991, Ser. No. 668,023
Int. Cl.[5] A01B *1/00*
U.S. Cl. 294—50.8 **33 Claims**

1. A device for the gathering and lifting of debris, comprising:

a first pivot arm and a second pivot arm pivotally connected to said first pivot arm at a pivot point, said pivot arms being movable about said pivot point between an open position and a closed position;

said first pivot arm comprising a first blade, a first vertical lower extension mounted to said first blade, a first middle elongated arm mounted to said first lower extension by means of a first lower elbow, and a first upper extension mounted to said first middle arm by means of a first upper elbow, said first upper elbow being adapted to be grasped by the hand of a user whereupon said first upper extension will be located under and contacted by the forearm of the user;

said second pivot arm comprising a second blade, a second vertical lower extension mounted to said second blade, a second middle elongated arm mounted to said second lower extension by means of a second lower elbow, and a second upper extension mounted to said second middle



arm by means of a second upper elbow, said second upper elbow being adapted to be grasped by the hand of a user whereupon said second upper extension will be located under and contacted by the forearm of the user;

said debris being collectible within said first and second blades when said pivot arms are in said closed position;

said first and second blades having an upper edge and a lower edge, the lower edges of said first and second blades having a forward portion and a rearward portion, said first and second blades being disposed such that when said pivot arms are in said closed position, said first and second blades contact one another at said rearward portion of said lower edges thereof;

a gap being formed between said forward portions of said first and second blade lower edges;

said device being free standing when said pivot arms are in said open position.

5,114,200

GRAVITY OPERATED AUTOMATIC HOOK

Louis Visnyouszky, Twinsburg, and Adam G. Bay, Chesterland, both of Ohio, assignors to Gould Inc., Eastlake, Ohio

Filed Oct. 30, 1990, Ser. No. 605,783
Int. Cl.[5] B66C *1/34*
U.S. Cl. 294—81.56 **5 Claims**

1. An arresting device for gripping a generally cylindrical shaft comprising:

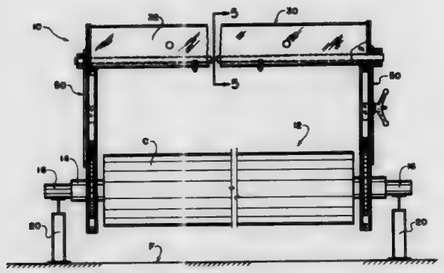
plate means;

an elongated slot extending into said plate means, said slot being dimensioned to have a width slightly larger than the diameter of said shaft wherein said slot is operable to receive said shaft therein when said shaft is generally perpendicular to said plate means;

hook means having a hook inner cam surface, a support surface and a hook mating surface, said inner cam surface and said support surface forming an acute angle therebetween, and said hook means being pivotally mounted to said plate means at one side of said slot at about the verti-

cal midpoint of the portion of said hook means on which said inner cam surface is located, said cam surface having a predetermined position relative to said support surface wherein said hook means has a first position wherein said first cam surface generally traverses said slot and a second position wherein said support surface generally traverses said slot;

latch means having a cam surface and a mating surface, said



latch means being pivotally mounted to said plate means and disposed toward said hook means wherein said latch means cam surface intersects said slot and said latch means mating surface engages said hook mating surface to hold said hook means in said second position and to confine said shaft within said slot, and

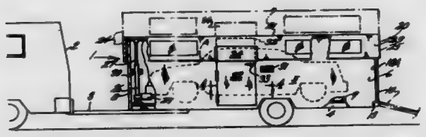
selectively securable locking means to prevent contact of said shaft with said latch means to prevent inadvertent release of said hook means.

5,114,202

MULTIPURPOSE TRAILER

Richard D. Johnson, 42891 McKenzie Hwy., Leaburg, Oreg. 97489

Filed Apr. 5, 1991, Ser. No. 680,850
Int. Cl.[5] B62D *33/08*
U.S. Cl. 296—26 **2 Claims**



1. A multipurpose trailer for the transport of an auto and for user occupancy when parked, said trailer comprising,

a wheel supported frame,

a front wall and side walls on said frame,

a roof structure having a skirt wall thereabout,

electromechanical actuators in series with one another and each of said actuators coupled to said roof structure to position same,

ramp means hingedly coupled to said frame and positionable to an upright position and thereat constituting a rear wall of the trailer,

said vehicle body including collapsible fixtures, hinge means attaching said fixtures to said walls permitting horizontal deployment of the fixtures and oppositely collapsing of the fixtures,

one of said side walls having a door therein providing an open area for the reception of the door of an auto to permit entry into and exiting from the auto, and

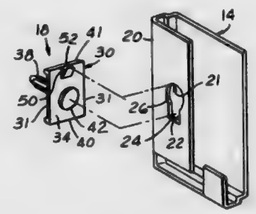
said ramp means including a pair of ramps, locks locking each of said ramps to one each of said side walls.

5,114,203

RETAINER DEVICE AND KEYHOLE ATTACHING ARRANGEMENT

Vince S. Carnes, Belleville, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 24, 1990, Ser. No. 632,828
Int. Cl.[5] B62D *25/00, 33/00;* **F16B** *37/00, 39/00*
U.S. Cl. 296—50 **1 Claim**



1. In combination with a vehicle tailgate outer sheet metal skin:

a rectangular applique panel having a vertically extending return flange at each end, each said return flange having a plurality of attaching keyhole-shaped apertures therein, each said keyhole-shaped aperture defined by a slot portion having one closed end and an opposed open end terminating in a circular opening defining a pair of cusps at the juncture between said slot portion and said circular opening, said sheet metal skin having a plurality of mounting holes therein;

a one-piece plastic blind attachment retainer device for each said mounting hole, each said retainer device comprising a flat rectangular elongated base having a bottom side, an upper side, and leading and trailing edges disposed transversely to a major axis defining a longitudinally extending vertically disposed plane of symmetry, an integral fastener pine-tree type shank projecting outwardly from said bottom side with its principal axis intersecting said major axis at right angles, each said pine-tree type shank adapted for push-in axial insertion in an associated one of said sheet metal skin mounting holes about said principal axis;

an integral fastener collar extending outwardly from said upper side symmetrically disposed on said major axis, a fastener circular head extending radially outwardly from said collar and having its center aligned on said principal axis, said head having an undersurface thereof formed with a C-shaped continuous chamfer having a half-circle segment terminating in a pair of parallel trailing segments;

an integral locking cam extending outwardly from said base upper side symmetrically disposed on said major axis adjacent said trailing edge, said locking cam having a ramp and an arcuate facet in opposite longitudinal relation with said ramp, said ramp sloped toward said fastener head and said arcuate facet spaced a predetermined distance from said collar outboard shoulder, said arcuate facet having a predetermined radius of curvature with its center located on said major axis;

each said panel return flange keyhole-shaped aperture circular opening having a predetermined diameter slightly larger than said head, said keyhole-shaped aperture predetermined maximum longitudinal dimension from said slot one closed end to a diametrically opposite arcuate portion of said circular opening slightly larger than the longitudinal dimension along said major axis between said cam arcuate facet and the diametrically opposite collar stop shoulder;

each said base having the trailing portion thereof aft of said collar canted outwardly from said base inner surface by a slight acute angle whereby said base trailing portion upper surface is adapted to be resiliently biased into contact with said sheet metal skin opposed surface thereof;

upon each said retainer device head being initially inserted in

an associated one of said keyhole-shaped aperture circular openings with said base leading transverse edge spaced a predetermined longitudinal dimension from the slot closed one end, wherein said chamfer half-circle segment engaging said keyhole-shaped aperture pair of cusps allowing guided smooth lead-in insertion of each said retainer device therein, such that moving each said retaining longitudinally toward its associated slot one closed end causes each said pair of chamfer parallel trailing segments to engage their associated slot parallel side edges and said collar leading stop edge to engage its associated slot one closed end; and

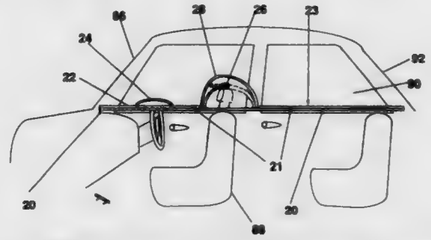
wherein said locking cam snaps into its associated keyhole-shaped aperture circular opening with said arcuate facet providing line contact with its associated circular opening at a point of intersection thereof with its associated major axis, whereby each said retainer is snugly captured in its associated keyhole-shaped aperture with each said pine-tree type shank principal axis exactly aligned with its associated sheet metal skin mounting hole so as to be axially received in a push-in manner therein readily securing each said panel return flange to said sheet metal skin.

5,114,204

COLLAPSIBLE INTERIOR SUN SHADE FOR UNOCCUPIED MOTOR VEHICLE

Alfredo P. Bernardo, 4399 Arrowwood Cir., Concord, Calif. 94521

Filed Sep. 12, 1989, Ser. No. 405,943
Int. Cl.[5] B60J *11/00*
U.S. Cl. 296—136 **2 Claims**



1. A collapsible sunshade cover for the interior of an unoccupied motor vehicle, which interior has a front, a rear, and opposite sides, a dashboard across the front of said interior, a steering wheel to the rear of said dashboard, at least one seat having an upright back to the rear of said steering wheel, said seat having an upper edge, a rear window to the rear of said seat, and at least one side window on each opposite side of said interior, said sunshade cover comprising:

a sheet of flexible material of sufficient size to cover horizontally said interior from said dashboard to under said rear window, and from one side of said interior to the other side, said sheet being arranged to extend over said steering wheel and said back of said seat,

support means for keeping said sheet of flexible material taut and snug in place, said support means comprising a plurality of rigid arms on opposite side edges of said flexible sheet, said arms including means for collapsing said arms so that said cover can be stored in a more compact arrangement, and

means for affixing said edges of said flexible sheet to said arms,

said plurality of rigid arms being positioned on said dashboard and at a plurality of positions on said upper edge of said seat,

said rigid arms each comprising a fixed portion and slidable portion,

said means for collapsing said arms so that said cover can be stored in a more compact arrangement including sliding means for extending and retracting said slidable portion of each arm in a generally horizontal plane for allowing easy installation and storage of said sunshade,

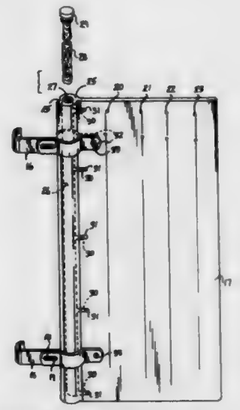
said sheet of flexible material comprising two portions, one affixed to said slidable portion of each arm and another affixed to said fixed portion of each arm.

5,114,205

VEHICULAR AIR DEFLECTOR

Elwood Y. Jee, 1800 Wynnewood La., Cincinnati, Ohio 45237

Filed Jul. 12, 1991, Ser. No. 729,174
Int. Cl.[5] B60H *1/24*
U.S. Cl. 296—152 **3 Claims**



1. A vehicular air deflector, comprising,

a deflector plate, the deflector plate mounted coextensively to a support boss, the support boss including an elongate concave recess coextensive with the support boss, and

the support boss including a plurality of "J" shaped mounting plates mounted to the support boss, each "J" shaped mounting plate including a leg member, each leg member positioned forwardly relative to the concave recess to secure a door frame between each leg member and the concave recess, and

wherein each mounting plate includes an elongate slot positioned adjacent the support boss, and the support boss defined by an elongate cylindrical configuration, and a plurality of pairs of support boss clamps, each pair of support boss clamps mounting one of said mounting plates thereto, and at least one of said support boss clamps including an elongate boss slot aligned with the slot of each mounting plate to longitudinally secure each mounting plate relative to each pair of support boss clamps.

5,114,206

MOUNTING OF WINDOW GLASS PLATE ON VEHICLE BODY PANEL

Yukihiki Yada, Nagoya, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Ooba, Japan

Filed Oct. 16, 1990, Ser. No. 598,196
Claims priority, application Japan, Oct. 30, 1989, 1-125667
Int. Cl.[5] B60R *13/06*
U.S. Cl. 296—201 **7 Claims**

1. Mounting of a window glass plate on a vehicle body panel, comprising:

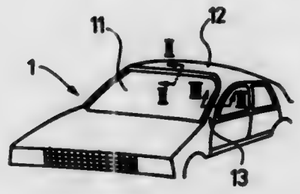
a formed portion formed at a peripheral portion of a window opening of said vehicle body panel for mounting said window glass plate having a size larger than that of said window opening;

a stripe of protuberant adhesive applied to a rear surface of

an overall peripheral portion of said window glass plate along an outer edge thereof;

an unitary holding strip member extending along an upper edge portion and opposite side edge portions of said window glass plate, said holding strip member having an unitary first groove for engaging said upper and opposite side edge portions of said window glass plate and maintaining a water-tight condition, said first groove opening to face an edge surface of said window glass plate, said holding strip member further having an unitary second groove opening in a direction perpendicular to an opening direction of said first groove and extending in parallel to said edge surface of said window glass plate, said second groove being formed with a first projection which projects inward from an inner wall surface of said second groove; and

a molding extending along said upper edge portion and said opposite side edge portions of said window glass plate,



said molding including a leg portion adapted to be tightly inserted into said second groove of said holding strip member, a garnish portion projecting from a top of said leg portion to said window glass plate and having a predetermined width, and a seal portion projecting from said top of said leg portion to said vehicle body panel, said leg portion having at least one second projection adapted to engage said first projection;

whereby when said peripheral portion of said window glass plate is bonded by said adhesive to said formed portion, a part of said garnish portion of said molding at said upper edge portion of said window glass plate is in liquid-tight close contact with a front surface of said window glass plate, and the remaining primary part of said garnish portion at each of said opposite side edge portions is spaced from said front surface of said window glass plate to define a gap serving as a gutter for allowing flow of water.

5,114,207

BODY FOR BATTERY-POWERED INDUSTRIAL VEHICLE

Hidemi Nakajima, Tokorozawa, and Toshio Nagano, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Continuation of Ser. No. 288,174, Dec. 22, 1988, abandoned.
This application Jan. 19, 1990, Ser. No. 540,388
Claims priority, application Japan, Dec. 25, 1987, 62-331275
Int. Cl.[5] B60R *27/00*
U.S. Cl. 296—204 **4 Claims**

1. An industrial vehicle body construction, comprising:

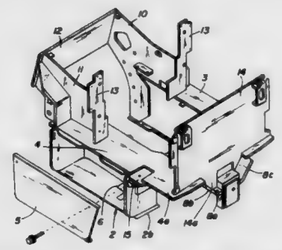
a pair of side frames spaced laterally from each other, each side frame having rear cross walls and open upper ends; a center cross member interconnecting said side frames;

a pair of deck plates respectively secured to said upper open ends of said side members and cooperating with the same to form a closed cross-section, said deck plates each having extensions at the rear ends thereof;

a pair of drive axle mounting plates secured to front portions of said side frames and said deck plates;

a rear cross member extending between said rear cross walls of said side frames and secured to the same;

a steering axle mounting member extending between said extensions of said deck plates and secured in a butt joint manner to rear ends of said deck plates; and



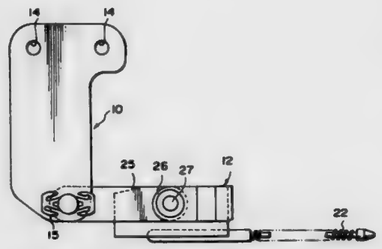
a rear battery unit support plate extending between said extensions of said deck plates, placed thereon and secured to the same.

5,114,208

SLIDING MECHANISM FOR SUNROOF

Nobuyuki Ikeda, Ikeda; Kazuhisa Nagata, Okazaki, and Chikashi Oba, Toyohashi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jul. 27, 1990, Ser. No. 558,332
Claims priority, application Japan, Aug. 4, 1989, 1-92318[U]; Aug. 4, 1989, 1-92319[U]
Int. Cl.[5] B60J *7/047*
U.S. Cl. 296—216 **3 Claims**



1. A sunroof sliding mechanism comprising:

a roof housing (**4**) disposed around an opening (**2**) formed in a roof (**1**) of an automotive vehicle;

a rail portion (**7**) situated on each side of the opening and fixed to said roof housing, said rail portion including one wall having a first groove and another wall having a second groove;

a sunroof (**3**) for opening and closing the opening;

a front arm (**10**) having a distal end fixed to a front portion of said sunroof, a lower end, and a freely rotatable shoe (**15**) connected to said lower end on a pivot axis;

a slider (**12**);

a link (**25**) having one end pivotally connected to said slider and an opposite end pivotally connected to said front arm on said pivot axis; and

a drive cable (**22**) connected to said slider and coupled to a source of driving force;

said shoe being free to move along the first groove in said one wall of said rail portion and said slider being free to move along the second groove in said other wall of said rail portion;

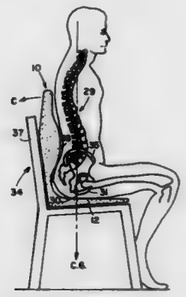
said rail portion comprising a downwardly curved front end portion (**11*b***) and a horizontal main portion (**11*a***).

5,114,209

CHAIR INSERT HAVING A CONTOURED BACK SUPPORT PORTION AND A SEAT SUPPORT PORTION

John C. Dunn, 4621 Autumnwoods Way, Tallahassee, Fla. 32303

Filed Mar. 21, 1990, Ser. No. 496,661
Int. Cl.[5] A47C *7/02*
U.S. Cl. 297—231 **14 Claims**



1. A chair insert comprising:

a) seat portion means for providing a flat seating surface level with a floor when said chair insert is installed on a chair having a rearwardly sloping seat and backrest;

b) backrest portion including

i) means for supporting a gluteal and pelvic region of a user,

ii) means for supporting a lumbar curve region of a user, and

iii) means for supporting a thoraic kyphotic region of a user;

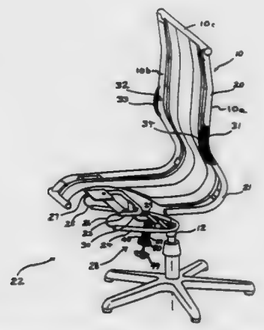
c) whereby said chair insert supports the body of a user to place the center of gravity of the head of the user over the vertical axis of the spinal column and pelvis of the user.

5,114,210

TILTING CHAIR WITH IMPROVED LUMBAR SUPPORT

Johan H. Naess, Hazelbrook, Australia, assignor to Maxton Fox Commercial Furniture Pty. Ltd., New South Wales, Australia

PCT No. PCT/AU90/00007, § 371 Date Sep. 10, 1990, § 102(e) Date Sep. 10, 1990, PCT Pub. No. WO90/07887, PCT Pub. Date Jul. 26, 1990
PCT Filed Jan. 11, 1990, Ser. No. 576,400
Claims priority, application Australia, Jan. 11, 1989, PJ2242
Int. Cl.[5] A47C *3/00*
U.S. Cl. 297—300 **8 Claims**



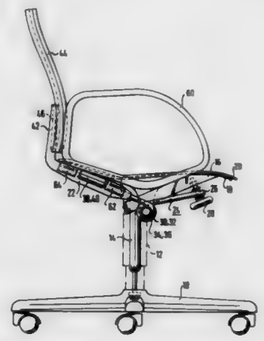
1. A chair comprising a frame having a seat portion and a back portion adapted to support the trunk of the body of an occupant, said frame being supported on a base, and means for allowing that part of the back portion supporting the upper trunk of the body of the occupant to tilt relative to that part of the back portion supporting the lower trunk of the body of the occupant and seat portion, and means for allowing the seat portion to tilt relative to the base, wherein the tilt axis is located underneath and substantially adjacent to the anterior end of the seat portion, the back portion including a pair of oppositely disposed tubular arms that define side members of the frame, each of the said tubular arms being discontinuous at a point adjacent the lumbar region of the seated occupant, the back portion tilting means comprising a pair of coiled springs each tightly inserted within the respective tubular arm and extending across the respective point of discontinuity, and further including means for controlling the angle of tilt of each of the said tubular arms, said controlling means comprising an elongated spring member having its ends anchored into the anterior face of its respective tubular arm immediately above and below the corresponding location of its respective inserted coiled spring, the portion of the spring member intermediate its anchored ends being arched outwardly from the anterior face of the tubular member, the arrangement being such that the extent of tilt of each of the said tubular arms is dependent on the location of the anchored ends therealong and the clearance of the arched connecting portion of the spring member from the anterior face of the tubular member.

5,114,211

CHAIR, IN PARTICULAR AN OFFICE CHAIR

Simon Desanta, Hollen, Im Loheden, D-4830 Gütersloh 12, Fed. Rep. of Germany

Filed Sep. 12, 1990, Ser. No. 581,730
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1989, 3930361
Int. Cl.[5] A47C *3/00*
U.S. Cl. 297—301 **8 Claims**



1. A chair comprising

(a) a vertical column (**12**) rising from a pedestal (**10**);

(b) a bracket (**16**) projecting forwardly from a top end of said column;

(c) a seat (**20**) connected to said bracket and supported in a rear region of said seat by a leg spring (**24**) having a generally U-shaped portion and two open ends (**38**, **40**); and

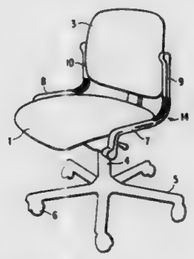
(d) a back rest (**44**) supported in a spring-mounted manner by said leg spring, wherein said seat (**20**) is fixedly connected approximately in the region of its front third to a support plate (**18**) attached to said bracket (**16**), and said seat is fixedly connected approximately in a region of its rear third to a rigid bearing plate (**22**) which carries sleeves (**62**, **64**, **66**, **68**) on an underside of said bearing plate, and in spaced relation to one another on opposite lateral sides of said bearing plate, for receiving, in a displaceable and lockable manner, said two open ends (**38**, **40**) of said leg

spring (24), and the seat (20) is designed so as to be able to move at least in the region of its middle third.

5,114,212
CHAIR WITH ADJUSTABLE ARM REST

Claude Verney, and Alex Strassle, both of Kirchberg, Switzerland, assignors to Intercollection Development S.A., Kirchberg, Switzerland

Filed Oct. 2, 1990, Ser. No. 592,731
Claims priority, application Switzerland, Oct. 2, 1989, 3579/89; Nov. 9, 1989, 4037/89
Int. Cl.[5] A47C *7/54*
U.S. Cl. 297—421 **12 Claims**



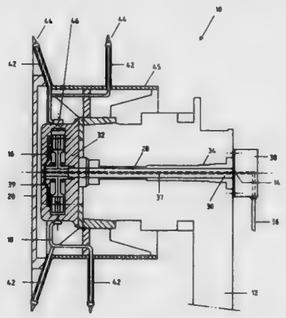
1. A chair, comprising:
a seat unit;
a back rest secured to the seat unit;
at least one side unit including a support member and an arm rest, proximal ends of the support member and the arm rest being articulated together, a distal end of the support member being bent downwardly relative to a collapsed position of the side unit whereat the support member and arm rest lie alongside the seat and back rest, respectively, at an angle of from 70° to 90°, and said distal end being pivotally mounted to the seat unit below a seat thereof; and
means pivotally mounting a distal end of the arm rest to a side of the back rest,
wherein the side unit can be displaced between said collapsed position, and a raised position whereat the support member and arm rest are substantially perpendicular to the seat and back rest, respectively.

5,114,213
HIGH PRESSURE WATER ASSISTED MINING AND TUNNELLING MACHINE

Julian Kornecki, Secunda, South Africa by Mark Yammin , and Charles J. Armstrong, deceased, late of Johannesburg, South Africa by Mark Yammin, legal representative , assignors to Sasol Mining (Proprietary) Limited, Johannesburg, South Africa

Continuation of Ser. No. 314,719, Feb. 23, 1989, abandoned. This application Feb. 22, 1991, Ser. No. 660,338
Claims priority, application South Africa, Feb. 26, 1988, 88/1364
Int. Cl.[5] E21C *35/22*
U.S. Cl. 299—81 **12 Claims**

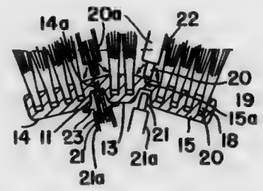
4. An accessory for a mining or tunnelling machine comprising a cutting drum, the accessory including:
a plurality of radial piston pumps arranged in an axially spaced apart relation;
each pump comprising a plurality of piston and cylinder assemblies, each piston and cylinder assembly being adapted to supply water under pressure to one or more nozzles for directing water onto material to be cut by the machine, the radial piston pumps being mountable in the cutting drum;
a hollow shaft adapted for driving the cutting drum; and
a hollow rod coaxially and non-rotatably located in the bore of the hollow shaft, the bore of the rod being in communication with the supply side of each rotary piston pump for conveying low-pressure water thereto.



5,114,214
PROCESS FOR PRODUCING TOOTH BRUSHES AND BLANKS FOR USE FOR SAME

Rolf Barman, Olav Kyrregst. 45, N-5000 Bergen, Norway

PCT No. PCT/NO88/00091, § 371 Date Aug. 21, 1990, § 102(e) Date Aug. 21, 1990, PCT Pub. No. WO90/06701, PCT Pub. Date Jun. 28, 1990
PCT Filed Dec. 13, 1988, Ser. No. 555,434
Int. Cl.[5] A46D *3/00*; A46B *9/04*
U.S. Cl. 300—21 **14 Claims**

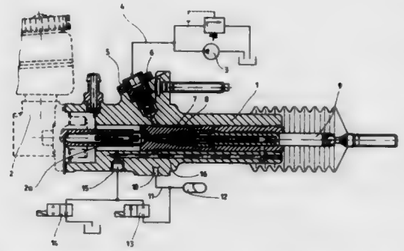


1. A process for producing a toothbrush comprising the steps of
providing a toothbrush blank having a central head portion and a pair of end head portions disposed in coplanar relation, a plurality of bristles extending from each head portion on one side of the blank and a plurality of grooves on an opposite side of the blank, each groove being disposed between said central head portion and an adjacent end head portion;
heating the blank in the region of the grooves while bending each end head portion relative to said central head portion in a direction to close the grooves;
thereafter cutting the bristles to form rows of bristles of different lengths; and
thereafter heating the bent blank in the region of the grooves while bending each end head portion relative to said central head portion in a direction to open the grooves.

5,114,215
BRAKE SYSTEM

Roland Benzinger, Stuttgart; Edgar Schmitt, Vaihingen/Enz; Heinz Siegel, Stuttgart; Ewald Huebl, Schwieberdingen; Klaus Mueller, Tamm; Manfred Himmelsbach, Villingen-Schwenningen, and Martin Jordan, Koblenz, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 31, 1990, Ser. No. 575,761
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1989, 3932147
Int. Cl.[5] B60T *8/44, 8/32*
U.S. Cl. 303—113 TB **15 Claims**



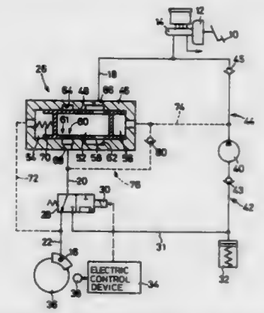
1. A brake system with traction control, comprising a master brake cylinder for at least one brake circuit, a brake booster operative by a pedal, said brake booster includes a pressure cylinder (9) which leads to the brake pedal, a displaceable servo piston and a pressure rod to actuate said master cylinder, a pressure reservoir, said pressure reservoir communicates with the brake booster via servo pressure lines, magnetic valves (13, 14) disposed in said servo pressure lines to regulate servo pressure and to provide traction control thereby, a pump (3), a pressure connection (5) which communicates with said pump (3) via a servo pressure line (4), an annular chamber (7) in said brake booster which surrounds said servo piston (8), said pressure connection discharges in the brake booster (1) into said annular chamber (7) which surrounds the servo piston (8), a servo pressure line (11) leading from the annular chamber (7) to the pressure reservoir (12) through a bore (10) is provided on the brake booster (1), and a supply line (16) is provided leading from the pressure reservoir (12) to the pressure cylinder (9), via said magnetic valves (13, 14), and through an inlet bore (15) that is provided on the brake booster (1), a piston (17) abuts a valve slide (18), which is movable partially within the pressure cylinder (9) and partially within the servo piston (8), said valve slide (18) is further adapted to actuate an inner valve seat (19).

5,114,216
ANTI-LOCK BRAKE SYSTEM HAVING FLOW RESTRICTOR

Kazuhiko Tsuda; Hiroyoshi Kako, both of Nagoya; Hirohiko Morikawa, Toyota; Noboru Noguchi, Toyota, and Nobuyasu Nakanishi, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

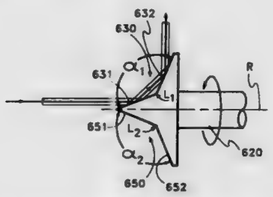
Filed Dec. 8, 1989, Ser. No. 448,210
Claims priority, application Japan, Dec. 15, 1988, 63-316666; Mar. 29, 1989, 1-78783
Int. Cl.[5] B60T *8/46*
U.S. Cl. 303—117 **17 Claims**

1. An anti-lock brake system comprising:
a hydraulic power source;
a wheel cylinder for applying a brake to a wheel;
a solenoid-operated valve device disposed between said power source, and said wheel cylinder and a reservoir, and operable between a pressure-increase position thereof for fluid communication between said wheel cylinder and said power source, and a pressure-decrease position thereof for fluid communication between said wheel cylinder and said reservoir;
an electric control device electrically connected to said solenoid-operated valve device, for controlling said valve device so as to normally hold said valve device in said pressure-increase position, and upon detection of a locking state of said wheel, place said valve device in an anti-lock state in which the valve device is alternately placed in said pressure-increase and pressure-decrease position for increasing and decreasing a fluid pressure in said wheel cylinder and thereby maintaining a slip ratio of said wheel within a predetermined range;
a flow control device having a first pilot chamber which receives as a first pilot pressure the pressure in said wheel cylinder, and a second pilot chamber which receives as a second pilot pressure a pressure in one of two portions of a fluid passage connecting said power source and said solenoid-operated valve device, said two portions consisting of a first portion connecting said power source and said flow control device and a second portion connecting said flow control device and said valve device, said flow control device being normally operated in a first state for effecting a first mode of operation to allow a relatively large rate of flow of a fluid from said power source toward said wheel cylinder while said second pilot pressure is not higher than said first pilot pressure, said flow



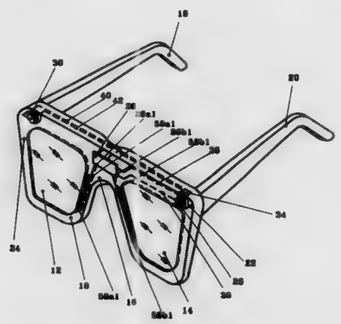
control device being brought into a second state for effecting a second mode of operation when said valve device is placed into said anti-lock state while said second pilot pressure is higher than said first pilot pressure, said flow control device in said second mode of operation decreasing the rate of flow of the fluid with an increase in a pressure difference by which a pressure in said power source is higher than a pressure in said wheel cylinder; and
assisting means for enabling said flow control device to effect said first mode of operation for at least a first period between commencement of brake application to said wheel and commencement of an operation of said solenoid-operated valve device in said anti-lock state, and enabling said flow control device to effect said second mode of operation for at least a second period during which said valve device is placed in said pressure-increase position during said operation of the valve device in said anti-lock state, said assisting means operating during said first period to hold said second pilot pressure at a level not higher than said first pilot pressure, even if there arises a pressure difference between the pressure in said one of said two portions of said fluid passage and in said wheel cylinder, which pressures should be substantially equal to each other, said assisting means operating during said second period to hold said first and second pilot pressures at respective levels substantially equal to the pressures in said wheel cylinder and said power source, respectively.

5,114,217
DOUBLE-REFLECTION LIGHT SCANNER
Leo Beiser, Flushing, N.Y., assignor to Leo Beiser Inc., Flushing, N.Y.
Filed Jun. 8, 1990, Ser. No. 535,425
Int. Cl.[5] G02B *26/10*
U.S. Cl. 359—216 **18 Claims**



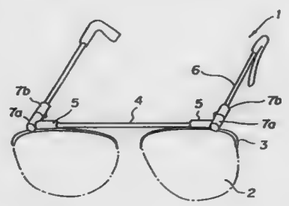
1. A light scanner for scanning an input light beam, comprising:
a rotatable support having an axis of rotation that is substantially parallel to said input light beam;
a reflector subsystem including a plurality of reflector pairs, each of said reflector pairs being mounted on said support at a different azimuthal location around the axis of said rotatable support;
the central ray of said input light beam being offset from the rotational axis of said rotatable support;
each of said reflector pairs having first and second light-reflective plane surfaces, the planes of which intersect at an obtuse angle, said first light-reflective surface being oriented to receive said input light beam during at least a portion of each rotational cycle of the rotatable support and to reflect said beam toward said second light-reflective surface, and said second light-reflective surface being oriented to further reflect said beam to be approximately orthogonal to the direction of said input light beam.

5,114,218
LIQUID CRYSTAL SUNGLASSES WITH SELECTIVELY COLOR ADJUSTABLE LENSES
Michael Black, Foster City, and Vladimir Kupershmidt, Fremont, both of Calif., assignors to Reliant Laser Corp., Foster City, Calif.
Filed Jan. 11, 1991, Ser. No. 640,042
Int. Cl.[5] G02C *7/10*
U.S. Cl. 351—44 **20 Claims**



1. Liquid crystal sunglasses with at least one selectively color adjustable lens comprising:
a rim and a bridge portion which support said lens;
a pair of temples supported by said rim;
a voltage power source; and
an electronic control unit connected to said power source;
a color changing switch connected to said power source and to said electronic control unit, said switch being switchable between a plurality of color positions;
said color adjustable lens comprising a laminated structure composed of a color mosaic mask, an input polarizing plate, a liquid crystal cell sandwiched between a pair of voltage-controlled active matrices, and an output polarizing plate;
said mask, said input polarizing plate, said liquid crystal cell with said active matrices, and said output polarizing plate being arranged sequentially in the direction of incident light;
said active matrices being electrically connected to said control unit.

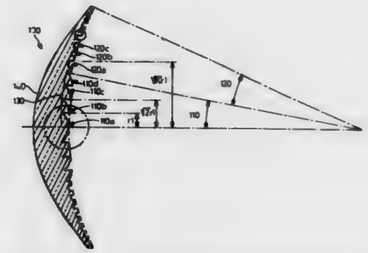
5,114,219
EYEGLASS FRAME HAVING TUBULAR CONNECTORS
Isao Hyoi, Fukui, Japan, assignor to Murai Co., Ltd., Fukui, Japan
PCT No. PCT/JP88/01166, § 371 Date Jul. 17, 1989, § 102(e) Date Jul. 17, 1989, PCT Pub. No. WO90/05935, PCT Pub. Date May 31, 1990
PCT Filed Nov. 18, 1988, Ser. No. 543,842
Int. Cl.[5] G02C *5/14, 5/02*
U.S. Cl. 351—121 **3 Claims**



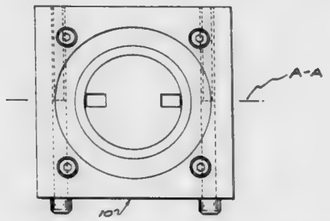
1. An eyeglass frame for a pair of right and left eyeglass lenses, comprising:
rims for supporting the right and left eyeglass lenses;
a bar member disposed between upper portions of said rims, said bar member having opposite ends;
first engagement tubes secured to the opposite ends of said bar member;
second engagement tubes fixedly secured to said first engagement tubes, respectively; and
temple members secured to said second engagement tubes,
said first engagement tubes being secured to the upper portions of said rims so that a gap is maintained between said bar member and said upper portions of said rims.

5,114,220
MULTIPLE CONTOUR DIFFRACTIVE LENS
Dominique Baude, Saint Ouen; Pierre Chavel, Chilly Mazarin; Denis Joyeux, Les Ulis, and Jean Taboury, Sceaux, all of France, assignors to Essilor International, Compagnie Generale d'Optique, Creteil, France
Filed May 15, 1989, Ser. No. 351,968
Claims priority, application France, May 19, 1988, 88 06699
Int. Cl.[5] G02C *7/04*
U.S. Cl. 351—160 R **37 Claims**

1. An opthalmic lens comprising at least two concentric regions having diffractive components with different phase contours in order to use different orders of diffraction, wherein the diffractive components are formed by annular and concentric structures in relief on one of the faces of the lens, the contour of the various structures in relief being identical for a considered region, but different from one region to another, and the external radius of the structures in relief, considered with respect to the optical axis of the lens, corresponds to a geometrical progression of the type $\sqrt{k}r_1$ where k designates whole numbers and r1 designates the external radius of the central structure.



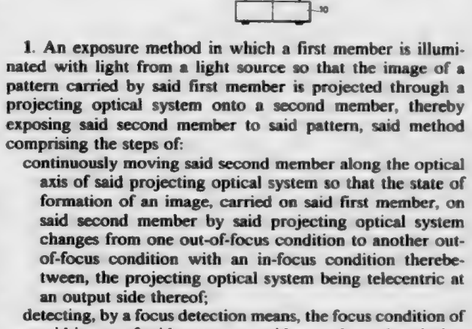
5,114,221
LENS LOCATION BLOCK
Stephen J. Wylde, 22 Bath Road, Emsworth, Hampshire PO10 7EP, United Kingdom
Filed Sep. 1, 1989, Ser. No. 401,915
Claims priority, application United Kingdom, Nov. 30, 1988, 8827947
Int. Cl.[5] G02C *7/02*
U.S. Cl. 351—177 **10 Claims**



1. A lens assembly comprising a bi-focal or multi-focal lens element or blank made of a clear synthetic plastics material and, attached to a face of the lens element or blank, a lens location block made of a mouldable non-metallic material so as to be moulded on to the said face of the lens element or blank, wherein the lens location block includes integrally-moulded location means to permit the block to be driven through the location means after the block has been fitted on a lens-treatment machine, and wherein release material is interposed between the said face of the lens element or blank and an opposed face of the lens location block to facilitate subsequent release of the lens element or blank from the block whereby the block can be disposed of after the lens element or blank has been released from the block.

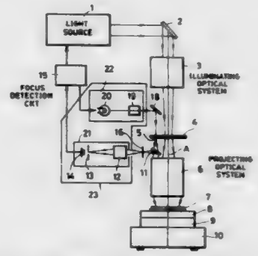
5,114,222
METHOD AND APPARATUS FOR PERIMETRY
Tom N. Cornsweet, Irvine, Calif., assignor to Pulse Medical Instruments, Rockville, Md.
Filed Dec. 11, 1989, Ser. No. 448,550
Int. Cl.[5] A61B *3/02*
U.S. Cl. 351—204 **10 Claims**

9. A perimetry system comprising in combination;
means for displaying a first stimulating spot in the focal plane of the eye of a patient;
means for moving said first spot in a spiral path of generally concentric circles centered on a second stimulating spot;
means to detect a pupillary response to said first stimulating spot, including a first infrared source for producing a backlighted image of the pupil of the patient's eye on a scanning video detector;
means for detecting if said eye is directed toward said fixed spot, including a second infrared source for producing a reflection from the cornea of said eye on said video detector;



means for energizing said first and second infrared sources on alternate scans of said video detector; and
means for correlating the position of the image of said spot on the retina with said pupillary response.

5,114,223
EXPOSURE METHOD AND APPARATUS
Makoto Torigoe, Kawasaki, and Hiroshi Sato, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 512,601, Apr. 23, 1990, abandoned, which is a continuation of Ser. No. 186,737, Apr. 22, 1988, abandoned, which is a continuation of Ser. No. 883,753, Jul. 9, 1986, abandoned. This application Jul. 3, 1991, Ser. No. 724,451
Claims priority, application Japan, Jul. 15, 1985, 60-155349; May 19, 1986, 61-114194
Int. Cl.[5] G03B *27/42*
U.S. Cl. 353—101 **29 Claims**



1. An exposure method in which a first member is illuminated with light from a light source so that the image of a pattern carried by said first member is projected through a projecting optical system onto a second member, thereby exposing said second member to said pattern, said method comprising the steps of:
continuously moving said second member along the optical axis of said projecting optical system so that the state of formation of an image, carried on said first member, on said second member by said projecting optical system changes from one out-of-focus condition to another out-of-focus condition with an in-focus condition therebetween, the projecting optical system being telecentric at an output side thereof;
detecting, by a focus detection means, the focus condition of said image of said pattern on said second member during

the continuous movement of said second member and producing an output signal representing the focus condition; and

effecting exposure of said second member in response to the output signal from said focus detecting means during the continuous movement of said second member along said optical axis of said projecting optical system without requiring that said movement be stopped in order to achieve said exposure.

5,114,224

AUTOMATIC FOLLOW-UP PROJECTING SYSTEM

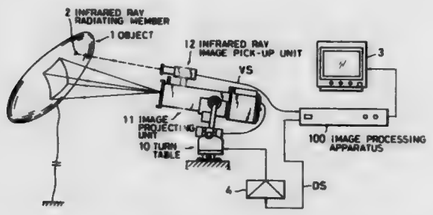
Takashi Miyamoto; Kazuya Miyagawa; Yukihito Tomimatsu; Tsutomu Sugiura; Kenji Nishi, and Taku Ichihara, all of Tokyo, Japan, assignors to Densu Prox., Inc. and Aoi Studio Co., Ltd., both of Tokyo, Japan

Filed Jul. 24, 1990, Ser. No. 556,978

Claims priority, application Japan, Feb. 19, 1990, 2-37943

Int. Cl.[5] G03B *21/00*

U.S. Cl. 353—122 **9 Claims**



1. An automatic follow-up projecting system comprising; a turntable pivotable arbitrarily about vertical and horizontal axes in response to a movement of a moving object having a light emitting member; an image projecting unit affixed said turntable, and having directivity so as to project an image at a predetermined position on said moving object; an image pick-up means for light emitted from said light emitting member; a calculating controlling means connected to said image pick-up means and said turntable. for driving and controlling said turntable in accordance with light quantity signals obtained from said light emitting member by said image pick-up means, thereby moving said turntable so as to cause said image projecting unit to track said moving object.

5,114,225

APPARATUS FOR VARYING ACCEPTANCE ANGLE OF CAMERA

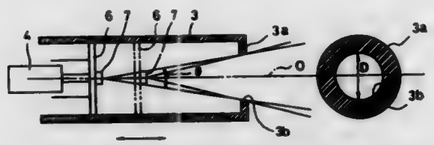
Kimiaki Ogawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1990, Ser. No. 501,844

Claims priority, application Japan, Apr. 5, 1989, 1-86625

Int. Cl.[5] G03B *7/099*

U.S. Cl. 354—481 **22 Claims**



1. In a camera having a strobe unit and a photographing lens with a variable focal length and a strobe light receiver which receives light reflected from a subject to be photographed, an acceptance angle varying apparatus comprising:

acceptance angle varying means for varying the acceptance angle of said strobe light receiver;

focal length reading means for reading focal length data of the photographing lens; and

driving means for moving said acceptance angle varying means in association with the focal length of the photographing lens.

5,114,226

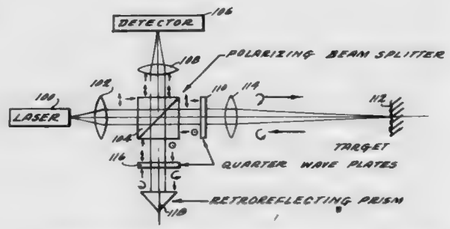
3-DIMENSIONAL VISION SYSTEM UTILIZING COHERENT OPTICAL DETECTION

Frank E. Goodwin, and Dana Simonson, both of Burke, Va., assignors to Digital Optronics Corporation, Springfield, Va.

Continuation of Ser. No. 28,317, Mar. 20, 1987, abandoned. This application Sep. 28, 1990, Ser. No. 589,625

Int. Cl.[5] G01C *3/08, 1/00;* G01B *11/26*

U.S. Cl. 356—5 **22 Claims**



1. A vision system for determining characteristics of a target comprising:

optical source means for providing a source light beam which is linearly polarized in a first orientation;

beam splitter means for splitting said source beam into a target beam and a reference beam both of which are linearly polarized in said first orientation;

quarter wave plate means for converting said target beam to circular polarization in a first rotational direction and directing said target beam toward the target, and for receiving a return light beam reflected from said target which is circularly polarized in a second rotational direction opposite to said first rotational direction, said quarter wave plate means converting said return light beam to linear polarization in a second orientation perpendicular to said first orientation;

retroreflector means for converting said return light beam which is linearly polarized in said second orientation to linear polarization in said first orientation and for reflecting said return beam;

detector means for optical heterodyne detection of said reference and return beams which are both linearly polarized in said first orientation, and for providing an output signal including information about said

scanning means for scanning said target beam across said target; and

processing means for controlling said scanning.

5,114,227

LASER TARGETING SYSTEM

William C. Cleveland, Jr., Santa Ana, Calif., assignor to Loral Aerospace Corp., New York, N.Y.

Filed May 14, 1987, Ser. No. 49,488

Int. Cl.[5] G01C *1/00;* F41G *5/06;* G02F *1/00*

U.S. Cl. 356—152 **11 Claims**

1. A real-time laser targeting system comprising:

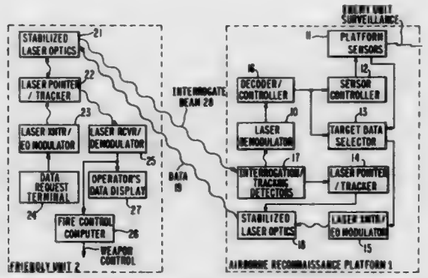
an airborne reconnaissance platform comprising platform sensors disposed to surveille enemy targets, to produce targeting information in response to said surveillance, and to store said targeting information in an on-board target

data selector which comprises a computer that discriminates and classifies the targets;

several friendly units capable of firing weapons at the enemy targets;

first laser communications means situated on board each friendly unit by which each friendly unit can interrogate the airborne reconnaissance platform as to targeting information regarding targets suitable for that friendly unit;

second laser communications means situated on board the airborne reconnaissance platform by which the airborne



reconnaissance platform delivers to friendly units in a real-time fashion targeting information stored in said target data selector for targets that are the subject of friendly unit interrogations; and

a decoder/controller on board the airborne reconnaissance platform for verifying the validity of requests delivered by the friendly units, assigning priority to each request, and categorizing said requests into those for which targeting data already exists in the target data selector and those for which targeting data does not exist in the target data selector.

5,114,228

APPARATUS FOR MEASURING THE ENERGY OF RAPIDLY PULSING RADIATION

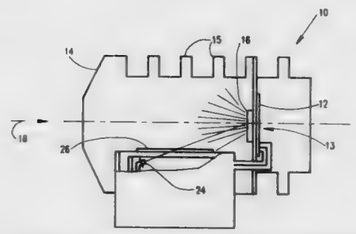
Ephraim Greenfield, and Jacob J. Vecht, both of Jerusalem, Israel, assignors to Ophir-Aryt Optronics, Ltd., Jerusalem, Israel

Filed Dec. 3, 1990, Ser. No. 624,974

Claims priority, application Israel, Mar. 28, 1990, 93918

Int. Cl.[5] G01J *1/42*

U.S. Cl. 356—222 **20 Claims**



1. Apparatus for determining the energy of single pulses of rapidly pulsing laser radiation comprising:

first radiation sensing means for providing a first signal output V_i in response to single pulses of a plurality of pulses of rapidly pulsing radiation;

second radiation sensing means for providing a second signal output P in response to a plurality of pulses of rapidly pulsing radiation, said second signal output P being an indication of the overall average incident optical power of the plurality of pulses; and

signal processing means, associated with said first and second radiation sensing means, for receiving and processing said first and second signal outputs for storing the output of said first radiation sensing means to provide an average signal value V_{av} and so as to determine an average pulse f of said plurality of pulses and thereby also to provide an output indication e_i of the energy of single pulses of the plurality of pulses of rapidly pulsing radiation in accordance with the following functional relationship:

$$e_i=(V_i/V_{av})\times(P/f).$$

5,114,229

APPARATUS FOR MEASURING LEADS OF ELECTRICAL COMPONENT AND METHOD OF MEASURING LEADS OF ELECTRICAL COMPONENT

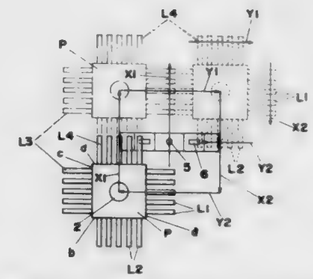
Osamu Hideshima, Tosu, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 6, 1990, Ser. No. 609,722

Claims priority, application Japan, Nov. 10, 1989, 1-293543

Int. Cl.[5] G01N *21/88*

U.S. Cl. 356—237 **3 Claims**



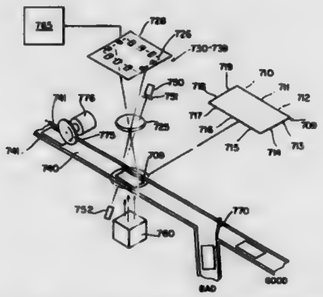
1. A method of measuring leads projecting from sides of a molding body of an electrical component, comprising the steps of:

positioning a pick and place head having means for holding an electrical component over a measuring apparatus having laser light emitting means and photodetector means;

causing relative movement in a substantially horizontal plane between said pick and place head and said measuring apparatus in four directions such that a locus of said relative movement has a substantially rectangular shape; and

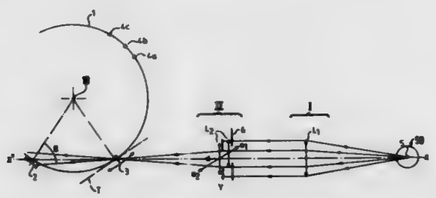
during said relative movement in each of said four respective directions, radiating laser light from said laser light emitting means toward leads projecting from a respective side of the molding body of the electrical component and causing laser light reflected from said leads to be received by said photodetector means.

5,114,230
ELECTRO-OPTICAL INSPECTION
Timothy R. Pryor, Windsor, Canada, assignor to Diffracto Ltd., Windsor, Canada
Continuation of Ser. No. 217,748, Jul. 12, 1988, abandoned, which is a continuation of Ser. No. 95,865, Sep. 14, 1987, abandoned, which is a continuation of Ser. No. 48,501, May 5, 1987, Pat. No. 4,875,776, which is a continuation of Ser. No. 815,270, Dec. 24, 1985, abandoned, which is a continuation of Ser. No. 531,210, Aug. 26, 1983, abandoned, which is a division of Ser. No. 269,614, Jun. 2, 1981, Pat. No. 4,576,482, which is a continuation of Ser. No. 73,366, Sep. 3, 1979, abandoned. This application Jan. 3, 1990, Ser. No. 460,641
Int. Cl.[5] G01B *11/00*
U.S. Cl. 356—372 **14 Claims**



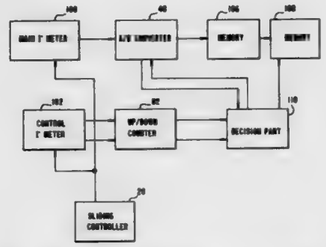
1. Apparatus for simultaneously determining two dimensions of a workpiece comprising:
an inspection station;
electro-optical sensor means for generating a first set of signals indicative of two dimensions of the workpiece in said inspection station and for generating a second set of signals indicative of a two dimensional position of the workpiece in said inspection station; and
means for analyzing said first and second sets of signals to determine the two dimensions of said workpiece.

5,114,231
SPECTROSCOPIC ANALYSIS DEVICE
Jean-Claude Gautherin, and Henri Zegre, both of Sucy en Brie, France, assignors to Instrument SA, France
Filed Sep. 5, 1990, Ser. No. 577,891
Claims priority, application France, Sep. 5, 1989, 89 11607
Int. Cl.[5] G01J *3/20*
U.S. Cl. 356—328 **12 Claims**



1. A spectrometric analysis device comprising a light source of which it is desired to analyze a useful part, a light analyzer comprising an assembly of an entrance slit, a diffraction grating and at least one exit slit associated with a detector, the assembly being disposed along a Rowland circle, and an optical transmission system, disposed along an optical axis passing through a useful part of the source, the entrance slit and the center of the grating and associated with means for selecting the useful light, wherein the entrance slit (3) is mounted so as to be displaceable along the Rowland circle (1), on either side of a central position, wherein the optical transmission system comprises a first part (I) associated with the useful part of the light source (5; 8) and remaining fixed during the analysis of said useful part and a second, movable part (II) associated with the entrance slit (3) and mounted so as to be displaceable parallel to itself in a direction (a_1, a_2; b_1, b_2; c_1, c_2) parallel to the tangent (T) to the Rowland circle (1) at the central position of the entrance slit (3), on either side of a mean position for which the optical axis of said movable part (II) passes through said central position, and wherein the device comprises means for controlling the displacements, in synchronism, of the entrance slit (3) along the Rowland circle (1) and of the movable part (II), parallel to the tangent (T) with maintenance of the direction parallel to itself.

5,114,232
MOVING MIRROR VELOCITY DETECTION IN AN INTERFERENCE SPECTROPHOTOMETER
Fumio Tsuji, and Osamu Yoshikawa, both of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan
Filed Dec. 28, 1990, Ser. No. 635,023
Claims priority, application Japan, Dec. 29, 1989, 1-342371
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—346 **2 Claims**



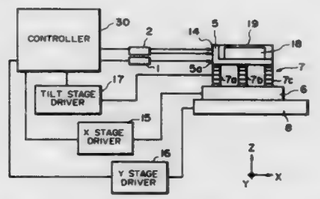
1. An interference spectrophotometer comprising:
a beam splitter dividing an incident linearly polarized laser beam into two parts;
a movable mirror and a fixed mirror which return the two parts of the beam to the beam splitter;
a phase plate installed between one of the mirrors and the beam splitter;
a polarizing beam splitter which divides the interference radiations meeting at the first-mentioned beam splitter into two;
two detectors receiving the two polarized radiations, respectively, emerging from the polarizing beam splitter;
an analog-to-digital converter for converting sampled signals into digital form;
an up/down counter which receives the output signals from the two detectors and which, when the counter's value varies, produces a signal to cause the analog-to-digital converter to start analog-to-digital conversion of data associated with said counter value; and
a decision part which checks the counter's value after the completion of the A/D conversion and which, if this value differs from the count value obtained at the beginning of the A/D conversion, determines that the movable mirror abnormally slid.

5,114,233
METHOD FOR INSPECTING ETCHED WORKPIECES
Linda A. Clark, Mountainside; Richard A. Gottscho; Joseph B. Kruskal, both of Maplewood, and Diane Lambert, Berkeley Heights, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Oct. 9, 1990, Ser. No. 594,774
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—354 **5 Claims**



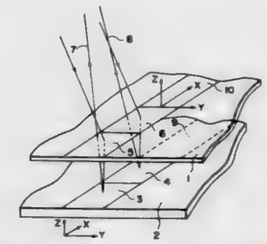
1. A method for optically inspecting workpieces comprising the steps of:
determining by singular value decomposition a set of principal components for the intensity envelope of light scattered from one or more reference workpieces over a range of spatial frequencies corresponding to a plurality of diffraction orders,
defining criteria for the acceptability or nonacceptability of a workpiece in accordance with the principal component content of the intensity envelope of the workpiece;
exposing a workpiece to be tested to a beam of coherent light;
measuring the intensity of the light scattered from said workpiece over a range of spatial frequencies corresponding to a plurality of diffraction orders,
determining the principal component content of the intensity envelope of said workpiece to be tested for one or more principal components; and
accepting or rejecting said workpiece in accordance with whether or not said principal component content satisfies said criteria.

5,114,234
STAGE POSITIONING CONTROL METHOD AND APPARATUS
Hiroyuki Otsuka; Kotaro Hosaka, both of Ushiku, and Makoto Higomura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 402,357, Sep. 5, 1989, abandoned. This application Aug. 20, 1991, Ser. No. 750,695
Claims priority, application Japan, Sep. 5, 1988, 63-220484
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—358 **7 Claims**



1. A stage positioning control method, comprising the steps of:
detecting an attitude of a laser interferometer mirror disposed on a linearly movable stage by means of a tilting stage to provide a first detected attitude;
projecting a laser beam onto the laser interferometer mirror;
controlling a linear position of the stage using the laser beam projected onto the laser interferometer mirror;
detecting again the attitude of the laser interferometer mirror after the positioning of the linearly movable stage to provide a second detected attitude;
determining a difference between the first detection attitude and the second detection attitude; and
controlling the tilting stage on the basis of the difference in order to correct an Abbe error.

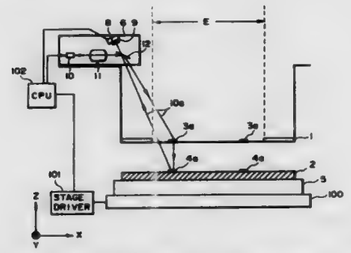
5,114,235
METHOD OF DETECTING POSITIONAL DEVIATION
Shigeyuki Suda, Yokohama, and Naoto Abe, Isehara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 17, 1990, Ser. No. 553,315
Claims priority, application Japan, Jul. 18, 1989, 1-186937
Int. Cl.[5] G01B *11/27*
U.S. Cl. 356—401 **38 Claims**



1. In a method of detecting relative positional deviation of first and second substrates, wherein first and second marks having optical powers are formed on the first substrate, wherein third and fourth marks having optical powers are formed on the second substrate, wherein a radiation beam is projected to the first substrate by an irradiating means, wherein as a result of the irradiation with the radiation beam the first and third marks produce a first beam whose position of incidence upon a predetermined plane is changeable in a first direction with the relative positional deviation of the first and second substrates, while the second and fourth marks produce a second beam whose position of incidence upon that plane is changeable in a second direction, different from the first direction, with the relative positional deviation of the first and second substrates, wherein a sensor disposed adjacent to the predetermined plane receives the first and second beams to produce an output signal corresponding to the spacing between the first and second beams upon the sensor, and wherein by using the output signal from the sensor the relative positional deviation of the first and second substrates is detected, the improvement comprising:
providing a reference mark adapted to produce, when irradiated with a radiation beam, third and fourth beams so that the third and fourth beams advance along respective light paths which are substantially coincident with the light paths for the first and second beams advancing to the sensor when the first and second substrates are in a predetermined positional relationship;
projecting, by use of the irradiating means, a radiation beam to the reference mark to thereby produce the third and fourth beams;
receiving, by use of the sensor, the produced third and fourth beams and producing, by use of the sensor, a reference signal corresponding to the spacing of the third and fourth beams upon the sensor; and
detecting the relative position of the first and second sub-

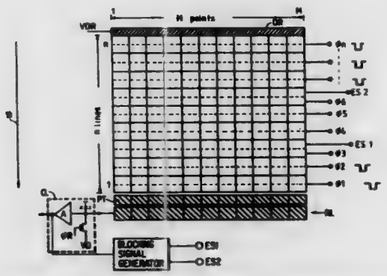
strates on the basis of the output signal and the reference signal.

5,114,236
POSITION DETECTION METHOD AND APPARATUS
Masakazu Matsugu, Atsugi; Kenji Saitoh, and Mitsutoshi Ohwada, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 3, 1990, Ser. No. 562,656
Claims priority, application Japan, Aug. 4, 1989, 1-203053; May 25, 1990, 2-136827
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—401 **52 Claims**



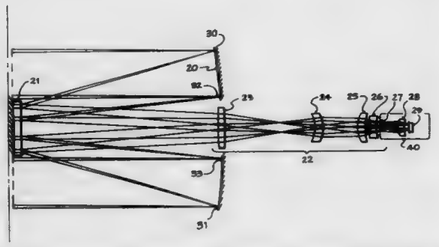
1. A position detecting method for detecting the position of a substrate by use of a mark provided on the substrate and having an optical power dependent upon wavelength, said method comprising the steps of:
irradiating the mark with first and second radiation beams having different wavelengths; and
receiving the first and second radiation beams from the mark by use of a sensor to determine the position of the substrate on the basis of the position of incidence of each of the first and second radiation beams on the sensor.

5,114,237
PROGRAMMABLE INTEGRATION TIME PHOTOSENSITIVE SENSOR
Yvon Cazaux, Grenoble, France, assignor to Thomson Composants Militaires et Spatiaux, Courbevoie, France
Filed Oct. 24, 1990, Ser. No. 602,671
Claims priority, application France, Oct. 24, 1989, 89 13907
Int. Cl.[5] H04N *5/15, 5/217*
U.S. Cl. 358—213.23 **6 Claims**



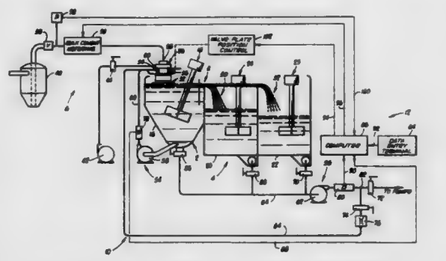
1. Multilinear photosensitive sensor of n lines operating in charge integration and time delay mode, organized in n lines of M columns of elementary photosensitive cells, with programming of the number k of lines actually used in charge integration and transfer, the sensor including electrodes which enable stored charges to be transferred from one line to the next adjacent line and the charges in the last line of cells to be transferred to a reading stage, with clock signals common to all the lines to provoke these transfers, characterized by the fact that means are also provided to apply to certain electrodes known as "blocking electrodes" either the clock signals enabling the transfer to be made, or a blocking potential preventing any transfer at this electrode while the other electrodes situated between this electrode and the reading stage continue to receive potentials for transfers.

5,114,238
INFRARED CATADIOPTRIC ZOOM RELAY TELESCOPE
Robert D. Sigler, Cupertino, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.
Filed Jun. 28, 1990, Ser. No. 545,211
Int. Cl.[5] G02B *23/00, 5/24, 17/00*
U.S. Cl. 359—399 **15 Claims**



1. A catadioptric zoom relay telescope capable of achieving a continuously variable focal length over a band of infrared wavelengths, said telescope comprising a primary mirror for gathering rays in said infrared wavelength band, a secondary Mangin mirror for directing said rays through an aperture in said primary mirror, said primary mirror and said secondary Mangin mirror being coaxially disposed along an optical axis, said aperture in said primary mirror being substantially symmetric about said optic axis, an imaging system comprising movable lens elements disposed along said optic axis to form a real image of said primary mirror at a Lyot stop, said Lyot stop being disposed along said optic axis externally of said imaging system, and field lens means disposed along said optic axis to focus rays passed by said Lyot stop onto a detector, said field lens means being fixedly positioned relative to said primary mirror and said secondary Mangin mirror.

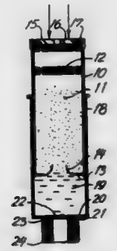
5,114,239
MIXING APPARATUS AND METHOD
Thomas E. Allen, Comanche, Okla., assignor to Halliburton Company, Duncan, Okla.
Filed Sep. 21, 1989, Ser. No. 412,231
Int. Cl.[5] B01F *15/02;* **B28C** *9/04*
U.S. Cl. 366—6 **24 Claims**



1. An apparatus for producing an averaged mixture,

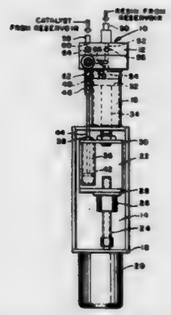
a first tub;
inlet means for producing and inputting initial mixtures including a first substance and a second substance into said first tub for producing a first averaged mixture within said first tub;
a second tub;
a third tub; means for selectably directing a portion of said first averaged mixture from said first tub into at least a selected one of said second tub and said third tub for producing a second averaged mixture within the selected at least one of said second tub and said third tub; and
means for recirculating at least a portion of each of said first averaged mixture and said second averaged mixture back to said inlet means for mixing with initial mixtures of said inlet means.

5,114,240
METHOD AND A DEVICE FOR PREPARING A MIXTURE OF A SOLID AND A LIQUID COMPONENT
Ture Kindt-Larsen, Vedbæk; Per Wolff, Birkerød, and Michael Morris, Allerød, all of Denmark, assignors to Wolff & Kaaber A/S, Denmark
Filed May 10, 1990, Ser. No. 521,733
Claims priority, application Denmark, May 12, 1989, 2355/89
Int. Cl.[5] B67B *7/24*
U.S. Cl. 366—129 **36 Claims**



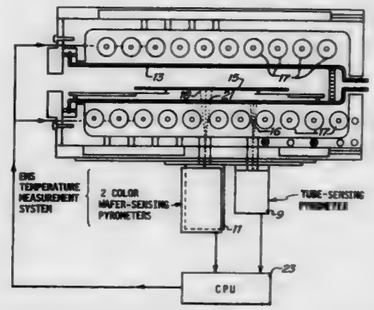
12. A mixing device for mixing a solid, particulate or powdered first component and a liquid second component so as to provide a paste-like material therefrom, said device comprising:
a first cylinder for containing said first component and having a first end and an opposite second end provided with venting means;
a second cylinder for containing said liquid second component and having a first end and an opposite second end sealingly receiving the first end of the first cylinder in a piston-like manner;
means for providing communication between inner spaces of the first and second cylinders through at least one of said first end of the first cylinder and said second end of said second cylinder, thereby allowing the liquid second component from the second cylinder to be injected into interstices defined between particles of the first component contained in the first cylinder for providing said paste-like material, when said first cylinder is relatively moved into the second cylinder;
said venting means comprising means for allowing gaseous matter to be removed to the atmosphere from said first cylinder during relative movement of said first and second cylinders thereby allowing said first and second components to mix to form a substantially homogeneous mixture comprising said paste-like material in said first cylinder; and further comprising:
a discharge orifice at the closed first end of the second cylinder for providing said paste-like material from said first cylinder; and
means for expelling said mixed paste-like material out of the first cylinder through the orifice.

5,114,241
DEVICE FOR INSULATING MOTOR STATORS
William O. Morrison, 7666 Ross Rd., Madison, Ohio 44057
Filed Jan. 22, 1991, Ser. No. 643,216
Int. Cl.[5] B01F *15/04, 5/12*
U.S. Cl. 366—162 **5 Claims**



1. Apparatus for the precision metering of a first material and a second material and the mixing of same comprising:
means for providing a predetermined amount of said fist material;
means for providing a predetermined amount of said second material;
means for driving said first material providing means and said second material providing means, said driving means comprising a drive screw and a stationary nut assembly which is operatively connected to said first material providing means and said second material providing means;
means for adding said predetermined amount of said second material to said predetermined amount of said first material; and
means for mixing said predetermined amount of said first material and said predetermined amount of said second material after said predetermined amount of said second material has been added to said predetermined amount of said first material.

5,114,242
BICHANNEL RADIATION DETECTION METHOD
Arnon Gat, Palo Alto, and David Mordo, San Jose, both of Calif., assignors to AG Processing Technologies, Inc., Sunnyvale, Calif.
Filed Dec. 7, 1990, Ser. No. 624,206
Int. Cl.[5] G01J *5/62, 5/60, 5/54, 5/10*
U.S. Cl. 374—128 **9 Claims**



1. A method for accurately determining in non-destructive,

non-contacting manner the temperature within a processing chamber of an object that is selected from a population of similar objects using a plurality of pyrometers that operate in different wavebands on the radiation received through a wall of the processing chamber from an object within the chamber, the method comprising the steps of:

substantially calibrating the responses of each pyrometer on a reference object within the chamber to yield corrected responses at at least one reference temperature;

selecting a master object from the population of objects;

determining master emissivities of the master object at a reference temperature within the chamber from the corrected responses of each of the calibrated pyrometers;

altering the corrected pyrometer responses relative to the master emissivities to provide extreme values of emissivity from the corrected pyrometer responses to radiation at the reference temperature from within the chamber of each of a set of objects selected from said population which exhibit emissivities near extremes of the range of emissivities of objects in the population;

providing signal values determined for each of said set of objects selected from said population from the responses of the corrected pyrometers which are altered in accordance with the master emissivities;

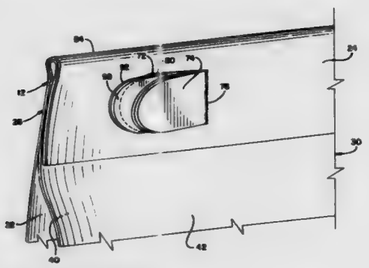
determining a correlation between said signal values and the emissivity values of the objects providing the extreme values;

elevating another object selected from said population to a temperature within the chamber near the reference temperature;

calculating the emissivity values of said another object from the corrected responses of the pyrometers in accordance with said correlation; and

altering the emissivity values of said another object within the chamber in accordance with the calculated emissivity values of said another object for determining the temperature of said another object within the chamber.

5,114,243
PACKAGE
Hubert Thier, Crystal Lake, Ill., assignor to Sengewald/USA, Inc., Marengo, Ill.
Filed Feb. 15, 1991, Ser. No. 656,475
Int. Cl.[5] B65D *27/20*
U.S. Cl. 383—85 **9 Claims**



1. A package comprising:

at least one wall defining a well having an openable end; and a closure means for closing said openable end;

said openable end being bounded by at least one generally flexible sheet, said at least one sheet being extendable across said openable end to a covered position, said covered position presenting a first segment and a second segment of said at least one sheet in substantially abutting facing relationship across a generally planar expanse;

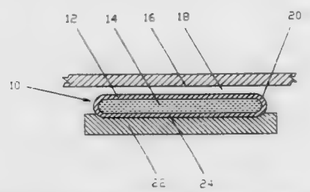
said closure means comprising at least one interference-fit structure within said expanse, each of said at least one interference-fit structure comprising an aperture-set, each said aperture-set including a first respective aperture in said first segment and a second respective aperture in said second segment, each of said first respective aperture and said second respective aperture having a tab means for effecting an interference fit, each said tab means presenting a free distal end depending within an associated aperture of said first respective aperture and said second respective aperture from a flex line, said flex line partially bounding said associated aperture, said first respective aperture and said second respective aperture in each said aperture-set being generally adjacently registrable in said covered position;

each of said at least one interference-fit structure being configured to hold said at least one sheet in said covered position by displacing said distal end of said tab means associated with each respective aperture of an aperture-set in a first direction generally laterally to said expanse sufficiently to extend each said distal end through at least an adjacent respective aperture of said aperture-set;

said first respective aperture having a first width and a first length and said second respective aperture having a second width and a second length, said first width and said second width being substantially equal;

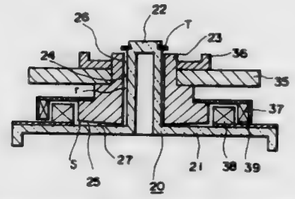
said first length and said second length being substantially equal, and said flex line of said first respective aperture being offset from said flex line of said second respective aperture in said closed position along an axis, said axis being generally perpendicular to said flex line of said first respective aperture and to said flex line of said second respective aperture, whereby an enhanced interference fit is effected when said distal end of said tab means of said first respective aperture is displaced to extend through said second respective aperture.

5,114,244
COMPLIANT BEARING SURFACE WITH ENCLOSED FLUID SUPPORT
James L. Dunham, and Catherine C. Cutter, both of 216 Redwood Ave., Willits, Calif. 95490
Filed Sep. 4, 1991, Ser. No. 754,966
Int. Cl.[5] F16C *32/06*
U.S. Cl. 384—103 **14 Claims**



1. An improved bearing surface assembly, said improvement comprising a compliant bearing plate, a nearly incompressible fluid, an elastic base with at least one perforation, and a sub-base, said compliant bearing plate overlaying said perforated elastic base overlaying said sub-base enclosing at least one cavity, said cavity filled with said nearly incompressible fluid, said nearly incompressible fluid in said cavity and said elastic base a support means for said compliant bearing plate.

5,114,245
DYNAMIC PRESSURE BEARING DEVICE
Katsuhiko Tanaka, Yamato; Takeyuki Yoshiba, Fujisawa; Takanobu Sato, Odawara; Ikunori Kawakami, Fujisawa, and Koichi Kawakami, Yokohamashi, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 11, 1990, Ser. No. 551,549
Claims priority, application Japan, Jul. 17, 1989, 1-183989; Jan. 31, 1990, 2-21808
Int. Cl.[5] F16C *32/06*
U.S. Cl. 384—112 **6 Claims**



1. A dynamic pressure bearing device comprising:

a sleeve having a cylindrical radial bearing surface formed in an inner peripheral surface and a thrust bearing surface formed at one end surface;

a shaft member fitted into said sleeve and having a radial receiving surface opposing the radial bearing surface and a thrust receiving surface opposing the thrust bearing surface;

a first groove for generating a dynamic pressure formed in at least one of the radial bearing surface and the radial receiving surface;

a second groove for generating a dynamic pressure formed in at least one of the thrust bearing surface and the thrust receiving surface; and

a thrust bearing gap formed between the thrust bearing surface and the thrust receiving surface, said thrust bearing gap increasing gradually radially and outwardly.

4. A dynamic pressure bearing device comprising:

a sleeve having a cylindrical radial bearing surface formed in an inner peripheral surface and a thrust bearing surface formed at one end surface;

said sleeve being formed from an aluminum alloy containing a carbon fiber;

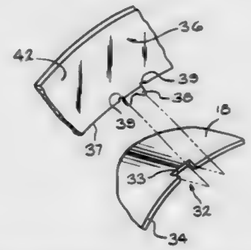
a shaft member fitted into said sleeve and having a radial receiving surface opposing the radial bearing surface and a thrust receiving surface opposing the thrust bearing surface;

a first groove for generating a dynamic pressure formed in at least one of the radial bearing surface and the radial receiving surface; and

a second groove for generating a dynamic pressure formed in at least one of the thrust bearing surface and the thrust receiving surface.

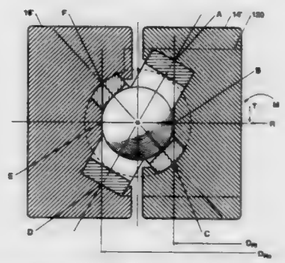
5,114,246
FLOATING FLANGE HALF BEARING
James L. Gowan, Atlantic, Iowa, assignor to JPI Transportation Products, Inc., Ann Arbor, Mich.
Filed Dec. 3, 1990, Ser. No. 620,727
Int. Cl.[5] F16C *9/02*
U.S. Cl. 384—275 **22 Claims**

1. A flanged half-bearing comprising a substantially semi-cylindrical shell adapted to be positioned within a support with slight interference between said shell and said support, said shell having a curved edge provided with at least one recessed portion therein and having at least one axial thrust half washer mounted thereon, said washer having a curved edge partially corresponding in shape to said shell curved edge and at least one appendage extending from said washer curved edge and projecting into said recessed portion, said appendage including a generally V-shaped notch being defined therein and forming a plurality of legs projecting into said recessed portion, said legs coacting with said recessed portion so as to retainingly engage said washer with said shell preventing separation of



said washer from said shell, said washer being movable relative to said shell when retainingly engaged thereon to accommodate forces applied to said flanged half-bearing and dimensional changes resulting from thermal influences.

5,114,247
MULTI-ELEMENT BEARINGS
Frank A. Folino, Weston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Division of Ser. No. 370,805, Jun. 20, 1989, abandoned. This application Dec. 10, 1990, Ser. No. 625,760
Int. Cl.[5] F16C *19/49, 19/56*
U.S. Cl. 384—461 **8 Claims**



1. A bearing assembly, configured to rotate about an axis and containing rolling elements between an inner and an outer race of a raceway, said assembly comprising

a first rolling element of a first diameter,

a second rolling element of a second diameter wherein said second diameter is greater than said first diameter, and

a third rolling element of a third diameter,

said rolling elements being oriented between said inner and outer races so that said first element contacts said inner race at a point lying on an inner pitch diameter and said outer race at a point lying on an outer pitch diameter, said second element contacts said inner race at a point lying on said inner pitch diameter and said outer race at a point lying on said outer pitch diameter, and said third element contacts said inner race at a point lying on said inner pitch diameter and said outer race at a point lying on said outer pitch diameter,

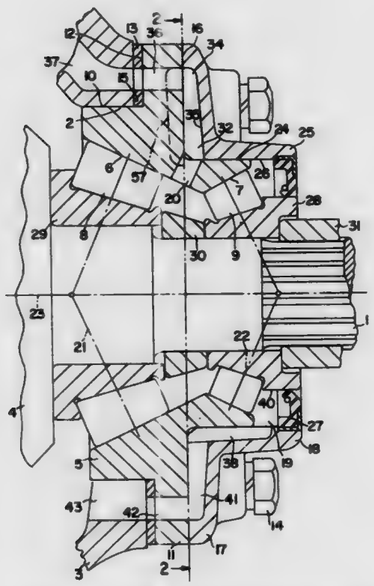
wherein the contact points of each of said rolling elements with said inner and said outer races are different from the contact points of the other two of said rolling elements with said inner and said outer races, so that said first, said second, and said third rolling elements together make six-point contact with said races.

5,114,248

BEARING FOR A SHAFT MEMBER OR THE LIKE

Ortwin Harsdorff, Zell, Fed. Rep. of Germany, assignor to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 6, 1991, Ser. No. 665,260
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1990, 4007881
Int. Cl.[5] F16C *19/38*
U.S. Cl. 384—473 **10 Claims**



1. A bearing assembly for a shaft mounting in a bore of a housing, comprising:

an outer ring having two outer raceways for inner and outer rows of rolling elements, said outer ring including a seating surface section seated in the through-bore and a radially outward-direction flange section, a cover having a contact surface of a ring-shaped flange for sealing off the roller bearing on the outside and at least one oil bore in said outer ring between the two outer raceways, extending radially from the outside toward the inside to a reservoir for the rolling elements to supply or carry away a lubricant to or from the reservoir, characterized in that said outer ring (5) has a lateral surface section (24) of a ring-shaped extension carrying the outside outer raceway (7), said lateral surface section being adjacent to outside end surface (16) of said flange section (11) of said outer ring, on which ring-shaped extension an inner surface (26) of a centering extension (25) is tightly seated, said centering extension being adjacent to said outside surface of the ring-shaped flange (17) of the cover (18, 44);

in that each said oil bore (20,56) is located between said outside end surface (16) of said flange section (11) and said lateral surface section (24) on the circumference of said outer ring (5); and

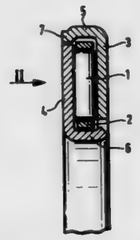
in that each of the said oil bores opens at its radially outer end into a connecting channel (32, 41, 45, 46) between said flange section (11) of said outer ring (5) and said ring-shaped flange (17) of said cover 18,44), said connecting channel extending in an essentially radial direction.

5,114,249

AXIAL ROLLING BEARING

Leo Muntnich, Aurachtal; Wolfgang Steinberger, and Wilfried Soyka, both of Herzogenaurach, all of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Continuation of Ser. No. 577,267, Sep. 4, 1990, abandoned. This application Aug. 6, 1991, Ser. No. 740,886
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1989, 3935637
Int. Cl.[5] F16C *33/58*
U.S. Cl. 384—622 **6 Claims**



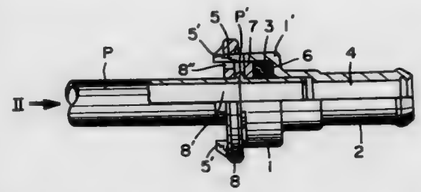
1. An axial rolling bearing comprising a cage containing rolling elements and arranged between two plane-parallel, thin-walled bearing discs made of sheet metal, wherein the three components form a structural unit by engaging together in a forming-locking manner and at least the first of the bearing discs mergers at its outer circumferential edge into an axially directed first collar which engages around the cage with clearance and extends into the region of the second bearing disc characterized in that there is a narrow guiding clearance at at least some peripheral points between the mutually facing circumferential surfaces of the first collar and of the second bearing disc respectively.

5,114,250

JOINT FOR COUPLING SMALL-DIAMETER PIPES

Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Japan

Filed Mar. 18, 1991, Ser. No. 670,993
Claims priority, application Japan, Mar. 19, 1990, 2-27902[U]
Int. Cl.[5] F16L *39/00*
U.S. Cl. 285—319 **5 Claims**



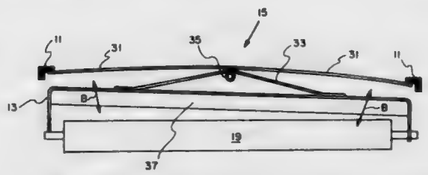
1. A joint for a visually monitored coupling for a small-diameter pipe, said pipe having an end and an annular projection wall in proximity to said end, said joint comprising: a body including opposed said front rear ends, a cylindrical joint wall adjacent the front end and defining a bore extending rearwardly from the front end, and a continuous cylindrical chamber wall rearwardly of the joint wall and defining a stepped enlarged chamber in communication with said bore, a plurality of spaced apart holder walls extending rearwardly from the cylindrical chamber wall, said holder walls having pawls at ends thereof remote from the cylindrical chamber wall said enlarged chamber being dimensioned and configured to receive a seal, a bushing and a portion of the pipe extending from the end thereof to the annular projection wall; and a support comprising a disk including a central hole, said pipe being mounted through the central hole in the disk of the support such that the disk is adjacent the annular projection wall of the pipe and on the side thereof opposite the end of the pipe, and a plurality of holes passing through the disk in surrounding relation to the central hole; said pawls being engaged with the holes of the support such that the disk of the support urges the annular projection wall against the bushing in the stepped enlarged chamber of the joint body and retains the pipe in the joint body, whereby the spaced apart rearwardly extending holder walls and the disk of the support enable the coupling to be visually monitored.

5,114,251

SELF-ALIGNING THERMAL PRINT HEAD AND PAPER LOADING MECHANISM

Steven A. Mahoney, McMinnville, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 25, 1990, Ser. No. 529,014
Int. Cl.[5] B41J *2/32*
U.S. Cl. 400—120 **3 Claims**



3. A self-aligning thermal print head mounting mechanism comprising,

a stationary frame,

a print head support bracket supporting a thermal print head array, the bracket having a back wall and a pair of extending side walls, each side wall having a U-shaped receiving slot,

means associated between the stationary frame and the support bracket for pivotally biasing the support bracket in a free floating manner, the means for biasing including a leaf spring with ends supported by said stationary frame and biased to exert a force towards the platen, and a centering strap coupled to said print head support bracket, the leaf spring and the centering strap being in abutting relation at a point of contact such that the centering strap pivots about the point of contact,

a movable cover supporting a platen and being slidable from an engaged position and a disengaged position with the print head support bracket, the platen being rotatable and having a shaft which is adapted to being received in said pair of U-shaped slots with the axis of rotation of the platen being aligned parallel to the print head array,

a switch pin set in the stationary frame and positioned to contact the centering strap when the movable cover is not in the print ready position, the centering strap moving away from the switch pin when the movable cover is slid into the print ready position thereby allowing the print head to be energized, and

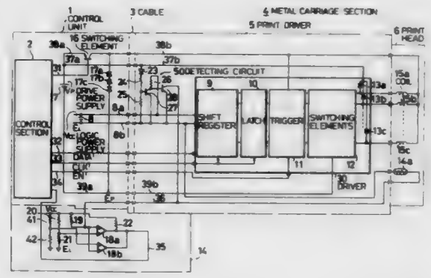
motive means associated with said stationary frame and a drive coupling means associated with said platen, the drive coupling means being engageable with the motive means for providing rotation to the platen when in the print ready position.

5,114,252

PRINTER WITH PROTECTION FROM DISCHARGE LINE DISCONNECTION

Jiro Tanuma, and Shinichi Katakura, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1990, Ser. No. 592,292
Claims priority, application Japan, Oct. 13, 1989, 1-266866
Int. Cl.[5] B41J *2/30*
U.S. Cl. 400—124 **18 Claims**



1. A printer comprising:

a carriage section having a print head which is mounted therein and which has a plurality of drive coils provided therein;

a control unit having a power supply circuit mounted therein and supplying drive power to said print head;

a cable comprising a plurality of conductors for connecting said control unit and said carriage section;

a drive power supply node and a discharge node in said carriage section being connected to an output terminal of said power supply circuit in said control unit via a drive power supply conductor and a discharge conductor forming part of said cable;

drive power for said plurality of drive coils being supplied from said terminal of said power supply circuit through said drive power supply node;

magnetic energy accumulated in said drive coils being discharged through said discharge node to said output terminal of said power supply circuit;

a printer protection circuit means provided in said carriage section for detecting an unsatisfactory connection of said discharge node with said terminal of said power supply circuit in accordance with the magnitude of the voltage applied to said discharge conductor, and for preventing the printing operation when it detects an unsatisfactory connection;

a temperature sensor for detecting the temperature of the print head and producing a signal which is in a certain region when the temperature is higher than a predetermined value;

a means for inhibiting the printing operation when the signal output from said temperature sensor is within said certain region;

said printer protection circuit means comprising means for bringing the output of the temperature sensor into said certain region;

said control unit further comprising an additional power supply node connected to said cable, and having a predetermined potential difference from the discharge node when the connection is satisfactory;

wherein said printer protection circuit means comprises means for monitoring the potential difference between said discharge node and said additional power supply node;

wherein said potential difference monitoring means comprises a voltage divider connected across the discharge node and said additional power supply node, and a transis-

tor turned on or off depending on the potential on the output of the voltage divider; and

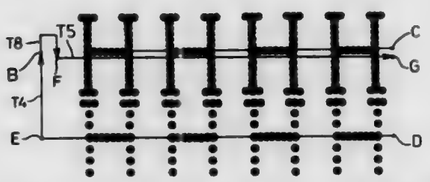
wherein said additional power supply node is one of a pair of logic power supply nodes connected to said cable, and said transistor is connected through a resistor across said pair of logic power supply nodes, and said potential difference monitoring means further comprises an additional transistor tuned on or off depending on the on/off operation of the first-mentioned transistor, and connected across the output of the temperature sensor and said additional power supply node.

5,114,253

DOT PRINTING METHOD FOR DOT PRINTER

Satoshi Yoshimoto, Konaki, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 23, 1991, Ser. No. 763,607
Claims priority, application Japan, Nov. 21, 1990, 2-317500
Int. Cl.[5] B41J *19/30*
U.S. Cl. 400—124 **15 Claims**



1. A dot printing method for a dot printer including a print head which has a plurality of dot print elements arranged at equal intervals in a predetermined direction, driving means for driving said dot print elements of said print head, head displacing means for reciprocally moving said print head along a printing line perpendicular to said predetermined direction, relative displacing means for relatively displacing at least one of said print head and a sheet to be printed in said predetermined direction, memory means for storing at least dot patterns corresponding to two lines including a odd line and an even line, and control means for controlling said driving means, said head displacing means, and said relative displacing means based on the dot patterns stored in said memory means, said dot printing method for said dot printer comprising:

a first step of driving said dot print elements by said driving means so as to print one part of the dot patterns corresponding to the odd line stored in said memory means while displacing said print head in a first direction along the printing line by said head displacing means;

a second step of relatively displacing at least one of said print head and the sheet in said predetermined direction by said relative displacing means thereby to hold said print head in alignment with the even line;

a third step of driving said dot print elements by said driving means so as to print one part of the dot patterns corresponding to the even line stored in said memory means while displacing said print head in a second direction opposite to said first direction along the printing line by said head displacing means;

a fourth step of relatively displacing at least one of said print head and the sheet in a direction opposite to said predetermined direction by said relative displacing means thereby to hold said print head in alignment with the odd line;

a fifth step of driving said dot print elements by said driving means so as to print another part of the dot patterns corresponding to the odd line stored in said memory means while displacing said print head in said first direction along the printing line by said head displacing means;

a sixth step of relatively displacing at least one of said print head and the sheet in said predetermined direction by said relative displacing means thereby to hold said print head in alignment with the even line; and

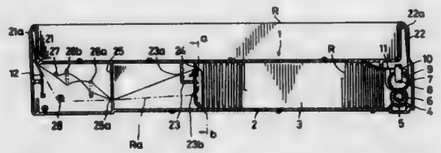
a seventh step of driving said dot print elements by said driving means so as to print another part of the dot patterns corresponding to the even line stored in said memory means while displacing said print head in said second direction along the printing line by said head displacing means.

5,114,254

RIBBON CASSETTE HAVING MEANS TO FEED BOTH FABRIC AND FILM RIBBONS

Hiroyuki Sato, and Mikishige Sugasa, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1990, Ser. No. 492,706
Claims priority, application Japan, Mar. 13, 1989, 1-60252
Int. Cl.[5] B41J *35/28*
U.S. Cl. 400—207 **26 Claims**



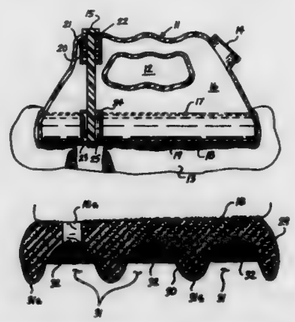
1. A ribbon cassette useable for both a fabric ribbon and a film ribbon, said cassette including means enabling said cassette to be used with either a fabric ribbon or a film ribbon without modification of the cassette, said means comprising a case having a ribbon inlet opening and a ribbon outlet opening for a fabric ribbon and a film ribbon, a ribbon storage chamber storing an endless fabric ribbon and film ribbon in a meandering state, said storage chamber having a downstream wall means, first slit means in said wall means for a fabric ribbon, a second slit means in said wall means for a film ribbon, said first slit means being spaced from said second slit means, a rib means on said case juxtaposed to said first slit means for applying a load to said fabric ribbon as said fabric ribbon passes from said storage chamber, and ribbon handling means disposed between said wall means and said ribbon outlet opening for said fabric ribbon and said film ribbon such that the same cassette is useable for both a fabric ribbon and a film ribbon without modification of the cassette.

5,114,255

APPLICATOR BRUSH ASSEMBLY

Jose R. Villarreal, P.O. Box 923, Pearsall, Tex. 78061

Filed Oct. 15, 1990, Ser. No. 597,542
Int. Cl.[5] A46B *11/04*; B05L *1/06, 17/00*
U.S. Cl. 401—45 **1 Claim**



1. An applicator brush assembly comprising, in combination,

a hollow housing, the housing including a top surface and a bottom surface, and including a housing cavity defined within the housing, and

at least one fill spout and removable cap directed through the housing in fluid communication with the cavity, and

a flow absorbent cup-shaped pad mounted to the bottom surface of the housing, with the pad including a pad floor and an annular skirt projecting above the floor, the annular skirt arranged in surrounding relationship relative to a lower portion of the housing, and

a plunger well positioned within the top surface of the housing, and

a plunger head projecting exteriorly of the plunger well, and a spring captured between the plunger head and a floor of the well, and

a plunger rod fixedly mounted to the plunger head and extending through the housing and into an apertured metering housing, the metering housing mounted within a floor opening directed through the bottom surface of the housing, and

a plug member mounted to a lower terminal end of the plunger rod overlying the floor opening whereupon depressing of the plunger head displaces the plug member relative to the floor opening to permit directing of fluid within the cavity exteriorly of the cavity and into the cup-shaped pad, and

wherein the cup-shaped pad includes a pad floor opening coaxially aligned with the floor opening of the housing, and

wherein the floor of the cup-shaped pad coextensively therewith includes a first hook and loop fastener surface, and the bottom surface of the housing coextensively therewith includes a second hook and loop fastener surface, wherein the first and second hook fastener surfaces are selectively securable together to secure the pad to the housing, and

including a partition wall coextensively formed throughout the housing to define the cavity and a further cavity, the further cavity including a further fill spout in fluid communication with the further cavity and further removable cap mounted to the further fill spout, and including a further plunger head mounted within a further plunger well, and the further plunger well positioned within the top wall of the housing spaced from the plunger well and mounting the further plunger head in cooperation with a further resilient plug member cooperative with a further floor opening in fluid communication with the further cavity, wherein the cavity and further cavity within the hollow housing each include a respective first and second fluid therewithin, and

wherein the cup-shaped pad includes a sinusoidal bottom surface defining a plurality of troughs therewithin, each of the plurality of troughs including a plurality of projections in surrounding relationship to each trough, and each trough is defined by a predetermined depth, and a bristle brush matrix assembly is fixedly mounted within each trough, and each bristle brush matrix assembly is defined by a predetermined length, and the predetermined length is less than the predetermined depth, and the projections are deformable to permit access of each bristle brush matrix assembly to a surface to be cleaned upon compression of the projections.

5,114,256

CLEANING BRUSH

Shih C. Lin, Ping Tung Hsien, Taiwan, assignor to Halcyon Corporation, Ping Tung Hsien, Taiwan

Filed Jan. 22, 1991, Ser. No. 643,743
Int. Cl.[5] A46B *11/06*
U.S. Cl. 401—46 **1 Claim**

1. A cleaning brush comprising:

a body;

tubular means integrated with said body for connection to a water source;

an enclosed chamber for a cleaning solution in the body independent of said tubular means and provided with a single inlet and at least one countersink outlet;

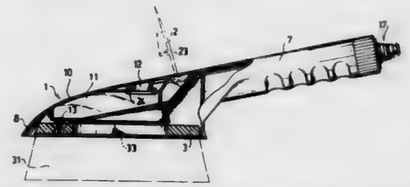
a flap pivotally mounted on the outside of said body and integrated with a plug for sealing said inlet;

a skirt extending around a bottom of said body, thereby defining an opening in the body;

at least one valve complementary in form to said at least one countersink outlet and including

a head, being compatible with said at least one countersink outlet, including a first condition sealing said countersink outlet and a second condition allowing a solution to drain out of said chamber through said countersink outlet,

a plunger including a first end integrated with said head and



a second end formed with an annular groove, projecting through said countersink outlet,

a washer received in said groove, and

a spring adjacent said plunger and including a first end abutting a bottom wall of said chamber and a second end abutting said washer, thereby urging said valve head in said first condition; and

a bristle plate retained within said opening and including at least one countersink aligning with said at least one valve and including at least one rib,

said plunger abutting said rib so that said valve is urged away from said countersink outlet when said bristle plate is urged toward said chamber, thereby rendering said head in said second condition.

5,114,257

WRITING APPARATUS WITH STAPLER INCORPORATED THEREIN

Nick Hsu, 5F., No. 44, Alley 3, Lane 550, Minchuan E. Rd., Taipei, Taiwan

Filed Mar. 15, 1991, Ser. No. 669,703
Int. Cl.[5] B26B *11/00*; B43K *29/00, 25/00*; B25C *7/00*
U.S. Cl. 401—195 **2 Claims**



1. A writing apparatus comprising a penholder with a ball refill retained therein for writing, and a staple driving mechanism incorporated therein for driving staples through paper as for binding pamphlets, characterized in that:

said penholder is comprised of a ball refill holder set inside an outer cylinder, said ball refill holder being an elongated cartridge having one end closed and an opposite end opened for feeding of staples, a channel defined therein for keeping said ball refill and said staples, an outer thread on said opened end for mounting a front socket through screw joint through which the ball-point nib of said ball refill projects for writing, a staple outlet hole in communicating with said channel through which said staples can be driven out, two clamping plates respectively mounted on the top and the bottom thereof for holding two plate springs, said outer cylinder being comprised of an upper

part and a lower part having each an end pivoted to said opened end of said ball refill holder and an opposite end respectively supported by said plate spring to space from each other, said upper part having a striking plate movably secured therein by a sliding button and controlled by said upper part to strike said staples out of said staple outlet hole for binding paper, said lower part having a receiving trough for keeping space staples, a matrix mounting seat for mounting a matrix to match with said striking plate for performing staple driving operation, and a lock cap pivoted thereto for releasably securing said upper part to said lower part.

5,114,258

CAP WITH AIR PASSAGE

Masahiro Yasunaga, Osaka, Japan, assignor to Kabushiki Kaisha Sakura Kurepasu, Osaka, Japan

PCT No. PCT/JP90/01553, § 371 Date Jul. 10, 1991, § 102(e) Date Jul. 10, 1991, PCT Pub. No. WO91/08115, PCT Pub. Date Jun. 13, 1991

PCT Filed Nov. 30, 1990, Ser. No. 690,938

Claims priority, application Japan, Dec. 1, 1989, 1-140049

Int. Cl.[5] B43K *9/00, 25/00*

U.S. Cl. 401—202 **6 Claims**



1. A cap comprising a cap body and a clip attached to the cap body, the cap body having a small portion in a tip side thereof, and the small portion having smaller sectional shape that an adjacent portion thereto, the clip having an annular mounting portion mounted on an outside of the small portion of the cap body, and an air passage for communicating a space before the tip side end of the cap with a space between the clip body and the cap body.

5,114,259

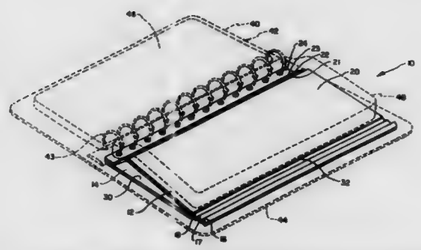
ADJUSTABLE WRITING PLATFORM FOR A NOTEBOOK

Jay A. Meservy, 564 Pheasant Cir., Bountiful, Utah 84010, and Jerry D. Meservy, 692 S. 850 East, Centerville, Utah 84014

Continuation-in-part of Ser. No. 532,050, Jun. 1, 1990, Pat. No. 5,044,807. This application Jun. 20, 1991, Ser. No. 718,203

Int. Cl.[5] B42F *13/00*

U.S. Cl. 402—80 R **18 Claims**



1. A writing platform for a notebook having a ring binder comprising:

a writing table mountable on said ring binder in said notebook; and

elevation means for elevating an inner edge of said writing table adjacent said ring binder while in said notebook to provide said writing platform, said elevation means elevating only said inner edge while an outer edge of said writing table is not elevated.

5,114,260

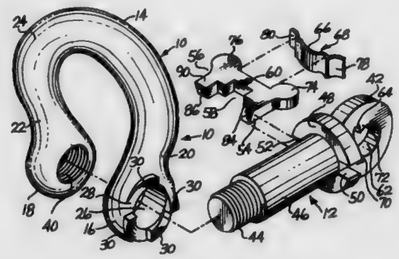
CLEVIS AND SCREW PIN TYPE SHACKLE WITH PIN LOCK

Judy L. Hart, 2322 - 37th S.W., Seattle, Wash. 98128, and William A. Munday, P.O. Box 15611, Seattle, Wash. 98115

Filed May 13, 1991, Ser. No. 699,451

Int. Cl.[5] F16D *1/00*

U.S. Cl. 403—24 **15 Claims**



13. A shackle, comprising:

a substantially U-shaped clevis having a closed end and an open end, a pair of spaced apart eyes at the open end defining a throat between them, one of said eyes including a first opening, an outer face, and a plurality of lock ramps on said outer face, each said lock ramp having a first end substantially flush with said outer face, a second end spaced both circumferentially from said first end and axially outwardly from said face, an inclined surface extending from the first end to the second end, and an end surface at said second end extending out from said outer face, and the second of said eyes including a threaded second opening in axial alignment with the first opening;

a closure pin comprising a head portion and a shank extending axially from said head portion, said shank including a threaded end portion opposite said head portion;

a releasable lock member carried by said closure pin and including a plurality of detents, each extending axially towards the threaded end of the shank, and a pull portion; and

a spring biasing said lock member axially endwise of the closure pin, towards the threaded end of the shank, to place the detents into an extended first position, said lock member being movable axially against said spring by a pull on said pull portion to move the detents into a retracted second position,

wherein in use the closure pin is picked-up and moved to insert the threaded end portion of the shank into and through the first opening, across the throat, to and into the second opening, and is then rotated to screw the threaded end portion of the shank into the threaded second opening, wherein during such rotation the detents contact the inclined surfaces of the lock ramps and each by such contact is retracted, wherein when the closure pin is connected to the clevis a reverse rotation of the closure pin is prevented by contact of the detents with the end surface of the lock ramp, and wherein the closure pin is removed from the clevis by first pulling on said pull portion of the lock member to retract the detents into their second position and holding them in said second position while rotating the closure pin in a reverse direction.

5,114,261

SWASHPLATE TYPE HYDRAULIC DEVICE HAVING A BALL JOINT CONNECTION

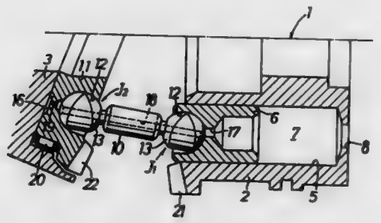
Kimiyasu Sugimoto, and Hajime Yoshino, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1990, Ser. No. 559,037

Claims priority, application Japan, Jul. 31, 1989, 1-198557; Aug. 7, 1989, 1-204288; Feb. 19, 1990, 2-38036

Int. Cl.[5] F16C *11/06*; F04B *27/08*

U.S. Cl. 403—122 **8 Claims**



1. A swashplate type hydraulic device comprising a cylinder block having an axis, a plurality of plungers arranged annularly around the axis of the cylinder block and slidably fitted in the cylinder block, a shoe member disposed at an angle to the axis of the cylinder block for synchronous rotation with the block, and connecting rods including at least one of which is connected at opposite ends thereof to the shoe member and associated plunger via ball joints, respectively, at least one of the ball joints comprising a spherical socket having a longitudinal section of major arc formed in one of said shoe member and said plunger and a ball formed at one end of the connecting rod and fitted into the socket for swinging motion of the connecting rod therearound, wherein the socket has an inlet whose center is offset by a predetermined amount of distance from the center of the socket so as to inscribe at a periphery of the inlet the profile of the socket when viewed in a plan from the side of the inlet, and the ball is formed with a cylindrical portion which has a center offset from the center of the ball by an amount equal to said predetermined offset amount of the center of the inlet and which is capable of fitting into the inlet, the centers of the inlet and the cylindrical portion being offset relative to each other in a state of the ball being fitted into the socket.

5,114,262

HOLLOW CERAMIC PISTON PIN

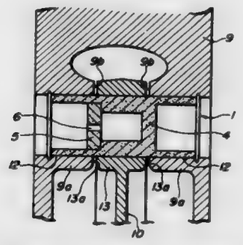
Takio Kojima, Aichi, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Mar. 21, 1990, Ser. No. 497,207

Claims priority, application Japan, Mar. 23, 1989, 1-32160[U]

Int. Cl.[5] F16J *1/14*

U.S. Cl. 403—150 **6 Claims**



1. An internal combustion engine comprising a piston having piston pin bosses with diametrically opposed inner ends, a connecting rod having a small end portion with opposite ends facing said inner ends, respectively, and a hollow ceramic piston pin having a pair of circular ribs axially separating the inside thereof and a circumferential wall consisting of a pair of axially separated thin-walled circumferential wall portions and a uniformly thick-walled circumferential wall portion therebetween, said ribs being located at opposite axial ends of said thick-walled circumferential wall portion, one of said ribs being formed with a concentric air vent in the form of a concentric opening and the other of sad ribs being solid, a diameter of said air vent being less than ½ of an inner diameter of said thin-walled circumferential wall portion with which it is joined, said piston pin having said ribs in axial positions thereof at which it mates the respective inner ends of the piston pin bosses of the piston and the respective ends of the small end portion of the connecting rods when attaching the piston to the connecting rod.

5,114,263

JOINT HAVING BALL AND SHAFT COUPLED THROUGH PLASTIC DEFORMATION

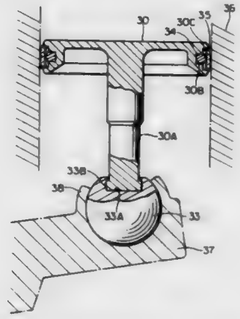
Hisanobu Kanamaru; Tomiyasu Onuma, and Kazushi Sasaya, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 810,299, Dec. 18, 1985, abandoned. This application May 24, 1991, Ser. No. 705,552

Claims priority, application Japan, Dec. 25, 1984, 59-278782; Dec. 25, 1984, 59-278783

Int. Cl.[5] G25G *3/28*

U.S. Cl. 403—274 **1 Claim**



1. A joint having a harder ball portion and a piston rod, the joint comprising:

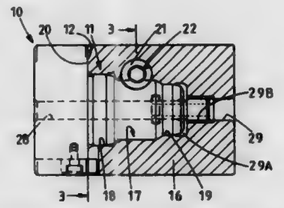
a blind mounting hole bored toward a center of said ball portion;

a corrugated surface means formed in an inner circumferential surface of said mounting hole for forming a bond between said harder ball portion and said piston rod; said piston rod being inserted into said mounting hole and being made of a softer material than said ball portion and including at one end thereof a piston portion;

wherein a outer circumferential portion of said piston rod is plastically locally deformed in a vicinity of said corrugated surface means so as to bond said ball portion and said piston rod to each other with a tightening force caused by plastic deformation of said outer circumferential portion of said piston rod into said corrugated surface means formed in the inner circumferential surface of said mounting hole, and

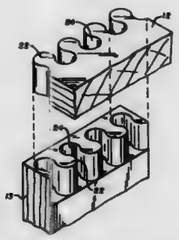
wherein said piston rod and said piston portion are integrally formed of an aluminum material, and an end of said piston rod is plastically deformed in said mounting hole.

5,114,264
COUPLING
Philip D. Barlow, Warwickshire, England, assignor to Hahn & Kolb GmbH & Co., Fed. Rep. of Germany
Filed Nov. 21, 1990, Ser. No. 616,430
Claims priority, application United Kingdom, Nov. 25, 1989, 8926672; Feb. 17, 1990, 9003651
Int. Cl.[5] B25G *3/18*
U.S. Cl. 403—323 **10 Claims**



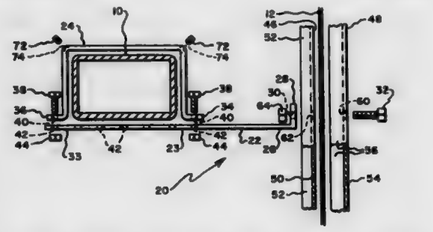
1. A coupling for securing together two parts comprising a first member defining a cylindrical spigot having a fist pair of spaced cylindrical locating surfaces and a first radially extending thrust face, and a second member defining a second radially extending thrust face and also a spigot bore in which the spigot locates, the spigot bore having a second pair of locating surfaces complementary to the first pair of locating surfaces, said first and second pairs of locating surfaces engaging with each other when the spigot is located in the spigot bore to provide radial location of the first and second members and means operable to move the members relative to each other so that the thrust faces are urged into engagement with each other, said means comprising a further bore formed in the second member, said further bore extending parallel to a tangent to the spigot bore, an angularly adjustable member mounted in the further bore and movable about the axis of the further bore, a first thrust surface defined on the spigot, a second thrust surface defined on the angularly adjustable member for engagement with the first thrust surface when the spigot is located in the spigot bore, said thrust surfaces, when the angularly adjustable member is moved about the axis of the further bore, cooperating to produce an axial thrust which urges said thrust faces into engagement with each other.

5,114,265
INTERLOCKING ROUTED JOINT
Kenneth M. Grisley, P.O. Box 4646, Quesnel, B. C., Canada V2J 3J8
Filed Apr. 15, 1991, Ser. No. 685,347
Int. Cl.[5] F16B *12/00;* **B27C** *5/00;* **B27F** *1/14*
U.S. Cl. 403—381 **20 Claims**



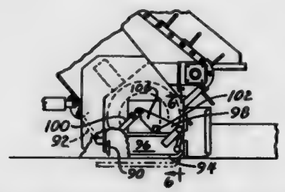
1. An interlocking joint for joining two panels together comprising:
two panels having edges to be joined, the edges of both panels having curved jigsaw puzzle shaped protrusions with curved jigsaw puzzle shaped indents between the protrusions, such that the protrusions and indents on the edge of one panel interlock with the indents and protrusions on the edge of the other panel, the sides of the protrusions being substantially perpendicular to surface faces of the protrusions.

5,114,266
BARRIER APPARATUS AND METHOD OF MOUNTING SAME
Joseph Cocina, Jr., P.O. Box 65, Hamburg, N.Y. 14075
Continuation of Ser. No. 571,088, Aug. 22, 1990
Filed Feb. 8, 1991, Ser. No. 652,866
Int. Cl.[5] E01F *13/00*
U.S. Cl. 404—6 **20 Claims**



1. Barrier apparatus comprising a barrier structure extending over a predetermined length and a plurality of means spaced apart generally over at least a portion of said predetermined length for mounting said barrier structure, said mounting means comprising a pair of channel members which are reversible between a nested and back-to-back position with said barrier structure received therebetween, said channel members being attached to each other with said barrier structure received therebetween so that said barrier structure may be tautly attached to said mounting means over at least a portion of said predetermined length, and means for anchoring said channel members with said barrier structure received therebetween.

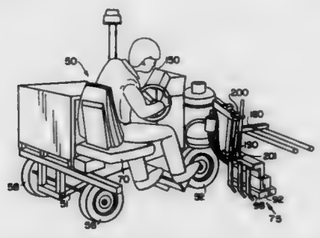
5,114,267
INTEGRATED PAVER WITH WINDROW PICK-UP CAPABILITY
Donald W. Smith, Aurora; James J. Plociennik, North Aurora; George Goehst, Plano, and Andrew Green, Geneva, all of Ill., assignors to Caterpillar Paving Products, Inc., Peoria, Ill.
Continuation of Ser. No. 309,080, Feb. 10, 1989, abandoned.
This application Oct. 16, 1990, Ser. No. 599,257
Int. Cl.[5] E01C *19/02*
U.S. Cl. 404—83 **44 Claims**



1. A paver capable of picking-up a windrow of paving material from the ground, the pave comprising:
a self-propelled chassis having a forward end and a rear end;
a pick-up means pivotally supported on the forward end of the chassis capable of conveying paving material from outside the chassis and depositing it in the chassis; and
means for carrying the paving material deposited in the chassis to the ground near the rear end of the chassis;
means supported on the rear end of the chassis for producing a road surface from paving material deposited on the ground;
wherein the pick-up means is pivotally supported to pivot in two dimensions relative to the chassis; and
wherein the pick-up means is pivotally supported on a mounting which is itself pivotally supported on the chassis, the pivotal support on the mounting being perpendicular to the pivotal support on the chassis.

30. A method of paving a road with paving material laid in a windrow utilizing a self-propelled chassis having a forward end supporting a conveyor means capable of picking-up paving material from a windrow and depositing it in the chassis, and the chassis having a rear end supporting means for producing a road surface from paving material deposited on the ground, the method comprising the steps of:
supporting the conveyor means off the ground by runner means capable of sliding along the ground and also capable of vertical movement relative to the conveyor means; and
providing scraper means attached to the conveyor means and communicating with the runner means, the scraper means capable of vertical movement relative to the conveyor means, said scraper means movement corresponding to the movement of the runner means.

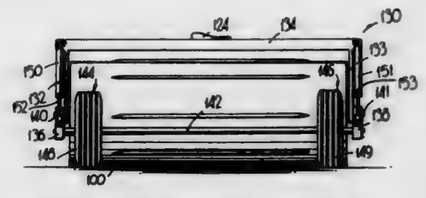
5,114,268
APPARATUS FOR APPLYING A TRAFFIC STRIPE TO A ROAD
Forrest Marcato, Montgomery, Ala., assignor to MAC Stripers, Inc., Montgomery, Ala.
Filed Jan. 18, 1991, Ser. No. 642,968
Int. Cl.[5] E01C *23/16, 23/00*
U.S. Cl. 404—92 **59 Claims**



1. An apparatus for applying a traffic stripe, comprising:
a vehicle including a pair of front wheels and a pair of rear wheels;
steering means, disposed on said vehicle, for steering said front wheels;
applying means, disposed outward of said front wheels and adjacent to one of said front wheels, for applying a traffic stripe to a road;
connecting means for pivotally connecting said applying means to said vehicle, said connecting means defining an axis about which said applying means pivots relative to the vehicle; and
turning means, connected to said applying means, disposed forward of said pivot axis and acting in response to the steering of said front wheels, for turning said applying means in the same direction as said front wheels when said front wheels are turned.

50. An apparatus for applying a continuous reflective stripe and an adjacent interrupted reflective stripe to a road comprising:
a vehicle including at least three wheels and a frame;
means, connected to said vehicle, for applying reflective stripes to the road including:
means for spraying a plurality of thermoplastic stripes generally parallel to a center line of the frame of said vehicle when said wheels of said vehicle are aligned substantially parallel to the center line of the frame of said vehicle;
means, disposed rearward of and in alignment with said thermoplastic spraying means, for spraying reflective material over said plurality of thermoplastic stripes;
said thermoplastic spraying means further comprises a housing including first and second outlets;
means, connected to said housing, for controlling said thermoplastic spraying means so that one of said outlets of said thermoplastic spraying means housing can be continuously open for spraying a thermoplastic stripe on the road while the other of said outlets can be intermittingly opened for spraying thermoplastic stripes for predetermined lengths on the road and intermittingly closed to prevent spraying for predetermined gaps; and
means, connected to said reflective material spraying means, for controlling said reflective material spraying means so that said reflective material is primarily sprayed only over the plurality of thermoplastic stripes.

5,114,269
VEHICLE MOUNTED DRUM ADJUSTABLE AGAINST A SURFACE
J. Harold Shepherd, 1840 River Forest Rd., N.W., Atlanta, Ga. 30327
Filed Jun. 9, 1986, Ser. No. 872,228
Int. Cl.[5] E01C *19/26*
U.S. Cl. 404—122 **18 Claims**



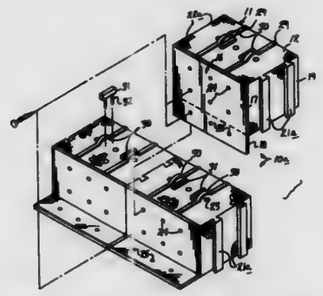
1. In a paving vehicle for selectively making indentations on a surface:
paving means on said vehicle for supporting same during paving movement over the surface,
a roller drum on said vehicle comprising means for making indentations when engaged against the surface such as asphalt and the like,
means on said vehicle selectively for raising and lowering said roller drum relative to the surface,
and means for supporting said vehicle for movement over the surface when said drum is in raised position.

5,114,270
BARRIER APPARATUS
James J. Riddle, 41 Springside Ave., Pittsfield, Mass. 01201
Filed Mar. 22, 1991, Ser. No. 673,308
Int. Cl.[5] E02B *7/04*
U.S. Cl. 405—15 **4 Claims**

1. A barrier apparatus comprising,
a barrier block defined by a parallelepiped configuration, including a planar top wall, a planar bottom wall, a planar rear wall, and a planar forward wall, the barrier block includes a right end wall spaced from a left end wall, and
the right end wall includes a plurality of parallel ribs defined apart a predetermined spacing, the parallel ribs are defined by a predetermined cross-sectional configuration, and the left end wall includes a plurality of parallel grooves, the parallel grooves defined by the predetermined cross-sectional configuration and spaced apart the predetermined spacing, and the parallel ribs and the parallel grooves extend orthogonally between the planar top wall and the planar bottom wall, and

a plurality of first bores orthogonally directed from the top wall through to the bottom wall, and a plurality of first spikes receivable within the first bores, wherein the first spikes extend exteriorly of the planar bottom wall when the spikes are directed into the first bores, and,

a flexible web screen coextensively mounted to the planar forward wall, wherein the flexible web screen includes a vertical screen plate coextensively mounted overlying the



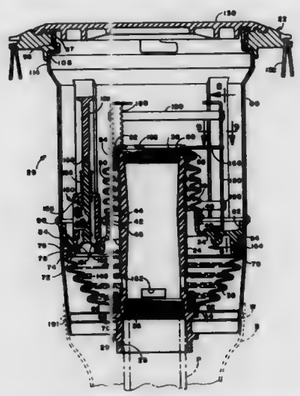
forward wall, and a horizontal screen plate extending beyond the vertical screen plate, and the vertical screen plate including second bores including second pins directed into the second bores receivable within the barrier block through the planar forward wall, and the horizontal screen plate including third bores receiving third pins for mounting the horizontal screen plate to an underlying surface.

5,114,271

SPILL CONTAINMENT DEVICES

Charles A. Sunderhaus, Hamilton, and Paul B. Anderson, Cincinnati, both of Ohio, assignors to Dover Corporation, New York, N.Y.

Filed Oct. 3, 1990, Ser. No. 592,132
Int. Cl.[5] B65G *5/00*; B65B *3/06*
U.S. Cl. 405—52 **55 Claims**



1. A containment device for preventing soil contamination in filling underground storage tanks of the type having riser pipe means, terminating below ground level, through which fuel, or other potentially hazardous liquid, flows into a storage tank, said device comprising

a bucket member in the form of a vertically disposed shell,

a riser pipe extension adapted to be mounted on a storage tank riser pipe and comprises the riser pipe means,

a bottom member secured in fixed, assembled relation to said bucket and having an opening through which the riser pipe extension projects in spaced relation thereto,

said riser pipe extension having an upper end portion above the bottom member and a lower end portion disposed beneath the bottom member,

an upper flexible member extending between the bottom member and the upper portion of riser pipe extension to provide for relative movement between the bucket member and the riser pipe means,

said bucket member, bottom member and upper flexible member defining an upwardly open, spillage container,

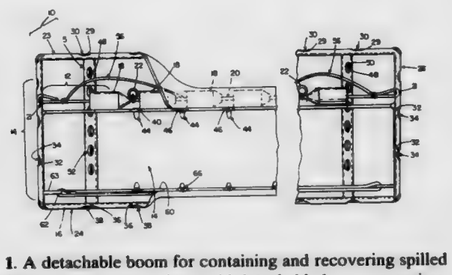
a lower, flexible member extending between said bottom member and the lower portion of said riser pipe extension and defining, at least in part, a lower chamber beneath said spillage container.

5,114,272

DETACHABLE BOOM AND METHOD FOR ITS USE

Frederic P. Brunhoff, P.O. Box 4071, Kodiak, Ak. 99615; Enok P. Lian, and Libbie B. Lian, both of P.O. Box 106, Cordova, Ak. 99574

Filed Jul. 2, 1990, Ser. No. 547,952
Int. Cl.[5] E02B *15/06*; A01K *71/00*
U.S. Cl. 405—66 **20 Claims**



1. A detachable boom for containing and recovering spilled fluids on open water, where said detachable boom comprises:

a float system, said float system having a plurality of individual floats arrayed along and fixedly attached to a flexible, stretch resistant cork line with two ends, said floats having a cross-sectional perimeter length;

a barrier, said barrier being substantially rectangular in shape with a length, a width, a top edge, bottom edge, and two end edges, said barrier further being made from a flexible, stretch resistant material;

a first attachment system, said first attachment system fixedly, but detachably attaching said barrier to said float system substantially along said barrier length, said first attachment system substantially enfolding said float system within said barrier proximate said barrier top edge;

an elongated weight device with two ends, said weight device having a length substantially equal to said barrier length; and

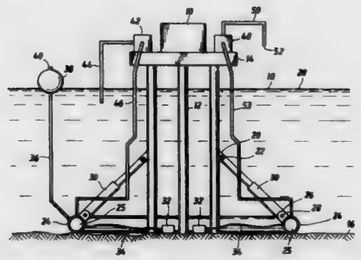
a second attachment system, said second attachment system fixedly, but detachably attaching said elongated weight device to said barrier substantially along said barrier length proximate said barrier bottom edge.

5,114,273

OFFSHORE PLATFORM POLLUTION CONTAINMENT DEVICE

Ray C. Anderson, 7605 S. Quebec, Tulsa, Okla. 74136

Continuation-in-part of Ser. No. 379,362, Jul. 13, 1989, abandoned. This application Sep. 29, 1989, Ser. No. 414,308
Int. Cl.[5] E02B *17/00*
U.S. Cl. 405—68 **5 Claims**



1. An oil spill containment offshore platform system for use in a marine environment having a water surface and a sea bottom, said system containment for oil spills, comprises:

(a) a rigid tubular flotation member being positioned in encompassing relation about said offshore platform and forming an internal chamber for selectively containing air and water for controlling the buoyancy thereof, said tubular flotation member being vertically movable and capable of assuming an operative position floating on the surface of the water and an inoperative position being submerged in the water;

(b) means for stationing said tubular flotation member about said platform and controllably positioning said rigid tubular flotation member at both said operative and inoperative positions;

(c) an oil containment skirt being connected to said tubular flotation member and extending downwardly from said tubular flotation member to form an open bottomed oil containing barrier about said offshore platform;

(d) an drain pump mounted on said platform and having the suction thereof in communication with said internal chamber by pumping and being operative for discharging water from said internal chamber and thus controlling the buoyancy of said rigid tubular flotation member to selectively position said tubular flotation member at said opeative position;

(e) a fill pump mounted on said platform and having the discharge thereof in communication with said internal chamber and being operative to introduce water into said internal chamber for rendering said tubular flotation member non-buoyant to selectively position said tubular flotation member at said inoperative position; and

(f) an air vent line being in communication with said internal chamber and having an escape port located above the surface of the water through which air is permitted to escape from said internal chamber when displaced by water being pumped into said internal chamber by said pump, said air vent line communicating air from said escape port into said internal chamber upon the pumping of water from said internal chamber by said drain pump.

5,114,274

SEWAGE TANK SYSTEM AND METHOD OF CONSTRUCTION

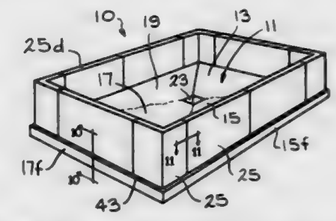
Leo J. Heiler, Jr., Eagle, Mich., assignor to Enviroland, Inc., DeWitt, Mich.

Filed Mar. 20, 1991, Ser. No. 672,391
Int. Cl.[5] E02D *27/00*; B09B *3/00*
U.S. Cl. 405—128 **42 Claims**

1. A sewage collection and separation tank for density separation of sewage which prevents leakage of the sewage from the tank which comprises:

(a) a preformed concrete sump box means adapted to be recessed in a floor of an earthen pit with a bottom wall and at least one sidewall extending from the bottom wall around a vertical axis, the sump box means having a first gasket means mounted in an outer surface of the sidewall and spaced above the bottom wall of the sump box means;

(b) a poured concrete tank floor on the floor of the earthen pit around the outer surface of the sump box means which envelopes the first gasket means of the sump box means, wherein the tank floor has been poured in consecutive sections radially around the vertical axis and the outer surface of the sidewall of the sump box means, each section of the tank floor having a lower face adjacent to the floor of the pit and a spaced apart upper face and spaced apart first and second sides between the faces and spaced apart edges between the sides;



(c) a second gasket means extending laterally from the first gasket means mounted in the sidewall of the sump box means, the second gasket means mounted along a first side of a first section of the tank floor so that when a last section of the tank floor is poured, a second side of the last section and the first side of the first section envelope the second gasket means to form a seal between the last section and the first section; and

(d) a tank wall extending from the tank floor to define the tank.

5,114,275

PROCESS AND WASTE PIT LINER FOR IMPROVED HYDROPHOBIC WASTE STORAGE

Philip W. West, 605 Nelson Dr., Baton Rouge, La. 70808, and William H. Daly, 1135 Lakeview Dr., Baton Rouge, La. 70819

Continuation of Ser. No. 119,900, Nov. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 833,513, Feb. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 555,683, Nov. 28, 1983, abandoned. This application Feb. 26, 1991, Ser. No. 662,388
Int. Cl.[5] B09B *1/00*
U.S. Cl. 405—128 **36 Claims**

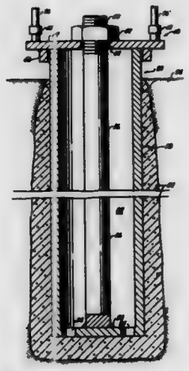
1. A process for lining a hazardous waste pit capable of containing liquid organic waste and brine solution, comprising the steps of: forming a blend by mixing a finely divided, inorganic matrix material and a hydrophobic liquid absorbing, polymer particles dispersed in a continuous, water miscible, liquid phase, wherein said polymer particles in said blend are adsorbed on to said matrix material; and compacting said blend to form a layer on a surface of said pit.

5,114,276

APPARATUS AND METHOD FOR MOORING A FLOATING VESSEL

Richard M. Dupin, Brea, Calif., assignor to Union Oil Company of California, dba UNOCAL, Los Angeles, Calif.

Filed Mar. 8, 1990, Ser. No. 490,740
Int. Cl.[5] B63B *21/50*
U.S. Cl. 405—224 **31 Claims**



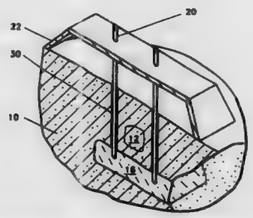
1. A mooring apparatus comprising an elongated housing extending a substantial depth into a sea floor and having a vertically extending passageway therethrough, an inner tension member located within and extending upwardly through the passageway, the inner tension member having an end connected to a lower portion of the elongated housing and an opposite upwardly extending end for connection to a cap means, an outer tension member having an end connected to said cap means and an upwardly extending end for connection to a floating vessel, said cap means including a downwardly extending portion located substantially about an outer periphery of the upper portion of the elongated housing for transmitting horizontal forces to an upper portion of said elongated housing and means for pretensioning said tension member.

5,114,277

VITRIFIED UNDERGROUND STRUCTURES

Mark T. Murphy, Kennewick; James L. Buelt, Richland; James A. Stottlemyre, Richland, and John S. Tixier, Jr., Richland, all of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Feb. 22, 1991, Ser. No. 660,205
Int. Cl.[5] E02D *3/11*; G21F *9/16*
U.S. Cl. 405—231 **16 Claims**



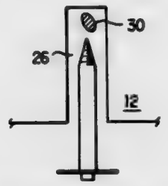
1. A method for making vitrified underground structures, comprising the steps of:
(a) inserting at least one pair of electrodes into soil in the ground at spaced positions from one another;
(b) providing an initial electrically conductive resistance path in the soil across the electrodes;
(c) providing a passive electrode in the form of an electrically conductive material for controlling the path of electrical current through the soil thereby limiting the extent of the soil that is melted and producing a substantially planar approximately rectangular cross section volume;
(d) passing electrical current through the electrically conductive resistance path by application of current to the electrodes to heat the soil about the path of its melting temperature;
(e) continuing application of current to the electrodes until the soil between them and immediately adjacent to them has been melted; and
(f) terminating application of current to the electrodes to permit cooling and solidification of substantially all the melted soil in situ between the electrode positions into a solid planar mass.

5,114,278

MINING BOLT APPARATUS AND METHOD

Frank M. Locotos, Bridgeville, and Robert S. Bechtold, Pittsburgh, both of Pa., assignors to F. M. Locotos Equipment & Design Co., McMurray, Pa.

Continuation of Ser. No. 489,697, Mar. 7, 1990, abandoned. This application Oct. 4, 1991, Ser. No. 771,523
Int. Cl.[5] E21D *20/02*
U.S. Cl. 405—259.6 **12 Claims**



11. A method for holding rock in a mining comprising the steps of:
drilling a bore hole into the rock;
inserted a resin capsule into the bore hole;
inserting a shaft of a mining bolt into the bore hole, said shaft having a flange system disposed about the shaft in proximity to a first end thereof, said shaft having threads fixedly nonmovably attached to the shaft, said shaft being of a length longer than a length of the bore hole, said shaft having a diameter smaller than the diameter of the bore hole such that there is a space between the shaft and the rock in which the bore hole is disposed;
puncturing the resin capsule with shaft such that the resin flows down the bore hole in the space; and
screwing the shaft into the rock at a top of the bore hole opposite the bore hole opening such that the threads of the shaft penetrate into the rock and the flange system abuts under tension the rock face.

5,114,279

DEVICE FOR SETTING A ROCK BOLT

Jan Bjerngren, Sollentuna; Sven Eriksson, and Lars Persson, both of Örebro, all of Sweden, assignors to Atlas Copco Construction and Mining Technique AB, Stockholm, Sweden

Filed Jun. 26, 1991, Ser. No. 721,114
Claims priority, application Sweden, Jul. 10, 1990, 9002399
Int. Cl.[5] E21D *20/00*
U.S. Cl. 405—303 **1 Claim**

1. Device for setting a rock bolt comprising a feed beam (1), a slide (2) movable to-and-fro along the feed beam, a machine switch (3) by means of which a rock drilling machine (4) or a bolt setting machine (5) is movable between a first rest position and a first working position on said slide (2) at the same time as the other of said machines is movable between a second working position on said slide and a second rest position, each of said machines having a working position on said same slide; said device further including a bolt magazine (6) arranged on said feed beam (1), a finger (7) by means of which a rock bolt (8) can be inserted into said bolt setting machine (5) when the bolt setting machine is in its said rest position, and a swingable arm 9; said swingable arm (9) and said bolt setting machine (5) being arranged to transfer the rock bolt (8) from said bolt magazine (6) to a setting position.

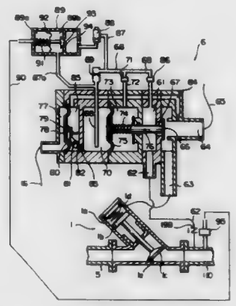


5,114,280

VACUUM TYPE SEWAGE COLLECTING SYSTEM AND VACUUM VALVE CONTROLLER FOR THE SAME

Akihiro Ushitora, Kanagawa; Kazuo Yamaguchi, Tokyo, and Tsuneo Asanagi, Kanagawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Aug. 29, 1990, Ser. No. 574,196
Claims priority, application Japan, Aug. 31, 1989, 1-225838
Int. Cl.[5] B65G *53/66*
U.S. Cl. 406—18 **4 Claims**



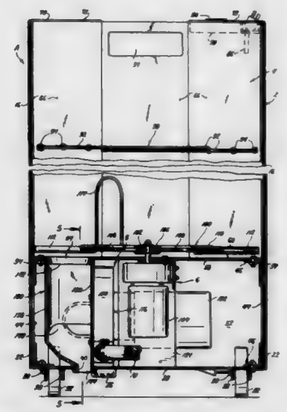
1. A vacuum type sewage collecting system for collecting sewage from a plurality of facilities, said system comprising: a sewage reservoir for storing the sewage from the facilities; a vacuum valve and a vacuum sewage pipe, the interior of which pipe is held at a negative pressure, connected to said sewage reservoir for delivering the sewage from the reservoir; detecting means for detecting the quantity of the sewage stored in said reservoir, and a controller for controlling opening/closing operations of said vacuum valve, said controller including a first vacuum chamber, a second vacuum chamber, first piping connecting said first vacuum chamber and said second vacuum chamber to said vacuum sewage pipe, fluid flow resisting means disposed in said first piping for offering resistance against the flow of fluid through said first piping, atmospheric pressure introducing means for introducing an atmospheric pressure into said first vacuum chamber when the quantity of the sewage stored in said sewage reservoir that is detected by said detecting means exceeds a predetermined value, shifting means for selectively introducing the negative pressure from said sewage pipe to said vacuum valve to open or close the vacuum valve depending on the differential pressure existing between the first vacuum chamber and the second vacuum chamber,
at least one pipe having a second fluid flow resisting means disposed therein for offering resistance against the flow of fluid in said one pipe, said one pipe being connected to said first piping in a parallel relationship therewith, and opening/closing valve means operatively connected in said one pipe for closing said one pipe when the negative pressure in the vacuum sewage pipe is lower than a predetermined value.

5,114,281

MACHINE FOR BLOWING THERMAL INSULATION

Joseph F. Hartnett, and Richard E. Wendt, both of St. Louis County, Mo. assignors to Louisiana Pacific Corporation, Portland, Oreg.

Filed Jun. 21, 1990, Ser. No. 541,381
Int. Cl.[5] B60D *1/60*
U.S. Cl. 406—39 **21 Claims**



1. A machine for blowing loose thermal insulation into cavities in the walls, ceilings, and floors of buildings, said machine comprising: a housing having generally smooth and uninterrupted side walls, a lower wall extending across and closing the lower end of the housing and an upper wall extending through the housing between its upper end and the lower wall, whereby the side walls, lower wall and upper wall enclose an equipment cavity in the housing, the upper wall having a feed hole; a hopper located in the housing above the upper wall of the housing and having a cross-sectional size smaller than the cross-sectional size of the housing so that at least one channel exists between the side of the hopper and the side of the housing; a first motor located in the equipment cavity of the housing and an agitating wheel located in the hopper and connected to the first motor for rotation about a vertical axis that is offset from the feed hole, the wheel having end elements which pass over the feed hole as the wheel revolves to sweep loose insulation that is within the hopper into the feed hole; a blowing unit located within the equipment cavity and including a second motor, a fan housing having a suction port and a discharge port, an impeller which is rotated by the second motor in the fan housing to generate an airstream which passes into the fan housing at the suction port and leaves through the discharge port, and a carburetor having a mixing chamber that opens into the fan housing at the suction port of the fan housing, the carburetor having a product opening which opens into the hopper through the feed hole of the

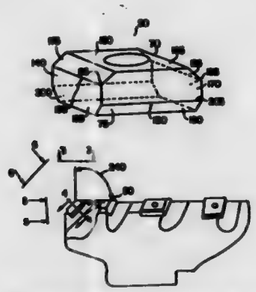
hopper and an air inlet, whereby when the second motor is energized, the impeller draws air and loose insulation into the carburetor to create an airstream in which the loose insulation is entrained; and a hose extending from the upper end of the housing, the hose being in communication with the discharge port on the fan housing for the blowing unit.

5,114,282

INDEXABLE INSERT FOR ROUGHING AND FINISHING

James A. Pawlik, Sterling Heights, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Mar. 21, 1988, Ser. No. 171,332
Int. Cl.[5] B23C *5/02*
U.S. Cl. 407—40 **43 Claims**



1. A cutting tool comprising a body with central axis,
said body having at least one recessed pocket disposed about said axis for receipt of at least one cutting insert,
means for securing said inserts in said pockets
said insert comprising a wafer of hardened material with polygonal shaped top and bottom faces,
said faces oriented parallel to each other and separated by at least three adjoining peripheral side sections,
each side forming at least one acute angle with an adjoining side,
each side further comprising first and second planar surfaces which extend the entire length of the side and intersect with each other to form an obtuse included angle,
said intersecting planar surfaces forming a line parallel to imaginary planes passing through said top and bottom faces,
said first surface of one side intersecting said top face at a right angle,
said first and second surfaces of at least one adjoining side intersecting said top face at an obtuse included angle and said bottom face at a right angle respectively,
said adjacent first surfaces intersecting at an acute included angle to form at least one cutting edge,
said cutting edge having a negative radial rake and positive axial rake,
said cutting edge having a positive lead angle, and
said cutting edge having a negative true rake and a positive angle of inclination.

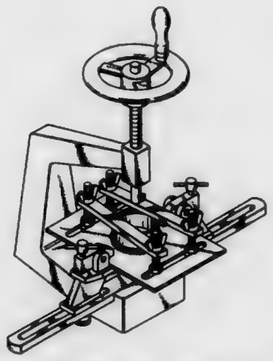
5,114,283

SPRING BARREL BUSHER ATTACHMENT

James H. Fulton, 4000 Flynn St. #58, Bellingham, Wash. 98226

Filed Jun. 22, 1990, Ser. No. 541,945
Int. Cl.[5] B23B *41/00*
U.S. Cl. 408—103 **2 Claims**

1. An attachment piece for conventional clock bushing tools for reaming out worn clock spring barrels said attachment piece comprising: a flat plate capable of being secured into the clamps of said conventional clock bushing tool, said plate having two ends and a central aperture capable of allowing the drill of the conventional bushing tool to pass through, said plate having two slots near the two ends of said plate, said slots being on opposite sides of the plate from each other, each slot in connection with two vertical pieces, each of said vertical pieces having an attaching means, each attaching means being in connection to a cross piece, said cross pieces having a hole at each end so that said cross pieces may be attached to said



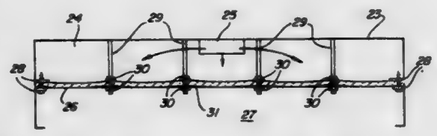
vertical pieces so that said cross pieces are approximately parallel to each other and capable of accommodating said spring barrel in the space between said cross pieces and said flat piece.

5,114,284

HEATER FOR ASPHALT PAVEMENT OR THE LIKE

Gregory J. Keizer, 2105 McKail Rd., Leonard, Mich. 48038, and Carl W. Morris, 5181 Crawford Rd., Dryden, Mich. 48428

Continuation of Ser. No. 155,966, Feb. 16, 1988, abandoned, which is a division of Ser. No. 860,847, May 8, 1988, abandoned.
This application Dec. 17, 1990, Ser. No. 629,092
Int. Cl.[5] E01C *23/14;* **F24H** *1/00;* **F23C** *5/00*
U.S. Cl. 404—95 **9 Claims**



1. A heater for asphalt pavement, comprising:
a two-section heating chamber which overlies the pavement to be heated, said two-section heating chamber including a first section and a second section;
a first hinge for connecting said first section to said second section, said first hinge permitting said first section and said second section to overlie the pavement, said first hinge further permitting said first section to be folded atop said second section when said heater is in a trailered position;
at least one removable fuel tank attached to said first section;
an air channel and a blower connected to said removable fuel tank;
a mixing channel located in each of said first and second sections, said air channel and said blower being connected to said mixing channels, said mixing channels receiving combustible mixtures from said air channel and blower;
said first section and said second section each further comprising an outer shell, each of said shells forming a manifold, said manifolds distributing combustible mixtures from said mixing channels;
a ceramic fiber blanket located adjacent to and beneath each of said manifolds within said shells, said combustible mixtures being forced down through the micro spaces between the fibers in said ceramic fiber blankets to be burned across its lower surface, radiating heat downward;
a pair of trailer tires attached to said second section, said tires extending downward when said first section is folded atop said second section; and
a trailer tongue extending from said second section, said tongue permitting said heater to be towed when said sections are folded.

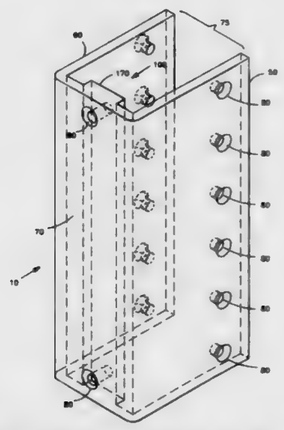
8. A heater for asphalt pavement comprising:
a shell having a roof, sides, and an open bottom which faces said pavement;
a porous ceramic blanket disposed in said shell dividing the interior of said shell into a manifold located between said porous ceramic blanket and said roof and a heating chamber located between said porous ceramic blanket and said open bottom;
a plurality of rigid bars located on upper and lower sides of said porous ceramic blanket, said rigid bars squeezing said blanket;
a plurality of shafts attached to said shell, said shafts extending through said porous ceramic blanket and said rigid bars to support said porous ceramic blanket;
means for providing a combustible mixture of air and gas into said manifold, said combustible mixture of air and gas flowing from said manifold to said heating chamber through said porous ceramic blanket;
means for manually positioning said heater over a desired area of asphalt pavement; and
means for converting said heater from an extended position in which said shell overlies the asphalt pavement to be heated to a folded position in which said heater is easily transported.

5,114,285

DOOR DRILLING TEMPLATE

Michael K. Brydon, 19744 Beach Blvd. #432, Huntington Beach, Calif. 92648

Filed Mar. 4, 1991, Ser. No. 664,317
Int. Cl.[5] B27C *5/00;* **B23B** *41/00*
U.S. Cl. 408—115 R **5 Claims**



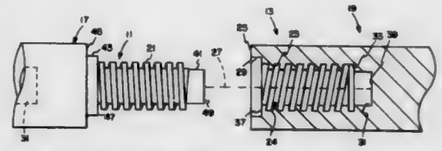
1. A template for preparing a door for the mounting of operating hardware, the door having a lockset recess, the template comprising:
a channel having a first side and a second side supported in generally parallel planes by a third side, said third side defining a space between said first and second sides, said first, second, and third sides having a plurality of through guide holes marking the centers of proposed mounting holes for said operating hardware, thereby with the template placed over the edge of said door, the interior surface of the third side being in contact with the edge of the door, and said first and second sides lying in contact with the sides of the door, the accurate placement of pilot holes in the door is facilitated by said through guide holes.

5,114,286

INTERCHANGEABLE TOOL ALIGNMENT SYSTEM

Donald W. Calkins, 35 Edgemont Rd., Devon, Conn. 06460

Filed Aug. 13, 1991, Ser. No. 744,345
Int. Cl.[5] B23B *51/02*
U.S. Cl. 408—226 **24 Claims**



1. An interchangeable cutting tool alignment and positioning system comprising, at least, a first tool segment and a second tool segment, said first tool segment comprising a male coupler means axially aligned with and concentric with an axis of rotation of said first tool segment, said second tool segment comprising a female coupler means aligned with and concentric with an axis of rotation of said second tool segment, said male coupler means which extends from an end of said first tool segment, said male coupler means which comprises:
a.) pilot means, extending from one end of said male coupler means as an integral part of said male coupler means, said pilot means which provides a first cylindrical mating surface for assembly of said first and second tool segments in coaxial alignment with each other relative to their respective axes of rotation;
b.) concentric alignment means, separated from and spaced apart from said pilot means, said concentric alignment means which are integral parts of said male coupler means, said concentric alignment means which provides a second cylindrical mating surface for assembly of said first and second tool segments in coaxial alignment with each other relative to their respective axes of rotation;
c.) first planar surface means which provide a first planar mating surface for assembly of said first and second tool segments in coaxial alignment with each other relative to their respective axes of rotation, said first planar mating surface which is perpendicular to said first tool segment axis of rotation and said second cylindrical mating surface of said concentric alignment means, said first planar mating surface which extends inwardly, from said concentric alignment means, toward said first tool segment axis of rotation;
d.) second planar surface means which provide a second planar mating surface for assembly of said first and second tool segments in coaxial alignment with each other relative to their respective axes of rotation, said second planar mating surface extending outwardly from said concentric alignment means, away from said first tool segment axis of rotation, at the opposite end of said concentric alignment means from said first planar surface means, said second planar mating surface which is perpendicular to said first tool segment axis of rotation and said second cylindrical mating surface of said concentric alignment means;
e.) male thread means, extending between and spacing apart said pilot means and said concentric alignment means, said male thread means which are concentric with said pilot means and said concentric alignment means, said male thread means which serve to provide threadable engagement between, and the holding together of, said assembly

of said first and second tool segments in coaxial alignment with each other relative to their respective axes of rotation; and

said female coupler means which are integral with and formed into one end of said second tool segment, said female coupler means which comprise:

f.) pilot bore means, extending within said one end of said female coupler means, said pilot bore means which provide a first complementary cylindrical mating surface, corresponding to said first cylindrical mating surface of said pilot means, for assembly of said first and second tool segments in coaxial alignment with each other relative to their respective axes of rotation;

g.) concentric bore means, separated and spaced apart from said pilot means, said concentric bore means which are integral with said female coupler means, said concentric bore means which provide a second complementary cylindrical mating surface corresponding to said second cylindrical mating surface of said concentric alignment means, for assembly of said first and second tool segments coaxially aligned with each other relative to their respective axes of rotation;

h.) first complementary planar surface means which provide a first complementary planar mating surface, corresponding to said first planar mating surface of said concentric alignment means, for assembly of said first and second tool segments in coaxial alignment with each other relative to their respective axes of rotation, said first complementary planar mating surface which is perpendicular to said second tool segment axis of rotation and said second complementary cylindrical mating surface of said concentric bore means, said first complementary planar mating surface means which extends inwardly from said concentric bore means toward said second tool segment axis of rotation;

i.) second complementary planar surface means which provide a second complementary planar mating surface, corresponding to said second planar mating surface of said second planar mating surface means, for assembly of said first and second tool segments in coaxial alignment with each other relative to their respective axes of rotation, said second complementary planar mating surface which extends outwardly from said concentric bore means away from said second tool segment axis of rotation, said second complementary planar mating surface which extends at the opposite end of said concentric bore means from said first complementary planar surface means, said second complementary planar mating surface which is perpendicular to said second tool segment axis of rotation;

j.) female thread means extending between said pilot bore means and said concentric bore means, separating and spacing apart said pilot bore means and said concentric bore means, said female thread means which are concentric with said pilot bore means and said concentric bore means, said female thread means which are complementary with and correspond to said male thread means, said female thread means which, in conjunction with said male thread means, provide threadable engagement between and the holding together of said first and second tool segments, for assembly of said first and second tool segments in coaxial alignment with each other relative to their respective axes of rotation;

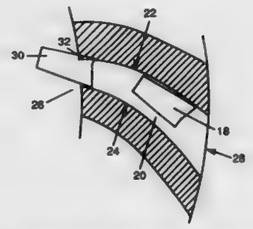
said male coupler means and said female coupler means which provide for threadable coaxial engagement of said first and second tool segments relative to their respective axes of rotation to concentrically align said first and second tool segments such that a single common rotational axis is provided, said male coupler means and said female coupler means which, on assembly of said first and second tool segments, also prevent misalignment of said first and second tool segment from said single common rotational axis.

5,114,287

PROCESS FOR PRODUCING FACE HOBBED BEVEL GEARS WITH TOE RELIEF

Earl D. Ervay, Fairport, and Mark J. Boch, East Rochester, both of N.Y., assignors to The Gleason Works, Rochester, N.Y.

Filed Mar. 30, 1990, Ser. No. 502,385
Int. Cl.[5] B23F *9/10, 19/10*
U.S. Cl. 409—13 **12 Claims**



1. A method of continuously forming a bevel gear having toe relief, said method comprising:

forming a plurality of teeth about said bevel gear by continuously cutting a gear blank, wherein each of said teeth extend longitudinally from a toe end to a heel end, each of said teeth having a longitudinally extending convex flank and a longitudinally extending concave flank, said teeth being separated by root portions, and,

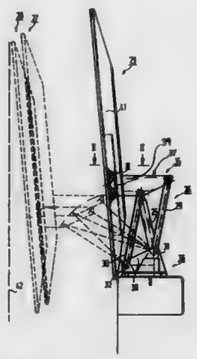
simultaneously with said cutting, forming a relief surface at each of the toe ends of one of said convex and concave flanks, with the relief surface being formed in flanks of the same curvature for all teeth of said gear.

5,114,288

ROAD TRANSPORT VEHICLE

Heinrich Langendorf, Bahnhofstrasse, and Reinhard Olfers, Castroper Strasse, both of Fed. Rep. of Germany, assignors to Fahrzeugbau Langendorf GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 6, 1990, Ser. No. 609,818
Int. Cl.[5] B60P *7/10*
U.S. Cl. 410—34 **10 Claims**



1. A road transport vehicle comprising:

an interior load space;

a transport frame disposed substantially upright within said interior load space, said transport frame having a pair of oppositely disposed inwardly sloping surfaces, each of said pair of inwardly sloping surfaces being adapted for receiving a load;

a pair of securing devices located on opposite sides of said transport frame, each of said pair of securing devices being pivotally mounted to said road transport vehicle;

a linkage pivotally attached to each of said pair of securing devices;

a buffer mounted to each said linkage, said buffer facing said load space;

a transport brace attached to each said buffer such that a larger portion of said transport brace extends upwardly from said buffer than extends downwardly from said buffer, each of said transport braces being positioned so as to be parallel to a corresponding adjacent one of said pair of inwardly sloping surfaces; and

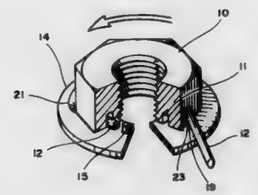
cranking means for rotating each of said pair of securing devices between a secure position where each of said transport braces abuts said load received upon said corresponding adjacent one of said inwardly sloping surfaces of said transport frame and a release position where each of said transport braces is retracted from said load space, said cranking means rotating said pair of securing devices such that each of said transport braces remains parallel to said corresponding adjacent one of said pair of inwardly sloping surfaces.

5,114,289

DISPLACED FILLER NUT

Bernardo Coiffman, 3610 Yacht Club Dr., Apt. 601, North Miami Beach, Fla. 33180

Filed Apr. 22, 1991, Ser. No. 688,309
Int. Cl.[5] F16B *31/02*
U.S. Cl. 411—13 **13 Claims**



1. A device for indicating tensile strength, said device comprising, in combination;

a nut having an annular groove routed on the bottom thereof and connected to a shaft having an egress point which terminates at the top or side of the said nut,

a filler material, wherein said filler material is placed within said annular groove and shaft, and;

a washer having a boss, said boss being of a size smaller in height and width than said annular groove sufficient to fit within said annular groove, wherein said nut and said washer are disengagably connected.

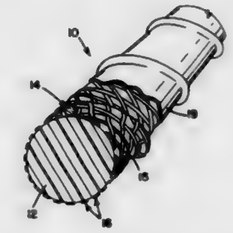
5,114,290

FIBER REINFORCED COMPOSITE THREADED MEMBER

Sharad R. Moghe, Northfield Center, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 16, 1988, Ser. No. 285,482
Int. Cl.[5] F16B *35/04;* B32B *31/00*
U.S. Cl. 411—411 **48 Claims**

1. A threaded member comprising an elongate core, a thread-defining element containing fibrous reinforcement helically extending around and along the lengthwise direction of the core and projecting radially outwardly of the core, and a reinforcing fabric layer enveloping, conforming and secured to the outer surface of the combined core and thread-defining element, the reinforcing fabric layer having some fibers extending helically generally in the directional sense of the thread-defining element and other fibers extending helically in



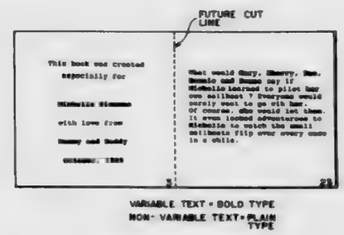
a directional sense opposite to that of the thread-defining element.

5,114,291

METHOD OF MAKING PERSONALIZED CHILDREN'S STORYBOOK

John B. Hefty, Milton, Fla., assignor to Karen McCraw Hefty

Continuation-in-part of Ser. No. 286,083, Dec. 19, 1988, abandoned. This application Aug. 22, 1990, Ser. No. 571,221
Int. Cl.[5] B42C *9/00;* B42D *1/00*
U.S. Cl. 412—8 **8 Claims**



1. A method of making a personalized, children's storybook having non-variable text and variable text merged together to create a complete, personalized story, comprising:

pre-entering non-variable text, to be completed by entry of personalized data, in a computer to form an incomplete storybook format;

obtaining personal data about a recipient of said storybook to develop the complete text for said storybook format;

entering said variable text in said computer;

storing said variable text in a memory of said computer;

merging said variable text with said non-variable text to insert said variable text into said non-variable text forming merged text thereby completing said storybook format and forming a complete personalized story;

inserting a sufficient number of single sheets containing no text in a computer printer to enable printing of said merged text of said complete personalized story;

sending said complete, personalized story to said printer;

printing said story on one side of said sheets to thereby form text pages of said storybook and printing on the other side of said sheets to complete the printing of said story;

manually cutting said printed sheets in half;

stacking said cut sheets so that smaller numbered text pages are placed on top of larger numbered text pages;

hand collating said printed text pages with preprinted picture pages in an alternating manner to form a properly numbered sequence for said book;

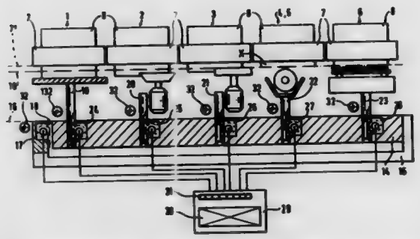
placing self-adhesive sheets on the front and back of said collated pages;

manually stapling together said sheets and pages;

peeling backing sheets off said self-adhesive sheets; and

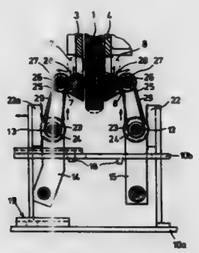
binding said book into a hard cover.

5,114,292
PERFECT BINDER
Peter Geiser, Matzingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland
Filed Apr. 15, 1991, Ser. No. 685,527
Claims priority, application Switzerland, Apr. 23, 1990, 1364/90
Int. Cl.[5] B42C *13/00*
U.S. Cl. 412—11 **11 Claims**



1. A perfect binder wherein stacks of sheets are bonded to covers by means of an adhesive, comprising a first unit having means for transporting a series of stacks along a predetermined path in a predetermined direction past a plurality of successive treating stations from a receiving to a withdrawing location, said transporting means including discrete grippers for the stacks of said series and said grippers having surfaces disposed in a common plane; a second unit including a plurality of treating devices, at least one at each of said stations and each adjacent but spaced apart from said plane; and means for moving one of said units relative to the other of said units to thereby change the spacing of said treating devices from said plane.

5,114,293
METHOD AND APPARATUS FOR ROUNDING THE BACKS OF BOOK BLOCKS
Horst Rathert, Minden, Fed. Rep. of Germany, assignor to Kolbus GmbH & Co. KG, Rahden, Fed. Rep. of Germany
Filed Feb. 25, 1991, Ser. No. 660,648
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1990, 4005948
Int. Cl.[5] B42C *5/02*
U.S. Cl. 412—30 **19 Claims**



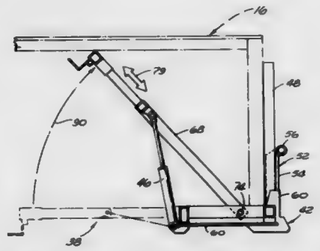
1. In apparatus for shaping the backs of book blocks, the shaping apparatus being associated with a transport system including continuously moving clamps which engage and move a book block along a path, the shaping apparatus further having back-rounding means including rounding rollers which act on both sides of the book block once it has been released by a transport system clamp, the rounding rollers applying pressure to the book block and being caused to exert a rotational force on the block while the pressure is applied, the improvement comprising;

said clamps each comprising a pair of oppositely acting jaws, the clamp jaws each being provided with an aperture sized and shaped to permit the passage of a said rounding roller therethrough;

means for causing said shaping apparatus to move in a first direction in synchronism with the motion of said clamps along at least a portion of the path of book block movement established by the transport system; and

means for imparting reciprocal motion to said rounding rollers in a second direction generally transverse to said first direction whereby said rounding rollers may be extended through said apertures in said jaws to engage the book block and may be retracted from said apertures.

5,114,294
MULTI-DIRECTIONAL LIFTING AND HANDLING ATTACHMENT FOR A BOOM-TYPE VEHICLE
Carl P. Attman, 1096 Oak Knoll Dr., Pomona, Calif. 91768
Continuation of Ser. No. 361,957, Jun. 6, 1989, Pat. No. 5,073,077. This application Mar. 25, 1991, Ser. No. 674,213
The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.
Int. Cl.[5] B65G *47/00*
U.S. Cl. 414—11 **8 Claims**



1. A panel lifter assembly attached to a vehicle having lifting means and adapted to lift a substantially orthogonal panel assembly that has a panel portion attached to a purline, the panel lifter assembly being oriented in an orthogonal x, y and z axis coordinate system, wherein the x axis coincides with a longitudinal axis of the panel assembly, comprising:

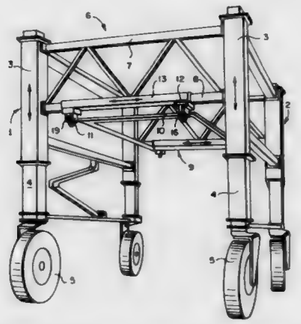
a purline supporting section operatively connected to the vehicle adapted to support the purline of the panel assembly;

a panel supporting section having a first end pivotally attached to said purline supporting section, and a second opposite end with a pair of panel supporting members that extend from said panel supporting section along an axis that is parallel to the x axis such that said panel supporting section can support the panel portion of the panel assembly; and

rotation means operatively connected to said purline supporting section and said panel supporting section for controllably rotating said panel supporting section relative to said purline supporting section such that said panel supporting section can be vertically rotated into a position to support an under side of the panel portion of the panel assembly;

whereby the panel lifter assembly can support the panel assembly.

5,114,295
CONTAINER HANDLING WAGON
Hadar Jansson, Helsingborg, Sweden, assignor to Sea Flats Aktiebolag, Helsingborg, Sweden
Filed Mar. 12, 1990, Ser. No. 491,701
Claims priority, application Sweden, Mar. 13, 1989, 8900871
Int. Cl.[5] B60P *1/02*
U.S. Cl. 414—460 **10 Claims**



1. A container handling wagon of the straddle type for handling a container, said wagon comprising:

a movable frame for straddling a container, including generally parallel horizontal lateral supports,

means for allowing vertical displacing said lateral supports relative to a remainder of said frame,

a respective slide bar slidably mounted on a respective said lateral support, for lateral movement thereon in a direction parallel to said supports,

a respective hydraulic cylinder means, mounted to a respective said support and connected to a respective said slide bar, for displacing said slide bars,

a respective pair of slide plate guides mounted to an underside of a respective said slide bar, and a respective slide plate adapted to be displaceably received by each respective said slide plate guide,

a respective twist lock housing mounted to respective said slide plates,

rigid connection means mounted to said housings for interconnecting associated said housings and thereby being together with said housings laterally displaceable in directions parallel and perpendicular to said support means and further rotatable with respect to said support means,

twist lock means for locking into lock receiving bores on the container to be handled, said twist lock means fixedly mounted to said housings, said twist lock means thereby being laterally displaceable in tandem with said connection means,

the combination of vertical displacement of said supports along with lateral and rotational displacement of said twist locks thus allowing said twist locks to be easily aligned with the lock receiving bores of the container to be handled for locking therein to thereby secure the container to the frame.

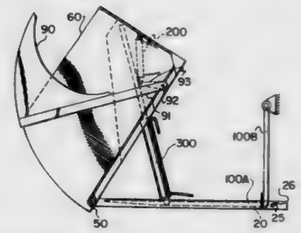
5,114,296
ALL TERRIAN TRANSPORTER BUCKET FOR A FORKLIFT
Roland C. Badder, P.O. Box 1343, Woodstock, Ontario, Canada N4S 8R2
Filed Oct. 10, 1990, Ser. No. 597,995
Claims priority, application Canada, Oct. 30, 1989, 2001760
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—607 **11 Claims**

1. An assembly mountable on forks of a motorized vehicle comprising:

(a) a frame having a pair of channels open at one end for insertion into respective ones of said forks;

(b) a bucket, having a floor section and fixed leading edge, a pair of parallel spaced side walls, a rear wall and an open front area, movably mounted on said frame and movable within selected limits, from a lowered position to a raised position;

(c) a pair of housings on an inside of said bucket adjacent and attached to the side walls and the rear wall;



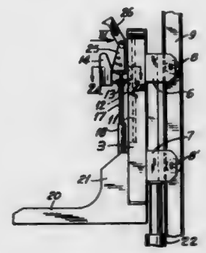
(d) a door pivotally attached to the bucket and located at said open front area and movable within selected limits from a door lowered position to a door raised position;

(e) a pair of shiver plates, one overlying each channel when said bucket is in the lowered position;

(f) a first hydraulic cylinder located in at least one of said housings for moving said bucket from a lowered position to a raised position; and

(g) a second hydraulic cylinder located in at least one of said housings for moving said door from a lowered position to a raised position.

5,114,297
CONTAINER HANDLING EQUIPMENT
Johannes Kirchhoff, Iserlohn, Fed. Rep. of Germany, assignor to Edelhoff Polytechnik GmbH & Co., Iserlohn, Fed. Rep. of Germany
Filed Feb. 21, 1990, Ser. No. 483,053
Int. Cl.[5] B65F *3/04, 9/18*
U.S. Cl. 414—622 **4 Claims**



1. A conveying and handling device for containers comprising a lifting carriage adapted to be secured to a lifting rig provided with spaced vertical beams and to be moved vertically with respect to said lifting rig, said lifting carriage comprising spaced vertical beams connected to each other by transverse beams disposed one above the other in spaced relationship, a plurality of coupling claws having an essentially triangular configuration with upwardly directed apexes supported on the upper of said transverse beams, each claw of said plurality of claws having an essentially flat rear face and a convex, spherically curved front face which in cross section converges at the face defined by the sides of the triangle and t an acute angle with the rear face, and latching members adapted to cooperate with said coupling claws in the manner of

tongs, whereby each of said plurality of coupling claws engages a respective complementary projecting claw socket mounted on an outside surface of said containers and said latching members engage a top rim of said containers, said upper transverse beam being movable vertically in vertical guides located in said spaced vertical beams of said lifting carriage and moved by a fluid power piston and cylinder actuator connected to said upper transverse beam, and said lifting carriage having in the lower part thereof below said upper transverse beam, support means adapted to fit under the floor of said container and being movable vertically in guideways in said spaced vertical beams of said lifting rig by a hydraulic piston and cylinder actuator.

5,114,299

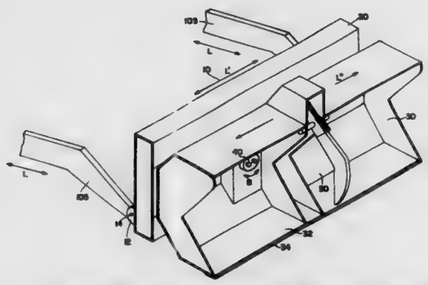
ATTACHMENT FOR A PRIME MOVER

Thomas Roche, and James Roche, both of Gurteen, Ballinasloe, County Galway, Ireland

Continuation of Ser. No. 390,547, Aug. 8, 1989, abandoned. This application Mar. 15, 1991, Ser. No. 670,482

Int. Cl.[5] E02F *9/00*

U.S. Cl. 414—722 **5 Claims**



1. A versatile attachment adapted for mounting on lifting arms of a prime mover comprising in combination;

a frame having a front face, a rear face and pivotal mounting means on the rear face of said frame for pivotally mounting said frame on the lifting arms about a pivotal axis in the plane of an axis which is transverse to the longitudinal axes of the lifting arms;

a loading bucket having a depth which is so dimensioned that said loading bucket is adapted for handling loose materials;

slewing means for securing said loading bucket on said front face of said frame, said slewing means being operable to slew said loading bucket laterally relative to said frame about a slewing plane which is perpendicular to the pivotal axis of said frame from 0° to at least 90°, wherein 0° corresponds to a relative position between said bucket and said frame wherein the longitudinal axes of said bucket and said frame are parallel and wherein 90° corresponds to a relative position between said bucket and said frame wherein the longitudinal axes of said bucket and said frame are perpendicular to one another, said slewing means having a slewing axis which is offset relative to the center of the bucket and intersects the longitudinal axis of said bucket;

grappling means mounted on said loading bucket and movable therewith, said grappling means comprising at least one fixed grapple member located within said loading bucket and at least one movable grapple member which is operable by a hydraulic ram, said fixed and movable members being adapted for clamping an elongate element therebetween; and

whereby said versatile attachment is adapted for handling both loose material and elongate members, such as poles, tools, and the like.

5,114,300

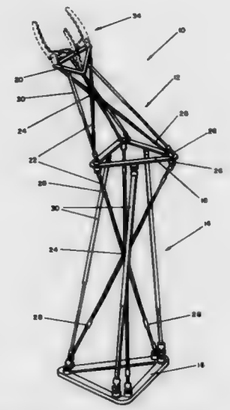
ROBOTIC APPARATUS

Mohsen Shahinpoor, Albuquerque, and Bradford L. Smith, Santa Fe, both of N. Mex., assignors to Wovenwire Corporation, Santa Fe, N. Mex.

Continuation-in-part of Ser. No. 319,653, Mar. 2, 1989, Pat. No. 4,927,674. This application Jan. 17, 1990, Ser. No. 466,041

Int. Cl.[5] B25J *17/02*

U.S. Cl. 414—729 **23 Claims**



1. A low mass robotic arm comprising:

a base platform;

an effector platform;

means for supportively spacing and connecting said base platform and said effector platform, said means for supportively spacing and connecting said base platform and said effector platform comprising interwoven movable joint means intermediate said base platform and said effector platform;

linear actuator means operatively connecting said base platform and said effector platform; and

means for selectively actuating each of said linear actuator means to operate said robotic arm.

5,114,301

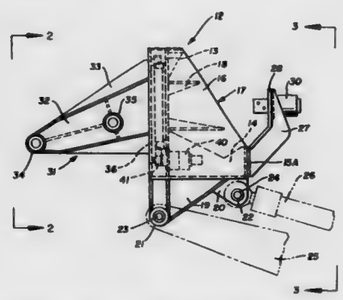
ROTATOR FOR BACKHOE EQUIPMENT

John Ramun, Youngstown, Ohio, assignor to Allied Gator, Inc., Youngstown, Ohio

Filed Jan. 10, 1991, Ser. No. 639,300

Int. Cl.[5] B66C *23/00*

U.S. Cl. 414—742 **5 Claims**



1. A rotator device for attachments on a backhoe having a

boom with controlled piston and cylinder assembly connected thereto comprising, a main frame pivotally secured to said boom, and a rotatable attachment mounting assembly within said main frame, said main frame having an apertured disk, a continuously contoured annular side wall extending in opposite directions to said disk and secured at right angles to said disk along an edge thereof so as to at least partially enclose said rotatable attachment mounting assembly, reinforcing elements interconnecting said disk with said side wall, a hydraulic rotary joint spaced in relation to said disk, means for interconnecting said disk, annular wall and said rotary joint, said rotatable attachment mounting assembly comprising* spaced parallel beams extending from an apertured support plate, bushings within said beams, a bearing assembly interconnecting said apertured disk and said apertured support plate and maintaining them in spaced relation to one another, and means for driving said attachment mounting assembly relative to said main frame.

5,114,302

APPARATUS FOR PERFORMING IN-FEED OF WORKING MEMBER TO WORKING STATION

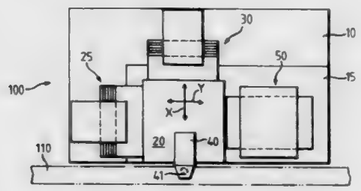
Claudio Meisser, Cham; Hans Eggenschwiler, and Walter Nehls, both of Steinhausen, all of Switzerland, assignors to Esec SA, Cham, Switzerland

Filed Nov. 22, 1988, Ser. No. 274,865

Claims priority, application Switzerland, Nov. 25, 1987, 4579/87

Int. Cl.[5] B25T *5/00*

U.S. Cl. 414—751 **19 Claims**



1. Apparatus for performing the in-feed of a working member to a working station, comprising a sliding plate; a support element for receiving the working member and arranged on the sliding plate; at least two drives operatively connected to said support element to adjust the support element in X and Y direction along two axes of coordinates oriented substantially at right angles to one another in a plane, with respect to the sliding plate, said support element being operatively connected with a moving part of a respective drive, said support element being arranged on the sliding plate in vacuum-pressurized manner by at least one air cushion bearing arranged on an underside of the support element, said underside facing said sliding plate and being formed with a substantially flat vacuum zone and a compressed air zone completely surrounding said vacuum zone so that said support element is movable by said drives over said bearing in a single given horizontal plane with a translational degree of freedom and is supported in substantially freely floating manner on said sliding plate.

5,114,303

GARBAGE TRUCK

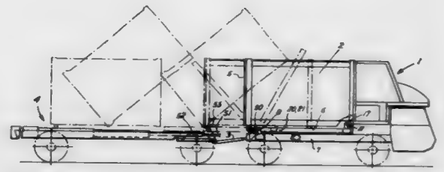
Johannes Kirchhoff, and Hans Klassek, both of Iserlohn, Fed. Rep. of Germany, assignors to Waste Management of North America, Oak Brook, Ill.

Division of Ser. No. 572,177, Aug. 23, 1990. This application Jul. 8, 1991, Ser. No. 714,611

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1990, 3927867

Int. Cl.[5] B60P *1/64*; **B65F** *9/00*

U.S. Cl. 414—786 **3 Claims**



1. A method for picking up, depositing and transporting containers which are adapted to be coupled to a truck-trailer combination, the method comprises, in combination,

a) providing a truck comprising a chassis having a rear portion, a pivoted frame, a carriage adapted to be moved in a reciprocal fashion and coupled to a transport container by a hook located on the carriage;

b) providing a trailer connected to the truck comprising a trailer carriage movable in a longitudinal direction and having means to lock the transport container thereto, and means for displacing the trailer carriage relative to the trailer;

c) pushing a transport container in a first horizontal position while hooked to the carriage of the truck onto the trailer carriage such that a supporting roller on the transport container engages and locks into a depression in the trailer carriage;

d) pivoting the pivoted frame using a hydraulic piston-cylinder unit, the pivoting occurring about a transverse axis disposed in the rear portion of the chassis through an arc of 180° such that the transport container locked to the carriage is erected from the first horizontal position to a vertical position;

e) pulling the trailer carriage and attached transport container in a longitudinal direction along the trailer while simultaneously completing the pivoting movement of the pivoted frame about the roller of the transport container until the transport container achieves a second horizontal position; and

f) pushing the transport container in the second horizontal position using the hydraulic piston-cylinder unit and simultaneously disengaging the hook from the transport container, the pushing being completed when the transport container no longer is supported by the chassis of the truck.

5,114,304

MOTOR-DRIVEN GARBAGE TRUCK COMPRISING A DETACHABLE CONTAINER

Gustav D. Edelhoff, Iserlohn, Fed. Rep. of Germany, and Fred T. Smith, Palos Verdes Peni, Calif., assignors to Edelhoff Polytechnik GmbH & Co., Iserlohn, Fed. Rep. of Germany

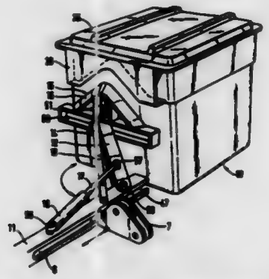
Division of Ser. No. 464,648, Jan. 11, 1990, Pat. No. 5,064,332, which is a continuation of Ser. No. 108,811, Oct. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 733,865, May 14, 1985, Pat. No. 4,715,767. This application Jul. 24, 1990, Ser. No. 557,254

Claims priority, application Fed. Rep. of Germany, May 29, 1984, 3420058

The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.[5] B65F *3/04*

U.S. Cl. 414—786 **6 Claims**



1. A refuse container adapted for engagement by a pick-up claw of a tipping apparatus on a motor driven refuse collection truck, said refuse container comprising:

a body having a bottom and a continuous sidewall upstanding therefrom which defines an open top at its upper end;

a profiled reinforcing member on said body in the region of said open top at its upper end, said profiled reinforcing member providing a receiving pocket adapted for releasable engagement by the pick-up claw of said tipping apparatus, said receiving pocket having an undercut portion having generally triangular configuration of an isosceles triangle with an upwardly directed apex and a generally downwardly flaring beveled profile so as to receive a complementarily triangularly shaped engaging portion of said pick-up claw; and

a hinged lid mounted to said body for pivoting about an axis located on a side of said body generally opposite said receiving pocket, said lid opening when said container is tilted to allow refuse contained therein to spill out into the refuse collection truck, such that said container can be easily and securely grasped by said pick-up claw for automatically deporting the contents of said container into said truck and returning the container to the ground without requiring any manual handling of the container.

6. A method for picking up and emptying a refuse container of its contents and returning said container to a position of rest comprising:

(1) providing a refuse container comprising a body having a bottom and a continuous sidewall extending upwardly therefrom which defines an open top at its upper end, and a tipping apparatus, including a gripping arm, on a motor-driven refuse collection truck which comprises a pick-up claw attached to a free end of said gripping arm and adapted to cooperate with the upper end of said refuse container,

said refuse container having a profiled reinforcing member on said body near the open top at its upper end,

said profiled reinforcing member providing a receiving pocket adapted for releasable engagement by said pick-up claw of said tipping apparatus,

said receiving pocket provided with an undercut portion which is complementary to said pick-up claw and has a generally triangular configuration with an upwardly directed apex and downwardly flaring, beveled edges,

and said pick-up claw including a plate having a generally triangular shape with an upwardly directed vertex and upper sides forming inwardly tapered, beveled, gripping edges for cooperating with said downwardly flaring, beveled edges of said receiving pocket;

(2) inserting said pick-up claw into said receiving pocket and centering said refuse container on said pick-up claw;

(3) raising said tipping apparatus and said refuse container over said refuse collection truck and tipping said refuse container and emptying said container of its contents; and

(4) lowering said tipping apparatus toward said position of rest, removing said pick-up claw from said receiving pocket and depositing said empty refuse container at said position of rest.

5,114,305

APPARATUS FOR STORING SLIDE FASTENER SLIDERS

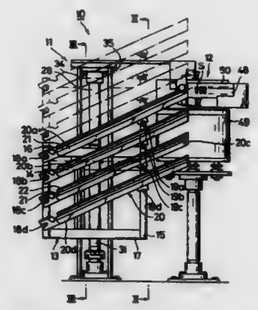
Shunji Akashi, Kurobe; Michio Ito, Uozu, and Kazuki Kuse, Toyama, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 24, 1990, Ser. No. 571,717

Claims priority, application Japan, Aug. 26, 1989, 1-219748

Int. Cl.[5] B65G *47/26*

U.S. Cl. 414—787 **4 Claims**



1. An apparatus for storing arrays of sliders to be applied onto a fastener stringer chain which comprises:

(a) a stocker holder having a plurality of a first group of hooks and a second group of hooks;

(b) a plurality of slider stockers removably mounted on said hooks and each having a rail;

(c) a slider supply means including a chute for lining up and transferring a supply of sliders from said supply means onto said slider stockers; and

(d) a drive means for moving said stocker holder relatively to said slider supply means to bring said slider stockers successively into operative position registering with said chute, said first and second groups of hooks being displaced with respect to their common horizontal axis such that each of said slider stockers is tilted downwardly to allow gravity movement of said sliders along said rail.

5,114,306

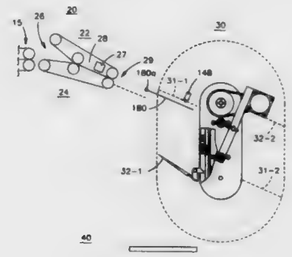
DUAL DRIVE STACKER AND METHOD FOR OPERATING SAME

Christer A. Sjogren, Miami; Louis D. Kipp, Miramar, and William K. Moritz, Hollywood, all of Fla., assignors to Quipp, Incorporated, Miami, Fla.

Filed Sep. 19, 1989, Ser. No. 409,625

Int. Cl.[5] B65G *57/11*

U.S. Cl. 414—790.4 **21 Claims**



1. A method for operating a stacker for batching signatures delivered to the stacker in a stream, said signatures being arranged in imbricated fashion and said stacker including first and second bucket means for receiving and collecting signatures, said method comprising the steps of:

moving said first bucket means to a home position immediately above the signature stream;

abruptly moving said first bucket means a predetermined distance from said home position to intercept said signature stream upon the occurrence of a predetermined condition, said predetermined distance being a function of the thickness of the signatures being batched;

moving said first bucket means along a stacking region at a rate responsive to the speed of the incoming stream;

moving said second bucket means to said home position as said first bucket means is moving through said stacking region whereby the signatures from said stream continue to be collected on said first bucket means;

rapidly accelerating said second bucket means to intercept said signature stream and thereby terminate the collecting of signatures on said first bucket means;

abruptly halting said first and second bucket means to allow the last signature delivered to said first bucket means to settle on the batch being formed;

moving said first bucket means in a drop region out from beneath the batch deposited thereon to permit said batch to fall upon a collection surface located beneath the stacking region.

5,114,307

APPARATUS FOR STACKING SLICES

Vincent A. Meli, Greenbay; Michael A. Matharani, DePere; Ted A. Brzezinski, Greenbay; David L. Shaft, Greenbay, and James L. Urmanski, Greenbay, all of Wis., assignors to Schreiber Foods, Inc., Green Bay, Wis.

Continuation of Ser. No. 361,405, Jun. 5, 1989, abandoned. This application Jan. 18, 1991, Ser. No. 644,481

Int. Cl.[5] B65G *57/04*

U.S. Cl. 414—793.1 **21 Claims**

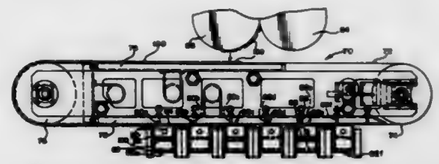
1. An apparatus for stacking slices of a product in at least one stacking location, the apparatus comprising:

a belt having a plurality of apertures, the belt being arranged such that at least part of the belt is disposed above the at least one stacking location;

means for moving the belt such that the belt travels over the at least one stacking location, the bottom of the belt facing the at least one stacking location;

vacuum means for providing vacuum through the apertures of the belt along a product-holding section of the belt, the vacuum being continuously provided during a stacking operation such that the slices of the product are maintained on the belt;

a selectively engageable air ejector operatively connected to provide positive air pressure through the apertures in the belt at an air ejector location, the air ejector location being



disposed downstream of the product-holding section of the belt at the beginning of the at least one stacking location, the air ejector being continuously operated during a stacking operation to provide positive air pressure to the apertures at the air ejector location simultaneously with the vacuum being provided through the apertures at the product-holding section of the belt such that the leading edge of a slice of product is urged off of the belt by the positive air pressure as the slice is moved past the apertures at the air ejector location.

5,114,308

METHOD OF PLACING COMPONENTS ON CARRIERS AND DEVICE FOR CARRYING OUT THE METHOD

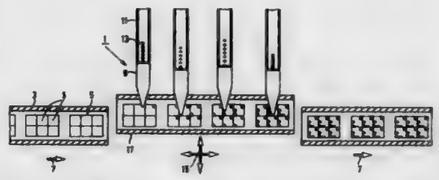
Jozef G. H. M. Smolders, and Peter I. Sygall, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1990, Ser. No. 495,546

Claims priority, application Netherlands, Mar. 23, 1989, 8900715

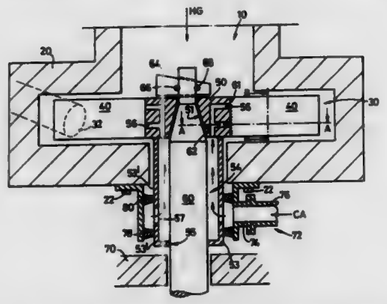
Int. Cl.[5] B23P *21/00*; B65G *47/90*

U.S. Cl. 414—799 **10 Claims**



3. A device for placing components on a plurality of component carriers comprising transport means for transporting said component carriers to a placement region, a first plurality of placement heads for placing a plurality of said components on a plurality of said carriers corresponding in number to said first plurality, means for feeding components of a different type to each respective placement head, said placement heads performing a fixed pick and place stroke for simultaneously placing said plurality of components on said plurality of carriers, said transport means including a table for releaseably receiving said carriers and including means for moving the table and carriers in x, y directions to position said carriers to receive components placed on said carriers by said heads during said stroke.

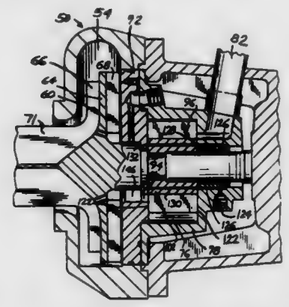
5,114,309
HOT GAS BLOWER WITH LAMINATED FAN BLADES AND COOLING SYSTEM THEREFOR
Adrianus J. Hengelmolen, Nottingham, England, assignor to Copermill Limited, Nottingham, England
Filed Aug. 16, 1990, Ser. No. 568,011
Claims priority, application United Kingdom, Nov. 28, 1990, 8926815
Int. Cl.[5] F01D *25/08*
U.S. Cl. 415—114 **7 Claims**



1. A hot gas blower for blowing hot exhaust gases in a desired direction, the hot gas blower including inlet means for said hot exhaust gases and outlet means for said hot exhaust gases,
housing means,
blade means mounted within said housing means,
a spindle, the spindle being mounted for rotation within the housing means, the blade means being mounted on said spindle for rotation therewith,
in which the blade means comprises a plurality of blades of predetermined size and shape to blow said hot gases from said inlet means to said outlet means,
wherein each blade includes air passage means for the passage of cooling air or gas through the blade,
in which each blade comprises a laminated structure, the air passage means comprising a plurality of elongate passages formed in the structure in a direction along the length of the blade,
in which each blade is substantially rectangular and has a cross section which is substantially flat with a raised central portion providing additional rigidity and,
in which each blade is constructed from two sheets of heat resistant metal, the sheets being separated by elongate spacing pieces, each sheet being welded to the spacing pieces, such that the spacing pieces form the elongate air passages through the blade.

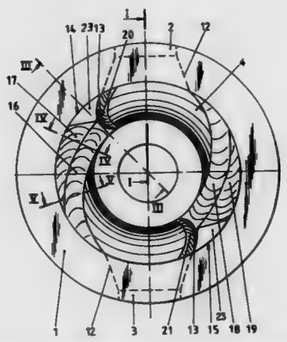
5,114,310
CENTRIFUGAL PUMP WITH SEALING MEANS
Harold Haavik, Norwalk, Conn.; Tapio Peroaho, Tavastilla, Finland; Reijo Vesala, Kotka, Finland, and Vesa Vikman, Kymi, Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland
Filed Sep. 7, 1990, Ser. No. 579,403
Int. Cl.[5] F01D *1/10, 25/32*
U.S. Cl. 415—169.1 **15 Claims**

1. A centrifugal pump for pumping a gas-containing medium comprising:
a centrifugal pumping housing (**50**) having an inlet (**52**) and an outlet for said medium;
a centrifugal impeller (**60**) within said centrifugal pumping housing (**50**);
a liquid ring vacuum pump (**70**) adjacent said centrifugal pumping housing (**50**), said vacuum pump including a vacuum pump chamber (**76**) defined by first and second opposed side walls (**112, 110**) spaced apart by a circumferential annular wall (**100**);
a vacuum pump rotor eccentrically positioned within said vacuum pump chamber (**76**), said rotor having a central portion (**102**) carrying a plurality of blades with outwardly extending opposed side edges facing said vacuum pump side walls (**112, 110**) and forming a clearance therebetween;
a rotary shaft (**58**) extending through said vacuum pump chamber and into said centrifugal pump housing (**50**); said



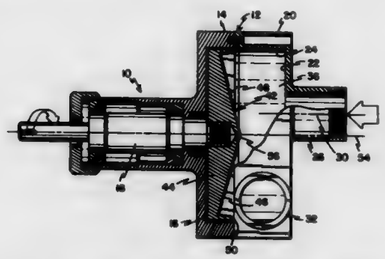
central portion (**102**) having an outer surface defined radially outwardly from said rotary shaft (**58**);
said centrifugal pump impeller and said vacuum pump rotor being mounted on said shaft in spaced relation to each other; and
means within at least one of said vacuum pump side walls (**112, 110**) for supplying a sealing liquid to said clearance (**122**) between said rotor central portion (**102**) and at least one of said side walls (**112, 110**) of said vacuum pump chamber (**76**) at a location between said central portion outer surface and said rotary shaft (**58**).

5,114,311
CENTRIFUGAL PUMP WITH INNER AND OUTER CASINGS
Karlheinz Becker, and Gunter Pfeiffer-Müller, both of Worms, Fed. Rep. of Germany, assignors to KSB Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany
Filed Feb. 20, 1991, Ser. No. 658,172
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1990, 4005414; Dec. 22, 1990, 4041545
Int. Cl.[5] F01D *1/00*
U.S. Cl. 415—182.1 **16 Claims**



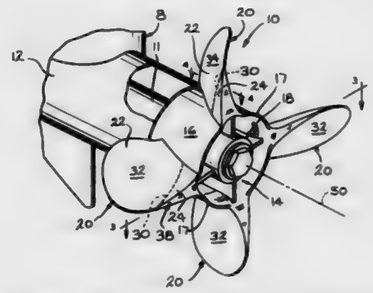
1. A centrifugal pump comprising an outer casing having a fluid-admitting inlet and an outlet including at least one lateral fluid discharge branch; an inner casing disposed in and defining with said outer casing a chamber connecting said inlet with said outlet; a pump shaft rotatably journalled in said inner casing; an impeller mounted on said shaft between said inlet and said chamber for rotation in a predetermined direction; and fluid flow controlling guide means including at least one insert in said chamber, said inner casing having an outer diameter which increases from said impeller toward said outlet and said insert having a front face adjacent said impeller and a guide surface adjacent said casings, said front face being offset relative to the center of said at least one discharge branch in said predetermined direction and said guide surface including a first section nearer to said inner casing and a second section nearer to said outer casing, said first and second sections extending from said front face in said predetermined direction and said guide surface further including a third section which extends counter to said direction and is nearer to said at least one discharge branch than said first and second sections.

5,114,312
SLURRY PUMP APPARATUS INCLUDING FLUID HOUSING
Joseph Stanislao, Fargo, N. Dak., assignor to ATSCO, Inc., Belgrade, Mont.
Division of Ser. No. 538,985, Jun. 15, 1990. This application Jun. 13, 1991, Ser. No. 714,698
Int. Cl.[5] F04D *29/42*
U.S. Cl. 415—206 **7 Claims**



1. A fluid housing mountable to an impeller housing of a slurry pump wherein the impeller housing contains a rotatable impeller rotatable about an axis of rotation, the fluid housing comprising:
a circular wall member opposing the impeller and having a substantially circular input passage eccentrically located relative to a center of the circular wall member, the input passage further being eccentrically located relative to the axis of rotation of the impeller; and
a circular side wall member surrounding the circular wall member about an outer periphery of the circular wall member, the circular side wall member having a substantially circular output passage, the circular side wall member being mountable to the impeller housing wherein the circular wall member and the circular side wall member of the fluid housing cooperate with the impeller housing to define a fluid chamber, the impeller of the impeller housing being located substantially outside the fluid chamber;
the circular side wall member having an interior width substantially equal to an inside diameter of the input passage and an inside diameter of the output passage.

5,114,313
BASE VENTED SUBCAVITATING MARINE PROPELLER
William S. Vorus, Gregory, Mich., assignor to 501 Michigan Wheel Corp., Grand Rapids, Mich.
Filed Apr. 10, 1990, Ser. No. 506,944
Int. Cl.[5] B63H *1/28*
U.S. Cl. 416—93 A **6 Claims**

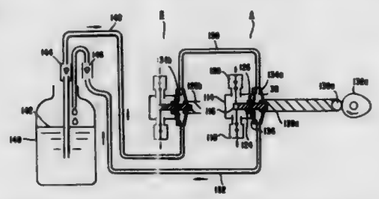


1. A propeller assembly having means for mounting to the drive shaft of a propeller driven water vehicle, the assembly comprising:
a hollow hub defining a central axis and having an annular cross-sectional shape through which a gas can flow; and
a plurality of generally radially extending arcuate blades positioned substantially equidistantly on said hub, said blades having a generally fish-shaped cross-sectional shape, said cross-sectional shape increasing in thickness in a forwardly located fin portion from a leading edge to a local maximum thickness and subsequently decreasing in thickness to a local minimum thickness, said cross-sectional shape thereafter increasing in thickness along concave surfaces of a rearwardly located post portion being integrally formed with said fin portion and said hub, said post portions being flared and rearwardly terminating said blade at a trailing surface, said trailing surface forming a smooth transition from the interior of said hollow hub for drawing the gas flowing through said hub therealong, whereby said fish-shaped cross-sectional shape and ventilating of said trailing surface enables said propeller assembly to function efficiently at increased operational speeds by effectuating a delay in the appearance of cavitation, wherein said hub includes a flared rear rim formed thereon, said trailing surface being smoothly formed with said flared rear rim.

5,114,314
RECIPROCATING TYPE FLUID DELIVERY PUMP
Shigeaki Fujimoto, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan
Continuation-in-part of Ser. No. 255,570, Oct. 11, 1988, abandoned. This application Aug. 29, 1990, Ser. No. 574,174
Claims priority, application Japan, Mar. 28, 1988, 63-77585
Int. Cl.[5] F04B *49/06, 49/08*
U.S. Cl. 417—3 **5 Claims**

1. A reciprocating type fluid delivery pump with two pump heads arranged for parallel flow of fluid output therefrom, comprising:
a driving motor;
a pair of plungers for driving said two pump heads, respectively, each plunger reciprocable within a pump chamber of one of said two respective pump heads, wherein each pump chamber has a pump chamber seal for reducing leakage around a respective one of said plungers;
a converting means for converting the rotational motion of said driving motor into reciprocating motion of each plunger, wherein said converting means includes a pair of

cams, wherein each cam engages with a corresponding one of said plungers for reciprocating said plungers to provide a delivery flow rate of fluid from each plunger, during a delivery starting period, which is in excess of a delivery flow rate during other periods of each plunger cycle when said driving motor is rotated at a constant velocity when fluid delivery is not carried out under high pressure, and when the fluid delivery is carried out under high pressure, the delivery flow rate is substantially constant when said driving motor is rotated at a constant velocity, and wherein each cam has a shape such that,



during the delivery starting period, each cam drives its corresponding plunger to have only and increasing or constant plunger speed;

a means for selectively decelerating and driving motor during said excess delivery period when fluid delivery is not carried out under high pressure; and

a rinsing means, housed within one of said pump heads, for preventing crystallization of a salt on a rear portion of said pump chamber seal of said one pump head, wherein said rinsing means includes at least one rinse chamber having an inner volume which constantly changes for conducting rinsing fluid therethrough.

5,114,315

CLUTCH CONTROL SYSTEM FOR AN AIR COMPRESSOR

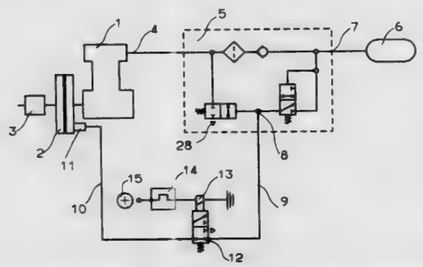
Wolfgang Kaltenthaler, Wennigsen, and Karl-Heinrich Schönfeld, Seelze, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 1, 1990, Ser. No. 487,759

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1989, 3906534; Jul. 19, 1989, 3923882

Int. Cl.[5] F04B *49/06*

U.S. Cl. 417—18 **22 Claims**



1. A device for the generation of compressed air comprising

a pressure line having an end connected to a user;

a compressor connected to the pressure line for supplying air via a pressure line to the user;

a pressure controller disposed in the pressure line, which pressure controller is capable of blocking a supply stream from the compressor to the user through a user-aide pressure and of diverting said supply stream into the atmosphere upon reaching or, respectively, surpassing of a preset and defined pressure value;

a switchable coupling connected to the compressor and by way of which the compressor can be separated from its drive;

a switching means for connecting to the switchable coupling;

a coupling control device connected to the switching means for controlling the switching means;

a temperature sensor connected to the coupling control device for furnishing an ambient temperature-dependent signal;

a pressure sensor communicating the pressure in the pressure line on its end toward the user and furnishing a pressure signal, derived from a pressure prevailing at the user side, wherein the temperature dependent signal and the pressure signal are fed to the coupling control device, wherein the coupling control device serves for combining the two signals such that the coupling separates the compressor from its drive in case the ambient temperature is above a preset temperature value and the user-side pressure is above a preset user-side pressure.

5,114,316

METHOD OF REGENERATING A VACUUM PUMPING DEVICE

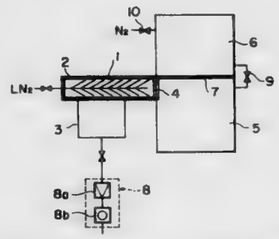
Takayuki Shimizu, Kikuchi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 5, 1990, Ser. No. 622,518

Claims priority, application Japan, Mar. 8, 1990, 2-54965

Int. Cl.[5] F04B *15/08*

U.S. Cl. 417—53 **5 Claims**



1. A method of regenerating a vacuum pumping device having a molecule trapping chamber for generating a vacuum in a process chamber, comprising the steps of:

isolating the molecule trapping chamber from a process chamber;

raising the temperature of the molecule trapping chamber from a first temperature at which molecule trapping can be performed to a second temperature below room temperature at which molecules trapped in the molecule trapping chamber are directly transformed into a vapor state while maintaining the interior of the molecule trapping chamber isolated from the exterior of the molecule trapping chamber; and

evacuating the molecule trapping chamber to remove molecules transformed into a vapor state.

5,114,317

LOW WEIGHT FAN WITH INTERNAL COOLING

Mordechai Cohen, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 23, 1989, Ser. No. 424,949

Int. Cl.[5] F04B *35/04*

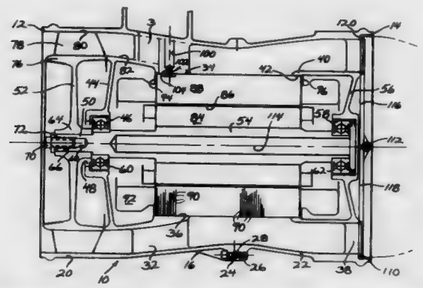
U.S. Cl. 417—354 **6 Claims**

1. An electric fan comprising:

an elongated duct-like housing having a generally circular cross section, opposed open ends, and a circumferential split between said ends dividing the housing into two parts;

means securing said parts together;

each of said parts having an internal ring of reduced diameter and inwardly directed, circumferentially spaced struts mounting the rings in aligned but axially spaced relation;



an electric motor stator located in said housing with its ends in corresponding ones of said rings;

bearing mounting webs on said struts;

bearings carried by said webs;

a rotor journalled in said stator by said bearings; and

an impeller within said housing at one end thereof and secured to said rotor for rotation therewith.

5,114,318

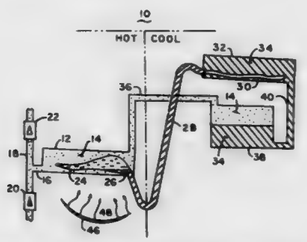
AUTOMATIC-CYCLING HEAT-POWERED FLUID PUMP

John C. Freeborn, P.O. Box 538/51818 Cheyenne Tr., Morongo Valley, Calif. 92256

Filed Jul. 5, 1991, Ser. No. 726,260

Int. Cl.[5] F04B *17/00;* **F03G** *7/06*

U.S. Cl. 417—379 **12 Claims**



1. An automatic cycling, heat powered, fluid pump actuated by the vaporization and condensation of a volatile working fluid wherein the cyclic action of the pump is accomplished without the use of control valves or other external influence but only by the force of gravity and the pressure difference characteristic of the working fluid vapor pressures at two different temperatures, said two temperatures resulting from the continuous application of heat at one place and the continuous extraction of heat from another place, said fluid pump comprising:

a rigid walled pumping chamber;

rigid walled condensing chamber located in a cooler environment and at a higher elevation than the pumping chamber;

fluid conduit means interconnecting the two rigid walled chambers;

a first variable volume chamber located within the pumping chamber;

a second variable volume chamber located within the condensing chamber;

fluid conductor means interconnecting the two variable volume chambers;

a quantity of a working fluid located within the variable volume system composed of said first and second volume chambers and their interconnecting fluid conductor means;

a fluid to be pumped, gasseous or liquid, located within the rigid walled chambers and their interconnecting conduit means but outside said variable volume system;

an intake/output port permitting flow of fluid to be pumped into and out of the pump;

heating means supplying heat to vaporize said working fluid, the vapor of which collects in said first variable volume chamber within the pumping chamber and,

cooling means removing heat to cause condensation of working fluid vapor in said second variable volume chamber within the condensing chamber;

whereby vaporization of the working fluid forces an accumulation of vapor within the first variable volume chamber thus expanding this chamber and raising the pressure within the fluid to be pumped to a level sufficient to cause it to flow out of the pump, said expansion and flow continuing until said first variable volume chamber reaches the limits of its expansion after which further vaporization forces the remaining working fluid and vapor out of said first variable volume chamber thence upward through said fluid conductor means and into said second variable volume chamber where heat is extracted thus condensing the working fluid vapor and causing a contraction of the volume of the working fluid system with an attendant reduction of pressure to a level at which an intake flow of fluid to be pumped occurs said contraction and intake flow continuing until condensation is complete at which time the condensed working fluid liquid fills the fluid conductor means thus satisfying the conditions necessary to establish a gravity induced siphon by which the condensed liquid returns through the fluid conductor means to the place of vaporization and initiates another cycle.

5,114,319

CONCRETE-PUMPING DEVICE

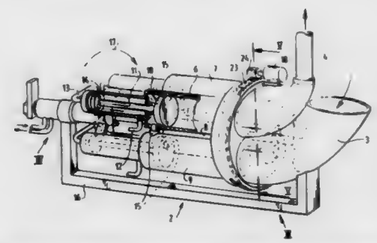
Pieter Faber, No. 19; Des Meute NL-8213 BH, Creil, Netherlands

Filed Oct. 10, 1990, Ser. No. 595,242

Claims priority, application Netherlands, Oct. 13, 1989, 8902546

Int. Cl.[5] F04B *17/00*

U.S. Cl. 417—342 **19 Claims**



1. Concrete-pumping device comprising a frame a number of hydraulic jacks having plungers a number of pump cylinders mounted on the frame which comprise a pump opening close to one end of the frame sealed pump pistons which are guided in the pump cylinders toward and away from the pumping device and which are each coupled for reciprocal driving to the plunger of a coaxially arranged hydraulic jack, hydraulic switching means for cyclically feeding to and discharging from the jack hydraulic oil under pressure such that the plunger causes the reciprocating movement of the pump piston, and concrete switching means for alternately placing the pump

opening in communication with a feed funnel and a concrete pressure conduit synchronously with the movement of the pump piston in order to pump concrete out of the feed funnel into the pressure conduit, characterized in that the hydraulic switching means comprise at least three pump cylinders with associated hydraulic jacks and that the hydraulic and concrete switching means are embodied such that each time before a pump piston of a first pump cylinder has completed a pressure stroke another pump piston of another pump cylinder has already completed the suction stroke and the pump opening of this other pump cylinder is connected to the discharge line and that the pressure stroke of this other pump piston begins directly at the moment that the pressure stroke of the one cylinder has been completed with the velocity of the pressure stroke of each pump cylinder being equal to the velocity of the suction stroke of that pump cylinder.

5,114,320

BLOWER OR PUMP WITH CAPILLARY FILTER FOR REPLENISHMENT OF OIL SEPARATED BY VACUUM PUMP

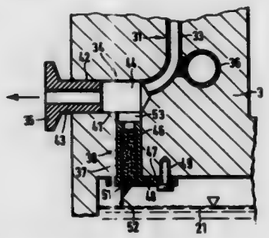
Hans-Peter Kabelitz; Martin Mühlhoff, both of Cologne; Hans Kriechel, Bornheim; Wolfgang Maas, and Dieter-Martin Kolvenbach, both of Cologne, all of Fed. Rep. of Germany, assignors to Leybold AG, Hanau, Fed. Rep. of Germany

Filed Dec. 20, 1990, Ser. No. 630,530

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1989, 3943113

Int. Cl.[5] F04B *17/00*

U.S. Cl. 417—423.13 **13 Claims**



1. Blower apparatus comprising

a rotor having a rotor shaft which is vertically disposed in operation,

a motor housing disposed below said rotor, said housing having an interior and a pair of shaft bearings which receive said rotor shaft therethrough,

a motor on said shaft in said interior of said housing,

an oil sump below said housing,

an evacuating line for connecting a vacuum pump to the interior of said housing, and

a drain line directly connecting said evacuating line to said pump, said sump lying below said evacuating line, said drain line having capillary action filter means therein.

5,114,321

FLUID DISPLACEMENT APPARATUS WITH TRAVELING CHAMBERS

Ski Milburn, Boulder, and Jeffrey Barber, Lafayette, both of Colo., assignors to Vairex Corporation, Boulder, Colo.

Filed Feb. 12, 1991, Ser. No. 654,210

Int. Cl.[5] F04B *1/10*

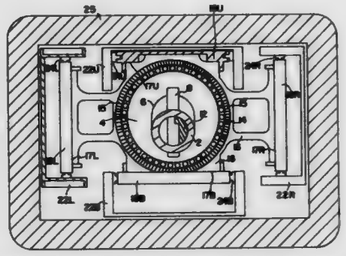
U.S. Cl. 417—467 **17 Claims**

1. The method of providing continuous fluid displacement including the steps of

providing a movable chamber with a movable piston therein,

driving said piston in a non-rotational orbit,

generating a reciprocating force independent of interaction between said piston and said chamber, and



driving said chamber with said force along a linear reciprocating path with a displacement equal to the component of motion of said piston in a direction parallel with said path.

5,114,322

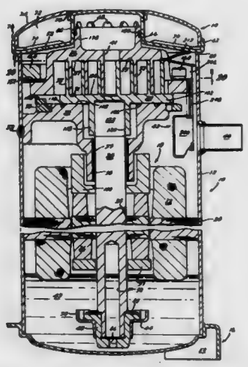
SCROLL-TYPE MACHINE HAVING AN INLET PORT BAFFLE

Jean-Luc M. Caillat; Roger C. Weatherston, both of Dayton, and James W. Bush, Sidney, all of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Division of Ser. No. 387,699, Jul. 31, 1989, Pat. No. 4,992,033, which is a division of Ser. No. 189,485, May 2, 1988, Pat. No. 4,877,382, which is a division of Ser. No. 899,003, Aug. 22, 1986, Pat. No. 4,767,293. This application Jan. 31, 1991, Ser. No. 649,001

Int. Cl.[5] F04C *29/02*; B01D *45/08*

U.S. Cl. 418—55.6 **4 Claims**



1. A hermetic fluid compressor, comprising:

(a) a hermetic shell having a fluid inlet port through the wall thereof;

(b) a motor-compressor disposed within said shell and having a fluid inlet spaced from said inlet port;

(c) a baffle having a central body portion and laterally spaced elongated flange portions affixed to said shell so as to position said central body portion in overlying relationship to said inlet port, said baffle cooperating with said shell to define openings therebetween above and below said inlet port, said lower opening acting as a drain for oil entrained in inlet fluid which separates upon impingement with said baffle; and

(d) a plastic member having means at one end received within said upper opening of said baffle and defining an axially extending passageway in communication with said upper opening for receiving inlet fluid and means at the opposite end for directing inlet fluid into said compressor inlet.

5,114,323

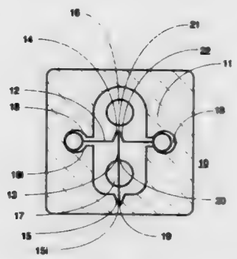
NUTATOR BEARING ASSEMBLY

John E. Durand, 26581 Doloroso, Mission Viejo, Calif. 92691

Continuation-in-part of Ser. No. 235,567, Aug. 24, 1988, Pat. No. 4,911,622. This application Oct. 29, 1990, Ser. No. 604,809

Int. Cl.[5] F01C *1/02*; G01F *3/08*

U.S. Cl. 418—58 **1 Claim**



1. In a nutating positive displacement device including a nutator capable of nutating within a nutation chamber defined by the interior surface of the body of the positive displacement device between an inlet into and an outlet out of the positive displacement device, wherein the positive displacement device is capable of performing the typical positive displacement device functions such as pump, generator, flow meter, etc.,

an inverted pendulous, low friction, substantially non sliding nutator vertically elongated double pivoting fulcrum, wherein:

the fulcrum is one member comprising a bottom base coupled to a central beam coupled to a top nutator support bearing surface, the bottom of the fulcrum comprising a pivoting base pivotally and substantially non slidably mating with a base receptacle defined by a body interior surface, the base coupled to the fulcrum beam which in turn supports the fulcrum nutator support bearing surface, and the nutator support bearing surface pivotally and substantially non slidably mates with a nutator restraint defined by the center bottom surface of the nutator.

5,114,324

ROTARY HYDRAULIC MOTOR WITH BRAKE SYSTEM

Walter Spindeldreher, Irschenberg, Fed. Rep. of Germany, assignor to Kinshafer Greiftechnik GmbH, Miesbach, Fed. Rep. of Germany

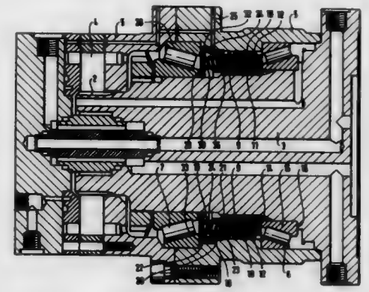
Filed Nov. 9, 1990, Ser. No. 612,397

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1990, 4004411; Mar. 15, 1990, 4008362

Int. Cl.[5] F03C *2/08*; F04C *2/10*

U.S. Cl. 418—61.3 **8 Claims**

1. In a rotary hydraulic motor comprising a brake, which is adapted to be applied under the pressure of springs and to restrain an output shaft of a hydraulic motor when the hydraulic motor is not pressurized and which is arranged to be lifted by a hydraulic cylinder in response to a supply of hydraulic liquid under pressure to the hydraulic motor, the improvement wherein a piston of the hydraulic cyclinder is provided with a



bore means through which the hydraulic liquid can enter a chamber of the hydraulic motor.

5,114,325

ROTARY INTERNAL GEAR PUMP HAVING TEETH WITH ASYMMETRICAL TRAILING EDGES

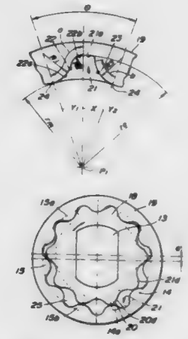
Shoji Morita, Kanagawa, Japan, assignor to Atsugi Motor Parts Company, Limited, Kanagawa, Japan

Continuation of Ser. No. 154,053, Feb. 9, 1988, abandoned. This application Jul. 2, 1990, Ser. No. 547,590

Claims priority, application Japan, Jul. 27, 1987, 62-187279

Int. Cl.[5] F04C *2/10*

U.S. Cl. 418—171 **8 Claims**



1. A fluid pump comprising:

a casing having an inlet opening and a discharge opening, said casing being formed with a recess;

an outer rotor rotatably disposed in said recess formed in said casing, said outer rotor being formed with a plurality of internal teeth, each of said internal teeth having a leading edge and a trailing edge, said leading edge preceding said trailing edge in a direction of rotation of said outer rotor, said outer rotor being rotatable about a first axis;

an inner rotor disposed within said outer rotor, said inner rotor being formed with a plurality of external teeth, each of said external teeth having a leading edge and a trailing edge, said external teeth being receivable in said internal teeth, said inner rotor being rotatable about a second axis which is offset from said first axis;

said internal teeth of said outer rotor and said external teeth of said inner rotor being formed in a convex-shaped configuration;

said trailing edge of each of said internal teeth being profiled so as to have a first convexly curved portion which has a

first radius of curvature, and a second concavely curved portion which merges with said first convexly curved portion, said second concavely curved portion having a second radius of curvature, the origin of said first radius of curvature falling on a first imaginary line, said first imaginary line having an origin coincident with said first axis and which passes through a point on the inner periphery of said outer rotor which defines the beginning of the profile of said outer rotor and which defines the beginning of the profile of one of said internal teeth, said second radius of curvature having an origin which lies on a second imaginary line, said second imaginary line having an origin which is coincident with said first axis and which passes through essentially the mid point of said one internal tooth; and

said leading edge of each of said internal teeth including a top land portion and a third convexly curved portion, said third convexly curved portion having a third radius of curvature, said third radius of curvature having an origin which lies on a third imaginary line which has an origin coincident with said first axis and which passes through a point on the inner periphery of said inner rotor which defines the end of the profile of said one internal tooth.

7. A fluid pump comprising:

a casing having an inlet opening and a discharge opening;

an outer rotor rotatably disposed in a recess formed in said casing, said outer rotor being formed with a plurality of internal teeth, each of said internal teeth having a leading edge and a trailing edge, said leading edge preceding said trailing edge in a direction of rotation of said outer rotor, said outer rotor being rotatable about a first axis;

an inner rotor disposed within said outer rotor, said inner rotor being formed with a plurality of asymmetric external teeth, each of said external teeth having a leading edge and a trailing edge, said external teeth being receivable in said internal teeth, said inner rotor being rotatable about a second axis which is offset from said first axis; and

said leading and trailing edges of said internal teeth having essentially symmetrical shapes and said trailing edge of each of said asymmetric external teeth being formed with a flat surface.

5,114,326

APPARATUS FOR MANUFACTURING DIAPHRAGMS

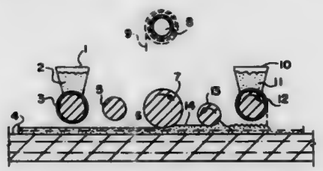
Heinz Wülleweber, Frankfurt am Main; Peter Kohl, Neuberg; Herbert Jung, Oberursel, all of Fed. Rep. of Germany; Jürgen Borchardt, Trolstorrenta, Switzerland; Wolfgang Bickle, Reilingen, Fed. Rep. of Germany; Jürgen Braun, Walldorf, Fed. Rep. of Germany, and Hans-Joachim Hiedemann, Cologne, Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main; Kolbenschmidt, Neckarsulm and Jean Hiedemann GmbH & Co. KG, Cologne, all of, Fed. Rep. of Germany

Division of Ser. No. 339,747, Apr. 18, 1989, Pat. No. 4,961,901. This application Jul. 17, 1990, Ser. No. 554,642

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813743

Int. Cl.[5] B22F *3/18*

U.S. Cl. 425—79 **2 Claims**



1. An apparatus for manufacturing a diaphragm made up of a wire net carrier and a porous ceramic layer joined to the carrier, comprising: a support; first means for applying metal powder onto the support in a first feed direction to form a powder layer thereon, wherein the metal powder is flowable with difficulty and consists of irregularly shaped particles; a first distributing roller rotatable in a direction opposite to the first feed direction; means for moving the applied powder and the support under the distributing roller in the first feed direction while rotating the distribution roller in the direction opposite the first feed direction to impart a uniform thickness to the powder layer; a wire net; means for applying the wire net onto the uniform thickness powder layer and for compacting the uniform thickness powder layer at the same time by 30 to 60% comprising a single compacting roller; second means for applying the metal powder onto the support in a second feed direction to form a second powder layer thereon, a second distributing roller rotatable in a direction opposite to the second feed direction; second means for moving the applied powder and the support under the second distributing roller in the second feed direction while rotating the distribution roller in the direction opposite the second feed direction to impart a uniform thickness to the second powder layer and second means for compacting the uniform thickness second powder layer; and means for firing the compacted powder layers and wire net in an oxidizing atmosphere.

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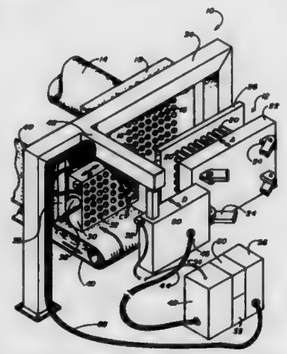
RAPID COOLING APPARATUS FOR AN INJECTION MOLDING MACHINE

James T. Williamson, 225 Brydon Rd., Kettering, Ohio 45419, and Michael A. Carter, 723 12th St., Miamisburg, Ohio 45342

Filed Jan. 25, 1991, Ser. No. 646,071

Int. Cl.[5] B29C *45/80*

U.S. Cl. 425—139 **12 Claims**



1. Apparatus for use with an injection molding machine, the injection molding machine having a core unit and a cavity unit for rapidly cooling a set of molded workpieces, the apparatus comprising:

receiver means for receiving said molded workpieces upon ejection from said molding machine;

transporter means coupled to the receiver means for transporting the receiver means relative to said molding machine between a first position within said injection molding machine and a second position adjacent to said injection molding machine;

a source of cooling fluid and directing means for directing the cooling fluid toward a surface of each workpiece in the receiver means;

moving means coupled to the directing means for moving the directing means relative to the receiver means between an engaged position where the directing means and receiver means are engaged with each other and a disengaged position where the directing means and receiver means are spaced from each other by a minimum selected distance;

sealing means for sealing the directing means to the receiver means to restrict any escape of cooling fluid while the directing means and receiver means are engaged with each other;

control means coupled to the source of cooling fluid and responsive to the relative position of the receiver means and the directing means for releasing cooling fluid from said source only when the directing means is engaged with the receiver means at the engaged position; and

vacuum means coupled to the receiver means for withdrawing cooling fluid from the receiver means subsequent to contact between the workpieces and the cooling fluid.

5,114,328

Patent Not Issued For This Number

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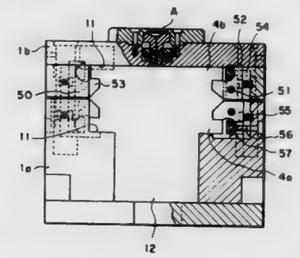
MOLD UNIT FOR INJECTION MOLDING

Susumu Nakamura, and Koichi Yokoi, both of Yamanashi, Japan, assignors to Sankyo Engineering Co., Ltd., Yamanashi, Japan

Filed Mar. 6, 1991, Ser. No. 665,330

Int. Cl.[5] B29C *45/66*

U.S. Cl. 425—190 **4 Claims**



1. A mold unit for injection molding, and for receiving a core inside mold which is mated to and joined with a cavity inside mold, each mold having an outer flange with the outer flanges of the molds being spaced away from each other and each flange having a selected thickness, the mold unit comprising:

a pair of mold frames, each having an inner wall against which a respective one of the mold flanges is engageable;

a pair of spaced apart pressing members pivotally connected to each respective frame, each pressing member having a pressing end movable toward the inner wall with pivoting of the pressing member, into a clamping position for clamping a mold flange between the pressing end of the pressing member and the inner wall, each pressing end being movable away from the inner wall with pivoting of the pressing member into a releasing position for accepting and releasing a mold flange;

biasing means connected to each pressing member for urging each pressing end toward the release position;

each pressing member having a base end adjacent said inner wall of a respective frame; and

a clamp bolt for each pressing member, extending into each respective frame and into engagement with a respective base end, for rotation to pull a respective base end away from a respective inner wall to pivot said pressing members to move said pressing ends into their clamping positions so that both molds are simultaneously fixed to said frames, in alignment of said molds with each other, so that said frames can be moved toward and away from each other while maintaining alignment between said molds.

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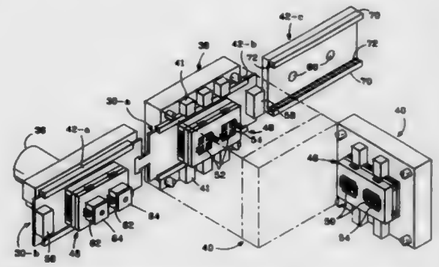
APPARATUS FOR MOLD MODULE CHANGE-OUT

Peter G. Nielsen, King, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 13, 1990, Ser. No. 627,094

Int. Cl.[5] B29C *33/00*

U.S. Cl. 425—193 **4 Claims**



1. Apparatus for use in a molding press, said apparatus comprising:

first and second plate receiving means with said first plate receiving means mounted on a movable platen and said second plate receiving means positioned to one side of and in alignment with said first plate receiving means;

a first plate slidably mounted on one of said plate receiving means;

frame means mounted on said first plate for receiving removable mold modules;

plate actuating means sliding said first plate between said first and second plate receiving means; and

ejector means removing mold modules from said frame means mounted on said first plate.

5,114,331

APPARATUS OF SHRINKING VOLUMES OF WASTE FOAMED PLASTICS

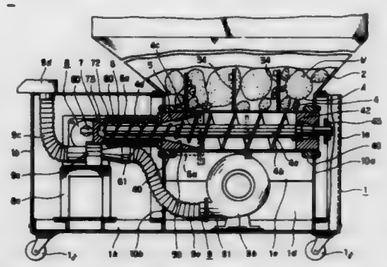
Takeshi Umehara; Toshio Ikeda, and Kazuhisa Urata, all of Shizuoka, Japan, assignors to Suruga Seiki Co., Ltd., Shimizu, Japan

Filed Jan. 24, 1991, Ser. No. 645,107

Claims priority, application Japan, Feb. 9, 1990, 2-11523[U]

Int. Cl.[5] B29C *47/10, 47/38*

U.S. Cl. 425—200 **12 Claims**



1. Apparatus for treating materials comprising foamed thermoplastic synthetic resins, said apparatus comprising

a main body frame having a crushing room inwardly tapered towards its lower part;

a hopper in communication with said crushing room and into which said materials are charged;

a crushing shaft rotatably traversing said crushing room, said crushing shaft comprising a plurality of crushing

vanes for crushing said materials and having a radius of gyration sufficient to extend into said hopper so as to destroy the lower layer of said materials within said hopper;

a sending cylinder disposed in said main body frame outside of said crushing room, said sending cylinder having receipt opening means in communication with said crushing room for receiving said materials from said crushing room; said sending cylinder housing a rotatable shaft having a screw vane for moving said materials along its axial length;

a compressing cylinder through which said rotatable shaft is partially disposed, said compression cylinder having an inlet and an outlet, said inlet being in communication with and connected in series to said sending cylinder; the diameter of said inlet being larger than the diameter of said outlet so that said compressing cylinder is tapered;

a heating cylinder for heating said materials to a temperature lower than the temperature at which said materials completely melt, so as to soften and fuse said materials one to another, said heating cylinder having an inlet and an outlet, said inlet being in communication with said outlet of said compressing cylinder;

extruding nozzle means in communication with said outlet of said heating cylinder for extruding said materials in an elastic state;

rotating cutting means disposed about said extruding nozzle means for cutting said extruded materials; and

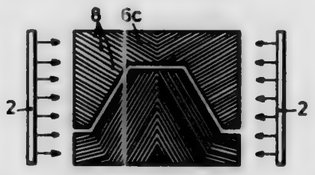
exhausting means comprising receiving means for receiving the cut materials and gas flow means for exhausting said materials out of said apparatus.

5,114,332

MOLDING APPARATUS HAVING ELEMENTS MADE OF COMPOSITE MATERIAL

Joël M. D. Benoit, Cesson La Foret; Gilles J. M. Bessenay, Paris, and Daniel G. Girault, Melun, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Feb. 22, 1991, Ser. No. 659,569
Claims priority, application France, Feb. 23, 1990, 90 02237
Int. Cl.[5] B29C *43/00*; B30B *15/00*
U.S. Cl. 425—407 **7 Claims**



1. Molding apparatus for the hot pressing of a part made of a refractory material in a press-furnace having heating means and external cooling means for cooling said part, which comprises:

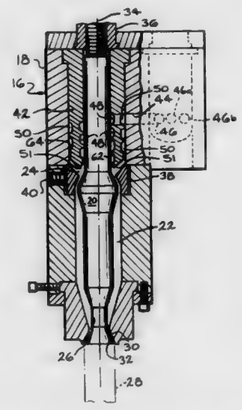
at least one element formed of a composite material which is resistant to high temperatures, said composite material comprising fibers uninterrupted from one side to another of said element and disposed in a refractory matrix which is less thermally conductive than said fibers, said fibers being oriented so as to ensure heat transfer, in one direction or the other, towards areas of said part furthest from its outer edges, thereby enabling homogenous heating or cooling to be achieved throughout said part of all times, an arrangement of said fibers also being such that said element possesses mechanical resistance to compression stresses.

5,114,333

DIE HEAD FOR PLASTIC WITH BARRIER FORMING MATERIAL

Michael Hirschberger, Sylvania, Ohio, assignor to Hoover Universal, Inc., Plymouth, Mich.

Continuation of Ser. No. 418,554, Oct. 10, 1989, abandoned. This application Dec. 13, 1990, Ser. No. 626,336
Int. Cl.[5] B29C *47/22*
U.S. Cl. 425—466 **3 Claims**



1. A die head for forming a hollow tubular parison of plastic material comprising:

a mandrel having an upright longitudinal axis;

a die body enclosing said mandrel in a spaced relation thereto forming a tubular chamber having an open upper end and an annular outlet orifice spaced axially below said open upper end, said die body forming an inlet flow passage axially above said chamber open upper end for receiving a solid stream of molten plastic resin; and

a diverter sleeve within said die head between said mandrel and said die body and above said tubular chamber open upper end, said sleeve having a radially extending connecting port therethrough aligned with said resin inlet flow passage, said sleeve having an outer surface with a spiral groove therein extending from said connecting port toward said tubular chamber upper end forming an outer spiral flow channel in cooperation with said die body, said outer surface engaging said die body to confine resin within said outer spiral flow channel for at least approximately one revolution around said sleeve afterwhich said outer surface is spaced from said die body to permit a portion of the resin in said groove to flow axially between said sleeve and said die body forming an outer resin body flowing toward said tubular chamber open upper end;

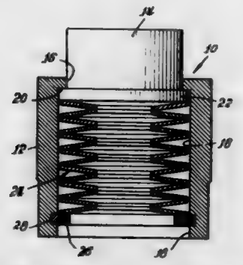
said sleeve having an inner surface with a spiral groove therein extending from said connecting port toward said tubular chamber open upper end forming an inner spiral flow channel in cooperation with said mandrel, said inner surface engaging said mandrel to confine resin within said inner flow channel for at least approximately one revolution around said mandrel afterwhich said inner surface is spaced from said mandrel to permit a portion of the resin in said inner groove to flow axially between said mandrel and said sleeve forming an inner resin body flowing toward said tubular chamber open upper end where said inner and outer resin bodies merge together forming a single hollow tubular resin body in said chamber, said single hollow tubular resin body flowing axially downwardly through said outlet orifice to form said hollow tubular parison.

5,114,334

SPRING PLUNGER

Borislav Boskovic, 2102 Bannockburn, Inverness, Ill. 60067

Continuation of Ser. No. 279,449, Dec. 2, 1988, abandoned. This application Mar. 20, 1990, Ser. No. 497,741
Int. Cl.[5] B29C *45/40*
U.S. Cl. 425—556 **12 Claims**



1. A spring member for use in a plastic mold for separating and cushioning parts of the mold, said spring member being located in a bore in one part of the mold in contacting alignment with a second part of the mold which is movable relative to the first part and comprising

a. a cylindrical body having a circular opening at one end,

b. an internal cylindrical bore in said body, said bore joining and extending from said opening and having a diameter greater than the diameter of said opening, forming an internal annular shoulder in said body at the junction of said opening and said bore,

c. a cylindrical plunger extending from said body through said opening, said plunger having a length less than the length of said internal bore and having a collar disposed within said bore and bearing against said shoulder, said collar being located at one end of said plunger,

d. retaining means for retaining elements of the spring member within said bore, said retaining means being lodged in said bore and spaced from said one end, and

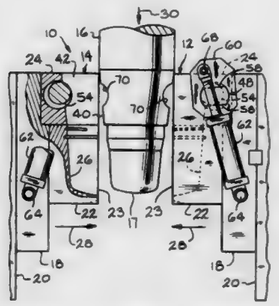
e. means in said bore extending between said retaining means and said one end and bearing against said one end of said plunger to resiliently urge said plunger through said opening.

5,114,335

MECHANICAL LOCKING MECHANISM FOR INJECTION MOLD

Jack A. Tinsley, Sylvania, Ohio, assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed May 2, 1991, Ser. No. 694,901
Int. Cl.[5] B29C *45/64*
U.S. Cl. 425—577 **5 Claims**



1. Lock mechanism for holding a core rod in place in an injection mold cavity for molding an elongated hollow body having a closed lower end and an open upper end, said lock mechanism resisting longitudinal movement of said core rod in response to injection pressure in said mold tending to force said rod from said mold cavity, said lock mechanism comprising:

a concave recess in said core rod above said article open upper end forming a camming surface;

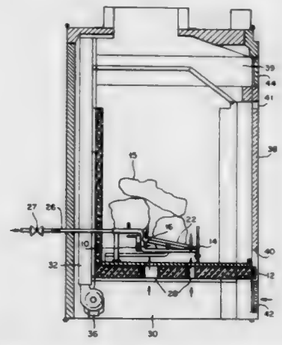
a cam engaging a portion of said camming surface in line contact when said injection mold is closed, said cam being rotatable to move the line of contact from an upper portion of said camming surface facing said mold cavity to a lower portion of said camming surface facing away from said mold cavity.

5,114,336

METHOD AND APPARATUS FOR PRODUCING A YELLOW FLAME WITHIN A FIREPLACE

Tadeusz Karabin, Huntington, and Roy E. Mundy, Roann, both of Ind., assignors to Majco Building Specialties, L.P., Huntington, Ind.

Filed Jul. 11, 1990, Ser. No. 551,504
Int. Cl.[5] F23Q *2/32*
U.S. Cl. 431—125 **34 Claims**



1. A fireplace gas burning assembly for producing a yellow clean burning flame, comprising:

a housing said housing including a base plate

a chamber defined within said housing;

means for introducing a substantially vertical flow of flammable fluid to said chamber; and

means for introducing a substantially vertical stream of secondary air to said chamber positioned so that the stream of secondary air and flow of flammable fluid intersect such that when ignition occurs a yellow clean burning flame will be produced, said means for introducing secondary air being positioned beneath said means for introducing flammable fluid

said means for introducing secondary air including a plurality of openings in said base plate;

said assembly further including at least one imitation log positioned above the means for introducing the flammable fluid such that when said intersecting stream and flammable fluid burns, said imitation log appears to burn.

5,114,337

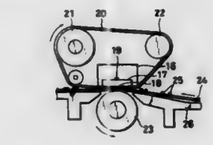
HEAT FIXING METHOD

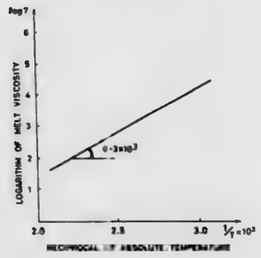
Masuo Yamazaki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1990, Ser. No. 522,047
Claims priority, application Japan, May 11, 1989, 1-116052
Int. Cl.[5] F27B *9/28*; G03G *15/20*
U.S. Cl. 432—8 **12 Claims**

1. A method of heat fixing a toner image, comprising heat fixing a toner image on a recording material with a heating

member fixed and supported and a pressurizing member which is opposed to, in pressure contact with said heating member and adapted to bring said recording material into pressure contact with said heating member through a film, wherein said toner image is formed of a toner, said toner comprises a binder resin and a colorant, said binder resin has a melt viscosity of 0.1 to 10^7 centipoise at 140° C. and the gradient (θ) of the straight line represented by the following formula comprising the reciprocal number (1/T) of the absolute temperature when the toner is melted by heating with the heating member and the logarithm (log η) of the melt viscosity of the binder resin at this time is 10^2 to 3×10^3:





$$\log \eta = \theta(1/T) + B'$$

(where B' represents a constant); and peeling off said film from the surface of the recording material having the fixed toner image under the temperature condition which is higher than the temperature T_4 of the maximum value of the heat absorption peak of said toner, wherein the temperature T_4 of the maximum value of the heat absorption peak of the toner is 40° to 120° C., and the temperature T_3 when the film is peeled off from the fixed toner image surface is higher by 30° C. or more than the temperature T_4.

5,114,338

FURNACE FOR HEATING HIGHLY PURE QUARTZ PREFORM FOR OPTICAL FIBER

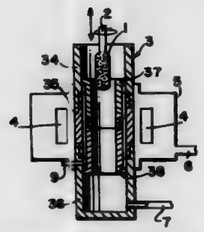
Ichiro Tsuchiya; Shinji Ishikawa; Masahide Saitoh, and Yoichi Ishiguro, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 469,914, Jan. 22, 1990, abandoned. This application Mar. 22, 1991, Ser. No. 673,870

Claims priority, application Japan, Jan. 23, 1989, 1-14628

Int. Cl.[5] C03B *37/00, 37/14, 20/00*

U.S. Cl. 432—206 **12 Claims**



1. A heating furnace for heating a porous preform made of fine particles of highly pure quartz glass for an optical fiber, which furnace comprises a cylindrical furnace body, a heater installed in said furnace body and a muffle tube installed inside said heater serving to separate a sealed inner atmosphere thereof from a sealed outer atmosphere thereof, wherein said muffle tube is made of highly pure carbon and includes an inner and an outer surface which are both coated with a gas impermeable carbon.

5,114,339

METHOD OF APPLYING AN ORTHODONTIC AID, AND MOLD THEREFOR

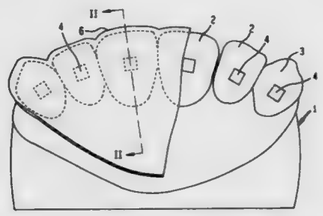
Marinus B. Guis, Sliedrecht, Netherlands, assignor to Orthodontie Research B.V., Sliedrecht, Netherlands

Filed Mar. 1, 1991, Ser. No. 663,366

Claims priority, application Netherlands, Dec. 18, 1990, 9002792

Int. Cl.[5] A61C *3/00*

U.S. Cl. 433—24 **18 Claims**



1. A method of applying an orthodontic aid to at least one tooth in a row of teeth, comprising

making a cast of said row of teeth by means of molding and counter-molding;

temporarily securing the aid to the cast in a desired position;

applying a deformable layer of material to the cast with aid, and deforming said layer to conform to the shape of the cast with aid to form a mold; and

placing the mold with aid on said row of teeth, a bonding agent for securing the aid being permitted to harden in a controlled manner, followed by removing the mold, leaving the aid affixed to the row of teeth by means of the bonding agent; characterized in that:

prior to placing the mold with aid on the row of teeth, an adhesive layer is applied to at least a part of the surface of the mold that is brought into contact with the row of teeth, which adhesive layer has weaker adhesive strength than the bonding agent for securing the aid to the row of teeth; and

the mold, when placed on the row of teeth, is temporarily retained in position by means of the adhesive layer.

5,114,340

APPARATUS FOR SELECTION OF TOOTH COLOR

Rainer Hahn, Hindenburgstrasse 119, D-7300 Esslingen, Fed. Rep. of Germany

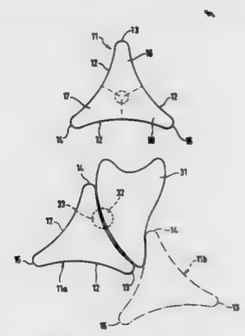
Filed Sep. 5, 1990, Ser. No. 577,555

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1989, 3929737

Int. Cl.[5] A61C *19/10*

U.S. Cl. 433—26 **35 Claims**

1. An apparatus for selecting tooth color of a dental prothesis comprising a platelet color specimen having at least one lateral edge concavely curved toward a central region of the platelet color specimen; the platelet color specimen having a



shape which permits placement contiguous with any exposed surface of a tooth.

5,114,341

DENTAL MATRIX

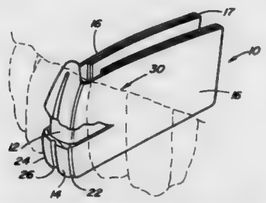
Larry I. Kassel, 1347 Hickory Hollow Dr., Flint, Mich. 48532

Continuation-in-part of Ser. No. 351,386, May 15, 1989, Pat. No. 4,997,367. This application Jan. 16, 1991, Ser. No. 642,030

The portion of the term of this patent subsequent to Mar. 5, 2008, has been disclaimed.

Int. Cl.[5] A61C *5/04*

U.S. Cl. 433—39 **13 Claims**



1. An apparatus for use during restoration of a tooth having a labial surface, a pair of proximal surfaces, an incisal surface, and a lingual surface, said apparatus comprising:

a matrix having a form portion, said form portion having an anatomically shaped inner surface adjacent to and covering at least one desired surface of said tooth; and means for pulling said inner surface of said matrix into a position adjacent said desired surface, said means for pulling further comprising at least one interproximal wing attached to and extending from said form portion.

5,114,342

SALIVA EJECTOR TIP WITH INTEGRAL VALVE

Rily Young, 8681 Luss Dr., Huntington Beach, Calif. 92646, and James Shen, 18751 Beach Blvd., Huntington Beach, Calif. 92648

Filed Nov. 1, 1990, Ser. No. 607,570

Int. Cl.[5] A61C *17/06*

U.S. Cl. 433—95 **16 Claims**

1. A suction tip and valve, comprising:

an elongated tubular housing having an axial lumen therein, one end of said tubular housing being closed by an end surface which is perpendicular to said lumen, the other end of said lumen comprising means for attachment to a source of fluid at a different pressure than ambient pressure outside said housing,

said housing having a side having a portion containing a plurality of openings, said openings being separated by web portions,

said housing containing an internal annular valve seat on one side of said portion thereof,

an inside surface of said end surface having one end of an elongated obturator attached thereto, the other end of said obturator being shaped to mate with and close said valve



seat, said obturator being shaped so that it is normally spaced from said valve seat so that fluid can pass through said plurality of openings to said other end of said lumen, said web portions being flexible so that they can be collapsed so as to allow said obturator to move toward and mate with and close said valve seat so that fluid cannot pass through said plurality of openings to said other end of said lumen.

5,114,343

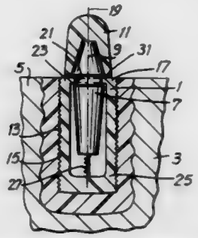
RESILIENT SUPPORT STRUCTURE

Barry L. Musikant, and Allan S. Deutsch, both of New York, N.Y., assignors to Essential Dental Systems, Inc., Hackensack, N.J.

Filed Aug. 27, 1990, Ser. No. 573,568

Int. Cl.[5] A61C *8/00, 13/28*

U.S. Cl. 433—173 **3 Claims**



1. A dental support structure for insertion into engagement with an implant in a jaw, the implant having internal walls adapted to retain said dental support structure mechanism, said dental support structure mechanism comprising

a cylindrical stem having a stem axis and having at one end an anchoring portion for an artificial crown,

a cylindrical dental support structure guide having a guide axis adapted to be retained by the internal walls of the implant, said dental support structure guide slidably retaining said stem in an engagement moveable along an axis

and capable of unconstrained motion of the axis of said stem with respect to said guide axis,

pressure exerting means within said dental support structure guide at an extremity thereof, wherein said stem is capable of axial motions along said guide axis and wherein said pressure exerting means applies a force opposing the motion of said post stem in one direction along said guide axis, and

wherein said motion of the axis simulates the motion of the axis of a natural tooth,

said dental support structure guide having an internal groove engaging a boss in said dental post stem to stop the motion of said stem axis relative to said guide axis at a predetermined distance along said guide axis,

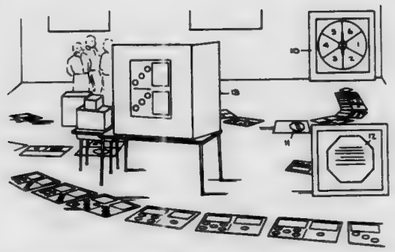
said pressure exerting means having a spring means disposed within said dental support structure guide and comprising a plurality of elastomeric materials having different effective spring constants.

5,114,344

METHOD OF PLAYING AN EDUCATIONAL GAME

Liabeth L. Fumagalli, Katonah, N.Y.; Katherine M. Love, R1, 16 Reynold's La., and Carrin Schechter, Bedford Rd., both of Katonah, N.Y. 10536, assignors to Katherine M. Love and Carrin Schechter, both of Katonah, N.Y.

Filed Sep. 19, 1991, Ser. No. 762,412
Int. Cl.[5] G09B *19/22*
U.S. Cl. 434—128 **9 Claims**



1. A method of playing an educational game comprising:

determining by chance the number of steps a student will take upon entering a step trail;

the student stopping at a location upon taking the determined number of steps and reading educational information where stopped and the student taking an additional number of steps to enter an educational center staffed by a person who reviews educational facts with the student;

the student having a carrier with a portion corresponding to the educational facts reviewed and receiving a cover piece for the corresponding portion.

5,114,345

PROCESS AND APPARATUS FOR REPRESENTING TIDAL MOVEMENT

Bernard Vaarnesson, 1 Blvd. St. Michel, 75006 Paris, France

Filed May 1, 1990, Ser. No. 517,301
Claims priority, application France, May 5, 1989, 8905997
Int. Cl.[5] G04B *19/00*
U.S. Cl. 434—130 **10 Claims**

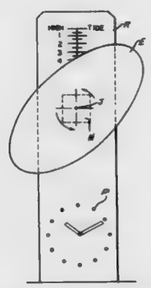
1. Apparatus for representing tidal movement, comprising:

an elliptical element rotatable about an axis perpendicular to the plane of the ellipse and passing through the center of the ellipse,

means for rotating the elliptical element at a variable speed between one revolution per 24 hours, 38 minutes and one revolution per 24 hours, 74 minutes, the average speed of rotation being one revolution per 24 hours, 52 minutes during any single lunar cycle, and

a scale graduated in hours between high and low tides,

the elliptical element and scale being so relatively positioned that at any given time the position of the edge of the



ellipse with respect to the scale graduations indicates the amount of time which must elapse until the next high or low tide.

5,114,346

TEACHING MEANS

Michael J. Fioramonti, 103 Grant Ave., E. Rockaway, N.Y. 11518

Filed Aug. 10, 1990, Ser. No. 565,147
Int. Cl.[5] G09B *17/00*
U.S. Cl. 434—184 **6 Claims**



1. Means for teaching learning-disabled or dyslexic persons to grasp the concept of properly orientated letters and ciphers, comprising:

three-dimensional characters; and

means, borne by said characters, for indicating a correct orientation of said characters by distinguishing between left-hand and right-hand sides thereof; wherein

said characters have a substantially planar surface; and

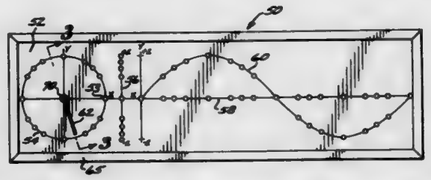
said orientation-indicating means comprises discretely color-coded indicia borne on said surface in laterally opposite areas thereof.

5,114,347

MATHEMATICAL FUNCTION DEMONSTRATOR BOARDS

Mead B. Camp, 5595 Gloucester Way, Riverside, Calif. 92506

Filed Apr. 8, 1991, Ser. No. 681,934
Int. Cl.[5] G09B *23/02*
U.S. Cl. 434—214 **26 Claims**



1. A trigonometric function demonstrator apparatus, comprising:

a front surface panel;

at least two groups of selectively activatable light emitters, a first group of said light emitters being disposed at selected locations around the periphery of a unit circle defined on said front surface panel, a second group of said light emitters being disposed in relation to coordinates defined on said front surface panel to indicate the value of said trigonometric function at particular angles indicated by said first group of light emitters;

angle pointing means centered on the center of said unit circle and being rotatable about said unit circle to illustrate selected angles on the unit circle; and

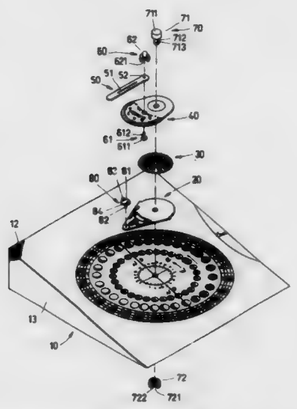
operator manipulated means for mechanically rotating said pointing means and activating selected corresponding ones of said first and second groups of said light emitters when said angle pointing means is pointing to particular angles about said unit circle.

5,114,348

TUTORIAL DEVICE FOR OBSERVING LUNAR PHASE

Shui-Tan Tzeng, 7F~1, No. 2, Lane 34, Mo Fan st., Taichung, Taiwan

Filed Jul. 16, 1990, Ser. No. 552,565
Int. Cl.[5] G09B *23/00*
U.S. Cl. 434—284 **4 Claims**



1. A tutorial device for observing lunar phase comprising:

a base sheet with a central hole, a time-graduation scale, a ring of moon pictures and a ring of moon phases provided on the base sheet around the central hole, a direction hole in the center of each moon picture, each moon picture showing sunshine on the moon during orbit of the moon per month, said ring of moon phases showing the morphology of the month, 1st, 2nd, 3rd, and 4th circles around the ring of moon phases for indicating individually the respective month and times of moonset, moonsharp and moonrise, and a depiction of the sun outside the 4th circle;

a segment-shaped moon guide disc mounted for rotation about the central hole through a hold in a larger end of the moon guide, a further direction hole in a smaller end of the moon guide to align with the direction holes in each moon picture, the moon guide having opposite edges and a central line forming moonrise, moonsharp and moonset lines respectively;

a circular globe longitude disc with a central hole mounted coaxially over the moon guide, at least one radial longitude line on the longitude disc and a peripheral notch at the outer end of said longitude line;

a transparent elevation disc rotatably and coaxially mounted over the globe longitude disc by a hole in the elevation disc, the elevation disc having an outer end with a graduated moon angle scale and a further hole centrally of said scale to align with said notch of the globe longitude disc;

a transparent elevation finger rotatably mounted in said further hole in said elevation disc to extend outwardly of said angle scale, the finger including an angle indicating line;

a first journal member for attaching said finger to said elevation disc and for locating the elevation disc relative to said notch in the globe longitude disc;

a second journal member in the central hole of said base sheet for mounting said elevation disc, said globe longitude disc and said moon guide on the base sheet; and

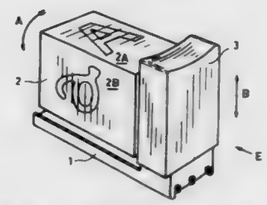
a direction element for locating said moon guide in a direction hold of a selected moon picture and for guiding the elevation finger.

5,114,349

ELEMENT FOR A DIDACTIC PLAY, AND A SET FORMED BY SUCH ELEMENTS

Alessandro Quercetti, Strada San Vito a Revigliasco 48, I-10133 Torino, Italy

Filed Nov. 9, 1990, Ser. No. 612,124
Claims priority, application Italy, Nov. 17, 1989, 68012 A/89
Int. Cl.[5] G09B *1/22, 1/10*
U.S. Cl. 434—403 **13 Claims**



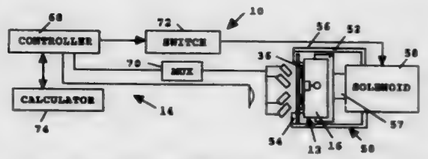
1. An element for a didactic play, comprising a support, a prismatic body having several angularly spaced faces, representations applied to said faces of the prismatic body, said prismatic body being pivoted on said support, and a control member movably carried by said support and operatively connected with said prismatic body so as to cause a rotation of said prismatic body on operation of said control member, said rotation extending along the angle which separates the adjacent faces of said prismatic body, whereby on each operation of said control member each face of said prismatic body is replaced in its position by the subsequent face, and therefore the displayed representation is replaced by the representation carried by the subsequent face.

5,114,350

CONTROLLED-VOLUME ASSAY APPARATUS

Gary E. Hewett, Milpitas, Calif., assignor to Cholestech Corporation, Hayward, Calif.

Filed Mar. 8, 1989, Ser. No. 320,474
Int. Cl.[5] C12M *1/34, 1/40*; G01N *21/11*
U.S. Cl. 435—288 **10 Claims**



1. A diagnostic apparatus for use in determining the concentration of a selected analyte in a body-fluid sample, comprising sample dispenser having (i) a support, (ii) a well defined in the support for receiving such sample, (iii) a fibrous filter

matrix, (iv) capillary means for drawing sample fluid from said well into the matrix, and (v) an absorbent strip on said support having a central region in fluid contact with said matrix for distributing ample fluid from the matrix by capillary flow to sample-delivery sites in opposite end regions of the strip,

a test plate carrying a plurality of wettable, absorbent pads, each having an exposed outer surface region and a defined expanse, said plurality of pads containing reagent means effective to produce a detectable analyte-dependent reaction product for detection of a selected analyte, when sample fluid is transferred from said sample-delivery sites to said plurality of pads, and

means mounting said plate on said dispenser, said mounting means being adjacent to and spaced from said plurality of pads, for movement toward and away from a sample-delivery position at which substantially the entire outer exposed surface regions of said plurality of pads are in contact with the sample-delivery sites, for simultaneous transfer of substantially the same volume of sample fluid from each of said delivery sites to each of said pads in the support with fluid movement at a substantially uniform flow rate in a direction normal to the pad outer surface regions throughout the entire expanse of each of said pads, whereby said pads are filled uniformly to a selected volume when said pads are held in contact with said sample-delivery sites for a selected period of time, and

control means operatively connected to said shifting means for placing said support at its sample-delivery position for such sample-delivery time.

5,114,351

SLIDING CONTACT ARRANGEMENT FOR CARBON BRUSHES

Peter Hoffmann, Steeg, Austria, assignor to Hoffmann & Co. Elektrokohle KG, Steeg, Austria

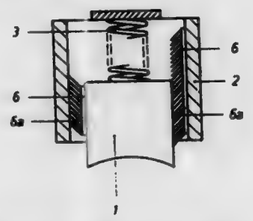
PCT No. PCT/EP88/00970, § 371 Date Apr. 27, 1990, § 102(e) Date Apr. 27, 1990, PCT Pub. No. WO89/04073, PCT Pub. Date May 5, 1989

PCT Filed Oct. 27, 1988, Ser. No. 466,397

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1987, 3736535

Int. Cl.[5] H01R *39/00*

U.S. Cl. 439—13 **3 Claims**



1. A sliding contact arrangement comprising a holder having spaced apart, opposed internal surfaces, a sliding contact member movably guided in said holder, disposed between and having sides which oppose and are spaced apart from said internal surfaces, spring means biasing said sliding contact member in a feed direction, and blocking means for preventing movement of said sliding contact member relative to said holder in a direction opposite to said feed direction and permitting movement of said sliding contact member under a biasing force exerted by the spring means in said feed direction, said blocking means including bristle strips disposed between said sides and said internal surfaces which oppose each other, each bristle strip including a multiplicity of resiliently stiff, substantially parallel bristles which are obliquely inclined relative to said sides and said internal surfaces, said bristle strips being attached to one of the said opposing sides and said inner surfaces, ends of the bristles engaging another one of said sides and said inner surfaces, each of said bristles being oriented and having a length and a stiffness selected so that movement of said sliding contact member in the feed direction causes said bristle ends to move substantially freely relative to said another one of said sides and internal surfaces to thereby permit free movement of said sliding contact member in said feed direction, and so that said bristle ends blockingly engage said another one of said sides and said inner surfaces when said sliding contact member is urged in said opposite direction to thereby prevent movement of said sliding contact member in said opposite direction.

5,114,352

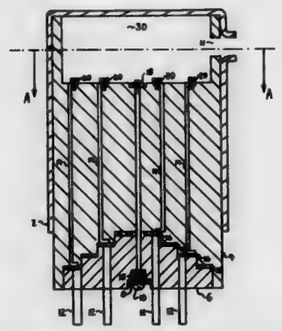
ROTATABLE MARINE ELECTRIC CONNECTOR

Hugh Gahagen, P.O. Box 492, Lake Como, Fla. 32157; Helen E. Roman, 2755 NE. 28th Ave., Apt. 4-A, Lighthouse Point, Fla. 33064, and Sonia Holt, R.R. 1, Box 54, S. Woodstock, Vt. 05071

Filed May 21, 1991, Ser. No. 703,740

Int. Cl.[5] H01R *39/02*

U.S. Cl. 439—22 **1 Claim**



1. A rotatable electrical connector for maintaining a plurality of electrical circuits between two rotating parts, to be connected to an electrical power cord, comprising, in combination:

(a) an upper section containing an aperture through which a power cord may be introduced at approximately a 90 degree angle to the longitudinal axis of the apparatus;

(b) a lower section operably and rotationally engaged with the upper section;

(c) a boot operably and removeably engaged with the upper section;

(d) a first means for maintaining the upper and lower sections operably and rotatably engaged, said first means comprising:

(i) a threaded nut operably engaged with the upper section;

(ii) a washer;

(iii) a screw operably engaged with the threaded nut and the washer;

(iv) a spring operably engaged with the screw;

(e) a second means for extending at least one electrical circuit between and through the upper and lower sections comprising:

(i) at least one skid bar operably engaged with the upper section, said skid bar having a coating of carbon to facilitate rotation and conduction of electricity;

(ii) at least one electrical terminal operably engaged with the skid bar;

(iii) at least one skid plate operably engaged with the lower section and the skid bar;

(iv) at least one electrical contact operably engaged with one said skid plate.

5,114,353

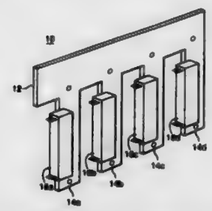
MULTIPLE CONNECTOR ARRANGEMENT FOR PRINTED CIRCUIT BOARD INTERCONNECTION

Stephen P. Sample, Mountain View, Calif., assignor to Quick-turn Systems, Incorporated, Mountain View, Calif.

Filed Mar. 1, 1991, Ser. No. 664,417

Int. Cl.[5] H05K *1/00*

U.S. Cl. 439—65 **2 Claims**



1. A system of circuit boards and connectors for accomplishing high density levels of electronic circuit interconnection, including:

at least one circuit board of a first type, said at least one circuit board including a body portion and at least two finger portions extending from said body portion;

a plurality of N-connection-node, side-insertion connectors of a first mating type mounted parallel to one another on said finger portions of said first circuit boards;

at least two circuit boards of a second type, each of said circuit boards of said second type having a maximum profile height;

a plurality of N-connection node top-insertion type connectors of a second mating type mounted on each of said at least two circuit boards of said second type, said top-insertion type connectors of the second type mounted at positions with respect to the positions of said side insertion connectors of the first mating type to allow mating therewith;

said side-insertion connectors of said first mating type and said top-insertion type connectors of said second mating type having a characteristic insertion travel distance;

said finger portions of said first circuit boards having an interfinger spacing distance at least equal to the sum of said maximum profile height and said insertion travel distance;

said system of circuit boards being interconnectable by placing said at least one circuit board of said second type between adjacent fingers of said at least one circuit board of said first type and at an angle thereto and connecting said side-insertion connectors of said first mating type and said top-insertion type connectors of said second mating type.

5,114,354

CLAMPING DEVICE

George J. Franks, Jr., 664 Thompson Cir., Inverness, Ill. 60067

Continuation-in-part of Ser. No. 320,360, Mar. 8, 1989, Pat. No. 5,006,074, which is a continuation-in-part of Ser. No. 204,397, Jun. 9, 1988, Pat. No. 4,993,960, which is a continuation-in-part of Ser. No. 116,899, Nov. 5, 1987, Pat. No. 4,828,504. This application Apr. 3, 1991, Ser. No. 679,895

Int. Cl.[5] H01R *4/66*

U.S. Cl. 439—92 **14 Claims**

1. A clamping device for mechanical and electrical connection to an object having a flat surface comprising:

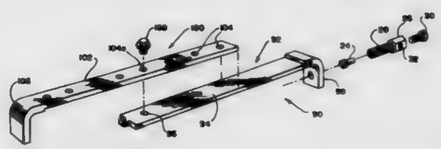
a clamping member having a first and second portion extending outwardly from a common base for positioning therebetween an object to be clamped;

a threaded stud carried by said first portion and extending therefrom toward said second portion, said threaded stud being rotatable to effect axial movement of said stud relative to said first and second portions;

a stud tip composed of metallic material that is harder and tougher than the material of the stud comprising an object contacting portion and a mating portion;

connection means for mechanically securing to and electrically connecting the end of said stud to said mating portion of said stud tip;

said stud tip object contacting portion having an object contacting surface for contacting the flat surface of the object to be clamped, whereby the object can be placed at least partially within said clamping member and secured therein by axially moving said stud with said tip inserted therein toward said flat surface until the object is secured



between said second clamping member portion and said object contacting surface;

a wire attaching means for attaching a wire to said clamping device;

wherein said connection means comprises an open cavity in the end of said stud nearer said second portion for mating with said stud tip and said mating portion of said stud tip comprises a shank portion complementary to and insertable within said open cavity of said stud, the axial dimension of said contacting portion being less than the axial dimension of said mating portion.

5,114,355

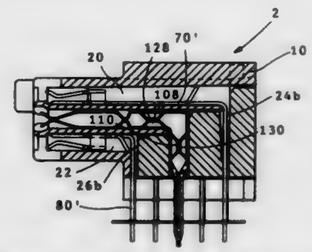
RIGHT ANGLE IMPEDANCE MATCHED ELECTRICAL CONNECTOR

David J. Kimmel, Clearwater; Paul P. Siwinski, Seminole; Robert A. Smith, Palm Harbor; Richard E. Thurman, Seminole; Stephen R. Adkins, Clearwater; Steven Feldman, Hudson, and Raymond J. Look, New Port Richey, all of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 519,367, May 4, 1990, abandoned. This application Feb. 26, 1991, Ser. No. 662,384

Int. Cl.[5] H01R *13/652*

U.S. Cl. 439—101 **9 Claims**



1. An electrical connector in which signal contacts arranged in at least one row are positioned adjacent a ground bus, the signal contacts of said one row being separated from the ground bus by a first dielectric wall, said ground bus comprising two separate mutually opposed members each of which has a blade section, each blade section including:

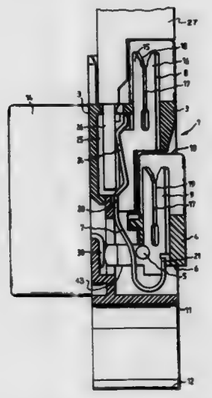
(a) a bus mating section at one end thereof having at least one contact point for mating with a male bus member; and

(b) a bus lead section at the other end thereof having at least one lead extending therefrom,

at least one of said blade sections having a projection disposed between said contact point and said lead and ar-

ranged to engage the other opposed member so that a first of said opposed members is always urged toward and always remains in engagement with said first dielectric wall, thereby reducing variations in impedance and reducing crosstalk along the length of said ground bus.

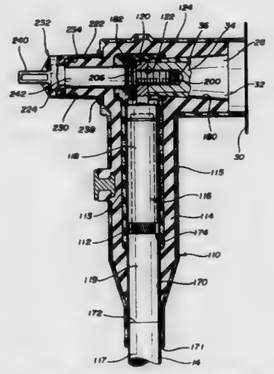
5,114,356
CONNECTING BLOCK FOR THE TELECOMMUNICATION AND DATA TECHNOLOGY
Christa Taybl; Manfred Müller; Dieter Gerke, and Harald Bülow, all of Berlin, Fed. Rep. of Germany, assignors to Krone AG, Berlin, Fed. Rep. of Germany
Filed Mar. 12, 1991, Ser. No. 668,195
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1990, 4008386; Mar. 13, 1990, 4008388
Int. Cl.[5] H01R *13/60*
U.S. Cl. 439—133 **14 Claims**



1. A connecting block for connecting insulated cable conductors for telecommunication and data technology systems, comprising a connecting block structure and a block body including insulation displacement contact elements received in the block body and arranged in a line and connection means for connecting the block body to said connecting block structure including an axis of rotation for swingingly rotating said block body relative to said connecting block structure.

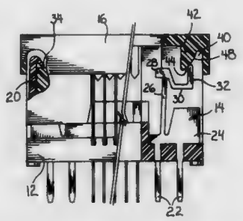
5,114,357
HIGH VOLTAGE ELBOW
Glenn Luzzi, Mt. Bethel, Pa., assignor to Amerace Corporation, Hackettstown, N.J.
Filed Apr. 29, 1991, Ser. No. 692,587
Int. Cl.[5] H01R *13/53*
U.S. Cl. 439—183 **8 Claims**

1. A connector connecting a high voltage electrical cable to a high voltage terminal comprising:
an elongate body portion of resilient insulating material having a first end and a second and a central bore extending therethrough from said first end to said second end;
a leg portion of resilient insulating material having a first end and a second end and a central bore extending from said first end to said second end; said leg portion joined to said body portion adjacent said second end of said leg portion and said second end of said body portion; said central bore of said leg portion communicating with said central bore of said body portion adjacent said second end of said leg portion and said second end of said body portion;
fastening means comprising a bolt having an externally threaded portion at a first end and an enlarged head portion with a socket therein at a second end;
tool access means adjacent said fastening means and aligned with said socket in said second end of said fastening means to permit said fastening means to be operated from outside of said connector;
an annular ring having a passage therethrough positioned adjacent said second end of said leg portion with said passage aligned with said central bore of said leg portion;
said annular ring having a first annular recess in the surface defining said passage and said head portion of said bolt



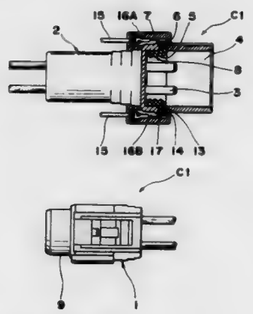
having a second annular recess in the outer surface of said enlarged head portion adapted to be aligned with said first annular recess;
and locking means positionable in said first annular recess and said second annular recess to lock said bolt to said annular ring while permitting said bolt to freely rotate with respect to said annular ring, said bolt when turned in a first direction assisting in the connection of said connector to a high voltage terminal, and when turned in a second, opposite direction, assisting in the separation of said connector from a high voltage terminal.

5,114,358
CHIP CARRIER SOCKET
Bruce B. Myers, South Bend, Ind., assignor to Wells Electronics, Inc., South Bend, Ind.
Filed Mar. 11, 1991, Ser. No. 667,470
Int. Cl.[5] H01R *11/22*
U.S. Cl. 439—266 **11 Claims**



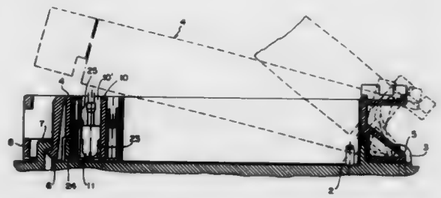
1. A socket for a chip carrier having conductive parts, said socket comprising a base member, a plurality of conductive resilient contacts for engaging said conductive parts on said carrier, each contact anchored in said base member and including an upwardly extending part, said contacts positioned in an opposing relationship and constituting clamping means for engaging said carrier at its said conductive parts within said socket, each contact including a cantilevered part projecting from its upwardly extending part outwardly relative to said base member, and a moveable top overlying said base member, said top including abutment means engaging each contact cantilevered part for moving said contacts in an outward direction relative to the base member upon movement of the top in a substantially straight line downward direction between an uppermost position and a lowermost position to cause the contacts to be flexed to allow insertion of said carrier into the socket, said top abutment means including camming surface means having variable angular relationships, said camming surface means for applying a variable downward force upon the cantilevered part of each contact wherein said force applied by said top in a vertical component remains generally constant as the top is shifted from its uppermost position toward its lowermost position.

5,114,359
CONNECTOR
Masamitsu Chishima, Suzuka, and Takao Nozaki, Tsu, both of Japan, assignors to Sumitomo Wiring Systems Ltd., Mie, Japan
Filed Jun. 18, 1991, Ser. No. 717,154
Claims priority, application Japan, Jul. 13, 1990, 2-186573; Jul. 13, 1990, 2-186574
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—271 **4 Claims**



1. A connector comprising:
a first connector housing having a fitting recess portion;
a seal ring having an elastic seal portion and being attached to said fitting recess portion, said seal portion having a cavity provided in a wall thereof;
a second connector housing including a forward half portion adapted to be retained within said fitting recess portion so as to press against an inner circumference of said seal ring;
a detection switch disposed within said cavity in said wall of said elastic seal portion, and including a pair of confronting contacts adapted to electrically contact each other when said second connector is coupled to said first connector causing the wall of said elastic seal portion to be compressed thereby indicating that said first and second connector housing have been completely coupled to one another.

5,114,360
ELECTRICAL COUPLING DEVICE
Helmut Steinhardt, Nürnberg, and Anton Bieringer, Schwabach, both of Fed. Rep. of Germany, assignors to TRW Daut & Rietz GmbH & Co. KG, Nurnberg, Fed. Rep. of Germany
PCT No. PCT/EP89/01196, § 371 Date Jul. 10, 1990, § 102(e) Date Jul. 10, 1990, PCT Pub. No. WO90/04271, PCT Pub. Date Apr. 19, 1990
PCT Filed Oct. 10, 1989, Ser. No. 499,410
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1988, 3834651
Int. Cl.[5] H01R *4/50*
U.S. Cl. 439—341 **7 Claims**



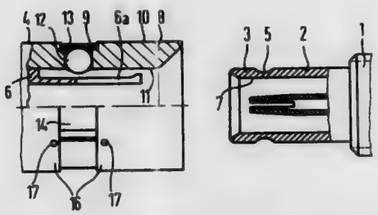
1. Electrical coupling device comprising:
an equipment frame having a first end and a second end, said equipment frame having a projection;
a blade contact strip fixed to said equipment frame;
a housing having a hook;
a socket contact strip contained in said housing;
said housing being mounted on pivot pins on the equipment frame at the first end, and at the second end of the frame, said hook being arranged on the housing and said projection aligned with said hook so that the equipment frame can be locked together to said housing;
said housing having a frame;
modules held by said frame, said modules having socket contacts capable of being plugged into said frame;
said frame having longitudinal frame sections equipped on the inside with strips which extend in the insertion direction of the modules;
said strips being used as coding elements, and said frame having cut strip sections having molded piece projections being supporting elements for said modules; and
said modules having supporting strips, and said supporting elements forming abutments for said supporting strips arranged on said modules.

5,114,361
ARRESTING MECHANISM/LOCK FOR COAXIAL PLUG CONNECTORS
Bernard Houtteman, Oostkamp, Belgium, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Continuation of Ser. No. 568,016, Aug. 16, 1990, abandoned. This application Oct. 11, 1991, Ser. No. 777,431
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1989, 8910843[U]
Int. Cl.[5] H01R *4/50*
U.S. Cl. 439—348 **5 Claims**

1. Arresting mechanism for a coaxial plug connector composed of first and second plug connector halves that can be plugged together, an outside conductor sleeve of the first plug connector half provided with a surrounding groove in a front section on an outside surface thereof and the second plug connector half having a receiving space between an outside rigid protective sleeve and an outside conductor sleeve, into which the front section of the outside conductor sleeve of the first plug connector half can be inserted, at least one ball stored in a stepped radial boring of the protective sleeve being provided such that the ball can snap into the surrounding groove,

when the first and second plug connector halves are assembled, comprising:

the stepped radial bore of the protective sleeve extending into a surrounding flat groove of the protective sleeve which is open towards the outside of the protective sleeve, and a circularly bent band spring contained in this flat groove, the band spring supporting itself at the ball and being interrupted at one location, the band spring being fastened in the flat groove only by means of two



opposed indentations in opposite edges, respectively, of a border of the flat groove, the two opposed indentations being at the same circumferential location at one end of the band spring, and the one location of the interruption in the band spring being positioned in the flat groove relative to a location of the stepped radial bore and the indentations in the border of the flat groove being positioned relative to the location of the stepped radial bore such that a certain desired force is applied to the ball stored in the stepped radial bore.

5,114,362

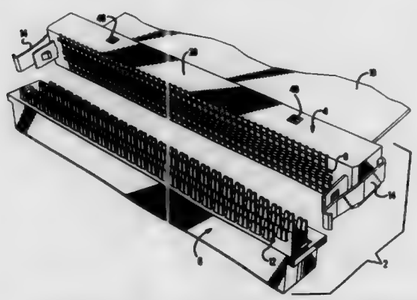
HIGH DENSITY ELECTRICAL CONNECTOR AND METHOD OF MAKING A HIGH DENSITY ELECTRICAL CONNECTOR

Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 25, 1991, Ser. No. 660,757

Int. Cl.[5] H01R *13/58*

U.S. Cl. 439—460 **19 Claims**



1. An electrical connector for electrically connecting conductors of a high density ribbon cable, comprising:

strain relief means, comprising bipartite strain relief halves, adapted the cable from opposite sides, and span the width of the cable;

a fixture housing comprising an upper face and a lower fixture face, said fixture housing including a recessed cavity extending inwardly from said upper face, and an elongate slot continuous with said cavity and extending through said fixture face, said fixture face including a plurality of terminal clearance slots extending therein, and alignment means to position the conductors of the ribbon cable over said terminal clearance slots, said strain relief halves being adapted to position the ribbon cable through said elongate slot, and maintain axial juxtaposition of said cable relative to said fixture face;

a terminal housing having a mating face and a termination face, and terminal receiving passageways extending between said mating face and said termination face, said terminal receiving passageways being aligned with said terminal clearance slots in said fixture housing; and

a plurality of electrical terminals positioned in said terminal receiving passageways, said terminals comprising insulation displacement portions extending above said termination face, said insulation displacement portions being receivable in said terminal receiving slots upon abutment of said terminal housing with said fixture housing.

5,114,363

ELECTRICAL CONNECTING DEVICE AND COLORED STRIP

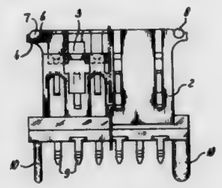
Niranjan Mitra, Eindhoven, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 11, 1991, Ser. No. 684,134

Claims priority, application Netherlands, Apr. 11, 1990, 9000856

Int. Cl.[5] H01R *3/00*

U.S. Cl. 439—491 **2 Claims**



1. An electrical connector for interconnecting a plurality of conductors of cable with a plurality of contact elements adapted for mating with another electronic component, said connector comprising

a housing of electrically insulating material, having a plurality of conductor channels for receiving said conductors and a plurality of electrical contact elements disposed so as to electrically contact respective conductors received in said conductor channels,

a plurality of recesses formed in the housing for receiving different color-coded coding members for identifying said connector, at least one said recess shaped to receive a spherical coding member and having a snap-locking edge at its top to lock said spherical coding member in said recess while permitting a portion of said spherical coding member to project from said recess so as to be visible from one side of the housing, at least a second said recess having at least a partially cylindrical shape to receive a cylindrical coding member of a predetermined color, said cylindrical coding member projecting partially from said second recess so as to be visible from a second side of said connector.

5,114,364

SHIELDED CONNECTOR

Stephen B. Hunter, Kinross, United Kingdom, assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Feb. 12, 1991, Ser. No. 654,157

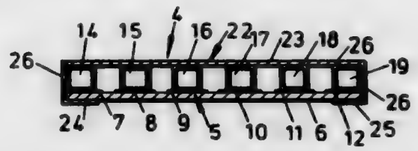
Claims priority, application United Kingdom, Feb. 13, 1990, 9003214.8

Int. Cl.[5] H01R *9/07*

U.S. Cl. 439—497 **12 Claims**

1. A shielded connector for connecting a cable or cables to a backplane having at least one row of parallel connection pins, the connector comprising a support plate of insulating material carrying a number of spaced parallel pin socket contacts on one face thereof and an electrically conductive layer forming a grounded plane on the other face thereof, the pin socket

contacts being adapted for electrical connection to respective wires of said cable or cables, and a screening shell joined to the support plate to form a casing of rectangular cross section enclosing the pin socket contacts, the screening shell comprising an electrically conductive outer layer which is electrically connected to the ground plane layer of the support plate and an inner layer of an insulating material, said screening shell em-



bracing transversely opposed edges of the support plate such that corresponding edge portions of the screening shell underlie the opposed support plate edge portions and such that insulating material is absent from the screening shell edge portions in a manner such that electrical contact is made between the screening shell and the electrically conductive layer on said other face of the support plate.

5,114,365

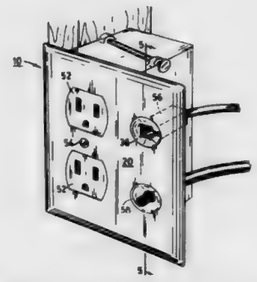
WALL PLATE

William H. Thompson, 66 Washington Rd., Pittsford, N.Y. 14534, and Alan W. Brownlie, Skaneateles, N.Y., assignors to William H. Thompson, Pittsford, N.Y.

Filed Aug. 30, 1990, Ser. No. 575,334

Int. Cl.[5] H01R *13/74*

U.S. Cl. 439—540 **30 Claims**



1. In a wall plate for covering an open end of an electrical box recessed within a wall and for exposing duplex receptacles of a standard electrical outlet mounted on the electrical box, the wall plate being of the type including:

an integral plate having front and back surfaces, a first opening formed through said plate and shaped to enclose peripheral surfaces of the receptacles that project into said front surface of the plate, and a mounting hole formed through said plate and sized for capturing a head portion of a screw that extends into engagement with the duplex outlet, characterized by:

an extended portion of said plate for elongating said front and back surfaces of the plate beyond one side of the open end of the electrical box;

a socket formed in said extended portion with integrally formed wall portions projecting from said back surface of the plate for mounting a communication outlet on said plate;

a second opening formed through said plate for exposing the communication outlet in said front surface of the plate;

said socket being positioned in said extended portion so that said plate may be mounted in inverted positions with respect to the standard electrical outlet for locating said socket on either side of the electrical box;

said socket providing for mounting one of an audio and video communication outlet to said plate; and

said integrally formed wall portions of the socket forming a cavity in said front surface of the plate with an annular seat at a base of said cavity for mounting a male terminal of a coaxial video cable on said plate.

5,114,366

ELECTRICAL CONNECTOR AND METHOD OF LOADING SAME

Kensaku Sato, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

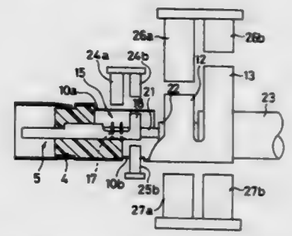
Filed Nov. 9, 1990, Ser. No. 610,927

Claims priority, application Japan, Nov. 15, 1989, 1-294931

The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.

Int. Cl.[5] H01R *17/04*

U.S. Cl. 439—585 **3 Claims**



1. An electrical connector for a shield cable comprising:

a shielding sleeve portion including a contact holding portion having a pair of opposed jig entrances, a shield wires crimping portion having a pair of crimping tabs, and an outer sheath crimping portion having a pair of crimping tabs; and

a signal line contact having a contact body, an insulator crimping portion, and an insulation displacement portion with an insulation displacement contact to which a signal line of said shield cable is to be connected by insulation displacement, said signal line contact being placed within said contact holding portion via an insulator body so that said insulator crimping portion is positioned between said jig entrances, said jig entrances being large enough to accept crimping tools so as to allow said shield wires crimping portion and said insulator crimping portion to be simultaneously crimped.

5,114,367

ELECTRICAL CONNECTION TERMINAL

Roman Bolliger, Allschwil, Switzerland, assignor to Oskar Woertz, Inhaber Hans Woertz, Muttenz, Switzerland

Filed Jun. 19, 1991, Ser. No. 717,478

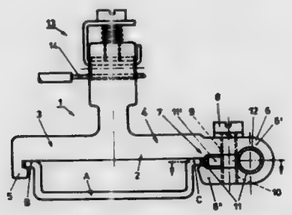
Claims priority, application Switzerland, Jul. 24, 1990, 2445/90

Int. Cl.[5] H01R *9/26*

U.S. Cl. 434—716 **5 Claims**

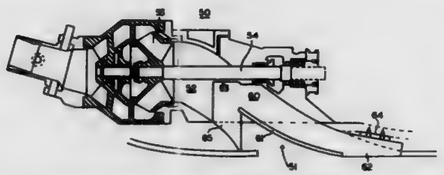
1. An electrical connection terminal for snapping on a carrier rail having outwardly projecting flanges, wherein the terminal body has a foot with two oppositely directed fingers of which one has a reversely projecting claw on its underside and the other has a mouth-like recess formed by a U-shaped extension, which fingers are provided for engaging the flanges of the carrier rail in the mounted position, as well as a screw for securing to the mouth-like recess, wherein the foot of the terminal with the U-shaped extension having the mouth-like recess being formed so much wider than the carrier rail with its side flanges that when the terminal is mounted on the carrier

rail the screw passes externally of the rail flange through a bore in the upper limb and the recess into a threaded bore in the lower limb of the U-shaped extension, and a resiliently deformable element is arranged in the mouth-like recess which on



mounting the terminal on a carrier rail is resiliently compressed by the rail flange through an external force effect and then pushes the terminal away until the carrier rail lies in the desired position in the oppositely lying opening of the claw.

5,114,368
SHAFT SHIELDING TOP LOADER
Don R. Moyle, Rte. 1, Box 1762, and Glendon L. Dilworth, 1215 E. 16th, both of, Burley, Id. 83318
Continuation of Ser. No. 449,977, Dec. 12, 1989, abandoned. This application Apr. 1, 1991, Ser. No. 681,432
Int. Cl.[5] B63H *11/103*
U.S. Cl. 440—47 **2 Claims**



1. A shaft shielding top loader for use in a watercraft propelled by a jet pump means, said jet pump means including a water inlet channel, an impeller and an impeller drive shaft being disposed in said channel, which comprises:
- a single actuate top loading plate generally concave in the up direction having a top surface and a bottom surface and being relatively horizontally disposed within said water inlet channel to divide said channel into an upper impeller portion and a lower impeller portion;
- a single shaft shielding partition being centrally and vertically attached within said inlet and aligned with said drive shaft, said partition further being normally attached to the top surface of said top loading plate; and
- said shaft shielding partition having a straight shaft facing edge which is disposed in close spaced relation parallel and in juxtaposition with the impeller drive shaft.

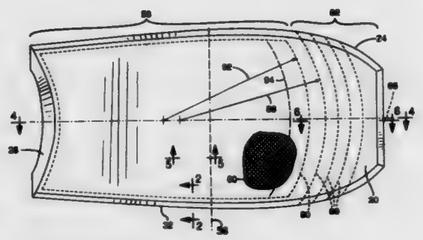
5,114,369
WATER SKIER'S SAFETY SYSTEM
Donald R. Coffey, 18801 N. 50th Ave., Glendale, Ariz. 85308
Filed Jun. 30, 1989, Ser. No. 373,567
Int. Cl.[5] B63C *9/20*
U.S. Cl. 411—11 **9 Claims**

1. A water skier safety system comprising:
- a multiple section flag pole, the multiple sections of said flag pole being disposed in a minimal dimension for transport, and joined to form a flag pole of extended length;
- a signal flag coupled to said flag pole and furled about said flag pole when said flag pole is in its minimal dimension for transport, and displayed from said flag pole when said flag pole is in its extended length, said flag pole in its extended length being hand manipulatable to wave said pole from the end of a person's arm to display said flag above the head of a person;
- a holster base for transporting said flag pole and said signal flag when said base is coupled to the limb of a person;
- means coupled to said base for coupling said base to the limb of a person;
- a holster pocket coupled to said holster base for carrying said flag pole, in its minimal transport dimension with said



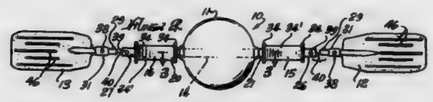
furled flag, while said base is coupled to a limb of a person; and
- quick release means coupled to said holster base for maintaining said flag pole and said flag carried by said holster pocket during transport on a limb of a person and for quickly releasing said flag pole and said flag from said pocket when a person wishes to manipulate said flag pole in its extended length to display said flag.

5,114,370
BODYBOARD WITH VARIABLE STIFFNESS
Steven M. Moran, Long Beach, Calif., assignor to Kransco, San Francisco, Calif.
Filed Jan. 4, 1991, Ser. No. 638,835
Int. Cl.[5] B63B *35/72;*
U.S. Cl. 441—65 **5 Claims**



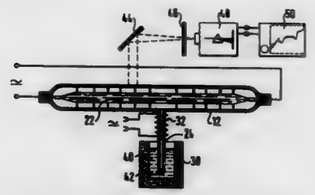
1. A bodyboard comprising:
- an elongate board extending between a front nose end and rear tail end and including a bottom skin which provides a planing surface, a semi-rigid foam core, a top skin which provides a riding surface, and laterally-opposed side edges extending from the nose end to the tail end,
- the board including a stiffened portion encompassing a major portion of the length of the board from a region adjacent the tail end to a region forward of the midpoint between the nose end and tail ends, the stiffened portion extending generally between the side edges of the board, the board structure in the stiffened portion further including a lower stiffening layer including thermoplastic fiber mesh laminated between the foam core and the bottom skin and an upper stiffening layer including thermoplastic fiber mesh laminated between the foam core and the top skin, and
- a plurality of parallel, generally arcuate channels extending into the foam beneath the top skin in the portion of the board forward of the stiffened portion for enhancing the flexure and bendability of the forward portion of the board, the parallel channels extending laterally between the side edges of the board and arching toward the nose end of the board.

5,114,371
WATER PADDLE AND FLOTATION DEVICE FOR USE BY SWIMMERS
Rudy Alonzo, Pico Rivera, Calif., assignor to California Aqua Paddle, Inc., Anaheim, Calif.
Filed Nov. 15, 1990, Ser. No. 614,096
Int. Cl.[5] B63C *9/08*
U.S. Cl. 441—129 **10 Claims**



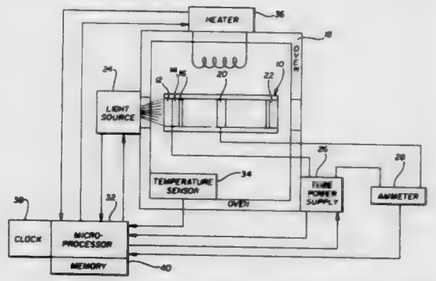
1. An improved paddle assembly for use by a swimmer to assist in propelling the swimmer through the water, said paddle assembly comprising:
- a hollow, rigid, thermoplastic ball having two diametrically opposed openings therein, said openings including an integral, hollow, cylindrical sleeve formed therein;
- a hollow, thermoplastic tube having an inner surface and an outer surface, said hollow, thermoplastic tube extending through both of said hollow, cylindrical sleeves of said diametrically opposed openings, said hollow tube being sealed in an airtight manner at its outer surface to the hollow, cylindrical sleeves of said two diametrically opposed openings;
- a rigid tube extending through said hollow tube and extending beyond said hollow tube at each end thereof to form first and second tube ends; and
- first and second paddles affixed to said first and second tube ends whereby the user may grasp the hollow tube and manipulate the paddles to propel the user rapidly through the water.

5,114,372
METHOD OF PRODUCING A GAS DISCHARGE LIGHT SOURCE
Herbert K. Fuchs, Mahone Bay, Canada, assignor to Vector Related Physics (Consultants) Ltd., Island of Jersey, Great Britain
Filed Jun. 12, 1991, Ser. No. 714,390
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1990, 4018792
Int. Cl.[5] H01J *9/395, 9/42*
U.S. Cl. 445—3 **11 Claims**



1. A method of producing a gas discharge light source for emitting an electromagnetic radiation comprising a gas discharge tube which is filled with at least one discharge gas material, and a means for generating a gas discharge, comprising the following method steps
- a) igniting the gas discharge tube filled with the discharge gas material,
- b) performing a forming operation in which
- b.1) the electrical operating power of the gas discharge light source is at least as high as the desired continuous operation power.
- b.2) the gas discharge tube is held at a temperature which is at least as high as the subsequent operating temperature,
- b.3) the intensity of the emitted electromagnetic radiation in the region of the desired wavelengths is monitored and
- b.4) the partial pressure of the vaporized discharge gas material is varied until the intensity of the selected electromagnetic radiation has reached a maximum value,
- c) whereupon a reservoir with excess discharge gas material is separated from the gas discharge tube in such a manner that the gas discharge tube under operating conditions does not contain any condensed discharge gas material.

5,114,373
METHOD FOR OPTIMIZING PHOTO CATHODE PHOTO-RESPONSE
Robert Peckman, Roanoke, Va., assignor to ITT Corporation, New York, N.Y.
Filed Feb. 11, 1991, Ser. No. 653,690
Int. Cl.[5] H01J *9/42, 9/02*
U.S. Cl. 445—3 **20 Claims**



1. A method for optimizing the photo-response of a photocathode having a gallium-arsenide layer and a cesium-oxide surface coating comprising the steps of:
- (a) heating said photocathode;
- (b) measuring the photo-response of said photocathode during said step of heating;
- (c) ascertaining the rate of increase of photo-response due to aid step of heating; and
- (d) adjusting the temperature at which said step of heating occurs to shorten the duration of said step of heating required to substantially optimize the photo-response of said photocathode.

5,114,374
DECORATIVE RING FOR BABY BOTTLE WHICH ATTACHES IN GROVE OF NIPPLE
Lynda H. Estiva, 2044 Cypress Ave., San Pablo, Calif. 94806
Filed Apr. 29, 1991, Ser. No. 693,000
Int. Cl.[5] A63H *33/00;* **A61J** *9/00, 9/08;* **B65D** *39/00*
U.S. Cl. 446—77 **5 Claims**

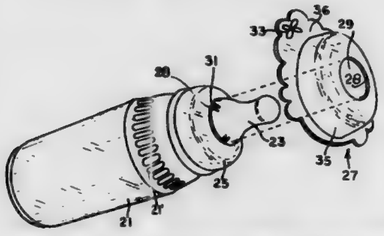
1. A baby bottle assembly of the type comprising:
- a bottle having an open mouth and attachment means around said mouth for enabling a nipple-holding cap ring to be attached to said mouth,
- a flexible, stretchable nipple having an elongated teat, said teat having a base, a flange extending from said base and shaped and dimensioned to mate with said mouth of said

bottle, and a groove around said base of said teat at the junction of said teat with said flange, and

a nipple-holding cap ring, said cap ring including coupling means which is coupled to said attachment means around said mouth of said bottle, said cap ring having an opening through which said teat is inserted so that said ring is coupled to said bottle and said teat is inserted through said opening, said cap ring mating with said groove in said base of said teat and clamping said flange of said nipple against said mouth of said bottle,

an improvement comprising a decorative ring comprising a thin annular member with a body part which is convex when seen from a front side thereof and concave when seen from a back side thereof,

said body part of said decorative ring having a center opening which is sized to mate with said groove in said base of said teat, such that said center opening can be pushed down over said teat and snapped into said groove, and



opening of said decorative ring mating with and engaging said groove, and,

said body part of said decorative ring being shaped so that when said opening of said decorative ring mates with said groove with said back, concave side of said decorative ring facing said bottle and said convex side facing said teat, said body part will extend over and cover said cap ring,

said body part of said decorative ring having a base portion remote from said center opening,

said decorative ring having a flange extending out from said base portion of said body part, such that when said decorative ring is snapped into said groove with said concave side of said decorative ring facing said bottle, said flange will be spaced away from said teat so that a baby feeding from said teat can see said flange and so that said flange will not interfere with said baby feeding from said nipple,

said flange having decorations thereon for amusing said baby when it feeds from said bottle.

5,114,375

TOY APPARATUS

Brenda L. Wellhausen, and James R. Wellhausen, both of 10310 Coakley Rd., Logan, Ohio 43138

Filed Jul. 1, 1991, Ser. No. 723,776

Int. Cl.[5] A63H *33/00*

U.S. Cl. 446—246 **4 Claims**

1. A toy apparatus, comprising in combination,

a transparent container, including a container upper end portion, with a transparent lid, the transparent lid selectively securable to the container upper end portion,

and

the transparent lid including a lid top surface, the lid top surface including a crank handle flange fixedly mounted to the lid top surface adjacent a side wall thereof,

and

the crank handle flange including a gear cavity therewithin, the gear cavity including a crank gear rotatably mounted within the gear cavity,

and

a crank handle axle fixedly mounted to the crank gear, with the crank handle axle rotatably mounted to the crank handle flange and the crank handle axle fixedly mounted to a crank handle wherein the crank handle is rotatably mounted relative to the crank handle flange to effect rotation of the crank gear,

and

a matrix of gear members mounted within the transparent lid,

and

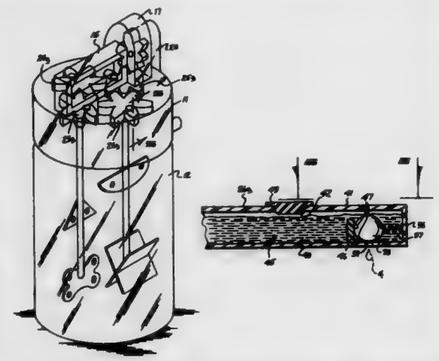
a gear lid cavity formed within the transparent lid containing the gear members therewithin, and the gear members are orthogonally oriented relative to the crank gear,

and

each of the gear members in inter-meshing communication relative to one another and at least one of the gear members in inter-meshing communication with the crank gear to effect rotation of the gear members upon rotation of the crank gear,

and

each gear member including an output shaft coaxially and



fixedly mounted to each gear member, with each output shaft projecting into the container,

and

each output shaft including a paddle blade mounted at a lower terminal end of each output shaft;

and

each output shaft of each gear member is of a varying predetermined length, and each paddle blade is of a varying contrasting configuration,

and

a plurality of paddle blades include apertures directed therethrough,

and

each of the output shafts are parallel relative to one another,

and

each gear member is hollow and defines a reservoir therewithin, and each gear member contains a fluid dye therewithin, and valve means mounted within at least one of the gear members to effect selective flow of the fluid dye into the container.

5,114,376

TOY ANIMAL WITH ILLUMINATED BELLY

Michael C. Copley, La Jolla, Calif., and Cheung Y. Kwai, Mei Foo Sun Kowlon, Hong Kong, assignors to OTWP, Inc., San Diego, Calif.

Filed Dec. 5, 1990, Ser. No. 622,617

Int. Cl.[5] A63H *3/02, 33/26*

U.S. Cl. 446—369 **16 Claims**

1. A stuffed toy having a main body configured as an animal, said body having an illuminatable belly portion, comprising in combination:

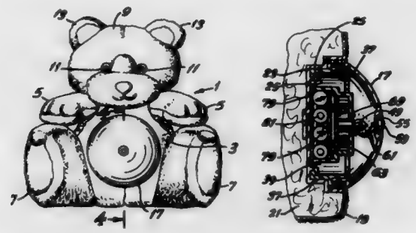
(a) a generally circular cavity formed in said belly portion,

(b) a generally circular housing conformally fitting securely within said cavity,

(c) an annular member having a reduced peripheral, generally circular base adapted to friction fit within said housing,

(d) a dome-shaped cover member adapted to coextensively cover said cavity in said belly portion, said domed-shaped cover member having an apex aperture,

(e) an illumination means retained in said housing,



(f) a switch means to turn on said illumination means, said switch means being retained in said apex aperture,

(g) a circuit means to be activated by said switch means to automatically turn off said illumination means after a predetermined time, and

(h) a power source in said housing in electrical contact with said illumination means and said circuit means, said power source being operatively connected to illuminate said illumination means.

5,114,377

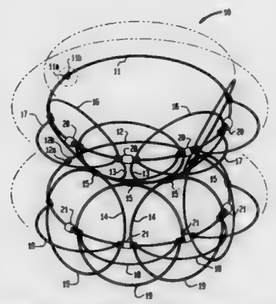
FLEXIBLE TOY AND THERAPEUTIC DEVICE

Leslie M. Cove Mercuri, and Luis A. Mercuri, both of 71 Waller Ave., White Plains, N.Y. 10605

Filed Apr. 2, 1990, Ser. No. 503,059

Int. Cl.[5] A63H *33/00*; A44C *5/00*

U.S. Cl. 446—487 **6 Claims**



1. A framework assembly forming a flexible toy and therapeutic device adaptable to a variety of selective configurations comprising

a first circular frame member;

a second circular frame member;

a plurality of first semi-circled frame members rotatably attached at their ends to said first circular frame member in successively overlapping engagement along the length of said first circular frame member;

a plurality of second semi-circled frame members rotatably attached at their ends to said second circular frame member in successively overlapping engagement along the length of said second circular frame member;

a plurality of first beads rotatably attached to said first circular frame member between adjacently disposed first semi-circled frame members;

a plurality of second beads rotatably attached to said second circular frame member between adjacently disposed second semi-circled frame members;

means to attach the midpoints of said first semi-circled frame member and said second semi-circled frame member in rotatable engagement;

a plurality of third semi-circled frame members corresponding in number to said plurality of first of semi-circled frame members, said plurality of third semi-circled frame members being rotatably attached at their ends to said first circular frame member in successively overlapping engagement along the length of said first circular frame member, the ends of said plurality of third semi-circled frame members being adjacently disposed to the inside of the ends of the corresponding first semi-circled frame member;

a plurality of fourth semi-circled frame members corresponding in number to said plurality of third semi-circled frame members, said plurality of fourth semi-circled frame members being rotatably attached to said first circular frame member and disposed at a side of the corresponding plurality of third semi-circled frame member in successively overlapping engagement along the length of said first circular frame member, the ends of said plurality of fourth semi-circled frame members being adjacently disposed to the inside of the ends of the corresponding third semi-circled frame member;

a plurality of fifth semi-circled frame members corresponding in number to said plurality of second semi-circled frame members, said plurality of fifth semi-circled frame members being rotatably attached at their ends to said second circular frame member in successively overlapping engagement along the length of said second circular frame member, the ends of said plurality of fifth semi-circled frame members being adjacently disposed to the inside of the ends of the corresponding second semi-circled frame member; and

a plurality of sixth semi-circled frame members corresponding in number to said plurality of fifth semi-circled frame members, said plurality of sixth semi-circled frame members being rotatably attached to said second circular frame member and at a side of the corresponding plurality of fifth semi-circled frame member in successive overlapping engagement along the length of said second circular frame member, the ends of said plurality of sixth semi-circled frame members being adjacently disposed to the inside of the ends of the corresponding fifth semi-circled frame member.

5,114,378

CLOTHES PIN DOWN PULLER

Preston D. Montgomery, Amarillo, Tex., assignor to Multiple Systems, Inc., Amarillo, Tex.

Filed Feb. 7, 1991, Ser. No. 651,961

Int. Cl.[5] A22B *5/16*

U.S. Cl. 452—128 **16 Claims**

1. The method for removing a hide from an animal carcass that includes the following steps:

a. suspending an animal carcass by said carcass' hind legs so that the carcass hangs with a head end of the carcass downward and a hind end of the carcass upward,

b. positioning the carcass adjacent to a hide pulling machine having a platform upon which a motor connected to a hide pulling pin is fixed,

c. loosening a portion of a hide from the carcass, thereby

d. forming a skin flap that hangs from the carcass,

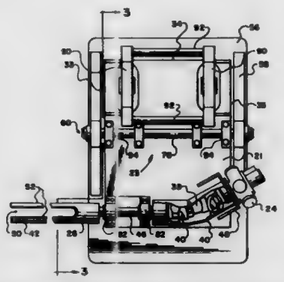
e. attaching the skin flap to the pulling pin, and

f. pulling the hide from the carcass, wherein the improved method for removing the hide from the animal carcass comprises:

f1. mounting the platform to a base unit so that a hinge is formed between said platform and said base unit,

f2. positioning the hide pulling pin so that a center line of said pin is parallel to and away from a horizontal tilt line about which said platform moves when said platform is tilted on said hinge,

f3. positioning the motor so that said motor is on an opposite side of said pin's center line from the carcass, thereby



f4. maintaining a greater distance between the carcass and the motor than between the carcass and the pulling pin,

f5. mounting the motor and the pin to the platform so that the orientation between said pin and said motor remains unchanged throughout the hide removal process, thus maintaining the carcass in a sanitary condition by preventing the carcass from contacting portions of the motor.

5,114,379

APPARATUS FOR TREATING MEAT

Otto Prosenbauer, Innstrasse 23, A-1201 Wien, Austria

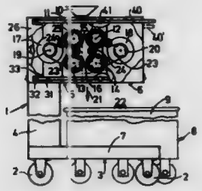
PCT No. PCT/AT88/00057, § 371 Date Dec. 19, 1990, § 102(e) Date Dec. 19, 1990, PCT Pub. No. WO90/00011, PCT Pub. Date Jan. 11, 1990

PCT Filed Jul. 23, 1988, Ser. No. 613,802

Claims priority, application Austria, Jun. 28, 1988, 1674/88

Int. Cl.[5] A22C *5/00*

U.S. Cl. 452—142 **5 Claims**



1. An apparatus for treating meat comprising:

at least two pairs of rollers disposed one above the other, the rollers of each pair of said at least two pairs of rollers being spaced apart from each other a predetermined gap distance, said at least two pairs of rollers having protrusions on their peripheral surface which press into said meat passing each of said at least two pairs of rollers from up to down;

means for driving said at least two pairs of rollers in an opposite sense of rotation to transport said meat along said predetermined gap distance between said at least two pairs of rollers, said means for driving being juxtaposed said at least two pairs of rollers and rotatably engaging said at least two pairs of rollers for driving communication therewith in a transport direction of said meat, said means for driving said at least two pairs of rollers further comprising;

means for driving each roller of at least one pair of said at least two pairs of rollers at a different peripheral speed; and

means for adjusting said predetermined gap distance between said at least two pairs of rollers whereby varying thicknesses of meat may be processed such that meat entering between said protrusions on said peripheral surface of said at least two pairs of rollers may be manipulated along said transport direction of said meat by said rollers of said at least two pairs of rollers;

said means for adjusting said predetermined gap distance comprising a first support member for bearingly supporting one roller of each pair of said at least two pairs of rollers and a second support member for bearingly supporting the other roller of each pair of said at least two pairs of rollers;

means for parallely shifting said first support member and said second support member relative to each other;

means for swivelling said first support member and said second support member relative to each other;

said means for driving said at least two pairs of rollers comprising a first motor carried by said support member for driving said rollers carried by said first support member; and

a second motor carried by said second support member for driving said rollers carried by said second support member.

5,114,380

METHOD FOR EVISCERATING ANIMAL CARCASSES, PREFERABLY PIG CARCASSES, A PLUG AND PLANT THEREFOR

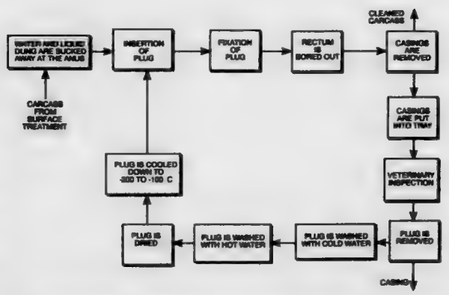
Poul Larsen, Alleroed, Denmark, assignor to Slagteriernes Forskningsinstitut, Denmark

Filed Sep. 18, 1990, Ser. No. 584,255

Claims priority, application Netherlands, Sep. 29, 1989, 4846/89

Int. Cl.[5] A22C *21/00*

U.S. Cl. 452—176 **7 Claims**



1. A method for eviscerating animal carcasses, said method comprising the steps of: freezing a plug to a temperature below the point of water; inserting the plug into the anus of a carcass; and cutting around the anus.

5,114,381

COIN FEEDING APPARATUS FOR COIN HANDLING MACHINE

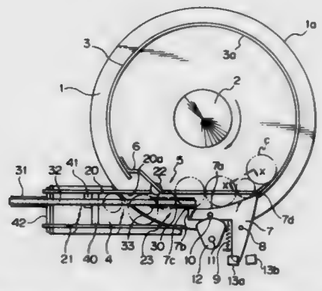
Nobuo Ueda, Sakae; Tatuo Okita, Itami; Mikio Suzuki, Izumi; Yasunori Ikemoto, and Hiloyuki Shibao, both of Osaka, all of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1991, Ser. No. 665,579

Claims priority, application Japan, Mar. 14, 1990, 63588

Int. Cl.[5] G07D *1/00*

U.S. Cl. 453—57 **6 Claims**



1. A coin feeding apparatus for a coin handling machine comprising a rotatable disk for receiving coins, guide ring means having a circular inner circumference disposed inside of an outer periphery of the rotatable disk for guiding by the inner circumference thereof coins received by the rotatable disk and moved toward the outer periphery of the rotatable disk by centrifugal force produced by the rotation of the rotatable disk, an opening in said guide ring a coin passage communicating with said opening and having a pair of first and second guide rail means and transporting belt means for transporting coins, the coins being transported along the first guide rail means disposed on the side of the rotatable disk, discriminating means for discriminating the denomination of coins and whether or not the coins are acceptable, counting means for counting the value of deposited coins, the discriminating means and the counting means being arranged along the first guide rail means of said coin passage, rotatable guide roller means disposed upstream of said first guide rail means, the first guide rail means extending onto the rotatable disk, said coin feeding apparatus for a coin handling machine further comprising

guide means extending along the coin feed direction in the vicinity of said coin passage,

said guide means being swingable between a first position where one face of the guide means is smoothly aligned with said inner circumference of said guide ring means and a second position where said face is not smoothly aligned with said inner circumference of said guide ring means,

said guide means having a downstream corner portion at an end of said face, said portion being the pint of the guide means closet to the guide roller means when said guide means is in said first position,

said first position being further characterized in that a first plane formed tangential to said inner circumference of said guide ring means at said downstream corner portion is spaced at a distance less than the diameter of the smallest diametered coin to be handled from a second plane lying along the first guide rail means,

said second position being further characterized in that said downstream corner portion is located essentially in line with said second guide rail means such that the distance between said downstream corner portion and said guide roller means is larger than the largest diametered coin to be handled.

5,114,382

WINDSHIELD DEFROSTING APPARATUS AND METHOD FOR AIRCRAFT

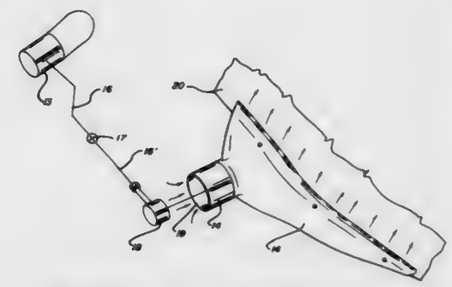
Norman F. Steiner, Longmont, Colo., assignor to Air Comm Corporation, Boulder, Colo.

Continuation of Ser. No. 124,007, Dec. 23, 1987, Pat. No. 5,014,606. This application Apr. 22, 1991, Ser. No. 688,848

The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.

Int. Cl.[5] B60H *1/00*

U.S. Cl. 454—76 **17 Claims**



1. A defrosting apparatus for aircraft having an engine providing a high pressure, high temperature air supply source, a windshield, and an existing air disperser adjacent to the windshield for distributing air at the windshield, the disperser having an air inlet, said apparatus comprising expelling means connectable with the supply source of high pressure, high temperature air and positionable adjacent to the inlet of the disperser for expelling high pressure, high temperature air into the inlet so that cabin air is also drawn into the inlet, mixed in the disperser with the high temperature air and distributed as warm air from the disperser of the windshield.

5,114,383

APPARATUS FOR CONTROLLING CONTINUOUS VARIABLE TRANSMISSION

Sadayuki Hirano; Yoshinori Yamashita, both of Shizuoka; Takumi Tatsumi, and Hiroaki Yamamoto, both of Hyogo, all of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha and Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 588,595, Sep. 26, 1990, abandoned. This application Jun. 12, 1991, Ser. No. 714,218

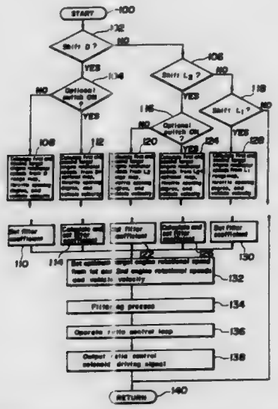
Claims priority, application Japan, Sep. 30, 1989, 1-256338

Int. Cl.[5] F16H *63/00*

U.S. Cl. 474—18 **9 Claims**

1. In an apparatus for controlling a continuous variable transmission of a vehicle, including a fixed pulley member and a movable pulley member which is supported relative to the fixed pulley member so as to be movable toward and away from the fixed pulley member, a groove defined between the pulley members having a width which is decreased and increased to thereby increase and decrease a rotational radius of a belt which is reeved between both of the pulley members in said groove, and a control means for executing speed change control so as to change the belt ratio to a selected value, the improvement wherein said control means comprises a control unit having means for receiving a throttle opening degree detection signal and vehicle velocity detection signal, means for determining a first target engine rotational speed based on the throttle opening degree detection signal and the selected belt ratio, means for determining a second target engine rotational speed based on the vehicle velocity detection signal and the selected belt ratio, at least one of said target engine rotation speed determining means including speed setting means for setting the associated target engine rotational speed to a first

speed value in response to a first belt ratio being selected and to a second speed value which is different from said first speed value in response to a second belt ratio being selected, said speed setting means including proportional distribution means for selectively setting the associated target engine rotational speed to a third speed value between said first and second speed values even though one of said first and second belt ratios is selected, means for determining an optimum target

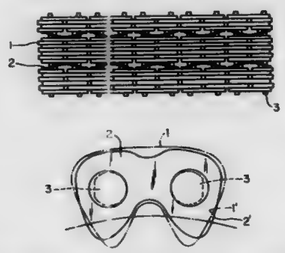


engine rotational speed from said first and second target engine rotational speeds, means for setting upper and lower limit values of the optimum target engine rotational speed in accordance with predetermined conditions, and means for obtaining a final target engine rotational speed from said optimum target engine rotational speed, whereby the speed change control is executed so as to assure desired operating characteristics adapted to the running state of the vehicle.

5,114,384
SILENT DRIVE CHAIN

Hideo Tsuyama, Wakayama, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

Filed Mar. 27, 1991, Ser. No. 676,180
Claims priority, application Japan, Mar. 28, 1990, 2-31017
Int. Cl.[5] F16G *13/00*
U.S. Cl. 474—212 **11 Claims**

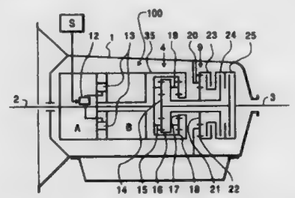


1. A silent chain for transmitting power through a sprocket wheel, said chain comprising layers of series-connected ink plates, each link plate having a surface for interengaging a sprocket wheel tooth, and leaf spring links held in compression between said layers, each leaf spring link being located alongside of at least one adjacent link plate with spring surface projected beyond said plate surface for resiliently interengaging the tooth before said plate surface interengages the same tooth.

5,114,385
BRANCHED INFINITELY-VARIABLE HYDROMECHANICAL TRANSMISSION FOR MOTOR VEHICLES

Michael Meyerle, Kiefernweg 9, D-7996 Meckenbeuren-Lochbrucke, Fed. Rep. of Germany

PCT No. PCT/DE86/00367, § 371 Date Jul. 16, 1987, § 102(e) Date Jul. 16, 1987, PCT Pub. No. WO87/01781, PCT Pub. Date Mar. 26, 1987
Continuation of Ser. No. 494,856, Mar. 19, 1990, abandoned, which is a continuation of Ser. No. 300,175, Jan. 17, 1989, abandoned, which is a continuation of Ser. No. 113,187, Jul. 16, 1987, abandoned. This PCT application Sep. 16, 1986, Ser. No. 595,707
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3533192; Mar. 24, 1986, 3609907
Int. Cl.[5] F16H *47/04*
U.S. Cl. 475—79 **11 Claims**



1. A multiple path, infinitely variable hydromechanical transmission comprising:

a rotatable power input shaft;

a first adjustable volume hydrostatic unit that is coupled to said power input shaft for receiving input power therefrom;

a second hydrostatic unit having a hydrostatic power outlet shaft, said first and second hydrostatic units being operably hydraulically coupled by high and low pressure lines;

a multiple shaft summation gear train having a first shaft coupled to said power input shaft, a second shaft coupled to said hydrostatic power outlet shaft, and a third shaft that may be coupled to a load, said gear train being arranged such that said second shaft is rotated by the gear train at a higher rotational speed than said power input shaft to thereby drive the second hydrostatic unit at a higher speed than the first hydrostatic unit when the third shaft is coupled to a load at zero speed in a starting range; and

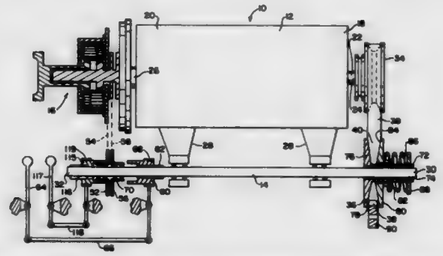
a bypass valve operably connected between said high and low pressure lines for relieving pressure developed as a result of said second hydrostatic unit being driven by the gear train at a higher speed than the first hydrostatic unit.

5,114,386
REVERSIBLE VARIABLE SPEED DRIVE MECHANISM

Gyula Csotonyi, Box 346, Wabamum, Alberta, Canada T0E 2K0

Filed Feb. 28, 1991, Ser. No. 661,601
Int. Cl.[5] F16H *37/00*
U.S. Cl. 475—211 **5 Claims**

1. An improvement in a reversible variable speed drive mechanism consisting of a motor driven input shaft having a first end and a second end, a balancing shaft having a first end and a second end rotatably mounted on supports and extending parallel to the input shaft, a first pulley non-rotatably secured to the first end of the input shaft, a second pulley non-rotatably secured to the first end of the balancing shaft and coupled to the first pulley with a belt whereby a rotational movement is imparted by the input shaft to the balancing shaft, one of the pulleys having a belt supporting circumference which is adjustable such that the relative speed of the balancing shaft in relation to the input shaft is adjustable by altering the circumference of the adjustable pulley around which the belt travels, a planetary gear assembly having a sun gear, a pluarality of planetary gears contained in a yoke, a ring gear rotatably driven by the planetary gears, one of the sun gear and the ring gears serving as an input gear and the other of the sun gear and the ring gears serving as an output gear, one of the input gear, and the planetary yoke being coupled to the second end of the input shaft and the other of the input gear and the planetary yoke being coupled to the second end of the balancing shaft, such that by adjusting the belt supporting circumference of the adjustable pulley the relative rotational speed of the input shaft and the balancing shaft and the relative rotational speed of the input gear and the planetary yoke can be altered such that when the rotational speed of the planetary yoke relative to the



input gear is greater than the gear ratio, the output gear rotates in a first direction; when the rotational speed of the planetary yoke relative to the input gear is less than the gear ratio, the output gear rotates in a second direction; and when the rotational speed of the planetary yoke relative to the input gear corresponds to the gear ratio, the output gear assumes a neutral position remaining stationary, the improvement comprising:

a. a balancing sprocket mounted on the second end of the balancing shaft, the balancing sprocket being coupled by a chain to the planetary yoke;

b. a locking sprocket rotatably mounted on the balancing shaft, the locking sprocket being coupled by a chain to the input gear such that the locking sprocket rotates in response to the rotation of the input gear; and

c. means for locking the locking sprocket to the balancing shaft when the output gear is in a neutral position, thereby preventing the speed of the planetary yoke from being altered relative to the speed of the input gear.

5,114,387
EXERCISE APPARATUS

Louis Keppler, 17529 Fairfax La., Strongsville, Ohio 44136

Filed Feb. 22, 1991, Ser. No. 659,845
Int. Cl.[5] A63B *23/04*
U.S. Cl. 482—51 **11 Claims**

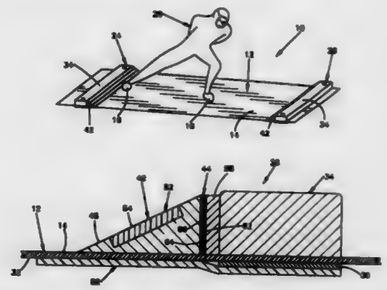
1. An exercise apparatus for use in training for skating and other sports, said apparatus comprising:

a longitudinally extending flexible sheet having a length which is substantially greater than its width, said flexible sheet having a smooth glide surface along which the feet of a person can slide;

first bumper means releasably connected with said flexible sheet near a first end of said flexible sheet and extending transverse to the longitudinal extent of said flexible sheet for engaging a side of a foot of a person sliding in a first direction on the glide surface along the longitudinal extent of said flexible sheet;

said first bumper means including a first rigid base member disposed beneath said flexible sheet, a first rigid main section disposed above said flexible sheet, first fastener means interconnecting said first base member and said first main section to releasably clamp a portion of said flexible sheet between said first base member and said first main section, a first ramp section having side surface means sloping upwardly away from the glide surface on said flexible sheet toward said first main section at an acute angle to the glide surface for engaging the side of a foot of a person sliding in the first direction on the glide surface, and a first resilient means between said first ramp section and said first main section for cushioning forces applied against said first ramp section by a foot of a person using the exercise apparatus; and

second bumper means releasably connected with said flexible sheet near a second end of said flexible sheet and extending transverse to the longitudinal extent of said flexible sheet for engaging a side of a foot of a person sliding in a second direction on the glide surface along the longitudinal extent of said flexible sheet;



said second bumper means including a second rigid base member disposed beneath said flexible sheet, a second rigid main section disposed above said flexible sheet, second fastener means interconnecting said second base member and said second main section to releasably clamp a portion of said flexible sheet between said second base member and said second main section anywhere along the length of said flexible sheet, a second ramp section having side surface means sloping upwardly away from the glide surface on said flexible sheet toward said second main section at an acute angle to the glide surface for engaging the side of a foot of a person sliding in the second direction on the glide surface, and a second resilient means between said second ramp section and said second main section for cushioning forces applied against said second ramp section by a foot of a person using the exercise apparatus.

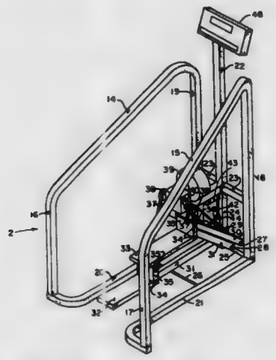
5,114,388
STAIR SIMULATOR EXERCISER WITH ADJUSTABLE INCLINE

James A. Trulaske, Town & Country, Mo., assignor to True Fitness Technology, Inc., O'Fallon, Mo.

Filed Jul. 26, 1991, Ser. No. 736,724
Int. Cl.[5] A63B *23/04*
U.S. Cl. 482—52 **15 Claims**

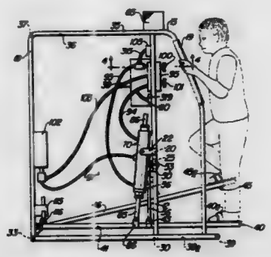
1. A stair simulator exerciser for use in maintaining personal fitness comprising a frame means, a pivot assembly adjustably mounted to said frame means, a pair of foot platforms pivotally connected operatively to said pivot assembly, and said pivot assembly adjustably mounted for proximate vertical movement a select distance with respect to the frame means, so as to vary

the orientation of the arc angle of movement of the foot platforms during their manipulation by the exerciser, and means



for inducing resistance in the pivoting of the foot platforms during performance of an exercise function.

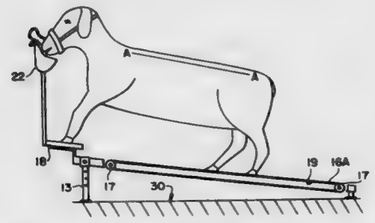
5,114,389
STAIR CLIMBER EXERCISE DEVICE
Brentham, Jerry D., 2121 Industrial Park Rd., Belton, Tex. 76513
Continuation of Ser. No. 371,333, Jun. 23, 1989, abandoned. This application Oct. 1, 1990, Ser. No. 593,339
Int. Cl.[5] A63B *23/04*
U.S. Cl. 482—53 **13 Claims**



1. A leg exercising device comprising: a frame, a shaft secured to said frame; a pair of pedals; foot engaging means on said pedals adapted to exert face in opposite directions toward and away from each of said pedals as a result of movement of the foot of a user in opposite directions; first and second pedal arms secured to said pedals and pivotally secured to said shaft; a rocker arm pivotally secured to said frame; connector means secured between ends of said rocker arm and one of said pedals; and means secured between one of said pedal arms and said frame resisting pivotal movement of one of said pedal arms about said shaft in two directions.

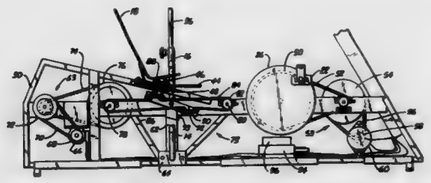
5,114,390
SHEEP TREADMILL
Victor E. Tribelhorn, Jr., 41564 County Rd. J, Yuma, Colo. 80759
Filed Nov. 9, 1990, Ser. No. 611,028
Int. Cl.[5] A63B *22/02*
U.S. Cl. 482—54 **10 Claims**

1. A treadmill for exercising and conditioning a plurality of sheep simultaneously, said treadmill comprising:
(a) frame means having a lower end and an upper end; wherein said upper end is higher than said lower end;
(b) a belt member extending between the upper and lower ends of the frame; wherein said belt is capable of supporting a plurality of sheep in side-by-side manner;
(c) motor drive means for driving said belt at a speed in the range of about 14 to 22 inches per second; and



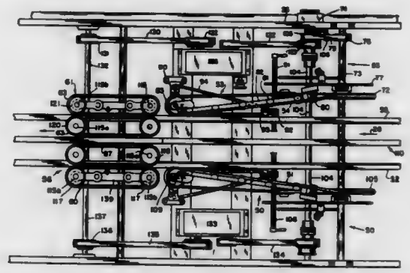
(d) raised and stationary front support means for supporting the front legs of said sheep above the plane of said belt means.

5,114,391
UPPER AND LOWER BODY EXERCISER
Gerald Pitzen, Arden Hills; Douglas Garfield, Northfield; Warren G. Beltz; Lawrence O. Arntzen, both of St. Paul, and Joseph C. Bina, Oakdale, all of Minn., assignors to Bioform Engineering, Inc., Ross, Calif.
Division of Ser. No. 252,169, Sep. 30, 1988, Pat. No. 4,923,193. This application May 7, 1990, Ser. No. 520,075
Int. Cl.[5] A63B *21/00, 21/005*
U.S. Cl. 482—62 **13 Claims**



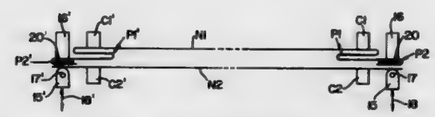
12. A stationary, upper and lower body exercise device comprising:
a support frame
an adjustable seat mounted on the frame;
a crankset including pedals supported on the frame for rotation;
first and second movable exercise arms mounted on the frame;
means for converting movement of the exercise arms to rotational motion;
a generator energized by movement of the crankset;
a generator energized by movement of the first or second exercise arms;
a control and display panel;
a microcomputer for accepting operator inputs to the control and display panel and for displaying data on the control and display panel;
a power dissipation board controllable by control signal for dissipating energy generated by the generators, thereby providing a load on the generators; and
the microcomputer providing the control signal for controlling the load applied to the generators and determining the energy dissipated for display.

5,114,392
APPARATUS FOR FOLDING PAPER BOXES
Hugh A. McAdam, III, Wilton; Robert Tremblay, Hollis, and James Pacocha, Hudson, all of N.H., assignors to The International Paper Box Machine Co., Inc., Hillsborough Cty., N.H.
Division of Ser. No. 413,790, Sep. 28, 1989, Pat. No. 5,092,827. This application Apr. 5, 1991, Ser. No. 680,822
Int. Cl.[5] B31B *3/58, 5/58*
U.S. Cl. 493—179 **9 Claims**



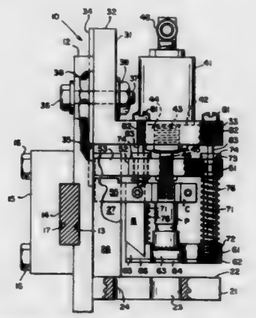
1. In a paper box folding machine, an apparatus for folding a flap onto a panel about a fold axis of each of a plurality of box blanks advancing individually and successively along an elongated horizontal path including a folding station comprising:
A. an endless belt having a portion between an entrance point and an exit point therefor for folding the flap toward the panel,
B. first adjustable positioning means for adjusting the position of said entrance point in the plane of the panel to engage the flap at a preselected distance from the fold axis,
C. second adjustable positioning means for adjusting the position of said exit point to be at the preselected distance from the fold axis in a plane that intersects the fold axis and that is displaced angularly from the plane of the blank, and
D. means for driving said endless belt from said entrance point to said exit point whereby said endless belt folds the flap with respect to the panel into the angularly displaced plane as the blank advances along the horizontal path.

5,114,393
METHOD AND APPARATUS FOR MANUFACTURING SACKS, AND SACKS OBTAINED THEREBY
Natale Vettorato, Minerbio, Italy, assignor to B.L. Macchine Automatiche S.r.l., Italy
Filed Jun. 13, 1990, Ser. No. 547,843
Int. Cl.[5] B31B *49/00*
U.S. Cl. 493—193 **3 Claims**



1. An apparatus for manufacturing sacks by effecting longitudinal welds on two superposed sheets of heat-weldable material, to form a tube from which sacks are obtained by successive transverse welding and cutting operations, comprising:
two pairs of sheet-transporting chains;
means for folding longitudinal edges of at least one of two opposing sheets to form folded edges so that outer faces of said edges are directed towards inner faces of edges of the opposing sheet when said sheets are superposed on each other between said two pairs of chains which clamp said sheets and advance said sheets longitudinally, said superposed sheets comprising a sack forming tube;
insert strips supported at upper ends thereof by stationary supporting means arranged upstream of where said two sheets are superposed on each other to form said tube, said insert strips being inserted inside said folded edges so as to prevent said folded edges from being welded to the sheet from which said portions are originated; and
welding bars acting on non-folded edges of one of the two sheets, while contrasting members act in opposition to said bars.

5,114,394
PUNCHING ATTACHMENT FOR BAG MAKING MACHINE
Dale R. Madsen, 2392 Taylor Rd., Savannah, N.Y. 13146
Filed Sep. 17, 1990, Ser. No. 583,472
Int. Cl.[5] B31B *23/14;* **B26D** *7/02, 9/00, 5/12*
U.S. Cl. 493—227 **12 Claims**



1. A web clamping, slitting and punching device for plastic bag making machines of the type having a stationary web supporting surface across which each of two overlapping webs of plastic, bag-making film travel during the manufacture of bags on said machine, comprising
a first bracket disposed to be removably fixed to said machine adjacent one side thereof,
a second bracket removably mounted for vertical adjustment on said first bracket and having thereon a lateral projection disposed to overlie said stationary web supporting surface,
a fluid pressure-operated cylinder having a reciprocable piston rod projecting from one end thereof, and disposed to be connected to a supply of fluid under pressure operative intermittently to reciprocate said rod between retracted and advanced positions, respectively,
means releasably mounting said cylinder on said lateral projection on said second bracket with one end of said piston rod extending downwardly beneath said lateral projection,
means removably mounting a slitting blade and a hole punch on said one end of said rod for reciprocation by said rod between retracted positions in which the operating ends of said blade and punch are disposed in spaced, confronting relation to said stationary web supporting surface and the webs passing thereover, and advanced positions in which said operating ends of said blade and punch engage and pass through said webs and into registering opening in said stationary web supporting surface, and
web clamping means resiliently supported on said one end of said rod adjacent said blade and punch and having thereon a clamping surface overlying said web supporting surface normally to be spaced therefrom when said rod is in its retracted position,

said web clamping means being operative upon the initial movement of said rod from its retracted to its advanced position to urge said clamping surface toward said stationary web supporting surface to engage and operatively clamp said plastic webs against movement on said stationary surface before said operating ends of said blade and punch engage said webs, and

said blade and punch mounting means being operative to urge said operating ends of said blade and punch through said webs during the remaining movement of said rod to its advanced position.

7. In a plastic bag making machine of the type having a stationary web supporting surface across which each of two overlapping webs of plastic, bag making film travel and a fluid pressure-operated web punching and slitting device, said surface having therein a pair of adjacent apertures beneath said device for accommodating the operating ends of, respectively, a web slitting blade and a web hole punch which form part of said device, the improvement wherein said device comprises

a bracket having thereon a lateral projection,

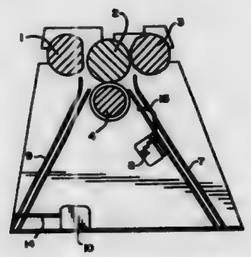
means releasably securing said bracket on said machine for vertical adjustment relative to said web supporting surface, and to support said lateral projection in spaced, confronting relation to said web supporting surface,

means releasably securing a fluid pressure-operated cylinder over an opening in said lateral projection, said cylinder having a reciprocable piston rod which extends at one end thereof through said opening and toward said web supporting surface,

means resiliently mounting a pressure plate on said one end of said piston rod for reciprocation thereby into and out of clamping engagement with the webs supported on said support surface, said pressure plate having therethrough a pair of adjacent apertures registering with and similar in configuration to said pair of apertures in said web supporting surface, and

means releasably securing said web slitting blade and said web hole punch on said piston rod with the operating ends thereof registering with the respective apertures in said web supporting surface and said pressure plate, and operative upon each reciprocation of said piston rod to force the operating ends of said blade and punch through the overlapping webs on said web supporting surface after the webs have been clamped against said surface by said pressure plate.

5,114,395
PAPER SHEET FOLDING DEVICE
Richard J. Abramson, Glen Ellyn, Ill., assignor to Martin Yale Industries, Inc., Wabash, Ind.
Filed Mar. 23, 1990, Ser. No. 498,029
Int. Cl.[5] B31F *1/00, 7/00*
U.S. Cl. 493—421 **12 Claims**



7. A folding machine for sheet material comprising:

a frame;

a plurality of rollers attached to said frame, said rollers forming at least first, second and third roller pairs, said first roller pair being formed by a roller flat and a take-in roller, said roller flat having a circumference including a flat side and a curved side, said take-in roller adjacent to said roller flat so as to define a feed gap when said flat side of said roller flat faces said take-in roller, and a take-in nip when said curved side of said roller flat faces said take-in roller, said second roller pair being formed by said take-in roller and a first fold roller, said first fold roller adjacent to said take-in roller so as to define a first fold nip, said third roller pair being formed by said take-in roller and a second fold roller, said second fold roller adjacent to said take-in roller so as to define a second fold nip;

means for driving said rollers;

a first pocket assembly attached to said frame;

said first pocket assembly having an open end and a closed end, said open end disposed downstream of said take-in nip;

a first pocket assembly microswitch in contact with said first pocket assembly;

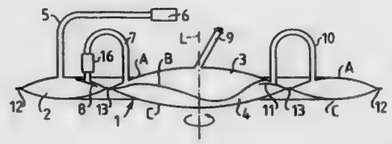
a second pocket assembly attached to said frame, said second pocket assembly having an open end and a closed end, said open end disposed downstream of said first fold nip;

a second pocket assembly microswitch in contact with said second pocket assembly;

a cam attached to one end of said roller flat; and

a cam microswitch in contact with said cam.

5,114,396
METHOD OF WASHING BLOOD CELLS AND CONTAINER ASSEMBLY THEREOF
Peter Unger, Stockholm, and Eric Westberg, Lidingö , both of Sweden, assignors to Omega Medicinteknik AB, Sweden
Continuation of Ser. No. 469,524, Mar. 14, 1990, abandoned. This application Jun. 18, 1991, Ser. No. 722,351
Claims priority, application Sweden, Sep. 15, 1987, 8703562-2
Int. Cl.[5] B04B *5/02, 11/06*
U.S. Cl. 494—37 **8 Claims**



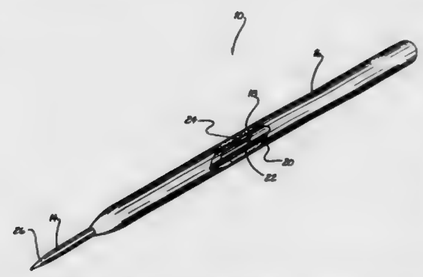
1. A method of washing blood cells in a system of closed collapsible containers of flexible material which are positioned concentrically in a centrifuge rotor, the blood cells being held in an annular primary container into which wash liquid is transferred under action of the centrifugal field through a valve-controlled first passage from a wash liquid container positioned centrally in the centrifuge rotor and from which a centrifugally formed supernatent is transferred through a valve-controlled second passage into a waste container while the primary container is being compressed under action of the centrifugal field, said method comprising the following steps:

transferring the supernatent into a waste container positioned centrally of the centrifuge rotor;

deforming an elastic body positioned in the centrifuge rotor to compress the primary container; and

transferring wash liquid into the primary container after lowering the rotational speed of the centrifugal rotor to a speed below the speed at which the supernatent is transferred.

5,114,397
APPARATUS FOR REMOVING METAL FRAGMENTS FROM THE EYE
Ronald F. Tokarek, Box 5112, Stn E. Edmonton, Alberta, Canada T5P 4C1 , and Wesley E. Herman, 10305 - 109 Ave., Edmonton, Alberta T5M 2G7, Canada
Filed Jun. 6, 1990, Ser. No. 533,834
Claims priority, application Canada, Jun. 14, 1989, 602717
Int. Cl.[5] A61B *17/52*
U.S. Cl. 600—11 **4 Claims**



1. An apparatus for removing metal fragments from the eye comprising:

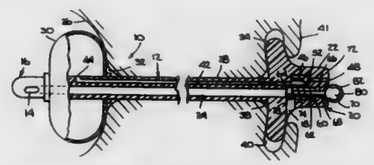
a magnetizable probe having a working end;

means for transmitting a magnetic field through the magnetizable probe to the working end;

the working end including a tip end having reduced diameter; and

a barb formed at the tip end of the magnetizable probe.

5,114,398
FEMALE INCONTINENCE CONTROL DEVICE WITH MECHANICALLY OPERABLE VALVE
Robert E. Trick, Racine, and Carl B. Barwick, Caledonia, both of Wis., assignors to Medical Engineering Corporation, Racine, Wis.
Filed Feb. 27, 1990, Ser. No. 485,696
Int. Cl.[5] A61M *25/00*
U.S. Cl. 600—29 **21 Claims**



1. An incontinence device for a female, comprising:

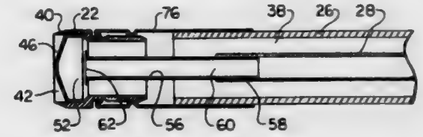
conduit means for receiving, conducting and discharging urinary fluids from the bladder, said conduit means having a proximal end portion with an inlet opening and a distal end portion with an outlet opening,

an antegrade restraining member attached to said conduit means and positionable within the body for restraining said conduit means from moving antegrade within the urethra,

a retrograde restraining member attached to said conduit means and positionable outside the urethra for restraining said conduit means from moving retrograde within the urethra, said retrograde and antegrade restraining means cooperably holding said conduit means in a predetermined position relative to the urethra so that said inlet opening receives urinary fluid from the bladder and said outlet opening is positioned outside the urethra, and

mechanically actuatable valve means attached to the distal end portion of said conduit means for selectively controlling the flow of urinary fluid through said conduit means for discharge through said outlet opening, said valve means including a valve member within said retrograde restraining member, said valve member being outside the urethra when said conduit means is in said predetermined position, said valve member being manually actuatable between a normally closed position and an open condition, said open condition permitting flow of urinary fluid through said conduit means for discharge through said outlet opening, said valve means further including a biasing spring at said distal end portion for urging said valve member into said normally closed position.

5,114,399
SURGICAL DEVICE
Steven W. Kovalcheck, San Diego, Calif., assignor to Intramed Laboratories, San Diego, Calif.
Filed Oct. 1, 1990, Ser. No. 590,930
Int. Cl.[5] A61B *17/20*
U.S. Cl. 604—22 **17 Claims**



1. A surgical device for coring, homogenizing, and aspirating obstructive material from a body cavity or lumenal passage with the aid of a fluid diluent, the device comprising:

a catheter having a proximal end and distal end and defining an aspirating lumen extending therebetween, the distal end for passing into the cavity, the proximal end for remaining outside the cavity,

a coring blade defining a hollow cylindrical passage for coring the obstructive material from the cavity, said coring blade being coupled to and extending from the distal end of said catheter,

an irrigation tube incorporated within said catheter for conducting fluid diluent from the proximal end into the hollow cylindrical passage of said coring blade,

homogenizing means mounted for rotation and nested within the hollow cylindrical passage of said coring blade for homogenizing the cored obstructive material therein in conjunction with the fluid diluent conducted thereto, and means for rotationally driving said homogenizing means within said coring blade.

5,114,400
BLOOD WITHDRAWAL APPARATUS AND METHOD
Lawrence A. Lynn, 1275 Olentangy River Rd., Ste. 202, Columbus, Ohio 43212
Filed Jun. 19, 1990, Ser. No. 540,605
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—53 **34 Claims**

1. For use in aspirating a sample of blood from a flow channel into an interior chamber of a blood storage container, the flow channel being adapted for communication through a catheter with the lumen of a blood vessel of a patient, the blood vessel lumen containing blood under pressure, an aspiration assembly comprising:

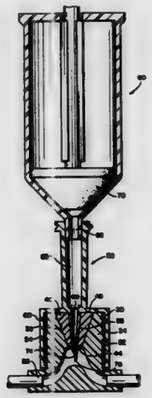
a housing having an internal passage for communication with the flow channel;

a cannula having a distal tip, first and second openings, and a bore through said cannula extending between said first and second openings, said second opening being located adjacent said distal tip of said cannula;

an elastomeric element in said housing normally occluding

said internal passage and adapted to be penetrated by said cannula so that at least a portion of said cannula can enter and pass through said element to locate said second opening in communication with the flow channel so that blood from the flow channel can enter said bore through said second opening for passage through said bore and through said first opening;

means carried by the cannula for connecting said cannula to the blood storage container so that said cannula bore lies



in communication with the interior chamber of the blood storage container through said first opening;

means carried by said housing responsive to at least partial withdrawal of said cannula from said housing for precluding communication between said cannula bore and both the flow channel and ambient atmosphere; and

means carried by at least one of said cannula and said housing for indicating when communication between said cannula and the flow channel is precluded.

5,114,401

METHOD FOR CENTRAL VENOUS CATHETERIZATION

Regina K. Stuart, Brighton; Jeffrey A. Lowell, Dorchester; John K. Baxter, III, Belmont; Bruce R. Bistrian, Ipswich, and Scott Shikora, Brighton, all of Mass., assignors to New England Deaconess Hospital Corporation, Boston, Mass.

Filed Feb. 23, 1990, Ser. No. 483,906

Int. Cl.[5] A61M *31/00*

U.S. Cl. 604—53 **15 Claims**



1. A method for the placement of a catheter into a blood vessel comprising the steps of:

A. inserting a needle having a bore through the skin of a patient and into said blood vessel such that a first portion of said needle resides within said blood vessel and a second portion outside said blood vessel;

B. sliding a guidewire through said bore of said needle and along said blood vessel until a first end of said guidewire resides at a predetermined location within said blood vessel and a second end resides outside said blood vessel, said guidewire having a diameter smaller than an inner diameter of said catheter and said guidewire also having marks thereon for indicating the position of said guidewire relative to the skin of said patient;

C. removing said needle from said blood vessel by sliding said needle over said guidewire while maintaining said guidewire at a substantially constant position by observing the position of said marks relative to the skin of said patient;

D. sliding said catheter over said guidewire until the distal end of said catheter is positioned in close proximity to the distal end of said guidewire while maintaining said guidewire at a substantially constant position by observing the position of said marks relative to the skin of said patient, said catheter having a tubular portion defining at least one central lumen, said catheter being formed of a translucent material, and said catheter including an internal channel extending along said axis, said channel having a cross-section sized such that said catheter is slidable over said guidewire; and

E. removing said guidewire while maintaining said catheter in place in said blood vessel.

5,114,402

SPRING-BIASED TIP ASSEMBLY

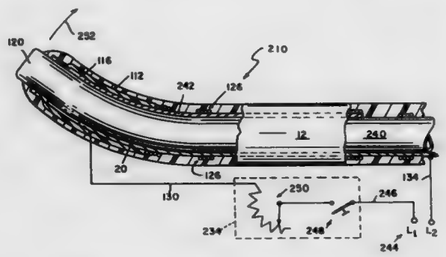
William C. McCoy, Zionsville, Ind., assignor to Catheter Research, Inc., Indianapolis, Ind.

Continuation of Ser. No. 282,318, Dec. 8, 1988, abandoned, which is a continuation of Ser. No. 103,926, Oct. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 870,926, Jun. 5, 1986, Pat. No. 4,758,222, which is a continuation-in-part of Ser. No. 728,634, May 3, 1985, Pat. No. 4,601,705, which is a continuation-in-part of Ser. No. 547,402, Oct. 31, 1983, Pat. No. 4,543,090. This application Mar. 5, 1991, Ser. No. 664,527

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.[5] A61M *37/00*

U.S. Cl. 604—95 **10 Claims**



1. An apparatus comprising

an elongated tubular member having a proximal end and a flexible distal end for insertion into a body,

resilient means for applying a predetermined biasing force to move the flexible distal end of the tubular member to assume a predetermined curved shape, the resilient means being coupled to the distal end of the tubular member and configured to provide the predetermined biasing force, a shape-control element coupled to the distal end, and a control mechanism configured to vary the shape of the shape-control element within the elongated tubular member so that the flexible distal end of the tubular member is moved against the biasing force provided by the resilient means to assume a shape other than its predetermined curved shape.

5,114,403

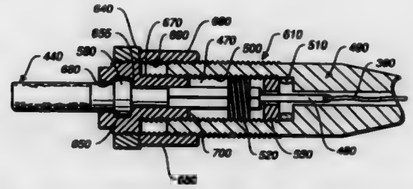
CATHETER TORQUE MECHANISM

Ray Clarke, Los Altos, and Matthew S. Solar, Sunnyvale, both of Calif., assignors to Eclipse Surgical Technologies, Inc., Palo Alto, Calif.

Filed Sep. 15, 1989, Ser. No. 407,462

Int. Cl.[5] A61M *29/00*

U.S. Cl. 604—96 **4 Claims**



1. A torque control mechanism for a catheter, the catheter having a catheter body with a proximal end, a distal end, means positioned near said distal end for treatment of a patient, and a first lumen through the catheter body defining a catheter axis, the torque control mechanism including:

a tip attached to the catheter distal end;

a torque wire having a first end and a second end and positioned in the first lumen with said first end at said catheter proximal end and with said second end affixed to said tip; and

means attached to said first end for rotating said torque wire independently of the catheter body, for positioning the treatment means within the patient,

wherein said rotating means includes:

a handle and

means for attaching said handle to said proximal end said handle being rotatable relative to said attaching means, for allowing rotation of said second end of said torque wire by rotation of said handle,

wherein said rotating means further includes means for limiting rotation of said handle relative to said attachment means,

wherein said handle includes first coupling means,

wherein said attaching means includes a housing connected to the catheter body and having second coupling means coupled with said first coupling means,

wherein said first and second coupling means are configured for varying their relative positions when said handle is rotated, said attaching means further including limiting means for defining a range of rotation of said handle,

wherein said first coupling means comprises a nut having first threads,

said second coupling means comprises second threads carried on said housing, such that rotation of said handle causes said nut to move relative to said housing, and

said limiting means comprises a first stop and a second stop positioned at a first and second ends, respectively, of said second coupling means, for preventing threading of said nut past said first and second stops, respectively.

5,114,404

MULTIFUNCTIONAL RETRACTABLE NEEDLE TYPE GENERAL PURPOSE DISABLING SYRINGE HAVING ENHANCED SAFETY FEATURES AND RELATED METHOD OF OPERATION

Gerald R. Paxton, 1407 S. Arcadia St., Boise, Id. 83705; Norman W. Seid, 3865 Barstow Ct., and Garry L. Gilman, 9750 Klondike Ct., both of Boise, Id. 83709

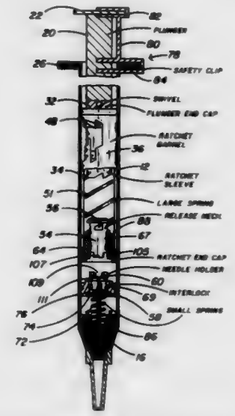
Filed Jul. 24, 1990, Ser. No. 557,537

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—110 **27 Claims**

1. A syringe of the type having a retracted needle movable within a syringe housing and therein protected and shielded prior to syringe use including, in combination:

a. means for maintaining said needle in a completely retracted position within said housing prior to use, and



b. plunger means mechanically coupled between one end of said syringe where it is exposed to pressing by a finger or thumb at one end of said needle for driving said needle to an extended and exposed position when said syringe is ready for use, whereby said syringe may be operated with one hand of a user.

5,114,405

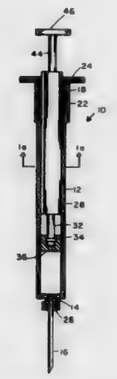
SINGLE USE TAMPER RESISTANT SYRINGE

Douglas A. Winter, 160 Parkwood Rd., West Islip, N.Y. 11795

Filed May 21, 1990, Ser. No. 525,833

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 **1 Claim**



1. A single use syringe comprising:

a. hollow cylindrical barrel means containing plunger means having an abutment adjacent the proximal end of said plunger means within said barrel means when said plunger means is fully depressed and slidable within said barrel means;

b. said hollow cylindrical barrel means having hollow needle means extending from the distal end of and communicating with the interior of said barrel means;

c. said plunger means extending out of the proximal end of said barrel means;
d. lock means comprising a dog mounted within and adjacent the proximal end of said barrel means for engaging said abutment when the plunger means is fully depressed within said barrel means after delivering the contents of said syringe through said needle to prevent retraction and reuse of said syringe, said dog being biased in the direction of said abutment, said plunger means having a cylindrical body forming said abutment at one end and extending toward the distal end of said syringe, said cylindrical body preventing said dog from engaging said abutment until said plunger means is fully depressed within said barrel means, the distal end of said plunger means including detachable plunger cap means forming the piston end of said plunger means for ejecting fluid out of said syringe through said needle means when said plunger means is depressed, and said detachable plunger cap means including an abutment for engagement by said dog when said plunger means is withdrawn from said barrel means prior to use of said syringe to dislodge said plunger cap means from said plunger means thereby rendering ineffective said syringe to prevent tampering of said lock means within said barrel means.

5,114,406

INJECTION DEVICE FOR INJECTION, ESPECIALLY SELF-ADMINISTERED INJECTION, OF MEDICAMENT, INCLUDING MECHANISMS FOR NULLING AND FOR SELECTING DOSAGE, ESPECIALLY FOR USE WITH MULTI-DOSE AMPULES

Jochen Gabriel, Stuttgart; Herbert Bechtold, Ehningen; Gerhard Hambrecht, Rosenberg-Sindolzheim, and Klaus Nothdurft, Stuttgart, all of Fed. Rep. of Germany, assignors to Wilhelm Haselmeier GmbH & Co., Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 121,192, Nov. 16, 1987, abandoned.
This application Jan. 18, 1990, Ser. No. 466,999
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3638984
Int. Cl.[5] A61M *5/20*
U.S. Cl. 604—136 **42 Claims**



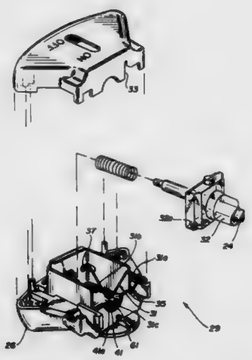
1. Injection device for performing dosed injections, said injection device defining a proximal end and a distal end, and having
a housing (30, 32) for reception of an ampule or medication container (12) retaining a medicinal fluid, and a fluid expelling piston (17) movable in proximal direction within the ampule;
an injection needle (16) engageable with the proximal end of the ampule and movable with the ampule in proximal direction with respect to the housing, in an injecting direction;
an injection plunger (18) engageable against said piston (17);
a plunger length setting mechanism (77) coupled to said plunger and forming with said plunger an injection dosing arrangement (18–77);
a spring (95) coupled to the injection dosing arrangement (18–77);
user operable spring cocking means (100);
user operable spring release means (42, 104),
said spring (95), after cocking, moving the plunger (18) of the injection dosing arrangement (18–77), upon release by the spring release means (41, 104) in engagement with said piston (17) to expel medicament fluid from the injection needle (16),
wherein, in accordance with the invention,
the plunger length setting mechanism (18–77) comprises
a tubular element (77') having an internal thread;
the injection plunger (18) includes an elongated stem (18") having an external thread (76) matching the internal thread of the tubular element (77) and telescopically receivable therein, and a plunger head (18') engageable with said piston (17) of the ampule;
means (80, 82, 83) are provided for restraining relative rotation of the injection plunger (18) with respect to the housing (30, 32) while permitting axial movement of said injection plunger and said plunger length setting mechanism (77) within the housing; and
user dosage setting means (56, 65) are provided and engageable with said tubular element (77') of the plunger length setting mechanism (77) to effect relative rotation of the plunger length setting mechanism (77) and to control the extent of telescopic penetration of the plunger (18) within said tubular element (77') and hence the overall length of the injection dosing arrangement (18–77) to thereby control the extent of movement of said piston (17) within the ampule upon release of said spring (95) by the spring release means (42, 104).

5,114,407

SAFETY MECHANISM FOR TROCAR

John E. Burbank, Ridgefield, Conn., assignor to Ethicon, Inc., Somerville, N.J.

Filed Aug. 30, 1990, Ser. No. 575,245
Int. Cl.[5] A61M *5/18*
U.S. Cl. 604—164 **9 Claims**



1. A trocar comprising:
a trocar tube having a proximal end and a distal end, said tube proximal end connected to a trocar handle;
an obturator having a perforating tip and extendable through the tube to perforate tissue at the distal end of the tube;
a safety shield extendable to shield the tip of the obturator,

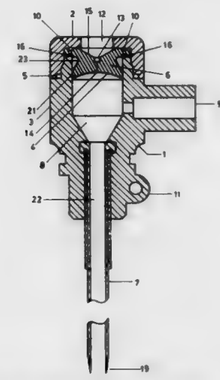
said safety shield exhibiting a rounded distal end with a slot for passage of said obturator tip therethrough; and
wherein said shield and obturator are connected to a handle having a top and a bottom, and said handle comprising:
a first spring;
a securement plate for maintaining said shield and said obturator in a closed position wherein said shield encloses said obturator, said securement plate movable by said first spring into an open position wherein said obturator tip may be exposed; and
wherein said first spring comprises a retainment spring, said retainment spring pivoted about a pair of points on said handle such that when in said open position said retainment spring contacts said plate, and in said closed position said retainment spring rotates out of the path of said plate.

5,114,408

UNIVERSAL HEMOSTASIS VALVE HAVING IMPROVED SEALING CHARACTERISTICS

John J. Fleischhaker, Wayzata, and Tim T. Hidani, St. Paul, both of Minn., assignors to Daig Corporation, Minnetonka, Minn.

Filed Oct. 18, 1990, Ser. No. 599,691
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—167 **18 Claims**



1. A hemostasis cannula unit comprising:
(a) a longitudinally extended valve housing having a first opening and a central longitudinal chamber communicating with a second opening;
(b) a cap means enclosing the first opening of the valve housing and providing a hole to permit the insertion of a catheter into the housing's first opening through the central chamber and out the second opening; and
(c) a one-piece seal means stationarily located within said central chamber and having an entry face containing a conical receiving area tapered into a pilot opening wherein said entry face is in contact with a slit concave exit face.

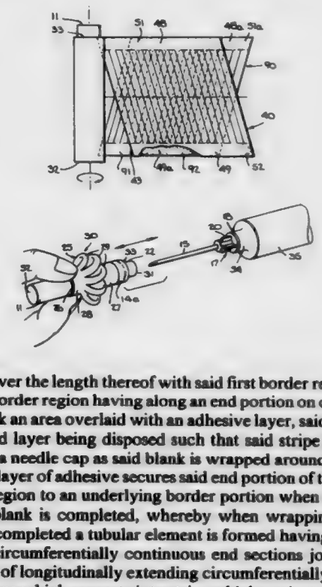
5,114,409

BLANK FOR AND METHOD OF FABRICATING A NEEDLE CAP FINGER GUARD

Richard L. Kole, New Hempstead, and Bernard Cohen, Spring Valley, both of N.Y., assignors to Design Opportunity Corp., New City, N.Y.

Filed Jan. 23, 1991, Ser. No. 644,827
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **22 Claims**

1. A blank for providing a needle cap, having a longitudinal axis and both an open end and a closed end with a finger guard upon wrapping the blank about the needle cap, said blank comprising at least one rhomboid piece of flexible sheet material that is resistant to piercing by a needle and is bounded by first and second pairs of parallel side edges, said piece of material being divided into a central rhomboid region and first and second border regions where the border regions border, respectively, each of one pair of the parallel side boundaries of said central region, each border region being also coextensive with and adjacent a corresponding one of said first pair of parallel side edges of the piece of material, substantially the entire area of said central rhomboid region being scored with substantially equidistantly spaced parallel lines of weakening extending from said first border region to said second border region, said first border region being provided on one side of said blank with a stripe of an adhesive substantially coextensive



at least over the length thereof with said first border region, said second border region having along an end portion on one side of said blank an area overlaid with an adhesive layer, said adhesive stripe and layer being disposed such that said stripe joins said blank to a needle cap as said blank is wrapped around said cap, and said layer of adhesive secures said end portion of the second border region to an underlying border portion when wrapping of said blank is completed, whereby when wrapping of said blank is completed a tubular element is formed having first and second circumferentially continuous end sections joined by a plurality of longitudinally extending circumferentially contiguous regions which separate into strips which project radially to form an umbrella-like structure when said end sections are urged axially toward one another.

5,114,410

DISPOSABLE HYPODERMIC SYRINGE

Jaime Caralt Batlle, Barri del Pi, 15, 08230 Matapedrera, Barcelona, Spain

Filed Jan. 18, 1991, Ser. No. 642,303
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—195 **2 Claims**

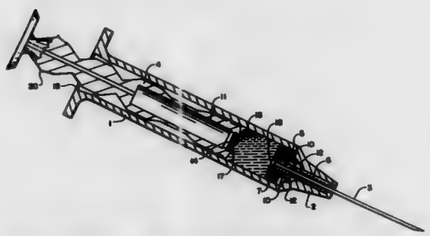
1. A disposable hypodermic syringe designed to be used only once, comprising:
a tubular barrel having a leading end and a trailing end and a longitudinally extending sidewall having a radially inwardly facing internal surface; said tubular barrel further including at said leading end a leading end part which necks down in internal diameter at an internal shoulder and extends longitudinally with a bore having a smaller internal diameter than that of said sidewall; said leading end part having a leading end out through which said bore opens out of said barrel;
means defining a plurality of flexible tongues arranged in within said barrel in a ring, said tongues having outer ends mounted to said sidewall of said barrel adjacent a trailing end of said leading end part of said barrel, said

tongues obliquely projecting radially inwardly and axially towards said leading end of said leading end part from said outer ends thereof, terminating in respective radially inner ends, so as to partially internally obdurate said barrel adjacent said internal shoulder;

a hypodermic needle having a longitudinal bore, a leading end arranged to be penetrated into a subject, when exposed from said barrel, and a trailing end disposed within said barrel; said needle, between said leading and trailing ends thereof, extending longitudinally within said bore; said hypodermic needle, adjacent said trailing ends thereof having an enlarged head which at said trailing end provides a countersunk opening into said longitudinal bore of said needle and a flaring external shoulder;

a discoidal part disposed in said barrel and being made of flexible material; said discoidal part having a radially outer portion circumferentially disposed in sliding sealing engagement with said inwardly facing internal surface of said sidewall of said barrel and being arranged, prior to use of said needle, so as to have a longitudinally bore of said discoidal part slidingly receive and circumferentially surround said enlarged head of said needle, with a trailing end of said discoidal part engaged against said flaring external shoulder of said enlarged head of said needle;

said discoidal part further having on a leading end thereof appendage means which extend longitudinally towards said leading end of said needle and engage said flexible tongues of sites radially intermediate said inner and outer ends of said flexible tongues;



means defining a spring cavity in said leading end part of said barrel, said spring cavity having a radial shoulder formed therein adjacent where said bore of said leading end part opens out of said barrel;

a compression coil spring having a leading end engaged against said radial shoulder of said spring cavity, and having a trailing end engaged with said enlarged head of said needle; said compression coil spring being at least partially housed in said spring cavity, and spiralingly surrounding said needle;

said radially inner ends of said flexible tongues, prior to use of said needle, being axially spaced from said internal shoulder of said leading end part of said barrel;

said enlarged head of said needle further having a radially outwardly opening circumferentially extending groove in which, prior to use of said needle, said radially inner ends of said flexible tongues are seated, with said compression coil spring thereby held in an axially compressed condition;

a piston telescopically received in said barrel through said trailing end of said barrel and arranged to be slid axially from an outer position in which a leading end of said piston is substantially spaced from said head of said needle, thereby defining a fluid-receiving cavity within said barrel, and an inner position, in which the leading end of said piston engages said discoidal part and pushes said discoidal part sufficiently towards said leading end of said needle as to cause said appendage means on said discoidal part to flex said flexible tongues towards said internal shoulder sufficiently to unseat said radially inner ends of said flexible tongues from said groove, thereby releasing said spring to recover from its compressed condition, and thus retract said needle into said barrel;

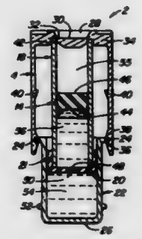
said piston having a cavity extending longitudinally therein and opening centrally of said leading end of said piston, to receive said enlarged head and a longitudinally adjoining intermediate portion of said needle, as needle is retracted into said barrel by recovery of said spring; said spring having sufficient travel while recovering as to sufficiently retract said needle into said barrel that said leading end of said needle no longer emerges from said bore of said lead end part of said barrel.

5,114,411

MULTI-CHAMBER VIAL

Terry M. Haber, Lake Forest; Clark B. Foster, Laguna Niguel, and William H. Smedley, Lake Elsinore, all of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Nov. 19, 1990, Ser. No. 615,610
Int. Cl.[5] A61M *5/24, 37/00*
U.S. Cl. 604—203 **8 Claims**



1. A component mixing vial, for use with first and second components, the second component being a liquid component, comprising:

a mixing container having first and second ends, openings at the first and second ends and a hollow elongate portion communicating with the first end and extending towards the second end;

a piston positioned within the elongate portion of the mixing container forming an airtight barrier across the elongate portion and movable from a pre-mix position, away from the first end, to a post-mix position, towards the first end;

a seal covering the second open end of the mixing container, the seal including a diaphragm with a pressure sensitive weakened region, the first component being within a variable volume mixing region between the seal and the piston;

a supplemental container, coupled to the second end of the mixing container, the supplemental container containing the second component;

means for forcing the second component past the seal into the variable volume mixing region causing the first and second components to mix in the variable volume mixing region and forcing the piston towards the first end to the post-mix position;

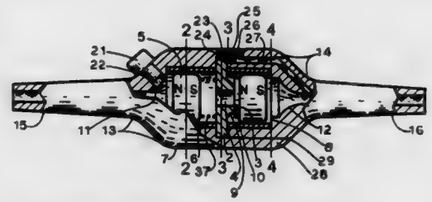
means for preventing needle access to the piston while the piston is in the pr-mix position and for permitting needle access to the piston when the piston is in the post-mix position, the piston being pierceable by a hollow needle at the post-mix position to permit the mixed contents within the variable volume region to be withdrawn through the hollow needle; and

a hollow spike adaptor including a spike end, adapted to engage with a spike post of an IV bag, and a hollow needle end, adapted to pierce the piston when at the post-mix position so to permit the contents of the variable volume mixing region to be transferred to the IV bag through the spike adaptor.

5,114,412

MAGNETIC BLADDER CYCLER

David E. Flinchbaugh, 4855 Big Oaks La., Orlando, Fla. 32806
PCT No. PCT/US88/03929, § 371 Date Apr. 20, 1989, § 102(e) Date Apr. 20, 1989
PCT Filed Nov. 7, 1988, Ser. No. 401,434
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—247 **12 Claims**



1. A magnetic bladder cycler comprising:

a non-magnetic tubular housing;

a non-magnetic tubular inlet conveyance positioned concentrically to the axis of an inlet end of the tubular housing;

a non-magnetic tubular outlet conveyance positioned concentrically to the axis of an outlet end of the tubular housing;

a valve-port well positioned stationary within the tubular housing between the inlet and outlet ends thereof and having a valve orifice concentric to the axis of the tubular housing;

a valve member having an outside periphery greater than the inside periphery of the valve orifice in slidable contact with the portions of the inside periphery of the housing and positioned between the valve-port wall and the outlet end of the tubular housing;

selective magnetic attraction of the valve member in the direction of the orifice in the valve-port wall;

a siphon-vent orifice positioned in the outlet end of the tubular housing;

a upstream magnetic member in slidable contact with portions of the inside periphery of the housing selectively upstream from the valve-port wall within the housing;

a magnetic valve member with a magnetic pole facing in the direction of an opposite magnetic pole of the upstream magnetic member; and

a resilient member with selective expansion pressure between the upstream magnetic member and the valve-port wall such that the upstream magnetic member is slidable further upstream and magnetic attraction between the two magnetic members is decreased further when the two magnetic members are separated by pressure from fluid mass and tissue resistance within the bladder and resistance to flow of fluid from the bladder during bladder-drainage cycles is minimized.

5,114,413

METHODS TO MAKE AND USE PROTEINACEOUS MATERIAL PRESENT IN KININ-FREE HIGH MOLECULAR WEIGHT KININOGEN

Deane F. Mosher, and Shinji Asakura, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jun. 8, 1990, Ser. No. 544,133
Int. Cl.[5] A61M *5/32, 25/00*
U.S. Cl. 604—266 **7 Claims**

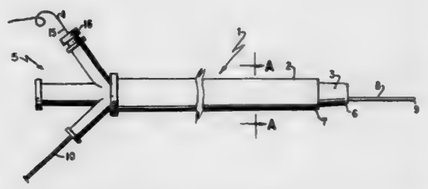
1. A method for reducing the tendency of a composition selected from the group of a blood component and an animal cell, to adhere a surface, the method comprising coating the surface with an exogenously supplied proteinaceous material that is present in passifin, whereby the tendency of said composition to adhere to the surface is reduced.

5,114,414

LOW PROFILE STEERABLE CATHETER

Maurice Buchbinder, San Diego, Calif., assignor to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 213,662, Jun. 30, 1988, Pat. No. 4,960,411, which is a continuation-in-part of Ser. No. 65,122, Jun. 18, 1987, abandoned, and Ser. No. 193,201, May 9, 1988, abandoned, and Ser. No. 48,850, May 12, 1987, abandoned. This application Oct. 1, 1990, Ser. No. 591,385
Int. Cl.[5] A61N *11/00*
U.S. Cl. 604—95 **8 Claims**



3. A steerable catheter means comprising:

a flexible catheter member having distal and proximal ends and a single lumen closed at its distal end,

a deflection wire having distal and proximal ends and extending the length of the catheter member through said lumen, the distal end of the wire being embedded in said closed end, and

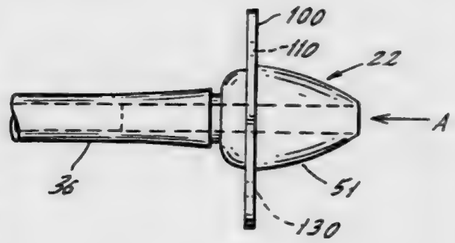
control means attached to the proximal end of the catheter member, the proximal end of the deflection wire extending to the control means, the control means having engaging means which fixedly engages the proximal end of said deflection wire to cause said deflection wire to be displaced distally or proximally, said displacement causing the distal end of the catheter member to bend out of or toward the line of its longitudinal axis, and the control means having rotation means to cause said deflection wire and the catheter member to rotate substantially together to cause the distal end of the catheter member to rotate about its longitudinal axis.

5,114,415

APPARATUS FOR SUCTIONING SECRETIONS FROM UPPER AIRWAYS

Susan Shedlock, 3 Ironwood Ct., Stony Point, N.Y. 10980

Continuation-in-part of Ser. No. 365,783, Jun. 14, 1989. This application Sep. 26, 1991, Ser. No. 765,465
Int. Cl.[5] A61M *1/00, 31/00, 1/06, 11/00*
U.S. Cl. 604—319 **7 Claims**



1. Apparatus for maintaining a patient's upper airway clear

by removing fluid secretions through such patient's oropharynx and nasopharynx, said apparatus including:

power driven first means for generating suction at an input port thereof;

flexible connecting tube means having a first end operatively connected to said input port, and a second end remote from said first end;

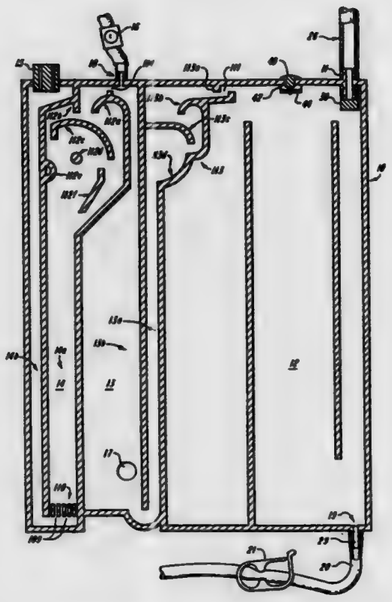
removable nozzle means operatively connected to said second end; said nozzle means being operatively constructed to be operatively positioned and maintained manually at oropharynx and nasopharynx openings for suction removal of fluid secretions therethrough; said nozzle means being operatively constructed and proportioned relative to such openings to permit no more than minimal insertion of the nozzle means through such openings; and said nozzle means including a flange having at least one aperture therethrough, said flange being located adjacent said removable nozzle means for partially blocking air flow into and out of said oropharynx and nasopharynx openings during said suction removal.

5,114,416

FLUID RECOVERY SYSTEM HAVING AN IMPROVED FLOAT VALVE

Theodore Karwoski, Hollis; Steve A. Herweck, and Steve Vail, both of Nashua, all of N.H., assignors to Atrium Medical Corporation, Hollis, N.H.

Filed Jul. 20, 1990, Ser. No. 556,022
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—321 **40 Claims**



1. A system for the collection of body fluid, comprising a collection vessel defining an interior chamber, said chamber having first, second, and third openings therein adapted for communication with the atmosphere, a hospital vacuum source, and a fluid collection tube, respectively, said chamber being subdivided to provide a buffered volume of first, second, and third successive intercommunicating sub-chambers having said respective first, second, and third openings therein,

first and second water columns included in said first and second sub-chambers to define during normal operation first and second pressure differentials for establishing unidirectional flow from said first and third openings to said second opening while maintaining a desired subatmospheric pressure range in said third sub-chamber, said second opening being in direct fluid communication with a low pressure side of each of said first and second water columns, and

an automatically releasing float valve positioned between said second and third sub-chambers for preventing water flow to said third sub-chamber, the float valve comprising,

a float having a density less than one and being positioned in a fluid path of said second sub-chamber, and

a valve seat disposed above said float, said valve seat defining an aperture having a maximum dimension smaller than the outer dimension of said float, said aperture being

shaped so that when, due to a negative pressure condition in said third sub-chamber, the water level in said second sub-chamber rises to cause said float to be seated in said aperture, a quantity of water can still pass therethrough into an impound volume, said valve seat being positioned at a height in relation to the volume of water in said second water column such that water passing through said aperture depletes said water column and it no longer supports said float in said aperture thereby causing said float valve to release.

5,114,417

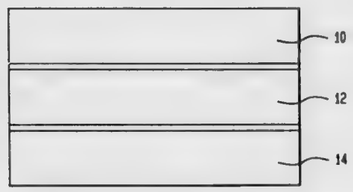
Patent Not Issued For This Number

5,114,418

HIGHLY ABSORBENT, LEAK-PROOF AND BREATHABLE DIAPER

Harry Levy, 219-04 Stewart Rd., Hollis Hills, N.Y. 11427

Filed Dec. 10, 1990, Ser. No. 625,148
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—365 **4 Claims**



1. A breathable, durable and reusable diaper, comprising:

a first layer of terry cloth for providing a high absorbency characteristic to urine, fluids, moisture and body wastes;

a second layer of polyurethane film for providing a high leakage preventing characteristic to urine, fluids, moisture and body wastes absorbed by said first layer;

a first urethane adhesive joined between said first and second layers for laminating together said first and second layers;

a third layer of one of woven or knit fabric, also for providing a high leakage preventing characteristic to urine, fluids, moisture and body wastes absorbed by said first layer;

a second urethane adhesive joined between said second and third layers for laminating together said second and third layers; and

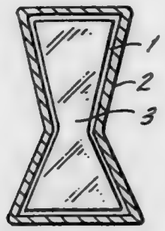
with said first layer, when said diaper is worn, structured to be in contact with the body of the wearer.

5,114,419

HYGIENIC DEVICE

Sarah Daniel, Betzalel Linda 3, Rehovot; Dan Lewinthal, Moshav Asseret 119, and Jacques Daniel, Betzalel Linda 3, Rehovot, all of Israel

Filed Nov. 2, 1989, Ser. No. 430,714
Int. Cl.[5] A61F *13/15, 13/00*; A41B *9/08*
U.S. Cl. 604—385.1 **18 Claims**



1. Hygienic device for protecting the genital, urinary and rectal parts of the human body against environmental agents causing irritation, inflammation and/or infection during bathing or swimming, which is made from flexible, thermoplastic and liquid impermeable material and having a shape with a periphery defined by outer edges which covers and closely adheres to said parts by all said edges, the hygienic device having body adhering water resistant, non-irritating adhesive means at all of said edges operative to hermetically seal all of said parts from an outside contaminated liquid environment and having an inner layer which is soft, non-irritating and non-allergic cloth or sponge.

5,114,420

DISPOSABLE DIAPER

Takamitsu Igaue, Kawanoe; Hideaki Kitaoka, Chiba, and Hiroyuki Tanji, Ehime, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan

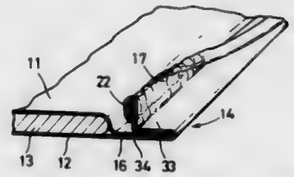
Division of Ser. No. 176,324, Mar. 31, 1988, Pat. No. 4,904,251, which is a continuation-in-part of Ser. No. 34,673, Mar. 30, 1987, abandoned. This application Feb. 20, 1990, Ser. No. 481,288
Claims priority, application Japan, Mar. 31, 1986, 61-73767; Dec. 20, 1986, 61-304437
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—385.2 **7 Claims**

1. A disposable diaper, comprising:

a liquid-permeable topsheet, a liquid-impermeable backsheet, and an absorbent body interposed between said topsheet and said backsheet; and

a pair of generally upstanding elastic leg gathers extending longitudinally of said diaper on respective lateral sides of said absorbent body,

each said leg gather including an inner elastic element, and an outer covering sleeve including a portion which extends outwardly from a respective side edge of said absorbent and which is secured to at least one of said topsheet and said backsheet, said inner elastic element of each said elastic leg gather being provided in a crotch area of said disposable diaper between a front area thereof and a rear area thereof,



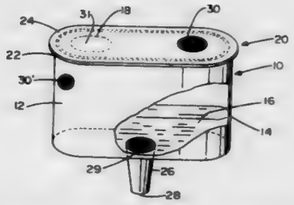
wherein the transverse distance between said inner elastic elements of said pair of elastic leg gathers is larger in the rear area of said disposable diaper than the transverse distance between said inner elastic elements in the front area of said disposable diaper.

5,114,421

MEDICAMENT CONTAINER/DISPENSER ASSEMBLY

Robert B. Polak, 160 Kimberley Ave., Asheville, N.C. 28804

Continuation-in-part of Ser. No. 910,407, Sep. 22, 1986, abandoned. This application Aug. 30, 1989, Ser. No. 400,370
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—403 **55 Claims**



1. A disposable container/dispenser assembly for the extended storage and delivery of two incompatible materials, comprising:

a main body defining a main chamber for containing a first one of said materials, said main body including a main opening and a pressure equalization opening;

an auxiliary body formed from a single, unitary deformable container section defining an auxiliary chamber for containing the second one of said materials to be mixed with said first material, said auxiliary body having an open end in facing relation to said main opening;

at least one gas and vapor impermeable, rupturable wall means, positioned between the main body and the auxiliary body and secured to at least one of said main body and said auxiliary body for preventing mixing of said materials and for providing a gas and vapor barrier between materials in the main body and auxiliary body;

plunger means fixedly secured to an inner wall of said container section in opposing relation to said at least one rupturable wall means; and

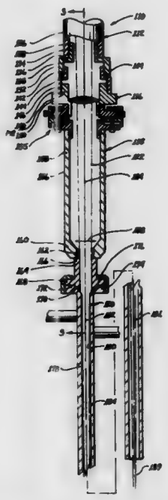
membrane means for permitting air to pass therethrough to said main chamber while preventing liquid from flowing therethrough from said main chamber, said membrane being secured to said main body in covering and sealing relation to said pressure equalization opening of said main body, in a second area outside of said first area.

5,114,422

LASER LAPAROSCOPE ASSEMBLY AND METHOD THEREFOR

Ioan Cosmescu, 14449 N. 22nd St., Phoenix, Ariz. 85022

Filed Dec. 11, 1989, Ser. No. 448,329
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—14 4 Claims



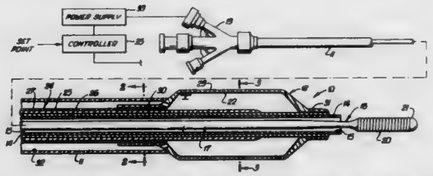
2. A laser laparoscope assembly comprising in combination:
a laser having a laser beam passage for a laser beam having a laser beam axis;
a laparoscope having a laparoscope passage having a passage axis; and
an adjustable coupler for connecting the laser to the laparoscope and for aligning the laparoscope passage axis with the laser beam axis;
said adjustable coupler comprising:
a first coupler portion fixedly connected to the laser;
a second coupler portion adjustably connected to the first coupler portion; and
a third coupler portion fixedly connected to the laparoscope and adjustably connected to the second coupler portion;
said second coupler portion having offset adjusting means for moving the second coupler portion and the third coupler portion in a direction normal to the laser beam axis, thereby causing the laparoscope passage axis to intersect the laser beam axis at a center point of tilt; and
said third coupler portion having tilt adjusting means for angularly displacing the third coupler portion about the center point of tilt, thereby causing the laparoscope passage axis to longitudinally align with the laser beam axis; and
wherein the adjustable coupler also comprises:
a coupler cylinder having an upper wall attached to the third coupler portion and having a lower wall;
an end coupler portion having an upper wall attached to the coupler cylinder lower wall and having a lower wall joined to the laparoscope;
said coupler cylinder and end coupler portion having a selected overall length to suit a tapered laser beam; and
said end coupler portion having, near an entry to the laparoscope, a selected inner diameter dimension, said inner diameter dimension being approximately equal to the inner diameter dimension of the laparoscope passage.

5,114,423

DILATATION CATHETER ASSEMBLY WITH HEATED BALLOON

Daniel J. Kasprzyk, Sunnyvale; Jean C. Orth, San Jose; John W. Gaiser, Mountain View, and Russell A. Houser, Pleasanton, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 351,777, May 15, 1989. This application May 9, 1990, Ser. No. 521,337
Int. Cl.[5] A61M *29/00*
U.S. Cl. 606—27 5 Claims



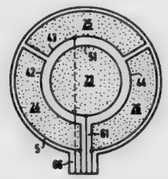
1. A balloon dilatation catheter having means to apply heat to atheroma in a patient's artery during the dilatation thereof, comprising:
a) an elongated tubular member having a first inner lumen extending therein which is adapted to direct inflation fluid therethrough;
b) a flexible, relatively inelastic balloon on the distal portion of the tubular member which is adapted to receive inflating fluid from the first inner lumen within the tubular member;
c) a tubular extension having a second inner lumen and extending from the tubular member through the interior of the balloon; and
d) a resistive or inductive heating means which is disposed around the tubular extension, which has a pair of leads electrically connected to an electrical power source with a frequency of at least 100 kilohertz and which is adapted to heat fluid within the balloon which in turn heats the balloon.

5,114,424

MULTIPART PLANAR ELECTRODE FOR AN HF-SURGERY DEVICE

Uwe Hagen, Forchheim, and Peter Feucht, Berlin, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 27, 1990, Ser. No. 572,259
Claims priority, application European Pat. Off., Sep. 7, 1989, 89116574.8
Int. Cl.[5] A61B *17/39*
U.S. Cl. 606—32 10 Claims



1. A multipart planar electrode for use as a neutral electrode in an HF surgery device comprising
a flexible carrier; and
at least four sub-electrodes disposed on a side of said carrier, at least one of said four sub-electrodes being disposed in a central region of said carrier, with the remainder of said at least four sub-electrodes being arranged outside of said central region of said carrier, said remainder of said at least four sub-electrodes being disposed adjacent and electrically isolated from said sub-electrode disposed in said central region of said carrier, at least three of said sub-electrodes having substantially the same area, and said at least three sub-electrodes including at least two neighboring sub-electrodes having respective, identical adjacent limiting edges disposed parallel to at least a portion of a limiting edge of one of the other of said four sub-electrodes.

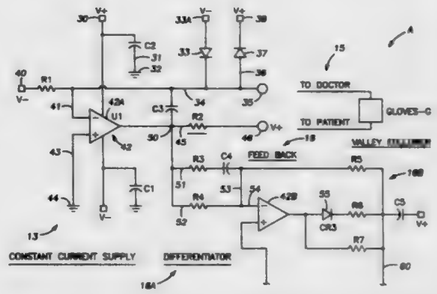
5,114,425

METHOD AND APPARATUS FOR DETECTING ACTUAL OR LIKELY ADULTERATION OF CRITICAL USE GLOVES

Robert E. Williams; William H. Marshall; Robert B. Stout, and John J. McCourt, Jr., all of Houston, Tex., assignors to Novatec Medical Products, Inc., Houston, Tex.

Filed May 25, 1990, Ser. No. 528,926
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—034 21 Claims

1. Apparatus for detecting adulteration or a condition of near-adulteration of a glove used in critical use applications such as in surgery where gloves are worn by a health care worker and are exposed to the body fluids of a patient, comprising:
an electronic circuit including power means, first and second leads for electrical attachment to the health care worker and to the patient, feedback detection means and signal alarm means to provide one or more signals in response to a condition of adulteration or near-adulteration of a surgical glove;
said power means includes means for providing a supply current to said first and second leads such that a series connection is available from said first lead, through said health care worker, said gloves and said patient depending upon the condition of said gloves;
said feedback detection means for detecting adulteration and/or near-adulteration of a glove through detection of the condition and rate of change in the electrical condition



of a glove and providing feedback signals indicative thereof; and
said signal alarm means operably connected to said feedback detection means for providing one or more alarm signals responsive to said feedback signals such that condition of adulteration and/or near-adulteration of a glove is detected.

5,114,426

CHEMICAL STONEWASH METHODS FOR TREATING FABRICS

David J. Milora, Whitpain; David M. Shank, Lower Providence, both of Pa., and Peter A. Curato, Clementon, N.J., assignors to Atochem North America, Inc., Philadelphia, Pa.

Filed Dec. 28, 1988, Ser. No. 290,779

Int. Cl.[5] D06L *3/00*

U.S. Cl. 8—102 **12 Claims**

1. A method for abrading dyed fabric to produce a stonewashed effect comprising tumbling said fabric with stones of a chemical composition which is soluble in tumble, wash or rinse liquid for the fabric, said stones being of sufficient size and hardness to effect abrasion of said fabric without substantial mechanical disintegration of the stones and essentially completely dissolving during the tumble, wash or rinse cycle so that little or no subsequent residues are left to be removed from the fabric or the equipment plumbing.

5,114,427

METHOD FOR LEVEL EXHAUST DYEING CELLULOSE FIBER MATERIAL WITH REACTIVE DYES BY THE CONTROLLED ADDITION OF THE FIXING ALKALI WITH A GIVEN PROGRESSION WHICH IS CHANGED BEFORE COMPLETION

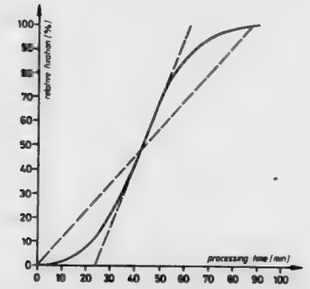
Sture Damm, Brämhult, Sweden, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 262,154, Oct. 17, 1982, abandoned, which is a continuation of Ser. No. 13,626, Dec. 29, 1986, abandoned. This application Oct. 11, 1990, Ser. No. 596,567

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1985, 3515406

Int. Cl.[5] D06P *1/38, 3/66, 5/00*

U.S. Cl. 8—400 **12 Claims**



1. In the process for the level dyeing on material made at least partly of cellulosic fibers, in an aqueous medium and by an exhaust technique with a reactive dye which is fixable onto the textile material under alkaline conditions, an alkali for the fixation of the reactive dye being gradually added at a fixing temperature to the aqueous medium which contains the fabric material, in a substantially continuous manner according to a mathematical function obtained by varying a rate of alkali addition as a function of time during a time interval during which a sufficient amount of alkali is added to complete fixation of the reactive dye, an improvement comprising:

initially adding the alkali to the aqueous medium at a first rate of alkali addition which varies as a first function of time according to a first mathematical non-parabolic function during an initial predetermined portion of the time interval required to complete the fixing process;

adding additional alkali to the aqueous medium by abruptly changing to a second rate of alkali addition from said first rate of alkali addition, which said second rate of alkali addition is different from the first rate of alkali addition, and which said second rate of alkali addition varies as at least a second function of time according to at least a second non-parabolic mathematical function during a remaining predetermined portion of the time interval required to complete the fixing process, wherein a combination of said first mathematical function and said at least a second mathematical function results in a non-parabolic function.

5,114,428

HAIR DYE PREPARATION

Horst Hoeffkes, Duesseldorf; Fritz Lange, Essen, and Dieter Schrader, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

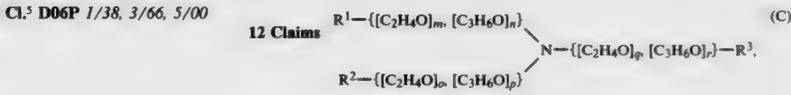
PCT No. PCT/EP89/00771, § 371 Date Jan. 14, 1991, § 102(e) Date Jan. 14, 1991, PCT Pub. No. WO90/00386, PCT Pub. Date Jan. 25, 1990

PCT Filed Jul. 5, 1989, Ser. No. 635,173

Int. Cl.[5] A61K *2/13*

U.S. Cl. 8—405 **20 Claims**

1. A liquid preparation of oxidation hair dyes comprising hair dye intermediates and an aqueous or aqueous-alcoholic carrier containing soaps (A) and water-soluble cationic polymers (B), wherein the improvement comprises the stabilization of the preparation by the presence therein of amines corresponding to formula (C):



(C)

in which

m, n, o, p, q and r are numbers of 0 to 6,

R^1 is a C_{8-22} alkyl group,

R^2 is hydrogen or a $C_{8>}$alkyl group,

R^3 is hydrogen except when r=q=0 and then is C_{1-4} alkyl, and

if m=n=0, R^2 *and* R^3 are not both hydrogen.

5,114,429

ALIPHATIC ALPHA, OMEGA-DIAMINE COMPOUNDS AND THEIR USE IN HAIR DYEING

Alex Junino, Livry-Gargan; Alain Genet, Aulnay-sous-Bois, and Gérard Lang, Saint-Gratien, all of France, assignors to L'oreal, Paris, France

Filed Sep. 6, 1989, Ser. No. 403,390

Claims priority, application France, Sep. 6, 1988, 88 11634

Int. Cl.[5] A61K *7/13;* **C07C** *211/51, 211/55*

U.S. Cl. 8—410 **8 Claims**

3. A composition for dyeing keratinous fibres, in particular for hair, comprising, an effective concentration of an oxidation dye precursor selected from the group consisting of N,N'-bis(β-hydroxyethyl) -N,N'-bis (4'-aminoinophenyl)-1,3-diamino -2-propanol, N,N'-bis(ethyl)-N,N-40 -bis (4'-amino-3'-methylphenyl)ehtylenediamine, acid addition salts of N,N'-bis(β-hydroxyethyl) -N,N'-bis (4'-amino-phenyl)-1,3-diamino -2-propanol and N,N'-bis(ethyl)-N,N'-bis(4'-amino-3'-methylphenyl) ethylenediamine and a carrier suitable for dyeing said fibres, wherein said effective concentration is sufficient, upon oxidative coupling of said precursor, to dye said fibres.

5,114,430

PROCESS FOR TRICHROMATIC DYEING OR PRINTING OF NATURAL AND SYNTHETIC POLYAMIDE MATERIAL WITH FIBRE-REACTIVE FORMAZAN DYES AND FIBRE-REACTIVE AZO DYES

Urs Lehmann, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

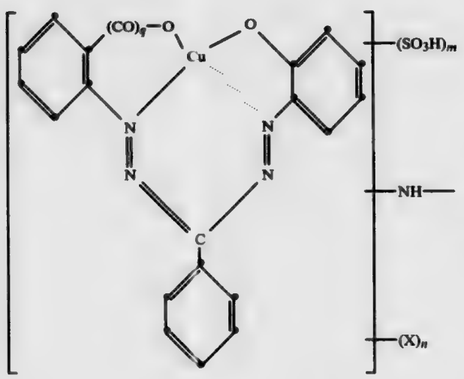
Division of Ser. No. 374,320, Jun. 29, 1989, Pat. No. 4,994,562. This application Nov. 13, 1990, Ser. No. 612,754

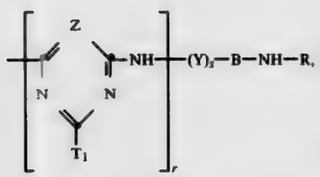
Claims priority, application Switzerland, Jun. 29, 1988, 2473/88

Int. Cl.[5] C09B *62/46*; D21H *21/28*; D06P *1/38*

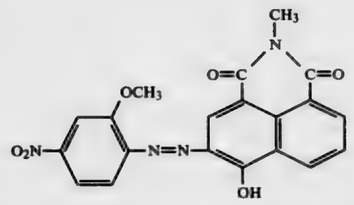
U.S. Cl. 8—549 **7 Claims**

1. A process for the trichromatic dyeing or printing of natural and synthetic polyamide materials with dye mixtures, which comprises using a fibre-reactive formazan dye of the formula

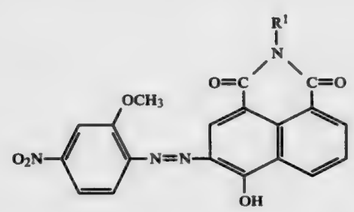




where B is an aliphatic or sulfo-free aromatic bridge member, R is α,β-dihalopropionyl, α-haloacryloyl or haloacetyl, T_1 is halogen, X is halogen, C_1–C_4alkyl, C_1–C_4alkoxy, cyano or nitro, Y is —CO— or —SO_2—, Z is nitrogen or —C—T_2, T_2 is halogen, hydrogen, C_1–C_4alkylthio, cyano, formyl or C_1–C_4alkylsulfonyl, m is 1, 2 or 3, n is 0, 1 or 2, q is 0 or 1, and r and s are each either 0 or 1 but never the same as each other, together with a fibre-reactive sulfo-containing red-dyeing azo dye and a fibre-reactive sulfo-containing yellow- or orange-dyeing azo dye.



and at least one red disperse dye of the following formula (B):



wherein R^1 is C_2–C_4 alkyl, C_1–C_4 alkoxy C_2–C_3 alkyl or C_1–C_4 alkoxyethoxyethyl, in a weight ratio of (B)/(A) of from 0.1 to 5.

5,114,431

DISPERSE DYE MIXTURE: TWO RED DISPERSE DYES FOR POLYESTER FIBERS-AZO DYES CONTAINING NAPHTHALIC IMIDE COUPLER

Riyouichi Sekioka, and Kouichi Seto, both of Kitakyushu, Japan, assignors to Hoechst Mitsubishi Kasei Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1991, Ser. No. 654,055

Claims priority, application Japan, Feb. 15, 1990, 2-34732

Int. Cl.[5] C09B *29/15, 67/22*; D06P *1/18, 3/54*

U.S. Cl. 8—639 **10 Claims**

1. A disperse dye mixture comprising a red disperse dye of the following formula (A):

and at least one red disperse dye of the following formula (B):

wherein R^1 is C_2–C_4 alkyl, C_1–C_4 alkoxy C_2–C_3 alkyl or C_1–C_4 alkoxyethoxyethyl, in a weight ratio of (B)/(A) of from 0.1 to 5.

5,114,432

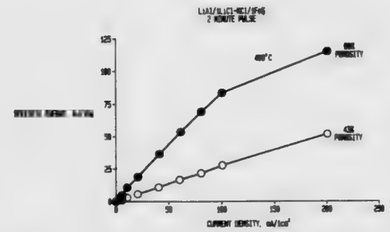
ELECTRODE FOR USE IN A HIGH TEMPERATURE RECHARGEABLE MOLTEN SALT BATTERY AND METHOD OF MAKING SAID ELECTRODE

Edward J. Plichta, Howell, and Wishvender K. Behl, Ocean, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 1, 1990, Ser. No. 561,119

Int. Cl.[5] H01M *4/04*

U.S. Cl. 29—623.5 **9 Claims**



1. Method of making an electrode for use in a high temperature, rechargeable molten salt battery, said method including the steps of:

(A) mixing about 80 to 90 weight percent of a member of the group consisting of a reactive anode material and a reactive cathode material and about 10 to 20 weight percent of a powdered electrolyte salt,

(B) spreading the powdered electrode mixture evenly onto an electric current collector sheet, and

(C) heating the current collector containing the electrode mixture under a dry inert gas at or near the melting point of the electrolyte salt.

5,114,433

DIRECTLY DISTILLED DIESEL FUELS HAVING IMPROVED CETANE NUMBERS

Bernard Dubreux, Francheville-le-Bas; Jacques Kervennal, Lyons; Philippe Mulard, Saint-Pierre-de-Chandieu, and Michele Pralus, Saint-Cyr-au-Mont-d'Or, all of France, assignors to Atochem, Puteaux, France

Filed Mar. 14, 1990, Ser. No. 493,461

Claims priority, application France, Mar. 14, 1989, 89 03576

The portion of the term of this patent subsequent to May 19, 2009, has been disclaimed.

Int. Cl.[5] C10L *1/04, 5/00*

U.S. Cl. 44—322 **12 Claims**

1. A process for improving the cetane number of a directly distilled diesel fuel, comprising intimately contacting such directly distilled diesel fuel with an effective amount of hydrogen peroxide in the presence of formic acid, acetic acid or propionic acid, or with an effective amount of performic acid, peracetic acid or perpropionic acid either in the presence or absence of hydrogen perioxide.

5,114,434

VISCOREDUCED DIESEL FUELS HAVING IMPROVED CETANE NUMBERS

Michele Praulus, Saint-Cyr-au-Mont-d'Or; Bernard Dubreux, Francheville-le-Bas, and Philippe Mulard, Saint-Pierre-de-Chandieu, all of France, assignors to Atochem, Puteaux, France

Filed Feb. 5, 1990, Ser. No. 475,348

Claims priority, application France, Feb. 8, 1989, 89 01657

The portion of the term of this patent subsequent to May 19, 2009, has been disclaimed.

Int. Cl.[5] C10L *5/00, 1/04*

U.S. Cl. 44—322 **13 Claims**

1. A process for improving the cetane number of a viscoreduced diesel fuel, comprising intimately contacting said viscoreduced diesel fuel with an effective amount of hydrogen peroxide in the presence of formic acid, acetic acid or propionic acid, or with an effective amount of performic acid, peracetic acid or perpropionic acid either in the presence or absence of hydrogen peroxide.

5,114,435

POLYALKYLENE SUCCINIMIDE DEPOSIT CONTROL ADDITIVES AND FUEL COMPOSITIONS CONTAINING SAME

Guy P. Abramo, Sewell, and Jeffrey C. Trewella, Flemington, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 292,139, Dec. 30, 1988, abandoned. This application Feb. 20, 1990, Ser. No. 481,938

Int. Cl.[5] C10L *1/18, 1/22*

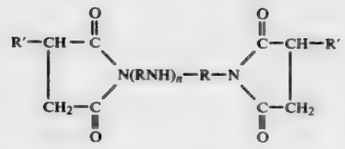
U.S. Cl. 44—348 **16 Claims**

1. A liquid fuel composition comprising a major amount of a liquid fuel and a minor amount of an additive composition for reducing carbon deposits in internal combustion engines comprising:

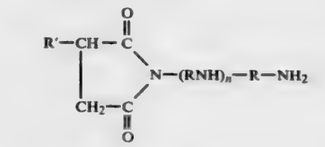
(a) a polyalkylene succinimide prepared by reacting a polyalkylenesuccinic acid or anhydride with a polyalkylene polyamine of the formula:

$$NH_2—(RNH)_n—R—NH_2$$

in which R is an alkylene radical having from 1 to 5 carbon atoms and n is from 0 to 10, said reaction product being a member of the group consisting of bis-succinimides of the structural formula:



wherein R′ is polyalkylene containing 12 to 500 carbon atoms, R is alkylene containing 1 to 5 carbon atoms and n is from 0 to 10, and mixtures of said bis-succinimides and mono-succinimides of the structural formula:



wherein R′ is polyalkylene containing 12 to 500 carbon atoms, R is alkylene containing 1 to 5 carbon atoms and n is from 0 to 10;

(b) a polyalkylene; and

(c) a mineral oil.

5,114,436

PROCESS AND COMPOSITION FOR STABILIZED DISTILLATE FUEL OILS

Dwight K. Reid, Houston, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Apr. 20, 1987, Ser. No. 40,407

The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.

Int. Cl.[5] C10G *9/12*

U.S. Cl. 44—385 **23 Claims**

1. A process for stabilizing distillate fuel oil which comprises adding to said fuel oil and effective stabilizing amount of a mixture of (a) a phosphite compound selected from the group consisting of triethylphosphite, triphenylphosphite, ethylhexyldiphenylphosphite and triisooctyl phosphite and (b) acetic acid, wherein the weight ratio of (a):(b) is from about 1:5 to about 1000:1.

5,114,437

POLISHING COMPOSITION FOR METALLIC MATERIAL

Yoshiaki Takeuchi; Koji Yamamoto, and Hiroshi Umezaki, all of Ehime, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Aug. 27, 1991, Ser. No. 750,683

Claims priority, application Japan, Aug. 28, 1990, 2-227264

Int. Cl.[5] C09K *3/14*; C09G *1/02*

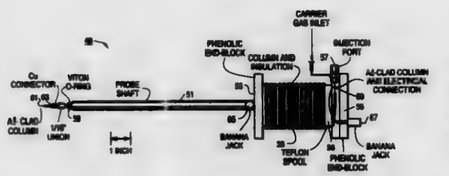
U.S. Cl. 51—293 **7 Claims**

1. A polishing composition for metallic materials, said composition comprising water, an alumina polishing agent, and a polishing accelerator, wherein said polishing accelerator is at least one selected from the group consisting of chromium(III) nitrate, lanthanum nitrate, ammonium cerium(III) nitrate, and neodymium nitrate.

5,114,438
ABRASIVE ARTICLE
Dennis D. Leatherman; James J. McGinley, both of Pittsburgh, Pa.; Daniel E. Adams, Barrington, Ill., and George A. Brons, Lincroft, N.J., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Oct. 29, 1990, Ser. No. 605,283
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—296 **31 Claims**

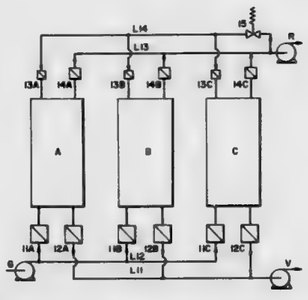
1. In an abrasive article wherein abrasive particles are bonded to a backing, the improvement wherein said backing is microporous material which on a coating-free, printing ink-free, and impregnant-free basis comprises:
(a) a matrix consisting essentially of substantially water insoluble thermoplastic organic polymer;
(b) finely divided substantially water-insoluble filler particles, of which at least about 50 percent by weight are siliceous particles, said filler particles being distributed throughout said matrix and constituting from about 40 to about 90 percent by weight of said microporous material; and
(c) a network of interconnecting pores communicating substantially throughout said microporous material, the pores constituting from about 35 to about 80 percent by volume of said microporous material.

5,114,439
DIRECT RESISTIVE HEATING AND TEMPERATURE MEASUREMENT OF METAL-CLAD CAPILLARY COLUMNS IN GAS CHROMATOGRAPHY AND RELATED SEPARATION TECHNIQUES
Richard A. Yost, and Mark E. Hail, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.
Continuation of Ser. No. 372,270, Jun. 27, 1989, abandoned. This application Sep. 25, 1990, Ser. No. 587,513
Int. Cl.[5] B01D *15/08*
U.S. Cl. 55—20 **15 Claims**



1. In a gas chromatography method comprising the steps of providing a tubular non-metallic column, heating said column according to a predetermined program, passing a mixture of chemical components into the inlet end of said column whereby said components are selectively separated in said column, and detecting said separated components as they emerge from the outlet end of said column, the improvement consisting essentially of
a. providing a tubular non-metallic column of low thermal mass having a continuous electrically resistive film adhered to the outside surface of, and over substantially the entire length of, said column; and
b. passing a controlled electric current through said film so as to directly heat said column in a controlled manner, wherein said controlled heating of said column includes:
(i) calibrating said electrically resistive film so as to derive a set of values that relate the resistance of said film to the temperature thereof;
(ii) measuring the voltage applied to said resistive film and the current passing therethrough at each pre-selected point in time; and
(iii) deriving the temperature of said film at each said point in time by applying the formula:
wherein:
T=column temperature;
V_T=measured voltage at T;
i_T=measured current at T;
V_o=measured voltage at 0° C.;
i_o=measured current at 0° C.;
δ=temperature coefficient of resistivity of film.

5,114,440
PROCESS FOR THE ADSORPTIVE OXYGEN-ENRICHMENT OF AIR WITH MIXTURES OF CA ZEOLITE A MOLECULAR SIEVES BY MEANS OF VACUUM SWING ADSORPTION
Gerhard Reiss, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Continuation of Ser. No. 442,763, Nov. 29, 1989, abandoned. This application Mar. 19, 1991, Ser. No. 672,148
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3842930
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—25 **3 Claims**

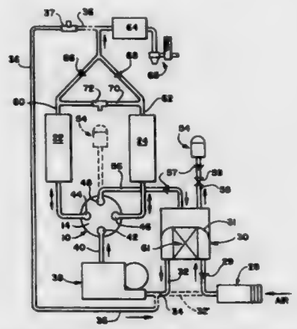


1. In a process for oxygen-enrichment of air by means of vacuum swing adsorption (VSA) with adsorbers containing Ca zeolite A molecular sieves, the improvement wherein the adsorbers of the VSA units are filled with separate layers of Ca zeolite A molecular sieves which have different adsorption characteristics.

5,114,441
OXYGEN CONCENTRATOR SYSTEM AND VALVE STRUCTURE
Rowland W. Kanner, Guntersville, and Stephen P. Lisak, Arab, both of Ala., assignors to Ryder International Corporation, Arab, Ala.
Filed Nov. 2, 1990, Ser. No. 609,186
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—26 **9 Claims**

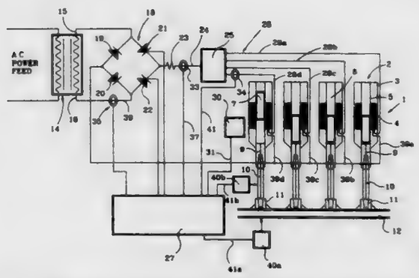
5. A method for increasing the concentration of oxygen in the product stream from an air separation process, comprising the steps of:
a) feeding a feed mixture of air and oxygen to an oxygen concentration processor;
b) processing said mixture to produce an oxygen-enriched product stream discharged from said processor;
c) recycling a portion of said discharged oxygen-enriched product stream into mixture with air to form an oxygen-enriched air mixture defining said feed mixture in step (a);
d) discharging a waste gas stream from step b);
e) transferring pressure from said waste gas stream to one of:

1) said air;
2) said oxygen enriched product stream; or



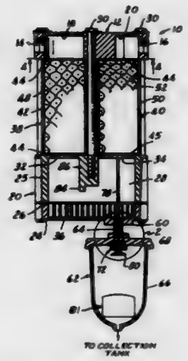
3) said feed mixture in order to increase the pressure of said feed mixture in step (a) while reducing the pressure of said waste gas stream.

5,114,442
RAPPER CONTROL SYSTEM FOR ELECTROSTATIC PRECIPITATOR
Karl M. H. Artz, Madison, Ohio, assignor to Neundorfer, Inc., Willoughby, Ohio
Filed Dec. 27, 1990, Ser. No. 634,427
Int. Cl.[5] B03C *3/76*
U.S. Cl. 55—112 **11 Claims**



1. A rapper control system for an electrostatic precipitator including:
a) power supply means for supplying electrical power to a rapper device mounted on an electrostatic precipitator;
b) control means for regulating the electrical power supplied to the rapper device by the power supply means;
c) temperature sensing means located generally adjacent the rapper device for measuring ambient temperature adjacent said rapper device; and
d) first feedback means interconnecting the temperature sensing means and the control means for adjusting the output of the power supply means in direct relationship to changes in ambient temperature measured by the temperature sensing means.

5,114,443
AIR LINE VAPOR TRAP
Kenneth W. Overby, Hamilton, Ind., assignor to La-Man Corporation, Hamilton, Ind.
Continuation of Ser. No. 726,760, Jul. 8, 1991, abandoned, which is a continuation of Ser. No. 402,809, Sep. 5, 1989, Pat. No. 5,030,262, which is a continuation of Ser. No. 188,638, May 2, 1988, Pat. No. 4,874,408, which is a continuation of Ser. No. 115,416, Nov. 2, 1987, abandoned. This application Aug. 27, 1991, Ser. No. 773,731
The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.
Int. Cl.[5] B01D *19/00*
U.S. Cl. 55—219 **10 Claims**

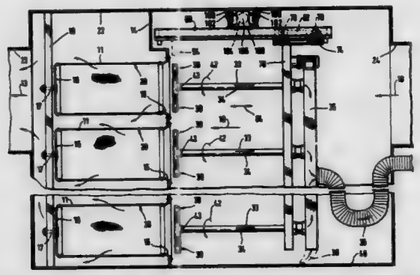


1. An assembly for draining liquid from an air treatment unit which includes means for directing a flow of compressed air, means for coalescing liquid from vapor entrained in the flow of compressed air, and means for collecting liquid coalesced by the coalescing means in a sump, the assembly comprising
enclosure means for defining an enclosed volume,
aspirator tube means for using compressed air flowing in the directing means to develop negative pressure in the enclosed volume, the aspirator tube means interconnecting the enclosure means and the directing means, and
means for conducting liquid collected in the sump into the enclosed volume in response to suction generated by the negative pressure developed in the enclosed volume, the conducting means interconnecting the collecting means and the enclosure means.

5,114,444
FILTER ARRANGEMENT INCLUDING AT LEAST ONE DRUM-TYPE FILTER
Helmut Stible, Spartanburg, S.C., assignor to LTG Lufttechnische GmbH, Stuttgart, Fed. Rep. of Germany
Filed Dec. 13, 1990, Ser. No. 627,056
Claims priority, application Fed. Rep. of Germany, May 29, 1990, 4017206
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—294 **26 Claims**

1. A filter arrangement comprising at least one drum-type filter having a cylindrical inside and an outside, wherein flow occurs from the inside of the filter to the outside, the filter arrangement further comprising a suction device for suctioning-off the inside of the at least one drum-type filter along a helical line, the suction device including at least one suction hose and a suction nozzle provided at a free end of the suction hose, the suction nozzle being mounted so as to contact the inside of the at least one drum-type filter, the suction hose being attached to an end portion of a suction pipe, the suction hose comprising flexible hose means extending essentially in a radial direction of said drum-type filter and being mounted

between the suction nozzle and the suction pipe for biasing said suction nozzle radially outwardly against the inside surface of said drum-type filter, said suction nozzle being supported solely by said suction hose, means for rotating the suction pipe, means for moving the end portion of the suction pipe back and



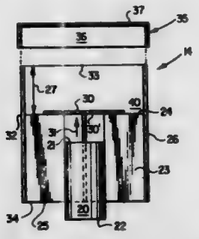
forth in longitudinal direction of the at least one drum-type filter and out of the at least one filter, and means for moving the suction pipe when the suction pipe is moved out of the at least one drum-type filter in a direction transversely of the longitudinal direction of the at least one drum-type filter.

5,114,445

FLARE VENT HEAD

Anthony R. Burton, and Dallas D. Douglas, both of Andrews, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 18, 1991, Ser. No. 716,871
Int. Cl.[5] B01D *50/00*
U.S. Cl. 55—320 **7 Claims**



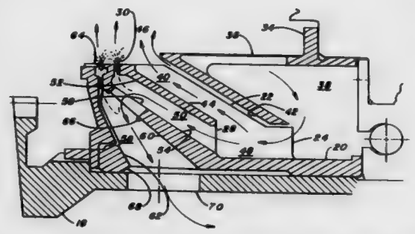
1. In a flare vent head adapted for use on a vent riser to vent to the atmosphere a gas-liquid mixture passing through said riser to an upper end thereof, the improvement comprising a hollow adapter means having open upper and lower ends and means for fixing said vent head to said upper end of said riser so that said gas-liquid mixture passes from said riser into and through said adapter and exits from said open upper end of said adapter means, a plurality of upstanding spaced apart baffle means carried by and around the periphery of said adapter means, said baffle means having upper and lower ends and extending laterally away from said adapter means and each baffle means ending in an outer edge, said baffle means also extending from near the lower end of said adapter means to a common level above the upper end of said adapter means, a solid diversion member fixed at the upper ends of said baffle means and extending over said open upper end of said adapter means so that said gas-liquid mixture that exits from said upper open end of said adapter means impinges on said diversion member and is redirected at least in part laterally away from said adapter means, said baffle means extending laterally beyond the outer edge of said diversion member a wall closure means having an open top and bottom and encompassing said baffle means and adapter means, said wall closure means being fixed to said outer edges of said baffle means to provide a space between the outer edge of said diversion member and said wall closure means for the passage of gas therethrough, said wall closure means extending from near the lower end of said adapter means to a height substantially above said diversion member, a mist extractor cap carried over said open top of said wall closure means, said cap being perforate so as to allow most if not all gas to pass therethrough that emanates from said adapter means but with sufficient spaced apart solid members to knock a substantial amount of any liquid particles being carried by said gas downwardly toward said open bottom end of said wall closure means.

5,114,446

DEOILER FOR JET ENGINE

Rodney L. Giersdorf, Port St. Lucie; Alfred Peduzzi, Juno Isles; Allan D. Krul; Stephen R. Jones, both of Jupiter, and Gregory E. Chetta, Palm Beach Gardens, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 15, 1991, Ser. No. 656,381
Int. Cl.[5] B01D *45/14*
U.S. Cl. 55—345 **7 Claims**



1. In a rotating deoiler for a jet engine, said deoiler being installed in an environment of an air/oil mixture and having a housing and passage means for the flow of said mixture therethrough, means for first stage separation of oil from the air including first vanes for centrifugally forcing oil droplets in said mixture outwardly from said deoiler into casing means containing said air/oil mixture, means for second stage separation of oil from the air including second vanes mounted between inner and outer conical walls for centrifugally forcing oil droplets in said air/oil mixture outward through first holes in the perimeter of the deoiler housing, windows in said inner conical wall for the flow therethrough of the air/oil mixture to a third separation stage, and means for third stage separation of oil from the air including third vanes mounted between said second stage vane inner conical wall and a third wall for centrifugally forcing any remaining oil droplets in said air/oil mixture outward through second holes in the perimeter of the deoiler housing, the improvement of the extension of said first vanes along the outer surface of said second vanes outer conical wall and the addition to the leading edge of said first vanes of inducer vanes curved in the direction of rotation of the deoiler.

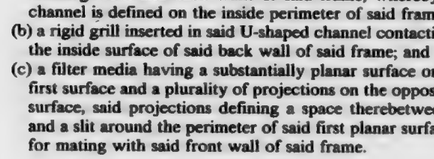
5,114,447

ULTRA-HIGH EFFICIENCY POROUS METAL FILTER

Christopher B. Davis, Suffield, Conn., assignor to Mott Metallurgical Corporation, Farmington, Conn.

Filed Mar. 12, 1991, Ser. No. 665,963
Int. Cl.[5] B01D *46/12, 39/20*
U.S. Cl. 55—485 **18 Claims**

1. An ultra-high efficiency particulate air filter for use in filtering process gases for the semiconductor and microelectronics manufacturing industries comprising a filter element made from porous sintered metal, said element having a filtration efficiency relative to its most penetrating particle size of at least 6 log reduction and a specific surface per unit area of at least 0.055 m^2/cm^2 when standardized to a thickness of 0.068



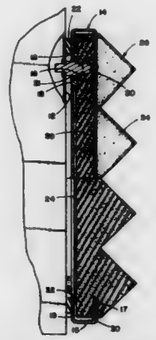
inch, said filtration efficiency being measured at a flow rate of 30 SLPM for an 11.3 $in.^2$ filter area.

5,114,448

AIR FILTERING APPARATUS

Bradley W. Bartilson, Chippewa Falls, Wis., assignor to Cray Research, Inc., Eagan, Minn.

Filed Oct. 8, 1991, Ser. No. 773,148
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—491 **9 Claims**



1. A high reliability, non-blocking air filter for filtering large volumes of low pressure air comprising:
   (a) a frame having first and second pairs of oppositely disposed U-shaped frame members joined together to form a substantially rectangular shape, the bottom side of said U-shaped frame members defining the outside perimeter of said frame and the sides of said U-shaped members defining front and back walls of said frame, whereby a channel is defined on the inside perimeter of said frame;
   (b) a rigid grill inserted in said U-shaped channel contacting the inside surface of said back wall of said frame; and
   (c) a filter media having a substantially planar surface on a first surface and a plurality of projections on the opposite surface, said projections defining a space therebetween, and a slit around the perimeter of said first planar surface for mating with said front wall of said frame.

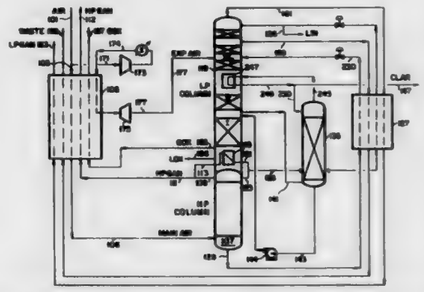
5,114,449

ENHANCED RECOVERY OF ARGON FROM CRYOGENIC AIR SEPARATION CYCLES

Rakesh Agrawal, Allentown, and Donald W. Woodward, New Tripoli, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 28, 1990, Ser. No. 573,952
Int. Cl.[5] F25J *3/04*
U.S. Cl. 62—22 **6 Claims**

1. In a cryogenic air distillation process producing argon using a multiple column distillation system comprising a high pressure column, a low pressure column and a crude argon column; wherein feed air is compressed, cooled and at least a portion thereof is fed to the high pressure column; wherein in the high pressure, the compressed, cooled feed air is rectified into a crude liquid oxygen bottoms and a high pressure overhead; wherein the crude liquid oxygen bottoms is fed to the low pressure column; wherein in the low pressure column, the crude liquid oxygen is distilled into a liquid oxygen bottoms and a gaseous nitrogen overhead; wherein the low pressure column and the high pressure column are thermally linked such that at least a portion of the high pressure nitrogen overhead is condensed in a reboiler/condenser against vaporizing liquid oxygen bottoms; wherein an argon containing gaseous side stream is removed from a lower intermediate location of the low pressure column and fed at essentially the same pressure to the crude argon column; wherein in the crude argon column, the argon containing gaseous side stream is rectified into an argon-rich vapor overhead and an argon-lean bottoms



liquid, and the argon-lean bottoms liquid is returned to the low pressure column; the improvement for increasing argon recovery comprises condensing at least a portion of the argon-rich vapor overhead from the crude argon column by heat exchange in a boiler/condenser against at least a portion of liquid descending the low pressure column selected from a location of the low pressure column between the feed point of the crude liquid oxygen from the bottom of the high pressure column and the removal point for the argon containing gaseous side stream for the crude argon column wherein an adequate temperature differences exists between the descending liquid and the condensation argon, thereby at least partially vaporizing said liquid portion; and returning at least a portion of the condensed argon to a top of the crude argon column to provide liquid reflux.

5,114,450

METHOD OF RECOVERING LIQUID HYDROCARBONS IN A GASEOUS CHARGE AND PLANT FOR CARRYING OUT THE METHOD

Henri Paradowski, Cergy, and Michel Leroy, Domont, both of France, assignors to Compagnie Francaise D'Etudes et de Construction-Technip, France

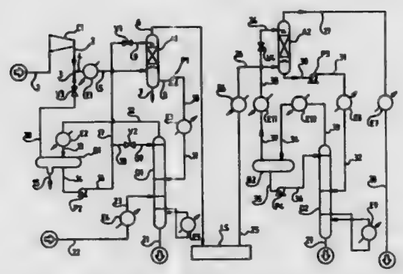
Filed Apr. 24, 1990, Ser. No. 513,558
Claims priority, application France, Apr. 25, 1989, 89 05488
Int. Cl.[5] F25J *3/02, 3/06, 3/00*
U.S. Cl. 62—24 **8 Claims**

1. A method for recovering liquid hydrocarbons contained in a gaseous batch containing light hydrocarbons of less than 3 carbons atoms and heavier hydrocarbons of 3 or more carbon atoms, compressing the batch, condensing it partially and injecting it into a first absorber provided with an upper portion and a lower portion to produce at the upper portion a pretreated gas and at the lower portion heavier hydrocarbons which are treated in a first distillation column wherein light hydrocarbons are removed leaving heavier hydrocarbons, washing and drying the thus treated gas then cooling it and injecting it into a second absorber to produce at an upper portion the treated gas and at a lower portion liquid hydrocarbons which are treated in a second distillation column wherein

light hydrocarbons are removed to produce heavier hydrocarbons, comprising:

injecting the heavier hydrocarbons at the lower portion of the first absorber into a debutinization column to obtain at a lower portion of the debutinization column, a liquid cut which contains all of the hydrocarbons of 6 of more carbon atoms, at least 90% of the hydrocarbons of 5 carbon atoms, at most 2% of the hydrocarbons of 4 carbon atoms present in the branch and being free of hydrocarbons of 3 or fewer carbon atoms while at the upper portion of the same column a liquid cut rich in C4 and lighter hydrocarbons is obtained and reinjected as a reflux into said column and as a feed into the upper portion of the first absorber, and a gaseous distillate is recycled into the gaseous batch upstream of the first absorber,

injecting the liquid hydrocarbons from the lower portion of the second absorber after reheating into a de-ethanization column to obtain at the lower portion of said de-ethaniza-



tion column a liquid cut which contains at least 90% of the hydrocarbons of 3 carbon atoms and the total amount of the hydrocarbons of 4 carbon atoms present in the treated gas and obtaining at the upper portion of said column a liquid cut rich in hydrocarbons of 2 or fewer carbon atoms, reinjecting the same as a reflux into said column and as a gaseous distillate rich in hydrocarbons of 2 or fewer carbon atoms which after cooling and at least partial condensation is injected as a feed into the upper portion of the second absorber,

whereby at least 90% of the hydrocarbons of 3 carbon atoms and at least 99.9% of the of 4 or more carbon atoms hydrocarbons contained in the gaseous batch are recovered, and the pretreated gas issuing from the first absorber contains all of the hydrocarbons of 3 or fewer carbon atoms, at least 98% of the hydrocarbons of 4 carbon atoms and at most 1% of the hydrocarbons of 5 carbon atoms, while being free of hydrocarbons of 6 or more carbon atoms.

5,114,451

LIQUEFIED NATURAL GAS PROCESSING

C. L. Rambo; John D. Wilkinson, and Hank M. Hudson, all of Midland, Tex., assignors to Elcor Corporation, Dallas, Tex.

Filed Mar. 12, 1990, Ser. No. 492,548

The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.

Int. Cl.[5] F25J *3/02*

U.S. Cl. 62—24 **14 Claims**

1. In a process for the separation of liquefied natural gas containing methane, C_2 components, C_3 components and heavier hydrocarbon components, in which process

(a) said liquefied natural gas stream is supplied to a fractionation column in one or more feed streams; and

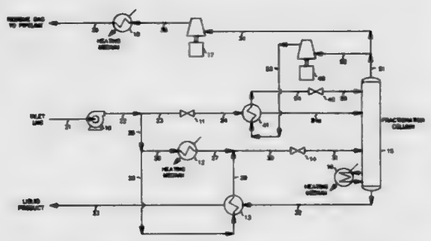
(b) said liquefied natural gas is fractionated into a more volatile fraction containing a major portion of said methane and a relatively less volatile fraction containing a major portion of said C_2 components, C_3 components and heavier hydrocarbon components;

the improvement wherein

(1) a distillation stream is withdrawn from an upper region of said fractionation column and thereafter divided into said more volatile fraction and a recycle stream;

(2) said recycle stream is compressed and thereafter said compressed recycle stream is directed in heat exchange relation with at least a portion of said liquefied natural gas whereby said compressed recycle stream is cooled sufficiently to substantially condense it, while said liquefied natural gas portion is heated;

(3) said substantially condensed compressed recycle stream



is supplied to said fractionation column at a top column feed position;

(4) said heated liquefied natural gas portion is supplied to said fractionation column at a mid-column feed position; and

(5) the quantity and pressure of said compressed recycle stream and the temperatures of said feed streams to said fractionation column are effective to maintain column overhead temperature at a temperature whereby the major portion of said C_2 components, C_3 components and heavier hydrocarbon components is recovered in said relatively less volatile fraction.

5,114,452

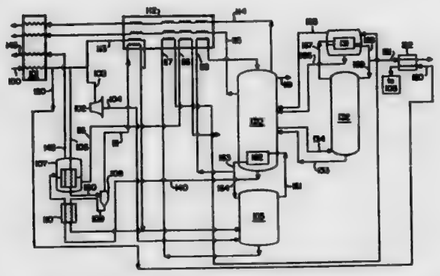
CRYOGENIC AIR SEPARATION SYSTEM FOR PRODUCING ELEVATED PRESSURE PRODUCT GAS

James R. Dray, Kenmore, N.Y., assignor to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Jun. 27, 1990, Ser. No. 544,372

Int. Cl.[5] F25J *3/02*

U.S. Cl. 62—24 **18 Claims**



1. Method for the separation of air by cryogenic distillation to produce product gas comprising:

(A) turboexpanding a first portion of cooled, compressed feed air and introducing the resulting turboexpanded portion into a first column of an air separation plant, said first column operating at a pressure generally within the range of from 60 to 100 psia;

(B) condensing at least part of a second portion of the cooled, compressed feed air and introducing resulting liquid into said first column;

(C) separating the fluids passed into said first column into nitrogen-enriched and oxygen-enriched fluids and passing said fluids into a second column of said air separation plant, said second column operating at a pressure less than that of said first column;

(D) separating the fluids passed into the second column into nitrogen-rich vapor and oxygen-rich liquid;

(E) vaporizing oxygen-rich liquid by indirect heat exchange with the second portion of the cooled, compressed feed air to carry out the condensation of step (B);

(F) recovering vapor resulting from the heat exchange of step (E) as product oxygen gas; and

(G) passing argon-containing fluid from the second column into an argon column, separating the argon-containing fluid into oxygen-richer liquid and argon-richer vapor, and recovering at least some argon-richer fluid.

5,114,453

LIGHTWAVE GUIDE PRODUCED BY ION EXCHANGE OF CS+ IONS

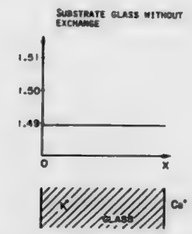
Ludwig Roos, Klein-Winternheim and Werner Schumann, Mainz, both of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Division of Ser. No. 437,295, Nov. 16, 1989, Pat. No. 5,004,707, which is a continuation of Ser. No. 267,651, Nov. 1, 1988, abandoned, which is a continuation of Ser. No. 821,435, Jan. 22, 1986, abandoned. This application Nov. 27, 1990, Ser. No. 618,606

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501898; Jul. 10, 1985, 3524605

Int. Cl.[5] C03C *25/02*

U.S. Cl. 65—30.13 **6 Claims**



1. A method of producing a lightwave guide which comprises contacting a substrate glass body consisting essentially of the following composition, in mol %:

SiO_2	45–72
B_2O_3	8–25
Al_2O_3	1–25
Li_2O	0–1
Na_2O	0–2
K_2O	6–18
MO	0–1

wherein MO=MgO, CaO, SrO, BaO, ZnO, PbO, having a polished or fire-polished surface, with F^- ions to replace a portion of the O^{2-} ions present in the glass by 1–15 mol % F^- ions, followed by contacting the substrate glass body with a Cs-salt melt at an elevated temperature for a period of time sufficient to produce a lightwave conducting zone by incorporating Cs^+ ions into the substrate glass body by an ion-exchange of K^+, Li^+, and/or Na^+ ions against Cs^+ ions to effect a refractive index gradient within the glass.

5,114,454

BENDING FURNACE FOR GLAZINGS

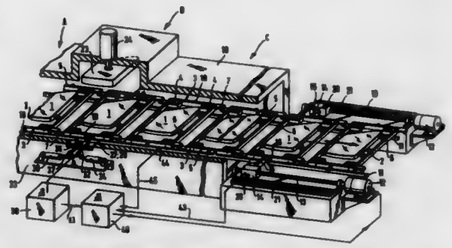
Hans-Josef Promper, Aachen, Fed. Rep. of Germany; Benoit D'Iribarne, Essex, Great Britain; Hans-Werner Kuster; Hans-Werner Nowoczyn, both of Aachen, Fed. Rep. of Germany, and Luc Vanaschen, Eupen, Belgium, assignors to Saint-Gobain Vitrage International, Courbevoie, France

Filed Jul. 1, 1991, Ser. No. 723,566

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1990, 4020971

Int. Cl.[5] C03B *23/023, 35/14*

U.S. Cl. 65—163.000 **14 Claims**



1. A bending furnace comprising:

a bending station including means for bending a heated glazing;

a train of coupled carriages for supporting a glazing, said train of carriages being movable through the bending station; and

means for intermittently moving said train of carriages through, and stopping one of said carriages in, a bending position in the bending station, said intermittent moving means comprising:

a) means for engaging and driving another of said carriages,

b) at least one stop means in said bending station for engaging and stopping said one carriage,

c) a temperature sensor positioned for sensing the temperature of said bending station,

d) means for detecting the position of said engaging means, and

e) means for calculating the position of said one carriage in said bending station as a function of the detected position of said engaging means and the temperature detected by said temperature sensor.

5,114,455

MOLD FOR PRODUCING LENS, USING MOLD RECESSES TO AID IN LENS RELEASE

Shinichiro Hirota, Hachioji; Kishio Sugawara, Hamura, and Kenji Okamura, Akigawa, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Jan. 17, 1991, Ser. No. 642,392

Claims priority, application Japan, Jan. 24, 1990, 2-14282

Int. Cl.[5] C03B *11/08*

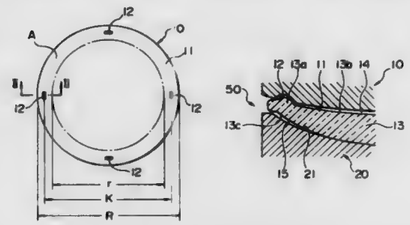
U.S. Cl. 65—275 **19 Claims**

1. A mold for use in producing a lens having an effective aperture, comprising:

a pair of first and second mold portions arranged in opposed relation to each other, at least one of said first and second mold portions being movable toward and away from the other, said first and second mold portions having respective molding surfaces, said molding surfaces having respective areas located radially outwardly of the effective aperture of the lens during molding thereof; and

means including a plurality of recesses formed in said molding surface area of at least one of said first and second mold portions for forming, during molding, a plurality of projections on the lens outwardly of its effective aperture

whereby shrinkage of the lens during molding causes the projections to ride up respectively in said recesses to



establish a gap between the lens and the molding surface of said one mold portion, thereby allowing for easy lens removal from said at least one mold portion.

5,114,456

DISCHARGING DEVICE FOR A GLASS MELTING FURNACE

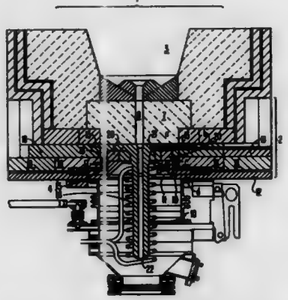
Siegfried Weisenburger, Au/Rhein; Wolfgang Grünewald, Eggenstein, and Hartmut Seiffert, Karlsruhe, all of Fed. Rep. of Germany, assignors to Keraforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Feb. 25, 1991, Ser. No. 660,028

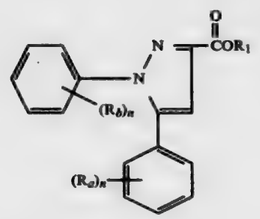
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1990, 4005748

Int. Cl.[5] C03B *5/26*

U.S. Cl. 65—327 **4 Claims**



is hydroxy, carboxy, carbamoyl, or alkoxycarbonyl; or an agriculturally acceptable salt thereof.



in which R_1 is

(i) hydrogen;

(ii) a plant-physiologically acceptable metal or ammonium cation;

(iii) an unsubstituted, monosubstituted or polysubstituted alkyl group of 1 to 18 carbon atoms or cycloalkyl group of 3 to 18 carbon atoms in which the substituents are selected from the group consisting of alkenyl of 2 to 8 carbon atoms, alkynyl of 2 to 8 carbon atoms, cycloalkenyl of 3 to 8 carbon atoms, halo, nitro, cyano, alkoxy of 1 to 4 carbon atoms, alkoxycarbonyl of 1 to 4 carbon atoms, alkylcarbonyl of 1 to 4 carbon atoms, carbamoyl, dialkylcarbamoyl in which each alkyl group has 1 to 4 carbon atoms, amino, alkylamino of 1 to 4 carbon atoms, and dialkylamino in which each alkyl group has 1 to 4 carbon atoms;

(iv) the group —U in which U is unsubstituted, monosubstituted or polysubstituted phenyl or naphthyl in which the substituents are selected from the group consisting of halo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, haloalkoxy of 1 to 4 carbon atoms, cyano, nitro, carboxy, alkoxycarbonyl of 1 to 4 carbon atoms, alkylcarbonyl of 1 to 4 carbon atoms, carbamoyl, alkylcarbamoyl of 1 to 4 carbon atoms, dialkylcarbamoyl wherein each alkyl group has 1 to 4 carbon atoms, sulfamoyl, alkylsulfamoyl of 1 to 4 carbon atoms, dialkylsulfamoyl wherein each alkyl group has 1 to 4 carbon atoms, pyrrolidino, piperidino, pyrrolidinocarbonyl, piperidinocarbonyl, and morpholinocarbonyl;

(v) the group —EU in which U is as herein defined and E is alkylene of 1 to 4 carbon atoms, alkenylene of 2 to 4 carbon atoms, or alkynylene of 2 to 4 carbon atoms;

R_a is hydrogen, halo, alkyl of 1 to 5 carbon atoms, haloalkyl of 1 to 5 carbon atoms, or cyano;

R_b is halo, alkyl of 1 to 5 carbon atoms, haloalkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, alkynyl of 2 to 5 carbon atoms, or cyano; and

each n, independently of the other, has a value of 0 to 3 with the proviso that when R_a is hydrogen, R_1 is hydrogen or ethyl, and R_b is methyl or halo, R_b is in the ortho position.

5,114,462

1,5-DIPHENYLPYRAZOLE-3-CARBOXYLIC ACID DERIVATIVES FOR THE PROTECTION OF CULTIVATED PLANTS

Hans Moser, Magden; Beat Böhner, Binningen, and Werner Föry, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

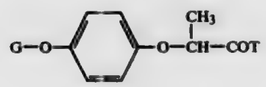
Division of Ser. No. 109,667, Oct. 16, 1987, Pat. No. 5,078,780. This application Mar. 20, 1989, Ser. No. 325,834

Claims priority, application Switzerland, Oct. 22, 1986, 4215/86; Oct. 22, 1986, 4217/86

Int. Cl.[5] A01N *43/40, 43/56*

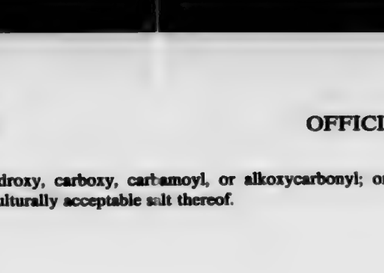
U.S. Cl. 71—88 **9 Claims**

1. A selective herbicidal composition for controlling weeds in crops of useful plants, which compostion contains a herbicidally effective amount of a phenoxypropionic acid ester herbicide of the formula



in which

G is



in which

Hal_1 is fluoro, chloro, bromo, iodo or trifluoromethyl;

Hal_2 is hydrogen, fluoro, chloro, bromo or trifluoromethyl;

Z is —N′ or —CH═;

X is oxygen or sulfur;

T is methoxy, ethoxy, propoxy, isopropoxy, butoxy, dimethylaminoethoxy, propargyloxy, 1-cyano-1-methylethoxy, methylcarbonylmethylthio, 1-ethoxycarbonylethoxy, butoxycarbonyl, acetoximoxy, methylethylketoximoxy, or cyclohexanoximoxy,

R_1' is halo, trifluoromethyl, nitro, cyano, C_1–C_4-alkyl or C_1–C_4-alkoxy; and

n represents 0, 1, 2 or 3, and a herbicidally-antagonistic effective amount of a 1,5-diphenylpyrazole-3-carboxylic acid derivative of the formula

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5,114,463

PYRIMIDINE DERIVATIVES AND HERBICIDAL COMPOSITIONS CONTAINING THE SAME

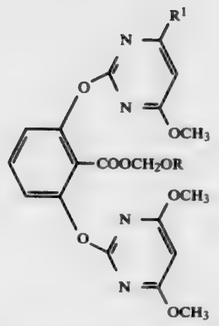
Nobuhide Wada, Kakegawa, and Ryo Yoshida, Shizuoka, both of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

Filed Feb. 28, 1991, Ser. No. 662,570

Int. Cl.[5] H01N *43/54;* C07D *403/10*

U.S. Cl. 71—92 **9 Claims**

1. A pyrimidine derivative having the formula,



wherein R is a lower alkyl group, and R^1 is a lower alkoxy group, a halogen atom or a halogen-substituted lower alkoxy group.

5,114,464

4-QUINOXALINYLOXYPHENOXYALKYLINITRILE HERBICIDES

Robert G. Davis, Naugatuck, and Allyn R. Bell, Cheshire, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Sep. 27, 1990, Ser. No. 589,293

Int. Cl.[5] H01N *43/60;* C07D *241/44*

U.S. Cl. 71—92 **2 Claims**

1. A method for selectively controlling the growth of undesirable gramineous plants comprising applying to the locus of such plants an herbicidally effective amount of a compound of the formula:

(I)

wherein:

n is 0

R is H; and

R^1 is halogen,

said method being substantially innocuous to corn.

5,114,465

SUBSTITUTED PYRIDINE COMPOUNDS AND HERBICIDAL COMPOSITIONS AND METHODS

Robert D. Bryant, St. Louis; Shridhar G. Hegde, Maryland Heights, and Lea F. Lee, St. Charles, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

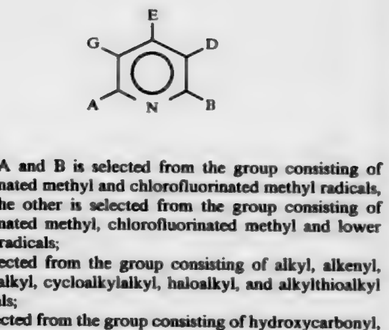
Continuation-in-part of Ser. No. 457,893, Dec. 27, 1989, abandoned. This application Jun. 17, 1991, Ser. No. 716,418

The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.

Int. Cl.[5] A01N *43/40;* C07D *213/75*

U.S. Cl. 71—94 **12 Claims**

9. A method of controlling undesirable vegetation which comprises applying to the plant locus an effective amount of a compound represented by the formula



wherein:

one of A and B is selected from the group consisting of fluorinated methyl and chlorofluorinated methyl radicals, and the other is selected from the group consisting of fluorinated methyl, chlorofluorinated methyl and lower alkyl radicals;

E is selected from the group consisting of alkyl, alkenyl, cycloalkyl, cycloalkylalkyl, haloalkyl, and alkylthioalkyl radicals;

G is selected from the group consisting of hydroxycarbonyl, alkoxycarbonyl, haloalkoxycarbonyl, alkylthiocarbonyl, alkenyloxycarbonyl, alkynyloxycarbonyl, cyano, pyridylthiocarbonyl, aminocarbonyl, monoalkylsubstituted aminocarbonyl, and dialkylsubstituted aminocarbonyl, or is the same as D; and

D is —NHR in which R is selected from the group consisting of 3-halopropylcarbonyl, 4-halobutylcarbonyl, and 2-haloethoxycarbonyl groups, optionally substituted with one or more groups selected from alkyl, fluoro, chloro, bromo, iodo, alkylidene, alkoxy, alkylthio, and haloalkyl radicals.

5,114,466

1-(3-SUBSTITUTED BENZYL)-3-HALOGENO-4-(1-HALOGENO-ALKYL)-2-PYRROLIDINONE DERIVATIVES AND HERBICIDES CONTAINING THEM

Kengo Oda; Koichi Moriyasu; Masao Hayashi; Makoto Nishida; Masami Oyamada; Akie Fujiwara, all of Mobara, and Junko Watanabe, Tokyo, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

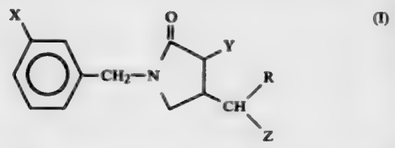
Filed Jun. 6, 1990, Ser. No. 534,060

Claims priority, application Japan, Jun. 14, 1989, 1-149516

Int. Cl.[5] C07D *207/38;* A01N *43/36*

U.S. Cl. 71—94 **15 Claims**

1. A 3,4-cis 1-(3-substituted benzyl)-3-halogeno-4-(1-halogenoalkyl)-2-pyrrolidinone represented by the general formula (I):



(I)

where X represents a hydrogen atom or chlorine atom, Y and Z each represents a chlorine atom and R represents an alkyl group with 2 to 4 carbon atoms.

5,114,467

METHOD FOR MANUFACTURING MAGNETOSTRICTIVE MATERIALS

Eiji Nakamura, and Hiroyuki Mizutani, both of Aichi, Japan, assignors to Sumitomo Light Metal Industries Ltd., Tokyo, Japan

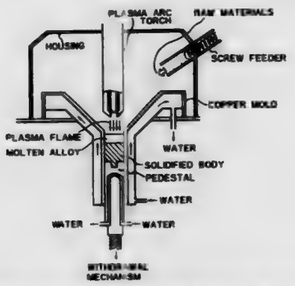
Filed Mar. 22, 1991, Ser. No. 673,555

Int. Cl.[5] C22D *7/00;* C22B *4/00*

U.S. Cl. 75—10.22 **9 Claims**

1. A method for manufacturing rare earth-iron magnetostrictive materials comprising continuously feeding rare earth and iron raw materials into a plasma arc melting furnace having a

plasma arc torch and a water-cooled bottomless elongated mold located beneath the torch, melting the raw materials together by plasma flames to form a pool of a molten alloy of



said rare earth and iron at the top of the mold, removing heat from the melt by water cooling through the mold so as to cause the melt to solidify progressively from the bottom thereof, and continuously pulling down the solidified body in the mold.

5,114,468

CU-BASE SINTERED ALLOY

Hidetoshi Akutsu, Okegawa; Tohru Kohno, and Masato Otsuki, both of Omiya, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

PCT No. PCT/JP89/01098, § 371 Date Mar. 23, 1990, § 102(e) Date Mar. 23, 1990, PCT Pub. No. WO90/04657, PCT Pub. Date May 3, 1990

PCT Filed Oct. 26, 1989, Ser. No. 474,748

Claims priority, application Japan, Oct. 26, 1988, 63-270109; Oct. 26, 1988, 63-270110; Oct. 26, 1988, 63-270111; Nov. 11, 1988, 63-285214

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

Int. Cl.[5] C22C *29/12*

U.S. Cl. 75—234 **28 Claims**

1. A Cu-based sintered alloy comprising a composition which contains on weight basis:

Zn in an amount from 10–40%, Al in an amount from 03.–6%, oxygen in the form of oxides, in an amount from 0.3–1%;

at least one additional element selected from the group consisting of (a) at least one of Fe, Ni and Co in an amount from 0.1–5%, (b) Mn in an amount from 0.1–5%, (c) Si in an amount from 0.1–3% and (d) at least one of W and Mo in an amount from 0.1–3%; and

the remaining consisting of Cu and inevitable impurities;

said alloy having a structure in the matrix of which the oxides are distributed with a granule size ranging from 1 to 40 μm, said intermetallic compounds being distributed with a granular size from 1 to 25 μm.

5,114,469

LOW-TEMPERATURE CONSOLIDATION METAL-BASED COMPOSITIONS AND METHOD

Sam M. Weiman, Cypress, Calif., assignor to General Dynamics Corporation Air Defense Systems Division, Pomona, Calif.

Filed Dec. 10, 1987, Ser. No. 131,497

Int. Cl.[5] C20L *29/12*

U.S. Cl. 75—235 **16 Claims**

1. A process of making substantially nonporous three-component metal articles comprising:

forming a mixture of a first component of one or more low-melting temperature metals or alloys thereof, a second component of one or more high-melting temperature metals or alloys thereof, a third component of one or more refractory compounds in a fine state of subdivision, said first and second components or alloys thereof having low and high melting temperatures, respectively, and said refractory component having a melting temperature about or greater than said melting temperature of said second component or alloys thereof;

heating said mixture until a semi-solid mass forms, and subsequently lowering the temperature below the melting temperature of said first component or alloy thereof, and shaping said mixture while at said temperature; and

raising the temperature above the melting temperature of said first component or alloy thereof and below the melting temperature of said second component or alloy thereof and said refractory third component until said mixture exhibits uniform consistency.

5,114,470

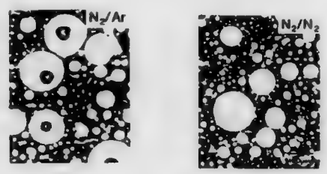
PRODUCING VOID-FREE METAL ALLOY POWDERS BY MELTING AS WELL AS ATOMIZATION UNDER NITROGEN AMHIENT

Francis S. Biancaniello, Gaithersburg, Md.; Gregg N. Janowski, Hoover, Ala., and Stephen D. Ridder, Gaithersburg, Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Oct. 4, 1990, Ser. No. 593,915

Int. Cl.[5] B22D *23/00*; B22F *9/00*

U.S. Cl. 75—338 **22 Claims**



1. A method of producing a nitrogenated metal alloy powder which comprises the following steps:

(a) melting a metal alloy under a nitrogen atmosphere to increase the nitrogen content of said alloy and thereafter

(b) subjecting said molten alloy to a gas atomizing process to produce solid, substantially spherical shaped nitrogenated metal alloy particles, wherein nitrogen is utilized as the atomizing gas in said gas atomizing process and said gas atomization process is controlled so that nitrogen provided to increase said nitrogen content in step (a) is absorbed into the resulting metal alloy particles.

5,114,471

HYDROMETALLURGICAL PROCESS FOR PRODUCING FINELY DIVIDED SPHERICAL MARAGING STEEL POWDERS

Walter A. Johnson, Towanda; Nelson E. Kopatz, Sayre, and Joseph E. Ritsko, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 140,371, Jan. 4, 1988, abandoned. This application Dec. 29, 1988, Ser. No. 291,832

Int. Cl.[5] B22F *9/00*

U.S. Cl. 75—346 **8 Claims**

1. A process for producing a maraging steel powder comprising plasma densified and melt solidified spherical shaped particles having an average particle size less than about 50 micrometers wherein at least 50% of the particles having a size less than about 50 micrometers and having a desirable composition consisting essentially of an alloy wherein said alloy consists essentially of from about 5% to about 20% by weight of cobalt, from about 5% to about 20% by weight of nickel, from about 1% to about 14% by weight of molybdenum, and the balance iron, said process comprising:

a) forming an aqueous solution containing the metal values of iron, cobalt, nickel and molybdenum, said metals being present in a predetermined ratio for forming said maraging steel powder having said desirable composition, said solution comprising a mineral acid,

b) forming from said solution a reducible solid material selected from the group consisting of salts of said metals, hydroxides of said metals and mixtures thereof, said reducible solid material being formed by adjusting the pH of said solution to form said reducible solid material, and separating said reducible solid material from the resulting aqueous phase,

c) obtaining from said reducible solid material, smaller sized particles of said reducible solid material having a particle size less than about 50 micrometers, said smaller sized particles of said reducible solid material being obtained by subjecting said reducible solid material to particle size reduction,

d) heating said smaller sized particles of said reducible solid material in a reducing atmosphere at a temperature above the reducing temperature of said reducible solid material and below the melting point of metals in said smaller sized particles of said reducible solid material to thereby form metallic powder particles,

e) entraining at least a portion of said metallic powder particles in a carrier gas,

f) feeding said entrained metallic powder particles and said carrier gas into a high temperature zone and maintaining said particles in said zone for a sufficient time to melt at least about 50% by weight of said metallic particles, and form droplets therefrom, said carrier gas being an inert gas and said high temperature zone being created by a plasma torch, and

g) cooling said droplets to form essentially spherical shaped maraging steel alloy particles thereby producing a maraging steel powder having said desirable composition.

5,114,472

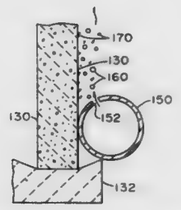
MULTISTAGE RIGID MEDIA FILTER FOR MOLTEN METAL AND METHOD OF FILTERING

C. Edward Eckert, New Kensington; Thomas R. Hornack, Lower Burrell; George E. Lyness, Pittsburgh, all of Pa.; John A. Kaems; Clarence J. Cox, both of Maryville, Tenn.; Ronald E. Miller, Murrysville, Pa.; Diran Apelian, Worcester, Mass., and Rajakkannu Mutharasan, Broomall, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 13, 1990, Ser. No. 627,000

Int. Cl.[5] C22B *9/02*

U.S. Cl. 75—412 **61 Claims**



1. A method of treating molten aluminum containing particles therein to remove particles from the molten aluminum comprising:

(a) passing said molten aluminum through a first rigid filter media having a first surface to remove a fraction of the particles from said molten aluminum;

(b) collecting particles on said first surface as filter cake, particles in the filter cake capable of being removed from said surface by contacting the filter cake with gas bubbles; and

(c) passing said molten aluminum from step (a) through a second rigid filter media to remove particles therefrom having a size generally smaller than the particles removed in step (a).

5,114,473

TRANSITION METAL RECOVERY

Anthony G. Abatjoglou, Charleston, and David R. Bryant, South Charleston, both of W. Va., assignors to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

Filed Aug. 25, 1988, Ser. No. 236,221

Int. Cl.[5] C01G *55/00*

U.S. Cl. 75—722 **17 Claims**

1. A method for recovering Group VIII transition metal from a transition metal-containing liquid which comprises

(i) contacting said transition metal-containing liquid with an ion-exchange resin wherein said resin has a first organophosphorus ligand bonded ionically thereto, to cause transition metal to be removed from the liquid and bound to the resin, and

(ii) thereafter contacting said resin with a liquid containing a sufficient quantity of a second organophosphorus ligand to remove transition metal from the resin.

5,114,474

ARRANGEMENT AND METHOD FOR INTRODUCING WASTE MATERIAL INTO A MOLTEN SLAG

Ludwig Wilhelm, Engen, and Hans Schmidt, Singen, both of Fed. Rep. of Germany, assignors to Georg Fischer AG, Switzerland

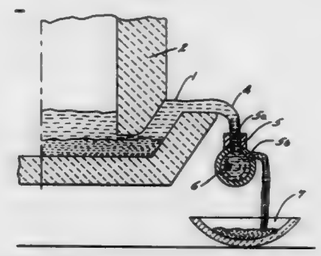
PCT No. PCT/CH90/00189, § 371 Date Apr. 2, 1991, § 102(e) Date Apr. 2, 1991, PCT Pub. No. WO91/02095, PCT Pub. Date Feb. 21, 1991

PCT Filed Aug. 9, 1990, Ser. No. 656,156

Claims priority, application Switzerland, Aug. 9, 1989, 2927/89

Int. Cl.[5] C21C *5/38*

U.S. Cl. 75—751 **8 Claims**



1. A method for the economic and environmentally safe disposal of waste material and molten slag from a cupola furnace comprising the steps of:

siphoning off the slag from a cupola furnace;

continuously feeding said siphoned slag to a mixing vessel;

removing waste material from the off gases of said cupola furnace;

feeding said waste material to said mixing vessel;

mixing said waste material into said slag in said mixing vessel so as to produce a substantially homogeneous mixture of waste material in said slag; and

discharging said homogeneous mixture from said mixing vessel to a collection container.

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5,114,475
METHOD FOR THE PREPARATION OF A FINE-GRAINED MIXTURE HAVING HYDROPHOBIC PROPERTIES

Werner Siegmund, deceased, late of Heiligkreuzsteinach by Gisela Siegmund, executrix ; Wilhelm Kämereit, Düsseldorf; Oskar M. Schmitt, Stolberg; Volker Weidmann, Den Haag, and Otto J. Friedrich, Düsseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 15, 1990, Ser. No. 597,440
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1989, 3934657; May 25, 1990, 4017291; Jun. 21, 1990, 4020009
Int. Cl.[5] C09K *9/12, 3/14*
U.S. Cl. 106—13 **15 Claims**

1. A method of forming a fine-grained hydrophobic mixture having a grain size less than 0.2 mm, comprising mixing or grinding in an amount of at least 50% by weight of the fine-grained hydrophobic mixture and a hydrophilic component with a hydrophobic component, said hydrophilic component comprising a mixture of 55–99.5% by weight of the hydrophilic component of a residual salt resulting from a separation of spent lye from glycerol produced during soap production and 45–0.5% by weight of the hydrophilic component of an additive selected from the group consisting of salts, oxides and hydroxides, and combinations thereof of alkali-earth metals and non-alkali metals, said additive being at least partially ground and having a moisture content which results in a free-flowing granulate after mixing.

5,114,476
CHRISTMAS TREE FIRE-RETARDANT COMPOSITIONS

J. E. McGill, 14661 Frenchtown Rd., Brownsville, Calif. 95919

Filed Jan. 28, 1991, Ser. No. 646,404
Int. Cl.[5] C09D *5/18*
U.S. Cl. 106—18.12 **7 Claims**

1. A fire-retardant composition for application to Christmas trees, boughs or wreaths comprising by volume:

(A) Alkali metal silicate	28–65%
(B) Corn syrup	6–28%
(C) Water	10–45%
(D) Wetting agent	.01–1%
(E) Calcium halide	.01–1%.

5,114,477
LIQUID INK COMPOSITIONS

Joseph Mort, and Mary A. Machonkin, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 3, 1991, Ser. No. 754,084
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—20 **21 Claims**

1. An ink composition which comprises an aqueous or organic liquid vehicle, and as a colorant a fullerene, or a mixture of fullerenes.

5,114,478
HOMOGENOUS INK COMPOSITION

Judith Auslander, Westport, Conn.; Norman C. Hochwalt, West Carrollton, Ohio, and Thiagaraj Sarada, Norwalk, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 7, 1991, Ser. No. 637,713
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—20 **6 Claims**

1. A homogeneous ink composition comprising: 5% to 25% glycol having a low vapor pressure of <1 mm Hg at ambient, a polarity expressed as Hildebrand solubility parameter >9, 15% to 35% non ionic surfactant with a viscosity <100 cps and an HLB between 3 and 15, 3% to 5% non volatile polar solvent having a viscosity of <10 cps, a boiling point $>230°$ C. and being inert to rubber, 20% to 50% resin, 0.3% to 5% fluorescent dye and less than 0.1% non fluorescent dye.

5,114,479
DYE-LATEX COMBINATIONS AND USE IN AQUEOUS INKS

William P. Keaveney, Pompton Plains, and Reinhard J. Sappok, Montclair, both of N.J., assignors to BASF Corporation, Parsippany, N.J.

Filed Jun. 29, 1990, Ser. No. 546,115
Int. Cl.[5] C09D *11/08, 11/02;* **C08L** *9/10*
U.S. Cl. 106—30 **5 Claims**

1. An aqueous ink composition comprising an oil-soluble dye selected from the group consisting of solvent dyes, dispersed dyes and basic dyes dispersed in a fortified latex comprising a blend of a distinct dispersed polymer phase in a distinct soluble polymer phase.

5,114,480
INTERNAL MOULD RELEASE COMPOSITIONS

Edward F. Cassidy, Brussels, Belgium; Herbert R. Gillis, Sterling Heights, Mich.; Malcolm Hannaby, Leuven, and Alain Parfondry, Evere, both of Belgium, assignors to Imperial Chemical Industries plc, London, England

Division of Ser. No. 331,402, Mar. 30, 1989, Pat. No. 5,055,134, which is a continuation-in-part of Ser. No. 287,940, Dec. 21, 1988, Pat. No. 4,983,659, which is a continuation-in-part of Ser. No. 160,647, Feb. 26, 1988, Pat. No. 4,794,129, which is a continuation-in-part of Ser. No. 105,641, Oct. 6, 1987, abandoned. This application Jul. 18, 1991, Ser. No. 731,964
Claims priority, application United Kingdom, Mar. 31, 1988, 8807654
Int. Cl.[5] B29C *33/56, 33/60*
U.S. Cl. 106—38.24 **6 Claims**

1. An isocyanate-reactive composition comprising at least one compound having a plurality of isocyanate-reactive groups having dissolved or dispersed therein an effective amount of an internal mould release composition comprising:
(a) a metal salt of an organic acid, said metal salt having mould release properties, and
(b) a compatibilising amount of an amidine or imidate compound or mixture thereof of formula (1)



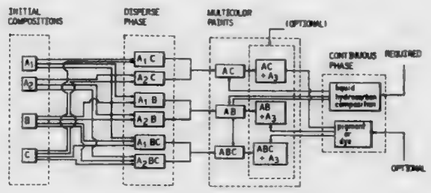
(1)

wherein X represents O, S or NR^1 and wherein each of R^1 to R^4, independently or together represents H or an organic radical, selected from:
(a) alkyl radicals
(b) cyclo alkyl radicals
(c) aralkyl radicals and aryl radicals and
(d) polymeric chains containing hetero atoms
and wherein the metal salt in the mould release composition is incompatible with the compound having a plurality of isocyanate-reactive groups in the absence of the amidine or imidate compound(s) of formula (1), under the conditions of preparation and processing employed for said isocyanate reactive composition.

5,114,481
AEROSOL-TYPE, SPRAYABLE, WATER-IN-LIQUID HYDROCARBON MULTICOLOR PAINT AND PROCESS FOR MAKING

James F. Lynch, Schaumburg, Ill., assignor to Multicolor Specialties, Inc., Cicero, Ill.

Filed Sep. 21, 1990, Ser. No. 586,342
Int. Cl.[5] C09D *5/29*
U.S. Cl. 106—170 **16 Claims**



1. A method for making a multicolor water-in-liquid hydrocarbon paint comprising the steps of:
(A) providing a first composition comprising on a 100 weight percent basis:
(a) about 10 to about 40 weight percent dissolved, water dispersable, film-forming, crosslinkable, carboxylated polymer,
(b) about 0.5 to about 2 weight percent dissolved hydroxy (lower alkyl) cellulose,
(c) about 0.5 to about 10 weight percent dissolved crosslinking agent selected from the group consisting of polyfunctional aziridines and multifunctional carbodiimides,
(d) from and including 0 to about 30 weight percent dispersed pigment,
(e) from and including 0 to about 10 weight percent organic cosolvent, and
(f) about 44.4 to about 65.8 weight percent water;
(B) providing a second composition comprising on a 100 weight percent basis:
(a) about 0.5 to about 5 weight percent dissolved cationic quaternized cellulose ether, and
(b) about 95 to about 99.5 weight percent water;
(C) providing a third composition comprising on a 100 weight percent basis:
(a) about 0.5 to about 2 weight percent dissolved peptizing agent,
(b) about 5 to about 10 weight percent dispersed water swellable clay, and
(c) about 88 to about 95 weight percent water;
(D) blending said first composition with a composition selected from the group consisting of:
(a) said second composition in the weight ratio range of about 85:15 to about 80:20 of said first composition to said second composition,
(b) said third composition in the weight ratio range of about 85:15 to about 80:20 of said first composition to said third composition, and
(c) a combination of said second composition and said third composition in the weight ratio range of about 70:15:15 to about 80:10:10 of said first composition to said second composition to said third composition
so as to produce a first disperse phase gel composition having a viscosity in the range of about 25,000 to about 85,000 centipoises;
(E) mixing said first disperse phase gel composition with a continuous uniform hydrocarbon liquid phase composition comprising on a 100 weight percent basis:
(a) about 2 to about 20 weight percent film-forming polymer,
(b) about 0.5 to about 5 weight percent thickener,
(c) about 0 to about 1.5 weight percent wax,
(d) about 0 to about 10 weight percent pigment, and
(e) about 68 to about 96 weight percent liquid hydrocarbon
and said hydrocarbon liquid phase composition having a viscosity in the range of about 5000 to about 7000 centipoises, the mixing shear force used in said mixing being sufficient to break up said first disperse phase gel composition into discrete gel bodies dispersed in said continuous uniform hydrocarbon liquid phase composition, said mixing shear force being inversely proportional to the average size of said discrete bodies, thereby to produce said multicolor paint.

5,114,482
SKI WAX FOR USE WITH SINTERED BASE SNOW SKIS

Terry A. Hertel, P.O. Box A, Cupertino, Calif. 95015

Filed Mar. 2, 1990, Ser. No. 487,424
Int. Cl.[5] C08L *91/06;* **C09D** *4/00, 101/60*
U.S. Cl. 106—270 **19 Claims**

1. A liquid ski wax composition for use on sintered base skis which comprises a lubricity increasing effective amount of a perfluoropolyether diol and a liquid vehicle compatible with the perfluoropolyether diol so as to provide as a single phase system wherein said vehicle is employed from about 80 to about 99 weight percent based on the weight of the ski wax composition and further wherein the perfluoropolyether diol is employed from about 1 to about 5 weight percent based on the weight of the ski wax composition.

5,114,483
OPEN-GRADED ASPHALT

Peter E. Graf, Orinda, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 925,334, Oct. 31, 1986. This application Jul. 14, 1988, Ser. No. 219,112
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.[5] C08L *95/00*
U.S. Cl. 106—281.1 **11 Claims**

1. A paving composition comprising about 80 to 97% by weight of an open-graded aggregate and about 3 to 20% asphalt, said composition being formed by successively mixing two asphalt-containing emulsions A and B with said aggregate wherein:
emulsion A comprises about 40 to 75% by weight of a soft asphalt having a viscosity in the range of 50 to 1000 centistokes at 210° F. and 0.05 to 5% by weight of an emulsifier, and water as a continuous phase of said emulsion A to make up 100% by weight; and
emulsion B comprises about 40 to 75% by weight of a hard asphalt having a penetration of 5 to 25 dmm at 77° F. and 0.05 to 5% by weight of an emulsifier, and water as a continuous phase of said emulsion B to make up 100% by weight and wherein said emulsifier in emulsion A and emulsion B is a cationic or anionic emulsifier.

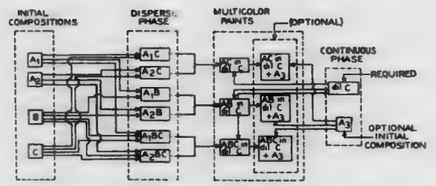
5,114,484
WATER-IN-WATER MULTICOLOR PAINT AND PROCESS FOR MAKING SAME

James F. Lynch, Schaumburg, Ill., assignor to Multicolor Specialties, Inc., Cicero, Ill.

Filed Sep. 21, 1990, Ser. No. 586,762
Int. Cl.[5] C09D *5/29*
U.S. Cl. 106—170 **17 Claims**

1. A method for making a multicolor water-in-water paint comprising the steps of:
(A) providing a first composition comprising on a 100 weight percent basis:
(a) about 10 to about 40 weight percent dissolved, water dispersable, film-forming, crosslinkable, carboxylated polymer,

(b) about 0.5 to about 2 weight percent dissolved hydroxy (lower alkyl) cellulose,
(c) about 0.5 to about 10 weight percent dissolved crosslinking agent selected from the group consisting of polyfunctional azir dines and multifunctional carbodiimides,
(d) about 0 to about 30 weight percent dispersed pigment,
(e) about 0 to about 10 weight percent organic cosolvent, and
(f) about 44.4 to about 65.8 weight percent water;
(B) providing a second composition comprising on a 100 weight percent basis:
(a) about 0.5 to about 5 weight percent dissolved cationic quaternized cellulose ether, and
(b) about 95 to about 99.5 weight percent water;
(C) providing a third composition comprising on a 100 weight percent basis:
(a) about 0.5 to about 2 weight percent dissolved peptizing agent,
(b) about 5 to about 10 weight percent dispersed water swellable clay, and
(c) about 88 to about 95 weight percent water;
(D) blending said first composition with a composition selected from the group consisting of:
(a) said second composition in the weight ratio range of

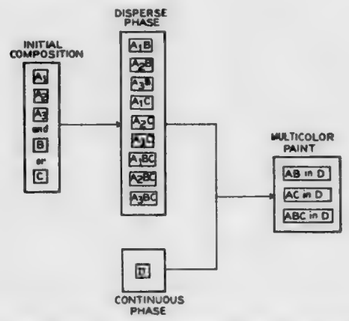


about 85:15 through about 80:20 of said first composition to said second composition,
(b) said third composition in the weight ratio range of about 85:15 to about 80:20 of said first composition to said third composition, and
(c) a combination of said second composition and said third composition in the weight ration range of about 70:15:15 to about 80:10:10 of said first composition to said second composition to said third composition so as to produce a first disperse phase gel composition having a viscosity in the range of about 25,000 to about 85,000 centipoises;
(E) mixing said disperse phase gel composition with a continuous aqueous liquid phase composition comprised of components as in said third composition except that the amount of water present therein is approximately twice that employed in said third composition so that the ration of the viscosity of said continuous aqueous phase composition to the viscosity of said disperse phase composition is in the range of about 1:500 to about 1:100, the mixing shear force used in said mixing being sufficient to break up said disperse phase gel composition into discrete gel bodies dispersed in said continuous aqueous phase, said mixing shear force being inversely proportional to the average size of said so formed disperse phase bodies, thereby to produce said multicolor paint.

5,114,485
WATER-IN-WATER MULTICOLOR PAINT AND METHOD

James F. Lynch, Schaumburg, and John Predkelis, Glen-Ellyn, both of Ill., assignors to Multicolor Specialties, Inc., Cicero, Ill.

Continuation-in-part of Ser. No. 586,762, Sep. 21, 1990. This application May 1, 1991, Ser. No. 694,311
Int. Cl.[5] C09D *5/29*
U.S. Cl. 106—311 **19 Claims**



1. A method for making a water-in-water multicolor paint comprising the steps of:
(A) providing a first composition comprising on a 100 weight percent basis:
(a) about 10 to about 40 weight percent dissolved, water dispersable, film-forming, crosslinkable, carboxylated polymer,
(b) about 0.5 to about 2 weight percent dissolved hydroxy (lower alkyl) cellulose,
(c) about 0.5 to about 10 weight percent dissolved crosslinking agent selected from the group consisting of polyfunctional aziridines and multifunctional carbodiimides,
(d) about 0 to about 30 weight percent dispersed pigment,
(e) about 0 to about 10 weight percent organic cosolvent, and
(f) about 20 to about 80 weight percent water;
(B) providing a second composition comprising on a 100 weight percent basis:
(a) about 0.5 to about 5 weight percent dissolved cationic quaternized cellulose ether, and
(b) about 95 to about 99.5 weight percent water;
(C) providing a third composition comprising on a 100 weight percent basis:
(a) about 0.5 to about 2 weight percent dissolved peptizing agent,
(b) about 5 to about 10 weight percent dispersed water swellable clay, and
(c) about 88 to about 95 weight percent water;
(D) providing a further composition comprising on a 100 weight percent basis:
(a) about 2 to about 5 weight percent dispersed water swellable clay,
(b) about 0.1 to about 0.75 weight percent dissolved peptizing agent,
(c) about 30 to about 60 weight percent water dispersable, film-forming, crosslinkable, carboxylated polymer,
(d) about 0.05 to about 0.2 weight percent anti-foaming agent,
(e) about 0.05 to about 0.2 weight percent wetting agent,
(f) about 1 to about 5 weight percent silica,
(g) about 0.01 to about 0.25 weight percent organofunctional silane,
(h) about 0.5 to about 3 weight percent organic co-solvent, and

(i) about 35 to about 65 weight percent water, said fourth composition having a viscosity in the range of about 3,000 to about 7,000 centipoises;
(E) blending said first composition with a composition selected from the group consisting of:
(a) said second composition in the weight ratio range of about 85:15 through about 80:20 of said first composition to said second composition,
(b) said third composition in the weight ration range of about 85:15 through about 80:20 of said first composition to said third composition, and
(c) a combination of said second composition and said third composition in the weight ratio range of about 70:15:15 to about 80:10:10 of said first composition to said
second composition to said third composition so as to produce a first disperse phase gel composition having a viscosity in the range of about 25,000 to about 85,000 centipoises; and
(F) mixing said first disperse phase gel composition with said fourth composition so that the ratio of the viscosity of said fourth composition to the viscosity of said first disperse phase composition is in the range of about 1:5 to about 1:10, the mixing shear force used in said mixing being sufficient to break up said first disperse phase gel composition into discrete gel bodies dispersed in said fourth composition said mixing shear force being inversely proportional to the average size of said so formed disperse phase bodies, thereby to produce said multicolor paint.

5,114,486
PIGMENTS

Maria Demostheaous, Calais, and Francis Van Meyel, Marck, both of France, assignors to Tioxide Group PLC, England

Filed Mar. 26, 1991, Ser. No. 674,955
Claims priority, application United Kingdom, Apr. 4, 1990, 9007602
Int. Cl.[5] D05B *3/02*
U.S. Cl. 106—443 **12 Claims**

1. A process for the production of a pigment comprising forming an aqueous dispersion of a titanium dioxide pigment containing a water soluble salt of zinc and a phosphate or phosphoric acid, adding to the dispersion an alkaline solution of an alkali metal aluminate to precipitate a coating containing zinc and phosphate ions and maintaining the pH of the dispersion during precipitation of the coatings at a value not exceeding 8.0.

5,114,487
CEMENTITIOUS COMPOSITION AND MAKING CONCRETE THEREFROM

Gavin C. Gartshore, Sevenoaks, and Norman E. Holme, Wilmslow Cheshire, both of United Kingdom, assignors to Blue Circle Industries PLC and ALH Systems Limited, United Kingdom

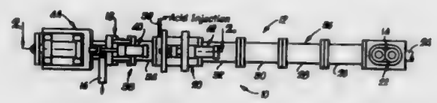
Filed Jan. 25, 1991, Ser. No. 646,155
Claims priority, application United Kingdom, Jan. 26, 1990, 9001799
Int. Cl.[5] C04B *7/32, 11/28*
U.S. Cl. 106—695 **16 Claims**

1. A cementitious composition, which consists essentially of (a) a ground sulfoaluminous cement clinker; (b) 1 to 5 parts by weight, per part by weight of component (a), of a ground Portland cement clinker having a fineness equivalent to a specific surface of at least 450 m^2/kg; (c) 0.25 to 0.5 part by weight, per part by weight of component (a), of calcium sulfate; (d) 1 to 4 parts by weight, per part by weight of component (a), of fine aggregate and 4 to 8 parts by weight, per part by weight of component (a), of coarse aggregate; (e) ferrous metal fibre in an amount of 1 to 5%, by weight, of the total composition on a dry weight basis; (f) a plasticizer in an amount of from 0.25 to 1% by weight of the total composition on a dry weight basis; (g) a hardening or setting accelerator in an amount of up to 5% by weight of the composition on a dry weight basis; and (h) a set-controlling agent in an amount of 0.01 to 0.02% by weight of the total composition on a dry weight basis.

5,114,488
EXTRUSION METHOD AND APPARATUS FOR ACID TREATMENT OF CELLULOSIC MATERIALS

Gordon R. Huber; LaVon G. Wenger; Bobbie W. Hauck; Galen J. Rokey, all of Sabetha; Lawrence E. Schmeizle, Oneida, and Timothy R. Hartter, Sabetha, all of Kans., assignors to Wenger Manufacturing, Inc., Sabetha, Kans.

Continuation of Ser. No. 135,692, Dec. 21, 1987, abandoned, which is a continuation of Ser. No. 914,553, Oct. 1, 1986, Pat. No. 4,728,367, which is a continuation of Ser. No. 697,416, Jan. 31, 1985, abandoned, which is a continuation of Ser. No. 467,878, Feb. 18, 1983, abandoned. This application Dec. 5, 1988, Ser. No. 279,852
The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.
Int. Cl.[5] B01J *3/00*
U.S. Cl. 127—1 **5 Claims**



1. Apparatus for the processing of materials, comprising:
an elongated tubular member including an inlet end for receiving material to be processed, and an outlet end downstream of said inlet end, said member presenting an interior and an inner surface along the length thereof;
an elongated, axially rotatable flighted screw situated within and extending along said member,
said screw being configured for transporting, working and elevating the temperature of said material during passage of the material along the length of the screw;
injection means fluidically connected with the interior of said member for injecting a processing agent into the interior of said member downstream of said inlet end;
die means adjacent said outlet end of said member and oriented for receiving said material in at least a partially processed condition and at an elevated temperature and pressure, and delivering said process material to said outlet end,
said die means including walls defining an orifice, and poppet means separate from said flighted screw and adjacent to and normally in a partial flow-blocking relationship with said orifice,
said poppet means having an exterior surface which, in cooperation with said orifice-defining walls, presents a material flow passageway between the exterior surface of the poppet means and the orifice-defining walls;
motor means operatively coupled with said die means for selective translational shifting of the poppet means or said orifice-defining walls in order to selectively vary the size of said material flow passageway.

5,114,489
MEANS FOR PRODUCING A HIGH BRIX SUGAR LIQUID

Ted D. Milner, Westminster, and Robert V. Zimmerman, Denver, both of Colo., assignors to Silver Engineering Works, Inc., Aurora, Colo.

Filed Nov. 29, 1990, Ser. No. 619,645
Int. Cl.[5] C13F *1/06*
U.S. Cl. 127—2 **13 Claims**

12. A centrifuge comprising means for producing a high brix

sugar liquid, which centrifuge has a magma mixing ring, said means comprising:

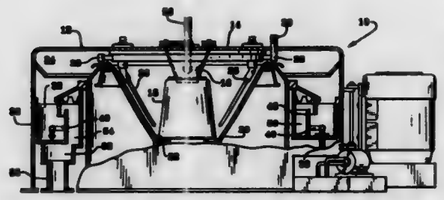
first means, for disposition thereof (a) below the mixing ring of the centrifuge, and (b) external of and circumjacent the rotating basket of the centrifuge, for receiving therein magma from said ring;

second means, coupled to said first means, for (a) agitating the magma received from said ring, and (b) melting sugar crystals, in the received magma, to a high brix sugar liquid;

third means, coupled to said first means, for receiving therein such high brix sugar liquid from said first means; and

means for discharging the sugar liquid from said third means; wherein

said first means comprises an annular compartment for receiving the magma;



said second means comprises means for setting the magma, received in said annular compartment, into a circular motion within said compartment;

said third means comprises a second annular compartment, joined to said magma-receiving compartment;

both of said compartments have a common wall, over which wall such high brix sugar liquid, produced from melted sugar crystals, can flow into said second compartment;

said sugar liquid discharging means comprises a sub-compartment, which opens onto said second annular compartment, and a depending discharge pipe which opens onto said sub-compartment; and

said discharging means further comprises means interposed between said sub-compartment and said second annular compartment for slowing a discharge of the sugar liquid from said second annular compartment to said sub-compartment.

5,114,490

APPARATUS FOR CONTROL OF SUGARCANE HALF-BILLETS

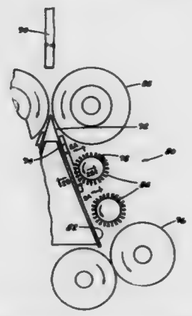
Sydney E. Tilby, 4688 Boulderwood Dr., Victoria, B.C., Canada V8Y 2P8

Filed Jan. 4, 1991, Ser. No. 637,470
Int. Cl.[5] B02C *23/02*
U.S. Cl. 127—2 **15 Claims**

1. In sugarcane separation apparatus having means to feed billets onto and over a blade to form half billets, a substantially planar slide extending from the blade in a first direction toward a depithing means, and roll means upstream of the depithing means and adjacent to the slide for half-billet control, the improvement wherein the roll means comprises:

at least one rotatably-mounted billet guide roll in proximity to the slide and transverse to the first direction, the guide roll having annular flexible projections substantially parallel to the first direction, substantially perpendicular to the slide, and spaced apart by a distance substantially less than the average billet diameter,

whereby half billets moving along the slide nestle between projections and are thereby oriented and reoriented as necessary to align their longitudinal axes parallel to the first direction.

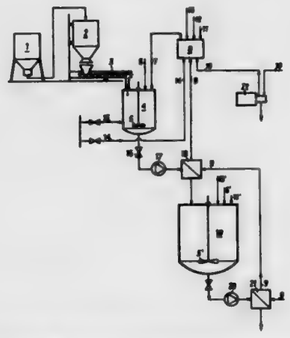


5,114,491

METHOD FOR HYDROLYZING STARCH TO PRODUCE SACCHARIFIED MASH

Schahroch Sarhaddar, Vienna, Austria, assignor to Vogelbusch GmbH, Vienna, Austria

Continuation of Ser. No. 636,016, Jan. 4, 1991, abandoned, which is a continuation of Ser. No. 14,124, Feb. 2, 1987, abandoned, which is a continuation of Ser. No. 616,482, Jun. 1, 1984, abandoned. This application Aug. 7, 1991, Ser. No. 741,987
Claims priority, application Austria, Jun. 9, 1983, 2108/83
Int. Cl.[5] C13K *1/06*
U.S. Cl. 127—38 **7 Claims**



1. A method for hydrolyzing amylaceous grains to produce saccharified mash; comprising the steps of:

providing an aqueous take-up liquor at a temperature between 85° and 100°;

directly and continuously adding, under agitation, raw untreated amylaceous grains to the liquor for gelatinizing the grains at atmospheric pressure and at said temperature range between 85° and 100°;

introducing a solubilizing enzyme to the liquor after commencing said adding step of raw untreated amylaceous grains to provide a hydrolyzed mixture, with said adding step being continued during and after introduction of the solubilizing enzyme; and

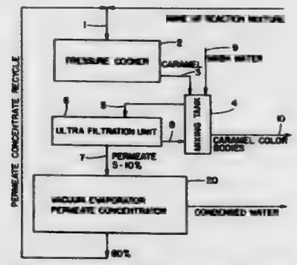
withdrawing and cooling the hydrolyzed mixture to a temperature from at least 60° to 65° before being fed for saccharification.

5,114,492

PROCESS FOR SEPARATING CARAMEL COLORS

Peter A. Wolf, South Salem, N.Y., and Setlur R. Ramaswamy, Louisville, Ky., assignors to PepsiCo Inc., Purchase, N.Y.

Filed Aug. 24, 1990, Ser. No. 572,717
Int. Cl.[5] C13D *3/16*; C13J *1/08*
U.S. Cl. 127—42 **7 Claims**



1. A continuous process for producing ammonium sulphite caramel color having an acceptable flavor for beverage and food use which comprises caramelizing a carbohydrate solution to form high molecular weight color bodies, subjecting said caramelized solution to ultrafiltration through a semi-permeable membrane to give a permeated fraction and a retained fraction, said retained fraction comprising the high molecular weight color bodies, removing the color bodies, recovering the permeate, concentrating the permeate to at least 30% solids, adding fresh make-up reaction mixture to the reclaimed and concentrated permeate at least in an amount sufficient to make-up for the reaction mixture removed as color, recaramelizing the concentrated permeate and make-up reaction mixture to produce color bodies of acceptable flavor for beverage use, and repeating the color separation, recycle, and make-up steps a plurality of times.

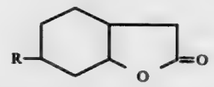
5,114,493

SMOKING COMPOSITIONS CONTAINING A HEXAHYDROBENZOFURANONE FLAVORANT

Kenneth F. Podraza, Richmond, Va., assignor to Philip Morris Inc., New York, N.Y. and Philip Morris Products Inc., Richmond, Va.

Filed Nov. 2, 1988, Ser. No. 266,161
Int. Cl.[5] A24B *3/12*; C07D *307/02, 407/00, 305/12*
U.S. Cl. 131—276 **16 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and tobacco substitutes, and (2) between about 0.0001–5 weight percent, based on the total weight of filler, of a hexahydrobenzofuranone flavorant additive corresponding to the formula:



where R is a C_1–C_6 alkyl, C_1–C_4 alkylphenyl or C_1–C_4 alkoxyphenyl substituent.

5,114,494

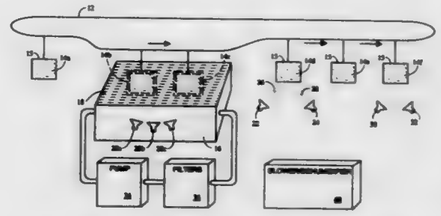
MASK WASHING SYSTEM AND METHOD

Thomas M. Remec, Des Plaines, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed May 2, 1990, Ser. No. 517,997
Int. Cl.[5] B08B *9/00*
U.S. Cl. 134—1 **37 Claims**

1. A method for cleaning a cathode ray tube (CRT) shadow mask contaminated by a cross-linked polymer film adhering tenaciously thereto as a result of CRT phosphor screen manufacturing processes, the cleaning taking place prior to mask installation in the CRT, and wherein the shadow mask includes a large number of small, closely spaced apertures therein, the method comprising the steps of:

washing the shadow mask in an ultrasonic bath, by placing the shadow mask in a cleaning solution containing a chemically active agent capable of degrading the bonds of the polymer film by chemical action;



directing pressure waves of said solution onto the shadow mask thereby removing the polymer film from the shadow mask;

rinsing the shadow mask with water; and

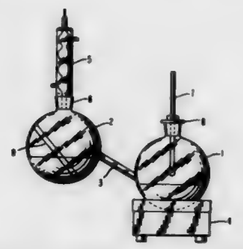
directing an air flow on the shadow mask for drying the shadow mask.

5,114,495

USE OF AZEOTROPIC COMPOSITIONS IN VAPOR DEGREASING

Eric L. Mainz, Colwich, Kans., assignor to Vulcan Materials Company, Wichita, Kans.

Filed Feb. 4, 1991, Ser. No. 650,201
Int. Cl.[5] B08B *5/00, 3/05*
U.S. Cl. 134—11 **7 Claims**



1. A process for removing both hydrophobic and water-soluble soil from the surface of solid articles by vapor phase degreasing in a degreasing zone having a boiling sump in a lower portion thereof containing a lower liquid layer consisting essentially of perchloroethylene and an upper liquid layer consisting essentially of water and a vapor space thereabove, which process comprises introducing the soiled solid articles into the vapor space of the degreasing zone at a temperature below the boiling of the perchloroethylene-water vapor mixture formed therein, heating said liquid perchloroethylene and water in the sump to a boil thereby forming an azeotropic vapor mixture consisting essentially of perchloroethylene and water which condenses in the vapor space on the soiled articles located therein thereby cleaning them, and returning the resulting liquid condensate containing the removed soil to the boiling sump for further evaporation.

5,114,496

METHOD OF CLEANING WORKPIECES AND AN APPARATUS FOR CARRYING OUT THE METHOD

Vladimir V. Bordunov, prospekt Akademicheskiy, 11, kv. 25; Leonid N. Karmadonov, ulitsa Ust-Kerepit, 104, kv. 1; Jury M. Ospischev, pereulok Miray, 17, kv. 1; Vladimir A. Fedjunin, ulitsa Kosharnikova, 7, kv. 60; Sergei P. Zhuravkov, ulitsa 30 let Pobedy, 3, komnata 712; Evgeny A. Cherepenko, ulitsa Lazo, 20, kv. 57, all of Tomsk; Anatoly B. Sviridov, Krasny prospekt, 87/2, kv. 62, Novosibirsk; Lev S. Verkhorubov, ulitsa Udmurtskaya, 255, kv. 184; Arkady T. Mikhailov, ulitsa Dzerzhinskaya, 61, kv. 29, both of Izhevsk; Jury L. Bakhmutov, ulitsa Glazovskaya, 3, kv. 8, and Valery S. Shaidurov, ulitsa Kirovogradskaya, 75, kv. 18, both of Perm, all of U.S.S.R.

PCT No. PCT/SU88/00075, § 371 Date Dec. 4, 1989, § 102(e) Date Dec. 4, 1989, PCT Pub. No. WO89/09099, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 29, 1988, Ser. No. 445,725

Int. Cl.[5] B08B *5/04*

U.S. Cl. 134—13 **7 Claims**

1. A method of cleaning workpieces to remove petroleum products and solid impurities by treating the surface of said workpieces with a circulating solvent, drying the cleaned workpieces, regenerating a spent solvent and recovering solvent vapors, said method comprising treating the surface of said workpieces with a melt of a solvent accompanied by crystallization of said solvent on the surface of said workpieces, subsequently melting said solvent, cooling said spent solvent to a temperature close to the melting point of the solvent to allow it to settle into two layers; an upper layer containing petroleum products, light solid impurities and a quantity of the solvent, and a lower layer containing the solvent, heavy solid impurities and a quantity of petroleum product; cooling the upper layer to complete crystallization of the solvent therein, separating petroleum products therefrom, melting crystals of the solvent and adding them to the lower layer from which the solvent is separated and recycled for cleaning the workpieces, and drying the light solid impurities of the upper layer and heavy solid impurities of the lower layer to separate solvent, and recycling the solvent for cleaning workpieces.

5,114,497

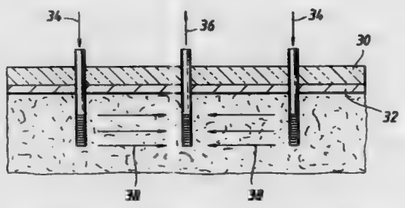
SOIL DECONTAMINATION

Paul C. Johnson, Sugarland; James D. Colthart, Houston; Arthur L. Otermat, Houston; David A. Weingaertner, Houston; Charles C. Chou, Houston; Dallas L. Byers, Katy; Stephen M. Stearns, Richmond; Arnold R. Marsden, Jr., and George M. Deeley, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 26, 1991, Ser. No. 675,377

Int. Cl.[5] B08B *5/00*; B09B *3/00*; E21B *43/16, 43/24*

U.S. Cl. 134—21 **7 Claims**



1. A process for the remediation of soil containing organic or semi-volatile inorganic contaminants which comprises the steps of:

applying thermal energy to said soil by a heating means;

transferring a portion of said thermal energy to one or more heat transfer means comprising soil-free vertical passages extending downwardly from the surface of said soil from about 1 foot to about 4 feet;

vaporizing a portion of said contaminants;

collecting the vapors resulting from the application of said thermal energy, said collecting being performed by one or more soil-free vertical passages extending upwardly through the soil from below the surface of the soil and removed from said heat transfer passages, said collecting passages operating at reduced pressure;

separating the environmentally undesirable portion of said collected vapors; and

passing the remainder of said collected vapors to the atmosphere at or above the surface of said soil.

5,114,498

PHOTOVOLTAIC DEVICE

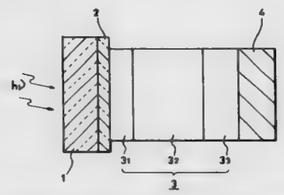
Shingo Okamoto; Tsuyoshi Takahama; Masato Nishikuni, and Shoichi Nakano, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Mar. 30, 1990, Ser. No. 502,837

Claims priority, application Japan, Mar. 31, 1989, 1-83104

Int. Cl.[5] H01L *31/075*

U.S. Cl. 136—258 **9 Claims**



1. A photovoltaic device comprising a substrate having a conductive electrode, and a first semiconductor layer of a first conductivity type consisting of a single layer, a substantially intrinsic second semiconductor layer and a third semiconductor layer of a conductivity type opposite to the first conductivity type, deposited successively on said conductive surface, said first and second semiconductor layers each having a hydrogen content of 10% or less, and wherein at least said second semiconductor layer is formed of an amorphous semiconductor material.

5,114,499

METHOD OF FORMING CHILLED LAYER

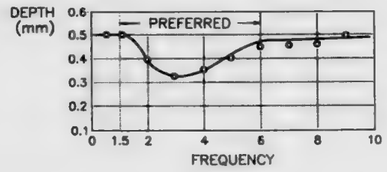
Hiroaki Kusunoki, Otake, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 4, 1991, Ser. No. 664,137

Claims priority, application Japan, Mar. 5, 1990, 2-53100; May 21, 1990, 2-131640

Int. Cl.[5] C21D *1/09*

U.S. Cl. 148—512 **1 Claim**



1. A method of forming a chilled layer in a surface of a workpiece comprising the steps of:

directing an energy beam to remelt the surface with heat so as to form a molten metal layer in the surface;

applying an alternating current having a frequency in the range of approximately one and one half to six Hz to an electromagnetic coil to generate a magnetic field coaxial with said energy beam so as to cause said energy beam to flare, thereby agitating molten metal of the molten metal layer;

causing a predetermined reciprocating movement of said energy beam relative to the surface during remelting of the surface so as to cause a flow of the molten metal from extreme sides of the molten metal layer toward a center of the molten metal layer, thereby providing the molten metal layer with a substantially uniform depth; and

cooling and hardening the molten metal, thereby forming a chilled layer of uniform thickness.

5,114,500

NITRIDING FURNACE APPARATUS AND METHOD

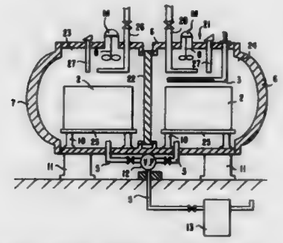
Masaaki Tahara, Takatsuki; Haruo Senbokuya, Tondabayashi; Kenzo Kitano, Kawachinagano, and Teruo Minato, Hashimoto, all of Japan, assignors to Daidousanso Company Ltd., Osaka, Japan

Filed Jul. 31, 1990, Ser. No. 560,694

Claims priority, application Japan, Dec. 22, 1989, 1-333425

Int. Cl.[5] C21D *1/48*

U.S. Cl. 148—230 **4 Claims**



1. A nitriding furnace apparatus, comprising:

a furnace body having an interior;

a heating apparatus disposed in said furnace body;

an openable and closeable center wall for selectably dividing said interior of said furnace body into two regions, one of said two regions comprising a nitriding chamber and the other one of said two regions comprising a pretreating chamber;

fluorinated gas supply means for supplying fluorinated gas to said pretreating chamber;

nitriding gas supply means for supplying nitriding gas to said nitriding chamber;

gas removing means for withdrawing gas from said nitriding chamber and from said pretreating chamber;

a support frame for supporting articles to be treated, said support frame being selectively movable between said two chambers;

wherein the articles to be treated initially are supported on said support frame in said pretreating chamber, and fluorinated gas is supplied to said pretreating chamber while said center wall is disposed such that it closes said pretreating chamber from said nitriding chamber; after pretreating, said fluorinated gas being removed by said gas removing means, after which said center wall is opened so that said support frame can be moved into said nitriding chamber; said center wall being closed and nitriding gas being supplied to said nitriding chamber by said nitriding gas supply means to nitride the articles; whereby a fluorinated layer is deposited in said interior of said furnace body substantially only in said pretreating chamber, so that removal of said fluorinated layer is unnecessary during subsequent cycles of pretreating in said pretreating chamber, thereby conserving fluorinating gas.

5,114,501

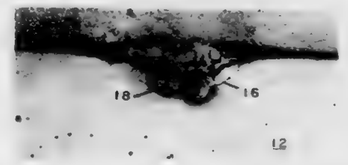
METHOD EMPLOYING SKIN-PASS ROLLING TO ENHANCE THE QUALITY OF PHOSPHOROUS-STRIPED SILICON STEEL

S. Leslie Ames, Sarver, and Jeffrey M. Breznak, Springdale, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Division of Ser. No. 435,142, Nov. 9, 1989, Pat. No. 5,041,170. This application Apr. 4, 1991, Ser. No. 680,230

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—117 **5 Claims**



1. A method of providing a smooth surface on cube-on-edge grain-oriented silicon steel sheet having an insulation base coating thereon and having refined magnetic domain wall spacing by the use of metallic contaminants, the method comprising:

skin pass rolling the domain-refined sheet having the contaminants therein with rolling pressure to smooth the surface of the sheet by rolling the contaminants into the steel;

thereafter stress relief annealing the sheet to effect a core loss value.

5,114,502

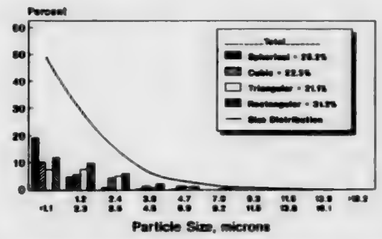
MAGNETIC MATERIALS AND PROCESS FOR PRODUCING THE SAME

Yakov Bogatin, Philadelphia, Pa., assignor to SPS Technologies, Inc., Newtown, Pa.

Filed Jun. 13, 1989, Ser. No. 365,622

Int. Cl.[5] H01F *1/053*

U.S. Cl. 148—302 **6 Claims**

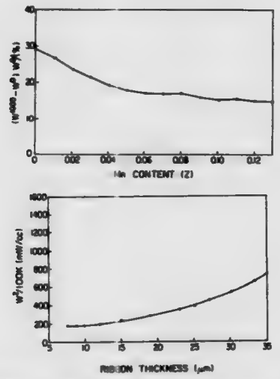


1. An improved permanent magnet comprised of, in atomic percent of the overall composition, from about 12% to about 24% of at least one rare earth element selected from the group consisting of neodymium, praseodymium, lanthanum, cerium, terbium, dysprosoum, holmium, erbium, europium, samarium, gadolinium, promethium, thulium, ytterbium, lutetium, yttrium, and scandium, from about 2% to about 28% boron and at least 52% iron, wherein the improvement comprises said magnet being formed of having nitrogen surface concentration of from about 0.4 to about 26.8 atomic percent.

5,114,503
MAGNETIC CORE

Yoshihito Yoshizawa, and Kiyotaka Yamauchi, both of Saitama, Japan, assignors to Hitachi Metals, Inc., Japan

Continuation of Ser. No. 736,262, May 21, 1985, abandoned. This application Mar. 24, 1987, Ser. No. 29,675
Claims priority, application Japan, May 22, 1984, 59-103492
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—304 1 Claim



1. A magnetic core comprising an amorphous alloy ribbon wound into a torodial shape having a composition of the formula:

$$(Co_{1-x-y-z}Fe_xNi_yMn_z)_{100-a-b-c}M_aSi_bB_c$$

wherein M is at least one element selected from the group consisting of Nb, Cr and Mo, and x, y, z, a, b and c are numbers which satisfy relations of $0<a\leqq 6$, $13\leqq b\leqq 16$, $7\leqq c\leqq 10$, $0<x\leqq 0.1$, $0\leqq y\leqq 0.2$ and $0\leqq z\leqq 0.13$ respectively on condition of $18<a+b+c+<32$ and $18\leqq b+c\leqq 30$, wherein said magnetic core has a rectangular ratio Br/Bs of at least 80%, a Bs value in a range of 5KG to 8KG and a stress relief ratio of at least 75% causing a low disaccommodation of core loss, after a heat-treatment of the core at a temperature between a crystallization temperature (Tx) and a Curie temperature (Tc) for stress realization, and a subsequent heat-treatment at a temperature of less by about 50° C. than the Curie temperature in a magnetic field, the direction of which is substantially coincident with the direction of the magnetic path of the core.

5,114,504
HIGH TRANSFORMATION TEMPERATURE SHAPE MEMORY ALLOY

David N. AbuJudom, II, Brookfield; Paul E. Thoma, Cedarburg; Ming-Yuan Kao, Fox Point, and David R. Angst, West Allis, all of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

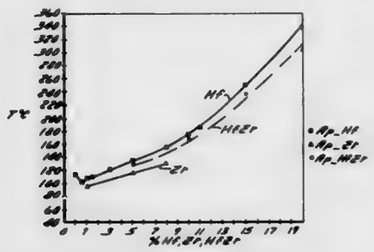
Filed Nov. 5, 1990, Ser. No. 609,377
Int. Cl.[5] C22C *14/00, 19/00*
U.S. Cl. 148—402 11 Claims

1. An article made of a shape memory titanium-based alloy, wherein said alloy has been subjected to a memory-imparting heat treatment, and the alloy consists essentially of a composition of the general formula:

$$M_ATi_{(100-A-B)}X_B$$

wherein M consists essentially of nickel, A is from about 30 to 51 at. %, B is from about 3.5 to 40 at. %, and X is a combination of Hf and Zr, provided that:

(a) the amount of Zr does not exceed about 25 at. % in the alloy;

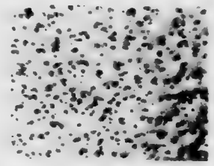


(b) the amount of Hf is at least 0.1 at. %; and
(c) the sum of A+B is 80 at. % or less.

5,114,505
ALUMINUM-BASE COMPOSITE ALLOY

Prakash K. Mirchandani, Troy, Mich.; Raymond C. Benn, Madison, Conn., and Walter E. Mattson, Huntington, W. Va., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Continuation-in-part of Ser. No. 432,124, Nov. 6, 1989, abandoned. This application Aug. 30, 1990, Ser. No. 574,903
Int. Cl.[5] C22C *21/00;* B22F *9/00*
U.S. Cl. 148—437 13 Claims



1. A composite aluminum-base alloy comprising:
a mechanically alloyed aluminum matrix alloy having about 4 to 40 percent by volume of an aluminum-containing intermetallic phase, said aluminum-containing intermetallic phase including at least one element selected from the group consisting of niobium, titanium and zirconium, said aluminum-containing intermetallic phase being essentially insoluble in said matrix alloy below one half the solidus temperature of said matrix alloy and having the balance of said matrix alloy principally being aluminum; and
a composite stiffener distributed within said matrix alloy, said stiffener being from about 5 to 30 percent by volume of said composite aluminum-base alloy.

5,114,506
ENERGETIC COMPOSITES OF CYCLODEXTRIN NITRATE ESTERS AND NITRATE ESTER PLASTICIZERS

John P. Consaga, LaPlata, and Steven L. Collignon, Waldorf, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 8, 1991, Ser. No. 728,918
Int. Cl.[5] C06B *25/00*
U.S. Cl. 149—88 12 Claims

1. An energetic composite comprising a mixture of:
A. an energetic organic solid material that is a nitrate ester of a cyclodextrin or a mixture of cyclodextrins which has an average of from 2 to 3 nitrate ester groups per D-glucose unit in the cyclodextrin or cyclodextrin mixture; and
B an energetic nitrate ester plasticizer;
wherein the amount of the plasticizer ranges from the amount required to produce a flexible composite up to the amount that saturates the composite.

5,114,507
CLOSURE DEVICE FOR A PACKAGING CONTAINER

Lars-Erik Piltz, Dalby, and Stina Stenberg, Lund, both of Sweden, assignors to AB Akerlund & Rausing, Sweden

Division of Ser. No. 414,740, Sep. 28, 1989, abandoned, which is a continuation of Ser. No. 309,076, Feb. 10, 1989, abandoned. This application Feb. 6, 1991, Ser. No. 651,426
Claims priority, application Sweden, Feb. 16, 1988, 8800518
Int. Cl.[5] B29B *45/00*
U.S. Cl. 156—69 8 Claims

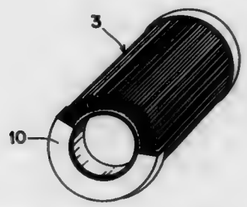


1. A process for making a closure device for a packaging container comprising the steps of:
forming, by injection molding, an outer layer including an annular outer portion defining an outer periphery of said closure device and an easy-openable device integrally attached thereto, said easy-openable device having a grip in the shape of a pull ring and said easy-openable device and said annular outer portion being joined in the proximity of at least one tearing denotation extending circumferentially around said annular outer portion spaced inwardly from said outer periphery thereof, said outer layer including said annular outer portion and said integrally attached easy-openable device defining a central region having said grip arranged therein;
and welding an inner layer to both said annular outer portion and said integrally attached easy-openable device, said inner layer having a surface exposed to the environment through said central region.

5,114,508
FILTER ELEMENT AND ITS PRODUCTION

Tokuya Miyagi, 1-14-35, Katsuyama Kita, Ikuno-ku, Osaka-shi, Osaka-fu; Akihisa Inoue, 3-53-402, Minamimachi, Gotenyama, Hirakata-shi, Osaka-fu; Taisuke Otsubo, 386, Oaza Uchiage, Neyagawa-shi, Osaka-fu, and Yoshihiro Hori, 747-14, Yokosuna, Shimizu-shi, Shizuoka-ken, all of Japan

Continuation of Ser. No. 812,320, Dec. 23, 1985, abandoned. This application Jul. 21, 1987, Ser. No. 77,031
Claims priority, application Japan, Dec. 24, 1984, 59-279291; Dec. 24, 1984, 59-279292
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—69 13 Claims

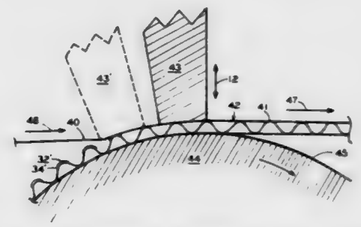


1. A method of producing a filter element made wholly of a fluorocarbon resin which comprises superimposing a net supporter made of thermoplastic fluorocarbon resin on both sides of a 0.01 to 0.22 μm pore diameter filter membrane made of fluorocarbon resin, pleating the resulting sandwich form sheet, bending the pleated sheet to cylindrical form, forming a seam in the cylinder by liquid-tightly welding the longitudinal edge parts of adjacent sides of the sheet, inserting slowly an end part of the obtained cylindrical pleated filter material endwise into melted thermoplastic fluorocarbon resin to a depth of 1–10 mm in a mold maintained at a temperature above the melting point of said melted fluorocarbon resin without pre-welding the pleats, at a rate of not more than 6 mm/minute to force the melted resin into spaces between the pleats at the end part, and to embed the filter sheet end part in the resin, and thereafter cooling the filter material to allow the melted resin to set, thereby welding for sealing the end part of the filter material.

5,114,509
STARCH ADHESIVE BONDING

Herbert N. Johnston; Donald F. Hiscock, and Ralph E. Beard, all of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Continuation of Ser. No. 462,900, Dec. 29, 1989, abandoned, which is a continuation of Ser. No. 153,287, Feb. 8, 1988, abandoned, which is a continuation of Ser. No. 736,623, May 21, 1985, Pat. No. 4,747,894. This application Apr. 15, 1991, Ser. No. 685,981
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.[5] B29C *65/08;* B31F *1/28;* C09J *103/02*
U.S. Cl. 156—73.1 11 Claims



1. A method of adhering substrates of paper, corrugated paperboard, and cellulosic-fiber materials to each other by means of adhesive composition therebetween, which method comprises the steps of:
a. applying a coating of an adhesive composition, which comprises starch and water, to a surface area of a first substrate, which substrate is a single-faced corrugated board in the form of sheet or web-like lengths, whereby the coating of the adhesive composition is applied to tips of flutes of the single-faced corrugated board;
b. positioning an uncoated surface area of another substrate in contact with the applied coating, which another substrate is a liner in the form of sheet or web-like lengths;
c. contacting an output horn of an ultrasonic energy generating means with one or the other of the first or another positioned substrates at a moving exterior surface area thereof juxtapositional to the applied coating between the positioned substrates;
d. carrying the adhesive-uncoated reverse surface of the single-faced corrugated board on a support drive so as the support drive functions as an anvil for the output horn and in conjunction with the output horn provides a nip spacing between the support drive and the output horn of less than the caliper of the resultant double-faced corrugated board so as to produce compression of the liner and single-faced corrugated board in the nip between the horn and

support drive without exceeding the compressive strength of the liner and single-faced corrugated board; and

e. generating ultrasonic energy with the ultrasonic energy generating means so as to transmit from the output horn into the coating the ultrasonic energy of a frequency above 2 kHz and for a time duration so as to increase adhesiveness of the coating to the positioned substrates;

whereby the product of the method is double-faced corrugated board.

10. An apparatus for adhering substrates of paper, paperboard, corrugated paperboard, and cellulosic-fiber materials to each other by means of an adhesive composition therebetween, which apparatus comprises the following components:

a. first coating means for applying a coating of an adhesive composition, which comprises starch and water, to a surface area of a first substrate;

b. first positioning means for positioning an uncoated surface area of another substrate in juxtapositional contact with the applied coating;

c. first generating means for generating ultrasonic energy above 2 kHz for application to one or the other or both of the first or the another positioned substrates at an exterior surface area thereof juxtapositional to the applied coating between the positioned substrates;

d. one or more roll means provided with flutes thereon for forming of a fluted corrugating medium to function as the first substrate, and with the first generating means positioned so as to provide, between an output horn of the first generating means and a flute on a said roll means, a nip space less than the combined thickness of the first substrate, the coating and the other substrate, whereby the product is a single-faced corrugated board;

e. second coating means for applying a coating of an adhesive composition, which comprises starch and water, to the tips of flutes of the single-faced corrugated board;

f. second positioning means for positioning an uncoated surface area of a double-backer liner in juxtapositional contact with the applied coating of the second coating means;

g. second generating means for generating ultrasonic energy above 2 kHz for application to one or the other or both of the single-faced corrugated board or double-backer liner at an exterior surface area thereof juxtapositional to the applied coating of the second coating means between them; and

h. support drive means for carrying a single-faced corrugated board and with the second generating means positioned so as to provide, between an output horn of the second generating means and a surface of the support drive means, a nip space less than the caliper of a resultant double-faced corrugated board so as to provide compression of the liner and single-faced corrugated board without exceeding the compressive strength of the single-faced corrugated board, whereby the product is a double-faced corrugated board.

5,114,510

METHOD OF FORMING A LIGHTWEIGHT STRUCTURAL PANEL

John T. Wright, 19 Kratz Rd., Harleysville, Pa. 19438

Filed Sep. 26, 1990, Ser. No. 588,144

Int. Cl.[5] B32B *31/24*

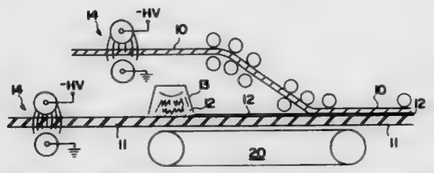
U.S. Cl. 156—82 **9 Claims**

1. A method of forming a lightweight structural panel comprising the steps of:

treating a first surface of a metal cover sheet to an oxidizing treatment to remove foreign substances therefrom;

treating a first surface of a lightweight core member to an electron, plasma treatment to remove foreign substances therefrom, said lightweight core member being made of a plastic sound-deadening material;

applying an adhesive layer to the treated first surface of said core member, said adhesive being a reactive adhesive material;



bonding the treated first surface of said metal cover sheet to treated first surface of said lightweight core member through said reactive adhesive layer.

5,114,511

MANUFACTURE OF A TUBULAR ARTICLE USING FLEXIBLE CARRIER

Anthony G. Goodfellow, Maghull, United Kingdom, assignor to Bridgestone/Firestone, Inc., Akron, Ohio

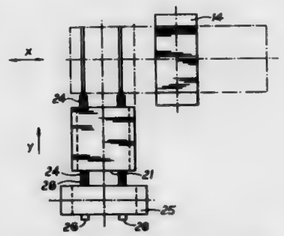
PCT No. PCT/GB89/00259, § 371 Date Aug. 22, 1990, § 102(e) Date Aug. 22, 1990, PCT Pub. No. WO89/08545, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 13, 1989, Ser. No. 566,396

Claims priority, application United Kingdom, Mar. 12, 1988, 8805923

Int. Cl.[5] B29D *30/30*

U.S. Cl. 156—133 **17 Claims**



1. A method for the manufacture of a tubular article comprising receiving flexible sheet material onto a flexible carrier of a non-tubular form at a first work station, feeding said sheet material from the first to a second work station whilst said material is supported on and retained by the flexible carrier and causing said sheet material and flexible carrier to lie at the second work station in a peripherally continuous tubular form substantially coaxially relative to a former with the sheet material disposed between the flexible carrier and former with the flexible carrier completely encircling the sheet material, and then moving said former and carrier relatively one toward the other whereby said sheet material may be subject to pressure between the former and carrier.

5,114,512

BEAD FILLER CONSTRUCTION

Eric Holroyd, Knutsford, and Anthony R. Wright, Southport, both of England, assignors to Bridgestone/Firestone Inc., Akron, Ohio

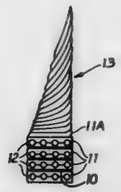
PCT No. PCT/GB88/00985, § 371 Date May 1, 1990, § 102(e) Date May 1, 1990, PCT Pub. No. WO89/04250, PCT Pub. Date May 18, 1989

PCT Filed Nov. 14, 1988, Ser. No. 474,129

Claims priority, application United Kingdom, Nov. 13, 1987, 8726628

Int. Cl.[5] B60C *15/04*; B29D *30/48*

U.S. Cl. 156—135 **9 Claims**



1. In the production of a pneumatic tire by applying a carcass ply to a former, wrapping discrete annular bead formations around the ply at spaced apart locations, expanding the ply between the bead formations to a substantially toroidal shape and turning up the ply around the bead formations, a method of constructing a bead filler or apex, comprising helically winding one or more flat strips of polymeric material over the radially outer side of a said bead so as to produce an approximately triangular formation of superimposed turns tapering radially outwardly of the bead shaped wholly to fill the space between shaped and turned up regions of the ply on the radially outer side of said bead.

5,114,513

OPTICAL DEVICE AND MANUFACTURING METHOD THEREOF

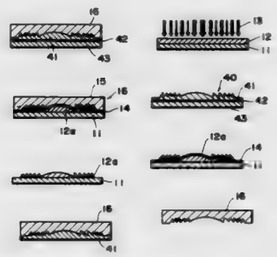
Hayami Hosokawa, Yawata, and Tsukasa Yamashita, Nara, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 25, 1989, Ser. No. 426,274

Claims priority, application Japan, Oct. 27, 1988, 63-269549; Mar. 13, 1989, 1-60278; Mar. 16, 1989, 1-65276

Int. Cl.[5] C25D *5/20*

U.S. Cl. 156—150 **20 Claims**



1. An optical device manufacturing method comprising the steps of:

accumulating an inorganic material having optical transmissivity on a stamper having an optical device forming section by growing a vacuum thin-film;

fixing a substrate on a surface of the accumulated optical device inorganic material by use of an adhesive agent interposed between said accumulated optical device and said substrate;

solidifying the adhesive agent to integrate the accumulated optical device inorganic material on the substrate; and

separating the substrate and the accumulated optical device inorganic material integrated with each other from the stamper to obtain an optical device comprising the substrate and the accumulated optical device inorganic material.

5,114,514

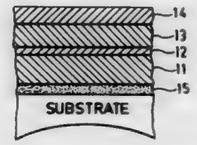
BONDING OF THERMOPLASTIC SHEET MATERIAL TO ROUGHENED SUBSTRATES

Newton C. M. Landis, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 30, 1990, Ser. No. 530,390

Int. Cl.[5] B32B *31/00, 31/12*; B29C *65/00*

U.S. Cl. 156—153 **14 Claims**



1. A process for adhesively bonding a protective and decorative, stretchable, thermoplastic polymeric film to a substrate, wherein said process reduces or eliminates the tendency of the bonded polymeric film to develop an undesirable surface texture, said process comprising the steps of:

(a) applying a layer of a pressure-sensitive adhesive composition to a surface of said film;

(b) treating a surface of the substrate which is to be bonded to said film to roughen the surface and to raise its surface energy to a level corresponding to a critical surface tension of wetting of at least about 40 dynes per cm and to provide a substantially uniform surface roughness; and

(c) pressing the adhesive layer of said film into bonding contact with the treated surface of the substrate, wherein the roughness of the roughened surface ranges from about 1 to about 100 microinches, and the surface being sufficiently smooth such that said film when bonded thereto has a 20° glass of at least about 80 and a DOI of at least about 80 as measured by ASTM TEST E-430.

5,114,515

METHOD FOR FORMING POLYMER COMPOSITE FILMS USING REMOVABLE SUBSTRATES

Jeffrey D. Birdwell, Lake Jackson, and William P. Carl, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 739,943, May 31, 1985, abandoned.

This application Jan. 11, 1988, Ser. No. 143,210

The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.

Int. Cl.[5] B32B *31/00*; B29C *47/00*

U.S. Cl. 156—155 **15 Claims**

1. A method for forming polymer composite films using a removal substrate comprising:

(a) forming a first dispersion of a first perfluorinated polymer containing sites convertible to ion exchange groups and a dispersant having: a boiling point less than about 110° C.; a density of from about 1.55 to about 2.97 grams per cubic centimeter; and a solubility parameter of from greater than about 7.1 to about 8.2 hildebrands;

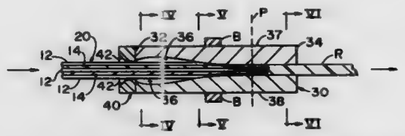
(b) depositing the first dispersion onto a first removable substrate;

(c) removing the first dispersant from the first dispersion, thereby forming a first film;
(d) forming a second dispersion of a second perfluorinated polymer containing sites convertible to ion exchange groups and a second dispersant having: a boiling point less than about 110° C.; a density of from about 1.55 to about 2.97 grams per cubic centimeter; and a solubility parameter of from greater than about 7.1 to about 8.2 hildebrands;
(e) depositing the second dispersion onto a second removable substrate;
(f) removing the second dispersant from the second dispersion, thereby forming a second film;
(g) bonding the first film to the second film; and
(h) removing the first and the second substrate
wherein the first and the second dispersants are independently represented by the general formula:

$XCF_2—CYZX'$

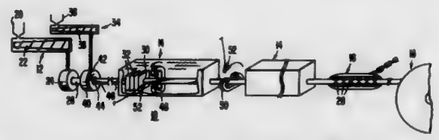
wherein:
X is selected from the group consisting of F, Cl, Br, and I;
X' is selected from the group consisting of Cl, Br, and I;
Y and Z are independently selected from the group consisting of H, F, Cl, Br, I and R';
R' is selected from the group of perfluoroalkyl radicals and chloroperfluoroalkyl radicals having from 1 to 6 carbon atoms.

5,114,516
METHOD FOR PULTRUDING FIBER-REINFORCED, THERMOPLASTIC STOCK
Douglas A. Pilling, San Pedro, and George Korzeniowski, Sherman Oaks, both of Calif., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Oct. 5, 1990, Ser. No. 593,185
Int. Cl.[5] D04H *3/12*; B32B *1/00*
U.S. Cl. 156—180 **20 Claims**



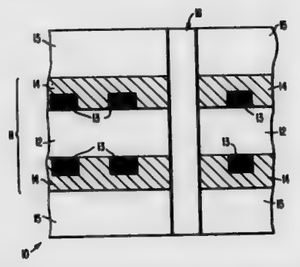
17. A method for pultruding fiber-reinforced, thermoplastic resin into substantially continuous sheet stock comprises:
(a) pulling through a heated die an array of alternating sheets of dry fiber and thermoplastic film layers, said array having dry fiber layers on its outermost surfaces for preventing the film layers from melting prematurely, said die including:
(i) an entrance and an exit;
(ii) a tapered, heating zone for melting the film layers of the array;
(iii) means for maintaining a pool of molten thermoplastic resin at or near the die entrance, the film layers of said array being substantially the sole source of resin supply to said molten pool;
(iv) a zone for impregnating molten thermoplastic resin into the fiber layers of the array; and
(v) a zone for shaping and compressing the thermoplastic-impregnated fibers into sheet stock; and
(b) cooling the sheet stock exiting the die.

5,114,517
METHODS, APPARATUS AND DEVICES RELATING TO MAGNETIC MARKERS FOR ELONGATED HIDDEN OBJECTS
John B. Rippingale, Leesburg, and Erick O. Schonstedt, Reston, both of Va., assignors to Schonstedt Instrument Company, Reston, Va.
Continuation-in-part of Ser. No. 428,757, Oct. 30, 1989, Pat. No. 5,006,806, which is a continuation-in-part of Ser. No. 323,860, Mar. 15, 1989, abandoned. This application Feb. 9, 1990, Ser. No. 477,447
Int. Cl.[5] B32B *31/04*
U.S. Cl. 156—187 **24 Claims**



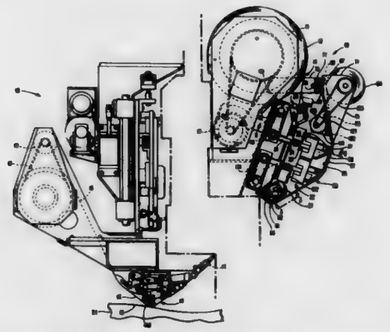
1. A method of making a magnetic marker, comprising applying magnetic material to a substrate that is elongated, and forming at least a portion of said material into a helical permanent magnet pattern having a helix axis extending along the length, of said substrate, and wherein said forming of said helical magnetic pattern includes permanently magnetizing at least said portion of said material.

5,114,518
METHOD OF MAKING MULTILAYER CIRCUIT BOARDS HAVING CONFORMAL INSULATING LAYERS
Joseph G. Hoffarth; Donald J. Lazzarini; John A. Welsh, all of Binghamton, and John P. Wiley, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 183,491, Apr. 15, 1988, Pat. No. 4,918,574, which is a continuation-in-part of Ser. No. 95,089, Sep. 11, 1987, abandoned, which is a continuation of Ser. No. 922,422, Oct. 23, 1986, abandoned. This application Jan. 10, 1990, Ser. No. 463,222
Int. Cl.[5] H05K *1/11*; B32B *31/20*
U.S. Cl. 156—212 **4 Claims**



1. A method for making a multilayer circuit board comprising the steps of:
forming a plurality of circuit cores, each of said circuit cores having an initial substrate of an insulating material with a conductive pattern deposited directly thereon;
coating one side of one of said circuit cores with a conformal layer of insulating material;
curing said conformal layer of insulating material;
then stacking said plurality of circuit cores with said cured conformal layer with an additional insulating layer between each pair of adjacent circuit cores; and
laminating said plurality of circuit cores together, said conformal layer insulating its respective side of one of said circuit cores from the adjacent additional insulating layer.

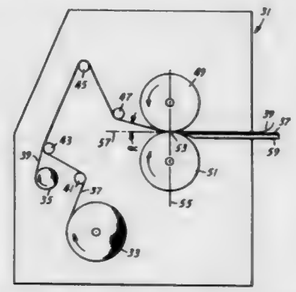
5,114,519
METHOD FOR LAYING CUT COMPOSITE TAPE ON A MOLD HAVING SCRAP REMOVAL
Michael N. Grimshaw, Milford; Stephen J. Albers, Norwood, and Ralph J. Rust, Cheviot, all of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio
Division of Ser. No. 380,573, Jul. 17, 1989, Pat. No. 4,978,417. This application Sep. 10, 1990, Ser. No. 580,402
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—235 **7 Claims**



1. A method for laying a composite tape on a mold from a tape assembly including a backing to which the composite tape is releasably adhered including:
advancing a composite tape and a backing of a tape assembly from a supply source along a predetermined path;
severing portions of the composite tape from each other without severing the backing;
applying selected severed portions of the composite tape to a mold while the backing is advanced to storage means along the predetermined path after each selected severed portion of the composite tape has been applied to a mold;
removing each non-selected severed portion of the composite tape from the backing after severing portions of the composite tape from each other and prior to the selected severed portions of the composite tape being applied to the mold by selectively moving a material having a greater adherence to the composite tape than the backing into and out of engagement with each non-selected severed portion of the composite tape;
and advancing the material of greater adherence so that there is no relative movement between the material of greater adherence and the composite tape when the material of greater adherence is moved into engagement with each non-selected severed portion of the composite tape.

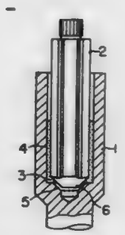
5,114,520
IMAGE TRANSFER APPARATUS AND METHOD
Paul J. Wang, Jr., Woodbury; Michael J. Petrich, Lake Elmo; Francis A. Wadzinski, Madison, and James E. Guither, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sep. 27, 1991, Ser. No. 766,764
Int. Cl.[5] B44C *1/00*
U.S. Cl. 156—240 **16 Claims**

9. Apparatus for transferring images carried on a substrate to a vinyl receptor sheet comprising
a) means for holding and feeding a vinyl web,
b) means for holding and feeding a carrier web having images on one major surface thereof,
c) upper and lower pressure rolls having means to urge said rolls toward one another and form a nip area for receiving a web of material,
d) means to rotate at least one of said pressure rolls around its axis to cooperate with the other pressure roll to draw said web of material presented to said nip between said rolls to an exit point on the other side of said nip area,
e) a series of idler rolls for bringing the image bearing surface of said carrier web into contact with said vinyl web to form a laminated web and advancing said laminated web



in a wrinkle-free condition along a path toward said nip formed by said pressure rolls,
f) a final idler roll arranged along the laminated web path between 8 and 30 centimeters from the entry to said nip area, said idler roll arranged to direct the laminated web away from the idler roll at an angle of between 8 and 12 degrees from a reference line perpendicular to the common center line of the pressure rolls and passing through said nip.

5,114,521
METHOD FOR PRODUCING A SLIDING COUPLING BY A MONOMER CASTING METHOD
Yo Isegawa; Takeshi Kito, both of Yokkaichi; Kimimasa Muryayama, Toyota; Shoji Ikawa, Toyota; Takahiro Iwase, Toyota; Tutomu Sugiura, Toyota, and Atsuyuki Tsuzuki, Toyota, all of Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan
Filed Apr. 6, 1990, Ser. No. 505,990
Claims priority, application Japan, Apr. 10, 1989, 1-88033; Jul. 6, 1989, 1-173030
Int. Cl.[5] B29C *39/02*
U.S. Cl. 156—242 **9 Claims**

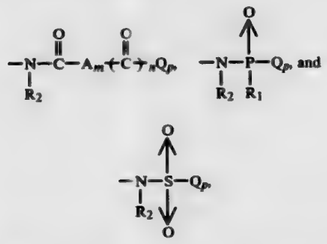


1. A method for producing a sliding coupling, which comprises injecting a casting material comprising the following components (A) and (B) into a clearance between a bearing and a shaft fitted in and rotatably or reciprocatively supported by the bearing, wherein a primer is preliminarily applied to either the shaft or the bearing and a releasing agent is preliminarily applied to the other; followed by polymerization and

curing to form a resin lining on the surface of the shaft or the bearing:

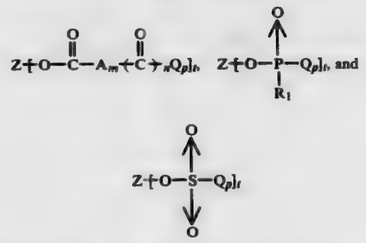
(A) a Ω-lactam liquid containing a polymerization catalyst of an alkali metal or alkaline earth metal compound; and

(B) a Ω-lactam liquid containing at least one polymerization initiator selected from the group consisting of a polyoxyalkylene, an oxyalkylene copolymer, a polyalkadiene, an alkadiene copolymer, a polyalkene and an alkene copolymer, each of which has at least two terminal groups selected from the group consisting of lactam terminal groups of the following formulae:



wherein Q is a lactam residue having a C_3–C_{11} alkylene group, said lactam residue being bonded to C, P or S via its nitrogen atom; A is an aliphatic or aromatic hydrocarbon group, or a hydrocarbon group having an ether linkage; m is 0 or 1; when m is 0, n is 0 or 1, and p is 1; when m is 1, n is within a range of from 1 to 3, and p=n; R_1 is an alkyl group, an aralkyl group, an alkoxy group, an aryloxy group, a halogen atom or an aralkyloxy group; and R_2 is a hydrogen atom or an alkyl group; or

at least one polymerization initiator selected from the group consisting of lactam initiators of the following formulae;



wherein Z is a polypropylene oxide polyol, t is at least 1, and Q, A, m, n and p are as defined above.

5,114,522

METHOD FOR PRODUCING AN AUTOMOBILE BUMPER

Yutaka Takado, 5-6, Shin-machi, Kanagawa-ku, Yokohama-shi, Kanagawa-ken; Masayuki Yamazaki, 8-231, Shimoda-cho 5-chome, Kohoku-ku, Yokohama-shi, Kanagawa-ken; Takashi Mikami, 23-48, Izumihon-machi 3-chome, Komae-shi, Tokyo, and Tetsuo Tomiyama, 1418-3 Shukugawara, Tama-ku, Kawasaki-shi, Kanagawa-ken, all of Japan

PCT No. PCT/JP87/00448, § 371 Date Mar. 28, 1988, § 102(e) Date Mar. 28, 1988, PCT Pub. No. WO88/00127, PCT Pub. Date Jan. 14, 1988

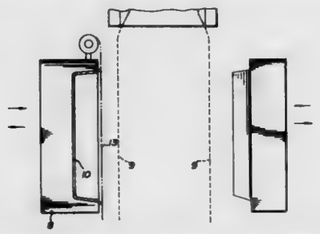
PCT Filed Jun. 30, 1987, Ser. No. 159,967

Claims priority, application Japan, Jun. 30, 1986, 61-154856

Int. Cl.[5] B29C *49/22, 49/04*

U.S. Cl. 156—245 **2 Claims**

1. A method for producing an automobile bumper comprising the steps of loading a preformed surface skin member of a thermoplastic resin composition preformed so as to have a smooth surface into a blow die half of a blow mold, disposing an adhesive resin film over the blow die half in which said surface skin member has previously been loaded, and then blowing a parison, consisting essentially of a thermoplastic resin capable of blow molding, in said mold whereby the



blown parison is bonded to said surface skin member so as to provide a hollow cushioning body firmly bonded to said surface skin member, wherein the surface skin member is fusion-bonded to the hollow cushioning body by the adhesive resin film therebetween.

5,114,523

PROCESS AND DEVICE FOR MANUFACTURE OF ADHESIVE ROLLS FOR ROLLER REVERSING MECHANISMS OF WEB-PROCESSING MACHINES, PARTICULARLY WEB-FED PRINTING PRESSES

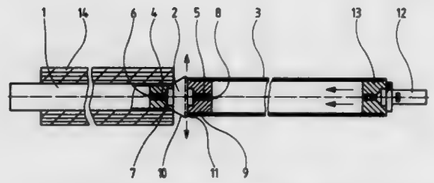
Ernst Ammon, Seideaweg, and Robert Langach, Zollikofen, both of Switzerland, assignors to WIFAG, Bern, Switzerland

Filed Jun. 26, 1990, Ser. No. 544,208

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1989, 3921045

Int. Cl.[5] B23P *11/02, 19/04*

U.S. Cl. 156—294 **9 Claims**



1. A process for manufacturing adhesive rolls for web processing machine rolls for web fed printing presses, comprising the steps of:

providing an adhesive roller including a dimensionally stable carrying tube having a first mounting end and a second mounting end for providing a compressed gas conduit; providing a compressed gas connection at said first mounting end and passing gas through said second mounting end; providing a soft elastic tubular body of flexible foam material, the support tube having an external diameter smaller than an internal diameter of the soft elastic tubular body; having a transition piece providing a first connection end, a second connection end, and a transition piece conduit extending from said first connection end to a discharge zone; said transition piece also having a conical surface and a discharge side, said conical surface having a small diameter end, the small diameter end being substantially equal in dimension to said external diameter of said carrying tube and including a large diameter end, said large diameter end being larger in dimension than an external diameter of said carrying tube, said discharge side having a substantially angled surface extending from said large diameter end to a reduced diameter end, the reduced

diameter end being substantially equal in dimension to a diameter of said carrying tube, a region between said reduced diameter end and said large diameter end defining said discharge zone; pushing said tubular flexible body over said support tube; connecting said support tube with tubular flexible body to said second end of said transition piece; connecting said first end of said transition piece to said second end of said roller; supplying compressed air through said roller and said transition piece to direct compressed air from said discharge zone outwardly of said transition piece and simultaneously rearwardly in a direction of said roller; and, pushing said flexible body from said support tube to said carrying tube over said transition piece and establishing an air cushion between said tubular flexible body, transition piece and roller.

5,114,524

METHOD FOR THE VERTICAL MANUFACTURE OF SANDWICH STRUCTURAL ELEMENTS

Paul Svensson, Krokusvagen 2, Laholm, Sweden 312 31 ; Christer Nilsson, Aleden 28, Laholm, Sweden 312 00 ; Jan Bäcklund, Skyttevagen 6, Lidingo, Sweden 181 46 ; Karl G. Ericsson, Verkmastargatan 62, Enkoping, Sweden 199 33 ; Leif Jilkén, Blamesvagen 13, Sundsvall, Sweden 852 55 , and Harry Kihlberg, Kaptensgatan 8, Saffle, Sweden 661 00

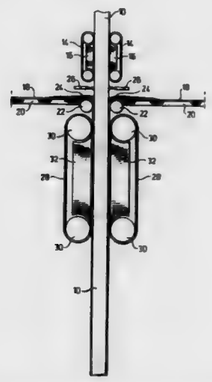
Division of Ser. No. 246,309, Sep. 9, 1989, Pat. No. 4,961,810. This application Jul. 20, 1990, Ser. No. 554,899

Claims priority, application Sweden, Mar. 27, 1986, 8601441

The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.

Int. Cl.[5] B32B *31/08, 31/12*

U.S. Cl. 156—295 **4 Claims**



1. A method of manufacturing sandwich structural elements in laminated material where a cellular core material having open surface cells on at least one side thereof is given a covering layer over each of the surface cells and wherein the core material is impervious to the passage of gases therethrough comprising the steps of:

a. conveying the core material generally vertically so that the open surface cells along at least one side of the core material are oriented generally horizontally;

b. conveying the covering layer laterally toward the open surface cells along at least one side of the core material and then vertically toward a flush engagement against the surface cells along said at least one side of the core material so as to form a nip area in the region where the covering engages the core material.

c. applying an excess of liquid adhesive into the nip area in an amount which is sufficient to fill the open surface cells being conveyed through the nip area to thereby remove any gas therefrom by allowing the liquid adhesive to expel the gas vertically from each of the surface cells so that the surface cells are completely filled with liquid adhesive prior to the covering layer being brought into engagement therewith; and

d. thereafter pressing the covering layer against the core material as the liquid adhesive is hardening so as to close each of the surface cells which are completely filled with the liquid adhesive so that substantially no gas is trapped between the covering layer and the core material.

5,114,525

MACHINE FOR FROSTING GLASS ARTICLES

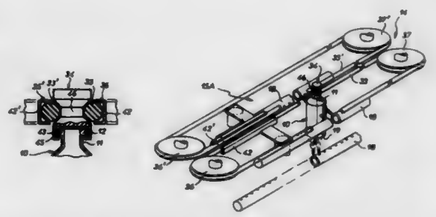
Jean-Louis Dubuit, Paris, France, assignor to Societe Nouvelle C.T.A., France

Filed Dec. 18, 1990, Ser. No. 629,712

Claims priority, application France, Dec. 26, 1989, 89 17172

Int. Cl.[5] B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—345 **12 Claims**



1. A frosting machine for necked bottles comprising at least one operating station including at least one spray manifold for spraying a liquid for use in frosting, a conveyor for conveying bottles to be frosted through said operating station, said conveyor including rotator means for rotating bottles about axes thereof in said liquid sprayed by said spray manifold, each said rotator means including a caplike support member in engagement with a neck of the corresponding bottle and an annular groove in cooperative engagement with said conveyor whereby the bottle rotates as it is conveyed through the operating station.

5,114,526

FILM BONDING APPARATUS

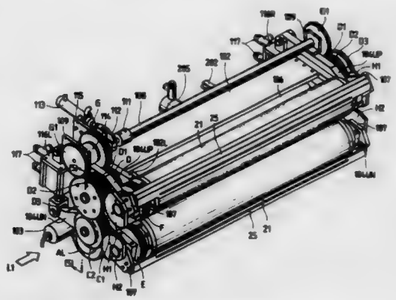
Hiroshi Taguchi, Tokyo; Youji Washizaki, Saitama; Akira Igarashi, Tokyo, and Hiroyoshi Nakano, Saitama, all of Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Sep. 27, 1990, Ser. No. 589,107

Claims priority, application Japan, Apr. 6, 1990, 2-91554

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—361 **2 Claims**



1. A film bonding apparatus comprising:

a pressure bonding roller having a peripheral surface and

being rotatable at a circumferential velocity, said roller being provided so that a film cut to a length corresponding to that of a base plate is bonded to the film bonding surface of said plate by said roller;

a film trailing edge holding member rotatably supported near the peripheral surface of said roller, said member holding the trailing edge portion of said film cut to said length and being moveable to a position near the mutual contact surfaces of said roller and said film on said plate, at a speed equal to or slightly less than the rotative circumferential velocity of said roller; and

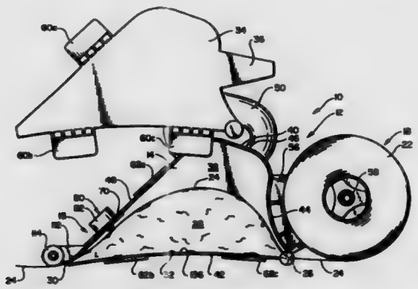
film trailing edge holding member movement speed control means for automatically changing the speed of the movement of said member depending on the rotative circumferential velocity of said roller, wherein said film trailing edge holding member comprises a rotary shaft from rotatably supporting said holding member, said movement speed control means comprises first gears for driving the pressure bonding roller, second gears engaged with said first gears so as to move the film trailing edge holding member, and a coupling means for coupling and uncoupling said rotary shaft of said holding member to at least one of said first and second gears so that said shaft can be selectively uncoupled from said holding member moving gears.

5,114,527

DRYWALL TAPE APPLYING TOOL

Donald J. Stern; Jeff S. Heaton, both of Bellingham, and James A. Tryon, Seattle, all of Wash., assignors to DJS&T Limited Partnership, Bellingham, Wash.

Filed Jul. 17, 1990, Ser. No. 554,798
Int. Cl.[5] B44C 7/02
U.S. Cl. 156—575 **22 Claims**



1. A taping tool comprising:

a. a housing having a forward end and a rear end, and defining a chamber to contain a compound to be applied to a tape to be dispensed;

b. said tool having a front dispensing opening leading from said chamber;

c. tape supply means to supply tape to said chamber in a manner that said tape is able to move along a path of travel through said chamber to have the compound applied thereto and to exit through said dispensing opening;

d. said tool having a first plate means defining one side of said dispensing opening;

e. said tool having a second adjustably mounted plate means having a lengthwise axis and having a forward end defining a second side of said dispensing opening;

f. said housing comprising a close tolerance slideway means for said second plate means, said slideway means having slideway surface means having a close tolerance fit with longitudinally extending guide surface portions of said second plate means in a manner that said second plate means is caused to move along said lengthwise axis, with any angular or wobbling motion being restrained within close tolerances by said slideway means;

g. adjusting means comprising adjusting knob means mounted to said tool so as to be movable to a plurality of adjusting positions, and comprising actuating means positioned to be in engagement with said second plate means, in a manner that movement of said adjusting knob means causes said actuating means to move said second plate means to move along said lengthwise axis within close tolerances so as to be able to precisely adjust a width dimension of said dispensing opening;

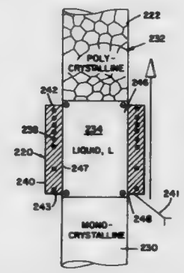
h. said adjusting knob means being mounted to said housing rotatably so as to be movable to a plurality of angularly spaced adjusting positions about a first axis, said actuating means being positioned at a second axis spaced from said first axis in a manner that rotation of said adjusting knob means causes an increment of linear movement of said actuating means along said lengthwise axis.

5,114,528

EDGE-DEFINED CONTACT HEATER APPARATUS AND METHOD FOR FLOATING ZONE CRYSTAL GROWTH

Sindo Kou, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Aug. 7, 1990, Ser. No. 563,706
Int. Cl.[5] B01J 17/10
U.S. Cl. 156—616.1 **22 Claims**



1. Apparatus for growing a monocrystalline body from a polycrystalline feed rod by floating zone refining such that a molten zone is caused to traverse the polycrystalline rod to convert the polycrystalline rod to a monocrystalline body, comprising:

(a) a heater that is positioned to heat a short section of the polycrystalline rod to create the molten zone, the heater formed to include a shaper that contacts the polycrystalline rod in the molten zone and that has a hole to allow flow of molten material in the molten zone between the polycrystalline rod side and the monocrystalline body side of the shaper, the shaper having edge means, including an edge that defines the boundary of the cross-section of the monocrystalline body that is formed as the molten material solidifies, for allowing molten material to flow up to the edge and no further so that the monocrystalline body assumes the outer boundary defined by the edge; and

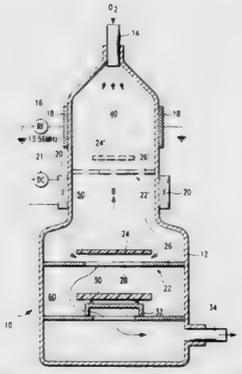
(b) means for moving the heater and the polycrystalline feed rod relative to one another along the rod to form the monocrystalline body.

5,114,529

PLASMA PROCESSING METHOD AND APPARATUS

Akira Masuyama, Kusatsu, and Takaki Saitoh, Ohtsu, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 9, 1991, Ser. No. 682,825
Claims priority, application Japan, Apr. 10, 1990, 2-93309
Int. Cl.[5] B44C 1/22; B29C 37/00
U.S. Cl. 156—643 **15 Claims**



1. A plasma processing method comprising the steps of:

generating a plasma containing electricallyneutral reaction species in a plasma generating area;

processing a workpiece by said reaction species in a processing area; and,

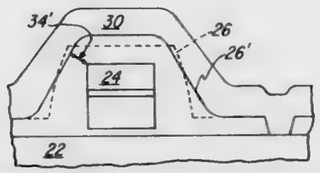
generating a mirror magnetic field between said plasma generating area and said processing area for restricting charged particles from moving from said plasma generating area to said processing area.

5,114,530

INTERLEVEL DIELECTRIC PROCESS

Kalipatnam V. Rao, Plano; Allan T. Mitchell, Garland, and James L. Paterson, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 249,795, Sep. 27, 1988, abandoned, which is a continuation of Ser. No. 793,593, Oct. 31, 1985, Pat. No. 4,799,992. This application Jul. 16, 1990, Ser. No. 552,369
Int. Cl.[5] H01L 21/00
U.S. Cl. 156—653 **8 Claims**



1. A method for fabricating an integrated circuit on a substrate having topographical features including at least two closely adjacent raised areas defining a low area therebetween, comprising the steps of:

depositing a dielectric layer over the surface of said substrate so as to fill said defined low area to a thickness greater than a selected thickness and to cover said raised areas to a thickness greater than said selected thickness;

anisotropically etching said dielectric layer such that the thickness of said dielectric layer covering at least one of said raised areas is reduced to a thickness equal to said selected thickness, and the thickness of said dielectric layer covering said defined low area remains greater than said selected thickness;

removing selected portions of said dielectric layer to provide vias; and

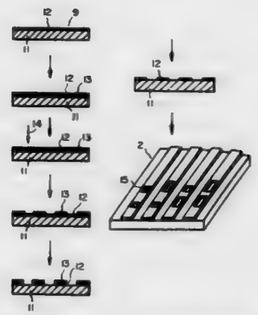
depositing and patterning a conductive layer, said conductive layer extending into said vias to contact components in said substrate.

5,114,531

METHOD OF PRODUCING MASKS FOR ROM TYPE OPTICAL RECORDING CARDS AND METHOD OF INSPECTING MASKS

Yoichi Fukushima; Minoru Fujita, and Yuji Kakinuma, all of Tokyo, Japan, assignors to Kyodo Printing Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00393, § 371 Date Oct. 12, 1990, § 102(e) Date Oct. 12, 1990, PCT Pub. No. WO89/09990, PCT Pub. Date Oct. 19, 1989
PCT Filed Apr. 12, 1989, Ser. No. 582,853
Claims priority, application Japan, Apr. 13, 1988, 63-090953; Dec. 23, 1988, 63-325174
Int. Cl.[5] B44C 1/22; C23F 1/02
U.S. Cl. 156—659.1 **7 Claims**



2. A method of producing a mother mask for ROM type optical recording cards each having the same preformatting pattern as writable type optical recording cards comprising steps;

coating a resist on a hard mask blank,

next, exposing said resist to a light beam in accordance with the configuration of the same preformatting pattern as said writable type optical recording cards,

next, developing said resist,

next, etching said hard mask blank, and

next, removing the resist from said hard mask blank.

5,114,532

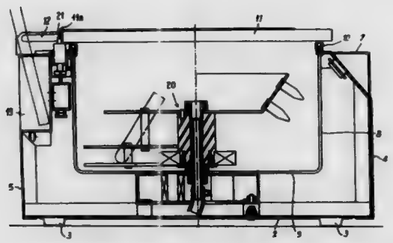
PROCESS OF ETCHING IRON-SILICON-ALUMINUM TRIALLOYS AND ETCHANT SOLUTIONS USED THEREFOR

Wei C. Hsie, Eden Prairie, Minn., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Mar. 21, 1991, Ser. No. 674,071
Int. Cl.[5] B44C 1/22; C23F 1/00
U.S. Cl. 156—665 **15 Claims**

1. A process for etching an iron-silicon-aluminum trialloy which comprises the step of applying to said trialloy an aqueous solution of nitric acid and a source of fluoride ions.

5,114,533
CLOSING COVERS OF APPARATUSES WITH CENTRIFUGAL ROTORS
Jean-Luc Guy, Massy, and Jean-Pierre Saladin, Bagneux, both of France, assignors to Jouan, Saint-Nazaire, France
Filed Mar. 5, 1990, Ser. No. 487,936
Claims priority, application France, Mar. 17, 1989, 89 03505
Int. Cl.[5] B01D *1/00*; B65D *43/16*
U.S. Cl. 159—6.1 13 Claims



1. Apparatus with centrifugal rotor and operating under a vacuum, said apparatus comprising means defining an edge of said apparatus, an enclosure, means to establish a vacuum in said enclosure, a centrifugal rotor mounted to be rotatable about a vertical axis in the enclosure, the enclosure defining an upper opening in a substantially horizontal plane, and a cover for closing said opening, the cover comprising a strong plate, guide means associated with the plate for guiding the plate in translation in said plane along the opening between a closing position of the plate superimposed on said opening and a releasing position which is offset in said plane from the closing position, means cooperative with the plate for preventing the plate from moving away from the plane of the opening in said closing position, means associated with the plate for pivoting, solely in said releasing position, the plate about an axis located in the region of said edge so that the plate can occupy, in proximity to said edge, a pivoted position making a large angle with the horizontal plane of the opening.

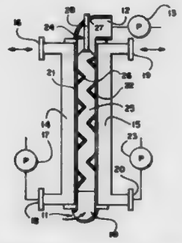
5,114,534
DRYING CELLULOSIC PULP
Donald G. Rachor, Puyallup, and Richard F. Buchholz, Shelton, both of Wash., assignors to Georgia-Pacific Corporation, Atlanta, Ga.
Continuation-in-part of Ser. No. 524,039, May 16, 1990, abandoned. This application Dec. 10, 1990, Ser. No. 625,112
Int. Cl.[5] D21C *9/00*
U.S. Cl. 162—9 15 Claims

1. A method for reducing the energy needed to form a dried market pulp from a cellulosic pulp slurry which comprises contacting said pulp slurry with between about 0.005 and 0.5 parts by weight of sodium sulfate per 100 parts by weight of oven dry pulp solids in said pulp slurry, dewatering said slurry in the presence of a water spray subsequent to said contacting to form a mat of said pulp solids from said pulp slurry, said pulp solids being essentially free of said sodium sulfate and drying said mat, wherein said contacting of said cellulosic pulp slurry with said sodium sulfate is continued for a time sufficient to reduce the energy needed to dry said mat of pulp solids, as compared to a pulp not treated with said sodium sulfate.

5,114,535
PROCESS FOR THE PRODUCTION OF CELLULOSE ACETATE FROM WOOD PULP
Richard Burley, Derby, and Patrick Roche, Derbyshire, both of United Kingdom, assignors to Courtaulds PLC, Great Britain
Continuation of Ser. No. 402,837, Sep. 6, 1981, abandoned. This application Mar. 19, 1991, Ser. No. 671,679
Claims priority, application United Kingdom, Sep. 6, 1988, 8820905
Int. Cl.[5] C08B *3/06*; D21C *1/06*
U.S. Cl. 162—9 3 Claims

1. A process for the production of cellulose acetate from wood pulp which comprises forming a slurry of the wood pulp in water, passing the slurry through a press to remove water, drying the pressed slurry to form dried cellulose material under conditions which do not allow deactivation to take place, activating the dried material with acetic acid, and subsequently esterifying the dried cellulose material with an acetylating agent after said activation with acetic acid to form cellulose acetate, wherein the activation with acetic acid is the only activation of the process, in which process the pressed slurry of wood pulp is dried in a pin mill through which a hot drying gas is passed under conditions which produce an exit temperature of the drying gas in the range 80° C. to 95° C. and a moisture content of the dried cellulose material in the range 4 to 15% by weight, based on the dry weight of the material, to provide a dried cellulose material in the form of a cellulose flock.

5,114,536
METHOD FOR CLEANING FIBERS
Martti Y. O. Kangas, P.O. Box 2470, Decatur, Ga. 30031
Continuation-in-part of Ser. No. 351,384, May 15, 1989, Pat. No. 4,976,822. This application Nov. 29, 1990, Ser. No. 619,877
Int. Cl.[5] D21D *9/02, 9/06*
U.S. Cl. 162—55 5 Claims



1. In the method for cleaning fiber, wherein paper is processed to separate the fibers therein and to suspend said fibers in a liquid to form a slurry, and wash water contacts said fibers to remove contaminants from said fibers, the improvement comprising the steps of passing said slurry through a passageway, constantly agitating said slurry for fluidizing said slurry and preventing agglomeration of said fibers and assuring that said fibers remain as separate, individual, fibers in suspension in said slurry, and contacting said slurry with wash water for removing contaminants from said fibers during the said step of constantly agitating said slurry for fluidizing said slurry, the said step of contacting said slurry with wash water including forming opposed walls of said passageway of the screen, providing at least one channel carrying wash water adjacent to said screen, and creating a pressure differential between said at least one channel and said passageway, the arrangement being such that wash water moves through the screen walls of said passageway and contacts said individual fibers, and said wash water and said contaminants move through said screen walls and into said at least one channel.

5,114,537
DRY SHEET-LIKE FILTERING MATERIAL FOR LIQUID DEPTH FILTRATION
Robert S. Scott, and Richard W. Atwood, both of Mill Valley, Calif., assignors to BIO Associates, a California partnership, Petaluma, Calif.
Filed Oct. 23, 1990, Ser. No. 601,077
Int. Cl.[5] D21H *13/06*
U.S. Cl. 162—146 22 Claims

1. A dry liquid depth filter sheet having a thickness of at least about 2 mm comprising from about 2% to about 30% cellulose ester fibrils having a surface area of at least 5 square meters per gram and from about 98% to about 70% cellulose fibers, said cellulose fibers having been beaten.

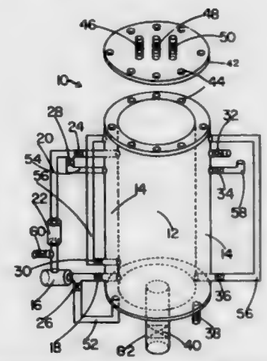
5,114,538
PROCESS FOR SIZING PAPER AND SIMILAR PRODUCTS
Francesco Malatesta, Rome, Italy, assignor to Exxon Chemical Patents Inc., Linden, N.J.
Filed Jun. 19, 1989, Ser. No. 367,779
Claims priority, application Italy, Jun. 21, 1988, 41627 A/88
Int. Cl.[5] D21H *17/05*
U.S. Cl. 162—158 25 Claims

1. A process for sizing paper products derived from aqueous-based cellulosic fiber paper stock adapted to form a web comprising:
(1) treating a cellulose fiber water slurry paper making stock with a cationizing agent to form a cationized paper making stock;
(2) providing a non-emulsified sizing agent reactive with cellulose consisting essentially of neat, liquid, reactive sizing material or unreactive sizing material dissolved in an inert, anhydrous, water soluble, organic, protic or aprotic solvent, wherein said reactive sizing material comprises at least one member selected from the group consisting of acyl halide, cyclic acid anhydride, alkyl ketone dimer, isocyanate, alkyl amino chloride, carbonic acid chloride, chlorosulphonic acid amide, and chlorophosphoric acid amide;
(3) contacting and applying to at least a portion of the fiber surface of said cationized appear marking stock:
(a) before, during or subsequent to forming the cationized paper making stock into a web; and
(b) with a fine droplet non-emulsified spray of said sizing agent for a time and in a manner sufficient to provide absorption by the fibers of said paper making stock, of at lest 0.005 weight % non-emulsified sizing material based on the weight of dry cellulose fiber; and
(4) reaction the sizing material applied in accordance with step (3) with the cellulose fibres of the paper making stock.

5,114,539
METHODS FOR MANUFACTURING PAPER PRODUCTS
John G. Pennimas, Carmel, and Maria S. Reichlin, White Plains, both of N.Y., assignors to Paper Chemistry Laboratory, Inc., Carmel, N.Y.
Continuation-in-part of Ser. No. 77,149, Jul. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 806,884, Dec. 9, 1985, abandoned. This application Sep. 9, 1988, Ser. No. 224,225
The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.
Int. Cl.[5] D21D *3/00*; D21F *11/00*
U.S. Cl. 162—184 15 Claims

1. A method for improving the rate of water removal of a paper product during its manufacture which comprises applying a solution consisting essentially of at least one water-insoluble liquid hydrocarbon at any point on a papermaking machine prior to the end of the press section in an amount sufficient to at least partially replace interstitial water in the web; and pressing the web in the press section to obtain a pressed web wherein some of the water has been replaced by hydrocarbon in order to improve water removal efficiency during the manufacture of the paper product.

5,114,540
APPARATUS FOR CHEMICAL TREATMENT OF LIGNOCELLULOSIC MATERIALS
Kwei-Nam Law, 3705 Boulevard des Cheaux, Trois-Rivieres, Quebec, Canada G8Y 1A5 , assignor to Kwei-Nam Law and Jacques L. Valade, both of Québec, Canada
Filed Sep. 5, 1989, Ser. No. 402,629
Int. Cl.[5] D21C *7/10, 7/14*
U.S. Cl. 162—247 7 Claims



1. An apparatus for chemically treating lignocellulosic materials comprising in combination a main body composed of interconnected, concentric, inner and outer compartments and a top and bottom cover; a heat exchanger; a pump for circulating water or treatment liquor from said compartments to said heat exchanger; a quick-discharge valve located at the bottom of the inner compartment for discharging treated material; conduits connecting the inner and outer compartments, the compartments and the pump, the pump and the heat exchanger, and the heat exchanger and the compartments; valves installed at different locations in said conduits, said valves capable of regulating the flow of said water or said treatment liquor for a particular treatment process of said lignocellulosic materials; means for collecting a sample of the treatment liquor during the treatment process; means for introducing water into the outer compartment; means for introducing treatment liquor into the inner compartment; means for introducing lignocellulosic materials into the inner compartment; and means for draining said outer compartment, said pump, and said heat exchanger.

5,114,541
PROCESS FOR PRODUCING SOLID, LIQUID AND GASEOUS FUELS FROM ORGANIC STARTING MATERIAL
Ernst Bayer, 74 Tübingen, Bei der Ochsenweide 17, Fed. Rep. of Germany
Continuation of Ser. No. 123,220, Nov. 20, 1987, abandoned, which is a continuation of Ser. No. 504,231, Jun. 14, 1983, abandoned, which is a continuation of Ser. No. 319,884, Nov. 10, 1981, abandoned. This application May 13, 1991, Ser. No. 698,897
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3042964
Int. Cl.[5] C10B *53/00, 57/14*
U.S. Cl. 201—2.5 16 Claims

16. A process for producing a petroleum-type liquid fuel consisting essentially of de-watering an organic starting mate-

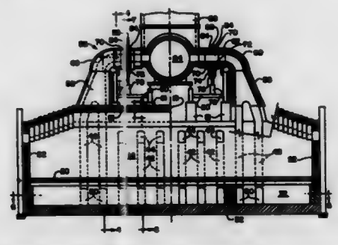
rial selected from the group consisting of fresh sludge, sewage sludge, fermentation sludge from waste water purifying plants, and organic components of private or industrial garbage to obtain a dry, solid bulk material of powdery or granular consistency, subjecting said dry material to heating under the exclusion of air under such conditions that no substantial cleavage of carbon-carbon bonds takes place, said heating being carried out at a rate of 5° C. to 30° C. per minute up to a conversion temperature until the development of gases and vapors has substantially ceased, isolating the gases and vapors from the remaining solid residues and separating the liquid contained in the isolated gases and vapors whereby a petroleum-type fuel is produced.

5,114,542

NONRECOVERY COKE OVEN BATTERY AND METHOD OF OPERATION

James H. Childress; Steve E. Newberry, both of Honaker, Charles W. Pruitt, Pounding Mill, all of Va., assignors to Jewell Coal and Coke Company, Vansant, VA.

Filed Sep. 25, 1990, Ser. No. 587,742
Int. Cl.[5] C10B *5/08, 21/20, 27/06*
U.S. Cl. 201—15 **19 Claims**



1. An improved draft control system in combination with a nonrecovery coke oven battery including a plurality of elongated coking ovens having opposite open ends normally closed by removable doors and constructed in side-by-side relation with each adjacent pair of ovens being separated by a common sidewall, separate systems of sole flues located beneath the opposite ends of each of the ovens, a plurality of downcomers in each of the common sidewalls connecting the upper portion of each adjacent oven to one of the sole flue systems beneath that oven, a plurality of uptakes in each of the common sidewalls including at least one uptake connected to one of the sole flue systems beneath that oven, an elongated exhaust tunnel extending above and transversely of the ovens in the battery, a stack connected to the exhaust tunnel and extending upwardly therefrom, and an insulated duct system connecting the exhaust tunnel to said uptakes to provide a continuous gas flow path from each oven through the downcomers, sole flue systems, uptakes, insulated duct system, exhaust tunnel and stack to the atmosphere, said insulated duct system including separate insulated duct means connected between said exhaust tunnel and said at least one uptake connected to each of the sole flue systems, the improvement wherein said draft control system comprises,

draft regulating valve means located in each said insulated duct means, each said draft regulating valve means including a movable valve member and first power means operable to position said movable valve member to regulate the flow of hot flue gases from the connected sole flue system to the exhaust tunnel, and

stack draft regulating means mounted on said stack and operable to restrict the flow of hot stack gases from said stack to the atmosphere, said stack draft regulating means including damper means and second power means operable to open and close said damper means to thereby control the draft applied by the stack to the exhaust tunnel, whereby a controlled uniform draft is applied by the stack through the exhaust tunnel to all said insulated duct means in the battery, and the flow of hot flue gases from each sole flue system is regulated by said draft regulating valve means to control the draft applied to each oven independently and thereby independently control the coking rate in the respective ovens.

5,114,543

METHOD OF MAKING THIN COPPER FOIL FOR PRINTED WIRING BOARD

Toshiyuki Kajiwara; Yoshinori Tanii, and Kazuhiko Hashimoto, all of Kyoto, Japan, assignors to Fukuda Kinoku Hakufun Kogyo Kabushiki Kaisha, Kyoto, Japan

Division of Ser. No. 524,755, May 17, 1990. This application Mar. 18, 1991, Ser. No. 670,812
Claims priority, application Japan, May 17, 1989, 1-123496; Oct. 12, 1989, 1-265680
Int. Cl.[5] C25D *3/58, 7/06*
U.S. Cl. 205—152 **2 Claims**



1. A method of manufacturing a thin copper foil for a printed wiring board comprising the steps of:

(a) preparing a copper foil supporter having a rough surface on at least a side thereof,

(b) forming a parting layer on the rough surface of the copper foil supporter by immersing the rough surface in a chromate bath including hexavalent chromium ions and keeping a value of pH between 2.0 and 6.5,

(c) forming a copper-nickel compound metal layer by immersing the parting layer in a compound metal plating bath including cupric ions, nickel ions and citric acid and keeping a value of pH more than 5.0 and by plating same by means of cathodic electrolysis, and

(d) immersing the copper-nickel compound metal layer in an electric plating bath to deposit a thin copper foil layer.

5,114,544

PRODUCTION OF FLUOROCARBONS

Steven R. Forsyth, Chester, and Brian T. Grady, Cheshire, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 412,313, Sep. 26, 1989, abandoned. This application Jan. 23, 1991, Ser. No. 644,741
Claims priority, application United Kingdom, Sep. 26, 1988, 8822541
Int. Cl.[5] G25B *3/04*; C07C *19/08*
U.S. Cl. 204—59 F **17 Claims**

1. In a process for the production of a fluorocarbon by reducing a fluorocarbon which contains at least one atom selected from the group consisting of chlorine and bromine in the presence of a reducing agent, wherein the resulting reduction, the atom of chlorine and/or bromine is replaced by hydrogen said process comprising steps wherein the reduction is effected in the presence of a solution of a reducing agent which reducing agent consists essentially of a redox couple which comprises a metal or a compound of a metal which exists in a plurality of states, the reduction being effected by the metal or compound of the metal in a lower oxidation state and being oxidized to a higher oxidation state in the process reducing the oxidized redox couple electrolytically and reusing the redox couple in the fluorocarbon reduction step of the process.

5,114,545

ELECTROLYTE CHEMISTRY FOR IMPROVED PERFORMANCE IN MODERN INDUSTRIAL ALUMINA REDUCTION CELLS

Thomas R. Alcorn, Florence; Alton T. Tabereaux, Sheffield, both of Ala., and Lake R. Trembley, Quebec, Canada, assignors to Reynolds Metals Company, Richmond, Va.

Filed Jun. 17, 1991, Ser. No. 716,146
Int. Cl.[5] C25C *3/06, 3/18*; H01B *1/06*
U.S. Cl. 204—67 **10 Claims**

1. In a process for producing aluminum metal which process includes electrolytically decomposing alumina to aluminum metal in a molten electrolyte bath, the bath being predominantly cryolite, the improvement wherein the bath comprises in parts by weight, 0.5 to 1.5% LiF, 0–2.0% MgF_2 3.0 to 5.0% CaF_2, and 8.0 to 12.0% excess AlF_3.

5,114,546

PROCESS FOR THE PREPARATION OF FLUORINATED ACRYLIC ACIDS AND DERIVATIVES THEREOF

Steffen Dapperheld, Kriftel; Rudolf Heumüller, Rodgau, and Manfred Wildt, Brombachtal, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 532,914, Jun. 4, 1990, abandoned, which is a continuation of Ser. No. 246,363, Sep. 20, 1988, abandoned. This application Oct. 15, 1991, Ser. No. 777,488
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731914
Int. Cl.[5] C25B *3/04*
U.S. Cl. 204—72 **10 Claims**

1. A process for the preparation of compounds of the formula I



(I)

in which

R^1 denotes a fluorine atom or a methyl or deuteromethyl group,

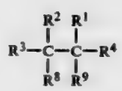
R^2 and R^3 are identical or different and denote a fluorine, chlorine, bromine, iodine, hydrogen or deuterium atom, and

R^4 is a cyano group or the



group where R^5 denotes —OH, —OD, —OMe where Me=an alkali metal ion, an alkaline-earth metal ion or an NH_4+ ion, C_1 to C_{12}-alkoxy or —NR^6R^7 in which R^6 and R^7 are identical or different and represent H, D, C_1 to C_{12}-alkyl or phenyl,

by electrolytic reduction, wherein compounds of the formula II



(II)

in which

R^1, R^2, R^3 and R^4 have the abovementioned meaning and

R^8 and R^9 are identical or different and denote a chlorine, bromine or iodine atom, in an undivided cell or a divided cell in an electrolysis liquid comprising—in each case relative to the total amount of the electrolyte in an undivided cell or the catholyte in a divided cell—

0 to 100% by weight of water
100 to 0% by weight of one or more organic solvents, and
0 to 10% by weight of a salt of a metal having a hydrogen overvoltage of at least 0.25 V (based on a current density of 300 mA/cm^2) and/or having dehalogenating properties,

are subjected to electrolysis at a temperature from −10° C. to the boiling point of the electrolysis liquid and galvanostatically at a current density between 1 and 600 mA/cm^2, the cathode comprising lead, cadmium, zinc, copper, tin, zirconium or carbon

wherein the resulting fluorine-containing acrylic acid remains in the unsaturated form in the catholyte.

5,114,547

ELECTRODE

Anders Ullman, Ljungaverk, Sweden, assignor to Permascand AB, Ljungavert, Sweden

Filed Jul. 12, 1990, Ser. No. 551,315
Claims priority, application Sweden, Jul. 14, 1989, 8902536
Int. Cl.[5] C25B *9/00, 11/00*
U.S. Cl. 204—128 **19 Claims**



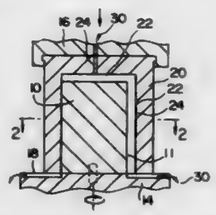
1. An electrode for electrolysis, comprising an electrically conducting metal having a surface embossed with at least one central, vertical circulation channel and with upwardly directed channels in a herring-bone pattern, the upwardly directed channels forming an angle of less than about 90° with a horizontal line in the plane of the electrode surface and communicating with the circulation channel.

5,114,548

ORBITAL ELECTROCHEMICAL MACHINING

Lawrence J. Rhoades, Pittsburgh, Pa., assignor to Extrude Hone Corporation, Irwin, Pa.

Filed Aug. 9, 1990, Ser. No. 564,604
Int. Cl.[5] B23H *3/00, 5/06, 5/14, 7/28*
U.S. Cl. 204—129.46 **40 Claims**

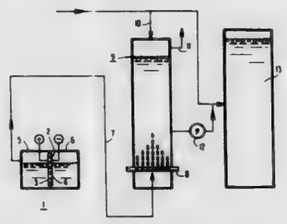


1. A method of machining a surface of an electrically conductive workpiece the steps comprising:

a. forming a tool comprising an electrically conductive body

with a surface of nonconductive abrasive particles complementary to said form to be machined;
b. mounting said workpiece and said tool in an oscillating relationship to each other such that said nonconductive abrasive surface is opposed to said surface to be machined;
c. connecting said tool and said workpiece to a DC power supply such that said tool is cathodic and said workpiece is anodic;
d. introducing an electrolyte between said tool and said workpiece which is passivating to said workpiece to form a passivation layer thereon;
e. causing a relative contacting motion between said tool and said workpiece such that said abrasive particles on the surface of said tool will abrade said workpiece only on those areas of the workpiece where machining is to be performed and thereby selectively abrade away only selected portions of said passivation layer on said workpiece to expose fresh workpiece metal thereunder, thereby permitting a portion of said workpiece metal to be removed by an electrochemical action of the electrolyte;
f. causing a relative reciprocal motion between said tool and said workpiece sufficient to pump said electrolyte between said tool and said workpiece to prevent over-heating thereof;
g. causing an advancing motion between said tool and said workpiece while said workpiece metal is being removed so as to maintain contact between said tool and said workpiece.

5,114,549
METHOD AND APPARATUS FOR TREATING WATER USING ELECTROLYTIC OZONE
Takayuki Shimamune, Tokyo; Shuji Nakamatsu, Kanagawa; Isao Sawamoto, Kanagawa; Hiroshi Masuda, Kanagawa, and Yoshinori Nishiki, Kanagawa, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan
Continuation of Ser. No. 413,499, Sep. 27, 1989. This application Oct. 29, 1991, Ser. No. 784,738
Claims priority, application Japan, Sep. 29, 1988, 63-244980
Int. Cl.[5] C02F *1/78*
U.S. Cl. 204—149 **19 Claims**

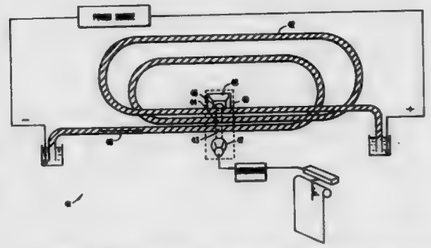


1. A method of water treatment using electrolytic ozone, which comprises electrolyzing water in an electrolytic cell comprising an anode compartment and a cathode compartment separated by an ion-exchange membrane having on the anode side thereof an anodic substance of ozone-generating capacity to generate an ozone-containing gas in the anode compartment of the electrolytic cell, separating the ozone-containing gas from the anolyte, and contacting the separated ozone-containing gas with the water to be treated, said water to be treated being different than the water for electrolysis.

5,114,550
METHOD FOR THE PRODUCTION OF GEL FILLED CAPILLARIES FOR CAPILLARY GEL ELECTROPHORESIS
Gerhard Schomburg, and Jurgen A. Lux, both of Mülheim/-Ruhr, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle MbH, Mulheim A.D. Ruhr, Fed. Rep. of Germany
Filed May 2, 1991, Ser. No. 694,742
Claims priority, application European Pat. Off., May 5, 1990, 90108487.1
Int. Cl.[5] G01N *27/26*; B21D *57/12*
U.S. Cl. 204—180.1 **9 Claims**

1. In the production of a gel filled microcapillary for capillary gel electrophoresis by filling the microcapillary with a solution of a polymerizable monomer and polymerizing the monomer to form a hydrophilic polymer-containing gel matrix, the improvement which comprises effecting the polymerization by γ-radiation of the filled capillary.

5,114,551
MULTI-POINT DETECTION METHOD FOR ELECTROPHORESIS AND CHROMATOGRAPHY IN CAPILLARIES
Stellan Hjerten, and Tasanee Srichaiyo, both of Upsala, Sweden, assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.
Filed Sep. 30, 1991, Ser. No. 769,073
Int. Cl.[5] B01D *57/02, 61/42*; C25D *13/00*
U.S. Cl. 204—180.1 **20 Claims**

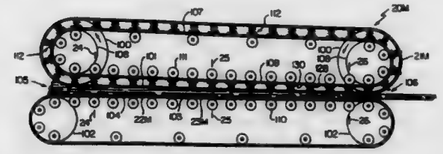


1. A method for obtaining a plurality of solute peak patterns representing successive stages of a continuous separation of solutes by a separation process selected from chromatographic and electrophoretic separations performed in a separation medium retained in a capillary, said method comprising detecting, with a single detector, variations in light absorptivity as a function of time at a plurality of locations spaced apart along the length of said capillary.

5,114,552
COMPOSITIONS COMPRISING IONIC RESINS AND CAPPED POLYISOCYANATE MIXTURES CONTAINING A DIPHENYL-2,4'-DIISOCYANATE AND A DIPHENYL-4,4'-DIISOCYANATE
Gregory J. McCollum, Glenshaw, and George W. Mauer, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 698,993, Feb. 7, 1985, Pat. No. 4,615,779. This application Feb. 25, 1986, Ser. No. 833,872
Int. Cl.[5] C25D *13/06*
U.S. Cl. 204—181.7 **24 Claims**

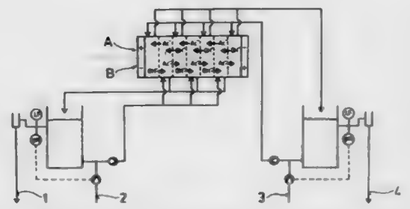
12. A method of electrocoating an electrically conductive surface serving as an electrode in an electrical circuit comprising said electrode and a counter-electrode of opposite polarity immersed in an aqueous dispersion of an electrocoating composition, comprising passing electric current between the electrodes to cause a coating to deposit on said electrode, wherein the curable electrocoating composition comprises an active hydrogen-containing ionic resin derived from at least one epoxy functional reactant and a capped polyisocyanate for which the capping agent is a low molecular weight alcohol having an average molecular weight no greater than 76, in which the polyisocyanate comprises a mixture of a diphenyl-2,4'-diisocyanate and a diphenyl-4,4'-diisocyanate in which the diphenyl-2,4'-diisocyanate comprises at least 5 percent by weight of the polyisocyanate mixture, such that said aqueous dispersion composition is physically stable for at least about two weeks at a temperature of at least about 21° C.

5,114,553
APPARATUS AND METHOD FOR REMOVING LIQUID FROM LIQUID BEARING MATERIAL
James T. Candor, 5440 Cynthia La., Dayton, Ohio 45429
Division of Ser. No. 454,718, Dec. 21, 1989, Pat. No. 4,975,166, which is a continuation-in-part of Ser. No. 386,579, Jul. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 284,197, Dec. 14, 1988, Pat. No. 4,877,503, which is a continuation-in-part of Ser. No. 213,709, Jun. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 189,974, May 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 62,201, Jun. 15, 1987, Pat. No. 4,780,188, which is a continuation-in-part of Ser. No. 32,746, Mar. 31, 1987, Pat. No. 4,767,514. This application Aug. 29, 1990, Ser. No. 575,416
The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.
Int. Cl.[5] B01D *57/02*
U.S. Cl. 204—182.1 **36 Claims**



1. In a method for removing liquid from liquid bearing material and comprising the steps of providing a pair of electrode means having portions thereof disposed adjacent each other and defining an inlet means to said adjacent portions and an outlet means from said adjacent portions, feeding said liquid bearing material into said inlet means, moving said liquid bearing material from said inlet means to said outlet means so that sections of said material serially move from said inlet means to said outlet means while being disposed between said adjacent portions, vibrating said liquid bearing material between said adjacent portions of said electrode means as said material is moving from said inlet means to said outlet means whereby a vibratory action is applied to said material, and creating a voltage between said pair of electrode means so as to create an electrostatic field arrangement between said adjacent portions of said pair of electrode means for acting through said material that is disposed therebetween to remove liquid from said material, the improvement comprising the steps of providing different voltages between different parts of said pair of electrode means so that different intensities of the electrostatic field arrangement serially act through each said section of said material as each said section of material moves from said inlet means to said outlet means, and providing different vibratory actions to different parts of said material that is disposed between said inlet means and said outlet means so that different intensities of said vibratory action serially act on each said section of said material as each said section of said material moves from said inlet means to said outlet means.

5,114,554
REMOVAL OF ACID FROM CATHODIC ELECTROCOATING BATHS BY ELECTRODIALYSIS
Hartwig Voss, Frankenthal, and Thomas Braecken, Dortmund, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Dec. 1, 1988, Ser. No. 278,353
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1987, 3740785
The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.
Int. Cl.[5] B01D *13/02*
U.S. Cl. 204—182.4 **10 Claims**

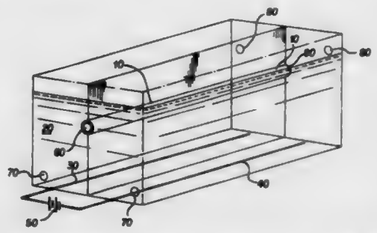


1. A process for removing acid from a cathodic electrocoating bath in which an electroconductive substrate is being coated with a cationic resin in the form of an aqueous dispersion by separation of the dispersion by ultrafiltration into a resin dispersion and an ultrafiltrate and deacidification of the ultrafiltrate by passing the ultrafiltrate through the chambers K_1 of a direct current operated electrodialysis cell comprising the characteristic sequence

$$-(K_2\text{-}M_1\text{-}K_1\text{-}M_1)_n\text{-},$$

where M_1 is an anion exchange membrane and n is from 1 to about 500, and passing and aqueous base through the chambers K_2, which comprises reversing the polarity of the electric field responsible for ion transport through the membrane.

5,114,555
CONTINUOUS ISOELECTRIC SEPARATION
Donald I. Stimpson, Zion, Ill., assignor to Monsanto Company, St. Louis, Mo.
Continuation-in-part of Ser. No. 140,855, Jan. 5, 1988, abandoned. This application Nov. 23, 1988, Ser. No. 273,780
Int. Cl.[5] G01N *27/26*; B01D *57/02*
U.S. Cl. 204—183.2 **5 Claims**



1. An apparatus for continuous purification and collection of a target protein or protein fraction which comprises:
a) a first buffer chamber having an inlet port and an outlet port for the ingress and egress of buffer fluid;
b) a second buffer chamber having an inlet port and an outlet port for the ingress and egress of buffer fluid;
c) at least one nonionic, nonelectrically conductive porous membrane conduit of substantially uniform diameter and of constant flow character having an inlet port and an

outlet port for the ingress of feed protein solution to be separated and the egress of the target protein solution, said conduit having an inside diameter and an outside diameter and said inlet and outlet ports having an inside diameter which is substantially the same as the inside diameter of the conduit, said conduit being positioned to serve as a septum between said buffer chambers and adapted to permit the free flow of electrophoretically-driven proteins therethrough;

d) a cathode electrode contained in said first buffer chamber;

e) an anode electrode contained in said second buffer chamber; and

f) a direct current power source connected to said electrodes, said power source adapted to induce an electric field through a suitable buffer contained in said chambers and sufficient to induce an electrophoretic force on charged proteins of the protein solution to be separated;

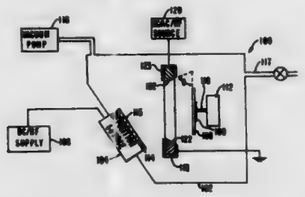
said electrodes being adapted, when connected to said power source, to induce an electric field substantially uniformly in a single direction, and said membrane conduit being positioned such that the electric field induced by said power source is uniformly substantially perpendicular to the direction of fluid flow through the membrane conduit.

5,114,556

DEPOSITION APPARATUS AND METHOD FOR ENHANCING STEP COVERAGE AND PLANARIZATION ON SEMICONDUCTOR WAFERS

Lawrence T. Lamont, Jr., San Jose, Calif., assignor to Machine Technology, Inc., Parsippany, N.J.

Filed Dec. 27, 1989, Ser. No. 457,347
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.12 **31 Claims**



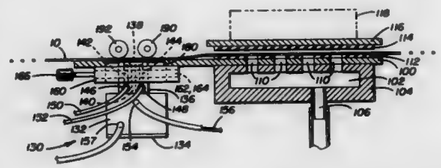
1. Apparatus for depositing a layer of a substance on a surface of a substrate, said apparatus comprising means for holding said substrate, depositing means for depositing said substance in the presence of a plasma from a gaseous phase onto said surface of said substrate to form a layer of said substance thereon, creating means for creating neutral atoms or molecules from a portion of said gaseous phase independent of said separate from said depositing means, said creating means comprising an electrode having a reflecting surface for reflecting said neutral atoms or molecules at an angle to the surface of said substrate to mobilize said substance deposited thereon by collision with said neutral atoms or molecules, first means for controlling the operation of said depositing means, and second means for controlling the operation of said creating means, said second means operable for controlling the creation and energy level of said neutral atoms or molecules independently from the depositing of said substance by operation of said first means, said second means controlling said creating means whereby ions from said plasma which form said neutral atoms or molecules have an energy level deficient for effecting sputtering of said electrode, said neutral atoms or molecules having an energy level sufficient to effect mobilization of said layer of said substance while an energy level deficient for effective resputtering of said substance from said substrate.

5,114,557

SELECTIVE PLATING APPARATUS WITH OPTICAL ALIGNMENT SENSOR

Hooshang Jahani, Fremont, Calif., assignor to Tooltek Engineering Corp., Fremont, Calif.

Filed Feb. 20, 1991, Ser. No. 659,577
Int. Cl.[5] C25D *17/00*
U.S. Cl. 204—206 **24 Claims**



1. Apparatus for plating selected portions of a web being moved intermittently along a path of travel, comprising:

a plating mask disposed along said path and having a web facing side, said plating mask having a plurality of apertures through said web facing side at predefined locations relative to each other to define said selected portions of said web relative to each other;

means for sealing said web against said web facing side of said plating mask and for supplying a plating fluid through said apertures to said web during pauses in the movement of said web; and

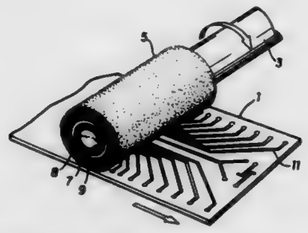
optical sensor means having an optical sensor surface disposed along said path of travel to detect registration of said web relative to said apertures, said optical sensor surface being rigidly attached to said plating mask.

5,114,558

METHOD AND APPARATUS FOR MANUFACTURING INTERCONNECTS WITH FINE LINES AND SPACING

Igor V. Kadija, 118 Sherwood Rd., Ridgewood, N.J. 07450

Division of Ser. No. 311,212, Feb. 15, 1989. This application Apr. 22, 1991, Ser. No. 688,257
Int. Cl.[5] C25D *17/14*
U.S. Cl. 204—224 R **12 Claims**



1. Apparatus for making fine line and spacing interconnects comprising:

a plurality of electroconductive wires;

perforated means attached to and supporting said wires for permitting electrolyte to pass therethrough;

first means electrically connected to said metallic wires for applying a first polarity electrical potential thereto;

metallic means mounted in proximity to said metallic wires; and

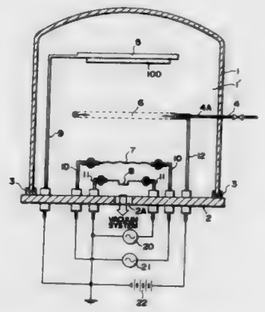
second means electrically connected to said metallic means for applying a second polarity electrical potential thereto.

5,114,559

THIN FILM DEPOSITION SYSTEM

Wasaburo Ohtu; Masashi Nakazawa, both of Yokohama, and Mikio Kinoshita, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 25, 1990, Ser. No. 587,998
Claims priority, application Japan, Sep. 26, 1989, 1-249500; Nov. 10, 1989, 1-293240; Jul. 9, 1990, 2-181051; Aug. 6, 1990, 2-208423
Int. Cl.[5] C23C *16/50*
U.S. Cl. 204—298.05 **2 Claims**



1. A thin film deposition system comprising: a vacuum casing;

gas inlet means for introducing an active gas or an inert gas or a mixture of an active gas and an inert gas into said vacuum casing;

an evaporation source disposed in said vacuum casing, for evaporating a material carried thereon;

an electrode for supporting a substrate on which a thin film is to be deposited, said electrode being disposed in said vacuum casing in confronting relation to said evaporation source;

a filament for emitting thermions, said filament being disposed between said evaporation source and said electrode;

a grid for passing the evaporated material therethrough, said grid being disposed between said filament and said electrode;

power supply means for developing a predetermined electric condition in said vacuum casing;

electric conductive means electrically connecting said power supply means to said vacuum casing, said evaporation source, said electrode, said filament, and said grid, for keeping said filament negative in potential with respect to said vacuum casing and said grid; and

wherein said grid is of a double-layer structure, and said gas inlet means is connected to said grid.

5,114,560

APPARATUS AND METHOD FOR REMOVAL OF LIQUIDS

Nagabhusan Senapati, 1188 Kilham Ct., Worthington, Ohio 43235; Harold W. Johnson, 4222 Cedar Valley, Kingwood, Tex. 77345; Byung C. Kim, 2380 Hardesty Dr., S., Columbus, Ohio 43204; Satya P. Chauhan, 866 Werner Way, Worthington, Ohio 43085; Dennis A. Gamlen, 2315 Deer Meadow, Missouri City, Tex. 77459; Raju Eason, 11307 Gondola, Stafford, Tex. 77477; H. S. Muralidhara, 2660 Sawmill Forest Ave., Dublin, Ohio 43017, and Matthew S. Zelinski, 446 Colonial Ave., Worthington, Ohio 43085

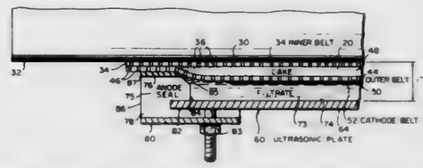
Filed Aug. 28, 1989, Ser. No. 400,296
Int. Cl.[5] B01D *33/00*; C25B *7/00*
U.S. Cl. 204—299 R **9 Claims**

4. An apparatus for continuously removing liquid from a moist cake which is moved along a processing path, the apparatus comprising:

a support;

a first cake-engaging element carried by and movable relative to said support for engaging one side of the cake and for contributing to transportation of the cake along the processing path;

a second cake-engaging element carried by and movable relative to said support and located in opposed relation to said first cake engaging element for engaging the other side of the cake and for further contributing to transportation of the cake along the processing path, said first and second cake-engaging elements mechanically removing liquid from said cake, whereby the cake will be disposed between the first and second cake-engaging elements and transported along therewith, the second cake-engaging element having passageways therein to allow liquid to pass from the cake and to collect as liquid filtrate;



an acoustic transducer arrangement coupled with said support and disposed in spaced relation to said second cake-engaging element; and

an all-liquid coupling interposed between said second cake-engaging element and said acoustic transducer arrangement, said all-liquid coupling including a filtrate bath contained within a filtrate chamber acoustically connecting said second cake-engaging element to said acoustic transducer, which filtrate chamber is completely filled with liquid filtrate during normal operation;

whereby acoustic energy transmitted through an all-liquid media in the form of the liquid-filled filtrate chamber maximizes acoustic transmission and enhances dewatering and whereby acoustic energy in the filtrate chamber helps in preventing formation of deposits and to clean the deposits on said second cake-engaging element which passes through this chamber.

5,114,561

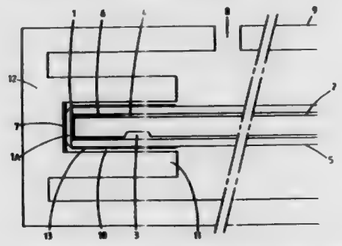
OXYGEN PROBE ASSEMBLY

Michael J. Bannister, Glen Waverley, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

PCT No. PCT/AU89/00113, § 371 Date Oct. 31, 1990, § 102(e) Date Oct. 31, 1990, PCT Pub. No. WO89/09398, PCT Pub. Date Oct. 5, 1989
PCT Filed Mar. 21, 1989, Ser. No. 585,084
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—421 **6 Claims**

1. An oxygen probe assembly comprising a solid electrolyte oxygen sensor and means for conveying a test gas and a reference gas to the appropriate electrodes of the sensor, characterized in that the means for conveying the test gas, the reference gas, or both of said gasses to the appropriate electrode(s) include a pathway in the form of a labyrinth or annulus which extends to the electrode and through which the gas must diffuse before reaching the electrode, and wherein at least part of the said labyrinth or annulus is coated with an oxidation cata-

lyst, whereby combustible substances in the gas(es) passing through said pathway(s) are removed by catalytic oxidation



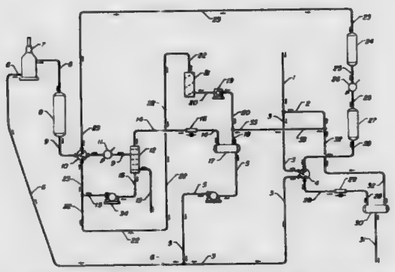
over said catalyst before the gas(es) reach the appropriate electrode(s).

5,114,562

TWO-STAGE HYDRODESULFURIZATION AND HYDROGENATION PROCESS FOR DISTILLATE HYDROCARBONS

Edward C. Haun, Glendale Heights; Gregory J. Thompson, Waukegan; Jayant K. Corawara, Mundelein, and Dana K. Sullivan, Mt. Prospect, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Aug. 3, 1990, Ser. No. 562,172
Int. Cl.[5] C10G *65/12*
U.S. Cl. 208—89 12 Claims



1. A hydrotreating process which comprises the steps:

a) passing a stream of middle distillate charge stock into the first of at least two reaction zones and producing a first reaction zone effluent, the two reaction zones comprising a first catalytic reaction zone containing a fixed bed of solid desulfurization catalyst comprising a non-noble metal active component chosen form the group comprising cobalt, molybdenum, nickel and tungsten and maintained at desulfurization conditions, and a second reaction zone containing a fixed bed of hydrogenation catalyst comprising a platinum group active component and maintained at hydrogenation conditions which include a higher pressure and lower temperature than the first reaction zone;

b) separating the first reaction zone effluent into liquid and vapor fractions and stripping the liquid fraction with hydrogen in a stripping zone operated at stripping conditions including a temperature of 150 to 200 degrees C. to produce a first stripping zone gas stream, and then heating the resultant liquid fraction by indirect heat exchange against the first reaction zone effluent stream at a point prior to said separation of the first reaction zone effluent;

c) removing hydrogen sulfide from the first stripping zone gas stream, and passing the first stripping zone gas stream into the second reaction zone;

d) passing the liquid fraction of the effluent of the first reaction zone into the second reaction zone after heating from stripping conditions by indirect heat exchange against the first reaction zone effluent and producing a second reaction zone effluent; and,

e) separating hydrogen-rich gas from the second reaction zone effluent and passing portions of hydrogen-rich gas separated from the second reaction zone effluent directly into both the first and the second reaction zones, and recovering a reduced aromatic hydrocarbon content product stream from the effluent of the second reaction zone.

5,114,563

HYDROCARBON CONVERSIONS USING CATALYSTS SILICOALUMINOPHOSPHATES

Brent M. Lok, New City; Celeste A. Messina, Ossining; Robert L. Patton, Katonah, all of N.Y.; Richard T. Gajek, New Fairfield, Conn.; Thomas R. Cannan, Valley Cottage, and Edith M. Flanigen, White Plains, both of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation of Ser. No. 575,745, Jan. 31, 1984, abandoned, Division of Ser. No. 400,438, Jul. 26, 1982, Pat. No. 4,440,871.
This application Nov. 27, 1990, Ser. No. 618,761
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.
Int. Cl.[5] C07C *2/00, 4/00;* C10G *11/00, 17/00*
U.S. Cl. 208—114 15 Claims

1. Process for converting a hydrocarbon which comprises contacting said hydrocarbon under hydrocarbon converting conditions with a microporous crystalline silicoaluminophosphate the pores of which are uniform and have nominal diameters of greater than about 3 Angstroms and whose essential empricial chemical composition in the as-synthesized and anhydrous form is

$$mR:(Si_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" has a value of from 0.02 to 0.3; "m" represents the moles of "R" present per mole of $(Si_xAl_yP_z)O_2$; "x", "y" and "z" represent the mole fractions of silicon, aluminum and phosphorus respectively, present as tetrahedral oxides, said mole fractions being such that they are within the pentagonal compositional area defined by points ABCD and E of the ternary diagram which is FIG. 1 of the drawings.

5,114,564

SLUDGE AND OXYGEN QUENCHING IN DELAYED COKING

Shri K. Goyal, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Jun. 18, 1991, Ser. No. 716,789
Int. Cl.[5] C10G *9/14, 11/00*
U.S. Cl. 208—131 20 Claims

1. A delayed coking process wherein hot feed is maintained at thermal cracking temperature in a coke drum for a period of time to produce cracked vapors which are recovered from the coke drum through a vapor outlet and solid coke which is recovered from the drum after it has been cooled during a quenching cycle, wherein feed to the coke drum is stopped and thereafter oxygen and sludge are added to the solid coke in the coke drum during the quench cycle at thermal treatment conditions to effect oxidation of at least a portion of hydrocarbons contained in the sludge.

5,114,565

REFORMING NAPHTHA WITH BORON-CONTAINING LARGE-PORE ZEOLITES

Stacey I. Zones, San Francisco; Dennis L. Holtermann, Crockett, and Andrew Rainis, Walnut Creek, all of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 471,256, Jan. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 377,360, Jan. 7, 1989, abandoned. This application Jan. 25, 1991, Ser. No. 647,106
Int. Cl.[5] C10G *35/06*
U.S. Cl. 208—138 31 Claims

1. A catalytic reforming process which comprises contacting a hydrocarbonaceous feedstream under catalytic reforming conditions with a composition comprising larger-pore borosilicate zeolites having a pore size greater than 6 and less than 8 angstroms containing less than 1000 parts per million aluminum.

5,114,566

CRUDE OIL DESALTING PROCESS

Dennis P. Naeger, and Joseph J. Perugini, both of The Woodlands, Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 321,424, Mar. 9, 1989, Pat. No. 4,992,210.
This application Jan. 4, 1991, Ser. No. 609,351
Int. Cl.[5] C10G *29/00*
U.S. Cl. 208—289 6 Claims

1. A method for removing chlorides from crude oil during processing in a petroleum refinery desalter wash water operation comprising adding to the wash water or the crude oil upstream of the desalter a sufficient amount for the purpose of a composition comprising an organic amine with a pKb of from 2 to 6 and in which 1 to 18 carbon atoms are present per nitrogen atom and potassium hydroxide, said composition being mixed with said crude oil in said desalter to remove said chlorides from the crude oil at the desalter.

5,114,567

METHOD FOR DETERMINING THE PROPERTIES AND AMOUNT OF FLUID IN A SAMPLE

Rocco DiFoggio, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 29, 1988, Ser. No. 149,758
Int. Cl.[5] C10G *1/00*
U.S. Cl. 208—401 11 Claims

1. A method for determining the amount of hydrocarbon and aqueous fluids in a porous sample, comprising:

providing a representative specimen of said porous sample,

extracting hydrocarbon and aqueous fluids from said sample with a solvent mixture comprising a first solvent to dissolve hydrocarbon fluids and a second solvent to dissolve aqueous fluids,

separating said solvent mixture and extracted fluids into an aqueous containing phase and a hydrocarbon containing phase, and

determining the amount of hydrocarbon fluid from said separated hydrocarbon containing phase, and the amount of aqueous fluid from said separated aqueous containing phase.

5,114,568

RECLAMATION SYSTEM FOR CONTAMINATED MATERIAL

Brian J. Brinsmead; Gary F. Stepenoff, both of Scottsdale; Vicki H. Bess, Tempe; Gary R. Huxel, Phoenix, and John A. Wetmore, Mesa, all of Ariz., assignors to Earth Solutions, Inc., Tempe, Ariz.

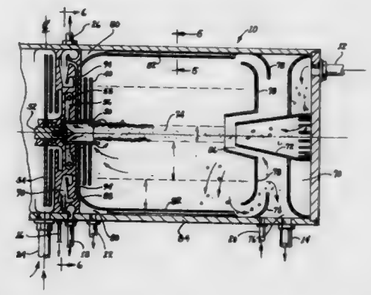
Filed Jul. 13, 1990, Ser. No. 553,536
Int. Cl.[5] B03D *1/14, 1/24;* B04C *3/04, 3/06*
U.S. Cl. 209—170 21 Claims

1. An apparatus for removing toxic material from contaminated material by gas sparged centrifugal techniques comprising, in combination:

cylindrical separation chamber means for containing a slurry of the contaminated material;

coaxially rotating disks means located coaxially within said cylindrical separation chamber means for rotating along the axis of said cylindrical separation chamber means;

means coupling to said coaxially rotating disks means for rotating said coaxially rotating disks means to create a vortex within said cylindrical separation chamber means thereby subjecting said slurry to centrifugal classification, said centrifugal classification causing relatively heavier material particles in said slurry to accumulate and exit the chamber tangentially along the outer edge of said vortex and relatively lighter material and toxic material in said



slurry to accumulate and exit the chamber axially along the center of said vortex;

means to feed said slurry of the contaminated material into the center of said vortex;

gas sparging means for sparging a stream of gas into said vortex from a stationary wall of said cylindrical separation chamber means thereby creating boundary layer turbulence to increase particle dispersion and improve the flotation characteristics of the slurry to obtain more rapid separation of lighter material and toxic material entrained in the gas phase from relatively heavier material particles;

means for isolating said lighter material and toxic material collected in gaseous suspension from the center of said vortex from the gas phase in which they are entrained; and

means for isolating said heavier material from the outer edge of the vortex.

5,114,569

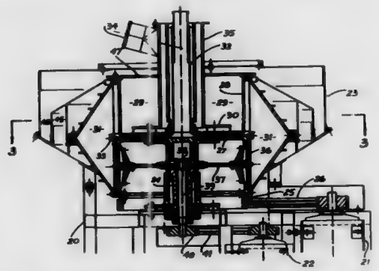
JIG PULSION MECHANISM

Christopher G. Kelsey, Sydney, Australia, assignor to Lowan Management Pty. Limited, South Australia, Australia

PCT No. PCT/AU89/00279, § 371 Date Dec. 20, 1990, § 102(e) Date Dec. 20, 1990, PCT Pub. No. WO90/00090, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 28, 1989, Ser. No. 623,922
Claims priority, application Australia, Jul. 1, 1988, PI9116
Int. Cl.[5] B03B *5/12*
U.S. Cl. 209—425 21 Claims

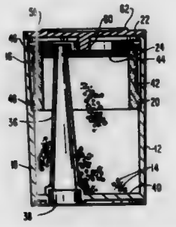
1. A centrifugal jig comprising a container mounted for rotation about its longitudinal axis, the container comprising an axial region, a peripheral region comprising at least one hutch chamber separated from the axial region by ragging, means for

rotating said container, means for introducing feed material to the axial region and dilating means for repetitively dilating the



ragging in a circumferential sequence while the container rotates.

5,114,570
WATER FILTER CARTRIDGE
Sharon L. Nelson; John E. Petrovic, and Gerald T. Swanson, all of Fort Collins, Colo., assignors to Teledyne Industries Inc., Fort Collins, Colo.
Filed Aug. 14, 1989, Ser. No. 393,262
Int. Cl.[5] B01D *27/02, 27/07, 27/08*
U.S. Cl. 210—94 **22 Claims**

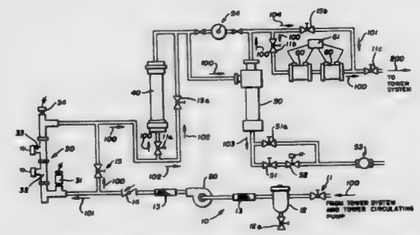


1. In a water filter cartridge having a shell within which is confined a water filtration material and having opposite first and second end walls, a conduit disposed through said material from a first opening in one of said end walls to a second opening in the other of said end walls, a third opening in one of said end walls spaced from one of said first and second openings for communicating the flow of water with said material and a fourth opening in the other of said end walls spaced from the other of said first and second openings for communicating the flow of water with said material at a location spaced from said third opening, the improvement comprising:

a hollow water filtration element of a cylindrical porous medium shaped to nest within a portion of said shell encircling a corresponding portion of said material and defining a space between said medium and the inner side wall of said shell with said space being in the entire path of water flow between said third opening and said material through said medium;

and a reference color exhibited over a portion of the exterior side wall of said shell adjacent to the location within said shell of said medium with said medium exhibiting a given color upon the beginning of usage but changing color with continued usage in response to its entrapment of matter in said water and with said shell being transparent over said medium to enable a user to compare said medium and reference colors.

5,114,571
WATER TREATMENT SYSTEM
James M. Pier, Akron, and Gary E. Starr, Clinton, both of Ohio, assignors to Water Enhancement Systems, Inc., Akron, Ohio
Filed Sep. 5, 1989, Ser. No. 402,622
Int. Cl.[5] C02F *9/00*
U.S. Cl. 210—96.1 **8 Claims**



1. An automatic water treatment system for treating a moving stream of water having inlet and outlet means, comprising:

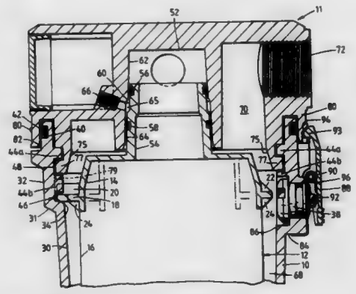
a) means for neutralizing minerals and minimizing corrosion;

b) means for separating and removing solids disposed in fluid communication with said means for neutralizing minerals and minimizing corrosion;

c) at least one copper/silver ionizer for controlling system algae and bacteria disposed in fluid communication with said means for separating and removing solids; and

d) system control means disposed between the inlet and outlet means for optimizing system blowdown by monitoring total dissolved solids within the system.

5,114,572
FILTER ASSEMBLY AND CARTRIDGE THEREFOR
George S. Hunter, Richmond, and Michael J. Hawker, Hadleigh, both of England, assignors to Process Scientific Innovations Limited, Bowburn, United Kingdom
PCT No. PCT/GB89/01054, § 371 Date May 7, 1991, § 102(e) Date May 7, 1991, PCT Pub. No. WO90/02597, PCT Pub. Date Mar. 22, 1990
PCT Filed Sep. 7, 1989, Ser. No. 679,013
Claims priority, application United Kingdom, Sep. 9, 1988, 8821238
Int. Cl.[5] B01D *27/08*
U.S. Cl. 210—120 **13 Claims**



1. A filter assembly comprising:

a filter head;

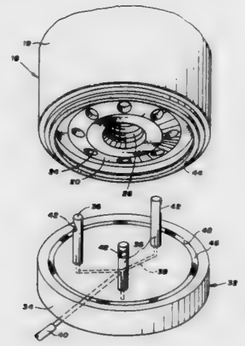
a filter bowl removably mountable to the filter head;

a filter cartridge that fits in the bowl and is removably captive therein;

means for establishing a connection between the filter cartridge and a fluid flow port in the filter head; and

means for establishing a bayonnet connection between the filter bowl and filter cartridge so that the filter bowl and the filter cartridge are together mountable to and demountable from the filter head.

5,114,573
APPARATUS FOR DEPOSITING A VISCOUS VALVE OPENER MATERIAL WITHIN AN ENGINE OIL FILTER
Lewis A. Frostick, Peck, Mich., assignor to Saturn Corporation, Troy, Mich.
Division of Ser. No. 401,720, Sep. 1, 1989, Pat. No. 4,997,554, which is a continuation-in-part of Ser. No. 322,856, Mar. 14, 1989, abandoned. This application May 25, 1990, Ser. No. 528,402
The portion of the term of this patent subsequent to Mar. 5, 2008, has been disclaimed.
Int. Cl.[5] B01D *27/10*; F01M *7/00*
U.S. Cl. 210—136 **3 Claims**



1. In combination, an oil filter assembly for an internal combustion engine, said oil filter assembly comprising a valve seat having a plurality of inlets therethrough for admitting a lubricating oil into the oil filter assembly, an outlet, a filter element located between said inlets and outlet, and an anti-drainback valve located between said filter element and said inlets and normally closed against said valve seat to prevent oil from draining out said inlets, apparatus for depositing a viscous material as a temporary valve opener between said anti-drainback valve and said seat, said apparatus comprising a base, a plurality of injectors extending in parallel relationship from the base and angularly and radially spaced about a center point so as to align with a corresponding number of said inlets and be insertable therethrough, said injectors having a length determined to engage and lift said valve off its seat leaving a space therebetween when said filter is forced against said base with said injectors extending through said inlets, said injectors each having an outlet port located axially therealong and facing in a radial direction so as to be opposite the space between said valve and said seat, and a source of temporary valve opener material connected to said injectors.

5,114,574
BACKFLUSH FILTER SYSTEM WITH INSERT MEMBER DIFFUSING FILTERING AND BACKFLUSH FLOW
Robert M. Barry, St. Paul, Minn., assignor to CFR Corporation, Roseville, Minn.
Filed Jul. 23, 1990, Ser. No. 556,175
Int. Cl.[5] B01D *21/30*
U.S. Cl. 210—137 **6 Claims**

1. A back flush filter system comprising,

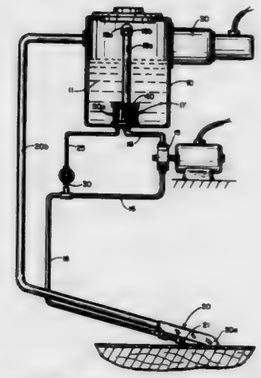
a liquid reservoir tank having an inside with a liquid level

a main conduit having an inlet end communicating with the inside of the tank below the liquid level thereof, and having an outlet end,

a pump connected to said conduit to pump liquid from said tank through the conduit,

a backflow conduit having one end connected to an intermediate portion of said main conduit downstream of the pump and one end connected to lower portion of said tank to provide back flow of liquid to the tank from said pump and main conduit,

a pressure regulating valve connected in the backflow conduit for controlling the flow through said backflow conduit to release liquid therethrough when the pressure in said main conduit exceeds a predetermined level.



a hollow filter element having a filter chamber defined therewithin, defining a filter surface area and mounted in the lower portion of said tank with both of said conduits communicating with the filter chamber defined within said hollow filter element, and

a diffusing insert member mounted within said hollow filter element arranged to cause liquid flowing through the hollow filter element in both filtering and backflow directions to be diffused substantially uniformly across the filter surface area of the hollow filter element.

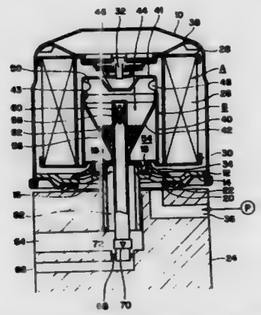
5,114,575
OIL FILTER
Hisashi Yano, Yokohama; Junsuke Yabumoto, Atsugi, and Ryuzi Kuwavara, Yokohama, all of Japan, assignors to Mitsubishi Oil Co., Ltd., Tokyo, Japan
Filed Jan. 15, 1991, Ser. No. 641,527
Claims priority, application Japan, Jan. 18, 1990, 2-2667
Int. Cl.[5] B01D *19/00*
U.S. Cl. 210—188 **9 Claims**

1. An oil filter comprising a housing opened at one end thereof, a cylindrical first separator unit disposed in said housing for removing solid contaminants from the oil introduced into said housing, and a second separator unit disposed within said first separator unit for removing gaseous contaminants from the oil that has passed through said first separator unit, said second separator unit including a funnel-shaped cyclone defining a funnel-shaped chamber for generating a vortical flow of the oil introduced therein to thereby separate gas-rich oil and a removal pipe extending into said chamber along an axis thereof for discharging said gas-rich oil, the improvement comprising:

a wall of said cyclone defining said chamber having a first portion and a second portion, and a plurality of pores formed in said first portion for allowing the oil to flow out of said cyclone, said first portion having a smaller mean diameter than that of said second portion; and

an end portion of said removal pipe positioned adjacent said

second portion of said wall of cyclone, said end portion of said removal pipe being formed with a plurality of orifices for permitting said gas-rich oil to flow into said removal pipe;



said first portion and said end portion being arranged in such a manner that they do not overlap with each other in a direction along the axis of said chamber.

5,114,576

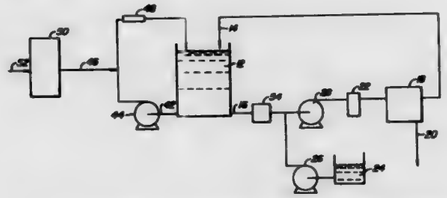
PREVENTION OF CONTAMINANTS BUILDUP IN CAPTURED AND RECIRCULATED WATER SYSTEMS

Lee C. Ditzler, Diablo; Ronald Lemberger, Danville; William K. McGrane, Pleasanton, and Jerry F. Choy, Fremont, all of Calif., assignors to TriNEos, Dublin, Calif.

Division of Ser. No. 480,722, Feb. 15, 1990. This application Oct. 11, 1990, Ser. No. 595,502

Int. Cl.[5] C02F 1/78

U.S. Cl. 210—195.1 **8 Claims**



1. A system for the combined control of levels of biological organisms and dissolved mineral impurities in a body of water, said system comprising:

first circulating means for drawing a first side stream from, and recirculating said first side stream back to, said body of water;

ozonation means for treating said first side stream with ozone to kill substantially all organisms present therein;

second circulating means for drawing a second side steam from, and recirculating said second side stream back to, said body of water;

chemical filter means in said second side stream for concentrating said dissolved mineral impurities;

a source of an organic chemical agent tending to enhance dispersion of mineral precipitating from said dissolved mineral impurities;

a bed member selected from the group consisting of activated carbon, manganese dioxide and a combination thereof, in said second side stream at a location upstream of said chemical filter means, for eliminating substantially all ozone therein; and

impurities removing means for removing said dissolved mineral impurities concentrated by said chemical filter means.

5,114,577

COMPOSITE SEPARATING AGENT

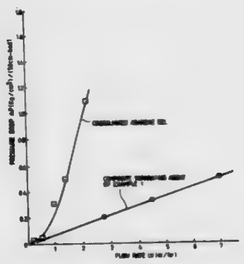
Hiroshi Kusano, Yokohama; Tsuyoshi Ito, Machida; Takayuki Tashiro, Machida; Hiroaki Takayanagi, Machida, and Eiji Miyata, Kitakyushu, all of Japan, assignors to Mitsubishi Kasei Corporation, Japan

Continuation of Ser. No. 291,101, Dec. 28, 1988, abandoned. This application Feb. 5, 1991, Ser. No. 651,117

Claims priority, application Japan, Dec. 29, 1987, 62-333023; Apr. 1, 1988, 63-78229; Apr. 1, 1988, 63-78230

Int. Cl.[5] B01D 15/08

U.S. Cl. 210—198.2 **7 Claims**



1. A composite separating agent for aqueous gel permeation chromatography which comprises a crosslinked polysaccharide hydrophilic polymer separating agent incorporated within pores of an organic polymer substrate;

wherein said separating agent shows a degree of swelling in water of 10 to 100 ml/g-dry, and has a macro-network structure, each pore of said substrate having a pore volume of 0.5 to 3 ml/g and a pore radius of 200 to 100,000 Å; and

said substrate shows a degree of swelling in water of 20 ml/g-dry or below and a degree of crosslinking of 4 to 100 mol %, has a porous structure, and is a copolymer of a monounsaturated monomer and a polyunsaturated monomer;

wherein said monounsaturated monomer is selected from the group consisting of styrene, ethylvinylbenzene, p-methyl styrene, glycidyl methacrylate, allyl glycidyl ether, acryl glycidyl ether, 2-hydroxyethyl methacrylate, polyethyleneglycol methacrylate, methacrylic acid, methyl methacrylate, vinyl formate, vinyl acetate, allyl formate, and allyl acetate; and said polyunsaturated monomer is selected from the group consisting of divinyl benzene, trivinyl benzene, and substituted derivatives thereof, ethylene glycol dimethacrylate, polyethylene glycol dimethacrylate, propylene glycol dimethacrylate, polypropylene glycol dimethacrylate, glycerol trimethacrylate, glycerol dimethacrylate, and triallyl isocyanurate.

5,114,578

SETTLING APPARATUS

Gustaf F. Sundström, Djursholm, Sweden, assignor to Stiftelsen Centrum for Dentalteknik Och Biomaterial I Huddinge, Huddinge, Sweden

Filed Feb. 12, 1991, Ser. No. 654,041

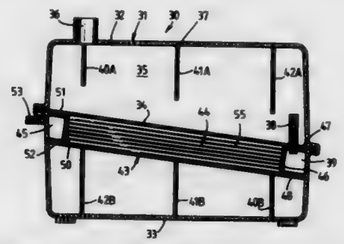
Claims priority, application Sweden, Feb. 14, 1990, 9000524

Int. Cl.[5] B01D 21/02

U.S. Cl. 210—256 **9 Claims**

1. A settling apparatus for removing amalgam from waste water produced in a dental procedure, comprising a housing having upper and lower compartments separated from each other by an inclined partition wall, said upper compartment defining a pre-settling chamber; an inclined passage having an inclination to the horizontal of from about 3° to 15°; a plurality of tubes extending through said passage and the number thereof being sufficient that substantially all of the tubes

contact other tubes in a side-by-side manner and form channels therebetween; means for flowing said waste water from said pre-settling chamber to a lowermost end of said passage and from said lowermost end of said passage through said passage, tubes and channels in laminar flow and out of said passage, wherein the inclination of said inclined partition wall is equal



to the inclination of said inclined passage, said inclined passage being disposed in the lower compartment and beneath said inclined partition wall, and wherein amalgam in said waste water is settled in said pre-settling chamber and in and among said tubes and channels in said passage during said flowing of the waste water.

5,114,579

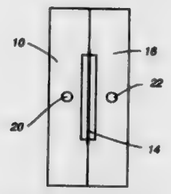
SEPARATION OF METALS BY SUPPORTED LIQUID MEMBRANE

Doreen Y. Takigawa, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 22, 1990, Ser. No. 602,460

Int. Cl.[5] B01D 15/04, 17/00

U.S. Cl. 210—638 **15 Claims**



6. A process of separating a preselected chemical species selected from the group consisting of aluminum, arsenic, antimony, bismuth, cadmium, chromium, copper, cobalt, gallium, gold, hafnium, indium, iridium, iron, lead, manganese, mercury, molybdenum, neodymium, nickel, niobium, osmium, palladium, platinum, rhenium, rhodium, ruthenium, selenium, silver, tantalum, tellurium, thallium, thorium, tin, tungsten, uranium, vanadium, zinc, or zirconium from a feedstream comprising:

a. providing a supported liquid membrane having both a first and a second side, said membrane comprised of microporous polybenzimidazole, said polybenzimidazole containing within the polybenzimidazole pores an extractant mixture selective for said preselected chemical species;

b. contacting a feedstream containing said preselected chemical species with the first side of said supported liquid membrane in a feed compartment adjacent to said supported liquid membrane for a time sufficient to extract at least a portion of said preselected chemical species from the feedstream into the extractant mixture; and,

c. contacting a stripping solution with the second side of said supported liquid membrane in a stripping compartment adjacent to said supported liquid membrane, for a time sufficient to extract at least a portion of said preselected chemical species from the extractant mixture into the stripping solution.

5,114,580

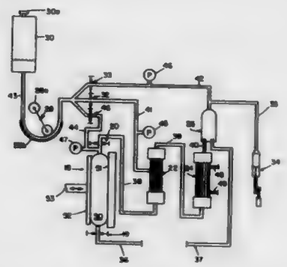
COMBINED HEMOFILTRATION AND HEMODIALYSIS SYSTEM

Suhail Ahmad, Seattle; James J. Cole, Arlington, and William Jensen, Seattle, all of Wash., assignors to The Board of Regents of the University of Washington, Seattle, Wash.

Continuation-in-part of Ser. No. 368,665, Jun. 20, 1989, abandoned. This application Jun. 20, 1990, Ser. No. 540,747

Int. Cl.[5] B01D 61/28, 61/32, 61/34

U.S. Cl. 210—646 **28 Claims**



1. A hemodialysis system comprising:

a blood pump having a blood outlet and a blood inlet for connection to a patient via an arterial route;

a hemofilter having a blood inlet connected to said blood outlet of the pump, and having a blood outlet and a filtrate outlet;

a hemodialyzer having a blood outlet, a blood inlet connected to said blood outlet of the hemofilter, and a dialysate inlet and outlet;

a filtrate reservoir;

an air-removal and filtrate pump having an outlet connected to said reservoir and having an inlet;

an air collection chamber having a blood inlet connected to said blood outlet of the hemodialyzer, a blood outlet for connection to a patient via a venous route, and an air removal outlet;

tube and valve means selectively connecting and disconnecting said inlet of the air-removal and filtrate pump with said filtrate outlet of the hemofilter and air removal outlets; and means for introducing an anti-coagulant to said air collection chamber.

8. A hemodialysis method comprising:

introducing blood from a patient into an external blood circuit connected to the patient;

isolating equal volumetric increments of the introduced blood in a flexible vessel in said external circuit;

linearly compressing said vessel each time only that it contains one of said increments, and advancing the respective increment along said external circuit while the vessel is being compressed;

filtering the advancing increments and thereby removing excess fluid as filtrate; and

diffusing solutes from each increment as its advances further along said external circuit for return to the patient.

12. A hemodialysis method comprising:

circulating blood during a treatment period from a patient through an external circuit and back to the patient;

filtering excess fluid from the circulating blood by a hemofilter in said external circuit and collecting the excess fluid filtrate in a filtrate reservoir within a filtrate circuit in a sterile environment;

dialyzing the circulating blood at a dialyzer in said external circuit; and

displacing the blood remaining in said external blood circuit at the close of said treatment period with the collected

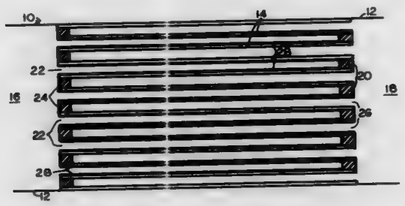
excess fluid filtrate to return such remaining blood to the patient.

5,114,581

BACK-FLUSHABLE FILTRATION DEVICE AND METHOD OF FORMING AND USING SAME

Robert L. Goldsmith, Belmont, and Bruce A. Bishop, Cambridge, both of Mass., assignors to CeraMem Corporation, Waltham, Mass.

Filed Jan. 10, 1991, Ser. No. 639,568
Int. Cl.[5] B01D *61/00, 29/00, 24/00*
U.S. Cl. 210—650 **21 Claims**



1. In a filtration device for separating a particulate-containing feed stock into a filtrate and a particulate-containing filter cake, which filtration device comprises a monolith of porouos material containing a plurality of passageways extending longitudinally from an inlet end face to an outlet end face and having a plurality of plugs in the ends of the passageways at the inlet end face and at the outlet end face to prevent direct passage of the feed stock through the passageways from the inlet end face to the outlet end face, the improvement which comprises:

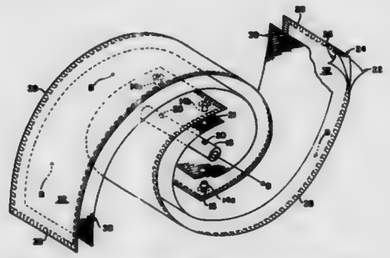
a microporous membrane selected to separate the feed stock into a filtrate and a particulate-containing filter cake, the membrane applied to at least the wallsurfaces of the passageways open at the inlet end face and of mean pore size smaller than the mean pore size of the porous material of the monolith, the membrane substantially preventing the entrance of the particulate of the feed stock into the pores of the porous material, and the filtration device regenerable by withdrawal of the filter cake from the inlet end face of the filtration device.

5,114,582

FILTER ELEMENT AND SPIRAL-WOUND MEMBRANE CARTRIDGE CONTAINING SAME

Eric L. Sandstrom, Kensington, N.H.; Alfred Prokop, North Andover, Mass.; William H. Young, II, East Kingston, N.H., and Anthony M. D'Urso, Bradford, Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Apr. 12, 1991, Ser. No. 684,704
Int. Cl.[5] B01D *63/00*
U.S. Cl. 210—321.74 **12 Claims**



1. A spiral wound membrane cartridge comprising:

a) a cylindrical permeate transport tube having a plurality of axial apertures;

b) at least one filter element spirally wound around said permeate transport tube, said filter element comprising:

i) a feed spacer; and

ii) a membrane element comprising a first membrane having a membrane surface and a heat-sealable backing surface with a permeate port heat sealed thereto, a second membrane having a membrane surface and a heat-sealable backing surface, and a permeate carrier layer interposed between the backing surfaces of the first and second membranes, wherein the membranes are heat sealed together around their entire periphery;

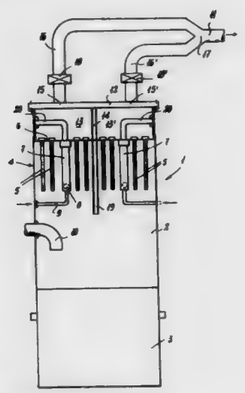
wherein the filter element is wound around the permeate transport tube such that the permeate port sealingly engages one of the axial apertures therein in order that sealed fluid communication is established between the permeate carrier layer of the membrane element and the permeate transport tube.

5,114,583

FILTER UNIT WITH HIGH VOLUMETRIC EFFICIENCY AND REDUCED FILTERING SURFACE

Antonio Conci, via Martiri di Belfiore 2, 20052 Monza, Milano

Filed Nov. 20, 1990, Ser. No. 616,203
Claims priority, application Italy, Nov. 29, 1989, 22169/89[U]
Int. Cl.[5] B01D *29/52*
U.S. Cl. 210—346 **5 Claims**



1. A filter unit comprising:

a casing

a filtering surface extending across the interior of said casing,

a plurality of filter tubes mounted in said filtering surface;

shaker means for shaking said filtering surface;

an inlet pipe in fluid communication with said casing on the upstream side of said filtering surface;

an outlet pipe in fluid communication with said casing on the downstream side of said filtering surface; and

at least two separate chambers each independently connectable to said outlet pipe, and wherein said casing comprises:

at least one sealing partition extending from the interior of said casing to the downstream side of said filtering surface, thereby defining said separate chambers downstream of said filtering surface; and

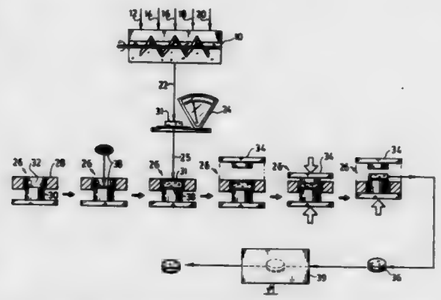
a number of dividing walls, equal in number to a number of said sealing partitions said dividing walls vertically arranged and suspended from the upstream side of said filtering surface.

5,114,584

FILTER DRYER BODY

Chad A. Sheckler, Newark, and Jeffrey J. Yost, Clifton Springs, both of N.Y., assignors to Refractron Technologies Corporation, Newark, N.Y.

Filed Dec. 13, 1990, Ser. No. 626,952
Int. Cl.[5] B01D *69/00*
U.S. Cl. 210—490 **17 Claims**



1. A filter body comprised of at least about 75 weight percent of molecular sieve material and from about 9 to about 20 weight percent of nylon, wherein said filter body has a density of from about 10 to about 25 grams per cubic inch, a compressive strength of at least about 500 pounds per square inch, a pressure drop of from about 5 to about 20 inches (water column), a water pickup of at least about 11 weight percent, and an initial 24-hour water pickup of at least about 6 weight percent, wherein:

(a) said molecular sieve has the formula $M_{2/n}O:Al_2O_3:SiO_2$, wherein:

1. M is a metal ion selected from the group consisting of sodium, potassium, calcium, strontium, barium, cesium, magnesium, and mixtures thereof, and

2. n is the valence of the metal ion and is selected from the group consisting of 1 and 2;

(b) substantially all of the pores of said molecular sieve material are smaller than about 4 angstroms; and

(c) substantially all of the particles of said molecular sieve are larger than 100 microns and smaller than 2,000 microns.

5,114,585

CHARGED POROUS FILTER

Menahem Kraus, Ann Arbor; Diosie Velazquez, Saline, and Chan-Hong Wang, Ann Arbor, all of Mich., assignors to Gelman Sciences, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 166,727, Mar. 1, 1988, abandoned, which is a continuation of Ser. No. 894,337, Aug. 8, 1986, abandoned. This application Dec. 27, 1989, Ser. No. 462,283
Int. Cl.[5] B01D *69/00*
U.S. Cl. 210—490 **23 Claims**

1. A charged filtration medium comprising:

a pre-formed, microporous or macroporous filtration medium structure characterized by being inherently permeable to albumin solutes and having internal and external surfaces; and

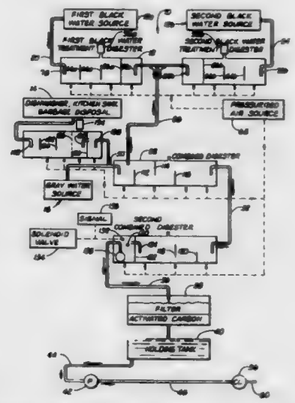
a preformed non-particulate polymer selected from polyvinylpyridine and polyalkyleneimine, said polymer by a post-treatment being physically adhered to said surfaces in surface covering relation, the nitrogen of said polymer by a post-treatment being quaternized and the thus adhered polymer being rendered charged and insoluble and adhered to said surfaces by alkylating exposure of the polymer to a solution of a polyfunctional alkylating agent in a compatible solvent.

5,114,586

SANITATION SYSTEM

Frank Humphrey, P.O. Box 4176, Carlsbad, Calif. 92008

Filed Aug. 1, 1990, Ser. No. 561,416
Int. Cl.[5] C02F *3/02*
U.S. Cl. 210—606 **19 Claims**



10. A method wherein a black stream is discharged from each of at least two toilets and wherein a grey water stream is discharged from a grey water source such as a dishwasher, kitchen sink, garbage disposal, shower, lavatory, comprising:

inputting each black water stream into a black water treatment digester, removing a substantial portion of the solids from the received black water stream in each black water treatment digester and treating the solids at each black water treatment digester removed from the black water stream via digestion and discharging from each of the black water treatment digesters a treated black water stream having a substantial portion of the solids removed therefrom; and

inputting the treated black water streams into a combined digester and inputting the grey water stream into the combined digester, and removing solids from the inputted treated black water streams and from the inputted grey water stream, digesting in the combined digester the removed solids and discharging a treated combined black and grey water stream, the treated combined black and grey water stream being outputted as an outputted reconditioned water stream.

5,114,587

METHOD OF SEWAGE TREATMENT

Lars-Erik Hägerstedt, Stekelvägen, Sweden, assignor to Hydro Supra AB, Landskrona, Sweden

PCT No. PCT/SE89/00039, § 371 Date Jan. 4, 1991, § 102(e) Date Jan. 4, 1991, PCT Pub. No. WO89/10898, PCT Pub. Date Nov. 16, 1989
PCT Filed Feb. 3, 1989, Ser. No. 602,258
Claims priority, application Sweden, May 9, 1988, 8801736
Int. Cl.[5] C02F *1/72*
U.S. Cl. 210—614 **5 Claims**

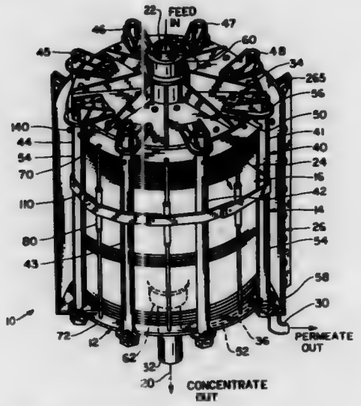
1. A process for waste water or sewage purification treatment comprising chemical precipitation, biological purification and application of added nitrate, wherein the improvement comprises nitrate being added at an early stage at least at one point in a pipe line system transporting waster water or sewage to a final treatment unit and that the amount of nitrate is regulated by monitoring oxygen demanding matter ahead of the final treatment unit.

5,114,588

EASILY REPLACEABLE ROTOR MEMBRANE PACK

William Greene, Gardena, Calif., assignor to Aquatechnology Resource Management Inc., Hermosa Beach, Calif.

Filed Apr. 19, 1991, Ser. No. 687,508
Int. Cl.[5] B01D *63/16*
U.S. Cl. 210—634 14 Claims



1. A rotary filtration apparatus comprising:

a rotor frame which is rotatable about a frame axis and which has first and second frame end plates with peripheral plate portions, said frame also having a plurality of tying members spaced about said frame axis and tying together locations along different of said frame peripheral plate portions;

first and second bearings coupled respectively to said first and second frame plates and supporting said rotor frame in rotation about said axis;

a membrane pack assembly having a stack axis, a multiplicity of stacked filtration membrane packs, and a plurality of tension members which are spaced about said stack axis and which are under tension to hold said membrane packs in compression;

a sufficient number of said tying members being removable to leave an opening in the frame periphery between said frame plates, which is wide enough to receive said membrane pack assembly by radial movement of said pack assembly into said opening until said frame and stack axes are substantially coincident, whereby to facilitate replacement of a membrane stack assembly.

11. A method for installing a stack of filtration membrane packs in a rotor frame with an axis, which includes first and second frame end parts and a plurality of tying members that tie said frame end parts together, comprising:

means providing an alternate to removing a rotor form at least one of its bearings to enable removal of a rotor end plate so spent membrane pack can be replaced for man end of the rotor by:

stacking a plurality of membrane packs away from said rotor, to form an independent membrane pack assembly with a stack axis;

removing a sufficient number of said rotor frame tying members to leave an opening in said frame which is wide enough to pass said membrane pack assembly therethrough;

moving said stack radially into said opening in said frame until said stack axis is substantially coaxial with said frame axis;

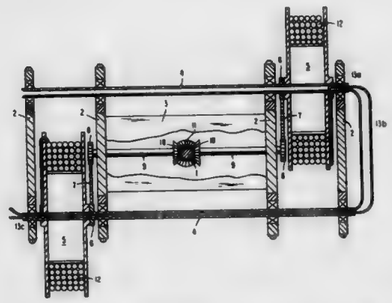
replacing said number of said rotor frame tying members.

5,114,589

TYPE-XLL CROSS-AXIS SYNCHRONOUS FLOW-THROUGH COIL PLANET CENTRIFUGE FOR SEPARATION OF BIOPOLYMERS

Yoichi Shibusawa, Rockville, and Yoichiro Ito, Bethesda, both of Md., assignors to The United States Government as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Jan. 17, 1991, Ser. No. 642,340
Int. Cl.[5] B10D *15/08*
U.S. Cl. 210—657 14 Claims



7. A method of partitioning macromolecules utilizing a cross-axis synchronous flow-through coil planet centrifuge which comprises:

providing a cross-axis synchronous flow-through coil planet centrifuge with multi-layered coil columns which consists of left-handed coils;

providing an aqueous-aqueous tow-phase solvent system including a stationary phase and a mobil phase;

filling said centrifuge with said stationary phase of said aqueous-aqueous two-phase solvent system;

injecting a sample containing macromolecules into said centrifuge;

supplying said mobil phase of said aqueous-aqueous two-phase solvent system to said centrifuge while rotating said centrifuge; and

eluting said macromolecules from said sample.

5,114,590

CONTINUOUS PROCESS AND DEVICE FOR THE CHROMATOGRAPHIC SEPARATION OF A MIXTURE OF AT LEAST THREE CONSTITUENTS INTO THREE PURIFIED EFFLUENTS BY MEANS OF A SINGLE SOLVENT AT TWO DIFFERENT TEMPERATURES AND/OR AT TWO DIFFERENT PRESSURES

Gérard Hotier, Rueil Malmaison; Jean-Michel Toussaint, Asnieres; Gabriel Terneuil, Grenoble, and Daniel Lonchamp, La Demi Lune, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Aug. 28, 1990, Ser. No. 573,564
Claims priority, application France, Aug. 28, 1989, 89 11365
Int. Cl.[5] B01D *15/08*
U.S. Cl. 219—659 10 Claims

1. A process for the continuous separation, in the fluid phase, of a mixture or charge of at least three constituents into three fractions, wherein a fluid comprising said mixture and solvent are circulated in cocurrent over a sorbent contained in at least one separation column which has, at regularly spaced intervals, feed inlets for at least part of the fluid circulating downstream of these inlets, and draw-off outlets for at least part of the fluid circulating downstream of these inlets, said column having a link or loop for external circulation of the fluid between an upstream end and a downstream end, and said draw-off outlets and the feed inlets are caused to move in cocurrent under so-called simulated countercurrent conditions, the constituents having degrees of strong, moderate and weak relative adsorption with respect to the sorbent and the solvent, the process being characterized by the following combination of steps:

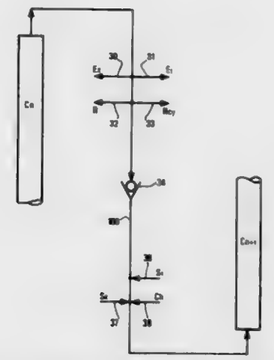
a) five contiguous zones 2, 3, 4, 5 and 6 are determined which have different functions and which are connected to one another in series so that said zones and the external link ensure continuity,

b) a zone 2 is determined for adsorption of the least adsorbed constituent or constituents in the column, said zone 2 being defined by a quantity of sorbent located between an outlet for a "weak solvent" raffinate R at an upstream end of this zone and an outlet for a recycling stream at a downstream end of said zone,

c) a zone 3 is determined for adsorption of the moderately adsorbed constituent or constituents in the column,

said zone being defined by a quantity of sorbent located between an inlet for said mixture at an upstream end of said zone and the outlet for the weak solvent raffinate R, said zone 3 being situated immediately upstream of zone 2,

d) a zone 4 is determined for desorption of the least adsorbed constituent or constituents immediately upstream of zone 3, said zone 4 being defined by a quantity of sorbent located between said inlet for the mixture and an outlet for a so-called weak solvent extract E_1, defined below, at an upstream end of said zone 4,



e) a zone 5 is determined for desorption of the moderately adsorbed constituent or constituents immediately upstream of zone 4, said zone 5 being defined by a quantity of sorbent located between said outlet for the weak solvent extract E_1 and an inlet for a weak solvent feed at an upstream end of said zone 5,

f) a zone 6 is determined for desorption of the most adsorbed constituent or constituents immediately upstream of zone 5, said zone 6 being defined by a quantity of sorbent located between an outlet for a so-called strong solvent extract E_2, defined below, at a downstream end of said zone 6 and an inlet for a strong solvent feed at an upstream end of said zone,

g) the upstream end of zone 6 is fed with so-called strong solvent S_2, the upstream end of zone 5 is fed with the same so-called weak solvent S_1 and the upstream end of zone 3 is fed with said mixture, solvent S_2 being at a higher temperature and/or at a higher pressure than solvent S_1,

h) the mixture and a stream coming from zone 4 are circulated in zone 3 under adsorption conditions which are such as to permit the adsorption of the moderately adsorbed constituent or constituents in said zone 3, and raffinate R, comprising the least adsorbed constituent or constituents and part of solvent S_1, is drawn off from zone 3 and separated,

i) strong solvent S_2 and at least part of the stream coming from zone 2 are circulated in zone 6 under desorption conditions which are such as to permit the desorption of the most adsorbed constituent or constituents in zone 6, and extract E_2, comprising the most adsorbed constituent or constituents and the bulk of solvent S_2, is drawn off from zone 6 and separated,

j) solvent S_1 and the remaining part of the stream coming from zone 6 are circulated in zone 5 under desorption conditions which are such as to permit the desorption of the moderately adsorbed constituent or constituents in zone 5, and extract E_1, comprising the moderately adsorbed constituent or constituents and part of solvent S_1, is drawn off from zone 5 and separated,

k) a stream coming from zone 5 is circulated in zone 4 under desorption conditions which are such as to permit the desorption of the least adsorbed constituent or constituents and the adsorption of the moderately adsorbed constituents,

l) the remaining part of the stream coming from zone 3 is circulated in zone 2 under adsorption conditions which are such as to permit the adsorption of the least adsorbed constituent or constituents in zone 2,

m) the inlet for the mixture, the outlet for raffinate R, the inlet for strong solvent S_2, the outlet for extract E_2, the inlet for weak solvent S_1, the outlet for extract E_1 and the outlet for the recycling stream are periodically caused to advance synchronously through the column of sorbent in the direction of circulation of the mixture and the solvent so as to displace zones 2, 3, 4, 5 and 6 in the column of sorbent and produce the following three fractions: said raffinate R, said extract E_1 and said extract E_2, each of these fractions containing at least one constituent, the constituent or constituents of each fraction being substantially totally recovered,

said process being further characterized in that the recycling stream removed at the downstream end of zone 2 is sent alternately to the upstream end of zone 6 and then to the upstream end of zone 5, and in that at least part of the stream removed at the downstream end of zone 6 is sent alternately to the upstream end of zone 5 and then to the outlet for the strong solvent S_2 extract E_2.

5,114,591

ORGANIC CONTAMINANT REMOVAL FROM PAINT SPRAY BOOTH WATER

R. R. Patzelt, Bloomfield Hills, Mich., and M. A. Romba, Orland Park, Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 7, 1991, Ser. No. 772,766
Int. Cl.[5] B01D *15/04*
U.S. Cl. 210—663 18 Claims

1. A method for reducing the organic material content of waste water from a paint spray comprising passing said waste water through a column containing at least one type of macroreticular resin, whereby a portion of said organic material is adsorbed by said macroreticular resin.

5,114,592

PROCEDURE FOR SEPARATING ARSENIC FROM WASTE MATERIAL

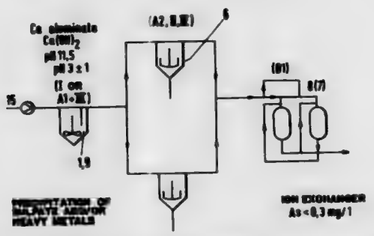
Georg Schuster, Tegernheim, and Hans Kaestle, Laub, both of Fed. Rep. of Germany, assignors to Walhalla-Kalk, Entwichlungs- und Vertriebsgesellschaft mbH, Fed. Rep. of Germany

Filed Mar. 27, 1990, Ser. No. 500,010
Claims priority, application European Pat. Off., Mar. 31, 1989, 89105712
Int. Cl.[5] C02F *9/00*
U.S. Cl. 210—667 199 Claims

1. A process for the separation of arsenic from waste material, said process comprising the steps of:

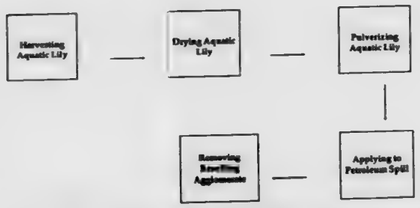
(A1) precipitating arsenic in the form of low solubility calcium magnesium arsenates by adding at least one calcium compound and at least one magnesium compound to the

waste material at a pH value in the range of 2 to 12 during a precipitation span of 10 to 60 minutes;
(A2) separating the calcium magnesium arsenates;



(C1) adsorptively separating arsenic by contacting the waste material with active carbon at a pH value in the range of 2 to 11; and
(C2) separating the charged active carbon by itself or along with precipitation products.

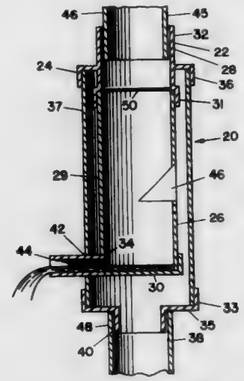
5,114,593
METHOD OF ABSORBING OIL USING POWDERED AQUATIC LILY PLANT
Jorge V. Diaz, Vergel Arboledas, Mexico, assignor to Luis R. Duhalt, a part interest
Filed Jul. 24, 1991, Ser. No. 734,887
Int. Cl.[5] C02F *1/28*
U.S. Cl. 210—691 **6 Claims**



4. A method of removing liquid petroleum products from a body of water comprising applying a powder of dried and pulverized aquatic water lily to the liquid petroleum product and to absorb the petroleum product and to form a resulting agglomerate, removing the resulting agglomerate from the body of water.

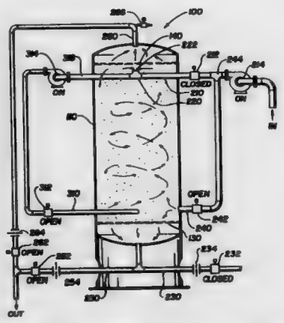
5,114,594
RAINWATER DIVERTER
Linda L. Rosebrock, 770 Pepper Mill Run, Greenwood, Ind. 46143, and Ronald L. Rosebrock, deceased, late of Whiteland, Ind. by Linda L. Rosebrock, personal representative
Filed Feb. 26, 1991, Ser. No. 661,511
Int. Cl.[5] E04D *13/08*; B01D *35/02*
U.S. Cl. 210—767 **17 Claims**

16. A method for diverting rainwater flowing through a gutter downspout, comprising the steps of:
providing a fluid flow diverter including:
an outer duct;
an inner duct positioned within said outer duct, said inner duct having a closed bottom end and defining a reservoir to collect fluid;
a drainage duct extending into said inner duct and exteriorly of said outer duct;
said inner duct further having a bypass opening to said outer duct at a height above said drainage duct; and
positioning said fluid flow diverter in said downspout, wherein fluid flowing down said downspout flows into the inner duct and is diverted through the drainage duct, and fluid unable to flow through the drainage duct accumulates in the inner duct to said height, whereupon excess



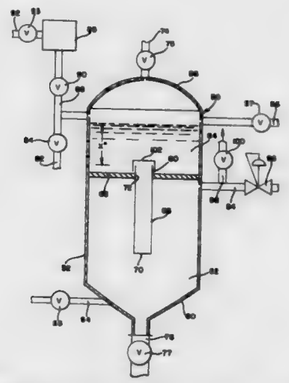
fluid flows through the bypass opening, through the outer duct and out of the bottom of said downspout.

5,114,595
MULTIPLE SCREEN FILTER AND METHOD
Jerry L. Hensley, Odessa, Tex., assignor to Coyanosa Operations Company, Inc., Odessa, Tex.
Filed Feb. 19, 1991, Ser. No. 657,444
Int. Cl.[5] B01D *24/46*
U.S. Cl. 210—792 **8 Claims**



1. A method of scrubbing a particulate filter medium, wherein during a filtration cycle a particulate filter medium is retained within a filtration vessel by a bottom screen, but wherein during a scrubbing cycle the particulate filter medium is retained within a filtration vessel by at least one bottom screen and at least one top screen, the bottom screen and top screen used during the scrubbing cycle having a combined surface area substantially greater than the surface area of the bottom screen used during the filtration cycle so that the pressure differential across the bottom screen and the top screen during the scrubbing cycle is substantially reduced relative to the pressure differential across the bottom screen during the filtration cycle, the scrubbing method comprising:
fluidizing the particulate filter medium with a scrubbing fluid and violently circulating the fluidized filter medium through a circulating pump to remove accumulated contaminating material from the filter medium, thereby suspending the contaminating material in the fluidized mixture, and meanwhile diluting the level of suspended contaminating material in the fluidized mixture by circulating a scrubbing fluid through the fluidized filter medium so that the contaminating material is removed with the scrubbing fluid through the bottom screen and the top screen but the filter medium is retained within the filtration vessel by the bottom screen and the top screen.

5,114,596
BACKWASH METHOD AND APPARATUS
Terrance Laterra, Old Bridge, N.J., assignor to The Graver Company, Union, N.J.
Filed Oct. 16, 1990, Ser. No. 598,542
Int. Cl.[5] B01D *25/32*
U.S. Cl. 210—798 **9 Claims**



1. A method for cleaning a plurality of filter elements having inner cores vertically positioned within a filter vessel which has a tube sheet dividing the filter vessel into a lower filter compartment and an upper plenum compartment, said filter elements being positioned within said filter compartment and having upper portions that are in fluid communication with said plenum compartment through openings formed in said tube sheet, said method comprising:
draining substantially all of the liquid from the filter compartment;
establishing a pressurized condition in said filter compartment and said filter elements that is sufficient to support a predetermined volume of backwash liquid in said plenum compartment above said tube sheet;
increasing the pressure in said plenum compartment and reducing the pressure in said filter compartment so as to cause said predetermined volume of backwash liquid to move rapidly downward through the cores of said filter elements and surge radially outward through the filter surfaces thereof.

5,114,597
METHOD OF MAKING A DRILLING FLUID CONTAINING CARBON BLACK IN A DISPERSED STATE
Jerry J. Rayborn, Franklintown, La., and J. Phillip Dickerson, McComb, Miss., assignors to Sun Drilling Products Corporation, Belle Chasse, La.
Filed Feb. 22, 1990, Ser. No. 482,852
The portion of the term of this patent subsequent to May 19, 2007, has been disclaimed.
Int. Cl.[5] E21B *43/00, 33/13*
U.S. Cl. 507—126 **53 Claims**

1. A process for the manufacture of a water based drilling fluid additive comprising the steps of:
(a) mixing hydrophobic carbon black and either a surfactant or a dispersant, and
(b) shearing the mixture of step (a) under a sufficiently high mechanical shear for a sufficient time to convert the hydrophobic carbon black into hydrophilic carbon black.

5,114,598
METHOD OF MAKING DRILLING FLUID CONTAINING ASPHALTITE IN A DISPERSED STATE
Jerry J. Rayborn, Franklintown, La., and J. Phillip Dickerson, McComb, Miss., assignors to Sun Drilling Products Corporation, Belle Chasse, La.
Filed Feb. 1, 1990, Ser. No. 473,474
The portion of the term of this patent subsequent to May 19, 2009, has been disclaimed.
Int. Cl.[5] E21B *33/13, 43/00*
U.S. Cl. 507—126 **48 Claims**

1. A process for the manufacture of a water based drilling fluid additive comprising the steps of:
(a) mixing hydrophobic asphaltite and either a surfactant or a dispersant, and
(b) shearing the mixture of step (a) under a sufficiently high mechanical shear for a sufficient time to convert the hydro-phobic asphaltite into hydrophilic asphaltite.

5,114,599
USE OF LIGNIN/AMINE/SURFACTANT BLENDS IN ENHANCED OIL RECOVERY
Francis E. Debons, Richmond, Tex.; Larry D. Pedersen, Pinckney, Mich., and Lawrence E. Whittington, Katy, Tex., assignors to Texaco Producing Inc., Houston, Tex. and Reed Lignin, Inc., Greenwich, Conn.
Continuation of Ser. No. 315,382, Feb. 23, 1989, abandoned, which is a continuation of Ser. No. 59,561, Jun. 8, 1987, Pat. No. 4,822,501, which is a continuation-in-part of Ser. No. 727,098, Apr. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 481,950, Apr. 4, 1983, abandoned. This application Jun. 7, 1990, Ser. No. 534,839
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[5] E21B *43/22*
U.S. Cl. 252—8.554 **10 Claims**

1. A method for the enhanced recovery of oil from a subterranean formation containing oil and having at least one production well and at least one injection well comprising:
injecting into said formation a surfactant system comprising a surfactant blend comprising primary alkyl amine of 8 to 22 carbon atoms, a lignin selected from the group consisting of water soluble alkali and soda lignins and a water soluble anionic surfactant selected from the group consisting of petroleum sulfonates and alkylaryl sulfonates, said blend having from about 1 to about 20% of said amine, from about 5% to about 70% of said lignin, and from about 10 to about 99% of said water soluble anionic surfactant; and water, wherein the equilibrated interfacial tension between said oil and said surfactant system is less than about 100 millidynes/cm;
driving said surfactant system through said formation; and
producing the oil mobilized by said surfactant system through said production well.

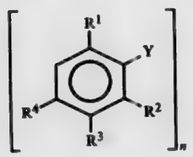
5,114,600
FABRIC CONDITIONERS
Ian S. Biggin, Cardiff; Peter S. Cartwright, South Glamorgan, both of United Kingdom; David Farrar; Malcolm Hawe, both of West Yorkshire, England, and Walter E. Paget, Cardiff, United Kingdom, assignors to BP Chemicals Limited, London, United Kingdom
PCT No. PCT/GB90/00600, § 371 Date Oct. 29, 1990, § 102(e) Date Oct. 29, 1990, PCT Pub. No. WO90/12862, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 19, 1990, Ser. No. 603,665
Claims priority, application United Kingdom, Apr. 21, 1989, 8909069
Int. Cl.[5] D06M *10/08*
U.S. Cl. 252—86 28 Claims

1. An aqueous based fabric conditioning formulation consisting essentially of effective amounts of a water-dispersible cationic softener and a thickener characterized in that the thickener is a cross-linked cationic polymer that is derivable from a water-soluble cationic acrylic monomer or blend of monomers which is cross-linked by 5 to 45 ppm of across-linking agent comprising polyethylenic functions.

5,114,601
OVERBASED CALIXARATES, COMPOSITIONS CONTAINING THEM AND USE AS LUBRICATING OIL ADDITIVES
Stephen J. Cook, North Humberside; Sean P. O'Connor, Reigate, and Andrew Pearce, North Humberside, all of Great Britain, assignors to BP Chemicals (Additive) Limited, London, England
Filed Mar. 22, 1991, Ser. No. 674,509
Claims priority, application United Kingdom, Mar. 31, 1990, 9007314
Int. Cl.[5] C10M *145/00*; C07C *35/22*
U.S. Cl. 252—25 10 Claims

1. A non-sulphurized overbased metal salt of a sulphur-free calixarene having a substituent hydroxyl group or groups available for reaction with a metal base wherein the calixarene has the formula:

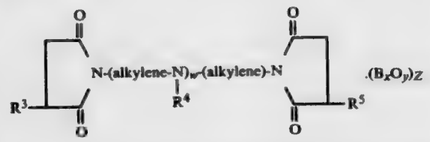
(I)



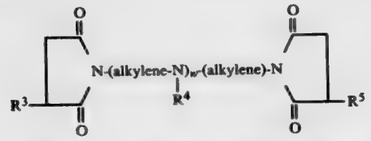
wherein in the formula (I):
Y is a divalent bridging group;
R^3 is a hydrocarbyl or a hetero-substituted hydrocarbyl group; either R^1 is hydroxyl and R^2 and R^4 are independently either hydrogen, hydrocarbyl or hetero-substituted hydrocarbyl or R^2 and R^4 are hydroxyl and R^1 is either hydrogen, hydrocarbyl or hetero-substituted hydrocarbyl; and
n is an integer in the range from 3 to 12.

5,114,602
LUBE OIL DISPERSANT BORATING AGENT
Dennis G. Petrille, and Herbert S. Golinkin, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.
Filed Jan. 31, 1991, Ser. No. 649,037
Int. Cl.[5] C10M *133/44*
U.S. Cl. 252—51.5 R 4 Claims

1. An internal combustion engine lube oil composition which exhibits improved compatibility with engine seals made of fluorine substituted elastomers, said lube oil composition comprising: a major amount of oil of lubricating viscosity and a minor amount, effective for dispersancy, of a borated ashless dispersant, and wherein said lube oil composition is prepared by the steps comprising:
(a) preparing a borated succinimide containing about 1.0 to about 3.0% boron and having the formula:



wherein R^3 and R^5 are polyisobutyl groups containing about 20 to about 165 carbon atoms, the alkylene groups each containing 2 to 8 carbon atoms, inclusive, R^4 is hydrogen or alkyl containing 1 to 4 carbon atoms, w is an integer having a value of 0 to 6, x is an integer having a value of 1 to 3, y is an integer having a value of 1 to 3, and z is an integer having a value of 2 to 56; said borated succinimide having a boron-to-nitrogen weight ratio of about 0.20 to about 65 and wherein said preparation of the borated succinimide is carried out by reacting a succinimide having the formula:



wherein R^3, R^4, R^5 and w are as defined above, with boric acid in the presence of water at a temperature of about 177° C. to about 204° C. for a reaction period of about one hour to about 24 hours;
(b) utilizing the borated succinimide prepared in step (a) above as a borating agent to borate a non-borated ashless dispersant by blending about 7 to about 235 parts by weight of said borated succinimide obtained in step (a) with about 100 parts of a mixture which comprises diluent oil plus non-borated ashless dispersant; and
(c) blending the product obtained in step (b) into a lubricating oil composition containing components suitable for an internal combustion engine.

5,114,603
FRICTION REDUCING LUBRICATING OIL COMPOSITION
Steven Kennedy; David W. Eggerding, both of Naperville, and Lionel D. Moore, Lisle, all of Ill., assignors to Amoco Corporation, Chicago, Ill.
Continuation of Ser. No. 153,331, Feb. 8, 1988, abandoned. This application Mar. 27, 1989, Ser. No. 328,873
Int. Cl.[5] C10M *1/26*
U.S. Cl. 252—56 R 1 Claim

1. A method for preparing a lubricating composition treated with a friction modifier comprising partial esters of glycerol and oleic acid, the method comprising: (a) modifying a mixture of partial esters of glycerol and oleic acid that comprises glycerol monooleate, glycerol dioleate and unreacted glycerol, by removing said unreacted glycerol therefrom until the amount of unreacted glycerol in the mixture is reduced to a level of about 1 wt.% or less based on the total weight of glycerol esters and glycerol present in the mixture; and (b) incorporating the modified partial ester mixture in a lubricating oil in an amount within the range of about 0.3 to about 1 wt.% of the oil.

5,114,604
RESIN BONDED PERMANENT MAGNET AND A BINDER THEREFOR
Junichi Ishii, Ichikawa; Tetsuji Takada, and Takayuki Kurohara, both of Osaka, all of Japan, assignors to Koei Chemical Co., Ltd., Osaka and Sumitomo Metal Mining Co., Ltd., Tokyo, both of, Japan
Filed Nov. 22, 1989, Ser. No. 440,205
Claims priority, application Japan, Nov. 24, 1988, 63-294760
Int. Cl.[5] C04B *35/04*; H01F *1/00*
U.S. Cl. 252—62.54 14 Claims

1. A resin bonded rare earth permanent magnet comprising:
(A) a rare earth permanent magnet powder; and
(B) a cured product of a curable resin binder which comprises:
(a) an epoxy resin which is a solid at room temperature,
(b) an epoxy resin curing agent which is inactive at room temperature, said epoxy resin curing agent consisting of a guanidine compound selected from the group consisting of dicyandiamide, guanidine and biguanide, and
(c) as a curing accelerator, a pyridine derivative containing at least one hydroxyl group in a molecule.

5,114,605
LUBRICANT OIL FOR REFRIGERATORS
Kinya Mizui, Ichihara, and Yoshiaki Furuya, Chiyoda, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Filed Oct. 30, 1990, Ser. No. 605,273
Claims priority, application Japan, Nov. 2, 1989, 1-286645
Int. Cl.[5] C09K *5/04*; C07C *69/00*; C10M *107/26*
U.S. Cl. 252—68 1 Claim

1. A lubricant oil for refrigerators, comprising (1) an ozone layer nondestructive hydrofluorocarbon (2) a sufficient amount to provide lubrication for said hydrofluorocarbon of a glycol ether carbonate represented by the general formula [I]

$$R_1—O-(-R_3—O)_m—CO-(-O—R_4)_n—OR_2 \quad [I]$$

wherein R_1 and R_2 are each independently an aliphatic group, an alicyclic group, an aromatic group and an aromatic-substituted aliphatic group each having not greater than 20 carbon atoms, R_3 and R_4 are each independently an ethylene group or an isopropylene group, and m and n are each independently an integer of 2 to 100, and (3) residual ingredient which is at least any one of the group consisting of mineral oil and α-olefin oligomer.

5,114,606
BLEACHING COMPOSITION COMPRISING AS A BLEACHING CATALYST A COMPLEX OF MANGANESE WITH A NON-CARBOXYLATE POLYHYDROXY LIGAND
Marten R. P. van Vliet, Haarlem, and Jan E. Iburg, Vlaardingen, both of Netherlands, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Feb. 19, 1991, Ser. No. 657,582
Claims priority, application United Kingdom, Feb. 19, 1990, 9003741
Int. Cl.[5] C11D *3/95, 3/04, 7/04*; D06L *3/02*
U.S. Cl. 252—103 14 Claims

1. A fabric bleaching composition comprising a peroxy compound bleach present in an effective amount to achieve a bleaching action and a catalyst for the bleaching action of said peroxy compound, wherein said catalyst is a water-soluble complex of manganese (II), (III) or (IV) or mixtures thereof present in an amount of from 0.0005% to about 0.5% by weight, with a ligand present in an effective amount to complex with said manganese which is a non-carboxylate polyhydroxy having at least three consecutive C—OH groups in its molecular structure.

5,114,607
LOW FOAMING ALKALINE CLEANER COMPRISING A SURFACTANT MIXTURE OF AN EO-PO-EO BLOCK COPOLYMER AND A PO-ZO-PO BLOCK COPOLYMER
Philip D. Deck, Ardsley; Jose B. Rivera, Philadelphia, and William L. Harpel, Langhorne, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.
Filed Aug. 8, 1990, Ser. No. 565,287
Int. Cl.[5] C11D *7/06, 1/66*
U.S. Cl. 252—156 3 Claims

1. A cleaning solution for cleaning and etching a metal surface with an alkali treatment including an alkali metal hydroxide and an alkali metal salt of gluconic acid, the improvement comprising including in said cleaning solution the combination of a low foaming ethylene oxide - propylene oxide block copolymer surfactant of the structure (RO)—(R'O)$_m$—(RO) and a defoaming reverse ethylene oxide - propylene oxide block copolymer surfactant of the structure (R'O)—(RO)$_n$—(R'O) as the sole foam agents where R is ethylene and R' is propylene; wherein the ratio of ethylene oxide - propylene oxide block copolymer to reverse ethylene oxide - propylene oxide block copolymer is from about 1 to 3 to about 3 to 1; and wherein the concentration of ethylene oxide - propylene oxide block copolymer surfactant and reverse ethylene oxide - propylene oxide block copolymer surfactant in the cleaning solution ranges from about 0.005 to about 0.18 volume percent.

5,114,608
METHOD OF CLEANING HOLLOW FIBER COMPONENTS OF A DIALYZER WITH CHLORO FLUOROCARBON COMPOSITIONS STABILIZED BY EPOXIDIZED FATTY ACID GLYCERIDES OR ESTERS
Robert M. Singa, Gurnee; Randolph H. Watkins, Wonder Lake; Henry M. Gajewski, Winnetka; Jerry D. Fisher, McHenry, and Dennis C. Berry, Woodstock, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.
Filed Oct. 12, 1990, Ser. No. 596,880
Int. Cl.[5] C11D *7/22, 7/50*; B08B *7/12, 3/00*
U.S. Cl. 252—162 12 Claims

1. A method for cleaning hollow fiber components of a dialyzer, which comprises refluxing such hollow fiber components in a chlorofluorocarbon-alcohol mixture within a cleaning apparatus having a metal surface exposed to the mixture under conditions which generate hydrochloric acid in the mixture, wherein the mixture contains a stabilizer in an amount effective to scavenge hydrochloric acid generated in the mixture and maintain a pH of at least about 4.5 during cleaning, the acid reacting with epoxide groups of the stabilizer to form non-toxic byproducts, whereby the stabilizer is effective for preventing corrosion of the exposed surface, and wherein the mixture consists essentially of 90 to 99 wt. % of a C_1–C_4 chlorofluorocarbon and 1 to 10 wt. % of a C_1–C_4 alcohol, and the stabilizer consists essentially of 0.01 to 10% by volume of the mixture of a stabilizer consisting essentially of an epoxidized fatty acid glyceride or ester having a molecular weight of at least 300 and an oxirane content of at least about 4%.

5,114,609
CLEANING COMPOSITIONS
Hans Buchwald, Rommenberg; Bolesiaus Raschkowski, Wiedensahl, and Dieter Singer, Laatzen, all of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hannover, Fed. Rep. of Germany
Filed Jan. 4, 1990, Ser. No. 461,117
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1989, 3900804; Apr. 6, 1989, 3911078
Int. Cl.[5] C11D *3/20, 3/24, 3/44, 3/18*
U.S. Cl. 252—171 14 Claims

1. A composition consisting essentially of from 97.5 to 89.0 wt-% of a fluorochlorohydrocarbon with 1 or 2 carbon atoms selected from the group consisting of trichlorofluoromethane, the tetrachlorodifluoroethanes, the trichlorotrifluoroethanes,

the dichlorotrifluoroethanes, and the dichloromonofluoroethanes, from 2.0 to 8.0 wt-% of an alkanol with 1 to 4 carbon atoms, and from 0.5 to 3 wt-% of an ester selected from the group consisting of ethyl propionate, methyl propionate and ethyl acetate.

5,114,610

SOLUBILIZING POLYMERS WITH AN ORGANIC SOLVENT SYSTEM

Samson A. Jenekhe, Rochester, N.Y., and James R. Peterson, St. Paul, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 291,815, Dec. 29, 1988, abandoned. This application Mar. 12, 1990, Ser. No. 492,201

The portion of the term of this patent subsequent to Jul. 31, 2007, has been disclaimed.

Int. Cl.[5] C09K *3/00*; C09B *3/02*

U.S. Cl. 252—182.33 **33 Claims**

1. A method of solubilizing organic macromolecules comprising chain or ladder polymers, the method comprising the step of contacting the macromolecules with a solvent system, the solvent system comprising:

an amount of at least one Lewis acid of the formula MX_n, where M is an element selected from the group consisting of metallic elements from the Periodic Table and elements exhibiting metallic characteristics in MX_n, X is an halogen selected from F, Cl, Br and I and n is an integer from 1 to 6; and

an amount of at least one aprotic organic solvent selected from the group of aprotic solvents consisting of those exhibiting relatively low electron donor properties (a donor number ≦10).

5,114,611

BLEACH ACTIVATION

Cornelis G. Van Kralingen, Waverton, Great Britain; Rudolf J. Martens, Vlaardingen, Netherlands; Mark E. Rerek, Fanwood, N.J.; Ton Swarthoff, Hellevoetsluis, and Marten Van Vliet, Haarlem, both of Netherlands, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Apr. 9, 1990, Ser. No. 507,075

Claims priority, application United Kingdom, Apr. 13, 1989, 8908416

Int. Cl.[5] C01B *15/00*

U.S. Cl. 252—186.33 **7 Claims**

1. Process for the bleaching and cleaning of substrates employing a bleaching agent selected from the group of peroxy compound bleaches consisting of hydrogen peroxide, hydrogen peroxide-liberating compounds, peroxyacids and their salts, and peroxyacid bleach precursors and mixtures thereof, characterized in that said bleaching agent is activated by a catalytic amount of a transition metal complex of the following general formula:

$$[M_a(L)_mX_p]^tY_z \quad \text{(I)}$$

wherein M is a metal ion selected from the group consisting of Mn, Fe, Co, and Du; X is selected from the group consisting of Cl^-, Br^-, I^-, NO_3^-, CLO_4^-, NCS^-, OH^-, O_2^{2-}, O_2^-, HO_2^-, H_2O_2, H_2O, NH_3, and pyridine;

n represents an integer from 1 to 2;

m is an integer from 1–5;

p is an integer from 0–8;

Y is a counter ion, the type of which is independent upon the charge z of the complex;

z denotes the charge of the complex and is an integer which can be positive or negative, whereby, if z is positive, Y is a common anion as denoted for X and, if z is negative, Y is a common cation selected from the group consisting of alkali metal, alkaline earth metal and an alkyl ammonium cation; and L is a ligand selected from the group consisting of 2,2-bispyridylamine and 2,2-bispyridylmethane.

5,114,612

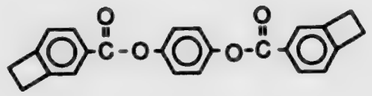
LIQUID CRYSTAL POLYESTER THERMOSETS

Brian C. Benicewicz, and Andrea E. Hoyt, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Continuation of Ser. No. 504,217, Apr. 4, 1990, abandoned. This application Jan. 22, 1991, Ser. No. 644,856

Int. Cl.[5] C09K *19/04, 19/10*; C08F *38/00*

U.S. Cl. 252—299.01 **7 Claims**



1. A curable liquid crystalline polyester monomer represented by the formula:

$$R^1—A^1—B^1—A^2—B^2—A^3—R^2$$

where R^1 and R^2 are radicals of ethynyl, A^1 and A^3 are 1,4-phenylene and the same where said groups contain one or more substituents selected from the group consisting of halo, nitro, lower alkyl, lower alkoxy, fluoroalkoxy or fluoroalkyl, A^2 is selected from the group consisting of substituted 1,4-phenylene containing one or more substituents selected from the group consisting of halo, nitro, lower alkyl, lower alkoxy, or fluoroalkyl, or 4,4'-biphenyl, 2,6-naphthalene and the same where said groups contain one or more substituents selected from the group consisting of halo, nitro, lower alkyl, lower alkoxy, or fluoroalkyl, and B^1 and B^2 are selected from the group consisting of —C(O)—O— and —O—C(O)—.

5,114,613

LACTIC ACID DERIVATIVE AND LIQUID CRYSTAL COMPOSITION CONTAINING SAME

Kazuo Yoshinaga, Machida; Kazuharu Katagiri, Tama; Akira Tsuboyama; Hiroyuki Kitayama, both of Tokyo; Kenji Shinjo, Yokohama, and Chieko Hioki, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

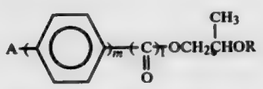
Division of Ser. No. 291,325, Dec. 28, 1988, Pat. No. 4,882,085, which is a continuation of Ser. No. 893,821, Aug. 6, 1986, abandoned. This application Sep. 13, 1989, Ser. No. 406,541

Claims priority, application Japan, Aug. 13, 1985, 60-176938; Nov. 7, 1985, 60-247994; Dec. 28, 1985, 60-299003; Jul. 25, 1986, 61-173921

Int. Cl.[5] C09K *19/34, 19/52*; C07D *239/02*; C07C *69/76*

U.S. Cl. 252—299.61 **9 Claims**

1. An optically active lactic acid derivative represented by the following formula (I):

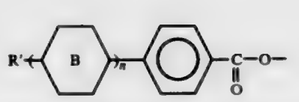


(I)

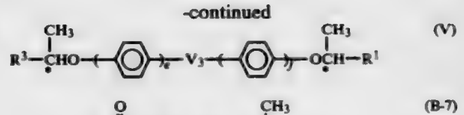
wherein R represents a linear saturated hydrocarbon group having 1 to 18 carbon atoms; C* represents an asymmetric carbon atom; l is 0 or 1; m is 1 or 2; A represents a group selected from the following groups (a) and (b):

(a) hydroxyl group, halogen, benzyloxy group, phenoxy group, toluenesulfonic acid group, acetyloxy group, trifluoroacetyloxy group;

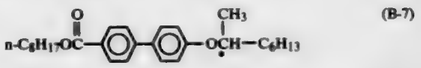
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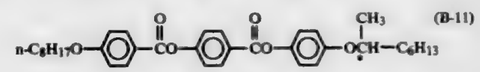
(b)



(V)



(B-7)



(B-11)

(wherein R' is an alkyl group or alkoxy group having 4 to 18 carbon atoms; n is 0 or 1,



with proviso that when A is selected from the groups in the above group (a), l is 1 and m is 1 or 2; and when A is selected from the groups in the above group (b), m=n=1 and l is 0.

5,114,614

LIQUID CRYSTAL COMPOSITION

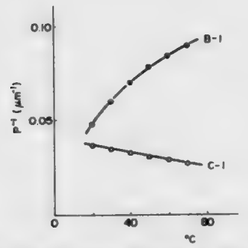
Naoyoshi Emoto; Hideo Saito, both of Yokohamashi, and Kenji Furukawa, Yokosukashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Division of Ser. No. 890,653, Jul. 30, 1986, Pat. No. 4,780,240. This application Aug. 12, 1988, Ser. No. 231,527

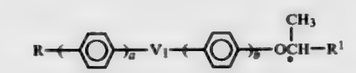
Claims priority, application Japan, Aug. 2, 1985, 60-170951; Aug. 5, 1985, 60-172090; Oct. 17, 1985, 60-232219; Nov. 15, 1985, 60-255866; Mar. 19, 1986, 61-61691; Mar. 19, 1986, 61-61692

Int. Cl.[5] C09K *19/12, 19/20, 19/34, 19/30*

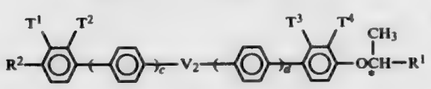
U.S. Cl. 252—299.65 **8 Claims**



1. A nematic liquid crystal composition comprising: (i) an optically active component which makes positive the temperature dependency of the twistability in terms of the reciprocal of the intrinsic helical pitch thereof, of the cholesteric phase induced when singly added to a nematic liquid crystal and which consists of one optically active substance or at least two optically active substances having the same helical twist sense to one another, said optically active substances being selected from the group consisting of compounds expressed by the formula (III), compounds expressed by the formula (IV), compounds expressed by the formula (V), a compound expressed by the formula (B-7) and a compound expressed by the formula (B-11),



(III)



(IV)

wherein, in the formula (III),

R represents an alkyl group or an alkoxy group each of 1 to 15 carbon atoms or a cyano group;

R^1 represents a linear chain alkyl group of 2 to 10 carbon atoms;

a represents an integer of 0, 1 or 2;

b represents an integer of 1 or 2;

the value of (a+b) is 2 or 3;

V_1 represents a single bond when a=0, and

when a is 1 or 2, V_1 represents —COO—, —OCO—, —CH_2O—, —OCH_2— or —CH_2CH_2—;

in the formula (IV),

R^1 represents a linear chain alkyl group of 2 to 10 carbon atoms;

R^2 represents an alkyl group or an alkoxy group each of 1 to 15 carbon atoms, a cyano group or a halogen atom;

T^1, T^2, T^3 and T^4 each independently represents a hydrogen atom, a halogen atom or a cyano group;

c and d each represent an integer of 0 or 1; and

V_2 represents a single bond, —COO—, or —OCO—; and in the formula (V),

R^1 and R^3 each independently represent a linear chain alkyl group of 2 to 10 carbon atoms;

e represents an integer of 0, 1 or 2;

f represents an integer of 1 or 2;

the value of (e+f) is 1 to 3;

V_3 represents a single bond when e=0, and

when e is 1 or 2, V_3 represents —COO— or —CH_2O—, and

(ii) at least one nematic liquid crystal compound, said optically active component being contained in a quantity in the range of 0.05 to 10% by weight in said composition.

5,114,615

LIQUID CRYSTAL COMPOUNDS AND INTERMEDIATES THEREOF

Shigeki Ishibashi; Kouzaburou Nakamura; Tohru Maruno, all of Musashino; Masaaki Nakahata, Kawagoe; Takaaki Negishi, Kawagoe, and Fumiyoshi Urano, Kawagoe, all of Japan, assignors to Wako Pure Chemical Industries, Ltd. and Nippon Telegraph and Telephone Corporation, Tokyo, both of, Japan

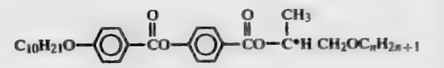
Continuation of Ser. No. 225,979, Jul. 29, 1988, abandoned. This application Sep. 25, 1991, Ser. No. 765,411

Claims priority, application Japan, Jul. 31, 1987, 62-190193

Int. Cl.[5] C09K *19/20, 19/52*; C07C *69/76, 41/00*

U.S. Cl. 252—299.67 **4 Claims**

1. A liquid crystal compound according to claim 1, which is represented by the formula:



wherein n is an integer of 2 to 5.

5,114,616

ESTERIFIED GLYCIDYL ETHER ADDITION PRODUCTS AND THEIR USE

Rainer Kupfer, Kastl; Martin Hille, Liederbach; Roland Böhm, Kelkheim/Taunus, and Friedrich Staiss, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 20, 1990, Ser. No. 569,999

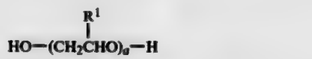
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1989, 3927638

Int. Cl.[5] B01D *17/04*; **C07C** *69/80, 69/75, 69/353*

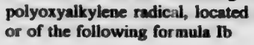
U.S. Cl. 252—337 **5 Claims**

1. An esterified glycidyl ether addition product prepared by esterification of the components consisting essentially of

(1) a diol compound of the following formula Ia

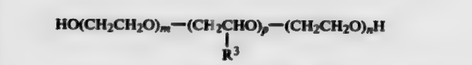


which a is a number from 2 to 40 and R^1 is H or CH_3 and can also assume both meanings within the chain of the polyoxyalkylene radical, located in blocks or randomly, or of the following formula Ib

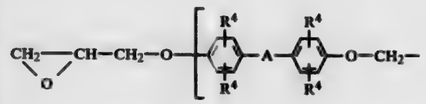


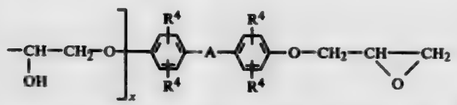
in which R^2 is an acyclic divalent hydrocarbon radical, and, or a propoxylated addition product

(2) an addition product of 1 mol of OH function of a polyether block copolymer of the following formula II

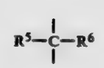


in which R^3 is methyl or ethyl, n and m are numbers which are chosen so that the polyethylene oxide content is 10 to 80% of the molecular weight of the total molecule and p is a number from 10 to 100, and 0.3 to 1 mol of epoxide function of a glycidyl ether of the following formula III

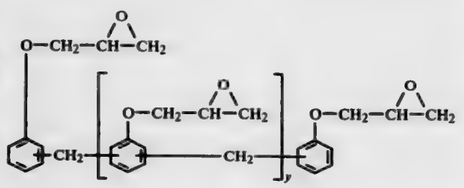




in which R^4 can be identical or different and is hydrogen, C_1 to C_4—alkyl or halogen, A is a direct bond, a sulfonyl or cyclohexyl group or a group of the formula



R^5 and R^6 are hydrogen, methyl or phenhyl and x is a number from 0 to 10, or 0.1 to 1.5 mol of epoxide function of a glycidyl ether of the following formula IV



in which y is a number from 1 to 10, which (3) a dicarboxylic acid, the reaction components (1), (2) and (3) being employed in an equivalent ratio of 1:0.1 to 1.5:0.5 to 2.

5,114,617

HIGH STRENGTH STRUCTURAL PERLITE CONCRETE

David A. Smetana, Cleveland Heights, Ohio, and R. Steve Williams, Nashville, Tenn., assignors to Advanced Concrete Technology, Inc., Cleveland Heights, Ohio

PCT No. PCT/US90/02759, § 371 Date Aug. 24, 1990, § 102(e) Date Aug. 24, 1990, PCT Pub. No. WO90/14319, PCT Pub. Date Nov. 29, 1990

Continuation-in-part of Ser. No. 354,829, May 22, 1989, abandoned, and a continuation-in-part of Ser. No. 418,326, Oct. 6, 1989. This PCT application May 18, 1990, Ser. No. 571,549

Int. Cl.[5] C04B *14/18, 20/06*

U.S. Cl. 252—378 P **21 Claims**



1. A high strength wet mix concrete composition comprising by weight from about

8 to 65 percent cement,

0.5 to 20 percent smooth-surfaced, vesicular, expanded perlite, at least about 78 percent by weight of which passes through a U.S. Standard Sieve No. 30 (0.6 mm) and at least about 45 percent by weight of which is retained on a U.S. Standard Sieve No. 50 (0.3 mm),

5 to 30 percent water,

0 to 12 percent finely divided pozzolan,

0 to 70 percent fine aggregate,

0 to 60 percent coarse aggregate, said concrete composition, after 28 days, having a compressive strength of at least 2000 psi (14 MPa) and an oven dry density of from about 58 to 135 pounds per cubic foot (928 to 2160 kilograms per cubic meter).

5,114,618

OXYGEN REMOVAL WITH KETO-GLUCONATES

Herman L. Gewanter, Waterford, and Ralph D. May, Oakdale, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Oct. 11, 1990, Ser. No. 595,530

Int. Cl.[5] C23F *11/10*

U.S. Cl. 252—389.53 **9 Claims**

1. A composition for the inhibition of corrosion due to the presence of oxygen in aqueous systems, said aqueous system having a temperature of from about 65° C. to about 175° C., said composition comprising an oxygen scavenging effective amount of an oxygen scavenger selected from the group consisting of alkali metal salts and amine salts of keto-gluconic acid, alkali metal salts and amine salts of stereoisomers thereof, and C_1–C_4 alkyl esters of said salts of keto-gluconic acid, and stereoisomers thereof, said composition also having a pH of above 7.

5,114,619

PRODUCTION OF POLYETHER POLYOLS WITH REDUCED UNSATURATION

A. J. Heuvelsland, Heikant, Netherlands, assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 14, 1989, Ser. No. 381,220

Int. Cl.[5] C07C *43/10, 43/196, 43/23*

U.S. Cl. 252—182.27 **16 Claims**

1. A process for preparing a polyol having an equivalent weight of 500 to 4000 which comprises reacting a monoepoxy compound comprising propylene oxide or butylene oxide with an initiator containing an active hydrogen atom in the presence of a catalyst substance selected from the group consisting of barium strontium and their oxides, barium and strontium hydroxides, barium and strontium hydrated hydroxides or barium and strontium monohydroxide salts, or mixtures thereof, and in the presence of water added during the reaction of monoepoxy compound with initiator, wherein the quantity of water is from about one part by weight for 100 to 20000 parts by weight of monoepoxy compound.

5,114,620

LIQUID NON-AQUEOUS CLEANING PRODUCTS COMPRISING A DISPERSION MODIFIER AND METHOD FOR THEIR PREPARATIONS

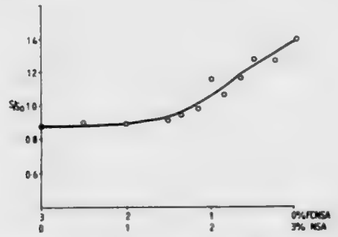
Michael J. Garvey, Wirral, and Ian C. Griffiths, Bebington, both of United Kingdom, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Oct. 6, 1989, Ser. No. 418,065

Claims priority, application United Kingdom, Oct. 14, 1988, 8824110

Int. Cl.[5] C11D *1/12, 1/755*

U.S. Cl. 252—558 **6 Claims**



1. A non-aqueous liquid cleaning composition comprising from 1% to 90% by weight of a solid phase consisting of solid particles having a particle size of 0.1 to 100 microns, said solid phase being dispersed in a non-aqueous liquid phase, the composition further comprising 0.1% to 8% by weight of a dispersion modifier wherein the dispersion modifier is a mixture of naphthalene sulfonic acid and formaldehyde condensate of naphthalene sulfonic acid in a weight ratio of 11:1 to 1:5.

5,114,621

INDOLINO-SPIRO-OXAZINE PHOTOCHROMIC COMPOUNDS WITH FIVE-MEMBERED RINGS, METHOD FOR THEIR PREPARATION, PHOTOCHROMIC COMPOSITIONS AND ARTICLES CONTAINING SUCH COMPOUNDS

Robert Guglielmetti, and Pascale Tardieu, both of Marseille, France, assignors to Essilor International (Compagnie Generale d'Optique, Creteil, France

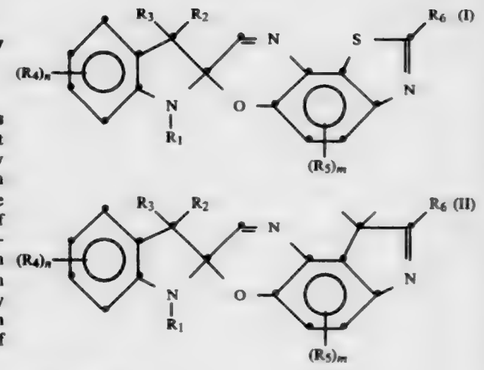
Filed Jun. 5, 1990, Ser. No. 532,325

Claims priority, application France, Jun. 5, 1989, 89 07402

Int. Cl.[5] G02B *5/23*; **F21V** *9/04*; **C07D** *265/00*

U.S. Cl. 252—586 **11 Claims**

1. A photochromic compound having one of the following formulae:



in each of which:

n is from 0 to 4,

m is 1 or 2,

R_1 is selected from:

i) an alkyl group of 1 to 16 carbon atoms;

ii) a group selected from alkyl, phenyl, arylalkyl, phenyl or phenyl substituted with 1 or 2 substituents selected from alkyl and alkoxy comprising each from 1 to 6 carbon atoms;

iii) an alicyclic group of up to 16 carbon atoms or;

iv) an aliphatic hydrocarbon group of up to 16 carbon atoms comprising in its chain at least one hetero atom selected from O, N or S;

R_2 and R_3 are each independently from each other a C_{1-8} alkyl group, phenyl, phenyl mono or di-substituted with at least one of C_{1-4} alkyl and C_{1-5} alkoxy group, or form together a cyclic ring comprising from 6 to 8 carbon atoms including the spiranic carbon in the third position of the indolinic hetero cycle;

R_4 and R_5 are independently from each other selected from:

i) a hydrogen atom or an amine group NR'R", wherein R' and R" each independently represent a hydrogen atom, an alkyl group, a cycloalkyl group, a phenyl group, or R' and R" form together a cycloalkyl group;

ii) a group selected from R, OR, SR, COR and COOR, wherein R is a hydrogen atom, an alkyl group comprising from 1 to 6 carbon atoms, an aryl group or a heteroaryl group;

iii) a halogen atom, a C_{1-4} mono-haloalkyl group, wherein the halogen is chlorine or bromine, or a C_{1-4} polyhaloalkyl group; and

iv) NO_2, CN and SCN, and

R_6 is a hydrogen atom, a C_{1-8} alkyl group, a phenyl group or amino, carbonyl or halogen.

5,114,622

METHOD OF CEMENTING RADIOACTIVE WASTE AND CEMENTED BODY

Kiyomi Funabashi, Katsuta; Osamu Kuriyama, Hitachi; Koichi Chino, Hitachi; Tsutomu Baba, Hitachi; Takashi Nishi, Hitachi, and Makoto Kikuchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP89/00451, § 371 Date Dec. 14, 1989, § 102(e) Date Dec. 14, 1989, PCT Pub. No. WO89/11149, PCT Pub. Date Nov. 16, 1989

PCT Filed Apr. 28, 1989, Ser. No. 449,917

Claims priority, application Japan, May 2, 1988, 63-109512; Sep. 14, 1988, 63-228705

Int. Cl.[5] G21F *9/16*

U.S. Cl. 252—629 **13 Claims**

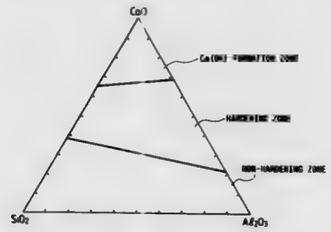
9. A cemented body of a radioactive waste, comprising:

a container;

a radioactive waste particles charged in said container; and

a hardened body of a cement filling gaps formed among the radioactive waste particles, the main oxide components of which are calcium oxide (CaO), silicon oxide (SiO_2) and aluminum oxide (Al_2O_3), and in which a calcium oxide component content is in a range expressed by the following formulae and a void fraction (porosity) of 20% by volume or less:

$$C_{CaO} > 0.62 \times C_{SiO2} + 0.27 \times C_{Al2O3}$$



and

$$C_{CaO} < 1.87 \times C_{SiO2} + 2.20 \times C_{Al2O3}$$

wherein

C_{CaO} is the calcium oxide component content (% by weight)

C_{SiO2} is the silicon oxide component content (% by weight);

C_{Al2O3} is the aluminum oxide component content (% by weight; and $C_{CaO} + C_{SiO2} + C_{Al2O3} = 100\%$.

5,114,623

PROCESS FOR THE DESTRUCTION OF ALKYLPHOSPHATE

Graham V. Hutson, Gosforth, United Kingdom, assignor to British Nuclear Fuels plc, Risley, England

Filed Nov. 14, 1990, Ser. No. 612,469

Claims priority, application United Kingdom, Nov. 14, 1989, 8925679

Int. Cl.[5] G21F *9/08*; C02F *1/72*

U.S. Cl. 252—631 **29 Claims**

1. A process for converting to an inorganic phosphate a trialkylphosphate having an alkyl group in the range ethyl to octyl, the process comprising the steps of:

a) partially de-alkylating the trialkylphosphate for a period at about reflux temperature with an aqueous solution of an alkali metal hydroxide at a concentration of at least six Molar, the period and the amount of the hydroxide being such as to remove by distillation most of any volatile organic material released and to produce two aqueous phases, a first aqueous phase comprising alkali metal of the partially de-alkylated said trialkylphosphate, and a second aqueous phase comprising residual of said hydroxide;

b) separating the first aqueous phase from the second aqueous phase, and

c) oxidising the separated first aqueous phase with an aqueous solution of hydrogen peroxide at an elevated temperature and in the presence of an effective amount of a transition metal catalyst to produce inorganic phosphate substantially free of organic material.

5,114,624

PROCESS FOR THE PRODUCTION AND RECOVERY OF ENE REACTION PRODUCTS

Herbert E. Fried, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 17, 1990, Ser. No. 510,311

Int. Cl.[5] C11B *1/10*

U.S. Cl. 554—162 **11 Claims**

1. In a process for the preparation and recovery of higher alkyl acrylic acid esters which comprises reacting one or more olefins having carbon number of at least 10 with one or more alkyl acrylic acid esters having carbon numbers in the range of about 4 to 12 in the presence of a halide catalyst, the improvement which comprises extracting the crude product mixture resulting from the reaction with an aqueous acid solution having a concentration of acid in the range from about 0.1 to about 10 percent by weight and a pH less than about 3, followed by distilling the extracted product mixture to recover unreacted C_{10+} olefin starting material.

5,114,625

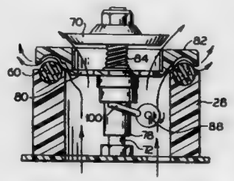
FRAGRANCE DISPENSER FOR EVAPORATING AROMATIC LIQUID

Clyde W. Gibson, 423 Lakeview Dr., Harrisburg, N.C. 28075

Filed Feb. 20, 1991, Ser. No. 658,187

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—30 **16 Claims**



1. A fragrance dispenser for circulating air and evaporating an aromatic liquid into the air comprising

a wick holder body having a fluid reservoir for holding an aromatic fluid and the like, and a wick receiving passage, said passage communicating with said fluid reservoir and having an exposed wick receiving channel portion, and wherein said wick holder body includes an air passageway extending therethrough and having an air inlet opening and circular air outlet opening, said exposed portion of said wick receiving channel extending adjacent the peripheral edge of said circular outlet opening,

a wick longitudinally positioned in said wick receiving passage and being exposed along the wick length received in the channel, said wick having a fluid receiving end disposed in said reservoir for drawing fluid therefrom into said wick,

a fan housing mounted to said wick holder body, and a fan mounted to said fan housing for blowing air through said housing and over said exposed wick portion,

a wick cover supported by said wick holder body and movable between a substantially closed position covering the exposed portion of the wick and an extended open position where the wick is fully exposed to a flow of air produced by the fan, and

means operatively connected to said wick cover for moving the wick cover from the substantially closed position into preselected open positions between said closed and extended, open positions for selectively limiting the amount of air which flows over the exposed portion of the wick and controlling the amount of fluid evaporated from the wick.

5,114,626

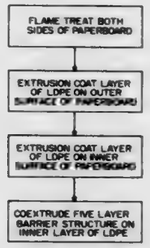
PROCESS FOR PREPARING A PAPERBOARD LAMINATE

Todd H. Huffman, Roanoke, Va., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 352,937, May 17, 1989, Pat. No. 5,059,459. This application Mar. 12, 1991, Ser. No. 667,860

Int. Cl.[5] B29C *13/00, 47/06*

U.S. Cl. 264—80 **8 Claims**



1. The process for manufacturing a paperboard laminate with heat-sealable outer and inner surfaces, having enhanced gas barrier properties and improved resistance to the migration of essential oils, flavors and vitamins comprising the steps:

(a) flame treating the inner and outer surfaces of a paperboard substrate;

(b) extrusion coating a layer of low density polyethylene polymer onto the outer surface of said paperboard substrate;

(c) extrusion coating a layer of low density polyethylene polymer onto the inner surface of said paperboard substrate; and

(d) coextruding a symmetrical sandwich comprising in order from one side of the sandwich to the other a low density polyethylene layer, an adhesive tie layer, a barrier layer, an adhesive tie layer, and a low density polyethylene layer in molten form onto the outer surface of the low density polyethylene polymer layer coated on the inner surface of said paperboard substrate to adhere one of the molten low density polyethylene layers of the sandwich to the low density polyethylene polymer layer coated on the inner surface of the paperboard substrate and provide a laminate having heat-sealable low density polyethylene layers at the outer and inner surfaces.

5,114,627

METHOD FOR PRODUCING A COLLAGEN HYDROGEL

Linda Civerchia, Ft. Lauderdale, Fla., assignor to CBS Lens, Santa Maria, Calif., a California general partnership

Division of Ser. No. 402,986, Sep. 1, 1989, Pat. No. 4,983,181, which is a continuation of Ser. No. 920,031, Oct. 16, 1986, abandoned. This application Dec. 6, 1990, Ser. No. 624,346

Int. Cl.[5] B29D *11/00*; C08H *1/00*

U.S. Cl. 264—1.1 **27 Claims**

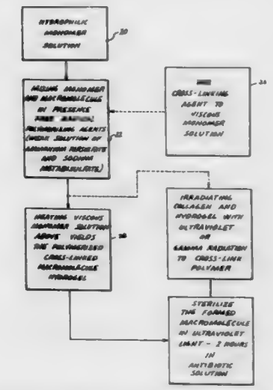
7. The method of producing a collagen-hydrogel lens for promoting epithelial cell growth when positioned contiguous to Bowman's membrane and corneal epithelium of the cornea of an eye comprising the steps of

forming a radical free polymer of a hydrophilic monomer;

mixing the hydrophilic monomer with a diluted solution of macromolecules comprising a constituent of ground substance of tissue in the presence of a weak solution of ammonium persulfate and sodium metabisulfate forming a clear viscous monomer solution;

heating said viscous monomer solution in the presence of a crosslinking agent to polymerize the same into a three dimensional polymeric meshwork having macromolecules comprising a constituent of ground substance of tissue interdispersed within the three dimensional polymeric meshwork; and

freezing the crosslinked and polymerized hydrogel-collagen material in a lens mold having a predetermined shape to



form a lens of a selected power to form an artificial lens of a predetermined shape and power.

5,114,628

METHOD FOR THE MANUFACTURE OF CONTACT LENSES

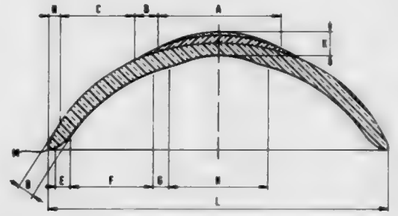
Peter Höfer, Aschaffenburg; Peter Hagmann, Hösbach-Bahnhof; Gunther Krieg, Karlsruhe, and Eberhard Vaas, Pforzheim, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 23, 1991, Ser. No. 644,355

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1990, 4002029

Int. Cl.[5] B29D *11/00*

U.S. Cl. 264—1.4 **10 Claims**



1. A method for the manufacture of contact lenses, wherein

the topography of the surface of the eye is measured three-dimensionally;

the geometry of the rear face of the lens is determined so as to fit the measured topography;

the optical effect of a lachrymal lens which is formed between the rear face of the lens and the surface of the eye is determined;

the geometry of the front face of the lens is determined taking into account the optical effect of the lachrymal lens and the sight correction to be achieved by the contact lens;

the data for the lens geometry of the front and the rear faces of the lens are stored; and

the particular contact lens concerned is produced in accordance with the stored lens geometry data.

5,114,629

PROCESS FOR CASTING LENSES

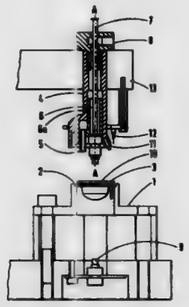
Albert H. Morland, Hampshire, and Timothy J. Warren, Southampton, both of England, assignors to CooperVision, Inc., Palo Alto, Calif.

Division of Ser. No. 119,269, Nov. 9, 1987, Pat. No. 4,944,899, which is a continuation of Ser. No. 840,781, Mar. 18, 1986, abandoned. This application May 24, 1990, Ser. No. 527,867

Claims priority, application United Kingdom, Mar. 19, 1985, 8507007

Int. Cl.[5] **B29D** *11/00*

U.S. Cl. 264—2.2 **10 Claims**



1. A process for casting contact lenses comprising:

(a) providing a contact lens mold comprising individual male and female mold halves, finished from a thermoplastic polymer wherein the male mold half forms a formed concave lens surface;

(b) introducing a polymerisable liquid composition into said female mold half;

(c) aligning and guiding the male half into the female half along a substantially vertical center-line axis of the halves;

(d) pressing said male mold half against said female mold half under an external closing pressure to thereby define a closed mold cavity with said liquid monomer;

(e) heat bonding said male and female mold halves together while under the external closing pressure resulting from pressing the male mold half into the female mold half so that the mold cavity remains closed during polymerization;

(f) releasing said closing pressure from said contact lens mold and placing said contact lens mold in a thermostatically controlled environment while said liquid composition therein polymerizes; and

(g) when the polymerization is complete, breaking the heat bond, opening said contact lens mold and removing the formed contact lens therefrom.

5,114,630

CONTINUOUS MANUFACTURE AND CASTING

Kirk E. Newman, Newport News; James A. Gusack, Williamsburg, and John A. Zehmer, III, Newport News, all of Va., assignors to The United of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 21, 1990, Ser. No. 586,182

Int. Cl.[5] **C06B** *21/00*

U.S. Cl. 264—3.1 **15 Claims**

1. Continuous process for making a fluid product, comprising

continuously supplying materials to a combining zone in a fluid flow system having a diverting zone downstream of the combining zone,

the system also having a product outlet and another outlet, the outlets being downstream of the diverting zone and in parallel flow relationship with one another,

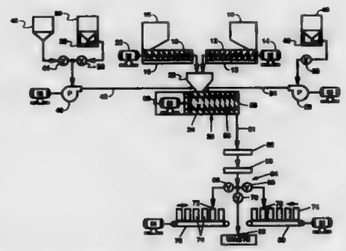
continuously combining the supplied materials to form a fluid product in the combining zone,

establishing continuous plug flow of the product in a stream toward the diverting zone,

measuring the quantities of the materials supplied,

determining time-averaged proportions of the supplied materials in a serial portion of the product flow stream from the measured quantities of materials supplied,

comparing the time-averaged proportions to a specification,



diverting the flowing product from the diverting zone toward the product outlet only when the compared proportions are within the specification and the serial portion having the determined proportions arrives at the diverting zone, and

diverting the flowing product from the diverting zone toward the other outlet when the compared proportions are out of the specification and the serial portion having the determined proportions arrives at the diverting zone,

whereby all product diverted to the product outlet meets the specification.

5,114,631

PROCESS FOR THE PRODUCTION FROM THERMOPLASTIC POLYMERS OF SUPERFINE FIBRE NONWOVEN FABRICS

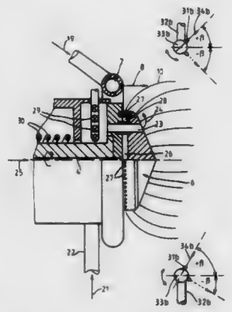
Peter R. Nyssen, Dormagen; Dirk Berkenhaus, Cologne, and Hans-Theo van Pey, Lipp, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1991, Ser. No. 676,782

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1990, 4011883

Int. Cl.[5] **B05B** *3/08;* **B05D** *1/12*

U.S. Cl. 264—6 **13 Claims**



1. Process for the production from thermoplastic polymers of superfine polymer fibre nonwoven fabrics with a mean fibre diameter of 0.1 μm–20 μm, in which the molten polymer at a supply pressure of 1 bar–200 bar in a rotating nozzle head is spun out radially from a plurality of melt discharge holes to form fibres and the not yet completely solidified fibres are

deflected in an axial direction at a radial distance of 10 mm to 200 mm from the discharge holes by an outer gas stream and afterwards deposited as nonwoven fabric on a circulating, air-permeable carrier, comprising in addition to the outer gas stream of high velocity, at a smaller radial distance than the melt discharge holes there emerges from a plurality of axial boreholes in the nozzle head an inner gas stream with lower velocity which, under the influence of the centrifugal sweeping forces arising at the rotating nozzle head, forms a rotationally symmetrical flow field with a predominantly radial velocity component and whose temperature is equal to or greater than the nozzle head temperature.

4. Process for the production from thermoplastic polymers of superfine polymer fibre nonwoven fabrics with a mean fibre diameter of 0.1 μm–20 μm, in which the molten polymer at a supply pressure of 1 bar–200 bar in a rotating nozzle head is spun out radially from a plurality of melt discharge holes to form fibres and the not yet completely solidified fibres are deflected in an axial direction at a radial distance of 10 mm to 200 mm from the discharge holes by an outer gas stream and afterwards deposited as nonwoven fabric on a circulating, air-permeable carrier, comprising in addition to the outer gas stream of high velocity, at a smaller radial distance than the melt discharge holes there emerges from a plurality of axial boreholes in the nozzle head an inner gas stream with lower velocity which, under the influence of the centrifugal sweeping forces arising at the rotating nozzle head, forms a rotationally symmetrical flow field with a predominantly radial velocity component and whose temperature is equal to or greater than the nozzle head temperature and wherein outside the nozzle head at an axial distance 0 mm ≦ a ≦ 500 mm from the melt discharge holes, at least two further delimiting gas streams are directed at an angle of 0° to 70° to the axis onto the axially deflected fibre stream.

5,114,632

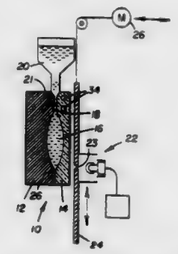
CONTROLLED CASTING OF A SHRINKABLE MATERIAL

David S. Soane, Piedmont, Calif., assignor to Soane Technologies, Inc., Hayward, Calif.

Continuation-in-part of Ser. No. 345,718, May 1, 1989. This application Nov. 1, 1990, Ser. No. 608,123

Int. Cl.[5] **B29C** *35/10, 39/10;* **B29D** *11/00*

U.S. Cl. 264—22 **2 Claims**



1. A method of forming an article of precise dimensions by in situ solidification in a precisely dimensioned mold of a liquified material comprising at least one monomer, prepolymer or polymer, that, upon exposure to a solidifier polymerizes the liquified material, shrinks; the method comprising the steps of:

a. providing a mold body having a first part and a second part, said first and second part defining an internal cavity therebetween, the cavity corresponding to the precise dimensions of the finished article and having a closed end and an open end, at least one of the first or the second part formed to permit exposure of the liquefied material to the solidifier in the internal cavity in a differential and sequential manner, including a non-polymer substrate as a part of the mold, wherein the substrate is treated with a chemical coupling agent enhancing adhesion of a polymer formed from the liquified material to the substrate material;

b. providing a source of the solidifier for imposition upon the surface of the liquefied material in a differential and sequential manner;

c. providing a source of the liquefied material at said open end of said mold body;

d. filling the internal cavity with the liquefied material;

e. differentially exposing said liquefied material to said solidifier starting at said closed end and proceeding to said open end while continuously supplying liquefied material to said open end so that polymerization takes place at a steady rate from the closed end to the open end as a function of exposure of the liquified material to the solidifier; and

f. removing the resultant solidified article from the cavity.

5,114,633

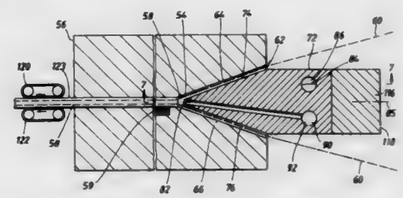
METHOD FOR THE RESIN-IMPREGNATION OF FIBERS

Steven L. Stewart, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 16, 1991, Ser. No. 700,825

Int. Cl.[5] **B29C** *47/04*

U.S. Cl. 264—23 **7 Claims**



1. A method of resin-impregnating a fiber, said method comprising the steps of providing:

an impregnation die having an inlet end and an outlet end and having a central duct opening defined therebetween sized to draw at least one resin-impregnated fiber therethrough, said inlet end of said impregnation die having a tapered opening defined by at least one tapered surface convergedly intersecting said central duct opening,

a resin feed head cooperatively positioned within said tapered opening, a portion of said resin feed head spaced from said tapered surface to allow at least one fiber to be drawn therebetween the thereafter into said central duct opening, said resin feed head having a mixing face positioned adjacent said central duct opening, said resin feed head having a first resin flow opening means and a second resin flow opening means defined therethrough, said resin flow opening means defining separate resin flow openings in said mixing face, and

ultrasonic driver means operatively coupled to said resin feed head and capable of vibrating said resin feed head,

drawing said fiber between said resin feed head and said tapered surface of said impregnation die into said central duct opening,

energizing said ultrasonic driver means to vibrate said resin feed head,

flowing a first resin stream through said first resin flow opening means and a second resin stream through said second resin flow opening means, said resin streams reacting when mixed together, said resin streams discharging through said separate resin flow openings in said mixing face and thereafter mixing, said mixed resin streams impregnating said at least one fiber with a mixed resin, and

drawing said resin impregnated fiber away from said mixing face before said mixed resin saturating said fiber hardens.

5,114,634

METHOD OF LINING A HOST PIPE WITH A LINER USING CRYOGENIC COOLING

Jim S. McMillan, and Simon Tarsha, both of P.O. Box 40360, Everman, Tex. 76140

Filed Mar. 21, 1991, Ser. No. 672,831
Int. Cl.[5] B29C *35/16, 43/46*
U.S. Cl. 264—28 **6 Claims**



1. A method of lining a host pipe with an elastomeric liner having an outside diameter which is initially greater than the inside diameter of the host pipe, the method being a continuous process comprising the steps of:

reducing a length of the liner to a downsized, generally cylindrical outside diameter at a downsizing station;

passing the downsized liner through a cooling station including a thermostatically controlled cooling chamber maintained at a supercooled temperature to thereby cryogenically cool the liner to a supercooled state, the step of supercooling the liner being effective to maintain the outside diameter of the liner in the downsized state and allow the liner to be inserted within the inside diameter of the host pipe;

inserting the downsized liner into the host pipe to be lined;

allowing the liner to expand with time and without heating to substantially its original outside diameter to thereby secure the liner within the host pipe.

5,114,635

PROCESS FOR PRODUCING CARBON MATERIAL AND CARBON/CARBON COMPOSITES

Yoshio Sohda, Kawasaki; Yasuzi Ido, Yokohama; Toshinori Nakamura, and Takeshi Suemitsu, both of Kobe, all of Japan, assignors to Kawasaki Heavy Industries, Ltd., Hyogo and Nippon Oil Company, Limited, Tokyo, both of, Japan

Filed Dec. 28, 1988, Ser. No. 291,007
Claims priority, application Japan, Dec. 28, 1987, 62-330018; Mar. 18, 1988, 63-63172; Nov. 10, 1988, 63-282387
Int. Cl.[5] C01B *31/00*
U.S. Cl. 264—29.2 **10 Claims**

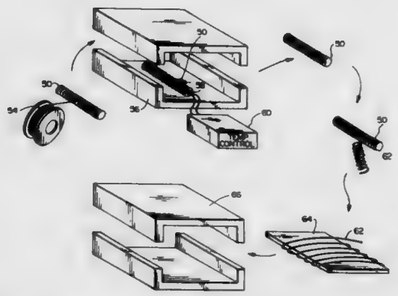
1. A process for producing a carbon material, which comprises placing a carbonaceous pitch in an open container, subjecting the pitch to a heat treatment under hot isostatic pressing in the open container, the heat treatment performed under an inert gas pressure and resulting in gas evolution, and controlling the discharge of said gas evolved by the heat treatment by an exhaust mechanism capable of continuously controlling and exhausting said gas evolved during the hot isostatic pressing such that in said gas evolved, evolution rates for H_2 and CH_4 each do not exceed 10 mol/hr per 100 grams of said carbonaceous pitch.

5,114,636

PROCESS FOR REDUCING THE INTERNAL CROSS SECTION OF ELASTOMERIC TUBING

Michael L. Evangelista, and Raymond A. Lia, both of Auburn, N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Division of Ser. No. 563,359, Jul. 31, 1990, Pat. No. 5,018,436. This application Jan. 14, 1991, Ser. No. 640,493
Int. Cl.[5] B29C *53/08, 53/20*
U.S. Cl. 264—40.1 **6 Claims**



1. Process of reducing the internal cross section of an elastomeric tubing for forming an elastomeric bladder therefrom, the process comprising the steps of

wrapping said tubing into a helical thread on a generally cylindrical fixture which has said helical thread formed thereon;

subjecting said tubing to heat treatment while the tubing is wrapped on said fixture, including elevating the temperature of said tubing to a suitable predetermined elevated temperature for a sufficient time for thermally setting said elastomeric tubing, thus forming a longitudinal fold therein; and

removing said tubing from said fixture wherein the resulting tubing has said longitudinal fold therein which minimizes the internal cross-sectional area thereof.

5,114,637

METHOD AND APPARATUS FOR MOULDING A FLUID SETTABLE MATERIAL

David R. Williams, Liskeard, England, and Trevor P. Gibson, County Armagh, Northern Ireland, assignors to Short Brothers PLC, Belfast, Northern Ireland

Filed Feb. 8, 1990, Ser. No. 477,329
Claims priority, application United Kingdom, Feb. 9, 1989, 8902841
Int. Cl.[5] B29C *45/23, 45/34, 45/76*
U.S. Cl. 264—40.3 **14 Claims**

1. Apparatus for moulding a fluid settable material, comprising:

male and female mould halves which can be brought together to define therebetween a mould cavity, each said halves having flange means,

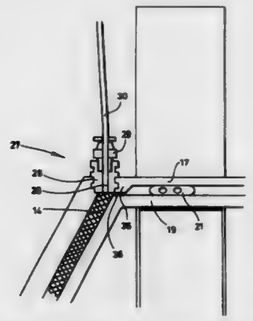
sealing means interposable between said flange means for compression between said flange means on closure of said mould halves to seal said mould cavity from the atmosphere,

clamping means to maintain said mould halves in a closed position,

means defining at least one vacuum outlet from a mould half leading via an isolation valve to a vacuum source,

means defining an inlet to said mould cavity for the introduction of a fluid settable material, and

stop means on said mould halves for defining a line of closest approach of said mould halves on closure of said mould cavity, said stop means forming a pinch line located radially inwardly of said sealing means so as to define the periphery of a moulded product.



5,114,638

PROCESS FOR PRODUCING AN OPACIFIED MOLDED PRODUCT

Takashi Kuroda; Kazuhiro Yamada; Tadao Ishibashi; Suetou Hayashida; Kyoichiro Kimura, and Masaru Sameshima, all of Chiba, Japan, assignors to Chisso Corporation & Maruzen Petrochemical Co., Ltd., Japan

Division of Ser. No. 499,630, Mar. 27, 1990, Pat. No. 5,082,900. This application May 1, 1991, Ser. No. 694,393
Claims priority, application Japan, Mar. 29, 1989, 1-74919; Mar. 31, 1989, 1-78293
Int. Cl.[5] B29C *55/12*
U.S. Cl. 264—41 **6 Claims**

1. A process for producing a stretched molded product which comprises preparing a raw sheet by melt extrusion of a composition comprising 100 parts by weight of a crystalline polypropylene and 3 to 40 parts by weight of at least one of a cyclopentadiene petroleum resin and a hydrogenated cyclopentadiene petroleum resin having a softening point of 160° C. or higher as measured according to the ring and ball method and stretching the raw sheet to twice its dimension or more in at least one direction at a temperature not higher than the softening point of the petroleum resin.

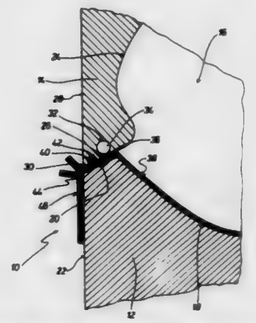
5,114,639

PROCESS AND APPARATUS FOR THE PRODUCTION OF A FOAM-BACKED CUSHION PORTION

Helmut Kurz, Salzbach-Roseaberg, and Martin Stoeberl, Schwarzenfeld, both of Fed. Rep. of Germany, assignors to Grammer AG, Amberg, Fed. Rep. of Germany

Filed Sep. 5, 1990, Ser. No. 578,066
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1989, 3930527
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—46.6 **3 Claims**

1. A process for the production of a foam-backed cushion portion comprising a foam core and a cover, wherein a cover portion for providing the cover of the cushion portion is introduced into a first mold portion of a mold, the cover portion is fixed in position between the first mold portion and a second mold portion along peripherally extending common contact portions between the mold portions, the mold when closed forming a mold cavity, and a reaction mixture is introduced into the mold cavity and foams during reaction thereof to fill the mold cavity and be joined to the cover, wherein a discharge flow of gas from the mold cavity is prevented in the region of the contact portions of the mold portions so that a gas cushion is formed in the cover portion region which is adjacent the mold cavity, and wherein the mold is sealed along said contact portions to prevent gas from escaping from the mold cavity by means of a flow of a gaseous flow agent which is directed from the contact portion of one mold portion towards an oppositely disposed contact portion of the other mold portion.



5,114,640

TIME-EFFICIENT PROCESS FOR MAKING EXPANDED POLYMERIC PRODUCTS WITH MULTIPASS EXPANSION OF POLYSTYRENE BEAD

William H. Harclerode, Ewing; John C. Knutsen, Highland Park; Barry J. Pekich, Bridgeton; John V. Wiman, Morristown, and John C. Voss, Trenton, all of N.J., assignors to BASF Corporation, Parsippany, N.J.

Division of Ser. No. 618,340, Jan. 26, 1990. This application Oct. 15, 1991, Ser. No. 776,952
Int. Cl.[5] C08J *9/22, 9/232, 9/24*
U.S. Cl. 264—53 **41 Claims**

1. A process for making an expanded polymeric molded product, the process comprising the steps of:

A. preexpanding unexpanded beads in from 2 to 4 preexpansion steps, the beads being comprised of:

i. a blowing agent which is at least one member selected from the group consisting of:

pentane, cyclopentane, methylcyclopentane, neopentane, isopentane, pentane petroleum distillate fractions), propane, butane, isobutane, hexane, isomers of hexane, methylcyclohexane, cyclohexane, heptane, propylene, 1-butylene, 2-butylene, isobutylene, mixtures of one or more aliphatic hydrocarbons having a molecular weight of at least 42 and a boiling point not higher than 95° C. at 760 millimeters absolute pressure, water, carbon dioxide, ammonium carbonate, and azo compounds that are decomposable to form a gas at a heat-plastifying temperature to which the polymer is brought,

the blowing agent being present in the beads in an amount of from about 2 weight percent to about 4.4 weight percent based on the weight of the beads; and

ii. a polymer produced from at least one monomer, wherein the monomer is at least one member selected from the group consisting of:

styrene, derivatives of styrene, vinyltoluene, mono- and polyhalogenated vinyltoluenes which form linear polymers, acrylonitrile, methyl methacrylate, and vinyl toluene,

the polymer being present in the beads in an amount of from about 93 weight percent to about 98 weight percent based on the weight of the beads, the polymer exhibiting:

(a) a polydispersity of from about 1 to less than 2.5,

(b) a weight average molecular weight of greater than about 180,000 to about 300,000, and

(c) an M_z:M_n of from about 2 to about 4.5,

wherein the polystyrene polymer is branched to from 0 to less than 5 weight percent, and

B. aging the expanded beads for a time period of from about 1 hour to about 80 hours after the first preexpansion step;

C. carrying out from 1 to 3 additional preexpansion steps in an expander at substantially atmospheric pressure, the additional preexpansion steps being carried out with an aging period of from about 1 hours to about 80 hours after each of the additional preexpansion steps, whereby finally-preexpanded beads are produced upon completion of the preexpansion steps; and

D. molding the finally-preexpanded beads in order to both fuse and further expand the finally-preexpanded beads, the preexpansion and molding steps being carried out so that a molded foamed object having a density of from about 0.8 pounds per cubic foot to about 1.1 pounds per cubic foot is formed.

5,114,641

METHOD FOR PRODUCING AN ELONGATED SINTERED ARTICLE

Susumu Yamamoto; Teruyuki Murai; Nozomu Kawabe, and Masaaki Tobioka, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

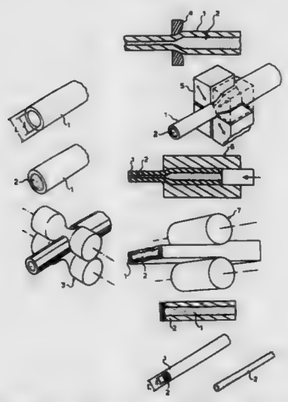
Continuation of Ser. No. 63,228, Jun. 17, 1987, Pat. No. 5,006,289. This application Oct. 31, 1990, Ser. No. 606,850

Claims priority, application Japan, Jun. 17, 1986, 61-141566; Aug. 13, 1986, 61-190891; Sep. 10, 1986, 61-214487; Oct. 17, 1986, 61-246937; Dec. 5, 1986, 61-291216; Dec. 26, 1986, 61-312958; Jan. 9, 1987, 62-3060

The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.

Int. Cl.[5] C04G *33/34*

U.S. Cl. 264—60 **28 Claims**



1. Method for producing an elongated sintered article, comprising the steps of filling powder material in a pipe, said powder material being ceramic, elongating said pipe filled with the powder material, to perform plastic deformation, and heating the elongated pipe filled with the powder material to burn and/or sinter the powder material.

5,114,642

PROCESS FOR PRODUCING A METAL-SCREENED CERAMIC PACKAGE

Tae Y. Jung, Seoul, Rep. of Korea, assignor to Samsung Corning Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 18, 1990, Ser. No. 553,634

Claims priority, application Rep. of Korea, Mar. 30, 1990, 90-4318

Int. Cl.[5] C04B *41/88*

U.S. Cl. 264—61 **3 Claims**



1. A method for preparing a metal-screened ceramic package, comprising:

providing a green ceramic sheet having a given composition, said sheet having a surface;

mixing a first component of fine metal particles of a given composition selected from the group consisting of tungsten and molybdenum, and having a particle size in the range of 0.5 to 1.5 μm, with a second component of coarse metal particles of said given composition and having a particle size in the range of 2.0 to 5.0 μm;

heating the resulting metal particle mixture to a temperature in the range of 100° C. to 1400° C., in a furnace, at an oxygen partial pressure in the range of 1×10^{-9} to 1×10^{-50}, in the presence of hydrogen and nitrogen gases, and thereby oxidizing said metal particles of said metal particle mixture on exposed surfaces thereof;

mixing the resultingly partially oxidized metal particle mixture with a binder and solvent so as to form a metal paste;

screen printing said metal paste in a pattern on said surface of said green ceramic sheet;

co-firing the resulting metal paste pattern and said green ceramic sheet at a temperature in the range of 500° C. to 1650° C. in the presence of hydrogen and nitrogen gases in the volumetric H_2/N_2 ratio of 15 to 85; and

permitting the resulting metal-screened ceramic sheet to cool.

5,114,643

FABRICATION OF CORDIERITE BODIES

Douglas M. Beall, Corning; Evelyn M. DeLiso, Elmira, and Martin J. Murtagh, Trumansburg, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Feb. 13, 1991, Ser. No. 654,527

Int. Cl.[5] C04B *35/14*

U.S. Cl. 264—63 **9 Claims**

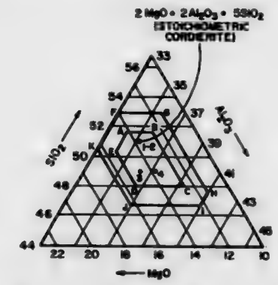
1. A method of fabricating a cordierite body, said method comprising:

a) selecting raw materials to form a nominal composition consisting essentially of in percent by weight about 11.5 to about 16.5 MgO, about 33.0 to about 41.0 Al_2O_3, and about 46.5 to about 53 SiO_2 said raw materials being selected from the group consisting of a first combination consisting essentially of silica and magnesium aluminate spinel, a second combination consisting essentially of silica, magnesium aluminate spinel, and a MgO yielding component, and a third combination consisting essentially of silica, magnesium aluminate spinel, and a Al_2O_3 yielding component, said raw materials being provided absent of clay and absent of talc;

b) intimately blending said raw materials with an effective amount of vehicle and forming aids to impart plastic formability and green strength to said raw materials and form a plastic mixture;

c) forming said raw materials into a green body;

d) drying said green body; and



e) firing said green body at a sufficient temperature for a sufficient time to form a cordierite body of at least about 90% by weight cordierite, wherein the coefficient of thermal expansion of said cordierite body is less than about 16×10^{-7}/° C. from about 25° C. to about 1000° C.

5,114,644

FABRICATION OF CORDIERITE BODIES

Douglas M. Beall, Corning; Evelyn M. DeLiso, Elmira; Donald L. Guile, Horseheads, and Martin J. Murtagh, Trumansburg, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Feb. 13, 1991, Ser. No. 654,528

Int. Cl.[5] C04B *35/14*

U.S. Cl. 264—63 **12 Claims**

1. A method of fabricating a cordierite body, said method comprising:

a) selecting raw materials to form a composition consisting essentially of in percent by weight about 12 to about 16 magnesium oxide, about 35 to about 41 aluminum oxide, about 43 to about 53 silica, said raw materials being absent of clay and absent of talc, said magnesium oxide being supplied by a magnesium oxide yielding component having an average particle size of no greater than about 15.0 micrometers in diameter, said aluminum oxide supplied by an aluminum oxide yielding component having an average particle size no greater than about 8.0 micrometers in diameter, said composition being capable of forming cordierite in the subsequent firing step;

b) intimately blending said raw materials with an effective amount of vehicle and forming aids to impart plastic formability and green strength to said raw materials and form a plastic mixture;

c) forming said raw materials into a green body;

d) drying said green body; and

e) firing said green body by heating said green body to a first temperature of about 1000° C. to about 1200° C. and thereafter raising the temperature at a heating rate of no greater than about 25° C. per hour to a second temperature sufficient to form cordierite, and maintaining said second temperature for a sufficient time to form a cordierite body of at least about 90% by weight cordierite, said cordierite body having a mean pore size of less than about 10.0 microns, and a coefficient of thermal expansion of no greater than about 9.0×10^{-7}/° C. from about 25° C. to about 1000° C.

5,114,645

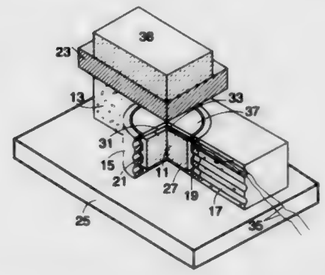
FABRICATION OF CERAMICS BY SHOCK COMPACTION OF MATERIALS PREPARED BY COMBUSTION SYNTHESIS

Andrus Niiler, Bel Air, Md.; Gerald L. Moss, Newark, Del., and Robert J. Eichelberger, Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 6, 1988, Ser. No. 296,999

Int. Cl.[5] C04B *33/32*

U.S. Cl. 264—84 **3 Claims**



1. A method for the fabrication of a high density, monolithic ceramic material comprising the steps of:

subjecting a mixed powder to a uniaxial pressure to form a green compact,

subjecting the compact to a solid combustion reaction employing self-propagating high temperature synthesis to form hot, porous ceramic,

subjecting the hot ceramic while at a temperature above its ductile brittle transition temperature to an explosively generated shockwave to generate high pressures to compress the ceramic, and

slowly cooling the material.

5,114,646

METHOD OF INCREASING THE DELAY PERIOD OF NONWOVEN WEBS HAVING DELAYED WETTABILITY

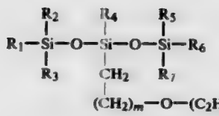
Ronald S. Nohr, Roswell, and J. Gavin MacDonald, Decatur, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 408,812, Sep. 18, 1989, abandoned. This application Mar. 2, 1990, Ser. No. 488,344

Int. Cl.[5] D01F *1/10*

U.S. Cl. 264—103 **5 Claims**

1. In a method for preparing a nonwoven web having delayed wettability, in that said web is not wettable by water upon its formation but becomes wettable thereafter without any post-formation treatment, which method comprises melting a mixture of at least one thermoplastic polyolefin and at least one additive having the general formula,



and extruding the resulting melt through a die at a shear rate of from about 50 to about 30,000 sec^{-1} and a throughput of no more than about 5.4 kg/cm/hour, in which:

(A) R_1–R_7 are independently selected monovalent C_1–C_3 alkyl groups;

(B) R_8 is hydrogen or a monovalent C_1–C3 alkyl group;

(C) m represents an integer of from 0 to about 5

(D) n represents an integer of from 3 to about 8;

(E) said additive has a molecular weight of from about 350 to about 700;

(F) said additive has a polydispersity of from about 1.0 to about 1.3; and

(G) said additive is present in an amount of from about 0.5 to about 1.75 percent by weight, based on the amount of thermoplastic polyolefin, which amount, if homogeneously distributed throughout the polyolefin, is not sufficient to render the polyolefin wettable by water;

the improvement which comprises including in said mixture of at least one thermoplastic polyolefin and at least one additive from about 0.1 to about 6 percent by weight, based on the amount of said thermoplastic polyolefin, of at least one material having the capacity to increase the delay period for up to about two weeks.

5,114,647

EFFERVESCENT TABLETS HAVING INCREASED DISINTEGRATION RATES

Kenneth J. Levesque, Bristol, and Roy P. Alexander, Killingworth, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Feb. 1, 1991, Ser. No. 648,948
Int. Cl.[5] B29C *43/02*
U.S. Cl. 264—115 **19 Claims**

1. A method for producing sanitizing compositions which comprises:

a) admixing an alkali metal carbonate with a solid water soluble aliphatic carboxylic acid to form an acidic mixture,

b) compressing the acidic mixture to produce a compressed form of the acidic mixture,

c) crushing the compressed form to produce granules of the acidic mixture, and,

d) admixing granules of the acidic mixture with an alkali metal chloroisocyanurate, and an alkali metal bicarbonate to produce a sanitizing composition.

5,114,648

METHOD OF PRODUCING PRODUCTS FROM RUBBER COMPOSITIONS

John Kuc, Sr., 131 Pusey Mill Rd., Lincoln, University, Pa. 19352

Filed Mar. 28, 1991, Ser. No. 676,513
Int. Cl.[5] B29B *7/42, 9/06*
U.S. Cl. 264—134 **17 Claims**

1. A process for producing thermoplastic resin products from an at least partially vulcanized rubber composition, including the steps of:

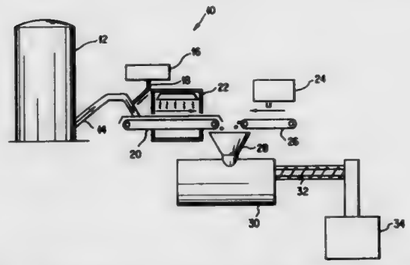
(a) providing said at least partially vulcanized rubber composition;

(b) pre-heating a heavy aromatic paraffin distillate composition to a point where said heavy aromatic paraffin distillate has a viscosity approximating 0.70 Centipoise;

(c) spray coating said heavy aromatic paraffin distillate composition on said vulcanized rubber composition to form a first intermediate mixture composition;

(d) heating said first intermediate mixture composition;

(e) introducing a thermoplastic composition to said first intermediate mixture composition to form a second intermediate composition;



(f) masticating said second intermediate composition subsequent to said introduction of said thermoplastic composition; and

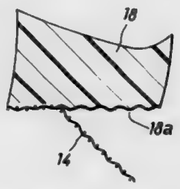
(g) extruding said masticated second intermediate composition for producing a final mixture composition which is molded or formed into said products.

5,114,649

PROCESS FOR IMPROVING AN ADHERING PROPERTY OF THE ADHERING SURFACE OF AN UNSATURATED POLYESTER RESIN

Hiroaki Hashiguchi, Utsunomiya, Japan, assignor to Prio Co. Incorporated, Utsunomiya, Japan

Filed Mar. 26, 1990, Ser. No. 498,649
Claims priority, application Japan, Mar. 24, 1989, 1-72822; Mar. 24, 1989, 1-72823
Int. Cl.[5] B29C *39/10, 41/20*
U.S. Cl. 264—139 **2 Claims**



1. A process for improving chemical and physical adhesive properties of an adhering surface of an unsaturated polyester resin to be adhered onto an article prepared from said unsaturated polyester resin which comprises:

laying a cloth on a portion of a mold, said cloth having a strong adhesivity for the unsaturated polyester resin;

impregnating the cloth with the unsaturated polyester resin and leaving the impregnated resin on said mold for hardening for a given time to form a sheet; and

stripping said cloth which is impregnated with the hardened unsaturated polyester resin from said unsaturated polyester resin to form an irregular or rugged adhering surface.

5,114,650

EXTRUSION SHAPING METHOD

Donald L. Franck, Warren; Suresh D. Shah, Rochester Hills; Manu K. Sheth, Troy, and Lawrence D. Zabel, Mt. Clemens, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 434,156, Nov. 13, 1989, abandoned. This application Apr. 16, 1991, Ser. No. 685,932
Int. Cl.[5] B29C *47/00, 47/02*
U.S. Cl. 264—151 **6 Claims**



2. A method of extruding a profiled strip of polymeric material off the extrusion die of a plastic extruder at a fixed speed and within 5 seconds thereafter without cooling said strip compression forming a predetermined section of said profiled strip into a predetermined shape when temperature of said polymeric material being sufficiently high allowing plastic flow in said profiled strip, said method comprising the steps of:

A. extruding a profiled strip of polymeric material through said extrusion die;

B. compression molding a predetermined section of said profiled strip into a predetermined shape within 5 seconds after exiting said extrusion die without substantial cooling of said strip with a set of compression molding dies capable of traveling with the profiled strip at substantially the same speed for a sufficient length of time to permanently set said predetermined shape, said compression molding dies equipped with a fade away open of at least 1 mm per 300 mm die length;

C. disengaging said compression molding dies from said profiled strip at a predetermined distance from said extrusion die;

D. cooling said profiled strip having said compression molded predetermined shape in a suitable cooling fluid such that said predetermined shape is permanently maintained; and

E. trimming said extruded profiled strip into discontinuous pieces each having said compression molded predetermined shape.

5,114,651

METHOD OF FORMING AN ORIFICE IN A STRUCTURE DURING MOLDING THEREOF

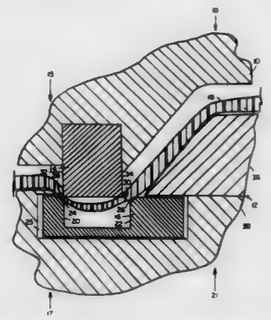
Richard T. Warburton, Canandaigua, N.Y., assignor to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 451,905, Dec. 18, 1989, Pat. No. 5,032,106. This application Mar. 11, 1991, Ser. No. 666,982
Int. Cl.[5] B29C *51/26*
U.S. Cl. 264—156 **7 Claims**

1. In a process for creating at least one orifice in a plastic structure during the shape molding thereof, comprising: placing moldable plastic between a pair of conformable mold members having a first mold member and a second mold member, closing the members to apply compression thereto, wherein during the molding, opposed male and female key members in the mold members pierce and form at least one orifice in the plastic; the improvement comprising:

(a) providing at least one male key member, carried by the first mold member, the male key member having on at least one side thereof a planar face terminating in either a cutting edge or a bevelled face;

(b) providing at least one female key member, carried by the second mold member, the female key member having a pair of spaced planar faces each terminating in either a cutting edge or a bevelled face; at least one of the key members being free to move transverse to the direction of mold member closure relative to the respective mold member carrying said at least one key member;



(c) registering the male and female key members through the free transverse movement of at least one of the key members relative to the respective mold member carrying said at least one key member so that a cutting edge of one key will be opposite to a bevelled face of the other key and closing the mold members so that initial contact will involve the cutting edge, the bevelled edge and the plastic therebetween; and

(d) closing the mold members further so that the cutting edge will ride off the bevelled face, causing alignment of the planar faces with a shearing through the plastic as the male key member cooperates with the female key member forming the orifice.

5,114,652

PROCESS FOR MAKING COLORED ARAMID FIBERS

Kiu-Seung Lee, Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 226,645, Aug. 1, 1988, Pat. No. 4,994,323. This application Oct. 11, 1990, Ser. No. 595,837
Int. Cl.[5] D01F *1/04, 6/60*
U.S. Cl. 264—184 **3 Claims**



1. A process for preparation of high strength, high modulus p-aramid fibers comprising the steps of:

a) agitating a mixture of:

i) sulfuric acid having a concentration of at least 98%;

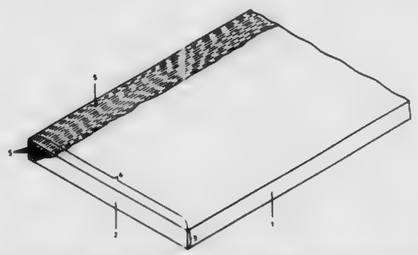
ii) p-aramid polymer having an inherent viscosity of at least 4 in an amount which is at least 18 weight percent of the mixture; and

iii) completely organic, sulfuric acid soluble, pigment in an amount which is from 0.01 to 6 weight percent based on the p-aramid polymer;
b) heating the mixture with continued agitation to a temperature of 80° to 105° C. to form a uniform solution;
c) extruding the solution through a spinneret;
d) passing the extruded solution through a non-coagulating fluid layer 0.5 to 2.5 centimeters thick such that the spin stretch factor is 3 to 10;
e) passing the stretched solution into and through an aqueous coagulating bath having a temperature of −5° to 25° C. to form filaments; and
f) washing the filaments with a liquid selected from the group consisting of water and dilute aqueous alkali.

5,114,653
PROCESSES OF MANUFACTURING PRESTRESSED CONCRETE

Hans-Juergen Schuerhoff, Wuppertal, Fed. Rep. of Germany; Arie Gerritse, Rotterdam, and Lambertus C. Mets, Arnhem, both of Netherlands, assignors to Akzo N.V. and Hollandsche Beton Groep N.V., both of, Netherlands

Continuation of Ser. No. 927,961, Nov. 7, 1986, abandoned. This application Jun. 13, 1989, Ser. No. 366,291
Claims priority, application Netherlands, Nov. 7, 1985, 8503052
Int. Cl.[5] B32B *27/34*
U.S. Cl. 264—228 **15 Claims**

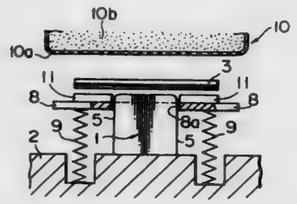


1. A process of producing a prestressed concrete element in which the prestressing force is exerted on the concrete by means of one or more reinforcing elements the process comprising the steps of:
(a) tensioning a reinforcing element, which comprises a plurality of substantially parallel continuous filaments which are embedded in a matrix of a thermosetting synthetic resin, wherein:
the filaments consist essentially of an aromatic polyamide;
the matrix comprises a thermosetting synthetic resin material selected from the group consisting of epoxy and bismaleimide resins;
the tensile strength of the plurality of filaments in the reinforcing element is higher than 2.0 GPa;
the modulus of elasticity of the plurality of filaments in the reinforcing element is higher than 60 GPa;
the elongation at rupture of the plurality of filaments in the reinforcing element is less than 6%;
the plurality of filaments in the reinforcing element form not more than 90% by volume of the reinforcing element and the synthetic matrix material forms at least 10% by volume thereof; and
the reinforcing element has a resistance to alkali, such that after 180 days at 80° C. in a saturated $Ca(OH)_2$ solution, the residual strength of the plurality of filaments in the reinforcing element is more than 40% of their initial strength;
(b) casting concrete about the tensioned reinforcing element;
(c) permitting the concrete to harden sufficiently to withstand the prestressing force imparted to the concrete upon release of the tension in the plurality of filaments;
(d) releasing the tension on the reinforcing element to impart a prestress to the hardened concrete;
(e) the tensioning imparting a prestressing force to the concrete element of such magnitude that the tensile stress in the reinforcing element is 40 to 70% of the tensile strength of the plurality of filaments in the reinforcing element.

5,114,654
METHOD FOR FORMING A PRODUCT HAVING WAVED SURFACE BY BENDING A COMPOSITE MATERIAL SHEET

Masanori Hosoi, Tochigi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1990, Ser. No. 570,598
Claims priority, application Japan, Aug. 28, 1989, 1-220951
Int. Cl.[5] B28B *3/00*
U.S. Cl. 264—313 **14 Claims**

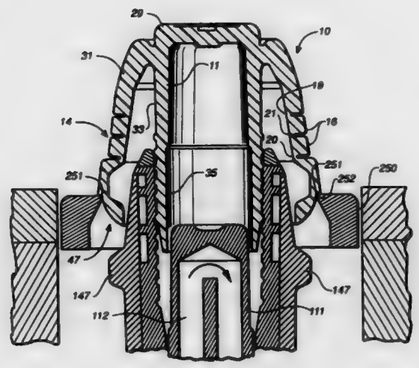


1. A method of bending and forming a composite material sheet made from laminated meshes of inelastic fibers, into a product of U-shaped cross section having a reference surface and pair of flange surfaces bent angularly along opposite curved longitudinal edges of the reference surface, said method comprising:
placing said composite material sheet onto a stationary forming die having an upper reference forming surface and flange forming surface extending downward from opposite curved longitudinal edges of said reference forming surface and onto a downwardly movable auxiliary forming die surrounding said stationary forming die and having convex auxiliary forming ridges on an upper surface thereof, with said fibers of said composite material sheet forming an approximately 45° relative to said edges of said reference forming surface;
pressing the composite material sheet downward against said stationary forming die and against said auxiliary forming die by means of an expandable elastic depressing die to shape an inner part of said composite material sheet on said upper reference forming surface of the stationary forming die into conformity with said upper reference forming surface, and to deform outer parts of said composite material sheet extending outward beyond said longitudinal edges of said reference forming surface into conformity with said auxiliary forming ridges, so as to shape said reference surface of the product;
further pressing the composite material sheet by said depressing die to move said auxiliary forming die downward with said outer parts of the composite material sheet being held between said depressing die and said auxiliary forming die, thereby to form the flange surfaces of the product; and
pulling and stretching said parts of the composite material sheet by said auxiliary forming ridges in such directions as to lower the density of the fibers, during at least one of said pressing steps so as to prevent creases and lines form being formed.

5,114,655
METHOD AND APPARATUS FOR INJECTION MOLDING

Harold E. Cole, Paradise, Calif., assignor to Cole Machine & Mfg. Co., Oakridge, Oreg.

Division of Ser. No. 394,934, Aug. 17, 1989. This application Oct. 16, 1990, Ser. No. 598,098
Int. Cl.[5] B29D *1/00*
U.S. Cl. 264—318 **2 Claims**

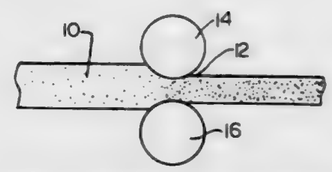


1. A method for forming a closure device having a cap portion; a cylindrical plug portion extending therefrom; a cylindrical collar extending substantially coextensively and coaxially with said plug portion spaced therefrom to provide an annular cavity for receiving the open end of a container to be closed, said collar having an annular shoulder thereon; and an intercoupling section comprised of at least one tether strip that is secured at its respective ends to said cap and said collar, said tether strip being joined to said cap and said collar along a preselected length of said tether strip by frangible webs of a preselected thickness to permit said tether strip to be separated from said cap and plug and said collar along said preselected length, said method comprising: providing injection outer mold means enclosing an injection mold cavity for defining the outer surface of said closure device, providing substantially cylindrical hollow outer core means extending into said injection mold cavity and defining said annular cavity in said closure device including the inner surface of said cylindrical collar and the outer surface of said plug portion, providing substantially cylindrical inner core means extending into said injection mold cavity and defining an inner cylindrical cavity in said hollow cylindrical plug portion, providing stripper means for separating the molded closure device from the mold's outer core means, injecting moldable material into said injection mold cavity, providing pushing means for separating said molded closure device from said inner core, removing said outer mold means that define the outer surfaces of said closure device, advancing said stripper means so it engages said annular shoulder on said closure device's collar and pushes against it until the molded closure device is separated from said outer core and pushing said molded closure device forward until said device is free from the mold's inner core, said pushing to occur after the mold means that define the outer surfaces of the closure device are removed, but before the stripper means are advanced so as to engage the annular shoulder on the closure device's collar.

5,114,656
METHOD OF FORMING PACKAGING MATERIAL

Robert A. Dionne, deceased, late of Martinsville, Va., by Pauline E. Dionne, administratix, 1620 Meadowview La., Martinsville, Va. 24112

Continuation of Ser. No. 60,257, Jul. 17, 1987, abandoned. This application Apr. 18, 1990, Ser. No. 512,532
Int. Cl.[5] B29C *67/20*
U.S. Cl. 264—321 **10 Claims**

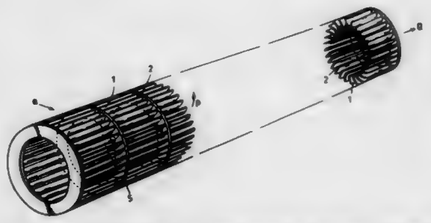


1. A method of increasing the density of molded expanded polystyrene packaging material which has been molded to produce a compressed molded material having improved cushioning characteristics and resiliency than that of the uncompressed molded material, said method comprising the steps of compressing the molded material from a thickness of about 2 inches at least on the order of 1 minute to have a deflection of at least on the order of 50%; and the step of releasing the compressed molded material, said method producing a compressed molded material having at least 90% recovery at an impact of greater than about 50% deflection.

5,114,657
INTEGRALLY MOLDED CROSS-FLOW FAN AND METHOD OF MAKING THE SAME BY RADIALLY WITHDRAWING GAP-FORMING MOLDS

Yukio Miyajima, Mitsuke, Japan, assignor to Sanko Plastics Co., Ltd., Niigata, Japan

Filed Mar. 19, 1990, Ser. No. 495,189
Claims priority, application Japan, Mar. 20, 1989, 1-68951; Dec. 6, 1989, 1-141220[U]; Dec. 6, 1989, 1-317360
Int. Cl.[5] B29C *39/00*
U.S. Cl. 264—334 **2 Claims**



1. A method of molding a cross-flow fan having a circular array of angularly spaced, radial vanes, comprising the steps of:
arranging a first group of a plurality of gap-forming molds angularly spaced from one another in an annular manner;
arranging a second group of a plurality of gap-forming molds angularly spaced from one another in an annular manner, said plurality of molds of said first group being individually alternatingly disposed with respect to said plurality of molds of said second group of having gaps therebetween so as to jointly define mold cavities for forming the vanes;
supplying a molding material into said mold cavities to mold the cross-flow fan; and
thereafter withdrawing said first group of gap-forming molds radially outwardly from between the molded vanes, and after elapse of a period of time, withdrawing said

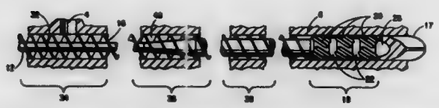
second group of gap-forming molds, which alternate with the gap-forming molds of the first group, radially outwardly from between the molded vanes.

5,114,658

ONE STEP PREPARATION AND FABRICATION OF PARTIALLY GRAFTED FLEXIBLE THERMOPLASTIC COMPOSITIONS

James D. Katsaros, Beaumont, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 15, 1990, Ser. No. 613,598
Int. Cl.[5] B29C *45/50, 45/60, 49/04, 49/06*
U.S. Cl. 264—537 **13 Claims**



1. In a process for fabricating shaped articles of a composition of (a) 25–50 volume percent thermoplastic resin, (b) 10–74 volume percent acid containing ethylene copolymer and (c) 1–50 volume percent polymeric grafting agent, containing 0.5–15.0 weight percent of monomers containing reactive groups based on component (c) only, wherein the quantity of reactive groups provided to the molten composition by the polymeric grafting agent expressed as millimoles of reactive groups per 100 grams of component (b) plus component (c) is between 1 and 35 when component (a) is non-reactive, and from 1 to 10 when component (a) is reactive, and further wherein the above volume percentages for the components (a), (b) and (c) are based on the total of component (a), component (b) and component (c) only and are calculated from the densities of the individual components prior to mixing, the process including bringing molten components (a), (b) and (c) together under sufficient shear to cause at least the components (b) and (c) to react with each other to in turn cause the component (a) to form a continuous phase, the improvement comprising the steps of

(1) bringing the molten components together for the first time in the screw of an injection mold or blow mold;
(2) subjecting the molten components to the sufficient shear on an intermittent basis; and
(3) intermittently fabricating in one-step the sheared molten composition to articles of pre-determined shape.

5,114,659

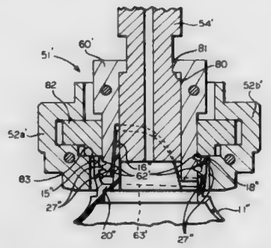
BLOW MOLDING METHOD FOR FORMING A ONE-PIECE SELF-DRAINING CONTAINER

Thomas J. Krall, Toledo, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 314,312, Feb. 22, 1989, abandoned, which is a continuation of Ser. No. 160,478, Feb. 25, 1988, abandoned. This application Jun. 5, 1990, Ser. No. 533,632
Int. Cl.[5] B29C *49/04, 49/54*
U.S. Cl. 264—539 **11 Claims**

1. The process of forming a one-piece self-draining plastic container comprising the steps of,

(a) providing a cavity in an injection mold defining
(i) a spout forming portion,
(ii) a cylindrical wall forming portion having an outer surface and an inner surface including a thread forming projection extending around the inner surface of said cylindrical wall forming portion for at least two complete turns
(iii) a web forming portion interconnecting the spout forming portion and cylindrical wall forming portion, each of said portions opening to the exterior of said mold;
(b) imparting relative movement between an extrusion die head for extruding heated and plasticized plastic material and said injection mold to engage said injection mold and said die head to close said cavity;
(c) injecting plastic material from said die head into said cavity to fill said cavity to form a pouring spout, cylindrical wall and integral web interconnecting said spout and said cylindrical wall with a thread integral with and extending at least two complete turns around on the inner surface of said cylindrical wall;
(d) imparting relative movement between said die head and said injection mold while extruding plastic material in the form of tubing from said die head, said tubing having a diameter at least equal to the diameter of said cylindrical wall;



(e) closing mold halves about the extruded tubing;
(f) expanding the tubing to form a self-draining plastic container having a closed bottom and said integral pouring spout, web and cylindrical wall; and,
(g) opening said mold halves and moving said pouring spout, cylindrical wall and integral web axially relative to said spout forming portion and said cylindrical wall forming portion to strip said pouring spout, cylindrical wall and web from said cavity and said thread from said thread forming projection, said thread being stretched as it is stripped from said thread forming projection such that the final thread is not distorted.

5,114,660

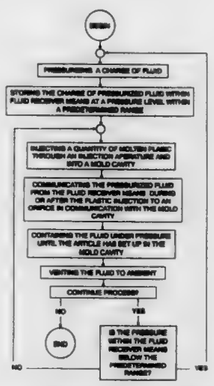
METHOD OF INJECTING MOLDING

James W. Hendry, Brooksville, Fla., assignor to Milad Limited Partnership, Naples, Fla.

Filed Jul. 16, 1990, Ser. No. 552,909
The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.
Int. Cl.[5] B29C *45/00;* **B29D** *22/00*
U.S. Cl. 264—572 **5 Claims**

1. A method for the injection molding of plastic articles in an injection molding system including a resin injection nozzle and a mold having an injection aperture and a mold cavity for receiving molten resin from the nozzle, the method comprising the steps of:

(a) pressurizing a charge of fluid;
(b) storing the charge of pressurized fluid within a fluid receiver means at a pressure level within a predetermined range of pressures;
(c) injecting a quantity of molten plastic from the injection nozzle through the injection aperture and into the mold cavity;
(d) communicating the pressurized fluid from the fluid receiver means to an orifice in communication with the mold cavity simultaneously with or after the step of injecting;
(e) containing the fluid under pressure within the mold until the article is set up in the mold cavity thereby completing the formation of the plastic article;
(f) venting the fluid from the mold;
(g) repeating steps (c) through (f) until the pressure within the fluid receiver means falls below the range of pressures; and
(h) repeating steps (a) and (b) as soon as the pressure within the fluid receiver falls below the range of pressures in



preparation for molding another article wherein the method further comprises the step of reducing the pressure of the fluid from the fluid receiver means to an acceptable level for molding the articles during step (d).

5,114,661

SOLID STATE LASER MEDIA DRIVEN BY REMOTE NUCLEAR POWERED FLUORESCENCE

Mark A. Prelas, Columbia, Mo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 16, 1991, Ser. No. 641,831
Int. Cl.[5] H01S *3/09*
U.S. Cl. 376—146 **5 Claims**

1. An apparatus for driving solid state laser media by a remote nuclear-powered source comprising:

a) a nuclear reaction chamber producing diffuse fluorescence in the visible to infrared range, the reaction chamber including an aperture containing a lens capable of collecting the diffuse fluorescence from the reaction chamber, and further wherein the reaction chamber has an interior surface coated with material which is reflective and transmissive to visible to near infrared light such that the diffuse fluorescence collected in the reaction chamber by the lens is in the absorption bands of the remote solid state laser;
b) channeling means for channeling the fluorescence from the reaction chamber to the remote laser; the channeling means including a waveguide adjacent to the lens for channeling the collected fluorescence from the lens to the remotely located laser and,
c) coupling means for coupling the fluorescence to the laser such that the fluorescence is absorbed into the laser and pumps the laser.

5,114,662

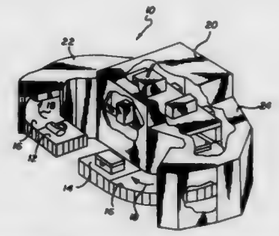
EXPLOSIVE DETECTION SYSTEM

Tsahi Gozani, Palo Alto, and Patrick M. Shea, Sunnyvale, both of Calif., assignors to Science Applications International Corporation, San Diego, Calif.

Division of Ser. No. 321,511, Mar. 9, 1989, Pat. No. 5,006,299, which is a continuation of Ser. No. 53,950, May 26, 1987, abandoned. This application Dec. 14, 1990, Ser. No. 627,702
Int. Cl.[5] G21G *1/06*
U.S. Cl. 376—159 **15 Claims**

1. A method of producing a three dimensional profile of the concentration of a particular element in a particular object, including the following steps:

providing a cavity structure for receiving the particular object,
providing a source for producing thermal neutrons,
directing the thermal neutrons within the cavity structure to the object to interact with the particular element in the object to form gamma rays of a particular energy,
providing a plurality of detectors around the periphery of the cavity structure in a common plane with the thermal neutron source in the cavity structure and in a C-shaped ring configuration and in a closed loop with the thermal



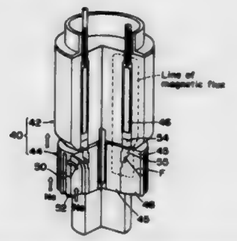
neutron source to detect the concentration of the particular element within the common plane, operating each of the detectors in said plurality of detectors independently of one another,
moving the object through the cavity structure in a direction transverse to the common plane to obtain the detection by the detectors of the presence of the particular element in successive planes of the object parallel to the common plane, processing the detections by the detectors of the particular element in the successive planes of the object parallel to the common plane to obtain the three dimensional profile of the concentration of the particular element within the object.

5,114,663

ELECTROMAGNET FOR NUCLEAR REACTOR SHUTDOWN SYSTEM

Makoto Saito, and Minoru Gunji, both of Mito, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Aug. 5, 1991, Ser. No. 740,616
Claims priority, application Japan, Aug. 16, 1990, 2-216332
Int. Cl.[5] G21C *9/02*
U.S. Cl. 376—233 **2 Claims**



1. An electromagnet for a nuclear reactor shutdown system having an upper iron core and a lower iron core disposed in an axially symmetrical arrangement and capable of latching with and delatching from each other, and a coil wound around said upper iron core, said lower iron core being provided at an outer circumferential portion thereof with a plurality of slits to form a plurality of fins between said slits, a part of said lower iron core being composed of a temperature sensitive magnetic material having a Curie-point lower than that of a material of

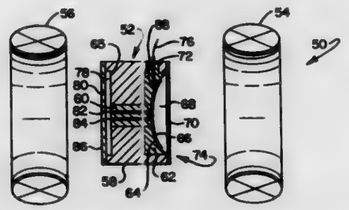
said iron cores, said upper and lower iron cores being delatched from each other when an ambient temperature increases so as to separate a control rod connected to said lower iron core, characterized in that said temperature sensitive magnetic material is disposed in the outer circumferential lower corner portion of said lower iron core, with the upper surface of the temperature sensitive magnet material taking the form of an outer side surface of a cone whose central axis is coincident with said symmetry axis and whose apex angle lies in the range of 60° to 120° with the lower surface of the iron core material taking the form of an inner surface of a cone and interfacing with said upper surface of said temperature sensitive magnet material.

5,114,664

METHOD FOR IN SITU EVALUATION OF CAPACITIVE TYPE PRESSURE TRANSDUCERS IN A NUCLEAR POWER PLANT

James H. Terhune, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed May 6, 1991, Ser. No. 695,840
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—245 **9 Claims**



8. In a nuclear power generating facility having at least one pressure responsive transducer immersed in a process fluid, the method for evaluating the performance of said pressure responsive transducer having a surface movable with pressure induced volume variations of a contained dielectric fluid and deriving an output signal in correspondence with the deflection of said surface, comprising the steps of:

generating a time varying magnetic field from a location effecting a field induced deflection of said surface;

monitoring said output signal for a time varying signal component;

determining a predetermined frequency component of a detected said time varying signal component;

storing said predetermined frequency component;

comparing said predetermined frequency component with a previously derived frequency component of a previous field induced deflection to determine the presence of a frequency shift; and

correlating said frequency shift with said deflection of said surface.

5,114,665

AUTONORMALIZING REACTIMETER

Russell M. Ball, Lynchburg, and John J. Madaras, Forest, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 25, 1990, Ser. No. 557,892
Int. Cl.[5] G21C *17/104*
U.S. Cl. 376—255 **4 Claims**

1. A method for measuring reactivity of a nuclear reactor which smoothly and continuously compensates for range changes, comprising:

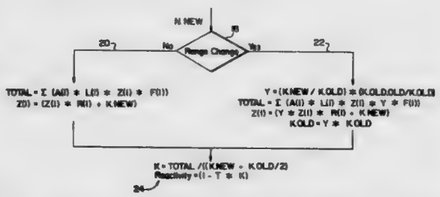
detecting fission products from the nuclear reactor to form a detection signal;

amplifying the detection signal in a linear amplifier having a plurality of ranges for amplifying detection signals of different amplitudes, to generate an analog signal;

sampling the analog signal at a selected sample interval (T) to form a digital signal (N.NEW) having a current sample history (K.NEW);

storing a first most recent sample history (K.OLD) and a second most recent sample history (K.OLD.OLD);

determining whether a range change has occurred during amplifying of the detection signal, between the current sample history (K.NEW) and the first most recent sample history (K.OLD), and establishing a first signal indicative of no range change or in the alternative a second signal indicative of a range change; and



calculating reactivity, in accordance with the first or second signals, the first signal calculating reactivity as a function of the current (K.NEW) and first most recent sample history (K.OLD)

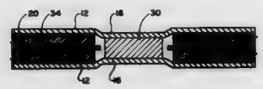
the second signal calculating reactivity as a function of the current sample history (K.NEW) and the first most recent sample history (K.OLD) times a normalization factor (Y) which is equal to the product of the current sample history (K.NEW) divided by the first most recent sample history (K.OLD), times the second most recent sample history (K.OLD.OLD) divided by the first most recent sample history (K.OLD) for avoiding inaccuracies in measuring reactivity.

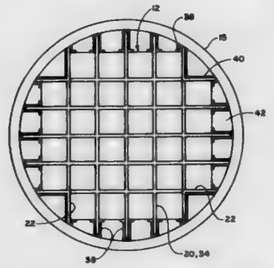
5,114,666

CASK BASKET CONSTRUCTION FOR HEAT-PRODUCING RADIOACTIVE MATERIAL

Frederick J. Ellingson, Murrysville, and P. Kent Shaver, Valencia, both of Pa., assignors to U.S. Tool & Die, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 405,475, Sep. 11, 1989, abandoned. This application Jan. 16, 1991, Ser. No. 642,184
Int. Cl.[5] G21F *5/00*
U.S. Cl. 376—272 **12 Claims**





1. Apparatus for storing heat-producing radioactive material to allow transport thereof, said apparatus including:

a cask basket comprising a plurality of individual storage cells interconnecting one with the another by spacers at spaced apart sites along each cell to form a unitary array of storage cells for supporting said radioactive material in selected ones of said storage cells, said spacers maintaining adjacent ones of said storage cells at predetermined spacings from one another;

a heat dissipating sheets at opposite sides of a nuclear poison sheet to define a total composite thickness of the sandwiched sheets such that the sandwiched sheets fit within said predetermined spacings to thereby become structural component of said array, said heat dissipating sheets transferring heat produced by said radioactive material when stored in a cell away from the storage cells of the array, and

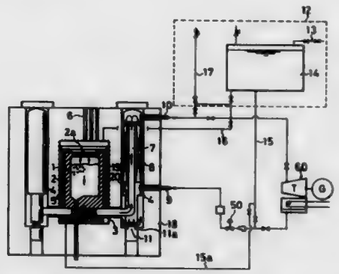
means for enclosing said array.

5,114,667

HIGH TEMPERATURE REACTOR HAVING AN IMPROVED FLUID COOLANT CIRCULATION SYSTEM

Takao Hayashi, Tokyo, and Yasuo Osawa, Kure, both of Japan, assignors to The Japan Atomic Power Company and Babcock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 24, 1991, Ser. No. 645,250
Claims priority, application Japan, Jan. 26, 1990, 2-16366
Int. Cl.[5] G21C *15/18*
U.S. Cl. 376—299 **7 Claims**



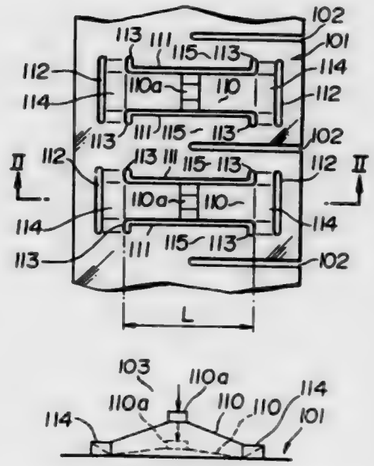
1. A high temperature reactor having a downflow-type nuclear reactor, comprising: a top gas inlet flow path provided at a top portion of the nuclear reactor; a gas outlet flow path provided at a bottom portion of the nuclear reactor in communication with said top gas inlet flow path; a plurality of steam generators provided around the nuclear reactor; a heat insulation tube provided vertically from the bottom portion of said nuclear reactor to a level higher than the top gas inlet flow path of said nuclear reactor, said steam generators each having a gas-descending flow path formed around the heat insulation tube; means for flowing a gas coolant from said top gas inlet flow path to said bottom gas outlet to thereby cool said nuclear reactor by absorption of heat therefrom into said gas coolant; means for flowing the thus-heated gas coolant from said bottom gas outlet flow path into said heat insulation tube; means for flowing said heated gas coolant up through said heat insulation tube, without substantially cooling said heated gas coolant during said upward flow, to said level higher than said top gas inlet flow path; means for flowing said heated gas coolant from said heat insulation tube down through said gas descending flow path and through a heat exchanger contained therein to thereby cool said heated gas coolant; and gas circulator means for recirculating said cooled gas coolant from said heat exchanger to said top gas inlet flow path.

5,114,668

GRID IN A NUCLEAR FUEL ASSEMBLY

Junichi Oyama; Kazuichi Suzuki; Akihiro Kato, all of Ibaraki; Hitoshi Inada, Kobe; Masaji Mori, Kobe; Hiromasa Miyai, Kobe, and Toshiyuki Kawagoe, Tokyo, all of Japan, assignors to Mitsubishi Nuclear Fuel Co., Tokyo, Japan

Filed Jan. 23, 1990, Ser. No. 469,014
Claims priority, application Japan, Jan. 25, 1989, 1-15986
Int. Cl.[5] G21C *3/34*
U.S. Cl. 376—442 **9 Claims**



1. A grid in a nuclear fuel assembly for supporting a plurality of fuel rods, comprising:

a plurality of elongated straps intersecting with each other to define a plurality of grid cells each having a peripheral wall, the peripheral walls of said grid cells having a plurality of pairs of punched sections formed therein such that each pair of punched sections are disposed in spaced relation to each other;

a plurality of elongated spring means each formed in the peripheral wall of said grid cell, the spring means being formed such that a portion of the peripheral wall of the grid cell between the pair of punched sections bulges and projects into the grid cell, the spring means being capable of being deflected toward the peripheral wall of the grid cell;

a plurality of pairs of projections associated respectively with said plurality of elongated spring means, each pair of projections being formed on the peripheral wall of said grid cell at both longitudinal ends of a corresponding one of said plurality of elongated spring means such that a pair of portions of the peripheral wall of the grid cell bulge, which pair of portions are located respectively at the both longitudinal ends of the spring means, the both longitudinal ends of the spring means being connected respectively to the pair of projections; and

a plurality of pairs of ribs associated respectively with said grid cells such that each pair of said plurality of ribs are formed respectively at both lateral sides of a corresponding one of said plurality of elongated spring means, the pair of ribs projecting respectively into a corresponding pair of said plurality of pairs of punched sections, and the pair of ribs extending between both longitudinal ends of the spring means.

5,114,669

FERROMAGNETIC MATERIALS

Brian Cockayne; William R. MacEwan, both of Worcestershire; Ivor R. Harris, Birmingham, and Nigel A. Smith, West Midlands, all of United Kingdom, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Whitehall, England

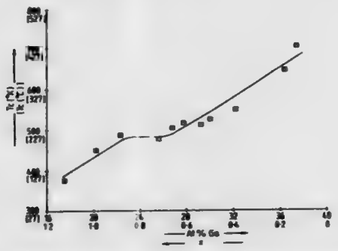
PCT No. PCT/GB89/00381, § 371 Date Dec. 13, 1990, § 102(e) Date Dec. 13, 1990, PCT Pub. No. WO89/10620, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 14, 1989, Ser. No. 623,981

Claims priority, application United Kingdom, Apr. 28, 1988, 8810125

Int. Cl.[5] C22C *38/00*

U.S. Cl. 420—8 **15 Claims**



1. A ferromagnetic material having the formula $MG_{2-x}Ga_x$ comprising Ga and As and the balance, apart from impurities, of M; where x has the range of $0.15 \leqq x \leqq 0.85$ and where M represents Fe3.

5,114,670

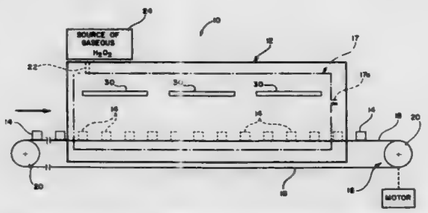
PROCESS FOR STERILIZING SURFACES

Craig L. Duffey, Galena, Ohio, assignor to Liqui-Box/B-Bar-B Corporation, Worthington, Ohio

Filed Aug. 30, 1990, Ser. No. 575,361

Int. Cl.[5] A61L *2/18*

U.S. Cl. 422—24 **6 Claims**



1. A process for sterilizing a surface of an article comprising the steps of:

providing a sterilization chamber to sterilize at least a surface of an article;

introducing a gaseous hydrogen peroxide sterilant into the sterilization chamber substantially free of hydrogen peroxide in liquid phase;

irradiating the sterilant surface of the article in the sterilization chamber with ultraviolet radiation in an amount to achieve sterilization of the surface; and

said irradiating step occurs simultaneously with the gaseous hydrogen peroxide being in said sterilization chamber.

5,114,671

METHOD FOR STERILIZING A MOVING MATERIAL WEB

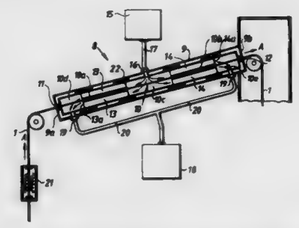
Pär Olanders, Lund, Sweden, assignor to Roby Teknik AB, Lund, Sweden

Division of Ser. No. 250,269, Sep. 28, 1988, Pat. No. 5,011,664. This application Jul. 18, 1990, Ser. No. 553,586

Claims priority, application Sweden, Oct. 9, 1987, 8703903

Int. Cl.[5] A61L *2/00*; B65B *55/04*

U.S. Cl. 422—28 **12 Claims**



11. A method of fabricating aseptic packages, comprising the steps of:

heating a material web to a temperature greater than a predetermined temperature;

advancing the material web continuously through a sterilization chamber having a web inlet opening and a web outlet opening, said web extending between said web inlet opening and said web outlet opening;

introducing a sterilizing gas through an inlet port intermediate said web inlet opening and said web outlet opening, said sterilizing gas having a dew point that is equal to said predetermined temperature;

withdrawing the sterilizing gas from said sterilization chamber through web outlet ports adjacent the respective web inlet and outlet openings, thereby inducing flow of the sterilizing gas through said chamber longitudinally of the advancing web;

constricting the flow of the sterilizing gas to a passage overlying and exposed to opposite surfaces of the material web as the sterilizing gas flows from said inlet port to the respective outlet ports, whereby the sterilizing gas contacts and is substantially uniformly distributed over the whole width of the material web so that effective sterilization of the entire material web takes place as a result of the contact of said sterilizing gas with said material web as the web advances through the sterilization chamber; and

converting the sterilized web material to individual aseptic packages.

5,114,672

METHOD FOR PRESERVING BLOOD FLUID

Hermann Knippscheer, Baldwin, N.Y., and Daniel D. Richard, Sedona, Ariz., assignors to Cryo-Cell International, Inc., Baldwin, N.Y.

Filed Aug. 27, 1990, Ser. No. 573,646

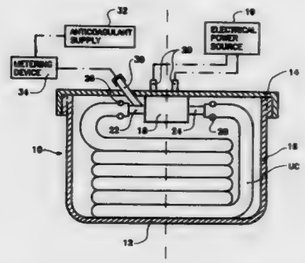
Int. Cl.[5] A01N *1/02*

U.S. Cl. 122—41 **20 Claims**

1. A method for treating fluid including blood, comprising the steps of:

providing an umbilical cord closed at opposite ends and containing a blood fluid to be treated;

adding through said umbilical cord an additive to said blood fluid in said umbilical cord; and



moving said blood fluid in said umbilical cord to distribute said additive throughout said blood fluid in said umbilical cord.

5,114,673

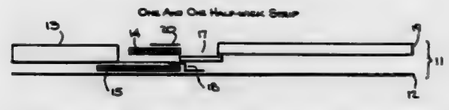
APPARATUS FOR DETERMINATION OF A COMPONENT IN A SAMPLE

Johann Berger; Fern DeLaCroix; Harvey Buck, and Juergen Schrenk, all of Indianapolis, Ind., assignors to Boehringer Mannheim Corporaton, Indianapolis, Ind.

Division of Ser. No. 146,574, Jan. 21, 1988, Pat. No. 4,891,313. This application Sep. 12, 1989, Ser. No. 406,918

Int. Cl.[5] G01N *21/00, 31/22*

U.S. Cl. 422—56 **12 Claims**



1. Apparatus for determining an analyte in a fluid sample, comprising:

(a) a first zone containing one component selected from the group consisting of (i) labeled analyte, (ii) labeled analyte analogue, and (iii) labeled receptor which specifically binds to said analyte, wherein said component dissolves in said fluid sample, and wherein if said component is labeled receptor, binds with said analyte to form a complex of analyte and labeled receptor,

(b) a second zone which is in fluid contact with said first zone and which receives fluid sample after passing through said first zone, wherein said second zone contains a solid phase bound receptor which binds to the component previously in said first zone, with the proviso that said solid phase bound receptor does not bind to complexes of analyte and labeled receptor,

(c) a third zone separated from said second zone by a means capable of being rendered fluid permeable, and containing a reactive compound which reacts with the label of said labeled analyte, labeled analyte analogue or labeled receptor when contacted thereto to form a detectable moiety, wherein said means (i) prevents passage of said reactive component into said second zone until completion of binding of said solid phase bound receptor to the component released from said first zone and (ii) permits passage of the component into said second zone thereafter wherein said third zone is positioned relative to said second zone to permit movement of said reactive component into said second zone when said means are rendered fluid permeable, and

(d) a fourth zone in fluid contact with said second zone which removes excess fluid flowing from said second zone.

5,114,674

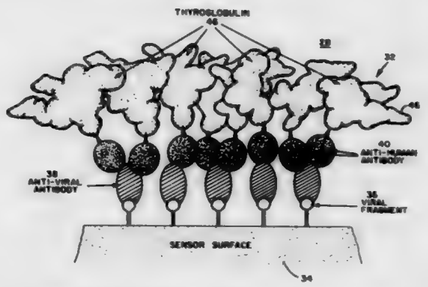
ADDED ARRAY OF MOLECULAR CHAINS FOR INTERFERING WITH ELECTRICAL FIELDS

William D. Stanbro, Columbia; Kenneth W. Hunter, Jr., Potomac, and Arnold L. Newman, Kensington, all of Md., assignors to Biotronic Systems Corporation, Rockville, Md.

Filed May 1, 1987, Ser. No. 44,767

Int. Cl.[5] G01N *27/02, 33/345*

U.S. Cl. 422—57 **29 Claims**



1. An apparatus for detecting an analyte comprising:

a means for generating an electrical field;

a means for interfering with the electrical field comprising a biochemically active layer to which an analyte binds and which is adjacent the means for generating the electrical field; and

a means for enhancing interference with the electrical field according to a concentration of the analyte, and comprising a molecular chain which binds to and extends from the analyte.

5,114,675

HF ALKYLATION UNIT WITH ADDITIVE DISPENSER

Saverio G. Greco, Princeton Junction, and Costandi A. Audeh, Princeton, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 229,669, Aug. 8, 1988, Pat. No. 4,938,935. This application Mar. 7, 1990, Ser. No. 489,986

Int. Cl.[5] G05B *9/05*

U.S. Cl. 422—62 **7 Claims**

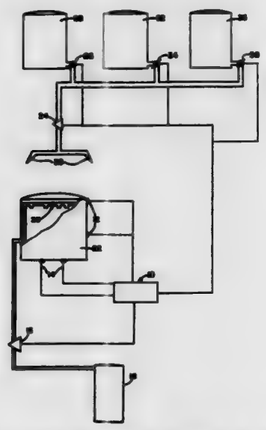
1. In an HF alkylation unit which comprises (i) a reaction section including an alkylation reactor in which an iso-paraffin is reacted with an olefin in the presence of HF as an alkylation catalyst to form an alkylate product, an acid settler in which the HF is separated from hydrocarbons including unreacted iso-paraffin and alkylate product, and (ii) a product recovery and fractionation section in which alkylate product from the reaction section is separated and recovered, the improvement comprising

means for detecting a hydrofluoric acid leak forming a vaporous cloud from the alkylation unit;

a container having a proton acceptor to be mixed with the HF acid in the unit to modify the properties of the acid to render droplets of the acid more susceptible to water drench,

means responsive to the means for detecting the hydrofluoric acid leak, for selectively releasing the proton acceptor into the reaction section of the unit in the event of a

detected release of acid from the unit, to mix the proton acceptor with the HF acid in the unit to modify the properties of the acid and render droplets of the acid more susceptible to water drench.

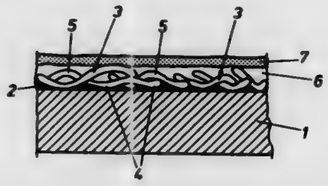


5,114,676

OPTICAL SENSOR FOR DETERMINING AT LEAST ONE PARAMETER IN A LIQUID OR GASEOUS SAMPLE

Marco J. Leiner; Leonie Weiss, and Otto S. Wolfbeis, all of Graz, Austria, assignors to AVL AG, Schaffhausen, Switzerland

Filed Jul. 28, 1989, Ser. No. 386,151
Claims priority, application Austria, Aug. 4, 1988, 1974/88
Int. Cl.[5] G01N *21/00*; C12M *1/40, 1/34*; G02B *6/02*
U.S. Cl. 422—82.06 **13 Claims**



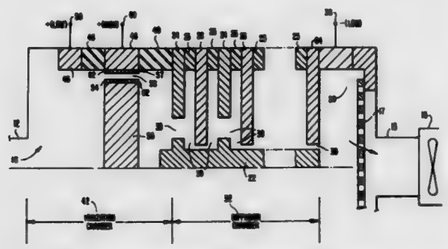
1. An optical thin-film sensor for determining at least one parameter in a liquid or gaseous sample, comprising:
- a polymer support film which is transparent to both excitation and emission radiation;
- a thin, transparent layer of a thermoplastic material adhered to said polymer film;
- an optically transparent hydrogel layer which covers said thermoplastic layer; and
- carrier particles having a diameter and a thickness with a fluorescent indicator immobilized thereon, a first part of said carrier particles being bonded to said thermoplastic material, having thermosetting properties after said carrier particles have been pressed in, and a second part of said carrier particles extending into said optically transparent hydrogel layer, said hydrogel layer being mechanically anchored by said carrier particles.

5,114,677

GAS DETECTION APPARATUS AND RELATED METHOD

Michael F. Steele, Fountain Valley, Calif.; John E. Lambright, South Daytona, and George M. Dobson, Deland, both of Fla., assignors to Brunswick Corporation, Skokie, Ill.

Filed Apr. 3, 1989, Ser. No. 332,129
Int. Cl.[5] G01N *27/62, 27/64, 27/66*
U.S. Cl. 422—83 **8 Claims**



1. A gas detection apparatus, comprising:
- a housing including an ionization chamber, a diffusion chamber, and a collection chamber in flow communication with each other;
- means for conducting an air stream through said chambers at a constant rate along a flowpath;
- radiation means including a radioactive material mounted in said ionization chamber for generating reactant ions of first and second respective charge types and product ions of said first and second respective charge types;
- means for generating an electrostatic field for increasing the velocity of the reactant ions of said first charge type while decreasing the velocity of reactant ions of said second charge type, said means including a plurality of axially spaced electrically conductive members for connection to respective different voltage potentials mounted in said ionization chamber, said radioactive material being disposed on a surface of at least one of said plurality of axially spaced members;
- baffle means mounted in said diffusion chamber for causing said air stream from the ionization chamber to follow a labyrinthine path for neutralizing ions having a mobility greater than a predetermined amount; and
- circuit means responsive to the presence of product ions of said second charge type in said collection chamber for completing an electrical circuit.

5,114,678

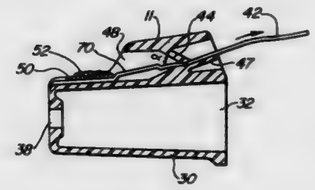
DEVICE FOR WIPING A REAGENT STRIP

Ferdon H. Crawford, Elkhart; Gabriel R. Shakour, South Bend; Robert C. Whitson, Osceola, and Ernest R. Wise, Elkhart, all of Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Mar. 21, 1990, Ser. No. 496,691
Int. Cl.[5] B01L *11/00*
U.S. Cl. 422—99 **5 Claims**

1. A device for wiping excess fluid from a test strip, comprising:
- a housing having an aperture therethrough, said aperture being dimensioned to allow a test strip inserted therein to be pulled therethrough, and an opening in said housing for the application of fluid directly to the top surface of a test pad of said test strip;
- a wiping member extending into said aperture to contact the fluid on said test strip as said test strip passes beneath said wiping member, whereby said wiping member removes excess fluid from said test strip; and said housing further includes a ramp portion which guides said test strip beneath said wiping member, said ramp portion extending upwardly in said housing from a horizontal plane;

wherein said wiping member includes a leading edge and a trailing edge, and wherein said wiping member is angled with respect to the direction of the motion of said test strip



to wipe the fluid from the test strip as the test strip passes beneath said wiping member from the leading edge to said trailing edge.

5,114,679

METHOD OF USING A PIPETTE

Angela H. Reifler, Spencerport, and Norbert S. Norkus, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 27, 1990, Ser. No. 572,576
Int. Cl.[5] B01L *3/02*
U.S. Cl. 422—100 **4 Claims**

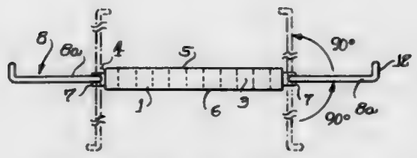
1. A method for withdrawing a fluid sample from a source fluid of comprising the steps of:
- providing a pipette which is initially configured in a folded U-shape and comprises a flexible and foldable tube portion having an aspirating end and a metering end, means for generating a change in pressure within said tube portion, and means for inhibiting air from aspirating into the metering end of said pipette upon a change in pressure within said tube portion;
- placing the aspirating end of the pipette in fluid communication with the source of fluid;
- engaging the inhibiting means to prevent air from aspirating into the metering end;
- establishing a negative pressure within said tube sufficient to allow a fluid sample to aspirate into the aspirating end of said tube portion while said inhibiting means are engaged;
- unfolding the pipette;
- inverting the pipette so that the metering end is at a lower elevation than the aspirating end; and
- releasing said inhibiting means to allow the fluid sample to be dispensed from the metering end thereof.

5,114,680

FLOATABLE LABORATORY TUBE HOLDER

Patrice S. Obermiller, San Diego, and Kirsten K. Blumeyer, Encinitas, both of Calif., assignors to La Jolla Biological Laboratories, San Diego, Calif.

Filed Oct. 2, 1989, Ser. No. 416,045
Int. Cl.[5] B01L *9/06*
U.S. Cl. 422—104 **9 Claims**



1. A floatable laboratory tube holder, comprising:
- (a) a block of material of a density floatable in water, having a base planar surface, a top planar surface, a pair of oppositely positioned side walls, a pair of oppositely positioned end walls, and having means defining a plurality of openings extending through both said top and base planar surfaces of said block for receiving laboratory tubes;
- (b) a pair of end members for supporting said block rotatably attached to opposing ends of said block wherein said end members may extend in a 180 degree rotation around the plane of said block;

said pair of end members each comprising two parallel arms, each arm being rotatably connected to said block at one end and said pair of parallel arms being interconnected by a cross arm at the ends opposite from which they are rotatably connected;
- (c) a pair of oppositely positioned support members secured to, and extending partially along, said pair of end walls, or said pair of side walls of said block,

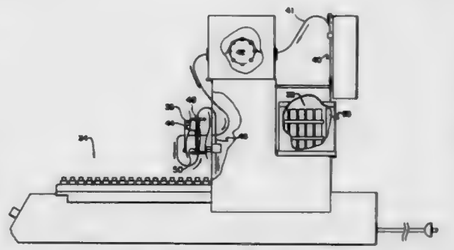
said pair of support members each having a position detent means comprising three indentations on opposite ends of each support member arranged in 90 degree angles relative to one another for receiving and retaining said pair of end members in an orientation either 90 degrees above the plane of said block, coplanar with said block, or 90 degrees below the plane of said block; and
- (d) an insert which is proportioned to be positioned along said top planar surface of said block of said holder between said pair of end members extended 90 degrees above the plane of said block.

5,114,681

SUPERFUSION APPARATUS

Joseph Bertoncini, Gaithersburg; Calvin Kroener; Wayne Cobb, both of Silver Spring, and Robert Evans, Damascus, all of Md., assignors to Biomedical Research And Development Laboratories, Inc., Gaithersburg, Md.

Filed Mar. 9, 1990, Ser. No. 491,717
Int. Cl.[5] C12M *1/00, 1/34, 1/02, 1/04*
U.S. Cl. 422—111 **20 Claims**



17. A superfusion device for treating biological samples comprising:
- (a) a housing having means for controlling the temperature of said housing;
- (b) a plurality of openings, in said housing;
- (c) a plurality of substantially hollow reaction chambers having ends and an outside configuration suitable for fitting inside said plurality of openings in said housing;
- (d) a plurality of reaction chamber plugs each having a first end and a second end and a passage connecting said first end with said second end and means for electrical stimulation disposed in said first end; and
- (e) a peristaltic pump for pumping fluids through said passage in said plurality of reaction chamber plugs and said plurality of substantially hollow reaction chambers.

5,114,682

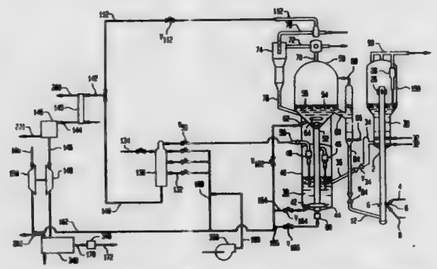
APPARATUS FOR RECOVERING HEAT ENERGY FROM CATALYST REGENERATOR FLUE GASES

Alan R. Goelzer, Atkinson, N.H., assignor to Stone & Webster Engineering Corporation, Boston, Mass.

Continuation of Ser. No. 472,895, Jan. 31, 1990, Pat. No. 4,904,372, which is a division of Ser. No. 273,266, Nov. 18, 1988, abandoned. This application Jan. 31, 1991, Ser. No. 648,584

Int. Cl.[5] B01J *8/28*

U.S. Cl. 422—142 **1 Claim**



1. An apparatus for use in a fluidized catalytic cracking-regeneration process for catalytically cracking heavy hydrocarbon feedstocks comprising:

(a) a reactor defined by a riser conduit for containing fluidized finely-divided catalyst particles for contacting hydrocarbon feedstocks therewith to produce cracked conversion products nd fouled catalyst particles having hydrocarbonaceous deposits thereon;

(b) separator means in flow communication with the riser reactor for receiving the fouled catalyst particles therefrom and separating vaporous hydrocarbon products from the fouled particles;

(c) a first fluidized catalyst regeneration vessel in flow communication along a fouled catalyst conduit with the separator means for receiving the fouled catalyst particles from the separator means and combusting substantially all the organic hydrogen associated with the hydrocarbonaceous deposits on the catalyst particles at temperatures of from about 1050° F. to about 1300° F. in the presence of an effective amount of oxygen-containing gas at pressures ranging from 20 to 40 psig, and producing a first regeneration flue gas having a carbon monoxide content of from about 2 to about 8 volume percent and partially regenerated catalyst, said first regeneration vessel also having an inlet for receiving the oxygen-containing gas required therein for fluidizing and combustion;

(d) CO-combustion/incinerator means in flow communication along a first regeneration flue gas conduit with the first regeneration vessel for receiving the first regeneration flue gas and combusting said flue gas in the presence of an effective amount of oxygen-containing gas at temperatures ranging from 1300° F. to 1900° F., and producing a CO-combustion effluent gas having a carbon monoxide content from about 0.02 to about 0.12 volume percent, said CO-combustion/incinerator means also having an inlet for receiving the oxygen-containing gas required therein for combustion;

(e) a second fluidized catalyst regeneration vessel in flow communication along a partially regenerated catalyst conduit with the first regeneration vessel for receiving the partially regenerated catalyst from the first regeneration vessel and combusting substantially all the carbonaceous deposits on the catalyst at temperatures ranging from 1300° F. to 1600° F., in the presence of an effective amount of oxygen-containing gas and producing a second regeneration flue gas having a carbon monoxide content of from 0.02 to 0.12 volume percent and fully regenerated catalyst having a carbon content of less than about 0.05 weight percent, said second regeneration vessel also having an outlet for passing the fully regenerated catalyst to the reactor riser for further contacting the hydrocarbon feedstocks, and an inlet for receiving oxygen-containing gas required therein for fluidizing and combustion;

(f) a flue gas conduit means in flow communication with both the CO-combustion/incinerator means and the second regeneration vessel for receiving and combining the respective effluents therefrom to form a flue gas combination stream of the CO-combustion/incinerator flue gas stream and the second regeneration flue gas stream;

(g) an expansion turbine-compressor means in flow communication with said flue gas combination conduit means for receiving the flue gas combination stream, and expanding the flue gas combination stream thereby compressing air supplied directly to the expansion-compressor means; and

(h) compressed air conduit means for passing the compressed air from the expansion-compressor means to the first regeneration vessel and second regeneration vessel to supply all the oxygen-containing gas required therein for fluidizing and combustion in the regeneration of catalyst therein, and also for passing the compressed air from the expansion-compressor means to the CO-combustion/incinerator means to supply at least a part of the oxygen-containing gas required therein for combustion.

5,114,683

THERMAL DECOMPOSITION TRAP

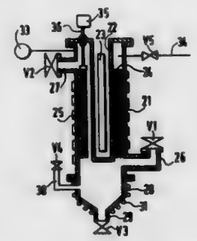
Ikuo Hirase, Toride, Japan, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed Feb. 9, 1990, Ser. No. 477,754

Claims priority, application European Pat. Off., Feb. 13, 1989, 89400388.8

Int. Cl.[5] F01N *3/10*

U.S. Cl. 422—173 **8 Claims**



1. A thermal decomposition trap comprising a trap main body having an inlet port for supplying a gas to be thermally decomposed and an outlet port for exhausting the gas, and heating means for heating the gas supplied in said trap main body, wherein an oil trap containing an oil and having an oil discharge port and a valve connected thereto is formed on a bottom portion of said trap main body; and

wherein a cooling means is located around said oil trap to prevent evaporation and decomposition of the oil.

5,114,684

IN-LINE ELECTROMAGNETIC ENERGY WAVE APPLICATOR

David R. Walker, Clearwater, Fla., assignor to SeraWaste Systems Corporation, Tampa, Fla.

Filed Dec. 13, 1990, Ser. No. 625,666

Int. Cl.[5] B01J *19/08*

U.S. Cl. 422—186 **74 Claims**

1. An apparatus for applying microwave energy to a product, comprising:

an electromagnetic energy generation unit for transmitting electromagnetic energy waves which disperse from a longitudinal axis from an entrance of the electromagnetic energy waves;

a first chamber with first interconnected walls forming an enclosure having an interior for receiving the electromagnetic energy waves and an exterior, the walls having a plurality of openings;

a second chamber formed by second interconnected walls surrounding the first chamber at a distance from the exterior of first chamber, the second chamber having a product inlet for receiving product and a product outlet for removing product passing through the second chamber from the product inlet to the product outlet; and

at least one electromagnetic energy diverter within the interior of the first chamber for diverting at least some of the electromagnetic energy waves dispersing from the longitudinal axis into the openings to irradiate product passing through the second chamber.



5,114,685

CATALYST RECOVERY TROUGH FOR UNLOADING MULTI-TUBE REACTORS WITH MAXIMUM DUST CONTAINMENT

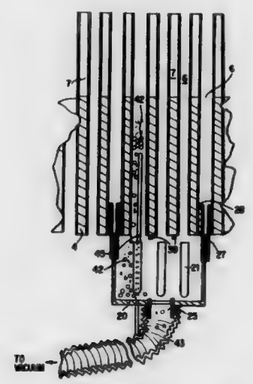
Paul C. Sapoff, Louisville, Ky., assignor to Catalyst Technology, Inc., Buckner, Ky.

Division of Ser. No. 430,128, Nov. 1, 1989, Pat. No. 4,994,241, which is a continuation of Ser. No. 772,139, Sep. 3, 1985, abandoned, which is a division of Ser. No. 514,287, Jul. 15, 1983, Pat. No. 4,820,496. This application Aug. 10, 1990, Ser. No. 565,232

The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.

Int. Cl.[5] B08B *9/06;* **B65G** *65/40*

U.S. Cl. 422—219 **14 Claims**



1. A catalyst recovery and dust control apparatus for application to a tube sheet of a tubular reactor, for unloading catalyst therefrom, comprising a receiving trough having an open top, side members and a bottom member, wherein said bottom member has at least one guide tube extending into said trough to a level adjacent to said open top for alignment with at least one tube of a tubular reactor, said guide tube being open at a lower end thereof to the exterior of the trough, means defining an opening in said trough for removal of catalyst particles and dust from said trough, and an outlet line for attachment to said opening, said outlet line comprising a vacuum line.

5,114,686

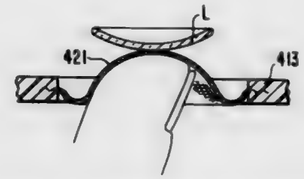
CONTACT LENS DISINFECTION UNIT WITH INVERTIBLE LENS HOLDING BASKETS

Peter J. Gillespie, Norcross, Ga., assignor to Ciba-Geigy Corporation, Hawthorne, N.Y.

Filed Mar. 16, 1989, Ser. No. 324,539

Int. Cl.[5] A61L *2/18*

U.S. Cl. 422—300 **27 Claims**



24. A lens holder for holding a contact lens for storage or for disinfection, comprising a lens basket which is flexibly invertible between a concave position in which it holds a lens positioned with the convex side against the lens basket and a convex position in which it pushes the lens out of the basket.

5,114,687

AMMONIA EXTRACTION OF GOLD AND SILVER FROM ORES AND OTHER MATERIALS

Kenneth N. Han, and Xinghui Meng, both of Rapid City, S. Dak., assignors to South Dakota School of Mines & Technology, Rapid City, S. Dak.

Filed Dec. 14, 1990, Ser. No. 627,502

Int. Cl.[5] C01G *3/14*

U.S. Cl. 423—32 **12 Claims**

1. A process for extracting elemental gold and elemental silver from gold-silver ores comprising the steps of:

I. Suspending the gold-silver ore in an aqueous leach solution of:

A. From about 2 to about 8 gram-moles per liter of ammonia; and,

B. Ammonium salts selected from the group consisting of ammonium sulfate, ammonium chloride, ammonium nitrate, and mixtures thereof; and

C. Oxidants;

thereby forming a suspension; and

II. charging the suspension to a reaction zone; and

III. heating the suspension in the reaction zone to a temperature of about 100° to 300° C. and a pressure of about 689.5 (100 psi) to 6895 kN/m^2 (1000 psi) thereby forming a leach solution containing gold-amine and silver-amine; and

IV. recovering the elemental gold and silver from the leach solution.

5,114,688

BINUCLEAR METAL MACROCYCLIC AND MACROBICYCLIC COMPLEXES FOR OXYGEN SEPARATION AND TRANSPORT

Arthur E. Martell, and Ramunas J. Motekaitis, both of College Station, Tex., assignors to L'Air Liquide, Societe Anonyme Pour l'Etude et Exploitation des Procedes Georges Claude, Paris, France

Filed Jan. 23, 1990, Ser. No. 468,938

Int. Cl.[5] C01B *13/00;* **C07F** *1/08, 13/00, 15/02*

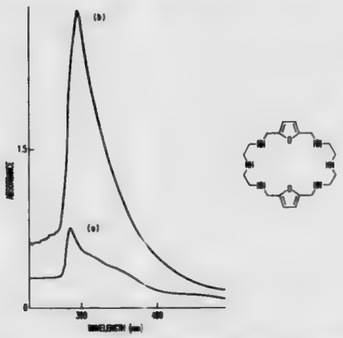
U.S. Cl. 423—219 **12 Claims**

1. A binuclear metal complex, comprising a metal-complexed ligand, which ligand is formed by the reaction of a dialdehyde and a bis-primary amine or a tris-primary amine,

which complex is capable of reacting reversibly with molecular oxygen.

6. A method of extracting oxygen from a gaseous mixture containing the same, which comprises:

a) contacting a binuclear metal complex, comprising a metal-complexed ligand, which ligand is formed by the reaction



of a dialdehyde and a bis-primary amine or a tris-primary amine, which complex reacts reversibly with molecular oxygen, with said gaseous mixture containing oxygen, to form a dioxygen adduct with said binuclear metal complex; and

b) inducing said dioxygen-binuclear metal adduct to release substantially pure oxygen therefrom.

5,114,689

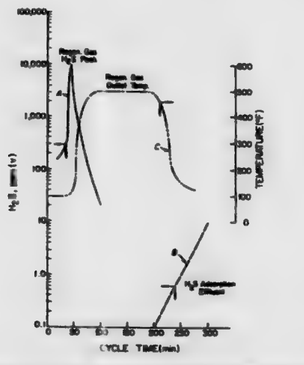
INTEGRATED PROCESS FOR THE REMOVAL OF SULFUR COMPOUNDS FROM FLUID STREAMS

Moez M. Nagji, Yonkers; Ervine S. Holmes, Yorktown Heights, both of N.Y., and Jenny L. Pai, Brookfield Center, Conn., assignors to UOP, Des Plaines, Ill.

Continuation of Ser. No. 175,331, Mar. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 104,099, Oct. 5, 1987, Pat. No. 4,830,733. This application Aug. 27, 1990, Ser. No. 574,565

Int. Cl.[5] C01B *17/16*

U.S. Cl. 423—230 **24 Claims**



1. In a process for the removal of sulfur compounds from a fluid stream feedstock containing not more than 100 ppmv of sulfur compounds wherein the fluid stream is passed at a temperature of from about 32° to about 700° F. and a pressure of from about 1 to about 4000 psi through an adsorption system for adsorbing sulfur compounds and regenerating a sulfur containing adsorbent by removal of sulfur compounds from said adsorbent, said adsorption system comprising at least one primary adsorber containing adsorbent selective for the adsorption of sulfur compounds to provide an adsorption effluent containing a reduced final concentration of sulfur compounds, the improvement which comprises:

(a) passing the fluid stream feedstock through the primary adsorber to provide an adsorption effluent having a reduced first concentration of sulfur compounds in the range of from 1 to about 10 ppmv, said first concentration of sulfur compounds being greater than said final concentration of sulfur compounds; and

(b) passing the adsorption effluent containing the said first concentration of sulfur compounds to a sorber containing a chemisorbent selective for the sorption of sulfur compounds in the adsorption effluent to provide a treated adsorption effluent containing the reduced final concentration of sulfur compounds.

5,114,690

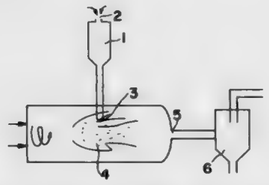
TWO STAGE SORPTION OF SULFUR COMPOUNDS

William E. Moore, Manassas, Va., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 8, 1991, Ser. No. 697,041

Int. Cl.[5] B01J *8/00;* **C01B** *17/00, 17/16;* **B01D** *47/00*

U.S. Cl. 423—244 **15 Claims**



1. A method for reducing the sulfur content of exhaust gases from the combustion of hydrocarbons, comprising:

rapidly heating an alkali- or alkaline-earth-based sorbent powder to a temperature near its vaporization point so that the sorbent becomes an activated sorbent comprising part vapor and part liquid;

injecting the activated sorbent into a sulfur-containing gas stream so as to form sulfur-containing sorbent; and

quenching and collecting the sulfur-containing sorbent.

5,114,691

PROCESS USING SORBENTS FOR THE REMOVAL OF SO_x FROM FLUE GAS

Thomas J. Pinnavaia; Jayantha Amarasekera, both of East Lansing, and Christine A. Polansky, Ithaca, all of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Continuation-in-part of Ser. No. 466,984, Jan. 18, 1990. This application Jun. 8, 1990, Ser. No. 535,147

Int. Cl.[5] B01J *8/00;* **C01B** *17/00*

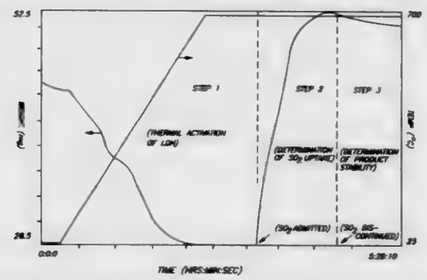
U.S. Cl. 423—244 **24 Claims**

1. A process for removing the SO_x components from a flue gas stream containing oxygen, sulfur dioxide and sulfur trioxide from the combustion of coal from a coal-fired boiler which comprises combusting the coal in the boiler to provide the flue gas stream and contacting the said gas stream with a heated sorbent composition at 400° to 1000° C. wherein the said sorbent before being heated is selected from the group consisting of a layered double hydroxide composition of formula:

$$[M_{1-x}^{II}M_x^{III}(OH)_2](A^{n-})_{x/n}yH_2O$$

wherein M^{II} is a divalent metal cation and M^{III} is a trivalent metal cation selected from the group consisting of Group IIA, IIB and IIIA metals as the cation which form metal oxides and

which are capable of reacting with SO_2 to form metal sulfites and SO_3 to form metal sulfates, A is an interlayer anion of charge n- which comprises at least one metal atoms selected from the group consisting of main group metals and transition



metals which provide oxidation of sulfur dioxide to sulfur trioxide in an amount sufficient that said layered double hydroxide structure promotes the oxidation of the sulfur dioxide to the sulfur trioxide at the combustion conditions within the coal-fired boiler, wherein y is moles of water.

5,114,692

CATALYTIC DESTRUCTION OF TOXIC ORGANIC CHEMICALS

Jozsef M. Berty, Akron, Ohio, assignor to Berty Reaction Engineers, Ltd., Fogelsville, Pa.

Division of Ser. No. 367,003, Jun. 16, 1990, Pat. No. 5,021,383. This application Feb. 19, 1991, Ser. No. 645,741

Int. Cl.[5] B01D *53/36*

U.S. Cl. 423—245.3 **12 Claims**

1. A method for the conversion of toxic hydrocarbons and halocarbons materials to non-toxic by-products which comprises contacting said toxic materials with an effective amount of catalyst in the presence of oxygen or an oxygen-containing gas, wherein said catalyst consists essentially of a metal selected from the group consisting of manganese, copper, silver, iron, and aluminum, or a metal oxide selected from the group consisting of nickel oxide, cobalt oxide, aluminum oxide, vanadium oxide, tungsten oxide, molybdenum oxide, and mixtures thereof, and wherein said metal or metal oxide is impregnated on or dispersed in an alkali metal carbonate, alkali metal bicarbonate, alkali-earth metal carbonate or alkali-earth metal bicarbonate, or mixtures thereof.

5,114,693

PROCESS FOR THE PRODUCTION OF SILICON NITRIDE AND PRODUCT MADE ACCORDING TO THE PROCESS

Jochen Hintermayer; Ernst Graf, both of Trostberg; Werner Gmohling, Hufschlag; Georg Schroll, Palling, and Wolfgang Kobler, Trostberg, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 445,001, Dec. 4, 1989, abandoned. This application May 9, 1991, Ser. No. 666,225

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1988, 3841311

Int. Cl.[5] C01B *21/06*

U.S. Cl. 423—344 **15 Claims**

1. A process for the production of silicon nitride by the reaction of silicon and nitrogen, said process comprising the step of:

reacting silicon powder having a particle size of less than 45 microns and a silicon content of at least 95% with nitrogen while said silicon is continuously rotated at a temperature of from 1000° C. to 1800° C. and at a pressure of from 1.01 to 1.8 bar to produce silicon nitride having a nitrogen content of from 1 to 39.5% by weight and a ratio of α:β-phase of 1:9 to 9:1.

5,114,694

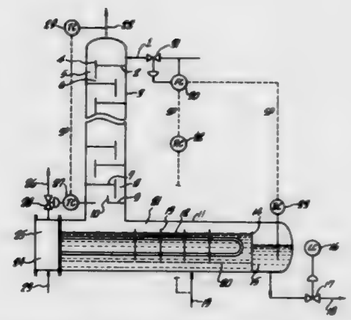
AMMONIA RECOVERY FROM PURGE GAS

Bernard J. Grotz, Jr., Pasadena, Calif., assignor to C. F. Braun & Co., Alhambra, Calif.

Filed Apr. 2, 1990, Ser. No. 503,266

Int. Cl.[5] C01C *1/00, 1/04*

U.S. Cl. 423—352 **20 Claims**



1. A process for the recovery of ammonia from a purge gas of an ammonia synthesis system, comprising the steps of absorbing ammonia contained in the purge gas in water to form an aqueous solution by means of a cooling step and an absorption step, the aqueous solution being formed by contacting the purge gas with water in counter current flow through the cooling step and the absorption step, the cooling step comprising indirect heat exchange with a coolant fluid, at least part of the aqueous solution being blended with at least part of an anhydrous ammonia product from the ammonia synthesis system to form a blended product, the flow rate of the water to the process being controlled to maintain a water concentration in the blended product between a minimum concentration required to provide corrosion protection to carbon steel storage equipment, and a maximum concentration allowed under specifications of the blended product, and the temperature of at least one point in the process being controlled at a level which avoids freezing of liquid at any point in the process.

5,114,695

PROCESS OF PRODUCING ALUMINUM AND TITANIUM NITRIDES

Mukesh K. Jain; Sadashiv K. Nadkarni, both of Jonquiere, and Adam Gesing, Kingston, all of Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Apr. 7, 1988, Ser. No. 179,214

Claims priority, application Canada, Apr. 14, 1987, 534707

Int. Cl.[5] C01B *21/076, 21/072*

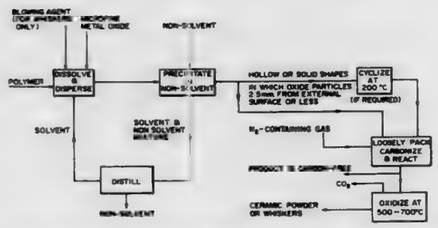
U.S. Cl. 423—411 **12 Claims**

1. A process for producing a nitride of a metal selected from the group consisting of aluminum and titanium in the form of fine particles selected from the group consisting of powder and whiskers by reaction of the corresponding metal oxide with carbon at high temperature in the presence of nitrogen, wherein the process comprises:

forming a uniform dispersion of microfine particles of said oxide in a polymer having the following characteristics: (a) a molecular weight of at least 10,000 and a long chain structure of at least 200 monomer units, (b) a carbon yield of at least 30% by weight, and (c) a chemical structure which is infusible or which is capable of being rendered infusible, said dispersion being formed by dissolving the polymer in a solvent, adding the oxide particles to the resulting solution, agitating the solution to disperse the

particles uniformly, and removing the solvent by adding the solution to a bath containing a non-solvent for the polymer and the metal oxide which non-solvent is miscible with the solvent such that the polymer is coagulated and such that said particles are substantially unagglomerated and separated from each other by said polymer;

while removing said solvent, forming the dispersion into bodies shaped in such a way that substantially none of the oxide particles within any one of said bodies is more than about 2.5 mm from an external surface of said one body;



loosely packing said bodies into a reactor in such a way that at least 40% of the volume of the packed bodies comprises voids between the bodies;

carbonizing the resulting bodies in said reactor in non-oxidizing atmosphere in order to convert the polymer to carbon;

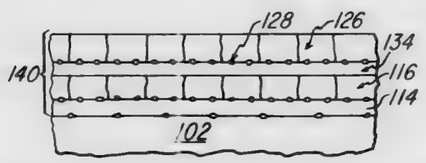
and heating the carbonized product in said reactor at high temperature in a non-oxidizing atmosphere containing nitrogen or a compound which decomposes to form nitrogen at said high temperature in order to form said nitride particles.

5,114,696

DIAMOND GROWTH METHOD

Andrew J. Purdes, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 6, 1990, Ser. No. 563,231
Int. Cl.[5] B01J *3/06*
U.S. Cl. 423—446 **14 Claims**



1. A method of diamond film formation on a body comprising the steps of:

(a) providing a body which will support formation of diamondlike material; and

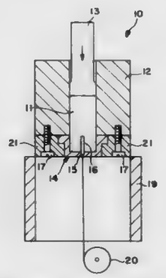
(b) forming alternating layers of diamondlike material and diamond material of said body such that at least two diamondlike layers and two diamond layers are formed.

5,114,697

HIGH STRENGTH, HIGH MODULUS PITCH-BASED CARBON FIBER

Tsutomu Naito; Genshiro Nishimura, and Kikuji Komine, all of Tokyo, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1989, Ser. No. 327,637
Claims priority, application Japan, Mar. 28, 1988, 63-73779; Mar. 3, 1989, 1-49779
Int. Cl.[5] D01F *9/12*
U.S. Cl. 423—447.1 **8 Claims**



5. A high strength, high modulus pitch-based carbon fiber comprising a crystalline structure in which the presence of the (112) cross-lattice line and the resolution of the diffraction band into the (100) and (101) defraction lines, which indicate the 3-dimensional order of the crystallite of the fiber, are not recognized, and in which the orientation angle (Φ) of X-ray structural parameter is not greater than 12° and the stack height (Lc) ranges between 80 and 180Å, said carbon fiber also having a single-fiber diameter of 5 to 12μm, tensile strength not lower than 3.0 GPa, tensile elastic modulus not smaller than 500 GPa and elongation not smaller than 0.5%, said carbon fiber being prepared by a process comprising the steps of:

(a) spinning of mesophase molten pitch to obtain a pitch fiber wherein the temperature drop of the pitch is maintained at a level below about 3° C. by using a nozzle which incorporates an insert member having a high heat conductivity.

(b) infusibilizing said pitch fiber by heating said pitch fiber in an atmosphere of an inert gas from a minimum temperature ranging from about 120° C to about 190° C. to a maximum temperature ranging from about 240° C. to about 350° C. at a heating rate of about 0.005° C./minute to about 0.1° C./minute, while said pitch fiber is under a tension ranging from about 0.0001 gram per filament to about 0.2 gram per filament, and

(c) carbonizing said infusibilized fiber by heating said infusibilized fiber in an inert gas atmosphere up to a temperature of about 1,000° C. at a rate of about 0.1° C./minute to about 10° C./minute, and thereafter heating said infusibilized fiber to a maximum temperature ranging from about 1,700° C. to about 2,500° C. at a rage of about 10° C./minute to about 500° C./minute.

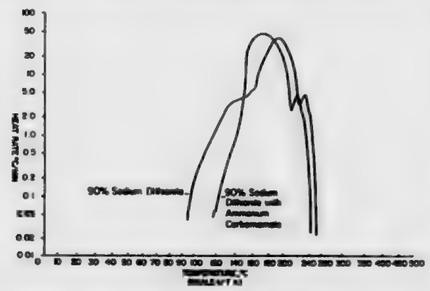
5,114,698

METHOD FOR STABILIZING SODIUM DITHIONITE

Donald M. Oglesby, and George E. Wells, IV, both of Virginia Beach, Va., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Aug. 15, 1990, Ser. No. 567,836
Int. Cl.[5] C01B *17/66*; B01D *19/00*; C09K *3/00*
U.S. Cl. 423—515 **8 Claims**

1. A method of stabilizing sodium dithionite to increase the temperature at which thermal decomposition begins, wherein said method comprises selecting a container, adding to said container at about atmospheric pressure a quantity of sodium dithionite and a quantity of an amino material selected from the group consisting of liquids and solids capable of releasing ammonia gas at or near the temperature at which sodium dithionite begins to decompose, and sealing said container, wherein said quantity of said amino material is selected so that



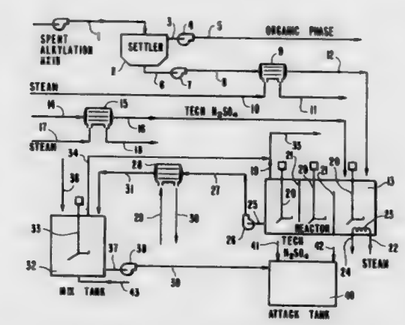
the partial pressure of ammonia gas created at a temperature where sodium dithionite begins to decompose is at least 0.5 atmospheres.

5,114,699

SPENT ALKYLATION ACID TREATMENT PROCESS

Tadeusz K. Wiewiorowski; Vivian C. Astley, both of New Orleans; Jody J. Taravella, and Michael A. Murray, both of Harvey, all of La., assignors to Freeport-McMoRan Resource Partners, New Orleans, La.

Filed Apr. 12, 1989, Ser. No. 336,791
Int. Cl.[5] C01B *17/90*
U.S. Cl. 423—531 **51 Claims**



1. A process for treating spent alkylation acid to recover a sulfuric acid product, comprising:

a. mixing spent alkylation acid having an H_2SO_4 concentration of at least 80% with a quantity of sulfuric acid of at least 93% H_2SO_4 concentration to increase the sulfuric acid concentration and decrease viscosity of the spent alkylation acid and to form an acid blend; and

b. agitating the acid blend to provide a homogenous blend of the two acids, and maintaining the acid blend at a temperature of a least about 275°–350° F. for a period of at least about 15 minutes thereby providing a treatment step wherein a substantial amount of the soluble organic compounds contained in the spent alkylation acid is converted to insoluble carbonaceous solids.

5,114,700

ELECTRICALLY HEATED FLUIDIZED BED REACTOR AND PROCESSES EMPLOYING SAME

Wolfgang F. A. T. Melhack; Nicholas A. Barcza, both of Randburg, and Michael J. Dry, Weltevreden Park, all of South Africa, assignors to Mintek, Randburg, South Africa

Continuation-in-part of Ser. No. 120,605, Nov. 16, 1987, abandoned, which is a division of Ser. No. 909,102, Sep. 18, 1986, abandoned. This application May 8, 1990, Ser. No. 520,541
Claims priority, application South Africa, Sep. 20, 1985, 85/7234
Int. Cl.[5] C01B *17/06*
U.S. Cl. 423—571 **17 Claims**

1. A method of carrying out an endothermic chemical reaction involving the use of at least one solid reactant in a fluidized bed reactor, wherein the reactor comprises a vessel assembly comprising at least one riser compartment and a down-comer compartment located adjacent each other and being interconnected at both their lower and upper end regions, said down-comer compartment having upper, central, and lower regions; each of said compartments having associated therewith means for introducing fluidizing gas therein and containing electrically conductive fluidizable particles; at least a solid reactant inlet to the vessel assembly for a solid reactant in subdivided form, wherein said inlet communicates with said upper or central region of the down-comer compartment; at least one outlet communicating with the upper end regions of said compartments wherein spent fluidizing gas and accompanying reaction products are removed; and electrodes associated with the vessel assembly and adapted to pass an electrical current through at least a selected zone of said fluidized bed therein, the method of comprising:

(a) introducing fluidizing gas into lower regions of both the down-comer and riser compartments, whereby in the down-comer compartment, the fluidizable particles are substantially in a state of incipient fluidization and having a superficial fluidizing gas velocity in the riser compartment at least intermittently higher than in the down-comer to thereby cause at least intermittent movement of the fluidizable particles up the riser compartment and over onto the upper region of the down-comer compartment, and a simultaneous downward movement of fluidizable particles in the down-comer compartment;

(b) introducing said at least one solid reactant through said solid reactant inlet to said upper or central region of said down-comer compartment, said reactant being in solid subdivided form, whereby it becomes entrained with the fluidizable particles and moves counter-currently to the flow of fluidizing gas;

(c) passing an electrical current between said electrodes to heat, by resistive heating, said fluidizable particles; and

(d) removing spent fluidizing gas together with reaction products accompanying same through the outlet.

5,114,701

METHOD FOR PRODUCING HYDROGEN PEROXIDE AND SOLVENT SYSTEM FOR USE IN THE HYDROGEN PEROXIDE PRODUCTION PROCESS

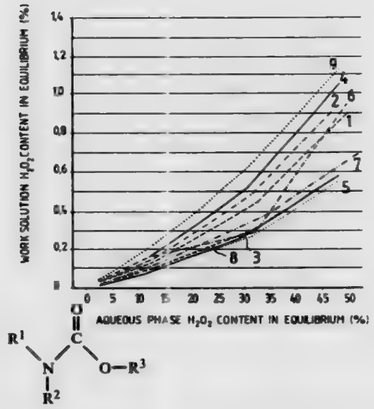
Elias Suokas, Espoo, and Reijo Aksela, Oulu, both of Finland, assignors to Kemira OY, Helsinki, Finland

Filed Aug. 22, 1990, Ser. No. 571,084
Claims priority, application Finland, Sep. 18, 1989, 894411
Int. Cl.[5] C01B *15/023*
U.S. Cl. 423—588 **8 Claims**

6. A cyclic process for production of hydrogen peroxide comprising:

(a) alternately reducing and oxidizing a quinone in a solvent system; and

(b) extracting the hydrogen peroxide formed; wherein the solvent system contains a carbamate having the general formula:



in which R_1 is hydrogen or C_1 to C_{20} linear alkyl, and R_2 and R_3 are C_1 to C_{20} linear alkyl.

5,114,702

METHOD OF MAKING METAL OXIDE CERAMIC POWDERS BY USING A COMBUSTIBLE AMINO ACID COMPOUND

Larry R. Pederson, Kennewick; Lawrence A. Chick, Richland, and Gregory J. Exarhos, Richland, all of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Continuation of Ser. No. 362,613, Jun. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 238,643, Aug. 30, 1988, abandoned. This application Oct. 16, 1990, Ser. No. 599,273

Int. Cl.[5] C01B *13/14*

U.S. Cl. 423—639 **21 Claims**

1. A process for producing a metal oxide powder, which comprises

forming a substantially homogeneous, aqueous precursor mixture comprising at least one substantially water soluble metal salt and a substantially water soluble combustible amino acid compound;

evaporating said aqueous precursor mixture to form a substantially homogeneous intermediate material having a concentration which will support combustion; and

heating said intermediate material to the point of autoignition thereby autoigniting and combusting said intermediate material to produce said metal oxide powder.

5,114,703

PERCUTANEOUS LYMPHOGRAPHY USING PARTICULATE FLUOROCARBON EMULSIONS

Gerald L. Wolf, Winchester, Mass., and David M. Long, El Cajon, Calif., assignors to Alliance Pharmaceutical Corp., San Diego, Calif.

Continuation-in-part of Ser. No. 358,678, May 30, 1989, abandoned. This application May 29, 1990, Ser. No. 530,034

Int. Cl.[5] G01N *31/00, 24/00;* **A61K** *31/28, 49/04*

U.S. Cl. 424—5 **24 Claims**

1. A method for diagnosing disease affecting the lymph nodes through indirect lymphography, comprising the steps of:

interstitially administering a diagnostically effective, non-toxic amount of a non-radioactive contrast agent to a mammal, wherein said agent is in particulate or colloidal form, said agent having a mean particle size from about 5 to about 900 nanometers in diameter and being imageable with sufficient resolution to permit visualization of intranodal architecture;

permitting the contrast agent to localize in lymph nodes; and

imaging the lymph nodes of the mammal in which said contrast agent has localized within about 1 month of said administration.

20. A method for performing indirect lymphography, comprising the steps of:

forming an aqueous emulsion having a continuous aqueous phase and having a dispersed fluorocarbon liquid phase having a mean particle size between about 5 and about 900 nanometers and having the ability to localize in lymph nodes after interstitial administration into the tissue of a mammal and being imageable with sufficient resolution to permit visualization of intranodal architecture; said emulsion having an initial fluorocarbon concentration of no more than 40%, w/v;

removing at least some of the aqueous phase to concentrate the emulsion to at least 50% w/v of fluorocarbon;

interstitially administering a diagnostically effective non-toxic amount of the concentrated emulsion to a mammal;

permitting the administered fluorocarbon to localize in lymph nodes; and

imaging the lymph nodes of the mammal in which said fluorocarbon has localized within about 1 month of said administration.

5,114,704

RAW HIDE HAVING A COATING CONTAINING AN INORGANIC PYROPHOSPHATE

Henry C. Spanier, West Milford, and Bassey O. Ekpo, Newark, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 358,149, May 30, 1989, Pat. No. 5,011,679. This application Feb. 20, 1991, Ser. No. 666,820

Int. Cl.[5] A61K *7/16;* **A23K** *1/02*

U.S. Cl. 424—57 **18 Claims**

1. Raw hide having a coating containing a tartar-control effective amount of at least one inorganic pyrophosphate compound.

5,114,705

ANTIPERSPIRANT COMPOSITION

David T. Callaghan, Quincy; Alan M. Phipps, Framingham, both of Mass., and Stephen J. Provancal, Addison, Ill., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 713,470, Mar. 19, 1985, abandoned. This application Dec. 20, 1988, Ser. No. 287,096

Claims priority, application Canada, Jul. 26, 1984, 459784

Int. Cl.[5] A61K *7/38, 7/035, 9/12*

U.S. Cl. 424—66 **3 Claims**

1. A stable, solid composition consisting essentially of zirconyl hydroxy chloride and aluminum chlorhydroxide in which the atomic ratio of Al to Zr is from 6:1 to 1:1 having high antiperspirant efficacy, said composition being further characterized in that a water solution containing 10% by weight of said solid composition in dissolved form, stored at room temperature for no more than two hours and subjected to gel permeation chromatography on cross-linked dextran having a molecular weight exclusion range of 1000 to 30,000 for globular proteins, exhibits a distribution pattern having peaks at Kd=0.7 and Kd=0.5, the ratio of the height of the first peak to that of the second being at least 1.5:1.

5,114,706

STABLE CONDITIONING SHAMPOO CONTAINING ANIONIC SURFACTANT/CATIONIC CONDITIONING AGENT - NON-VOLATILE SILICONE EMULSION

Lane A. Duvel, River Forest, Ill., assignor to Helene Curtis, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 552,437, Jul. 13, 1990, Pat. No. 5,034,218. This application Mar. 11, 1991, Ser. No. 667,575

The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.

Int. Cl.[5] A61K *7/06, 7/075*

U.S. Cl. 424—70 **24 Claims**

1. A hair conditioning shampoo composition comprising an emulsion of water; about 5 to about 65 percent by weight of an anionic cleaning surfactant; from about 0.1 to about 20 percent by weight of a cationic di-long chain alkyl quaternary nitrogen-containing conditioning agent, wherein the long alkyl chains bonded to the nitrogen atom have from about 12 to about 22 carbon atoms per alkyl chain; from about 0.5 to about 10 weight percent of a long chain fatty alcohol having about 8 to about 32 carbons in the long chain; from about 0.5 to about 10 weight percent of a non-volatile silicone; and about 0.1 to about 5% of an anionic cross-linked polymeric suspending agent selected from the group consisting of an acrylamide/sulfonic acid copolymer and a terpolymer of maleic anhydride, a vinyl ether, and a straight or branched chain diene having double bonds at the first and last positions and a carbon chain length of C_5–C_{18}.

5,114,707

POLYCONDENSATION SILICONE ELASTOMER DOSAGE FORMS FOR THE CONTROLLED RELEASE OF IODINE VALUES

Guy Cyprien, L'Hay les Roses; Alain Fisch, Paris; Johnny Haggiage, Lyons; Hugues Porte, Caluire; Thierry Prazuck, Paris, and Ghislaine Torres, Lyons, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Continuation of Ser. No. 161,445, Feb. 26, 1988, abandoned. This application Dec. 11, 1990, Ser. No. 625,708

Claims priority, application France, Feb. 26, 1987, 87 02883

The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.

Int. Cl.[5] A61K *31/73;* **A01N** *59/12*

U.S. Cl. 424—667 **17 Claims**

1. A polycondensation-curable silicone composition for the controlled release of iodine values, comprising (A) at least one diorganopolysiloxane oil bearing at least two condensable or hydrolyzable groups, or a single hydroxyl group, at each end of the polymer chain; (B) a therapeutically effective amount of at least one water soluble, nontoxic, organic and/or inorganic iodine compound which is dispersed homogeneously throughout the composition, in solid or liquid state at ambient temperature and which does not inhibit curing of the composition into an elastomer, molecular iodine being excluded; and (C) a catalytically effective amount of a polycondensation catalyst.

5,114,708

METHOD FOR STIMULATING GROWTH IN ANIMALS

Robert L. Hunter, Tucker, and William L. Ragland, Athens, both of Ga., assignors to Emory University, Atlanta, Ga.

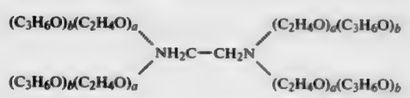
Continuation-in-part of Ser. No. 90,795, Aug. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 872,111, Jun. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 787,770, Oct. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 745,917, Jun. 19, 1985, abandoned. This application Oct. 9, 1987, Ser. No. 107,358

Int. Cl.[5] A61K *31/74*

U.S. Cl. 514—716 **9 Claims**

1. A method of stimulating the growth of animals comprising the step of:

administering to an animal an amount of a biologically-active copolymer sufficient to stimulate the growth of the animals, the biologically-active copolymer comprising an octablock copolymer having the following formula:



wherein:

the mean aggregate molecular weight of the portion of the octablock copolymer represented by polyoxypropylene is between approximately 5000 and 7000 daltons;

a is a number such that the portion represented by polyoxyethylene constitutes between approximately 10% to 40% of the compound by weight, and;

b is a number such that the polyoxypropylene portion of the total molecular weight of the octablock copolymer constitutes between approximately 60% and 90% of the compound by weight.

5,114,709

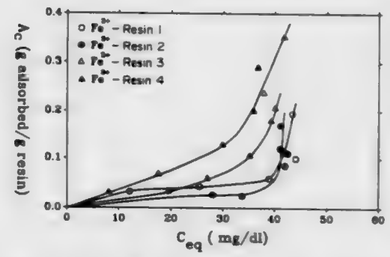
FERRIC ION COORDINATED POLYAMINE RESINS FOR THE LOWERING OF BLOOD CHOLESTEROL

Leon E. St. Pierre, Frelighsburg; George R. Brown, Dollard-des-Ormeaux; Gaoming Wu, Montreal, and Youlu Yu, Verdun, all of Canada, assignors to Lowchol Scientific Inc., Frelighsburg, Canada

Filed Jun. 12, 1991, Ser. No. 713,875

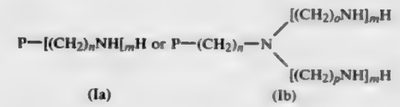
Int. Cl.[5] A61K *31/74*

U.S. Cl. 424—78.12 **27 Claims**



1. A ferric ion coordinated polyamine resin in which a ferric ion is coordinated with a cross-linked and non-digestible polymeric amine selected from the group consisting of:

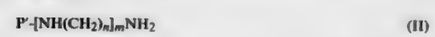
a) polyamine resins with a hydrophilic backbone, of the formula:



(Ia) (Ib)

wherein P represents a hydrophilic, cross-linked and non-digestible homopolymer backbone, m is an integer varying from 1 to 10 inclusive, and n, o and p are, independently, integers varying from 2 to 12 inclusive;

b) polyamine resins with a hydrophobic backbone, of the formula:



(II)

wherein P' represents a hydrophobic, cross-linked and non-digestible homopolymer backbone, m is an integer varying form 0 to 6 inclusive and n is an integer varying from 2 to 12 inclusive; and

c) cross-linked copolymers of a polyethylenepolyamine containing from 2 to 6 ethylene units and epichlorohydrin; said ferric ion being present in an amount ranging from 2 to 10 weight % of said ferric ion coordinated polyamine resin.

5,114,710

M-CSF AS A THERAPEUTIC AGENT FOR THROMBOCYTOPENIA

Fumimaro Takaku, Tokyo, and Kazuo Motoyoshi, Saitama, both of Japan, assignors to Green Cross Corporation, Osaka and Morinaga Milk Industry Co., Ltd., Tokyo, both of, Japan

Filed Feb. 10, 1989, Ser. No. 308,593

Claims priority, application Japan, Feb. 10, 1988, 63-29819

Int. Cl.[5] A61K *37/02*

U.S. Cl. 424—85.1 **6 Claims**

1. A process for preventing thrombocytopenia due to hemopoietic disorder which comprises administering to a patient in need of such prevention a hemopoietic disorder-induced thrombocytopenia effective prevention amount of a human monocyte-macrophage colony stimulating factor.

5,114,711

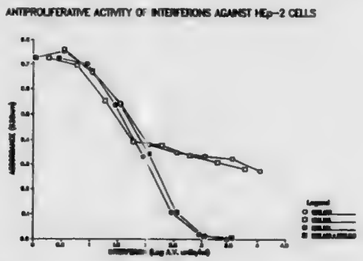
COVALENTLY LINKED POLYPEPTIDE CELL MODULATORS SUCH AS INTERFERON-LYMPHOTOXIN CONJUGATES

Leslie D. Bell, Thame; Keith G. McCullagh, Princes Risborough, and Alan G. Porter, High Wycombe, all of United Kingdom, assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 803,748, Dec. 2, 1985, Pat. No. 4,935,233. This application Jul. 13, 1989, Ser. No. 379,509

Int. Cl.[5] A61K *37/66, 39/44;* **C07K** *15/26, 17/02*

U.S. Cl. 424—85.1 **30 Claims**



1. A composition of the formula

$$R_1—L—R_2$$

wherein R_1 is gamma interferon or a biologically active modified gamma interferon which has one of the following activities:

(a) the ability to protect Vero cells against the cytopathic effect of encephalomyocarditis virus infection; or

(b) antiproliferative activity against HEp-2 cells;

(c) an immunomodulating activity of native gamma interferon;

R_2 is human lymphotoxin or a biologically active modified human lymphotoxin which retains a biological activity of native human lymphotoxin; and L is a peptide linker segment of from about 1 to about 500 amino acid residues wherein the L retains or potentiates the biological activity of R1 and/or R2.

5,114,712

COMMON ANTIGEN (PSC-A) TO *PSEUDOMONAS AERUGINOSA* WHICH ACTS AS AN AGENT FOR PROTECTING *PSEUDOMONAS AERUGINOSA* INFECTION

Tamotsu Fukuda, Chiba; Shiro Shigeta, Fukushima; Hiroaki Okuya, Chiba; Yasuyuki Kuroiwa, Chiba, and Tadashi Sudo, Chiba, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 28,174, Mar. 18, 1987, abandoned, which is a division of Ser. No. 797,796, Nov. 14, 1985, Pat. No. 4,702,910. This application Sep. 17, 1990, Ser. No. 586,337

Int. Cl.[5] A61K *37/04;* **C12N** *5/00*

U.S. Cl. 424—87 **4 Claims**

1. Cell line IFO 50097.

5,114,713

***P. FALCIPARUM* CS-PEPTIDES AS UNIVERSAL T-CELL EPITOPE**

Francesco Sinigaglia, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 18, 1989, Ser. No. 353,427

Claims priority, application United Kingdom, May 24, 1988, 8812214

Int. Cl.[5] A61K *39/00, 37/02*

U.S. Cl. 424—88 **7 Claims**

1. An antigenic structure comprised of a polypeptide of the amino acid sequence

$$R^1—Glu—Lys—Lys—Ile—Ala—Lys—Met—Glu—Lys—Ala—Ser—Ser—Val—Phe—Asn—Val—R^2 \quad (I)$$

wherein R^1 is H-Asp-Ile-, H-Ile- or H- and R^2 is -Val-Asn-Ser—OH, -Val-Asn—OH, -Val—OH or —OH and a B-cell epitope.

5,114,714

METHODS OF USE AND COMPOSITIONS OF (R)-ISOFLURANE AND (R)-DESFLURANE

James W. Young, Still River, and Steven Brandt, Marlborough, both of Mass., assignors to Sepracor, Inc., Marlborough, Mass.

Filed Nov. 29, 1990, Ser. No. 619,843

Int. Cl.[5] C07C *41/44, 43/192*

U.S. Cl. 424—400 **10 Claims**

1. A method of inducing and maintaining anesthesia while diminishing the concomitant liability of adverse effects associated with the administration of racemic isoflurane of desflurane, comprising administering by inhalation to a warm blooded animal including a mammal in need of anesthesia an amount sufficient to induce and maintain anesthesia but insufficient to cause said adverse effects, of (R)-isoflurane or (R)-desflurane, wherein when (R)-isoflurane is administered said amount contains about 90% or more by weight of (R)-isoflurane and about 10% or less by weight of (S)-isoflurane, or when (R)-desflurane is administered said amount contains about 90% or more by weight of (R)-desflurane and about 10% or less by weight of (S)-desflurane.

5,114,715

METHODS OF USE AND COMPOSITIONS OF (S)-ISOFLURANE AND (S)-DESFLURANE

James W. Young, Still River, and Steven Brandt, Marlborough, both of Mass., assignors to Sepracor Inc., Marlborough, Mass.

Filed Nov. 29, 1990, Ser. No. 619,780

Int. Cl.[5] C07C *41/44, 43/192*

U.S. Cl. 424—400 **10 Claims**

1. A method of inducing and maintaining anesthesia while diminishing the concomitant liability of adverse effects associated with the administration of racemic isoflurane or desflurane, comprising administering by inhalation to a warm blooded animal including a mammal in need of anesthesia an amount sufficient to induce and maintain anesthesia but insufficient to cause adverse effects, of (S)-isoflurane or (S)-desflurane, wherein when (S)-isoflurane is administered said amount contains about 90% or more by weight of (S)-isoflurane and about 10% or less by weight of (R)-isoflurane, or when (S)-desflurane is administered said amount contains about 90% or more by weight of (S)-desflurane and about 10% or less by weight of (R)-desflurane.

5,114,716

ANTI-OXIDANT SYSTEM CONTAINING STABILIZED ASCORBYL ESTER, TOCOPHEROL OR CAFEIC ACID OR A DERIVATIVE THEREOF, A COMPLEXING AGENT AND A POLYPEPTIDE, AND COMPOSITIONS CONTAINING THE ANTI-OXIDANT SYSTEM

Quang L. N'Guyen, Antony; Jacqueline Griat, Ablon; François Millecamps, Paris; Gérard Lang, Saint-Gratien, and Serge Forestier, Claye Souilly, all of France, assignors to Societe Anonyme Dite: L'Oreal, Paris, France

Filed Jul. 28, 1989, Ser. No. 385,878

Claims priority, application France, Jul. 29, 1988, 88 10295

Int. Cl.[5] A61K *7/00*

U.S. Cl. 424—401 **19 Claims**

1. An anti-oxidant system consisting essentially of at least one stabilized ascorbyl ester present in an amount ranging from 5–70 weight percent, at least one tocopherol or caferic acid or an ester or an amide there of present in an amount ranging from 0.5 to 20 weight percent, at least one chelating agent present in an amount ranging from 2 to 20 weight percent and at least one non-thiol peptide present in an amount ranging from 1 to 80 weight percent.

5,114,717

CLEAR COSMETIC STICKS WITH COMPATIBLE FRAGRANCE COMPONENTS

Matthew Kuznitz, Branford; David A. Brewster, Shelton; Joseph R. Faryniarz, Oxford, and Lewis Cancro, Trumbull, all of Conn., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Feb. 8, 1991, Ser. No. 652,856

Int. Cl.[5] A61K *7/00, 7/32*

U.S. Cl. 424—401 **12 Claims**

1. A clear gel stick composition comprising:

(i) from about 10 to about 90% of a polyhydric alcohol having from 2 to 6 carbon atoms and from 2 to 6 hydroxyl groups;

(ii) from about 1 to about 40% of a soap;

(iii) from about 1 to about 40% of an alkoxylate copolymer having the following formula:

$$R_f[(C_2H_4O)_a(C_3H_6O)_b(C_2H_4O)_c(C_3H_6O)_d]_e[H]_g$$

wherein R is selected from the group consisting of hydrogen, a C_{10}–C_{22} fatty alkoxide chain, ethylenediamine and combinations thereof;

a, b, c and d are independently selected integers ranging from 0 to 200 with proviso that sum of a, b, c and d is at least 5;

e is an integer from 1 to 4;

f is an integer from 0 to 1;

g is an integer from 0 to 4; and

(iv) an effective amount of a fragrance to impart a pleasant odor to said composition, said fragrance including from 25% down to 0.1% of total ester compounds by weight of said fragrance.

5,114,718

SUSTAINED RELEASE COMPOSITIONS FOR TREATING PERIODONTOL DISEASE

Nalinkant C. Damani, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 20, 1990, Ser. No. 585,445

Int. Cl.[5] A61F *13/00*

U.S. Cl. 424—422 **10 Claims**

1. A solid composition suitable for insertion into the periodontal pocket or the gingival sulcus of a person or lower animal suffering from diseases of the oral cavity comprising a non-biodegradable, biocompatible polymer selected from the group consisting of polyurethanes, ethylene vinyl acetate copolymers, collagen, poly isobutylene, ethylene vinyl alcohol copolymers, polyethylene polycarbonate, and polyvinyl chloride and a drug active selected from the group consisting of antiinflammatory agents, antimicrobials, antibiotics, peroxides, anesthetic agents, and vitamins in a concentration from about 0.5% to about 95% wherein said composition is in the form of a chip, cone or strip and wherein said composition provides steady state average concentrations of active of from about 10 μg to about 5000 μg, preferably from about 25 μg to about 2500 μg per milliliter of the gingival crevicular fluid of a treated periodontal pocket or gingival sulcus.

5,114,719

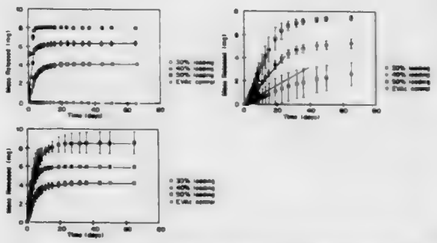
EXTENDED DRUG DELIVERY OF SMALL, WATER-SOLUBLE MOLECULES

Bernhard A. Sabel, Kreuzberg 6, 8011 Egmating, Fed. Rep. of Germany, and Andrew Freese, 115 Whitcomb Ave., Jamaica Plain, Mass. 02130

Continuation-in-part of Ser. No. 43,695, Apr. 29, 1987, Pat. No. 4,883,666. This application Sep. 14, 1989, Ser. No. 407,418

Int. Cl.[5] A61F *13/00*

U.S. Cl. 424—422 **5 Claims**



1. A polymeric composition for extended term delivery of low molecular weight, less than or equal to 1,000 water-soluble molecules following implantation in a patient comprising

biologically active, low molecular weight, water-soluble molecules to be delivered, the molecules being selected from the group of biologically active molecules consisting of proteins, carbohydrates, inorganic molecules, organic molecules, nucleic acids, and minerals, and

a matrix, consisting essentially of a polymer selected from the group consisting of acyl substituted cellulose acetates and alkyl derivatives thereof; partially and completely hydrolyzed alkylene-vinyl acetate copolymers, unplasticized polyvinyl chloride, crosslinked homo- and copolymers of polyvinyl acetate, crosslinked polyesters of acrylic and methacrylate; polyvinyl alkyl ethers; polyvinyl fluoride, silicone; polycarbonate, polyurethane; polyamide, polysulphones; styrene acrylonitrile copolymers, crosslinked poly(ethylene oxide); poly(alkylenes); poly(vinyl imidazole); poly(esters); poly(ethylene terephthalate); and chlorosulphonated polyolefines wherein the polymer is biocompatible and resistant to chemical and physical destruction at the site of implantation,

the biologically active molecules being dispersed within the polymer matrix in a concentration within a sufficient

number of pores and channels to the exterior of the matrix to result in linear diffusion of the dispersed molecules out of the matrix over an extended time period at a release rate controlled by the loading of the polymer matrix with the biologically active molecules.

5,114,720

GELATIN COATED TABLETS AND METHOD FOR PRODUCING SAME

Charles A. Littell, Bellvale; Thomas W. Kucharski, Goshen; Michael K. Doelling, New City; Douglas C. Becker, Warwick, all of N.Y., assignors, to American Cyanamid Company, Stamford, Conn.

Filed Dec. 27, 1990, Ser. No. 634,902
Int. Cl.[5] A61K *9/40*
U.S. Cl. 424—478 **4 Claims**

1. A coated tablet which consists essentially of a tablet core coated with an undercoating comprising about 2 to about 3 wt% of the total tablet weight and a gelatin overcoat having a thickness of from about 1 to 4 mils, said overcoat formed by spraying a composition consisting essentially of:

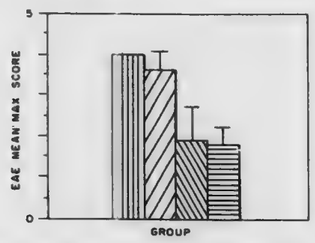
0.5 to 20 wt% gelatin having a bloom strength of 0 to 80, and 80 to 99.5 wt% water.

5,114,721

PREPARATION OF T-CELL AND T-CELL MEMBRANE FOR USE IN PREVENTION AND TREATMENT OF AUTOIMMUNE DISEASES

Irun R. Cohen; Meir Shlaitzky, both of Rehovot, Israel, and Richard L. Edelson, Westport, Conn., assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 910,876, Sep. 23, 1986, Pat. No. 4,996,194, which is a continuation-in-part of Ser. No. 648,802, Sep. 7, 1984, Pat. No. 4,634,590. This application Mar. 15, 1989, Ser. No. 323,705
Claims priority, application Israel, Mar. 15, 1988, 85746
Int. Cl.[5] A61K *31/35, 35/14*
U.S. Cl. 424—534 **16 Claims**



1. A preparation for preventing or treating an autoimmune disease, consisting essentially of T-lymphocyte cells specific for the autoimmune disease, which cells have been activated by having been exposed to an antigen specific for the autoimmune disease or a mitogen capable of inducing an immune response by the T-lymphocyte cells, and which cells have been further treated by contacting said cells with a photoactivatable psoralen cross-linking agent which is selective for a receptor on the cell membrane, said cross-linking agent having been present in an amount sufficient to cause cross-linking to occur on the surface of said cells upon photoactivation, followed by photoactivation of the psoralen cross-linking agent; or cell membranes separated from said treated T-lymphocyte cells.

5,114,722

MEDICAMENT FROM PEYER'S PATCHES

Eugen Zoubek, Alleschерstrasse 2a, 8000 Munchen 71, and Heinrich Kehlbeck, Bahnhofstrasse, 2812 Hoya, both of Fed. Rep. of Germany

Continuation of Ser. No. 351,966, May 15, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 607,595
Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817360
Int. Cl.[5] A61K *35/38*
U.S. Cl. 424—551 **5 Claims**

1. A medicament composition made by the process of: homogenizing Peyer's patches, preparing water extract from the homogenized Peyer's patches, the method characterized by heating the extract for about 30 minutes at 100° C. and forming a lyophilisate for preparation in homeopathic form.

5,114,723

BEVERAGE COMPOSITIONS FOR HUMAN CONSUMPTION

James Stray-Gundersen, Dallas, Tex., assignor to University of Texas System Board of Regents, Austin, Tex.

Continuation-in-part of Ser. No. 485,609, Feb. 27, 1990, Pat. No. 5,032,411. This application Jul. 5, 1990, Ser. No. 548,007
The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.
Int. Cl.[5] A23L *1/304*
U.S. Cl. 426—74 **60 Claims**

1. An aqueous beverage composition adapted for oral administration of water, physiologically essential electrolytes, nutrient minerals, and sweeteners to a human body comprising:

from about 3 to about 50 meq. of an electrolyte per liter of said beverage composition;

from about 0 to about 8 weight percent, based on the total weight of said beverage composition, of a carbohydrate;

from about 0 to about 14 weight percent, based on the total weight of said beverage composition, of a low-caloric sweetener;

a sufficient amount of an edible acid component to adjust the pH of said beverage composition to a range from about 2 to about 6.5;

said beverage composition having an osmolality of from about 100 to about 270 mOs/l, said osmolality being achieved essentially from said electrolyte, said carbohydrate, said low-caloric sweetener, and said edible acid component in a volume of water; and

said volume of water being in a sufficient amount necessary to establish the foregoing properties.

5,114,724

MULTI-COLOR PASTA PRODUCTS

Fabrizio Bottero, Greenwich, Conn., assignor to Patrick Nugent, Weston and Richard W. Egan, Wellesley Hills, both of, Mass.

Filed May 22, 1991, Ser. No. 703,914
Int. Cl.[5] A23L *1/16*
U.S. Cl. 426—249 **11 Claims**

1. A pasta product comprising a substantially flat sheet of pasta having outer surfaces of two or more colors, wherein each color extends uniformly through said sheet to the opposite surface thereof.

5,114,725

METHOD FOR COLOR PRESERVATION IN CANNED GREEN VEGETABLES

Luther H. Leake, Arden Hills, and Laurie K. Kirk, Minnetonka, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Jan. 18, 1991, Ser. No. 643,407
Int. Cl.[5] A23L *1/272*
U.S. Cl. 426—270 **38 Claims**

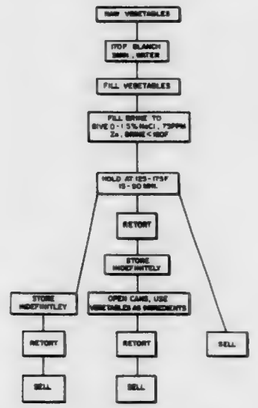
1. A method for preserving and enhancing the color of canned green vegetables comprising:

a) blanching said green vegetables;

b) filling said blanched green vegetables into a container;

c) covering said blanched green vegetables with a brine solution containing a metal ion selected from the group consisting of zinc and copper ions, within said container;

d) hermetically sealing said container;



e) holding said hermetically sealed container at an elevated temperature for a length of time; and

f) subjecting said hermetically sealed container to at least a plurality of thermal treatments, the first of which is sufficient to provide commercial sterility.

5,114,726

PROCESS FOR PREPARING ASPARTAME COATED ORGANIC ACID

Josef H. Tsau, Skokie; Dennis Seagle, Buffalo Grove, and Steven Laureaz, Mt. Prospect, all of Ill., assignors to The NutraSweet Company, Deerfield, Ill.

Continuation-in-part of Ser. No. 383,083, Jul. 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 224,977, Jul. 27, 1988, abandoned. This application May 15, 1991, Ser. No. 700,731
Int. Cl.[5] A23L *1/236*
U.S. Cl. 426—289 **6 Claims**

1. A process for producing a substantially free-flowing, dust-free, fast-dissolving consumable product including an organic acid selected from the group consisting of citric acid and malic acid, and aspartame, comprising the steps of:

adding aspartame powder to a coater and spraying water into said coater to wet said aspartame while mixing, said water added in an amount of from about 0.5%–2.5% by weight of the product;

adding granular organic acid to said coater, said organic acid blended with said aspartame and heated by a water jacket to a temperature of between about 44° C. to about 52° C.;

and discharging particles including aspartame coated organic acid from said coater before the temperature of said particles reaches 60° C.

5,114,727

COATED PASTA FOR PROVIDING FIRM TEXTURE

Christopher J. Brimelow, New Milford; Jau Y. Hsu, Brookfield, both of Conn., and Michael S. Proctor, Louth, Great Britain, assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 387,785, Aug. 1, 1989, Pat. No. 5,030,462. This application Jun. 12, 1991, Ser. No. 714,260
The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.
Int. Cl.[5] A23P *1/08*
U.S. Cl. 426—302 **11 Claims**

1. A pasta product comprising an uncooked pasta dough having a mixture of dried coagulated egg white and a edible oil coated thereon.

5,114,728

PROCESS FOR DECAFFEINATING GREEN COFFEE BEANS

Hedi Ben-Nasr, and Friedrich W. H. Coenen, both of Essen, Fed. Rep. of Germany, assignors to Kohlensäure-Werke Rud. Buse GmbH & Co, Bad Hönningen, Fed. Rep. of Germany

Division of Ser. No. 63,372, Jun. 18, 1987. This application Sep. 11, 1991, Ser. No. 757,571
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1986, 3620622; Apr. 25, 1987, 3713953
Int. Cl.[5] A23F *5/20*
U.S. Cl. 426—427 **10 Claims**

1. Process for decaffeinating green coffee beans, comprising:

a. wetting green coffee beans comprised of caffeine with water to provide wetted beans having a water content ranging from 35 to 50 percent by weight and having bean cells containing an aqueous caffeine solution;

b. compressing the wetted beans positioned in a pressure chamber by subjecting the wetted beans to an atmosphere comprised of a supercritical fluid which is a gas under standard conditions of temperature and pressure, under a pressure ranging from 75 to 300 bar and a temperature ranging from 20° to 80° C. for a period ranging from a few minutes to several hours;

c. decompressing the wetted beans in the pressure chamber to a pressure p for which critical pressure $p_c \geqq p \geqq 1$ bar to standard pressure to provide decompressed beans over a period ranging from abruptly to a few minutes under conditions controlled so that expansion cooling of the gaseous atmosphere does not freeze the wetted beans;

d. extracting caffeine from the decompressed beans with the supercritical fluid over a period ranging from a few minutes to several hours by raising the pressure in the pressure chamber to a pressure ranging from 75 to 300 bar at a temperature ranging from 20° to 80° C. to provide a supercritical fluid phase containing the supercritical fluid and at least a portion of the aqueous caffeine solution from the bean cells, circulating the supercritical fluid phase through a water washing means where it is washed with water to remove the caffeine therefrom and provide regenerated supercritical fluid, and recirculating the regenerated supercritical fluid to the pressure chamber, wherein caffeine is continuously recovered from the wash water in a recover means;

e. repeating the steps of compressing, decompressing and extracting as a process cycle one or more times to provide extracted beans;

f. centrifuging the extracted beans in a centrifuge to remove residual aqueous caffeine solution therefrom and provide pre-dried beans;

g. collecting the residual aqueous caffeine solution from the centrifuging step and recovering caffeine therefrom in a recovery means;

h. drying the pre-dried beans to provide dried beans having water content suitable for subsequent roasting; and

i. roasting the dried beans.

5,114,729
METHOD OF MAKING A NEW DAIRY-BASED FOOD PRODUCT FROM A MILK ULTRAFILTRATION RETENTATE

Philippe D. d'Aprigny, and Jean H. Le Treut, both of Saint Lo, France, assignors to Union Laitiere Normande, Sur-Vire, France

Filed Oct. 24, 1989, Ser. No. 426,738
Claims priority, application France, Oct. 24, 1988, 88 13899
Int. Cl.[5] A23C *9/142*
U.S. Cl. 426—580 **25 Claims**

1. A method of making a dairy-based food product which method consists essentially of the steps of:
concentrating a milk of animal origin by ultrafiltration; and
heat treating at a temperature in the range of about 60° C. to 100° C., the obtained ultrafiltration retentate which contains the natural proteins from the milk; such heat treatment ensuring at least partial coagulation of said retentate.

5,114,730
PROCESS FOR MAKING DARK COCOA

Larry D. Ellis, St. Louis County, Mo., assignor to Consolidated Flavor Corporation, Bridgeton, Mo.

Filed Nov. 21, 1990, Ser. No. 616,376
Int. Cl.[5] A23G *1/00*
U.S. Cl. 426—593 **18 Claims**

1. A process for making dark cocoa from cocoa powder comprising the steps of
a. forming a slurry of at least about 50% water and natural cocoa powder,
b. heating the slurry at atmospheric pressure for less than about 60 minutes with about 1 to about 6% dry solids basis (d.s.b.) alkali at a temperature below about 200° F.,
c. spray drying the resultant dark cocoa powder, and
d. recovering a whole dark cocoa powder.

5,114,731
PRODUCTS FROM GREEN COFFEE TREATMENT

David L. Belville, Marysville; Donald E. Wetherilt, Powell, and James E. Wimmers, Marysville, all of Ohio, assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 265,059, Oct. 31, 1988, Pat. No. 4,938,979. This application Jun. 8, 1990, Ser. No. 535,107
The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.
Int. Cl.[5] A23F *5/02*
U.S. Cl. 426—595 **14 Claims**

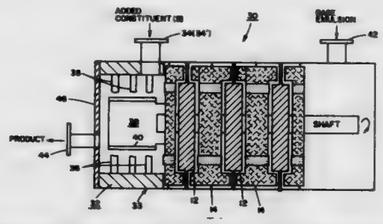
1. A process for treating coffee beans comprising:
increasing the moisture content of green coffee beans contained in the presence of a substantially inert gas atmosphere under a positive pressure for obtaining moisturized beans having a moisture content of at least about 25% by weight based upon the total weight of the moisturized beans;
heating the moisturized beans contained in a substantially inert gas atmosphere to a temperature sufficient and for a time sufficient for hydrolyzing and pyrolyzing the moisturized beans while avoiding charring them; and then
drying the hydrolyzed and pyrolyzed beans to a stable moisture content.

5,114,732
METHOD OF MIXING VISCOUS EMULSIONS

Michael D. Major, Evanston, Ill., and Marion A. Dupre, East Haven, Conn., assignors to Kraft General Foods, Inc., Glenview, Ill.

Filed Apr. 2, 1991, Ser. No. 679,385
Int. Cl.[5] A23L *1/24*
U.S. Cl. 426—605 **6 Claims**

1. A process for the formulation of viscous products possessing specified consistencies and textures; comprising blending a viscous base emulsion in a mixer; continually discharging said blended base emulsion from said mixer into a mixing chamber, said mixing chamber having a housing forming an annular space about a central splined rotor projecting into said mixing chamber, and a plurality of radially inwardly projecting stationary pin members extending from the inner wall of said chamber into proximity with the circumference of said rotor, said continuous feed of viscous base emulsion into said mixing chamber from said mixer being substantially axial into said



annular space intermediate said housing wall and said rotor; and continually introducing into said mixing chamber in a radial orientation at least one further constituent to said base emulsion whereby the base emulsion advancing through said mixing chamber and the further constituent admixed therewith are folded together through the interaction between said pin members and rotor blending and homogenizing said emulsion and further constituent to formulate a product having said specified consistency and texture.

5,114,733
PROCESS FOR PREPARING A SALAD PRODUCT AND AN EMULSION THEREFOR

René Quinet, Oostende, Belgium, assignor to Revi N.V., Oostende, Belgium

Filed Jun. 7, 1990, Ser. No. 534,675
Claims priority, application Belgium, Jun. 8, 1989, 8900625
Int. Cl.[5] A23L *1/24*
U.S. Cl. 426—605 **20 Claims**

1. A process for preparing a stable pasteurized salad product not requiring any preservative, comprising the steps of:
i) preparing an oil emulsion comprising oil, emulsifier, stabilizer, thickener, water, any seasonings, and egg-yolk, wherein:
ia) a mixture is prepared of a part of the oil, emulsifier, stabilizer and thickener;
ib) water is added;
ic) a pre-emulsion is prepared under vacuum;
id) the remainder of the oil and any seasonings are added to the pre-emulsion under vacuum; and then
ie) egg-yolk is added and the mixture is emulsified under vacuum to form the oil emulsion
provided that the emulsifier of step ia) is not egg-yolk;
ii) preparing a salad mixture from the oil emulsion and salad ingredients;
iii) placing and airtight closing of the salad mixture in a container;
iv) pasteurizing the container with the salad mixture under increased pressure; and
v) cooling the pasteurized salad product
such that the pasteurized salad product of v) comprises a stable oil-water emulsion.

5,114,734
MUSHROOM FLAVORANT

Lawrence A. Kibler; Zdenek Kratky, both of New Milford, and John S. Tandy, Litchfield, all of Conn., assignors to Nestec S.A., Vevey, Switzerland

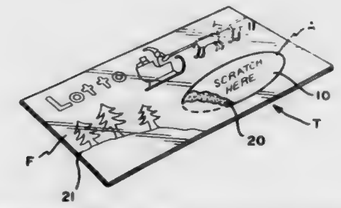
Continuation-in-part of Ser. No. 45,608, May 1, 1987, abandoned. This application Apr. 29, 1988, Ser. No. 188,360
Int. Cl.[5] A23L *1/226*
U.S. Cl. 426—650 **13 Claims**

1. A process for increasing the 1-octen-3-ol content of mushrooms for producing a mushroom flavorant comprising contacting a mushroom homogenate in an aqueous medium with a water-soluble salt of linoleic acid and with oxygen introduced into the homogenate for treating the homogenate for obtaining the flavorant.

5,114,735
FRAGRANCE ENHANCED SCRATCH-OFF LAYER FOR GAME CARDS

Louis Rua, Jr., Plainsboro, and Carl Schaab, Princeton, both of N.J., assignors to Webcraft Technologies, Inc., North Brunswick, N.J.

Division of Ser. No. 449,762, Dec. 12, 1989, Pat. No. 5,000,486. This application Dec. 11, 1990, Ser. No. 625,541
Int. Cl.[5] B44C *1/12*
U.S. Cl. 427—7 **5 Claims**



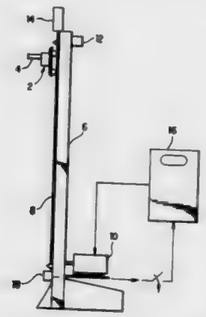
1. A method of making a game card comprising the steps of:
a) producing a blended fragrance-containing opaque material by mixing a liquid scratch-off material with a fragrance constituent;
b) printing fragrance-related and game-related indicia on a support substrate of sheet material;
c) covering at least a portion of said game related indicia with said blended material to produce an opaque layer so that when said layer is scratched off during play, the underlying game-related indicia is revealed and,
d) said fragrance constituent is formed of microencapsulated fragrance material.

5,114,736
METHOD FOR VARYING NOZZLE TRAVERSAL SPEED TO OBTAIN UNIFORM THICKNESS ELECTROSTATICALLY SPRAY COATED LAYERS

Clifford H. Griffiths, Pittsford; Paul J. Brach, Rochester; Edward C. Williams, Palmyra; Ronald A. Gaither, and Timothy J. Leenhouts, both of Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1989, Ser. No. 458,184
Int. Cl.[5] B05D *1/04*
U.S. Cl. 427—30 **6 Claims**

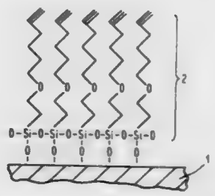
1. A method for coating an electrically grounded elongated cylindrical substrate with a material, said cylindrical substrate being supported at one end by an electrically grounded support, comprising:
atomizing in at least one spray nozzle a liquid coating material to form fluid droplets;
applying an electrical charge of one polarity to said droplets;
directing said droplets toward said electrically grounded elongated cylindrical substrate to form a coating of said coating material on said substrate;
traversing said nozzle along a length of said cylindrical substrate from said one end to another end of said cylindrical substrate; and
varying a speed of traversal of the nozzle as said nozzle traverses the length of said cylindrical substrate by reducing the speed of traversal of the nozzle as said nozzle approaches both of said ends of said cylindrical substrate so as to compensate for variations in electrostatic forces between said cylindrical substrate and said droplets to maintain the thickness of said coating substantially uniform to within 0.2 micron along the length of said cylindrical substrate.



5,114,737
PROCESS FOR PREPARING AN ORGANIC MONOMOLECULAR FILM

Kazufumi Ogawa, Hirakata, and Norihisa Mino, Settsu, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 5, 1991, Ser. No. 651,069
Claims priority, application Japan, Feb. 5, 1990, 2-25415; Feb. 5, 1990, 2-25416
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—36 **105 Claims**



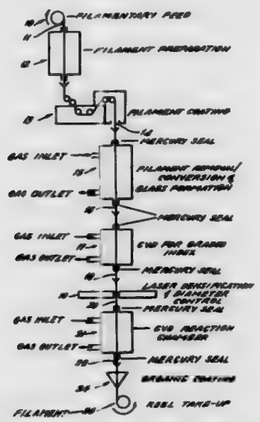
1. A process for preparing an organic monomolecular film comprising:
forming a monomolecular film on the surface of a base plate by adsorbing a chemical adsorbent having at least one triple bond, and a —SiCl group at one molecular end, and
irradiating said monomolecular film with a high energy beam under an inert atmosphere to polymerize said chemical adsorbent at the triple bond, thereby forming a highly oriented conjugated polymer having polyacetylenic bonds.

5,114,738

DIRECT OPTICAL FIBER GLASS FORMATION TECHNIQUES USING CHEMICALLY AND/OR PHYSICALLY REMOVABLE FILAMENTARY SUBSTRATES

Robert O. Savage, Neptune; Robert J. Fischer, and Sam Divita, both of West Long Branch, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 20, 1990, Ser. No. 555,220
Int. Cl.[5] B05D *3/06, 3/02, 5/06;* **B05B** *22/500*
U.S. Cl. 427—37 **30 Claims**



13. A process for forming elongated optical glass fiber comprising the steps of:

(a) providing an elongated core filament of volatilizable material;

(b) coating said core filament along its length with at least one uniform thickness filament coating of optical fiber-forming material;

(c) volatilizing said core filament to change the chemical state of said core filament so that the subsequently completely processed fiber will be capable of conduction of electromagnetic radiation along the length of said optical glass fiber;

(d) converting said optical fiber-forming coating into an optical fiber; and

(e) densifying said fiber along its length to a given diameter.

23. A process for forming elongated optical glass fiber comprising the steps of:

(a) providing an elongated core filament, wherein the core filament is composed of refractory oxides;

(b) continuously coating the core filament along its length with at least one coating of optical fiber-forming material;

(c) continuously chemically combining said at least one coating of optical fiber-forming material with the core filament to form an integrated optical fiber; and

(d) continuously densifying said integrated optical fiber along its length to a given diameter.

5,114,739

PROCESS OF MANUFACTURING A POLYESTER FILM WITH NODULE SURFACE

Edwin C. Culbertson, and John M. Heberger, both of Geer, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 453,728, Dec. 20, 1989, Pat. No. 5,096,784.
This application Oct. 28, 1991, Ser. No. 783,740
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—40 **11 Claims**

1. A process for manufacturing an oriented polyester film having a nodule surface for producing a low coefficient-of-friction surface comprising:

(i) corona treating at least one surface of a polyester film;

(ii) coating said corona treated surface of said polyester film with an emulsion of water and an acrylic composition, said acrylic composition comprising:

(a) from 80 to 97.9 percent by weight, based upon the total weight of said composition, of a methyl methacrylate terpolymer comprising:

(1) from 60 to 90 mole percent of methyl methacrylate;

(2) from 10 to 35 mole percent of at least one modifier selected from the group of ethyl acrylate, propyl acrylate, butyl acrylate, and a mixture of these;



(3) from 1 to 10 mole percent of at least one comonomer selected from the group of N-methylol acrylamide, N-methylol methacrylamide, acrylamide, methacrylamide, and a mixture of these;

(b) from 2 to 15 percent by weight, based upon the total weight of said coating composition, of a nonionic surfactant;

(c) at least from about 0.1 percent by weight, based upon the total weight of said coating composition, of an anionic surfactant,

(iii)drying said coating on said film to form said nodule surface;

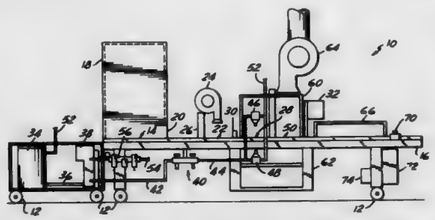
wherein said "nodule" surface is characterized by nodule islands rising from the surface of said film with a minimum surface coverage of about 5 percent.

5,114,740

METHOD AND APPARATUS FOR PROVIDING ANTISTATIC PROTECTION TO PLASTIC LENSES

Richard W. Plate, Brooklyn, and Mark J. Gresser, Ypsilanti, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 13, 1989, Ser. No. 297,457
Int. Cl.[5] B05D *3/06, 5/06*
U.S. Cl. 427—40 **19 Claims**



1. An antistatic treatment apparatus for providing antistatic protection to a plastic lens, said apparatus comprising:

(A) deionizing means for providing a flow of ionized air to at least a first major surface of said lens; and

(B) coating means for then applying a coating of liquid antistatic material to said lens, said coating means comprising an airless spray system for spraying said liquid antistatic material.

11. A process for providing antistatic protection to a plastic lens, said process comprising:

(A) exposing at least a major surface of said lens to a flow of ionized air; and

(B) subsequently applying a coating of liquid antistatic material to said lens by an airless spray system.

5,114,741

PHOTODEFINABLE INTERLEVEL DIELECTRICS

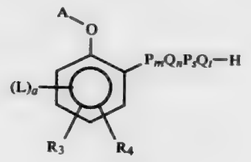
Joseph J. Zupancic, Bensenville, Ill.; Daniel C. Blazej, Annandale, and Howard A. Fraenkel, Lebanon, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 19, 1990, Ser. No. 630,118
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—43.1 **17 Claims**

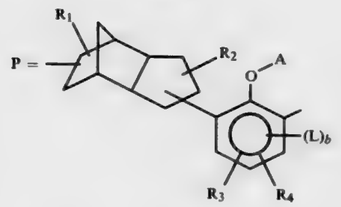
1. A method of forming a polymer on a substrate in a predetermined pattern comprising:

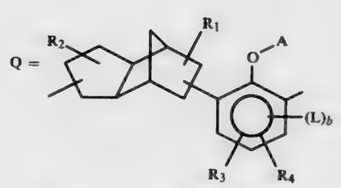
(a) coating a substrate with a mixture of prepolymers which comprises

(1) an ether of the reaction product of dicyclopentadiene with phenol having the formula



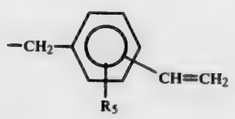
where





with

R_1, R_2=H or alkyl of 1–10 carbon atoms;
R_3=methyl;
R_4=H;
A=H,



an alkyl moiety containing 1 to 10 carbon atoms, a cycloalkyl moiety having 5 to 10 carbon atoms, or benzyl;
L=Br or Cl;
a=0, 1, or 2;
b=0 or 1;
m, n, s, and t are 0 or an integer, and m+n+s+t=z is an integer from 1–10; and

R_3=H, an alkyl moiety of 1–10 carbon atoms, a halogen or alkoxy moiety, or a monovalent aromatic radical;

(2) an ether of the oligomeric condensation product of

a) molar proportion of a dialdehyde and

b) from about 3 to about 4 molar proportions of a phenol; when the dialdehyde is selected from the group consisting of $OHC(CH_2)_rCHO$, where r=0 or an integer from 1 to 6, cyclopentanedialdehyde, phthalaldehyde, isophthalaldehyde, terephthalaldehyde, hexahydrophthalaldehyde, cycloheptanedialdehyde, hexahydroisophthalaldehyde, hexahydroterephthalaldehyde, and cyclooctanedialdehyde; where the phenol has the structure $R_6C_6H_4$ and R_6 is hydrogen or an alkyl group containing from 1 to about 10 carbon atoms; and where the phenol residue of said oligomeric condensation product is etherified with one or more substituents to afford ether moieties randomly selected from the group consisting of vinylbenzyl, alkyl moieties containing from 1 to 10 carbon atoms, cycloalkyl moieties from 5 to 10 carbon atoms, and benzyl, with the ratio of vinylbenzyl to other moieties being from 1:1 to about 6:1;

(b) irradiating the coated prepolymer of (a) through a masking pattern to selectively crosslink the portion of said coating being irradiated;

(c) selectively dissolving the non-irradiated part of the prepolymer coating of (a); and

(d) curing the crosslinked portion of the prepolymer coating by heating at a temperature in the range of 100° to 300° C. for a time sufficient to further crosslink said crosslinked coating and to transform the prepolymer to an infusible glassy solid.

5,114,742

METHOD OF PREPARING A SCANDATE CATHODE BY IMPREGNATING A POROUS TUNGSTEN BILLET WITH $Ba_3AL_2O_6$, COATING THE TOP SURFACE WITH A MIXTURE OF SC_6WO_{12},$SC_2(WO_4)_3$, AND W IN A 1:3:2 MOLE RATIO, AND HEATING IN

Louis F. Branovich, Howell; Gerard L. Freeman, Freehold, and Donald W. Eckart, Wall, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 17, 1991, Ser. No. 731,601
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—77 **3 Claims**

1. Method of preparing a scandate cathode having an increased emission density from a porous tungsten billet that has been impregnated with $Ba_3AL_2O_6$ including the steps of

(A) coating the top surface of the impregnated billet with a mixture of Sc_6WO_{12}, $SC_2(WO_4)_3$, and W in the mole ratio of 1:3:2,

(B) heating the billet to about 1000° C. in a vacuum to cause $BaWO_4$ and Sc to form in the coated billet in a mole ratio of 1:1,

(C) removing the coated billet and cleaning in a jewelers lathe, and

(D) preparing the billet for a cathode environment wherein heat is applied to the coated billet to drive electrons from the surface of the coated billet and to act as a scandate cathode.

5,114,743

METHOD OF MAKING NITRIDE AND OXIDE ELECTRODES ON A SOLID ELECTROLYTE

Neill Weber, Murray, Utah, assignor to BETA Power, Inc., Salt Lake City, Utah

Filed Nov. 20, 1989, Ser. No. 438,067
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—77 **30 Claims**

1. A method for forming a nitride film electrode on a surface of a solid electrolyte substrate, comprising the steps of:

suspending a metallic powder in a liquid having a binder dissolved therein;

forming a coating of the liquid suspension on the surface of the electrolyte, the liquid and binder being evaporable without substantial carbonization as it is heated past a first elevated temperature;

heating the coating in a hydrogen atmosphere to a selected second elevated temperature in a range from 800° C. to 1100° C. and higher than the first elevated temperature for converting the coating to a bonded film and for increasing bondability of the film to the electrolyte without the electrolyte losing ion conducting properties;

subjecting the film in the hydrogen atmosphere to the selected second elevated temperature for a first time period to effect a required degree of bonding of the film to the electrolyte; and

subjecting the film at the expiration of the first time period to a nitrogen atmosphere for a second time period effective to convert the bonded film to a nitride film.

5,114,744

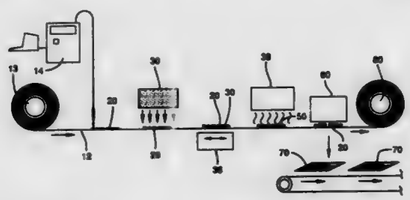
METHOD FOR APPLYING A CONDUCTIVE TRACE PATTERN TO A SUBSTRATE

Frank L. Cloutier, Singapore; Ching K. Chieng, Bukit Merah Central, and Siow W. Min, Singapore, all of Singapore, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 397,145, Aug. 21, 1989, abandoned. This application Nov. 7, 1990, Ser. No. 614,067

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—96 **6 Claims**



6. A method for applying conductive traces to a substrate comprising:

providing a substrate;

providing a supply of ink comprising about 5–40% by weight adhesive therein, said ink having a viscosity of about 5–25 cps and a surface tension of about 30–60 dynes/cm;

supplying said ink to a thermal ink jet printing apparatus;

activating said apparatus in order to deliver said ink to said substrate in a pattern;

providing a metal alloy power having a melting point of about 100–250 degrees C;

applying said metal alloy power onto said pattern in an amount sufficient to cover said pattern, said metal alloy powder adhering to said adhesive in said ink;

agitation said substrate with said pattern and said metal alloy powder thereon in an amount sufficient to displace any excess amounts of said metal alloy powder from said pattern; and

heating said substrate with said pattern and said metal alloy powder thereon at a temperature of about 100–250 degrees C for about 0.5–10 minutes so as to melt said metal alloy powder directly onto said pattern in order to form a metal layer on top of said pattern from the melted metal alloy powder, thereby creating an arrangement of conductive traces on said substrate identical with said pattern.

5,114,745

METHOD OF PRODUCING A THIN CARBIDE LAYER ON A CARBON SUBSTRATE, GROWING A DIAMOND OR DIAMOND-LIKE FILM ON THE CARBIDE LAYER, AND REMOVING THE CARBON SUBSTRATE

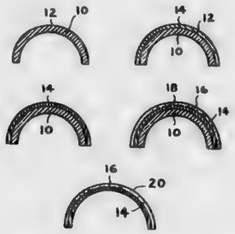
Barbara L. Jones, 80 Chisbury Place, Forest Park, Bracknell, RG12 3TX, England

Filed May 30, 1990, Ser. No. 530,658

Claims priority, application United Kingdom, May 31, 1989, 8912498

Int. Cl.[5] B05D *5/12, 3/06*

U.S. Cl. 427—113 **7 Claims**



1. A method of producing a diamond or diamond-like film having a desired profile includes the steps of providing a solid carbon substrate having a surface shaped to the desired profiled, producing a thin carbide layer on the profiled surface, growing a diamond or diamond-like film on the carbide layer and removing the substrate, wherein the solid substrate and/or carbide layer are removed by a method selected from machining, milling, etching and a combination thereof.

5,114,746

CABLE COATED WITH AT LEAST TWO CONCENTRIC LAYERS OF POLYMERIC MATERIAL AND PROCESS OF MAKING SAME

John O'Leary, Northcote, and Erik Adams, Kensington, both of Australia, assignors to ICI Australia Operations Proprietary Limited, Melbourne, Australia

Filed Dec. 7, 1989, Ser. No. 446,565

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—118 **24 Claims**

1. A process of manufacture of a cable comprising at least one elongate functional element which is coated with at least two concentric layers of polymeric material, the exterior layer comprising at least one polyamide of high surface gloss, hardness and resistance to formic acid, and the inner layer immediately adjacent to the exterior layer comprising essentially olefin polymer which comprises from 0.001% to 30.0% by weight of polar monomer selected from unsaturated acids and acid anhydrides, the layers being applied in a single operation wherein at least one of the polymeric materials is in a fluid state when the two polymeric materials are contacted.

5,114,747

TREATMENT OF HOT MELT INK IMAGES

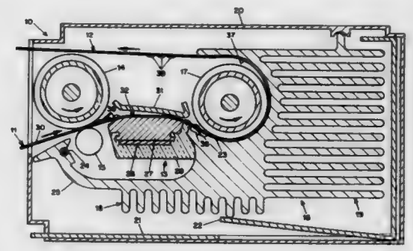
Steven J. Fulton, Hanover; Gerald T. Peters, Jr., Canaan, both of N.H.; Charles W. Spehrley, Jr., Hartford, Vt., and Lawrence R. Young, West Lebanon, N.H., assignors to Spectra, Inc., Hanover, N.H.

Division of Ser. No. 416,158, Oct. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 230,797, Aug. 10, 1988, Pat. No. 4,873,134. This application Feb. 6, 1991, Ser. No. 651,302

Int. Cl.[5] B05D *3/00, 3/02, 5/06*

U.S. Cl. 427—164 **6 Claims**

1. A method for providing a substrate with a coating of a hot melt ink having reduced light transmission losses caused by crystallization and frosting of the ink comprising maintaining the molten hot melt ink coating on the substrate for a selected time without cooling the substrate and thereafter cooling the



ink coating at a rate of at least 50° C. per second to minimize said crystallization and frosting.

5,114,748

METHOD OF PREPARING OR RUBBING A SUBSTRATE TO BE USED IN A LCD DEVICE BY SPRAYING IT WITH UNIFORMLY SIZED DROPLETS OR FROZEN WATER

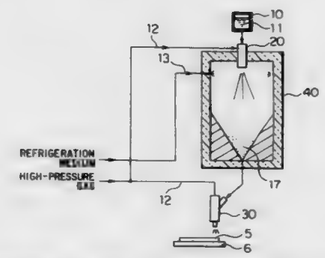
Masuo Tada, Yao; Hiroi Takahiko, Osaka; Takaaki Fukumoto, Itami; Toshiaki Ohmori, Itami, and Itaru Kanno, Itami, all of Japan, assignors to Taiyo Sanso Co. Ltd. and Mitsubishi Denki Kabushiki Kaisha, both of, Japan

Filed Nov. 29, 1990, Ser. No. 647,478

Claims priority, application Japan, Dec. 8, 1989, 1-320179

Int. Cl.[5] B05D *1/12; C09K 19/56*

U.S. Cl. 427—180 **8 Claims**



1. A method of treating a surface of substrate for a liquid crystal display device for orienting a liquid crystal material applied to the surface comprising:

spraying a liquid to form droplets having a substantially uniform size;

freezing the droplets to form frozen particles, each particle having substantially the same diameter, by heat exchange between the droplets and a refrigeration medium; and

ejecting, at a desired angle, the frozen particles onto the surface of a substrate for a liquid crystal display device to orient a liquid crystal material applied to the surface.

5,114,749

METHOD FOR MANUFACTURING CARBON MATERIAL HAVING GOOD RESISTANCE TO OXIDAITON BY COATING THE CARBON MATERIAL WITH AN INORGANIC POLYSILAZANE AND THEN HEATING

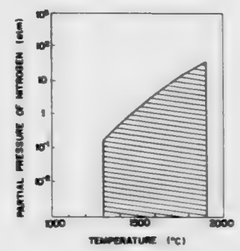
Hiroaki Nishio; Keiji Watanabe, and Michitaka Sato, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Jul. 18, 1990, Ser. No. 554,697

Claims priority, application Japan, Aug. 1, 1989, 1-197934; Aug. 1, 1989, 1-197935

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—226 **20 Claims**



1. A method for manufacturing carbon material having good resistance to oxidation, comprising the steps of:

coating carbon material with an inorganic polysilazane;

heating said carbon material coated with said inorganic polysilazane in an inert atmosphere to form amorphous silicon nitride on the surface of said carbon material; and

reheating said heated carbon material in a non-nitriding and non-oxidizing atmosphere, the amorphous silicon nitride being decomposed and silicon carbide being formed on the surface of said carbon material, said reheating being conducted at a temperature of 1300° C. to 1900° C. and said non-nitriding and non-oxidizing atmosphere having a partial pressure of nitrogen determined with reference to a graph wherein the abscissa is temperature in °C. and the ordinate is partial pressure of nitrogen in atmospheres, said partial pressure being defined within an area under a line connecting a first point corresponding to 1300° C. and 0.1 atmospheres and a second point corresponding to 1900° C. and 20 atmospheres.

5,114,750

TUNGSTEN AND TUNGSTEN NITRIDE COATINGS FOR METALS AND CERAMICS

Kevin E. Howard, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 6, 1990, Ser. No. 609,670

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—226 **6 Claims**

1. A method of coating a metal or ceramic body for protection against mechanical and thermal deterioration comprising:

(A) applying to the surface of said ceramic or metal body a precursor coating from a solution of a metal-organic compound, which is the reaction product of an alkyl or aryl amine and tungsten hexahalide, and

(B) heating said metal or ceramic body containing said precursor coating under an inert gas atmosphere at a temperature of about 600°–1200° C. to convert said precursor coating to tungsten or a mixture of tungsten and tungsten nitride.

5,114,751

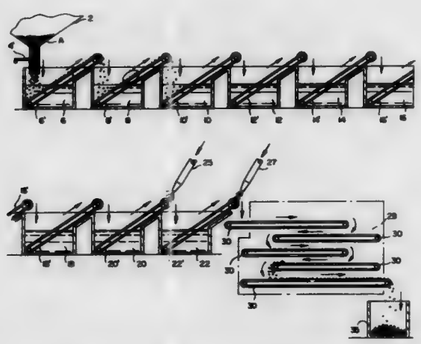
APPLICATION OF AN ORGANIC COATING TO SMALL METAL ARTICLES

Bashir M. Ahmed, Ambler; Barry P. Gunagan, Hatboro, both of Pa., and Wilbur S. Hall, Springvale, Me., assignors to Henkel Corporation, Ambler, Pa.

Continuation of Ser. No. 426,146, Oct. 24, 1989, abandoned. This application Sep. 6, 1991, Ser. No. 759,096

Int. Cl.[5] B05D *1/02*

U.S. Cl. 427—242 **20 Claims**



1. A process for forming an organic coating on a plurality of small metallic articles by contacting the articles with a liquid coating composition containing an organic film forming material, said process comprising:

(A) providing a plurality of said articles, with at least some of the articles being in contact with at least one other of said articles;

(B) immersing the plurality of articles into a bath of said composition under conditions such that the articles are not in contact with another article in said composition;

(C) maintaining the articles in separated form and in free fall under gravitational force in said composition for a period of time sufficiently long for the entirety of the surfaces of the articles to be coated with said composition, thereby forming on the articles an organic coating which is capable of coalescing into a continuous film;

(D) collecting the coated articles in the bath in a form in which at least some of the coated articles are in contact with another of said coated articles;

(E) withdrawing from said composition said coated articles, including those in contact with other of said articles; and thereafter

(F-1) rinsing said coated articles with water and forming said continuous film from said coating; or

(F-2) forming said continuous film on said coated articles under conditions such that the coated articles are not in contact with another article;

wherein the coating composition is capable of forming on a steel panel immersed therein a coating having a wet strength such that its rinse resistance is at least about 30 seconds.

5,114,752

METHOD FOR GAS-AIDED DISPENSING OF LIQUID MATERIALS

Robert C. Hall, Strongville, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Division of Ser. No. 283,259, Dec. 12, 1988, Pat. No. 4,987,854. This application Dec. 21, 1990, Ser. No. 633,049

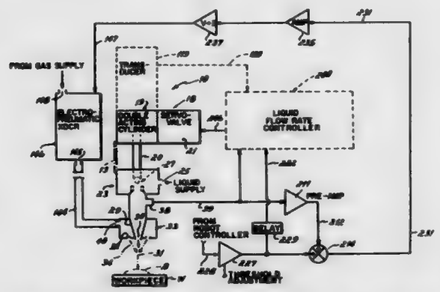
Int. Cl.[5] B05D *3/12, 5/00, 1/02*

U.S. Cl. 427—273 **13 Claims**

1. A method of dispensing fluid material onto a workpiece, said method comprising the steps of:

(a) discharging a stream of the material under pressure from a nozzle outlet, said pressure being subject to pressure drops;

(b) effecting relative movement between the nozzle and the workpiece to deposit said material in the form of a bead upon the workpiece;



(c) directing a flow of gas toward at least one of, said stream and said bead to impart a desired conformation to said bead, and

(d) reducing said flow of gas in response to the sensed occurrence of said pressure drops.

5,114,753

METHOD AND APPARATUS FOR COATING WEB WHILE PREVENTING CONTACT OF EDGE PORTIONS THEREOF WITH COATING HEAD

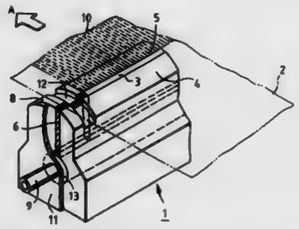
Norio Shibata; Tsunehiko Sato; Naoyoshi Chino, and Yasuhito Hiraki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 454,237, Dec. 21, 1989, abandoned. This application Oct. 16, 1991, Ser. No. 777,628

Claims priority, application Japan, Dec. 21, 1988, 63-320546; Feb. 16, 1989, 1-34940

Int. Cl.[5] B05D *5/00, 1/26;* B05C *3/18, 3/20*

U.S. Cl. 427—286 **24 Claims**



1. A coating method comprising the steps of:

continuously running a flexible support with the slot of a coating head abutted against said flexible support, said coating head having a doctor edge portion and a back portion, said doctor edge portion being forward of said back edge portion in a direction of travel of said flexible support, said slot being defined between said doctor edge portion and said back edge portion;

applying coating solution to said flexible support with said coating head through said slot;

supporting edges of said flexible support on said coating head so that, of both edge portions of said flexible support to which no coating solution is applied, first parts which are close to a coating portion of said flexible support are held out of sliding contact with both ends of said coating head by recesses formed in said both ends of said coating head, and second parts outside of said first parts are supported by shoulder portions of said head formed outside said recesses; and

blocking the flow of said coating solution through said slot in areas adjacent said edge portions of said flexible support to which no coating solution is applied to thereby define a coating width with a pair of regulating boards disposed between said doctor edge portion and said back edge portion.

5,114,754

PASSIVATION OF METAL IN METAL/POLYIMIDE STRUCTURES

John E. Cronin, Arrowhead Estates; Paul A. Farrar, Sr., South Burlington; Harold G. Linde, and Rosemary A. Previti-Kelly, both of Richmond, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 14, 1991, Ser. No. 641,036

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—333 **28 Claims**

1. A process for forming a polyimide layer on a substrate comprising a metal surface, comprising the steps of:

applying to said substrate an organic solution, prepared by reacting an aminoalkoxysilane monomer and water in a solvent;

heating said substrate under such conditions as to form a layer of cured silsesquioxane polymer, containing reactive amino groups which coordinate to said metal, so as to passivate said metal and inhibit interaction between said metal and a polyimide precursor material to be applied;

applying to said cured layer a solution comprising a polyimide precursor material; and

heating said substrate under such conditions as to imidize said polyimide precursor material.

5,114,755

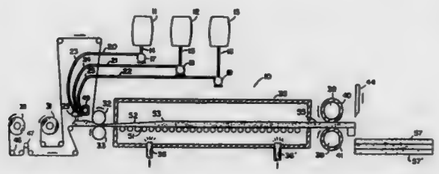
PROCESS FOR MAKING A LAMINATE AND THE LAMINATE MADE THEREBY

John S. Canaday, Tampa, and Ernest K. Moss, Clearwater, both of Fla., assignors to Sloss Industries Corporation, Birmingham, Ala.

Division of Ser. No. 353,297, May 17, 1989, Pat. No. 5,001,165, which is a continuation of Ser. No. 781,622, Sep. 30, 1985, abandoned. This application Oct. 22, 1990, Ser. No. 600,653

Int. Cl.[5] B32B *27/40, 27/00*

U.S. Cl. 427—373 **20 Claims**



1. In a process for producing a laminate comprising

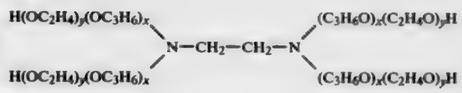
(A) contacting at least one facing sheet with a foam-forming mixture selected from the group consisting of polyisocyanurate and polyurethane foam-forming mixtures comprising an organic polyisocyanate, a blowing agent, a catalyst and a polyol component, the improvement which comprises utilizing a blend comprising:

(a) about 10 to 50 percent by weight of a halogenated organic blowing agent, and

(b) about 90 to 50 percent by weight of a polyol component comprising:

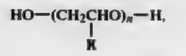
(1) about 10 to 95 percent by weight of a polyester polyol,

(2) about 1 to 50 percent by weight of a compatibilizer consisting essentially of a polyoxyalkylene polyol of the formula



wherein x is sufficiently large to provide a molecular weight of the oxypropylene chains of a least about 250 and wherein y is sufficiently large to provide about 10 to 90% of the total molecular weight of the compound,

(3) about 0 to 35 percent by weight of an alkylene glycol having the formula



wherein R is hydrogen or lower alkyl of one to four carbon atoms and n is from 1 to 10, and

(4) about 0 to 70 percent by weight of at least one other polyether polyol, and

(B) foaming said foam-forming mixture.

5,114,756

CONDUCTIVE EPOXYPOLYAMIDE COATING COMPOSITION

Mary N. Mirabeau, Glen Mills, Pa., and Frank Rohrbacher, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 515,401, Apr. 27, 1990, Pat. No. 5,051,209. This application May 10, 1991, Ser. No. 698,271

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—379 **15 Claims**

1. A process for finishing the exterior surface of an automobile component to form a multilayer composition which comprises

(1) applying a conductive coating composition to the exterior surface of the component;

(2) curing the coating at a temperature of about 80°–125° C. for about 15–45 minutes.

(3) applying a pigmented liquid enamel basecoat and over the basecoat applying an enamel liquid clear coat and curing both coats at a temperature of about 80°–125° C. to provide basecoat/clearcoat finish on said component;

wherein the conductive coating composition comprises a film forming binder in an organic liquid carrier and pigment in a pigment to binder weight ratio of about 15:100 to 100:100; wherein the binder consists essentially of

(A) 40–70% by weight of an amine component having at least two reactive amine groups selected from the group consisting of an amine, polyamide, polyamido amine resin or mixtures thereof; and

(B) 30–60% by weight of an epoxy resin having at least two epoxy groups per resin molecule;

wherein the pigment comprises an electrically conductive pigment that comprises silica selected from the group consisting of amorphous silica, a silica containing material or silica coated pigment, said silica being in association with a two-dimensional network of antimony-containing tin oxide crystallites in which the antimony content ranges from about 1–30% by weight of the tin oxide and the composition forms a coating having a surface conductivity of at least 100 Randsburg units.

5,114,757

ENHANCEMENT OF POLYIMIDE ADHESION ON REACTIVE METALS

Harold G. Linde, HCR, Box 188, and Rosemary A. Previti-Kelly, R.D. 1, Box 213-7, both of Richmond, Vt. 05477

Filed Oct. 26, 1990, Ser. No. 604,702
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—387 **28 Claims**

1. A process for improving the adhesion of a polyimide layer to a metal surface, comprising the steps of:

applying to said surface an organic solution, prepared by reacting an aminoalkoxysilane monomer, an arylalkoxysilane or arysilazane monomer and water in a solvent;

heating said surface under such conditions as to form a partially cured layer on said surface;

applying to said partially cured layer a solution comprising a polyimide precursor material; and

heating said surface under such conditions as to simultaneously form a layer of cured silsesquioxane copolymer, containing reactive amino groups which coordinate to said metal, and which passivates said metal and a polyimide layer.

5,114,758

PROCESS FOR PRODUCING RESIN FOR PAPER COATING

Shigeru Ura, Nara; Haruo Tanaka, Osaka; Hisao Takagishi, Kyoto; Hiroko Fukuyama, Osaka; Takuya Fukuyama, Osaka, and Yuko Fukuyama, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Division of Ser. No. 586,399, Sep. 18, 1990, which is a continuation of Ser. No. 914,010, Oct. 28, 1986, abandoned. This application Mar. 13, 1991, Ser. No. 700,944
Claims priority, application Japan, Oct. 28, 1985, 60-242529; Oct. 29, 1985, 60-242400; Nov. 15, 1985, 60-257437; Nov. 21, 1985, 262284; Nov. 21, 1985, 60-262285; Nov. 21, 1985, 60-262286
Int. Cl.[5] B32B *9/00*
U.S. Cl. 427—391 **5 Claims**

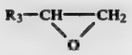
1. A process for preparing a coated paper which comprises coating a paper with a water soluble resin which is obtained by reacting (a) a polyalkylenepolyamine, (b) an alicyclic dibasic carboxylic acid and/or a reaction product having a free carboxyl group that is obtained by reacting an alicylic dibasic carboxylic acid with a glycol having two carboxyl groups directly attached to the alicylic ring, wherein the carboxyl groups in the alicylic dibasic carboxylic acid are connected directly with the alicyclic ring, (c) a urea, and (d) an aldehyde and/or an alkylating agent selected from compounds represented by the formula:

$$R_1—X$$

wherein R_1 represents a lower alkyl group, an alkenyl group, a benzyl group or a phenoxyethyl group; and X represents a halogen atom; compounds represented by the formula:

$$(R_2O)_2SO_v$$

wherein R_2 represents a lower alkyl group; and v represents 1 or 2; compounds represented by formula:



wherein R_3 represents a hydrogen atom, a lower alkyl group, a hydroxyalkyl group or a phenyl group; compounds represented by formula:



wherein X represents a halogen atom; and w represents 1, 2 or 3, compounds represented by formula:

$$HOCH_2(CH_2)_wX$$

wherein X and w are as defined above, compounds represented by formula:



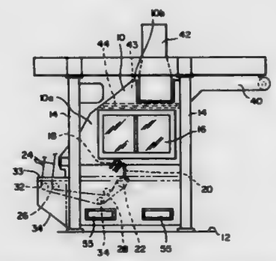
wherein X is as defined above; and either one of Y and Z represents a halogen atom, with the other being a hydroxyl group, and mixtures thereof.

5,114,759

APPARATUS AND METHOD FOR CURTAIN COATING

Douglas S. Finnicum; Edward R. Schickler, both of Webster; William J. Soules, and Robert A. Wahlers, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 559,806, Jul. 30, 1990, abandoned. This application Jul. 12, 1991, Ser. No. 729,115
Int. Cl.[5] B05D *1/30*
U.S. Cl. 427—420 **16 Claims**



9. A method of coating a web or object with a liquid, including:

providing a hopper for forming a layer of liquid and for forming said layer into a curtain falling under gravity;

supporting and moving said web or object through the curtain;

providing an enclosure around said hopper and the curtain and the web or object where it is impinged by the liquid in the curtain;

introducing a flow of air into an upper region of the enclosure; and

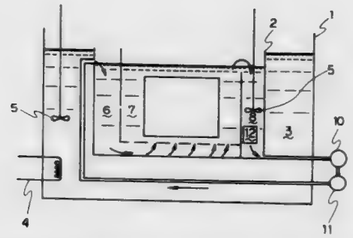
allowing air to flow out of a lower region of the enclosure, whereby the flow of air is substantially vertically downwards in the region of the curtain and is of such low velocity that distrubance of the curtain is avoided.

5,114,760

METHOD FOR MANUFACTURING LAYER-BUILT MATERIAL WITH SILICON DIOXIDE FILM CONTAINING ORGANIC COLORANT AND THE LAYER-BUILT MATERIAL MANUFACTURED THEREBY

Kazuo Takemura, Takarazuka; Juichi Ino, Nishinomiya; Hideo Kawahara, Mino, and Masaki Kitaoka, Nishinomiya, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Mar. 29, 1990, Ser. No. 500,987
Claims priority, application Japan, Apr. 1, 1989, 1-83816; Jun. 29, 1989, 1-167366; Jun. 29, 1989, 1-167367; Jun. 29, 1989, 1-167368; Aug. 7, 1989, 1-204214; Aug. 23, 1989, 1-217124; Aug. 24, 1989, 1-218054; Sep. 5, 1989, 1-229694; Sep. 13, 1989, 1-238295; Sep. 13, 1989, 1-238296
Int. Cl.[5] B05D *1/8*
U.S. Cl. 427—430.1 **21 Claims**



1. A method for forming a colored silicon dioxide film comprising the steps of:

saturating an aqueous solution of hydrosilicofluoric acid with silicon dioxide;

supersaturating the resulting saturated solution by adding an additive to the saturated solution or by heating the saturated solution;

adding an organic colorant to the saturated or supersaturated solution; and

immersing a substrate in the resulting supersaturated solution containing the organic colorant, thereby depositing a silicon dioxide film containing the organic colorant onto the substrate.

5,114,761

DECORATIVE DRAWSTRING BOW FORMING RIBBON ASSEMBLY

Henry T. Doherty, Franklin Lakes, N.J., assignor to Berwick Industries Inc., Pa.

Filed May 21, 1991, Ser. No. 703,658
Int. Cl.[5] D04D *7/10*
U.S. Cl. 428—4 **14 Claims**

1. In a bow-forming ribbon assembly comprising:

a longitudinal-extending decorative flexible ribbon having opposite side edges and a central longitudinal axis;

a plurality of cutouts within opposite side edges of said ribbon at longitudinally spaced positions forming narrow necks joining uncut portions of said ribbon intermediate of said cut-outs;

a longitudinally extending drawstring fixed at one end to said longitudinally extending decorative flexible ribbon and extending along said ribbon; and

a retainer encircling each neck and said drawstring at said neck, such that said drawstring runs freely through said retainer, whereby; pulling of the free end of the drawstring causes loops to be formed by said uncut portions of said ribbon within said assembly by stacking of the retainers in proximity to each other, the improvement wherein;

said cutouts extend from said opposite side edges laterally beyond the longitudinally center line such that necks alternate asymmetrically to opposite sides of the longitudinal center line such that said loops, are automatically spaced angularly around the longitudinally axis of the



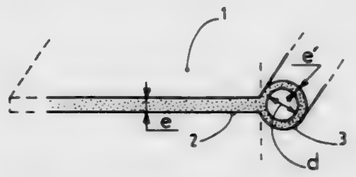
bow-forming ribbon assembly during the formation of the bow.

5,114,762

PROCESS FOR MANUFACTURING COMPOSITE TUBES

Maurice Boutems, and Denis Desmicht, both of Pagny sur Moselle, France, assignors to Le Carbone Lorraine, Courbevoie, France

Filed Oct. 31, 1990, Ser. No. 606,902
Claims priority, application France, Nov. 14, 1989, 89 15284
Int. Cl.[5] B29C *53/42*
U.S. Cl. 428—34.5 **13 Claims**



1. A process for manufacturing a tube of composite material, comprising the steps of:

providing a reinforcing sheet of defined width and thickness and first and second ends, the thickness of said sheet being slit parallel to the width of the sheet over a portion of the width and near said first end of the width, thereby forming a casing portion of the sheet where slit, and a strip portion of the sheet where not slit,

said casing portion having walls defining a uniform and smooth interior surface of a geometry adapted to a known mandrel;

impregnating said reinforcing sheet with a resin to form a prepreg;

inserting said known mandrel into said casing portion;

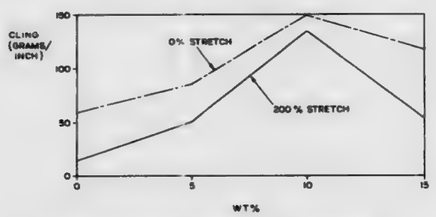
rotating said mandrel to thereby roll said strip portion around said mandrel;

placing said rolled prepreg and mandrel in a plastic case;

cross-linking the resin which impregnates the sheet; and

removing the mandrel from the sheet with cross-linked impregnated resin to form a tube.

5,114,763
TACKIFIED POLYETHYLENE LAYERS IN STRETCH/CLING FILMS
Patrick Brant, Seabrook, and Paul M. German, Friendswood, both of Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.
Filed Dec. 28, 1990, Ser. No. 635,194
Int. Cl.[5] B65B *53/00*
U.S. Cl. 428—34.9 **23 Claims**



1. A stretch/wrap thermoplastic film, comprising:
a cling layer comprising a blend of (i) polyethylene having a density of from about 0.87 to about 0.92 g/cc, a melt index of from about 0.1 to about 30 dg/min, and a ratio of weight average molecular weight to number average molecular weight (M_w/M_n) less than about 6, and (ii) a compatible hydrogenated cycloaliphatic hydrocarbon tackifier, said blend having a glass transition temperature of about −20° C. to about 0° C., said tackifier having a Tg of between about −50° C. to about 50° C.

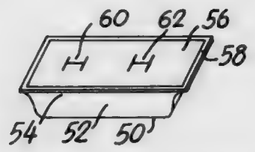
5,114,764
CURABLE KETIMINOXY/ORGANOPOLYSILOXANE COMPOSITIONS DEVOID OF ORGANOMETALLIC CURING CATALYSTS
Patrice Perrin, Lyons, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France
Division of Ser. No. 661,296, Feb. 27, 1991. This application Sep. 16, 1991, Ser. No. 760,128
Claims priority, application France, Feb. 27, 1990, 90 02697
Int. Cl.[5] B65D *65/00*; A61L *15/00*
U.S. Cl. 428—35.5 **5 Claims**

1. A cured elastomeric organoopolysiloxane composition devoid of any organo metallic curing catalyst, which comprises (A) an α,ω-dihydroxydiorgano polysiloxane polymer, (B) a ketiminoxysilane crosslinking agent, (C) inorganic filler material; (D) an organofunctional silane other than the ketiminoxysilane claimed as component (B) and (E) a substituted hydroxylamine.

5,114,765
LARGE-SIZED CONTAINER
Jun Inada; Shinichi Sato; Ryoichi Shimizu, all of Yokkaichi; Akinobu Kitani, and Kunio Nakano, both of Ube, all of Japan, assignors to Tosoh Corporation; Ube Industries, Ltd., both of Yamaguchi and Sumitomo Corporation, Osaka, all of, Japan
Filed Sep. 18, 1990, Ser. No. 584,218
Claims priority, application Japan, Sep. 22, 1989, 1-246871
Int. Cl.[5] B29D *22/00*; B32B *27/08*
U.S. Cl. 428—35.7 **13 Claims**

1. A large-sized container made of a laminate comprising;
a layer (A) including a modified polyolefin modified with 0.005 to 1.0 wt. % unsaturated carboxylic acid or derivative thereof, having a melt flow rate determined under a load of 2.16 kg of 0.01 to 10 g/10 min and a melt flow rate determined under a load of 21.6 kg of 0.5 to 50 g/10 min and having a Mw/Mn>17 and Mz/Mw>7, and
a layer (B) including a modified polyamide comprising (a) 50 to 95 wt. % polyamide and (b) 5 to 50% polyolefin modified with 0.005 to 1.0 wt. % unsaturated carboxylic acid or derivative thereof, having a melt flow rate determined under a load of 2.16 kg of 0.01 to 10 g/10 min, the mixture of (a) and (b) having a melt flow rate determined at a temperature of 235° C. under a load of 2.16 kg of 0.01 to 7.0 g/10 min.

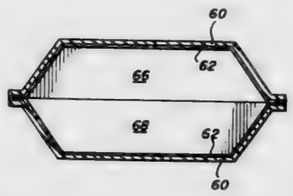
5,114,766
CONTAINER PROVIDED WITH A MULTILAYER COVER WITH VENTING PROVISIONS AND RELATED METHOD
Pierre J. Jacques, 10 Coptor Ct., Huntington, N.Y. 11743
Filed Jul. 13, 1990, Ser. No. 553,167
Int. Cl.[5] B65B *25/22*; B65D *51/16, 65/10*
U.S. Cl. 428—35.7 **18 Claims**



1. A package comprising a container provided with an opening and including a peripheral edge portion encircling said opening, and a multilayer sheet coupled to said edge portion in hermetically sealed relation, said sheet including first and second layers connected in face-to-face relationship with said first layer being heat sensitive and melded to said edge portion, said first layer being adjacent said container and obturating said opening, said second layer being provided with a slit arrangement defining at least one displaceable flap, said first layer sealing the slit arrangement but being relatively thin and responsive to a buildup of pressure within said container to rupture in correspondence with said slit arrangement and displace said flap whereby to vent said container, the first and second layers including faces which are connected together except in an area encompassing said slit arrangement, said package further comprising a third layer connected in face-to-face relation with said second layer and also provided with said slit arrangement; said third layer being relatively heat resistant and shape retentive, said third layer including at least one flap in registration with the first said flap displaceable therewith, said first and third layers being on opposite faces of said second layer, said first layer being maintained in position by said second and third layers.

5,114,767
PROCESS FOR TWIN-SHEET FORMING HIGH HEAT DISTORTION TEMPERATURE THERMOPLASTIC MATERIAL AND ARTICLES THEREFROM
Evan M. Berns, Cheshire, Conn., and Angelika H. Clark, Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.
Filed Feb. 9, 1990, Ser. No. 477,784
Int. Cl.[5] B29D *22/00*
U.S. Cl. 428—35.7 **4 Claims**

2. A hollow, twin sheet, thermoformed structure comprising:
a) a first outer shell layer of thermoplastic material having a heat distortion temperature of at least 300° F.,
b) a second outer shell layer of thermoplastic material having a heat distortion temperature of at least 300° F., and
c) a third layer of a thermoplastic material having a heat distortion temperature of at most 280° F.,
said third layer being disposed between said first and second layers and providing adhesion between said first outer shell layer and said second outer shell layer at the peripheries of said first and second layers and conforming to the shape of said first outer shell layer or said second outer shell layer in the hollow region of the structure.

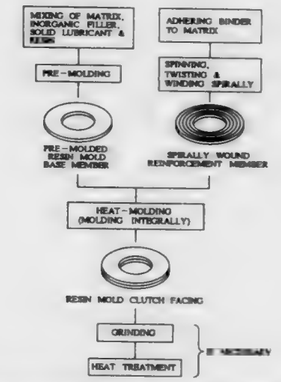


5,114,768
SURFACES WITH REDUCED PROTEIN INTERACTIONS
Sally A. Swedberg, Santa Cruz, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Continuation-in-part of Ser. No. 7,234,456, Aug. 19, 1988, Pat. No. 4,931,328. This application Apr. 11, 1990, Ser. No. 507,937
Claims priority, application PCT Int'l Appl., Jun. 2, 1988, PCT/US88/01877
The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.
Int. Cl.[5] B29D *22/00*; C25D *13/00*
U.S. Cl. 428—36.91 **22 Claims**

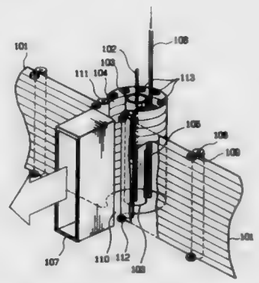
1. An article of manufacture being exposed to protein solutes in use comprising:
a solid surface defined by or carrying a polymer, the polymer selected from the group consisting of nylon, styrene, phenyl silicones, acrylics, polyurethanes, polycarbonates, polyesters, silicon alkoxy elastomers, and fluorocarbons, an interfacial layer covalently bound to the polymer at a plurality of attachment points and effective to reduce interactions between the surface and protein solutes, the interfacial layer including a hydratable amphoteric phase or a plurality of halogen atoms bound in the interfacial layer through at least one heteroatom.

5,114,769
RESIN MOLD CLUTCH FACING
Harunobu Kani, Toyota, and Kenji Kakihara, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Continuation of Ser. No. 155,059, Feb. 11, 1988, abandoned. This application Jan. 25, 1990, Ser. No. 469,680
Claims priority, application Japan, Feb. 18, 1987, 62-35371
The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.
Int. Cl.[5] B32B *5/02*; D04H *3/02*; F16D *11/00, 13/00*
U.S. Cl. 428—37 **10 Claims**

1. A resin mold clutch facing integrally heat molded out of a resin mold base member and a reinforcement member, wherein,
said resin mold base member consists essentially of a matrix composed of a mixture of short fibers, an inorganic filler, a solid lubricant, and a thermosetting resin binder;
said reinforcement member consists essentially of a matrix composed of a string-shaped strand or yarn roving and a binder resin containing a rubber component and adhered to said matrix of said reinforcement member, said matrix of said reinforcement member being shaped in a spirally wound configuration, and said reinforcement member being integrally heat molded with said resin mold base member.



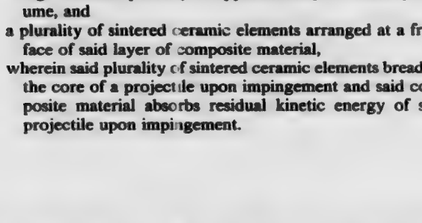
5,114,770
METHOD FOR CONTINUOUSLY FORMING FUNCTIONAL DEPOSITED FILMS WITH A LARGE AREA BY A MICROWAVE PLASMA CVD METHOD
Hiroshi Echizen, Tokyo; Yasushi Fujioka; Katsumi Nakagawa, both of Nagahama; Masahiro Kanai, Tokyo; Toshimitsu Kariya, Nagahama; Jinsho Matsuyama, Nagahama, and Tetsuya Takei, Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 26, 1990, Ser. No. 543,431
Claims priority, application Japan, Jun. 28, 1989, 1-166233; Aug. 14, 1989, 1-207852
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—38 **25 Claims**



1. A method for continuously forming a functional deposited film with a large area according to a microwave plasma CVD process, which method comprises the steps of:
continuously traveling a band-shaped member containing a conductive member along its length during which a pillar-shaped film-forming space capable of being kept substantially in vacuum therein is established by the use of the traveling band-shaped member as a side wall for the film-forming space;
charging starting gases for film formation through a gas feed means into the film-forming space;
and simultaneously radiating a microwave in all directions through a microwave antenna which is extended into the pillar-shaped film forming space and is substantially parallel to said sidewall so that microwave power is supplied to

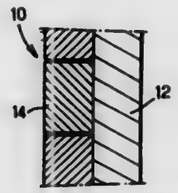
the film-forming space to intiate a plasma in the space whereby the film is deposited on the surface of the continuously traveling band-shaped member which constitutes the side wall exposed to the plasma.

5,114,771
PERFORATOR BLADE FOR PAPER PRODUCTS AND PRODUCTS MADE THEREFROM
Randy G. Ogg, Cincinnati, and Mark A. Habel, Oxford, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Dec. 11, 1990, Ser. No. 625,511
Int. Cl.[5] B32B *3/10*
U.S. Cl. 428—43 **5 Claims**



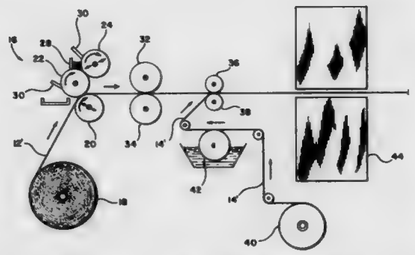
1. A core wound paper product having adjacent sheets defined and divided by transverse perforations, said perforations comprising alternately spaced cuts and lands, each of said cuts having a width of less than about 0.9 millimeters, and each of said lands having a width less than about 0.5 millimeters, said paper product having a total land width of less than about 30.5 millimeters per 11.33 centimeters of width of said paper product.

5,114,772
PROTECTIVE MATERIAL HAVING A MULTILAYER CERAMIC STRUCTURE
Michel Vives, Eysines; Pierre Taveau, Le Bouscat; Jacques Etienne, Eysines; Yves Remillieux, Sur Yvette, and Lucien Charbonnel, Maurice Montcouronne, all of France, assignors to Societe Europeenne De Propulsion, Suresnes, France
Continuation of Ser. No. 451,440, Dec. 15, 1989, abandoned. This application Aug. 15, 1991, Ser. No. 746,213
Claims priority, application France, Dec. 19, 1988, 88 16753
Int. Cl.[5] F41H *5/04*; B32B *3/10, 3/14*
U.S. Cl. 428—49 **7 Claims**



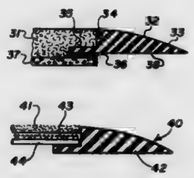
1. A ceramic protective material comprising:
a layer of composite material comprising a fibrous reinforcement arrangement densified by a ceramic matrix and having a residual porosity of approximately 10–15% by volume, and
a plurality of sintered ceramic elements arranged at a front face of said layer of composite material,
wherein said plurality of sintered ceramic elements bread up the core of a projectile upon impingement and said composite material absorbs residual kinetic energy of said projectile upon impingement.

5,114,773
RESILIENT COMPOSITE OPEN-CELL FOAM STRUCTURE AND METHOD OF MAKING SAME
John Bogdany, Ft. Oglethorpe, Ga., assignor to Resilient Systems, Inc., Dalton, Ga.
Continuation-in-part of Ser. No. 331,183, Mar. 31, 1989, Pat. No. 4,957,798, which is a continuation-in-part of Ser. No. 163,010, Mar. 2, 1988, abandoned. This application Aug. 17, 1990, Ser. No. 568,770
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—95 **22 Claims**



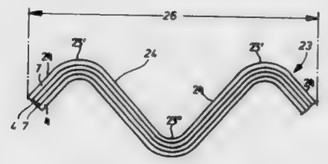
1. A carpet underlay cushion structure comprising:
a carrier layer of open-cell resilient foam material having an initial thickness, said resilient foam material being substantially completely and uniformly impregnated with an impregnant composition containing a polymer which is cured after said impregnation, wherein the open cells of said carpet underlay cushion structure partially comprise said foam material of said carrier layer, and wherein said cured polymer impregnant retains said carpet underlay cushion structure comprising said carrier layer and said cured polymer impregnant at a finished thickness less than said initial thickness of said carrier layer, and wherein the carpet underlay cushion structure possesses substantially the mechanical and physical properties of the polymer impregnant and wherein said carpet underlay cushion structure retains an open cell configuration at said finished thickness.

5,114,774
ABSORBENT FLOOR MAT
Henry A. Maxim, Jr., Salem, Ohio, assignor to Maxim Sorbents, Inc., Salem, Ohio
Continuation-in-part of Ser. No. 245,827, Sep. 16, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 485,218
Int. Cl.[5] B32B *3/06, 3/02, 33/00*; B05D *1/14*
U.S. Cl. 428—101 **8 Claims**



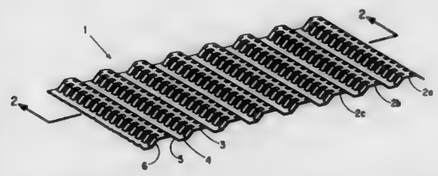
1. A floor mat for placement upon a base floor subject to unclean or wet environments, said mat comprising a fiber-containing removable portion removably attached to an upper surface portion and at least partially bounded by an edging portion, said fiber-containing removable portion being removably attached to said edging portion or said upper surface, said removable portion comprised of an absorbent material adapted for absorbing liquids and for permitting drainage of liquid therethrough, said upper surface portion adapted to reduce incidence of pedestrian skidding relative to base floor surface on which said mat is placed.

5,114,775
GRIPPER ROD FOR SHUTTLELESS LOOMS AND METHOD FOR MAKING THE GRIPPER ROD
Rainer Goell, Weissenberg, Fed. Rep. of Germany; Philip White, Chandler, Ariz., assignors to Lindauer Dornier Gesellschaft m.b.H, Lindau, Fed. Rep. of Germany.
Filed Apr. 25, 1990, Ser. No. 514,081
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1989, 3913602
Int. Cl.[5] B32B *5/12*
U.S. Cl. 428—107 **20 Claims**



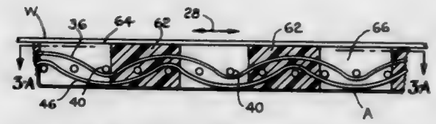
1. A gripper rod for a shuttleless loom, comprising a corrugated stack of fiber composite layers forming a toothed rack, each layer including reinforcing fibers embedded in a matrix material cured for bonding said layers to one another, said fibers having such an orientation in each layer, at least prior to said bonding and prior to any compressing of said layers for forming said stack, that the fibers in any layer extend in a direction that crosses the fiber direction in at least one directly neighboring layer at a crossing angle, and wherein said crossing angle is changed by said compressing without stretching said fibers by said compressing.

5,114,776
CORRUGATED THERMOPLASTIC SHEET HAVING FLUID FLOW PASSAGES
Anthony J. Cesaroni, 9 Heathmore Court, Unionville, Ontario, Canada L3R 8J1
Filed Jun. 28, 1990, Ser. No. 545,087
Claims priority, application United Kingdom, Jul. 28, 1989, 8917241
Int. Cl.[5] B32B *3/10*
U.S. Cl. 428—131 **9 Claims**



1. A corrugated sheet having a plurality of corrugations formed from a thermoplastic polymer composition and having a plurality of fluid-flow passages through each corrugation, each corrugation having peaks and troughs with slopes between them, the slope of each corrugation having a plurality of slits in side-by-side arrangement extending through the sheet, the fluid-flow passages being formed by alternate displacement of the thermoplastic polymer between successive slits and being staggered relative to passages on adjacent corrugations said sheet being flexible, elastomeric and/or compressible,

5,114,777
WOVEN MULTILAYER PAPERMAKING FABRIC HAVING INCREASED STABILITY AND PERMEABILITY AND METHOD
Hermann Gaisser, Sondelfingen, Fed. Rep. of Germany, assignor to Wangner Systems Corporation, Greenville, S.C.
Filed Aug. 5, 1985, Ser. No. 763,039
Int. Cl.[5] D03D *3/04*; D21F *3/02, 7/08*
U.S. Cl. 428—137 **23 Claims**

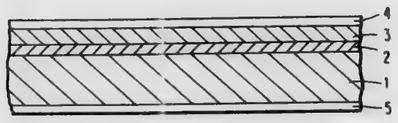


1. A permeable woven multilayer papermaking fabric having increased fabric stability in the machine direction of a papermaking machine, said fabric being of the type which includes a paper support side and a roller contact side facilitating travel as an endless belt in said machine direction wherein said woven fabric comprises:
a first warp layer of first load bearing warp yarns extending in said machine direction on said paper support side of said fabric;
a second layer of second load bearing warp yarns extending in said machine direction on said roller contact side of said fabric;
stacked warp yarn pairs defined by respective ones of said first and second warp yarns of said first and second warp layers arranged in a generally vertically stacked superposed position one over the other along the entire fabric length;
said stacked warp yarn pairs being arranged relative to one another in a cross-machine direction in said fabric to provide desired fabric permeability;
a warp balancing weft yarn interwoven with said first and second warp layers to bind said respective ones of said first and second warp yarns in said stacked pairs; and
said warp balancing weft yarn interwoven in a warp balancing weave pattern with said stacked pairs of warp yarns which maintain said warp yarns stacked upon one another and in general vertical alignment in said weave pattern;
whereby a fabric having increased fabric stability in the machine direction and a desired permeability is provided.

12. A method of weaving a multilayered papermaking fabric having a weave pattern which provides increased fabric stability in a machine direction and fluid permeability comprising:
weaving a first warp layer having first load bearing warp yarns extending in said machine direction;
weaving a second warp layer having second load bearing warp yarns extending in said machine direction;
weaving a weft yarn in the cross-machine direction with said warp yarns in said first and second layers;
weaving respective ones of said first and second warp yarns of said first and second warp layers on top of each other to define stacked pairs of warp yarns in said weave pattern along the entire fabric length;
weaving said weft yarn in a cross-machine direction with said first and second load bearing warp yarns in said first and second layers in a pattern to balance and maintain said warp yarns in said stacked pairs; and
arranging said stacked pairs of warp yarns relative to each other in said cross-machine direction to provide a desired fabric permeability while providing said increased fabric stability in said machine direction.

14. The method of claim **12** wherein said stacked pairs of warp yarns are arranged in said cross-machine direction to provide a projected fabric open area of thirty percent or more of the total fabric area.

5,114,778
MAGNETIC RECORDING MEDIUM
Akio Yanai, and Tadashi Yasunaga, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 24, 1988, Ser. No. 261,068
Claims priority, application Japan, Oct. 23, 1987, 62-267702
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—141 **3 Claims**



1. A magnetic recording medium comprising a non-magnetic support having provided thereon an underlayer and a magnetic layer composed of a thin ferromagnetic metal film in that order, said underlayer being composed mainly of a resin compound having on the surface thereof an uneven orange peel texture, wherein said underlayer has an average surface area of a unit cell of the uneven orange peel texture of from 3×10^{-6} to 3×10^{-3} mm^2 and has a surface roughness of from 0.01 to 0.1 μm.

5,114,779
SHAPED THERMOPLASTIC MATERIAL WITH FILLERS AND METHOD OF MAKING THE SAME
Siegfried Hopperdietzel, Selb, Fed. Rep. of Germany, assignor to Rehau AG & Co., Rehau, Fed. Rep. of Germany
Filed Sep. 18, 1990, Ser. No. 584,082
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1989, 3931074
Int. Cl.[5] B29C *47/04*
U.S. Cl. 428—144 **18 Claims**

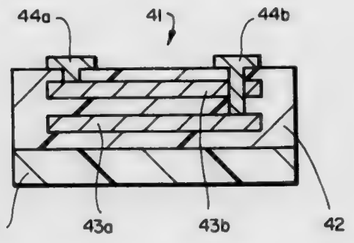
1. A method of making a shaped thermoplastic article, comprising the following steps:

(a) mixing metal coated plastic filler particles of a size between about 0.1 mm and about 0.7 mm with a thermoplastic material, said metal coated plastic filler particles present in a percentage of between about 5 weight percent and about 15 weight percent compared to the weight of the thermoplastic material, for affecting a surface roughness of the article, and said metal coating of said metal coated plastic filler particles being a vapor deposited metal coating;

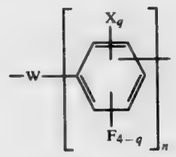
(b) extruding the mixture resulting from step (a) to obtain the shaped thermoplastic article comprising said thermoplastic material and said metal coated plastic filler particles, said metal coated plastic filler particles being distributed throughout said shaped thermoplastic article, said surface roughness of the shaped thermoplastic article having a depth between about 10 and 40 μm; and

(c) maintaining the temperature of the mixture during the performance of steps (a) and (b) below the melting temperature of said metal coated plastic filler particles.

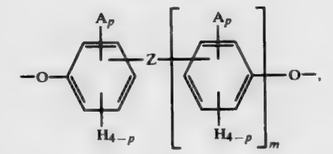
5,114,780
ELECTRONIC ARTICLES CONTAINING A FLUORINATED POLY(ARYLENE ETHER) DIELECTRIC
Frank W. Mercer, Belmont; Timothy D. Goodman, Redwood City; Aldrich N. K. Lau, Palo Alto; Lanchi P. Vo, San Jose, and Richard C. Sovish, Los Altos, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation-in-part of Ser. No. 510,386, Apr. 17, 1990, abandoned, and a continuation-in-part of Ser. No. 510,353, Apr. 17, 1990, abandoned, and a continuation-in-part of Ser. No. 447,750, Dec. 8, 1989, abandoned. This application Sep. 17, 1990, Ser. No. 583,900
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 **31 Claims**

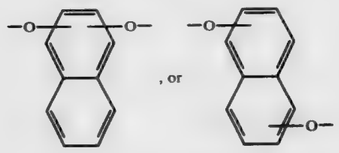


1. A multichip module comprising a substrate, a plurality of semiconductor chips carried on the substrate, and a multilayer interconnect which connects the semiconductor chips and comprises plural layers of conductive material and plural layers of a dielectric material, wherein the dielectric material comprises a fluorinated poly(arylene ether) comprising a repeat unit of the structure



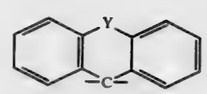
wherein —W— is





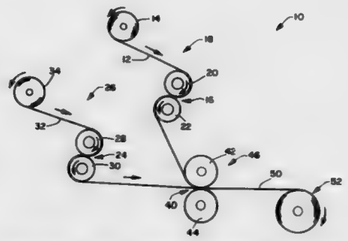
, or

wherein each —A is independently —F, —Cl, —Br, —CF_3, —CH_3, —$CH_2CH{=}CH_2$, or —C_6H_5; p is 0, 1, or 2; —Z— is a direct bond, —$C(CH_3)_2$—, —$C(CF_3)_2$—, —O—, —S—, —SO_2—, —CO—, —$P(C_6H_5)$—, $C(CH_3)(C_6H_5)$, —$C(C_6H_5)_2$—, —$(CF_2)_{1\text{-}6}$—, or



wherein —Y— is —O— or a direct bond; and m is 0, 1, or 2; each —X is independently —H, —Cl, —Br, —CF_3, —CH_3, —$CH_2CH{=}CH_2$, or —C_6H_5; q is 0, 1, or 2; and n is 1 or 2.

5,114,781
MULTI-DIRECTION STRETCH COMPOSITE ELASTIC MATERIAL INCLUDING A REVERSIBLY NECKED MATERIAL
Michael T. Morman, Alpharetta, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 15, 1989, Ser. No. 451,281
The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.
Int. Cl.[5] B32B *27/14*
U.S. Cl. 428—198 **26 Claims**

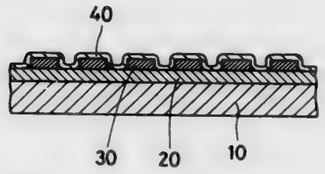


1. A composite elastic material capable of stretching in at least two directions comprising:

at least one elastic sheet; and

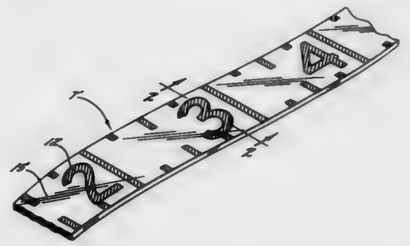
at least one reversibly necked material joined to the elastic sheet at least at three locations arranged in a non-linear configuration, the reversibly necked material being gathered between at least two of the locations.

5,114,782
PROCESSED PAPER FOR DOCUMENTS PROTECTED FROM BEING REPRODUCED
Kazumasa Nagafuchi, Hyogo, Japan, assignor to Kisokaseisangyou Co., Ltd., Osaka, Japan
Filed Jan. 9, 1990, Ser. No. 462,707
Claims priority, application Japan, Nov. 9, 1989, 1-291922
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—207 **10 Claims**



1. A processed paper for documents protected from being reproduced, said processed paper comprising a paper substrate having a front surface, an orange, brown or red colored ink layer, coated over all of said front surface and a silvery ink layer coated in a pattern of grain or mesh over all of said colored ink layer.

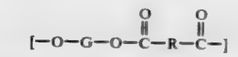
5,114,783
PROTECTIVE COATING SYSTEM FOR IMPARTING RESISTANCE TO ABRASION, IMPACT AND SOLVENTS
William P. Hodnett, III, Martinsville, Va., assignor to Thor Radiation Research, Inc., Martinsville, Va.
Filed Aug. 23, 1988, Ser. No. 235,917
Int. Cl.[5] B32B *7/02, 27/00*
U.S. Cl. 428—217 **15 Claims**



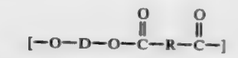
1. An abrasion resistant clear, transparent and non-yellowing coating system for imparting a highly scratch resistant, chemical resistant, impact resistant protective finish to a substrate comprising an outer coating layer of hard radiation cured acrylic copolymer derived from at least 40 percent by weight of a multi-functional acrylate monomer of three to six functional groups and a lesser proportion of a monofunctional acrylate monomer, adhered to a base coating layer of softer radiation cured urethane copolymer derived from at least 40 percent by weight of an acrylated urethane resin and a lesser proportion of said multi-functional acrylate monomer of three to six functional groups.

5,114,784
MOLDING MADE FROM A FOAM PLASTIC, AND THE PRODUCTION THEREOF
Henricus J. M. Van de Ven, and Erik de Haan, both of Arnhem, Netherlands, assignors to Akzo N.V., Velperweg, Netherlands
Filed Nov. 1, 1990, Ser. No. 607,672
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1989, 3937107
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—246 **11 Claims**

1. A molding made from a foam plastic having an integrated covering comprising a laminate having a layer of a copolyether ester which comprises a multiplicity of recurring intralinear long-chain ester units and short-chain ester units connected randomly head-to-tail by ester bridges, the long-chain ester units conforming to the formula



and the short-chain ester units conforming to the formula



in which G is a divalent radical produced by removing terminal hydroxyl groups from at least one long-chain glycol which has a molecular weight in the range from 800 to 6000 and has a carbon:oxygen atomic ratio in the range from 2.0 to 4.3, at least 15% by weight of the long-chain glycol having a carbon-:oxygen ratio in the range from 2.0 to 4.0, R is a divalent radical produced by removing carboxyl groups from at least one dicarboxylic acid having a molecular weight of less than 300, and D is a divalent radical produced by removing hy-

droxyl groups from at least one diol which has a molecular weight of less than 250, at least 80% of the dicarboxylic acid used comprising one of terephthalic acid and an ester-forming equivalent thereof, and at least 80 mol % of the low-molecular weight diol comprising one of a 1,4-butanediol and an ester-forming equivalent thereof, the sum of the mole percentages of the dicarboxylic acid other than terephthalic acid or an ester-forming equivalent thereof and of the low-molecular-weight diol other than 1,4-butanediol or an ester-forming equivalent thereof being not greater than 20, and the short-chain ester units forming from 40 to 85% by weight of copolyether ester.

8. The molding as claimed in claim 1, wherein the copolyether ester layer is a constituent of a laminate additionally containing at least one of a textile layer and a foam plastic layer.

5,114,785

SILICON BASED INTERMETALLIC COATINGS FOR REINFORCEMENTS

M. A. Tenhover, Solon, and D. B. Lukco, Sagamore Hills, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 9, 1990, Ser. No. 594,248
Int. Cl.[5] B32B *7/00, 9/00*; D02G *3/00*; C04B *35/02*
U.S. Cl. 428—263 **21 Claims**

1. A coated reinforcement comprising a fiber reinforcement having a Si-containing coating of the general formula:

$$A_xSi_{100-x}$$

wherein

A is selected from the group consisting of Au, Pt, Ru, Rh, Ir, Ni, Pd and combinations thereof; and

x is in the range of greater than zero to about 40, said reinforcement is selected from the group consisting of Si_3N_4, SiAlON, Si, AlON, B_4C and SiC.

5,114,786

FLAME RETARDANT POLYAMIDE FABRICS

Henry Louis, Wyckoff, N.J., assignor to Apex Chemical Corp., Elizabethport, N.J.

Filed Jun. 25, 1990, Ser. No. 543,226
Int. Cl.[5] C09K *21/08*; D06M *11/57, 13/21*
U.S. Cl. 428—270 **13 Claims**

1. A process for imparting a wash-durable flame retardant finish to a fabric comprising a synthetic polyamide which comprises subjecting said fabric to an effective amount of an aqueous ionizable tetrabromophthalate in the presence of an effective uptakeaccelerating amount of magnesium sulfate at a pH having a maximum of about 2 and at a temperature between about 80° and 120° C.

12. A treating bath for the flame retarding of a polyamide which comprises the composition of claim 1.

13. A flame retardant polyamide fabric as produced by the process of claim 1.

5,114,787

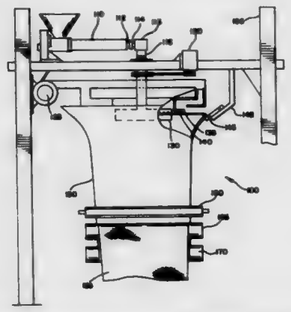
MULTI-LAYER NONWOVEN WEB COMPOSITES AND PROCESS

Mitchell E. Chaplin, Powder Springs; Geraldine M. Eaton, Acworth; Brian A. Hickie, Atlanta; Peter W. Pascavage, Marietta, and Jessie Tyson, Clarkston, all of Ga., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 483,113, Sep. 21, 1990. This application May 23, 1991, Ser. No. 704,816
Int. Cl.[5] B32B *27/34*
U.S. Cl. 428—284 **20 Claims**

1. A multi-layer nonwoven web composite comprising,

at least one layer of a uniform basis weight, self-bonded, fibrous, nonwoven web comprising a plurality of substantially randomly disposed, substantially continuous thermoplastic filaments wherein said web has a Basis Weight Uniformity Index of 1.0±0.05 determined from average



basis weights having standard deviations of less than 10%, adhered to

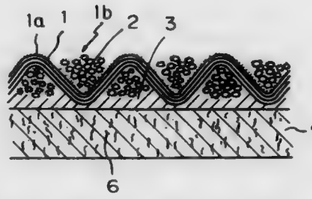
at least one layer of a carded web of staple fibers.

5,114,788

FABRIC HAVING WATER ABSORPTION PROPERTY AND METHOD OF MANUFACTURING THE FABRIC

Yukio Nakagawa, Katano; Syoji Koizumi, Izumi; Masao Miyake, Otsu; Teruo Akita, Kusatsu, and Tomohisa Uno, Koga, all of Japan, assignors to Asahi Kasei Textile Ltd., Tokyo, Japan

Filed Oct. 13, 1989, Ser. No. 421,109
Claims priority, application Japan, Oct. 17, 1988, 63-259409; Apr. 28, 1989, 1-109959
Int. Cl.[5] B32B *27/00, 9/00*
U.S. Cl. 428—284 **14 Claims**



1. A fabric comprising a base fabric and a chitin group substance applied through a synthetic resin to the base fabric, said synthetic resin being at least one selected from polyurethane resin, a polyacrylic resin, a polyvinyl chloride resin, a modified polyamide resin, a polyacrylic ester resin and a polyvinyl alcohol.

5,114,789

PROTECTIVE AND DECORATIVE SHEET MATERIAL HAVING A TRANSPARENT TOPCOAT

Gerald G. Reafler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 116,426, Nov. 3, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 287,417
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—328 **10 Claims**

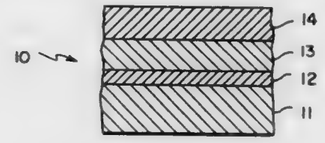
1. A protective and decorative sheet material for covering substrates comprising:

a thin flexible carrier film;

a protective and decorative paint layer adhered to one surface of said carrier film; said paint layer containing generally flat light reflective flakes;

a transparent topcoat layer overlying said paint layer, said topcoat layer having a thickness of at least about 0.1 millimeter;

said sheet material having a substantially unstressed relaxed state and a relaxed area; said sheet material being heat softenable to a substantially plastic state in which it is plastically extendable and formable over irregular surfaces to an extended state having an extended area at least 50% greater than said relaxed area; and



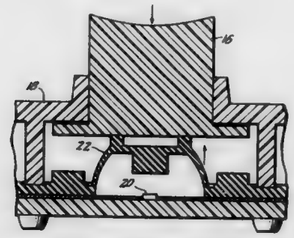
said paint layer being adhered to said carrier film and said topcoat layer being adhered to said paint layer and both layers having a substantially uniform quality and appearance in both said relaxed and extended states of said sheet material.

5,114,790

KEYBOARD WITH CONDUCTIVE RESILIENT PAD

Daniel P. Corbett, Bridgewater, Mass., assignor to Acushnet Company, New Bedford, Mass.

Filed Nov. 10, 1988, Ser. No. 269,939
The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.
Int. Cl.[5] B32B *9/00, 27/08*
U.S. Cl. 428—408 **8 Claims**



1. In a keyboard having activation devices activated by keys and having a conductive resilient pad between said keys and said activation device, the improvement comprising a one-piece conductive resilient pad comprising about 25 to about 75 parts of an ethylene-propylene terpolymer; about 75 to about 25 parts of a copolymer of propylene oxide and allyl glycidyl ether; and about 1 to about 30 parts of a carbon black having a BET (N_2) surface area between about 700 and about 1500 m^2/g and a bulk density between about 100 and about 200 g/l.

5,114,791

TWO-COMPONENT INJECTION MOLDING WITH POLYARYLENE SULFIDES

Kurt-Rainer Stahlke, Kuerten; Klaus Reinking, Wermelskirchen; Erhard Tresper; Klaus Kraft, both of Krefeld, and Axel Kaminski, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 2, 1989, Ser. No. 305,075
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804536
Int. Cl.[5] C08G *75/14*
U.S. Cl. 428—419 **4 Claims**

1. In an improved two-component, core-shell, injection-molded article wherein both the two components are thermoplasts,

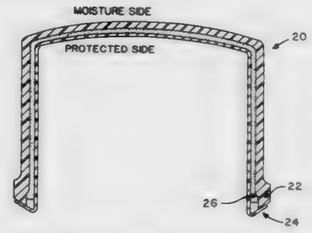
the improvement comprises polyarylene sulfide being at least one of the two components.

5,114,792

MOISTURE RESISTANT LAMINATED COVER ELECTRONIC UTILITY METER

William H. McWilliams, Pittsburgh, Pa.; Charles L. Hamermesh, Malibu, Calif., and Evan B. Welch, Medway, Mass., assignors to M&FC Holding Company, Inc., Wilmington, Del.

Division of Ser. No. 353,872, May 18, 1989, Pat. No. 5,080,744. This application Apr. 4, 1991, Ser. No. 680,338
Int. Cl.[5] B32B *27/00*; G01F *15/00*
U.S. Cl. 428—422 **9 Claims**



1. A moisture barrier laminated structure comprising:

a sheet of transparent plastic;

a sheet of polychlorotrifluoroethylene; and

a curable adhesive, interposed between the interfacial surfaces of said sheet of plastic and said sheet of polychlorotrifluoroethylene;

wherein the assembled structure is cured, said assembled structure retaining its optical clarity.

5,114,793

MAGNETIC RECORDING MEDIUM COMPRISING A SPECIFIED POLYURETHANE BINDER

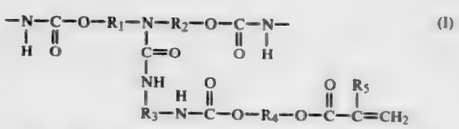
Tomoyuki Okada, Ottawa, Canada; Naoki Kannen, Utsuomiya, Japan; Tadashi Nishimori, and Rikio Tsushima, both of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 187,975, Apr. 29, 1988, abandoned. This application Jun. 18, 1991, Ser. No. 715,739
Claims priority, application Japan, May 6, 1987, 62-110347; Jul. 24, 1987, 184734; Jul. 24, 1987, 62-184736
Int. Cl.[5] G11B *5/00*
U.S. Cl. 428—425.9 **8 Claims**

1. A magnetic recording medium which comprises a nonmagnetic support and a magnetic layer coated on said nonmagnetic support,

said magnetic layer comprising a binder and powder of a ferromagnetic substance dispersed in said binder,

said binder comprising a crosslinked product of a polyurethane having an average molecular weight of 900 to 50,000 and comprising at least one unit having the formula (I)



and wherein R_1, R_2 and R_4 are each an alkylene, R_3 is a hydrocarbon group derived from a di-isocyanate compound, and R_5 is hydrogen or methyl, said unit of formula (I) having —OH, —NCO or —OOC—Cr_5=CH_2 at both

terminals of the main chain thereof, provided that the terminals of the main chain thereof are not —NCO when the molecular weight of the polyurethane is in the range of from 900 to less than 10,000.

5,114,794

MODIFIED POLYSILOXANE-COATED SANITARY RUBBER ARTICLE AND A PROCESS FOR THE PRODUCTION OF THE SAME

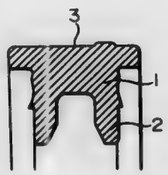
Morihiro Sudo, Sumida; Tomoyasu Muraki, Abiko; Eiji Kawachi, Kiryu, and Yasushi Kawachi, Ashikaga, all of Japan, assignors to Daikyo Gomu Seiko Ltd., Tokyo, Japan

Filed Jun. 21, 1988, Ser. No. 209,639

Claims priority, application Japan, Jun. 23, 1987, 62-154272; Sep. 2, 1987, 62-218026

Int. Cl.[5] B32B *25/08, 27/08*

U.S. Cl. 428—447 **10 Claims**



1. A sanitary rubber article, the rubber surface of which is coated, through bridging and bonding, with a modified polysiloxane composition comprising a modified polysiloxane having at least one modifying group selected from the group consisting of alkenyl, acryloyl, vinyloxy, maleimide and phenylketone groups in the molecule.

5,114,795

MULTILAYERED HIGH BARRIER PACKAGING MATERIALS METHOD FOR THE PREPARATION THEREOF

Elena S. Percec, Pepper Pike; Lucy Melamud, Beachwood, and Gerald P. Coffey, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 17, 1968, Ser. No. 258,621

The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.

Int. Cl.[5] B32B *27/08, 27/06*

U.S. Cl. 428—516 **17 Claims**

1. Multilayered high barrier film products comprising:
at least a first polymer film having low permeability to moisture; and,
a polymer blend film comprising;
from about 80 to 99 parts by weight of a high nitrile gas barrier polymer produced by polymerizing a major proportion of a monounsaturated nitrile, a minor proportion of another monovinyl monomer copolymerizable therewith optionally in the presence of a diene rubber, and
from about 1 to 20 parts by weight of a second polymer selected from the group consisting of polyolefins having from 2 to about 6 carbon atoms, functionalized with an unsaturated compound selected from the group consisting of unsaturated carboxylic acids, esters, anhydrides, and imides for compatibility with said gas barrier polymer so as to allow said polymer blend film to adhere to said first polymer film.

5,114,796

FAST CURING AND STORAGE STABLE THERMOSET POLYMER THICK FILM COMPOSITIONS

Richard L. Frentzel, Chino Hills, and Warren R. Oakdale, Upland, both of Calif., assignors to Advanced Products Inc., Cheshire, Conn.

Division of Ser. No. 510,382, Apr. 17, 1990, Pat. No. 4,057,245. This application Jul. 29, 1991, Ser. No. 737,119

Int. Cl.[5] B32B *27/30, 27/42*

U.S. Cl. 428—521 **14 Claims**

1. A substrate having a cured conductive polymer thick film coating thereon which comprises a cured admixture of:
(a) a cured resin system comprising a reaction product of:
(i) about 3–15 parts by weight of at least one poly(hydroxystyrene) resin; and
(ii) a crosslinking resin selected from the group consisting of:
(aa) about 5–25 parts by weight of at least one blocked isocyanate resin;
(bb) about 2–10 parts by weight of at least one melamine-formaldehyde resin;
(b) a conductive material selected from the group consisting of:
(i) about 50–80 parts by weight silver flakes; and
(ii) an admixture of about 15–45 parts by weight graphite and about 1–10 parts by weight carbon black.
(iii) a mixture of (i) and (ii).

5,114,797

METAL STRUCTURAL COMPONENT HAVING A HEAT INSULATING TITANIUM FIRE INHIBITING PROTECTIVE COATING

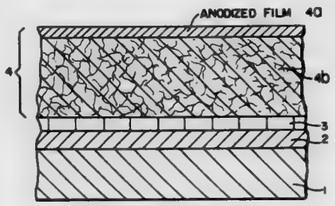
Thomas Uihlen, Dachau, and Klaus Schweitzer, Niederpoecking, both of Fed. Rep. of Germany, assignors to MTU Motoren- und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 30, 1991, Ser. No. 693,818

Claims priority, application Fed. Rep. of Germany, May 10, 1990, 4015010

Int. Cl.[5] B22F *7/04;* **B32B** *15/20*

U.S. Cl. 428—553 **10 Claims**



1. A metal structural component, comprising a protective coating on its surface, said protective coating comprising a first metallic base layer (2) intimately bonded to said surface of said structural component, a second intermediate heat insulating single ply oxidic layer (3) covering said base layer (2), said base layer providing a tenacious bonding between said intermediate heat insulating layer (3) and said structural component, and a third metallic cover layer (4) on said intermediate layer, said third metallic cover layer comprising aluminum oxide lamellae uniformly distributed and embedded inside said cover layer, whereby a three layer structure is formed for inhibiting titanium fires.

5,114,798

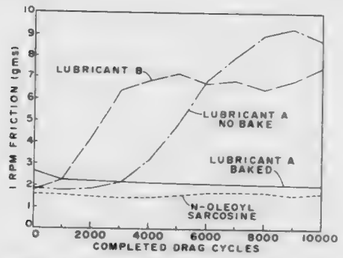
MEMORY DISC LUBRICATED BY N-ACYL SARCOSINE DERIVATIVE

Mei-Yuan Tsai, Murrysville, and Vincent A. Paolu, Jeannette, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

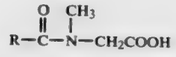
Filed Jun. 19, 1991, Ser. No. 717,468

Int. Cl.[5] G11B *5/70;* **H01F** *10/00*

U.S. Cl. 428—611 **18 Claims**



14. A hard disc comprising:
(a) an aluminum alloy substrate;
(b) a magnetic memory layer supported by said substrate;
(c) a sputtered carbon wear layer overlying said magnetic memory layer; and
(d) an organic lubricant film overlying said wear layer, said lubricant film consisting essentially of a substituted N-acyl sarcosine having the formula



wherein R is a saturated or unsaturated aliphatic group having at least 12 carbon atoms said lubricant film being essentially free of any particulate matter.

5,114,799

MATERIAL FOR ROOFING AND FACING

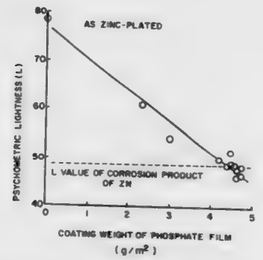
Hidetsugu Ohashi, Shinnanyo; Masayuki Kinugasa, Kure; Toshiro Adachi; Akihiro Nonomura, both of Shinnanyo, and Waro Sekimoto, Yachiyo, all of Japan, assignors to Nisshin Steel Company, Ltd., Tokyo and Shinsei Kogyo Company, Ltd., Chiba, both of, Japan

Filed Jan. 24, 1991, Ser. No. 645,101

Claims priority, application Japan, Jan. 30, 1990, 2-17980

Int. Cl.[5] B32B *15/04, 15/18*

U.S. Cl. 428—659 **2 Claims**



1. A roofing and facing material comprising a ferritic stainless steel sheet having a hot-dip plated zinc layer or layers capable of forming a corrosion product and which are phosphated so that the surface of the phosphated material and the corrosion product have a color tone defined by chromaticness indices of L=45–52, a=0.0–0.4, b=1.3–4.4.

5,114,800

SOFT MAGNETIC THIN FILM

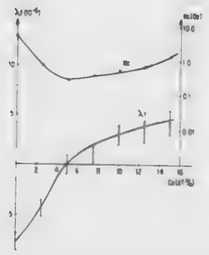
Osamu Shimizu, and Kanji Nakanishi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 9, 1990, Ser. No. 549,996

Claims priority, application Japan, Jul. 10, 1989, 1-178924

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—692 **25 Claims**



1. A soft magnetic thin film consisting essentially of 1 to 15 atomic percent of one or both of Co and Ni, and the balance being Fe, and having a crystal structure of a body-centered cubic system, wherein the film is oriented substantially in the [111] direction and the absolute value of the saturation magnetostriction λ_f of the film is not more than 5×10^{-6}.

5,114,801

MAGNETIC RECORDING MEDIUM HAVING A MAGNETIC LAYER COMPRISING HEXAGONAL BARIUM FERRITE MAGNETIC PARTICLES CONTAINING TIN AND MAGNESIUM IN SPECIFIED PROPORTIONS

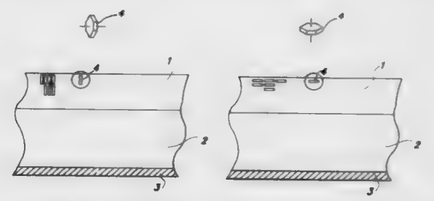
Nobuyuki Aoki; Keiichi Ochiai, and Hideaki Komoda, all of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 21, 1990, Ser. No. 571,093

Claims priority, application Japan, Aug. 21, 1989, 1-214490; Mar. 30, 1990, 2-86539

Int. Cl.[5] G11B *5/00*

U.S. Cl. 428—694 **6 Claims**



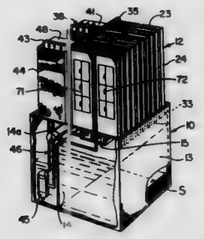
1. A magnetic recording medium having a magnetic layer comprising hexagonal ferrite magnetic particles each consisting of $BaO.Fe_{12-x-y}Sn_xMg_yO_{18}$ where, $0.55 \leqq x \leqq 0.88$, $0.71 \leqq y \leqq 1.05$.

5,114,802

CAUSTIC-BASED METAL BATTERY WITH SEEDED RECIRCULATING ELECTROLYTE

Wilfrid B. O'Callaghan, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Sep. 5, 1990, Ser. No. 577,519
Int. Cl.[5] H01M 12/06
U.S. Cl. 429—13 13 Claims



1. In a method of operating a caustic-based metal battery of the type comprising a cathode adapted to reduce oxygen and a metal anode positioned in spaced juxtaposed relation to said cathode to define therewith an anode-cathode gap for receiving electrolyte to form an anode-cathode pair electrically coupled by electrolyte, wherein electrolyte is supplied to said anode-cathode gap and oxygen is supplied to said cathode

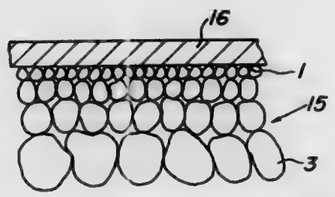
the improvement which comprises providing in said anode-cathode gap an alkaline electrolyte containing seed particles adapted to seed alumina trihydrate particles and prevent passivation of the anode during discharge of the battery, said seed particles being α-alumina of very fine particle size distribution obtained by calcination of high-purity alum.

5,114,803

SOLID OXIDE FUEL CELL AND POROUS ELECTRODE FOR USE IN THE SAME

Takeshi Ishihara, Toyoake; Tadashi Fujita, Nagoya, and Hidenobu Misawa, Toyoake, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jul. 1, 1991, Ser. No. 724,152
Claims priority, application Japan, Jul. 7, 1990, 2-178502
Int. Cl.[5] H01M 8/10
U.S. Cl. 429—30 18 Claims



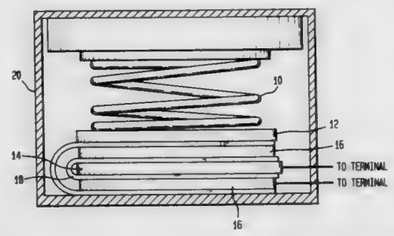
1. A solid oxide fuel cell including a solid electrolyte film having ion conductivity and a porous electrode joined to the solid electrolyte film, wherein a pore diameter of that portion of said porous electrode which is in contact with the solid electrolyte film at an interface therebetween is smaller than that of the surface portion of the porous electrode which is located on the side opposite to the interface.

5,114,804

BATTERY AND METHOD OF MAKING THE BATTERY

James A. R. Stiles, North Vancouver, and Klaus Brandt, Vancouver, both of Canada, assignors to Moli Energy Limited, Canada

Continuation of Ser. No. 470,996, Jan. 22, 1990, abandoned, which is a continuation of Ser. No. 403,286, Jul. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 292,606, Aug. 13, 1981, abandoned. This application Dec. 4, 1990, Ser. No. 625,622
Int. Cl.[5] H01M 2/10, 4/02
U.S. Cl. 429—66 49 Claims



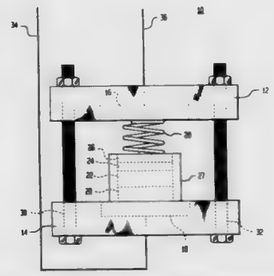
1. A reversible battery cell comprising a cathode capable of providing a substantially uniform current density for said battery cell; an anode comprising a lithium metal substrate; a non-aqueous electrolyte; and means for substantially continuously applying a compressive load to said anode during both the charging and the discharging of said reversible battery cell under charging conditions of current density inhibiting the formation of dendrites, said compressive load being sufficient to inhibit the formation of a porous deposit of exterior, irregularly oriented, amalgamated grains when lithium metal is deposited on said lithium metal substrate of said anode and thereby to produce a substantially non-porous deposit structure providing enhanced reversibility for the anode.

5,114,805

HIGH TEMPERATURE MOLTEN SALT ELECTROCHEMICAL CELL

Wishvender K. Behl, Ocean, and Edward J. Plichta, Howell, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 30, 1990, Ser. No. 561,411
Int. Cl.[5] H01M 6/36, 4/58
U.S. Cl. 429—112 13 Claims



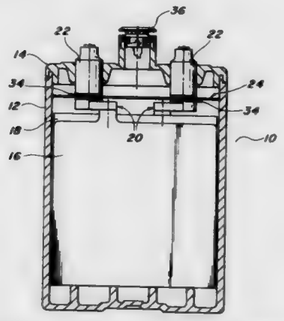
1. A high temperature molten salt electrochemical cell, said cell comprising an electrode stack assembly sealed in a containment vessel, the electrode stack assembly including an electrode stack housed inside of a boron nitrite bushing, the electrode stack including a negative electrode, a separator disk atop the negative electrode, a positive electrode atop the separator disk, and a graphite current collector disk atop the positive electrode, the positive and negative electrodes being maintained under constant compression by means of a high temperature stainless steel compression spring and stainless steel assembly screws positioned external to the electrode stack to vary the degree of cell compression applied to the electrode stack by the spring.

5,114,806

PERFORATED RETAINER FOR HORIZONTAL MOUNT GELLED-ELECTROLYTE CELLS

Frank J. Chiacchio, 1746 Crowder Ave., Reading, Pa. 19607, and Frank L. Tarantino, 901 York Ave., Lansdale, Pa. 19446

Filed Mar. 19, 1991, Ser. No. 671,382
Int. Cl.[5] H01M 10/12
U.S. Cl. 429—126 2 Claims



1. A lead-acid storage battery of the type which employs a gelled electrolyte, comprising:

a container sealed by a cover;

a plurality of electrode plates mounted within the container, with plates of like polarity connected to terminal posts extending through the cover;

a gelled electrolyte disposed throughout the container between and surrounding the electrode plates, and terminating in a surface above the plates such that an open space exists between said surface and the inside of the cover; and

a retainer embedded in the gelled electrolyte near its said surface and extending substantially over the length and width of the container, the retainer comprising a sheet of non-conducting material perforated by a plurality of through holes of sufficient size and density to allow the electrolyte in its liquid state to flow into the container.

5,114,807

LIGHTWEIGHT BIPOLAR STORAGE BATTERY

John J. Rowlette, Monrovia, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Apr. 30, 1990, Ser. No. 516,439
Int. Cl.[5] H01M 2/20
U.S. Cl. 429—152 22 Claims

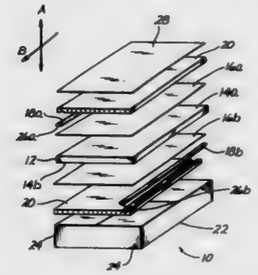
1. An apparatus comprising:

a rechargeable bipolar means in the form of a cell stack for generating electrical power having a positive output end and a negative output end;

a combined means for collecting and removing current from said rechargeable bipolar means in parallel electrical communication with said positive and said negative output ends;

a rigid means for sandwiching said rechargeable bipolar means in parallel communication with said combined means,

a sealed means for enclosing said rechargeable bipolar means, said combined means and said rigid means disposed in parallel communication with said rigid means, said



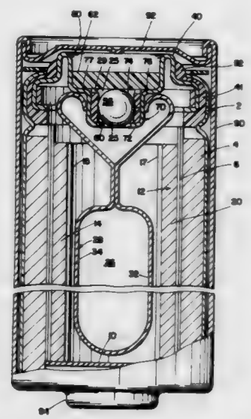
sealed means having apertured means for exposing said combined means to external electrical connection.

5,114,808

CELL COVER WITH INTERNAL COMPRESSION RING OF HIGH YIELD STRENGTH MATERIAL

Earl J. Chaney, Jr., Medina, and Theodore P. Dziak, Fairview Park, both of Ohio, assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Filed May 7, 1990, Ser. No. 519,583
Int. Cl.[5] H01M 2/12
U.S. Cl. 429—172 13 Claims



1. An electrochemical cell employing a complex cover that has been highly cold worked but is resistant to corrosion, comprising:

a cell housing containing the chemically active components of the cell;

said housing having an open end;

a cold worked and subsequently annealed metal cover over said open end;

said cover including a vent well containing a vent seal member therein;

said cover having an outer wall including a vertically extending rim;

said rim including an outer face and an inner face;

a sealing gasket between said outer rim face and said housing;

a compression ring of high yield strength material;

said compression ring being in radially outwardly compres-

sive engagement with said rim inner face to retain said outer rim face of said annealed cover in firm engagement with said gasket and thereby tightly seal said gasket against said housing.

5,114,809

ALL SOLID-STATE LITHIUM SECONDARY BATTERY

Yoshifumi Nakacho; Akiyoshi Inubushi, and Yuji Tada, all of Tokushima, Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP90/00210, § 371 Date Oct. 19, 1990, § 102(e) Date Oct. 19, 1990, PCT Pub. No. WO90/10317, PCT Pub. Date Jul. 9, 1990

PCT Filed Feb. 21, 1990, Ser. No. 598,648

Claims priority, application Japan, Feb. 22, 1989, 1-44328

Int. Cl.[5] H01M *10/40*

U.S. Cl. 429—192 **2 Claims**



1. An all solid-state lithium secondary battery comprising an oxide of layer structure serving as a positive electrode active substance and represented by the formula

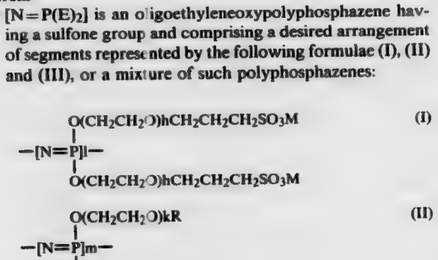
$$(V_2O_5)x\bullet(A)y\bullet zH_2O$$

wherein $x+y=1$, $y=0.03$ to 0.5, $z=0.1$ to 1.6, A is at least one oxide selected from among GeO_2, SiO_2, B_2O_3, MoO_3, WO_3, Nb_2O_5, TeO_2, Bi_2O_3, Cr_3O_8 and ZrO_2, lithium or a lithium alloy serving as a negative electrode active substance, and a compound serving as an electrolyte and represented by the formula

$$\{[N=P(E)_2]_a(LiX)_a\}_b$$

wherein

i) $[N=P(E)_2]$ is an oligoethyleneoxypolyphosphazene having a sulfone group and comprising a desired arrangement of segments represented by the following formulae (I), (II) and (III), or a mixture of such polyphosphazenes:



ii) X is an anion,

iii) M is a metal from Groups I and II in Periodic table of the chamical elements,

iv) R and R' are each methyl, ethyl or propyl,

v) h and k are each the average number of repeating ethyleneoxy units and are in the range of $0 \leqq h \leqq 15$ and $0 \leqq k \leqq 22.5$, respectively,

vi) a is the ratio of (LiX) to $[N=P(E)_2]$ and is a real number of about 0.001 to about 4,

vii) l, m and n are each 0 or a posotive integer in the range of $3 \leqq b=l+m+n \leqq 200000$, and $l+n \neq 0$.

5,114,810

CATHODE CURRENT COLLECTOR MATERIAL FOR SOLID CATHODE CELL

Christine A. Frysz, East Amherst, and W. Richard Brown, Clarence Center, both of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Feb. 5, 1990, Ser. No. 475,261

Int. Cl.[5] C22C *38/42, 30/02*

U.S. Cl. 429—194 **11 Claims**

1. In an electrochemical cell comprising a lithium anode, a solid cathode material used in conjunction with a metal cathode current collector, and an ionically conductive electrolyte solution operatively associated with said anode and cathode, wherein the improvement comprises a cathode current collector of a highly alloyed nickel-containing ferritic stainless steel material, said material providing high corrosion resistance particularly where elevated temperature storage and performance is required thereby increasing cell longevity, said material comprising, by weight:

from about 27.0 percent to about 29.0 percent chromium;

from about 2.0 percent to about 3.0 percent molybdenum;

from about 3.0 percent to about 4.5 percent nickel;

the sum of carbon plus nitrogen in an amount less than or equal to 0.045 percent;

the sum of niobium plus zirconium in an amount of at least ten times the percent of carbon plus nitrogen; and

the remainder being iron.

5,114,811

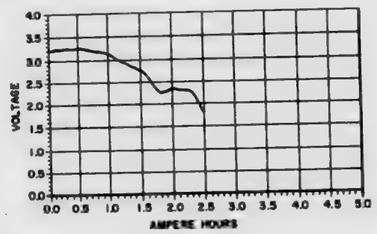
HIGH ENERGY DENSITY NON-AQUEOUS ELECTROLYTE LITHIUM CELL OPERATIONAL OVER A WIDE TEMPERATURE RANGE

Steven J. Ebel, Tonawanda; Michael F. Pyszczyk, Hamburg; Christine A. Frysz, East Amherst, and Michael A. Zelinsky, Lancaster, all of N.Y., assignors to W. Greatbatch Ltd., Clarence, N.Y.

Filed Feb. 5, 1990, Ser. No. 475,410

Int. Cl.[5] H01M *6/16*

U.S. Cl. 429—194 **26 Claims**



1. An electrochemical primary cell for delivering power at a relatively high rate and having a metallic anode comprising a Group IA, IIA or IIIB element or alloy thereof and a solid cathode of electronically conductive material and characterized by an ionic conductive non-aqueous electrolyte solution operatively associated and in direct contact with said anode and said cathode, said non-aqueous electrolyte solution comprising a first component consisting of a high boiling aprotic solvent, or combinations thereof, selected to provide a stable, high temperature electrolyte, and a second component consisting of at least one lithium salt, a cathode current collector of non-corroding ferritic stainless steel and an hermetic enclosure for said cell including a metal casing and glass-to-metal seal on the electrical feed-through, said cell demonstrating an energy density of up to about 0.6 watt hrs./cc and exhibiting consistent performance predictability over an operational temperature range of from about −20° C. to about 180° C.

5,114,812

ELECTRODES FOR PRIMARY AND SECONDARY ELECTRIC CELLS

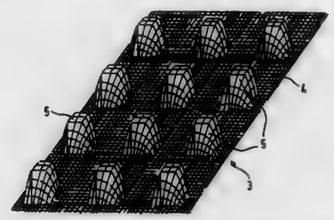
Dieter Disselbeck, Bad Soden am Taunus; Karl C. Berger, Bad Sassendorf, and Jürgen Drews, Soest, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft and Hagen Batterie AG, both of, Fed. Rep. of Germany

Filed Jul. 9, 1990, Ser. No. 549,899

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1989, 3922425

Int. Cl.[5] H01M *4/74*

U.S. Cl. 429—234 **9 Claims**



1. An electrode for primary and secondary electric cells comprising an active material and a grid plate which acts as support for the active material and conducts current to and from the active material, the grid plate comprising an electrically conductive network material which forms a three dimensional structure provided with humplike depressions and/or elevations distributed over its areas and in whose areas the distance between the plastics filaments is increased, the grid plate extending skeletally throughout the active material.

5,114,813

METHOD OF FORMING STABLE IMAGES IN ELECTRON BEAM WRITABLE GLASS COMPOSITIONS

Stephen W. Smoot, Wilkes-Barre; Joseph S. Hayden, Clarks Summit, both of Pa.; Marc Clement, Mainz, Fed. Rep. of Germany; Danuta Grabowski, Taunusstein, Fed. Rep. of Germany; Eva Holzel, Ober-Olm, Fed. Rep. of Germany; Peter Nass, Mainz, Fed. Rep. of Germany, and Martin Heming, Saulheim, Fed. Rep. of Germany, assignors to Schott Glass Technologies, Inc., Duryea, Pa.

Continuation-in-part of Ser. No. 369,997, Jun. 23, 1989. This application Feb. 8, 1990, Ser. No. 476,051

Int. Cl.[5] G03C *5/00*; G11B *7/00*

U.S. Cl. 430—5 **28 Claims**

1. A method of forming an image readable by UV radiation comprising writing said image in a silicate glass article by electron beam irradiation thereof, the glass article being one of the following silicate glass composition in mole %:

SiO_2	30–95
P_2O_5	0–20
B_2O_3	0–30
Al_2O_3	0–40
RO	0–40
R_2O	1–35
OD agent	0.01–10
halide	0–10

and essentially no transition metals having 1–4 d-electrons in the atomic state, wherein

RO is MgO, CaO, SrO, BaO, ZnO and/or PbO,

R_2O is Li_2O, Na_2O, K_2O, Rb_2O and/or Cs_2O,

halide is Cl, F, Br and/or I,

OD agent is one or more metals which do not possess 1–4 d-electrons in the atomic state and which can have at least two stable oxidation states other than the atomic state in silicate glasses,

at least one surface of said article having a substantially continuous silver and hydration content over its area, effective to render said surface darkenable upon exposure to electron beam radiation but substantially not thermoplastic,

said article being capable of being substantially darkened by electron beam irradiation over at least a portion of at least one surface thereof,

and said article having gemetric characteristics suitable for functioning as either a photomask reticle or an archival storage medium.

24. A method of forming an image readable by UV radiation comprising writing said image in a silicate glass article by electron beam irradiation thereof, the glass article being one of the following silicate glass compositions in mole %

SiO_2	30–95
P_2O_5	0–20
B_2O_3	0–30
Al_2O_3	0–40
RO	0–40
R_2O	1–35
OD agent	0.01–10
halide	0–10

and an amount of transition metals having 1–4 d-electrons in the atomic state which is ineffective to substantially affect the photosensitivity properties of the glass article, wherein

RO is MgO, CaO, SrO, BaO, ZnO and/or PbO,

R_2O is Li_2O, Na_2O, K_2O, Rb_2O and/or Cs_2O,

halide is Cl, F, Br and/or I,

OD agent is one or more metals which do not possess 1–4 d-electrons in the atomic state and which can have at least two stable oxidation states other than the atomic state in silicate glasses,

at least one surface of said article having a substantially continuous silver and hydration content over its area, effective to render said surface darkenable upon exposure to electron beam radiation but substantially not thermoplastic,

said article substantially not exhibiting alterable photo-anisotropic effects inducible by actinic UV radiation,

and said article having geometric characteristics suitable for functioning as either a photomask reticle or an archival storage medium.

5,114,814

PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY, IMAGE FORMING METHOD AND ELECTROPHOTOGRAPHIC APPARATUS USING THE SAME

Harumi Sakoh, Tokyo; Kiyoshi Sakai, Chofu, and Shoji Amamiya, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 253,082, Oct. 4, 1988, abandoned. This application Apr. 3, 1991, Ser. No. 680,797

Claims priority, application Japan, Oct. 12, 1987, 62-256769

Int. Cl.[5] G03G *5/043*

U.S. Cl. 430—46 **15 Claims**

1. An image forming method, comprising the steps of:

providing an electrophotographic photosensitive member comprising an organic photoconductor having an average surface roughness of 0.3 to 5.0 microns and rotating at a process speed of 80 mm/sec or larger,

charging the photosensitive member,

exposing the photosensitive member imagewise correspond-

ing to image information thereby to form thereon an electrostatic latent image,
developing the electrostatic latent image with a two-component developer which comprises a dry non-magnetic toner comprising a binder resin having a glass transition point of 60° C. or below, and a magnetic material coated with a resin, thereby to form a toner image on the photosensitive member,
transferring the toner image onto a transfer-receiving material, and
removing the residual toner remaining on the photosensitive member by an elastomeric blade thereby to clean the photosensitive member,
wherein said steps of charging, exposing and developing are repeated plural times to form a multi-color toner image on the transfer-receiving material.

5,114,815

ELECTROPHOTOGRAPHIC PHOTORECEPTOR HAVING A LIGHT-SENSITIVE LAYER FORMED FROM TITANYL PHTHALOCYANINE PIGMENT DISPERSED IN A BRANCHED ESTER OR ALCOHOL SOLVENT

Yasuhiro Oda; Hiroshi Yoshioka; Hajime Tadokoro, and Yoshihide Fujimaki, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 29, 1990, Ser. No. 545,546
Claims priority, application Japan, Jun. 30, 1989, 1-168595
Int. Cl.[5] G03G *5/06*
U.S. Cl. 430—58 **13 Claims**

1. In an electrophotographic photoreceptor comprising a light-sensitive layer on an electroconductive base, wherein said light-sensitive layer is formed from a dispersion comprising a titanyl phthalocyanine pigment having at least two predominant peaks of the Bragg angle 2θ at 9.6°±0.2° and 27.2°±0.2° in a diffraction spectrum obtained with characteristic X-rays of Cu Ka at a wavelength of 1.54 Å dispersed in a dispersion medium that contains a dispersion solvent selected from branched esters, branched alcohols and mixtures thereof as a chief component.

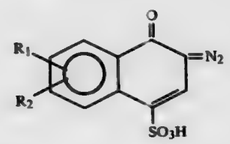
5,114,816

RADIATION-SENSITIVE COMPOUNDS, RADIATION-SENSITIVE MIXTURE PREPARED THEREWITH AND COPYING MATERIAL

Siegfried Scheler, Wiesbaden; Gerhard Buhr, Koenigstein; Helmut Lenz, Hattersheim; Klaus Bergmann, Mainz-Bretzenheim, and Herbert Siegel, Hofheim/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 3, 1989, Ser. No. 431,221
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1988, 3837500
Int. Cl.[5] G03F *7/023, 7/039*
U.S. Cl. 430—192 **25 Claims**

1. A radiation-sensitive compound which is an ester or amide of a 1,2-naphthoquinone-(2)-diazide-4-sulfonic acid of the general formula:



(I)

in which
R_1 and R_2 are identical or different and denote hydrogen, an alkyl group containing 1 to 6 carbon atoms, an alkyl ether group or an alkyl thioether group whose carbon chains may be interrupted by ether oxygen atoms, containing a total of 1 to 6 carbon atoms, or an acylamino group containing 2 to 6 carbon atoms,
R_1 and R_2 not being hydrogen at the same time.

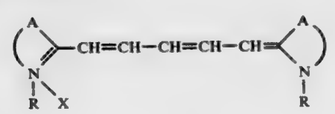
5,114,817

CYAN-COLORED PHOTOSENSITIVE TONER CONTAINING ZINC OXIDE

Akiyoshi Urano, Takarazuka, and Yumiko Sano, Ibaraki, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jun. 11, 1990, Ser. No. 536,374
Claims priority, application Japan, Jun. 13, 1989, 1-150935
Int. Cl.[5] G03G *5/09*
U.S. Cl. 430—93 **3 Claims**

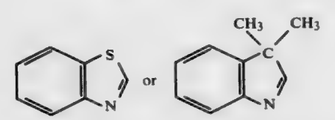
1. A cyan-colored photosensitive toner sensitive to light with wavelengths in the range of 600 to 700 nm, including zinc oxide, a sensitizing dye, and a resinous binder, said sensitizing dye being a cyanine dye which is represented by the following general formula (I):

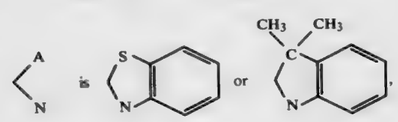


(I)



wherein is





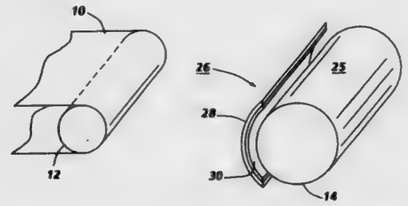
R is CH_3, C_2H_5, n-C_4H_9, n-C_7H_{15}, CH_2COOH, C_2H_4COOH or allyl, and X is I, Cl, Br, NO_3 or tolylsulfonyl.

5,114,818

HEAT SHIELDED ELECTROSTATOGRAPHIC IMAGING MEMBERS

Robert C. U. Yu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 27, 1990, Ser. No. 544,566
Int. Cl.[5] G03G *13/06, 13/20, 15/20*
U.S. Cl. 430—97 **20 Claims**



1. Electrostatographic imaging apparatus comprising an organic electrostatographic imaging member having at least one arcuate surface, a heat fuser roll spaced from and adjacent to said arcuate surface, and a thin heat shield comprising a solid polymer substrate having a T_g of at least about 100° C. coated with a thin heat reflective metallic layer interposed between said heat fuser roll and the adjacent arcuate surface, said metallic layer of said shield being concentric to and facing said fuser roll.

5,114,819

MAGNETIC ENCAPSULATED TONER COMPOSITIONS

Beng S. Ong, Mississauga; Guerino Sacripante, Cambridge; Grazyna Kmiecik-Lawrynowicz, and T. Brian McAneney, both of Burlington, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 1, 1990, Ser. No. 561,397
The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.
Int. Cl.[5] G03G *9/083, 9/093*
U.S. Cl. 430—106.6 **47 Claims**

1. An encapsulated toner composition comprised of a core comprised of a polymer binder, a nonvolatile organic liquid, and magnetite; and wherein the core is encapsulated in a polyether-urea polymer shell.

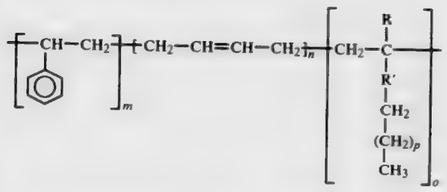
5,114,820

POLYALKYL STYRENE BUTADIENE TONER COMPOSITIONS

Michael K. Georges, Guelph, and Lupu Alexandru, Toronto, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 27, 1989, Ser. No. 428,134
Int. Cl.[5] G03G *9/00*
U.S. Cl. 430—109 **28 Claims**

1. A toner composition comprised of pigment particles and a branched lauryl methacrylate/styrene/butadiene polymer of the following formula



wherein m, n and o are weight fraction numbers, p is 10, R is methyl, and R′ is carbonyloxy, wherein the weight average molecular weight of said polymer is from 50,000 to less than 75,000, and minimum fix temperature of the toner is from about 225° F. to 300° F.

5,114,821

TONER AND DEVELOPER COMPOSITIONS WITH CHARGE ENHANCING ADDITIVES

John L. Haack, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1990, Ser. No. 547,001
Int. Cl.[5] C03G *9/00, 9/083, 9/107*
U.S. Cl. 430—110 **36 Claims**

4. A toner composition comprised of resin particles, pigment particles, and a quaternary ammonium hydrogen bisulfate charge enhancing additive of the formula $R'_2N+R''HX-$, wherein R′ is alkyl or aryl, R″ is alkyl or aryl, and X is a bisulfate anion.

5,114,822

LIQUID DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY

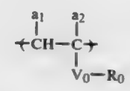
Eiichi Kato, and Hideyuki Hattori, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 29, 1991, Ser. No. 647,110
Claims priority, application Japan, Jan. 31, 1990, 2-18949; Jun. 13, 1990, 2-152537; Jun. 13, 1990, 2-152538
Int. Cl.[5] G03G *9/12*
U.S. Cl. 430—114 **10 Claims**

1. A liquid developer for electrostatic photography comprising at least resin grains dispersed in a non-aqueous solvent having an electric resistance of at least 10^9 Ωcm and a dielectric constant of not higher than 3.5, wherein the dispersed resin grains are polymer resin grains obtained by polymerizing a solution containing at least one mono-functional monomer (A) which is soluble in said non-aqueous solvent but becomes insoluble therein by being polymerized, in the presence of a dispersion-stabilizing resin soluble in said non-aqueous solvent, which is an AB block copolymer having a weight average molecular weight from 1×10^4 to 5×10^5 composed of
an A block containing at least a polymer component represented by the general formula (I) described below and
a B block comprising a polymer component containing at least one polar group selected from a carboxy group, a sulfo group, a hydroxyl group, a formyl group, an amino group, a phosphono group and a



group (wherein Q_0 represents $—Q_1$ or $—OQ_1$ (wherein Q_1 represents a hydrocarbon group) and/or a polymer component corresponding to the monofunctional monomer (A):



(I)

wherein V_0 represents —COO—, —OCO—, $(-CH_2)_l$COO—, $(-CH_2)_l$OCO— or —O— (wherein l represents an integer of from 1 to 3), R_0 represents an aliphatic group having 10 or more carbon atoms, and a_1 and a_2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —COO—D_1 or —COO—D_2 bonded via a hydrocarbon group (wherein D_1 represents a hydrogen atom or a hydrocarbon group which may be substituted).

5,114,823

DEVELOPING METHOD FOR ELECTROSTATIC IMAGES

Shinya Tomura, Yamato, and Mitsuaki Kohyama, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 159,340, Feb. 23, 1988, abandoned. This application Jul. 23, 1990, Ser. No. 561,265
Claims priority, application Japan, Feb. 25, 1987, 62-41631
Int. Cl.[5] G03G *13/08*
U.S. Cl. 430—120 **21 Claims**

1. A developing method, comprising: forming a one-component developing agent layer on the surface of a developing agent-carrying body by pressing a one-component developing agent to the developing-agent carrying body by means of a coating member, said one-component developing agent containing toner particles including a synthetic resin and auxiliary particles capable of being oppositely charged with respect to the polarity of charge on the charge of the toner particles; and

electrostatically depositing toner particles from the one-component developing agent layer onto an electrostatic latent image formed on an image-bearing body which faces the one-component developing agent layer.

5,114,824

PROCESSES FOR ENCAPSULATED TONERS

Hock S. Tan, Burlington; Tie H. Ng, and Hadi K. Mahabadi, both of Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 1, 1990, Ser. No. 592,092
Int. Cl.[5] G03G *9/093*
U.S. Cl. 430—137 **36 Claims**

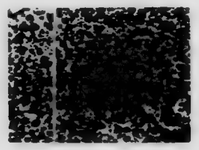
1. A process for the preparation of encapsulated toners which consists essentially of (1) mixing a blend of a core monomer or monomers, free radical chemical initiator, pigment, and an oil soluble shell monomer to form an organic phase; (2) dispersing the resulting organic phase in the absence of surfactant or stabilizer in an aqueous solution comprised of a water-soluble shell monomer whereby interfacial shell polymerization is initiated; (3) stirring the resulting suspension to allow completion of interfacial shell polymerization; (4) initiating free radical core polymerization by increasing the temperature of the suspension from ambient to about 75 to about 90° C.; (5) completing core polymerization by maintaining the aforementioned temperature in step (4) for an effective period of time; (6) cooling; (7) filtering; and (8) drying.

5,114,825

SUBSTRATES FOR PS PLATES

Kazushige Takizawa, and Hirokazu Sakaki, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigari, Japan

Filed Jun. 5, 1989, Ser. No. 361,430
Claims priority, application Japan, Jun. 6, 1988, 63-138675
Int. Cl.[5] G03C *1/52, 1/495;* C25F *3/04*
U.S. Cl. 430—159 **16 Claims**



(×1500)

8. The aluminum alloy substrate for presensitized plates for use in making lithographic printing plates comprising an aluminum alloy plate including 0.22 to 0.5% by weight of Si; 0.2 to 0.7% by weight of Fe; 0.3 to 1.5% by weight of Mn; less than 0.05% by weight of Cu; not more than 0.05% by weight of Ti; and the balance of aluminum and unavoidable impurities, the surface of the aluminum alloy plate being subjected to electrolytic graining treatment followed by anodic oxidizing treatment.

11. A presensitized plate for use in making lithographic printing plates comprising the aluminum alloy plate as defined in claim **8** having coated thereon a light-sensitive layer.

13. The presensitized plate of claim **11**, wherein the surface of the aluminum alloy plate is further post-treated with an aqueous solution of an alkali metal silicate.

14. The presensitized plate of claim **13**, wherein said light-sensitive layer comprises a light-sensitive diazo resin and a water-insoluble and lipophilic polymeric compound.

5,114,826

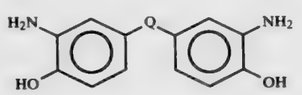
PHOTOSENSITIVE POLYIMIDE COMPOSITIONS

Ranee W. Kwong; Harbans S. Sachdev, and Krishna G. Sachdev, all of Wappingers Falls, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 28, 1989, Ser. No. 458,130
Int. Cl.[5] C08F *2/46;* C08G *73/14;* C08J *3/28;* G03C *1/52*
U.S. Cl. 430—192 **23 Claims**

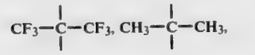
1. A thermally stable photosensitive polymer composition comprising a substantially gel-free polyamic acid, polyamic ester or polyimide formed in a solvent comprising a N-methyl-pyrrolidone-diglyme mixture by the condensation of

(a) a bis-(3-amino-4-hydroxyphenyl) composition of the structure



(I)

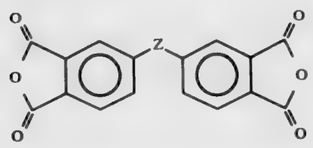
where Q is selected from the group consisting of



and

(b) a dianhydride selected form the group consisting of

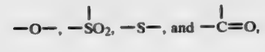
(1) a bis-(3,4 dicarboxyphenyl) anhydride composition of the structure



(II)

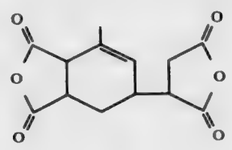
where Z is selected from the group consisting of





and

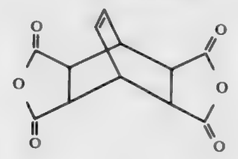
(2) an aliphatic tetracarboxylic anhydride of the form



(III)

and

-continued



(IV)

and

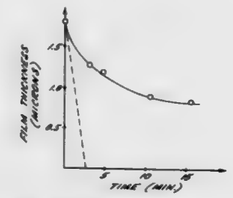
a photoactive compound.

5,114,827

PHOTORESISTS RESISTANT TO OXYGEN PLASMAS

Farid M. Tranjan; Thomas D. DuBois, both of Charlotte; Rudolf G. Frieser, Concord; Stephen M. Bobbio, Wake Forest, and Susan K. S. Jones, Durham, all of N.C., assignors to Microelectronics Center of N.C., Durham and University of North Carolina at Charlotte, Charlotte, both of, N.C.

Division of Ser. No. 424,663, Oct. 20, 1989, which is a division of Ser. No. 212,440, Jun. 28, 1988, Pat. No. 4,968,582. This application Sep. 20, 1990, Ser. No. 585,708
Int. Cl.[5] G03F *7/09*
U.S. Cl. 430—271 **1 Claim**



1. A wafer of semiconductor material and one or more layers of material thereon which together define devices and device-precursor geometries, and coated with a modified organic photoresist composition formed from a mixture of an organic photoresist and a phosphorous-containing compound of a type and in an amount effective to substantially prevent etching of said composition in an oxygen-containing plasma without substantially adversely affecting the photosensitivity of said photoresist or the elasticity or adhesion of the etch resistant film formed during oxygen-containing plasma exposure to an underlying material to be patterned and etched, and wherein at least one of said layers coated with said modified photoresist composition is selected from the group consisting of: polyimides, polydimethylglutarimide, crosslinked novolac resins, and thermosetting polyesters.

5,114,828

OPTICAL INFORMATION RECORDING MEDIUM CONTAINING LINEAR ACRYLIC RESIN

Tokuji Tanaka; Etsuji Akimoto, and Seiichi Ohta, all of Hyogo, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 19, 1990, Ser. No. 511,171
Int. Cl.[5] G03C *1/93*
U.S. Cl. 430—272 **10 Claims**

1. An optical information recording medium comprising a glass base, a primer coating layer formed on said glass base and a recording layer formed on said primer coating layer, wherein said primer coating layer consists essentially of a copolymer of methyl methacrylate and methyl acrylate, and wherein said recording layer consists essentially of a Te-Se alloy.

7. An optical information recording medium comprising a glass base, a primer coating layer formed on said glass base, a recording layer formed on said primer coating layer and a coupling agent for enhancing adhesion through interposition between said primer coating layer and said recording layer, wherein said primer coating layer consists essentially of a copolymer of methyl methacrylate and methyl acrylate, and wherein said recording layer consists essentially of a Te-Se alloy.

5,114,829

MASTER DISC SUITABLE FOR THE MANUFACTURE OF MATRICES CONTAINING A RECORDING DOUBLE LAYER

Dirk J. Gravesteijn; Josephus M. Wijn, and Johannes P. J. G. van Liempd, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 329,738, Mar. 28, 1989, Pat. No. 5,019,487, which is a continuation-in-part of Ser. No. 246,584, Sep. 19, 1988, abandoned. This application Feb. 25, 1991, Ser. No. 660,773
Claims priority, application Netherlands, Feb. 11, 1988, 8800335
Int. Cl.[5] G03F *1/02*
U.S. Cl. 430—275 **1 Claim**

1. A master disc which can suitably be used for the manufacture of matrices which in turn are used in the production of manufacture of optically readable information carriers, said master disc comprising a substrate plate which is provided on one side with a synthetic resin recording double layer in which information bits in the form of bulges can be recorded by exposure to a modulated laser beam, the recording double layer comprising an expansion layer facing said substrate plate, a retention layer positioned on the side of said expansion layer away from said substrate plate and an optically readable, reflective structure forming a follower track for positioning the laser beam provided at the interface of said substrate plate and said expansion layer or at the interface of said expansion layer and said retention layer or at the interface of said retention layer and air.

5,114,830

SOLDER MASK RESINS HAVING IMPROVED STABILITY CONTAINING A MULTIFUNCTIONAL EPOXIDE AND A PARTIAL ESTER OR STYRENE-MALEIC ANHYDRIDE COPOLYMER

Sherry L. Surber, Powder Springs, Ga., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Oct. 28, 1988, Ser. No. 264,223
Int. Cl.[5] G03C *1/72*
U.S. Cl. 430—280 **12 Claims**

1. A radiation curable composition comprising a partial ester of a hydroxyalky (meth)acrylate and a styrene-maleic anhydride copolymer, a multifunctional (meth)acrylate monomer, a photoinitiator, and a multifunctional epoxide.

7. A method of preparing a cured solder mask comprising the steps of coating a printed circuit board with a radiation curable photopolymer composition comprising a partial ester of a hydroxyalky (meth)arcylate and a styrene-maleic anhydride copolymer, a multifunctional (meth)acrylate monomer, a photoinitiator, and a multifunctional epoxide; exposing the coated radiation curable photopolymer composition imagewise to actinic radiation to effect imagewise curing and cross-linking of said composition; removing unexposed photopoly-

mer from said printed circuit board; baking the printed circuit board bearing the cured photopolymer composition at a temperature of at least 100° C to effect further curing of the composition, whereby free anhydride groups are generated on said copolymer as a result of dissociation of hydroxyalky (meth)acrylate groups therfrom, thereby decreasing the cross-link density in said composition; and reacting said epoxide with said anhydride groups to provide new cross-linking of said composition.

5,114,831

PHOTOPOLYMERIZABLE LAMINATING MATERIAL

Friedrich Seitz, Friedelsheim; Gerhard Hoffmann, Otterstadt, and Gerhard Bauer, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 2, 1990, Ser. No. 562,568

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1989, 3926708

Int. Cl.[5] G03C *1/68*

U.S. Cl. 430—281 **12 Claims**

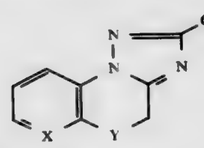
1. A photopolymerizable laminating material, consisting essentially of

(a) at least one film-forming polymer as a binder,

(b) at least one organic compound which is compatible with the binder, has at least two double bonds capable of addition polymerization,

(c) a photoinitiator or photoinitiator system and

(d) an adhesion promoter of the formula (I)



(I)

where X is CH or N, Y is O, S or NR^1 and R^1 is H, alkyl or aryl, or a tautomer thereof, the amount of a, b, c and d, respectively, in the laminating material being from 40 to 90, 10 to 60, 1.0 to 10 and 0.1 to 2 percent by weight.

5,114,832

PHOTOPOLYMERIZABLE MIXTURE AND RECORDING MATERIAL PREPARED THEREFROM, HAVING A PHOTOINITIATING SET OF COMPOUNDS WHICH GIVE INCREASED ABSORPTION BELOW 450 NM

Rudolf Zertani, Mainz-Bretzenheim; Dieter Mohr, Budenheim; Klaus Rode, Suzano-SP; Werner Frass, Wiesbaden-Naurod, and Klaus Joerg, Ingelheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 11, 1989, Ser. No. 406,424

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1988, 3830914

Int. Cl.[5] G03F *7/031, 7/033*

U.S. Cl. 430—285 **15 Claims**

1. A photopolymerizable mixture comprising, in admixture:

(a) a polymeric binder,

(b) a photopolymerizable acrylate or alkacrylate of a polyhydric alcohol possessing at least one photooxidizable group,

(c) a compound or a combination of compounds, which under the action of light in the spectral region of 450 to 650 nm is capable of initiating the polymerization of compound (b), and

(d) between about 10 and 30% by weight, of a combination of at least one dibenzal acetone and at least one oxadiazole derivative, which combination absorbs light in the region below 450 nm or that forms a compound that absorbs light in the region below 450 nm upon exposure in the mixture, whereby the optical density of the exposed mixture in this range is at least about 2.0 at a layer thickness of 2 μm.

5,114,833

CHARGE-COUPLED DEVICE AND PROCESS OF MAKING THE DEVICE

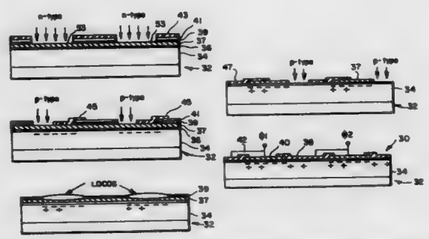
Herbert J. Erhardt, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 237,029, Aug. 29, 1988, Pat. No. 4,910,569.

This application Feb. 6, 1990, Ser. No. 475,561

Int. Cl.[5] G03F *7/09*; H01L *31/339*

U.S. Cl. 430—313 **1 Claim**



1. A method of making a charge-coupled device, said method comprising the steps of:

implanting a buried channel of a first conductivity type on a substrate of a second conductivity type;

growing a gate oxide on the substrate over the buried channel;

depositing successive layers of polysilicon, silicon nitride, and silicon dioxide over said gate oxide;

defining a first gate electrode area by means of photoresist and removing the nitride and oxide layers in these areas to expose the polysilicon layers;

implanting a material of said first conductivity type through the exposed polysilicon and through the gate oxide;

defining a stepped potential region under said first gate electrode areas by means of photoresist;

implanting a material of said second conductivity type in said stepped potential region;

locally oxidizing exposed polysilicon and then etching to form a first gate electrode;

defining a second stepped potential region adjacent said first gate electrode;

implanting a material of said second conductivity type in said second stepped potential region;

depositing a second polysilicon layer over said second stepped potential region to form a second gate electrode; and

electrically connecting the first and second gate electrodes together.

5,114,834

PHOTORESIST REMOVAL

Yehuda Nachshon, 6, Haalon Street, Timrat, Israel

Continuation-in-part of Ser. No. 260,526, Oct. 21, 1988, abandoned. This application Sep. 14, 1989, Ser. No. 407,141

Claims priority, application Israel, Oct. 23, 1987, 84255

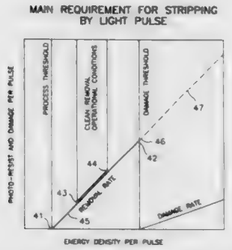
Int. Cl.[5] C08C *19/08*

U.S. Cl. 430—329 **7 Claims**

1. A process for removal of a patterned, post-baked photoresist layer from a semiconductor wafer performed in a dry atmosphere, comprising the steps of scanning a surface of the wafer by means of a narrow rectangular pulsed high energy beam so that each point of the wafer surface is exposed to a train of pulses, wherein each pulse has a duration of less that 100 nsec (nanoseconds), an energy from 50 mJ/cm^2 to 300 mJ/cm^2 and a wavelength between 150 nm and 400 nm, and

wherein further each pulse of the beam ablates the post-baked photoresist layer to a certain depth, so that the train of pulses completely removes by ablation the entire post-bake photoresist layer without damaging the wafer.

7. A process for the complete stripping of a patterned, post-baked photoresist layer from a semiconductor wafer in a dry atmosphere, comprising the steps of sweeping an area of the



wafer by means of an elongated narrow beam at its intersection with the wafer, wherein the beam is a high intensity beam of a laser, and wherein further the beam is pulsed at pulses of about less that 200 nsec duration, at a wavelength of from about 150 nm to about 400 nm, and applies per cm^2 of the wafer an energy of from about 50 mJ to about 300 mJ, so that the pulsed beam completely strips by ablation the entire post-baked photoresist layer without damaging the wafer.

5,114,835

PROCESS FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Kei Sakanoue, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 21, 1989, Ser. No. 313,008

Claims priority, application Japan, Feb. 20, 1988, 63-37701

Int. Cl.[5] G03C *7/00*

U.S. Cl. 430—393 **8 Claims**

1. A process for processing an imagewise exposed silver halide color photographic material with a processing solution having a bleaching ability after color development, wherein said silver halide color photographic material contains at least one bleaching accelerator-releasing compound capable of reacting with an oxidation product of a developing agent upon development to release a bleaching accelerator and said processing solution having a bleaching ability has a pH of from 2.0 to 5.3 and contains as a first component (1) at least one ferric complex salt of a compound selected from the Compound Group (A) and as a second component (2) a ferric complex salt of 1,3-diaminopropanetetraacetic acid as bleaching agents in such proportion that the molar ratio of component (1l) to component (2) is 3 or less: Compound Group (A)

A-1 ethylenediaminetetraacetic acid

A-2 diethylenetriaminepentaacetic acid

A-3 cyclohexanediaminetetraacetic acid

A-4 1,2-propylenediaminetetraacetic acid;

and wherein the bleaching accelerator-releasing compound is represented by formula (I):

$$A—(T_1)_l—[B—(T_2l)_n]_m—Z \quad (I)$$

wherein A represents a group which is split off from $(T_1)_l—[B—(T_2l)_n]_m—Z$ upon reaction with an oxidation product of an aromatic primary amine developing agent; T_1 and T_2 each represents a timing group; B represents a group which is split off from T_2 upon reaction with an oxidation product of an aromatic primary amine developing agent after A is split off from $(T_1)_l—[B—(T_2)_n]_m—Z$; l, m and n each represents an integer of 0 or 1; and Z is a group showing a bleach-accelerator effect after B is split off from T_2 which can be represented by formula (Z-1):

$$—S—L_1—(X_1)_a \quad (Z\text{-}1)$$

wherein a represents an integer of from 1 to 4; L_1 represents a straight or branched alkylene group of a valency of (a+1) containing 1 to 8 carbon atoms; and X_1 represents a hydroxy group, a carboxyl group, a cyano group, an amino group containing 0 to 10 carbon atoms, an acyl group containing 1 to 10 carbon atoms, a heterocyclic thio group containing 1 to 10 carbon atoms, a carbamoyl group containing 1 to 10 carbon atoms, a sulfonyl group containing 1 to 10 carbon atoms, a heterocyclic group containing 1 to 10 carbon atoms, a sulfamoyl group containing 0 to 10 carbon atoms, a carbonamide group containing 1 to 10 carbon atoms, an ammoniumyl group containing 3 to 12 carbon atoms, a ureido group containing 1 to 10 carbon atoms, a sulfamoylamino group containing 0 to 10 carbon atoms, an alkoxy group containing 1 to 6 carbon atoms, an amidino group, a guanidino group or an amidinothio group, provided that, when a represents 2 or more the plurality of (X_1) groups may be the same or different, and further provided that L_1 does not represent a cycloalkylene group.

5,114,836

METHOD OF DEVELOPMENT COMPRISING INTERMITTENTLY SPRAYING A PHOTOGRAPHIC MATERIAL

Kiyoshi Sato; Masaaki Taguchi; Yasunori Wada; Mikio Kawasaki; Shinichi Ohtani, all of Hachioji; Masatosi Iwada, Akishima, and Noboru Hatakeyama, Sagamihara, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 473,812, Feb. 2, 1990. This application Jul. 19, 1990, Ser. No. 554,528

Claims priority, application Japan, Feb. 7, 1989, 1-27820; Apr. 11, 1989, 1-92656; Jul. 28, 1989, 1-195644; Mar. 1, 1990, 2-49828; Apr. 18, 1990, 2-102737

Int. Cl.[5] G03C *5/24*

U.S. Cl. 430—434 **8 Claims**



1. A method of developing a silver halide photographic material, comprising a step of supplying a developer at least twice and intermittently, with an interval time of each supplying being not more than 10 seconds, to a surface of an exposed silver halide photographic material, wherein the photographic material is transferred between at least a pair of rollers and wherein the amount of developer retained in the light-sensitive material ranges from 50 to 250 ml/m^2.

5,114,837

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Tadashi Ogawa, Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 8, 1989, Ser. No. 433,138

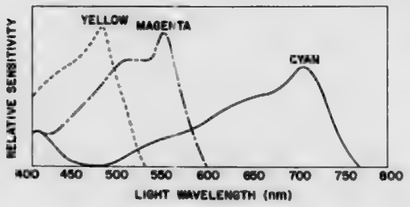
Claims priority, application Japan, Nov. 9, 1988, 63-283121

Int. Cl.[5] G03C *1/46*

U.S. Cl. 430—504 **29 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one blue-sensitive silver halide emulsion layer containing a yellow coupler, at least one green-

sensitive silver halide emulsion layer containing a magenta coupler and at least one sensitive silver halide layer containing a cyan coupler, wherein the sensitive silver halide emulsion layer containing a cyan coupler comprises a silver chlorobromide or silver chlorobromoiodide emulsion having a silver



chloride content of at least 80 mol % and a silver iodide content of no greater than 1 mol % and said sensitive silver halide emulsion is spectrally sensitized with a red-sensitive sensitizing dye and at least one or both of a blue-sensitive sensitizing dye and a green-sensitive sensitizing dye.

5,114,838

PROCESS FOR PREPARING SILVER HALIDE EMULSION AND SILVER HALIDE X-RAY PHOTOGRAPHIC MATERIAL CONTAINING SAID EMULSION

Sumito Yamada, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 20, 1990, Ser. No. 540,734

Claims priority, application Japan, Jun. 21, 1989, 1-158925

Int. Cl.[5] G03C *1/015*

U.S. Cl. 430—569 **13 Claims**

1. A process for preparing a chemically sensitized tabular silver halide emulsion comprising the steps of:

first reacting a water-soluble silver salt and a water-soluble alkali halide in an aqueous reaction system containing gelatin and adding to the reaction system either during grain formation or after grain formation a reduction sensitizing agent to form a reduction sensitized tabular silver halide emulsion containing tabular silver halide grains;

next adding a nitrogen-containing heterocyclic compound which forms a complex with silver following formation of the reduction sensitized tabular silver halide grains;

adding a sulfur sensitizing agent simultaneously with or after addition of the nitrogen-containing heterocyclic compound to effect sulfur sensitization of the tabular silver halide grains; and

adding a gold sensitizing agent following addition of the nitrogen-containing heterocyclic compound and during or following addition of the sulfur sensitizing agent to effect gold sensitization of the tabular silver halide grains,

said tabular emulsion having a grain size distribution such that grains having an average aspect ratio of not lower than 3.0 constitute at least 50% of the total projected area of all of the total silver halide grains.

5,114,839

PROCESS FOR DNA SEQUENCING USING OLIGONUCLEOTIDE BANK

Helmut Blöcker, Braunschweig, Fed. Rep. of Germany, assignor to Gesellschaft fur biotechnologische Forsching mbH, Braunschweig, Fed. Rep. of Germany

PCT No. PCT/EP89/00579, § 371 Date Jan. 11, 1990, § 102(e) Date Jan. 11, 1990, PCT Pub. No. WO89/11211, PCT Pub. Date Nov. 30, 1989

PCT Filed May 24, 1989, Ser. No. 457,815

Claims priority, application Fed. Rep. of Germany, May 24, 1988, 3817591

Int. Cl.[5] C07H *1/00, 21/04*

U.S. Cl. 435—6 **3 Claims**

1. Process for DNA sequencing by the multi-primer method which comprises;

(a) selecting in the DNA to be sequenced a single-stranded primer-attachment site of known sequence;

(b) hybridizing immediately adjacent to each other at the primer-attachment site two oligonucleotides selected from the group consisting of hexameric, heptameric, octameric and nonameric oligonucleotides obtained from a bank comprising all possible 4^6, 4^7, 4^8 an $d4^9$ different oligonucleotides;

(c) hybridizing simultaneously with step (b) or after step (b) a further hexameric, heptameric, octameric or nonameric oligonucleotide immediately adjacent to one of the other two oligonucleotides at the primer-attachment site,

(d) ligating the oligonucleotides to form a primer, and

(e) heat treating to remove non-ligated oligonucleotides.

5,114,840

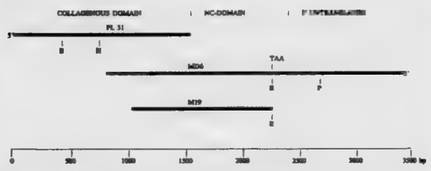
METHOD FOR DETERMINING THE NUCLEOTIDE SEQUENCE OF A NOVEL α5(IV) CHAIN OF HUMAN TYPE IV COLLAGEN

Karl Tryggvason, Fyysikontie 8, and Sirkka L. Hostikka, Tapionte 9 A 21, both of SK-90570 Oulu, Finland

Filed Jul. 7, 1989, Ser. No. 377,238

Int. Cl.[5] C12Q *1/68;* **C12P** *19/34;* **C12N** *1/06;* **C07H** *15/12*

U.S. Cl. 435—6 **27 Claims**



1. A process for isolating cDNA clones which code for part of the α5(IV) polypeptide chain of human type IV collagen comprising the steps of:

a) synthesizing the oligonucleotide sequences that code for the amino acid sequence —Cys—Gln—Val—Cys—Met—;

b) screening a cDNA library containing clones coding for human type IV collagen with said oligonucleotide sequences in order to isolate those cDNA clones coding for type IV collagen containing the synthesized oligonucleotide sequences;

c) cloning the isolated cDNA clones coding for human type IV collagen, containing the synthesized oligonucleotide sequences into a vector and inserting the vector into a bacterial host;

d) duplicating and marking said bacteria hosts for reference;

e) lysing the original bacteria hosts and binding the DNA contained therein to a filter;

f) hybridizing the DNA bound on the filter with oligonucleotide sequences that code for the amino acid sequence —Cys—Gln—Val—Cys—Met—;

g) hybridizing the positively hybridized DNA with cDNA clones coding for α1(IV) and α2(IV) polypeptide chains of type IV collagen and determining which of those previously positively hybridized collagen DNA did not hybridize with the cDNA clones coding for the α1(IV) and α2(IV) polypeptides;

h) replating the duplicate bacterial hosts of those cDNA clones which positively hybridized collagen DNA but did not hybridize with the clones coding for the α1(IV) and α2(IV) polypeptides;

i) lysing the duplicated bacterial hosts and separating the vector from the cDNA inserts;

j) subcloning the cDNA inserts into a second vector for sequencing; and,

k) sequencing the cDNA inserts thereby identifying the isolated cDNA clones which encode for part of the α5-(IV) polypeptide chain of human type I collagen.

5,114,841

LUMINESCENT OR LUMINOMETRIC ASSAYS

Fred Blomberg, Illersstigen 22, S-171 Solna; Jan Friberg, Meijerfeldts väg 3, S-183 50 Täby; Jan-Olof Glindre, Gränsholmsbacken 16, S-127 42 Skarholmen, and Jarl Kangasmetsä, Ostermalmsgaten 84, S-114 50 Stockholm, all of Sweden

PCT No. PCT/GB89/00512, § 371 Date Jan. 9, 1991, § 102(e) Date Jan. 9, 1991, PCT Pub. No. WO89/11103, PCT Pub. Date Nov. 16, 1989

PCT Filed May 11, 1989, Ser. No. 602,280

Claims priority, application European Pat. Off., May 12, 1988, 8811294.1

Int. Cl.[5] C12Q *1/28*

U.S. Cl. 435—7.9 **11 Claims**

1. A luminescent or luminometric assay which comprises the following steps:

(i) carrying out an initial reaction between an oxidant containing a peroxy group, a peroxidase, and an aromatic substrate for said peroxidase, to obtain an intermediate product which comprises an oxidizing agent capable of causing luminescent oxidation of a chemiluminescent 2,3-dihydro-1,4 phthalazinedione;

(ii) and then carrying out a reaction between the intermediate product generated in step (i) above and a chemiluminescent 2,3-dihydro-1,4 phthalazinedione and detecting or measuring the luminescence produced thereby and wherein the light is emitted as a flash with high intensity and short duration and at an effective pH.

5,114,842

PEPTIDES AND ANTIBODIES THAT INHIBIT PLATELET ADHESION

Edward F. Plow, and Mark H. Ginsberg, both of San Diego, Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Continuation-in-part of Ser. No. 70,953, Jul. 8, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 175,342

Int. Cl.[5] C12Q *1/00;* **A61K** *37/00, 49/00;* **C07K** *7/00*

U.S. Cl. 424—85.8 **9 Claims**

3. A method of assaying for the presence of a cell surface receptor-ligand complex in a vascular fluid sample wherein said complex contains a platelet glycoprotein GPIIb-IIIa receptor and a ligand that are specifically bound, which method comprises the steps of:

(a) forming an immunoreaction admixture by admixing a vascular fluid sample with a monoclonal antibody composition containing antibody molecules that immunoreact with said platelet glycoprotein GPIIb-IIIa receptor-ligand complex but do not immunoreact with the platelet glycoprotein GPIIb-IIIa receptor or the ligand when either is in non-bound form;

(b) maintaining the admixture for a time period sufficient for said antibody molecules to immunoreact with any platelet glycoprotein GPIIb-IIIa receptor-ligand complex present in the sample and form an immunoreaction product; and

(c) detecting the presence of any immunoreaction product formed in step (b) and thereby the presence of said complex in said sample.

5,114,843

HUMORAL HYPERCALCEMIC FACTOR ANTAGONISTS

Michael Rosenblatt, Ardmore; Roberta L. McKee; Michael P. Caulfield, both of Lansdale, and Ruth F. Nutt, Green Lane, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 341,530, Apr. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 191,513, May 9, 1988, abandoned. This application Feb. 25, 1991, Ser. No. 662,340

Int. Cl.[5] G01N *33/567;* **C07K** *7/10;* **A61K** *37/02*

U.S. Cl. 435—7.21 **4 Claims**

1. A peptide selected from the group consisting of $hHCF(14–34)NH_2$ or $hHCF(10–34)NH_2$ wherein Gly^{12} in each of said peptides is substituted by an amino acid which is a member selected from the group consisting of the D- or L-stereoisomers of Trp, Pro, Ala, Aib, napthyl Ala, alpha-Me Trp and N Me Gly.

5,114,844

DIAGNOSIS AND TREATMENT OF INSULIN DEPENDENT DIABETES MELLITUS

Irun R. Cohen; Dana Elias, both of Rehovot, and Doron Markovits, Gedera, all of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 322,864, Mar. 14, 1989, abandoned. This application Jun. 26, 1989, Ser. No. 371,249

Int. Cl.[5] G01N *33/543, 33/564*

U.S. Cl. 435—7.21 **7 Claims**

1. A method for diagnosing the presence or incipience of IDDM in a patient showing no blatant signs or symptoms of arthritis, comprising testing said patient for the presence of hHSP65 protein or anti-hHSP65 antibodies, whereby a result indicating the positive presence of hHSP65 proteins or anti-hHSP65 antibodies indicates a high probability of the presence or incipience of IDDM.

5,114,845

ASSAYS FOR PLASMINOGEN ACTIVATOR INHIBITOR AND SOLUBLE FIBRIN

Mats G. Rånby, Umea, Sweden, assignor to Biopool International, Inc., New York, N.Y.

Division of Ser. No. 70,068, Jul. 6, 1987, abandoned. This application Aug. 9, 1989, Ser. No. 391,744

Int. Cl.[5] C12Q *1/56*

U.S. Cl. 435—13 **1 Claim**

1. A method for determining the amount of soluble fibrin in a sample comprising the steps of:

a. mixing a fixed amount of sample with a fixed amount of reagent containing single chain tPA, wherein the arginine residue in the sequence -Gln-Pro-Gln-Phe-Arg-Ile-Lys-Gly-Gly of the tPA has been substituted with a threonine, plasminogen and a plasmin substrate;

b. measuring the rate of plasmin substrate cleavage;

c. correlating this with the amount of soluble fibrin in the sample.

5,114,846

PROCESS FOR PRODUCING STREPTOVARICIN

Kaname Inoue, Kawasaki; Motohide Yamazaki, Joetsu, both of Japan, and Richard W. Armentrout, La Jolla, Calif., assignors to Shin-Etsu Bio, Inc., San Diego, Calif.

Filed Oct. 23, 1990, Ser. No. 601,876

Int. Cl.[5] C12Q *1/04;* **C12N** *1/36;* **C12P** *17/18*

U.S. Cl. 435—34 **11 Claims**

1. A process for the increased production of Streptovaricin C which comprises the steps of:

a) culturing a wild-type strain of *Streptomyces spectabilis;*

b) growing a multiplicity of colonies from said culture;

c) selecting those colonies which are asporogenous; and

d) culturing a selected asporogenous colony in an aqueous nutrient broth containing an assimilable carbon source, a nitrogen source, minerals, fumaric acid or water-soluble salt of fumaric acid in the presence of absorbent polymer beads.

5,114,847

PROCESS FOR THE PRODUCTION OF PERMANENTLY CULTURABLE ANIMAL AND HUMAN CELL LINES AND THE USE THEREOF

Herbert Jungfer; Heinrich Barchet, both of Tutzing, and Winfried Albert, Pähl, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 784,696, Oct. 3, 1985, abandoned, which is a continuation of Ser. No. 490,094, Apr. 29, 1983, abandoned. This application Sep. 25, 1990, Ser. No. 590,602

Claims priority, application Fed. Rep. of Germany, May 4, 1982, 3216650; Dec. 9, 1982, 3245665

Int. Cl.[5] C12P *1/00;* **C12N** *5/00*

U.S. Cl. 435—41 **7 Claims**

1. A process for obtaining animal and human cells which are permanently culturable in vitro, comprising the steps of:

(a) fusing normal animal or human cells with cytoplasts or cytoplasm fractions which are incapable of multiplying and which are obtained from transformed cells; and

(b) cultivating the fused product of step (a) in non-selective medium to obtain permanently culturable cells.

5,114,848

EXTRACELLULAR EXOPOLYMER, PROCESS FOR ITS PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAID EXOPOLYMER

Ramon Pares Farras, Begues; Juan Jofre Torroella, Tiana, both of Spain; Jean-Paul Ricard, Geneva, Switzerland; Adrian Schultheiss, Begnins, Switzerland; Jean-Claude Farine, Eysins, Switzerland; Marie-Christine Michelet, Bouveret, Switzerland; Agnès Ramsteiner, Onex, Switzerland, and Jacques Bauer, St-Sulpice, Switzerland, assignors to Laboratoires OM S.A., Meyrin, Switzerland

Filed Aug. 9, 1990, Ser. No. 566,294

Claims priority, application Switzerland, Sep. 29, 1989, 3536/89

Int. Cl.[5] C12P *19/04;* **C07H** *1/00*

U.S. Cl. 435—101 **5 Claims**

1. A method of producing an extracellular exopolymer, comprising culturing a biologically pure culture of Sp. *Bifidobacterium infantis longum* having all the identifying characteristics of CNCM No. I-885 in a culture medium, separating the microorganisms from the cultured medium, and separating from the cultured medium an exopolymer having an apparent molecular weight of 10,000-100,000 daltons, free of nucleic acids and lipids and organic acids, which is polysaccharidic in nature and comprises primarily glucose and galactose in the ration between 1:1 and 4:1.

5,114,849

PROTECTANTS FOR MICROBIAL FERMENTATION

Arie Ben-Bassat, Walnut Creek; Kent D. Coddington, El Cerrito, both of Calif., and Donald C. Johnson, Auburn, Wash., assignors to Weyerhaeuser Company, Wash.

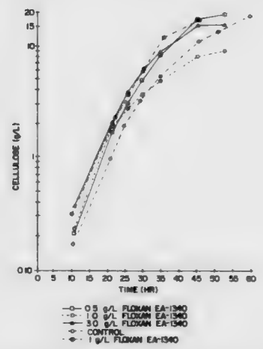
Filed Oct. 26, 1990, Ser. No. 604,587

Int. Cl.[5] C12P *19/04*

U.S. Cl. 435—101 **18 Claims**

1. A process for the aerobic production of microbial cellulose in an agitated culture of microbial cells capable of producing cellulose, grown in a suitable nutrient growth medium, wherein the process comprises the steps:

(a) culturing microbial cells in the presence of an agent comprising a polyacrylamide-containing polymer having a weight average molecular weight in the range of about



10^6 to about 10^7 daltons at a concentration effective to improve cellulose yield from an agitated culture; and

(b) recovering the microbially produced cellulose.

5,114,850

METHODS FOR PREPARING ACETATE ESTERS OF DIOLS AND POLYOLS USING CORYNEBACTERIUM OXYDANS IN SUBSTANTIALLY AQUEOUS MEDIA

Frank A. Pettrone; Gregory M. Whited, and Charles T. Goodhue, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 22, 1990, Ser. No. 542,290

Int. Cl.[5] C12P *7/62, 19/02;* **C12N** *1/04*

U.S. Cl. 435—135 **15 Claims**

1. A method for the preparation of an mono-acetate ester of diols and polyols,

said method comprising the step of reacting an diol or polyol with an acetate ester in a aqueous environment, wherein the ratio of acetate ester to water is about 1–10% by volume of acetate ester to about 90–99% by volume of water, and in the presence of a catalytic amount of a biocatalyst derived from *Corynebacterium oxydans.*

5,114,851

LIGHT ACTIVATED ACYL-ENZYMES

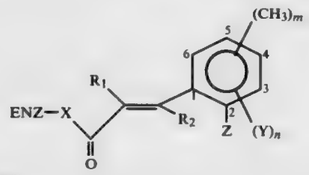
Ned A. Porter, and John D. Bruhnke, both of Durham, N.C., assignors to Duke University, Durham, N.C.

Filed Aug. 29, 1989, Ser. No. 400,507

Int. Cl.[5] C12N *13/00, 9/76, 9/70, 9/68*

U.S. Cl. 435—173 **40 Claims**

1. An acyl-enzyme of the formula:



III)

wherein:

ENZ is an enzyme selected from the group consisting of serine proteinases and cysteine proteinases;

X is the oxygen of the hydroxyl group in the catalytic center of ENZ when ENZ is a serine proteinase, and X is the sulfur of the sulfhydryl group in the catalytic center of ENZ when ENZ is a cysteine proteinase;

Y is selected from the group consisting of $—NR_3R_4$, $—OR_5$, and $—SR_5$;

Z is a nucleophile selected from the group consisting of —OH, —SH, $—NH_2$, and —NHR wherein R_6 is C1 to C4 alkyl;

m is 0 to 3;

n is 1 or 2, subject to the proviso that Y is substituted on said ring at said 4 position, said 6 position, or both said 4 and 6 position;

R_1 is selected from the group consisting of H, C1 to C4 alkyl, C3 to C4 unconjugated alkenyl, and C3 to C4 unconjugated alkynyl;

R_2 is selected from the group consisting of H, C1 to C4 alkyl, C3 to C4 unconjugated alkenyl, and C3 to C4 unconjugated alkynyl;

R_3 is selected from the group consisting of H, C1 to C4 alkyl, C3 to C4 unconjugated alkenyl, and C3 to C4 unconjugated alkynyl;

R is selected from the group consisting of C1 to C4 alkyl, C3 to C4 unconjugated alkenyl, and C3 to C4 unconjugated alkynyl; and

R_5 is selected from the group consisting of C1 to C4 alkyl, C3 to C4 unconjugated alkenyl, and C3 to C4 unconjugated alkynyl.

5,114,852

CHIMERIC FUSED MONOOXYGENASE OF CYTOCHROME P-450 AND NADPH-CYTOCHROME P-450 REDUCTASE

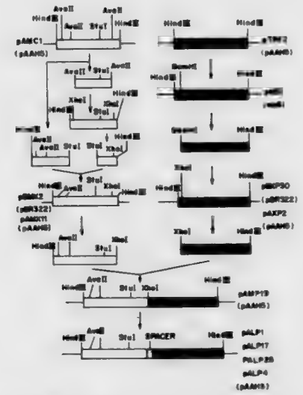
Yoshiyasu Yabusaki; Hiroko Murakami, both of Hyogo; Toshiyuki Sakai; Megumi Shibata, both of Osaka, and Hideo Ohkawa, Hyogo, all of Japan, assignors to Director-General of Agency of Industrial Science & Technology, Tokyo, Japan

Continuation of Ser. No. 81,647, Aug. 4, 1987, abandoned. This application Mar. 27, 1990, Ser. No. 500,220

Claims priority, application Japan, Aug. 12, 1986, 61-187713

Int. Cl.[5] C12N *9/02;* **C07K** *13/00*

U.S. Cl. 435—189 **9 Claims**



1. A genetically engineered microsomal monooxygenase having monooxygenase activity derived from cytochrome P-450 and reductase activity derived from NADPH-cytochrome P-450 reductase, which is constructed by linking the soluble region of the NADPH-cytochrome P-450 reductase to the C-terminal of the cytochrome P-450 in a single protein.

wherein A represents Ser or Ala, X represents Asp or Glu, Y represents Ala or Ser, and B represents Leu or Met; and wherein Z1, Z2, and Z3, each represent a thermostability-conferring amino acid, provided that Z1, Z2, and Z3 taken together cannot be Glu, Gln, and Tyr, respectively.

5,114,853

RECOMBINANT DNA, TRANSFORMANT CONTAINING SAID DNA, AND PROCESS FOR PREPARING HEAT-STABLE GLUCOSE DEHYDROGENASE BY USE OF SAID TRANSFORMANT

Yasutaka Makino, Suita; Seiji Negoro, Osaka; Itaru Urabe, Akashi, and Hirosuke Okada, Osaka, all of Japan, assignors to Amano Pharmaceutical Co., Ltd., Aichi, Japan

Filed Sep. 22, 1989, Ser. No. 410,844

Claims priority, application Japan, Sep. 22, 1988, 62-237699

Int. Cl.[5] C12N *9/04, 15/53, 15/70, 1/21*

U.S. Cl. 435—190 **9 Claims**

1. An isolated DNA fragment encoding a thermostable glucose dehydrogenase, said thermostable glucose dehydrogenase having the following amino acid sequence:

Met—Tyr—Lys—Asp—Leu—Glu—Gly—Lys—Val—Val— (10)
Val—Ile—Thr—Gly—Ser—Ser—Thr—Gly—Leu—Gly— (20)
Lys—A—Met—Ala—Ile—Arg—Phe—Ala—Thr—Glu— (30)
Lys—Ala—Lys—Val—Val—Val—Asn—Tyr—Arg—Ser— (40)
Lys—Glu—X—Glu—Ala—Asn—Ser—Val—Leu—Glu— (50)
Glu—Ile—Lys—Lys—Val—Gly—Gly—Glu—Ala—Ile— (60)
Ala—Val—Lys—Gly—Asp—Val—Thr—Val—Glu—Ser— (70)
Asp—Val—Ile—Asn—Leu—Val—Gln—Ser—Y—Ile— (80)
Lys—Glu—Phe—Gly—Lys—Leu—Asp—Val—Met—Ile— (90)
Asn—Asn—Ala—Gly—B—Glu—Asn—Pro—Val—Ser— (100)
Ser—His—Glu—Met—Ser—Leu—Ser—Asp—Trp—Asn— (110)
Lys—Val—Ile—Asp—Thr—Asn—Leu—Thr—Gly—Ala— (120)
Phe—Leu—Gly—Ser—Arg—Glu—Ala—Ile—Lys—Tyr— (130)
Phe—Val—Glu—Asn—Asp—Ile—Lys—Gly—Thr—Val— (140)
Ile—Asn—Met—Ser—Ser—Val—His—Glu—Lys—Ile— (150)
Pro—Trp—Pro—Leu—Phe—Val—His—Tyr—Ala—Ala— (160)
Ser—Lys—Gly—Gly—Met—Lys—Leu—Met—Thr—Glu— (170)
Thr—Leu—Ala—Leu—Glu—Tyr—Ala—Pro—Lys—Gly— (180)
Ile—Arg—Val—Asn—Asn—Ile—Gly—Pro—Gly—Ala— (190)
Ile—Asn—Thr—Pro—Ile—Asn—Ala—Glu—Lys—Phe— (200)
Ala—Asp—Pro—Gln—Glu—Arg—Ala—Asp—Val—Glu— (210)
Ser—Met—Ile—Pro—Met—Gly—Tyr—Ile—Gly—Glu— (220)
Pro—Glu—Glu—Ile—Ala—Ala—Val—Ala—Ala—Trp— (230)
Leu—Ala—Ser—Ser—Glu—Ala—Ser—Tyr—Val—Thr— (240)
Gly—Ile—Thr—Leu—Phe—Ala—Asp—Gly—Gly—Met— (250)
Thr—Gln—Tyr—Pro—Ser—Phe—Gln—Ala—Gly—Arg— (260)
Gly

5,114,854

PROCESS OF EFFECTING A MICROINJECTION INTO LIVING CELLS

Günter Bertholdt, Mössingen, Fed. Rep. of Germany, assignor to Firma Eppendorf-Netheler-Hinz GmbH, Hamburg, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 312,960

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1988, 3808531

Int. Cl.[5] **C12N** *15/89*

U.S. Cl. 435—240.1 **3 Claims**

1. A process for placing a cannula at a desired location within a living cell positioned on a stage, comprising the steps of:

providing a stage with living cells positioned thereon;

providing a movably supported cannula which has an axis along the length thereof and a tip at the end thereof, said tip constituting a pointer, said cannula being adjustably connected to said stage so that said tip is proximate to said stage and said axis forms an acute angle with respect to said stage, said cannula and said stage being movable relative to one another along two perpendicular axes (X, Y) in a plane that is parallel to said stage, said cannula also being movable along a vertical axis (Z) which is perpendicular to said parallel plane;

moving said cannula in a first plane (Z_1) above a cell and parallel to said stage so that said tip points to a desired location within the cell, wherein said tip is spaced from said desired location along said vertical axis which intersects said desired location;

imparting a setback movement to said cannula from said pointing location, as a function of said acute angle and in a direction of a projection of said cannula on said parallel plane for a distance which is sufficient so that said cannula at an end of said setback movement is in a position to intersect said desired location when moved in a direction along said axis of said cannula towards the cell;

puncturing the cell by moving said cannula from said setback position in a direction along said axis of said cannula;

arresting said puncturing movement when said tip has intersected said desired location.

5,114,855

METHOD FOR AGGREGATING CELLS WITH SMALL MICROSPHERES

Wei-Shou Hu, Falcon Heights, Minn., and Stephane Goetghebeur, Villeneuve d'Ascq, France, assignors to Regents of the University of Minnesota, St. Paul, Minn.

Filed Apr. 19, 1990, Ser. No. 511,419

Int. Cl.[5] **C12N** *5/00, 5/02, 11/00*

U.S. Cl. 435—240.24 **46 Claims**

1. A method of inducing aggregate formation of anchorage-dependent cells comprising the steps of:

(a) forming a suspension of anchorage-dependent cells in nutrient medium; and

(b) introducing into the suspension microspheres having a positive finite derivatized diameter of less than about 60 μm, when measured in a buffer saline or cell culture media.

5,114,856

HIV-1_{MN} HUMAN MONOCLONAL ANTIBODY

James E. Robinson, New Orleans, La., and Charles F. Scott, Boston, Mass., assignors to Repligen Corporation, Cambridge, Mass. and Board of Supervisors of Louisiana State University and Mechanical College Through Its Medical Center, New Orleans, La.

Filed Nov. 3, 1989, Ser. No. 431,731

Int. Cl.[5] **C12N** *5/22, 15/02;* **C07K** *15/28;* **C12P** *21/08*

U.S. Cl. 530—387.9 **2 Claims**

1. A human monoclonal antibody which is capable of inhibiting syncytium formation by HIV-1_{MN} infected cells or cells infected by an HIV-1_{MN} variant, said antibody produced by the cell line having A.T.C.C. Accession No. HB10290.

5,114,857

ACTINOMADURA HIBISCA MICROORGANISM USEFUL FOR PREPARING SERINE ANALOGS OF BU-3608 ANTIBIOTICS

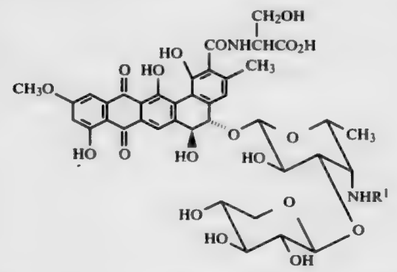
Yosuke Sawada, Tokyo; Masatoshi Kakushima, Yokohama; Maki Nishio, Tokyo; Takeo Miyaki, and Toshikazu Oki, both of Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 569,679, Aug. 20, 1990, which is a division of Ser. No. 269,821, Nov. 10, 1988, Pat. No. 4,973,673. This application May 14, 1991, Ser. No. 699,548

Int. Cl.[5] **C12R** *1/03;* **C12P** *17/56;* **C07H** *15/24;* **A61K** *37/70*

U.S. Cl. 435—252.1 **2 Claims**

1. A biologically pure culture of the microorganism *Actinomadura hibisca* ATCC 54815 which is capable of producing an antibiotic of the formula



where R^1 is H or methyl, upon cultivation in an aqueous medium containing an assimilable source of carbon, nitrogen and D-serine.

5,114,858

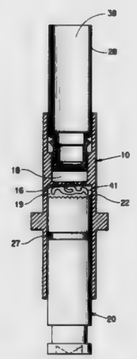
CELLULAR COMPONENT EXTRACTION PROCESS IN A DISPOSABLE FILTRATION VESSEL

John G. Williams, Landenberg, Pa., and Louis Rosanio, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 26, 1990, Ser. No. 543,928

Int. Cl.[5] **C12N** *1/08, 1/06;* **G01N** *1/18;* **C12M** *1/12*

U.S. Cl. 435—270 **3 Claims**



1. A method of separating nucleic acids from a biological sample, comprising:

(a) releasing the intracellular contents from the sample in the extraction vessel by operating the disrupting means;

b) separating aqueous solvent-soluble components of the cells into one phase and organic solvent-soluble components of the cells into a second phase in a first chamber of an extraction device comprising:

(i) the first chamber and a second chamber separated by a radially extending wall with means for allowing fluid to pass through, the first chamber and the second chamber having openable ends;

(ii) a plunger means for insertion into said first chamber and a means for retaining the plunger means in the first chamber to retain the sample between inserted end of the plunger means and the radially extending wall;

(iii) a means associated with the plunger means and the radially extending wall for disrupting the sample, whereby nucleic acids are released therefrom;

(iv) a means for sealing between the plunger means and the first chamber to block fluid communication of the released nucleic caids through the openable end of the first chamber;

c) filtering the aqueous phase sample into a tube means having a barrel, the tube means being insertable in the second chamber for accumulating nucleic acid-containing fluid introduced therein from the first chamber, the tube means further including a filter means having a first and second side such that the aqueous solvent phase is on the second side of the filter means and the organic solvent phase and any cellular debris is on the first side of the filter means upon transfer of the nucleic acid-containing fluid from the the second chamber to the barrel of the tube means, and a means for sealing between the tube means and the second chamber to block fluid communication of the released nucleic acids through the openable end of the second chamber;

d) precipitating nucleic acids out of the aqueous phase in the barrel of the tube means; and

e) filtering the precipitated nucleic acids onto the second side of said filter means.

5,114,859

METHOD FOR MEASURING A CHARACTERISTIC IN A SAMPLE FLUID

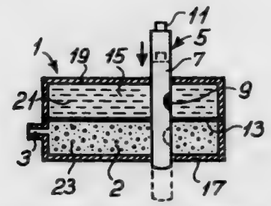
Henrik Kagenow, Farum, Denmark, assignor to Radiometer A/S, Denmark

Continuation of Ser. No. 608,012, Oct. 31, 1990, abandoned, which is a continuation of Ser. No. 238,556, Aug. 30, 1988, abandoned. This application Apr. 22, 1991, Ser. No. 689,727

Claims priority, application Denmark, Jul. 21, 1988, 4091/88

Int. Cl.[5] **G01N** *35/02*

U.S. Cl. 436—50 **44 Claims**



1. A method for measuring a characteristic which is a function of the concentration of one or more chemical species in a sample fluid, by using a measuring device comprising

a sensor having a sensing surface part, and

a chamber adapted to contain a conditioning fluid, the chamber being partly defined by a first wall part adapted to allow the sensor to pass through it and establish a seal around the sensor when the sensor traverses the first wall part, the sensor and the chamber being movable relative to each other so as to transfer the sensing surface part of the sensor through the first wall part from a position where the sensing surface part of the sensor is inside the chamber to a position where it is outside the chamber,

the method comprising

exposing the sensing surface part of the sensor to a conditioning fluid in the chamber,

moving the sensor and the chamber relative to each other so as to transfer the sensing surface part of the sensor through the first wall part and position it outside the chamber,

exposing the sensing surface part of the sensor to a sample fluid,

deriving the characteristic on the basis of a response generated by the sensor when the sensing surface part of the sensor is exposed to the sample fluid, and, optionally, a response generated by the sensor when the sensing surface part of the sensor is exposed to the conditioning fluid, and

discarding the measuring device after one measurement of the characteristic.

5,114,860

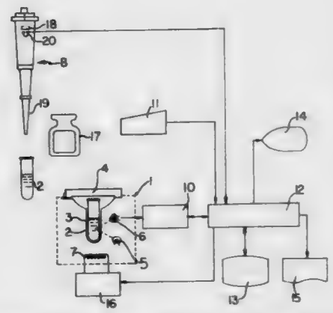
DEVICE OF MEASURING A BLOOD COAGULATING TIME

Masayoshi Hayashi, Kobe, Japan, assignor to Toa Medical Electronics Co., Ltd., Japan

Continuation of Ser. No. 183,320, Apr. 6, 1988, abandoned, which is a continuation of Ser. No. 925,363, Oct. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 652,176, Sep. 18, 1984, abandoned. This application Feb. 8, 1991, Ser. No. 654,403

Int. Cl.[5] **G01N** *21/59*

U.S. Cl. 436—69 **2 Claims**



1. A device for measuring blood coagulating time comprising:

a detecting section for measuring coagulation of blood, said detecting section comprising an accommodator for housing a container containing a specimen of blood plasma, a cover for covering the accommodator against outside light , an optical unit for continuously measuring coagulation of said specimen of blood plasma and continuously generating first output signals which are transmitted from said detecting section, said optical unit including a source of light and a light receiver located beside the container and a thermal controller whereby the specimen in the container is maintained at a desired temperature;

a pipette including a switch whereby the measuring of time for the specimen of blood to coagulate is started by activating said switch;

a detector means for receiving the first output signals from the detecting section and generating second output signals;

a keyboard switch by which items to be measured and desired conditions are input to said device;

an arithmetic means for comparing successive second output

signals from said detector means, said arithmetic means connected to the pipette, the keyboard switch, the detector means, and the thermal controller;

a memory means for storing second output signals, said memory means connected to the arithmetic means;

a display screen means connected to he arithmetic means, said display screen means for generating in-process graphs of coagulation measurements; and

a recording section connected to the arithmetic means, said arithmetic means connected to said pipette such that when said switch in said pipette is turned on a signal is sent to said arithmetic means to start timing a blood coagulating time, said arithmetic means connected to said detector means such that second output signals are continuously transmitted to said arithmetic means and stored in said memory means, said arithmetic means comparing each successive second output signal, transmitting a signal to the detector means so as to stop the measuring of blood coagulation when a saturation value is reached, the saturation value being obtained when said second output signals from the detector means remain constant, and said arithmetic means conducting an arithmetic operation on a presumption that the saturation value is 100% thereby determining blood coagulating time by calculating a percentage between 20% and 80% predetermined by the keyboard switch.

5,114,861

DETECTING THE ENDPOINT IN INTERFACIAL AROMATIC POLYCARBONATE POLYMERIZATION REACTIONS

James M. Silva, Clifton Park, and Thomas J. Fyvie, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 14, 1990, Ser. No. 582,317

Int. Cl.[5] G01N *33/44, 21/62*

U.S. Cl. 436—85 **20 Claims**

1. A method of detecting the endpoint of an interfacial aromatic polycarbonate polymerization reaction comprising illuminating a sample of the polymer preparation reaction mixture with electromagnetic radiation having a wavelength of at least about 300 nanometers, and monitoring the proportion of incident radiation which is absorbed and scattered by the reaction mixture during the course of the polycondensation reaction until at or about the endpoint of the reaction mixture a predetermined threshold proportion is achieved, wherein the polycarbonate polymerization reaction is a heterogeneous mixture comprising water, a substantially water-insoluble organic liquid, an organobishydroxy compound or organochloroformate oligomer, an acid acceptor, an effective amount of an interfacial polycarbonate condensation catalyst, and optionally a polycarbonate chainstopper and phosgene.

5,114,862

METHOD FOR DISTRIBUTING AND ANALYZING A FLUID SAMPLE ONTO A TEST SURFACE

Allen J. Brenneman, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.

Division of Ser. No. 351,489, May 15, 1989. This application Apr. 29, 1991, Ser. No. 693,155

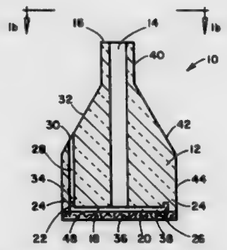
Int. Cl.[5] G01N *1/10*

U.S. Cl. 436—169 **2 Claims**

1. A method for distributing and analyzing a fluid sample, comprising:

attaching a reagent film having a first surface and a second surface to a reagent format device comprising main body, said main body having a capillary tube extending from a first end of said main body through to a second end of said main body and forming an opening at each end, said second end including a flow surface surrounding the opening and extending outwardly to an outer edge of the main body, said second end further including a step shoulder extending peripherally about the outer edge of said flow surface to contain said reagent film, said main body further including a vent passageway having an outlet in communication with said flow surface;

moving said reagent format device into direct contact with a fluid sample such that said fluid sample is introduced



into the first end of said capillary tube and flows into said flow surface where said fluid sample contacts the first surface of said reagent film; and

thereafter analyzing any change in the color of the reagent film by viewing the second surface of said reagent film.

5,114,863

IMMUNOSORBANT ASSAY FOR α-1-ANTITRYPSIN, KIT EMPLOYING SAID ASSAY, MONOCLONAL ANTIBODY TO α-1-ANTITRYPSIN, AND HYBRIDOMA FOR PRODUCING SAID MONOCLONAL ANTIBODY

Candace C. McCombs; Joseph P. Michalski, both of Covington; William R. Gallaher, and James J. Thompson, both of New Orleans, all of La., assignors to Board of Supervisors of Louisiana State University & Agricultural & Mechanical College, New Orleans, La.

Continuation of Ser. No. 913,238, Sep. 30, 1986, abandoned. This application Nov. 15, 1990, Ser. No. 617,402

Int. Cl.[5] G01N *33/543*

U.S. Cl. 436—518 **13 Claims**

3. A monoclonal antibody having specific reactivity to α_1AT, wherein said antibody is produced by a hybridoma cell line having American Type Culture Collection accession number HB-9199.

5. A double antibody immunoassay for detecting alpha-1-antitrypsin (α_1AT) in a test sample, comprising the steps of:

immobilizing a first anti-α_1AT antibody with a solid substrate;

reacting with the immobilized first antibody in sample suspected of containing α_1AT to form a first antibody-α_1AT complex;

reacting a labelled second anti-α_1AT antibody with the formed complex; and

detecting the amount of labelled second antibody which reacts with the formed complex,

wherein one of said antibodies is the monoclonal antibody of claim **3**.

5,114,864

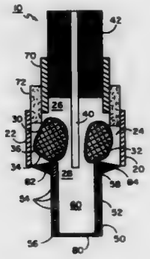
FIBER OPTIC SENSORS, APPARATUS, AND DETECTION METHODS USING FLUID ERODIBLE CONTROLLED RELEASE POLYMERS FOR DELIVERY OF REAGENT FORMULATIONS

David R. Walt, Lexington, Mass., assignor to Trustees of Tufts College, Medford, Mass.

Continuation-in-part of Ser. No. 294,175, Jan. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 878,128, Jun. 25, 1986, Pat. No. 4,822,746, and Ser. No. 305,176, Feb. 2, 1989, which is a continuation of Ser. No. 878,128,. This application Sep. 19, 1989, Ser. No. 409,462

Int. Cl.[5] G01N *21/62, 21/63, 21/64*

U.S. Cl. 436—528 **12 Claims**



1. A fiber optic sensor for performing optical determinations of a plurality of test fluids, said sensor comprising;

a housing with a securing means to hold a fiber optic strand, said housing comprising a reservoir chamber of fixed configuration and interior spatial volume comprised of at least one side wall and having at least one open portal accessing said interior spatial volume;

at least one polymeric matrix comprising a fluid contact positioned within said interior spatial volume of said reservoir chamber, said polymeric matrix comprising a fluid erodible, continuous release polymer and a sustained release reagent formulation above to react with a molecule of interest in each of the test fluids;

a fiber optic strand positioned proximal to said erodible polymeric matrix within said reservoir chamber, said fiber optic strand being able to convey light energy into and out of said interior spatial volume of said reservoir chamber; and

a conduit member of fixed dimensions and shape in fluid flow communication with said portal of said reservoir chamber, said conduit member being comprised of at least one side wall, at least one aperture perforating said wall, and a perforated internal volume in flow communication with said interior spatial volume of said reservoir chamber.

5,114,865

METHOD OF MANUFACTURING A SOLID-STATE IMAGE SENSING DEVICE HAVING AN OVERFLOW DRAIN STRUCTURE

Mikihiro Kimura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 505,387, Apr. 6, 1990, Pat. No. 5,051,798. This application Jul. 17, 1991, Ser. No. 731,232

Claims priority, application Japan, Apr. 7, 1989, 1-89341

Int. Cl.[5] H01L *31/18, 21/339*

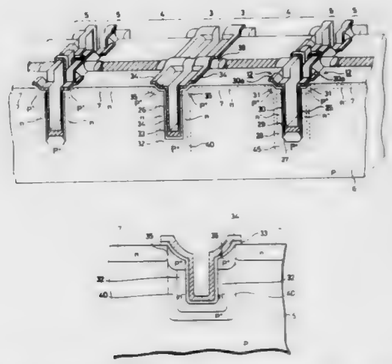
U.S. Cl. 437—2 **3 Claims**

1. A method of manufacturing a solid-state image sensing device having an overflow drain structure for purging superfluous charges generated when light exceeding a predetermined quantity enters optoelectro transducers, comprising the steps of;

forming first impurity regions (**35**) of a first conduction type having a high concentration on predetermined regions of a main surface of a semiconductor substrate of the first conduction type,

forming element isolating oxide films (**38**) on surfaces of said first impurity regions, applying impurity ions (**39**) of a second conduction type to the surface of said semiconductor substrate by using said element isolating oxide films as a mask, thereby forming second impurity regions (**7**) constituting optoelectro transducer,

removing said element isolating oxide films from selected positions of said semiconductor substrate,



forming grooves (**26**) in said first impurity regions (**7**) from which said element isolating oxide films have been removed,

forming third impurity regions (**32**) of the second conduction type on opposite side walls and bottom walls of said grooves,

forming insulating films (**33**) on the opposite side walls and the bottom walls of said grooves, and

forming conductive layers (**34**) on surfaces of said insulating films.

5,114,866

FABRICATING AN AVALANCHE PHOTO DIODE HAVING A STEP-LIKE DISTRIBUTION

Kazuhiro Ito, Tokyo; Hiroshi Matsuda, Kanagawa, and Yuuji Nagano, Urawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corporation, both of Tokyo, Japan

Continuation-in-part of Ser. No. 474,336, Feb. 2, 1990. This application Apr. 24, 1991, Ser. No. 690,352

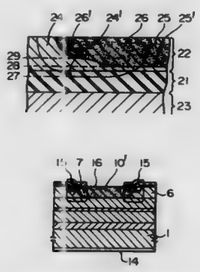
Claims priority, application Japan, Feb. 10, 1989, 1-29802; Apr. 27, 1990, 2-110062

Int. Cl.[5] H01L *31/18*

U.S. Cl. 437—3 **9 Claims**

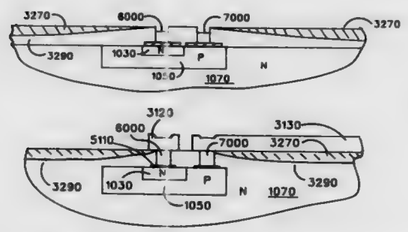
1. A method for producing a semiconductor photo-detection device provided with a first impurity-doped region having a relatively high concentration and a step-like distribution for forming a light absorbing area in a semiconductor, and a second impurity-doped region forming a guardring and surrounding said first impurity-doped region while partly superimposing on said first impurity-doped region, in which said first

impurity-doped region is formed by performing at least two times a step of forming an impurity-doped region so that said



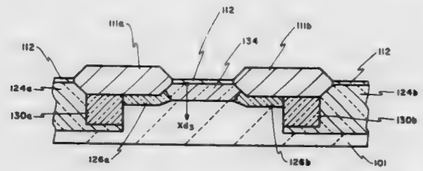
first impurity-doped region has a depth which is arranged so as to continuously vary in said second impurity-doped region.

5,114,867
SUB-MICRON BIPOLAR DEVICES WITH METHOD FOR FORMING SUB-MICRON CONTACTS
Frank Z. Custode, Norco, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Division of Ser. No. 529,020, May 25, 1990, Pat. No. 5,057,801.
This application Sep. 17, 1990, Ser. No. 583,251
Int. Cl.[5] H01L *21/44, 21/48*
U.S. Cl. 437—31 **4 Claims**



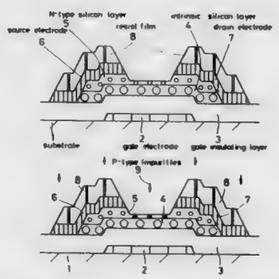
1. The method of making a sub-micron bipolar transistor, comprising the steps of:
diffusing a first region through a wafer surface into the wafer, doped one way, to comprise a base;
diffusing a second region into the wafer through said surface, doped opposite to said one way, to comprise an emitter;
constructing polysilicon whisker electrodes above and in contact with the base and emitter, respectively;
doping the electrodes the same as their underlying region;
surrounding the doped whisker electrodes with plasma oxide covered by spin on glass;
planarizing the glass and exposing the tops of the electrodes;
disposing electrical interconnects over the spin on glass to the tops of each of said electrodes; and,
said electrodes having maximum cross sectional dimensions in the range approximately 0.1 to 1.0 microns.

5,114,868
MANUFACTURING METHOD OF WELL REGION IN COMS INTERGRATED CIRCUIT
Hiroshi Yoshida, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Aug. 1, 1990, Ser. No. 561,191
Claims priority, application Japan, Aug. 2, 1989, 1-201647
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—34 **16 Claims**



1. A manufacturing method of CMOS integrated circuit device comprising the steps of:
ion-implanting first impurities into a MOS transistor area defined at a main surface portion of a semiconductor substrate, said first impurities representing a conductivity type that is equal to a conductivity type of said semiconductor substrate and said MOS transistor area having an element formation region and an isolation region;
forming an oxidation-resist film to cover said element formation region of said MOS transistor area except said isolation region;
performing oxidation treatment by using said oxidation-resist film as a mask to form a field oxide film embedded partially in said isolation region and to form a channel stopper under said field oxide film by said first impurities; and
ion-implanting second impurities representing the same conductivity type of said first impurities into said element formation region by using said field oxide film as a mask thereby to form a well region having a predetermined impurity profile in said element formation region.

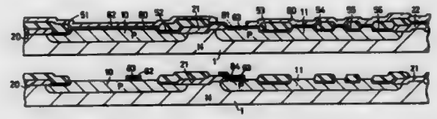
5,114,869
METHOD FOR PRODUCING REVERSE STAGGERED TYPE SILICON THIN FILM TRANSISTOR
Sakae Tanaka; Yoshiaki Watanabe, both of Tokyo; Katsuo Shirai, and Yoshihisa Ogiwara, both of Tochigi, all of Japan, assignors to Seikosha Co., Ltd. and Nippon Precision Circuits Ltd., both of Tokyo, Japan
Filed May 26, 1989, Ser. No. 358,039
Claims priority, application Japan, May 30, 1988, 63-132090
Int. Cl.[5] H01L *21/265*
U.S. Cl. 43—40 **13 Claims**



1. A method for producing a reverse staggered type silicon thin film transistor, comprising the steps of:
forming a gate electrode on a surface of a substrate, and

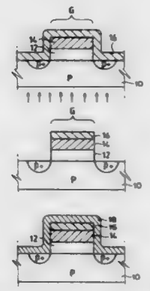
forming a gate insulating layer on said substrate and gate electrode;
forming an intrinsic silicon film on a predetermined portion of the gate insulating layer overlying said gate electrode and extending beyond said gate electrode;
forming an n-type silicon layer on said intrinsic silicon layer to cover said predetermined portion thereof;
forming a source electrode and a drain electrode to overlie a first portion of said n-type silicon layer; and
doping a second portion of said n-type silicon layer other than said first portion thereof with p-type impurities by means of a mask.

5,114,870
METHOD FOR MANUFACTURING FIELD EFFECT TRANSISTORS
Yuji Yatsuda, Hachioji, Japan; Takaaki Hagiwara, Stanford, Calif.; Ryuji Kondo, Kodaira; Shinichi Minami, Kokubunji, and Yokichi Itoh, Hachiohji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed May 15, 1989, Ser. No. 351,847
Claims priority, application Japan, May 25, 1979, 54-63941
The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.
Int. Cl.[5] H01L *21/336, 27/088, 27/112, 27/115*
U.S. Cl. 437—40 **40 Claims**



1. A method of manufacturing semiconductor devices formed at a major surface of a semiconductor substrate comprising:
(a) forming an anti-oxidation film on the surface of the semiconductor substrate;
(b) locally forming an insulating film on said anti-oxidation film;
(c) introducing impurities of a first type of conductivity into the surface of the semiconductor substrate in portions which are not covered by said insulating film in order to form at least one semiconductor region of the first type of conductivity;
(d) oxidizing the surface of the semiconductor substrate, using as a mask an anti-oxidation film having openings formed in portions which are not covered by said insulating film, so as to form an oxide film;
(e) introducing impurities of a second type of conductivity into the surface of the semiconductor substrate using the oxide film as a mask, in self-aligned manner to said oxide film; and
(f) forming insulated gate field effect transistors in the at least one semiconductor region, said forming of the transistors including providing gate electrodes on the at least one semiconductor region, and providing source or drain regions of the second type of conductivity in the at least one semiconductor region at the side of the gate electrodes.

5,114,871
MANUFACTURING DIAMOND ELECTRONIC DEVICES
Barbara L. Jones, 80 Chisbury Place, Forest Park, Bracknell, RG12 3TX, England
Filed May 24, 1989, Ser. No. 356,773
Claims priority, application United Kingdom, May 24, 1988, 8812235
Int. Cl.[5] H01L *21/283, 21/336*
U.S. Cl. 437—41 **5 Claims**

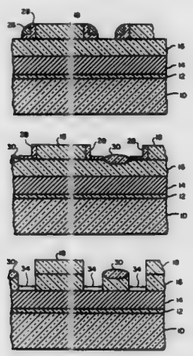


1. A process for manufacturing a unipolar semiconductor device characterized in that it includes the steps of:
providing a p-type diamond substrate which is transparent to ultraviolet light;
depositing a layer of insulating material on the surface of the substrate;
depositing a layer of a first metal over the layer of insulating material;
selectively removing the deposited layers to define a gate region of the unipolar semiconductor device;
forming source and drain regions of the unipolar semiconductor device adjacent to the gate area;
depositing a layer of positive photoresist material over the source, gate and drain regions;
exposing the layer of photoresist material to ultraviolet light which is passed thorugh the substrate;
removing the exposed photoresist material, so that a layer of photoresist material remains above the gate region;
depositing a layer of a second metal over the source, gate and drain regions; and
selectively removing the layer of photoresist material and hence the layer of the second metal above the gate region, a MISFET structure thereby being obtained which has source and drain contacts of the second metal and a gate contact of the first metal.

5,114,872
FORMING PLANAR ITO GATE ELECTRODE ARRAY STRUCTURES
Paul L. Roselle, Webster; Stephen L. Kosman, and Patricia A. Mahns, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 4, 1991, Ser. No. 663,996
Int. Cl.[5] H01L *21/302*
U.S. Cl. 437—48 **1 Claim**

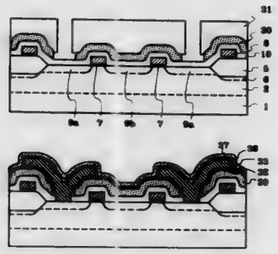
1. A method of forming a planar ITO gate electrode array structure with sub-micron spacing between such ITO gates, comprising the steps of:
a sequentially providing layers of ITO, polysilicon and LTO oxide;
(b) patterning the LTO layer to form spaced LTO structures which have rectangular cross-sections and exposing the surface of the polysilicon layer between such spaced LTO structures;
(c) forming a conformal thin nitride layer on the exposed polysilicon and the LTO structures;

(d) forming a conformal oxide layer on the thin nitride layer;
(e) anisotropically etching the oxide layer and nitride layer to expose the poly layer and the top surface of the LTO structures while leaving oxide spacers over L-shaped nitride portions between such structures;
(f) removing the oxide spacers leaving L-shaped nitride portions between the LTO structures;
(g) oxidizing the exposed polysilicon between the L-shaped nitride portions;
(h) removing the L-shaped nitride portions providing sub-



micron openings between the LTO and the oxidized polysilicon;
(i) anisotropically etching a polysilicon down to the ITO layer through the sub-micron openings formed between the LTO structures and the oxidized polysilicon;
(j) removing the LTO structures and the oxidized polysilicon;
(k) anisotropically etching the ITO through the sub-micron openings formed between the polysilicon; and
(l) removing the polysilicon layer leaving a planar ITO gate electrode array structure.

5,114,873
METHOD FOR MANUFACTURING A STACKED CAPACITOR DRAM CELL
Kyung-hun Kim; Seong-tae Kim, and Hyeong-kyu Lee, all of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea
Filed Oct. 4, 1990, Ser. No. 592,807
Claims priority, application Rep. of Korea, May 21, 1990, 90-7268[U]
Int. Cl.[5] H01 *21/70*
U.S. Cl. 437—52 **8 Claims**

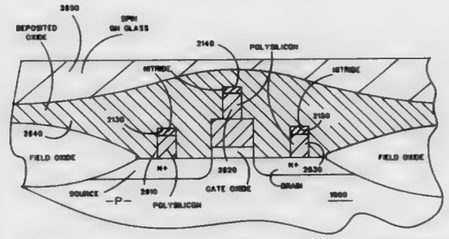


1. A method for manufacturing a semiconductor device having a plurality of memory cells, each of which consists of a transistor and a stack capacitor, said method comprising the steps of:
(a) forming said transistor on a surface of a semiconductor substrate;
(b) depositing an interlayer insulating layer on the surface of said substrate whereon the transistor has been formed in step (a);
(c) depositing a first conductive layer on the surface of said substrate whereon the interlayer insulating layer has been deposited in step (b);
(d) forming a design pattern on the first conductive layer by vertically etching an etching pattern from a mask onto the first conductive layer;
(e) horizontally overetching the design pattern on the first conductive layer formed in step (d) by a wet etching process, using the etching pattern of step (d);
(f) depositing a first thin insulating film on the surface of the substrate whereon the first conductive layer has been horizontally overetched in step (e),
(g) depositing a second conductive layer on the first thin insulating film to provide sufficient thickness to protect the first insulating film;
(h) vertically etching the second conductive layer, the first thin insulating film and the interlayer insulating layer with the mask used in etching the first conductive layer in step (d), wherein a first contact hole is formed to contact the transistor;
(i) depositing a predetermined thickness of a material used in the second conductive layer on the surface of the substrate whereon the contact hole has been formed in step (h);
(j) forming a design pattern by vertically etching an etching pattern from a mask onto the second conductive layer;
(k) horizontally overetching the second conductive layer by a wet etching process, using the etching pattern of step (j);
(l) depositing a thin second insulating film on the whole surface of the structure after removing the second conductive layer;
(m) depositing a sufficient thickness of a third conductive layer to protect the second insulating film;
(n) partially exposing a surface of the first conductive layer by vertically etching the third conductive layer and the thin second insulating film by applying the mask used in etching the second conductive layer in step (j); and
(o) depositing a predetermined thickness of a material used in the third conductive layer on the surface of the substrate partially exposed in step (n) so that a surface of the first conductive layer is partially exposed.

5,114,874
METHOD OF MAKING A SUB-MICRON NMOS, PMOS AND CMOS DEVICES WITH METHODS FOR FORMING SUB-MICRON CONTACTS
Frank Z. Custode, Norco, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Continuation-in-part of Ser. No. 73,591, Jul. 15, 1987, Pat. No. 4,942,225. This application May 30, 1990, Ser. No. 529,982
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—57 **10 Claims**

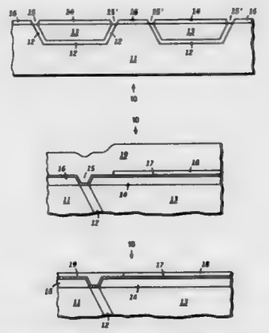
1. The method of making a sub-micron NMOS transistor using a wafer as a substrate therefor, comprising the steps of:
depositing a layer of oxide on a surface of the wafer;
depositing a layer of nitride over the oxide;
delineating an active region on the wafer by removing the oxide and nitride surrounding the active region;
growing field oxide surrounding the active region;
removing the oxide and nitride over the active region;
growing a gate oxide in the active region;
depositing a layer of polysilicon over the gate oxide;
delineating a gate of polysilicon in the active region, and removing the remainder of the polysilicon;
diffusing a first region into the active region of said wafer doped one way to comprise a source on one side of the gate;

diffusing a second region into the wafer, doped the same way, to comprise a drain on the other side of the gate;
depositing a further layer of polysilicon;
delineating a polysilicon whisker over each of the source, drain and the gate;
doping the whiskers over the source and drain the same as



their underlying source and drain and doping the whisker over the gate and the gate at the same time;
surrounding the so-doped whiskers with plasma oxide covered by spin on glass;
planarizing the glass and exposing the tops of the whiskers; and,
disposing electrical interconnects to each of said whiskers.

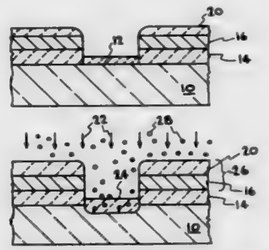
5,114,875
PLANAR DIELECTRIC ISOLATED WAFER
Thomas R. Baker, Tempe; Bernard W. Boland, and David A. Shumate, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 24, 1991, Ser. No. 705,407
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—62 **18 Claims**



12. A method of planarizing a dielectric isolated wafer comprising:
providing a plurality of active areas that are formed in a substrate and that are electrically isolated from the substrate by a dielectric wherein an interface through exists between each active area and the substrate;
covering the trough and at least a portion of each active area with a thin stress relief layer;
covering the thin stress relief layer and any exposed portions of the substrate with a planarizing layer; and
removing a portion of an exposed surface of the planarizing layer and leaving a portion of the planarizing layer covering the stress relief layer that is in the trough in order to form a substantially planar surface.

13. A method of planarizing a dielectric isolated wafer comprising:
providing a plurality of active areas that are formed in a substrate with each active area electrically isolated from the substrate by a dielectric wherein an interface trough exists between each active area and the substrate;
covering the trough, and at least a portion of the substrate with a layer of polysilicon; and
removing a portion of an exposed surface of the polysilicon layer and leaving a portion of the polysilicon in the trough in order to form a substantially planar surface.

5,114,876
SELECTIVE EPITAXY USING THE GILD PROCESS
Kurt H. Weiner, Campbell, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Dec. 7, 1990, Ser. No. 623,854
Int. Cl.[5] H01L *21/20, 21/266, 21/268*
U.S. Cl. 437—89 **20 Claims**



1. A method of selective epitaxy on a semiconductor substrate, said method comprising:
a. providing a crystalline semiconductor substrate;
b. forming an oxide layer on the substrate;
c. depositing a reflectivity mask over the oxide layer;
d. removing a selected portion of the reflectivity mask and the oxide layer in a selective epitaxy region, thereby uncovering the substrate in the selective epitaxy region;
e. depositing an upper layer over the substrate in the selective epitaxy region and adjacent portions of the reflectivity mask;
f. applying laser radiation, so that a molten region is formed in the selective epitaxial region, the molten region comprising the material in the upper layer and the substrate; and,
g. cooling the resulting structure so that the molten region solidifies to form a crystalline epitaxial section that comprises a mixture of the material in the upper layer and the substrate.

5,114,877
METHOD OF FABRICATING QUANTUM WIRE SEMICONDUCTOR LASER VIA PHOTO INDUCED EVAPORATION ENHANCEMENT DURING IN SITU EPITAXIAL GROWTH
Thomas L. Paoli, Los Altos, Calif., and John E. Epler, Zurich, Switzerland, assignors to Xerox Corporation, Stamford, Conn.
Filed Jan. 8, 1991, Ser. No. 638,587
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—129 **36 Claims**

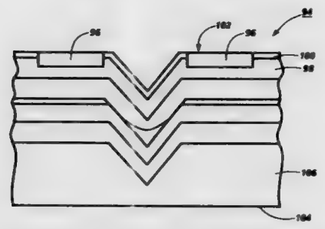
1. A method of forming a quantum wire semiconductor laser structure comprising the steps of:
epitaxially depositing several semiconductor layers on a substrate, at least one of said semiconductor layers or said substrate having at least one groove,
at least one of said semiconductor layers, immediately adjacent to one of said semiconductor layers having at least one groove, being an active quantum well layer, which

provides lightwave generation and propagation under lasing conditions,

interrupting the epitaxial growth of said semiconductor layers after the deposition of said quantum well layer,

selectively desorbing in situ, employing photo induced evaporation, portions of said quantum well layer in said at least one groove to the interface with the semiconductor layer therebeneath forming at least one quantum wire in the vertex of at least one of said at least one groove, and

continuing the epitaxial deposition of the remaining semiconductor layers.



5,114,878

METHOD OF BONDING BUMPS TO LEADS OF TAB TAPE AND AN APPARATUS FOR ARRANGING BUMPS USED FOR THE SAME

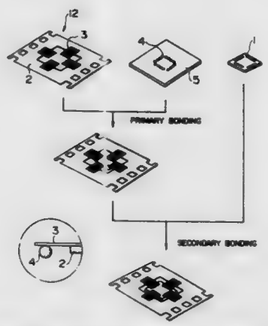
Tadakatsu Maruyama; Yasuhide Ohno, both of Kawasaki; Masashi Konda, Tokyo; Toshiharu Kikuchi, Kawasaki; Yasuhiro Suzuki, Kitakyushu; Tomohiro Uno, Kawasaki; Hiroaki Otsuka, Kawasaki, and Hiroyuki Tanahashi, Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Japan

Continuation-in-part of Ser. No. 578,491, Sep. 6, 1990. This application Mar. 13, 1991, Ser. No. 669,189

Claims priority, application Japan, Sep. 11, 1989, 1-234915; Sep. 11, 1989, 1-234916; Sep. 11, 1989, 1-234917; Mar. 14, 1990, 2-064926; Apr. 16, 1990, 2-101026; Jul. 6, 1990, 2-179266; Jul. 10, 1990, 2-183645; Jul. 18, 1990, 2-189637; Jan. 25, 1991, 3-025312

Int. Cl.[5] H01U *23/48*

U.S. Cl. 437—182 **13 Claims**



1. A method of bonding bumps to leads of a TAB tape comprising the steps of:

preparing a substrate which is provided with through-holes, each having a size which does not allow the bumps to pass therethrough, at positions corresponding to bonding positions of the leads of the TAB tape where the bumps are to be bonded;

provisionally arranging the bumps at positions of the through-holes at one side of the substrate by reducing a pressure in another side of the substrate opposite to said one side to suck the bumps in said through-holes;

disposing the substrate on which the bumps are provisionally arranged and said TAB tape in such a positional relationship that said bumps face to the bonding positions of the leads of said TAB tape; and

bonding the provisionally arranged bumps to the leads at the bonding positions.

5,114,879

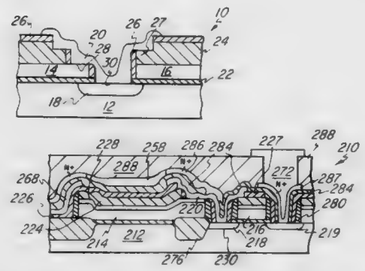
METHOD OF FORMING A MICROELECTRONIC CONTACT

Sudhir K. Madan, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1990, Ser. No. 620,961

Int. Cl.[5] H01L *21/283*

U.S. Cl. 437—195 **12 Claims**



8. A method of forming an integrated-circuit device, the method comprising:

(a) providing a substrate;

(b) providing a first conductor adjacent said substrate, said first conductor having a conductor contact region;

(c) forming a first-conductor insulator over at least a portion of said first conductor, including said conductor contact area of said first conductor, said first-conductor insulator presenting an original thickness;

(d) removing selected portions of said first-conductor insulator so that said first-conductor insulator includes a stepped portion at least over said conductor contact region, said stepped portion of said first-conductor insulator presenting a reduced thickness, substantially less than said original thickness;

(e) providing an active region in said substrate, said active region proximal to said first conductor, upper portions of said active region presenting a moat contact area;

(f) providing a second conductor adjacent said substrate, said second conductor proximal said active region and laterally spaced from said first conductor;

(g) providing a second-conductor insulator, said second-conductor insulator presenting a thickness substantially greater than said reduced thickness of said first-conductor insulator;

(h) exposing said conductor contact region and said moat contact area without exposing said second conductor; and

(i) providing a third conductor in intimate contact with said first conductor at said conductor contact region and said active region at said moat contact area whereby said third conductor is not electrically shorted to said second conductor.

5,114,880

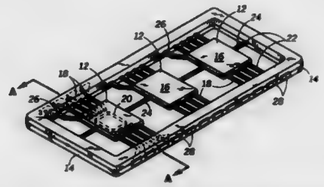
METHOD FOR FABRICATING MULTIPLE ELECTRONIC DEVICES WITHIN A SINGLE CARRIER STRUCTURE

Paul T. Lin, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 538,629, Jun. 15, 1990, Pat. No. 5,036,381. This application May 28, 1991, Ser. No. 680,890

Int. Cl.[5] H01L *21/60*

U.S. Cl. 437—217 **10 Claims**



1. A method for fabricating multiple electronic devices within a single carrier structure, comprising the steps of:

providing a leadframe having a plurality of semiconductor die receiving areas, each of which are surrounded on at least two sides by a plurality of leads having proximal ends near said receiving areas and distal ends away from said receiving area;

providing a plurality of semiconductor die;

positioning said semiconductor die within said semiconductor die receiving areas;

electrically coupling said die to said proximal ends of said plurality of leads of said leadframe;

providing a plurality of package bodies which encapsulate each of said semiconductor die and portions of said proximal ends of said plurality of leads; and

providing a single carrier structure which encapsulates portions of said distal ends of said plurality of leads and encircles said plurality of package bodies, allowing individual electrical access to each of said semiconductor die.

5,114,881

PROCESS FOR PRODUCING A CERAMIC PREFORM

Tsugio Kaneko; Tsuneo Kimura; Michihiro Ikeda; Akira Utsunomiya, and Yuka Ohno, all of Kitakyushu, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Continuation of Ser. No. 314,887, Feb. 24, 1989, abandoned. This application Apr. 15, 1991, Ser. No. 684,501

Claims priority, application Japan, Mar. 4, 1988, 1-50838; Feb. 2, 1989, 2-24538

Int. Cl.[5] C03C *3/06*

U.S. Cl. 501—12 **25 Claims**

1. A process for producing a ceramic preform, which comprises mixing an alkoxysilane and fine silica powder without the addition of water, molding the mixture, and heating said mixture to effect de-alcoholysis by reaction of the alkoxysilane with hydroxyl groups on the surface of the fine silica powder.

5,114,882

FILTER FOR ALUMINUM HOT MELT HAVING A PARTIALLY CRYSTALLINE BINDER

Takashi Sugiyama, Kagamihara; Osamu Yamakawa, and Akira Sumiya, both of Kani, all of Japan, assignors to NGK Insulators, Ltd. and NGK Adrec Co., Ltd., Japan

Filed Feb. 26, 1991, Ser. No. 660,851

Claims priority, application Japan, Mar. 2, 1990, 2-52184

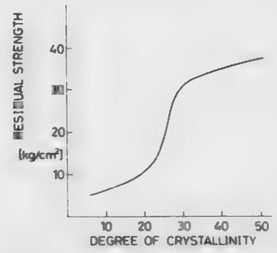
Int. Cl.[5] C03C *14/00, 8/14*

U.S. Cl. 501—17 **5 Claims**

5. A filter for aluminum hot melt comprising:

alumina aggregate particles; and

an inorganic binder in an amount of 5 to 20 parts by weight bound to 100 parts by weight of said alumina aggregate particles, said inorganic binder being composed of 15 wt % to 80 wt % of B_2O_3, 2 wt % to 60 wt % of Al_2O_3, 0 wt % to 30 wt % of CaO and 5 wt % to 50 wt % of MgO, wherein a peak-height of $9Al_2O_3.2B_2O_3$ at $2\theta=16.5°$ is not less than 30% of a peak-height of α-Al_2O_3 at $2\theta=43.4°$ when measured by powder X-ray diffractometry;



said filter being produced by a method comprising sintering said filter and then cooling said filter, from a melting temperature of said inorganic binder during sintering, at a cooling rate of not more than 70° C./hr.

5,114,883

PROCESS FOR THE PREPARATION OF VITREOUS MATERIAL NOTABLY FOR JEWELLERY

Rubin Kagan, 3 Place de la Nation, 75011 Paris; Michel Kagan, 36, avenue Jugnot, 75018 Paris; Jean Kagan, 9, rue Guy Labarbe, 94130 Nogent s/Marne, all of France, and Livio Verita, Via Paolo Erizzo No. 7, Venice Lido, Italy

PCT No. PCT/FR89/00647, § 371 Date Aug. 28, 1990, § 102(e) Date Aug. 28, 1990, PCT Pub. No. WO90/07471, PCT Pub. Date Jul. 12, 1990

PCT Filed Dec. 12, 1989, Ser. No. 566,354

Claims priority, application France, Dec. 28, 1988, 88 17336

Int. Cl.[5] C03C *6/02, 3/062, 4/00*

U.S. Cl. 501—32 **16 Claims**

1. A process for the manufacture of vitreous material exhibiting a characteristic color ranging from orangish-yellow to ox blood-red, based on lead silicate, comprising:

a) preparing a lead silicate melt, by mixing lead oxide and silica to obtain a mixture comprising 65% by weight of lead oxid and 35% by weight silica, based on the total weight of the melt, at a melting temperature between about 1000° C. to 1300° C.;

b) adding copper oxide and antimony into the melt of step (a), the quantity of the addition being sufficient to obtain a final product having a copper oxide content of about 6 to 8% by weight, and maintaining the temperature of the melt between about 1000° C. and 1300° C.;

c) maintaining the melt at rest at a temperature of about 1000° to 1300° C., so as to eliminate bubbles;

d) heat treating of material resulting from step (c) at a temperature of between about 500° C. and 800° C. for a time sufficient to produce formation and growth of microcrystals of cuprite; and

e) slow cooling of material resulting from step (d) to room temperature in order to avoid formation of residual stresses therein.

5,114,884

ALKALI BISMUTH GALLATE GLASSES

Josef C. Lapp, Corning, and Mark L. Powley, Savona, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

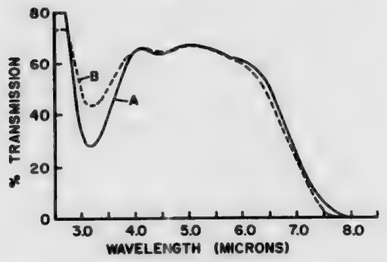
Filed Apr. 26, 1991, Ser. No. 691,843

Int. Cl.[5] C03C *3/12, 3/23, 4/08*

U.S. Cl. 501—41 **4 Claims**

1. Thermally stable, chemically durable, heavy metal oxide glasses exhibiting good transmission of infrared radiation to

wavelengths of about 7 microns, consisting essentially, expressed in terms of weight per cent on the oxide basis, of

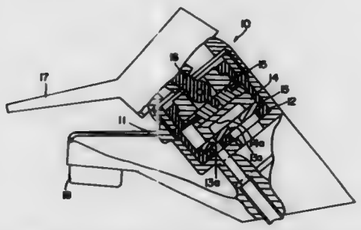


7.5–25% Ga_2O_3, 70–92% Bi_2O_3, and 0.25–12% R_2O, wherein R_2O consists of at least one alkali metal oxide selected from the group consisting of Na_2O, and K_2O.

5,114,885
ENCAPSULANT COMPOSITION
Jacob Hormadaly, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 16, 1991, Ser. No. 685,911
Int. Cl.[5] C03C *3/074*
U.S. Cl. 501—76 **11 Claims**

1. An crystallizable glass composition consisting essentially of by weight % 15–34.5% ZnO, 41–65% PbO, 10–30% B_2O_3, 0.5–15% SiO_2, 0.5–10% SnO_2 and 0–7% Al_2O_3, Cr_2O_3 or mixtures thereof the TCE being at least 57.9×10^{-7}/°C. upon firing at 510°–560° C.

5,114,886
UNIQUE CERAMIC COMPOUND
Kiyotaka Tsukada, Nagoya, Japan, assignor to Ibiden, Co., Ltd., Ogaki, Japan
Division of Ser. No. 349,988, May 8, 1989, Pat. No. 4,932,438, which is a continuation of Ser. No. 935,232, Nov. 6, 1986, abandoned. This application Feb. 28, 1990, Ser. No. 486,237
Claims priority, application Japan, Mar. 12, 1985, 60-48968; April. 19, 1985, 60-85096; Mar. 12, 1986, PCT/JP86/00126
Int. Cl.[5] C04B *35/56*
U.S. Cl. 501—88 **5 Claims**



1. A sliding material comprising a sintered silicon carbide having open pores of a three dimensional network structure:
said open pores comprising 5 to 40% by volume
said open pores being impregnated with a lubricant wherein said lubricant comprises a fluorine or silicone oil.

5,114,887
PROCESS FOR PREPARING OXYNITRIDE CERAMIC FIBERS
Masahiro Sekine, and Shingo Katayama, both of Kitakyushu, Japan, assignors to Colloid Research Institute, Fukuoka, Japan
Filed Apr. 19, 1991, Ser. No. 687,666
Claims priority, application Japan, Apr. 27, 1990, 2-110580
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—95 **7 Claims**

1. A process for preparing oxynitride ceramic fibers comprising spinning a viscous sol obtained by hydrolysis of a feed mainly consisting of metal alkoxides to produce gel fibers, treating the resulting gel fibers with steam, and firing the steam-treated fibers in a stream of ammonia.

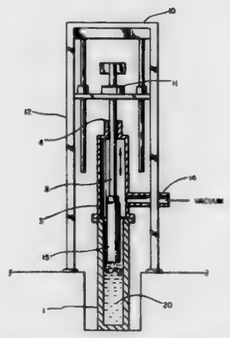
5,114,888
SILICON NITRIDE SINTERED BODY AND METHOD FOR PRODUCING SAME
Kenichi Mizuno; Yo Tajima, and Masakazu Watanabe, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan
Filed Nov. 15, 1990, Ser. No. 612,691
Claims priority, application Japan, Nov. 21, 1989, 1-300851
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—96 **19 Claims**

1. A silicon nitride base sintered body consisting essentially of:
1 to 20 wt %, calculated as oxides, of at least one rare earth element;
0.5 to 8 wt % of V calculated as V_2O_5;
0.5 to 8 wt %, calculated as oxides, of at least one selected from the group consisting of Nb, Ta, Cr, Mo and W; with the sum of the amounts of Va and VIa group elements according to the International Periodic Table, calculated as oxides, being 1 to 10 wt %;
and the balance being silicon nitride.

5,114,889
SILICON NITRIDE SINTERED BODY AND PROCESS FOR PREPARATION THEREOF
Kazumi Osamura; Masaki Terazono; Shoji Kohsaka; Kazunori Koga; Akira Saito; Masahiro Sato, and Hideki Uchimura, all of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan
Filed Nov. 27, 1990, Ser. No. 618,480
Claims priority, application Japan, Nov. 27, 1989, 1-308621; Nov. 30, 1989, 1-312736; Mar. 13, 1990, 2-61781
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—97 **9 Claims**

1. A silicon nitride sintered body comprising 70 to 99 mole% of silicon nitride, 0.1 to 5 mole% of a rare earth element oxide and from 0.2 to 25 mole% of silicon oxide and having a silicon oxide-to-rare earth element oxide molar ratio of from 2 to 25, wherein silicon nitride crystal grains have a fine acicular structure having an average particle major axis of up to 7 μm and an average aspect ratio of at least 3.

5,114,890
ZIRCONIUM-CONTAINING COATING COMPOSITION
John R. Peterson, Salem, Oreg., assignor to Teledyne Industries, Inc., Albany, Oreg.
Division of Ser. No. 240,001, Sep. 2, 1988, Pat. No. 4,856,576. This application Jun. 19, 1989, Ser. No. 367,719
Int. Cl.[5] C04B *35/48*
U.S. Cl. 501—103 **7 Claims**



1. A binderless coating composition, free from allkaline and alkaline earth metallic oxides, hafnium, silica, and alumina, comprising substantially pure zirconium oxide suspended in an aqueous zirconyl nitrate and ammonium hydroxide gel.

5,114,891
SINTERED MATERIAL BASED ON ALUMINUM OXIDE
Reiner Kunz, Waldshut-Tiengen, Fed. Rep. of Germany, and Konrad Kampfer, Thayngen, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland
Division of Ser. No. 547,191, Jul. 3, 1990, Pat. No. 5,076,815. This application Aug. 6, 1991, Ser. No. 740,965
Claims priority, application Switzerland, Jul. 7, 1989, 2537/89
Int. Cl.[5] C04B *35/10*
U.S. Cl. 501—127 **17 Claims**

13. Sintered material based on alpha-aluminum oxide consisting of:
(a) 90 to 99.9 percent by weight of Al_2O_3;
(b) 0.1 to 10 percent by weight of TiO_2; and
(c) 0.001 to 5.0 percent by weight of at least one sintering auxiliary agent, grain growth inhibitor, nucleating agent and/or glass phase maker selected from the group consisting of SiO_2, MgO, ZrO_2, $MgAl_2O_4$, $MgTiO_3$, $FeAl_2O_4$, NiO, $NiTiO_3$, $NiAl_2O_4$, alpha-Cr_2O_3, CeO_2, $ZnTiO_3$, $ZnAl_2O_4$ and Y_2O_3;
having a crystal size of at least 95 percent by all crystallites of less than 4 microns.

5,114,892
CLAY MIXTURE HAVING CONTAMINATION RESISTANCE
Arthur J. Clem, Chicago, Ill., assignor to James Clem Corporation, Chicago, Ill.
Division of Ser. No. 304,464, Feb. 1, 1989, Pat. No. 4,997,695, which is a continuation-in-part of Ser. No. 274,166, Nov. 21, 1988, Pat. No. 4,997,701. This application Dec. 21, 1990, Ser. No. 631,832
Int. Cl.[5] C04B *33/00*
U.S. Cl. 501—141 **3 Claims**

1. A dry clay mixture for use in restricting flow of water consisting of:
a substantially dry bentonite,
and about 0.05% by weight to about 3% by weight of a compound selected from the group consisting of sodium salts of polyphosphoric acids.

5,114,893
METHOD OF IMPROVING WATER-SWELLABLE CLAY PROPERTIES BY RE-DRYING, COMPOSITIONS AND ARTICLES
John Hughes, Long Grove, Ill., assignor to American Colloid Company, Arlington Heights, Ill.
Filed Nov. 5, 1990, Ser. No. 608,816
Int. Cl.[5] C04B *33/02*
U.S. Cl. 501—149 **11 Claims**

1. A method of treating a water-swellable clay that has been recovered and dried to a moisture content of 12% or less, based on the dry weight of the clay, to improve one or more of its properties comprising:
re-wetting the clay to a moisture content in the range of about 15% to about 25% by weight based on the dry weight of the clay; and
drying the re-wetted clay to a moisture content of about 12% by weight or less, based on the dry weight of the clay.

5,114,894
FILTER MATERIAL
Paul R. Witt, Muscatine, Iowa, assignor to Grain Processing corporation, Muscatine, Iowa
Filed Feb. 18, 1991, Ser. No. 656,603
Int. Cl.[5] B01J *20/16*
U.S. Cl. 502—62 **9 Claims**

1. A dry granular composition for use as a filter aid for precoating a filter screen used to filter liquids comprising a major amount of a cross-linked, substantially water-insoluble phosphorylated starch and minor amounts of a colloidal aluminum silicate clay and cellulosic fibers having a low capacity to absorb water, the particle size of the granular composition being sufficiently large for retention on a filter screen.

5,114,895
ALUMINA CLAY COMPOSITIONS
Jennifer S. Holmgren, Bloomingdale; Stanley A. Gembicki, Clarendon Hills; Michael W. Schoonover, Arlington Heights, and Joseph A. Kocal, Gurnee, all of Ill., assignors to UOP, Des Plaines, Ill.
Continuation-in-part of Ser. No. 483,844, Feb. 22, 1990, abandoned. This application Dec. 20, 1990, Ser. No. 632,244
Int. Cl.[5] B01J *21/16*
U.S. Cl. 502—84 **28 Claims**

1. A composition consisting essentially of a layered clay homogeneously dispersed in an inorganic oxide matrix, such that the clay layers are completely surrounded by the inorganic oxide matrix, the inorganic oxide selected from the group consisting of alumina, titania, silica, zirconia, P_2O_5 and mixtures thereof.

21. A process of preparing a composition consisting essentially of a layered clay homogeneously dispersed in an inorganic oxide matrix, the process comprising mixing a clay with a hydrosol of a precursor of the inorganic oxide, forming spherical particles from said clay containing hydrosol and calcining said particles to form a composition comprising a clay homogeneously dispersed in an inorganic oxide matrix, such that the clay layers are completely surrounded by the inorganic oxide matrix.

5,114,896

PROCESS FOR THE PRODUCTION OF A CATALYTIC COMPONENT FOR THE POLYMERIZATION OF OLEFINS

Teruo Yashiro; Seizaburo Kanazawa; Akira Nakano; Masahide Murata, and Masafumi Inai, all of Iruma, Japan, assignors to Tonen Corporation, Tokyo, Japan

PCT No. PCT/JP90/01085, § 371 Date Apr. 29, 1991, § 102(e) Date Apr. 29, 1991, PCT Pub. No. WO91/03501, PCT Pub. Date Mar. 21, 1991
PCT Filed Aug. 27, 1990, Ser. No. 678,318
Claims priority, application Japan, Aug. 28, 1989, 1-218600
Int. Cl.[5] C08F 4/654
U.S. Cl. 502—111 1 Claim

1. A process for the production of a catalytic component for the polymerization of olefins, which comprises contacting (a) metallic magnesium, (b) a halogenated hydrocarbon represented by the general formula RX, wherein R is an alkyl group, aryl group or cycloalkyl group having 1 to 20 carbon atoms and (c) a compound represented by the general formula $X^1_n M(OR^1)_{m-n}$ in which X^1 is a hydrogen atom, a halogen atom or a hydrocarbon group of 1 to 20 carbon atoms, M is boron, carbon, aluminum, silicon or phosphorus atom, R^1 is a hydrocarbon group of 1 to 20 carbon atoms, m is the atomic valence of M and $m>n\geqq 0$ to obtain a magnesium-containing solid, contacting the magnesium-containing solid with (c) a halogen-containing alcohol and then contacting with (d) a titanium compound and (e) a solid halogenated hydrocarbon.

5,114,897

CATALYST AND PROCESS FOR POLYMERIZING OLEFINS

Joseph G. Schell, Jr.; Gary R. Marchand, and Larry A. Meiske, all of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 510,492, Apr. 18, 1990, Pat. No. 5,045,612.
This application May 31, 1991, Ser. No. 708,416
Int. Cl.[5] C08F 4/646
U.S. Cl. 502—111 14 Claims

1. The solid catalytic product resulting from removing the liquid components from the product resulting from admixing in an inert diluent and in an atmosphere which excludes moisture and oxygen

(A) at least one hydrocarbon soluble organomagnesium compound:

(B) at least one organic hydroxyl-containing compound;

(C) at least one reducing halide (X) source;

(D) at least one transition metal (Tm) alkoxide; and wherein

(a) the components are added in the order (A) (B), (C) and (D) or (A), (B), (D) and (C); and

(b) the components are employed in quantities so as to provige the following atomic ratios Mg:Tm of from about 0.1:1 to about 100:1; and g:Mg of from about 10:1 to about 20:1; and

(c) the organic hydroxyl-containing compound is employed in a quantity such that for every metal atom present in component (A) there remains on, the average not more than about 0.g hydrocargon group attached to such metal atoms.

5,114,898

LAYERED DOUBLE HYDROXIDE SORBENTS FOR THE REMOVAL OF SO_x FROM FLUE GAS AND OTHER GAS STREAMS

Thomas J. Pinnavaia; Jayantha Amarasekera, both of East Lansing, and Christine A. Polansky, Ithaca, all of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Division of Ser. No. 466,984, Jan. 18, 1990. This application Sep. 28, 1990, Ser. No. 589,424
Int. Cl.[5] B01J 20/04, 20/06, 20/08
U.S. Cl. 502—406 24 Claims

1. A sorbent composition useful for removing sulfur oxides from flue gas and other gas streams which comprises contacting said gas streams with a heated sorbent composition wherein the said sorbent before being heated has a layered double hydroxide structure of the formula:

$$[M_{1-x}^{II}M_x^{III}(OH)_2](A^{n-})_{x/n}\cdot pH_2O$$

wherein M^{II} is a divalent metal cation and M^{III} is a trivalent metal cation, A is an interlayer anion of charge n— which forms a volatile gas at elevated temperatures, x is between 0.8 and 0.12, and contains an additional transition metal cation which is impregnated as a salt in admixture with the said sorbent composition and p is a number representing moles of water, wherein said additional metal cation which is impregnated as a salt into the sorbent composition is selected from the group consisting of metal cations which provide oxidation of sulfur dioxide to sulfur trioxide in an amount sufficient that said layered double hydroxide structure promotes the oxidation of the sulfur dioxide to the sulfur trioxide at sulfur dioxide oxidation conditions.

5,114,899

OLEFIN DISPROPORTIONATION CATALYST AND PROCESS

Jiang-Jen Lin, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 27, 1990, Ser. No. 572,571
Int. Cl.[5] B01J 31/00
U.S. Cl. 502—158 29 Claims

1. A disproportionation catalyst comprising at least one of molybdenum and rhenium supported on an inorganic oxide support promoted with an organosilane compound selected from the group consisting of silanes containing at least one silicon-hydrogen bond per molecule, silanes containing at least one silicon-silicon bond per molecule and mixtures thereof, wherein said organoxilane compound containing at least one silicon-hydrogen bond per molecule is selected from the group consisting of triethylsilane, tricyclohexylsilane, trimethylsilane, diethylsilane, diphenylsilane, triphenylsilane, and mixtures thereof, and wherein said organosilane compound containing at least one silicon-silicon bond per molecule is selected from the group consisting of hexamethyldisilane, hexaethyldisilane, trimethyltriethyldisilane, hexaphenyldisilane, and mixtures thereof.

5,114,900

ALKOXYLATION USING MODIFIED CALCIUM-CONTAINING BIMETALLIC OR POLYMETALLIC CATALYSTS

Stephen W. King, Scott Depot, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 30, 1988, Ser. No. 251,433
Int. Cl.[5] B01J 31/00
U.S. Cl. 502—162 27 Claims

1. A method for providing an alkoxylation catalyst comprising:

(a) reacting or solubilizing, at least partially, calcium metal or a calcium-containing compound, by mixing with an activator having the formula

$$Z_a—X—Q—Y—Z'_b$$

wherein X and Y are the same or different electronegative, heteroatoms selected from the group consisting of oxygen, nitrogen, sulfur and phosphorus; a and b are the same or different integers satisfying the valency requirements of X and Y; Q is an organic radical which is electropositive or essentially neutral relative as to X and/or Y; Z and Z' are the same or different and are either hydrogen or an organic radial which does not present said reacting or solubilizing, thereby forming a calcium-containing composition which has titratable alkalinity;

(b) reacting a divalent or polyvalent metal or a divalent or polyvalent metal-containing compound wherein the divalent or polyvalent metal is selected from the group consisting of beryllium, magnesium, strontium, barium, lanthanum, titanium, zirconium, hafnium, niobium, tantalum, molybdenum, tungsten, iron, cobalt, nickel, copper, zinc, boron, gallium, silicon, germanium tin, phosphorus, antimony, sulfur, selenium, tellurium, cerium and thorium with an organic compound having at least one active hydrogen to produce a divalent or polyvalent metal-containing composition;

(c) reacting the calcium-containing composition with the divalent or polyvalent metal-containing composition under effective reaction conditions to produce a catalyst precursor composition; and

(d) reacting the catalyst precursor composition with a divalent or polyvalent oxyacid or a divalent or polyvalent metal salt of an oxyacid or mixtures thereof under effective reaction conditions to produce the alkoxylation catalyst.

5,114,901

CERAMIC COATING FOR A CATALYST SUPPORT

Chih-Hao M. Tsang, Davison, and Raymond E. Bedford, Burton, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 19, 1991, Ser. No. 656,663
Int. Cl.[5] B01J 21/08, 32/00
U.S. Cl. 502—240 10 Claims

1. A method of making a catalyst support for treatment of exhaust emissions from diesel engines, the improvement comprising:

a) forming a mixture consisting essentially of two groups of fine silica particles of respective average sizes and size ranges which are virtually non-overlapping, the average size of one of the groups being at least 20 times greater than the average size of the other group;

b) forming a suspension of the mixture; and

c) applying the suspension as a layer onto a support substrate in a packed arrangement such that the particles of the one group occupy voids between the particles of the other group to provide an adhered coating in a form suitable for carrying dispersed catalytic material.

3. A method according to claim 1 wherein the mixture includes the catalytic material.

5,114,902

PROCESS OF MAKING SUPPORTED CATALYST

James A. Schwarz, Fayetteville, N.Y., and Somasundaram Subramanian, Melvindale, Mich., assignors to Syracuse University, Syracuse, N.Y.

Filed Jan. 29, 1990, Ser. No. 471,413
Int. Cl.[5] B01J 21/04, 21/06, 23/42, 23/46
U.S. Cl. 502—334 8 Claims

1. A process of forming an impregnated supported catalyst in which the structure and activity of a Group VIII metal catalyst, supported on a metal oxide or composite metal oxide support, is altered by the presence of an additional metal ion selected from the group that consists of aluminum, silicon, and zirconium derived from the dissolution of the support or added externally using suitable metal salt precursors during impregnation, wherein the support has a particle size on the order of 40–80 mesh, the process comprising the steps of

co-impregnating the support with a solution consisting essentially of a precursors of said metal catalyst selected from the group consisting of chloroplatinic and chloroiridic acid and mixtures thereof and at the same time with a nitrate precursor of said additional metal, and

calcining at an elevated temperature the support impregnated with the precursors of said metal catalysts and said additional metal to produce said supported catalyst.

5,114,903

THERMALLY-RESPONSIVE RECORD MATERIAL

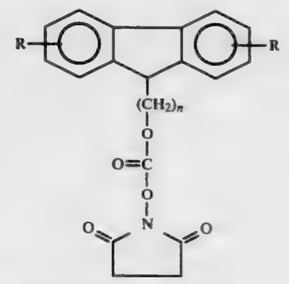
Dean G. Dalebroux, Green Bay, Wis., assignor to Appleton Papers Inc., Appleton, Wis.

Filed Nov. 8, 1991, Ser. No. 789,716
Int. Cl.[5] B41M 5/30
U.S. Cl. 503—209 10 Claims

1. A thermally-responsive record material comprising a support having provided thereon in substantially contiguous relationship

an electron donating dye precursor,

a succinimide of the formula



wherein n is an integer from 1 to 3

wherein each R is independently selected from hydrogen and C_1 to C_8 alkyl,

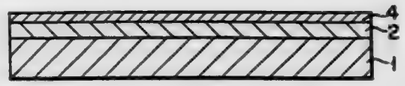
and a suitable binder therefor.

5,114,904

THERMAL TRANSFER RECORDING MEDIUM AND IMAGE FORMING BODY

Takeo Kawakami, Noda; Takashi Kagami, Tokyo; Yosei Chosa, Yokohama, and Masato Yoshida, Kasukabe, all of Japan, assignors to Toppan Printing Co., Tokyo, Japan

Division of Ser. No. 222,906, Jul. 22, 1988, abandoned. This application Dec. 20, 1990, Ser. No. 630,880
Claims priority, application Japan, Jul. 27, 1987, 62-187074; Jul. 27, 1987, 62-187075; Jan. 18, 1988, 63-7814; Apr. 8, 1988, 63-86363
Int. Cl.[5] B41M 5/035, 5/26
U.S. Cl. 503—227 3 Claims



3. A thermal transfer system which comprises:

(a) a thermal transfer recording medium comprising: a film-like supporting body consisting of a polyester resin; a first thermal transfer layer, formed on the supporting body, consisting mainly of a saturated polyester copolymer having a molecular weight of 8,000 to 30,000, and containing a sublimation or hot-melt transfer dye; and a second thermal transfer layer, formed on the first transfer layer and consisting mainly of a thermoplastic vinyl acetal resin, and containing a sublimation or hot-melt transfer dye of the same color as that of the first thermal transfer layer; and

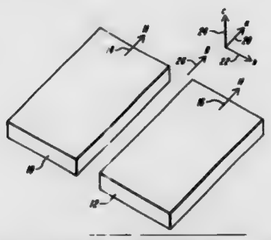
(b) a thermal transfer image forming body comprising: a

supporting body; and a dyeing image forming layer, formed on the supporting body, consisting mainly of a thermoplastic resin having four or more hydroxyl groups per molecule, a tensile break strength of 300 kg/cm^2 (ASTM D638) or greater, a tensile break elongation of 20% (ASTM D638) or greater, and a dyeing property with respect to a sublimation or hot-melt migration dye, and containing a dye-permeating lubricant consisting of an addition reaction or condensation reaction curing silicon resin.

5,114,905
CRYSTAL ALIGNMENT TECHNIQUE FOR SUPERCONDUCTORS

Bill C. Giessen, Cambridge; Robert S. Markiewicz, Lexington, and Feng Chen, Boston, all of Mass., assignors to Northeastern University, Boston, Mass.

Filed Mar. 8, 1990, Ser. No. 490,752
Int. Cl.[5] H01L *39/12*; B06B *1/02*
U.S. Cl. 505—1 **13 Claims**



1. A method of performing multi-axis crystal alignment of ceramic cuprate superconductor material composed of a plurality of crystals having an a-b plane with high critical current carrying capability and a c-axis which is perpendicular to said a-b plane, and containing a rare earth element selected from the group consisting of Europium, Erbium and Ytterbium, comprising the steps of:

selecting at least one of said rare earth elements to be incorporated into said ceramic cuprate superconductor material, said crystals including a magnetic moment predictably oriented along a predetermined crystal axis which lies within the a-b plane and thereby lies perpendicular to the c-axis, said magnetic moment determined by said at least one selected rare earth element;

providing said superconductor material in a form in which said crystals may be re-oriented tin response to a plurality of applied forces;

applying a magnetic field along a first spatial direction to orient the magnetic moments of the crystals with said predetermined crystal axis lying in said a-b plane along said first spatial direction;

applying an external force which aligns the superconductor material such that the c-axis of the crystals are parallel and aligned along a second spatial direction which is perpendicular to said first spatial direction; and

maintaining the alignment of the crystals along the first and second spatial directions while the crystals of said superconductor material become fixed.

5,114,906
PROCESS FOR DEPOSITING TL-CONTAINING SUPERCONDUCTING THIN FILMS ON (110) MGO SUBSTRATES

Kenjiro Higaki; Keizo Harada; Naoji Fujimori; Hideo Itozaki, and Shuji Yazu, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 367,736, Jun. 19, 1989, Pat. No. 4,997,813.
This application Mar. 4, 1991, Ser. No. 663,451
Claims priority, application Japan, Jun. 17, 1988, 63-149414
Int. Cl.[5] B05D *5/12*; C23C *14/00*
U.S. Cl. 505—1 **14 Claims**

1. Process for depositing a superconducting thin film of a compound oxide containing thallium (Tl) by vapour deposition on a substrate, characterized in that said superconducting thin film is deposited on {110} plane of a single crystal of magnesium oxide (MgO).

5,114,907
CRYOGENIC FLUID LEVEL SENSOR

Lewis Erwin, Winnetka; Keith Crandell, Hinsdale, both of Ill., and Justin Whitney, Butte, Mont., assignors to Illinois Superconductor Corporation, Evanston, Ill.

Filed Mar. 15, 1991, Ser. No. 670,236
Int. Cl.[5] G01F *23/24*; H01L *39/04*
U.S. Cl. 505—1 **6 Claims**



1. A cryogenic level sensor assembly, comprising:

a continuous length of high temperature ceramic superconductor material providing an indication of the level of cryogenic fluid as determined by the length of fluid in contact with said ceramic superconductor material;

an exterior housing disposed apart from and at least partly around said ceramic superconductor material for holding said length of ceramic superconductor material;

a support material disposed between said ceramic superconductor material and said exterior housing; and

a resilient retention material disposed opposite said exterior housing and opposite said ceramic superconductor material for holding said superconductor material while allowing expansion and contraction thereof during thermal cycling.

5,114,908
SUPERCONDUCTIVE CONDUCTOR

Kenichi Sato, and Hidehito Mukai, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 7, 1990, Ser. No. 564,217
Claims priority, application Japan, Aug. 9, 1989, 1-207687
Int. Cl.[5] H01B *12/00, 12/02*
U.S. Cl. 505—1 **10 Claims**



1. A superconductive conductor comprising:

at least three superconducting wires each comprising an oxide superconductor member and an electrically conductive stabilizing member enclosing said oxide superconductive member; and

means for holding said superconducting wires so that said superconducting wires are point-symmetrically arranged in section wherein said superconducting wires have longitudinal sectional configurations and are so arranged that directions perpendicular to the longitudinal directions are radially directed from the center of point symmetry.

5,114,909
FLUX PINNING BY PRECIPITATES IN THE BI-SR-CA-CU-O SYSTEM

Donglu Shi, Chicago, Ill., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 28, 1990, Ser. No. 486,636
Int. Cl.[5] H01B *12/00*; H01L *39/12*
U.S. Cl. 505—1 **11 Claims**



1. A method for forming a ceramic oxide superconductor comprising the steps, in sequence, of:

heating a ceramic oxide to a temperature above its melting point to form a liquid;

introducing calcium or copper into the ceramic oxide liquid to the extent that the ceramic oxide is supersaturated with calcium or copper;

quenching the ceramic oxide liquid so as to convert the ceramic oxide to a glass supersaturated with calcium or copper; and

annealing the calcium or copper and the ceramic oxide in forming grains in the ceramic oxide and a precipitate of the calcium or copper within the grains of the ceramic oxide so as to form superconducting phases in the ceramic oxide.

5,114,910
PASSIVATION OF THIN FILM OXIDE SUPERCONDUCTORS

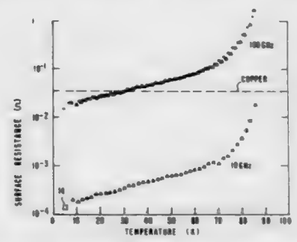
Jack Y. Josefowicz, Westlake Village; David B. Rensch, Thousand Oaks, and Kai-Wei Nieh, Monrovia, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 1, 1990, Ser. No. 608,120
Int. Cl.[5] B32B *9/00*
U.S. Cl. 505—1 **10 Claims**

1. A passivation coating for oxide superconductors comprising:

(a) a first layer of a Group II oxide encapsulating said oxide superconductor, said Group II having a substantially amorphous structure and having a thickness ranging from about 500 Åto 2 μm; and

(b) a second layer of a polymer covering said Group II oxide, said polymer comprising a composition selected from the group consisting of polyimide, polybenzyl methacrylate, polybutyl methacrylate, polybutyl styrene, polybutadiene, styrenes, polyamide resins, polyacrylics, polyacrylamides, polystyrenes, polyethylene, polyisoprene,

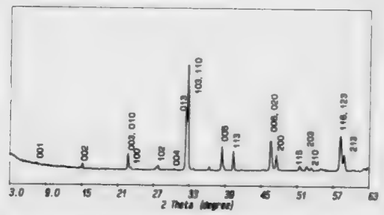


polymethyl pentenes, polymethyl methacrylates, and polyvinyls.

5,114,911
HOMOGENEOUS COPRECIPITATION METHOD FOR PREPARING YBACUO SUPERCONDUCTING POWDER

Cheng-Yie Shei, Taipei Hsien; Weir-Mirn Hurng, and Chau-Ting Chang, both of Hsinchu, all of Taiwan, assignors to Industrail Technology Research Institute, Chutung, Taiwan

Filed Feb. 20, 1991, Ser. No. 658,055
Int. Cl.[5] C01B *13/36*; C01F *11/02, 17/00*; C01G *3/02*
U.S. Cl. 505—1 **6 Claims**



1. A homogeneous coprecipitation process for preparing a superconducting YBaCuO system precursor powder comprising:

(a) preparing an aqueous solution containing nitrates of yttrium, barium and copper;

(b) preparing an organic solution by dissolving a dibasic ester in acetone, said dibasic ester being selected from the group consisting of dimethyl oxalate and diethyl oxalate;

(c) adding an organic base in the organic solution for the adjustment of pH value;

(d) mixing the aqueous solution and the organic solution; and

(e) applying an ultrasound vibration to the mixture of the aqueous solution and the organic solution to coprecipitate oxalates of yttrium, barium and copper.

5,114,912
TWO-DIMENSIONAL, JOSEPHSON-ARRAY, VOLTAGE-TUNABLE, HIGH-FREQUENCY OSCILLATOR

Samuel P. Benz, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed May 13, 1991, Ser. No. 699,282
Int. Cl.[5] H03B *15/00*
U.S. Cl. 505—1 **34 Claims**

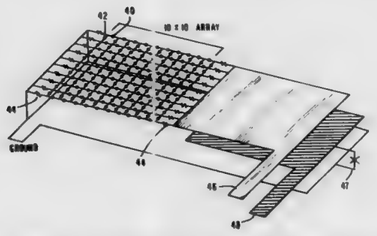
28. A method of generating voltage tunable high-frequency signals with a two-dimensional array of superconducting Josephson junctions arranged in a matrix of vertical columns and horizontal rows, comprising the steps of:

(a) applying a tunable DC bias to said array;

(b) maintaining a uniform voltage across each said Josephson

junction along a horizontal row for each horizontal row of Josephson junctions;

(c) mutually phase locking each said Josephson junction in said array; and



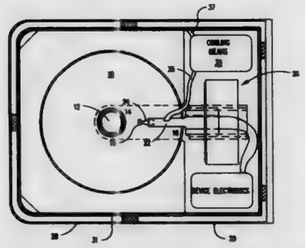
(d) emitting coherent power at a predetermined frequency from said array.

5,114,913

MAGNETIC HEAD SLIDER EMPLOYING SUPERCONDUCTOR FOR LEVITATION

Hans J. Coufal, and Mason L. Williams, III, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 331,056, Mar. 28, 1989, which is a continuation of Ser. No. 155,328, Feb. 12, 1988, abandoned.
This application Apr. 30, 1990, Ser. No. 516,381
Int. Cl.[5] H01B *12/00*; G11B *5/60*
U.S. Cl. 505—1 **16 Claims**



1. A slider assembly for supporting a magnetic transducer at a predetermined uniform spacing with respect to the surface of a magnetic recording medium comprising:

a magnetic recording medium having magnetically recorded data on a surface thereof;

a slider body having first and second surfaces, said first surface positioned to face the surface of said magnetic recording medium;

a layer of a superconducting material on said first surface of said slider, said superconducting material having a critical temperature below which superconducting properties are exhibited;

a magnetic transducer supported on said second surface of said slider body;

means for maintaining said slider assembly in a vacuum of a predetermined level; and

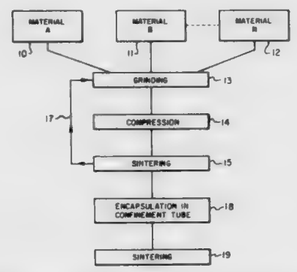
means for cooling said slider assembly to a temperature below the critical temperature of said superconductor material whereby said slider and said magnetic transducer are levitated to a predetermined small uniform spacing above the surface of said magnetic recording medium due to magnetic forces between the magnetized magnetic recording medium and said layer of superconducting material.

5,114,914

FABRICATION OF HIGH TEMPERATURE SUPERCONDUCTORS

Martin J. Sablik; Colin I. Nicholls, both of San Antonio, and Robert E. Anderson, San Marcos, all of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Mar. 13, 1989, Ser. No. 337,362
Int. Cl.[5] B05D *5/12*
U.S. Cl. 505—1 **16 Claims**



2. A method of making a high temperature superconductor comprising the steps of:

(a) preparing a powder of selected superconductor materials including yttrium, copper oxide and barium;

(b) selecting a confinement chamber of material essentially impervious to oxygen and non-reactive with said selected superconductor materials;

(c) essentially filling said confinement chamber with said powder thereby to produce a filled confinement chamber;

(d) sealing said confinement chamber after it has been filled to produce a filled and sealed confinement chamber essentially impervious to oxygen; and

(e) heating said filled and sealed confinement chamber to the sintering temperature of said powder thereby to sinter said powder and form said superconductor.

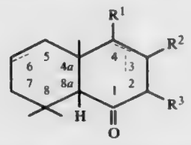
5,114,915

DECALIN KETONES, THEIR USE IN PERFUMERY AND PROCESS FOR THE PREPARATION THEREOF

Charles Fehr, Versoix; José Galindo, Les Avanchets, and Olivier Guntern, Geneva, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Jun. 26, 1991, Ser. No. 721,747
Claims priority, application Switzerland, Jul. 9, 1990, 2283/90
Int. Cl.[5] A61K *7/46*
U.S. Cl. 512—15 **12 Claims**

1. A method to confer, improve, enhance or modify the odor properties of a perfuming composition or a perfumed article, which method comprises adding to said composition or article a fragrance effective amount of a decalin ketone of formula



(I)

having a single or double bond in one of the positions indicated by the dotted lines, or two double bonds in positions 2 and 5 or 3 and 5 such as indicated by the dotted lines, and wherein symbols R^1, R^2 and R^3 represent a hydrogen atom or a methyl radical.

5,114,916

THERAPEUTIC AGENT FOR THE PREVENTION OF INTRAVENTRICULAR HEMORRHAGE IN PREMATURE INFANTS

Akira Shirahata, Fukuoka; Minoru Uchida, Kanagawa; Satoshi Tanaka, and Kenichiro Tsumura, both of Chiba, all of Japan, assignors to Hoechst Japan Limited, Tokyo, Japan

Continuation of Ser. No. 313,568, Feb. 22, 1989, abandoned.
This application Feb. 14, 1990, Ser. No. 480,358
Claims priority, application Japan, Feb. 24, 1988, 63-39646
Int. Cl.[5] A61K *37/00*
U.S. Cl. 514—2 **5 Claims**

1. A method for the prevention of intraventricular hemorrhage in premature infants, which comprises administering to the said infants an effective amount of human coagulation factor XIII.

5,114,917

TREATMENT OF INFLAMMATION USING ALPHA 1-ANTICHYMOTRYPSIN

John Lezdey, 976 Kingston Dr., Cherry Hill, N.J. 08034, and Allan Wachter, 9822 S. Grandview, Tempe, Ariz. 85284

Continuation-in-part of Ser. No. 445,005, Dec. 4, 1989, Pat. No. 5,008,242, and a continuation-in-part of Ser. No. 181,707, Apr. 14, 1989, abandoned, and a continuation-in-part of Ser. No. 242,735, Sep. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 946,445, Dec. 24, 1986, abandoned. This application Oct. 2, 1990, Ser. No. 591,630
Int. Cl.[5] A61K *37/64*
U.S. Cl. 514—8 **6 Claims**

1. A method for the treatment of inflammation in a patient in which mast cells and neutrophils are implicated which comprises administering an effective amount of alpha 1-antichymotrypsin, its salts or derivatives to control elastase and cathepsin G at the site of the inflammation.

5,114,918

ENDOTHELIN ANTAGONISTIC CYCLIC PENTAPEPTIDES

Kiyofumi Ishikawa; Takehiro Fukami; Takashi Hayama; Kenji Niiyama; Toshio Nagase; Toshiaki Mase; Kagari Fujita; Masaru Nishikibe; Masaki Ihara, and Mitsuo Yano, all of Tokyo, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1990, Ser. No. 630,505
Claims priority, application Japan, Dec. 28, 1989, 1-342695; Jul. 13, 1990, 2-185867
Int. Cl.[5] A61K *37/02*; C07K *7/54, 7/64*
U.S. Cl. 514—11 **2 Claims**

1. A cyclic pentapeptide of the formula:

cyclo (—X^1—X^2—X^3—X^4—X^5—) (I)

wherein X^n (n=1–5) represents amino acid residues, respectively, and X^1 is D-Phe, D-Tyr, D-Tha, D-Tza, D-Nal, D-Bta, D-Trp, D-Trp(O), D-Trp(CHO) or D-Trp($(CH_2)_mCOR^1$), wherein m is from 0 to 6, and R^1 is a hydroxyl group, a C_1–C_6 alkoxy group, an amino group or a C_1–C_6 monoalkylamino group, provided that when m=0, R^1 is not a hydroxyl group; X^2 is D-Asp, D-Glu, or D-Cys(O_3H); X^3 is Pro, Hyp, Pip, Thz, β-Ala, Gly, Ala, α-Aba, Aib, Val, Nva, Leu, Ile, aIle, Nle, Met, Met(O), Met(O_2), Phe, Tza, Tha, Tyr, Trp, His, Arg, Lys, Lys(CHO), Orn, Orn(CHO), Asn, Gln, Asp, Glu, Cys-(O_3H), Cys, Ser or Thr wherein those α-amino acids having a hydrogen atom on the α-amino group are optionally substituted by a C_1–C_6 alkyl or C_3–C_7 cycloalkyl group which optionally has a group selected from the group consisting of an imidazolyl group, a carboxyl group, a sulfo group and a hydroxy group; X^4 is D-Ala, D-Thr, D-α-Aba, D-Val, D-Nva, D-Leu, D-Ile, D-aIle, D-Nle, D-tert-Leu, D-Cpg, D-Chg, D-Dpg, D-Pen, Aib, Ac_3c, Ac_4c, Ac_5c, Ac_6c, Ac_7c, D-Phg, D-Thg, D-Fug, D-Tzg or D-Itg wherein those α-amino acids having a hydrogen atom at the α-position are optionally substituted by a C_1–C_3 alkyl group; X^5 is Pro, Pip, Thz, His, Ala, α-Aba, Val, Nva, Leu, Ile, aIle, Nle, Met, C_3al, C_4al, C_5al or C_6al wherein those α-amino acids having hydrogen atom on the α-amino group are optionally substituted by a C_1–C_6 alkyl group; or a pharmaceutically acceptable salt thereof.

2. A pharmaceutical composition comprising an effective amount of a cyclic pentapeptide of the formula (I) as defined in claim 1 or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier.

5,114,919

ADJUNCTS IN CANCER CHEMOTHERAPY

John J. Baldwin, Gwynedd Valley, and David C. Remy, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 484,963, Feb. 26, 1990, Pat. No. 4,996,321.
This application Feb. 11, 1991, Ser. No. 653,323
Int. Cl.[5] A61K *31/55, 31/70*; C07D *211/70*
U.S. Cl. 514—11 **3 Claims**

1. A pharmaceutical composition useful in treating multi-drug resistant tumor cells in a patient in need thereof which comprises a mixture of the compound which is selected from the group consisting of:

(−)-1-cyclopropylmethyl-4-(3-trifluoromethylthio-5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine;

(+)-1-cyclopropylmethyl-4-(3-iodo-5H-dibenzo[a,d]cyclohepten-5-ylidene)piperidine;

4-amino-5-chloro-2-methoxy-N-((5-(1-methyl-4-piperidinylidene)-5H-dibenzo[a,d]cyclohepten-3-yl)methyl)-benzamide;

3,4,5-trimethoxy-N-((5-(1-methyl-4-piperidinylidene)-5H-dibenzo[a,d]cyclohepten-3-yl)methyl)benzamide; and

diethyl 1,4-dihydro-2,6-dimethyl-4-(5-(1-methyl-4-piperidinylidene)-5H-dibenzo[a,d]cyclohepten-3-yl)-pyridinedicarboxylate

or pharmaceutically acceptable acid addition salt thereof, and an anticancer agent which is selected from the group consisting of: vinblastine, vincristine, dactinomycin, daunorubicin, doxorubicin or mithramycin.

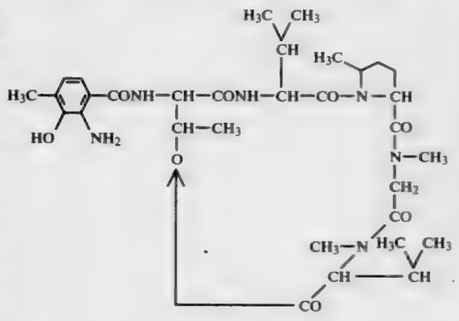
5,114,920

BU-3292T ANTIBIOTICS

Koko Sugawara, Saitama; Yuji Nishiyama; Koji Tomita, both of Tokyo; Masataka Konishi, Kawasaki, and Toshikazu Oki, Yokohama, all of Japan, assignors to Bristol-Myers Squibb Co., New York, N.Y.

Filed Sep. 14, 1988, Ser. No. 244,225
Int. Cl.[5] A61K *37/02*; C07K *7/00*
U.S. Cl. 514—11 **3 Claims**

1. The compound BU3292T A having the formula



5,114,921

AMPHIPHILIC PEPTIDES AND USE THEREOF

Michael Zasloff, Merion Station, Pa., assignor to The Children's Hospital of Philadelphia, Philadelphia, Pa.

Continuation of Ser. No. 362,341, Jun. 5, 1989, abandoned, which is a continuation-in-part of Ser. No. 199,927, May 27, 1988, abandoned. This application Nov. 6, 1990, Ser. No. 613,923

Int. Cl.[5] A61K *37/02;* **C07K** *7/06, 7/08*

U.S. Cl. 514—12 **28 Claims**

1. A peptide containing at least eight amino acids wherein the peptide, is selected from the group consisting of the following sequences:

$(W_1)_a(A\text{-}B\text{-}C\text{-}D)_n(Z_1)_b$; (i)

$(W_2)_a(B\text{-}C\text{-}D\text{-}A)_n(Z_2)_b$; (ii)

$(W_3)_a(C\text{-}D\text{-}A\text{-}B)_n(Z_3)_b$; (iii)

or

$(W_4)_a(D\text{-}A\text{-}B\text{-}C)_n(Z_4)_b$, (iv)

wherein each of A and B is a hydrophobic amino acid wherein each of A and B may be the same or different amino acids, and one of C and D is a basic hydrophilic amino acid and the other of C and D is a basic or neutral hydrophilic amino acid, and wherein:

W_1 is D-, C-D-, or B-C-D-;

W_2 is A-, D-A-, or C-D-A-;

W_3 is B-, A-B-, or D-A-B-;

W_4 is C-, B-C-, or A-B-C-;

Z_1 is -A, -A-B, or -A-B-C;

Z_2 is -B, -B-C, or B-C-D

Z_3 is -C, -C-D, or -C-D-A; and

Z_4 is -D, -D-A, or -D-A-B, n is 2 or 3, a is 0 or 1, b is 0 or 1, and wherein when the peptide encounters an oily surface or membrane, the peptide chain forms a rod like structure.

5,114,922

POLYPEPTIDES WITH AN ANTICOAGULANT ACTIVITY

Reinhard Maschler, Oldenburg, Fed. Rep. of Germany; Verena Steiner, Basle; Markus G. Grütter, Hochwald, and Fritz Raschdorf, Basle, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. and UCP Gen-Pharma AG, Kirchberg, Switzerland

Filed Jun. 8, 1989, Ser. No. 363,648

Claims priority, application United Kingdom, Jun. 11, 1988, 8813876; Jul. 29, 1988, 8818123

Int. Cl.[5] C07K *7/00;* **A61K** *37/02*

U.S. Cl. 514—12 **8 Claims**

1. A polypeptide selected from the group consisting of the polypeptide having the amino acid sequence

MRYTACTESG QNQCICEGND VCGQGRNCQF

Z
|
DSSGKKCVEG EGT* RKPQNEG QHDFDPIPEE YLS

(I)

and the polypeptide having the amino acid sequence

VSYTDCTSGQ NYCLCGGNFC GDGKHCEMDG

SENKCVDGEG TPKRQT* SGPS DFEEFSLDDI EQ

(II)

wherein T* represents threonine the hydroxy group of which is free or O-glycosylated, and wherein Z represents the phenolic hydrogen atom of tyrosine or a group $—SO_3H$, and salts thereof.

5,114,923

RECOMBINANT TECHNIQUES FOR PRODUCTION OF NOVEL NATRIURETIC AND VASODILATOR PEPTIDES

Jeffrey J. Seilhamer, Milpitas; John A. Lewicki, Los Gatos; Robert M. Scarborough, Belmont, and J. Gordon Porter, Newark, all of Calif., assignors to California Biotechnology Inc., Mountain View, Calif.

PCT No. PCT/US89/02373, § 371 Date Feb. 2, 1990, § 102(e) Date Feb. 2, 1990

Continuation-in-part of Ser. No. 299,880, Jan. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 206,470, Jun. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 200,383, May 31, 1988, abandoned. This PCT application May 31, 1989, Ser. No. 460,855

Int. Cl.[5] A61K *37/02;* **C07K** *7/08, 7/10*

U.S. Cl. 514—12 **4 Claims**

1. A peptide having natriuretic activity of the formula

R^1-*Cys-Phe-Gly-Arg-Arg-Leu-Asp-Arg-Ile-Gly-Ser-Leu-Ser-Gly-Leu-Gly-Cys-*R^2

wherein R^1 is selected from

(H);

Gly—;

Ser—Gly—;

Gly—Ser—Gly—;

Gln—Gly—Ser—Gly—;

Val—Gln—Gly—Ser—Gly—;

Met—Val—Gln—Gly—Ser—Gly—;

Lys—Met—Val—Gln—Gly—Ser—Gly—;

Pro—Lys—Met—Val—Gln—Gly—Ser—Gly—;

Ser—Pro—Lys—Met—Val—Gln—Gly—Ser—Gly—; and

R^3—Ser—Pro—Lys—Met—Val—Gln—Gly—Ser—Gly—;

wherein R^3 is the 102 amino acid sequence shown as positions 1–99 for the human protein in FIG. 6, or a C-terminal portion thereof, and

R^2 is (OH), NH_2, NHR' or NR'R'' wherein R' and R'' are independently lower alkyl (1–4C) or R^2 is

Lys;

Lys-Val;

Lys-Val-Leu;

Lys-Val-Leu-Arg;

Lys-Val-Leu-Arg-Arg;

Lys-Val-Leu-Arg-Arg-His;

or the amides (NH_2, NHR' or NR'R'') thereof.

5,114,924

Patent Not Issued For This Number

5,114,925

RENIN INHIBITORS CONTAINING THE 2-[[(2R,3S)-3-AMINO-4-CYCLOHEXYL-2-HYDROXY-1-BUTYL]THIO)ALKANOYL MOIETY AND THE CORRESPONDING SULFOXIDE AND SULFONE DERIVATIVES

Wallace T. Ashton, Clark; Christine L. Cantone, Hazlet, and Richard L. Tolman, Warren, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 644,412, Jan. 22, 1991, abandoned. This application Sep. 9, 1991, Ser. No. 756,632

Int. Cl.[5] A61K *37/00*

U.S. Cl. 514—18 **18 Claims**

1. A compound which is 2-[X-thio]acetic acid in which X means [(2R,3S)-3-(Boc-L-phenylalanyl-L-histidylamino)-4-cyclohexyl-2-hydroxy-1-butyl].

5,114,926

TETRAPEPTIDE INHIBITING THE ENTRY INTO CYCLE OF HEMOPOIETIC STEM CELLS PROCESSES FOR ITS PREPARATION, AND ITS USES

Emilia Frindel, Paris; Maryse Lenfant, Gif Sur Yvette; Martine Guigon, Neuilly, and Johanna Bakala, Paris, all of France, assignors to Institut National De La Sante Et De La Recherche Medicale and Institut Gustave Roussy, both of Paris, France

PCT No. PCT/FR87/00281, § 371 Date Mar. 17, 1989, § 102(e) Date Mar. 17, 1989, PCT Pub. No. WO88/00594, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 16, 1987, Ser. No. 313,972

Claims priority, application France, Jul. 18, 1986, 86 10486

Int. Cl.[5] C07K *5/10;* **A16K** *37/02*

U.S. Cl. 514—18 **10 Claims**

1. Tetrapeptide, substantially pure and homogeneous, of the general formula:

Ser-Asp-Lys-Pro-OH

unsubstituted or having at least one of its amino, hydroxyl or carboxyl groups protected with protecting groups selected from the group consisting of acetyl, benzyl, methyl, phenyl, benzyloxycarbonyl and tert-butoxycarbonyl and pharmaceutically acceptable salts of said tetrapeptide.

5,114,927

ANALOG OF PEPTIDASE SUBSTRATES

Daniel G. Schirlin, Bischheim, France, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 422,255, Oct. 16, 1989, abandoned. This application Sep. 5, 1991, Ser. No. 759,057

Claims priority, application European Pat. Off., Oct. 28, 1988, 88402735

Int. Cl.[5] C07K *5/08, 5/10*

U.S. Cl. 514—18 **2 Claims**

1. A compound of the formula

$$R_1\text{—}NH\text{—}\underset{\displaystyle R_2}{CH}\text{—}C(=O)\text{—}CF_2\text{—}\underset{\displaystyle R_3}{CH}\text{—}NR_aR_b$$

or a pharmaceutically acceptable salt thereof, wherein

R_1 is Iva-(O-methyl)Tyr-nVal-;

R_2 is cyclohexylmethyl;

R_3 is H;

R_a is H; and

R_b is H.

5,114,928

PHOSPHOLIPID-CONTAINING COMPOSITION, A PROCESS FOR ITS PREPARATION AND ITS USE AS AN EXCIPIENT FOR PHARMACEUTICAL SUBSTANCES

Benedikt Gajdos, Cologne, and Heinz J. Mentzen, Neuss, both of Fed. Rep. of Germany, assignors to A. Nattermann & Cie. GmbH, Cologne, Fed. Rep. of Germany

PCT No. PCT/EP89/00898, § 371 Date Jun. 19, 1990, § 102(e) Date Jun. 19, 1990, PCT Pub. No. WO90/01269, PCT Pub. Date Feb. 22, 1990

PCT Filed Aug. 1, 1989, Ser. No. 499,524

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1988, 3826946

Int. Cl.[5] A61K *9/20;* **A23J** *7/00*

U.S. Cl. 514—25 **7 Claims**

1. A phospholipid-containing composition comprising phospholipid and sugar in a weight ratio of 1:20 to 20:1, said sugar comprising a 1:1 mixture of glucopyranosido-1,6-mannitol and glucopyranosido-1,6-sorbitol.

5,114,929

PHARMACEUTICAL FORMULATION

Robert R. Vartan, Bristol, Tenn., assignor to Beecham Group p.l.c., England

Continuation-in-part of Ser. No. 326,619, Mar. 21, 1989, abandoned. This application Mar. 1, 1990, Ser. No. 484,662

Int. Cl.[5] A01N *43/04;* **A61K** *31/43, 31/545*

U.S. Cl. 514—29 **25 Claims**

1. An unpressurized container containing a palatable pharmaceutical formulation comprising a homogenous, non-aqueous suspension of an orally active medicament, an edible oily vehicle, an edible emulsifier having a hydrolipophylic balance in the range 2 to 14 and a finely particulate sugar, said suspension being free of propellant and foaming agent and having no oily aftertaste.

5,114,930

AVERMECTIN DERIVATIVES WITH A SPACER INSERTED BETWEEN THE DISACCHARIDE AND THE AGLYCONE USEFUL AS ANTIPARASITIC AGENTS

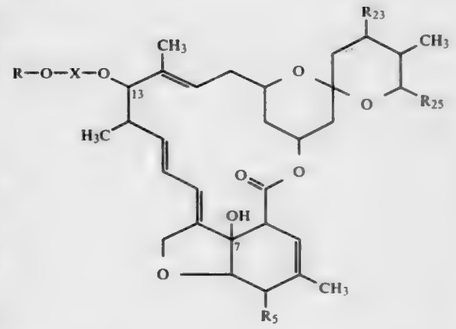
Timothy A. Blizzard, Rahway, and Gaye Margiatto, Freehold, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 14, 1990, Ser. No. 522,709

Int. Cl.[5] A61K *31/70;* **C07H** *17/04*

U.S. Cl. 514—30 **23 Claims**

1. A compound having the formula:



wherein:

R is a mono- or di-oleandrose, rhamnose, olivose, digitoxose, mycarose, daunosamine, glucose, ribose, galactose or 2-deoxy-ribose;

$X=—(CH_2)_n—$, $—CH_2CH_2OCH_2—$;

n=2–5;

R_5=OH, oxime;

R_{23}=H, OH, oxo (OH or oxo only if the broken line is a single bond);

R_{25}=lower alkyl, lower alkenyl;

and the broken line indicates a single or double bond between carbons 22 and 23.

5,114,931

INJECTABLE THERAPEUTIC COMPOSITIONS CONTAINING STABLE S-ADENOSYL-L-METHIONINE SALTS

Federico Gennari, Truccazzano, Italy, assignor to Bioresearch S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 637,054, Aug. 2, 1984. This application Oct. 4, 1985, Ser. No. 784,855

Claims priority, application Italy, Aug. 24, 1983, 22623 A/83

Int. Cl.[5] C07H *19/167*

U.S. Cl. 514—46 **4 Claims**

1. Injectable therapeutic aqueous compositions containing stable S-adenosyl-L-methionine (SAMe) salts, including 100–500 mg of SAMe salt (expressed as SAMe ion per vial and sodium hydroxide in a molar proportion of between 0.2:1 and 1:1 with respect to the SAMe ion and an amino acid selected from the group consisting of lysine, arginine and ornithine, in a molar proportion of between 3:1 and 5:1 with respect to the SAMe ion, said aqueous composition having a pH between 5 and 8.5.

3. Injectable therapeutic aqueous compositions containing stable S-adenosyl-L-methionine salts, characterised by comprising sodium hydroxide in a molar proportion of between 3:1

and 6:1 with respect to the SAMe ion and an amino acid selected from the group consisting of glycine, alanine and serine, in a molar proportion of between 3:1 and 10:1 with respect to the SAMe ion, said aqueous composition having a pH between 5 and 8.5.

5,114,932

HYPEROSMOLAR OXYREPLETE HEMOSUBSTITUTE

Thomas M. Runge, 2630 Exposition Blvd., Austin, Tex. 78703

Filed Nov. 30, 1990, Ser. No. 620,539

Int. Cl.[5] **A61K** *31/66, 31/70*

U.S. Cl. 514—58 **14 Claims**

1. A blood substitute comprising an oxygen carrier and having an osmolarity greater than 303 milliosmoles per liter.

5,114,933

CEPHALOSPORIN COMPOUNDS

Alain M. Bertrandie, Cormontreuil; Thomas G. C. Bird, Witry-les-Reims, and Frederic H. Jung, Rilly la Montagne, all of France, assignors to ICI Pharma, Cergy Cedex, France

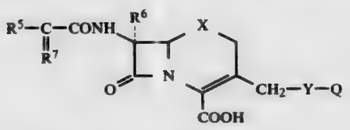
Filed Nov. 23, 1987, Ser. No. 124,213

Claims priority, application European Pat. Off., Nov. 21, 1986, 86402592

Int. Cl.[5] **C07D** *501/36;* **A61K** *31/545*

U.S. Cl. 514—202 **6 Claims**

1. A cephalosporin compound of the formula (IV):



IV

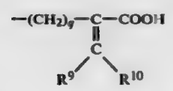
or a salt or ester thereof; wherein,

X is sulphur or sulphinyl;

R^6 is hydrogen, methoxy or formamido;

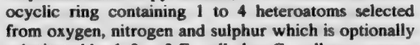
R^5 is 2-aminothiazol-4-yl or 2-aminooxazol-4-yl each unsubstituted or substituted in the 5-position by fluorine, chlorine or bromine, or R^5 is 5-aminoisothiazol-3-yl, 5-amino-1,2,4-thiadiazol-3-yl, 3-aminopyrazol-5-yl, 3-aminopyrazol-4-yl, 2-aminopyrimidin-5-yl, 2-aminopyrid-6-yl, 4-aminopyrimidin-2-yl, 2-amino-1,3,4-thiadiazol-5-yl or 5-amino-1-methyl-1,2,4-triazol-3-yl;

R^7 is of the formula =N.O.R^8 (having the syn configuration about the double bond) wherein R^8 is hydrogen, (1–6C)alkyl, 3–8C)cycloalkyl, (1–3C)alkyl(3–6C)cycloalkyl, (3–6C)cycloalkyl(1–3C)alkyl, (3–6C)alkenyl, carboxy(-3–6C)alkenyl, (5–8C)cycloalkenyl, (3–6C)alkynyl, (3–5C-)alkylcarbamoyl, phenylcarbamoyl, benzylcarbamoyl, (1–4C)alkylcarbamoyl(1–4C)alkyl, di(1–4C)alkylcarbamoyl(1–4C)alkyl, (1–4C)haloalkylcarbamoyl(1–4C)alkyl, (1–3C)haloalkyl, (2–6C)hydroxyalkyl, (1–4C)alkoxy(-2–4C)alkyl, (1–4C)alkylthio(2–4C)alkyl, (1–4C)alkanesulphinyl(1–4C)alkyl, (1–4C)alkanesulphonyl(1–4C)alkyl, (2–6C)aminoalkyl, (1–4C)alkylamino(1–6C)alkyl, (2–8C-)dialkylamino(2–6C)alkyl, (1–5C)cyanoalkyl, 3-amino-3-carboxypropyl, 2-(amidinothio)ethyl, 2-(N-aminoamidinothio)ethyl, tetrahydropyran-2-yl, thietan-3-yl, 2-oxopyrrolidinyl, or 2-oxotetrahydrofuranyl, or R^8 is of the formula V:



V

wherein q is one or two and R^9 and R^{10} are independently hydrogen or C_{1-4}alkyl; or R^8 is of the formula VI:



VI

wherein r is 0–3, R^{11} is hydrogen, (1–3C)alkyl or methylthio, R^{12} is hydrogen (1–3C)alkyl, (3–7C)cycloalkyl, cyano, carboxy, (2–5C)carboxyalkyl or methanesulphonylamino, or R^{11} and R^{12} are joined to form, together with the carbon to which they are attached, a (3–7C)carbocyclic ring, and R^{13} is hydroxy, amino, (1–4C) alkoxy, (1–4C) alkylamino or of the formula $NHOR^{14}$ in which R^{14} is hydrogen or (1–4C)alkyl;

or R^7 may be of the formula =CH.R^{15} wherein R^{15} is hydrogen, halogen, (1–6C)alkyl, (3–7C)cycloalkyl, (2–6C)alkenyl, (3–7C)cycloalkenyl, phenyl or benzyl;

wherein Q is:

a benzene ring (optionally fused to a further benzene ring so forming a naphthyl group or optionally fused to a 5 or 6 membered heterocyclic aromatic group containing 1, 2 or 3 heteroatoms selected from the nitrogen, oxygen and sulphur), said benzene ring being substituted by groups R^1 and R^2 which are ortho with respect to one another, wherein R^1 is hydroxy or an in vivo hydrolyzable ester thereof and R^2 is hydroxy, or an in vivo hydrolyzable ester thereof,

wherein ring Q (or, in the case wherein ring Q is a benzene ring fused to another benzene ring, either benzene ring) is optionally substituted by C_{1-4} alkyl, halo, hydroxy, hydroxy C_{1-4} alkyl, cyano, trifluoromethyl, nitro, amino, C_{1-4} alkylamino, di-C_{1-4} alkylamino, amino C_{1-4} alkyl, C_{1-4}alkylamino C_{1-4} alkyl, di-C_{1-4} alkylamino C_{1-4} alkyl, C_{1-4} alkanoyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{1-4} alkanoyloxy, carbamoyl, C_{1-4} alkylcarbamoyl, di-C_{1-4} alkyl carbamoyl, carboxy, carboxy C_{1-4} alkyl, sulpho, sulpho C_{1-4} alkyl, C_{1-4} alkanesulphonamido, C_{1-4} alkoxycarbonyl, C_{1-4} alkanoylamino, nitroso, thioureido, amidino, ammonium, mono-, di- or tri- C_{1-4} alkylammonium or pyridinium, or a 5-membered heterocyclic ring containing 1 to 4 heteroatoms selected from oxygen, nitrogen and sulphur which is optionally substituted by 1, 2 or 3 C_{1-4} alkyl or C_{1-4} alkoxy groups;

Y, which links into the benzene ring, is a group —V—Y'— wherein V is a group —NR^4— and Y'— is a covalent bond or C_{1-4}, alkylene wherein R^4 is hydrogen, C_{1-4} alkyl optionally substituted by any of halo, hydroxy, C_{1-4} alkoxy, carboxy, amino, cyano, C_{1-4} alkanoylamino, phenyl or furanyl or pyrid-4-yl, or R^4 is C_{2-6} alkanoyl or C_{1-4} alkanesulphonyl.

5,114,934

TRICYCLIC PYRIDONE DERIVATIVES

Ulf Fischer, Frenkendorf; Fernand Schneider, Basel, and Ulrich Widmer, Rheinfelden, all of Switzerland, assignors to Hoffman-La Roche, Inc., Nutley, N.J.

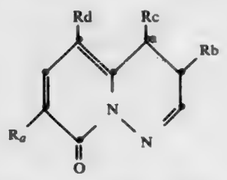
Division of Ser. No. 937,934, Dec. 4, 1986, Pat. No. 4,855,297. This application Jun. 1, 1989, Ser. No. 359,616

Claims priority, application Switzerland, Dec. 13, 1985, 5324/85; Oct. 1, 1986, 3922/86

Int. Cl.[5] **A61K** *31/38, 31/50;* **C07D** *513/04, 223/02*

U.S. Cl. 514—212 **41 Claims**

1. A compound of the formula



I

wherein Ra is a phenyl, pyridyl or thienyl group which is unsubstituted or substituted by halogen, trifluoromethyl, nitro, lower alkyl or lower alkoxy, Rb and Rc together with the carbon atom denoted by α are a group of the formula $>C_\alpha$—S—CH=CH—(a) or $>C_\alpha$—CH=CH—S(b) which is unsubstituted or substituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro, amino or mono- or di (lower alkyl-)amino and the dotted line is an additional bond, Rd is the group of the formula $—(A^1)_m—(CO)_n—(Q^1A^2)_q—R^1$, m, n and q each are the integer 0 or 1, A^1 is lower alkylene, A^2 is lower alkylene, a direct bond or the group —CO—, Q^1 is an oxygen atom or the group $—NR^2—$, R^1 is hydrogen, hydroxy, cyano, nitro, halogen, lower alkoxy, lower alkyl, lower alkoxycarbonyl, aryl, a group of the formula $—NR^3R^4$ or a 5-membered saturated or partially unsaturated heterocycle which is selected from the group consisting of 2-oxazolin-2-yl, 3-methyl-1,2,4-oxadiazol-5-yl, 3-cyclopropyl-1,2,4-oxadiazol-5-yl, 2-thiazolin-2-yl, 2-tetrahydrofuryl and 2-thiazolyl which is unsubstituted or substituted by one or two lower alkyl groups or by a (C_{3-6})-cycloalkyl, hydroxy, lower alkoxy, lower alkanoyloxy, lower hydroxyalkyl, lower alkoxyalkyl, lower alkanoyloxyalkyl, lower alkoxy-carbonyl, lower alkanoyl, carbamoyl, mono- or di(lower alkyl)carbamoyl, oxo or alkylenedioxy group, R^2 is hydrogen, lower alkyl or aryl, R^3 and R^4 each is hydrogen, lower alkyl, lower alkoxyalkyl, lower dialkoxyalkyl, lower alkylenedioxyalkyl, lower cyanoalkyl, lower haloalkyl, lower hydroalkyl, lower dihydroxyalkyl, lower alkanoyl, lower alkoxycarbonyl or a (C_{3-7})-cycloalkyl group which is unsubstituted or substituted by hydroxy, lower alkoxy, lower alkanoyloxy, lower hydroxyalkyl, lower alkoxyalkyl, lower alkanoyloxyalkyl, oxo, carbamoyl, mono- or di (lower alkyl) carbamoyl or by lower alkylenedioxy or R^3 and R^4 together with the nitrogen atom are a saturated N-heterocycle selected from the group consisting of 4,4-(C_{1-4}alkylenedioxy)-1-piperidinyl, 1-azetidinyl, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 4-thiomorpholinyl or 4-R^5-1-piperazinyl which is unsubstituted or substituted by one or two lower alkyl groups or by one or two hydroxy, lower alkoxy, lower alkanoyloxy, lower hydroxyalkyl, lower alkoxyalkyl, lower alkanoyloxyalkyl, lower alkanoyl, lower alkoxycarbonyl, carbamoyl or mono- or di(lower alkyl)carbamoyl, with the proviso that n is the integer 0 and when q is the integer 1 and A^2 is the group —CO—, that R^1 is other than cyano, nitro, halogen or lower alkoxycarbonyl when q is the integer 0 and n is the integer 1 or when q is the integer 1 and A^2 is the group —CO—, that R^1 is other than hydroxy, cyano, nitro, halogen, lower alkoxy-carbonyl, lower alkoxy and $—NR^3R^4$ when q is the integer 1 and A^2 is a direct bond, or a pharmaceutically acceptable acid addition salt of compound of formula I which has one or more basic substituents.

5,114,935

SUBSTITUTED 6-BENZYL-2H-3,4,5,6-TETRAHYDRO-(1,3)-OXAZINES

Helmut Ballhause; Gunther Engelhardt; Claus A. Landgraf; Norbert Mayer; Willy Roth, all of Biberach; Kurt Schumacher, Speyer, and Alex Prox, Warthausen, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

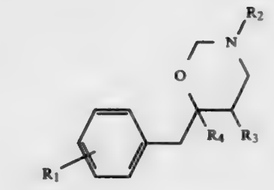
Filed Aug. 15, 1990, Ser. No. 568,446

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1989, 3926898

Int. Cl.[5] **C07D** *265/06;* **A61K** *31/535*

U.S. Cl. 514—228.8 **18 Claims**

1. A compound of the formula

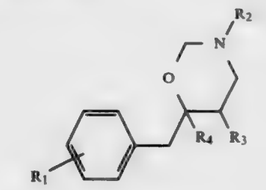


I

wherein R_1 is a hydrogen or halogen atom, R_2 is a C_{1-3} alkyl group, and R_3 and R_4 are each a C_{1-3} alkyl group,

or the physiologically acceptable acid addition salts thereof with an organic or inorganic acid.

7. A method for treating coughing in a patient, which comprises administering to the patient an antitussive amount of a compound of the formula



wherein R_1 is a hydrogen or halogen atom, R_2 is a C_{1-3} alkyl group, and R_3 and R_4 are each a C_{1-3} alkyl group, or the physiologically acceptable acid addition salts thereof with an organic or inorganic acid.

5,114,936

6,7-DIHYDRO-3-PHENYL-1,2-BENZISOXAZOL-4(5H)-ONES AND -OLS, COMPOSITIONS AND PHARMACEUTICAL USE

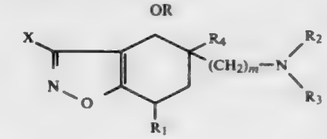
David G. Wettlaufer, Phillipsburg; Gregory M. Shutske, Flemington, and Peter A. Nemoto, Piscataway, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Continuation-in-part of Ser. No. 571,482, Jun. 20, 1990, abandoned. This application Apr. 26, 1991, Ser. No. 692,341

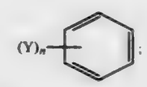
Int. Cl.[5] **A61K** *31/42, 31/535;* **C07D** *261/20, 413/06*

U.S. Cl. 514—233.8 **47 Claims**

1. A compound of the formula

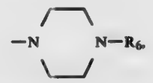


wherein X is

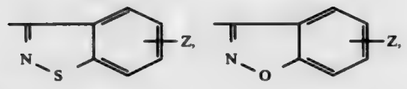


Y is hydrogen, halogen, loweralkyl, loweralkoxy, trifluoromethyl, nitro or amino; R is H when the bond between the oxygen atom and the carbon atom in question is a single bond; otherwise the dotted line signifies part of a double bond to the oxygen atom; R_1 is hydrogen, loweralkyl or arylloweralkyl; R_2 and R_3 are independently hydrogen, loweralkyl or arylloweralkyl

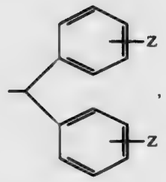
eralkyl, or R_2 and R_3 taken together with the nitrogen atom form an optionally substituted heterocycle selected from the group consisting of piperidinyl, pyrrolidinyl, morpholinyl, imidazol-1-yl, 1-piperazinyl, said substituents being hydrogen or loweralkyl; 4-substituted-1-piperazinyl of the formula



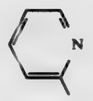
where R_6 is aryl, arylloweralkyl,



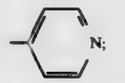
2-pyrimidyl,



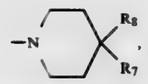
2-pyridinyl of the formula



or 4-pyridinyl of the formula



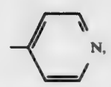
4-substituted-1-piperidinyl of the formula



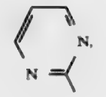
wherein R_7 is hydrogen, loweralkyl, aryl, arylloweralkyl, 2-pyridinyl of the formula



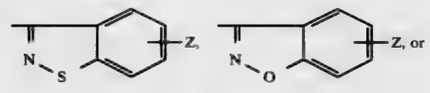
4-pyridinyl of the formula

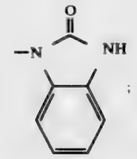


2-pyrimidinyl of the formula



arylcarbonyl,





R_8 is hydrogen or —OH; with the proviso that R_7 and R_8 are not simultaneously hydrogen and that R_7 is not loweralkyl when R_8 is hydrogen, R_4 is hydrogen, loweralkoxycarbonyl or aryloxycarbonyl; Z is chlorine, bromine or fluorine; m is an integer of 1 to 4; n is an integer of 1 to 4 or a pharmaceutically acceptable acid addition salt thereof and where applicable the geometric and optical isomers and racemic mixtures thereof.

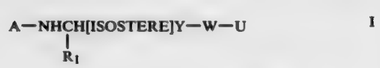
5,114,937

RENIN INHIBITING NONPEPTIDES

James M. Hamby, Livonia; James S. Kaltenbronn, and Joseph T. Repine, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 28, 1989, Ser. No. 442,952
Int. Cl.[5] A61K *31/395;* C07D *265/30*
U.S. Cl. 514—238.2 **25 Claims**

1. A compound of formula

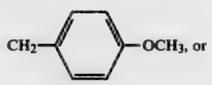


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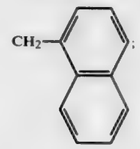
or a pharmaceutically acceptable acid addition salt thereof wherein:

A is SMO;

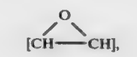
R_1 is CH_2Ph,



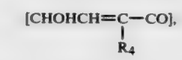
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[isostere] is [$CHOHCH_2$], [$COCH_2$], [CHOHCHOH], [CH=CH],



[CH_2NH], [CH_2NOH], [CH_2S], [$CH_2(NH_2)CH_2$], [CH_2SO_2], [CH_2CH_2],



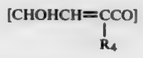
[CHOHCHOHCHOHCO] or [CH_2O] wherein R_4 is H, loweralkyl, lower alkenyl, lower alkynyl, CO_2R_3, or arylmethyl.

Y is absent,



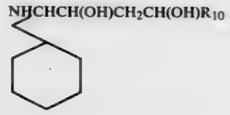
wherein

R_5 is hydrogen, OR_6, $S(O)_nR_6$, NR_7R_8 or $NHCOR_9$ wherein R_6 is lower alkyl, lower alkenyl, lower alkynyl, or aryl, n is an integer of from 0 to 2, R_7 and R_8 are each independently hydrogen, lower alkyl, lower alkenyl, lower alkynyl, or aryl, R_9 is hydrogen, lower alkyl or aryl with the proviso that when [ISOSTERE]is



or [CHOHCHOHCHOHCO], Y is absent;

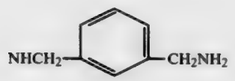
W is CAD, CAH, DECYS, DEKCYS, DFSTA, DFKSTA, ASTA, ACYS or



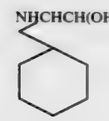
wherein

R_{10} is lower alkyl or alkenyl; and

U is absent, MBA, $NHCH_2Ph$, NHC_4H_9, $NHCH_3$ or



with the proviso that when W is CAD, CAH or



U is absent.

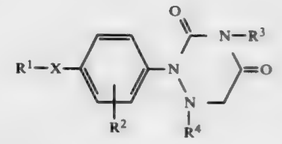
5,114,938

PARASITICIDAL SUBSTITUTED HEXAHYDRO-1,2,4-TRIAZINEDIONES AND USE THEREAS

Werner Lindner, Cologne, and Axel Haberkorn, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 2, 1990, Ser. No. 459,895
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1989, 3900373
Int. Cl.[5] A61K *31/53;* C07D *253/06*
U.S. Cl. 514—242 **11 Claims**

1. A substituted hexahydro-1,2,4-triazinedione of the formula



I

in which

R^1 represents thiazolyl, oxazolyl, benzothiazolyl or benzoxazolyl, each of which is optionally substituted by halogen, alkyl, cyano, nitro, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy, halogenoalkylthio, halogenoalkylsulfonyl, halogenoalkylsulfinyl, amino, alkylamino, halogenoalkylamino or acylamino,

X represents O, S, SO, SO_2 or $—CR^5(CN)$-,

R^2 represents one or more identical or different radicals from the group consisting of hydrogen, halogen, nitro, alkyl, alkoxy, halogenoalkyl, halogenoalkoxy, alkylthio and halogenoalkylthio,

R^3 and R^4, independently of one another, represent hydrogen, alkyl, alkenyl, alkinyl or aralkyl, and

R^5 represents hydrogen or alkyl, excepting compound in which X represents $—CR^5(CN)$- and

R^1 represents thienyl.

6. A method of combatting parasites which comprises applying to such parasites or to a medium from which it is desired to exclude such parasites a parasiticidally effective amount of a compound according to claim 1.

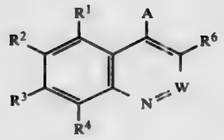
5,114,939

SUBSTITUTED QUINOLINES AND CINNOLINES AS FUNGICIDES

Barry A. Dreikorn, Lawrence; Glen P. Jourdan, Morristown, and Robert G. Suhr, Greenfield, all of Ind., assignors to DowElanco, Indianapolis, Ind.

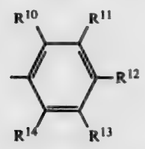
Continuation-in-part of Ser. No. 150,366, Jan. 29, 1988, abandoned. This application Mar. 16, 1989, Ser. No. 324,058
Int. Cl.[5] A01N *43/42, 43/60*
U.S. Cl. 514—248 **28 Claims**

1. A fungicidal method which comprises applying to the locus of a plant pathogen a fungicidally effective but nonpytotoxic amount of a compound of the formula (1)



(1)

wherein:
R^1 to R^4 are independently
H, halo, $(C_1–C_4)$ alkyl, branched $(C_3–C_4)$ alkyl, halo $(C_1–C_4)$ alkyl, $(C_1–C_4)$ alkoxy, NO_2, or NH_2, at least two of R^1 to R^4 being H,
or one of R^2 to R^4 is $—NR^7—Y—Ar$ or $O—Y—AR$ and the rest of R^1 to R^4 are H;
W is N, or CR^5;
R^5 is H, CH_3, Cl, $O—Y—Ar$, or $—NR^7—Y—Ar$;
R^6 is H, CH_3, Cl, or Br;
A is —O—Alk or —X—Y—Ar;
Alk is a $C_2–C_{18}$ saturated or unsaturated hydrocarbon chain, straight chain or branched, optionally substituted with halo, halo $(C_1–C_4)$ alkoxy, $(C_3–C_8)$ cycloalkyl, hydroxy, or acetyl;
X is O, NR^7, or CR^8R^9, provided that if one of R^2 to R^5 is $NR^7—Y—AR$ or $O—Y—Ar$, then X—Y—Ar is an identical group;
R^7 is H, $(C_1–C_4)$ alkyl, or acetyl;
R^8 and R^9 are independently H, $(C_1–C_4)$ alkyl, halo, or OH, or R^8 and R^9 combine to form a saturated or unsaturated carbocyclic ring comprising three to seven carbon atoms;
Y is an alkylene chain 2 to 8 carbon atoms long that optionally includes an O, S, SO, SO_2, or NR^7 group, and optionally includes a saturated or unsaturated carbocyclic ring comprising three to seven carbon atoms, and optionally is substituted with $(C_1–C_3)$ alkyl, $(C_2–C_4)$ alkenyl, phenyl, $(C_3–C_8)$ cycloalkyl, hydroxy, halo, or acety; and
Ar is
1,3-benzodioxolyl
fluorenyl,
pyridyl,
substituted pyridyl,
indolyl,
furanyl,
substituted furanyl,
thienyl, optionally substituted with CH_3 or Cl,
thiazolyl,
cyclopentyl,
1-methylcyclopentyl,
cyclohexenyl (tetrahydrophenyl),
cyclohexyl (hexahydrophenyl),
naphthyl,
substituted naphthyl,
dihydronaphthyl,
tetrahydronaphthyl,
decahydronaphthyl, or
a group of formula (2);



(2)

where
R^{10} to R^{14} are independently H, halo, $(C_1–C_{10})$ alkyl, branched $(C_3–C_6)$ alkyl, halo $(C_1–C_7)$ alkyl, $(C_1–C_7)$ alkoxy, halo $(C_1–C_7)$ alkoxy, phenoxy, substituted phenoxy, phenylthio, substituted phenylthio, phenyl, substituted phenyl, NO_2, NH_2, acetoxy, OH, CN, $SiR^{15}R^{16}R^{17}$, or $OSiR^{15}R^{16}R^{17}$, where R^{15}, R^{16}, and R^{17} are independently $(C_1–C_4)$ alkyl or $(C_3–C_4)$ branched alkyl, phenyl, or substituted pehnyl, provided that unless each of R^{10} to R^{14} is F, CH_3, or H, then at least two of R^{10} to R^{14} are H:
or an acid addition salt of a compound of formula (1) or an N-oxide of a compound of formula (1) when W is CR^5;
where, in the foregoing definitions, the term substituted phenyl refers to phenyl substituted with up to three groups selected from halo, $(C_1–C_{10})$ alkyl, branched $(C_3–C_6)$ alkyl, halo $(C_1–C_7)$ alkyl, hydroxy $(C_1–C_7)$ alkyl, $(C_1–C_7)$ alkoxy, halo $(C_1–C_7)$ alkoxy, phenoxy, phenyl, NO_2, OH, CN, $(C_1–C_4)$ alkanoyloxy, or benzyloxy;
the term substituted phenoxy refers to a phenoxy group substituted with up to three groups selected from halo, $(C_1 \propto C_{10})$ alkyl, branched $(C_3–C_6)$ alkyl, halo $(C_1–C_7)$ alkyl, hydroxy $(C_1–C_7)$alkyl, $(C_1–C_7)$ alkoxy, halo $(C_1–C_7)$ alkoxy, phenoxy, phenyl, NO_2, OH, CN $(C_1–C_4)$ alkanoyloxy, or benzyloxy;
the term substituted phenylthio refers to a phenylthio group substituted with up to three groups selected from halo, $(C_1–C_{10})$ alkyl, branched $(C_3–C_6)$ alkyl, halo $(C_1–C_7)$ alkoxy, phenoxy, phenyl, NO_2, OH, CN $(C_1–C_4)$ alkanoyloxy, or benzyloxy;
the term substituted phenylsulfonyl refers to a phenylsulfonyl group substituted with up to three groups selected from halo, $(C_1–C_{10})$ alkyl, branched $(C_3–C_6)$ alkyl, halo $(C_1–C_7)$ alkyl, hydroxy $(C_1–C_7)$ alkyl, $(C_1–C_7)$ alkoxy, halo $(C_1–C_7)$ alkoxy, phenoxy, phenyl, NO_2, OH, CN $(C_1–C_4)$ alkanoyloxy, or benzyloxy; and
the terms substituted naphthyl, substituted pyridyl, and substituted furanyl refer to these ring systems substituted with halo, halo $(C_1–C_4)$ alkyl, CN, NO_2, $(C_1–C_4)$ alkyl, $(C_3–C_4)$ branched alkyl, phenyl, $(C_1–C_4)$ alkoxy, or halo $(C_1–C_4)$ alkoxy.

5,114,940

PESTICIDES

Robert J. Blade; Robert J. Peek, and George S. Cockerill, all of Wellcome Research Laboratories, Ravens Lane, Berkhamsted, Herts, HP4 2DY, England

Continuation-in-part of Ser. No. 269,968, Nov. 10, 1988, abandoned. This application May 22, 1989, Ser. No. 355,976
Claims priority, application United Kingdom, Nov. 14, 1987, 8726735
Int. Cl.[5] A61K *31/47;* **C07D** *215/36*
U.S. Cl. 514—248 **16 Claims**

1. A compound of the formula (I):

$$ArQQ^1C(=X)NHR^1$$

or a salt thereof, wherein Ar is selected from quinoline, isoquinoline, quinoxaline, cinnoline, quinazoline, phthalazine, benzothiazole, naphthyridine, tetrahydroquinoline and tetrahydroisoquinoline; Q is an alkyl chain containing 1 to 12 carbon atoms and optionally containing a sulphur or one oxygen atom adjacent to the Ar ring system; Q^1 is a group $(C(R^2)=C(R^3))_a—(C(R^4)=C(R^5))$ wherein a is 0 or 1, R^2, R^3, R^4 and R^5 are the same or different, at least two being hydrogen and the other two being independently selected from hydrogen, halo, C_{1-4} alkyl or C_{1-4} haloalkyl; X is oxygen or sulphur; and R^1 is selected from hydrogen and C_{1-8} hydrocarbon optionally substituted by dioxalanyl, halo, cyano, trifluoromethyl, trifluoromethylthio or C_{1-6} alkoxy.

12. A method for the control of arthropod or helminth pests which comprises administering to the arthropod or helminth or their environment and effective amount of the compound of formula (I)

$$ArQQ^1C(=X)NHR^1 \qquad (I)$$

or a salt thereof, wherein Ar is selected from quinoline, isoquinoline, quinoxaline, cinnoline, quinazoline, phthalazine, benzothiazole, naphthyridine, tetrahydroquinoline and tetrahydroisoquinoline; Q is an alkyl chain containing 1 to 12 carbon atoms and optionally containing a sulphur or one oxygen atom adjacent to the Ar ring system; Q^1 is a group $(C(R^2)=C(R^3))_a—(C(R^4)=C(R^5))$ wherein a is 0 or 1, R^2, R^3, R^4, and R^5 are the same or different, at least two being hydrogen and the other two being independently selected from hydrogen, halo, C_{1-4} alkyl or C_{1-4} haloalkyl; X is oxygen or sulphur; and R_1 is selected from hydrogen and C_1.C_8 hydrocarbyl optionally substituted by dioxalanyl, halo, cyano, trifluoromethyl, trifluoromethylthio or C_{1-6} alkoxy to the plane susceptible to pest infestation.

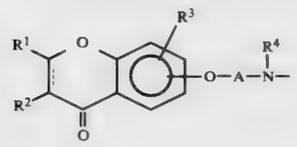
5,114,941

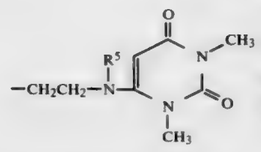
PYRIMIDINEDIONE DERIVATIVE COMPOUNDS, METHOD FOR PREPARING SAME, AND ANTIARRYTHMIC AGENTS CONTAINING SAME

Tsutomu Katakami; Tatsuro Yokoyama; Haruki Mori; Nobuya Kawauchi; Joji Kamiya, and Masaaki Ishii, all of Mobara, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Nov. 27, 1990, Ser. No. 618,245
Claims priority, application Japan, Dec. 1, 1989, 1-310615
Int. Cl.[5] A61K *31/495, 31/505;* **C07D** *405/12*
U.S. Cl. 514—253 **5 Claims**

1. A pyrimidinedione compound of the formula





wherein A is $—(CHhd\ 2)_n—$, n is 2 or 3 or $—CH_2CH(OH)CH_2—$, and R^1 is hydrogen, a lower alkyl group, lower alkoxycarbonyl group, phenyl group, 4-pyridyl group, 3-pyridyl group or 2-pyridyl group, R^2 is hydrogen, a lower alkyl group or phenyl group, R^3 is hydrogen or a nitro group, ··· is a single bond or double bond, R^4 is a lower alkyl group or a lower alkyl group substituted by a hydroxyl group, and R^5 is hydrogen or may be combined with R^4 to form $—CH_2CH_2—$ or a pharmaceutically acceptable salt thereof.

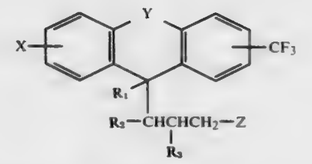
5,114,942

TREATING HABIT DISORDERS

Frank H. Gawin, New Haven, Conn.; Brian G. Humblestone, and David F. Allen, both of Nassau, The Bahamas, assignors to Yale University, New Haven, Conn.

Division of Ser. No. 331,923, Mar. 31, 1989, Pat. No. 5,059,600. This application Jan. 15, 1991, Ser. No. 641,378
Int. Cl.[5] A61K *31/38, 31/40, 31/445, 31/495*
U.S. Cl. 514—255 **6 Claims**

1. A method for treating drug disorders in a human comprising administering to said human an effective anti-habitual amount of a pharmaceutically active compound or an ester thereof or a pharmaceutically acceptable salt thereof, either alone, or in admixture with a physiologically acceptable diluent, said pharmaceutically active compound resulting in activation of brain reward systems, wherein th compound is of the formula



(1)

, wherein X is a halogen, $SO_2N(CH_3)_2$or CF_3; Y is sulfur; R_1 and R_2 are members selected from the group consisting of hydrogen and hydroxy and, when taken together, a single bond; R_3 is a member selected from the group consisting of hydrogen and methyl; and Z is a member selected from the group consisting of unsubstituted di-lower alkylamino and di-lower alkylamino wherein one or both alkyl groups are substituted with a substituent selected from the group consisting of hydroxy, N-pyrrolidinyl, N-piperidyl and N'-lower-alkyl-N-piperazinyl, wherein the alkyl is unsubstituted or substituted with OH,
except for treating drug disorders by administering flupenthixol.

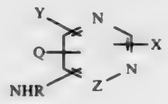
5,114,943

AMINO-SUBSTITUTED PYRIMIDINES, DERIVATIVES AND METHODS OF USE THEREFOR

Peter C. Ulrich, Tenafly, N.J., and Anthony Cerami, Shelter Island, N.Y., assignors to The Rockefeller University, New York, N.Y. and Alteon Inc., Northvale, N.J.

Continuation-in-part of Ser. No. 220,504, Jul. 18, 1989, abandoned, which is a division of Ser. No. 798,032, Nov. 14, 1985, Pat. No. 4,758,583, which is a continuation-in-part of Ser. No. 590,820, Mar. 19, 1984, Pat. No. 4,665,192. This application Jan. 11, 1991, Ser. No. 640,271
Int. Cl.[5] A61K *31/505*
U.S. Cl. 514—256 **6 Claims**

1. A method for inhibiting the advanced glycosylation of a target protein comprising contacting the target protein with an effective amount of composition comprising a compound selected from the group consisting of a compound of the formula



where
Z is CH—;
X, Y and Q are each independently a hydrogen, amino, amino lower alkyl, lower alkyl or hydroxy group;
and R is hydrogen;
and their corresponding 3-oxides; and a biocompatible and pharmaceutically acceptable salt thereof, and a mixture thereof, and a carrier therefor.

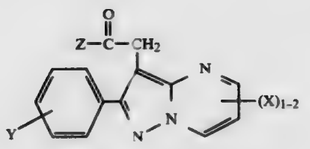
5,114,944

2-PHENYLPYRAZOLO[1,5-A]PYRIMIDINE-3-ACETIC ACID DERIVATIVES EXHIBITING THERAPEUTIC EFFECTS

Chandler R. Taylor, Jr., Mechanicsville; Harold F. Stauffer, Jr., Midlothian, both of Va., and Bruce E. Tomczuk, Fairport, N.Y., assignors to A. H. Robins Company Incorporated, Richmond, Va.

Filed Apr. 12, 1991, Ser. No. 684,247
Int. Cl.[5] C07D *487/04;* **A61K** *31/505*
U.S. Cl. 514—258 **23 Claims**

1. A 2-phenylpyrazolo[1,5-a]pyrimidine-3-acetic acid or derivatives thereof corresponding to the formula:



where X is hydrogen or a halogen, hydroxy, C_1–C_4 alkyl or C_1–C_4 alkoxy substituent; Y is hydrogen or a halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy substituent; Z is a hydroxy, C_1–C_4 alkoxy or —NRR substituent; and R is, independently hydrogen or a C_1–C_4 alkyl substituent; or a pharmaceutically acceptable salt thereof.

5,114,945

SPIROPIPERIDINE DERIVATIVES

Norman F. Hayes, Hitchin; David I. C. Scopes, Furneux Pelham; Andrew B. McElroy, Watton-at-Stone; Ann G. Hayes, Potters Bar, and Clive A. Meerholz, Buntingford, all of United Kingdom, assignors to Glaxo Group Limited, London, England

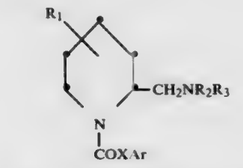
Filed Feb. 23, 1989, Ser. No. 315,261

Claims priority, application United Kingdom, Feb. 23, 1988, 8804014

Int. Cl.[5] A01N *43/42;* **A61K** *31/44;* **C07D** *491/113, 495/10, 513/10*

U.S. Cl. 514—278 **10 Claims**

1. A compound of formula (I)



(I)

wherein together with the carbon atom to which it is attached,

R_1 forms a 1,3-dithiolane, 1,3-dioxalane, or thiazolidine ring;

R_2 and R_3 are the same or different and represent C_{1-6}alkyl or C_{3-6}alkenyl; or $—NR_2R_3$ forms a 5-membered ring wherein R_2R_3 together is selected from the group consisting of butylidene, butenylidene, oxypropylidine, and oxypropenylidene or 6-membered ring wherein the ring contains no other heteroatoms in the radical R_2R_3, which ring optionally contains one unit of unsaturation and which is unsubstituted or substituted by hydroxy, oxo, unsubstituted methylidene or methylidene substituted by a group selected from the group consisting of nitrile, phenyl, carboxyl, amido, C_{1-6}alkyl phenyl, (C_{1-6})alkyl, C_{1-6}hydroxyalkyl, C_{1-6}carboxylalkyl and C_{1-6}amidoalkyl, $—COR_6$ (where R_6 represents C_{1-6}alkyl, $—OR_7$ or NHR_7 and R_7 represents hydrogen, C_{1-6}alkyl, phenyl or phen(C_{1-6})alkyl) or $=NOR_8$ (where R_8 represents C_{1-6}alkyl);

X represents a direct bond, $—CH_2—$ or $—CH_2O—$;

Ar represents a phenyl moiety substituted by one or more groups or atoms selected from the group consisting of halogen atoms, C_{1-6}alkyl, CF_3 and NO_2 groups,

and physiologically acceptable salts thereof.

10. A method of treating a human suffering from pain or cerebral ischaemia which comprises administering an analgesically effective amount of a compound of formula (I) as defined in claim **1** or a physiologically acceptable salt.

5,114,946

TRANSDERMAL DELIVERY OF PHARMACEUTICALS

James R. Lawter, Orange, N.Y., and John M. Pawelchak, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 283,204, Dec. 12, 1988, Pat. No. 4,992,445, which is a continuation-in-part of Ser. No. 61,842, Jun. 12, 1987, abandoned. This application Jan. 25, 1991, Ser. No. 645,942

The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—279 **6 Claims**

1. A pharmaceutical composition for transdermal administration which comprises:

(a) an amount of a substantially pure enantiomer or an enantiomer mixture containing disproportionate amounts of enantiomers of a pharmacologically active chiral compound wherein the racemic modification of said pharmacologically active compound has a melting point that is 5° C. or more above the melting point of the pure enantiomer or of said enantiomer mixture; and

(b) a vehicle for said pharmacologically active chiral compound.

5,114,947

METHOD FOR ALLEVIATING ANXIETY USING BENZOBICYCLIC CARBOXAMIDES

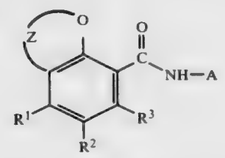
Anthony R. Imondi, Westerville, Ohio, assignor to Erbamont Inc., Dublin, Ohio

Filed Dec. 27, 1990, Ser. No. 634,648

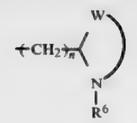
Int. Cl.[5] A61K *31/41, 31/44*

U.S. Cl. 514—282 **27 Claims**

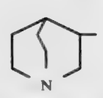
1. A method for the treatment of anxiety comprising orally or parenterally administering to a patient in need of such treatment an anxiolytically effective amount of a compound of the formula (I) or a pharmaceutically acceptable salt thereof



wherein Z represents the carbon and hydrogen atoms necessary to complete a substituted or unsubstituted, saturated or unsaturated, 5-membered ring; R^1, R^2, and R^3 may be the same or different and represent a member selected from the group consisting of hydrogen, lower alkyl, cycloalkyl, lower alkoxy, amino, lower alkyl substituted amino, acylamido, sulfonamido, halogen, and nitro; A represents moiety selected from the group consisting of formulas (II) and (VII).



(II)



(VII)

wherein W represents a single bond or the carbon and hydrogen atoms necessary to complete a 3- to 8-membered saturated or unsaturated ring; R^6 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenalkyl, fluorine-substituted alkyl, propargyl, and allyl; and n is 0 or an integer of 1 to 3; provided that when Z represents the atoms necessary to complete a 2,2-dimethyl-2,3-dihydrobenzofuran ring, R^1, R^2 and R^3 may not simultaneously equal hydrogen and when R^2 is flourine, R^1 and R^3 may not equal hydrogen.

5,114,948

STABILIZED PERGOLIDE COMPOSITIONS

James W. Conine, Indianapolis; Denis L. Sparks, Greenwood, and Julian L. Stowers, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 19, 1989, Ser. No. 424,018

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—288 **17 Claims**

1. A pharmaceutical composition of pergolide or a salt thereof stabilized to oxidation comprising a therapeutically effective amount of pergolide or a salt thereof, a stabilizing agent selected from methionine, cysteine, and cysteine hydrochloride in an amount sufficient to effect stabilization to oxidation, and pharmaceutically acceptable excipients.

5,114,949

HETEROCYCLIC DERIVATIVES, THEIR PREPARATION AND MEDICINAL PRODUCTS CONTAINING THEM

Claude Gueremy, Houilles; Jean-Luc Malleron, Marcoussis, and Serge Mignani, Livry-Gargan, all of France, assignors to Rhone-Poulenc Sante, Antony, France

Filed Nov. 19, 1990, Ser. No. 615,670

Claims priority, application France, Nov. 20, 1989, 89 15177; Dec. 26, 1989, 89 17164; Jun. 21, 1990, 90 07774

Int. Cl.[5] A61K *31/44, 31/445*

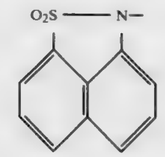
U.S. Cl. 514—293 **6 Claims**

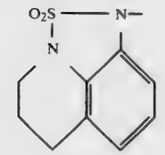
1. A compound of formula:

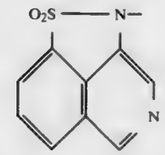
$R_1—(CH_2)_n—Het$ (I)

in which

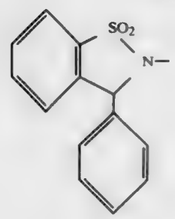
R_1 represents a residue of formula:



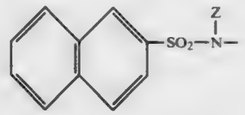




-continued



(D)



(J)

X represents a hydrogen atom or an alkyl radical,

Y represents a hydrogen atom or an alkyl or alkoxy radical,

Z represents an alkyl radical,

n is equal to 2 or 3,

Het represents a substituted piperidino (substituted at the 4-position with a 1-indenylidene, 1-indenyl or 1-indanyl radical or with a chain $—(CH_2)_m—R_2$ or $=CH—R_2$),

m is equal to 1 or 2, and

R_2 represents a 2- or 3-indolyl (optionally substituted with a halogen atom and/or on the nitrogen atom with an alkyl radical), 1- or 2-indanyl, 1- or 2-indenyl, or 1-indolyl radical, as well as its salts with inorganic or organic acids and its racemates and enantiomers when it contains at least one asymmetric center, it being understood that the alkyl and alkoxy radicals contain 1 to 4 carbon atoms in a straight or branched chain.

5,114,950

5,6-DIHYDRO-N-[(IMIDAZOL-4(OR 5)-YL)METHYL]-4H-PYRROLO[3,2,1-IJ]QUINOLINE-1-CARBOXAMIDES HAVING 5-HT$_3$ANTAGONIST ACTIVITY

Alexander W. Oxford, Royston; David E. Bays, Ware; David J. Cavalla, Cambridge, and Peter C. North, Royston, all of England, assignors to Glaxo Group Limited, London, England

Filed Jun. 13, 1990, Ser. No. 538,072

Claims priority, application United Kingdom, Jun. 14, 1989, 8913646

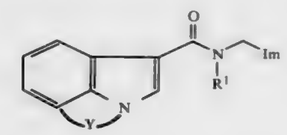
Int. Cl.[5] C07D *451/14;* **A61K** *31/44*

U.S. Cl. 514—294 **7 Claims**

1. A compound of formula (I)

(A)

(B)



(I)

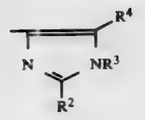
(C)

wherein

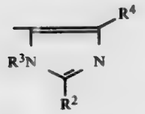
R^1 is a hydrogen atom or a C_{1-6}alkyl group,

Y represents a group $—(CH_2)_m—$, where m represents 3; and

Im represents an imidazolyl group of the formula:



or



wherein one of the groups represented by R^2, R^3 and R^4 is a hydrogen atom or a C_{1-6}alkyl, C_{3-7}cycloalkyl, C_{3-6}alkenyl, phenyl or phenyl C_{1-3}alkyl group, and each of the other two groups, which may be the same or different, represents a hydrogen atom or a C_{1-6}alkyl group;
or a physiologically acceptable salt or solvate thereof.

5,114,951
AGENTS FOR COMBATING MULTIPLE DRUG RESISTANCE

Ann C. King, Chapel Hill, N.C., assignor to Burroughs Wellcome Company, Research Triangle Park, N.C.

Filed Apr. 11, 1989, Ser. No. 336,192
Int. Cl.[5] A01N *43/42*; A61K *31/44, 31/445*
U.S. Cl. 514—290 **2 Claims**

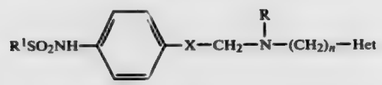
1. A method of combating multiple drug resistance of susceptible tumor cells in a subject in need of such treatment, comprising administering to the subject a compound, in an amount effective to combat multiple drug resistance of tumor cells sensitive to said compound, wherein said compound is selected from the group consisting of triprolidine, cis-triprolidine, and pharmaceutically acceptable salts thereof.

5,114,952
ISOQUINOLINYLSULFONAMIDES AS ANTI-ARRHYTHMIC AGENTS

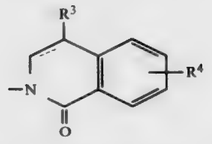
John E. Arrowsmith, Deal; Peter E. Cross, Canterbury, and Geoffrey N. Thomas, Sandwich, all of England, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 360,517, Jun. 2, 1989, Pat. No. 4,990,509, which is a division of Ser. No. 37,309, Apr. 9, 1987, Pat. No. 4,863,948. This application Nov. 21, 1990, Ser. No. 617,112
Claims priority, application United Kingdom, Apr. 16, 1986, 8609331
Int. Cl.[5] A61K *31/40, 31/47*; C07D *209/46, 217/22*
U.S. Cl. 514—309 **10 Claims**

1. A sulfonamide compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein
R and R^1 are each C_1–C_4 alkyl;
X is —CH_2—, —CO— or —CH(OH)—;
n is two, three or four; and
"Het" is a nitrogen-containing heterocyclic group of the formula:



wherein R^3 and R^4 are each hydrogen, halogen or C_1–C_4 alkyl; and the dotted line represents an optional bond.

5,114,953
TREATMENT FOR TISSUE ULCERATION

Richard E. Galardy, Guilford, Conn.; Damian Grobelny, MacLeod West, Australia, and Gregory Schultz, Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

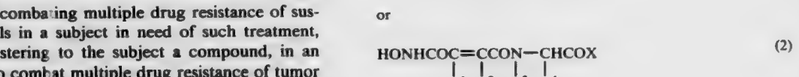
Filed Nov. 21, 1990, Ser. No. 616,021
Int. Cl.[5] A61K *31/40, 31/445*
U.S. Cl. 514—323 **4 Claims**

1. A method to treat or prevent ulceration of tissue which method comprises administering to a subject in need of such treatment an effective amount of a compound which inhibits at least one mammalian matrix metalloprotease, said compound having the formula:



(1)

or



(2)

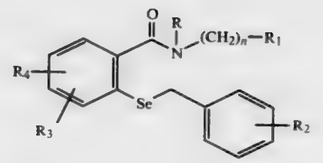
wherein R^1 is H and R^2 is alkyl (3-8C) or wherein R^1 and R^2 taken together are —$(CH_2)_n$— wherein n = 3–5;
R^3 is H or alkyl (1–4C);
R^4 is a fused or conjugated substituted or unsubstituted bicycloaryl methylene;
X is OR^5 or NHR^5, wherein R^5 is H or substituted or unsubstituted alkyl (1–12C), aryl (6–12C), aryl alkyl (6–16C); or
X is an amino acid residue or amide thereof; or
X is the residue of a cyclic amine or heterocyclic amine
or pharmaceutical composition thereof effective to treat or prevent said ulceration.

5,114,954
ANTIINFLAMMATORY BENZYLSELENOBENZAMIDES FROM AMINOPYRIDINES AND PICOLYLAMINES

Jürgen Biedermann, Pulheim, Fed. Rep. of Germany; Michel Evers, Liege, Belgium; Rolf Terlinden, Cologne, Fed. Rep. of Germany; Sigurd Leyck, Pulheim, Fed. Rep. of Germany, and Erich Graf, Kerpen-Horrem, Fed. Rep. of Germany, assignors to A. Nattermann & Cie. GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 8, 1990, Ser. No. 611,275
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1989, 3937170
Int. Cl.[5] C07D *213/24*; A61K *31/64*
U.S. Cl. 514—338 **5 Claims**

1. A benzylselenobenzamide of the formula



I

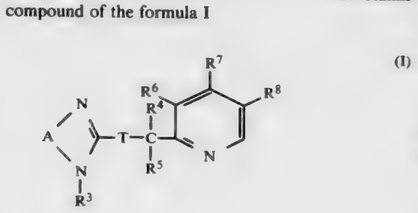
where
R is hydrogen, methyl or ethyl and
R_1 represents the 2-, 3-, or 4-pyridyl group which can be substituted with fluorine, chlorine, bromine, C_{1-4}alkyl, C_{1-4}-alkoxy, hydroxy, cyano, amino, dimethylamino or nitro and
R_2, R_3 and R_4 are identical or different and, taken separately, represent hydrogen, fluorine, chlorine, bromine, trifluoromethyl, C_{1-4}-alkyl, C_{1-4}-alkoxy, hydroxy, cyano or nitro or
R_3, R_4 taken together, represent methylenedioxy and
n is zero or 1.

5,114,955
SUBSTITUTED THIENOIMIDAZOLE DERIVATIVES

Hans-Jochen Lang, Hofheim am Taunus; Klaus Weidmann, Kronberg/Taunus; Karl-Heinz Scheunemann; Hildegard Nimmesgern, both of Frankfurt am Main; Robert Rippel, Hofheim am Taunus, and Andreas W. Herling, Bad Camberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

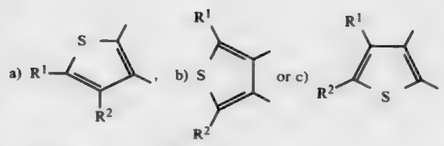
Filed Nov. 10, 1988, Ser. No. 269,285
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738520; Jun. 4, 1988, 3819084; Aug. 19, 1988, 3828158
Int. Cl.[5] A61K *31/44*; C07D *405/14*
U.S. Cl. 514—338 **15 Claims**

1. A compound of the formula I

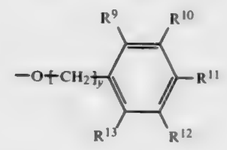


(I)

in which
A stands for



T denotes —S—, —SO— or —SO_2,
R^1 and R^2 are identical or different and denote hydrogen, $(C_1$–$C_3)$-alkyl, halogen, $(C_1$–$C_4)$-alkoxy, —O—[C_{H_2}—$]_xC_fH_{(2f+1-g)}F_g$, or $(C_1$–$C_4)$-alkoxycarbonyl,
R^3 denotes hydrogen, $(C_1$–$C_6)$-alkanoyl, $(C_1$–$C_6)$-alkylcarbamoyl, $(C_1$–$C_6)$-alkoxycarbonyl, benzyloxycarbonyl or another physiologically tolerable N^{im} protecting group which can be cleaved in acidic medium and/or under physiological conditions selected from the group consisting of $(C_1$–$C_{10})$-acyloxy-$(C_1$–$C_6)$-alkyl, $(C_1$–$C_{10})$-alkanoyloxy-$(C_1$–$C_6)$-alkyl, benzoyloxy-$(C_1$–$C_6)$-alkyl, benzyloxycarbonyloxy-$(C_1$–$C_6)$-alkyl or $(C_1$–$C_6)$-alkoxycarbonyloxy-$(C_1$–$C_6)$-alkyl,
R^4 and R^5 each denote hydrogen,
R^6 and R^8 are identical or different and denote hydrogen, halogen, $(C_1$–$C_3)$-alkyl, $(C_1$–$C_6)$-alkoxy or a fluoroalkoxy radical of the formula —O—[CH_2—$]_xC_fH_{(2f+1-g)}F_g$,
R^7 denotes a monosubstituted or polysubstituted benzyl-oxy or phenoxy radical of the formula



y is 0 or 1,
R^9, R^{10}, R^{11}, R^{12} and R^{13} are identical or different and denote hydrogen, fluorine, chlorine, bromine, or trifluoromethyl, cyano, nitro, $(C_1$–$C_6)$-alkoxycarbonyl
f is 1, 2, 3, 4, 5, 6, 7 or 8,
g is 0, 1 to (2f+1),
x is 0, 1, 2 or 3,
or a physiologically tolerable salt thereof.

5,114,956
PARENTERAL FORMULATION OF NIMODIPINE

Dieter Hoff, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 599,037, Apr. 11, 1984, abandoned. This application Jan. 15, 1991, Ser. No. 641,323
Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316510
Int. Cl.[5] A61K *31/44*
U.S. Cl. 514—356 **2 Claims**

1. A method of making a parenteral formulation consisting essentially of about
a) 0.01–0.4% by weight of nimodipine, relative to 100 parts by weight of a solvent consisting essentially of about
b) 15–40% by weight of polyethylene glycol, 15–30% by weight of ethanol, and water,
which comprises dissolving the nimodipine in the polyethylene glycol and ethanol, and then adding the water to the solution.

5,114,957
TOCOPHEROL-BASED ANTIVIRAL AGENTS AND METHOD OF USING SAME

Sheldon S. Hendler, La Jolla, and Robert Sanchez, Carlsbad, both of Calif., assignors to Biodor U.S. Holding and Vyrex Corporation, both of La Jolla, Calif.

Filed May 8, 1990, Ser. No. 520,633
Int. Cl.[5] A61K *31/44, 31/355*
U.S. Cl. 514—356 **28 Claims**

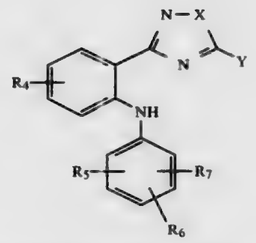
1. A method for treating viral infections in a living organism infected with a virus comprising administering to said living organism an effective antiviral amount of tocopherol or a pharmaceutically effective prodrug thereof.

5,114,958
1,2,4-OXADIAZOLE AND 1,2,4-THIADIAZOLE DERIVATIVES OF FENAMATES AS ANTIINFLAMMATORY AGENTS

Diane H. Boschelli, Plymouth, and David T. Connor, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 9, 1991, Ser. No. 697,374
Int. Cl.[5] A61K *31/41*; C07D *271/06, 285/08, 285/14*
U.S. Cl. 514—361 **13 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein,

X is O or S;

Y is OH, SH, NH_2, OR^1, $S(O)_nR^1$, $NR^1{}_2$ or NHR^2, in which n is 0, 1, or 2; R^1 is lower alkyl, phenyl, or phenyl substituted by one to three substituents selected from fluorine, chlorine, bromine, iodine, trifluoromethyl, lower alkyl, CN, hydroxy, lower alkoxy, $S(O)_n$-lower alkyl, NO_2 and NR^8R^9 wherein R^8 and R^9 are independently hydrogen, lower alkyl, lower alkanoyl, benzoyl, or benzoyl substituted by one to three substituents selected from fluorine, chlorine, bromine, iodine, trifluoromethyl, lower alkyl, CN, hydroxy, lower alkoxy, $S(O)_n$-lower alkyl, NO_2, and $NR^{10}R^{11}$ wherein R^{10} and R^{11} are independently hydrogen or lower alkyl, and R^2 is lower alkyl, phenyl, or substituted phenyl as defined above, OR^1, CN, $C(W)NHR^3$ or $NHC(W)NHR^3$ wherein R^3 is hydrogen, lower alkyl, phenyl, or substituted phenyl as defined above, and W is O, S or NH; and

R^4, R^5, R^6, and R^7 are each independently hydrogen, fluorine, chlorine, bromine, iodine, trifluoromethyl, lower alkyl, CN, hydroxy, lower alkoxy, $S(O)_n$-lower alkyl, NO_2, or NR^8R^9 wherein R^8 or R^9 are independently hydrogen, lower alkyl, lower alkanoyl, benzoyl, or substituted benzoyl as defined above.

5,114,959

FUNGICIDAL SUBSTITUTED ACRYLIC ESTERS

Alexander Klausener, Stolberg; Gerd Kleefeld, Duesseldorf; Wilhelm Brandes, Leichlingen; Stefan Dutzmann, Duesseldorf, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 9, 1990, Ser. No. 478,119

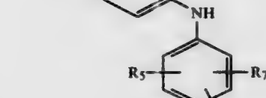
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1989, 3905119

The portion of the term of this patent subsequent to Nov. 6, 2007, has been disclaimed.

Int. Cl.[5] **C07D** *77/42;* **A01N** *43/78*

U.S. Cl. 514—369 **10 Claims**

1. A substituted acrylic ester of the formula



(I)

in which

R^1 represents hydrogen, or represents straight-chain or branched alkyl having 1 to 8 carbon atoms, or represents straight-chain or branched alkenyl having 2 or 8 carbon atoms, or represents aralkyl having 1 to 6 carbon atoms in the straight-chain or branched alkyl moiety, aralkenyl having 2 to 6 carbon atoms in the straight-chain or branched alkenyl moiety or aryl having 6 to 10 carbon atoms in the respective aryl moiety, each of which is optionally monosubstituted to polysubstituted in the aryl moiety by identical or different substituents selected from the group consisting of

halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy or alkylthio, each of which has 1 to 4 carbon atoms, in each case straight-chain or branched halogenoalkyl, halogenoalkoxy or halogenoalkylthio, each of which has 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, in each case straight-chain or branched alkoxycarbonyl or alkoximinoalkyl, each of which has 1 to 8 carbon atoms in the individual alkyl moieties, cycloalkyl having 3 to 7 carbon atoms, double-linked alkanediyl having 3 to 5 carbon atoms, or aryl, aralkyl, aryloxy or aralkyloxy, each of which has 6 to 10 carbon atoms in the aryl moiety and if appropriate 1 to 4 carbon atoms in the straight-chain or branched alkyl moiety and each of which is optionally monosubstituted to polysubstituted in the aryl moiety by identical or different substituents from the group consisting of halogen, alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy and halogenoalkylthio, each having 1 to 4 carbon atoms and if appropriate 1 to 9 identical or different halogen atoms, or heteroarylalkyl or heteroaryl, each of which has 2 to 9 carbon atoms and 1 to 4 identical or different oxygen, sulphur or nitrogen hetero atoms in the heteroaryl moiety and if appropriate 1 to 4 carbon atoms in the straight-chain or branched alkyl moiety and each of which is optionally monosubstituted to polysubstituted in the heteroaryl moiety by identical or different substituents from the group consisting of halogen, alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy and halogenoalkylthio, each having 1 to 4 carbon atoms and if appropriate 1 to 9 identical or different halogen atoms;

R^1 furthermore represents a heteroaryl radical which has 2 to 9 carbon atoms and 1 to 4 identical or different hetero atoms and which is optionally monosubstituted to polysubstituted by identical or different substituents, selected from the group consisting of the same substituents as provided for in the definition of aryl substituents given above,

R^2 represents fluorine, chlorine, bromine, iodine, cyano, nitro or formyl, or represents straight-chain or branched halogenoalkyl having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, or represents in each case straight-chain or branched alkoxyalkyl or alkylthioalkyl, each of which has 1 to 4 carbon atoms in the individual alkyl moieties, or represents in each case straight-chain or branched hydroximinoalkyl, alkoximinoalkyl, N-alkyliminoalkyl or N,N-dialkylhydrazonoalkyl, each of which has 1 to 4 carbon atoms in the individual alkyl moieties, or represents in each case straight-chain or branched alkoxy or alkylthio, each of which has 1 to 4 carbon atoms, or represents in each case straight-chain or branched halogenoalkoxy or halogenoalkylthio, each of which has 1 to 4 carbon atoms and each of which has 1 to 9 identical or different halogen atoms, or represents in each case straight-chain or branched alkanoyl, alkoxycarbonyl or N,N-dialkylcarbamoyl, each of which has 1 to 4 carbon atoms in the individual alkyl moieties, or represents heterocyclylcarbonyl, the heterocyclyl radical being a saturated five- to seven-membered N-linked heterocyclic ring which can optionally contain a further oxygen, sulphur or nitrogen hetero atom and which can optionally be monosubstituted to tetrasubstituted by methyl and/or ethyl;

R^2 furthermore represents N-aryliminoalkyl, aryloxy or arylthio, each of which is optionally monosubstituted to polysubstituted in the aryl moiety by identical or different substituents, each of which has 6 to 10 carbon atoms, the straight-chain or branched alkyl moiety having 1 to 4 carbon atoms and possible aryl substituents in each case being: halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy or alkylthio, each of which has 1 to 4 carbon atoms, in each case straight-chain or branched halogenoalkyl, halogenoalkoxy or halogenoalkylthio, each of which has 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, in each case straight-chain or branched alkoxycarbonyl or alkoximinoalkyl, each of which has 1 to 4 carbon atoms in the individual alkyl moieties, or phenyl which is optionally monosubstituted to polysubstituted by identical or different substituents from the group consisting of halogen and/or straight-chain or branched alkyl having 1 to 4 carbon atoms,

R^3 represents straight-chain or branched alkyl having 1 to 6 carbon atoms, or represents aralkyl which has 1 to 4 carbon atoms in the straight-chain or branched alkyl moiety and 6 to 10 carbon atoms in the aryl moiety and which is optionally monosubstituted to polysubstituted in the aryl moiety by identical or different substituents, including the substituents mentioned in the case of R^1,

R^4 represents dialkylamino having in each case 1 to 6 carbon atoms in the individual straight-chain or branched alkyl moieties, or represents a radical $—Z—R^5$,

X represents oxygen or sulphur and

Y represents oxygen or sulphur or represents a radical



where

R^5 represents straight-chain or branched alkyl having 1 to 6 carbon atoms, or represents aralkyl which has 1 to 4 carbon atoms in the straight-chain or branched alkyl moiety and 6 to 10 carbon atoms in the aryl moiety and which is optionally monosubstituted to polysubstituted in the aryl moiety by identical or different substituents, including the substituents mentioned in the case of R^1,

R^6 represents hydrogen, or represents straight-chain or branched alkyl having 1 to 6 carbon atoms, or represents straight-chain or branched alkanoyl having 1 to 6 carbon atoms in the alkyl moiety, or represents aralkyl which has 1 to 6 carbon atoms in the straight-chain or branched alkyl moiety or aryl having in each case 6 to 10 carbon atoms in the respective aryl moiety, each of these aralkyl or aryl moieties being optionally monosubstituted to polysubstituted in the aryl moiety by identical or different substituents, including the substituents in the aryl moiety mentioned in the case of R^1, and

Z represents oxygen or sulphur.

5,114,960

SUBSTITUTED ISOXAZOLE DERIVATIVES

Geoffrey Lawton, Hitchin; John M. Osbond, Hatfield, and Christopher R. Self, Hitchin, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

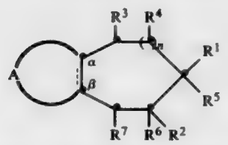
Filed Jun. 26, 1990, Ser. No. 543,905

Claims priority, application United Kingdom, Jul. 20, 1989, 8916563; May 11, 1990, 9010591

Int. Cl.[5] **C07D** *261/20, 275/04;* **A61K** *31/42, 31/425*

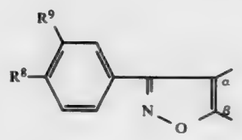
U.S. Cl. 514—379 **20 Claims**

1. A compound of the formula

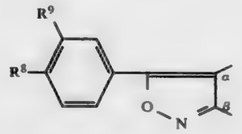


1

wherein A taken together with the two carbon atoms denoted as α and β signifies a group of the formula



(i)



(ii)

and the dotted line is the double bond present in formula (i); and wherein n is zero, 1, 2 or 3, one of R^1 and R^2 is carboxy or C_{1-6}-alkoxycarbonyl and the other is hydrogen, R^3 is hydrogen, C_{1-6}-alkyl, C_{1-6}-alkoxy, phenoxy or naphthyloxy group which is optionally substituted by one or more substituents selected from halogen, C_{1-6}-alkyl and C_{1-6}-alkoxy, azido, cyano or C_{1-6}-alkylthio, R^4, R^5, R^6 and R^7 each independently, are hydrogen, or C_{1-6}-alkyl or, when R^1 is carboxy or C_{1-6}-alkoxycarbonyl and n is 1, R^4 and R^6 taken together can be a carbon-carbon bond or, when R^2 is carboxy or C_{1-6}-alkoxycarbonyl, R^5 and R^7 taken together can be a carbon-carbon bond, R^8 is halogen, C_{1-6}-alkyl, C_{1-6}-haloalkyl or C_{1-6}-alkoxy and R^9 is hydrogen, halogen, C_{1-6}-alkyl or C_{1-6}-alkoxy, or a pharmaceutically acceptable salt of a compound of formula I in which one of R^1 and R^2 is carboxy and the other is hydrogen.

5,114,961

2,5-DIARYL TETRAHYDOFURANS AND ANALOGS THEREOF AS PAF ANTAGONISTS

Tesfaye Biftu, Parlin; Robert L. Bugianesi, Colonia; Nirindar N. Girotra, Parlin; Mitree M. Ponpipom, Branchburg; Soumya P. Sahoo, Edison, and Chan H. Kuo, South Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

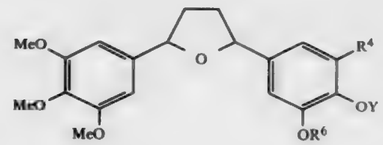
Division of Ser. No. 362,915, Jun. 8, 1989, Pat. No. 4,996,203.

This application Dec. 10, 1990, Ser. No. 624,449

Int. Cl.[5] **C07D** *407/12;* **A61K** *31/415*

U.S. Cl. 514—397 **16 Claims**

1. A compound of the following structural formula:



wherein:

R^4 is $[(a)]S(O)_n R^2$, in which n is 0, 1 or 2, and

R^2 is selected from the group consisting of

(1) C_{1-6}alkyl,

(2) substituted C_{1-6}alkyl wherein the substituent is selected from the group consisting of hydroxy, and amino,

(3) C_{2-6}alkenyl,

(4) C_{1-6}alkylcarbonyl-C_{1-6}alkyl,

(5) N-substituted C_{106}aminoalkyl, wherein the substitutent is C_{1-6}alkyl,

(6) N,N-di-substituted C_{1-6}aminoalkyl, wherein the substituents each independently represent C_{1-6}alkyl,

(7) imidazolyl-C_{1-6}alkyl;

Y is selected from the group consisting of

(a) C_{1-12}alkyl,

(b) substituted C_{1-8}alkyl wherein the substituent is se-

lected from the group consisting of hydroxy, and amino,
(c) C_{1-8}alkoxy-C_{1-6}alkyl,
(d) C_{2-6}alkenyl,
(e) C_{1-6}alkyl $S(O)_m$-C_{1-6}alkyl in which m is 0, 1 or 2, and
(f) imidazolylthio-C_{1-6}alkyl;
R^6 is selected from the group consisting of
(a) C_{1-6}alkyl,
(b) substituted C_{1-6}alkyl wherein the substituent is selected from the group consisting of hydroxy and amino,
(c) C_{1-6}alkyl—O—R^{10}, wherein R^{10} is
(1) $—PO_2(OH)^- M^+$ wherein M^+ is a pharmaceutically acceptable cation
(2) $—C(O)(CH_2)_2—CO_2^- M^+$, or
(3) $—SO_3^- M^+$,
(d) C_{1-6}-alkicarbonyl-C_{1-6}alkyl,
(e) C_{1-6}carboxyalkyl,
(f) C_{1-4}alkylamino-C_{1-6}alkyl,
(g) N,N-di-substituted C_{1-6}aminoalkyl wherein the substituents each independently represent C_{1-6}alkyl,
(h) imidazolyl-C_{1-6}alkyl, and
(i) imidazolyl-X—C_{1-6}alkyl wherein X is thio or amino;
provided that at least one of R^4, Y and R^6 contains an imidazolyl.

5,114,962

NEW AMINO ACID ESTERS, A PROCESS FOR THEIR PREPARATION, MEDICAMENTS CONTAINING THEM, AND THE USE THEREOF

Wolfgang Rüger, Kelkheim; Hansjörg Urbach, Kronberg-/Taunus; Reinhard Becker, Wiesbaden, and Franz Hock, Dieburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

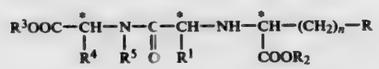
Continuation of Ser. No. 244,389, Sep. 14, 1988, abandoned. This application Jun. 19, 1990, Ser. No. 540,634

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, 3731085

Int. Cl.[5] A61K *31/475;* **C07D** *209/12, 209/14*

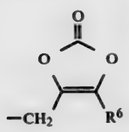
U.S. Cl. 514—412 **4 Claims**

1. A compound of the formula I



(I)

wherein n is 1 or 2;
R is phenyl or C_1–C_8 alkyl;
R^1 is a side chain of a naturally occurring alpha, amino acid,
R^2 and R^3 are identical or different and are selected from (C_1–C_6) alkyl, (C_6–C_{12})-aryl-(C_1–C_4)-alkyl and a radical of the formula



in which R^6 is hydrogen or an aliphatic radical having 1–6 carbon atoms,
and where at least one of R^2 or R^3 denotes said radical;
R^4 and R^5 together with the atoms carrying them form a ring system selected from octahydroindole, and octahydrocyclopenta[b]pyrrole;
or a physiologically tolerated salt thereof.

5,114,963

METHOD OF REDUCING SERUM LEVELS OF LIPOPROTEIN(A)

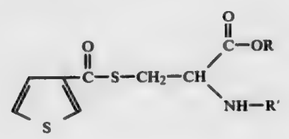
John W. Holsday, Rowayton, Conn.; Jonah Shacknai, New York, N.Y., and Leonard L. Mazur, Mountain Lakes, N.J., assignors to Medicis Corporation, New York, N.Y.

Filed Mar. 13, 1991, Ser. No. 668,304

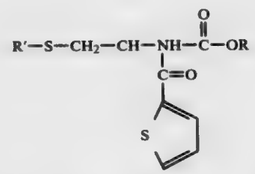
Int. Cl.[5] A61K *31/38*

U.S. Cl. 514—448 **14 Claims**

1. A method for reducing the serum level of lipoprotein(a) in a human or animal with an elevated level of lipoprotein(a) comprising administering to the human or animal an amount of a compound selected from the group consisting of compounds with the following formula:



and



wherein R is selected from the group consisting of hydrogen and an alkyl group containing 1 to 8 carbon atoms and R′ is selected from the group consisting of acetyl, benzoyl, thenoyl, 2 chromone-carbonyl and succinyl, and pharmaceutically acceptable salts thereof sufficient to reduce the serum level of lipoprotein(a).

5,114,964

ARYL-SUBSTITUTED BENZOCYCLOALKYL-DERIVED ANTI-ATHEROSCLEROTIC AGENTS

Jeffrey N. Barton, Philadelphia, Pa., assignor to Rhone-Poulenc Rorer Pharmaceuticals Inc., Collegeville, Pa.

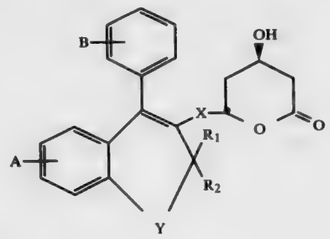
Continuation-in-part of Ser. No. 431,417, Nov. 3, 1989, Pat. No. 4,946,860. This application Jan. 5, 1990, Ser. No. 461,198

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.[5] A61K *31/35;* **C07D** *309/30*

U.S. Cl. 514—460 **5 Claims**

1. A compound of the formula



wherein:
A is H, alkyl or alkoxy;
B is H, alkyl, alkoxy, halo or CF_3;
X is CH_2CH_2 or CH=CH
Y is CH_2, CH_2CH_2 or CH=CH
R_1 and R_2 are independently H, alkyl, hydroxyalkyl, halo or CF_3;
or a pharmaceutically acceptable salt thereof.

5,114,965

FLUBENZIMINE CONTAINING AGENTS FOR COMBATING PESTS

John Anderson, Langenfeld; Bernhard Homeyer, Leverkusen, both of Fed. Rep. of Germany, and Walter M. Zeck, Vero Beach, Fla., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany and Miles Inc., Pittsburgh, Pa.

Division of Ser. No. 938,675, Dec. 5, 1986, Pat. No. 4,965,256. This application Aug. 13, 1990, Ser. No. 566,284

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3545060

Int. Cl.[5] A01N *43/08, 43/78, 47/10*

U.S. Cl. 514—469 **5 Claims**

1. A pesticidal composition for soil application displaying an enhanced duration of activity comprising an effective amount of a carbamate soil pesticide and an effective amount for enhancing the period of activity of said pesticide, flubenzimine wherein the weight ratio of soil pesticide to flubenzimine is between about 1:50 and 50:1.

5,114,966

2,3-DIHYDRO-5-OXY-4,6,7-TRIMETHYLBENZOFURANS 2-(RS)-SUBSTITUTED, USEFUL AS ANTIOXIDIZING PHARMACEUTICAL PRODUCTS HAVING MUCOREGULATING AND ANTI-ISCHEMIC PROPERTIES

Romolo Scuri, Frosinone; Mario Brufani, Castelgandolfo; Stefano Ceccarelli, Frosinone; Patrizia De Vellis, Frosinone; Patrizia Giannetti, Frosinone; Agnese Paesano, Frosinone, and Sergio Zanarcella, Mentana, all of Italy, assignors to Biomedica Foscama Industria Chimico-Farmaceutica S.p.A., Rome, Italy

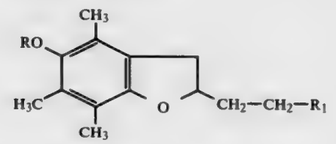
Filed Aug. 6, 1990, Ser. No. 562,731

Claims priority, application Italy, Aug. 18, 1989, 21532 A/89

Int. Cl.[5] A61K *31/34;* **C07D** *307/79, 307/80*

U.S. Cl. 514—469 **6 Claims**

1. A compound of formula



wherein R is:
a hydrogen atom;
linear or branched alkyl with 1 to 6 carbon atoms;
benzyl;
aliphatic acyl, that is COR_2 wherein R_2 is a linear or branched alkyl with 1 to 6 carbon atoms;
hemicaryl of a dicarboxylic acid; and where R_1 is:
—SH or an acylthio group that is $—SCOR_3$, where R_3 is a lower alkyl.

5,114,967

ANTIBIOTIC ALISAMYCIN AND ITS USE

Christopher M. M. Franco; Erra K. S. Vijayakumar; Sugata Chatterjee; Bimal N. Ganguli; Jürgen Blumbach, all of Bombay, India; Herbert Kogler, Kelkheim, and Hans-Wolfram Fehlhaber, Idstein/Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

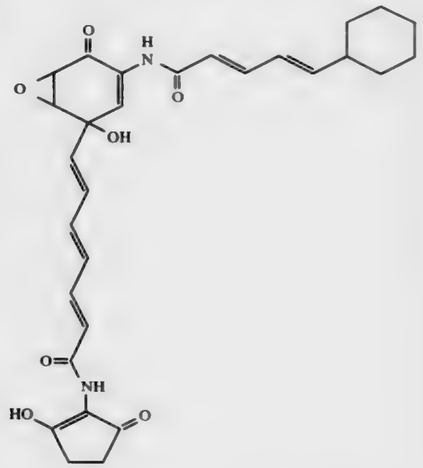
Filed Jan. 10, 1991, Ser. No. 639,343

Claims priority, application European Pat. Off., Jan. 12, 1990, 90100591.8

Int. Cl.[5] A61K *31/335;* **C07D** *303/14*

U.S. Cl. 514—475 **3 Claims**

1. Alisamycin, a compound of the formula



5,114,968

ACYLATED CARBAMATES AND USE AS INSECTICIDES

Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

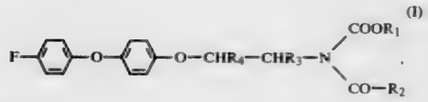
Filed Apr. 18, 1990, Ser. No. 510,493

Claims priority, application Switzerland, Apr. 24, 1989, 1557/89

Int. Cl.[5] A61K *31/27;* **C07D** *269/02*

U.S. Cl. 514—482 **9 Claims**

1. A N-acyl-2-[4-(4-fluorophenoxy)phenoxy]ethylcarbamate of formula I

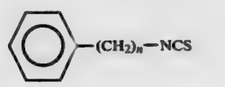


(I)

wherein
R_1 is C_1–C_8alkyl, C_3–C_4alkenyl or C_3–C_4alkynyl,
R_2 is C_1–C_8alkyl, C_1–C_8alkoxy, —CO—R_5 or $—NR_6R_7$,
R_3 and R_4 are each independently of the other hydrogen or methyl,
R_5 is C_1–C_8alkoxy or $—NR_8R_9$,
R_6 is C_1–C_4alkyl,
R_7 is C_1–C_4alkyl,
R_8 is hydrogen or C_1–C_4alkyl, and
R_9 is hydrogen, C_1–C_4alkyl, benzyl, phenyl or phenyl which is substituted by halogen or methyl.

5,114,969
METHOD OF INHIBITING LUNG TUMORS, ARYLALKYL ISOTHIOCYANATES, AND METHOD OF SYNTHESIZING SAME
Fung-Lung Chung, Yorktown Heights; Stephen S. Hecht, Larchmont, both of N.Y.; Karin Eklind, Riverside, Conn., and Mark A. Morse, Croton-on-Hudson, N.Y., assignors to American Health Foundation, Valhalla, N.Y.
Continuation-in-part of Ser. No. 326,964, Mar. 22, 1989, abandoned. This application May 31, 1990, Ser. No. 531,023
Int. Cl.[5] A61K *31/21, 31/26*
U.S. Cl. 514—514 **7 Claims**

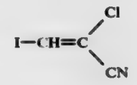
1. A method comprising treating a mammal with an isothiocyanate adapted for inhibiting lung tumor multiplicity and/or incidence, said isothiocyanate being administered in the diet of said mammal in an amount effective to inhibit said lung tumor multiplicity and/or incidence, wherein the isothiocyanate is selected from the group of isothiocyanates having the formula:



wherein n is an integer greater than or equal to 2 and less than or equal to 6.

5,114,970
USE OF 3-IODO-2-CHLORO-2-PROPENENITRILE AS AN ANTIMICROBIAL
Kalakota S. Reddy, and Connie I. Deford, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Jul. 25, 1991, Ser. No. 735,570
Int. Cl.[5] A01N *37/34*
U.S. Cl. 514—526 **2 Claims**

1. A method for combatting fungi or bacteria which comprises contacting said fungi, bacteria or habitat thereof with a fungicidally or bactericidally effective amount of a compound of the formula:



5,114,971
PROSTAGLANDIN DERIVATIVES FOR THE TREATMENT OF GLAUCOMA OR OCULAR HYPERTENSION
Johan W. Stjernschantz, and Bahram Resul, both of Uppsala, Sweden, assignors to Kabi Pharmacia AB, Uppsala, Sweden
Continuation of Ser. No. 375,018, May 15, 1989, abandoned. This application Oct. 23, 1990, Ser. No. 601,383
Int. Cl.[5] A61K *31/557*
U.S. Cl. 514—530 **12 Claims**

1. A method for the treatment of glaucoma or ocular hypertension which comprises contacting the eye with a composition containing an ophthalmologically compatible vehicle and an effective intraocular pressure reducing amount of a compound selected from the group consisting of
(a) 11 epi PGF_{2alpha}-1-alkyl ester and
(b) 11 epi PGF_{2alpha}-1-alkylaryl ester.

5,114,972
SYNTHESIS AND USES OF NEW ASCORBIC ACID DERIVATIVES WHICH HAVE ANTI-OXIDANT AND ANTI-CANCER ACTIVITIES
Tsuyoshi Ohnishi, 502 King of Prussia Rd., Radnor, Pa. 19087
Filed Jul. 30, 1990, Ser. No. 559,480
Int. Cl.[5] C07C *177/00*
U.S. Cl. 514—530 **6 Claims**

1. A preparation method for synthesizing ascorbic acid 6-prostaglandin esters; said method comprising forming ester compounds of ascorbic acid either with prostaglandin B_2 monomer (PGB_2) or with its oligomer, which is prepared from the monomer PGB_2 by the alkaline polymerization method; said preparation method further comprising combining 1 g ascorbic acid and 0.5 g of either PGB_2 or PGB_2 oligomer in the presence of 6 ml pyridine, 1 g 1,3-dicyclohexylcarbodiimide, 0.2 g p-toluenesulfonic acid, stirring for 12 hours at room temperature, cooling said stirred materials to 0° C., adding 0.1 ml acetic acid to produce a precipitate of 1,3-dicyclohexylcarbodiimide, producing a filtrate by filtering the said precipitate, evaporating said filtrate in vacuo to produce a residue, taking up the residue in ethyl alcohol, producing a precipitate by adding diethyl ether to said ethyl alcohol solution, separating the said precipitate from the supernatant containing p-toluenesulfonic acid by the centrifugation of 600×g for 5 minutes, dissolving the said precipitate in isobutyl alcohol, washing the said solution with water to remove ascorbic acid, reevaporating the isobutyl alcohol layer, and extracting the residue with ethyl alcohol.

5,114,973
METHOD FOR TREATING AUTOIMMUNE DISEASE USING SUCCINYLACETONE
Richard A. Hess, Bethesda, and R. Michael Blaese, Rockville, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.
Filed May 6, 1988, Ser. No. 191,067
Int. Cl.[5] A61K *31/19*
U.S. Cl. 514—557 **14 Claims**

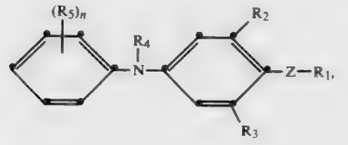
1. A method of treating autoimmune disease in a host in need thereof comprising:
administering to said host a therapeutically effective amount of succinylacetone sufficient to modulate the effects of said autoimmune disease in said host.

5,114,974
TREATMENT OF ATHEROSCLEROSIS WITH $MGNA_2EDTA$
Martin Rubin, 3218 Pauline Dr., Chevy Chase, Md. 20815
Filed Jan. 30, 1991, Ser. No. 647,965
Int. Cl.[5] A61K *31/195*
U.S. Cl. 514—566 **1 Claim**

1. A method of treating atherosclerosis in a living host
to reduce the level of blood plasma iron and cause its excretion into the urine,
to inhibit the oxidation of ascorbic acid in blood plasma by decreasing the plasma iron content,
to reduce the concentration of calcium in the blood plasma and cause its excretion into the urine,
to inhibit the calcium dependent coagulation process in the vascular system,
to produce a flux of calcium from vascular tissue to blood plasma to urine excretion,
to enhance the vascular tissue uptake of magnesium and
to enhance the circulation of blood in the peripheral vasculature by stimulation of the output of parathyroid gland
which treatment comprises the intravenous infusion of pure disodium salt of the Mg chelate of EDTA ($Na_2MgEDTA$) prepared by the interaction of Na_2EDTA with a compound of magnesium selected from the group consisting of MgO, $Mg(OH)_2$ and $MgCO_3$, in a dosage of at least 1.0 g and not more than 3.0 g over a three hour interval.

5,114,975
ANILINOPHENYL CARBODIIMIDES COMPOSITIONS CONTAINING THEM, AND THE USE THEREOF IN PEST CONTROL
Manfred Böger, Weil am Rhein, Fed. Rep. of Germany; Jozef Drabek, Oberwil, and Josef Ehrenfreund, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Division of Ser. No. 230,814, Aug. 11, 1988, Pat. No. 5,026,730. This application Apr. 3, 1991, Ser. No. 679,890
Claims priority, application Switzerland, Aug. 21, 1987, 3213/87; Jun. 21, 1988, 2382/88
Int. Cl.[5] A01N *37/22, 35/10;* **C07C** *233/43, 267/00*
U.S. Cl. 514—630 **9 Claims**

1. A compound of formula I



(I)

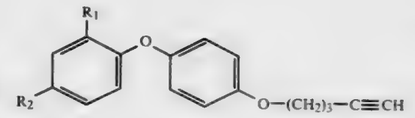
wherein
R_1 is C_1–C_{12}alkyl, unsubstituted or substituted by one or more halogen atoms and/or C_1–C_6alkoxy groups; C_3–C_8-cycloalkyl, unsubstituted or substituted by one or more C_1–C_3alkyl groups; or C_3–C_8cycloalkyl-C_1–C_4alkyl,
R_2 and R_3 are each C_1–C_5alkyl or C_5–C_6cycloalkyl,
R_4 is hydrogen, methyl or —CHO,
R_5 is halogen; C_1–C_4alkyl, unsubstituted or substituted by one or more halogen atoms; C_1–C_4alkoxy, unsubstituted or substituted by one or more halogen atoms; or is a $-(CH=CH)_2-$, $-(CH_2)_3-$ or $-(CH_2)_4-$ bridge in 2,3- or 3,4,-position.
n is 0, 1, 2, 3 or 4,
Z is —N=C=N—;
or a salt thereof with an organic or inorganic acid.

5,114,976
METHOD FOR TREATING CERTAIN PSYCHIATRIC DISORDERS AND CERTAIN PSYCHIATRIC SYMPTOMS
Michael J. Norden, 348 NW. 113th Pl., Seattle, Wash. 98177
Continuation of Ser. No. 294,461, Jan. 6, 1989, abandoned. This application Nov. 5, 1990, Ser. No. 610,339
Int. Cl.[5] A61K *31/135*
U.S. Cl. 514—646 **3 Claims**

1. A method for enhancing the treatment of a disorder selected from the group consisting of circadian rhythm disorder, borderline personality disorder, hypochondriasis, late luteal phase dysphoric disorder, psychoactive substance use disorder, sexual disorder and schizophrenia comprising, administering a therapeutically effective, nontoxic dose of fluoxetine, and derivatives and pharmaceutically acceptable salts thereof.

5,114,977
ETHERS
Friedrich Karrer, Zofingen, and Alfred Rindlisbacher, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation of Ser. No. 403,254, Sep. 5, 1989, abandoned. This application Aug. 2, 1991, Ser. No. 740,657
Claims priority, application Switzerland, Sep. 15, 1988, 3444/88
Int. Cl.[5] A01N *31/14;* **C07C** *43/285, 43/29*
U.S. Cl. 514—720 **8 Claims**

1. A 1-[4-(halophenoxy)phenoxy]-4-pentine of formula I



(I)

wherein R_1 and R_2 are each independently of the other hydrogen or fluoro with the proviso that R_1 and R_2 are not simultaneously hydrogen.

5,114,978
ANHYDROUS BLENDS OF P-CHLORO-M-XYLENOL IN SURFACTANT MIXTURES
Mike E. Corti, New Egypt, N.J., and Richard R. Tenore, North East, Md., assignors to Rhone-Poulenc Surfactants and Specialties, L.P., Princeton, N.J.
Filed Oct. 15, 1990, Ser. No. 596,295
Int. Cl.[5] A61K *31/055*
U.S. Cl. 514—737 **23 Claims**

1. A composition that forms a clear, homogeneous solution with water in all proportions comprising a substantially anhydrous mixture of a blend of parachlorometaxylenol, a diethanolamide of a fatty acid, and an anionic surfactant of the class of a diethanolammonium salt of an alkylpolyoxyethylsulfuric acid.

5,114,979
FRUITY FLAVORED NASAL DECONGESTANT COMPOSITION
James R. Kielley, Springfield, N.J., assignor to Schering Corporation, Kenilworth, N.J.
Division of Ser. No. 423,075, Oct. 18, 1989, Pat. No. 4,970,240. This application Aug. 31, 1990, Ser. No. 576,021
Int. Cl.[5] A61K *9/08, 47/00*
U.S. Cl. 514—783 **7 Claims**

1. A plastic squeeze pump spray or dropper bottle filled with an aqueous, flavored topical decongestant nose drop or nasal spray composition comprising an amount of oxymetazoline or a pharmaceutically acceptable salt thereof sufficient to effect nasal decongestion but causing a bitter medicinal after-taste, an isotonic aqueous carrier buffered to maintain the pH in the range of about 4.0 to about 6.5 and an amount of a fruity flavor sufficient to mask the medicinal after-taste of the topical decongestant nose drop or nasal spray composition.

5,114,980
POLYURETHANE INTEGRAL SKIN FOAM OF LOW OZONE DEPLETION POTENTIAL
Lucky J. Lii, and Shi-Shiow Chen, both of Hsin-chu, Taiwan, assignors to Industrial Technology Research Institute, Hsin-chu, Taiwan
Filed May 20, 1991, Ser. No. 702,998
Int. Cl.[5] B29D *9/00;* **C08J** *9/34*
U.S. Cl. 521—51 **11 Claims**

1. A process for preparing polyurethane integral skin foam with low ozone depletion potential, which comprises mixing 100 pph of a polyether polyol, 5–50 pph of a chain extender, 0.1–2.0 pph of a surfactant, 0.01–0.20 pph of an amine and 0.01–0.20 pph of an organotin catalyst, 0–3.0 pph of a nucleating agent and 1.0–30 pph of a blowing agent comprising 50 to 100 weight percent of HCFC-123 ($CHCl_2CF_3$) and 50 to 0 weight percent of HCFC-141b (CH_3CFCL_2) to form a polyol mixture; blending said polyol mixture with isocyanate having an ISO index =0.95 to 1.10 and reacting said blend at a temperature from 0° –70° C. in a mold at a temperature of from 10 to 90° C. for a molding time of 1 to 9 minutes to form a polyurethane integral skin foam.

5,114,981

PROCESS AND COMPOSITION FOR PRODUCING FLAME RETARDANT REBONDED FOAM PRODUCTS

Robert W. Ward; Rogelio Tornero, both of Greensboro, and Freeman J. Henderson, High Point, all of N.C., assignors to Triad-Fabco, Inc., Greensboro, N.C.

Division of Ser. No. 743,721, Aug. 12, 1991. This application Nov. 13, 1991, Ser. No. 791,900

Int. Cl.[5] C08J *9/24*

U.S. Cl. 521—55 **1 Claim**

1. A process for producing a rebonded polyurethane foam having improved flame retardany comprising the steps of:

(a) mixing polyurethane foam chips, a solid flame, retardant comprising:

(a) decabromodiphenylethalene oxide;

(b) antimony oxide;

(c) boric acid; and

(d) magnesium sulfate,

and a water based adhesive with an excess amount of water to form a first foam mass;

(b) drying the first foam mass;

(c) mixing the dried foam mass, a water/steam activated binder and a liquid flame retardant to form a second foam mass; and

(d) curing the second foam mass.

5,114,982

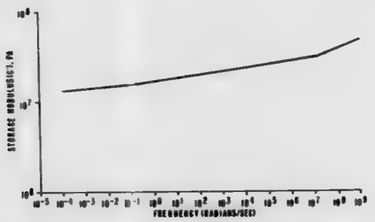
ACOUSTIC SCATTERING AND HIGH REFLECTION LOSS COMPOSITIONS

Morris A. Mendelsohn, Wilkins Twp., Allegheny County; Francis W. Navish, Jr., East Pittsburgh, both of Pa., and Richard Bolton, Saratoga, Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 20, 1989, Ser. No. 438,828

Int. Cl.[5] C08J *9/16;* **C08G** *18/32, 18/48*

U.S. Cl. 521—59 **17 Claims**



1. An acoustic composition consisting essentially of: (a) about 1 equivalent of a polybutadiene based polyol having a molecular weight of about 500 to 10,000 and a hydroxy equivalent weight of about 1100 to 1400; (b) about 2.8 to 6.8 equivalents of a polyol selected from the group consisting of polyoxytetramethylene glycol; 1,4-butane-diol; resorcinol di(β-hydroxy ethyl)ether; hydroquinone di(β-hydroxyethyl)ether, and mixtures thereof; (c) about 3.8 to 7.8 equivalents of a diisocyanate selected from the group consisting of carbodiimide derivative of diphenylmethane diisocyanate; 2,4- and 2,6-toluene diisocyanates; 4,4'-methylene-bis(cyclohexyldiisocyanate); isophorone diisocyanate; and 4,4'-methylene-bis(-phenylisocyanate); and (d) about 1.5% to 6.8% by weight of the total composition of hollow polymeric microspheres, where the composition is curable to an acoustic sound reduction material having inertness toward moisture and pressure.

5,114,983

USE OF POLYARYLENE SULPHIDES FOR THE PRODUCTION OF A STRUCTURAL FOAM RESISTANT TO HIGH TEMPERATURES, PROCESS FOR THE PREPARATION OF THIS FOAM, AND MOLDINGS OBTAINABLE BY THIS PROCESS

Kurt-Rainer Stahlke, Kürten, Fed. Rep. of Germany, and William C. Bushong, Pittsburgh, Pa., assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jun. 26, 1990, Ser. No. 543,555

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1989, 3922038

Int. Cl.[5] C08J *9/10*

U.S. Cl. 521—95 **1 Claim**

1. Process for production of a molded article of polyalkylene foam which comprises homogeneous dry blending for 10 for 40 minutes polyarylene sulfide with 0.1 to 5% by weight of a blowing agent masterbatch which contains 0.2 to 10% by weight of a chemical blowing agent selected from the group consisting of azo compounds, anhydrides and azoles with or without zinc oxide, in an amorphous or partially crystalline polycarbonate resin resistant to high temperatures and having a relative viscosity of 1.260–1.285 measured in CH_2Cl_2 at 25° C. at 0.5 gram per 100 ml, then at 300° to 360° C. foaming and molding the blended mixture by injection or extrusion molding.

5,114,984

PROCESS FOR PRODUCING AN ANTIMICROBIALLY EFFECTIVE POLYURETHANE

Charles E. Branch, Norwalk; David F. Gavin, Cheshire, and Thomas E. Robitaille, Portland, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Apr. 26, 1991, Ser. No. 692,331

Int. Cl.[5] C08G *18/14*

U.S. Cl. 521—121 **13 Claims**

1. A process for producing an antimicrobially effective polyurethane which comprises the steps of:

(a) dissolving a pyrithione salt(s) in an alkanolamine to provide a dissolved pyrithione salt,

(b) contacting said dissolved pyrithione salt with a polyol to provide a liquid mixture containing said polyol plus said dissolved pyrithione salt, and

(c) reacting said liquid mixture with a polyisocyanate in order to produce a polyurethane characterized by uniform biocidal effectiveness throughout the polyurethane.

5,114,985

DIBASIC ACID ESTERS AS CELL OPENERS IN LOW DENSITY RIGID POLYURETHANES USEFUL IN POUR-BEHIND-FABRIC APPLICATIONS OF LOW DENSITY SHIM

Gregg S. Kuyzin, Ypsilanti, and Leslie E. Schmidtke, Jr., Grosse Ile, both of Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Sep. 6, 1991, Ser. No. 756,244

Int. Cl.[5] C08J *9/12*

U.S. Cl. 521—130 **8 Claims**

1. I. A low density, open cell, rigid polyurethane, comprising:

A. an organic isocyanate,

B. a resin, comprising

i. an isocyanate reactive hydroxyl containing compound selected from the group comprising, polyoxyalkylene polyether polyols, polyester polyols, and mixtures thereof,

ii. a blowing agent consisting essentially of water,

iii. an effective amount of a catalyst or mixture of catalysts capable of promoting urethane and/or isocyanurate linkages,

iv. optionally, fillers, pigments, crosslinkers, chain extenders, or antioxidants, and

C. a dibasic acid ester selected from the group comprising the dimethyl esters of adipic acid, glutaric acid, succinic acid, and mixtures thereof.

5,114,986

POLYURETHANE FOAMS MANUFACTURED WITH MIXED GAS/LIQUID BLOWING AGENTS

Chung-Yuan Lin, Orange, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 355,539, May 22, 1989, Pat. No. 4,996,242. This application Dec. 18, 1990, Ser. No. 629,300

Int. Cl.[5] C08J *9/00;* **C08K** *9/00*

U.S. Cl. 521—131 **6 Claims**

1. A rigid cellular polymer prepared by bringing together under foam forming conditions an aromatic polyisocyanate, a polymeric polyol, and a mixed blowing agent comprising (1) from about 2 to about 25 percent by weight of at least one halocarbon blowing agent having a boiling point below about 10° C.; (2) from about 30 to about 90 percent by weight of at least one halocarbon blowing agent having a boiling point of from about 20° C. to about 35° C.; and (3) from about 8 to about 45 percent by weight of an inert organic liquid having a boiling point from about 35° C. to about 125° C., and provided at least one of said components (1), (2), or (3) contains at least one hydrogen atom, wherein the proportions of reactants are such that the ratio of isocyanate equivalents to total active hydrogen equivalents falls within a range of from about 0.90:1 to about 4:1 provided that when the ratio exceeds about 1.15:1 an isocyanurate catalyst is present.

5,114,987

FOAMED POLYMER BLENDS

Mukerrem Cakmak, Monroe Falls, Ohio, and Anit Dutta, Wilmington, Del., assignors to Edison Polymer Innovation Corp., Broadview Heights, Ohio

Filed Oct. 15, 1990, Ser. No. 597,431

Int. Cl.[5] C08J *9/10*

U.S. Cl. 521—84.1 **11 Claims**

1. A process for preparing a foamed polymeric material from a blend of a thermoplastic polymer selected from the group consisting of a polyolefin, polystyrene, poly(methyl methacrylate) and poly(vinylidene chloride) with an elastomeric polymer selected from the group consisting of natural and synthetic rubbers comprising the following steps:

(1) mixing a chemical blowing agent and rubber compounding additives with said elastomeric polymer to form a mixture;

(2) mixing a mixture with said thermoplastic polymer at a temperature at which at least one of said polymers is in a fluid state, thereby forming a homogeneous blend;

(3) mixing said blend with a curing system to form a curable composition; and

(4) activating said curing system and said blowing agent so that the blowing of said material commences no sooner than when curing commences and before said elastomeric polymer has been fully cured.

5,114,988

POLYETHER POLYOLS HAVING REDUCED UNSATURATION AND POLYURETHANE FOAMS PREPARED THEREFROM

Steven D. Gagnon, Detroit; Oscar M. Grace, Troy; Theodore M. Smiecinski, Woodhaven, and Steven E. Wujcik, Romulus, all of Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Oct. 23, 1989, Ser. No. 425,077

Int. Cl.[5] C08G *18/48*

U.S. Cl. 521—167 **30 Claims**

1. A polyoxyalkylene polyether polyol prepared by oxyalkylating an initiator molecule comprising a 1,2-diaminocycloalkane having from 4 to 8 carbon atoms in the cycloalkane ring, with an oxirane selected from the group consisting of oxirane, methyloxirane, and ethyloxirane wherein the hydroxyl number of said polyol is from 10 to about 100.

5,114,989

ISOCYANATE-TERMINATED PREPOLYMER AND POLYURETHANE FOAM PREPARED THEREFROM

Richard J. Elwell; Robert A. Sewell; Werner A. Lidy, and Johan A. Thoen, all of Terneuzen, Netherlands, assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 13, 1990, Ser. No. 612,722

Int. Cl.[5] C08G *18/10;* **C08L** *75/04*

U.S. Cl. 521—159 **7 Claims**

1. An isocyanate-terminated prepolymer prepared by reacting a polyisocyanate comprising 4,4'-methylene diphenyldiisocyanate in from at least 40 weight percent with a polyoxyalkylene polyol, wherein the polyol has an average functionality of from about 2 to about 4 and a hydroxyl equivalent weight of from about 2200 to about 3500 and an oxyethylene content of from about 40 to about 68 percent by weight.

5,114,990

PROCESS FOR THE PRODUCTION OF PIGMENT/PLASTIC PREMIXES

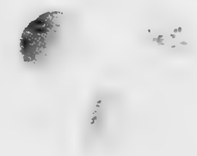
Ralf-Burkhard Dethlefs, Osnabruck, Fed. Rep. of Germany, assignor to Felix Schoeller Jr. GmbH KG, Fed. Rep. of Germany

Continuation of Ser. No. 311,144, Dec. 15, 1989, abandoned. This application May 4, 1990, Ser. No. 522,068

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1988, 3804775

Int. Cl.[5] C08K *9/00*

U.S. Cl. 523—200 **32 Claims**



1. A process for the production of pigment/plastic premixes comprising, in sequence:

a) activating the surface of inorganic oxide pigment particles using a compound containing an element selected from the transition elements of the IV to VIII secondary groups of the periodic table;

b) introducing a selected olefin; and

c) initiating a polymerization reaction by introducing a metallo-organic catalyst system using a compound containing an element selected from the transition elements of the IV to VIII secondary group of the periodic table as well as a metallo-organic compound containing an element selected from the elements of the I to III groups.

5,114,991

PAPER FELTS OR MATS

Terry C. Neubert, Kent, Ohio, assignor to GenCorp Inc., Fairlawn, Ohio

Continuation of Ser. No. 637,912, Jan. 7, 1991, abandoned, which is a continuation of Ser. No. 484,601, Feb. 26, 1990, Pat. No. 5,002,982. This application Sep. 5, 1991, Ser. No. 759,049

Int. Cl.[5] C08G *83/00;* **C08K** *3/20;* **C08L** *63/00, 9/08*

U.S. Cl. 523—201 **3 Claims**

1. A paper felt or mat comprising about, on a dry-weight basis, a predominant amount of finely divided clay or talc particles, minor amounts of polyethylene particles, glass fibers, antioxidants and biocides, from 5 to 20 parts of kraft wood pulp and from 8 to 16 parts of a core shell copolymer of:

A. A core of copolymer made from about 6 to 8 parts of at

least one vinyl aryl monomer having from 8 to 10 carbon atoms and from about 0.5 to about 8 parts of at least one dicarboxylic acid monomer selected from the group consisting of fumaric acid, itaconic acid, or a combination of fumaric acid and itaconic acid; and

B. A shell of a copolymer made from about 40 to 60 parts of at least one vinyl aryl monomer having from 8 to 10 carbon atoms, from 60 to 40 parts of at least one conjugated diene monomer having from 4 to 6 carbon atoms, from 1.5 to 5.0 parts of at least one glycidyl monomer selected from the group consisting of glycidyl acrylate, glycidyl methacrylate, or a combination of the glycidyl acrylate and glycidyl methacrylate, and from 0 to 2.0 parts of at least one monocarboxylic acid monomer selected from the group consisting of acrylic acid, methacrylic acid, or a combination of acrylic acid and methacrylic acid, wherein the core copolymer comprises from about 7.5 to 10.5 parts and where the shell copolymer comprises from about 92.5 to 89.5 parts of the core-shell copolymer, all parts of monomers in the core-shell copolymer adding up to about 100 parts.

5,114,992

REINFORCED POLYMERS

Stephen J. Hanley, Whippany, N.J., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 26, 1990, Ser. No. 633,896
Int. Cl.[5] C08K *9/02*
U.S. Cl. 523—217 **8 Claims**

1. A composition having improved mechanical properties consisting essentially of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and glass fiber having a blocked isocyanate sizing material.

5,114,993

AQUEOUS COATING AGENT, PROCESS FOR ITS PREPARATION, AND ITS USE FOR COATING CANS, BASED ON ACRYLIC MONOMERS, EPOXY-POLYESTERS AND METHYLOL FUNCTIONAL CURING AGENTS

Karl-Heinz Scherping, Drensteinfurt; Hans-Jorg Holscher, Munster; Uwe Reichelt, Tecklenburg, and Udo Reiter, Telgte, all of Fed. Rep. of Germany, assignors to BASF Lacke & Farben AG, Münster, Fed. Rep. of Germany

Division of Ser. No. 327,964, Feb. 14, 1989, Pat. No. 4,997,865.
This application Jan. 8, 1991, Ser. No. 642,243
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1986, 3627860; PCT Int'l Appl., Aug. 13, 1987, PCT/EP87/00445
Int. Cl.[5] C08L *63/00;* **C09D** *3/00*
U.S. Cl. 523—409 **21 Claims**

1. A process for the preparation of an aqueous coating agent wherein the coating agent comprises:

(a) 30 to 70% by weight of a binder having an acid number of 20 to 150 and comprised of the reaction product of:

(A) 20 to 80% by weight of an epoxy resin having an average of more than one epoxy group per molecule and having an average molecular weight of at least 500,

(B) 1 to 60% by weight of a polyester polycarboxylic acid having an average molecular weight of 500 to 5,000 and having an acid number of 30 to 150, and

(C) 10 to 50% by weight of ethylenically unsaturated monomers, 10 to 50% of which contain carboxy groups, and a peroxide initiator which is present in an amount which is at least 2% by weight relative to the weight of the ethylenically unsaturated monomers,

the sum of (A), (B), and (C) being 100% weight;

(b) 2 to 30% by weight of a phenolic or amino resin cross-linking agent;

(c) 1 to 7% by weight of ammonia or an amine neutralizing agent, and

(d) 20 to 60% by weight of an organic solvent, the sum of a), b), c) and d) being 100% by weight;

the process comprising the steps of:

1. reacting the epoxy resin A) with the polyester polycarboxylic acid component B) at a temperature of about 80° to 200° C. in the presence of catalyst so that at least 80% of the oxirane rings initially present are opened;
2. polymerizing component C) in the presence of the reaction product of step 1 at a temperature of about 100° to 160° C.;
3. neutralizing the polymerization product of step 2 using component (c);
4. adding the organic solvent d) and the crosslinking agent b) to the neutralized product of step 3 to form the coating agent, and
5. dispersing the coating agent in water.

5,114,994

EPOXY RESIN COMPOSITION FOR SEALING SEMICONDUCTOR

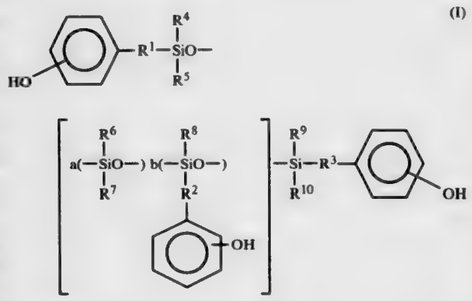
Hiromi Ito; Ichiro Takahashi, and Hirozoh Kanegae, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1991, Ser. No. 670,433
Claims priority, application Japan, Mar. 23, 1990, 2-75128; Jul. 24, 1990, 2-198272
Int. Cl.[5] C08L *83/04, 63/00*
U.S. Cl. 523—436 **28 Claims**

1. An epoxy resin composition for sealing a semiconductor, containing a flexibilizer, epoxy resin, a hardener, a hardening accelerator, a filler, a mold releasing agent, a colorant and a finishing agent, wherein

said flexibilizer is prepared from silicone containing hydroxyphenyl groups on ends of and/or in its molecules, being formed of a copolymer of denatured silicone oil A having hydroxyphenyl groups, denatured silicone oil B havig epoxy groups and/or bifunctional epoxy resin having epoxy groups on both ends,

said denatured silicone oil A being expressed in the following general formula (I):

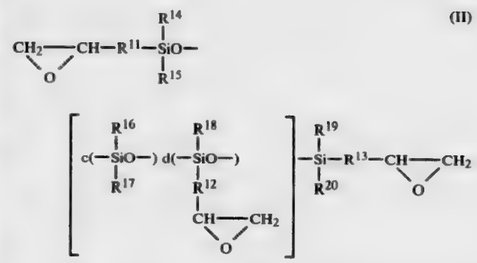


(I)

where

R^1 and R^3 bivalent organic groups respectively, R^4 to R^{10} represent alkyl groups having carbon numbers of 1 to 10, alkoxy groups having carbon numbers of 1 to 10, hydroxyalky group having carbon numbers of 1 to 10, or phenyl groups, or fluorine displaced alkyl groups having carbon numbers of 1 to 10 respectively, a represents an integer in a range of 5 to 300 and b represents an integer in a range of 0 to 10, $0 \leqq [b/(a+b)] \leqq 0.32$,

said denatured silicon oil B being expressed in the following general formula (II):

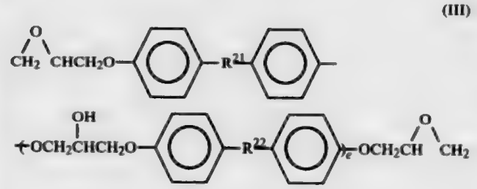


(II)

where

R^{11} and R^{13} represent bivalent groups respectively, R^{14} to R^{20} represent alkyl groups having carbon numbers of 1 to 10, alkoxy groups having carbon numbers of 1 to 10, hydroxyalkyl groups having carbon numbers of 1 to 10, phenyl groups or fluorine displaced alkyl groups having carbon numbers of 1 to 10 respectively, c represents an integer in a range of 5 to 300 and d represents an integer in a range of 0 to 10, $0 \leqq [d/(c+d)] \leqq 0.32$,

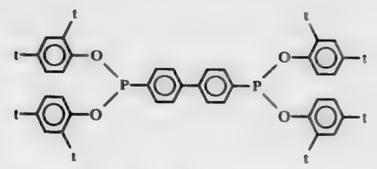
said bifunctional epoxy resin being expressed in the following general formula (III):



(III)

where

R^{21} and R^{22} represent direct-coupling or bivalent organic groups respectively and e represents an integer in a range of 0 to 20, and hydrogen atoms of benzene rings may be displaced.



where t represents a tertiary butyl radical.

5,114,996

STABILIZED TALC-FILLED POLYESTER COMPOSITIONS

Michael D. Golder, Allendale, N.J., and David K. Walker, Union, Ky., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Dec. 6, 1990, Ser. No. 623,077
Int. Cl.[5] C08K *5/52;* **C08L** *67/02*
U.S. Cl. 523—506 **16 Claims**

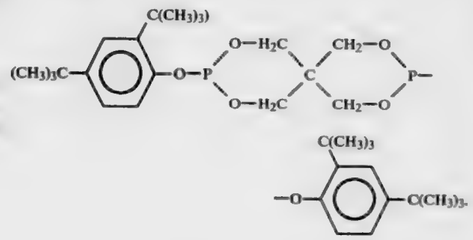
1. A stabilized thermoplastic composition comprising:

a) a thermoplastic polyester containing a blend of (i) one or more polyesters formed by the reaction of an aliphatic or cycloaliphatic diol or mixtures thereof and an aromatic dicarboxylic acid and (ii) one or more segmented copolyester elastomers;

b) talc;

c) a butadiene-based impact modifier; and

d) a stabilizing amount of a phosphorus compound of the formula:



5,114,995

STABILIZED TALC-FILLED POLYESTER COMPOSITIONS

Michael D. Golder, Allendale, N.J., and David K. Walker, Union, Ky., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Dec. 6, 1990, Ser. No. 623,080
Int. Cl.[5] C08K *5/53;* **C08L** *67/02*
U.S. Cl. 523—506 **16 Claims**

1. A stabilized thermoplastic composition comprising:

a) a thermoplastic polyester containing a blend of (i) one or more polyesters formed by the reaction of an aliphatic or cycloaliphatic diol or mixtures thereof and an aromatic dicarboxylic acid and (ii) one or more segmented copolyester elastomers;

b) talc;

c) a butadiene-based impact modifier; and

d) a stabilizing amount of a phosphorous compound of the formula:

5,114,997

STABILIZED TALC-FILLED POLYESTER COMPOSITIONS

Michael D. Golder, Allendale, N.J., and David K. Walker, Union, Ky., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Dec. 6, 1990, Ser. No. 623,079
Int. Cl.[5] C08K *5/20;* **C08L** *67/02*
U.S. Cl. 523—508 **13 Claims**

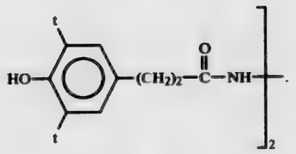
1. A stabilized thermoplastic composition comprising:

a) a thermoplastic polyester containing a blend of (i) one or more polyesters formed by the reaction of an aliphatic or cycloaliphatic diol or mixtures thereof and an aromatic dicarboxylic acid and (ii) one or more segmented copolyester elastomers;

b) talc;

c) a butadiene-based impact modifier; and

d) a stabilizing amount of a diamide compound of the formula:

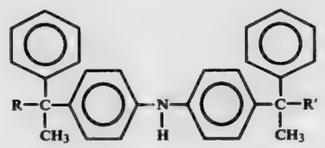


5,114,998
STABILIZED TALC-FILLED POLYESTER COMPOSITIONS

Michael D. Golder, Allendale, N.J., and David K. Walker, Union, Ky., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Dec. 6, 1990, Ser. No. 623,078
Int. Cl.[5] C08K *5/17*; C08L *67/02*
U.S. Cl. 523—508 **13 Claims**

1. A stabilized thermoplastic composition comprising:
a) a thermoplastic polyester containing a blend of (i) one or more polyesters formed by the reaction of an aliphatic or cycloaliphatic diol or mixtures thereof and an aromatic dicarboxylic acid and (ii) one or more segmented copolyester elastomers;
b) talc;
c) a butadiene-based impact modifier; and
d) a stabilizing amount of a diphenylamine compound the formula:



where R and R' are methyl or phenyl.

5,114,999
GLYOXAL-CONTAINING BINDER INSOLUBILIZER

Sai H. Hui, Hudson, and W. Bruce Darlington, Wadsworth, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 3, 1989, Ser. No. 333,353
Int. Cl.[5] C08K *5/07*; C08L *61/00*; C08G *89/00*; B32B *23/08*
U.S. Cl. 524—47 **3 Claims**

1. An aqueous binder insolubilizer formulation for use with binder-containing paper coating composition, said formulation consisting essentially of from about 20 to about 35 weight percent of titratable glyoxal and a mixture of:
(a) polyalkylene glycol selected from diethylene glycol and dipropylene glycol, and
(b) starch syrup,
the solids content of said formulation being from about 30 to about 80 weight percent.

5,115,000
BIODEGRADABLE STARCH PLASTICS INCORPORATING MODIFIED POLYETHYLENE

Jay-Lin Jane; Alan W. Schwabacher; Sam N. Ramrattan, and Jeffrey A. Moore, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jun. 19, 1990, Ser. No. 540,583
Int. Cl.[5] C08L *3/00, 23/00*; C08F *8/00*
U.S. Cl. 524—47 **11 Claims**

1. A blended, high tensile strength, biodegradable plastic composition comprising a starchy material, oxidized polyethylene and unmodified polyethylene the ratio of said starchy material to said oxidized polyethylene being within the range of 1:1 up to about 3.3:1.

5,115,001
VULCANIZABLE RUBBER MIXTURE, VULCANIZED RUBBER MATERIAL AND METHOD OF PRODUCING RUBBER ARTICLES FROM THE VULCANIZABLE RUBBER MIXTURE

Otto Beckmann, Traiskirchen, Austria, assignor to Semperit Reifen Aktiengesellschaft, Traiskirchen, Austria

Filed Jun. 11, 1990, Ser. No. 536,282
Claims priority, application Austria, Jun. 28, 1989, 1585/89
Int. Cl.[5] C08K *7/00, 3/10*
U.S. Cl. 524—58 **23 Claims**

1. A vulcanizable rubber mixture comprising:
a bonding additive for forming a durable bond between the vulcanizable rubber mixture and copper alloys during vulcanization of the vulcanizable rubber mixture; and
said bonding additive containing at least one monosaccharide selected from the group of ketoses.

5,115,002
STABILIZED COPOLYMER COMPOSITIONS

Arend K. Van Helden; Jean-Pierre Gilson, both of Amsterdam, and Johannes L. M. Syrier, The Hague, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 29, 1991, Ser. No. 751,476
Claims priority, application United Kingdom, Nov. 8, 1990, 9024278
Int. Cl.[5] C08K *5/3495, 3/34, 3/38*
U.S. Cl. 524—91 **20 Claims**

1. A copolymer composition comprising a major amount of an alternating copolymer of carbon monoxide with one or more olefinically unsaturated compounds and a minor amount of at least one stabilizing additive which is a zeolite-type trivalent-metal silicate compound containing a cation of an element of Group 2 of the Periodic Table of elements.

5,115,003
STABILIZED POLYKETONE COMPOSITIONS CONTAINING A MIXTURE OF A HYDROXYAPATITE AND A MERCAPTOBENZIMIDAZOLE

Eric R. George, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 20, 1991, Ser. No. 703,067
Int. Cl.[5] C08K *3/32, 5/3445*
U.S. Cl. 524—93 **18 Claims**

1. A stabilized polymer composition comprising:
a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon; and
a mixture of a 2-mercaptobenzimidazole and calcium hydroxyapatite or tribasic calcium phosphate, wherein the mixture is present in the composition in a stabilizing amount.

5,115,004
POLYESTER RESIN MOLDING COMPOSITIONS AND MOLDED ARTICLES FORMED OF THE SAME

Mitsuhiro Mochizuki; Mitsuo Wada, and Hiromitsu Seitou, all of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Aug. 14, 1991, Ser. No. 744,500
Claims priority, application Japan, Aug. 14, 1990, 2-214744; Apr. 8, 1991, 3-73439
Int. Cl.[5] C08K *5/15*
U.S. Cl. 524—107 **13 Claims**

1. A polyester resin molding composition comprising a blend of:
(A) a crystalline polyester base resin;
(B) between 1 to 50 parts by weight, based on the weight of the polyester base resin, of a polyester elastomer resin; and

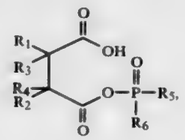
(C) between about 0.01 to 10 parts by weight of a sorbitan ester which is the reaction product of a sorbitan and a fatty acid having at least 12 carbon atoms.

5,115,005
PHOSPHINIC ACID FLAME RETARDANTS

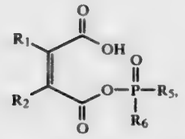
Hans-Peter Hörner, Wehr, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 9, 1991, Ser. No. 756,405
Claims priority, application Switzerland, Sep. 12, 1990, 2950/90
Int. Cl.[5] C07F *9/32*; C08K *5/5313*
U.S. Cl. 524—133 **12 Claims**

1. A compound of the formula Ia or Ib



(Ia)



(Ib)

in which R_1 and R_2, independently of one another, are hydrogen, alkyl, cycloalkyl, alkenyl, aryl or aralkyl or, together with the carbon atoms in the α-position to the carbonyl groups, form a cyclopentane, cyclopentene, cyclohexane, cyclohexene, cyclohexadiene or bicyclo[2.2.1]hept-5-ene ring which is unsubstituted or substituted by C_1–C_4alkyl, or form a monocyclic or polycyclic, aromatic ring system which is unsubstituted or substituted by C_1–C_4alkyl, R_3 and R_4, independently of one another, are hydrogen, alkyl, alkenyl, aryl or aralkyl, and R_5 and R_6, independently of one another, are alkyl, aryl or aralkyl groups.

9. A composition comprising a polymer and a flame retardant amount of at least one compound of the formula Ia or Ib according to claim 1.

5,115,006
RUBBER COMPOSITION

Hiroyuki Watanabe, Yokohama; Kohkichi Noguchi, Kamakura; Shuichi Akita, and Kumiko Kohtaki, both of Yokohama, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 465,621, Jan. 22, 1990, abandoned, which is a continuation of Ser. No. 156,024, Feb. 16, 1988, abandoned. This application Jan. 18, 1991, Ser. No. 642,558
Claims priority, application Japan, Feb. 16, 1987, 62-32657
Int. Cl.[5] C08K *3/20*
U.S. Cl. 524—251 **13 Claims**

1. A rubber composition consisting essentially of
(1) 100 parts by weight of a rubber component composed of
(a) 10 to 100% weight of a modified conjugated diene polymer obtained by reacting a conjugated diene polymer having an alkali metal or an alkaline earth metal at the terminals prepared by polymerizing the undermentioned monomer using an alkali metal base catalyst and/or an alkaline earth metal base catalyst with a compound containing the



bond in which M represents an oxygen or sulfur atom in the molecule, said modified conjugated diene polymer consisting essentially of 50 to 100% by weight of at least one C_4–C_{12} conjugated diene monomer and 0 to 50% by weight of an aromatic vinyl monomer, the amount of said compound bonded being at least 0.1 mole per mole of said polymer, and (b) 90 to 0% by weight of at least one rubber selected from the group consisting of styrene-butadiene copolymer rubber, styrene-isoprene copolymer rubber, polybutadiene rubber, polyisoprene rubber, butadiene-isoprene copolymer rubber, polyalkenamers and natural rubber, and
(2) 0.01 to 1 part by weight of at least one amine selected from the group consisting of aliphatic primary amines and alicyclic primary amines.

5,115,007
ABRASION RESISTANT POLYURETHANE BLEND COMPOSITIONS

Kohji Y. Chihara, Hudson, and Gerd M. Lenke, Canton, both of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

Continuation-in-part of Ser. No. 443,413, Nov. 30, 1989, abandoned. This application Feb. 21, 1991, Ser. No. 658,730
Int. Cl.[5] C08K *5/54*
U.S. Cl. 524—267 **30 Claims**

1. A heat curable, solvent-based, primerless, one-part, storage-stable composition, comprising:
a blocked polyurethane prepolymer, the precursor polyurethane prepolymer being the reaction product of a hydroxyl functional hydrogenated polydiene or polyolefin intermediate with at least 1.8 equivalents of a polyisocyanate for each equivalent of said hydroxyl functional hydrocarbon intermediate, said hydrogenated polydiene or polyolefin having greater than 1.5 hydroxyl groups per average intermediate molecule and a number average molecular weight of from about 500 to about 15,000, and said precursor polyurethane prepolymer being blocked with a blocking agent;
a crosslinking agent, said crosslinking agent having $—NH_2$, $—NHR^6$ where said R^6 is an alkyl having from 1 to 4 carbon atoms, —OH, or —SH curing groups, the amount of said crosslinking agent being such that the ratio of blocked isocyanate groups to said curative groups is from about 0.8 to about 50, and
from about 1 to about 100 parts by weight of silicone oil per 100 parts by weight of said blocked polyurethane prepolymer.

5,115,008
CURABLE FILM FORMING COMPOSITIONS

Yukihiko Sasaki, Claremont, Calif., assignor to Avery Dennison Corporation, Pasadena, Calif.

Continuation of Ser. No. 57,504, Jun. 3, 1987. This application Aug. 9, 1990, Ser. No. 566,560
Int. Cl.[5] C08K *5/01*; C08L *53/00*; C08J *7/04*
U.S. Cl. 524—271 **17 Claims**

1. A pressure-sensitive adhesive consisting essentially of a free radical cured mixture containing at least 15 parts by weight of at least one unsaturated elastomeric polymer and at least one tackifying organic additive which is substantially non-responsive to the action of free radicals and selected from the group consisting of saturated aromatic resins, aromatic resins which are at least 50% saturated, saturated aliphatic resins, aliphatic resins in which at least 65% of the unsaturated groups in the resin as formed in saturated or made non responsive to the action of free radicals and saturated oils, said addi-

tive present in an amount sufficient to modify the properties of the cured elastomeric polymer, said cured adhesive pressure-sensitive formed in the absence of a non elastomeric cross-linker having a glass transition temperature at least 10° C. below use temperature and an elevated temperature shear higher than the elevated temperature shear prior to cure, said mixture when at a proportion of 40 parts by weight elastomeric polymer and 60 parts by weight organic additive having relative incipient gel dosage of cure of no more than about 1.65 at an electron beam radiation level of 200 kv.

5,115,009

POLYKETONE POLYMER COMPOSITIONS CONTAINING A POLAR ESTER OR AMINE LUBRICATING COMPOUND

Edgar J. Smutny; William P. Gergen, both of Houston, Tex.; Antonius A. Broekhuis, Amsterdam, Netherlands; Franciscus C. Groenland, Amsterdam, Netherlands, and Johan M. Beijen, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 19, 1991, Ser. No. 671,232

Claims priority, application United Kingdom, Apr. 3, 1990, 9007432

Int. Cl.[5] C08K *5/10, 5/17*

U.S. Cl. 524—306 **20 Claims**

1. A polymer composition comprising a major proportion of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and a minor proportion of at least one polar ester or amine compound lubricating additive having at least two hydrocarbyl substituents of substantial carbon number attached to polar moieties of the polar compound.

5,115,010

FIRE-RETARDANT POLYAMIDE COMPOSITION HAVING GOOD HEAT RESISTANCE

Hideki Sakai, Iwakuni; Kazuo Ishiwatari, Obatake, and Fumitoshi Ikejiri, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 512,507, Apr. 20, 1990, abandoned, which is a continuation of Ser. No. 183,688, Apr. 19, 1988, abandoned. This application Apr. 15, 1991, Ser. No. 684,517

Claims priority, application Japan, Apr. 20, 1987, 62-95082; Nov. 25, 1987, 62-295341

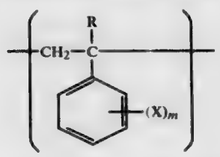
Int. Cl.[5] C08K *7/14*

U.S. Cl. 524—410 **4 Claims**

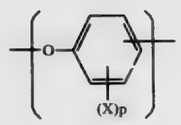
1. A fire-retardant polyamide composition having good heat resistance, consisting essentially of:

100 parts by weight of a polyamide having excellent heat resistance which is a polycondensation product between a dibasic acid component composed of 60 to 100 mole % of terephthalic acid and 0 to 40 mole % of an aromatic dicarboxylic acid other than terephthalic acid and an alkylenediamine component having 4 to 25 carbon atoms, and has an intrinsic viscosity (η), measured in concentrated sulfuric acid at 30° C., of at least 0.5 dl/g;

10 to 100 parts by weight of a halogenated polystyrene composed of recurring units of the formula



wherein R is H or CH_3, X is Br or Cl, and m is a number of 1 to 5, or a halogenated phenylene oxide composed of recurring units of the formula



wherein X is Br or Cl and p is a number of 1 to 4;

0.5 to 50 parts by weight of sodium antimonate having a composition of the formula $Na_2Sb_2O_6$;

0.05 to 50 parts by weight of magnesium oxide; and

5 to 250 parts by weight of a fibrous reinforcing agent.

5,115,011

PROCESS FOR PRODUCING QUALITY-IMPROVED WATER-ABSORBENT POLYMERS AND PRODUCTS

Nobuyuki Harada; Toshihiro Okuno, and Tadao Shimomura, all of Osaka, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Feb. 20, 1990, Ser. No. 481,274

Claims priority, application Japan, Feb. 28, 1989, 1-45239; May 29, 1989, 1-132576

Int. Cl.[5] C08K *3/30*

U.S. Cl. 524—419 **17 Claims**

1. A process for producing an improved water absorbent polymer (II), selected from the group consisting of: hydrolysis products of a graft copolymer of starch with acrylonitrile, neutralization products of a graft copolymer of starch with acrylic acid, saponification products of copolymers of an acrylic acid ester with vinyl acetate, hydrolysis products of acrylonitrile copolymers, hydrolysis products of copolymers of acrylamide, neutralization products of self cross-linked polyacrylic acids, cross-linked products of salts of polyacrylic acids, and neutralization products of cross-linked copolymers of isobutylene with maleic anhydride, which process comprises treating such polymer (II) with an aqueous liquid (I) containing:

(A) at least one water soluble salt having at least one anion (a) selected from the group consisting of: halogenated moieties, sulfates, acetates, and nitrates; and at least one polyvalent metal cation (a') selected from the group consisting of aluminum, calcium and magnesium; and

(B) at least one water soluble salt having at least one anion derived from an oxyacid (b) selected from the group consisting of: sulfurous acid and thiosulfuric acid; and at least one cation (b') selected from the group consisting of: monovalent metal and ammonium;

wherein said salt (A) and said salt (B) are each present, respectively, in a proportion of about 0.1 to 10 parts by weight per 100 parts by weight of said polymer (II).

5,115,012

THERMOPLASTIC BLOW MOLDABLE POLYESTER COMPOSITIONS

King L. Howe, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 18, 1990, Ser. No. 539,648

Int. Cl.[5] C08L *67/02*

U.S. Cl. 524—456 **23 Claims**

1. A semi-crystalline extrusion blow-moldable polyester composition which comprises a melt blend of

a) 65–92 weight percent of at least one polyester selected from the group consisting of linear poly(ethylene terephthalate) PET having an inherent viscosity of at least 0.65 dl/g, branched PET having an inherent viscosity of at least 0.60 dl/g, mixtures of such PET's, poly(butylene terephthalate) having an inherent viscosity of at least 0.8 dl/g and mixtures of such PET's and PBT's, provided the latter mixtures contain no more than 20 weight percent PET,

b) 4–17 weight percent of at least one ethylene copolymer, E/X/Y, where E is ethylene at least 50 weight percent, X is glycidyl methacrylate from 2–10 weight percent and Y is from 0–40 weight percent of a moiety derived form C_1–C_6 alkyl(meth)acrylate,

c) 2–10 weight percent of at least one methyl methacrylate copolymer which contains 49–98 weight percent of units derived from methyl methacrylate, 2–11 weight percent of units derived from glycidyl(meth)acrylate and 0–40 weight percent of units derived from a group consisting of methyl acrylate and C_2–C_6 alkyl(meth)acrylate, provided that the methyl methacrylate copolymer has an epoxide functionality of at least 2.5, and

d) 2–8 weight percent of at least one ionomer obtained by neutralizing with Na+ or K+ at least 40 percent of the carboxyl groups in an ethylene copolymer which contains about 9–20 weight percent of units derived form (meth)acrylic acid and 0–35 weight percent of units derived from C_1–C_6 alkyl (meth)acrylate,

with the weight percentages of components a), b), c) and d) being based on the total of those components only.

5,115,013

GRAFT COPOLYMERS CONTAINING PERFLUOROALKYL GROUPS

Jutta Röttger, Cologne; Karl-Heinz Passon, Leverkusen; Wolf-Dieter Schröer, München, and Wilfried Kortmann, deceased, late of Nachrodt-Wiblingwerde, all of Fed. Rep. of Germany by Margot Kortmann, Bettina Kortmann, Axel Kortmann, heirs , assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 12, 1991, Ser. No. 686,321

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1990, 4012630

Int. Cl.[5] C08F *8/12*

U.S. Cl. 524—457 **8 Claims**

1. An aqueous dispersion of copolymers and/or graft copolymers composed of ethylenically unsaturated perfluoroalkyl monomers and perfluoroalkyl-free ethylenically unsaturated monomers, prepared by polymerisation in the presence of aqueous, emulsifier-free polyurethane dispersions as the graft base wherein the polyurethanes contain the following structural components incorporated therein:

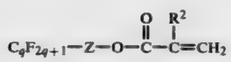
A) organic polyisocyanates

B) partial esters of fatty acids with polyols

C) compounds containing perfluoroalkyl groups and active hydrogen atoms

D) compounds containing active hydrogen atoms and salt groups or groups which can be converted into salt groups,

the polyurethane dispersion characterized in that it has a fluorine content of 5 to 30%, relative to the solid, the said aqueous dispersion characterized in that the perfluoroalkyl monomers have the formula



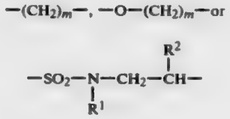
(VI)

in which

q represents the numbers 4 to 12,

R^2 represents hydrogen or methyl, and

Z represents the grouping



in which

m represents numbers 1 to 4, and

R^1 represents the C_1–C_4-alkyl.

5,115,014

SILYL GROUP-CONTAINING VINYL RESIN AND CURABLE COMPOSITION

Hiroshi Wakabayashi, and Joe Kawamura, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 449,481, Dec. 18, 1989, abandoned, which is a continuation of Ser. No. 129,337, Dec. 3, 1987, abandoned, which is a division of Ser. No. 845,293, Mar. 28, 1986, abandoned. This application Aug. 19, 1991, Ser. No. 749,514

Claims priority, application Japan, Mar. 30, 1985, 60-67890

Int. Cl.[5] C08F *130/08*

U.S. Cl. 524—506 **14 Claims**

1. In a liquid paint having a non-aqueous solvent and which is capable of curing to a hard finish, the improvement comprising producing increased adhesion and weatherability by including a silyl group-containing vinyl resin as an effective component, said resin having a molecular weight of 500 to 100,000, the main chain of which is formed by polymerizing 9 to 19% by weight of a silane monomer having an hydrolyzable group bonded thereto, 1 to 28% by weight of a monomer selected from the group consisting of an acrylic acid alkyl ester and a methacrylic acid ester, said alkyl having not less than 10 carbon atoms, and the remainder being at least one different vinyl monomer.

5,115,015

HIGH SOLIDS COATING COMPOSITIONS

Forrest A. Richey, Jr., Charleston, and Kenneth L. Hoy, St. Albans, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 81,243, Jun. 29, 1987, abandoned. This application Apr. 4, 1991, Ser. No. 681,459

Int. Cl.[5] C08L *75/00, 77/00;* **C08F** *8/32*

U.S. Cl. 524—507 **22 Claims**

1. A high solids coating composition comprising:

(a) at least on cross-linkable organic polymer which contains a plurality of reactive —OH— and/or —NHCO— groups;

(b) at least one cross-linking agent having a functionality greater than 2 selected from the group of methylol phenol, polyepoxide, aminoplast, polyisocyanate and blocked polyisocyanate cross-linking agents;

(c) at least one solvent selected from the group consisting of water and organic solvent:

(d) at least one reactive diluent having difunctionality of the formula:

$$R_1OC(R_2)(R_3)N(R_4)C(O)M \quad (I)$$

wherein:

R_1 represents hydrogen or methyl;

R_2 and R_3 individually represent hydrogen;

R_4 represent hydrogen, alkyl of from 1 to 10 carbon atoms or hydroxyalkyl of from 2 to 10 carbon atoms; and

M represents: $—R_5$, $—OR_5$ or $—N(R_5)R_6$

wherein:

R_5 and R_6 individually represent hydrogen, alkyl of from 1 to 10 carbon atoms or hydroxyalkyl of from 2 to 10 carbon atoms,

with the proviso that:

(i) when R_5 is attached to oxygen, it is not hydrogen;

(ii) there is only one NH nucleophilic group or only one OH nucleophilic group in the molecule in addition to the OH nucleophilic group which may be present when R_1 is hydrogen; and

(iii) the molecule has one each of (A) OH or NH nucleophilic groups and (B) methylolamido or methoxyme-

thyleneamide electrophilic groups and (A) and (B) are stoichiometrically balanced.

5,115,016

REINFORCED POLYESTER MOLDING COMPOSITIONS HAVING HIGH GLOSS AND IMPROVED RESISTANCE TO WARPING

Virgel Dickens, and Michael G. Minnick, both of Mount Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 947,663, Dec. 30, 1986, abandoned. This application Dec. 19, 1990, Ser. No. 631,182

Int. Cl.[5] C08L *67/02*

U.S. Cl. 524—513 **2 Claims**

1. In a method for providing an improved polyester resin molding composition exhibiting improved gloss and resistance to warping, said method consisting essentially of mixing

(a) a crystalline polyester or copolyester resin, wherein said polyester resin consists essentially of poly(ethylene terephthalate), and

(b) an effective amount of a reinforcing glass, the improvement consisting essentially of adding to the mixture of (a) and (b) an effective amount of

(c) at least one modifier selected from an amorphous or a semi-crystalline thermoplastic poly(methyl methacrylate), in an amount effective to improve the gloss and reduce the warp of articles molded from said polyester resin.

5,115,017

POLYVINYL OLEATE AS A FAT REPLACEMENT

Ronald P. D'Amelia, Hicksville, N.Y., and Peter T. Jacklin, Lafayette, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 312,618, Feb. 17, 1989, Pat. No. 4,915,974. This application Dec. 5, 1989, Ser. No. 446,220

Int. Cl.[5] C08G *68/78;* **A23L** *1/307;* **A23D** *9/00*

U.S. Cl. 525—59 **32 Claims**

1. A process for synthesizing an edible fat product comprising:

(a) dissolving molecular weight 500 to 8000 polyvinyl alcohol in a fatty acid anhydride in the absence of a solvent;

(b) stirring and warming at reflux in the absence of a catalyst until the reaction is substantially complete; and

(c) recovering the polyvinyl fatty acid ester thereby produced.

5,115,018

HIGH-IMPACT, STYRENIC POLYMER/THERMOPLASTIC POLYMER GRAFTED BLENDS

Murali K. Akkapeddi, Morris Township, Morris County; Bruce VanBuskirk, Dover, and Timothy J. Kraft, Pompton Plains, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 446,893, Dec. 6, 1989, abandoned, which is a division of Ser. No. 262,196, Oct. 19, 1988, Pat. No. 4,902,749, which is a continuation of Ser. No. 88,738, Aug. 24, 1987, abandoned. This application Sep. 25, 1990, Ser. No. 587,892

Int. Cl.[5] C08L *67/02, 55/02, 51/04*

U.S. Cl. 525—64 **8 Claims**

1. A blended composition comprising:

(a) a preblend of a modified styrenic polymer wherein said modified styrenic polymer comprises the reaction product of polybutadiene modified styrene acrylonitrile resin with an ethylenically unsaturated grafting agent, said grafting agent being maleic anhydride and said modified styrenic polymer containing the acid anhydride groups of said maleic anhydride as pendant reactive functionalities, and a rubber and

(b) a polyester.

5,115,019

CARBOXY-FUNCTIONAL HYDROGENATED BLOCK COPOLYMER DISPERSED IN EPOXY RESIN

Edward J. Marx, and Michael J. Watkins, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1990, Ser. No. 503,343

Int. Cl.[5] C08G *59/14;* **G08L** *63/02, 63/04*

U.S. Cl. 525—65 **7 Claims**

1. A process for preparing an elastomer-modified epoxy resin composition comprising the steps of:

(a) dispersing from about 5 to about 30 weight percent based on unmodified epoxy resin of a carboxy-functionalized hydrogenated conjugated diolefin/ monoalkenylarene block copolymer in a liquid epoxy resin to produce an elastomer-dispersed epoxy resin composition;

(b) contacting the elastomer-dispersed epoxy resin composition and from about 15 to about 30 weight percent, based on the weight of the elastomer-modified epoxy resin composition, of a polyhydric phenolic compound in the presence of an advancement catalyst at a temperature within the range of about 40° C. to about 200° C. for time effective for producing a solid elastomer-modified epoxy resin having an epoxy equivalent weight in the range of about 500 to about 1,500; and

(c) recovering said solid elastomer-modified expoxy resin.

5,115,020

COMPOSITE RESIN PARTICLES AND PREPARATION THEREOF

Hisaichi Muramoto, Osaka; Yusuke Ninomiya; Keizou Ishii, both of Hyogo, and Shinichi Ishikura, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jul. 19, 1990, Ser. No. 556,258

Claims priority, application Japan, Jul. 19, 1989, 1-188399

Int. Cl.[5] C08G *63/48*

U.S. Cl. 525—74 **1 Claim**

1. A method for preparing composite resin particles which comprises a combination of steps of dispersing in an aqueous medium a mixed solution of

(A) a crosslinked structure-forming component having a number average molecular weight of about 180 to 1,000,000 selected from a resin having both dispersive power and crosslinking properties or a combination of two organic compounds each bearing mutually reactive functional groups which are required for the formation of a crosslinked high molecular weight compound when said two compounds are reacted with each other, at least one of said organic compounds having dispersive power,

(B) a non-crosslinking thermoplastic resin which is not reactive with said (A) component, and

(C) an organic solvent which is a solvent for said components (A) or (B), effecting a crosslinking of the crosslinked structure-forming components in the dispersed particles, and removing the aqueous solvent and the organic solvent.

5,115,021

PNEUMATIC TIRES

Robert J. Blythe, Birmingham, and Brian D. W. Powell, Nuneaton, both of England, assignors to Sumitomo Rubber Industries Ltd., Kobe, Japan

Filed Jun. 28, 1989, Ser. No. 372,877

Claims priority, application United Kingdom, Jul. 2, 1988, 8815793

Int. Cl.[5] C08L *51/04, 7/00, 9/06;* **B60C** *1/00*

U.S. Cl. 525—84 **14 Claims**

1. A pneumatic tire, with improved steering response, whose tread portion comprises a composition including a blend of a base elastomer of a styrene butadiene rubber or a natural rubber and, as a steering response substance a graft copolymer of polyisoprene and an unsaturated compound selected from methacrylic acid, acrylic acid and lower alkyl esters thereof, the graft copolymer being compatible with the base elastomer and said steering response substance being present in an amount in a range of 5 to 60 parts by weight per 100 parts of the total weight of the base elastomer and the steering response substance, whereby frictional grip on wet road surfaces is not reduced as a result of improved steering response.

5,115,022

THERMOPLASTICS OF POLYALKYLENE TEREPHTHALATES IMPACT MODIFIED WITH FUNCTIONALIZED POLYMERS AND USE THEREOF FOR PRODUCING MOLDINGS

Klaus Bronstert, Carlsberg; Hans-Dieter Schwaben, Freisbach, and Adolf Echte, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 153,931, Feb. 9, 1988, abandoned. This application Feb. 20, 1990, Ser. No. 481,689

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3706017

Int. Cl.[5] C08L *67/02*

U.S. Cl. 525—92 **2 Claims**

1. An impact modified thermoplastic blend consisting essentially of from 99 to 60 percent by weight of a polymeric rigid matrix component A and from 1 to 40 percent by weight of a polymeric flexibilizing component B, said weight percentages being based on the sum of components A and B, wherein the rigid polymer component A is selected from the group consisting of

a1) polybutylene terephthalate and

a2) polyethylene terephthalate and the flexibilizing component B is a block copolymer of butadiene and styrene having amino end groups.

5,115,023

SILOXANE ORGANIC HYBRID POLYMERS

John D. Basil, Pittsburgh; Chin-Cheng Lin, Gibsonia, and Robert M. Hunia, Kittanning, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 133,831, Dec. 16, 1987, abandoned. This application Nov. 5, 1990, Ser. No. 609,041

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—103 **6 Claims**

1. A siloxane organic hybrid polymer reaction product of a mixture of reactants consisting essentially of:

a. an organoalkoxysilane or mixture of organoalkoxysilanes of the general formula $R_xSi(OR')_{4-x}$ wherein R is an organic radical selected from the group consisting of methyl and methacryloxypropyl groups, R′ is a low molecular weight alkyl group selected from the group consisting of methyl, ethyl, propyl and butyl, and x is at least one and less than 4; and

b. polyvinylpyrrolidone.

5,115,024

METHOD FOR THE PREPARATION OF CROSSLINKED POLYCARBONATES

Luca P. Fontana, Evansville, Ind., and Sterling B. Brown, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

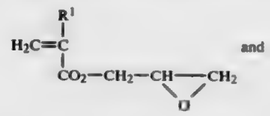
Continuation-in-part of Ser. No. 443,455, Nov. 30, 1989, abandoned, which is a division of Ser. No. 214,965, Jul. 5, 1988, Pat. No. 4,916,189. This application Feb. 13, 1991, Ser. No. 654,708

Int. Cl.[5] C08L *69/00, 37/00*

U.S. Cl. 525—133 **16 Claims**

1. A method for the preparation of crosslinked polycarbonates comprising the reaction at elevated temperature of a composition comprising cyclic polycarbonate oligomers, an effective amount of a polycarbonate formation catalyst and at least one polyglycidyl acrylate copolymer which is the reaction product of A and B, wherein

A is at least one monomer of the formula



(I)

and

B is at least one olefinic compound having a reactivity such that B forms a copolymer with A; and

R^1 is selected from the group consisting of hydrogen, alkyl groups containing about 1–10 carbon atoms and aromatic groups containing about 6–20 carbon atoms.

5,115,025

(N-SUBSTITUTED CARBAMOYLOXY)ALKANOYLOXYALKYL ACRYLATE POLYMERS AND COMPOSITIONS MADE THEREFROM

Joseph V. Koleske, Charleston, W. Va.; Donald F. Smith, Jr., Bridgewater, and Robert J. Weber, Jr., Neshanic, both of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 67,828, Jun. 30, 1987, Pat. No. 4,847,329. This application Jun. 30, 1989, Ser. No. 373,548

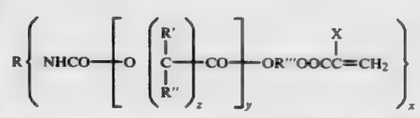
The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.

Int. Cl.[5] C08K *5/07*

U.S. Cl. 525—162 **6 Claims**

1. A curable composition comprising a non-crosslinked prepolymer of molecular weight of about 400 to about 150,000, obtained by reacting:

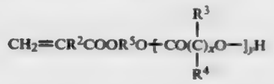
(a) an (N-substituted carbamoyloxy) alkanoyloxyalkyl acrylate monomer of the following average formula:



(I)

wherein R is an unsubstituted or substituted (i) linear or branched alkyl group having from 1 to 10 carbon atoms, or (ii) aryl, alkaryl or aralkyl group having 6 or 10 ring carbon atoms, or (iii) cycloalkyl group having from 5 to 8 ring carbon atoms when x is 1, and polyvalent alkylene, arylene, alkarylene or cycloalkylene having carbon atom values defined for (i) to (iii) supra and a valence equal to the value of x when x is greater than 1; wherein the substituents on the R group are not reactive with the isocyanato radical; R′ and R″ are hydrogen, phenyl, or alkyl or alkoxy having from 1 to 6 carbon atoms; R‴ is a linear or branched divalent alkylene of 1 to 10 carbon atoms, divalent cycloalkylene of 5 to 12 carbon atoms, or divalent arylene of 6 to 10 ring carbon atoms; X is hydrogen, methyl or cyano; x has a value of from 1 to 4; y is an integer having an average value of from 1 to about 20, and z is an integer having a value of from 3 to about 10, and

(b) 0 to about 90 weight percent of a lactone acrylate monomer of the following average formula:



wherein R^5 is a divalent radical, R^2 is hydrogen methyl, or cyano, each of R^3 and R^4 is hydrogen, phenyl, or lower alkyl having 1 to about 6 carbon atoms, x is an integer

having a value of up to about 10, and y is an integer having a value up to about 20.

5,115,026

COMPOSITE MATERIAL BASED ON A POLYMER MATRIX COMPRISING FLUOROELASTOMERS OR FLUOROPLASTOMER

Mario Visca, Alessandria; Giancarlo Boero, Asti, and Daria Lenti, Valenza, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Division of Ser. No. 19,255, Feb. 26, 1987, Pat. No. 4,798,854, which is a continuation-in-part of Ser. No. 848,278, Apr. 4, 1986, abandoned. This application Sep. 13, 1988, Ser. No. 243,830

Claims priority, application Italy, Apr. 5, 1985, 20262 A/85

Int. Cl.[5] C08L 27/12; C08J 3/20, 5/02; C08K 7/02

U.S. Cl. 525—199 **11 Claims**

1. A composite material consisting essentially of a fluoroelastomer matrix containing a fluoroplastomer in a dispersed state, said dispersed fluoroplastomer being homogeneously dispersed substantially in the form of primary particles, both the fluoroelastomer matrix and the dispersed fluoroplastomer being obtained by emulsion or dispersion polymerization in an aqueous phase in which the fluoroelastomer is selected from the group consisting of copolymers of vinylidene fluoride and hexafluoropropylene, terpolymers of vinylidene fluoride, hexafluoropropylene and tetrafluoroethylene; terpolymers of vinylidene fluoride, tetrafluoroethylene and a perfluoroalkylvinyl ether; copolymers of vinylidene fluoride and hydropentafluoropropylene, terpolymers of vinylidene fluoride, hydropentafluoropropylene and tetrafluoroethylene and the corresponding polymers containing in the chain a small quantity of trifluorobromethylene and the fluoroplastomer is selected from the group consisting of polytetrafluoroethylene; copolymers of tetrafluoroethylene and a perfluoroalkyl vinyl ether; copolymers of vinylidene fluoride and chlorotrifluoroethylene and copolymers of tetrafluoroethylene and propylene.

5,115,027

POLYPROPYLENE STRETCHED FILM

Tadatoshi Ogawa, Grange Height, Singapore; Seiichiro Ima, Ichihara, and Kazuki Wakamatsu, Chiba, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 433,124, Nov. 8, 1989, abandoned. This application Jun. 5, 1991, Ser. No. 710,470

Claims priority, application Japan, Nov. 16, 1988, 63-290920

Int. Cl.[5] C08L 23/12, 23/14, 53/00; C08J 5/18

U.S. Cl. 525—216 **1 Claim**

1. A polypropylene stretched film consisting essentially of a composition which comprises a crystalline propylene polymer and 1.05% ppm by weight to 10% by weight of a polymer of vinylcyclohexane, the composition having a melting point of 164° C. or more, a crystallization temperature of 128° C. or more and a 20° C. xylene soluble portion of 2.5% by weight or less.

5,115,028

TOUGH POLYMER COMPOSITIONS

Osman S. Gebizlioglu, Hazlet, N.J.; Robert E. Cohen, Jamaica Plain, Mass.; Ali S. Argon, Belmont, Mass.; Haskell W. Beckham, Cambridge, Mass., and Jian Qin, Medford, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 48,179, May 11, 1987, abandoned. This application Jan. 31, 1990, Ser. No. 473,261

Int. Cl.[5] C08L 9/00, 25/04

U.S. Cl. 525—232 **6 Claims**

1. A polymer blend comprising a glassy thermoplastic polymer having a glass transition temperature greater than ambient room temperature and between about 0.1 and 4.0 weight percent of a rubbery polymer or copolymer obtained from a diolefin compound wherein said rubbery polymer is interspersed as pools having a size between about 200 and 1000 Angstroms within said glassy thermoplastic polymer.

5,115,029

EXTRUDABLE POLYMERIC COMPOSITION

Donald E. Kirkpatrick, Midland, Mich.; James A. Stevenson, Pittsburgh, Pa., and Kun S. Hyun, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 219,619, Jan. 15, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 484,748

Int. Cl.[5] C08L 27/08; C08K 3/24, 3/32

U.S. Cl. 525—239 **24 Claims**

1. A polymeric blend composition consisting essentially of:

(a) a vinylidene chloride interpolymer, the interpolymer comprising vinylidene chloride and at least one monoethylenically unsaturated monomers copolymerizable with vinylidene chloride, said ethylenically unsaturated comonomer being maintained below an amount sufficient to destroy the semicrystalline character of the interpolymer; and

(b) from about 0.1 to about 40 weight percent, based on the total weight of the polymeric composition, of a friction reducing olefin polymer (FRP) having a melt flow rate of less than 325 grams per ten minutes, an average molecular weight of at least 10,000, a viscosity of at least 750 poise at a temperature of 175° C., measured at 100 sec^{-1}., and a coefficient of friction such that the frictional coefficient of the polymeric composition is at least 20 percent lower than the frictional coefficient of the polymeric composition without the FRP,

whereby the mechanical energy to extrude of the polymeric composition is decreased.

5,115,030

POLYPROPYLENE RESIN COMPOSITION

Mutsuhiro Tanaka, and Masahiro Sugi, both of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 388,927

Claims priority, application Japan, Aug. 4, 1988, 63-195058

Int. Cl.[5] C08L 23/10, 23/16, 23/20, 53/00

U.S. Cl. 525—240 **10 Claims**

1. A polypropylene resin composition capable of providing transparent heat sealable film consisting of

(A) 50% to 99% by weight of a polypropylene resin having a propylene unit content of 90 mol % or more and having an insoluble matter in boiling n-hexane of 90% or more;

(B) 1% to 50% by weight of a rubber component, and optionally

(C) one or more compounds selected from antioxidant, an UV-ray absorber, a lubricant, a nucleating agent, an antistatic agent, a flame retardant, a pigment, a dye, an inorganic filler, and an organic filler,

said rubber component (B) consisting of a random copolymer composition containing:

(i) an ethylene random copolymer selected from the group consisting of random copolymers of ethylene with α-olefin having 3 to 20 carbon atoms having an ethylene content of 60 to 95 mol % and $MFR_{230°C}$ of 0.1 to 50 g/10 min., and a crystallinity of 40% or less and

(ii) a propylene random copolymer selected from the group consisting of random copolymers of propylene with α-olefin having 4 to 20 carbon atoms, having a propylene content of 60 to 95 mol % and $MFR_{230°C}$ of 0.1 to 50 g/10 min., and a crystallinity of 40% or less, at weight ratio of (i):(ii) of from 95:5 to 20:80.

5,115,031

PROCESS FOR THE MANUFACTURE OF AN IMPACT RESISTANT THERMOPLASTIC RESIN

Philippe Heim, and Gerard Riess, both of Mulhouse, France, assignors to Norsolor, France

Division of Ser. No. 234,055, Aug. 19, 1988, Pat. No. 4,952,635. This application Apr. 6, 1990, Ser. No. 505,483

Claims priority, application France, Aug. 20, 1987, 87 11759

Int. Cl.[5] C08F 2/30, 265/04, 279/02

U.S. Cl. 525—243 **15 Claims**

1. A process for the manufacture of an impact resistant thermoplastic resin modified with an elastomeric latex, comprising the steps of:

(a) preparing the elastomeric latex in an aqueous emulsion from at least one ethylenically unsaturated monomer in the presence of a non-ionic surfactant; (a1) polymerizing a compatibilization monomer with the latex of step (a) by emulsion polymerization to form a product, said compatibilization monomer comprising at least one monoethylenically unsaturated monomer selected from the monomers employed in step (b);

(b) adding at least one vinyl monomer to the elastomeric latex from step (a), said vinyl monomer being insoluble or substantially insoluble in water, and adding at least one polymer or copolymer based on carboxylic units and capable of forming an interpolymeric complex with the non-ionic surfactant employed in step (a), and lowering the pH of the mixture sufficiently to transfer the particles of the latex from step (a) into said vinyl monomer and to cause formation of the interpolymeric complex; and,

(c) polymerizing the elastomeric latex and the vinyl monomer from step (b).

5,115,032

CURABLE RESIN COMPOSITION

Eiichiro Takiyama, Kamakura; Ryushi Ogura, Takasaki, and Noriaki Harigai, Hasuda, all of Japan, assignors to Showa Highpolymer Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1989, Ser. No. 442,570

Int. Cl.[5] C08F 291/12

U.S. Cl. 525—279 **6 Claims**

1. A curable resin composition comprising:

a component (A) which is a polymer having at least two reactive carbon-carbon double bonds are at least one reactive carbon-carbon triple bond at its side chain and having a molecular weight of at least 1,000,

and a component (B) which is a reaction-product having at least one thiol group and alicyclic structure in the molecule, which is obtained by reacting an unsaturated alicyclic compound having at least two unsaturated bonds in the molecule, at least one unsaturated bond thereof being in the ring, with a polythiol compound having at least two thiol groups; in a proportion whereby the total number of thiol groups of the polythiol compound are in excess of the total number of unsaturated bonds of the unsaturated alicyclic compound.

5,115,033

COEXTRUDABLE ADHESIVES

Chun S. Wong, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Feb. 27, 1990, Ser. No. 485,708

Claims priority, application United Kingdom, Feb. 27, 1989, 890443

Int. Cl.[5] C08F 255/02; C09J 151/06

U.S. Cl. 525—285 **10 Claims**

1. A coextrudable adhesive composition comprising:

(a) an acid copolymer selected from the group consisting of polyolefins grafted with at least one of an ethylenically unsaturated carboxylic acid and an ethylenically unsaturated carboxylic acid anhydride, said grafted polyolefin containing a total amount of at least 0.001% by weight to 5% by weight of carboxylic acid and carboxylic acid anhydride groups; and

(b) a catalytic amount up to 0.5% by weight of an agent selected from the group consisting of monoalkyl phoephates, dialkyl phosphates, monoalkylamines, dialkylamines, trialkylamines, heterocyclic amino compounds, aminocarboxylic acids and salts of such acids; the amines being monoamines; the heterocyclic amino compounds being selected from the group consisting of benzimidazole, histidine, quinoline and piperazine; and the aminocarboxylic acids being selected from the group consisting of glycine, arginine and lysine.

5,115,034

CONDENSED PHASE POLYMERS

Spencer F. Silver, White Bear Lake; William R. Bronn, Maplewood, and Eugene G. Joseph, Arden, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 316,016, Feb. 27, 1989, abandoned, which is a division of Ser. No. 107,292, Oct. 9, 1987, Pat. No. 4,857,618. This application Oct. 31, 1990, Ser. No. 607,838

Int. Cl.[5] C08F 230/08, 230/10, 297/04

U.S. Cl. 525—288 **7 Claims**

1. A copolymer comprising the product of the reaction of a multifunctional linking agent monomer and an anionically terminated elastomeric copolymer having a condensed phase structure wherein polymer branches occur along a polymer backbone, said elastomeric copolymer comprising the copolymerized reaction product of

(a) hydrocarbyl lithium initiator;

(b) at least one anionically polymerizable monomer;

(c) a condensing agent monomer having the general formula

$$CH_2=C(R')QY(R)_n(X)_m$$

wherein

Y is tetravalent Si, Ge, Sn, or Pb;

X is H, —OR'', Cl, Br or F, wherein R''is a monovalent lower alkyl group having from 1 to 6 carbon atoms;

R is hydrogen, a monovalent lower alkyl group having from 1 to 6 carbon atoms, or phenyl;

Q is phenylene;

R' is hydrogen, a monovalent lower alkyl group having from 1 to 6 carbon atoms, or phenyl;

m is an integer of 1, 2 or 3; and

n is an integer equal to 3-m wherein the mole ratio of (a) to (c) is about (1+m):1 and wherein the mole percentage of condensing agent in each copolymer segment containing said condensing agent is in the range of about 0.01% to about 5%.

5,115,035

TERMINAL-MODIFIED BLOCK COPOLYMER AND COMPOSITIONS CONTAINING THE SAME

Toshinori Shiraki, Yamato, and Yasuo Hattori, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 939,483, filed as PCT/JP86/00516, Oct. 9, 1986, abandoned.

Claims priority, application Japan, Oct. 11, 1985, 60-224806; Nov. 19, 1985, 60-257739; Jan. 31, 1986, 61-18195; Jun. 5, 1986, 61-129179

Int. Cl.[5] C08F 297/04; C08L 93/04, 53/02

U.S. Cl. 525—314 **7 Claims**

1. A composition which comprises:

(a) 100 parts by weight of a terminal-modified block copolymer having the unreacted residue of a terminal-treating agent bonded to the polymer terminal which is obtained by treating the active terminal of a block copolymer comprising conjugated dienes and vinylaromatic hydrocarbon compounds, which is obtained by the use of at least one member selected from alkali metals or organo-alkali metals as a polymerization initiator and has a vinyl-aromatic hydrocarbon content of 5 to 95% by weight and a number

average molecular weight of 10,000 to 1,000,000, with at least one terminal-treating agent selected from the group consisting of imide compounds, cyanamide compounds, amide compounds, alkylene oxide compounds, silicon compounds, and tin compounds, wherein said silicon compounds and said tin compounds have at least one functional group represented by the formula:

$$-MX_nR'_{3-n}, \text{ or } -MR'_3$$

wherein R' is hydrogen, an alkyl group of 1 to 22 carbon atoms, a cycoalkyl group of 4 to 22 carbon atoms, an aryl group of 6 to 22 carbon atoms, or an alkoxy group; M is silicon or tin; X is a halogen atom; and n is an integer of 0 to 3, and

(b) 40 to 200 parts by weight of a tackifier resin or 3 or 100 parts by weight of an electroconductive substance.

5,115,036

METALI IC ION SORBER

Shujiro Shiga; Koji Kabasawa; Tadayuki Ohmae, and Hisao Tanaka, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 344,643, Apr. 28, 1989, abandoned. This application Oct. 25, 1990, Ser. No. 602,888

Claims priority, application Japan, Apr. 28, 1988, 63-107251

Int. Cl.[5] C08F *220/34*

U.S. Cl. 525—328.2 **3 Claims**

1. A metallic ion sorber having sorbed thereon inorganic ions of a metal belonging to group IIIA, IVA, VA, VIA, VIIA, VIII, IB, IIB, or IVB, but excluding iron, cobalt, and chromium, which comprises an ethylene copolymer containing from 40 to 95% by weight of ethylene and from 5 to 60% be weight of at least one aminoalkyl acrylate compounds represented by formula:



wherein R_1 represents a hydrogen atom or a methyl group R_2 and R_3 each represents an alkyl group having from 1 to 4 carbon atoms; and n represents an integer from 1 to 4, and having a number average molecular weight of from 5,000 to 50,000.

5,115,037

HYDROGENATED CYCLIC ALKYL POLYMERS

Jawed Asrar, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 19, 1990, Ser. No. 629,910

Int. Cl.[5] C08F *8/04*

U.S. Cl. 525—326.8 **7 Claims**

1. Polyethylene cyclopentanedicarboxiimide.

5,115,038

TETRAFLUOROETHYLENE COPOLYMER AND PROCESS FOR PREPARING THE SAME

Kiyohiko Ihara; Katsuhide Ootani; Yutaka Nakata, and Toshio Miyatani, all of Settsu, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed May 13, 1991, Ser. No. 698,863

Claims priority, application Japan, May 14, 1990, 2-123470

Int. Cl.[5] C08F *8/32*

U.S. Cl. 525—326.2 **2 Claims**

1. A copolymer of tetrafluorethylene and a perfluoro(alkyl vinyl ether) having the formula (I):

$$CF_2{=}CF{-}O{-}Rf \qquad (I)$$

wherein Rf is a perfluoroalkyl group having 3 or 4 carbon atoms;

said copolymer having 1 to 10% by weight of the perfluoro(alkyl vinyl ether) units,

having 7 to 20, per 10^6 carbon atoms, of terminal groups $-CONH_2$,

having substantially no $-CH_2OH$ and no $-COF$, and having a melt viscosity at 380° C. of 0.1×10^4 to 100×10^4 poise.

5,115,039

POLYACRYLATE ESTERS WITH QUATERNARY AMMONIUM GROUPS

Jürgen Fock, Düsseldorf; Dietmar Schaefer, and Eberhard Esselborn, both of Essen, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Division of Ser. No. 448,168, Dec. 8, 1989, Pat. No. 5,057,580. This application Jun. 5, 1991, Ser. No. 711,364

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1988, 3842201

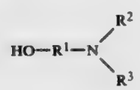
Int. Cl.[5] C08F *8/30*

U.S. Cl. 525—329.5 **1 Claim**

1. A polyacrylate ester having tertiary amino groups, said ester being the transesterification product of

(a) an alkyl polyacrylate ester, obtained by free radical polymerization, the alkyl groups of which contain 1 to 8 carbon atoms, with

(b) a compound of the general formula



wherein

R^1 is a bivalent group of the general formula

$$-CH(R^4)-CH_2- \text{ or } -(C_nH_{2n}O)_m-C_pH_{2p}-$$

in which

R^4 is hydrogen or an alkyl group with 1 to 16 carbon atoms,

n=2, 3 or 4,

m=1 to 20,

p=2, 3 or 4 and

R^2, R^3 are alkyl groups with 1 to 18 carbon atoms, and

(c) a saturated or unsaturated aliphatic alcohol with 8 to 22 carbon atoms,

the molar ratio of the dialkylaminoalcohol (b) to the alkanol (c) with 8 to 22 carbon atoms being 1:9 to 9:1,

the transesterification being performed

(i) in such amounts that up to 70% of the ester groups are transesterified,

(ii) in the presence of a transesterification catalyst, and

(iii) in the presence of or without a solvent.

5,115,040

POLYACRYLATE ESTERS WITH QUATERNARY AMMONIUM GROUPS

Jürgen Fock, Düsseldorf; Dietmar Schaefer, and Eberhard Esselborn, both of Essen, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Division of Ser. No. 448,169, Dec. 8, 1989, Pat. No. 5,057,579. This application Jun. 20, 1991, Ser. No. 718,193

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1988, 3842202

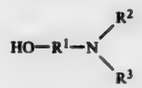
Int. Cl.[5] C08F *8/30*

U.S. Cl. 525—329.5 **3 Claims**

1. A polyacrylate ester having tertiary amino groups, said ester being the transesterification product of

(a) an alkyl polyacrylate ester, obtained by free radical polymerization, the alkyl groups of which contain 1 to 8 carbon atoms, with

(b) a compound of the general formula



wherein

R^1 is a bivalent group of the general formula

$$-CH(R^4)-CH_2- \text{ or } -(C_nH_{2n}O)_m-C_pH_{2p}-$$

in which

R^4 is hydrogen or an alkyl group with 1 to 16 carbon atoms,

n =2, 3 or 4,

m =1 to 20,

p =2, 3 or 4 and

R^2, R^3 are alkyl groups with 1 to 18 carbon atoms,

the transesterification being performed

(i) in such amounts that up to 70% of the ester groups are transesterified,

(ii) in the presence of a transesterification catalyst, and

(iii) in the presence of or without a solvent.

5,115,041

SUBSTRATE FOR OPTICAL RECORDING MEDIA AND MOLDING COMPOSITION THEREFOR

Linwood P. Tenney, Birmingham, Ala., and Dennis C. Shen, Brecksville, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 31, 1989, Ser. No. 331,310

Int. Cl.[5] C08F *8/04*

U.S. Cl. 525—332.1 **11 Claims**

1. A substantially optically clear molding composition produced by

polymerizing a cycloolefin monomer in the presence of a catalyst effective to promote ring-opening polymerization to produce a polycycloolefin polymer; and

hydrogenating the resultant polymer product to provide a polymer having a weight average molecular weight of from about $35–50\times10^3$ and a salt flow index of between about 40 to about 65 load, and g/10 min. as determined on a TINUS-OLSON melt-flow index system at 300° C. with a 1.2 Kg wherein the monomer comprises about 60–95% methyl-tetracyclododecene and about 90–5% dicyclopentadiene, based on the total weight of said mixture.

5,115,042

COPOLYMERS OF AMINE-TERMINATED POLYMERS AND ORTHO ESTER-CAPPED POLYPHENYLENE ETHERS

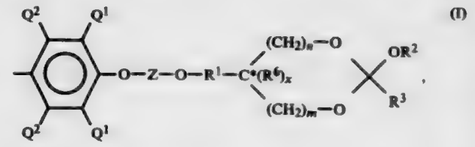
Farid F. Khouri, Clifton Park; Sterling B. Brown, and John T. Jackman, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 567,575, Aug. 15, 1990, abandoned. This application Jul. 9, 1991, Ser. No. 727,209

Int. Cl.[5] C08G *65/38*; C08L *71/12, 77/00*; C07D *251/00*

U.S. Cl. 525—397 **23 Claims**

1. A method for preparing a copolymer-containing composition which comprises effecting reaction between at least one polymer containing amine groups and a capped polyphenylene ether containing ortho ester end groups of the formula



(I)

wherein:

each Q^1 is independently halogen, primary or secondary lower alkyl, phenyl, haloalkyl, aminoalkyl, hydrocarbonoxy, or halohydrocarbonoxy wherein at least two carbon atoms separate the halogen and oxygen atoms;

each Q^2 is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl, haloalkyl, hydrocarbonoxy or halohydrocarbonoxy as defined for Q^1;

R^1 is a C_{1-6} alkylene radical;

R^2 is a C_{1-4} primary or secondary alkyl radical, or is an alkylene radical forming a 5- or 6-membered ring with C^*, and R^3 is a C_{1-4} primary or secondary alkyl or C_{6-10} aromatic radical, or R^2 and R^3 together with the atoms connecting them form a 5-, 6- or 7-membered ring;

R^6 is hydrogen or C_{1-4} primary or secondary alkyl;

Z is a linking group which is substantially inert under capping conditions;

m is 0 or 1;

n is from 1 to 2-m; and

x is 0 when R^2 and C^* form a ring and is otherwise

5,115,043

PROCESS FOR FUNCTIONALIZING POLYPHENYLENE ETHER WITH SUBSTITUTED CHLOROTRIAZINE

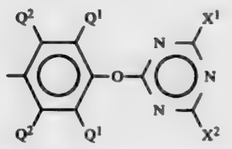
John B. Yates, III, Glenmont; Sterling B. Brown, Schenectady, both of N.Y.; Richard C. Lowry, Phoenixville, Pa.; James C. Blubaugh, Albany, and David F. Aycock, Glenmont, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1991, Ser. No. 659,659

Int. Cl.[5] C08G *65/48*

U.S. Cl. 525—390 **20 Claims**

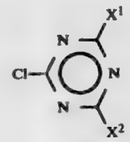
1. A method of preparing a substituted hlorotriazine-capped polyphenylene ether composition comprising polymer molecules having end groups of the formula



comprising sequential steps of:

(a) contacting under reactive conditions at least one polyphenylene ether with an aqueous basic reagent; and (b)

contacting under reactive conditions a composition resulting from step (a) with substituted chlorotriazine of the formula



wherein each Q^1 is independently halogen, primary or secondary lower alkyl, phenyl, haloalkyl, aminoalkyl, hydrocarbonoxy, or halohydrocarbonoxy wherein at least two carbon atoms separate the halogen and oxygen atoms; each Q^2 is independently hydrogen, halogen, primary or secondary lower alkyl, phenyl, haloalkyl, hydrocarbonoxy or halohydrocarbonoxy as defined for Q^1; X^1 and X^2 are independently a substituted or unsubstituted oxyalkyl, alkyl-substituted oxyaryl, or an oxyaryl group.

5,115,044

HIGH IMPACT STRENGTH THERMOPLASTIC MOLDING COMPOSITIONS BASED ON POLYPHENYLENE ETHER GRAFT COPOLYMERS AND POLYAMIDES AND PROCESS FOR PRODUCING THEM

Wolfgang Neugebauer, Duelmen, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 14, 1989, Ser. No. 393,367

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1988, 3831348

Int. Cl.[5] C08F *283/08;* **C08L** *51/04, 53/02*

U.S. Cl. 525—392 **13 Claims**

1. A thermoplastic molding composition, comprising:

a) 70–250 parts by weight of a polyamide, and

b) 100 parts by weight of a graft copolymer, said graft copolymer being prepared by a process consisting essentially of reacting 100 parts by weight of a polyphenylene ether with about 0.1–6 parts by weight of a mixture of 10–50 mole% maleic anhydride and 90–50 mole% of a vinylaromatic compound, wherein said reacting is conducted at a temperature between 100–350° C. in solution, in the solid phase, or in a melt.

5,115,045

ISOCYANATE REACTIVE COMPOSITIONS

Herbert R. Gillis, Sterling Heights, Mich., and Malcolm Hannaby, Sterrebeek, Belgium, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 487,698, Mar. 1, 1990, abandoned. This application Mar. 19, 1991, Ser. No. 671,565

Claims priority, application United Kingdom, Mar. 13, 1989, 8905761

Int. Cl.[5] C08G *18/32*

U.S. Cl. 525—420 **13 Claims**

1. An isocyanate-reactive composition comprising the reaction product of :

(a) an organic compound having the formula :

$$Q\text{—}[X\text{—}COY]_n$$

or

$$Q\text{—}[X\text{—}CO\text{—}R\text{—}(COY)_m]_n$$

wherein Q represents an organic residue, X represents oxygen or sulphur, Y represents a halogen atom or an aryloxy group, R is a polyvalent hydrocarbon radical, m is a whole number from 1 to 3 and n is a whole number of at least 2, and

(b) a polyfunctional compound which is capable of reacting with reactant (a) and contains at least one imino or enamino group.

5,115,046

MISCIBLE POLYARYLATE-POLYAMIDE BLENDS

Barry D. Dean, Belle Mead, N.J., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 273,950, Nov. 21, 1988, abandoned. This application May 6, 1991, Ser. No. 695,937

Int. Cl.[5] C08L *67/02, 77/10*

U.S. Cl. 525—425 **7 Claims**

1. A thermoplastic miscible polymer blend composition having a single glass transition temperature, comprising:

(1) an aliphatic-aromatic polyamide wherein the ratio of the total number of aliphatic carbons to the total number of aromatic carbons is in the range of about 1.5 to 2.5; and

(2) a polyarylate comprising repeating units derived from (i) a dihydric aromatic moiety; (ii) an aromatic dicarboxylic acid moiety; and (iii) at least one tertiary butyl substituted moiety selected from the group consisting of tertiary butyl substituted aromatic dicarboxylic acid moieties and tertiary butyl substituted dihydric aromatic moieties, wherein said tertiary butyl substituted moiety constitutes from about 12 mole % to about 50 mole % of the total polyarylate moieties.

5,115,047

COPOLYESTER, POLYESTER COMPOSITION CONTAINING THE COPOLYESTER, AND POLYESTER LAMINATED STRUCTURE HAVING LAYER COMPOSED OF THE COPOLYESTER OR THE POLYESTER COMPOSITION

Mikio Hashimoto, and Norio Kaneshige, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 432,855, Nov. 9, 1989, Pat. No. 5,039,780. This application May 28, 1991, Ser. No. 706,316

Claims priority, application Japan, Nov. 8, 1988, 63-281800; Dec. 26, 1988, 63-328733; Dec. 26, 1988, 63-328737

Int. Cl.[5] C08G *63/02, 63/18, 63/183*

U.S. Cl. 525—444 **32 Claims**

1. A polyester composition comprising (A) 50 to 95 % by weight of polyethylene terephthalate and (B) 50 to 5 % by weight of a copolyester having an intrinsic viscosity, measured in o-chlorophenol at 25° C., of 0.3 to 1.5 dl/g and being derived from dicarboxylic acid units composed of 95 to 60 mole % of isophthalic acid units and to 40 mole % of 2,6-naphthalenedicarboxylic acid units and dihydroxy compound units composed of 95 to 70 mole % of ethylene glycol units and 5 to 30 mole % of 1,3-bis-(2-hydroxyethoxy)benzene units.

5,115,048

COATING COMPOSITION FOR MOLD COAT OF MOLDED POLYURETHANE RESIN

Mitsuyo Maeda, Sagamihara; Toshio Tanabe; Shimata Tanabe, both of Osaka; Takashi Toyama, Ebina, and Masashi Ono, Chigasaki, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Tanabe Chemical Industrial Inc., Osaka, both of, Japan

Filed Mar. 21, 1989, Ser. No. 326,761

Claims priority, application Japan, Mar. 22, 1988, 63-68795

Int. Cl.[5] C08F *299/06*

U.S. Cl. 525—457 **15 Claims**

1. A coating composition for use in a mold coat coating process, wherein said coating process includes the steps of initially coating said coating composition the inner surface of a mold prior to molding of a polyurethane resin and subsequently transferring during molding said coating composition onto the surface of the molded polyurethane resin, said coating composition comprising:

(a) a principal component comprising a resin constituent that comprises units of (i) at least one selected from the group consisting of isophorone diisocyanate, hexamethylene diisocyanate and hydrogenated methane diisocyanate, and (ii) a polycarbonate polyol; and

(b) a hardener component comprising an addition polymer including an alipatic diisocyanate.

5,115,049

FATTY CARBOXYLIC SILICONE AMINE SALTS

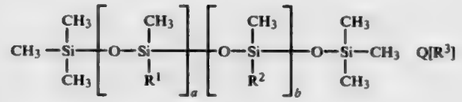
John Imperante, Lebanon, N.J., and Anthony J. O'Lenick, Jr., Lilburn, Ga., assignors to Siltech Inc., Norcross, Ga.

Filed Feb. 19, 1991, Ser. No. 656,834

Int. Cl.[5] C08F *283/00*

U.S. Cl. 525—479 **10 Claims**

1. A silicone compound which conforms to the following structure;



a is an integer from 1 to 200;

b is an integer from 1 to 50;

R^1 is selected from $—(CH_2)_nCH_3$ and phenyl;

n is an integer from 0 to 10;

R^2 is selected from;

$—(CH_2)_3—(OCH_2CH_2)x—(OCH_2CH(CH_3.$
$))y—(OCH_2CH_2)z—NH_3$; or

$—(CH_2)_3—(CH_2)v—N(H)_2—[(CH_2)_3—N(H)_2]_m—H$;

v is an integer ranging from 0 to 5;

x, y and z are integers and are independently selected from 0 to 20, with the proviso that the value of x+y+z ranges from 15 to 60;

m is an integer from 1 to 10;

R^3 is the anion of a fatty carboxylic acid and conforms to the following structure;

$$\ominus O—C(O)—R^4$$

R^4 is alkyl having from 5 to 45 carbon atoms or mixtures thereof;

Q is an integer needed for charge balance and is equal to the number of nitrogen atoms present in the R^2 group.

5,115,050

POLYAMIDE MOULDING COMPOSITIONS CONTAINING FINELY DIVIDED POLYARYLENE SULPHIDES

Werner Nielinger; Karsten-Josef Idel, both of Krefeld; Uwe Westeppe, Mettmann; Dieter Freitag, Krefeld; Claus Wulff, Krefeld, and Hans-Detlef Heinz, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 23, 1990, Ser. No. 513,072

Claims priority, application Fed. Rep. of Germany, May 4, 1989, 3914715

Int. Cl.[5] C08F *283/00;* **C08L** *81/00*

U.S. Cl. 525—537 **5 Claims**

1. A process for preparing a polymer mixture of polyamide and polyarylene sulphide with the polyarylene sulphide being discrete particles of 0.05 to 5 μm and the polyarylene sulphide content of the mixture being 0.1 to 40% by weight, said process comprising polymerizing polyamide precursors in the presence of a solution of polyarylene sulphide in the polyamide precursors wherein the polyamide precursors are an aminocarboxylic acid, a lactam or a mixture of a diamine and a dicarboxylic acid.

5,115,051

METHOD OF PREVENTING POLYMER SCALE DEPOSITION IN A POLYMERIZATION VESSEL

Toshihide Shimizu, Urayasu; Ichiro Kaneko, Hazaki, and Mikio Watanabe, Kamisu, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1989, Ser. No. 447,856

Claims priority, application Japan, Dec. 9, 1988, 63-311603; Dec. 9, 1988, 63-311604

Int. Cl.[5] C08F *2/00*

U.S. Cl. 526—62 **14 Claims**

1. A method of preventing polymer scale deposition in a polymerization vessel during polymerization of a monomer having an ethylenically unsaturated double bond, wherein said polymerization is carried out in a polymerization vessel of which the inner wall has been previously first coated with

(A) a coating solution comprising an aromatic condensate and at least one member selected from the group consisting of metal compounds and inorganic colloids, wherein said metal compounds are metal salts comprising anions in which the anions are selected from the group consisting of silicates, carbonates, phosphates, sulfates, nitrates, borates, acetates, hydroxides, oxides, and halides, and the coating thus formed has been coated with

(B) a coating solution comprising at least one member selected from the group consisting of anionic polymeric compounds, amphoteric polymeric compounds and hydroxyl group-containing polymeric compounds.

5,115,052

PROCESS FOR PRODUCING CYCLOOLEFIN RANDOM COPOLYMERS

Hiroo Wamura; Shunyo Uesugi, and Takashi Hayashi, all of Kuga, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 403,371, Sep. 6, 1989, abandoned. This application Mar. 13, 1991, Ser. No. 670,485

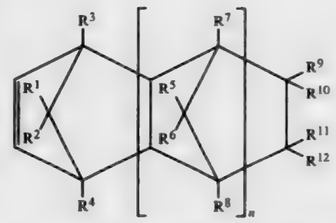
Claims priority, application Japan, Sep. 7, 1988, 63-223777

Int. Cl.[5] C08F *2/06, 232/04, 232/08*

U.S. Cl. 526—87 **5 Claims**

1. A process for the production of cycloolefin random copolymers comprising copolymerizing ethylene with at least one cycloolefin of the general formula [I] noted below in a liquid phase in the presence of a catalyst and a hydrocarbon solvent in a polymerization vessel, wherein ethylene is copolymerized with the cycloolefin while feeding the liquid cycloolefin alone or a homogeneous solution of a mixture of the cycloolefin and the solvent onto the inside circumferential wall of the polymerization vessel above the gas-liquid interface in the polymerization vessel,

[I]



wherein n is 0 or a positive integer, and R^1 to R^{12} are the same or different, and each represents a hydrogen or halogen atom or a hydrocarbon group, or R^9 (or R^{10}) and R^{11} (or R^{12}), when taken together, may form a mono- or poly-cyclic ring.

5,115,053

TWICE-AGED POROUS INORGANIC OXIDES, CATALYSTS, AND POLYMERIZATION PROCESSES

Ronald D. Knudsen; Max P. McDaniel; Elizabeth A. Benham, and F. Wallace Bailey, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 223,849, Jul. 25, 1988, Pat. No. 4,981,831. This application Nov. 13, 1990, Ser. No. 612,048

Int. Cl.[5] C08F *4/24*

U.S. Cl. 526—106 **40 Claims**

1. A polymerization process comprising:

a) forming a silica-titania cogel hydrogel;

b) aging said cogel substantially under neutral pH conditions for a time of at least 2 hours to produce a neutral-aged cogel:

c) aging said neutral-aged cogel under alkaline pH conditions in an aqueous solution at a pH, for a sufficient time in the range of about 1 minute to about 50 hours and at a sufficient temperature to accomplish at least one of decreasing surface area, increasing pore volume, and increasing pore radius of the xerogel thereby producing a twice-aged cogel;

d) spray drying said twice-aged cogel thereby forming a xerogel;

e) incorporating a chromium compound into said xerogel to produce a catalyst system;

f) activating said catalyst system for mono-1-olefin polymerization to produce an activated polymerization catalyst system; and

g) contacting monomer of at least one mono-1-olefin containing about 2 to about 8 carbon atoms per molecule and said activated polymerization catalyst system in a reaction zone under polymerization conditions.

5,115,054

CATALYSTS CONTAINING POLY(3-ETHYL-1-HEXENE) AND USES THEREOF

Phil M. Stricklen; Francis X. Mueller, Jr.; Kenneth W. Willcox, and Joyce K. Snow, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 12, 1990, Ser. No. 597,458

Int. Cl.[5] C08F *4/64*

U.S. Cl. 526—159 **4 Claims**

1. A process comprising contacting at least one olefin under polymerization conditions with a composition comprising 3-ethyl-1-hexene prepolymer a titanium trichloride catalyst and an organo Al cocatalyst to produce an olefin polymer having improved optical properties.

5,115,055

HYDROPEROXIDE CATALYZED FREE RADICAL POLYMERIZATION OF VINYL AROMATIC MONOMERS

Virginia A. Dais, and Duane B. Priddy, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 704,480, May 23, 1991, abandoned. This application Oct. 29, 1991, Ser. No. 784,139

Int. Cl.[5] C08F *4/34, 112/08*

U.S. Cl. 526—225 **4 Claims**

1. A process for free radical polymerization of styrene to prepare high molecular weight polystyrene characterized in that the polymerization is conducted in the presence of from 5 to 5,000 ppm of a soluble organic acid having pKa from 0.5 to 2.5° C. and from 50 to 2000 ppm of an organic hydroperoxide.

5,115,056

FLUORINE AND/OR SILICONE CONTAINING POLY(ALKYLENE-OXIDE)-BLOCK COPOLYMERS AND CONTACT LENSES THEREOF

Karl F. Mueller, New York, and Walter L. Plankl, Yorktown Heights, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 368,755, Jun. 20, 1989, abandoned. This application Feb. 28, 1990, Ser. No. 486,493

Int. Cl.[5] C08F *12/30*

U.S. Cl. 526—243 **65 Claims**

1. A copolymer which is oxygen permeable, flexible, wettable, biocompatible and suitable for use in ophthalmic devices, such as contact lenses, which copolymer comprises the polymerization product of

(A) 10 to 80% by weight of a vinyl-telechelic polyether, or a mixture thereof,

(B) 90 to 20% by weight of

(B-1) a fluorinated, ethylenically unsaturated monomer, or

(B-2) a silicone-containing ethylenically unsaturated monomer, or a mixture of monomer (B-1) and monomer (B-2), and

(C) 0 to 60% by weight of an ethylenically unsaturated monomer or mixture of monomers other than monomer (B-1) or monomer (B-2).

5,115,057

ELECTRON-CONDUCTIVE HIGH POLYMER AND ELECTROCONDUCTIVE MATERIAL HAVING THE SAME

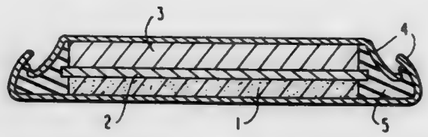
Shigetoshi Ono, and Eiji Funatsu, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 5, 1990, Ser. No. 548,648

Claims priority, application Japan, Jul. 4, 1989, 1-172412; Jul. 7, 1989, 1-176447

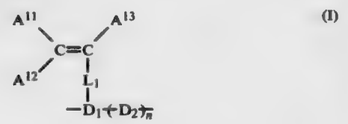
Int. Cl.[5] C08F *228/06, 226/06, 226/00, 228/02, 216/12, 12/02/12/28;* H01M *6/18, 2/16*

U.S. Cl. 526—256 **14 Claims**



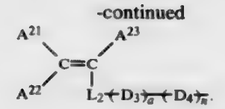
1. An electron-conductive high polymer which has at least (1) an ethylenic repeating unit having an electron-conductive site comprising at least one of aniline compounds and heterocyclic compounds as the repeating unit in the side chain and (2) at least one ethylenic repeating unit selected from the group consisting of an ethylenic repeating unit having an anionic group in the side chain and an ethylenic repeating unit having a repeating unit of an oxyalkylene group in the side chain,

wherein the ethylenic repeating unit (1) having an electron-conductive site is derived from an ethylenic compound of formula (I) or (II):



(I)

-continued



(II)

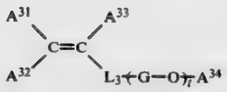
wherein A^{11}, A^{12}, A^{13}, A^{21}, A^{22} and A^{23} may be the same or different and each represent a hydrogen atom or a substituent on the ethylenic carbon;

L_1 and L_2 may be the same or different and each represents a divalent linking group;

D_1, D_2, D_3 and D_4 may be the same or different and each represents a residue of an aniline compound or a heterocyclic compound; and

a represents 0 or 1,

wherein the ethylenic repeating unit (2) having a repeating unit of an oxyalkylene group in the side chain is derived from an ethylenic compound of formula (III):



(III)

wherein A^{31}, A^{32} and A^{33} may be the same or different and each represents a hydrogen atom or a substituent on the ethylene carbon;

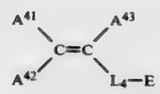
A^{34} represents a hydrogen atom, a substituted or unsubstituted alkyl, a substituted or unsubstituted aryl, a substituted or unsubstituted alkylcarbonyl, a substituted or unsubstituted arylcarbonyl, a substituted or unsubstituted alkylsulfonyl or a substituted or unsubstituted arylsulfonyl group;

L_3 represents a divalent linking group;

G represents a substituted or unsubstituted alkylene group; and

t represents from 2 to 30, provided that plural G's may be the same or different, and

wherein the ethylenic repeating unit (2) having an anionic group in the side chain is derived from an ethylenic compound of formula (IV):



(IV)

where A^{41}, A^{42} and A^{43} may be the same or different and each represents a hydrogen atom or a substituent on the ethylenic carbon;

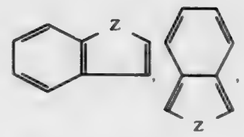
L_4 represents a divalent linking group; and

E represents an anionic group, and

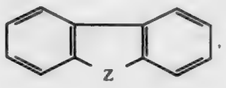
wherein said heterocyclic compound is a compound having a hetero ring selected from the group consisting of



pyrazole, imidazole, triazole, oxazole, thiazole, pyridine, diazine,



benzothiazole, purine, quinoline, isoquinoline, benzodiazine, fluorene



acridine,

phenazone, phenoxazone, pyrazolotrizole, pyrazolodiazole, pyrazoloazole, and benzopyrazoloazole and wherein Z represents —O—, —S— or



where R^3 represents a hydrogen atom, or an alkyl group having from 1 to 6 carbon atoms, n=1 to 10,000.

5,115,058

BIO- AND PHOTO-DEGRADABLE RESIN COMPOSITION

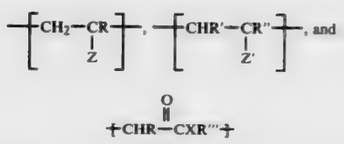
Kevin D. Sikkema, and Duane B. Priddy, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 631,509, Dec. 21, 1990, abandoned. This application Sep. 6, 1991, Ser. No. 755,914

Int. Cl.[5] C08F *226/06, 224/00*

U.S. Cl. 526—258 **5 Claims**

1. Thermoplastic polymers comprising repeat units corresponding to the formulas:



wherein R is hydrogen or methyl: R′ is hydrogen, C_{1-6} alkyl, C_{1-6} alkoxide, or phenyl: R″ is R, CN, $CONR^{\bullet}_2$, or $CO_2R^{\bullet}$, wherein $R^{\bullet}$ is H, C_{1-10} alkyl, C_{6-10} aryl, or C_{6-10} alkaryl; R‴ is C_{2-4} α,ω-alkadiyl, optionally substituted with up to 2 C_{1-6} alkyl or phenyl groups: X is oxygen or nitrogen; Z is a phenyl or C_{1-4} alkyl or halo substituted phenyl, halo, CN, or $CO_2R^{\bullet}$: and Z′ is a C_{2-10} aliphatic or aromatic acyl moiety derived from a vinyl ketone, isopropenyl ketone or substituted derivative thereof.

5,115,059

TERPOLYMERS OF ALKYL ACRYLATES OR METHACRYLATES, AN OLEFINICALLY UNSATURATED HOMO OR HETEROCYCLIC-NITROGEN COMPOUND AND AN ALLYL ACRYLATE OR METHACRYLATE

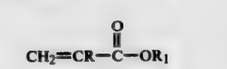
Hanh T. Le, Wilmington, Del., assignor to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 408,862, Sep. 18, 1989, abandoned, which is a division of Ser. No. 265,602, Oct. 31, 1988, Pat. No. 4,900,569. This application Dec. 13, 1990, Ser. No. 628,277

Int. Cl.[5] C08F *26/06*

U.S. Cl. 526—260 **13 Claims**

1. An alkyl ester of unsaturated monocarboxylic acid an olefinically unsaturated homo or heterocyclic-nitrogen compound and allyl acrylate or methacrylate terpolymer having pour point depressant properties, said terpolymer comprising the reaction product of (a) a monomeric alkyl ester of carboxylic acid or a mixture of alkyl esters of carboxylic acid having the formula:



wherein R is H or CH_3 and R_1 is alkyl having from about 1 to about 30 carbon atoms; (b) vinyl pyridine; and (c) an allyl acrylate or methacrylate.

5,115,060

ALTERNATING COPOLYMERS OF OLEFINICALLY UNSATURATED SULFONATE SALTS AND UNSATURATED IMIDES

Roger A. Grey, West Chester, Pa., assignor to Arco Chemical Technology, L.P., Wilmington, Del.

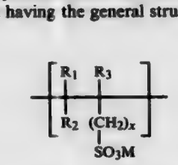
Filed Nov. 21, 1990, Ser. No. 616,977

Int. Cl.[5] C08F *22/40*

U.S. Cl. 526—262 **19 Claims**

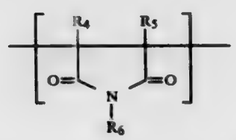
1. A copolymer comprised of

a) recurring polymerized units of an olefinically unsaturated sulfonate salt having the general structure;



wherein R_1, R_2, and R_3 are the same or different and are independently selected from the group consisting of hydrogen and C_1–C_6 alkyl, x is 0, 1, or 2, and M is an alkali metal, alkaline earth or ammonium;

b) recurring polymerized units of an α,β-unsaturated dicarboxylic acid imide having the general structure:



wherein R_4, R_5, and R_6 are the same or different and are independently selected from the group consisting of hydrogen, phenyl, tolyl, halophenyl, nitrophenyl, xylyl, mesityl, cumenyl, naphthyl, anthryl, benzyl, phenethyl, and C_1–C_6 alkyl; and

c) optionally, recurring polymerized units of an α,β-unsaturated dicarboxylic acid anhydride; said copolymer having a peak molecular weight of from about 500 to 30,000.

5,115,061

N-PROPIONITRILE MALEIMIDES, PREPARATION PROCESS AND POLYMERS THEREOF

Charles F. Parsons, Little Hocking, Ohio, assignor to General Electric Company, N.Y.

Division of Ser. No. 401,296, Aug. 31, 1989, abandoned. This application Sep. 10, 1990, Ser. No. 580,447

Int. Cl.[5] C08F *22/40*

U.S. Cl. 526—262 **3 Claims**

1. A homopolymer formed from N-(beta-propionitrile) maleimide.

5,115,062

NONLINEAR OPTICAL AND CONDUCTIVE POLYMERIC MATERIAL

Thomas J. Barton; Sina Ijadi-Maghsoodi, and Yi Pang, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 442,046, Nov. 29, 1989, abandoned. This application Oct. 9, 1990, Ser. No. 594,481

Int. Cl.[5] C08F *30/08*

U.S. Cl. 526—279 **6 Claims**

1. A polymeric material comprising repeating units containing a silacyclobutene group with a predominantly polyacetylene chain structure, said material having a molecular weight between about 20,000 and about 200,000 grams per mole.

5,115,063

HIGH MAGNETIC STRENGTH MAGNETS CONTAINING A FLEXIBLE ACRYLATE-2-ACRYLAMIDO-2-METHYLPROPANE SULFONIC ACID SALT BINDER

Vincent M. Rasicci, Uniontown; John F. Mioduszeski, Richfield, both of Ohio, and Cecil R. Gurganus, Evansville, Ind., assignors to GenCorp Inc., Fairlawn, Ohio

Continuation of Ser. No. 448,421, Dec. 8, 1989, abandoned, which is a continuation of Ser. No. 303,618, Jan. 30, 1989, Pat. No. 4,911,855. This application Sep. 9, 1991, Ser. No. 758,230

Int. Cl.[5] C08F *8/00*

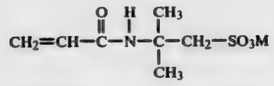
U.S. Cl. 526—287 **12 Claims**

1. A copolymer,

consisting essentially of (1) a monomer having the formula



wherein R^1 is an alkyl having from 2 to 4 carbon atoms or a corresponding methacrylate, and (2) a comonomer having the formula



wherein M is an alkaline metal of NH_4, the amount of said acrylate monomer being from about 90 percent to about 99.8 percent by weight and the amount of said comonomer being from about 0.2 percent to about 10 percent by weight, said percentages based upon the total weight of said acrylate monomer and said comonomer.

5,115,064

SOLUBLE, CROSSLINKABLE ACRYLATE COPOLYMER, PROCESSES FOR ITS PREPARATION, AND COATING AGENTS BASED ON THE ACRYLATE COPOLYMER

Werner Jung, Ascheberg, and Axel Sievers, Münster, both of Fed. Rep. of Germany, assignors to BASF Lacke & Farben AG, Münster, Fed. Rep. of Germany

Division of Ser. No. 449,295, Dec. 5, 1989, Pat. No. 4,988,760, which is a continuation of Ser. No. 57,921, May 29, 1987, abandoned. This application Dec. 31, 1990, Ser. No. 636,302

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534874

Int. Cl.[5] C08F *26/02*; C08L *39/00*

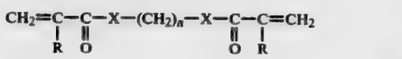
U.S. Cl. 526—301 **21 Claims**

1. A soluble addition copolymer obtained by copolymerization of a monomer having at least 2 polymerizable, olefinically unsaturated double bonds, a monomer having at least one crosslinkable group and a further polymerizable monomer, wherein the copolymer contains, as copolymerized units:

a_1) 5 to 30% by weight of a monomer having at least 2 polymerizable olefinically unsaturated double bonds selected from the group consisting of:

(1) divinyl benzene,

(2) a compound of the formula:



wherein

R represents H or methyl;

X represents O or NR', with R' equal to H, alkyl or aryl, and

n represents 2 to 8;

(3) the reaction product of a carboxylic acid compound having a polymerizable, olefinically unsaturated double bond and glycidyl acrylate or glycidyl methacrylate;

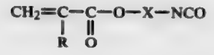
(4) the reaction product of an unsaturated mono-carboxylic acid or a poly-carboxylic acid esterified with an unsaturated alcohol;

(5) the reaction product of a polyisocyanate and an unsaturated alcohol or amine, or

(6) the diester of polyethylene glycol or polypropylene glycol having a mean molecular weight or less than 1500 and acrylic or methacrylic acid;

a_2) from 5 to 50% by weight of a monomer having a crosslinkable group selected from:

(1) a vinyl isocyanate or an isocyanatoalkyl ester of an unsaturated carboxylic acid of the formula:

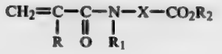


wherein

R represents H, methyl or ethyl, and X represents $-(CH_2)_{1-12}-$;

(2) the reaction product of a diisocyanate with a monomer containing an active hydrogen;

(3) a monomer of the formula:



wherein:

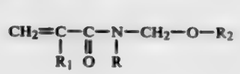
R is H or methyl;

R_1 represents H, alkyl or aryl;

R_2 represents alkyl, and

X represents —C(O)—, —Ch(R_1)—, —CH(OR)— or —CH(CO_2R_1)—;

(4) an alkoxymethylacrylamide or alkoxymethylmethacrylamide of the formula:



wherein:

R_1 represents H or methyl;

R_2 represents H or alkyl, and

R represents H, alkyl or aryl, or

(5) a monomer containing glycidyl groups; and

a_3) from 20 to 92% by weight of a further monomer having a polymerizable, olefinically unsaturated double bond, wherein at least one monomer from components a_1), a_2) and a_3) is an acrylate monomer.

5,115,065

POLYMERIC PAPERMAKING ADDITIVE

Masatomi Ogawa, and Mitsuhiro Murata, both of Ichihara, Japan, assignors to DIC-Hercules Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 914,277, Oct. 2, 1986, abandoned. This application Mar. 9, 1988, Ser. No. 169,114

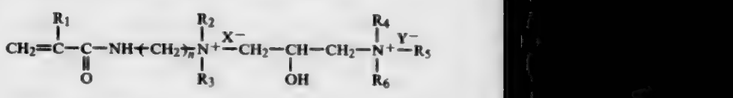
Claims priority, application Japan, Oct. 4, 1985, 60-220268

Int. Cl.[5] L08F *20/58*

U.S. Cl. 526—304 **4 Claims**

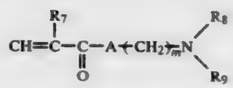
1. A papermaking additive useful for papermaking in a neutral to alkaline pH region, which comprises as an active component a water-soluble copolymer comprising as constituent monomers

(a) 0.1 to 20 mole % of a bisquaternary ammonium (meth)acrylamide represented by the general formula



wherein n represents 2, 3 or 4, R_1 represents a hydrogen atom or a methyl group, R_2 to R_6 are identical or different and each represents an alkyl group of 1 to 3 carbon atoms, and X^{31} and Y^{31} are identical or different and each represents an anion,

(b) 0.5 to 2.5 mole % of an acrylamide or acrylic ester derivative represented by the general formula



wherein m represents 2, 3 or 4, R_7 represents a hydrogen atom or a methyl group, R_8 or R_9 are identical or different and each represents an alkyl group of 1 to 3 carbon atoms, and A represents NH or an oxygen atom, its salt or mixture thereof,

(c) 50 to 99.9 mole % of acrylamide, methacrylamide or mixture thereof, and

(d) 1 to 10 mole % of an alpha,beta-unsaturated dicarboxylic acid, its salt or mixture thereof.

5,115,066

POLYSTYRENE HAVING HIGH DEGREE OF EXPANDABILITY, AND FORMULATION HAVING A HIGHLY-EXPANDABLE POLYMER THEREIN

Eugene K. Zimmermann, Hamilton Square; Bernhard Wagner, Cranbury; William E. Volz, Marlboro; William H. Harclerode, Ewing; John V. Wiman, Morristown, and John C. Voss, Trenton, all of N.J., assignors to BASF Corporation, Parsippany, N.J.

Division of Ser. No. 617,711, Nov. 26, 1990. This application Oct. 15, 1991, Ser. No. 777,869

Int. Cl.[5] C08F *12/02, 112/02*

U.S. Cl. 526—346 **14 Claims**

1. A polystyrene polymer exhibiting:
(a) a polydispersity of from about 1 to less than 2.0,
(b) a weight average molecular weight of greater than about 200,000 to about 300,000, and
(c) an M_z:M_n of from about 2 to less than about 3.0, wherein the polystyrene polymer is branched to from 0 to less than 5 weight percent.

5,115,067

MOLECULARLY ORIENTED MOLDED BODY OF ULTRA-HIGH-MOLECULAR WEIGHT ETHYLENE/α-OLEFIN COPOLYMER

Kazuo Yagi, Ohtake, and Akinori Toyota, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 179,399, Apr. 8, 1988, abandoned. This application Apr. 4, 1990, Ser. No. 504,105

Claims priority, application Japan, May 6, 1987, 62-108813; May 6, 1987, 62-108814; May 7, 1987, 62-109724; May 7, 1987, 62-109725

Int. Cl.[5] C08F *210/02*; D01F *6/00*

U.S. Cl. 526—348.1 **19 Claims**

1. A molecularly oriented molded body of a high-molecular-weight ethylene/α-olefin copolymer having an intrinsic viscosity (η) of at least 5 dl/g and such a content of an α-olefin having at least 3 carbon atoms that the number of molecules of the α-olefin is 0.1 to 15 on the average per 1000 carbon atoms, wherein the molded body shows at least two crystal fusion endothermic peaks when the measurement is conducted in the restraint state by using a differential scanning calorimeter, the molded body has at least one crystal fusion endothermic peak (Tp) at a temperature higher by at least 20° C. than the inherent crystal fusion temperature (Tm) of the high-molecular-weight ethylene/α-olefin copolymer determined as the main fusion endothermic peak at the time of the second elevation of the temperature, and the quantity of heat based on said crystal fusion endothermic peak (Tp) is a least 15% based on the total fusion heat quantity; and said molded body has an elastic modulus retention ratio of at least 90% and a tensile strength retention ratio of at least 90% when the molded body is heated at 170° C. for 5 minutes, which is obtained by melt-kneading a composition comprising the high-molecular weight ethylene-alpha-olefin copolymer and a diluent, extruding the melt to form a molded body, and drawing the obtained molded body.

5,115,068

HIGH STRENGTH LINEAR, LOW DENSITY ETHYLENE COPOLYMER

Fay W. Bailey; Elizabeth A. Benham, and Max P. McDaniel, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 249,740, Sep. 26, 1988, Pat. No. 4,966,951. This application Aug. 13, 1990, Ser. No. 565,780

Int. Cl.[5] C08F *210/14, 210/08*

U.S. Cl. 526—348.5 **17 Claims**

1. A copolymer composition of ethylene and a higher alpha-olefin comprising:
a) from 2 to 3.5 mole percent higher alpha-olefin in said copolymer; and
b) from 100 to 180 short chain branches per 10,000 backbone carbons of said copolymer; and
wherein said copolymer has a density within the range of 0.915 to 0.932 g/cc, a dart impact strength of greater than 400 g for 1 mil film, a Spencer impact value of greater than 1.2 J, a HLMI/MI ratio in the range of 70 to 150, and a heterogeneity index in the range of 10 to 20.

5,115,069

GLYCIDOXY GROUP-CONTAINING ORGANOSILICON COMPOUND

Hisao Motegi; Takeshi Sunaga, and Michio Zenbayashi, all of Gunma, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

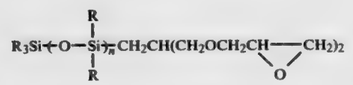
Filed Mar. 27, 1990, Ser. No. 499,740

Claims priority, application Japan, Mar. 29, 1989, 1-76913

Int. Cl.[5] C08G *77/06*

U.S. Cl. 52.8—15 **4 Claims**

1. A glycidoxy group-containing organosilicon compound represented by formula (I)



(I)

wherein R which may be the same or different each represents an alkyl group, an aryl group, or an alkenyl group, and n is 0 or an integer of 1 to 1,000.

5,115,070

POLYALKYENEOXY POLYAHLS CONTAINING HYDROGEN BONDING MOIETIES IN THEIR BACKBONE AND HYDROXYALKYL CARBAMATE END GROUPS AND A PROCESS FOR THEIR PREPARATION

Robert F. Harris, and Michael D. Joseph, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 9, 1990, Ser. No. 491,376

Int. Cl.[5] C08G *18/00, 71/00*

U.S. Cl. 528—59 **20 Claims**

1. A polyahl comprising
(1) a backbone having:
(a) at least one acyclic moiety selected from the group consisting of biuret, thiourea, dithiobiuret, amide, and thioamide; and
(b) at least two polyalkyleneoxy moieties: and
(2) at least one terminal hydroxyalkyl carbamate group.

5,115,071

HIGH PERFORMANCE POLYURETHANE COATING COMPOSITIONS AND PROCESSES FOR MAKING SAME

Jeffrey R. Quay, Kutztown; Sherri L. Bassner, Landsdale, and Thomas M. Santosusso, Macungie, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 9, 1991, Ser. No. 682,790

Int. Cl.[5] C08G *18/10*

U.S. Cl. 528—59 **31 Claims**

1. In a process for producing a polyurethane coating wherein a polyisocyanate is reacted with a long chain polyol component to produce a polyurethane prepolymer and the polyurethane prepolymer is chain extended with water, an amine or short chain diol, the improvement which comprises:
utilizing as said prepolymer, a prepolymer having an equivalent weight from 250 to 2000 grams per equivalent which is formed by reacting a polyisocyanate with a long chain polyol component having an average functionality of greater than 2.0 at a ratio of from 4 to 20 equivalents of polyisocyanate per equivalent of polyol component and removing the unreacted polyisocyanate component to a concentration of less than about 1% by weight.

5,115,072

REACTIVE RESINS WITH TERMINAL AND/OR PENDANT VINYL GROUPS

Hildeberto Nava, Jacksonville, Fla.; Robert D. Lake, Coraopolis, and Robert B. Makepeace, Pittsburgh, both of Pa., assignors to Reichhold Chemicals, Inc., Durham, N.C.

Filed Sep. 5, 1990, Ser. No. 578,064

Int. Cl.[5] C08G *18/70, 18/72, 18/81*

U.S. Cl. 528—67 **26 Claims**

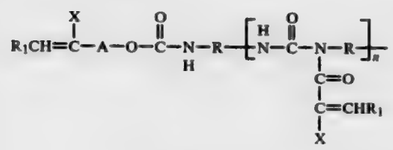
1. A method for forming a copolymerizable thermosetting resin with pendant and terminal vinyl groups comprising:
(a) reacting at least two diisocyanates, which have the structural formula:

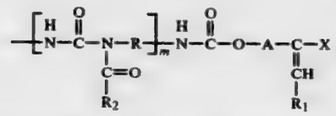
OCN—R—NCO

wherein R represents a difunctional aliphatic, cycloaliphatic, aromatic, or araliphatic radical having from about 2 to 25 carbon atoms, and free of any group which can react with isocyanate groups to form a polycarbodiimide intermediate:

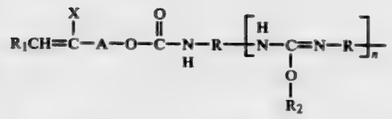
OCN—R—N=C=N—R]$_n$NCO

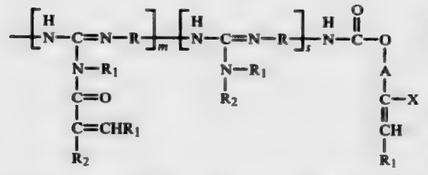
(b) and further reacting said polycarbodiimide intermediate with a saturated or unsaturated monomer having an active hydrogen selected from the group consisting of carboxylic, amino, alcohol or thio groups, to form said copolymerizable thermosetting resin with pendant and terminal vinyl groups as follows:



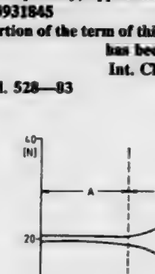


wherein n+m independently=0 to 25, and n+m are at least 1; or





wherein n+m+s=0 to 25, and n+m+s are at least 1;
X represents hydrogen, chlorine, bromine, an aliphatic, cycloaliphatic, aromatic, or araliphatic radical containing from about 1 to 12 carbon atoms;
R represents a difunctional aliphatic, cycloaliphatic, aromatic, or araliphatic radical having from about 2 to 25 carbon atoms, and free of any group which can react with isocyanate groups;
R_1 represents hydrogen, an aliphatic, cycloaliphatic, aromatic, araliphatic radical having from about 1 to 12 carbon atoms;
R_2 represents hydrogen or a monovalent radical selected from the group consisting of aliphatic, cycloaliphatic, araliphatic, aromatic, alkyl substituted aromatic, and alkyl substituted cycloaliphatic, which contains one or two double bonds; and
A represents a divalent group selected from the group consisting of:



wherein, R_4 is a divalent hydrocarbon radical that is aliphatic or alicyclic and y is an integer from 1–8.

5,115,073

RAPIDLY CRYSTALLIZING POLYURETHANE SYSTEMS

Walter Meckel, Neuss; Eduard Hänsel, Wuppertal-Elberfeld; Güter Arend, Dormagen, and Klaus König, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

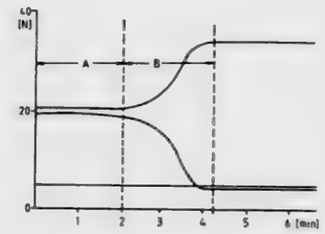
Filed Sep. 11, 1990, Ser. No. 580,717

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1989, 3931845

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

Int. Cl.[5] C09J *3/14*

U.S. Cl. 528—83 **9 Claims**



1. A polyurethane system containing isocyanate groups prepared by reacting:
A) 70 to 98 parts by weight of at least one polyester diol having a melting point of 30° C. to 60° C. and a molecular weight of a 800 to 8,000,
B) 2 to 30 parts by weight of at least one polyester diol having a melting point of 65° C. to 150°C. and a molecular weight of 600 to 8,000, and
C) no more than 1 mole of a diol having a molecular weight of less than 600 per moles of A) plus B), with,
D) at least one organic polyisocyanate, the ratio of isocyanate groups to hydroxyl groups is between 3:1 and 1.2:1.

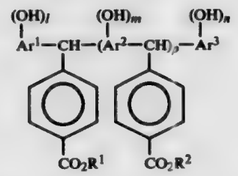
5,115,074

EPOXY COMPOUND, PRECURSOR THEREOF, PRODUCTION PROCESSES THEREOF, USE OF THE PRECURSOR AND CURED PRODUCT OF THE EPOXY COMPOUND

Hiroyuki Umetani; Shunichi Matsumura, and Takeyoshi Yamada, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 6, 1990, Ser. No. 623,025
Claims priority, application Japan, Dec. 6, 1989, 1-315362
Int. Cl.[5] **C08G** *59/00*
U.S. Cl. 528—98 **17 Claims**

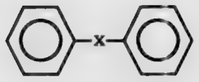
1. A compound selected from a hydroxycarboxylic acid or its ester of the formula (I)



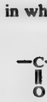
(I)

wherein:

Ar^1, Ar^2 and Ar^3 may be same or different and each independently represents a benzene skeleton, a naphthalene skeleton or a skeleton of the formula



in which X is a bond, —O—, —S—, $—SO_2—$,



or an alkylidene group having 1 to 3 carbon atoms, provided that these skeletons may be substituted with a halogen atom or an alkyl group having 1 to 5 carbon atoms and that the total number of carbon atoms of each of Ar^1, Ar^2 and Ar^3 is not more than 20,

R^1 and R^2 may be same or different and each independently represents a hydrogen atom or an alkyl group having 1 to 10 carbon atoms,

q is a number of 0 to 20, and

each of l, m and n is a number of 1 to 3.

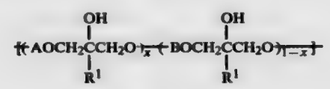
5,115,075

AMIDE AND HYDROXYMETHYL FUNCTIONALIZED POLYETHERS AS THERMOPLASTIC BARRIER RESINS

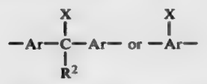
David J. Brennan; Jerry E. White; Anthony P. Haag, and Shari L. Kram, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 8, 1990, Ser. No. 520,689
Int. Cl.[5] **C08G** *59/00, 65/08, 65/14*
U.S. Cl. 528—99 **10 Claims**

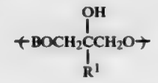
1. A thermoplastic polyether having repeating units represented by the formula:



wherein each A is individually a divalent aromatic moiety represented by one of the formulae:



wherein Ar is arylene, X is amido, N-substituted amido or hydroxyalkyl and R2 is hydrogen or hydrocarbyl or substituted hydrocarbyl wherein the hydrocarbyl is a monovalent hydrocarbon selected from alkyl, cycloalkyl, aralkyl or aryl and the substitutent (s) is (are) a monovalent moiety which is inert in the reactions used to prepare the copolyether; each B is individually a divalent aromatic moiety different from A; R1 is hydrogen or a monovalent hydrocarbon; and X is a number sufficient to reduce the oxygen permeability of the polyether to a value which is measurably lower than that of a polyether consisting of repeating units represented by the formula:



wherein B and R1 are as previously defined.

5,115,076

AROMATIC COPOLYETHER KETONES OF DIHYDROXYDIPHENYL ALKANES AND PHTHALEINS AND A PROCESS FOR THEIR PRODUCTION

Knud Reuter, Krefeld; Wolfgang Jilge, Bergisch-Gladbach; Bernd Pittel, Heinsberg, and Günther Weymans, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 21, 1990, Ser. No. 526,446
Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917628
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Int. Cl.[5] **C08G** *8/02, 14/00*
U.S. Cl. 528—125 **6 Claims**

1. Aromatic polyether ketone containing the following recurring structural unit:

—O—E—O—E′— (VIII)

in which —E— is a bivalent residue of an aromatic ketone corresponding to formula (IXa)



(IXa)

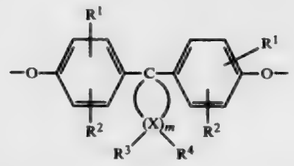
in which

Ar and Ar′ are the same or different and represent bivalent aromatic radicals containing from 6 to 50 carbon atoms

and in which

—O—E—O— (Xa)

is a bivalent diphenolate residue, wherein from 5 to 90 mol-% of the diphenolate residues of formula (Xa) are those corresponding to formula (Ia)



(Ia)

in which

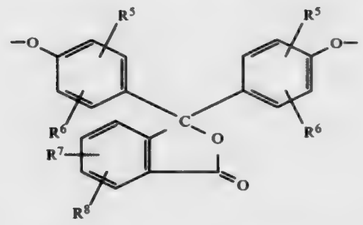
R^1 and R^2 independently of one another represent hydrogen, halogen, C_{1-8} alkyl, C_{5-6} cycloalkyl, C_{6-10} aryl and C_{7-12} aralkyl,

m is an integer of from 4 to 7,

R^3 and R^4 are individually selected for each X and independently of one another represent hydrogen or C_{1-6} alkyl and

X represents carbon, with the proviso that, at least one atom X, both R^3 and R^4 are alkyl,

10 to 95 mol-% of the diphenolate residues of formula (Xa) are those corresponding to formula (IIa)



(IIa)

in which R^5 to R^8 have the same meaning as defined above R^1 and R^2, but are independent of R^1 and R^2, and 0 to 85 mol-% of the diphenolate residues of the formula (Xa) are residues of other diphenols.

5,115,077

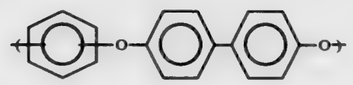
POLYETHERIC COPOLYMERS, PROCESS FOR PREPARING THE SAME COMPOSITIONS CONTAINING THE SAME, THEIR MOLDED PRODUCTS, AND THEIR USE

Shigeru Matsuo; Shigeru Murakami; Shinji Chino, and Naoto Yako, all of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Dec. 13, 1989, Ser. No. 449,192
Claims priority, application Japan, Dec. 14, 1988, 63-315679; Feb. 21, 1989, 1-40559; Feb. 21, 1989, 1-40560; Apr. 18, 1989, 1-98397; Jun. 15, 1989, 1-152520; Jul. 15, 1989, 1-183186; Aug. 7, 1989, 1-204325; Aug. 9, 1989, 1-206328; Sep. 19, 1989, 1-243066; Oct. 4, 1989, 1-259090; Oct. 9, 1989, 1-263751; Oct. 9, 1989, 1-263752; Oct. 11, 1989, 1-264726; Oct. 20, 1989, 1-273416
Int. Cl.[5] **C08G** *8/02, 65/40, 2/00, 12/00*
U.S. Cl. 528—125 **33 Claims**

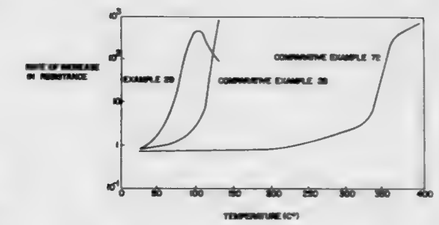
1. A polyetheric copolymer comprising:

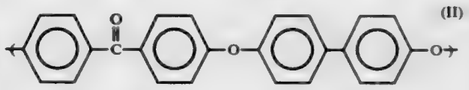
benzonitrile recurring units as represented by the following general formula (I):



(I)

and benzophenone recurring units as represented by the following general formula (II):





(II)

having a molar ratio of the recurring unit (I) to a sum of the recurring units (I) and (II) in the range from 0.15:1 to 0.40:1, and having a melt viscosity (zero shear viscosity) at 400° C. in the range from 500 to 100,000 poise.

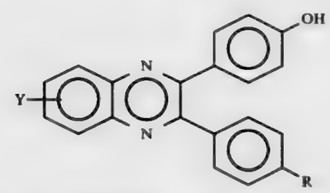
5,115,078

SELF POLYMERIZABLE PHENYLQUINOXALINES, THEIR PREPARATION AND USE IN POLYPHENYLQUINOXALINE HOMOPOLYMERS AND COPOLYMERS

Frank W. Harris, Akron, and Joseph E. Korleski, Massillon, both of Ohio, assignors to The University of Akron, Akron, Ohio

Continuation of Ser. No. 368,572, Jun. 20, 1989, Pat. No. 5,030,704. This application Feb. 4, 1991, Ser. No. 635,487
The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.
Int. Cl.[5] **C08G** *73/06*
U.S. Cl. 528—125 **8 Claims**

1. A self polymerizable phenylquinoxaline comprising a compound of formula (I):



(I)

where Y is selected from the group consisting of F, Cl and NO_2 and Y is in either the 6 or 7 position of the quinoxaline ring system and where R is selected from the group consisting of H, an alkyl group having from 1 to about 16 carbon atoms, a carbocyclic aromatic group, a heterocyclic aromatic group, or an alkoxy group having from 1 to 8 carbon atoms.

5,115,079

CURED BISPHENOL ETHER PRODUCTS

Pui K. Wong, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 471,464, Jan. 29, 1990, Pat. No. 5,041,600. This application Apr. 26, 1991, Ser. No. 691,757
Int. Cl.[5] **C08G** *75/02*
U.S. Cl. 528—171 **5 Claims**

1. The cured product obtained by heating an arylcyclobutenealkyl diether of a di(hydroxyphenyl) oligomer of a

plurality of aromatic rings at least two of which are connected by a sulfone moiety to a temperature above about 150° C.

5,115,080

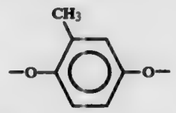
THERMOTROPIC LIQUID CRYSTALLINE POLYESTERS FROM 2-METHYLHYDROQUINONE

Marion G. Waggoner, Hockessin, and Michael R. Samuels, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 24, 1990, Ser. No. 602,853
Int. Cl.[5] C08G *63/00, 63/02;* C08K *3/40;* C08J *67/00*
U.S. Cl. 528—190 **16 Claims**

1. A thermotropic liquid crystalline polyester composition consisting essentially of recurring units of

(a) structure (I),



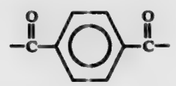
(I)

(b) structure (II),



(II)

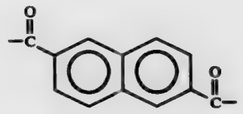
(c) structure (III),



(III)

and

(d) structure (IV),



(IV)

wherein the molar ratio of (I):(II) ranges from 95:5 to 70:30, wherein the molar ratio of (III):(IV) ranges from 75:25 to 30:70, and further wherein the molar ratio of the total of (I) and (II) to the total of (III) and (IV) is substantially 1:1.

5,115,081

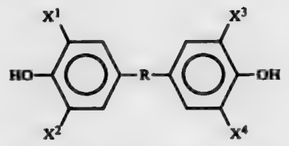
PROCESS FOR PRODUCING COPOLYCARBONATE OLIGOMER FROM DICHLOROFORMATE

Mituhiko Masumoto, Osaka, Japan, assignor to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Division of Ser. No. 453,168, May 26, 1988, which is a continuation of Ser. No. 196,891, May 26, 1988, abandoned. This application Dec. 3, 1990, Ser. No. 620,797
Claims priority, application Japan, May 27, 1987, 62-127988
Int. Cl.[5] C08G *64/28*
U.S. Cl. 528—196 **3 Claims**

1. A process for producing an aromatic copolycarbonate oligomer having an average degree of copolymerization of from 2 to 20 by an interfacial process, which comprises:

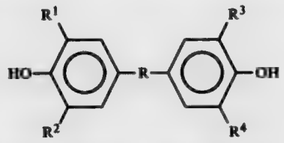
(a) adding a catalyst for chloroformate production to a tetrahalogenated bisphenol represented by formula (I):



(I)

wherein R represents a straight or branched chain or cyclic alkylidene group, an aryl-substituted alkylene group, an arylene group, —O—, —CO—, —S—, —SO— or —SO_2—; and X^1, X^2, X^3, and X^4 each represents a bromine atom or a chlorine atom, in an amount of from 1×10^{-4} to 1×10^{-1} mol per mol of the bisphenol and consecutively adding phosgene to effect reaction while controlling pH of the reaction system to between 10 and 12 by consecutive addition of a basic inorganic compound to the reaction system, thereby forming a dichloroformate monomer solution, and then

(b) adding a bisphenol represented by formula (II):



(II)

wherein R is the same as defined above, and R^1, R^2, R^3, and R^4 each represents a hydrogen atom or a lower alkyl group, and a catalyst for polymerization to the dichloroformate monomer solution obtained in step (a) above to effect reaction, thereby forming the aromatic copolycarbonate oligomer.

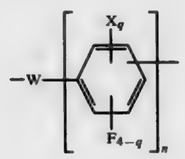
5,115,082

FLUORINATED POLY(ARYLENE ETHER)

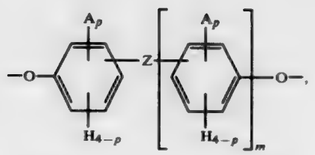
Frank W. Mercer, Belmont, and Richard C. Sovish, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 510,386, Apr. 17, 1990, abandoned, and a continuation-in-part of Ser. No. 510,353, Apr. 17, 1990, abandoned. This application Sep. 17, 1990, Ser. No. 583,899
Int. Cl.[5] C08G *65/40*
U.S. Cl. 528—219 **13 Claims**

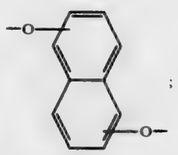
1. A fluorinated poly(arylene ether) comprising a repeat unit of the structure



wherein —W— is

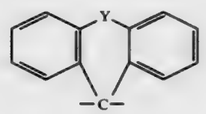


, or



;

wherein independently each —A is —$CH_2CH{=}CH_2$ or —A is —F, —Cl, —Br, —CF_3, —CH_3, or —C_6H_5; p is 0, 1, or 2; —Z— is —$C(CH_3)_2$—, —$C(CF_3)_2$—, —O—, —S—, —SO_2—, —CO—, —$P(C_6H_5)$—, $C(CH_3)(C_6H_5)$, —$C(C_6H_5)_2$—, —$(CF_2)_{1\text{-}6}$—, or



wherein

—Y— is —O— or —Y— is a direct bond;

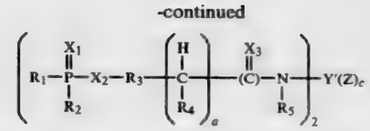
and m is 0, 1, or 2;

independently each —X is —$CH_2CH{=}CH_2$ or X is —H, —Cl, —Br, —CF_3, —CH_3, or —C_6H_5;

q is 0, 1, or 2; and n is 1 or 2;

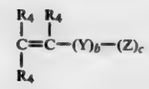
provided that when —Z— is —$C(CH_3)_2$—, —S—, or —SO_2— and m is 1, then p and q are not both 0.

-continued



(II)

(B-2) an acid, or an ester, a metal salt or ammonium salt of a sulfo compound represented by the formula:



(III)

(B-3) an acid, or an ammonium or metal salt of a reaction product of at least one amine and the sulfo compound of (B-2); and mixtures thereof;

where in Formulae I and II

R_1 and R_2 are each independently hydrocarbyl or hydrocarbyloxy or hydrocarbylthio groups;

where in Formulae I, II and III

each X_1 and X_2 is independently sulfur or oxygen;

R_3 is a divalent hydrocarbyl group;

each R_4 and R_5 is independently a hydrogen or hydrocarbyl group;

a is 0 or 1;

b is 0 or 1;

c is 1 or 2;

Y is a divalent or trivalent hydrocarbyl group or —$C_{(3)}NR_5Y'$;

X_3 is sulfur or oxygen;

Y' is a divalent, trivalent or tetravalent hydrocarbyl group provided that Y' is not divalent in Formula II;

Z is —S(O)OH, or —$S(O)_2$OH; and

a member selected from the group consisting of (C), (D) and (E), wherein:

(C) is at least one aminoplast co-reactant;

(D) is at least one overbased or gelled material composition; and

(E) is a mixture of (C) and (D).

5,115,083

CURABLE AMINOPLAST COMPOSITIONS AND CATALYSTS FOR CURING SAME

Carlos A. Piedrahita, Mentor; Robert E. Quinn, Cleveland, and John S. Perz, Mentor, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

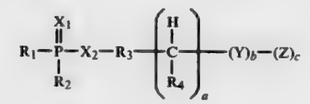
Division of Ser. No. 432,233, Nov. 6, 1989, Pat. No. 5,025,085. This application Apr. 15, 1991, Ser. No. 686,058
Int. Cl.[5] C08L *61/28*
U.S. Cl. 528—230 **59 Claims**

1. A curable composition comprising:

(A) at least one aminoplast resin;

(B) an amount effective to cure the composition of at least one catalyst selected from the group consisting of

(B-1) an acid, or an anhydride, ester, ammonium salt or metal salt of the acid that is represented by one of the formulae



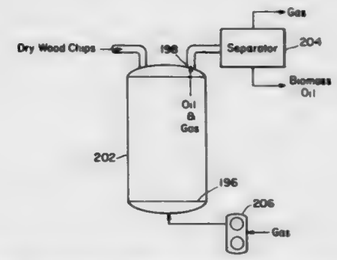
(I)

5,115,084

METHOD FOR CONTROLLING OIL RESERVOIR PERMEABILITY USING BIOMASS OIL

D. Andrew Himmelblau, Lexington, Mass., assignor to Biocarbons Corporation, Woburn, Mass.

Continuation-in-part of Ser. No. 382,232, Jul. 19, 1989, Pat. No. 5,034,498. This application Jan. 29, 1991, Ser. No. 647,588
Int. Cl.[5] C08G *8/20*
U.S. Cl. 528—230 **28 Claims**



1. A method for controlling the permeability of a petroleum-bearing subterranean formation, comprising:

producing viscous biomass oil by thermal decomposition of lignocellulosic material; and

injecting at least a fraction of said biomass oil into the petroleum-bearing formation to decrease the permeability of at least some of said formation for altering flow paths through the formation to increase petroleum yield from the formation.

5,115,085

PROCESS FOR THE PREPARATION OF POLYESTER RESIN

Jürgen Sadlowski, Münster; Manfred Dangschat, Drensteinfurt; Horst Diefenbach, Nottuln; Theo Laser, Münster, and Deiter Schmitt, Weisenheim, all of Fed. Rep. of Germany, assignors to Max- BASF Lacke+Farben Aktiengesellschaft[DE/DE], Munster, Fed. Rep. of Germany

PCT No. PCT/EP89/00162, § 371 Date Nov. 15, 1990, § 102(e) Date Nov. 15, 1990, PCT Pub. No. WO89/09794, PCT Pub. Date Oct. 19, 1989

PCT Filed Feb. 22, 1989, Ser. No. 598,610

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1988, 3812366

Int. Cl.[5] C08G *63/78*

U.S. Cl. 528—272 **7 Claims**

1. Process for the preparation of polyester and alkyd resins from bifunctional and/or polyfunctional carboxylic acids and/or carboxylic anhydrides and/or carboxylic acid esters and from bifunctional and/or polyfunctional alcohols, in which the reaction is carried out with the application of pressure in stirred kettle reactors which are operated discontinuously and equipped with rectifying columns, wherein

A) the reaction temperature is between 180° and 320° C.

B) during the entire process an entraining agent is introduced into the reaction mixture below surface level by means of a delivery device in order to improve the transport of the products of the condensation reaction,

C) the condensation reaction is carried out under an absolute pressure between 1.5 and 10 bar which is kept constant until at least the time when the reaction rate is at the maximum (reaction phase I) and

D) the pressure is then reduced to atmospheric pressure at a gradient of −0.05 bar/hour to −5 bar/hour (reaction phase II),

E) the reaction is completed under normal pressure while the reaction temperature is kept constant and the admission of entraining agent into the reaction mixture and to the head of the column is maintained (reaction phase III).

5,115,086

PRIMER COMPOSITION FOR IMPROVING THE BONDING OF A URETHANE ADHESIVE

Harry W. S. Hsieh, Edison, N.J., assignor to Essex Specialty Products, Inc., Clifton, N.J.

Filed Feb. 6, 1990, Ser. No. 475,669

Int. Cl.[5] C08G *63/20*; C09D *167/02*

U.S. Cl. 528—272 **23 Claims**

1. A primer which comprises a solution of:

(a) a polyester resin of a carboxylic acid and a glycol;

(b) a polymethylene poly(phenyl isocyanate), diphenylmethane diisocyanate, or mixture thereof;

in a volatile solvent, wherein the weight ratio of (a):(b) is in the range of from about 0.25:1.0 to 1.5:1.0.

5,115,087

COREACTIVE IMIDO OLIGOMER BLENDS

Clyde H. Sheppard, Bellevue, Wash., and Hyman R. Lubowitz, Rolling Hills Estates, Calif., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 29, 1988, Ser. No. 174,747

Int. Cl.[5] C08G *73/10*

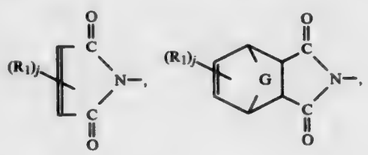
U.S. Cl. 528—322 **45 Claims**

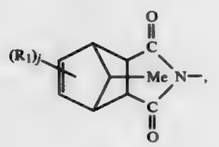
1. A coreactive oligomer blend comprising a mixture of a first oligomer of the general formula: wherein

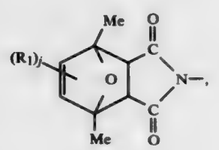
i=1 or 2;

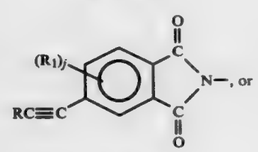
A=a hydrocarbon backbone having an average molecular weight of at least about 10,000;

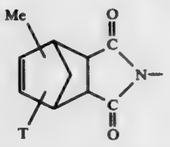
D=an unsaturated hydrocarbon residue including a segment selected from the group consisting of:











R is hydrogen, lower alkyl, or phenyl;

j is 0, 1, or 2;

Me is methyl;

T is allyl or methallyl;

G is $-SO_2-$, $-S-$, $-O-$, $-CH_2-$, $-CHR-$, $-CR_2-$, or $-CO-$; and

R_1 is lower alkyl, lower alkoxy, ayl, aryloxy, substituted alkyl, substituted aryl, halogen, or mixtures thereof:

and a second oligomer of the general formula:

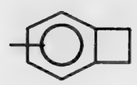
$$Z_k-B-Z_k$$

where

k is 1 or 2;

B is a hydrocarbon backbone;

Z is a hydrocarbon residue including a segment having the formula



5,115,088

MOLDING COMPOSITION COMPOSED OF A THERMOPLASTICALLY PROCESSABLE AROMATIC POLYAMIDE

Günter Poll, Marl; Martin Bartmann, Recklinghausen, and Jürgen Finke, Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 24, 1990, Ser. No. 603,038

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1989, 3935468

Int. Cl.[5] C08G *69/28, 8/02, 63/00*

U.S. Cl. 528—336 **18 Claims**

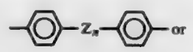
1. A molding composition comprising thermoplastically processable aromatic polyamide derived from the following monomers:

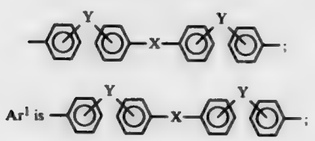
Component (A) HOOC—Ar—COOH

Component (B) $H_2N-Ar'-NH_2$

Component (C) R'—COOH

wherein the symbols have the meanings which follow Ar is 1,3- or 1,4-phenylene; 1,4-, 1,5-, 2,6- or 2,7-naphthylene;





Ar^1 is

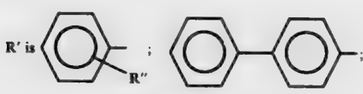
X=$-SO_2-$; $-CO-$;

Y=$-O-$; $-S-$;

Z=$-O-$; $-S-$; $-SO_2-$; $-CO-$; $-CR_2-$;

R=$-H$; C_1–C_4-alkyl;

R' is



1- or 2-naphthyl;

R''=$-H$; C_1–C_4-alkyl; halogen;

n=0; 1,

where the component C is present in said aromatic polyamide in an amount of from 0.01 to 10 mol % relative to the sum of components A and B.

5,115,089

PROCESSES FOR PREPARATION OF POLYIMIDE-ISOINDROQUINAZOLINEDIONE AND PRECURSOR THEREOF

Masatoshi Yoshida, Oyama; Katsuji Shibata, Shimotsuma; Mitsumasa Kojima; Hidetaka Satou, both of Hitachi; Toshihiko Kato; Yasuo Miyadera, both of Tsukuba, and Masami Yusa, Shimodate, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1988, Ser. No. 245,157

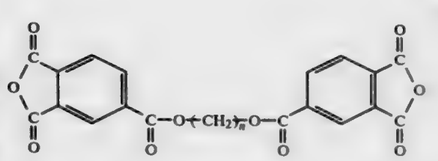
Claims priority, application Japan, Sep. 17, 1987, 62-233066

Int. Cl.[5] C08G *69/26, 8/02, 77/06, 75/00*

U.S. Cl. 528—353 **13 Claims**

1. A process for the preparation of a polyimide-isoindroquinazolinedione precursor which comprises reacting

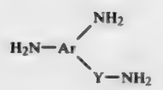
(a) a tetracarboxylic acid dianhydride containing at least 50% by mol of the dianhydride represented by the general formula (I):



(I)

wherein n represents an integer of 2–16,

(b) a diaminoamide compound represented by the general formula (II):



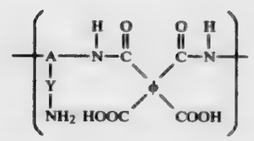
(II)

wherein Ar represents an aromatic group, Y represents $-SO_2-$ or



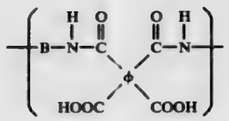
and at least the Y—NH_2 group and at least one —NH_2 group are bonded to carbon atom adjacent to the Ar, and

(c) an another diamine; said polyimide-isoindroquinazolinedione precursor having the constitutional units represented by the general formula (IV):



(IV)

wherein Y is same as in the general formula (II), A is the residual group of the diaminoamide compound and ϕ is the residual group of the tetracarboxylic acid dianhydride and by the general formula (V):



(V)

wherein B is the residual group of the another diamine and ϕ is the residual group of the tetracarboxylic acid anhydride.

5,115,090

VISCOSITY STABLE, ESSENTIALLY GEL-FREE POLYAMIC ACID COMPOSITIONS

Krishna G. Sachdev, 14 Tanglewood Dr., Wappingers Falls, N.Y. 12590; John P. Hummel, P.O. Box 120, Verbank, N.Y. 12585; Ranee W. Kwong, 31 Mina Dr., Wappingers Falls, N.Y. 12590; Robert N. Lang, R.D. #2, Box 286, North Avenue, Pleasant Valley, N.Y. 12569; Leo L. Linehan, 6 Schofield Pl., Beacon, N.Y. 12508, and Harbans S. Sachdev, 14 Tanglewood Dr., Wappingers Falls, N.Y. 12590

Filed Mar. 30, 1990, Ser. No. 503,401

Int. Cl.[5] C08G *69/26, 69/28*

U.S. Cl. 528—353 **13 Claims**

1. An improved polyamic acid composition comprising the viscosity-stable essentially gel-free reaction product N-methyl-2-pyrrolidone as a solvent with a stoichiometry of 100 mole parts of a linear aromatic diamine with from 97 to 99.5 mole parts of an aromatic dianhydride and a sufficient amount of an aromatic anhydride to react with the residual amine sites and stabilize the composition.

5,115,091

POLY(ARYLENE THIOETHER) COPOLYMERS AND PROCESS FOR PRODUCING THEREOF

Tomoji Tamai, Mie; Tetsuya Asahi, Chiba, and Yozo Kondo, Mie, all of Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Filed Jul. 7, 1989, Ser. No. 376,444

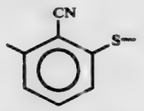
Claims priority, application Japan, Jul. 8, 1988, 63-168799

The portion of the term of this patent subsequent to Nov. 27, 2007, has been disclaimed.

Int. Cl.[5] C08G *75/10, 75/02*

U.S. Cl. 528—388 **3 Claims**

1. A poly(arylene thioether) copolymer wherein the copolymer backbone, consists of the following two repeating units of the following formulae:



(I)

and

the number of the repeating units of formula (I) in the copolymer molecule being m, the number of the repeating units of formula (II) in the copolymer molecule being n, the value of m/(m+n) ranging from 0.01 to 0.99, said copolymer having a reduced viscosity (sp/c) of at least 0.2 dl/g as measured using a 0.5 g/d solution of the copolymer in p-chlorophenol at 120° C.

5,115,092

POLY(ARYLENE SULFIDE) SHEET

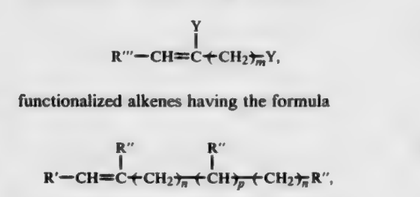
Toshiya Mizuno; Yoshikichi Teramoto; Takeshi Saito, all of Tsuchiura, and Juichi Wakabayashi, Ibaraki, all of Japan, assignors to Kureha Kagaku Kogyo, Japan

Continuation of Ser. No. 291,201, Dec. 28, 1988, Pat. No. 4,976,908. This application Apr. 19, 1990, Ser. No. 511,133

Claims priority, application Japan, Dec. 28, 1987, 62-329542

Int. Cl.[5] B29C *71/02*

U.S. Cl. 528—388 **1 Claim**



1. In an unstretched poly(arylene sulfide) sheet excellent in planarity and smoothness, said sheet being formed of a composition consisting essentially of a substantially linear, high molecular poly(aryldene sulfide) having a melt viscosity of at least 1,000 poises, the improvement wherein:

(a) said sheet has an elongation at break of at least 10% at 23° C. and a Young's modulus of at least 5 kg/mm^2 at 200° C.;

(b) per area of 1 cm×2 cm on at least one of the surfaces of the sheet, said sheet contains not more than 1 convexity or concavity whose angle of elevation or depression is at least 2° and whose height ofr depth is at least 10 μm; and

(c) the sheet is non-locally crystallized and has a degree of crystallization of at least 20 weight percent.

5,115,093

PROCESS FOR PREPARING ARYLENE SULFIDE POLYMERS IN THE PRESENCE OF FUNCTIONALIZED OLEFIN

Carlton E. Ash, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 23, 1990, Ser. No. 617,228

Int. Cl.[5] C08G *75/16*

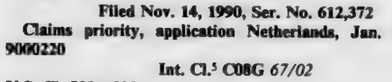
U.S. Cl. 528—388 **16 Claims**

1. A process for preparing arylene sulfide polymers comprising the steps of:

(a) contacting at least one sulfur source, at least one cyclic organic amide, and at least one dihaloaromatic compound to form a polymerization mixture,

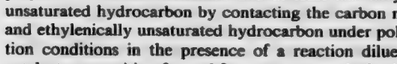
(b) subjecting said polymerization mixture to polymerization conditions of temperature and time sufficient to form said arylene sulfide polymer, and

(c) recovering said arylene sulfide polymer, wherein said process is conducted in the presence of an olefin selected from the group consisting of alkenes having 2 to about 20 carbon atoms, dienes having 2 to about 20 carbon atoms, functionalized alkenes having the formula



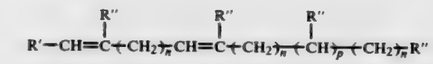
(I)

functionalized alkenes having the formula

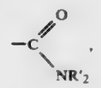


(II)

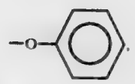
and functionalized dienes having the formula



wherein R′ is selected from the group consisting of hydrogen and alkyl groups having 1 to about 10 carbon atoms, R″ is selected from the group consisting of —H, —CN, —NR′$_2$, —NO$_2$, —aryl,



—OR′,



—PO$_3$H, —SO$_3$H, —SO$_2$R′,



—PR′$_2$,



and —SiR′$_3$, R‴ is selected from the group consisting of —H and —CH$_3$, Y is selected from the group consisting of —H and —COO$^-$ wherein COO$^-$ is obtained by addition of the corresponding carboxylate salt or is prepared in-situ by reaction of the free carboxylic acid with a stoichiometric amount of a base, m is 0 or 1, n is 0 to 10, p is 0 or 1 and Y, n and R″ in any of said formulas are the same or different, and wherein the total number of carbon atoms in said functionalized alkene of formula (II) and said functionalized diene is from 2 to about 20 and the total number of carbon atoms in said functionalized alkene of formula (I) is 3 or 4.

5,115,094

POLYMERIZATION OF CO/OLEFIN WITH MOLAR RATIO OF NON HYDROHALOGENIC ACID TO PALLADIUM COMPOUND

Barend Mastenbroek, and Leonardus Petrus, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 14, 1990, Ser. No. 612,372

Claims priority, application Netherlands, Jan. 30, 1990, 9000220

Int. Cl.[5] C08G *67/02*

U.S. Cl. 528—392 **7 Claims**

1. In the continuous process of producing a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting the carbon monoxide and ethylenically unsaturated hydrocarbon under polymerization conditions in the presence of a reaction diluent and a catalyst composition formed from a compound of palladium, a non-hydrohalogenic acid having a pKa below 2 and a bidentate ligand of phosphorus, the improvement wherein the catalyst composition comprises a molar ratio of the non-hydrohalogenic acid to palladium compound below 6.

5,115,095

EPOXY FUNCTIONAL ORGANOSILICON POLYMER

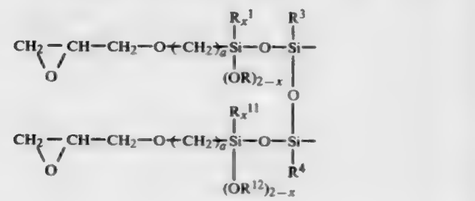
Edward D. Babich, Chappaqua, N.Y.; Jeffrey D. Gelorme, Plainville, Conn.; Michael Hatzakis, Chappaqua, N.Y.; Jane M. Shaw, Ridgefield, Conn.; Kevin J. Stewart, Lake Peekskill, and David F. Witman, Pleasantville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

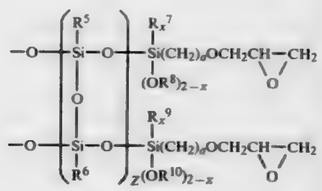
Division of Ser. No. 419,047, Oct. 10, 1989, Pat. No. 5,059,512. This application Apr. 11, 1991, Ser. No. 683,713

Int. Cl.[5] C08F *283/00*

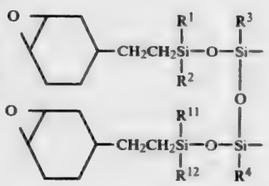
U.S. Cl. 525—474 **6 Claims**

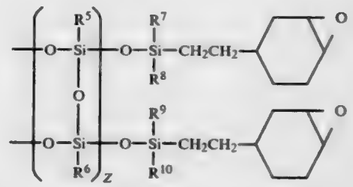
1. An epoxy functional organosilicon polymer having a structural formula selected from the group:





or





wherein each R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11} and R^{12} radical is individually selected from the group of hydrogen, monovalent hydrocarbon radicals, epoxy groups, mercapto radical, or cyanoalkyl radicals; each a is an integer from 0 to 12, Z is an integer from 1 to 10^2 and each x is an integer from 0 to 2.

5,115,096

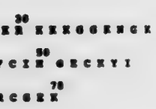
AMPHIREGULIN: A BIFUNCTIONAL GROWTH MODULATING GLYCOPROTEIN

Mohammed Shoyab, Seattle; Vicki L. McDonald, Kent; James G. Bradley, Woodinville, and Gregory D. Plowman, Seattle, all of Wash., assignors to Oncogen, Seattle, Wash.

Continuation-in-part of Ser. No. 181,884, Apr. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 148,327, Jan. 25, 1988, abandoned. This application Jan. 17, 1989, Ser. No. 297,816

Int. Cl.[5] C07K *9/00*

U.S. Cl. 530—322 **23 Claims**



1. A protein having an amino acid sequence:

1 10 20
VVKPPQNKTE SENTSDKPKR KKKGGKNGK

30 40 50
NR R NRKKKNPC NAEFQNFCIH GECKYI

60 70 78
EHLE AVTCKCQQEY FGERCGEK

5,115,097

SYNTHETIC PEPTIDE FROM THE CARBOXY TERMINAL OF HUMAN MN-SUPEROXIDE DISMUTASE

Taizo Uda; Akira Takeyasu; Tetsuo Kawaguchi, and Yukio Nakajima, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Aug. 17, 1989, Ser. No. 395,010

Claims priority, application Japan, Sep. 21, 1988, 63-234824

Int. Cl.[5] A61K *37/02*; C07K *7/06, 7/08, 7/10*

U.S. Cl. 530—326 **2 Claims**

1. Monomeric synthetic peptide and dimeric synthetic peptide consisting essentially of an amino acid sequence represented by the formula:

X-Asn-Val-Thr-Glu-Arg-Tyr-Met-Ala-Cys-Lys-Lys

wherein X represents a residue comprising a 0-to-10-amino-acid sequence from the carboxy end of human Mn-SOD; and Asn is aspartic acid; Val is valine, Thr is threonine, Glu is glutamic acid, Arg is arginine, Tyr is tyrosine, Met is methionine, Ala is alanine, Cys is cysteine and Lys is lysine.

5,115,098

END-BLOCKED PEPTIDES INHIBITING BINDING CAPACITY OF GP120

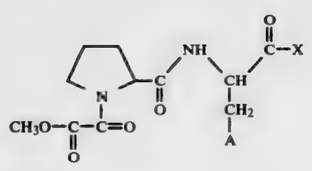
Steven J. Burakoff, Newton, and Stuart L. Schreiber, Boston, both of Mass., assignors to President and Fellows of Harvard College, Cambridge and Dana-Farber Cancer Institute, Inc., Boston, both of, Mass.

Filed Feb. 28, 1990, Ser. No. 486,522

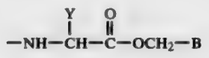
Int. Cl.[5] A61K *37/02*; C07K *5/06, 5/08*; ,

U.S. Cl. 530—331 **4 Claims**

1. A C- and N-blocked prolyl-alanine compound having the structure



in which X is —OCH_2—B or



in which A and B are hydrogen or phenyl and Y is isobutyl.

5,115,099

SUBSTRATES FOR DETERMINATION OF ENZYME ACTIVITY AND INTERMEDIATES FOR SYNTHESIS OF THE SUBSTRATES AS WELL AS PROCESS FOR PRODUCING THE INTERMEDIATES

Katsumasa Kuroiwa; Hitoshi Matsuura; Katsuhiro Katayama; Shuichi Nakatsuyama, all of Koriyama; Takeshi Nagasawa, Urawa, and Koji Eado, Koriyama, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

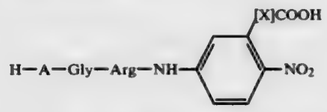
Filed Jun. 13, 1989, Ser. No. 365,418

Claims priority, application Japan, Jun. 14, 1988, 63-146089; Jul. 14, 1988, 63-173788

Int. Cl.[5] C07K *5/08, 1/06*; C12Q *1/38*

U.S. Cl. 530—331 **6 Claims**

1. A substrate for determination of enzyme activity represented by the following formula



wherein A represents D-Glu(OR or NR'R''), wherein OR or NR'R'' is a group binding to γ-carboxyl group of glutamic acid; R represents hydrogen, a substituted or unsubstituted alkyl of 1 to 8 carbon atoms or a substituted or unsubstituted cycloalkyl of 3 to 8 carbon atoms; R' and R'', which may be the same or different, each represents hydrogen, an alkyl of 1 to 7 carbon atoms or a cycloalkyl of 3 to 7 carbon atoms, or R' and R'' are combined together to form a alkylene linkage which with the nitrogen atom form a cyclic group of 2 to 7 carbon atoms; or an acid addition salt thereof.

5,115,100

PURIFICATION OF HEMOGLOBIN AND METHEMOGLOBIN BY BIOSELECTIVE ELUTION

Xiang-Fu Wu, Shanghai, Switzerland, and Jeffrey T. Wong, Don Mills, Canada, assignors to Kinetic Investments Limited, Don Mills, Canada

Filed Aug. 17, 1989, Ser. No. 394,945

Claims priority, application Canada, Aug. 17, 1988, 575010

Int. Cl.[5] A61K *35/14*; C07K *13/00*

U.S. Cl. 530—385 **18 Claims**

1. A method for purifying a hemoprotein mixed with other non-hemoproteins, comprising:

contacting the protein with an ion exchange matrix selected from the group consisting of phosphopolysaccharide, sulfopolysaccharide, carboxymethylpolysaccharide and diethylaminoethylpolysaccharide, so that at least the hemoprotein component of the mixture is absorbed to the matrix along with some of the other non-hemoproteins;

washing the matrix to remove unadsorbed components; and

selectively eluting the hemoprotein using a ligand which specifically binds to the hemoprotein causing it to desorb from the matrix leaving the non-hemoprotein adsorbed to the matrix.

5,115,101

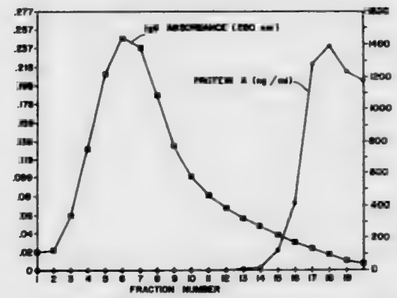
REMOVAL OF PROTEIN A FROM ANTIBODY PREPARATIONS

James W. Bloom, Richmond; Melvin F. Wong, San Francisco, and Gautam Mitra, Kensington, all of Calif., assignors to Miles Inc., Elkhart, Ind.

Division of Ser. No. 584,677, Sep. 19, 1990, abandoned, which is a division of Ser. No. 204,054, Jun. 8, 1988, Pat. No. 4,983,722. This application Jun. 26, 1991, Ser. No. 721,005

Int. Cl.[5] C07K *3/22, 15/28, 15/00*

U.S. Cl. 530—388.25 **6 Claims**



1. An antibody preparation prepared from a mixture of antibodies and protein A, the preparation being made by contacting the mixture with an anion exchange material under conditions sufficient to adsorb both the antibodies and the protein A and then sequentially eluting the antibodies and protein A under conditions of increasing ionic strength, the preparation being substantially free of protein A.

5,115,102

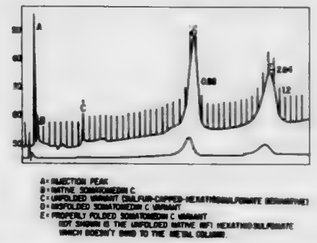
VARIANT PROTEINS AND POLYPEPTIDES POSSESSING ENHANCED AFFINITY FOR IMMOBILIZED-METAL AFFINITY MATRICES

Barry L. Haymore, Creve Coeur; Gary S. Bild, Chesterfield, and Gwen G. Krivi, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 21, 1989, Ser. No. 383,778

Int. Cl.[5] C07K *3/18, 15/00*; C12N *15/09*

U.S. Cl. 530—399 **13 Claims**



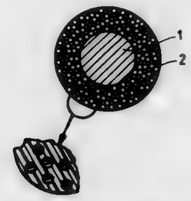
5. Variant protein comprising a protein having been modified to include within the terminii of said protein a metal-chelating amino acid sequence represented by the formula -A-B_x-C_y-D_z-E-wherein A and E are independently metal-binding amino acids, B, C and D are amino acids and x, y, and z are independently integers from 0 to 3, provided that x+y+z in combination with the secondary structure of the segment of the protein containing the metal-chelating sequence affords a stereochemical arrangement of A and E adapted to form a chelate with an immobilized metal.

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5,115,103
INSULATED CONDUCTOR AND METHOD OF PRODUCING THE SAME

Toru Yamanishi; Tatsuya Kakuta, both of Kanagawa, and Akinori Mori, Tochigi, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 6, 1989, Ser. No. 446,679
Claims priority, application Japan, Dec. 13, 1968, 63-312923; Feb. 27, 1989, 1-43153
Int. Cl.[5] H01B *7/00*
U.S. Cl. 174—24 **5 Claims**



1. An insulated conductor coated on its outer surface with an insulating layer, said insulating layer comprising:
an energy irradiation curable resin; and
microspheres, having a shell portion made of vinylidene chloride-acrylonitrile copolymer, mixed in said resin.

5. A method of producing an insulating conductor, comprising the steps of:
mixing microspheres into an energy irradiation curable resin composition to prepare a coating resin composition;
applying said coating resin composition to an outer surface of said conductor; and
hardening said coating resin composition through energy irradiation to form a coating layer;
said microspheres having a shell portion consisting of venylidene chloride-acrylonitrile copolymer.

5,115,104
EMI/RFI SHIELDING GASKET

Michael A. Bunyan, Derry, N.H., assignor to Chomerics, Inc., Woburn, Mass.

Filed Mar. 29, 1991, Ser. No. 677,730
Int. Cl.[5] H05K *9/00*
U.S. Cl. 174—35 GC **26 Claims**



1. A shielding gasket comprising a resilient core, having an outer surface at least a portion of which surface has a coating of a flocking adhesive, said coating having a layer of conductive fibers bonded therearound.

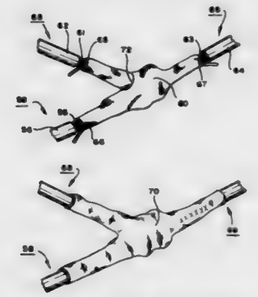
5,115,105
OVERBRAIDED IN-LINE DATA BUS LOOM

David O. Gallusser, Oneonta, and James B. LeBaron, Sidney, both of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.

Filed Feb. 21, 1990, Ser. No. 482,707
Int. Cl.[5] H01B *7/34;* **H02G** *15/18*
U.S. Cl. 174—36 **25 Claims**

1. An assembly for shielding a data bus coupler, comprising:
a conductive shield continuation including means electrically connecting a braided shield of a branch cable to a braided shield of each of two parts of a main cable, said branch cable and said main cable being electrically coupled by a data bus coupler, in order to provide a continuous uninterrupted EMI shield for the coupler, said conductive shield continuation completely enclosing said coupler.

15. A method of providing a continuous uninterrupted EMI shield connecting braided outer shields of at least two cables, comprising the steps of:
(a) electrically connecting respective individual wires of at

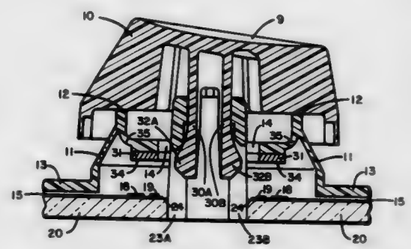


least two cables, each cable surrounded by a braided shield, to a data bus coupler, one of said cables having two parts connected respectively to different terminations on said coupler, a second cable being a branch cable connected to a third termination on said coupler;
(b) subsequently enclosing the resulting connections within an overbraided shield which completely encloses the coupler;
(c) electrically connecting the overbraided shield of braided outer shields to form a continuous uninterrupted shield between said braided outer shields.

5,115,106
MOMENTARY "ON" SWITCH SUITABLE FOR KEYBOARDS

Walter M. Weiland; Michael A. Disch, and Patrick L. Ohm, all of El Paso, Tex., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 511,493, Apr. 20, 1990, abandoned.
This application Mar. 15, 1991, Ser. No. 670,508
Int. Cl.[5] H01H *1/10*
U.S. Cl. 200—517 **17 Claims**



1. In a keyboard having a baseplate; a key having a keytop on which is an actuation surface; a key support projecting from said baseplate and maintaining said key in translational sliding relation with said support along an actuation path approximately normal to the baseplate with the actuation surface facing away from the baseplate; a movable conductive contact shifting with the key's translation along the actuation path; a fixed conductive contact in the path of and facing the movable

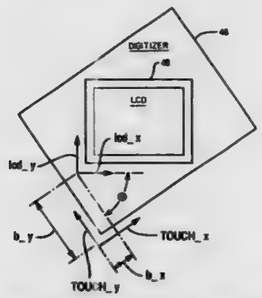
conductive contact and making electrical contact with the movable electrical contact when force on the keytop causes the movable conductive contact to approach the baseplate; and a spring contacting both the key and the baseplate to urge the key away from the baseplate, an improved arrangement of the keyboard's elements wherein the support comprises a cylindrical projection having an end spaced from the baseplate, an axis extending along the actuation path, and a bore extending along the actuation path from the end of the projection toward the baseplate; wherein the key includes a projection extending from a surface of the key opposite the actuation surface, said key projection's external surface conforming with the cylindrical projection's bore so as to guide translation of the key along the actuation path; wherein the key projection and cylindrical projection cooperatively comprises a means for retaining the key projection within the bore of the cylindrical projection; and wherein the spring comprises a resilient boot in surrounding relation to the cylindrical projection, said boot having an aperture through which the key projection passes; said improved arrangement further including a membrane having an aperture through which the cylindrical projection passes, said membrane carrying the fixed electrical contact at a point adjacent both the cylindrical projection and the baseplate.

5,115,107

METHOD OF CORRECTING SKEW BETWEEN A DIGITIZER AND A DIGITAL DISPLAY

John F. Crooks, and Robert L. Protheroe, both of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 11, 1991, Ser. No. 640,321
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—18 **8 Claims**



1. The method of producing image position signals lcd_x and lcd_y for a display device comprising the steps of:

mounting a digitizer in fixed relation to said display device; said digitizer being provided with touch sensing means for generating position signals touch_x and touch_y representing the position of a point at which said digitizer has been touched,

establishing two skew constants s_x and s_y and two offset constants b_x and b_y respectively representing the skew angle and the offset distance between said digitizer and said display device,

establishing two scale constants m_x and m_y representing scale differences between said stylus position signals and said image drive signals, and

generating said image position signals according to the equations:

$$lcd_x = m_x * touch_x + s_x * touch_y + b_x$$

and

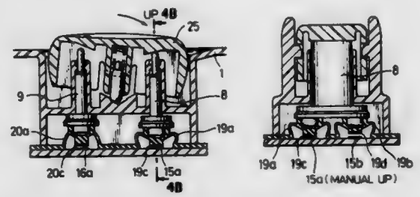
$$lcd_y = m_y * touch_y + s_y * touch_x + b_y$$

5,115,108

TWO-STAGE RUBBER SWITCH

Kikuo Ogawa, and Kazuya Arai, both of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Feb. 13, 1991, Ser. No. 654,547
Claims priority, application Japan, Feb. 14, 1990, 2-12711[U]; Feb. 14, 1990, 2-31522
Int. Cl.[5] H01H *9/26, 1/10*
U.S. Cl. 200—1 B **6 Claims**



1. A two-stage rubber switch, comprising:

(a) a switch housing;

(b) a pivotal operating knob pivotally supported by said switch housing;

(c) at least two push bodies slidably disposed at an interval within said housing, one of said push bodies being depressed whenever said operating knob is pivoted to either side.

(d) a contact wiring board having at least four mutually-opposing contact end portions arranged two by two under each of said two push bodies; and

(e) a two-stage rubber switching member interposed between said two push bodies and said contact wiring board, said rubber switching member having:

(1) at least four roughly hemispherical rubber buckling portions located two by two under each of said two push bodies and formed with four upper surfaces brought into contact with said push bodies two by two, respectively, when said push bodies are depressed when said operating knob is pivoted to either side, and four lower surfaces two of which are two different stroke distances away from said contact wiring board, respectively; and

(2) at least four conductive contact pieces fixed to said four lower surfaces of said buckling portions, respectively, so as to be brought into contact with the four contact end portions on said contact wiring board two by two, respectively, at two different stroke distances by said push body depressed by said pivotably operating knob.

5,115,109

SPEED DETECTOR FOR TRAFFIC CONTROL

James R. Fisher, 202 Rooloowaree Road, Cronulla, New South Wales, 2230, Australia

PCT No. PCT/AU89/00348, § 371 Date Mar. 20, 1990, § 102(e) Date Mar. 20, 1990, PCT Pub. No. WO90/02410, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 17, 1988, Ser. No. 490,690
Claims priority, application Australia, Aug. 17, 1988, PI9934
Int. Cl.[5] H01H *21/26*
U.S. Cl. 200—86 A **4 Claims**

1. An arrangement for monitoring traffic comprising:

an elongate strip member adapted to be placed on a road surface, said elongate strip member including a base layer;

at least two longitudinally extending and laterally spaced apart electrical contact means being provided on the upper surface of said base layer;

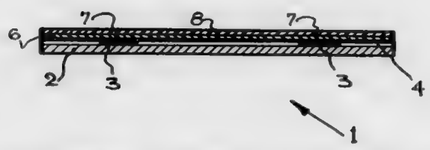
a dielectric spacer layer extending over the upper surface of said base layer;

a plurality of longitudinally and laterally spaced apart apertures being provided in said dielectric layer, so as to be located substantially over the electrical contact means provided on the upper surface of said base layer;

said apertures in said dielectric layer being formed of at least two sets of longitudinally spaced apart apertures, each said set being laterally spaced apart one from the other by a distance over which monitoring and/or timing of traffic is to take place;

a resilient material layer extending over said dielectric spacer layer;

at least two further longitudinally extending and laterally spaced apart electrical contact means being provided on the lower surface of said resilient material layer so as to be located substantially over said apertures;



said longitudinally and laterally spaced apart apertures, and said respective electrical contact means, forming a plurality of longitudinally spaced apart switches, each of said switches being connected to monitoring and/or timing means associated with said strip member; and

means being provided to supply voltage across said electrical contact means;

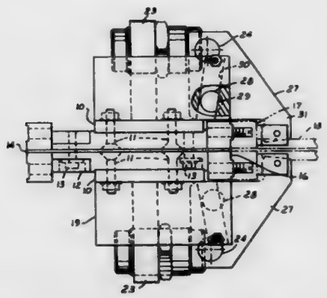
whereby upon one or more vehicles passing over said elongate strip member, one or more of said switches will be actuated by said resiliently mounted electrical contact means being caused to make contact with said base layer electrical contact means through one or more of said apertures, to thereby actuate said monitoring and/or timing means.

5,115,110

HYDRAULIC QUICK CHANGE CLAMP

Jerome E. Tucker, Capac, and Henry Dykstra, Milford, both of Mich., assignors to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Jun. 18, 1990, Ser. No. 539,797
Int. Cl.[5] H05B *6/64*
U.S. Cl. 219—10.67 **23 Claims**



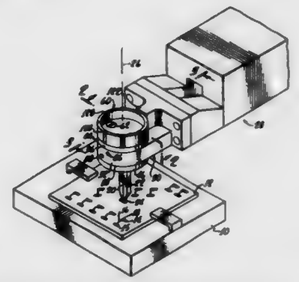
1. Clamp for releasably clamping interchangeable articles on a fixed base comprising, a fixed base, clamp arm means for article clamping engagement, pivotal mounting means on the base for said arm means, means on the base to produce releasable article clamping actuation of said arm means in a direction for clamping engagement characterized by, means on said base for accommodating movement of said pivotal mounting means together with said arm means to a relative clearance position for said articles upon release of said clamping actuation.

5,115,111

DUAL TIP ROTATING WELDING ELECTRODE

William M. Fries, San Diego; Thomas L. Ratledge, Carlsbad, and William H. Hill, Pala, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 6, 1990, Ser. No. 563,014
Int. Cl.[5] B23K *11/31*
U.S. Cl. 219—56.21 **18 Claims**



1. A method for mounting welding electrodes and welding a lead to an electronic circuit component comprising the steps of:

mounting a pair of cylindrical axially aligned bobbins in a weld support arm for rotation relative to the arm,

mounting a pair of mutually spaced and mutually insulated electrodes in said bobbins with at least one of said electrodes extending through both of the bobbins,

holding the first bobbin in contact with the first electrode and the second bobbin in contact with the second electrode,

insulating the electrodes from each other,

insulating the first electrode from the second bobbin and the second electrode from the first bobbin,

firmly pressing first and second electrical contacts against said first and second bobbins, respectively,

rotating the bobbins and the electrodes relative to the weld support arm to a desired orientation relative to the circuit components to be welded,

moving the weld head into position at a lead to be welded, and

applying welding current to said first and second contacts to cause welding current to flow through said bobbins and electrodes to the lead being welded.

5,115,112

SPARK EROSION MACHINING DEVICE AND METHOD FOR CORRECTING FOR THE WEAR OF A MACHINING ELECTRODE

George E. Fitz, III; Rudi O. Krenz, and Harmon R. Carnes, all of Albuquerque, N. Mex., assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 25, 1991, Ser. No. 660,086
Int. Cl.[5] B23H *7/12, 9/10*
U.S. Cl. 219—69.2 **16 Claims**

1. A device for machining a cylindrically shaped component, comprising:

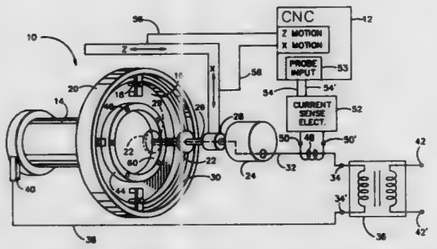
a computer numerical controlled lathe having a faceplate to mount the component and to rotate the component at a chosen speed and a chosen direction about a cylindrical axis of the component;

a wheel-shaped electrode for spark erosion machining of the component;

drive means for rotating said wheel-shaped electrode about a rotational axis at a selected speed and a selected direction relative to the chosen speed and direction of rotation of the component;

means for generating an arc between said wheel-shaped electrode and the component when said electrode is in a

machining position in close proximity to the component, said arc causing removal of a chosen quantity of material from the component and erosion of material from said wheel-shaped electrode; and



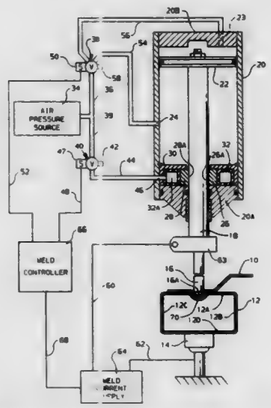
means for automatically correcting for the erosion of material from the wheel-shaped electrode after a machining cycle to dimensionally control the quantity of material removed from the component in a subsequent machining operation.

5,115,113

SPOT WELDING METHOD AND APPARATUS HAVING WELD ELECTRODE LOCK-UP

Earl G. Miller, Shelby Township, Macomb County, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 24, 1990, Ser. No. 587,202
Int. Cl.[5] B23K *11/10*
U.S. Cl. 219—89 **8 Claims**



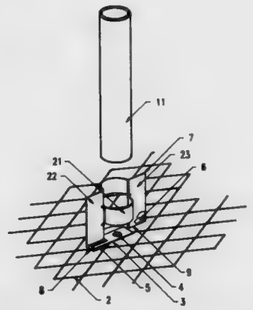
1. The method of resistance spot welding a pair of metallic parts, the steps comprising, disposing said parts between a pair of welding electrodes, moving one of said electrodes into contact with one of said parts and applying a welding force to said one electrode that is operative to tightly clamp said parts together and between said electrodes, applying a welding current to said electrodes while maintaining said one electrode locked from movement in a direction into the part that it engages, terminating the supply of welding current to said electrodes, unlocking said one welding electrode to allow it to move and then moving said one electrode to a retracted position.

5,115,114

CERAMIC FIBER ATTACHING SYSTEM FOR A BACKING PLATE

George J. Paulonis, Hudson, Ohio, and David R. Dunlap, Claremore, Okla., assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Apr. 25, 1990, Ser. No. 514,449
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—99 **33 Claims**



32. The method of attaching insulating fiber to a back plate, which method comprises:

(a) securing a combination of a stud retainer member, which has an at least substantially centrally located perforation, plus a tube retainer member to a perforate backing member, and with there being held in said tube retainer member an elongated and hollow electrically non-conductive and removable tube extending away from said perforate backing member;

(b) enveloping said stud retainer member plus tube retainer member combination in insulating fiber so as to leave exposed the outermost end of said removable tube;

(c) inserting a stud through said removable tube, as well as through the perforation of said stud retainer member and the perforate backing member, and into contact with said back plate;

(d) welding said stud to said back plate; and

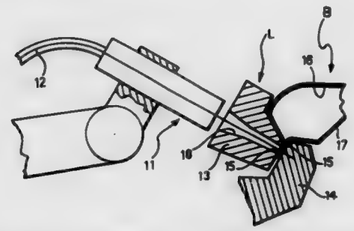
(e) removing said removable tube.

5,115,115

APPARATUS FOR WELDING MOTOR-VEHICLE BODIES

Giancarlo Alborante, Trofarello, Italy, assignor to Comau S.p.A., Turin, Italy

Filed Jan. 31, 1991, Ser. No. 648,752
Claims priority, application Italy, Jan. 31, 1990, 52850/90[U]
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.63 **3 Claims**



1. Apparatus for welding motor-vehicle bodies which have been assembled loosely beforehand, comprising:

a station for welding the body,

a conveyor line for transporting the loosely preassembled bodies to the welding station,

a plurality of locating devices arranged at the welding station for clamping the component parts of the body in the correct positions for welding, and

welding means provided at the welding station for welding the component parts of the body together after they have been clamped by the locating devices,

in which the locating devices are supported by at least two pairs of locating frames movable along a predetermined path so as to be interchangeable rapidly at the working position according to the type of body located at the welding station to be welded, the locating devices of each pair of locating frames being suitable for a respective body type,

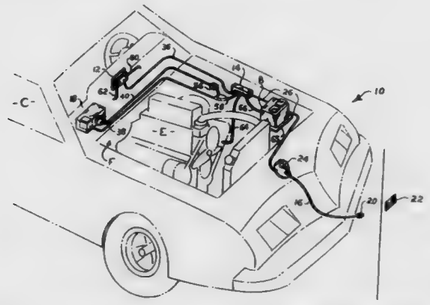
wherein said welding means include at least one laser-welding robot and at least some of said locating devices each have an element for engaging said body, each element defining a through hole for allowing the passage of a laser beam output by a said welding robot and the focussing of said beam on the body to be welded.

5,115,116

VEHICLE PREHEATING SYSTEM

Mark E. Reed, Pierre, S. Dak., assignor to Durkin-Reed, Inc., Pierre, S. Dak.

Filed May 25, 1989, Ser. No. 357,213
Int. Cl.[5] B60L *1/02*
U.S. Cl. 219—202 **10 Claims**



1. In a vehicle having a body defining an engine compartment separated from a passenger compartment by a firewall, a liquid cooled internal combustion engine in the engine compartment, a storage battery forming a component of the vehicle electrical system, a heater assembly having a core adapted to receive heated liquid from the engine and including electrically driven fan means powered by the vehicle electrical system for discharging heated air from the heater core into the passenger compartment, the improvement comprising;

said heater assembly including a housing having at least one outlet for said discharging of heated air,

said fan means when operated defining an air flow path directing air from said heater housing through said outlet,

an electrical resistance heating unit within said heater assembly housing and disposed within said air flow path,

said heating unit operable to generate heat upon the application of electrical current,

an electrical connection on said vehicle adapted to be supplied with alternating current from an external source,

electrical circuits between said electrical connection and said heater assembly,

said circuits including a first circuit joined to said electrical resistance heating unit and a second circuit joined to said fan means,

said first circuit includes a terminal block, said terminal block containing a plurality of electrical outlets, said electrical outlets provide electrical current for a plurality of vehicle component preheating devices,

said electrical circuits including means to utilize said supplied electrical current through said second circuit to operate said fan means and through said first circuit operate said heating unit, whereby

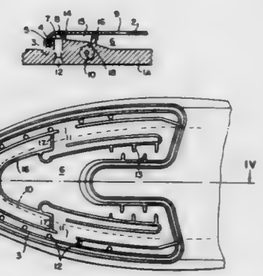
an operator may employ externally supplied alternating current to operate both said electrical resistance heater unit and said fan means to preheat the confines of the vehicle passenger compartment.

5,115,117

STEAM IRON PROVIDED WITH AN INTERMEDIATE VAPORIZATION CHAMBER TO PREVENT EXPULSION OF UNVAPORIZED WATER THROUGH THE STEAM OUTLET ORIFICES

Jacques H. J. Amiot; Jean-Paul A. A. Bouleau, and Gerard R. M. Molveaux, all of Alencon, France, assignors to Moulinex (Societe Anonyme), Bagnolet, France

Filed Oct. 23, 1990, Ser. No. 600,992
Claims priority, application France, Nov. 7, 1989, 89 14598
Int. Cl.[5] D06F *75/18;* **H05B** *3/00*
U.S. Cl. 219—254 **4 Claims**



1. Electric iron comprising a cast sole (1A) closed by a cover (2) and in which are provided two chambers (6, 7) separated from each other by a partition (8), namely a principal vaporization chamber (6) fed with water by an injection device through an opening (9) provided in the cover (2), the water being vaporized by a sheathed resistance (10) embedded in the sole (1A), and a steam distribution chamber (7) communicating on the one hand with the principal vaporization chamber (6) by means of a passage (11) provided in the partition (8), and on the other hand with the exterior through outlet orifices (12) provided in the sole (1A), wherein the sole (1A) also comprises an intermediate vaporization chamber (15) disposed between the principal vaporization chamber (6) and the distribution chamber (7) and extending adjacent the injection opening (9) of the water, the intermediate vaporization chamber (15) comprising a closed space delimited by a continuous counter-partition (16) arranged between the injection opening (9) and the partition (8) and extending from the sole (1A) to the cover (2).

5,115,118

HEAT-TREATMENT FURNACE

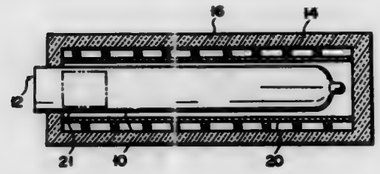
Hiromi Harada, Hiratsuka, and Toshihisa Nozawa, Yokohama, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Dec. 5, 1990, Ser. No. 622,481
Claims priority, application Japan, Dec. 22, 1989, 1-333591
Int. Cl.[5] F27B *5/14*
U.S. Cl. 219—390 **7 Claims**

1. A heat-treatment furnace, comprising:

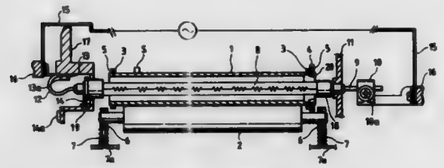
a process tube for containing objects to be heat-treated, said process tube having an open end through which said object is carried in said process tube or out of said process

tube, said process tube having a soaking zone in which said objects are to be arranged;
a heater surrounding the process tube; and
an infrared impermeable member for suppressing infrared



radiation from said heater toward said open end of said process tube and enlarging said soaking zone, said infrared impermeable member being removably located inside said process tube and at least on a portion corresponding to said open end of said process tube.

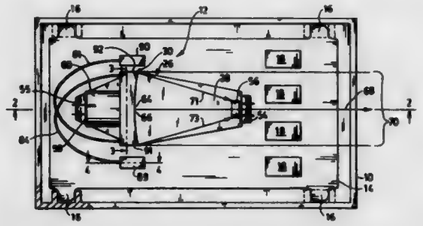
5,115,119
HEATING APPARATUS AND HEATER
Nobukazu Adachi, and Toshio Yoshimoto, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 21, 1990, Ser. No. 541,387
Claims priority, application Japan, Jun. 23, 1989, 1-161302
Int. Cl.[5] G03G *15/20*
U.S. Cl. 219—469 **21 Claims**



1. A heating apparatus comprising:
a heat rotary member;
a heater arranged in said heat rotary member along a rotation center line thereof, said heater having first and second base members at first and second ends thereof, respectively, with a lead wire for supplying power connected to said first base member and an electrode pin for supplying power connected to said second base member;
a holder member for holding said first base member, wherein said heater can be removed from said heat rotary member by pulling said first base member with said lead wire in an axial direction without removing said holder member.

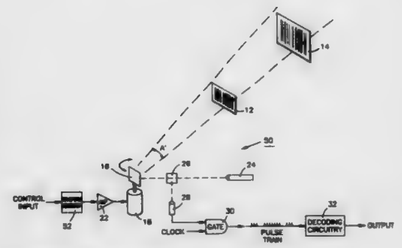
5,115,120
SCAN MODULES FOR BAR CODE READERS AND IN WHICH SCAN ELEMENTS ARE FLEXURALLY SUPPORTED
Jay M. Eastman, Pittsford, N.Y., assignor to Photographic Sciences Corporation, Rochester, N.Y.
Filed Jun. 26, 1990, Ser. No. 543,950
The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.
Int. Cl.[5] G06K *7/10*; H01J *3/14, 5/16*; G02B *26/08*
U.S. Cl. 235—462 **23 Claims**

22. A portable, miniature, hand-held bar code scanning terminal which comprises a data collection and entry unit and scan module removably connected to said unit for providing therebetween mechanical support and electrical power and signal connections, said scanning module having a housing and an assembly comprising a body having a laser diode and a board adapted to carry circuit components and connecting elements, which support said body on said board for reciprocal rotation to enable a laser beam from said laser diode to scan said code , said body being movably attached to said board by means including a plurality of flexural elements, and means for



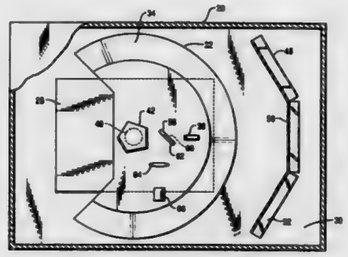
reciprocatably driveng said body against restoring forces provided by said flexural elements to scan said laser beam generated by said laser diode across said code.

5,115,121
VARIABLE-SWEEP BAR CODE READER
James S. Bianco, Enfield, Conn., and Bernard Drummond, Southwick, Mass., assignors to Control Module Inc., Enfield, Conn.
Filed Jan. 5, 1990, Ser. No. 461,936
Int. Cl.[5] G06K *7/10*
U.S. Cl. 235—467 **5 Claims**



3. A reader comprising:
a) a light source to produce a beam of light;
b) scanning means to cause said beam of light to travel through an angle of selected constant magnitude and to sweep across, at a selected scan rate, coded indicia consisting of a pattern of relatively more and less reflective regions;
c) photodetector means to detect light reflected from the relatively more reflective regions of said coded indicia and thereby discriminate between said more and less reflective regions;
d) pulse-generating means connected to receive an output signal from said photodetector means and to produce a pulse train representative of said pattern during a selected portion of said angle of constant magnitude of the swept beam of light; and
e) means, connected to said pulse generating means, to vary the selected portion of said angle of constant magnitude of the swept beam of light during which said pulse-generating means produces said pulse train.

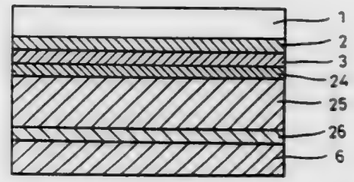
5,115,122
COMPACT OPTICAL SCANNING SYSTEM
Chin-Hung Jwo, and Paul S. Wu, both of Ithaca, N.Y., assignors to NCR Corporation, Dayton, Ohio
Filed Dec. 12, 1990, Ser. No. 626,156
Int. Cl.[5] G06K *7/10*; G02B *26/08*
U.S. Cl. 235—467 **5 Claims**



1. In an optical scanning system, an optical scanning apparatus for reading bar code symbols on objects passing adjacent the scanning apparatus the comprising:
a housing member which includes a cover portion having an aperture therein through which scanning light beams are projected and a floor portion;
support means mounted on the floor portion of the housing member;
a semicircular shaped mirror member mounted on said support means for reflecting light beams through the aperture in the form of a scanning pattern;
a source of light beams mounted on said mirror member for directing light beams along a first light path;
scanning means mounted on said support means and extending through said mirror member and into said first light path for cyclically sweeping the light beams along a second light path; and
reflecting means secured to the interior surface of said cover portion and in said second light path for reflecting the light beams along a third light path; said mirror member including a reflecting portion comprising a cone-shaped edge portion of the mirror member mounted in said third light path for reflecting light beams through said aperture in the cover portion for scanning a bar code label positioned adjacent said aperture.

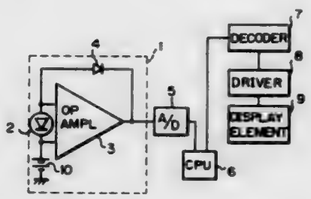
5,115,123
CONTACT TYPE PHOTOELECTRIC TRANSDUCER
Katsuhiko Hayashi; Minori Yamaguchi, and Takehisa Nakayama, all of Kobe, Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan
PCT No. PCT/JP89/01247, § 371 Date Aug. 1, 1990, § 102(e) Date Aug. 1, 1990, PCT Pub. No. WO90/07195, PCT Pub. Date Jun. 28, 1990
PCT Filed Dec. 13, 1989, Ser. No. 555,416
Claims priority, application Japan, Dec. 14, 1988, 63-315972; Mar. 17, 1989, 1-66749; Mar. 17, 1989, 1-66750; Mar. 17, 1989, 1-66751
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 **7 Claims**

1. A photosensor which comprises a first electrode layer, a light-transmitting second electrode layer, and a laminate structure disposed between the two electrode layers and comprising a first photoconductive layer, a blocking layer and a second photoconductive layer for charge injection,
the main component of said first photoconductive layer being silicon,
said blocking layer being made of a substance having a broader band gap than hydrogenated amorphous silicon and composed mainly of a member selected from the group consisting of (1) silicon and carbon, (2) silicon and nitrogen and (3) silicon and oxygen, and



the main component of said second photoconductive layer being silicon and the silicon of said second photoconductive layer being doped with at least one element selected from groups III and V of he periodic table.

5,115,124
SEMICONDUCTOR PHOTOSENSOR HAVING UNITARY CONSTRUCTION
Kazuhiko Muto, Kawasaki; Takahiro Shirai, Hiratsuka, and Tsunenori Yoshinari, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 480,361, Feb. 14, 1990, abandoned, which is a continuation of Ser. No. 357,634, May 24, 1989, abandoned, which is a continuation of Ser. No. 208,858, Jun. 14, 1988, abandoned, which is a continuation of Ser. No. 15,930, Feb. 18, 1987, abandoned. This application Mar. 5, 1991, Ser. No. 666,458
Claims priority, application Japan, Feb. 8, 1986, 61-044788; Feb. 28, 1986, 61-044787
Int. Cl.[5] H01V *40/14*
U.S. Cl. 250—214 L **11 Claims**

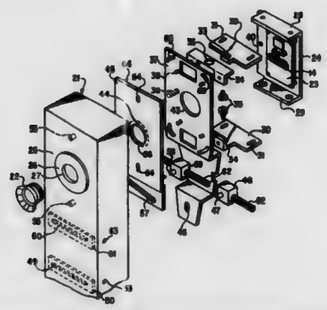


1. A semiconductor photo-sensor comprising:
a plurality of photo-sensors for converting an optical signal an electrical signal;
a signal processing circuit for processing the electrical signals of the respective photo-sensors comprising:
a plurality of logarithmic amplifiers each having an input and an output for amplifying the electrical signals of the respective photo-sensors, each of the logarithmic amplifiers including an operational amplifier and a logarithmic diode;
a multiplexer electrically connected to the outputs of said logarithmic amplifiers; and
decoder for supplying a signal to control said multiplexor,
said photo-sensors and said signal processing circuit being formed on one semiconductor substrate.

5,115,125
PIN DETECTION SYSTEM WITH AN ADJUSTABLY-MOUNTED ARRAY OF SENSORS

Ross O. Biggs, P.O. Box 145, Tweed Heads, New South Wales 2485, Australia

Division of Ser. No. 520,194, May 9, 1990, abandoned. This application Aug. 19, 1991, Ser. No. 746,976
Claims priority, application Australia, May 9, 1989, PJ4081
Int. Cl.[5] G01V 9/04
U.S. Cl. 250—222.1 19 Claims



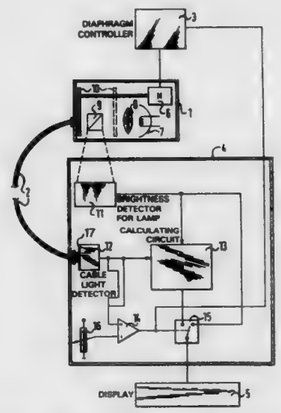
1. A detection system for sensing standing pins in a bowling apparatus of the type including a bowling lane and a pin deck at the end of the lane for supporting pins thereon comprising:
a sensing head;
said sensing head including a housing;
lens means supported on said housing for receiving light reflected from the standing pins;
a linear array of photosensitive devices disposed within said housing rearwardly of said lens means to receive said reflected light through said lens means, said array providing a serial output corresponding to the level of light reflected from said standing pins, which in turn is dependent upon the presence or absence of one or more pins in the field of view of said lens means;
bracket means supporting said linear array; and
means for moving said bracket means, whereby to premit variation of the position of said array relative to said lens means to thereby vary the incidence of reflected light on said array.

5,115,126
MEANS FOR CHECKING ENDOSCOPE EQUIPMENT

Felix Ams, Kämpfelbach, and Roland Schäfer, Bretten-Dürrenbüchig, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Jul. 11, 1990, Ser. No. 551,586
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 3929562
Int. Cl.[5] H01J 5/16; G01N 21/00
U.S. Cl. 250—227.11 3 Claims

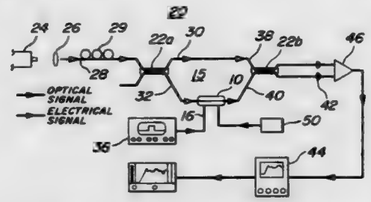
1. Apparatus for checking a lamp of alight source unit producing illuminating light for an endoscope and for checking a light-guide cable which conveys the illuminating light to an object being observed, said light source unit having a controllable first diaphragm through which light is conducted to the light-guide cable and means for controlling the quantity of light fed into the light-guide cable, comprising beam splitting means positionable in a beam path of the lamp for diverting a first quantity of the illuminating light, first means for detecting said first quantity of illuminating light to check said lamp, second means for detecting a second quantity of light emerging from a distal end of the light-guide cable, comparator means for comparing a first signal generated by said second detecting means with a brightness threshold level settable by an adjuster, whereby said comparator feeds a second signal to said control means if the level is exceeded whereby said control means sets said first diaphragm in a predetermined position in response to said second signal, and calculating circuit means for determining a quotient of said second an first quantities of detected light, said quotient representing a transmission factor to check said light guide cable.



5,115,127
OPTICAL FIBER SENSOR FOR MEASURING PHYSICAL PROPERTIES OF FLUIDS

Lloyd C. Bobb, Warminster, Pa.; Barbara J. White, Hatboro; Jon P. Davis, Willow Grove, all of Pa., and Arthur Samouris, Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 460,435, Jan. 3, 1990, Pat. No. 5,047,626. This application Sep. 17, 1990, Ser. No. 585,331
Int. Cl. H01J 5/16; G01D 5/34
U.S. Cl. 250—227.19 2 Claims

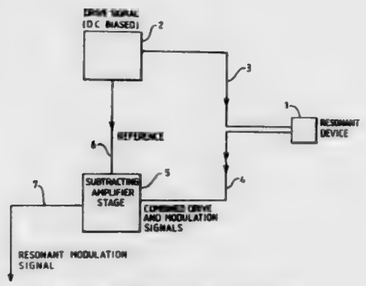


1. A method for measuring the flow rate of a fluid using a light transmitting optical fiber, comprising the steps of:
(a) disposing a conductive material upon the surface of a region of the light transmitting optical fiber;
(b) disposing at least a portion of said fiber region having said conductive material in the fluid;
(c) applying light energy to a first end of the light transmitting optical fiber;
(d) applying electrical energy to said conductive material for a period of time long enough for the fiber to achieve temperature equilibrium;
(e) receiving transmitted light at a second end of said optical fiber;
(f) measuring the change in phase of said transmitted light during said period of time; and
(g) determining the flow rate in accordance with said change in phase and said applied electrical energy.

5,115,128
SIGNAL EXTRACTION APPARATUS AND METHOD

Alan J. Cook, Birmingham, England, assignor to Lucas Industries Public Limited Companies, Birmingham, England

Filed Dec. 29, 1989, Ser. No. 456,787
Claims priority, application United Kingdom, Jan. 6, 1989, 8900304
Int. Cl.[5] H01J 5/16
U.S. Cl. 250—227.21 15 Claims



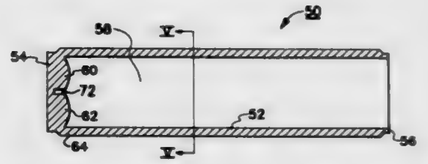
1. A signal extraction apparatus comprising:
a modulating signal generator;
light generating means for generating a drive signal comprising a carrier signal amplitude modulated by a modulating signal from said modulating signal generator;
coupling means for coupling the drive signal to a resonant sensor having a resonant frequency substantially equal to a frequency of the modulating signal;
a demodulator comprising a photodetector for demodulating a portion of the drive signal reflected by the sensor; and
frequency determining means for determining changes in the resonant frequency of the sensor, said modulating signal generator comprising
a voltage controlled oscillator having an output and a control voltage input,
a low pass filter having an output connected to said control voltage input of said voltage controlled oscillator and an input,
a phase sensitive detector having an output connected to said input of said low pass filter, a first input connected to said output of said voltage controlled oscillator and a second input connected to said demodulator, and
divide-by-two frequency divider having an input connected to said output of said voltage controlled oscillator and an output connected to said generating means.

5,115,129
PHOTOELECTRIC DEVICE WITH A LENS FORMED IN ITS HOUSING

Donald D. Johnson, Pearl City, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 1, 1991, Ser. No. 662,864
Int. Cl.[5] H01J 5/16
U.S. Cl. 250—239 19 Claims

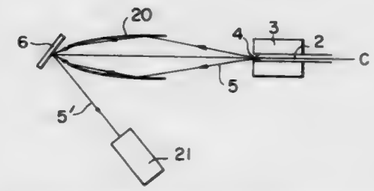
1. A photoelectric device comprising:
a one piece housing structure, said housing structure comprising a generally tubular portion having first and second ends, said first end being an integral part of said tubular portion, said second end comprising an opening, said first end being fluid impermeable, light transmissive and shaped to form at least one lens;
a photosensitive element disposed within said housing structure, said photosensitive element being disposed in optical communication with said first end;
an electrical circuit disposed within said housing structure, said electrical circuit being connected in electrical communication with said photosensitive element; and
a cover shaped to be received in said opening, said cover being disposed in fluid sealing association with said opening to prevent fluid from passing into said housing structure.



5,115,130
SURFACE MEASURING METHOD AND APPARATUS

Keizo Suzuki, Kodaira; Ken Ninomiya, Higashimatsuyama, and Takashi Yunogami, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 7, 1990, Ser. No. 536,152
Claims priority, application Japan, Jun. 9, 1989, 1-145328
Int. Cl.[5] H05H 3/00
U.S. Cl. 250—251 30 Claims



1. A surface measuring method, comprising the steps of:
(a) blowing out neutral particles;
(b) forming said blown-out particles into a beam;
(c) controlling a locus of said neutral particle beam, including converging said neutral particle beam by directing said neutral particle beam at a solid body surface such that said surface reflects a beam having a controlled locus;
(d) colliding said controlled locus neutral particle beam against a surface of a specimen such that neutral particles are reflected off of said specimen surface;
(e) detecting said neutral particles reflected from said specimen surface; and
(f) analyzing the energy of said detected neutral particles.

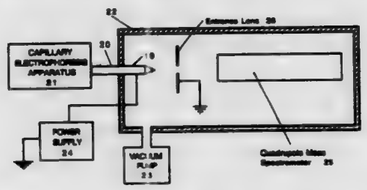
5,115,131
MICROELECTROSPRAY METHOD AND APPARATUS

James W. Jorgenson, and Daniel M. Dohmeier, both of Chapel Hill, N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Filed May 15, 1991, Ser. No. 700,572
Int. Cl.[5] B01D 59/44; A01J 49/00
U.S. Cl. 250—288 25 Claims

21. An apparatus for generating an electrospray from a solution, comprising:
a capillary tube having a terminal portion and an outlet opening formed in said terminal portion, said capillary tube terminal portion having an inner diameter of not more than 50 micrometers and an outer diameter of not more than 150 micrometers;
a vacuum chamber containing said capillary tube terminal portion, said vacuum chamber further containing a conductor spaced from said capillary tube terminal portion; and

power supply means for providing an electrical potential difference between said capillary tube terminal portion

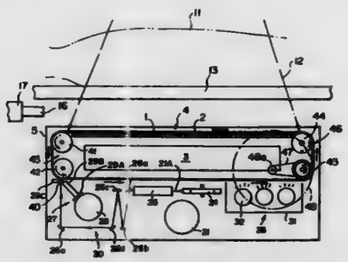


and said conductor spaced from said terminal portion, with said potential sufficient to cause said solution to electrospray from said capillary outlet.

5,115,132
RADIATION IMAGE RECORDING AND READ-OUT APPARATUS

Shigeru Sactome, and Masamitsu Ishida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 182,682, Apr. 18, 1988, abandoned. This application Jan. 11, 1990, Ser. No. 464,669
Claims priority, application Japan, Apr. 17, 1987, 62-94545; Apr. 17, 1987, 62-94555
Int. Cl.[5] G03B *42/02*
U.S. Cl. 250—327.2 **2 Claims**



1. A radiation image recording and read-out apparatus which comprises:

(i) a recording and read-out unit provided with:

a) a case for housing therein a stimulable phosphor sheet and having longitudinal and transverse dimensions approximately equal to the longitudinal and transverse dimensions of a single image recording area on said stimulable phosphor sheet,

b) an image recording section for holding said stimulable phosphor sheet in said case at an image recording position exposed to radiation passing through an object, and having a radiation image of said object stored on said stimulable phosphor sheet,

c) an image read-out section provided in said case for exposing said stimulable phosphor sheet carrying said radiation image stored thereon to stimulating rays which cause said stimulable phosphor sheet to emit light in proportion to the stored radiation energy, and photoelectrically detecting the emitted light to obtain image signals, and

d) an erasing section provided in said case for releasing the radiation energy remaining on said stimulable phosphor sheet, for which the detection of said emitted light has been carried out, before the image recording is carried out on said stimulable phosphor sheet,

ii) a shutter provided on a radiation incidence side with respect to said stimulable phosphor sheet held at said image recording position, having a size covering at least a part of said stimulable phosphor sheet, and moveable between a masking position at which said shutter prevents impingement of the radiation upon a part of said stimulable phosphor sheet and a retracted position at which said shutter allows impingement of the radiation upon approximately the overall area of the single image recording region of said stimulable phosphor sheet,

iii) a shutter operation means operated from the exterior for moving said shutter between said masking position and said retracted position,

iv) a unit movement means for moving said recording and read-out unit so that said stimulable phosphor sheet at said image recording position is moved approximately in the same plane, and

v) a subdivision image recording operation means for, upon receiving a subdivision image recording instruction, operating said shutter operation means to move said shutter to said masking position, and operating said unit movement means to move said recording and read-out unit so that the uncovered portion of said stimulable phosphor sheet at said image recording position that is not covered by said shutter changes sequentially;

wherein said stimulable phosphor sheet is shaped in an endless belt-like form,

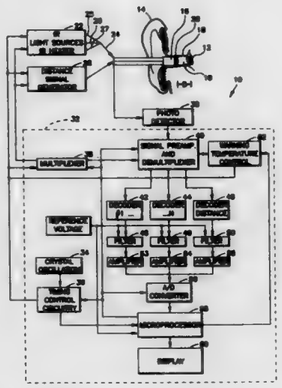
said stimulable phosphor sheet in the endless belt-like form is held at said image recording position by being applied around two sets of roller sections which are spaced from each other by a distance approximately equal to the length of a single image area, and

in the course of feeding the image-recorded portion of said stimulable phosphor sheet out of said image recording position and feeding a different portion of said stimulable phosphor sheet to said image recording position, said stimulating rays are scanned in a sub-scanning direction by the movement of said stimulable phosphor sheet, whereby the detection of said light emitted by said stimulable phosphor sheet is carried out.

5,115,133
TESTING OF BODY FLUID CONSTITUENTS THROUGH MEASURING LIGHT REFLECTED FROM TYMPANIC MEMBRANE

Mark B. Knudson, Arden Hills, Minn., assignor to Inomet, Inc., Minneapolis, Minn.

Filed Apr. 19, 1990, Ser. No. 510,935
Int. Cl.[5] G01N *33/48*
U.S. Cl. 250—341 **69 Claims**



1. An apparatus for determining a level of a constituent in a body fluid, said apparatus comprising

light generating means for generating a testing light of known intensity with said testing light including at least one wavelength absorbable by said constituent and directing said testing light toward said fluid;

light detecting means for measuring an intensity of said testing light reflected from said fluid;

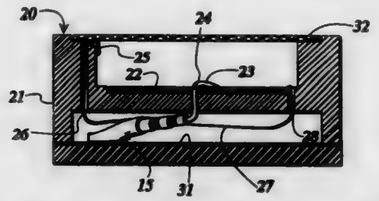
light path measurement means for measuring an actual distance of a light path from said light generating means to said light detecting means via said fluid;

circuit means for calculating a level of said constituent in said fluid in response to a reduction in intensity of said testing light between said light generating means and said light detecting means and in response to said actual distance measured by said light path measurement means.

5,115,134
PRECISION LOW ENERGY RADIATION DOSIMETRY SYSTEM

Thomas W. Slowey, 701 Ronnie Rd., Madison, Tenn. 37115

Continuation of Ser. No. 275,286, Nov. 23, 1988, abandoned. This application Oct. 4, 1990, Ser. No. 594,891
Int. Cl.[5] G01T *1/02*; H01J *47/02*
U.S. Cl. 250—374 **4 Claims**



1. A low energy radiation dosimetry system comprising:

a. an electrometer-type dosimeter adapted for precise measurement and display of a low energy radiation dose level over a continuous range;

b. an ionization chamber open to the atmosphere adapted for use in simulation of tissue radiation exposure comprising a non-conductive chamber body, charge collector means internal to said body, means for applying bias voltage to said charge collector means, and a beryllium radiation window covering one end of said body such window having a coating which is adapted, in cooperation with said window, to produce ideal flat response to radiation energy levels over the range 6.5 KeV to 40 KeV; and

c. cable means connecting said charge collector means and said bias means of said chamber to said dosimeter.

5,115,135
ION SOURCE

Tatsuo Oomori, and Koaichi Ono, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1990, Ser. No. 487,460
Claims priority, application Japan, Apr. 21, 1989, 1-103177
Int. Cl.[5] H01J *37/08*
U.S. Cl. 250—423 P **36 Claims**

1. An ion source comprising:

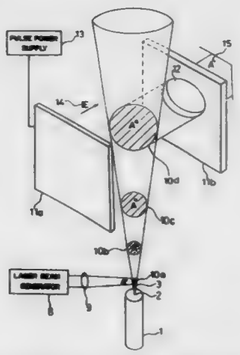
a particle flow generator for generating particle flow comprising atoms or molecules;

a laser beam generator for generating a laser beam with one or a plurality of wavelengths which irradiates a region of the whole or one part of the atoms or molecules in the particle flow near an exhaust nozzle of said particle flow generator;

a pair of electrodes for applying an electric field over one part or the whole of the particle flow after the particle flow has been sufficiently defused in a downstream region of the region irradiated with said laser beam said pair of electrodes located downstream form the region irradiated; and

a power supply for applying a voltage to said pair of electrodes which generates the electric field between said pair of electrodes,

wherein said laser beam has one or a plurality of excitation wavelengths for exciting specific atoms or molecules in the particle flow from a ground state to highly excited



state of the Rydberg state in which the principal quantum number of a valence electron is large,

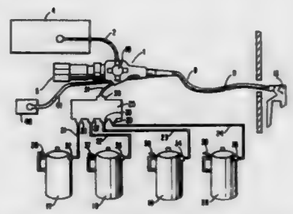
said voltage for generating the electric field of more than a minimum electric field for ionizing the atoms or molecules in said Rydberg state is applied between said pair of electrodes after irradiation of the laser beam, and

one or a plurality of outlet holes through which an ion beam is drawn out are provided at predetermined portions of said pair electrodes.

5,115,136
ULTRAVIOLET REMOTE VISUAL INSPECTION SYSTEM

Michael D. Tomasch, Kew Gardens, N.Y., assignor to Olympus Corporation, Lake Success, N.Y.

Filed Aug. 6, 1990, Ser. No. 562,741
Int. Cl.[5] G01J *5/04, 5/48*
U.S. Cl. 250—461.1 **11 Claims**



1. An apparatus for detecting cracks in a remote surface through the use of a dye penetrant which fluoresces upon illumination with ultraviolet light comprising:

a fiberscope including a probe for receiving an image of a surface, a lens for focusing an image received by the probe, an eyepiece for viewing an image, a means for guiding ultraviolet light through the probe to a surface, and a channel means for allowing for the transportation of material through said probe to a surface;

a source of ultraviolet light communicating with the means for guiding ultraviolet light of the fiberscope;

a first cannister having a sealable orifice capable of holding a dye penetrant under pressure, said first cannister includ-

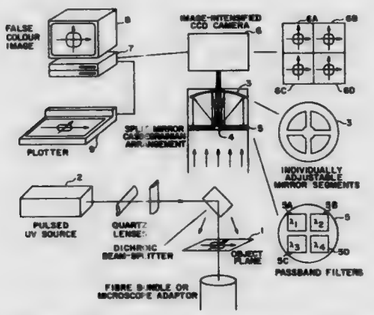
ing a means for releasing dye penetrant under pressure through said orifice;
a second cannister having a sealable orifice capable of holding a liquid, solid or gaseous material under pressure, said second cannister including a means for releasing the material under pressure through said orifice;
a manifold having at least two input fittings and an output fitting;
tubing means joining the orifice of the first cannister to an input fitting of the manifold;
tubing means joining the orifice of the second cannister to an input fitting of the manifold; and
tubing means joining the output fitting of the manifold to the channel means of said fiberscope.

5,115,137

DIAGNOSIS BY MEANS OF FLUORESCENT LIGHT EMISSION FROM TISSUE

Stefan Andersson-Engels, Hoor; Jonas Johansson, Lund; Unne Stenram, Lund; Katarina Svanberg, Lund, and Sune Svanberg, Lund, all of Sweden, assignors to Spectraphos AB, Lund, Sweden

PCT No. PCT/SE90/00118, § 371 Date Nov. 28, 1990, § 102(e) Date Nov. 28, 1990, PCT Pub. No. WO90/10219, PCT Pub. Date Sep. 7, 1990
PCT Filed Feb. 21, 1990, Ser. No. 598,716
Claims priority, application Sweden, Feb. 22, 1989, 8900612
Int. Cl.[5] G01N *21/64*
U.S. Cl. 250—461.2 **10 Claims**



1. A method for determining tissue character by fluorescence, comprising the steps of
i. exciting the tissue with a laser wavelength below 500 nm,
ii. detecting a fluorescence intensity within a plurality of predetermined spectral intervals for obtaining a plurality of numerical intensity values, at least two of said predetermined spectral intervals comprising spectral intervals centered on wavelengths having substantially equal absorption values in blood,
iii. performing an arithmetic operation on said numerical intensity values including at least one division operation.

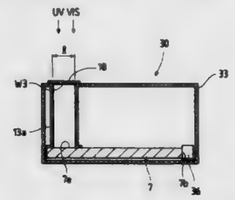
5,115,138

ULTRAVIOLET RAY DETECTING DEVICE

Satoru Tanaka, and Fumio Matsui, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 11, 1990, Ser. No. 625,713
Claims priority, application Japan, Jul. 4, 1990, 2-71433[U]
Int. Cl.[5] G01J *1/58*
U.S. Cl. 250—485.1 **14 Claims**

1. An ultraviolet ray detecting device comprising:
an external light shielding means for shielding an external light from entering there;
a fluorescent member disposed in said external light shielding means and containing a fluorescent substance, said fluorescent member being excited by an ultraviolet ray to thereby generate a fluorescence ray from the fluorescent substance, said fluorescent member being provided with one end through which the fluorescence ray is discharged;
a light entrance means through which a light is guided and emitted to said fluorescent member;
means for extracting the ultraviolet ray from the light through said light entrance means, including a partition wall member disposed on said fluorescent member and forming said light entrance means, a height of the partition wall member and a width of the light entrance means



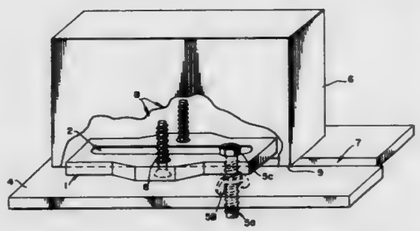
being regulated so that an incident angle of the light beams projected on a surface of the fluorescent member is smaller that a critical angle of visual light and preventing the visual light from propagating in the fluorescent member with repeating total reflection; and
a light discharging means provided with a window at a portion of said external light shielding means so as to allow for detection of the quantity of ultraviolet rays by visual observation of an intensity of said fluorescence ray generated by the excitation of said fluorescent member and discharged externally.

5,115,139

BRACKET DEVICE AND METHOD OF ADJUSTABLE FIELD SHAPING FOR EXTERNAL BEAM RADIATION THERAPY TREATMENT

Gregory W. Cotter, 5709 Marquis Ct., Mobile, Ala. 36609

Filed Oct. 29, 1990, Ser. No. 604,664
Int. Cl.[5] H01J *37/09*
U.S. Cl. 250—505.1 **10 Claims**



1. A device for blocking radiation, typically electron beam and X-ray radiation, from specific areas comprising:
a. at least one connection flange defining a slot providing for lateral and rotational movement;
b. at least one shielding block which is larger than said connection flange;
c. a blocking tray having at least one slotted track;
d. a mounting means allowing rotational and lateral movement between the connection flange and the shielding block.

5,115,140

EMR/RFR/MWR BODY SHIELD COMPOSITION

Tomas M. Rodriguez, Miami, Fla., assignor to Progressive Products, Inc., Miami, Fla.

Filed Jan. 24, 1991, Ser. No. 645,425
Int. Cl.[5] G21F *3/02*
U.S. Cl. 250—516.1 **10 Claims**



1. Wearing apparel for shielding a wearer from electromagnetic or radio frequency or microwave radiation produced by electronic equipment; wherein the apparel comprises a shell of flexible material containing a flexible insert having a copper-based coating applied thereon in an amount sufficient to shield the wearer from the electromagnetic, radio frequency or microwave radiation; the insert being made by the following steps:
(a) preparing electroless plated copper, which comprises the following steps in the order named:
(i) adding to an alcohol reaction bath copper particles to a concentration of about 25% to about 35% w/v relative to the alcohol component;
(ii) adding distilled water in an amount of about 200.00% to about 300.00% w/v relative to the alcohol component;
(iii) adding a non-ionic surfactant to a concentration of about 0.0009% to 0.06% w/v relative to the alcohol component;
(iv) adding a dilute acid to a concentration of about 0.5% to about 2.0% w/v relative to the alcohol component;
(v) adding an anionic surfactant to a concentration of about 0.050% to about 0.100% w/v relative to the alcohol component;
(vi) adding a plating metal to a concentration of about 1.0% to about 4.5% w/v relative to the alcohol component to produce plate copper particles;
(vii) collecting the plated copper particles by filtration;
(viii) washing the treated copper with water;
(ix) washing the plated copper particles with alcohol;
(x) adding the plated copper particles to a solvent base resin to produce a plated copper/resin mixture having a plated copper particle to resin ratio of about 0.5:1 to about 8:1, and
(b) applying the plated copper/resin mixture to a substrate.

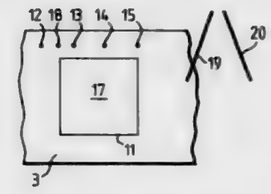
5,115,141

REGISTER MARK DETECTION APPARATUS UTILIZING A FIRST AND SECOND LINEAR ARRAY OF SENSORS ARRANGED NON-PARALLEL ALLOWING LONGITUDINAL AND TRANSVERSE MONITORING

Daniel Gold, Bushey, England, assignor to Crosfield Press Controls Limited, England

Filed May 24, 1990, Ser. No. 527,809
Claims priority, application United Kingdom, Jun. 15, 1989, 8913770
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—548 **16 Claims**

1. Register mark detection apparatus for detecting register marks on a web during relative movement between said web and said apparatus, said apparatus comprising:
detection means including a first linear array of sensors extending transverse to said direction of relative movement, each said sensor of said first array generating a signal when a mark is detected, and a second linear array of sensors (20) extending transverse to said direction of relative movement and substantially non-parallel with said first array, each said sensor of said second array generating a signal when a mark is detected; and



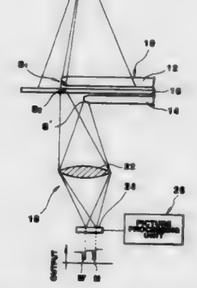
processing means for monitoring said signals from said sensors so as to determine which sensor or group of sensors has sensed the passage of a mark.

5,115,142

DEVICE FOR DETECTING EDGE OF TRANSPARENT SHEET OF LAMINATED TRANSPARENT AND TRANSLUCENT SHEET ASSEMBLY

Chiaki Taguchi, Hisai, and Hiroyuki Nishii, Ise, both of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Aug. 15, 1990, Ser. No. 567,906
Claims priority, application Japan, Aug. 18, 1989, 1-212438; Aug. 18, 1989, 1-212439
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 **12 Claims**



1. An apparatus for cutting off a protruding edge of a translucent sheet laminated to a transparent sheet in a laminated translucent and transparent sheet assembly, comprising:
means for holding the assembly approximately fixed relative to said holding means and for holding the assembly approximately adjacent to a reference position;
means for optically detecting a position of an edge of the transparent sheet relative to the reference position and producing signals representative thereof;
means for computing an amount of movement of the assembly out of the reference position depending upon the signals from said detecting means and for producing a signal representative thereof; and
means for cutting off the protruding end portion of the translucent sheet of the translucent and transparent sheet assembly while adjusting a position of the cutting means relative to the reference position depending on the signal from said comprising means for compensating for the

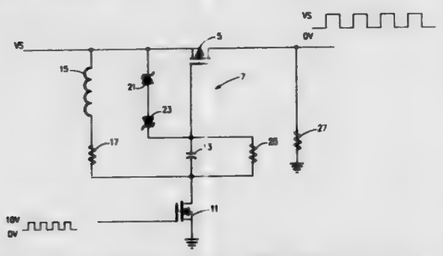
amount of movement of the assembly out of the reference position.

5,115,143

EFFICIENT P-CHANNEL FET DRIVE CIRCUIT

Alan S. Robelick, Endwell, and Ronnie A. Wunderlich, Endicott, both of N.Y., assignors to International Business Machines, Armonk, N.Y.

Filed Aug. 8, 1991, Ser. No. 741,922
Int. Cl.[5] H03K *17/687, 3/01, 17/16;* **H01J** *19/82*
U.S. Cl. 307—571 **7 Claims**



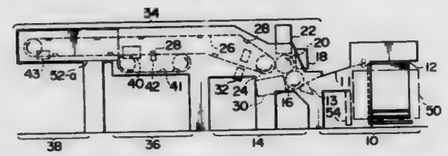
1. A drive circuit for a P-channel field effect transistor comprising:
- a first and second input terminal couplable to a dc voltage source and a first and second output terminal, said second input and second output terminal coupled to one another, said P-channel field effect transistor having its source and drain terminals coupling the first input terminal to the first output terminal;
- a capacitor having one side coupled to the gate of the P-channel field effect transistor;
- switch means coupled between the other side of the capacitor and the second input terminal; and
- an inductor coupling said first input terminal and the junction of said switch means and said capacitor, said switch means when conductive and nonconductive causing said P-channel transistor to be biased into and out of conduction, respectively.

5,115,144

AUTOMATIC SELECTION APPARATUS OF SHEET MATERIAL

Kouji Konishi; Tadayoshi Ohshima; Masakazu Fujii, all of Hiroshima; Motoyuki Hagino, Tokyo; Satoshi Hosono, Tokyo, and Masayoshi Miyake, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha; Oji Paper Company Ltd. and Toei Electronics Co., Ltd., all of Tokyo, Japan

Continuation of Ser. No. 625,706, Dec. 11, 1990, abandoned, which is a continuation of Ser. No. 501,354, Mar. 28, 1990, abandoned, which is a continuation of Ser. No. 316,522, Feb. 27, 1989, abandoned, which is a continuation of Ser. No. 41,284, Apr. 22, 1987, abandoned. This application Aug. 8, 1991, Ser. No. 742,286
Claims priority, application Japan, Apr. 23, 1986, 61-93680
Int. Cl.[5] G01N *9/04, 21/88*
U.S. Cl. 250—572 **12 Claims**



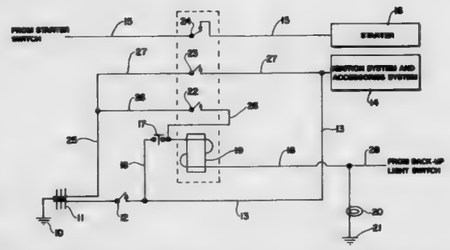
1. An automatic selection apparatus for detecting defects and sorting a stack of sheet materials comprising:
feeding means for individually feeding said sheet materials into the apparatus in a perpendicular direction to a flow direction of a manufacturing process for said sheet materials;
carrying means having a plurality of inspection drums and a downstream carrying chain with a plurality of grippers, the plurality of inspection drums receiving the individual sheet materials from the feeding means and transferring the individual sheet materials to the carrying chain, some of the plurality of grippers holding a front edge of each of said sheet material as the material is fed by the carrying chain;
first optical defect detection means having at least one reflection type detector facing one of the plurality of inspection drums for detecting defects while said sheet material is on said inspection drum, the sheet material being free of the carrying chain when the at least one reflection type detector is detecting defects;
second optical defect detection means having a laser light transmission type detector facing said carrying chain for detecting defects of said sheet material carried by the carrying chains by using a plurality of laser illuminators;
switching means disposed adjacent the carrying chain for selectively activating said carrying means which discontinues movement of said sheet materials by said carrying chain; and
control means for discharging said sheet materials into a first bin and a second bin in response to said first and second optical defect detection means.

5,115,145

MOTOR VEHICLE SECURITY SYSTEM

Frederick W. Westberg, Elyria, and Dean P. Brondos, Rocky River, both of Ohio, assignors to Dittrick/Christensen Enterprises, Inc., Champaign, Ill.

Filed Sep. 21, 1990, Ser. No. 586,438
Int. Cl.[5] B60R *25/10*
U.S. Cl. 307—10.3 **3 Claims**



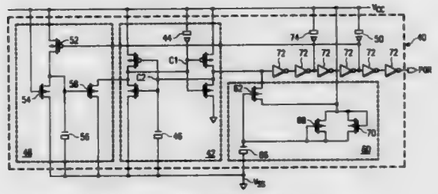
1. A security system for motor vehicles containing an engine ignition system controlled by a key-actuated ignition switch having "off", "on", and "start" positions, the security system comprising:
(a) a solenoid;
(b) a switch means which is closable by the vehicle operator to energize the solenoid when the engine is running and the vehicle prepared for parking, and which is automatically opened to deenergize the solenoid as the vehicle is prepared for driving;
(c) a bypass line from the battery to the ignition system and accessories system;
(d) a bypass switch in the bypass line, which bypass switch is normally open but is closed when the solenoid is energized; and
(e) a starter-override switch in the existing line from the battery to the starter, which starter-override switch is normally closed but is opened when the solenoid is energized;
such that: (1) if the switch means is closed by the vehicle operator when the engine is running and the vehicle prepared for parking, the solenoid is energized and the bypass line provides current to the ignition system and accessories system so that the ignition switch can be turned to the "off" position and the ignition key removed without turning off the engine and accessories; (2) if, while the solenoid is energized, the ignition key is reinserted and the ignition switch turned to the "on" position, the open starter-override switch prevents the flow of current to the starter should the ignition switch be inadvertently turned past the "on" position to the "start" position and the solenoid is deenergized as the vehicle is prepared for driving; and (3) if, while the solenoid is energized, a person without the ignition key attempts to drive the vehicle, the switch means of the security system automatically opens and the engine turns off.

5,115,146

POWER-ON RESET CIRCUIT FOR CONTROLLING TEST MODE ENTRY

David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Aug. 17, 1990, Ser. No. 569,000
Int. Cl.[5] H03K *17/22*
U.S. Cl. 307—272.3 **24 Claims**



1. A power-on reset circuit comprising:
- a latch, biased from a bias voltage terminal, and having a first state into which it enters upon the power-up of a bias voltage, said latch having an output for indicating the state of said latch;
- a timed switch circuit, having an input coupled to said bias voltage terminal, having a feedback input coupled to the output of said latch, and having an output coupled to said latch, for switching said latch to a second state upon the voltage at said bias voltage terminal exceeding a first threshold level for a selected duration of time, said timed switch circuit disabled responsive to the output of said latch indicating said second state and enabled responsive to the output of said latch indicating said first state; and
- a reset circuit, having an input coupled to said bias voltage terminal and having an output coupled to the output of said latch, for resetting the output of said latch to said first state upon the voltage at said bias voltage terminal falling below a second threshold level, thereby enabling said timed switch circuit.

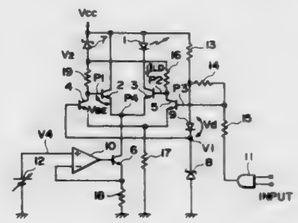
5,115,147

DRIVER FOR LIGHT EMITTING DEVICE FOR PROVIDING A STABLE BEAM OUTPUT

Akihisa Kusano, Kawasaki; Junichi Kimizuka, Yokohama; Toshiyuki Ito, Sagamihara; Kaoru Sato, Hiyoshi; Makoto Abe, Kashiwa; Kazuhiko Okazawa, Kawasaki, and Toshihiko Inuyama, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed May 31, 1989, Ser. No. 358,867
Claims priority, application Japan, Jun. 1, 1988, 63-134823
Int. Cl.[5] H01S *3/00;* **H03K** *3/01*
U.S. Cl. 307—311 **4 Claims**

1. A driver for a light emitting device, comprising:
first switching means having a first control terminal and second switching means having a second control terminal, said first and second control switching means for performing complementary first and second switching operations, including a switching operation to switch a current for driving a light emitting device, in accordance with voltages applied to said first and second control terminals;
voltage regulator means for generating a predetermined voltage; and



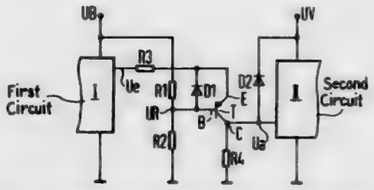
application means for applying the predetermined voltage generated by said voltage regulator means to one of said first and second control terminals in accordance with an input signal, and for applying a voltage different from the predetermined voltage to the other of said first and second control terminals hereby the switching means of the control terminal that received the predetermined voltage is turned on.

5,115,148

INTERFACE BETWEEN TWO ELECTRICAL CIRCUITS OPERATED AT DIFFERENT OPERATING VOLTAGES

August Kammerl, Brunn, and Ernst Niedermeier, Hohenegebraching, both of, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 22, 1990, Ser. No. 600,668
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1989, 8912984[U]
Int. Cl.[5] H03K *19/0175, 5/153*
U.S. Cl. 307—475 **11 Claims**



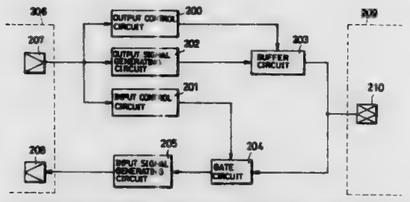
1. Interface between first and second electrical circuits operated from a highly fluctuating first voltage and a second operating voltage, respectively, comprising:
- said interface receiving an input signal corresponding to an output first circuit signal of the first circuit, said input signal being compared in a means for comparing to a reference voltage which is proportional to the first operating voltage, an output signal of the means for comparing corresponding to an input second circuit signal of the second circuit;
- a transistor being the means for comparing;
- a first terminal being the collector of the transistor from which the output signal is taken and which is connected via a resistor to a negative pole of the first operating voltage;
- a second terminal of the transistor receiving the reference voltage; and
- a third terminal of the transistor receiving the input signal.

5,115,149

BIDIRECTIONAL I/O SIGNAL SEPARATION CIRCUIT

Yoshinori Hashimoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Mar. 28, 1991, Ser. No. 675,561
Claims priority, application Japan, Jan. 24, 1991, 3-7221
Int. Cl.[5] H03K *19/092, 19/00*
U.S. Cl. 307—475 **4 Claims**



1. A bidirectional I/O signal separation circuit for connecting a first circuit device having a bidirectional I/O terminal with a second circuit device having individual input and output terminals, said bidirectional I/O signal separation circuit comprising:

an output control circuit connected to said output terminal for generating an output control pulse signal when a logical level of a signal transmitted from said output terminal is changed;

an input control circuit connected to said output terminal for generating an input control pulse signal when said logical level of said signal transmitted from said output terminal is changed;

an output signal generating circuit connected to said output terminal for generating an output pulse signal when said logical level of said signal transmitted from said output terminal is changed;

a buffer circuit having an input connected to said output signal generating circuit and an output connected to said I/O terminal and adapted to permit said output pulse signal to be supplied to said I/O terminal during a period of time during which said output control pulse signal is supplied to a control terminal thereof and brings said output thereof into a high impedance state during a period of time during which said output control pulse signal is not supplied to said control terminal;

a gate circuit having an input connected to said I/O terminal and adapted to block a pulse signal transmitted from said I/O terminal during a period of time during which said input control pulse signal is supplied to a control terminal thereof; and

an input signal generating circuit having an input connected to an output of said gate circuit and an output connected to said input terminal and adapted to generate a signal whose logical level is changed whenever said input signal generating circuit receives, via said gate circuit, said pulse signal transmitted from said I/O terminal and supply said generated signal to said input terminal.

5,115,150

LOW POWER CMOS BUS RECEIVER WITH SMALL SETUP TIME

Mark A. Ludwig, Loveland, Colo., assignor to Hewlett-Packard Co., Palo Alto, Calif.

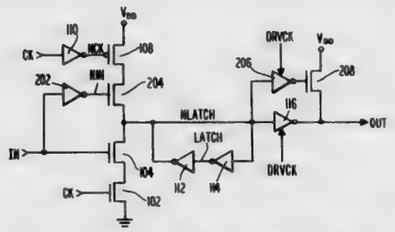
Filed Nov. 19, 1990, Ser. No. 615,681
Int. Cl.[5] H03K *19/092, 19/096*
U.S. Cl. 307—475 **7 Claims**

1. A latching CMOS bus receiver, comprising:

a CMOS inverter responsive to a clock signal for inverting a logic state of an input signal during a predetermined clock state of said clock signal, said CMOS inverter comprising a series connection of a first NFET transistor and a second NFET transistor having a small CMOS inverter at an input gate thereof, said input signal being received at an input of said small CMOS inverter and a gate of said first NFET transistor and being inverted at an output of said CMOS inverter at common node between said first and second series connected NFET transistors;

feedback means for latching the inverted input signal output by said CMOS inverter; and

means responsive to a latched output of said feedback means



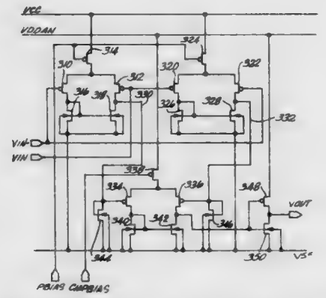
for driving the input signal onto an output bus, said driving means comprising first and second driving CMOS inverters which receive said latched output of said feedback means and a bus access signal, and an NFET having a gate connected to an output of said first driving CMOS inverter, a source connected to a voltage source, and a drain connected to an output of said second driving CMOS inverter and said output bus.

5,115,151

TRIPLE COMPARATOR CIRCUIT

Richard W. Hull, Laguna Hills, and Timothy G. O'Shaughnessy, Norco, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Jun. 8, 1990, Ser. No. 535,177
Int. Cl.[5] H03K *5/24*
U.S. Cl. 307—355 **4 Claims**



1. A high impedance differential comparator circuit having symmetrical delay comprising;

a first MOS differential amplifier having a first input, a second input and an output, the first input connected to a first signal source and the second input connected to second signal source;

a second MOS differential amplifier identical to the first differential amplifier having the first input connected to the second signal source and the second input connected to the first signal source;

a third MOS differential amplifier having a first input connected to the output of the first differential amplifier, a second input connected to the output of the second differential amplifier and an output; and,

means for clamping the outputs of the first and second differential amplifiers thereby providing a maximum limit on

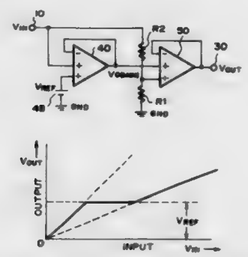
voltage at the first and second inputs to the third differential amplifier.

5,115,152

AMPLIFIER HAVING POLYGONAL-LINE CHARACTERISTICS EMPLOYING TWO COMPARATORS

Kouichi Nishimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 27, 1991, Ser. No. 766,768
Claims priority, application Japan, Sep. 27, 1990, 2-257781
Int. Cl.[5] H03K *5/24, 5/01*
U.S. Cl. 307—490 **9 Claims**



1. A polygonal-line characteristic amplifier comprising:

a signal input terminal and a signal output terminal;

a minimum-voltage discrimination circuit for detecting and outputting a lower one of two input voltages respectively applied to two non-inverting input terminals of said minimum-voltage discrimination circuit, one of said non-inverting input terminals being supplied with an input voltage applied to said signal input terminal and the other of said non-inverting input terminals being supplied with a predetermined reference voltage; and

a maximum-voltage discrimination circuit for detecting and outputting a higher one of two input voltages respectively applied to two non-inverting input terminals of said maximum-voltage discrimination circuit, one of said two non-inverting input terminals of said maximum-voltage discrimination circuit being supplied with the output from said minimum-voltage discrimination circuit,

whereby a polygonal-line characteristic voltage corresponding to an input voltage applied to said signal input terminal is outputted from said signal output terminal.

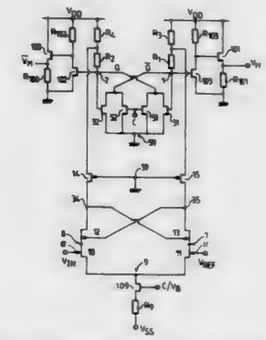
5,115,153

DIFFERENTIAL STAGE COMPRISING MESFETS

Thierry Ducourant, Crosne, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 16, 1989, Ser. No. 367,520
Claims priority, application France, Jun. 17, 1988, 88 08147
Int. Cl.[5] H03K *5/08, 17/16*
U.S. Cl. 307—491 **19 Claims**

1. An integrated circuit, comprising a differential MESFET transistor pair with each MESFET coupled to a supply voltage via a respective load, an input for supplying an analog input voltage to a control electrode of one transistor of said transistor pair thereby to produce switching of the transistor pair, a node between the respective MESFET and its associated load being coupled to a sub-circuit for controlling the sub-circuit, and smoothing means coupled to said MESFET transistors for smoothing fluctuations of an output impedance



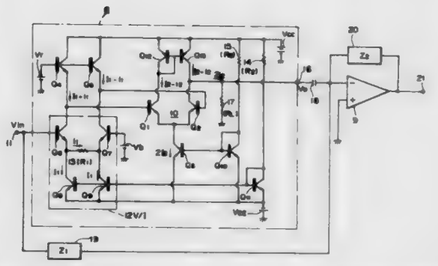
of said differential MESFET transistor pair during switching thereof.

5,115,154

FREQUENCY AND/OR PHASE CHARACTERISTIC CONTROL CIRCUIT HAVING CONTROLLED CURRENT MULTIPLYING RATIO

Ikuo Terado, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 6, 1991, Ser. No. 651,609
Claims priority, application Japan, Feb. 9, 1990, 2-8372
Int. Cl.[5] H03G *1/00*
U.S. Cl. 307—494 **6 Claims**



1. A frequency and/or phase characteristic control circuit comprising:

(a) a current multiplier having a multiplying ratio and containing an input terminal to be supplied with an input voltage, a voltage/current converter supplied with said input voltage so as to produce a pair of current signals at the output thereof, a pair of diode junctions supplied with said pair of current signals, a differential amplifier having first and second transistors and a current source, said first and second transistors being supplied with the voltage across said pair of diode junctions to produce a multiplied output current, and an output terminal connected to the output of said differential amplifier so as to produce output voltage across a load resistor proportional to said multiplied output current;

(b) an operational amplifier having an in-phase input terminal, an out-of-phase input terminal and an output terminal;

(c) a capacitor connected between the output terminal of said current multiplier and the out-of-phase input terminal of said operational amplifier;

(d) a first impedance connected between the input terminal

of said current multiplier and the out-of-phase input terminal of said operational amplifier; and

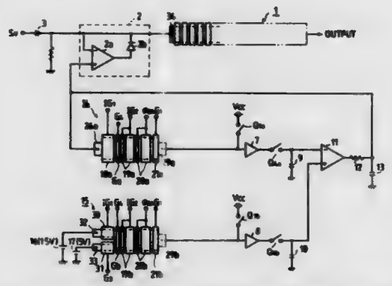
(e) a second impedance connected between the out-of-phase input terminal and the output terminal of said operational amplifier; wherein the frequency and/or phase of the output signal of said operational amplifier is controlled by varying the multiplying ratio of said current multiplier.

5,115,155

CCD DELAY LINE

Takashi Miida; Yoshimitsu Kudoh, and Hiedki Mutoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 16, 1991, Ser. No. 685,773
Claims priority, application Japan, Apr. 20, 1990, 2-103101
Int. Cl.[5] G11C *19/28*
U.S. Cl. 307—607 **5 Claims**



1. A charge-coupled device (CCD) delay line comprising: a delay line circuit, said delay line circuit comprising a plurality of buried CCDs; input bias adjusting means for clamping a signal to be delayed and supplying said clamped signal to said delay line circuit; a first register having a transfer path comprising a plurality of buried CCDs of the same structure as said delay line circuit; a second register having a transfer path comprising a plurality of buried CCDs of the same structure as said delay line circuit and said first register; first means for detecting an amount of charge applied from said first register; second means for detecting an amount of charge applied from said second register; bias means for controlling a bias adjustment amount of said input bias adjusting means in accordance with a charge representative of a difference between said amounts of charge detected by said first and second charge amount detection means and applying a voltage corresponding to said difference to an input contact of said first register;

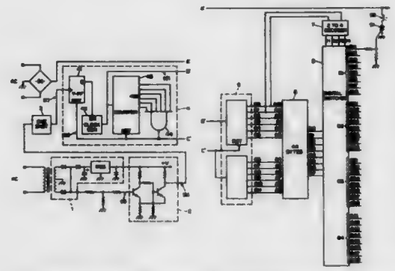
wherein an input section of said second register comprises: a first diffusion layer having a first predetermined potential applied thereto; a second diffusion layer having a second predetermined potential applied thereto, said second potential being higher than said first potential; a measuring gate electrode having an intermediate potential applied thereto and being connected to a charge transfer path, said intermediate potential being between said first and second potentials; a first gate electrode being disposed between said first diffusion layer and said measuring gate electrode; and a second gate electrode being disposed between said second diffusion layer and said measuring gate electrode; said CCD delay line measuring transferred charge by applying a control signal of a predetermined voltage at predetermined timing to said first gate electrode and applying a constant voltage to said second gate electrode so that a charge corresponding to a difference between a potential below said second gate electrode and a potential below said measuring gate electrode is generated below said measuring gate electrode.

5,115,156

APPARATUS FOR TRIGGERING A PLURALITY OF THYRISTOR DEVICES

Huai-Chou Tsai, 4F, No. 8-3, Sheng-Li Rd., Tainan City, Taiwan

Filed Oct. 1, 1990, Ser. No. 591,287
Int. Cl.[5] H03K *17/296, 17/72, 17/94*
U.S. Cl. 307—638 **3 Claims**



1. An apparatus for triggering a plurality of thyristor devices into conduction, comprising:

a full-wave rectifier circuit means having a sinusoidal pulse output;

a Schmitt trigger circuit means for generating a constant amplitude pulse signal when said sinusoidal pulse output exceeds a certain triggering level;

means for generating a predetermined number of clock pulses within the duration of said constant amplitude pulse signal;

an address counter to receive said clock pulses, said address counter having a digital output corresponding to the number of clock pulses received; and

a read-only memory means to store digital data, said read-only memory means having a plurality of address lines to receive said digital output of said address counter, said read-only memory means having a set of output data bits corresponding to said stored digital data accessed according to said digital output of said address counter, each of said thyristor devices being triggered into the conducting state by one of said output data bits of said read-only memory means.

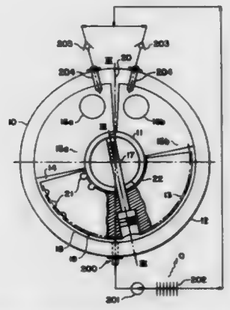
5,115,157

LIQUID SEALED VANE OSCILLATORS

Leif Blumenau, Beer Sheva, Israel, assignor to Technion Research & Development Foundation, Ltd., Haifa, Israel

Filed Dec. 15, 1989, Ser. No. 451,520
Claims priority, application Israel, Dec. 21, 1988, 88759
Int. Cl.[5] H02K *44/00*; F25B *9/00*
U.S. Cl. 310—11 **22 Claims**

1. A liquid sealed oscillator, comprising a stationary oscillation space, constituted by a sector of an annular cavity, having a rectangular cross-section in a plane through the axis of the cavity and vertically oriented plane of symmetry, which cavity contains a sealing liquid, two opposing pressure chambers on top of said oscillator, said chambers having parts communicating with the outside and a free-body vane of smaller included sector angle than the said oscillation cavity and having its surface in closely matching relationship with the inner facing wall of the said cavity, wherein the said vane is symmetrically oscillatable with the sealing liquid in the narrow gaps between the vane and the cavity walls providing a liquid dynamic seal across the vane relative to said two opposing pressure chambers.

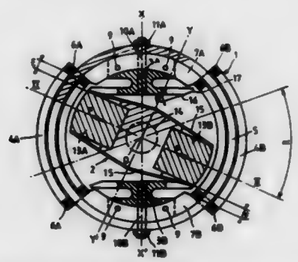


5,115,158

ELECTRIC MOTOR WITH MAGNETIC LOCKING ABUTMENT MEMBER AND HEAT SHIELD FOR A SPACE VEHICLE OPERATED BY A MOTOR OF THIS KIND

Hubert Vaillant de Guelis, Aubergenville, and Jean-Louis Joly, Bazemont, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

PCT No. PCT/FR88/00635, § 371 Date Aug. 23, 1989, § 102(e) Date Aug. 23, 1989, PCT Pub. No. WO89/06063, PCT Pub. Date Jun. 29, 1989
PCT Filed Dec. 22, 1988, Ser. No. 415,353
Claims priority, application France, Dec. 23, 1987, 87 18074
Int. Cl.[5] H02K *33/00*
U.S. Cl. 310—15 **17 Claims**



14. An electric motor comprising:

a stator loop member made of a magnetic material and comprising two substantially elongate stator portions;

a movable member made of a magnetic material and including at least one permanent magnet, movable between two abutment configurations and substantially extending transversely to said elongate stator portions, and having two ends adapted respectively to move along said elongate stator portions when said movable member is moved between said abutment configuration, said two ends being spaced from said elongate stator portion by airgaps having a width which remains constant when said movable member is moved between said abutment configurations, said at least one permanent magnet generating a magnetic flux which is closed through said two ends, said airgaps and said stator loop member;

at least one winding wound around at least one of said elongate stator portions along a length of said at least one of said elongate stator portions such that one of said two ends of said movable member keeps facing said winding when said movable member is in or between abutment configurations;

at least one pair of abutment members for respectively contacting one of said two ends when said movable member is in respectively one or the other of said abutment configurations, each of said abutment members being provided with a magnetic portion connected to the stator member into which passes a part of said magnetic flux of said at least one permanent magnet when one of said two ends is abutting against said each of said abutment members,

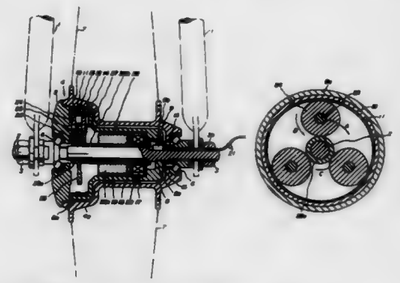
whereby said movable member is moved into one or the other of said abutment configurations by energizing said at least one winding with a direct current in one sense or in the opposite sense, and remains magnetically locked on any of said abutment members by said magnetic portion in said abutment members.

5,115,159

BUILT-IN GENERATOR FOR BICYCLE

Kikuzo Takamiya, Kitamoto, and Ritsuo Nishimura, Urawa, both of Japan, assignors to Bridgestone Cycle Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1990, Ser. No. 601,639
Claims priority, application Japan, Oct. 25, 1989, 1-275998; Nov. 28, 1989, 1-306433; Feb. 6, 1990, 2-25125; Mar. 9, 1990, 2-56330
Int. Cl.[5] H02K *7/00*
U.S. Cl. 310—67 A **14 Claims**



1. A built-in generator, comprising:

an axle to be fixed to a frame of a bicycle;

a hub of a bicycle wheel rotatably provided around said axle;

a hollow cylinder fixed to and around said axle and disposed within said hub, said hollow cylinder having an open end at one end of said axle;

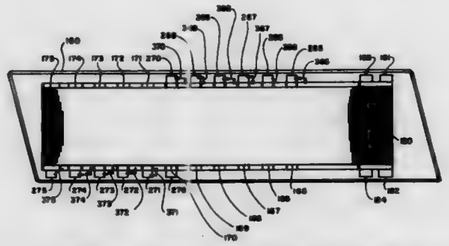
a generating coil unit disposed within and fixed to said hollow cylinder at the other end of said axle;

a planetary transmission device comprising a set of elements including a sun roller rotatably provided around and concentric to said axle, a planet carrier disposed adjacent to said sun roller and rotatably provided around said axle at said one end thereof, a plurality of planet rollers supported by said planet carrier and arranged to circumscribe said sun roller, and an elastic ring circumscribing said planet rollers for urging said planet rollers into pressure contact with said sun roller; and

a rotor magnet rotatably provided around said sun roller adjacent to said coil unit;

wherein said planetary transmission device transmits rotation of said hub to said rotor magnet to thereby rotate said rotor magnet at a greater velocity than a rotational velocity of said hub.

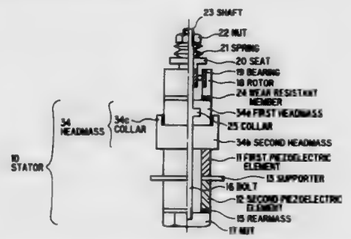
5,115,160
EASILY ENCODABLE SURFACE ACOUSTIC WAVE (SAW) SECURITY DEVICES
William C. Knoll, Turbotville, Pa.; James R. McColl, Concord, Mass., and James O. Lawson, Williamsport, Pa., assignors to GTE Products, Danvers, Mass.
Filed Aug. 28, 1989, Ser. No. 399,126
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—313 B **32 Claims**



1. A device that provides a code of surface acoustic waves, whose code is settable in an in situ environment comprising:
means defining a number of surface acoustic wave units arranged to provide a coded sequence, each of said number of surface acoustic wave units being operative in one of two conditions, a first condition wherein a surface acoustic wave unit is substantially wave reflective, and a second condition wherein a surface acoustic wave unit is substantially wave non-reflective, each of said number of surface acoustic wave units including a fusible link that is fusible in an in situ environment, and when openly fused changes said surface acoustic wave unit from said second condition to said first condition, thus defining a sequential code, means defining a pulse emitting main surface acoustic wave unit disposed upstream of said number of surface acoustic wave units, and means defining chosen positions for said surface acoustic wave units such that reflected waves therefrom will arrive at said pulse emitting main surface acoustic wave unit in a half-integer of a pulse emitted from said pulse emitting main surface acoustic wave unit, whereby quadruple transit spurious signals that arrive at integer multiples of a pulse emitted from said pulse emitting main surface acoustic wave unit will be distinguishable from said coded, reflective sequence of said surface acoustic wave units.

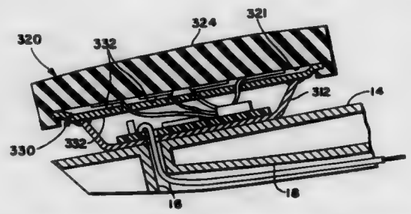
5,115,161
ULTRASONIC MOTOR
Osamu Myohga, and Tadao Uchikawa, both of Tokyo, Japan, assignors to NEC Corporation, Japan
Filed Dec. 3, 1990, Ser. No. 620,776
Claims priority, application Japan, Dec. 4, 1989, 1-315842; Dec. 5, 1989, 1-316655
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 **10 Claims**

1. An ultrasonic motor, comprising:
a stator for generating an ultrasonic elliptic vibration from a combination of longitudinal and torsional vibrations, said stator including a head mass defined by a first head mass having a stiffness which resists longitudinal vibrations and a second head mass having an inertial mass which resists torsional vibrations, a rear mass and first and second piezoelectric elements positioned between the head mass and the rear mass; and



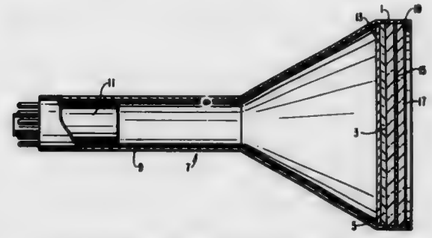
a rotor in press-contact with said stator to receive said ultrasonic vibration via a friction force form said stator.

5,115,162
ACTUATION RESPONSIVE BRAKE PEDAL PAD ASSEMBLY
Mark L. Leonard, Redford; Loren H. Uthoff, Jr., Canton, both of Mich., and Jerome K. Hastings, Sussex, Wis., assignors to Eaton Corporation, Cleveland, Ohio
Filed Apr. 18, 1990, Ser. No. 510,643
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—339 **10 Claims**



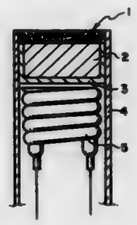
1. A pressure-sensitive brake pedal transducer comprising:
(a) support means adapted for attachment to a vehicle brake pedal arm;
(b) pad means received on said support means, said pad means formed of resilient flexible material having embedded therein,
(i) a spacer layer of resiliently deformable electrically insulating material.
(ii) a first plurality of spaced generally parallel strips disposed on one side of said spacer layer said strips formed of relatively thin piezoelectric material.
(iii) a second plurality of spaced generally parallel strips disposed on the side of said spacer opposite said one side, said second plurality of strips formed of relatively thin piezoelectric material and disposed to extend generally at right angles to said first plurality of strips, wherein upon application of a brake actuating force to said pad means, some of said first plurality and some of second plurality of strips are simultaneously individually deformed to give separate electrical signals indicative of said actuating force.

5,115,163
CATHODE RAY TUBE DEVICE WITH IMPROVED COOLANT
Brian J. Fitzpatrick, Ossining; Phyllis M. Harnack, Hastings on Hudson, both of N.Y., and Scott H. Baker, Knoxville, Tenn., assignors to North American Philips Corporation, New York, N.Y.
Filed Oct. 23, 1990, Ser. No. 603,973
Int. Cl.[5] H01J *61/52*
U.S. Cl. 313—36 **8 Claims**



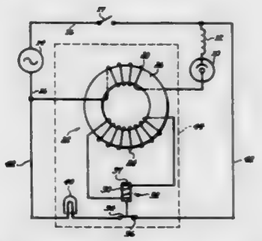
1. A cathode-ray tube device for generating a bright light spot comprising:
a cathode-ray tube including an evacuated envelope, means for generating an electron beam, a transparent glass face plate forming part of said envelope and situated in said electronic beam, said transparent glass face plate having an interior surface situated in said electronic beam provided with a phosphor coating capable of emitting visible radiation upon excitation by said electron beam,
and a coolant means for said cathode-ray tube positioned outside of said cathode-ray tube, and in a beam of said radiation, said coolant means comprising, in a container which at least in a direction parallel to the axis of said tube is transparent to said visible radiation, a solution consisting essentially of about 0.5–2.0% by weight of a surfactant selected from the group consisting of sorbitan esters of fatty acids of 12–18 carbons, polyoxyethylene derivatives thereof and ethers of polyoxyethylene in polyethylene glycol 200–300, all of said container in contact with said solution being formed of polymethyl methacrylate and all surfaces of which container are in contact with said solution being provided with a thin layer of silicon dioxide.

5,115,164
DISPENSER CATHODE
Jong-in Jeong; Jong-seo Choi; Hwan-cheol No, and Kyu-nam Ju, all of Suwon, Rep. of Korea, assignors to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea
Filed Nov. 7, 1990, Ser. No. 611,688
Claims priority, application Rep. of Korea, Nov. 10, 1989, 89-16316
Int. Cl.[5] H01J *1/28*
U.S. Cl. 313—346 DC **2 Claims**



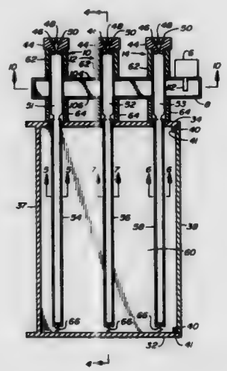
1. A dispenser cathode comprising:
an electron emissive material stored in a reservoir comprising barium calcium aluminate and tungsten:
a porous metal base body disposed on the top of said electron emissive material; and
a sleeve supporting said reservoir and enclosing a heater;
wherein said electron emissive material further comprises nickel and an alloy of barium and aluminum.

5,115,165
SAFETY LIGHTING MEANS FOR USE WITH A HIGH INTENSITY DISCHARGE LAMP
David W. Knoble, East Flat Rock, N.C., assignor to General Electric Company, Schenectady, N.Y.
Filed Mar. 16, 1990, Ser. No. 494,389
Int. Cl.[5] H05B *41/46*
U.S. Cl. 315—92 **13 Claims**



1. Safety lighting means for use with variously rated HID light sources having current ratings ranging from a relatively low value to a relatively high value, the HID light sources being respectively adapted for connection in a primary a.c. circuit for supplying current to the HID light source connected therein; the safety lighting means comprising:
(a) a current transformer comprising a magnetizable core, a primary winding inductively coupled to said core for connection in series with said primary a.c. circuit and said HID light source, and a secondary winding inductively coupled to said core, the secondary winding having a substantially greater number of turns than said primary winding,
(b) a monitoring relay connected in series circuit with said secondary winding so as to derive the relay's operating energy solely from said current transformer and operable into an activated condition by energy derived from said current transformer in response to said primary winding being traversed by a predetermined minimum value of primary current, said relay being operable to a deactivated condition in response to interruption of said primary current by a power interruption,
(c) an auxiliary light source serving as a safety light, and
(d) energizing means for said auxiliary light source that (i) is effective to operate said auxiliary light source when said relay is in a deactivated condition but (ii) is rendered ineffective to operate said auxiliary light source when said relay is operated into its activated condition, said monitoring relay being operated to said activated condition immediately upon establishment of said predetermined minimum value of primary current such that said auxiliary light is extinguished without time delay.

5,115,166
PLASMA STERILIZER AND METHOD
Bryant A. Campbell, Los Gatos, and Kern A. Moulton, Livermore, both of Calif., assignors to Abtox, Inc., Pleasanton, Calif.
Continuation-in-part of Ser. No. 321,483, Mar. 8, 1989, and a continuation-in-part of Ser. No. 475,602, Feb. 6, 1990, abandoned. This application Aug. 31, 1990, Ser. No. 576,292
Int. Cl.[5] **A61L** *2/14*
U.S. Cl. 315—111.21 **13 Claims**



1. An apparatus for plasma sterilization of articles comprising a sterilizing chamber, a plasma generator means external to the sterilizing chamber, and a plasma distribution means for distributing plasma from the plasma generator means to the sterilizing chamber;

the plasma generator means further comprising:

a plasma generating chamber means for generating plasma therein; and

an electromagnetic wave generator for providing an electromagnetic field zone substantially in the plasma generating chamber means;

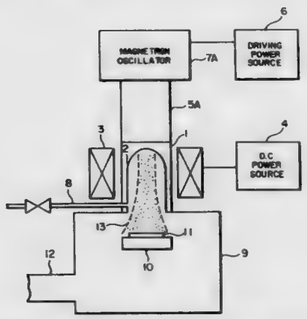
the plasma generating chamber means further comprising:

a generator tube having an inlet and an outlet, said inlet connected to receive a gas mixture and said outlet connected to the plasma distribution means, the generator tube being positioned in the electromagnetic field zone of the electromagnetic wave generator for generating plasma from the gas mixture; and

a restriction means at the outlet for maintaining the gas pressure in the plasma generating chamber at from 0.1 to 10 torr.

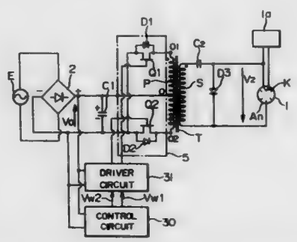
5,115,167
PLASMA PROCESSOR
Hiroki Ootera, and Mutsumi Touda, both of Amagasaki City, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Apr. 4, 1989, Ser. No. 333,042
Claims priority, application Japan, Apr. 5, 1988, 63-82276; Nov. 17, 1988, 63-292995
Int. Cl.[5] **H05H** *1/46*
U.S. Cl. 315—111.21 **5 Claims**

1. A plasma processor comprising a chamber including a cylindrical plasma generation portion in which an electron cyclotron resonance plasma is generated, means for producing a magnetic field in said plasma generation portion for establishing the electron cyclotron resonance plasma, means for supplying a gas to the plasma generation portion in which the electron cyclotron resonance plasma is established, and means for producing right hand polarized microwave energy and for supplying the right hand polarized microwave energy and for supplying the right hand polarized microwave energy to said plasma generation portion including a magnetron oscillator and a circular cross-section waveguide interposed between said magnetron oscillator and said plasma generation portion for transmitting right hand polarized microwave energy, said chamber including a plasma reaction portion for retaining a



substrate to be processed with the plasma generated in said plasma generation portion, wherein said cylindrical plasma generation portion and said circular waveguide each have diameters, and the diameter of said plasma generation portion is larger than the diameter of said circular waveguide.

5,115,168
POWER SUPPLY FOR MICROWAVE DISCHARGE LIGHT SOURCE
Isao Shoda; Hitoshi Kodama; Kazuo Magome, all of Kamakura; Akihiko Iwata, Amagasaki; Kenji Yoshizawa, Amagasaki, and Masakazu Taki, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 329,786, Mar. 17, 1989, Pat. No. 4,988,922.
This application Nov. 20, 1990, Ser. No. 616,244
Claims priority, application Japan, Jul. 28, 1987, 62-188256
Int. Cl.[5] **H05B** *37/02*
U.S. Cl. 315—223 **13 Claims**



1. A circuit system adapted to supply microwave energy to a microwave discharge light source apparatus including an electrodeless discharge bulb, comprising:

first rectifier means, adapted to be coupled to an AC voltage source of a relatively low voltage and frequency, for outputting a rectified voltage of a relatively low voltage;

filter means, coupled to said first rectifier means, for smoothing said rectified voltage outputted from said first rectifier means, and for outputting a smoother rectified voltage;

inverter means, coupled to said filter means, for converting said smoothed rectified voltage outputted from said filter means to an AC voltage of a relatively high frequency having a waveform of alternating pulses, wherein the relative high frequency f, expressed in kilohertz, of the AC voltage outputted by said inverter means is not less than 1500 divided by a diameter D, expressed in millimeters, of said electrodeless discharge bulb of the microwave light source apparatus:

$$f \geqq 1500/D;$$

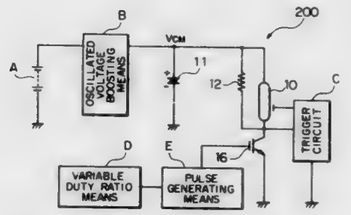
pulse width modulation control means for modulating a pulse width of said pulses of said AC voltage outputted from said inverter means;

a step-up transformer having a primary winding coupled to an output of said inverter means, a secondary winding of the step-up transformer outputting an AC voltage of said relative high frequency and of a relatively high voltage;

second rectifier means, coupled to said secondary winding of said step-up transformer, for rectifying said AC voltage of the relative high frequency and the relative high voltage outputted from said secondary winding to a rectified voltage of a relatively high voltage; and

a magnetron coupled to said second rectifier means, to be supplied with and operated by said rectified voltage of the relative high voltage outputted from said second rectifier means.

5,115,169
FLASH LIGHT CONTROL CIRCUIT
Tetsushi Aoki, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan
Filed Oct. 23, 1990, Ser. No. 601,999
Claims priority, application Japan, Oct. 31, 1989, 1-2845504
Int. Cl.[5] **H05B** *41/32*
U.S. Cl. 315—241 R **4 Claims**



1. A flash bulb control circuit for controlling the quantity of light emitted from said flashbulb, said circuit comprising

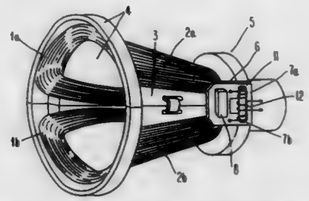
(a) a switching element electrically connected to one terminal of said flashbulb and to a trigger circuit, by which a trigger voltage is impressed on a trigger terminal of said flashbulb thereby causing an ON state in said switching element wherein energy stored in a main capacitor is discharged into said flashbulb to cause said bulb to flash:

(b) a signal emitter adapted to output a signal to extend the duration of said ON state based on discharging characteristics of said flashbulb;

(c) a receiving circuit for controlling the duration of said ON state based upon said signal from said signal emitter;

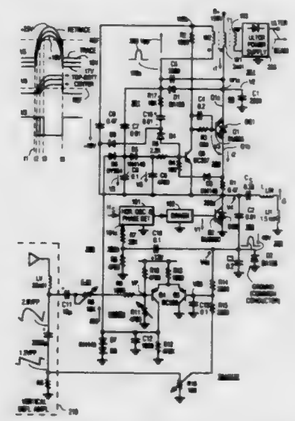
whereby quantities of light emitted by said flashbulb are substantially equal in successive flashings of said flashbulb.

5,115,170
DEFLECTION YOKE FOR USE IN COLOR CATHODE RAY TUBES
Toshio Ose, Osaka; Toshifumi Yoshida, Saita, and Katsuyo Iwasaki, Nishinomiya, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan
Filed Jul. 27, 1990, Ser. No. 558,740
Claims priority, application Japan, Jul. 31, 1989, 1-199005
Int. Cl.[5] **H01J** *29/56*
U.S. Cl. 315—370 **9 Claims**



1. A deflection yoke for use in color cathode ray tubes, the deflection yoke comprising a larger rim portion and a smaller rim portion, a vertical deflection coil for generating a vertical deflecting magnetic field having a barrel-shaped distortion, and a horizontal deflection coil for generating a horizontal deflection magnetic field having a pin-cushion shaped distortion, a differential coil connected to the horizontal deflection coil, a pair of cores located in opposite positions in relation to the smaller rim portion, the cores being provided with coils for generating a quadripolar magnetic field, a pick-up coil magnetically coupled to one of the differential coil and the horizontal deflection coil, and a current waveform shaping circuit for supplying a current to the quadripolar magnetic field generating coils.

5,115,171
RASTER DISTORTION CORRECTION CIRCUIT
Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Licensing Corporation, Princeton, N.J.
Filed Jun. 28, 1991, Ser. No. 722,809
Claims priority, application United Kingdom, Jan. 4, 1991, 9100123; Apr. 5, 1991, 9107215
Int. Cl.[5] **G09G** *1/04*
U.S. Cl. 315—371 **26 Claims**



1. A television deflection apparatus, comprising:

a source of a first input signal at a frequency that is related to a first deflection frequency;

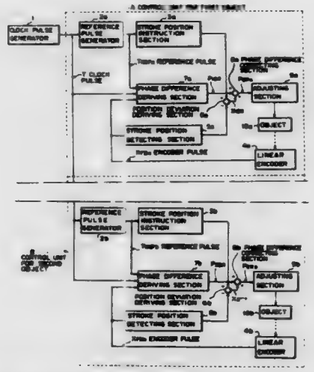
a retrace resonant circuit including a deflection winding and a first retrace capacitance;
a source of an input supply voltage;
a supply inductance coupled to said source of input supply voltage for developing at least a portion of a flyback pulse voltage in said supply inductance;
first switching means responsive to said first input signal and coupled to said retrace resonant circuit and to said supply inductance for generating a deflection current in said deflection winding and for developing at least a portion of a first retrace pulse voltage in said retrace resonant circuit during a retrace interval of a given deflection cycle;
a source of a modulation second input signal; and
second switching means responsive to said first and second input signals and coupled to said supply inductance and to said retrace resonant circuit for decoupling said supply inductance from said retrace resonant circuit and to develop said flyback pulse voltage at a first main current conducting terminal of said second switching means and said first retrace pulse voltage at a second main current conducting terminal of said second switching means, during a controllable first portion of said first retrace pulse voltage that occurs when said supply inductance and said retrace resonant circuit are decoupled, the controllable first portion of said first retrace pulse voltage varying in accordance with said second input signal.

5,115,172

PHASE LOCKED LOOP SPEED CONTROL CIRCUIT FOR CONTROLLING SPEEDS AND RELATIVE POSITIONS OF OBJECTS

Hiroshi Ishii, and Masaaki Ozaki, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed May 15, 1990, Ser. No. 523,432
Claims priority, application Japan, May 22, 1989, 1-129371
Int. Cl.[5] H01P *5/00*
U.S. Cl. 318—38 **10 Claims**



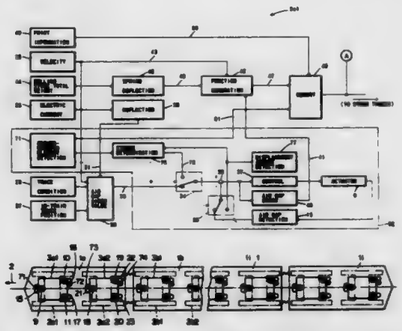
1. A phase locked loop speed control circuit for controlling the speeds of two or more objects, comprising:
clock pulse generator means for respectively generating reference pulses for said two or more objects, said clock pulse generator means including a clock pulse generator for generating clock pulses used for a time base and reference clock pulse generators for dividing the clock pulses output by said clock pulse generator for producing the reference pulses corresponding to desired speeds of said two or more objects;
first counting means for counting the corresponding reference pulses output by said reference clock pulse generators;
encoder means for detecting the corresponding relative movements of said objects to provide respective encoder pulses;
second counting means for counting the corresponding encoder pulses output by said encoder means;
first subtractor means for subtracting each count of said second counting means from each count of said first counting means for producing position deviations of said objects;
second subtractor means for subtracting each encoder pulse of said encoder means from each respective reference pulse of said reference clock pulse generators for producing phase differences of said objects;
correcting means for correcting said phase differences; and
adjusting means for adjusting the movement of said objects based on the results output by said correcting means.

5,115,173

AIR GAP CONTROLLING SYSTEM FOR LINEAR MOTOR

Noboru Kobayashi, Kobe, and Hiromu Miki, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jul. 25, 1991, Ser. No. 735,555
Claims priority, application Japan, Jul. 30, 1990, 2-203585; Jul. 30, 1990, 2-203586; Jul. 30, 1990, 2-203587
Int. Cl.[5] H02K *41/00*
U.S. Cl. 318—135 **10 Claims**



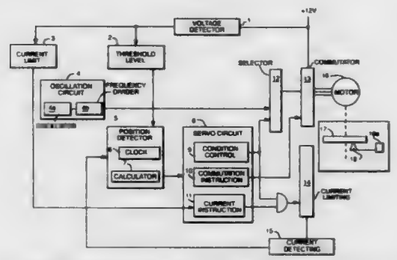
1. An air gap controlling system for a linear motor which is constituted from a truck-carried element mounted on each of a plurality of trucks of each of a plurality of rolling stocks of a train and a plurality of ground-mounted elements secured to the ground along a running route of said trucks, comprising:
driving means for driving each of the truck-carried elements to be displaced upwardly or downwardly;
velocity detecting means for detecting a running speed of said rolling stocks;
truck position signal generating means for generating a truck position signal indicative of a position of each of the trucks in said train;
air gap aimed value setting means provided on each of said trucks for setting an aimed value of an air gap between each of the truck-carried elements of each of said trucks and an opposing ground-mounted element in response to outputs of the corresponding velocity detecting means and the corresponding truck position signal generating means;
air gap detecting means provided for each of the driving means for detecting an air gap between the corresponding truck-carried element and an opposing ground-mounted element;
controlling means provided for each of said driving means for controlling the driving means in response to an air gap instruction value and an output of a detected air gap of the corresponding air gap detecting means so that the detected air gap may be equal to the air gap instruction value;
air gap error detecting means provided on a first one of said trucks for detecting an air gap error between an air gap aimed value from the corresponding air gap aimed value setting means and a detected air gap from the corresponding air gap detecting means;
the air gap aimed value from the air gap aimed value setting means on the first truck being provided as an air gap instruction value to the controlling means for the first truck to effect control of an air gap of the first truck;
point information generating means for generating information of a point where each of the truck-carried elements passes along the running route;
weight detecting means for detecting a weight of each of said rolling stocks;
forecasting signal generating means for generating forecasting signals from a relation of an air gap error from said air gap error detecting means to a detected velocity from said velocity detecting means and detected weights from the weight detecting means;
storage means for storing therein forecasting signals from said forecasting signal generating means in a corresponding relationship to point information from said point information generating means; and
correcting means provided on those of said trucks succeeding to said first truck for correcting air gap aimed values from the air gap aimed value setting means provided on the succeeding trucks with forecasting signals from said storage means corresponding to points at which the succeeding trucks run and for providing the thus corrected air gap aimed values as air gap instruction values to the controlling means for the succeeding trucks.

5,115,174

METHOD OF CONTROLLING BRUSHLESS DC MOTOR

Hiroshi Masuda, Hiratuka, and Katubiro Tunata, Odawara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 460,990, Jan. 4, 1990, Pat. No. 5,012,166. This application Jan. 31, 1991, Ser. No. 648,994
Claims priority, application Japan, Jan. 31, 1990, 2-21607
Int. Cl.[5] H02P *7/00*
U.S. Cl. 318—254 **26 Claims**



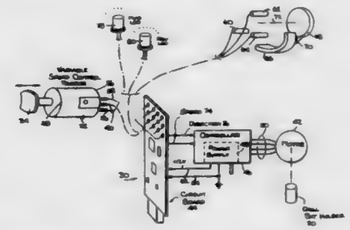
1. A method of controlling a brushless DC motor from the start of rotation until a normal speed is obtained, the motor having a plurality of windings and a rotor with a plurality of magnetic poles, and in which the current for driving the rotor is successively applied to the windings for each of successive predetermined periods of time in order to rotate the rotor, comprising the steps of:
feeding an electric current from a power source to at least a first winding among the plurality of windings for a first period of time;
monitoring the voltage of the power source during said feeding;
setting a threshold level in accordance with said voltage monitoring;
reducing the electric current fed to the first winding and thereafter increasing the reduced electric current to flow into the first winding, and simultaneously measuring a rising condition of the increasing current during the first period of time;
comparing the rising condition that is measured with the threshold level;
determining whether the electric current fed to the first winding during the first period of time is to be commutatingly switched to a second winding for a second period of time in accordance with the result of the comparing step;
commutatingly switching said feeding of the electric current to the second winding at the end of the first period of time in accordance with a determination, from said step of determining, that the electric current fed to the first winding is to be commutatingly switched; and
repeating said steps of feeding, monitoring, reducing, increasing, measuring, comparing, determining, repeating, and switching with respect to the second winding for a second period of time when said determination to commutatingly switch has been made.

5,115,175

DRILL HAVING ALTERNATE MODE CONTROL

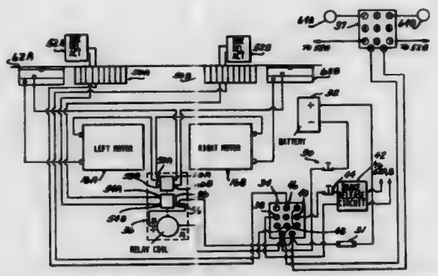
Henry H. Fletcher, Oakview, Calif., assignor to Hall Surgical, Warsaw, Ind.

Filed Feb. 3, 1988, Ser. No. 151,730
Int. Cl.[5] H02P *7/00*
U.S. Cl. 318—280 **20 Claims**



1. A drill comprising,
(a) a drill bit holder,
(b) a motor for rotating the drill bit holder in a forward (clockwise) direction, or a reverse (counterclockwise) direction,
(c) actuator means for actuating movement of said motor at a predetermined speed in said forward direction or said reverse direction, said actuator means having a normally unactuated position corresponding to zero movement of said motor and being actuatable in a first direction to a plurality of selected progressive actuation positions corresponding to specific predetermined speeds of said motor, and
(d) logic means for causing the motor to rotate in one of said forward and reverse directions in response to an initial actuation of said actuator means in said first direction, said logic means causing said motor to automatically rotate in the other of said forward and reverse directions in response to a second actuation of said actuator means in said first direction after said actuator means is permitted to return to the unactuated position following said initial actuation.

5,115,176
CONTROL ARRANGEMENT FOR ELECTRICALLY PROPELLED WHEELED VEHICLES
Dewitt T. White, 12637 S. Barnes Rd., Byron, Mich. 48418, and Thomas A. Plessinger, 1625 Killarney, Walled Lake, Mich. 48390
Filed Oct. 22, 1990, Ser. No. 600,663
Int. Cl.[5] H02P 3/00
U.S. Cl. 318—362 **6 Claims**

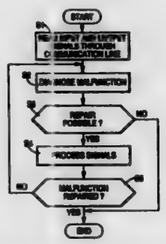


1. A control arrangement in combination with a self propelled automatically guided wheeled vehicle including at least one electrical motor coupled to drive one or more wheels of said vehicle to establish a propelling drive of said vehicle, control circuit connected to said electrical motor for energizing or denergizing said motor incidental to controlling the propelling drive of said vehicle by the drive of said wheels by said electrical motor, and also including spring applied brakes for said wheels of said vehicle, electrical actuator release means for releasing said brakes, the improvement comprising,

a control arrangement including a manually operable control circuit isolation switch; disconnect means for electrically disconnecting said control circuit from said at least one electrical motor in response to operation of said switch to electrically isolate said control circuit from said at least one electrical motor; and

means for supplying power to said electrical actuator release means for said releasing said brakes simultaneously with disconnection of said at least one electrical motor and said control circuit upon operation of said circuit isolation switch.

5,115,177
MALFUNCTION DIAGNOSIS METHOD
Kunio Tanaka, Akishima, and Kosuke Chiba, Yamanashi, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan
PCT No. PCT/JP89/00836, § 371 Date Apr. 2, 1990, § 102(e) Date Apr. 2, 1990, PCT Pub. No. WO90/02364, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 16, 1989, Ser. No. 469,462
Claims priority, application Japan, Aug. 26, 1988, 63-211956
Int. Cl.[5] G05B 9/02
U.S. Cl. 318—568.1 **3 Claims**



1. A malfunction diagnosis method for diagnosing a malfunction of a numerical control system (CNC) having a programmable controller (PC) including a non-volatile memory, using a remote host computer, comprising the steps of:

(a) reading input and output signals of said PC by said remote host computer;

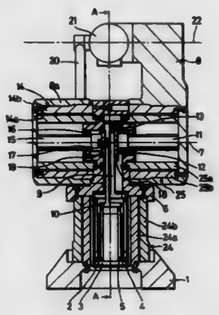
(b) diagnosing said malfunction to determine whether said malfunction can be repaired by providing an instruction from said remote host computer;

(c) storing correct processing signals in response to the instruction and when said malfunction can be repaired;

(d) repairing said malfunction by ignoring said input and output signals caused by said malfunction and storing corrected processing signals in said non-volatile memory; and

(e) automatically executing the sequence program by providing the corrected processing signals from said non-volatile memory to control the numerical control system.

5,115,178
GRAVITY COMPENSATING MECHANISM FOR ARTICULATED TYPE INDUSTRIAL ROBOTS
Tsuyoshi Umeda, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan
Filed Sep. 10, 1990, Ser. No. 580,643
Claims priority, application Japan, Sep. 27, 1989, 1-253082
Int. Cl.[5] B25J 9/20
U.S. Cl. 318—568.11 **3 Claims**

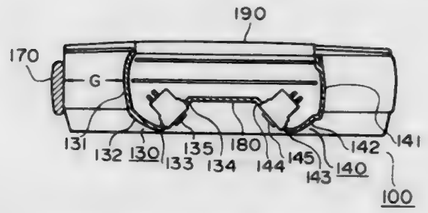


1. In an articulated type industrial robot including: a lower arm for whirling on a first horizontal axis in the direction of gravity; and

an upper arm disposed above said lower arm for whirling on a second horizontal axis in the direction of gravity,

an articulated type industrial robot gravity compensating mechanism comprising two lines of mechanism disposed within the robot for compensating the gravities of said lower arm and said upper arm comprising a first elastic member, a first cam follower rotatably connected to the lower arm, a first slider biased by the first elastic member into contact with the first cam follower to provide a moment on the first horizontal axis having a direction opposite to the force of gravity of the lower arm, a second elastic member, a second cam follower rotatably connected to the upper arm and a second slider biased by the second elastic member into contact with the second cam follower to provide a moment on the second horizontal axis having a direction opposite to the force of gravity of the upper arm.

5,115,179
PORTABLE TEACHING APPARATUS
Kenjiro Fujii, Funabashi; Masao Oura, Yachiyo; Kazuyuki Tuburaya, Akikawa, and Shigehisa Hagura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 30, 1988, Ser. No. 251,887
Claims priority, application Japan, Oct. 2, 1987, 62-247853
Int. Cl.[5] G05B 19/42
U.S. Cl. 318—568.13 **11 Claims**



1. A portable teaching apparatus comprising:

at least one interlock cancellation switch means connected to a robot control circuit for directly interrupting a power supply to a motor of a robot when said interlock cancellation switch means is not operated;

at least one operating switch for manual operation of the robot wherein a signal of the operating switch is effective only when the interlock cancellation switch means is operated;

a box-shaped body with the at least one operating switch arranged on a surface thereof;

at least one grip which, starting from sides of the body, as an apex inwardly of the sides of the body in at least one slope continuing toward a surface of the body on a back side thereof; and

wherein said interlock cancellation switch means is mounted in the slope inwardly of the apex of the grip.

5,115,180
AUTOMATIC DRIFT COMPENSATION METHOD AND DEVICE FOR POSITION-LOOP CONTROLLER
Ting P. Chung, Hsinchu, Taiwan, assignor to Microtek International Inc., Taiwan
Filed Mar. 22, 1990, Ser. No. 497,411
Int. Cl.[5] G05B 5/01
U.S. Cl. 318—618 **8 Claims**



1. An automatic drift compensation device for a position-loop controller that generates position instruction signals to control displacement of a working machine, the compensating device comprising:

instruction detection means to detect the position instruction signals;

a timer;

timer control means to start the timer for a predetermined period in response to the detection of a predetermined position instruction signal by the instruction detection means;

accumulated instruction calculating means for calculating an accumulated instruction position value, ΣPC, from the position instruction signals;

feedback means to generate feedback signals in response to actual displacement of the working machine, and to transmit said feedback signals to the position-loop controller;

accumulated feedback position calculating means for calculating an accumulated feedback position value, ΣPF, from the feedback signals;

compensation lag error setting means for setting a compensation lag error value, PE', by means of a first formula: $PE' = \Sigma PC - \Sigma PF + vF$, wherein vF represents actual drift of the position-loop controller;

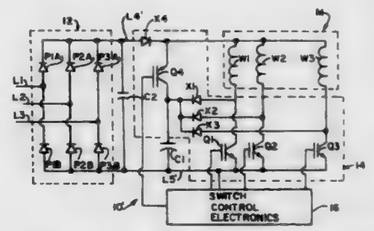
lag error calculating means for calculating a current lag error value, PE, in response to the timer control means starting the timer, and according to a second formula: $PE = \Sigma PC - \Sigma PF$;

reset detection means for detecting the value of PE', and for generating an arrive signal when the value of PE' is less than or equal to a given value; and

compensation lag error resetting means for receiving the arrive signal from the reset detection means and for resetting the compensation lag error value at the end of said predetermined period if no arrive signal has been received from the reset detection means during the predetermined period;

wherein after the compensation lag error resetting means resets the compensation lag error value, the lag error calculating means resets the lag error value, PE, according to a third formula: $PE = -vF$.

5,115,181
POWER CONVERTER FOR A SWITCHED RELUCTANCE MOTOR
Pradeep K. Sood, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 5, 1990, Ser. No. 593,122
Int. Cl.[5] H02P 6/02, 5/40
U.S. Cl. 318—701 **14 Claims**



1. A power conversion apparatus for a switched reluctance motor having n-windings, each winding having a first end and a second end comprising:

means for rectifying line voltage supplied to the motor, said rectifying means having a first electrical side and a second electrical side, the first end of each of said n-windings of said motor being electrically connected to the first side of said rectifying means;

switch means electrically connected to said n-winding for selectively energizing the n-winding of said motor most capable of converting electrical energy to useful work;

capacitor means electrically connected between the second end of each of said n-windings and the second side of said rectifying means, said capacitor means storing any unconverted portion of the energy of said n-windings and returning it to said n-windings during subsequent cycles, said switch means including a capacitor discharge switch for discharging said capacitor means through said windings, said last mentioned switch being electrically connected between said second end of each of said n-windings and the first side of said rectifying means;

switch control means for controlling operation of said switch means and said discharge switch for producing an energy period for supplying electrical energy to the n-

motor windings which is equal to at least 2(1/cos-(Eb/Vpk) radians for each line voltage cycle, where Eb is the motor's back emf, and Vpk is the peak voltage of the rectified line voltage; and

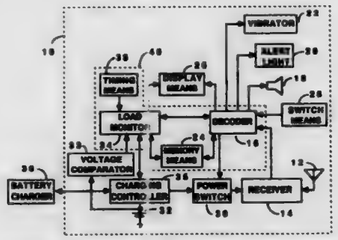
means for preventing flow of current from the capacitor means toward the rectifying means so that substantially all the current which flows from the capacitor means flows to said n-windings when the capacitor means is discharged through the discharge switch.

5,115,182

BATTERY CHARGING CONTROLLER FOR A BATTERY POWERED DEVICE AND METHOD FOR USING THE SAME

Edward L. Ehmke, West Palm Beach; Tuan K. Nguyen, and Michael J. DeLuca, both of Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 23, 1990, Ser. No. 513,405
Int. Cl.[5] H02J *7/10*
U.S. Cl. 320—14 **40 Claims**



1. A method of charging a rechargeable battery for a battery powered device using an external charging source, said method comprising the steps of:

periodically determining device functions active during a predetermined time interval;

recovering a value for the energy consumed by the active device functions during the predetermined time interval;

accumulating a value for the energy consumed for the active device functions during the predetermined time interval;

accumulating a measure of the energy consumed by adding the values for the energy consumed during each predetermined time interval since the battery was previously charged; and

controlling the charging from the external charging source in response to the measure of the energy consumed by the device.

5,115,183

BATTERY CHARGING SYSTEM FOR MOTOR-GENERATOR

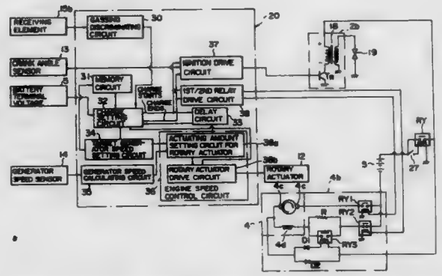
Yasuaki Kyoukane, and Toshihiro Nagano, both of Omiya, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1990, Ser. No. 611,059
Claims priority, application Japan, Nov. 13, 1989, 1-295691; Nov. 24, 1989, 1-304980
Int. Cl.[5] H02J *7/32*; B60L *11/12*
U.S. Cl. 320—61 **17 Claims**

1. A battery charging system for motor-generator mounted on an electric vehicle, said vehicle having a battery, a motor provided to drive an axle of said vehicle depending on the electric energy supplied from said battery, a generator connected to said battery, an engine provided to drive said generator for charging said battery, engine speed changing means for variably changing an engine speed, generator speed detecting means for detecting a generator speed and for generating a generator speed signal indicative thereof and battery terminal voltage sensing means for sensing a battery terminal voltage and for generating a battery terminal voltage signal indicative thereof, said system comprising:

charge setting means responsive to said battery terminal voltage signal for discriminating a condition where the battery should be charged;

engine driving means for driving said engine only while said condition is discriminated by said charge setting means;



target generator speed setting means for setting a target speed of said generator while said charge setting means discriminates said condition and for generating a target speed signal indicative thereof; and

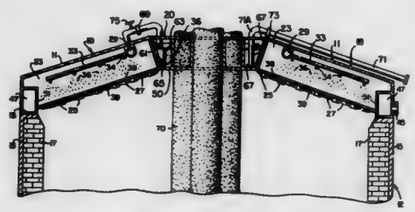
engine speed control means responsive to said generator speed signal and said target speed signal for actuating said engine speed changing means to control the engine speed in the manner that said generator speed converges to said target speed.

5,115,184

COOLING SYSTEM FOR FURNACE ROOF HAVING A REMOVABLE DELTA

Mark T. Arthur, Lakewood, and Frank H. Miner, Jr., North Olmsted, both of Ohio, assignors to Ucar Carbon Technology Corporation, Danbury, Conn.

Filed Mar. 28, 1991, Ser. No. 676,528
Int. Cl.[5] F27D *1/02*
U.S. Cl. 373—74 **10 Claims**



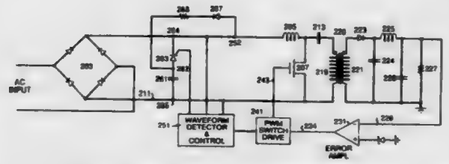
1. A cover for a vessel for handling a heated substance, said cover comprising an outer cover defining an inner opening into which is seated a removable inner cover, said outer cover comprising a bottom wall, an upstanding peripheral wall, an upstanding inner wall and a top wall defining an enclosed space, and said upstanding inner wall defining said inner opening into which said removable inner cover is seated; spray means comprising a plurality of tubes coupled to spray nozzles disposed within said enclosed space of the outer cover; inlet means for bringing a coolant to the tubes and spray nozzles in said enclosed space of the outer cover with the spray nozzles arranged to direct a spray of coolant onto at least the bottom wall of the outer cover; outlet means for removing the coolant from the enclosed space of the outer cover; said inner cover comprising a bottom wall, an upstanding wall and a top wall defining an enclosed space for said inner cover; spray means comprising a plurality of tubes coupled to spray nozzles disposed within said enclosed spaced of said inner cover and secured to the top wall; inlet means for bringing a coolant to the tubes and spray nozzles in the inner cover and said spray nozzles arranged to direct a spray of coolant onto at least the bottom wall of the inner cover; outlet means for removing the coolant from the enclosed space in the inner cover; and said inner cover defining at least one opening by a separate upstanding wall extended from the bottom wall to the top wall so that coolant in the enclosed space is prevented from entering said at least one opening in said inner cover.

5,115,185

SINGLE CONVERSION POWER FACTOR CORRECTION USING SEPTIC CONVERTER

Simon Fraidlin, Plano; William F. Slack, Garland, and James C. Wadlington, Dallas, all of Tex., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 28, 1990, Ser. No. 590,410
Int. Cl.[5] G05F *1/56*
U.S. Cl. 323—207 **4 Claims**



1. An off line power converter powered by an AC line power source, comprising:

an input rectifier for rectifying an applied AC line voltage;

a power train including an inductor and a capacitor connected at a juncture in series connection and coupling the rectifier to a power transformer;

a return path connecting the power transformer to the rectifier;

a power switch coupling the juncture to the return path;

an output circuit coupling the power transformer to a load via a rectifying diode and a voltage storage capacitor;

the converter including control circuitry operative for enhancing power factor comprising;

drive circuitry for the power switch including;

a waveform detector for detecting an existence of and a waveform of voltage applied to the inductor;

a pulse width modulator responsive to the wave form detector and having a signal transform characteristic operative to drive the power switch to maintain a current waveform in the inductor substantially sinusoidal;

holdover circuitry for supplying voltage to the inductor in the event of failure of the AC line power source, including;

a holdover voltage storage capacitor connected between the rectifier and the power switch and connected to receive voltage for storage from the rectifier, and

a SCR switch connecting the holdover voltage storage capacitor to the inductor; and

the waveform detector connected to the inductor and responsive to a discontinuance of voltage applied, via the rectifier, to the inductor and the waveform detector connected to apply a trigger signal to the SCR switch to enable it into conduction and couple the holdover voltage capacitor to the inductor;

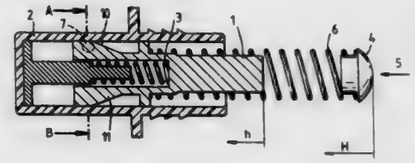
whereby the power transformer transforms voltage of the holdover voltage capacitor to an output voltage level.

5,115,186

TRAVEL SENSOR FOR DETERMINING THE POSITION OF A MEMBER SUCH AS A BRAKE PEDAL

Hans-Dieter Reinartz, Frankfurt am Main; Helmut Steffes, Hattersheim; Juergen Rausch, Eschborn, and Stefan Risch, Wiesbaden, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 23, 1990, Ser. No. 512,694
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1989, 3914400; Jul. 22, 1989, 3924327
Int. Cl.[5] G01B *7/14, 11/14*; G05G *1/28*
U.S. Cl. 324—207.22 **3 Claims**



1. A travel sensor for measuring mechanical quantities of motion for determining the position of the pedal of a brake system as said pedal is advanced through a travel range to operate said brake system, comprising a housing;

an actuating element engagable by said brake pedal to be moved thereby as said brake pedal is advanced through said travel range;

a sensor element movably mounted in said housing;

distance measuring means mounted in said housing generating a signal corresponding to the position of said sensor element in said housing;

transmission means interconnecting said actuating element and said sensor element to cause advancing movement of said sensor element by movement of said actuating element as said pedal is advanced through said travel range, said transmission means accommodating a reduction in the extent of advancing travel of said sensor element relative the extent of travel of said actuating element, said reduction corresponding to the level of resistance to advancing movement presented by said sensor element; and

means adjacent said sensor element and acting thereon to exert a resistance force resisting advancing movement, said resistance force at a level corresponding to the extent of advancing movement of said sensor element caused by said transmission means, said means thereby acting in conjunction with said transmission means to produce a proportionately reduced movement of said sensor element relative to the extent of said advancing movement of said actuating element over at least a segment of the advancing movement of the sensor element;

whereby providing a proportional reduction of the advancing movement of said sensor element caused by advancing motion of said actuating element and brake pedal.

5,115,187

WIDE DYNAMIC RANGE CURRENT SOURCE CIRCUIT

Shigeo Hayashi, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 28, 1990, Ser. No. 589,583
Claims priority, application Japan, Sep. 28, 1989, 1-252657
Int. Cl.[5] G05F *3/16*
U.S. Cl. 323—315 **5 Claims**

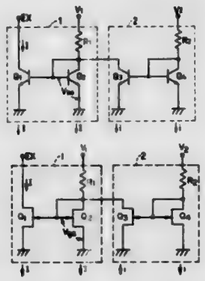
1. A wide dynamic range current source circuit, comprising:

a first current mirror circuit comprising:

a first transistor providing a first output current path, and

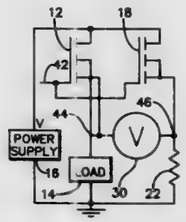
a second transistor for receiving a first control voltage, said second transistor providing an input current path for controlling a current flow in said output current path; and

a second current mirror circuit comprising:
a third transistor providing a second output current path, said third transistor bypassing said input current path of said first current mirror circuit, and
a fourth transistor for receiving a second control voltage different from said first control voltage and controlling a current of said second output current path,



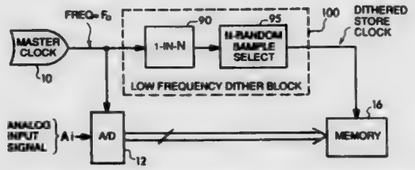
said second current mirror circuit controlling a current flow in said first current mirror circuit, said current flow in said first current mirror circuit being larger than a current flowing during non-linear operation of said first current mirror circuit.

5,115,188
RESISTANCE SENSOR AND SWITCH
Peter Norton, P.O. Box 336, Denville, N.J. 07834
Continuation of Ser. No. 262,135, Oct. 19, 1988, abandoned, which is a continuation of Ser. No. 74,076, Jul. 16, 1987, abandoned. This application Sep. 11, 1989, Ser. No. 405,399
Int. Cl.[5] G01R *27/02*
U.S. Cl. 323—365 **10 Claims**



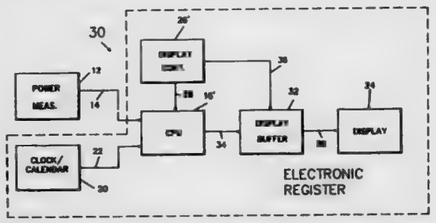
1. A circuit for detecting resistance changes in a resistive device, said circuit comprising:
a bridge circuit having a pair of input terminals and a pair of output terminals,
first and second MOSFET transistors,
a resistive device,
a comparison resistor,
said first MOSFET transistor and said resistive device being coupled in series between said input terminals,
said second MOSFET transistor and said comparison resistor being coupled in series between said input terminals,
one of said output terminals being connected with the junction between said first MOSFET transistor and said resistive device,
the other of said output terminals being connected with the junction between said second MOSFET transistor and said comparison resistor,
means for switching the first and second MOSFET transistors on for simultaneous conduction,
and voltage sensing means responsive to the voltage between said output terminals.

5,115,189
ANTI-ALIASING DITHERING METHOD AND APPARATUS FOR LOW FREQUENCY SIGNAL SAMPLING
Matthew S. Holcomb, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 6, 1991, Ser. No. 651,694
Int. Cl.[5] G01R *13/20*
U.S. Cl. 324—121 R **11 Claims**



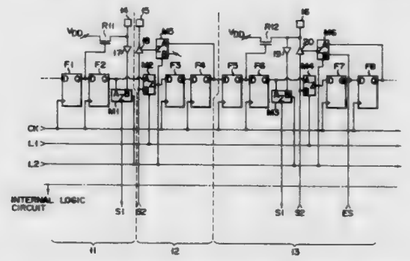
1. A method for sampling an analog input signal and storing digital representation of said samples in a memory, said method comprising:
generating a series of clock pulses at a predetermined frequency F_o;
sampling said input signal at each clock pulse and converting said sample to a predetermined digital format;
arbitrarily selecting one of said clock pulses from each successive series of N clock pulses (where N is a predetermined integer much greater than one) by means of the following sequence of steps for each series of N clock pulses:
(a) generating an arbitrary target integer between zero and N − 1 and loading a counter with a digital value equal to N − 1 at the first clock pulse in each series of N clock pulses, where said target integer is typically not equal to the target integer for the previous series of N clock pulses;
(b) decrementing said counter by one at each of the next N clock pulses; and
(c) comparing said counter with said target integer at each clock pulse and selecting the clock pulse for which said counter equals said target integer; and
storing the current sample in a memory at each of said selected clock pulses.

5,115,190
FREEZING ITEMS FOR DISPLAY IN ELECTRONIC WATTHOUR REGISTER
Albert R. Varney, Jr., Rochester, N.H., assignor to General Electric Company, Somersworth, N.H.
Continuation of Ser. No. 512,799, Apr. 27, 1990, abandoned, which is a continuation of Ser. No. 22,145, Mar. 5, 1987, abandoned. This application Aug. 22, 1991, Ser. No. 751,652
Int. Cl.[5] G01R *11/32, 13/02*
U.S. Cl. 324—142 **9 Claims**



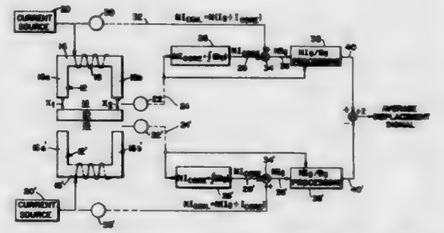
1. An apparatus for a metering system, the metering system including power measurement means for producing electrical signals indicative of consumption of a quantum of electricity, said apparatus comprising:
(a) processing means for deriving a plurality of data items from signals produced by the power measurement means;
(b) display means for displaying the data items as a plurality of data sets, said display means being operable to sequentially display each data set so that each data set is displayed and visible to a human observer one at a time;
(c) display buffer means;
(d) first means for transferring, substantially simultaneously, the plurality of data items which compose all of the data sets to be displayed as part of a single sequence from said processing means to said display buffer means; and
(e) second means for transferring said plurality of data items from said display buffer means to said display means, said display buffer means providing that the data items transferred thereto are unchanged in said display buffer means during the sequential display of the plurality of data sets.

5,115,191
TESTING INTEGRATED CIRCUIT CAPABLE OF EASILY PERFORMING PARAMETRIC TEST ON HIGH PIN COUNT SEMICONDUCTOR DEVICE
Takashi Yoshimori, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 11, 1991, Ser. No. 713,291
Claims priority, application Japan, Jun. 12, 1990, 2-153587
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 R **20 Claims**



1. A boundary-scan-testing integrated circuit adapted to both a functional test on an entire IC chip and a parametric test, comprising:
first memory circuits respectively formed in an input buffer portion, an output buffer portion, and an bidirectional buffer portion, which are provided in a peripheral cell area of the IC chip and respectively connected to an input pad, an output pad, and an bidirectional pad;
second memory circuits, formed in the peripheral cell area of the IC chip, for controlling ON/OFF operations of active elements, formed in the input buffer portion and the bidirectional buffer portion, for supplying a pad potential;
third memory circuits, formed in the peripheral cell area of the IC chip, for controlling ON/OFF operations of tri-state buffers of the output buffer portion and the bidirectional buffer portion;
circuit means functioning as a shift register controlled by a first control signal, said circuit means being constituted by said first, second, and third memory circuits serially connected;
first data selectors for receiving data output from the first memory circuits and a signal output from the input buffer, selecting one of them in accordance with a second control signal, and supplying it to an internal logic circuit of the IC chip; and
second data selectors for receiving data output from the third memory circuits and a normal operation signal, selecting one of them in accordance with a third control signal, and supplying it as an operation control signal to the output buffer portion.

5,115,192
MAGNETIC DISPLACEMENT TRANSDUCER WITH SATURATION COMPENSATION
Theodor Bardas; Jules Eisenbart; Tim Harris, and Cal Oleksuk, all of Calgary, Canada, assignors to NOVA Corporation of Alberta, Calgary, Canada
Filed Nov. 6, 1990, Ser. No. 609,646
Int. Cl.[5] G01B *7/14;* **G05D** *3/00*
U.S. Cl. 324—207.12 **9 Claims**



1. A displacement transducer for monitoring the displacement between a pair of components comprising a magnetomotive force generating means to establish a magnetic flux between the components, flux measuring means to provide a signal indicative of the flux density between said pair of components, a magnetomotive force measuring means, wherein said magnetomotive force measuring means produces a second signal indicative of the magnetomotive force which establishes said magnetic flux, a first signal processing means to process, according o a predetermined relationship, said first signal to provide a third signal indicative of the magnetomotive force produced by the magnetic flux establishe l by said magnetomotive force generating means, means to subtract said third signal from said second signal wherein said subtraction provides a fourth signal indicative of the magnetomotive force existing between said pair of components, and a second processing means to divide said fourth signal by said first signal wherein said division produces a fifth signal indicative o the displacement between said pair of components.

5,115,193
INDUCTIVE LINEAR DISPLACEMENT TRANSDUCER AND TEMPERATURE-COMPENSATING SIGNAL PROCESSOR
Orville E. Bean, Wayland, and Daniel R. Weber, Groton, both of Mass., assignors to Data Instruments, Inc., Acton, Mass.
Filed Dec. 5, 1990, Ser. No. 622,436
Int. Cl.[5] G01B *7/14;* **H01F** *15/16, 21/06*
U.S. Cl. 324—207.12 **20 Claims**

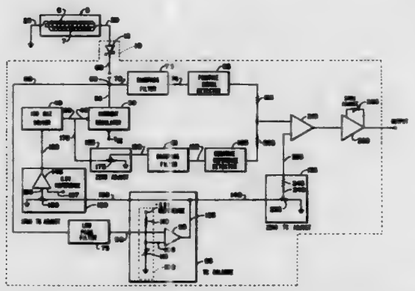
16. A temperature-compensated transducer system for measuring the linear displacement of an object, said system comprising:
an inductive linear displacement transducer and temperature-compensating signal processing means coupled to said transducer;
said transducer comprising a helical electrically-conducting coil wound around a support, and an elongated member of electrically conductive, non-ferromagnetic material matingly received in telescoping relation with said coil and said support, said member or said coil being attached to an object whose linear displacement is to be measured, whereby linear displacement of said object will result in linear displacement of said member relative to said coil; and

said temperature-compensating signal processing means comprising:

(a) means including current regulator means for connecting said coil to a source of DC potential so as to provide a current through said coil;

(b) means for AC modulating the current output of said current regulator means;

(c) temperature-sensitive means connected in series between said coil and said current regulator means; and



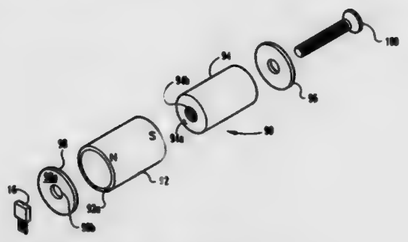
(d) signal processing means coupled to said temperature-sensitive means for providing a temperature-corrected output signal representative of linear displacement of said member relative to said coil, said signal processing means including means for monitoring the amplitude of the AC component of the signal coming from said coil and producing a DC output signal as a function of said AC component which is representative of the position of said core relative to said coil.

5,115,194

HALL EFFECT POSITION SENSOR WITH FLUX LIMITER AND MAGNETIC DISPERSION MEANS

Robert H. Luetzow, Huntington, Ind., and Edwin J. Luetzow, Farmington, Minn., assignors to Kearney-National Inc., White Plains, N.Y.

Filed Sep. 27, 1990, Ser. No. 589,454
Int. Cl.[5] G01B *7/14, 7/30;* G01P *3/488*
U.S. Cl. 324—207.2 **10 Claims**



10. A position sensor comprising:

a Hall effect IC;

a magnet which produces magnetic flux; and

a pole piece including means for limiting magnetic flux passing therethrough and means for dispersing magnetic flux, said means for limiting and said means for dispersing situated in magnetic communication with one another, said Hall effect IC attached to said means for dispersing and said magnet attached to said means for limiting magnetic flux, said means for limiting establishing a predetermined maximum magnetic flux limit and supplying flux from said magnet to said means for dispersing; and

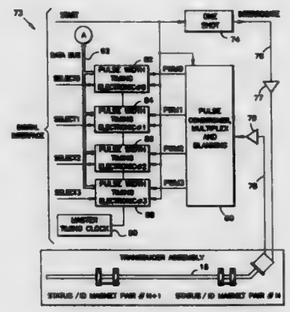
wherein said Hall effect IC produces an output signal in response to a magnetic flux level in excess of a predetermined limit.

5,115,195

SYSTEM AND METHOD FOR MEASURING THE ABSOLUTE POSITION OF ONE BODY WHICH IS CONSTRAINED TO MOVE WITH RESPECT TO ANOTHER BODY

Wade D. Peterson, Morrisville, N.C.; Joachim Hellwig, and Rainer Heuckelbach, both of Lüdenscheid, Fed. Rep. of Germany, assignors to MTS Systems Corporation, Minneapolis, Minn.

Filed Jan. 22, 1991, Ser. No. 644,273
Int. Cl.[5] G01B *7/14*
U.S. Cl. 324—207.13 **10 Claims**



1. A system for measuring the absolute position of one body which is constrained to move with respect to another body, comprising:

a plurality of magnetic identification units mounted in a predetermined absolute position on a first body, each of said units having an identity characteristic associated therewith;

sensor means, having a transducer fixed to a second body, for sensing (a) the relative distance of at least one of said magnetic identification units with respect to a benchmark location which is fixed relative to said transducer and said second body; and (b) the identity characteristic of the sensed unit; and

controller means for (a) storing said predetermined absolute positions of said magnetic identification units; (b) receiving data representing the relative distance and identity characteristic of the sensed unit from said sensor means; (c) identifying the sensed unit from the differentiating characteristic data; (d) recalling the predetermined absolute position of the sensed unit and (e) determining an absolute position for said benchmark location by summing the predetermined absolute position of the sensed unit with the relative distance of the sensed unit to the benchmark position.

5,115,196

GIRTH WELD DETECTION SYSTEM FOR PIPELINE SURVEY PIG

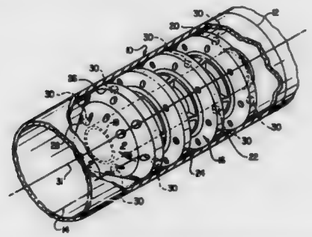
Stanley T. Low, Tucson, Ariz.; Pedro F. Lara, Dallas, Tex.; David L. Foreman, Tucson, Ariz., and Steven G. Petermann, Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 1, 1988, Ser. No. 201,009
Int. Cl.[5] G01N *27/72, 27/82;* G01R *33/12*
U.S. Cl. 324—220 **5 Claims**

1. A method for determining the change in length of a section of fluid transmission pipeline comprising the steps of:

providing a pipeline survey pig including spaced apart support members for supporting said survey pig in said pipeline and for traversal therethrough, means for sensing a change in the velocity of said pig when traversing said section of pipeline, a first sensor unit mounted on one of said support members and a second sensor unit mounted on the other of said support members and in proximity to the wall surface of said pipeline, each of said sensor units including means for generating a magnetic flux field which is interruptible upon passing in proximity to a first magnetic anomaly associated with said section of said pipeline, each of said sensor units being adapted to provide an output signal upon sensing said first magnetic anomaly;

providing circuit means for receiving output signals from each of said sensor units and for recording the elapsed time between one of said sensor units sensing said first magnetic anomaly and the other of said sensor units sensing said first magnetic anomaly;



traversing said pig through said pipeline and monitoring said sensor units to determine when an output signal is received from a sensor unit, respectively;

measuring the elapsed time between output signals from each of said sensor units upon sensing said first magnetic anomaly to determine the velocity of said survey pig through said pipeline;

measuring any change in said velocity of said pig while traversing said section of pipeline;

monitoring said sensor units to determine when an output signal is received from a selected one of said sensor units indicating the passage of a second magnetic anomaly associated with said section of pipeline; and

comparing the elapsed time between the sensing of said first magnetic anomaly and said second magnetic anomaly by said selected sensor unit with the velocity of said survey pig through said pipeline to determine the distance between said first and second magnetic anomalies.

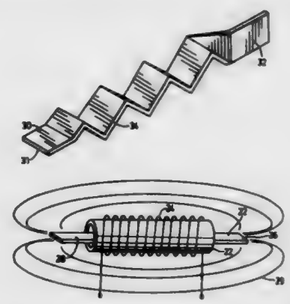
5,115,197

FLUXGATE SENSOR HAVING ADJUSTABLE CORE EXTENDING BEYOND A COIL WINDING AND A GRADIOMETER INCORPORATING A PAIR OF SENSORS

Giusseppe Brandolino, 36 Karen Court, Brampton, Ontario, Canada L6Y 4J1 , and Fred Maroske, 28 Shieldmark Crescent, Thornhill, Canada L3T 3T5

Filed Mar. 26, 1990, Ser. No. 498,675
Int. Cl.[5] G01R *33/022, 33/04;* G01V *3/40*
U.S. Cl. 324—245 **12 Claims**

1. A fluxgate sensor comprising: a coil body defining a bore and an axis; a coil wound on the body around the axis; and an adjustable core formed from an elongate strip of ferromagnetic material, said strip being generally rectangular and of uniform thickness and said core having a generally zig zag profile; wherein said core is located in said bore and said core extends along the bore axis beyond either end of said coil, and wherein



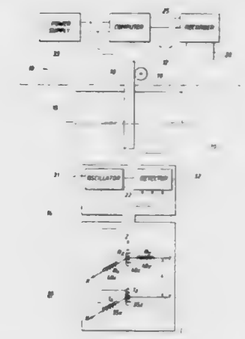
the position of said core relative to said coil can be adjusted to balance the sensor relative to another similar sensor.

5,115,198

PULSED ELECTROMAGNETIC DIPMETER METHOD AND APPARATUS EMPLOYING COILS WITH FINITE SPACING

Stanley C. Gianzero, and Shey-Min Su, both of Austin, Tex., assignors to Halliburton Logging Services, Inc., Houston, Tex.

Filed Sep. 14, 1989, Ser. No. 407,089
Int. Cl.[5] G01V *3/28*
U.S. Cl. 324—339 **18 Claims**



1. An electromagnetic dipmeter apparatus for determining properties of formations penetrated by a well borehole, the apparatus including transmitter and receiver coil means adapted for movement through such a borehole, the dipmeter apparatus comprising:

means fixedly mounting said transmitter and receiver coil means on a supportive structure for movement through a borehole;

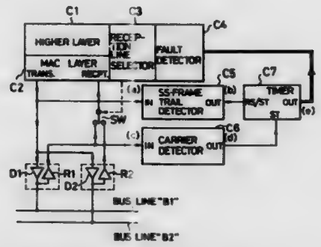
means coupled to the transmitter coil means for transmitting a transient pulse signal into adjacent formations to induce in the receiver coil means a received formation orientation dependent signal characteristic of such formations,

measuring means connected with the coil means for measuring said formation orientation dependent characteristic signal, and

means associated with said measuring means for determining, from measured formation orientation dependent char-

acteristic signal, at least the strike of the adjacent formation.

5,115,199
FAULT DETECTING SYSTEM FOR DUPLEXING TYPE LOCAL AREA NETWORKS
Takashi Yamagishi, Fuchu-shi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 18, 1990, Ser. No. 510,248
Claims priority, application Japan, Apr. 19, 1989, 1-97485
Int. Cl.[5] G01R *31/11*
U.S. Cl. 324—533 **5 Claims**



1. A fault detecting system employed in at least first and second stations coupled to each other via a carrier band type LAN (local area network), said fault detecting system comprising:

signal trail detecting means for detecting a signal trail of a solicit-successor frame contained in a transmission signal to produce a trail start-timing detection signal;

carrier detecting means for detecting a carrier signal component contained in a reflection signal of said signal trail, which has been reflected from a fault occurrence location on said local area network, within a response window frame, to reduce a reflection end-timing detection signal;

timer means for measuring a time period after said trail start-timing signal is produced from said signal trail detecting means until said reflection end-timing detection signal is produced from said carrier detecting means; and,

processing means for processing time periods derived from said timer means of fault detecting systems employed in said first and second stations to calculate a distance from said fault occurrence location on said LAN to each of said first and second stations.

5,115,200
METHOD AND APPARATUS FOR TESTING THE IMPEDANCE OF TWO ELECTRICALLY CONDUCTING MEMBERS USING TWO PAIRS OF ELECTRODES IN WHICH THE SPACING OF THE PAIRS IS ADJUSTABLE AND THE ELECTRODES ARE INDEPENDENTLY AXIALLY SLIDABLE
Pierre V. A. Lahitte, Salsaues; Michel J. Raymond, Listrac-Medoc, and Jean-Paul Kayser, Saint-Medard-en-Jalles, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France
Continuation of Ser. No. 788,136, Oct. 16, 1985, abandoned. This application Jul. 26, 1990, Ser. No. 559,498
Claims priority, application France, Oct. 22, 1984, 84 16138
Int. Cl.[5] G01R *27/14, 31/02*
U.S. Cl. 324—718 **8 Claims**

1. An apparatus for determining the quality of an elongate electrical junction between two electrically conducting members, wherein said apparatus comprises:

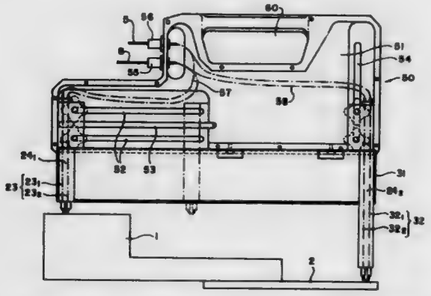
a) a generator for producing an alternating current having a frequency of 10KHz to 1MHz;

b) a voltmeter;

c) an ammeter operatively connected to said generator;

d) an impedance calculating means; and

e) a body having a first pair of spaced-apart parallel rectilinear electrodes extending from said body, said first pair of electrodes being operatively connected to said generator, a second pair of spaced-apart parallel electrodes extending from the body and closely-spaced to said first pair of electrodes, a first electrode of said first pair of electrodes and a first electrode of said second pair of electrodes being independently axially slidable within a first socket cooperating with said body, and a second electrode of said first pair of electrodes and a second electrode of said second pair of electrodes being independently axially slidable within a second socket socket cooperating with said body, at least one of said first and second socket being movable on said body for selectively adjusting the spacing between each electrode of said first and second pair of electrodes, each electrode further being independently biased by a complementary spring member to urge said electrode outwardly from said body, stop means for limiting out-



ward displacement of each electrode, each of said spring members biasing said first pair of electrodes having a first end electrically connected to said electrode and a second end electrically connected to said generator, and wherein said spring members biasing said second pair of electrodes have a first end electrically connected to each electrode of said second pair of electrodes and a second end electrically connected to said volunteer, wherein said first pair of electrodes and spring members in cooperation with said generator, ammeter and electrically conducting members define a first electrical loop for injecting an alternating electric current across said electrical junction and wherein said second pair of electrodes and complementary spring members in cooperation with said voltmeter and said electrically conducting members define a second electrical loop substantially the same length at the first loop to measure the voltage drop across said junction;

wherein said impedance calculating means is operatively connected to said voltmeter and is operatively connected to said generator to calculate impedance across said junction.

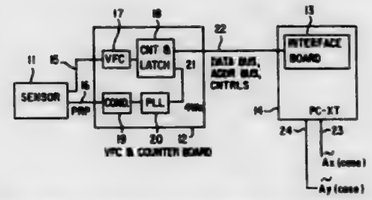
5,115,201
DIGITAL DEMODULATOR
Mark D. Asplund, Olathe, Kans., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Dec. 17, 1990, Ser. No. 628,266
Int. Cl.[5] H03D *1/00*; G01C *21/18*
U.S. Cl. 329—356 **16 Claims**

1. A digital demodulator comprising:

VFC (voltage to frequency converter) and counter board means that receives acceleration sinusoidal signals and phase reference pulses, performs analog to digital conversion and provides digitized output information; and,

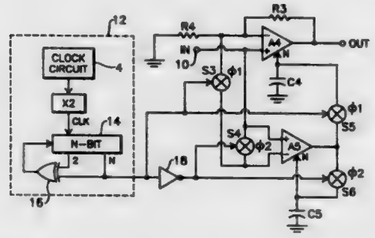
computer means connected to said VFC and counter board means that receives said digitized output information from

said VFC and counter board means, performs processing, and provides demodulated outputs therefore combining



demodulation and analog to digital conversion into one step.

5,115,202
CHOPPER-STABILIZED AMPLIFIER WITH SPREAD-SPECTRUM CLOCKING
James E. C. Brown, Menlo Park, Calif., assignor to Analog Devices, Inc., Norwood, Mass.
Filed Apr. 10, 1991, Ser. No. 683,448
Int. Cl.[5] H03F *1/02*
U.S. Cl. 330—9 **9 Claims**



1. A high bandwidth chopper-stabilized amplifier (CSA), comprising:

a main electrical signal amplifier,

an auxiliary electrical signal amplifier connected in a chopper-stabilizer circuit with said main amplifier to reduce the input voltage offset (V_{OS}) of the main amplifier, and

means for operating said chopper-stabilized circuit at a dynamically varying randomized chopping signal frequency that substantially reduces intermodulation distortion between the input signal to the main amplifier and the chopping signal.

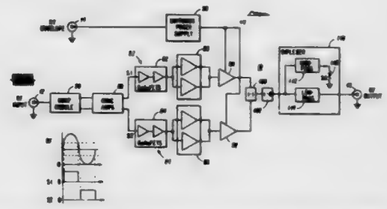
5,115,203
DIGITAL POWER AMPLIFIER
David L. Krett, Springville, and Timothy L. Kean, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Jun. 25, 1990, Ser. No. 543,281
Int. Cl.[5] H03F *3/217*
U.S. Cl. 330—251 **11 Claims**

1. A high efficiency digital RF power amplification system, comprising:

an exciter for providing a low power RF carrier signal;

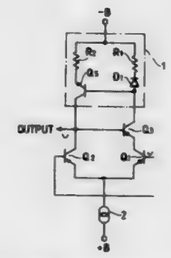
means for converting said RF carrier signal into a modified square wave signal characterized by a RF waveform having three or more voltage levels;

a power amplifier for amplifying the power of said modified square wave signal; and



a diplexer for filtering the output of said power amplifier in order to suppress high frequency harmonics.

5,115,204
DIFFERENTIAL AMPLIFIER
Hiroshi Tomonaga, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Feb. 21, 1991, Ser. No. 658,712
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—257 **10 Claims**



1. A differential amplifier comprising:

a first and second transistors which are differentially coupled, said first transistor supplying an output voltage directly from a collector thereof;

a load connected with collectors of said first and second transistors; and

a third transistor having a base directly connected to the collector of said first transistor and having an emitter-collector path connected between the collector of said second transistor and said load, said third transistor maintaining a constant voltage difference between a collector-emitter voltage of the first transistor and a collector-emitter voltage of the second transistor.

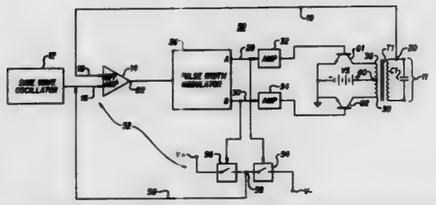
5,115,205
AC AMPLIFIER WITH AUTOMATIC DC COMPENSATION
Charles M. Holmes, Jr., Escondido, Calif., assignor to Square D Company, Palatine, Ill.
Filed Dec. 28, 1990, Ser. No. 635,074
Int. Cl.[5] H03F *3/217*
U.S. Cl. 330—10 **17 Claims**

11. An AC amplifier with DC compensation, comprising:

a) means for generating a pulse width modulated signal having alternating opposite polarities and a varying duty cycle; and

b) means for controlling the duty cycle of the pulse width modulated signal to produce therefrom an AC power output signal including a feedback system responsive both

to the AC power output signal for AC wave shaping and to the duty cycle of the pulse width modulated signal to



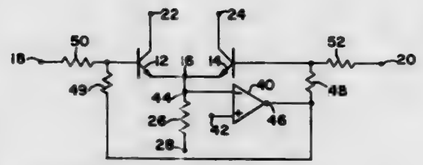
reduce the introduction of DC into the AC power output signal.

5,115,206

MERGED DIFFERENTIAL AMPLIFIER AND CURRENT SOURCE

William D. Mack, Cupertino, and Daniel J. Linebarger, San Jose, both of Calif., assignors to North American Philips Corp., Signetics Division, Sunnyvale, Calif.

Filed Nov. 8, 1990, Ser. No. 610,639
Int. Cl.[5] H03F *3/14, 3/45*
U.S. Cl. 330—261 **13 Claims**



1. An electronic circuit comprising:
first and second signal input nodes for receiving first and second input signals;
first and second active devices each having (i) a main current path and (ii) a device input coupled to a respective one of the signal input nodes for control of the main current path;
a current source coupled to the main current paths via a tail node for biasing the active devices; and
feed-back means that provides a common-mode coupling from the tail node to each device input for controlling a bias current through each main current path in response to a control signal, different from the first and second input signals, applied to the feed-back means, wherein the feed-back means includes:
a differential amplifier with a first input for receiving the control signal, a second input coupled to the tail node, and an output, and
a resistive coupling between the amplifier's output and each device input.

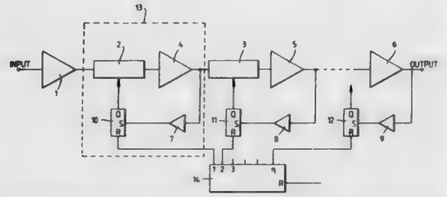
5,115,207

AUTOMATIC SIGNAL PARAMETER CONTROL

David W. Fry, Sawbridgeworth, Great Britain, assignor to STC PLC, London, England

Filed Jul. 19, 1990, Ser. No. 555,292
Claims priority, application United Kingdom, Jul. 26, 1989, 8917096; Jan. 11, 1990, 9000607
Int. Cl.[5] H03G *3/30*
U.S. Cl. 330—284 **9 Claims**

1. An automatic gain control arrangement for TDMA applications and serving to control the amplitude of digital packet signals automatically, a respective fixed gain being provided for the duration of each packet, which arrangement includes first means having different states in which the first means can affect the amplitude accordingly, and second means for measuring the amplitude of the packet signals at an input to said arrangement and changing the state of the first means as appropriate, the arrangement including a delay element and a first a.g.c. amplifier, comprising said first means, disposed in series



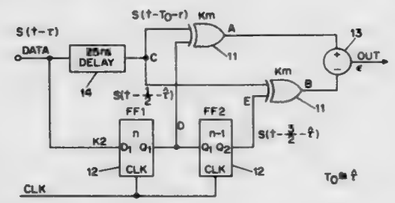
between said input and an output of said arrangement; a second a.g.c. amplifier, identical to the first a.g.c. amplifier and comprising said second means, coupled to said input; and a level detector coupled to the output of said second a.g.c. amplifier, which level detector controls the gain of the first and second a.g.c. amplifiers.

5,115,208

PLL CLOCK SIGNAL REGENERATOR USING A PHASE CORRELATOR

Arturo Masdea; Rosanna Masucci, both of Pomezia; Manuel Bignami, Rome, and Roberto Bartolomei, Ariccia, all of Italy, assignors to Selenia Industrie Elettroniche Associate S.p.A., Rome, Italy

Filed Jul. 23, 1990, Ser. No. 557,311
Claims priority, application Italy, Jul. 21, 1989, 48218 A/89
Int. Cl.[5] H03L *7/087*
U.S. Cl. 331—1 A **11 Claims**



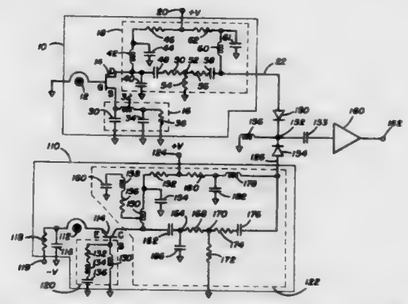
11. A device for the extraction of a clock signal, produced by a clock regeneration circuit responsive to an output of said device, from a clocked data stream having a clock period, said device comprising:
a data signal input for receiving said clocked data stream;
a clock signal input for receiving a regenerated clock signal;
delay means for introducing a delay in said data signal and forming a delayed data signal;
a temporal shift register having at least two storage registers for storing samples of said data signal and having a first tap for outputting the contents of a storage register delayed by one half of one clock period and a second tap for outputting the contents of a storage register delayed by three halves of one clock period, said storing of said samples being controlled according to said clock signal;
a first phase comparator and a second phase comparator, said first phase comparator having as inputs said delayed data signal and said output from said first tap of said shift register and having a first phase comparator output, said second phase comparator having as inputs said delayed data signal and said output from said second tap of said shift register and having as an output a second phase comparator output; and
clock correction signal forming means for receiving said first and said second phase comparator outputs and producing at an output of said device a clock correction signal for correcting a phase of said regenerated clock input signal.

5,115,209

MULTIPLE YIG OSCILLATOR

Martin I. Grace, and Richard E. Simmons, both of San Jose, Calif., assignors to Wiltron Company, Morgan Hill, Calif.

Continuation of Ser. No. 592,859, Oct. 4, 1990, abandoned. This application Jun. 28, 1991, Ser. No. 725,388
Int. Cl.[5] H03B *5/18*
U.S. Cl. 331—49 **20 Claims**



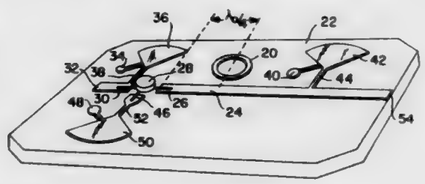
1. YIG apparatus having an apparatus output, comprising:
a first circuit including as a component a first YIG resonator, said first circuit outputting a first signal having a first analog characteristic which varies as a first function of the strength of the magnetic field containing said first resonator;
a second circuit including as a component a second YIG resonator, said second circuit outputting a second signal having a second analog characteristic which varies as a second function of the strength of the magnetic field containing said second resonator;
magnetic field generating means for generating a single magnetic field, said first and second resonators both being disposed in said single magnetic field; and
switch means for providing to said apparatus output an output signal responsive to selectably said first signal or said second signal.

5,115,210

MICROWAVE OSCILLATOR USING A RING RESONATOR AND OPERABLE AS A REMOTE TEMPERATURE SENSOR

Michael Cummings, Howell; Roland Cadotte, Jr., Freehold, and Adam Rachlin, Eatontown, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 15, 1991, Ser. No. 687,601
Int. Cl.[5] H03B *5/18*; G01K *7/00*
U.S. Cl. 331—99 **11 Claims**



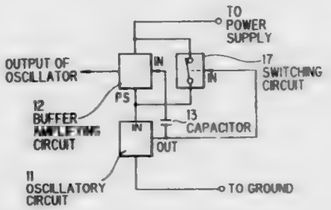
1. A microwave oscillator, comprising:
a substrate;
a transistor located on a surface of the substrate and including a control electrode and first and second current conducting electrodes;
a first length of planar circuitry and a biasing decoupling network formed on said surface of the substrate and connected to said control electrode;
a second and relatively longer length of planar circuitry and another biasing decoupling network formed on said surface of the substrate and connected to said first current conducting electrode, said another biasing decoupling network being located at a predetermined distance away from said first current conducting electrode;
a third biasing decoupling network formed on said surface of the substrate and connected to said second current conducting electrode; and
an annular metallic ring member having a predetermined circumference located adjacent said second length of planar circuitry a predetermined distance away from and between an edge of said second length of planar circuitry connected to said first current conducting electrode and said another biasing decoupling network, whereby upon biasing potentials being selectively applied to said biasing decoupling networks, said oscillator generates a highly stable output signal of a frequency which is a function of the circumference of said ring member.

5,115,211

PIEZO-ELECTRIC OSCILLATOR

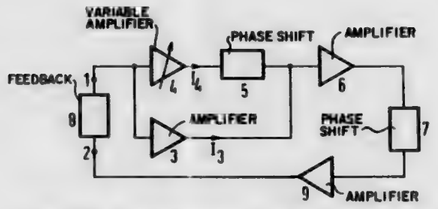
Takaaki Hara, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 29, 1991, Ser. No. 737,464
Claims priority, application Japan, Jul. 27, 1990, 2-197624
Int. Cl.[5] H03B *5/36, 5/06*
U.S. Cl. 331—116 FE **6 Claims**



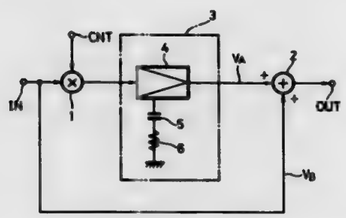
1. A piezo-electric oscillator, comprising:
oscillatory means including a piezo-electric resonator for generating an oscillatory signal;
buffer amplifying means for buffering and amplifying said oscillatory signal, said buffer amplifying means being connected serially with said oscillatory means; and
switching means for switching a power supply line, said switching means being connected in parallel with said buffer amplifying means and selectively short-circuiting said buffer amplifying means in accordance with an output signal of said oscillatory means.

5,115,212
INTEGRABLE VARIABLE-FREQUENCY OSCILLATOR CIRCUIT
Josef Feak, Eching/Ottenburg, and Martin Schulz, Eisdorf-Berendorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Nov. 13, 1990, Ser. No. 613,156
Claims priority, application European Pat. Off., Nov. 10, 1989, 89120906.6
Int. Cl.[5] H03B *5/12*
U.S. Cl. 331—117 R **9 Claims**



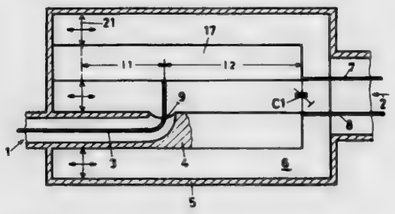
1. Integrable variable-frequency oscillator circuit with a feedback amplifier configuration, comprising:
a) first and second input terminals;
b) a frequency-determining feedback element connected between said input terminals;
c) first and second amplifier stages having inputs connected to said first input terminal and outputs supplying output signals generated by said amplifier stages;
d) said second amplifier stage having a variable gain;
e) a first phase-shifting component connected to said output of said second amplifier stage for receiving the output signal of said second amplifier stage;
f) a third amplifier stage connected downstream of said first phase-shifting component for generating an output signal;
g) said output of said first amplifier stage being connected downstream of said phase-shifting component for adding the output signal of said first amplifier stage to the output signal of said second amplifier stage; and
h) a second phase-shifting component connected between said third amplifier stage and said second input terminal for supplying the output signal of said third amplifier stage to said second input terminal.

5,115,213
FREQUENCY EQUALIZER
Takeo Eguchi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jun. 29, 1990, Ser. No. 545,611
Claims priority, application Japan, Jun. 30, 1989, 1-168377
Int. Cl.[5] H03G *5/16*
U.S. Cl. 333—18 **5 Claims**



1. An apparatus for correcting a frequency characteristic of an input signal, comprising:
first input means for receiving said input signal;
second input means for receiving a control signal; and
at least one signal processing means including a first signal transmitting circuit including multiplying means having a first input terminal for receiving said input signal from said first input means and a second input terminal for receiving said control signal from said second input means for multiplying said input signal and said control signal to produce a multiplied signal, amplifying means having a predetermined frequency characteristic and coupled with said multiplying means for amplifying said multiplied signal to thereby produce a first signal, a second signal transmitting circuit having a flat frequency characteristic, and coupled with said first input means to receive said input signal therefrom and thereby produce a second signal, and adding means for adding said first and second signals to thereby produce a corrected signal, whereby a signal transmission characteristic of the apparatus may be controlled by said control signal for correcting a frequency characteristic of said intput signal.

5,115,214
BALANCING LOOP
Felix Gassmann, Zürich, and Ole Snedkerud, Windisch, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland
Filed Oct. 11, 1990, Ser. No. 595,406
Claims priority, application Switzerland, Nov. 9, 1989, 4048/89
Int. Cl.[5] H01P *5/10*
U.S. Cl. 333—26 **11 Claims**

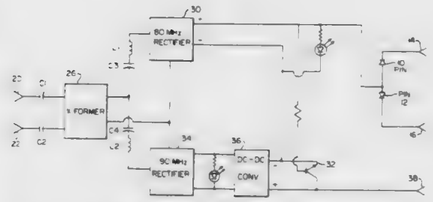


1. A balancing loop comprising:
a housing having an interior;
inside the housing, a first conductor part having a first and second sublength, the first sublength of the first conductor part constructed as a coaxial line with a coaxial inner conductor, which passes through the housing on the one side as a coaxial line and forms a coaxial input there, and ends freely on the other side inside the housing;
inside the housing, a second conductor part having the same overall length as said first conductor part and including corresponding first and second sublengths, wherein the first sublength of said second conductor part extends spaced from and parallel to the first sublength of the first conductor part and is connected on the one side of the coaxial input to the housing, and the second sublength of said second conductor part ends freely on the other side inside the housing;
in the first conductor part, an opening at the end of the first sublength, through which the coaxial inner conductor emerges at a right angle from the first conductor part and is connected to the second conductor part at an interface between the first and second sublengths of said second conductor part;
two symmetrical output liens which are connected on the second sublengths in each case to one of the conductor parts, lead out of the housing, and form a symmetrical output there; and
at least one variable capacitor connected between the second sublengths of the first and second conductor parts;

wherein a characteristic lien impedance of the line made up of the first and second conductor parts within the housing and the first sublength of the first and second conductor parts are chosen such that the balancing loop can be tuned to different frequencies by means of only the at least one capacitor, without need for changing the electrical length of the first sublength;
wherein the minimum capacitance C_{min} of said at least one capacitor is chosen such that
$C_{min}C_{asym}>b$,

wherein C_{asym} is the maximum occurring stray capacitance difference at said symmetrical output lines of an asymmetrical load at the output of said balancing loop.

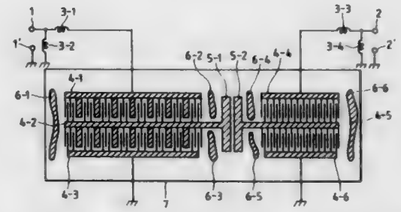
5,115,215
PIN DIODE ACTIVATION METHOD AND APPARATUS
Floyd A. Koontz, Holcomb, N.Y., assignor to Harris Corporation, Melbourne, Fla.
Filed Oct. 18, 1990, Ser. No. 599,464
Int. Cl.[5] H01P *1/15*
U.S. Cl. 333—103 **6 Claims**



1. A PIN diode switch comprising:
plural PIN diodes each having an anode connected to the anode of another of said PIN diodes;
plural filter means, each filter means being responsive to one of plural frequencies;
plural VHF signal rectifier means, each rectifier means operatively connected to one of said plural filter means, and producing a predetermined bias voltage in response to an input signal; and,
bias selection means for applying a selected predetermined bias voltage to the anodes of said plural diodes;
so that upon the application of a VHF signal having a frequency corresponding to one of said plural frequencies to the plural filter means, a selected one of said predetermined bias voltages is applied to the anodes of the plural PIN diodes to selectively enable signal conduction across the PIN diodes.

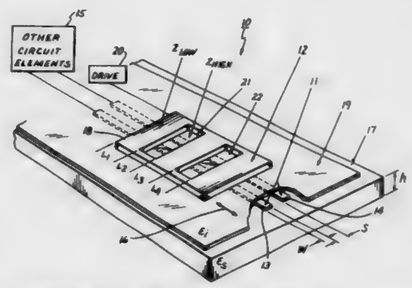
5,115,216
SURFACE ACOUSTIC WAVE FILTER INCLUDING SAW RESONATORS WITH TRANSMISSION SPACES THEREIN
Mitsutaka Hikita, Hachiouji; Toyoji Tabuchi, Tsukui; Kazuhito Kurosawa, Nakaminato, and Nobuhiko Shibagaki, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 7, 1989, Ser. No. 335,140
Claims priority, application Japan, Apr. 11, 1988, 63-87380
Int. Cl.[5] H03H *9/64*
U.S. Cl. 333—195 **30 Claims**

1. A SAW (surface acoustic wave) filter comprising:
an input portion receiving input electric signals;
an output portion emitting output electric signals;
a plurality of SAW resonators being electrically connected so as to form a filter, each one of said plurality of resonators having a plurality of first and second electrode fingers interleavedly disposed on a piezoelectric substrate, a first SAW resonator generating surface acoustic waves in accordance with said input electric signals, and a second SAW resonator converting said surface acoustic waves into said output electric signal,
wherein one of said plurality of resonators includes SAW transmission spaces being interposed between the first and



the second electrode fingers, said transmission spaces having an electric length greater than a half-wavelength of the surface acoustic waves so as to transmit the surface acoustic waves generated in the resonators and equalize the surface acoustic waves as to have the same phase.

5,115,217
RF TUNING ELEMENT
William R. McGrath, Monrovia, and Victor M. Lubecke, Whittier, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.
Filed Dec. 6, 1990, Ser. No. 622,939
Int. Cl.[5] H01P *1/28*
U.S. Cl. 333—246 **14 Claims**



1. A device for tuning a circuit, comprising:
a substrate, a transmission line on the substrate that includes first and second conductors coupled to a circuit to be tuned, and means defining a movable short-circuit for varying the impedance the transmission line presents to the circuit to be tuned;
the means defining a movable short-circuit including a dielectric layer disposed atop the transmission line and a distributed shorting element in the form of a conductive member that is configured to be slid along at least a portion of the transmission line atop the dielectric layer;
the conductive member being configured to span the first and second conductors of the transmission line and to define at least a first opening that spans the two conductors so that the conductive member includes first and second sections separated by the first opening;
the first and second sections of the conductive member combining with the first and second conductors of the transmission line and the dielectric layer to form first and second low impedance sections of transmission line, and the opening combining with the first and second conductors of the transmission line to form a first high impedance

section of transmission line intermediate the first and second low impedance sections; and

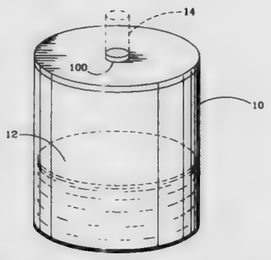
at least each of the first low impedance section and the first high impedance section having a length along the transmission line of approximately one-quarter wavelength, thus providing a periodic variation of transmission line impedance that enhances reflection of rf power.

5,115,218

MICROWAVE PROCESS SEAL AND METHOD

Buford R. Jean, Round Rock, Tex., assignor to Baker Hughes Inc., Houston, Tex.

Filed Mar. 11, 1991, Ser. No. 667,589
Int. Cl.[5] H01P *1/08*
U.S. Cl. 333—252 **4 Claims**



1. A process seal for reducing the reflection and attenuation of energy passing therethrough in association with a process material in a container comprising:

(a) a member for passing energy therethrough; and

(b) a configuration in operative association with said member and having a geometrical shape orientated at an angle equal to the arctangent of the square root of the dividend of the dielectric constant of the material by the dielectric constant of the process seal for providing total transmission across the process seal for energy impinging the process seal with a linear polarization such that the electric field of the energy lies in the plane formed by the propagation vector and the vector normal to the surface of the process seal.

5,115,219

SUPERCONDUCTING MAGNETIC ENERGY STORAGE APPARATUS STRUCTURAL SUPPORT SYSTEM

Gregory J. Withers; Stephen W. Meier, both of Bolingbrook; Robert J. Walter, Batavia; Michael D. Child, Naperville, and Douglas W. DeGraaf, Downers Grove, all of Ill., assignors to Chicago Bridge and Iron Technical Services, Oak Brook, Ill.

Filed Jun. 4, 1990, Ser. No. 532,902
Int. Cl.[5] H01F *7/22*
U.S. Cl. 335—216 **60 Claims**

1. A superconducting magnetic energy storage apparatus comprising:

a generally cylindrical shaped superconducting coil structure;

the coil structure having an inner circumferential face, an outer circumferential face and a bottom face;

a generally cylindrical shaped coil containment vessel, surrounding and enclosing the coil structure, and adapted to hold a liquid;

the coil containment vessel having an inner circumferential wall spaced inward of the coil structure inner circumferential face;

the coil containment vessel having an outer circumferential wall, spaced outward of the coil structure outer circumferential face;

the coil containment vessel having a bottom wall spaced downward of the coil structure bottom face;

a generally cylindrical shaped vacuum vessel surrounding and enclosing the coil containment vessel;

the vacuum vessel being located in a restraining structure having an inner circumferential wall, an outer circumferential wall and a floor;

the vacuum vessel having an outer circumferential wall spaced inward of the restraining structure outer circumferential wall;

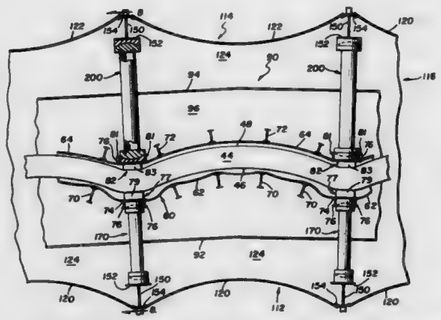
the vacuum vessel having an inward circumferential wall spaced radially outward of the restraining structure inner circumferential wall;

the vacuum vessel having a bottom spaced downward of the coil containment vessel bottom wall;

coil support means supporting the coil structure bottom face above the coil containment vessel bottom wall;

substantially horizontal compression member means between the coil structure outer face and the coil containment vessel outer wall, and substantially horizontal compression member means between the coil structure inner face and the coil containment vessel inner wall;

substantially horizontal cold to warm compression member means between the coil containment vessel outer wall and the vacuum vessel outer wall and substantially horizontal



compression member means between the coil containment vessel inner wall and the vacuum vessel inner wall;

compression bearing means, on the outside of the vacuum vessel outer wall, aligned with compression bearing means on the restraining structure outer wall;

compression bearing means, on the outside of the vacuum vessel inner wall, aligned with compression bearing means on the restraining structure inner wall;

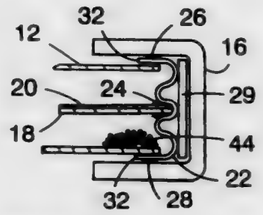
the comrpession members being dimensioned such that when the coil containment vessel is loaded with a liquid cryogen, the vacuum vessel is evacuated to an operable system vacuum and the coil structure contains an amount of electrical energy between a minimal amount and a substantial load, an outwardly directed radial force is exerted by the resulting magnetic energy the compression bearing means on the outside of the inner wall of the vacuum vessel is spaced radial outwards from, and out of contact with, the compression bearing means on the restraining structure inner wall and the compression bearing means on the outside of the outer wall of the vacuum vessel is spaced radial inwards form, and out of contact with, the compression bearing means on the restraining structure outer wall.

5,115,220

FUSE WITH THIN FILM FUSIBLE ELEMENT SUPPORTED ON A SUBSTRATE

David E. Suuronen, Newburyport, and Jean C. Terry, Amesbury, both of Mass., assignors to Gould, Inc., Eastlake, Ohio

Filed Jan. 3, 1991, Ser. No. 637,161
Int. Cl.[5] H01H *85/04, 71/20*
U.S. Cl. 337—297 **12 Claims**



1. A fuse comprising

a fuse casing,

an end cap terminal at an end of said casing,

a substrate supporting a thin film fusible element thereon and located within said casing, and

a springy metal connecting strip made of sheet metal and providing electrical connection between said element and said terminal and mechanical support for said substrate,

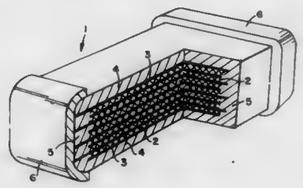
said substrate having an end spaced from said end cap terminal, said connecting strip biasing said substrate away from said end cap terminal.

5,115,221

VARISTOR STRUCTURES

Stephen P. Cowman, Dundalk, Ireland, assignor to ECCO Limited, Dundalk, Ireland

Filed Jun. 26, 1990, Ser. No. 543,921
Int. Cl.[5] H01C *7/10*
U.S. Cl. 338—21 **26 Claims**



1. A varistor comprising:

a plurality of layers of ceramic material;

a plurality of layers of electrode material, said layers being interleaved with each ceramic material layer sandwiched between two electrode material layers, and at least a portion of at least one of said layers of electrode material extending to a first surface portion of the varistor, and at least a portion of at least one other of said layers of electrode material extending to a second surface portion of the varistor;

a first body of conductive material being adhered at least to said first surface portion for electrical communication with said portion of said at least one electrode material layer;

said portion of said at least one electrode material layer being spaced from all other surface portions of the varistor by ceramic material;

a second body of conductive material being adhered to at least said second surface portion for electrical communication with said portion of said at least one other electrode material layer;

said portion of said at least one portion material layer being spaced from all other surface portions of the varistor by ceramic material;

said bodies of conductive material defining terminals of the varistor;

said ceramic material layers each being sandwiched between two electrode material layers having a thickness dimension less than 30 microns; and

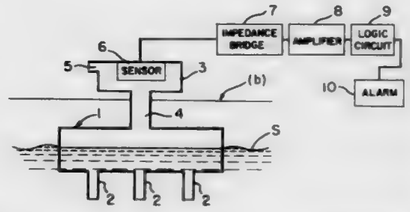
wherein at least one of said layers of electrode material is separated from an external surface portion of the varistor by a layer of ceramic material of a different composition from that of said separating layer of ceramic material.

5,115,222

ALARM TO DETECT ACCIDENTAL SUDDEN OR SLOW FALLS FROM CHILDREN INTO SWIMMING POOLS

Joaquin O. Peralta, Constitucion 339 1st Fl. "E" , and Rafael H. Martinez, Belgrano 159, 4300 La Banda, both of Santiago del Estero, Argentina

Filed May 23, 1990, Ser. No. 528,037
Claims priority, application Argentina, May 24, 1989, 314001
Int. Cl.[5] G08B *23/00*
U.S. Cl. 340—573 **9 Claims**



1. An apparatus for detecting full or partial immersion of an object in a confined body of water, comprising: a first chamber having a plurality of openings submergible in a body of water during use of the apparatus to allow the water to enter into the first chamber and having a first hole disposed above the level of water in the first chamber; a second chamber having a second hole in communication with the first hole of the first chamber; and sensing means disposed in the second chamber for sensing a variation in air contained in the second chamber caused by the immersion of an object in the body of water and generating an alarm in response thereto.

5,115,223

PERSONNEL LOCATION MONITORING SYSTEM AND METHOD

Thomas O. Moody, 1616 Centaur Circle, Lafayette, Colo. 80026

Filed Sep. 20, 1990, Ser. No. 585,639
Int. Cl.[5] G08B *21/00, 13/18*
U.S. Cl. 340—573 **27 Claims**

1. A personnel location monitoring system for indicating when an individual is no longer in a predetermined area and for providing an indication of the direction to the individual, the system comprising:

(a) a band adapted to be worn by an individual comprising,

(1) a transmitter for periodically transmitting on a predetermined frequency a digital signal uniquely identifying the individual wearing the band,

(2) a strap for carrying the transmitter and adapted to be removably affixed to the individual by encircling a part of the individual,

(3) at least one tamper detector carried internally of the strap substantially along its length for indicating to the transmitter that a portion of the strap may have been removed,

(4) a latch with pressure sensing means for holding the

strap encircling a part of the individual when the latch is closed and for indicating to the transmitter that the latch is not applying pressure to the pressure sensing means when the latch is open; and

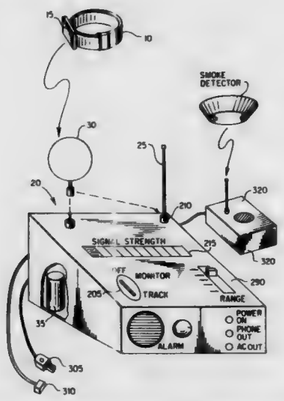
(b) a monitoring/tracking unit comprising,

(1) selector means for selecting one of a monitoring mode and a tracking mode, said selector means having secure means for preventing unauthorized deselection of the monitoring mode,

(2) antenna means for omnidirectional and directional reception on the predetermined frequency,

(3) receiver means connected to the antenna means for receiving a signal on the predetermined frequency and for indicating the signal strength thereof,

(4) a comparator for comparing data in the received signal to a predetermined identifier that uniquely identifies the



individual whose location is to be monitored and for providing a predetermined voltage when the data in the received signal matches the predetermined identifier,

(5) a timer operably connected to the comparator that is reset by receipt of the voltage for providing an indication that the voltage has not been received for a predetermined period of time after the timer has been reset,

(6) alarm means responsive to the indication that the timer has not received the voltage for a predetermined period of time for indicating that the individual may not be in the particular area,

(7) means for disabling the timer when the tracking mode is selected,

(8) means for providing an indication that the signal strength of the received signal exceeds a predetermined level when the tracking mode is selected.

5,115,224

PERSONAL SECURITY SYSTEM NETWORK

Karl H. Kostusiak, Pittsford; Daniel F. Pedtke, Palmyra, and Todd E. Heckleman, Hamlin, all of N.Y., assignors to Detection Systems, Inc., Fairport, N.Y.

Filed Jul. 5, 1991, Ser. No. 726,362
Int. Cl.[5] G08B *25/00*
U.S. Cl. 340—574 **13 Claims**

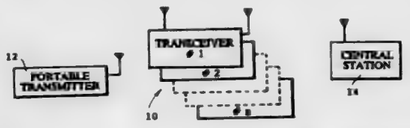
1. A personal security system comprising:

at least one movable transmitter adapted to produce an emergency signal transmission when activated;

a plurality of transceivers adapted to receive emergency signal transmissions from the movable transmitter;

means for comparing the received strength of an emergency signal received by one of said transceivers with the received signal strength of an emergency signal received by others of said transceivers; and

means for causing a transceiver to produce an alarm signal only in response to receipt of a transmission whose signal



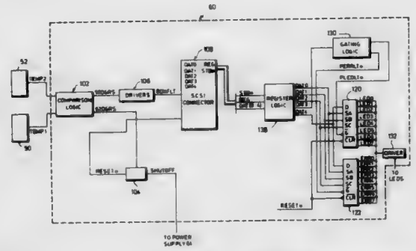
strength is at least as strong as any other received signal strength to which it has been compared.

5,115,225

DISK DRIVE UNIT OVERHEATING WARNING SYSTEM

Hung D. Dao, Tomball; Thomas W. Grieff, Spring; Thomas W. Lattin, Jr., Houston; Darren R. Thomas, Spring; Stephen M. Schultz, Houston; Richard Ewert, Cypress, and David L. Flower, Tomball, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Nov. 13, 1990, Ser. No. 612,133
Int. Cl.[5] G08B *17/00*
U.S. Cl. 340—584 **8 Claims**



1. An apparatus for detecting overheating in a disk drive chamber, the disk drive chamber including one or more disk drives, the disk drives coupled to a disk drive controller which is in communication with an operating system, the apparatus comprising:

means located in the drive chamber for sensing the temperature in the drive chamber and generating a signal indicative thereof;

comparing means coupled to said temperature sensing means which receives said temperature indicating signal for determining if the drive chamber temperature is above a limit temperature indicative of overheating and for generating a signal indicative thereof;

an external indicating alarm;

means coupled to said comparing means which receives said limit indicating signal and generates an interrupt signal; and

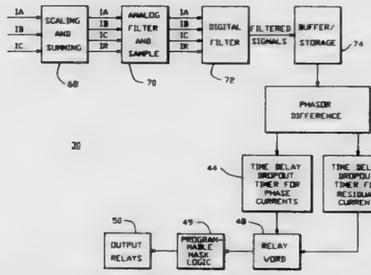
means on the disk drive controller coupled to said external indicating alarm and said interrupt signal generating means and receiving said interrupt signal for triggering said external indicating alarm and communicating the overheating status to the operating system when said overheating is detected.

5,115,226

RELAY FOR DETECTING A CURRENT DISTURBANCE AND ASSERTING AN OUTPUT

Edmund O. Schweitzer, III, Whitman County, Wash., assignor to Schweitzer Engineering Laboratories, Inc., Pullman, Wash.

Filed Oct. 12, 1989, Ser. No. 420,551
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—664 **21 Claims**



16. An apparatus for detecting a power system disturbance, comprising:

means for receiving at least one phase current or a residual current of a power system;

means for converting the current into a current phasor;

means for determining the rate of change of said current phasor, said determining means includes means for determining a phasor difference between the present value of said current and a value of said current of a predetermined earlier time;

means for comparing the rate of change to a predetermined value; and

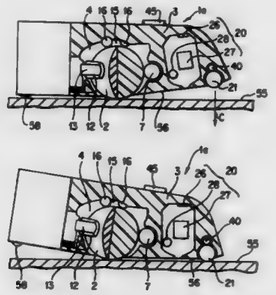
means for asserting an output if the predetermined value is exceeded.

5,115,227

INPUT DEVICE POSSESSING PLURAL FUNCTIONS

Yamaguchi Keiji, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 15, 1988, Ser. No. 206,797
Claims priority, application Japan, Jun. 22, 1987, 62-156224
Int. Cl.[5] G06K *9/22*
U.S. Cl. 340—709 **4 Claims**



1. An input device movable along a surface and possessing plural functions, comprising:

a package housing shaped so as to have at least a first and second operatively stable rotational position for placement and movement on said surface such that when placed in said first position said housing can be operatively moved in an arbitrary X-Y direction;

a co-ordinate position means mounted within said housing, having a ball shaped roller which contacts said surface when said package housing is in said first and said second position, which outputs a signal corresponding to rotation of said roller indicative of X and Y motion of said device along said surface;

an image reading means mounted within said housing which scans images on said surface and outputs a signal indicative of a displacement of said housing along said surface and images on said surface when said housing is placed in said first rotational position;

a switch means attached to said housing for selecting between said co-ordinate position signal and said image reading signal;

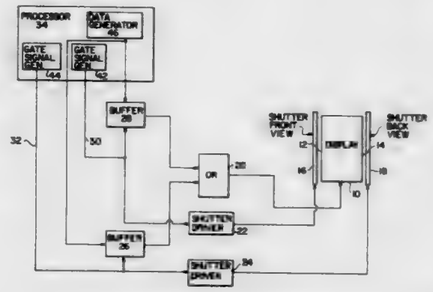
a cylindrical guide roller having an axle around which said cylindrical roller rotates, said axle attached to said housing such that when housing is placed in said first rotational position said cylindrical roller does not contact said surface and when said housing is placed in said second position said cylindrical roller stably contacts said surface.

5,115,228

SHUTTERED DISPLAY PANEL

Richard H. Harris, Raleigh; Richard G. Minor, Wake Forest, and Robert W. Price, Cary, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1990, Ser. No. 561,758
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—716 **10 Claims**



1. An electronic display system comprising:

a display for displaying an image through a front and rear side of said display;

a front shutter coupled to said display front side;

a rear shutter coupled to said display rear side;

a shutter control means coupled to said display for controlling said front shutter and said rear shutter;

said shutter control means opening said front shutter when said image is to be seen through said display front side and closing said front shutter when said image is not to be seen through said front side;

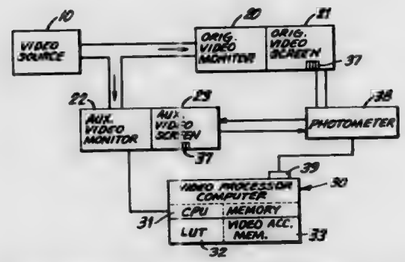
said shutter control means opening said rear shutter when said image is to be seen through said display rear side and closing said rear shutter when said image is not to be seen through said rear side; and

said shutter control means coordinates opening said front shutter with opening said rear shutter to display said image on said front side during a first time interval and to display said image on said rear side during a second time interval wherein said first time interval is out of phase with respect to said second time interval.

5,115,229
METHOD AND SYSTEM IN VIDEO IMAGE REPRODUCTION

Hanoch Shalit, 86 Edwards St. - #2A, Roslyn, N.Y. 11577

Continuation-in-part of Ser. No. 275,218, Nov. 23, 1988, Pat. No. 4,939,581. This application Jun. 26, 1990, Ser. No. 544,232
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—716 **12 Claims**



1. The method reproducing a series of images on a second video screen of a second video monitor which are accurate tone reproductions of the luminance ratios of the video images on a first video screen of a first video monitor including the steps of:

(a) forming a gray scale test video image on the first and second video screens; wherein said second video monitor includes electronic means to vary the luminance values on said second screen on a pixel-by-pixel basis, said test images having predetermined tone scales including defined areas differing in luminance ratios;

(b) luminance measuring the differences in luminance in the gray scale on the first screen to obtain a first set of luminance difference values using a photoelectric photometer and entering the first set of luminance difference values into a computer having computer memory and storing said first set in the computer memory;

(c) luminance measuring the differences in luminance in the gray scale on the second screen to obtain a second set of luminance difference values using a photoelectric photometer and entering the second set of luminance difference values into the computer;

(d) in the computer, comparing said entered second set of luminance values with said first set of luminance values stored in computer memory;

(e) using the computer to generate a set of corrections for each luminance value for each pixel of said second screen, and

(f) altering the tones on the second video screen according to said set of computer produced corrections by altering the settings of the electronic means of said second video device.

5,115,230
LIGHT-PEN SYSTEM FOR PROJECTED IMAGES

Lanny S. Smoot, Morristown, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Continuation of Ser. No. 381,859, Jul. 19, 1989, abandoned. This application Jan. 18, 1991, Ser. No. 643,156
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—707 **8 Claims**

1. A light pen system for generating a cursor which forms part of a projected video image, said light pen system comprising:

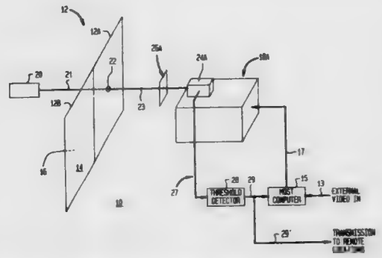
projection means for projecting a video image including a cursor onto a screen,

a source of a collimated beam of radiation for forming a spot at a desired location on said screen,

position locating means including a video camera for producing an output signal indicative of the location of the spot on the screen,

processing means for receiving an externally generated video signal, for receiving said output signal from said position locating means, and for modifying said externally generated video signal in response to said output signal of said position locating means to produce a modified video signal capable of forming a video image including a cursor at the location of said spot on said screen, and

means for transmitting said modified video signal to said projection means to form said video image including said cursor on said screen,



wherein said light pen system further comprises:

a source of a wide area beam of radiation, and

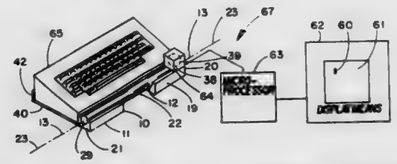
sensing means for sensing the presence of said wide area beam and for transmitting an output signal to said processing means indicative of the presence of said wide area beam,

said processing means modifying said external video signal in response to said output signal from said position locating means in cooperation with said output signal from said sensing means.

5,115,231
IMAGE POSITION CONTROL

Harold C. Avila, 11498 Pierce St., #AA, Riverside, Calif. 92505, and Arthur E. Oberg, Anaheim, Calif., assignors to Harold C. Avila, Riverside, Calif.

Continuation of Ser. No. 694,816, Jan. 25, 1985, Pat. No. 4,799,049. This application Dec. 28, 1988, Ser. No. 291,132
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[5] G09G *1/00*
U.S. Cl. 340—709 **20 Claims**



1. A system for selectively and accurately positioning an image on a screen, said system comprising:

display means having the screen on which said image is to be displayed;

stationary support means having a longitudinally extending axis;

movable image position control means mated to said support means and adapted to slide laterally on said support means in a direction parallel to the longitudinally extending axis thereof and rotate relative to said support means in a direction perpendicular to said axis;

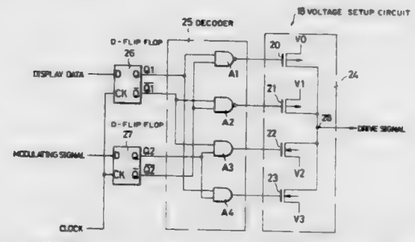
means for detecting the lateral and rotational movements of said image position control means relative to the longitudinal axis of said support means; and

computer means interconnected between said movement detecting means and said display means for causing the image to move on said screen in directions which correspond to the movements of said image position control means.

5,115,232
DISPLAY DEVICE DRIVING CIRCUIT

Taiji Iizuka, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 13, 1990, Ser. No. 509,014
Claims priority, application Japan, Apr. 15, 1989, 1-95957
Int. Cl.[5] G09G *3/36*; H04N *5/04*
U.S. Cl. 340—784 **6 Claims**



1. A display device driving circuit for converting a binary display data into an AC signal having no DC component and supplying said AC signal to a display device comprising:

synchronizing means for receiving said display data, a binary modulating signal and a clock signal and for synchronizing said display data and said modulating signal with said clock signal;

decoder means connected to said synchronizing means for generating a signal having a logic level corresponding to logic levels of said synchronized display data and modulating signal; and

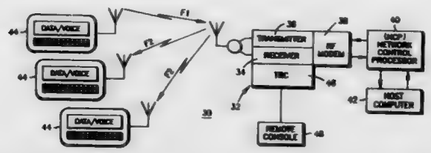
power supply means connected to said decoder means for outputting a voltage having an amplitude corresponding to said logic level of said signal received from said decoder means to said display device;

wherein said synchronizing means comprise a first D-type flip-flop which receives said display data at one input thereof and said clock signal at the other input thereof, and a second D-type flip-flop which receives said modulating signal at one input thereof and said clock signal at the other input thereof.

5,115,233
SHARED DATA/VOICE COMMUNICATION SYSTEM WITH PROGRAMMABLE DATA PRIORITY

Kenneth J. Zdunek, Schaumburg, and Jay R. Krebs, Crystal Lake, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 31, 1988, Ser. No. 175,888
Int. Cl.[5] G08B *5/22*
U.S. Cl. 340—825.44 **24 Claims**



1. A shared RF data/voice communication system operating on a communications channel and having a central base station controlled by a network control processor which grants channel access only when the channel is clear and a plurality of radio data terminals with voice capability, said system operating normally in a data mode, and wherein data priority is maintained for a set but programmable level of data usage, comprising in combination:

means in each of the data terminals for seeking access to the communication channel and requesting voice mode operation by transmitting a predetermined data packet;

means in said network control processor for granting the request, operating the central base station in voice mode and inhibiting all other system terminals from sending data messages during the pendency of said requesting terminal operating in voice mode;

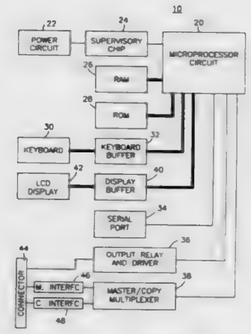
means for terminating voice mode operation and returning the base station to data mode only operation; and

means in said network control processor for maintaining a set, programmable level of data traffic for the communication system as compared to voice traffic by denying any voice mode request by a terminal when said programmable level of data traffic has not been reached.

5,115,234
KEYPAD CONTROLLER FOR COPIER-DUPLICATOR

Charles B. Levinski, South River; John M. Persel, Toms River, and David N. Widmann, Manasquan, all of N.J., assignors to Hecon Corporation, Eatontown, N.J.

Filed Jul. 17, 1990, Ser. No. 554,667
Int. Cl.[5] G03G *15/00*; G07C *3/10*
U.S. Cl. 340—825.310 **30 Claims**



1. Control means for controlling a machine capable of performing first and second different operations and generating a first or a second pulse indicative of the performance of the respective first and second operations, said control means comprising:

means for enabling said machine responsive to receipt of a valid access code;

means for accumulating at least one of said first and second pulses;

means for storing a quantity representing a usage criteria for the machine which criteria includes a value representing a predetermined minimum number of one of said first and second different operations to provide advantageous economic use of the machine;

means responsive to determination of the present machine usage for storing a violation condition when the accumulated number of machine operations just completed is less than a stored minimum number of machine operations, said violation count being associated with a valid access code permitting the last machine usage;

means responsive to the subsequent entry of a valid access code for determining if the same access code previously entered has a violation condition associated therewith; and

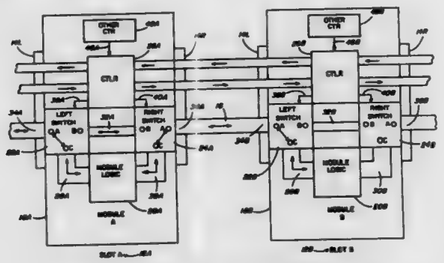
means for preventing access to said machine if a violation condition is present.

5,115,235

FLEXIBLE MODULE INTERCONNECT SYSTEM

Christopher J. Oliver, Rochester, N.H., assignor to Cabletron Systems, Inc., Rochester, N.H.

Filed Sep. 25, 1989, Ser. No. 412,091
Int. Cl.[5] H04Q *1/00*
U.S. Cl. 340—825.52 **14 Claims**



1. A module interconnect system comprising:
a backplane having a plurality of module-receiving slots;
a plurality of modules mounted in selected ones of said slots and electrically connected to said backplane, each of said modules including a module circuit with input/output lines;
a first switch means for each module having a first group of said input/output lines connected thereto and a second switch means for each module having a second group of said input/output lines connected thereto, each of said switch means having at least two states;
switch connection means for interconnecting the first and second switch means for each module;
a first module connection means for connecting the first switch means of a selected module to a first adjacent module;
a second module connection means for connecting the second switch means of the selected module to a second adjacent module; and
control means responsive to a control signal from an external source for controlling the state of the first switch means of each module to thereby selectably connect said first group of input/output lines, said second switch means and said first adjacent module; and for controlling the state of the second switch means of each module to thereby selectably connect said second group of input/output lines, said first switch means and said second adjacent module, said control signal including information representative of the module type of said first and second adjacent modules.

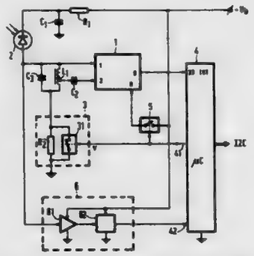
5,115,236

REMOTE CONTROL SYSTEM USING A WAKE UP SIGNAL

Hans E. P. Köhler, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1988, Ser. No. 264,489
Claims priority, application Netherlands, Nov. 18, 1987, 8702749
Int. Cl.[5] G08C *19/00*
U.S. Cl. 340—825.69 **4 Claims**

1. A remote control system comprising a transmitter and a receiver for the transmission and reception of messages, in which system said transmitter comprises means for generating messages, each message comprising a series of pulses and the beginning of each message including a wake-up pulse; a modulation circuit for modulating the generated messages; in said system said receiver comprises means for generating power supply energy; a demodulation circuit for demodulating received modulated messages and for generating a rough version of each received modulated message; a signal processing circuit fed by said power supply means and being coupled to the demodulation circuit for receiving the rough versions of messages and generating a stylized version of each message; said receiver also comprising a wake-up pulse detection circuit generating an auxiliary wake-up pulse in response to each received wake-up pulse; and switching means coupled to the



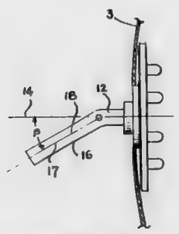
signal processing circuit for selectively applying power supply energy thereto; said switching means applying the power supply energy to the signal processing circuit only after an auxiliary wake-up pulse has been generated and discontinuing said supply if no auxiliary wake-up pulse has been generated for a predetermined period, said receiver maintaining said wake-up pulse detection circuit in condition to sense the next transmitted wake-up pulse after each said predetermined period.

5,115,237

COMBINATION AIRCRAFT YAW/ANGLE OF ATTACK SENSOR

Leonard M. Greene, Scarsdale, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Filed Apr. 16, 1990, Ser. No. 509,140
Int. Cl.[5] G08B *23/00*
U.S. Cl. 340—967 **4 Claims**



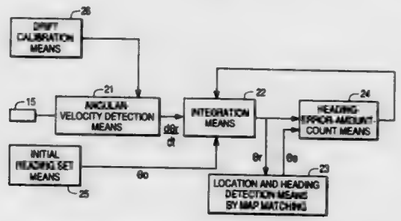
1. A device for sensing the angle of attack of an aircraft, the device comprising,
a sensor comprising an arm (12) rotatably attached at one end to the exterior surface of the aircraft and having an axis of rotation (14), and a vane (16) fixedly attached to the other end of the arm (12), said vane (16) having a leading edge (18) and a plane of symmetry (17) which passes through said leading edge (18), the plane of symmetry (17) of said vane (16) being canted at an angle to the axis of rotation (14) of the arm (12).

5,115,238

CALIBRATION APPARATUS OF ANGULAR VELOCITY SENSOR IN SELF-CONTAINED NAVIGATIONAL SYSTEM

Osamu Shimizu; Kenji Tenmoku; Yoichi Doi, and Kunihiko Mito, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 2, 1990, Ser. No. 502,551
Claims priority, application Japan, Apr. 7, 1989, 1-88440
Int. Cl.[5] G08G *1/123*
U.S. Cl. 340—988 **4 Claims**



1. A calibration apparatus of an angular-velocity detection sensor for detecting a heading of a vehicle which is used in a self-contained navigational system, comprising:
angular-velocity detection means for calculating an angular velocity from an output signal of said angular-velocity detection sensor;
integration means for calculating a current heading of the vehicle by integrating said angular velocity and by adding the integrated angular velocity to the previous heading of the vehicle;
location and heading detection means which estimates a location of the vehicle from said current heading calculated by said integration means, a heading obtained by a magnetic sensor and from a distance obtained by a distance sensor and which compares the estimated location with road network data obtained from a road map memory to obtain an estimated heading of the vehicle; and
heading correction means for calculating a difference between said current heading of said integration means and said estimated heading of said location and heading detection means and integrating said difference over a predetermined distance to obtain an error per unit distance, for calculating said difference or said error per unit distance, as a correction value for correcting said current heading of said integration means, and for feeding said correction value back to said integration means;
said current heading of said integration means being corrected by subtracting said correction value from said current heading of said integration means.

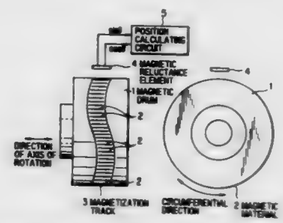
5,115,239

MAGNETIC ABSOLUTE POSITION ENCODER WITH AN UNDULATING TRACK

Shigeyuki Ushiyama, Yamanashi, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP89/00846, § 371 Date Apr. 19, 1990, § 102(e) Date Apr. 19, 1990, PCT Pub. No. WO90/02312, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 21, 1989, Ser. No. 474,027
Claims priority, application Japan, Aug. 31, 1988, 63-215186
Int. Cl.[5] H03M *1/22*; G01D *5/18*
U.S. Cl. 341—15 **8 Claims**

1. A magnetic-type absolute position encoder, comprising:
a magnetic drum including a magnetic material magnetized on a circumferential surface thereof, said magnetic drum being rotatable around a rotational axis, and said magnetic material having polarities which are arranged to form tracks which undulate n cycles per revolution in the direction of the rotational axis, a width of the magnetization track being substantially constant;
a magnetic reluctance element arranged to oppose the circumferential surface, and so that the rotation of said magnetic drum causes sinusoidal and cosinusoidal signals



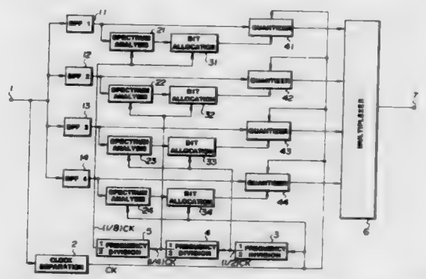
having a phase difference of substantially 90° to be output by said magnetic reluctance element and
absolute position calculating means for computing an absolute position in one revolution based on the sinusoidal and cosinusoidal signals.

5,115,240

METHOD AND APPARATUS FOR ENCODING VOICE SIGNALS DIVIDED INTO A PLURALITY OF FREQUENCY BANDS

Yoshihito Fujiwara; Tomoko Umezawa; Masayuki Nishiguchi, all of Kanagawa; Makoto Akune, Tokyo; Naoto Iwahashi, and Kenzo Akagiri, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 1990, Ser. No. 586,494
Claims priority, application Japan, Sep. 26, 1989, 1-249835; Oct. 25, 1989, 1-278207
Int. Cl.[5] H03M *7/00*
U.S. Cl. 341—51 **12 Claims**



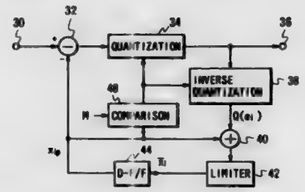
1. A digital signal encoding method of the type in which input digital signals are divided into a plurality of frequency bands which are so set that the bands with higher frequencies will have broader bandwidths, and in which encoded signals are synthesized and outputted for each of the frequency bands, wherein the improvement resides in the steps of:
detecting by spectral analyses properties of the frequency components of the frequency bands, with the period of the spectral analyses, which is the detection time interval or the time width as a unit of the analyses along the time axis, being selected to be longer for lower frequencies, and generating a corresponding detection output signal; and
controlling the synthesizing and encoding as a function of the detection output signal.

5,115,241

PREDICTIVE CODING DEVICE WITH INCREASED RESOLUTION

Hisashi Ishikawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1990, Ser. No. 535,139
Claims priority, application Japan, Jun. 9, 1989, 1-147809
Int. Cl.[5] H03M *3/00*; H04B *14/04*
U.S. Cl. 341—143 **13 Claims**



1. A coding device comprising:

(a) input means for inputting a value to be quantized;

(b)quantizing means for converting the value to be quantized which was input via the input means into a coding code of n bits,

the quantizing means being structured and arranged to be able to output 2^n coding codes which include $(2^{n-1}-1)$ coding codes corresponding to $(2^{n-1}-1)$ coding codes quantization representative values, $(2^{n-1}-1)$ coding codes corresponding to $(2^{n-1}-1)$ negative quantization representative values, a coding code corresponding to the quantization representative value of a difference value "0", and a last coding code; and

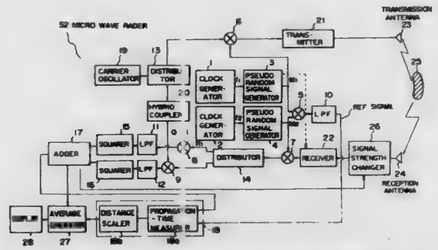
(c) switching means for switching the quantizing means between a first mode to make the last coding code correspond to a positive quantization representative value and a second mode to make the last coding code correspond to a negative quantization representative value.

5,115,242

IN-FURNACE SLAG LEVEL MEASURING APPARATUS

Akio Nagamune; Kouichi Tezuka, and Isamu Komine, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Mar. 27, 1991, Ser. No. 676,081
Claims priority, application Japan, Mar. 30, 1990, 2-81312; Mar. 30, 1990, 2-81313
Int. Cl.[5] G01S *13/28*
U.S. Cl. 342—124 **9 Claims**



1. An in-furnace slag level measuring apparatus provided with a microwave radar, said microwave radar comprising;

a first pseudo random signal generation means for outputting a first pseudo random signal;

a second pseudo random signal generation means for outputting a second pseudo random signal having a pattern the same as that of said first pseudo random signal and having a frequency slightly different from that of said first pseudo random signal;

a first multiplier for multiplying said first and second pseudo random signals by each other;

a carrier generation means;

a transmission means for transmitting a transmission signal based on said first pseudo random signal to a slag surface through a transmission antenna inserted into a furnace;

a reception means for receiving a signal reflected on said slag surface through a reception antenna inserted into said furnace to thereby obtain a detection signal;

a second multiplier for multiplying said reception signal by said second pseudo signal to thereby output a carrier;

a detector means for detecting said carrier outputted from said second multiplier to thereby output a reception strength signal; and

a time difference measurement means for measuring a time difference between a time series pattern of said reception strength signal outputted from said detector means and a time series patterns of a multiplication value outputted from said first multiplier to thereby outputs a level measurement value; and

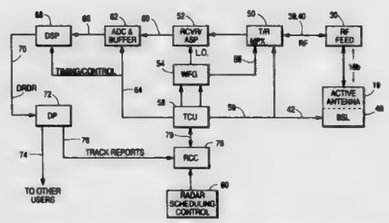
a signal strength changer inserted between said transmission means and said transmission antenna or between said reception antenna and said reception means for adjusting the signal level of said transmission signal or said reception signal in accordance with a degree of said reception strength signal outputted from said detector means and for outputting the thus adjusted signal.

5,115,243

RADAR SYSTEM WITH ACTIVE ARRAY ANTENNA, BEAM MULTIPLEX CONTROL AND PULSE INTEGRATION CONTROL RESPONSIVE TO AZIMUTH ANGLE

Michael S. Perry, Haddonfield; Jerome E. Freedman, Moorestown Township, Burlington County, and John J. Gallagher, Washington Township, Gloucester County, all of N.J., assignors to General Electric Co., Moorestown, N.J.

Filed Apr. 16, 1991, Ser. No. 686,092
Int. Cl.[5] G01S *13/66*
U.S. Cl. 342—158 **16 Claims**



7. A method for detecting targets by radar, comprising the steps of:

generating pulses of radio frequency energy;

applying said pulses of radio-frequency energy to a controllable active antenna array means for forming a single pencil beam which may be steered in azimuth and elevation directions;

thinning the aperture distribution of said active antenna array means for causing said pencil beam to have relatively low sidelobe levels;

controlling said active antenna array means for directing said pencil beam at selected discrete azimuth and elevation angles for scanning a predetermined volume during each of recurrent volume scan intervals;

controlling said generation of radio-frequency pulses for producing a single pulse during each of recurrent first and second transmit/receive intervals;

controlling said antenna array means for causing said beam to be directed at a first azimuth angle during said first transmit/receive intervals and at a second azimuth angle different from said first azimuth angle during said second transmit/receive intervals;

during each said volume scan interval, controlling said generation of radio-frequency pulses so that a relatively small number of said radio-frequency pulses are generated during those times in which said pencil beam is directed at one of said selected angles which is, in at least one plane, relatively near a broadside direction of said active array, and so that a relatively large number of said radio-frequency pulses are generated during those times in which said pencil beam is directed at another of said selected angles which is, in said plane, relatively far from said broadside direction;

receiving echo signals during said recurrent first and second transmit/receive intervals; and

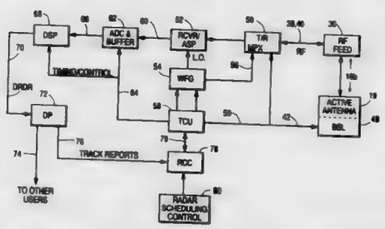
segregating said echo signals received during said first transmit/receive intervals from those received during said second transmit/receive intervals.

5,115,244

RADAR SYSTEM WITH ACTIVE ARRAY ANTENNA, ELEVATION-RESPONSIVE PRF CONTROL, AND PULSE INTEGRATION CONTROL RESPONSIVE TO AZIMUTH ANGLE

Jerome E. Freedman, Moorestown; Michael S. Perry, Haddonfield, and John J. Gallagher, Turnersville, all of N.J., assignors to General Electric Company, Moorestown, N.J.

Filed Apr. 16, 1991, Ser. No. 686,053
Int. Cl.[5] G01S *13/22, 13/66*
U.S. Cl. 342—158 **16 Claims**



7. A method for detecting targets by radar, comprising the steps of:

generating pulses of radio frequency energy;

amplifying said pulses of radio-frequency energy by an array of radio-frequency amplifier means to form a plurality of amplified pulses;

applying each of said amplified pulses to an antenna element of an antenna array for transmitting pulses on a pencil beam;

controlling the azimuth and elevation angles of said pencil beam to scan to a preselected number of discrete beam positions during each of recurrent volume scan intervals;

in said step of generating pulses, controlling the pulse recurrence frequency of said pulses of radio-frequency energy in a manner responsive to the elevation angle of said pencil beam;

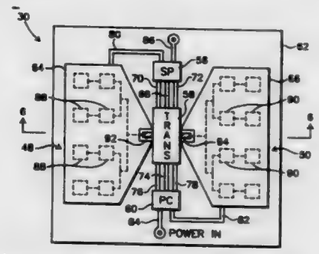
during each of said volume scan intervals, controlling the number of said pulses of radio-frequency energy generated in said step of generating pulses at each of said beam positions, in a manner which is responsive to the azimuth angle of said beam.

5,115,245

SINGLE SUBSTRATE MICROWAVE RADAR TRANSCEIVER INCLUDING FLIP-CHIP INTEGRATED CIRCUITS

Cheng P. Wen, Mission Viejo; Gregory S. Mendolia, Torrance; Mario Siracusa, Fountain Valley, all of Calif.; Joseph J. Maieron, Kokomo; William D. Higdon, Greentown, both of Ind.; John J. Wooldridge, Manhattan Beach, and Jon Gulick, Hawthrone, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif. and Delco Electronics Corporation, Kokomo, Ind.

Filed Sep. 4, 1990, Ser. No. 576,915
Int. Cl.[5] H01Q *13/26*
U.S. Cl. 342—175 **12 Claims**



1. A microwave radar assembly, comprising:

an electrically insulative substrate having a surface;

coplanar microwave transmission line means formed on said surface of the substrate;

a microwave radar integrated circuit chip having a surface; and

coplanar microwave transmission line means formed on said surface of the radar chip;

the radar chip being mounted on the substrate with said surface of the radar chip facing said surface of the substrate, wherein portions of the transmission line means of the substrate to be interconnected with respective portions of the transmission line means of the radar chip are aligned with each other, and the transmission line means of the radar chip being electrically interconnected with the transmission line means of the substrate, wherein solder is formed on said portions of the transmission line means of the substrate and is fused with said respective portions of the transmission lines means of the radar chip.

5,115,246

RADAR TARGET LOCATING AND TRACKING APPARATUS USING A DUAL-INTERLEAVED PULSE TRAIN RADAR WAVEFORM

Daniel D. Thomas, Jr., Liverpool; Hugh W. Hadley, and Joseph J. Len, both of Skaneateles, all of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 27, 1991, Ser. No. 661,767
Int. Cl.[5] G01S *13/12*
U.S. Cl. 342—195 **5 Claims**

1. A radar target locating and tracking apparatus comprising in combination:

means for transmitting a radar signal, said transmitting means transmitting a non-ideal radar waveform,

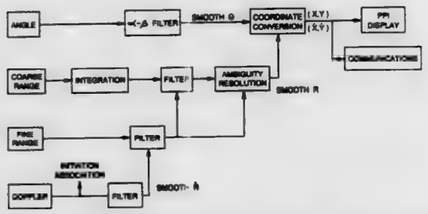
means for receiving a radar return signal, said radar return signal containing target locating data including Doppler signals,

means for filtering Doppler signale, said Doppler filter means extracting range rate from said Doppler signals,

means for filtering fine range signals, said fine range filter means receiving said range rate from said Doppler filtering means, said fine range filtering means filtering said fine range signals and said range rate to provide a fine range signal,

means for filtering coarse range signals, said coarse range filtering means including integration means which integrates said coarse range signals prior to filtering in said coarse range filtering means, said coarse range filtering means receives said fine range signal and said coarse range signal to provide an estimated fine range signal,

means for ambiguity resolution, said ambiguity resolution means receiving said estimated fine range signal and said fine range signal and resolving the ambiguity therebetween to provide a corrected fine range signal,



means for filtering angle signals, said angle filtering means filtering angle signals to provide a smoothed angle signal,

means for coordinate conversion receiving said smoothed angle signals and said corrected fine range signal, said coordinate conversion means providing target display coordinates, and,

a ppi display means receiving said target display coordinates, said ppi display means providing a display of target locations.

5,115,247

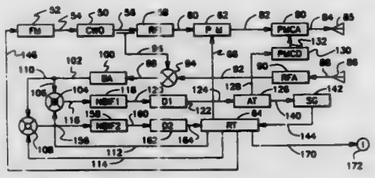
FREQUENCY MODULATED, PHASE CODED RADAR

Baard H. Thue, Columbus Township, Anoka County, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 156,155, Feb. 16, 1988, abandoned. This application Oct. 12, 1989, Ser. No. 423,489

Int. Cl.[5] **G01S** *13/28, 13/34, 13/36*

U.S. Cl. 342—201 **2 Claims**



1. Radar ranging apparatus comprising:

transmission means including (i) modulating means for generating a frequency modulated signal where the frequency changes from a first value to a second value along a substantially linearly sloped curve, (ii) phase coding means for reversing the phase of the frequency modulated signal at predetermined times according to a predetermined code, the transmission means operable to transmit the frequency modulated phase coded signal to a remote object, and operable to vary the power of the transmitted signal in accordance with a power management signal;

receiver means including (i) mixer means connected to the transmission means to receive frequency modulated signals therefrom and connected to receive signals reflected from the object, such reflected signals being delayed with respect to the transmitted signals by a time which varies with the distance to the object, the mixer means providing a coded intermediate frequency signal of a substantially constant frequency which frequency is dependent upon the slope of the substantially linearly sloped curved, and (ii) correlator means connected to the phase coding means and to the mixer means to receive the intermediate frequency signal therefrom, the correlator means operable to remove the code from the intermediate frequency signal to produce an uncoded signal of the substantially constant frequency;

tracking means connected to the correlator means to change the time delay of the correlation code relative to the transmitted code, the tracking means responsive to the decoded intermediate frequency from the correlator means to produce an output indicative of the distance to the object; and

power management means operable to produce the power management signal in response to the reflected signal received by the receiver means and connected to supply the power management signal to the transmission means, the power management signal being characterized to control the power of the transmitted frequency modulated phase coded signal as a predetermined function of the distance to the remote object.

5,115,248

MULTIBEAM ANTENNA FEED DEVICE

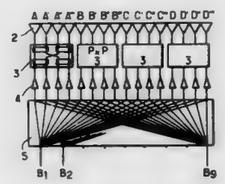
Antoine Roederer, Noordwijk, Netherlands, assignor to Agence Spatiale Europeenne, France

Filed Sep. 21, 1990, Ser. No. 585,996

Claims priority, application France, Sep. 26, 1989, 89 12584

Int. Cl.[5] **H01Q** *3/22*

U.S. Cl. 342—373 **18 Claims**



1. A feed device for a multibeam antenna, said antenna providing Nb beams by means of Ne feed elements cooperating with a focusing means, each of the beams being generated by a sub-group of Nc feed elements, the feed elements being shared among overlapping beams, said feed device comprising:

a set of Nc hybrid, multiport power dividers, each having an equal number of input ports and output ports, said number of input ports or output ports being a power of two, a power of three, or a product of a power of two and a power of three, the number of said output ports being Na, which number is equal to or greater than Ne, each of said feed elements of the antenna being excitable by one of said output ports so that for each beam provided by the antenna, each divider feeds one of the feed elements contributing to the respective beam, and each of said power dividers including an orthogonal and unitary distribution matrix;

a set of Na amplifier modules, each input port of said power dividers being connected to one of said modules, each said module comprising at least one of a transmission power amplifier and a low-noise reception amplifier, all of said amplifiers essentially operating at the same optimum nominal signal level responsive to changes in the relative loading of the beams; and

a beam forming network having Nb input ports and Na output ports, each input port of said network being connected to each output port of said network by means providing appropriate insertion phase shifts for each beam, each of said Na output ports being connected to one of said Na amplifier modules connected between said dividers and said beam forming network.

5,115,249

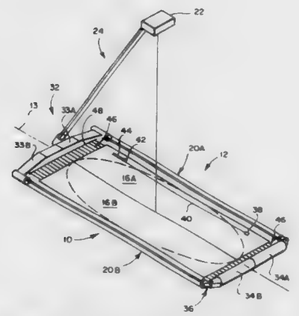
ARRANGEMENT FOR WINDOW SHADE-DEPLOYED RADAR

Peter K. Homer, Langhorne, Pa., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 28, 1990, Ser. No. 573,808

Int. Cl.[5] **H01Q** *19/06*

U.S. Cl. 343—753 **6 Claims**



1. A collapsible radar lens assembly comprising:

first and second parallel mounted flexible membranes for mounting lens aperture elements thereto;

a first end of each membrane fastened to corresponding first and second hollow collapsible drums for rolling the membranes thereon;

first and second collapsible main beams located in spaced parallel relation to the drums co-linearly arranged when the lens assembly is deployed;

first and second wire signal busses located within respective main beams; and

wires for conducting signals directly connected between the aperture elements and the busses thereby avoiding a rotating connection therebetween.

5,115,250

WIPER FOR INK-JET PRINTHEAD

J. P. Harmon, Washougal, Wash., and George T. Kaplinsky, San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 12, 1990, Ser. No. 463,755

Int. Cl.[5] **B41J** *2/165*

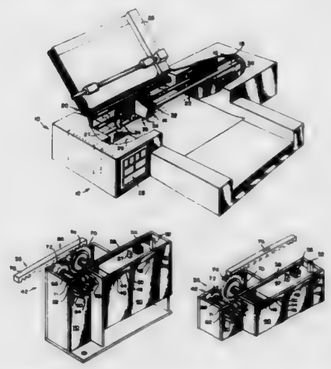
U.S. Cl. 346—1.1 **39 Claims**

1. Apparatus for cleaning an orifice plate of a printhead on an ink-jet printer comprising:

a wiper having a central axis of rotation and a plurality of resilient blades extending therefrom, each said resilient blade having a distal tip, wherein said distal tips of said resilient blades together define a circle whose center is on said central axis of rotation;

means for rotating said wiper about said central axis for successively bringing said distal tips of said resilient blades into wiping contact with the printhead orifice plate; and

means for removing contaminants from said resilient blades while said resilient blades are rotating, wherein said removing means comprises a plurality of generally rigid scraper blades disposed about a portion of a circumference



of the circle defined by said distal tips of said resilient blades.

5,115,251

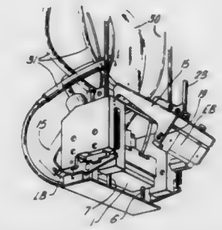
CONTINUOUS INK JET PRINTING DEVICE

Colin Gray, Combridgeshire, England, assignor to Elmjet Limited, Cambridge, England

Filed Aug. 17, 1990, Ser. No. 568,775

Int. Cl.[5] **G01D** *15/18*

U.S. Cl. 346—75 **11 Claims**



1. A continuous ink jet printing device comprising a nozzle plate (1) with a plurality of nozzles (4) from which, in use, jets of ink drops are ejected, and an electrode assembly (LB) with a drop-charging electrode (9), the electrode assembly being located relatively to the nozzle plate in directions perpendicular to the direction of the ink jets by virtue of one of the electrode assembly and nozzle plate being rigid with a rigid rail (6, 7), and by virtue of a groove (10) rigid with the other of the electrode assembly and nozzle plate engaging directly the rail, said groove having opposing edge surfaces engaged by the rail.

5,115,252

THERMAL HEAD DRIVE APPARATUS CORRECTING FOR THE INFLUENCE ON A PRINTING ELEMENT OF HEAT FROM OTHER PRINTING ELEMENTS

Eiichi Sasaki, 205 Takahashi-Haitsu, 1994-1 Futoo-cho, Kohoku-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Jan. 30, 1990, Ser. No. 475,898

Claims priority, application Japan, Feb. 3, 1989, 1-24922; Oct. 16, 1989, 1-268628

Int. Cl.[5] **B41J** *2/36;* **B41M** *5/26*

U.S. Cl. 346—76 PH **10 Claims**

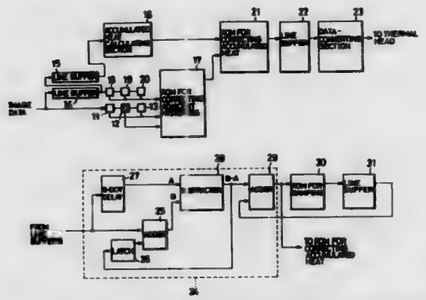
1. An apparatus for driving a plurality of heating resistors arranged in one line in a thermal head by using image data to

perform a printing operation with respect to picture elements every one line, said apparatus comprising:

first correcting means (17) for initially correcting image data to be printed by one heating resistor according to adjacent image data printed in the same printing operation so as to cancel a thermal influence of adjacent heating resistors on said one heating resistor;

first delay means (15) for delaying image data to provide previous image data;

a calculating section (16) coupled to said first delay means for outputting correction data representing an amount of accumulated heat of heating resistors by previous printing operations according to previous image data, said calculating section including



second delay means (31) for delaying said correction data,

damping means (30) for damping delayed correction data so as to represent accumulated heat after one line printing period,

calculating means (29) for calculating said correction data by using damped correction data;

second correcting means (21) for correcting initially corrected image data according to said correction data so as to cancel an influence of said accumulated heat of heating resistors on said one heating resistor; and

driving means for driving said one heating resistor according to image data corrected by said second correcting means.

5,115,253

METHOD FOR DRIVING AND CONTROLLING A THERMAL PRINTER

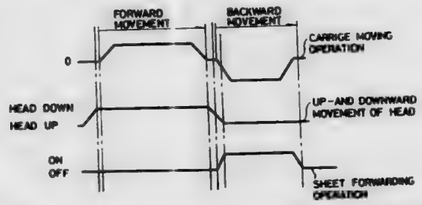
Hideki Yorozu, and Akihiro Takeuchi, both of Iwate, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1990, Ser. No. 593,912

Claims priority, application Japan, Oct. 27, 1989, 1-280850; Oct. 31, 1989, 1-283987; Oct. 31, 1989, 1-283988

Int. Cl.[5] G01D *15/10*

U.S. Cl. 346—76 PH **9 Claims**



5. An improved method for driving and controlling a thermal printer having

a carriage movement operation for effecting movement of a carriage along a platen, said carriage movement operation consisting of a forward speed period and a backward speed period;

a thermal head movement operation for effecting movement of a thermal head against or away from said platen, said thermal head being operably disposed on said carriage; and

a sheet forwarding operation for positioning a printing sheet between said platen and said carriage such that said sheet forwarding operation advances said sheet a predetermined distance in a direction perpendicular to said movement of said carriage;

said improved method comprising the steps of:

initiating said thermal head movement operation to move said thermal head away from said platen;

initiating said backward speed of said carriage movement operation to move said carriage to a position determining a beginning of a new printing line and substantially simultaneously initiating said sheet forwarding operation to forward said printing sheet said predetermined distance;

such that said carriage movement operation and said sheet forwarding operation are initiated after said initiation of said thermal head movement operation and before the completion of said thermal head movement operation.

5,115,254

THERMAL TRANSFER RECORDING APPARATUS USING A THERMAL TRANSFER MATERIAL AND A RECORDING MEDIUM

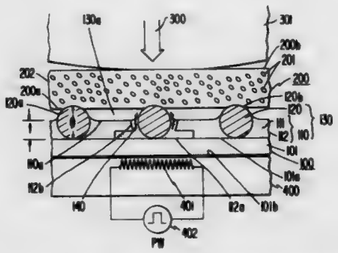
Hiroshi Onishi, Hirakata; Tadao Kohashi, Kawasaki; Soichiro Mima, Nishinomiya, and Hiroshi Esaki, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 165,983, Mar. 9, 1988, abandoned. This application May 12, 1989, Ser. No. 353,227

Claims priority, application Japan, Mar. 10, 1987, 62-54548

Int. Cl.[5] G01D *15/10*; E41M *3/12*

U.S. Cl. 346—76 PH **12 Claims**



1. A thermal transfer recording apparatus comprising:

a recording medium sheet formed of a plastic film material, said recording medium sheet having an ink accepter surface and insulation/flexibility increasing means or insulating against heat conduction and for increasing flexibility of said ink accepter surface, said insulation/flexibility increasing means comprising numerous minute voids formed in said plastic film material;

a thermal transfer recording sheet formed of a heat resistive base sheet with opposing surfaces, and a thermal transfer layer coated onto one of said opposing surfaces of said base sheet, said thermal transfer layer comprising an ink material containing a binder material and being transferable to said ink accepter surface of said recording medium sheet, and particles which are solid at room temperature and are mixed into said thermal transfer layer in order to form minute protrusions on a surface of said thermal transfer layer;

means for raising the temperature of said thermal transfer layer in a controlled manner so as to decrease the viscosity of said thermal transfer layer; and

means for transporting said recording medium sheet placed between said thermal transfer recording sheet and said temperature raising means.

5,115,255

THERMAL PRINTER SUITABLE FOR BOTH THERMAL TRANSFER AND HEAT SENSITIVE RECORDING

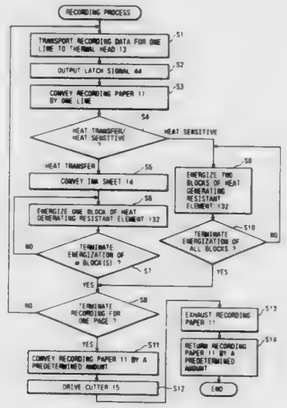
Makoto Kobayashi; Takehiro Yoshida, both of Tokyo; Satoshi Wada, Kawasaki; Hisao Terajima, Yokohama; Takeshi Ono, Yokohama; Minoru Yokoyama, Yokohama; Takashi Awai, Yokohama; Akihiro Tomoda, Yokohama, and Yasushi Ishida, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1989, Ser. No. 430,179

Claims priority, application Japan, Nov. 1, 1988, 63-274374

Int. Cl.[5] G01D *15/10*

U.S. Cl. 346—76 PH **8 Claims**



1. A thermal printer which can perform both a heat-sensitive recording operation and a heat-transfer recording operation, comprising:

a recording medium loading portion for removably receiving a recording medium for said heat-sensitive recording operation and a recording medium for said heat-transfer recording operation;

an ink sheet loading portion for removably receiving an ink sheet used with said heat-transfer recording operation;

recording means for recording an image on said recording medium, said recording means having a plurality of dots; and

control means for energizing said recording means to heat a predetermined number of said dots when the image is recorded on said recording medium for said heat-transfer recording operation by means of said recording means and for energizing said recording means to heat a number of said dots larger than said predetermined number of dots when the image is recorded on said recording medium for said heat-sensitive recording operation.

5,115,256

BEAM RECORDER WITH SCAN POSITION CONTROL

Ken Miyagi, Yokohama, and Hiroyuki Miyake, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 244,409, Sep. 14, 1988, abandoned. This application Apr. 30, 1990, Ser. No. 515,346

Claims priority, application Japan, Sep. 14, 1987, 61-228474

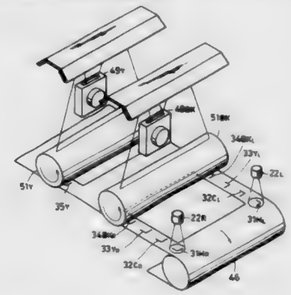
Int. Cl.[5] H04N *1/21*

U.S. Cl. 346—108 **16 Claims**

10. A recording apparatus comprising:

beam generating means for generating a beam;

scanning means for scanning a recording medium with the beam generated by said beam generating means, said scanning means having deflecting means for deflecting said beam, a motor for driving said deflecting means, and driving means for driving said motor on the basis of a predetermined clock signal;



deviation amount detecting means for detecting an amount of deviation of an image formed on said recording medium; and

controlling means for controlling a phase of said clock signal in accordance with the amount of deviation detected by said detecting means.

5,115,257

MULTI-TONE LASER BEAM WRITING APPARATUS FOR IMAGE FORMING EQUIPMENT

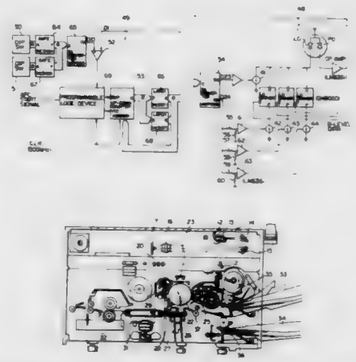
Hiroshi Takahashi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 25, 1990, Ser. No. 528,493

Claims priority, application Japan, May 30, 1989, 1-134675

Int. Cl.[5] H04N *1/21*

U.S. Cl. 346—108 **5 Claims**



1. A multi-tone laser beam writing apparatus comprising:

pixel clock generating means for generating pixel clocks by dividing a plurality of reference clocks; and

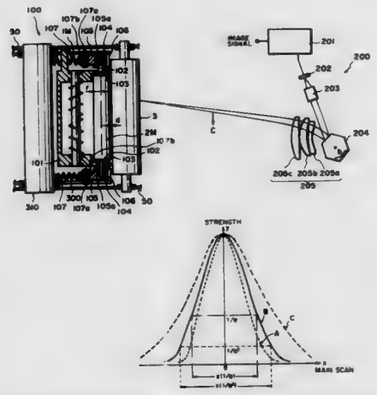
analog modulating means for analog-modulating a quantity of a laser beam in response to said pixel clocks generated by said pixel clock generating means

wherein said pixel clock generating means generates said pixel clocks on the basis of upper bit data of image density data while said analog modulating means analog-modulates the quantity of the laser beam on the basis of lower bit data of said image density data.

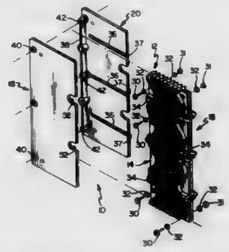
5,115,258

Patent Not Issued For This Number

5,115,259
ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS
Masahiro Itoh, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 13, 1991, Ser. No. 714,838
Claims priority, application Japan, Jun. 15, 1990, 2-158469
Int. Cl.[5] G03G *15/01, 15/04*
U.S. Cl. 346—157 **14 Claims**



1. An electrophotographic image forming apparatus, comprising:
a movable electrophotographic photosensitive member;
laser beam means for providing a laser beam modulated in accordance with signals representing images to be recorded;
a scanning optical system for scanningly deflecting the laser beam in a main scan direction, wherein a spot diameter ($x(1/e^2)$), measured in the main scan direction, of a spot of the laser beam formed on said photosensitive member is not more than 45 microns, and an intensity distribution ($x(1/e^2)/x(1/e)$) thereof in the main scan direction is not more than 1.6;
a developing device for developing in a developing zone an electrostatic latent image formed by the laser beam on said photosensitive member; and
supporting means for supporting said developing means to face it in the developing zone to said photosensitive member without contact thereto from one another in a second direction along said surface normal to said first direction, said channels being so formed in



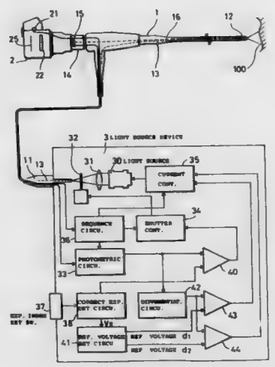
said surface as to undulate in said second direction to provide strain relief for cables placed in said channels.

5,115,260
COMPACT STRAIN RELIEF DEVICE FOR FIBER OPTIC CABLES
Curtis E. Hayward, Rhinebeck; Gerald W. Peterson, Poughkeepsie, and Robert E. Post, Connelly, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 4, 1990, Ser. No. 577,415
Int. Cl.[5] G02B *6/44;* **H02G** *15/064*
U.S. Cl. 385—100 **8 Claims**

1. A cable strain relief device comprising a cable manifold having a pair of opposite ends and a generally planar surface extending between said ends, said surface being formed with a plurality of cable-receiving channels extending generally in a first direction along said surface between said ends and spaced

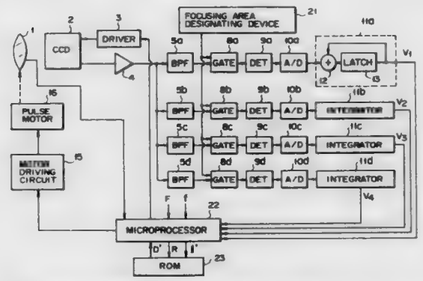
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5,115,261
PHOTOGRAPHING LIGHT QUANTITY CONTROLLER FOR ENDOSCOPE
Nobuhiro Noda; Katsuhiko Furuya; Tadashi Takahashi, and Masaaki Nakasima, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 18, 1990, Ser. No. 553,610
Claims priority, application Japan, Jul. 25, 1989, 1-193684; Oct. 16, 1989, 1-270081
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—62 **18 Claims**



1. A photographing light quantity controller for an endoscope, which is used to control the quantity of illuminating light when a photograph is to be taken through said endoscope, comprising:
means for photoelectrically converting a brightness level of the reflected light from an object, which is illuminated with a light source, into an electric signal and outputting said electric signal;
means for integrating an output from said photoelectric conversion means and outputting an integral value;
means for differentially detecting and outputting a rise of a signal representative of an integral value which is outputted from said integration means; and
means for controlling the brightness of illuminating light wherein, when the output from said detecting means is greater than a first reference value, the brightness of light that illuminates said object is controlled to a relatively low level, and wherein, when the output from said detecting means is less than said first reference value, the brightness of said illuminating light is controlled to a relatively high level, and when the output from said detecting means is between said first and second reference values, the brightness of said illuminating light is controlled to a predetermined level between said two brightness levels.

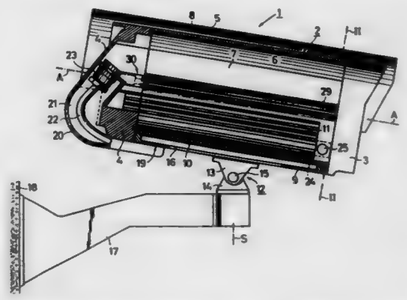
5,115,262
AUTO-FOCUSING APPARATUS
Yasuhiro Komiya, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Apr. 18, 1991, Ser. No. 687,452
Claims priority, application Japan, Apr. 25, 1990, 2-109876; Nov. 8, 1990, 2-303285
Int. Cl.[5] G02B *7/28;* **H04N** *5/232;* **G03B** *13/36*
U.S. Cl. 354—402 **16 Claims**



1. An auto-focusing apparatus comprising:
an optical system for obtaining an optical image of an object;
means for imaging the optical image;
driving means for moving at least one of said imaging means and said optical system along a direction of an optical axis;
filter means for extracting a predetermined frequency component from an output signal from said imaging means;
detecting means for detecting an output signal from said filter means and generating a focus signal representing a focusing degree of the optical image, which is a function of relative positions of said imaging means and said optical system;
means for obtaining an intermediate parameter which characterizes a function curve of the focus signal on the basis of the frequency component extracted by said filter means and an F-number of said optical system;
means for determining a sampling interval on the basis of a constant representing a characteristic of said detecting means and the intermediate parameter; and
means for obtaining an in-focus point by sampling the focus signal every sampling interval while at least one of said optical system and said imaging means is moved by said driving means and interpolating a plurality of sampled signal values.

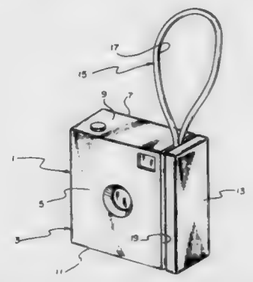
5,115,263
PROTECTIVE CASING FOR OPTICAL INSTRUMENTS
Rainer Bernhardt, Rosbach, and Reiner Waldschmitt, Eschborn, both of Fed. Rep. of Germany, assignors to Videor Technical E. Hartig GmbH, Rödermark, Fed. Rep. of Germany
Filed Mar. 14, 1991, Ser. No. 669,668
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1990, 4008338
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—81 **16 Claims**

1. Protective casing for optical instruments comprising
a base,
a casing support mounted on said base,
a back wall fixed to said casing support and having aperture means for receiving electrical cable means therethrough,
a tubular casing shell having a longitudinal axis, a front end, a rear end, and a bottom extending between said ends, said bottom being received on said casing support, said rear end being detachably connected to said back wall,
an instrument support inside said casing shell and fixed to said back wall, said instrument support having a pair of



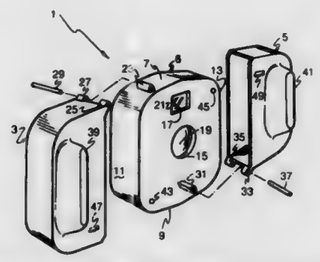
parallel sidewalls connected by a crossbar to form a trough open at the top, said sidewalls having mutually facing inside faces, each inside face having a plurality of channels which parallel said axis and allow insertion of at least one instrument support plate at selectable heights with said casing shell.

5,115,264
PHOTOGRAPHIC CAMERA WITH INTEGRATABLE WRIST STRAP
Joseph J. Schappler, Bedford, N.H., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 12, 1991, Ser. No. 714,296
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—82 **7 Claims**



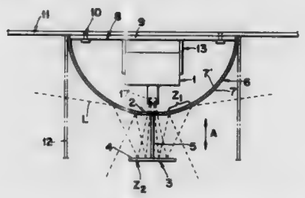
1. A photographic camera comprising a camera body, and a flexible looped wrist strap secured to said camera body to permit said wrist strap to be extended along its length as a loop from the camera body to receive one's wrist in said loop, is characterized in that:
said camera body has an elongate recess which is dimensioned to receive said looped wrist strap completely along the length of the wrist strap to fully integrate the wrist strap with said camera body, but to cause the wrist strap to slightly protrude along its length from said elongate recess to permit the wrist strap to be used further as a fixed hand grip for the camera body.

5,115,265
PHOTOGRAPHIC CAMERA WITH PIVOTABLE COVER PARTS
Samuel F. Swayze, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 7, 1991, Ser. No. 637,853
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—82 **5 Claims**



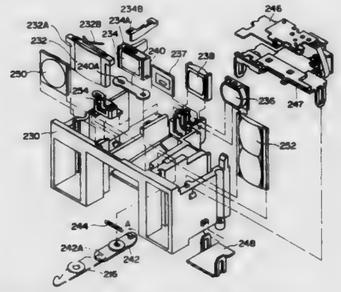
1. A photographic camera comprising a camera body having a pair of opposite ends and respective front openings for a taking lens and a viewfinder situated between said opposite ends, and a pair of cover parts normally substantially encasing said camera body, is characterized in that:
mounting means connects said camera body and said cover parts for individual movement of the cover parts relative to the camera body to a covering position encasing the camera body and to a fixed open position removed from said front openings to uncover said taking lens and said viewfinder and to form respective enclosed spaces between said opposite ends and the cover parts to allow one to manually grasp the cover parts at separate locations directly across from the opposite ends.

5,115,266
OPTICAL SYSTEM FOR RECORDING OR PROJECTING A PANORAMIC IMAGE
Gerald J. Troje, 69-21 F 186 La., Fresh Meadows, N.Y. 11365
Continuation-in-part of Ser. No. 433,283, Nov. 8, 1989, abandoned. This application Apr. 11, 1991, Ser. No. 683,691
Int. Cl.[5] G03B *37/00*
U.S. Cl. 354—95 **23 Claims**



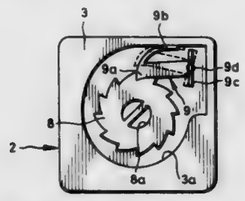
1. An optical system for recording a panoramic image, comprising:
a camera having a camera lens,
a first member including a transparent section thereof,
a second member spaced from said first member in an axial direction, said second member having a reflecting surface facing said first member,
a third member connecting said first and second members together, and
a fourth member having a reflecting surface spaced from said second member in said axial direction, said reflecting surface of said fourth member being oriented with respect to said reflecting surface of said second member such that light rays are reflected therebetween, said reflecting surface of said second member being oriented with respect to said transparent section such that said light rays are also reflected therebetween, the reflecting surface of the fourth member having a curvature closely matching the curvature of the camera lens.

5,115,267
ZOOM LENS DRIVE MECHANISM
Shigeru Kondo; Naoki Takatori, both of Tokyo; Masaaki Morizumi, Omiya, and Shino Kanamori, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Division of Ser. No. 398,684, Aug. 25, 1989, Pat. No. 4,961,635. This application Jul. 24, 1990, Ser. No. 556,514
Claims priority, application Japan, Sep. 6, 1988, 63-223139; Sep. 6, 1988, 63-223145
Int. Cl.[5] G03B *13/14*
U.S. Cl. 354—221 **2 Claims**



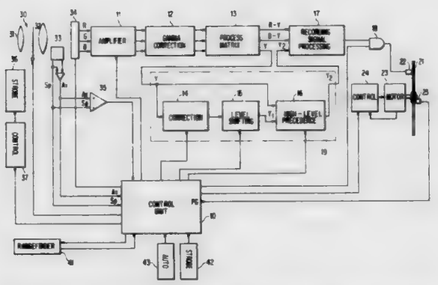
1. A parallax correction mechanism comprising:
a finder guided so as to be freely movable in a direction where an objective lens moves towards and away from a taking lens;
a focus adjustment mechanism for adjusting the focus of said taking lens so that an image of an object can be in focus on an image pickup surface; and,
a connecting mechanism part for connecting said focus adjustment mechanism with said objective lens of said finder and for moving said objective lens in link with the operation of said focus adjustment mechanism.

5,115,268
PHOTOGRAPHIC FILM CASSETTE
Kuniharu Kitagawa; Hideaki Kataoka; Tomoyuki Takahashi, and Kiichiro Kitagawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 24, 1990, Ser. No. 571,966
Claims priority, application Japan, Aug. 25, 1989, 1-219433
Int. Cl.[5] G03B *17/26, 17/36*
U.S. Cl. 354—275 **9 Claims**



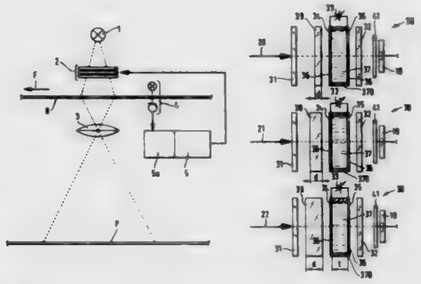
1. A photographic film cassette for use in a camera, said cassette including a spool, a photographic film roll coiled on said spool with a trailing end of a photographic film attached to said spool, and a lighttight cassette body for rotatably supporting said spool, said photographic film cassette further comprising:
film advancement means for advancing a leader end of said photographic film outwardly from the interior of said cassette body in accordance with rotation of said spool when said spool is rotated in a film unwinding direction; and
spool lock means for preventing said spool from being rotated, wherein said spool lock means comprises a ratchet wheel fixed to said spool and a pawl having a single detent portion retaining said ratchet wheel, such that said spool is prevented from being rotated in the film in winding direction.

5,115,269
CAMERA HAVING LUMINANCE DIFFERENCE MODE CONTROL
Yamamoto Masanaga; Kaneko Kiyotaka; Yoshida Masanori, and Miyake Izumi, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 9, 1990, Ser. No. 610,874
Claims priority, application Japan, Nov. 13, 1989, 1-294535
Int. Cl.[5] G03B *7/00, 15/03*
U.S. Cl. 354—420 **9 Claims**



1. A camera comprising:
first photometry means for measuring a first average luminance of substantially the entirety of an imaged region in a visual field of an imaging optical system;
second photometry means for measuring spot luminance of a specific small region corresponding to an imaged position of a subject in the imaged region;
means for determining a second average luminance of the entirety of the imaged region based on said first average luminance and said spot luminance;
luminance-difference arithmetic means for calculating a difference between the second average luminance and the spot luminance;
rangefinding means for measuring distance to the subject; and
mode selecting means for discriminating the luminance difference by using a predetermined threshold value, and selecting a suitable photographic mode in dependence upon results of the discrimination and the distance measured by said rangefinding means;
wherein the threshold value for discriminating the luminance difference is varied in conformity with the distance measured by said rangefinding means.

5,115,270
PHOTOGRAPHIC COLOR COPYING APPARATUS AND EXPOSURE CONTROL PROCESS
Walter Kraft, Zurich, and Jürgen Nehring, Wettingen, both of Switzerland, assignors to Gretag Systems, Bothell, Wash.
Filed Sep. 28, 1990, Ser. No. 595,111
Claims priority, application Switzerland, Sep. 29, 1989, 3556/89
Int. Cl.[5] G03B *27/80*
U.S. Cl. 355—38 **36 Claims**

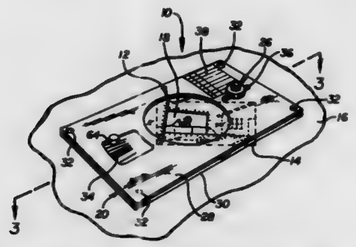


1. Photographic color copying apparatus for reproducing a copy master on a photosensitive copy material, comprising:
a projection layout;
a measuring layout for photoelectrically analyzing a copy master and for determining color extract values adapted to the spectral sensitivity variations of a copy material, said measuring layout further including
a plurality of electro-optical measuring filters which are individually adjustable relative to their spectral transmission or absorption behavior and may be varied by application of an electrical field, said electro-optical filters including polarizing filters with an input polarizer and an output polarizer, and electro-optical liquid crystals located within an approximately parallelepiped cell that is transparent at least at its approximately plane parallel light inlet and light outlet surfaces and
a plurality of photoelectric detectors; and,
an exposure control device to further process said color extract values to determine quantities of copying light impacting the copy material and to cooperate with the measuring layout and the projection layout.

5,115,271
CROPPING DEVICE FOR PHOTOGRAPHS AND THE LIKE
James C. Hagopian, 915 N. Mansfield Ave., Hollywood, Calif. 90038
Filed May 30, 1991, Ser. No. 708,047
Int. Cl.[5] G03B *27/58*
U.S. Cl. 355—74 **20 Claims**

1. A cropping device for photographs and the like, comprising:
a housing having a central window;
a first mask within the housing, capable of rotational and translational movement therein;
a second mask within the housing, capable of rotational and translational movement therein, the first mask and the second mask cooperatively defining a variable, generally rectilinear aperture within the housing window; and
means for coordinating and controlling movement of the

first mask relative to the second mask, whereby the proportions of the rectilinear aperture can be selected, and



then the size of the rectilinear aperture varied without changing the selected proportions.

5,115,272

IMAGE-FORMING APPARATUS HAVING AN ERASE DEVICE LOCATED AT A FIRST OR SECOND POSITION WHEN THE APPARATUS IS IN AN OPENED OR CLOSED POSITION

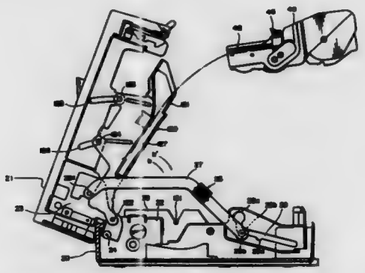
Naoto Ohmori, and Takashi Gonda, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 477,416, Feb. 9, 1990, abandoned. This application May 21, 1991, Ser. No. 703,713

Claims priority, application Japan, Feb. 10, 1989, 1-31827

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—200 **14 Claims**



1. An image-forming apparatus comprising:

a first unit having at least a part of a passage for a copy paper;

a second unit opening and closing with respect to said first unit;

an image-forming unit having, at least, a photosensitive member, a developing means for making developer adhere on an electrostatic latent image on the member to form a visible image, and a housing surrounding the member and the developing means, the housing have an opening for connecting with an outer surface of the member;

holding means detachably holding said image-forming unit and attached to said second unit to move between a first position and a second position, said holding means being positioned at the first position when said second unit is opened and at the second position when said second unit is closed; and

eraser means arranged at said second unit to erase unnecessary electric charge on the member, said eraser means being positioned outside the opening of the housing of said image-forming unit when said holding means is at the first position and in the opening thereof when said holding means is at the second position.

5,115,273

IMAGE FORMING APPARATUS HAVING A DETACHABLE MEMORY

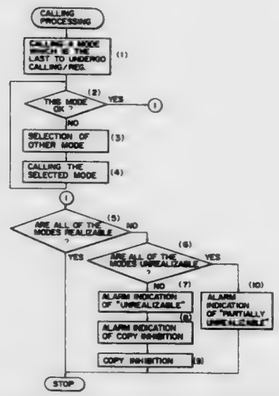
Souhei Ujiie, and Tadashi Suzuki, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1990, Ser. No. 525,708

Claims priority, application Japan, May 26, 1989, 1-131295

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—209 **16 Claims**



1. An image forming apparatus from which an external memory medium storing an image formation mode operable in various kinds of image forming apparatus and being adapted for use in said various kinds of image forming apparatus on a common basis is arbitrarily detachable, comprising:

image forming means for forming an image on a recording material in a desired image formation mode;

an attachment unit adapted to attach said external memory medium thereto;

discrimination means for discriminating as to whether an image formation mode stored in said external memory medium is executable or not when said external memory medium is attached to the image forming apparatus; and

informing means for informing a discrimination result from said discrimination means.

5,115,274

COPYING MAGNIFICATION SETTING DEVICE FOR AN ELECTROPHOTOGRAPHIC COPYING APPARATUS

Kenji Shibazaki, Aichi; Yutaka Irie, Toyokawa; Masazumi Ito, Toyokawa, and Tomoji Murata, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 246,499, Sep. 16, 1988, Pat. No. 4,956,672, which is a division of Ser. No. 762,122, Aug. 2, 1985, Pat. No. 4,644,499, which is a division of Ser. No. 498,885, May 27, 1983, Pat. No. 4,543,643. This application Sep. 10, 1990, Ser. No. 580,264

Claims priority, application Japan, May 28, 1982, 57-91877; Nov. 25, 1982, 57-206444; Nov. 29, 1982, 57-209845; Feb. 10, 1983, 58-20833; Mar. 8, 1983, 58-38743

Int. Cl.[5] G03G *15/04*

U.S. Cl. 355—243 **21 Claims**

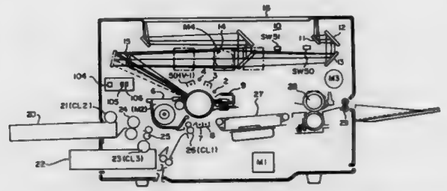
1. A device for setting and storing a plurality of copying magnification values in an electrophotographic copying apparatus that can be powered by an electrical source for copying operation, said device comprising:

operator means for manually inputting a numerical value (M) that is a copying magnification value;

a plurality of memory means (Q_1–Q_N) connected to the operator means, each capable of storing said numerical value (M) inputted by the operator and maintaining the stored numerical value (M) regardless of any on-off status of said electrical source;

selection key means for selecting any one of said plurality of memory means (Q_1–Q_N), and

control means for memorizing the numerical value (M) inputted by the operator in said one of said memory means



(Q_1–Q_N) selected by said selection key means, said control means setting an operation mode of said copying apparatus such that the numerical value (M) memorized in one of said memory means selected by said selection key means will always be the same copying magnification value (M) inputted by the operator and will be capable of controlling a copying operation.

5,115,275

DEVELOPING UNIT FOR AN IMAGE RECORDING APPARATUS

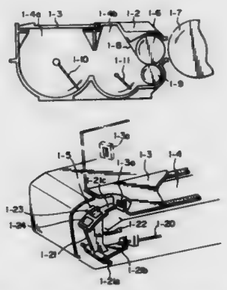
Minoru Suzuki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 1, 1990, Ser. No. 531,702

Claims priority, application Japan, Jun. 2, 1989, 1-139186; Jul. 7, 1989, 1-174199; Jul. 12, 1989, 1-178178; Feb. 23, 1990, 2-41232

Int. Cl.[5] G03G *15/06, 21/00*

U.S. Cl. 355—245 **17 Claims**



1. A developing unit removably mounted on an image recording apparatus, comprising:

a developer chamber for storing a developer fed from the outside;

detecting means for detecting an amount of the developer remaining in said developer chamber;

a counter operated by an output signal of said detecting means;

a cover member openably closing said developer chamber; and

locking means for locking said cover member when said counter reaches a predetermined value.

5,115,276

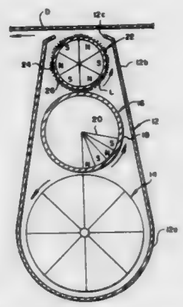
MAGNETIC BRUSH DEVELOPMENT APPARATUS

Edward T. Miskinis, Rochester; Frank H. Johnson, Victor, and Francis M. Paczkowski, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 5, 1991, Ser. No. 755,402

Int. Cl.[5] G03G *15/09*

U.S. Cl. 355—253 **11 Claims**



1. A magnetic brush development apparatus for applying pigmented marking particles to a latent image charge pattern on a dielectric member, said magnetic brush development apparatus comprising:

a housing defining, in a portion thereof, a sump for containing a mixture of magnetic carrier particles and pigmented marking particles;

means located in said sump of said housing for mixing magnetic carrier particles and pigmented marking particles so as to effect a triboelectric attraction of said pigmented marking particles to said magnetic carrier particles;

intermediate means for attracting mixed magnetic carrier particles and attracted pigmented marking particles, transporting said mixed magnetic carrier particles and attracted pigmented marking particles from said sump, and then separating said pigmented marking particles from said magnetic carrier particles, returning said magnetic carrier particles to said sump; and

a magnetic brush development roller including a magnetic core and a shell rotatable relative to one another, said shell being coated with a prescribed layer of magnetic carrier particles whereby, as required, marking particles are attracted from said intermediate means to said magnetic brush and then transferred to a latent image charge pattern on said dielectric member to develop such pattern.

5,115,277

ELECTROSTATICALLY ASSISTED TRANSFER ROLLER AND METHOD FOR DIRECTLY TRANSFERRING LIQUID TONER TO A PRINT MEDIUM

Thomas Camis, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

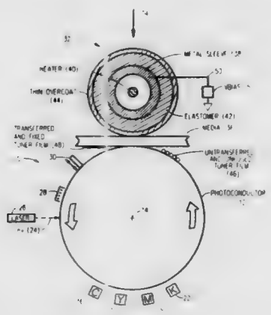
Filed May 17, 1991, Ser. No. 704,572

Int. Cl.[5] G03G *15/16*

U.S. Cl. 355—273 **9 Claims**

7. A method of transferring a color image to a print media which comprises the steps of:

a. developing transparent toners one on top of another on the surface of a photoconductive drum, and



b. utilizing a combination of heat, mechanical forces, and electrostatic forces to transfer said developed toners onto said print media.

5,115,278

HEATING APPARATUS USING LOW RESISTANCE FILM

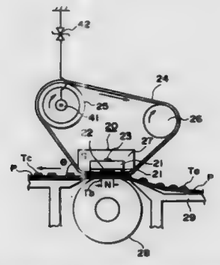
Hidekazu Maruta, Hachioji; Hiroyuki Adachi; Akira Yamamoto, both of Tokyo; Shigeo Kimura, Yokohama, and Kensaku Kusaka, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1990, Ser. No. 542,018

Claims priority, application Japan, Jun. 22, 1989, 1-160276

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—285 **17 Claims**



1. A heating apparatus for heating a visualized image on a recording material, comprising:

a heater;

a movable resin film comprising a first layer having a surface contactable to said heater, and a second layer having a surface contactable to the recording material, wherein the surface of said second layer is in contact with the recording material at a position of said film where the surface of said first layer is in contact with said heater;

wherein said layers each have a volume resistivity of no more than 10^{11} ohm.cm; and

connecting means for electrically grounding said first layer of said film.

5,115,279

FIXING DEVICE

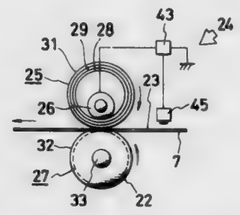
Hisashi Nishikawa; Ikuo Fujisawa, and Yukihiro Ohsugi, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1990, Ser. No. 560,828

Claims priority, application Japan, Jul. 31, 1989, 1-199071; Apr. 26, 1990, 2-110770

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—290 **18 Claims**



1. A fixing device comprising:

a freely rotatable exothermic member formed in a ring shape composed of an exothermic resistor layer of high resistivity, for generating heat when having a current supplied thereto, formed on an inner peripheral surface and a conductor layer of low resistivity formed on the outer peripheral surface of the exothermic resistor layer;

a medium-leading member forming a conveyance path for a recording medium between the outer peripheral surface of the exothermic member and making contact with the outer peripheral surface;

a pressing electrode member having a conductive connection to said exothermic resistor layer supplying current to and allowing the current to flow through said exothermic resistor layer by supporting said exothermic member in abutment against the inner peripheral surface of said exothermic member, and being positioned opposing the medium-leading member;

a power supplying electrode being connected to said conductor layer by making contact at least with an edge part on one side of said exothermic member; and

a power supply for applying a voltage between the power supplying electrode and said pressing electrode member.

5,115,280

RESIDUAL TONER CLEANING APPARATUS FOR COLOR IMAGE FORMING DEVICE

Jun-ichi Hamada, Kunitachi, and Yukio Okamoto, Hachioji, both of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 12, 1991, Ser. No. 654,013

Claims priority, application Japan, Feb. 14, 1990, 2-33362

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—299 **4 Claims**

1. An apparatus for forming a color image, comprising:

a rotatable image carrying member having an image area for carrying a latent image corresponding to the color image;

means for forming the latent image in the image area and a stripe latent image other than in the image area, the stripe latent image being formed at an upstream side of the image area with respect to a rotation of the image carrying member;

means for developing the latent image with a plurality of different color toners to form a color image composed of a plurality of toner images on the image carrying member, each of the toner images corresponding to the different color toners;

wherein a latent image formation and a development are repeated by the latent image forming means and the developing means during a plurality of the rotation of the image carrying member so as to form the color image;

means for transferring the color image onto a transfer sheet;

means for cleaning residual toner from the image carrying member; and

means for abutting the cleaning means to the surface of the

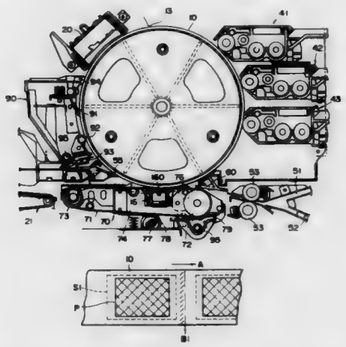


image carrying member so that the stripe latent image attracts the toner from the cleaning means after the transferring, wherein the abutting means releases the cleaning means from the image carrying member so as not to deteriorate the toner image.

5,115,281

IMAGE FORMING APPARATUS WITH PLURAL FORMING UNITS

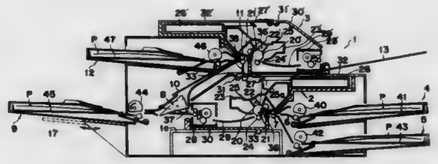
Masahito Ohtsuka, Kawasaki; Hiroo Kobayashi, Tokyo; Toshifumi Moritani, Yokohama; Tadashi Yagi, Machida; Yoshiro Tsuchiya, Yokohama; Takahiro Azeta, Kawasaki; Tsuyoshi Waragai, Tokyo; Hiroshi Yukimachi, Kawasaki, and Hiroaki Miyake, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1990, Ser. No. 577,601

Claims priority, application Japan, Sep. 5, 1989, 1-228393; Oct. 13, 1989, 1-264895; Oct. 13, 1989, 1-264897; Oct. 19, 1989, 1-270405; Nov. 16, 1989, 1-296155; Nov. 22, 1989, 1-306073; Nov. 27, 1989, 1-306817

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—319 **13 Claims**



1. An image forming apparatus comprising a first image forming unit incorporating an image formation process means therein, a sheet supply portion for feeding a sheet to said first image forming unit, and a sheet ejecting portion for ejecting the sheet on which an image is formed by said first image forming unit out of the image forming apparatus, characterized by that:

a second image forming unit having the same function and size as said first image forming unit is mounted within the image forming apparatus and a sheet inlet of said second image forming unit is directly connected to said sheet ejecting portion, said sheet ejecting portion having a roller functioning as ejector roller when said second image forming unit is not mounted and functioning as register roller for said image forming apparatus when said second image forming unit is mounted.

5,115,282

COPYING APPARATUS CAPABLE OF COPYING IN TWO COLORS SIMULTANEOUSLY

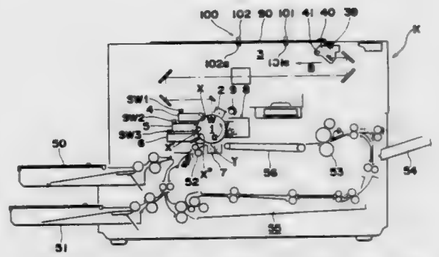
Kimihiko Higashio, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 268,465, Nov. 8, 1988, abandoned. This application Jan. 11, 1991, Ser. No. 639,387

Claims priority, application Japan, Nov. 9, 1987, 62-282779

Int. Cl.[5] G03G *15/01*

U.S. Cl. 355—328 **9 Claims**



1. An electrophotographic copying apparatus comprising:

a document support member for holding a document thereon;

an image forming means which scans an image of an original document so as to form an electrostatic latent image of the original document on a photosensitive member;

developing means for developing the elastrostatic latent image formed on said photosensitive member by said image forming means;

said developing means including three or more developing devices containing developers of different colors, respectively;

selecting means for arbitrarily selecting two of said developing devices;

region designating means which is arranged adjacent to said document support member to move in a scanning direction of said image forming means and designates, for said two developing devices selected by said selecting means, positions specifying regions of the electrostatic latent image to be developed, respectively;

signal generating means, responsive to arrival of said image forming means at a position designated by said region designating means, for generating a signal for changing over operation from one to another of said selected two developing devices relative to one scanning operation of said image forming means; and

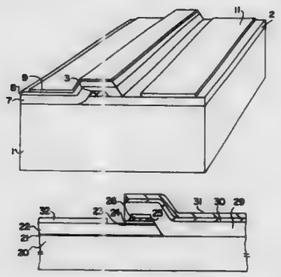
actuating means for sequentially actuating, in response to the signal generated by said signal generating means, said two developing devices during one scanning operation of said image forming means so as to form a two-color image.

5,115,283

OPTOELECTRONIC DEVICE ON SEMI-INSULATOR SUBSTRATE AND METHODS FOR MAKING SUCH A DEVICE

Robert Blondeau, Ablis; Daniel Rondt, Paris; Geneviève Glastre, Gif Sur Yvette, and Michel Krakowski, Bourg La Reine, all of France, assignors to Thomson-CSF, Puteaux, France

Filed May 30, 1990, Ser. No. 530,607
Claims priority, application France, Jun. 6, 1989, 89 07454
Int. Cl.[5] H01L *33/00;* **H01S** *3/18, 3/19*
U.S. Cl. 357—17 **6 Claims**



1. An optoelectronic device, on a semi-insulator substrate, comprising, stacked on one another, at least:
one substrate made of semi-insulator material;
one lower confinement layer with a first type of conductivity;
at least one active layer having a width narrower than the width of the substrate to be in strip form;
an upper confinement lever with a second type of conductivity;
wherein the lower confinement layer covers one side of the semi-insulator substrate in passing beneath the active layer and coming to a stop substantially vertically to this active layer and wherein the upper confinement layer covers the other side of the semi-insulator substrate in passing over the active layer and coming to a stop substantially vertically to this active layer, further comprising a first chemical attack barrier layer, between the lower confinement layer and the substrate, and a second chemical attack barrier layer separating the lower confinement layer into two layers and in a plane parallel to the first chemical attack barrier layer.

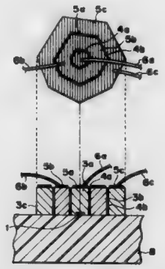
5,115,284

LIGHT-EMITTING DEVICE

Hideshi Kawasaki, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1990, Ser. No. 554,905
Claims priority, application Japan, Jul. 20, 1989, 1-186067; Jul. 20, 1989, 1-186068
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 **34 Claims**

1. A light-emitting device comprising:
a substrate;
a first clad layer of a predetermined extent formed on a part of said substrate;
a first active layer formed on the outer periphery of said first clad layer on the substrate and adapted to emit light by current injection;
a second clad layer formed on the outer periphery of said first active layer on the substrate, wherein said first active layer and said first and second clad layers constitute a first double heterogeneous structure having junction-planes substantially perpendicular to the surface of the substrate;
a second active layer formed on the outer periphery of said second clad layer on the substrate and adapted to emit light by current injection;
a third clad layer formed on the outer periphery of said second active layer on the substrate, wherein said second active layer and said second and third clad layers constitute a second double heterogeneous structure having



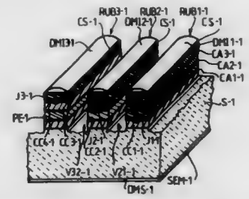
junction planes substantially perpendicular to the surface of the substrate; and
electrodes for supplying said first and second active layers with electric currents.

5,115,285

METHOD OF PRODUCING A QUASI-FLAT SEMICONDUCTOR DEVICE CAPABLE OF A MULTI-WAVELENGTH LASER EFFECT AND THE CORRESPONDING DEVICE

Louis Menigaux, Bures sur Yvette, and Louis Dugrand, Chelles, both of France, assignors to Etat Francais, Ministre des Postes, des Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications), Issy les Moulineaux, France

Division of Ser. No. 466,591, Jan. 17, 1990, abandoned. This application Apr. 25, 1991, Ser. No. 691,362
Claims priority, application France, Jan. 20, 1989, 89 00710
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 **4 Claims**



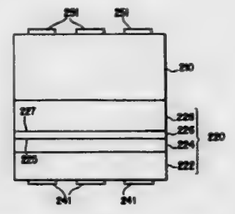
1. A semiconductor device comprising a substrate having disposed thereon at least two double heterostructure stacks, each stack comprising at least one active layer bounded by two confinement layers, said stacks being in the form of elongated strips disposed side by side, electrically insulated from each other, and having opposite transverse ends and an upper surface opposite said substrate, each said stack having active layers of compositions differing from one another and each said confinement and active layer being assigned a rank in order of disposing on said substrate, and each stack comprising a P-N junction therein which is individually and electrically operable and situated in the vicinity of an active layer of a different composition and rank in each stack, the opposite transverse ends of these strips being optically prepared, the upper surfaces of the strips forming an upper surface for the device which is substantially flat.

5,115,286

ELECTRO-OPTICAL DEVICE WITH INVERTED TRANSPARENT SUBSTRATE AND METHOD FOR MAKING SAME

Michael D. Camras, Sunnyvale; Louis W. Cook, Santa Clara, and Virginia M. Robbins, Mountain View, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 465,963, Jan. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 237,797, Aug. 26, 1988, Pat. No. 4,912,532. This application Feb. 27, 1991, Ser. No. 663,056
Int. Cl.[5] H01L *31/12, 31/16, 33/00*
U.S. Cl. 357—19 **13 Claims**



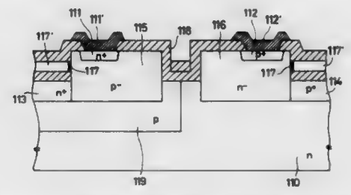
1. An electro-optical device comprising:
an active section which interconnects electrical current and light, said active section including a semiconductor material; and
a substrate abutting the active section, said substrate being substantially transparent to the light to be converted or emitted by the active section, said substrate being epitaxial with the active section and having a lattice dimension mismatch with the active section, the dislocation density in the active section being less than the dislocation density in the transparent substrate.

5,115,287

STEP-CUT INSULATED GATE STATIC INDUCTION TRANSISTORS AND METHOD OF MANUFACTURING THE SAME

Junichi Nishizawa; Nobuo Takeda, and Sohbe Suzuki, all of Sendai, Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

Continuation of Ser. No. 527,677, May 23, 1990, abandoned, which is a continuation of Ser. No. 122,720, Nov. 18, 1987, abandoned. This application Aug. 30, 1991, Ser. No. 752,934
Claims priority, application Japan, Nov. 19, 1986, 61-273934; Nov. 19, 1986, 61-273935; Nov. 21, 1986, 61-276754; Nov. 21, 1986, 61-276755
Int. Cl.[5] H01L *29/10, 29/78, 29/06*
U.S. Cl. 357—23.4 **8 Claims**



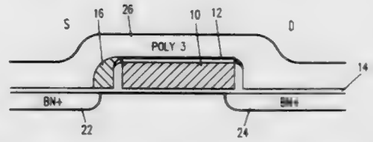
1. A step-cut insulated gate static induction transistor, comprising:
a U-shaped groove in a main surface of a semiconductor substrate and a drain region having a high impurity concentration provided in said main surface;
a source region having a high impurity concentration provided along a bottom portion of said U-shaped groove;
a channel region having a low impurity concentration provided between said drain region and said source region, said source region and said drain region being non-overlapping across said channel region in a depthwise direction when said source region and said drain region are projected onto a plane; and
an insulated gate structure provided on at least a part of said side wall of said U-shaped groove for controlling a current flowing through said channel region.

5,115,288

SPLIT-GATE EPROM CELL USING POLYSILICON SPACERS

Martin H. Manley, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 545,397, Jun. 28, 1990, abandoned. This application Jul. 9, 1991, Ser. No. 728,823
Int. Cl.[5] H01L *29/68, 29/78;* **G11C** *11/34*
U.S. Cl. 357—23.5 **4 Claims**



1. A split-gate memory cell utilizable in a virtual ground erasable programmable read only memory array, the memory cell comprising:
(a) a semiconductor substrate of a first conductivity type having first and second spaced-apart regions of a second conductivity type formed therein, the first and second regions defining a substrate channel region therebetween;
(b) a first layer of insulating material formed on the channel region;
(c) a conductive floating gate formed on the insulating material and extending over a first section of the channel region between a first edge of the floating gate and the first region, thereby defining a second section of the channel region between the first edge of the floating gate and the second region, a second edge of the floating gate being used to define an edge of the first region;
(d) a second layer of insulating material formed on the floating gate;
(e) a conductive spacer formed adjacent to the floating gate and overlying the second section of the channel region, the conductive spacer being insulated from the floating gate by sidewall insulator formed therebetween, the conductive spacer being used to define an edge of the second region; and
(f) a conductive control gate formed subsequent to and in electrical contact with the conductive spacer and overlying but electrically insulated from the floating gate by the second layer of insulating material, the control gate extending in a direction parallel to the direction of current flow between the first and second regions.

5,115,289

SEMICONDUCTOR DEVICE AND SEMICONDUCTOR MEMORY DEVICE

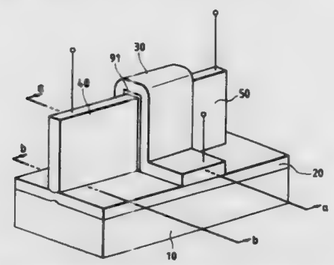
Dai Hisamoto, Kokubunji; Toru Kaga, Uraws; Shinichiro Kimura, Hachioji; Masahiro Moniwa, Hannou; Haruhiko Tanaka, Kokubunji; Atsushi Hiraiwa, Kodaira, and Eiji Takeda, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 438,016, Nov. 20, 1989, abandoned. This application Aug. 5, 1991, Ser. No. 742,196

Claims priority, application Japan, Nov. 21, 1988, 63-292499; Feb. 28, 1989, 1-45403

Int. Cl.[5] H01L *29/78, 29/06*

U.S. Cl. 357—23.7 **25 Claims**



1. In a semiconductor device having a field effect transistor, which is provided with a source electrode and a drain electrode on a substrate and which is provided with a channel between said source electrode and said drain electrode and with a gate electrode causing a field effect on said channel via an insulating film, the semiconductor device characterized in that at least a part of said channel is provided in a semiconductor thin layer which has a height greater than a width thereof, and which has a pair of main surfaces on opposite sides thereof, which main surfaces each have a greater surface area than any other surfaces of said semiconductor thin layer, wherein said gate electrode is disposed on at least one of said main surfaces through said insulating film, and further wherein said at least one of the main surfaces is substantially perpendicular to said substrate so that a direction of current flowing through said channel is substantially parallel to both of said substrate and said at least one of said main surfaces of the semiconductor thin layer.

5,115,290

MOS TYPE SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

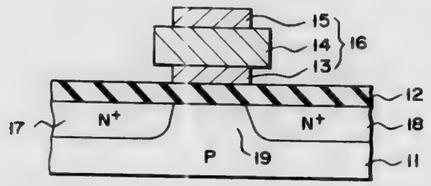
Kouji Murakami, Tokyo, and Taira Matsunaga, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 5, 1990, Ser. No. 577,749

Claims priority, application Japan, Sep. 6, 1989, 1-230642

Int. Cl.[5] H01L *29/06*

U.S. Cl. 357—23.9 **2 Claims**



1. A MOS type semiconductor device comprising:
a semiconductor substrate of a first conductivity type:
source and drain regions of a second conductivity type formed in a surface portion of the semiconductor substrate;
a channel region formed in the surface portion of the semiconductor substrate such that it extends between the source and drain regions;
a gate insulating film formed at least on the channel region; and
a gate electrode comprising a first high melting point metal silicide layer formed on the gate insulating film, a high melting point metal layer formed on the first high melting point metal silicide layer and a second high melting point metal silicide layer formed on the high melting point metal layer, in which a length of the first high melting point silicide layer defined in the same direction as that in which the channel region extends is made shorter in length than the high melting point metal layer.

5,115,291

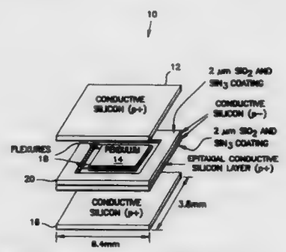
ELECTROSTATIC SILICON ACCELEROMETER

John F. Stokes, Wyoming, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 386,338, Jul. 27, 1989, abandoned. This application Jul. 12, 1991, Ser. No. 730,037

Int. Cl.[5] G01P *15/08;* **H01G** *7/00*

U.S. Cl. 357—26 **12 Claims**



1. A solid state accelerometer, comprising:
a first conductive silicon plate;
a conductive silicon frame bonded to said first silicon plate;
a first thin insulating oxidized silicon layer located between said first silicon plate and said silicon frame;
a second conductive silicon plate bonded to said silicon frame;
a second thin insulating oxidized silicon layer located between said second silicon plate and said silicon frame;
wherein the bonding of the first and second silicon plates to the silicon frame results in an enclosure sealed from an external environment;
a silicon conductive pendulum, situated within the enclosure, said pendulum comprising an epitaxial layer of silicon deposited between two silicon wafers and having at least one conductive silicon flexure connecting said pendulum to said frame; and
feedback loop electronics electrically connected to said first and second plates and to said frame; and
wherein:
said pendulum is located between and approximately equidistant from said first and second plates;
said pendulum and said first plate have a first capacitance;
said pendulum and said second plate have a second capacitance;
the first and second capacitances have first and second original values, respectively, that are nearly equal to each other in absence of any gravitational or acceleration force upon said accelerometer;
said pendulum moves slightly upon an occurrence of any gravitational or acceleration force in a direction of a normal axis that intersects said first and second plates and said frame, thereby causing a slight change in the first and second capacitances;
any movement of said pendulum from being approximately equidistant between said first and second plates is counteracted by electrostatic forces between said pendulum and said first and second plates, said electrostatic forces being generated by said feedback loop electronics which operate in response to slight changes in the first and second capacitances to provide voltages across said pendulum and said first silicon plate and across said pendulum and said second silicon plate sufficient to move the pendulum to a position approximately equidistant from said silicon plates; and
magnitudes of the voltages provided indicate a magnitude of accelerational or gravitational force acting on said accelerometer in a direction approximately parallel to the normal axis.

5,115,292

SEMICONDUCTOR SENSOR

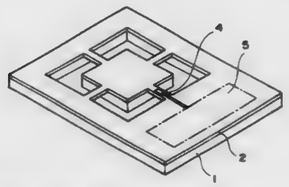
Katsuhiko Takebe; Mizuho Doi, both of Tokyo; Hiroyasu Takehara, Wako; Satoshi Hiyama, Tokyo, and Masanobu Urabe, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1989, Ser. No. 403,296

Claims priority, application Japan, Sep. 2, 1988, 63-219862; Sep. 8, 1988, 63-224975; Jan. 10, 1989, 1-3496; Jan. 24, 1989, 1-14581; May 31, 1989, 1-137883; May 31, 1989, 1-137884; Jun. 8, 1989, 1-145752

Int. Cl.[5] H01L *29/84, 29/96, 29/48, 29/56*

U.S. Cl. 357—26 **16 Claims**



1. A semiconductor sensor, comprising:
a support member;
an elastically deformable member which is deformable by application of an external physical force, said elastically deformable member (i) having four arms respectively extending in different directions from sides thereof and (ii) being secured to said support member by said four arms;
a piezoelectric semiconductor layer supported on said support member and said elastically deformable member; and
a field-effect transistor having a Shottky junction in a gate region thereof and formed in a portion of a region of said piezoelectric semiconductor layer above said elastically deformable member in which deformation of said elastically deformable member takes place,
whereby a stress or a change of stress developed in said elastically deformable member in response to application of the external physical force is sensed based on a change of an electrical characteristic of said field-effect transistor.

5,115,293

SOLID-STATE IMAGING DEVICE

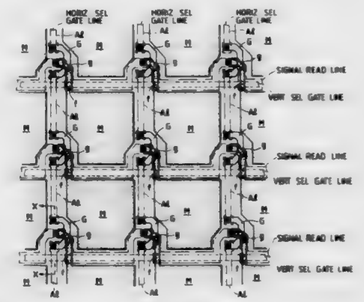
Jin Murayama, and Jun Fukazawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 5, 1990, Ser. No. 632,435

Claims priority, application Japan, Dec. 11, 1989, 1-318963; Dec. 11, 1989, 1-318964

Int. Cl.[5] H01L *27/14, 31/00*

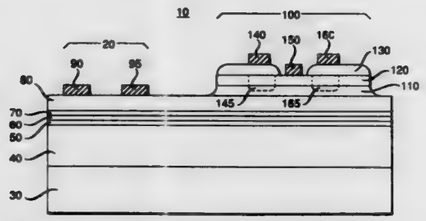
U.S. Cl. 357—30 **12 Claims**



1. A solid-state imaging device comprising:
a plurality of photodiodes arrayed in matrix form so as to serve as a group of pixels, each of said photodiodes having a surface region of a predetermined shape and a projection, said projection having first and second portions, said first portion of said projection being located between said region and said second portion;
a vertical scanning circuit;
a horizontal scanning circuit;
a plurality of vertical selection gate lines extending from said vertical scanning circuit, each of said vertical selection gate lines being formed from a polysilicon material;
a plurality of horizontal selection gate lines extending from said horizontal scanning circuit;
a plurality of signal read lines interconnected between said photodiodes; wherein each of said pixels comprises:
a first switching transistor, disposed between a corresponding one of said photodiodes and a predetermined signal read line, for performing an on/off operation in synchronism with a vertical scanning signal transmitted from said vertical scanning circuit through a respective one of said vertical selection gate lines; and
a second switching transistor for performing an on/off operation in synchronism with a horizontal scanning signal transmitted from said horizontal scanning circuit through a respective one of said horizontal selection gate lines so as to permit a pixel signal from said corresponding one of said photodiodes to be read in synchronism with signal read line scanning at a predetermined timing by said vertical scanning circuit and said horizontal scanning circuit;
said first switching transistor being formed by interconnection of a corresponding one of said vertical selection gate lines overlapping said first portion of a corresponding one of said projections; and
said second switching transistor comprising a vertically oriented gate portion made of said polysilicon material overlapping said second portion of said corresponding one of said projections;
wherein each of said horizontal selection gate lines comprises a plurality of vertically aligned ones of said gate portions serially coupled by predetermined portions of a first conductive layer, said first conductive layer being located above and insulated from a second conductive layer comprising said polysilicon material; and
said signal read lines comprising a plurality of predetermined portions of said first conductive layer, each signal read

line being located so as to shield said projection and said first and second switching transistors, said signal read lines being insulated from said horizontal selection gate lines.

5,115,294
OPTOELECTRONIC INTEGRATED CIRCUIT
Aasmund S. Sudbo, Summit; Won-Tien Tsang, Holmdel, and Long Yang, Edison, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Continuation of Ser. No. 527,672, May 21, 1990, abandoned, which is a continuation of Ser. No. 373,968, Jun. 29, 1989, abandoned. This application Aug. 14, 1991, Ser. No. 746,308
Int. Cl.[5] H01L *29/48, 27/14, 23/48*
U.S. Cl. 357—30 **4 Claims**



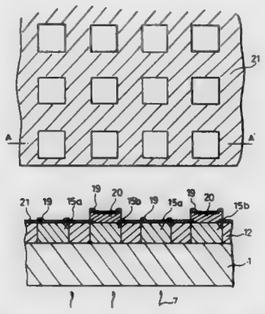
1. A device comprising:
a photodetector for 1.3–1.55 micron radiation including a first layer of semiconductor material and first and second spaced metal electrodes overlying said first layer, characterized in that
said first layer has a composition which includes $In_{1-x}Ga_xAs_yP_{1-y}$ where $0<y\leqq 1$ and

$$x = \frac{0.4526y}{1 - 0.031y}\ (1 \pm 0.1), \text{ and}$$

said photodetector also includes a second layer of semiconductor material having a composition which includes InP doped with an acceptor dopant chosen from the group consisting of Fe, Ti, Co and Ta, said second layer being positioned between said electrodes and said first layer, said electrodes contacting a surface of said second layer but not the first layer so that a region of doped InP separates the metal electrodes from the first layer and so that a Schottky barrier is formed between the said electrodes and the surface of the second layer.

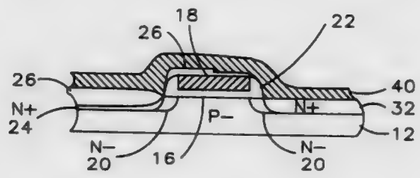
5,115,295
PHOTODETECTOR DEVICE
Yoshihiro Hisa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Continuation-in-part of Ser. No. 554,405, Jul. 19, 1990, abandoned. This application Oct. 19, 1990, Ser. No. 600,180
Claims priority, application Japan, Oct. 31, 1989, 1-285221; Oct. 31, 1989, 1-285221
Int. Cl.[5] H01L *27/14, 31/00, 29/06, 29/161*
U.S. Cl. 357—30 **4 Claims**

1. A photodetector device comprising:
a semi-insulating substrate transparent to incident light;
a plurality of second conductivity type semiconductor regions disposed on and contacting said substrate and a first conductivity type, opposite the second conductivity type, semiconductor layer disposed on and contacting said semiconductor substrate and disposed between and contacting said second conductivity type regions;
an electrically conductive light absorption layer for absorbing light and having a light absorption coefficient that varies with light wavelength disposed on at least one of said second conductivity type semiconductor regions opposite said substrate;
metal electrodes having a high reflectance for the incident light disposed on said light absorption layer and on said second conductivity type semiconductor regions where said light absorption layer is not present opposite said substrate; and



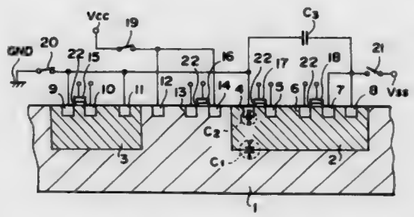
a protection layer disposed on said first conductivity type semiconductor layer opposite said substrate and contacting said second conductivity type regions.

5,115,296
PREFERENTIAL OXIDIZATION SELF-ALIGNED CONTACT TECHNOLOGY
Chen-Chiu Hsue, and Cheng-Han Huang, both of Hsin-chu, Taiwan, assignors to United Microelectronics Corporation, Hsinchu, Taiwan
Filed Jan. 14, 1991, Ser. No. 640,835
Int. Cl.[5] H01L *27/02, 21/265*
U.S. Cl. 357—42 **27 Claims**



21. A self-aligned contact MOS field effect transistor integrated circuit made by the method comprising:
providing a silicon substrate doped with a dopant of a first conductivity;
said substrate having field oxide regions separating the planned active transistor regions, and gate dielectric/gate electrode structures over the designated channel regions for the integrated circuit device;
ion implanting opposite type conductivity ions into the said doped silicon substrate to form the lightly doped portion of the source/drain regions for the transistor;
forming sidewall dielectric spacers on the sidewalls of said gate dielectric/gate electrode structures;
forming a block out mask over the said source/drain regions designated to have self-aligned contacts made thereto while leaving nondesignated self-aligned contact regions outside of the block out mask;
ion implanting opposite type conductivity ion into the said doped substrate to form heavily doped portion and to complete the formation of the source/drain regions in those said nondesignated self-aligned contact regions;
removing the said block out mask;
subjecting the structure to an oxidizing atmosphere to preferentially oxidize polysilicon gate region and heavily doped source/drain regions as compared to the lightly doped source/drain regions;
ion implanting opposite type conductivity ion into the said doped substrate to form heavily doped portion and to complete the formation of the source/drain regions in those said designated self-aligned contact regions;
etching to remove thin oxide over the said designated self-aligned contact source/drain regions while leaving an oxide layer remaining over the said nondesignated source/drain contact regions; and
providing the appropriate metallurgy to said designated self-aligned regions to electrically connect said MOS field effect transistors into a desired said integrated circuit.

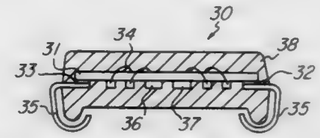
5,115,297
COMPLEMENTARY TYPE SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE
Masanori Yoshimori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Apr. 1, 1991, Ser. No. 678,837
Claims priority, application Japan, Mar. 30, 1990, 2-83594
Int. Cl.[5] H01L *27/02*
U.S. Cl. 357—42 **10 Claims**



1. A complementary type semiconductor integrated circuit device adapted to be connected to a high potential input terminal, a low potential input terminal and and intermediate potential input terminal, said circuit device comprising:
a semiconductor substrate of a first conductivity type connected to said high potential input terminal;
a first well region of a second conductivity type formed selectively on a surface of said semiconductor substrate and connected to said intermediate potential input terminal;
a second well region of said second conductivity type formed selectively on a surface of said semiconductor substrate and connected to said low potential input terminal;
a diffusion region of said first conductivity type formed selectively on a surface of said second well region and connected to said intermediate potential input terminal; and
a capacitor interconnecting said intermediate potential input terminal and said low potential input terminal, the capacitance of said capacitor being of a value larger than that existing between said high potential input terminal and said intermediate potential input terminal.

5,115,298
PACKAGED INTEGRATED CIRCUIT WITH ENCAPSULATED ELECTRONIC DEVICES
Wah K. Loh, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 26, 1990, Ser. No. 470,673
Int. Cl.[5] H01L *23/48, 23/28, 23/02, 23/16*
U.S. Cl. 357—70 **28 Claims**

1. An integrated circuit device comprising:
a first plurality of leadfingers;
a second plurality of leadfingers;
a first leadframe power supply bus having a portion lying between the first plurality of leadfingers and the second plurality of leadfingers;
a second lead frame power supply bus having a portion lying between the first plurality of leadfingers and the second plurality of leadfingers;



an electronic device connected to the first leadframe power supply portion and the second leadframe power supply portion; and
another electronic device connected to the first leadframe power supply portion and the second leadframe power supply portion.

5,115,299
HERMETICALLY SEALED CHIP CARRIER WITH ULTRA VIOLET TRANSPARENT COVER
John O. Wright, Warren, Pa., assignor to GTE Products Corporation, Stamford, Conn.
Filed Jul. 13, 1989, Ser. No. 379,400
The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.
Int. Cl.[5] H01L *23/28, 39/02*
U.S. Cl. 357—72 **12 Claims**



1. A hermetically sealed chip carrier, comprising:
a pre-molded base comprising plastic and including a recessed portion bounded by a first peripheral wall;
a first epoxy B-stage preform having a first surface which engages said base and is adhered thereto, and an opposite second surface, said first epoxy B-stage preform including an open area through which said first peripheral wall extends, and a die pad engaging area within said open area;
a lead frame having a first side which engages said opposite second surface and is adhered thereto, and an opposite second side, said lead frame having a die adjacent said open area and adhered to said opposite second surface at said die pad engaging area;
a chip having a first area which engages and is adhered to said die pad and an opposite second area, said chip being electrically connected to said lead frame;
a second epoxy B-stage preform having a lower surface which engages said lead frame and said base and is adhered thereto, and an opposite upper surface, said second epoxy B-stage preform including a peripheral edge portion and an open central portion;

an ultra violet transparent cover bonded to said pre-molded base by said peripheral edge portion; and

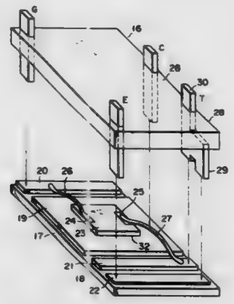
means associated with said pre-molded base for aligning said lead from relative to said pre-molded base.

5,115,300

HIGH-POWER SEMICONDUCTOR DEVICE

Shingo Yanagida, Yokohama, and Tetsujiro Tsunoda, Fujisawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 5, 1990, Ser. No. 622,591
Claims priority, application Japan, Dec. 7, 1989, 1-318153
Int. Cl.[5] H01L *23/16, 39/02, 49/00*
U.S. Cl. 357—75 **12 Claims**



1. A high-power semiconductor device comprising:

a plurality of conductive layers selectively adhered to a surface of an insulating substrate, including first and second conductive layers;

a semiconductor element having a plurality of electrodes connected to the conductive layers;

a group of terminals electrically connected to the electrodes; and

a sealing resin layer covering said conductive layers and the semiconductor element,

said semiconductor device further comprising an overcurrent detecting terminal, and characterized in that:

the first conductive layer has a portion that is thinner in cross-section than the second conductive layer;

one of the group of terminals for the electrodes is connected to a first end of said one of the first and second conductive layers; and

said overcurrent detecting terminal is electrically connected to a second end opposite the first end of one of the first and second conductive layers.

5,115,301

APPARATUS FOR ELIMINATING A MOTION ARTIFACT IN A WIDESCREEN TELEVISION SIGNAL

Robert N. Hurst, Jr., Hopewell, N.J., assignor to General Electric Company, Princeton, N.J.

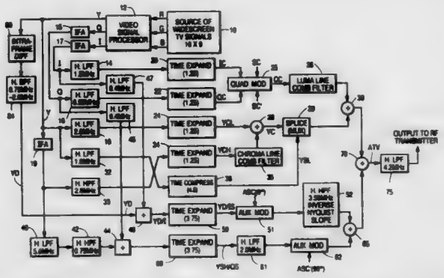
Filed Dec. 28, 1990, Ser. No. 635,433
Int. Cl.[5] H04N *11/06, 7/04*
U.S. Cl. 358—12 **12 Claims**

1. In a system for processing a widescreen television signal having a main panel component, a side panel component and an image aspect ratio greater than that of a standard aspect ratio television signal, apparatus comprising:

first means for intraframe processing said main panel component above a first frequency, within a given image frame;

second means for intraframe processing said side panel component above a second frequency, different from said first frequency, within said image frame; and

means for generating an auxiliary signal derived from within said image frame and containing field difference information over a range of frequencies between said first and second frequencies.

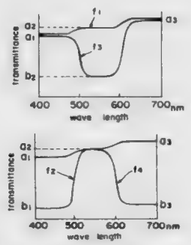


5,115,302

SOLID STATE COLOR IMAGING DEVICE

Takashi Watanabe, Soraku, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 18, 1991, Ser. No. 687,322
Claims priority, application Japan, Apr. 26, 1990, 2-111061; Feb. 26, 1991, 3-30508
Int. Cl.[5] H04N *9/04, 9/07*
U.S. Cl. 358—41 **1 Claim**



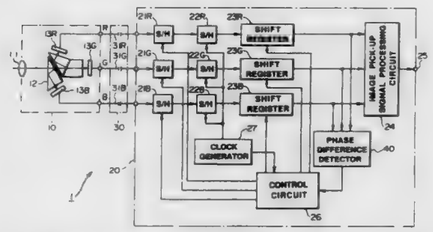
1. A color solid state imaging device comprising a first horizontal line having a pixel laminated with a first and a second color filters and a pixel laminated with a third and a fourth color filters arranged alternately in a horizontal direction, and a second horizontal line having a pixel laminated with said first and fourth color filters and a pixel laminated with said third and second color filters arranged alternately in the horizontal direction, said first horizontal line being arranged alternately in a vertical direction to said second horizontal line with one horizontal scanning period spaced therebetween, the spectral characteristics of three of said four color filters being agreed in any of the three or more color band regions divided from the visible spectral band of the received light, and the combination of said three color filters having the same spectral characteristics being different for each of said color band regions, while the spectral characteristics of said four color filters are different from each other in the whole of said visible spectral band of the received light.

5,115,303

IMAGE PICK-UP APPARATUS

Muneo Hayashi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 27, 1990, Ser. No. 618,411
Claims priority, application Japan, Nov. 27, 1989, 1-306858
Int. Cl.[5] H04N *9/093*
U.S. Cl. 358—51 **2 Claims**



1. An image pick-up apparatus having photoelectric converter for producing three base band color signals from incoming light signal, three transmitting channels connected to said photoelectric converter for transmitting each of said three base band color signal respectively, and signal process means for producing a video signal from said three base band color signals transmitted by said three transmitting channels, wherein said processing means comprising;

a. a clock signal generating means for generating a clock signal having a predetermined frequency,

b. first, second and third sample-and-hold circuits for sampling each of said three base band color signals respectively transmitted by said three transmitting channels,

c. fourth, fifth and sixth sample-and-hold circuits supplied with each output of said first, second and third sample-and-hold circuits for sampling the same in response to said clock signal,

d. first, second and third delay circuits supplied with each output of said fourth, fifth and sixth sample-and-hold circuits respectively for delaying the same.

e. phase difference detector supplied with the outputs of said first, second and third delay circuits for detecting phase differences among the outputs of said first, second and third delay circuits, and

f. phase control means for controlling sampling timing of said first, second and third sample-and-hold circuits to adjust said phases differences to that phase differences less than one sampling period can be adjusted thereby, and for controlling the delay time of said first, second and third delay circuits to adjust said phase differences so that phase differences being N (N is an integer) times said sampling period can be adjusted thereby.

5,115,304

COPYING DEVICE WITH DEVELOPING AND TRANSFER DEVICE

Sumio Yoshikawa; Yoshiharu Okino, and Satoru Sawada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

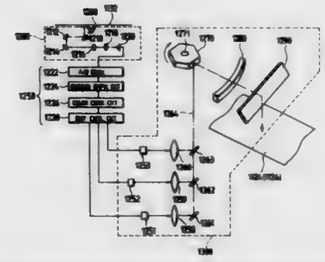
Filed Jun. 16, 1989, Ser. No. 367,079
Claims priority, application Japan, Jun. 16, 1988, 63-146951; Sep. 12, 1988, 63-226552
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 **18 Claims**

1. A copying machine comprising;

an image reading device for photoelectrically scanning an original to obtain a trichromatic separated signal;

an image processing device for reading and processing the trichromatic separated signal and providing an output signal accordingly;

an exposure device for trichromatically exposing thermodevelopment and color-sensitive materials in accordance with the output signal from said image processing device; and



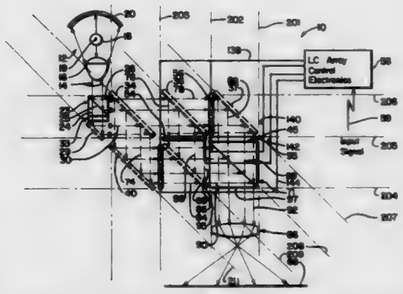
a thermodevelopment and transfer device for thermally developing the exposed color-sensitive materials and thermally transferring an image represented by said trichromatic separated signal to an image-receiving material in a single stage.

5,115,305

ELECTRICALLY ADDRESSABLE LIQUID CRYSTAL PROJECTION SYSTEM WITH HIGH EFFICIENCY AND LIGHT OUTPUT

Thomas G. Baur, 7460 Weld County Rd. 1, Longmont, Colo. 80504, and Roger H. Badertscher, 27284 Byrne Park La., Los Altos, Calif. 94022

Filed Jul. 5, 1990, Ser. No. 549,594
Int. Cl.[5] H04N *9/31*
U.S. Cl. 358—60 **76 Claims**



1. Color video projector apparatus, comprising a structural geometry oriented in a manner that describes nine positionally related component planes, including:

first, second, and third planes positioned substantially parallel to each other and with adjacent ones of those first, second, and third planes positioned approximately equidistant apart;

fourth, fifth, and sixth planes positioned substantially parallel to each other and perpendicularly intersecting said first, second, and third planes, adjacent ones of said fourth, fifth, and sixth planes being positioned approximately the same distance apart as the distance between adjacent ones of said first, second, and third planes;

a seventh plane positioned to intersect said first and second planes where said first and second planes intersect said fifth and sixth planes, respectively; an eighth plane positioned to intersect said first, second, and third planes where said first, second, and third planes intersect said fourth, fifth, and sixth planes, respectively; and a ninth plane positioned to intersect said second and third planes

where said second and third planes intersect said fifth and sixth planes, respectively, such that said seventh, eighth, and ninth planes are parallel to each other and are oriented at substantially 45-degree angles to said first, second, and third planes as well as to said fourth, fifth, and sixth planes;

first transmissive light valve means with an incident surface positioned in said third plane between said fourth and fifth planes for modulating a first color light beam being transmitted therethrough;

second transmissive light valve means with an incident surface positioned in said fifth plane between said second and third planes for modulating a second color light beam being transmitted therethrough;

third transmissive light valve means with an incident surface positioned in said second plane between said fifth and sixth planes for modulating a third color light beam being transmitted therethrough;

first color light source means for creating said first color light beam and directing it to the incident surface of said first transmissive light valve means;

second color light source means for creating said second color light beam and directing it to the incident surface of said second transmissive light valve means;

third color light source means for creating said third color light beam and directing it to the incident surface of said third transmissive light valve means;

first beam combining means positioned in said ninth plane between said second and third planes for combining said first color light beam emerging from said first transmissive light valve means with said second color light beam emerging from said second transmissive light valve means to create a combined first and second colors light beam directed between and substantially parallel to said fourth and fifth planes;

second beam combining means positioned in said eighth plane between said fourth and fifth planes for combining said third color light beam emerging from said third transmissive light valve means with said combined first and second colors light beam to create a first, second, and third colors light beam; and

first light redirecting means positioned in said seventh plane between said fifth and sixth planes for redirecting said third color light beam into said second beam combining means.

5,115,306

PROJECTION CRT WITH A GREEN EMITTING TERBIUM ACTIVATED LANTHANUM OXYCHLORIDE PHOSPHOR EXHIBITING NEARLY CONSTANT LIGHT-OUTPUT OF ELEVATED TEMPERATURES

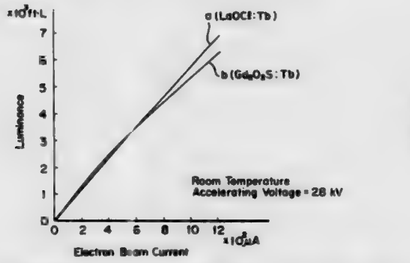
Nobuyuki Tsuda, Kawasaki; Masaaki Tamatani, Fujisawa; Fukaya Ajiro, and Nagai Hitosi, both of Fukaya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 552,986, Nov. 17, 1983, abandoned. This application May 29, 1986, Ser. No. 887,950

Claims priority, application Japan, Nov. 18, 1982, 57-201159

Int. Cl.[5] H04N *9/31;* **H01J** *29/10;* **C09K** *11/08*

U.S. Cl. 358—60 **3 Claims**



1. A projection cathode-ray tube for a projection video apparatus, comprising a green-emitting screen including a terbium-activated lanthanum oxychloride phosphor.

5,115,307

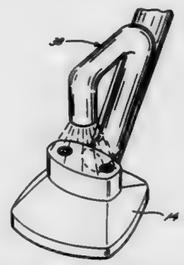
ELECTRONIC VIDEO DENTAL CAMERA

David H. Cooper, Saratoga, and Charles S. Bush, Los Gatos, both of Calif., assignors to Fuji Optical Systems, Los Gatos, Calif.

Division of Ser. No. 149,521, Jan. 28, 1988, Pat. No. 5,016,098, which is a continuation-in-part of Ser. No. 22,177, Mar. 5, 1987, Pat. No. 4,727,416. This application Aug. 2, 1989, Ser. No. 388,666

Int. Cl.[5] A61B *1/04, 1/06, 1/24*

U.S. Cl. 358—98 **16 Claims**



1. A dental camera for use in displaying an image from inside the mouth onto a monitor comprising an electronic video endoscope comprising:

a handle;

a camera head at the distal end of said handle, including a transillumination device.

5,115,308

IMAGE PROCESSING APPARATUS

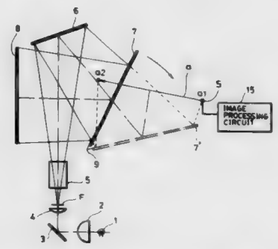
Kazuhiko Onuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1990, Ser. No. 535,594

Claims priority, application Japan, Jun. 30, 1989, 1-169417

Int. Cl.[5] G06K *9/20;* **H04N** *1/387*

U.S. Cl. 358—102 **13 Claims**



1. An image processing apparatus switchable between an observation mode for projecting an optical image onto an observation position and a read mode for projecting the optical image onto a read position, said apparatus comprising:

optical means for forming an optical path for projecting the optical image onto said observation position and said read position, said optical means including a mirror being movable between a first position and a second position, said mirror projecting said optical image reflected by said mirror onto said observation position in said first position and projecting said optical image reflected by said mirror onto said read position in said second position, said mirror being set in said first position when the apparatus is switched in said observation mode and being set in said second position when the apparatus is switched in said read mode;

first moving means for moving said mirror to said first position and to said second position;

an image sensor disposed at said read position and being movable in a direction crossing the reflection optical path of said mirror when said mirror is set in said second position; and

second moving means for moving said image sensor in the direction crossing said reflection optical path.

5,115,309

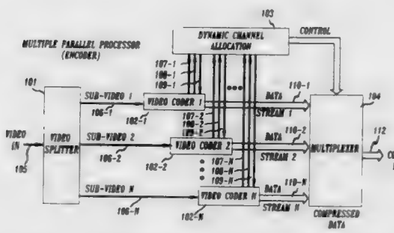
METHOD AND APPARATUS FOR DYNAMIC CHANNEL BANDWIDTH ALLOCATION AMONG MULTIPLE PARALLEL VIDEO CODERS

Hsueh-Ming Hang, Howell, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 10, 1990, Ser. No. 580,412

Int. Cl.[5] H04N *7/12*

U.S. Cl. 358—133 **19 Claims**



1. Apparatus for dynamically allocating portions of available overall channel bandwidth comprising:

a set including a plurality of individual video coders each of which is processing in parallel at least a different portion of at least one video signal comprised of frames wherein each frame contains an at least one image representation;

means for receiving as an input from each member of said set of individual video coders an average frame quantization step size employed in a previous frame; and

means responsive to said average frame quantization step size from each of said individual video coders for generating for a current frame a set of estimated channel sharing factors.

5,115,310

NEWS PROGRAM BROADCASTING SYSTEM

Masayuki Takano, Tokyo; Kuniharu Onozuka, Kanagawa; Fumihiro Nagasawa, Kanagawa, and Akihiko Matsumoto, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 338,272

Claims priority, application Japan, Apr. 16, 1988, 63-94156

Int. Cl.[5] H04M *5/222*

U.S. Cl. 358—185 **8 Claims**

1. A television program transmission system for transmitting a plurality of materials for transmission in order according to a cue sheet, each of said materials for transmission being assigned a name and said television program transmission system comprising:

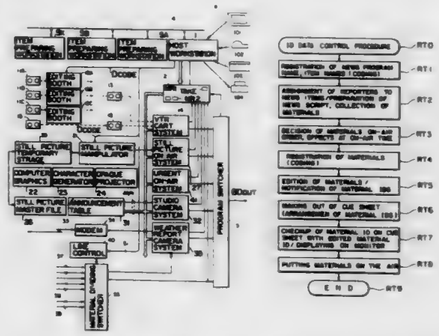
cue sheet preparation means for preparing said cue sheet according to contents of a program;

ID code assignment means for assigning an ID code to the name of a material for transmission in said cue sheet;

material-to-be-transmitted registration means for assigning an ID code to material for transmission to be actually transmitted and registering it in the system;

check means for checking said ID code assigned to the name of a material for transmission with said ID code assigned to the material to be transmitted and passing said material to be transmitted when said two ID codes are the same; and

transmission means for transmitting said material to be transmitted, of which said ID code has passed in the checking, according to said cue sheet.



5,115,311

HIGH RESOLUTION TRANSLATION OF IMAGES

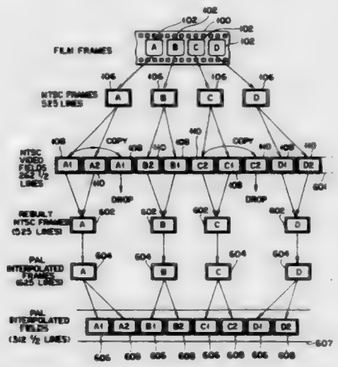
Douglas A. Jaqua, Northridge, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 437,017, Nov. 14, 1989, Pat. No. 4,998,167. This application Oct. 16, 1990, Ser. No. 598,546

The portion of the term of this patent subsequent to Mar. 5, 2008, has been disclaimed.

Int. Cl.[5] H04N *7/01, 7/04, 11/06, 11/20*

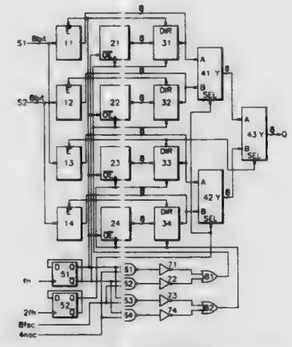
U.S. Cl. 358—140 **37 Claims**



1. A translator for creating, from a first sequence of fields, a second sequence of fields, where each sequence of fields represents the same series of images of a motion picture, each image being at a single point in time of the motion picture, the first sequence comprising a plurality of groups of plural fields where each group represents a different single one of said images, each field of the first sequence comprising a first number of lines per field and each field of the second sequence comprising a second number of lines per field where the first and second numbers of lines differ, the translator comprising:

means for analyzing the first sequence of fields to determine which of the fields belong in the same said group representing a single image;
means for selecting such fields for spatial interpolation from the first sequence that are determined to be in the same group of fields representing a single image; and
means for spatially interpolating the lines of the selected fields of the first sequence to derive the lines of at least one of the fields of the second sequence.

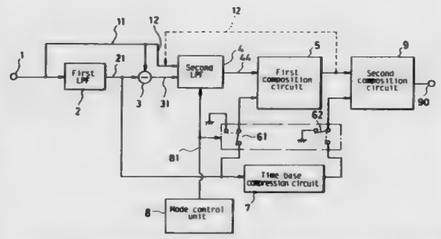
5,115,312
DOUBLE SCANNING CIRCUIT OF ID-TV
U-kyung Shim, Kyungki, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Rep. of Korea
Filed Dec. 11, 1989, Ser. No. 448,692
Claims priority, application Rep. of Korea, Dec. 12, 1988, 88-20486[U]
Int. Cl.[5] H04N *7/01*
U.S. Cl. 358—140 **4 Claims**



1. A double scanning circuit ID-TV for executing broadcasting signal by digital double speed process, comprising:
logic gates;
line memories adapted to receive a color signal, said line memories including at least two line memories for receiving said color signal during writing operation by means of a first frequency clock having a frequency, supplied by said logic gates and said line memories; and
said line memories other than said at least two line memories being adapted to receive double speed scanning alternatively during reading operation by a frequency clock having a frequency twice that of said first frequency clock.

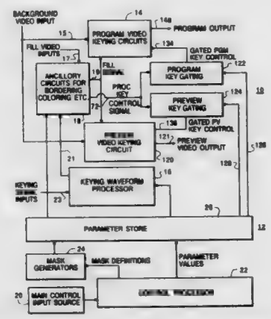
5,115,313
PICTURE SIGNAL PROCESSING APPARATUS HAVING A TEMPORAL FILTER AND A PICTURE-IN-PICTURE FUNCTION
Mitsuo Isobe, Osaka, and Katsumi Morita, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 21, 1989, Ser. No. 439,974
Claims priority, application Japan, Nov. 22, 1988, 63-294910
Int. Cl.[5] H04N *5/45*
U.S. Cl. 358—183 **4 Claims**

1. A picture signal processing apparatus comprising:
low pass means for selectively passing a low frequency signal component from an input picture signal;
high pass means for selectively passing a high frequency signal component from said input picture signal;
signal selection means for selectively forwarding one of said input picture signal and said high frequency signal component;
picture signal memory/processing means, which has frame delay means, for applying temporal low pass processing to a signal forwarded from said signal selection means;
a first composition circuit for mixing output signals of said low pass means and said picture signal memory/processing means;
mode control means for controlling said frame delay means and said signal selection means;



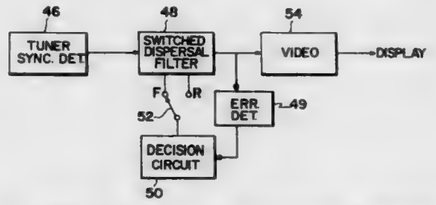
time base compression means for applying time base compression to an output signal of said low pass means;
a second composition circuit which mixes an output signal of said time base compression means and an output signal of said first composition circuit and forwards a picture signal and a predetermined still picture signal taken out from said picture signal.

5,115,314
VIDEO KEYING CIRCUITRY INCORPORATING TIME DIVISION MULTIPLEXING
John D. Ross, and David A. Ross, both of Iroquois, Canada, assignors to Ross Video Limited, Iroquois, Ontario, Canada
Filed Apr. 26, 1990, Ser. No. 514,019
Int. Cl.[5] H04N *5/275*
U.S. Cl. 358—183 **44 Claims**



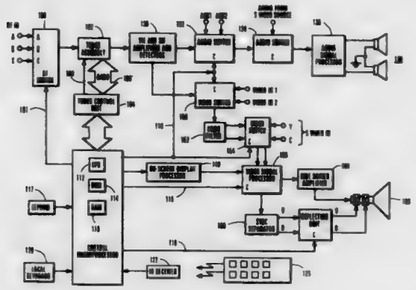
1. Multi-keying circuitry for a television signal comprising:
keying means for keying at least one fill video signal into a background video signal in response to at least one modified keying signal;
keying signal processing means for modifying at least one keying signal in response to at least one control signal to thus obtain said one modified keying signal; and
control means for generating said control signal at at least two different time periods during a raster scan of the television signal where said two different time periods respectively correspond to two different predetermined mask portions of the raster;
whereby the modification of the keying signal by the processing means during each said time period is a function of the value of the control signal during that time period to thus effect time sharing of the keying signal processing means by the control means during the raster scan.

5,115,315
DIGITAL VIDEO SIGNAL TRANSMISSION SYSTEM USING REVERSIBLE DISPERSIVE FILTERS
Richard W. Citta, Oak Park, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.
Filed Dec. 31, 1990, Ser. No. 636,303
Int. Cl.[5] H04N *7/00, 5/40, 5/222*
U.S. Cl. 358—186 **11 Claims**



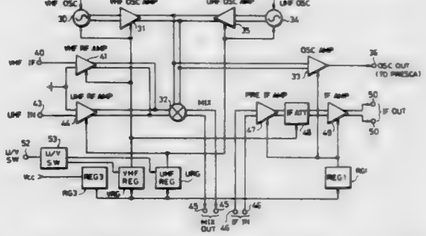
1. A method of operating a television signal transmission system comprising:
transmitting an error protected digital signal that has been processed through a dispersal filter of one sense;
receiving and detecting said transmitted signal;
processing said received signal through a receiver dispersal filter and error detecting the result; and
controlling said receiver dispersal filter as a function of errors detected.

5,115,316
FIELD SERVICE SWITCH FOR A TELEVISION RECEIVER
Thomas D. Gurley, and Gene K. Sendelweck, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics Inc.
Filed May 3, 1991, Ser. No. 694,974
Int. Cl.[5] H04N *5/44, 17/00*
U.S. Cl. 358—188 **1 Claim**



1. A television receiver, comprising:
a radio frequency (RF) signal input terminal for receiving a group of RF signals;
tuner means coupled to said RF signal input terminal for receiving said group of RF signals, said tuner means selecting a particular RF signal from said group of RF signals in response to a first control signal, and converting said particular RF signal to a signal at an intermediate frequency (IF);
first video processing means coupled to said tuner means for receiving, demodulating and amplifying said IF signal, and producing a detected video signal at an output; and
control means for generating said first control signal for causing said tuner means to select said particular RF signal;
means, coupled to said control means, for entering data in response to operation by a user;
memory means having a plurality of areas for storing data related to the tuning of preferred ones of said RF signals;
a video input terminal for receiving an auxiliary video signal;
switch means for selectively coupling its output terminal to one of said video input terminal and said output of said first video processing means;
second video processing means coupled to said output of said switch means for processing a signal supplied by said switch means, said second video processing means including brightness adjusting means having a control input; and
deflection means for producing horizontal and vertical deflection signals, said deflection means having a control input;
wherein in response to a detection of a code for invoking a set up mode, said control means automatically causes said switch means to select said video input terminal, controls said brightness adjusting means to adjust the brightness level to a predetermined value, and controls said deflection means to cease producing vertical scan signals.

5,115,317
TUNING APPARATUS FOR A TELEVISION RECEIVER INCLUDING SELECTIVELY ACTIVATED AMPLIFIER AND LOCAL OSCILLATOR CIRCUITS
Sadao Igarashi, and Susumu Ushida, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan
Filed Dec. 17, 1990, Ser. No. 628,741
Claims priority, application Japan, Dec. 22, 1989, 1-334226; Jan. 22, 1990, 2-12022
Int. Cl.[5] H04N *5/50*
U.S. Cl. 358—191.1 **8 Claims**



1. A tuning apparatus for a television receiver comprising:
a first amplifier and a second amplifier for amplifying signals of a first band and a second band, respectively;
a mixer for common use for converting an output signal from either of said first and second amplifiers to an intermediate frequency for a television receiver;
a first local oscillator for supplying said mixer with a local oscillation signal corresponding to said first band and a second local oscillator for supplying said mixer with a local oscillation signal corresponding to said second band;
a first control circuit for controlling the activated state of said first amplifier and said first local oscillator;
a second control circuit for controlling the activated state of said second amplifier and said second local oscillator; and
a switching circuit for supplying said first or said second control circuit with a signal for activating either said first amplifier and said first local oscillator or said second amplifier and said second local oscillator;
wherein said first and second amplifiers each have an amplifying transistor circuit and said first and second local oscillators each have an oscillating transistor circuit, and wherein each of said first and second amplifiers has a

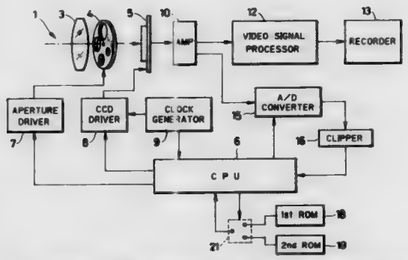
constant current circuit between said amplifying transistor circuit and ground and wherein each of said first and second local oscillators has a constant current circuit between said oscillating transistor circuit and ground, and wherein said constant current circuit of said first amplifier and said constant current circuit of said first local oscillator or said constant current circuit of said second amplifier and said constant current circuit of said second local oscillator are selectively activated by said first or said second control circuit.

5,115,319

AUTOMATIC EXPOSURE CONTROL APPARATUS AND METHOD FOR ELECTRONIC STILL CAMERA

Fumihito Arai, and Yoshihiko Mori, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 7, 1990, Ser. No. 623,531
Claims priority, application Japan, Dec. 8, 1989, 1-319668
Int. Cl.[5] H04N *5/238, 3/14, 5/335*
U.S. Cl. 358—228 **15 Claims**



1. An automatic exposure control apparatus for an electronic still camera comprising:

a solid state imaging device disposed in an image plane of a taking lens for converting an optical image into an electric signal, said solid state imaging device being used for subject brightness measurement as well as for photographing;

aperture stop means disposed in front of said solid state imaging device for adjusting the size of aperture through which light from the taking lens travels toward said solid state imaging device; and

memory means which stores a first program for selecting a first combination of an aperture value and a shutter speed for a main measurement from among a first group of aperture values and shutter speeds on the basis of a brightness value detected by a preliminary measurement that is performed with a predetermined combination of an aperture value and a shutter speed, and a second program for selecting a second combination of an aperture value and a shutter speed for photographing from among a second group of aperture values and shutter speeds on the basis of a brightness value detected by said main measurement, said second group having a larger variation in aperture value than said first group.

5,115,320

APPARATUS FOR EDITING AND PRINTING A VIDEO IMAGE

Toshiyuki Ebihara, Hachioji; Satoru Sakai, Ooi; Masaji Nishikawa, Hachioji, and Masashi Asano, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

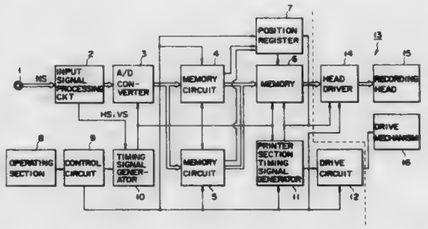
Filed Sep. 14, 1990, Ser. No. 583,949
Claims priority, application Japan, Sep. 20, 1989, 1-244602; Sep. 29, 1989, 1-253933
Int. Cl.[5] H04N *1/21, 1/04*
U.S. Cl. 358—296 **4 Claims**

1. A video printing apparatus for printing an edit image obtained by editing an original video image having a half tone image area framed on a predetermined portion of a screen, said video printing apparatus comprising:

a control circuit means for storing coordinates representing the half tone image area of the original video image and coordinates representing a half tone image receiving area of the edit image;

an image edit memory board; and

means for selectively switching modes between a normal recording mode wherein an original video image corresponding to one display screen is printed, as is, on a print sheet, and a composite editing mode or recording mode wherein half tone image areas of a plurality of original video images are synthesized, edited and recorded on a print sheet;



editing means for, when the composite editing or recording mode is selected, automatically picking up half tone image areas of original video images on a basis of the coordinates stored in the control circuit means and representing the half tone image area of the original video image and of the coordinates stored in the control circuit means and representing a half tone image receiving area of the edit image;

processing means on the image edit memory board for synthesizing and editing said half tone image areas of the original video images obtained from said editing means to provide an edit image means for printing said edit image; and

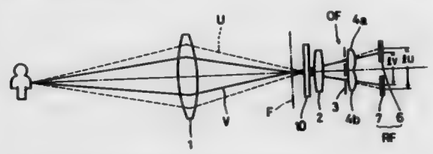
means for printing said edit image.

5,115,321

IMAGE SENSING SYSTEM

Tokuji Ishida; Toshio Norita, and Jun Hasegawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 437,271, Nov. 16, 1989, abandoned, which is a continuation of Ser. No. 141,080, Jan. 5, 1988, Pat. No. 4,905,033. This application Jun. 7, 1991, Ser. No. 712,094
Claims priority, application Japan, Jan. 6, 1987, 62-950; Mar. 18, 1987, 62-63459
Int. Cl.[5] H04N *3/19*
U.S. Cl. 358—213.19 **1 Claim**



1. A solid state image device comprising:

an image sensor for receiving light from an object and for outputting an electric signal, accumulating the electric signal and transferring the accumulated electric signal in order;

input means for inputting a clock signal having a predetermined frequency; and

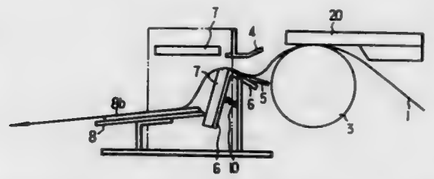
transfer clock producing means for dividing the frequency of the clock signal and producing a transfer clock signal, wherein said image sensor transfers the accumulated electric signal in synchronization with the transfer clock signal, and said image sensor, said input means, and said transfer clock producing means are formed in one chip or on the same semiconductor substrate.

5,115,322

GUIDING MECHANISM FOR A FACSIMILE FOR PREVENTING JAM OF HEAT-SENSITIVE RECORDING PAPER

Dug-Hwan Jang, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 13, 1989, Ser. No. 450,086
Claims priority, application Rep. of Korea, Jun. 30, 1989, 9318/1989
Int. Cl.[5] B41J *2/32, 11/70, 15/04;* **B65H** *35/06, 29/70*
U.S. Cl. 358—304 **5 Claims**



1. A device for preventing jam of heat-sensitive recording paper for use in a facsimile system comprising:

a heat-sensitive recording element for recording received data on heat-sensitive recording paper;

a receiving roll mounted below said heat-sensitive recording element for conveying said heat-sensitive recording paper;

a first intermediate guiding unit adjacent said receiving roll for receiving and guiding said heat-sensitive recording paper from said receiving roll;

a second intermediate guiding unit having an "L" shape including a cutting blade mounted on one part of said "L" and another part of said "L" being pivotally mounted below said first intermediate guiding unit;

an automatic cutter for cutting said heat-sensitive paper guided by said first guiding unit over said cutting blade of said second guiding unit, wherein said automatic cutter rotatably contacts said cutting blade thereby pushing said one part of said "L" backward causing said another part of said "L" to rotate upward to contact said first intermediate guiding unit;

a spring mounted below said one part of said "L" for pushing said cutting blade to its original position after said automatic cutter no longer is in contact with said cutting blade; and

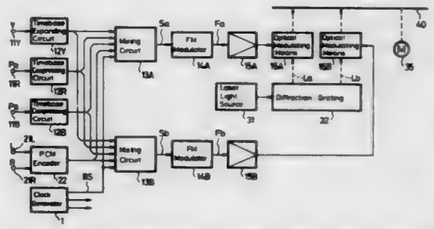
a final guide having a plurality of elongated ridges formed on a surface there of for receiving and guiding said heat-sensitive recording paper from said second intermediate guiding unit, said elongated ridges causing a contact surface area between said heat-sensitive recording paper and said final guide to be reduced.

5,115,323

VIDEO DISC APPARATUS RECORDING TIME-EXPANDED LUINANCE SIGNALS AND TIME-COMPRESSED CHROMINANCE SIGNALS

Kaoru Tachibana; Ken Morita, and Hiroo Takahashi, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 27, 1989, Ser. No. 413,064
Claims priority, application Japan, Oct. 12, 1988, 63-256682
Int. Cl.[5] H04N *11/02*
U.S. Cl. 358—330 **24 Claims**



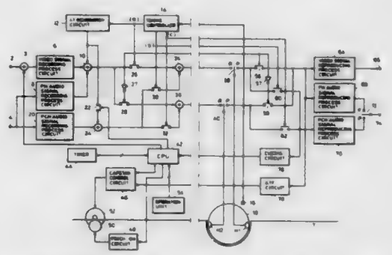
1. A method of recording on a video disc a composite color video signal having wide bandwidth and including a luminance component and first and second color difference components, said method comprising the steps of timebase expanding said luminance component; timebase compressing each of said first and second color different components to a bandwidth substantially equal to the bandwidth of the timebase expanded luminance component; time division multiplexing the timebase expanded luminance component and the timebase compressed color difference components by multiplexing the timebase expanded luminance component of every other horizontal line interval with alternate ones of the timebase compressed first and second color difference components, respectively, to form a first multiplexed signal channel, and multiplexing the timebase expanded luminance component of the remaining horizontal line intervals with alternate ones of the timebase compressed second and first color difference components, respectively, to form a second multiplexed channel; and recording the first and second multiplexed channels in separate tracks on said video disc.

5,115,324

INFORMATION SIGNAL RECORDING APPARATUS PERFORMING A CUEING FUNCTION

Hiroyuki Takimoto, and Mikihiro Fujimoto, both of Yokohama, Japan, assignors to Nancy Seith, Chester Township, Meigs, Ohio

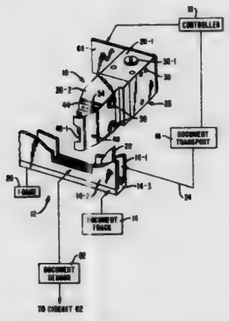
Filed Nov. 21, 1989, Ser. No. 439,689
Claims priority, application Japan, Nov. 30, 1988, 63-304855
Int. Cl.[5] H04N *5/782*
U.S. Cl. 358—335 **18 Claims**



1. An information signal recording apparatus comprising:

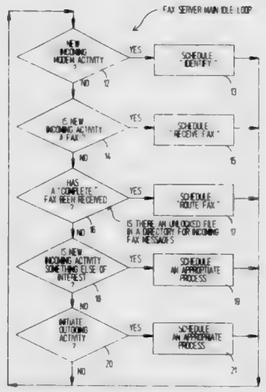
(a) timing means for automatically renewing date information;
(b) recording means for recording an information signal;
(c) control signal generation means for generating a control signal at a first instance of recording said information signal by said recording means after the renewal of the date information by said timing means; and
(d) means for providing a mark on a recording medium in response to said control signal.

5,115,325
OPTICAL READER HEAD WITH VIDEO COMPENSATION METHOD AND CIRCUIT WHICH INTEGRATES FOUR ADJACENT PIXELS INTO A COMPOSITE PIXEL
Fredrik L. N. Kallin, and Raymond L. Higgins, both of Kitchener, Canada, assignors to NCR Corporation, Dayton, Ohio
Division of Ser. No. 137,836, Dec. 24, 1987, Pat. No. 4,916,552. This application Mar. 15, 1990, Ser. No. 493,594
Int. Cl.[5] H04M *1/10*
U.S. Cl. 358—406 **8 Claims**



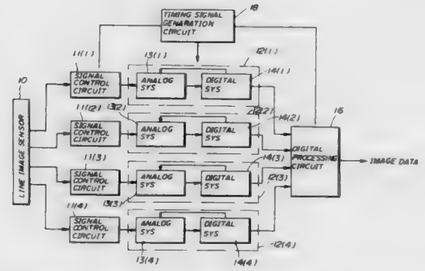
1. In an optical reader, the combination comprising:
a scanning plane having a scanning line thereat;
transport means for moving documents to be scanned to said scanning line; and
a read heat positioned at said scanning plane to direct light at said scanning line;
said read head comprising:
a body having a front end and a rear end;
a first line and a second line of light bulbs;
a mounting member mounted on said front end of said body for mounting said first and second lines of light bulbs in spaced parallel relationship thereon to enable the light from the light bulbs to be directed at a document positioned at said scanning line and to be reflected from said document between said first and second lines of light bulbs towards the read end of said body;
an array of a predetermined number of light sensors positioned at said rear end of said body, with each said sensor producing a pixel of data corresponding to an area of the document at said scanning line;
a lens and mounting means for adjustably fixing said lens in said body to direct light reflected from said document at said array of light sensors;
a resilient member adjustably secured to said body to maintain a document at said scanning line a predetermined distance from said lens; and
a circuit for combining the pixels of data produced by adjacent ones of said light sensors within each of a plurality of groups into which said light sensors are divided to produce a series of combined pixels therefrom whereby the sensitivity of said array of light sensors is effectively increased to enable said light bulbs to be of a low wattage to avoid head damage to a document which may become jammed at said scanning line;
said circuit further including test means for use in focusing said lens, said test means comprising:
a test pattern consisting of alternate black and white lines positioned at said scanning line in aligned relationship with said sensors so that a sensor is focused entirely on a black line and an adjacent sensor is focused entirely on a white line;
a display; and
circuit means for detecting the difference between the outputs of the combined pixels from said sensors as the focusing of said lens is adjusted so as to provide a maximum signal to said display when said lens is in focus.

5,115,326
METHOD OF ENCODING AN E-MAIL ADDRESS IN A FAX MESSAGE AND ROUTING THE FAX MESSAGE TO A DESTINATION ON A NETWORK
Ken L. Burgess, and John S. Marvin, both of Fort Collins, Colo., assignors to Hewlett Packard Company, Palo Alto, Calif.
Filed Jun. 26, 1990, Ser. No. 543,998
Int. Cl.[5] H04M *11/00*
U.S. Cl. 358—440 **9 Claims**



1. A method of routing the digitally encoded facsimile representation of a document to a destination on a network, the method comprising the steps of:
scanning in opposing directions a selected page of the document for bar code;
detecting the presence of a selected bar code cipher in a selected location within the scanned bar code, the selected cipher being asymmetrical when scanned from opposing directions;
converting a remaining portion of the scanned bar code into an address suitable for use in addressing a destination location on the network;
erecting the pages of a document that is upside down in response to the detecting step being successful upon a bar code scanned in a selected direction; and
sending the document to the destination location on the network.

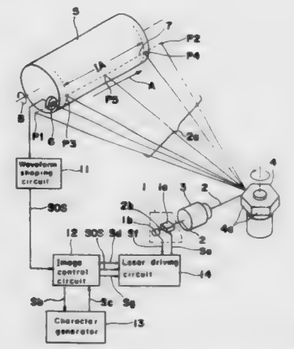
5,115,327
GAIN CONTROL CIRCUIT FOR USE IN SHADING COMPENSATION CIRCUIT
Kazumi Ishima, Kashiwa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Mar. 2, 1990, Ser. No. 487,302
Claims priority, application Japan, Mar. 3, 1989, 1-51396
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—461 **6 Claims**



1. A gain control circuit used in a shading compensation circuit comprising:
signal processing means for inputting an image signal successively output from each of cells of a line image sensor and a gain control signal corresponding to shading data output from an external signal system and converting said image signal into a signal with a level corresponding to said gain control signal and for outputting a converted version of said signal as a compensation image signal,
signal feed back means for inverting a reference compensation image signal and holding an inverted version of said reference compensation image signal and for feeding said inverted version of the reference compensation image signal back to a terminal of said signal processing means and to which said image signal is input, said reference compensation signal being obtained from said signal processing means when a reference gain control signal having a predetermined value and a reference image signal having a predetermined reference level are input to said signal processing means, the reference gain control signal being supplied from said external signal means, the reference image signal being included in a predetermined part of said image signal, and
bias means for shifting a level of said image signal supplied to said terminal of said signal processing means by a predetermined level so that the reference compensation signal has a level greater than a predetermined value.

5,115,328
BEAM SCAN TYPE RECORDING APPARATUS WITH ELECTRICALLY F THETA CORRECTING FUNCTION
Takashi Kadono, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Apr. 25, 1989, Ser. No. 342,819
Claims priority, application Japan, Apr. 25, 1988, 63-103459; Jul. 6, 1988, 63-167980; Jul. 6, 1988, 63-167981; Jul. 6, 1988, 63-167982
Int. Cl.[5] A04N *1/40*
U.S. Cl. 358—474 **7 Claims**

1. A beam scan type recording apparatus for deflecting and scanning using a deflecting means a laser beam emitted from a laser source periodically at each occurrence of a timing pulse signal so as to form an image on a photosensitive medium for recording a visible image comprised of dot images, comprising:
a clock generator for generating a reference clock signal having a predetermined frequency;
an address counter for altering the counting value by one in accordance with a dot clock signal outputted at a timing for recording one dot image so as to output the counting value as address data;
a memory means for changing a time interval between adjacent occurrences of said timing pulse signal by storing numerical data representing time interval between emission timings of the laser beam corresponding to respective dot images at each address corresponding thereto so as to output the numerical data stored at the address corresponding to the address data input from said address counter, said numerical data corresponding to at least a center portion of said photoconductive medium in a direction of scan of the laser beam being different from said numerical data corresponding to end portions of said photoconductive medium in the direction of the scan of the laser beam;

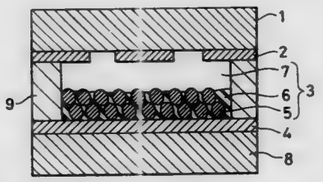


a dot clock counter being set the numerical data outputted from said memory means as a preset value in response to a load signal, counting the value by one in accordance with the reference clock signal outputted from said clock generator, and outputting said timing pulse signal when the counting value agrees with the present value, said timing pulse signal being returned to said dot clock counter as the load signal and being supplied to said address counter to rest it; and
a driving means for driving said laser means according to image data in synchronous with said timing pulse signal outputted from said dot clock counter;
whereby the scan of the laser beam is ensured at a predetermined speed without an optical correction means.

5,115,329
ELECTROLUMINESCENT DEVICE HAVING A LIQUID CRYSTAL LAYER ADJACENT TO THE ELECTROLUMINESCENT LAYER WITHOUT ANY ELECTRODE PLACED THEREBETWEEN
Masami Ikarashi; Kenichi Mitsumori; Mitsuru Kano; Yasuhiro Miki; Takemi Akimoto; Masahiko Yamaguchi, all of Furukawa; Yorihiko Sasaki, Toda; Tomoo Kamigaki, Furukawa; Jun Nakanowatari, Toda; Yoshinori Kato, Furukawa, and Hitoshi Seki, Sendai, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan
Filed May 29, 1990, Ser. No. 530,134
Claims priority, application Japan, Aug. 17, 1989, 1-211687
Int. Cl.[5] G02F *1/13;* H05B *33/00*
U.S. Cl. 359—50 **1 Claim**

1. An electroluminescent device comprising:
a transparent substrate having transparent electrodes thereon;
an insulating substrate having an opposing electrode formed thereon; and
a liquid crystal layer and an electroluminescent layer which are disposed between said transparent and insulating sub-

strates, such that said liquid crystal layer is positioned adjacent to said transparent substrate and said liquid crystal layer and said electroluminescent layer are adjacent to each other without any electrode placed therebetween.

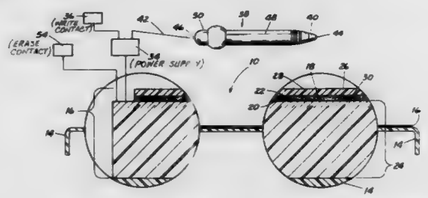


5,115,330

LIQUID CRYSTAL WRITING SLATE

Frederick E. Nobile, DePere; John F. Harris, III, Franksville; Gary S. Silverman, Racine, and Richard A. Baumann, Franksville, all of Wis., assignors to Western Publishing Company, Racine, Wis.

Filed Aug. 9, 1990, Ser. No. 566,105
Int. Cl.[5] G02F *1/133;* **G09G** *3/02, 3/36;* **G08C** *21/00*
U.S. Cl. 359—52 **30 Claims**



1. In a slate of the type having an image-displaying surface area, means to form an image thereon, and erasing means, the improvement comprising:

a base;

a laminate secured to the base, said laminate having an LC-layer with first and second surfaces and formed of polymeric material holding micro-volumes of liquid crystal material, a conductive layer along the first surface, and a substantially transparent protective overlayer on the second surface;

image-application means movably secured to the base apart from said laminate for selective transitory application of electrical potential directly from the image-application means through the LC-layer to the conductive layer to cause an image appearing at the image-displaying surface area; and means secured to the base for draining the electrical potential between the image-displaying surface and the conductive layer to erase the image.

5,115,331

HIGH SPEED SERIAL OPTICAL CROSSBAR SWITCH

Debra M. Gookin, San Diego; Mark H. Berry, El Cajon, and Markham E. Lasher, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 485,341, Feb. 26, 1990, abandoned. This application Sep. 3, 1991, Ser. No. 752,985
Int. Cl.[5] H04J *14/00*
U.S. Cl. 359—117 **3 Claims**

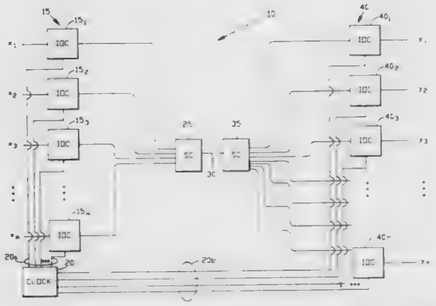
1. A high speed optical crossbar switch capable of handling broadband optical data signals at GHz rates comprising:

a set of input integrated optical couplers each receiving an optical data signal and having the capability to be selectably actuated by a voltage signal to produce signals representative of each said optical data signal at a maximum output level signal being a substantially distortionless signal throughput of said optical data signal or a minimum output level signal with no storage of said optical data signal, each being coupled in parallel with respect to the other input integrated optical couplers;

a first star coupler having a plurality of optical fibers each optically coupled to an integrated optical coupler to receive the maximum output level signals and minimum output level signals from a respective separate one of said input integrated optical couplers and present them as serial signals at an output;

an optical cable optically coupled to said output of said first star coupler that transmits said serial signals;

a second star couple optically coupled to said optical cable having optical fibers coupled to feed said serial signals therethrough;



a set of output integrated optical couplers each coupled to receive said serial signals from said second star coupler and having the capability to be selectably actuated by a voltage signal to produce signals representative of each of said serial signals at a maximum output level signal being a substantially distortionless signal throughput of each said optical data signal or a minimum output level signal with no storage of each said optical data signal, each of said output integrated optical couplers being coupled in parallel with respect to the other said output integrated optical couplers

a clock operatively coupled to each of said input integrated optical couplers and each of said output integrated optical couplers to provide clock voltage signals that actuate said input integrated optical couplers and said output integrated optical couplers in a time division multiplex switching sequence at rates in excess of 10 GHz.

5,115,332

RECEIVER FOR COHERENT OPTICAL COMMUNICATION

Takao Naito, Kawasaki; Terumi Chikama, Machida; Shigeki Watanabe, Kawasaki; Tetsuya Kiyonaga, Kawasaki; Yoshihito Onoda, Kawasaki, and Hideo Kuwahara, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 18, 1990, Ser. No. 553,744
Claims priority, application Japan, Jul. 20, 1989, 1-185906; Aug. 11, 1989, 1-206635
Int. Cl.[5] H04B *10/06*
U.S. Cl. 359—189 **35 Claims**

1. A receiver for coherent optical communication comprising: 'an optical local oscillator which emits a local-oscillator beam;

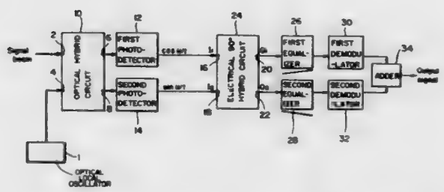
an optical hybrid circuit, operatively connected to said optical local oscillator, which is provided with a first optical input port for receiving a signal beam, a second optical input port for receiving the local-oscillator beam, a first optical output port and a second optical output port,

said optical hybrid circuit branching the signal beam to produce a first branched signal beam and a second branched signal beam and branching the local-oscillator beam to produce a first branched local oscillator beam and a second branched local-oscillator beam, said optical hybrid circuit producing a predetermined phase shift between the first branched signal beam and the second branched signal beam or between the first branched local-oscillator beam and the second branched local-oscillator beam, and said optical hybrid circuit adding the first branched signal beam and the first branched local-oscillator beam to produce a first added beam and adding the second branched signal beam and the second branched local-oscillator beam to produce a second added beam, and applying the first and second added beams respectively to the first and second optical output ports;

a first photodetector operatively connected to said optical hybrid circuit, for the photoelectric conversion of a beam received from the first optical output port of the optical hybrid circuit;

a second photodetector, operatively connected to said optical hybrid circuit, for the photoelectric conversion of a beam received from the second optical output port of the optical hybrid circuit;

an electrical 90° hybrid circuit, operatively connected to said first and second photodetectors, which is provided with first and second electrical input ports for receiving the output signals of the first and second photodetectors, respectively, and first and second electrical output ports,



said electrical 90° hybrid circuit adding the signal received at the first electrical input port to the signal received at the second electrical input port after shifting the phase of the signal received at the first electrical input port by 90° to obtain an added signal and applying the added signal to the second electrical output port, and said electrical 90° hybrid circuit adding the signal received at the second electrical input port to the signal received at the first electrical input port after shifting the phase of the signal received at the second electrical input port by 90° to obtain an added signal and applying the added signal to the first electrical output port;

a first equalizer, operatively connected to said electrical 90° hybrid circuit, which delays a signal received from the first electrical output port by a delay corresponding to the frequency of the same received signal;

a second equalizer, operatively connected to said electrical 90° hybrid circuit, which delays a signal received from the second electrical output port by a delay corresponding to the frequency of the same received signal;

a first demodulator, operatively connected to said first equalizer, which demodulates an output signal of the first equalizer;

a second demodulator, operatively connected to said second equalizer, which demodulates an output signal of the second equalizer; and

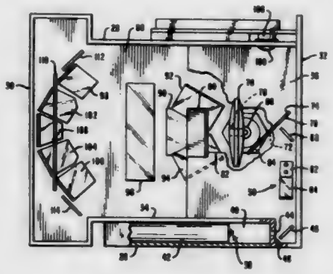
an adder, operatively connected to said first and second demodulators, which adds the respective output signals of the first and second demodulators.

5,115,333

VARIABLE LASER BEAM ATTENUATOR

Barry M. Mergenthaler, Cambridge, and Paul O. Detwiler, New Concord, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 16, 1990, Ser. No. 509,699
Int. Cl.[5] G02B *26/02;* **G06K** *7/10*
U.S. Cl. 359—196 **3 Claims**



1. An apparatus for projecting scanning light beams at a coded label on an object comprising:

a supporting surface;

a source of scanning light beams projected along an axis adjacent said supporting surface;

an elongated support member having one end secured to said supporting surface and its opposite end being movable to a position orientated at an angle to the supporting surface, said support member having a reduced portion intermediate its ends enabling said opposite end to be rotated about said one end;

an optical transparent element secured to said opposite end of the support member and extending to a position across the axis of the light beam for varying the power of the light beam projected along said axis in accordance with the angle of incidence of the light beam striking the element, said element varying the angle of incidence in accordance with the amount of rotation of the opposite end;

means mounted along said axis for projecting said light beam along a plurality of light paths; and

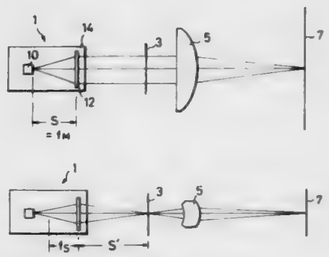
reflecting means mounted in each of said plurality of light paths for forming a scanning pattern for scanning a coded label in response to receiving said plurality of light beams.

5,115,334

OPTICAL SCANNING DEVICE

Kan Tomita, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 22, 1991, Ser. No. 673,387
Claims priority, application Japan, Apr. 9, 1990, 2-93676
Int. Cl.[5] G02B *26/08, 13/08, 3/08*
U.S. Cl. 359—216 **4 Claims**



1. An optical scanning device comprising:

a light source which emits a luminous flux for irradiating a scanning surface and comprises a semiconductor laser element and an anamorphic ellipsoidal Fresnel lens;

a rotary polygon mirror having reflection surfaces for deflecting said luminous flux emitted from said light source; and

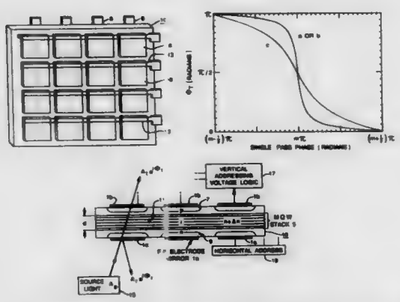
an image forming optical system disposed between said polygon mirror and said scanning surface for forming an optical spot image from said luminous flux on said scanning surface, said optical spot being arranged to scan said scanning surface in a horizontal scanning direction and a vertical scanning direction, said optical system being so arranged that said reflection surface and said scanning surface are positioned at conjugate points with respect to each other for the luminous flux with regard to said vertical scanning direction.

5,115,335

ELECTROOPTIC FABRY-PEROT PIXELS FOR PHASE-DOMINANT SPATIAL LIGHT MODULATORS

Richard A. Soref, Newton Centre, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 29, 1990, Ser. No. 546,482
Int. Cl.[5] H01L 27/14, 29/205; G02F 1/01
U.S. Cl. 559—248 **21 Claims**



1. A resonant phase dominant Fabry Perot spatial light modulator for phase modulating light directed therethrough comprising:

(a) a light transmissive array of p-i-n diodes having a semiconductor superlattice within intrinsic regions of said p-i-n diodes;

(b) light transmissive partially reflecting first and second electrode means positioned upon opposite faces of said array of p-i-n diodes respectively, configured to form Fabry Perot resonators;

(c) means for directing light to be phase modulated through at least one of said electrode means and a said array of p-i-n diodes; and

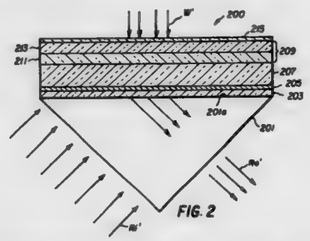
(d) electric field producing means coupled to said electrode means, for producing a Wannier-Stark blue shift in the absorption spectrum of said superlattice, sufficient to induce electro-optic phase excursions in said p-i-n diodes within a critical rapid phase change region positioned about a Fabry Perot amplitude resonance point of said Fabry Perot resonators, for in turn producing large output phase changes in said light transmitted directed through said array of p-i-n diodes.

5,115,336

PHOTOREFRACTIVE SYSTEM AND PROCESS FOR ITS USE

Jay S. Schildkraut; Michael Scozzafava, both of Rochester, and Dennis G. Howe, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 491,397, Mar. 9, 1990, abandoned. This application Aug. 20, 1990, Ser. No. 569,302
Int. Cl.[5] G02F 1/01
U.S. Cl. 359—263 **30 Claims**



1. A combination capable of modulating electromagnetic radiation from a first source as a function of spatially intersecting electromagnetic radiation from a second source comprising

first and second spaced electrodes,

first intermediate means exhibiting a variance in its refractive index as a function of a potential gradient, and

second intermediate means having a conductivity that varies as a function of exposure to the electromagnetic radiation from the second source, characterized in that

said first intermediate means is a layer in contact with said first electrode having a second order polarization susceptibility of greater than 10^{-9} electrostatic units and is comprised of organic polar aligned noncentrosymmetric molecular dipoles each containing an electron donor moiety linked through a conjugated π bonding system to an electron acceptor moiety,

said second intermediate means is comprised of an electrophotographic photoreceptor layer unit interposed between said first intermediate means and said second electrode, and

at least one of said first and second electrodes are transmissive to the electromagnetic radiation from the first source.

5,115,337

NONLINEAR OPTICAL MATERIAL

Masaki Okazaki; Tadao Shishido, and Seiiti Kubodera, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 263,977, Oct. 26, 1988, Pat. No. 4,982,112, which is a continuation of Ser. No. 24,496, Mar. 11, 1987, abandoned. This application Oct. 16, 1990, Ser. No. 598,514
Claims priority, application Japan, Mar. 11, 1986, 61-53462; Mar. 12, 1986, 61-53884
Int. Cl.[5] G02F 1/37
U.S. Cl. 359—328 **4 Claims**

1. A method of converting a wavelength of a laser beam comprising irradiating with a laser beam, a nonlinear optical material comprising a compound represented by formula (II) or an acid addition salt thereof:



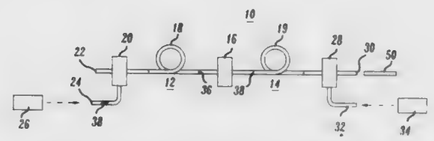
wherein Z^{11} represents an atomic group forming a substituted or unsubstituted pyridine ring or benzene ring having at least one nitro group as a substituent; and Z^{12} represents an atomic group forming a substituted or unsubstituted pyrrole, imidazole, pyrazole, triazole or tetrazole ring; and wherein the substituent for Z^{11} is a nitro group, and the substituent or substituents for Z^{12} are independently selected from the group consisting of methyl, ethyl, chlorine, or bromine.

5,115,338

MULTI-STAGE OPTICAL AMPLIFIER

David J. DiGiovanni, Scotch Plains, and Clinton R. Giles, Holmdel, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 530,665, May 30, 1990, abandoned. This application Apr. 12, 1991, Ser. No. 686,013
Int. Cl.[5] G02B 6/26; H01L 15/00
U.S. Cl. 359—337 **2 Claims**



1. A multi-stage optical amplifier comprising a first stage of amplification comprising an Erbium-doped optical amplifying fiber having a first port and a second port and lacking an isolator, a second stage of amplification comprising an Erbium-doped optical amplifying fiber having a first port and a second port and lacking an isolator,

a first coupler coupled to the second port of said first stage of amplification,

a second coupler coupled to the first port of said second stage of amplification,

means for generating a pump signal at a pump wavelength coupled to said first stage of amplification through said first coupler and to said second stage of amplification through said second coupler,

a third coupler interposed between said first coupler and said second coupler,

a fourth coupler interposed between said third coupler and said second coupler,

a first optical isolator and a first optical filter interposed between said third and fourth couplers to pass a signal of a first wavelength from first stage of amplification to said second stage of amplification, and

a second optical isolator and a second optical filter interposed between said third and fourth couplers to pass a signal of a second wavelength from said second stage of amplification to said first stage of amplification.

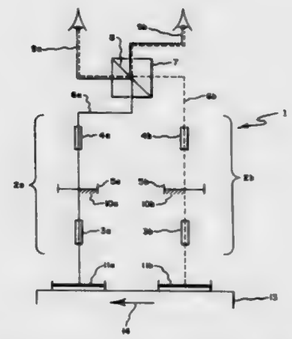
5,115,339

STEREOMICROSCOPE

(II)

Ronald J. Martino, Geneva, and Fred J. Ramsey, Rochester, both of N.Y., assignors to Cambridge Instruments Inc., Buffalo, N.Y.

Filed Jul. 3, 1989, Ser. No. 376,235
Int. Cl.[5] G02B 21/22, 27/22
U.S. Cl. 359—378 **11 Claims**



1. A stereomicroscope optical system for viewing a composite image of complementary portions of two identical fields of substantially identical photographs and indicating any difference therebetween which comprises:

a first optical means for presenting a first image from one of the two photographs, said first means including a first intermediate image plane, a first occluder selectively positionable in said first intermediate image plane, said first occluder blocking a chosen part of the first image for providing a first composite image part;

a second optical means for presenting an second image from the other of the two photographs, said second means including a second intermediate image plane, a second occluder selectively positionable in said second intermediate image plane, said second occluder blocking a complementary part of the second image for providing a second composite image part;

means to position said first and second occluders in their respective image planes;

means to combine said first and second composite image parts; and

means to move said photographs simultaneously relative to said occluders,

whereby a difference between photographs is identified during transition between image parts.

5,115,340

HIGH AVERAGE POWER FARADAY ISOLATOR

Steve C. Tidwell, Woodinville, Wash., assignor to Amoco Corporation, Chicago, Ill.

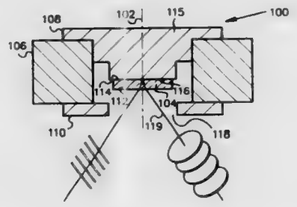
Continuation of Ser. No. 252,045, Sep. 30, 1988, abandoned. This application May 2, 1990, Ser. No. 519,258
Int. Cl.[5] G02F 1/09
U.S. Cl. 359—484 **17 Claims**

1. An apparatus comprising:

polarization rotation means for 1) rotating the polarization of polarized incident optical energy in the presence of a substantially uniform magnetic field to produce a first optical energy with a polarization which is rotated through an angle with respect to the polarization of the polarized incident optical energy, 2) reflecting the first optical energy, and 3) further rotating the polarization of the reflected first optical energy in the presence of the magnetic field to product a second optical energy with a polarization which is further rotated through the angle

with respect to the polarization of the first optical energy, the polarization rotation means producing a total rotation of the second optical energy relative to the incident optical energy greater than the angle, the polarization rotation means having a first side for receiving and transmitting incident optical energy, and a second side opposite the first side for reflecting the first optical energy;

magnet means positioned adjacent and coaxially along an



axis with the polarization rotation means for producing a constant, substantially uniform magnetic field in a fixed direction in the polarization rotation means;

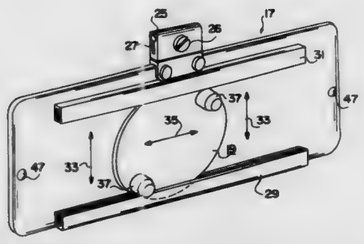
first and second pole pieces, positioned coaxially on the axis on opposite sides of the polarization rotation means and the magnet means, for substantially confining the magnetic field to the polarization rotation means; and

cooling means coaxial with the polarization rotation means for absorbing heat from the polarization rotation means.

5,115,341
SUN VISOR

William H. Bentley, Wyomissing, Pa., assignor to American Polarizers, Inc., Reading, Pa.

Filed Apr. 3, 1990, Ser. No. 503,749
Int. Cl.[5] G02B *5/30*
U.S. Cl. 359—493 **7 Claims**



1. A sun visor device for use by the operator of a vehicle comprising:

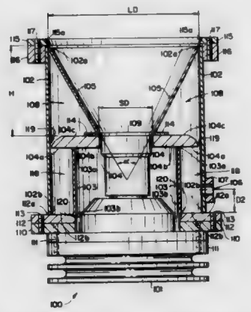
an optically active visor movably mounted in operable relationship with the windshield in said vehicle, said visor being polarized in the vertical plane and having a substantial horizontal length to width ratio, said visor further including a pair of tracks defining a linear path along the length of said visor; and

a polarized disk movably mounted in said tracks on said visor to permit both linear movement for positioning said disk and rotational movement for selective rotation between vertical and horizontal polarization positions, said disk being sized to occlude from approximately 4° to approximately 10° of the line of sight of the operator in the vehicle.

5,115,342
LAMINAR FLOW DUST SHIELD FOR WIDE ANGLE LENS

Norman R. Rowe, Chester, and William R. Sweeney, Richmond, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Feb. 26, 1991, Ser. No. 661,501
Int. Cl.[5] B08B *5/02;* **G02B** *23/16*
U.S. Cl. 359—509 **33 Claims**



1. Apparatus for preventing the deposition of particles on a surface to be kept clean comprising:

a first plenum having a gas distribution outlet;

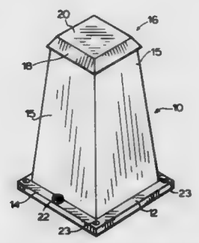
a second plenum having a gas inlet and a porous gas distribution outlet, the gas inlet being in gaseous communication with the gas distribution outlet of the first plenum, the porous gas distribution outlet being a hollow porous frustrum disposed about the surface to be kept clean; and

means for introducing gas into the first plenum, thereby to provide a widely-dispersed, uniformly-distributed flow of gas through the porous gas outlet away from the surface to be kept clean.

5,115,343
PYLON

Reginald S. Bennett, 44 Charles Street, West, Suite 4408, Toronto, Ontario, Canada M4Y 1R8

Continuation-in-part of Ser. No. 507,840, Apr. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 469,376, Jan. 24, 1990, abandoned. This application Nov. 26, 1990, Ser. No. 617,766
Int. Cl.[5] G02B *5/122, 5/12;* **E01F** *9/00*
U.S. Cl. 359—529 **26 Claims**

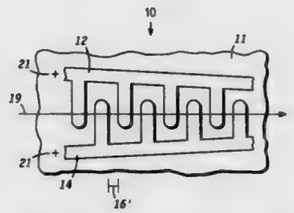


1. Landing pylon comprising means for stably supporting, on a support surface, an upwardly extending column, defining a vertical axis; said upwardly extending column, being defined by a plurality of generally flat side panels sloping inwardly and upwardly at between 3° and 6° to the vertical axis, said panels designed to be retroreflectant and to provide a higher degree of retroreflection in directions normal to said panels and substantial but lesser retroreflectance at other angles.

5,115,344
TUNABLE DIFFRACTION GRATING

James E. Jaskie, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1990, Ser. No. 592,389
Int. Cl.[5] G02B *5/18*
U.S. Cl. 359—573 **18 Claims**



1. A tunable diffraction grating, comprising:

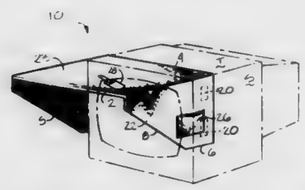
rows of an electrically conductive material disposed on a deformable material, wherein the deformable material is transparent to a light of numerous wavelengths, and wherein the rows of the electrically conductive material diffract a first wavelength of light; and

a means for applying a voltage on the rows of the electrically conductive material to cause a change in space between the rows so that the diffraction grating diffracts a second wavelength of light.

5,115,345
ANTI-GLARE, ANTI-STATIC VIDEO MONITOR VISOR

Michael G. Hobson, 545 Shell Pkwy. #3212, Redwood City, Calif. 94065, and Maurice K. Nelson, 305 Glen Ridge Way, El Dorado Hills, Calif. 95630

Filed Sep. 12, 1989, Ser. No. 406,284
Int. Cl.[5] G02B *27/00*
U.S. Cl. 359—601 **20 Claims**



1. A visor of a video monitor having an output video screen, comprising, in combination:

said visor having a top surface and a bottom surface and a leading edge,

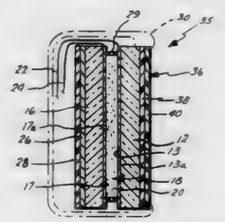
said bottom surface configured to rest upon a portion of the video monitor and include a shelf-like projection extending forward of the video monitor with respect to a plane defined by the output video screen,

said visor including an anti-static coating on said bottom surface to provide anti-static means which offsets an inherent tendency of the output video screen, when the video monitor is operated, to exhibit an affinity for dust particles through electrostatic attraction.

5,115,346
ANTI-SCATTER, ULTRAVIOLET PROTECTED, ANTI-MISTING, ELECTRO-OPTICAL REARVIEW MIRROR

Niall R. Lynam, Holland, Mich., assignor to Donnelly Corporation, Holland, Mich.

Continuation-in-part of Ser. No. 155,256, Feb. 12, 1988, abandoned. This application Jan. 16, 1990, Ser. No. 464,888
The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.
Int. Cl.[5] G02B *5/08, 5/22;* **G02F** *1/15*
U.S. Cl. 359—604 **64 Claims**



1. A reduced ultraviolet radiation transmitting, electro-optic rearview mirror assembly comprising:

first and second spaced, optically transparent elements mounted in a mirror case, said elements each having front and rear surfaces and defining a space between the rear surface of said first element and the front surface of said second element;

an electro-optic medium confined in said space whose light transmittance is variable upon the application of an electric field thereto;

means for applying an electric field to said electro-optic medium to cause variation in the light transmittance of said medium;

a reflective coating on one surface of said second element adapted to reflect light incident thereon through said first element and said electro-optic medium; and

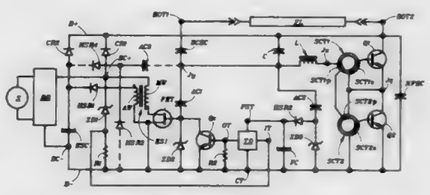
ultraviolet radiation reducing means incorporated in said assembly for reducing ultraviolet radiation degradation of said electro-optic medium in said assembly; and

spectrally selective absorbing means for absorbing more light in those regions of the visible spectrum from about 560 nanometers to about 780 nanometers than is absorbed in those regions of the visible spectrum from about 400 nanometers to about 560 nanometers.

5,115,347
ELECTRONICALLY POWER-FACTOR-CORRECTED BALLAST

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Filed Aug. 20, 1990, Ser. No. 569,639
Int. Cl.[5] H05B *41/24*
U.S. Cl. 315—247 **24 Claims**



1. An arrangement comprising:

inverter circuit means connected with a set of DC supply terminals;

rectifier means connected with an AC power line voltage and operative to provide a first DC voltage at a rectifier output means; the instantaneous absolute magnitude of the first DC voltage being substantially equal to the of the AC power line voltage;

converter means connected with the rectifier output means and operative to charge an energy-storing capacitor means; there existing a second DC voltage across the energy-storing capacitor means; and

commutation means connected in circuit with the rectifier output means, the energy-storing capacitor means, and the inverter circuit means the commutation means being operative to cause a DC supply voltage to be provided to the DC supply terminals; the instantaneous absolute magnitude of the DC supply voltage being the larger of: (i) the instantaneous absolute magnitude of the first DC voltage; and (ii) the instantaneous absolute magnitude of the second DC voltage.

5,115,348

LENS BARREL

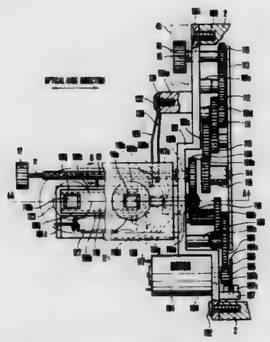
Hidefumi Notagashira, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1990, Ser. No. 557,417

Claims priority, application Japan, Jul. 26, 1989, 1-192879; Jul. 26, 1989, 1-192880; Jul. 26, 1989, 1-192882

Int. Cl.[5] G02B *15/00*

U.S. Cl. 359—697 **38 Claims**



1. A lens barrel comprising:

a) an operation member arranged to permit selection between a power varying operation in a telephoto direction and a power varying operation in a wide-angle direction;

b) a first transmission mechanism for driving a focusing mechanism;

c) a second transmission mechanism for driving a power varying mechanism;

d) a driving mechanism arranged to generate a driving force; and

e) a change-over mechanism arranged to connect said driving mechanism to said second transmission mechanism in response to said power varying operation of said operation member in the telephoto direction or in the wide-angle direction and to forcibly connect said driving mechanism to said first transmission mechanism in response to a cancellation of said power varying operation of said operation member.

5,115,349

PROJECTOR SYSTEM AND SYSTEM FOR DETECTING FLAW

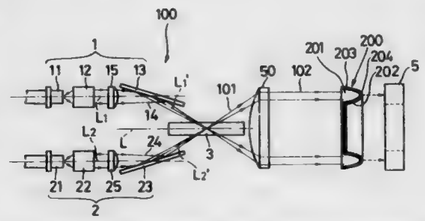
Jiro Fuse, Kasukabe, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan

Filed May 22, 1990, Ser. No. 526,136

Claims priority, application Japan, May 25, 1989, 1-130256; May 25, 1989, 1-130257

Int. Cl.[5] G02B *3/04, 6/06;* **G01N** *21/00*

U.S. Cl. 358—709 **14 Claims**



14. A system for detecting a flaw in an annular portion of an object to be detected, comprising:

(a) an optical converter element of a cylindrical shape for converting incident light, applied thereto, into outgoing light spreading out radially of said optical converter element, wherein said optical converter element comprises a cylindrical solid lens;

(b) light beam-generating means for generating a plurality of light beams, optical axes of said plurality of light beams being spaced from one another in a direction of the circumference of said optical converter element and intersecting one another substantially at one point lying on the axis of said optical converter element, and the optical axes of said plurality of light beams being inclined at the same angle less than 90° with respect to the axis of said optical converter element, so that when said plurality of light beams are incident on said optical converter element, an outgoing light beam is emitted from said optical converter element so that said outgoing light beam extends along an imaginary conical surface coaxial with said optical converter element; and

(c) a collimator lens disposed on one side of said optical converter element opposite to said light beam-generating means, said collimator lens being coaxial with said optical converter element, the focus of said collimator lens lying substantially on an apex of said imaginary conical surface, and when said light beam emitted from said optical converter element along said imaginary conical surface is incident on said collimator lens, a light beam being emitted from said collimator lens along an imaginary cylindrical surface coaxial with said collimator lens; and

(d) a photosensor disposed on one side of said collimator lens opposite to said optical converter element, the object to be detected being disposed between said collimator lens and said photosensor, said light beam emitted from said collimator lens being applied to the annular portion of said object, so that said photosensor detects part of said light beam leaking through the flaw in said annular portion.

5,115,350

LIGHT INTERCEPTING APPARATUS OF LENS

Hitoshi Tanaka, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1990, Ser. No. 526,637

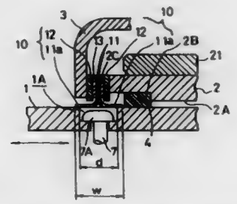
Claims priority, application Japan, May 24, 1989, 1-60185[U]

Int. Cl.[5] G02B *7/02*

U.S. Cl. 359—823 **18 Claims**

1. A light intercepting apparatus positioned between a lens barrel which moves in an optical axis direction and a lens holding member which supports said lens barrel so as to slide in the optical axis direction, comprising:

a pair of light intercepting rings provided on said lens holding member, each of said light intercepting rings being made of a flexible material and having a center opening of



a diameter smaller than an outer diameter of said lens barrel;

wherein inner ends of said light intercepting rings which define said center openings are deformed in opposite directions so as to be brought into contact with an outer peripheral surface of said lens barrel.

5,115,351

MIRROR SUPPORT APPARATUS AND SYSTEM

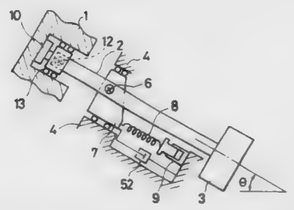
Keizou Miyawaki; Noboru Itoh, and Izumi Mikami, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Hyogo, Japan

Filed Mar. 17, 1989, Ser. No. 324,652

Claims priority, application Japan, Mar. 18, 1988, 63-66261; Mar. 18, 1988, 63-66262; May 16, 1988, 63-116997; May 16, 1988, 63-116998; May 16, 1988, 63-116999; May 16, 1988, 63-117000; May 19, 1988, 63-124213

Int. Cl.[5] G02B *5/08, 26/08*

U.S. Cl. 359—849 **20 Claims**



1. A mirror support apparatus for mounting a mirror of a reflecting telescope in a mirror cell to provide axial and radial support to the mirror comprising:

a lever having a first end and a second end, said lever being oriented in a direction substantially parallel to the axis of said telescope;

a counterweight fastened to the first end of said lever;

a first sliding mechanism slidably mounted in said mirror cell;

a first gimbal mounted in said first sliding mechanism and attached to an intermediate point of said lever, for enabling said lever to pivot at different angles with respect to said first sliding mechanism;

a load cell directly and rigidly attached to said mirror for detecting axial force;

means for coupling the second end of said lever to said mirror and said load cell so that said lever can exert an axial force on said load cell and a radial force on said mirror;

a drive mechanism mounted in said mirror cell, for moving said first sliding mechanism in a direction substantially parallel to the axis of said telescope; and

means for controlling said drive mechanism according to the force detected by said load cell.

5,115,352

DOUBLE EXTERNAL REAR VIEW MIRROR ASSEMBLY FOR VEHICLES

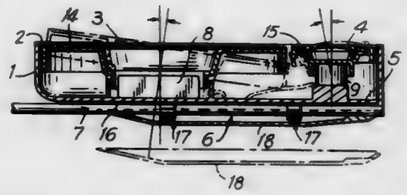
Antonio Ferreira do Espirito Santo, Almirante Tamandare Street 85, Sao Bernardo do Campo, Sao Paulo, Brazil

Filed Jan. 10, 1990, Ser. No. 462,796

Claims priority, application Brazil, Jan. 10, 1989, 8900142

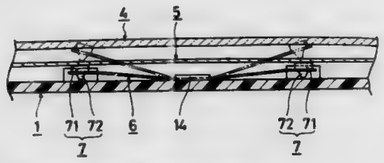
Int. Cl.[5] G02B *5/08;* **B60R** *1/06*

U.S. Cl. 359—855 **3 Claims**



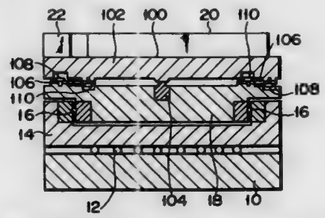
1. A double external rear view mirror assembly for motor vehicles, comprising a substantially prismatic frame including a base having inner and outer surfaces; a comparatively large flat mirror and a comparatively small convex mirror supported in said frame, each mirror having longitudinal and transverse axis; and two actuators arranged in said frame for moving said large and small mirrors, respectively, about their respective longitudinal and transverse axes, each of said two actuators including a pair of electric motors for moving a respective mirror about its longitudinal and transverse axes, respectively, and mounted on the inner surface of said base, a support for supporting said respective mirror in said frame, and transmission means for connecting said pair of electric motors with said support to move said support with said respective mirror about the longitudinal and transverse axes of said respective mirror, said pair of electric motors including a first motor having an axis and a first output shaft, and mounted on said inner surface of said base such that the axis of said first motor extends parallel to the longitudinal axis of said respective mirror, and a second motor having an axis and a second output shaft, and mounted on said inner surface of said base such that the axis of said second motor extends parallel to the transverse axis of said respective mirror, said transmission means comprising a ring member having an upper edge for fixedly supporting said support for said respective mirror and surrounding said first and second motors, first and second arched racks extending substantially perpendicular to the longitudinal and transverse axes of said respective mirror, respectively, and fixedly connected to said ring member, and first and second gears mounted on said first and second output shafts of said first and second motors, respectively, and engaging said first and second arched racks, respectively, for pivoting said ring member together with said support for said respective mirror about the longitudinal and transverse axes of said respective mirror, respectively.

5,115,353
MIRROR APPARATUS
Keiji Mori, Kariya, and Hidekazu Kogita, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Oct. 1, 1990, Ser. No. 591,229
Claims priority, application Japan, Sep. 30, 1989, 1-256634
Int. Cl.[5] G02B *7/18*
U.S. Cl. 359—871 **1 Claim**



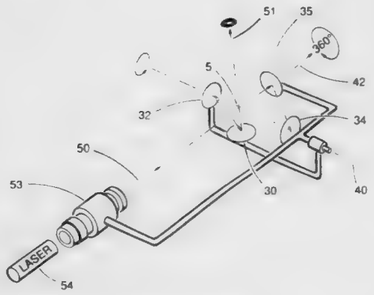
1. A mirror apparatus, comprising:
a holder having a cup-shaped configuration with an opening enclosed by a holding portion defined by an inward projection;
a mirror disposed within the holder and having an outer surface exposed through the opening and a rear surface;
a supporting member engaging with the rear surface of the mirror;
leaf spring means for urging the mirror to the holding portion via the supporting member independent from deformation of the holder, end portions of the leaf spring urging the supporting member and a central portion secured to the holder; and a buffer member secured to each end portion of the leaf spring so as to be engaged with the supporting member and the holding portion.

5,115,354
HIGH ACCURACY TRAVELING TABLE APPARATUS
Akira Iwase, Gotenba, Japan, assignor to Toshiba Machine Co., Ltd., Tokyo, Japan
Division of Ser. No. 539,615, Jun. 18, 1990, abandoned, which is a division of Ser. No. 368,150, Jun. 15, 1989, Pat. No. 4,953,965, which is a continuation of Ser. No. 201,283, May 27, 1988, abandoned, which is a continuation of Ser. No. 945,855, Dec. 23, 1986, abandoned. This application May 14, 1991, Ser. No. 700,952
Claims priority, application Japan, Aug. 25, 1986, 61-129079
Int. Cl.[5] G02B *7/18;* **A47B** *7/00*
U.S. Cl. 359—873 **4 Claims**



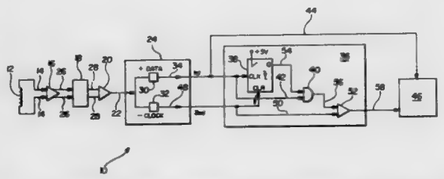
1. A high-accuracy traveling table apparatus comprising a workpiece fixing means and a laser mirror for position measurement provided on a table capable of traveling at least in the direction of one axis, said table comprising:
a mount to which said workpiece fixing means and said laser mirror are fixed; and
at least one partially coupling means for partially coupling said mount to said table so as to prevent transmission of a distortion of said table to said mount, said partially coupling means being interposed between peripheral portions of the surfaces of said mount and said table so as to couple the peripheral portions of the surfaces of said mount and said table to each other, said partially coupling means having at least three elastic coupling members, each of which is coupled with said mount and said table, said elastic coupling member exhibiting elasticity only in the Z axis direction and not in the direction perpendicular to the Z axis.

5,115,355
COMPACT COUDE OPTICS SYSTEM
Murray Dunn, Carlsbad, Calif., assignor to Thermo Electron Technologies Corp., San Diego, Calif.
Filed Nov. 27, 1990, Ser. No. 618,645
Int. Cl.[5] G02B *7/18*
U.S. Cl. 359—876 **1 Claim**



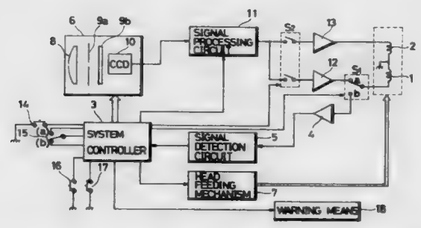
1. A coude optics system comprising:
a two axis gimbal system defining a first axis and a second axis, said first axis intersecting said second axis at a point defining a coude center of rotation,
a first mirror,
a second mirror,
a third mirror and
a fourth mirror;
said first and second mirrors being fixed with respect to each other and arranged to rotate about said first axis, said third and fourth mirrors being fixed with respect to each other and arranged to rotate about said second axis;
said mirrors being positioned so a to permit a light beam entering said system along said first axis to be reflected off each mirror in turn and directed to various targets within a wide field of regard by appropriate movement of the two gimbals.

5,115,356
DECODER CIRCUIT WITH MISSING CLOCK GENERATOR
Fernando G. Silva, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation of Ser. No. 401,395, Aug. 31, 1989, abandoned. This application Sep. 19, 1991, Ser. No. 762,058
Int. Cl.[5] G11B *5/09, 20/14*
U.S. Cl. 360—51 **4 Claims**



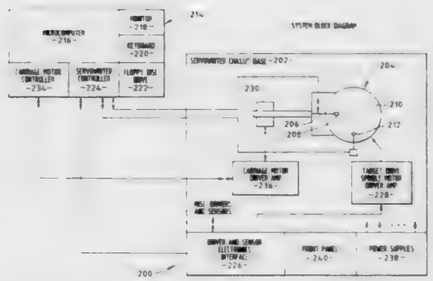
1. An electrical circuit suitable for decoding a binary data stream that has been encoded in a sequential bitcell code format, the encoding resulting in an encoded signal waveform that carries clock information with significant timing variability between clock pulses of bitcells in the stream and data information, which electrical circuit comprises:
a) a reading means for reading the decoded signal and producing a read signal, the read signal comprising a succession of bitcells, wherein each bitcell is expected to comprise a pair of clock transitions that set-off a data transition;
b) a detector means for receiving the read signal and separating the clock transitions from the data transistions, thereby generating
(i) a first output signal comprising a succession of data transitions; and
(ii) a second output signal comprising a succession of clock transistions;
c) a missing clock generator (MCG) for receiving the first and second output signals and executing logical operations comprising:
(i) interrogating the first and second output signals for establishing whether or not each bitcell comprises the expected pair of clock transitions;
(ii) generating, in the presence of the expected clock transitions, a simulated second output signal;
(iii) generating, in the absence of an otherwise expected clock transition, a substitute clock transition, for injection in a reconstituted second output signal; and
d) a computation means for
i) receiving the first output signal comprising the succession of data transition from the detector means;
ii) receiving from the missing clock generator the simulated second output signal, or the reconstituted second output signal; and
iii) mapping the first output signal with the simulated or reconstituted second output signal, for assigning a decoded valuation to said first output signal.

5,115,357
IMAGE FORMING RECORDING DEVICE CAPABLE OF CARRYING OUT FRAME OR FIELD RECORDING
Kenji Nakamura, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 563,947, Aug. 7, 1990, abandoned, which is a continuation of Ser. No. 139,750, Dec. 30, 1987, abandoned. This application Jun. 18, 1991, Ser. No. 715,889
Claims priority, application Japan, Jan. 6, 1987, 62-951
Int. Cl.[5] G11R *5/55;* **H04N** *5/781*
U.S. Cl. 360—75 **11 Claims**



11. An image recording device which records an image signal on a recording medium having a multiplicity of recording regions and is operable in a frame recording mode in which one frame of a single image is recorded on two adjacent regions of the recording medium, the image recording device comprising:
recording means for recording an image signal and reproducing a signal recorded on the recording medium;
means for designating regions of the recording medium one by one;
signal detection means for determining whether a designated region is unrecorded or not based on the signal reproduced by the record means every time the designating means designates one region; and
a controller for controlling the designating means to designate regions of the recording medium one by one until the signal detection means detects presence of two adjacent unrecorded regions in the frame recording mode.

5,115,358
CONFIGURABLE DISK MEMORY SERVOWRITER
Douglas F. Widney, Camarillo, Calif., assignor to Data Exchange Corporation, Camarillo, Calif.
Continuation of Ser. No. 265,837, Nov. 1, 1988, abandoned. This application Nov. 20, 1990, Ser. No. 618,511
Int. Cl.[5] G11B *31/00*
U.S. Cl. 360—75 **5 Claims**



1. A configurable servo pattern writer for writing a selected servo pattern composed of a plurality of servo pattern types which are to be written in a selected order onto a magnetic disc of a magnetic disc drive data storage device, comprising:
(a) clock signal producing means for providing a plurality of clock signals which bear a fixed relation to one another and which differ form one another with respect to one of frequency and phase;
(b) pattern type control signal generating means for producing control signals representative of a desired servo pattern type;
(c) a programmable gate array composed of a plurality of logic gates and programmable interconnection means for interconnecting said logic gates in a logic pattern in response to program signals, said programmable gate array having a plurality of signal inputs connected to receive the plurality of clock signals and the control signals and a single data output for providing an output signal dependent on the clock signals, the control signals and the logic pattern in which said logic gates are interconnected;
(d) a servo read-write head having a signal input connected to said data output of said gate array and constructed for writing upon a magnetic disc a servo pattern corresponding in form to the output signal provided at said output of said gate array; and
(e) means for storing, and applying to said interconnection means, a logic gate interconnection program which defines an interconnection of said logic gates in a pattern for giving the output signal at said data output of said gate array the form of the selected servo pattern.

5,115,359

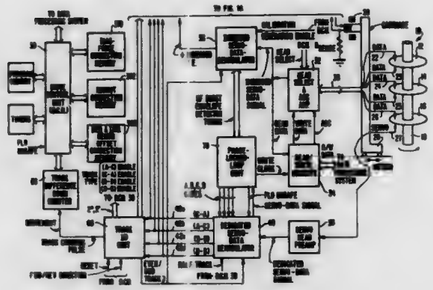
FAULT TOLERANT FRAME, GUARDBAND AND INDEX DETECTION METHODS

Michael D. Sidman, Colorado Springs, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 490,504, Feb. 28, 1990, which is a continuation of Ser. No. 308,963, Feb. 10, 1989, abandoned, which is a continuation of Ser. No. 106,017, Oct. 1, 1987, abandoned, which is a continuation of Ser. No. 926,885, Nov. 6, 1986, abandoned, which is a continuation of Ser. No. 376,971, May 10, 1982, abandoned. This application Mar. 4, 1991, Ser. No. 502,921

Int. Cl.[5] G11B *5/596, 27/32*

U.S. Cl. 360—77.05 **15 Claims**



1. For a magnetic disk drive incorporating a disk assembly comprising a surface having servo tracks containing servo transitions, a head positioning system for positioning a servo signal sensor over a corresponding servo track, each servo track containing a series of frames radially aligned with the frames in the other tracks, each frame containing a synchronizing field, said synchronizing fields containing first and second dibit transitions, said second dibit transitions being contained in every synchronizing field in a given track, said first dibit transitions being contained in fewer than every synchronizing field in the track, but in at least one of any two successive synchronizing fields, each of said first dibit transitions being followed by a second dibit transition in the same field as the surface moves past the servo signal sensor, the time period between the sensing of said first and second dibit transitions in a frame being shorter than the time period between the sensing of any other pair of dibit transitions, a method for frame detection and synchronization comprising:

A) sensing and detecting dibit transitions as they pass beneath the servo signal sensor;

B) generating a synchronization signal indicating the detection of a second dibit transition upon detection of a dibit transition when a first dibit transition is present in the current frame as indicated when said detection of a dibit transition follows a previous detection of a dibit transition within a time period corresponding to the time between expected detection of first and second dibit transition pairs; and

C) generating a synchronization signal indicating the detection of a second dibit transition upon detection of a dibit transition when a first dibit transition is absent from the current frame as indicated when:

i) said detection of a dibit transition is not preceded by a previous detection of a dibit transition within a time period corresponding to the time between expected detection of first and second dibit transition pairs; and

ii) said detection of a dibit transition occurs following the detection of an immediately prior second dibit transition by a time period greater than the time between detection of that prior second dibit transition and the expected occurrence of a first dibit transition in the current frame but less than a time slightly greater than the time between succeeding pairs of second dibits.

5,115,360

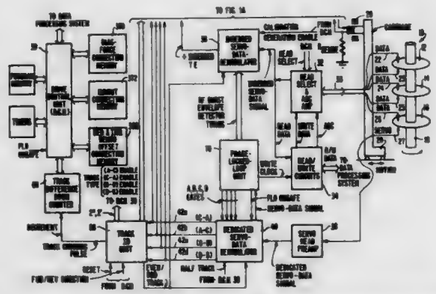
EMBEDDED BURST DEMODULATION AND TRACKING ERROR GENERATION

Michael D. Sidman, Colorado Springs, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 490,504, Feb. 28, 1990, which is a continuation of Ser. No. 308,963, Feb. 10, 1989, abandoned, which is a continuation of Ser. No. 106,017, Oct. 1, 1987, abandoned, which is a continuation of Ser. No. 926,885, Nov. 6, 1986, abandoned, which is a continuation of Ser. No. 376,971, May 10, 1982, abandoned. This application Mar. 4, 1991, Ser. No. 502,512

Int. Cl.[5] G11B *5/596*

U.S. Cl. 360—77.08 **10 Claims**



9. For a disk drive incorporating a disk assembly comprising at least one data surface having circular data tracks containing sectors each of which includes a data field and a servo field providing embedded servo signals, a sensor for sensing said embedded servo signals and a head positioning system for positioning said sensor over a selected data track, the embedded servo signals in each servo field comprising first and second substantially constant amplitude high-frequency bursts consisting of transitions of alternating polarity, and said first and second bursts being disposed on opposite sides of the centerline of the track containing them and offset relative to each other in the circumferential direction, a method for providing an embedded track error signal to which said head positioning system respond, said method comprising:

A) rectifying the sensed servo signals to provide a rectified signal output;

B) smoothing the rectified output corresponding to each of said bursts to provide servo signals outputs corresponding to the strengths of the sensed servo signals;

C) sampling the servo signal outputs corresponding to each of said bursts; and

D) comparing the sampled outputs from the bursts on one side of the track centerline with the sampled outputs from the bursts on the other side of the centerline to provide said track error signal.

5,115,361

GUIDE MECHANISM FOR POSITIONING TAPE GUIDES IN A MAGNETIC TAPE LOADING APPARATUS

Takao Terayama, Ushiku; Hajime Yokota, Katsuta; Kazuo Sakai, Ibaraki, and Nobuyuki Kaku, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

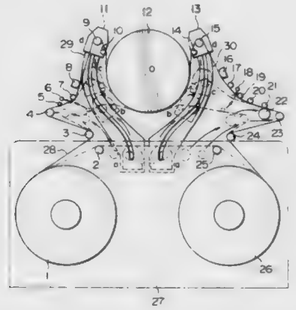
Continuation-in-part of Ser. No. 381,960, Jul. 19, 1989, abandoned, and a continuation-in-part of Ser. No. 697,497, May 3, 1991, which is a continuation of Ser. No. 155,886, Feb. 16, 1988, Pat. No. 4,866,549. This application Oct. 25, 1990, Ser. No. 603,289

Claims priority, application Japan, Feb. 25, 1987, 62-42097; Oct. 25, 1989, 1-275870

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] G11B *15/665*

U.S. Cl. 360—85 **9 Claims**



1. A magnetic tape loading apparatus comprising:

a rotatable drum having a lead provided on an outer periphery thereof, said drum being adapted to be engaged by a magnetic tape during an operation of the apparatus;

a pair of tape guides for pulling out said tape from a tape cassette into engagement with said drum;

a pair of tape pulling movable members for respectively supporting said tape guides;

means for driving said movable members and said tape guides together; and

a pair of guide members for guiding said movable members and said tape guides such that positions of said tape guides relative to each other are changed during movements thereof by said driving means to cause an edge of the tape to continuously run along said lead of said drum when the tape is engaged with said drum, whereby, during a tape loading and unloading operation, damage to the tape can be prevented and stable running ensured.

5,115,362

CASSETTE CHANGER FOR TAPE PLAYER

Tamotsu Harada, Shizuoka; Gen Kumagai, Saitama; Kiyoshi Yanagida, Saitama; Katsuhiko Yaguchi, Saitama; Nagaki Fujioka, Saitama; Akiharu Yagi, Saitama; Koji Yanoguchi, Saitama, and Satoru Kodaira, Saitama, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

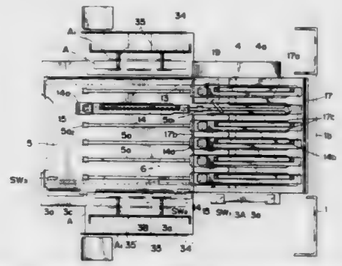
Filed Feb. 2, 1990, Ser. No. 474,569

Claims priority, application Japan, Feb. 16, 1989, 1-35087; Feb. 16, 1989, 1-35088; Feb. 16, 1989, 1-35089; Feb. 16, 1989, 1-35090; Feb. 16, 1989, 1-35091; Feb. 16, 1989, 1-35092; Feb. 16, 1989, 1-35093; Feb. 16, 1989, 1-35094; Feb. 16, 1989, 1-35095; Dec. 1, 1989, 1-313030

Int. Cl.[5] G11B *15/68*

U.S. Cl. 360—92 **26 Claims**

1. A cassette changer for a tape player, comprising a plurality of cassette receiving members each for removably receiving a tape cassette thereon, an accommodating member for receiving said cassette receiving members in a row thereon, a selectively actuating means for selectively moving one of said cassette receiving members from a home position on said accommodating member to a transfer position outside said accommodating member, a tape conveying mechanism mounted in a fixed relationship with respect to said accommodating



member for receiving a tape cassette thereon and conveying a tape of the tape cassette, and a carrier for receiving therein a tape cassette from a selected one of said cassette receiving members moved to the transfer position and setting the tape cassette in position onto said tape conveying mechanism.

5,115,363

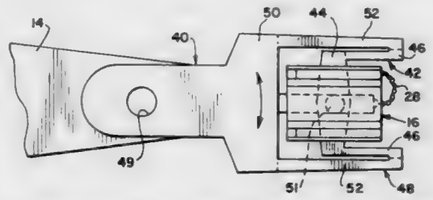
HEAD/GIMBAL ASSEMBLY HAVING LOW STIFFNESS CROSS BAND FLEXURE

Amanullah Khan, Holden, and Neville K. Lee, Sherborn, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 16, 1990, Ser. No. 482,027

Int. Cl.[5] G11B *5/60, 15/64, 17/32, 21/20*

U.S. Cl. 360—104 **16 Claims**



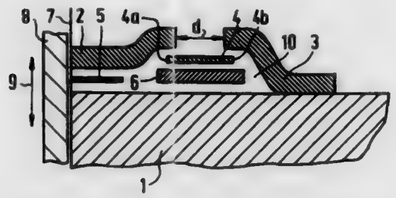
9. A substantially planar suspension flexure having a length and a width for use in a head/gimbal assembly of a disc-type data storage system, said flexure comprising:

a generally "U"-shaped inner support member having a cross band portion with upper and lower surfaces and a pair of inner suspension band portions generally forming a pair of arms of said "U"-shaped inner support member, said arms having one end attached to said cross band portion and one distal end, said cross band portion also having a generally centrally located dimple protruding from a general plane of the upper surface of said cross band portion and said inner suspension portions extending generally parallel to the length of said flexure; and

a generally fork-shaped outer support member having a shank and two prongs, each of said prongs having upper and lower surfaces and a generally planar outer support section forming the shank of said outer support member and a pair of outer suspension portions generally forming the prongs of said outer suspension member, said outer suspension band portions extending generally parallel to the length of said flexure and connected to said inner suspension band portions of said inner support member along their respective distal ends to allow freedom of movement of said inner support member substantially

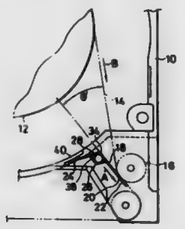
transverse to the general plane of said outer support member.

5,115,364
THIN-FILM MAGNETIC HEAD HAVING TWO MAGNETO-RESISTANT ELEMENTS
Gerardus H. J. Somers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 17, 1990, Ser. No. 599,329
Claims priority, application Netherlands, Oct. 17, 1989, 8902570
Int. Cl.[5] G11B *5/127, 5/33, 5/147*
U.S. Cl. 360—113 4 Claims



1. A thin-film magnetic head having a head face for cooperation with an information carrier, which thin-film magnetic head comprises a magnetic yoke having a first and a second flux conductor contiguous to the head face and a magneto-resistance element remote from the head face, a first edge portion of which is closer to the head face than a second edge portion and has an axis of easy magnetization extending parallel to the head face and which magneto-resistance element has a longitudinal axis which extends in a direction parallel to the head face, the first flux conductor extending at least to the second edge portion and the second flux conductor extending to at least roughly the first edge portion and the thin-film magnetic head comprising a further magneto-resistance element having an axis of easy magnetization parallel to the head face, characterized in that the further magneto-resistance element is located between the first and second flux conductors at the head face and magnetically cooperates with the first and second flux conductors during operation.

5,115,365
MAGNETIC TAPE CASSETTE HAVING ELASTIC PAD ELEMENT
Kenji Hashizume; Masatoshi Okamura, and Haruo Shiba, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed May 1, 1990, Ser. No. 517,171
Claims priority, application Japan, May 2, 1989, 1-51634
Int. Cl.[5] G11B *23/087*
U.S. Cl. 360—132 8 Claims



1. A magnetic tape cassette comprising:
a casing;
a pair of reels rotatably arranged in said casing;
a magnetic tape wound on said reels so that it may stretchedly travel therebetween;
a guide roller arranged with respect to at least one of said reels in said casing for guiding said magnetic tape;
an elastic pad element arranged with respect to at least said one reel in said casing and including a holding portion defined thereon at which said elastic pad element elastically abuts said magnetic tape against said guide roller; and
a support arranged in said casing for supporting said elastic pad element thereon;
said support being positioned between said one reel and said guide roller;
said elastic pad element including a section extending between said support and at least said holding portion;
said section of said elastic pad element being arranged so as to extend substantially in the tangential direction of said guide roller at the position of said guide roller at which said holding portion of said elastic pad element acts on said guide roller and in proximity to the portion of said magnetic tape between said one reel and said guide roller,
wherein said elastic pad element is pivotally supported on said support so that said section of said elastic pad element may be pivotally moved about said support.

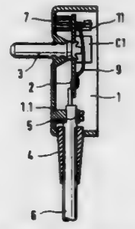
5,115,366
MAGNETIC DISK CARTRIDGE HAVING A CENTER CORE WHICH ENGAGES WITH A DRIVE SPINDLE OF A DISK DRIVE
Kengo Oishi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 27, 1990, Ser. No. 499,743
Claims priority, application Japan, Apr. 6, 1989, 1-40716
Int. Cl.[5] G11B *23/03, 5/016*
U.S. Cl. 360—133 3 Claims

1. A magnetic disk cartridge for a disk drive means including a drive spindle having a center shaft and having a groove formed in said drive spindle, said magnetic disk cartridge comprising a magnetic disk, which is secured to a center core and rotates when said center core is rotated by said drive spindle, and a housing which rotatably accommodates the magnetic disk and the center core, the center core including a base plate,
wherein said center core is provided with:
i) an outer circumferential annular rib with which the position of said center core is adjusted with respect to the position of said drive spindle which rotates said center core,
ii) an inner circumferential annular rib which fits onto said center shaft of said drive spindle, and
iii) a third rib having a preset height d as measured from said base plate and which is located between said outer circumferential annular rib and said inner circumferential annular rib and which engages with said groove formed in said drive spindle;
wherein said drive spindle includes an annular chucking surface for contacting said center core, said groove being formed in said chucking surface; and
further wherein the preset height d of said third rib must satisfy the inequality as follows:

$$d < \frac{H}{2} \times \frac{r_1 + r_2}{R + r_2}$$

where H denotes the distance between upper and lower, inner surfaces of said housing;
r_1 denotes an inner radius of said annular chucking surface of said drive spindle;
r_2 denotes an outer radius of said annular chucking surface of said drive spindle; and
R denotes a radius of said center core.

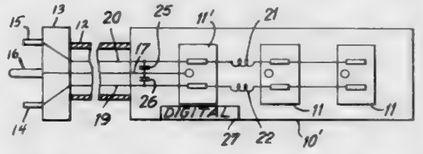
5,115,367
RIGHT ANGLE PLUG
Harry Gaus, Schwanheimer Strasse 93, 6140 Bensheim; Gunter Schliebs, Claudiusweg 17A, 6100 Darmstadt, and Hagen Gross, Am Zollstock 29, 6380 Bad Homburg, all of Fed. Rep. of Germany
Filed Aug. 2, 1989, Ser. No. 392,726
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1988, 3826462
Int. Cl.[5] H02H *3/16*
U.S. Cl. 361—49 20 Claims



1. Device for the protection of electrical equipment fed from a power line through a power cord terminating in a plug, comprising:
a circuit board having a cut-out;
a fusible wire;
an automatic-opening mechanical protective switch with two sets of contacts in the power leads of the power cord plug, said sets of contacts having pre-stressed contact springs which are held in closed state with contact rods by said fusible wire;
an electronic firing circuit having a two-pole output with contact lugs to which said fusible wire is electrically and mechanically connectable;
said electronic firing circuit being arranged on said circuit board together with said protective switch in a housing for said power cord plug; and,
said circuit board having said cut-out at said contact lugs into which said fusible wire is mountable with reinforced ends.

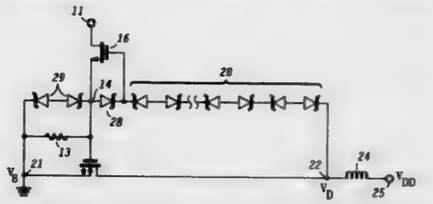
5,115,368
AC POWER STRIP WITH GROUNDED DIGITAL AND GROUND ISOLATED ACCESSORY RECEPTACLES
Lawrence C. Smith, 32 Church St., Malverne, N.Y. 11565
Filed May 15, 1991, Ser. No. 700,394
Int. Cl.[5] H02H *9/04;* H01R *13/652*
U.S. Cl. 361—56 2 Claims

1.—An A C power strip for use with a high accuracy audio or video system which includes a source incorporating digital switching, comprising a housing having a plurality of power outlet receptacles, a mains line extending from said housing and including a live, a neutral, and a ground lead, one said receptacle including ground, live and neutral contacts, said ground contact being coupled to said ground lead, capacitor means in the series connection between said live and neutral contacts respectively, and said ground contact for shunting to ground high frequency products, indicia means on said strip for designating said one receptacle as a digital receptacle, the others of said receptacles having live and neutral contacts,



inductor means in series connection between said live and neutral contacts of said one receptacle and said live and neutral contacts, respectively, of said other receptacles, said other receptacles being isolated from said ground lead.

5,115,369
AVALANCHE STRESS PROTECTED SEMICONDUCTOR DEVICE HAVING VARIABLE INPUT IMPEDANCE
Stephen P. Robb, Tempe; John P. Phipps, Phoenix, and Michael D. Gadberry, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Division of Ser. No. 474,889, Feb. 5, 1990, Pat. No. 5,005,061.
This application Jan. 7, 1991, Ser. No. 637,719
Int. Cl.[5] H02H *9/02;* H03K *17/08;* G05F *1/63*
U.S. Cl. 361—93 7 Claims



1. A method of protecting a power transistor having a control electrode and first and second current carrying electrodes, comprising the steps of: providing a first means for passing current from the first current carrying electrode to the control electrode when an avalanche stress condition exists; providing a variable resistance which is controlled by the first means for passing current, wherein the variable resistance is coupled in series with the power transistor control electrode; and increasing the variable resistance when current flows in the first means for passing current.

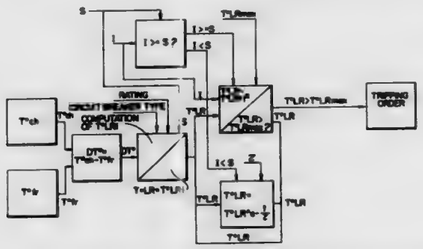
5,115,370
Patent Not Issued For This Number

5,115,371
CIRCUIT BREAKER COMPRISING AN ELECTRONIC TRIP DEVICE
Paul Tripodi, Eybens, France, assignor to Merlin Gerin, France
Filed Sep. 5, 1990, Ser. No. 577,605
Claims priority, application France, Sep. 13, 1989, 89 12083
Int. Cl.[5] H02H *5/04*
U.S. Cl. 361—106 15 Claims

1. A molded case electrical circuit breaker, comprising at least one connection terminal to a conductor designed to be protected by the circuit breaker, detection means of the current flowing in the conductor, measurement means of the temperature in a predetermined zone of the circuit breaker, an electronic trip device, to which the output signals from the current detection means and the temperature measurement means are applied, performing at least a delayed tripping function so as to generate a tripping order when the current ex-

ceeds preset thresholds, the trip device comprising means designed to modify a tripping function time delay in terms of the temperature measured when the circuit breaker closes, the circuit breaker comprising tripping means controlled by said tripping order,

the temperature measurement means comprising temperature measurements means in a cold zone of the case and



temperature measurement means in a hot zone of the case, in proximity to the connection terminals, the trip device comprising computation means of the temperature difference between the hot and cold zones, and means designed to modify the tripping function time delay in a manner inversely proportional to the temperature difference measured when the circuit breaker closes.

5,115,372

HIGH PURITY AROMATIC POLYESTERS

Edward F. Hampl, Jr., St. Paul, Minn.; Mohammad Iqbal, Austin, Tex., and Suzanne J. Thompson, Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 348,262, May 5, 1989, Pat. No. 4,967,306. This application Apr. 19, 1990, Ser. No. 512,047

Int. Cl.[5] H01G *3/175;* **C08K** *5/34*

U.S. Cl. 361—323 **24 Claims**

18. An electrical device comprising an electrical conductor insulated with an oligomer-free polyester said polyester consisting essentially of repeating interpolymerized units derived from 9,9-bis-(4-hydroxyphenyl)-fluorene and isophthalic acid and or terephthalic acid wherein said polyester is present in the form of a film coated onto the conductor by solution coating, and said electrical conductor is an amorphous metallic glass ribbon.

5,115,373

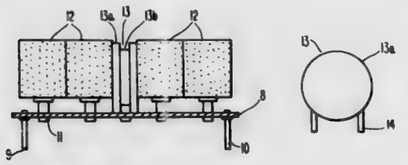
DIELECTRIC FILTER

Yukihiro Takeda, Kashihara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 11, 1991, Ser. No. 728,630

Int. Cl.[5] H01G *1/14;* **H01P** *1/205*

U.S. Cl. 361—329 **1 Claim**



1. A dielectric filter comprising:

a substrate;

a plurality of dielectric coaxial resonators arranged in a row on said substrate; and

an inductance element interposed between two of said plurality of dielectric coaxial resonators;

wherein said plurality of dielectric coaxial resonators are electrically connected in parallel through a capacitance, and said inductance element is electrically connected in parallel relative to said capacitance.

5,115,374

PORTABLE COMPUTER INCLUDING, FOR FACSIMILE TRANSMISSION, A DOCUMENT SCANNER INTEGRAL WITH THE DISPLAY MODULE

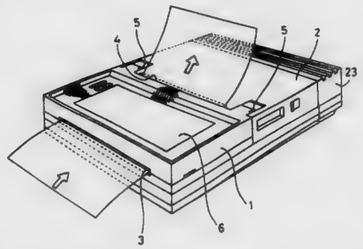
Nobuhiko Hongoh, Tokyo, Japan, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jul. 31, 1990, Ser. No. 560,393

Claims priority, application Japan, Aug. 2, 1989, 1-201146

Int. Cl.[5] H05K *5/00;* **G06F** *1/00*

U.S. Cl. 361—393 **11 Claims**



1. A portable computer comprising:

a main body having a keyboard, a disc drive, data processing means, and a communication modem;

a display module pivotally connected to said main body, said display module having first and second mutually opposite major sides, a computer display panel on said first major side, a paper feed slot, a paper release slot, a manuscript paper path within the display module extending between said paper feed slot and said paper release slot, a paper feed sensor within said display module at a first place along said path near said paper feed slot, an image scanner means within said display module at a second place along said path for converting scanned information into digital signals, and guide rollers actuated by a motor and positioned at a plurality of further places along the manuscript paper path; and

display connector means electrically connecting said display module to said main body so as to transport computer display drive signals from said main body to said display module.

5,115,375

SNAP-IN RETAINER SLEEVE

Antonio A. Garay, Roselle, Ill., assignor to Switchcraft Inc., Chicago, Ill.

Division of Ser. No. 402,742, Sep. 5, 1989, abandoned. This application Apr. 30, 1990, Ser. No. 517,976

Int. Cl.[5] H05K *7/02*

U.S. Cl. 361—400 **1 Claim**

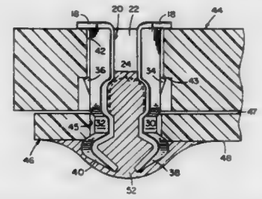
1. Apparatus comprising:

an electrical device having a hole with a first portion having a first diameter and a second portion having a second diameter larger than the first diameter providing a shoulder between the first and second portions;

a printed circuit board having an aperture with a third diameter;

a fastener inserted through the hole in the electrical device and the aperture in the printed circuit board for holding the electrical device to the printed circuit board, the fastener comprising a sleeve having a flange at one end engaging a surface of the electrical device adjacent the first portion of the hole, the sleeve having at least one sidewardly extended tab positioned within the second portion of the hole and engaging the shoulder to secure the fastener to the electrical device, the tab plus the sleeve having a dimension greater than the first diameter and the tab being inwardly flexible wherein the fastener is adapted for insertion legs-first into the first portion of the hole with the tab flexed inwardly until passing into the second portion wherein the tab flexes outwardly and engages the shoulder;

the fastener further comprising a pair of outwardly bowed



legs inserted through the aperture in the printed circuit board to secure the electrical device flushly against the printed circuit board, the outwardly bowed legs having a diameter larger than the third diameter and the legs being inwardly flexible wherein the fastener is adapted for inserting the legs through the aperture of the printed circuit board with the legs flexed inwardly until passing through the aperture wherein the legs flex outwardly to engage the printed circuit board to the electrical device; and

solder positioned between the legs and forming a rigid inner core for preventing the legs from flexing inwardly to remove said electrical device from said printed circuit board.

5,115,376

IC CARD EJECTING DEVICE

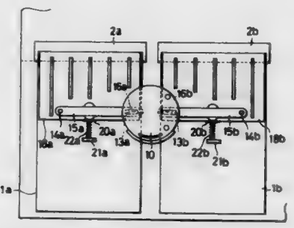
Akira Nakajima, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 13, 1990, Ser. No. 627,807

Claims priority, application Japan, Jan. 23, 1990, 2-5447

Int. Cl.[5] H05K *7/16*

U.S. Cl. 361—415 **6 Claims**



1. An IC card ejecting device for selectively ejecting one of two IC cards which are inserted in each of two connectors and are disposed in parallel to each other side by side, the device comprising:

a manipulation means for ejecting one of said two IC cards, which means is disposed at a position between said two IC cards and is movable in a first direction for ejecting one of said two IC cards and in a second direction opposite to said first direction for ejecting the other of said two IC cards;

a first pulling out means having a hook means which engages with one of said two IC cards;

a second pulling out means having a hook means which engages with the other of said two IC cards;

a first link means arranged between said manipulation means and said first pulling out means in such a way that said first link means engages with said first pulling out means and urges said first pulling out means in a direction of pulling out said one of said two IC cards from one of said two connectors when said manipulation means is moved in said first direction; and

a second link means arranged between said manipulation means and said second pulling out means in such a way that said second link means engages with said second pulling out means and urges said second pulling out means in a direction of pulling out said other of said two IC cards from the other of said two connectors when said manipulation means is moved in said second direction.

5,115,377

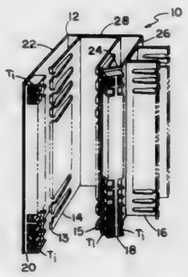
WIREWAY CHANNEL ASSEMBLY FOR ELECTRICAL CABINETS

Robert J. Dransman, West Chester, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jun. 3, 1991, Ser. No. 709,546

Int. Cl.[5] H01R *9/00*

U.S. Cl. 361—426 **5 Claims**



1. A wireway channel assembly for electrical cabinets comprising:

a. a channel member fabricated of a single piece of material and having a substantially "U" shaped cross section with at least one flange portion formed in a side thereof, the flange being oblique to the sides of the channel member;

b. a first wireway mounted inside the "U" of the channel member at the base thereof;

c. a second wireway mounted to the side of the channel member including the flange portion; and

d. a terminal strip mounted to the flange portion for terminating wires confined within the first and second wireways.

5,115,378

ELECTRIC DOUBLE LAYER CAPACITOR

Yoshinobu Tsuchiya, Fujisawa; Ken Kurabayashi, Chigasaki; Seiichiro Kito, Ayase, and Yoriaki Niida, Yamato, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Feb. 11, 1991, Ser. No. 653,286

Claims priority, application Japan, Feb. 9, 1990, 2-030829

Int. Cl.[5] H01G *9/00*

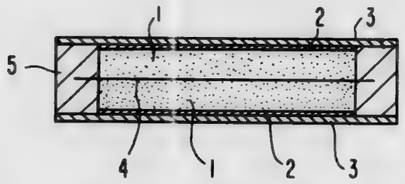
U.S. Cl. 361—502 **5 Claims**

1. An electric double layer capacitor having an electric double layer composed of an interface between activated carbon and electrolyte, comprising:

a pair of electrode bodies having surfaces confronting each other, each of said electrode bodies comprising a porous sintered body of joined active carbon particles;

a pair of electrically conductive layers formed on and fused

to respective other surfaces of said electrode bodies at the time the electrode bodies are sintered;
a separator interposed between said electrode bodies;
a gasket housing said electrode bodies and said separator therein; and



a pair of current collectors disposed on the respective other surfaces of said electrode bodies in contact with said electrically conductive layers, respectively, said current collectors having respective peripheral edges joined to said gasket.

5,115,379

COMPOSITE FILTER AND ILLUMINATING DEVICE

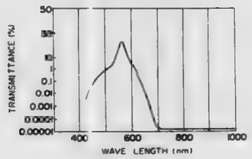
Kiyoshi Nagai, 228-91, Sachigawa, Oomiyashi Saitama, Japan

Continuation of Ser. No. 287,589, Dec. 4, 1988, abandoned, which is a continuation of Ser. No. 92,683, Sep. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 900,542, Aug. 26, 1986, abandoned. This application Dec. 31, 1990, Ser. No. 635,795

Claims priority, application Japan, Aug. 27, 1985, 60-130728

Int. Cl.[5] G01D *11/28*

U.S. Cl. 362—23 **6 Claims**





1. A composite filter comprising a dyed organic resin layer provided on a dyed glass plate, wherein the resin layer and the glass plate in combination absorb light of a radiation spectrum in the region of longer than 600 nm under the condition that the transmission of orange-red light at 650 nm is defined to a level in the range of 1×10^{-3} to 5% and the transmission of light at 800 nm is defined to a level of lower than 2×10^{-5}%.

5,115,380

TASK LIGHT PANEL

James H. Huisingh, and Edward L. Elzinga, both of Holland, Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

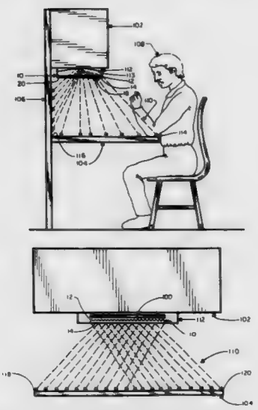
Continuation of Ser. No. 495,371, Mar. 19, 1990, Pat. No. 5,040,104. This application May 6, 1991, Ser. No. 682,091

The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.

Int. Cl.[5] F21V *5/08*

U.S. Cl. 362—33 **2 Claims**

1. In combination, a work station having a work surface illuminated by a light source, and a panel interposed between the light source and the work surface for distributing light onto the work surface, said work surface including front and rear edges and opposed side edges, said panel comprising a first surface and a second surface; and
a plurality of like asymmetrical first prisms on the panel first surface substantially parallel to the front edge; and
a plurality of asymmetrical second prisms on the second surface substantially parallel to a side edge;



said second prisms being substantially perpendicular to the first prisms;
said panel being positioned adjacent the light source and away from the work surface a sufficient distance so that the prisms will refract light from the light source substantially toward the area bounded by the front, rear, and side edges for uniform illumination of the work surface and away from the area outside the work surface.

5,115,381

MOTOR VEHICLE HEADLAMP AND REFLECTOR BODY FOR SAME

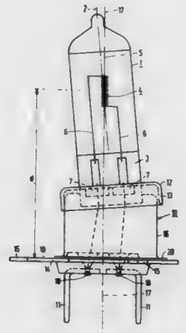
Johannes A. A. M. Van Heeswijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 26, 1990, Ser. No. 619,168

Claims priority, application Netherlands, Dec. 21, 1989, 8903129

Int. Cl.[5] B60Q *1/04*

U.S. Cl. 362—61 **7 Claims**



1. A motor vehicle headlamp comprising
a translucent lamp vessel (1) which is sealed in a vacuum-tight manner and is provided with an axis (2) and an end portion (3) having a seal;
a light source (4) having an axis (5) and positioned in the lamp vessel;
current supply conductors (6) which are connected to the light source and which extend from the lamp vessel to the exterior;
a holder body (10) provided with
electrically mutually insulated contacts (11) facing away from the lamp vessel, which contacts are connected to the current supply conductors (6);
a metal retaining member (12) which is fastened to the end portion (3) of the lamp vessel (1) without cement, which retaining member has a portion (13) which extends alongside the axis of the lamp vessel;
a positioning member ((14), (34)) having reference tabs ((15), (35)) for positioning the lamp vessel (1) inside a reflector body;
a metal coupling member (16) connected to the positioning member ((14), (34)) and telescopically fastened to the retaining member (12),
characterized in that the positioning member ((14), (34)) is a separate metal part of the holder body (10), to which the coupling member (16) is fastened, and in that the coupling member (16), before being fastened to the positioning member ((14), (34)) can be shifted in mutually perpendicular directions over a surface (19) of this positioning member ((14), (34)).

5,115,382

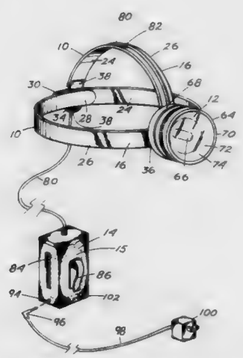
HEADLAMP APPARATUS

Robert C. Smith, 4440 Bacall Ct., Sacramento, Calif. 95842

Filed Sep. 28, 1990, Ser. No. 590,133

Int. Cl.[5] F21L *15/14*

U.S. Cl. 362—105 **4 Claims**



1. A headlamp apparatus for wearing by a human, comprising in combination:
a widely adjustable headband including an elongated flexible circumferential band member and an elongated flexible longitudinal band member;
said circumferential band member having two oppositely disposed terminal ends, one of said terminal ends affixed with an elongated portion of hook fastener, and the other of said terminal ends affixed with an elongated portion of loop fastener, said affixed hook and loop fasteners of said terminal ends placeable to be facing one another so as to be able to be releasibly connected together in an overlapping arrangement;
said longitudinal band member having one end thereof affixed to said circumferential band member generally centrally between said terminal ends of said circumferential band member and in a portion of said circumferential band member intended to be placed adjacent a person's forehead, a distal end of said longitudinal band member affixed with an elongated portion of hook fastener on one side thereof and further being affixed with an elongated portion of loop fastener on an oppositely disposed side from said hook fastener of said longitudinal band member, said hook fastener of said longitudinal band member placeable to be facing said loop fastener of a said terminal end of said circumferential band member simultaneously with said loop fastener of said longitudinal band member facing said hook fastener of the other said terminal end of said circumferential band member;
said elongated portions of said hook and loop fasteners of said terminal ends of said circumferential band member being sufficiently elongated to provide for adjustability of placement against one another so as to allow said circumferal band member to be snugly affixed around a variety of head sizes simultaneously with said distal end of said longitudinal band member being sandwiched and affixed between said terminal ends of said circumferential band member with said loop fastener of said longitudinal band member affixed to said hook fastener of one said terminal end, and said hook fastener of said longitudinal band member affixed to said loop fastener of the other said terminal end of said circumferential band member, said elongated hook and loop fastener portions of said distal end of said longitudinal band member being sufficiently elongated so as to allow for adjustable fastening thereof to and between said terminal ends with said longitudinal band member extending across a person's head simultaneously with said circumferential band member affixed around the person's head;
a lamp assembly affixed generally centrally to said circumferential band member by an adjustably positionable linkage member, said linkage member providing connective structural means between said headband and said lamp assembly to allow both selective vertical and horizontal positioning of said lamp assembly, said lamp assembly including a lamp housing having a lens affixed in a free end of said housing generally oppositely disposed from said linkage member, a reflector retained inside said housing, a lamp socket within said housing, an electric lamp releasably mounted in said lamp socket and positioned at least in part between said reflector and said lens, means providing selective adjustability of spacing between said lens and said lamp for focusing light emitted from said lamp;
a remote battery housing containing at least one battery, electrical conductors extending between said battery housing and said lamp socket to circuit electrical power from said battery to said lamp, an electrical on/off switch in line with at least one of said electrical conductors to provide means for turning said lamp on and off, said battery housing having means for releasable attachment onto an article of clothing;
voltage transforming and cord means connectable to and between a remote A/C power outlet and an electrical jack on said battery housing for recharging said battery with said battery contained within said battery housing, said voltage transforming and cord means further providing means for supplementing electrical power circuited from said battery to said lamp to extend a period of time which said lamp may be operated.

5,115,383

GAME LIGHT APPARATUS

Norman K. Lee, 70 Russell St., San Francisco, Calif. 94109

Filed Nov. 5, 1990, Ser. No. 610,158

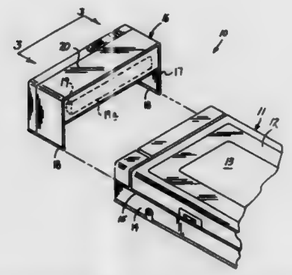
Int. Cl.[5] F21V *33/00*

U.S. Cl. 362—109 **4 Claims**

1. A game light apparatus comprising, in combination,
an electronic game member including a housing, with the housing including a top wall orthogonally arranged relative to spaced parallel side walls, the top wall including a viewing screen directed therethrough, and each side wall

includes a groove member arranged parallel to the top wall and spaced at a predetermined equal spacing from the top wall, and

an illumination member, wherein the illumination member includes a "U" shaped housing, with the "U" shaped housing including spaced parallel side legs, each side leg of the side legs securable to a respective side wall of the game member; and



wherein each side leg of the "U" shaped housing is formed of an equal predetermined length, and each lower terminal end of each side leg includes an elongate cylindrical runner, each cylindrical runner of each side leg complementarily receivable within a respective groove member of a side wall, and

wherein the illumination member includes a translucent illumination plate arranged between the side legs and underlying a top plate of the "U" shaped housing and including an illumination bulb contained therewithin.

5,115,384
SOFT LIGHT

Stanislaw Loth, Nanuet, N.Y., and Volker W. Bahnemann, Greenwich, Conn., assignors to Arriflex Corporation

Filed Nov. 15, 1990, Ser. No. 614,506
Int. Cl.[5] F21V *7/00*
U.S. Cl. 362—301 **10 Claims**



1. A soft light, comprising:

a housing having a front opening and a hinged upper portion;

a light source arranged in a lower frontal position in said housing;

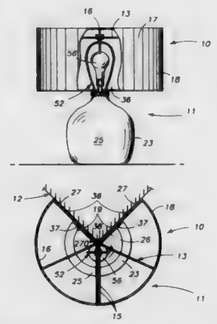
internal reflector means for directing light from said light source toward a rear portion of said housing opposite the front opening; and

a rear reflector removably mounted at the rear portion of said housing so as to reflect the light from the light source and the internal reflector means out of the front opening of said housing.

5,115,385
SHAPED LAMP SHADE

William A. Jeckle, N. 2215 Houk Ct. #14, Spokane, Wash. 99216

Filed Jan. 29, 1991, Ser. No. 647,047
Int. Cl.[5] F21V *1/04*
U.S. Cl. 362—358 **11 Claims**



1. A wall conforming shaped lamp shade mountable to a lamp base, comprising:

a frame;

a lamp shade formed over the frame;

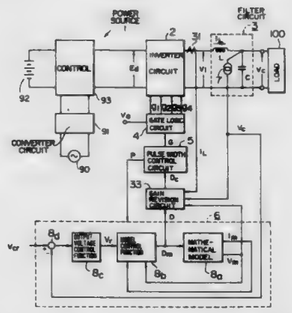
wherein the lamp shade and frame are shaped to accommodate a complementary structure wall surface configuration when positioned adjacent thereto; and

shade mounting means including a slide member with means for releasably securing the frame and lamp shade to the lamp base for translational sliding movement of the lamp shade relative to the lamp base toward or away from the structure wall surface.

5,115,386
CIRCUIT FOR CONTROLLING AN ELECTRIC POWER SUPPLY APPARATUS, A METHOD THEREFOR AND AN UNINTERRUPTIBLE POWER SUPPLY

Hidefumi Shirahama; Ikuo Yamato; Norikazu Tokunaga, all of Hitachi, Japan; Yasuo Matsuda, Eastchester, N.Y.; Mitsufumi Iwanaka, Hitachi, Japan; Takeshi Nagano, Yokohama, Japan, and Youuji Ishida, Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Oct. 15, 1990, Ser. No. 597,338
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—41 **20 Claims**



1. A control circuit for an electric power supply apparatus adapted to convert electric power supplied from an electric power supply source to variable frequency and variable voltage AC electric power by a converter including a plurality of switching elements and to supply said converted electric power to a load, said control circuit comprising:

a detector for detecting an output voltage applied to said load;

a processing circuit for generating a pulse width reference value in response to a value detected by said detector and an output voltage reference value;

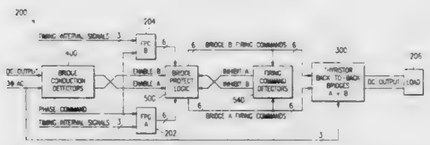
a pulse width control circuit for generating a gate reference signal by the use of said pulse width reference value; and

a gate logic control circuit for generating gate pulses for said plurality of switching elements in response to said gate reference signal.

5,115,387
CIRCUITRY AND METHOD OF PROTECTING THYRISTORS

Luther Miller, Plano, Tex., assignor to Polyspede Electronics Corporation, Dallas, Tex.

Filed Aug. 14, 1990, Ser. No. 567,151
Int. Cl.[5] H02M *7/757*
U.S. Cl. 363—54 **27 Claims**



1. A circuit for detecting conduction in at least two thyristors arranged in a back-to-back relationship, the circuit comprising:

means for monitoring the voltage drop across both said thyristors;

means for providing a CONDUCTING signal in response to said monitored voltage drop reaching at least a predetermined level indicative of forward conduction;

means for providing a NOT-CONDUCTING signal in response to said monitored forward voltage drop being is greater than said predetermined level or said monitored voltage drop is indicative of reverse bias;

a processor for controlling the firing of said thyristors in accordance with said CONDUCTING and NOT-CONDUCTING signals; and

an enable circuit responsive to conduction in said thyristors for preventing the firing of either of said thyristors while one of said thyristors is forward biased to said predetermined conduction level, said enable circuit having first and second ENABLE outputs.

5,115,388
TEMPERATURE RESPONSE PROTECTION CIRCUIT FOR BRIDGE INVERTER

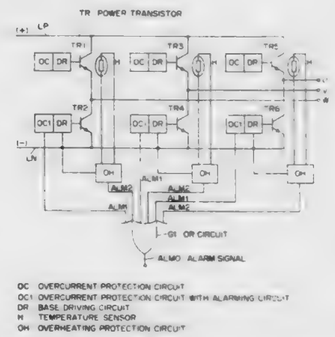
Hisao Shigekane, Matsumoto, Japan, assignor to Fuji Electric Co., Ltd., Japan

Filed Feb. 26, 1991, Ser. No. 661,513
Claims priority, application Japan, Feb. 26, 1990, 2-45016
Int. Cl.[5] H02H *7/122*
U.S. Cl. 363—56 **10 Claims**

1. A semiconductor device for converting direct current into alternating current, comprising a plurality of parallel-connected pairs of series-connected power transistors,

each pair of power transistors comprising a first transistor whose base is connected to a common positive input terminal, and a second transistor whose emitter is connected to a common negative input terminal,

said device further comprising first and second overcurrent protection means respectively associated with first and second transistors,

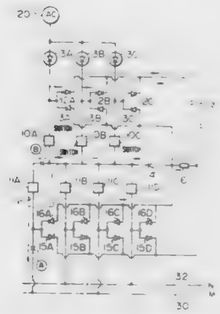


said first overcurrent protection means comprising temperature sensing means, and said second overcurrent protection means comprising current sensing means.

5,115,389
DC POWER SUPPLY CIRCUIT ARRANGEMENT

Shigetoshi Ouchi; Tatsuji Shirouzu; Shinichi Ode, all of Hitachi; Takasi Ichinose, Ibaraki, and Tutomu Kanno, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 4, 1990, Ser. No. 577,024
Claims priority, application Japan, Sep. 6, 1989, 1-229179
Int. Cl.[5] H02M *7/162*
U.S. Cl. 363—125 **10 Claims**



1. A DC power supply circuit arrangement for supplying DC power from a power source to a load, comprising:

a common conductor;

a plurality of switches each having one terminal directly connected to the power source and the other terminal directly connected to said common conductor;

first circuit means for connecting said common conductor to the load;

energy absorbing means having two terminals;

first diode means connected between the one terminal of each of said plurality of switches and one of the two terminals of said energy absorbing means in a polarity so as to allow a current to flow from the one terminal of a respective switch to the one terminal of said energy absorbing means;

second diode means connected between the one terminal of each of said plurality of switches and the other terminal of said energy absorbing means in a polarity so as to allow a current to flow from the other terminal of said energy

absorbing means to the one terminal of said respective switch; and

second circuit means for connecting the other terminal of said energy absorbing means to said common conductor.

5,115,390

CONTROL DATA INPUT APPARATUS

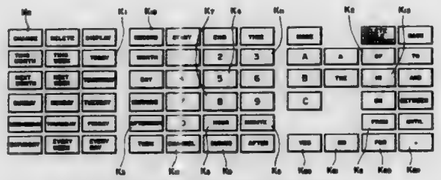
Joji Fukuda, Kanagawa; Seiichi Misawa, Saitama, and Takaaki Enomoto, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 13, 1989, Ser. No. 434,432

Claims priority, application Japan, Nov. 15, 1988, 63-288125

Int. Cl.[5] G06F *15/403*

U.S. Cl. 364—146 **3 Claims**



1. A control data input apparatus comprising;

word input means having an input keyboard for manual actuation by a user and including a plurality of keys corresponding to a plurality of words of a natural language and to a plurality of alphanumeric characters, combinations of said words and characters selected by the user representing control command sentences for a controlled system; and

natural language processing means responsive to said plurality of words and alphanumeric characters from said input keyboard of said word input means for analyzing said control command sentence formed by a selected combination of said words and characters from said word input means and determining that said selected combination forms a complete sentence that is a valid one of said control command sentences and forming data corresponding to said complete sentence represented by said selected combination of natural language words and alphanumeric characters,

wherein said data corresponding to said yield one of said control command sentences represented by said natural language words and alphanumeric characters and analyzed by said natural language processing means is fed to said controlled system.

5,115,391

KALMAN FILTER-BASED OPTIMIZER AND METHOD AND OPTIMIZING

Sarat C. Puthenpura, Jackson, and Lakshman P. Sinha, East Brunswick, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 26, 1990, Ser. No. 471,175

Int. Cl.[5] G06F *15/20*

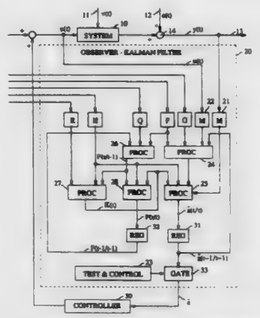
U.S. Cl. 364—152 **12 Claims**

1. Apparatus comprising:

a filter having first and second input ports an output port, which filter develops at said output port an estimate of the state of a system whose observable output corresponds to the input signal applied to said first input port, and whose output matrix, which relates said observable output to the current state of said system, corresponds to the input signal to said second input port;

a combiner responsive to said output port of said filter, to a first input port of said apparatus, and to a second input port of said apparatus, where said first input port of said apparatus is adapted to receive a collection of signal elements representative of a matrix A, said second input port of said apparatus is adapted to receive a collection of signals representative of a vector c, and said combiner develops an output signal γ that is proportional to $c-A^Tw$, where w is the signal at said output port of said filter, where A^T is the transpose of of matrix A and A^Tw is the product of the matrix A^T by the vector w;

a processor responsive to said outpput port of said filter, to said first input port of said apparatus, to said second input port of said apparatus, and to the signal γ, for developing a replacement control signal candidate, $x(k+1)$, based on



said γ, A, c, and a current control signal candidate, x(k), and for incrementing k, where k is an integer,

means for developing a signal $D_{x(k)}$, a signal $D_{x(k)}c$, and a signal $A^TD_{x(k)}$, where $D_{x(k)}$ represents a diagonal matrix with the values of x(k) on the diagonal;

means for applying said $D_{x(k)}c$ signal to said first input port of said filter, and said $A^TD_{x(k)}$ signal to said second input port of said filter; and

means for applying said x(k) signal to an output port of said apparatus.

5,115,392

METHOD AND APPARATUS FOR MULTI-TRANSACTION BATCH PROCESSING

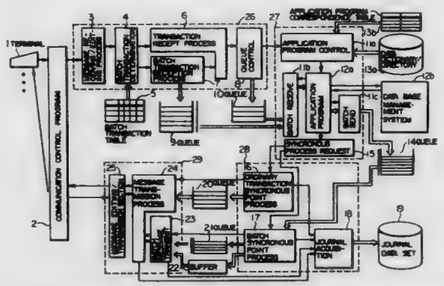
Yoshifumi Takamoto, Hachioji, and Shunichi Torii, Musashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1987, Ser. No. 106,062

Claims priority, application Japan, Oct. 9, 1986, 61-239009

Int. Cl.[5] G06F *15/16, 3/02*

U.S. Cl. 395—650 **13 Claims**



1. A transaction processing method which implements transaction processing in a data communication management system in which a transaction causes an application program to start, said method comprising with an electronic apparatus executing the steps of:

essentially determining whether a transaction is to be batch processed in accordance with a type of the application program required by said transaction;

storing said transaction in a batch process transaction queue when said transaction is determined to be batch processed;

starting an application program which electronically processes transactions stored in said batch process transaction queue when a predetermined condition is met, and upon termination of electronic processing of said application program, issuing once a synchronous point acquisition request for all processed transactions so as to acquire synchronous points of transactions in a batch fashion; and

transmitting transmission messages of said processed transactions in a batch fashion, after batch acquisition of synchronous points for the transactions has been made.

5,115,393

VECTOR PROCESSOR PERFORMING DATA OPERATIONS IN ONE HALF OF A TOTAL TIME PERIOD OF WRITE OPERATION AND THE READ OPERATION

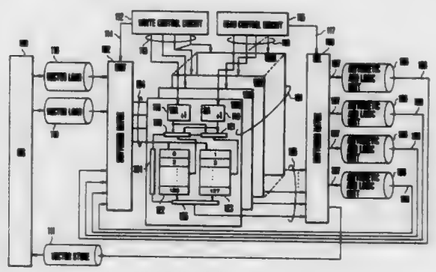
Masamori Kashiyama; Koichi Ishii, both of Hadano; Shun Kawabe, Machida, and Masami Usami, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 399,917

Claims priority, application Japan, Sep. 14, 1988, 63-228326

Int. Cl.[5] G06F *15/347, 12/04, 9/28, 9/38*

U.S. Cl. 395—425 **6 Claims**



1. A vector processor comprising:

a vector register including a RAM which stores vector elements, the RAM requiring a first time period to perform a write operation and a second time period to perform a read operation, the first time period being longer than the second time period, whereby time in excess of the second time period allocated for a read operation is wasted;

pipeline processing units which perform data operations to obtain a data operation result in connection with the vector element, the pipeline processing units performing each data operation in a third time period, the third time being an average of the first time period and the second time period, whereby the data operations are performed more quickly than the write operations and more slowly than the read operations;

data transferring units connected between the pipeline processing units and the vector register for transferring vector elements between the pipeline processing units and the RAM;

clock generating means for generating a clock cycle signal with clock cycles equal to the third time period, whereby the data operations are performed in one half of a total time period of the write operation and the read operation;

the vector register including a plurality of banks for sequentially storing the vector elements, each successive vector element being stored in a different bank from an immediately preceding vector element;

a holding means synchronized with the clock cycle signal for receiving and holding the vector elements from the data transferring units and selectively supplying the vector elements sequentially to the plurality of banks, the holding means including a plurality of holding units which correspond to the plurality of banks;

first address generation means synchronized with the clock cycle signal for generating write addresses and for sequentially providing each of the write addresses to the plurality of banks for the first time period, whereby each write address is provided for a time longer than the third time period;

write means for selectively writing the vector elements held in the holding units sequentially into the plurality of banks in accordance with the write addresses, whereby the write operation lasts longer than one clock cycle;

second address generation means synchronized with the clock cycle signal for generating read addresses and for providing each of the read addresses sequentially to the plurality of banks for the second time period, whereby each read address is provided for less than one clock cycle;

read means for selectively reading out the vector elements sequentially from the plurality of banks in accordance with the read addresses, whereby the read operation is shorter than one clock cycle;

a means for providing read vector elements to the pipeline processing units, whereby the read and write operation taken together are twice the data operation time and whereby utilizing two of the banks alternatively, one synchronized with even and the other with odd cycles enables the vector processor to operate with a clock cycle time that is shorter than the time required for the write operation.

5,115,394

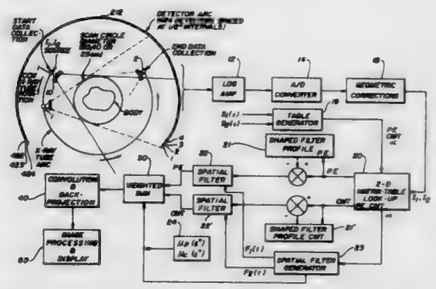
DUAL ENERGY COMPUTERIZED TOMOGRAPHY SYSTEM

Ronald G. Walters, Aurora, Ohio, assignor to Technicare Corporation, Solon, Ohio

Filed Nov. 25, 1983, Ser. No. 555,105

Int. Cl.[5] G06F *15/42*

U.S. Cl. 364—413.17 **9 Claims**



1. In a multiple energy scanning system wherein each energy scan is selected for predominant emphasis of data from a different one of first and second basis sets and wherein first and second images are first reconstructed based respectively on data from each of said basis sets, imaging apparatus comprising:

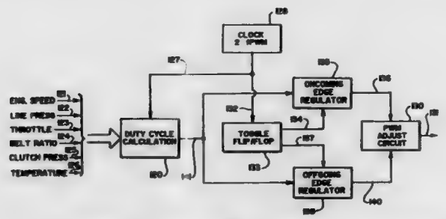
a) means for developing a first filter function for convolution with said first image;

b) means for developing a second filter function for convolution with said second image;

c) means for dynamically varying said first and second filter functions relative to one another for maintenance of mu-

tual orthogonality of said basis sets thereby to provide cancellation of correlated noise components;
d) means, responsive to said respective means for developing, for performing said respective convolutions; and
e) means for developing a composite image as a composite weighted superposition of said respective convolved images.

5,115,395
PULSE WIDTH MODULATION TECHNIQUE
Werner P. Petzold, Harwood Heights, Ill., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.
Continuation-in-part of Ser. No. 497,727, Mar. 19, 1990, which is a continuation of Ser. No. 25,477, Mar. 12, 1987, abandoned. This application Jul. 19, 1990, Ser. No. 555,715
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—424.1 **5 Claims**

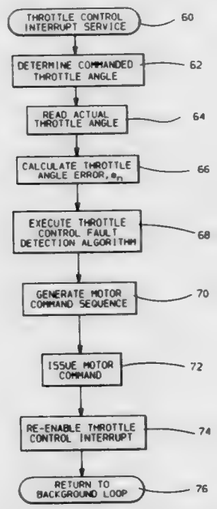


1. A system for generating a pulse-width-modulation (PWM) control signal for controlling a clutch control valve in a continuously variable transmission system comprising:
clock means for generating a clocking signal at twice a selected PWM modulation rate;
digital duty cycle calculation means responsive to said clocking signal for sampling selected operating characteristics of said continuously variable transmission system and generating an output signal representative of a duty cycle for said clutch control valve;
pulse generating means responsive to said duty cycle output signal from said calculation means and to said clocking signal to generate a train of pulses at said selected PWM modulation rate as a control signal for said clutch control valve, whereby each pulse in said control signal reflects two duty cycle calculations.

5,115,396
ACTUATION VALIDATION ALGORITHM
Kevin R. Keegan, Hilton, N.Y., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 13, 1990, Ser. No. 552,171
Int. Cl.[5] G05B *13/04*; **F02D** *41/04*
U.S. Cl. 364—431.04 **9 Claims**

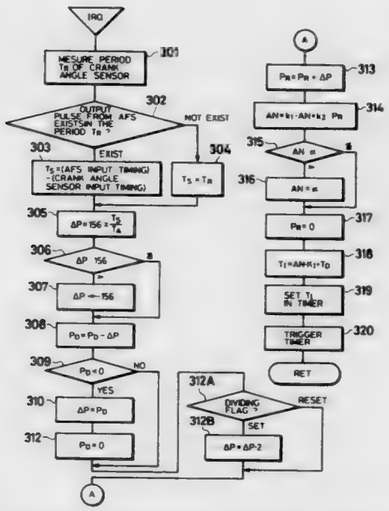
1. A method of detecting a fault condition in a control system which controls the position of a movable body from a present actual position to a commanded position, the method comprising the steps of:
measuring the present actual position of said movable body;
generating the commanded position of said movable body;
calculating the rate of change in the commanded position of said movable body;
establishing an error limit by (a) setting the error limit to a reset value which is a predetermined function of the calculated rate of change in the commanded position of said movable body when the reset value is greater than the error limit value and (b) decaying the error limit value by means of a predetermined decay rate when the reset value is less than the error limit value;
calculating the error in said position, said error comprising the difference between said commanded position and said actual position;
comparing said position error to said error limit;
indicating a fault condition when said position error exceeds said error limit.

5. An apparatus for detecting a fault condition in a commanded throttle angle tracking system in an internal combustion engine, comprising:
a throttle blade seated in the bore of the air inlet of said engine, said blade being rotatable with respect to said bore to control the amount of air allowed into said engine;
rotational actuating means connected to said blade to rotate said blade with respect to said bore;
blade angle commanding means for commanding a blade angle of said blade with respect to said bore, corresponding to a desired amount of air to be allowed into said engine;
means for determining the rate of change of said blade angle command from said blade angle commanding means;
actuator control means for controlling said actuating means to rotate said blade to an angle corresponding to said commanded blade angle from said blade angle commanding means;



blade angle measuring means connected to said blade to measure the angular displacement of said blade with respect to said bore;
blade angle error computing means for computing the blade angle displacement error, said error comprising the difference between said commanded blade angle and said measured blade angle;
error limit determining means for determining limit an error value of said blade angle error, comprising (a) means for resetting said error limit to a reset value that is a function of said rate of change of said commanded throttle angle when said reset value is greater than said error limit value, and (b) means for decaying said error limit value when said reset value is less than said error limit value, said decaying means having a rate of decay proportional to a normal response time of the system to changes in said commanded throttle angle;
comparing means for comparing said blade angle error to said error limit;
fault signaling means for indicating a fault condition when said blade angle error exceeds said error limit.

5,115,397
SURGE-CORRECTED FUEL CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE
Akira Takahashi, Kyoto; Yoshiaki Kanno, Hyogo; Jiro Sumitani, Hyogo; Katsuya Nakamoto, Hyogo; Takeo Sasaki, Hyogo, and Masahira Akasu, Hyogo, all of Japan, assignors to Mitsubishi Jidosha Kogyo K.K. and Mitsubishi Denki K.K., both of Tokyo, Japan
Continuation of Ser. No. 886,846, Jul. 18, 1986, abandoned. This application Jul. 3, 1990, Ser. No. 547,541
Claims priority, application Japan, Jul. 18, 1985, 60-158532
Int. Cl.[5] F02D *41/18*
U.S. Cl. 364—431.05 **4 Claims**



1. A fuel control apparatus for an internal combustion engine having a throttle valve and a combustion chamber, comprising:
an air flow rate sensor disposed upstream of said throttle valve for generating a first output signal in proportion to a quantity of air sucked into said internal combustion engine;
a crank angle sensor for generating a second output signal every predetermined crank angle of said internal combustion engine;
detection means for calculating an air quantity Q_a passed through said air flow rate sensor based on said first output signal in every section which is divided by said second output signal;
operation means for sequentially calculating a value of Q_e on the basis of an expression

$$Q_e(n)=K\times Q_e(n-1)+(1-K)\times Q_a(n)$$

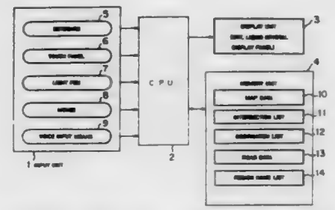
wherein Q_e represents an air quantity sucked in said combustion chamber of said internal combustion engine, $Q_e(n)$ represents Q_e in the n-th section, $Q_e(n-1)$ represents Q_e in the $(n-1)$th section, and $Q_a(n)$ represents Q_a in the n-th section, and $K=1/(1+V_c/V_s)$; where V_c represents a volume of air sucked into the internal combustion engine per stroke, and V_s represents a volume of the path from the throttle valve to the internal combustion engine; and
control means for controlling a quantity of fuel to be supplied to said internal combustion engine based on said Q_e obtained by said operation means.

5,115,398
METHOD OF DISPLAYING NAVIGATION DATA FOR A VEHICLE IN AN IMAGE OF THE VEHICLE ENVIRONMENT, A NAVIGATION SYSTEM FOR PERFORMING THE METHOD, AND A VEHICLE COMPRISING A NAVIGATION SYSTEM
Durk J. De Jong, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.
Continuation of Ser. No. 545,318, Jun. 27, 1990, abandoned. This application Jul. 29, 1991, Ser. No. 737,815
Claims priority, application Netherlands, Jul. 4, 1989, 8901695
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—443 **9 Claims**



7. A vehicular navigation display system for displaying navigation data generated by a navigation system in conjunction with an image of a local vehicle environment, comprising: an image pick-up means for generating an image of the local environment, a transformation means for transforming said navigation data in conformity with a position of the image pick-up means with respect to the environment, a video generator means for generating an indication signal from the transformed navigation data for marking a path to be followed with respect to the environment, a combination means for combining the image of the environment and the indication signal so as to form a combined image signal representing said indication signal superimposed on the image of the environment, and a display unit for displaying the combined image signal.

5,115,399
POSITION INPUT SYSTEM FOR VEHICULAR NAVIGATION APPARATUS
Mitsuhiro Nimura; Shoji Yokoyama; Takashi Yamada; Koji Sumiya, and Shuzo Moroto, all of Anjo, Japan, assignors to Kabushiki Kaisha Shinsangyokaihatsu and Aisin AW Co., Ltd., both of, Japan
Continuation of Ser. No. 290,202, Dec. 27, 1988, abandoned. This application Nov. 26, 1990, Ser. No. 618,021
Claims priority, application Japan, Dec. 28, 1987, 62-333052
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—449 **5 Claims**



1. A navigation system for a vehicle having a position input system for assisting vehicle navigation to a desired destination, which comprises:
input means for inputting said desired destination and for

inputting a present intersection position in terms of characters or code numbers identifying the present intersection;

memory means for storing information about said desired destination and map information; said map information including an intersection list and a road data list; said intersection list including information of landmarks located in the vicinity of respective intersections; said road data list including starting point intersection information and ending point intersection information;

display means for displaying guidance information; and

control means for controlling said display means to display the present intersection, roads in said road data list having starting point information corresponding to said intersection and a landmark in the vicinity of said intersection, wherein said control means includes means for determining a line bisecting an angle between two roads displayed on said display means and intersecting at said intersection, and means for positioning the display of the landmark on the bisecting line a selected distance from said intersection;

said input means further including means for inputting a present road position by identifying one of said displayed roads relative to said landmark as displayed on said display means.

5,115,400

CAD/CAM APPARATUS

Kotaro Watanabe, and Tetsu Itaba, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1990, Ser. No. 501,821
Claims priority, application Japan, May 8, 1989, 1-114645
Int. Cl.[5] G06F *15/46*; G05B *19/403*
U.S. Cl. 364—474.24 **6 Claims**

1. A CAD/CAM apparatus comprising:

geometric shape generation means for generating a plurality of geometric shapes to be machined in an interactive manner with a display screen;

machining attribute definition means for defining a machining attribute to be assigned to a desired geometric element of each geometric shape to be machined;

machining process definition means for defining a machining process including a machining path, machining order of each geometric element of each geometric shape to be machined;

storage means for storing machining attribute information and machining process information for each geometric element of each geometric shape to be machined;

machining process edition means for re-editing the machining process information stored in said storage means over again according to a change in machining conditions; and

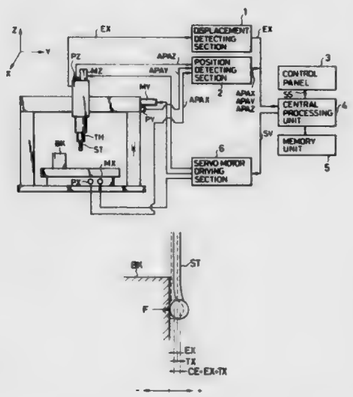
NC information generation means for generating and outputting NC information on the geometric shapes to be machined including the machining attribute information and the machining process information for each geometric element of each geometric shape to be machined.

5,115,401

METHOD FOR AUTOMATICALLY CORRECTING DEFLECTION OF STYLUS IN DIGITIZING DEVICE

Hiroshi Oyama, and Takao Hasebe, both of Ooguchi, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Filed Nov. 27, 1989, Ser. No. 441,318
Claims priority, application Japan, Nov. 28, 1988, 63-300048
Int. Cl.[5] G06F *15/46*; G01B *9/00*
U.S. Cl. 364—474.37 **3 Claims**



1. A method for automatically correcting a deflection of a stylus in a digitizing device wherein the stylus held at a tracer head in the digitizing device is moved along surfaces of a three-dimensional model, and digitized data representing a configuration of the three-dimensional model is calculated from the relative position between said three-dimensional model and said tracer head and the displacement of said stylus, said method comprising the steps of moving said stylus in a direction of a predetermined axis relative to said three-dimensional model, determining the relative position as a first relative position when a displacement of said stylus approximates a predetermined first displacement, determining the relative position as a second relative position when the displacement of said stylus approximates a predetermined second displacement, automatically obtaining a deflection correction coefficient of said stylus based on said first and second displacements and the first and second relative positions, and automatically correcting the displacement of said stylus using the thus obtained deflection correction coefficient, wherein said deflection correction coefficient is $(1+k_1/k_2)$, where k_1 is an elastic coefficient of a spring which holds said stylus in place and k_2 is an elastic coefficient of the stylus.

5,115,402

SCAN-CONVERSION PROCESS AND PROCESSOR FOR CONVERTING A GRAPHIC PRIMITIVE TO A PIXEL MAP

Nobuhito Matsushiro; Hazime Hatanaka; Takayoshi Yoshida, and Ikuo Oyake, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1989, Ser. No. 390,818
Claims priority, application Japan, Aug. 15, 1988, 63-201966
Int. Cl.[5] G06F *15/62*
U.S. Cl. 395—141 **18 Claims**

12. A scan-conversion processor for converting a graphic primitive, defined in an x-y coordinate system by an outline comprising vertices joined by edges, to pixel data disposed on scan lines parallel to the x-axis of the x-y coordinate system, comprising:

an input register for temporarily storing graphic primitive input data;

an output register for temporarily storing information such as commands and requests;

a control unit for controlling said input register and said output register;

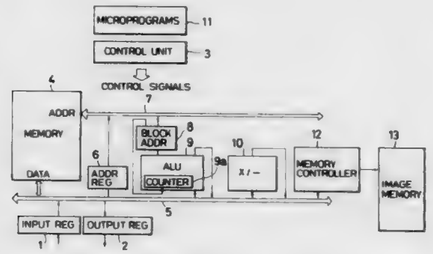
a scan-conversion memory connected to and controlled by said control unit for storing graphic primitive data acquired via said input register, vertex data blocks linked cyclically be vertex pointers, and edge data blocks storing at least a minimum y-coordinate value, a maximum y-coordinate value, an x-coordinate value, and an x-coordinate increment value, respectively, said edge data blocks being linked by edge chain pointers on a plurality of edge chains in ascending order of said minimum y-coordinate values;

a data bus for interconnecting said input register, said output register and said scan-conversion memory;

an address register connected to said data bus and said control unit and controlled by said control unit for indicating locations at which data are stored in said scan-conversion memory;

an address bus connected to said address register for conveying address information from said address register to said scan-conversion memory;

a block address register file connected to and controlled by said control unit for furnishing the addresses of said vertex data blocks and said edge data blocks to said scan-conversion memory via said address bus, and for storing starting edge pointers to said edge chains;



an arithmetic and logic unit connected to and controlled by said control unit and connected to said data bus and said block address register file for receiving, for example, block address information from said block address register file, and executing addition, substraction, and logical operations thereon;

a multiplier/divider connected to and controlled by said control unit and connected to said data bus for executing multiplication and division operations for calculating values such as increment values;

a microprogram storage unit connected to and controlled by said control unit for storing microprograms executed by said control unit, comprising a first microprogram for creating said vertex data blocks from said graphic primitive input data, a second microprogram for constructing said edge data blocks from said vertex data blocks, and a third microprogram for scanning said graphic primitive on successive scan lines, using said edge chains to identify edges intersecting respective scan lines, using said x-coordinate values to create segments disposed on respective scan lines in the interior of said graphic primitive, converting said segments to pixel data, and using said x-coordinate increment values to update said x-coordinate values; and

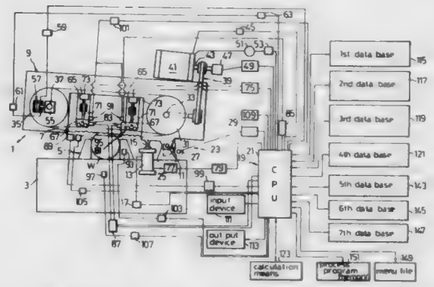
a memory controller connected to and controlled by said control unit and connected to said data bus for receiving said pixel data and writing them in an external device such as an image memory.

5,115,403

WORKPIECE WORKABILITY DETECTION METHOD AND A METHOD FOR CUTTING A WORKPIECE BY MEANS OF A CUTTING MACHINE UTILIZING THAT METHOD

Akiyoshi Yoneda, Akashi; Mitsuyoshi Sawamura, Kobe; Kikuo Tanaka, Ono, and Takashi Kokado, Kasai, all of Japan, assignors to Amada Company, Limited, Japan

Filed Feb. 3, 1989, Ser. No. 305,759
Claims priority, application Japan, Feb. 4, 1988, 63-22878; Mar. 30, 1988, 63-74753; Mar. 30, 1988, 63-74754; Apr. 4, 1988, 63-81186
Int. Cl.[5] G06F *15/46*; B23D *45/00*
U.S. Cl. 364—474.15 **18 Claims**



1. A workability detection method for cutting a workpiece, comprising the steps of:

cutting a workpiece up to a certain position as a result of which the load on a blade of the cutting machine is kept relatively small;

detecting the cutting resistance during the cutting operation;

comparing the detected data with back-up data which has been previously obtained and stored in a data base of a data storing means for the workpiece cut by the same type of blade; and

judging workability of cutting by determining whether the detected data is within a predetermined range of values stored in the database.

5,115,404

DIGITAL STORAGE OSCILLOSCOPE WITH INDICATION OF ALIASED DISPLAY

Pei-hwa Lo, Ramsey, N.J., and Tran Thong, Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 23, 1987, Ser. No. 138,221
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—143 **3 Claims**

1. A method of processing a sequence of n sample values occurring during a recording interval, comprising:

(a) determining which of the n sample values is the smallest,

(b) determining which of the n sample values is the largest,

(c) determining whether the smallest sample value occurred before or after the largest sample value and loading the smallest sample value into one of first and second memory portions in dependence upon whether the smallest sample value occurred before or after the largest sample value and loading the largest sample value into the other of the first and second memory portions,

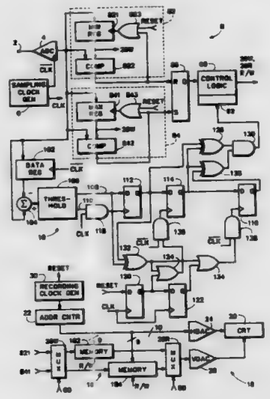
(d) determining whether the rate of change of sample value with respect to time changed in sign more than twice during the recording interval,

(e) repeating steps (a)–(d) m times, where m is an integer greater than three, whereby 2m sample values are stored,

(f) reading the stored sample values, and

(g) in the event that the sign of the rate of change of sample value with respect to time is determined to have changed

more than twice during a recording interval, utilizing the read sample values for that recording interval as coordinates that are plotted on a display device to create a display thereon of a first trace representing the value stored in the first memory portion for that recording interval and a second trace representing the value stored in the second memory portion for that recording interval.

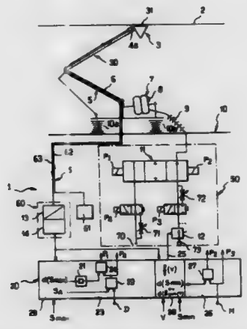


5,115,405

DEVICE FOR ADJUSTING THE BEARING FORCE OF A PANTOGRAPH ON A CATENARY WIRE AND PROCESS RELATING THERETO

Jacques Cathala, Balan-Mire, and Pascale Forte, Tours, both of France, assignors to Faiveley Transport, St-Ouen Cedex, France

Filed Apr. 19, 1990, Ser. No. 513,486
Claims priority, application France, Apr. 28, 1989, 8905653
Int. Cl.[5] B60L *5/16*
U.S. Cl. 364—550 **22 Claims**



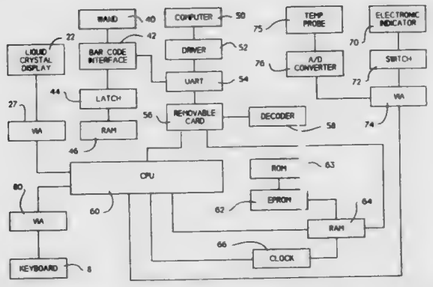
15. Process for adjusting the bearing force of a pantograph (30) of a railroad train set (10) exerted on a catenary wire (2) by a bow (3), the pantograph (30) being connected to controlled actuator means (7) exerting a nominal force on it at predetermined points and in a predetermined direction which comprises a step of measuring the contact force (Fc) between the bow (3) of the pantograph (30) and the catenary wire (2), a step of comparing the measured force (Fc) with a maximum contact-force threshold (Smax) and of detecting the crossing of said maximum threshold (Smax), and a step of changing the force setting of said actuator means (7), carried out when the measured contact force (Fc) exceeds said maximum force threshold (Smax).

5,115,406

ROTATING MACHINERY DIAGNOSTIC SYSTEM

John M. Zatezalo, and Michael S. Panson, both of Pittsburgh, Pa., assignors to Gateshead Manufacturing Corporation, McMurray, Pa.

Filed Oct. 5, 1990, Ser. No. 593,699
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—551.01 **14 Claims**



1. A diagnostic system for evaluating rotating machinery of the type wherein two machines have rotating shafts coupled to each other, the diagnostic system being able to be customized for particular rotating machinery comprising

a. a keypad having numerical keys and function keys for selecting programs and responding to messages;

b. a display of sufficient size to display messages and numbers;

c. a face plate to which the keyboard and display are attached having thereon at least one illustration of two machines having interconnected shafts;

d. a plurality of indicators attached to the face plate at various positions around the illustration to indicate points where measurements must be taken and adjustments be made in the machines in a sequence compatible with a program;

e. a first memory storing at least one program and having a means of receiving and storing input from the keyboard and external sources;

f. an application specific removable card containing a memory having a program which contains instructions applicable to particular rotating machinery said program for receiving and processing information about the particular rotating machinery entered by a user;

g. a processing unit connected to the keyboard, display, indicators, first memory and application specific removable card for receiving data, performing calculations and other operations according to at least one program in at least one of the first memory and the application specific removable card and transmitting a result to at least one of the display, the first memory, the application specific removable card and an external receiver;

h. a decoding unit connected to the processing unit, display, indicators, first memory and application specific removable card for receiving signals from the processing unit to actuate the indicators and the first memory; and

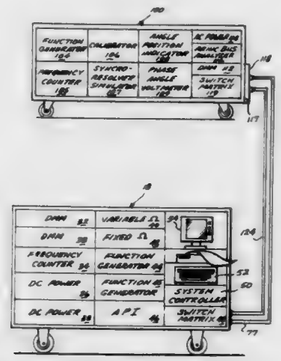
i. means for receiving data from at least one of electronic measurement devices, optical sensors, temperature probe, modem, bar code reader, external memory and external computer connected to at least one of the processing unit, first memory and application specific removable card.

5,115,407

INTEGRATED CERTIFICATION-CALIBRATION SYSTEM FOR A TESTING SYSTEM HAVING MULTIPLE TEST INSTRUMENTS

Ronald W. Bird, Kent, and David K. Shaffer, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 467,781, Jan. 19, 1990. This application Apr. 10, 1991, Ser. No. 684,066
Int. Cl.[5] G06F *11/00*
U.S. Cl. 364—551.01 **15 Claims**



1. A certification system for certifying a plurality of processor-controllable test instruments, the test instruments being arranged in at least two groups of separate test instruments, wherein each said test instrument generates signals for application to a unit under test or monitors signals generated by said unit under test, said certification system comprising:

a. a plurality of processor-controllable certification instruments for certifying the test instruments by measuring the signals produced by the test instruments or by producing signals that are monitored by the test instruments;

b. connection means for selectively interconnecting each of said at least two groups of test instruments to said certification instruments; and

c. at least two system controllers wherein each said system controller is integrally associated with each group of test instruments, is connected to the test instruments associated therewith has an input/output unit selectively connectable to said certification instruments, and is operable to perform certification tests on the associated test instruments by directing said certification instruments to measure signals produced by the associated test instruments or to produce signals for monitoring by the associated test instruments and includes means for receiving and storing the results of said certification tests.

5,115,408

HIGH SPEED MULTIPLIER

Henry M. Darley, Plano; Jeffrey A. Niehaus, Dallas, and Kevin M. Ovens, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 418,708, Oct. 3, 1989, abandoned, which is a continuation of Ser. No. 149,779, Jan. 29, 1988, abandoned. This application Feb. 5, 1991, Ser. No. 652,241
Int. Cl.[5] G06F *7/52, 7/38*
U.S. Cl. 364—754 **7 Claims**

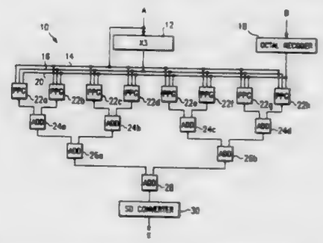
1. A circuit for multiplying a multiplicand by a multiplier, said circuit comprising:

input means for receiving the multiplicand;

tripling circuitry coupled to said input means for generating an intermediate product equal to three times the multiplicand;

recoding circuitry receiving said multiplier and recoding the multiplier into digits of an octal representation;

partial product generators coupled to said input means, said tripling circuitry, and said recoding circuitry to generate signed digit partial products equal to the digits of the octal representation of the multiplier times the multiplicand;



adding circuitry coupled to said partial product generators and arrayed as a binary tree to sum the signed digit partial products; and

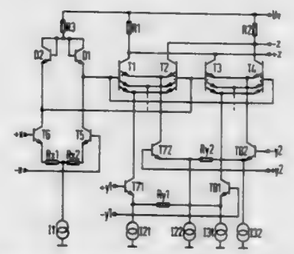
conversion circuitry coupled to said adding circuitry to convert the sum of the partial products to a selected numeric representation.

5,115,409

MULTIPLE-INPUT FOUR-QUADRANT MULTIPLIER

Richard Stepp, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 14, 1989, Ser. No. 393,607
Claims priority, application European Pat. Off., Aug. 31, 1988, 88114225
Int. Cl.[5] G06G *7/163;* **G06J** *1/00*
U.S. Cl. 364—841 **5 Claims**



1. A four-quadrant multiplier in the form of a monolithic integrated electronic circuit, comprising:

two signal-output terminals, one of which signal-output terminal consists of a first transistor with its collector connected to the collector of a third transistor and, via a first resistance, to a supply potential; and

the other signal-output terminal consisting of a second transistor with its collector connected to the collector of a fourth transistor and, via a second resistance, to the supply potential;

wherein the base of the first transistor is connected to the base of the fourth transistor, to the collector of a fifth transistor, and to the cathode of a first diode; and

wherein the base of the second transistor is connected to the base of the third transistor, to the collector of a sixth transistor, and to the cathode of a second diode;

wherein the anode of the first diode is connected, along with the anode of the second diode and via a third resistor, to the supply potential, wherein the emitters of the fifth transistor and of the sixth transistor are coupled to refer-

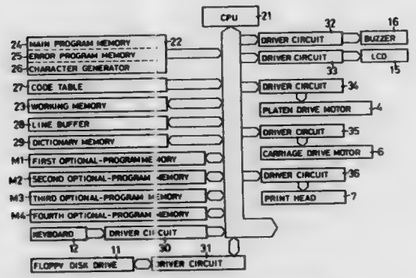
ence potential via a source of constant current, wherein the base of the sixth transistor comprises one of the multiplier's input terminals and the base of the fifth transistor comprises the other input terminal, wherein the first four transistors are multiple-emitter transistors, wherein each emitter of the first transistor is connected to one emitter of the second transistor and to the current-input terminal of a source of variable current, wherein the current-output terminal of the respective source of variable current is connected to reference potential, wherein the control-input terminal of each of said respective sources of variable current are non-inverting input terminals, such that each emitter of the third transistor is connected to a corresponding emitter of the fourth transistor and to the current-input terminal of an individual source of variable current, such that each current-output terminal of each of said respective sources of variable current is connected to reference potential, and wherein the control-input terminals of said sources of variable current are inverting input terminals.

5,115,410

PROGRAM PROCESSING SYSTEM HAVING STANDARD PROGRAM FOR PROCESSING OPTIONALLY POST-STORED PROGRAMS

Keiichi Hirata, Kuwana; Yoshinari Morimoto; Minoru Ooishi, both of Nagoya; Tomohiro Ban, Iwakura, and Akihiro Furukawa, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 4, 1988, Ser. No. 228,222
Claims priority, application Japan, Aug. 10, 1987, 62-200531
Int. Cl.[5] G06F *9/00, 13/00*
U.S. Cl. 395—650 **9 Claims**



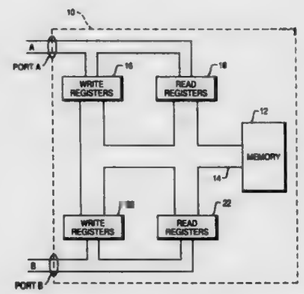
9. A program processing system, comprising:
program input means including a disk drive operable with an optional-program storage disk, for entering at least one optional program for performing an optional function;
optional-program memory means for storing said at least one optional program entered through said program input means;
commanding means for designating one of said at least one optional program, for execution of the designated optional program;
standard-program memory means which stores a standard program for performing a basic function, said standard program including a step of permitting said at least one optional program to be stored in said optional-program memory means through said disk drive, a step of determining whether said commanding means has been activated to designate said one of said at least one optional program, a step of determining whether the designated optional program is stored in said optional-program memory means, and a step of permitting said designated optional program to be executed if said designated optional program is stored in said optional-program memory means; and
control means connected to said optional-program memory means, said standard-program memory means and said commanding means, for executing said standard program and said designated optional program stored in said optional-program memory means, said control means retrieving said designated optional program from said optional-program memory means, to perform the corresponding optional function, if said designated optional program is stored in said optional-program memory means, said control means skipping said step of permitting said designated optional program to be executed, if said designated optional program is not stored in said optional-program memory means.

5,115,411

DUAL PORT MEMORY SYSTEM

William J. Kass, Easley, and Michael R. Hilley, Belton, both of S.C., assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 6, 1990, Ser. No. 534,081
Int. Cl.[5] G11C *7/00, 11/407, 11/409*
U.S. Cl. 365—189.01 **13 Claims**



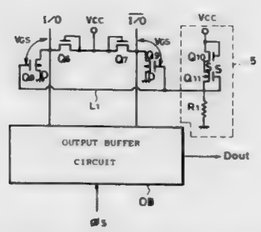
11. A dual port memory system comprising:
a memory for storing m data bytes at each addressable location therein;
an n byte wide first data bus and a p byte wide second data bus, wherein $n<m$ and $p<m$;
m, byte wide, parallel, first write registers connected between said first bus and said memory;
m, byte wide, parallel, first read registers connected in parallel with said first write registers between said first bus and said memory;
m, byte wide, parallel, second write registers connected between said second bus and said memory;
m, byte wide, parallel, second read registers connected in parallel with said write registers between said second bus and said memory;
first and second address lines, n first control lines, and p second control lines;
m first multiplexers connected between said memory and first and second write registers;
third and fourth control lines; and
n second multiplexers and p third multiplexers connected between said first and second read registers and first and second busses, respectively;
wherein every first write register is connected to said first address line, each first register is connected to one of said first control lines with an equal number of said first write registers being connected to each first control line, every second write register is connected to said second address line, and each second write register is connected to one of said second control lines with an equal number of said second write registers being connected to each second control line;
wherein said first multiplexers are responsive to control signals for selectively enabling the transfer of up to m data bytes from said first or second write registers into said memory;
wherein every first read register is connected to said third control line and every second read register is connected to said fourth control line;
wherein said third and fourth control lines provide complementary enable signals, respectively, and a clock signal;
wherein each first read register is connected to one of said second multiplexers with an equal number of said first read registers being connected to each of said second multiplexers; and
wherein each second read register is connected to one of said third multiplexers with an equal number of said second read registers being connected to each of said third multiplexers.

5,115,412

DATA READ CIRCUIT OF SEMICONDUCTOR MEMORY DEVICE AND METHOD OF READING DATA OUT

Youichi Tobita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1989, Ser. No. 425,272
Claims priority, application Japan, Oct. 24, 1988, 63-267388
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—189.09 **19 Claims**



1. A semiconductor memory device comprising:
a plurality of memory cells arranged in a matrix of rows and columns;
a plurality of common signal lines each connected to a row of said plurality of memory cells, each said column signal line transmitting thereon data of a selected memory cell;
means responsive to an external address for selecting a corresponding column signal line;
a data output bus for having a signal transmitted from a selected column signal line;
means for sensing and amplifying the signal on said data output bus;
first potential setting means provided between a first supply potential and said data output bus for setting said data output bus to a first predetermined potential; and
second potential setting means for detecting a potential on said data output bus and for setting said data output bus to said first predetermined potential in response to the detected potential.

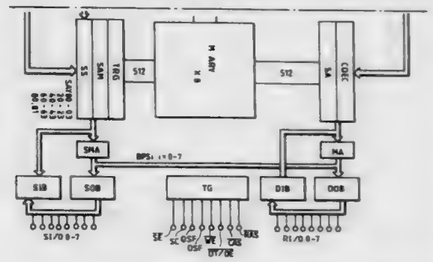
5,115,413

SEMICONDUCTOR MEMORY DEVICE

Katsuyuki Sato, Akishima; Miki Matsumoto; Sadayuki Ohkuma, both of Ohme; Masahiro Ogata, Fussa, and Masahiro Yoshida, Tachikawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corporation, both of Tokyo, Japan

Filed Mar. 20, 1990, Ser. No. 496,258
Claims priority, application Japan, Mar. 20, 1989, 1-65843
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—230.09 **16 Claims**

15. A multi-port semiconductor memory device comprising:
a random access memory;
a serial access memory coupled to said random access memory;
a first input/output port coupled to said random access memory to permit input and output of data to and from said random access memory;
a second input/output port coupled to said serial access memory to permit input and output of data to and from said serial access memory;
serial input/output lines provided in said serial access memory to couple storage elements in said serial access memory to said second input/output port, wherein said serial input/output lines are each divided at substantially a middle point thereof into first and second parts to reduce the load of said serial input/output lines;
random input/output lines provided in said random access memory to couple storage elements in said random access memory to said first input/output port, wherein said random input/output lines are each divided substantially at a middle point thereof into first and second parts to reduce the load of said random input/output lines;



a first input/output circuit coupled to said first parts of said serial input/output lines and a second input/output circuit coupled to said second parts of said serial input/output lines, wherein said first and second input/output circuits are respectively located at opposite ends of said serial access memory; and
a third input/output circuit coupled to said first parts of said random input/output lines and a fourth input/output circuit coupled to said second parts of said random input-/output lines, wherein said third and fourth input/output circuits are respectively located at opposite ends of said random access memory.

5,115,414

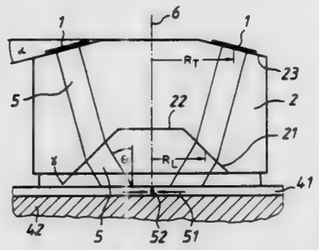
CONICAL ULTRASONIC WAVE DEFLECTION SYSTEM

Abdullah Atalar, Bilkent Univ. Loj. 8/4, P.K. 8, Maltepe/Ankara 06572, and Hayrettin Koeymen, Guniz Sok. No: 34/10,, Kavaklidere/Ankara, both of Turkey

Filed Sep. 12, 1990, Ser. No. 581,721
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1989, 3931048
Int. Cl.[5] G03B *42/06*
U.S. Cl. 367—7 **29 Claims**

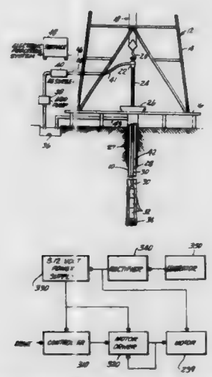
1. A conical ultrasonic deflection system comprising:
an ultrasonic transducer generating ultrasonic waves for ultrasonic microscopy using at least one of surface waves and Lamb waves in an object under examination; and
an ultrasonic deflection element deflecting ultrasonic waves generated by said ultrasonic transducer to direct a conical wave front onto said object, said conical wave front defined by a deflection cone axis; and
said ultrasonic transducer and ultrasonic deflection element preventing a portion of said object in the vicinity of said

deflection cone axis from being influenced by undeflected waves; and



wherein said ultrasonic transducer is cone shaped with a transducer cone axis of said ultrasonic transducer coinciding with said deflection cone axis.

5,115,415
STEPPER MOTOR DRIVEN NEGATIVE PRESSURE PULSE GENERATOR
Edward S. Mumby, and Kevin J. Shinneman, both of Houston, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.
Filed Mar. 6, 1991, Ser. No. 665,310
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—85 **9 Claims**



1. A pressure pulse generator for sending information to a surface pressure pulse detector through drilling fluid in a bore hole, the generator comprising:

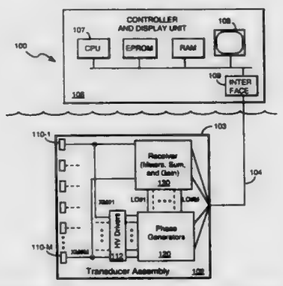
a valve assembly having a poppet and a seat, the poppet variably displaceable from the seat along an axis, the seat and poppet meeting at an interface when closed, the seat intermediate an inlet port of the valve in communication with high pressure drilling fluid in the drill string and an exit nozzle from the valve in communication with low pressure drilling fluid in the well bore;

a stepper motor having an output shaft, the motor providing stepped rotary motion through the shaft in a selectable direction;

means interconnecting the output shaft and the poppet for converting rotary motion of the shaft to axial motion of the poppet; and,

an electronic control means connected to the stepper motor for selecting the direction, number of steps, and timing of steps by the motor to displace the poppet from the seat to a variable position with variable acceleration.

5,115,416
ACTIVE TRANSDUCER ASSEMBLY FOR A PHASED ARRAY DEPTH SOUNDER
Steve M. Gehlbach, 1825 Austin Ave., Los Altos, 94024, and K. L. Venkatachalam, Palo Alto, both of Calif., assignors to Steve M. Gehlbach, Los Altos, Calif.
Filed Aug. 7, 1991, Ser. No. 741,649
Int. Cl.[5] H04B *1/02*
U.S. Cl. 367—138 **8 Claims**



1. A phased array acoustic transducer apparatus, comprising:

a transducer assembly; and

a controller, coupled to said transducer assembly by a cable, which sends power and control signals via said cable to said transducer asembly;

said transducer assembly including:

an array of ultrasonic transducers mounted in a water tight housing;

a transmitter circuit, located in said water light housing and coupled to said array of ultrasonic transducers, which sends phased excitation signals to said array of ultrasonic transducers so as to generate a directed beam of acoustic energy; and

a receiver cicuit, located in said water tight housing and coupled to said array of ultrasonic transducers, which processes and combines signals received by said array of ultrasonic transducers to generate an output signal.

5,115,417
TIDE CALCULATING AND DISPLAY DEVICE
Alan J. Saunders, P.O. Box 336, Danforth Ln., Califon, N.J. 07830
Filed Feb. 28, 1989, Ser. No. 316,986
Int. Cl.[5] G04B *19/26*
U.S. Cl. 368—19 **29 Claims**

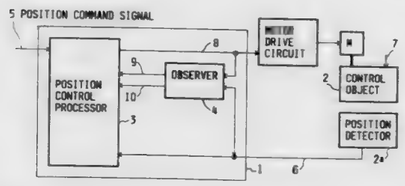


1. A tide prediction device for receiving known tide condition inputs and producing predicted tide condition readings therefrom comprising:

a. future tide prediction means for receiving a known tide height input corresponding to a known time input, for receiving a selected time output when a prediction of tide height is desired, and for determining a predicted tide height reading corresponding to the selected time input; and

b. target height output means for generating the predicted tide height reading.

5,115,418
SERVO CONTROL APPARATUS
Akira Shimada, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan
Filed Sep. 25, 1990, Ser. No. 587,450
Claims priority, application Japan, Sep. 25, 1989, 1-248762; Sep. 25, 1989, 1-248763
Int. Cl.[5] G05B *5/01*
U.S. Cl. 318—616 **9 Claims**



1. A servo control apparatus for controlling according to a position command signal an object in a mechanical drive system having a position detector and for driving the object by a drive torque signal, comprising:

state observation means receptive of a drive torque signal, and receptive of a position detection signal from the position detector for processing these signals to estimate concurrently a disturbance torque signal and an estimated velocity signal; and

position control means receptive of the position command signal, the position detection signal, the estimated disturbance signal and the estimated velocity signal for processing these signals to carry out positive feedback of the estimated disturbance torque signal and velocity feedback compensation by the estimated velocity signal to thereby produce the drive torque signal effective to control the object and to cancel out an actual disturbance torque generated in the object.

5,115,419
DISC PLAYBACK DEVICE CAPABLE OF CONTINUOUSLY PLAYING BACK A PLURALITY OF DISCS
Hiroo Akiyama, and Kazuhiro Tamada, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan
Filed May 16, 1990, Ser. No. 525,187
Claims priority, application Japan, May 18, 1989, 1-124681; Aug. 9, 1989, 1-93571[U]; Aug. 9, 1989, 1-206354
Int. Cl.[5] G11B *17/22, 17/26*
U.S. Cl. 369—37 **16 Claims**

1. A disk playback device comprising:

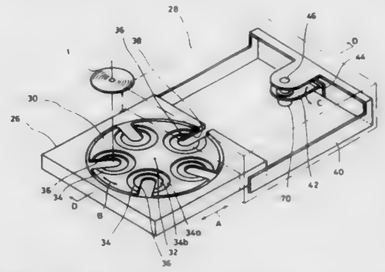
a main body of the disc playback device;

a table formed with a plurality of disc holding sections in which a disc on which information is reproduceably recorded can be detachably held, wherein each holding section includes a recess formed therein;

table moving means for moving said table relative to said main body for being received in and drawn out of said main body;

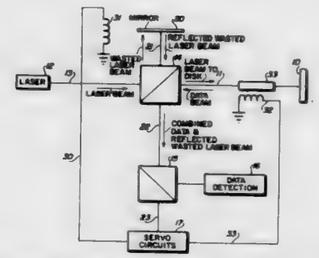
a reproducing portion provided in said main body separately from said table moving means for reproducing the information recorded on said disc;

wherein said table is moved into the main body to position one of the disc holding sections near the reproducing portion to allow a disc to be detached from the holding



section and played back by the reproducing portion and wherein said table is drawn out of the main body while the disc is being played back by keeping clear of the reproducing portion through the recess of the respective holding section.

5,115,420
UTILIZING WASTED LASER LIGHT IN OPTICAL SYSTEMS
Blair I. Finkelstein, Tucson, Ariz., and Terry W. McDaniel, Morgan Hill, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 16, 1990, Ser. No. 465,849
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.14 **16 Claims**



1. In an optical recording device having a relatively-movable optical head and an optical storage member, which are in a signal-transferring relationship, wherein the head supplies a wasted light beam, which does not impinge on the storage member, and a data beam which impinges upon the storage member and is reflected back to the head as a reflected light beam,

including, in combination:

first means for receiving and redirecting the wasted light beam and including phase means for adjusting the phase of the redirected light beam to be in phase with the reflected light beam, and

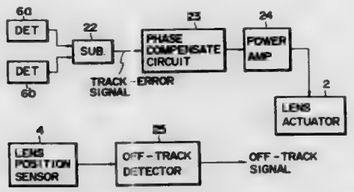
second means in optical communication with said first means for combining the reflected light beam with said redirected light beam for generating a single light beam of greater light intensity than said reflected light beam.

5,115,421

OPTICAL RECORDING/REPRODUCING APPARATUS

Takao Rokutan, Higashimurayama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1989, Ser. No. 304,817
Claims priority, application Japan, Feb. 5, 1988, 63-24010
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.33 **6 Claims**



1. An optical recording/reproducing apparatus using an optical recording medium having a plurality of tracks extending in a given track direction, comprising:

an optical system for radiating a light beam onto a track of said optical recording medium;

track-error detecting means for receiving a light beam reflected from said optical recording medium to detect a track error signal;

tracking means for moving a portion of said optical system in a direction perpendicular to said track direction in accordance with the track error signal detected by said track-error detecting means so as to direct the light beam onto the track;

off-track state detecting means for detecting a position of said portion of said optical system, and including means for detecting an off-track state when a distance between the detected position and a reference position exceeds a predetermined value during a tracking operation of said optical system by said tracking means; and

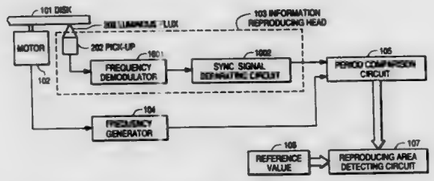
means for stopping an operation of the optical recording/reproducing apparatus upon detection of the off-track state by said off-track state detecting means.

5,115,422

INFORMATION REPRODUCING APPARATUS FOR DETECTING A REPRODUCED AREA ON A DISC

Akihiro Ishikawa, Neyagawa; Haruo Isaka, Hirakata, and Yoshio Sakakibara, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 20, 1989, Ser. No. 370,745
Claims priority, application Japan, Jun. 21, 1988, 63-153251
Int. Cl.[5] G11B *7/00, 3/90*
U.S. Cl. 369—54 **5 Claims**



5. An information reproducing apparatus comprising:

a motor for rotating a disk having recorded thereon at an approximately constant linear velocity a high frequency signal carrying information to be reproduced;

an information reproducing head for reproducing the recorded high frequency signal from the disk to generate a reproduced high frequency signal;

frequency generating means for generating a frequency signal having a frequency corresponding to the number of rotations of the motor;

period comparison means for comparing a period of the frequency signal generated by the frequency generating means with a period of the reproduced high frequency signal;

reproducing area detecting means for detecting a reproducing area on the disk by comparing an output value from the period comparison means with predetermined first and second reference values, the second reference value being larger than the first reference value, wherein the reproducing area detecting means, in a case where the disk is reproduced from an inner area to an outer area thereof, detects that the reproducing position is shifted from the inner area to the outer area when the output value of the period comparison means becomes larger than the second reference value, and, in a case where the disk is reproduced from the outer area to the inner area, detects that the reproducing position is shifted from the outer area to the inner area when the output value from the period comparison means becomes smaller than the first reference value.

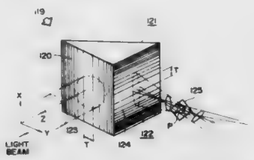
5,115,423

OPTOMAGNETIC RECORDING/REPRODUCING APPARATUS

Hideo Maeda, Tokyo; Shigeru Ohuchida, Zama, and Junichi Kitabayashi, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 6, 1989, Ser. No. 294,466
Claims priority, application Japan, Jan. 7, 1988, 63-1518; Jan. 13, 1988, 63-5575; Jan. 29, 1988, 63-19146; Mar. 23, 1988, 63-37847[U]
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—112 **9 Claims**





1. An optomagnetic information recording and reproducing apparatus, comprising:

a first diffraction grating for receiving light reflected from an optomagnetic information recording medium to separate said light into a first transmitting light beam and a first diffracted light beam in first and second directions, respectively;

a second diffraction grating disposed for transmitting said first transmitting light beam and diffracting said first diffracted light beam thereby producing a twice transmitted light beam and a twice diffracted light beam in third and fourth directions, respectively,

a tracking error signal detecting means for detecting a tracking error signal by receiving one of said twice transmitted and said twice diffracted light beams; and

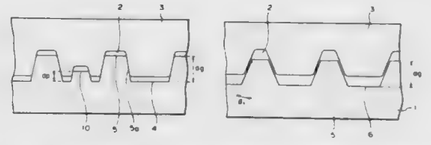
a focusing error detecting means for detecting a focusing error signal by receiving the remaining of said twice transmitted and said twice diffracted light beams.

5,115,424

OPTICAL STORAGE MEDIUM WITH PROVISION FOR LIMITATION OF THERMAL CONDUCTION

Hajime Nakajima; Isao Watanabe, and Kunimaro Tanaka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 23, 1989, Ser. No. 301,329
Claims priority, application Japan, Jan. 22, 1988, 63-10790
Int. Cl.[5] G11B *7/24*
U.S. Cl. 569—275.4 **6 Claims**



1. An information storage medium responsive to light of wavelength λ, comprising:

a base member including a transparent material having an index of refraction n;

said base member having at least one guide groove formed thereon;

said base member having at least one land located adjacent said guide groove;

said at least one guide groove having side walls;

said at least one guide groove having a geometrical depth of about

$$\frac{2N+1}{8n}\lambda,$$

where N is any positive integer; and

a recording material for storing information and disposed on said at least one land and said at least one guide groove but not on at least a portion of said guide groove side walls so as to inhibit thermal conduction via said side walls when said medium is irradiated with the light wherein each of said side walls has an inclination angle θ that is less than 45°.

5,115,425

SWITCHING SYSTEM RELIABILITY

Menachem T. Ardon, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 31, 1990, Ser. No. 531,480
Int. Cl.[5] H04Q *11/00*; H04M *7/14*
U.S. Cl. 370—54 **25 Claims**

22. An arrangement comprising

a plurality of call switching means each for communicating during calls,

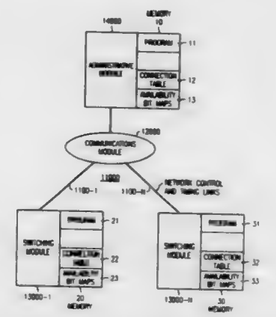
means for providing paths among said plurality of call switching means,

means for storing connection and availability status information for paths of said providing means,

means for selecting, for each call between first and second ones of said call switching means, based on said stored connection and availability status information, an available path of said providing means between said first and second call switching means, and

means for establishing said selected path through said providing means when the selected path is not already established,

said selecting means being operative in a first call processing mode for selecting said available path without reference to whether said available path is presently established through said providing means, and



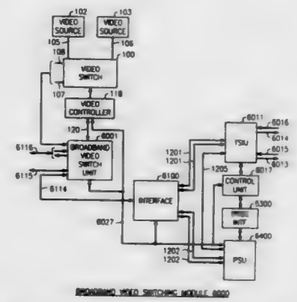
said selecting means being operative in a second call processing mode for selecting said available path from only established paths of said providing means between said first and second call switching means.

5,115,426

BROADBAND ISDN PACKET SWITCHING ARRANGEMENTS

Ronald A. Spanke, Wheaton, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 30, 1990, Ser. No. 502,592
Int. Cl.[5] H04J *3/26*
U.S. Cl. 370—60 **17 Claims**



1. A packet switching arrangement comprising;

a packet switching network comprising a plurality of incoming lines for receiving customer packets from customers, a plurality of outgoing lines for conveying packetized information to said customers and means responsive to customer packets received on said incoming lines for selectively connecting said received customer packets to said outgoing lines;

a plurality of sources of video signal packets;

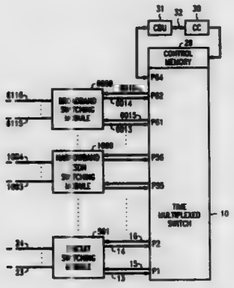
video switch means for selectively connecting ones of said video signal packets to said outgoing lines without being transmitted through said packet switching network; and

control means common to said packet switching network and said video switch means and responsive to control signals received from said incoming lines for controlling the connections provided by said packet switching network and said video switch means.

5,115,427
ARRANGEMENTS FOR SWITCHING MULTIPLE PACKET TYPES COMBINED IN A SINGLE PACKET STREAM

James M. Johnson, Jr., Marietta, Ga., and Ronald A. Spanke, Wheaton, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 30, 1990, Ser. No. 502,352
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—60 **23 Claims**



1. A packet switching arrangement comprising:

a broadband packet switch means, connected to a plurality of broadband customer lines and to a narrowband switch means, for selectively connecting broadband packets among said broadband customer lines and said narrowband switch means;

means in said broadband switch means responsive to a broadband service request packet from a first broadband customer line requesting a packet communication between said first broadband customer line and a second broadband customer line for connecting said service request packet to said narrowband switch means;

said service request packet comprises a predetermined signaling virtual channel identifier;

said broadband packet switch means comprises means responsive to said signaling virtual channel identifier for connecting said service request packet to said narrowband switch means;

said narrowband switch means comprises means responsive to said service request packet for connecting said service request packet to a control means; and

said control means is responsive to said service request packet for controlling said broadband packet switch means to selectively connect packets comprising said requested packet communication between said first broadband customer line and said second broadband customer line.

5,115,428
SERIAL ARRAY TIME-SLOT INTERCHANGERS

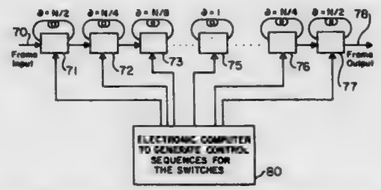
Srinivasan V. Ramanan, Boulder, and Harry F. Jordan, Ward, both of Colo., assignors to The University of Colorado Foundation, Inc., Boulder, Colo.

Filed Sep. 5, 1989, Ser. No. 402,948
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—68 **19 Claims**

1. Apparatus for interchanging data containing time slots wherein N of said time slots occur during a predetermined frame of time comprising

a plurality of switching elements each having an input means and an output means and each responding to a first control signal introduced thereto for coupling said input means directly to said output means and responding to at least one second control signal introduced thereto for producing signals from said input means at said output means after a predetermined time delay,

means coupling said switching elements input and output means in a serial array with the first said switching element of said serial array having said frame containing N time slots coupled to the input thereof, and

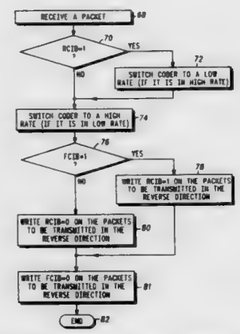


means producing a sequence of said control signals for causing said serial array to produce a frame of N time slots at the Output of the last said switching element of said array with said time slots occupying time sequence relationships therebetween different from the time sequence introduced to said input means of said first switch element.

5,115,429
DYNAMIC ENCODING RATE CONTROL MINIMIZES TRAFFIC CONGESTION IN A PACKET NETWORK

Michael G. Hluchyj, Wellesley, and Nanying Yin, Cambridge, both of Mass., assignors to Codex Corporation, Mansfield, Mass.

Filed Aug. 2, 1990, Ser. No. 561,623
Int. Cl.[5] H04J *3/22*
U.S. Cl. 370—84 **12 Claims**



1. A method for minimizing traffic overload at an edge node in a packet network that carries bursty traffic and includes intermediate nodes through which traffic is routed, the method comprising the steps of:

coding bursty information at one edge node into a digital format for transmission as packets to another edge node, the coding including a first coding rate utilized except during a traffic overload and a second coding rate less than the first rate;

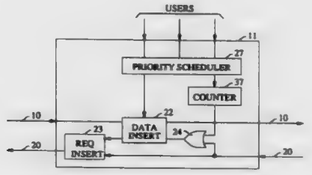
determining at said one edge node if a reverse congestion indicator (RCIB) in the header of a packet sent from said another node is set thereby indicating a traffic overload condition in the transmission path from said one edge node to said another node;

if said RCIB is set, utilizing said second coding rate at said one node to reduce the traffic input into the network.

5,115,430
FAIR ACCESS OF MULTI-PRIORITY TRAFFIC TO DISTRIBUTED-QUEUE DUAL-BUS NETWORKS

Ellen L. Hahne, Westfield, and Nicholas F. Maxemchuk, Mountainside, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 24, 1990, Ser. No. 586,661
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—85.6 **25 Claims**



1. A method for allocating transmission capacity in a network having a data bus that passes through network nodes 1 to N of said network in ascending order and a request bus that passes from network nodes N to 1 in descending order, where transmission capacity on said data bus is divided into slots and where each slot on said data bus contains a data field and a header field that includes a busy subfield and a request subfield, and where each node j, where j is an integer between 1 and N, accepts data with an associated priority level from a user port of said node, for transmission to a node K on said network where $j<k\leq N$, and controls the injection of said data into said data bus in accordance with a procedure comprising the steps of:

each node determining an effective spare capacity available to itself on said data bus based on the presence of request bits in the request subfield of slots on the request bus, and the busy bits in the request subfield of slots on the data bus; and

each node throttling its rate of injecting of data into said data bus to a fraction of the effective spare capacity, where said fraction is related to the priority of the data presented to the node.

5,115,431
METHOD AND APPARATUS FOR PACKET COMMUNICATIONS SIGNALING

Charles S. T. Williams, Palo Alto, and Shrikanth S. Kattemalalavadi, San Jose, both of Calif., assignors to Stratacom, Inc., Campbell, Calif.

Filed Sep. 28, 1990, Ser. No. 589,699
Int. Cl.[5] H04J *3/24*
U.S. Cl. 370—94.1 **18 Claims**



1. A method for encoding signaling transition information for transmission on a packet transmission network, comprising the steps of:

(a) generating a packet if a signaling transition has occurred;

(b) generating a burst count for the packet, wherein a burst is a collection of signaling transitions that occur within a predetermined time interval, wherein the burst includes at least one signaling transition, and wherein the burst count identifies the burst the packet is associated with;

(c) generating a sequence number for the packet to identify a sequence of the packet with respect to any other packet associated with the burst;

(d) generating signaling state information for the packet for indicating a state of a signal to be replicated;

(e) generating a burst time for the packet, wherein

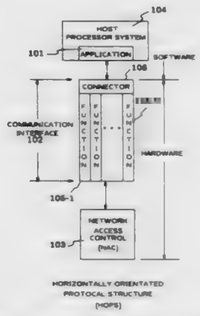
(1) if the packet is a first packet of the burst, then the burst time approximately indicates a time from a time that transmission of the packet is desired to a time that the packet is transmitted; and

(2) if the packet is not a first packet of the burst, then the burst time indicates a time since a previous signaling transition.

5,115,432
COMMUNICATION ARCHITECTURE FOR HIGH SPEED NETWORKING

Zygmunt Haas, Matawan, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 12, 1989, Ser. No. 449,201
Int. Cl.[5] H04J *3/00*; G06F *3/00, 13/00*
U.S. Cl. 370—94.1 **10 Claims**



1. Apparatus for providing high-level non-application layer services between low-level services interfacing a network and application layer services of a host processor, the apparatus being characterized by:

a plurality of independent parallel horizontally oriented function means for providing a plurality of high-level communication services;

means for interfacing said plurality of parallel horizontally oriented function means to said low-level services; and

means for interfacing said plurality of parallel horizontally oriented function means to said application layer services, said means for interfacing to said application layer includes means for resolving dependencies among said plurality of parallel horizontally oriented function means.

5,115,433
METHOD AND SYSTEM FOR ROUTING PACKETS IN A PACKET COMMUNICATION NETWORK

Paul Baran, Atherton; George H. Flammer, III, Cupertino, and Robert L. Kalkwarf, San Jose, all of Calif., assignors to Metricom, Inc., Campbell, Calif.

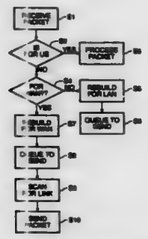
Continuation-in-part of Ser. No. 383,273, Jul. 18, 1989, Pat. No. 4,939,726, which is a continuation of Ser. No. 133,720, Dec. 16, 1987, abandoned. This application Apr. 20, 1990, Ser. No. 513,364
The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.
Int. Cl.[5] H04J *3/26*
U.S. Cl. 370—94.3 **12 Claims**

1. A method for routing packets of data without a network director comprising the steps of:

assigning to each node in a network an identifier indicative

of geographic location, said identifier including a coordinate value referenced to a terrestrial grid;

addressing a packet to an ultimate destination node by designating in a packet header said ultimate destination node only by said coordinate value of said ultimate destination node and without designating a complete intermediate path to said ultimate destination node such that the network is free to route the packet via any intermediate path to said ultimate destination node;



at a lock node, selecting at least one of a plurality of neighboring nodes by using said packet header and other information specific to said lock node according to preselected criteria;

forwarding said packet to said selected neighboring node for eventual delivery to said ultimate destination node; and

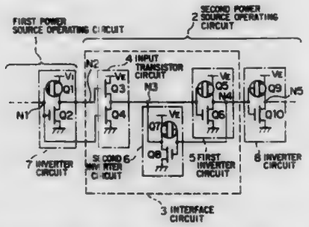
selecting one neighboring node requiring the least amount of power for forwarding said packet.

5,115,434

DIFFERENT POWER SOURCE INTERFACE CIRCUIT

Akane Aizaki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 6, 1991, Ser. No. 651,137
Claims priority, application Japan, Feb. 6, 1990, 2-27603
Int. Cl.[5] H03K *19/092, 3/01*
U.S. Cl. 307—475 **1 Claim**



1. A different power sources interface circuit for connecting a first power source operating circuit for supplying complementary outputs with a second power source operating circuit having a power source for supplying a voltage higher than that of the power source of the first power source circuit, comprising:

an input transistor circuit including first and second N channel MOS transistors which are in series connected between said second power source and a ground and have respective gates to which the complementary outputs of said first power circuit are supplied;

a first inverter circuit having an input connected with a connection between both said transistors; and

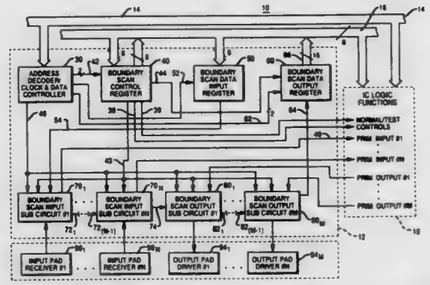
a second inverter circuit having an input and an output thereof which are connected with the output and input of said first inverter circuit, respectively.

5,115,435

METHOD AND APPARATUS FOR BUS EXECUTED BOUNDARY SCANNING

Thomas L. Langford, II, and Philip W. Bullinger, both of Wichita, Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 19, 1989, Ser. No. 423,924
The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.
Int. Cl.[5] H04B *17/00*
U.S. Cl. 371—22.3 **14 Claims**



1. A boundary scan test apparatus for use in a digital integrated circuit of a digital system, the digital integrated circuit having an integrated circuit data bus that connects to an external system data bus, a normal mode of operation and a boundary scan test mode of operation, said boundary scan test apparatus, comprising:

means for switching a plurality of data inputs and a plurality of data outputs of the digital integrated circuit from the normal mode of operation to the boundary scan test mode of operation to form a boundary scan test circuit;

means for inputting a boundary scan test word from the external system data bus via the integrated circuit data bus to the boundary scan test circuit as a test input thereto; and

means for outputting a boundary scan test response to the boundary scan test word, from the boundary scan test circuit via the integrated circuit data bus to the external system data bus;

whereby the boundary scan test apparatus boundary scan tests the digital integrated circuit without adding any external lead connections beyond those used by the integrated circuit during the normal mode of operation.

5,115,436

FORWARD ERROR CORRECTION CODE SYSTEM

Anthony J. McAuley, Rockaway, N.J., assignor to Bell Communications Research, Livingston, N.J.

Filed May 4, 1990, Ser. No. 521,114
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—37.1 **14 Claims**

1. A method for communicating information in a broadband telecommunications network using a forward error correcting code comprising the steps of

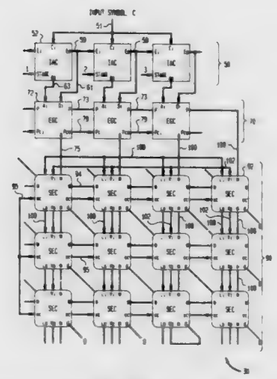
at an encoder, generating signals representing an n symbol codeword with m bits per symbol, said codeword comprising k known information symbols and h parity symbols having predetermined locations in said codeword, each of said symbols being chosen from a field of 2^m integers which is closed with respect to addition and multiplication,

electronically generating signals representing a set of h simultaneous linear algebraic equations in terms of said k known information symbols and said h parity symbols,

electronically determining signals which represent solutions of said set of simultaneous equations to determine said h parity symbols,

transmitting said signals representing said codeword from said encoder comprising said k information symbols and said h parity symbols,

receiving said transmitted signal representing said codeword at a decoder, and



at said decoder, electronically correcting up to h symbol erasures of said codeword, said symbol erasures being a combination of erased information symbols and parity symbols, said correcting step comprising the step of

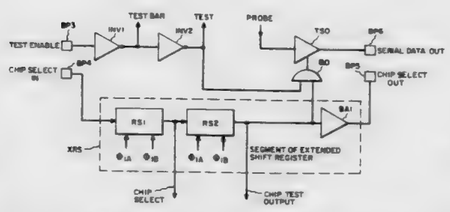
electronically generating a set of linear algebraic simultaneous equations and electronically determining signals which represent solutions of said set of simultaneous equations to determine up to h symbol erasures.

5,115,437

INTERNAL TEST CIRCUITRY FOR INTEGRATED CIRCUITS USING TOKEN PASSING TO SELECT TESTING PORTS

Kenneth B. Welles, II, Scotia; Richard I. Hartley, Schenectady, and Michael J. Hartman, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1990, Ser. No. 487,481
Int. Cl.[5] G01R *31/28*
U.S. Cl. 371—22.5 **19 Claims**



1. A monolithic integrated circuit including circuitry to be tested and internal test circuitry; said internal test circuitry having connections from a serial test feed line, to a serial test output line, from a test clock line and from instruction lines; said internal test circuitry comprising:

means for receiving, storing and passing a first token;

means for receiving, storing and passing a second token;

a first shift register, having a respective serial data input port connecting from said serial test feed line, having a respective parallel data output port and having a respective clock signal input port;

means for selecting clock signal from said test clock line for application to the clock signal input port of said first shift register, said selecting being done responsive to there being received via said instruction lines an instruction to shift the contents of said first shift register concurrently with said first token being stored in said means for receiving, storing and passing said first token of the same said monolithic integrated circuit;

means for selecting signal from the parallel data output port of said first shift register during testing to a test input port of the circuitry to be tested;

a second shift register having a respective serial data input port connecting from said serial test feed line, having a respective parallel data output port and having a respective clock signal input port;

means for selecting clock signal from said test clock line for application to the clock signal input line of said second shift register, said selecting being done responsive to there being received via said instruction lines an instruction to shift the contents of said second shift register concurrently with said second token being stored in said means for receiving, storing and passing said second token of the same said monolithic integrated circuit; and

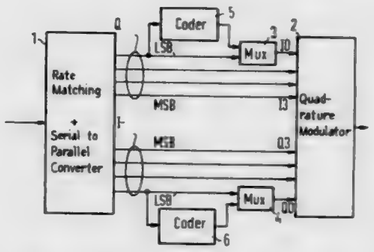
means for selecting to said serial test output line a bit from a specified test output port of the circuitry to be tested, as controlled by parallel data from the parallel data output port of said second shift register.

5,115,438

METHOD FOR REDUNDANCY-SAVING, ERROR-CORRECTING CODING IN DIGITAL RADIO LINK SYSTEMS HAVING MULTI-LEVEL MODULATION

Karl-Josef Friederichs, Puchheim, and Otmar Ringelhaan, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 24, 1989, Ser. No. 383,652
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1988, 3826564
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—43 **10 Claims**



1. A method for redundancy-saving, error-correcting coding in digital radial link systems having multi-level modulation, using forward error correction, comprising the steps of:

supplying the serial binary data stream to be transmitted to a means for rate matching and serial-to-parallel conversion, in which first, the data rate is increased to the transmission rate and three locations are formed for the acceptance of redundancy bits and, second, a corresponding plurality of parallel data streams is generated from the serial data stream, with one half of these parallel data streams forming the I-channel and, the other half forming the Q-channel;

supplying the least significant bit of the I-channel and the least significant bit of the Q-channel, in which the redundancy locations lie, to the two inputs of a multiplexer, first directly and, secondly, via a coder, the output side of said multiplexer being connected to a quadrature modulator, with the more significant bits of the I-channel and Q-chan-

nel directly controlling corresponding inputs of said quadrature modulator;

said coders each receiving inputs from said means for rate matching and serial-to-parallel conversion in the form of a sequence consisting of a defined plurality of k incoming bits to generate one or more redundancy bits therefrom in accord with the coding rule of an underlaid code, said redundancy bits being inserted with the assistance of said multiplexer at locations in the I-channel and Q-channel; and

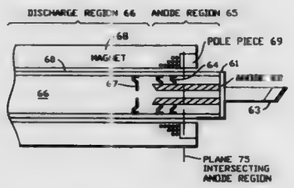
correcting transmission errors in a decoder means.

5,115,439

POLE PIECE TO SHAPE AXIAL MAGNETIC FIELD IN GAS LASER

Neil Howard, San Jose, Calif., assignor to Spectra-Physics Lasers, Inc., Mountain View, Calif.

Filed Nov. 29, 1989, Ser. No. 443,560
Int. Cl.[5] H01S *3/00*
U.S. Cl. 372—37 **31 Claims**



1. In a gas laser comprising a gas discharge tube having a first end, a second end and a discharge region between the first and second ends; a cathode, mounted adjacent the first end in a cathode region of the discharge tube; and means, mounted with the discharge tube, for inducing an axial magnetic field within the discharge region; an improvement comprising:

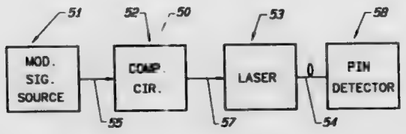
means, coupled with the means for inducing the axial magnetic field, and adjacent the first end of the discharge tube, for shaping the axial magnetic field to reduce the axial magnetic field in the cathode region.

5,115,440

DELAY DISTORTION COMPENSATING CIRCUIT FOR OPTICAL TRANSMISSION SYSTEM

Hermann Gysel, and Mani Ramachandran, both of San Jose, Calif., assignors to Synchronous Communications, Inc., San Jose, Calif.

Filed Jan. 3, 1991, Ser. No. 637,072
Int. Cl.[5] H01S *3/00*
U.S. Cl. 372—38 **18 Claims**



1. In a laser driven optical transmission system having a laser for providing a modulated optical output in response to a modulation signal applied thereto and a fiber optic cable for propagating said modulated optical output, said laser including means which produces laser chirp in response to said modulation signal and said fiber optic cable including means which produces chromatic dispersion of said modulated optical output, a delay distortion compensation circuit for compensating for a time shift in said modulated optical output caused by said chromatic dispersion of said fiber optic cable and said laser the improvement comprising:

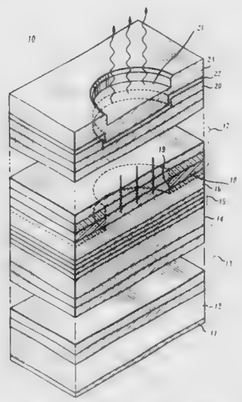
means for producing a time shift of the instantaneous amplitude of said modulation signal applied to said laser that is inverse to said time shift caused by said chromatic dispersion of said fiber optic cable and said laser chirp so that the sum of the two time shifts is substantially equal to a constant.

5,115,441

VERTICAL CAVITY SURFACE EMMITTING LASERS WITH TRANSPARENT ELECTRODES

Rose F. Kopf, Bound Brook; Henry M. O'Bryan, Jr., Plainfield; Erdmann F. Schubert, New Providence; Li-Wei Tu, Westfield; Yeong-Her Wang, Scotch Plains, and George J. Zydzik, Warren County, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 3, 1991, Ser. No. 637,245
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—45 **19 Claims**



1. A semiconductor vertical cavity surface emitting laser comprising a semiconductor body which comprises a plurality of layers selected from Group III-V and II-VI compound semiconductors having nominal formula GaAs, InP, InGaAs, InGaPAs, AlAs, AlGaAs, and AlGaInAs, said plurality of layers including

an active region which generates optical radiation,

a bottom multilayer mirror which reflects said radiation,

a top multilayer mirror which partially reflects and partially transmits said radiation in a direction perpendicular to said active region, said top mirror including an ion-implanted region arranged peripherally of the layers of said top mirror and defining a window for confining passage of current and of lasing emission to an area defined by said window,

a dielectric layer upon said top mirror, said dielectric layer having a window aligned with said window in said ion-implanted region,

a metallic barrier layer upon said dielectric layer and contacting that surface of said top mirror layer which is exposed in said window of said dielectric mirror layer,

a layer of an optically transparent semiconductor material on said metal barrier layer forming a top electrode of the laser, said optically transparent layer having conductivity ranging from 1×10^3 to $1\times10^5\Omega^{-1}\,cm^{-1}$, light transmissivity of at least 80 percent and absorption of less than 10 percent, and

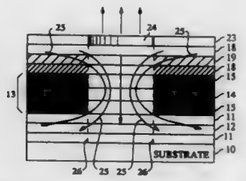
a bottom electrode for applying in unity with said top electrode an excitation current in direction substantially perpendicular to said active region and substantially parallel to the direction of propagation of optical radiation.

5,115,442

TOP-EMITTING SURFACE EMITTING LASER STRUCTURES

Yong H. Lee, Middletown, and Benjamin Tell, Matawan, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 13, 1990, Ser. No. 509,653
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—45 **15 Claims**



1. In an apparatus comprising at least one electrically pumped, vertical cavity, surface emitting laser, said laser being a columnar portion of a larger layered structure constructed primarily of semiconductor material, substantially all of the layers of the said structure being continuous throughout the said columnar portion, said structure including in order, a substrate, a first multilayer dielectric mirror, an active region containing at least one layer of active gain material and a second multilayer dielectric mirror, both of said dielectric mirrors depending for reflectivity upon inclusion of a plurality of pairs of mirror layers of differing refractive index for the wavelength of laser emission, said mirrors being doped with significant impurity one such mirror region being doped p-type and the other n-type, said laser being provided with pumping means for electrically pumping active gain material to achieve lasing, said means including an electrode in electrical contact with said second multilayer dielectric mirror, said electrode being provided with an aperture permitting laser emission therethrough,

characterized in that said larger structure has an electrical conductivity profile which causes current introduced into said electrode to follow a path, initially encompassing and non-enroaching on said columnar portion and subsequently encroaching on said columnar portion so that a significant part of such current passes through the said active gain region of said portion to achieve lasing, whereby laser emission passes through the said aperture, in which the said path is to a substantial extent a consequence of a buried region of increased electrical resistance, said region encompassing the said columnar portion and the said increased electrical resistance being the consequence of ion implantation damage.

5,115,443

SEMICONDUCTOR LASER APPARATUS

Seiichi Miyazawa, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP89/00303, § 371 Date Nov. 21, 1989, § 102(e) Date Nov. 21, 1989
PCT Filed Mar. 22, 1989, Ser. No. 445,851
Claims priority, application Japan, Mar. 22, 1988, 63-065857
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—46 **21 Claims**

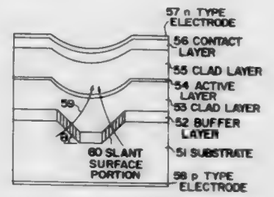
1. A semiconductor laser apparatus comprising:

a substrate in which a cross section extending in a resonant direction has a groove with a trapezoid shape, said substrate comprising a p type semiconductor, the width of said groove falling in the range of 3 to 10 μm;

a buffer layer comprising a semiconductor containing p and n type impurity, formed on said substrate, in said buffer layer a portion formed on an oblique surface of said groove having a p type polarity and the other portion having n type polarity;

a first clad layer comprising a p type semiconductor formed on said buffer layer;

an active layer comprising a non-doped semiconductor formed on said first clad layer;



a second clad layer comprising a n type semiconductor formed on said active layer;

a n type electrode formed on said second clad layer; and

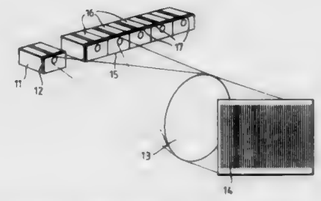
a p type electrode formed on the bottom surface of said substrate.

5,115,444

MULTICHANNEL CAVITY LASER

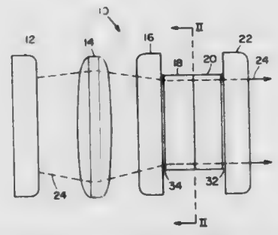
Paul A. Kirkby, Old Harlow, and Ian H. White, Harston, both of United Kingdom, assignors to STC PLC, London, England

Continuation-in-part of Ser. No. 439,648, Nov. 20, 1989, abandoned. This application Dec. 11, 1990, Ser. No. 625,818
Claims priority, application United Kingdom, Nov. 23, 1988, 8827385
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 **5 Claims**



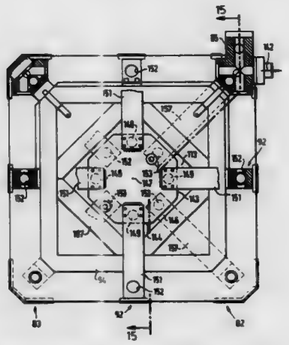
1. A switchable multichannel cavity laser having a plurality of n optical resonant cavities defined between a set of n reflectors and a common reflector, wherein a dispersive element is located between the set of n reflectors and the common reflector so as to provide the n optical cavities with different frequency bands, wherein each of the n optical cavities includes one of a set of n individually addressable semiconductor laser amplifiers, each having a single reflecting facet that constitutes one of said set of n reflectors, and wherein all of the optical cavities include a further semiconductor laser amplifier that is common to all n optical cavities and that has a single reflecting facet that consitutes said common reflector.

5,115,445
MICROCHIP LASER ARRAY
Aram Mooradian, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation-in-part of Ser. No. 512,981, Apr. 23, 1990, which is a division of Ser. No. 308,251, Feb. 9, 1989, Pat. No. 4,953,166, which is a continuation-in-part of Ser. No. 151,396, Feb. 2, 1988, Pat. No. 4,860,304. This application Aug. 22, 1990, Ser. No. 571,073
Int. Cl.[5] H01S *3/094*
U.S. Cl. 372—75 **52 Claims**



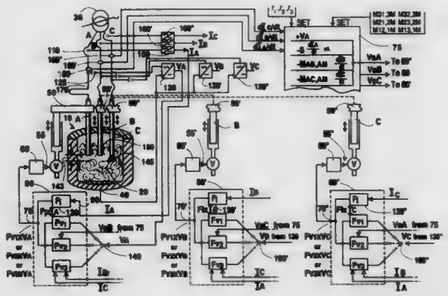
1. A system for generating a beam of light comprising an array of solid state lasers comprised of:
a) an array of solid state gain medium material lasers comprised of:
a) an array of solid state gain medium material formed of:
(i) a body of gain material having first and second opposed surfaces with individual pixel elements formed therein and laterally isolated from each other;
(ii) a first mirror formed on said first surface which is reflective of light at a first wavelength;
(iii) a second mirror formed on said second surface which is reflective of light at a second wavelength; and
(iv) an array of pumping lasers disposed adjacent said first surface for generating light at said second wavelength and each pumping laser stimulating light emission at said first wavelength in a corresponding pixel element to form a beam of light.

5,115,446
DEVICE FOR A POWER LASER
Michael von Borstel; Heinz-Jurgen Prokop, both of Stuttgart, and Reinhard Wollerman-Windgasse, Vaihingen/Enz-Riet, all of Fed. Rep. of Germany, assignors to Trumpf Lasertechnik GmbH, Ditzingen, Fed. Rep. of Germany
Filed Sep. 19, 1990, Ser. No. 584,703
Int. Cl.[5] H01S *3/081*
U.S. Cl. 372—93 **21 Claims**



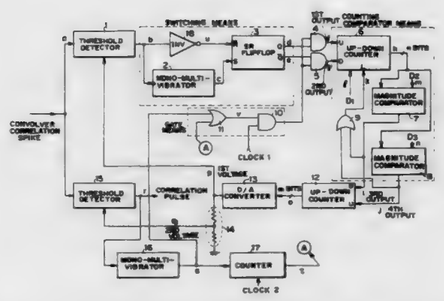
1. A longitudinal-flow CO_2 laser comprising
a first laser beam path and a second laser beam path, each laser beam path having intermediate corner flanges with deflecting mirrors for folding the laser beam path in at least three partial segments and a respective first and second geometric central plane zone,
at least one end flange with a totally reflecting mirror and an output mirror, and
a carrying structure for supporting said corner flanges and said end flange,
wherein said carrying structure has a third geometric central plane zone disposed between said first and second geometric central plane zones and parallel thereto, so that said carrying structure includes said flanges of said first laser beam path and said second laser beam path.

5,115,447
ARC FURNACE ELECTRODE CONTROL
Ben B. Bowman, Geneva, Switzerland, assignor to UCAR Carbon Technology Corporation, Danbury, Conn.
Filed Jan. 10, 1991, Ser. No. 639,547
Int. Cl.[5] H05B *7/144*
U.S. Cl. 373—102 **6 Claims**



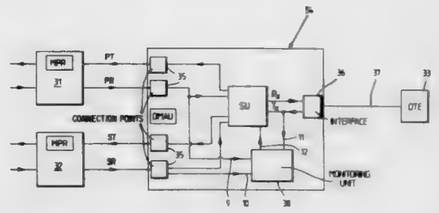
1. A system for regulating the height of each of a first, second and third electrode in an electric arc furnace relative to a charge of material in said arc furnace, with said arc furnace being connected to a three phase source of power through a transformer having secondary windings connected to apply a different phase-to-neutral voltage to each electrode in a predetermined phase sequence and with each electrode having a desired operating height corresponding to a pre-set arc voltage value in a range of 0.5 to 0.85 of the phase-to-neutral voltage applied to each such electrode respectfully, means for generating a variable voltage signal corresponding in value to an instantaneous height of each electrode relative to said charge of material, means for continuously comparing said variable voltage signal with said pre-set arc voltage value to provide an error signal for each electrode, means for adjusting the height of each electrode in response to said error signal and control circuit means responsive to the presence of a short or open circuit condition across each of said electrodes for modifying said pre-set arc voltage values for correcting said short or open circuit condition wherein said control circuit means comprises:
(1) means for monitoring the arc voltage across each electrode for determining the presence of a short circuit condition; and
(2) means responsive to the presence of a short circuit condition across one of said electrodes for switching the pre-set arc voltage value for the electrode next ahead in phase rotation to a different predetermined value of above 0.85 of the phase-to neutral voltage applied to the electrode and for switching said different voltage value back to said pre-set value when said short circuit condition is corrected.

5,115,448
SPREAD SPECTRUM RECEIVER
Masaharu Mori, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan
Filed Sep. 20, 1990, Ser. No. 585,402
Claims priority, application Japan, Sep. 22, 1989, 1-244930
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 **18 Claims**



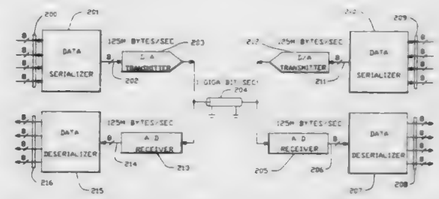
1. A signal processing circuit processing pulses received from a convolver in a spread spectrum receiver and sending processed pulses to an output terminal comprising:
first comparison means for providing an output pulse responsively to receipt of each convolver pulse of amplitude greater than that of a first reference signal level supplied to said first comparison means;
second comparison means for providing to said output terminal a processing circuit output pulse responsively to receipt of each convolver pulse of amplitude greater than that of a second reference signal level supplied to said second comparison means;
means for supplying said second reference signal level as a given fraction of said first reference signal level;
reversible system counting means including first and second counter input terminal means for providing an output signal condition indicative of a number stored therein, and including means for incrementing said number responsively to pulses supplied to one of said counter input terminal means and means for decrementing said number responsively to pulses supplied to the other of said counter input terminal means;
pulsing means for supplying a train of pulses to said first counter input terminal means responsively to the presence of output pulses at said first comparison means and including means for supplying a train of pulses to said second counter input terminal means responsively to the absence of output pulses from said first comparison means; and
digital-to-analogue converter means responsive to said output signal condition of said system counting means for providing said first reference signal level so that said reference signal level rises responsively to the presence of said output pulses of said first comparison means and decreases responsively to the disappearance of said output pulses of said first comparison means.

5,115,449
DATA NETWORKS
Terence D. Lockyer, 10 Avebury Avenue, Luton, Bedfordshire LU2 7DT, and Martin C. Adams, 2 Mill Cottages, Station Road, Much Hadham, Hertfordshire SG10 6AU, both of England
Filed May 21, 1990, Ser. No. 525,721
Claims priority, application United Kingdom, May 25, 1989, 8912090.1
Int. Cl.[5] H04B *1/74*
U.S. Cl. 375—3 **11 Claims**



1. A data network including
at least first and second repeater units for receiving data signals and repeating them to other parts of the data network;
a transceiver unit for transmitting and receiving data;
a primary data link comprising a primary transmit line for transmitting data from said transceiver unit to said first repeater unit and a primary receive line for receiving data from said first repeater unit and transmitting it to said transceiver unit;
a secondary data link comprising a secondary transmit line for transmitting data from said transceiver unit to said second repeater unit and a secondary receive line for receiving data from said second repeater unit and transmitting it to said transceiver unit;
and intelligent monitoring means for determining whether or not said transceiver unit is transmitting data and also whether or not data signals are present on each of the primary receive line and said secondary receive line;
and a switch unit actuated by signals from said monitoring means to switch between two states in which either said primary transmit and receive lines or said secondary transmit and receive lines, but not both, are in communication with the transceiver unit.

5,115,650
HIGH SPEED DIGITAL TO ANALOG TO DIGITAL COMMUNICATION SYSTEM
Salvatore Arcuri, Dublin, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Jul. 6, 1989, Ser. No. 376,882
Int. Cl.[5] H04J *3/02*
U.S. Cl. 375—7 **27 Claims**



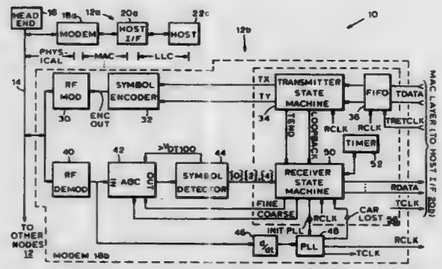
15. An apparatus couplable to receive a first plurality of N-bit input streams of digital data from respective sources, each of the first plurality of N-bit input streams including a

series of N-bit words, wherein the apparatus is couplable to an analog communication link, and the apparatus comprises:

serializer means (**201** or **210**) for receiving the first plurality of N-bit input streams in parallel and for serializing the first plurality of N-bit streams into a first N-bit stream in a time-multiplexing manner such that N-bit words from respective N-bit streams of the first plurality of N-bit streams are sequentially inserted into the first N-bit stream; and

transmitter means (**203** or **212**), coupled to the serializer means, for converting the first N-bit stream into a first analog stream, and for transmitting the first analog stream onto the analog communication link.

5,115,451
LOCAL AREA NETWORK MODEM
Darrell Furlong, Uxbridge, Mass., assignor to Concord Communications, Inc., Marlboro, Mass.
Filed Oct. 14, 1988, Ser. No. 257,858
Int. Cl.[5] H04B *1/38*
U.S. Cl. 375—7 **4 Claims**



1. A local area network modem, for modulating data and control information signals received from an interface so they can be transmitted over a signalling medium, the modem comprising:

A. a transmitter portion including:

i. a first-in first-out memory arranged to receive the data and control information signals, and to receive a return clock signal from the interface, the memory having an input clock control coupled to receive the return clock signal, and an output clock control coupled to receive the local clock signal; and

ii. transmitter state machine means, for receiving the data and control information signals output by the first-in first-out memory, for operating in phase synchronism with a local clock signal, and for providing a loopback signal; and

B. a receiver portion including:

i. means for generating the local clock signal, and for forwarding the local signal over the interface;

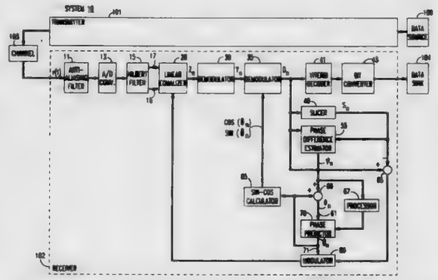
ii. receiver state machine means, for receiving the loopback signal, and for operating in phase synchronism with the local clock signal.

5,115,452
PHASE JITTER CORRECTION ARRANGEMENT
Robert L. Cupo, Eatontown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Aug. 2, 1990, Ser. No. 562,050
Int. Cl.[5] H04L *25/08*
U.S. Cl. 375—14 **24 Claims**

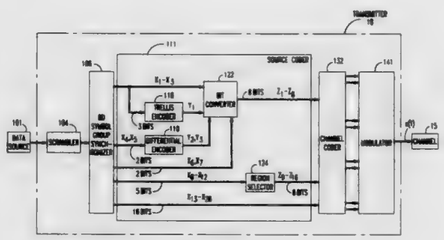
1. Apparatus for estimating phase jitter in a received signal, said apparatus comprising

means for receiving a phase error signal which is representative of a difference between said phase jitter and an estimate thereof, and

means for forming said estimate in response to said phase error signal, said forming means having an impulse response of infinite duration and also having a transfer function which is determined by an autocorrelation of said phase error signal.



5,115,453
TECHNIQUE FOR DESIGNING A MULTIDIMENSIONAL SIGNALING SCHEME
Arthur R. Calderbank, Maplewood, N.J., and Lawrence H. Ozarow, Schenectady, N.Y., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Oct. 1, 1990, Ser. No. 590,849
Int. Cl.[5] H04L *5/12;* **H03M** *13/00*
U.S. Cl. 375—39 **34 Claims**



1. Data transmission apparatus comprising

means for selecting signal points in a signal constellation in response to incoming data, said signal constellation including a plurality of regions with each region having an identical number of signal points, said selecting means carrying out said selecting in accordance with a predetermined signal point probability distribution in which the selection of signal points within any one region is equally probable and the probability of selecting any signal point in one region is different from that in another region, and

means for transmitting a signal representative of the selected signal points.

5,115,454
METHOD AND APPARATUS FOR CARRIER SYNCHRONIZATION AND DATA DETECTION
Andy D. Kucar, 249 Temby, Ottawa, Ont., Canada K1T-2W6
Filed May 12, 1987, Ser. No. 48,777
Int. Cl.[5] H03D *1/24*
U.S. Cl. 375—77 **1 Claim**

1. In an apparatus for estimating concurrent phase synchronization and data detection from a received signal (**103**), said received signal including at least one suppressed carrier modulated with at least one data signal, said apparatus including:

a) first mixing means (**106**, **108**) for mixing said received signal (**103**) with a reference carrier signal (**113**, **115**) and providing a first mixing means output (**109**, **111**);

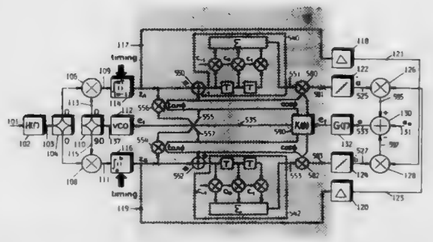
b) data recovery means for sampling (**114**, **116**) said first mixing means output and providing a first sampling means output (**117**, **119**);

c) delay element means (**118**, **120**) for delaying said first sampling means output and providing a first delaying means output (**121**, **123**);

d) first amplification means (**554**, **556**) for amplification said first sampling means output (**119**, **117**), where an amount of amplification—gain is governed by a phase setting signal (**535**) and providing a first amplified output (**555**, **557**);

e) first signal addition/subtraction means (**550**, **552**) for addition/subtraction said first amplified output and said first sampling means output (**117**, **119**) and providing a first sum means output;

f) first equalization means (**540**, **542**) for equalization of timing error caused intersymbol interference said first sum means output, where tap gains are governed by the timing (clock) error signal, and providing a first equalized signal (**551**, **553**),



g) attenuation means (**580**, **582**) for attenuation said first equalized signal, where an amount of attenuation is governed by said phase setting signal (**535**) and providing a second attenuated output (**581**, **583**);

h) first data estimating means (**122**, **124**) for estimating said second attenuated output to obtain a data estimate (**525**, **527**);

i) second mixing means (**126**, **128**) for mixing said data estimate with said first delaying means and providing a second mixing means output (**595**, **597**);

j) second signal addition/subtraction means (**130**) for addition/subtraction of second mixing means and a correction signal (**131**) and providing a first error signal (**533**);

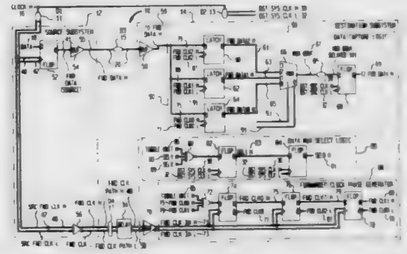
k) filtering means G(f) (**132**) for filtering of said first error signal and providing a first filtered error signal;

l) signal estimating means (**590**) for estimating said first filtered error signal and providing said phase setting signal (**535**);

m) first voltage controlled oscillator means (**112**) for providing an estimated carrier phase error signal (**137**) in accordance with said phase setting signal;

n) splitting means (**110**) for splitting said estimated carrier phase error signal and providing said reference carrier signal (**113**, **115**).

5,115,455
METHOD AND APPARATUS FOR STABILIZED DATA TRANSMISSION
William A. Samaras, Haverhill; David T. Vaughan, Tyngsboro, and Andrew D. Ingraham, Acton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Jun. 29, 1990, Ser. No. 546,400
Int. Cl.[5] H04L *7/04*
U.S. Cl. 375—106 **12 Claims**



10. A method of transmitting accurately a series of data items from a source subsystem to a destination subsystem, each of the source and destination subsystems being coupled to a clock signal having a clock cycle time, comprising the steps of:

(a) transmitting the data items serially along a data path coupling the source subsystem to the destination subsystem;

(b) transmitting a forwarded clock signal along a clock path coupling the source subsystem to the destination subsystem;

(c) delaying the forwarded clock signal by a portion of the clock cycle time before the forwarded clock signal reaches the destination subsystem;

(d) sequentially enabling a plurality of latches arranged in parallel in the destination subsystem as a function of the delayed forwarded clock to capture the data items being transmitted serially along the data path from the source subsystem in an interleaved manner through a continuous rotation among the plurality of latches;

(e) sequentially passing the data items through the latches to inputs of a multiplexer as a function of the forwarded clock signal;

(f) sequentially enabling the multiplexer to pass the data items at its inputs to its outputs; and

(g) capturing each one of the data items from the output of the multiplexer in a state device within two clock cycle times from when each one of the data items was transmitted from the source subsystem.

5,115,456
MASK FOR EXPOSING WAFER WITH RADIATION AND ITS EXPOSING METHOD
Takeshi Kimura, Higashimurayama; Shinji Kuniyoshi, Tokyo; Akihiko Kishimoto, Tachikawa, and Takashi Soga, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 8, 1989, Ser. No. 447,865
Claims priority, application Japan, Dec. 23, 1988, 63-323293
Int. Cl.[5] G21K *5/00*
U.S. Cl. 378—35 **8 Claims**

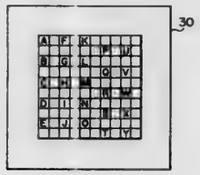
1. A mask for exposing a wafer with radiation comprising:

a thin film through which the radiation can pass;

a mask pattern disposed at a first side of said thin film for absorbing the radiation, said mask pattern having a plurality of rectangular mask pattern areas arranged at prescribed intervals, and each of said rectangular mask pattern areas corresponding to a respective predetermined divided area of a single integrated circuit chip of the wafer; and

a support frame positioned at a second side of said thin film

for supporting said thin film, said support frame having a plurality of radiation exposure windows respectively

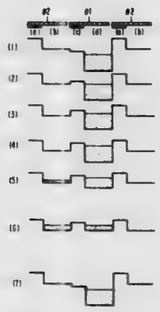


aligned with said plurality of rectangular mask pattern areas of said mask pattern.

5,115,457
METHOD OF DETERMINING TITANIUM DIOXIDE CONTENT IN PAINT
B. Pinkerton Lewandowski, Wilmington, Del., and Michael J. Fahsel, Pennsville, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 1, 1990, Ser. No. 591,122
Int. Cl.[5] G01N *23/223*
U.S. Cl. 378—45 **11 Claims**

1. A method of determining the TiO_2 content of a wet paint sample comprising drying the sample, calcining the dried sample to produce an ash sample fusing the ash sample with a flux, analyzing the resultant product by X-ray fluorescence to determine the TiO_2 content thereof, and correlating said TiO_2 content so determined with said wet paint sample to determine the weight per unit volume of TiO_2 in said wet paint sample.

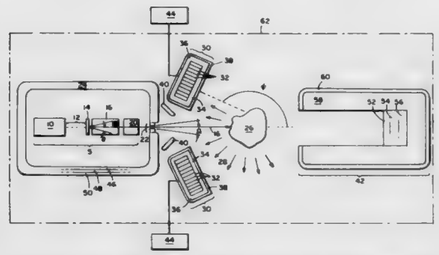
5,115,458
REDUCING DARK CURRENT IN CHARGE COUPLED DEVICES
Bruce Burkey, Rochester; Win-Chyi Chang, Penfield, and Teh-Hsuang Lee, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Continuation of Ser. No. 402,735, Sep. 5, 1989, abandoned. This application Jun. 27, 1991, Ser. No. 725,957
Int. Cl.[5] G11C *19/28;* **H01L** *29/78, 27/14;* **H04N** *3/14*
U.S. Cl. 377—58 **6 Claims**



1. A method of reducing dark current during the operation of a two phase buried channel CCD having a repeating series of two gate pixels with the first pixel gate being connected to a phase line O_1 and the second pixel gate to a phase line O_2, the method comprising the step of:

simultaneously applying appropriate voltages to both phase lines O_1 and O_2 so as to attract holes to the buried channel.

5,115,459
EXPLOSIVES DETECTION USING RESONANCE FLUORESCENCE OF BREMSSTRAHLUNG RADIATION
William Bertozzi, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation-in-part of Ser. No. 567,970, Aug. 15, 1990. This application Nov. 30, 1990, Ser. No. 620,266
Int. Cl.[5] G01N *23/201*
U.S. Cl. 378—88 **42 Claims**



1. A method for detecting explosive materials in a target, the explosive materials containing characteristically large or small amounts of one or more nuclear species of interest, comprising:

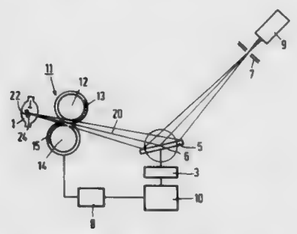
resonantly exciting nuclei of the target with a beam of bremsstrahlung radiation,

resonantly exciting nuclei of one or more reference scatterers with the beam of bremsstrahlung radiation transmitted through the target, each said reference scatterer comprising one or more of the nuclear species of interest,

measuring the intensity of photons at energies of interest scattered from each said reference scatterer in a direction or directions, said energies of interest for each reference scatterer corresponding to the spacings between the quantized energy states of the nuclear species of interest of which the reference scatterer is comprised, and

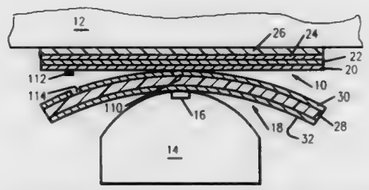
estimating the abundance of each nuclear species of interest in the target from the measured intensity of photons scattered from the reference scatterer or scatterers comprising the nuclear species.

5,115,460
X-RAY ANALYSIS APPARATUS COMPRISING AN ADJUSTABLE SLIT DIAPHRAGM
Roelof De Lange, Almelo, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.
Filed Dec. 11, 1990, Ser. No. 626,085
Claims priority, application Netherlands, Dec. 12, 1989, 8903044
Int. Cl.[5] G01N *23/20;* **G21K** *1/04*
U.S. Cl. 378—150 **11 Claims**



1. An X-ray analysis apparatus, comprising an X-ray source, an adjustable divergence slit, an angle adjusting mechanism for rotating an object about an θ-axis, and an X-ray detector, wherein the improvement comprises that the adjustable divergence slit comprise two cylindrical X-ray absorbing laminations each being rotatably mounted on their axes, said axes extending parallel to the θ-axis of the angle adjusting device, said axes being situated at a distance which is substantially equal to the cylinder radius of the respective cylindrical laminations, on both sides of a radiation vector extending between the center of the X-ray source and the central point of the object to be irradiated.

5,115,461
METHOD AND APPARATUS FOR LABELING X-RAY FILM
Robert E. Kranz, Phoenix, and John Pace, Tempe, both of Ariz., assignors to Kroy, Inc., Scottsdale, Ariz.
Filed Mar. 4, 1991, Ser. No. 663,748
Int. Cl.[5] H05G *1/28*
U.S. Cl. 378—165 **6 Claims**



1. An X-ray label system for use with X-ray film, the system comprising:

a recording medium having

a substrate that is substantially transparent to X-ray radiation and

a self-adhesive layer on one side of the substrate;

a ribbon having a base film covered by a heat sensitive X-ray absorbing layer deposited thereon; and

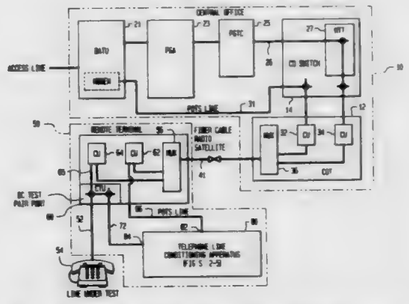
printing means for pressing the ribbon against the recording medium and for selectively heating areas of the X-ray absorbing layer to soften the heated areas so that they loosen from the ribbon and adhere to the recording medium to create images on the recording medium that provide identification data in visible light and that shield areas of the X-ray film corresponding to the images from exposure to X-ray radiation.

5,115,462
REMOTELY CONTROLLED APPARATUS FOR CONDITIONING TELEPHONE LINE EXCLUSIVE OF METALLIC DC BYPASS PAIR
Michael Kennedy, Ventura; Ben Pierce, Camarillo, and Aaron Chan, Moorpark, all of Calif., assignors to Harris Corporation, Melbourne, Fla.
Filed Apr. 3, 1991, Ser. No. 679,934
Int. Cl.[5] H04M *3/30;* **H04B** *3/46*
U.S. Cl. 379—29 **19 Claims**

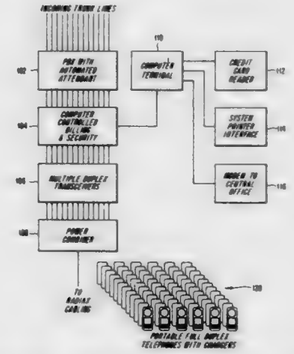
1. For use with a telephone system including a central office which communicates with a remote terminal by way of a central office/remote terminal communication link, the remote terminal being coupled to respective telephone lines through which user telephone devices have access to the telephone system, an apparatus for conditioning a respective telephone line by way of a telephone line conditioning control unit at the central office comprising:

a telephone line termination unit having a telephone line access port to which a telephone line pair may be coupled, said telephone line termination unit including means for controllably imparting a selected one of a plurality of electrical signalling conditions by way of said telephone line access port to a telephone line pair coupled thereto; and

a control unit, coupled to said telephone line termination unit and said central office/remote terminal communication link, for receiving telephone line conditioning messages from said central office and controlling the operation of said telephone line termination unit.



5,115,463
EXTENDED CORDLESS TELEPHONE SYSTEM
David Moldavsky, 7 Ferncliff Dr., West Hartford, Conn. 06117, and Robert L. Stone, Box 83, Garland Rd., Newfield, Me. 04056
Filed Jun. 25, 1990, Ser. No. 543,010
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—58 **16 Claims**



4. An extended phone service system for communicating information signals from a plurality of communication lines through a local exchange to a plurality of remote units, comprising:

a plurality of transmitter means having an amplitude companded sideband (ACSB) modulator coupled to said local exchange, for transmitting information signals as ACSB signals;

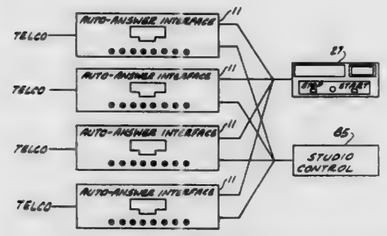
a power combiner coupled to said plurality of transmitter means, said power combiner including a plurality of combiner striplines connected for combining power outputted from said plurality of transmitters to an output of said power combiner;

isolator means coupled between each of said transmitter means and each of said combiner striplines coupled to each of said transmitter means, respectively, for isolating power outputted from said transmitter means;

a plurality of high Q filters coupled between each of said transmitter means and each of said isolator means coupled to each of said transmitter means, respectively, for filtering power outputted from said transmitter means; and

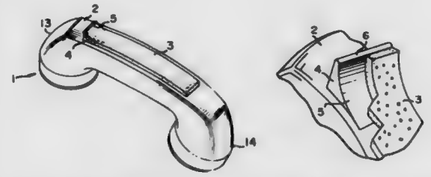
at least one radiax cable coupled to the output of said power means for radiating the ACSB signals to said plurality of remote units.

5,115,464
MULTILINE TELEPHONE ANSWERING SYSTEM AND INTERFACE THEREFORE
Michael I. Waldman, 14180 Forest Crest Dr., Chesterfield, Mo. 63017
Continuation of Ser. No. 902,230, Aug. 29, 1986, Pat. No. 4,860,338. This application Aug. 2, 1989, Ser. No. 388,345
Int. Cl.[5] H04M *1/65, 1/64*
U.S. Cl. 379—72 **5 Claims**



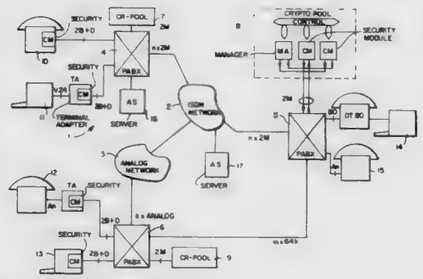
1. An interface unit for selectively providing interconnection between a telephone line and an audio device comprising:
means for setting the mode of operation of the unit;
enabling means responsive to the unit being in a first mode and the presence of a ring signal on the telephone line for putting the unit in a waiting state;
first switching means responsive to a first state of the audio device for making a connection between the telephone line and the audio device only when the unit is in the first mode and the waiting state;
means independent of the first switching means for making a connection between the telephone line and the device in response to a ring signal when the unit is in a second mode; and
second switching means responsive to an external signal for making a connection between the telephone line and the audio device in response to the external signal, independently of the mode of the unit as set by the mode setting means;
wherein said audio device is a playback deck having a prerecorded message and wherein in the first mode of operation the playback deck controls the interface unit to only connect the telephone line to the playback deck at the start of the prerecorded message.

5,115,465
SHOULDER REST
Lester P. Freer, 864 Brook Rd., Scottsville, N.Y. 14546
Filed Jan. 24, 1990, Ser. No. 469,267
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—449 **3 Claims**



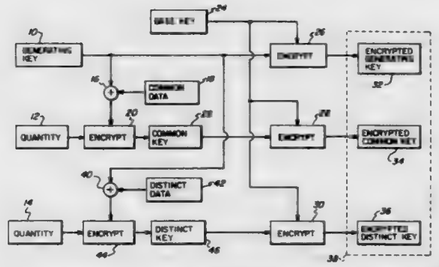
1. An article of manufacture comprising a telephone handset comprising a handle, a receiver and a transmitter at opposite ends of said handle, said handle receiving an inner surface extending between said receiver and said transmitter and an outer surface which extends substantially the length of the handset; said outer surface including a wedge-shaped object positioned a short distance from the end of said receiver; said wedge-shaped object having a flat upper concave surface with its under surface shaped to fit the outer surface of said handset and terminating in an edge; a removable cushion comprising a strip of open-celled plastic foam material having a cell count of form 40–120 cells per inch, a density from 4–6 lb/ft^3 and a load deflection value measured by ASTM test method D-3574-81 or D-3574-77 from 0.5–0.7 psi, said cushion being secured to said concave surface of the wedge-shaped object and extending beyond the edge of said wedge substantially the length of said outer surface and secured thereto.

5,115,466
COMMUNICATION NETWORK INTENDED FOR SECURE TRANSMISSION OF SPEECH AND DATA
Kare Presttun, Oslo, Norway, assignor to Alcatel STK A/S, Oslo, Norway
Filed Oct. 31, 1990, Ser. No. 607,912
Claims priority, application Norway, Nov. 13, 1989, 894506
Int. Cl.[5] H04L *9/00, 9/08*
U.S. Cl. 380—9 **10 Claims**



1. Communication network for secure transmission of information, comprising:
at least three subscriber terminals,
at least two switching modules including a first switching module associated with a first and second said subscriber terminal and a second switching module associated with a third said switching module,
subscriber lines to connect each of the subscriber terminals with its associated said switching module,
at least one transmission link connecting the switching modules to each other to thereby form a switched network, and
at least two cryptographic devices, including a first cryptographic device associated with the first switching module and a second cryptographic device associated with the second switching module, to undertake encryption/decryption of at least some of the information transmitted through the switched network between the first switching module and the second switching module,
wherein:
the first cryptographic device is physically separated from said first switching module,
the first cryptographic device uses standardized interface and communication protocols, to communicate with said first switching module and, via said first switching module, with said first and second subscriber terminals,
said first cryptographic device is a crypto-pool device comprising a plurality of cryptographic modules for simultaneous encryption/decryption of respective different information being transmitted between the associated said first switching module and one or more other said switching modules, each said cryptographic module providing a non-secure communication path via said first switching module to a currently designated one of said at least two subscriber terminals, and a secure communication path via said first switching module, said switched network and a currently designated said second switching module to a currently designated said second cryptographic device.

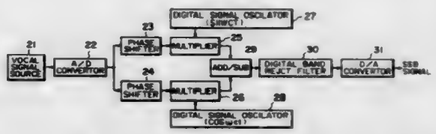
5,115,467
SIGNAL ENCRYPTION APPARATUS FOR GENERATING COMMON AND DISTINCT KEYS
James N. Esserman, and Christopher J. Bennett, both of San Diego, Calif., assignors to General Instrument Corporation, Hatboro, Pa.
Filed Jan. 23, 1991, Ser. No. 644,923
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—44 **23 Claims**



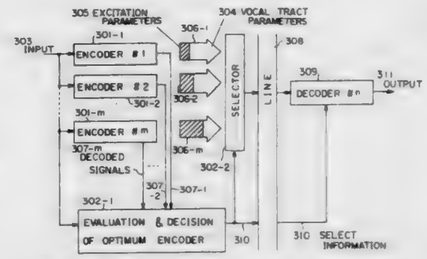
1. A method for locally generating common and distinct cryptographic keys at a plurality of sites comprising the steps of:
initializing a terminal for each site with a set of distinct parameter data unique to the site, a common secret generating key that is the same for all sites, and a set of common parameter data that is the same for all sites;
combining the generating key with the set of common parameter data in each terminal to provide a common intermediate key that is the same for all sites;
transforming the common intermediate key through a first one way function in each terminal into a common key that is the same for all sites;
combining the generating key with the set of distinct parameter data in each terminal to provide a distinct intermediate key that is unique for each site; and
transforming the distinct intermediate key through a second one way function in each terminal into a distinct key that is unique for each site.

5,115,468
SSB DIGITAL MODULATOR
Nobumitsu Asahi, Sagamihara, and Seiji Kawase, Yokohama, both of Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan
Continuation of Ser. No. 204,756, Jun. 10, 1988, abandoned. This application May 9, 1990, Ser. No. 614,552
Claims priority, application Japan, Jun. 13, 1987, 62-146246
Int. Cl.[5] G10L *3/02*
U.S. Cl. 381—31 **9 Claims**

1. A digital single sideband modulator for producing a carrier suppressed single sideband signal of a signal bandwidth ΔF and carrier frequency fc, the modulator comprising:
an analog to digital converter for converting an analog baseband signal into a digital baseband signal;
modulation means for taking a multiplication of the digital baseband signal with two orthogonal carriers to produce a digital signal sideband signal; and
a digital to analog converter for converting the digital single sideband signal produced by said modulation means into an analog single sideband signal;
wherein said modulation means includes a digital sawtooth filter provided with an n stage delay element and feedback loop, n being an integer equal to or larger than 2 and the frequency response of the filter having dips at a plurality of equally spaced frequencies for suppressing a residual carrier signal component in the digital single sideband signal prior to the conversion by said digital to analog converter and said digital to analog converter converts the digital single sideband signal from which the residual carrier signal component has been suppressed by said digital sawtooth filter.



5,115,469
SPEECH ENCODING/DECODING APPARATUS HAVING SELECTED ENCODERS
Tomohiko Taniguchi, Yokohama; Kohei Iseda; Koji Okazaki, both of Kawasaki; Fumio Amano, Tokyo; Shigeyuki Unagami, Atsugi; Yoshinori Tanaka, Yokohama, and Yasuji Ohta, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
PCT No. PCT/JP89/00580, § 371 Date Feb. 8, 1990, § 102(e) Date Feb. 8, 1990, PCT Pub. No. WO89/12292, PCT Pub. Date Dec. 14, 1989
PCT Filed Jun. 7, 1989, Ser. No. 460,099
Claims priority, application Japan, Jun. 8, 1988, 63-141343; Mar. 14, 1989, 1-61533
Int. Cl.[5] G01L *5/00*
U.S. Cl. 381—36 **12 Claims**

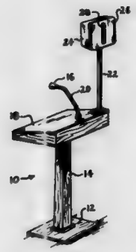


1. A speech encoding apparatus for encoding a speech signal by separating a plurality of characteristics of said speech signal into articulation information representing at least one of a plurality of articulation characteristics of said speech signal, and excitation information representing at least one of a plurality of excitation characteristics of said speech signal, comprising:
a plurality of encoding means for encoding the articulation information and the excitation information extracted from said speech signal by performing a local decoding of said speech signal, each of said plurality of encoding means having a different ratio of a transmission rate between the encoded articulation information and the encoded excitation information as compared to a similar ratio of other ones of said plurality of encoding means; and
evaluation/selection means for evaluating a quality of each of a plurality of decoded signals based on the encoded articulation information and the encoded excitation infor-

mation, from respective ones of said plurality of encoding means to provide an evaluation result, and for determining and selecting a most appropriate one of the plurality of encoding means from among said plurality of encoding means, based on the evaluation result, to output a result indicative of the most appropriate one of the plurality of encoding means, as selection information,

the encoding means selected by said evaluation/selection means outputting said encoded articulation information and said encoded excitation information, and said evaluation/selection means outputting said selection information.

5,115,470
SOUND REINFORCEMENT SYSTEM
Peter E. Sutheim, 5146 Almaden Dr., Los Angeles, Calif. 90042
Filed Apr. 11, 1990, Ser. No. 515,077
Int. Cl.[5] H04R *27/00*
U.S. Cl. 381—76 **11 Claims**



1. An improved sound reinforcement system, for use in a location adjacent to an audience region, comprising, in combination:

a directional microphone chosen to provide a directivity pattern characterized by substantially attenuated sensitivity within a designated insensitive portion of a hemispheric rear region beyond 90 degrees from a forward direction of the microphone;

a directional speaker unit, energized from an audio power amplifier receiving input from said microphone, having directivity means for providing a directivity pattern characterized by substantially attenuated response within a designated attenuated portion of a hemispheric rear region beyond 90 degrees from a forward direction of the speaker unit; and

a support structure comprising:

a rectangular lectern table attached to a floor base by pedestal means;

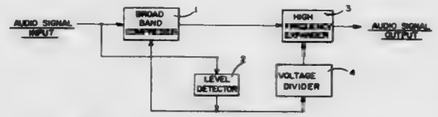
microphone support means attached to said microphone and to the table; and

a hollow rigid vertical pole, attached at a lower end to the table in a corner region thereof, supporting at an upper end the speaker unit and enclosing wiring associated with the speaker unit;

said support structure being configured to locate said microphone at a normal working height facing away from the audience region, and to hold said speaker unit facing said audience region at a designated height above said microphone, the microphone and the speaker unit being located in close proximity in the order of a few feet, said microphone being located within the designated attenuated portion of the rear region of said speaker unit and said speaker unit being located within the designated insensitive portion of the rear region of said microphone;

whereby suppression of acoustic feedback from said speaker unit to said microphone enables the system to effectively reinforce sound sensed by the microphone and project the reinforced sound to the audience region with a high degree of fidelity, clarity, intelligibility and original-source localization.

5,115,471
HIGH FREQUENCY EXPANDER DEVICE
Gary Liden, Granada Hills, Calif., assignor to Aphex Systems, Ltd., Sun Valley, Calif.
Filed Jan. 2, 1991, Ser. No. 636,761
Int. Cl.[5] H03G *7/00*
U.S. Cl. 381—106 **16 Claims**



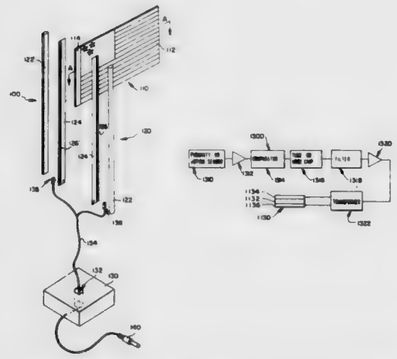
1. An audio signal compression system for outputting an output signal that is a compressed version of an input audio signal that is input to the system comprising:

broadband compression means for compressing the input signal in response to a control signal,

high frequency expansion means for expanding the high frequency components of the signal output from the broadband compression means in response to the control signal,

control means for generating the control signal responsive to the input signal.

5,115,472
ELECTROACOUSTIC NOVELTIES
Kyung T. Park, 710 Newton Rd., Berwyn, Pa. 19312, and Peter F. Radice, 438 Springhouse Rd., King of Prussia, Pa. 19406
Filed Oct. 7, 1988, Ser. No. 255,008
Int. Cl.[5] H04R *25/00;* **G09F** *27/00;* **H01L** *41/04*
U.S. Cl. 381—152 **26 Claims**



4. An electroacoustic novelty with microphone, comprising:

a flexible substrate forming at least a portion of said novelty, at least a portion of said substrate having a curved, noncontinuous cross section;

a piezoelectric polymer film having opposed first and second surfaces which responds to received sound waves by vibrating with said substrate and producing an electrical audio signal;

a first electrode electrically coupled with said first surface;

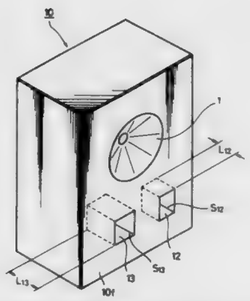
a second electrode electrically coupled with said second surface;

a device responsive to processed electrical audio signals;

means for conformably adhering said film to the portion of said substrate having the curved, noncontinuous cross section; and

receiving means electrically coupled with said first and second electrodes for processing the electrical audio signal generated by said film when said film is caused to vibrate by sound waves and delivering the processed electrical audio signal to said device.

5,115,473
TRANSDUCER HAVING TWO DUCTS
Makoto Yamagishi, Tokyo; Masao Fujihira, Kanagawa; Kazuo Azami, Saitama, and Ikuo Shinohara, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Aug. 2, 1990, Ser. No. 561,864
Claims priority, application Japan, Sep. 4, 1989, 1-103586[U]; Feb. 19, 1990, 2-38082[U]
Int. Cl.[5] H04R *25/00, 1/02;* **H05K** *5/00*
U.S. Cl. 381—154 **7 Claims**



1. An electroacoustic transducer apparatus comprising:

(a) an electroacoustic transducing element supplied with an input signal;

(b) a sealed housing which surrounds said electroacoustic transducing element so that a sound producing surface of said electroacoustic transducer is exposed through one wall of said sealed housing; and

(c) a plurality of sound ducts arranged inside said housing and separated from said transducing element and communicating the inside and outside of said sealed housing, wherein said sound ducts are different in length and have equal equivalent masses.

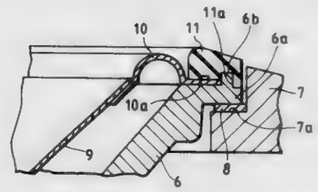
5,115,474
SPEAKER SYSTEM
Yukio Tsuchiya; Hiroshi Tanaka, and Shunichi Takahashi, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Continuation of Ser. No. 282,229, Dec. 9, 1988, abandoned. This application May 6, 1991, Ser. No. 698,175
Claims priority, application Japan, Apr. 30, 1988, 63-59608[U]
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—158 **2 Claims**

1. A speaker system comprising:

a cabinet having a baffle board therein;

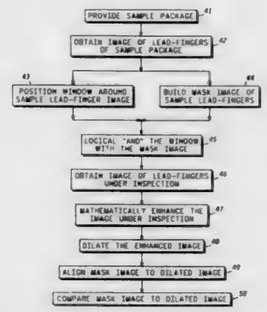
a speaker comprising a frame, an edge member, and a diaphragm, said diaphragm of said speaker unit being supported at its outermost circumferential edge by said edge member, said edge member being supported by a front portion of an outermost circumferential edge of said frame, said outermost circumferential edge of said frame being disposed at the front of said cabinet; and

damping material disposed on and covering said front portion of said outermost circumferential edge of said frame



to minimize sound radiation from said outermost circumferential edge of said frame.

5,115,475
AUTOMATIC SEMICONDUCTOR PACKAGE INSPECTION METHOD
Christopher J. Lebeau, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 4, 1990, Ser. No. 532,779
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—8 **8 Claims**



1. A method of automatically inspecting lead-fingers of a semiconductor package comprising: providing a sample package; obtaining an image of lead-fingers of the sample package; positioning a window around the sample lead-finger image; building a sample mask image from the sample lead-finger image; logical ANDing the window with the sample mask image; obtaining an image of lead-fingers under inspection; mathematically enhancing the image under inspection; dilating the enhanced image; aligning the mask image to the dilated image; and comparing the mask image to the dilated image to determine acceptability of the lead-fingers.

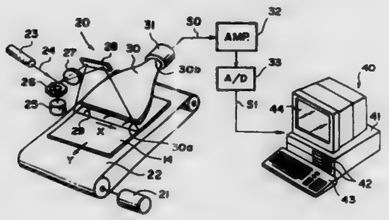
5,115,476
EDGE FINDING METHOD AND APPARATUS
Wataru Ito, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jan. 24, 1991, Ser. No. 645,526
Claims priority, application Japan, Jan. 29, 1990, 2-18205
Int. Cl.[5] G06K *9/08*
U.S. Cl. 382—22 **14 Claims**

1. An edge finding method wherein, from an image signal made up of a series of image signal components representing a radiation image of an object, judgements are made as to whether predetermined picture elements in the radiation image belong or do not belong to a part corresponding to an edge in the radiation image,

the edge finding method comprising the steps of:

i) from image signal components representing picture

elements belonging to a plurality of predetermined regions in said radiation image, each of said plurality of predetermined regions having a predetermined picture element P0 in the middle, calculating for each predetermined region moments of the image signal components representing the picture elements, which surround said predetermined picture element P0, with respect to a single predetermined direction on said radiation image, or calculating for each predetermined region moments of the image signal components representing the picture elements, which surround said predetermined picture



element P0, with respect to two different predetermined directions on said radiation image, and

ii) calculating characteristic values based upon the moments, which have been calculated with respect to the single predetermined direction, or from the moments, which have been calculated with respect to the two different predetermined directions;

iii) determining which one of the characteristic values exceed a predetermined threshold value and judging whether said predetermined picture element P0 belongs or does not belong to a part corresponding to an edge in said radiation image.

5,115,477

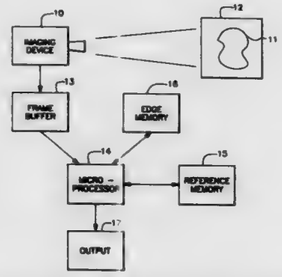
IMAGE RECOGNITION EDGE DETECTION METHOD AND SYSTEM

John L. Groezinger, Madison, Wis., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 175,558, Mar. 31, 1988, abandoned. This application Feb. 7, 1991, Ser. No. 652,409

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—22 **4 Claims**



1. In a system in which an image frame formed of a two dimensional array of pixels is represented by a plurality of gray scale values, each gray scale value representing a gray scale of a separate pixel in the image frame, means for determining the edges of an object in the image frame, comprising:

reference determining means for establishing a reference contract level based on the distribution of differences between gray scale and values of pairs of contiguous pixels in the image frame said reference determining means comprising means for examining the distribution of differences between gray scale values of pair of contiguous pixels, and establishing as the reference contrast level the difference level which is the last of a predetermined number of successive difference levels each of which exceeds the next smaller difference level by at least a predetermined amount, said reference determining means comprising additional means for examining groups of gray scale values, the groups corresponding to square groupings of four contiguous pixels, and, for each group, calculating the differences between every combination of pairs of gray scale values, said means for examining groups of gray scale values further determining the distribution of differences between gray scale values of pairs of contiguous pixels; and

means for examining groups of gray scale values, the groups corresponding to square groupings of four contiguous pixels, and producing a two dimensional array of elements arranged to correspond to the arrangement of square groupings of four contiguous pixels, each element in the array having either a first or second value, the first value occurring only if the difference between gray scale values corresponding to a pair of pixels in a square grouping of four contiguous pixels is greater than the reference contrast level, whereby the first values are arranged to represent the edges of the object in the image frame.

5,115,478

IMAGE READER

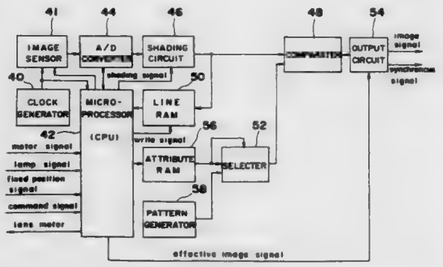
Masamichi Sugiura, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 289,439, Dec. 23, 1988, abandoned, which is a continuation of Ser. No. 2,223, Jan. 12, 1987, abandoned. This application Oct. 10, 1990, Ser. No. 595,698

Claims priority, application Japan, Jan. 10, 1986, 61-4080; Feb. 5, 1986, 61-24837

Int. Cl.[5] G06K *9/38*

U.S. Cl. 382—50 **16 Claims**



1. A scan apparatus, comprising:

a platen on which a document can be placed;

criterion member means providing a reference boundary for determining a margin for a copied image, said boundary formed of at least one black zone and at least one white zone positioned successively in the subscan direction, said criterion member means being arranged adjacent the platen in alignment in the subscan direction with a location on the platen on which the document can be placed and on the side of the platen from which a subscan is started;

means for detecting a linear optical image of the document to obtain a density distribution of a linear optical image;

means for scanning the criterion member means and a document in the subscan direction, said means including means for illuminating a document placed on a document area of the platen and the criterion member; and

means for initiating a time delay before starting a scan of the document on the platen, said means being connected to the means for detecting a linear optical image so as to detect said boundary on the criterion member means and initiating the time delay at the time at which the boundary is detected.

5,115,479

IMAGE DATA PROCESSING METHOD FOR COMPRESSING AN IMAGE BY APPROXIMATING CURVES USING A POLYNOMIAL

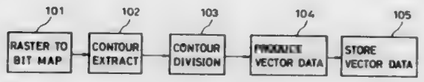
Noboru Murayama, Machida, Japan, assignor to Ricoh Company, Ltd., Japan

Continuation of Ser. No. 391,788, Aug. 9, 1989, abandoned. This application Sep. 30, 1991, Ser. No. 768,465

Claims priority, application Japan, Aug. 10, 1988, 63-198015

Int. Cl.[5] G06K *9/46*

U.S. Cl. 382—56 **10 Claims**



1. A method of transmitting and receiving image data in a compressed format, the method comprising:

a) storing a scanned image as a raster pattern in a pattern storage device;

b) extracting a contour of the pattern from the pattern storage device;

c) dividing the contour into line portions and curve portions;

d) compressing the line portions into an initial point and a terminal point, and compressing the curve portions into first, second, third and fourth vector data, using a procedure including the steps of:

1) defining the initial point as the first vector datum;

2) defining the terminal point as the second vector datum;

3) detecting a first tangent passing through the initial point of the curve portion and making a tangential contact therewith;

4) detecting a second tangent passing through the terminal point of the curve portion and making a tangential contact therewith;

5) detecting a third tangent passing through a point on the curve portion other than the initial and terminal points;

6) defining the third vector datum as the intersection of the first tangent and third tangent; and

7) defining fourth vector datum as the intersection of the second tangent and third tangent;

e) storing the first, second, third, and fourth vector data in a vector data storage device;

f) transmitting the vector data stored in the vector data storage device;

g) receiving the vector data;

h) storing the vector data in a vector data storage device;

i) forming, from the vector data in the vector data storage device, a curve portion contour based on the vector data and first, second and third tangents defined by the vector data; and reproducing a line portion contour based on initial and terminal points; the forming steps performed in accordance with a polynomial M(X,Y) defined by

$$A(1-t)^3+(cP-(c-3)A)(1-t)^2t+(dQ-(d-3)E)(1-t)^2+Et^3$$

wherein

A stands for the first vector datum,

E stands for the second vector datum,

P stands for the third vector datum,

Q stands for the fourth vector datum,

c and d are predetermined coefficients, and

t is a parameter changing its value between zero and one and representing a position on the curve;

j) forming a bit map based on the contours; and

k) storing the bit map as a pattern in a pattern storage device.

5,115,480

OPTICAL POLARISATION STATE CONTROLLERS

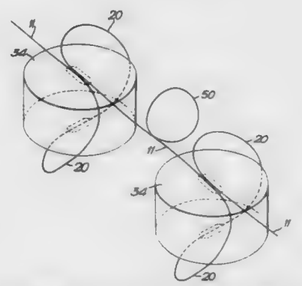
Timothy A. Large, Papworth Everard, Great Britain, assignor to Northern Telecom Europe Limited, London, England

Filed Mar. 19, 1991, Ser. No. 671,453

Claims priority, application United Kingdom, Mar. 28, 1990, 9006867

Int. Cl.[5] G02B *6/02, 6/26*

U.S. Cl. 385—12 **12 Claims**



1. An optical fibre polarisation state controller including a coil of single mode optical fibre, means mechanically coupling said coil to a transducer, said coil being a coil twisted out of planar form so as to make it circularly birefringent, and means associated with the transducer for adjusting the amount of the twist of the coil out of planar form.

5,115,481

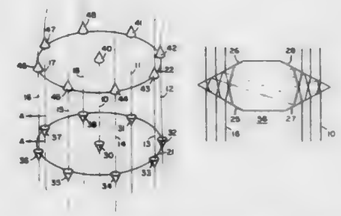
MULTI-POSITION OPTICAL FIBER ROTARY SWITCH

Carl F. Buhrer, Framingham, Mass., assignor to GTE Laboratores Incorporated, Waltham, Mass.

Filed Jul. 23, 1991, Ser. No. 736,263

Int. Cl.[5] G02B *6/34*

U.S. Cl. 385—25 **8 Claims**



1. Apparatus for providing for the exchange redirection of one common optical path with one of a plurality of other optical paths, wherein each of said plurality of other optical paths is parallel to, equidistant from and evenly spaced around said common optical path, said plurality of other optical paths intersecting input and output planes in a circular configuration, and said common optical path intersecting said input plane and said output plane at the center of said circular configuration, comprising:

a single prism between said input and said output planes, said prism oriented in a reference position on said common optical path so that light thereon can pass undeflected through said prism and so that light on each of said other optical paths can pass unimpeded adjacent said prism; and

means for repositioning said prism by a rotation about said common optical path and a radial translation toward one

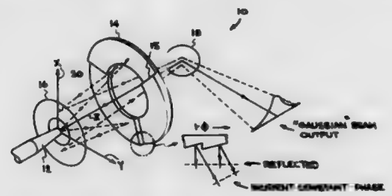
of said plurality of other optical paths thereby intercepting and exchanging light thereon with light on said common optical path.

5,115,482

OPTICAL APPARATUS FOR CONVERSION OF WHISPERING-GALLERY MODES INTO A FREE SPACE GAUSSIAN LIKE BEAM

Barry W. Stallard; Michael A. Makowski, both of Livermore, and Jack A. Byers, Danville, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 7, 1991, Ser. No. 711,693
Int. Cl.[5] G02B *6/26*; H01P *1/16*
U.S. Cl. 385—28 **18 Claims**



1. An optical apparatus comprising:

an aperture at the end of a tubular waveguide, and first, second, and third mirrors having reflective surfaces and arranged along an axis so that said axis passes through said aperture and said three mirrors wherein;

said first mirror has a central opening which said axis passes through and is positioned away from said waveguide in front of said aperture;

said second mirror has a central opening which said axis passes through and is positioned closer to said aperture than said first mirror;

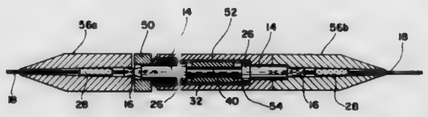
said third mirror is solid where said axis passes through and is positioned farther from said aperture than said first mirror.

5,115,483

HIGH-STRENGTH IN-LINE FIBER OPTIC CONNECTOR

Roger L. Morency, Voluntown, and Gregory H. Ames, Gales Ferry, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1991, Ser. No. 691,767
Int. Cl.[5] G02B *6/38*
U.S. Cl. 385—60 **8 Claims**



1. A fiber optic connector for connecting optical fibers comprising:

a pair of ferruled components with each of said ferruled components having aperture means for passing one of said optical fibers throughout the entire length of said ferruled component and having holding means for holding one of said optical fibers, each of said ferruled components further having a ferrule with a face at an end of said ferrule, the faces providing an interface between said optical fibers;

a pair of compression nuts having threads, with each compression nut abutting and positioning one of said ferruled components;

a split ceramic tube having each of said ferrules inserted into opposite ends of said tube; and

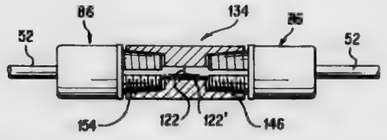
a connecting sleeve having threads at opposite ends of said sleeve with each end threaded to respective compression nuts for enabling each of said compression nuts to abut and position one of said ferruled components.

5,115,484

MULTIPURPOSE OPTICAL FIBER CONNECTOR

Paul D. Johnson, Knightdale, N.C., assignor to Square D Company, Palatine, Ill.

Filed Dec. 27, 1990, Ser. No. 634,660
Int. Cl.[5] G02B *6/38*
U.S. Cl. 385—72 **10 Claims**



5. A fiber optic connector for end to end connection of two standard plastic covered fiber optic cables without connecting tips, one standard plastic covered fiber optic cable without a connecting tip and one armored plastic fiber optic cable having a cable connecting tip, or two armored plastic fiber optic cables each having a cable connecting tip, said connector comprising:

a. a body, having a first exterior end, a first interior end, a first threaded passage connecting said first exterior and interior ends, a second exterior end, a second interior end, a second threaded passage connecting said second exterior and interior ends, and a passage connecting said first and second interior ends, and

b. a pair of bushing, each generally tubular in shape and having a passage through the center thereof for receiving, clamping, and biasing either the standard plastic covered fiber optic cable without a connecting tip or the armored fiber optic cable having said cable connecting tip, each said bushing being received in one of said first or second threaded passages of said body.

5,115,485

CABLE FOR HOUSING PARALLELLY ORIENTED OPTICAL FIBERS AND METHOD AND APPARATUS FOR PRODUCING THE SAME

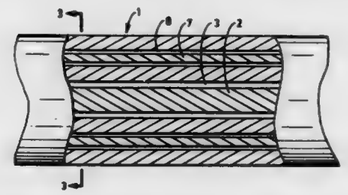
Ronald L. Gandy, Culpeper, Va., assignor to Rochester Corporation, Culpeper, Va.

Continuation-in-part of Ser. No. 45,599, May 4, 1987, abandoned, and a continuation-in-part of Ser. No. 45,863, May 4, 1987, abandoned. This application Mar. 10, 1988, Ser. No. 166,316
Int. Cl.[5] G02B *6/44*
U.S. Cl. 385—101 **5 Claims**

5. A signal transmitting cable comprising:

an electrically conductive strength member surrounded by and embedded in an elastomeric material, said strength member being substantially parallel to an axis of said cable;

a plurality of signal transmitting optical fibers completely surrounded by and embedded in said elastomeric material, said optical fibers being substantially parallel to said strength member along the entire length of said cable wherein one of said optical fibers is positioned in the



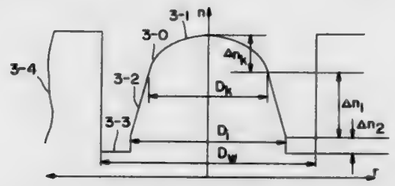
center of said cable and said strength member surrounds said optical fiber.

5,115,486

FLEXIBLE OPTICAL GRADED-INDEX PROFILE FIBER FOR TRANSMISSION OF LASER RADIATION WITH HIGH OUTPUT WITH SUBSTANTIAL PRESERVATION OF THE MODE STRUCTURE

Hubertus C. Bader, Mainz; Kurt Nattermann, Ingelheim, and Uwe Rutze, Mainz, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Jan. 23, 1991, Ser. No. 644,638
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1990, 4001781
Int. Cl.[5] G02B *6/18*
U.S. Cl. 385—124 **20 Claims**



1. A flexible, optical, graded-index profile multimode fiber useful for transmission of laser radiation with high output and maximum mode order, o, with substantial preservation of the mode structure, having a fiber core with diameter D_k, a cladding around the core and a protective sheath around the cladding, wherein the refractive index profile in the core substantially follows the law of exponents:

$$n^2_k(r)=n^2_{ki}-(n^2_{ki}-n^2_{ka})\cdot(2\cdot r/D_k)^g$$

wherein r is the distance from the fiber axis, n_{ki} is the refractive index in the fiber axis and n_{ka} is the refractive index in the core on the interface at the cladding, n_{ki} being greater than n_{ka}, and,

a) core diameter D_k is between $200.10^{-6}\sqrt{m}$ and 800.10^{-6}m,

b) but D_k is at least 2.5 times $(o'\cdot\lambda)/\sqrt{\Delta n_k}$ and o' has the value 5 if the maximum mode order of laser radiation o is less than 5, o'=o if o is in the range of 5 to 20, or o'=4.5·$\sqrt{o}$ if o is greater than 20, $\sqrt{\Delta n_k}$ is the root of the refractive index difference Δn_k in the core and λ is the wavelength of the laser radiation to be transmitted,

c) exponent g is between 1.4 and 3.0

d) and the refractive index difference in the core,

$$n_k=n_{ki}-n_{ka},$$

is greater than $1.6\cdot19^{-3}$.

5,115,487

ALKENE-TREATED SILICONE COMPOUNDS

Lee L. Blyler, Jr., Basking Ridge; Edwin A. Chandross, Berkeley Heights, and Xina S. Quan, Bridgewater, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 169,265, Mar. 17, 1988, abandoned. This application Feb. 8, 1991, Ser. No. 653,461
Int. Cl.[5] G02B *6/02*; C08F *283/12*
U.S. Cl. 385—128 **6 Claims**

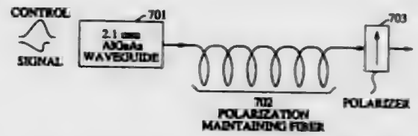
1. The article formed by the process of treating a body with an alkene wherein said body comprises a siloxane polymer 1) that has reactive hydrogen atoms bound to silicon atoms and 2) that has been sufficiently cured to be gelatinous whereby said alkene chemically reacts with said hydrogen atoms.

5,115,488

APPARATUS COMPRISING AN ALL-OPTICAL GATE

Mohammed N. Islam, Hazlet, and Richard E. Slusher, Lebanon, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 679,389, Apr. 2, 1991. This application May 10, 1991, Ser. No. 699,080
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—129 **7 Claims**



1. An article comprising an all-optical gate comprising optical waveguide means of effective length L, the waveguide means adapted for guiding electromagnetic signal radiation of wavelength λ_s, associated with said waveguide means being a bandgap energy E_g, a non-linear refractive index n_2 and an absorption coefficient α, with n_2 and α being such that, in the presence of a control pulse of electromagnetic radiation, a pulse of signal radiation of centerwavelength λ_s can, while propagating through said waveguide means, undergo a phase shift of magnitude at least equal to π while, at the same time, undergo attenuation by less than e^{-1};

characterized in that

a) 1.2 $\mu m<\lambda_s<1.7$ μm; and

b) the optical waveguide means are planar semiconductor waveguide means comprising $Al_{1-x}Ga_xAs$, with $0<x<1$, with x selected such that $(hc/\lambda_s)<E_g/2$, where h is Planck's constant, and c is the speed of light in vacuum.

5,115,489

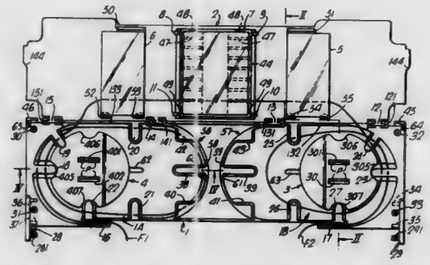
SPLICE TRAY

Stephen H. Norris, St. Albans, England, assignor to British Telecommunications public limited company, United Kingdom

PCT No. PCT/GB89/00202, § 371 Date Aug. 1, 1990, § 102(e) Date Aug. 1, 1990, PCT Pub. No. WO89/08276, PCT Pub. Date Sep. 8, 1989
PCT Filed Feb. 27, 1989, Ser. No. 548,983
Claims priority, application United Kingdom, Mar. 2, 1988, 8805017
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—135 **16 Claims**

1. A splice tray for optic fibres (F1, F2) comprising two spaced-apart reel means (3, 4) defining respective at least part-annular spaces (1B, 1A) for locating respective coiled optic fibres (F2, F1) and a splice protector housing (44, 7) for locat-

ing a spliced joint (X) formed between such optic fibres, characterised in that at least one of said reel means (3, 4) is adjust-



able so as to enable the size of its at least part-annular space (1A, 1B) to be varied.

5,115,490

VARIABLE LENGTH DATA PROCESSING APPARATUS WITH DELIMITER LOCATION-BASED ADDRESS TABLE

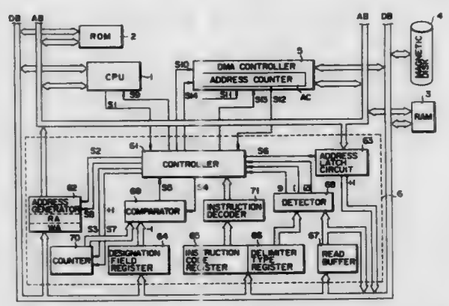
Junichi Komuro; Tetsuya Sato, and Norihiro Hidaka, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1989, Ser. No. 375,386

Claims priority, application Japan, Jul. 15, 1988, 63-175111; Dec. 9, 1988, 63-311346; Dec. 9, 1988, 63-311347

Int. Cl.[5] G06F *3/00, 7/04, 15/40*

U.S. Cl. 395—400 **9 Claims**



1. A data processing apparatus which accesses a storage means which stores a plurality of data blocks, each data block comprising variable length data delimited by delimiter codes to perform data processing, the data processing apparatus comprising:

controlling means, coupled to said storage means through an address bus, said controlling means including:

means for designating an address through said address bus every time one clock signal is generated,

means for reading out from said storage means data stored at a designated address onto a data bus, said designated address being designated by said means for designating an address, and

means for incrementing the designated address every time the data is read out from said storage means;

detecting means, coupled to said data bus, for detecting in response to every clock signal whether or not data on said data bus coincides with a delimiter code of a data block, which delimiter code indicates a delimitation of a data block;

latching means, coupled to said address bus, for, when said detecting means detects a coincidence, latching the address on said address bus;

table means for storing address data based on the address latched by said latching means; and

processing means for designating a start address of each data block stored in said storage means as a function of the address data stored in said table means, and for performing a data processing operation for each data block.

5,115,491

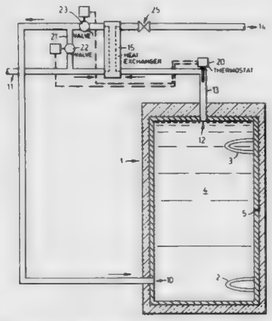
TEMPERING SYSTEM FOR STORAGE TANK WATER HEATERS UTILIZING INLET AND OUTLET HEAT EXCHANGER

Maier Perlman, 344 York Hill Blvd., Thornhill, Canada L4J 3B6 ; James M. Bell, 1049 Albertson Cresc., Mississauga, Ont, Canada L5H 3C6 , and Colin A. McGugan, 866 Ribston Road, Mississauga, Ontario, Canada L4Y 1B1

Filed Dec. 17, 1990, Ser. No. 627,865

Int. Cl.[5] H05B *3/78;* **F24H** *1/20*

U.S. Cl. 392—454 **18 Claims**



1. A fluid tempering system, comprising:

a storage tank having heating means;

outlet means for conveying heated fluid form the storage tank to a distribution system on demand;

cold fluid inlet means for replenishing the storage tank on demand;

means for transferring heat energy between heated fluid exiting and cold fluid entering the storage tank, without fluid communication between the outlet means and the cold fluid inlet means;

a fluid temperature sensor located in the outlet means; and

means to bypass the means for transferring heat energy on receiving a signal from the fluid temperature sensor indicating a heated fluid temperature below a set minimum level.

5,115,492

DIGITAL CORRELATORS INCORPORATING ANALOG NEURAL NETWORK STRUCTURES OPERATED ON A BIT-SLICED BASIS

William E. Engeler, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 14, 1990, Ser. No. 628,257

Int. Cl.[5] G06F *15/18*

U.S. Cl. 395—27 **68 Claims**

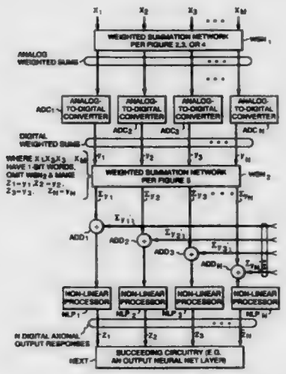
1. A system for performing N weighted summations of digital input signals that are M in number and are identified by respective ones of consecutive ordinal numbers first through Mth, N being an integer greater than zero and M being an integer greater than one, said system comprising:

means for supplying said first through Mth digital input signals in bit-serial form, with B bits per arithmetic word, B being an integer more than one, each bit being expressed

in terms of respective voltage levels for its being a ZERO or for its being a ONE;

means for N-fold weighting of each successive bit of said first through Mth digital input signals to generate respective first through N^{th} summands, each manifested in terms of at least one respective quantity of electric charge, which means is of a type including a network of capacitive elements and means for connecting them so their capacitances determine the weightings respectively applied to voltage levels expressing current bits of said first through Mth digital input signals when generating said first through N^{th} summands in accordance with Colomb's Law;

means for combining concurrently generated summands



identified by the same ordinal numbers to generate first through N^{th} partial weighted summations, each manifested in terms of at least one respective quantity of electric charge;

means for sensing each of said first through N^{th} partial summations, as manifested in terms of at least one respective quantity of electric charge, to generate first through N^{th} analog signals respectively;

means for digitizing said first through N^{th} analog signals to generate first through N^{th} digital partial weighted summations respectively; and

means for digitally accumulating said first through N^{th} digital partial weighted summations with appropriate respective weighting to generate first through N^{th} digital final weighted summations.

5,115,493

CONTINUOUS LASER PRINTER FOR PRINTING OVER PAGE BOUNDARIES

Ivan M. Jeanblanc, 225 Chesterfield Industrial Blvd., Chesterfield, Mo. 63005; Stephen E. Hutchison, 234 Old Meramec Station Rd., Ste. D, Manchester, Mo. 63021; Mark K. Virkus, 234 Old Meramec Station Rd., Ste. D, Manchester, Mo. 63021, and Ronald J. Johnsen, 234 Old Meramec Station Rd., Ste. D, Manchester, Mo. 63021

Continuation-in-part of Ser. No. 541,820, Jun. 21, 1990, and a continuation-in-part of Ser. No. 558,036, Jul. 25, 1990. This application Aug. 15, 1990, Ser. No. 567,839

Int. Cl.[5] G06F *3/12*

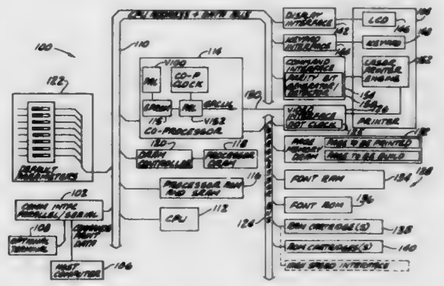
U.S. Cl. 395—117 **31 Claims**

1. An apparatus for controlling a laser printer engine in response to commands and print data signals provided by a computer representing patterns to be printed by the laser printer engine, said apparatus comprising:

a pattern memory in which signals representing reference patterns are stored;

a page memory in which signals representing patterns on a first page to be printed are stored and in which signals representing patterns on second and subsequent pages to be built are stored;

central processing means, responsive to the commands and print data signals, for selectively storing the reference pattern signals from the pattern memory into the page memory, wherein said central processing means provides the first page pattern signals stored in the page memory to the laser printer engine for use in printing the first page while simultaneously providing the second page pattern signals from the pattern memory to the page memory to build the second page in the page memory and, after the first page pattern signals have been provided to the laser printer engine, said central processing means provides the



second page pattern signals stored in the page memory to the laser printer engine for printing while simultaneously providing the subsequent page pattern signals from the pattern memory to the first page memory to build the subsequent page in the page memory wherein the laser printer engine defines virtual page boundaries and said central processing means includes means for splitting a reference pattern to be printed on one of the virtual page boundaries between the first and second pages; and

means for interconnecting the computer and the central processing means, for interconnecting the pattern memory and the page memory, and for interconnecting the page memory and the laser printer engine.

5,115,494

METHOD OF DRAWING A CUBIC VIEW

Nobuhiro Seki, Amagasaki, Japan, assignor to International Technical Illustration Co., Inc., Osaka, Japan

Continuation-in-part of Ser. No. 53,128, May 22, 1987, abandoned. This application Jan. 26, 1990, Ser. No. 469,763

Claims priority, application Japan, May 28, 1986, 61-123066; Jan. 30, 1987, 62-21162

Int. Cl.[5] G06F *15/72*

U.S. Cl. 395—127 **6 Claims**

1. A method of drawing a cubic view using a known computer assisted design (CAD) system that includes cooperating elements for storing shape-related data, for manipulating stored data and for displaying and copying shapes selected by a user, comprising the steps of:

storing in a storage element a selection of specific standard shapes of predetermined dimensions and geometries, for manipulation to respective selected orientations and combinations thereof for display and subsequent storage;

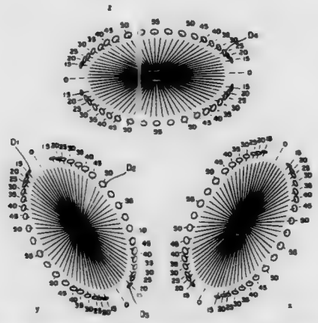
forming standard patterns obtained by displaying and manipulating a selection of said specific standard shapes to selected different inclination angles with respect to a plane of projection and selection projection thereof onto said plane of projection, and storing the standard patterns in said storage element;

displaying at least one of said stored standard patterns at an arbitrary position on a screen of a displaying element;

manipulating a standard pattern selected from a plurality of

said standard patterns displayed on said screen and copying said selected standard pattern at a predetermined position; and

adjusting a size of said copied standard pattern, to selectively magnify or reduce the same at said predetermined position by multiplying the copied standard pattern by a ratio of a



required dimension to a predetermined standard dimension for subsequent display, storage or copying thereof,

wherein said standard shapes comprise ellipses, and said ellipses are each defined by a combination of two semi-ellipses which can be separated with respect to each other along a major axis of the corresponding ellipse.

5,115,495

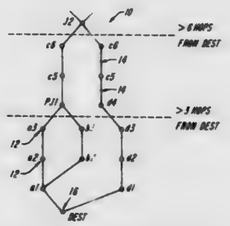
COMMUNICATIONS NETWORK SYSTEM USING FULL-JUNCTURE AND PARTIAL-JUNCTURE STATION STATUS INFORMATION FOR ALTERNATE-PATH DISTANCE-VECTOR ROUTING

Paul F. Tsuchiya, Washington, D.C.; W. Worth Kirkman, Fairfax, and John F. Weidner, Springfield, both of Va., assignors to The Mitre Corporation, Bedford, Mass.

Filed Oct. 18, 1988, Ser. No. 259,329

Int. Cl.[5] G06F *15/16*

U.S. Cl. 395—200 **19 Claims**



1. A communications network comprising:

a plurality of communications stations interconnected by a plurality of communication links, and

at least one destination station, wherein, for each destination station,

each communications station informs each neighboring communications station of the distance between itself and the destination station,

each communications station stores an indication of the distance to the destination station through each downtree neighboring communications station,

each communications station that is not a full-junction station stores an indication of the distance to the destination station through all uptree neighboring communications stations that lead to a full-junction station, a full-junction station being a station having at least two downtree paths to the destination station, wherein said downtree paths do not share any communication links, each communications station that is not a full-junction station stores an indication of the distance to the destination station through all uptree neighboring communications stations that lead to a partial-juncture station that acts as a junction station for the communications station that is not a full-junction station, a partial-juncture station being a station having at least two downtree paths to the destination via distinct downtree neighbor stations, wherein said downtree paths share at least one downtree communication link, and communciations are routed to the destination station through said communication links according to the stored distance indications.

5,115,496

QUEUE DEVICE CAPABLE OF QUICKLY TRANSFERRING A DIGITAL SIGNAL UNIT OF A WORD LENGTH DIFFERENT FROM A SINGLE WORD LENGTH

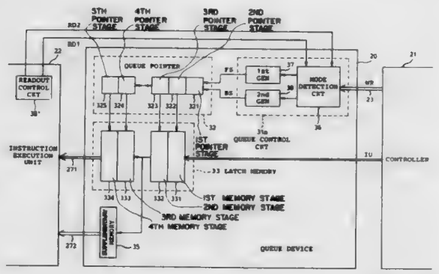
Masahiro Nomura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,089

Claims priority, application Japan, Jan. 26, 1988, 63-13649; Jul. 22, 1988, 63-184151

Int. Cl.[5] G06F *5/06*

U.S. Cl. 395—250 **6 Claims**



1. A queue device for use in combination with a digital signal producing circuit which produces a sequence of digital signal units and with a processing circuit which is supplied through said queue device with said digital signal units as output digital signal units, each of said digital signal units having a single word length, said queue device comprising:

a first-in first-out memory device having first through N-th memory stages to store said digital signal units one at a time as stored digital signal units, each of said memory stages having said single word length, to successively output each stored digital signal unit as a basic sequence of said stored digital signal units unit by unit, where N is a natural number; and

a supplementary memory of said single word length, connected to an n-th memory stage selected from said first through N-th memory stages, to store an n-th one of said stored digital signal units sent from said n-th memory stage to successively output an n-th one of said stored digital signal units as an additional sequence of said stored digital signal units;

both said first-in first-out memory device and said supplementary memory being directly connected to said processing circuit such that stored digital signal units of said basic sequence and of said additional sequence which have a word length equal to twice said single word length are concurrently transferred to said processing circuit as said output digital signal units under control of said processing circuit.

5,115,497

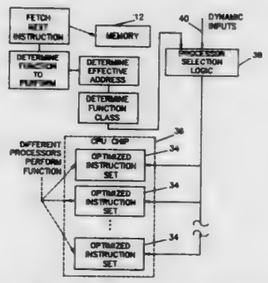
OPTICALLY INTRACONNECTED COMPUTER EMPLOYING DYNAMICALLY RECONFIGURABLE HOLOGRAPHIC OPTICAL ELEMENT

Larry A. Bergman, Van Nuys, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Oct. 1, 1987, Ser. No. 103,192

Int. Cl.[5] G06F *9/00*

U.S. Cl. 395—375 **35 Claims**



1. In a computer including a memory for holding a sequence of instructions to be executed, logic for accessing the instructions in sequence, logic for determining for each instruction a function to be performed and an effective address thereof, and logic for executing each instruction, the improvement wherein:

(a) the logic for executing instructions comprises:

a plurality of individual elements on a common support substrate optimized to perform certain logical sequences employed in executing instructions; and

(b) the computer comprises:

element selection logic means connected to the logic determining the function to be performed for each instruction for determining a class of each function and for causing the instruction to be executed by those of said elements which perform those of said logical sequences affecting the instruction execution in an optimum manner.

5,115,498

LOCAL MEMORY FAST SELECTING APPARATUS INCLUDING A MEMORY MANAGEMENT UNIT (MMU) AND AN AUXILIARY MEMORY

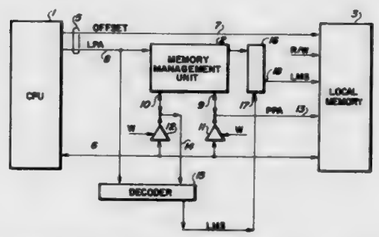
Tiziano Maccianti, Pregnana Milanese, and Angelo Oldani, Ossona, both of Italy, assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Feb. 27, 1989, Ser. No. 315,996

Claims priority, application Italy, Mar. 15, 1988, 19770 A/88

Int. Cl.[5] G06F *12/00*; G11C *8/00*

U.S. Cl. 395—425 **3 Claims**



1. A local memory fast selection apparatus, in a data processing system having a plurality of memory resources including a local memory and addressing by logical/virtual addresses which are converted into physical addresses, including a memory management unit for converting a logical address into a physical address and for generating a destination code which identifies a memory resource to be selected from among said plurality of memory resources, a decoder connected to outputs of said memory management unit for receiving said destination code and for issuing a local memory selection signal, said local memory fast selection apparatus comprising: an auxiliary memory addressed by the same logical address used to address said MMU and having an input connected to an output of said decoder for receiving said local memory selection signal and for storing a bit corresponding to said local memory selection signal when said memory management unit and said auxiliary memory are simultaneously addressed by the same logical address for a write operation, said auxiliary memory having an output connected to said local memory for issuing to said local memory, when said local memory and said auxiliary memory are addressed by the same logical address for a read operation, a selection signal corresponding to the stored bit without any decoding delay.

5,115,499

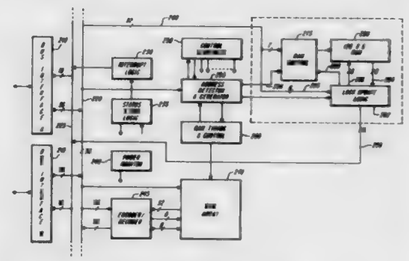
SHARED COMPUTER RESOURCE ALLOCATION SYSTEM HAVING APPARATUS FOR INFORMING A REQUESTING COMPUTER OF THE IDENTITY AND BUSY/IDLE STATUS OF SHARED RESOURCES BY COMMAND CODE

Jack J. Stiffler, Hopkinton; James M. Nolan, Holliston; Peter Mark, Boston, and David Harvey, Brookline, all of Mass., assignors to Sequoia Systems, Inc., Marlborough, Mass.

Continuation of Ser. No. 294,949, Dec. 30, 1988, abandoned, which is a continuation of Ser. No. 863,140, May 14, 1986, abandoned. This application Jan. 2, 1991, Ser. No. 635,396

Int. Cl.[5] G06F *12/02, 12/06, 13/20, 13/30*

U.S. Cl. 395—425 **3 Claims**



1. In a computer system comprising:

a plurality of data processing elements, each of said plurality f data processing elements being capable of sequentially executing a plurality of data processing tasks;

a processor bus connected to each of said plurality of data processing elements for receiving signals from, and transmitting signals to, said data processing elements;

a system bus;

first interface means for connecting said processor bus to said system bus;

a plurality of shared system resources, each of said plurality of shared resources having a busy and an idle status;

a peripheral bus connected to each of said plurality of shared resources;

second interface means for connecting said peripheral bus to said system bus;

a memory location in one of said plurality of shared resources;

means for selecting one of said plurality of data processing elements for performing one of said plurality of processing tasks, said selected data processing element including means for generating command codes;

lock status circuitry in said one shared resources responsive

to a first command code generated by said selected data processing element for returning to said selected data processing element a status code stored in said memory location, said status code indicating to said selected processing element the busy and idle status of each of said plurality of shared system resources; and

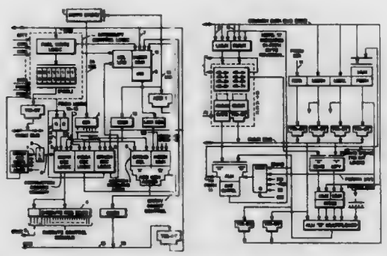
lock update circuitry in said one shared resource responsive to a second command code generated by said selected data processing element for storing in said memory location an identifying code identifying one of said plurality of shared system resources which said selected data processing element can use for a subsequent data processing task, said identifying code being calculated in a predetermined manner from said command code and a status code stored in said memory location indicating the busy and idle status of each of said plurality of shared system resources.

5,115,500

PLURAL INCOMPATIBLE INSTRUCTION FORMAT DECODE METHOD AND APPARATUS

Larry D. Larsen, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 11, 1988, Ser. No. 142,585
Int. Cl.[5] G06F *9/34, 12/04, 9/30;* **G11C** *8/00*
U.S. Cl. 395—425 **7 Claims**



1. A method of decoding for execution normally incompatible plural format process instructions into compatible single format execution codes in a processor, comprising steps of:

fetching sequentially for decoding and execution said process instructions from a first addressable storage means; and

decoding sequentially said fetched process instructions for execution in said processor by accessing execution codes stored in a second addressable storage means by utilizing at least a portion of said address in said first addressable storage means from which each said process instruction was fetched together with at least a portion of said fetched process instruction itself as an address for said second addressable storage means.

5,115,501

PROCEDURE FOR AUTOMATICALLY CUSTOMIZING THE USER INTERFACE OF APPLICATION PROGRAMS

Linda L. Kerr, North Richland Hills, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1988, Ser. No. 267,420
Int. Cl.[5] G06F *15/40, 15/403, 15/417, 15/74*
U.S. Cl. 395—600 **15 Claims**

1. A data processing system which customizes a user interface of an application program to present a limited set of operations based on relevant characteristics of a user comprising:

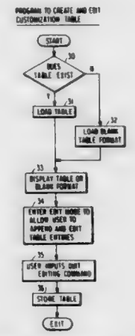
means for accepting input data relating to identifiers of actual or potential users of the application program, relevant characteristics of classes of users, and sets of operations of the application program which are appropriate for each class of users;

means for creating a user profile table which stores said relevant characteristics of individual user in a format which is searchable using an identifier of a user as a key value;

means coupled to said user profile table creating means, for storing the user profile table for later access;

means for creating a customization table which stores said sets of operations for each class of users in a format which is searchable using said relevant characteristics of classes of users as key values;

means coupled to said customization table creating means, for storing the customization table for later access;



means coupled to said user profile table storing means, for determining relevant characteristics of an individual user when a user invokes the application program;

means coupled to said customization table storing means and in response to said determining means, for searching the customization table for the appropriate set of operations for a user in his class of users based on relevant characteristics of the user; and

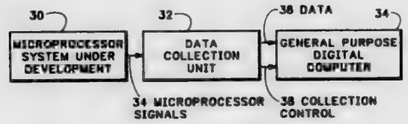
means coupled to said searching means, for automatically generating user interface components during the running of the application program which present only the operations specified for the user.

5,115,502

METHOD AND APPARATUS FOR DETERMINING INTERNAL STATUS OF A PROCESSOR USING SIMULATION GUIDED BY ACQUIRED DATA

James L. Tallman, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 667,687, Nov. 2, 1984, Pat. No. 4,813,009.
This application Sep. 19, 1988, Ser. No. 246,046
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—500 **6 Claims**



1. Apparatus for determining conditions internal to a processor from information descriptive of the processor and from activities of the processor during the execution of a known set of instructions comprising:

means coupled to the processor for monitoring and recording the activities of the processor during the execution of the known set of instructions; and

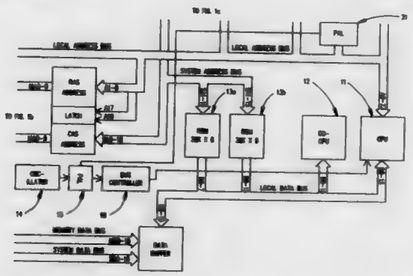
means responsive to the information descriptive of the processor and to the recorded activities of the processor during the execution of the known set of instructions for simulating conditions internal to the processor during the execution of the known set of instructions by a re-execution of the program guided by the recorded activities to determine the conditions internal to the processor at each setup of the known set of instructions.

5,115,503

SYSTEM FOR ADAPTING ITS CLOCK FREQUENCY TO THAT OF AN ASSOCIATED BUS ONLY WHEN IT REQUIRES USAGE THEREOF

Michael D. Durkin, Austin, Tex., assignor to Dell U.S.A. Corporation, Austin, Tex.

Continuation of Ser. No. 296,796, Jan. 12, 1989, abandoned. This application Jul. 15, 1991, Ser. No. 730,383
Int. Cl.[5] G06F *1/08, 1/12*
U.S. Cl. 395—550 **5 Claims**



1. A digital computer having internal and external devices, and having circuitry for adapting its normal clock frequency to a clock frequency of an associated bus connected to the external devices, wherein said associated bus is operating at a different clock frequency, comprising:

(a) central processor means;

(b) clock oscillator means;

(c) frequency adjusting means, connected to receive the output from the clock oscillator means for providing a system clock to the central processor means at a desired frequency; and for providing the normal clock frequency to the central processor means when the desired frequency is not the normal clock frequency and immediately after said desired frequency is no longer required;

(d) addressing means, connected to the central processor means, for referencing the internal and external devices; and

(e) decoding means, connected to the addressing means, to detect desired references to the external devices, and connected to the frequency adjusting means to cause the frequency adjusting means to adjust the system clock to said desired frequency, wherein said desired frequency is approximately the clock frequency of the associated bus, thereby causing the central processor means to operate at the same frequency as the associated bus.

5,115,504

INFORMATION MANAGEMENT SYSTEM

Edward J. Belove, Wayland; Todd R. Drake, Cambridge, both of Mass.; S. Jerrold Kaplan, San Francisco, Calif.; Mitchell D. Kapor, Brookline; Richard A. Landsman, Hingham, both of Mass., and Stephen Zagieboylo, Norfolk, Mass., assignors to Lotus Development Corporation, Cambridge, Mass.

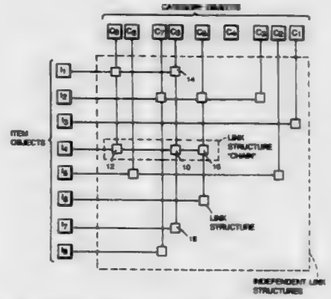
Filed Nov. 1, 1988, Ser. No. 265,683
Int. Cl.[5] G06F *15/40*
U.S. Cl. 395—600 **7 Claims**

1. An item/category database system, comprising

means for storing independent data objects including category objects, item objects and view objects, along with networks of independent link structures, said category and item objects each containing character string representations of categories and items, respectively, and pointers to certain ones of said link structures, said link structures containing essentially only pointers to data objects and/or other link structures serving thereby to interconnect item and category objects in one cross-linked network representing a relationship between categories and their assigned items, and view and category objects in another cross-linked network,

means for defining views in relation to view objects, each view comprising at least one section of items assigned to a category represented by a particular category object to which a respective view object is linked within said another cross-linked network,

means for visually representing a defined view by displaying separately in each section each item of alphanumeric information represented respectively in each of the item objects already linked to the particular category object corresponding to the section,



means for entering new information into the database within the context of any given view by accepting new alphanumeric information as a free form character string entered under a section in the given view, storing a digital representation of said character string in a new item object and linking the new item object with the particular category object corresponding to said section by means of a new independent link structure within said one cross-linked network, and

means for further associating said new item object with pre-existing category objects by examining the character string of the new item object to match portions thereof with other category objects and linking the new item object to said other category objects via new respective link structures within said one cross-linked network.

5,115,505

CONTROLLED DYNAMIC LOAD BALANCING FOR A MULTIPROCESSOR SYSTEM

Thomas P. Bishop, Aurora; Mark H. Davis, Warrenville; James S. Peterson, Aurora, and Grover T. Surratt, West Chicago, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

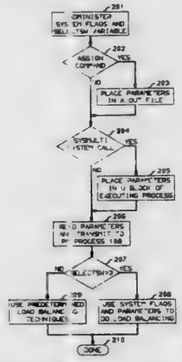
Continuation of Ser. No. 941,701, Dec. 22, 1986, abandoned. This application Jun. 28, 1990, Ser. No. 545,679
Int. Cl.[5] G06F *9/46, 15/16*
U.S. Cl. 395—650 **16 Claims**

1. A method for controlling the allocation of system resources in a multiprocessor system having a plurality of processors and one of said processors storing an object code program in a file and said object code program to be initiated on said multiprocessor system, comprising the steps of:

writing by a requesting one of said processors which is requesting the execution of said object code program a set of processor allocation parameters into said stored object code program in response to a user command executed by a user of said multiprocessor system;

reading said stored object code program by an allocating one of said processors in order to allocate the execution of said object code program;

allocating an executing one of said processors by said allocating one of said processors in response to said processor allocation parameters which define processor resources in the read object code program to execute said read object code program; and



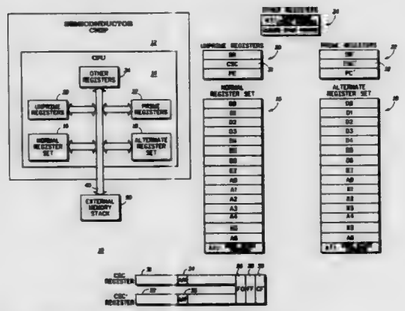
providing by said requesting one of said processors other processor allocation parameters for use by said allocating step in response to a system call.

5,115,506

METHOD AND APPARATUS FOR PREVENTING RECURSION JEOPARDY

Robert B. Cohen, and Robert E. Garner, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1990, Ser. No. 461,587
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—725 **23 Claims**



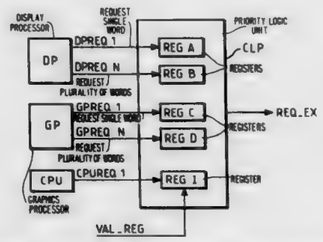
1. A digital data processor comprising:
a bus;
a first register set coupled to the bus;
a second register set coupled to the bus;
a first status bit coupled to the bus;
a second status bit coupled to the bus;
central processing unit means coupled to the bus for utilizing said first and second register sets one at a time;
first interrupt receiving means coupled to the central processing unit and to a first interrupt request signal conductor for receiving interrupt requests of a first type;
second interrupt receiving means coupled to the central processing unit and to a second interrupt request signal conductor for receiving interrupt requests of a second type;
state determining means coupled to the first and second status bits and the first and second interrupt receiving means for determining, in response to receipt of an interrupt request by either the first or second interrupt receiving means, whether the interrupt request is of the first type or the second type, whether the first status bit is in a first state or a second state and whether the second status bit is in the first state or the second state; and
register set selecting means coupled to the state determining means and to the central processing unit means for selecting, in response to receipt of an interrupt request by either the first or second interrupt receiving means, one of the first and second register sets for utilization by the central processing unit means, the selection by the register set selecting means is dependent upon determinations of the state determining means.

5,115,507

SYSTEM FOR MANAGEMENT OF THE PRIORITIES OF ACCESS TO A MEMORY AND ITS APPLICATION

Jean-Michel Callemyn, Nogent sur Marne, France, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 288,540, Dec. 21, 1988, abandoned.
This application Mar. 25, 1991, Ser. No. 675,028
Claims priority, application France, Dec. 23, 1987, 87 18943
Int. Cl.[5] G06F *9/46*
U.S. Cl. 395—725 **9 Claims**



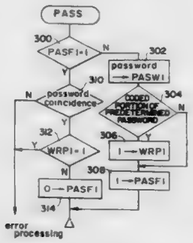
1. System for management of access to a memory, the system comprising:
a) at least one request generator module including means for emitting requests for access, and
b) an arbitration module to arbitrate between the requests for access and thus to elect a request for access o be executed with priority,
wherein
c) at least one request generator module includes:
i) first means for emitting requests for access to a single word of the memory; and
ii) second means for emitting requests for access to a plurality of consecutive words of the memory, said first means for emitting being separate from said second means for emitting, and
d) the arbitration module includes arbitration means, first receiving means for receiving requests from the first means for emitting, second receiving means for receiving requests from the second means for emitting, and means for detecting if a request originates from the first or second receiving means, whereby the requests for access to a single word are directly assigned priorities which are distinct from the priorities of the requests for access to a plurality of consecutive words, without decoding the requests, even if the requests emanate from the same request generator module.

5,115,508

PASSWORD SYSTEM UTILIZING TWO PASSWORD TYPES, THE FIRST BEING CHANGEABLE AFTER ENTRY, THE SECOND BEING UNCHANGEABLE UNTIL POWER IS REMOVED

Koichi Hatta, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 735,198, May 17, 1985, abandoned.
This application Mar. 29, 1988, Ser. No. 175,614
Claims priority, application Japan, May 22, 1984, 59-104209
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—725 **7 Claims**



4. A method for protecting data in a data entry and storage device comprising the steps of:
entering a predetermined password in the device, said predetermined password being a first or a second type, said first type of predetermined password containing a descriptive portion and said second type of predetermined password containing both a descriptive portion and a coded portion;
entering and storing data in said device, said data being associated with the predetermined password;
inputting a user password in said device;
determining whether said user password corresponds to the descriptive portion of the predetermined password;
accessing said data if said user password corresponds to the descriptive portion of the predetermined password;
entering a new predetermined password after the accessing if the predetermined password which was previously entered is a first type, said new predetermined password being exchanged for the previously entered predetermined password upon entering of the new predetermined password; and
precluding entry of a new predetermined password after the accessing if the previously entered predetermined password is a second type.

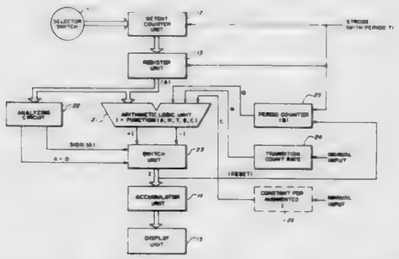
5,115,509

SYSTEM FOR PREDETERMINING NUMERICAL VALUE AS A RESULT OF NON-LINEAR ACCUMULATION OF DETENT SIGNAL ROTATIONAL RATES OF A SELECTOR SWITCH WITH PREESTABLISHED SAMPLING TIME PERIODS

Jeffrey A. Kahler, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 14, 1989, Ser. No. 310,823
Int. Cl.[5] G06F *7/38, 7/02*
U.S. Cl. 395—775 **11 Claims**

8. A device for entering a predetermined numerical value by an operator, said device comprising:
a selector switch for generating detent signals in response to a rotation of a selector switch knob by said operator;
sampling means, coupled to said selector switch, for determining a detent signal count during each of a sequence of time periods, each of said time periods having a preestablished length;
arithmetic logic means for computing an intermediate numerical value as a function of said detent signal count, said arithmetic logic means using an algorithm changing a stored numerical value at a rate generally equal to a generation rate of said detent signals when said generation rate is less than a preselected value, said algorithm changing said stored numerical value at a rate greater than said generation rate of said detent signals when said generation rate is greater than said preselected value; accumulator means for combining in said accumulator means said stored numerical value with said intermediate numerical value from said arithmetic logic means and storing a resulting numerical value in said accumulator means in place of said stored numerical value; and,



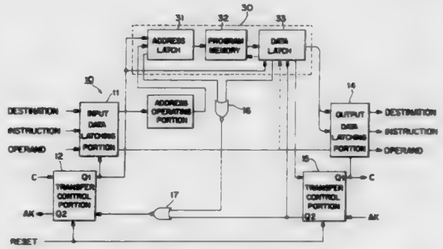
wherein; said algorithm being I=INTEGER $[(A^2)/(N*B*T)]+1$ and wherein INTEGER [X] is a function that discards any fractional value of X; T is said preestablished length of a sampling time period; A is said detent signal count; N is said preselected value of said detent signals per second that provides the maximum rotational rate, and B is the number of time periods T since the most recent entry in said accumulator unit.

5,115,510

MULTISTAGE DATA FLOW PROCESSOR WITH INSTRUCTION PACKET, FETCH, STORAGE TRANSMISSION AND ADDRESS GENERATION CONTROLLED BY DESTINATION INFORMATION

Toshiya Okamoto, Kyoto, and Souichi Miyata, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 19, 1988, Ser. No. 259,722
Claims priority, application Japan, Oct. 20, 1987, 62-265733; Jan. 18, 1988, 63-7791
Int. Cl.[5] G06F *3/00*
U.S. Cl. 395—775 **11 Claims**



1. A data flow type information processor, comprising:
program storing means for storing a data flow program having a data packet of destination information and instruction information, said program storing means being provided separate from an information processing portion of the data flow type processor; and
program providing means for processing an input data packet of input destination information, input instruction information and operand data, said program providing means being provided in said information processing por-

tion of the data flow type information processor and including,

input storing means having said input data packet together with a transmission signal applied thereto for storing said input destination information, said input instruction information and said operand data included in said input data packet and autonomously and selectively transferring said input destination information, said input instruction information and said operand data to said program storing means, said input storing means comprising input-side data holding means including an area for storing said input destination information, said input instruction information and said operand data included in said input data packet and input-side transfer control means responsive to the application of said transmission signal and a transmission authorizing signal for holding said input destination information, said input instruction information and said operand data included in said input data packet,

address operating means for developing address data which addresses said program storing means in response to said input destination information transferred from said input storing means and reading out said destination information and said instruction information from said program storing means in response to said address data, and

output storing means having only the held operand data and said transmission signal input thereto from said input-side transfer control means for storing said destination information and said instruction information read out from said program storing means and autonomously and selectively transferring said destination information and said instruction information to an external device, and generating said transmission authorizing signal, said output storing means comprising output-side data holding means including an area for storing said destination information, said instruction information and said operand data and output-side transfer control means responsive to the application of said transmission signal from said input-side transfer control means and the application of a succeeding transmission authorizing signal from the succeeding processor stage for holding said destination information and said instruction information read out from said program storing means and said operand data outputted from said input-side data holding means and said output-side data holding means.

5,115,511

ARRANGEMENT FOR LOADING THE PARAMETERS INTO ACTIVE MODULES IN A COMPUTER SYSTEM

Sven-Axel Nilsson, Deisenhofen, Fed. Rep. of Germany; Ronald J. Ebersole, Beaverton, Oreg.; Gerhard Bier, Herxheim, and Karl-Heinz Honeck, Essingen, both of Fed. Rep. of Germany, assignors to Siemens AK., Berlin, Fed. Rep. of Germany and Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 94,234, Sep. 8, 1987, abandoned. This application May 11, 1990, Ser. No. 522,474

Int. Cl.[5] G06F *13/20, 13/40, 13/42, 13/14*

U.S. Cl. 395—800 **6 Claims**

1. For use in a computer system, a combination comprising:

a plurality of system assemblies (MA, CB, I/O);

a serial system support bus (SSBA) connected to each of said system assemblies;

each of said system assemblies having one or more active modules and a parameter controller thereon;

a parameter controller (PC) on a particular system assembly (CB) including a first port (P0) for receiving digitally-coded, multi-bit words and a second port (P1) for sending digitally-coded, multi-bit words;

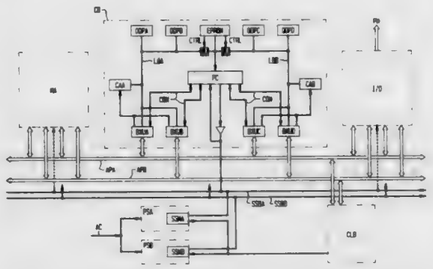
first means (EP1, EP2, EP3, EP4) for specifying first configuration parameters which provide information specific to said active modules (BXUA, BXUB, . . .) on said particular system assembly (CB) and specific to said particular system assembly (CB);

said first means being connected to said first port (P0) such that parameters specific to said particular assembly (CB) can be inputted to said parameter controller;

said parameter controller (PC) on a particular system assembly (CB) further including a third port (P2) connected to said one or more active modules (BXUA, BXUB, . . .) on said system assembly (CB);

said parameter controller (PC) on a particular system assembly (CB) further including a connection means (SSB) to said system support bus (SSBA),

said connection means (SSB) creating a connection to other parameter controllers on others (MA, I/O) of said plurality of system assemblies through said connection means (SSB) such that said system support information may be



sent to said other parameter controllers on others (MA, I/O) of said plurality of system assemblies and other system support information may be received from said other parameter controllers on said others (MA, I/O) of said plurality of system assemblies;

said first means being connected to said second port (P1) such that said system support information can be inputted to said parameter controller;

said third port (P2) having a number of communication connections (COM) to said active modules (BXUA, BXUB, . . .) on said system assembly (CB) through which serial communication codes (COM-WORDS) can be sent in a serial mode to a register at each active module to thereby load information derived from both said first configuration parameters and said system support information.

5,115,512

OPTICAL WAVEGUIDE DEVICE AND METHOD OF MAKING THE SAME

Takumi Fujiwara; Hiroshi Mori, and Takemi Kawazoe, both of Oume, all of Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan

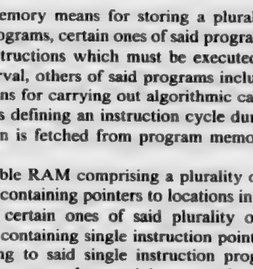
Filed Oct. 4, 1990, Ser. No. 592,976

Claims priority, application Japan, Oct. 6, 1989, 1-259936

Int. Cl.[5] G02B *6/12*

U.S. Cl. 385—14 **8 Claims**

1. An optical waveguide device comprising a base plate made of a ferroelectric crystal having a, b and c crystallographic axes, an optical waveguide having a high index of refraction and formed on a portion of the base plate from the surface thereof to a predetermined depth, said waveguide having a transmission direction along the a or b axis of said base plate, and a film covering the surface of said optical waveguide in the direction along the c axis of said crystal base plate



and made of a highly transmissive substance having electrical conductance higher than that of said optical waveguide.

5,115,513

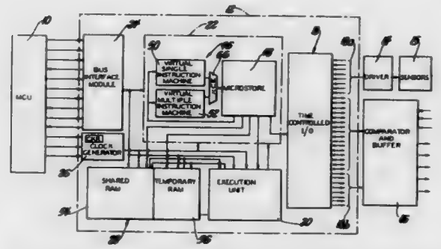
MICROPROGRAMMED TIMER PROCESSOR

Mario D. Nemirovsky, Goleta, Calif., and Matthew D. Sale, Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Division of Ser. No. 233,678, Aug. 18, 1988. This application Feb. 1, 1991, Ser. No. 649,503

Int. Cl.[5] G06F *9/30*

U.S. Cl. 395—800 **3 Claims**



1. A timer processor for capturing and or modifying the state of a plurality of input/output pins at a programmably recurring interval of time while performing other functions which need not necessarily be performed at regular time intervals comprising;

program memory means for storing a plurality of microcoded programs, certain ones of said programs containing single instructions which must be executed at a regular time interval, others of said programs including multiple instructions for carrying out algorithmic calculations,

clock means defining an instruction cycle during which an instruction is fetched from program memory for execution,

a pointer table RAM comprising a plurality of addressable locations containing pointers to locations in said program memory, certain ones of said plurality of addressable locations containing single instruction pointers dedicated to pointing to said single instruction programs in said program memory, the remaining ones of said plurality of addressable locations containing entry pointers dedicated to pointing to entry addresses in said multiple instruction programs in said program memory,

a single instruction program pointer register connected with said pointer table RAM and adapted to be loaded with an address pointing to a single instruction program in said microstore,

a multiple instruction program pointer register connected with said pointer table RAM and adapted to be loaded with an entry address to a multiple instruction program,

means for incrementing said multiple instruction program pointer register,

multiplexer means connected between said program pointer registers and said program memory for permitting access to said program memory by said single instruction program register and said multiple instruction program register on alternate instruction cycles,

means for selecting said entry pointers on a priority basis, and

means for establishing a fixed size loop of single instruction pointers and for sequentially addressing said single instruction pointers to establish said regular time interval.

5,115,514

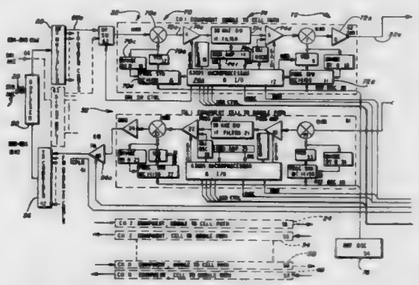
MEASURING AND CONTROLLING SIGNAL FEEDBACK BETWEEN THE TRANSMIT AND RECEIVE ANTENNAS OF A COMMUNICATIONS BOOSTER

Samuel A. Leslie, Forest, Va., assignor to Orion Industries, Inc., Solon, Ohio

Continuation-in-part of Ser. No. 81,120, Aug. 3, 1987, Pat. No. 4,941,200. This application Aug. 12, 1988, Ser. No. 231,766

Int. Cl.[5] H04B *1/60, 7/14*

U.S. Cl. 455—9 **14 Claims**



1. An apparatus for measuring feedback in an adjustable gain booster usable in a radiotelephone system, the booster having at least one adjustable gain amplifier and being capable of receiving signals at an input port and transmitting amplified signals corresponding thereto from an output port, the apparatus comprising:

means for storing a list of signal channels to be measured;

means for transmitting signals from the output port corresponding to said list;

means for measuring a parameter value of each said transmitted signal;

means for receiving signals at the input port, corresponding to said transmitted signals;

means for measuring a parameter value of each received signal which corresponds to one of the transmitted signals; and

means for processing said two parameter values associated with each said transmitted signal including means for forming an isolation indicium therefrom for each said transmitted signal.

VOL
1138
ISS
3
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5,115,515

METHOD AND APPARATUS FOR RADIO COMMUNICATION WITH IMPROVED AUTOMATIC FREQUENCY CONTROL

Yuuri Yamamoto, Kanagawa, and Mitsuo Makimoto, Yokohama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 19, 1989, Ser. No. 367,577

Claims priority, application Japan, Jun. 29, 1988, 63-161673

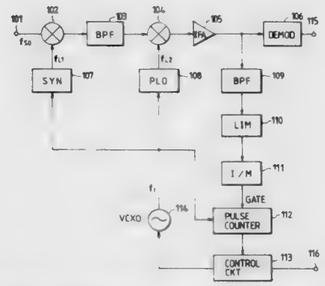
Int. Cl.[5] H04B *7/00, 1/06, 1/26*

U.S. Cl. 455—71 **10 Claims**

1. In a communications system for providing communications between a base station and a mobile station, the base station transmitting a radio-frequency signal to the mobile station, the radio-frequency signal including a frequency calibration signal, the mobile station including a receiver for receiving the radio-frequency signal, the receiver including a reference oscillator generating a reference signal having a frequency responsive to a frequency of the frequency calibration signal, the receiver further including a local oscillator and a radio-frequency mixer for mixing the radio-frequency signal with a signal from the local oscillator thereby converting the radio-frequency signal into an intermediate-frequency signal, a method comprising the steps of:

synchronizing the local oscillator signal with the reference signal;

dividing a frequency of the intermediate-frequency signal and thereby deriving a frequency-divided signal; and



controlling a frequency of the reference signal in response to the frequency-divided signal.

DESIGN PATENTS

GRANTED May 19, 1992

ERRATA

For CLASS	See PATENT NO.
D9-526	326,217
D9-526	326,218
D12-111	326,247

VOL
1138
ISS
3
MY
19
1992
UMI

326,177
SHOE FOR MARINE ACTIVITIES
Harry Miller, Boston, and Rosalba L. Mische, Hopkinton, both of Mass., assignors to Omega Corporation, Boston, Mass.
Filed Jan. 24, 1990, Ser. No. 469,841
Term of patent 14 years
U.S. Cl. D2—265



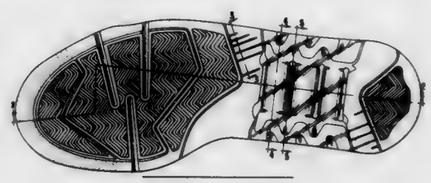
326,178
SKI BOOT
Claude Perrissoud, Saint-Jorioz, and Serge Lagier, Rumilly, both of France, assignors to Salomon S.A., Annecy, France
Filed May 24, 1990, Ser. No. 528,181
Claims priority, application Int'l Pat. Institute, Dec. 6, 1989, DMA/001139
Term of patent 14 years
U.S. Cl. D2—276



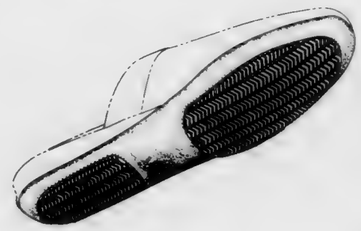
326,179
SOLE FOR FOOTWEAR
William F. Walker, Northampton, Great Britain, assignor to Burlington International Group p.l.c., Northampton, Great Britain
Filed Aug. 15, 1989, Ser. No. 393,767
Claims priority, application United Kingdom, Feb. 16, 1989, 1057181
Term of patent 14 years
U.S. Cl. D2—320



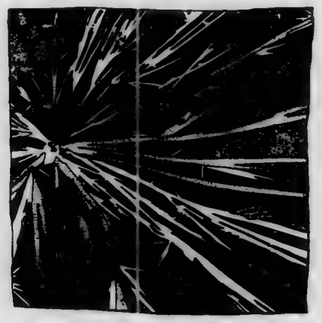
326,180
OUTSOLE BOTTOM
Bruce E. Rogers, Portland, Oreg., assignor to Nike, Inc. & Nike International Ltd., Beaverton, Oreg.
Filed Jan. 9, 1991, Ser. No. 634,741
Term of patent 14 years
U.S. Cl. D2—320



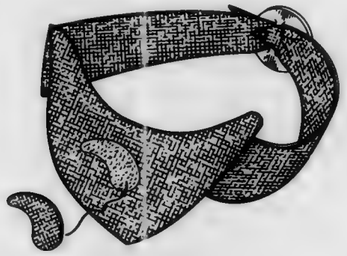
326,181
FOOTWEAR SOLE
Joyce M. Katz, Columbus, Ohio, and Tracy C. Roan, Groveport, Minn., assignors to R. G. Barry Corporation, Pickerington, Ohio
Filed Oct. 31, 1990, Ser. No. 607,093
Term of patent 14 years
U.S. Cl. D2—320



326,182
HEADSCARF
Harriet M. Spry, Worcester Park, England, assignor to Beecham Group p.l.c.
Filed Nov. 18, 1988, Ser. No. 273,868
Claims priority, application United Kingdom, May 20, 1988, 1050884
Term of patent 14 years
U.S. Cl. D2—502



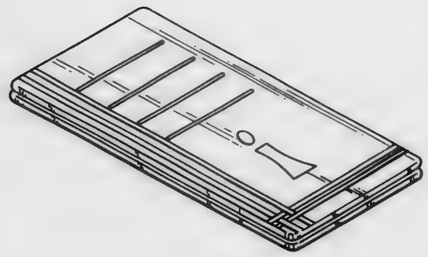
326,183
GARMENT BELT
Janice C. Woods, 474 E. Alluvial, #103, Fresno, Calif. 93710
Filed Feb. 5, 1990, Ser. No. 475,094
Term of patent 14 years
U.S. Cl. D2—627



326,184
ANGLED UMBRELLA HANDLE
Mark H. Sadowski, 2911 Bayview Avenue #207C, Willowdale, Ontario M2K 1E8, and Stephen L. Levitan, 92 King Edward Avenue, Toronto, Ontario M4C 5J6, both of Canada
Filed Dec. 23, 1988, Ser. No. 289,360
Term of patent 14 years
U.S. Cl. D3—16



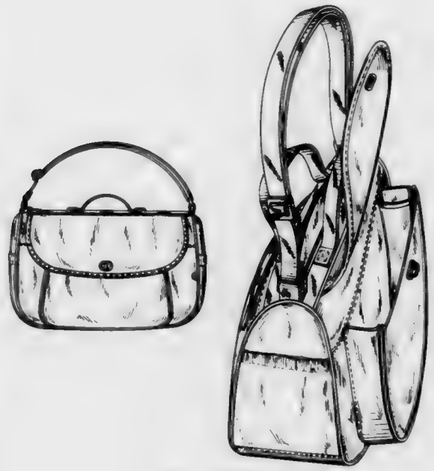
326,185
BILLFOLD
Vincent Miscavage, 21 Brighton Ave., Kearny, N.J. 07032
Filed Feb. 2, 1990, Ser. No. 473,712
Term of patent 14 years
U.S. Cl. D3—56



326,187
SUITCASE
Francios Chauvin, Saone, France, assignor to Superior S.A., Besancon, France
Filed Dec. 14, 1989, Ser. No. 450,371
Term of patent 14 years
U.S. Cl. D3—76



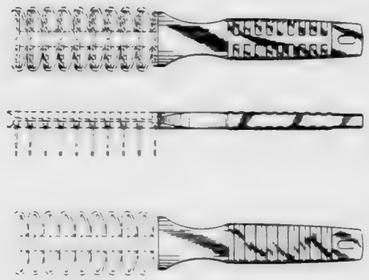
326,188
DIAPER BAG
Suzanne Thomas, Laconia, N.H., assignor to A. D. Sutton & Sons, Inc., New York, N.Y.
Filed Oct. 19, 1990, Ser. No. 600,239
Term of patent 14 years
U.S. Cl. D3—48



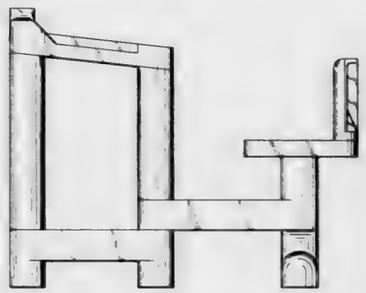
326,189
MUSICAL TOOTHBRUSH WITH ADJUSTABLE NECK AND MIRROR
Latonya M. R. Brooks, 4911 Jay St., NE. #1, Washington, D.C. 20019
Filed Dec. 27, 1988, Ser. No. 289,761
Term of patent 14 years
U.S. Cl. D4—108



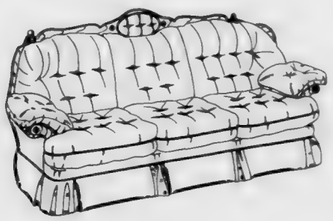
326,190
HAIRBRUSH HANDLE
Francis G. Caron, Strasbourg, France, assignor to Celluloid S.A., Celestat, France
Filed Mar. 6, 1989, Ser. No. 319,071
Claims priority, application France, Sep. 5, 1988, 88 5508
Term of patent 14 years
U.S. Cl. D4—138



326,191
CHILDREN'S ACTIVITY CENTER
Alvin Schiffman, Palm Beach, Fla., assignor to Jis, Inc., Boca Rotan, Fla.
Filed Aug. 23, 1989, Ser. No. 397,306
Term of patent 14 years
U.S. Cl. D6—338



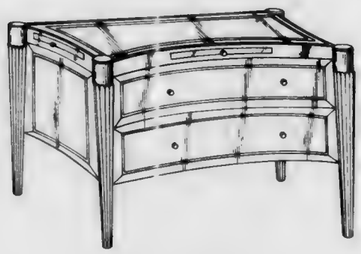
326,192
SEAT
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Feb. 2, 1990, Ser. No. 473,859
Term of patent 14 years
U.S. Cl. D6—381



326,193
COMBINED STORAGE AND DISPLAY UNIT
Connie Haugabook, Montezuma, Ga., assignor to Little Friends, Inc., Montezuma, Ga.
Filed Sep. 6, 1989, Ser. No. 403,529
Term of patent 14 years
U.S. Cl. D6—434



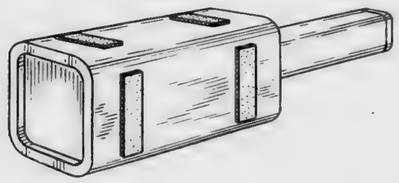
326,194
CHEST OF DRAWERS
Sally S. Lewis, 8950 St. Ives Dr., Los Angeles, Calif. 90069
Filed Dec. 26, 1989, Ser. No. 456,285
Term of patent 14 years
U.S. Cl. D6—446

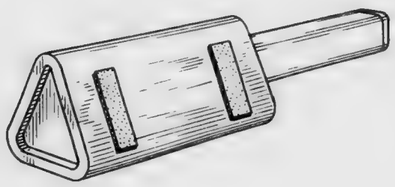


326,195
REMOTE CONTROL HOLDER
Terry J. Lowe, 1202 Virginia Ave., Goodlettsville, Tenn. 37072
Filed Oct. 25, 1988, Ser. No. 262,508
The portion of the term of this patent subsequent to Sep. 17, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—457

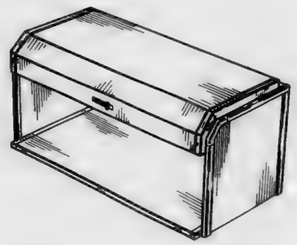


326,196
REMOTE CONTROL HOLDER
Barry Shikoff, 8129 N. Santa Monica Blvd., Milwaukee, Wis. 53217, and John C. Baseheart, 6408 W. Boehlke, Milwaukee, Wis. 53223
Filed Oct. 12, 1989, Ser. No. 421,712
Term of patent 14 years
U.S. Cl. D6—467

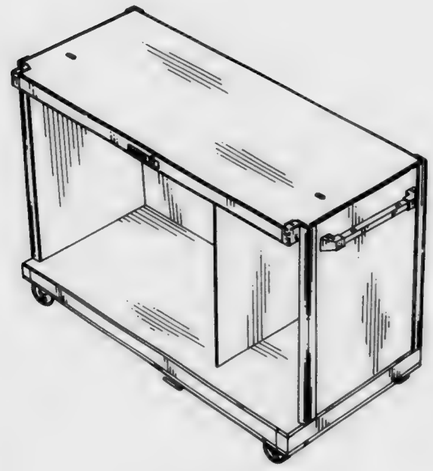




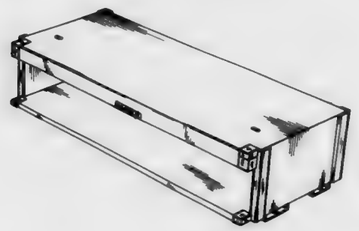
326,197
CABINET HOUSING FOR RECEIVING DRAWERS
Charles H. Heiligenthal; Larry D. Pacetti; Jack A. Parise, and George R. Slivon, all of Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed Nov. 7, 1989, Ser. No. 437,921
Term of patent 14 years
U.S. Cl. D6—474



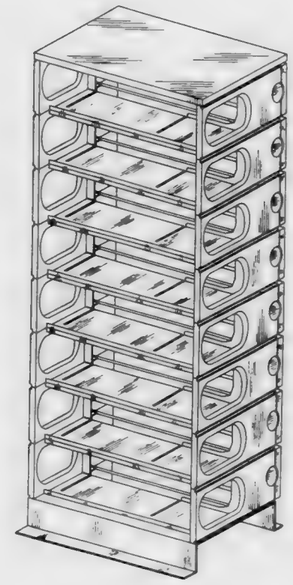
326,198
CABINET HOUSING FOR RECEIVING DRAWERS
Larry D. Pacetti; Jack A. Parise, and George R. Slivon, all of Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed Sep. 25, 1989, Ser. No. 411,622
Term of patent 14 years
U.S. Cl. D6—477



326,199
CABINET HOUSING FOR RECEIVING DRAWERS
Charles H. Heiligenthal; Larry D. Pacetti; Jack A. Parise, and George R. Slivon, all of Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed Feb. 5, 1990, Ser. No. 475,082
Term of patent 14 years
U.S. Cl. D6—477



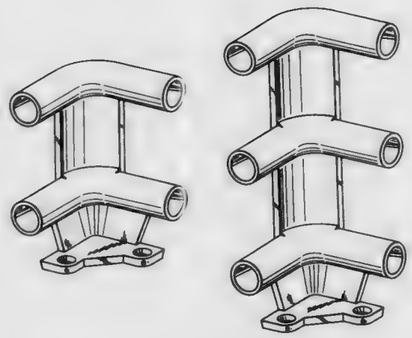
326,200
RACK FOR ELECTRONIC EQUIPMENT
Duane V. Allen, Saugerties, and Arnold M. Davis, Bloomington, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 11, 1989, Ser. No. 392,612
Term of patent 14 years
U.S. Cl. D6—479



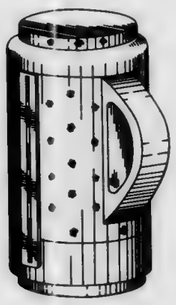
326,201
SUPPORT PEDESTAL FOR A TABLE
Steven A. Beaudry, 12261 Drake St., Coon Rapids, Minn. 55433
Division of Ser. No. 81,436, Aug. 4, 1987, Pat. No. Des. 316,350.
This application Feb. 8, 1991, Ser. No. 655,233
Term of patent 14 years
U.S. Cl. D6—495



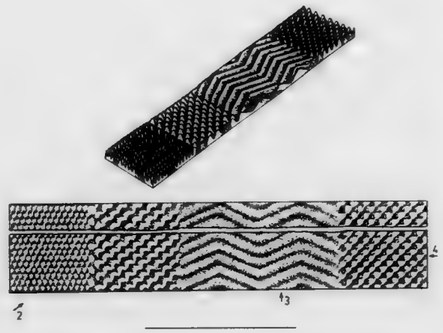
326,202
CORNER CONNECTOR FOR USE IN THE CONSTRUCTION OF A DRAWER
Reinhold Rupp, Langenau, Fed. Rep. of Germany, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Fed. Rep. of Germany
Filed Mar. 10, 1989, Ser. No. 321,741
Claims priority, application Austria, Sep. 13, 1988, 27585/456; Sep. 13, 1988, 27588/456
Term of patent 14 years
U.S. Cl. D6—510



326,203
PORTABLE PAPER TOWEL HOLDER
Jane Butler, R.R. 3, Box 222B, Rockwood, Tenn. 37854-9207
Filed Sep. 25, 1990, Ser. No. 587,428
Term of patent 14 years
U.S. Cl. D6—522



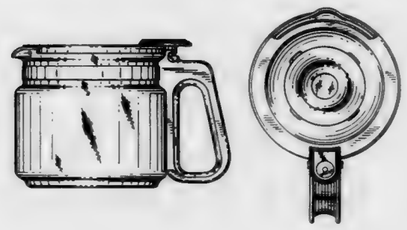
326,204
MATTRESS PAD
Ewan J. Main, 7 Pintail Court, Guelph, Ontario, Canada N1C 1A8
Filed Nov. 27, 1989, Ser. No. 441,936
Claims priority, application Canada, Jan. 11, 1989, 0111894
Term of patent 14 years
U.S. Cl. D6—596



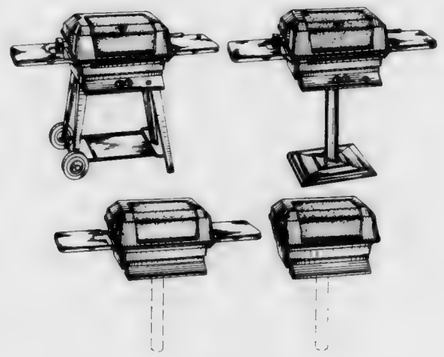
326,205
BEACH TOWEL
Shirley J. Secreet, 634 First St., McDonald, Pa. 15057
Filed Jul. 11, 1990, Ser. No. 551,257
Term of patent 14 years
U.S. Cl. D6—608



326,206
CARAFE
William J. Rakocy, Madison; Ronald L. Muller, Old Saybrook, and Masao Tsuji, Old Lyme, all of Conn., assignors to North American Philips Corp., New York, N.Y.
Division of Ser. No. 217,571, Jul. 11, 1988, Pat. No. Des. 317,546. This application Jan. 30, 1991, Ser. No. 647,869
Term of patent 14 years
U.S. Cl. D7—317



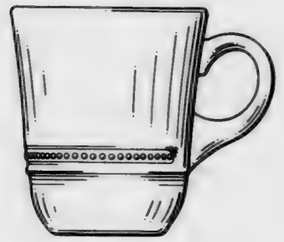
326,207
BARBECUE GRILL
Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Aug. 13, 1990, Ser. No. 566,287
Term of patent 14 years
U.S. Cl. D7—332



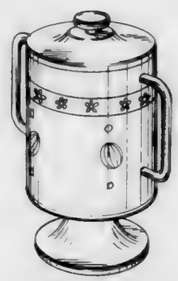
326,208
CUP OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 10, 1989, Ser. No. 321,349
Term of patent 14 years
U.S. Cl. D7—536



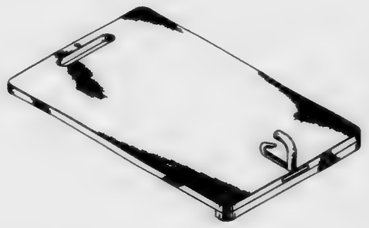
326,209
DEMITASSE CUP OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 10, 1989, Ser. No. 322,224
The portion of the term of this patent subsequent to May 19, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—536



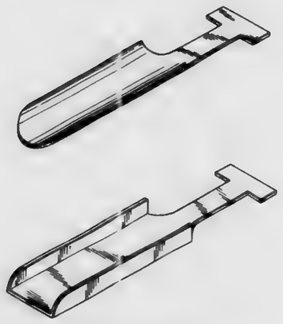
326,210
GARLIC CONTAINER
Josephine Girardi, 233 N. Queens Ave., North Massapequa, N.Y. 11758
Filed Jul. 12, 1990, Ser. No. 551,613
Term of patent 14 years
U.S. Cl. D7—612



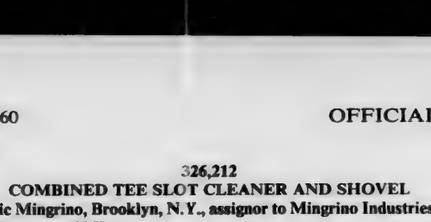
326,211
CUTTING BOARD FOR FISH
Jonathan C. Allen, 800 Main Ave., Cordova, Ill. 61242
Filed Jun. 12, 1989, Ser. No. 365,054
Term of patent 14 years
U.S. Cl. D7—698



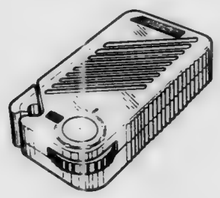
326,212
COMBINED TEE SLOT CLEANER AND SHOVEL
Eric Mingrino, Brooklyn, N.Y., assignor to Mingrino Industries, Brooklyn, N.Y.
Filed Aug. 2, 1990, Ser. No. 562,140
Term of patent 14 years
U.S. Cl. D8—10



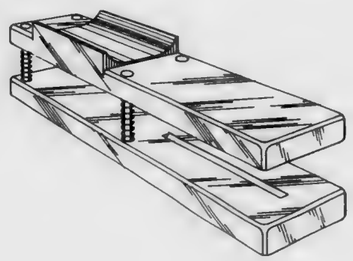
326,213
RETRACTABLE SCREWDRIVER
Joshua Freilich, Tano Point La., Rte. 4, Box 204, Santa Fe, N. Mex. 87501-9804
Filed Jul. 11, 1988, Ser. No. 217,601
Term of patent 14 years
U.S. Cl. D8—82



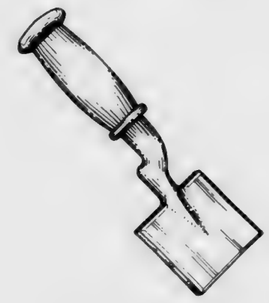
326,214
WIRE STRIPPER
Paul S. Hepworth, Guildford, England, assignor to Plas Plugs Limited, Staffs, England
Filed Sep. 8, 1989, Ser. No. 404,440
Claims priority, application United Kingdom, Mar. 9, 1989, 1057745
Term of patent 14 years
U.S. Cl. D8—98



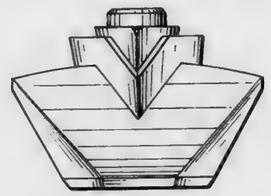
326,215
RIBBON SHREDDER
Arnold M. DeJaynes, R.R. #1, Box 168, New London, Iowa 52645
Continuation-in-part of Ser. No. 204,787, Jun. 10, 1988. This application Dec. 11, 1989, Ser. No. 448,604
Term of patent 14 years
U.S. Cl. D8—98



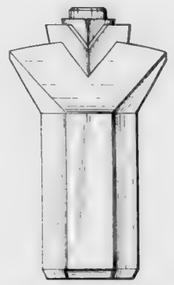
326,216
COMMODE SEAT LIFT HANDLE
Harold J. Hampton, P.O. Box 224, Bryant, Ark. 72422
Filed Jun. 4, 1990, Ser. No. 532,990
Term of patent 14 years
U.S. Cl. D8—307



326,217
DISPENSING CONTAINER
Nick Petschek, New York, N.Y., assignor to ReSeal International Limited Partnership, New York, N.Y.
Filed Oct. 11, 1990, Ser. No. 596,342
Term of patent 14 years
U.S. Cl. D9—526



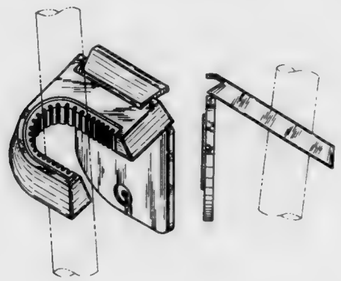
326,218
DISPENSING CONTAINER
Nick Petschek, New York, N.Y., assignor to ReSeal International Limited Partnership, New York, N.Y.
Filed Oct. 11, 1990, Ser. No. 596,343
Term of patent 14 years
U.S. Cl. D9—526



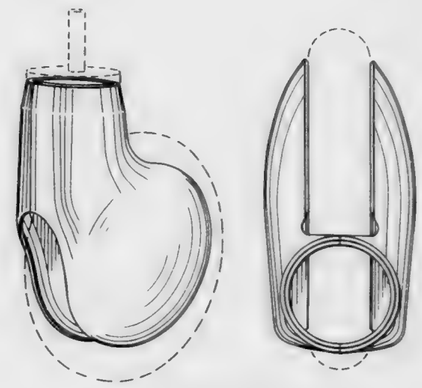
326,219
KNOB
Laverne E. Clayton, Rockford, Ill., assignor to Amoco Corporation, Rockford, Ill.
Filed Mar. 12, 1990, Ser. No. 491,614
Term of patent 14 years
U.S. Cl. D8—310



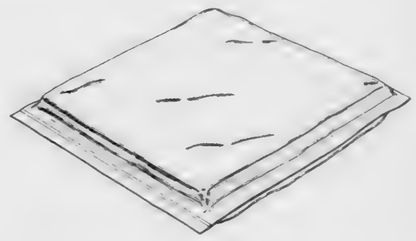
326,220
HOLDER FOR THE HAFT OF A BROOM, MOP OR SIMILAR ARTICLE
James Hampshire, Solon, Ohio, assignor to InterDesign Inc., Solon, Ohio
Filed Feb. 5, 1991, Ser. No. 650,652
Term of patent 14 years
U.S. Cl. D8—373



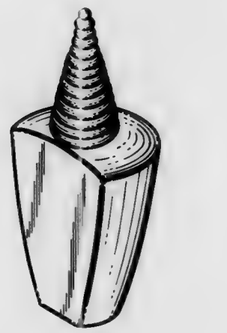
326,221
CASTER COVER
Phillippe Y. Brule', Richland, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.
Filed Nov. 15, 1989, Ser. No. 437,360
Term of patent 14 years
U.S. Cl. D8—375

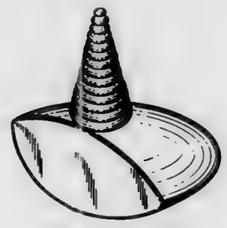


326,222
VACUUM-PACKED FOIL PACKAGE
Frank J. McAtarian, 416 Edgewood Pl., Rutherford, N.J. 07070
Filed Jan. 26, 1990, Ser. No. 471,134
Term of patent 14 years
U.S. Cl. D9—345

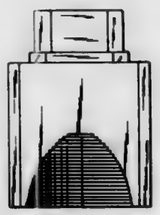


326,223
COSMETIC CONTAINER
Maurizia Dova, Milano, Italy, assignor to Euroitalia S.R.L., Monza, Italy
Filed May 17, 1989, Ser. No. 352,912
Claims priority, application Italy, Nov. 30, 1988, 2222/88[U]
Term of patent 14 years
U.S. Cl. D9—522

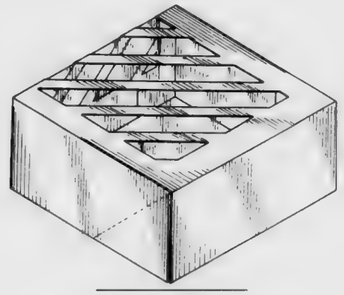




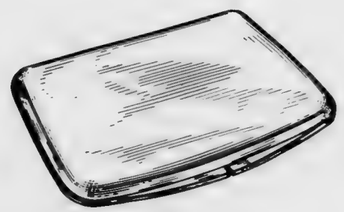
326,224
COMBINED PERFUME BOTTLE AND CAP
Pierre F. Dinand, Levallois, France, assignor to Fox Fragrances S.r.l., Milan, Italy
Filed Apr. 19, 1990, Ser. No. 511,471
Claims priority, application Hague, Dec. 19, 1989, DM/015379
Term of patent 14 years
U.S. Cl. D9—522



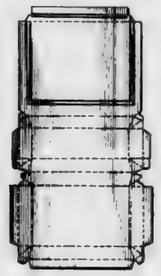
326,225
BOX
Kenneth Beckerman; Alan Beckerman; Beth A. Brady, all of Allegheny County; Kenneth Kocinski, Beaver County, and Michael Leusch, Allegheny County, all of Pa., assignors to Package Products, Inc., Pittsburgh, Pa.
Filed Mar. 8, 1990, Ser. No. 490,943
Term of patent 14 years
U.S. Cl. D9—418



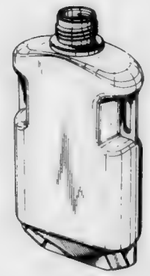
326,226
PACKAGING CONTAINER
Mark D. Gerhart, Ridley Park, Pa., assignor to Scott Paper Company, Philadelphia, Pa.
Filed Jun. 16, 1989, Ser. No. 367,511
Term of patent 14 years
U.S. Cl. D9—423



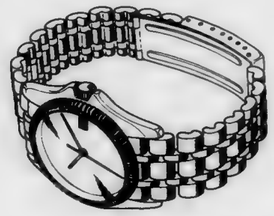
326,227
CARTON BLANK
Hampton E. Forbes, Jr., Newark, Del., assignor to Westvaco Corporation, New York, N.Y.
Filed Apr. 9, 1990, Ser. No. 506,387
Term of patent 14 years
U.S. Cl. D9—433



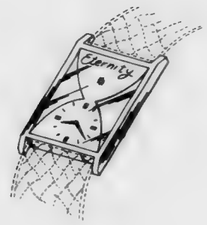
326,228
CONTAINER
Michael G. Stratford, Tring, and Richard J. Shorter, Dunstable, both of United Kingdom, assignors to Coopers Animal Health Limited, Hertfordshire, United Kingdom
Filed Oct. 1, 1990, Ser. No. 591,110
Claims priority, application United Kingdom, Apr. 4, 1990, 2005945
Term of patent 14 years
U.S. Cl. D9—521



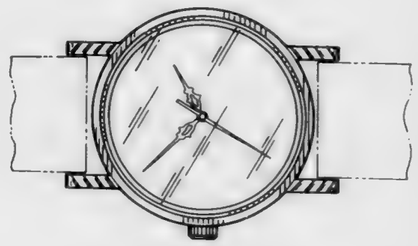
326,229
WRISTWATCH
Gérald A. G. St. Dizier, Gaillard, France, assignor to Rolex Watch U.S.A., Inc., New York, N.Y.
Filed Sep. 20, 1989, Ser. No. 409,870
Claims priority, application World Int. Prop. O., Mar. 23, 1989, DM/013155
Term of patent 14 years
U.S. Cl. D10—32



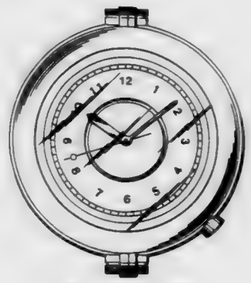
326,230
WRISTWATCH HAVING AN HOURGLASS FACE
Philomina B. Wilson, P.O. Box 2601, Pasadena, Calif. 91102-2601
Filed Jul. 3, 1990, Ser. No. 548,732
Term of patent 14 years
U.S. Cl. D10—33



326,231
WRISTWATCH
Benjamin E. Woomer, 1597 E. 30th St., Cleveland, Ohio 44114
Filed Nov. 21, 1988, Ser. No. 273,871
Term of patent 14 years
U.S. Cl. D10—39



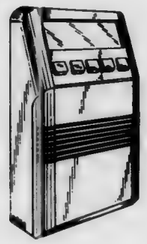
326,232
WRISTWATCH
Masao Kurebayashi, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan
Filed Sep. 27, 1989, Ser. No. 414,089
Claims priority, application Japan, Apr. 12, 1989, D1-13463
Term of patent 14 years
U.S. Cl. D10—39



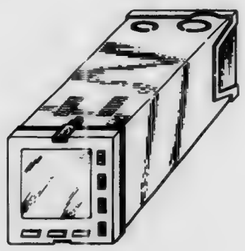
326,233
WATCH
Eddy Burgener, Moutier, Switzerland, assignor to Swiss Army Brands, Ltd., Shelton, Conn.
Filed Oct. 4, 1989, Ser. No. 417,003
Claims priority, application World Int. Prop. O., Apr. 6, 1989, DMA/000975
Term of patent 14 years
U.S. Cl. D10—39



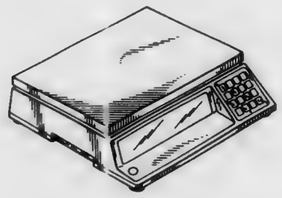
326,234
COMBINED THERMOSTAT AND TIMER
Bernhard H. Tinz, Reutlingen, Fed. Rep. of Germany, assignor to Graesslin KG, Fed. Rep. of Germany
Filed Jun. 14. 1989, Ser. No. 366,037
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1988, M8803941.2
Term of patent 14 years
U.S. Cl. D10—50



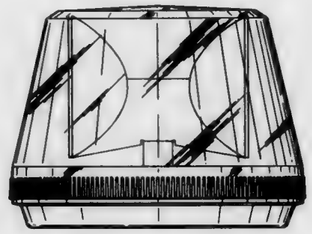
326,235
PROCESS COMMAND CONTROLLER
Edward Bastijanic, Concord; Richard J. Molnar, Willoughby, and David J. Wroblewski, Mentor, all of Ohio, assignors to Elsag International B.V.
Filed Jan. 22. 1990, Ser. No. 468,994
Term of patent 14 years
U.S. Cl. D10—75

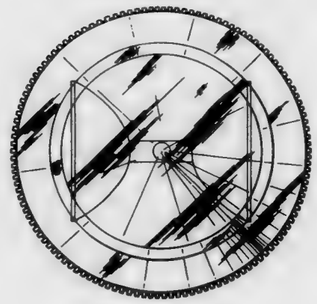


326,236
ELECTRONIC BALANCE
Kiyoshi Saito, Tokyo, Japan, assignor to Tokyo Electric Company Ltd., Tokyo, Japan
Filed Mar. 23, 1987, Ser. No. 29,466
Claims priority, application Japan, Sep. 22, 1986, 61-37432; Sep. 22, 1986, 61-37433
Term of patent 14 years
U.S. Cl. D10—91

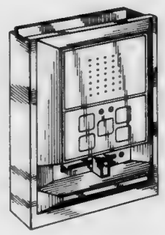


326,237
ROTATING WARNING BEACON
Bradley D. Gale, St. Louis, and J. Stanley Davis, Town & Country, both of Mo., assignors to Public Safety Equipment, Inc., St. Louis, Mo.
Filed Jul. 5, 1990, Ser. No. 548,736
Term of patent 14 years
U.S. Cl. D10—114

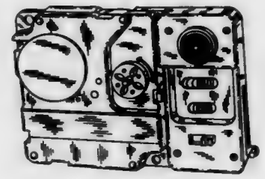




326,238
COMBINED ANNUNCIATOR AND SWITCHING UNIT FOR HOSPITAL PATIENTS
Robert J. Spinosa, Austin, Tex., assignor to MRD, Inc., Austin, Tex.
Filed Jul. 2, 1990, Ser. No. 547,583
Term of patent 14 years
U.S. Cl. D10—18



326,239
CLOCK MOVEMENT
Katsuhiro Hatano, 1-1, Taihei 4-chome, Sumida-ku, Tokyo, Japan
Filed Feb. 23, 1990, Ser. No. 484,618
Term of patent 14 years
U.S. Cl. D10—129



326,240
NECKLACE OR SIMILAR ARTICLE
Marjorie K. Kouns, 15 Minetta St., New York, N.Y. 10012
Division of Ser. No. 67,909, Jun. 29, 1987, Pat. No. Des. 309,275. This application Jul. 3, 1990, Ser. No. 547,908
Term of patent 14 years
U.S. Cl. D11—6



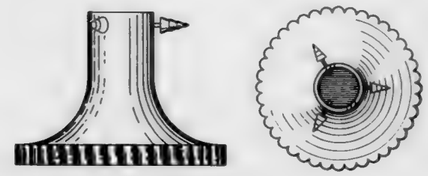
326,241
HAND KNITTING AID
Norma J. Kroh, 114 Pottawatomie, Hiawatha, Kans. 66434
Filed Aug. 28, 1989, Ser. No. 399,297
Term of patent 14 years
U.S. Cl. D11—27



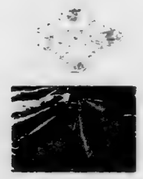
326,242
BADGE
Ian Pierce, 648 Sir Richard's Road, Mississauga, Ontario, Canada L5C 1A4
Filed Dec. 13, 1990, Ser. No. 626,855
Term of patent 14 years
U.S. Cl. D11—99



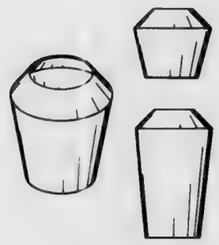
326,243
CHRISTMAS TREE STAND
George P. Franci, 3216 Flora St., Burleson, Tex. 76028
Filed Jan. 6, 1989, Ser. No. 294,502
Term of patent 14 years
U.S. Cl. D11—130.1



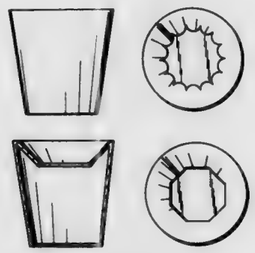
326,244
FLOWER POT COVER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.
Division of Ser. No. 356,281, May 23, 1989, Pat. No. Des. 313,376. This application Oct. 12, 1990, Ser. No. 598,451
Term of patent 14 years
U.S. Cl. D11—149



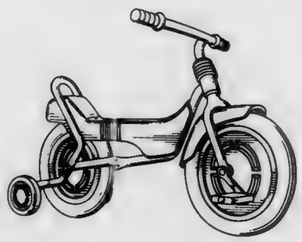
326,245
FLOWER POT COVER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corp., Highland, Ill.
Filed Mar. 9, 1989, Ser. No. 321,460
The portion of the term of this patent subsequent to Jan. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—152



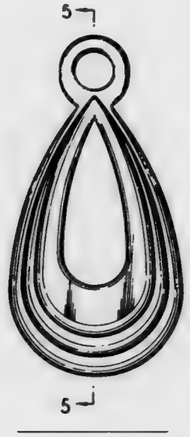
326,246
FLOWER POT COVER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corp., Highland, Ill.
Filed Mar. 9, 1989, Ser. No. 321,461
The portion of the term of this patent subsequent to Jan. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—152



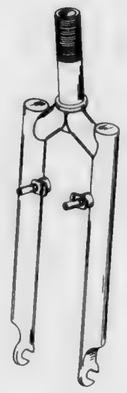
326,247
BICYCLE
Stanley C. Hess, Camarillo, Calif., assignor to Hess Design, Camarillo, Calif.
Filed Jan. 16, 1990, Ser. No. 465,019
Term of patent 14 years
U.S. Cl. D12—111



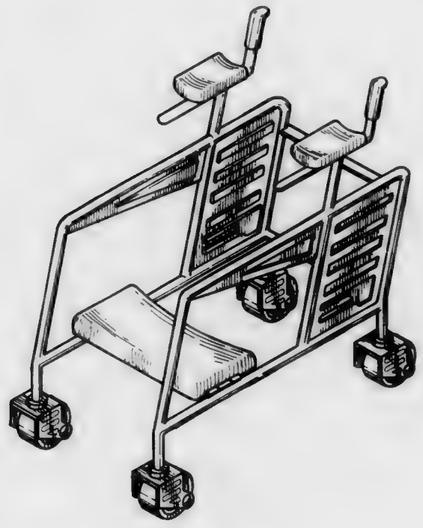
326,248
PULL TAB FOR SLIDE FASTENER
Yoshiyuki Horita, and Hiroshi Mizuno, both of Toyama, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan
Filed May 30, 1989, Ser. No. 357,858
Term of patent 14 years
U.S. Cl. D11—221



326,249
FRONT FORK FOR A BICYCLE
Christopher W. Chance, Winchester, and Jeffrey B. Feddersen, Harvard, both of Mass., assignors to Fat City Cycles, Inc., Somerville, Mass.
Filed Jan. 16, 1991, Ser. No. 641,565
Term of patent 14 years
U.S. Cl. D12—118



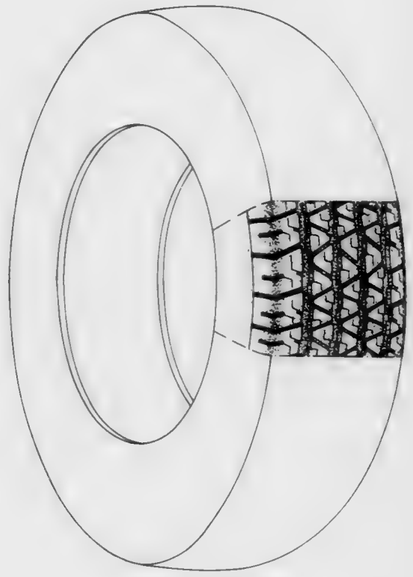
326,250
COMBINED WHEELCHAIR AND WALKER
Beverley J. Oliver, 2451 Cherry Ave., Steubenville, Ohio 43952
Filed Jul. 18, 1990, Ser. No. 553,686
Term of patent 14 years
U.S. Cl. D12—130



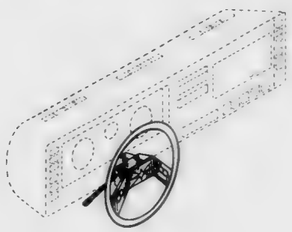
326,251
AUTOMOBILE TIRE
Shunsuke Aoki, and Masao Nakamura, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Feb. 27, 1990, Ser. No. 495,531
Claims priority, application Japan, Aug. 28, 1989, 1-30925
Term of patent 14 years
U.S. Cl. D12—141



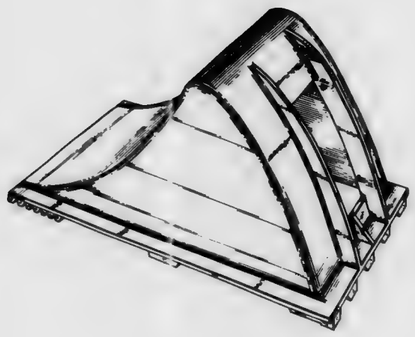
326,252
TIRE
Douglas J. Slagh, Greer, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Feb. 15, 1990, Ser. No. 480,521
Term of patent 14 years
U.S. Cl. D12—147



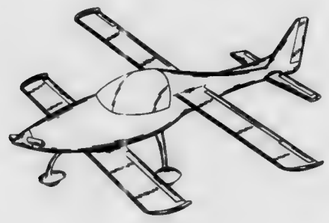
326,253
STEERING WHEEL
Jesus Frietze, 1715 Lester Ave., Las Cruces, N. Mex. 88001
Filed May 16, 1990, Ser. No. 523,927
Term of patent 14 years
U.S. Cl. D12—176



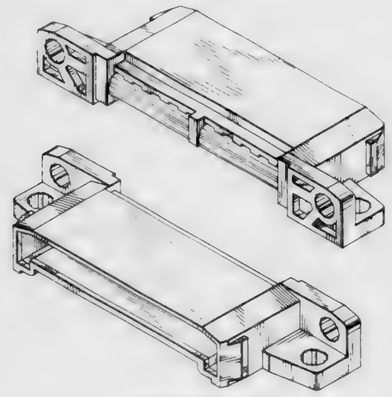
326,254
VEHICLE WHEEL BLOCK
Theodore Ziaylek, Jr., 140 Riverview Dr., and Michael P. Ziaylek, 3 Brook La., both of Yardley, Pa. 19067
Filed Mar. 12, 1990, Ser. No. 492,177
Term of patent 14 years
U.S. Cl. D12—217



326,255
AIRCRAFT
Arthur D. B. Graham, Mosman Park, Australia; John G. Roncz, Granger, Ind., and Graham Swanell, Willetton, Australia, assignors to Composite Industries Limited, Australia
Filed Sep. 23, 1988, Ser. No. 249,075
Term of patent 14 years
U.S. Cl. D12—331



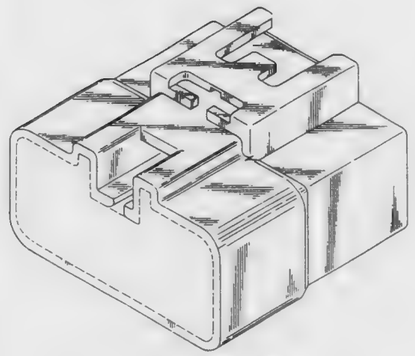
326,256
ELECTRICAL CONNECTOR HOUSING
Lahman D. Lambert, II, Mechanicsburg, Pa., and Dean A. Puerner, Maricopa, Ariz., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of Ser. No. 386,536, Jul. 28, 1989, Pat. No. 4,921,442, which is a continuation-in-part of Ser. No. 338,790, Apr. 14, 1989, abandoned, and a continuation-in-part of Ser. No. 433,412, Nov. 7, 1989, Pat. No. 4,944,693, which is a continuation-in-part of Ser. No. 387,203, Jul. 28, 1989. This application Feb. 9, 1990, Ser. No. 479,543
Term of patent 14 years
U.S. Cl. D13—147



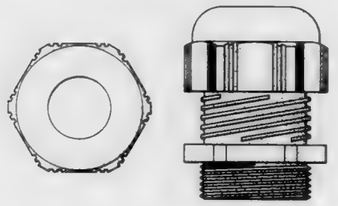
326,257
INSULATING JACKET FOR ELECTRICAL CONNECTORS AND CABLES
Noel Lee, Daly City, and Rodney Herman, Alameda, both of Calif., assignors to Monster Cable, South San Francisco, Calif.
Filed Nov. 14, 1989, Ser. No. 436,443
Term of patent 14 years
U.S. Cl. D13—129



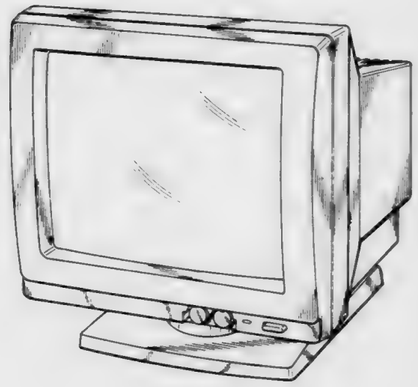
326,258
HOUSING FOR ELECTRICAL CONNECTOR
Yasuhiro Nagasaka; Yasuo Hirayama, both of Toyota; Shigekazu Wakata; Shinichi Yamada, both of Yokkaichi, and Yoshihiro Tanaka, Mie, all of Japan, assignors to Sumitomo Wiring systems, Ltd., Yokkaichi, Japan
Filed Apr. 18, 1989, Ser. No. 339,634
Claims priority, application Japan, Oct. 20, 1988, 63-41167
The portion of the term of this patent subsequent to Mar. 24, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—147



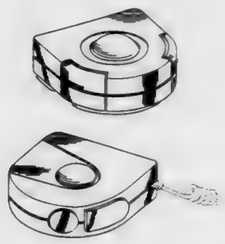
326,259
CABLE GLAND FOR SECURING ELECTRICAL CABLES AND CONDUITS
Udo Studenski, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to U.I. Lapp KG, Fed. Rep. of Germany
Filed Jul. 17, 1989, Ser. No. 380,645
Term of patent 14 years
U.S. Cl. D13—156



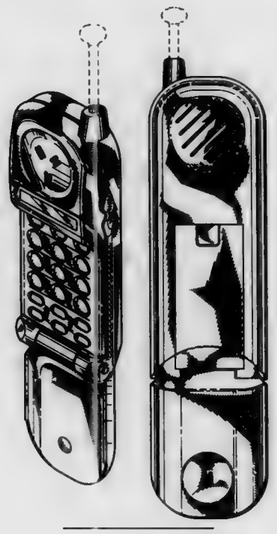
326,260
MONITOR OR SIMILAR ARTICLE
Yuriko Oshima, Suwa, Japan, assignor to Seiko Epson Corporation, Japan
Filed Mar. 26, 1990, Ser. No. 499,077
Claims priority, application Japan, Sep. 25, 1989, 1-34890
Term of patent 14 years
U.S. Cl. D14—113



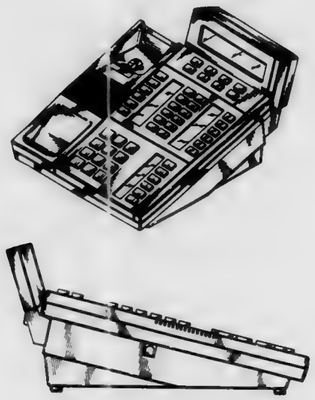
326,261
TRACKBALL FOR COMPUTER
Stuart Ashmun, Seattle; Charlie Garthwaite, Kirkland; Bridget Cameron, Seattle; Allan H. Stephan, Seattle; Michael D. Nelson, Seattle; Mike M. Paull, Seattle, all of Wash.; Paul Bradley, Woodside, Calif.; James R. Yurchenco, Palo Alto, Calif., and Elinor J. Fulton, Kennington, Calif., assignors to Microsoft Corporation, Redmond, Wash.
Continuation-in-part of Ser. No. 598,562, Oct. 22, 1990, which is a continuation-in-part of Ser. No. 425,527, Oct. 23, 1989. This application Mar. 8, 1991, Ser. No. 666,397
Term of patent 14 years
U.S. Cl. D14—114



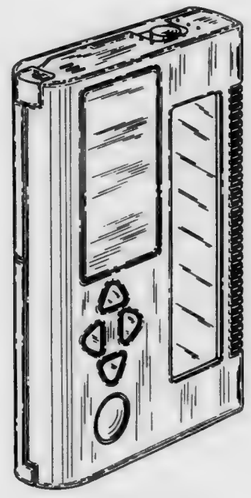
326,262
PORTABLE HANDSET TELEPHONE OR SIMILAR ARTICLE
Leonid Soren, Lincolnwood, and Shrinrang Jambhekar, Schaumburg, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.
Filed Sep. 26, 1991, Ser. No. 765,865
Term of patent 14 years
U.S. Cl. D14—138



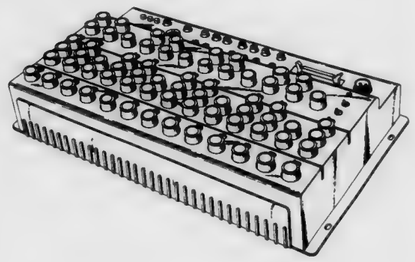
326,263
TELEPHONE BASE WITH DISPLAY
Jerry W. Fuqua, and James M. Sharp, Jr., both of Corinth, Miss., assignors to International Telecommunication Corp., Memphis, Tenn.
Filed Jul. 16, 1990, Ser. No. 553,943
Term of patent 14 years
U.S. Cl. D14—151



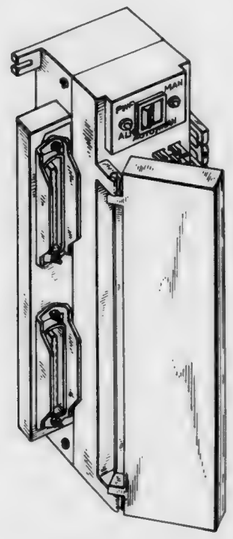
326,264
PAGING RECEIVER
Louis J. Bouhuys, Nuenen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 20, 1990, Ser. No. 541,417
Claims priority, application Hague, Feb. 1, 1990, DM/015.771
Term of patent 14 years
U.S. Cl. D14—191



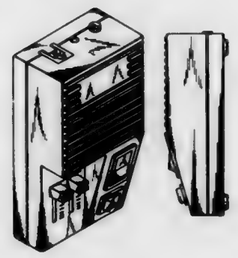
326,265
EQUALIZER FOR AUTOMOBILE AUDIO SYSTEMS OR THE LIKE
Tommyca Freadman, Goshen, N.Y., assignor to Sparkomatic Corp., Milford, Pa.
Filed Apr. 10, 1989, Ser. No. 336,461
Term of patent 14 years
U.S. Cl. D14—217



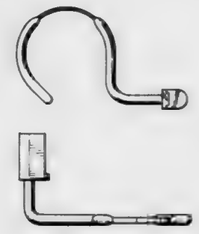
326,266
POWER TRANSFER BLOCK FOR TELEPHONE SYSTEMS OR SIMILAR DEVICE
Helmuth Neuwirth, Garden City; Carmine Cupani, and Michael Mattei, both of Smithtown, all of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.
Filed Aug. 10, 1990, Ser. No. 565,326
Term of patent 14 years
U.S. Cl. D14—240



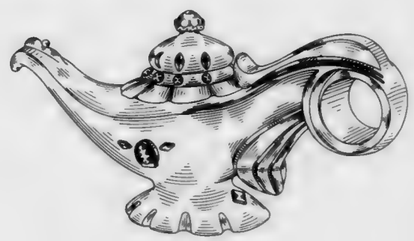
326,267
PORTABLE TELEPHONE AMPLIFIER UNIT
Margaret A. Weiser, and Isaac Weiser, both of 4760 Corbin Ave., Tarzana, Calif. 91356
Filed Dec. 7, 1989, Ser. No. 447,116
Term of patent 14 years
U.S. Cl. D14—243



326,268
SUPPORT FOR A TELEPHONE HEADSET OR A SIMILAR ARTICLE
Eric D. P. Le Tixerant, 19 rue Andre Del Sarte, 75018 Paris, France
Filed Oct. 16, 1989, Ser. No. 421,705
Claims priority, application France, Apr. 15, 1989, 89 2537
Term of patent 14 years
U.S. Cl. D14—253



326,269
COMBINED SOUND GENERATOR AND LIGHT
Dorothy J. Phillips, Rte. 5, Box 447B, Bakersfield, Calif. 93307
Filed May 4, 1989, Ser. No. 347,414
Term of patent 14 years
U.S. Cl. D14—299



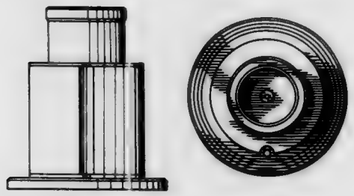
326,270
MOWING APPARATUS
Minoru Wada, Hamura, and Mitsuru Taniguchi, Tokyo, both of Japan, assignors to Komatsu Zenoah Co., Tokyo, Japan
Filed Jan. 13, 1989, Ser. No. 297,234
Term of patent 14 years
U.S. Cl. D15—16



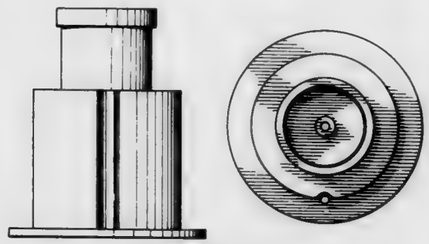
326,271
TRIGGER LOCK FOR A FUEL PUMP NOZZLE
James R. McGiboney, 1019 Hwy 213, Covington, Ga. 30209-8307
Filed Jul. 31, 1990, Ser. No. 560,328
Term of patent 14 years
U.S. Cl. D15—9.1



326,272
HEAT INSULATING CYLINDER FOR THERMAL TREATMENT OF SEMICONDUCTOR WAFERS
Ken Nakao, and Wataru Ohkase, both of Sagamihara, Japan, assignors to Tel Sagami Limited, Kanagawa, Japan
Filed Jan. 25, 1989, Ser. No. 301,995
Claims priority, application Japan, Jul. 25, 1988, 63-29836
The portion of the term of this patent subsequent to May 19, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—144.1



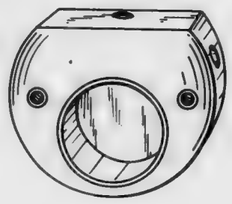
326,273
HEAT INSULATING CYLINDER FOR THERMAL TREATMENT OF SEMICONDUCTOR WAFERS
Ken Nakao, Sagamihara; Seishiro Sato, Machida, and Wataru Ohkase, Sagamihara, all of Japan, assignors to Tel Sagami Limited, Kanagawa, Japan
Filed Jan. 25, 1989, Ser. No. 301,997
Claims priority, application Japan, Jul. 25, 1988, 63-29832
The portion of the term of this patent subsequent to May 19, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—144.1



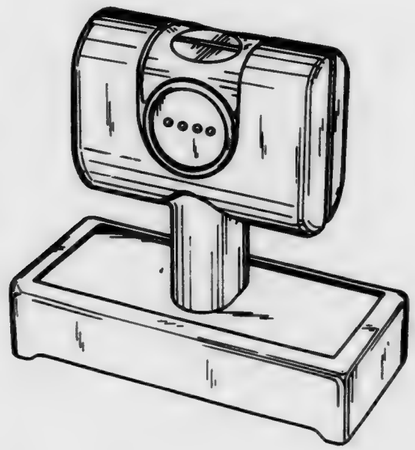
326,274
SPECTACLES
Alain-Dominique Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V., Amsterdam, Netherlands
Filed Nov. 16, 1990, Ser. No. 614,758
Claims priority, application France, May 18, 1990, 903216
Term of patent 14 years
U.S. Cl. D16—102



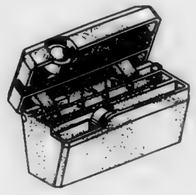
326,275
SUPPORT UNIT FOR TOM-TOM DRUMS
Werner Sassmannshausen, and Werner Sassmannshausen, both of Bad Berleburg, Fed. Rep. of Germany, assignors to Johs. Link GmbH & Co. KG, Bad Berleburg, Fed. Rep. of Germany
Filed Dec. 19, 1989, Ser. No. 452,956
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1989, 8904321
Term of patent 14 years
U.S. Cl. D17—22



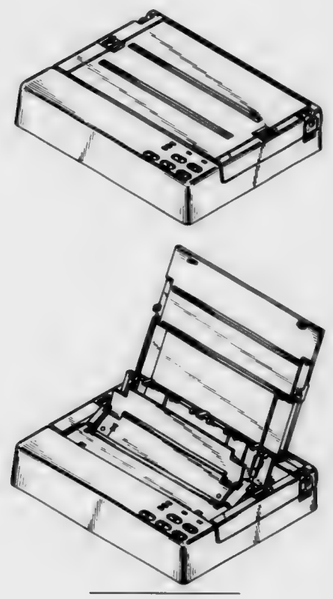
326,276
HAND STAMP
David E. Mehaffey, Charlotte, N.C., and Richard Lindahl, Malmo, Sweden, assignors to Porelon, Inc., Cookeville, Tenn.
Filed Sep. 6, 1989, Ser. No. 403,717
The portion of the term of this patent subsequent to Jan. 7, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—15



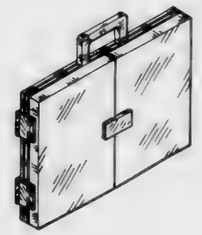
326,277
PAPER TRIMMER FOR TEARING AWAY EDGES OF PERFORATED COMPUTER PAPER
William J. Lund, Stockton, Calif., assignor to Lund Company, Ltd., Stockton, Calif.
Filed Feb. 13, 1990, Ser. No. 479,591
Term of patent 14 years
U.S. Cl. D18—34



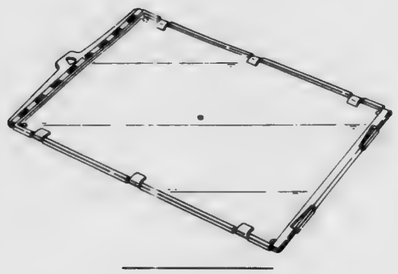
326,278
DATA PRINTER
Hatto Grosse, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Jun. 21, 1990, Ser. No. 541,370
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 8908731
Term of patent 14 years
U.S. Cl. D18—54



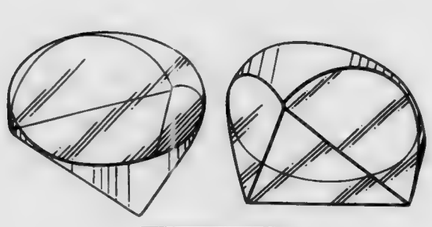
326,279
COMBINED MULTI-PANELED EASEL AND ART DISPLAY CASE
Genevieve R. Logan, 627 Mauze, San Antonio, Tex. 78216
Filed May 17, 1989, Ser. No. 352,813
Term of patent 14 years
U.S. Cl. D19—36



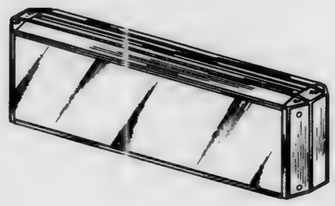
326,280
SUPPORTING PLATE FOR AFFIXING PAPER SHEETS
Tor Arnt-Jensen, Postboks 1 Lunden, N-1501 Moss, Norway
Filed Nov. 23, 1988, Ser. No. 275,316
Claims priority, application Norway, May 26, 1988, 69392
Term of patent 14 years
U.S. Cl. D19—88



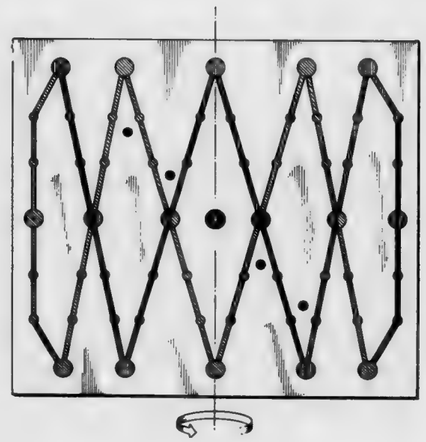
326,281
PAPERWEIGHT
Ichiji Funazaki, Hatano, Japan, assignor to Sokkisha Co. Ltd., Tokyo, Japan
Filed May 9, 1989, Ser. No. 349,031
Claims priority, application Japan, Nov. 29, 1988, 63-46253
Term of patent 14 years
U.S. Cl. D19—96



326,282
VEHICLE MESSAGE DISPLAY SIGN
Davor Spoljaric, Espoo, Finland, assignor to Warrec Company, Greenwich, Conn.
Filed Dec. 28, 1989, Ser. No. 459,108
Term of patent 14 years
U.S. Cl. D20—10



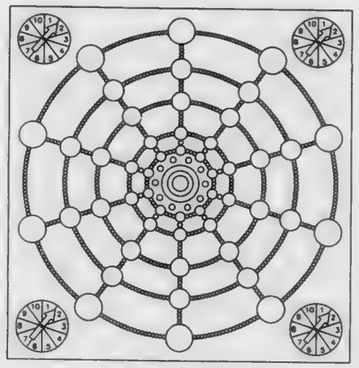
326,283
GAME BOARD
Jack C. Davis, 5715 Deanve Ave., Los Angeles, Calif. 90043
Filed Apr. 13, 1990, Ser. No. 508,407
Term of patent 14 years
U.S. Cl. D21—15



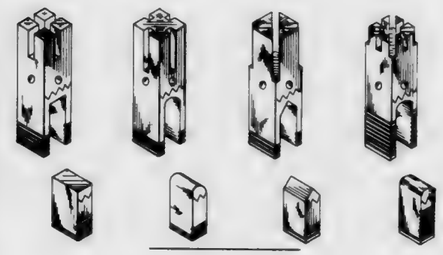
326,284
GAME BOARD
Alexander P. Vella-Zarb, and Fergus A. Coyle, both of 411 Duplex Ave., Apt. 2010, Toronto, Ontario, Canada M4R 1V2
Filed Apr. 23, 1990, Ser. No. 514,322
Term of patent 14 years
U.S. Cl. D21—33



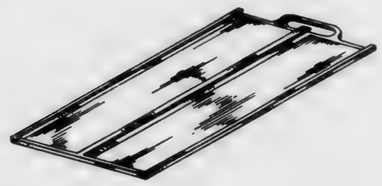
326,285
GAME BOARD
Norman H. Leveille, Star Rte. 3 - Box 1058-B, Satsuma, Fla. 32089
Filed Aug. 2, 1990, Ser. No. 561,656
Term of patent 14 years
U.S. Cl. D21—35



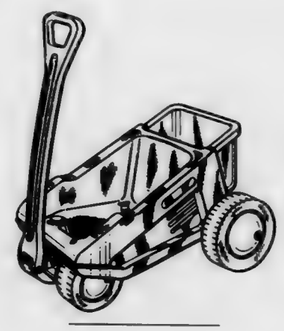
326,286
CHESS SET
David W. Kerivan, 900 E. Fayette St., Baltimore, Md. 21202
Filed Jan. 30, 1989, Ser. No. 303,400
Term of patent 14 years
U.S. Cl. D21—52



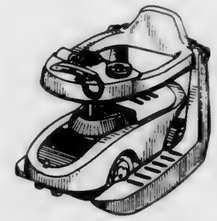
326,287
GAME CARD HOLDER
Furrell E. Grauer, Jr., W238 S3860 Big Bend Rd., Waukesha, Wis. 53186
Filed Aug. 28, 1989, Ser. No. 400,753
Term of patent 14 years
U.S. Cl. D21—54



326,288
CHILD'S VEHICLE
John Arnott, and Gary Kaga, both of Toronto, Canada, assignors to Noma Outdoor Products Inc., Brampton, Canada
Filed Oct. 18, 1990, Ser. No. 599,790
Term of patent 14 years
U.S. Cl. D21—71



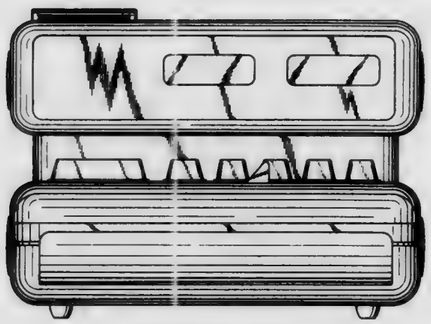
326,289
TOY VEHICLE
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan
Filed Oct. 22, 1990, Ser. No. 610,262
Claims priority, application Japan, Apr. 24, 1990, 2-14243
Term of patent 14 years
U.S. Cl. D21—71



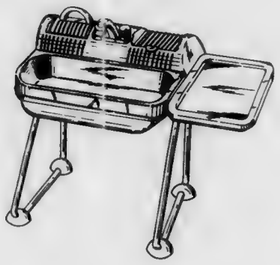
326,290
MOTORIZED SCOOTER
William J. Badsey, 30162 Silver Spur Rd., San Juan Capistrano, Calif. 92675
Filed Aug. 14, 1990, Ser. No. 567,542
Term of patent 14 years
U.S. Cl. D21—81



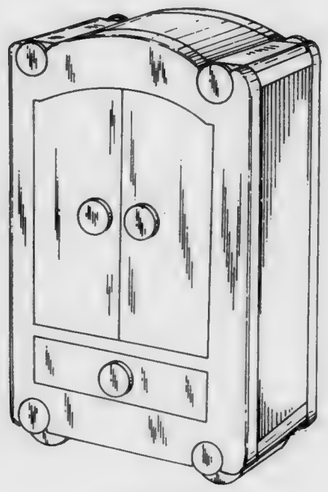
326,291
TOY BAR CODE AND CASH REGISTER
Mitsunori Noshiro, and Hitoshi Itakura, both of Tateishi, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan
Filed Aug. 31, 1990, Ser. No. 575,789
Claims priority, application Japan, Mar. 2, 1990, 2-6878
Term of patent 14 years
U.S. Cl. D21—111



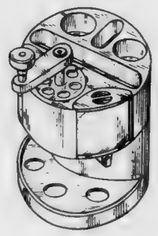
326,292
DOLL BATH OR THE LIKE
Alain Monneret, Lons Le Saunier, France, assignor to Monneret Jouets, Lons Le Saunier, France
Filed Jul. 25, 1990, Ser. No. 557,114
Claims priority, application Int'l Pat. Institute, Jan. 26, 1990, DM/015698
Term of patent 14 years
U.S. Cl. D21—121



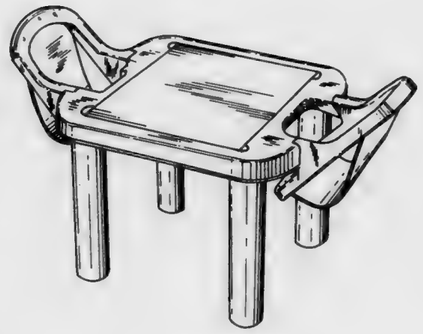
326,293
TOY CUPBOARD
Alain Monneret, Voiteur, France, assignor to Monneret Jouets, Lons Le Saunier, France
Filed Jul. 31, 1990, Ser. No. 560,579
Claims priority, application Japan, Jan. 31, 1990, DM/015 740
Term of patent 14 years
U.S. Cl. D21—121



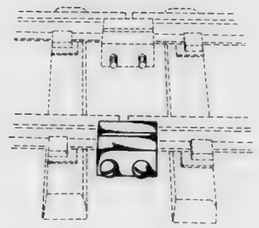
326,294
TOY ICE GRATING MACHINE
Paolo Zampolli, Azzate, Italy, assignor to Harbert - Giochi per Giocare S.r.l., Milan, Italy
Filed Jul. 13, 1990, Ser. No. 552,267
Claims priority, application Italy, Jan. 24, 1990, 20491/90[U]
Term of patent 14 years
U.S. Cl. D21—122



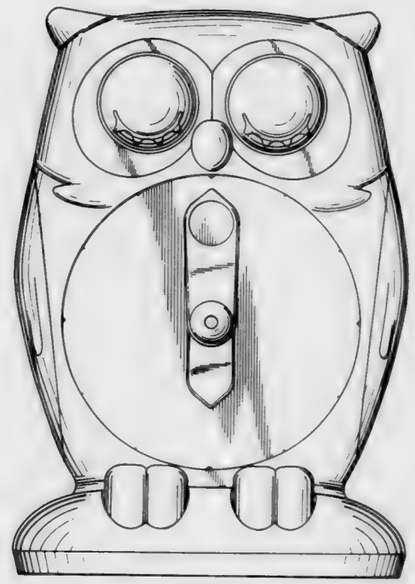
326,295
COMBINED TABLE AND SEATING FOR DOLLS OR THE LIKE
Alain Monneret, Voiteur, France, assignor to Monneret Jouets, Lons Le Saunier, France
Filed Jul. 30, 1990, Ser. No. 560,581
Claims priority, application Int'l Pat. Institute, Jan. 31, 1990, DM/015 740
Term of patent 14 years
U.S. Cl. D21—123



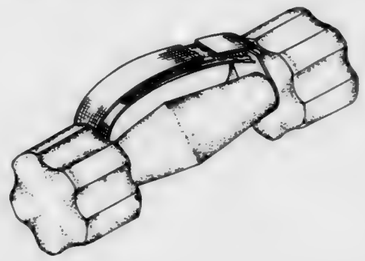
326,296
MODEL RAILROAD TRACK CLAMP
Richard K. Hillman, 942 Lakehome Dr., Lodi, Calif. 95242
Filed Aug. 6, 1990, Ser. No. 563,546
Term of patent 14 years
U.S. Cl. D21—143



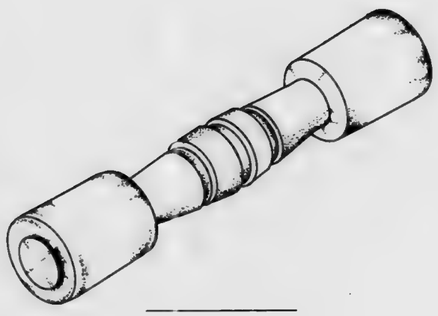
326,297
TOY CLOCK
Mitsunori Noshiro, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan
Filed Aug. 16, 1990, Ser. No. 568,322
Claims priority, application Japan, Feb. 16, 1990, 2-4800
Term of patent 14 years
U.S. Cl. D21—144



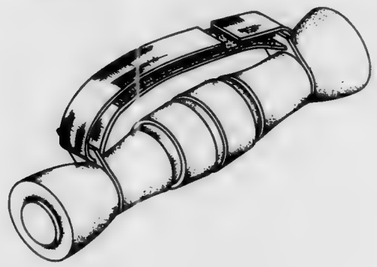
326,298
DUMBBELL
Jon E. King, and Bradley G. Stack, both of St. Louis, Mo., assignors to Sinclair & Rush, Inc., St. Louis, Mo.
Filed Feb. 25, 1991, Ser. No. 660,580
Term of patent 14 years
U.S. Cl. D21—197



326,299
DUMBBELL
Jon E. King, and Bradley G. Stack, both of St. Louis, Mo., assignors to Sinclair & Rush, Inc., St. Louis, Mo.
Filed Feb. 25, 1991, Ser. No. 660,581
Term of patent 14 years
U.S. Cl. D21—197



326,300
DUMBBELL
Jon E. King, and Bradley G. Stack, both of St. Louis, Mo., assignors to Sinclair & Rush, Inc., St. Louis, Mo.
Filed Feb. 25, 1991, Ser. No. 660,582
Term of patent 14 years
U.S. Cl. D21—197



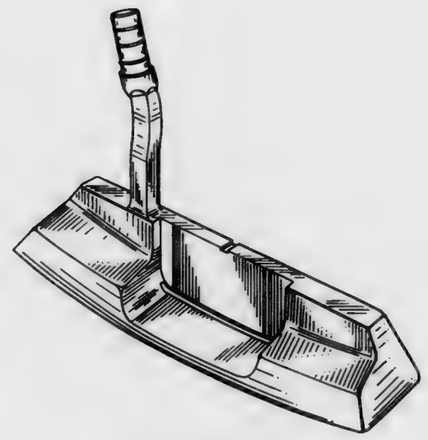
326,301
GOLF BALL RETRIEVER
Stanley R. Burton, 1030 Silver Rd., Ocala, Fla. 32672
Filed Nov. 17, 1989, Ser. No. 438,897
Term of patent 14 years
U.S. Cl. D21—206



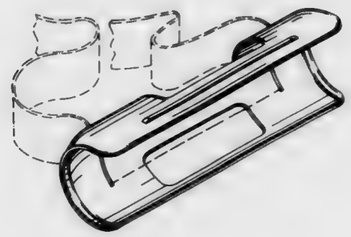
326,302
GOLF PUTTER
J. Douglas Guerin, Sr., 1227 S. Prescot Dr., Morgan City, La. 70381
Filed Aug. 29, 1989, Ser. No. 400,045
Term of patent 14 years
U.S. Cl. D21—217



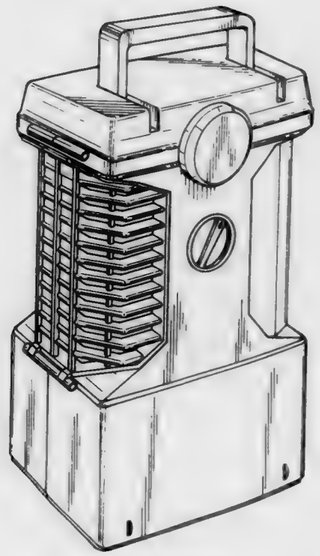
326,303
GOLF PUTTER HEAD
Don T. Cameron, Mission Viejo, Calif., assignor to Ray Cook Company, Carlsbad, Calif.
Filed Jul. 25, 1989, Ser. No. 385,267
Term of patent 14 years
U.S. Cl. D21—219



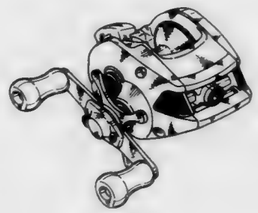
326,304
HOLDER FOR TENNIS BALLS
Larry E. Brown, Hurricane, Utah, assignor to HIP Industries, Inc., Cedar City, Utah
Filed Jul. 17, 1989, Ser. No. 380,654
Term of patent 14 years
U.S. Cl. D21—223



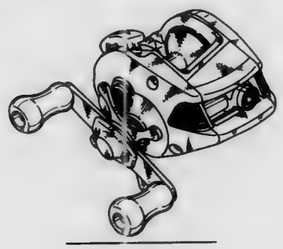
326,305
COMBINED INSECT KILLER AND LAMP
Lee K. Wah, New Territories, Hong Kong, assignor to Lomak Industrial Company Limited, Hong Kong, Hong Kong
Filed Jul. 13, 1989, Ser. No. 379,453
Claims priority, application United Kingdom, Jan. 30, 1989, 1056714
Term of patent 14 years
U.S. Cl. D22—123



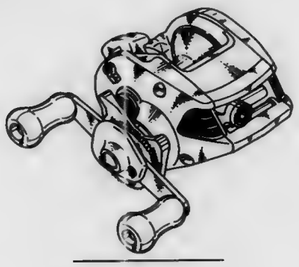
326,306
TOP PORTION OF FISHING REEL
Tomoharu Sakurai, Sakai, Japan, assignor to Shimano, Inc., Osaka, Japan
Filed Oct. 21, 1988, Ser. No. 260,654
Claims priority, application Japan, Apr. 27, 1988, 63-17328
Term of patent 14 years
U.S. Cl. D22—140



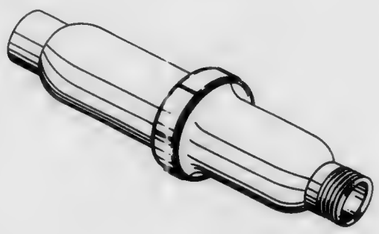
326,307
TOP PORTION OF FISHING REEL
Tomoharu Sakurai, Sakai, Japan, assignor to Shimano Inc., Osaka, Japan
Filed Oct. 21, 1988, Ser. No. 260,655
Claims priority, application Japan, Apr. 27, 1988, 63-17329
The portion of the term of this patent subsequent to May 19, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—140



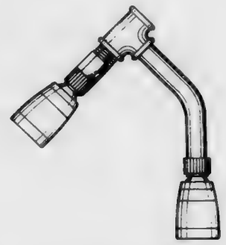
326,308
TOP PORTION OF FISHING REEL
Tomoharu Sakurai, Sakai, Japan, assignor to Shimano Inc., Osaka, Japan
Filed Oct. 20, 1988, Ser. No. 263,121
Claims priority, application Japan, Apr. 22, 1988, 63-16493
The portion of the term of this patent subsequent to May 19, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—140



326,309
CHEMICAL DISPENSER
Virgil P. Kendrick, 10822 E. Revels Rd., Howey-in-the-Hills, Fla. 32727
Filed Sep. 5, 1989, Ser. No. 402,245
Term of patent 14 years
U.S. Cl. D23—208



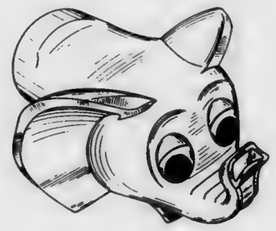
326,310
DUAL-HEADED SHOWER
Sharon D. Francoeur, 9 Prince St., Fairhaven, Mass. 02719
Filed Oct. 1, 1990, Ser. No. 591,012
Term of patent 14 years
U.S. Cl. D23—213



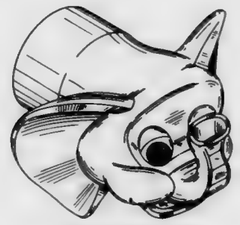
326,311
SPRAY HEAD FOR A SHOWER
Fabio Lenci, and Giovanna Talocci, both of Rome, Italy, assignors to Fornara & Maulini S.p.A., Gravellona Toce, Italy
Filed Dec. 13, 1990, Ser. No. 626,881
Claims priority, application Int'l Pat. Institute, Jun. 18, 1990, DM/016947
Term of patent 14 years
U.S. Cl. D23—223



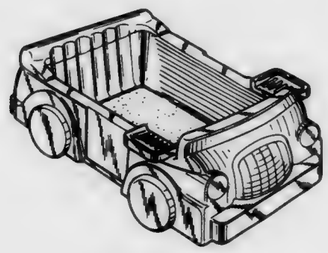
326,312
COMBINATION SPOUT COVER AND LIQUID SOAP DISPENSER
Gail B. Frankel, Dallas, Tex., assignor to Kel-Gar, Inc., Dallas, Tex.
Filed Sep. 8, 1989, Ser. No. 405,006
The portion of the term of this patent subsequent to May 19, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—256



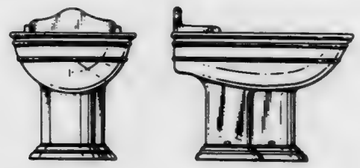
326,313
COMBINATION SPOUT COVER AND LIQUID SOAP DISPENSER
Gail B. Frankel, Dallas, Tex., assignor to Kel-Gar, Inc., Dallas, Tex.
Filed Oct. 26, 1990, Ser. No. 605,014
The portion of the term of this patent subsequent to May 19, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—256



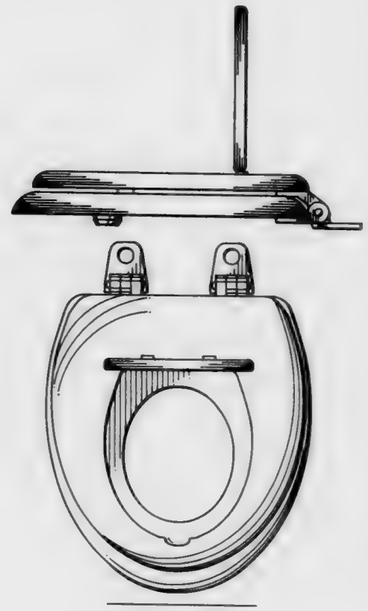
326,314
BATHTUB FOR INFANTS
Leighton S. Purrier, and Jennifer Leyton-Purrier, both of Heath Villa, 16 South Road, Norton, Stourbridge, West Midlands DY8 3XZ, England
Filed May 11, 1990, Ser. No. 521,934
Claims priority, application United Kingdom, Nov. 11, 1989, 2002412
Term of patent 14 years
U.S. Cl. D23—278



326,315
BIDET
Jonathan G. Waldren, London, England, assignor to B.C. Sanitan Limited, Berkshire, England
Filed Jan. 19, 1990, Ser. No. 467,224
Claims priority, application United Kingdom, Jul. 21, 1989, 1060988
Term of patent 14 years
U.S. Cl. D23—295



326,316
COMBINATION DUAL SIZE TOILET SEAT AND COVER
Xiao P. Zhang, 1027 Cottonwood St., Emporia, Kans. 66801
Filed Mar. 27, 1989, Ser. No. 328,601
Term of patent 14 years
U.S. Cl. D23—312



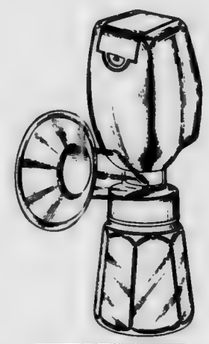
326,317
HOUSING FOR A HEATER
Michael C. Coup, Wichita; Glen W. Ediger, Newton; Donald J. Moore, Wichita; Gary P. Israel, Wichita, and Neill E. Bryan, Wichita, all of Kans., assignors to Vornado Air Circulation Systems, Inc., Wichita, Kans.
Filed Apr. 12, 1991, Ser. No. 684,655
Term of patent 14 years
U.S. Cl. D23—332



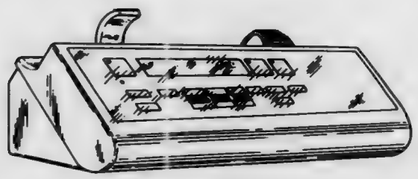
326,318
HEATER
Michael C. Coup, Wichita; Glen W. Ediger, Newton; Donald J. Moore, Wichita; Gary P. Israel, Wichita, and Neill E. Bryan, Wichita, all of Kans., assignors to Vornado Air Circulation Systems, Inc., Wichita, Kans.
Filed Apr. 12, 1991, Ser. No. 684,654
Term of patent 14 years
U.S. Cl. D23—335



326,319
BREAST PUMP
John M. Chambers, 49 Fox Wood Run, Middletown, N.J. 07748
Filed Feb. 8, 1990, Ser. No. 476,677
Term of patent 14 years
U.S. Cl. D24—109



326,320
MEDICAL SYRINGE PUMP FOR INFUSION
Paul Rutter, Warwick, England, assignor to Graseby Medical Limited, Cambridge, England
Filed May 5, 1989, Ser. No. 347,790
Claims priority, application United Kingdom, Nov. 24, 1988, 1055196
The portion of the term of this patent subsequent to May 12, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—111



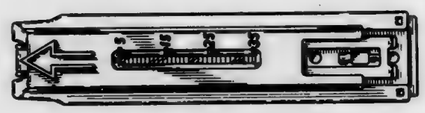
326,321
COMBINED FEEDING TUBE AND CATHETER ADAPTER
Patricia A. Schneider, Wauconda, Ill.; Kent E. Iverson, Columbus, Ohio; Ronald A. Coules, Barrington, Ill., and Robert D. Clegg, Pickerington, Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Sep. 7, 1989, Ser. No. 404,376
Term of patent 14 years
U.S. Cl. D24—112



326,322
HOOD FOR A FEEDING TUBE OR THE LIKE
Robert D. Clegg, Pickerington; Robert S. Osborne, Gahanna, both of Ohio, and Patricia A. Schneider, Wauconda, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Sep. 7, 1989, Ser. No. 404,377
Term of patent 14 years
U.S. Cl. D24—130



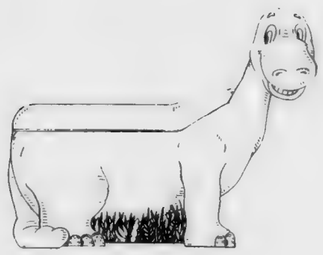
326,323
CARTRIDGE FOR A SKIN STAPLER
John V. Hunt, Milford, Ohio, and Michael A. Murray, Bellevue, Ky., assignors to Ethicon, Inc., Somerville, N.J.
Filed Sep. 28, 1989, Ser. No. 413,887
Term of patent 14 years
U.S. Cl. D24—145



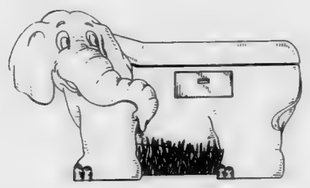
326,324
TONGUE CLEANER
Keiko Iida, 1-31-1 Asakusa, Taitoh-ku, Tokyo, Japan
Filed Jul. 26, 1989, Ser. No. 386,465
Term of patent 14 years
U.S. Cl. D24—147



326,325
EXAMINATION TABLE
Ann M. Kochsiek, 1624 Brooks Ave., Maplewood, Minn. 55109
Filed Feb. 20, 1990, Ser. No. 482,408
Term of patent 14 years
U.S. Cl. D24—183



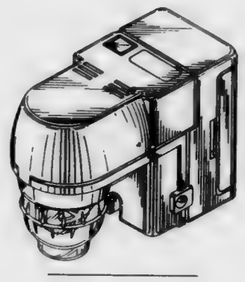
326,326
EXAMINATION TABLE
Ann M. Kochsiek, 1624 Brooks Ave., Maplewood, Minn. 55109
Filed Feb. 20, 1990, Ser. No. 482,672
Term of patent 14 years
U.S. Cl. D24—183



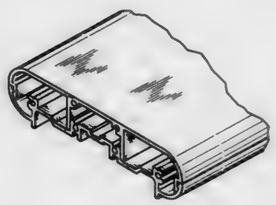
326,327
MASSAGER
Harold Sue, 45-923 Lilipuna Rd., Kaneohe, Hi. 96744
Filed Jun. 7, 1989, Ser. No. 362,597
Term of patent 14 years
U.S. Cl. D24—214



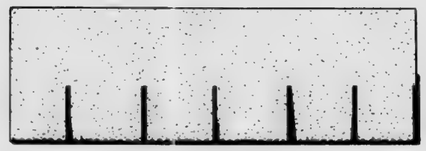
326,328
CONTACT LENS WASHER OR SIMILAR ARTICLE
Ching-Shih Chen, No. 18, Shuang-Hsi St., Sheh-Lin Dist., Taipei, Taiwan
Filed Aug. 18, 1989, Ser. No. 395,943
Term of patent 14 years
U.S. Cl. D24—218



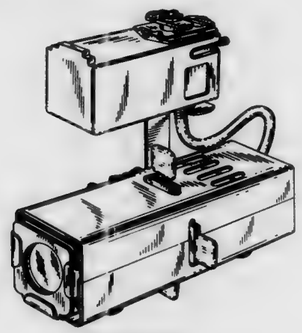
326,329
CHANNEL CAP EXTRUSION FOR GLASS BLOCK AND THE LIKE
George Ballstadt, 4850 Richmond Ave., Fremont, Calif. 94536
Filed Mar. 30, 1990, Ser. No. 502,497
Term of patent 14 years
U.S. Cl. D25—122



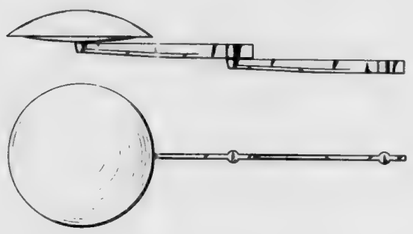
326,330
SHINGLE
John R. Klein, deceased, late of Malvern, Pa. by Helen Klein, executrix , assignor to CertainTeed Corporation, Valley Forge, Pa.
Filed Mar. 28, 1988, Ser. No. 174,021
Term of patent 14 years
U.S. Cl. D25—139



326,331
LIGHT FIXTURE
Robert Riccadelli, Industrial Park, Rte. 9W, Stony Point, N.Y. 10980
Filed Jan. 22, 1990, Ser. No. 468,787
Term of patent 14 years
U.S. Cl. D26—63



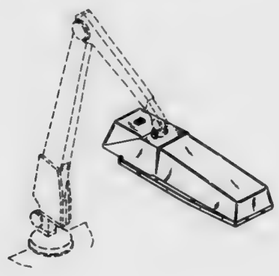
326,332
ADJUSTABLE LAMP
John J. Rizzi, Weston, and Anthony B. Rorke, Fairfield, both of Conn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 2, 1990, Ser. No. 473,842
The portion of the term of this patent subsequent to Mar. 10, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—25



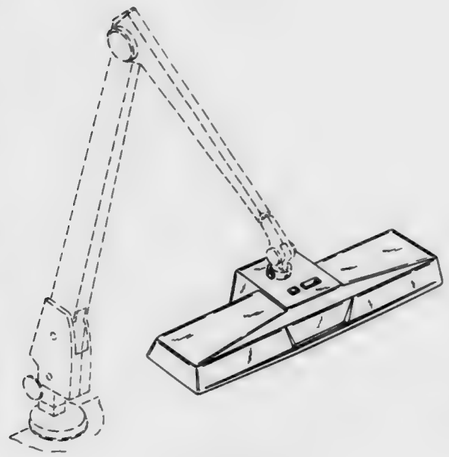
326,333
ADJUSTABLE LAMP
John J. Rizzi, Weston, and Anthony B. Rorke, Fairfield, both of Conn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 2, 1990, Ser. No. 473,844
The portion of the term of this patent subsequent to Mar. 10, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—65



326,334
LAMP HEAD FOR AN ADJUSTABLE TASK LIGHT
Carl X. Meyer, Grantwood Village; Louis O. Vitt, St. Louis; David P. Burchell, Valley Park, and James A. Schmid, St. Louis, all of Mo., assignors to Dazor Manufacturing Corporation, St. Louis, Mo.
Filed Oct. 12, 1990, Ser. No. 596,899
Term of patent 14 years
U.S. Cl. D26—65



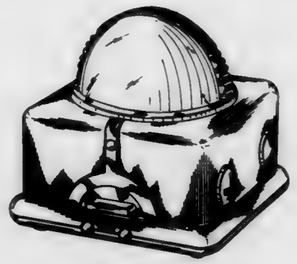
326,335
LAMP HEAD FOR AN ADJUSTABLE TASK LIGHT
Carl X. Meyer, Grantwood Village; Louis O. Vitt, St. Louis; David P. Burchell, Valley Park, and James A. Schmid, St. Louis, all of Mo., assignors to Dazor Manufacturing Corporation, St. Louis, Mo.
Filed Oct. 12, 1990, Ser. No. 596,903
Term of patent 14 years
U.S. Cl. D26—65



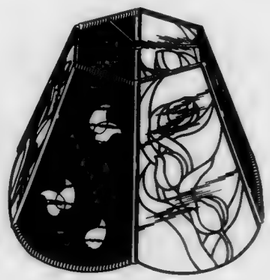
326,336
LAMP
Joseph T. Christ, Dyer, Ind., assignor to Craft Creations Co., Inc., Dyer, Ind.
Filed Mar. 15, 1990, Ser. No. 493,674
Term of patent 14 years
U.S. Cl. D26—94



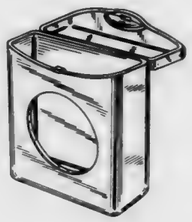
326,337
TOUCH RESPONSIVE NIGHT LIGHT OR SIMILAR ARTICLE
Haruo Miyazaki, Neyagawa; Shigehiro Uemura, Kyoto, and Kazuo Takada, Nara, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Dec. 8, 1989, Ser. No. 448,142
Claims priority, application Japan, Jun. 12, 1989, 1-21678
Term of patent 14 years
U.S. Cl. D26—104



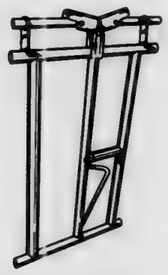
326,338
LAMP SHADE
Shizumi Tateyama, Iruma, Japan, assignor to Nihon Art Pascon Service Yugen Kaisha, Tokyo, Japan
Filed Jul. 25, 1990, Ser. No. 556,980
Term of patent 14 years
U.S. Cl. D26—129



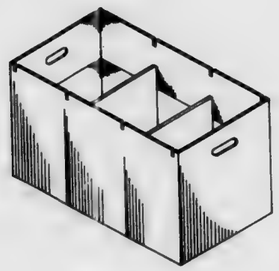
326,339
DENTAL FLOSS DISPENSER HOUSING
Adam Sherman, Brooklyn, and Thomas M. Dair, Valley Cottage, both of N.Y., assignors to Colgate-Palmolive Company, Piscataway, N.J.
Filed Jun. 19, 1989, Ser. No. 369,553
Term of patent 14 years
U.S. Cl. D28—64



326,340
CATTLE FEEDING STANCHION
John A. DaSilveira, 25251 E. Mariposa Rd., Escalon, Calif. 95320
Filed May 2, 1991, Ser. No. 694,854
Term of patent 14 years
U.S. Cl. D30—119



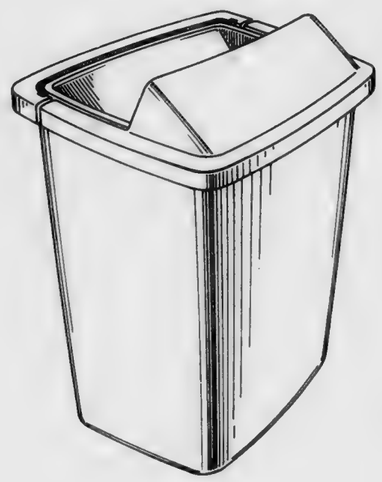
326,341
CARTON
Robert W. Frauhiger, 144 Harbra Ct., Lexington, S.C. 29072
Filed Oct. 15, 1990, Ser. No. 607,081
Term of patent 14 years
U.S. Cl. D34—1



326,342
REFUSE CONTAINER
André Doxey, Shaker Heights, and John L. Hradisky, Medina, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Dec. 28, 1990, Ser. No. 636,612
Term of patent 14 years
U.S. Cl. D34—7



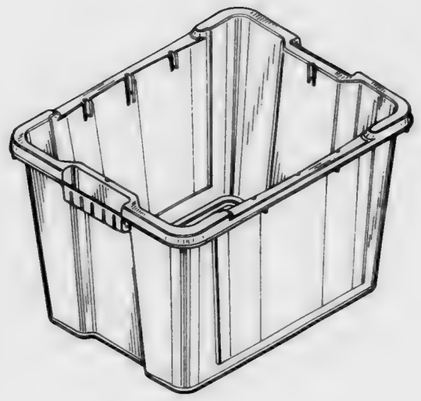
326,343
DROP TOP WASTEBASKET
John L. Hradisky, Medina, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 5, 1990, Ser. No. 461,444
Term of patent 14 years
U.S. Cl. D34—7



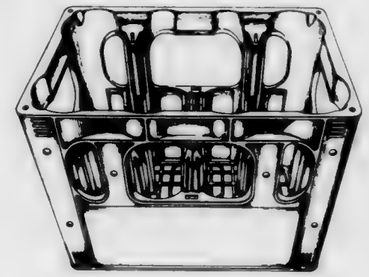
326,344
SECURITY WASTE DISPOSAL CABINET WITH PIVOTAL DOOR
Benjamin Fitermann; Rebecca L. Waterston, both of Golden Valley; Mark A. Feucht, Champlin, and Stanley R. Thorud, Plymouth, all of Minn., assignors to Liberty Diversified Industries, New Hope, Minn.
Filed Apr. 11, 1990, Ser. No. 507,727
Term of patent 14 years
U.S. Cl. D34—11



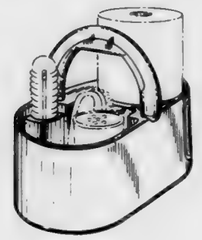
326,345
RECYCLING CONTAINER
Jonathan Mandell, and Howard Andrews, Jr., both of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Dec. 14, 1989, Ser. No. 450,387
Term of patent 14 years
U.S. Cl. D34—40



326,346
CRATE FOR BOTTLES
Kunio Osakada, Kawasaki, Japan, assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Oct. 15, 1990, Ser. No. 598,442
Term of patent 14 years
U.S. Cl. D34—40



326,347
HOLDER FOR DRY CLEANING ACCESSORIES
Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Continuation-in-part of Ser. No. 447,258, Dec. 7, 1989, abandoned. This application Mar. 26, 1990, Ser. No. 499,081
Term of patent 14 years
U.S. Cl. D34—45



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF MAY, 1992

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See—*
Haavik, Harold; Peroaho, Tapio; Vesala, Reijo; and Vikman, Vesa, 5,114,310, Cl. 415-169.100.

A. H. Robins Company Incorporated: *See—*
Taylor, Chandler R., Jr.; Stauffer, Harold F., Jr.; and Tomczuk, Bruce E., 5,114,944, Cl. 514-258.000.

A-LOK Products, Inc.: *See—*
Ditcher, Jack, 5,114,162, Cl. 277-207.00A.

A. Nattermann & Cie. GmbH: *See—*
Biedermann, Jurgen; Evers, Michel; Terlinden, Rolf; Leyck, Sigurd; and Graf, Erich, 5,114,954, Cl. 514-338.000.
Gajdos, Benedikt; and Mentzen, Heinz J., 5,114,928, Cl. 514-25.000.

AB Akerlund & Rausing: *See—*
Piltz, Lars-Erik; and Stenberg, Stina, 5,114,507, Cl. 156-69.000.

Abatjoglou, Anthony G.; and Bryant, David R., to Union Carbide Chemicals and Plastics Technology Corporation. Transition metal recovery. 5,114,473, Cl. 75-722.000.

Abbott, Roy W.: *See—*
Wachs, Fred B., III; and Abbott, Roy W., 5,113,668, Cl. 62-305.000.

Abe, Makoto: *See—*
Kusano, Akihisa; Kimizuka, Junichi; Ito, Toshiyuki; Sato, Kaoru; Abe, Makoto; Okazawa, Kazuhiko; and Inuyama, Toshihiko, 5,115,147, Cl. 307-311.000.

Abe, Minoru: *See—*
Kajitani, Koji; Abe, Minoru; and Fujiwara, Shinpei, 5,113,991, Cl. 192-98.000.

Abe, Naoto: *See—*
Suda, Shigeyuki; and Abe, Naoto, 5,114,235, Cl. 356-401.000.

Abendroth, Paul; Herzel, Joachim; Hummel, Peter; Ortner, Robert; Steuer, Joachim; Stoffler, Achim; and Despot, Janko, to MAN Roland Druckmaschinen AG. Ink metering apparatus with pivotally engageable ink duct. 5,113,762, Cl. 101-350.000.

Able, Edward C.; and Gibler, Martin J., to United States of America, Air Force. High temperature combustor liner. 5,113,660, Cl. 60-752.000.

Able, Stephen D.: *See—*
White, Lawrence W.; Pietrykowski, Gabriel J.; and Able, Stephen D., 5,113,898, Cl. 137-454.500.

Abramo, Guy P.; and Trewella, Jeffrey C., to Mobil Oil Corporation. Polyalkylene succinimide deposit control additives and fuel compositions containing same. 5,114,435, Cl. 44-348.000.

Abramson, Richard J., to Martin Yale Industries, Inc. Paper sheet folding device. 5,114,395, Cl. 493-421.000.

Abtox, Inc.: *See—*
Campbell, Bryant A.; and Moulton, Kern A., 5,115,166, Cl. 315-111.210.

AbuJudom, David N., II; Thoma, Paul E.; Kao, Ming-Yuan; and Angst, David R., to Johnson Service Company. High transformation temperature shape memory alloy. 5,114,504, Cl. 148-402.000.

AC&R Components Components, Inc.: *See—*
Westermeyer, Gary W., 5,113,671, Cl. 62-468.000.

Ackeret, Peter, to Licinvest AG. Storage container for a pile of sheets. 5,113,613, Cl. 40-513.000.

AcroMed Corporation: *See—*
Asher, Marc A.; Strippgen, Walter E.; Heinig, Charles F.; and Carson, William L., 5,113,685, Cl. 72-458.000.

Acushnet Company: *See—*
Corbett, Daniel P., 5,114,790, Cl. 428-408.000.

Adachi, Hiroyuki: *See—*
Maruta, Hidekazu; Adachi, Hiroyuki; Yamamoto, Akira; Kimura, Shigeo; and Kusaka, Kensaku, 5,115,278, Cl. 355-285.000.

Adachi, Nobukazu; and Yoshimoto, Toshio, to Canon Kabushiki Kaisha. Heating apparatus and heater. 5,115,119, Cl. 219-469.000.

Adachi, Toshiro: *See—*
Ohashi, Hidetsugu; Kinugasa, Masayuki; Adachi, Toshiro; Nonomura, Akihiro; and Sekimoto, Waro, 5,114,799, Cl. 428-659.000.

Adams, Daniel E.: *See—*
Leatherman, Dennis D.; McGinley, James J.; Adams, Daniel E.; and Brons, George A., 5,114,438, Cl. 51-296.000.

Adams, Erik: *See—*
O'Leary, John; and Adams, Erik, 5,114,746, Cl. 427-118.000.

Adams, Martin C.: *See—*
Lockyer, Terence D.; and Adams, Martin C., 5,115,449, Cl. 375-3.000.

Addario, John J.: *See—*
Carey, James; Addario, John J.; and Juarez, Roberto, 5,113,765, Cl. 102-336.000.

Adkins, Stephen R.: *See—*
Kimmel, David J.; Siwinski, Paul P.; Smith, Robert A.; Thurman, Richard E.; Adkins, Stephen R.; Feldman, Steven; and Look, Raymond J., 5,114,355, Cl. 439-101.000.

Advanced Cardiovascular Systems, Inc.: *See—*
Kasprzyk, Daniel J.; Orth, Jean C.; Gaiser, John W.; and Houser, Russell A., 5,114,423, Cl. 606-27.000.

Advanced Combustion Technology, Inc.: *See—*
Kraus, Greg A.; Simmons, William R.; and Wells, Mark R. J., 5,113,804, Cl. 123-1.00A.

Advanced Concrete Technology, Inc.: *See—*
Smetana, David A.; and Williams, R. Steve, 5,114,617, Cl. 252-378.00P.

Advanced Cooling Technology, Inc.: *See—*
Wachs, Fred B., III; and Abbott, Roy W., 5,113,668, Cl. 62-305.000.

Advanced Hydrolyzing Systems, Inc.: *See—*
Anderson, Paul S.; Law, Roger W.; Law, Ronald R.; and Lum, Kenneth, 5,113,755, Cl. 99-483.000.

Advanced Micro Devices, Inc.: *See—*
Arcuri, Salvatore, 5,115,450, Cl. 375-7.000.

Advanced Products Inc.: *See—*
Frentzel, Richard L.; and Oakdale, Warren R., 5,114,796, Cl. 428-521.000.

Advantage Engineering, Inc.: *See—*
Oswalt, Philip D.; and Wolfe, Ronald A., 5,113,931, Cl. 165-78.000.

Advantec Corp.: *See—*
Hirsh, Robert, 5,113,911, Cl. 137-844.000.

Aerospatiale Societe Nationale Industrielle: *See—*
Vaillant de Guelis, Hubert; and Joly, Jean-Louis, 5,115,158, Cl. 310-15.000.

Ag-Chem Equipment Co., Inc.: *See—*
Takata, Harry H., 5,114,078, Cl. 239-655.000.

AG Processing Technologies, Inc.: *See—*
Gat, Arnon; and Mordo, David, 5,114,242, Cl. 374-128.000.

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Roederer, Antoine, 5,115,248, Cl. 342-373.000.
Schoeyer, Herman F. R.; Borso, Guido; and Gibilisco, Salvatore, 5,113,763, Cl. 102-202.000.

Agrawal, Rakesh; and Woodward, Donald W., to Air Products and Chemicals, Inc. Enhanced recovery of argon from cryogenic air separation cycles. 5,114,449, Cl. 62-22.000.

Ahmad, Suhail; Cole, James J.; and Jensen, William, to University of Washington, The Board of Regents of the. Combined hemofiltration and hemodialysis system. 5,114,580, Cl. 210-646.000.

Ahmed, Bashir M.; Gunagan, Barry P.; and Hall, Wilbur S., to Henkel Corporation. Application of an organic coating to small metal articles. 5,114,751, Cl. 427-242.000.

Air Comm Corporation: *See—*
Steiner, Norman F., 5,114,382, Cl. 454-76.000.

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Agrawal, Rakesh; and Woodward, Donald W., 5,114,449, Cl. 62-22.000.
Quay, Jeffrey R.; Bassner, Sherri L.; and Santosusso, Thomas M., 5,115,071, Cl. 528-59.000.

Aircast Incorporated: *See—*
Johnson, Glenn W., Jr.; and McVicker, Henry J., 5,113,877, Cl. 128-882.000.

Aisin AW Co., Ltd.: *See—*
Ishihara, Yoshimi; and Otsubo, Kazutaka, 5,113,594, Cl. 33-722.000.
Nimura, Mitsuhiro; Yokoyama, Shoji; Yamada, Takashi; Sumiya, Koji; and Moroto, Shuzo, 5,115,399, Cl. 364-449.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Ikeda, Nobuyuki; Nagata, Kazuhisa; and Oba, Chikashi, 5,114,208, Cl. 296-216.000.
Mori, Keiji; and Kogita, Hidekazu, 5,115,353, Cl. 359-871.000.

Aizaki, Akane, to NEC Corporation. Different power source interface circuit. 5,115,434, Cl. 307-475.000.

Ajiro, Fukaya: *See—*
Tsuda, Nobuyuki; Tamatani, Masaaki; Ajiro, Fukaya; and Hitosi, Nagai, 5,115,306, Cl. 358-60.000.

Akagiri, Kenzo: *See—*
Fujiwara, Yoshihito; Umezawa, Tomoko; Nishiguchi, Masayuki; Akune, Makoto; Iwahashi, Naoto; and Akagiri, Kenzo, 5,115,240, Cl. 341-51.000.

Akashi, Shunji; Ito, Michio; and Kuse, Kazuki, to Yoshida Kogyo K. K. Apparatus for storing slide fastener sliders. 5,114,305, Cl. 414-787.000.

Akasu, Masahira: *See—*
Takahashi, Akira; Kanno, Yoshiaki; Sumitani, Jiro; Nakamoto, Katsuya; Sasaki, Takeo; and Akasu, Masahira, 5,115,397, Cl. 364-431.050.

Akatsu, Yohsuke: *See—*
Fukunaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, 5,114,177, Cl. 280-707.000.

Akimoto, Etsuji: *See—*
Tanaka, Tokuji; Akimoto, Etsuji; and Ohta, Seiichi, 5,114,828, Cl. 430-272.000.

Akimoto, Takashi: *See*—
Nakagawa, Toshiyuki; Takahashi, Nobuyuki; and Akimoto, Takashi, 5,113,929, Cl. 165-61.000.

Akimoto, Takemi: *See*—
Ikarashi, Masami; Mitsumori, Kenichi; Kano, Mitsuru; Miki, Yasuhiro; Akimoto, Takemi; Yamaguchi, Masahiko; Sasaki, Yorihiko; Kamigaki, Tomoo; Nakanowatari, Jun; Kato, Yoshinori; and Seki, Hitoshi, 5,115,329, Cl. 359-50.000.

Akita, Shuichi: *See*—
Watanabe, Hiroyuki; Noguchi, Kohkichi; Akita, Shuichi; and Kohtaki, Kumiko, 5,115,006, Cl. 524-251.000.

Akita, Teruo: *See*—
Nakagawa, Yukio; Koizumi, Syoji; Miyake, Masao; Akita, Teruo; and Uno, Tomohisa, 5,114,788, Cl. 428-284.000.

Akiyama, Hiroo; and Tamada, Kazuhiro, to Yamaha Corporation. Disc playback device capable of continuously playing back a plurality of discs. 5,115,419, Cl. 369-37.000.

Akkapeddi, Murali K.; VanBuskirk, Bruce; and Kraft, Timothy J., to Allied-Signal Inc. High-impact, styrenic polymer/thermoplastic polymer grafted blends. 5,115,018, Cl. 525-64.000.

AKP-Tekno Oy: *See*—
Nurmi, Pekka; and Salo, Heikki, 5,114,189, Cl. 285-7.000.

Aksela, Reijo: *See*—
Suokas, Elias; and Aksela, Reijo, 5,114,701, Cl. 423-588.000.

A.B. Chance Company: *See*—
Seider, Gary L.; and Hamilton, Daniel V., 5,113,626, Cl. 52-157.000.

Akune, Makoto: *See*—
Fujiwara, Yoshihito; Umezawa, Tomoko; Nishiguchi, Masayuki; Akune, Makoto; Iwahashi, Naoto; and Akagiri, Kenzo, 5,115,240, Cl. 341-51.000.

Akutsu, Hidetoshi; Kohno, Toru; and Otsuki, Masato, to Mitsubishi Materials Corporation. Cu-base sintered alloy. 5,114,468, Cl. 75-234.000.

Akzo N.V.: *See*—
Schuerhoff, Hans-Juergen; Gerritse, Arie; and Mets, Lambertus C., 5,114,653, Cl. 264-228.000.
Van de Ven, Henricus J. M.; and de Haan, Erik, 5,114,784, Cl. 428-246.000.

Albers, Stephen J.: *See*—
Grimshaw, Michael N.; Albers, Stephen J.; and Rust, Ralph J., 5,114,519, Cl. 156-235.000.

Albert, Winfried: *See*—
Jungfer, Herbert; Barchet, Heinrich; and Albert, Winfried, 5,114,847, Cl. 435-41.000.

Alborante, Giancarlo, to Comau S.p.A. Apparatus for welding motor-vehicle bodies. 5,115,115, Cl. 219-121.630.

Alcan International Limited: *See*—
O'Callaghan, Wilfrid B., 5,114,802, Cl. 429-13.000.
Paquin, Ronald J., 5,113,735, Cl. 83-508.300.

Alcatel STK A/S: *See*—
Presttun, Kare, 5,115,466, Cl. 380-9.000.

Alcon International Limited: *See*—
Jain, Mukesh K.; Nadkarni, Sadashiv K.; and Gesing, Adam, 5,114,695, Cl. 423-411.000.

Alcorn, Thomas R.; Tabereaux, Alton T.; and Trembley, Luke R., to Reynolds Metals Company. Electrolyte chemistry for improved performance in modern industrial alumina reduction cells. 5,114,545, Cl. 204-67.000.

Alexander, Roy P.: *See*—
Levesque, Kenneth J.; and Alexander, Roy P., 5,114,647, Cl. 264-115.000.

Alexandru, Lupu: *See*—
Georges, Michael K.; and Alexandru, Lupu, 5,114,820, Cl. 430-109.000.

Alfred Teves GmbH: *See*—
Reinartz, Hans-Dieter; Steffes, Helmut; Rausch, Juergen; and Risch, Stefan, 5,115,186, Cl. 324-207.220.
Weiler, Rolf; Schiel, Wolfgang; and Bretzler, Rainer, 5,113,978, Cl. 188-73.310.

Alladin Steel Products: *See*—
Henry, Daniel S.; and Hoteling, G. Michael, 5,113,843, Cl. 126-77.000.

Allegheny Ludlum Corporation: *See*—
Ames, S. Leslie; and Breznak, Jeffrey M., 5,114,501, Cl. 148-117.000.

Allegheny-Singer Research Institute: *See*—
Christlieb, Ignacio Y., 5,113,858, Cl. 128-419.00P.

Allen, David F.: *See*—
Gawin, Frank H.; Humblestone, Brian G.; and Allen, David F., 5,114,942, Cl. 514-255.000.

Allen, Stephen, to Palmer, David, a part interest. Stabilizing device for a gun. 5,113,745, Cl. 89-14.050.

Allen, Thomas E., to Halliburton Company. Mixing apparatus and method. 5,114,239, Cl. 366-6.000.

Alleon, Alain G. J. M. Lighted cigarette dispensing apparatus. 5,113,879, Cl. 131-329.000.

Alliance Pharmaceutical Corp. *See*—
Wolf, Gerald L.; and Long, David M., 5,114,703, Cl. 424-5.000.

Alliance Rubber Company, Inc.: *See*—
Spencer, Richard R., 5,113,757, Cl. 101-35.000.

Alliant Techsystems, Inc.: *See*—
Harris, James C., 5,114,094, Cl. 244-3.220.

Allied Gator, Inc.: *See*—
Ramun, John, 5,114,301, Cl. 414-742.000.

Allied-Signal Inc.: *See*—
Akkapeddi, Murali K.; VanBuskirk, Bruce; and Kraft, Timothy J., 5,115,018, Cl. 525-64.000.
Asplund, Mark D., 5,115,201, Cl. 329-356.000.
Ball, Larry K., 5,113,910, Cl. 137-630.150.
Kobayashi, Robert J., 5,113,658, Cl. 60-608.000.
Zupancic, Joseph J.; Blazej, Daniel C.; and Fraenkel, Howard A., 5,114,741, Cl. 427-43.100.

Allied Tube & Conduit Corporation: *See*—
Maitra, Kalyan K.; and Patel, Vijay B., 5,113,557, Cl. 29-33.00D.

Alonzo, Rudy, to California Aqua Paddle, Inc. Water paddle and flotation device for use by swimmers. 5,114,371, Cl. 441-129.000.

Alpine Plant Foods limited: *See*—
Nguyen, Kim D.; and Spink, Donald R., 5,114,460, Cl. 71-34.000.

Alps Electric Co., Ltd.: *See*—
Igarashi, Sadao; and Ushida, Susumu, 5,115,317, Cl. 358-191.100.
Ikarashi, Masami; Mitsumori, Kenichi; Kano, Mitsuru; Miki, Yasuhiro; Akimoto, Takemi; Yamaguchi, Masahiko; Sasaki, Yorihiko; Kamigaki, Tomoo; Nakanowatari, Jun; Kato, Yoshinori; and Seki, Hitoshi, 5,115,329, Cl. 359-50.000.
Yorozu, Hideki; and Takeuchi, Akihiro, 5,115,253, Cl. 346-76.0PH.

Alteon Inc.: *See*—
Ulrich, Peter C.; and Cerami, Anthony, 5,114,943, Cl. 514-256.000.

Alternative Resources Corporation: *See*—
Parent, Richard, 5,113,546, Cl. 15-315.000.

Aluminum Company of America: *See*—
Eckert, C. Edward; Hornack, Thomas R.; Lyness, George E.; Kaems, John A.; Cox, Clarence J.; Miller, Ronald E.; Apelian, Diran; and Mutharasan, Rajakkannu, 5,114,472, Cl. 75-412.000.
Pilling, Douglas A.; and Korzeniowski, George, 5,114,516, Cl. 156-180.000.
Tsai, Mei-Yuan; and Paola, Vincent A., 5,114,798, Cl. 428-611.000.

AM International Incorporated: *See*—
Bryson, Robert A., 5,113,639, Cl. 53-466.000.

Amada Company, Limited: *See*—
Yoneda, Akiyoshi; Sawamura, Mitsuyoshi; Tanaka, Kikuo; and Kokado, Takashi, 5,115,403, Cl. 364-474.150.

Amador, Gonzalo; Burrows, Randy O.; and Epp, George C., to Texas Instruments Incorporated. Voice coil programmable wire tensioner. 5,114,066, Cl. 228-4.500.

Amamiya, Shoji: *See*—
Sakoh, Harumi; Sakai, Kiyoshi; and Amamiya, Shoji, 5,114,814, Cl. 430-46.000.

Amano, Fumio: *See*—
Taniguchi, Tomohiko; Iseda, Kohei; Okazaki, Koji; Amano, Fumio; Unagami, Shigeyuki; Tanaka, Yoshinori; and Ohta, Yasuji, 5,115,469, Cl. 381-36.000.

Amano, Hironobu: *See*—
Matsuura, Makoto; Amano, Hironobu; and Ohta, Kunio, 5,113,680, Cl. 72-53.000.

Amano Pharmaceutical Co., Ltd.: *See*—
Makino, Yasutaka; Negoro, Seiji; Urabe, Itaru; and Okada, Hirosuke, 5,114,853, Cl. 435-190.000.

Amarasekera, Jayantha: *See*—
Pinnavaia, Thomas J.; Amarasekera, Jayantha; and Polansky, Christine A., 5,114,691, Cl. 423-244.000.
Pinnavaia, Thomas J.; Amarasekera, Jayantha; and Polansky, Christine A., 5,114,898, Cl. 502-406.000.

Amerace Corporation: *See*—
Luzzi, Glenn, 5,114,357, Cl. 439-183.000.

American Colloid Company: *See*—
Hughes, John, 5,114,893, Cl. 501-149.000.

American Cyanamid Company: *See*—
Becker, Douglas C., 5,114,720, Cl. 424-478.000.
Lawter, James R.; and Pawelchak, John M., 5,114,946, Cl. 514-279.000.

American Health Foundation: *See*—
Chung, Fung-Lung; Hecht, Stephen S.; Eklind, Karin; and Morse, Mark A., 5,114,969, Cl. 514-514.000.

American Polarizers, Inc.: *See*—
Bentley, William H., 5,115,341, Cl. 359-493.000.

American Standard Inc.: *See*—
Lilja, Philip C.; Ehrlich, Paul W.; and Martin, Allenn E., 5,114,070, Cl. 236-49.300.

American Tech Manufacturing Corporation: *See*—
Linker, Frank V., Jr., 5,113,916, Cl. 140-147.000.

American Tourister, Inc.: *See*—
Pulichino, John; and Tong, Joy, 5,113,982, Cl. 190-18.00A.

Ames, Gregory H.: *See*—
Morency, Roger L.; and Ames, Gregory H., 5,115,483, Cl. 385-60.000.

Ames, S. Leslie; and Breznak, Jeffrey M., to Allegheny Ludlum Corporation. Method employing skin-pass rolling to enhance the quality of phosphorous-striped silicon steel. 5,114,501, Cl. 148-117.000.

Amiot, Jacques H. J.; Bouleau, Jean-Paul A. A.; and Molveaux, Gerard R. M., to Moulinex (Societe Anonyme). Steam iron provided with an intermediate vaporization chamber to prevent expulsion of unvaporized water through the steam outlet orifices. 5,115,117, Cl. 219-254.000.

Ammon, Ernst; and Langsch, Robert, to WIFAG. Process and device for manufacture of adhesive rolls for roller reversing mechanisms of web-processing machines, particularly web-fed printing presses. 5,114,523, Cl. 156-294.000.

Amoco Corporation: *See*—
Chaplin, Mitchell E.; Eaton, Geraldine M.; Hickie, Brian A.; Pascavage, Peter W.; and Tyson, Jessie, 5,114,787, Cl. 428-284.000.

Dean, Barry D., 5,115,046, Cl. 525-425.000.
Goyal, Shri K., 5,114,564, Cl. 208-131.000.
Kennedy, Steven; Eggerding, David W.; and Moore, Lionel D., 5,114,603, Cl. 252-56.00R.
Petrille, Dennis G.; and Golinkin, Herbert S., 5,114,602, Cl. 252-51.50R.
Tidwell, Steve C., 5,115,340, Cl. 359-484.000.

AMP Incorporated: *See*—
Kimmel, David J.; Siwinski, Paul P.; Smith, Robert A.; Thurman, Richard E.; Adkins, Stephen R.; Feldman, Steven; and Look, Raymond J., 5,114,355, Cl. 439-101.000.
Nielsen, Peter G., 5,114,330, Cl. 425-193.000.
Olsson, Billy E., 5,114,362, Cl. 439-460.000.

Amphenol Corporation: *See*—
Gallusser, David O.; and LeBaron, James B., 5,115,105, Cl. 174-36.000.

Amrein, Bruce E.; McCoy, Curtis L.; Brucksch, Robert C.; and Melnik, George, to United States of America, Army. Flotation device for a combat vehicle. 5,113,779, Cl. 114-270.000.

Ams, Felix; and Schafer, Roland, to Richard Wolf GmbH. Means for checking endoscope equipment. 5,115,126, Cl. 250-227.110.

Analog Devices, Inc.: *See*—
Brown, James E. C., 5,115,202, Cl. 330-9.000.

Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., to Bayer Aktiengesellschaft; and Miles Inc. Flubenzimine containing agents for combating pests. 5,114,965, Cl. 514-469.000.

Anderson, Paul B.: *See*—
Sunderhaus, Charles A.; and Anderson, Paul B., 5,114,271, Cl. 405-52.000.

Anderson, Paul S.; Law, Roger W.; Law, Ronald R.; and Lum, Kenneth, to Advanced Hydrolyzing Systems, Inc. Apparatuses for producing a proteinaceous product by digestion of raw animal parts. 5,113,755, Cl. 99-483.000.

Anderson, Ray C. Offshore platform pollution containment device. 5,114,273, Cl. 405-68.000.

Anderson, Robert E.: *See*—
Sablik, Martin J.; Nicholls, Colin I.; and Anderson, Robert E., 5,114,914, Cl. 505-1.000.

Anderson, William B., to Rexnord Corporation. Splice apparatus including splice plates with compound curvature. 5,114,001, Cl. 198-844.200.

Andersson-Engels, Stefan; Johansson, Jonas; Stenram, Unne; Svanberg, Katarina; and Svanberg, Sune, to Spectraphos AB. Diagnosis by means of fluorescent light emission from tissue. 5,115,137, Cl. 250-461.200.

Andreson, Paul D.: *See*—
Blunier, Dennis L.; Shankwitz, Phillip J.; Caudill, Maurice L.; Andreson, Paul D.; Kazmierzak, Richard R.; and Schweisberger, Joel C., 5,113,677, Cl. 72-7.000.

Andrews, Kim N. Music stand. 5,114,111, Cl. 248-460.000.

ANELVA Corporation: *See*—
Nakagawa, Toshiyuki; Takahashi, Nobuyuki; and Akimoto, Takashi, 5,113,929, Cl. 165-61.000.

Angst, David R.: *See*—
AbuJudom, David N., II; Thoma, Paul E.; Kao, Ming-Yuan; and Angst, David R., 5,114,504, Cl. 148-402.000.

Anthony's Manufacturing Company, Inc.: *See*—
Richardson, Richard J.; and Downing, Bennie R., 5,113,628, Cl. 52-171.000.

Anzai, Makoto, to Nissan Motor Co., Ltd. Intake air control system for internal combustion engine. 5,113,826, Cl. 123-403.000.

Aoi Studio Co., Ltd.: *See*—
Miyamoto, Takashi; Miyagawa, Kazuya; Tomimatsu, Yukihito; Sugiura, Tsutomu; Nishi, Kenji; and Ichihara, Taku, 5,114,224, Cl. 353-122.000.

Aoki, Nobuyuki; Ochiai, Keiichi; and Komoda, Hideaki, to Matsushita Electric Industrial Co., Ltd. Magnetic recording medium having a magnetic layer comprising hexagonal barium ferrite magnetic particles containing tin and magnesium in specified proportions. 5,114,801, Cl. 428-694.000.

Aoki, Tetsushi, to Konica Corporation. Flash light control circuit. 5,115,169, Cl. 315-241.00R.

Aono, Masao: *See*—
Osada, Tokihiro; and Aono, Masao, 5,114,133, Cl. 271-22.000.

Apelian, Diran: *See*—
Eckert, C. Edward; Hornack, Thomas R.; Lyness, George E.; Kaems, John A.; Cox, Clarence J.; Miller, Ronald E.; Apelian, Diran; and Mutharasan, Rajakkannu, 5,114,472, Cl. 75-412.000.

Apex Chemical Corp.: *See*—
Louis, Henry, 5,114,786, Cl. 428-270.000.

Aphex Systems, Ltd.: *See*—
Liden, Gary, 5,115,471, Cl. 381-106.000.

Appeldorn, Roger H.: *See*—
Wilson, Shari J.; Appeldorn, Roger H.; and Hamlin, Robert N., 5,113,555, Cl. 24-576.000.

Appleford, David E.; Millum, Colin G.; Scott, Duncan M.; and Rimmer, Michael J., to Scottish Development Agency. Connector for fluid carrying conduits. 5,114,117, Cl. 251-149.900.

Appleton Papers Inc.: *See*—
Dalebroux, Dean G., 5,114,903, Cl. 503-209.000.

Aqua Dynamics Group Corp.: *See*—
Holcomb, Robert R.; Arnold, Edward R.; and Garrison, Alexander J., 5,113,751, Cl. 99-286.000.

Aquatechnology Resource Management Inc.: *See*—
Green, William, 5,114,588, Cl. 210-634.000.

Arachnid, Inc.: *See*—
Tillery, Michael L.; Harlan, Eugene G.; Martin, John R.; Zammuto, Samuel N.; and Bonilla, Marcio, 5,114,155, Cl. 273-371.000.

Arai, Fumihito; and Mori, Yoshihiko, to Fuji Photo Film Co., Ltd. Automatic exposure control apparatus and method for electronic still camera. 5,115,319, Cl. 358-228.000.

Arai, Hiroyuki: *See*—
Hamanaka, Izumi; Maekawa, Yoshikazu; Arai, Hiroyuki; Nishiki, Akihiko; Muramatsu, Takeshi; Yokoyama, Toshio; and Yukizane, Shigemi, 5,114,130, Cl. 270-53.000.

Arai, Kazuya: *See*—
Ogawa, Kikuo; and Arai, Kazuya, 5,115,108, Cl. 200-1.00B.

Araki, Masakatsu: *See*—
Tamai, Seishin; Doi, Yoshinori; and Araki, Masakatsu, 5,113,957, Cl. 172-10.000.

Aramaki, Takashi, to Nissan Motor Company, Limited. Self-diagnosing fuel-purging system used for fuel processing system. 5,113,834, Cl. 123-520.000.

Arato, Laszlo F.; and Schell, Ferenc. Device for taking up, transporting, positioning and assembling a flexible, plane workpiece. 5,114,132, Cl. 271-18.300.

Arco Chemical Technology, L.P.: *See*—
Grey, Roger A., 5,115,060, Cl. 526-262.000.

Arcuri, Salvatore, to Advanced Micro Devices, Inc. High speed digital to analog to digital communication system. 5,115,450, Cl. 375-7.000.

Ardon, Menachem T., to AT&T Bell Laboratories. Switching system reliability. 5,115,425, Cl. 370-54.000.

Arend, Gunter: *See*—
Meckel, Walter; Hansel, Eduard; Arend, Gunter; and Konig, Klaus, 5,115,073, Cl. 528-83.000.

Argon, Ali S.: *See*—
Gebizlioglu, Osman S.; Cohen, Robert E.; Argon, Ali S.; Beckham, Haskell W.; and Qin, Jian, 5,115,028, Cl. 525-232.000.

Arizona Board of Regents on behalf of University of Arizona: *See*—
McDaniel, Robert G., 5,113,617, Cl. 47-58.000.

Armentrout, Richard W.: *See*—
Inoue, Kaname; Yamazaki, Motohide; and Armentrout, Richard W., 5,114,846, Cl. 435-34.000.

Armstrong, Charles J., deceased: *See*—
Kornecki, Julian; and Armstrong, Charles J., deceased, 5,114,213, Cl. 299-81.000.

Armstrong, Michael J.: *See*—
Harris, William H., Jr; Nussbaum, William E.; Armstrong, Michael J.; Deming, Victor H.; and Brink, John E., 5,114,128, Cl. 270-11.000.

Arnold, Edward R.: *See*—
Holcomb, Robert R.; Arnold, Edward R.; and Garrison, Alexander J., 5,113,751, Cl. 99-286.000.

Arnout, Michel; Lasnier, Didier; and Soula, Richard, to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation Des Procedes Georges Claude. Cutting head with oxygen jet. 5,114,121, Cl. 266-48.000.

Arntzen, Lawrence O.: *See*—
Pitzen, Gerald; Garfield, Douglas; Beltz, Warren G.; Arntzen, Lawrence O.; and Bina, Joseph C., 5,114,391, Cl. 482-62.000.

Aro Corporation, The: *See*—
White, Lawrence W.; Pietrykowski, Gabriel J.; and Able, Stephen D., 5,113,898, Cl. 137-454.500.

Arriflex Corporation: *See*—
Loth, Stanislaw; and Bahnemann, Volker W., 5,115,384, Cl. 362-301.000.

Arrowsmith, John E.; Cross, Peter E.; and Thomas, Geoffrey N., to Pfizer Inc. Isoquinolinylsulfonamides as anti-arrhythmic agents. 5,114,952, Cl. 514-309.000.

Arthur, Mark T.; and Miner, Frank H., Jr., to Ucar Carbon Technology Corporation. Cooling system for furnace roof having a removable delta. 5,115,184, Cl. 373-74.000.

Artz, Karl M. H., to Neundorfer, Inc. Rapper control system for electrostatic precipitator. 5,114,442, Cl. 55-112.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Kami, Yoshinori; and Fukumori, Kunihiko, 5,114,180, Cl. 280-743.000.
Shiraki, Toshinori; and Hattori, Yasuo, 5,115,035, Cl. 525-314.000.

Asahi Kasei Textile Ltd.: *See*—
Nakagawa, Yukio; Koizumi, Syoji; Miyake, Masao; Akita, Teruo; and Uno, Tomohisa, 5,114,788, Cl. 428-284.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Noda, Nobuhiro; Furuya, Katsuhiko; Takahashi, Tadashi; and Nakasima, Masaaki, 5,115,261, Cl. 354-62.000.
Ogawa, Kimiaki, 5,114,225, Cl. 354-481.000.
Tanaka, Hitoshi, 5,115,350, Cl. 359-823.000.

Asahi, Nobumitsu; and Kawase, Seiji, to Kabushiki Kaisha Kenwood. SSB digital modulator. 5,115,468, Cl. 381-31.000.

Asahi, Tetsuya: *See*—
Tamai, Tomoji; Asahi, Tetsuya; and Kondo, Yozo, 5,115,091, Cl. 528-388.000.

Asai, Katsutoshi: *See*—
Morishima, Ryuji; and Asai, Katsutoshi, 5,113,816, Cl. 123-179.250.

Asakura, Shinji: *See*—
Mosher, Deane F.; and Asakura, Shinji, 5,114,413, Cl. 604-266.000.

Asanagi, Tsuneo: *See*—
Ushitora, Akihiro; Yamaguchi, Kazuo; and Asanagi, Tsuneo, 5,114,280, Cl. 406-18.000.

Asano, Masashi: *See*—
Ebihara, Toshiyuki; Sakai, Satoru; Nishikawa, Masaji; and Asano, Masashi, 5,115,320, Cl. 358-296.000.
Asayama, Toshiaki, to Mitsubishi Denki K.K. Throttle valve control apparatus for an internal combustion engine. 5,113,822, Cl. 123-360.000.
Asayama, Yoshio; Tsubota, Makio; Okura, Yasunori; and Sato, Takayuki, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for controlling gear box. 5,113,720, Cl. 74-866.000.
Ascalon, David; and Ascalon, Maurice. Token holder. 5,114,014, Cl. 206-0.840.
Ascalon, Maurice: *See*—
Ascalon, David; and Ascalon, Maurice, 5,114,014, Cl. 206-0.840.
Asea Brown Boveri Ltd.: *See*—
Gassmann, Felix; and Snedkerud, Ole, 5,115,214, Cl. 333-26.000.
Ash, Carlton E., to Phillips Petroleum Company. Process for preparing arylene sulfide polymers in the presence of functionalized olefin. 5,115,093, Cl. 528-388.000.
Asher, Marc A.; Strippgen, Walter E.; Heinig, Charles F.; and Carson, William L., to AcroMed Corporation. Apparatus for contouring spine plates and/or rods. 5,113,685, Cl. 72-458.000.
Ashton, Wallace T.; Cantone, Christine L.; and Tolman, Richard L., to Merck & Co., Inc. Renin inhibitors containing the 2-[[(2R,3S)-3-amino-4-cyclohexyl-2-hydroxy-1-butyl]thio]alkanoyl moiety and the corresponding sulfoxide and sulfone derivatives. 5,114,925, Cl. 514-18.000.
Aslanian, Jerry L. Flow control device for administration of intravenous fluids. 5,113,904, Cl. 137-556.000.
Asplund, Mark D., to Allied-Signal Inc. Digital demodulator. 5,115,201, Cl. 329-356.000.
Asrar, Jawed, to Monsanto Company. Hydrogenated cyclic alkyl polymers. 5,115,037, Cl. 525-326.800.
Astec Inc.: *See*—
Nihira, Shohachi, 5,113,759, Cl. 101-93.210.
Astley, Vivian C.: *See*—
Wiewiorowski, Tadeusz K.; Astley, Vivian C.; Taravella, Jody J.; and Murray, Michael A., 5,114,699, Cl. 423-531.000.
Astucit: *See*—
Drachkovitch, Albert, 5,113,615, Cl. 43-42.190.
AT&T Bell Laboratories: *See*—
Ardon, Menachem T., 5,115,425, Cl. 370-54.000.
Bishop, Thomas P.; Davis, Mark H.; Peterson, James S.; and Surratt, Grover T., 5,115,505, Cl. 395-650.000.
Blyler, Lee L., Jr.; Chandross, Edwin A.; and Quan, Xina S., 5,115,487, Cl. 385-128.000.
Calderbank, Arthur R.; and Ozarow, Lawrence H., 5,115,453, Cl. 375-39.000.
Clark, Linda A.; Gottscho, Richard A.; Kruskal, Joseph B.; and Lambert, Diane, 5,114,233, Cl. 356-354.000.
Cupo, Robert L., 5,115,452, Cl. 375-14.000.
DiGiovanni, David J.; and Giles, Clinton R., 5,115,338, Cl. 359-337.000.
Fraidlin, Simon; Slack, William F.; and Wadlington, James C., 5,115,185, Cl. 323-207.000.
Haas, Zygmunt, 5,115,432, Cl. 370-94.100.
Hahne, Ellen L.; and Maxemchuk, Nicholas F., 5,115,430, Cl. 370-85.600.
Hang, Hsueh-Ming, 5,115,309, Cl. 358-133.000.
Islam, Mohammed N.; and Slusher, Richard E., 5,115,488, Cl. 385-129.000.
Johnson, James M., Jr.; and Spanke, Ronald A., 5,115,427, Cl. 370-60.000.
Kopf, Rose F.; O'Bryan, Henry M., Jr.; Schubert, Erdmann F.; Tu, Li-Wei; Wang, Yeong-Her; and Zydzik, George J., 5,115,441, Cl. 372-45.000.
Lee, Yong H.; and Tell, Benjamin, 5,115,442, Cl. 372-45.000.
Puthenpura, Sarat C.; and Sinha, Lakshman P., 5,115,391, Cl. 364-152.000.
Spanke, Ronald A., 5,115,426, Cl. 370-60.000.
Sudbo, Aasmund S.; Tsang, Won-Tien; and Yang, Long, 5,115,294, Cl. 357-30.000.
Atago, Takeshi: *See*—
Nagano, Masami; Atago, Takeshi; and Nemoto, Mamoru, 5,113,833, Cl. 123-491.000.
Atalar, Abdullah; and Koeymen, Hayrettin. Conical ultrasonic wave deflection system. 5,115,414, Cl. 367-7.000.
Atlantic Richfield Company: *See*—
Burton, Anthony R.; and Douglas, Dallas D., 5,114,445, Cl. 55-320.000.
Hearn, David D., 5,113,703, Cl. 73-151.000.
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Morita, Shoji, 5,114,325, Cl. 418-171.000.
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Visca, Mario; Boero, Giancarlo; and Lenti, Daria, 5,115,026, Cl. 525-199.000.
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Yamagishi, Makoto; Fujihira, Masao; Azami, Kazuo; and Shinohara, Ikuo, 5,115,473, Cl. 381-154.000.
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Ohtsuka, Masahito; Kobayashi, Hiroo; Moritani, Toshifumi; Yagi, Tadashi; Tsuchiya, Yoshiro; Azeta, Takahiro; Waragai, Tsuyoshi; Yukimachi, Hiroshi; and Miyake, Hiroaki, 5,115,281, Cl. 355-319.000.
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Hayashi, Takao; and Osawa, Yasuo, 5,114,667, Cl. 376-299.000.
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Ball, Russell M.; and Madaras, John J., 5,114,665, Cl. 376-255.000.
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Loth, Stanislaw; and Bahnemann, Volker W., 5,115,384, Cl. 362-301.000.
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Faull, Simon H., 5,113,837, Cl. 123-587.000.
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Frindel, Emilia; Lenfant, Maryse; Guigon, Martine; and Bakala, Johanna, 5,114,926, Cl. 514-18.000.
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Donovan, Joseph F., 5,113,941, Cl. 166-250.000.
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Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Nishikibe, Masaru; Ihara, Masaki; and Yano, Mitsuo, 5,114,918, Cl. 514-11.000.
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Milburn, Ski; and Barber, Jeffrey, 5,114,321, Cl. 417-467.000.
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Jungfer, Herbert; Barchet, Heinrich; and Albert, Winfried, 5,114,847, Cl. 435-41.000.
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Meihack, Wolfgang F. A. T.; Barcza, Nicholas A.; and Dry, Michael J., 5,114,700, Cl. 423-571.000.
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Barlow, Philip D., to Hahn & Kolb GmbH & Co. Coupling. 5,114,264, Cl. 403-323.000.
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Baron, Richard D.; Smith, Malcolm C.; Spoeth, Carl R.; and Quadros, Valdemiro M., to Lykes Pasco Inc. Pump and mixing device for liquids. 5,114,047, Cl. 222-129.100.
Barr, Craig K., to Universal City Studios, Inc. Explosion simulator. 5,114,140, Cl. 472-75.000.
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Remboski, Donald J.; Plee, Steven L.; Yang, Jialin; and Law, Robert W., 5,113,828, Cl. 123-425.000.
Barry, Robert M., to CFR Corporation. Backflush filter system with insert member diffusing filtering and backflush flow. 5,114,574, Cl. 210-137.000.
Bartelt, Robert D.; Belson, William W., III; and Bruno, Michael R., to Bruno, Michael Roman. Pivotable extravehicular equipment mounting system. 5,114,120, Cl. 254-323.000.
Bartilson, Bradley W., to Cray Research, Inc. Air filtering apparatus. 5,114,448, Cl. 55-491.000.
Bartmann, Martin: *See*—
Poll, Gunter; Bartmann, Martin; and Finke, Jurgen, 5,115,088, Cl. 528-336.000.
Bartolomei, Roberto: *See*—
Masdea, Arturo; Masucci, Rosanna; Bignami, Manuel; and Bartolomei, Roberto, 5,115,208, Cl. 331-1.00A.
Barton, Jeffrey N., to Rhone-Poulenc Rorer Pharmaceuticals Inc. Aryl-substituted benzocycloalkyl-derived anti-atherosclerotic agents. 5,114,964, Cl. 514-460.000.
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Barwick, Carl B.: *See*—
Trick, Robert E.; and Barwick, Carl B., 5,114,398, Cl. 600-29.000.
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Bronstert, Klaus; Schwaben, Hans-Dieter; and Echte, Adolf, 5,115,022, Cl. 525-92.000.
Schoettle, Klaus; Borck, Gerald-Wolfgang; Schmidts, Kurt; and Pavelka, Bozidar, 5,114,008, Cl. 206-387.000.
Seitz, Friedrich; Hoffmann, Gerhard; and Bauer, Gerhard, 5,114,831, Cl. 430-281.000.
Voss, Hartwig; and Bruecken, Thomas, 5,114,554, Cl. 204-182.400.
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Gagnon, Steven D.; Grace, Oscar M.; Smiecinski, Theodore M.; and Wujcik, Steven E., 5,114,988, Cl. 521-167.000.
Harclerode, William H.; Knutsen, John C.; Pekich, Barry J.; Wiman, John V.; and Voss, John C., 5,114,640, Cl. 264-53.000.
Keaveney, William P.; and Sappok, Reinhard J., 5,114,479, Cl. 106-30.000.
Kuyzin, Gregg S.; and Schmidtke, Leslie E., Jr., 5,114,985, Cl. 521-130.000.
Zimmermann, Eugene K.; Wagner, Bernhard; Volz, William E.; Harclerode, William H.; Wiman, John V.; and Voss, John C., 5,115,066, Cl. 526-346.000.
BASF Lacke & Farben AG: *See*—
Jung, Werner; and Sievers, Axel, 5,115,064, Cl. 526-301.000.
Scherping, Karl-Heinz; Holscher, Hans-Jorg; Reichelt, Uwe; and Reiter, Udo, 5,114,993, Cl. 523-409.000.
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Basil, John D.; Lin, Chia-Cheng; and Hunia, Robert M., to PPG Industries, Inc. Siloxane organic hybrid polymers. 5,115,023, Cl. 525-103.000.
Bassner, Sherri L.: *See*—
Quay, Jeffrey R.; Bassner, Sherri L.; and Santosusso, Thomas M., 5,115,071, Cl. 528-59.000.
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Johnston, Herbert N.; Hiscock, Donald F.; and Beard, Ralph E., 5,114,509, Cl. 156-73.100.
Murphy, Mark T.; Buelt, James L.; Stottlemyre, James A.; and Tixier, John S., Jr., 5,114,277, Cl. 405-231.000.
Pederson, Larry R.; Chick, Lawrence A.; and Exarhos, Gregory J., 5,114,702, Cl. 423-639.000.
Baude, Dominique; Chavel, Pierre; Joyeux, Denis; and Taboury, Jean, to Essilor International, Compagnie Generale d'Optique. Multiple contour diffractive lens. 5,114,220, Cl. 351-160.00R.
Bauer, Gerhard: *See*—
Seitz, Friedrich; Hoffmann, Gerhard; and Bauer, Gerhard, 5,114,831, Cl. 430-281.000.
Bauer, Jacques: *See*—
Pares Farras, Ramon; Jofre Torroella, Juan; Ricard, Jean-Paul; Schulthess, Adrian; Farine, Jean-Claude; Michelet, Marie-Christine; Ramsteiner, Agnes; and Bauer, Jacques, 5,114,848, Cl. 435-101.000.
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Baum, Charles S., 5,114,144, Cl. 273-72.00R.
Baumann, Richard A.: *See*—
Nobile, Frederick E.; Harris, John F., III; Silverman, Gary S.; and Baumann, Richard A., 5,115,330, Cl. 359-52.000.
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Kummerfeld, Ryszard; Baumgarten, Siegfried; Holzapfel, Gerd; Falb, Wolfgang; and Palm, Ulrich, 5,113,897, Cl. 137-357.000.
Baur, Thomas G.; and Badertscher, Roger H. Electrically addressable liquid crystal projection system with high efficiency and light output. 5,115,305, Cl. 358-60.000.
Bavis, Edward F. Food service system for drive-in restaurants. 5,113,970, Cl. 186-41.000.
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Sluga, Robert M.; Watkins, Randolph H.; Fisher, Jerry D.; Berry, Dennis C.; and Eldridge, Milo, 5,113,883, Cl. 134-60.000.
Sluga, Robert M.; Watkins, Randolph H.; Gajewski, Henry M.; Fisher, Jerry D.; and Berry, Dennis C., 5,114,608, Cl. 252-162.000.

Baxter, John K., III: *See—*
Stuart, Regina K.; Lowell, Jeffrey A.; Baxter, John K., III; Bistrian, Bruce R.; and Shikora, Scott, 5,114,401, Cl. 604-53.000.

Bay, Adam G.: *See—*
Visnyouszky, Louis; and Bay, Adam G., 5,114,200, Cl. 294-81.560.

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Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., 5,114,965, Cl. 514-469.000.
Hoff, Dieter, 5,114,956, Cl. 514-356.000.
Klausener, Alexander; Kleefeld, Gerd; Brandes, Wilhelm; Dutzmann, Stefan; and Hansler, Gerd, 5,114,959, Cl. 514-369.000.
Lindner, Werner; and Haberkorn, Axel, 5,114,938, Cl. 514-242.000.
Meckel, Walter; Hansel, Eduard; Arend, Gunter; and Konig, Klaus, 5,115,073, Cl. 528-83.000.
Nielinger, Werner; Idel, Karsten-Josef; Westeppe, Uwe; Freitag, Dieter; Wulff, Claus; and Heinz, Hans-Detlef, 5,115,050, Cl. 525-537.000.
Nyssen, Peter R.; Berkenhaus, Dirk; and van Pey, Hans-Theo, 5,114,631, Cl. 264-6.000.
Reiss, Gerhard, 5,114,440, Cl. 55-25.000.
Reuter, Knud; Jilge, Wolfgang; Pittel, Bernd; and Weymans, Gunther, 5,115,076, Cl. 528-125.000.
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Bays, David E.: *See—*
Oxford, Alexander W.; Bays, David E.; Cavalla, David J.; and North, Peter C., 5,114,950, Cl. 514-294.000.

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Beard, Ralph E.: *See—*
Johnston, Herbert N.; Hiscock, Donald F.; and Beard, Ralph E., 5,114,509, Cl. 156-73.100.

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Guillaume, Nicolas; and Becerril, Philippe, 5,113,620, Cl. 49-375.000.

Bechtold, Herbert: *See—*
Gabriel, Jochen; Bechtold, Herbert; Hambrecht, Gerhard; and Nothdurft, Klaus, 5,114,406, Cl. 604-136.000.

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Locotos, Frank M.; and Bechtold, Robert S., 5,114,278, Cl. 405-259.600.

Becker, Douglas C., to American Cyanamid Company. Gelatin coated tablets and method for producing same. 5,114,720, Cl. 424-478.000.

Becker, Karlheinz; and Pfeiffer-Muller, Gunter, to KSB Aktiengesellschaft. Centrifugal pump with inner and outer casings. 5,114,311, Cl. 415-182.100.

Becker, Reinhard: *See—*
Ruger, Wolfgang; Urbach, Hansjorg; Becker, Reinhard; and Hock, Franz, 5,114,962, Cl. 514-412.000.

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Gebizlioglu, Osman S.; Cohen, Robert E.; Argon, Ali S.; Beckham, Haskell W.; and Qin, Jian, 5,115,028, Cl. 525-232.000.

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Bedford, Raymond E.: *See—*
Tsang, Chih-Hao M.; and Bedford, Raymond E., 5,114,901, Cl. 502-240.000.

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Vartan, Robert R., 5,114,929, Cl. 514-29.000.

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Plichta, Edward J.; and Behl, Wishvender K., 5,114,432, Cl. 29-623.500.

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Smutny, Edgar J.; Gergen, William P.; Broekhuis, Antonius A.; Groenland, Franciscus C.; and Beijen, Johan M., 5,115,009, Cl. 524-306.000.

Beirle, Walter, to Waeschle Maschinenfabrik GmbH. Rotary feeder for granulated bulk material. 5,114,053, Cl. 222-345.000.

Beiser, Leo, to Leo Beiser Inc. Double-reflection light scanner. 5,114,217, Cl. 359-216.000.

Belikan, Thomas: *See—*
Krauss, Werner; Wurster, Helmut; and Belikan, Thomas, 5,113,848, Cl. 128-24.0EL.

Bell, Allyn R.: *See—*
Davis, Robert G.; and Bell, Allyn R., 5,114,464, Cl. 71-92.000.

Bell Communications Research: *See—*
McAuley, Anthony J., 5,115,436, Cl. 371-37.100.

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Smoot, Lanny S., 5,115,230, Cl. 340-707.000.

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Perlman, Maier; Bell, James M.; and McGugan, Colin A., 5,115,491, Cl. 392-454.000.

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Bellwoar, George: *See—*
Levine, Mark; Bellwoar, George; and Murphy, Douglas A., 5,113,602, Cl. 40-634.000.

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Belson, William W., III: *See—*
Bartelt, Robert D.; Belson, William W., III; and Bruno, Michael R., 5,114,120, Cl. 254-323.000.

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Pitzen, Gerald; Garfield, Douglas; Beltz, Warren G.; Arntzen, Lawrence O.; and Bina, Joseph C., 5,114,391, Cl. 482-62.000.

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Esserman, James N.; and Bennett, Christopher J., 5,115,467, Cl. 380-44.000.

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Killion, Mead C.; Stewart, Jonathan K.; Falco, Robert; and Berger, Elliott H., 5,113,967, Cl. 181-132.000.

Berger, Johann; DeLaCroix, Fern; Buck, Harvey; and Schrenk, Juergen, to Boehringer Mannheim Corporaton. Apparatus for determination of a component in a sample. 5,114,673, Cl. 422-56.000.

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Disselbeck, Dieter; Berger, Karl C.; and Drews, Jurgen, 5,114,812, Cl. 429-234.000.

Bergerstock, Dana D. Race game apparatus. 5,114,151, Cl. 273-246.000.

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Scheler, Siegfried; Buhr, Gerhard; Lenz, Helmut; Bergmann, Klaus; and Siegel, Herbert, 5,114,816, Cl. 430-192.000.

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Nyssen, Peter R.; Berkenhaus, Dirk; and van Pey, Hans-Theo, 5,114,631, Cl. 264-6.000.

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Sluga, Robert M.; Watkins, Randolph H.; Fisher, Jerry D.; Berry, Dennis C.; and Eldridge, Milo, 5,113,883, Cl. 134-60.000.
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Weber, Neill, 5,114,743, Cl. 427-77.000.

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Deck, Philip D.; Rivera, Jose B.; and Harpel, William L., 5,114,607, Cl. 252-156.000.
Naeger, Dennis P.; and Perugini, Joseph J., 5,114,566, Cl. 208-289.000.
Reid, Dwight K., 5,114,436, Cl. 44-385.000.

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Bianco, James S.; and Drummond, Bernard, to Control Module Inc. Variable-sweep bar code reader. 5,115,121, Cl. 235-467.000.

Bickle, Wolfgang: *See—*
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, 5,114,326, Cl. 425-79.000.

Biedermann, Jurgen; Evers, Michel; Terlinden, Rolf; Leyck, Sigurd; and Graf, Erich, to A. Nattermann & Cie. GmbH. Antiinflammatory benzylselenobenzamides from aminopyridines and picolylamines. 5,114,954, Cl. 514-338.000.

Bier, Gerhard: *See—*
Nilsson, Sven-Axel; Ebersole, Ronald J.; Bier, Gerhard; and Honeck, Karl-Heinz, 5,115,511, Cl. 395-800.000.

Bieringer, Anton: *See—*
Steinhardt, Helmut; and Bieringer, Anton, 5,114,360, Cl. 439-341.000.

Biftu, Tesfaye; Bugianesi, Robert L.; Girotra, Nirindar N.; Ponpipom, Mitree M.; Sahoo, Soumya P.; and Kuo, Chan H., to Merck & Co., Inc. 2,5-diaryl tetrahydofurans and analogs thereof as PAF antagonists. 5,114,961, Cl. 514-397.000.

Biggin, Ian S.; Cartwright, Peter S.; Farrar, David; Hawe, Malcolm; and Paget, Walter E., to BP Chemicals Limited. Fabric conditioners. 5,114,600, Cl. 252-86.000.

Biggs, Ross O. Pin detection system with an adjustably-mounted array of sensors. 5,115,125, Cl. 250-222.100.

Bignami, Manuel: *See—*
Masdea, Arturo; Masucci, Rosanna; Bignami, Manuel; and Bartolomei, Roberto, 5,115,208, Cl. 331-1.00A.

Bild, Gary S.: *See—*
Haymore, Barry L.; Bild, Gary S.; and Krivi, Gwen G., 5,115,102, Cl. 530-399.000.

Bina, Joseph C.: *See—*
Pitzen, Gerald; Garfield, Douglas; Beltz, Warren G.; Arntzen, Lawrence O.; and Bina, Joseph C., 5,114,391, Cl. 482-62.000.

Binks Manufacturing Company: *See—*
Telchuk, Steve E., 5,113,600, Cl. 34-90.000.

BIO Associates, a California partnership: *See—*
Scott, Robert S.; and Atwood, Richard W., 5,114,537, Cl. 162-146.000.

Bio-Rad Laboratories, Inc.: *See—*
Hjerten, Stellan; and Srichaiyo, Tasanee, 5,114,551, Cl. 204-180.100.

Biocarbons Corporation: *See—*
Himmelblau, D. Andrew, 5,115,084, Cl. 528-230.000.

Biodor U.S. Holding: *See—*
Hendler, Sheldon S.; and Sanchez, Robert, 5,114,957, Cl. 514-356.000.

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Biomedica Foscama Industria Chimico-Farmaceutica S.p.A.: *See—*
Scuri, Romolo; Brufani, Mario; Ceccarelli, Stefano; De Vellis, Patrizia; Giannetti, Patrizia; Paesano, Agnese; and Zanarcella, Sergio, 5,114,966, Cl. 514-469.000.

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Bertoncini, Joseph; Kroener, Calvin; Cobb, Wayne; and Evans, Robert, 5,114,681, Cl. 422-111.000.

Biopool International, Inc.: *See—*
Ranby, Mats G., 5,114,845, Cl. 435-13.000.

Bioresearch S.p.A.: *See—*
Gennari, Federico, 5,114,931, Cl. 514-46.000.

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Stanbro, William D.; Hunter, Kenneth W., Jr.; and Newman, Arnold L., 5,114,674, Cl. 422-57.000.

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Bishop, Bruce A.: *See—*
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Bishop, Thomas P.; Davis, Mark H.; Peterson, James S.; and Surratt, Grover T., to AT&T Bell Laboratories. Controlled dynamic load balancing for a multiprocessor system. 5,115,505, Cl. 395-650.000.

Bistrian, Bruce R.: *See—*
Stuart, Regina K.; Lowell, Jeffrey A.; Baxter, John K., III; Bistrian, Bruce R.; and Shikora, Scott, 5,114,401, Cl. 604-53.000.

Bjerngren, Jan; Eriksson, Sven; and Persson, Lars, to Atlas Copco Construction and Mining Technique AB. Device for setting a rock bolt. 5,114,279, Cl. 405-303.000.

Black, Michael; and Kupershmidt, Vladimir, to Reliant Laser Corp. Liquid crystal sunglasses with selectively color adjustable lenses. 5,114,218, Cl. 351-44.000.

Blade, Robert J.; Peek, Robert J.; and Cockerill, George S. Pesticides. 5,114,940, Cl. 514-248.000.

Blaese, R. Michael: *See—*
Hess, Richard A.; and Blaese, R. Michael, 5,114,973, Cl. 514-557.000.

Blancher, Eldon C., II: *See—*
Jones, Barton G.; Green, Ray E.; and Blancher, Eldon C., II, 5,113,792, Cl. 119-3.000.

Blazej, Daniel C.: *See—*
Zupancic, Joseph J.; Blazej, Daniel C.; and Fraenkel, Howard A., 5,114,741, Cl. 427-43.100.

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Blomberg, Fred; Friberg, Jan; Glindre, Jan-Olof; and Kangasmetsa, Jarl. Luminescent or luminometric assays. 5,114,841, Cl. 435-7.900.

Blondeau, Robert; Rondt, Daniel; Glastre, Genevieve; and Krakowski, Michel, to Thomson-CSF. Optoelectronic device on semi-insulator substrate and methods for making such a device. 5,115,283, Cl. 357-17.000.

Bloom, James W.; Wong, Melvin F.; and Mitra, Gautam, to Miles Inc. Removal of protein A from antibody preparations. 5,115,101, Cl. 530-388.250.

Blubaugh, James C.: *See—*
Yates, Jonn B., III; Brown, Sterling B.; Lowry, Richard C.; Blubaugh, James C.; and Aycock, David F., 5,115,043, Cl. 525-390.000.

Blue Circle Industries PLC and ALH Systems Limited: *See—*
Gartshore, Gavin C.; and Holme, Norman E., 5,114,487, Cl. 106-695.000.

Blumbach, Jurgen: *See—*
Franco, Christopher M.; Vijayakumar, Erra K. S.; Chatterjee, Sugata; Ganguli, Bimal N.; Blumbach, Jurgen; Kogler, Herbert; and Fehlhaber, Hans-Wolfram, 5,114,967, Cl. 514-475.000.

Blumenau, Leif, to Technion Research & Development Foundation, Ltd. Liquid sealed vane oscillators. 5,115,157, Cl. 310-11.000.

Blumeyer, Kirsten K.: *See—*
Obermiller, Patrice S.; and Blumeyer, Kirsten K., 5,114,680, Cl. 422-104.000.

Blunier, Dennis L.; Shankwitz, Phillip J.; Caudill, Maurice L.; Andreson, Paul D.; Kazmierzak, Richard R.; and Schweisberger, Joel C., to Caterpillar Inc. Apparatus and method for selectively forming a

thickened edge on a plate of formable material. 5,113,677, Cl. 72-7.000.

Blyler, Lee L., Jr.; Chandross, Edwin A.; and Quan, Xina S., to AT&T Bell Laboratories. Alkene-treated silicone compounds. 5,115,487, Cl. 385-128.000.

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Board of Supervisors of Louisiana State University & Agricultural & Mechanical College: *See—*
McCombs, Candace C.; Michalski, Joseph P.; Gallaher, William R.; and Thompson, James J., 5,114,863, Cl. 436-518.000.

Board of Supervisors of Louisiana State University and Mechanical College Through Its Medical Center: *See—*
Robinson, James E.; and Scott, Charles F., 5,114,856, Cl. 530-387.900.

Board of Trustees operating Michigan State University: *See—*
Pinnavaia, Thomas J.; Amarasekera, Jayantha; and Polansky, Christine A., 5,114,691, Cl. 423-244.000.
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Boarman, George L. Contraception and prophylaxis enhancement system. 5,113,873, Cl. 128-830.000.

Bobb, Lloyd C.; White, Barbara J.; Davis, Jon P.; and Samouris, Arthur, to United States of America, Navy. Optical fiber sensor for measuring physical properties of fluids. 5,115,127, Cl. 250-227.190.

Bobbio, Stephen M.: *See—*
Tranjan, Farid M.; DuBois, Thomas D.; Frieser, Rudolf G.; Bobbio, Stephen M.; and Jones, Susan K. S., 5,114,827, Cl. 430-271.000.

Boch, Mark J.: *See—*
Ervay, Earl D.; and Boch, Mark J., 5,114,287, Cl. 409-13.000.

Bode, Jerry E.; and Duckett, Ronnie E., to Milliken Research Corporation. Apparatus to measure yarn tension. 5,113,708, Cl. 73-862.410.

Boehringer Mannheim Corporation: *See—*
Berger, Johann; DeLaCroix, Fern; Buck, Harvey; and Schrenk, Juergen, 5,114,673, Cl. 422-56.000.

Boehringer Mannheim GmbH: *See—*
Jungfer, Herbert; Barchet, Heinrich; and Albert, Winfried, 5,114,847, Cl. 435-41.000.

Boeing Company, The: *See—*
Bird, Ronald W.; and Shaffer, David K., 5,115,407, Cl. 364-551.010.
Rudolph, Peter K. C.; and Georgefalvy, Dezso, 5,114,100, Cl. 244-134.00C.
Sheppard, Clyde H.; and Lubowitz, Hyman R., 5,115,087, Cl. 528-322.000.
Wang, Timothy, 5,114,102, Cl. 244-207.000.

Boero, Giancarlo: *See—*
Visca, Mario; Boero, Giancarlo; and Lenti, Daria, 5,115,026, Cl. 525-199.000.

Bogatin, Yakov, to SPS Technologies, Inc. Magnetic materials and process for producing the same. 5,114,502, Cl. 148-302.000.

Bogdany, John, to Resilient Systems, Inc. Resilient composite open-cell foam structure and method of making same. 5,114,773, Cl. 428-95.000.

Boger, Manfred; Drabek, Jozef; and Ehrenfreund, Josef, to Ciba-Geigy Corporation. Anilinophenyl carbodimides compositions containing them, and the use thereof in pest control. 5,114,975, Cl. 514-630.000.

Bogner, Martin, to GEZE Sport International GmbH. Bearing arrangement for the laterally movable vertical support of a ski boot on a ski. 5,114,174, Cl. 280-636.000.

Bohm, Roland: *See—*
Kupfer, Rainer; Hille, Martin; Bohm, Roland; and Staiss, Friedrich, 5,114,616, Cl. 252-337.000.

Bohner, Beat: *See—*
Moser, Hans; Bohner, Beat; and Fory, Werner, 5,114,462, Cl. 71-88.000.

Boland, Bernard W.: *See—*
Baker, Thomas R.; Boland, Bernard W.; and Shumate, David A., 5,114,875, Cl. 437-62.000.

Boler Company, The: *See—*
Srch, James L.; and Cadden, Robert L., 5,114,125, Cl. 267-265.000.

Bolliger, Roman, to Oskar Woertz, Inhaber Hans Woertz. Electrical connection terminal. 5,114,367, Cl. 434-716.000.

Bolton, Richard: *See—*
Mendelsohn, Morris A.; Navish, Francis W., Jr.; and Bolton, Richard, 5,114,982, Cl. 521-59.000.

Bonde, Kevin G.; and Hall, Ronald L., to Tecumseh Products Company. Combination crankcase gasket/baffle. 5,113,818, Cl. 123-196.00W.

Bongrain S.A.: *See—*
Herpe, Michel, 5,114,045, Cl. 222-105.000.

Bonilla, Marcio: *See—*
Tillery, Michael L.; Harlan, Eugene G.; Martin, John R.; Zammuto, Samuel N.; and Bonilla, Marcio, 5,114,155, Cl. 273-371.000.

Bontems, Maurice; and Desmicht, Denis, to Le Carbone Lorraine. Process for manufacturing composite tubes. 5,114,762, Cl. 428-34.500.

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Borchardt, Jurgen: *See—*
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, 5,114,326, Cl. 425-79.000.

Borck, Gerald-Wolfgang: *See—*
Schoettle, Klaus; Borck, Gerald-Wolfgang; Schmidts, Kurt; and Pavelka, Bozidar, 5,114,008, Cl. 206-387.000.

Bordunov, Vladimir V.; Karmadonov, Leonid N.; Ospischev, Jury M.; Fedjunin, Vladimir A.; Zhurnykov, Sergei P.; Cherepenko, Evgeny A.; Sviridov, Anatoly B.; Verkhorubov, Lev S.; Mikhailov, Arkady T.; Bakhmutov, Jury L.; and Shaidurov, Valery S. Method of cleaning workpieces and an apparatus for carrying out the method. 5,114,496, Cl. 134-13.000.

Borg-Warner Automotive, Inc.: *See—*
Petzold, Werner P., 5,115,395, Cl. 364-424.100.

Borso, Guido: *See—*
Schoeyer, Herman F. R.; Borso, Guido; and Gibilisco, Salvatore, 5,113,763, Cl. 102-202.000.

Boschelli, Diane H.; and Connor, David T., to Warner-Lambert Company. 1,2,4-oxadiazole and 1,2,4-thiadiazole derivatives of fenamates as antiinflammatory agents. 5,114,958, Cl. 514-361.000.

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Bothwell, Roy: *See—*
Bothwell, Peter W.; and Bothwell, Roy, 5,114,164, Cl. 280-37.000.

Botkin, Lawrence A.; and Javadi, Mahmud K., to Fruehauf Trailer Corporation. Drop frame truck trailer. 5,114,169, Cl. 280-423.100.

Bottero, Fabrizio, to Nugent, Patrick; and Egan, Richard W. Multicolor pasta products. 5,114,724, Cl. 426-249.000.

Bouleau, Jean-Paul A. A.: *See—*
Amiot, Jacques H. J.; Bouleau, Jean-Paul A. A.; and Molveaux, Gerard R. M., 5,115,117, Cl. 219-254.000.

Bowman, Ben B., to UCAR Carbon Technology Corporation. Arc furnace electrode control. 5,115,447, Cl. 373-102.000.

Bowman, Gary: *See—*
Mahn, Gary; and Bowman, Gary, 5,114,107, Cl. 248-217.400.

Box, J. William: *See—*
Jahrmarkt, Scott L.; Viera, Fernando M.; and Box, J. William, 5,113,872, Cl. 128-772.000.

Boyer, Robert. Radar detector mounting apparatus. 5,114,060, Cl. 224-32.00R.

BP Chemicals (Additive) Limited: *See—*
Cook, Stephen J.; O'Connor, Sean P.; and Pearce, Andrew, 5,114,601, Cl. 252-25.000.

BP Chemicals Limited: *See—*
Biggin, Ian S.; Cartwright, Peter S.; Farrar, David; Hawe, Malcolm; and Paget, Walter E., 5,114,600, Cl. 252-86.000.

Brach, Paul J.: *See—*
Griffiths, Clifford H.; Brach, Paul J.; Williams, Edward C.; Gaither, Ronald A.; and Leenhouts, Timothy J., 5,114,736, Cl. 427-30.000.

Bradley, James G.: *See—*
Shoyab, Mohammed; McDonald, Vicki L.; Bradley, James G.; and Plowman, Gregory D., 5,115,096, Cl. 530-322.000.

Bradley, Richard A.: *See—*
Niewold, D. Wayne; and Bradley, Richard A., 5,113,952, Cl. 175-57.000.

Bradshaw, Roger D.: *See—*
Wilson, William N.; Bradshaw, Roger D.; Wilton, Bonsall S.; and Carpenter, Robert B., 5,113,943, Cl. 166-291.000.

Brady, Thomas J. Waterproof pouch releasably clampable to wearing apparel. 5,114,061, Cl. 224-252.000.

Branch, Charles E.; Gavin, David F.; and Robitaille, Thomas E., to Olin Corporation. Process for producing an antimicrobially effective polyurethane. 5,114,984, Cl. 521-121.000.

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Branch, Thomas R. Bar coded laundry ticket. 5,114,187, Cl. 283-81.000.

Brandes, Wilhelm: *See—*
Klausener, Alexander; Kleefeld, Gerd; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 5,114,959, Cl. 514-369.000.

Brandolino, Giusseppe; and Maroske, Fred. Fluxgate sensor having adjustable core extending beyond a coil winding and a gradiometer incorporating a pair of sensors. 5,115,197, Cl. 324-245.000.

Brandon, Mark A.: *See—*
Bischoff, Ronald E.; Brandon, Mark A.; Caulfield, John J.; Cook, Lawrence G.; and Uplinger, George B., 5,114,018, Cl. 211-41.000.

Brandt, Klaus: *See—*
Stiles, James A. R.; and Brandt, Klaus, 5,114,804, Cl. 429-66.000.

Brandt, Steven: *See—*
Young, James W.; and Brandt, Steven, 5,114,714, Cl. 424-400.000.
Young, James W.; and Brandt, Steven, 5,114,715, Cl. 424-400.000.

Branovich, Louis F.; Freeman, Gerard L.; and Eckart, Donald W., to United States of America, Army. Preparing a scandate cathode by impregnating a porous tungsten billet with $Ba_3Al_2O_6$, coating the top surface with a mixture of Sc_6WO_{12}, $Sc_2(WO_4)_3$, and W in a 1:3:2 mole ratio, and heating in a vacuum. 5,114,742, Cl. 427-77.000.

Brant, Patrick; and German, Paul M., to Exxon Chemical Patents Inc. Tackified polyethylene layers in stretch/cling films. 5,114,763, Cl. 428-34.900.

Bratcher, William M. Archery bow and bow riser therefor. 5,113,841, Cl. 124-23.100.

Braus, Jurgen: *See—*
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, 5,114,326, Cl. 425-79.000.

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Martin, James A.; and Braytenbah, Andrew S., 5,113,691, Cl. 73-116.000.

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Brennan, David J.; White, Jerry E.; Haag, Anthony P.; and Kram, Shari L., to Dow Chemical Company, The. Amide and hydroxymethyl functionalized polyethers as thermoplastic barrier resins. 5,115,075, Cl. 528-99.000.

Brenneman, Allen J., to Miles Inc. Method for distributing and analyzing a fluid sample onto a test surface. 5,114,862, Cl. 436-169.000.

Brentham, Jerry D. Stair climber exercise device. 5,114,389, Cl. 482-53.000.

Breslow, Morrison, Terzian & Associates, Inc.: *See—*
Rosenwinkel, Donald A.; and Moormann, Randall H., 5,114,153, Cl. 273-292.000.

Bretzler, Rainer: *See—*
Weiler, Rolf; Schiel, Wolfgang; and Bretzler, Rainer, 5,113,978, Cl. 188-73.310.

Brewer, Alan W., to Bunn-O-Matic Corporation. Bypass basket structure for iced tea makers. 5,113,752, Cl. 99-295.000.

Brewster, David A.: *See—*
Kuznitz, Matthew; Brewster, David A.; Faryniarz, Joseph R.; and Cancro, Lewis, 5,114,717, Cl. 424-401.000.

Brey, Arthur: *See—*
Gabrius, A. J.; Mesh, Robert C.; Brey, Arthur; and Hartogh, Daniel, 5,113,990, Cl. 194-206.000.

Breznak, Jeffrey M.: *See—*
Ames, S. Leslie; and Breznak, Jeffrey M., 5,114,501, Cl. 148-117.000.

Bridge Products, Inc.: *See—*
Gilbert, Major H., 5,113,900, Cl. 137-515.500.

Bridgestone Cycle Co., Ltd.: *See—*
Takamiya, Kikuzo; and Nishimura, Ritsuo, 5,115,159, Cl. 310-67.00A.

Bridgestone/Firestone, Inc.: *See—*
Goodfellow, Anthony G., 5,114,511, Cl. 156-133.000.
Holroyd, Eric; and Wright, Anthony R., 5,114,512, Cl. 156-135.000.

Brimelow, Christopher J.; Hsu, Jau Y.; and Proctor, Michael S., to Nestec S.A. Coated pasta for providing firm texture. 5,114,727, Cl. 426-302.000.

Brink, John E.: *See—*
Harris, William H., Jr; Nussbaum, William E.; Armstrong, Michael J.; Deming, Victor H.; and Brink, John E., 5,114,128, Cl. 270-11.000.

Brinsmead, Brian J.; Stepenoff, Gary F.; Bess, Vicki H.; Huxel, Gary R.; and Wetmore, John A., to Earth Solutions, Inc. Reclamation system for contaminated material. 5,114,568, Cl. 209-170.000.

Brischoux, Jean-Claude: *See—*
Goud, Gilles R.; and Brischoux, Jean-Claude, 5,114,173, Cl. 280-633.000.

Bristol-Myers Company: *See—*
Sawada, Yosuke; Kakushima, Masatoshi; Nishio, Maki; Miyaki, Takeo; and Oki, Toshikazu, 5,114,857, Cl. 435-252.100.

Bristol-Myers Squibb Co.: *See—*
Sugawara, Koko; Nishiyama, Yuji; Tomita, Koji; Konishi, Masataka; and Oki, Toshikazu, 5,114,920, Cl. 514-11.000.

British Nuclear Fuels plc: *See—*
Hutson, Graham V., 5,114,623, Cl. 252-631.000.

British Telecommunications public limited company: *See—*
Norris, Stephen H., 5,115,489, Cl. 385-135.000.

Broekhuis, Antonius A.: *See—*
Smutny, Edgar J.; Gergen, William P.; Broekhuis, Antonius A.; Groenland, Franciscus C.; and Beijen, Johan M., 5,115,009, Cl. 524-306.000.

Brondos, Dean P.: *See—*
Westberg, Frederick W.; and Brondos, Dean P., 5,115,145, Cl. 307-10.300.

Bronn, William R.: *See—*
Silver, Spencer F.; Bronn, William R.; and Joseph, Eugene G., 5,115,034, Cl. 525-288.000.

Brons, George A.: *See—*
Leatherman, Dennis D.; McGinley, James J.; Adams, Daniel E.; and Brons, George A., 5,114,438, Cl. 51-296.000.

Bronstert, Klaus; Schwaben, Hans-Dieter; and Echte, Adolf, to BASF Aktiengesellschaft. Thermoplastics of polyalkylene terephthalates impact modified with functionalized polymers and use thereof for producing moldings. 5,115,022, Cl. 525-92.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Hirata, Keiichi; Morimoto, Yoshinari; Ooishi, Minoru; Ban, Tomohiro; and Furukawa, Akihiro, 5,115,410, Cl. 395-650.000.
Nishikawa, Hiroshi, 5,113,741, Cl. 84-609.000.
Yoshimoto, Satoshi, 5,114,253, Cl. 400-124.000.

Brown, Arnold; and Giblin, Edward J., to Lever Brothers Company, Division of CONOPCO, Inc. Carton with coated reclosable pouring opening. 5,114,013, Cl. 229-216.000.

Brown, David M., to Epicor Industries, Inc. Vehicle radiator cap. 5,114,035, Cl. 220-203.000.

Brown, Garrett W. Cable-suspended apparatus for supporting a stabilized camera assembly. 5,113,768, Cl. 104-112.000.

Brown, George R.: *See—*
St. Pierre, Leon E.; Brown, George R.; Wu, Gaoming; and Yu, Youlu, 5,114,709, Cl. 424-78.120.

Brown, James E. C., to Analog Devices, Inc. Chopper-stabilized amplifier with spread-spectrum clocking. 5,115,202, Cl. 330-9.000.

Brown, Sterling B.: *See—*
Fontana, Luca P.; and Brown, Sterling B., 5,115,024, Cl. 525-133.000.
Khouri, Farid F.; Brown, Sterling B.; and Jackman, John T., 5,115,042, Cl. 525-397.000.
Yates, Jonn B., III; Brown, Sterling B.; Lowry, Richard C.; Blubaugh, James C.; and Aycock, David F., 5,115,043, Cl. 525-390.000.

Brown, W. Richard: *See—*
Frysz, Christine A.; and Brown, W. Richard, 5,114,810, Cl. 429-194.000.

Brownlie, Alan W.: *See—*
Thompson, William H.; and Brownlie, Alan W., 5,114,365, Cl. 439-540.000.

Brucksch, Robert C.: *See—*
Amrein, Bruce E.; McCoy, Curtis L.; Brucksch, Robert C.; and Melnik, George, 5,113,779, Cl. 114-270.000.

Bruecken, Thomas: *See—*
Voss, Hartwig; and Bruecken, Thomas, 5,114,554, Cl. 204-182.400.

Brufani, Mario: *See—*
Scuri, Romolo; Brufani, Mario; Ceccarelli, Stefano; De Vellis, Patrizia; Giannetti, Patrizia; Paesano, Agnese; and Zanarcella, Sergio, 5,114,966, Cl. 514-469.000.

Bruhnke, John D.: *See—*
Porter, Ned A.; and Bruhnke, John D., 5,114,851, Cl. 435-173.000.

Brundiek, Horst, to Leosche GmbH. Grinding surface of rolling mills. 5,114,082, Cl. 241-121.000.

Brunhoff, Frederic P.; Lian, Enok P.; and Lian, Libbie B. Detachable boom and method for its use. 5,114,272, Cl. 405-66.000.

Bruno, Michael R.: *See—*
Bartelt, Robert D.; Belson, William W., III; and Bruno, Michael R., 5,114,120, Cl. 254-323.000.

Bruno, Michael Roman: *See—*
Bartelt, Robert D.; Belson, William W., III; and Bruno, Michael R., 5,114,120, Cl. 254-323.000.

Brunswick Corporation: *See—*
Steele, Michael F.; Lambright, John E.; and Dobson, George M., 5,114,677, Cl. 422-83.000.

Bryant, Billy O., to Bryant, Billy O. Above ground fuel storage and dispensing apparatus. 5,114,046, Cl. 222-108.000.

Bryant, David R.: *See—*
Abatjoglou, Anthony G.; and Bryant, David R., 5,114,473, Cl. 75-722.000.

Bryant, Robert D.; Hegde, Shridhar G.; and Lee, Len F., to Monsanto Company. Substituted pyridine compounds and herbicidal compositions and methods. 5,114,465, Cl. 71-94.000.

Brydon, Michael K. Door drilling template. 5,114,285, Cl. 408-115.00R.

Bryson, Robert A., to AM International Incorporated. Selective article wrapping. 5,113,639, Cl. 53-466.000.

Brzezinski, Ted A.: *See—*
Meli, Vincent A.; Matharani, Michael A.; Brzezinski, Ted A.; Shaft, David L.; and Urmanski, James L., 5,114,307, Cl. 414-793.100.

Buchbinder, Maurice, to Medtronic, Inc. Low profile steerable catheter. 5,114,414, Cl. 604-95.000.

Buchholz, Richard F.: *See—*
Rachor, Donald G.; and Buchholz, Richard F., 5,114,534, Cl. 162-9.000.

Buchwald, Hans; Raschkowski, Boleslaus; and Singer, Dieter, to Kali-Chemie AG. Cleaning compositions. 5,114,609, Cl. 252-171.000.

Buck, Harvey: *See—*
Berger, Johann; DeLaCroix, Fern; Buck, Harvey; and Schrenk, Juergen, 5,114,673, Cl. 422-56.000.

Buckeye Stamping Company, The: *See—*
Storer, Clyde K., 5,114,196, Cl. 292-307.00R.

Buegel, John F. Thumb release for pistol magazine. 5,113,603, Cl. 42-7.000.

Buelt, James L.: *See—*
Murphy, Mark T.; Buelt, James L.; Stottlemyre, James A.; and Tixier, John S., Jr., 5,114,277, Cl. 405-231.000.

Bugianesi, Robert L.: *See—*
Biftu, Tesfaye; Bugianesi, Robert L.; Girotra, Nirindar N.; Ponpipom, Mitree M.; Sahoo, Soumya P.; and Kuo, Chan H., 5,114,961, Cl. 514-397.000.

Buhr, Gerhard: *See—*
Scheler, Siegfried; Buhr, Gerhard; Lenz, Helmut; Bergmann, Klaus; and Siegel, Herbert, 5,114,816, Cl. 430-192.000.

Buhrer, Carl F., to GTE Laboratores Incorporated. Multi-position optical fiber rotary switch. 5,115,481, Cl. 385-25.000.

Bull HN Information Systems Inc.: *See—*
Maccianti, Tiziano; and Oldani, Angelo, 5,115,498, Cl. 395-425.000.

Bullinger, Philip W.: *See—*
Langford, Thomas L., II; and Bullinger, Philip W., 5,115,435, Cl. 371-22.300.

Bulow, Harald: *See—*
Taybl, Christa; Muller, Manfred; Gerke, Dieter; and Bulow, Harald, 5,114,356, Cl. 439-133.000.

Bunn-O-Matic Corporation: *See—*
Brewer, Alan W., 5,113,752, Cl. 99-295.000.

Bunyan, Michael A., to Chomerics, Inc. EMI/RFI shielding gasket. 5,115,104, Cl. 174-35.0GC.

Burakoff, Steven J.; and Schreiber, Stuart L., to President and Fellows of Harvard College; and Dana-Farber Cancer Institute, Inc. End-blocked peptides inhibiting binding capacity of gp120. 5,115,098, Cl 530-331.000.

Burbank, John E., to Ethicon, Inc. Safety mechanism for trocar. 5,114,407, Cl. 604-164.000.

Burgess, Ken L.; and Marvin, John S., to Hewlett Packard Company. Method of encoding an E-mail address in a fax message and routing the fax message to a destination on a network. 5,115,326, Cl. 358-440.000.

Burke, John W., Jr.; and Gazzara, Peter J. Face shield. 5,113,528, Cl. 2-9.000.

Burkey, Bruce; Chang, Win-Chyi; and Lee, Teh-Hsuang, to Eastman Kodak Company. Reducing dark current in charge coupled devices. 5,115,458, Cl. 377-58.000.
Burley, Richard; and Roche, Patrick, to Courtaulds PLC. Process for the production of cellulose acetate from wood pulp. 5,114,535, Cl. 162-9.000.
Burndy Corporation: *See—*
Ferraro, Neil P.; Nager, Urs F., Jr.; Logue, Raymond C.; Chen, Edward J.; and Lee, Patrick S., 5,113,679, Cl. 72-21.000.
Burroughs Wellcome Company *See—*
King, Ann C., 5,114,951, Cl. 514-290.000.
Burrows, Randy O.: *See—*
Amador, Gonzalo; Burrows, Randy O.; and Epp, George C., 5,114,066, Cl. 228-4.500.
Burton, Anthony R.; and Douglas, Dallas D., to Atlantic Richfield Company. Flare vent head. 5,114,445, Cl. 55-320.000.
Bush, Charles S.: *See—*
Cooper, David H.; and Bush, Charles S., 5,115,307, Cl. 358-98.000.
Bush, James W.: *See—*
Caillat, Jean-Luc M.; Weatherston, Roger C.; and Bush, James W., 5,114,322, Cl. 418-55.600.
Bushong, William C.: *See—*
Stahlke, Kurt-Rainer; and Bushong, William C., 5,114,983, Cl. 521-95.000.
Byers, Dallas L.: *See—*
Johnson, Paul C.; Colthart, James D.; Otermat, Arthur L.; Weingartner, David A.; Chou, Charles C.; Byers, Dallas L.; Stearns, Stephen M.; Marsden, Arnold R., Jr.; and Deeley, George M., 5,114,497, Cl. 134-21.000.
Byers, Jack A.: *See—*
Stallard, Barry W.; Makowski, Michael A.; and Byers, Jack A., 5,115,482, Cl. 385-28.000.
Byrd, James D.: *See—*
Junior, Kenneth E.; and Byrd, James D., 5,113,650, Cl. 60-253.000.
C. F. Braun & Co.: *See—*
Grotz, Bernard J., Jr., 5,114,694, Cl. 423-352.000.
Cable, Brian, to Elkhart Brass Mfg. Co., Inc. Foam/water/air injector mixer. 5,113,945, Cl. 169-15.000.
Cabletron Systems, Inc.: *See—*
Oliver, Christopher J., 5,115,235, Cl. 340-825.520.
Cadden, Robert L.: *See—*
Srch, James L.; and Cadden, Robert L., 5,114,125, Cl. 267-265.000.
Cadotte, Roland, Jr.: *See—*
Cummings, Michael; Cadotte, Roland, Jr.; and Rachlin, Adam, 5,115,210, Cl. 331-99.000
Caillat, Jean-Luc M.; Weatherston, Roger C.; and Bush, James W., to Copeland Corporation. Scroll-type machine having an inlet port baffle. 5,114,322, Cl. 418-55.600.
Cakmak, Mukerrem; and Dutta, Anit, to Edison Polymer Innovation Corp. Foamed polymer blends. 5,114,987, Cl. 521-84.100.
Calabrese, Frank A. Linear energy communicator. 5,113,962, Cl. 180-167.000.
Calderbank, Arthur R.; and Ozarow, Lawrence H., to AT&T Bell Laboratories. Technique for designing a multidimensional signaling scheme. 5,115,453, Cl. 375-39.000.
California Aqua Paddle, Inc.: *See—*
Alonzo, Rudy, 5,114,371, Cl. 441-129.000.
California Biotechnology Inc.: *See—*
Seilhamer, Jeffrey J.; Lewicki, John A.; Scarborough, Robert M.; and Porter, J. Gordon, 5,114,923, Cl. 514-12.000.
California Institute of Technology: *See—*
Bergman, Larry A., 5,115,497, Cl. 395-375.000.
McGrath, William R.; and Lubecke, Victor M., 5,115,217, Cl. 333-246.000.
Rowlette, John J., 5,114,807, Cl. 429-152.000.
Calkins, Donald W. Interchangeable tool alignment system. 5,114,286, Cl. 408-226.000.
Callaghan, David T.; Phipps, Alan M.; and Provancal, Stephen J., to Gillette Company, The. Antiperspirant composition. 5,114,705, Cl. 424-66.000.
Callemyn, Jean-Michel, to U.S. Philips Corp. System for management of the priorities of access to a memory and its application. 5,115,507, Cl. 395-725.000.
Calmar Inc.: *See—*
Knickerbocker, Michael G., 5,114,049, Cl. 222-153.000.
Cambridge Instruments Inc.: *See—*
Martino, Ronald J.; and Ramsey, Fred J., 5,115,339, Cl. 359-378.000.
Camilleri, Paul, to Foundation Technology Limited. Propulsion apparatus. 5,113,609, Cl. 37-87.000.
Camis, Thomas, to Hewlett-Packard Company. Electrostatically assisted transfer roller and method for directly transferring liquid toner to a print medium. 5,115,277, Cl. 355-273.000.
Camp, Mead B. Mathematical function demonstrator boards. 5,114,347, Cl. 434-214.000.
Campbell, Bryant A.; and Moulton, Kern A., to Abtox, Inc. Plasma sterilizer and method. 5,115,166, Cl. 315-111.210.
Campbell, Teddy G., to Texaco Inc. Aircraft engine protective cover. 5,114,098, Cl. 244-121.000.
Camras, Michael D.; Cook, Louis W.; and Robbins, Virginia M., to Hewlett-Packard Company. Electro-optical device with inverted transparent substrate and method for making same. 5,115,286, Cl. 357-19.000.
Canada, Her Majesty the Queen in right of: *See—*
Herget, Gerhard H., 5,113,707, Cl. 73-784.000.
Canaday, John S.; and Moss, Ernest K., to Sloss Industries Corporation. Process for making a laminate and the laminate made thereby. 5,114,755, Cl. 427-373.000.
Cancro, Lewis: *See—*
Kuznitz, Matthew; Brewster, David A.; Faryniarz, Joseph R.; and Cancro, Lewis, 5,114,717, Cl. 424-401.000.
Candor, James T. Apparatus and method for removing liquid from liquid bearing material. 5,114,553, Cl. 204-182.100.
Cannan, Thomas R.: *See—*
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., 5,114,563, Cl. 208-114.000.
Canon Kabushiki Kaisha: *See—*
Adachi, Nobukazu; and Yoshimoto, Toshio, 5,115,119, Cl. 219-469.000.
Echizen, Hiroshi; Fujioka, Yasushi; Nakagawa, Katsumi; Kanai, Masahiro; Kariya, Toshimitsu; Matsuyama, Jinsho; and Takei, Tetsuya, 5,114,770, Cl. 427-38.000.
Ishikawa, Hisashi, 5,115,241, Cl. 341-143.000.
Itoh, Masahiro, 5,115,259, Cl. 346-157.000.
Kawasaki, Hideshi, 5,115,284, Cl. 357-17.000.
Kobayashi, Makoto; Yoshida, Takehiro; Wada, Satoshi; Terajima, Hisao; Ono, Takeshi; Yokoyama, Minoru; Awai, Takashi; Tomoda, Akihiro; and Ishida, Yasushi, 5,115,255, Cl. 346-76.0PH.
Kusano, Akihisa; Kimizuka, Junichi; Ito, Toshiyuki; Sato, Kaoru; Abe, Makoto; Okazawa, Kazuhiko; and Inuyama, Toshihiko, 5,115,147, Cl. 307-311.000.
Maruta, Hidekazu; Adachi, Hiroyuki; Yamamoto, Akira; Kimura, Shigeo; and Kusaka, Kensaku, 5,115,278, Cl. 355-285.000.
Matsugu, Masakazu; Saitoh, Kenji; and Ohwada, Mitsutoshi, 5,114,236, Cl. 356-401.000.
Miyagi, Ken; and Miyake, Hiroyuki, 5,115,256, Cl. 346-108.000.
Miyazawa, Seiichi, 5,115,443, Cl. 372-46.000.
Muto, Kazuhiko; Shirai, Takahiro; and Yoshinari, Tsunenori, 5,115,124, Cl. 250-214.00L.
Notagashira, Hidefumi, 5,115,348, Cl. 359-697.000.
Ohtsuka, Masahito; Kobayashi, Hiroo; Moritani, Toshifumi; Yagi, Tadashi; Tsuchiya, Yoshiro; Azeta, Takahiro; Waragai, Tsuyoshi; Yukimachi, Hiroshi; and Miyake, Hiroaki, 5,115,281, Cl. 355-319.000.
Onuki, Kazuhiko, 5,115,308, Cl. 358-102.000.
Otsuka, Hiroyuki; Hosaka, Kotaro; and Higomura, Makoto, 5,114,234, Cl. 356-358.000.
Sakoh, Harumi; Sakai, Kiyoshi; and Amamiya, Shoji, 5,114,814, Cl. 430-46.000.
Suda, Shigeyuki; and Abe, Naoto, 5,114,235, Cl. 356-401.000.
Torigoe, Makoto; and Sato, Hiroshi, 5,114,223, Cl. 353-101.000.
Ujiie, Souhei; and Suzuki, Tadashi, 5,115,273, Cl. 355-209.000.
Yamazaki, Masuo, 5,114,337, Cl. 432-8.000.
Yoshinaga, Kazuo; Katagiri, Kazuharu; Tsuboyama, Akira; Kitayama, Hiroyuki; Shinjo, Kenji; and Hioki, Chieko, 5,114,613, Cl. 252-299.610.
Cantone, Christine L.: *See—*
Ashton, Wallace T.; Cantone, Christine L.; and Tolman, Richard L., 5,114,925, Cl. 514-18.000.
Capotosto, David A.: *See—*
Gelardi, Paul J.; Gelardi, John A.; and Capotosto, David A., 5,114,092, Cl. 242-199.000.
Capps, Lloyd O. Boat and dock guard. 5,113,702, Cl. 114-219.000.
Caralt Batlle, Jaime. Disposable hypodermic syringe. 5,114,410, Cl. 604-195.000.
Cardano, Mario, to Officine Meccaniche Giovanni Cerutti S.P.A. Device for the automatic clamping of a spool of material in web form. 5,114,088, Cl. 242-68.400.
Carey, James; Addario, John J.; and Juarez, Roberto. Absolute anti-roll emergency road flare. 5,113,765, Cl. 102-336.000.
Carl Freudenberg, Firma: *See—*
Hamaekers, Arno; and Simuttis, Arnold, 5,113,965, Cl. 180-300.000.
Carl, William P.: *See—*
Birdwell, Jeffrey D.; and Carl, William P., 5,114,515, Cl. 156-155.000.
Carnes, Harmon R.: *See—*
Fitz, George E., III; Krenz, Rudi O.; and Carnes, Harmon R., 5,115,112, Cl. 219-69.200.
Carnes, Vince S., to Chrysler Corporation. Retainer device and keyhole attaching arrangement. 5,114,203, Cl. 296-50.000.
Carney, Frederick P. Water freeze guard valve. 5,113,891, Cl. 137-60.000.
Caron, Fabrice, to SKF France. Clutch thrust bearing comprising means for connection to the operating member. 5,113,988, Cl. 192-98.000.
Carpenter, Robert B.: *See—*
Wilson, William N.; Bradshaw, Roger D.; Wilton, Bonsall S.; and Carpenter, Robert B., 5,113,943, Cl. 166-291.000.
Carr, Charles W.; and Kolodny-Hirsch, Douglas M., to Crop Genetics International Corporation. Method and apparatus for mass producing insects entomopathogens and entomoparasites. 5,113,799, Cl. 119-6.500.
Carr, J. Scott. Eyeglasses visor and retainer. 5,113,529, Cl. 2-13.000.
Carrick, Arthur W. Glass pane removal prevention device. 5,113,629, Cl. 52-207.000.
Carson, William L.: *See—*
Asher, Marc A.; Stripppgen, Walter E.; Heinig, Charles F.; and Carson, William L., 5,113,685, Cl. 72-458.000.

Carter, Michael A.: *See—*
Williamson, James T.; and Carter, Michael A., 5,114,327, Cl. 425-139.000.
Cartwright, Peter S.: *See—*
Biggin, Ian S.; Cartwright, Peter S.; Farrar, David; Hawe, Malcolm; and Paget, Walter E., 5,114,600, Cl. 252-86.000.
Casey, Lawrence J.: *See—*
Mushinski, Roger J.; Lewis, Charles E.; and Casey, Lawrence J., 5,114,012, Cl. 206-523.000.
Casio Computer Co., Ltd.: *See—*
Komuro, Junichi; Sato, Tetsuya; and Hidaka, Norihiro, 5,115,490, Cl. 395-400.000.
Matsumoto, Naoaki, 5,113,742, Cl. 84-615.000.
Cassidy, Edward F.; Gillis, Herbert R.; Hannaby, Malcolm; and Parfondry, Alain, to Imperial Chemical Industries plc. Internal mould release compositions. 5,114,480, Cl. 106-38.240.
Castillo, Jose R.; and de Liendo, Marilu S., to Intevep S.A. Fertilizers having a high hardness and storage stability. 5,114,458, Cl. 71-28.000.
Castro, Jacqueline. Zippered decorative necktie. 5,113,531, Cl. 2-144.000.
Catalyst Technology, Inc.: *See—*
Sapoff, Paul C., 5,114,685, Cl. 422-219.000.
Caterpillar Inc.: *See—*
Blunier, Dennis L.; Shankwitz, Phillip J.; Caudill, Maurice L.; Andreson, Paul D.; Kazmierzak, Richard R.; and Schweisberger, Joel C., 5,113,677, Cl. 72-7.000.
Caterpillar Paving Products, Inc.: *See—*
Smith, Donald W.; Plociennik, James J.; Goehst, George; and Green, Andrew, 5,114,267, Cl. 404-83.000.
Cathala, Jacques; and Forte, Pascale, to Faiveley Transport. Device for adjusting the bearing force of a pantograph on a catenary wire and process relating thereto. 5,115,405, Cl. 364-550.000.
Catheter Research, Inc.: *See—*
McCoy, William C., 5,114,402, Cl. 604-95.000.
Caudill, Maurice L.: *See—*
Blunier, Dennis L.; Shankwitz, Phillip J.; Caudill, Maurice L.; Andreson, Paul D.; Kazmierzak, Richard R.; and Schweisberger, Joel C., 5,113,677, Cl. 72-7.000.
Caulfield, John J.: *See—*
Bischoff, Ronald E.; Brandon, Mark A.; Caulfield, John J.; Cook, Lawrence G.; and Uplinger, George B., 5,114,018, Cl. 211-41.000.
Caulfield, Michael P.: *See—*
Rosenblatt, Michael; McKee, Roberta L.; Caulfield, Michael P.; and Nutt, Ruth F., 5,114,843, Cl. 435-7.210.
Cavalla, David J.: *See—*
Oxford, Alexander W.; Bays, David E.; Cavalla, David J.; and North, Peter C., 5,114,950, Cl. 514-294.000.
Cavanna S.p.A.: *See—*
Francioni, Renzo, 5,113,996, Cl. 198-441.000.
Cazaux, Yvon, to Thomson Composants Militaires et Spatiaux. Programmable integration time photosensitive sensor. 5,114,237, Cl. 358-213.230.
CBS Lens: *See—*
Civerchia, Linda, 5,114,627, Cl. 264-1.100.
Ceccarelli, Stefano: *See—*
Scuri, Romolo; Brufani, Mario; Ceccarelli, Stefano; De Vellis, Patrizia; Giannetti, Patrizia; Paesano, Agnese; and Zanarcella, Sergio, 5,114,966, Cl. 514-469.000.
Central Glass Company, Limited: *See—*
Taguchi, Chiaki; and Nishii, Hiroyuki, 5,115,142, Cl. 250-561.000.
Centre de Recherche Industrielle du Quebec: *See—*
Drolet, Luc; and Michaud, Paul, 5,113,969, Cl. 182-2.000.
CeraMem Corporation: *See—*
Goldsmith, Robert L.; and Bishop, Bruce A., 5,114,581, Cl. 210-650.000.
Cerami, Anthony: *See—*
Ulrich, Peter C.; and Cerami, Anthony, 5,114,943, Cl. 514-256.000.
Cerny, Mark S., to Siemens Automotive L.P. Fuel injector end cap. 5,114,077, Cl. 239-483.000.
Cesaroni, Anthony J. Corrugated thermoplastic sheet having fluid flow passages. 5,114,776, Cl. 428-131.000.
CFR Corporation: *See—*
Barry, Robert M., 5,114,574, Cl. 210-137.000.
Chalmers, Robert C., to Parker Hannifin Corporation. Electrically insulated tube union. 5,114,190, Cl. 285-53.000.
Chan, Aaron: *See—*
Kennedy, Michael; Pierce, Ben; and Chan, Aaron, 5,115,462, Cl. 379-29.000.
Chandross, Edwin A.: *See—*
Blyler, Lee L., Jr.; Chandross, Edwin A.; and Quan, Xina S., 5,115,487, Cl. 385-128.000.
Chaney, Earl J., Jr.; and Dziak, Theodore P., to Eveready Battery Company, Inc. Cell cover with internal compression ring of high yield strength material. 5,114,808, Cl. 429-172.000.
Chang, Chau-Ting: *See—*
Shei, Cheng-Yie; Hurng, Weir-Mirn; and Chang, Chau-Ting, 5,114,911, Cl. 505-1.000.
Chang, Robert; and McNicholas, Thomas J., Sr., to R. R. Donnelley & Sons Company. Signature feeding apparatus. 5,114,129, Cl. 270-1.100.
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Burkey, Bruce; Chang, Win-Chyi; and Lee, Teh-Hsuang, 5,115,458, Cl. 377-58.000.
Chaplin, Mitchell E.; Eaton, Geraldine M.; Hickie, Brian A.; Pascavage, Peter W.; and Tyson, Jessie, to Amoco Corporation. Multi-layer nonwoven web composites and process. 5,114,787, Cl. 428-284.000.
Charbonnel, Lucien: *See—*
Vives, Michel; Taveau, Pierre; Etienne, Jacques; Remillieux, Yves; and Charbonnel, Lucien, 5,114,772, Cl. 428-49.000.
Chatterjee, Sugata: *See—*
Franco, Christopher M.; Vijayakumar, Erra K. S.; Chatterjee, Sugata; Ganguli, Bimal N.; Blumbach, Jurgen; Kogler, Herbert; and Fehlhaber, Hans-Wolfram, 5,114,967, Cl. 514-475.000.
Chau, Hin-Leung: *See—*
Wise, Kensall D.; and Chau, Hin-Leung, 5,113,868, Cl. 128-675.000.
Chauhan, Satya P.: *See—*
Senapati, Nagabhusan; Johnson, Harold W.; Kim, Byung C.; Chauhan, Satya P.; Gamlen, Dennis A.; Eason, Raju; Muralidhara, H. S.; and Zelinski, Matthew S., 5,114,560, Cl. 204-299.00R.
Chavel, Pierre: *See—*
Baude, Dominique; Chavel, Pierre; Joyeux, Denis; and Taboury, Jean, 5,114,220, Cl. 351-160.00R.
Chen, Chang, to Tung I Enterprise Co., Ltd. Tool box with drawer member. 5,114,007, Cl. 206-373.000.
Chen, Edward J.: *See—*
Ferraro, Neil P.; Nager, Urs F., Jr.; Logue, Raymond C.; Chen, Edward J.; and Lee, Patrick S., 5,113,679, Cl. 72-21.000.
Chen, Feng: *See—*
Giessen, Bill C.; Markiewicz, Robert S.; and Chen, Feng, 5,114,905, Cl. 505-1.000.
Chen, Shi-Shiow: *See—*
Lii, Lucky J.; and Chen, Shi-Shiow, 5,114,980, Cl. 521-51.000.
Cherepenko, Evgeny A.: *See—*
Bordunov, Vladimir V.; Karmadonov, Leonid N.; Ospischev, Jury M.; Fedjunin, Vladimir A.; Zhuravkov, Sergei P.; Cherepenko, Evgeny A.; Sviridov, Anatoly B.; Verkhorubov, Lev S.; Mikhailov, Arkady T.; Bakhmutov, Jury L.; and Shaidurov, Valery S., 5,114,496, Cl. 134-13.000.
Chesebrough-Pond's USA Co., Division of Conopco, Inc.: *See—*
Kuznitz, Matthew; Brewster, David A.; Faryniarz, Joseph R.; and Cancro, Lewis, 5,114,717, Cl. 424-401.000.
Chetta, Gregory E.: *See—*
Giersdorf, Rodney L.; Peduzzi, Alfred; Krul, Allan D.; Jones, Stephen R.; and Chetta, Gregory E., 5,114,446, Cl. 55-345.000.
Chevron Research and Technology Company: *See—*
Graf, Peter E., 5,114,483, Cl. 106-281.100.
Zones, Stacey I.; Holtermann, Dennis L.; and Rainis, Andrew, 5,114,565, Cl. 208-138.000.
Chiacchio, Frank J.; and Tarantino, Frank L. Perforated retainer for horizontal mount gelled-electrolyte cells. 5,114,806, Cl. 429-126.000.
Chiba, Kosuke: *See—*
Tanaka, Kunio; and Chiba, Kosuke, 5,115,177, Cl. 318-568.100.
Chicago Bridge and Iron Technical Services: *See—*
Withers, Gregory J.; Meier, Stephen W.; Walter, Robert J.; Child, Michael D.; and DeGraaf, Douglas W., 5,115,219, Cl. 335-216.000.
Chick, Lawrence A.: *See—*
Pederson, Larry R.; Chick, Lawrence A.; and Exarhos, Gregory J., 5,114,702, Cl. 423-639.000.
Chieng, Ching K.: *See—*
Cloutier, Frank L.; Chieng, Ching K.; and Min, Siow W., 5,114,744, Cl. 427-96.000.
Chihara, Kohji Y.; and Lenke, Gerd M., to GenCorp Inc. Abrasion resistant polyurethane blend compositions. 5,115,007, Cl. 524-267.000.
Chikama, Terumi: *See—*
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onoda, Yoshihito; and Kuwahara, Hideo, 5,115,332, Cl. 359-189.000.
Child, Michael D.: *See—*
Withers, Gregory J.; Meier, Stephen W.; Walter, Robert J.; Child, Michael D.; and DeGraaf, Douglas W., 5,115,219, Cl. 335-216.000.
Children's Hospital of Philadelphia, The: *See—*
Zasloff, Michael, 5,114,921, Cl. 514-12.000.
Childress, James H.; and Newberry, Steve E., to Jewell Coal and Coke Company. Nonrecovery coke oven battery and method of operation. 5,114,542, Cl. 201-15.000.
Chino, Koichi: *See—*
Funabashi, Kiyomi; Kuriyama, Osamu; Chino, Koichi; Baba, Tsutomu; Nishi, Takashi; and Kikuchi, Makoto, 5,114,622, Cl. 252-629.000.
Chino, Naoyoshi: *See—*
Shibata, Norio; Sato, Tsunehiko; Chino, Naoyoshi; and Hiraki, Yasuhito, 5,114,753, Cl. 427-286.000.
Chino, Shinji: *See—*
Matsuo, Shigeru; Murakami, Shigeru; Chino, Shinji; and Yako, Naoto, 5,115,077, Cl. 528-125.000.
Chishima, Masamitsu; and Nozaki, Takao, to Sumitomo Wiring Systems Ltd. Connector. 5,114,359, Cl. 439-271.000.
Chisso Corporation: *See—*
Emoto, Naoyoshi; Saito, Hideo; and Furukawa, Kenji, 5,114,614, Cl. 252-299.650.
Chisso Corporation & Maruzen Petrochemical Co., Ltd.: *See—*
Kuroda, Takashi; Yamada, Kazuhiro; Ishibashi, Tadao; Hayashida, Suetou; Kimura, Kyoichiro; and Sameshima, Masaru, 5,114,638, Cl. 264-41.000.
Choi, Jong-seo: *See—*
Jeong, Jong-in; Choi, Jong-seo; No, Hwan-cheol; and Ju, Kyu-nam, 5,115,164, Cl. 313-346.0DC.
Cholestech Corporation: *See—*
Hewett, Gary E., 5,114,350, Cl. 435-288.000.

Cholet, Henri, to Institut Francais de Petrole. Device for separating a mixture of free gas and liquid at the intake of a pump at the bottom of a drilled well. 5,113,937, Cl. 166-105.500.
Chomerics, Inc.: *See*—
Bunyan, Michael A., 5,115,104, Cl. 174-35.0GC.
Chosa, Yosei: *See*—
Kawakami, Takeo; Kagami, Takashi; Chosa, Yosei; and Yoshida, Masato, 5,114,904, Cl. 503-227.000.
Chou, Charles C.: *See*—
Johnson, Paul C.; Colthart, James D.; Otermat, Arthur L.; Weingaertner, David A.; Chou, Charles C.; Byers, Dallas L.; Stearns, Stephen M.; Marsden, Arnold R., Jr.; and Deeley, George M., 5,114,497, Cl. 134-21.000.
Chou, Long-Shou, to Entropy International Co., Ltd. Ticket dispenser. 5,113,758, Cl. 101-66.000.
Chow, W. L.: *See*—
Gao, Ge, 5,114,099, Cl. 244-130.000.
Choy, Jerry F.: *See*—
Ditzler, Lee C.; Lemberger, Ronald; McGrane, Willam K.; and Choy, Jerry F., 5,114,576, Cl. 210-195.100.
Christensen, Per B.; and Sonderby, Svend A., to V. Kann Rasmussen Industri A/S. Venetian blind assembly for a window in an inclined roof. 5,113,922, Cl. 160-171.000.
Christlieb, Ignacio Y., to Allegheny-Singer Research Institute. Method for control of output of cardiomyostimulator. 5,113,858, Cl. 128-419.00P.
Chrysler Corporation: *See*—
Benford, Howard L., 5,113,984, Cl. 192-3.300.
Carnes, Vince S., 5,114,203, Cl. 296-50.000.
Vincent, Michael T., 5,113,827, Cl. 123-417.000.
Chung, Fung-Lung; Hecht, Stephen S.; Eklind, Karin; and Morse, Mark A., to American Health Foundation. Method of inhibiting lung tumors, arylalkyl isothiocyanates, and method of synthesizing same. 5,114,969, Cl. 514-514.000
Chung, Ting P., to Microtek International Inc. Automatic drift compensation method and device for position-loop controller. 5,115,180, Cl. 318-618.000.
Ciba-Geigy Corporation: *See*—
Boger, Manfred; Drabek, Jozef; and Ehrenfreund, Josef, 5,114,975, Cl. 514-630.000.
Gillespie, Peter J., 5,114,686, Cl. 422-300.000.
Hofer, Peter; Hagmann, Peter; Krieg, Gunther; and Vaas, Eberhard, 5,114,628, Cl. 264-1.400.
Horner, Hans-Peter, 5,115,005, Cl. 524-133.000.
Karrer, Friedrich, 5,114,968, Cl. 514-482.000.
Karrer, Friedrich; and Rindlisbacher, Alfred, 5,114,977, Cl. 514-720.000.
Lehmann, Urs, 5,114,430, Cl. 8-549.000.
Martin, Peter, 5,113,701, Cl. 118-58.000.
Martin, Peter, 5,113,785, Cl. 118-58.000.
Maschler, Reinhard; Steiner, Verena; Grutter, Markus G.; and Raschdorf, Fritz, 5,114,922, Cl. 514-12.000.
Moser, Hans; Bohner, Beat; and Fory, Werner, 5,114,462, Cl. 71-88.000.
Mueller, Karl F.; and Plankl, Walter L., 5,115,056, Cl. 526-243.000.
Cincinnati Milacron Inc.: *See*—
Dransman, Robert J., 5,115,377, Cl. 361-426.000.
Grimshaw, Michael N.; Albers, Stephen J.; and Rust, Ralph J., 5,114,519, Cl. 156-235.000.
Cincotta, Manuel; and Nadolink, Richard H., to United States of America, Navy. Articulated control surface. 5,114,104, Cl. 244-219.000.
Cipolla, Thomas M.; Coteus, Paul W.; Johnson, Glen W.; Murphy, Philip; and Oden, Christopher W., to International Business Machines Corp. Apparatus and method for inspection and alignment of semiconductor chips and conductive lead frames. 5,113,565, Cl. 29-25.010.
Citizen Watch Co., Ltd.: *See*—
Nihira, Shohachi, 5,113,759, Cl. 101-93.210.
Citta, Richard W., to Zenith Electronics Corporation. Digital video signal transmission system using reversible dispersive filters. 5,115,315, Cl. 358-186.000.
Civerchia, Linda, to CBS Lens, a California general partnership. Method for a collagen hydrogel producing. 5,114,627, Cl. 264-1.100.
Clarion Co., Ltd.: *See*—
Mori, Masaharu, 5,115,448, Cl. 375-1.000.
Clark, Angelika H.: *See*—
Berns, Evan M.; and Clark, Angelika H., 5,114,767, Cl. 428-35.700.
Clark, Linda A.; Gottscho, Richard A.; Kruskal, Joseph B.; and Lambert, Diane, to AT&T Bell Laboratories. Method for inspecting etched workpieces. 5,114,233, Cl. 356-354.000.
Clark Moulding Co., Inc.: *See*—
Hayslip, Michael R., 5,113,786, Cl. 118-314.000.
Clarke, Ray; and Solar, Matthew S., to Eclipse Surgical Technologies, Inc. Catheter torque mechanism. 5,114,403, Cl. 604-96.000.
Clayton, Charley H. Whipstock. 5,113,938, Cl. 166-117.600.
Clem, Arthur J., to James Clem Corporation. Clay mixture having contamination resistance. 5,114,892, Cl. 501-141.000.
Clement, Marc: *See*—
Smoot, Stephen W.; Hayden, Joseph S.; Clement, Marc; Grabowski, Danuta; Holzel, Eva; Nass, Peter; and Heming, Martin, 5,114,813, Cl. 430-5.000.
Cleveland, William C., Jr., to Loral Aerospace Corp. Laser targeting system. 5,114,227, Cl. 356-152.000.
Cloutier, Frank L.; Chieng, Ching K.; and Min, Siow W., to Hewlett-Packard Company. Method for applying a conductive trace pattern to a substrate. 5,114,744, Cl. 427-96.000.
Coachmen Industries, Inc.: *See*—
Haluda, Raymond; and Michen, Ramon, 5,114,183, Cl. 280-781.000.
Cobb, Wayne: *See*—
Bertoncini, Joseph; Kroener, Calvin; Cobb, Wayne; and Evans, Robert, 5,114,681, Cl. 422-111.000.
Coburn, Ronald, to Passive Bullet Traps Limited. Bullet trap. 5,113,700, Cl. 89-36.020.
Cocina, Joseph, Jr. Barrier apparatus and method of mounting same. 5,114,266, Cl. 404-6.000.
Cockayne, Brian; MacEwan, William R.; Harris, Ivor R.; and Smith, Nigel A., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Ferromagnetic materials. 5,114,669, Cl. 420-8.000.
Cockerill, George S.: *See*—
Blade, Robert J.; Peek, Robert J.; and Cockerill, George S., 5,114,940, Cl. 514-248.000.
Coddington, Kent D.: *See*—
Ben-Bassat, Arie; Coddington, Kent D.; and Johnson, Donald C., 5,114,849, Cl. 435-101.000.
Codex Corporation: *See*—
Hluchyj, Michael G.; and Yin, Nanying, 5,115,429, Cl. 370-84.000.
Coenen, Friedrich W. H.: *See*—
Ben-Nasr, Hedi; and Coenen, Friedrich W. H., 5,114,728, Cl. 426-427.000.
Coffey, Donald R. Water skier's safety system. 5,114,369, Cl. 411-11.000.
Coffey, Gerald P.: *See*—
Percec, Elena S.; Melamud, Lucy; and Coffey, Gerald P., 5,114,795, Cl. 428-516.000.
Coffinberry, George A., to General Electric Company. Self-powered heat exchange system. 5,113,669, Cl. 62-401.000.
Coffinberry, George A., to General Electric Company. Aircraft engine electrically powered boundary layer bleed system. 5,114,103, Cl. 244-209.000.
Cohen, Bernard: *See*—
Kole, Richard L.; and Cohen, Bernard, 5,114,409, Cl. 604-192.000.
Cohen, Eric D.; Jones, Andrew R.; de Castro, Jose T.; Litchfield, Paul; and Smith, Steven F., to Reebok International Ltd. Athletic shoe having inflatable bladder. 5,113,599, Cl. 36-88.000.
Cohen, Irun R.; Shinitzky, Meir; and Edelson, Richard L., to Yeda Research and Development Co. Ltd. Preparation of T-cell and T-cell membrane for use in prevention and treatment of autoimmune diseases. 5,114,721, Cl. 424-534.000.
Cohen, Irun R.; Elias, Dana; and Markovits, Doron, to Yeda Research and Development Co., Ltd. Diagnosis and treatment of insulin dependent diabetes mellitus. 5,114,844, Cl. 435-7.210.
Cohen, Mordechai, to Sundstrand Corporation. Low weight fan with internal cooling. 5,114,317, Cl. 417-354.000.
Cohen, Robert B.; and Garner, Robert E., to Motorola, Inc. Method and apparatus for preventing recursion jeopardy. 5,115,506, Cl. 395-725.000.
Cohen, Robert E.: *See*—
Gebzlioglu, Osman S.; Cohen, Robert E.; Argon, Ali S.; Beckham, Haskell W.; and Qin, Jian, 5,115,028, Cl. 525-232.000.
Coiffman, Bernardo. Displaced filler nut. 5,114,289, Cl. 411-13.000.
Colasanto, Thomas: *See*—
diGirolamo, Edward R.; Colasanto, Thomas; and Rothstein, Jonathan C., 5,113,631, Cl. 52-236.800.
Cole, Harold E., to Cole Machine & Mfg. Co. Method and apparatus for injection molding. 5,114,655, Cl. 264-318.000.
Cole, James J.: *See*—
Ahmad, Suhail; Cole, James J.; and Jensen, William, 5,114,580, Cl. 210-646.000.
Cole Machine & Mfg. Co.: *See*—
Cole, Harold E., 5,114,655, Cl. 264-318.000.
Coleman, John F.: *See*—
Evangelista, Donato D.; and Coleman, John F., 5,114,135, Cl. 271-187.000.
Colistro, Vincent A., to Schulte Industries Ltd. Rotary mower with five blade sets. 5,113,640, Cl. 56-6.000.
Collignon, Steven L.: *See*—
Consaga, John P.; and Collignon, Steven L., 5,114,506, Cl. 149-88.000.
Collins, Elia E., Jr. Aerosol can emptying device. 5,114,043, Cl. 222-86.000.
Colloid Research Institute: *See*—
Sekine, Masahiro; and Katayama, Shingo, 5,114,887, Cl. 501-95.000.
Colthart, James D.: *See*—
Johnson, Paul C.; Colthart, James D.; Otermat, Arthur L.; Weingaertner, David A.; Chou, Charles C.; Byers, Dallas L.; Stearns, Stephen M.; Marsden, Arnold R., Jr.; and Deeley, George M., 5,114,497, Cl. 134-21.000.
Comau S.p.A.: *See*—
Alborante, Giancarlo, 5,115,115, Cl. 219-121.630.
Commissariat a l'Energie Atomique: *See*—
Fedeli, Jean-Marc; Moriceau, Hubert; Muffato, Viviane; and Vaudaine, Marie-Helene, 5,113,575, Cl. 29-603.000.
Commonwealth Scientific and Industrial Research Organization: *See*—
Bannister, Michael J., 5,114,561, Cl. 204-421.000.
Compagnie Francaise D'Etudes et de Construction-Technip: *See*—
Paradowski, Henri; and Leroy, Michel, 5,114,450, Cl. 62-24.000.
Compaq Computer Corporation: *See*—
Dao, Hung D.; Grieff, Thomas W.; Lattin, Thomas W., Jr.; Thomas, Darren R.; Schultz, Stephen M.; Ewert, Richard; and Flower, David L., 5,115,225, Cl. 340-584.000.

Compton, David J.; Nix, Richard A.; and Leigh-Monstevens, Keith V., to Automotive Products plc. Modular hydraulic control apparatus. 5,113,657, Cl. 60-533.000.
Comstock, Gary L.: *See*—
Soroka, Daniel P.; Sheehan, Terrence M.; Comstock, Gary L.; and Greenall, Glenn E., 5,113,558, Cl. 29-57.000.
Conard, William A., to West Company, Incorporated, The. Tip off container cap with removable stem. 5,114,030, Cl. 215-249.000.
Concin, Antonio. Filter unit with high volumetric efficiency and reduced filtering surface. 5,114,583, Cl. 210-346.000.
Concord Communications, Inc.: *See*—
Furlong, Darrell, 5,115,451, Cl. 375-7.000.
Conine, James W.; Sparks, Denis L.; and Stowers, Julian L., to Eli Lilly and Company. Stabilized pergolide compositions. 5,114,948, Cl. 514-288.000.
Conlon, William M.; and Hendricks, Donald M., to Polar Spring Corporation. Melt system for liquid purification by batch crystallization. 5,113,664, Cl. 62-124.000.
Connell Limited Partnership: *See*—
Oster, Eugene A., 5,113,684, Cl. 72-448.000.
Connelly, Eugene B., to Crucible Materials Corporation. Device for measuring out-of-roundness. 5,113,591, Cl. 33-550.000.
Connor, David T.: *See*—
Boschelli, Diane H.; and Connor, David T., 5,114,958, Cl. 514-361.000.
Conoco Inc.: *See*—
Le, Hanh T., 5,115,059, Cl. 526-260.000.
Consaga, John P.; and Collignon, Steven L., to United States of America, Navy. Energetic composites of cyclodextrin nitrate esters and nitrate ester plasticizers. 5,114,506, Cl. 149-88.000.
Conslidated Flavor Corporation: *See*—
Ellis, Larry D., 5,114,730, Cl. 426-593.000.
Constructions Mechaniques F. LaRoche & Fils: *See*—
LaRoche, Robert; and Morel, Andre, 5,113,559, Cl. 29-121.100.
Control Module Inc.: *See*—
Bianco, James S.; and Drummond, Bernard, 5,115,121, Cl. 235-467.000.
Conway, Anthony J.; Conway, Philip J.; and Fryar, Richard D., Jr., to Rochester Medical Corporation. External urinary catheter having integral adhesive means. 5,114,417, Cl. 604-349.000.
Conway, Philip J.: *See*—
Conway, Anthony J.; Conway, Philip J.; and Fryar, Richard D., Jr., 5,114,417, Cl. 604-349.000.
Cook, Alan J., to Lucas Industries Public Limited Companies. Signal extraction apparatus and method. 5,115,128, Cl. 250-227.210.
Cook, Arnold J., to PCast Equipment Corporation. Investment casting of metal matrix composites. 5,113,925, Cl. 164-35.000.
Cook, Lawrence G.: *See*—
Bischoff, Ronald E.; Brandon, Mark A.; Caulfield, John J.; Cook, Lawrence G.; and Uplinger, George B., 5,114,018, Cl. 211-41.000.
Cook, Lewis W.; and Cregger, Warren K. Lawn mower control apparatus. 5,113,641, Cl. 56-10.500.
Cook, Louis W.: *See*—
Camras, Michael D.; Cook, Louis W.; and Robbins, Virginia M., 5,115,286, Cl. 357-19.000.
Cook, Robert W., to Vulcan Australia Limited. Heat exchanger. 5,113,844, Cl. 126-110.00R.
Cook, Stephen J.; O'Connor, Sean P.; and Pearce, Andrew, to BP Chemicals (Additive) Limited. Overbased calixarates, compositions containing them and use as lubricating oil additives. 5,114,601, Cl. 252-25.000.
Cooper, David H.; and Bush, Charles S., to Fuji Optical Systems. Electronic video dental camera. 5,115,307, Cl. 358-98.000.
Cooper, Grant S. Fire-fighting system. 5,113,946, Cl. 169-24.000.
CooperVision, Inc.: *See*—
Morland, Albert H.; and Warren, Timothy J., 5,114,629, Cl. 264-2.200.
Copeland Corporation: *See*—
Caillat, Jean-Luc M.; Weatherston, Roger C.; and Bush, James W., 5,114,322, Cl. 418-55.600.
Copermill Limited: *See*—
Hengelmolen, Adrianus J., 5,114,309, Cl. 415-114.000.
Copley, Michael C.; and Kwai, Cheung Y., to OTWP, Inc. Toy animal with illuminated belly. 5,114,376, Cl. 446-369.000.
Corain, Luciano, to NUOVOPIGNONE-Industrie Meccaniche e Fonderia S.p.A. Leaf spring type weft gripping device in a shuttleless loom. 5,113,914, Cl. 139-448.000.
Corbett, Daniel P., to Acushnet Company. Keyboard with conductive resilient pad. 5,114,790, Cl. 428-408.000.
Cordis Corporation: *See*—
Jahrmarkt, Scott L.; Viera, Fernando M.; and Box, J. William, 5,113,872, Cl. 128-772.000.
Cornelius, Craig J.: *See*—
Grlj, Steven F.; and Cornelius, Craig J., 5,113,698, Cl. 73-862.590.
Corning Incorporated: *See*—
Beall, Douglas M.; DeLiso, Evelyn M.; and Murtagh, Martin J., 5,114,643, Cl. 264-63.000.
Beall, Douglas M.; DeLiso, Evelyn M.; Guile, Donald L.; and Murtagh, Martin J., 5,114,644, Cl. 264-63.000.
Lapp, Josef C.; and Powley, Mark L., 5,114,884, Cl. 501-41.000.
Cornsweet, Tom N., to Pulse Medical Instruments. Method and apparatus for perimetry. 5,114,222, Cl. 351-204.000.
Cornwall, Mickey: *See*—
Stern, Theodore G.; and Cornwall, Mickey, 5,114,101, Cl. 244-173.000.
Corti, Mike E.; and Tenore, Richard R., to Rhone-Poulenc Surfactants and Specialties, L.P. Anhydrous blends of p-chloro-m-xylenol in surfactant mixtures. 5,114,978, Cl. 514-737.000.
Cosmescu, Ioan. Laser laparoscope assembly and method therefor. 5,114,422, Cl. 606-14.000.
Cote, James H.; and Ekberg, Jurgen M., to National Semiconductor Corporation. Cartridge with projections to secure articles held within. 5,114,005, Cl. 206-328.000.
Coteus, Paul W.: *See*—
Cipolla, Thomas M.; Coteus, Paul W.; Johnson, Glen W.; Murphy, Philip; and Oden, Christopher W., 5,113,565, Cl. 29-25.010.
Cotter, Gregory W. Bracket device and method of adjustable field shaping for external beam radiation therapy treatment. 5,115,139, Cl. 250-505.100.
Coufal, Hans J.; and Williams, Mason L., III, to International Business Machines Corporation. Magnetic head slider employing superconductor for levitation. 5,114,913, Cl. 505-1.000.
Coupland, Ralph: *See*—
Baines, Robert G.; Keegan, Colm M. P.; and Coupland, Ralph, 5,113,652, Cl. 60-288.000.
Courtaulds PLC: *See*—
Burley, Richard; and Roche, Patrick, 5,114,535, Cl. 162-9.000.
Cove Mercuri, Leslie M.; and Mercuri, Luis A. Flexible toy and therapeutic device. 5,114,377, Cl. 446-487.000.
Cowman, Stephen P., to ECCO Limited. Varistor structures. 5,115,221, Cl. 338-21.000.
Cox, Clarence J.: *See*—
Eckert, C. Edward; Hornack, Thomas R.; Lyness, George E.; Kaems, John A.; Cox, Clarence J.; Miller, Ronald E.; Apelian, Diran; and Mutharasan, Rajakkannu, 5,114,472, Cl. 75-412.000.
Cox, Michael J., to Rolls-Royce plc. Method for evaluating the working line characteristics of a compressor of a gas turbine engine. 5,113,646, Cl. 60-39.060.
Coyanosa Operations Company, Inc.: *See*—
Hensley, Jerry L., 5,114,595, Cl. 210-792.000.
Crandell, Keith: *See*—
Erwin, Lewis; Crandell, Keith; and Whitney, Justin, 5,114,907, Cl. 505-1.000.
Crawford, Ferdon H.; Shakour, Gabriel R.; Whitson, Robert C.; and Wise, Ernest R., to Miles Inc. Device for wiping a reagent strip. 5,114,678, Cl. 422-99.000.
Cray Research, Inc.: *See*—
Bartilson, Bradley W., 5,114,448, Cl. 55-491.000.
Creative Works L.P.: *See*—
Shapiro, Bruce; and Narubin, Gunar, 5,113,590, Cl. 33-471.000.
Cree, James W.: *See*—
Green, Keith; and Cree, James W., 5,113,924, Cl. 164-63.000.
Cregger, Warren K.: *See*—
Cook, Lewis W.; and Cregger, Warren K., 5,113,641, Cl. 56-10.500.
Cronin, John E.; Farrar, Paul A., Sr.; Linde, Harold G.; and Previti-Kelly, Rosemary A., to International Business Machines Corporation. Passivation of metal in metal/polyimide structures. 5,114,754, Cl. 427-333.000.
Crooks, John F.; and Protheroe, Robert L., to NCR Corporation. Method of correcting skew between a digitizer and a digital display. 5,115,107, Cl. 178-18.000.
Crop Genetics International Corporation: *See*—
Carr, Charles W.; and Kolodny-Hirsch, Douglas M., 5,113,799, Cl. 119-6.500.
Crosfield Press Controls Limited: *See*—
Gold, Daniel, 5,115,141, Cl. 250-548.000.
Cross, Peter E.: *See*—
Arrowsmith, John E.; Cross, Peter E.; and Thomas, Geoffrey N., 5,114,952, Cl. 514-309.000.
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Connelly, Eugene B., 5,113,591, Cl. 33-550.000.
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Knippscheer, Hermann; and Richard, Daniel D., 5,114,672, Cl. 122-41.000.
Cryomech, Inc.: *See*—
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Csotonyi, Gyula. Reversible variable speed drive mechanism. 5,114,386, Cl. 475-211.000.
Culbertson, Edwin C.; and Heberger, John M., to Hoechst Celanese Corporation. Process of manufacturing a polyester film with nodule surface. 5,114,739, Cl. 427-40.000.
Cummings, Michael; Cadotte, Roland, Jr.; and Rachlin, Adam, to United States of America, Army. Microwave oscillator using a ring resonator and operable as a remote temperature sensor. 5,115,210, Cl. 331-99.000.
Cupo, Robert L., to AT&T Bell Laboratories. Phase jitter correction arrangement. 5,115,452, Cl. 375-14.000.
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Milora, David J.; Shank, David M.; and Curato, Peter A., 5,114,426, Cl. 8-102.000.
Curran, Steven P., to Kansas State University Research Foundation. Simplified method and apparatus for producing white flour from wheat grain. 5,114,079, Cl. 241-3.000.
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Dunham, James L.; and Cutter, Catherine C., 5,114,244, Cl. 384-103.000.

Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Huges; Prazuck, Thierry; and Torres, Ghislaine, to Rhone-Poulenc Chimie. Polycondensation silicone elastomer dosage forms for the controlled release of iodine values. 5,114,707, Cl. 424-667.000.

Dae Sam Co., Ltd.: *See—*
Kim, Kwang M., 5,113,605, Cl. 42-50.000.

Daicel Chemical Industries, Ltd.: *See—*
Tanaka, Tokuji; Akimoto, Etsuji; and Ohta, Seiichi, 5,114,828, Cl. 430-272.000.

Daidousanso Company Ltd : *See—*
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; and Minato, Teruo, 5,114,500, Cl. 148-230.000.

Daig Corporation: *See—*
Fleischhaker, John J.; and Hidani, Tim T., 5,114,408, Cl. 604-167.000.

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Ihara, Kiyohiko; Ontani, Katsuhide; Nakata, Yutaka; and Miyatani, Toshio, 5,115,038, Cl. 525-326.200.

Daikyo Gomu Seiko Ltd.: *See—*
Sudo, Morihiro; Murak, Tomoyasu; Kawachi, Eiji; and Kawachi, Yasushi, 5,114,794, Cl. 428-447.000.

Daimler-Benz AG: *See—*
Schumacher, Josef; and Topfer, Claus, 5,113,655, Cl. 60-408.000.

Dais, Virginia A.; and Priddy, Duane B., to Dow Chemical Company, The. Hydroperoxide catalyzed free radical polymerization of vinyl aromatic monomers. 5,115,055, Cl. 526-225.000.

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Suzuki, Seiichi, 5,113,564, Cl. 28-218.000.

Dalebroux, Dean G., to Appleton Papers Inc. Thermally-responsive record material. 5,114,903, Cl. 503-209.000.

Daly, William H.: *See—*
West, Philip W.; and Daly, William H., 5,114,275, Cl. 405-128.000.

Damani, Nalinkant C., to Procter & Gamble Company, The. Sustained release compositions for treating periodontol disease. 5,114,718, Cl. 424-422.000.

D'Amelia, Ronald P.; and Jacklin, Peter T., to Nabisco Brands, Inc. Polyvinyl oleate as a fat replacement. 5,115,017, Cl. 525-59.000.

Damm, Sture, to Hoechst Aktiengesellschaft. Method for level exhaust dyeing cellulose fiber material with reactive dyes by the controlled addition of the fixing alkali with a given progression which is changed before completion. 5,114,427, Cl. 8-400.000.

Dana-Farber Cancer Institute, Inc.: *See—*
Burakoff, Steven J.; and Schreiber, Stuart L., 5,115,098, Cl. 530-331.000.

Dangschat, Manfred: *See—*
Sadlowski, Jurgen; Dangschat, Manfred; Diefenbach, Horst; Laser, Theo; and Schmitt, Deiter, 5,115,085, Cl. 528-272.000.

Daniel, Jacques: *See—*
Daniel, Sarah; Lewinthal, Dan; and Daniel, Jacques, 5,114,419, Cl. 604-385.100.

Daniel, Sarah; Lewinthal, Dan; and Daniel, Jacques. Hygienic device. 5,114,419, Cl. 604-385.100.

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Poloni, Alfredo, 5,113,582, Cl. 72-237.000.

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Dao, Hung D.; Grieff, Thomas W.; Lattin, Thomas W., Jr.; Thomas, Darren R.; Schultz, Stephen M.; Ewert, Richard; and Flower, David L., to Compaq Computer Corporation. Disk drive unit overheating warning system. 5,115,225, Cl. 340-584.000.

Dapperheld, Steffen; Heumuller, Rudolf; and Wildt, Manfred, to Hoechst Aktiengesellschaft. Process for the preparation of fluorinated acrylic acids and derivatives thereof. 5,114,546, Cl. 209-72.000.

d'Aprigny, Philippe D.; and Le Treut, Jean H., to Union Laitiere Normande. Method of making a new dairy-based food product from a milk ultrafiltration retentate. 5,114,729, Cl. 426-580.000.

Darley, Henry M.; Niehaus, Jeffrey A.; and Ovens, Kevin M., to Texas Instruments Incorporated. High speed multiplier. 5,115,408, Cl. 364-754.000.

Darlington, W. Bruce: *See—*
Hui, Sai H.; and Darlington, W. Bruce, 5,114,999, Cl. 524-47.000.

Data Exchange Corporation: *See—*
Widney, Douglas F., 5,115,358, Cl. 360-75.000.

Data Instruments, Inc.: *See—*
Bean, Orville E.; and Weber, Daniel R., 5,115,193, Cl. 324-207.120.

Daugherty, Rodney J. Universal container holding device. 5,114,106, Cl. 248-206.400.

Davis, Christopher B., to Mott Metallurgical Corporation. Ultra-high efficiency porous metal filter. 5,114,447, Cl. 55-485.000.

Davis, John M., to Miller Structures, Inc. Non-cumbustible modular building. 5,113,625, Cl. 52-143.000.

Davis, Jon P.: *See—*
Bobb, Lloyd C.; White, Barbara J.; Davis, Jon P.; and Samouris, Arthur, 5,115,127, Cl. 250-227.190.

Davis, Mark H.: *See—*
Bishop, Thomas P.; Davis, Mark H.; Peterson, James S.; and Surratt, Grover T., 5,115,505, Cl. 395-650.000.

Davis, Robert G.; and Bell, Allyn R., to Uniroyal Chemical Company, Inc. 4-quinoxalinyloxyphenoxyalkylnitrile herbicides. 5,114,464, Cl. 71-92.000.

Davis, Ronnie D. Fish stringer with hand-grip for horizontal carrying. 5,114,058, Cl. 224-103.000.

Davloor, Ramana; Root, Richard; and Root, Douglas R. Liquid sampling device. 5,113,711, Cl. 73-864.630.

Dawson, Albert K.: *See—*
Nappholz, Tibor A.; Hursta, William N.; Dawson, Albert K.; and Steinhaus, Bruce M., 5,113,869, Cl. 128-696.000.

Dawson, Derek J., to T&N Technology Limited. Grinding non-metallic hard materials. 5,113,624, Cl. 51-325.000.

Dean, Barry D., to Amoco Corporation. Miscible polyarylate-polyamide blends. 5,115,046, Cl. 525-425.000.

Dearien, John A., Jr. Wheel and rail assembly. 5,114,073, Cl. 238-15.000.

Debons, Francis E.; Pedersen, Larry D.; and Whittington, Lawrence E., to Texaco Producing Inc.; and Reed Lignin, Inc. Use of lignin-/amine/surfactant blends in enhanced oil recovery. 5,114,599, Cl. 252-8.554.

de Castro, Jose T.: *See—*
Cohen, Eric D.; Jones, Andrew R.; de Castro, Jose T.; Litchfield, Paul; and Smith, Steven F., 5,113,599, Cl. 36-88.000.

Deck, Philip D.; Rivera, Jose B.; and Harpel, William L., to Betz Laboratories, Inc. Low foaming alkaline cleaner comprising a surfactant mixture of an EO-PO-EO block copolymer and a PO-ZO-PO block copolymer. 5,114,607, Cl. 252-156.000.

Deeks, Daniel H. Energy storage arrangement. 5,113,661, Cl. 62-3.100.

Deeley, George M.: *See—*
Johnson, Paul C.; Colthart, James D.; Otermat, Arthur L.; Weingaertner, David A.; Chou, Charles C.; Byers, Dallas L.; Stearns, Stephen M.; Marsden, Arnold R., Jr.; and Deeley, George M., 5,114,497, Cl. 134-21.000.

Deford, Connie I.: *See—*
Reddy, Kalakota S.; and Deford, Connie I., 5,114,970, Cl. 514-526.000.

DeGraaf, Douglas W.: *See—*
Withers, Gregory J.; Meier, Stephen W.; Walter, Robert J.; Child, Michael D.; and DeGraaf, Douglas W., 5,115,219, Cl. 335-216.000.

de Haan, Erik: *See—*
Van de Ven, Henricus J. M.; and de Haan, Erik, 5,114,784, Cl. 428-246.000.

De Jong, Durk J., to U.S. Philips Corp. Method of displaying navigation data for a vehicle in an image of the vehicle environment, a navigation system for performing the method, and a vehicle comprising a navigation system. 5,115,398, Cl. 364-443.000.

DeLaCroix, Fern: *See—*
Berger, Johann; DeLaCroix, Fern; Buck, Harvey; and Schrenk, Juergen, 5,114,673, Cl. 422-56.000.

De Lange, Roelof, to U.S. Philips Corp. X-ray analysis apparatus comprising an adjustable slit diaphragm. 5,115,460, Cl. 378-150.000.

Delaware Capital Formation, Inc.: *See—*
Tucker, Jerome E.; and Dykstra, Henry, 5,115,110, Cl. 219-10.670.

Delco Electronics Corporation: *See—*
Nemirovsky, Mario D.; and Sale, Matthew D., 5,115,513, Cl. 395-800.000.
Wen, Cheng P.; Mendolia, Gregory S.; Siracusa, Mario; Maieron, Joseph J.; Higdon, William D.; Wooldridge, John J.; and Gulick, Jon, 5,115,245, Cl. 342-175.000.

Delgado, Joseph A.: *See—*
Gillespie, Gordon A.; and Delgado, Joseph A., 5,114,142, Cl. 273-26.00C.

de Liendo, Marilu S.: *See—*
Castillo, Jose R.; and de Liendo, Marilu S., 5,114,458, Cl. 71-28.000.

DeLiso, Evelyn M.: *See—*
Beall, Douglas M.; DeLiso, Evelyn M.; and Murtagh, Martin J., 5,114,643, Cl. 264-63.000.
Beall, Douglas M.; DeLiso, Evelyn M.; Guile, Donald L.; and Murtagh, Martin J., 5,114,644, Cl. 264-63.000.

Dell U.S.A. Corporation: *See—*
Durkin, Michael D., 5,115,503, Cl. 395-550.000.

DeLuca, Michael J.: *See—*
Ehmke, Edward L.; Nguyen, Tuan K.; and DeLuca, Michael J., 5,115,182, Cl. 320-14.000.

Delzio, Robert J. Cat scratching post feeder. 5,113,795, Cl. 119-51.010.

Deming, Victor H.: *See—*
Harris, William H., Jr; Nussbaum, William E.; Armstrong, Michael J.; Deming, Victor H.; and Brink, John E., 5,114,128, Cl. 270-11.000.

Demosthenous, Maria; and Van Meyel, Francis, to Tioxide Group PLC. Pigments. 5,114,486, Cl. 106-443.000.

Den Herder, James F. Support for dinghy. 5,113,783, Cl. 114-365.000.

Densu Prox., Inc.: *See—*
Miyamoto, Takashi; Miyagawa, Kazuya; Tomimatsu, Yukihito; Sugiura, Tsutomu; Nishi, Kenji; and Ichihara, Taku, 5,114,224, Cl. 353-122.000.

Desanta, Simon. Chair, in particular an office chair. 5,114,211, Cl. 297-301.000.

Design Opportunity Corp.: *See—*
Kole, Richard L.; and Cohen, Bernard, 5,114,409, Cl. 604-192.000.

Design Technology Corporation: *See—*
Robinson, Hugh, 5,113,753, Cl. 99-326.000.
Robinson, Hugh; and Menzin, Marvin, 5,113,754, Cl. 99-326.000.

Desmicht, Denis: *See—*
Bontems, Maurice; and Desmicht, Denis, 5,114,762, Cl. 428-34.500.

Despot, Janko: *See—*
Abendroth, Paul; Herzel, Joachim; Hummel, Peter; Ortner, Robert; Steuer, Joachim; Stoffler, Achim; and Despot, Janko, 5,113,762, Cl. 101-350.000.

Detection Systems, Inc.: *See—*
Kostusiak, Karl H.; Pedtke, Daniel F.; and Heckleman, Todd E., 5,115,224, Cl. 340-574.000.

Dethlefs, Ralf-Burkhard, to Felix Schoeller Jr. GmbH KG. Process for the production of pigment/plastic premixes. 5,114,990, Cl. 523-200.000.

Detwiler, Paul O.: *See—*
Mergenthaler, Barry M.; and Detwiler, Paul O., 5,115,333, Cl. 359-196.000.

Detzel, Josef; Matzel, Jurgen; Kraus, Rudolf; and Peissl, Dieter, to Lever Brothers Company, Division of Conopco, Inc. Pack. 5,114,069, Cl. 229-125.150.

Deutsch, Allan S.: *See—*
Musikanti, Barry L.; and Deutsch, Allan S., 5,114,343, Cl. 433-173.000.

Deutschbein, Ulrich: *See—*
Reil, Wilhelm; Deutschbein, Ulrich; Knobloch, Gerd; and Liebram, Udo, 5,114,068, Cl. 229-123.200.

De Vellis, Patrizia: *See—*
Scuri, Romolo; Brufani, Mario; Ceccarelli, Stefano; De Vellis, Patrizia; Giannetti, Patrizia; Paesano, Agnese; and Zanarcella, Sergio, 5,114,966, Cl. 514-469.000.

Diaz, Jorge V., to Duhalt, Luis R., a part interest. Method of absorbing oil using powdered aquatic lily plant. 5,114,593, Cl. 210-691.000.

Diaz, Stephen H.: *See—*
Tomita, Akira; Diaz, Stephen H.; Dubrow, Robert S.; and Feldman, Michael, 5,113,787, Cl. 118-400.000.

DiBugnara, Raymond, to Semicon Components, Inc. Method of manufacturing hybrid integrated circuit. 5,113,579, Cl. 29-840.000.

DIC-Hercules Chemicals, Inc.: *See—*
Ogawa, Masatomi; and Murata, Mitsuhiro, 5,115,065, Cl. 526-304.000.

Dickens, Virgel; and Minnick, Michael G., to General Electric Company. Reinforced polyester molding compositions having high gloss and improved resistance to warping. 5,115,016, Cl. 524-513.000.

Dickerman, JoAnn A.: *See—*
Dickerman, Stair; and Dickerman, JoAnn A., 5,113,857, Cl. 128-207.180.

Dickerman, Stair; and Dickerman, JoAnn A. Breathing gas delivery system and holding clip member therefor. 5,113,857, Cl. 128-207.180.

Dickerson, J. Phillip: *See—*
Rayborn, Jerry J.; and Dickerson, J. Phillip, 5,114,597, Cl. 507-126.000.
Rayborn, Jerry J.; and Dickerson, J. Phillip, 5,114,598, Cl. 507-126.000.

Dickey, Jonathan B. Helmet with filtered air supply. 5,113,853, Cl. 128-200.280.

Didier-Werke AG: *See—*
Pfyl, Anton, 5,114,123, Cl. 266-236.000.

Diefenbach, Horst: *See—*
Sadlowski, Jurgen; Dangschat, Manfred; Diefenbach, Horst; Laser, Theo; and Schmitt, Deiter, 5,115,085, Cl. 528-272.000.

Diehl GmbH & Co.: *See—*
Schroppel, Werner; and Leidenberger, Thomas, 5,114,095, Cl. 244-3.280.

Diffracto Ltd.: *See—*
Pryor, Timothy R., 5,114,230, Cl. 356-372.000.

DiFoggio, Rocco, to Shell Oil Company. Method for determining the properties and amount of fluid in a sample. 5,114,567, Cl. 208-401.000.

DiForte, Mario P. Inflatable life belt. 5,114,041, Cl. 222-6.000.

DiGiovanni, David J.; and Giles, Clinton R., to AT&T Bell Laboratories. Multi-stage optical amplifier. 5,115,338, Cl. 359-337.000.

diGirolamo, Edward R.; Colasanto, Thomas; and Rothstein, Jonathan C. Structural system for supporting a building utilizing light weight steel framing for walls and hollow core concrete slabs for floors and method of making same. 5,113,631, Cl. 52-236.800.

Digital Equipment Corporation: *See—*
Khan, Amanullah; and Lee, Neville K., 5,115,363, Cl. 360-104.000.
Samaras, William A.; Vaughan, David T.; and Ingraham, Andrew D., 5,115,455, Cl. 375-106.000.
Sidman, Michael D., 5,115,359, Cl. 360-77.050.
Sidman, Michael D., 5,115,360, Cl. 360-77.080.

Digital Optronics Corporation: *See—*
Goodwin, Frank E.; and Simonson, Dana, 5,114,226, Cl. 356-5.000.

Dilworth, Glendon L.: *See—*
Moyle, Don R.; and Dilworth, Glendon L., 5,114,368, Cl. 440-47.000.

Dionne, administratrix, Pauline E.: *See—*
Dionne, deceased Robert A.; and Dionne, administratrix, Pauline E., 5,114,656, Cl. 264-321.000.

Dionne, deceased Robert A.; and Dionne, administratrix, Pauline E. Method of forming packaging material. 5,114,656, Cl. 264-321.000.

Director-General of Agency of Industrial Science & Technology: *See—*
Yabusaki, Yoshiyasu; Murakami, Hiroko; Sakai, Toshiyuki; Shibata, Megumi; and Ohkawa, Hideo, 5,114,852, Cl. 435-189.000.

D'Iribarne, Benoit: *See—*
Promper, Hans-Josef; D'Iribarne, Benoit; Kuster, Hans-Werner; Nowoczyn, Hans-Werner; and Vanaschen, Luc, 5,114,454, Cl. 65-163.000.

Disch, Michael A.: *See—*
Weiland, Walter M.; Disch, Michael A.; and Ohm, Patrick L., 5,115,106, Cl. 200-517.000.

Disselbeck, Dieter; Berger, Karl C.; and Drews, Jurgen, to Hoechst Aktiengesellschaft; and Hagen Batterie AG. Electrodes for primary and secondary electric cells. 5,114,812, Cl. 429-234.000.

Ditcher, Jack, to A-LOK Products, Inc. Gasket for use in manhole bases and the like. 5,114,162, Cl. 277-207.00A.

Dittrick/Christensen Enterprises, Inc.: *See—*
Westberg, Frederick W.; and Brondos, Dean P., 5,115,145, Cl. 307-10.300.

Ditzler, Lee C.; Lemberger, Ronald; McGrane, Willam K.; and Choy, Jerry F., to TriNeos. Prevention of contaminants buildup in captured and recirculated water systems. 5,114,576, Cl. 210-195.100.

Divita, Sam: *See—*
Savage, Robert O.; Fischer, Robert J.; and Divita, Sam, 5,114,738, Cl. 427-37.000.

DJS&T Limited Partnership: *See—*
Stern, Donald J.; Heaton, Jeff S.; and Tryon, James A., 5,114,527, Cl. 156-575.000.

do Espirito Santo, Antonio Ferreita. Double external rear view mirror assembly for vehicles. 5,115,352, Cl. 359-855.000.

Dobson, George M.: *See—*
Steele, Michael F.; Lambright, John E.; and Dobson, George M., 5,114,677, Cl. 422-83.000.

Dr. Ing. h.c.F. Porsche AG: *See—*
Thull, Wolfram; and Kohlmeier, Hans-Heinrich, 5,114,182, Cl. 280-779.000.

Dr. Karl Thomae GmbH: *See—*
Ballhause, Helmut; Engelhardt, Gunther; Landgraf, Claus A.; Mayer, Norbert; Roth, Willy; Schumacher, Kurt; and Prox, Alex, 5,114,935, Cl. 514-228.800.

Doherty, Henry T., to Berwick Industries Inc. Decorative drawstring bow forming ribbon assembly. 5,114,761, Cl. 428-4.000.

Dohmeier, Daniel M.: *See—*
Jorgenson, James W.; and Dohmeier, Daniel M., 5,115,131, Cl. 250-288.000.

Doi, Mizuho: *See—*
Takebe, Katsuhiko; Doi, Mizuho; Takehara, Hiroyasu; Hiyama, Satoshi; and Urabe, Masanobu, 5,115,292, Cl. 357-26.000.

Doi, Yoichi: *See—*
Shimizu, Osamu; Tenmoku, Kenji; Doi, Yoichi; and Mito, Kunihiko, 5,115,238, Cl. 340-988.000.

Doi, Yoshinori: *See—*
Tamai, Seishin; Doi, Yoshinori; and Araki, Masakatsu, 5,113,957, Cl. 172-10.000.

Donnelly Corporation: *See—*
Lynam, Niall R., 5,115,346, Cl. 359-604.000.

Donovan, Joseph F., to Baker Hughes Incorporated. Surface sand detection monitoring device and method. 5,113,941, Cl. 166-250.000.

Dorr, Hermann, to Siemens Aktiengesellschaft. Control valve for media in vapor or liquid form. 5,113,902, Cl. 137-556.000.

Dorr, Hermann, to Siemens Aktiengesellschaft. Steam converting valve with spindle actuation. 5,113,903, Cl. 137-556.000.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Saito, Makoto; and Gunji, Minoru, 5,114,663, Cl. 376-233.000.

Dosch, Jeffrey J.; and Zappa, James V., to Figgie International, Inc. Quick-donning protective hood assembly. 5,113,854, Cl. 128-201.230.

Douglas, Dallas D.: *See—*
Burton, Anthony R.; and Douglas, Dallas D., 5,114,445, Cl. 55-320.000.

Dover Corporation: *See—*
Sunderhaus, Charles A.; and Anderson, Paul B., 5,114,271, Cl. 405-52.000.

Dow Chemical Company, The: *See—*
Birdwell, Jeffrey D.; and Carl, William P., 5,114,515, Cl. 156-155.000.
Brennan, David J.; White, Jerry E.; Haag, Anthony P.; and Kram, Shari L., 5,115,075, Cl. 528-99.000.
Dais, Virginia A.; and Priddy, Duane B., 5,115,055, Cl. 526-225.000.
Elwell, Richard J.; Sewell, Robert A.; Lidy, Werner A.; and Thoen, Johan A., 5,114,989, Cl. 521-159.000.
Harris, Robert F.; and Joseph, Michael D., 5,115,070, Cl. 528-59.000.
Heuvelsland, A. J., 5,114,619, Cl. 252-182.270.
Howard, Kevin E., 5,114,750, Cl. 427-226.000.
Kirkpatrick, Donald E.; Stevenson, James A.; and Hyun, Kun S., 5,115,029, Cl. 525-239.000.
Lin, Chung-Yuan, 5,114,986, Cl. 521-131.000.
Reddy, Kalakota S.; and Deford, Connie I., 5,114,970, Cl. 514-526.000.
Schell, Joseph G., Jr.; Marchand, Gary R.; and Meiske, Larry A., 5,114,897, Cl. 502-111.000.
Sikkema, Kevin D.; and Priddy, Duane B., 5,115,058, Cl. 526-258.000.

DowElanco: *See—*
Dreikorn, Barry A.; Jourdan, Glen P.; and Suhr, Robert G., 5,114,939, Cl. 514-248.000.

Downing, Bennie R.: *See—*
Richardson, Richard J.; and Downing, Bennie R., 5,113,628, Cl. 52-171.000.

Doyel, John S. Shoe organizer. 5,114,017, Cl. 211-34.000.

Drabek, Jozef: *See—*
Boger, Manfred; Drabek, Jozef; and Ehrenfreund, Josef, 5,114,975, Cl. 514-630.000.

Drachkovitch, Albert, to Astucit. Spinning spoon for fishing carnivorous fish. 5,113,615, Cl. 43-42.190.

Dragerwerk Aktiengesellschaft: *See—*
Kummerfeld, Ryszard; Baumgarten, Siegfried; Holzapfel, Gerd; Falb, Wolfgang; and Palm, Ulrich, 5,113,897, Cl. 137-357.000.
van der Smissen, Carl E., 5,113,856, Cl. 128-205.270.

Drahtseilwerk Saar GmbH: *See—*
Verreet, Roland, 5,114,025, Cl. 212-147.000.

Drake, Todd R.: *See—*
Belove, Edward J.; Drake, Todd R.; Kaplan, S. Jerrold; Kapor, Mitchell D.; Landsman, Richard A.; and Zagieboylo, Stephen, 5,115,504, Cl. 395-600.000.

Dransman, Robert J., to Cincinnati Milacron Inc. Wireway channel assembly for electrical cabinets. 5,115,377, Cl. 361-426.000.

Dray, James R., to Union Carbide Industrial Gases Technology Corporation. Cryogenic air separation system for producing elevated pressure product gas. 5,114,452, Cl. 62-24.000.

Drefs, Wolfgang: *See—*
Kuhn, Friedrich; Drefs, Wolfgang; Ruff, Hans; and Scheuter, Siegbert, 5,114,062, Cl. 226-95.000.

Dreikorn, Barry A.; Jourdan, Glen P.; and Suhr, Robert G., to DowElanco. Substituted quinolines and cinnolines as fungicides. 5,114,939, Cl. 514-248.000.

Drennen, David B.; Huth, Ronald G.; and Hudson, David M., to General Motors Corporation. Fluid return channels for a cover of a viscous fluid clutch. 5,113,987, Cl. 192-58.00B.

Dresser Industries, Inc.: *See—*
Steinke, Joseph H., 5,113,908, Cl. 137-625.300.

Drews, Jurgen: *See—*
Disselbeck, Dieter; Berger, Karl C.; and Drews, Jurgen, 5,114,812, Cl. 429-234.000.

Driessen, Jan, to Monroe Auto Equipment Company. Base valve for a shock absorber. 5,113,979, Cl. 188-280.000.

Drolet, Luc; and Michaud, Paul, to Centre de Recherche Industrielle du Quebec. Displaceable working platform with extensible boom. 5,113,969, Cl. 182-2.000.

Drummond, Bernard: *See—*
Bianco, James S.; and Drummond, Bernard, 5,115,121, Cl. 235-467.000.

Dry, Michael J.: *See—*
Meihack, Wolfgang F. A. T.; Barcza, Nicholas A.; and Dry, Michael J., 5,114,700, Cl. 423-571.000.

Du Pont Canada Inc.: *See—*
Wong, Chun S., 5,115,033, Cl. 525-285.000.

DuBois, Thomas D.: *See—*
Tranjan, Farid M.; DuBois, Thomas D.; Frieser, Rudolf G.; Bobbio, Stephen M.; and Jones, Susan K. S., 5,114,827, Cl. 430-271.000.

Dubreux, Bernard; Kervennal, Jacques; Mulard, Philippe; and Pralus, Michele, to Atochem. Directly distilled diesel fuels having improved cetane numbers. 5,114,433, Cl. 44-322.000.

Dubreux, Bernard: *See—*
Praulus, Michele; Dubreux, Bernard; and Mulard, Philippe, 5,114,434, Cl. 44-322.000.

Dubrow, Robert S.: *See—*
Tomita, Akira; Diaz, Stephen H.; Dubrow, Robert S.; and Feldman, Michael, 5,113,78[illegible], Cl. 118-400.000.

Dubuit, Jean-Louis, to Societe Nouvelle C.T.A. Machine for frosting glass articles. 5,114,525, Cl. 156-345.000.

Ducanis, Paul. Bar stock guide arrangement for screw machines. 5,113,730, Cl. 82-162.000.

Duckett, Ronnie E.: *See—*
Bode, Jerry E.; and Duckett, Ronnie E., 5,113,708, Cl. 73-862.410.

Ducourant, Thierry, to U.S. Philips Corporation. Differential stage comprising MESFETS. 5,115,153, Cl. 307-491.000.

Dudek, David M.: *See—*
Radosav, Jon J.; Evans, Thomas A.; Dudek, David M.; Wieser, Russell G.; Atwater, Brian J.; and Eisbrenner, Robert J., 5,114,163, Cl. 277-81.00S.

Duffey, Craig L., to Liqui-Box/B-Bar-B Corporation. Process for sterilizing surfaces. 5,114,670, Cl. 422-24.000.

Dugrand, Louis: *See—*
Menigaux, Louis; and Dugrand, Louis, 5,115,285, Cl. 357-17.000.

Duhalt, Luis R.: *See—*
Diaz, Jorge V., 5,114,593, Cl. 210-691.000.

Duke University: *See—*
Porter, Ned A.; and Bruhnke, John D., 5,114,851, Cl. 435-173.000.

Dumschat, Rainer; and Schremmer, Gottfried, to Mercedes-Benz AG. Releasable locking device for a vehicle steering column adjustable in the longitudinal direction. 5,113,716, Cl. 74-493.000.

Dunham, James L.; and Cutter, Catherine C. Compliant bearing surface with enclosed fluid support. 5,114,244, Cl. 384-103.000.

Dunlap, David R.: *See—*
Paulonis, George J.; and Dunlap, David R., 5,115,114, Cl. 219-99.000.

Dunn, John C. Chair insert having a contoured back support portion and a seat support portion. 5,114,209, Cl. 297-231.000.

Dunn, Ken, to Electrolux Northern Limited. Lawn mowers. 5,113,642, Cl. 56-12.800.

Dunn, Murray, to Thermo Electron Technologies Corp. Compact coude optics system. 5,115,355, Cl. 359-876.000.

Dupin, Richard M., to Union Oil Company of California, dba UNOCAL. Apparatus and method for mooring a floating vessel. 5,114,276, Cl. 405-224.000.

Du Pont de Nemours, E. I., and Company: *See—*
Hormadaly, Jacob, 5,114,885, Cl. 501-76.000.
Howe, King L., 5,115,012, Cl. 524-456.000.
Jackisch, David A.; May, Ralph F.; and Berl, Kevin D., 5,114,003, Cl. 206-204.000.
Katsaros, James D., 5,114,658, Cl. 264-537.000.
Lee, Kiu-Seung, 5,114,652, Cl. 264-184.000.
Lewandowski, B. Pinkerton; and Fahsel, Michael J., 5,115,457, Cl. 378-45.000.
Mirabeau, Mary N.; and Rohrbacher, Frank, 5,114,756, Cl. 427-379.000.
Mitra, Niranjan, 5,114,363, Cl. 439-491.000.
Waggoner, Marion G.; and Samuels, Michael R., 5,115,080, Cl. 528-190.000.
Williams, John G.; and Rosanio, Louis, 5,114,858, Cl. 435-270.000.

Dupre, Marion A.: *See—*
Major, Michael D.; and Dupre, Marion A., 5,114,732, Cl. 426-605.000.

Durand, John E. Nutator bearing assembly. 5,114,323, Cl. 418-58.000.

Durkin, Michael D., to Dell U.S.A. Corporation. System for adapting its clock frequency to that of an associated bus only when it requires usage thereof. 5,115,503, Cl. 395-550.000.

Durkin-Reed, Inc.: *See—*
Reed, Mark E., 5,115,116, Cl. 219-202.000.

Durkopp Adler AG: *See—*
Grube, Erwin; Kuhlmann, Walter; and Schneuing, Ralf, 5,113,998, Cl. 198-465.400.

D'Urso, Anthony M.: *See—*
Sandstrom, Eric L.; Prokop, Alfred; Young, William H., II; and D'Urso, Anthony M., 5,114,582, Cl. 210-321.740.

Dusch, Albert; and Walter, Karl-Heinz, to Pfaff Industriemaschinen GmbH. Thread cutting device on a sewing machine. 5,113,774, Cl. 112-292.000.

Dustin, Miles O.: *See—*
Baker, Karl W.; and Dustin, Miles O., 5,113,659, Cl. 60-641.800.

Dutta, Anit: *See—*
Cakmak, Mukerrem; and Dutta, Anit, 5,114,987, Cl. 521-84.100.

Dutzmann, Stefan: *See—*
Klausener, Alexander; Kleefeld, Gerd; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 5,114,959, Cl. 514-369.000.

Duvel, Lane A., to Helene Curtis, Inc. Stable conditioning shampoo containing anionic surfactant/cationic conditioning agent - non-volatile silicone emulsion. 5,114,706, Cl. 424-70.000.

Dykstra, Henry: *See—*
Tucker, Jerome E.; and Dykstra, Henry, 5,115,110, Cl. 219-10.670.

Dziak, Theodore P.: *See—*
Chaney, Earl J., Jr.; and Dziak, Theodore P., 5,114,808, Cl. 429-172.000.

Dziorny, Paul J.: *See—*
McAuliffe, Christopher; and Dziorny, Paul J., 5,113,670, Cl. 62-402.000.

Eagle Industry Co., Ltd.: *See—*
Ootsuka, Junji; Ogata, Youichi; and Nishi, Keizaburo, 5,114,160, Cl. 277-70.000.

Earnhardt, Daniel E., to Siemens Automotive L.P. Functional testing of solenoid valves in air. 5,113,705, Cl. 73-168.000.

Earth Solutions, Inc.: *See—*
Brinsmead, Brian J.; Stepenoff, Gary F.; Bess, Vicki H.; Huxel, Gary R.; and Wetmore, John A., 5,114,568, Cl. 209-170.000.

Eason, Raju: *See—*
Senapati, Nagabhusan; Johnson, Harold W.; Kim, Byung C.; Chauhan, Satya P.; Gamlen, Dennis A.; Eason, Raju; Muralidhara, H. S.; and Zelinski, Matthew S., 5,114,560, Cl. 204-299.00R.

Eastman, Jay M., to Photographic Sciences Corporation. Scan modules for bar code readers and in which scan elements are flexurally supported. 5,115,120, Cl. 235-462.000.

Eastman Kodak Company: *See—*
Burkey, Bruce; Chang, Win-Chyi; and Lee, Teh-Hsuang, 5,115,458, Cl. 377-58.000.
Erhardt, Herbert J., 5,114,833, Cl. 430-313.000.
Finnicum, Douglas S.; Schickler, Edward R.; Soules, William J.; and Wahlers, Robert A., 5,114,759, Cl. 427-420.000.
Landis, Newton C. M., 5,114,514, Cl. 156-153.000.
Miskinis, Edward T.; Johnson, Frank H.; and Paczkowski, Francis M., 5,115,276, Cl. 355-253.000.
Pettrone, Frank A.; Whited, Gregory M.; and Goodhue, Charles T., 5,114,850, Cl. 435-135.000.
Reafler, Gerald G., 5,114,789, Cl. 428-328.000.
Reifler, Angela H.; and Norkus, Norbert S., 5,114,679, Cl. 422-100.000.
Roselle, Paul L.; Kosman, Stephen L.; and Mahns, Patricia A., 5,114,872, Cl. 437-48.000.
Schappler, Joseph J., 5,115,264, Cl. 354-82.000.
Schildkraut, Jay S.; Scozzafava, Michael; and Howe, Dennis G., 5,115,336, Cl. 359-263.000.
Silva, Fernando G., 5,115,356, Cl. 360-51.000.
Swayze, Samuel F., 5,115,265, Cl. 354-82.000.

Eaton Corporation: *See—*
Leonard, Mark L.; Uthoff, Loren H., Jr.; and Hastings, Jerome K., 5,115,162, Cl. 310-339.000.

Eaton, Geraldine M.: *See—*
Chaplin, Mitchell E.; Eaton, Geraldine M.; Hickie, Brian A.; Pascavage, Peter W.; and Tyson, Jessie, 5,114,787, Cl. 428-284.000.

Eaton Leonard Picot S.A.: *See—*
Lafrasse, Jean, 5,113,683, Cl. 72-306.000.

Ebara Corporation: *See—*
Ushitora, Akihiro; Yamaguchi, Kazuo; and Asanagi, Tsuneo, 5,114,280, Cl. 406-18.000.

Ebel, Steven J.; Pyszczyk, Michael F.; Frysz, Christine A.; and Zelinsky, Michael A., to W. Greatbatch Ltd. High energy density non-aqueous electrolyte lithium cell operational over a wide temperature range. 5,114,811, Cl. 429-194.000.

Ebersole, Ronald J.: *See—*
Nilsson, Sven-Axel; Ebersole, Ronald J.; Bier, Gerhard; and Honeck, Karl-Heinz, 5,115,511, Cl. 395-800.000.

Ebihara, Toshiyuki; Sakai, Satoru; Nishikawa, Masaji; and Asano, Masashi, to Olympus Optical Co., Ltd. Apparatus for editing and printing a video image. 5,115,320, Cl. 358-296.000.

ECCO Limited: *See—*
Cowman, Stephen P., 5,115,221, Cl. 338-21.000.

Echizen, Hiroshi; Fujioka, Yasushi; Nakagawa, Katsumi; Kanai, Masahiro; Kariya, Toshimitsu; Matsuyama, Jinsho; and Takei, Tetsuya, to Canon Kabushiki Kaisha. Method for continuously forming functional deposited films with a large area by a microwave plasma CVD method. 5,114,770, Cl. 427-38.000.

Echte, Adolf: *See—*
Bronstert, Klaus; Schwaben, Hans-Dieter; and Echte, Adolf, 5,115,022, Cl. 525-92.000.

Eckart, Donald W.: *See—*
Branovich, Louis F.; Freeman, Gerard L.; and Eckart, Donald W., 5,114,742, Cl. 427-77.000.

Eckert, C. Edward; Hornack, Thomas R.; Lyness, George E.; Kaems, John A.; Cox, Clarence J.; Miller, Ronald E.; Apelian, Diran; and Mutharasan, Rajakkannu, to Aluminum Company of America. Multistage rigid media filter for molten metal and method of filtering. 5,114,472, Cl. 75-412.000.

Eclipse Surgical Technologies, Inc.: *See—*
Clarke, Ray; and Solar, Matthew S., 5,114,403, Cl. 604-96.000.

Economou, Demitri G. Simple stepless variable transmission. 5,113,712, Cl. 74-69.000.

Edelhoff, Gustav D.; and Smith, Fred T., to Edelhoff Polytechnik GmbH & Co. Motor-driven garbage truck comprising a detachable container. 5,114,304, Cl. 414-786.000.

Edelhoff Polytechnik GmbH & Co.: *See—*
Edelhoff, Gustav D.; and Smith, Fred T., 5,114,304, Cl. 414-786.000.
Kirchhoff, Johannes, 5,114,297, Cl. 414-622.000.

Edelson, Richard L.: *See—*
Cohen, Irun R.; Shinitzky, Meir; and Edelson, Richard L., 5,114,721, Cl. 424-534.000.

Edison Polymer Innovation Corp.: *See—*
Cakmak, Mukerrem; and Dutta, Anit, 5,114,987, Cl. 521-84.100.

Egan, Richard W.: *See—*
Bottero, Fabrizio, 5,114,724, Cl. 426-249.000.

Egawa, Sinpei: *See—*
Shimomura, Takeshi; Sakane, Katumi; Tokuda, Makoto; and Egawa, Sinpei, 5,114,184, Cl. 280-784.000.

Eggenschwiler, Hans: *See—*
Meisser, Claudio; Eggenschwiler, Hans; and Nehls, Walter, 5,114,302, Cl. 414-751.000.

Eggerding, David W.: *See—*
Kennedy, Steven; Eggerding, David W.; and Moore, Lionel D., 5,114,603, Cl. 252-56.00R.

Eguchi, Takeo, to Sony Corporation. Frequency equalizer. 5,115,213, Cl. 333-18.000.

Ehmke, Edward L.; Nguyen, Tuan K.; and DeLuca, Michael J., to Motorola, Inc. Battery charging controller for a battery powered device and method for using the same. 5,115,182, Cl. 320-14.000.

Ehrenfreund, Josef: *See—*
Boger, Manfred; Drabek, Jozef; and Ehrenfreund, Josef, 5,114,975, Cl. 514-630.000.

Ehrlich, Paul W.: *See—*
Lilja, Philip C.; Ehrlich, Paul W.; and Martin, Allenn E., 5,114,070, Cl. 236-49.300.

Eichelberger, Robert J.: *See—*
Niiler, Andrus; Moss, Gerald L.; and Eichelberger, Robert J., 5,114,645, Cl. 264-84.000.

Eickmann, Karl. Double piston engine. 5,113,808, Cl. 123-53.0BP.

Eisbrenner, Robert J.: *See—*
Radosav, Jon J.; Evans, Thomas A.; Dudek, David M.; Wieser, Russell G.; Atwater, Brian J.; and Eisbrenner, Robert J., 5,114,163, Cl. 277-81.00S.

Eisenbart, Jules: *See—*
Bardas, Theodor; Eisenbart, Jules; Harris, Tim; and Oleksuk, Cal, 5,115,192, Cl. 324-207.120.

Eismann, Dieter: *See—*
Wallisch, Gebhard; Eismann, Dieter; Matthes, Roland; and Kammerer, Manfred, 5,113,955, Cl. 177-25.150.

Ekberg, Jurgen M.: *See—*
Cote, James H.; and Ekberg, Jurgen M., 5,114,005, Cl. 206-328.000.

Eklind, Karin: *See—*
Chung, Fung-Lung; Hecht, Stephen S.; Eklind, Karin; and Morse, Mark A., 5,114,969, Cl. 514-514.000.

Eklund, Wayne D.; and Kerley, James J., to United States of America, National Aeronautics & Space Administration. User friendly joystick. 5,113,714, Cl. 74-471.0XY.

Ekola, Kenneth E. Convertible web tension transducer. 5,113,709, Cl. 73-862.480.

Ekpo, Bassey O.: *See—*
Spanier, Henry C.; and Ekpo, Bassey O., 5,114,704, Cl. 424-57.000.

Elcor Corporation: *See—*
Rambo, C. L.; Wilkinson, John D.; and Hudson, Hank M., 5,114,451, Cl. 62-24.000.

Eldridge, Milo: *See—*
Sluga, Robert M.; Watkins, Randolph H.; Fisher, Jerry D.; Berry, Dennis C.; and Eldridge, Milo, 5,113,883, Cl. 134-60.000.

Electrolux Northern Limited: *See—*
Dunn, Ken, 5,113,642, Cl. 56-12.800.

Electrovert Ltd.: *See—*
Gileta, John, 5,113,882, Cl. 134-19.000.

Eli Lilly and Company: *See—*
Conine, James W.; Sparks, Denis L.; and Stowers, Julian L., 5,114,948, Cl. 514-288.000.

Elias, Dana: *See—*
Cohen, Irun R.; Elias, Dana; and Markovits, Doron, 5,114,844, Cl. 435-7.210.

Elizondo-Gonzalez, Cesar; Juarez-Mata, Virgilio; Viramontes-Brown, Ricardo; Quintero-Flores, Raul; and Roesch-Dietlen, Juan-Jorge, to Hylsa S.A. de C.V. Method and apparatus for regulating the flow of particulate ferromagnetic solids. 5,113,890, Cl. 137-13.000.

Elkhart Brass Mfg. Co., Inc.: *See—*
Cable, Brian, 5,113,945, Cl. 169-15.000.

Ellenburg, George W. Axial cylinder internal combustion engine having variable displacement. 5,113,809, Cl. 123-58.0BA.

Ellingson, Frederick J.; and Shaver, P. Kent, to U.S. Tool & Die, Inc. Cask basket construction for heat-producing radioactive material. 5,114,666, Cl. 376-272.000.

Ellis, Larry D., to Conslidated Flavor Corporation. Process for making dark cocoa. 5,114,730, Cl. 426-593.000.

Elmjet Limited: *See—*
Gray, Colin, 5,115,251, Cl. 346-75.000.

ELTECH Systems Corporation: *See—*
Paulonis, George J.; and Dunlap, David R., 5,115,114, Cl. 219-99.000.

Elwell, Richard J.; Sewell, Robert A.; Lidy, Werner A.; and Thoen, Johan A., to Dow Chemical Company, The. Isocyanate-terminated prepolymer and polyurethane foam prepared therefrom. 5,114,989, Cl. 521-159.000.

Elzinga, Edward L.: *See—*
Huisingh, James H.; and Elzinga, Edward L., 5,115,380, Cl. 362-33.000.

Emerson Electric Company: *See—*
Houben, J. P.; and Moolenaar, A. J., 5,113,951, Cl. 173-075.000.
Sood, Pradeep K., 5,115,181, Cl. 318-701.000.

Emery, Jerome W.; and O'Loughlin, John P., to TRW Inc. Safety apparatus. 5,114,179, Cl. 280-741.000.

Emhart Inc.: *See—*
Jackson, Rodney P.; and Rossmeisl, Mark E., 5,113,578, Cl. 29-743.000.

Emory University: *See—*
Hunter, Robert L.; and Ragland, William L., 5,114,708, Cl. 514-716.000.

Emoto, Naoyoshi; Saito, Hideo; and Furukawa, Kenji, to Chisso Corporation. Liquid crystal composition. 5,114,614, Cl. 252-299.650.

Emus, Ronald W., Jr. Dart board positioniong device. 5,113,595, Cl. 33-759.000.

Endo, Koji: *See—*
Kuroiwa, Katsumasa; Matsuura, Hitoshi; Katayama, Katsuhiro; Nakatsuyama, Shuichi; Nagasawa, Takeshi; and Endo, Koji, 5,115,099, Cl. 530-331.000.

Endo, Masaaki: *See—*
Murai, Ryukichi; and Endo, Masaaki, 5,113,556, Cl. 24-633.000.

Engeler, William E., to General Electric Company. Digital correlators incorporating analog neural network structures operated on a bit-sliced basis. 5,115,492, Cl. 395-27.000.

Engelhardt, Gunther: *See—*
Ballhause, Helmut; Engelhardt, Gunther; Landgraf, Claus A.; Mayer, Norbert; Roth, Willy; Schumacher, Kurt; and Prox, Alex, 5,114,935, Cl. 514-228.800.

Enlight Corporation: *See—*
Liu, Chi, 5,114,036, Cl. 220-307.000.

Enomoto, Takaaki: *See—*
Fukuda, Joji; Misawa, Seiichi; and Enomoto, Takaaki, 5,115,390, Cl. 364-146.000.

Entropy International Co., Ltd.: *See—*
Chou, Long-Shou, 5,113,758, Cl. 101-66.000.

Enviroland, Inc.: *See—*
Heiler, Leo J., Jr., 5,114,274, Cl. 405-128.000.

Epicor Industries, Inc.: *See—*
Brown, David M., 5,114,035, Cl. 220-203.000.

Epler, John E.: *See—*
Paoli, Thomas L.; and Epler, John E., 5,114,877, Cl. 437-129.000.

Epp, George C.: *See—*
Amador, Gonzalo; Burrows, Randy O.; and Epp, George C., 5,114,066, Cl. 228-4.500.

Eppendorf-Netheler-Hinz GmbH, Firma: *See—*
Bertholdt, Gunter, 5,114,854, Cl. 435-240.100.

Erbamont Inc.: *See—*
Imondi, Anthony R., 5,114,947, Cl. 514-282.000.

Erel, David: *See—*
Lin, Israel; and Erel, David, 5,113,881, Cl. 134-1.000.

Erhardt, Herbert J., to Eastman Kodak Company. Charge-coupled device and process of making the device. 5,114,833, Cl. 430-313.000.

Ericsson, Karl G.: *See—*
Svensson, Paul; Nilsson, Christer; Backlund, Jan; Ericsson, Karl G.; Jilken, Leif; and Kihlberg, Harry, 5,114,524, Cl. 156-295.000.

Eriksson, Sven: *See—*
Bjerngren, Jan; Eriksson, Sven; and Persson, Lars, 5,114,279, Cl. 405-303.000.

Ervay, Earl D.; and Boch, Mark J., to Gleason Works, The. Process for producing face hobbed bevel gears with toe relief. 5,114,287, Cl. 409-13.000.

Erwin, Lewis; Crandell, Keith; and Whitney, Justin, to Illinois Superconductor Corporation. Cryogenic fluid level sensor. 5,114,907, Cl. 505-1.000.

Esaki, Hiroshi: *See—*
Onishi, Hiroshi; Kohashi, Tadao; Mima, Soichiro; and Esaki, Hiroshi, 5,115,254, Cl. 346-76.0PH.
Esec SA: *See—*
Meisser, Claudio; Eggenschwiler, Hans; and Nehls, Walter, 5,114,302, Cl. 414-751.000.
Esselborn, Eberhard: *See—*
Fock, Jurgen; Schaefer, Dietmar; and Esselborn, Eberhard, 5,115,039, Cl. 525-329.500.
Fock, Jurgen; Schaefer, Dietmar; and Esselborn, Eberhard, 5,115,040, Cl. 525-329.500.
Essential Dental Systems, Inc.: *See—*
Musikanti, Barry L.; and Deutsch, Allan S., 5,114,343, Cl. 433-173.000.
Esserman, James N.; and Bennett, Christopher J., to General Instrument Corporation. Signal encryption apparatus for generating common and distinct keys. 5,115,467, Cl. 380-44.000.
Essex Specialty Products, Inc. *See—*
Hsieh, Harry W. S., 5,115,386, Cl. 528-272.000.
Essilor International, Compagnie Generale d'Optique: *See—*
Baude, Dominique; Chavel, Pierre; Joyeux, Denis; and Taboury, Jean, 5,114,220, Cl. 351-160.00R.
Guglielmetti, Robert; and Tardieu, Pascale, 5,114,621, Cl. 252-586.000.
Estiva, Lynda H. Decorative ring for baby bottle which attaches in grove of nipple. 5,114,374, Cl. 446-77.000.
Etat Francais, Ministre des Postes, des Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications): *See—*
Menigaux, Louis; and Dugrand, Louis, 5,115,285, Cl. 357-17.000.
Ethicon, Inc.: *See—*
Burbank, John E., 5,114,407, Cl. 604-164.000.
Ethridge, Richard T. Utility tool. 5,113,726, Cl. 81-60.000.
Ethyl Petroleum Additives, Inc.: *See—*
Hollrah, Don P.; and Lenane, Denis L., 5,113,803, Cl. 123-1.00A.
Etienne, Jacques: *See—*
Vives, Michel; Taveau, Pierre; Etienne, Jacques; Remillieux, Yves; and Charbonnel, Lucien, 5,114,772, Cl. 428-49.000.
Etymotic Research, Inc.: *See—*
Killion, Mead C.; Stewart, Jonathan K.; Falco, Robert; and Berger, Elliott H., 5,113,967, Cl. 181-132.000.
Eurotool B.V.: *See—*
van Boekel, Franciscus A. J.; and van den Brink, Anthonie, 5,113,576, Cl. 29-611.000.
Evangelista, Donato D.; and Coleman, John F., to Xerox Corporation. Disk stacker including registration assist device. 5,114,135, Cl. 271-187.000.
Evangelista, Michael L.; and Lia, Raymond A., to Welch Allyn, Inc. Process for reducing the internal cross section of elastomeric tubing. 5,114,636, Cl. 264-40.100.
Evans, James R., to Feehan, John J., III. Soil amendment. 5,114,457, Cl. 71-23.000.
Evans, Robert: *See—*
Bertoncini, Joseph; Kroener, Calvin; Cobb, Wayne; and Evans, Robert, 5,114,681, Cl. 422-111.000.
Evans, Thomas A.: *See—*
Radosav, Jon J.; Evans, Thomas A.; Dudek, David M.; Wieser, Russell G.; Atwater, Brian J.; and Eisbrenner, Robert J., 5,114,163, Cl. 277-81.000.
Eveready Battery Company, Inc.: *See—*
Chaney, Earl J., Jr.; and Dziak, Theodore P., 5,114,808, Cl. 429-172.000.
Everhart, Alvie E. Plumb-align device. 5,114,127, Cl. 269-41.000.
Evers, Michel: *See—*
Biedermann, Jurgen; Evers, Michel; Terlinden, Rolf; Leyck, Sigurd; and Graf, Erich, 5,114,954, Cl. 514-338.000.
EVG Entwicklungs- u.Verwertungs-Gesellschaft m.b.H.: *See—*
Ritter, Gerhard; Ritter, Klaus; Schmidt, Gerhard; and Resch, Walter, 5,113,915, Cl. 140-112.000.
Ewert, Richard: *See—*
Dao, Hung D.; Grieff, Thomas W.; Lattin, Thomas W., Jr.; Thomas, Darren R.; Schultz, Stephen M.; Ewert, Richard; and Flower, David L., 5,115,225, Cl. 340-584.000.
Exarhos, Gregory J.: *See—*
Pederson, Larry R.; Chick, Lawrence A.; and Exarhos, Gregory J., 5,114,702, Cl. 423-639.000.
Extrude Hone Corporation: *See—*
Rhoades, Lawrence J., 5,114,548, Cl. 204-129.460.
Exxon Chemical Patents Inc.: *See—*
Brant, Patrick; and Germin, Paul M., 5,114,763, Cl. 428-34.900.
Malatesta, Francesco, 5,114,538, Cl. 162-158.000.
F. M. Locotos Equipment & Design Co.: *See—*
Locotos, Frank M.; and Bechtold, Robert S., 5,114,278, Cl. 405-259.600.
Faber, Pieter. Concrete-pumping device. 5,114,319, Cl. 417-342.000.
Fabriques de Tabac Reunies, S.A.: *See—*
Mussini, Gian P., 5,114,015, Cl. 209-535.000.
Piade, Jean-Jacques; and Nicholas, Gregor, 5,113,689, Cl. 73-23.310.
Fahrzeugbau Langendorf GmbH & Co. KG: *See—*
Langendorf, Heinrich; and Olfers, Reinhard, 5,114,288, Cl. 410-34.000.
Fahsel, Michael J.: *See—*
Lewandowski, B. Pinkerton; and Fahsel, Michael J., 5,115,457, Cl. 378-45.000.
Faiveley Transport: *See—*
Cathala, Jacques; and Forte, Pascale, 5,115,405, Cl. 364-550.000.
Falb, Wolfgang: *See—*
Kummerfeld, Ryszard; Baumgarten, Siegfried; Holzapfel, Gerd; Falb, Wolfgang; and Palm, Ulrich, 5,113,897, Cl. 137-357.000.
Falco, Robert: *See—*
Killion, Mead C.; Stewart, Jonathan K.; Falco, Robert; and Berger, Elliott H., 5,113,967, Cl. 181-132.000.
Fanuc Ltd.: *See—*
Tanaka, Kunio; and Chiba, Kosuke, 5,115,177, Cl. 318-568.100.
Ushiyama, Shigeyuki, 5,115,239, Cl. 341-15.000.
Farine, Jean-Claude: *See—*
Pares Farras, Ramon; Jofre Torroella, Juan; Ricard, Jean-Paul; Schulthess, Adrian; Farine, Jean-Claude; Michelet, Marie-Christine; Ramsteiner, Agnes; and Bauer, Jacques, 5,114,848, Cl. 435-101.000.
Farrar, David: *See—*
Biggin, Ian S.; Cartwright, Peter S.; Farrar, David; Hawe, Malcolm; and Paget, Walter E., 5,114,600, Cl. 252-86.000.
Farrar, Paul A., Sr.: *See—*
Cronin, John E.; Farrar, Paul A., Sr.; Linde, Harold G.; and Previti-Kelly, Rosemary A., 5,114,754, Cl. 427-333.000.
Farrington, Sheryl L.: *See—*
Pastryk, Jim J.; and Farrington, Sheryl L., 5,113,542, Cl. 8-158.000.
Faryniarz, Joseph R.: *See—*
Kuznitz, Matthew; Brewster, David A.; Faryniarz, Joseph R.; and Cancro, Lewis, 5,114,717, Cl. 424-401.000.
Faulhaber, Rudolf K.: *See—*
Geisler, Michael; Jung, Michael; and Faulhaber, Rudolf K., 5,113,790, Cl. 118-723.000.
Faull, Simon H., to Baitel, Mike. Air induction control device. 5,113,837, Cl. 123-587.000.
Faylo, John. Apparatus and method of playing a game with multi-colored sticks. 5,114,147, Cl. 273-146.000.
Fedeli, Jean-Marc; Moriceau, Hubert; Muffato, Viviane; and Vaudaine, Marie-Helene, to Commissariat a l'Energie Atomique. Process for producing a magnetic head with an appropriately oriented easy axis of magnetization. 5,113,575, Cl. 29-603.000.
Fedjunin, Vladimir A.: *See—*
Bordunov, Vladimir V.; Karmadonov, Leonid N.; Ospischev, Jury M.; Fedjunin, Vladimir A.; Zhuravkov, Sergei P.; Cherepenko, Evgeny A.; Sviridov, Anatoly B.; Verkhorubov, Lev S.; Mikhailov, Arkady T.; Bakhmutov, Jury L.; and Shaidurov, Valery S., 5,114,496, Cl. 134-13.000.
Feehan, John J., III: *See—*
Evans, James R., 5,114,457, Cl. 71-23.000.
Fehlhaber, Hans-Wolfram: *See—*
Franco, Christopher M.; Vijayakumar, Erra K. S.; Chatterjee, Sugata; Ganguli, Bimal N.; Blumbach, Jurgen; Kogler, Herbert; and Fehlhaber, Hans-Wolfram, 5,114,967, Cl. 514-475.000.
Fehr, Charles; Galindo, Jose ; and Guntern, Olivier, to Firmenich SA. Decalin ketones, their use in perfumery and process for the preparation thereof. 5,114,915, Cl. 512-15.000.
Feigler, Jacques, to Valeo. Actuating assembly for a clutch release bearing, in particular for an automotive vehicle. 5,113,989, Cl. 192-98.000.
Feinmechanische Werke Mainz GmbH: *See—*
Muller, Heinrich; and Wobbe, Jens-Peter, 5,114,116, Cl. 251-129.150.
Feldman, Michael: *See—*
Tomita, Akira; Diaz, Stephen H.; Dubrow, Robert S.; and Feldman, Michael, 5,113,787, Cl. 118-400.000.
Feldman, Steven: *See—*
Kimmel, David J.; Siwinski, Paul P.; Smith, Robert A.; Thurman, Richard E.; Adkins, Stephen R.; Feldman, Steven; and Look, Raymond J., 5,114,355, Cl. 439-101.000.
Felix Schoeller Jr. GmbH KG: *See—*
Dethlefs, Ralf-Burkhard, 5,114,990, Cl. 523-200.000.
Fenk, Josef; and Schulz, Martin, to Siemens Aktiengesellschaft. Integrable variable-frequency oscillator circuit. 5,115,212, Cl. 331-117.00R.
Ferag AG: *See—*
Hansch, Egon, 5,113,732, Cl. 83-154.000.
Reist, Walter, 5,113,731, Cl. 83-35.000.
Ferrari S.p.A.: *See—*
Rosa, Riccardo, 5,113,813, Cl. 123-90.160.
Ferraro, Neil P.; Nager, Urs F., Jr.; Logue, Raymond C.; Chen, Edward J.; and Lee, Patrick S., to Burndy Corporation. Apparatus for crimping articles. 5,113,679, Cl. 72-21.000.
Feucht, Peter: *See—*
Hagen, Uwe; and Feucht, Peter, 5,114,424, Cl. 606-32.000.
Feyerl, Gunther; and Konig, Franz, to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft. Apparatus for needling a web. 5,113,563, Cl. 28-115.000.
Figge, Dieter; and Fink, Peter, to Mannesmann Aktiengesellschaft. Method and apparatus for grinding the work rolls of a planetary rolling mill. 5,113,623, Cl. 51-289.00R.
Figgie International, Inc.: *See—*
Dosch, Jeffrey J.; and Zappa, James V., 5,113,854, Cl. 128-201.230.
Fink, Peter: *See—*
Figge, Dieter; and Fink, Peter, 5,113,623, Cl. 51-289.00R.
Finke, Jurgen: *See—*
Poll, Gunter; Bartmann, Martin; and Finke, Jurgen, 5,115,088, Cl. 528-336.000.
Finkelstein, Blair I.; and McDaniel, Terry W., to International Business Machines Corporation. Utilizing wasted laser light in optical systems. 5,115,420, Cl. 369-44.140.

Finnicum, Douglas S.; Schickler, Edward R.; Soules, William J.; and Wahlers, Robert A., to Eastman Kodak Company. Apparatus and method for curtain coating. 5,114,759, Cl. 427-420.000.
Fioramonti, Michael J. Teaching means. 5,114,346, Cl. 434-184.000.
Firequip Helmets, Inc.: *See—*
Lane, Abbott A.; and Hetzel, John M., Jr., 5,113,534, Cl. 2-416.000.
Firmenich SA: *See—*
Fehr, Charles; Galindo, Jose ; and Guntern, Olivier, 5,114,915, Cl. 512-15.000.
Fisch, Alain: *See—*
Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Huges; Prazuck, Thierry; and Torres, Ghislaine, 5,114,707, Cl. 424-667.000.
Fischer, Robert J.: *See—*
Savage, Robert O.; Fischer, Robert J.; and Divita, Sam, 5,114,738, Cl. 427-37.000.
Fischer, Ulf; Schneider, Fernand; and Widmer, Ulrich, to Hoffman-La Roche, Inc. Tricyclic pyridone derivatives. 5,114,934, Cl. 514-212.000.
Fisher, James R. Speed detector for traffic control. 5,115,109, Cl. 200-86.00A.
Fisher, Jerry D.: *See—*
Sluga, Robert M.; Watkins, Randolph H.; Fisher, Jerry D.; Berry, Dennis C.; and Eldridge, Milo, 5,113,883, Cl. 134-60.000.
Sluga, Robert M.; Watkins, Randolph H.; Gajewski, Henry M.; Fisher, Jerry D.; and Berry, Dennis C., 5,114,608, Cl. 252-162.000.
Fisher, Michael V.; Schaubel, Kurt M.; and Raggio, William A., to General Atomics. Fiber combiner for aligning filaments in a planar filament array. 5,114,087, Cl. 242-42.000.
Fister, Julius C.: *See—*
Mandigo, Frank N.; Mei, George C.; and Fister, Julius C., 5,113,764, Cl. 102-202.900.
Fitz, Erich; and Resch, Klaus, to HTG High Tech Geratebau GmbH. Telescopically extensible lifting column, in particular for the height adjustment of a camera. 5,114,109, Cl. 248-404.000.
Fitz, George E., III; Krenz, Rudi O.; and Carnes, Harmon R., to General Electric Company. Spark erosion machining device and method for correcting for the wear of a machining electrode. 5,115,112, Cl. 219-69.200.
Fitzpatrick, Brian J.; Harnack, Phyllis M.; and Baker, Scott H., to North American Philips Corporation. Cathode ray tube device with improved coolant. 5,115,163, Cl. 313-36.000.
Flaig, Ulrich, to Robert Bosch GmbH. Method of avoiding excessive engine drag torque. 5,113,820, Cl. 123-325.000.
Flammer, George H., III: *See—*
Baran, Paul; Flammer, George H., III; and Kalkwarf, Robert L., 5,115,433, Cl. 370-94.300.
Flanigen, Edith M.: *See—*
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., 5,114,563, Cl. 208-114.000.
Fleischhaker, John J.; and Hidani, Tim T., to Daig Corporation. Universal hemostasis valve having improved sealing characteristics. 5,114,408, Cl. 604-167.000.
Fletcher, Henry H., to Hall Surgical. Drill having alternate mode control. 5,115,175, Cl. 318-280.000.
Flinchbaugh, David E. Magnetic bladder cycler. 5,114,412, Cl. 604-247.000.
Florida International University: *See—*
Hagmann, Mark J.; and Babij, Tadeusz M., 5,113,864, Cl. 128-653.100.
Flower, David L.: *See—*
Dao, Hung D.; Grieff, Thomas W.; Lattin, Thomas W., Jr.; Thomas, Darren R.; Schultz, Stephen M.; Ewert, Richard; and Flower, David L., 5,115,225, Cl. 340-584.000.
FMC Corporation: *See—*
Le Devehat, Eugene, 5,113,895, Cl. 137-244.000.
Fock, Jurgen; Schaefer, Dietmar; and Esselborn, Eberhard, to Th. Goldschmidt AG. Polyacrylate esters with quaternary ammonium groups. 5,115,039, Cl. 525-329.500.
Fock, Jurgen; Schaefer, Dietmar; and Esselborn, Eberhard, to Th. Goldschmidt AG. Polyacrylate esters with quaternary ammonium groups. 5,115,040, Cl. 525-329.500.
Focke & Co., (GmbH & Co.): *See—*
Focke, Heinz; and Liedtke, Kurt, deceased, 5,113,638, Cl. 53-462.000.
Focke, Heinz; and Liedtke, Kurt, deceased (by Liedtke, Ruth, legal representative), to Focke & Co., (GmbH & Co.). Process and apparatus for producing (cigarette) packs. 5,113,638, Cl. 53-462.000.
Folino, Frank A., to Massachusetts Institute of Technology. Multi-element bearings. 5,114,247, Cl. 384-461.000.
Fontana, Luca P.; and Brown, Sterling B., to General Electric Company. Method for the preparation of crosslinked polycarbonates. 5,115,024, Cl. 525-133.000.
Ford Motor Company: *See—*
Plate, Richard W.; and Gresser, Mark J., 5,114,740, Cl. 427-40.000.
Foreman, David L.: *See—*
Low, Stanley T.; Lara, Pedro F.; Foreman, David L.; and Petermann, Steven G., 5,115,196, Cl. 324-220.000.
Forestier, Serge: *See—*
N'Guyen, Quang L.; Griat, Jacqueline; Millecamps, Francois; Lang, Gerard; and Forestier, Serge, 5,114,716, Cl. 424-401.000.
Forselius, Randall A. Multi-tone whistle. 5,113,784, Cl. 116-137.00R.
Forsyth, Steven R.; and Grady, Brian T., to Imperial Chemical Industries PLC. Production of fluorocarbons. 5,114,544, Cl. 204-59.00F.
Forte, Pascale: *See—*
Cathala, Jacques; and Forte, Pascale, 5,115,405, Cl. 364-550.000.
Fory, Werner: *See—*
Moser, Hans; Bohner, Beat; and Fory, Werner, 5,114,462, Cl. 71-88.000.
Foster, Clark B.: *See—*
Haber, Terry M.; Foster, Clark B.; and Smedley, William H., 5,114,411, Cl. 604-203.000.
Foster, Kenneth L., to Stanley-Bostitch, Inc. Pliers with removable jaw inserts. 5,113,727, Cl. 81-423.000.
Foundation Technology Limited: *See—*
Camilleri, Paul, 5,113,609, Cl. 37-87.000.
Fraenkel, Howard A.: *See—*
Zupancic, Joseph J.; Blazej, Daniel C.; and Fraenkel, Howard A., 5,114,741, Cl. 427-43.100.
Fraidlin, Simon; Slack, William F.; and Wadlington, James C., to AT&T Bell Laboratories. Single conversion power factor correction using septic converter. 5,115,185, Cl. 323-207.000.
Framatome: *See—*
Sevenet, Jacques, 5,113,543, Cl. 14-24.000.
Francioni, Renzo, to Cavanna S.p.A. Rotary multiple point discharge conveyer. 5,113,996, Cl. 198-441.000.
Franck, Donald L.; Shah, Suresh D.; Sheth, Manu K.; and Zabel, Lawrence D., to General Motors Corporation. Extrusion shaping method. 5,114,650, Cl. 264-151.000.
Franco, Christopher M.; Vijayakumar, Erra K. S.; Chatterjee, Sugata; Ganguli, Bimal N.; Blumbach, Jurgen; Kogler, Herbert; and Fehlhaber, Hans-Wolfram, to Hoechst Aktiengesellschaft. Antibiotic alisamycin and its use. 5,114,967, Cl. 514-475.000.
Franks, George J., Jr. Clamping device. 5,114,354, Cl. 439-92.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 5,113,767, Cl. 104-7.200.
Theurer, Josef; Oellerer, Friedrich; and Gruber, Leopold R., 5,114,119, Cl. 254-134.30R.
Frass, Werner: *See—*
Zertani, Rudolf; Mohr, Dieter; Rode, Klaus; Frass, Werner; and Joerg, Klaus, 5,114,832, Cl. 430-285.000.
Frauenberger & Co.: *See—*
Laumann geb. Quensen, Betina, 5,114,038, Cl. 220-575.000.
Frauenthal, Ellen S.; and Silverstein, Leonard A. Retraction resistant straw. 5,114,074, Cl. 239-33.000.
Fredrickson, Howard J., to IMI Cornelius Inc. Self feeding display peg. 5,114,021, Cl. 211-54.100.
Freeborn, John C. Automatic-cycling heat-powered fluid pump. 5,114,318, Cl. 417-379.000.
Freedman, Jerome E.; Perry, Michael S.; and Gallagher, John J., to General Electric Company. Radar system with active array antenna, elevation-responsive PRF control, and pulse integration control responsive to azimuth angle. 5,115,244, Cl. 342-158.000.
Freedman, Jerome E.: *See—*
Perry, Michael S.; Freedman, Jerome E.; and Gallagher, John J., 5,115,243, Cl. 342-158.000.
Freeland Industries, Inc.: *See—*
Van Epps, James L., II; and Van Epps, Lynn, 5,113,800, Cl. 119-78.000.
Freeman, Dixon: *See—*
Hillis, Mark; and Freeman, Dixon, 5,114,037, Cl. 220-4.030.
Freeman, Gerard L.: *See—*
Branovich, Louis F.; Freeman, Gerard L.; and Eckart, Donald W., 5,114,742, Cl. 427-77.000.
Freeport-McMoRan Resource Partners: *See—*
Wiewiorowski, Tadeusz K.; Astley, Vivian C.; Taravella, Jody J.; and Murray, Michael A., 5,114,699, Cl. 423-531.000.
Freer, Lester P. Shoulder rest. 5,115,465, Cl. 379-449.000.
Freese, Andrew: *See—*
Sabel, Bernhard A.; and Freese, Andrew, 5,114,719, Cl. 424-422.000.
Freitag, Dieter: *See—*
Nielinger, Werner; Idel, Karsten-Josef; Westeppe, Uwe; Freitag, Dieter; Wulff, Claus; and Heinz, Hans-Detlef, 5,115,050, Cl. 525-537.000.
Frentzel, Richard L.; and Oakdale, Warren R., to Advanced Products Inc. Fast curing and storage stable thermoset polymer thick film compositions. 5,114,796, Cl. 428-521.000.
Friberg, Jan: *See—*
Blomberg, Fred; Friberg, Jan; Glindre, Jan-Olof; and Kangasmetsa, Jarl, 5,114,841, Cl. 435-7.900.
Fried, Herbert E., to Shell Oil Company. Process for the production and recovery of ene reaction products. 5,114,624, Cl. 554-162.000.
Friederichs, Karl-Josef; and Ringelhaan, Otmar, to Siemens Aktiengesellschaft. Method for redundancy-saving, error-correcting coding in digital radio link systems having multi-level modulation. 5,115,438, Cl. 371-43.000.
Friedrich, Otto J.: *See—*
Siegmund, Werner, deceased; Kamereit, Wilhelm; Schmitt, Oskar M.; Weidmann, Volker; and Friedrich, Otto J., 5,114,475, Cl. 106-13.000.
Fries, William M.; Ratledge, Thomas L.; and Hill, William H., to Hughes Aircraft Company. Dual tip rotating welding electrode. 5,115,111, Cl. 219-56.210.
Friesen, Arlyn E.: *See—*
Friesen, Milford E.; and Friesen, Arlyn E., 5,113,956, Cl. 172-311.000.
Friesen, Milford E.; and Friesen, Arlyn E. Forwardly folding tool bar. 5,113,956, Cl. 172-311.000.

Frieser, Rudolf G.: *See—*
Tranjan, Farid M.; DuBois, Thomas D.; Frieser, Rudolf G.; Bobbio, Stephen M.; and Jones, Susan K. S., 5,114,827, Cl. 430-271.000.

Frindel, Emilia; Lenfant, Maryse; Guigon, Martine; and Bakala, Johanna, to Institut National De La Sante Et De La Recherche Medicale; and Institut Gustave Roussy. Tetrapeptide inhibiting the entry into cycle of hemopoietic stem cells processes for its preparation, and its uses. 5,114,926, Cl. 514-18.000.

Frost, Barry L., to New Venture Gear, Inc. Synchronizer strut guide. 5,113,985, Cl. 192-53.00F.

Frost, Barry L., to New Venture Gear, Inc. Strut-type synchronizer mechanism with retracting and centering strut. 5,113,986, Cl. 192-53.00F.

Frostick, Lewis A., to Saturn Corporation. Apparatus for depositing a viscous valve opener material within an engine oil filter. 5,114,573, Cl. 210-136.000.

Fruehauf Trailer Corporation: *See—*
Botkin, Lawrence A.; and Javadi, Mahmud K., 5,114,169, Cl. 280-423.100.

Fry, David W., to STC PLC. Automatic signal parameter control. 5,115,207, Cl. 330-284.000.

Fryar, Richard D., Jr.: *See—*
Conway, Anthony J.; Conway, Philip J.; and Fryar, Richard D., Jr., 5,114,417, Cl. 604-349.000.

Frye, Ricky J., to MIM Industries, Inc. Pleating method and apparatus. 5,114,056, Cl. 223-30.000.

Frysz, Christine A.; and Brown, W. Richard, to Wilson Greatbatch Ltd. Cathode current collector material for solid cathode cell. 5,114,810, Cl. 429-194.000.

Frysz, Christine A.: *See—*
Ebel, Steven J.; Pyszczyk, Michael F.; Frysz, Christine A.; and Zelinsky, Michael A., 5,114,811, Cl. 429-194.000.

Fuchs, Herbert K., to Vector Related Physics (Consultants) Ltd. Method of producing a gas discharge light source. 5,114,372, Cl. 445-3.000.

Fuji Electric Co., Ltd.: *See—*
Shigekane, Hisao, 5,115,388, Cl. 363-56.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Hosoi, Masanori, 5,114,654, Cl. 264-313.000.
Kyoukane, Yasuaki; and Nagano, Toshihiro, 5,115,183, Cl. 320-61.000.
Sato, Keiji, 5,113,718, Cl. 74-846.000.

Fuji Kuuki Kabushiki Kaisha: *See—*
Ohkubo, Masaaki; and Fukada, Ryo, 5,113,949, Cl. 173-177.000.

Fuji Optical Systems: *See—*
Cooper, David H.; and Bush, Charles S., 5,115,307, Cl. 358-98.000.

Fuji Photo Film Co., Ltd.: *See—*
Arai, Fumihito; and Mori, Yoshihiko, 5,115,319, Cl. 358-228.000.
Ito, Wataru, 5,115,476, Cl. 382-22.000.
Kato, Eiichi; and Hattori, Hideyuki, 5,114,822, Cl. 430-114.000.
Kitagawa, Kuniharu; Kataoka, Hideaki; Takahashi, Tomoyuki; and Kitagawa, Kiichiro, 5,115,268, Cl. 354-275.000.
Kondo, Shigeru; Takatori, Naoki; Morizumi, Masaaki; and Kanamori, Shino, 5,115,267, Cl. 354-221.000.
Masanaga, Yamamoto; Kiyotaka, Kaneko; Masanori, Yoshida; and Izumi, Miyake, 5,115,269, Cl. 354-420.000.
Miida, Takashi; Kudoh, Yoshimitsu; and Mutoh, Hiedki, 5,115,155, Cl. 307-607.000.
Murayama, Jin; and Fukazawa, Jun, 5,115,293, Cl. 357-30.000.
Ogawa, Tadashi, 5,114,837, Cl. 430-504.000.
Oishi, Kengo, 5,115,366, Cl. 360-133.000.
Okazaki, Masaki; Shishido, Tadao; and Kubodera, Seiiti, 5,115,337, Cl. 359-328.000.
Ono, Shigetoshi; and Funatsu, Eiji, 5,115,057, Cl. 526-256.000.
Sakanoue, Kei, 5,114,835, Cl. 430-393.000.
Saotome, Shigeru; and Ishida, Masamitsu, 5,115,132, Cl. 250-327.200.
Shibata, Norio; Sato, Tsunehiko; Chino, Naoyoshi; and Hiraki, Yasuhito, 5,114,753, Cl. 427-286.000.
Shimizu, Osamu; and Nakanishi, Kanji, 5,114,800, Cl. 428-692.000.
Takizawa, Kazushige; and Sakaki, Hirokazu, 5,114,825, Cl. 430-159.000.
Yamada, Sumito, 5,114,838, Cl. 430-569.000.
Yanai, Akio; and Yasunaga, Tadashi, 5,114,778, Cl. 428-141.000.
Yoshikawa, Sumio; Okino, Yoshiharu; and Sawada, Satoru, 5,115,304, Cl. 358-75.000.

Fujihira, Masao: *See—*
Yamagishi, Makoto; Fujihira, Masao; Azami, Kazuo; and Shinohara, Ikuo, 5,115,473, Cl. 381-154.000.

Fujii, Kenjiro; Oura, Masao; Tuburaya, Kazuyuki; and Hagura, Shigehisa, to Hitachi, Ltd. Portable teaching apparatus. 5,115,179, Cl. 318-568.130.

Fujii, Masakazu: *See—*
Konishi, Kouji; Ohshima, Tadayoshi; Fujii, Masakazu; Hagino, Motoyuki; Hosono, Satoshi; and Miyake, Masayoshi, 5,115,144, Cl. 250-572.000.

Fujii, Nobuo; Kiyota, Hiroyuki; Katagishi, Yoshihiro; and Miyazawa, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Cryogenic refrigerator. 5,113,662, Cl. 62-6.000.

Fujii, Yutaka, to Teijin Seiki Company, Limited. Press machine. 5,113,756, Cl. 100-48.000.

Fujikake, Yasushi: *See—*
Kanzawa, Yoshikazu; Fujikake, Yasushi; Ito, Osami; Ito, Shuho; Oikawa, Hironobu; Otsubo, Makoto; Morikawa, Iwao; Shiratori, Yuichi; and Tsukada, Kiyoshi, 5,113,926, Cl. 164-119.000.

Fujikura Ltd.: *See—*
Sakaya, Masuji; Okiai, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, 5,113,932, Cl. 165-104.260.

Fujimaki, Yoshihide: *See—*
Oda, Yasuhiro; Yoshioka, Hiroshi; Tadokoro, Hajime; and Fujimaki, Yoshihide, 5,114,815, Cl. 430-58.000.

Fujimori, Naoji: *See—*
Higaki, Kenjiro; Harada, Keizo; Fujimori, Naoji; Itozaki, Hideo; and Yazu, Shuji, 5,114,906, Cl. 505-1.000.

Fujimoto, Mikihiro: *See—*
Takimoto, Hiroyuki; and Fujimoto, Mikihiro, 5,115,324, Cl. 358-335.000.

Fujimoto, Shigeaki, to Shimadzu Corporation. Reciprocating type fluid delivery pump. 5,114,314, Cl. 417-3.000.

Fujimura, Itaru: *See—*
Fukunaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, 5,114,177, Cl. 280-707.000.

Fujioka, Nagaki: *See—*
Harada, Tamotsu; Kumagai, Gen; Yanagida, Kiyoshi; Yaguchi, Katsuhiko; Fujioka, Nagaki; Yagi, Akiharu; Yanoguchi, Koji; and Kodaira, Satoru, 5,115,362, Cl. 360-92.000.

Fujioka, Yasushi: *See—*
Echizen, Hiroshi; Fujioka, Yasushi; Nakagawa, Katsumi; Kanai, Masahiro; Kariya, Toshimitsu; Matsuyama, Jinsho; and Takei, Tetsuya, 5,114,770, Cl. 427-38.000.

Fujisawa, Ikuo: *See—*
Nishikawa, Hisashi; Fujisawa, Ikuo; and Ohsugi, Yukihiro, 5,115,279, Cl. 355-290.000.

Fujita, Kagari: *See—*
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Nishikibe, Masaru; Ihara, Masaki; and Yano, Mitsuo, 5,114,918, Cl. 514-11.000.

Fujita, Masayoshi: *See—*
Nakagawa, Seiichi; Muruyama, Yoshiharu; Shiota, Masanori; Ishida, Kando; Fujita, Masayoshi; and Yamada, Shigenobu, 5,113,944, Cl. 169-13.000.

Fujita, Minoru: *See—*
Fukushima, Yoichi; Fujita, Minoru; and Kakinuma, Yuji, 5,114,531, Cl. 156-659.100.

Fujita, Tadashi: *See—*
Ishihara, Takeshi; Fujita, Tadashi; and Misawa, Hidenobu, 5,114,803, Cl. 429-30.000.

Fujitsu Limited: *See—*
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onoda, Yoshihito; and Kuwahara, Hideo, 5,115,332, Cl. 359-189.000.
Taniguchi, Tomohiko; Iseda, Kohei; Okazaki, Koji; Amano, Fumio; Unagami, Shigeyuki; Tanaka, Yoshinori; and Ohta, Yasuji, 5,115,469, Cl. 381-36.000.

Fujiwara, Akie: *See—*
Oda, Kengo; Moriyasu, Koichi; Hayashi, Masao; Nishida, Makoto; Oyamada, Masami; Fujiwara, Akie; and Watanabe, Junko, 5,114,466, Cl. 71-94.000.

Fujiwara, Shinpei: *See—*
Kajitani, Koji; Abe, Minoru; and Fujiwara, Shinpei, 5,113,991, Cl. 192-98.000.

Fujiwara, Takumi; Mori, Hiroshi; and Kawazoe, Takemi, to Sumitomo Metal Mining Co., Ltd. Optical waveguide device and method of making the same. 5,115,512, Cl. 385-14.000.

Fujiwara, Yoji: *See—*
Murakawa, Masatake; Imanishi, Ryozo; and Fujiwara, Yoji, 5,113,819, Cl. 123-198.00E.

Fujiwara, Yoshihito; Umezawa, Tomoko; Nishiguchi, Masayuki; Akune, Makoto; Iwahashi, Naoto; and Akagiri, Kenzo, to Sony Corporation. Method and apparatus for encoding voice signals divided into a plurality of frequency bands. 5,115,240, Cl. 341-51.000.

Fukada, Ryo: *See—*
Ohkubo, Masaaki; and Fukada, Ryo, 5,113,949, Cl. 173-177.000.

Fukai, Kikuji: *See—*
Imai, Mizuho; Ito, Atsuo; Sekiguchi, Mikio; Iida, Hideyo; Fukai, Kikuji; and Kato, Komei, 5,114,076, Cl. 239-338.000.

Fukami, Takehiro: *See—*
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Nishikibe, Masaru; Ihara, Masaki; and Yano, Mitsuo, 5,114,918, Cl. 514-11.000.

Fukazawa, Jun: *See—*
Murayama, Jin; and Fukazawa, Jun, 5,115,293, Cl. 357-30.000.

Fukuda, Joji; Misawa, Seiichi; and Enomoto, Takaaki, to Sony Corporation. Control data input apparatus. 5,115,390, Cl. 364-146.000.

Fukuda, Kenji: *See—*
Yamaguchi, Harumi; Higuchi, Takeshi; and Fukuda, Kenji, 5,114,084, Cl. 241-178.000.

Fukuda Kinoku Hakafun Kogyo Kabushiki Kaisha: *See—*
Kajiwara, Toshiyuki; Tanii, Yoshinori; and Hashimoto, Kazuhiko, 5,114,543, Cl. 205-152.000.

Fukuda, Tamotsu; Shigeta, Shiro; Okuya, Hiroaki; Kuroiwa, Yasuyuki; and Sudo, Tadashi, to Mitsui Toatsu Chemicals, Inc. Common antigen (PSC-A) to *Pseudomonas aeruginosa* which acts as an agent for protecting *Pseudomonas aeruginosa* infection. 5,114,712, Cl. 424-87.000.

Fukui, Wataru; Iwata, Toshio; Ueda, Atsushi; Matsumura, Masami; and Koiwa, Mitsura, to Mitsubishi Denki Kabushiki Kaisha. Vehicle speed governor. 5,113,821, Cl. 123-335.000.

Fukumori, Kunihiko: *See—*
Kami, Yoshinori; and Fukumori, Kunihiko, 5,114,180, Cl. 280-743.000.

Fukumoto, Takaaki: *See—*
Tada, Masuo; Hiroi Takahiko; Fukumoto, Takaaki; Ohmori, Toshiaki; and Kanno, Itaru, 5,114,748, Cl. 427-180.000.

Fukunaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, to Nissan Motor Company, Limited. Anti-rolling controlling system for automotive active suspension system with road friction dependent variable control characteristics. 5,114,177, Cl. 280-707.000.

Fukushima, Naoto: *See—*
Fukunaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, 5,114,177, Cl. 280-707.000.

Fukushima, Yoichi; Fujita, Minoru; and Kakinuma, Yuji, to Kyodo Printing Co., Ltd. Method of producing masks for ROM type optical recording cards and method of inspecting masks. 5,114,531, Cl. 156-659.100.

Fukuyama, Hiroko: *See—*
Ura, Shigeru; Tanaka, Haruo; Takagishi, Hisao; Fukuyama, Hiroko; Fukuyama, Takuya; and Fukuyama, Yuko, 5,114,758, Cl. 427-391.000.

Fukuyama, Takuya: *See—*
Ura, Shigeru; Tanaka, Haruo; Takagishi, Hisao; Fukuyama, Hiroko; Fukuyama, Takuya; and Fukuyama, Yuko, 5,114,758, Cl. 427-391.000.

Fukuyama, Yuko: *See—*
Ura, Shigeru; Tanaka, Haruo; Takagishi, Hisao; Fukuyama, Hiroko; Fukuyama, Takuya; and Fukuyama, Yuko, 5,114,758, Cl. 427-391.000.

Fulton, James H. Spring barrel busher attachment. 5,114,283, Cl. 408-103.000.

Fulton, Steven J.; Peters, Gerald T., Jr.; Spehrley, Charles W., Jr.; and Young, Lawrence R., to Spectra, Inc. Treatment of hot melt ink images. 5,114,747, Cl. 427-164.000.

Fumagalli, Lisbeth L.; Love, Katherine M.; and Schechter, Carrin, to Love, Katherine M.; and Schechter, Carrin. Method of playing an educational game. 5,114,344, Cl. 434-128.000.

Funabashi, Kiyomi; Kuriyama, Osamu; Chino, Koichi; Baba, Tsutomu; Nishi, Takashi; and Kikuchi, Makoto, to Hitachi, Ltd. Method of cementing radioactive waste and cemented body. 5,114,622, Cl. 252-629.000.

Funatsu, Eiji: *See—*
Ono, Shigetoshi; and Funatsu, Eiji, 5,115,057, Cl. 526-256.000.

Funke, Hermann D., to Medtronic, Inc. Acoustic body bus medical device communication system. 5,113,859, Cl. 128-419.0PG.

Furlong, Darrell, to Concord Communications, Inc. Local area network modem. 5,115,451, Cl. 375-7.000.

Furrer, Fredrick J.; and Lemme, Charles D., to Hyrad Corporation. Quick response adjustable shock absorber and system. 5,113,980, Cl. 188-299.000.

Furukawa, Akihiro: *See—*
Hirata, Keiichi; Morimoto, Yoshinari; Ooishi, Minoru; Ban, Tomohiro; and Furukawa, Akihiro, 5,115,410, Cl. 395-650.000.

Furukawa, Kenji: *See—*
Emoto, Naoyoshi; Saito, Hideo; and Furukawa, Kenji, 5,114,614, Cl. 252-299.650.

Furuya, Katsuhiko: *See—*
Noda, Nobuhiro; Furuya, Katsuhiko; Takahashi, Tadashi; and Nakasima, Masaaki, 5,115,261, Cl. 354-62.000.

Furuya, Yoshiaki: *See—*
Mizui, Kinya; and Furuya, Yoshiaki, 5,114,605, Cl. 252-68.000.

Fuse, Jiro, to Kabushiki Kaisha Machida Seisakusho. Projector system and system for detecting flaw. 5,115,349, Cl. 358-709.000

Fyvie, Thomas J.: *See—*
Silva, James M.; and Fyvie, Thomas J., 5,114,861, Cl. 436-85.000.

G. D. Searle & Co.: *See—*
Bell, Leslie D.; McCullagh, Keith G.; and Porter, Alan G., 5,114,711, Cl. 424-85.100.

G.M. Pfaff: *See—*
Klundt, Kurt, 5,113,773, Cl. 112-320.000.

Gabriel, Jochen; Bechtold, Herbert; Hambrecht, Gerhard; and Nothdurft, Klaus, to Wilhelm Haselmeier GmbH & Co. Injection device for injection, especially self-administered injection, of medicament, including mechanisms for nulling and for selecting dosage, especially for use with multi-dose ampules. 5,114,406, Cl. 604-136.000.

Gabrius, A. J.; Mesh, Robert C.; Brey, Arthur; and Hartogh, Daniel, to Bally Manufacturing Corporation. Bill validation and change system for a slot machine. 5,113,990, Cl. 194-206.000.

Gadberry, Michael D.: *See—*
Robb, Stephen P.; Phipps, John P.; and Gadberry, Michael D., 5,115,369, Cl. 361-93.000.

Gagnon, Steven D.; Grace, Oscar M.; Smiecinski, Theodore M.; and Wujcik, Steven E., to BASF Corporation. Polyether polyols having reduced unsaturation and polyurethane foams prepared therefrom. 5,114,988, Cl. 521-167.000.

Gahagen, Hugh; Roman, Helen E.; and Holt, Sonia. Rotatable marine electric connector. 5,114,352, Cl. 439-22.000.

Gaiser, John W.: *See—*
Kasprzyk, Daniel J.; Orth, Jean C.; Gaiser, John W.; and Houser, Russell A., 5,114,423, Cl. 606-27.000.

Gaisser, Hermann, to Wangner Systems Corporation. Woven multilayer papermaking fabric having increased stability and permeability and method. 5,114,777, Cl. 428-137.000.

Gaither, Ronald A.: *See—*
Griffiths, Clifford H.; Brach, Paul J.; Williams, Edward C.; Gaither, Ronald A.; and Leenhouts, Timothy J., 5,114,736, Cl. 427-30.000.

Gajdos, Benedikt; and Mentzen, Heinz J., to A. Nattermann & Cie. GmbH. Phospholipid-containing composition, a process for its preparation and its use as an excipient for pharmaceutical substances. 5,114,928, Cl. 514-25.000.

Gajek, Richard T.: *See—*
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., 5,114,563, Cl. 208-114.000.

Gajewski, Henry M.: *See—*
Sluga, Robert M.; Watkins, Randolph H.; Gajewski, Henry M.; Fisher, Jerry D.; and Berry, Dennis C., 5,114,608, Cl. 252-162.000.

Galardy, Richard E.; Grobelny, Damian; and Schultz, Gregory, to University of Florida. Treatment for tissue ulceration. 5,114,953, Cl. 514-323.000.

Galindo, Jose : *See—*
Fehr, Charles; Galindo, Jose ; and Guntern, Olivier, 5,114,915, Cl. 512-15.000.

Gallagher, John J.: *See—*
Freedman, Jerome E.; Perry, Michael S.; and Gallagher, John J., 5,115,244, Cl. 342-158.000.
Perry, Michael S.; Freedman, Jerome E.; and Gallagher, John J., 5,115,243, Cl. 342-158.000.

Gallaher, William R.: *See—*
McCombs, Candace C.; Michalski, Joseph P.; Gallaher, William R.; and Thompson, James J., 5,114,863, Cl. 436-518.000.

Gallo, Christine A.; and Giglio, Bianca M. Clothing hanger clip. 5,113,554, Cl. 24-545.000.

Gallusser, David O.; and LeBaron, James B., to Amphenol Corporation. Overbraided in-line data bus loom. 5,115,105, Cl. 174-36.000.

Gamba, Eugenio. Chair equipped with a singing seat. 5,113,851, Cl. 128-33.000.

Gamlen, Dennis A.: *See—*
Senapati, Nagabhusan; Johnson, Harold W.; Kim, Byung C.; Chauhan, Satya P.; Gamlen, Dennis A.; Eason, Raju; Muralidhara, H. S.; and Zelinski, Matthew S., 5,114,560, Cl. 204-299.00R.

Gandy, Ronald L., to Rochester Corporation. Cable for housing parallelly oriented optical fibers and method and apparatus for producing the same. 5,115,485, Cl. 385-101.000.

Ganguli, Bimal N.: *See—*
Franco, Christopher M.; Vijayakumar, Erra K. S.; Chatterjee, Sugata; Ganguli, Bimal N.; Blumbach, Jurgen; Kogler, Herbert; and Fehlhaber, Hans-Wolfram, 5,114,967, Cl. 514-475.000.

Ganse, Akira: *See—*
Ikebuchi, Iwao; Ihara, Yoshitaka; Takei, Hisashi; Yamada, Syozo; Nakano, Mamoru; and Ganse, Akira, 5,114,083, Cl. 241-153.000.

Gao, Ge, to Chow, W. L. Surface for low drag in turbulent flow. 5,114,099, Cl. 244-130.000.

Garay, Antonio A., to Switchcraft Inc. Snap-in retainer sleeve. 5,115,375, Cl. 361-400.000.

Gareo Sports, Inc.: *See—*
Mahoney, Kenneth J., 5,114,141, Cl. 273-1.50R.

Garfield, Douglas: *See—*
Pitzen, Gerald; Garfield, Douglas; Beltz, Warren G.; Arntzen, Lawrence O.; and Bina, Joseph C., 5,114,391, Cl. 482-62.000.

Garner, Robert E.: *See—*
Cohen, Robert B.; and Garner, Robert E., 5,115,506, Cl. 395-725.000.

Garrison, Alexander J.: *See—*
Holcomb, Robert R.; Arnold, Edward R.; and Garrison, Alexander J., 5,113,751, Cl. 99-286.000.

Gartshore, Gavin C.; and Holme, Norman E., to Blue Circle Industries PLC and ALH Systems Limited. Cementitious composition and making concrete therefrom. 5,114,487, Cl. 106-695.000.

Garvey, Michael J.; and Griffiths, Ian C., to Lever Brothers Company, Division of Conopco, Inc. Liquid non-aqueous cleaning products comprising a dispersion modifier and method for their preparations. 5,114,620, Cl. 252-558.000.

Gassmann, Felix; and Snedkerud, Ole, to Asea Brown Boveri Ltd. Balancing loop. 5,115,214, Cl. 333-26.000.

Gat, Arnon; and Mordo, David, to AG Processing Technologies, Inc. Bichannel radiation detection method. 5,114,242, Cl. 374-128.000.

Gateshead Manufacturing Corporation: *See—*
Zatezalo, John M.; and Panson, Michael S., 5,115,406, Cl. 364-551.010.

Gaus, Harry; Schliebs, Gunter; and Gross, Hagen. Right angle plug. 5,115,367, Cl. 361-49.000.

Gautherin, Jean-Claude; and Zegre, Henry, to Instrument SA. Spectroscopic analysis device. 5,114,231, Cl. 356-328.000.

Gavin, David F.: *See—*
Branch, Charles E.; Gavin, David F.; and Robitaille, Thomas E., 5,114,984, Cl. 521-121.000.

Gawin, Frank H.; Humblestone, Brian G.; and Allen, David F., to Yale University. Treating habit disorders. 5,114,942, Cl. 514-255.000.

Gazzara, Peter J.: *See—*
Burke, John W., Jr.; and Gazzara, Peter J., 5,113,528, Cl. 2-9.000.

Geach, Neil J.; Gilmour, James; Hatton, Leslie R.; and Smith, Philip H. G., to May & Baker Limited. Cyclic diones. 5,114,461, Cl. 71-88.000.

Gebizlioglu, Osman S.; Cohen, Robert E.; Argon, Ali S.; Beckham, Haskell W.; and Qin, Jian, to Massachusetts Institute of Technology. Tough polymer compositions. 5,115,028, Cl. 525-232.000.

Gehlbach, Steve M.; and Venkatachalam, K. L., to Gehlbach, Steve M. Active transducer assembly for a phased array depth sounder. 5,115,416, Cl. 367-138.000.
Geiser, Peter, to Grapha-Holding AG. Perfect binder. 5,114,292, Cl. 412-11.000.
Geisler, Michael; Jung, Michael; and Faulhaber, Rudolf K., to Leybold AG. Apparatus for the plasma treatment of substrates. 5,113,790, Cl. 118-723.000.
Gelardi, John A.: *See*—
Gelardi, Paul J.; Gelardi, John A.; and Capotosto, David A., 5,114,092, Cl. 242-199.000.
Gelardi, Paul J.; Gelardi, John A.; and Capotosto, David A., to Gelardi, Paul J. Low cost video cassette. 5,114,092, Cl. 242-199.000.
Gelbard, Edward S. Nested plastic bags and method of manufacture. 5,113,637, Cl. 53-429.000.
Gelman Sciences, Inc.: *See*—
Kraus, Menahem; Velazquez, Diosie; and Wang, Chan-Hong, 5,114,585, Cl. 210-490.000.
Gelorme, Jeffrey D.: *See*—
Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., 5,115,095, Cl. 525-474.000.
Gembicki, Stanley A.: *See*—
Holmgren, Jennifer S.; Gembicki, Stanley A.; Schoonover, Michael W.; and Kocal, Joseph A., 5,114,895, Cl. 502-84.000.
GenCorp Inc.: *See*—
Chihara, Kohji Y.; and Lenke, Gerd M., 5,115,007, Cl. 524-267.000.
Neubert, Terry C., 5,114,991, Cl. 523-201.000.
Rasicci, Vincent M.; Miodusezski, John F.; and Gurganus, Cecil R., 5,115,063, Cl. 526-287.000.
General Atomics: *See*—
Fisher, Michael V.; Schaubel, Kurt M.; and Raggio, William A., 5,114,087, Cl. 242-42.000.
General Automotive Specialty Co., Inc.: *See*—
Levine, Mark; Bellwoar, George; and Murphy, Douglas A., 5,113,602, Cl. 40-634.000.
General Drawings Corporation Convair Division: *See*—
Mole, Philip J., 5,113,696, Cl. 73-147.000.
General Dynamics Corporation Air Defense Systems Division: *See*—
Weiman, Sam M., 5,114,460, Cl. 75-235.000.
General Dynamics Corporation/Space Systems Division: *See*—
Stern, Theodore G.; and Cornwall, Mickey, 5,114,101, Cl. 244-173.000.
General Electric Company: *See*—
Berns, Evan M.; and Clark, Angelika H., 5,114,767, Cl. 428-35.700.
Coffinberry, George A., 5,113,669, Cl. 62-401.000.
Coffinberry, George A., 5,114,103, Cl. 244-209.000.
Dickens, Virgel; and Minnick, Michael G., 5,115,016, Cl. 524-513.000.
Engeler, William E., 5,115,492, Cl. 395-27.000.
Fitz, George E., III; Krenz, Rudi O.; and Carnes, Harmon R., 5,115,112, Cl. 219-69.200
Fontana, Luca P.; and Brown, Sterling B., 5,115,024, Cl. 525-133.000.
Freedman, Jerome E.; Perry, Michael S.; and Gallagher, John J., 5,115,244, Cl. 342-158.000.
Hurst, Robert N., Jr., 5,115,301, Cl. 358-12.000.
Khouri, Farid F.; Brown Sterling B.; and Jackman, John T., 5,115,042, Cl. 525-397.000.
Knoble, David W., 5,115,165, Cl. 315-92.000.
Monson, Paul J. E.; Rocksiroh, Todd J.; Mannava, Seetha R.; and Baeumel, Robert E., 5,113,582, Cl. 29-889.200.
Parsons, Charles F., 5,115,361, Cl. 526-262.000.
Perry, Michael S.; Freedman, Jerome E.; and Gallagher, John J., 5,115,243, Cl. 342-158.000.
Siedlecki, Walter F., Jr., 5,113,649, Cl. 60-226.300.
Silva, James M.; and Fyvie, Thomas J., 5,114,861, Cl. 436-85.000.
Terhune, James H., 5,114,064, Cl. 376-245.000.
Varney, Albert R., Jr., 5,115,190, Cl. 324-142.000.
Welles, Kenneth B., II; Hartley, Richard I.; and Hartman, Michael J., 5,115,437, Cl. 371-22.000.
Yates, Jonn B., III; Brown, Sterling B.; Lowry, Richard C.; Blubaugh, James C.; and Aycock, David F., 5,115,043, Cl. 525-390.000.
General Instrument Corporation: *See*—
Esserman, James N.; and Bennett, Christopher J., 5,115,467, Cl. 380-44.000.
General Motors Corporation: *See*—
Drennen, David B.; Huth, Ronald G.; and Hudson, David M., 5,113,987, Cl. 192-58.003.
Franck, Donald L.; Shah, Suresh D.; Sheth, Manu K.; and Zabel, Lawrence D., 5,114,650, Cl. 264-151.000.
Keegan, Kevin R., 5,115,396, Cl. 364-431.040.
Kotzan, Joseph M.; and Labus, Gregory E., 5,113,651, Cl. 60-274.000.
Miller, Earl G., 5,115,113, Cl. 219-89.000.
Tsang, Chih-Hao M.; and Bedford, Raymond E., 5,114,901, Cl. 502-240.000.
Genet, Alain: *See*—
Junino, Alex; Genet, Alain; and Lang, Gerard, 5,114,429, Cl. 8-410.000.
Gennari, Federico, to Bioresearch S.p.A. Injectable therapeutic compositions containing stable S-adenosyl-L-methionine salts. 5,114,931, Cl. 514-46.000.
Gentex Corporation: *See*—
Hedges, George D.; and Kuna, Francis J., 5,113,535, Cl. 2-424.000.
Georg Fischer AG: *See*—
Wilhelm, Ludwig; and Schmidt, Hans, 5,114,474, Cl. 75-751.000.
George, Eric R., to Shell Oil Company. Stabilized polyketone compositions containing a mixture of a hydroxyapatite and a mercaptobenzimidazole. 5,115,003, Cl. 524-93.000.
Georgefalvy, Dezso: *See*—
Rudolph, Peter K. C.; and Georgefalvy, Dezso, 5,114,100, Cl. 244-134.00C.
Georges, Michael K.; and Alexandru, Lupu, to Xerox Corporation. Polyalkyl styrene butadiene toner compositions. 5,114,820, Cl. 430-109.000.
Georgia-Pacific Corporation: *See*—
Rachor, Donald G.; and Buchholz, Richard F., 5,114,534, Cl. 162-9.000.
Gergen, William P.: *See*—
Smutny, Edgar J.; Gergen, William P.; Broekhuis, Antonius A.; Groenland, Franciscus C.; and Beijen, Johan M., 5,115,009, Cl. 524-306.000.
Gerin, Merlin: *See*—
Tripodi, Paul, 5,115,371, Cl. 361-106.000.
Gerke, Dieter: *See*—
Taybl, Christa; Muller, Manfred; Gerke, Dieter; and Bulow, Harald, 5,114,356, Cl. 439-133.000.
German, Paul M.: *See*—
Brant, Patrick; and German, Paul M., 5,114,763, Cl. 428-34.900.
Gerritse, Arie: *See*—
Schuerhoff, Hans-Juergen; Gerritse, Arie; and Mets, Lambertus C., 5,114,653, Cl. 264-228.000.
Gesellschaft fur biotechnologische Forsching mbH: *See*—
Blocker, Helmut, 5,114,839, Cl. 435-6.000.
Gesing, Adam: *See*—
Jain, Mukesh K.; Nadkarni, Sadashiv K.; and Gesing, Adam, 5,114,695, Cl. 423-411.000.
Gewanter, Herman L.; and May, Ralph D., to Pfizer Inc. Oxygen removal with keto-gluconates. 5,114,618, Cl. 252-389.530.
GEZE Sport International GmbH: *See*—
Bogner, Martin, 5,114,174, Cl. 280-636.000.
Giannetti, Patrizia: *See*—
Scuri, Romolo; Brufani, Mario; Ceccarelli, Stefano; De Vellis, Patrizia; Giannetti, Patrizia; Paesano, Agnese; and Zanarcella, Sergio, 5,114,966, Cl. 514-469.000.
Gianzero, Stanley C.; and Su, Shey-Min, to Halliburton Logging Services, Inc. Pulsed electromagnetic dipmeter method and apparatus employing coils with finite spacing. 5,115,198, Cl. 324-339.000.
Gibilisco, Kenneth J., to Merck & Co., Inc. Child resistant bottle closure assemblage. 5,114,029, Cl. 215-220.000.
Gibilisco, Salvatore: *See*—
Schoeyer, Herman F. R.; Borso, Guido; and Gibilisco, Salvatore, 5,113,763, Cl. 102-202.000.
Gibler, Martin J.: *See*—
Able, Edward C.; and Gibler, Martin J., 5,113,660, Cl. 60-752.000.
Giblin, Edward J.: *See*—
Brown, Arnold; and Giblin, Edward J., 5,114,013, Cl. 229-216.000.
Gibson, Clyde W. Fragrance dispenser for evaporating aromatic liquid. 5,114,625, Cl. 261-30.000.
Gibson, Trevor P.: *See*—
Williams, David R.; and Gibson, Trevor P., 5,114,637, Cl. 264-40.300.
Giersdorf, Rodney L.; Peduzzi, Alfred; Krul, Allan D.; Jones, Stephen R.; and Chetta, Gregory E., to United Technologies Corporation. Deoiler for jet engine. 5,114,446, Cl. 55-345.000.
Giessen, Bill C.; Markiewicz, Robert S.; and Chen, Feng, to Northeastern University. Crystal alignment technique for superconductors. 5,114,905, Cl. 505-1.000.
Gifford, Peter E., to Cryomech, Inc. Multi-stage cryogenic refrigerator. 5,113,663, Cl. 62-6.000.
Giglio, Bianca M.: *See*—
Gallo, Christine A.; and Giglio, Bianca M., 5,113,554, Cl. 24-545.000.
Gilad-Smolinsky, Zvi: *See*—
Mastov, Eduard; Mautner, Yehezkel; Gilad-Smolinsky, Zvi; and Levy, Moshe, 5,113,959, Cl. 180-11.000.
Gilbert, Major H., to Bridge Products, Inc. Check valve with quick lock attachment feature. 5,113,900, Cl. 137-515.500.
Gildemeister Italiana S.p.A.: *See*—
Ronzoni, Enrico, 5,113,729, Cl. 82-137.000.
Giles, Clinton R.: *See*—
DiGiovanni, David J.; and Giles, Clinton R., 5,115,338, Cl. 359-337.000.
Gileta, John, to Electrovert Ltd. Method of cleaning workpieces with a potentially flammable or explosive liquid and drying in the tunnel. 5,113,882, Cl. 134-19.000.
Gillespie, Gordon A.; and Delgado, Joseph A. Training device for baseball hitters. 5,114,142, Cl. 273-26.00C.
Gillespie, Peter J., to Ciba-Geigy Corporation. Contact lens disinfection unit with invertible lens holding baskets. 5,114,686, Cl. 422-300.000.
Gillette Company, The: *See*—
Callaghan, David T.; Phipps, Alan M.; and Provancal, Stephen J., 5,114,705, Cl. 424-66.000.
Lazarchik, Daniel B.; and Shurtleff, Jill M., 5,113,586, Cl. 30-90.000.
Rogers, Brian A.; and Tseng, Mingchih M., 5,113,585, Cl. 30-41.000.
Gillis, Herbert R.; and Hannaby, Malcolm, to Imperial Chemical Industries PLC. Isocyanate reactive compositions. 5,115,045, Cl. 525-420.000.

Gillis, Herbert R.: *See*—
Cassidy, Edward F.; Gillis, Herbert R.; Hannaby, Malcolm; and Parfondry, Alain, 5,114,480, Cl. 106-38.240.
Gillott, Michael A., to United Technologies Corporation. Dual independent input hydraulic shutoff. 5,114,115, Cl. 251-26.000.
Gilman, Garry L.: *See*—
Paxton, Gerald R.; Seid, Norman W.; and Gilman, Garry L., 5,114,404, Cl. 604-110.000.
Gilmour, James: *See*—
Geach, Neil J.; Gilmour, James; Hatton, Leslie R.; and Smith, Philip H. G., 5,114,461, Cl. 71-88.000.
Gilson, Jean-Pierre: *See*—
Van Helden, Arend K.; Gilson, Jean-Pierre; and Syrier, Johannes L. M., 5,115,002, Cl. 524-91.000.
Ginsberg, Mark H.: *See*—
Plow, Edward F.; and Ginsberg, Mark H., 5,114,842, Cl. 424-85.800.
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Benoit, Joel M. D.; Bessenay, Gilles J. M.; and Girault, Daniel G., 5,114,332, Cl. 425-407.000.
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Glaser, Mark C., to Weatherford U.S., Inc. Well apparatuses and anti-rotation device for well apparatuses. 5,113,940, Cl. 166-156.000.
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Blondeau, Robert; Rondt, Daniel; Glastre, Genevieve; and Krakowski, Michel, 5,115,283, Cl. 357-17.000.
Glaxo Group Limited: *See*—
Hayes, Norman F.; Scopes, David I. C.; McElroy, Andrew B.; Hayes, Ann G.; and Meerholz, Clive A., 5,114,945, Cl. 514-278.000.
Oxford, Alexander W.; Bays, David E.; Cavalla, David J.; and North, Peter C., 5,114,950, Cl. 514-294.000.
Gleason Works, The: *See*—
Ervay, Earl D.; and Boch, Mark J., 5,114,287, Cl. 409-13.000.
Glindre, Jan-Olof: *See*—
Blomberg, Fred; Friberg, Jan; Glindre, Jan-Olof; and Kangasmetsa, Jarl, 5,114,841, Cl. 435-7.900.
Gmohling, Werner: *See*—
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Godbe, Murray C.; and Nichols, Howard H. Apparatus for incinerating waste materials. 5,113,770, Cl. 110-187.000.
Goeddecke, Franz: *See*—
Strasser, Siegfried; Goeddecke, Franz; and Wolter, Albrecht, 5,114,131, Cl. 241-19.000.
Goehst, George: *See*—
Smith, Donald W.; Plociennik, James J.; Goehst, George; and Green, Andrew, 5,114,267, Cl. 404-83.000.
Goelzer, Alan R., to Stone & Webster Engineering Corporation. Apparatus for recovering heat energy from catalyst regenerator flue gases. 5,114,682, Cl. 422-142.000.
Goetghebeur, Stephane: *See*—
Hu, Wei-Shou; and Goetghebeur, Stephane, 5,114,855, Cl. 435-240.240.
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Paasche, George; and Hanssen, Ketil, 5,113,778, Cl. 114-256.000.
Gold, Daniel, to Crosfield Press Controls Limited. Register mark detection apparatus utilizing a first and second linear array of sensors arranged non-parallel allowing longitudinal and transverse monitoring. 5,115,141, Cl. 250-548.000.
Golden Needles Knitting & Glove Co., Inc.: *See*—
Sutton, Roger L., 5,113,532, Cl. 2-167.000.
Golder, Michael D.; and Walker, David K., to Hoechst Celanese Corp. Stabilized talc-filled polyester compositions. 5,114,995, Cl. 523-506.000.
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Petrille, Dennis G.; and Golinkin, Herbert S., 5,114,602, Cl. 252-51.50R.
Gonda, Takashi: *See*—
Ohmori, Naoto; and Gonda, Takashi, 5,115,272, Cl. 355-200.000.
Goodfellow, Anthony G., to Bridgestone/Firestone, Inc. Manufacture of a tubular article using flexible carrier. 5,114,511, Cl. 156-133.000.
Goodhue, Charles T.: *See*—
Pettrone, Frank A.; Whited, Gregory M.; and Goodhue, Charles T., 5,114,850, Cl. 435-135.000.
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Mercer, Frank W.; Goodman, Timothy D.; Lau, Aldrich N. K.; Vo, Lanchi P.; and Sovish, Richard C., 5,114,780, Cl. 428-195.000.
Goodwin, Frank E.; and Simonson, Dana, to Digital Optronics Corporation. 3-Dimensional vision system utilizing coherent optical detection. 5,114,226, Cl. 356-5.000.
Goody Products, Inc.: *See*—
Tiramani, Paolo M. B.; and Van Dyk, Thomas C., 5,114,052, Cl. 222-207.000.
Goodyear Tire & Rubber Company, The: *See*—
Lazeration, Joel J., 5,113,688, Cl. 73-8.000.
Gookin, Debra M.; Berry, Mark H.; and Lasher, Markham E., to United States of America, Navy. High speed serial optical crossbar switch. 5,115,331, Cl. 359-117.000.
Gorawara, Jayant K.: *See*—
Haun, Edward C.; Thompson, Gregory J.; Gorawara, Jayant K.; and Sullivan, Dana K., 5,114,562, Cl. 208-89.000.
Gotoh, Noboru: *See*—
Nishiguchi, Masanori; and Gotoh, Noboru, 5,113,622, Cl. 51-165.730.
Gottscho, Richard A.: *See*—
Clark, Linda A.; Gottscho, Richard A.; Kruskal, Joseph B.; and Lambert, Diane, 5,114,233, Cl. 356-354.000.
Goud, Gilles R.; and Brischoux, Jean-Claude, to Salomon S.A. Safety ski binding. 5,114,173, Cl. 280-633.000.
Gould, Inc.: *See*—
Suuronen, David E.; and Terry, Jean C., 5,115,220, Cl. 337-297.000.
Visnyouszky, Louis; and Bay, Adam G., 5,114,200, Cl. 294-81.560.
Govenius, Rainer: *See*—
Viljanto, Jouko; Govenius, Rainer; Lonnqvist, Kurt; and Hurula, Timo, 5,113,871, Cl. 128-768.000.
Gowan, James L., to JPI Transportation Products, Inc. Floating flange half bearing. 5,114,246, Cl. 384-275.000.
Goyal, Shri K., to Amoco Corporation. Sludge and oxygen quenching in delayed coking. 5,114,564, Cl. 208-131.000.
Gozani, Tsahi; and Shea, Patrick M., to Science Applications International Corporation. Explosive detection system. 5,114,662, Cl. 376-159.000.
Grabowski, Danuta: *See*—
Smoot, Stephen W.; Hayden, Joseph S.; Clement, Marc; Grabowski, Danuta; Holzel, Eva; Nass, Peter; and Heming, Martin, 5,114,813, Cl. 430-5.000.
Grace, Martin J.; and Simmons, Richard E., to Wiltron Company. Multiple YIG oscillator. 5,115,209, Cl. 331-49.000.
Grace, Oscar M.: *See*—
Gagnon, Steven D.; Grace, Oscar M.; Smiecinski, Theodore M.; and Wujcik, Steven E., 5,114,988, Cl. 521-167.000.
Grace Sierra Horticultural Products Co.: *See*—
Peters, John R.; and Peters, Robert B., 5,114,459, Cl. 71-32.000.
Grady, Brian T.: *See*—
Forsyth, Steven R.; and Grady, Brian T., 5,114,544, Cl. 204-59.00F.
Graf, Erich: *See*—
Biedermann, Jurgen; Evers, Michel; Terlinden, Rolf; Leyck, Sigurd; and Graf, Erich, 5,114,954, Cl. 514-338.000.
Graf, Ernst: *See*—
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Graf, Martin, to Grob & Co. Aktiengesellschaft. Toggle type clamp for coupling a heddle frame to a frame holder. 5,113,913, Cl. 139-91.000.
Graf, Peter E., to Chevron Research and Technology Company. Open-graded asphalt. 5,114,483, Cl. 106-281.100.
Graillat, Gerard: *See*—
Rousset, Didier; and Graillat, Gerard, 5,114,172, Cl. 280-633.000.
Grain Processing corporation: *See*—
Witt, Paul R., 5,114,894, Cl. 502-62.000.
Grammer AG: *See*—
Kurz, Helmut; and Stoeberl, Martin, 5,114,639, Cl. 264-46.600.
Grant, Barry. Fuel pressure regulator. 5,113,831, Cl. 123-457.000.
Grapha-Holding AG: *See*—
Geiser, Peter, 5,114,292, Cl. 412-11.000.
Graver Company, The: *See*—
Laterra, Terrance, 5,114,596, Cl. 210-798.000.
Gravesteijn, Dirk J.; Wijn, Josephus M.; and van Liempd, Johannes P. J. G., to U.S. Philips Corporation. Master disc suitable for the manufacture of matrices containing a recording double layer. 5,114,829, Cl. 430-275.000.
Gray, Colin, to Elmjet Limited. Continuous ink jet printing device. 5,115,251, Cl. 346-75.000.
Great Lakes Chemical Corporation: *See*—
Robin, Mark L., 5,113,947, Cl. 169-46.000.
Greco, Saverio G.; and Audeh, Costandi A., to Mobil Oil Corporation. HF alkylation unit with additive dispenser. 5,114,675, Cl. 422-62.000.
Green, Andrew: *See*—
Smith, Donald W.; Plociennik, James J.; Goehst, George; and Green, Andrew, 5,114,267, Cl. 404-83.000.
Green Cross Corporation: *See*—
Takaku, Fumimaro; and Motoyoshi, Kazuo, 5,114,710, Cl. 424-85.100.
Green, Keith; and Cree, James W., to Hitchiner Manufacturing Co., Inc. Method of casting wear-resistant, cast iron machine element. 5,113,924, Cl. 164-63.000.
Green, Ray E.: *See*—
Jones, Barton G.; Green, Ray E.; and Blancher, Eldon C., II, 5,113,792, Cl. 119-3.000.

Green, William, to Aquatechnology Resource Management Inc. Easily replaceable rotor membrane pack. 5,114,588, Cl. 210-634.000.
Greenall, Glenn E.: *See—*
Soroka, Daniel P.; Sheehan, Terrence M.; Comstock, Gary L.; and Greenall, Glenn E., 5,113,558, Cl. 29-57.000.
Greene, Leonard M., to Safe Flight Instrument Corporation. Combination aircraft yaw/angle of attack sensor. 5,115,237, Cl. 340-967.000.
Greenfield, Ephraim; and Vecht, Jacob J., to Ophir-Aryt Optronics, Ltd. Apparatus for measuring the energy of rapidly pulsing radiation. 5,114,228, Cl. 356-222.000.
Gregory, Danny L.; Hardee, Harry C.; and Smallwood, David O., to United States of America Energy. Downhole hydraulic seismic generator. 5,113,966, Cl. 181-106.000.
Grerory, Alex. Seven string electric guitar. 5,113,737, Cl. 84-267.000.
Gresser, Mark J.: *See—*
Plate, Richard W.; and Gresser, Mark J., 5,114,740, Cl. 427-40.000.
Gretag Systems: *See—*
Kraft, Walter; and Nehring, Jurgen, 5,115,270, Cl. 355-38.000.
Grey, Roger A., to Arco Chemical Technology, L.P. Alternating copolymers of olefinically unsaturated sulfonate salts and unsaturated imides. 5,115,060, Cl. 526-242.000.
Griat, Jacqueline: *See—*
N'Guyen, Quang L.; Griat, Jacqueline; Millecamps, Francois; Lang, Gerard; and Forestier, Serge, 5,114,716, Cl. 424-401.000.
Grieff, Thomas W.: *See—*
Dao, Hung D.; Grieff, Thomas W.; Lattin, Thomas W., Jr.; Thomas, Darren R.; Schultz, Stephen M.; Ewert, Richard; and Flower, David L., 5,115,225, Cl. 340-584.000.
Griffin, William W., Jr.: *See—*
Baird, Donald J.; Rhodes, Brett D.; and Griffin, William W., Jr., 5,114,159, Cl. 277-53.000.
Griffiths, Clifford H.; Brach, Paul J.; Williams, Edward C.; Gaither, Ronald A.; and Leenhouts, Timothy J., to Xerox Corporation. Method for varying nozzle traversal speed to obtain uniform thickness electrostatically spray coated layers. 5,114,736, Cl. 427-30.000.
Griffiths, Ian C.: *See—*
Garvey, Michael J.; and Griffiths, Ian C., 5,114,620, Cl. 252-558.000.
Grimes, David B., to Montague Industries, Inc. Accuset micrometer lathe. 5,113,621, Cl. 51-5.00D.
Grimshaw, Michael N.; Albers, Stephen J.; and Rust, Ralph J., to Cincinnati Milacron Inc. Method for laying cut composite tape on a mold having scrap removal. 5,114,519, Cl. 156-235.000.
Grisley, Kenneth M. Interlocking routed joint. 5,114,265, Cl. 403-381.000.
Grlj, Steven F.; and Cornelius, Craig J., to Sundstrand Data Control, Inc. Vibrating beam transducer drive system. 5,113,698, Cl. 73-862.590.
Grob & Co. Aktiengesellschaft: *See—*
Graf, Martin, 5,113,913, Cl. 139-91.000.
Grobelny, Damian: *See—*
Galardy, Richard E.; Grobelny, Damian; and Schultz, Gregory, 5,114,953, Cl. 514-323.000.
Groenland, Franciscus C.: *See—*
Smutny, Edgar J.; Gergen, William P.; Broekhuis, Antonius A.; Groenland, Franciscus C.; and Beijen, Johan M., 5,115,009, Cl. 524-306.000.
Groezinger, John L., to Honeywell Inc. Image recognition edge detection method and system. 5,115,477, Cl. 382-22.000.
Grosch, Hermann, to Rheinmetall GmbH. Mine control device. 5,113,766, Cl. 102-427.000.
Gross, Hagen: *See—*
Gaus, Harry; Schliebs, Gunter; and Gross, Hagen, 5,115,367, Cl. 361-49.000.
Grotz, Bernard J., Jr., to C. F. Braun & Co. Ammonia recovery from purge gas. 5,114,694, Cl. 423-352.000.
Grube, Erwin; Kuhlmann, Walter; and Schneuing, Ralf, to Durkopp Adler AG. Hanging device for supporting a clothes-hanger on a suspended conveyor. 5,113,998, Cl. 198-465.400.
Gruber, Leopold R.: *See—*
Theurer, Josef; Oellerer, Friedrich; and Gruber, Leopold R., 5,114,119, Cl. 254-134.10R.
Grumman Aerospace Corporation: *See—*
Homer, Peter K., 5,115,249, Cl. 343-753.000.
Grunewald, Wolfgang: *See—*
Weisenburger, Siegfried; Grunewald, Wolfgang; and Seiffert, Hartmut, 5,114,456, Cl. 65-327.000.
Grutter, Markus G.: *See—*
Maschler, Reinhard; Steiner, Verena; Grutter, Markus G.; and Raschdorf, Fritz, 5,114,922, Cl. 514-12.000.
Gsell, Rainer; and White, Philip, to Lindauer Dornier Gesellschaft m.b.H. Gripper rod for shuttleless looms and method for making the gripper rod. 5,114,775, Cl. 428-107.000.
GTE Laboratores Incorporated: *See—*
Buhrer, Carl F., 5,115,481, Cl. 385-25.000.
GTE Products: *See—*
Knoll, William C.; McColl, James R.; and Lawson, James O., 5,115,160, Cl. 310-313.00B.
GTE Products Corporation: *See—*
Johnson, Walter A.; Koepatz, Nelson E.; and Ritsko, Joseph E., 5,114,471, Cl. 75-346.000.
Wright, John O., 5,115,299, Cl. 357-72.000.
GTE Valenite Corporation: *See—*
Cusack, Robert F., 5,115,593, Cl. 33-644.000.
Pawlik, James A., 5,114,282, Cl. 407-40.000.
Gueremy, Claude; Malleron, Jean-Luc; and Mignani, Serge, to Rhone-Poulenc Sante. Heterocyclic derivatives, their preparation and medicinal products containing them. 5,114,949, Cl. 514-293.000.
Guesnon, Jean; Laurencin, Andre; and Klopfeinstein, Claude, to Institut Francais du Petrole. Method and apparatus for forming a titanium or titanium alloy sheet element with a contoured surface. 5,113,681, Cl. 72-53.000.
Guglielmetti, Robert; and Tardieu, Pascale, to Essilor International (Compagnie Generale d'Optique. Indolino-spiro-oxazine photochromic compounds with five-membered rings, method for their preparation, photochromic compositions and articles containing such compounds. 5,114,621, Cl. 252-586.000.
Guigon, Martine: *See—*
Frindel, Emilia; Lenfant, Maryse; Guigon, Martine; and Bakala, Johanna, 5,114,926, Cl. 514-18.000.
Guile, Donald L.: *See—*
Beall, Douglas M.; DeLiso, Evelyn M.; Guile, Donald L.; and Murtagh, Martin J., 5,114,644, Cl. 264-63.000.
Guillaume, Nicolas; and Becerril, Philippe, to Rockwell-CIM. Device for connecting a window-bottom section of a vehical door to a sliding section of a window lift, and vehicle door equipped with this device. 5,113,620, Cl. 49-375.000.
Guis, Marinus B., to Orthodontie Research B.V. Method of applying an orthodontic aid, and mold therefor. 5,114,339, Cl. 433-24.000.
Guither, James E.: *See—*
Wang, Paul J., Jr.; Petrich, Michael J.; Wadzinski, Francis A.; and Guither, James E., 5,114,520, Cl. 156-240.000.
Gulick, Jon: *See—*
Wen, Cheng P.; Mendolia, Gregory S.; Siracusa, Mario; Maieron, Joseph J.; Higdon, William D.; Wooldridge, John J.; and Gulick, Jon, 5,115,245, Cl. 342-175.000.
Gunagan, Barry P.: *See—*
Ahmed, Bashir M.; Gunagan, Barry P.; and Hall, Wilbur S., 5,114,751, Cl. 427-242.000.
Gunji, Minoru: *See—*
Saito, Makoto; and Gunji, Minoru, 5,114,663, Cl. 376-233.000.
Guntern, Olivier: *See—*
Fehr, Charles; Galindo, Jose ; and Guntern, Olivier, 5,114,915, Cl. 512-15.000.
Gurganus, Cecil R.: *See—*
Rasicci, Vincent M.; Mioduszeski, John F.; and Gurganus, Cecil R., 5,115,063, Cl. 526-287.000.
Gurley, Thomas D.; and Sendelweck, Gene K., to Thomson Consumer Electronics Inc. Field service switch for a television receiver. 5,115,316, Cl. 358-188.000.
Gusack, James A.: *See—*
Newman, Kirk E.; Gusack, James A.; and Zehmer, John A., III, 5,114,630, Cl. 264-3.100.
Guy, Jean-Luc; and Saladin, Jean-Pierre, to Jouan. Closing covers of apparatuses with centrifugal rotors. 5,114,533, Cl. 159-6.100.
Gysel, Hermann; and Ramachandran, Mani, to Synchronous Communications, Inc. Delay distortion compensating circuit for optical transmission system. 5,115,440, Cl. 372-38.000.
Haack, John L., to Xerox Corporation. Toner and developer compositions with charge enhancing additives. 5,114,821, Cl. 430-110.000.
Haag, Anthony P.: *See—*
Brennan, David J.; White, Jerry E.; Haag, Anthony P.; and Kram, Shari L., 5,115,075, Cl. 528-99.000.
Haak, Martin, Sr. Scissor-type lifting device, particularly for a work platform. 5,113,972, Cl. 248-141.000.
Haas, Zygmunt, to AT&T Bell Laboratories. Communication architecture for high speed networking. 5,115,432, Cl. 370-94.100.
Haavik, Harold; Peroaho, Tapio; Vesala, Reijo; and Vikman, Vesa, to A. Ahlstrom Corporation. Centrifugal pump with sealing means. 5,114,310, Cl. 415-169.100.
Habel, Mark A.: *See—*
Ogg, Randy G.; and Habel, Mark A., 5,114,771, Cl. 428-43.000.
Haber, Terry M.; Foster, Clark B.; and Smedley, William H., to Habley Medical Technology Corporation. Multi-chamber vial. 5,114,411, Cl. 604-203.000.
Haberkorn, Axel: *See—*
Lindner, Werner; and Haberkorn, Axel, 5,114,938, Cl. 514-242.000.
Habley Medical Technology Corporation: *See—*
Haber, Terry M.; Foster, Clark B.; and Smedley, William H., 5,114,411, Cl. 604-203.000.
Hadley, Hugh W.: *See—*
Thomas, Daniel D., Jr.; Hadley, Hugh W.; and Len, Joseph J., 5,115,246, Cl. 342-195.000.
Haferl, Peter E., to RCA Licensing Corporation. Raster distortion correction circuit. 5,115,171, Cl. 315-371.000.
Hagen Batterie AG: *See—*
Disselbeck, Dieter; Berger, Karl C.; and Drews, Jurgen, 5,114,812, Cl. 429-234.000.
Hagen, Uwe; and Feucht, Peter, to Siemens Aktiengesellschaft. Multipart planar electrode for an HF-surgery device. 5,114,424, Cl. 606-32.000.
Hagerstedt, Lars-Erik, to Hydro Supra AB. Method of sewage treatment. 5,114,587, Cl. 210-614.000.
Haggiage, Johnny: *See—*
Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Huges; Prazuck, Thierry; and Torres, Ghislaine, 5,114,707, Cl. 424-667.000.
Hagino, Motoyuki: *See—*
Konishi, Kouji; Ohshima, Tadayoshi; Fujii, Masakazu; Hagino, Motoyuki; Hosono, Satoshi; and Miyake, Masayoshi, 5,115,144, Cl. 250-572.000.

Hagiwara, Takaaki: *See—*
Yatsuda, Yuji; Hagiwara, Takaaki; Kondo, Ryuji; Minami, Shinichi; and Itoh, Yokichi, 5,114,870, Cl. 437-40.000.
Hagmann, Mark J.; and Babij, Tadeusz M., to Florida International University. Electric field and temperature probe. 5,113,864, Cl. 128-653.100.
Hagmann, Peter: *See—*
Hofer, Peter; Hagmann, Peter; Krieg, Gunther; and Vaas, Eberhard, 5,114,628, Cl. 264-1.400.
Hagopian, James C. Cropping device for photographs and the like. 5,115,271, Cl. 355-74.000.
Hagstrom, David A.: *See—*
Bennett, Blake J.; and Hagstrom, David A., 5,113,780, Cl. 114-286.000.
Hagura, Shigehisa: *See—*
Fujii, Kenjiro; Oura, Masao; Tuburaya, Kazuyuki; and Hagura, Shigehisa, 5,115,179, Cl. 318-568.130.
Hahn & Kolb GmbH & Co.: *See—*
Barlow, Philip D., 5,114,264, Cl. 403-323.000.
Hahn, Rainer. Apparatus for selection of tooth color. 5,114,340, Cl. 433-26.000.
Hahne, Ellen L.; and Maxemchuk, Nicholas F., to AT&T Bell Laboratories. Fair access of multi-priority traffic to distributed-queue dual-bus networks. 5,115,430, Cl. 370-85.600.
Hail, Mark E.: *See—*
Yost, Richard A.; and Hail, Mark E., 5,114,439, Cl. 55-20.000.
Haines, Steven N. M., to Lucas Industries public limited company. Control system for engine. 5,113,830, Cl. 123-436.000.
Halcyon Corporation: *See—*
Lin, Shih C., 5,114,256, Cl. 401-46.000.
Hall, Robert C., to Nordson Corporation. Method for gas-aided dispensing of liquid materials. 5,114,752, Cl. 427-273.000.
Hall, Ronald L.: *See—*
Bonde, Kevin G.; and Hall, Ronald L., 5,113,818, Cl. 123-196.00W.
Hall Surgical: *See—*
Fletcher, Henry H., 5,115,175, Cl. 318-280.000.
Hall, Wilbur S.: *See—*
Ahmed, Bashir M.; Gunagan, Barry P.; and Hall, Wilbur S., 5,114,751, Cl. 427-242.000.
Halliburton Company: *See—*
Allen, Thomas E., 5,114,239, Cl. 366-6.000.
McMechan, David E., 5,113,942, Cl. 166-250.000.
Halliburton Logging Services, Inc.: *See—*
Gianzero, Stanley C.; and Su, Shey-Min, 5,115,198, Cl. 324-339.000.
Haluda, Raymond; and Michen, Ramon, to Coachmen Industries, Inc. Recreational vehicle frame. 5,114,183, Cl. 280-781.000.
Hamada, Jun-ichi; and Okamoto, Yukio, to Konica Corporation. Residual toner cleaning apparatus for color image forming device. 5,115,280, Cl. 355-299.000.
Hamaekers, Arno; and Simuttis, Arnold, to Carl Freudenberg, Firma. Engine mount. 5,113,965, Cl. 180-300.000.
Hamanaka, Izumi; Maekawa, Yoshikazu; Arai, Hiroyuki; Nishiki, Akihiko; Muramatsu, Takeshi; Yokoyama, Toshio; and Yukizane, Shigemi, to Konica Corporation. Recorded sheet handling apparatus. 5,114,130, Cl. 270-53.000.
Hambrecht, Gerhard: *See—*
Gabriel, Jochen; Bechtold, Herbert; Hambrecht, Gerhard; and Nothdurft, Klaus, 5,114,406, Cl. 604-136.000.
Hamby, James M.; Kaltenbronn, James S.; and Repine, Joseph T., to Warner-Lambert Company. Renin inhibiting nonpeptides. 5,114,937, Cl. 514-238.200.
Hamermesh, Charles L.: *See—*
McWilliams, William H.; Hamermesh, Charles L.; and Welch, Evan B., 5,114,792, Cl. 428-422.000.
Hamilton, Daniel V.: *See—*
Seider, Gary L.; and Hamilton, Daniel V., 5,113,626, Cl. 52-157.000.
Hamlin, Robert N.: *See—*
Wilson, Shari J.; Appeldorn, Roger H.; and Hamlin, Robert N., 5,113,555, Cl. 24-576.000.
Hampl, Edward F., Jr.; Iqbal, Mohammad; and Thompson, Suzanne J., to Minnesota Mining and Manufacturing Company. High purity aromatic polyesters. 5,115,372, Cl. 361-323.000.
Han, Kenneth N.; and Meng, Xinghui, to South Dakota School of Mines & Technology. Ammonia extraction of gold and silver from ores and other materials. 5,114,687, Cl. 423-32.000.
Hanel, Albert L.: *See—*
Young, Gary B.; Hanel, Albert L.; and Veselka, Kenneth R., 5,113,548, Cl. 15-346.000.
Hang, Hsueh-Ming, to AT&T Bell Laboratories. Method and apparatus for dynamic channel bandwidth allocation among multiple parallel video coders. 5,115,309, Cl. 358-133.000.
Hanley, Stephen J., to Shell Oil Company. Reinforced polymers. 5,114,992, Cl. 523-217.000.
Hannaby, Malcolm: *See—*
Cassidy, Edward F.; Gillis, Herbert R.; Hannaby, Malcolm; and Parfondry, Alain, 5,114,480, Cl. 106-38.240.
Gillis, Herbert R.; and Hannaby, Malcolm, 5,115,045, Cl. 525-420.000.
Hansch, Egon, to Ferag AG. Apparatus for preparing wire pieces for a stapling machine. 5,113,732, Cl. 83-154.000.
Hansel, Eduard: *See—*
Meckel, Walter; Hansel, Eduard; Arend, Gunter; and Konig, Klaus, 5,115,073, Cl. 528-83.000.
Hanson, Ronald A., to Woodline Manufacturing, Inc. Solid wood paneling system. 5,113,632, Cl. 52-385.000.
Hanssen, Ketil: *See—*
Paasche, George; and Hanssen, Ketil, 5,113,778, Cl. 114-256.000.
Hanssler, Gerd: *See—*
Klausener, Alexander; Kleefeld, Gerd; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 5,114,959, Cl. 514-369.000.
Hara, Koichi, to Hoya Corporation. Molding container for manufacturing glass article. 5,114,114, Cl. 249-60.000.
Hara, Takaaki, to NEC Corporation. Piezo-electric oscillator. 5,115,211, Cl. 331-116.0FE.
Harada, Hiromi; and Nozawa, Toshihisa, to Tokyo Electron Limited. Heat-treatment furnace. 5,115,118, Cl. 219-390.000.
Harada, Keizo: *See—*
Higaki, Kenjiro; Harada, Keizo; Fujimori, Naoji; Itozaki, Hideo; and Yazu, Shuji, 5,114,906, Cl. 505-1.000.
Harada, Nobuyuki; Okuno, Toshihiro; and Shimomura, Tadao, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Process for producing quality-improved water-absorbent polymers and products. 5,115,011, Cl. 524-419.000.
Harada, Tamotsu; Kumagai, Gen; Yanagida, Kiyoshi; Yaguchi, Katsuhiko; Fujioka, Nagaki; Yagi, Akiharu; Yanoguchi, Koji; and Kodaira, Satoru, to Pioneer Electronic Corporation. Cassette changer for tape player. 5,115,362, Cl. 360-92.000.
Harclerode, William H.; Knutsen, John C.; Pekich, Barry J.; Wiman, John V.; and Voss, John C., to BASF Corporation. Time-efficient process for making expanded polymeric products with multipass expansion of polystyrene bead. 5,114,640, Cl. 264-53.000.
Harclerode, William H.: *See—*
Zimmermann, Eugene K.; Wagner, Bernhard; Volz, William E.; Harclerode, William H.; Wiman, John V.; and Voss, John C., 5,115,066, Cl. 526-346.000.
Hardee, Harry C.: *See—*
Gregory, Danny L.; Hardee, Harry C.; and Smallwood, David O., 5,113,966, Cl. 181-106.000.
Hardinge Brothers, Inc.: *See—*
Soroka, Daniel P.; Sheehan, Terrence M.; Comstock, Gary L.; and Greenall, Glenn E., 5,113,558, Cl. 29-57.000.
Harigai, Noriaki: *See—*
Takiyama, Eiichiro; Ogura, Ryushi; and Harigai, Noriaki, 5,115,032, Cl. 525-279.000.
Harlan, Eugene G.: *See—*
Tillery, Michael L.; Harlan, Eugene G.; Martin, John R.; Zammuto, Samuel N.; and Bonilla, Marcio, 5,114,155, Cl. 273-371.000.
Harmon, J. P.; and Kaplinsky, George T., to Hewlett-Packard Company. Wiper for ink-jet printhead. 5,115,250, Cl. 346-1.100.
Harnack, Phyllis M.: *See—*
Fitzpatrick, Brian J.; Harnack, Phyllis M.; and Baker, Scott H., 5,115,163, Cl. 313-36.000.
Harpel, William L.: *See—*
Deck, Philip D.; Rivera, Jose B.; and Harpel, William L., 5,114,607, Cl. 252-156.000.
Harris Corporation: *See—*
Kennedy, Michael; Pierce, Ben; and Chan, Aaron, 5,115,462, Cl. 379-29.000.
Koontz, Floyd A., 5,115,215, Cl. 333-103.000.
Harris, Frank W.; and Korleski, Joseph E., to University of Akron, The. Self polymerizable phenylquinoxalines, their preparation and use in polyphenylquinoxaline homopolymers and copolymers. 5,115,078, Cl. 528-125.000.
Harris, Ivor R.: *See—*
Cockayne, Brian; MacEwan, William R.; Harris, Ivor R.; and Smith, Nigel A., 5,114,669, Cl. 420-8.000.
Harris, James C., to Alliant Techsystems, Inc. Navigation method for spinning body and projectile using same. 5,114,094, Cl. 244-3.220.
Harris, John F., III: *See—*
Nobile, Frederick E.; Harris, John F., III; Silverman, Gary S.; and Baumann, Richard A., 5,115,330, Cl. 359-52.000.
Harris, Richard H.; Minor, Richard G.; and Price, Robert W., to International Business Machines Corporation. Shuttered display panel. 5,115,228, Cl. 340-716.000.
Harris, Robert F.; and Joseph, Michael D., to Dow Chemical Company, The. Polyalkyeneoxy polyahls containing hydrogen bonding moieties in their backbone and hydroxyalkyl carbamate end groups and a process for their preparation. 5,115,070, Cl. 528-59.000.
Harris, Tim: *See—*
Bardas, Theodor; Eisenbart, Jules; Harris, Tim; and Oleksuk, Cal, 5,115,192, Cl. 324-207.120.
Harris, William H., Jr; Nussbaum, William E.; Armstrong, Michael J.; Deming, Victor H.; and Brink, John E., to U.S. News & World Report, L.P. Process and apparatus for personalizing magazines, books and other print media. 5,114,128, Cl. 270-11.000.
Harsdorff, Ortwin, to SKF GmbH. Bearing for a shaft member or the like. 5,114,248, Cl. 384-473.000.
Hart, Judy L.; and Munday, William A. Clevis and screw pin type shackle with pin lock. 5,114,260, Cl. 403-24.000.
Hartgrove, Randall J.: *See—*
Schroeder, Jon M.; Long, Joseph F.; and Hartgrove, Randall J., 5,113,580, Cl. 29-840.000.
Hartley, Richard I.: *See—*
Welles, Kenneth B., II; Hartley, Richard I.; and Hartman, Michael J., 5,115,437, Cl. 371-22.500.
Hartman, Michael J.: *See—*
Welles, Kenneth B., II; Hartley, Richard I.; and Hartman, Michael J., 5,115,437, Cl. 371-22.500.

VOL
1138
ISS
3
MY
19
19 92
UMI

Hartmann, Uwe; Mai, Udo; and Schichl, Roman, to Vogt Electronic AG. Ignition system for an internal combustion engine. 5,113,839, Cl. 123-606.000.
Hartnett, Joseph F.; and Wendt, Richard E., to Louisiana Pacific Corporation. Machine for blowing thermal insulation. 5,114,281, Cl. 406-39.000.
Hartogh, Daniel: *See*—
Gabrius, A. J.; Mesh, Robert C.; Brey, Arthur; and Hartogh, Daniel, 5,113,990, Cl. 194-206.000.
Hartter, Timothy R.: *See*—
Huber, Gordon R.; Wenger, LaVon G.; Hauck, Bobble W.; Rokey, Galen J.; Schmelzle, Lawrence E.; and Hartter, Timothy R., 5,114,488, Cl. 127-1.000.
Harvey, David: *See*—
Stiffler, Jack J.; Nolan, James M.; Mark, Peter; and Harvey, David, 5,115,499, Cl. 395-425.000.
Hasebe, Takao: *See*—
Oyama, Hiroshi; and Hasebe, Takao, 5,115,401, Cl. 364-474.370.
Hasegawa, Jun: *See*—
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 5,115,321, Cl. 358-213.190.
Hashiguchi, Hiroaki, to Prio Co. Incorporated. Process for improving an adhering property of the adhering surface of an unsaturated polyester resin. 5,114,649, Cl. 264-139.000.
Hashimoto, Kazuhiko: *See*—
Kajiwara, Toshiyuki; Tanii, Yoshinori; and Hashimoto, Kazuhiko, 5,114,543, Cl. 205-152.000.
Hashimoto, Mikio; and Kaneshige, Norio, to Mitsui Petrochemical Industries, Ltd. Copolyester, polyester composition containing the copolyester, and polyester laminated structure having layer composed of the copolyester or the polyester composition. 5,115,047, Cl. 525-444.000.
Hashimoto, Yoshinori, to Sharp Kabushiki Kaisha. Bidirectional I/O signal separation circuit. 5,115,149, Cl. 307-475.000.
Hashizume, Kenji; Okamura, Masatoshi; and Shiba, Haruo, to TDK Corporation. Magnetic tape cassette having elastic pad element. 5,115,365, Cl. 360-132.000.
Hassler, Dietrich; and Killig, Klaus, to Siemens Aktiengesellschaft. Method for ultrasound imaging. 5,113,866, Cl. 128-661.010.
Hastings, Jerome K.: *See*—
Leonard, Mark L.; Uthoff, Loren H., Jr.; and Hastings, Jerome K., 5,115,162, Cl. 310-339.000.
Hata, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha. Rotational position detecting apparatus with a signal generator. 5,113,693, Cl. 73-118.100.
Hatakeyama, Noboru: *See*—
Sato, Kiyoshi; Taguchi, Masaaki; Wada, Yasunori; Kawasaki, Mikio; Ohtani, Shinichi; Iwada, Masatosi; and Hatakeyama, Noboru, 5,114,836, Cl. 430-434.000.
Hatanaka, Hazime: *See*—
Matsushiro, Nobuhito; Hatanaka, Hazime; Yoshida, Takayoshi; and Oyake, Ikuo, 5,115,402, Cl. 395-141.000.
Hatta, Koichi, to Sharp Kabushiki Kaisha. Password system utilizing two password types, the first being changeable after entry, the second being unchangeable until power is removed. 5,115,508, Cl. 395-725.000.
Hatton, Leslie R.: *See*—
Geach, Neil J.; Gilmour James; Hatton, Leslie R.; and Smith, Philip H. G., 5,114,461, Cl. 71-88.000.
Hattori, Hideyuki: *See*—
Kato, Eiichi; and Hattori, Hideyuki, 5,114,822, Cl. 430-114.000.
Hattori, Morishige: *See*—
Okuno, Sumio; Takeichi, Michifumi; Ohmura, Keiji; Okazaki, Msato; Tsuruda, Hitoshi; Yamada, Hiroyuki; Hattori, Morishige; and Kimura, Kenji, 5,113,769, Cl. 105-422.000.
Hattori, Yasuo: *See*—
Shiraki, Toshinori; and Hattori, Yasuo, 5,115,035, Cl. 525-314.000.
Hatzakis, Michael: *See*—
Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., 5,115,095, Cl. 525-474.000.
Haubner, George, to Robert Bosch GmbH. Adjusting device. 5,113,824, Cl. 123-399.000.
Hauck, Bobble W.: *See*—
Huber, Gordon R.; Wenger, LaVon G.; Hauck, Bobble W.; Rokey, Galen J.; Schmelzle, Lawrence E.; and Hartter, Timothy R., 5,114,488, Cl. 127-1.000.
Hauers, Manfred; and Vits, Dieter, to Zinser Textilmaschinen GmbH. Textile machine service unit having a roving end extending apparatus. 5,113,645, Cl. 57-269.000.
Haun, Edward C.; Thompson, Gregory J.; Gorawara, Jayant K.; and Sullivan, Dana K., to UOP. Two-stage hydrodesulfurization and hydrogenation process for distillate hydrocarbons. 5,114,562, Cl. 208-89.000.
Hawe, Malcolm: *See*—
Biggin, Ian S.; Cartwright, Peter S.; Farrar, David; Hawe, Malcolm; and Paget, Walter E., 5,114,600, Cl. 252-86.000.
Hawker, Michael J.: *See*—
Hunter, George S.; and Hawker, Michael J., 5,114,572, Cl. 210-120.000.
Hayama, Takashi: *See*—
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Nishikibe, Masaru; Ihara, Masaki; and Yano, Mitsuo, 5,114,918, Cl. 514-11.000.
Hayasaki, Koichi, to Nissan Motor Co., Ltd. Control system for an automatic automotive transmission. 5,113,724, Cl. 74-867.000.
Hayashi, Katsuhiko; Yamaguchi, Minori; and Nakayama, Takehisa, to Kanegafuchi Chemical Industry Co., Ltd. Contact type photoelectric transducer. 5,115,123, Cl. 250-208.100.
Hayashi, Masao: *See*—
Oda, Kengo; Moriyasu, Koichi; Hayashi, Masao; Nishida, Makoto; Oyamada, Masami; Fujiwara, Akie; and Watanabe, Junko, 5,114,466, Cl. 71-94.000.
Hayashi, Masayoshi, to Toa Medical Electronics Co., Ltd. Device of measuring a blood coagulating time. 5,114,860, Cl. 436-69.000.
Hayashi, Muneo, to Sony Corporation. Image pick-up apparatus. 5,115,303, Cl. 358-51.000.
Hayashi, Shigeo, to Sumitomo Electric Industries, Ltd. Wide dynamic range current source circuit. 5,115,187, Cl. 323-315.000.
Hayashi, Takao; and Osawa, Yasuo, to Japan Atomic Power Company, The; and Babcock-Hitachi Kabushiki Kaisha. High temperature reactor having an improved fluid coolant circulation system. 5,114,667, Cl. 376-299.000.
Hayashi, Takashi: *See*—
Wamura, Hiroo; Uesugi, Shunyo; and Hayashi, Takashi, 5,115,052, Cl. 526-87.000.
Hayashi, Takeshi; Sato, Shigeru; Tsujimoto, Katsuaki; Miyazaki, Daishiro; Hiwasa, Yoneo; and Ishimatsu, Toshiki, to Mitsubishi Materials Corporation. Excavation tool. 5,113,954, Cl. 175-415.000.
Hayashida, Suetou: *See*—
Kuroda, Takashi; Yamada, Kazuhiro; Ishibashi, Tadao; Hayashida, Suetou; Kimura, Kyoichiro; and Sameshima, Masaru, 5,114,638, Cl. 264-41.000.
Hayden, Joseph S.: *See*—
Smoot, Stephen W.; Hayden, Joseph S.; Clement, Marc; Grabowski, Danuta; Holzel, Eva; Nass, Peter; and Heming, Martin, 5,114,813, Cl. 430-5.000.
Hayes, Ann G.: *See*—
Hayes, Norman F.; Scopes, David I. C.; McElroy, Andrew B.; Hayes, Ann G.; and Meerholz, Clive A., 5,114,945, Cl. 514-278.000.
Hayes, Norman F.; Scopes, David I. C.; McElroy, Andrew B.; Hayes, Ann G.; and Meerholz, Clive A., to Glaxo Group Limited. Spiropiperidine derivatives. 5,114,945, Cl. 514-278.000.
Haymore, Barry L.; Bild, Gary S.; and Krivi, Gwen G., to Monsanto Company. Variant proteins and polypeptides possessing enhanced affinity for immobilized-metal affinity matrices. 5,115,102, Cl. 530-399.000.
Hayslip, Michael R., to Clark Moulding Co., Inc. Apparatus for producing an imitation stone finish. 5,113,786, Cl. 118-314.000.
Hayward, Curtis E.; Peterson, Gerald W.; and Post, Robert E., to International Business Machines Corporation. Compact strain relief device for fiber optic cables. 5,115,260, Cl. 385-100.000.
Hearn, David D., to Atlantic Richfield Company. Tubing end locating apparatus for wellbores. 5,113,703, Cl. 73-151.000.
Heaton, Jeff S.: *See*—
Stern, Donald J.; Heaton, Jeff S.; and Tryon, James A., 5,114,527, Cl. 156-575.000.
Heberger, John M.: *See*—
Culbertson, Edwin C.; and Heberger, John M., 5,114,739, Cl. 427-40.000.
Hecht, Stephen S.: *See*—
Chung, Fung-Lung; Hecht, Stephen S.; Eklind, Karin; and Morse, Mark A., 5,114,969, Cl. 514-514.000.
Heckleman, Todd E.: *See*—
Kostusiak, Karl H.; Pedtke, Daniel F.; and Heckleman, Todd E., 5,115,224, Cl. 340-574.000.
Hecon Corporation: *See*—
Levinski, Charles B.; Persel, John M.; and Widmann, David N., 5,115,234, Cl. 340-825.310.
Hedges, George D.; and Kuna, Francis J., to Gentex Corporation. Simplified dual visor operating mechanism. 5,113,535, Cl. 2-424.000.
Heerema Group Services B.V.: *See*—
Van Ketel Hendrik, 5,114,026, Cl. 212-191.000.
Heffron, Michael E., to Pacer Industries, Inc. Method for air density compensation of internal combustion engines. 5,113,832, Cl. 123-478.000.
Hefty, John B., to Hefty, Karen McCraw. Method of making personalized children's storybook. 5,114,291, Cl. 412-8.000.
Hefty, Karen McCraw: *See*—
Hefty, John B., 5,114,291, Cl. 412-8.000.
Hegde, Shridhar G.: *See*—
Bryant, Robert D.; Hegde, Shridhar G.; and Lee, Len F., 5,114,465, Cl. 71-94.000.
Heiler, Leo J., Jr., to Enviroland, Inc. Sewage tank system and method of construction. 5,114,274, Cl. 405-128.000.
Heim, Philippe; and Riess, Gerard, to Norsolor. Process for the manufacture of an impact resistant thermoplastic resin. 5,115,031, Cl. 525-243.000.
Heinig, Charles F.: *See*—
Asher, Marc A.; Strippgen, Walter E.; Heinig, Charles F.; and Carson, William L., 5,113,685, Cl. 72-458.000.
Heinz, Hans-Detlef: *See*—
Nielinger, Werner; Idel, Karsten-Josef; Westeppe, Uwe; Freitag, Dieter; Wulff, Claus; and Heinz, Hans-Detlef, 5,115,050, Cl. 525-537.000.
Helena Laboratories Corporation: *See*—
Golias, Tipton L.; Sarrine, Robert J.; and Golias, Joseph H., 5,114,033, Cl. 222-82.000.

Helene Curtis, Inc.: *See*—
Duvel, Lane A., 5,114,706, Cl. 424-70.000.
Hellwig, Joachim: *See*—
Peterson, Wade D.; Hellwig, Joachim; and Heuckelbach, Rainer, 5,115,195, Cl. 324-207.130.
Helms, Bernd; Peters, Reiner; and Hoppe, Peter, to W. Kordes' Sohne Rosenschulen GmbH & Co. KG. Assembly for preparing bushy plants for packing. 5,113,633, Cl. 53-513.000.
Heming, Martin: *See*—
Smoot, Stephen W.; Hayden, Joseph S.; Clement, Marc; Grabowski, Danuta; Holzel, Eva; Nass, Peter; and Heming, Martin, 5,114,813, Cl. 430-5.000.
Henderson, Freeman J.: *See*—
Ward, Robert W.; Tornero, Rogelio; and Henderson, Freeman J., 5,114,981, Cl. 521-55.000.
Hendler, Sheldon S.; and Sanchez, Robert, to Biodor U.S. Holding; and Vyrex Corporation. Tocopherol-based antiviral agents and method of using same. 5,114,957, Cl. 514-356.000.
Hendricks, Donald M.: *See*—
Conlon, William M.; and Hendricks, Donald M., 5,113,664, Cl. 62-124.000.
Hendry, James W., to Milad Limited Partnership. Method of injecting molding. 5,114,660, Cl. 264-572.000.
Hengelmolen, Adrianus J., to Copermill Limited. Hot gas blower with laminated fan blades and cooling system therefor. 5,114,309, Cl. 415-114.000.
Henkel Corporation: *See*—
Ahmed, Bashir M.; Gunagan, Barry P.; and Hall, Wilbur S., 5,114,751, Cl. 427-242.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Hoeffkes, Horst; Lange, Fritz; and Schrader, Dieter, 5,114,428, Cl. 8-405.000.
Henry, Daniel S.; and Hoteling, G. Michael, to Alladin Steel Products. Combustion device for stoves and fireplaces. 5,113,843, Cl. 126-77.000.
Hensley, Jerry L., to Coyanosa Operations Company, Inc. Multiple screen filter and method. 5,114,595, Cl. 210-792.000.
Herget, Gerhard H., to Canada, Her Majesty the Queen in right of. Three-dimensional strain monitor for rock boreholes. 5,113,707, Cl. 73-784.000.
Herling, Andreas W.: *See*—
Lang, Hans-Jochen; Weidmann, Klaus; Scheunemann, Karl-Heinz; Nimmesgern, Hildegard; Rippel, Robert; and Herling, Andreas W., 5,114,955, Cl. 514-338.000.
Herman, John A. Skeletal stabilization apparatus for use in transporting and treating patients and methods therefor. 5,113,876, Cl. 128-870.000.
Herman, Jr. Harry H. Mobility assisting devices. 5,113,887, Cl. 135-68.000.
Herman Miller, Inc.: *See*—
Huisingh, James H.; and Elzinga, Edward L., 5,115,380, Cl. 362-33.000.
Herman, Wesley E.: *See*—
Tokarek, Ronald F.; and Herman, Wesley E., 5,114,397, Cl. 600-11.000.
Herman, Wesley K. Disposable ocular diagnosis device and method. 5,113,863, Cl. 128-652.000.
Herpe, Michel, to Bongrain S.A. Method and an installation for conserving and/or dispensing a liquid or semi-liquid substance. 5,114,045, Cl. 222-105.000.
Hertel, Terry J. Ski wax for use with sintered base snow skis. 5,114,482, Cl. 106-270.000.
Herweck, Steve A.: *See*—
Karwoski, Theodore; Herweck, Steve A.; and Vail, Steve, 5,114,416, Cl. 604-321.000.
Herzel, Joachim: *See*—
Abendroth, Paul; Herzel, Joachim; Hummel, Peter; Ortner, Robert; Steuer, Joachim; Stoffler, Achim; and Despot, Janko, 5,113,762, Cl. 101-350.000.
Herzig, Frank: *See*—
Brenish, Michael; and Herzig, Frank, 5,114,040, Cl. 222-1.000.
Hess, Richard A.; and Blaese, R. Michael, to United States of America, Health and Human Services. Method for treating autoimmune disease using succinylacetone. 5,114,973, Cl. 514-557.000.
Hetzel, John M., Jr.: *See*—
Lane, Abbott A.; and Hetzel, John M., Jr., 5,113,534, Cl. 2-416.000.
Heuckelbach, Rainer: *See*—
Peterson, Wade D.; Hellwig, Joachim; and Heuckelbach, Rainer, 5,115,195, Cl. 324-207.130.
Heumuller, Rudolf: *See*—
Dapperheld, Steffen; Heumuller, Rudolf; and Wildt, Manfred, 5,114,546, Cl. 209-72.000.
Heuvelsland, A. J., to Dow Chemical Company, The. Production of polyether polyols with reduced unsaturation. 5,114,619, Cl. 252-182.270.
Hewett, Gary E., to Cholestech Corporation. Controlled-volume assay apparatus. 5,114,350, Cl. 435-288.000.
Hewlett Packard Company: *See*—
Burgess, Ken L.; and Marvin, John S., 5,115,326, Cl. 358-440.000.
Camis, Thomas, 5,115,277, Cl. 355-273.000.
Camras, Michael D.; Cook, Louis W.; and Robbins, Virginia M., 5,115,286, Cl. 357-19.000.
Cloutier, Frank L.; Chieng, Ching K.; and Min, Siow W., 5,114,744, Cl. 427-96.000.
Harmon, J. P.; and Kaplinsky, George T., 5,115,250, Cl. 346-1.100.
Holcomb, Matthew S., 5,115,189, Cl. 324-121.00R.
Ludwig, Mark A., 5,115,150, Cl. 307-475.000.
Mahoney, Steven A., 5,114,251, Cl. 400-120.000.
Pittaro, Richard J., 5,113,706, Cl. 73-626.000.
Rasmussen, Steve O.; and Jackson, Larry A., 5,114,134, Cl. 271-34.000.
Rother, Peter, 5,113,861, Cl. 128-633.000.
Swedberg, Sally A., 5,114,768, Cl. 428-36.910.
Hickie, Brian A.: *See*—
Chaplin, Mitchell E.; Eaton, Geraldine M.; Hickie, Brian A.; Pascavage, Peter W.; and Tyson, Jessie, 5,114,787, Cl. 428-284.000.
Hidaka, Norihiro: *See*—
Komuro, Junichi; Sato, Tetsuya; and Hidaka, Norihiro, 5,115,490, Cl. 395-400.000.
Hidani, Tim T.: *See*—
Fleischhaker, John J.; and Hidani, Tim T., 5,114,408, Cl. 604-167.000.
Hidese, Wataru, to Matsushita Electric Industrial Co., Ltd. Outer lead bonding head and method of bonding outer lead. 5,113,581, Cl. 29-840.000.
Hideshima, Osamu, to Matsushita Electric Industrial Co., Ltd. Apparatus for measuring leads of electrical component and method of measuring leads of electrical component. 5,114,229, Cl. 356-237.000.
Hiedemann, Hans-Joachim: *See*—
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, 5,114,326, Cl. 425-79.000.
Higaki, Kenjiro; Harada, Keizo; Fujimori, Naoji; Itozaki, Hideo; and Yazu, Shuji, to Sumitomo Electric Industries, Ltd. Process for depositing Tl-containing superconducting thin films on (110) MgO substrates. 5,114,906, Cl. 505-1.000.
Higashi, Iwao, to Yamaha Corporation. Musical tone synthesizing apparatus. 5,113,743, Cl. 84-622.000.
Higashio, Kimihiko, to Minolta Camera Kabushiki Kaisha. Copying apparatus capable of copying in two colors simultaneously. 5,115,282, Cl. 355-328.000.
Higdon, William D.: *See*—
Wen, Cheng P.; Mendolia, Gregory S.; Siracusa, Mario; Maieron, Joseph J.; Higdon, William D.; Wooldridge, John J.; and Gulick, Jon, 5,115,245, Cl. 342-175.000.
Higgins, Raymond L.: *See*—
Kallin, Fredrik L. N.; and Higgins, Raymond L., 5,115,325, Cl. 358-406.000.
Higomura, Makoto: *See*—
Otsuka, Hiroyuki; Hosaka, Kotaro; and Higomura, Makoto, 5,114,234, Cl. 356-358.000.
Higuchi, Takeshi: *See*—
Yamaguchi, Harumi; Higuchi, Takeshi; and Fukuda, Kenji, 5,114,084, Cl. 241-178.000.
Hikita, Mitsutaka; Tabuchi, Toyoji; Kurosawa, Kazuhito; and Shibagaki, Nobuhiko, to Hitachi, Ltd. Surface acoustic wave filter including saw resonators with transmission spaces therein. 5,115,216, Cl. 333-195.000.
Hill, William H.: *See*—
Fries, William M.; Ratledge, Thomas L.; and Hill, William H., 5,115,111, Cl. 219-56.210.
Hille, Martin: *See*—
Kupfer, Rainer; Hille, Martin; Bohm, Roland; and Staiss, Friedrich, 5,114,616, Cl. 252-337.000.
Hilley, Michael R.: *See*—
Kass, William J.; and Hilley, Michael R., 5,115,411, Cl. 365-189.010.
Hillis, Mark; and Freeman, Dixon, to Perstorp Xytec, Inc. Container with sidewall extension. 5,114,037, Cl. 220-4.030.
Hiltebrandt, Siegfried; and Wolf, Johann, to Richard Wolf GmbH. Organ manipulator. 5,113,846, Cl. 128-20.000.
Hilti Aktiengesellschaft: *See*—
Jochum, Peter; and Muller, Martin, 5,114,064, Cl. 227-9.000.
Himmelblau, D. Andrew, to Biocarbons Corporation. Method for controlling oil reservoir permeability using biomass oil. 5,115,084, Cl. 528-230.000.
Himmelsbach, Manfred: *See*—
Benzinger, Roland; Schmitt, Edgar; Siegel, Heinz; Huebl, Ewald; Mueller, Klaus; Himmelsbach, Manfred; and Jordan, Martin, 5,114,215, Cl. 303-113.0TB.
Hintermayer, Jochen; Graf, Ernst; Gmohling, Werner; Schroll, Georg; and Kobler, Wolfgang, to SKW Trostberg Aktiengesellschaft. Process for the production of silicon nitride and product made according to the process. 5,114,693, Cl. 423-344.000.
Hioki, Chieko: *See*—
Yoshinaga, Kazuo; Katagiri, Kazuharu; Tsuboyama, Akira; Kitayama, Hiroyuki; Shinjo, Kenji; and Hioki, Chieko, 5,114,613, Cl. 252-299.610.
Hiraiwa, Atsushi: *See*—
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,115,289, Cl. 357-23.700.
Hirakata, Takashi: *See*—
Tanaka, So; Hirakata, Takashi; Kawasaki, Shingo; Nakata, Takuya; Makita, Hitoshi; and Kozuki, Koichi, 5,113,744, Cl. 84-634.000.
Hiraki, Yasuhito: *See*—
Shibata, Norio; Sato, Tsunehiko; Chino, Naoyoshi; and Hiraki, Yasuhito, 5,114,753, Cl. 427-286.000.
Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, to Suzuki Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling continuous variable transmission. 5,114,383, Cl. 474-18.000.

Hirase, Ikuo, to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude. Thermal decomposition trap. 5,114,683, Cl. 422-173.000.

Hirata, Keiichi; Morimoto, Yoshinari; Ooishi, Minoru; Ban, Tomohiro; and Furukawa, Akihiro, to Brother Kogyo Kabushiki Kaisha. Program processing system having standard program for processing optionally post-stored programs. 5,115,410, Cl. 395-650.000.

Hiroi Takahiko: *See—*
Tada, Masuo; Hiroi Takahiko; Fukumoto, Takaaki; Ohmori, Toshiaki; and Kanno, Itaru. 5,114,748, Cl. 427-180.000.

Hirose Electric Co., Ltd.: *See—*
Sato, Kensaku, 5,114,366, Cl. 439-585.000.

Hirota, Shinichiro; Sugawara, Kishio; and Okamura, Kenji, to Hoya Corporation. Mold for producing lens, using mold recesses to aid in lens release. 5,114,455, Cl. 65-275.000.

Hirschberger, Michael, to Hoover Universal, Inc. Die head for plastic with barrier forming material. 5,114,333, Cl. 425-466.000.

Hirsh, Robert, to Advantec Corp. Pressure actuated elastomeric valve. 5,113,911, Cl. 137-844.000.

Hisa, Yoshihiro, to Mitsubishi Denki Kabushiki Kaisha. Photodetector device. 5,115,295, Cl. 357-30.000.

Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, to Hitachi, Ltd. Semiconductor device and semiconductor memory device. 5,115,289, Cl. 357-23.700.

Hiscock, Donald F.: *See—*
Johnston, Herbert N.; Hiscock, Donald F.; and Beard, Ralph E., 5,114,509, Cl. 156-73.100.

Hitachi Chemical Co., Ltd.: *See—*
Yoshida, Masatoshi; Shibata, Katsuji; Kojima, Mitsumasa; Satou, Hidetaka; Kato, Toshihiko; Miyadera, Yasuo; and Yusa, Masami, 5,115,089, Cl. 528-353.000.

Hitachi Engineering Co., Ltd. *See—*
Shirahama, Hidefumi; Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; Iwanaka, Mitsufumi; Nagano, Takeshi; and Ishida, Youuji, 5,115,386, Cl. 363-41.000.

Hitachi, Ltd.: *See—*
Fujii, Kenjiro; Oura, Masao; Tuburaya, Kazuyuki; and Hagura, Shigehisa, 5,115,179, Cl. 318-568.130.
Funabashi, Kiyomi; Kuryama, Osamu; Chino, Koichi; Baba, Tsutomu; Nishi, Takashi; and Kikuchi, Makoto, 5,114,622, Cl. 252-629.000.
Hikita, Mitsutaka; Tabuchi, Toyoji; Kurosawa, Kazuhito; and Shibagaki, Nobuhiko, 5,115,216, Cl. 333-195.000.
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,115,289, Cl. 357-23.700.
Ito, Kazuhiro; Matsuda, Hiroshi; and Nagano, Yuuji, 5,114,866, Cl. 437-3.000.
Kanamaru, Hisanobu; Oruma, Tomiyasu; and Sasaya, Kazushi, 5,114,263, Cl. 403-274.000.
Kashiyama, Masamori; Ishii, Koichi; Kawabe, Shun; and Usami, Masami, 5,115,393, Cl. 395-425.000.
Kimura, Takeshi; Kuniyoshi, Shinji; Kishimoto, Akihiko; and Soga, Takashi, 5,115,456, Cl. 378-35.000.
Maeda, Akira; Kasama, Takashi; Yokoyama, Tetsuo; and Nishimura, Hiroshi, 5,113,865, Cl. 128-653.200.
Mannaka, Toshio; Kimura, Tomoaki; and Koyama, Mitsuru, 5,113,678, Cl. 72-8.000.
Masuda, Hiroshi; and Tanata, Katuhiro, 5,115,174, Cl. 318-254.000.
Nagano, Masami; Atago, Takeshi; and Nemoto, Mamoru, 5,113,833, Cl. 123-491.000.
Okuno, Sumio; Takeichi, Michifumi; Ohmura, Keiji; Okazaki, Msato; Tsuruda, Hitoshi; Yamada, Hiroyuki; Hattori, Morishige; and Kimura, Kenji, 5,113,769, Cl. 105-422.000.
Ouchi, Shigetoshi; Shiroguzu, Tatsuji; Ode, Shinichi; Ichinose, Takasi; and Kanno, Tuyomu, 5,115,389, Cl. 363-125.000.
Sato, Katsuyuki; Matsumoto, Miki; Ohkuma, Sadayuki; Ogata, Masahiro; and Yoshida, Masahiro, 5,115,413, Cl. 365-230.090.
Shirahama, Hidefumi; Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; Iwanaka, Mitsufumi; Nagano, Takeshi; and Ishida, Youuji, 5,115,386, Cl. 363-41.000.
Suzuki, Keizo; Ninomiya, Ken; and Yunogami, Takashi, 5,115,130, Cl. 250-251.000.
Takamoto, Yoshifumi; and Torii, Shunichi, 5,115,392, Cl. 395-650.000.
Terayama, Takao; Yokota, Hajime; Sakai, Kazuo; and Kaku, Nobuyuki, 5,115,361, Cl. 360-85.000.
Yatsuda, Yuji; Hagiwara, Takaaki; Kondo, Ryuji; Minami, Shinichi; and Itoh, Yokichi, 5,114,870, Cl. 437-40.000.

Hitachi Medical Corporation *See—*
Maeda, Akira; Kasama, Takashi; Yokoyama, Tetsuo; and Nishimura, Hiroshi, 5,113,865, Cl. 128-653.200.

Hitachi Metals, Inc.: *See—*
Yoshizawa, Yoshihito; and Yamauchi, Kiyotaka, 5,114,503, Cl. 148-304.000.

Hitachi Metals, Ltd.: *See—*
Yano, Mitsuru; and Yoshihara, Yasusro, 5,113,704, Cl. 73-162.000.

Hitachi Microcomputer Engineering Ltd.: *See—*
Maeda, Akira; Kasama, Takashi; Yokoyama, Tetsuo; and Nishimura, Hiroshi, 5,113,865, Cl. 128-653.200.

Hitachi VLSI Engineering Corporation: *See—*
Ito, Kazuhiro; Matsuda, Hiroshi; and Nagano, Yuuji, 5,114,866, Cl. 437-3.000.
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Hitchiner Manufacturing Co., Inc.: *See—*
Green, Keith; and Cree, James W., 5,113,924, Cl. 164-63.000.

Hitosi, Nagai: *See—*
Tsuda, Nobuyuki; Tamatani, Masaaki; Ajiro, Fukaya; and Hitosi, Nagai, 5,115,306, Cl. 358-60.000.

Hiwasa, Yoneo: *See—*
Hayashi, Takeshi; Sato, Shigeru; Tsujimoto, Katsuaki; Miyazaki, Daishiro; Hiwasa, Yoneo; and Ishimatsu, Toshiki, 5,113,954, Cl. 175-415.000.

Hiyama, Satoshi: *See—*
Takebe, Katsuhiko; Doi, Mizuho; Takehara, Hiroyasu; Hiyama, Satoshi; and Urabe, Masanobu, 5,115,292, Cl. 357-26.000.

Hjerten, Stellan; and Srichaiyo, Tasanee, to Bio-Rad Laboratories, Inc. Multi-point detection method for electrophoresis and chromatography in capillaries. 5,114,551, Cl. 204-180.100.

Hluchyj, Michael G.; and Yin, Nanying, to Codex Corporation. Dynamic encoding rate control minimizes traffic congestion in a packet network. 5,115,429, Cl. 370-84.000.

Hnat, James G. Apparatus for heat processing glass batch materials. 5,114,122, Cl. 266-186.000.

Ho, Ronald, to Quantum Medical Systems, Inc. Method and apparatus for winding a lumped element delay line. 5,114,086, Cl. 242-7.030.

Hobson, Michael G.; and Nelson, Maurice K. Anti-glare, anti-static video monitor visor. 5,115,345, Cl. 359-601.000.

Hochwalt, Norman C.: *See—*
Auslander, Judith; Hochwalt, Norman C.; and Sarada, Thjagaraj, 5,114,478, Cl. 106-20.000.

Hock, Franz: *See—*
Ruger, Wolfgang; Urbach, Hansjorg; Becker, Reinhard; and Hock, Franz, 5,114,962, Cl. 514-412.000.

Hodnett, William P., III, to Thor Radiation Research, Inc. Protective coating system for imparting resistance to abrasion, impact and solvents. 5,114,783, Cl. 428-217.000.

Hoechst Aktiengesellschaft: *See—*
Lang, Hans-Jochen; Weidmann, Klaus; Scheunemann, Karl-Heinz; Nimmesgern, Hildegard; Rippel, Robert; and Herling, Andreas W., 5,114,955, Cl. 514-338.000.

Hoechst Aktiengesellschaft: *See—*
Damm, Sture, 5,114,427, Cl. 8-400.000.
Dapperheld, Steffen; Heumuller, Rudolf; and Wildt, Manfred, 5,114,546, Cl. 209-72.000.
Disselbeck, Dieter; Berger, Karl C.; and Drews, Jurgen, 5,114,812, Cl. 429-234.000.
Franco, Christopher M.; Vijayakumar, Erra K. S.; Chatterjee, Sugata; Ganguli, Bimal N.; Blumbach, Jurgen; Kogler, Herbert; and Fehlhaber, Hans-Wolfram, 5,114,967, Cl. 514-475.000.
Kupfer, Rainer; Hille, Martin; Bohm, Roland; and Staiss, Friedrich, 5,114,616, Cl. 252-337.000.
Ruger, Wolfgang; Urbach, Hansjorg; Becker, Reinhard; and Hock, Franz, 5,114,962, Cl. 514-412.000.
Scheler, Siegfried; Buhr, Gerhard; Lenz, Helmut; Bergmann, Klaus; and Siegel, Herbert, 5,114,816, Cl. 430-192.000.
Zertani, Rudolf; Mohr, Dieter; Rode, Klaus; Frass, Werner; and Joerg, Klaus, 5,114,832, Cl. 430-285.000.

Hoechst Celanese Corporation: *See—*
Culbertson, Edwin C.; and Heberger, John M., 5,114,739, Cl. 427-40.000.
Golder, Michael D.; and Walker, David K., 5,114,995, Cl. 523-506.000.
Golder, Michael D.; and Walker, David K., 5,114,996, Cl. 523-506.000.
Golder, Michael D.; and Walker, David K., 5,114,997, Cl. 523-508.000.
Golder, Michael D.; and Walker, David K., 5,114,998, Cl. 523-508.000.
Oglesby, Donald M.; and Wells, George E., IV, 5,114,698, Cl. 423-515.000.

Hoechst Japan Limited: *See—*
Shirahata, Akira; Uchida, Minoru; Tanaka, Satoshi; and Tsumura, Kenichiro, 5,114,916, Cl. 514-2.000.

Hoechst Mitsubishi Kasei Co., Ltd.: *See—*
Sekioka, Riyouichi; and Seto, Kouichi, 5,114,431, Cl. 8-639.000.

Hoechst-Roussel Pharmaceuticals Incorporated: *See—*
Wettlaufer, David G.; Shutske, Gregory M.; and Nemoto, Peter A., 5,114,936, Cl. 514-233.800.

Hoeffkes, Horst; Lange, Fritz; and Schrader, Dieter, to Henkel Kommanditgesellschaft auf Aktien. Hair dye preparation. 5,114,428, Cl. 8-405.000.

Hofer, Peter; Hagmann, Peter; Krieg, Gunther; and Vaas, Eberhard, to Ciba-Geigy Corporation. Method for the manufacture of contact lenses. 5,114,628, Cl. 264-1.400.

Hoff, Dieter, to Bayer Aktiengesellschaft. Parenteral formulation of nimodipine. 5,114,956, Cl. 514-356.000.

Hoffarth, Joseph G.; Lazzarini, Donald J.; Welsh, John A.; and Wiley, John P., to International Business Machines Corporation. Method of making multilayer circuit boards having conformal Insulating layers. 5,114,518, Cl. 156-212.000.

Hoffman-La Roche, Inc.: *See—*
Fischer, Ulf; Schneider, Fernand; and Widmer, Ulrich, 5,114,934, Cl. 514-212.000.

Hoffmann & Co. Elektrokohle KG: *See—*
Hoffmann, Peter, 5,114,351, Cl. 439-13.000.

Hoffmann, Gerhard: *See—*
Seitz, Friedrich; Hoffmann, Gerhard; and Bauer, Gerhard, 5,114,831, Cl. 430-281.000.

Hoffmann-La Roche Inc.: *See—*
Lawton, Geoffrey; Osbond, John M.; and Self, Christopher R., 5,114,960, Cl. 514-379.000.
Sinigaglia, Francesco, 5,114,713, Cl. 424-88.000.

Hoffmann, Peter, to Hoffmann & Co. Elektrokohle KG. Sliding contact arrangement for carbon brushes. 5,114,351, Cl. 439-13.000.

Hogner, Marcelo A. Multiple rotary control valve for use with a sterilizing apparatus. 5,113,906, Cl. 137-595.000.

Hojo, Yasuo: *See—*
Tomomatsu, Hideo; and Hojo, Yasuo, 5,113,725, Cl. 74-869.000.

Holaday, John W.; Shacknai, Jonah; and Mazur, Leonard L., to Medicis Corporation. Method of reducing serum levels of lipoprotein(A). 5,114,963, Cl. 514-448.000.

Holcomb, Matthew S., to Hewlett-Packard Company. Anti-aliasing dithering method and apparatus for low frequency signal sampling. 5,115,189, Cl. 324-121.00R.

Holcomb, Robert R.; Arnold, Edward R.; and Garrison, Alexander J., to Aqua Dynamics Group Corp. Beverage brewing system. 5,113,751, Cl. 99-286.000.

Holden, Thomas R. Snow travel vehicle. 5,113,958, Cl. 180-9.400.

Hollandsche Beton Groep N.V.: *See—*
Schuerhoff, Hans-Juergen; Gerritse, Arie; and Mets, Lambertus C., 5,114,653, Cl. 264-228.000.

Hollrah, Don P.; and Lenane, Denis L., to Ethyl Petroleum Additives, Inc. Reduction of No_x emissions from gasoline engines. 5,113,803, Cl. 123-1.00A.

Holme, Norman E.: *See—*
Gartshore, Gavin C.; and Holme, Norman E., 5,114,487, Cl. 106-695.000.

Holmes, Charles M., Jr., to Square D Company. AC amplifier with automatic DC compensation. 5,115,205, Cl. 330-10.000.

Holmes, Ervine S.: *See—*
Nagji, Moez M.; Holmes, Ervine S.; and Pai, Jenny L., 5,114,689, Cl. 423-230.000.

Holmgren, Jennifer S.; Gembicki, Stanley A.; Schoonover, Michael W.; and Kocal, Joseph A., to UOP. Alumina clay compositions. 5,114,895, Cl. 502-84.000.

Holroyd, Eric; and Wright, Anthony R., to Bridgestone/Firestone Inc. Bead filler construction. 5,114,512, Cl. 156-135.000.

Holscher, Hans-Jorg: *See—*
Scherping, Karl-Heinz; Holscher, Hans-Jorg; Reichelt, Uwe; and Reiter, Udo, 5,114,993, Cl. 523-409.000.

Holt, Sonia: *See—*
Gahagen, Hugh; Roman, Helen E.; and Holt, Sonia, 5,114,352, Cl. 439-22.000.

Holtermann, Dennis L.: *See—*
Zones, Stacey I.; Holtermann, Dennis L.; and Rainis, Andrew, 5,114,565, Cl. 208-138.000.

Holzapfel, Gerd: *See—*
Kummerfeld, Ryszard; Baumgarten, Siegfried; Holzapfel, Gerd; Falb, Wolfgang; and Palm, Ulrich, 5,113,897, Cl. 137-357.000.

Holzel, Eva: *See—*
Smoot, Stephen W.; Hayden, Joseph S.; Clement, Marc; Grabowski, Danuta; Holzel, Eva; Nass, Peter; and Heming, Martin, 5,114,813, Cl. 430-5.000.

Holzworth, Dwight D. Device for stimulating intramuscular fluid pressure. 5,113,847, Cl. 128-24.00R.

Homer, Peter K., to Grumman Aerospace Corporation. Arrangement for window shade-deployed radar. 5,115,249, Cl. 343-753.000.

Homeyer, Bernhard: *See—*
Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., 5,114,965, Cl. 514-469.000.

Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English): *See—*
Seki, Yasunari; Kashiwabara, Shigeto; and Kaga, Takahiko, 5,113,835, Cl. 123-571.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Kanzawa, Yoshikazu; Fujikake, Yasushi; Ito, Osami; Ito, Shuho; Oikawa, Hironobu; Otsubo, Makoto; Morikawa, Iwao; Shiratori, Yuichi; and Tsukada, Kiyoshi, 5,113,926, Cl. 164-119.000.
Sugimoto, Kimiyasu; and Yoshino, Hajime, 5,114,261, Cl. 403-122.000.
Takebe, Katsuhiko; Doi, Mizuho; Takehara, Hiroyasu; Hiyama, Satoshi; and Urabe, Masanobu, 5,115,292, Cl. 357-26.000.

Honda, Narimichi; and Yagi, Kazuo, to Mitsui Petrochemical Industries, Ltd. Dental floss and interdental cleaning tool. 5,113,880, Cl. 132-321.000.

Honeck, Karl-Heinz: *See—*
Nilsson, Sven-Axel; Ebersole, Ronald J.; Bier, Gerhard; and Honeck, Karl-Heinz, 5,115,511, Cl. 395-800.000.

Honeywell Inc.: *See—*
Groezinger, John L., 5,115,477, Cl. 382-22.000.
Jenekhe, Samson A.; and Peterson, James R., 5,114,610, Cl. 252-182.330.
Johnson, Donald D., 5,115,129, Cl. 250-239.000.
Kahler, Jeffrey A., 5,115,509, Cl. 395-775.000.
Stokes, John F., 5,115,291, Cl. 357-26.000.
Thue, Baard H., 5,115,247, Cl. 342-201.000.
Weiland, Walter M.; Disch, Michael A.; and Ohm, Patrick L., 5,115,106, Cl. 200-517.000.

Hongoh, Nobuhiko, to U.S. Philips Corp. Portable computer including, for facsimile transmission, a document scanner integral with the display module. 5,115,374, Cl. 361-393.000.

Hook, Dan L., to Just One Good Idea. Fishing line connecting system and method of connecting a fishing line to a lure or weight to be moved through the water and components of such a system. 5,113,608, Cl. 43-42.490.

Hoover Universal, Inc.: *See—*
Hirschberger, Michael, 5,114,333, Cl. 425-466.000.
Tinsley, Jack A., 5,114,335, Cl. 425-577.000.

Hoppe, Peter: *See—*
Helms, Bernd; Peters, Reiner; and Hoppe, Peter, 5,113,633, Cl. 53-513.000.

Hopperdietzel, Siegfried, to Rehau AG & Co. Shaped thermoplastic material with fillers and method of making the same. 5,114,779, Cl. 428-144.000.

Hori, Yoshihiro: *See—*
Miyagi, Tokuya; Inoue, Akihisa; Otsubo, Taisuke; and Hori, Yoshihiro, 5,114,508, Cl. 156-69.000.

Hormadaly, Jacob, to Du Pont de Nemours, E. I., and Company. Encapsulant composition. 5,114,885, Cl. 501-76.000.

Hornack, Thomas R.: *See—*
Eckert, C. Edward; Hornack, Thomas R.; Lyness, George E.; Kaems, John A.; Cox, Clarence J.; Miller, Ronald E.; Apelian, Diran; and Mutharasan, Rajakkannu, 5,114,472, Cl. 75-412.000.

Horner, Hans-Peter, to Ciba-Geigy Corporation. Phosphinic acid flame retardants. 5,115,005, Cl. 524-133.000.

Hosaka, Kotaro: *See—*
Otsuka, Hiroyuki; Hosaka, Kotaro; and Higomura, Makoto, 5,114,234, Cl. 356-358.000.

Hosoi, Masanori, to Fuji Jukogyo Kabushiki Kaisha. Method for forming a product having waved surface by bending a composite material sheet. 5,114,654, Cl. 264-313.000.

Hosokawa, Hayami; and Yamashita, Tsukasa, to Omron Tateisi Electronics Co. Optical device and manufacturing method thereof. 5,114,513, Cl. 156-150.000.

Hosono, Satoshi: *See—*
Konishi, Kouji; Ohshima, Tadayoshi; Fujii, Masakazu; Hagino, Motoyuki; Hosono, Satoshi; and Miyake, Masayoshi, 5,115,144, Cl. 250-572.000.

Hostikka, Sirkka L.: *See—*
Tryggvason, Karl; and Hostikka, Sirkka L., 5,114,840, Cl. 435-6.000.

Hoteling, G. Michael: *See—*
Henry, Daniel S.; and Hoteling, G. Michael, 5,113,843, Cl. 126-77.000.

Hotier, Gerard; Toussaint, Jean-Michel; Terneuil, Gabriel; and Lonchamp, Daniel, to Institut Francais du Petrole. Continuous process and device for the chromatographic separation of a mixture of at least three constituents into three purified effluents by means of a single solvent at two different temperatures and/or at two different pressures. 5,114,590, Cl. 219-659.000.

Houben, J. P.; and Moolenaar, A. J., to Emerson Electric Company. Apparatus for driving a drilling or percussion tool. 5,113,951, Cl. 173-075.000.

Houser, Russell A.: *See—*
Kasprzyk, Daniel J.; Orth, Jean C.; Gaiser, John W.; and Houser, Russell A., 5,114,423, Cl. 606-27.000.

Houtteman, Bernard, to Siemens Aktiengesellschaft. Arresting mechanism/lock for coaxial plug connectors. 5,114,361, Cl. 439-348.000.

Howard, Kevin E., to Dow Chemical Company, The. Tungsten and tungsten nitride coatings for metals and ceramics. 5,114,750, Cl. 427-226.000.

Howard, Neil, to Spectra-Physics Lasers, Inc. Pole piece to shape axial magnetic field in gas laser. 5,115,439, Cl. 372-37.000.

Howe, Dennis G.: *See—*
Schildkraut, Jay S.; Scozzafava, Michael; and Howe, Dennis G., 5,115,336, Cl. 359-263.000.

Howe, King L., to Du Pont de Nemours, E. I., and Company. Thermoplastic blow moldable polyester compositions. 5,115,012, Cl. 524-456.000.

Hoy, Kenneth L.: *See—*
Richey, Forrest A., Jr.; and Hoy, Kenneth L., 5,115,015, Cl. 524-507.000.

Hoya Corporation: *See—*
Hara, Koichi, 5,114,114, Cl. 249-60.000.
Hirota, Shinichiro; Sugawara, Kishio; and Okamura, Kenji, 5,114,455, Cl. 65-275.000.

Hoyle, Michael D.: *See—*
Pruitt, John E.; Pruitt, John A.; and Pruitt, Jay L., 5,113,905, Cl. 137-571.000.

Hoyt, Andrea E.: *See—*
Benicewicz, Brian C.; and Hoyt, Andrea E., 5,114,612, Cl. 252-299.010.

Hsie, Wei C., to Seagate Technology, Inc. Process of etching iron-silicon-aluminum trialloys and etchant solutions used therefor. 5,114,532, Cl. 156-665.000.

Hsieh, Harry W. S., to Essex Specialty Products, Inc. Primer composition for improving the bonding of a urethane adhesive. 5,115,086, Cl. 528-272.000.

Hsu, Jau Y.: *See—*
Brimelow, Christopher J.; Hsu, Jau Y.; and Proctor, Michael S., 5,114,727, Cl. 426-302.000.

Hsu, Nick. Writing apparatus with stapler incorporated therein. 5,114,257, Cl. 401-195.000.

Hsue, Chen-Chiu; and Huang, Cheng-Han, to United Microelectronics Corporation. Preferential oxidization self-aligned contact technology. 5,115,296, Cl. 357-42.000.

HTG High Tech Geratebau GmbH: *See—*
Fitz, Erich; and Resch, Klaus, 5,114,109, Cl. 248-404.000.

Hu, Wei-Shou; and Goetghebeur, Stephane, to University of Minnesota, Regents of the. Method for aggregating cells with small microspheres. 5,114,855, Cl. 435-240.240.

Huang, Cheng-Han: *See—*
Hsue, Chen-Chiu; and Huang, Cheng-Han, 5,115,296, Cl. 357-42.000.

Huang, Tien-Tsai. Pressure gauge. 5,113,695, Cl. 73-146.800.

Huber, Gordon R.; Wenger, LaVon G.; Hauck, Bobble W.; Rokey, Galen J.; Schmelzle, Lawrence E.; and Hartter, Timothy R., to Wenger Manufacturing, Inc. Extrusion method and apparatus for acid treatment of cellulosic materials. 5,114,488, Cl. 127-1.000.

Hudson, David M.: *See—*
Drennen, David B.; Huth, Ronald G.; and Hudson, David M., 5,113,987, Cl. 192-58.000.

Hudson, Hank M.: *See—*
Rambo, C. L.; Wilkinson, John D.; and Hudson, Hank M., 5,114,451, Cl. 62-24.000.

Huebl, Ewald: *See—*
Benzinger, Roland; Schmitt, Edgar; Siegel, Heinz; Huebl, Ewald; Mueller, Klaus; Himmelsbach, Manfred; and Jordan, Martin, 5,114,215, Cl. 303-113.000.

Huels Aktiengesellschaft: *See—*
Neugebauer, Wolfgang, 5,115,044, Cl. 525-392.000.
Poll, Gunter; Bartmann, Martin; and Finke, Jurgen, 5,115,088, Cl. 528-336.000.

Huffman, Todd H., to Westvaco Corporation. Process for preparing a paperboard laminate. 5,114,526, Cl. 264-80.000.

Hughes Aircraft Company: *See—*
Fries, William M.; Ratledge, Thomas L.; and Hill, William H., 5,115,111, Cl. 219-56.210.
Josefowicz, Jack Y.; Rensch, David B.; and Nieh, Kai-Wei, 5,114,910, Cl. 505-1.000.
Wen, Cheng P.; Mendolia, Gregory S.; Siracusa, Mario; Maieron, Joseph J.; Higdon, William D.; Wooldridge, John J.; and Gulick, Jon, 5,115,245, Cl. 342-175.000.

Hughes, John, to American Colloid Company. Method of improving water-swellable clay properties by re-drying, compositions and articles. 5,114,893, Cl. 501-149.100.

Hui, Sai H.; and Darlington, W. Bruce, to PPG Industries, Inc. Glyoxal-containing binder insolubilizer. 5,114,999, Cl. 524-47.000.

Huisingh, James H.; and Elzinga, Edward L., to Herman Miller, Inc. Task light panel. 5,115,380, Cl. 362-33.000.

Hull, Harold L.; Romo, Rudolph R.; and Luschar, Donald J. Freeze control and drain valve. 5,113,892, Cl. 137-62.000.

Hull, Richard W.; and O'Shaughnessy, Timothy G., to Western Digital Corporation. Triple comparator circuit. 5,115,151, Cl. 307-355.000.

Humblestone, Brian G.: *See—*
Gawin, Frank H.; Humblestone, Brian G.; and Allen, David F., 5,114,942, Cl. 514-255.000.

Hummel, John P.: *See—*
Sachdev, Krishna G.; Hummel, John P.; Kwong, Ranee W.; Lang, Robert N.; Linehan, Leo L.; and Sachdev, Harbans S., 5,115,090, Cl. 528-353.000.

Hummel, Peter: *See—*
Abendroth, Paul; Herzel, Joachim; Hummel, Peter; Ortner, Robert; Steuer, Joachim; Stoffler, Achim; and Despot, Janko, 5,113,762, Cl. 101-350.000.

Humphrey, Frank. Sanitation system. 5,114,586, Cl. 210-606.000.

Hunia, Robert M.: *See—*
Basil, John D.; Lin, Chia-Cheng; and Hunia, Robert M., 5,115,023, Cl. 525-103.000.

Hunter, George S.; and Hawker, Michael J., to Process Scientific Innovations Limited. Filter assembly and cartridge therefor. 5,114,572, Cl. 210-120.000.

Hunter, James L.: *See—*
Martin, Ronald R.; and Hunter, James L., 5,114,195, Cl. 292-251.500.

Hunter, Kenneth W., Jr.: *See—*
Stanbro, William D.; Hunter, Kenneth W., Jr.; and Newman, Arnold L., 5,114,674, Cl. 422-57.000.

Hunter, Robert L.; and Ragland, William L., to Emory University. Method for stimulating growth in animals. 5,114,708, Cl. 514-716.000.

Hunter, Stephen B., to W. L. Gore & Associates, Inc. Shielded connector. 5,114,364, Cl. 439-497.000.

Hunziker, Ernst, to M & S Brugg AG. Veneer strip charging apparatus. 5,113,997, Cl. 198-460.000.

Hurng, Weir-Mirn: *See—*
Shei, Cheng-Yie; Hurng, Weir-Mirn; and Chang, Chau-Ting, 5,114,911, Cl. 505-1.000.

Hurst, Robert N., Jr., to General Electric Company. Apparatus for eliminating a motion artifact in a widescreen television signal. 5,115,301, Cl. 358-12.000.

Hursta, William N.: *See—*
Nappholz, Tibor A.; Hursta, William N.; Dawson, Albert K.; and Steinhaus, Bruce M., 5,113,869, Cl. 128-696.000.

Hurula, Timo: *See—*
Viljanto, Jouko; Govenius, Rainer; Lonnqvist, Kurt; and Hurula, Timo, 5,113,871, Cl. 128-768.000.

Hutchinson, T. Gordon. Fastening device. 5,113,553, Cl. 24-464.000.

Hutchison, Stephen E.: *See—*
Jeanblanc, Ivan M.; Hutchison, Stephen E.; Virkus, Mark K.; and Johnsen, Ronald J., 5,115,493, Cl. 395-117.000.

Huth, Ronald G.: *See—*
Drennen, David B.; Huth, Ronald G.; and Hudson, David M., 5,113,987, Cl. 192-58.000.

Hutson, Graham V., to British Nuclear Fuels plc. Process for the destruction of alkylphosphate. 5,114,623, Cl. 252-631.000.

Hutzinger, Otto: *See—*
Karasek' Francis W.; Naikwadi, Krishnat P.; and Hutzinger, Otto, 5,113,772, Cl. 110-345.000.

Huxel, Gary R.: *See—*
Brinsmead, Brian J.; Stepenoff, Gary F.; Bess, Vicki H.; Huxel, Gary R.; and Wetmore, John A., 5,114,568, Cl. 209-170.000.

Hydris: *See—*
Tortellier, Christian, 5,113,896, Cl. 137-269.000.

Hydro Supra AB: *See—*
Hagerstedt, Lars-Erik, 5,114,587, Cl. 210-614.000.

Hylsa S.A. de C.V.: *See—*
Elizondo-Gonzalez, Cesar; Juarez-Mata, Virgilio; Viramontes-Brown, Ricardo; Quintero-Flores, Raul; and Roesch-Dietlen, Juan-Jorge, 5,113,890, Cl. 137-13.000.

Hyoi, Isao, to Murai Co., Ltd. Eyeglass frame having tubular connectors. 5,114,219, Cl. 351-121.000.

Hyrad Corporation: *See—*
Furrer, Fredrick J.; and Lemme, Charles D., 5,113,980, Cl. 188-299.000.

Hyun, Kun S.: *See—*
Kirkpatrick, Donald E.; Stevenson, James A.; and Hyun, Kun S., 5,115,029, Cl. 525-239.000.

Ibiden, Co., Ltd.: *See—*
Tsukada, Kiyotaka, 5,114,886, Cl. 501-88.000.

Iburg, Jan E.: *See—*
van Vliet, Marten R. P.; and Iburg, Jan E., 5,114,606, Cl. 252-103.000.

Ichihara, Taku: *See—*
Miyamoto, Takashi; Miyagawa, Kazuya; Tomimatsu, Yukihito; Sugiura, Tsutomu; Nishi, Kenji; and Ichihara, Taku, 5,114,224, Cl. 353-122.000.

Ichinose, Tadashi, to Komori Corporation. Method and apparatus for multiple sheet detection. 5,114,138, Cl. 271-263.000.

Ichinose, Takasi: *See—*
Ouchi, Shigetoshi; Shirouzu, Tatsuji; Ode, Shinichi; Ichinose, Takasi; and Kanno, Tutomu, 5,115,389, Cl. 363-125.000.

ICI Australia Operations Proprietary Limited: *See—*
O'Leary, John; and Adams, Erik, 5,114,746, Cl. 427-118.000.

ICI Pharma: *See—*
Bertrandie, Alain M.; Bird, Thomas G. C.; and Jung, Frederic H., 5,114,933, Cl. 514-202.000.

Idel, Karsten-Josef: *See—*
Nielinger, Werner; Idel, Karsten-Josef; Westeppe, Uwe; Freitag, Dieter; Wulff, Claus; and Heinz, Hans-Detlef, 5,115,050, Cl. 525-537.000.

Idemitsu Kosan Company Limited: *See—*
Matsuo, Shigeru; Murakami, Shigeru; Chino, Shinji; and Yako, Naoto, 5,115,077, Cl. 528-125.000.

Ido, Yasuzi: *See—*
Sohda, Yoshio; Ido, Yasuzi; Nakamura, Toshinori; and Suemitsu, Takeshi, 5,114,635, Cl. 264-29.200.

Igarashi, Akira: *See—*
Taguchi, Hiroshi; Washizaki, Youji; Igarashi, Akira; and Nakano, Hiroyoshi, 5,114,526, Cl. 156-361.000.

Igarashi, Sadao; and Ushida, Susumu, to Alps Electric Co., Ltd. Tuning apparatus for a television receiver including selectively activated amplifier and local oscillator circuits. 5,115,317, Cl. 358-191.100.

Igaue, Takamitsu; Kitaoka, Hideaki; and Tanji, Hiroyuki, to Uni-Charm Corporation. Disposable diaper. 5,114,420, Cl. 604-385.200.

Ihara Chemical Industry Co., Ltd.: *See—*
Wada, Nobuhide; and Yoshida, Ryo, 5,114,463, Cl. 71-92.000.

Ihara, Kiyohiko; Ontani, Katsuhide; Nakata, Yutaka; and Miyatani, Toshio, to Daikin Industries, Ltd. Tetrafluoroethylene copolymer and process for preparing the same. 5,115,038, Cl. 525-326.200.

Ihara, Masaki: *See—*
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Nishikibe, Masaru; Ihara, Masaki; and Yano, Mitsuo, 5,114,918, Cl. 514-11.000.

Ihara, Yoshitaka: *See—*
Ikebuchi, Iwao; Ihara, Yoshitaka; Takei, Hisashi; Yamada, Syozo; Nakano, Mamoru; and Ganse, Akira, 5,114,083, Cl. 241-153.000.

Iida, Hideyo: *See—*
Imai, Mizuho; Ito, Atsuo; Sekiguchi, Mikio; Iida, Hideyo; Fukai, Kikuji; and Kato, Komei, 5,114,076, Cl. 239-338.000.

Iizuka, Naonori, to Jatco Corporation. Timing control during downshift to engine braking range. 5,113,722, Cl. 74-866.000.

Iizuka, Taiji, to Sharp Kabushiki Kaisha. Display device driving circuit. 5,115,232, Cl. 340-784.000.

Ijadi-Maghsoodi, Sina: *See—*
Barton, Thomas J.; Ijadi-Maghsoodi, Sina; and Pang, Yi, 5,115,062, Cl. 526-279.000.

Ikarashi, Masami; Mitsumori, Kenichi; Kano, Mitsuru; Miki, Yasuhiro; Akimoto, Takemi; Yamaguchi, Masahiko; Sasaki, Yorihiko; Kamigaki, Tomoo; Nakanowatari, Jun; Kato, Yoshinori; and Seki, Hitoshi, to Alps Electric Co., Ltd. Electroluminescent device having a liquid crystal layer adjacent to the electroluminescent layer without any electrode placed therebetween. 5,115,329, Cl. 359-50.000.

Ikawa, Shoji: *See—*
Isegawa, Yo; Kito, Takeshi; Muryayama, Kimimasa; Ikawa, Shoji; Iwase, Takahiro; Sugiura, Tutomu; and Tsuzuki, Atsuyuki, 5,114,521, Cl. 156-242.000.

Ikebuchi, Iwao; Ihara, Yoshitaka; Takei, Hisashi; Yamada, Syozo; Nakano, Mamoru; and Ganse, Akira, to Kubota, Ltd. Method and appatatus for pulverizing material. 5,114,083, Cl. 241-153.000.

Ikeda, Michihiro: *See—*
Kaneko, Tsugio; Kimura, Tsuneo; Ikeda, Michihiro; Utsunomiya, Akira; and Ohno, Yuka, 5,114,881, Cl. 501-12.000.

Ikeda, Nobuyuki; Nagata, Kazuhisa; and Oba, Chikashi, to Aisin Seiki Kabushiki Kaisha. Sliding mechanism for sunroof. 5,114,208, Cl. 296-216.000.

Ikeda, Toru, to Mitsubishi Denki Kabushiki Kaisha. Ignition control apparatus for an internal combustion engine. 5,113,815, Cl. 123-146.50B.

Ikeda, Toshio: *See—*
Umehara, Takeshi; Ikeda, Toshio; and Urata, Kazuhisa, 5,114,331, Cl. 425-200.000.

Ikejiri, Fumitoshi: *See—*
Sakai, Hideki; Ishiwatari, Kazuo; and Ikejiri, Fumitoshi, 5,115,010, Cl. 524-410.000.

Ikemoto, Yasunori: *See—*
Ueda, Nobuo; Okita, Tatuo; Suzuki, Mikio; Ikemoto, Yasunori; and Shibao, Hiloyuki, 5,114,381, Cl. 453-57.000.

Illinois Superconductor Corporation: *See—*
Erwin, Lewis; Crandell, Keith; and Whitney, Justin, 5,114,907, Cl. 505-1.000.

Ima, Seiichiro: *See—*
Ogawa, Tadatoshi; Ima, Seiichiro; and Wakamatsu, Kazuki, 5,115,027, Cl. 525-216.000.

Imai, Masafumi: *See—*
Yashiro, Teruo; Kanazawa, Seizaburo; Nakano, Akira; Murata, Masahide; and Imai, Masafumi, 5,114,896, Cl. 502-111.000.

Imai, Mizuho; Ito, Atsuo; Sekiguchi, Mikio; Iida, Hideyo; Fukai, Kikuji; and Kato, Komei, to Taiyo Yuden Co., Ltd. Atomizer for forming a thin film. 5,114,076, Cl. 239-338.000.

Imanishi, Ryozo: *See—*
Murakawa, Masatake; Imanishi, Ryozo; and Fujiwara, Yoji, 5,113,819, Cl. 123-198.00E.

Imhoff, Robert W. Aero hydrofoil sail boat. 5,113,775, Cl. 114-39.100.

IMI Cornelius Inc.: *See—*
Fredrickson, Howard J., 5,114,021, Cl. 211-54.100.

Imondi, Anthony R., to Erbamont Inc. Method for alleviating anxiety using benzobicyclic carboxamides. 5,114,947, Cl. 514-282.000.

Imperante, John; and O'Lenick, Anthony J., Jr., to Siltech Inc. Fatty carboxylic silicone amine salts. 5,115,049, Cl. 525-479.000.

Imperial Chemical Industries plc: *See—*
Cassidy, Edward F.; Gillis, Herbert R.; Hannaby, Malcolm; and Parfondry, Alain, 5,114,480, Cl. 106-38.240.
Forsyth, Steven R.; and Grady, Brian T., 5,114,544, Cl. 204-59.00F.
Gillis, Herbert R.; and Hannaby, Malcolm, 5,115,045, Cl. 525-420.000.

INA Walzlager Schaeffler KG: *See—*
Muntnich, Leo; Steinberger, Wolfgang; and Soyka, Wilfried, 5,114,249, Cl. 384-622.000.

Inada, Hitoshi: *See—*
Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, 5,114,668, Cl. 376-442.000.

Inada, Jun; Sato, Shinichi; Shimizu, Ryoichi; Kitani, Akinobu; and Nakano, Kunio, to Tosoh Corporation; Ube Industries, Ltd.; and Sumitomo Corporation. Large-sized container. 5,114,765, Cl. 428-35.700.

Inco Alloys International, Inc.: *See—*
Mirchandani, Prakash K.; Benn, Raymond C.; and Mattson, Walter E., 5,114,505, Cl. 148-437.000.

Industrail Technology Research Institute: *See—*
Shei, Cheng-Yie; Hurng, Weir-Mirn; and Chang, Chau-Ting, 5,114,911, Cl. 505-1.000.

Industrial Finishes & Systems, Inc.: *See—*
Smith, Jason R., 5,114,010, Cl. 206-453.000.

Industrial Technology Research Institute: *See—*
Lii, Lucky J.; and Chen, Shi-Shiow, 5,114,980, Cl. 521-51.000.

Infanti Chair Manufacturing Corp.: *See—*
Infanti, Vittorio, 5,114,112, Cl. 248-500.000.

Infanti, Vittorio, to Infanti Chair Manufacturing Corp. Detachable game stool assembly. 5,114,112, Cl. 248-500.000.

Ingraham, Andrew D.: *See—*
Samaras, William A.; Vaughan, David T.; and Ingraham, Andrew D., 5,115,455, Cl. 375-106.000.

Ino, Juichi: *See—*
Takemura, Kazuo; Ino, Juichi; Kawahara, Hideo; and Kitaoka, Masaki, 5,114,760, Cl. 427-430.100.

Inomet, Inc.: *See—*
Knudson, Mark B., 5,115,133, Cl. 250-341.000.

Inoshita, Gen: *See—*
Kunimaru, Noritaka; Shiba, Katsuhiro; Kudo, Norio; Inoshita, Gen; and Sato, Shogo, 5,114,093, Cl. 242-204.000.

Inoue, Akihisa: *See—*
Miyagi, Tokuya; Inoue, Akihisa; Otsubo, Taisuke; and Hori, Yoshihiro, 5,114,508, Cl. 156-69.000.

Inoue, Kaname; Yamazaki, Motohide; and Armentrout, Richard W., to Shin-Etsu Bio, Inc. Process for producing streptovaricin. 5,114,846, Cl. 435-34.000.

Institut Francais de Petrole: *See—*
Cholet, Henri, 5,113,937, Cl. 166-105.500.

Institut Francais du Petrole: *See—*
Guesnon, Jean; Laurencin, Andre; and Klopfeinstein, Claude, 5,113,681, Cl. 72-53.000.
Hotier, Gerard; Toussaint, Jean-Michel; Terneuil, Gabriel; and Lonchamp, Daniel, 5,114,590, Cl. 219-659.000.

Institut Gustave Roussy: *See—*
Frindel, Emilia; Lenfant, Maryse; Guigon, Martine; and Bakala, Johanna, 5,114,926, Cl. 514-18.000.

Institut National De La Sante Et De La Recherche Medicale: *See—*
Frindel, Emilia; Lenfant, Maryse; Guigon, Martine; and Bakala, Johanna, 5,114,926, Cl. 514-18.000.

Instrument SA: *See—*
Gautherin, Jean-Claude; and Zegre, Henry, 5,114,231, Cl. 356-328.000.

Intel Corporation: *See—*
Nilsson, Sven-Axel; Ebersole, Ronald J.; Bier, Gerhard; and Honeck, Karl-Heinz, 5,115,511, Cl. 395-800.000.

Intercollection Development S.A.: *See—*
Verney, Claude; and Strassle, Alex, 5,114,212, Cl. 297-421.000.

International Business Machines: *See—*
Rohulich, Alan S.; and Wunderlich, Ronnie A., 5,115,143, Cl. 307-571.000.

International Business Machines Corporation: *See—*
Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., 5,115,095, Cl. 525-474.000.
Bischoff, Ronald E.; Brandon, Mark A.; Caulfield, John J.; Cook, Lawrence G.; and Uplinger, George B., 5,114,018, Cl. 211-41.000.
Cipolla, Thomas M.; Coteus, Paul W.; Johnson, Glen W.; Murphy, Philip; and Oden, Christopher W., 5,113,565, Cl. 29-25.010.
Coufal, Hans J.; and Williams, Mason L., III, 5,114,913, Cl. 505-1.000.
Cronin, John E.; Farrar, Paul A., Sr.; Linde, Harold G.; and Previti-Kelly, Rosemary A., 5,114,754, Cl. 427-333.000.
Finkelstein, Blair L.; and McDaniel, Terry W., 5,115,420, Cl. 369-44.140.
Harris, Richard H.; Minor, Richard G.; and Price, Robert W., 5,115,228, Cl. 340-716.000.
Hayward, Curtis E.; Peterson, Gerald W.; and Post, Robert E., 5,115,260, Cl. 385-100.000.
Hoffarth, Joseph G.; Lazzarini, Donald J.; Welsh, John A.; and Wiley, John P., 5,114,518, Cl. 156-212.000.
Kerr, Linda L., 5,115,501, Cl. 395-600.000.
Kwong, Ranee W.; Sachdev, Harbans S.; and Sachdev, Krishna G., 5,114,826, Cl. 430-192.000.
Larsen, Larry D., 5,115,500, Cl. 395-425.000.
Masuyama, Akira; and Saitoh, Takaki, 5,114,529, Cl. 156-643.000.

International Paper Box Machine Co., Inc., The: *See—*
McAdam, Hugh A., III; Tremblay, Robert; and Pacocha, James, 5,114,392, Cl. 493-179.000.

International Technical Illustration Co., Inc.: *See—*
Seki, Nobuhiro, 5,115,494, Cl. 395-127.000.

Intevep S.A.: *See—*
Castillo, Jose R.; and de Liendo, Marilu S., 5,114,458, Cl. 71-28.000.

Intramed Laboratories: *See—*
Kovalcheck, Steven W., 5,114,399, Cl. 604-22.000.

Inubushi, Akiyoshi: *See—*
Nakacho, Yoshifumi; Inubushi, Akiyoshi; and Tada, Yuji, 5,114,809, Cl. 429-192.000.

Inui, Yasuo, to Kurimoto Ltd. Hammer for use in hammer mill. 5,114,085, Cl. 241-195.000.

Inuyama, Toshihiko: *See—*
Kusano, Akihisa; Kimizuka, Junichi; Ito, Toshiyuki; Sato, Kaoru; Abe, Makoto; Okazawa, Kazuhiko; and Inuyama, Toshihiko, 5,115,147, Cl. 307-311.000.

Iowa State University Research Foundation, Inc.: *See—*
Barton, Thomas J.; Ijadi-Maghsoodi, Sina; and Pang, Yi, 5,115,062, Cl. 526-279.000.
Jane, Jay-Lin; Schwabacher, Alan W.; Ramrattan, Sam N.; and Moore, Jeffrey A., 5,115,000, Cl. 524-47.000.

Iqbal, Mohammad: *See—*
Hampl, Edward F., Jr.; Iqbal, Mohammad; and Thompson, Suzanne J., 5,115,372, Cl. 361-323.000.

Irie, Yutaka: *See—*
Shibazaki, Kenji; Irie, Yutaka; Ito, Masazumi; and Murata, Tomoji, 5,115,274, Cl. 355-243.000.

Iriyama, Masahiro, to Nissan Motor Company, Limited. Throttle valve control apparatus for use with internal combustion engine. 5,113,823, Cl. 123-399.000.

Isabelle, Charles J.; Kish, Jules G.; and Stone, Robert A., to United Technologies Corporation. Elastomeric load sharing device. 5,113,713, Cl. 74-410.000.

Isaka, Haruo: *See—*
Ishikawa, Akihiro; Isaka, Haruo; and Sakakibara, Yoshio, 5,115,422, Cl. 369-54.000.

Iseda, Kohei: *See—*
Taniguchi, Tomohiko; Iseda, Kohei; Okazaki, Koji; Amano, Fumio; Unagami, Shigeyuki; Tanaka, Yoshinori; and Ohta, Yasuji, 5,115,469, Cl. 381-36.000.

Isegawa, Yo; Kito, Takeshi; Muryayama, Kimimasa; Ikawa, Shoji; Iwase, Takahiro; Sugiura, Tutomu; and Tsuzuki, Atsuyuki, to Mitsubishi Monsanto Chemical Company; and Toyota Jidosha Kabushiki Kaisha. Method for producing a sliding coupling by a monomer casting method. 5,114,521, Cl. 156-242.000.

Isekinoki Kabushiki Kaisha Gijutsubu: *See—*
Tamai, Seishin; Doi, Yoshinori; and Araki, Masakatsu, 5,113,957, Cl. 172-10.000.

Isella, Thomas: *See—*
Sigl, Alfred; Schmitt, Johannes; and Isella, Thomas, 5,113,963, Cl. 180-197.000.

Ishibashi, Nobuyuki: *See*—
Sonobe, Saburo; and Ishibashi, Nobuyuki, 5,113,760, Cl. 101-348.000.

Ishibashi, Shigeki; Nakamura, Kouzaburou; Maruno, Tohru; Nakahata, Masaaki; Negishi, Takaaki; and Urano, Fumiyoshi, to Wako Pure Chemical Industries, Ltd.; and Nippon Telegraph and Telephone Corporation. Liquid crystal compounds and intermediates thereof. 5,114,615, Cl. 252-299.670.

Ishibashi, Tadao: *See*—
Kuroda, Takashi; Yamada, Kazuhiro; Ishibashi, Tadao; Hayashida, Suetou; Kimura, Kyoichiro; and Sameshima, Masaru, 5,114,638, Cl. 264-41.000.

Ishida Iron Works, Co., Ltd.: *See*—
Takai, Hiroshi; and Ishida, Sachio, 5,113,635, Cl. 53-52.000.

Ishida, Kando: *See*—
Nakagawa, Seiichi; Muruyama, Yoshiharu; Shiota, Masanori; Ishida, Kando; Fujita, Masayoshi; and Yamada, Shigenobu, 5,113,944, Cl. 169-13.000.

Ishida, Masamitsu: *See*—
Saotome, Shigeru; and Ishida, Masamitsu, 5,115,132, Cl. 250-327.200.

Ishida, Sachio: *See*—
Takai, Hiroshi; and Ishida, Sachio, 5,113,635, Cl. 53-52.000.

Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, to Minolta Camera Kabushiki Kaisha. Image sensing system. 5,115,321, Cl. 358-213.190.

Ishida, Yasushi: *See*—
Kobayashi, Makoto; Yoshida Takehiro; Wada, Satoshi; Terajima, Hisao; Ono, Takeshi; Yokoyama, Minoru; Awai, Takashi; Tomoda, Akihiro; and Ishida, Yasushi, 5,115,255, Cl. 346-76.0PH.

Ishida, Youuji: *See*—
Shirahama, Hidefumi; Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; Iwanaka, Mitsufumi; Nagano, Takeshi; and Ishida, Youuji, 5,115,386, Cl. 363-41.000.

Ishiguro, Yoichi: *See*—
Tsuchiya, Ichiro; Ishikawa, Shinji; Saitoh, Masahide; and Ishiguro, Yoichi, 5,114,338, Cl. 432-206.000.

Ishihara, Takeshi; Fujita, Tadashi; and Misawa, Hidenobu, to NGK Insulators, Ltd. Solid oxide fuel cell and porous electrode for use in the same. 5,114,803, Cl. 429-30.000.

Ishihara, Yoshimi; and Otsubo, Kazutaka, to Aisin AW Co., Ltd. Oil level gauge. 5,113,594, Cl. 33-722.000.

Ishii, Hiroshi; and Ozaki, Masaaki, to Sharp Kabushiki Kaisha. Phase locked loop speed control circuit for controlling speeds and relative positions of objects. 5,115,172, Cl. 318-38.000.

Ishii, Junichi; Takada, Tetsuji; and Kurohara, Takayuki, to Koei Chemical Co., Ltd.; and Sumitomo Metal Mining Co., Ltd. Resin bonded permanent magnet and a binder therefor. 5,114,604, Cl. 252-62.540.

Ishii, Keizou: *See*—
Muramoto, Hisaichi; Ninomiya, Yusuke; Ishii, Keizou; and Ishikura, Shinichi, 5,115,020, Cl. 525-74.000.

Ishii, Koichi: *See*—
Kashiyama, Masamori; Ishii, Koichi; Kawabe, Shun; and Usami, Masami, 5,115,393, Cl. 395-425.000.

Ishii, Masaaki: *See*—
Katakami, Tsutomu; Yokoyama, Tatsuro; Mori, Haruki; Kawauchi, Nobuya; Kamiya, Joji; and Ishii, Masaaki, 5,114,941, Cl. 514-253.000.

Ishii, Mitsunori, to Nissan Motor Co., Ltd. Multi-cylinder two-cycle engine having improved transfer passage structure. 5,113,810, Cl. 123-73.00R.

Ishikawa, Akihiro; Isaka, Haruo; and Sakakibara, Yoshio, to Matsushita Electric Industrial Co., Ltd. Information reproducing apparatus for detecting a reproduced area on a disc. 5,115,422, Cl. 369-54.000.

Ishikawa, Hisashi, to Canon Kabushiki Kaisha. Predictive coding device with increased resolution 5,115,241, Cl. 341-143.000.

Ishikawa, Kiichirou, to Yoshida Kogyo K.K. Apparatus for feeding slide fastener chain with folding of attached fabric strips. 5,114,057, Cl. 223-37.000.

Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Masc. Toshiaki; Fujita, Kagari; Nishikibe, Masaru; Ihara, Masaki; and Yano, Mitsuo, to Banyu Pharmaceutical Co., Ltd. Endothelin antagonistic cyclic pentapeptides. 5,114,918, Cl. 514-11.000.

Ishikawa, Shinji: *See*—
Tsuchiya, Ichiro; Ishikawa, Shinji; Saitoh, Masahide; and Ishiguro, Yoichi, 5,114,338, Cl. 432-206.000.

Ishikura, Shinichi: *See*—
Muramoto, Hisaichi; Ninomiya, Yusuke; Ishii, Keizou; and Ishikura, Shinichi, 5,115,020, Cl. 525-74.000.

Ishima, Kazumi, to Ricoh Company, Ltd. Gain control circuit for use in shading compensation circuit. 5,115,327, Cl. 358-461.000.

Ishimatsu, Toshiki: *See*—
Hayashi, Takeshi; Sato, Shigeru; Tsujimoto, Katsuaki; Miyazaki, Daishiro; Hiwasa, Yoneo; and Ishimatsu, Toshiki, 5,113,954, Cl. 175-415.000.

Ishimoto, Kazumi: *See*—
Izumi, Yasuo; Sato, Syoji; Ishimoto, Kazumi; Makino, Yutaka; and Ueno, Shohzo, 5,113,788, Cl. 118-663.000.

Ishino, Tsutomu; and Maruyama, Ryoichi, to Kabushiki Kaisha Komatsu Seisakusho. Clutch changeover circuit for non-stage transmission. 5,113,723, Cl. 74-867.000.

Ishiwatari, Kazuo: *See*—
Sakai, Hideki; Ishiwatari, Kazuo; and Ikejiri, Fumitoshi, 5,115,010, Cl. 524-410.000.

Islam, Mohammed N.; and Slusher, Richard E., to AT&T Bell Laboratories. Apparatus comprising an all-optical gate. 5,115,488, Cl. 385-129.000.

Isobe, Mitsuo; and Morita, Katsumi, to Matsushita Electric Industrial Co., Ltd. Picture signal processing apparatus having a temporal filter and a picture-in-picture function. 5,115,313, Cl. 358-183.000.

Isono, Keinosuke; Yoshida, Takao; and Suzuki, Tatsuo, to Material Engineering Technology Laboratory Inc. Filled and sealed, self-contained mixing container. 5,114,004, Cl. 206-222.000.

Isuzu Ceramics Research Institute Co., Ltd.: *See*—
Kawamura, Hideo, 5,113,805, Cl. 123-21.000.

Isuzu Motors Limited: *See*—
Tsuchiya, Yoshinobu; Kurabayashi, Ken; Kito, Seiichiro; and Niida, Yoriaki, 5,115,378, Cl. 361-502.000.

Itaba, Tetsu: *See*—
Watanabe, Kotaro; and Itaba, Tetsu, 5,115,400, Cl. 364-474.240.

Ito, Atsuo: *See*—
Imai, Mizuho; Ito, Atsuo; Sekiguchi, Mikio; Iida, Hideyo; Fukai, Kikuji; and Kato, Komei, 5,114,076, Cl. 239-338.000.

Ito, Hiromi; Takahashi, Ichiro; and Kanegae, Hirozoh, to Mitsubishi Denki Kabushiki Kaisha. Epoxy resin composition for sealing semiconductor. 5,114,994, Cl. 523-436.000.

Ito, Kazuhiro; Matsuda, Hiroshi; and Nagano, Yuuji, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corporation. Fabricating an avalanche photo diode having a step-like distribution. 5,114,866, Cl. 437-3.000.

Ito, Masazumi: *See*—
Shibazaki, Kenji; Irie, Yutaka; Ito, Masazumi; and Murata, Tomoji, 5,115,274, Cl. 355-243.000.

Ito, Michio: *See*—
Akashi, Shunji; Ito, Michio; and Kuse, Kazuki, 5,114,305, Cl. 414-787.000.

Ito, Osami: *See*—
Kanzawa, Yoshikazu; Fujikake, Yasushi; Ito, Osami; Ito, Shuho; Oikawa, Hironobu; Otsubo, Makoto; Morikawa, Iwao; Shiratori, Yuichi; and Tsukada, Kiyoshi, 5,113,926, Cl. 164-119.000.

Ito, Shuho: *See*—
Kanzawa, Yoshikazu; Fujikake, Yasushi; Ito, Osami; Ito, Shuho; Oikawa, Hironobu; Otsubo, Makoto; Morikawa, Iwao; Shiratori, Yuichi; and Tsukada, Kiyoshi, 5,113,926, Cl. 164-119.000.

Ito, Toshiyuki: *See*—
Kusano, Akihisa; Kimizuka, Junichi; Ito, Toshiyuki; Sato, Kaoru; Abe, Makoto; Okazawa, Kazuhiko; and Inuyama, Toshihiko, 5,115,147, Cl. 307-311.000.

Ito, Tsuyoshi: *See*—
Kusano, Hiroshi; Ito, Tsuyoshi; Tashiro, Takayuki; Takayanagi, Hiroaki; and Miyata, Eiji, 5,114,577, Cl. 210-198.200.

Ito, Wataru, to Fuji Photo Film Co., Ltd. Edge finding method and apparatus. 5,115,476, Cl. 382-22.000.

Ito, Yoichiro: *See*—
Shibusawa, Yoichi; and Ito, Yoichiro, 5,114,589, Cl. 210-657.000.

Itoh, Masahiro, to Canon Kabushiki Kaisha. Electrophotographic image forming apparatus. 5,115,259, Cl. 346-157.000.

Itoh, Noboru: *See*—
Miyawaki, Keizou; Itoh, Noboru; and Mikami, Izumi, 5,115,351, Cl. 359-849.000.

Itoh, Yokichi: *See*—
Yatsuda, Yuji; Hagiwara, Takaaki; Kondo, Ryuji; Minami, Shinichi; and Itoh, Yokichi, 5,114,870, Cl. 437-40.000.

Itozaki, Hideo: *See*—
Higaki, Kenjiro; Harada, Keizo; Fujimori, Naoji; Itozaki, Hideo; and Yazu, Shuji, 5,114,906, Cl. 505-1.000.

ITT Corporation: *See*—
Peckman, Robert, 5,114,373, Cl. 445-3.000.

Iwada, Masatosi: *See*—
Sato, Kiyoshi; Taguchi, Masaaki; Wada, Yasunori; Kawasaki, Mikio; Ohtani, Shinichi; Iwada, Masatosi; and Hatakeyama, Noboru, 5,114,836, Cl. 430-434.000.

Iwahashi, Naoto: *See*—
Fujiwara, Yoshihito; Umezawa, Tomoko; Nishiguchi, Masayuki; Akune, Makoto; Iwahashi, Naoto; and Akagiri, Kenzo, 5,115,240, Cl. 341-51.000.

Iwanaka, Mitsufumi: *See*—
Shirahama, Hidefumi; Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; Iwanaka, Mitsufumi; Nagano, Takeshi; and Ishida, Youuji, 5,115,386, Cl. 363-41.000.

Iwasaki, Katsuyo: *See*—
Ose, Toshio; Yoshida, Toshifumi; and Iwasaki, Katsuyo, 5,115,170, Cl. 315-370.000.

Iwase, Akira; and Suzuki, Akira, to Toshiba Machine Co., Ltd. High accuracy traveling table apparatus. 5,115,354, Cl. 359-873.000.

Iwase, Takahiro: *See*—
Isegawa, Yo; Kito, Takeshi; Muryayama, Kimimasa; Ikawa, Shoji; Iwase, Takahiro; Sugiura, Tutomu; and Tsuzuki, Atsuyuki, 5,114,521, Cl. 156-242.000.

Iwata, Akihiko: *See*—
Shoda, Isao; Kodama, Hitoshi; Magome, Kazuo; Iwata, Akihiko; Yoshizawa, Kenji; and Taki, Masakazu, 5,115,168, Cl. 315-223.000.

Iwata, Toshio: *See*—
Fukui, Wataru; Iwata, Toshio; Ueda, Atsushi; Matsumura, Masami; and Koiwa, Mitsura, 5,113,821, Cl. 123-335.000.

Izumi, Miyake: *See*—
Masanaga, Yamamoto; Kiyotaka, Kaneko; Masanori, Yoshida; and Izumi, Miyake, 5,115,269, Cl. 354-420.000.

Izumi, Yasuo; Sato, Syoji; Ishimoto, Kazumi; Makino, Yutaka; and Ueno, Shohzo, to Matsushita Electric Industrial Co., Ltd. Screen printing machine for through hole printing an electric conductor. 5,113,788, Cl. 118-663.000.

J.M. Voith GmbH: *See*—
Kuhn, Friedrich; Drefs, Wolfgang; Ruff, Hans; and Scheuter, Siegbert, 5,114,062, Cl. 226-95.000.

Jackisch, David A.; May, Ralph F.; and Berl, Kevin D., to Du Pont de Nemours, E. I., and Company. Tablet vial with desiccant in bottom. 5,114,003, Cl. 206-204.000.

Jacklin, Peter T.: *See*—
D'Amelia, Ronald P.; and Jacklin, Peter T., 5,115,017, Cl. 525-59.000.

Jackman, John T.: *See*—
Khouri, Farid F.; Brown, Sterling B.; and Jackman, John T., 5,115,042, Cl. 525-397.000.

Jackson, Larry A.: *See*—
Rasmussen, Steve O.; and Jackson, Larry A., 5,114,134, Cl. 271-34.000.

Jackson, Rodney P.; and Rossmeisl, Mark E., to Emhart Inc. Tool tip assembly for surface mount machine. 5,113,578, Cl. 29-743.000.

Jacques, Pierre J. Container provided with a multilayer cover with venting provisions and related method. 5,114,766, Cl. 428-35.700.

Jahani, Hooshang, to Tooltek Engineering Corp. Selective plating apparatus with optical alignment sensor. 5,114,557, Cl. 204-206.000.

Jahrmarkt, Scott L.; Viera, Fernando M.; and Box, J. William, to Cordis Corporation. Guidewire extension system with connectors. 5,113,872, Cl. 128-772.000.

Jain, Mukesh K.; Nadkarni, Sadashiv K.; and Gesing, Adam, to Alcon International Limited. Process of producing aluminum and titanium nitrides. 5,114,695, Cl. 423-411.000.

Jamco International, Inc.: *See*—
Machen, James A., 5,113,612, Cl. 40-336.000.

James Clem Corporation: *See*—
Clem, Arthur J., 5,114,892, Cl. 501-141.000.

Jane, Jay-Lin; Schwabacher, Alan W.; Ramrattan, Sam N.; and Moore, Jeffrey A., to Iowa State University Research Foundation, Inc. Biodegradable starch plastics incorporating modified polyethylene. 5,115,000, Cl. 524-47.000.

Jang, Dug-Hwan, to SamSung Electronics Co., Ltd. Guiding mechanism for a facsimile for preventing jam of heat-sensitive recording paper. 5,115,322, Cl. 358-304.000.

Janowski, Gregg N.: *See*—
Biancaniello, Francis S.; Janowski, Gregg N.; and Ridder, Stephen D., 5,114,470, Cl. 75-338.000.

Jansson, Hadar, to Sea Flats Aktiebolag. Container handling wagon. 5,114,295, Cl. 414-460.000.

Janszen, David A. Fluid flow characterizing. 5,113,867, Cl. 128-661.090.

Japan Atomic Power Company, The: *See*—
Hayashi, Takao; and Osawa, Yasuo, 5,114,667, Cl. 376-299.000.

Jaqua, Douglas A., to Shell Oil Company. High resolution translation of images. 5,115,311, Cl. 358-140.000.

Jarrett, Robert L., Sr. Sign and anchor apparatus. 5,113,627, Cl. 52-157.000.

Jaskie, James E., to Motorola, Inc. Tunable diffraction grating. 5,115,344, Cl. 359-573.000.

Jatco Corporation: *See*—
Iizuka, Naonori, 5,113,722, Cl. 74-866.000.
Kouta, Joji, 5,113,692, Cl. 73-117.300.

Javadi, Mahmud K.: *See*—
Botkin, Lawrence A.; and Javadi, Mahmud K., 5,114,169, Cl. 280-423.100.

Jean, Buford R., to Baker Hughes Inc. Microwave process seal and method. 5,115,218, Cl. 333-252.000.

Jean Hiedemann GmbH & Co. KG: *See*—
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, 5,114,326, Cl. 425-79.000.

Jeanblanc, Ivan M.; Hutchison, Stephen E.; Virkus, Mark K.; and Johnsen, Ronald J. Continuous laser printer for printing over page boundaries. 5,115,493, Cl. 395-117.000.

Jeckle, William A. Shaped lamp shade. 5,115,385, Cl. 362-358.000.

Jee, Elwood Y. Vehicular air deflector. 5,114,205, Cl. 296-152.000.

Jenekhe, Samson A.; and Peterson, James R., to Honeywell Inc. Solubilizing polymers with an organic solvent system. 5,114,610, Cl. 252-182.330.

Jenkel, Steven D.; MacNitt, Donald G., Jr.; and Walker, Bryant H., to United Technologies Corporation. Integrally bladed rotor fabrication. 5,113,583, Cl. 29-889.210.

Jensen, William: *See*—
Ahmad, Suhail; Cole, James J.; and Jensen, William, 5,114,580, Cl. 210-646.000.

Jeong, Jong-in; Choi, Jong-seo; No, Hwan-cheol; and Ju, Kyu-nam, to Samsung Electron Devices Co., Ltd. Dispenser cathode. 5,115,164, Cl. 313-346.0DC.

Jewell Coal and Coke Company: *See*—
Childress, James H.; and Newberry, Steve E., 5,114,542, Cl. 201-15.000.

Jilge, Wolfgang: *See*—
Reuter, Knud; Jilge, Wolfgang; Pittel, Bernd; and Weymans, Gunther, 5,115,076, Cl. 528-125.000.

Jilken, Leif: *See*—
Svensson, Paul; Nilsson, Christer; Backlund, Jan; Ericsson, Karl G.; Jilken, Leif; and Kihlberg, Harry, 5,114,524, Cl. 156-295.000.

Jochum, Peter; and Muller, Martin, to Hilti Aktiengesellschaft. Powder charge operated setting tool. 5,114,064, Cl. 227-9.000.

Joerg, Klaus: *See*—
Zertani, Rudolf; Mohr, Dieter; Rode, Klaus; Frass, Werner; and Joerg, Klaus, 5,114,832, Cl. 430-285.000.

Jofre Torroella, Juan: *See*—
Pares Farras, Ramon; Jofre Torroella, Juan; Ricard, Jean-Paul; Schulthess, Adrian; Farine, Jean-Claude; Michelet, Marie-Christine; Ramsteiner, Agnes; and Bauer, Jacques, 5,114,848, Cl. 435-101.000.

Johansson, Jonas: *See*—
Andersson-Engels, Stefan; Johansson, Jonas; Stenram, Unne; Svanberg, Katarina; and Svanberg, Sune, 5,115,137, Cl. 250-461.200.

Johenning, John B., to Strata Flotation, Inc. Waterbed corner structure. 5,113,541, Cl. 5-451.000.

John Crane Inc.: *See*—
Radosav, Jon J.; Evans, Thomas A.; Dudek, David M.; Wieser, Russell G.; Atwater, Brian J.; and Eisbrenner, Robert J., 5,114,163, Cl. 277-81.00S.

Johnsen, Ronald J.: *See*—
Jeanblanc, Ivan M.; Hutchison, Stephen E.; Virkus, Mark K.; and Johnsen, Ronald J., 5,115,493, Cl. 395-117.000.

Johnson, Donald C.: *See*—
Ben-Bassat, Arie; Coddington, Kent D.; and Johnson, Donald C., 5,114,849, Cl. 435-101.000.

Johnson, Donald D., to Honeywell Inc. Photoelectric device with a lens formed in its housing. 5,115,129, Cl. 250-239.000.

Johnson, Frank H.: *See*—
Miskinis, Edward T.; Johnson, Frank H.; and Paczkowski, Francis M., 5,115,276, Cl. 355-253.000.

Johnson, Glen W.: *See*—
Cipolla, Thomas M.; Coteus, Paul W.; Johnson, Glen W.; Murphy, Philip; and Oden, Christopher W., 5,113,565, Cl. 29-25.010.

Johnson, Glenn W., Jr.; and McVicker, Henry J., to Aircast Incorporated. Ankle sprain management system. 5,113,877, Cl. 128-882.000.

Johnson, Harold W.: *See*—
Senapati, Nagabhusan; Johnson, Harold W.; Kim, Byung C.; Chauhan, Satya P.; Gamlen, Dennis A.; Eason, Raju; Muralidhara, H. S.; and Zelinski, Matthew S., 5,114,560, Cl. 204-299.00R.

Johnson, James M., Jr.; and Spanke, Ronald A., to AT&T Bell Laboratories. Arrangements for switching multiple packet types combined in a single packet stream. 5,115,427, Cl. 370-60.000.

Johnson, Paul C.; Colthart, James D.; Otermat, Arthur L.; Weingaertner, David A.; Chou, Charles C.; Byers, Dallas L.; Stearns, Stephen M.; Marsden, Arnold R., Jr.; and Deeley, George M., to Shell Oil Company. Soil decontamination. 5,114,497, Cl. 134-21.000.

Johnson, Paul D., to Square D Company. Multipurpose optical fiber connector. 5,115,484, Cl. 385-72.000.

Johnson, Richard D. Multipurpose trailer. 5,114,202, Cl. 296-26.000.

Johnson Service Company: *See*—
AbuJudom, David N., II; Thoma, Paul E.; Kao, Ming-Yuan; and Angst, David R., 5,114,504, Cl. 148-402.000.

Johnson, Walter A.; Kopatz, Nelson E.; and Ritsko, Joseph E., to GTE Products Corporation. Hydrometallurgical process for producing finely divided spherical managing steel powders. 5,114,471, Cl. 75-346.000.

Johnston, Herbert N.; Hiscock, Donald F.; and Beard, Ralph E., to Battelle Memorial Institute. Starch adhesive bonding. 5,114,509, Cl. 156-73.100.

Johnston, Ronald C. Road-map holder and organizer. 5,114,009, Cl. 206-425.000.

Joly, Jean-Louis: *See*—
Vaillant de Guelis, Hubert; and Joly, Jean-Louis, 5,115,158, Cl. 310-15.000.

Jones, Andrew R.: *See*—
Cohen, Eric D.; Jones, Andrew R.; de Castro, Jose T.; Litchfield, Paul; and Smith, Steven F., 5,113,599, Cl. 36-88.000.

Jones, Barbara L. Method of producing a thin carbide layer on a carbon substrate, growing a diamond or diamond-like film on the carbide layer, and removing the carbon substrate. 5,114,745, Cl. 427-113.000.

Jones, Barbara L. Manufacturing diamond electronic devices. 5,114,871, Cl. 437-41.000.

Jones, Barton G.; Green, Ray E.; and Blancher, Eldon C., II. Artificial reef module. 5,113,792, Cl. 119-3.000.

Jones, Lloyd G.; and Yeh, Charles S., to Mobil Oil Corporation. Gravel packing of wells. 5,113,935, Cl. 166-51.000.

Jones, Stephen R.: *See*—
Giersdorf, Rodney L.; Peduzzi, Alfred; Krul, Allan D.; Jones, Stephen R.; and Chetta, Gregory E., 5,114,446, Cl. 55-345.000.

Jones, Susan K. S.: *See*—
Tranjan, Farid M.; DuBois, Thomas D.; Frieser, Rudolf G.; Bobbio, Stephen M.; and Jones, Susan K. S., 5,114,827, Cl. 430-271.000.

Jordan, Harry F.: *See*—
Ramanan, Srinivasan V.; and Jordan, Harry F., 5,115,428, Cl. 370-68.000.

Jordan, Martin: *See*—
Benzinger, Roland; Schmitt, Edgar; Siegel, Heinz; Huebl, Ewald; Mueller, Klaus; Himmelsbach, Manfred; and Jordan, Martin, 5,114,215, Cl. 303-113.0TB.

Jorgenson, James W.; and Dohmeier, Daniel M., to University of North Carolina at Chapel Hill, The. Microelectrospray method and apparatus. 5,115,131, Cl. 250-288.000.

Josefowicz, Jack Y.; Rensch, David B.; and Nieh, Kai-Wei, to Hughes Aircraft Company. Passivation of thin film oxide superconductors. 5,114,910, Cl. 505-1.000.

Joseph, Eugene G.: *See*—
Silver, Spencer F.; Bronn, William R.; and Joseph, Eugene G., 5,115,034, Cl. 525-288.000.
Joseph, Michael D.: *See*—
Harris, Robert F.; and Joseph, Michael D., 5,115,070, Cl. 528-59.000.
Jouan: *See*—
Guy, Jean-Luc; and Saladin, Jean-Pierre, 5,114,533, Cl. 159-6.100.
Jourdan, Glen P.: *See*—
Dreikorn, Barry A.; Jourdan, Glen P.; and Suhr, Robert G., 5,114,939, Cl. 514-248.000.
Joyeux, Denis: *See*—
Baude, Dominique; Chavel, Pierre; Joyeux, Denis; and Taboury, Jean, 5,114,220, Cl. 351-160.00R.
JPI Transportation Products, Inc.: *See*—
Gowan, James L., 5,114,246, Cl. 384-275.000.
Ju, Kyu-nam: *See*—
Jeong, Jong-in; Choi, Jong-seo; No, Hwan-cheol; and Ju, Kyu-nam, 5,115,164, Cl. 313-346.00DC.
Juarez-Mata, Virgilio: *See*—
Elizondo-Gonzalez, Cesar; Juarez-Mata, Virgilio; Viramontes-Brown, Ricardo; Quintero-Flores, Raul; and Roesch-Dietlen, Juan-Jorge, 5,113,890, Cl. 137-13.000.
Juarez, Roberto: *See*—
Carey, James; Addario, John J.; and Juarez, Roberto, 5,113,765, Cl. 102-336.000.
Jung, Frederic H.: *See*—
Bertrandie, Alain M.; Bird, Thomas G. C.; and Jung, Frederic H., 5,114,933, Cl. 514-202.000.
Jung, Herbert: *See*—
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, 5,114,326, Cl. 425-79.000.
Jung, Michael: *See*—
Geisler, Michael; Jung, Michael; and Faulhaber, Rudolf K., 5,113,790, Cl. 118-723.000.
Jung, Tae Y., to Samsung Corning Co., Ltd. Process for producing a metal-screened ceramic package. 5,114,642, Cl. 264-61.000.
Jung, Werner; and Sievers, Axel, to BASF Lacke & Farben AG. Soluble, crosslinkable acrylate copolymer, processes for its preparation, and coating agents based on the acrylate copolymer. 5,115,064, Cl. 526-301.000.
Jungfer, Herbert; Barchet, Heinrich; and Albert, Winfried, to Boehringer Mannheim GmbH. Process for the production of permanently culturable animal and human cell lines and the use thereof. 5,114,847, Cl. 435-41.000.
Junino, Alex; Genet, Alain; and Lang, Gerard, to L'oreal. Aliphatic alpha, omega-diamine compounds and their use in hair dyeing. 5,114,429, Cl. 8-410.000.
Junior, Kenneth E.; and Byrd, James D., to Thiokol Corporation. Reorienting grain direction of calendered insulation sheet stock perpendicular to gas flow in solid propellant rocket motors. 5,113,650, Cl. 60-253.000.
Just One Good Idea: *See*—
Hook, Dan L., 5,113,608, Cl. 43-42.490.
Jwo, Chin-Hung; and Wu, Paul S., to NCR Corporation. Compact optical scanning system. 5,115,122, Cl. 235-467.000.
Kabasawa, Koji: *See*—
Shiga, Shujiro; Kabasawa, Koji; Ohmae, Tadayuki; and Tanaka, Hisao, 5,115,036, Cl. 525-328.200.
Kabelitz, Hans-Peter; Muhlhoff, Martin; Kriechel, Hans; Maas, Wolfgang; and Kolvenbach, Dieter-Martin, to Leybold AG. Blower or pump with capillary filter for replenishment of oil separated by vacuum pump. 5,114,320, Cl. 417-423.130.
Kabi Pharmacia AB: *See*—
Stjernschantz, Johan W.; and Resul, Bahram, 5,114,971, Cl. 514-530.000.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Kajitani, Koji; Abe, Minoru; and Fujiwara, Shinpei, 5,113,991, Cl. 192-98.000.
Sahashi, Masayoshi, 5,113,654, Cl. 60-330.000.
Kabushiki Kaisha Kenwood: *See*—
Asahi, Nobumitsu; and Kawase, Seiji, 5,115,468, Cl. 381-31.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Asayama, Yoshio; Tsubota, Makio; Okura, Yasunori; and Sato, Takayuki, 5,113,720, Cl. 74-866.000.
Ishino, Tsutomu; and Maruyama, Ryoichi, 5,113,723, Cl. 74-867.000.
Yoshida, Toshiyuki, 5,113,894, Cl. 137-106.000.
Kabushiki Kaisha Kosmek: *See*—
Yonezawa, Keitaro, 5,113,899, Cl. 137-461.000.
Kabushiki Kaisha Machida Seisakusho: *See*—
Fuse, Jiro, 5,115,349, Cl. 358-709.000.
Kabushiki Kaisha Murao and Company: *See*—
Sakurai, Akira, 5,113,995, Cl. 198-409.000.
Kabushiki Kaisha Okuma Tekkosho: *See*—
Oyama, Hiroshi; and Hanebe, Takao, 5,115,401, Cl. 364-474.370.
Kabushiki Kaisha Sakura Kurepasu: *See*—
Yasunaga, Masahiro, 5,114,258, Cl. 401-202.000.
Kabushiki Kaisha Shinsangyokaihatsu: *See*—
Nimura, Mitsuhiro; Yokoyama, Shoji; Yamada, Takashi; Sumiya, Koji; and Moroto, Shuzo, 5,115,399, Cl. 364-449.000.
Kabushiki Kaisha Toshiba: *See*—
Murakami, Kouji; and Matsunaga, Taira, 5,115,290, Cl. 357-23.900.
Tomura, Shinya; and Kohyama, Mitsuaki, 5,114,823, Cl. 430-120.000.
Yamagishi, Takashi, 5,115,199, Cl. 324-533.000.
Yanagida, Shingo; and Tsunoda, Tetsujiro, 5,115,300, Cl. 357-75.000.
Yoshimori, Takashi, 5,115,191, Cl. 324-158.00R.
Kabushikigaisha Tokyo Kikai Seisakusho: *See*—
Okamura, Yuichi, 5,113,761, Cl. 101-350.000.
Kadija, Igor V. Method and apparatus for manufacturing interconnects with fine lines and spacing. 5,114,558, Cl. 204-224.00R.
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Kallin, Fredrik L. N.; and Higgins, Raymond L., to NCR Corporation. Optical reader head with video compensation method and circuit which integrates four adjacent pixels into a composite pixel. 5,115,325, Cl. 358-406.000.
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Stahlke, Kurt-Rainer; Reinking, Klaus; Tresper, Erhard; Kraft, Klaus; and Kaminski, Axel, 5,114,791, Cl. 428-419.000.
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Katakami, Tsutomu; Yokoyama, Tatsuro; Mori, Haruki; Kawauchi, Nobuya; Kamiya, Joji; and Ishii, Masaaki, 5,114,941, Cl. 514-253.000.
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Wallisch, Gebhard; Eismann, Dieter; Matthes, Roland; and Kammerer, Manfred, 5,113,955, Cl. 177-25.150.
Kammerl, August; and Niedermeier, Ernst, to Siemens Aktiengesellschaft. Interface between two electrical circuits operated at different operating voltages. 5,115,148, Cl. 307-475.000.
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Echizen, Hiroshi; Fujioka, Yasushi; Nakagawa, Katsumi; Kanai, Masahiro; Kariya, Toshimitsu; Matsuyama, Jinsho; and Takei, Tetsuya, 5,114,770, Cl. 427-38.000.
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Kanegae, Hirozoh: *See*—
Ito, Hiromi; Takahashi, Ichiro; and Kanegae, Hirozoh, 5,114,994, Cl. 523-436.000.
Kanegafuchi Chemical Industry Co., Ltd.: *See*—
Hayashi, Katsuhiko; Yamaguchi, Minori; and Nakayama, Takehisa, 5,115,123, Cl. 250-208.100.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Wachi, Shun; and Yates, John G., 5,113,598, Cl. 34-57.00A.
Wakabayashi, Hiroshi; and Kawamura, Joe, 5,115,014, Cl. 524-506.000.
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Kangas, Martti Y. O. Method for cleaning fibers. 5,114,536, Cl. 162-55.000.
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Curran, Steven P., 5,114,079, Cl. 241-3.000.
Kanzawa, Yoshikazu; Fujikake, Yasushi; Ito, Osami; Ito, Shuho; Oikawa, Hironobu; Otsubo, Makoto; Morikawa, Iwao; Shiratori, Yuichi; and Tsukada, Kiyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Production process for a body frame and apparatus thereof. 5,113,926, Cl. 164-119.000.
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AbuJudom, David N., II; Thoma, Paul E.; Kao, Ming-Yuan; and Angst, David R., 5,114,504, Cl. 148-402.000.
Kaplan, S. Jerrold: *See*—
Belove, Edward J.; Drake, Todd R.; Kaplan, S. Jerrold; Kapor, Mitchell D.; Landsman, Richard A.; and Zagieboylo, Stephen, 5,115,504, Cl. 395-600.000.
Kaplinsky, George T.: *See*—
Harmon, J. P.; and Kaplinsky, George T., 5,115,250, Cl. 346-1.100.
Kapor, Mitchell D.: *See*—
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Karasek' Francis W.; Naikwadi, Krishnat P.; and Hutzinger, Otto, to University of Water of Waterloo. Suppression of dioxin production in the incineration of waste material. 5,113,772, Cl. 110-345.000.
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Bordunov, Vladimir V.; Karmadonov, Leonid N.; Ospischev, Jury M.; Fedjunin, Vladimir A.; Zhuravkov, Sergei P.; Cherepenko, Evgeny A.; Sviridov, Anatoly B.; Verkhorubov, Lev S.; Mikhailov, Arkady T.; Bakhmutov, Jury L.; and Shaidurov, Valery S., 5,114,496, Cl. 134-13.000.
Karrer, Friedrich, to Ciba-Geigy Corporation. Acylated carbamates and use as insecticides. 5,114,968, Cl. 514-482.000.
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Karwoski, Theodore; Herweck, Steve A.; and Vail, Steve, to Atrium Medical Corporation. Fluid recovery system having an improved float valve. 5,114,416, Cl. 604-321.000.
Kasama, Takashi: *See*—
Maeda, Akira; Kasama, Takashi; Yokoyama, Tetsuo; and Nishimura, Hiroshi, 5,113,865, Cl. 128-653.200.
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Seki, Yasunari; Kashiwabara, Shigeto; and Kaga, Takahiko, 5,113,835, Cl. 123-571.000.
Kashiyama, Masamori; Ishii, Koichi; Kawabe, Shun; and Usami, Masami, to Hitachi, Ltd. Vector processor performing data operations in one half of a total time period of write operation and the read operation. 5,115,393, Cl. 395-425.000.
Kasprzyk, Daniel J.; Orth, Jean C.; Gaiser, John W.; and Houser, Russell A., to Advanced Cardiovascular Systems, Inc. Dilatation catheter assembly with heated balloon. 5,114,423, Cl. 606-27.000.
Kass, William J.; and Hilley, Michael R., to NCR Corporation. Dual port memory system. 5,115,411, Cl. 365-189.010.
Kassel, Larry I. Dental matrix. 5,114,341, Cl. 433-39.000.
Katagiri, Kazuharu: *See*—
Yoshinaga, Kazuo; Katagiri, Kazuharu; Tsuboyama, Akira; Kitayama, Hiroyuki; Shinjo, Kenji; and Hioki, Chieko, 5,114,613, Cl. 252-299.610.
Katagishi, Yoshihiro: *See*—
Fujii, Nobuo; Kiyota, Hiroyuki; Katagishi, Yoshihiro; and Miyazawa, Takeshi, 5,113,662, Cl. 62-6.000.
Katakami, Tsutomu; Yokoyama, Tatsuro; Mori, Haruki; Kawauchi, Nobuya; Kamiya, Joji; and Ishii, Masaaki, to Mitsui Toatsu Chemicals, Incorporated. Pyrimidinedione derivative compounds, method for preparing same, and antiarrythmic agents containing same. 5,114,941, Cl. 514-253.000.
Katakura, Shinichi: *See*—
Tanamu, Jiro; and Katakura, Shinichi, 5,114,252, Cl. 400-124.000.
Kataoka, Hideaki: *See*—
Kitagawa, Kuniharu; Kataoka, Hideaki; Takahashi, Tomoyuki; and Kitagawa, Kiichiro, 5,115,268, Cl. 354-275.000.
Katayama, Katsuhiro: *See*—
Kuroiwa, Katsumasa; Matsuura, Hitoshi; Katayama, Katsuhiro; Nakatsuyama, Shuichi; Nagasawa, Takeshi; and Endo, Koji, 5,115,099, Cl. 530-331.000.
Katayama, Shingo: *See*—
Sekine, Masahiro; and Katayama, Shingo, 5,114,887, Cl. 501-95.000.
Kato, Akihiro: *See*—
Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, 5,114,668, Cl. 376-442.000.
Kato, Eiichi; and Hattori, Hideyuki, to Fuji Photo Film Co., Ltd. Liquid developer for electrostatic photography. 5,114,822, Cl. 430-114.000.
Kato, Komei: *See*—
Imai, Mizuho; Ito, Atsuo; Sekiguchi, Mikio; Iida, Hideyo; Fukai, Kikuji; and Kato, Komei, 5,114,076, Cl. 239-338.000.
Kato, Toshihiko: *See*—
Yoshida, Masatoshi; Shibata, Katsuji; Kojima, Mitsumasa; Satou, Hidetaka; Kato, Toshihiko; Miyadera, Yasuo; and Yusa, Masami, 5,115,089, Cl. 528-353.000.
Kato, Yoshinori: *See*—
Ikarashi, Masami; Mitsumori, Kenichi; Kano, Mitsuru; Miki, Yasuhiro; Akimoto, Takemi; Yamaguchi, Masahiko; Sasaki, Yorihiko; Kamigaki, Tomoo; Nakanowatari, Jun; Kato, Yoshinori; and Seki, Hitoshi, 5,115,329, Cl. 359-50.000.
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Kattemalalavadi, Shrikanth S.: *See*—
Williams, Charles S. T.; and Kattemalalavadi, Shrikanth S., 5,115,431, Cl. 370-94.100.
Kawabe, Nozomu: *See*—
Yamamoto, Susumu; Murai, Teruyuki; Kawabe, Nozomu; and Tobioka, Massaki, 5,114,641, Cl. 264-60.000.

Kawabe, Shun: *See—*
Kashiyama, Masamori; Ishii, Koichi; Kawabe, Shun; and Usami, Masami, 5,115,393, Cl. 395-425.000.

Kawachi, Eiji: *See—*
Sudo, Morihiro; Muraki, Tomoyasu; Kawachi, Eiji; and Kawachi, Yasushi, 5,114,794, Cl. 428-447.000.

Kawachi, Yasushi: *See—*
Sudo, Morihiro; Muraki, Tomoyasu; Kawachi, Eiji; and Kawachi, Yasushi, 5,114,794, Cl. 428-447.000.

Kawagoe, Toshiyuki: *See—*
Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, 5,114,668, Cl. 376-442.000.

Kawaguchi, Tetsuo: *See—*
Uda, Taizo; Takeyasu, Akira; Kawaguchi, Tetsuo; and Nakajima, Yukio, 5,115,097, Cl. 530-326.000.

Kawahara, Hideo: *See—*
Takemura, Kazuo; Ino, Juichi; Kawahara, Hideo; and Kitaoka, Masaki, 5,114,760, Cl. 427-430.100.

Kawahara, Tsutomu, to Mazda Motor Mfg. (USA) Corp. Zero-Tolerance die location pin. 5,113,686, Cl. 72-462.000.

Kawai Musical Inst. Mfg. Co., Ltd.: *See—*
Saito, Tsutomu, 5,113,740, Cl. 84-607.000.

Kawakami, Ikunori: *See—*
Tanaka, Katsuhiko; Yoshiba, Takeyuki; Sato, Takanobu; Kawakami, Ikunori; and Kawakami, Koichi, 5,114,245, Cl. 384-112.000.

Kawakami, Koichi: *See—*
Tanaka, Katsuhiko; Yoshiba, Takeyuki; Sato, Takanobu; Kawakami, Ikunori; and Kawakami, Koichi, 5,114,245, Cl. 384-112.000.

Kawakami, Takeo; Kagami, Takashi; Chosa, Yosei; and Yoshida, Masato, to Toppan Printing Co. Thermal transfer recording medium and image forming body. 5,114,904, Cl. 503-227.000.

Kawamura, Hideo, to Isuzu Ceramics Research Institute Co., Ltd. Variable-cycle engine. 5,113,805, Cl. 123-21.000.

Kawamura, Joe: *See—*
Wakabayashi, Hiroshi; and Kawamura, Joe, 5,115,014, Cl. 524-506.000.

Kawasaki Heavy Industries, Ltd.: *See—*
Sohda, Yoshio; Ido, Yasuzi; Nakamura, Toshinori; and Suemitsu, Takeshi, 5,114,635, Cl. 264-29.200.

Kawasaki, Hideshi, to Canon Kabushiki Kaisha. Light-emitting device. 5,115,284, Cl. 357-17.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Kobayashi, Noboru; and Miki, Hiromu, 5,115,173, Cl. 318-135.000.

Kawasaki, Mikio: *See—*
Sato, Kiyoshi; Taguchi, Masaaki; Wada, Yasunori; Kawasaki, Mikio; Ohtani, Shinichi; Iwada, Masatosi; and Hatakeyama, Noboru, 5,114,836, Cl. 430-434.000.

Kawasaki, Shingo: *See—*
Tanaka, So; Hirakata, Takashi; Kawasaki, Shingo; Nakata, Takuya; Makita, Hitoshi; and Kozuki, Koichi, 5,113,744, Cl. 84-634.000.

Kawase, Seiji: *See—*
Asahi, Nobumitsu; and Kawase, Seiji, 5,115,468, Cl. 381-31.000.

Kawauchi, Nobuya: *See—*
Katakami, Tsutomu; Yokoyama, Tatsuro; Mori, Haruki; Kawauchi, Nobuya; Kamiya, Joji; and Ishii, Masaaki, 5,114,941, Cl. 514-253.000.

Kawazoe, Takemi: *See—*
Fujiwara, Takumi; Mori, Hiroshi; and Kawazoe, Takemi, 5,115,512, Cl. 385-14.000.

Kayser, Jean-Paul: *See—*
Lahitte, Pierre V. A.; Raymond, Michel J.; and Kayser, Jean-Paul, 5,115,200, Cl. 324-718.100.

Kazmierzak, Richard R.: *See—*
Blunier, Dennis L.; Shankwitz, Phillip J.; Caudill, Maurice L.; Andreson, Paul D.; Kazmierzak, Richard R.; and Schweisberger, Joel C., 5,113,677, Cl. 72-7.000.

Kean, Timothy L.: *See—*
Krett, David L.; and Kean, Timothy L., 5,115,203, Cl. 330-251.000.

Kearney-National Inc.: *See—*
Luetzow, Robert H.; and Luetzow, Edwin J., 5,115,194, Cl. 324-207.200.

Keaveney, William P.; and Sappok, Reinhard J., to BASF Corporation. Dye-latex combinations and use in aqueous inks. 5,114,479, Cl. 106-30.000.

Kedar, Alon; and Zimron, Ohad, to Ormat Turbines (1965) Ltd. Means for purging noncondensable gases from condensers. 5,113,927, Cl. 165-13.000.

Keegan, Colm M. P.: *See—*
Baines, Robert G.; Keegan, Colm M. P.; and Coupland, Ralph, 5,113,652, Cl. 60-288.000.

Keegan, Kevin R., to General Motors Corporation. Actuation validation algorithm. 5,115,396, Cl. 364-431.040.

Kehl, Charles W. Boat trailer or kit. 5,114,168, Cl. 280-414.100.

Kehlbeck, Heinrich: *See—*
Zoubek, Eugen; and Kehlbeck, Heinrich, 5,114,722, Cl. 424-551.000.

Keiji, Yamaguchi, to Sharp Kabushiki Kaisha. Input device possessing plural functions. 5,115,227, Cl. 340-709.000.

Keizer, Gregory J.; and Morris, Carl W. Heater for asphalt pavement or the like. 5,114,284, Cl. 404-95.000.

Kelsey, Christopher G., to Lowan Management Pty. Limited. Jig pulsion mechanism. 5,114,569, Cl. 209-425.000.

Kemira OY: *See—*
Suokas, Elias; and Aksela, Reijo, 5,114,701, Cl. 423-588.000.

Kemnitz, Peter; Ullrich, Michael; and Wieland, Hanspeter, to Mahle, GmbH. Piston with specific land characteristics. 5,113,817, Cl. 123-193.600.

Kennedy, Michael; Pierce, Ben; and Chan, Aaron, to Harris Corporation. Remotely controlled apparatus for conditioning telephone line exclusive of metallic DC bypass pair. 5,115,462, Cl. 379-29.000.

Kennedy, Steven; Eggerding, David W.; and Moore, Lionel D., to Amoco Corporation. Friction reducing lubricating oil composition. 5,114,603, Cl. 252-56.00R.

Keppler, Louis. Exercise apparatus. 5,114,387, Cl. 482-51.000.

Kerley, James J.: *See—*
Eklund, Wayne D.; and Kerley, James J., 5,113,714, Cl. 74-471.0XY.

Kernforschungszentrum Karlsruhe GmbH: *See—*
Weisenburger, Siegfried; Grunewald, Wolfgang; and Seiffert, Hartmut, 5,114,456, Cl. 65-327.000.

Kerr, Linda L., to International Business Machines Corporation. Procedure for automatically customizing the user interface of application programs. 5,115,501, Cl. 395-600.000.

Kervennal, Jacques: *See—*
Dubreux, Bernard; Kervennal, Jacques; Mulard, Philippe; and Pralus, Michele, 5,114,433, Cl. 44-322.000.

Khan, Amanullah; and Lee, Neville K., to Digital Equipment Corporation. Head/gimbal assembly having low stiffness cross band flexure. 5,115,363, Cl. 360-104.000.

Khouri, Farid F.; Brown, Sterling B.; and Jackman, John T., to General Electric Company. Copolymers of amine-terminated polymers and ortho ester-capped polyphenylene ethers. 5,115,042, Cl. 525-397.000.

Kibler, Lawrence A.; Kratky, Zdenek; and Tandy, John S., to Nestec S.A. Mushroom flavorant. 5,114,734, Cl. 426-650.000.

Kielley, James R., to Schering Corporation. Fruity flavored nasal decongestant composition. 5,114,979, Cl. 514-783.000.

Kihlberg, Harry: *See—*
Svensson, Paul; Nilsson, Christer; Backlund, Jan; Ericsson, Karl G.; Jilken, Leif; and Kihlberg, Harry, 5,114,524, Cl. 156-295.000.

Kikuchi, Makoto: *See—*
Funabashi, Kiyomi; Kuriyama, Osamu; Chino, Koichi; Baba, Tsutomu; Nishi, Takashi; and Kikuchi, Makoto, 5,114,622, Cl. 252-629.000.

Kikuchi, Tosiharu: *See—*
Maruyama, Tadakatsu; Ohno, Yasuhide; Konda, Masashi; Kikuchi, Tosiharu; Suzuki, Yasuhiro; Uno, Tomohiro; Otsuka, Hiroaki; and Tanahashi, Hiroyuki, 5,114,878, Cl. 437-182.000.

Killig, Klaus: *See—*
Hassler, Dietrich; and Killig, Klaus, 5,113,866, Cl. 128-661.010.

Killion, Mead C.; Stewart, Jonathan K.; Falco, Robert; and Berger, Elliott H., to Etymotic Research, Inc. Audibility earplug. 5,113,967, Cl. 181-132.000.

Kim, Byung C.: *See—*
Senapati, Nagabhusan; Johnson, Harold W.; Kim, Byung C.; Chauhan, Satya P.; Gamlen, Dennis A.; Eason, Raju; Muralidhara, H. S.; and Zelinski, Matthew S., 5,114,560, Cl. 204-299.00R.

Kim, Kwang M., to Dae Sam Co., Ltd. Length-variable magazine. 5,113,605, Cl. 42-50.000.

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Kimberly-Clark Corporation: *See—*
Morman, Michael T., 5,114,781, Cl. 428-198.000.
Nohr, Ronald S.; and MacDonald, J. Gavin, 5,114,646, Cl. 264-103.000.

Kimizuka, Junichi: *See—*
Kusano, Akihisa; Kimizuka, Junichi; Ito, Toshiyuki; Sato, Kaoru; Abe, Makoto; Okazawa, Kazuhiko; and Inuyama, Toshihiko, 5,115,147, Cl. 307-311.000.

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Okuno, Sumio; Takeichi, Michifumi; Ohmura, Keiji; Okazaki, Msato; Tsuruda, Hitoshi; Yamada, Hiroyuki; Hattori, Morishige; and Kimura, Kenji, 5,113,769, Cl. 105-422.000.

Kimura, Kyoichiro: *See—*
Kuroda, Takashi; Yamada, Kazuhiro; Ishibashi, Tadao; Hayashida, Suetou; Kimura, Kyoichiro; and Sameshima, Masaru, 5,114,638, Cl. 264-41.000.

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Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,115,289, Cl. 357-23.700.

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Mannaka, Toshio; Kimura, Tomoaki; and Koyama, Mitsuru, 5,113,678, Cl. 72-8.000.

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Kaneko, Tsugio; Kimura, Tsuneo; Ikeda, Michihiro; Utsunomiya, Akira; and Ohno, Yuka, 5,114,881, Cl. 501-12.000.

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Wu, Xiang-Fu; and Wong, Jeffrey T., 5,115,100, Cl. 530-385.000.

King, Ann C., to Burroughs Wellcome Company. Agents for combating multiple drug resistance. 5,114,951, Cl. 514-290.000.

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Ohta, Wasaburo; Nakazawa, Masashi; and Kinoshita, Mikio, 5,114,559, Cl. 204-298.050.

Kinshafer Greiftechnik GmbH: *See—*
Spindeldreher, Walter, 5,114,324, Cl. 418-61.300.

Kinugasa, Masayuki: *See—*
Ohashi, Hidetsugu; Kinugasa, Masayuki; Adachi, Toshiro; Nonomura, Akihiro; and Sekimoto, Waro, 5,114,799, Cl. 428-659.000.

Kinyosha Co., Ltd.: *See—*
Sonobe, Saburo; and Ishibashi, Nobuyuki, 5,113,760, Cl. 101-348.000.

Kipp, Louis D.: *See—*
Sjogren, Christer A.; Kipp, Louis D.; and Moritz, William K., 5,114,306, Cl. 414-790.400.

Kirchhoff, Johannes, to Edelhoff Polytechnik GmbH & Co. Container handling equipment. 5,114,297, Cl. 414-622.000.

Kirchhoff, Johannes; and Klossek, Hans, to Waste Management of North America. Garbage truck. 5,114,303, Cl. 414-786.000.

Kirk, Laurie K.: *See—*
Leake, Luther H.; and Kirk, Laurie K., 5,114,725, Cl. 426-270.000.

Kirkby, Paul A.; and White, Ian H., to STC PLC. Multichannel cavity laser. 5,115,444, Cl. 372-50.000.

Kirkman, W. Worth: *See—*
Tsuchiya, Paul F.; Kirkman, W. Worth; and Weidner, John F., 5,115,495, Cl. 395-200.000.

Kirkpatrick, Donald E.; Stevenson, James A.; and Hyun, Kun S., to Dow Chemical Company, The. Extrudable polymeric composition. 5,115,029, Cl. 525-239.000.

Kish, Jules G.: *See—*
Isabelle, Charles J.; Kish, Jules G.; and Stone, Robert A., 5,113,713, Cl. 74-410.000.

Kishimoto, Akihiko: *See—*
Kimura, Takeshi; Kuniyoshi, Shinji; Kishimoto, Akihiko; and Soga, Takashi, 5,115,456, Cl. 378-35.000.

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Nagafuchi, Kazumasa, 5,114,782, Cl. 428-207.000.

Kita, Toshihiko, to SNK Corporation. Game machine having plural display panel units and plural memory cartridges. 5,114,157, Cl. 273-434.000.

Kitabayashi, Junichi: *See—*
Maeda, Hideo; Ohuchida, Shigeru; and Kitabayashi, Junichi, 5,115,423, Cl. 369-112.000.

Kitagawa, Kiichiro: *See—*
Kitagawa, Kuniharu; Kataoka, Hideaki; Takahashi, Tomoyuki; and Kitagawa, Kiichiro, 5,115,268, Cl. 354-275.000.

Kitagawa, Kuniharu; Kataoka, Hideaki; Takahashi, Tomoyuki; and Kitagawa, Kiichiro, to Fuji Photo Film Co., Ltd. Photographic film cassette. 5,115,268, Cl. 354-275.000.

Kitani, Akinobu: *See—*
Inada, Jun; Sato, Shinichi; Shimizu, Ryoichi; Kitani, Akinobu; and Nakano, Kunio, 5,114,765, Cl. 428-35.700.

Kitano, Kenzo: *See—*
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; and Minato, Teruo, 5,114,500, Cl. 148-230.000.

Kitaoka, Hideaki: *See—*
Igaue, Takamitsu; Kitaoka, Hideaki; and Tanji, Hiroyuki, 5,114,420, Cl. 604-385.200.

Kitaoka, Masaki: *See—*
Takemura, Kazuo; Ino, Juichi; Kawahara, Hideo; and Kitaoka, Masaki, 5,114,760, Cl. 427-430.100.

Kitayama, Hiroyuki: *See—*
Yoshinaga, Kazuo; Katagiri, Kazuharu; Tsuboyama, Akira; Kitayama, Hiroyuki; Shinjo, Kenji; and Hioki, Chieko, 5,114,613, Cl. 252-299.610.

Kito, Seiichiro: *See—*
Tsuchiya, Yoshinobu; Kurabayashi, Ken; Kito, Seiichiro; and Niida, Yoriaki, 5,115,378, Cl. 361-502.000.

Kito, Takeshi: *See—*
Isegawa, Yo; Kito, Takeshi; Muryayama, Kimimasa; Ikawa, Shoji; Iwase, Takahiro; Sugiura, Tutomu; and Tsuzuki, Atsuyuki, 5,114,521, Cl. 156-242.000.

Kiyonaga, Tetsuya: *See—*
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onoda, Yoshihito; and Kuwahara, Hideo, 5,115,332, Cl. 359-189.000.

Kiyota, Hiroyuki: *See—*
Fujii, Nobuo; Kiyota, Hiroyuki; Katagishi, Yoshihiro; and Miyazawa, Takeshi, 5,113,662, Cl. 62-6.000.

Kiyotaka, Kaneko: *See—*
Masanaga, Yamamoto; Kiyotaka, Kaneko; Masanori, Yoshida; and Izumi, Miyake, 5,115,269, Cl. 354-420.000.

Klausener, Alexander; Kleefeld, Gerd; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, to Bayer Aktiengesellschaft. Fungicidal substituted acrylic esters. 5,114,959, Cl. 514-369.000.

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Klausener, Alexander; Kleefeld, Gerd; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 5,114,959, Cl. 514-369.000.

Kloeckner-Humboldt-Deutz Aktiengesellschaft: *See—*
Strasser, Siegfried; Goeddecke, Franz; and Wolter, Albrecht, 5,114,131, Cl. 241-19.000.

Klopfeinstein, Claude: *See—*
Guesnon, Jean; Laurencin, Andre; and Klopfeinstein, Claude, 5,113,681, Cl. 72-53.000.

Klossek, Hans: *See—*
Kirchhoff, Johannes; and Klossek, Hans, 5,114,303, Cl. 414-786.000.

Klundt, Kurt, to G.M. Pfaff. Top feeding device for sewing machines. 5,113,773, Cl. 112-320.000.

Kmiecik-Lawrynowicz, Grazyna: *See—*
Ong, Beng S.; Sacripante, Guerino; Kmiecik-Lawrynowicz, Grazyna; and McAneney, T. Brian, 5,114,819, Cl. 430-106.600.

Knecht, Hillary. Flagstaff attached halyard retainer. 5,113,776, Cl. 114-102.000.

Knickerbocker, Michael G., to Calmar Inc. Child-resistant trigger sprayer. 5,114,049, Cl. 222-153.000.

Knippscheer, Hermann; and Richard, Daniel D., to Cryo-Cell International, Inc. Method for preserving blood fluid. 5,114,672, Cl. 122-41.000.

Knoble, David W., to General Electric Company. Safety lighting means for use with a high intensity discharge lamp. 5,115,165, Cl. 315-92.000.

Knobloch, Gerd: *See—*
Reil, Wilhelm; Deutschbein, Ulrich; Knobloch, Gerd; and Liebram, Udo, 5,114,068, Cl. 229-123.200.

Knoll, William C.; McColl, James R.; and Lawson, James O., to GTE Products. Easily encodable surface acoustic wave (SAW) security devices. 5,115,160, Cl. 310-313.00B.

Knudsen, Ronald D.; McDaniel, Max P.; Benham, Elizabeth A.; and Bailey, F. Wallace, to Phillips Petroleum Company. Twice-aged porous inorganic oxides, catalysts, and polymerization processes. 5,115,053, Cl. 526-106.000.

Knudson, Mark B., to Inomet, Inc. Testing of body fluid constituents through measuring light reflected from tympanic membrane. 5,115,133, Cl. 250-341.000.

Knutsen, John C.: *See—*
Harclerode, William H.; Knutsen, John C.; Pekich, Barry J.; Wiman, John V.; and Voss, John C., 5,114,640, Cl. 264-53.000.

Kobayashi, Hiroo: *See—*
Ohtsuka, Masahito; Kobayashi, Hiroo; Moritani, Toshifumi; Yagi, Tadashi; Tsuchiya, Yoshiro; Azeta, Takahiro; Waragai, Tsuyoshi; Yukimachi, Hiroshi; and Miyake, Hiroaki, 5,115,281, Cl. 355-319.000.

Kobayashi, Makoto; Yoshida, Takehiro; Wada, Satoshi; Terajima, Hisao; Ono, Takeshi; Yokoyama, Minoru; Awai, Takashi; Tomoda, Akihiro; and Ishida, Yasushi, to Canon Kabushiki Kaisha. Thermal printer suitable for both thermal transfer and heat sensitive recording. 5,115,255, Cl. 346-76.0PH.

Kobayashi, Manabu, to Yamaha Hatsudoki Kabushiki Kaisha. Cooling system for engine. 5,113,807, Cl. 123-41.740.

Kobayashi, Masayuki: *See—*
Suzuki, Yutaka; Kobayashi, Masayuki; and Wakahara, Tatsuo, 5,113,719, Cl. 74-866.000.

Kobayashi, Noboru, to Yamaha Hatsudoki Kabushiki Kaisha. Steering device for small jet boat. 5,113,777, Cl. 114-144.00R.

Kobayashi, Noboru; and Miki, Hiromu, to Kawasaki Jukogyo Kabushiki Kaisha. Air gap controlling system for linear motor. 5,115,173, Cl. 318-135.000.

Kobayashi, Robert J., to Allied-Signal, Inc. Hydraulic assist turbocharger system. 5,113,658, Cl. 60-608.000.

Kobler, Wolfgang: *See—*
Hintermayer, Jochen; Graf, Ernst; Gmohling, Werner; Schroll, Georg; and Kobler, Wolfgang, 5,114,693, Cl. 423-344.000.

Kocal, Joseph A.: *See—*
Holmgren, Jennifer S.; Gembicki, Stanley A.; Schoonover, Michael W.; and Kocal, Joseph A., 5,114,895, Cl. 502-84.000.

Koch, John J. Fingerprinting system and method. 5,114,188, Cl. 283-68.000.

Kodaira, Satoru: *See—*
Harada, Tamotsu; Kumagai, Gen; Yanagida, Kiyoshi; Yaguchi, Katsuhiko; Fujioka, Nagaki; Yagi, Akiharu; Yanoguchi, Koji; and Kodaira, Satoru, 5,115,362, Cl. 360-92.000.

Kodama, Hitoshi: *See—*
Shoda, Isao; Kodama, Hitoshi; Magome, Kazuo; Iwata, Akihiko; Yoshizawa, Kenji; and Taki, Masakazu, 5,115,168, Cl. 315-223.000.

Kodama, Kiyofumi, to Mita Industrial Co., Ltd. Image-forming apparatus provided with automatic original delivery mechanism and carrier sheet for use in said apparatus. 5,114,139, Cl. 271-265.000.

Koei Chemical Co., Ltd.: *See—*
Ishii, Junichi; Takada, Tetsuji; and Kurohara, Takayuki, 5,114,604, Cl. 252-62.540.

Koeymen, Hayrettin: *See—*
Atalar, Abdullah; and Koeymen, Hayrettin, 5,115,414, Cl. 367-7.000.

Koga, Kazunori: *See—*
Osamura, Kazumi; Terazono, Masaki; Kohsaka, Shoji; Koga, Kazunori; Saito, Akira; Sato, Masahiro; and Uchimura, Hideki, 5,114,889, Cl. 501-97.000

Kogita, Hidekazu: *See—*
Mori, Kelji; and Kogita, Hidekazu, 5,115,353, Cl. 359-871.000.

Kogler, Herbert: *See—*
Franco, Christopher M.; Vijayakumar, Erra K. S.; Chatterjee, Sugata; Ganguli, Bimal N.; Blumbach, Jurgen; Kogler, Herbert; and Fehlhaber, Hans-Wolfram, 5,114,967, Cl. 514-475.000.

Kohashi, Tadao: *See—*
Onishi, Hiroshi; Kohashi, Tadao; Mima, Soichiro; and Esaki, Hiroshi, 5,115,254, Cl. 346-76 0PH.

Kohl, Peter: *See—*
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, 5,114,326, Cl. 425-79.000.

Kohlensaeurewerk Deutschland GmbH: *See—*
Sylla, Klaus F., 5,113,597, Cl. 34-22.000.

Kohlensaure-Werke Rud. Buse GmbH & Co: *See—*
Ben-Nasr, Hedi; and Coenen, Friedrich W. H., 5,114,728, Cl. 426-427.000.

Kohler, Hans E. P., to U.S. Philips Corporation. Remote control system using a wake up signal. 5,115,236, Cl. 340-825.690.

Kohlmeier, Hans-Heinrich: *See—*
Thull, Wolfram; and Kohlmeier, Hans-Heinrich, 5,114,182, Cl. 280-779.000.

Kohno, Tohru: *See—*
Akutsu, Hidetoshi; Kohno, Tohru; and Otsuki, Masato, 5,114,468, Cl. 75-234.000.

Kohsaka, Shoji: *See—*
Osamura, Kazumi; Terazono, Masaki; Kohsaka, Shoji; Koga, Kazunori; Saito, Akira; Sato, Masahiro; and Uchimura, Hideki, 5,114,889, Cl. 501-97.000.

Kohtaki, Kumiko: *See—*
Watanabe, Hiroyuki; Noguchi, Kohkichi; Akita, Shuichi; and Kohtaki, Kumiko, 5,115,006, Cl. 524-251.000.

Kohyama, Mitsuaki: *See—*
Tomura, Shinya; and Kohyama, Mitsuaki, 5,114,823, Cl. 430-120.000.

Koiwa, Misturu: *See—*
Taruya, Massaki; and Koiwa, Misturu, 5,113,840, Cl. 123-644.000.

Koiwa, Mitsura: *See—*
Fukui, Wataru; Iwata, Toshio; Ueda, Atsushi; Matsumura, Masami; and Koiwa, Mitsura, 5,113,821, Cl. 123-335.000.

Koizumi, Syoji: *See—*
Nakagawa, Yukio; Koizumi, Syoji; Miyake, Masao; Akita, Teruo; and Uno, Tomohisa, 5,114,788, Cl. 428-284.000.

Kojima, Mitsumasa: *See—*
Yoshida, Masatoshi; Shibata, Katsuji; Kojima, Mitsumasa; Satou, Hidetaka; Kato, Toshihiko; Miyadera, Yasuo; and Yusa, Masami, 5,115,089, Cl. 528-353.000.

Kojima, Takio, to NGK Spark Plug Co., Ltd. Hollow ceramic piston pin. 5,114,262, Cl. 403-150.000.

Kokado, Takashi: *See—*
Yoneda, Akiyoshi; Sawamura, Mitsuyoshi; Tanaka, Kikuo; and Kokado, Takashi, 5,115,403, Cl. 364-474.150.

Kolbenschmidt: *See—*
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, 5,114,326, Cl. 425-79.000.

Kolbus GmbH & Co. KG: *See—*
Rathert, Horst, 5,114,293, Cl. 412-30.000.

Kole, Richard L.; and Cohen, Bernard, to Design Opportunity Corp. Blank for and method of fabricating a needle cap finger guard. 5,114,409, Cl. 604-192.000.

Koleske, Joseph V.; Smith, Donald F., Jr.; and Weber, Robert J., Jr., to Union Carbide Chemicals & Plastics Technology Corporation. (N-substituted carbamoyloxy)alkanoyloxyalkyl acrylate polymers and compositions made therefrom. 5,115,025, Cl. 525-162.000.

Kolodny-Hirsch, Douglas M.: *See—*
Carr, Charles W.; and Kolodny-Hirsch, Douglas M., 5,113,799, Cl. 119-6.500.

Kolvenbach, Dieter-Martin: *See—*
Kabelitz, Hans-Peter; Muhlhoff, Martin; Kriechel, Hans; Maas, Wolfgang; and Kolvenbach, Dieter-Martin, 5,114,320, Cl. 417-423.130.

Komine, Isamu: *See—*
Nagamune, Akio; Tezuka, Kouichi; and Komine, Isamu, 5,115,242, Cl. 342-124.000.

Komine, Kikuji: *See—*
Naito, Tsutomu; Nishimura, Genshiro; and Komine, Kikuji, 5,114,697, Cl. 423-447.100.

Komiya, Yasuhiro, to Olympus Optical Co., Ltd. Auto-focusing apparatus. 5,115,262, Cl. 354-402.000.

Komoda, Hideaki: *See—*
Aoki, Nobuyuki; Ochiai, Keiichi; and Komoda, Hideaki, 5,114,801, Cl. 428-694.000.

Komori Corporation: *See—*
Ichinose, Tadashi, 5,114,138, Cl. 271-263.000.

Komuro, Junichi; Sato, Tetsuya; and Hidaka, Norihiro, to Casio Computer Co., Ltd. Variable length data processing apparatus with delimiter location-based address table. 5,115,490, Cl. 395-400.000.

Konda, Masashi: *See—*
Maruyama, Tadakatsu; Ohno, Yasuhide; Konda, Masashi; Kikuchi, Tosiharu; Suzuki, Yasuhiro; Uno, Tomohiro; Otsuka, Hiroaki; and Tanahashi, Hiroyuki, 5,114,878, Cl. 437-182.000.

Kondo, Ryuji: *See—*
Yatsuda, Yuji; Hagiwara, Takaaki; Kondo, Ryuji; Minami, Shinichi; and Itoh, Yokichi, 5,114,870, Cl. 437-40.000.

Kondo, Shigeru; Takatori, Naoki; Morizumi, Masaaki; and Kanamori, Shino, to Fuji Photo Film Co., Ltd. Zoom lens drive mechanism. 5,115,267, Cl. 354-221.000.

Kondo, Yozo: *See—*
Tamai, Tomoji; Asahi, Tetsuya; and Kondo, Yozo, 5,115,091, Cl. 528-388.000.

Konica Corporation: *See—*
Aoki, Tetsushi, 5,115,169, Cl. 315-241.00R.
Hamada, Jun-ichi; and Okamoto, Yukio, 5,115,280, Cl. 355-299.000.
Hamanaka, Izumi; Maekawa, Yoshikazu; Arai, Hiroyuki; Nishiki, Akihiko; Muramatsu, Takeshi; Yokoyama, Toshio; and Yukizane, Shigemi, 5,114,130, Cl. 270-53.000.
Oda, Yasuhiro; Yoshioka, Hiroshi; Tadokoro, Hajime; and Fujimaki, Yoshihide, 5,114,815, Cl. 430-58.000.
Sato, Kiyoshi; Taguchi, Masaaki; Wada, Yasunori; Kawasaki, Mikio; Ohtani, Shinichi; Iwada, Masatosi; and Hatakeyama, Noboru, 5,114,836, Cl. 430-434.000.

Konig, Franz: *See—*
Feyerl, Gunther; and Konig, Franz, 5,113,563, Cl. 28-115.000.

Konig, Klaus: *See—*
Meckel, Walter; Hansel, Eduard; Arend, Gunter; and Konig, Klaus, 5,115,073, Cl. 528-83.000.

Konishi, Kouji; Ohshima, Tadayoshi; Fujii, Masakazu; Hagino, Motoyuki; Hosono, Satoshi; and Miyake, Masayoshi, to Mitsubishi Jukogyo Kabushiki Kaisha; Oji Paper Company Ltd.; and Toei Electronics Co., Ltd. Automatic selection apparatus of sheet material. 5,115,144, Cl. 250-572.000.

Konishi, Masataka: *See—*
Sugawara, Koko; Nishiyama, Yuji; Tomita, Koji; Konishi, Masataka; and Oki, Toshikazu, 5,114,920, Cl. 514-11.000.

Koontz, Floyd A., to Harris Corporation. PIN diode activation method and apparatus. 5,115,215, Cl. 333-103.000.

Kopatz, Nelson E.: *See—*
Johnson, Walter A.; Kopatz, Nelson E.; and Ritsko, Joseph E., 5,114,471, Cl. 75-346.000.

Kopf, Rose F.; O'Bryan, Henry M., Jr.; Schubert, Erdmann F.; Tu, Li-Wei; Wang, Yeong-Her; and Zydzik, George J., to AT&T Bell Laboratories. Vertical cavity surface emmitting lasers with transparent electrodes. 5,115,441, Cl. 372-45.000.

Korleski, Joseph E.: *See—*
Harris, Frank W.; and Korleski, Joseph E., 5,115,078, Cl. 528-125.000.

Kornecki, Julian; and Armstrong, Charles J., deceased (by Yammin, Mark, legal representative), to Sasol Mining (Proprietary) Limited. High pressure water assisted mining and tunnelling machine. 5,114,213, Cl. 299-81.000.

Kortmann, Margot, Bettina Kortmann, Axel Kortmann, heirs: *See—*
Rottger, Jutta; Passon, Karl-Heinz; Schroer, Wolf-Dieter; and Kortmann, Wilfried, deceased, 5,115,013, Cl. 524-457.000.

Kortmann, Wilfried, deceased: *See—*
Rottger, Jutta; Passon, Karl-Heinz; Schroer, Wolf-Dieter; and Kortmann, Wilfried, deceased, 5,115,013, Cl. 524-457.000.

Korzeniowski, George: *See—*
Pilling, Douglas A.; and Korzeniowski, George, 5,114,516, Cl. 156-180.000.

Kosman, Stephen L.: *See—*
Roselle, Paul L.; Kosman, Stephen L.; and Mahns, Patricia A., 5,114,872, Cl. 437-48.000.

Kostusiak, Karl H.; Pedtke, Daniel F.; and Heckleman, Todd E., to Detection Systems, Inc. Personal security system network. 5,115,224, Cl. 340-574.000.

Kotzan, Joseph M.; and Labus, Gregory E., to General Motors Corporation. Air injection system diagnostic. 5,113,651, Cl. 60-274.000.

Kou, Sindo, to Wisconsin Alumni Research Foundation. Edge-defined contact heater apparatus and method for floating zone crystal growth. 5,114,528, Cl. 156-616.100.

Kouta, Joji, to Jatco Corporation. Throttle valve position signal correcting apparatus. 5,113,692, Cl. 73-117.300.

Kovalcheck, Steven W., to Intramed Laboratories. Surgical device. 5,114,399, Cl. 604-22.000.

Koyama, Mitsuru: *See—*
Mannaka, Toshio; Kimura, Tomoaki; and Koyama, Mitsuru, 5,113,678, Cl. 72-8.000.

Koziol, Stanislaw: *See—*
Sgourakes, George E.; and Koziol, Stanislaw, 5,114,161, Cl. 277-138.000.

Kozminski, Jerry L.: *See—*
Peterson, Arthur; and Kozminski, Jerry L., 5,113,733, Cl. 83-169.000.

Kozuki, Koichi: *See—*
Tanaka, So; Hirakata, Takashi; Kawasaki, Shingo; Nakata, Takuya; Makita, Hitoshi; and Kozuki, Koichi, 5,113,744, Cl. 84-634.000.

Kraft General Foods, Inc.: *See—*
Major, Michael D.; and Dupre, Marion A., 5,114,732, Cl. 426-605.000.

Kraft, Klaus: *See—*
Stahlke, Kurt-Rainer; Reinking, Klaus; Tresper, Erhard; Kraft, Klaus; and Kaminski, Axel, 5,114,791, Cl. 428-419.000.

Kraft, Timothy J.: *See—*
Akkapeddi, Murali K.; VanBuskirk, Bruce; and Kraft, Timothy J., 5,115,018, Cl. 525-64.000.

Kraft, Walter; and Nehring, Jurgen, to Gretag Systems. Photographic color copying apparatus and exposure control process. 5,115,270, Cl. 355-38.000.

Krakowski, Michel: *See—*
Blondeau, Robert; Rondt, Daniel; Glastre, Genevieve; and Krakowski, Michel, 5,115,283, Cl. 357-17.000.

Krall, Thomas J., to Owens-Illinois Plastic Products Inc. Blow molding method for forming a one-piece self-draining container. 5,114,659, Cl. 264-539.000.

Kram, Shari L.: *See—*
Brennan, David J.; White, Jerry E.; Haag, Anthony P.; and Kram, Shari L., 5,115,075, Cl. 528-99.000.

Kransco: *See—*
Moran, Steven M., 5,114,370, Cl. 441-65.000.

Kranz, Robert E.; and Pace, John, to Kroy, Inc. Method and apparatus for labeling X-ray film. 5,115,461, Cl. 378-165.000.

Krasnoff, Eugene L. For percussive tools, a housing, a pneumatic distributor, and a hammer piston means therefor. 5,113,950, Cl. 173-13.000.

Kratky, Zdenek: *See—*
Kibler, Lawrence A.; Kratky, Zdenek; and Tandy, John S., 5,114,734, Cl. 426-650.000.

Kraus, Greg A.; Simmons, William R.; and Wells, Mark R. J., to Advanced Combustion Technology, Inc. Combustion enhancement system. 5,113,804, Cl. 123-1.00A.

Kraus, Menahem; Velazquez, Diosie; and Wang, Chan-Hong, to Gelman Sciences, Inc. Charged porous filter. 5,114,585, Cl. 210-490.000.

Kraus, Rudolf: *See—*
Detzel, Josef; Matzel, Jurgen; Kraus, Rudolf; and Peissl, Dieter, 5,114,069, Cl. 229-125.150.

Krauss, Werner; Wurster, Helmut; and Belikan, Thomas, to Richard Wolf GmbH. Apparatus for shock wave therapy. 5,113,848, Cl. 128-24.0EL.

Krebs, Jay R.: *See—*
Zdunek, Kenneth J.; and Krebs, Jay R., 5,115,233, Cl. 340-825.440.

Krenz, Rudi O.: *See—*
Fitz, George E., III; Krenz, Rudi O.; and Carnes, Harmon R., 5,115,112, Cl. 219-69.200.

Krett, David L.; and Kean, Timothy L., to Rockwell International Corporation. Digital power amplifier. 5,115,203, Cl. 330-251.000.

Kriechel, Hans: *See—*
Kabelitz, Hans-Peter; Muhlhoff, Martin; Kriechel, Hans; Maas, Wolfgang; and Kolvenbach, Dieter-Martin, 5,114,320, Cl. 417-423.130.

Krieg, Gunther: *See—*
Hofer, Peter; Hagmann, Peter; Krieg, Gunther; and Vaas, Eberhard, 5,114,628, Cl. 264-1.400.

Krinner, Klaus. Christmas tree stand. 5,114,113, Cl. 248-525.000.

Krivi, Gwen G.: *See—*
Haymore, Barry L.; Bild, Gary S.; and Krivi, Gwen G., 5,115,102, Cl. 530-399.000.

Kroener, Calvin: *See—*
Bertoncini, Joseph; Kroener, Calvin; Cobb, Wayne; and Evans, Robert, 5,114,681, Cl. 422-111.000.

Krohne AG: *See—*
van Nistelrooij, Petrus N. J.; and van Bekkum, Aart J., 5,113,690, Cl. 73-861.120.

Krone AG: *See—*
Taybl, Christa; Muller, Manfred; Gerke, Dieter; and Bulow, Harald, 5,114,356, Cl. 439-133.000.

Kroy, Inc.: *See—*
Kranz, Robert E.; and Pace, John, 5,115,461, Cl. 378-165.000.

KRP Enterprises, Inc.: *See—*
Peterson, Robert C.; Pauling, Kelly B.; and Tepfer, Russell J., 5,113,643, Cl. 56-153.000.

Krucoff, Darwin. Recorded music enhancement system. 5,113,738, Cl. 84-462.000.

Krul, Allan D.: *See—*
Giersdorf, Rodney L.; Peduzzi, Alfred; Krul, Allan D.; Jones, Stephen R.; and Chetta, Gregory E., 5,114,446, Cl. 55-345.000.

Kruskal, Joseph B.: *See—*
Clark, Linda A.; Gottscho, Richard A.; Kruskal, Joseph B.; and Lambert, Diane, 5,114,233, Cl. 356-354.000.

KSB Aktiengesellschaft: *See—*
Becker, Karlheinz; and Pfeiffer-Muller, Gunter, 5,114,311, Cl. 415-182.100.

Kubodera, Seiiti: *See—*
Okazaki, Masaki; Shishido, Tadao; and Kubodera, Seiiti, 5,115,337, Cl. 359-328.000.

Kubota Corporation: *See—*
Murakawa, Masatake; Imanishi, Ryozo; and Fujiwara, Yoji, 5,113,819, Cl. 123-198.00E.

Kubota, Ltd.: *See—*
Ikebuchi, Iwao; Ihara, Yoshitaka; Takei, Hisashi; Yamada, Syozo; Nakano, Mamoru; and Ganse, Akira, 5,114,083, Cl. 241-153.000.

Kuc, John, Sr. Method of producing products from rubber compositions. 5,114,648, Cl. 264-134.000.

Kucar, Andy D. Method and apparatus for carrier synchronization and data detection. 5,115,454, Cl. 375-77.000.

Kudo, Norio: *See—*
Kunimaru, Noritaka; Shiba, Katsuhiro; Kudo, Norio; Inoshita, Gen; and Sato, Shogo, 5,114,093, Cl. 242-204.000.

Kudoh, Yoshimitsu: *See—*
Miida, Takashi; Kudoh, Yoshimitsu; and Mutoh, Hiedki, 5,115,155, Cl. 307-607.000.

Kuhlmann, Walter: *See—*
Grube, Erwin; Kuhlmann, Walter; and Schneuing, Ralf, 5,113,998, Cl. 198-465.400.

Kuhn, Friedrich; Drefs, Wolfgang; Ruff, Hans; and Scheuter, Siegbert, to J.M. Voith GmbH. Roll for guiding web type material. 5,114,062, Cl. 226-95.000.

Kuiken, Paul A.; and Murray, Michael K. Finger extender. 5,113,849, Cl. 128-26.000.

Kumagai, Gen: *See—*
Harada, Tamotsu; Kumagai, Gen; Yanagida, Kiyoshi; Yaguchi, Katsuhiko; Fujioka, Nagaki; Yagi, Akiharu; Yanoguchi, Koji; and Kodaira, Satoru, 5,115,362, Cl. 360-92.000.

Kumiai Chemical Industry Co., Ltd.: *See—*
Wada, Nobuhide; and Yoshida, Ryo, 5,114,463, Cl. 71-92.000.

Kummerfeld, Ryszard; Baumgarten, Siegfried; Holzapfel, Gerd; Falb, Wölfgang; and Palm, Ulrich, to Dragerwerk Aktiengesellschaft. Height-adjustable supply unit for receiving working devices, especially medical devices. 5,113,897, Cl. 137-357.000.

Kuna, Francis J.: *See—*
Hedges, George D.; and Kuna, Francis J., 5,113,535, Cl. 2-424.000.

Kunimaru, Noritaka; Shiba, Katsuhiro; Kudo, Norio; Inoshita, Gen; and Sato, Shogo, to Pioneer Electronic Corporation. Brake mechanism for reel stands of a tape recorder. 5,114,093, Cl. 242-204.000.

Kuniyoshi, Shinji: *See—*
Kimura, Takeshi; Kuniyoshi, Shinji; Kishimoto, Akihiko; and Soga, Takashi, 5,115,456, Cl. 378-35.000.

Kunz, Reiner; and Kampfer, Konrad, to Lonza Ltd. Sintered material based on aluminum oxide. 5,114,891, Cl. 501-127.000.

Kuo, Chan H.: *See—*
Biftu, Tesfaye; Bugianesi, Robert L.; Girotra, Nirindar N.; Ponpipom, Mitree M.; Sahoo, Soumya P.; and Kuo, Chan H., 5,114,961, Cl. 514-397.000.

Kupershmidt, Vladimir: *See—*
Black, Michael; and Kupershmidt, Vladimir, 5,114,218, Cl. 351-44.000.

Kupfer, Rainer; Hille, Martin; Bohm, Roland; and Staiss, Friedrich, to Hoechst Aktiengesellschaft. Esterified glycidyl ether addition products and their use. 5,114,616, Cl. 252-337.000.

Kurabayashi, Ken: *See—*
Tsuchiya, Yoshinobu; Kurabayashi, Ken; Kito, Seiichiro; and Niida, Yoriaki, 5,115,378, Cl. 361-502.000.

Kureha Kagaku Kogyo: *See—*
Mizuno, Toshiya; Teramoto, Yoshikichi; Saito, Takeshi; and Wakabayashi, Juichi, 5,115,092, Cl. 528-388.000.

Kurimoto Ltd.: *See—*
Inui, Yasuo, 5,114,085, Cl. 241-195.000.

Kuriyama, Osamu: *See—*
Funabashi, Kiyomi; Kuriyama, Osamu; Chino, Koichi; Baba, Tsutomu; Nishi, Takashi; and Kikuchi, Makoto, 5,114,622, Cl. 252-629.000.

Kuroda, Takashi; Yamada, Kazuhiro; Ishibashi, Tadao; Hayashida, Suetou; Kimura, Kyoichiro; and Sameshima, Masaru, to Chisso Corporation & Maruzen Petrochemical Co., Ltd. Process for producing an opacified molded product. 5,114,638, Cl. 264-41.000.

Kurohara, Takayuki: *See—*
Ishii, Junichi; Takada, Tetsuji; and Kurohara, Takayuki, 5,114,604, Cl. 252-62.540.

Kuroiwa, Katsumasa; Matsuura, Hitoshi; Katayama, Katsuhiro; Nakatsuyama, Shuichi; Nagasawa, Takeshi; and Endo, Koji, to Nitto Boseki Co., Ltd. Substrates for determination of enzyme activity and intermediates for synthesis of the substrates as well as process for producing the intermediates. 5,115,099, Cl. 530-331.000.

Kuroiwa, Yasuyuki: *See—*
Fukuda, Tamotsu; Shigeta, Shiro; Okuya, Hiroaki; Kuroiwa, Yasuyuki; and Sudo, Tadashi, 5,114,712, Cl. 424-87.000.

Kurosawa, Kazuhito: *See—*
Hikita, Mitsutaka; Tabuchi, Toyoji; Kurosawa, Kazuhito; and Shibagaki, Nobuhiko, 5,115,216, Cl. 333-195.000.

Kurz, Helmut; and Stoeberl, Martin, to Grammer AG. Process and apparatus for the production of a foam-backed cushion portion. 5,114,639, Cl. 264-46.600.

Kusaka, Kensaku: *See—*
Maruta, Hidekazu; Adachi, Hiroyuki; Yamamoto, Akira; Kimura, Shigeo; and Kusaka, Kensaku, 5,115,278, Cl. 355-285.000.

Kusano, Akihisa; Kimizuka, Junichi; Ito, Toshiyuki; Sato, Kaoru; Abe, Makoto; Okazawa, Kazuhiko; and Inuyama, Toshihiko, to Canon Kabushiki Kaisha. Driver for light emitting device for providing a stable beam output. 5,115,147, Cl. 307-311.000.

Kusano, Hiroshi; Ito, Tsuyoshi; Tashiro, Takayuki; Takayanagi, Hiroaki; and Miyata, Eiji, to Mitsubishi Kasei Corporation. Composite separating agent. 5,114,577, Cl. 210-198.200.

Kuse, Kazuki: *See—*
Akashi, Shunji; Ito, Michio; and Kuse, Kazuki, 5,114,305, Cl. 414-787.000.

Kuster, Hans-Werner: *See—*
Promper, Hans-Josef; D'Iribarne, Benoit; Kuster, Hans-Werner; Nowoczyn, Hans-Werner; and Vanaschen, Luc, 5,114,454, Cl. 65-163.000.

Kusunoki, Hiroaki, to Mazda Motor Corporation. Method of forming chilled layer. 5,114,499, Cl. 148-512.000.

Kuwahara, Hideo: *See*—
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onoda, Yoshinito; and Kuwahara, Hideo, 5,115,332, Cl. 359-189.000.

Kuwavara, Ryuzi: *See*—
Yano, Hisashi; Yabumoto, Junsuke; and Kuwavara, Ryuzi, 5,114,575, Cl. 210-188.000.

Kuyzin, Gregg S.; and Schmidtke, Leslie E., Jr., to BASF Corporation. Dibasic acid esters as cell openers in low density rigid polyurethanes useful in pour-behind-fabric applications of low density SRIM. 5,114,985, Cl. 521-130.000.

Kuznitz, Matthew; Brewster, David A.; Faryniarz, Joseph R.; and Cancro, Lewis, to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Clear cosmetic sticks with compatible fragrance components. 5,114,717, Cl. 424-401.000.

Kwai, Cheung Y.: *See*—
Copley, Michael C.; and Kwai, Cheung Y., 5,114,376, Cl. 446-369.000.

Kwik Mount, Inc.: *See*—
Rottschafer, William A., 5,113,791, Cl. 114-362.000.

Kwong, Ranee W.; Sachdev, Harbans S.; and Sachdev, Krishna G., to International Business Machines Corporation. Photosensitive polyimide compositions. 5,114,826, Cl. 430-192.000.

Kwong, Ranee W.: *See*—
Sachdev, Krishna G.; Hummel, John P.; Kwong, Ranee W.; Lang, Robert N.; Linehan, Leo L.; and Sachdev, Harbans S., 5,115,090, Cl. 528-353.000.

Kyocera Corporation: *See*—
Osamura, Kazumi; Terazono, Masaki; Kohsaka, Shoji; Koga, Kazunori; Saito, Akira; Sato, Masahiro; and Uchimura, Hideki, 5,114,889, Cl. 501-97.000.

Kyodo Printing Co., Ltd.: *See*—
Fukushima, Yoichi; Fujita, Minoru; and Kakinuma, Yuji, 5,114,531, Cl. 156-659.100.

Kyoukane, Yasuaki; and Nagano, Toshihiro, to Fuji Jukogyo Kabushiki Kaisha. Battery charging system for motor-generator. 5,115,183, Cl. 320-61.000.

La Jolla Biological Laboratories: *See*—
Obermiller, Patrice S.; and Blumeyer, Kirsten K., 5,114,680, Cl. 422-104.000.

La-Man Corporation: *See*—
Overby, Kenneth W., 5,114,443, Cl. 55-219.000.

Laboratoires OM S.A.: *See*—
Pares Farras, Ramon; Jofre Torroella, Juan; Ricard, Jean-Paul; Schulthess, Adrian; Ferine, Jean-Claude; Michelet, Marie-Christine; Ramsteiner, Agnes; and Bauer, Jacques, 5,114,848, Cl. 435-101.000.

Labus, Gregory E.: *See*—
Kotzan, Joseph M.; and Labus, Gregory E., 5,113,651, Cl. 60-274.000.

Lafrasse, Jean, to Eaton Leonard Picot S.A. Pipe bending machine having two bending heads. 5,113,683, Cl. 72-306.000.

Lahitte, Pierre V. A.; Raymond, Michel J.; and Kayser, Jean-Paul, to Societe Nationale Industrielle Aerospatiale. Method and apparatus for testing the impedance of two electrically conducting members using two pairs of electrodes in which the spacing of the pairs is adjustable and the electrodes are independently axially slidable. 5,115,200, Cl. 324-718.000

Laidlaw, Willam S. Plug for sealing preservative in wood. 5,114,032, Cl. 215-356.000.

L'Air Liquide, Societe Anonyme Pour l'Etude et Exploitation des Procedes Georges Claude: *See*—
Martell, Arthur E.; and Motekaitis, Ramunas J., 5,114,688, Cl. 423-219.000.

L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation Des Procedes Georges Claude: *See*—
Arnout, Michel; Lasnier, Didier; and Soula, Richard, 5,114,121, Cl. 266-48.000.
Hirase, Ikuo, 5,114,683, Cl. 422-173.000.

Lake, Robert D.: *See*—
Nava, Hildeberto; Lake, Robert D.; and Makepeace, Robert B., 5,115,072, Cl. 528-67.000.

Lambert, Diane: *See*—
Clark, Linda A.; Gottscho, Richard A.; Kruskal, Joseph B.; and Lambert, Diane, 5,114,233, Cl. 356-354.000.

Lambright, John E.: *See*—
Steele, Michael F.; Lambright, John E.; and Dobson, George M., 5,114,677, Cl. 422-83.000.

Lamont, Lawrence T., Jr., to Machine Technology, Inc. Deposition apparatus and method for enhancing step coverage and planarization on semiconductor wafers. 5,114,556, Cl. 204-192.120.

Landgraf, Claus A.: *See*—
Ballhause, Helmut; Engelhardt, Gunther; Landgraf, Claus A.; Mayer, Norbert; Roth, Willy; Schumacher, Kurt; and Prox, Alex, 5,114,935, Cl. 514-228.800.

Landis, Newton C. M., to Eastman Kodak Company. Bonding of thermoplastic sheet material to roughened substrates. 5,114,514, Cl. 156-153.000.

Landsman, Richard A.: *See*—
Belove, Edward J.; Drake, Todd R.; Kaplan, S. Jerrold; Kapor, Mitchell D.; Landsman, Richard A.; and Zagieboylo, Stephen, 5,115,504, Cl. 395-600.000.

Lane, Abbott A.; and Hetzel, John M., Jr., to Firequip Helmets, Inc. Firefighter's helmet having tilt adjustment. 5,113,534, Cl. 2-416.000.

Lang, Gerard: *See*—
Junino, Alex; Genet, Alain; and Lang, Gerard, 5,114,429, Cl. 8-410.000.
N'Guyen, Quang L.; Griat, Jacqueline; Millecamps, Francois; Lang, Gerard; and Forestier, Serge, 5,114,716, Cl. 424-401.000.

Lang, Hans-Jochen; Weidmann, Klaus; Scheunemann, Karl-Heinz; Nimmesgern, Hildegard; Rippel, Robert; and Herling, Andreas W., to Hoechst Aktiengesellschaft. Substituted thienoimidazole derivatives. 5,114,955, Cl. 514-338.000.

Lang, Robert N.: *See*—
Sachdev, Krishna G.; Hummel, John P.; Kwong, Ranee W.; Lang, Robert N.; Linehan, Leo L.; and Sachdev, Harbans S., 5,115,090, Cl. 528-353.000.

Lange, Fritz: *See*—
Hoeffkes, Horst; Lange, Fritz; and Schrader, Dieter, 5,114,428, Cl. 8-405.000.

Langendorf, Heinrich; and Olfers, Reinhard, to Fahrzeugbau Langendorf GmbH & Co. KG. Road transport vehicle. 5,114,288, Cl. 410-34.000.

Langford, Thomas L., II; and Bullinger, Philip W., to NCR Corporation. Method and apparatus for bus executed boundary scanning. 5,115,435, Cl. 371-22.300.

Langsch, Robert: *See*—
Ammon, Ernst; and Langsch, Robert, 5,114,523, Cl. 156-294.000.

Lanni, Joseph; and Lanni, Ruth. Trailer coupling guide. 5,114,170, Cl. 280-477.000.

Lanni, Ruth: *See*—
Lanni, Joseph; and Lanni, Ruth, 5,114,170, Cl. 280-477.000.

Lantz, Michael D. Safety line shock absorber. 5,113,981, Cl. 188-371.000.

Lapp, Josef C.; and Powley, Mark L., to Corning Incorporated. Alkali bismuth gallate glasses. 5,114,884, Cl. 501-41.000.

Lara, Pedro F.: *See*—
Low, Stanley T.; Lara, Pedro F.; Foreman, David L.; and Petermann, Steven G., 5,115,196, Cl. 324-220.000.

Large, Timothy A., to Northern Telecom Europe Limited. Optical polarisation state controllers. 5,115,480, Cl. 385-12.000.

Larinoff, Michael W. Air-cooled vacuum steam condenser bundle isolation. 5,113,933, Cl. 165-111.000.

LaRoche, Robert; and Morel, Andre, to Constructions Mechaniques F. LaRoche & Fils. Rotary drum with points for a textile machine, an opener, a desintegrator, a tearer. 5,113,559, Cl. 29-121.100.

Larremore, Derek P. P.; and Larremore, Rhoda A. Massaging shoe apparatus. 5,113,850, Cl. 128-32.000.

Larremore, Rhoda A.: *See*—
Larremore, Derek P. P.; and Larremore, Rhoda A., 5,113,850, Cl. 128-32.000.

Larsen, Larry D., to International Business Machines Corporation. Plural incompatible instruction format decode method and apparatus. 5,115,500, Cl. 395-425.000.

Larsen, Poul, to Slagteriernes Forskningsinstitut. Method for eviscerating animal carcasses, preferably pig carcasses, a plug and plant therefor. 5,114,380, Cl. 452-176.000.

Laser, Theo: *See*—
Sadlowski, Jurgen; Dangschat, Manfred; Diefenbach, Horst; Laser, Theo; and Schmitt, Deiter, 5,115,085, Cl. 528-272.000.

Lasher, Markham E.: *See*—
Gookin, Debra M.; Berry, Mark H.; and Lasher, Markham E., 5,115,331, Cl. 359-117.000.

Lasnier, Didier: *See*—
Arnout, Michel; Lasnier, Didier; and Soula, Richard, 5,114,121, Cl. 266-48.000.

Laterra, Terrance, to Graver Company, The. Backwash method and apparatus. 5,114,596, Cl. 210-798.000.

Lattin, Thomas W., Jr.: *See*—
Dao, Hung D.; Grieff, Thomas W.; Lattin, Thomas W., Jr.; Thomas, Darren R.; Schultz, Stephen M.; Ewert, Richard; and Flower, David L., 5,115,225, Cl. 340-584.000.

Lau, Aldrich N. K.: *See*—
Mercer, Frank W.; Goodman, Timothy D.; Lau, Aldrich N. K.; Vo, Lanchi P.; and Sovish, Richard C., 5,114,780, Cl. 428-195.000.

Laumann geb. Quensen, Betina, to Frauenberger & Co. Tray-like carrier for plates and glasses. 5,114,038, Cl. 220-575.000.

Laurel Bank Machines Co., Ltd.: *See*—
Ueda, Nobuo; Okita, Tatuo; Suzuki, Mikio; Ikemoto, Yasunori; and Shibao, Hiloyuki, 5,114,381, Cl. 453-57.000.

Laurencin, Andre: *See*—
Guesnon, Jean; Laurencin, Andre; and Klopfeinstein, Claude, 5,113,681, Cl. 72-53.000.

Laurenz, Steven: *See*—
Tsau, Josef H.; Seagle, Dennis; and Laurenz, Steven, 5,114,726, Cl. 426-289.000.

Lavin, Janice A. Utility tray for intravenous pole. 5,114,023, Cl. 211-107.000.

Law, Kwei-Nam, to Law, Kwei-Nam; and Valade, Jacques L. Apparatus for chemical treatment of lignocellulosic materials. 5,114,540, Cl. 162-247.000.

Law, Robert W.: *See*—
Remboski, Donald J.; Plee, Steven L.; Yang, Jialin; and Law, Robert W., 5,113,828, Cl. 123-425.000.

Law, Roger W.: *See*—
Anderson, Paul S.; Law, Roger W.; Law, Ronald R.; and Lum, Kenneth, 5,113,755, Cl. 99-483.000.

Law, Ronald R.: *See*—
Anderson, Paul S.; Law, Roger W.; Law, Ronald R.; and Lum, Kenneth, 5,113,755, Cl. 99-483.000.

Lawson, James O.: *See*—
Knoll, William C.; McColl, James R.; and Lawson, James O., 5,115,160, Cl. 310-313.00B.

Lawter, James R.; and Pawelchak, John M., to American Cyanamid Company. Transdermal delivery of pharmaceuticals. 5,114,946, Cl. 514-279.000.

Lawton, Geoffrey; Osbond, John M.; and Self, Christopher R., to Hoffmann-La Roche Inc. Substituted isoxazole derivatives. 5,114,960, Cl. 514-379.000.

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Lazarchik, Daniel B.; and Shurtleff, Jill M., to Gillette Company, The. Dispenser cover for cartridge. 5,113,586, Cl. 30-90.000.

Lazeration, Joel J., to Goodyear Tire & Rubber Company, The. Laboratory traction test. 5,113,688, Cl. 73-8.000.

Lazzarini, Donald J.: *See*—
Hoffarth, Joseph G.; Lazzarini, Donald J.; Welsh, John A.; and Wiley, John P., 5,114,518, Cl. 156-212.000.

Le Carbone Lorraine: *See*—
Bontems, Maurice; and Desmicht, Denis, 5,114,762, Cl. 428-34.500.

Le, Hanh T., to Conoco Inc. Terpolymers of alkyl acrylates or methacrylates, an olefinically unsaturated homo or heterocyclic-nitrogen compound and an allyl acrylate or methacrylate. 5,115,059, Cl. 526-260.000.

Le, Tri C. Packing assembly for oilfield equipment and method. 5,114,158, Cl. 277-1.000.

Leader, Harvey G.; and Leader, Maureen M. Mobile pet carrier. 5,113,793, Cl. 119-19.000.

Leader, Maureen M.: *See*—
Leader, Harvey G.; and Leader, Maureen M., 5,113,793, Cl. 119-19.000.

Leake, Luther H.; and Kirk, Laurie K., to Pillsbury Company, The. Method for color preservation in canned green vegetables. 5,114,725, Cl. 426-270.000.

Leatherman, Dennis D.; McGinley, James J.; Adams, Daniel E.; and Brons, George A., to PPG Industries, Inc. Abrasive article. 5,114,438, Cl. 51-296.000.

LeBaron, James B.: *See*—
Gallusser, David O.; and LeBaron, James B., 5,115,105, Cl. 174-36.000.

Lebeau, Christopher J., to Motorola, Inc. Automatic semiconductor package inspection method. 5,115,475, Cl. 382-8.000.

Le Blanc, Joseph V., to Union Camp Corporation. Method and apparatus for removing deposit from recovery boilers. 5,113,802, Cl. 122-379.000.

Le Devehat, Eugene, to FMC Corporation. Three way valve and distribution pipe comprising same, both adapted to be cleaned by scraping. 5,113,895, Cl. 137-244.000.

Lee, Hyeong-kyu: *See*—
Kim, Kyung-hun; Kim, Seong-tae; and Lee, Hyeong-kyu, 5,114,873, Cl. 437-52.000.

Lee, Kiu-Seung, to Du Pont de Nemours, E. I., and Company. Process for making colored aramid fibers. 5,114,652, Cl. 264-184.000.

Lee, Len F.: *See*—
Bryant, Robert D.; Hegde, Shridhar G.; and Lee, Len F., 5,114,465, Cl. 71-94.000.

Lee, Neville K.: *See*—
Khan, Amanullah; and Lee, Neville K., 5,115,363, Cl. 360-104.000.

Lee, Norman K. Game light apparatus. 5,115,383, Cl. 362-109.000.

Lee, Patrick S.: *See*—
Ferraro, Neil P.; Nager, Urs F., Jr.; Logue, Raymond C.; Chen, Edward J.; and Lee, Patrick S., 5,113,679, Cl. 72-21.000.

Lee, Teh-Hsuang: *See*—
Burkey, Bruce; Chang, Win-Chyi; and Lee, Teh-Hsuang, 5,115,458, Cl. 377-58.000.

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Wenzel, Helmut, 5,113,584, Cl. 29-892.000.

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Chihara, Kohji Y.; and Lenke, Gerd M., 5,115,007, Cl. 524-267.000.

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Seilhamer, Jeffrey J.; Lewicki, John A.; Scarborough, Robert M.; and Porter, J. Gordon, 5,114,923, Cl. 514-12.000.

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Daniel, Sarah; Lewinthal, Dan; and Daniel, Jacques, 5,114,419, Cl. 604-385.100.

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Mushinski, Roger J.; Lewis, Charles E.; and Casey, Lawrence J., 5,114,012, Cl. 206-523.000.

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Geisler, Michael; Jung, Michael; and Faulhaber, Rudolf K., 5,113,790, Cl. 118-723.000.
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Elwell, Richard J.; Sewell, Robert A.; Lidy, Werner A.; and Thoen, Johan A., 5,114 989, Cl. 521-159.000.
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Reil, Wilhelm; Deutschbein, Ulrich; Knobloch, Gerd; and Liebram, Udo, 5,114,068, Cl. 229-123.200.
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Focke, Heinz; and Liedtke, Kurt, deceased, 5,113,638, Cl. 53-462.000.
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Basil, John D.; Lin, Chia-Cheng; and Hunia, Robert M., 5,115,023, Cl. 525-103.000.
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Rembold, Helmut; and Linder, Ernst, 5,113,811, Cl. 123-90.120.
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Mack, William D.; and Linebarger, Daniel J., 5,115,206, Cl. 330-261.000.
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Sachdev, Krishna G.; Hummel, John P.; Kwong, Ranee W.; Lang, Robert N.; Linehan, Leo L.; and Sachdev, Harbans S., 5,115,090, Cl. 528-353.000.
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Duffey, Craig L., 5,114,670, Cl. 422-24.000.
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Kanner, Rowland W.; and Lisak, Stephen P., 5,114,441, Cl. 55-26.000.
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Cohen, Eric D.; Jones, Andrew R.; de Castro, Jose T.; Litchfield, Paul; and Smith, Steven F., 5,113,599, Cl. 36-88.000.
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Martin, Thomas, 5,114,020, Cl. 211-50.000.
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Sareshwala, Sohel A., 5,114,191, Cl. 285-115.000.
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Hotier, Gerard; Toussaint, Jean-Michel; Terneuil, Gabriel; and Lonchamp, Daniel, 5,114,590, Cl. 219-659.000.
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Wolf, Gerald L.; and Long, David M., 5,114,703, Cl. 424-5.000.
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Schroeder, Jon M.; Long, Joseph F.; and Hartgrove, Randall J., 5,113,580, Cl. 29-840.000.
Lonnqvist, Kurt: *See*—
Viljanto, Jouko; Govenius, Rainer; Lonnqvist, Kurt; and Hurula, Timo, 5,113,871, Cl. 128-768.000.
Lonza Ltd.: *See*—
Kunz, Reiner; and Kampfer, Konrad, 5,114,891, Cl. 501-127.000.
Look, Raymond J.: *See*—
Kimmel, David J.; Siwinski, Paul P.; Smith, Robert A.; Thurman, Richard E.; Adkins, Stephen R.; Feldman, Steven; and Look, Raymond J., 5,114,355, Cl. 439-101.000.
Loomis, Stephen A. Cutting instrument. 5,113,587, Cl. 30-340.000.
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Cleveland, William C., Jr., 5,114,227, Cl. 356-152.000.
L'oreal: *See*—
Junino, Alex; Genet, Alain; and Lang, Gerard, 5,114,429, Cl. 8-410.000.
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Louis, Henry, to Apex Chemical Corp. Flame retardant polyamide fabrics. 5,114,786, Cl. 428-270.000.
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Hartnett, Joseph F.; and Wendt, Richard E., 5,114,281, Cl. 406-39.000.
Love, Katherine M.: *See*—
Fumagalli, Lisbeth L.; Love, Katherine M.; and Schechter, Carrin, 5,114,344, Cl. 434-128.000.
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Kelsey, Christopher G., 5,114,569, Cl. 209-425.000.
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St. Pierre, Leon E.; Brown, George R.; Wu, Gaoming; and Yu, Youlu, 5,114,709, Cl. 424-78.120.
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Stuart, Regina K.; Lowell, Jeffrey A.; Baxter, John K., III; Bistrian, Bruce R.; and Shikora, Scott, 5,114,401, Cl. 604-53.000.
Lowry, Richard C.: *See*—
Yates, Jonn B., III; Brown, Sterling B.; Lowry, Richard C.; Blubaugh, James C.; and Aycock, David F., 5,115,043, Cl. 525-390.000.
LTG Lufttechnische GmbH: *See*—
Stuble, Helmut, 5,114,444, Cl. 55-294.000.
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McGrath, William R.; and Lubecke, Victor M., 5,115,217, Cl. 333-246.000.
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Sheppard, Clyde H.; and Lubowitz, Hyman R., 5,115,087, Cl. 528-322.000.
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Piedrahita, Carlos A.; Quinn, Robert E.; and Perz, John S., 5,115,083, Cl. 528-230.000.
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Cook, Alan J., 5,115,128, Cl. 250-227.210.
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Tenhover, M. A.; and Lukco, D. B., 5,114,785, Cl. 428-263.000.
Lum, Kenneth: *See*—
Anderson, Paul S.; Law, Roger W.; Law, Ronald R.; and Lum, Kenneth, 5,113,755, Cl. 99-483.000.

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Hull, Harold L.; Romo, Rudolph R.; and Luschar, Donald J., 5,113,892, Cl. 137-62.000.
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Schomburg, Gerhard; and Lux, Jurgen A., 5,114,550, Cl. 204-180.100.
Luzzi, Glenn, to Amerace Corporation. High voltage elbow. 5,114,357, Cl. 439-183.000.
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McWilliams, William H.; Hamermesh, Charles L.; and Welch, Evan B., 5,114,792, Cl. 428-422.000.
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Hunziker, Ernst, 5,113,997, Cl. 198-460.000.
Maas, Wolfgang: *See*—
Kabelitz, Hans-Peter; Muhlhoff, Martin; Kriechel, Hans; Maas, Wolfgang; and Kolvenbach, Dieter-Martin, 5,114,320, Cl. 417-423.130.
MAC Stripers, Inc.: *See*—
Marcato, Forrest, 5,114,268, Cl. 404-92.000.
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Nohr, Ronald S.; and MacDonald, J. Gavin, 5,114,646, Cl. 264-103.000.
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Cockayne, Brian; MacEwan, William R.; Harris, Ivor R.; and Smith, Nigel A., 5,114,669, Cl. 420-8.000.
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Machine Technology, Inc.: *See*—
Lamont, Lawrence T., Jr., 5,114,556, Cl. 204-192.120.
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Mort, Joseph; and Machonkin, Mary A., 5,114,477, Cl. 106-20.000.
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Jenkel, Steven D.; MacNitt, Donald G., Jr.; and Walker, Bryant H., 5,113,583, Cl. 29-889.210.
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Madaras, John J.: *See*—
Ball, Russell M.; and Madaras, John J., 5,114,665, Cl. 376-255.000.
Madsen, Dale R. Punching attachment for bag making machine. 5,114,394, Cl. 493-227.000.
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Maekawa, Yoshikazu: *See*—
Hamanaka, Izumi; Maekawa, Yoshikazu; Arai, Hiroyuki; Nishiki, Akihiko; Muramatsu, Takeshi; Yokoyama, Toshio; and Yukizane, Shigemi, 5,114,130, Cl. 270-53.000.
Magome, Kazuo: *See*—
Shoda, Isao; Kodama, Hitoshi; Magome, Kazuo; Iwata, Akihiko; Yoshizawa, Kenji; and Taki, Masakazu, 5,115,168, Cl. 315-223.000.
Mahabadi, Hadi K.: *See*—
Tan, Hock S.; Ng, Tie H.; and Mahabadi, Hadi K., 5,114,824, Cl. 430-137.000.
Mahle, GmbH: *See*—
Kemnitz, Peter; Ullrich, Michael; and Wieland, Hanspeter, 5,113,817, Cl. 123-193.600.
Mahler, Edward H. Straight edge ripping guide for boards with two uneven edges. 5,113,734, Cl. 83-409.000.
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Mahns, Patricia A.: *See*—
Roselle, Paul L.; Kosman, Stephen L.; and Mahns, Patricia A., 5,114,872, Cl. 437-48.000.
Mahoney, Kenneth J., to Gareo Sports, Inc. Basketball rim assembly support apparatus. 5,114,141, Cl. 273-1.50R.
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Mai, Udo: *See*—
Hartmann, Uwe; Mai, Udo; and Schichl, Roman, 5,113,839, Cl. 123-606.000.
Maieron, Joseph J.: *See*—
Wen, Cheng P.; Mendolia, Gregory S.; Siracusa, Mario; Maieron, Joseph J.; Higdon, William D.; Wooldridge, John J.; and Gulick, Jon, 5,115,245, Cl. 342-175.000.
Mainstream Engineering Corp.: *See*—
Parrish, Clyde F.; and Scaringe, Robert P., 5,113,666, Cl. 62-259.300.
Mainz, Eric L., to Vulcan Materials Company. Use of azeotropic compositions in vapor degreasing. 5,114,495, Cl. 134-11.000.
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Karabin, Tadeusz; and Mundy, Roy E., 5,114,336, Cl. 431-125.000.
Major, Michael D.; and Dupre, Marion A., to Kraft General Foods, Inc. Method of mixing viscous emulsions. 5,114,732, Cl. 426-605.000.
Makepeace, Robert B.: *See*—
Nava, Hildeberto; Lake, Robert D.; and Makepeace, Robert B., 5,115,072, Cl. 528-67.000.
Makimoto, Mitsuo: *See*—
Yamamoto, Yuuri; and Makimoto, Mitsuo, 5,115,515, Cl. 455-71.000.
Makino, Yasutaka; Negoro, Seiji; Urabe, Itaru; and Okada, Hirosuke, to Amano Pharmaceutical Co., Ltd. Recombinant DNA, transformant containing said DNA, and process for preparing heat-stable glucose dehydrogenase by use of said transformant. 5,114,853, Cl. 435-190.000.
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Izumi, Yasuo; Sato, Syoji; Ishimoto, Kazumi; Makino, Yutaka; and Ueno, Shohzo, 5,113,788, Cl. 118-663.000.
Makita, Hitoshi: *See*—
Tanaka, So; Hirakata, Takashi; Kawasaki, Shingo; Nakata, Takuya; Makita, Hitoshi; and Kozuki, Koichi, 5,113,744, Cl. 84-634.000.
Makowski, Michael A.: *See*—
Stallard, Barry W.; Makowski, Michael A.; and Byers, Jack A., 5,115,482, Cl. 385-28.000.
Malatesta, Francesco, to Exxon Chemical Patents Inc. Process for sizing paper and similar products. 5,114,538, Cl. 162-158.000.
Malleron, Jean-Luc: *See*—
Gueremy, Claude; Malleron, Jean-Luc; and Mignani, Serge, 5,114,949, Cl. 514-293.000.
MAN Roland Druckmaschinen AG: *See*—
Abendroth, Paul; Herzel, Joachim; Hummel, Peter; Ortner, Robert; Steuer, Joachim; Stoffler, Achim; and Despot, Janko, 5,113,762, Cl. 101-350.000.
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Manley, Martin H., to National Semiconductor Corporation. Split-gate EPROM cell using polysilicon spacers. 5,115,288, Cl. 357-23.500.
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Mannava, Seetha R.: *See*—
Monson, Paul J. E.; Rockstroh, Todd J.; Mannava, Seetha R.; and Baeumel, Robert E., 5,113,582, Cl. 29-889.200.
Mannesmann AG: *See*—
Schlawne, Friedheim, 5,113,697, Cl. 73-602.000.
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Figge, Dieter; and Fink, Peter, 5,113,623, Cl. 51-289.00R.
Siegmund, Werner, deceased; Kamereit, Wilhelm; Schmitt, Oskar M.; Weidmann, Volker; and Friedrich, Otto J., 5,114,475, Cl. 106-13.000.
Manska, Wayne E. Method of manufacturing a connector for medical devices. 5,113,571, Cl. 29-453.000.
Marcato, Forrest, to MAC Stripers, Inc. Apparatus for applying a traffic stripe to a road. 5,114,268, Cl. 404-92.000.
Marchand, Gary R.: *See*—
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Margiatto, Gaye: *See*—
Blizzard, Timothy A.; and Margiatto, Gaye, 5,114,930, Cl. 514-30.000.
Marin, Seppo; and Pyotsia, Jouni, to Neles Oy. Closing member for a valve. 5,113,909, Cl. 137-625.320.
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Stiffler, Jack J.; Nolan, James M.; Mark, Peter; and Harvey, David, 5,115,499, Cl. 395-425.000.
Markiewicz, Robert S.: *See*—
Giessen, Bill C.; Markiewicz, Robert S.; and Chen, Feng, 5,114,905, Cl. 505-1.000.

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Cohen, Irun R.; Elias, Dana. and Markovits, Doron, 5,114,844, Cl. 435-7.210.

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Brandolino, Giusseppe; and Maroske, Fred, 5,115,197, Cl. 324-245.000.

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Possati, Mario, 5,113,592, Cl. 33-567.100.

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Johnson, Paul C.; Colthart, James D.; Otermat, Arthur L.; Weingaertner, David A.; Chou, Charles C.; Byers, Dallas L.; Stearns, Stephen M.; Marsden, Arnold R., Jr.; and Deeley, George M., 5,114,497, Cl. 134-21.000.

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Williams, Robert E.; Marshall, William H.; Stout, Robert B.; and McCourt, John J., Jr., 5,114,425, Cl. 606-034.000.

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Martens, Rudolf J.: *See—*
Van Kralingen, Cornelis G.; Martens, Rudolf J.; Rerek, Mark E.; Swarthoff, Ton; and Van Vliet, Marten, 5,114,611, Cl. 252-186.330.

Martin, Allenn E.: *See—*
Lilja, Philip C.; Ehrlich, Paul W.; and Martin, Allenn E., 5,114,070, Cl. 236-49.300.

Martin, James A.; and Braytenbah, Andrew S., to Westinghouse Electric Corp. Turbine-medium flow monitor. 5,113,691, Cl. 73-116.000.

Martin, John R.: *See—*
Tillery, Michael L.; Harlan, Eugene G.; Martin, John R.; Zammuto, Samuel N.; and Bonilla, Marcio, 5,114,155, Cl. 273-371.000.

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Martin, Ronald R.; and Hunter, James L., to Southwire Company. Tamper resistant magnetic gate lock. 5,114,195, Cl. 292-251.500.

Martin, Samuel W.; Silverberg, Morton; and Terry, Kenneth A. Single sheet self-mailing form with improved feeding characteristics. 5,114,067, Cl. 229-92.100.

Martin, Thomas, to Logo! Martin & Partner GmbH. Container for collecting and storing newspapers, magazines and other articles. 5,114,020, Cl. 211-50.000.

Martin Yale Industries, Inc.: *See—*
Abramson, Richard J., 5,114,395, Cl. 493-421.000.

Martinez, Rafael H.: *See—*
Peralta, Joaquin O.; and Martinez, Rafael H., 5,115,222, Cl. 340-573.000.

Martino, Ronald J.; and Ramsey, Fred J., to Cambridge Instruments Inc. Stereomicroscope. 5,115,339, Cl. 359-378.000.

Maruno, Tohru: *See—*
Ishibashi, Shigeki; Nakamura, Kouzaburou; Maruno, Tohru; Nakahata, Masaaki; Nejishi, Takaaki; and Urano, Fumiyoshi, 5,114,615, Cl. 252-299.670.

Maruta, Hidekazu; Adachi, Hiroyuki; Yamamoto, Akira; Kimura, Shigeo; and Kusaka, Kensaku, to Canon Kabushiki Kaisha. Heating apparatus using low resistance film. 5,115,278, Cl. 355-285.000.

Maruyama, Ryoichi: *See—*
Ishino, Tsutomu; and Maruyama, Ryoichi, 5,113,723, Cl. 74-867.000.

Maruyama, Tadakatsu; Ohno, Yasuhide; Konda, Masashi; Kikuchi, Tosiharu; Suzuki, Yasuhiro; Uno, Tomohiro; Otsuka, Hiroaki; and Tanahashi, Hiroyuki, to Nippon Steel Corporation. Method of bonding bumps to leads of tab tape and an apparatus for arranging bumps used for the same. 5,114,878, Cl. 437-182.000.

Marvin, John S.: *See—*
Burgess, Ken L.; and Marvin, John S., 5,115,326, Cl. 358-440.000.

Marx, Edward J.; and Watkins, Michael J., to Shell Oil Company. Carboxy-functional hydrogenated block copolymer dispersed in epoxy resin. 5,115,019, Cl. 525-65.000.

Masanaga, Yamamoto; Kiyotaka, Kaneko; Masanori, Yoshida; and Izumi, Miyake, to Fuji Photo Film Co., Ltd. Camera having luminance difference mode control. 5,115,269, Cl. 354-420.000.

Masanori, Yoshida: *See—*
Masanaga, Yamamoto; Kiyotaka, Kaneko; Masanori, Yoshida; and Izumi, Miyake, 5,115,269, Cl. 354-420.000.

Maschinenfabrik Rieter AG: *See—*
Siegenthaler, Marcel, 5,113,550, Cl. 19-159.00A.

Maschler, Reinhard; Steiner, Verena; Grutter, Markus G.; and Raschdorf, Fritz, to Ciba-Geigy Corporation; and UCP Gen-Pharma AG. Polypeptides with an anticoagulant activity. 5,114,922, Cl. 514-12.000.

Masdea, Arturo; Masucci, Rosanna; Bignami, Manuel; and Bartolomei, Roberto, to Selenia Industrie Elettroniche Associate S.p.A. PLL clock signal regenerator using a phase correlator. 5,115,208, Cl. 331-1.00A.

Mase, Toshiaki: *See—*
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Nishikibe, Masaru; Ihara, Masaki; and Yano, Mitsuo, 5,114,918, Cl. 514-11.000.

Mashiko, Kouichi: *See—*
Sakaya, Masuji; Okiai, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, 5,113,932, Cl. 165-104.260.

Massachusetts Institute of Technology: *See—*
Bertozzi, William, 5,115,459, Cl. 378-88.000.
Folino, Frank A., 5,114,247, Cl. 384-461.000.
Gebizlioglu, Osman S.; Cohen, Robert E.; Argon, Ali S.; Beckham, Haskell W.; and Qin, Jian, 5,115,028, Cl. 525-232.000.
Mooradian, Aram, 5,115,445, Cl. 372-75.000.

Massey-Ferguson Services N.V.: *See—*
Weyman, Roger M., 5,113,715, Cl. 74-473.00R.

Mastenbroek, Barend; and Petrus, Leonardus, to Shell Oil Company. Polymerization of CO/olefin with molar ratio of non hydrohalogenic acid to palladium compound. 5,115,094, Cl. 528-392.000.

Mastov, Eduard; Mautner, Yehezkel; Gilad-Smolinsky, Zvi; and Levy, Moshe, to Propel Partnership 1987. Electric drive attachment for a wheelchair. 5,113,959, Cl. 180-11.000.

Masucci, Rosanna: *See—*
Masdea, Arturo; Masucci, Rosanna; Bignami, Manuel; and Bartolomei, Roberto, 5,115,208, Cl. 331-1.00A.

Masuda, Hiroshi; and Tunata, Katuhiro, to Hitachi, Ltd. Method of controlling brushless DC motor. 5,115,174, Cl. 318-254.000.

Masuda, Hiroshi: *See—*
Shimamune, Takayuki; Nakamatsu, Shuji; Sawamoto, Isao; Masuda, Hiroshi; and Nishiki, Yoshinori, 5,114,549, Cl. 204-149.000.

Masumoto, Mituhiko, to Mitsubishi Gas Chemical Co., Inc. Process for producing copolycarbonate oligomer from dichloroformate. 5,115,081, Cl. 528-196.000.

Masuyama, Akira; and Saitoh, Takaki, to International Business Machines Corporation. Plasma processing method and apparatus. 5,114,529, Cl. 156-643.000.

Material Engineering Technology Laboratory Inc.: *See—*
Isono, Keinosuke; Yoshida, Takao; and Suzuki, Tatsuo, 5,114,004, Cl. 206-222.000.

Matharani, Michael A.: *See—*
Meli, Vincent A.; Matharani, Michael A.; Brzezinski, Ted A.; Shaft, David L.; and Urmanski, James L., 5,114,307, Cl. 414-793.100.

Matsuda, Hiroshi: *See—*
Ito, Kazuhiro; Matsuda, Hiroshi; and Nagano, Yuuji, 5,114,866, Cl. 437-3.000.

Matsuda, Takumi, to Seikosha Co., Ltd. Feeder. 5,113,796, Cl. 119-51.110.

Matsuda, Yasuo: *See—*
Shirahama, Hidefumi; Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; Iwanaka, Mitsufumi; Nagano, Takeshi; and Ishida, Youuji, 5,115,386, Cl. 363-41.000.

Matsugu, Masakazu; Saitoh, Kenji; and Ohwada, Mitsutoshi, to Canon Kabushiki Kaisha. Position detection method and apparatus. 5,114,236, Cl. 356-401.000.

Matsui, Fumio: *See—*
Tanaka, Satoru; and Matsui, Fumio, 5,115,138, Cl. 250-485.100.

Matsui, Toshikazu: *See—*
Miyoshi, Jun; Shibanaka, Mitsugu; Matsui, Toshikazu; and Ohtsuka, Nobukazu, 5,114,136, Cl. 271-213.000.

Matsumoto, Akihiko: *See—*
Takano, Masayuki; Onozuka, Kuniharu; Nagasawa, Fumihiro; and Matsumoto, Akihiko, 5,115,310, Cl. 358-185.000.

Matsumoto, Miki: *See—*
Sato, Katsuyuki; Matsumoto, Miki; Ohkuma, Sadayuki; Ogata, Masahiro; and Yoshida, Masahiro, 5,115,413, Cl. 365-230.090.

Matsumoto, Naoaki, to Casio Computer Co., Ltd. Electronic stringed instrument. 5,113,742, Cl. 84-615.000.

Matsumura, Masami: *See—*
Fukui, Wataru; Iwata, Toshio; Ueda, Atsushi; Matsumura, Masami; and Koiwa, Mitsura, 5,113,821, Cl. 123-335.000.

Matsumura, Shunichi: *See—*
Umetani, Hiroyuki; Matsumura, Shunichi; and Yamada, Takeyoshi, 5,115,074, Cl. 528-98.000.

Matsumura, Yukinobu. Golf swing analyzer. 5,114,150, Cl. 273-186.00R.

Matsunaga, Taira: *See—*
Murakami, Kouji; and Matsunaga, Taira, 5,115,290, Cl. 357-23.900.

Matsuo, Shigeru; Murakami, Shigeru; Chino, Shinji; and Yako, Naoto, to Idemitsu Kosan Company Limited. Polyetheric copolymers, process for preparing the same compositions containing the same, their molded products, and their use. 5,115,077, Cl. 528-125.000.

Matsushiro, Nobuhito; Hatanaka, Hazime; Yoshida, Takayoshi; and Oyake, Ikuo, to Oki Electric Industry Co., Ltd. Scan-conversion process and processor for converting a graphic primitive to a pixel map. 5,115,402, Cl. 395-141.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Aoki, Nobuyuki; Ochiai, Keiichi; and Komoda, Hideaki, 5,114,801, Cl. 428-694.000.
Hidese, Wataru, 5,113,581, Cl. 29-840.000.
Hideshima, Osamu, 5,114,229, Cl. 356-237.000.
Ishikawa, Akihiro; Isaka, Haruo; and Sakakibara, Yoshio, 5,115,422, Cl. 369-54.000.
Isobe, Mitsuo; and Morita, Katsumi, 5,115,313, Cl. 358-183.000.
Izumi, Yasuo; Sato, Syoji; Ishimoto, Kazumi; Makino, Yutaka; and Ueno, Shohzo, 5,113,788, Cl. 118-663.000.
Ogawa, Kazufumi; and Mino, Norihisa, 5,114,737, Cl. 427-36.000.

Onishi, Hiroshi; Kohashi, Tadao; Mima, Soichiro; and Esaki, Hiroshi, 5,115,254, Cl. 346-76.0PH.
Takeda, Yukihiro, 5,115,373, Cl. 361-329.000.
Yamamoto, Yuuri; and Makimoto, Mitsuo, 5,115,515, Cl. 455-71.000.

Matsushita Electronics Corporation: *See—*
Ose, Toshio; Yoshida, Toshifumi; and Iwasaki, Katsuyo, 5,115,170, Cl. 315-370.000.

Matsushita, Hiroomi: *See—*
Yamaguchi, Tetsuo; Matsushita, Hiroomi; and Niwa, Kunio, 5,114,145, Cl. 273-73.00F.

Matsuura, Hitoshi: *See—*
Kuroiwa, Katsumasa; Matsuura, Hitoshi; Katayama, Katsuhiro; Nakatsuyama, Shuichi; Nagasawa, Takeshi; and Endo, Koji, 5,115,099, Cl. 530-331.000.

Matsuura, Makoto; Amano, Hironobu; and Ohta, Kunio, to Sintokogio Ltd. Apparatus for detecting intensity and/or density of shot blasting. 5,113,680, Cl. 72-53.000.

Matsuyama, Jinsho: *See—*
Echizen, Hiroshi; Fujioka, Yasushi; Nakagawa, Katsumi; Kanai, Masahiro; Kariya, Toshimitsu; Matsuyama, Jinsho; and Takei, Tetsuya, 5,114,770, Cl. 427-38.000.

Matthes, Roland: *See—*
Wallisch, Gebhard; Eismann, Dieter; Matthes, Roland; and Kammerer, Manfred, 5,113,955, Cl. 177-25.150.

Mattson, Walter E.: *See—*
Mirchandani, Prakash K.; Benn, Raymond C.; and Mattson, Walter E., 5,114,505, Cl. 148-437.000.

Matzel, Jurgen: *See—*
Detzel, Josef; Matzel, Jurgen; Kraus, Rudolf; and Peissl, Dieter, 5,114,069, Cl. 229-125.150.

Mauer, George W.: *See—*
McCollum, Gregory J.; and Mauer, George W., 5,114,552, Cl. 204-181.700.

Mautino, Peter S., to McConway & Torley Corporation. Cast blockout apparatus for a draft gear pocket. 5,114,027, Cl. 213-57.000.

Mautner, Yehezkel: *See—*
Mastov, Eduard; Mautner, Yehezkel; Gilad-Smolinsky, Zvi; and Levy, Moshe, 5,113,959, Cl. 180-11.000.

Maxemchuk, Nicholas F.: *See—*
Hahne, Ellen L.; and Maxemchuk, Nicholas F., 5,115,430, Cl. 370-85.600.

Maxim, Henry A., Jr., to Maxim Sorbents, Inc. Absorbent floor mat. 5,114,774, Cl. 428-101.000.

Maxim Sorbents, Inc.: *See—*
Maxim, Henry A., Jr., 5,114,774, Cl. 428-101.000.

Maxton Fox Commercial Furniture Pty. Ltd.: *See—*
Naess, Johan H., 5,114,210, Cl. 297-300.000.

May & Baker Limited: *See—*
Geach, Neil J.; Gilmour, James; Hatton, Leslie R.; and Smith, Philip H. G., 5,114,461, Cl. 71-88.000.

May, Ralph D.: *See—*
Gewanter, Herman L.; and May, Ralph D., 5,114,618, Cl. 252-389.530.

May, Ralph F.: *See—*
Jackisch, David A.; May, Ralph F.; and Berl, Kevin D., 5,114,003, Cl. 206-204.000.

Mayer, Norbert: *See—*
Ballhause, Helmut; Engelhardt, Gunther; Landgraf, Claus A.; Mayer, Norbert; Roth, Willy; Schumacher, Kurt; and Prox, Alex, 5,114,935, Cl. 514-228.800.

Mayhew, William H. Adjustable wand for carpet soil extractors. 5,113,547, Cl. 15-322.000.

Mazda Motor Corporation: *See—*
Kusunoki, Hiroaki, 5,114,499, Cl. 148-512.000.
Shimomura, Takeshi; Sakane, Katumi; Tokuda, Makoto; and Egawa, Sinpei, 5,114,184, Cl. 280-784.000.

Mazda Motor Mfg. (USA) Corp.: *See—*
Kawahara, Tsutomu, 5,113,686, Cl. 72-462.000.

Mazur, Leonard L.: *See—*
Holaday, John W.; Shacknai, Jonah; and Mazur, Leonard L., 5,114,963, Cl. 514-448.000.

McAdam, Hugh A., III; Tremblay, Robert; and Pacocha, James, to International Paper Box Machine Co., Inc., The. Apparatus for folding paper boxes. 5,114,392, Cl. 493-179.000.

McAneney, T. Brian: *See—*
Ong, Beng S.; Sacripante, Guerino; Kmiecik-Lawrynowicz, Grazyna; and McAneney, T. Brian, 5,114,819, Cl. 430-106.600.

McAuley, Anthony J., to Bell Communications Research. Forward error correction code system. 5,115,436, Cl. 371-37.100.

McAuliffe, Christopher; and Dziorny, Paul J., to United Technologies Corporation. Bearing cooling arrangement for air cycle machine. 5,113,670, Cl. 62-402.000.

McBrady Engineering, Inc.: *See—*
Avelis, Julian P., 5,113,545, Cl. 15-308.000.

McCarty, Robert T. Boat boarding ladder. 5,113,782, Cl. 114-362.000.

McClure, David C., to SGS-Thomson Microelectronics, Inc. Power-on reset circuit for controlling test mode entry. 5,115,146, Cl. 307-272.300.

McColl, James R.: *See—*
Knoll, William C.; McColl, James R.; and Lawson, James O., 5,115,160, Cl. 310-313.00B.

McCollum, Gregory J.; and Mauer, George W., to PPG Industries, Inc. Compositions comprising ionic resins and capped polyisocyanate mixtures containing a diphenyl-2,4'-diisocyanate and a diphenyl-4,4'-diisocyanate. 5,114,552, Cl. 204-181.700.

McCombs, Candace C.; Michalski, Joseph P.; Gallaher, William R.; and Thompson, James J., to Board of Supervisors of Louisiana State University & Agricultural & Mechanical College. Immunosorbant assay for α-1-antitrypsin, kit employing said assay, monoclonal antibody to α-1-antitrypsin, and hybridoma for producing said monoclonal antibody. 5,114,863, Cl. 436-518.000.

McConway & Torley Corporation: *See—*
Mautino, Peter S., 5,114,027, Cl. 213-57.000.

McCosker, Robert E. Wheeled coasting board. 5,114,166, Cl. 280-87.042.

McCourt, John J., Jr.: *See—*
Williams, Robert E.; Marshall, William H.; Stout, Robert B.; and McCourt, John J., Jr., 5,114,425, Cl. 606-034.000.

McCoy, Curtis L.: *See—*
Amrein, Bruce E.; McCoy, Curtis L.; Brucksch, Robert C.; and Melnik, George, 5,113,779, Cl. 114-270.000.

McCoy, William C., to Catheter Research, Inc. Spring-biased tip assembly. 5,114,402, Cl. 604-95.000.

McCullagh, Keith G.: *See—*
Bell, Leslie D.; McCullagh, Keith G.; and Porter, Alan G., 5,114,711, Cl. 424-85.100.

McCurley, Ross M.: *See—*
Ross, Colby M.; Sproul, Richard M.; McCurley, Ross M.; and Young, Carter R., 5,113,939, Cl. 166-120.000.

McDaniel, Max P.: *See—*
Bailey, Fay W.; Benham, Elizabeth A.; and McDaniel, Max P., 5,115,068, Cl. 526-348.500.
Knudsen, Ronald D.; McDaniel, Max P.; Benham, Elizabeth A.; and Bailey, F. Wallace, 5,115,053, Cl. 526-106.000.

McDaniel, Robert G., to Arizona Board of Regents on behalf of University of Arizona. Chemical hybridizing agents. 5,113,617, Cl. 47-58.000.

McDaniel, Terry W.: *See—*
Finkelstein, Blair I.; and McDaniel, Terry W., 5,115,420, Cl. 369-44.140.

McDonald, Vicki L.: *See—*
Shoyab, Mohammed; McDonald, Vicki L.; Bradley, James G.; and Plowman, Gregory D., 5,115,096, Cl. 530-322.000.

McElroy, Andrew B.: *See—*
Hayes, Norman F.; Scopes, David I. C.; McElroy, Andrew B.; Hayes, Ann G.; and Meerholz, Clive A., 5,114,945, Cl. 514-278.000.

McGill, J. E. Christmas tree fire-retardant compositions. 5,114,476, Cl. 106-18.120.

McGinley, James J.: *See—*
Leatherman, Dennis D.; McGinley, James J.; Adams, Daniel E.; and Brons, George A., 5,114,438, Cl. 51-296.000.

McGinley, Michael L. Baseball pitching training device. 5,114,143, Cl. 273-26.00R.

McGrane, Willam K.: *See—*
Ditzler, Lee C.; Lemberger, Ronald; McGrane, Willam K.; and Choy, Jerry F., 5,114,576, Cl. 210-195.100.

McGrath, William R.; and Lubecke, Victor M., to California Institute of Technology. RF tuning element. 5,115,217, Cl. 333-246.000.

McGregor, Harold R. Vertical bottom-fill auger assembly. 5,113,917, Cl. 141-71.000.

McGregor, Harold R. Vertical bottom-fill auger assembly. 5,113,918, Cl. 141-114.000.

McGugan, Colin A.: *See—*
Perlman, Maier; Bell, James M.; and McGugan, Colin A., 5,115,491, Cl. 392-454.000.

McGuire, Virgil M., Jr. Floating intake for transport of liquid from a fixed depth below the surface of a reservoir. 5,113,889, Cl. 137-2.000.

McKee, Roberta L.: *See—*
Rosenblatt, Michael; McKee, Roberta L.; Caulfield, Michael P.; and Nutt, Ruth F., 5,114,843, Cl. 435-7.210.

McManus, Phillip W. Fish line to hook shank snap on and release connector. 5,113,616, Cl. 43-44.830.

McMechan, David E., to Halliburton Company. Method of opening cased well perforations. 5,113,942, Cl. 166-250.000.

McMillan, Jim S.; and Tarsha, Simon. Method of lining a host pipe with a liner using cryogenic cooling. 5,114,634, Cl. 264-28.000.

McNicholas, Thomas J., Sr.: *See—*
Chang, Robert; and McNicholas, Thomas J., Sr., 5,114,129, Cl. 270-1.100.

McQuinn, Roy L., to Minnesota Mining and Manufacturing Company. Non-invasive transmucosal drug level monitoring method. 5,113,860, Cl. 128-632.000.

McVicker, Henry J.: *See—*
Johnson, Glenn W., Jr.; and McVicker, Henry J., 5,113,877, Cl. 128-882.000.

McWilliams, William H.; Hamermesh, Charles L.; and Welch, Evan B., to M&FC Holding Company, Inc. Moisture resistant laminated cover electronic utility meter. 5,114,792, Cl. 428-422.000.

Meckel, Walter; Hansel, Eduard; Arend, Gunter; and Konig, Klaus, to Bayer Aktiengesellschaft. Rapidly crystallizing polyurethane systems. 5,115,073, Cl. 528-83.000.

Medeksza, Ludwik A. Method and apparatus for forming intermittent chips when machining a rotating workpiece. 5,113,728, Cl. 82-1.110.

Medical Engineering Corporation: *See—*
Trick, Robert E.; and Barwick, Carl B., 5,114,398, Cl. 600-29.000.

Medicis Corporation: *See—*
Holaday, John W.; Shacknai, Jonah; and Mazur, Leonard L., 5,114,963, Cl. 514-448.000.

Medtronic, Inc.: *See—*
Buchbinder, Maurice, 5,114,414, Cl. 604-95.000.

Funke, Hermann D., 5,113,859, Cl. 128-419.0PG.

Meerholz, Clive A.: *See—*
Hayes, Norman F.; Scopes, David I. C.; McElroy, Andrew B.; Hayes, Ann G.; and Meerholz, Clive A., 5,114,945, Cl. 514-278.000.

Mei, George C.: *See—*
Mandigo, Frank N.; Mei, George C.; and Fister, Julius C., 5,113,764, Cl. 102-202.900.

Meier, Stephen W.: *See—*
Withers, Gregory J.; Meier, Stephen W.; Walter, Robert J.; Child, Michael D.; and DeGraaf, Douglas W., 5,115,219, Cl. 335-216.000.

Meihack, Wolfgang F. A. T.; Barcza, Nicholas A.; and Dry, Michael J., to Mintek. Electrically heated fluidized bed reactor and processes employing same. 5,114,700, Cl. 423-571.000.

Meiske, Larry A.: *See—*
Schell, Joseph G., Jr.; Marchand, Gary R.; and Meiske, Larry A., 5,114,897, Cl. 502-111.000.

Meisser, Claudio; Eggenschwiler, Hans; and Nehls, Walter, to Esec SA. Apparatus for performing in-feed of working member to working station. 5,114,302, Cl. 414-751.000.

Meissner, Ernest H., to Vital Records Inc. Floating catwalk for storage racks. 5,114,024, Cl. 211-175.000.

Melamud, Lucy: *See—*
Percec, Elena S.; Melamud, Lucy; and Coffey, Gerald P., 5,114,795, Cl. 428-516.000.

Melgeorge, Edward L. Automatic hose washer. 5,113,884, Cl. 134-122.00R.

Meli, Vincent A.; Matharani, Michael A.; Brzezinski, Ted A.; Shaft, David L.; and Urmanski, James L., to Schreiber Foods, Inc. Apparatus for stacking slices. 5,114,307, Cl. 414-793.100.

Melnik, George: *See—*
Amrein, Bruce E.; McCoy, Curtis L.; Brucksch, Robert C.; and Melnik, George, 5,113,779, Cl. 114-270.000.

Mendelsohn, Morris A.; Navish, Francis W., Jr.; and Bolton, Richard, to Westinghouse Electric Corp. Acoustic scattering and high reflection loss compositions. 5,114,932, Cl. 521-59.000.

Mendolia, Gregory S.: *See—*
Wen, Cheng P.; Mendolia, Gregory S.; Siracusa, Mario; Maieron, Joseph J.; Higdon, William D.; Wooldridge, John J.; and Gulick, Jon, 5,115,245, Cl. 342-175.000.

Meng, Xinghui: *See—*
Han, Kenneth N.; and Meng, Xinghui, 5,114,687, Cl. 423-32.000.

Menigaux, Louis; and Dugrand, Louis, to Etat Francais, Ministre des Postes, des Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications). Method of producing a quasi-flat semiconductor device capable of a multi-wavelength laser effect and the corresponding device. 5,115,285, Cl. 357-17.000.

Mentzen, Heinz J.: *See—*
Gajdos, Benedikt; and Mentzen, Heinz J., 5,114,928, Cl. 514-25.000.

Menzin, Marvin: *See—*
Robinson, Hugh; and Menzin, Marvin, 5,113,754, Cl. 99-326.000.

Mercedes-Benz AG: *See—*
Dumschat, Rainer; and Schremmer, Gottfried, 5,113,716, Cl. 74-493.000.

Mercer, Frank W.; Goodman, Timothy D.; Lau, Aldrich N. K.; Vo, Lanchi P.; and Sovish, Richard C., to Raychem Corporation. Electronic articles containing a fluorinated poly(arylene ether) dielectric. 5,114,780, Cl. 428-195.000.

Mercer, Frank W.; and Sovish, Richard C., to Raychem Corporation. Fluorinated poly(arylene ether). 5,115,082, Cl. 528-219.000.

Merck & Co., Inc.: *See—*
Ashton, Wallace T.; Cantone, Christine L.; and Tolman, Richard L., 5,114,925, Cl. 514-18.000.
Baldwin, John J.; and Remy, David C., 5,114,919, Cl. 514-11.000.
Biftu, Tesfaye; Bugianesi, Robert L.; Girotra, Nirindar N.; Ponpipom, Mitree M.; Sahoo, Soumya P.; and Kuo, Chan H., 5,114,961, Cl. 514-397.000.
Blizzard, Timothy A.; and Margiatto, Gaye, 5,114,930, Cl. 514-30.000.
Gibilisco, Kenneth J., 5,114,029, Cl. 215-220.000.
Rosenblatt, Michael; McKee, Roberta L.; Caulfield, Michael P.; and Nutt, Ruth F., 5,114,843, Cl. 435-7.210.

Mercuri, Luis A.: *See—*
Cove Mercuri, Leslie M.; and Mercuri, Luis A., 5,114,377, Cl. 446-487.000.

Mergenthaler, Barry M.; and Detwiler, Paul O., to NCR Corporation. Variable laser beam attenuator. 5,115,333, Cl. 359-196.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
Schirlin, Daniel G., 5,114,927, Cl. 514-18.000.

Meservy, Jay A.; and Meservy, Jerry D. Adjustable writing platform for a notebook. 5,114,259, Cl. 402-80.00R.

Meservy, Jerry D.: *See—*
Meservy, Jay A.; and Meservy, Jerry D., 5,114,259, Cl. 402-80.00R.

Mesh, Robert C.: *See—*
Gabrius, A. J.; Mesh, Robert C.; Brey, Arthur; and Hartogh, Daniel, 5,113,990, Cl. 194-205.000.

Messina, Celeste A.: *See—*
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., 5,114,563, Cl. 208-114.000.

Metallgesellschaft AG: *See—*
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, 5,114,326, Cl. 425-79.000.

Metricom, Inc.: *See—*
Baran, Paul; Flammer, George H., III; and Kalkwarf, Robert L., 5,115,433, Cl. 370-94.300.

Mets, Lambertus C.: *See—*
Schuerhoff, Hans-Juergen; Gerritse, Arie; and Mets, Lambertus C., 5,114,653, Cl. 264-228.000.

Mettler-Toledo (Albstadt) GmbH: *See—*
Wallisch, Gebhard; Eismann, Dieter; Matthes, Roland; and Kammerer, Manfred, 5,113,955, Cl. 177-25.150.

Meyerle, George M. Electromagnetically driven punch press with magnetically isolated removable electromagnetic thrust motor. 5,113,736, Cl. 83-575.000.

Meyerle, Michael. Branched infinitely-variable hydromechanical transmission for motor vehicles. 5,114,385, Cl. 475-79.000.

Meyers, Jack G. T-square accessory for tape measure. 5,113,596, Cl. 33-770.000.

Michalski, Joseph P.: *See—*
McCombs, Candace C.; Michalski, Joseph P.; Gallaher, William R.; and Thompson, James J., 5,114,863, Cl. 436-518.000.

Michaud, Paul: *See—*
Drolet, Luc; and Michaud, Paul, 5,113,969, Cl. 182-2.000.

Michelet, Marie-Christine: *See—*
Pares Farras, Ramon; Jofre Torroella, Juan; Ricard, Jean-Paul; Schulthess, Adrian; Farine, Jean-Claude; Michelet, Marie-Christine; Ramsteiner, Agnes; and Bauer, Jacques, 5,114,848, Cl. 435-101.000.

Michen, Ramon: *See—*
Haluda, Raymond; and Michen, Ramon, 5,114,183, Cl. 280-781.000.

Microelectronics Center of N.C.: *See—*
Tranjan, Farid M.; DuBois, Thomas D.; Frieser, Rudolf G.; Bobbio, Stephen M.; and Jones, Susan K. S., 5,114,827, Cl. 430-271.000.

Microtek International Inc.: *See—*
Chung, Ting P., 5,115,180, Cl. 318-618.000.

Mignani, Serge: *See—*
Gueremy, Claude; Malleron, Jean-Luc; and Mignani, Serge, 5,114,949, Cl. 514-293.000.

Mihara, Hirokata; Takagi, Koichi; Shimizu, Teruo; Tashiro, Katsunori; and Takahashi, Hideo, to Mitsubishi Jukogyo Kabushiki Kaisha. Can lid feeder. 5,113,636, Cl. 53-308.000.

Miida, Takashi; Kudoh, Yoshimitsu; and Mutoh, Hiedki, to Fuji Photo Film Co., Ltd. CCD delay line. 5,115,155, Cl. 307-607.000.

Mikami, Izumi: *See—*
Miyawaki, Keizou; Itoh, Noboru; and Mikami, Izumi, 5,115,351, Cl. 359-849.000.

Mikami, Takashi: *See—*
Takado, Yutaka; Yamazaki, Masayuki; Mikami, Takashi; and Tomiyama, Tetsuo, 5,114,522, Cl. 156-245.000.

Mikhailov, Arkady T.: *See—*
Bordunov, Vladimir V.; Karmadonov, Leonid N.; Ospischev, Jury M.; Fedjunin, Vladimir A.; Zhuravkov, Sergei P.; Cherepenko, Evgeny A.; Sviridov, Anatoly B.; Verkhorubov, Lev S.; Mikhailov, Arkady T.; Bakhmutov, Jury L.; and Shaidurov, Valery S., 5,114,496, Cl. 134-13.000.

Miki, Hiromu: *See—*
Kobayashi, Noboru; and Miki, Hiromu, 5,115,173, Cl. 318-135.000.

Miki, Yasuhiro: *See—*
Ikarashi, Masami; Mitsumori, Kenichi; Kano, Mitsuru; Miki, Yasuhiro; Akimoto, Takemi; Yamaguchi, Masahiko; Sasaki, Yorihiko; Kamigaki, Tomoo; Nakanowatari, Jun; Kato, Yoshinori; and Seki, Hitoshi, 5,115,329, Cl. 359-50.000.

Milad Limited Partnership: *See—*
Hendry, James W., 5,114,660, Cl. 264-572.000.

Milburn, Ski; and Barber, Jeffrey, to Vairex Corporation. Fluid displacement apparatus with traveling chambers. 5,114,321, Cl. 417-467.000.

Miles Inc.: *See—*
Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., 5,114,965, Cl. 514-469.000.
Bloom, James W.; Wong, Melvin F.; and Mitra, Gautam, 5,115,101, Cl. 530-388.250.
Brenneman, Allen J., 5,114,862, Cl. 436-169.000.
Crawford, Ferdon H.; Shakour, Gabriel R.; Whitson, Robert C.; and Wise, Ernest R., 5,114,678, Cl. 422-99.000.

Millecamps, Francois: *See—*
N'Guyen, Quang L.; Griat, Jacqueline; Millecamps, Francois; Lang, Gerard; and Forestier, Serge, 5,114,716, Cl. 424-401.000.

Miller, Earl G., to General Motors Corporation. Spot welding method and apparatus having weld electrode lock-up. 5,115,113, Cl. 219-89.000.

Miller, Leroy; and Stoll, Mark S., to Liberty Diversified Industries. Utility tote container with unfastenable and refastenable side walls and end walls. 5,114,034, Cl. 220-7.000.

Miller, Luther, to Polyspede Electronics Corporation. Circuitry and method of protecting thyristors. 5,115,387, Cl. 363-54.000.

Miller, Ronald E.: *See—*
Eckert, C. Edward; Hornack, Thomas R.; Lyness, George E.; Kaems, John A.; Cox, Clarence J.; Miller, Ronald E.; Apelian, Diran; and Mutharasan, Rajakkannu, 5,114,472, Cl. 75-412.000.

Miller Structures, Inc.: *See—*
Davis, John M., 5,113,625, Cl. 52-143.000.

Milliken Research Corporation: *See—*
Bode, Jerry E.; and Duckett, Ronnie E., 5,113,708, Cl. 73-862.410.

Millipore Corporation: *See—*
Sgourakes, George E.; and Koziol, Stanislaw, 5,114,161, Cl. 277-138.000.

Millum, Colin G.: *See—*
Appleford, David E.; Millum, Colin G.; Scott, Duncan M.; and Rimmer, Michael J., 5,114,117, Cl. 251-149.900.

Milner, Ted D.; and Zimmerman, Robert V., to Silver Engineering Works, Inc. Means for producing a high brix sugar liquid. 5,114,489, Cl. 127-2.000.

Milora, David J.; Shank, David M.; and Curato, Peter A., to Atochem North America, Inc. Chemical stonewash methods for treating fabrics. 5,114,426, Cl. 8-102.000.

MIM Industries, Inc.: *See—*
Frye, Ricky J., 5,114,056, Cl. 223-30.000.

Mima, Soichiro: *See—*
Onishi, Hiroshi; Kohashi, Tadao; Mima, Soichiro; and Esaki, Hiroshi, 5,115,254, Cl. 346-76.0PH.

Min, Siow W.: *See—*
Cloutier, Frank L.; Chieng, Ching K.; and Min, Siow W., 5,114,744, Cl. 427-96.000.

Minami, Shinichi: *See—*
Yatsuda, Yuji; Hagiwara, Takaaki; Kondo, Ryuji; Minami, Shinichi; and Itoh, Yokichi, 5,114,870, Cl. 437-40.000.

Minato, Teruo: *See—*
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; and Minato, Teruo, 5,114,500, Cl. 148-230.000.

Miner, Frank H., Jr.: *See—*
Arthur, Mark T.; and Miner, Frank H., Jr., 5,115,184, Cl. 373-74.000.

Minke, Robert M. Faucet assembly having integral liquid product dispenser. 5,114,048, Cl. 222-135.000.

Minnesota Mining and Manufacturing Company: *See—*
Hampl, Edward F., Jr.; Iqbal, Mohammad; and Thompson, Suzanne J., 5,115,372, Cl. 361-323.000.
McQuinn, Roy L., 5,113,860, Cl. 128-632.000.
Pool, Dan B., 5,113,921, Cl. 156-71.000.
Silver, Spencer F.; Bronn, William R.; and Joseph, Eugene G., 5,115,034, Cl. 525-288.000.
Wang, Paul J., Jr.; Petrich, Michael J.; Wadzinski, Francis A.; and Guither, James E., 5,114,520, Cl. 156-240.000.
Wilson, Shari J.; Appeldorn, Roger H.; and Hamlin, Robert N., 5,113,555, Cl. 24-576.000.

Minnick, Michael G.: *See—*
Dickens, Virgel; and Minnick, Michael G., 5,115,016, Cl. 524-513.000.

Mino, Norihisa: *See—*
Ogawa, Kazufumi; and Mino, Norihisa, 5,114,737, Cl. 427-36.000.

Minolta Camera Kabushiki Kaisha: *See—*
Higashio, Kimihiko, 5,115,282, Cl. 355-328.000.
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 5,115,321, Cl. 358-213.190.
Kadono, Takashi, 5,115,328, Cl. 358-474.000.
Nakamura, Kenji, 5,115,357, Cl. 360-75.000.
Ohmori, Naoto; and Gonda, Takashi, 5,115,272, Cl. 355-200.000.
Shibazaki, Kenji; Irie, Yutaka; Ito, Masazumi; and Murata, Tomoji, 5,115,274, Cl. 355-243.000.
Sugiura, Masamichi, 5,115,478, Cl. 382-50.000.

Minor, Richard G.: *See—*
Harris, Richard H.; Minor, Richard G.; and Price, Robert W., 5,115,228, Cl. 340-716.000.

Mintek: *See—*
Meihack, Wolfgang F. A. T.; Barcza, Nicholas A.; and Dry, Michael J., 5,114,700, Cl. 423-571.000.

Mioduszeski, John F.: *See—*
Rasicci, Vincent M.; Mioduszeski, John F.; and Gurganus, Cecil R., 5,115,063, Cl. 526-287.000.

Mirabeau, Mary N.; and Rohrbacher, Frank, to Du Pont de Nemours, E. I., and Company. Conductive epoxypolyamide coating composition. 5,114,756, Cl. 427-379.000.

Mirchandani, Prakash K.; Benn, Raymond C.; and Mattson, Walter E., to Inco Alloys International, Inc. Aluminum-base composite alloy. 5,114,505, Cl. 148-437.000.

Misawa, Hidenobu: *See—*
Ishihara, Takeshi; Fujita, Tadashi; and Misawa, Hidenobu, 5,114,803, Cl. 429-30.000.

Misawa, Seiichi: *See—*
Fukuda, Joji; Misawa, Seiichi; and Enomoto, Takaaki, 5,115,390, Cl. 364-146.000.

Miskinis, Edward T.; Johnson, Frank H.; and Paczkowski, Francis M., to Eastman Kodak Company. Magnetic brush development apparatus. 5,115,276, Cl. 355-253.000.

Mita Industrial Co., Ltd.: *See—*
Kodama, Kiyofumi, 5,114,139, Cl. 271-265.000.
Miyoshi, Jun; Shibanaka, Mitsugu; Matsui, Toshikazu; and Ohtsuka, Nobukazu, 5,114,136, Cl. 271-213.000.
Urano, Akiyoshi; and Sano, Yumiko, 5,114,817, Cl. 430-93.000.

Mitchell, Allan T.: *See—*
Rao, Kalipatnam V.; Mitchell, Allan T.; and Paterson, James L., 5,114,530, Cl. 156-653.000.

Mito, Kunihiko: *See—*
Shimizu, Osamu; Tenmoku, Kenji; Doi, Yoichi; and Mito, Kunihiko, 5,115,238, Cl. 340-988.000.

Mitra, Gautam: *See—*
Bloom, James W.; Wong, Melvin F.; and Mitra, Gautam, 5,115,101, Cl. 530-388.250.

Mitra, Niranjan, to Du Pont de Nemours, E. I., and Company. Electrical connecting device and colored strip. 5,114,363, Cl. 439-491.000.

Mitre Corporation, The: *See—*
Tsuchiya, Paul F.; Kirkman, W. Worth; and Weidner, John F., 5,115,495, Cl. 395-200.000.

Mitsubishi Denki K.K.: *See—*
Asayama, Toshiaki, 5,113,822, Cl. 123-360.000.
Taji, Ryoichi; and Takizawa, Takushi, 5,113,573, Cl. 29-596.000.
Takahashi, Akira; Kanno, Yoshiaki; Sumitani, Jiro; Nakamoto, Katsuya; Sasaki, Takeo; and Akasu, Masahira, 5,115,397, Cl. 364-431.050.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Fujii, Nobuo; Kiyota, Hiroyuki; Katagishi, Yoshihiro; and Miyazawa, Takeshi, 5,113,662, Cl. 62-6.000.
Fukui, Wataru; Iwata, Toshio; Ueda, Atsushi; Matsumura, Masami; and Koiwa, Mitsura, 5,113,821, Cl. 123-335.000.
Hata, Toshiaki, 5,113,693, Cl. 73-118.100.
Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,114,383, Cl. 474-18.000.
Hisa, Yoshihiro, 5,115,295, Cl. 357-30.000.
Ikeda, Toru, 5,113,815, Cl. 123-146.50B.
Ito, Hiromi; Takahashi, Ichiro; and Kanegae, Hirozoh, 5,114,994, Cl. 523-436.000.
Kimura, Mikihiro, 5,114,865, Cl. 437-2.000.
Miyawaki, Keizou; Itoh, Noboru; and Mikami, Izumi, 5,115,351, Cl. 359-849.000.
Nakajima, Hajime; Watanabe, Isao; and Tanaka, Kunimaro, 5,115,424, Cl. 569-275.400.
Oomori, Tatsuo; and Ono, Kouichi, 5,115,135, Cl. 250-423.00P.
Ootera, Hiroki; and Tsuda, Mutsumi, 5,115,167, Cl. 315-111.210.
Sadamori, Masaaki, 5,113,992, Cl. 198-347.300.
Shimizu, Takayuki, 5,114,316, Cl. 417-53.000.
Shoda, Isao; Kodama, Hitoshi; Magome, Kazuo; Iwata, Akihiko; Yoshizawa, Kenji; and Taki, Masakazu, 5,115,168, Cl. 315-223.000.
Tada, Masuo; Hiroi Takahiko; Fukumoto, Takaaki; Ohmori, Toshiaki; and Kanno, Itaru, 5,114,748, Cl. 427-180.000.
Taruya, Massaki; and Koiwa, Misturu, 5,113,840, Cl. 123-644.000.
Tobita, Youichi, 5,115,412, Cl. 365-189.090.
Watanabe, Kotaro; and Itaba, Tetsu, 5,115,400, Cl. 364-474.240.

Mitsubishi Gas Chemical Co., Inc.: *See—*
Masumoto, Mituhiko, 5,115,081, Cl. 528-196.000.

Mitsubishi Jidosha Kogyo K.K.: *See—*
Takahashi, Akira; Kanno, Yoshiaki; Sumitani, Jiro; Nakamoto, Katsuya; Sasaki, Takeo; and Akasu, Masahira, 5,115,397, Cl. 364-431.050.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Konishi, Kouji; Ohshima, Tadayoshi; Fujii, Masakazu; Hagino, Motoyuki; Hosono, Satoshi; and Miyake, Masayoshi, 5,115,144, Cl. 250-572.000.
Mihara, Hirokata; Takagi, Koichi; Shimizu, Teruo; Tashiro, Katsunori; and Takahashi, Hideo, 5,113,636, Cl. 53-308.000.
Morishima, Ryuji; and Asai, Katsutoshi, 5,113,816, Cl. 123-179.250.

Mitsubishi Kasei Corporation: *See—*
Kaneko, Tsugio; Kimura, Tsuneo; Ikeda, Michihiro; Utsunomiya, Akira; and Ohno, Yuka, 5,114,881, Cl. 501-12.000.
Kusano, Hiroshi; Ito, Tsuyoshi; Tashiro, Takayuki; Takayanagi, Hiroaki; and Miyata, Eiji, 5,114,577, Cl. 210-198.200.

Mitsubishi Materials Corporation: *See—*
Akutsu, Hidetoshi; Kohno, Tohru; and Otsuki, Masato, 5,114,468, Cl. 75-234.000.
Hayashi, Takeshi; Sato, Shigeru; Tsujimoto, Katsuaki; Miyazaki, Daishiro; Hiwasa, Yoneo; and Ishimatsu, Toshiki, 5,113,954, Cl. 175-415.000.

Mitsubishi Monsanto Chemical Company: *See—*
Isegawa, Yo; Kito, Takeshi; Muryayama, Kimimasa; Ikawa, Shoji; Iwase, Takahiro; Sugiura, Tutomu; and Tsuzuki, Atsuyuki, 5,114,521, Cl. 156-242.000.

Mitsubishi Nuclear Fuel Co.: *See—*
Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, 5,114,668, Cl. 376-442.000.

Mitsubishi Oil Co., Ltd.: *See—*
Yano, Hisashi; Yabumoto, Junsuke; and Kuwavara, Ryuzi, 5,114,575, Cl. 210-188.000.

Mitsui Home Co., Ltd.: *See—*
Takenaka, Shintaro, 5,114,081, Cl. 241-79.000.

Mitsui Petrochemical Industries, Inc.: *See—*
Sakai, Hideki; Ishiwatari, Kazuo; and Ikejiri, Fumitoshi, 5,115,010, Cl. 524-410.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Hashimoto, Mikio; and Kaneshige, Norio, 5,115,047, Cl. 525-444.000.
Honda, Narimichi; and Yagi, Kazuo, 5,113,880, Cl. 132-321.000.
Mizui, Kinya; and Furuya, Yoshiaki, 5,114,605, Cl. 252-68.000.
Tanaka, Mutsuhiro; and Sugi, Masahiro, 5,115,030, Cl. 525-240.000.
Wamura, Hiroo; Uesugi, Shunyo; and Hayashi, Takashi, 5,115,052, Cl. 526-87.000.
Yagi, Kazuo; and Toyota, Akinori, 5,115,067, Cl. 526-348.100.

Mitsui Toatsu Chemicals, Inc.: *See—*
Fukuda, Tamotsu; Shigeta, Shiro; Okuya, Hiroaki; Kuroiwa, Yasuyuki; and Sudo, Tadashi, 5,114,712, Cl. 424-87.000.
Katakami, Tsutomu; Yokoyama, Tatsuro; Mori, Haruki; Kawauchi, Nobuya; Kamiya, Joji; and Ishii, Masaaki, 5,114,941, Cl. 514-253.000.
Oda, Kengo; Moriyasu, Koichi; Hayashi, Masao; Nishida, Makoto; Oyamada, Masami; Fujiwara, Akie; and Watanabe, Junko, 5,114,466, Cl. 71-94.000.

Mitsumori, Kenichi: *See—*
Ikarashi, Masami; Mitsumori, Kenichi; Kano, Mitsuru; Miki, Yasuhiro; Akimoto, Takemi; Yamaguchi, Masahiko; Sasaki, Yorihiko; Kamigaki, Tomoo; Nakanowatari, Jun; Kato, Yoshinori; and Seki, Hitoshi. 5,115,329, Cl. 359-50.000.

Miyadera, Yasuo: *See—*
Yoshida, Masatoshi; Shibata, Katsuji; Kojima, Mitsumasa; Satou, Hidetaka; Kato, Toshihiko; Miyadera, Yasuo; and Yusa, Masami, 5,115,089, Cl. 528-353.000

Miyagawa, Kazuya: *See—*
Miyamoto, Takashi; Miyagawa, Kazuya; Tomimatsu, Yukihito; Sugiura, Tsutomu; Nishi, Kenji; and Ichihara, Taku, 5,114,224, Cl. 353-122.000.

Miyagi, Ken; and Miyake, Hiroyuki, to Canon Kabushiki Kaisha. Beam recorder with scan position control. 5,115,256, Cl. 346-108.000.

Miyagi, Tokuya; Inoue, Akihisa; Otsubo, Taisuke; and Hori, Yoshihiro. Filter element and its production. 5,114,508, Cl. 156-69.000.

Miyai, Hiromasa: *See—*
Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, 5,114,668, Cl. 376-442.000

Miyajima, Yukio, to Sanko Plastics Co., Ltd. Integrally molded cross-flow fan and method of making the same by radially withdrawing gap-forming molds. 5,114,657. Cl. 264-334.000.

Miyake, Hiroaki: *See—*
Ohtsuka, Masahito; Kobayashi, Hiroo; Moritani, Toshifumi; Yagi, Tadashi; Tsuchiya, Yoshiro; Azeta, Takahiro; Waragai, Tsuyoshi; Yukimachi, Hiroshi; and Miyake, Hiroaki, 5,115,281, Cl. 355-319.000.

Miyake, Hiroyuki: *See—*
Miyagi, Ken; and Miyake, Hiroyuki, 5,115,256, Cl. 346-108.000.

Miyake, Masao: *See—*
Nakagawa, Yukio; Koizumi Syoji; Miyake, Masao; Akita, Teruo; and Uno, Tomohisa, 5,114,788, Cl. 428-284.000.

Miyake, Masayoshi: *See—*
Konishi, Kouji; Ohshima, Tadayoshi; Fujii, Masakazu; Hagino, Motoyuki; Hosono, Satoshi; and Miyake, Masayoshi, 5,115,144. Cl. 250-572.000.

Miyaki, Takeo: *See—*
Sawada, Yosuke; Kakushima, Masatoshi; Nishio, Maki; Miyaki, Takeo; and Oki, Toshikazu, 5,114,857, Cl. 435-252.100.

Miyamoto, Takashi; Miyagawa, Kazuya; Tomimatsu, Yukihito; Sugiura, Tsutomu; Nishi, Kenji; and Ichihara, Taku, to Densu Prox., Inc.; and Aoi Studio Co., Ltd. Automatic follow-up projecting system. 5,114,224, Cl. 353-122.000.

Miyata, Eiji: *See—*
Kusano, Hiroshi; Ito, Tsuyoshi; Tashiro, Takayuki; Takayanagi, Hiroaki; and Miyata, Eiji. 5,114,577, Cl. 210-198.200.

Miyata, Souichi: *See—*
Okamoto, Toshiya; and Miyata, Souichi, 5,115,510, Cl. 395-775.000.

Miyatani, Toshio: *See—*
Ihara, Kiyohiko; Ontani, Katsuhide; Nakata, Yutaka; and Miyatani, Toshio, 5,115,038, Cl. 528-326.200.

Miyawaki, Keizou; Itoh, Noboru; and Mikami, Izumi, to Mitsubishi Denki Kabushiki Kaisha. Mirror support apparatus and system. 5,115,351, Cl. 359-849.000.

Miyazaki, Daishiro: *See—*
Hayashi, Takeshi; Sato, Shigeru; Tsujimoto, Katsuaki; Miyazaki, Daishiro; Hiwasa, Yoneo; and Ishimatsu, Toshiki, 5,113,954, Cl. 175-415.000.

Miyazawa, Seiichi, to Canon Kabushiki Kaisha. Semiconductor laser apparatus. 5,115,443, Cl. 372-46.000.

Miyazawa, Takeshi: *See—*
Fujii, Nobuo; Kiyota, Hiroyuki; Katagishi, Yoshihiro; and Miyazawa, Takeshi, 5,113,662, Cl. 62-6.000.

Miyoshi, Jun; Shibanaka, Mitsugu; Matsui, Toshikazu; and Ohtsuka, Nobukazu, to Mita Industrial Co., Ltd. Document pusher plate of an image forming equipment. 5,114,136, Cl. 271-213.000.

Mizui, Kinya; and Furuya, Yoshiaki, to Mitsui Petrochemical Industries, Ltd. Lubricant oil for refrigerators. 5,114,605, Cl. 252-68.000.

Mizuno, Kenichi; Tajima, Yo; and Watanabe, Masakazu, to NGK Spark Plug Co., Ltd. Silicon nitride sintered body and method for producing same. 5,114,888, Cl. 501-96.000.

Mizuno, Toshiya; Teramoto, Yoshikichi; Saito, Takeshi; and Wakabayashi, Juichi, to Kureha Kagaku Kogyo. Poly(arylene sulfide) sheet. 5,115,092, Cl. 528-388.000.

Mizutani, Hiroyuki: *See—*
Nakamura, Eiji; and Mizutani, Hiroyuki, 5,114,467, Cl. 75-10.220.

Mobil Oil Corporation: *See—*
Abramo, Guy P.; and Trewella, Jeffrey C., 5,114,435, Cl. 44-348.000.
Greco, Saverio G.; and Audeh, Costandi A., 5,114,675, Cl. 422-62.000.
Jones, Lloyd G.; and Yeh, Charles S., 5,113,935, Cl. 166-51.000.
Warburton, Richard T., 5,114,651, Cl. 264-156.000.

Mochizuki, Masataka: *See—*
Sakaya, Masuji; Okiai, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, 5,113,932, Cl. 165-104.260.

Mochizuki, Mitsuhiro; Wada, Mitsuo; and Seitou, Hiromitsu, to Polyplastics Co., Ltd. Polyester resin molding compositions and molded articles formed of the same. 5,115,004, Cl. 524-107.000.

Moghe, Sharad R., to B. F. Goodrich Company, The. Fiber reinforced composite threaded member 5,114,290, Cl. 411-411.000.

Mohr, Dieter: *See—*
Zertani, Rudolf; Mohr, Dieter; Rode, Klaus; Frass, Werner; and Joerg, Klaus, 5,114,832, Cl. 430-285.000.

Moldavsky, David; and Stone, Robert L. Extended cordless telephone system. 5,115,463, Cl. 379-58.000.

Mole, Philip J., to General Drawings Corporation, Convair Division. Wind tunnel variable range balance. 5,113,696, Cl. 73-147.000.

Moli Energy Limited: *See—*
Stiles, James A. R.; and Brandt, Klaus, 5,114,804, Cl. 429-66.000.

Molveaux, Gerard R. M.: *See—*
Amiot, Jacques H. J.; Bouleau, Jean-Paul A. A.; and Molveaux, Gerard R. M., 5,115,117, Cl. 219-254.000.

Moniwa, Masahiro: *See—*
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,115,289, Cl. 357-23.700.

Monroe Auto Equipment Company: *See—*
Driessen, Jan, 5,113,979, Cl. 188-280.000.

Monsanto Company: *See—*
Asrar, Jawed, 5,115,037, Cl. 525-326.800.
Bryant, Robert D.; Hegde, Shridhar G.; and Lee, Len F., 5,114,465, Cl. 71-94.000.
Haymore, Barry L.; Bild, Gary S.; and Krivi, Gwen G., 5,115,102, Cl. 530-399.000.
Stimpson, Donald I., 5,114,555, Cl. 204-183.200.

Monson, Paul J. E.; Rockstroh, Todd J.; Mannava, Seetha R.; and Baeumel, Robert E., to General Electric Company. Method for making a gas turbine engine component. 5,113,582, Cl. 29-889.200.

Montague Industries, Inc.: *See—*
Grimes, David B., 5,113,621, Cl. 51-5.00D.

Montgomery, Preston D., to Multiple Systems, Inc. Clothes pin down puller. 5,114,378, Cl. 452-128.000.

Moody, Thomas O. Personnel location monitoring system and method. 5,115,223, Cl. 340-573.000.

Moolenaar, A. J.: *See—*
Houben, J. P.; and Moolenaar, A. J., 5,113,951, Cl. 173-075.000.

Mooradian, Aram, to Massachusetts Institute of Technology. Microchip laser array. 5,115,445, Cl. 372-75.000.

Moore, Jeffrey A.: *See—*
Jane, Jay-Lin; Schwabacher, Alan W.; Ramrattan, Sam N.; and Moore, Jeffrey A., 5,115,000, Cl. 524-47.000.

Moore, Lionel D.: *See—*
Kennedy, Steven; Eggerding, David W.; and Moore, Lionel D., 5,114,603, Cl. 252-56.00R.

Moore, William E., to United States of America, Energy. Two stage sorption of sulfur compounds. 5,114,690, Cl. 423-244.000.

Moormann, Randall H., to Tonka Corporation. Rapid fire ball launcher. 5,113,842, Cl. 124-65.000.

Moormann, Randall H.: *See—*
Rosenwinkel, Donald A.; and Moormann, Randall H., 5,114,153, Cl. 273-292.000.

Moran, Steven M., to Kransco. Bodyboard with variable stiffness. 5,114,370, Cl. 441-65.000.

Mordo, David: *See—*
Gat, Arnon; and Mordo, David, 5,114,242, Cl. 374-128.000.

Morel, Andre: *See—*
LaRoche, Robert; and Morel, Andre, 5,113,559, Cl. 29-121.100.

Morency, Roger L.; and Ames, Gregory H., to United States of America, Navy. High-strength in-line fiber optic connector. 5,115,483, Cl. 385-60.000.

Morgan Manufacturing Inc.: *See—*
Palmgren, Carl T., 5,113,687, Cl. 72-479.000.

Mori, Akinori: *See—*
Yamanishi, Toru; Kakuta, Tatsuya; and Mori, Akinori, 5,115,103, Cl. 174-24.000.

Mori, Haruki: *See—*
Katakami, Tsutomu; Yokoyama, Tatsuro; Mori, Haruki; Kawauchi, Nobuya; Kamiya, Joji; and Ishii, Masaaki, 5,114,941, Cl. 514-253.000.

Mori, Hiroshi: *See—*
Fujiwara, Takumi; Mori, Hiroshi; and Kawazoe, Takemi, 5,115,512, Cl. 385-14.000.

Mori, Kelji; and Kogita, Hidekazu, to Aisin Seiki Kabushiki Kaisha. Mirror Apparatus. 5,115,353, Cl. 359-871.000.

Mori, Masaharu, to Clarion Co., Ltd. Spread spectrum receiver. 5,115,448, Cl. 375-1.000.

Mori, Masaji: *See—*
Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, 5,114,668, Cl. 376-442.000.

Mori, Yoshihiko: *See—*
Arai, Fumihito; and Mori, Yoshihiko, 5,115,319, Cl. 358-228.000.

Moriceau, Hubert: *See—*
Fedeli, Jean-Marc; Moriceau, Hubert; Muffato, Viviane; and Vaudaine, Marie-Helene, 5,113,575, Cl. 29-603.000.

Morikawa, Hirohiko: *See—*
Tsuda, Kazuhiko; Kako, Hiroyoshi; Morikawa, Hirohiko; Noguchi, Noboru; and Nakanishi, Nobuyasu, 5,114,216, Cl. 303-117.000.

Morikawa, Iwao: *See—*
Kanzawa, Yoshikazu; Fujikake, Yasushi; Ito, Osami; Ito, Shuho; Oikawa, Hironobu; Otsubo, Makoto; Morikawa, Iwao; Shiratori, Yuichi; and Tsukada, Kiyoshi, 5,113,926, Cl. 164-119.000.

Morimoto, Yoshinari: *See—*
Hirata, Keiichi; Morimoto, Yoshinari; Ooishi, Minoru; Ban, Tomohiro; and Furukawa, Akihiro, 5,115,410, Cl. 395-650.000.

Morinaga Milk Industry Co., Ltd.: *See—*
Takaku, Fumimaro; and Motoyoshi, Kazuo, 5,114,710, Cl. 424-85.100.

Morishima, Ryuji; and Asai, Katsutoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Spiral spring type starter apparatus for an internal combustion engine. 5,113,816, Cl. 123-179.250.

Morita, Katsumi: *See—*
Isobe, Mitsuo; and Morita, Katsumi, 5,115,313, Cl. 358-183.000.

Morita, Ken: *See—*
Tachibana, Kaoru; Morita, Ken; and Takahashi, Hiroo, 5,115,323, Cl. 358-330.000.

Morita Pump Kabushiki Kaisha: *See—*
Nakagawa, Seiichi; Muruyama, Yoshihara; Shiota, Masanori; Ishida, Kando; Fujita, Masayoshi; and Yamada, Shigenobu, 5,113,944, Cl. 169-13.000.

Morita, Shoji, to Atsugi Motor Parts Company, Limited. Rotary internal gear pump having teeth with asymmetrical trailing edges. 5,114,325, Cl. 418-171.000.

Morita, Shoji: *See—*
Suga, Seiji; and Morita, Shoji, 5,113,814, Cl. 123-90.170.

Morita, Toshio. Fishing line device. 5,113,614, Cl. 43-42.740.

Moritani, Toshifumi: *See—*
Ohtsuka, Masahito; Kobayashi, Hiroo; Moritani, Toshifumi; Yagi, Tadashi; Tsuchiya, Yoshiro; Azeta, Takahiro; Waragai, Tsuyoshi; Yukimachi, Hiroshi; and Miyake, Hiroaki, 5,115,281, Cl. 355-319.000.

Moritz, William K.: *See—*
Sjogren, Christer A.; Kipp, Louis D.; and Moritz, William K., 5,114,306, Cl. 414-790.400.

Moriyasu, Koichi: *See—*
Oda, Kengo; Moriyasu, Koichi; Hayashi, Masao; Nishida, Makoto; Oyamada, Masami; Fujiwara, Akie; and Watanabe, Junko, 5,114,466, Cl. 71-94.000.

Morizumi, Masaaki: *See—*
Kondo, Shigeru; Takatori, Naoki; Morizumi, Masaaki; and Kanamori, Shino, 5,115,267, Cl. 354-221.000.

Morland, Albert H.; and Warren, Timothy J., to CooperVision, Inc. Process for casting lenses. 5,114,629, Cl. 264-2.200.

Morman, Michael T., to Kimberly-Clark Corporation. Multi-direction stretch composite elastic material including a reversibly necked material. 5,114,781, Cl. 428-198.000.

Moroto, Shuzo: *See—*
Nimura, Mitsuhiro; Yokoyama, Shoji; Yamada, Takashi; Sumiya, Koji; and Moroto, Shuzo, 5,115,399, Cl. 364-449.000.

Morris, Carl W.: *See—*
Keizer, Gregory J.; and Morris, Carl W., 5,114,284, Cl. 404-95.000.

Morris, Michael: *See—*
Kindt-Larsen, Ture; Wolff, Per; and Morris, Michael, 5,114,240, Cl. 366-129.000.

Morris, Peter, to Vaccar Systems (Proprietary) Limited. Service station forecourt installations. 5,114,050, Cl. 222-192.000.

Morrison, William O. Device for insulating motor stators. 5,114,241, Cl. 366-162.000.

Morse, Mark A.: *See—*
Chung, Fung-Lung; Hecht, Stephen S.; Eklind, Karin; and Morse, Mark A., 5,114,969, Cl. 514-514.000.

Mort, Joseph; and Machonkin, Mary A., to Xerox Corporation. Liquid ink compositions. 5,114,477, Cl. 106-20.000.

Mortazavi, Said, to Siemens Pacesetter, Inc. Blood oxygen sensor having leakage compensation. 5,113,862, Cl. 128-633.000.

Moser, Hans; Bohner, Beat; and Fory, Werner, to Ciba-Geigy Corporation. 1,5-Diphenylpyrazole-3-carboxylic acid derivatives for the protection of cultivated plants. 5,114,462, Cl. 71-88.000.

Mosher, Deane F.; and Asakura, Shinji, to Wisconsin Alumni Research Foundation. Methods to make and use proteinaceous material present in kinin-free high molecular weight kininogen. 5,114,413, Cl. 604-266.000.

Moss, Ernest K.: *See—*
Canaday, John S.; and Moss, Ernest K., 5,114,755, Cl. 427-373.000.

Moss, Gerald L.: *See—*
Niiler, Andrus; Moss, Gerald L.; and Eichelberger, Robert J., 5,114,645, Cl. 264-84.000.

Motegi, Hisao; Sunaga, Takeshi; and Zenbayashi, Michio, to Toshiba Silicone Co., Ltd. Glycidoxy group-containing organosilicon compound. 5,115,069, Cl. 52.8-15.000.

Motekaitis, Ramunas J.: *See—*
Martell, Arthur E.; and Motekaitis, Ramunas J., 5,114,688, Cl. 423-219.000.

Motorola, Inc.: *See—*
Baker, Thomas R.; Boland, Bernard W.; and Shumate, David A., 5,114,875, Cl. 437-62.000.
Cohen, Robert B.; and Garner, Robert E., 5,115,506, Cl. 395-725.000.
Ehmke, Edward L.; Nguyen, Tuan K.; and DeLuca, Michael J., 5,115,182, Cl. 320-14.000.
Jaskie, James E., 5,115,344, Cl. 359-573.000.
Lebeau, Christopher J., 5,115,475, Cl. 382-8.000.
Lin, Paul T., 5,114,880, Cl. 437-217.000.
Robb, Stephen P.; Phipps, John P.; and Gadberry, Michael D., 5,115,369, Cl. 361-93.000.
Zdunek, Kenneth J.; and Krebs, Jay R., 5,115,233, Cl. 340-825.440.

Motoyama, Yu, to Yamaha Hatsudoki Kabushiki Kaisha. Two cycle internal combustion engine. 5,113,829, Cl. 123-431.000.

Motoyoshi, Kazuo: *See—*
Takaku, Fumimaro; and Motoyoshi, Kazuo, 5,114,710, Cl. 424-85.100.

Mott Metallurgical Corporation: *See—*
Davis, Christopher B., 5,114,447, Cl. 55-485.000.

Moulinex (Societe Anonyme): *See—*
Amiot, Jacques H. J.; Bouleau, Jean-Paul A. A.; and Molveaux, Gerard R. M., 5,115,117, Cl. 219-254.000.

Moulton, Kern A.: *See—*
Campbell, Bryant A.; and Moulton, Kern A., 5,115,166, Cl. 315-111.210.

Moyle, Don R.; and Dilworth, Glendon L. Shaft shielding top loader. 5,114,368, Cl. 440-47.000.

MTS Systems Corporation: *See—*
Peterson, Wade D.; Hellwig, Joachim; and Heuckelbach, Rainer, 5,115,195, Cl. 324-207.130.

MTU Motoren- und Turbinen-Union Muenchen GmbH: *See—*
Uihlein, Thomas; and Schweitzer, Klaus, 5,114,797, Cl. 428-553.000.

Mueck, Edward A. Conveyer line straightener. 5,113,994, Cl. 198-395.000.

Mueller, Francis X., Jr.: *See—*
Stricklen, Phil M.; Mueller, Francis X., Jr.; Willcox, Kenneth W.; and Snow, Joyce K., 5,115,054, Cl. 526-159.000.

Mueller, Karl F.; and Plankl, Walter L., to Ciba-Geigy Corporation. Fluorine and/or silicone containing poly(alkylene-oxide)-block copolymers and contact lenses thereof. 5,115,056, Cl. 526-243.000.

Mueller, Klaus: *See—*
Benzinger, Roland; Schmitt, Edgar; Siegel, Heinz; Huebl, Ewald; Mueller, Klaus; Himmelsbach, Manfred; and Jordan, Martin, 5,114,215, Cl. 303-113.0TB.

Muffato, Viviane: *See—*
Fedeli, Jean-Marc; Moriceau, Hubert; Muffato, Viviane; and Vaudaine, Marie-Helene, 5,113,575, Cl. 29-603.000.

Muhlhoff, Martin: *See—*
Kabelitz, Hans-Peter; Muhlhoff, Martin; Kriechel, Hans; Maas, Wolfgang; and Kolvenbach, Dieter-Martin, 5,114,320, Cl. 417-423.130.

Mukai, Hidehito: *See—*
Sato, Kenichi; and Mukai, Hidehito, 5,114,908, Cl. 505-1.000.

Mulard, Philippe: *See—*
Dubreux, Bernard; Kervennal, Jacques; Mulard, Philippe; and Pralus, Michele, 5,114,433, Cl. 44-322.000.
Praulus, Michele; Dubreux, Bernard; and Mulard, Philippe, 5,114,434, Cl. 44-322.000.

Muller, Heinrich; and Wobbe, Jens-Peter, to Feinmechanische Werke Mainz GmbH. Electromagnetically actuated quick-action switching valve. 5,114,116, Cl. 251-129.150.

Muller, Manfred: *See—*
Taybl, Christa; Muller, Manfred; Gerke, Dieter; and Bulow, Harald, 5,114,356, Cl. 439-133.000.

Muller, Martin: *See—*
Jochum, Peter; and Muller, Martin, 5,114,064, Cl. 227-9.000.

Multicolor Specialties, Inc.: *See—*
Lynch, James F., 5,114,481, Cl. 106-170.000.
Lynch, James F., 5,114,484, Cl. 106-170.000.
Lynch, James F.; and Predkelis, John, 5,114,485, Cl. 106-311.000.

Multiple Systems, Inc.: *See—*
Montgomery, Preston D., 5,114,378, Cl. 452-128.000.

Mumby, Edward S.; and Shinneman, Kevin J., to Baker Hughes Incorporated. Stepper motor driven negative pressure pulse generator. 5,115,415, Cl. 367-85.000.

Munday, William A.: *See—*
Hart, Judy L.; and Munday, William A., 5,114,260, Cl. 403-24.000.

Mundy, Roy E.: *See—*
Karabin, Tadeusz; and Mundy, Roy E., 5,114,336, Cl. 431-125.000.

Muntnich, Leo; Steinberger, Wolfgang; and Soyka, Wilfried, to INA Walzlager Schaeffler KG. Axial rolling bearing. 5,114,249, Cl. 384-622.000.

Murai Co., Ltd.: *See—*
Hyoi, Isao, 5,114,219, Cl. 351-121.000.

Murai, Ryukichi; and Endo, Masaaki, to Yoshida Kogyo, K.K. Buckle. 5,113,556, Cl. 24-633.000.

Murai, Teruyuki: *See—*
Yamamoto, Susumu; Murai, Teruyuki; Kawabe, Nozomu; and Tobioka, Massaki, 5,114,641, Cl. 264-60.000.

Murakami, Hiroko: *See—*
Yabusaki, Yoshiyasu; Murakami, Hiroko; Sakai, Toshiyuki; Shibata, Megumi; and Ohkawa, Hideo, 5,114,852, Cl. 435-189.000.

Murakami, Kouji; and Matsunaga, Taira, to Kabushiki Kaisha Toshiba. MOS type semiconductor device and method for manufacturing the same. 5,115,290, Cl. 357-23.900.

Murakami, Shigeru: *See—*
Matsuo, Shigeru; Murakami, Shigeru; Chino, Shinji; and Yako, Naoto, 5,115,077, Cl. 528-125.000.

Murakawa, Masatake; Imanishi, Ryozo; and Fujiwara, Yoji, to Kubota Corporation. Cooling system for a liquid cooled engine. 5,113,819, Cl. 123-198.00E.

Muraki, Tomoyasu: *See—*
Sudo, Morihiro; Muraki, Tomoyasu; Kawachi, Eiji; and Kawachi, Yasushi, 5,114,794, Cl. 428-447.000.

Muralidhara, H. S.: *See—*
Senapati, Nagabhusan; Johnson, Harold W.; Kim, Byung C.; Chauhan, Satya P.; Gamlen, Dennis A.; Eason, Raju; Muralidhara, H. S.; and Zelinski, Matthew S., 5,114,560, Cl. 204-299.00R.

Muramatsu, Atsushi, to Tokai Rubber Industries, Ltd. Fluid-filled elastic mount having means for controlling pressure in air chamber in resonance member in pressure-receiving chamber. 5,114,124, Cl. 267-140.10A.

Muramatsu, Takeshi: *See—*
Hamanaka, Izumi; Maekawa, Yoshikazu; Arai, Hiroyuki; Nishiki, Akihiko; Muramatsu, Takeshi; Yokoyama, Toshio; and Yukizane, Shigemi, 5,114,130, Cl. 270-53.000.

Muramoto, Hisaichi; Ninomiya, Yusuke; Ishii, Keizou; and Ishikura, Shinichi, to Nippon Paint Co., Ltd. Composite resin particles and preparation thereof. 5,115,020. Cl. 525-74.000.

Murata, Masahide: *See—*
Yashiro, Teruo; Kanazawa, Seizaburo; Nakano, Akira; Murata, Masahide; and Imai, Masafumi, 5,114,896, Cl. 502-111.000.

Murata, Mitsuhiro: *See—*
Ogawa, Masatomi; and Murata, Mitsuhiro, 5,115,065, Cl. 526-304.000.

Murata, Tomoji: *See—*
Shibazaki, Kenji; Irie, Yutaka; Ito, Masazumi; and Murata, Tomoji, 5,115,274, Cl. 355-243.000.

Murayama, Jin; and Fukazawa, Jun, to Fuji Photo Film Co., Ltd. Solid-state imaging device. 5,115,293, Cl. 357-30.000.

Murayama, Noboru, to Ricoh Company, Ltd. Image data processing method for compressing an image by approximating curves using a polynomial. 5,115,479, Cl. 382-56.000.

Murphy, Douglas A.: *See—*
Levine, Mark; Bellwoar, George; and Murphy, Douglas A., 5,113,602, Cl. 40-634.000.

Murphy, Mark T.; Buelt, James L.; Stottlemyre, James A.; and Tixier, John S., Jr., to Battelle Memorial Institute. Vitrified underground structures. 5,114,277, Cl. 405-231.000.

Murphy, Philip: *See—*
Cipolla, Thomas M.; Coteus, Paul W.; Johnson, Glen W.; Murphy, Philip; and Oden, Christopher W., 5,113,565, Cl. 29-25.010.

Murray, Donald C., to Rock of Ages Corporation. Adjustable stone formed work support and method of providing same. 5,113,630, Cl. 52-223.00R.

Murray, Michael A.: *See—*
Wiewiorowski, Tadeusz K.; Astley, Vivian C.; Taravella, Jody J.; and Murray, Michael A., 5,114,699, Cl. 423-531.000.

Murray, Michael K.: *See—*
Kuiken, Paul A.; and Murray, Michael K., 5,113,849, Cl. 128-26.000.

Murtagh, Martin J.: *See—*
Beall, Douglas M.; DeLisio, Evelyn M.; and Murtagh, Martin J., 5,114,643, Cl. 264-63.000.
Beall, Douglas M.; DeLisio, Evelyn M.; Guile, Donald L.; and Murtagh, Martin J., 5,114,644, Cl. 264-63.000.

Murtonen, Salomo, to Next Wave Inc. Procedure and device for applying vibration to the human body. 5,113,852, Cl. 128-33.000.

Muruyama, Yoshiharu: *See—*
Nakagawa, Seiichi; Muruyama, Yoshiharu; Shiota, Masanori; Ishida, Kando; Fujita, Masayoshi; and Yamada, Shigenobu, 5,113,944, Cl. 169-13.000.

Muryayama, Kimimasa: *See—*
Isegawa, Yo; Kito, Takeshi; Muryayama, Kimimasa; Ikawa, Shoji; Iwase, Takahiro; Sugiura, Tutomu; and Tsuzuki, Atsuyuki, 5,114,521, Cl. 156-242.000.

Mushinski, Roger J.; Lewis, Charles E.; and Casey, Lawrence J., to WTA Inc. Interleaved spiral wrapping of foam product and stretch film for packaging carbonless paper rolls. 5,114,012, Cl. 206-523.000.

Musikanti, Barry L.; and Deutsch, Allan S., to Essential Dental Systems, Inc. Resilient support structure. 5,114,343, Cl. 433-173.000.

Mussini, Gian P., to Fabriques de Tabac Reunies, S.A. Delivery device and sorting machine for rod-like articles. 5,114,015, Cl. 209-535.000.

Mutharasan, Rajakkannu: *See—*
Eckert, C. Edward; Hornack, Thomas R.; Lyness, George E.; Kaems, John A.; Cox, Clarence J.; Miller, Ronald E.; Apelian, Diran; and Mutharasan, Rajakkannu, 5,114,472, Cl. 75-412.000.

Muto, Kazuhiko; Shirai, Takahiro; and Yoshinari, Tsunenori, to Canon Kabushiki Kaisha. Semiconductor photosensor having unitary construction. 5,115,124, Cl. 250-214.00L.

Mutoh, Hiedki: *See—*
Miida, Takashi; Kudoh, Yoshimitsu; and Mutoh, Hiedki, 5,115,155, Cl. 307-607.000.

Myers, Austin R., to Thermal Transfer Products, Ltd. Heat exchanger with fluid pressure relief means. 5,113,928, Cl. 165-38.000.

Myers, Bruce B., to Wells Electronics, Inc. Chip carrier socket. 5,114,358, Cl. 439-266.000.

Myohga, Osamu; and Uchikawa, Tadao, to NEC Corporation. Ultrasonic motor. 5,115,161, Cl. 310-323.000.

Nabisco Brands, Inc.: *See—*
D'Amelia, Ronald P.; and Jacklin, Peter T., 5,115,017, Cl. 525-59.000.
Spanier, Henry C.; and Ekpo, Bassey O., 5,114,704, Cl. 424-57.000.

Nachshon, Yehuda. Photoresist removal. 5,114,834, Cl. 430-329.000.

Nadkarni, Sadashiv K.: *See—*
Jain, Mukesh K.; Nadkarni, Sadashiv K.; and Gesing, Adam, 5,114,695, Cl. 423-411.000.

Nadolink, Richard H.: *See—*
Cincotta, Manuel; and Nadolink, Richard H., 5,114,104, Cl. 244-219.000.

Naeger, Dennis P.; and Perugini, Joseph J., to Betz Laboratories, Inc. Crude oil desalting process. 5,114,566, Cl. 208-289.000.

Naess, Johan H., to Maxton Fox Commercial Furniture Pty. Ltd. Tilting chair with improved lumbar support. 5,114,210, Cl. 297-300.000.

Nagafuchi, Kazumasa, to Kisokaseisangyou Co., Ltd. Processed paper for documents protected from being reproduced. 5,114,782, Cl. 428-207.000.

Nagai, Kiyoshi. Composite filter and illuminating device. 5,115,379, Cl. 362-23.000.

Nagamune, Akio; Tezuka, Kouichi; and Komine, Isamu, to NKK Corporation. In-furnace slag level measuring apparatus. 5,115,242, Cl. 342-124.000.

Nagano, Masami; Atago, Takeshi; and Nemoto, Mamoru, to Hitachi, Ltd. Method and controller for supplying fuel to cylinders of multi-cylinder internal combustion engine. 5,113,833, Cl. 123-491.000.

Nagano, Takeshi: *See—*
Shirahama, Hidefumi; Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; Iwanaka, Mitsufumi; Nagano, Takeshi; and Ishida, Youuji, 5,115,386, Cl. 363-41.000.

Nagano, Toshihiro: *See—*
Kyoukane, Yasuaki; and Nagano, Toshihiro, 5,115,183, Cl. 320-61.000.

Nagano, Toshio: *See—*
Nakajima, Hidemi; and Nagano, Toshio, 5,114,207, Cl. 296-204.000.

Nagano, Yuuji: *See—*
Ito, Kazuhiro; Matsuda, Hiroshi; and Nagano, Yuuji, 5,114,866, Cl. 437-3.000.

Nagasawa, Fumihiro: *See—*
Takano, Masayuki; Onozuka, Kuniharu; Nagasawa, Fumihiro; and Matsumoto, Akihiko, 5,115,310, Cl. 358-185.000.

Nagasawa, Takeshi: *See—*
Kuroiwa, Katsumasa; Matsuura, Hitoshi; Katayama, Katsuhiro; Nakatsuyama, Shuichi; Nagasawa, Takeshi; and Endo, Koji, 5,115,099, Cl. 530-331.000.

Nagase, Toshio: *See—*
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Nishikibe, Masaru; Ihara, Masaki; and Yano, Mitsuo, 5,114,918, Cl. 514-11.000.

Nagata, Kazuhisa: *See—*
Ikeda, Nobuyuki; Nagata, Kazuhisa; and Oba, Chikashi, 5,114,208, Cl. 296-216.000.

Nager, Urs F., Jr.: *See—*
Ferraro, Neil P.; Nager, Urs F., Jr.; Logue, Raymond C.; Chen, Edward J.; and Lee, Patrick S., 5,113,679, Cl. 72-21.000.

Nagji, Moez M.; Holmes, Ervine S.; and Pai, Jenny L., to UOP. Integrated process for the removal of sulfur compounds from fluid streams. 5,114,689, Cl. 423-230.000.

Naikwadi, Krishnat P.: *See—*
Karasek' Francis W.; Naikwadi, Krishnat P.; and Hutzinger, Otto, 5,113,772, Cl. 110-345.000.

Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onoda, Yoshihito; and Kuwahara, Hideo, to Fujitsu Limited. Receiver for coherent optical communication. 5,115,332, Cl. 359-189.000.

Naito, Tsutomu; Nishimura, Genshiro; and Komine, Kikuji, to Toa Nenryo Kogyo Kabushiki Kaisha. High strength, high modulus pitch-based carbon fiber. 5,114,697, Cl. 423-447.100.

Nakacho, Yoshifumi; Inubushi, Akiyoshi; and Tada, Yuji, to Otsuka Kagaku Kabushiki Kaisha. All solid-state lithium secondary battery. 5,114,809, Cl. 429-192.000.

Nakagawa, Katsumi: *See—*
Echizen, Hiroshi; Fujioka, Yasushi; Nakagawa, Katsumi; Kanai, Masahiro; Kariya, Toshimitsu; Matsuyama, Jinsho; and Takei, Tetsuya, 5,114,770, Cl. 427-38.000.

Nakagawa, Seiichi; Muruyama, Yoshiharu; Shiota, Masanori; Ishida, Kando; Fujita, Masayoshi; and Yamada, Shigenobu, to Morita Pump Kabushiki Kaisha. Simple fire extinguishing apparatus. 5,113,944, Cl. 169-13.000.

Nakagawa, Toshiyuki; Takahashi, Nobuyuki; and Akimoto, Takashi, to ANELVA Corporation. Temperature control system for semiconductor wafer or substrate. 5,113,929, Cl. 165-61.000.

Nakagawa, Yukio; Koizumi, Syoji; Miyake, Masao; Akita, Teruo; and Uno, Tomohisa, to Asahi Kasei Textile Ltd. Fabric having water absorption property and method of manufacturing the fabric. 5,114,788, Cl. 428-284.000.

Nakahata, Masaaki: *See—*
Ishibashi, Shigeki; Nakamura, Kouzaburou; Maruno, Tohru; Nakahata, Masaaki; Negishi, Takaaki; and Urano, Fumiyoshi, 5,114,615, Cl. 252-299.670.

Nakajima, Akira, to Sharp Kabushiki Kaisha. IC card ejecting device. 5,115,376, Cl. 361-415.000.

Nakajima, Hajime; Watanabe, Isao; and Tanaka, Kunimaro, to Mitsubishi Denki Kabushiki Kaisha. Optical storage medium with provision for limitation of thermal conduction. 5,115,424, Cl. 569-275.400.

Nakajima, Hidemi; and Nagano, Toshio, to Nissan Motor Co., Ltd. Body for battery-powered industrial vehicle. 5,114,207, Cl. 296-204.000.

Nakajima, Yukio: *See—*
Uda, Taizo; Takeyasu, Akira; Kawaguchi, Tetsuo; and Nakajima, Yukio, 5,115,097, Cl. 530-326.000.

Nakamatsu, Shuji: *See—*
Shimamune, Takayuki; Nakamatsu, Shuji; Sawamoto, Isao; Masuda, Hiroshi; and Nishiki, Yoshinori, 5,114,549, Cl. 204-149.000.

Nakamoto, Katsuya: *See—*
Takahashi, Akira; Kanno, Yoshiaki; Sumitani, Jiro; Nakamoto, Katsuya; Sasaki, Takeo; and Akasu, Masahira, 5,115,397, Cl. 364-431.050.

Nakamura, Eiji; and Mizutani, Hiroyuki, to Sumitomo Light Metal Industries Ltd. Method for manufacturing magnetostrictive materials. 5,114,467, Cl. 75-10.220.

Nakamura, Kenji, to Minolta Camera Kabushiki Kaisha. Image forming recording device capable of carrying out frame or field recording. 5,115,357, Cl. 360-75.000.

Nakamura, Kouzaburou: *See—*
Ishibashi, Shigeki; Nakamura, Kouzaburou; Maruno, Tohru; Nakahata, Masaaki; Negishi, Takaaki; and Urano, Fumiyoshi, 5,114,615, Cl. 252-299.670.

Nakamura, Susumu; and Yokoi, Koichi, to Sankyo Engineering Co., Ltd. Mold unit for injection molding. 5,114,329, Cl. 425-190.000.

Nakamura, Toshinori: *See—*
Sohda, Yoshio; Ido, Yasuzi; Nakamura, Toshinori; and Suemitsu, Takeshi, 5,114,635, Cl. 264-29.200.

Nakanishi, Kanji: *See—*
Shimizu, Osamu; and Nakanishi, Kanji, 5,114,800, Cl. 428-692.000.

Nakanishi, Nobuyasu: *See—*
Tsuda, Kazuhiko; Kako, Hiroyoshi; Morikawa, Hirohiko; Noguchi, Noboru; and Nakanishi, Nobuyasu, 5,114,216, Cl. 303-117.000.

Nakano, Akira: *See—*
Yashiro, Teruo; Kanazawa, Seizaburo; Nakano, Akira; Murata, Masahide; and Imai, Masafumi, 5,114,896, Cl. 502-111.000.

Nakano, Hiroyoshi: *See—*
Taguchi, Hiroshi; Washizaki, Youji; Igarashi, Akira; and Nakano, Hiroyoshi, 5,114,526, Cl. 156-361.000.

Nakano, Kunio: *See—*
Inada, Jun; Sato, Shinichi; Shimizu, Ryoichi; Kitani, Akinobu; and Nakano, Kunio, 5,114,765, Cl. 428-35.700.

Nakano, Mamoru: *See—*
Ikebuchi, Iwao; Ihara, Yoshitaka; Takei, Hisashi; Yamada, Syozo; Nakano, Mamoru; and Ganse, Akira, 5,114,083, Cl. 241-153.000.

Nakano, Shoichi: *See—*
Okamoto, Shingo; Takahama, Tsuyoshi; Nishikuni, Masato; and Nakano, Shoichi, 5,114,498, Cl. 136-258.000.

Nakanowatari, Jun: *See—*
Ikarashi, Masami; Mitsumori, Kenichi; Kano, Mitsuru; Miki, Yasuhiro; Akimoto, Takemi; Yamaguchi, Masahiko; Sasaki, Yorihiko; Kamigaki, Tomoo; Nakanowatari, Jun; Kato, Yoshinori; and Seki, Hitoshi, 5,115,329, Cl. 359-50.000.

Nakasima, Masaaki: *See—*
Noda, Nobuhiro; Furuya, Katsuhiko; Takahashi, Tadashi; and Nakasima, Masaaki, 5,115,261, Cl. 354-62.000.

Nakata, Takuya: *See—*
Tanaka, So; Hirakata, Takashi; Kawasaki, Shingo; Nakata, Takuya; Makita, Hitoshi; and Kozuki, Koichi, 5,113,744, Cl. 84-634.000.

Nakata, Yutaka: *See—*
Ihara, Kiyohiko; Ontani, Katsuhide; Nakata, Yutaka; and Miyatani, Toshio, 5,115,038, Cl. 525-326.200.

Nakatsuyama, Shuichi: *See—*
Kuroiwa, Katsumasa; Matsuura, Hitoshi; Katayama, Katsuhiro; Nakatsuyama, Shuichi; Nagasawa, Takeshi; and Endo, Koji, 5,115,099, Cl. 530-331.000.

Nakayama, Takehisa: *See—*
Hayashi, Katsuhiko; Yamaguchi, Minori; and Nakayama, Takehisa, 5,115,123, Cl. 250-208.100.

Nakazawa, Masashi: *See—*
Ohta, Wasaburo; Nakazawa, Masashi; and Kinoshita, Mikio, 5,114,559, Cl. 204-298.050.

Nalco Chemical Company: *See—*
Patzelt, R. R.; and Romba, M. A., 5,114,591, Cl. 210-663.000.

Nappholz, Tibor A.; Hursta, William N.; Dawson, Albert K.; and Steinhaus, Bruce M., to Telectronics Pacing Systems, Inc. Implantable ambulatory electrocardiogram monitor. 5,113,869, Cl. 128-696.000.

Narubin, Gunar: *See—*
Shapiro, Bruce; and Narubin, Gunar, 5,113,590, Cl. 33-471.000.

Nass, Peter: *See—*
Smoot, Stephen W.; Hayden, Joseph S.; Clement, Marc; Grabowski, Danuta; Holzel, Eva; Nass, Peter; and Heming, Martin, 5,114,813, Cl. 430-5.000.

Nass, Thomas O. Safety latch mechanism. 5,114,193, Cl. 292-67.000.

National Semiconductor Corporation: *See—*
Cote, James H.; and Ekberg, Jurgen M., 5,114,005, Cl. 206-328.000.
Manley, Martin H., 5,115,288, Cl. 357-23.500.

Nattermann, Kurt: *See—*
Bader, Hubertus C.; Nattermann, Kurt; and Rutze, Uwe, 5,115,486, Cl. 385-124.000.

Nava, Hildeberto; Lake, Robert D.; and Makepeace, Robert B., to Reichhold Chemicals, Inc. Reactive resins with terminal and/or pendant vinyl groups. 5,115,072, Cl. 528-67.000.

Navish, Francis W., Jr.: *See—*
Mendelsohn, Morris A.; Navish, Francis W., Jr.; and Bolton, Richard, 5,114,982, Cl. 521-59.000.

NCR Corporation: *See—*
Crooks, John F.; and Protheroe, Robert L., 5,115,107, Cl. 178-18.000.
Jwo, Chin-Hung; and Wu, Paul S., 5,115,122, Cl. 235-467.000.
Kallin, Fredrik L. N.; and Higgins, Raymond L., 5,115,325, Cl. 358-406.000.
Kass, William J.; and Hilley, Michael R., 5,115,411, Cl. 365-189.010.
Langford, Thomas L., II; and Bullinger, Philip W., 5,115,435, Cl. 371-22.300.
Mergenthaler, Barry M.; and Detwiler, Paul O., 5,115,333, Cl. 359-196.000.

NEC Corporation: *See—*
Aizaki, Akane, 5,115,434, Cl. 307-475.000.
Hara, Takaaki, 5,115,211, Cl. 331-116.0FE.
Myohga, Osamu; and Uchikawa, Tadao, 5,115,161, Cl. 310-323.000.
Nishimura, Kouichi, 5,115,152, Cl. 307-490.000.
Nomura, Masahiro, 5,115,496, Cl. 395-250.000.
Yoshida, Hiroshi, 5,114,868, Cl. 437-34.000.
Yoshimori, Masanori, 5,115,297, Cl. 357-42.000.

Negishi, Takaaki: *See—*
Ishibashi, Shigeki; Nakamura, Kouzaburou; Maruno, Tohru; Nakahata, Masaaki; Negishi, Takaaki; and Urano, Fumiyoshi, 5,114,615, Cl. 252-299.670.

Negoro, Seiji: *See—*
Makino, Yasutaka; Negoro, Seiji; Urabe, Itaru; and Okada, Hirosuke, 5,114,853, Cl. 435-190.000.

Nehls, Walter: *See—*
Meisser, Claudio; Eggenschwiler, Hans; and Nehls, Walter, 5,114,302, Cl. 414-751.000.

Nehring, Jurgen: *See—*
Kraft, Walter; and Nehring, Jurgen, 5,115,270, Cl. 355-38.000.

Neles Oy: *See—*
Marin, Seppo; and Pyotsia, Jouni, 5,113,909, Cl. 137-625.320.

Nelson, Maurice K.: *See—*
Hobson, Michael G.; and Nelson, Maurice K., 5,115,345, Cl. 359-601.000.

Nelson, Sharon L.; Petrovic, John E.; and Swanson, Gerald T., to Teledyne Industries Inc. Water filter cartridge. 5,114,570, Cl. 210-94.000.

Nemirovsky, Mario D.; and Sale, Matthew D., to Delco Electronics Corporation. Microprogrammed timer processor. 5,115,513, Cl. 395-800.000.

Nemoto, Mamoru: *See—*
Nagano, Masami; Atago, Takeshi; and Nemoto, Mamoru, 5,113,833, Cl. 123-491.000.

Nemoto, Peter A.: *See—*
Wettlaufer, David G.; Shutske, Gregory M.; and Nemoto, Peter A., 5,114,936, Cl. 514-233.800.

Nestec S.A.: *See—*
Belville, David L.; Wetherilt, Donald E.; and Wimmers, James E., 5,114,731, Cl. 426-595.000.
Brimelow, Christopher J.; Hsu, Jau Y.; and Proctor, Michael S., 5,114,727, Cl. 426-302.000.
Kibler, Lawrence A.; Kratky, Zdenek; and Tandy, John S., 5,114,734, Cl. 426-650.000.

Neubert, Terry C., to GenCorp Inc. Paper felts or mats. 5,114,991, Cl. 523-201.000.

Neugebauer, Wolfgang, to Huels Aktiengesellschaft. High impact strength thermoplastic molding compositions based on polyphenylene ether graft copolymers and polyamides and process for producing them. 5,115,044, Cl. 525-392.000.

Neundorfer, Inc.: *See—*
Artz, Karl M. H., 5,114,442, Cl. 55-112.000.

New England Deaconess Hospital Corporation: *See—*
Stuart, Regina K.; Lowell, Jeffrey A.; Baxter, John K., III; Bistrian, Bruce R.; and Shikora, Scott, 5,114,401, Cl. 604-53.000.

New Venture Gear, Inc.: *See—*
Frost, Barry L., 5,113,985, Cl. 192-53.00F.
Frost, Barry L., 5,113,986, Cl. 192-53.00F.

Newberry, Steve E.: *See—*
Childress, James H.; and Newberry, Steve E., 5,114,542, Cl. 201-15.000.

Newcomer, William L. Device for the gathering and lifting of debris. 5,114,199, Cl. 294-50.800.

Newhouse, Michael T. Powder inhaler. 5,113,855, Cl. 128-203.120.

Newman, Arnold L.: *See—*
Stanbro, William D.; Hunter, Kenneth W., Jr.; and Newman, Arnold L., 5,114,674, Cl. 422-57.000.

Newman, Kirk E.; Gusack, James A.; and Zehmer, John A., III, to United States of America, Navy. Continuous manufacture and casting. 5,114,630, Cl. 264-3.100.

Next Wave Inc.: *See—*
Murtonen, Salomo, 5,113,852, Cl. 128-33.000.

Ng, Tie H.: *See—*
Tan, Hock S.; Ng, Tie H.; and Mahabadi, Hadi K., 5,114,824, Cl. 430-137.000.

NGK Adrec Co., Ltd.: *See—*
Sugiyama, Takashi; Yamakawa, Osamu; and Sumiya, Akira, 5,114,882, Cl. 501-17.000.

NGK Insulators, Ltd.: *See—*
Ishihara, Takeshi; Fujita, Tadashi; and Misawa, Hidenobu, 5,114,803, Cl. 429-30.000.
Sugiyama, Takashi; Yamakawa, Osamu; and Sumiya, Akira, 5,114,882, Cl. 501-17.000.

NGK Spark Plug Co., Ltd.: *See—*
Kojima, Takio, 5,114,262, Cl. 403-150.000.
Mizuno, Kenichi; Tajima, Yo; and Watanabe, Masakazu, 5,114,888, Cl. 501-96.000.

Nguyen, Anh M.: *See—*
Ridings, James R.; and Nguyen, Anh M., 5,113,977, Cl. 188-69.000.

Nguyen, Kim D.; and Spink, Donald R., to Alpine Plant Foods limited. Production of low-chloride alkali metal phosphates. 5,114,460, Cl. 71-34.000.

N'Guyen, Quang L.; Griat, Jacqueline; Millecamps, Francois; Lang, Gerard; and Forestier, Serge, to Societe Anonyme Dite: L'Oreal. Anti-oxidant system containing stabilized ascorbyl ester, tocopherol or cafeic acid or a derivative thereof, a complexing agent and a polypeptide, and compositions containing the anti-oxidant system. 5,114,716, Cl. 424-401.000.

Nguyen, Tuan K.: *See—*
Ehmke, Edward L.; Nguyen, Tuan K.; and DeLuca, Michael J., 5,115,182, Cl. 320-14.000.

Nicholas, Gregor: *See—*
Piade, Jean-Jacques; and Nicholas, Gregor, 5,113,689, Cl. 73-23.310.

Nicholls, Colin I.: *See—*
Sablik, Martin J.; Nicholls, Colin I.; and Anderson, Robert E., 5,114,914, Cl. 505-1.000.

Nichols, Howard H.: *See—*
Godbe, Murray C.; and Nichols, Howard H., 5,113,770, Cl. 110-187.000.

Niedermeier, Ernst: *See—*
Kammerl, August; and Niedermeier, Ernst, 5,115,148, Cl. 307-475.000.

Nieh, Kai-Wei: *See—*
Josefowicz, Jack Y.; Rensch, David B.; and Nieh, Kai-Wei, 5,114,910, Cl. 505-1.000.

Niehaus, Jeffrey A.: *See—*
Darley, Henry M.; Niehaus, Jeffrey A.; and Ovens, Kevin M., 5,115,408, Cl. 364-754.000.

Nielinger, Werner; Idel, Karsten-Josef; Westeppe, Uwe; Freitag, Dieter; Wulff, Claus; and Heinz, Hans-Detlef, to Bayer Aktiengesellschaft. Polyamide moulding compositions containing finely divided polyarylene sulphides. 5,115,050, Cl. 525-537.000.

Nielsen, Peter G., to AMP Incorporated. Apparatus for mold module change-out. 5,114,330, Cl. 425-193.000.

Niewold, D. Wayne; and Bradley, Richard A., to Power Planter, Inc. Auger planter method. 5,113,952, Cl. 175-57.000.

Nihira, Shohachi, to Citizen Watch Co., Ltd.; and Astec Inc. Latch mechanism for small-size printer. 5,113,759, Cl. 101-93.210.

Niida, Yoriaki: *See—*
Tsuchiya, Yoshinobu; Kurabayashi, Ken; Kito, Seiichiro; and Niida, Yoriaki, 5,115,378, Cl. 361-502.000.

Niiler, Andrus; Moss, Gerald L.; and Eichelberger, Robert J., to United States of America, Army. Fabrication of ceramics by shock compaction of materials prepared by combustion synthesis. 5,114,645, Cl. 264-84.000.

Niiyama, Kenji: *See—*
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Nishikibe, Masaru; Ihara, Masaki; and Yano, Mitsuo, 5,114,918, Cl. 514-11.000.

Nilssen, Ole K. Electronically power-factor-corrected ballast. 5,115,347, Cl. 315-247.000.

Nilsson, Christer: *See—*
Svensson, Paul; Nilsson, Christer; Backlund, Jan; Ericsson, Karl G.; Jilken, Leif; and Kihlberg, Harry, 5,114,524, Cl. 156-295.000.

Nilsson, Sven-Axel; Ebersole, Ronald J.; Bier, Gerhard; and Honeck, Karl-Heinz, to Siemens AK.; and Intel Corporation. Arrangement for loading the parameters into active modules in a computer system. 5,115,511, Cl. 395-800.000.

Nimmesgern, Hildegard: *See—*
Lang, Hans-Jochen; Weidmann, Klaus; Scheunemann, Karl-Heinz; Nimmesgern, Hildegard; Rippel, Robert; and Herling, Andreas W., 5,114,955, Cl. 514-333.000.

Nimura, Mitsuhiro; Yokoyama, Shoji; Yamada, Takashi; Sumiya, Koji; and Moroto, Shuzo, to Kabushiki Kaisha Shinsangyokaihatsu; and Aisin AW Co., Ltd. Position input system for vehicular navigation apparatus. 5,115,399, Cl. 364-449.000.

Ninomiya, Ken: *See—*
Suzuki, Keizo; Ninomiya, Ken; and Yunogami, Takashi, 5,115,130, Cl. 250-251.000.

Ninomiya, Yusuke: *See—*
Muramoto, Hisaichi; Ninomiya, Yusuke; Ishii, Keizou; and Ishikura, Shinichi, 5,115,020, Cl. 525-74.000.

Nippon Magnetics USA, Inc.: *See—*
Yamaguchi, Harumi; Higuchi, Takeshi; and Fukuda, Kenji, 5,114,084, Cl. 241-178.000.

Nippon Oil Company, Limited *See—*
Sohda, Yoshio; Ido, Yasuzi; Nakamura, Toshinori; and Suemitsu, Takeshi, 5,114,635, Cl. 264-29.200.

Nippon Paint Co., Ltd.: *See—*
Muramoto, Hisaichi; Ninomiya, Yusuke; Ishii, Keizou; and Ishikura, Shinichi, 5,115,020, Cl. 525-74.000.

Nippon Precision Circuits Ltd.: *See—*
Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; and Ogiwara, Yoshihisa, 5,114,869, Cl. 43-40.000.

Nippon Seiko Kabushiki Kaisha: *See—*
Tanaka, Katsuhiko; Yoshiba, Takeyuki; Sato, Takanobu; Kawakami, Ikunori; and Kawakami, Koichi, 5,114,245, Cl. 384-112.000.

Nippon Seimitsu Kogyo Kabushiki Kaisha: *See—*
Osada, Tokihiro; and Aono, Masao, 5,114,133, Cl. 271-22.000.

Nippon Sheet Glass Co., Ltd.: *See—*
Takemura, Kazuo; Ino, Juichi; Kawahara, Hideo; and Kitaoka, Masaki, 5,114,760, Cl. 427-430.100.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Harada, Nobuyuki; Okuno, Toshihiro; and Shimomura, Tadao, 5,115,011, Cl. 524-419.000.

Nippon Steel Corporation: *See—*
Maruyama, Tadakatsu; Ohno, Yasuhide; Konda, Masashi; Kikuchi, Tosiharu; Suzuki, Yasuhiro; Uno, Tomohiro; Otsuka, Hiroaki; and Tanahashi, Hiroyuki, 5,114,878, Cl. 437-182.000.

Nippon Suisan Kaisha Ltd.: *See—*
Takai, Hiroshi; and Ishida, Sachio, 5,113,635, Cl. 53-52.000.

Nippon Telegraph and Telephone Corporation: *See—*
Ishibashi, Shigeki; Nakamura, Kouzaburou; Maruno, Tohru; Nakahata, Masaaki; Negishi, Takaaki; and Urano, Fumiyoshi, 5,114,615, Cl. 252-299.670.

Nippon Zeon Co., Ltd.: *See—*
Watanabe, Hiroyuki; Noguchi, Kohkichi; Akita, Shuichi; and Kohtaki, Kumiko, 5,115,006, Cl. 524-251.000.

Nishi, Keizaburo: *See—*
Ootsuka, Junji; Ogata, Youichi; and Nishi, Keizaburo, 5,114,160, Cl. 277-70.000.

Nishi, Kenji: *See—*
Miyamoto, Takashi; Miyagawa, Kazuya; Tomimatsu, Yukihito; Sugiura, Tsutomu; Nishi, Kenji; and Ichihara, Taku, 5,114,224, Cl. 353-122.000.

Nishi, Takashi: *See—*
Funabashi, Kiyomi; Kuriyama, Osamu; Chino, Koichi; Baba, Tsutomu; Nishi, Takashi; and Kikuchi, Makoto, 5,114,622, Cl. 252-629.000.

Nishida, Makoto: *See—*
Oda, Kengo; Moriyasu, Koichi; Hayashi, Masao; Nishida, Makoto; Oyamada, Masami; Fujiwara, Akie; and Watanabe, Junko, 5,114,466, Cl. 71-94.000.

Nishiguchi, Masanori; and Gotoh, Noboru, to Sumitomo Electric Industries, Ltd. Apparatus for grinding semiconductor wafer. 5,113,622, Cl. 51-165.730.

Nishiguchi, Masayuki: *See—*
Fujiwara, Yoshihito; Umezawa, Tomoko; Nishiguchi, Masayuki; Akune, Makoto; Iwahashi, Naoto; and Akagiri, Kenzo, 5,115,240, Cl. 341-51.000.

Nishii, Hiroyuki: *See—*
Taguchi, Chiaki; and Nishii, Hiroyuki, 5,115,142, Cl. 250-561.000.

Nishikawa, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Performance recording apparatus for recording informations used to control music generation instruments. 5,113,741, Cl. 84-609.000.

Nishikawa, Hisashi; Fujisawa, Ikuo; and Ohsugi, Yukihiro, to Tokyo Electric Co., Ltd. Fixing device. 5,115,279, Cl. 355-290.000.

Nishikawa, Masaji: *See—*
Ebihara, Toshiyuki; Sakai, Satoru; Nishikawa, Masaji; and Asano, Masashi, 5,115,320, Cl. 358-296.000.

Nishiki, Akihiko: *See—*
Hamanaka, Izumi; Maekawa, Yoshikazu; Arai, Hiroyuki; Nishiki, Akihiko; Muramatsu, Takeshi; Yokoyama, Toshio; and Yukizane, Shigemi, 5,114,130, Cl. 270-53.000.

Nishiki, Yoshinori: *See—*
Shimamune, Takayuki; Nakamatsu, Shuji; Sawamoto, Isao; Masuda, Hiroshi; and Nishiki, Yoshinori, 5,114,549, Cl. 204-149.000.

Nishikibe, Masaru: *See—*
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Nishikibe, Masaru; Ihara, Masaki; and Yano, Mitsuo, 5,114,918, Cl. 514-11.000.

Nishikuni, Masato: *See—*
Okamoto, Shingo; Takahama, Tsuyoshi; Nishikuni, Masato; and Nakano, Shoichi, 5,114,498, Cl. 136-258.000.

Nishimori, Tadashi: *See—*
Okada, Tomoyuki; Kannen, Naoki; Nishimori, Tadashi; and Tsushima, Rikio, 5,114,793, Cl. 428-425.900.

Nishimura, Genshiro: *See—*
Naito, Tsutomu; Nishimura, Genshiro; and Komine, Kikuji, 5,114,697, Cl. 423-447.100.

Nishimura, Hiroshi: *See—*
Maeda, Akira; Kasama, Takashi; Yokoyama, Tetsuo; and Nishimura, Hiroshi, 5,113,865, Cl. 128-653.200.

Nishimura, Kouichi, to NEC Corporation. Amplifier having polygonal-line characteristics employing two comparators. 5,115,152, Cl. 307-490.000.

Nishimura, Ritsuo: *See—*
Takamiya, Kikuzo; and Nishimura, Ritsuo, 5,115,159, Cl. 310-67.00A.

Nishinihon Kogyo Co., Ltd.: *See—*
Yano, Mitsuru; and Yoshihara, Yasusro, 5,113,704, Cl. 73-162.000.

Nishio, Hiroaki; Watanabe, Keiji; and Sato, Michitaka, to NKK Corporation. Method for manufacturing carbon material having good resistance to oxidaiton by coating the carbon material with an inorganic polysilazane and then heating. 5,114,749, Cl. 427-226.000.

Nishio, Maki: *See—*
Sawada, Yosuke; Kakushima, Masatoshi; Nishio, Maki; Miyaki, Takeo; and Oki, Toshikazu, 5,114,857, Cl. 435-252.100.

Nishiyama, Yuji: *See—*
Sugawara, Koko; Nishiyama, Yuji; Tomita, Koji; Konishi, Masataka; and Oki, Toshikazu, 5,114,920, Cl. 514-11.000.

Nishizawa, Junichi; Takedo, Nobuo; and Suzuki, Sohbe, to Research Development Corporation of Japan. Step-cut insulated gate static induction transistors and method of manufacturing the same. 5,115,287, Cl. 357-23.400.

Nissan Motor Co., Ltd.: *See—*
Anzai, Makoto, 5,113,826, Cl. 123-403.000.
Aramaki, Takashi, 5,113,834, Cl. 123-520.000.
Fukunaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, 5,114,177, Cl. 280-707.000.
Hayasaki, Koichi, 5,113,724, Cl. 74-867.000.
Iriyama, Masahiro, 5,113,823, Cl. 123-399.000.
Ishii, Mitsunori, 5,113,810, Cl. 123-73.00R.
Maeda, Mitsuyo; Tanabe, Toshio; Tanabe, Shimata; Toyama, Takashi; and Ono, Masashi, 5,115,048, Cl. 525-457.000.

Nakajima, Hidemi; and Nagano, Toshio, 5,114,207, Cl. 296-204.000.
Shibuya, Naoharu, 5,113,748, Cl. 454-127.000.
Suzuki, Yutaka; Kobayashi, Masayuki; and Wakahara, Tatsuo, 5,113,719, Cl. 74-866.000.

Nisshin Steel Company, Ltd.: *See—*
Ohashi, Hidetsugu; Kinugasa, Masayuki; Adachi, Toshiro; Nonomura, Akihiro; and Sekimoto, Waro, 5,114,799, Cl. 428-659.000.

Nitto Boseki Co., Ltd.: *See—*
Kuroiwa, Katsumasa; Matsuura, Hitoshi; Katayama, Katsuhiro; Nakatsuyama, Shuichi; Nagasawa, Takeshi; and Endo, Koji, 5,115,099, Cl. 530-331.000.

Niwa, Kunio: *See—*
Yamaguchi, Tetsuo; Matsushita, Hiroomi; and Niwa, Kunio, 5,114,145, Cl. 273-73.00F.

Nix, Martin E. Portable solar heating device and heating process utilizing solar energy. 5,113,845, Cl. 126-451.000.

Nix, Richard A.: *See—*
Compton, David J.; Nix, Richard A.; and Leigh-Monstevens, Keith V., 5,113,657, Cl. 60-533.000.

NKK Corporation: *See—*
Nagamune, Akio; Tezuka, Kouichi; and Komine, Isamu, 5,115,242, Cl. 342-124.000.
Nishio, Hiroaki; Watanabe, Keiji; and Sato, Michitaka, 5,114,749, Cl. 427-226.000.

No, Hwan-cheol: *See—*
Jeong, Jong-in; Choi, Jong-seo; No, Hwan-cheol; and Ju, Kyu-nam, 5,115,164, Cl. 313-346.0DC.

Noakes, Larry R. Reel chock with set screws for flange engagement. 5,113,976, Cl. 188-32.000.

Nobile, Frederick E.; Harris, John F., III; Silverman, Gary S.; and Baumann, Richard A., to Western Publishing Company. Liquid crystal writing slate. 5,115,330, Cl. 359-52.000.

Noble, James B. Directional drilling apparatus and method. 5,113,953, Cl. 175-61.000.

Noda, Nobuhiro; Furuya, Katsuhiko; Takahashi, Tadashi; and Nakasima, Masaaki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photographing light quantity controller for endoscope. 5,115,261, Cl. 354-62.000.

Noel Robertson-McKenzie: *See—*
Robertson-McKenzie, Noel, 5,113,527, Cl. 2-7.000.

Noguchi, Kohkichi: *See—*
Watanabe, Hiroyuki; Noguchi, Kohkichi; Akita, Shuichi; and Kohtaki, Kumiko, 5,115,006, Cl. 524-251.000.

Noguchi, Noboru: *See—*
Tsuda, Kazuhiko; Kako, Hiroyoshi; Morikawa, Hirohiko; Noguchi, Noboru; and Nakanishi, Nobuyasu, 5,114,216, Cl. 303-117.000.

Nohr, Ronald S.; and MacDonald, J. Gavin, to Kimberly-Clark Corporation. Method of increasing the delay period of nonwoven webs having delayed wettability. 5,114,646, Cl. 264-103.000.

Nolan, James M.: *See—*
Stiffler, Jack J.; Nolan, James M.; Mark, Peter; and Harvey, David, 5,115,499, Cl. 395-425.000.

Nomura, Masahiro, to NEC Corporation. Queue device capable of quickly transferring a digital signal unit of a word length different from a single word length. 5,115,496, Cl. 395-250.000.

Nonomura, Akihiro: *See—*
Ohashi, Hidetsugu; Kinugasa, Masayuki; Adachi, Toshiro; Nonomura, Akihiro; and Sekimoto, Waro, 5,114,799, Cl. 428-659.000.

Norden, Michael J. Method for treating certain psychiatric disorders and certain psychiatric symptoms. 5,114,976, Cl. 514-646.000.

Nordson Corporation: *See—*
Hall, Robert C., 5,114,752, Cl. 427-273.000.

Norita, Toshio: *See—*
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 5,115,321, Cl. 358-213.190.

Norkus, Norbert S.: *See—*
Reifler, Angela H.; and Norkus, Norbert S., 5,114,679, Cl. 422-100.000.

Norris, Stephen H., to British Telecommunications public limited company. Splice tray. 5,115,489, Cl. 385-135.000.

Norsolor: *See—*
Heim, Philippe; and Riess, Gerard, 5,115,031, Cl. 525-243.000.

North American Philips Corporation: *See—*
Fitzpatrick, Brian J.; Harnack, Phyllis M.; and Baker, Scott H., 5,115,163, Cl. 313-36.000.

North American Philips Corp., Signetics Division: *See—*
Mack, William D.; and Linebarger, Daniel J., 5,115,206, Cl. 330-261.000.

North, Peter C.: *See—*
Oxford, Alexander W.; Bays, David E.; Cavalla, David J.; and North, Peter C., 5,114,950, Cl. 514-294.000.

Northeastern University: *See—*
Giessen, Bill C.; Markiewicz, Robert S.; and Chen, Feng, 5,114,905, Cl. 505-1.000.

Northern Telecom Europe Limited: *See—*
Large, Timothy A., 5,115,480, Cl. 385-12.000.

Norton, Peter. Resistance sensor and switch. 5,115,188, Cl. 323-365.000.

Notagashira, Hidefumi, to Canon Kabushiki Kaisha. Lens barrel. 5,115,348, Cl. 359-697.000.

Nothdurft, Klaus: *See—*
Gabriel, Jochen; Bechtold, Herbert; Hambrecht, Gerhard; and Nothdurft, Klaus, 5,114,406, Cl. 604-136.000.

NOVA Corporation of Alberta: *See—*
Bardas, Theodor; Eisenbart, Jules; Harris, Tim; and Oleksuk, Cal, 5,115,192, Cl. 324-207.120.

Novatec Medical Products, Inc.: *See—*
Williams, Robert E.; Marshall, William H.; Stout, Robert B.; and McCourt, John J., Jr., 5,114,425, Cl. 606-034.000.

Nowoczyn, Hans-Werner: *See—*
Promper, Hans-Josef; D'Iribarne, Benoit; Kuster, Hans-Werner; Nowoczyn, Hans-Werner; and Vanaschen, Luc, 5,114,454, Cl. 65-163.000.

Nozaki, Takao: *See—*
Chishima, Masamitsu; and Nozaki, Takao, 5,114,359, Cl. 439-271.000.

Nozawa, Toshihisa: *See—*
Harada, Hiromi; and Nozawa, Toshihisa, 5,115,118, Cl. 219-390.000.

Nugent, Patrick: *See—*
Bottero, Fabrizio, 5,114,724, Cl. 426-249.000.

NUOVOPIGNONE-Industrie Meccaniche e Fonderia S.p.A.: *See—*
Corain, Luciano, 5,113,914, Cl. 139-448.000.

Nurmi, Pekka; and Salo, Heikki, to AKP-Tekno Oy. Suction box. 5,114,189, Cl. 285-7.000.

Nuss, Lothar, to Stapla Ultraschall-Technik GmbH. Process and device for the connection of armature coil wires with the lamellas of a hook-collecting device. 5,113,574, Cl. 29-597.000.

Nussbaum, William E.: *See—*
Harris, William H., Jr; Nussbaum, William E.; Armstrong, Michael J.; Deming, Victor H.; and Brink, John E., 5,114,128, Cl. 270-11.000.

NutraSweet Company, The: *See—*
Tsau, Josef H.; Seagle, Dennis; and Laurenz, Steven, 5,114,726, Cl. 426-289.000.

Nutt, Ruth F.: *See—*
Rosenblatt, Michael; McKee, Roberta L.; Caulfield, Michael P.; and Nutt, Ruth F., 5,114,843, Cl. 435-7.210.

Nyssen, Peter R.; Berkenhaus, Dirk; and van Pey, Hans-Theo, to Bayer Aktiengesellschaft. Process for the production from thermoplastic polymers of superfine fibre nonwoven fabrics. 5,114,631, Cl. 264-6.000.

O & K Orenstein & Koppel Aktiengesellschaft: *See—*
Steinkotter, Franz-Albert, 5,113,570, Cl. 29-433.000.

Oakdale, Warren R.: *See—*
Frentzel, Richard L.; and Oakdale, Warren R., 5,114,796, Cl. 428-521.000.

Oba, Chikashi: *See—*
Ikeda, Nobuyuki; Nagata, Kazuhisa; and Oba, Chikashi, 5,114,208, Cl. 296-216.000.

Oberg, Arthur E.: *See—*
Avila, Harold C.; and Oberg, Arthur E., 5,115,231, Cl. 340-709.000.

Obermiller, Patrice S.; and Blumeyer, Kirsten K., to La Jolla Biological Laboratories. Floatable laboratory tube holder. 5,114,680, Cl. 422-104.000.

O'Brien, James A.: *See—*
Toledo, George F.; and O'Brien, James A., 5,114,192, Cl. 292-21.000.

O'Bryan, Henry M., Jr.: *See—*
Kopf, Rose F.; O'Bryan, Henry M., Jr.; Schubert, Erdmann F.; Tu, Li-Wei; Wang, Yeong-Her; and Zydzik, George J., 5,115,441, Cl. 372-45.000.

O'Callaghan, Wilfrid B., to Alcan International Limited. Caustic-based metal battery with seeded recirculating electrolyte. 5,114,802, Cl. 429-13.000.

Ochiai, Keiichi: *See—*
Aoki, Nobuyuki; Ochiai, Keiichi; and Komoda, Hideaki, 5,114,801, Cl. 428-694.000.

O'Connor, Sean P.: *See—*
Cook, Stephen J.; O'Connor, Sean P.; and Pearce, Andrew, 5,114,601, Cl. 252-25.000.

Oda, Kengo; Moriyasu, Koichi; Hayashi, Masao; Nishida, Makoto; Oyamada, Masami; Fujiwara, Akie; and Watanabe, Junko, to Mitsui Toatsu Chemicals, Inc. 1-(3-substituted benzyl)-3-halogeno-4-(1-halogeno-alkyl)-2-pyrrolidinone derivatives and herbicides containing them. 5,114,466, Cl. 71-94.000.

Oda, Yasuhiro; Yoshioka, Hiroshi; Tadokoro, Hajime; and Fujimaki, Yoshihide, to Konica Corporation. Electrophotographic photoreceptor having a light-sensitive layer formed from titanyl phthalocyanine pigment dispersed in a branched ester or alcohol solvent. 5,114,815, Cl. 430-58.000.

Ode, Shinichi: *See—*
Ouchi, Shigetoshi; Shirouzu, Tatsuji; Ode, Shinichi; Ichinose, Takasi; and Kanno, Tutomu, 5,115,389, Cl. 363-125.000.

Oden, Christopher W.: *See—*
Cipolla, Thomas M.; Coteus, Paul W.; Johnson, Glen W.; Murphy, Philip; and Oden, Christopher W., 5,113,565, Cl. 29-25.010.

Oellerer, Friedrich: *See—*
Theurer, Josef; Oellerer, Friedrich; and Gruber, Leopold R., 5,114,119, Cl. 254-134.30R.

Officine Meccaniche Giovanni Cerutti S.P.A.: *See—*
Cardano, Mario, 5,114,088, Cl. 242-68.400.

Ogata, Masahiro: *See—*
Sato, Katsuyuki; Matsumoto, Miki; Ohkuma, Sadayuki; Ogata, Masahiro; and Yoshida, Masahiro, 5,115,413, Cl. 365-230.090.

Ogata, Youichi: *See—*
Ootsuka, Junji; Ogata, Youichi; and Nishi, Keizaburo, 5,114,160, Cl. 277-70.000.

Ogawa, Kazufumi; and Mino, Norihisa, to Matsushita Electric Industrial Co., Ltd. Process for preparing an organic monomolecular film. 5,114,737, Cl. 427-36.000.

Ogawa, Kikuo; and Arai, Kazuya, to Yazaki Corporation. Two-stage rubber switch. 5,115,108, Cl. 200-1.000.

Ogawa, Kimiaki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Apparatus for varying acceptance angle of camera. 5,114,225, Cl. 354-481.000.

Ogawa, Masatomi; and Murata, Mitsuhiro, to DIC-Hercules Chemicals, Inc. Polymeric papermaking additive. 5,115,065, Cl. 526-304.000.

Ogawa, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,114,817, Cl. 430-504.000.

Ogawa, Tadatoshi; Ima, Seiichiro; and Wakamatsu, Kazuki, to Sumitomo Chemical Company, Limited. Polypropylene stretched film. 5,115,027, Cl. 525-216.000.

Ogg, Randy G.; and Habel, Mark A., to Procter & Gamble Company, The. Perforator blade for paper products and products made therefrom. 5,114,771, Cl. 428-43.000.

Ogiwara, Yoshihisa: *See*—
Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; and Ogiwara, Yoshihisa, 5,114,869, Cl. 43-40.000.

Oglesby, Donald M.; and Wells, George E., IV, to Hoechst Celanese Corporation. Method for stabilizing sodium dithionite. 5,114,698, Cl. 423-515.000.

Ogura, Ryushi: *See*—
Takiyama, Eiichiro; Ogura, Ryushi; and Harigai, Noriaki, 5,115,032, Cl. 525-279.000

Ohashi, Hidetsugu; Kinugasa, Masayuki; Adachi, Toshiro; Nonomura, Akihiro; and Sekimoto, Waro, to Nisshin Steel Company, Ltd.; and Shinsei Kogyo Company, Ltd. Material for roofing and facing. 5,114,799, Cl. 428-659.000.

Ohkawa, Hideo: *See*—
Yabusaki, Yoshiyasu; Murakami, Hiroko; Sakai, Toshiyuki; Shibata, Megumi; and Ohkawa, Hideo, 5,114,852, Cl. 435-189.000.

Ohkubo, Masaaki; and Fukada, Ryo, to Fuji Kuuki Kabushiki Kaisha. Tightening control apparatus for a torque wrench. 5,113,949, Cl. 173-177.000.

Ohkuma, Sadayuki: *See*—
Sato, Katsuyuki; Matsumoto, Miki; Ohkuma, Sadayuki; Ogata, Masahiro; and Yoshida, Masahiro, 5,115,413, Cl. 365-230.090.

Ohm, Patrick L.: *See*—
Weiland, Walter M.; Disch, Michael A.; and Ohm, Patrick L., 5,115,106, Cl. 200-517.000

Ohmae, Tadayuki: *See*—
Shiga, Shujiro; Kabasawa, Koji; Ohmae, Tadayuki; and Tanaka, Hisao, 5,115,036, Cl. 525-128.200.

Ohmori, Naoto; and Gonda, Takashi, to Minolta Camera Kabushiki Kaisha. Image-forming apparatus having an erase device located at a first or second position when the apparatus is in an opened or closed position. 5,115,272, Cl. 355-200.000.

Ohmori, Toshiaki: *See*—
Tada, Masuo; Hiroi Takahiko; Fukumoto, Takaaki; Ohmori, Toshiaki; and Kanno, Itaru, 5,114,748, Cl. 427-180.000.

Ohmura, Keiji: *See*—
Okuno, Sumio; Takeichi, Michifumi; Ohmura, Keiji; Okazaki, Msato; Tsuruda, Hitoshi; Yamada, Hiroyuki; Hattori, Morishige; and Kimura, Kenji, 5,113,769, Cl. 105-422.000.

Ohnishi, Tsuyoshi. Synthesis and uses of new ascorbic acid derivatives which have anti-oxidant and anti-cancer activities. 5,114,972, Cl. 514-530.000.

Ohno, Yasuhide: *See*—
Maruyama, Tadakatsu; Ohno, Yasuhide; Konda, Masashi; Kikuchi, Tosiharu; Suzuki, Yasuhiro; Uno, Tomohiro; Otsuka, Hiroaki; and Tanahashi, Hiroyuki, 5,114,878, Cl. 437-182.000.

Ohno, Yuka: *See*—
Kaneko, Tsugio; Kimura, Tsuneo; Ikeda, Michihiro; Utsunomiya, Akira; and Ohno, Yuka, 5,114,881, Cl. 501-12.000.

Ohshima, Tadayoshi: *See*—
Konishi, Kouji; Ohshima, Tadayoshi; Fujii, Masakazu; Hagino, Motoyuki; Hosono, Satoshi; and Miyake, Masayoshi, 5,115,144, Cl. 250-572.000.

Ohsugi, Yukihiro: *See*—
Nishikawa, Hisashi; Fujisawa, Ikuo; and Ohsugi, Yukihiro, 5,115,279, Cl. 355-290.000.

Ohta, Kunio: *See*—
Matsuura, Makoto; Amano Hironobu; and Ohta, Kunio, 5,113,680, Cl. 72-53.000.

Ohta, Seiichi: *See*—
Tanaka, Tokuji; Akimoto, Etsuji; and Ohta, Seiichi, 5,114,828, Cl. 430-272.000.

Ohta, Wasaburo; Nakazawa, Masashi; and Kinoshita, Mikio, to Ricoh Company, Ltd. Thin film deposition system. 5,114,559, Cl. 204-298.050.

Ohta, Yasuji: *See*—
Taniguchi, Tomohiko; Ikeda, Kohei; Okazaki, Koji; Amano, Fumio; Unagami, Shigeyuki; Tanaka, Yoshinori; and Ohta, Yasuji, 5,115,469, Cl. 381-36.000.

Ohtani, Shinichi: *See*—
Sato, Kiyoshi; Taguchi, Masaaki; Wada, Yasunori; Kawasaki, Mikio; Ohtani, Shinichi; Iwada, Masatosi; and Hatakeyama, Noboru, 5,114,836, Cl. 430-434.000.

Ohtsuka, Masahito; Kobayashi, Hiroo; Moritani, Toshifumi; Yagi, Tadashi; Tsuchiya, Yoshiro; Azeta, Takahiro; Waragai, Tsuyoshi; Yukimachi, Hiroshi; and Miyake, Hiroaki, to Canon Kabushiki Kaisha. Image forming apparatus with plural forming units. 5,115,281, Cl. 355-319.000.

Ohtsuka, Nobukazu: *See*—
Miyoshi, Jun; Shibanaka, Mitsugu; Matsui, Toshikazu; and Ohtsuka, Nobukazu, 5,114,136, Cl. 271-213.000.

Ohuchida, Shigeru: *See*—
Maeda, Hideo; Ohuchida, Shigeru; and Kitabayashi, Junichi, 5,115,423, Cl. 369-112.000.

Ohwada, Mitsutoshi: *See*—
Matsugu, Masakazu; Saitoh, Kenji; and Ohwada, Mitsutoshi, 5,114,236, Cl. 356-401.000.

Oikawa, Hironobu: *See*—
Kanzawa, Yoshikazu; Fujikake, Yasushi; Ito, Osami; Ito, Shuho; Oikawa, Hironobu; Otsubo, Makoto; Morikawa, Iwao; Shiratori, Yuichi; and Tsukada, Kiyoshi, 5,113,926, Cl. 164-119.000.

Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge having a center core which engages with a drive spindle of a disk drive. 5,115,366, Cl. 360-133.000.

Oji Paper Company Ltd.: *See*—
Konishi, Kouji; Ohshima, Tadayoshi; Fujii, Masakazu; Hagino, Motoyuki; Hosono, Satoshi; and Miyake, Masayoshi, 5,115,144, Cl. 250-572.000.

Okada, Goro, to Sandvik Process Systems, Inc. Three way splitter. 5,113,993, Cl. 198-369.000.

Okada, Hirosuke: *See*—
Makino, Yasutaka; Negoro, Seiji; Urabe, Itaru; and Okada, Hirosuke, 5,114,853, Cl. 435-190.000.

Okada, Tomoyuki; Kannen, Naoki; Nishimori, Tadashi; and Tsushima, Rikio, to Kao Corporation. Magnetic recording medium comprising a specified polyurethane binder. 5,114,793, Cl. 428-425.900.

Okamoto, Shingo; Takahama, Tsuyoshi; Nishikuni, Masato; and Nakano, Shoichi, to Sanyo Electric Co., Ltd. Photovoltaic device. 5,114,498, Cl. 136-258.000.

Okamoto, Toshiya; and Miyata, Souichi, to Sharp Kabushiki Kaisha. Multistage data flow processor with instruction packet, fetch, storage transmission and address generation controlled by destination information. 5,115,510, Cl. 395-775.000.

Okamoto, Yukio: *See*—
Hamada, Jun-ichi; and Okamoto, Yukio, 5,115,280, Cl. 355-299.000.

Okamura, Kenji: *See*—
Hirota, Shinichiro; Sugawara, Kishio; and Okamura, Kenji, 5,114,455, Cl. 65-275.000.

Okamura, Masatoshi: *See*—
Hashizume, Kenji; Okamura, Masatoshi; and Shiba, Haruo, 5,115,365, Cl. 360-132.000.

Okamura, Yuichi, to Kabushikigaisha Tokyo Kikai Seisakusho. Inking device. 5,113,761, Cl. 101-350.000.

Okazaki, Koji: *See*—
Taniguchi, Tomohiko; Iseda, Kohei; Okazaki, Koji; Amano, Fumio; Unagami, Shigeyuki; Tanaka, Yoshinori; and Ohta, Yasuji, 5,115,469, Cl. 381-36.000.

Okazaki, Masaki; Shishido, Tadao; and Kubodera, Seiiti, to Fuji Photo Film Co., Ltd. Nonlinear optical material. 5,115,337, Cl. 359-328.000.

Okazaki, Msato: *See*—
Okuno, Sumio; Takeichi, Michifumi; Ohmura, Keiji; Okazaki, Msato; Tsuruda, Hitoshi; Yamada, Hiroyuki; Hattori, Morishige; and Kimura, Kenji, 5,113,769, Cl. 105-422.000.

Okazawa, Kazuhiko: *See*—
Kusano, Akihisa; Kimizuka, Junichi; Ito, Toshiyuki; Sato, Kaoru; Abe, Makoto; Okazawa, Kazuhiko; and Inuyama, Toshihiko, 5,115,147, Cl. 307-311.000.

Oki Electric Industry Co., Ltd.: *See*—
Matsushiro, Nobuhito; Hatanaka, Hazime; Yoshida, Takayoshi; and Oyake, Ikuo, 5,115,402, Cl. 395-141.000.
Tanamu, Jiro; and Katakura, Shinichi, 5,114,252, Cl. 400-124.000.

Oki, Toshikazu: *See*—
Sawada, Yosuke; Kakushima, Masatoshi; Nishio, Maki; Miyaki, Takeo; and Oki, Toshikazu, 5,114,857, Cl. 435-252.100.
Sugawara, Koko; Nishiyama, Yuji; Tomita, Koji; Konishi, Masataka; and Oki, Toshikazu, 5,114,920, Cl. 514-11.000.

Okiai, Ryuichi: *See*—
Sakaya, Masuji; Okiai, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, 5,113,932, Cl. 165-104.260.

Okino, Yoshiharu: *See*—
Yoshikawa, Sumio; Okino, Yoshiharu; and Sawada, Satoru, 5,115,304, Cl. 358-75.000.

Okita, Tatuo: *See*—
Ueda, Nobuo; Okita, Tatuo; Suzuki, Mikio; Ikemoto, Yasunori; and Shibao, Hiloyuki, 5,114,381, Cl. 453-57.000.

Okuno, Sumio; Takeichi, Michifumi; Ohmura, Keiji; Okazaki, Msato; Tsuruda, Hitoshi; Yamada, Hiroyuki; Hattori, Morishige; and Kimura, Kenji, to Hitachi, Ltd. Car body for railway rolling stock and method for fabricating car body. 5,113,769, Cl. 105-422.000.

Okuno, Toshihiro: *See*—
Harada, Nobuyuki; Okuno, Toshihiro; and Shimomura, Tadao, 5,115,011, Cl. 524-419.000.

Okura, Yasunori: *See*—
Asayama, Yoshio; Tsubota, Makio; Okura, Yasunori; and Sato, Takayuki, 5,113,720, Cl. 74-866.000.

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Fukuda, Tamotsu; Shigeta, Shiro; Okuya, Hiroaki; Kuroiwa, Yasuyuki; and Sudo, Tadashi, 5,114,712, Cl. 424-87.000.

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O'Leary, John; and Adams, Erik, to ICI Australia Operations Proprietary Limited. Cable coated with at least two concentric layers of

polymeric material and process of making same. 5,114,746, Cl. 427-118.000.

Oleksuk, Cal: *See*—
Bardas, Theodor; Eisenbart, Jules; Harris, Tim; and Oleksuk, Cal, 5,115,192, Cl. 324-207.120.

O'Lenick, Anthony J., Jr.: *See*—
Imperante, John; and O'Lenick, Anthony J., Jr., 5,115,049, Cl. 525-479.000.

Olfers, Reinhard: *See*—
Langendorf, Heinrich; and Olfers, Reinhard, 5,114,288, Cl. 410-34.000.

Olin Corporation: *See*—
Branch, Charles E.; Gavin, David F.; and Robitaille, Thomas E., 5,114,984, Cl. 521-121.000.
Levesque, Kenneth J.; and Alexander, Roy P., 5,114,647, Cl. 264-115.000.
Mandigo, Frank N.; Mei, George C.; and Fister, Julius C., 5,113,764, Cl. 102-202.900.

Oliver, Christopher J., to Cabletron Systems, Inc. Flexible module interconnect system. 5,115,235, Cl. 340-825.520.

Oliver Y Batlle, S.A.: *See*—
Pujol, Carlos O., 5,114,080, Cl. 241-69.000.

O'Loughlin, John P.: *See*—
Emery, Jerome W.; and O'Loughlin, John P., 5,114,179, Cl. 280-741.000.

Olschansky, Craig A. Detachable convenience food tray for vehicles. 5,114,108, Cl. 248-311.200.

Olson, Ray E. Right angle turn table and method. 5,114,137, Cl. 271-251.000.

Olsson, Billy E., to AMP Incorporated. High density electrical connector and method of making a high density electrical connector. 5,114,362, Cl. 439-460.000

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Tomasch, Michael D., 5,115,136, Cl. 250-461.100.

Olympus Optical Co., Ltd.: *See*—
Ebihara, Toshiyuki; Sakai, Satoru; Nishikawa, Masaji; and Asano, Masashi, 5,115,320, Cl. 358-296.000.
Komiya, Yasuhiro, 5,115,262, Cl. 354-402.000.
Rokutan, Takao, 5,115,421, Cl. 369-44.330.

Omega Medicinteknik AB: *See*—
Unger, Peter; and Westberg, Eric, 5,114,396, Cl. 494-37.000.

Omron Tateisi Electronics Co.: *See*—
Hosokawa, Hayami; and Yamashita, Tsukasa, 5,114,513, Cl. 156-150.000.

Oncogen: *See*—
Shoyab, Mohammed; McDonald, Vicki L.; Bradley, James G.; and Plowman, Gregory D., 5,115,096, Cl. 530-322.000.

Ong, Beng S.; Sacripante, Guerino; Kmiecik-Lawrynowicz, Grazyna; and McAneney, T. Brian, to Xerox Corporation. Magnetic encapsulated toner compositions. 5,114,819, Cl. 430-106.600.

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Ono, Kouichi: *See*—
Oomori, Tatsuo; and Ono, Kouichi, 5,115,135, Cl. 250-423.00P.

Ono, Masashi: *See*—
Maeda, Mitsuyo; Tanabe, Toshio; Tanabe, Shimata; Toyama, Takashi; and Ono, Masashi, 5,115,048, Cl. 525-457.000.

Ono, Shigetoshi; and Funatsu, Eiji, to Fuji Photo Film Co., Ltd. Electron-conductive high polymer and electroconductive material having the same. 5,115,057, Cl. 526-256.000.

Ono, Takeshi: *See*—
Kobayashi, Makoto; Yoshida, Takehiro; Wada, Satoshi; Terajima, Hisao; Ono, Takeshi; Yokoyama, Minoru; Awai, Takashi; Tomoda, Akihiro; and Ishida, Yasushi, 5,115,255, Cl. 346-76.0PH.

Onoda, Yoshihito: *See*—
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onoda, Yoshihito; and Kuwahara, Hideo, 5,115,332, Cl. 359-189.000.

Onozuka, Kuniharu: *See*—
Takano, Masayuki; Onozuka, Kuniharu; Nagasawa, Fumihiro; and Matsumoto, Akihiko, 5,115,310, Cl. 358-185.000.

Ontani, Katsuhide: *See*—
Ihara, Kiyohiko; Ontani, Katsuhide; Nakata, Yutaka; and Miyatani, Toshio, 5,115,038, Cl. 525-326.200.

Onuki, Kazuhiko, to Canon Kabushiki Kaisha. Image processing apparatus. 5,115,308, Cl. 358-102.000.

Onuma, Tomiyasu: *See*—
Kanamaru, Hisanobu; Onuma, Tomiyasu; and Sasaya, Kazushi, 5,114,263, Cl. 403-274.000.

Ooishi, Minoru: *See*—
Hirata, Keiichi; Morimoto, Yoshinari; Ooishi, Minoru; Ban, Tomohiro; and Furukawa, Akihiro, 5,115,410, Cl. 395-650.000.

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Ootera, Hiroki; and Tsuda, Mutsumi, to Mitsubishi Denki Kabushiki Kaisha. Plasma processor. 5,115,167, Cl. 315-111.210.

Ootsuka, Junji; Ogata, Youichi; and Nishi, Keizaburo, to Eagle Industry Co., Ltd. Quenching mechanism of shaft seal for slurry pumps. 5,114,160, Cl. 277-70.000.

Ophir-Aryt Optronics, Ltd.: *See*—
Greenfield, Ephraim; and Vecht, Jacob J., 5,114,228, Cl. 356-222.000.

Orion Industries, Inc.: *See*—
Leslie, Samuel A., 5,115,514, Cl. 455-9.000.

Ormat Turbines (1965) Ltd.: *See*—
Kedar, Alon; and Zimron, Ohad, 5,113,927, Cl. 165-13.000.

Orth, Jean C.: *See*—
Kasprzyk, Daniel J.; Orth, Jean C.; Gaiser, John W.; and Houser, Russell A., 5,114,423, Cl. 606-27.000.

Orthodontie Research B.V.: *See*—
Guis, Marinus B., 5,114,339, Cl. 433-24.000.

Ortner, Robert: *See*—
Abendroth, Paul; Herzel, Joachim; Hummel, Peter; Ortner, Robert; Steuer, Joachim; Stoffler, Achim; and Despot, Janko, 5,113,762, Cl. 101-350.000.

Osada, Tokihiro; and Aono, Masao, to Nippon Seimitsu Kogyo Kabushiki Kaisha. Automatic sheet feeding device. 5,114,133, Cl. 271-22.000.

Osamura, Kazumi; Terazono, Masaki; Kohsaka, Shoji; Koga, Kazunori; Saito, Akira; Sato, Masahiro; and Uchimura, Hideki, to Kyocera Corporation. Silicon nitride sintered body and process for preparation thereof. 5,114,889, Cl. 501-97.000.

Osawa, Yasuo: *See*—
Hayashi, Takao; and Osawa, Yasuo, 5,114,667, Cl. 376-299.000.

Osbond, John M.: *See*—
Lawton, Geoffrey; Osbond, John M.; and Self, Christopher R., 5,114,960, Cl. 514-379.000.

Ose, Toshio; Yoshida, Toshifumi; and Iwasaki, Katsuyo, to Matsushita Electronics Corporation. Deflection yoke for use in color cathode ray tubes. 5,115,170, Cl. 315-370.000.

O'Shaughnessy, Timothy G.: *See*—
Hull, Richard W.; and O'Shaughnessy, Timothy G., 5,115,151, Cl. 307-355.000.

Oskar Woertz, Inhaber Hans Woertz: *See*—
Bolliger, Roman, 5,114,367, Cl. 434-716.000.

Osmond, John S. Jet activated toilet flushing apparatus. 5,113,536, Cl. 4-368.000.

Ospischev, Jury M.: *See*—
Bordunov, Vladimir V.; Karmadonov, Leonid N.; Ospischev, Jury M.; Fedjunin, Vladimir A.; Zhuravkov, Sergei P.; Cherepenko, Evgeny A.; Sviridov, Anatoly B.; Verkhorubov, Lev S.; Mikhailov, Arkady T.; Bakhmutov, Jury L.; and Shaidurov, Valery S., 5,114,496, Cl. 134-13.000.

Oster, Eugene A., to Connell Limited Partnership. Electronic braking system for power press die change carriers. 5,113,684, Cl. 72-448.000.

Oswalt, Philip D.; and Wolfe, Ronald A., to Advantage Engineering, Inc. Heat transfer apparatus. 5,113,931, Cl. 165-78.000.

Otermat, Arthur L.: *See*—
Johnson, Paul C.; Colthart, James D.; Otermat, Arthur L.; Weingaertner, David A.; Chou, Charles C.; Byers, Dallas L.; Stearns, Stephen M.; Marsden, Arnold R., Jr.; and Deeley, George M., 5,114,497, Cl. 134-21.000.

Otis Engineering Corporation: *See*—
Ross, Colby M.; Sproul, Richard M.; McCurley, Ross M.; and Young, Carter R., 5,113,939, Cl. 166-120.000.

Otsubo, Kazutaka: *See*—
Ishihara, Yoshimi; and Otsubo, Kazutaka, 5,113,594, Cl. 33-722.000.

Otsubo, Makoto: *See*—
Kanzawa, Yoshikazu; Fujikake, Yasushi; Ito, Osami; Ito, Shuho; Oikawa, Hironobu; Otsubo, Makoto; Morikawa, Iwao; Shiratori, Yuichi; and Tsukada, Kiyoshi, 5,113,926, Cl. 164-119.000.

Otsubo, Taisuke: *See*—
Miyagi, Tokuya; Inoue, Akihisa; Otsubo, Taisuke; and Hori, Yoshihiro, 5,114,508, Cl. 156-69.000.

Otsuka, Hiroaki: *See*—
Maruyama, Tadakatsu; Ohno, Yasuhide; Konda, Masashi; Kikuchi, Tosiharu; Suzuki, Yasuhiro; Uno, Tomohiro; Otsuka, Hiroaki; and Tanahashi, Hiroyuki, 5,114,878, Cl. 437-182.000.

Otsuka, Hiroyuki; Hosaka, Kotaro; and Higomura, Makoto, to Canon Kabushiki Kaisha. Stage positioning control method and apparatus. 5,114,234, Cl. 356-358.000.

Otsuka Kagaku Kabushiki Kaisha: *See*—
Nakacho, Yoshifumi; Inubushi, Akiyoshi; and Tada, Yuji, 5,114,809, Cl. 429-192.000.

Otsuki, Masato: *See*—
Akutsu, Hidetoshi; Kohno, Tohru; and Otsuki, Masato, 5,114,468, Cl. 75-234.000.

OTWP, Inc.: *See*—
Copley, Michael C.; and Kwai, Cheung Y., 5,114,376, Cl. 446-369.000.

Ouchi, Shigetoshi; Shirouzu, Tatsuji; Ode, Shinichi; Ichinose, Takasi; and Kanno, Tutomu, to Hitachi, Ltd. DC power supply circuit arrangement. 5,115,389, Cl. 363-125.000.

Oura, Masao: *See*—
Fujii, Kenjiro; Oura, Masao; Tuburaya, Kazuyuki; and Hagura, Shigehisa, 5,115,179, Cl. 318-568.130.

Ovens, Kevin M.: *See*—
Darley, Henry M.; Niehaus, Jeffrey A.; and Ovens, Kevin M., 5,115,408, Cl. 364-754.000.

Overby, Kenneth W., to La-Man Corporation. Air line vapor trap. 5,114,443, Cl. 55-219.000.

Owens-Illinois Plastic Products Inc.: *See*—
Krall, Thomas J., 5,114,659, Cl. 264-539.000.

Oxford, Alexander W.; Bays, David E.; Cavalla, David J.; and North, Peter C., to Glaxo Group Limited. 5,6-dihydro-N-[(imidazol-4(or 5)-yl)methyl]-4H-pyrrolo[3,2,1-IJ]quinoline-1-carboxamides having 5-HT3antagonist activity. 5,114,950, Cl. 514-294.000.

Oyake, Ikuo: *See—*
Matsushiro, Nobuhito; Hatanaka, Hazime; Yoshida, Takayoshi; and Oyake, Ikuo, 5,115,402, Cl. 395-141.000.

Oyama, Hiroshi; and Hasebe, Takao, to Kabushiki Kaisha Okuma Tekkosho. Method for automatically correcting deflection of stylus in digitizing device. 5,115,401, Cl. 364-474.370.

Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, to Mitsubishi Nuclear Fuel Co. Grid in a nuclear fuel assembly. 5,114,668, Cl. 376-442.000.

Oyamada, Masami: *See—*
Oda, Kengo; Moriyasu, Koichi; Hayashi, Masao; Nishida, Makoto; Oyamada, Masami; Fujiwara, Akie; and Watanabe, Junko, 5,114,466, Cl. 71-94.000.

Ozaki, Masaaki: *See—*
Ishii, Hiroshi; and Ozaki, Masaaki, 5,115,172, Cl. 318-38.000.

Ozarow, Lawrence H.: *See—*
Calderbank, Arthur R.; and Ozarow, Lawrence H., 5,115,453, Cl. 375-39.000.

Paasche, George; and Hanssen, Ketil, to Golar-Nor Offshore AS. System for transferring fluids from a piping system in a ship's hull to a turning device, and vice versa. 5,113,778, Cl. 114-256.000.

Pace, John: *See—*
Kranz, Robert E.; and Pace, John, 5,115,461, Cl. 378-165.000.

Pacer Industries, Inc.: *See—*
Heffron, Michael E., 5,113,832, Cl. 123-478.000.

Pacocha, James: *See—*
McAdam, Hugh A., III; Tremblay, Robert; and Pacocha, James, 5,114,392, Cl. 493-179.000.

Paczkowski, Francis M.: *See—*
Miskinis, Edward T.; Johnson, Frank H.; and Paczkowski, Francis M., 5,115,276, Cl. 355-253.000.

Paesano, Agnese: *See—*
Scuri, Romolo; Brufani, Mario; Ceccarelli, Stefano; De Vellis, Patrizia; Giannetti, Patrizia; Paesano, Agnese; and Zanarcella, Sergio, 5,114,966, Cl. 514-469.000.

Paget, Walter E.: *See—*
Biggin, Ian S.; Cartwright, Peter S.; Farrar, David; Hawe, Malcolm; and Paget, Walter E., 5,114,600, Cl. 252-86.000.

Pai, Jenny L.: *See—*
Nagji, Moez M.; Holmes, Ervine S.; and Pai, Jenny L., 5,114,689, Cl. 423-230.000.

Palm, Ulrich: *See—*
Kummerfeld, Ryszard; Baumgarten, Siegfried; Holzapfel, Gerd; Falb, Wolfgang; and Palm, Ulrich, 5,113,897, Cl. 137-357.000.

Palmer, David: *See—*
Allen, Stephen, 5,113,745, Cl. 89-14.050.

Palmgren, Carl T., to Morgan Manufacturing Inc. Stud puller. 5,113,687, Cl. 72-479.000.

Pang, Yi: *See—*
Barton, Thomas J.; Ijadi-Maghsoodi, Sina; and Pang, Yi, 5,115,062, Cl. 526-279.000.

Panossian, Misak. Double acting dead latch mechanism. 5,113,676, Cl. 70-418.000.

Panson, Michael S.: *See—*
Zatezalo, John M.; and Panson, Michael S., 5,115,406, Cl. 364-551.010.

Paola, Vincent A.: *See—*
Tsai, Mei-Yuan; and Paola, Vincent A., 5,114,798, Cl. 428-611.000.

Paoli, Thomas L.; and Epler, John E., to Xerox Corporation. Method of fabricating quantum wire semiconductor laser via photo induced evaporation enhancement during in situ epitaxial growth. 5,114,877, Cl. 437-129.000.

Paper Chemistry Laboratory, Inc.: *See—*
Penniman, John G.; and Reichlin, Maria S., 5,114,539, Cl. 162-184.000.

Paquin, Ronald J., to Alcan International Limited. Slitting apparatus. 5,113,735, Cl. 83-508.300.

Paradowski, Henri; and Leroy, Michel, to Compagnie Francaise D'Etudes et de Construction-Technip. Method of recovering liquid hydrocarbons in a gaseous charge and plant for carrying out the method. 5,114,450, Cl. 62-24.000.

Parent, Richard, to Alternative Resources Corporation. Computer servicing cart with structural frame. 5,113,546, Cl. 15-315.000.

Pares Farras, Ramon; Jofre Torroella, Juan; Ricard, Jean-Paul; Schulthess, Adrian; Farine, Jean-Claude; Michelet, Marie-Christine; Ramsteiner, Agnes; and Bauer, Jacques, to Laboratoires OM S.A. Extracellular exopolymer, process for its preparation and pharmaceutical compositions containing the said exopolymer. 5,114,848, Cl. 435-101.000.

Parfondry, Alain: *See—*
Cassidy, Edward F.; Gillis, Herbert R.; Hannaby, Malcolm; and Parfondry, Alain, 5,114,480, Cl. 106-38.240.

Park, Kyung T.; and Radice, Peter F. Electroacoustic novelties. 5,115,472, Cl. 381-152.000.

Parker Hannifin Corporation: *See—*
Chalmers, Robert C., 5,114,190, Cl. 285-53.000.

Parrish, Clyde F.; and Scaringe, Robert P., to Mainstream Engineering Corp. Cooling device for hazardous materials suits. 5,113,666, Cl. 62-259.300.

Parsons, Charles F., to General Electric Company. N-propionitrile maleimides, preparation process and polymers thereof. 5,115,061, Cl. 526-262.000.

Pascavage, Peter W.: *See—*
Chaplin, Mitchell E.; Eaton, Geraldine M.; Hickie, Brian A.; Pascavage, Peter W.; and Tyson, Jessie, 5,114,787, Cl. 428-284.000.

Passive Bullet Traps Limited: *See—*
Coburn, Ronald, 5,113,700, Cl. 89-36.020.

Passon, Karl-Heinz: *See—*
Rottger, Jutta; Passon, Karl-Heinz; Schroer, Wolf-Dieter; and Kortmann, Wilfried, deceased, 5,115,013, Cl. 524-457.000.

Pastryk, Jim J.; and Farrington, Sheryl L., to Whirlpool Corporation. Centrifugal softener spray dispenser. 5,113,542, Cl. 8-158.000.

Pate, Wallace F. Segmental fishing lure and method. 5,113,607, Cl. 43-42.280.

Patel, Vijay B.: *See—*
Maitra, Kalyan K.; and Patel, Vijay B., 5,113,557, Cl. 29-33.00D.

Paterson, James L.: *See—*
Rao, Kalipatnam V.; Mitchell, Allan T.; and Paterson, James L., 5,114,530, Cl. 156-653.000.

Patton, Robert L.: *See—*
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., 5,114,563, Cl. 208-114.000.

Patzelt, R. R.; and Romba, M. A., to Nalco Chemical Company. Organic contaminant removal from paint spray booth water. 5,114,591, Cl. 210-663.000.

Pauling, Kelly B.: *See—*
Peterson, Robert C.; Pauling, Kelly B.; and Tepfer, Russell J., 5,113,643, Cl. 56-153.000.

Paulonis, George J.; and Dunlap, David R., to ELTECH Systems Corporation. Ceramic fiber attaching system for a backing plate. 5,115,114, Cl. 219-99.000.

Pavelka, Bozidar: *See—*
Schoettle, Klaus; Borck, Gerald-Wolfgang; Schmidts, Kurt; and Pavelka, Bozidar, 5,114,008, Cl. 206-387.000.

Pawelchak, John M.: *See—*
Lawter, James R.; and Pawelchak, John M., 5,114,946, Cl. 514-279.000.

Pawlik, James A., to GTE Valenite Corporation. Indexable insert for roughing and finishing. 5,114,282, Cl. 407-40.000.

Paxton, Gerald R.; Seid, Norman W.; and Gilman, Garry L. Multifunctional retractable needle type general purpose disabling syringe having enhanced safety features and related method of operation. 5,114,404, Cl. 604-110.000.

Payer, Hermann. Fastening strap. 5,113,552, Cl. 24-300.000.

PCast Equipment Corporation: *See—*
Cook, Arnold J., 5,113,925, Cl. 164-35.000.

Pearce, Andrew: *See—*
Cook, Stephen J.; O'Connor, Sean P.; and Pearce, Andrew, 5,114,601, Cl. 252-25.000.

Peckman, Robert, to ITT Corporation. Method for optimizing photo cathode photo-response. 5,114,373, Cl. 445-3.000.

Pedersen, Larry D.: *See—*
Debons, Francis E.; Pedersen, Larry D.; and Whittington, Lawrence E., 5,114,599, Cl. 252-8.554.

Pederson, Larry R.; Chick, Lawrence A.; and Exarhos, Gregory J., to Battelle Memorial Institute. Method of making metal oxide ceramic powders by using a combustible amino acid compound. 5,114,702, Cl. 423-639.000.

Pedtke, Daniel F.: *See—*
Kostusiak, Karl H.; Pedtke, Daniel F.; and Heckleman, Todd E., 5,115,224, Cl. 340-574.000.

Peduzzi, Alfred: *See—*
Giersdorf, Rodney L.; Peduzzi, Alfred; Krul, Allan D.; Jones, Stephen R.; and Chetta, Gregory E., 5,114,446, Cl. 55-345.000.

Peek, Robert J.: *See—*
Blade, Robert J.; Peek, Robert J.; and Cockerill, George S., 5,114,940, Cl. 514-248.000.

Peissl, Dieter: *See—*
Detzel, Josef; Matzel, Jurgen; Kraus, Rudolf; and Peissl, Dieter, 5,114,069, Cl. 229-125.150.

Pekich, Barry J.: *See—*
Harclerode, William H.; Knutsen, John C.; Pekich, Barry J.; Wiman, John V.; and Voss, John C., 5,114,640, Cl. 264-53.000.

Penniman, John G.; and Reichlin, Maria S., to Paper Chemistry Laboratory, Inc. Methods for manufacturing paper products. 5,114,539, Cl. 162-184.000.

PepsiCo Inc.: *See—*
Wolf, Peter A.; and Ramaswamy, Setlur R., 5,114,492, Cl. 127-42.000.

Peralta, Joaquin O.; and Martinez, Rafael H. Alarm to detect accidental sudden or slow falls from children into swimming pools. 5,115,222, Cl. 340-573.000.

Perbix, Kenneth E. Air curtain producing an outward ramping effect for use with an access way or enclosure. 5,113,749, Cl. 454-193.000.

Percec, Elena S.; Melamud, Lucy; and Coffey, Gerald P., to Standard Oil Company, The. Multilayered high barrier packaging materials method for the preparation thereof. 5,114,795, Cl. 428-516.000.

Perlman, Maier; Bell, James M.; and McGugan, Colin A. Tempering system for storage tank water heaters utilizing inlet and outlet heat exchanger. 5,115,491, Cl. 392-454.000.

Permascand AB: *See—*
Ullman, Anders, 5,114,547, Cl. 204-128.000.

Permelec Electrode Ltd.: *See—*
Shimamune, Takayuki; Nakamatsu, Shuji; Sawamoto, Isao; Masuda, Hiroshi; and Nishiki, Yoshinori, 5,114,549, Cl. 204-149.000.

Peroaho, Tapio: *See—*
Haavik, Harold; Peroaho, Tapio; Vesala, Reijo; and Vikman, Vesa, 5,114,310, Cl. 415-169.100.

Perrin, Patrice, to Rhone-Poulenc Chimie. Curable ketiminoxy/organopolysiloxane compositions devoid of organometallic curing catalysts. 5,114,764, Cl. 428-35.500.

Perry, Michael S.; Freedman, Jerome E.; and Gallagher, John J., to General Electric Co. Radar system with active array antenna, beam multiplex control and pulse integration control responsive to azimuth angle. 5,115,243, Cl. 342-158.000.

Perry, Michael S.: *See—*
Freedman, Jerome E.; Perry, Michael S.; and Gallagher, John J., 5,115,244, Cl. 342-158.000.

Persel, John M.: *See—*
Levinski, Charles B.; Persel, John M.; and Widmann, David N., 5,115,234, Cl. 340-825.310.

Persiani, Luigi, to SO.GE.MI. - S.P.A. Mechanism designed to ensure that actuators for automatically locking and unlocking automobile doors have no load at the end of their movement run. 5,114,197, Cl. 292-336.300.

Persson, Lars: *See—*
Bjerngren, Jan; Eriksson, Sven; and Persson, Lars, 5,114,279, Cl. 405-303.000.

Perstorp Xytec, Inc.: *See—*
Hillis, Mark; and Freeman, Dixon, 5,114,037, Cl. 220-4.030.

Perugini, Joseph J.: *See—*
Naeger, Dennis P.; and Perugini, Joseph J., 5,114,566, Cl. 208-289.000.

Perz, John S.: *See—*
Piedrahita, Carlos A.; Quinn, Robert E.; and Perz, John S., 5,115,083, Cl. 528-230.000.

Petermann, Steven G.: *See—*
Low, Stanley T.; Lara, Pedro F.; Foreman, David L.; and Petermann, Steven G., 5,115,196, Cl. 324-220.000.

Peters, Gerald T., Jr.: *See—*
Fulton, Steven J.; Peters, Gerald T., Jr.; Spehrley, Charles W., Jr.; and Young, Lawrence R., 5,114,747, Cl. 427-164.000.

Peters, John R.; and Peters, Robert B., to Grace Sierra Horticultural Products Co. Stabilized trace element fertilizer compositions and method of their use. 5,114,459, Cl. 71-32.000.

Peters, Reiner: *See—*
Helms, Bernd; Peters, Reiner; and Hoppe, Peter, 5,113,633, Cl. 53-513.000.

Peters, Robert B.: *See—*
Peters, John R.; and Peters, Robert B., 5,114,459, Cl. 71-32.000.

Peterson, Arthur; and Kozminski, Jerry L., to Link, Inc. Adjustable angular shearing device. 5,113,733, Cl. 83-169.000.

Peterson, Edwin R.; and Wheeler, Edwin L. Dual reel cord take-up device. 5,114,091, Cl. 242-107.110.

Peterson, Gerald W.: *See—*
Hayward, Curtis E.; Peterson, Gerald W.; and Post, Robert E., 5,115,260, Cl. 385-100.000.

Peterson, James R.: *See—*
Jenekhe, Samson A.; and Peterson, James R., 5,114,610, Cl. 252-182.330.

Peterson, James S.: *See—*
Bishop, Thomas P.; Davis, Mark H.; Peterson, James S.; and Surratt, Grover T., 5,115,505, Cl. 395-650.000.

Peterson, John R., to Teledyne Industries, Inc. Zirconium-containing coating composition. 5,114,890, Cl. 501-103.000.

Peterson, Robert C.; Pauling, Kelly B.; and Tepfer, Russell J., to KRP Enterprises, Inc. Dust suppression system. 5,113,643, Cl. 56-153.000.

Peterson, Wade D.; Hellwig, Joachim; and Heuckelbach, Rainer, to MTS Systems Corporation. System and method for measuring the absolute position of one body which is constrained to move with respect to another body. 5,115,195, Cl. 324-207.130.

Petrich, Michael J.: *See—*
Wang, Paul J., Jr.; Petrich, Michael J.; Wadzinski, Francis A.; and Guither, James E., 5,114,520, Cl. 156-240.000.

Petrille, Dennis G.; and Golinkin, Herbert S., to Amoco Corporation. Lube oil dispersant borating agent. 5,114,602, Cl. 252-51.50R.

Petrovic, John E.: *See—*
Nelson, Sharon L.; Petrovic, John E.; and Swanson, Gerald T., 5,114,570, Cl. 210-94.000.

Petrus, Leonardus: *See—*
Mastenbroek, Barend; and Petrus, Leonardus, 5,115,094, Cl. 528-392.000.

Pettrone, Frank A.; Whited, Gregory M.; and Goodhue, Charles T., to Eastman Kodak Company. Methods for preparing acetate esters of diols and polyols using corynebacterium oxydans in substantially aqueous media. 5,114,850, Cl. 435-135.000.

Petzold, Werner P., to Borg-Warner Automotive, Inc. Pulse width modulation technique. 5,115,395, Cl. 364-424.100.

Pfaff Industriemaschinen GmbH: *See—*
Dusch, Albert; and Walter, Karl-Heinz, 5,113,774, Cl. 112-292.000.

Pfeiffer-Muller, Gunter: *See—*
Becker, Karlheinz; and Pfeiffer-Muller, Gunter, 5,114,311, Cl. 415-182.100.

Pfizer Inc.: *See—*
Arrowsmith, John E.; Cross, Peter E.; and Thomas, Geoffrey N., 5,114,952, Cl. 514-309.000.
Gewanter, Herman L.; and May, Ralph D., 5,114,618, Cl. 252-389.530.

Pfyl, Anton, to Didler-Werke AG. Manipulator for manipulating a pouring pipe into position beneath a metallurgical vessel. 5,114,123, Cl. 266-236.000.

Philip Morris Inc.: *See—*
Podraza, Kenneth F., 5,114,493, Cl. 131-276.000.
Rowe, Norman R.; and Sweeney, William R., 5,115,342, Cl. 359-509.000.

Philip Morris Products Inc.: *See—*
Podraza, Kenneth F., 5,114,493, Cl. 131-276.000.

Phillips Petroleum Company: *See—*
Ash, Carlton E., 5,115,093, Cl. 528-388.000.
Bailey, Fay W.; Benham, Elizabeth A.; and McDaniel, Max P., 5,115,068, Cl. 526-348.500.
Knudsen, Ronald D.; McDaniel, Max P.; Benham, Elizabeth A.; and Bailey, F. Wallace, 5,115,053, Cl. 526-106.000.
Stricklen, Phil M.; Mueller, Francis X., Jr.; Willcox, Kenneth W.; and Snow, Joyce K., 5,115,054, Cl. 526-159.000.

Phipps, Alan M.: *See—*
Callaghan, David T.; Phipps, Alan M.; and Provancal, Stephen J., 5,114,705, Cl. 424-66.000.

Phipps, John P.: *See—*
Robb, Stephen P.; Phipps, John P.; and Gadberry, Michael D., 5,115,369, Cl. 361-93.000.

Photographic Sciences Corporation: *See—*
Eastman, Jay M., 5,115,120, Cl. 235-462.000.

Piade, Jean-Jacques; and Nicholas, Gregor, to Fabriques de Tabac Reunies, S.A. Cigarette sidestream smoke collection apparatus. 5,113,689, Cl. 73-23.310.

Piedrahita, Carlos A.; Quinn, Robert E.; and Perz, John S., to Lubrizol Corporation, The. Curable aminoplast compositions and catalysts for curing same. 5,115,083, Cl. 528-230.000.

Pier, James M.; and Starr, Gary E., to Water Enhancement Systems, Inc. Water treatment system. 5,114,571, Cl. 210-96.100.

Pierce, Ben: *See—*
Kennedy, Michael; Pierce, Ben; and Chan, Aaron, 5,115,462, Cl. 379-29.000.

Pietrykowski, Gabriel J.: *See—*
White, Lawrence W.; Pietrykowski, Gabriel J.; and Able, Stephen D., 5,113,898, Cl. 137-454.500.

Pignerol, Herve Y. High pressure piston sealing system and method of its assembly. 5,113,747, Cl. 92-175.000.

Pilling, Douglas A.; and Korzeniowski, George, to Aluminum Company of America. Method for pultruding fiber-reinforced, thermoplastic stock. 5,114,516, Cl. 156-180.000.

Pillsbury Company, The: *See—*
Leake, Luther H.; and Kirk, Laurie K., 5,114,725, Cl. 426-270.000.

Piltz, Lars-Erik; and Stenberg, Stina, to AB Akerlund & Rausing. Closure device for a packaging container. 5,114,507, Cl. 156-69.000.

Pinnavaia, Thomas J.; Amarasekera, Jayantha; and Polansky, Christine A., to Board of Trustees operating Michigan State University. Process using sorbents for the removal of SO_x from flue gas. 5,114,691, Cl. 423-244.000.

Pinnavaia, Thomas J.; Amarasekera, Jayantha; and Polansky, Christine A., to Board of Trustees operating Michigan State University. Layered double hydroxide sorbents for the removal of SO_x from flue gas and other gas streams. 5,114,898, Cl. 502-406.000.

Pioneer Electronic Corporation: *See—*
Harada, Tamotsu; Kumagai, Gen; Yanagida, Kiyoshi; Yaguchi, Katsuhiko; Fujioka, Nagaki; Yagi, Akiharu; Yanoguchi, Koji; and Kodaira, Satoru, 5,115,362, Cl. 360-92.000.
Kunimaru, Noritaka; Shiba, Katsuhiro; Kudo, Norio; Inoshita, Gen; and Sato, Shogo, 5,114,093, Cl. 242-204.000.
Tanaka, Satoru; and Matsui, Fumio, 5,115,138, Cl. 250-485.100.
Tomonaga, Hiroshi, 5,115,204, Cl. 330-257.000.
Tsuchiya, Yukio; Tanaka, Hiroshi; and Takahashi, Shunichi, 5,115,474, Cl. 381-158.000.

Pitney Bowes Inc.: *See—*
Auslander, Judith; Hochwalt, Norman C.; and Sarada, Thjagaraj, 5,114,478, Cl. 106-20.000.

Pittaro, Richard J., to Hewlett-Packard Company. Ultrasound system with dynamic transmit focus. 5,113,706, Cl. 73-626.000.

Pittel, Bernd: *See—*
Reuter, Knud; Jilge, Wolfgang; Pittel, Bernd; and Weymans, Gunther, 5,115,076, Cl. 528-125.000.

Pitzen, Gerald; Garfield, Douglas; Beltz, Warren G.; Arntzen, Lawrence O.; and Bina, Joseph C., to Bioform Engineering, Inc. Upper and lower body exerciser. 5,114,391, Cl. 482-62.000.

Plamper, Gerhard R., to Teleflex Incorporated. Motion transmitting remote control assembly with a conduit locator connecting means. 5,113,717, Cl. 74-502.600.

Plankl, Walter L.: *See—*
Mueller, Karl F.; and Plankl, Walter L., 5,115,056, Cl. 526-243.000.

Plate, Richard W.; and Gresser, Mark J., to Ford Motor Company. Method and apparatus for providing antistatic protection to plastic lenses. 5,114,740, Cl. 427-40.000.

Plee, Steven L.: *See—*
Remboski, Donald J.; Plee, Steven L.; Yang, Jialin; and Law, Robert W., 5,113,828, Cl. 123-425.000.

Plessinger, Thomas A.: *See—*
White, Dewitt T.; and Plessinger, Thomas A., 5,115,176, Cl. 318-362.000.

Plichta, Edward J.; and Behl, Wishvender K., to United States of America, Army. Electrode for use in a high temperature rechargeable molten salt battery and method of making said electrode. 5,114,432, Cl. 29-623.500.

Plichta, Edward J.: *See—*
Behl, Wishvender K.; and Plichta, Edward J., 5,114,805, Cl. 429-112.000.

Plociennik, James J.: *See—*
Smith, Donald W.; Plociennik, James J.; Goehst, George; and Green, Andrew, 5,114,267, Cl. 404-83.000.

Plow, Edward F.; and Ginsberg, Mark H., to Scripps Research Institute, The. Peptides and antibodies that inhibit platelet adhesion. 5,114,842, Cl. 424-85.800.

Plowman, Gregory D.: *See—*
Shoyab, Mohammed; McDonald, Vicki L.; Bradley, James G.; and Plowman, Gregory D., 5,115,096, Cl. 530-322.000.

Podraza, Kenneth F., to Philip Morris Inc.; and Philip Morris Products Inc. Smoking compositions containing a hexahydrobenzofuranone flavorant. 5,114,493, Cl. 131-276.000.

Polak, Robert B. Medicament container/dispenser assembly. 5,114,421, Cl. 604-403.000.

Polansky, Christine A.: *See—*
Pinnavaia, Thomas J.; Amarasekera, Jayantha; and Polansky, Christine A., 5,114,691, Cl. 423-244.000.
Pinnavaia, Thomas J.; Amarasekera, Jayantha; and Polansky, Christine A., 5,114,898, Cl. 502-406.000.

Polar Spring Corporation: *See—*
Conlon, William M.; and Hendricks, Donald M., 5,113,664, Cl. 62-124.000.

Polese, Pasquale. Cigarette-holder including a filter, suitable to wean smokers from the habit of smoking. 5,113,878, Cl. 131-198.200.

Poll, Gunter; Bartmann, Martin; and Finke, Jurgen, to Huels Aktiengesellschaft. Molding composition composed of a thermoplastically processable aromatic polyamide. 5,115,088, Cl. 528-336.000.

Polly, Johann, to Auto Polly Gesellschaft M.B.H. Method and apparatus for controlling a motor vehicle drive train. 5,113,721, Cl. 74-866.000.

Poloni, Alfredo, to Danieli & C. Officine Meccaniche S.p.A. Cartridge rolling stand. 5,113,682, Cl. 72-237.000.

Polyplastics Co., Ltd.: *See—*
Mochizuki, Mitsuhiro; Wada, Mitsuo; and Seitou, Hiromitsu, 5,115,004, Cl. 524-107.000

Polyspede Electronics Corporation: *See—*
Miller, Luther, 5,115,387, Cl. 363-54.000.

Ponpipom, Mitree M.: *See—*
Biftu, Tesfaye; Bugianesi, Robert L.; Girotra, Nirindar N.; Ponpipom, Mitree M.; Sahoo, Soumya P.; and Kuo, Chan H., 5,114,961, Cl. 514-397.000

Pool, Dan B., to Minnesota Mining and Manufacturing Company. Sheet material for masking apparatus. 5,113,921, Cl. 156-71.000.

Porte, Huges: *See—*
Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Huges; Prazuck, Thierry; and Torres, Ghislaine, 5,114,707, Cl. 424-667.000.

Porter, Alan G.: *See—*
Bell, Leslie D.; McCullagh, Keith G.; and Porter, Alan G., 5,114,711, Cl. 424-85.100.

Porter, J. Gordon: *See—*
Seilhamer, Jeffrey J.; Lewicki, John A.; Scarborough, Robert M.; and Porter, J. Gordon, 5,114,923, Cl. 514-12.000.

Porter, Ned A.; and Bruhnke, John D., to Duke University. Light activated acyl-enzymes. 5,114,851, Cl. 435-173.000.

Possati, Mario, to Marposs Societa' per Azioni. Master part and relevant manufacturing process. 5,113,592, Cl. 33-567.100.

Posso, Patrick, to Posso, Patrick. Component reel with latching detents to lock flanges to hub. 5,114,089, Cl. 242-71.800.

Post, Robert E.: *See—*
Hayward, Curtis E.; Peterson, Gerald W.; and Post, Robert E., 5,115,260, Cl. 385-100.000.

Potier, Michel, to Valeo Thermique Moteur. Heat exchanger of reduced width. 5,113,934, Cl. 165-173.000.

Powell, Brian D. W.: *See—*
Blythe, Robert J.; and Powell, Brian D. W., 5,115,021, Cl. 525-84.000.

Power Planter, Inc.: *See—*
Niewold, D. Wayne; and Bradley, Richard A., 5,113,952, Cl. 175-57.000.

Powley, Mark L.: *See—*
Lapp, Josef C.; and Powley, Mark L., 5,114,884, Cl. 501-41.000.

PPG Industries, Inc.: *See—*
Basil, John D.; Lin, Chia-Cheng; and Hunia, Robert M., 5,115,023, Cl. 525-103.000.
Hui, Sai H.; and Darlington, W. Bruce, 5,114,999, Cl. 524-47.000.
Leatherman, Dennis D.; McGinley, James J.; Adams, Daniel E.; and Brons, George A., 5,114,438, Cl. 51-296.000.
McCollum, Gregory J.; and Mauer, George W., 5,114,552, Cl. 204-181.700.

Pralus, Michele: *See—*
Dubreux, Bernard; Kerveanal, Jacques; Mulard, Philippe; and Pralus, Michele, 5,114,433, Cl. 44-322.000.

Praulus, Michele; Dubreux, Bernard; and Mulard, Philippe, to Atochem. Viscoreduced diesel fuels having improved cetane numbers. 5,114,434, Cl. 44-322.000.

Prazuck, Thierry: *See—*
Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Huges; Prazuck, Thierry; and Torres, Ghislaine, 5,114,707, Cl. 424-667.000.

Predkelis, John: *See—*
Lynch, James F.; and Predkelis, John, 5,114,485, Cl. 106-311.000.

Prelas, Mark A., to United States of America, Energy. Solid state laser media driven by remote nuclear powered fluorescence. 5,114,661, Cl. 376-146.000.

President and Fellows of Harvard College: *See—*
Burakoff, Steven J.; and Schreiber, Stuart L., 5,115,098, Cl. 530-331.000.

Presttun, Kare, to Alcatel STK A/S. Communication network intended for secure transmission of speech and data. 5,115,466, Cl. 380-9.000.

Previti-Kelly, Rosemary A.: *See—*
Cronin, John E.; Farrar, Paul A., Sr.; Linde, Harold G.; and Previti-Kelly, Rosemary A., 5,114,754, Cl. 427-333.000.
Linde, Harold G.; and Previti-Kelly, Rosemary A., 5,114,757, Cl. 427-387.000.

Price, Robert W.: *See—*
Harris, Richard H.; Minor, Richard G.; and Price, Robert W., 5,115,228, Cl. 340-716.000.

Priddy, Duane B.: *See—*
Dais, Virginia A.; and Priddy, Duane B., 5,115,055, Cl. 526-225.000.
Sikkema, Kevin D.; and Priddy, Duane B., 5,115,058, Cl. 526-258.000.

Prinz, Eugen. Lift truck with a drive unit pre-tensioned by spring loading in the vertical direction. 5,113,960, Cl. 180-65.500.

Prio Co. Incorporated: *See—*
Hashiguchi, Hiroaki, 5,114,649, Cl. 264-139.000.

Process Scientific Innovations Limited: *See—*
Hunter, George S.; and Hawker, Michael J., 5,114,572, Cl. 210-120.000.

Procter & Gamble Company, The: *See—*
Damani, Nalinkant C., 5,114,718, Cl. 424-422.000.
Ogg, Randy G.; and Habel, Mark A., 5,114,771, Cl. 428-43.000.

Proctor, Michael S.: *See—*
Brimelow, Christopher J.; Hsu, Jau Y.; and Proctor, Michael S., 5,114,727, Cl. 426-302.000.

Progressive Products, Inc.: *See—*
Rodriguez, Tomas M., 5,115,140, Cl. 250-516.100.

Prokop, Alfred: *See—*
Sandstrom, Eric L.; Prokop, Alfred; Young, William H., II; and D'Urso, Anthony M., 5,114,582, Cl. 210-321.740.

Prokop, Heinz-Jurgen: *See—*
von Borstel, Michael; Prokop, Heinz-Jurgen; and Wollerman-Windgasse, Reinhard, 5,115,446, Cl. 372-93.000.

Promper, Hans-Josef; D'Iribarne, Benoit; Kuster, Hans-Werner; Nowoczyn, Hans-Werner; and Vanaschen, Luc, to Saint-Gobain Vitrage International. Bending furnace for glazings. 5,114,454, Cl. 65-163.000.

Pront, Harry W. J.: *See—*
Weekamp, Johannes W.; and Pront, Harry W. J., 5,113,566, Cl. 29-25.350.

Propel Partnership 1987: *See—*
Mastov, Eduard; Mautner, Yehezkel; Gilad-Smolinsky, Zvi; and Levy, Moshe, 5,113,959, Cl. 180-11.000.

Prosenbauer, Otto. Apparatus for treating meat. 5,114,379, Cl. 452-142.000.

Protheroe, Robert L.: *See—*
Crooks, John F.; and Protheroe, Robert L., 5,115,107, Cl. 178-18.000.

Provancal, Stephen J.: *See—*
Callaghan, David T.; Phipps, Alan M.; and Provancal, Stephen J., 5,114,705, Cl. 424-66.000.

Prox, Alex: *See—*
Ballhause, Helmut; Engelhardt, Gunther; Landgraf, Claus A.; Mayer, Norbert; Roth, Willy; Schumacher, Kurt; and Prox, Alex, 5,114,935, Cl. 514-228.800.

Pruitt, Jay L.: *See—*
Pruitt, John E.; Pruitt, John A.; and Pruitt, Jay L., 5,113,905, Cl. 137-571.000.

Pruitt, John A.: *See—*
Pruitt, John E.; Pruitt, John A.; and Pruitt, Jay L., 5,113,905, Cl. 137-571.000.

Pruitt, John E.; Pruitt, John A.; and Pruitt, Jay L., to Hoyle, Michael D. Carbon dioxide fill manifold and method. 5,113,905, Cl. 137-571.000.

Pryor, Timothy R., to Diffracto Ltd. Electro-optical inspection. 5,114,230, Cl. 356-372.000.

Pujol, Carlos O., to Oliver Y Battle, S.A. Grinding body separator in mills for triturating and breaking up solids predispersed in liquids. 5,114,080, Cl. 241-69.000.

Pulichino, John; and Tong, Joy, to American Tourister, Inc. Garment bag with wheels and an inner panel with plural access openings. 5,113,982, Cl. 190-18.00A.

Pulse Medical Instruments: *See—*
Cornsweet, Tom N., 5,114,222, Cl. 351-204.000.

Purdes, Andrew J., to Texas Instruments Incorporated. Diamond growth method. 5,114,696, Cl. 423-446.000.

Puthenpura, Sarat C.; and Sinha, Lakshman P., to AT&T Bell Laboratories. Kalman filter-based optimizer and method and optimizing. 5,115,391, Cl. 364-152.000.

Pyotsia, Jouni: *See—*
Marin, Seppo; and Pyotsia, Jouni, 5,113,909, Cl. 137-625.320.

Pyszczyk, Michael F.: *See—*
Ebel, Steven J.; Pyszczyk, Michael F.; Frysz, Christine A.; and Zelinsky, Michael A., 5,114,811, Cl. 429-194.000.

Qin, Jian: *See—*
Gebzlioglu, Osman S.; Cohen, Robert E.; Argon, Ali S.; Beckham, Haskell W.; and Qin, Jian, 5,115,028, Cl. 525-232.000.

Quadros, Valdemiro M.: *See—*
Baron, Richard D.; Smith, Malcolm C.; Spoeth, Carl R.; and Quadros, Valdemiro M., 5,114,047, Cl. 222-129.100.

Quan, Xina S.: *See—*
Blyler, Lee L., Jr.; Chandross, Edwin A.; and Quan, Xina S., 5,115,487, Cl. 385-128.000.

Quantum Medical Systems, Inc.: *See—*
Ho, Ronald, 5,114,086, Cl. 242-7.030.

Quay, Jeffrey R.; Bassner, Sherri L.; and Santosusso, Thomas M., to Air Products and Chemicals, Inc. High performance polyurethane coating compositions and processes for making same. 5,115,071, Cl. 528-59.000.

Quercetti, Alessandro. Element for a didactic play, and a set formed by such elements. 5,114,349, Cl. 434-403.000.

Quickturn Systems, Incorporated: *See—*
Sample, Stephen P., 5,114,353, Cl. 439-65.000.

Quinet, Rene, to Revi N.V. Process for preparing a salad product and an emulsion therefor. 5,114,733, Cl. 426-605.000.

Quinn, Robert E.: *See—*
Piedrahita, Carlos A.; Quinn, Robert E.; and Perz, John S., 5,115,083, Cl. 528-230.000.

Quintero-Flores, Raul: *See—*
Elizondo-Gonzalez, Cesar; Juarez-Mata, Virgilio; Viramontes-Brown, Ricardo; Quintero-Flores, Raul; and Roesch-Dietlen, Juan-Jorge, 5,113,890, Cl. 137-13.000.

Quipp, Incorporated: *See—*
Sjogren, Christer A.; Kipp, Louis D.; and Moritz, William K., 5,114,306, Cl. 414-790.400.

R. R. Donnelley & Sons Company: *See—*
Chang, Robert; and McNicholas, Thomas J., Sr., 5,114,129, Cl. 270-1.100.

Rachlin, Adam: *See—*
Cummings, Michael; Cadotte, Roland, Jr.; and Rachlin, Adam, 5,115,210, Cl. 331-99.000.

Rachor, Donald G.; and Buchholz, Richard F., to Georgia-Pacific Corporation. Drying cellulosic pulp. 5,114,534, Cl. 162-9.000.

Radice, Peter F.: *See—*
Park, Kyung T.; and Radice, Peter F., 5,115,472, Cl. 381-152.000.

Radiometer A/S: *See—*
Kagenow, Henrik, 5,114,859, Cl. 436-50.000.

Radosav, Jon J.; Evans, Thomas A.; Dudek, David M.; Wieser, Russell G.; Atwater, Brian J.; and Eisbrenner, Robert J., to John Crane Inc. Split mechanical face seal. 5,114,163, Cl. 277-81.00S.

Raggio, William A.: *See—*
Fisher, Michael V.; Schaubel, Kurt M.; and Raggio, William A., 5,114,087, Cl. 242-42.000.

Ragland, William L.: *See—*
Hunter, Robert L.; and Ragland, William L., 5,114,708, Cl. 514-716.000.

Rahm, Larry. Animal shelter flooring apparatus. 5,113,794, Cl. 119-28.000.

Raichle Sportschuh AG: *See—*
Walkhoff, Klaus, 5,113,601, Cl. 36-117.000.

Rainis, Andrew: *See—*
Zones, Stacey I.; Holtermann, Dennis L.; and Rainis, Andrew, 5,114,565, Cl. 208-138.000.

Ramachandran, Mani: *See—*
Gysel, Hermann; and Ramachandran, Mani, 5,115,440, Cl. 372-38.000.

Ramanan, Srinivasan V.; and Jordan, Harry F., to University of Colorado Foundation, Inc., The. Serial array time-slot interchangers. 5,115,428, Cl. 370-68.000.

Ramaswamy, Setlur R.: *See—*
Wolf, Peter A.; and Ramaswamy, Setlur R., 5,114,492, Cl. 127-42.000.

Rambo, C. L.; Wilkinson, John D.; and Hudson, Hank M., to Elcor Corporation. Liquefied natural gas processing. 5,114,451, Cl. 62-24.000.

Ramirez, Ray C.: *See—*
Shekleton, Jack R.; and Ramirez, Ray C., 5,113,648, Cl. 60-39.091.

Ramrattan, Sam N.: *See—*
Jane, Jay-Lin; Schwabacher, Alan W.; Ramrattan, Sam N.; and Moore, Jeffrey A., 5,115,000, Cl. 524-47.000.

Ramsey, Donald G. Pipe cleaning apparatus. 5,113,885, Cl. 134-167.00C.

Ramsey, Fred J.: *See—*
Martino, Ronald J.; and Ramsey, Fred J., 5,115,339, Cl. 359-378.000.

Ramsteiner, Agnes: *See—*
Pares Farras, Ramon; Jofre Torroella, Juan; Ricard, Jean-Paul; Schulthess, Adrian; Farine, Jean-Claude; Michelet, Marie-Christine; Ramsteiner, Agnes; and Bauer, Jacques, 5,114,848, Cl. 435-101.000.

Ramun, John, to Allied Gator, Inc. Rotator for backhoe equipment. 5,114,301, Cl. 414-742.000.

Ranby, Mats G., to Biopool International, Inc. Assays for plasminogen activator inhibitor and soluble fibrin. 5,114,845, Cl. 435-13.000.

Randolph, Philip. Football exact yard marker and method for use. 5,113,589, Cl. 33-289.000.

Rao, Kalipatnam V.; Mitchell, Allan T.; and Paterson, James L., to Texas Instruments Incorporated. Interlevel dielectric process. 5,114,530, Cl. 156-653.000.

Rappen, Albert, to VSR Engineering GmbH. Stripping device for cleaning conveyor belts. 5,114,000, Cl. 198-499.000.

Raschdorf, Fritz: *See—*
Maschler, Reinhard; Steiner, Verena; Grutter, Markus G.; and Raschdorf, Fritz, 5,114,922, Cl. 514-12.000.

Raschkowski, Boleslaus: *See—*
Buchwald, Hans; Raschkowski, Boleslaus; and Singer, Dieter, 5,114,609, Cl. 252-171.000.

Rasicci, Vincent M.; Mioduszeski, John F.; and Gurganus, Cecil R., to GenCorp Inc. High magnetic strength magnets containing a flexible acrylate-2-acrylamido-2-methylpropane sulfonic acid salt binder. 5,115,063, Cl. 526-287.000.

Rasmussen, Steve O.; and Jackson, Larry A., to Hewlett-Packard Company. Paper feed arrangement. 5,114,134, Cl. 271-34.000.

Rathert, Horst, to Kolbus GmbH & Co. KG. Method and apparatus for rounding the backs of book blocks. 5,114,293, Cl. 412-30.000.

Ratledge, Thomas L.: *See—*
Fries, William M.; Ratledge, Thomas L.; and Hill, William H., 5,115,111, Cl. 219-56.210.

Rausch, Juergen: *See—*
Reinartz, Hans-Dieter; Steffes, Helmut; Rausch, Juergen; and Risch, Stefan, 5,115,186, Cl. 324-207.220.

Rayborn, Jerry J.; and Dickerson, J. Phillip, to Sun Drilling Products Corporation. Method of making a drilling fluid containing carbon black in a dispersed state. 5,114,597, Cl. 507-126.000.

Rayborn, Jerry J.; and Dickerson, J. Phillip, to Sun Drilling Products Corporation. Method of making drilling fluid containing asphaltite in a dispersed state. 5,114,598, Cl. 507-126.000.

Raychem Corporation: *See—*
Mercer, Frank W.; Goodman, Timothy D.; Lau, Aldrich N. K.; Vo, Lanchi P.; and Sovish, Richard C., 5,114,780, Cl. 428-195.000.
Mercer, Frank W.; and Sovish, Richard C., 5,115,082, Cl. 528-219.000.
Tomita, Akira; Diaz, Stephen H.; Dubrow, Robert S.; and Feldman, Michael, 5,113,787, Cl. 118-400.000.

Raymond, Michel J.: *See—*
Lahitte, Pierre V. A.; Raymond, Michel J.; and Kayser, Jean-Paul, 5,115,200, Cl. 324-718.000.

RCA Licensing Corporation: *See—*
Haferl, Peter E., 5,115,171, Cl. 315-371.000.

Reafler, Gerald G., to Eastman Kodak Company. Protective and decorative sheet material having a transparent topcoat. 5,114,789, Cl. 428-328.000.

Reddy, Kalakota S.; and Deford, Connie I., to Dow Chemical Company, The. Use of 3-iodo-2-chloro-2-propenenitrile as an antimicrobial. 5,114,970, Cl. 514-526.000.

Reebok International Ltd.: *See—*
Cohen, Eric D.; Jones, Andrew R.; de Castro, Jose T.; Litchfield, Paul; and Smith, Steven F., 5,113,599, Cl. 36-88.000.

Reed Lignin, Inc.: *See—*
Debons, Francis E.; Pedersen, Larry D.; and Whittington, Lawrence E., 5,114,599, Cl. 252-8.554.

Reed, Mark E., to Durkin-Reed, Inc. Vehicle preheating system. 5,115,116, Cl. 219-202.000.

Reedom, Eddie R. Protective cushion for automotive vehicles. 5,114,185, Cl. 280-801.000.

Refractron Technologies Corporation: *See—*
Sheckler, Chad A.; and Yost, Jeffrey J., 5,114,584, Cl. 210-490.000.

Rehau AG & Co.: *See—*
Hopperdietzel, Siegfried, 5,114,779, Cl. 428-144.000.

Reichelt, Uwe: *See—*
Scherping, Karl-Heinz; Holscher, Hans-Jorg; Reichelt, Uwe; and Reiter, Udo, 5,114,993, Cl. 523-409.000.

Reichhold Chemicals, Inc.: *See—*
Nava, Hildeberto; Lake, Robert D.; and Makepeace, Robert B., 5,115,072, Cl. 528-67.000.

Reichlin, Maria S.: *See—*
Penniman, John G.; and Reichlin, Maria S., 5,114,539, Cl. 162-184.000.

Reid, Dwight K., to Betz Laboratories, Inc. Process and composition for stabilized distillate fuel oils. 5,114,436, Cl. 44-385.000.

Reifler, Angela H.; and Norkus, Norbert S., to Eastman Kodak Company. Method of using a pipette. 5,114,679, Cl. 422-100.000.

Reil, Wilhelm; Deutschbein, Ulrich; Knobloch, Gerd; and Liebram, Udo, to Tetra Pak Holdings & Finance S.A. Apparatus for the separable attachment of two synthetic plastics parts and the use of the apparatus for a package to contain flowable contents. 5,114,068, Cl. 229-123.200.

Reinartz, Hans-Dieter; Steffes, Helmut; Rausch, Juergen; and Risch, Stefan, to Alfred Teves GmbH. Travel sensor for determining the position of a member such as a brake pedal. 5,115,186, Cl. 324-207.220.

Reinking, Klaus: *See—*
Stahlke, Kurt-Rainer; Reinking, Klaus; Tresper, Erhard; Kraft, Klaus; and Kaminski, Axel, 5,114,791, Cl. 428-419.000.

Reiss, Gerhard, to Bayer Aktiengesellschaft. Process for the adsorptive oxygen-enrichment of air with mixtures of Ca zeolite A molecular sieves by means of vacuum swing adsorption. 5,114,440, Cl. 55-25.000.

Reist, Walter, to Ferag AG. Method and apparatus for cutting printed products. 5,113,731, Cl. 83-35.000.

Reiter, Udo: *See—*
Scherping, Karl-Heinz; Holscher, Hans-Jorg; Reichelt, Uwe; and Reiter, Udo, 5,114,993, Cl. 523-409.000.

Reliant Laser Corp.: *See—*
Black, Michael; and Kupershmidt, Vladimir, 5,114,218, Cl. 351-44.000.

Rembold, Helmut; and Linder, Ernst, to Robert Bosch GmbH. Hydraulic valve control device for internal combustion engines. 5,113,811, Cl. 123-90.120.

Rembold, Helmut; and Linder, Ernst, to Robert Bosch GmbH. Valve control apparatus with magnet valve for internal combustion engines. 5,113,812, Cl. 123-90.120.

Remboski, Donald J.; Plee, Steven L.; Yang, Jialin; and Law, Robert W., to Barrack Technology Limited. Method and apparatus for determining combustion conditions and for operating an engine. 5,113,828, Cl. 123-425.000.

Remec, Thomas M., to Zenith Electronics Corporation. Mask washing system and method. 5,114,4[illegible]4, Cl. 134-1.000.

Remillieux, Yves: *See—*
Vives, Michel; Taveau, Pierre; Etienne, Jacques; Remillieux, Yves; and Charbonnel, Lucien, 5,114,772, Cl. 428-49.000.

Remy, David C.: *See—*
Baldwin, John J.; and Remy, David C., 5,114,919, Cl. 514-11.000.

Rensch, David B.: *See—*
Josefowicz, Jack Y.; Rensch, David B.; and Nieh, Kai-Wei, 5,114,910, Cl. 505-1.000.

Repine, Joseph T.: *See—*
Hamby, James M.; Kaltenbronn, James S.; and Repine, Joseph T., 5,114,937, Cl. 514-238.200.

Repligen Corporation: *See—*
Robinson, James E.; and Scott, Charles F., 5,114,856, Cl. 530-387.900.

Rera, Thomas. Animal feeding dish. 5,113,798, Cl. 119-61.000.

Rerek, Mark E.: *See—*
Van Kralingen, Cornelis G.; Martens, Rudolf J.; Rerek, Mark E.; Swarthoff, Ton; and Van Vliet, Marten, 5,114,611, Cl. 252-186.330.

Resch, Klaus: *See—*
Fitz, Erich; and Resch, Klaus, 5,114,109, Cl. 248-404.000.

Resch, Walter: *See—*
Ritter, Gerhard; Ritter, Klaus; Schmidt, Gerhard; and Resch, Walter, 5,113,915, Cl. 140-112.000.

Research Development Corporation of Japan: *See—*
Nishizawa, Junichi; Takeda, Nobuo; and Suzuki, Sohbe, 5,115,287, Cl. 357-23.400.

Resilient Systems, Inc.: *See—*
Bogdany, John, 5,114,773, Cl. 428-95.000.

Resul, Bahram: *See—*
Stjernschantz, Johan W., and Resul, Bahram, 5,114,971, Cl. 514-530.000.

Reuter, Knud; Jilge, Wolfgang; Pittel, Bernd; and Weymans, Gunther, to Bayer Aktiengesellschaft. Aromatic copolyether ketones of dihydroxydiphenyl alkanes and phthaleins and a process for their production. 5,115,076, Cl. 528-125.000.

Revi N.V.: *See—*
Quinet, Rene, 5,114,733, Cl. 426-605.000.

Rexnord Corporation: *See—*
Anderson, William B., 5,114,001, Cl. 198-844.200.

Reynolds Metals Company: *See—*
Alcorn, Thomas R.; Tabereaux, Alton T.; and Trembley, Luke R., 5,114,545, Cl. 204-67.000.

Rheinmetall GmbH: *See—*
Grosch, Hermann, 5,113,766, Cl. 102-427.000.

Rhoades, Lawrence J., to Extrude Hone Corporation. Orbital electrochemical machining. 5,114,548, Cl. 204-129.460.

Rhodes, Brett D.: *See—*
Baird, Donald J.; Rhodes, Brett D.; and Griffin, William W., Jr., 5,114,159, Cl. 277-53.000.

Rhone-Poulenc Chimie: *See—*
Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Huges; Prazuck, Thierry; and Torres, Ghislaine, 5,114,707, Cl. 424-667.000.
Perrin, Patrice, 5,114,764, Cl. 428-35.500.

Rhone-Poulenc Rorer Pharmaceuticals Inc.: *See—*
Barton, Jeffrey N., 5,114,964, Cl. 514-460.000.

Rhone-Poulenc Sante: *See—*
Gueremy, Claude; Malleron, Jean-Luc; and Mignani, Serge, 5,114,949, Cl. 514-293.000.

Rhone-Poulenc Surfactants and Specialties, L.P.: *See—*
Corti, Mike E.; and Tenore, Richard R., 5,114,978, Cl. 514-737.000.

Ricard, Jean-Paul: *See—*
Pares Farras, Ramon; Jofre Torroella, Juan; Ricard, Jean-Paul; Schulthess, Adrian; Farine, Jean-Claude; Michelet, Marie-Christine; Ramsteiner, Agnes; and Bauer, Jacques, 5,114,848, Cl. 435-101.000.

Richard, Daniel D.: *See—*
Knippscheer, Hermann; and Richard, Daniel D., 5,114,672, Cl. 122-41.000.

Richard Wolf GmbH: *See—*
Ams, Felix; and Schafer, Roland, 5,115,126, Cl. 250-227.110.
Hiltebrandt, Siegfried; and Wolf, Johann, 5,113,846, Cl. 128-20.000.
Krauss, Werner; Wurster, Helmut; and Belikan, Thomas, 5,113,848, Cl. 128-24.0EL.

Richardson, Randel E. Oil well fire extinguisher with internal pipe crimper. 5,113,948, Cl. 169-49.000.

Richardson, Richard J.; and Downing, Bennie R., to Anthony's Manufacturing Company, Inc. Ratless refrigerator display door. 5,113,628, Cl. 52-171.000.

Richey, Forrest A., Jr.; and Hoy, Kenneth L., to Union Carbide Chemicals & Plastics Technology Corporation. High solids coating compositions. 5,115,015, Cl. 524-507.000.

Ricoh Company, Ltd.: *See—*
Ishima, Kazumi, 5,115,32[illegible], Cl. 358-461.000.
Maeda, Hideo; Ohuchida, Shigeru; and Kitabayashi, Junichi, 5,115,423, Cl. 369-112.000.
Murayama, Noboru, 5,115,479, Cl. 382-56.000.
Ohta, Wasaburo; Nakazawa, Masashi; and Kinoshita, Mikio, 5,114,559, Cl. 204-298.050.
Suzuki, Minoru, 5,115,275, Cl. 355-245.000.
Takahashi, Hiroshi, 5,115,257, Cl. 346-108.000.
Tomita, Kan, 5,115,334, Cl. 359-216.000.

Ridder, Stephen D.: *See—*
Biancaniello, Francis S.; Janowski, Gregg N.; and Ridder, Stephen D., 5,114,470, Cl. 75-338.000.

Riddle, James J. Barrier apparatus. 5,114,270, Cl. 405-15.000.

Ridings, James R.; and Nguyen, Anh M., to Strato-Lift, Inc. Lift truck parking brake. 5,113,977, Cl. 188-69.000.

Riess, Gerard: *See—*
Heim, Philippe; and Riess, Gerard, 5,115,031, Cl. 525-243.000.

Rigsby, Robert. Protector for plant growing receptacle. 5,113,618, Cl. 47-71.000.

Rimmer, Michael J.: *See—*
Appleford, David E.; Millum, Colin G.; Scott, Duncan M.; and Rimmer, Michael J., 5,114,117, Cl. 251-149.900.

Rindlisbacher, Alfred: *See—*
Karrer, Friedrich; and Rindlisbacher, Alfred, 5,114,977, Cl. 514-720.000.

Ring Can Corporation: *See—*
Ring, Carl D., 5,114,028, Cl. 215-100.00A.

Ring, Carl D., to Ring Can Corporation. Container with integral handle structure. 5,114,028, Cl. 215-100.00A.

Ringelhaan, Otmar: *See—*
Friederichs, Karl-Josef; and Ringelhaan, Otmar, 5,115,438, Cl. 371-43.000.

Rini, Michael J.; and Towle, David P., to United States of America, Energy. Pulverized coal fuel injector. 5,113,771, Cl. 110-263.000.

Rinker, David E. Scented lure. 5,113,606, Cl. 43-42.190.

Rippel, Robert: *See—*
Lang, Hans-Jochen; Weidmann, Klaus; Scheunemann, Karl-Heinz; Nimmesgern, Hildegard; Rippel, Robert; and Herling, Andreas W., 5,114,955, Cl. 514-338.000.

Rippingale, John B.; and Schonstedt, Erick O., to Schonstedt Instrument Company. Methods, apparatus and devices relating to magnetic markers for elongated hidden objects. 5,114,517, Cl. 156-187.000.

Risch, Stefan: *See—*
Reinartz, Hans-Dieter; Steffes, Helmut; Rausch, Juergen; and Risch, Stefan, 5,115,186, Cl. 324-207.220.

Ritsko, Joseph E.: *See—*
Johnson, Walter A.; Kopatz, Nelson E.; and Ritsko, Joseph E., 5,114,471, Cl. 75-346.000.

Ritter, Gerhard; Ritter, Klaus; Schmidt, Gerhard; and Resch, Walter, to EVG Entwicklungs- u.Verwertungs-Gesellschaft m.b.H. Grid welding machine. 5,113,915, Cl. 140-112.000.

Ritter, Klaus: *See—*
Ritter, Gerhard; Ritter, Klaus; Schmidt, Gerhard; and Resch, Walter, 5,113,915, Cl. 140-112.000.

Rivera, Jose B.: *See—*
Deck, Philip D.; Rivera, Jose B.; and Harpel, William L., 5,114,607, Cl. 252-156.000.

Robb, Stephen P.; Phipps, John P.; and Gadberry, Michael D., to Motorola, Inc. Avalanche stress protected semiconductor device having variable input impedance. 5,115,369, Cl. 361-93.000.

Robbins, Edward S., III. Container assemblies with additive cups. 5,114,011, Cl. 206-499.000.

Robbins, Virginia M.: *See—*
Camras, Michael D.; Cook, Louis W.; and Robbins, Virginia M., 5,115,286, Cl. 357-19.000.

Robert Bosch GmbH: *See—*
Benzinger, Roland; Schmitt, Edgar; Siegel, Heinz; Huebl, Ewald; Mueller, Klaus; Himmelsbach, Manfred; and Jordan, Martin, 5,114,215, Cl. 303-113.0TB.
Flaig, Ulrich, 5,113,820, Cl. 123-325.000.
Haubner, George, 5,113,824, Cl. 123-399.000.
Rembold, Helmut; and Linder, Ernst, 5,113,811, Cl. 123-90.120.
Rembold, Helmut; and Linder, Ernst, 5,113,812, Cl. 123-90.120.
Sigl, Alfred; Schmitt, Johannes; and Isella, Thomas, 5,113,963, Cl. 180-197.000.

Roberts, John D., to Lift-All Company, Inc. Verifiable swaged fitting. 5,113,551, Cl. 24-115.00A.

Robertson-McKenzie, Noel, to Noel Robertson-McKenzie. Fire and smoke protective hood. 5,113,527, Cl. 2-7.000.

Robin, Mark L., to Great Lakes Chemical Corporation. Fire extinguishing methods and compositions utilizing 2-chloro-1,1,1,2-tetrafluoroethane. 5,113,947, Cl. 169-46.000.

Robinson, Hugh, to Design Technology Corporation. Apparatus for automatic application of condiments to a sandwich. 5,113,753, Cl. 99-326.000.

Robinson, Hugh; and Menzin, Marvin, to Design Technology Corporation. Apparatus for processing sandwich ingredients. 5,113,754, Cl. 99-326.000.

Robinson, James E.; and Scott, Charles F., to Repligen Corporation; and Board of Supervisors of Louisiana State University and Mechanical College Through Its Medical Center. HIV-1_{MN} human monoclonal antibody. 5,114,856, Cl. 530-387.900.

Robitaille, Thomas E.: *See—*
Branch, Charles E.; Gavin, David F.; and Robitaille, Thomas E., 5,114,984, Cl. 521-121.000.

Roby Teknik AB: *See—*
Olanders, Par, 5,114,671, Cl. 422-28.000.

Roche, James: *See—*
Roche, Thomas; and Roche, James, 5,114,299, Cl. 414-722.000.

Roche, Patrick: *See—*
Burley, Richard; and Roche, Patrick, 5,114,535, Cl. 162-9.000.

Roche, Thomas; and Roche, James. Attachment for a prime mover. 5,114,299, Cl. 414-722.000.

Rochester Corporation: *See—*
Gandy, Ronald L., 5,115,485, Cl. 385-101.000.

Rochester Medical Corporation: *See—*
Conway, Anthony J.; Conway, Philip J.; and Fryar, Richard D., Jr., 5,114,417, Cl. 604-349.000.

Rochester Medical Devices, Inc.: *See—*
Maronian, Hovaness H., 5,113,874, Cl. 128-844.000.

Rock of Ages Corporation: *See—*
Murray, Donald C., 5,113,630, Cl. 52-223.00R.

Rockefeller University, The: *See—*
Ulrich, Peter C.; and Cerami, Anthony, 5,114,943, Cl. 514-256.000.

Rockstroh, Todd J.: *See—*
Monson, Paul J. E.; Rockstroh, Todd J.; Mannava, Seetha R.; and Baeumel, Robert E., 5,113,582, Cl. 29-889.200.

Rockwell-CIM: *See—*
Guillaume, Nicolas; and Becerril, Philippe, 5,113,620, Cl. 49-375.000.

Rockwell International Corporation: *See—*
Custode, Frank Z., 5,114,867, Cl. 437-31.000.
Custode, Frank Z., 5,114,874, Cl. 437-57.000.
Krett, David L.; and Kean, Timothy L., 5,115,203, Cl. 330-251.000.

Rodart, George H. Bicatalytic igniter converter and processor for internal combustion engines. 5,113,806, Cl. 123-25.00P.

Rode, Klaus: *See—*
Zertani, Rudolf; Mohr, Dieter; Rode, Klaus; Frass, Werner; and Joerg, Klaus, 5,114,832, Cl. 430-285.000.

Rodriguez, Tomas M., to Progressive Products, Inc. EMR/RFR/MWR body shield composition. 5,115,140, Cl. 250-516.100.

Roederer, Antoine, to Agence Spatiale Europeenne. Multibeam antenna feed device. 5,115,248, Cl. 342-373.000.

Roediger Pittsburgh, Inc.: *See—*
Zeppenfeld, Reiner, 5,113,999, Cl. 198-497.000.

Roesch-Dietlen, Juan-Jorge: *See—*
Elizondo-Gonzalez, Cesar; Juarez-Mata, Virgilio; Viramontes-Brown, Ricardo; Quintero-Flores, Raul; and Roesch-Dietlen, Juan-Jorge, 5,113,890, Cl. 137-13.000.

Rogers, Brian A.; and Tseng, Mingchih M., to Gillette Company, The. Shaving system. 5,113,585, Cl. 30-41.000.

Rohrbacher, Frank: *See—*
Mirabeau, Mary N.; and Rohrbacher, Frank, 5,114,756, Cl. 427-379.000.

Rohulich, Alan S.; and Wunderlich, Ronnie A., to International Business Machines. Efficient P-channel FET drive circuit. 5,115,143, Cl. 307-571.000.

Rokey, Galen J.: *See—*
Huber, Gordon R.; Wenger, LaVon G.; Hauck, Bobble W.; Rokey, Galen J.; Schmelzle, Lawrence E.; and Hartter, Timothy R., 5,114,488, Cl. 127-1.000.

Rokutan, Takao, to Olympus Optical Co., Ltd. Optical recording/reproducing apparatus. 5,115,421, Cl. 369-44.330.

Rolls-Royce plc: *See—*
Cox, Michael J., 5,113,646, Cl. 60-39.060.

Roman, Helen E.: *See—*
Gahagen, Hugh; Roman, Helen E.; and Holt, Sonia, 5,114,352, Cl. 439-22.000.

Romba, M. A.: *See—*
Patzelt, R. R.; and Romba, M. A., 5,114,591, Cl. 210-663.000.

Romo, Rudolph R.: *See—*
Hull, Harold L.; Romo, Rudolph R.; and Luschar, Donald J., 5,113,892, Cl. 137-62.000.

Rondt, Daniel: *See—*
Blondeau, Robert; Rondt, Daniel; Glastre, Genevieve; and Krakowski, Michel, 5,115,283, Cl. 357-17.000.

Ronzoni, Enrico, to Gildemeister Italiana S.p.A. Clamping device for fixing a spindle sleeve on the platform of an automatic machine tool. 5,113,729, Cl. 82-137.000.

Rood, Terry M. House plant display structure. 5,114,022, Cl. 211-71.000.

Root, Douglas R.: *See—*
Davloor, Ramana; Root, Richard; and Root, Douglas R., 5,113,711, Cl. 73-864.630.

Root, Richard: *See—*
Davloor, Ramana; Root, Richard; and Root, Douglas R., 5,113,711, Cl. 73-864.630.

Rosa, Riccardo, to Ferrari S.p.A. Variable timing system, particularly for an internal combustion engine. 5,113,813, Cl. 123-90.160.

Rosanio, Louis: *See—*
Williams, John G.; and Rosanio, Louis, 5,114,858, Cl. 435-270.000.

Rosebrock, Linda L.; and Rosebrock, Ronald L., deceased (by Rosebrock, Linda L., personal representative). Rainwater diverter. 5,114,594, Cl. 210-767.000.

Rosebrock, Linda L., personal representative: *See—*
Rosebrock, Linda L.; and Rosebrock, Ronald L., deceased, 5,114,594, Cl. 210-767.000.

Rosebrock, Ronald L., deceased: *See—*
Rosebrock, Linda L.; and Rosebrock, Ronald L., deceased, 5,114,594, Cl. 210-767.000.

Roselle, Paul L.; Kosman, Stephen L.; and Mahns, Patricia A., to Eastman Kodak Company. Forming planar ITO gate electrode array structures. 5,114,872, Cl. 437-48.000.

Rosenblatt, Michael; McKee, Roberta L.; Caulfield, Michael P.; and Nutt, Ruth F., to Merck & Co., Inc. Humoral hypercalcemic factor antagonists. 5,114,843, Cl. 435-7.210.

Rosenwinkel, Donald A.; and Moormann, Randall H., to Breslow, Morrison, Terzian & Associates, Inc. Mechanical card dispenser and method of playing a card game. 5,114,153, Cl. 273-292.000.

Ross, Colby M.; Sproul, Richard M.; McCurley, Ross M.; and Young, Carter R., to Otis Engineering Corporation. Single bore packer with dual flow conversion for gas lift completion. 5,113,939, Cl. 166-120.000.

Ross, David A.: *See—*
Ross, John D.; and Ross, David A., 5,115,314, Cl. 358-183.000.

Ross, John D.; and Ross, David A., to Ross Video Limited. Video keying circuitry incorporating time division multiplexing. 5,115,314, Cl. 358-183.000.

Ross, Ludwig; and Schumann, Werner, to Schott Glaswerke. Lightwave guide produced by ion exchange of cs+ ions. 5,114,453, Cl. 65-30.130.

Ross Operating Valve Company: *See—*
Russell, Neil E., 5,113,907, Cl. 137-596.160.

Ross Video Limited: *See—*
Ross, John D.; and Ross, David A., 5,115,314, Cl. 358-183.000.

Rossenfeld, Joel P. Method and apparatus for the analysis, display and classification of event related potentials by interpretation of P3 responses. 5,113,870, Cl. 128-731.000.

Rossmeisl, Mark E.: *See—*
Jackson, Rodney P.; and Rossmeisl, Mark E., 5,113,578, Cl. 29-743.000.

Rosson, Gene T. Expandable screen tensioning frame with expansion devices. 5,113,611, Cl. 38-102.700.

Roth, Willy: *See—*
Balihause, Helmut; Engelhardt, Gunther; Landgraf, Claus A.; Mayer, Norbert; Roth, Willy; Schumacher, Kurt; and Prox, Alex, 5,114,935, Cl. 514-228.800.

Rother, Peter, to Hewlett-Packard Company. Method for processing signals, particularly for oximetric measurements on living human tissue. 5,113,861, Cl. 128-633.000.

Rothstein, Jonathan C.: *See—*
diGirolamo, Edward R.; Colasanto, Thomas; and Rothstein, Jonathan C., 5,113,631, Cl. 52-236.800.

Rotstein, Rony; and Spector, George. Self-cleaning cat litter box. 5,113,801, Cl. 119-163.000.

Rottger, Jutta; Passon, Karl-Heinz; Schroer, Wolf-Dieter; and Kortmann, Wilfried, deceased (by Kortmann, Margot, Bettina Kortmann, Axel Kortmann, heirs), to Bayer Aktiengesellschaft. Graft copolymers containing perfluoroalkyl groups. 5,115,013, Cl. 524-457.000.

Rottschafer, William A., to Kwik Mount, Inc. Outboard motor stowing bracket for slotted swim platform. 5,113,791, Cl. 114-362.000.

Rouse, Jesse L.: *See—*
Rouse, Jesse L.; and Rouse, Jesse L., 5,114,152, Cl. 273-246.000.

Rouse, Jessie L.; and Rouse, Jesse L. Automotive racing game. 5,114,152, Cl. 273-246.000.

Rousset, Didier; and Graillat, Gerard, to Salomon S.A. Integral binding. 5,114,172, Cl. 280-633.000.

Rowe, Norman R.; and Sweeney, William R., to Philip Morris Incorporated. Laminar flow dust shield for wide angle lens. 5,115,342, Cl. 359-509.000.

Rowlette, John J., to California Institute of Technology. Lightweight bipolar storage battery. 5,114,807, Cl. 429-152.000.

Roxell, N.V.: *See—*
van Daele, Antoine A., 5,113,797, Cl. 119-53.000.

Rua, Louis, Jr.; and Schaab, Carl, to Webcraft Technologies, Inc. Fragrance enhanced scratch-off layer for game cards. 5,114,735, Cl. 427-7.000.

Rubin, Martin. Treatment of atherosclerosis with $MgNa_2EDTA$. 5,114,974, Cl. 514-566.000.

Rudolph, Peter K. C.; and Georgefalvy, Dezso, to Boeing Company, The. Anti-icing system for aircraft. 5,114,100, Cl. 244-134.00C.

Ruff, Hans: *See—*
Kuhn, Friedrich; Drefs, Wolfgang; Ruff, Hans; and Scheuter, Siegbert, 5,114,062, Cl. 226-95.000.

Ruger, Wolfgang; Urbach, Hansjorg; Becker, Reinhard; and Hock, Franz, to Hoechst Aktiengesellschaft. New amino acid esters, a process for their preparation, medicaments containing them, and the use thereof. 5,114,962, Cl. 514-412.000.

Runge, Thomas M. Hyperosmolar oxyreplete hemosubstitute. 5,114,932, Cl. 514-58.000.

Russell, Neil E., to Ross Operating Valve Company. Dynamic self-monitoring air operating system. 5,113,907, Cl. 137-596.160.

Rust, Ralph J.: *See—*
Grimshaw, Michael N.; Albers, Stephen J.; and Rust, Ralph J., 5,114,519, Cl. 156-235.000.

Rutze, Uwe: *See—*
Bader, Hubertus C.; Nattermann, Kurt; and Rutze, Uwe, 5,115,486, Cl. 385-124.000.

Ryder International Corporation: *See—*
Kanner, Rowland W.; and Lisak, Stephen P., 5,114,441, Cl. 55-26.000.

Sabel, Bernhard A.; and Freese, Andrew. Extended drug delivery of small, water-soluble molecules. 5,114,719, Cl. 424-422.000.

Sablik, Martin J.; Nicholls, Colin I.; and Anderson, Robert E., to Southwest Research Institute. Fabrication of high temperature superconductors. 5,114,914, Cl. 505-1.000.

Sachdev, Harbans S.: *See—*
Kwong, Ranee W.; Sachdev, Harbans S.; and Sachdev, Krishna G., 5,114,826, Cl. 430-192.000.
Sachdev, Krishna G.; Hummel, John P.; Kwong, Ranee W.; Lang, Robert N.; Linehan, Leo L.; and Sachdev, Harbans S., 5,115,090, Cl. 528-353.000.

Sachdev, Krishna G.; Hummel, John P.; Kwong, Ranee W.; Lang, Robert N.; Linehan, Leo L.; and Sachdev, Harbans S. Viscosity stable, essentially gel-free polyamic acid compositions. 5,115,090, Cl. 528-353.000.

Sachdev, Krishna G.: *See—*
Kwong, Ranee W.; Sachdev, Harbans S.; and Sachdev, Krishna G., 5,114,826, Cl. 430-192.000.

Sacripante, Guerino: *See—*
Ong, Beng S.; Sacripante, Guerino; Kmiecik-Lawrynowicz, Grazyna; and McAneney, T. Brian, 5,114,819, Cl. 430-106.600.

Sadamori, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Vertical wafer carrying apparatus. 5,113,992, Cl. 198-347.300.

Sadlowski, Jurgen; Dangschat, Manfred; Diefenbach, Horst; Laser, Theo; and Schmitt, Deiter, to BASF Lacke+Farben Aktiengesellschaft[DE/DE], Max-. Process for the preparation of polyester resin. 5,115,085, Cl. 528-272.000.

Safe Flight Instrument Corporation: *See—*
Greene, Leonard M., 5,115,237, Cl. 340-967.000.

Sahashi, Masayoshi, to Kabushiki Kaisha Daikin Seisakusho. Securing structure and method of blade for torque converter. 5,113,654, Cl. 60-330.000.

Sahoo, Soumya P.: *See—*
Biftu, Tesfaye; Bugianesi, Robert L.; Girotra, Nirindar N.; Ponpipom, Mitree M.; Sahoo, Soumya P.; and Kuo, Chan H., 5,114,961, Cl. 514-397.000.

Saint-Gobain Vitrage International: *See—*
Promper, Hans-Josef; D'Iribarne, Benoit; Kuster, Hans-Werner; Nowoczyn, Hans-Werner; and Vanaschen, Luc, 5,114,454, Cl. 65-163.000.

St. Pierre, Leon E.; Brown, George R.; Wu, Gaoming; and Yu, Youlu, to Lowchol Scientific Inc. Ferric ion coordinated polyamine resins for the lowering of blood cholesterol. 5,114,709, Cl. 424-78.120.

Saito, Akira: *See—*
Osamura, Kazumi; Terazono, Masaki; Kohsaka, Shoji; Koga, Kazunori; Saito, Akira; Sato, Masahiro; and Uchimura, Hideki, 5,114,889, Cl. 501-97.000.

Saito, Hideo: *See—*
Emoto, Naoyoshi; Saito, Hideo; and Furukawa, Kenji, 5,114,614, Cl. 252-299.650.

Saito, Makoto; and Gunji, Minoru, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Electromagnet for nuclear reactor shutdown system. 5,114,663, Cl. 376-233.000.

Saito, Takeshi: *See—*
Mizuno, Toshiya; Teramoto, Yoshikichi; Saito, Takeshi; and Wakabayashi, Juichi, 5,115,092, Cl. 528-388.000.

Saito, Tsutomu, to Kawai Musical Inst. Mfg. Co., Ltd. Method and apparatus for representing musical tone information. 5,113,740, Cl. 84-607.000.

Saitoh, Kenji: *See—*
Matsugu, Masakazu; Saitoh, Kenji; and Ohwada, Mitsutoshi, 5,114,236, Cl. 356-401.000.

Saitoh, Masahide: *See—*
Tsuchiya, Ichiro; Ishikawa, Shinji; Saitoh, Masahide; and Ishiguro, Yoichi, 5,114,338, Cl. 432-206.000.

Saitoh, Takaki: *See—*
Masuyama, Akira; and Saitoh, Takaki, 5,114,529, Cl. 156-643.000.

Sakai, Hideki, to Toyota Jidosha Kabushiki Kaisha. Vehicle wheel suspension with quadrilateral link strut. 5,114,175, Cl. 280-675.000.

Sakai, Hideki; Ishiwatari, Kazuo; and Ikejiri, Fumitoshi, to Mitsui Petrochemical Industries, Inc. Fire-retardant polyamide composition having good heat resistance 5,115,010, Cl. 524-410.000.

Sakai, Kazuo: *See—*
Terayama, Takao; Yokota, Hajime; Sakai, Kazuo; and Kaku, Nobuyuki, 5,115,361, Cl. 360-85.000.

Sakai, Kiyoshi: *See—*
Sakoh, Harumi; Sakai, Kiyoshi; and Amamiya, Shoji, 5,114,814, Cl. 430-46.000.

Sakai, Satoru: *See—*
Ebihara, Toshiyuki; Sakai, Satoru; Nishikawa, Masaji; and Asano, Masashi, 5,115,320, Cl. 358-296.000.

Sakai, Toshiyuki: *See—*
Yabusaki, Yoshiyasu; Murakami, Hiroko; Sakai, Toshiyuki; Shibata, Megumi; and Ohkawa, Hideo, 5,114,852, Cl. 435-189.000.

Sakaki, Hirokazu: *See—*
Takizawa, Kazushige; and Sakaki, Hirokazu, 5,114,825, Cl. 430-159.000.

Sakakibara, Yoshio: *See—*
Ishikawa, Akihiro; Isaka, Haruo; and Sakakibara, Yoshio, 5,115,422, Cl. 369-54.000.

Sakane, Katumi: *See—*
Shimomura, Takeshi; Sakane, Katumi; Tokuda, Makoto; and Egawa, Sinpei, 5,114,184, Cl. 280-784.000.

Sakanoue, Kei, to Fuji Photo Film Co., Ltd. Process for processing silver halide color photographic material. 5,114,835, Cl. 430-393.000.

Sakaya, Masuji; Okiai, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, to Fujikura Ltd. Heat pipe and method of manufacturing the same. 5,113,932, Cl. 165-104.260.

Sakoh, Harumi; Sakai, Kiyoshi; and Amamiya, Shoji, to Canon Kabushiki Kaisha. Photosensitive member for electrophotography, image forming method and electrophotographic apparatus using the same. 5,114,814, Cl. 430-46.000.

Sakurai, Akira, to Kabushiki Kaisha Murao and Company. Cheese conveyor system. 5,113,995. Cl. 198-409.000.

Saladin, Jean-Pierre: *See—*
Guy, Jean-Luc; and Saladin, Jean-Pierre, 5,114,533, Cl. 159-6.100.

Sale, Matthew D.: *See—*
Nemirovsky, Mario D.; and Sale, Matthew D., 5,115,513, Cl. 395-800.000.

Salo, Heikki: *See—*
Nurmi, Pekka; and Salo, Heikki, 5,114,189, Cl. 285-7.000.

Salomon S.A.: *See—*
Goud, Gilles R.; and Brischoux, Jean-Claude, 5,114,173, Cl. 280-633.000.
Rousset, Didier; and Graillat, Gerard, 5,114,172, Cl. 280-633.000.

Samaras, William A.; Vaughan, David T.; and Ingraham, Andrew D., to Digital Equipment Corporation. Method and apparatus for stabilized data transmission. 5,115,455, Cl. 375-106.000.

Sameshima, Masaru: *See—*
Kuroda, Takashi; Yamada, Kazuhiro; Ishibashi, Tadao; Hayashida, Suetou; Kimura, Kyoichiro; and Sameshima, Masaru, 5,114,638, Cl. 264-41.000.

Samouris, Arthur: *See—*
Bobb, Lloyd C.; White, Barbara J.; Davis, Jon P.; and Samouris, Arthur, 5,115,127, Cl. 250-227.190.

Sample, Stephen P., to Quickturn Systems, Incorporated. Multiple connector arrangement for printed circuit board interconnection. 5,114,353, Cl. 439-65.000.

Samsonite Corporation: *See—*
Workman, David E., 5,113,983, Cl. 190-127.000.

Samsung Corning Co., Ltd.: *See—*
Jung, Tae Y., 5,114,642, Cl. 264-61.000.

Samsung Electron Devices Co., Ltd.: *See—*
Jeong, Jong-in; Choi, Jong-seo; No, Hwan-cheol; and Ju, Kyu-nam, 5,115,164, Cl. 313-346.0DC.
Shim, U-kyung, 5,115,312, Cl. 358-140.000.

SamSung Electronics Co., Ltd.: *See—*
Jang, Dug-Hwan, 5,115,322, Cl. 358-304.000.
Kim, Kyung-hun; Kim, Seong-tae; and Lee, Hyeong-kyu, 5,114,873, Cl. 437-52.000.

Samuels, Michael R.: *See—*
Waggoner, Marion G.; and Samuels, Michael R., 5,115,080, Cl. 528-190.000.

Sanchez, Robert: *See—*
Hendler, Sheldon S.; and Sanchez, Robert, 5,114,957, Cl. 514-356.000.

Sandbank, Mary E. Net for dishwasher rack. 5,114,019, Cl. 211-41.000.

Sandstrom, Eric L.; Prokop, Alfred; Young, William H., II; and D'Urso, Anthony M., to W. R. Grace & Co.-Conn. Filter element and spiral-wound membrane cartridge containing same. 5,114,582, Cl. 210-321.740.

Sandvik Process Systems, Inc.: *See—*
Okada, Goro, 5,113,993, Cl. 198-369.000.

Sanko Plastics Co., Ltd.: *See—*
Miyajima, Yukio, 5,114,657, Cl. 264-334.000.

Sankyo Engineering Co., Ltd.: *See—*
Nakamura, Susumu; and Yokoi, Koichi, 5,114,329, Cl. 425-190.000.

Sano, Yumiko: *See—*
Urano, Akiyoshi; and Sano, Yumiko, 5,114,817, Cl. 430-93.000.

Santosusso, Thomas M.: *See—*
Quay, Jeffrey R.; Bassner, Sherri L.; and Santosusso, Thomas M., 5,115,071, Cl. 528-59.000.

Sanyo Electric Company, Ltd.: *See—*
Katsuki, Hikaru, 5,113,665, Cl. 62-126.000.
Okamoto, Shingo; Takahama, Tsuyoshi; Nishikuni, Masato; and Nakano, Shoichi, 5,114,498, Cl. 136-258.000.

Saotome, Shigeru; and Ishida, Masamitsu, to Fuji Photo Film Co., Ltd. Radiation image recording and read-out apparatus. 5,115,132, Cl. 250-327.200.

Sapoff, Paul C., to Catalyst Technology, Inc. Catalyst recovery trough for unloading multi-tube reactors with maximum dust containment. 5,114,685, Cl. 422-219.000.

Sappok, Reinhard J.: *See—*
Keaveney, William P.; and Sappok, Reinhard J., 5,114,479, Cl. 106-30.000.

Sarada, Thjagaraj: *See—*
Auslander, Judith; Hochwalt, Norman C.; and Sarada, Thjagaraj, 5,114,478, Cl. 106-20.000.

Sareshwala, Sohel A., to Lokring Corporation. Pipe fitting with coupling body and improved isolation tooth arrangement. 5,114,191, Cl. 285-115.000.

Sarhaddar, Schahroch, to Vogelbusch GmbH. Method for hydrolyzing starch to produce saccharified mash. 5,114,491, Cl. 127-38.000.

Sarrine, Robert J.: *See—*
Golias, Tipton L.; Sarrine, Robert J.; and Golias, Joseph H., 5,114,033, Cl. 222-82.000.

Sasaki, Eiichi. Thermal head drive apparatus correcting for the influence on a printing element of heat from other printing elements. 5,115,252, Cl. 346-76.0PH.

Sasaki, Takeo: *See—*
Takahashi, Akira; Kanno, Yoshiaki; Sumitani, Jiro; Nakamoto, Katsuya; Sasaki, Takeo; and Akasu, Masahira, 5,115,397, Cl. 364-431.050.

Sasaki, Yorihiko: *See—*
Ikarashi, Masami; Mitsumori, Kenichi; Kano, Mitsuru; Miki, Yasuhiro; Akimoto, Takemi; Yamaguchi, Masahiko; Sasaki, Yorihiko; Kamigaki, Tomoo; Nakanowatari, Jun; Kato, Yoshinori; and Seki, Hitoshi, 5,115,329, Cl. 359-50.000.

Sasaki, Yukihiko, to Avery Dennison Corporation. Curable film forming compositions. 5,115,008, Cl. 524-271.000.

Sasaya, Kazushi: *See—*
Kanamaru, Hisanobu; Onuma, Tomiyasu; and Sasaya, Kazushi, 5,114,263, Cl. 403-274.000.

Sasol Mining (Proprietary) Limited: *See—*
Kornecki, Julian; and Armstrong, Charles J., deceased, 5,114,213, Cl. 299-81.000.

Sato, Hiroshi: *See—*
Torigoe, Makoto; and Sato, Hiroshi, 5,114,223, Cl. 353-101.000.

Sato, Hiroyuki; and Sugasa, Mikishige, to Seikosha Co., Ltd. Ribbon cassette having means to feed both fabric and film ribbons. 5,114,254, Cl. 400-207.000.

Sato, Kaoru: *See—*
Kusano, Akihisa; Kimizuka, Junichi; Ito, Toshiyuki; Sato, Kaoru; Abe, Makoto; Okazawa, Kazuhiko; and Inuyama, Toshihiko, 5,115,147, Cl. 307-311.000.

Sato, Katsuyuki; Matsumoto, Miki; Ohkuma, Sadayuki; Ogata, Masahiro; and Yoshida, Masahiro, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corporation. Semiconductor memory device. 5,115,413, Cl. 365-230.090.

Sato, Keiji, to Fuji Jukogyo Kabushiki Kaisha. Transmission ratio control system of a continuously variable transmission for a motor vehicle. 5,113,718, Cl. 74-846.000.

Sato, Kenichi; and Mukai, Hidehito, to Sumitomo Electric Industries, Ltd. Superconductive conductor. 5,114,908, Cl. 505-1.000.

Sato, Kensaku, to Hirose Electric Co., Ltd. Electrical connector and method of loading same. 5,114,366, Cl. 439-585.000.

Sato, Kiyoshi; Taguchi, Masaaki; Wada, Yasunori; Kawasaki, Mikio; Ohtani, Shinichi; Iwada, Masatosi; and Hatakeyama, Noboru, to Konica Corporation. Method of development comprising intermittently spraying a photographic material. 5,114,836, Cl. 430-434.000.

Sato, Masahiro: *See—*
Osamura, Kazumi; Terazono, Masaki; Kohsaka, Shoji; Koga, Kazunori; Saito, Akira; Sato, Masahiro; and Uchimura, Hideki, 5,114,889, Cl. 501-97.000.

Sato, Michitaka: *See—*
Nishio, Hiroaki; Watanabe, Keiji; and Sato, Michitaka, 5,114,749, Cl. 427-226.000.

Sato, Shigeru: *See—*
Hayashi, Takeshi; Sato, Shigeru; Tsujimoto, Katsuaki; Miyazaki, Daishiro; Hiwasa, Yoneo; and Ishimatsu, Toshiki, 5,113,954, Cl. 175-415.000.

Sato, Shinichi: *See—*
Inada, Jun; Sato, Shinichi; Shimizu, Ryoichi; Kitani, Akinobu; and Nakano, Kunio, 5,114,765, Cl. 428-35.700.

Sato, Shogo: *See—*
Kunimaru, Noritaka; Shiba, Katsuhiro; Kudo, Norio; Inoshita, Gen; and Sato, Shogo, 5,114,093, Cl. 242-204.000.

Sato, Syoji: *See—*
Izumi, Yasuo; Sato, Syoji; Ishimoto, Kazumi; Makino, Yutaka; and Ueno, Shohzo, 5,113,788, Cl. 118-663.000.

Sato, Takanobu: *See—*
Tanaka, Katsuhiko; Yoshiba, Takeyuki; Sato, Takanobu; Kawakami, Ikunori; and Kawakami, Koichi, 5,114,245, Cl. 384-112.000.

Sato, Takayuki: *See—*
Asayama, Yoshio; Tsubota, Makio; Okura, Yasunori; and Sato, Takayuki, 5,113,720, Cl. 74-866.000.

Sato, Tetsuya: *See—*
Komuro, Junichi; Sato, Tetsuya; and Hidaka, Norihiro, 5,115,490, Cl. 395-400.000.

Sato, Tsunehiko: *See—*
Shibata, Norio; Sato, Tsunehiko; Chino, Naoyoshi; and Hiraki, Yasuhito, 5,114,753, Cl. 427-286.000.

Satoh, Masaharu: *See—*
Fukunaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, 5,114,177, Cl. 280-707.000.

Satou, Hidetaka: *See—*
Yoshida, Masatoshi; Shibata, Katsuji; Kojima, Mitsumasa; Satou, Hidetaka; Kato, Toshihiko; Miyadera, Yasuo; and Yusa, Masami, 5,115,089, Cl. 528-353.000.

Saturn Corporation: *See—*
Frostick, Lewis A., 5,114,573, Cl. 210-136.000.

Saunders, Alan J. Tide calculating and display device. 5,115,417, Cl. 368-19.000.

Saunders Archery Company: *See—*
Saunders, Charles A., 5,114,156, Cl. 273-419.000.

Saunders, Charles A., to Saunders Archery Company. Arrow point. 5,114,156, Cl. 273-419.000.

Savage, Robert O.; Fischer, Robert J.; and Divita, Sam, to United States of America, Army. Direct optical fiber glass formation techniques using chemically and/or physically removable filamentary substrates. 5,114,738, Cl. 427-37.000.

Savair Inc: *See—*
Wolfbauer, Michael H., III, 5,113,710, Cl. 73-862.540.

Sawada, Satoru: *See—*
Yoshikawa, Sumio; Okino, Yoshiharu; and Sawada, Satoru, 5,115,304, Cl. 358-75.000.

Sawada, Yosuke; Kakushima, Masatoshi; Nishio, Maki; Miyaki, Takeo; and Oki, Toshikazu, to Bristol-Myers Company. *Actinomadura hibisca* microorganism useful for preparing serine analogs of BU-3608 antibiotics. 5,114,857, Cl. 435-252.100.

Sawai, Seiji, to Yamaha Hatsudoki Kabushiki Kaisha. Suspension mechanism for vehicles. 5,114,176, Cl. 280-691.000.

Sawamoto, Isao: *See—*
Shimamune, Takayuki; Nakamatsu, Shuji; Sawamoto, Isao; Masuda, Hiroshi; and Nishiki, Yoshinori, 5,114,549, Cl. 204-149.000.

Sawamura, Mitsuyoshi: *See—*
Yoneda, Akiyoshi; Sawamura, Mitsuyoshi; Tanaka, Kikuo; and Kokado, Takashi, 5,115,403, Cl. 364-474.150.

Scarborough, Robert M.: *See—*
Seilhamer, Jeffrey J.; Lewicki, John A.; Scarborough, Robert M.; and Porter, J. Gordon, 5,114,923, Cl. 514-12.000.

Scaringe, Robert P.: *See—*
Parrish, Clyde F.; and Scaringe, Robert P., 5,113,666, Cl. 62-259.300.

Schaab, Carl: *See—*
Rua, Louis, Jr.; and Schaab, Carl, 5,114,735, Cl. 427-7.000.

Schaefer, Dietmar: *See—*
Fock, Jurgen; Schaefer, Dietmar; and Esselborn, Eberhard, 5,115,039, Cl. 525-329.500.
Fock, Jurgen; Schaefer, Dietmar; and Esselborn, Eberhard, 5,115,040, Cl. 525-329.500.

Schafer, Roland: *See—*
Ams, Felix; and Schafer, Roland, 5,115,126, Cl. 250-227.110.

Schappler, Joseph J., to Eastman Kodak Company. Photographic camera with integratable wrist strap. 5,115,264, Cl. 354-82.000.

Schatz, Oskar. Heat storage means. 5,114,071, Cl. 237-12.30C.

Schaubel, Kurt M.: *See—*
Fisher, Michael V.; Schaubel, Kurt M.; and Raggio, William A., 5,114,087, Cl. 242-42.000.

Schechter, Carrin: *See—*
Fumagalli, Lisbeth L.; Love, Katherine M.; and Schechter, Carrin, 5,114,344, Cl. 434-128.000.

Scheler, Siegfried; Buhr, Gerhard; Lenz, Helmut; Bergmann, Klaus; and Siegel, Herbert, to Hoechst Aktiengesellschaft. Radiation-sensitive compounds, radiation-sensitive mixture prepared therewith and copying material. 5,114,816, Cl. 430-192.000.

Schell, Ferenc: *See—*
Arato, Laszlo F.; and Schell, Ferenc, 5,114,132, Cl. 271-18.300.

Schell, Joseph G., Jr.; Marchand, Gary R.; and Meiske, Larry A., to Dow Chemical Company, The. Catalyst and process for polymerizing olefins. 5,114,897, Cl. 502-111.000.

Schering Corporation: *See—*
Kielley, James R., 5,114,979, Cl. 514-783.000.

Scherping, Karl-Heinz; Holscher, Hans-Jorg; Reichelt, Uwe; and Reiter, Udo, to BASF Lacke & Farben AG. Aqueous coating agent, process for its preparation, and its use for coating cans, based on acrylic monomers, epoxy-polyesters and methylol functional curing agents. 5,114,993, Cl. 523-409.000.

Scheunemann, Karl-Heinz: *See—*
Lang, Hans-Jochen; Weidmann, Klaus; Scheunemann, Karl-Heinz; Nimmesgern, Hildegard; Rippel, Robert; and Herling, Andreas W., 5,114,955, Cl. 514-338.000.

Scheuter, Siegbert: *See—*
Kuhn, Friedrich; Drefs, Wolfgang; Ruff, Hans; and Scheuter, Siegbert, 5,114,062, Cl. 226-95.000.

Schichl, Roman: *See—*
Hartmann, Uwe; Mai, Udo; and Schichl, Roman, 5,113,839, Cl. 123-606.000.

Schickler, Edward R.: *See—*
Finnicum, Douglas S.; Schickler, Edward R.; Soules, William J.; and Wahlers, Robert A., 5,114,759, Cl. 427-420.000.

Schiel, Wolfgang: *See—*
Weiler, Rolf; Schiel, Wolfgang; and Bretzler, Rainer, 5,113,978, Cl. 188-73.310.

Schildkraut, Jay S.; Scozzafava, Michael; and Howe, Dennis G., to Eastman Kodak Company. Photorefractive system and process for its use. 5,115,336, Cl. 359-263.000.

Schirlin, Daniel G., to Merrell Dow Pharmaceuticals Inc. Analog of peptidase substrates. 5,114,927, Cl. 514-18.000.

Schlawne, Friedheim, to Mannesmann AG. Process and apparatus for detecting discontinuities on long workpieces. 5,113,697, Cl. 73-602.000.

Schliebs, Gunter: *See—*
Gaus, Harry; Schliebs, Gunter; and Gross, Hagen, 5,115,367, Cl. 361-49.000.

Schmelzle, Lawrence E.: *See—*
Huber, Gordon R.; Wenger, LaVon G.; Hauck, Bobbie W.; Rokey, Galen J.; Schmelzle, Lawrence E.; and Hartter, Timothy R., 5,114,488, Cl. 127-1.000.

Schmidt, Gerhard: *See—*
Ritter, Gerhard; Ritter, Klaus; Schmidt, Gerhard; and Resch, Walter, 5,113,915, Cl. 140-112.000.

Schmidt, Hans: *See—*
Wilhelm, Ludwig; and Schmidt, Hans, 5,114,474, Cl. 75-751.000.

Schmidtke, Leslie E., Jr.: *See—*
Kuyzin, Gregg S.; and Schmidtke, Leslie E., Jr., 5,114,985, Cl. 521-130.000.

Schmidts, Kurt: *See—*
Schoettle, Klaus; Borck, Gerald-Wolfgang; Schmidts, Kurt; and Pavelka, Bozidar, 5,114,008, Cl. 206-387.000.

Schmitt, Deiter: *See—*
Sadlowski, Jurgen; Dangschat, Manfred; Diefenbach, Horst; Laser, Theo; and Schmitt, Deiter, 5,115,085, Cl. 528-272.000.

Schmitt, Edgar: *See—*
Benzinger, Roland; Schmitt, Edgar; Siegel, Heinz; Huebl, Ewald; Mueller, Klaus; Himmelsbach, Manfred; and Jordan, Martin, 5,114,215, Cl. 303-113.0TB.

Schmitt, Johannes: *See—*
Sigl, Alfred; Schmitt, Johannes; and Isella, Thomas, 5,113,963, Cl. 180-197.000.

Schmitt, Oskar M.: *See—*
Siegmund, Werner, deceased; Kamereit, Wilhelm; Schmitt, Oskar M.; Weidmann, Volker; and Friedrich, Otto J., 5,114,475, Cl. 106-13.000.

Schneider, Fernand: *See—*
Fischer, Ulf; Schneider, Fernand; and Widmer, Ulrich, 5,114,934, Cl. 514-212.000.

Schneuing, Ralf: *See—*
Grube, Erwin; Kuhlmann, Walter; and Schneuing, Ralf, 5,113,998, Cl. 198-465.400.

Schoettle, Klaus; Borck, Gerald-Wolfgang; Schmidts, Kurt; and Pavelka, Bozidar, to BASF Aktiengesellschaft. Cassette container having inner reinforcing edge. 5,114,008, Cl. 206-387.000.

Schoeyer, Herman F. R.; Borso, Guido; and Gibilisco, Salvatore, to Agence Spatiale Europeenne. Consumable igniter for a solid rocket motor. 5,113,763, Cl. 102-202.000.

Schomburg, Gerhard; and Lux, Jurgen A., to Studiengesellschaft Kohle MbH. Method for the production of gel filled capillaries for capillary gel electrophoresis. 5,114,580, Cl. 204-180.100.

Schonfeld, Karl-Heinrich: *See—*
Kaltenthaler, Wolfgang; and Schonfeld, Karl-Heinrich, 5,114,315, Cl. 417-18.000.

Schonstedt, Erick O.: *See—*
Rippingale, John B.; and Schonstedt, Erick O., 5,114,517, Cl. 156-187.000.

Schonstedt Instrument Company: *See—*
Rippingale, John B.; and Schonstedt, Erick O., 5,114,517, Cl. 156-187.000.

Schoonover, Michael W.: *See—*
Holmgren, Jennifer S.; Gembicki, Stanley A.; Schoonover, Michael W.; and Kocal, Joseph A., 5,114,895, Cl. 502-84.000.

Schott Glass Technologies, Inc.: *See—*
Smoot, Stephen W.; Hayden, Joseph S.; Clement, Marc; Grabowski, Danuta; Holzel, Eva; Nass, Peter; and Heming, Martin, 5,114,813, Cl. 430-5.000.

Schott Glaswerke: *See—*
Bader, Hubertus C.; Nattermann, Kurt; and Rutze, Uwe, 5,115,486, Cl. 385-124.000.
Ross, Ludwig; and Schumann, Werner, 5,114,453, Cl. 65-30.130.

Schrader, Dieter: *See—*
Hoeffkes, Horst; Lange, Fritz; and Schrader, Dieter, 5,114,428, Cl. 8-405.000.

Schrader, V. E. (Bud). Vertical lift dolly. 5,114,118, Cl. 254-8.00R.

Schreiber Foods, Inc.: *See—*
Meli, Vincent A.; Matharani, Michael A.; Brzezinski, Ted A.; Shaft, David L.; and Urmanski, James L., 5,114,307, Cl. 414-793.100.

Schreiber, Stuart L.: *See—*
Burakoff, Steven J.; and Schreiber, Stuart L., 5,115,098, Cl. 530-331.000.

Schremmer, Gottfried: *See—*
Dumschat, Rainer; and Schremmer, Gottfried, 5,113,716, Cl. 74-493.000.

Schrenk, Juergen: *See—*
Berger, Johann; DeLaCroix, Fern; Buck, Harvey; and Schrenk, Juergen, 5,114,673, Cl. 422-56.000.

Schroeder, Jon M.; Long, Joseph F.; and Hartgrove, Randall J. Automated chip to board process. 5,113,580, Cl. 29-840.000.

Schroer, Wolf-Dieter: *See—*
Rottger, Jutta; Passon, Karl-Heinz; Schroer, Wolf-Dieter; and Kortmann, Wilfried, deceased, 5,115,013, Cl. 524-457.000.

Schroll, Georg: *See—*
Hintermayer, Jochen; Graf, Ernst; Gmohling, Werner; Schroll, Georg; and Kobler, Wolfgang, 5,114,693, Cl. 423-344.000.

Schroppel, Werner; and Leidenberger, Thomas, to Diehl GmbH & Co. Arrangement for the unlatching and extension of the stabilizing fins of a projectile. 5,114,095, Cl. 244-3.280.

Schubert, Erdmann F.: *See—*
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Plow, Edward F.; and Ginsberg, Mark H., 5,114,842, Cl. 424-85.800.

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Shimada, Akira, 5,115,418, Cl. 318-616.000.
Umeda, Tsuyoshi, 5,115,178, Cl. 318-568.110.

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Matsuda, Takumi, 5,113,796, Cl. 119-51.110.
Sato, Hiroyuki; and Sugasa, Mikishige, 5,114,254, Cl. 400-207.000.
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Ohashi, Hidetsugu; Kinugasa, Masayuki; Adachi, Toshiro; Nonomura, Akihiro; and Sekimoto, Waro, 5,114,799, Cl. 428-659.000.

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Lawton, Geoffrey; Osbond, John M.; and Self, Christopher R., 5,114,960, Cl. 514-379.000.

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DiBugnara, Raymond, 5,113,579, Cl. 29-840.000.

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Beckmann, Otto, 5,115,001, Cl. 524-58.000.

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Gurley, Thomas D.; and Sendelweck, Gene K., 5,115,316, Cl. 358-188.000.

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Thier, Hubert, 5,114,243, Cl. 383-85.000.

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Young, James W.; and Brandt, Steven, 5,114,714, Cl. 424-400.000.
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Stiffler, Jack J.; Nolan, James M.; Mark, Peter; and Harvey, David, 5,115,499, Cl. 395-425.000.

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Walker, David R., 5,114,684, Cl. 422-186.000.

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Usui, Masayoshi; and Serizawa, Haruo, 5,113,653, Cl. 60-299.000.

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McClure, David C., 5,115,146, Cl. 307-272.300.

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Holaday, John W.; Shacknai, Jonah; and Mazur, Leonard L., 5,114,963, Cl. 514-448.000.

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Bird, Ronald W.; and Shaffer, David K., 5,115,407, Cl. 364-551.010.

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Franck, Donald L.; Shah, Suresh D.; Sheth, Manu K.; and Zabel, Lawrence D., 5,114,650, Cl. 264-151.000.

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Hashimoto, Yoshinori, 5,115,149, Cl. 307-475.000.
Hatta, Koichi, 5,115,508, Cl. 395-725.000.
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Ishii, Hiroshi; and Ozaki, Masaaki, 5,115,172, Cl. 318-38.000.
Keiji, Yamaguchi, 5,115,227, Cl. 340-709.000.
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Watanabe, Takashi, 5,115,302, Cl. 358-41.000.

Shaver, P. Kent: *See—*
Ellingson, Frederick J.; and Shaver, P. Kent, 5,114,666, Cl. 376-272.000.

Shaw, Jane M.: *See—*
Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., 5,115,095, Cl. 525-474.000.

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Gozani, Tsahi; and Shea, Patrick M., 5,114,662, Cl. 376-159.000.

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DiFoggio, Rocco, 5,114,567, Cl. 208-401.000.
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George, Eric R., 5,115,003, Cl. 524-93.000.
Hanley, Stephen J., 5,114,992, Cl. 523-217.000.
Jaqua, Douglas A., 5,115,311, Cl. 358-140.000.
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Lin, Jiang-Jen, 5,114,899, Cl. 502-158.000.
Marx, Edward J.; and Watkins, Michael J., 5,115,019, Cl. 525-65.000.
Mastenbroek, Barend; and Petrus, Leonardus, 5,115,094, Cl. 528-392.000.
Smutny, Edgar J.; Gergen, William P.; Broekhuis, Antonius A.; Groenland, Franciscus C.; and Beijen, Johan M., 5,115,009, Cl. 524-306.000.
Stewart, Steven L., 5,114,633, Cl. 264-23.000.
Van Helden, Arend K.; Gilson, Jean-Pierre; and Syrier, Johannes L. M., 5,115,002, Cl. 524-91.000.
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Franck, Donald L.; Shah, Suresh D.; Sheth, Manu K.; and Zabel, Lawrence D., 5,114,650, Cl. 264-151.000.

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Shiba, Katsuhiro: *See—*
Kunimaru, Noritaka; Shiba, Katsuhiro; Kudo, Norio; Inoshita, Gen; and Sato, Shogo, 5,114,093, Cl. 242-204.000.

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Hikita, Mitsutaka; Tabuchi, Toyoji; Kurosawa, Kazuhito; and Shibagaki, Nobuhiko, 5,115,216, Cl. 333-195.000.

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Miyoshi, Jun; Shibanaka, Mitsugu; Matsui, Toshikazu; and Ohtsuka, Nobukazu, 5,114,136, Cl. 271-213.000.

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Ueda, Nobuo; Okita, Tatuo; Suzuki, Mikio; Ikemoto, Yasunori; and Shibao, Hiloyuki, 5,114,381, Cl. 453-57.000.

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Yoshida, Masatoshi; Shibata, Katsuji; Kojima, Mitsumasa; Satou, Hidetaka; Kato, Toshihiko; Miyadera, Yasuo; and Yusa, Masami, 5,115,089, Cl. 528-353.000.

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Yabusaki, Yoshiyasu; Murakami, Hiroko; Sakai, Toshiyuki; Shibata, Megumi; and Ohkawa, Hideo, 5,114,852, Cl. 435-189.000.

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Shigekane, Hisao, to Fuji Electric Co., Ltd. Temperature response protection circuit for bridge inverter. 5,115,388, Cl. 363-56.000.

Shigeta, Shiro: *See—*
Fukuda, Tamotsu; Shigeta, Shiro; Okuya, Hiroaki; Kuroiwa, Yasuyuki; and Sudo, Tadashi, 5,114,712, Cl. 424-87.000.

Shikora, Scott: *See—*
Stuart, Regina K.; Lowell, Jeffrey A.; Baxter, John K., III; Bistrian, Bruce R.; and Shikora, Scott, 5,114,401, Cl. 604-53.000.

Shim, U-kyung, to Samsung Electron Devices Co., Ltd. Double scanning circuit of ID-TV. 5,115,312, Cl. 358-140.000.

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Shimadzu Corporation: *See—*
Fujimoto, Shigeaki, 5,114,314, Cl. 417-3.000.
Tsuji, Fumio; and Yoshikawa, Osamu, 5,114,232, Cl. 356-346.000.

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Inada, Jun; Sato, Shinichi; Shimizu, Ryoichi; Kitani, Akinobu; and Nakano, Kunio, 5,114,765, Cl. 428-35.700.

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Mihara, Hirokata; Takagi, Koichi; Shimizu, Teruo; Tashiro, Katsunori; and Takahashi, Hideo, 5,113,636, Cl. 53-308.000.

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Yamashita, Noboru; Sugiura, Keiji; Shimomaki, Kazunori; and Takanishi, Toshiaki, 5,114,198, Cl. 293-120.000.

Shimomura, Tadao: *See—*
Harada, Nobuyuki; Okuno, Toshihiro; and Shimomura, Tadao, 5,115,011, Cl. 524-419.000.

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Takahashi, Keiichi, 5,113,825, Cl. 123-400.000.

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Inoue, Kaname; Yamazaki, Motohide; and Armentrout, Richard W., 5,114,846, Cl. 435-14.000.

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Cohen, Irun R.; Shinitzky, Meir; and Edelson, Richard L., 5,114,721, Cl. 424-534.000.

Shinjo, Kenji: *See—*
Yoshinaga, Kazuo; Katagiri, Kazuharu; Tsuboyama, Akira; Kitayama, Hiroyuki; Shinjo, Kenji; and Hioki, Chieko, 5,114,613, Cl. 252-299.610.

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Mumby, Edward S.; and Shinneman, Kevin J., 5,115,415, Cl. 367-85.000.

Shinohara, Ikuo: *See—*
Yamagishi, Makoto; Fujihira, Masao; Azami, Kazuo; and Shinohara, Ikuo, 5,115,473, Cl. 381-154.000.

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Ohashi, Hidetsugu; Kinugasa, Masayuki; Adachi, Toshiro; Nonomura, Akihiro; and Sekimoto, Waro, 5,114,799, Cl. 428-659.000.

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Takenaka, Shintaro, 5,114,081, Cl. 241-79.000.

Shiota, Masanori: *See—*
Nakagawa, Seiichi; Muruyama, Yoshiharu; Shiota, Masanori; Ishida, Kando; Fujita, Masayoshi; and Yamada, Shigenobu, 5,113,944, Cl. 169-13.000.

Shirahama, Hidefumi; Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; Iwanaka, Mitsufumi; Nagano, Takeshi; and Ishida, Youuji, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Circuit for controlling an electric power supply apparatus, a method therefor and an uninterruptible power supply. 5,115,386, Cl. 363-41.000.

Shirahata, Akira; Uchida, Minoru; Tanaka, Satoshi; and Tsumura, Kenichiro, to Hoechst Japan Limited. Therapeutic agent for the prevention of intraventricular hemorrhage in premature infants. 5,114,916, Cl. 514-2.000.

Shirai, Katsuo: *See—*
Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; and Ogiwara, Yoshihisa, 5,114,869, Cl. 43-40.000.

Shirai, Takahiro: *See—*
Muto, Kazuhiko; Shirai, Takahiro; and Yoshinari, Tsunenori, 5,115,124, Cl. 250-214.00L.

Shiraki, Toshinori; and Hattori, Yasuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Terminal-modified block copolymer and compositions containing the same. 5,115,035, Cl. 525-314.000.

Shiratori, Yuichi: *See—*
Kanzawa, Yoshikazu; Fujikake, Yasushi; Ito, Osami; Ito, Shuho; Oikawa, Hironobu; Otsubo, Makoto; Morikawa, Iwao; Shiratori, Yuichi; and Tsukada, Kiyoshi, 5,113,926, Cl. 164-119.000.

Shirouzu, Tatsuji: *See—*
Ouchi, Shigetoshi; Shirouzu, Tatsuji; Ode, Shinichi; Ichinose, Takasi; and Kanno, Tutomu, 5,115,389, Cl. 363-125.000.

Shishido, Tadao: *See—*
Okazaki, Masaki; Shishido, Tadao; and Kubodera, Seiiti, 5,115,337, Cl. 359-328.000.

Shoda, Isao; Kodama, Hitoshi; Magome, Kazuo; Iwata, Akihiko; Yoshizawa, Kenji; and Taki, Masakazu, to Mitsubishi Denki Kabushiki Kaisha. Power supply for microwave discharge light source. 5,115,168, Cl. 315-223.000.

Short Brothers PLC: *See—*
Williams, David R.; and Gibson, Trevor P., 5,114,637, Cl. 264-40.300.

Showa Highpolymer Co., Ltd.: *See—*
Takiyama, Eiichiro; Ogura, Ryushi; and Harigai, Noriaki, 5,115,032, Cl. 525-279.000.

Shoyab, Mohammed; McDonald, Vicki L.; Bradley, James G.; and Plowman, Gregory D., to Oncogen. Amphiregulin: a bifunctional growth modulating glycoprotein. 5,115,096, Cl. 530-322.000.

Shumate, David A.: *See—*
Baker, Thomas R.; Boland, Bernard W.; and Shumate, David A., 5,114,875, Cl. 437-62.000.

Shurtleff, Jill M.: *See—*
Lazarchik, Daniel B.; and Shurtleff, Jill M., 5,113,586, Cl. 30-90.000.

Shutske, Gregory M.: *See—*
Wettlaufer, David G.; Shutske, Gregory M.; and Nemoto, Peter A., 5,114,936, Cl. 514-233.800.

Sich, Gary M., to Westinghouse Air Brake Company. Modified pressure regulator valve for single car testing device. 5,113,694, Cl. 73-121.000.

Sidman, Michael D., to Digital Equipment Corporation. Fault tolerant frame, guardband and index detection methods. 5,115,359, Cl. 360-77.050.

Sidman, Michael D., to Digital Equipment Corporation. Embedded burst demodulation and tracking error generation. 5,115,360, Cl. 360-77.080.

Siedlecki, Walter F., Jr., to General Electric Company. Passive bypass valve assembly. 5,113,649, Cl. 60-226.300.

Siegel, Heinz: *See—*
Benzinger, Roland; Schmitt, Edgar; Siegel, Heinz; Huebl, Ewald; Mueller, Klaus; Himmelsbach, Manfred; and Jordan, Martin, 5,114,215, Cl. 303-113.0TB.

Siegel, Herbert: *See—*
Scheler, Siegfried; Buhr, Gerhard; Lenz, Helmut; Bergmann, Klaus; and Siegel, Herbert, 5,114,816, Cl. 430-192.000.

Siegenthaler, Marcel, to Maschinenfabrik Rieter AG. Sliver clamp and method for retrieving sliver cans for further processing. 5,113,550, Cl. 19-159.00A.

Siegmund, Gisela, executrix: *See—*
Siegmund, Werner, deceased; Kamereit, Wilhelm; Schmitt, Oskar M.; Weidmann, Volker; and Friedrich, Otto J., 5,114,475, Cl. 106-13.000.

Siegmund, Werner, deceased (by Siegmund, Gisela, executrix); Kamereit, Wilhelm; Schmitt, Oskar M.; Weidmann, Volker; and Friedrich, Otto J., to Mannesmann Aktiengesellschaft. Method for the preparation of a fine-grained mixture having hydrophobic properties. 5,114,475, Cl. 106-13.000.

Siemens AK.: *See—*
Nilsson, Sven-Axel; Ebersole, Ronald J.; Bier, Gerhard; and Honeck, Karl-Heinz, 5,115,511, Cl. 395-800.000.

Siemens Aktiengesellschaft: *See—*
Dorr, Hermann, 5,113,902, Cl. 137-556.000.
Dorr, Hermann, 5,113,903, Cl. 137-556.000.
Fenk, Josef; and Schulz, Martin, 5,115,212, Cl. 331-117.00R.
Friederichs, Karl-Josef; and Ringelhaan, Otmar, 5,115,438, Cl. 371-43.000.
Hagen, Uwe; and Feucht, Peter, 5,114,424, Cl. 606-32.000.
Hassler, Dietrich; and Killig, Klaus, 5,113,866, Cl. 128-661.010.
Houtteman, Bernard, 5,114,361, Cl. 439-348.000.
Kammerl, August; and Niedermeier, Ernst, 5,115,148, Cl. 307-475.000.
Stepp, Richard, 5,115,409, Cl. 364-841.000.
Wildgen, Andreas, 5,113,577, Cl. 29-620.000.

Siemens Automotive L.P.: *See—*
Cerny, Mark S., 5,114,077, Cl. 239-483.000.
Earnhardt, Daniel E., 5,113,705, Cl. 73-168.000.

Siemens Pacesetter, Inc.: *See—*
Mortazavi, Said, 5,113,862, Cl. 128-633.000.

Sievers, Axel: *See—*
Jung, Werner; and Sievers, Axel, 5,115,064, Cl. 526-301.000.

Sigl, Alfred; Schmitt, Johannes; and Isella, Thomas, to Robert Bosch GmbH. Drive slip control system. 5,113,963, Cl. 180-197.000.

Sigler, Robert D., to Lockheed Missiles & Space Company, Inc. Infrared catadioptric zoom relay telescope. 5,114,238, Cl. 359-399.000.

Sikkema, Kevin D.; and Priddy, Duane B., to Dow Chemical Company, The. Bio- and photo-degradable resin composition. 5,115,058, Cl. 526-258.000.

Siltech Inc.: *See—*
Imperante, John; and O'Lenick, Anthony J., Jr., 5,115,049, Cl. 525-479.000.

Silva, Fernando G., to Eastman Kodak Company. Decoder circuit with missing clock generator. 5,115,356, Cl. 360-51.000.

Silva, James M.; and Fyvie, Thomas J., to General Electric Company. Detecting the endpoint in interfacial aromatic polycarbonate polymerization reactions. 5,114,861, Cl. 436-85.000.

Silver Engineering Works, Inc.: *See—*
Milner, Ted D.; and Zimmerman, Robert V., 5,114,489, Cl. 127-2.000.

Silver, Spencer F.; Bronn, William R.; and Joseph, Eugene G., to Minnesota Mining and Manufacturing Company. Condensed phase polymers. 5,115,034, Cl. 525-288.000.

Silverberg, Morton: *See—*
Martin, Samuel W.; Silverberg, Morton; and Terry, Kenneth A., 5,114,067, Cl. 229-92.100.

Silverman, Gary S.: *See—*
Nobile, Frederick E.; Harris, John F., III; Silverman, Gary S.; and Baumann, Richard A., 5,115,330, Cl. 359-52.000.

Silverstein, Leonard A.: *See—*
Frauenthal, Ellen S.; and Silverstein, Leonard A., 5,114,074, Cl. 239-33.000.

Simmons, Richard E.: *See—*
Grace, Martin I.; and Simmons, Richard E., 5,115,209, Cl. 331-49.000.

Simmons, William R.: *See—*
Kraus, Greg A.; Simmons, William R.; and Wells, Mark R. J., 5,113,804, Cl. 123-1.00A.

Simon, Patrick. Closing capsule with a mobile element for flasks and other containers. 5,114,051, Cl. 222-192.000.

Simonson, Dana: *See—*
Goodwin, Frank E.; and Simonson, Dana, 5,114,226, Cl. 356-5.000.

Simuttis, Arnold: *See—*
Hamaekers, Arno; and Simuttis, Arnold, 5,113,965, Cl. 180-300.000.

Singer, Dieter: *See—*
Buchwald, Hans; Raschkowski, Boleslaus; and Singer, Dieter, 5,114,609, Cl. 252-171.000.

Sinha, Lakshman P.: *See—*
Puthenpura, Sarat C.; and Sinha, Lakshman P., 5,115,391, Cl. 364-152.000.

Sinigaglia, Francesco, to Hoffmann-La Roche Inc. *P. falciparum* CS-peptides as universal T-cell epitope. 5,114,713, Cl. 424-88.000.

Sintokogio Ltd.: *See—*
Matsuura, Makoto; Amano, Hironobu; and Ohta, Kunio, 5,113,680, Cl. 72-53.000.

Siracusa, Mario: *See—*
Wen, Cheng P.; Mendolia, Gregory S.; Siracusa, Mario; Maieron, Joseph J.; Higdon, William D.; Wooldridge, John J.; and Gulick, Jon, 5,115,245, Cl. 342-175.000.

Siwinski, Paul P.: *See—*
Kimmel, David J.; Siwinski, Paul P.; Smith, Robert A.; Thurman, Richard E.; Adkins, Stephen R.; Feldman, Steven; and Look, Raymond J., 5,114,355, Cl. 439-101.000.

Sjogren, Christer A.; Kipp, Louis D.; and Moritz, William K., to Quipp, Incorporated. Dual drive stacker and method for operating same. 5,114,306, Cl. 414-790.400.

SKF France: *See—*
Caron, Fabrice, 5,113,988, Cl. 192-98.000.

SKF GmbH: *See—*
Harsdorff, Ortwin, 5,114,248, Cl. 384-473.000.

SKW Trostberg Aktiengesellschaft: *See—*
Hintermayer, Jochen; Graf, Ernst; Gmohling, Werner; Schroll, Georg; and Kobler, Wolfgang, 5,114,693, Cl. 423-344.000.

Slack, William F.: *See—*
Fraidlin, Simon; Slack, William F.; and Wadlington, James C., 5,115,185, Cl. 323-207.000.

Slagteriernes Forskningsinstitut: *See—*
Larsen, Poul, 5,114,380, Cl. 452-176.000.

Sloss Industries Corporation: *See—*
Canaday, John S.; and Moss, Ernest K., 5,114,755, Cl. 427-373.000.

Slowey, Thomas W. Precision low energy radiation dosimetry system. 5,115,134, Cl. 250-374.000.

Sluga, Robert M.; Watkins, Randolph H.; Fisher, Jerry D.; Berry, Dennis C.; and Eldridge, Milo, to Baxter International Inc. Apparatus for cleaning objects with volatile solvents. 5,113,883, Cl. 134-60.000.

Sluga, Robert M.; Watkins, Randolph H.; Gajewski, Henry M.; Fisher, Jerry D.; and Berry, Dennis C., to Baxter International Inc. Method of cleaning hollow fiber components of a dialyzer with chloro fluorocarbon compositions stabilized by epoxidized fatty acid glycerides or esters. 5,114,608, Cl. 252-162.000.

Slusher, Richard E.: *See—*
Islam, Mohammed N.; and Slusher, Richard E., 5,115,488, Cl. 385-129.000.

Smallwood, David O.: *See—*
Gregory, Danny L.; Hardee, Harry C.; and Smallwood, David O., 5,113,966, Cl. 181-106.000.

Smedley, William H.: *See—*
Haber, Terry M.; Foster, Clark B.; and Smedley, William H., 5,114,411, Cl. 604-203.000.

Smetana, David A.; and Williams, R. Steve, to Advanced Concrete Technology, Inc. High strength structural perlite concrete. 5,114,617, Cl. 252-378.00P.

Smiecinski, Theodore M.: *See—*
Gagnon, Steven D.; Grace, Oscar M.; Smiecinski, Theodore M.; and Wujcik, Steven E., 5,114,988, Cl. 521-167.000.

Smith, Bradford L.: *See—*
Shahinpoor, Mohsen; and Smith, Bradford L., 5,114,300, Cl. 414-729.000.

Smith, Donald F., Jr.: *See—*
Koleske, Joseph V.; Smith, Donald F., Jr.; and Weber, Robert J., Jr., 5,115,025, Cl. 525-162.000.

Smith, Donald W.; Plociennik, James J.; Goehst, George; and Green, Andrew, to Caterpillar Paving Products, Inc. Integrated paver with windrow pick-up capability. 5,114,267, Cl. 404-83.000.

Smith, Flynn K. Fielder's glove with inflatable chambers. 5,113,530, Cl. 2-19.000.

Smith, Fred T.: *See—*
Edelhoff, Gustav D.; and Smith, Fred T., 5,114,304, Cl. 414-786.000.

Smith, Jason R., to Industrial Finishes & Systems, Inc. Protector for stacked sheet material. 5,114,010, Cl. 206-453.000.

Smith, Lawrence C. AC power strip with grounded digital and ground isolated accessory receptacles. 5,115,368, Cl. 361-56.000.

Smith, Malcolm C.: *See—*
Baron, Richard D.; Smith, Malcolm C.; Spoeth, Carl R.; and Quadros, Valdemiro M., 5,114,047, Cl. 222-129.100.

Smith, Nigel A.: *See—*
Cockayne, Brian; MacEwan, William R.; Harris, Ivor R.; and Smith, Nigel A., 5,114,669, Cl. 420-8.000.

Smith, Norman: *See—*
Lawton, Peter G.; and Smith, Norman, 5,113,568, Cl. 29-419.100.

Smith, Philip H. G.: *See—*
Geach, Neil J.; Gilmour, James; Hatton, Leslie R.; and Smith, Philip H. G., 5,114,461, Cl. 71-88.000.

Smith, Robert A.: *See—*
Kimmel, David J.; Siwinski, Paul P.; Smith, Robert A.; Thurman, Richard E.; Adkins, Stephen R.; Feldman, Steven; and Look, Raymond J., 5,114,355, Cl. 439-101.000.

Smith, Robert C. Headlamp apparatus. 5,115,382, Cl. 362-105.000.

Smith, Steven F.: *See—*
Cohen, Eric D.; Jones, Andrew R.; de Castro, Jose T.; Litchfield, Paul; and Smith, Steven F., 5,113,599, Cl. 36-88.000.

Smolders, Jozef G. H. M.; and Sygall, Peter I., to U.S. Philips Corporation. Method of placing components on carriers and device for carrying out the method. 5,114,308, Cl. 414-799.000.

Smoot, Lanny S., to Bell Communications Research, Inc. Light-pen system for projected images. 5,115,230, Cl. 340-707.000.

Smoot, Stephen W.; Hayden, Joseph S.; Clement, Marc; Grabowski, Danuta; Holzel, Eva; Nass, Peter; and Heming, Martin, to Schott Glass Technologies, Inc. Method of forming stable images in electron beam writable glass compositions. 5,114,813, Cl. 430-5.000.

Smutny, Edgar J.; Gergen, William P.; Broekhuis, Antonius A.; Groenland, Franciscus C.; and Beijen, Johan M., to Shell Oil Company. Polyketone compositions containing a polar ester or amine lubricating compound. 5,115,009, Cl. 524-306.000.

Snedkerud, Ole: *See—*
Gassmann, Felix; and Snedkerud, Ole, 5,115,214, Cl. 333-26.000.

SNK Corporation: *See—*
Kita, Toshihiko, 5,114,157, Cl. 273-434.000.

Snow, Joyce K.: *See—*
Stricklen, Phil M.; Mueller, Francis X., Jr.; Willcox, Kenneth W.; and Snow, Joyce K., 5,115,054, Cl. 526-159.000.

SO.GE.MI. - S.P.A.: *See—*
Persiani, Luigi, 5,114,197, Cl. 292-336.300.
Soane, David S., to Soane Technologies, Inc. Controlled casting of a shrinkable material. 5,114,632, Cl. 264-22.000.
Soane Technologies, Inc.: *See—*
Soane, David S., 5,114,632, Cl. 264-22.000.
Societe Anonyme Dite: L'Oreal: *See—*
N'Guyen, Quang L.; Griat, Jacqueline; Millecamps, Francois; Lang, Gerard; and Forestier, Serge, 5,114,716, Cl. 424-401.000.
Societe Europeenne De Propulsion: *See—*
Vives, Michel; Taveau, Pierre; Etienne, Jacques; Remillieux, Yves; and Charbonnel, Lucien, 5,114,772, Cl. 428-49.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See—*
Benoit, Joel M. D.; Bessonay, Gilles J. M.; and Girault, Daniel G., 5,114,332, Cl. 425-407.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Lahitte, Pierre V. A.; Raymond, Michel J.; and Kayser, Jean-Paul, 5,115,200, Cl. 324-718.000.
Societe Nouvelle C.T.A.: *See—*
Dubuit, Jean-Louis, 5,114,525, Cl. 156-345.000.
Soga, Takashi: *See—*
Kimura, Takeshi; Kuniyoshi, Shinji; Kishimoto, Akihiko; and Soga, Takashi, 5,115,456, Cl. 378-35.000.
Sohda, Yoshio; Ido, Yasuzi; Nakamura, Toshinori; and Suemitsu, Takeshi, to Kawasaki Heavy Industries, Ltd.; and Nippon Oil Company, Limited. Process for producing carbon material and carbon/carbon composites. 5,114,635, Cl. 264-29.200.
Solar, Matthew S.: *See—*
Clarke, Ray; and Solar, Matthew S., 5,114,403, Cl. 604-96.000.
Somar Corporation: *See—*
Taguchi, Hiroshi; Washizaki, Youji; Igarashi, Akira; and Nakano, Hiroyoshi, 5,114,526, Cl. 156-361.000.
Somers, Gerardus H. J., to U.S. Philips Corporation. Thin-film magnetic head having two magneto-resistant elements. 5,115,364, Cl. 360-113.000.
Sonderby, Svend A.: *See—*
Christensen, Per B.; and Sonderby, Svend A., 5,113,922, Cl. 160-172.000.
Songer, Richard B. Crash pad for vehicle steering wheel. 5,114,181, Cl. 280-750.000.
Sonobe, Saburo; and Ishibashi, Nobuyuki, to Kinyosha Co., Ltd. Ink roller for printing machine. 5,113,760, Cl. 101-348.000.
Sony Corporation: *See—*
Eguchi, Takeo, 5,115,213, Cl. 333-18.000.
Fujiwara, Yoshihito; Umezawa, Tomoko; Nishiguchi, Masayuki; Akune, Makoto; Iwahashi, Naoto; and Akagiri, Kenzo, 5,115,240, Cl. 341-51.000.
Fukuda, Joji; Misawa, Seiichi; and Enomoto, Takaaki, 5,115,390, Cl. 364-146.000.
Hayashi, Muneo, 5,115,303, Cl. 358-51.000.
Tachibana, Kaoru; Morita, Ken; and Takahashi, Hiroo, 5,115,323, Cl. 358-330.000.
Takano, Masayuki; Onozuka, Kuniharu; Nagasawa, Fumihiro; and Matsumoto, Akihiko, 5,115,310, Cl. 358-185.000.
Terado, Ikuo, 5,115,154, Cl. 307-494.000.
Yamagishi, Makoto; Fujihira, Masao; Azami, Kazuo; and Shinohara, Ikuo, 5,115,473, Cl. 381-154.000.
Sood, Pradeep K., to Emerson Electric Co. Power converter for a switched reluctance motor. 5,115,181, Cl. 318-701.000.
Soref, Richard A., to United States of America, Air Force. Electrooptic fabry-perot pixels for phase-dominant spatial light modulators. 5,115,335, Cl. 559-248.000.
Soriano, Eligio L. Barbecue apparatus. 5,113,699, Cl. 99-421.00H.
Soroka, Daniel P.; Sheehan, Terrence M.; Comstock, Gary L.; and Greenall, Glenn E., to Hardinge Brothers, Inc. Bed cooler and chip flusher for a machine tool. 5,113,558, Cl. 29-57.000.
Soula, Richard: *See—*
Arnout, Michel; Lasnier, Didier; and Soula, Richard, 5,114,121, Cl. 266-48.000.
Soules, William J.: *See—*
Finnicum, Douglas S.; Schickler, Edward R.; Soules, William J.; and Wahlers, Robert A., 5,114,759, Cl. 427-420.000.
Source Scientific Systems, Inc.: *See—*
Wells, John R.; and Urea, Jack R., Jr., 5,113,886, Cl. 134-172.000.
South Dakota School of Mines & Technology: *See—*
Han, Kenneth N.; and Meng, Xinghui, 5,114,687, Cl. 423-32.000.
Southern, Don L. Adjustable stand-off brace for a ladder. 5,113,973, Cl. 182-214.000.
Southwest Research Institute: *See—*
Sablik, Martin J.; Nicholls, Colin I.; and Anderson, Robert E., 5,114,914, Cl. 505-1.000.
Southwire Company: *See—*
Martin, Ronald R.; and Hunter, James L., 5,114,195, Cl. 292-251.500.
Sovish, Richard C.: *See—*
Mercer, Frank W.; Goodman, Timothy D.; Lau, Aldrich N. K.; Vo, Lanchi P.; and Sovish, Richard C., 5,114,780, Cl. 428-195.000.
Mercer, Frank W.; and Sovish, Richard C., 5,115,082, Cl. 528-219.000.
Soyka, Wilfried: *See—*
Muntnich, Leo; Steinberger, Wolfgang; and Soyka, Wilfried, 5,114,249, Cl. 384-622.000.
Spanek, George, Jr. Multiple sleeve pastry tube. 5,114,044, Cl. 222-94.000.
Spanier, Henry C.; and Ekpo, Bassey O., to Nabisco Brands, Inc. Raw hide having a coating containing an inorganic pyrophosphate. 5,114,704, Cl. 424-57.000.
Spanke, Ronald A., to AT&T Bell Laboratories. Broadband ISDN packet switching arrangements. 5,115,426, Cl. 370-60.000.
Spanke, Ronald A.: *See—*
Johnson, James M., Jr.; and Spanke, Ronald A., 5,115,427, Cl. 370-60.000.
Sparks, Denis L.: *See—*
Conine, James W.; Sparks, Denis L.; and Stowers, Julian L., 5,114,948, Cl. 514-288.000.
Spector, George: *See—*
Rotstein, Rony; and Spector, George, 5,113,801, Cl. 119-163.000.
Spectra, Inc.: *See—*
Fulton, Steven J.; Peters, Gerald T., Jr.; Spehrley, Charles W., Jr.; and Young, Lawrence R., 5,114,747, Cl. 427-164.000.
Spectra-Physics Lasers, Inc.: *See—*
Howard, Neil, 5,115,439, Cl. 372-37.000.
Spectraphos AB: *See—*
Andersson-Engels, Stefan; Johansson, Jonas; Stenram, Unne; Svanberg, Katarina; and Svanberg, Sune, 5,115,137, Cl. 250-461.200.
Speed Queen Company: *See—*
Studt, Timothy K., 5,113,562, Cl. 29-401.100.
Spehrley, Charles W., Jr.: *See—*
Fulton, Steven J.; Peters, Gerald T., Jr.; Spehrley, Charles W., Jr.; and Young, Lawrence R., 5,114,747, Cl. 427-164.000.
Spencer, Richard R., to Alliance Rubber Company, Inc. Method and apparatus for making printed elastic bands. 5,113,757, Cl. 101-35.000.
Spindeldreher, Walter, to Kinshafer Greiftechnik GmbH. Rotary hydraulic motor with brake system. 5,114,324, Cl. 418-61.300.
Spink, Donald R.: *See—*
Nguyen, Kim D.; and Spink, Donald R., 5,114,460, Cl. 71-34.000.
Spirol International Holding Corporation: *See—*
Walshe, Brendan J.; and Wexler, Guenter C., 5,114,039, Cl. 221-171.000.
Spoeth, Carl R.: *See—*
Baron, Richard D.; Smith, Malcolm C.; Spoeth, Carl R.; and Quadros, Valdemiro M., 5,114,047, Cl. 222-129.100.
Sproul, Richard M.: *See—*
Ross, Colby M.; Sproul, Richard M.; McCurley, Ross M.; and Young, Carter R., 5,113,939, Cl. 166-120.000.
SPS Technologies, Inc.: *See—*
Bogatin, Yakov, 5,114,502, Cl. 148-302.000.
Square D Company: *See—*
Holmes, Charles M., Jr., 5,115,205, Cl. 330-10.000.
Johnson, Paul D., 5,115,484, Cl. 385-72.000.
Srch, James L.; and Cadden, Robert L., to Boler Company, The. Suspension adjustment. 5,114,125, Cl. 267-265.000.
Srichaiyo, Tasanee: *See—*
Hjerten, Stellan; and Srichaiyo, Tasanee, 5,114,551, Cl. 204-180.100.
Stahlke, Kurt-Rainer; Reinking, Klaus; Tresper, Erhard; Kraft, Klaus; and Kaminski, Axel, to Bayer Aktiengesellschaft. Two-component injection molding with polyarylene sulfides. 5,114,791, Cl. 428-419.000.
Stahlke, Kurt-Rainer; and Bushong, William C., to Bayer Aktiengesellschaft. Use of polyarylene sulphides for the production of a structural foam resistant to high temperatures, process for the preparation of this foam, and moldings obtainable by this process. 5,114,983, Cl. 521-95.000.
Staiss, Friedrich: *See—*
Kupfer, Rainer; Hille, Martin; Bohm, Roland; and Staiss, Friedrich, 5,114,616, Cl. 252-337.000.
Stallard, Barry W.; Makowski, Michael A.; and Byers, Jack A., to United States of America, Energy. Optical apparatus for conversion of whispering-gallery modes into a free space gaussian like beam. 5,115,482, Cl. 385-28.000.
Stanbro, William D.; Hunter, Kenneth W., Jr.; and Newman, Arnold L., to Biotronic Systems Corporation. Added array of molecular chains for interfering with electrical fields. 5,114,674, Cl. 422-57.000.
Standard Oil Company, The: *See—*
Percec, Elena S.; Melamud, Lucy; and Coffey, Gerald P., 5,114,795, Cl. 428-516.000.
Tenhover, M. A.; and Lukco, D. B., 5,114,785, Cl. 428-263.000.
Stanislao, Joseph, to ATSCO, Inc. Slurry pump apparatus including fluid housing. 5,114,312, Cl. 415-206.000.
Stanley-Bostitch, Inc.: *See—*
Foster, Kenneth L., 5,113,727, Cl. 81-423.000.
Stapla Ultraschall-Technik GmbH: *See—*
Nuss, Lothar, 5,113,574, Cl. 29-597.000.
Starr, Gary E.: *See—*
Pier, James M.; and Starr, Gary E., 5,114,571, Cl. 210-96.100.
Stauffer, Harold F., Jr.: *See—*
Taylor, Chandler R., Jr.; Stauffer, Harold F., Jr.; and Tomczuk, Bruce E., 5,114,944, Cl. 514-258.000.
STC PLC: *See—*
Fry, David W., 5,115,207, Cl. 330-284.000.
Kirkby, Paul A.; and White, Ian H., 5,115,444, Cl. 372-50.000.
Stearns, Stephen M.: *See—*
Johnson, Paul C.; Colthart, James D.; Otermat, Arthur L.; Weingaertner, David A.; Chou, Charles C.; Byers, Dallas L.; Stearns, Stephen M.; Marsden, Arnold R., Jr.; and Deeley, George M., 5,114,497, Cl. 134-21.000.
Steele, Michael F.; Lambright, John E.; and Dobson, George M., to Brunswick Corporation. Gas detection apparatus and related method. 5,114,677, Cl. 422-83.000.

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Reinartz, Hans-Dieter; Steffes, Helmut; Rausch, Juergen; and Risch, Stefan, 5,115,186, Cl. 324-207.220.
Steinberger, Wolfgang: *See—*
Muntnich, Leo; Steinberger, Wolfgang; and Soyka, Wilfried, 5,114,249, Cl. 384-622.000.
Steiner, Norman F., to Air Comm Corporation. Windshield defrosting apparatus and method for aircraft. 5,114,382, Cl. 454-76.000.
Steiner, Verena: *See—*
Maschler, Reinhard; Steiner, Verena; Grutter, Markus G.; and Raschdorf, Fritz, 5,114,922, Cl. 514-12.000.
Steinhardt, Helmut; and Bieringer, Anton, to TRW Daut & Rietz GmbH & Co. KG. Electrical coupling device. 5,114,360, Cl. 439-341.000.
Steinhaus, Bruce M.: *See—*
Nappholz, Tibor A.; Hursta, William N.; Dawson, Albert K.; and Steinhaus, Bruce M., 5,113,869, Cl. 128-696.000.
Steinke, Joseph H., to Dresser Industries, Inc. Multistep trim design. 5,113,908, Cl. 137-625.300.
Steinkotter, Franz-Albert, to O & K Orenstein & Koppel Aktiengesellschaft. Method and apparatus for shaping belt straps to enable them to be pulled through support roller stations. 5,113,570, Cl. 29-433.000.
Stenberg, Stina: *See—*
Piltz, Lars-Erik; and Stenberg, Stina, 5,114,507, Cl. 156-69.000.
Stenram, Unne: *See—*
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Stepenoff, Gary F.: *See—*
Brinsmead, Brian J.; Stepenoff, Gary F.; Bess, Vicki H.; Huxel, Gary R.; and Wetmore, John A., 5,114,568, Cl. 209-170.000.
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Abendroth, Paul; Herzel, Joachim; Hummel, Peter; Ortner, Robert; Steuer, Joachim; Stoffler, Achim; and Despot, Janko, 5,113,762, Cl. 101-350.000.
Stevenson, James A.: *See—*
Kirkpatrick, Donald E.; Stevenson, James A.; and Hyun, Kun S., 5,115,029, Cl. 525-239.000.
Stewart, Jonathan K.: *See—*
Killion, Mead C.; Stewart, Jonathan K.; Falco, Robert; and Berger, Elliott H., 5,113,967, Cl. 181-132.000.
Stewart, Kevin J.: *See—*
Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., 5,115,095, Cl. 525-474.000.
Stewart, Steven L., to Shell Oil Company. Method for the resin-impregnation of fibers. 5,114,633, Cl. 264-23.000.
Stiffler, Jack J.; Nolan, James M.; Mark, Peter; and Harvey, David, to Sequoia Systems, Inc. Shared computer resource allocation system having apparatus for informing a requesting computer of the identity and busy/idle status of shared resources by command code. 5,115,499, Cl. 395-425.000.
Stiftelsen Centrum for Dentalteknik Och Biomaterial I Huddinge: *See—*
Sundstrom, Gustaf F., 5,114,578, Cl. 210-256.000.
Stiles, James A. R.; and Brandt, Klaus, to Moli Energy Limited. Battery and method of making the battery. 5,114,804, Cl. 429-66.000.
Stimpson, Donald I., to Monsanto Company. Continuous isoelectric separation. 5,114,555, Cl. 204-183.200.
Stjernschantz, Johan W.; and Resul, Bahram, to Kabi Pharmacia AB. Prostaglandin derivatives for the treatment of glaucoma or ocular hypertension. 5,114,971, Cl. 514-530.000.
Stoeberl, Martin: *See—*
Kurz, Helmut; and Stoeberl, Martin, 5,114,639, Cl. 264-46.600.
Stoffler, Achim: *See—*
Abendroth, Paul; Herzel, Joachim; Hummel, Peter; Ortner, Robert; Steuer, Joachim; Stoffler, Achim; and Despot, Janko, 5,113,762, Cl. 101-350.000.
Stokes, John F., to Honeywell Inc. Electrostatic silicon accelerometer. 5,115,291, Cl. 357-26.000.
Stoll, Mark S.: *See—*
Miller, Leroy; and Stoll, Mark S., 5,114,034, Cl. 220-7.000.
Stone, Robert A.: *See—*
Isabelle, Charles J.; Kish, Jules G.; and Stone, Robert A., 5,113,713, Cl. 74-410.000.
Stone, Robert L.: *See—*
Moldavsky, David; and Stone, Robert L., 5,115,463, Cl. 379-58.000.
Stone & Webster Engineering Corporation: *See—*
Goelzer, Alan R., 5,114,682, Cl. 422-142.000.
Storace, Anthony, to Technalytics, Inc. Surgical stapler. 5,114,065, Cl. 227-175.000.
Storer, Clyde K., to Buckeye Stamping Company, The. Tamper deterrent locking device and method of using. 5,114,196, Cl. 292-307.00R.
Stottlemyre, James A.: *See—*
Murphy, Mark T.; Buelt, James L.; Stottlemyre, James A.; and Tixier, John S., Jr., 5,114,277, Cl. 405-231.000.
Stout, Robert B.: *See—*
Williams, Robert E.; Marshall, William H.; Stout, Robert B.; and McCourt, John J., Jr., 5,114,425, Cl. 606-034.000.
Stowers, Julian L.: *See—*
Conine, James W.; Sparks, Denis L.; and Stowers, Julian L., 5,114,948, Cl. 514-288.000.
Strasser, Siegfried; Goeddecke, Franz; and Wolter, Albrecht, to Kloeckner-Humboldt-Deutz Aktiengesellschaft. Circulation-type grinding system for grinding brittle material. 5,114,131, Cl. 241-19.000.
Strassle, Alex: *See—*
Verney, Claude; and Strassle, Alex, 5,114,212, Cl. 297-421.000.
Strata Flotation, Inc.: *See—*
Johenning, John B., 5,113,541, Cl. 5-451.000.
Stratacom, Inc.: *See—*
Williams, Charles S. T.; and Kattemalalavadi, Shrikanth S., 5,115,431, Cl. 370-94.100.
Strato-Lift, Inc.: *See—*
Ridings, James R.; and Nguyen, Anh M., 5,113,977, Cl. 188-69.000.
Stray-Gundersen, James, to University of Texas System Board of Regents. Beverage compositions for human consumption. 5,114,723, Cl. 426-74.000.
Streil, Brian M. Adjustable firmness coil spring mattress with inflatable tubes. 5,113,539, Cl. 5-464.000.
Stricklen, Phil M.; Mueller, Francis X., Jr.; Willcox, Kenneth W.; and Snow, Joyce K., to Phillips Petroleum Company. Catalysts containing poly(3-ethyl-1-hexene) and uses thereof. 5,115,054, Cl. 526-159.000.
Strippgen, Walter E.: *See—*
Asher, Marc A.; Strippgen, Walter E.; Heinig, Charles F.; and Carson, William L., 5,113,685, Cl. 72-458.000.
Stuart, Regina K.; Lowell, Jeffrey A.; Baxter, John K., III; Bistrian, Bruce R.; and Shikora, Scott, to New England Deaconess Hospital Corporation. Method for central venous catheterization. 5,114,401, Cl. 604-53.000.
Stuble, Helmut, to LTG Lufttechnische GmbH. Filter arrangement including at least one drum-type filter. 5,114,444, Cl. 55-294.000.
Studiengesellschaft Kohle MbH: *See—*
Schomburg, Gerhard; and Lux, Jurgen A., 5,114,550, Cl. 204-180.100.
Studt, Timothy K., to Speed Queen Company. Method for reversing mounting side of clothes dryer door assembly. 5,113,562, Cl. 29-401.100.
Su, Shey-Min: *See—*
Gianzero, Stanley C.; and Su, Shey-Min, 5,115,198, Cl. 324-339.000.
Subramanian, Somasundaram: *See—*
Schwarz, James A.; and Subramanian, Somasundaram, 5,114,902, Cl. 502-334.000.
Suda, Shigeyuki; and Abe, Naoto, to Canon Kabushiki Kaisha. Method of detecting positional deviation. 5,114,235, Cl. 356-401.000.
Sudbo, Aasmund S.; Tsang, Won-Tien; and Yang, Long, to AT&T Bell Laboratories. Optoelectronic integrated circuit. 5,115,294, Cl. 357-30.000.
Sudo, Morihiro; Muraki, Tomoyasu; Kawachi, Eiji; and Kawachi, Yasushi, to Daikyo Gomu Seiko Ltd. Modified polysiloxane-coated sanitary rubber article and a process for the production of the same. 5,114,794, Cl. 428-447.000.
Sudo, Tadashi: *See—*
Fukuda, Tamotsu; Shigeta, Shiro; Okuya, Hiroaki; Kuroiwa, Yasuyuki; and Sudo, Tadashi, 5,114,712, Cl. 424-87.000.
Suemitsu, Takeshi: *See—*
Sohda, Yoshio; Ido, Yasuzi; Nakamura, Toshinori; and Suemitsu, Takeshi, 5,114,635, Cl. 264-29.200.
Suga, Seiji; and Morita, Shoji, to Atsugi Unisia Corporation. Valve timing control system for internal combustion engine with enhanced response characteristics in adjustment of valve timing. 5,113,814, Cl. 123-90.170.
Sugasa, Mikishige: *See—*
Sato, Hiroyuki; and Sugasa, Mikishige, 5,114,254, Cl. 400-207.000.
Sugawara, Kishio: *See—*
Hirota, Shinichiro; Sugawara, Kishio; and Okamura, Kenji, 5,114,455, Cl. 65-275.000.
Sugawara, Koko; Nishiyama, Yuji; Tomita, Koji; Konishi, Masataka; and Oki, Toshikazu, to Bristol-Myers Squibb Co. BU-3292T antibiotics. 5,114,920, Cl. 514-11.000.
Sugi, Masahiro: *See—*
Tanaka, Mutsuhiro; and Sugi, Masahiro, 5,115,030, Cl. 525-240.000.
Sugimoto, Kimiyasu; and Yoshino, Hajime, to Honda Giken Kogyo Kabushiki Kaisha. Swashplate type hydraulic device having a ball joint connection. 5,114,261, Cl. 403-122.000.
Sugiura, Keiji: *See—*
Yamashita, Noboru; Sugiura, Keiji; Shimomaki, Kazunori; and Takanishi, Toshiaki, 5,114,198, Cl. 293-120.000.
Sugiura, Masamichi, to Minolta Camera Kabushiki Kaisha. Image reader. 5,115,478, Cl. 382-50.000.
Sugiura, Tsutomu: *See—*
Miyamoto, Takashi; Miyagawa, Kazuya; Tomimatsu, Yukihito; Sugiura, Tsutomu; Nishi, Kenji; and Ichihara, Taku, 5,114,224, Cl. 353-122.000.
Sugiura, Tutomu: *See—*
Isegawa, Yo; Kito, Takeshi; Muryayama, Kimimasa; Ikawa, Shoji; Iwase, Takahiro; Sugiura, Tutomu; and Tsuzuki, Atsuyuki, 5,114,521, Cl. 156-242.000.
Sugiyama, Kazuo. Shock absorbing ski pole. 5,114,186, Cl. 280-821.000.
Sugiyama, Takashi; Yamakawa, Osamu; and Sumiya, Akira, to NGK Insulators, Ltd.; and NGK Adrec Co., Ltd. Filter for aluminum hot melt having a partially crystalline binder. 5,114,882, Cl. 501-17.000.
Suhr, Robert G.: *See—*
Dreikorn, Barry A.; Jourdan, Glen P.; and Suhr, Robert G., 5,114,939, Cl. 514-248.000.

Sullivan, Dana K.: *See—*
Haun, Edward C.; Thompson, Gregory J.; Gorawara, Jayant K.; and Sullivan, Dana K. 5,114,562, Cl. 208-89.000.
Sullivan, John T. Fan coil unit. 5,113,667, Cl. 62-291.000.
Sumitani, Jiro: *See—*
Takahashi, Akira; Kanno, Yoshiaki; Sumitani, Jiro; Nakamoto, Katsuya; Sasaki, Takeo; and Akasu, Masahira, 5,115,397, Cl. 364-431.050.
Sumitomo Chemical Company, Limited: *See—*
Ogawa, Tadatoshi; Imai, Seiichiro; and Wakamatsu, Kazuki, 5,115,027, Cl. 525-216.000.
Shiga, Shujiro; Kabasawa, Koji; Ohmae, Tadayuki; and Tanaka, Hisao, 5,115,036, Cl. 525-328.200.
Takeuchi, Yoshiaki; Yamamoto, Koji; and Umezaki, Hiroshi, 5,114,437, Cl. 51-293.000.
Ura, Shigeru; Tanaka, Haruo; Takagishi, Hisao; Fukuyama, Hiroko; Fukuyama, Takuya; and Fukuyama, Yuko, 5,114,758, Cl. 427-391.000.
Sumitomo Corporation: *See—*
Inada, Jun; Sato, Shinichi; Shimizu, Ryoichi; Kitani, Akinobu; and Nakano, Kunio, 5,114,765, Cl. 428-35.700.
Sumitomo Electric Industries, Ltd.: *See—*
Hayashi, Shigeo, 5,115,187, Cl. 323-315.000.
Higaki, Kenjiro; Harada, Keizo; Fujimori, Naoji; Itozaki, Hideo; and Yazu, Shuji, 5,114,906, Cl. 505-1.000.
Nishiguchi, Masanori; and Gotoh, Noboru, 5,113,622, Cl. 51-165.730.
Sato, Kenichi; and Mukai, Hidehito, 5,114,908, Cl. 505-1.000.
Shimizu, Osamu; Tenmoku, Kenji; Doi, Yoichi; and Mito, Kunihiko, 5,115,238, Cl. 340-988.000.
Tsuchiya, Ichiro; Ishikawa, Shinji; Saitoh, Masahide; and Ishiguro, Yoichi, 5,114,338, Cl. 432-206.000.
Yamamoto, Susumu; Murai, Teruyuki; Kawabe, Nozomu; and Tobioka, Massaki, 5,114,641, Cl. 264-60.000.
Yamanishi, Toru; Kakuta, Tatsuya; and Mori, Akinori, 5,115,103, Cl. 174-24.000.
Sumitomo Light Metal Industries Ltd.: *See—*
Nakamura, Eiji; and Mizutani, Hiroyuki, 5,114,467, Cl. 75-10.220.
Sumitomo Metal Mining Co., Ltd.: *See—*
Fujiwara, Takumi; Mori, Hiroshi; and Kawazoe, Takemi, 5,115,512, Cl. 385-14.000.
Ishii, Junichi; Takada, Tetsuji; and Kurohara, Takayuki, 5,114,604, Cl. 252-62.540.
Sumitomo Rubber Industries Ltd.: *See—*
Blythe, Robert J.; and Powell, Brian D. W., 5,115,021, Cl. 525-84.000.
Yamaguchi, Tetsuo; Matsushita, Hiroomi; and Niwa, Kunio, 5,114,145, Cl. 273-73.00F.
Sumitomo Wiring Systems Ltd.: *See—*
Chishima, Masamitsu; and Nozaki, Takao, 5,114,359, Cl. 439-271.000.
Sumiya, Akira: *See—*
Sugiyama, Takashi; Yamakawa, Osamu; and Sumiya, Akira, 5,114,882, Cl. 501-17.000.
Sumiya, Koji: *See—*
Nimura, Mitsuhiro; Yokoyama, Shoji; Yamada, Takashi; Sumiya, Koji; and Moroto, Shuzo, 5,115,399, Cl. 364-449.000.
Sun Drilling Products Corporation: *See—*
Rayborn, Jerry J.; and Dickerson, J. Phillip, 5,114,597, Cl. 507-126.000.
Rayborn, Jerry J.; and Dickerson, J. Phillip, 5,114,598, Cl. 507-126.000.
Sunaga, Takeshi: *See—*
Motegi, Hisao; Sunaga, Takeshi; and Zenbayashi, Michio, 5,115,069, Cl. 52.8-15.000.
Sunderhaus, Charles A.; and Anderson, Paul B., to Dover Corporation. Spill containment devices. 5,114,271, Cl. 405-52.000.
Sundstrand Corporation: *See—*
Cohen, Mordechai, 5,114,317, Cl. 417-354.000.
Shekleton, Jack R., 5,113,647, Cl. 60-39.360.
Shekleton, Jack R.; and Ramirez, Ray C., 5,113,648, Cl. 60-39.091.
Sundstrand Data Control, Inc.: *See—*
Grlj, Steven F.; and Cornelius, Craig J., 5,113,698, Cl. 73-862.590.
Sundstrom, Gustaf F., to Stiftelsen Centrum for Dentalteknik Och Biomaterial I Huddinge. Settling apparatus. 5,114,578, Cl. 210-256.000.
Suokas, Elias; and Aksela, Reijo, to Kemira OY. Method for producing hydrogen peroxide and solvent system for use in the hydrogen peroxide production process. 5,114,701, Cl. 423-588.000.
Surber, Sherry L., to W. R. Grace & Co.-Conn. Solder mask resins having improved stability containing a multifunctional epoxide and a partial ester or styrene-maleic anhydride copolymer. 5,114,830, Cl. 430-280.000.
Surratt, Grover T.: *See—*
Bishop, Thomas P.; Davis, Mark H.; Peterson, James S.; and Surratt, Grover T., 5,115,505, Cl. 395-650.000.
Suruga Seiki Co., Ltd.: *See—*
Umehara, Takeshi; Ikeda, Toshio; and Urata, Kazuhisa, 5,114,331, Cl. 425-200.000.
Sutera, Carl M. Self-filling bottled-water cooler conversion kit. 5,114,042, Cl. 222-67.000.
Sutheim, Peter E. Sound reinforcement system. 5,115,470, Cl. 381-76.000.
Sutherland, James M. Wellhead seal probe. 5,113,936, Cl. 166-85.000.
Sutton, Roger I., to Golden Needles Knitting & Glove Co., Inc. Method of making garment, garment and strand material. 5,113,532, Cl. 2-167.000.
Suuronen, David E.; and Terry, Jean C., to Gould, Inc. Fuse with thin film fusible element supported on a substrate. 5,115,220, Cl. 337-297.000.
Suzuki, Akira: *See—*
Iwase, Akira; and Suzuki, Akira, 5,115,354, Cl. 359-873.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,114,383, Cl. 474-18.000.
Yamauchi, Kosaku, 5,113,964, Cl. 180-224.000.
Suzuki, Kazuichi: *See—*
Oyama, Junichi; Suzuki, Kazuichi; Kato, Akihiro; Inada, Hitoshi; Mori, Masaji; Miyai, Hiromasa; and Kawagoe, Toshiyuki, 5,114,668, Cl. 376-442.000.
Suzuki, Keizo; Ninomiya, Ken; and Yunogami, Takashi, to Hitachi, Ltd. Surface measuring method and apparatus. 5,115,130, Cl. 250-251.000.
Suzuki, Mikio: *See—*
Ueda, Nobuo; Okita, Tatuo; Suzuki, Mikio; Ikemoto, Yasunori; and Shibao, Hiloyuki, 5,114,381, Cl. 453-57.000.
Suzuki, Minoru, to Ricoh Company, Ltd. Developing unit for an image recording apparatus. 5,115,275, Cl. 355-245.000.
Suzuki Motor Corporation: *See—*
Yamashita, Noboru; Sugiura, Keiji; Shimomaki, Kazunori; and Takanishi, Toshiaki, 5,114,198, Cl. 293-120.000.
Suzuki, Seiichi, to Daisuzu Kogyo Co., Ltd. Device for undoing yarn from tubular knitted fabric. 5,113,564, Cl. 28-218.000.
Suzuki, Sohbe: *See—*
Nishizawa, Junichi; Takedo, Nobuo; and Suzuki, Sohbe, 5,115,287, Cl. 357-23.400.
Suzuki, Tadashi: *See—*
Ujiie, Souhei; and Suzuki, Tadashi, 5,115,273, Cl. 355-209.000.
Suzuki, Tatsuo: *See—*
Isono, Keinosuke; Yoshida, Takao; and Suzuki, Tatsuo, 5,114,004, Cl. 206-222.000.
Suzuki, Yasuhiro: *See—*
Maruyama, Tadakatsu; Ohno, Yasuhide; Konda, Masashi; Kikuchi, Tosiharu; Suzuki, Yasuhiro; Uno, Tomohiro; Otsuka, Hiroaki; and Tanahashi, Hiroyuki, 5,114,878, Cl. 437-182.000.
Suzuki, Yutaka; Kobayashi, Masayuki; and Wakahara, Tatsuo, to Nissan Motor Co., Ltd. Engine load responsive line pressure control arrangement for automatic automotive transmission. 5,113,719, Cl. 74-866.000.
Svanberg, Katarina: *See—*
Andersson-Engels, Stefan; Johansson, Jonas; Stenram, Unne; Svanberg, Katarina; and Svanberg, Sune, 5,115,137, Cl. 250-461.200.
Svanberg, Sune: *See—*
Andersson-Engels, Stefan; Johansson, Jonas; Stenram, Unne; Svanberg, Katarina; and Svanberg, Sune, 5,115,137, Cl. 250-461.200.
Svensson, Paul; Nilsson, Christer; Backlund, Jan; Ericsson, Karl G.; Jilken, Leif; and Kihlberg, Harry. Method for the vertical manufacture of sandwich structural elements. 5,114,524, Cl. 156-295.000.
Sviridov, Anatoly B.: *See—*
Bordunov, Vladimir V.; Karmadonov, Leonid N.; Ospischev, Jury M.; Fedjunin, Vladimir A.; Zhuravkov, Sergei P.; Cherepenko, Evgeny A.; Sviridov, Anatoly B.; Verkhorubov, Lev S.; Mikhailov, Arkady T.; Bakhmutov, Jury L.; and Shaidurov, Valery S., 5,114,496, Cl. 134-13.000.
Swansen, Theodore L. External combustion engine and heat pump. 5,113,656, Cl. 60-525.000.
Swanson, Gerald T.: *See—*
Nelson, Sharon L.; Petrovic, John E.; and Swanson, Gerald T., 5,114,570, Cl. 210-94.000.
Swarthoff, Ton: *See—*
Van Kralingen, Cornelis G.; Martens, Rudolf J.; Rerek, Mark E.; Swarthoff, Ton; and Van Vliet, Marten, 5,114,611, Cl. 252-186.330.
Swayze, Samuel F., to Eastman Kodak Company. Photographic camera with pivotable cover parts. 5,115,265, Cl. 354-82.000.
Swedberg, Sally A., to Hewlett-Packard Company. Surfaces with reduced protein interactions. 5,114,768, Cl. 428-36.910.
Sweeney, William R.: *See—*
Rowe, Norman R.; and Sweeney, William R., 5,115,342, Cl. 359-509.000.
Sweeten, Theodore P., to Ventures Unlimited, Inc. Filter for lowering harmful crankcase emissions in an internal combustion engine. 5,113,836, Cl. 123-573.000.
Switchcraft Inc.: *See—*
Garay, Antonio A., 5,115,375, Cl. 361-400.000.
Sygall, Peter I.: *See—*
Smolders, Jozef G. H. M.; and Sygall, Peter I., 5,114,308, Cl. 414-799.000.
Sylla, Klaus F., to Kohlensaeurewerk Deutschland GmbH. Process for drying of plant or animal material. 5,113,597, Cl. 34-22.000.
Synchronous Communications, Inc.: *See—*
Gysel, Hermann; and Ramachandran, Mani, 5,115,440, Cl. 372-38.000.
Syracuse University: *See—*
Schwarz, James A.; and Subramanian, Somasundaram, 5,114,902, Cl. 502-334.000.
Syrier, Johannes L. M.: *See—*
Van Helden, Arend K.; Gilson, Jean-Pierre; and Syrier, Johannes L. M., 5,115,002, Cl. 524-91.000.

T&N Technology Limited: *See—*
Dawson, Derek J., 5,113,624, Cl. 51-325.000.
Tabereaux, Alton T.: *See—*
Alcorn, Thomas R.; Tabereaux, Alton T.; and Trembley, Luke R., 5,114,545, Cl. 204-67.000.
Taboury, Jean: *See—*
Baude, Dominique; Chavel, Pierre; Joyeux, Denis; and Taboury, Jean, 5,114,220, Cl. 351-160.00R.
Tabuchi, Toyoji: *See—*
Hikita, Mitsutaka; Tabuchi, Toyoji; Kurosawa, Kazuhito; and Shibagaki, Nobuhiko, 5,115,216, Cl. 333-195.000.
Tachibana, Kaoru; Morita, Ken; and Takahashi, Hiroo, to Sony Corporation. Video disc apparatus recording time-expanded luinance signals and time-compressed chrominance signals. 5,115,323, Cl. 358-330.000.
Tada, Masuo; Hiroi Takahiko; Fukumoto, Takaaki; Ohmori, Toshiaki; and Kanno, Itaru, to Taiyo Sanso Co. Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Method of preparing or rubbing a substrate to be used in a LCD device by spraying it with uniformly sized droplets or frozen water. 5,114,748, Cl. 427-180.000.
Tada, Yuji: *See—*
Nakacho, Yoshifumi; Inubushi, Akiyoshi; and Tada, Yuji, 5,114,809, Cl. 429-192.000.
Tadokoro, Hajime: *See—*
Oda, Yasuhiro; Yoshioka, Hiroshi; Tadokoro, Hajime; and Fujimaki, Yoshihide, 5,114,815, Cl. 430-58.000.
Taguchi, Chiaki; and Nishii, Hiroyuki, to Central Glass Company, Limited. Device for detecting edge of transparent sheet of laminated transparent and translucent sheet assembly. 5,115,142, Cl. 250-561.000.
Taguchi, Hiroshi; Washizaki, Youji; Igarashi, Akira; and Nakano, Hiroyoshi, to Somar Corporation. Film bonding apparatus. 5,114,526, Cl. 156-361.000.
Taguchi, Masaaki: *See—*
Sato, Kiyoshi; Taguchi, Masaaki; Wada, Yasunori; Kawasaki, Mikio; Ohtani, Shinichi; Iwada, Masatosi; and Hatakeyama, Noboru, 5,114,836, Cl. 430-434.000.
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; and Minato, Teruo, to Daidousanso Company Ltd. Nitriding furnace apparatus and method. 5,114,500, Cl. 148-230.000.
Taiyo Sanso Co. Ltd.: *See—*
Tada, Masuo; Hiroi Takahiko; Fukumoto, Takaaki; Ohmori, Toshiaki; and Kanno, Itaru, 5,114,748, Cl. 427-180.000.
Taiyo Yuden Co., Ltd.: *See—*
Imai, Mizuho; Ito, Atsuo; Sekiguchi, Mikio; Iida, Hideyo; Fukai, Kikuji; and Kato, Komei, 5,114,076, Cl. 239-338.000.
Taji, Ryoichi; and Takizawa, Takushi, to Mitsubishi Denki K.K. Stator manufacturing method. 5,113,573, Cl. 29-596.000.
Tajima, Yo: *See—*
Mizuno, Kenichi; Tajima, Yo; and Watanabe, Masakazu, 5,114,888, Cl. 501-96.000.
Takada, Tetsuji: *See—*
Ishii, Junichi; Takada, Tetsuji; and Kurohara, Takayuki, 5,114,604, Cl. 252-62.540.
Takada, Toshiyuki. Arm band. 5,113,533, Cl. 2-170.000.
Takado, Yutaka; Yamazaki, Masayuki; Mikami, Takashi; and Tomiyama, Tetsuo. Method for producing an automobile bumper. 5,114,522, Cl. 156-245.000.
Takagi, Koichi: *See—*
Mihara, Hirokata; Takagi, Koichi; Shimizu, Teruo; Tashiro, Katsunori; and Takahashi, Hideo, 5,113,636, Cl. 53-308.000.
Takagishi, Hisao: *See—*
Ura, Shigeru; Tanaka, Haruo; Takagishi, Hisao; Fukuyama, Hiroko; Fukuyama, Takuya; and Fukuyama, Yuko, 5,114,758, Cl. 427-391.000.
Takahama, Tsuyoshi: *See—*
Okamoto, Shingo; Takahama, Tsuyoshi; Nishikuni, Masato; and Nakano, Shoichi, 5,114,498, Cl. 136-258.000.
Takahashi, Akira; Kanno, Yoshiaki; Sumitani, Jiro; Nakamoto, Katsuya; Sasaki, Takeo; and Akasu, Masahira, to Mitsubishi Jidosha Kogyo K.K.; and Mitsubishi Denki K.K. Surge-corrected fuel control apparatus for an internal combustion engine. 5,115,397, Cl. 364-431.050.
Takahashi, Hideo: *See—*
Mihara, Hirokata; Takagi, Koichi; Shimizu, Teruo; Tashiro, Katsunori; and Takahashi, Hideo, 5,113,636, Cl. 53-308.000.
Takahashi, Hiroo: *See—*
Tachibana, Kaoru; Morita, Ken; and Takahashi, Hiroo, 5,115,323, Cl. 358-330.000.
Takahashi, Hiroshi, to Ricoh Company, Ltd. Multi-tone laser beam writing apparatus for image forming equipment. 5,115,257, Cl. 346-108.000.
Takahashi, Ichiro: *See—*
Ito, Hiromi; Takahashi, Ichiro; and Kanegae, Hirozoh, 5,114,994, Cl. 523-436.000.
Takahashi, Keiichi, to Shin Caterpillar Mitsubishi Ltd. Engine controller. 5,113,825, Cl. 123-400.000.
Takahashi, Nobuyuki: *See—*
Nakagawa, Toshiyuki; Takahashi, Nobuyuki; and Akimoto, Takashi, 5,113,929, Cl. 165-61.000.
Takahashi, Shunichi: *See—*
Tsuchiya, Yukio; Tanaka, Hiroshi; and Takahashi, Shunichi, 5,115,474, Cl. 381-158.000.
Takahashi, Tadashi: *See—*
Noda, Nobuhiro; Furuya, Katsuhiko; Takahashi, Tadashi; and Nakasima, Masaaki, 5,115,261, Cl. 354-62.000.
Takahashi, Tomoyuki: *See—*
Kitagawa, Kuniharu; Kataoka, Hideaki; Takahashi, Tomoyuki; and Kitagawa, Kiichiro, 5,115,268, Cl. 354-275.000.
Takai, Hiroshi; and Ishida, Sachio, to Nippon Suisan Kaisha Ltd.; and Ishida Iron Works, Co., Ltd. Apparatus for automatically feeding and packing surimi of fish or shellfish. 5,113,635, Cl. 53-52.000.
Takaku, Fumimaro; and Motoyoshi, Kazuo, to Green Cross Corporation; and Morinaga Milk Industry Co., Ltd. M-CSF as a therapeutic agent for thrombocytopenia. 5,114,710, Cl. 424-85.100.
Takamiya, Kikuzo; and Nishimura, Ritsuo, to Bridgestone Cycle Co., Ltd. Built-in generator for bicycle. 5,115,159, Cl. 310-67.00A.
Takamoto, Yoshifumi; and Torii, Shunichi, to Hitachi, Ltd. Method and apparatus for multi-transaction batch processing. 5,115,392, Cl. 395-650.000.
Takanishi, Toshiaki: *See—*
Yamashita, Noboru; Sugiura, Keiji; Shimomaki, Kazunori; and Takanishi, Toshiaki, 5,114,198, Cl. 293-120.000.
Takano, Masayuki; Onozuka, Kuniharu; Nagasawa, Fumihiro; and Matsumoto, Akihiko, to Sony Corporation. News program broadcasting system. 5,115,310, Cl. 358-185.000.
Takata, Harry H., to Ag-Chem Equipment Co., Inc. Baffle system for pneumatic applicators of solid particles. 5,114,078, Cl. 239-655.000.
Takatori, Naoki: *See—*
Kondo, Shigeru; Takatori, Naoki; Morizumi, Masaaki; and Kanamori, Shino, 5,115,267, Cl. 354-221.000.
Takayanagi, Hiroaki: *See—*
Kusano, Hiroshi; Ito, Tsuyoshi; Tashiro, Takayuki; Takayanagi, Hiroaki; and Miyata, Eiji, 5,114,577, Cl. 210-198.200.
Takebe, Katsuhiko; Doi, Mizuho; Takehara, Hiroyasu; Hiyama, Satoshi; and Urabe, Masanobu, to Honda Giken Kogyo Kabushiki Kaisha. Semiconductor sensor. 5,115,292, Cl. 357-26.000.
Takeda, Eiji: *See—*
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,115,289, Cl. 357-23.700.
Takeda, Yukihiro, to Matsushita Electric Industrial Co., Ltd. Dielectric filter. 5,115,373, Cl. 361-329.000.
Takedo, Nobuo: *See—*
Nishizawa, Junichi; Takedo, Nobuo; and Suzuki, Sohbe, 5,115,287, Cl. 357-23.400.
Takehara, Hiroyasu: *See—*
Takebe, Katsuhiko; Doi, Mizuho; Takehara, Hiroyasu; Hiyama, Satoshi; and Urabe, Masanobu, 5,115,292, Cl. 357-26.000.
Takei, Hisashi: *See—*
Ikebuchi, Iwao; Ihara, Yoshitaka; Takei, Hisashi; Yamada, Syozo; Nakano, Mamoru; and Ganse, Akira, 5,114,083, Cl. 241-153.000.
Takei, Tetsuya: *See—*
Echizen, Hiroshi; Fujioka, Yasushi; Nakagawa, Katsumi; Kanai, Masahiro; Kariya, Toshimitsu; Matsuyama, Jinsho; and Takei, Tetsuya, 5,114,770, Cl. 427-38.000.
Takeichi, Michifumi: *See—*
Okuno, Sumio; Takeichi, Michifumi; Ohmura, Keiji; Okazaki, Msato; Tsuruda, Hitoshi; Yamada, Hiroyuki; Hattori, Morishige; and Kimura, Kenji, 5,113,769, Cl. 105-422.000.
Takemura, Kazuo; Ino, Juichi; Kawahara, Hideo; and Kitaoka, Masaki, to Nippon Sheet Glass Co., Ltd. Method for manufacturing layer-built material with silicon dioxide film containing organic colorant and the layer-built material manufactured thereby. 5,114,760, Cl. 427-430.100.
Takenaka, Shintaro, to Mitsui Home Co., Ltd.; and Shinyou Sangyo Co., Ltd. System for mechanically and biologically decomposing garbage. 5,114,081, Cl. 241-79.000.
Takeuchi, Akihiro: *See—*
Yorozu, Hideki; and Takeuchi, Akihiro, 5,115,253, Cl. 346-76.0PH.
Takeuchi, Yoshiaki; Yamamoto, Koji; and Umezaki, Hiroshi, to Sumitomo Chemical Co., Ltd. Polishing composition for metallic material. 5,114,437, Cl. 51-293.000.
Takeyasu, Akira: *See—*
Uda, Taizo; Takeyasu, Akira; Kawaguchi, Tetsuo; and Nakajima, Yukio, 5,115,097, Cl. 530-326.000.
Taki, Masakazu: *See—*
Shoda, Isao; Kodama, Hitoshi; Magome, Kazuo; Iwata, Akihiko; Yoshizawa, Kenji; and Taki, Masakazu, 5,115,168, Cl. 315-223.000.
Takigawa, Doreen Y., to United States of America, Energy. Separation of metals by supported liquid membrane. 5,114,579, Cl. 210-638.000.
Takimoto, Hiroyuki; and Fujimoto, Mikihiro, to Seith, Nancy. Information signal recording apparatus performing a cueing function. 5,115,324, Cl. 358-335.000.
Takiyama, Eiichiro; Ogura, Ryushi; and Harigai, Noriaki, to Showa Highpolymer Co., Ltd. Curable resin composition. 5,115,032, Cl. 525-279.000.
Takizawa, Kazushige; and Sakaki, Hirokazu, to Fuji Photo Film Co., Ltd. Substrates for PS plates. 5,114,825, Cl. 430-159.000.
Takizawa, Takushi: *See—*
Taji, Ryoichi; and Takizawa, Takushi, 5,113,573, Cl. 29-596.000.
Tallman, James L., to Tektronix, Inc. Method and apparatus for determining internal status of a processor using simulation guided by acquired data. 5,115,502, Cl. 395-500.000.
Tamada, Kazuhiro: *See—*
Akiyama, Hiroo; and Tamada, Kazuhiro, 5,115,419, Cl. 369-37.000.
Tamai, Seishin; Doi, Yoshinori; and Araki, Masakatsu, to Isekinoki Kabushiki Kaisha Gijutsubu. Lifting control device for an agricultural machine. 5,113,957, Cl. 172-10.000.

Tamai, Tomoji; Asahi, Tetsuya; and Kondo, Yozo, to Tosoh Corporation. Poly(arylene thioether) copolymers and process for producing thereof. 5,115,091, Cl. 528-388.000.
Tamatani, Masaaki: *See*—
Tsuda, Nobuyuki; Tamatani, Masaaki; Ajiro, Fukaya; and Hitosi, Nagai, 5,115,306, Cl. 358-60.000.
Tan, Hock S.; Ng, Tie H.; and Mahabadi, Hadi K., to Xerox Corporation. Processes for encapsulated toners. 5,114,824, Cl. 430-137.000.
Tanabe Chemical Industrial Inc.: *See*—
Maeda, Mitsuyo; Tanabe Toshio; Tanabe, Shimata; Toyama, Takashi; and Ono, Masashi. 5,115,048, Cl. 525-457.000.
Tanabe, Shimata: *See*—
Maeda, Mitsuyo; Tanabe Toshio; Tanabe, Shimata; Toyama, Takashi; and Ono, Masashi. 5,115,048, Cl. 525-457.000.
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Maeda, Mitsuyo; Tanabe Toshio; Tanabe, Shimata; Toyama, Takashi; and Ono, Masashi. 5,115,048, Cl. 525-457.000.
Tanahashi, Hiroyuki: *See*—
Maruyama, Tadakatsu; Ohno, Yasuhide; Konda, Masashi; Kikuchi, Tosiharu; Suzuki, Yasuhiro; Uno, Tomohiro; Otsuka, Hiroaki; and Tanahashi, Hiroyuki, 5,114,878, Cl. 437-182.000.
Tanaka, Haruhiko: *See*—
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,115,289, Cl. 357-23.700.
Tanaka, Haruo: *See*—
Ura, Shigeru; Tanaka, Haruo; Takagishi, Hisao; Fukuyama, Hiroko; Fukuyama, Takuya; and Fukuyama, Yuko, 5,114,758, Cl. 427-391.000.
Tanaka, Hiroshi: *See*—
Tsuchiya, Yukio; Tanaka, Hiroshi; and Takahashi, Shunichi, 5,115,474, Cl. 381-158.000.
Tanaka, Hisao: *See*—
Shiga, Shujiro; Kabasawa, Koji; Ohmae, Tadayuki; and Tanaka, Hisao, 5,115,036, Cl. 525-328.200.
Tanaka, Hitoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Light intercepting apparatus of lens. 5,115,350, Cl. 359-823.000.
Tanaka, Katsuhiko; Yoshiba, Takeyuki; Sato, Takanobu; Kawakami, Ikunori; and Kawakami, Koichi, to Nippon Seiko Kabushiki Kaisha. Dynamic pressure bearing device. 5,114,245, Cl. 384-112.000.
Tanaka, Kikuo: *See*—
Yoneda, Akiyoshi; Sawamura, Mitsuyoshi; Tanaka, Kikuo; and Kokado, Takashi, 5,115,403, Cl. 364-474.150.
Tanaka, Kunimaro: *See*—
Nakajima, Hajime; Watanabe, Isao; and Tanaka, Kunimaro, 5,115,424, Cl. 569-275.400.
Tanaka, Kunio; and Chiba, Kosuke, to Fanuc Ltd. Malfunction diagnosis method. 5,115,177, Cl. 318-568.100.
Tanaka, Mutsuhiro; and Sugi, Masahiro, to Mitsui Petrochemical Industries, Ltd. Polypropylene resin composition. 5,115,030, Cl. 525-240.000.
Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; and Ogiwara, Yoshihisa, to Seikosha Co. Ltd.; and Nippon Precision Circuits Ltd. Method for producing reverse staggered type silicon thin film transistor. 5,114,869, Cl. 43-40.000.
Tanaka, Satoru; and Matsui, Fumio, to Pioneer Electronic Corporation. Ultraviolet ray detecting device. 5,115,138, Cl. 250-485.100.
Tanaka, Satoshi: *See*—
Shirahata, Akira; Uchida, Minoru; Tanaka, Satoshi; and Tsumura, Kenichiro, 5,114,916, Cl. 514-2.000.
Tanaka, So; Hirakata, Takashi; Kawasaki, Shingo; Nakata, Takuya; Makita, Hitoshi; and Kozuki, Koichi, to Yamaha Corporation. Automatic performance apparatus having plural memory areas. 5,113,744, Cl. 84-634.000.
Tanaka, Tokuji; Akimoto, Etsuji; and Ohta, Seiichi, to Daicel Chemical Industries, Ltd. Optical information recording medium containing linear acrylic resin. 5,114,928, Cl. 430-272.000.
Tanaka, Yoshinori: *See*—
Taniguchi, Tomohiko; Iseda, Kohei; Okazaki, Koji; Amano, Fumio; Unagami, Shigeyuki; Tanaka, Yoshinori; and Ohta, Yasuji, 5,115,469, Cl. 381-36.000.
Tanamu, Jiro; and Katakura, Shinichi, to Oki Electric Industry Co., Ltd. Printer with protection from discharge line disconnection. 5,114,252, Cl. 400-124.000.
Tandy, John S.: *See*—
Kibler, Lawrence A.; Kratky, Zdenek; and Tandy, John S., 5,114,734, Cl. 426-650.000.
Taniguchi, Tomohiko; Iseda, Kohei; Okazaki, Koji; Amano, Fumio; Unagami, Shigeyuki; Tanaka, Yoshinori; and Ohta, Yasuji, to Fujitsu Limited. Speech encoding/decoding apparatus having selected encoders. 5,115,469, Cl. 381-36.000.
Tanii, Yoshinori: *See*—
Kajiwara, Toshiyuki; Tanii, Yoshinori; and Hashimoto, Kazuhiko, 5,114,543, Cl. 205-152.000.
Tanji, Hiroyuki: *See*—
Igaue, Takamitsu; Kitaoka, Hideaki; and Tanji, Hiroyuki, 5,114,420, Cl. 604-385.200.
Tarantino, Frank L.: *See*—
Chiacchio, Frank J.; and Tarantino, Frank L., 5,114,806, Cl. 429-126.000.
Taravella, Jody J.: *See*—
Wiewiorowski, Tadeusz K.; Astley, Vivian C.; Taravella, Jody J.; and Murray, Michael A., 5,114,699, Cl. 423-531.000.
Tardieu, Pascale: *See*—
Guglielmetti, Robert; and Tardieu, Pascale, 5,114,621, Cl. 252-586.000.
Tarsha, Simon: *See*—
McMillan, Jim S.; and Tarsha, Simon, 5,114,634, Cl. 264-28.000.
Taruya, Massaki; and Koiwa, Misturu, to Mitsubishi Denki Kabushiki Kaisha. Igniter for an engine. 5,113,840, Cl. 123-644.000.
Tashiro, Katsunori: *See*—
Mihara, Hirokata; Takagi, Koichi; Shimizu, Teruo; Tashiro, Katsunori; and Takahashi, Hideo, 5,113,636, Cl. 53-308.000.
Tashiro, Takayuki: *See*—
Kusano, Hiroshi; Ito, Tsuyoshi; Tashiro, Takayuki; Takayanagi, Hiroaki; and Miyata, Eiji, 5,114,577, Cl. 210-198.200.
Tatsumi, Takumi: *See*—
Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,114,383, Cl. 474-18.000.
Taveau, Pierre: *See*—
Vives, Michel; Taveau, Pierre; Etienne, Jacques; Remillieux, Yves; and Charbonnel, Lucien, 5,114,772, Cl. 428-49.000.
Taybl, Christa; Muller, Manfred; Gerke, Dieter; and Bulow, Harald, to Krone AG. Connecting block for the telecommunication and data technology. 5,114,356, Cl. 439-133.000.
Taylor, Chandler R., Jr.; Stauffer, Harold F., Jr.; and Tomczuk, Bruce E., to A. H. Robins Company Incorporated. 2-phenylpyrazolo[1,5-a]pyrimidine-3-acetic acid derivatives exhibiting therapeutic effects. 5,114,944, Cl. 514-258.000.
TDK Corporation: *See*—
Hashizume, Kenji; Okamura, Masatoshi; and Shiba, Haruo, 5,115,365, Cl. 360-132.000.
Technalytics, Inc.: *See*—
Storace, Anthony, 5,114,065, Cl. 227-175.000.
Technicare Corporation: *See*—
Walters, Ronald G., 5,115,394, Cl. 364-413.170.
Technion Research & Development Foundation, Ltd.: *See*—
Blumenau, Leif, 5,115,157, Cl. 310-11.000.
Tecumseh Products Company: *See*—
Bonde, Kevin G.; and Hall, Ronald L., 5,113,818, Cl. 123-196.00W.
Teijin Limited: *See*—
Umetani, Hiroyuki; Matsumura, Shunichi; and Yamada, Takeyoshi, 5,115,074, Cl. 528-98.000.
Teijin Seiki Company, Limited: *See*—
Fujii, Yutaka, 5,113,756, Cl. 100-48.000.
Tektronix, Inc.: *See*—
Lo, Pei-hwa; and Thong, Tran, 5,115,404, Cl. 395-143.000.
Tallman, James L., 5,115,502, Cl. 395-500.000.
Telchuk, Steve E., to Binks Manufacturing Company. Combination paint spray booth-drying oven with single air fan. 5,113,600, Cl. 34-90.000.
Telectronics Pacing Systems, Inc.: *See*—
Nappholz, Tibor A.; Hursta, William N.; Dawson, Albert K.; and Steinhaus, Bruce M., 5,113,869, Cl. 128-696.000.
Teledyne Industries Inc.: *See*—
Nelson, Sharon L.; Petrovic, John E.; and Swanson, Gerald T., 5,114,570, Cl. 210-94.000.
Peterson, John R., 5,114,890, Cl. 501-103.000.
Teleflex Incorporated: *See*—
Plamper, Gerhard R., 5,113,717, Cl. 74-502.600.
Tell, Benjamin: *See*—
Lee, Yong H.; and Tell, Benjamin, 5,115,442, Cl. 372-45.000.
Tenhover, M. A.; and Lukco, D. B., to Standard Oil Company, The. Silicon based intermetallic coatings for reinforcements. 5,114,785, Cl. 428-263.000.
Tenmoku, Kenji: *See*—
Shimizu, Osamu; Tenmoku, Kenji; Doi, Yoichi; and Mito, Kunihiko, 5,115,238, Cl. 340-988.000.
Tenney, Linwood P.; and Shen, Dennis C., to B. F. Goodrich Company, The. Substrate for optical recording media and molding composition therefor. 5,115,041, Cl. 525-332.100.
Tenore, Richard R.: *See*—
Corti, Mike E.; and Tenore, Richard R., 5,114,978, Cl. 514-737.000.
Tepfer, Russell J.: *See*—
Peterson, Robert C.; Pauling, Kelly B.; and Tepfer, Russell J., 5,113,643, Cl. 56-153.000.
Terado, Ikuo, to Sony Corporation. Frequency and/or phase characteristic control circuit having controlled current multiplying ratio. 5,115,154, Cl. 307-494.000.
Terajima, Hisao: *See*—
Kobayashi, Makoto; Yoshida, Takehiro; Wada, Satoshi; Terajima, Hisao; Ono, Takeshi; Yokoyama, Minoru; Awai, Takashi; Tomoda, Akihiro; and Ishida, Yasushi, 5,115,255, Cl. 346-76.0PH.
Teramoto, Yoshikichi: *See*—
Mizuno, Toshiya; Teramoto, Yoshikichi; Saito, Takeshi; and Wakabayashi, Juichi, 5,115,092, Cl. 528-388.000.
Terayama, Takao; Yokota, Hajime; Sakai, Kazuo; and Kaku, Nobuyuki, to Hitachi, Ltd. Guide mechanism for positioning tape guides in a magnetic tape loading apparatus. 5,115,361, Cl. 360-85.000.
Terazono, Masaki: *See*—
Osamura, Kazumi; Terazono, Masaki; Kohsaka, Shoji; Koga, Kazunori; Saito, Akira; Sato, Masahiro; and Uchimura, Hideki, 5,114,889, Cl. 501-97.000.
Terhune, James H., to General Electric Company. Method for in situ evaluation of capacitive type pressure transducers in a nuclear power plant. 5,114,664, Cl. 376-245.000.
Terlinden, Rolf: *See*—
Biedermann, Jurgen; Evers, Michel; Terlinden, Rolf; Leyck, Sigurd; and Graf, Erich, 5,114,954, Cl. 514-338.000.

Terneuil, Gabriel: *See*—
Hotier, Gerard; Toussaint, Jean-Michel; Terneuil, Gabriel; and Lonchamp, Daniel, 5,114,590, Cl. 219-659.000.
Terry, Jean C.: *See*—
Suuronen, David E.; and Terry, Jean C., 5,115,220, Cl. 337-297.000.
Terry, Kenneth A.: *See*—
Martin, Samuel W.; Silverberg, Morton; and Terry, Kenneth A., 5,114,067, Cl. 229-92.100.
Tetra Pak Holdings & Finance S.A.: *See*—
Reil, Wilhelm; Deutschbein, Ulrich; Knobloch, Gerd; and Liebram, Udo, 5,114,068, Cl. 229-123.200.
Texaco Inc.: *See*—
Campbell, Teddy G., 5,114,098, Cl. 244-121.000.
Texaco Producing Inc.: *See*—
Debons, Francis E.; Pedersen, Larry D.; and Whittington, Lawrence E., 5,114,599, Cl. 252-8.554.
Texas Instruments Incorporated: *See*—
Amador, Gonzalo; Burrows, Randy O.; and Epp, George C., 5,114,066, Cl. 228-4.500.
Darley, Henry M.; Niehaus, Jeffrey A.; and Ovens, Kevin M., 5,115,408, Cl. 364-754.000.
Loh, Wah K., 5,115,298, Cl. 357-70.000.
Madan, Sudhir K., 5,114,879, Cl. 437-195.000.
Purdes, Andrew J., 5,114,696, Cl. 423-446.000.
Rao, Kalipatnam V.; Mitchell, Allan T.; and Paterson, James L., 5,114,530, Cl. 156-653.000.
Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft: *See*—
Feyerl, Gunther; and Konig, Franz, 5,113,563, Cl. 28-115.000.
Tezuka, Kouichi: *See*—
Nagamune, Akio; Tezuka, Kouichi; and Komine, Isamu, 5,115,242, Cl. 342-124.000.
Th. Goldschmidt AG: *See*—
Fock, Jurgen; Schaefer, Dietmar; and Esselborn, Eberhard, 5,115,039, Cl. 525-329.500.
Fock, Jurgen; Schaefer, Dietmar; and Esselborn, Eberhard, 5,115,040, Cl. 525-329.500.
Thatcher, G. Bryce, to Ultimate Direction, Inc. Universally adjustable, frameless backpack. 5,114,059, Cl. 224-209.000.
Thermal Transfer Products, Ltd.: *See*—
Myers, Austin R., 5,113,928, Cl. 165-38.000.
Thermo Electron Technologies Corp.: *See*—
Dunn, Murray, 5,115,355, Cl. 359-876.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Continuous action ballast compacting machine. 5,113,767, Cl. 104-7.200.
Theurer, Josef; Oellerer, Friedrich; and Gruber, Leopold R., to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Method for laying a catenary and/or a contact wire of an overhead line. 5,114,119, Cl. 254-134.30R.
Thier, Hubert, to Sengewald/USA, Inc. Package. 5,114,243, Cl. 383-85.000.
Thiokol Corporation: *See*—
Junior, Kenneth E.; and Byrd, James D., 5,113,650, Cl. 60-253.000.
Thoen, Johan A.: *See*—
Elwell, Richard J.; Sewell, Robert A.; Lidy, Werner A.; and Thoen, Johan A., 5,114,989, Cl. 521-159.000.
Thoma, Paul E.: *See*—
AbuJudom, David N., II; Thoma, Paul E.; Kao, Ming-Yuan; and Angst, David R., 5,114,504, Cl. 148-402.000.
Thomas, Daniel D., Jr.; Hadley, Hugh W.; and Len, Joseph J., to United States of America, Air Force. Radar target locating and tracking apparatus using a dual-interleaved pulse train radar waveform. 5,115,246, Cl. 342-195.000.
Thomas, Darren R.: *See*—
Dao, Hung D.; Grieff, Thomas W.; Lattin, Thomas W., Jr.; Thomas, Darren R.; Schultz, Stephen M.; Ewert, Richard; and Flower, David L., 5,115,225, Cl. 340-584.000.
Thomas, Geoffrey N.: *See*—
Arrowsmith, John E.; Cross, Peter E.; and Thomas, Geoffrey N., 5,114,952, Cl. 514-309.000.
Thomas Industries, Inc.: *See*—
Toledo, George F.; and O'Brien, James A., 5,114,192, Cl. 292-21.000.
Thompson, Bradley G.: *See*—
Leps, Walter T.; and Thompson, Bradley G., 5,113,619, Cl. 47-57.600.
Thompson, Gregory J.: *See*—
Haun, Edward C.; Thompson, Gregory J.; Gorawara, Jayant K.; and Sullivan, Dana K., 5,114,562, Cl. 208-89.000.
Thompson, James J.: *See*—
McCombs, Candace C.; Michalski, Joseph P.; Gallaher, William R.; and Thompson, James J., 5,114,863, Cl. 436-518.000.
Thompson, Suzanne J.: *See*—
Hampl, Edward F., Jr.; Iqbal, Mohammad; and Thompson, Suzanne J., 5,115,372, Cl. 361-323.000.
Thompson, William H.; and Brownlie, Alan W., to Thompson, William H. Wall plate. 5,114,365, Cl. 439-540.000.
Thomson Composants Militaires et Spatiaux: *See*—
Cazaux, Yvon, 5,114,237, Cl. 358-213.230.
Thomson Consumer Electronics Inc.: *See*—
Gurley, Thomas D.; and Sendelweck, Gene K., 5,115,316, Cl. 358-188.000.
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Blondeau, Robert; Rondt, Daniel; Glastre, Genevieve; and Krakowski, Michel, 5,115,283, Cl. 357-17.000.
Thomson, Pamela J. Musical calculator. 5,113,739, Cl. 84-473.000.
Thong, Tran: *See*—
Lo, Pei-hwa; and Thong, Tran, 5,115,404, Cl. 395-143.000.
Thor Radiation Research, Inc.: *See*—
Hodnett, William P., III, 5,114,783, Cl. 428-217.000.
Thue, Baard H., to Honeywell Inc. Frequency modulated, phase coded radar. 5,115,247, Cl. 342-201.000.
Thull, Wolfram; and Kohlmeier, Hans-Heinrich, to Dr. Ing. h.c.F. Porsche AG. Motor vehicle steering column. 5,114,182, Cl. 280-779.000.
Thurman, Richard E.: *See*—
Kimmel, David J.; Siwinski, Paul P.; Smith, Robert A.; Thurman, Richard E.; Adkins, Stephen R.; Feldman, Steven; and Look, Raymond J., 5,114,355, Cl. 439-101.000.
Tidwell, Steve C., to Amoco Corporation. High average power Faraday isolator. 5,115,340, Cl. 359-484.000.
Tilby, Sydney E. Apparatus for control of sugarcane half-billets. 5,114,490, Cl. 127-2.000.
Tillery, Michael L.; Harlan, Eugene G.; Martin, John R.; Zammuto, Samuel N.; and Bonilla, Marcio, to Arachnid, Inc. System for automatic collection and distribution of player statistics for electronic dart games. 5,114,155, Cl. 273-371.000.
Tinsley, Jack A., to Hoover Universal, Inc. Mechanical locking mechanism for injection mold. 5,114,335, Cl. 425-577.000.
Tioxide Group PLC: *See*—
Demosthenous, Maria; and Van Meyel, Francis, 5,114,486, Cl. 106-443.000.
Tiramani, Paolo M. B.; and Van Dyk, Thomas C., to Goody Products, Inc. Manually actuated trigger sprayer. 5,114,052, Cl. 222-207.000.
Tixier, John S., Jr.: *See*—
Murphy, Mark T.; Buelt, James L.; Stottlemyre, James A.; and Tixier, John S., Jr., 5,114,277, Cl. 405-231.000.
Toa Medical Electronics Co., Ltd.: *See*—
Hayashi, Masayoshi, 5,114,860, Cl. 436-69.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Naito, Tsutomu; Nishimura, Genshiro; and Komine, Kikuji, 5,114,697, Cl. 423-447.100.
Tobioka, Massaki: *See*—
Yamamoto, Susumu; Murai, Teruyuki; Kawabe, Nozomu; and Tobioka, Massaki, 5,114,641, Cl. 264-60.000.
Tobita, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Data read circuit of semiconductor memory device and method of reading data out. 5,115,412, Cl. 365-189.090.
Todd, Alvin E. Ceiling fan display stand. 5,114,016, Cl. 211-26.000.
Toei Electronics Co., Ltd.: *See*—
Konishi, Kouji; Ohshima, Tadayoshi; Fujii, Masakazu; Hagino, Motoyuki; Hosono, Satoshi; and Miyake, Masayoshi, 5,115,144, Cl. 250-572.000.
Toifl, Pamela G.; and Toifl, Samuel D. Safety closure device for appliances. 5,114,194, Cl. 292-106.000.
Toifl, Samuel D.: *See*—
Toifl, Pamela G.; and Toifl, Samuel D., 5,114,194, Cl. 292-106.000.
Tokai Kogyo Kabushiki Kaisha: *See*—
Yada, Yukihiki, 5,114,206, Cl. 296-201.000.
Tokai Rubber Industries, Ltd.: *See*—
Muramatsu, Atsushi, 5,114,124, Cl. 267-140.10A.
Tokarek, Ronald F.; and Herman, Wesley E. Apparatus for removing metal fragments from the eye. 5,114,397, Cl. 600-11.000.
Tokuda, Makoto: *See*—
Shimomura, Takeshi; Sakane, Katumi; Tokuda, Makoto; and Egawa, Sinpei, 5,114,184, Cl. 280-784.000.
Tokunaga, Norikazu: *See*—
Shirahama, Hidefumi; Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; Iwanaka, Mitsufumi; Nagano, Takeshi; and Ishida, Youuji, 5,115,386, Cl. 363-41.000.
Tokyo Electric Co., Ltd.: *See*—
Nishikawa, Hisashi; Fujisawa, Ikuo; and Ohsugi, Yukihiro, 5,115,279, Cl. 355-290.000.
Tokyo Electron Limited: *See*—
Harada, Hiromi; and Nozawa, Toshihisa, 5,115,118, Cl. 219-390.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Tsuda, Nobuyuki; Tamatani, Masaaki; Ajiro, Fukaya; and Hitosi, Nagai, 5,115,306, Cl. 358-60.000.
Toledo, George F.; and O'Brien, James A., to Thomas Industries, Inc. Latching system. 5,114,192, Cl. 292-21.000.
Tolman, Richard L.: *See*—
Ashton, Wallace T.; Cantone, Christine L.; and Tolman, Richard L., 5,114,925, Cl. 514-18.000.
Tomasch, Michael D., to Olympus Corporation. Ultraviolet remote visual inspection system. 5,115,136, Cl. 250-461.100.
Tomczuk, Bruce E.: *See*—
Taylor, Chandler R., Jr.; Stauffer, Harold F., Jr.; and Tomczuk, Bruce E., 5,114,944, Cl. 514-258.000.
Tomimatsu, Yukihito: *See*—
Miyamoto, Takashi; Miyagawa, Kazuya; Tomimatsu, Yukihito; Sugiura, Tsutomu; Nishi, Kenji; and Ichihara, Taku, 5,114,224, Cl. 353-122.000.
Tomita, Akira; Diaz, Stephen H.; Dubrow, Robert S.; and Feldman, Michael, to Raychem Corp. Optical fiber termination coating dispenser. 5,113,787, Cl. 118-400.000.
Tomita, Kan, to Ricoh Company, Ltd. Optical scanning device. 5,115,334, Cl. 359-216.000.
Tomita, Koji: *See*—
Sugawara, Koko; Nishiyama, Yuji; Tomita, Koji; Konishi, Masataka; and Oki, Toshikazu, 5,114,920, Cl. 514-11.000.

Tomiyama, Tetsuo: *See—*
Takado, Yutaka; Yamazaki, Masayuki; Mikami, Takashi; and Tomiyama, Tetsuo, 5,114,522, Cl. 156-245.000.
Tomoda, Akihiro: *See—*
Kobayashi, Makoto; Yoshida, Takehiro; Wada, Satoshi; Terajima, Hisao; Ono, Takeshi; Yokoyama, Minoru; Awai, Takashi; Tomoda, Akihiro; and Ishida, Yasushi, 5,115,255, Cl. 346-76.0PH.
Tomomatsu, Hideo; and Hojo, Yasuo, to Toyota Jidosha Kabushiki Kaisha. Hydraulic control device of automatic transmission more smooth in low coast upshifting under under-D manual shift range. 5,113,725, Cl. 74-869.000.
Tomonaga, Hiroshi, to Pioneer Electronic Corporation. Differential amplifier. 5,115,204, Cl. 330-257.000.
Tomura, Shinya; and Kohyama, Mitsuaki, to Kabushiki Kaisha Toshiba. Developing method for electrostatic images. 5,114,823, Cl. 430-120.000.
Tonen Corporation: *See—*
Yashiro, Teruo; Kanazawa, Seizaburo; Nakano, Akira; Murata, Masahide; and Imai, Masafumi, 5,114,896, Cl. 502-111.000.
Tong, Joy: *See—*
Pulichino, John; and Tong, Joy, 5,113,982, Cl. 190-18.00A.
Tonka Corporation: *See—*
Moormann, Randall H., 5,113,842, Cl. 124-65.000.
Tooltek Engineering Corp.: *See—*
Jahani, Hooshang, 5,114,557, Cl. 204-206.000.
Topfer, Claus: *See—*
Schumacher, Josef; and Topfer, Claus, 5,113,655, Cl. 60-408.000.
Toppan Printing Co.: *See—*
Kawakami, Takeo; Kagumi, Takashi; Chosa, Yosei; and Yoshida, Masato, 5,114,904, Cl. 503-227.000.
Torigoe, Makoto; and Sato, Hiroshi, to Canon Kabushiki Kaisha. Exposure method and apparatus. 5,114,223, Cl. 353-101.000.
Torii, Shunichi: *See—*
Takamoto, Yoshifumi; and Torii, Shunichi, 5,115,392, Cl. 395-650.000.
Tornero, Rogelio: *See—*
Ward, Robert W.; Tornero, Rogelio; and Henderson, Freeman J., 5,114,981, Cl. 521-55.000.
Torres, Ghislaine: *See—*
Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Huges; Prazuck, Thierry; and Torres, Ghislaine, 5,114,707, Cl. 424-667.000.
Tortellier, Christian, to Hydrs. Safety valve for fluid circuit. 5,113,896, Cl. 137-269.000.
Toshiba Machine Co., Ltd.: *See—*
Iwase, Akira; and Suzuki, Akira, 5,115,354, Cl. 359-873.000.
Toshiba Silicone Co., Ltd.: *See—*
Motegi, Hisao; Sunaga, Takeshi; and Zenbayashi, Michio, 5,115,069, Cl. 52.8-15.000.
Tosoh Corporation: *See—*
Inada, Jun; Sato, Shinichi; Shimizu, Ryoichi; Kitani, Akinobu; and Nakano, Kunio, 5,114,765, Cl. 428-35.700.
Tamai, Tomoji; Asahi, Tetsuya; and Kondo, Yozo, 5,115,091, Cl. 528-388.000.
Toussaint, Jean-Michel: *See—*
Hotier, Gerard; Toussaint, Jean-Michel; Terneuil, Gabriel; and Lonchamp, Daniel, 5,114,590, Cl. 219-659.000.
Towle, David P.: *See—*
Rini, Michael J.; and Towle, David P., 5,113,771, Cl. 110-263.000.
Toyama, Takashi: *See—*
Maeda, Mitsuyo; Tanabe, Toshio; Tanabe, Shimata; Toyama, Takashi; and Ono, Masashi, 5,115,048, Cl. 525-457.000.
Toyota, Akinori: *See—*
Yagi, Kazuo; and Toyota, Akinori, 5,115,067, Cl. 526-348.100.
Toyota Jidosha Kabushiki Kusha: *See—*
Isegawa, Yo; Kito, Takeshi; Muryayama, Kimimasa; Ikawa, Shoji; Iwase, Takahiro; Sugiura, Tutomu; and Tsuzuki, Atsuyuki, 5,114,521, Cl. 156-242.000.
Kani, Harunobu; and Kakihara, Kenji, 5,114,769, Cl. 428-37.000.
Sakai, Hideki, 5,114,175, Cl. 280-675.000.
Tomomatsu, Hideo; and Hojo, Yasuo, 5,113,725, Cl. 74-869.000.
Tsuda, Kazuhiko; Kako, Hiroyoshi; Morikawa, Hirohiko; Noguchi, Noboru; and Nakanishi, Nobuyasu, 5,114,216, Cl. 303-117.000.
Tranjan, Farid M.; DuBois, Thomas D.; Frieser, Rudolf G.; Bobbio, Stephen M.; and Jones, Susan K. S., to Microelectronics Center of N.C.; and University of North Carolina at Charlotte. Photoresists resistant to oxygen plasmas. 5,114,827, Cl. 430-271.000.
Traut, Davis E.: *See—*
White, Jack C.; and Traut, Davis E., 5,113,923, Cl. 164-41.000.
Tremblay, Robert: *See—*
McAdam, Hugh A., III; Tremblay, Robert; and Pacocha, James, 5,114,392, Cl. 493-179.000.
Trembley, Luke R.: *See—*
Alcorn, Thomas R.; Tabereaux, Alton T.; and Trembley, Luke R., 5,114,545, Cl. 204-67.000.
Tresper, Erhard: *See—*
Stahlke, Kurt-Rainer; Reinking, Klaus; Tresper, Erhard; Kraft, Klaus; and Kaminski, Axel, 5,114,791, Cl. 428-419.000.
Trewella, Jeffrey C.: *See—*
Abramo, Guy P.; and Trewella, Jeffrey C., 5,114,435, Cl. 44-348.000.
Triad-Fabco, Inc.: *See—*
Ward, Robert W.; Tornero, Rogelio; and Henderson, Freeman J., 5,114,981, Cl. 521-55.000.
Tribelhorn, Victor E., Jr. Sheep treadmill. 5,114,390, Cl. 482-54.000.
Trick, Robert E.; and Barwick, Carl B., to Medical Engineering Corporation. Female incontinence control device with mechanically operable valve. 5,114,398, Cl. 600-29.000.
TriNeos: *See—*
Ditzler, Lee C.; Lemberger, Ronald; McGrane, Willam K.; and Choy, Jerry F., 5,114,576, Cl. 210-195.100.
Tripodi, Paul, to Gerin, Merlin. Circuit breaker comprising an electronic trip device. 5,115,371, Cl. 361-106.000.
Trocola, Gary M., to Ball and Socket Manufacturing Company of Delaware, Inc., The. Machine and method for automatically assembling buttons. 5,113,572, Cl. 29-509.000.
Troje, Gerald J. Optical system for recording or projecting a panoramic image. 5,115,266, Cl. 354-95.000.
True Fitness Technology, Inc.: *See—*
Trulaske, James A., 5,114,388, Cl. 482-52.000.
Trulaske, James A., to True Fitness Technology, Inc. Stair simulator exerciser with adjustable incline. 5,114,388, Cl. 482-52.000.
Trumpf Lasertechnik GmbH: *See—*
von Borstel, Michael; Prokop, Heinz-Jurgen; and Wollerman-Windgasse, Reinhard, 5,115,446, Cl. 372-93.000.
TRW Daut & Rietz GmbH & Co. KG: *See—*
Steinhardt, Helmut; and Bieringer, Anton, 5,114,360, Cl. 439-341.000.
TRW Inc.: *See—*
Emery, Jerome W.; and O'Loughlin, John P., 5,114,179, Cl. 280-741.000.
Tryggvason, Karl; and Hostikka, Sirkka L. Method for determining the nucleotide sequence of a novel α5(IV) chain of human type IV collagen. 5,114,840, Cl. 435-6.000.
Tryon, James A.: *See—*
Stern, Donald J.; Heaton, Jeff S.; and Tryon, James A., 5,114,527, Cl. 156-575.000.
Tsai, Mei-Yuan; and Paola, Vincent A., to Aluminum Company of America. Memory disc lubricated by N-acyl sarcosine derivative. 5,114,798, Cl. 428-611.000.
Tsang, Chih-Hao M.; and Bedford, Raymond E., to General Motors Corporation. Ceramic coating for a catalyst support. 5,114,901, Cl. 502-240.000.
Tsang, Won-Tien: *See—*
Sudbo, Aasmund S.; Tsang, Won-Tien; and Yang, Long, 5,115,294, Cl. 357-30.000.
Tsau, Josef H.; Seagle, Dennis; and Laurenz, Steven, to NutraSweet Company, The. Process for preparing aspartame coated organic acid. 5,114,726, Cl. 426-289.000.
Tseng, Mingchih M.: *See—*
Rogers, Brian A.; and Tseng, Mingchih M., 5,113,585, Cl. 30-41.000.
Tsubakimoto Chain Co.: *See—*
Tsuyama, Hideo, 5,114,384, Cl. 474-212.000.
Tsubota, Makio: *See—*
Asayama, Yoshio; Tsubota, Makio; Okura, Yasunori; and Sato, Takayuki, 5,113,720, Cl. 74-866.000.
Tsuboyama, Akira: *See—*
Yoshinaga, Kazuo; Katagiri, Kazuharu; Tsuboyama, Akira; Kitayama, Hiroyuki; Shinjo, Kenji; and Hioki, Chieko, 5,114,613, Cl. 252-299.610.
Tsuchiya, Ichiro; Ishikawa, Shinji; Saitoh, Masahide; and Ishiguro, Yoichi, to Sumitomo Electric Industries, Ltd. Furnace for heating highly pure quartz preform for optical fiber. 5,114,338, Cl. 432-206.000.
Tsuchiya, Paul F.; Kirkman, W. Worth; and Weidner, John F., to Mitre Corporation, The. Communications network system using full-juncture and partial-juncture station status information for alternate-path distance-vector routing. 5,115,495, Cl. 395-200.000.
Tsuchiya, Yoshinobu; Kurabayashi, Ken; Kito, Seiichiro; and Niida, Yoriaki, to Isuzu Motors Limited. Electric double layer capacitor. 5,115,378, Cl. 361-502.000.
Tsuchiya, Yoshiro: *See—*
Ohtsuka, Masahito; Kobayashi, Hiroo; Moritani, Toshifumi; Yagi, Tadashi; Tsuchiya, Yoshiro; Azeta, Takahiro; Waragai, Tsuyoshi; Yukimachi, Hiroshi; and Miyake, Hiroaki, 5,115,281, Cl. 355-319.000.
Tsuchiya, Yukio; Tanaka, Hiroshi; and Takahashi, Shunichi, to Pioneer Electronic Corporation. Speaker system. 5,115,474, Cl. 381-158.000.
Tsuda, Kazuhiko; Kako, Hiroyoshi; Morikawa, Hirohiko; Noguchi, Noboru; and Nakanishi, Nobuyasu, to Toyota Jidosha Kabushiki Kaisha. Anti-lock brake system having flow restrictor. 5,114,216, Cl. 303-117.000.
Tsuda, Mutsumi: *See—*
Ootera, Hiroki; and Tsuda, Mutsumi, 5,115,167, Cl. 315-111.210.
Tsuda, Nobuyuki; Tamatani, Masaaki; Ajiro, Fukaya; and Hitosi, Nagai, to Tokyo Shibaura Denki Kabushiki Kaisha. Projection CRT with a green emitting terbium activated lanthanum oxychloride phosphor exhibiting nearly constant light-output of elevated temperatures. 5,115,306, Cl. 358-60.000.
Tsudakoma Kogyo Kabushiki Kaisha: *See—*
Yasue, Tsutomu, 5,114,126, Cl. 269-32.000.
Tsui, Huai-Chou. Apparatus for triggering a plurality of thyristor devices. 5,115,156, Cl. 307-638.000.
Tsuji, Fumio; and Yoshikawa, Osamu, to Shimadzu Corporation. Moving mirror velocity detection in an interference spectrophotometer. 5,114,232, Cl. 356-346.000.
Tsujimoto, Katsuaki: *See—*
Hayashi, Takeshi; Sato, Shigeru; Tsujimoto, Katsuaki; Miyazaki, Daishiro; Hiwasa, Yoneo; and Ishimatsu, Toshiki, 5,113,954, Cl. 175-415.000.

Tsukada, Kiyoshi: *See—*
Kanzawa, Yoshikazu; Fujikake, Yasushi; Ito, Osami; Ito, Shuho; Oikawa, Hironobu; Otsubo, Makoto; Morikawa, Iwao; Shiratori, Yuichi; and Tsukada, Kiyoshi, 5,113,926, Cl. 164-119.000.
Tsukada, Kiyotaka, to Ibiden, Co., Ltd. Unique ceramic compound. 5,114,886, Cl. 501-88.000.
Tsumura, Kenichiro: *See—*
Shirahata, Akira; Uchida, Minoru; Tanaka, Satoshi; and Tsumura, Kenichiro, 5,114,916, Cl. 514-2.000.
Tsunoda, Tetsujiro: *See—*
Yanagida, Shingo; and Tsunoda, Tetsujiro, 5,115,300, Cl. 357-75.000.
Tsuruda, Hitoshi: *See—*
Okuno, Sumio; Takeichi, Michifumi; Ohmura, Keiji; Okazaki, Msato; Tsuruda, Hitoshi; Yamada, Hiroyuki; Hattori, Morishige; and Kimura, Kenji, 5,113,769, Cl. 105-422.000.
Tsushima, Rikio: *See—*
Okada, Tomoyuki; Kannen, Naoki; Nishimori, Tadashi; and Tsushima, Rikio, 5,114,793, Cl. 428-425.900.
Tsuyama, Hideo, to Tsubakimoto Chain Co. Silent drive chain. 5,114,384, Cl. 474-212.000.
Tsuzuki, Atsuyuki: *See—*
Isegawa, Yo; Kito, Takeshi; Muryayama, Kimimasa; Ikawa, Shoji; Iwase, Takahiro; Sugiura, Tutomu; and Tsuzuki, Atsuyuki, 5,114,521, Cl. 156-242.000.
Tu, Li-Wei: *See—*
Kopf, Rose F.; O'Bryan, Henry M., Jr.; Schubert, Erdmann F.; Tu, Li-Wei; Wang, Yeong-Her; and Zydzik, George J., 5,115,441, Cl. 372-45.000.
Tuburaya, Kazuyuki: *See—*
Fujii, Kenjiro; Oura, Masao; Tuburaya, Kazuyuki; and Hagura, Shigehisa, 5,115,179, Cl. 318-568.130.
Tucker, Jerome E.; and Dykstra, Henry, to Delaware Capital Formation, Inc. Hydraulic quick change clamp. 5,115,110, Cl. 219-10.670.
Tufts College, Trustees of: *See—*
Walt, David R., 5,114,864, Cl. 436-528.000.
Tunata, Katuhiro: *See—*
Masuda, Hiroshi; and Tunata, Katuhiro, 5,115,174, Cl. 318-254.000.
Tung I Enterprise Co., Ltd.: *See—*
Chen, Chang, 5,114,007, Cl. 206-373.000.
Turk, Sandra L. Portable sleeping unit for children. 5,113,537, Cl. 5-121.000.
Tymco, Inc.: *See—*
Young, Gary B.; Hanel, Albert L.; and Veselka, Kenneth R., 5,113,548, Cl. 15-346.000.
Tyson, Jessie: *See—*
Chaplin, Mitchell E.; Eaton, Geraldine M.; Hickie, Brian A.; Pascavage, Peter W.; and Tyson, Jessie, 5,114,787, Cl. 428-284.000.
Tzeng, Shui-Tan. Tutorial device for observing lunar phase. 5,114,348, Cl. 434-284.000.
Ube Industries, Ltd.: *See—*
Inada, Jun; Sato, Shinichi; Shimizu, Ryoichi; Kitani, Akinobu; and Nakano, Kunio, 5,114,765, Cl. 428-35.700.
Uda, Taizo; Takeyasu, Akira; Kawaguchi, Tetsuo; and Nakajima, Yukio, 5,115,097, Cl. 530-326.000.
Ucar Carbon Technology Corporation: *See—*
Arthur, Mark T.; and Miner, Frank H., Jr., 5,115,184, Cl. 373-74.000.
Bowman, Ben B., 5,115,447, Cl. 373-102.000.
Uchida, Minoru: *See—*
Shirahata, Akira; Uchida, Minoru; Tanaka, Satoshi; and Tsumura, Kenichiro, 5,114,916, Cl. 514-2.000.
Uchikawa, Tadao: *See—*
Myohga, Osamu; and Uchikawa, Tadao, 5,115,161, Cl. 310-323.000.
Uchimura, Hideki: *See—*
Osamura, Kazumi; Terazono, Masaki; Kohsaka, Shoji; Koga, Kazunori; Saito, Akira; Sato, Masahiro; and Uchimura, Hideki, 5,114,889, Cl. 501-97.000.
UCP Gen-Pharma AG: *See—*
Maschler, Reinhard; Steiner, Verena; Grutter, Markus G.; and Raschdorf, Fritz, 5,114,922, Cl. 514-12.000.
Uda, Taizo; Takeyasu, Akira; Kawaguchi, Tetsuo; and Nakajima, Yukio, to Ube Industries, Ltd. Synthetic peptide from the carboxy terminal of human Mn-superoxide dismutase. 5,115,097, Cl. 530-326.000.
Ueda, Atsushi: *See—*
Fukui, Wataru; Iwata, Toshio; Ueda, Atsushi; Matsumura, Masami; and Koiwa, Mitsura, 5,113,821, Cl. 123-335.000.
Ueda, Nobuo; Okita, Tatuo; Suzuki, Mikio; Ikemoto, Yasunori; and Shibao, Hiloyuki, to Laurel Bank Machines Co., Ltd. Coin feeding apparatus for coin handling machine. 5,114,381, Cl. 453-57.000.
Ueno, Shohzo: *See—*
Izumi, Yasuo; Sato, Syoji; Ishimoto, Kazumi; Makino, Yutaka; and Ueno, Shohzo, 5,113,788, Cl. 118-663.000.
Uesugi, Shunyo: *See—*
Wamura, Hiroo; Uesugi, Shunyo; and Hayashi, Takashi, 5,115,052, Cl. 526-87.000.
Uihlen, Thomas; and Schweitzer, Klaus, to MTU Motoren- und Turbinen-Union Muenchen GmbH. Metal structural component having a heat insulating titanium fire inhibiting protective coating. 5,114,797, Cl. 428-553.000.
Ujiie, Souhei; and Suzuki, Tadashi, to Canon Kabushiki Kaisha. Image forming apparatus having a detachable memory. 5,115,273, Cl. 355-209.000.
Ullman, Anders, to Permascand AB. Electrode. 5,114,547, Cl. 204-128.000.
Ullrich, Michael: *See—*
Kemnitz, Peter; Ullrich, Michael; and Wieland, Hanspeter, 5,113,817, Cl. 123-193.600.
Ulrich, Peter C.; and Cerami, Anthony, to Rockefeller University, The; and Alteon Inc. Amino-substituted pyrimidines, derivatives and methods of use therefor. 5,114,943, Cl. 514-256.000.
Ultimate Direction, Inc.: *See—*
Thatcher, G. Bryce, 5,114,059, Cl. 224-209.000.
Umeda, Tsuyoshi, to Seiko Instruments Inc. Gravity compensating mechanism for articulated type industrial robots. 5,115,178, Cl. 318-568.110.
Umehara, Takeshi; Ikeda, Toshio; and Urata, Kazuhisa, to Suruga Seiki Co., Ltd. Apparatus of shrinking volumes of waste foamed plastics. 5,114,331, Cl. 425-200.000.
Umetani, Hiroyuki; Matsumura, Shunichi; and Yamada, Takeyoshi, to Teijin Limited. Epoxy compound, precursor thereof, production processes thereof, use of the precursor and cured product of the epoxy compound. 5,115,074, Cl. 528-98.000.
Umezaki, Hiroshi: *See—*
Takeuchi, Yoshiaki; Yamamoto, Koji; and Umezaki, Hiroshi, 5,114,437, Cl. 51-293.000.
Umezawa, Tomoko: *See—*
Fujiwara, Yoshihito; Umezawa, Tomoko; Nishiguchi, Masayuki; Akune, Makoto; Iwahashi, Naoto; and Akagiri, Kenzo, 5,115,240, Cl. 341-51.000.
Unagami, Shigeyuki: *See—*
Taniguchi, Tomohiko; Iseda, Kohei; Okazaki, Koji; Amano, Fumio; Unagami, Shigeyuki; Tanaka, Yoshinori; and Ohta, Yasuji, 5,115,469, Cl. 381-36.000.
Unger, Peter; and Westberg, Eric, to Omega Medicinteknik AB. Method of washing blood cells and container assembly thereof. 5,114,396, Cl. 494-37.000.
Uni-Charm Corporation: *See—*
Igaue, Takamitsu; Kitaoka, Hideaki; and Tanji, Hiroyuki, 5,114,420, Cl. 604-385.200.
Union Camp Corporation: *See—*
Le Blanc, Joseph V., 5,113,802, Cl. 122-379.000.
Union Carbide Chemicals and Plastics Technology Corporation: *See—*
Abatjoglou, Anthony G.; and Bryant, David R., 5,114,473, Cl. 75-722.000.
King, Stephen W., 5,114,900, Cl. 502-162.000.
Koleske, Joseph V.; Smith, Donald F., Jr.; and Weber, Robert J., Jr., 5,115,025, Cl. 525-162.000.
Richey, Forrest A., Jr.; and Hoy, Kenneth L., 5,115,015, Cl. 524-507.000.
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Dray, James R., 5,114,452, Cl. 62-24.000.
Union Laitiere Normande: *See—*
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Union Oil Company of California, dba UNOCAL: *See—*
Dupin, Richard M., 5,114,276, Cl. 405-224.000.
Uniroyal Chemical Company, Inc.: *See—*
Davis, Robert G.; and Bell, Allyn R., 5,114,464, Cl. 71-92.000.
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Cockayne, Brian; MacEwan, William R.; Harris, Ivor R.; and Smith, Nigel A., 5,114,669, Cl. 420-8.000.
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Hsue, Chen-Chiu; and Huang, Cheng-Han, 5,115,296, Cl. 357-42.000.
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Harris, William H., Jr; Nussbaum, William E.; Armstrong, Michael J.; Deming, Victor H.; and Brink, John E., 5,114,128, Cl. 270-11.000.
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Air Force: *See—*
Able, Edward C.; and Gibler, Martin J., 5,113,660, Cl. 60-752.000.
Soref, Richard A., 5,115,335, Cl. 559-248.000.
Thomas, Daniel D., Jr.; Hadley, Hugh W.; and Len, Joseph J., 5,115,246, Cl. 342-195.000.
Army: *See—*
Amrein, Bruce E.; McCoy, Curtis L.; Brucksch, Robert C.; and Melnik, George, 5,113,779, Cl. 114-270.000.
Behl, Wishvender K.; and Plichta, Edward J., 5,114,805, Cl. 429-112.000.
Branovich, Louis F.; Freeman, Gerard L.; and Eckart, Donald W., 5,114,742, Cl. 427-77.000.
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Savage, Robert O.; Fischer, Robert J.; and Divita, Sam, 5,114,738, Cl. 427-37.000.
Commerce: *See—*
Benz, Samuel P., 5,114,912, Cl. 505-1.000.
Biancaniello, Francis S.; Janowski, Gregg N.; and Ridder, Stephen D., 5,114,470, Cl. 75-338.000.
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Benicewicz, Brian C.; and Hoyt, Andrea E., 5,114,612, Cl. 252-299.010.

Gregory, Danny L.; Hardee, Harry C.; and Smallwood, David O., 5,113,966, Cl. 181 106.000.
Moore, William E., 5,114,690, Cl. 423-244.000.
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Rini, Michael J.; and Towle, David P., 5,113,771, Cl. 110-263.000.
Shi, Donglu, 5,114,909, Cl. 505-1.000.
Stallard, Barry W.; Malowski, Michael A.; and Byers, Jack A., 5,115,482, Cl. 385-28.000.
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Hess, Richard A.; and Blaese, R. Michael, 5,114,973, Cl. 514-557.000.
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White, Jack C.; and Traut, Davis E., 5,113,923, Cl. 164-41.000.

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Baker, Karl W.; and Dustin, Miles O., 5,113,659, Cl. 60-641.800.

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Eklund, Wayne D.; and Kerley, James J., 5,113,714, Cl. 74-471.0XY.

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Cincotta, Manuel; and Nadolink, Richard H., 5,114,104, Cl. 244-219.000.
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Newman, Kirk E.; Gusack, James A.; and Zehmer, John A., III, 5,114,630, Cl. 264-3.100.

U.S. Philips Corp.: *See—*
Callemyn, Jean-Michel, 5,115,507, Cl. 395-725.000.
De Jong, Durk J., 5,115,398, Cl. 364-443.000.
De Lange, Roelof, 5,115,460, Cl. 378-150.000.
Ducourant, Thierry, 5,115,153, Cl. 307-491.000.
Gravesteijn, Dirk J.; Wijn, Josephus M.; and van Liempd, Johannes P. J. G., 5,114,829, Cl. 430-275.000.
Hongoh, Nobuhiko, 5,115,374, Cl. 361-393.000.
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Smolders, Jozef G. H. M.; and Sygall, Peter I., 5,114,308, Cl. 414-799.000.
Somers, Gerardus H. J., 5,115,364, Cl. 360-113.000.
Van Heeswijk, Johannes A. A. M., 5,115,381, Cl. 362-61.000.
Weekamp, Johannes W.; and Pront, Harry W. J., 5,113,566, Cl. 29-25.350.

U.S. Tool & Die, Inc.: *See—*
Ellingson, Frederick J.; and Shaver, P. Kent, 5,114,666, Cl. 376-272.000.

United Technologies Corporation: *See—*
Baird, Donald J.; Rhodes, Brett D.; and Griffin, William W., Jr., 5,114,159, Cl. 277-53.000.
Giersdorf, Rodney L.; Peduzzi, Alfred; Krul, Allan D.; Jones, Stephen R.; and Chetta, Gregory E., 5,114,446, Cl. 55-345.000.
Gillott, Michael A., 5,114,115, Cl. 251-26.000.
Isabelle, Charles J.; Kish, Jules G.; and Stone, Robert A., 5,113,713, Cl. 74-410.000.
Jenkel, Steven D.; MacNitt, Donald G., Jr.; and Walker, Bryant H., 5,113,583, Cl. 29-889.210.
McAuliffe, Christopher; and Dziorny, Paul J., 5,113,670, Cl. 62-402.000.

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Barr, Craig K., 5,114,140, Cl. 472-75.000.

Universal Folding Box, Inc.: *See—*
Warner, David M., 5,114,002, Cl. 206-45.140.

University of Akron, The: *See—*
Harris, Frank W.; and Korleski, Joseph E., 5,115,078, Cl. 528-125.000.

University of Colorado Foundation, Inc., The: *See—*
Ramanan, Srinivasan V.; and Jordan, Harry F., 5,115,428, Cl. 370-68.000.

University of Florida: *See—*
Galardy, Richard E.; Grobelny, Damian; and Schultz, Gregory, 5,114,953, Cl. 514-323.000.
Yost, Richard A.; and Heil, Mark E., 5,114,439, Cl. 55-20.000.

University of Michigan, The Regents of The: *See—*
Wise, Kensall D.; and Chau, Hin-Leung, 5,113,868, Cl. 128-675.000.

University of Minnesota, Regents of the: *See—*
Hu, Wei-Shou; and Goetghebeur, Stephane, 5,114,855, Cl. 435-240.240.

University of North Carolina at Chapel Hill, The: *See—*
Jorgenson, James W.; and Dohmeier, Daniel M., 5,115,131, Cl. 250-288.000.

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Tranjan, Farid M.; DuBois, Thomas D.; Frieser, Rudolf G.; Bobbio, Stephen M.; and Jones, Susan K. S., 5,114,827, Cl. 430-271.000.

University of Texas System Board of Regents: *See—*
Stray-Gundersen, James, 5,114,723, Cl. 426-74.000.

University of Washington, The Board of Regents of the: *See—*
Ahmad, Suhail; Cole, James J.; and Jensen, William, 5,114,580, Cl. 210-646.000.

University of Water of Waterloo: *See—*
Karasek' Francis W.; Naikwadi, Krishnat P.; and Hutzinger, Otto, 5,113,772, Cl. 110-345.000.

Uno, Tomohiro: *See—*
Maruyama, Tadakatsu; Ohno, Yasuhide; Konda, Masashi; Kikuchi, Tosiharu; Suzuki, Yasuhiro; Uno, Tomohiro; Otsuka, Hiroaki; and Tanahashi, Hiroyuki, 5,114,878, Cl. 437-182.000.

Uno, Tomohisa: *See—*
Nakagawa, Yukio; Koizumi, Syoji; Miyake, Masao; Akita, Teruo; and Uno, Tomohisa, 5,114,788, Cl. 428-284.000.

UOP: *See—*
Haun, Edward C.; Thompson, Gregory J.; Gorawara, Jayant K.; and Sullivan, Dana K., 5,114,562, Cl. 208-89.000.
Holmgren, Jennifer S.; Gembicki, Stanley A.; Schoonover, Michael W.; and Kocal, Joseph A., 5,114,895, Cl. 502-84.000.
Lok, Brent M.; Messina, Celeste A.; Patton, Robert L.; Gajek, Richard T.; Cannan, Thomas R.; and Flanigen, Edith M., 5,114,563, Cl. 208-114.000.
Nagji, Moez M.; Holmes, Ervine S.; and Pai, Jenny L., 5,114,689, Cl. 423-230.000.

Uplinger, George B.: *See—*
Bischoff, Ronald E.; Brandon, Mark A.; Caulfield, John J.; Cook, Lawrence G.; and Uplinger, George B., 5,114,018, Cl. 211-41.000.

Ura, Shigeru; Tanaka, Haruo; Takagishi, Hisao; Fukuyama, Hiroko; Fukuyama, Takuya; and Fukuyama, Yuko, to Sumitomo Chemical Co., Ltd. Process for producing resin for paper coating. 5,114,758, Cl. 427-391.000.

Urabe, Itaru: *See—*
Makino, Yasutaka; Negoro, Seiji; Urabe, Itaru; and Okada, Hirosuke, 5,114,853, Cl. 435-190.000.

Urabe, Masanobu: *See—*
Takebe, Katsuhiko; Doi, Mizuho; Takehara, Hiroyasu; Hiyama, Satoshi; and Urabe, Masanobu, 5,115,292, Cl. 357-26.000.

Urano, Akiyoshi; and Sano, Yumiko, to Mita Industrial Co., Ltd. Cyan-colored photosensitive toner containing zinc oxide. 5,114,817, Cl. 430-93.000.

Urano, Fumiyoshi: *See—*
Ishibashi, Shigeki; Nakamura, Kouzaburou; Maruno, Tohru; Nakahata, Masaaki; Negishi, Takaaki; and Urano, Fumiyoshi, 5,114,615, Cl. 252-299.670.

Urata, Kazuhisa: *See—*
Umehara, Takeshi; Ikeda, Toshio; and Urata, Kazuhisa, 5,114,331, Cl. 425-200.000.

Urbach, Hansjorg: *See—*
Ruger, Wolfgang; Urbach, Hansjorg; Becker, Reinhard; and Hock, Franz, 5,114,962, Cl. 514-412.000.

Uren, Jack R., Jr.: *See—*
Wells, John R.; and Uren, Jack R., Jr., 5,113,886, Cl. 134-172.000.

Urmanski, James L.: *See—*
Meli, Vincent A.; Matharani, Michael A.; Brzezinski, Ted A.; Shaft, David L.; and Urmanski, James L., 5,114,307, Cl. 414-793.100.

Usami, Masami: *See—*
Kashiyama, Masamori; Ishii, Koichi; Kawabe, Shun; and Usami, Masami, 5,115,393, Cl. 395-425.000.

Ushida, Susumu: *See—*
Igarashi, Sadao; and Ushida, Susumu, 5,115,317, Cl. 358-191.100.

Ushitora, Akihiro; Yamaguchi, Kazuo; and Asanagi, Tsuneo, to Ebara Corporation. Vacuum type sewage collecting system and vacuum valve controller for the same. 5,114,280, Cl. 406-18.000.

Ushiyama, Shigeyuki, to Fanuc Ltd. Magnetic absolute position encoder with an undulating track. 5,115,239, Cl. 341-15.000.

Usui Kokusai Sangyo Kabushiki Kaisha: *See—*
Usui, Masayoshi; and Serizawa, Haruo, 5,113,653, Cl. 60-299.000.

Usui Kokusai Sangyo Kaisha Ltd.: *See—*
Usui, Masayoshi, 5,114,250, Cl. 285-319.000.

Usui, Masayoshi; and Serizawa, Haruo, to Usui Kokusai Sangyo Kabushiki Kaisha. Exhaust gas cleaning apparatus. 5,113,653, Cl. 60-299.000.

Usui, Masayoshi, to Usui Kokusai Sangyo Kaisha Ltd. Joint for coupling small-diameter pipes. 5,114,250, Cl. 285-319.000.

Uthoff, Loren H., Jr.: *See—*
Leonard, Mark L.; Uthoff, Loren H., Jr.; and Hastings, Jerome K., 5,115,162, Cl. 310-339.000.

Utsunomiya, Akira: *See—*
Kaneko, Tsugio; Kimura, Tsuneo; Ikeda, Michihiro; Utsunomiya, Akira; and Ohno, Yuka, 5,114,881, Cl. 501-12.000.

Uyeda, Alan K. Intermediate door locking mechanism. 5,113,675, Cl. 70-477.000.

V. Kann Rasmussen Industri A/S: *See—*
Christensen, Per B.; and Sonderby, Svend A., 5,113,922, Cl. 160-172.000.

Vaas, Eberhard: *See—*
Hofer, Peter; Hagmann, Peter; Krieg, Gunther; and Vaas, Eberhard, 5,114,628, Cl. 264-1.400.

Vaccar Systems (Proprietary) Limited: *See—*
Morris, Peter, 5,114,050, Cl. 222-192.000.

Vail, Steve: *See—*
Karwoski, Theodore; Herweck, Steve A.; and Vail, Steve, 5,114,416, Cl. 604-321.000.

Vaillant de Guelis, Hubert; and Joly, Jean-Louis, to Aerospatiale Societe Nationale Industrielle. Electric motor with magnetic locking abutment member and heat shield for a space vehicle operated by a motor of this kind. 5,115,158, Cl. 310-15.000.

Vairex Corporation: *See—*
Milburn, Ski; and Barber, Jeffrey, 5,114,321, Cl. 417-467.000.

Valade, Jacques L.: *See—*
Law, Kwei-Nam, 5,114,540, Cl. 162-247.000.

Valeo: *See—*
Feigler, Jacques, 5,113,989, Cl. 192-98.000.

Valeo Thermique Moteur: *See—*
le Gauyer, Philippe, 5,113,930, Cl. 165-78.000.
Potier, Michel, 5,113,934, Cl. 165-173.000.

Van Ketel Hendrik, to Heerema Group Services B.V. Hoisting devices. 5,114,026, Cl. 212-191.000.

Vanaschen, Luc: *See—*
Promper, Hans-Josef; D'Iribarne, Benoit; Kuster, Hans-Werner; Nowoczyn, Hans-Werner; and Vanaschen, Luc, 5,114,454, Cl. 65-163.000.

van Bekkum, Aart J.: *See—*
van Nistelrooij, Petrus N. J.; and van Bekkum, Aart J., 5,113,690, Cl. 73-861.120.

van Boekel, Franciscus A. J.; and van den Brink, Anthonie, to Eurotool B.V. Process for the production of an injection nozzle for use in an injection molding device. 5,113,576, Cl. 29-611.000.

VanBuskirk, Bruce: *See—*
Akkapeddi, Murali K.; VanBuskirk, Bruce; and Kraft, Timothy J., 5,115,018, Cl. 525-64.000.

van Daele, Antoine A., to Roxell, N.V. Adjustable feeding device for poultry. 5,113,797, Cl. 119-53.000.

van den Brink, Anthonie: *See—*
van Boekel, Franciscus A. J.; and van den Brink, Anthonie, 5,113,576, Cl. 29-611.000.

van der Smissen, Carl E., to Dragerwerk Aktiengesellschaft. Impregnation for respirator filters filled with active carbon. 5,113,856, Cl. 128-205.270.

Van de Ven, Henricus J. M.; and de Haan, Erik, to Akzo N.V. Molding made from a foam plastic, and the production thereof. 5,114,784, Cl. 428-246.000.

Van Dyk, Thomas C.: *See—*
Tiramani, Paolo M. B.; and Van Dyk, Thomas C., 5,114,052, Cl. 222-207.000.

Van Epps, James L., II; and Van Epps, Lynn, to Freeland Industries, Inc. Nestable livestock watering tank with removable drinker tray. 5,113,800, Cl. 119-78.000.

Van Epps, Lynn: *See—*
Van Epps, James L., II; and Van Epps, Lynn, 5,113,800, Cl. 119-78.000.

Van Heeswijk, Johannes A. A. M., to U.S. Philips Corporation. Motor vehicle headlamp and reflector body for same. 5,115,381, Cl. 362-61.000.

Van Helden, Arend K.; Gilson, Jean-Pierre; and Syrier, Johannes L. M., to Shell Oil Company. Stabilized copolymer compositions. 5,115,002, Cl. 524-91.000.

Van Kralingen, Cornelis G.; Martens, Rudolf J.; Rerek, Mark E.; Swarthoff, Ton; and Van Vliet, Marten, to Lever Brothers Company, Divison of Conopco, Inc. Bleach activation. 5,114,611, Cl. 252-186.330.

van Liempd, Johannes P. J. G.: *See—*
Gravesteijn, Dirk J.; Wijn, Josephus M.; and van Liempd, Johannes P. J. G., 5,114,829, Cl. 430-275.000.

Van Meyel, Francis: *See—*
Demosthenous, Maria; and Van Meyel, Francis, 5,114,486, Cl. 106-443.000.

van Nistelrooij, Petrus N. J.; and van Bekkum, Aart J., to Krohne AG. Electromagnetic flowmeter. 5,113,690, Cl. 73-861.120.

van Pey, Hans-Theo: *See—*
Nyssen, Peter R.; Berkenhaus, Dirk; and van Pey, Hans-Theo, 5,114,631, Cl. 264-6.000.

Van Vliet, Marten: *See—*
Van Kralingen, Cornelis G.; Martens, Rudolf J.; Rerek, Mark E.; Swarthoff, Ton; and Van Vliet, Marten, 5,114,611, Cl. 252-186.330.

van Vliet, Marten R. P.; and Iburg, Jan E., to Lever Brothers Company, Division of Conopco, Inc. Bleaching composition comprising as a bleaching catalyst a complex of manganese with a non-carboxylate polyhydroxy ligand. 5,114,606, Cl. 252-103.000.

Varney, Albert R., Jr., to General Electric Company. Freezing items for display in electronic watthour register. 5,115,190, Cl. 324-142.000.

Vartan, Robert R., to Beecham Group p.l.c. Pharmaceutical formulation. 5,114,929, Cl. 514-29.000.

Vaudaine, Marie-Helene: *See—*
Fedeli, Jean-Marc; Moriceau, Hubert; Muffato, Viviane; and Vaudaine, Marie-Helene, 5,113,575, Cl. 29-603.000.

Vaughan, David T.: *See—*
Samaras, William A.; Vaughan, David T.; and Ingraham, Andrew D., 5,115,455, Cl. 375-106.000.

Vayda, Mark. Timed cycle single stop shopping facility. 5,113,974, Cl. 186-36.000.

Vecht, Jacob J.: *See—*
Greenfield, Ephraim; and Vecht, Jacob J., 5,114,228, Cl. 356-222.000.

Vector Related Physics (Consultants) Ltd.: *See—*
Fuchs, Herbert K., 5,114,372, Cl. 445-3.000.

Velazquez, Diosie: *See—*
Kraus, Menahem; Velazquez, Diosie; and Wang, Chan-Hong, 5,114,585, Cl. 210-490.000.

Venkatachalam, K. L.: *See—*
Gehlbach, Steve M.; and Venkatachalam, K. L., 5,115,416, Cl. 367-138.000.

Ventures Unlimited, Inc.: *See—*
Sweeten, Theodore P., 5,113,836, Cl. 123-573.000.

Verduyn, Hendrik A., to Seac International B.V. Spraying system for treating a flue gas. 5,114,075, Cl. 239-135.000.

Verita, Livio: *See—*
Kagan, Rubin; Kagan, Michel; Kagan, Jean; and Verita, Livio, 5,114,883, Cl. 501-32.000.

Verkhorubov, Lev S.: *See—*
Bordunov, Vladimir V.; Karmadonov, Leonid N.; Ospischev, Jury M.; Fedjunin, Vladimir A.; Zhuravkov, Sergei P.; Cherepenko, Evgeny A.; Sviridov, Anatoly B.; Verkhorubov, Lev S.; Mikhailov, Arkady T.; Bakhmutov, Jury L.; and Shaidurov, Valery S., 5,114,496, Cl. 134-13.000.

Verney, Claude; and Strassle, Alex, to Intercollection Development S.A. Chair with adjustable arm rest. 5,114,212, Cl. 297-421.000.

Verreet, Roland, to Drahtseilwerk Saar GmbH. Swivel for use in cranes and the like. 5,114,025, Cl. 212-147.000.

Vesala, Reijo: *See—*
Haavik, Harold; Peroaho, Tapio; Vesala, Reijo; and Vikman, Vesa, 5,114,310, Cl. 415-169.100.

Veselka, Kenneth R.: *See—*
Young, Gary B.; Hanel, Albert L.; and Veselka, Kenneth R., 5,113,548, Cl. 15-346.000.

Vetter, Manfred. Inflatable cushion for sealing off leaks in containers and pipes. 5,113,912, Cl. 138-99.000.

Vettorato, Natale, to B.L. Macchine Automatiche S.r.l. Method and apparatus for manufacturing sacks, and sacks obtained thereby. 5,114,393, Cl. 493-193.000.

Videor Technical E. Hartig GmbH: *See—*
Bernhardt, Rainer; and Waldschmitt, Reiner, 5,115,263, Cl. 354-81.000.

Viera, Fernando M.: *See—*
Jahrmarkt, Scott L.; Viera, Fernando M.; and Box, J. William, 5,113,872, Cl. 128-772.000.

Vijayakumar, Erra K. S.: *See—*
Franco, Christopher M.; Vijayakumar, Erra K. S.; Chatterjee, Sugata; Ganguli, Bimal N.; Blumbach, Jurgen; Kogler, Herbert; and Fehlhaber, Hans-Wolfram, 5,114,967, Cl. 514-475.000.

Vikman, Vesa: *See—*
Haavik, Harold; Peroaho, Tapio; Vesala, Reijo; and Vikman, Vesa, 5,114,310, Cl. 415-169.100.

Viljanto, Jouko; Govenius, Rainer; Lonnqvist, Kurt; and Hurula, Timo. Device for the determination of incisional wound healing ability. 5,113,871, Cl. 128-768.000.

Villarreal, Jose R. Applicator brush assembly. 5,114,255, Cl. 401-45.000.

Villiano, Mark J. Detachable handle for paint roller pan. 5,113,549, Cl. 96-114.00R.

Vincent, Michael T., to Chrysler Corporation. Programmed spark scatter for idle speed control. 5,113,827, Cl. 123-417.000.

Violet, Roy L. Adjustable roofing jack. 5,113,971, Cl. 182-45.000.

Viramontes-Brown, Ricardo: *See—*
Elizondo-Gonzalez, Cesar; Juarez-Mata, Virgilio; Viramontes-Brown, Ricardo; Quintero-Flores, Raul; and Roesch-Dietlen, Juan-Jorge, 5,113,890, Cl. 137-13.000.

Virkus, Mark K.: *See—*
Jeanblanc, Ivan M.; Hutchison, Stephen E.; Virkus, Mark K.; and Johnsen, Ronald J., 5,115,493, Cl. 395-117.000.

Visca, Mario; Boero, Giancarlo; and Lenti, Daria, to Ausimont S.p.A. Composite material based on a polymer matrix comprising fluoroelastomers or fluoroplastomer. 5,115,026, Cl. 525-199.000.

Visnyouszky, Louis; and Bay, Adam G., to Gould Inc. Gravity operated automatic hook. 5,114,200, Cl. 294-81.560.

Vital Records Inc: *See—*
Meissner, Ernest H., 5,114,024, Cl. 211-175.000.

Vits, Dieter: *See—*
Hauers, Manfred; and Vits, Dieter, 5,113,645, Cl. 57-269.000.

Vives, Michel; Taveau, Pierre; Etienne, Jacques; Remillieux, Yves; and Charbonnel, Lucien, to Societe Europeenne De Propulsion. Protective material having a multilayer ceramic structure. 5,114,772, Cl. 428-49.000.

Vo, Lanchi P.: *See—*
Mercer, Frank W.; Goodman, Timothy D.; Lau, Aldrich N. K.; Vo, Lanchi P.; and Sovish, Richard C., 5,114,780, Cl. 428-195.000.

Vogel, Monty D. Storable wheeled cargo carrier. 5,114,165, Cl. 280-47.331.

Vogel, Wayne A.: *See—*
Windemuller, Donald; and Vogel, Wayne A., 5,113,644, Cl. 56-330.000.

Vogelbusch GmbH: *See—*
Sarhaddar, Schahroch, 5,114,491, Cl. 127-38.000.

Vogt Electronic AG: *See—*
Hartmann, Uwe; Mai, Udo; and Schichl, Roman, 5,113,839, Cl. 123-606.000.

Vohora, Ashni K. Support apparatus. 5,114,110, Cl. 248-444.000.

Volz, William E.: *See—*
Zimmermann, Eugene K.; Wagner, Bernhard; Volz, William E.; Harclerode, William H.; Wiman, John V.; and Voss, John C., 5,115,066, Cl. 526-346.000.

von Borstel, Michael; Prokop, Heinz-Jurgen; and Wollerman-Windgasse, Reinhard, to Trumpf Lasertechnik GmbH. Device for a power laser. 5,115,446, Cl. 372-93.000.

Vorus, William S., to 501 Michigan Wheel Corp. Base vented subcavitating marine propeller. 5,114,313, Cl. 416-93.00A.

Voss, Hartwig; and Bruecken, Thomas, to BASF Aktiengesellschaft. Removal of acid from cathodic electrocoating baths by electrodialysis. 5,114,554, Cl. 204-182.400

Voss, John C.: *See*—
Harclerode, William H.; Knutsen, John C.; Pekich, Barry J.; Wiman, John V.; and Voss, John C., 5,114,640, Cl. 264-53.000.
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Gaisser, Hermann, 5,114,777, Cl. 428-137.000.

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Morland, Albert H.; and Warren, Timothy J., 5,114,629, Cl. 264-2.200.

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Taguchi, Hiroshi; Washizaki, Youji; Igarashi, Akira; and Nakano, Hiroyoshi, 5,114,526, Cl. 156-361.000.

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Kirchhoff, Johannes; and Klossek, Hans, 5,114,303, Cl. 414-786.000.

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Pier, James M.; and Starr, Gary E., 5,114,571, Cl. 210-96.100.

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Kamian, George D., 5,113,789, Cl. 118-715.000.

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Marx, Edward J.; and Watkins, Michael J., 5,115,019, Cl. 525-65.000.

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Rua, Louis, Jr.; and Schaab, Carl, 5,114,735, Cl. 427-7.000.

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Siegmund, Werner, deceased; Kamereit, Wilhelm; Schmitt, Oskar M.; Weidmann, Volker; and Friedrich, Otto J., 5,114,475, Cl. 106-13.000.

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Tsuchiya, Paul F.; Kirkman, W. Worth; and Weidner, John F., 5,115,495, Cl. 395-200.000.

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Evangelista, Michael L.; and Lia, Raymond A., 5,114,636, Cl. 264-40.100.

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McWilliams, William H.; Hamermesh, Charles L.; and Welch, Evan B., 5,114,792, Cl. 428-422.000.

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Myers, Bruce B., 5,114,358, Cl. 439-266.000.

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Oglesby, Donald M.; and Wells, George E., IV, 5,114,698, Cl. 423-515.000.

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Kraus, Greg A.; Simmons, William R.; and Wells, Mark R. J., 5,113,804, Cl. 123-1.00A.

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Hoffarth, Joseph G.; Lazzarini, Donald J.; Welsh, John A.; and Wiley, John P., 5,114,518, Cl. 156-212.000.

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Hartnett, Joseph F.; and Wendt, Richard E., 5,114,281, Cl. 406-39.000.

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Huber, Gordon R.; Wenger, LaVon G.; Hauck, Bobbie W.; Rokey, Galen J.; Schmelzle, Lawrence E.; and Hartter, Timothy R., 5,114,488, Cl. 127-1.000.

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Unger, Peter; and Westberg, Eric, 5,114,396, Cl. 494-37.000.

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Hull, Richard W.; and O'Shaughnessy, Timothy G., 5,115,151, Cl. 307-355.000.

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Sich, Gary M., 5,113,694, Cl. 73-121.000.

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Martin, James A.; and Braytenbah, Andrew S., 5,113,691, Cl. 73-116.000.
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Huffman, Todd H., 5,114,626, Cl. 264-80.000.

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Belville, David L.; Wetherilt, Donald E.; and Wimmers, James E., 5,114,731, Cl. 426-595.000.

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Walshe, Brendan J.; and Wexler, Guenter C., 5,114,039, Cl. 221-171.000.

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Ben-Bassat, Arie; Coddington, Kent D.; and Johnson, Donald C., 5,114,849, Cl. 435-101.000

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Weymans, Gunther: *See—*
Reuter, Knud; Jilge, Wolfgang; Pittel, Bernd; and Weymans, Gunther, 5,115,076, Cl. 528-125.000.

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Peterson, Edwin R.; and Wheeler, Edwin L., 5,114,091, Cl. 242-107.110.

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Pastryk, Jim J.; and Farrington, Sheryl L., 5,113,542, Cl. 8-158.000.

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Brennan, David J.; White, Jerry E.; Haag, Anthony P.; and Kram, Shari L., 5,115,075, Cl. 528-99.000.

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Gsell, Rainer; and White, Philip, 5,114,775, Cl. 428-107.000.

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Erwin, Lewis; Crandell, Keith; and Whitney, Justin, 5,114,907, Cl. 505-1.000.

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Crawford, Ferdon H.; Shakour, Gabriel R.; Whitson, Robert C.; and Wise, Ernest R., 5,114,678, Cl. 422-99.000.

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Debons, Francis E.; Pedersen, Larry D.; and Whittington, Lawrence E., 5,114,599, Cl. 252-8.554.

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Levinski, Charles B.; Persel, John M.; and Widmann, David N., 5,115,234, Cl. 340-825.310.

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Fischer, Ulf; Schneider, Fernand; and Widmer, Ulrich, 5,114,934, Cl. 514-212.000.

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Kemnitz, Peter; Ullrich, Michael; and Wieland, Hanspeter, 5,113,817, Cl. 123-193.600.

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Radosav, Jon J.; Evans, Thomas A.; Dudek, David M.; Wieser, Russell G.; Atwater, Brian J.; and Eisbrenner, Robert J., 5,114,163, Cl. 277-81.00S

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Ammon, Ernst; and Langsch, Robert, 5,114,523, Cl. 156-294.000.

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Gabriel, Jochen; Bechtold, Herbert; Hambrecht, Gerhard; and Nothdurft, Klaus, 5,114,406, Cl. 604-136.000.

Wilhelm, Ludwig; and Schmidt, Hans, to Georg Fischer AG. Arrangement and method for introducing waste material into a molten slag. 5,114,474, Cl. 75-751.000.

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Stricklen, Phil M.; Mueller, Francis X., Jr.; Willcox, Kenneth W.; and Snow, Joyce K., 5,115,054, Cl. 526-159.000.

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Coufal, Hans J.; and Williams, Mason L., III, 5,114,913, Cl. 505-1.000.

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Smetana, David A.; and Williams, R. Steve, 5,114,617, Cl. 252-378.00P.

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Williamson, James T.; and Carter, Michael A. Rapid cooling apparatus for an injection molding machine. 5,114,327, Cl. 425-139.000.

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Frysz, Christine A.; and Brown, W. Richard, 5,114,810, Cl. 429-194.000.

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Grace, Martin I.; and Simmons, Richard E., 5,115,209, Cl. 331-49.000.

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Harclerode, William H.; Knutsen, John C.; Pekich, Barry J.; Wiman, John V.; and Voss, John C., 5,114,640, Cl. 264-53.000.
Zimmermann, Eugene K.; Wagner, Bernhard; Volz, William E.; Harclerode, William H.; Wiman, John V.; and Voss, John C., 5,115,066, Cl. 526-346.000.

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Belville, David L.; Wetherilt, Donald E.; and Wimmers, James E., 5,114,731, Cl. 426-595.000.

Windemuller, Donald; and Vogel, Wayne A. Blueberry picking machine. 5,113,644, Cl. 56-330.000.

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Kou, Sindo, 5,114,528, Cl. 156-616.100.
Mosher, Deane F.; and Asakura, Shinji, 5,114,413, Cl. 604-266.000.

Wise, Ernest R.: *See—*
Crawford, Ferdon H.; Shakour, Gabriel R.; Whitson, Robert C.; and Wise, Ernest R., 5,114,678, Cl. 422-99.000.

Wise, Kensall D.; and Chau, Hin-Leung, to University of Michigan, The Regents of The. Ultraminiature pressure sensor with addressable read-out circuit. 5,113,868, Cl. 128-675.000.

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Babich, Edward D.; Gelorme, Jeffrey D.; Hatzakis, Michael; Shaw, Jane M.; Stewart, Kevin J.; and Witman, David F., 5,115,095, Cl. 525-474.000.

Witt, Paul R., to Grain Processing corporation. Filter material. 5,114,894, Cl. 502-62.000.

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Muller, Heinrich; and Wobbe, Jens-Peter, 5,114,116, Cl. 251-129.150.

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Hiltebrandt, Siegfried; and Wolf, Johann, 5,113,846, Cl. 128-20.000.

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Wolfbauer, Michael H., III, to Savair Inc. Load measuring apparatus. 5,113,710, Cl. 73-862.540.

Wolfbeis, Otto S.: *See—*
Leiner, Marco J.; Weiss, Leonie; and Wolfbeis, Otto S., 5,114,676, Cl. 422-82.060.

Wolfe, Ronald A.: *See—*
Oswalt, Philip D.; and Wolfe, Ronald A., 5,113,931, Cl. 165-78.000.

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Kindt-Larsen, Ture; Wolff, Per; and Morris, Michael, 5,114,240, Cl. 366-129.000.

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Kindt-Larsen, Ture; Wolff, Per; and Morris, Michael, 5,114,240, Cl. 366-129.000.

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von Borstel, Michael; Prokop, Heinz-Jurgen; and Wollerman-Windgasse, Reinhard, 5,115,446, Cl. 372-93.000.

Wolter, Albrecht: *See—*
Strasser, Siegfried; Goeddecke, Franz; and Wolter, Albrecht, 5,114,131, Cl. 241-19.000.

Wong, Chun S., to Du Pont Canada Inc. Coextrudable adhesives. 5,115,033, Cl. 525-285.000.

Wong, Jeffrey T.: *See—*
Wu, Xiang-Fu; and Wong, Jeffrey T., 5,115,100, Cl. 530-385.000.

Wong, Melvin F.: *See—*
Bloom, James W.; Wong, Melvin F.; and Mitra, Gautam, 5,115,101, Cl. 530-388.250.

Wong, Pui K., to Shell Oil Company. Cured bisphenol ether products. 5,115,079, Cl. 528-171.000.

Woodline Manufacturing, Inc.: *See—*
Hanson, Ronald A., 5,113,632, Cl. 52-385.000.

Woodward, Donald W.: *See—*
Agrawal, Rakesh; and Woodward, Donald W., 5,114,449, Cl. 62-22.000.

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Wen, Cheng P.; Mendolia, Gregory S.; Siracusa, Mario; Maieron, Joseph J.; Higdon, William D.; Wooldridge, John J.; and Gulick, Jon, 5,115,245, Cl. 342-175.000.

Workman, David E., to Samsonite Corporation. Frame for soft luggage case. 5,113,983, Cl. 190-127.000.

Worth, John N., to W. R. Grace & Co.-Conn. A reinforced tubular seal. 5,114,055, Cl. 222-542.000.

Wovenwire Corporation: *See—*
Shahinpoor, Mohsen; and Smith, Bradford L., 5,114,300, Cl. 414-729.000.

WPM, Inc.: *See—*
Barhydt, Dirck, Sr., 5,114,072, Cl. 239-428.500.

Wright, Anthony R.: *See—*
Holroyd, Eric; and Wright, Anthony R., 5,114,512, Cl. 156-135.000.

Wright, John O., to GTE Products Corporation. Hermetically sealed chip carrier with ultra violet transparent cover. 5,115,299, Cl. 357-72.000.

Wright, John T. Method of forming a lightweight structural panel. 5,114,510, Cl. 156-82.000.

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Mushinski, Roger J.; Lewis, Charles E.; and Casey, Lawrence J., 5,114,012, Cl. 206-523.000.

Wu, Gaoming: *See—*
St. Pierre, Leon E.; Brown, George R.; Wu, Gaoming; and Yu, Youlu, 5,114,709, Cl. 424-78.120.

Wu, Paul S.: *See—*
Jwo, Chin-Hung; and Wu, Paul S., 5,115,122, Cl. 235-467.000.

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Wujcik, Steven E.: *See—*
Gagnon, Steven D.; Grace, Oscar M.; Smiecinski, Theodore M.; and Wujcik, Steven E., 5,114,988, Cl. 521-167.000.

Wulff, Claus: *See—*
Nielinger, Werner; Idel, Karsten-Josef; Westeppe, Uwe; Freitag, Dieter; Wulff, Claus; and Heinz, Hans-Detlef, 5,115,050, Cl. 525-537.000.

Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jurgen; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, to Metallgesellschaft AG; Kolbenschmidt; and Jean Hiedemann GmbH & Co. KG. Apparatus for manufacturing diaphragms. 5,114,326, Cl. 425-79.000.

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Rohulich, Alan S.; and Wunderlich, Ronnie A., 5,115,143, Cl. 307-571.000.

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Krauss, Werner; Wurster, Helmut; and Belikan, Thomas, 5,113,848, Cl. 128-24.0EL.

Wylde, Stephen J. Lens location block. 5,114,221, Cl. 351-177.000.

Wyss, John R. Tractor and trailer combination air cushioned vehicle. 5,113,961, Cl. 180-116.000.

Xerox Corporation: *See—*
Evangelista, Donato D.; and Coleman, John F., 5,114,135, Cl. 271-187.000.
Georges, Michael K.; and Alexandru, Lupu, 5,114,820, Cl. 430-109.000.
Griffiths, Clifford H.; Brach, Paul J.; Williams, Edward C.; Gaither, Ronald A.; and Leenhouts, Timothy J., 5,114,736, Cl. 427-30.000.
Haack, John L., 5,114,821, Cl. 430-110.000.
Mort, Joseph; and Machonkin, Mary A., 5,114,477, Cl. 106-20.000.
Ong, Beng S.; Sacripante, Guerino; Kmiecik-Lawrynowicz, Grazyna; and McAneney, T. Brian, 5,114,819, Cl. 430-106.600.
Paoli, Thomas L.; and Epler, John E., 5,114,877, Cl. 437-129.000.
Tan, Hock S.; Ng, Tie H.; and Mahabadi, Hadi K., 5,114,824, Cl. 430-137.000.
Yu, Robert C. U., 5,114,818, Cl. 430-97.000.

Yabumoto, Junsuke: *See—*
Yano, Hisashi; Yabumoto, Junsuke; and Kuwavara, Ryuzi, 5,114,575, Cl. 210-188.000.

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Yagi, Akiharu: *See—*
Harada, Tamotsu; Kumagai, Gen; Yanagida, Kiyoshi; Yaguchi, Katsuhiko; Fujioka, Nagaki; Yagi, Akiharu; Yanoguchi, Koji; and Kodaira, Satoru, 5,115,362, Cl. 360-92.000.

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Yagi, Kazuo: *See—*
Honda, Narimichi; and Yagi, Kazuo, 5,113,880, Cl. 132-321.000.

Yagi, Tadashi: *See—*
Ohtsuka, Masahito; Kobayashi, Hiroo; Moritani, Toshifumi; Yagi, Tadashi; Tsuchiya, Yoshiro; Azeta, Takahiro; Waragai, Tsuyoshi; Yukimachi, Hiroshi; and Miyake, Hiroaki, 5,115,281, Cl. 355-319.000.

Yaguchi, Katsuhiko: *See—*
Harada, Tamotsu; Kumagai, Gen; Yanagida, Kiyoshi; Yaguchi, Katsuhiko; Fujioka, Nagaki; Yagi, Akiharu; Yanoguchi, Koji; and Kodaira, Satoru, 5,115,362, Cl. 360-92.000.

Yako, Naoto: *See—*
Matsuo, Shigeru; Murakami, Shigeru; Chino, Shinji; and Yako, Naoto, 5,115,077, Cl. 528-125.000.

Yale University: *See—*
Gawin, Frank H.; Humblestone, Brian G.; and Allen, David F. 5,114,942, Cl. 514-255.000.

Yamada, Hiroyuki: *See—*
Okuno, Sumio; Takeichi, Michifumi; Ohmura, Keiji; Okazaki, Msato; Tsuruda, Hitoshi; Yamada, Hiroyuki; Hattori, Morishige; and Kimura, Kenji, 5,113,769, Cl. 105-422.000.

Yamada, Kazuhiro: *See—*
Kuroda, Takashi; Yamada, Kazuhiro; Ishibashi, Tadao; Hayashida, Suetou; Kimura, Kyoichiro; and Sameshima, Masaru, 5,114,638, Cl. 264-41.000.

Yamada, Shigenobu: *See—*
Nakagawa, Seiichi; Muruyama, Yoshiharu; Shiota, Masanori; Ishida, Kando; Fujita, Masayoshi; and Yamada, Shigenobu, 5,113,944, Cl. 169-13.000.

Yamada, Sumito, to Fuji Photo Film Co., Ltd. Process for preparing silver halide emulsion and silver halide X-ray photographic material containing said emulsion. 5,114,838, Cl. 430-569.000.

Yamada, Syozo: *See—*
Ikebuchi, Iwao; Ihara, Yoshitaka; Takei, Hisashi; Yamada, Syozo; Nakazo, Mamoru; and Ganse, Akira, 5,114,083, Cl. 241-153.000.

Yamada, Takashi: *See—*
Nimura, Mitsuhiro; Yokoyama, Shoji; Yamada, Takashi; Sumiya, Koji; and Moroto, Shuzo, 5,115,399, Cl. 364-449.000.

Yamada, Takeyoshi: *See—*
Umetani, Hiroyuki; Matsumura, Shunichi; and Yamada, Takeyoshi, 5,115,074, Cl. 528-98.000.

Yamagishi, Makoto; Fujihira, Masao; Azami, Kazuo; and Shinohara, Ikuo, to Sony Corporation. Transducer having two ducts. 5,115,473, Cl. 381-154.000.

Yamagishi, Takashi, to Kabushiki Kaisha Toshiba. Fault detecting system for duplexing type local area networks. 5,115,199, Cl. 324-533.000.

Yamaguchi, Harumi; Higuchi, Takeshi; and Fukuda, Kenji, to Nippon Magnetics USA, Inc. Crushing machine. 5,114,084, Cl. 241-178.000.

Yamaguchi, Kazuo: *See—*
Ushitora, Akihiro; Yamaguchi, Kazuo; and Asanagi, Tsuneo, 5,114,280, Cl. 406-18.000.

Yamaguchi, Masahiko: *See—*
Ikarashi, Masami; Mitsumori, Kenichi; Kano, Mitsuru; Miki, Yasuhiro; Akimoto, Takemi; Yamaguchi, Masahiko; Sasaki, Yorihiko; Kamigaki, Tomoo; Nakanowatari, Jun; Kato, Yoshinori; and Seki, Hitoshi, 5,115,329, Cl. 359-50.000.

Yamaguchi, Minori: *See—*
Hayashi, Katsuhiko; Yamaguchi, Minori; and Nakayama, Takehisa, 5,115,123, Cl. 250-208.100.

Yamaguchi, Tetsuo; Matsushita, Hiroomi; and Niwa, Kunio, to Sumitomo Rubber Industries, Ltd. Tennis racket frame. 5,114,145, Cl. 273-73.00F.

Yamaha Corporation: *See—*
Akiyama, Hiroo; and Tamada, Kazuhiro, 5,115,419, Cl. 369-37.000.
Higashi, Iwao, 5,113,743, Cl. 84-622.000.
Tanaka, So; Hirakata, Takashi; Kawasaki, Shingo; Nakata, Takuya; Makita, Hitoshi; and Kozuki, Koichi, 5,113,744, Cl. 84-634.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Kobayashi, Manabu, 5,113,807, Cl. 123-41.740.
Kobayashi, Noboru, 5,113,777, Cl. 114-144.00R.
Motoyama, Yu, 5,113,829, Cl. 123-431.000.
Sawai, Seiji, 5,114,176, Cl. 280-691.000.

Yamakawa, Osamu: *See—*
Sugiyama, Takashi; Yamakawa, Osamu; and Sumiya, Akira, 5,114,882, Cl. 501-17.000.

Yamamoto, Akira: *See—*
Maruta, Hidekazu; Adachi, Hiroyuki; Yamamoto, Akira; Kimura, Shigeo; and Kusaka, Kensaku, 5,115,278, Cl. 355-285.000.

Yamamoto, Hiroaki: *See—*
Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,114,383, Cl. 474-18.000.

Yamamoto, Koji: *See—*
Takeuchi, Yoshiaki; Yamamoto, Koji; and Umezaki, Hiroshi, 5,114,437, Cl. 51-293.000.

Yamamoto, Susumu; Murai, Teruyuki; Kawabe, Nozomu; and Tobioka, Massaki, to Sumitomo Electric Industries, Ltd. Method for producing an elongated sintered article. 5,114,641, Cl. 264-60.000.

Yamamoto, Yuuri; and Makimoto, Mitsuo, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for radio communication with improved automatic frequency control. 5,115,515, Cl. 455-71.000.
Yamanishi, Toru; Kakuta, Tatsuya; and Mori, Akinori, to Sumitomo Electric Industries, Ltd. Insulated conductor and method of producing the same. 5,115,103, Cl. 174-24.000.
Yamashita, Noboru; Sugiura, Kenji; Shimomaki, Kazunori; and Takanishi, Toshiaki, to Suzuki Motor Corporation. Synthetic resin bumper. 5,114,198, Cl. 293-120.000.
Yamashita, Tsukasa: *See*—
Hosokawa, Hayami; and Yamashita, Tsukasa, 5,114,513, Cl. 156-150.000.
Yamashita, Yoshinori: *See*—
Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,114,383, Cl. 474-18.000.
Yamato, Ikuo: *See*—
Shirahama, Hidefumi; Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; Iwanaka, Mitsufumi; Nagano, Takeshi; and Ishida, Youuji, 5,115,386, Cl. 363-41.000.
Yamauchi, Kiyotaka: *See*—
Yoshizawa, Yoshihito; and Yamauchi, Kiyotaka, 5,114,503, Cl. 148-304.000.
Yamauchi, Kosaku, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Front and rear wheel drive motorcycle. 5,113,964, Cl. 180-224.000.
Yamazaki, Masayuki: *See*—
Takado, Yutaka; Yamazaki, Masayuki; Mikami, Takashi; and Tomiyama, Tetsuo, 5,114,522, Cl. 156-245.000.
Yamazaki, Masuo, to Canon Kabushiki Kaisha. Heat fixing method. 5,114,337, Cl. 432-8.000.
Yamazaki, Motohide: *See*—
Inoue, Kaname; Yamazaki, Motohide; and Armentrout, Richard W., 5,114,846, Cl. 435-34.000.
Yammin, Mark, legal representative: *See*—
Kornecki, Julian; and Armstrong, Charles J., deceased, 5,114,213, Cl. 299-81.000.
Yanagida, Kiyoshi: *See*—
Harada, Tamotsu; Kumagai, Gen; Yanagida, Kiyoshi; Yaguchi, Katsuhiko; Fujioka, Nagaki; Yagi, Akiharu; Yanoguchi, Koji; and Kodaira, Satoru, 5,115,362, Cl. 360-92.000.
Yanagida, Shingo; and Tsunoda, Tetsujiro, to Kabushiki Kaisha Toshiba. High-power semiconductor device. 5,115,300, Cl. 357-75.000.
Yanai, Akio; and Yasunaga, Tadashi, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 5,114,778, Cl. 428-141.000.
Yang, Jialin: *See*—
Remboski, Donald J.; Plec, Steven L.; Yang, Jialin; and Law, Robert W., 5,113,828, Cl. 123-425.000.
Yang, Long: *See*—
Sudbo, Aasmund S.; Tsang, Won-Tien; and Yang, Long, 5,115,294, Cl. 357-30.000.
Yano, Hisashi; Yabumoto, Junsuke; and Kuwavara, Ryuzi, to Mitsubishi Oil Co., Ltd. Oil filter 5,114,575, Cl. 210-188.000.
Yano, Mitsuo: *See*—
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Nishikibe, Masaru; Ihara, Masaki; and Yano, Mitsuo, 5,114,918, Cl. 514-11.000.
Yano, Mitsuru; and Yoshihara, Yasusro, to Hitachi Metals, Ltd.; and Nishinihon Kogyo Co., Ltd. Gear tester. 5,113,704, Cl. 73-162.000.
Yanoguchi, Koji: *See*—
Harada, Tamotsu; Kumagai, Gen; Yanagida, Kiyoshi; Yaguchi, Katsuhiko; Fujioka, Nagaki; Yagi, Akiharu; Yanoguchi, Koji; and Kodaira, Satoru, 5,115,362, Cl. 360-92.000.
Yashiro, Teruo; Kanazawa, Seizaburo; Nakano, Akira; Murata, Masahide; and Imai, Masafumi, to Tonen Corporation. Process for the production of a catalytic component for the polymerization of olefins. 5,114,896, Cl. 502-111.000.
Yasue, Tsutomu, to Tsudakoma Kogyo Kabushiki Kaisha. Metal working vise. 5,114,126, Cl. 269-32.000.
Yasunaga, Masahiro, to Kabushiki Kaisha Sakura Kurepasu. Cap with air passage. 5,114,258, Cl. 401-202.000.
Yasunaga, Tadashi: *See*—
Yanai, Akio; and Yasunaga, Tadashi, 5,114,778, Cl. 428-141.000.
Yates, John G.: *See*—
Wachi, Shun; and Yates, John G., 5,113,598, Cl. 34-57.00A.
Yates, Jonn B., III; Brown, Sterling B.; Lowry, Richard C.; Blubaugh, James C.; and Aycock, David F., to General Electric Company. Process for functionalizing polyphenylene ether with substituted chlorotriazine. 5,115,043, Cl. 525-390.000.
Yatsuda, Yuji; Hagiwara, Takaaki; Kondo, Ryuji; Minami, Shinichi; and Itoh, Yokichi, to Hitachi, Ltd. Method for manufacturing field effect transistors. 5,114,870, Cl. 437-40.000.
Yazaki Corporation: *See*—
Ogawa, Kikuo; and Arai, Kazuya, 5,115,108, Cl. 200-1.00B.
Yazu, Shuji: *See*—
Higaki, Kenjiro; Harada, Keizo; Fujimori, Naoji; Itozaki, Hideo; and Yazu, Shuji, 5,114,906, Cl. 505-1.000.
Yeda Research and Development Co. Ltd.: *See*—
Cohen, Irun R.; Shinitzky, Meir; and Edelson, Richard L., 5,114,721, Cl. 424-534.000.
Cohen, Irun R.; Elias, Dana; and Markovits, Doron, 5,114,844, Cl. 435-7.210.
Yeh, Charles S.: *See*—
Jones, Lloyd G.; and Yeh, Charles S., 5,113,935, Cl. 166-51.000.
Yin, Nanying: *See*—
Hluchyj, Michael G.; and Yin, Nanying, 5,115,429, Cl. 370-84.000.
Yokoi, Koichi: *See*—
Nakamura, Susumu; and Yokoi, Koichi, 5,114,329, Cl. 425-190.000.
Yokota, Hajime: *See*—
Terayama, Takao; Yokota, Hajime; Sakai, Kazuo; and Kaku, Nobuyuki, 5,115,361, Cl. 360-85.000.
Yokoyama, Minoru: *See*—
Kobayashi, Makoto; Yoshida, Takehiro; Wada, Satoshi; Terajima, Hisao; Ono, Takeshi; Yokoyama, Minoru; Awai, Takashi; Tomoda, Akihiro; and Ishida, Yasushi, 5,115,255, Cl. 346-76.0PH.
Yokoyama, Shoji: *See*—
Nimura, Mitsuhiro; Yokoyama, Shoji; Yamada, Takashi; Sumiya, Koji; and Moroto, Shuzo, 5,115,399, Cl. 364-449.000.
Yokoyama, Tatsuro: *See*—
Katakami, Tsutomu; Yokoyama, Tatsuro; Mori, Haruki; Kawauchi, Nobuya; Kamiya, Joji; and Ishii, Masaaki, 5,114,941, Cl. 514-253.000.
Yokoyama, Tetsuo: *See*—
Maeda, Akira; Kasama, Takashi; Yokoyama, Tetsuo; and Nishimura, Hiroshi, 5,113,865, Cl. 128-653.200.
Yokoyama, Toshio: *See*—
Hamanaka, Izumi; Maekawa, Yoshikazu; Arai, Hiroyuki; Nishiki, Akihiko; Muramatsu, Takeshi; Yokoyama, Toshio; and Yukizane, Shigemi, 5,114,130, Cl. 270-53.000.
Yoneda, Akiyoshi; Sawamura, Mitsuyoshi; Tanaka, Kikuo; and Kokado, Takashi, to Amada Company, Limited. Workpiece workability detection method and a method for cutting a workpiece by means of a cutting machine utilizing that method. 5,115,403, Cl. 364-474.150.
Yonezawa, Keitaro, to Kabushiki Kaisha Kosmek. Check valve with valve opening device. 5,113,899, Cl. 137-461.000.
Yorozu, Hideki; and Takeuchi, Akihiro, to Alps Electric Co., Ltd. Method for driving and controlling a thermal printer. 5,115,253, Cl. 346-76.0PH.
Yoshiba, Takeyuki: *See*—
Tanaka, Katsuhiko; Yoshiba, Takeyuki; Sato, Takanobu; Kawakami, Ikunori; and Kawakami, Koichi, 5,114,245, Cl. 384-112.000.
Yoshida, Hiroshi, to NEC Corporation. Manufacturing method of well region in coms intergrated circuit. 5,114,868, Cl. 437-34.000.
Yoshida Kogyo K. K.: *See*—
Akashi, Shunji; Ito, Michio; and Kuse, Kazuki, 5,114,305, Cl. 414-787.000.
Yunoki, Akio, 5,113,567, Cl. 29-408.000.
Yoshida Kogyo K.K.: *See*—
Ishikawa, Kiichirou, 5,114,057, Cl. 223-37.000.
Murai, Ryukichi; and Endo, Masaaki, 5,113,556, Cl. 24-633.000.
Yoshida, Masahiro: *See*—
Sato, Katsuyuki; Matsumoto, Miki; Ohkuma, Sadayuki; Ogata, Masahiro; and Yoshida, Masahiro, 5,115,413, Cl. 365-230.090.
Yoshida, Masato: *See*—
Kawakami, Takeo; Kagami, Takashi; Chosa, Yosei; and Yoshida, Masato, 5,114,904, Cl. 503-227.000.
Yoshida, Masatoshi; Shibata, Katsuji; Kojima, Mitsumasa; Satou, Hidetaka; Kato, Toshihiko; Miyadera, Yasuo; and Yusa, Masami, to Hitachi Chemical Co., Ltd. Processes for preparation of polyimide-isoindroquinazolinedione and precursor thereof. 5,115,089, Cl. 528-353.000.
Yoshida, Ryo: *See*—
Wada, Nobuhide; and Yoshida, Ryo, 5,114,463, Cl. 71-92.000.
Yoshida, Takao: *See*—
Isono, Keinosuke; Yoshida, Takao; and Suzuki, Tatsuo, 5,114,004, Cl. 206-222.000.
Yoshida, Takayoshi: *See*—
Matsushiro, Nobuhito; Hatanaka, Hazime; Yoshida, Takayoshi; and Oyake, Ikuo, 5,115,402, Cl. 395-141.000.
Yoshida, Takehiro: *See*—
Kobayashi, Makoto; Yoshida, Takehiro; Wada, Satoshi; Terajima, Hisao; Ono, Takeshi; Yokoyama, Minoru; Awai, Takashi; Tomoda, Akihiro; and Ishida, Yasushi, 5,115,255, Cl. 346-76.0PH.
Yoshida, Toshifumi: *See*—
Ose, Toshio; Yoshida, Toshifumi; and Iwasaki, Katsuyo, 5,115,170, Cl. 315-370.000.
Yoshida, Toshiyuki, to Kabushiki Kaisha Komatsu Seisakusho. Counterbalance valve. 5,113,894, Cl. 137-106.000.
Yoshihara, Yasusro: *See*—
Yano, Mitsuru; and Yoshihara, Yasusro, 5,113,704, Cl. 73-162.000.
Yoshikawa, Osamu: *See*—
Tsuji, Fumio; and Yoshikawa, Osamu, 5,114,232, Cl. 356-346.000.
Yoshikawa, Sumio; Okino, Yoshiharu; and Sawada, Satoru, to Fuji Photo Film Co., Ltd. Copying device with developing and transfer device. 5,115,304, Cl. 358-75.000.
Yoshimori, Masanori, to NEC Corporation. Complementary type semiconductor integrated circuit device. 5,115,297, Cl. 357-42.000.
Yoshimori, Takashi, to Kabushiki Kaisha Toshiba. Testing integrated circuit capable of easily performing parametric test on high pin count semiconductor device. 5,115,191, Cl. 324-158.00R.
Yoshimoto, Satoshi, to Brother Kogyo Kabushiki Kaisha. Dot printing method for dot printer. 5,114,253, Cl. 400-124.000.
Yoshimoto, Toshio: *See*—
Adachi, Nobukazu; and Yoshimoto, Toshio, 5,115,119, Cl. 219-469.000.
Yoshinaga, Kazuo; Katagiri, Kazuharu; Tsuboyama, Akira; Kitayama, Hiroyuki; Shinjo, Kenji; and Hioki, Chieko, to Canon Kabushiki Kaisha. Lactic acid derivative and liquid crystal composition containing same. 5,114,613, Cl. 252-299.610.
Yoshinari, Tsunenori: *See*—
Muto, Kazuhiko; Shirai, Takahiro; and Yoshinari, Tsunenori, 5,115,124, Cl. 250-214.00L.
Yoshino, Hajime: *See*—
Sugimoto, Kimiyasu; and Yoshino, Hajime, 5,114,261, Cl. 403-122.000.
Yoshioka, Hiroshi: *See*—
Oda, Yasuhiro; Yoshioka, Hiroshi; Tadokoro, Hajime; and Fujimaki, Yoshihide, 5,114,815, Cl. 430-58.000.
Yoshizawa, Kenji: *See*—
Shoda, Isao; Kodama, Hitoshi; Magome, Kazuo; Iwata, Akihiko; Yoshizawa, Kenji; and Taki, Masakazu, 5,115,168, Cl. 315-223.000.
Yoshizawa, Yoshihito; and Yamauchi, Kiyotaka, to Hitachi Metals, Inc. Magnetic core. 5,114,503, Cl. 148-304.000.
Yost, Jeffrey J.: *See*—
Sheckler, Chad A.; and Yost, Jeffrey J., 5,114,584, Cl. 210-490.000.
Yost, Richard A.; and Hail, Mark E., to University of Florida. Direct resistive heating and temperature measurement of metal-clad capillary columns in gas chromatography and related separation techniques. 5,114,439, Cl. 55-20.000.
Young, Carter R.: *See*—
Ross, Colby M.; Sproul, Richard M.; McCurley, Ross M.; and Young, Carter R., 5,113,939, Cl. 166-120.000.
Young, Gary B.; Hanel, Albert L.; and Veselka, Kenneth R., to Tymco, Inc. Surface sweeping machine with over-the-cab hopper dumping. 5,113,548, Cl. 15-346.000.
Young, Jack W. Sewer relief valve. 5,113,901, Cl. 137-554.000.
Young, James W.; and Brandt, Steven, to Sepracor, Inc. Methods of use and compositions of (R)-isoflurane and (R)-desflurane. 5,114,714, Cl. 424-400.000.
Young, James W.; and Brandt, Steven, to Sepracor Inc. Methods of use and compositions of (s)-isoflurane and (s)-desflurane. 5,114,715, Cl. 424-400.000.
Young, John A. Electrical box support bracket. 5,114,105, Cl. 248-27.100.
Young, Lawrence R.: *See*—
Fulton, Steven J.; Peters, Gerald T., Jr.; Spehrley, Charles W., Jr.; and Young, Lawrence R., 5,114,747, Cl. 427-164.000.
Young, Rily; and Shen, James. Saliva ejector tip with integral valve. 5,114,342, Cl. 433-95.000.
Young, William H., II: *See*—
Sandstrom, Eric L.; Prokop, Alfred; Young, William H., II; and D'Urso, Anthony M., 5,114,582, Cl. 210-321.740.
Yu, Robert C. U., to Xerox Corporation. Heat shielded electrostatographic imaging members. 5,114,818, Cl. 430-97.000.
Yu, Youlu: *See*—
St. Pierre, Leon E.; Brown, George R.; Wu, Gaoming; and Yu, Youlu, 5,114,709, Cl. 424-78.120.
Yuda, Lawrence F. Cylinder with abutments formed on guide rods to prevent finger entrapment. 5,113,746, Cl. 92-165.0PR.
Yukimachi, Hiroshi: *See*—
Ohtsuka, Masahito; Kobayashi, Hiroo; Moritani, Toshifumi; Yagi, Tadashi; Tsuchiya, Yoshiro; Azeta, Takahiro; Waragai, Tsuyoshi; Yukimachi, Hiroshi; and Miyake, Hiroaki, 5,115,281, Cl. 355-319.000.
Yukizane, Shigemi: *See*—
Hamanaka, Izumi; Maekawa, Yoshikazu; Arai, Hiroyuki; Nishiki, Akihiko; Muramatsu, Takeshi; Yokoyama, Toshio; and Yukizane, Shigemi, 5,114,130, Cl. 270-53.000.
Yunogami, Takashi: *See*—
Suzuki, Keizo; Ninomiya, Ken; and Yunogami, Takashi, 5,115,130, Cl. 250-251.000.
Yunoki, Akio, to Yoshida Kogyo K. K. Method of and apparatus for feeding an array of sliders. 5,113,567, Cl. 29-408.000.
Yusa, Masami: *See*—
Yoshida, Masatoshi; Shibata, Katsuji; Kojima, Mitsumasa; Satou, Hidetaka; Kato, Toshihiko; Miyadera, Yasuo; and Yusa, Masami, 5,115,089, Cl. 528-353.000.
Zabel, Lawrence D.: *See*—
Franck, Donald L.; Shah, Suresh D.; Sheth, Manu K.; and Zabel, Lawrence D., 5,114,650, Cl. 264-151.000.
Zagieboylo, Stephen: *See*—
Belove, Edward J.; Drake, Todd R.; Kaplan, S. Jerrold; Kapor, Mitchell D.; Landsman, Richard A.; and Zagieboylo, Stephen, 5,115,504, Cl. 395-600.000.
Zammuto, Samuel N.: *See*—
Tillery, Michael L.; Harlan, Eugene G.; Martin, John R.; Zammuto, Samuel N.; and Bonilla, Marcio, 5,114,155, Cl. 273-371.000.
Zanarcella, Sergio: *See*—
Scuri, Romolo; Brufani, Mario; Ceccarelli, Stefano; De Vellis, Patrizia; Giannetti, Patrizia; Paesano, Agnese; and Zanarcella, Sergio, 5,114,966, Cl. 514-469.000.
Zappa, James V.: *See*—
Dosch, Jeffrey J.; and Zappa, James V., 5,113,854, Cl. 128-201.230.
Zasloff, Michael, to Children's Hospital of Philadelphia, The. Amphiphilic peptides and use thereof. 5,114,921, Cl. 514-12.000.
Zatezalo, John M.; and Panson, Michael S., to Gateshead Manufacturing Corporation. Rotating machinery diagnostic system. 5,115,406, Cl. 364-551.010.
Zdunek, Kenneth J.; and Krebs, Jay R., to Motorola, Inc. Shared data/voice communication system with programmable data priority. 5,115,233, Cl. 340-825.440.
Zeck, Walter M.: *See*—
Anderson, John; Homeyer, Bernhard; and Zeck, Walter M., 5,114,965, Cl. 514-469.000.
Zegre, Henry: *See*—
Gautherin, Jean-Claude; and Zegre, Henry, 5,114,231, Cl. 356-328.000.
Zehmer, John A., III: *See*—
Newman, Kirk E.; Gusack, James A.; and Zehmer, John A., III, 5,114,630, Cl. 264-3.100.
Zelinski, Matthew S.: *See*—
Senapati, Nagabhusan; Johnson, Harold W.; Kim, Byung C.; Chauhan, Satya P.; Gamlen, Dennis A.; Eason, Raju; Muralidhara, H. S.; and Zelinski, Matthew S., 5,114,560, Cl. 204-299.00R.
Zelinsky, Michael A.: *See*—
Ebel, Steven J.; Pyszczyk, Michael F.; Frysz, Christine A.; and Zelinsky, Michael A., 5,114,811, Cl. 429-194.000.
Zenbayashi, Michio: *See*—
Motegi, Hisao; Sunaga, Takeshi; and Zenbayashi, Michio, 5,115,069, Cl. 52.8-15.000.
Zenith Electronics Corporation: *See*—
Citta, Richard W., 5,115,315, Cl. 358-186.000.
Remec, Thomas M., 5,114,494, Cl. 134-1.000.
Zeppenfeld, Reiner, to Roediger Pittsburgh, Inc. Positionable doctor blade. 5,113,999, Cl. 198-497.000.
Zertani, Rudolf; Mohr, Dieter; Rode, Klaus; Frass, Werner; and Joerg, Klaus, to Hoechst Aktiengesellschaft. Photopolymerizable mixture and recording material prepared therefrom, having a photoinitiating set of compounds which give increased absorption below 450 nm. 5,114,832, Cl. 430-285.000.
Zhuravkov, Sergei P.: *See*—
Bordunov, Vladimir V.; Karmadonov, Leonid N.; Ospischev, Jury M.; Fedjunin, Vladimir A.; Zhuravkov, Sergei P.; Cherepenko, Evgeny A.; Sviridov, Anatoly B.; Verkhorubov, Lev S.; Mikhailov, Arkady T.; Bakhmutov, Jury L.; and Shaidurov, Valery S., 5,114,496, Cl. 134-13.000.
Zimmerman, Robert V.: *See*—
Milner, Ted D.; and Zimmerman, Robert V., 5,114,489, Cl. 127-2.000.
Zimmermann, Eugene K.; Wagner, Bernhard; Volz, William E.; Harclerode, William H.; Wiman, John V.; and Voss, John C., to BASF Corporation. Polystyrene having high degree of expandability, and formulation having a highly-expandable polymer therein. 5,115,066, Cl. 526-346.000.
Zimron, Ohad: *See*—
Kedar, Alon; and Zimron, Ohad, 5,113,927, Cl. 165-13.000.
Zinser Textilmaschinen GmbH: *See*—
Hauers, Manfred; and Vits, Dieter, 5,113,645, Cl. 57-269.000.
Zones, Stacey I.; Holtermann, Dennis L.; and Rainis, Andrew, to Chevron Research and Technology Company. Reforming naphtha with boron-containing large-pore zeolites. 5,114,565, Cl. 208-138.000.
Zoubek, Eugen; and Kehlbeck, Heinrich. Medicament from Peyer's patches. 5,114,722, Cl. 424-551.000.
Zucchero, Rocco. Bicycle rim water reflecting apparatus. 5,113,975, Cl. 188-24.120.
Zupancic, Joseph J.; Blazej, Daniel C.; and Fraenkel, Howard A., to Allied-Signal Inc. Photodefinable interlevel dielectrics. 5,114,741, Cl. 427-43.100.
Zydzik, George J.: *See*—
Kopf, Rose F.; O'Bryan, Henry M., Jr.; Schubert, Erdmann F.; Tu, Li-Wei; Wang, Yeong-Her; and Zydzik, George J., 5,115,441, Cl. 372-45.000.
501 Michigan Wheel Corp.: *See*—
Vorus, William S., 5,114,313, Cl. 416-93.00A.

VOL
1138
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF MAY, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Semiconductor Equipment Technologies: *See*—
Whitney, Theodore R., Re. 33,931, Cl. 355-53.000.
Ardent, John C. Adjustable support system for marine craft. Re. 33,930, Cl. 269-296.000.
Bruton, Billy R.; Corneillie, Jerome E.; and Perkins, Marion W., to U.S. Industries, Inc. Fire-safe valve actuator. Re. 33,928, Cl. 92-94.000.
Corneillie, Jerome E.: *See*—
Bruton, Billy R.; Corneillie, Jerome E.; and Perkins, Marion W., Re. 33,928, Cl. 92-94.000.
Diener, Rudolph, to Kwik Products International Corporation. Central injection device for internal combustion engines. Re. 33,929, Cl. 261-88.000.
Fukasawa, Hiromichi; and Monzen, Takashi, to Terumo Corporation. Hollow fiber-type artificial lung. Re. 33,932, Cl. 422-46.000.
Fuzimura, Yasuyuki, to Kankyo Company Limited. Air cleaner. Re. 33,927, Cl. 55-129.000.
Hou, Jack. Toy music rocking chair. Re. 33,933, Cl. 446-301.000.
Kankyo Company Limited: *See*—
Fuzimura, Yasuyuki, Re. 33,927, Cl. 55-129.000.
Kwik Products International Corporation: *See*—
Diener, Rudolph, Re. 33,929, Cl. 261-88.000.
Monzen, Takashi: *See*—
Fukasawa, Hiromichi; and Monzen, Takashi, Re. 33,932, Cl. 422-46.000.
Perkins, Marion W.: *See*—
Bruton, Billy R.; Corneillie, Jerome E.; and Perkins, Marion W., Re. 33,928, Cl. 92-94.000.
Tennant Company: *See*—
Waldhauser, Steven J. A., Re. 33,926, Cl. 15-320.000.
Terumo Corporation: *See*—
Fukasawa, Hiromichi; and Monzen, Takashi, Re. 33,932, Cl. 422-46.000.
U.S. Industries, Inc.: *See*—
Bruton, Billy R.; Corneillie, Jerome E.; and Perkins, Marion W., Re. 33,928, Cl. 92-94.000.
Waldhauser, Steven J. A., to Tennant Company. Scrubber squeegees for scrubbing forward and backward. Re. 33,926, Cl. 15-320.000.
Whitney, Theodore R., to American Semiconductor Equipment Technologies. Laser pattern generating system. Re. 33,931, Cl. 355-53.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bresser, Robert E.; and Wursthorn, Karl R., to Thiokol Corporation. Stabilizer compositions for PVC resins. B1 4,701,486, 5-19-92, Cl. 524-182.000.
Drexelbrook Controls, Inc.: *See*—
Sun, Robert J.; and Maltby, Frederick L., B1 4,166,388, Cl. 73-304.00R.
Hickey, David J. Poultry tray liner. B1 4,832,228, 5-19-92, Cl. 220-408.000.
Maltby, Frederick L.: *See*—
Sun, Robert J.; and Maltby, Frederick L., B1 4,166,388, Cl. 73-304.00R.
Nolph, Karl D.: *See*—
Twardowski, Zbylut J.; and Nolph, Karl D., B1 4,772,269, Cl. 604-175.000.
Sun, Robert J.; and Maltby, Frederick L., to Drexelbrook Controls, Inc. RF admittance measuring method and apparatus for determining the level of a conductive liquid. B1 4,166,388, 5-19-92, Cl. 73-304.00R.
Thiokol Corporation: *See*—
Bresser, Robert E.; and Wursthorn, Karl R., B1 4,701,486, Cl. 524-182.000.
Twardowski, Zbylut J.; and Nolph, Karl D., to University of Missouri, The, Curators of the. Peritoneal dialysis catheter. B1 4,772,269, 5-19-92, Cl. 604-175.000.
University of Missouri, The, Curators of the: *See*—
Twardowski, Zbylut J.; and Nolph, Karl D., B1 4,772,269, Cl. 604-175.000.
Wursthorn, Karl R.: *See*—
Bresser, Robert E.; and Wursthorn, Karl R., B1 4,701,486, Cl. 524-182.000.

LIST OF DESIGN PATENTEES

A. D. Sutton & Sons, Inc.: *See*—
Thomas, Suzanne, 326,188, Cl. D3-48.000.
Abbott Laboratories: *See*—
Clegg, Robert D.; Osborne, Robert S.; and Schneider, Patricia A., 326,322, Cl. D24-130.000.
Schneider, Patricia A.; Iverson, Kent E.; Coules, Ronald A.; and Clegg, Robert D., 326,321, Cl. D24-112.000.
Allen, Duane V.; and Davis, Arnold M., to International Business Machines Corporation. Rack for electronic equipment. 326,200, 5-19-92, Cl. D6-479.000.
Allen, Jonathan C. Cutting board for fish. 326,211, 5-19-92, Cl. D7-698.000.
Amoco Corporation: *See*—
Clayton, Laverne E., 326,219, Cl. D8-310.000.
AMP Incorporated: *See*—
Lambert, Lahman D., II; and Puerner, Dean A., 326,256, Cl. D13-147.000.
Ancona, Bruce: *See*—
Ancona, Jane; and Ancona, Bruce, 326,347, Cl. D34-45.000.
Ancona, Jane; and Ancona, Bruce, to M. Kamenstein, Inc. Holder for dry cleaning accessories. 326,347, 5-19-92, Cl. D34-45.000.
Andrews, Howard, Jr.: *See*—
Mandell, Jonathan; and Andrews, Howard, Jr., 326,345, Cl. D34-40.000.
Aoki, Shunsuke; and Nakamura, Masao, to Bridgestone Corporation. Automobile tire. 326,251, 5-19-92, Cl. D12-141.000.
Aprica Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 326,289, Cl. D21-71.000.
Arnott, John; and Kaga, Gary, to Noma Outdoor Products Inc. Child's vehicle. 326,288, 5-19-92, Cl. D21-71.000.
Arnt-Jensen, Tor. Supporting plate for affixing paper sheets. 326,280, 5-19-92, Cl. D19-88.000.
Ashmun, Stuart; Garthwaite, Charlie; Cameron, Bridget; Stephan, Allan H.; Nelson, Michael D.; Paull, Mike M.; Bradley, Paul; Yurchenco, James R.; and Fulton, Elinor J., to Microsoft Corporation. Trackball for computer. 326,261, 5-19-92, Cl. D14-114.000.
B.C. Sanitan Limited: *See*—
Waldren, Jonathan G., 326,315, Cl. D23-295.000.
Badsey, William J. Motorized scooter. 326,290, 5-19-92, Cl. D21-81.000.
Ballstadt, George. Channel cap extrusion for glass block and the like. 326,329, 5-19-92, Cl. D25-122.000.
Baseheart, John C.: *See*—
Shikoff, Barry; and Baseheart, John C., 326,196, Cl. D6-467.000.

Bastijanic, Edward; Molnar, Richard J.; and Wroblewski, David J., to Elsag International B.V. Process command controller. 326,235, 5-19-92, Cl. D10-75.000.
Beaudry, Steven A. Support pedestal for a table. 326,201, 5-19-92, Cl. D6-495.000.
Beckerman, Alan: *See*—
Beckerman, Kenneth; Beckerman, Alan; Brady, Beth A.; Kocinski, Kenneth; and Leusch, Michael, 326,225, Cl. D9-418.000.
Beckerman, Kenneth; Beckerman, Alan; Brady, Beth A.; Kocinski, Kenneth; and Leusch, Michael, to Package Products, Inc. Box. 326,225, 5-19-92, Cl. D9-418.000.
Beecham Group p.l.c.: *See*—
Spry, Harriet M., 326,182, Cl. D2-502.000.
Bouhuys, Louis J., to U.S. Philips Corporation. Paging receiver. 326,264, 5-19-92, Cl. D14-191.000.
Bradley, Paul: *See*—
Ashmun, Stuart; Garthwaite, Charlie; Cameron, Bridget; Stephan, Allan H.; Nelson, Michael D.; Paull, Mike M.; Bradley, Paul; Yurchenco, James R.; and Fulton, Elinor J., 326,261, Cl. D14-114.000.
Brady, Beth A.: *See*—
Beckerman, Kenneth; Beckerman, Alan; Brady, Beth A.; Kocinski, Kenneth; and Leusch, Michael, 326,225, Cl. D9-418.000.
Bridgestone Corporation: *See*—
Aoki, Shunsuke; and Nakamura, Masao, 326,251, Cl. D12-141.000.
Brooks, Latonya M. R. Musical toothbrush with adjustable neck and mirror. 326,189, 5-19-92, Cl. D4-108.000.
Brown, Larry E., to HIP Industries, Inc. Holder for tennis balls. 326,304, 5-19-92, Cl. D21-223.000.
Brule', Phillippe Y., to Stryker Corporation. Caster cover. 326,221, 5-19-92, Cl. D8-375.000.
Bryan, Neill E.: *See*—
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 326,317, Cl. D23-332.000.
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 326,318, Cl. D23-335.000.
Burchell, David P.: *See*—
Meyer, Carl X.; Vitt, Louis O.; Burchell, David P.; and Schmid, James A., 326,334, Cl. D26-65.000.
Meyer, Carl X.; Vitt, Louis O.; Burchell, David P.; and Schmid, James A., 326,335, Cl. D26-65.000.
Burgener, Eddy, to Swiss Army Brands, Ltd. Watch. 326,233, 5-19-92, Cl. D10-39.000.
Burlington International Group p.l.c.: *See*—
Walker, William F., 326,179, Cl. D2-320.000.
Burton, Stanley R. Golf ball retriever. 326,301, 5-19-92, Cl. D21-206.000.
Butler, Jane. Portable paper towel holder. 326,203, 5-19-92, Cl. D6-522.000.
Cameron, Bridget: *See*—
Ashmun, Stuart; Garthwaite, Charlie; Cameron, Bridget; Stephan, Allan H.; Nelson, Michael D.; Paull, Mike M.; Bradley, Paul; Yurchenco, James R.; and Fulton, Elinor J., 326,261, Cl. D14-114.000.
Cameron, Don T., to Ray Cook Company. Golf putter head. 326,303, 5-19-92, Cl. D21-219.000.
Caron, Francis G., to Celluloid S.A. Hairbrush handle. 326,190, 5-19-92, Cl. D4-138.000.
Cartier International B.V.: *See*—
Perrin, Alain-Dominique, 326,274, Cl. D16-102.000.
Celluloid S.A.: *See*—
Caron, Francis G., 326,190, Cl. D4-138.000.
CertainTeed Corporation: *See*—
Klein, John R., deceased, 326,330, Cl. D25-139.000.
Chambers, John M. Breast pump. 326,319, 5-19-92, Cl. D24-109.000.
Chance, Christopher W.; and Feddersen, Jeffrey B., to Fat City Cycles, Inc. Front fork for a bicycle. 326,249, 5-19-92, Cl. D12-118.000.
Chauvin, Francios, to Superior S.A. Suitcase. 326,187, 5-19-92, Cl. D3-76.000.
Chen, Ching-Shih. Contact lens washer or similar article. 326,328, 5-19-92, Cl. D24-218.000.
Christ, Joseph T., to Craft Creations Co., Inc. Lamp. 326,336, 5-19-92, Cl. D26-94.000.
Clayton, Laverne E., to Amoco Corporation. Knob. 326,219, 5-19-92, Cl. D8-310.000.
Clegg, Robert D.; Osborne, Robert S.; and Schneider, Patricia A., to Abbott Laboratories. Hood for a feeding tube or the like. 326,322, 5-19-92, Cl. D24-130.000.
Clegg, Robert D.: *See*—
Schneider, Patricia A.; Iverson, Kent E.; Coules, Ronald A.; and Clegg, Robert D., 326,321, Cl. D24-112.000.
Coca-Cola Company, The: *See*—
Osakada, Kunio, 326,346, Cl. D34-40.000.
Colgate-Palmolive Company: *See*—
Sherman, Adam; and Dair, Thomas M., 326,339, Cl. D28-64.000.
Composite Industries Limited: *See*—
Graham, Arthur D. B.; Roncz, John G.; and Swanell, Graham, 326,255, Cl. D12-331.000.
Coopers Animal Health Limited: *See*—
Stratford, Michael G.; and Shorter, Richard J., 326,228, Cl. D9-521.000.
Coules, Ronald A.: *See*—
Schneider, Patricia A.; Iverson, Kent E.; Coules, Ronald A.; and Clegg, Robert D., 326,321, Cl. D24-112.000.
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., to Vornado Air Circulation Systems, Inc. Housing for a heater. 326,317, 5-19-92, Cl. D23-332.000.
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., to Vornado Air Circulation Systems, Inc. Heater. 326,318, 5-19-92, Cl. D23-335.000.
Coyle, Fergus A.: *See*—
Vella-Zarb, Alexander P.; and Coyle, Fergus A., 326,284, Cl. D21-33.000.
Craft Creations Co., Inc.: *See*—
Christ, Joseph T., 326,336, Cl. D26-94.000.
Cupani, Carmine: *See*—
Neuwirth, Helmuth; Cupani, Carmine; and Mattei, Michael, 326,266, Cl. D14-240.000.
Dair, Thomas M.: *See*—
Sherman, Adam; and Dair, Thomas M., 326,339, Cl. D28-64.000.
DaSilveira, John A. Cattle feeding stanchion. 326,340, 5-19-92, Cl. D30-119.000.
Davis, Arnold M.: *See*—
Allen, Duane V.; and Davis, Arnold M., 326,200, Cl. D6-479.000.
Davis, J. Stanley: *See*—
Gale, Bradley D.; and Davis, J. Stanley, 326,237, Cl. D10-114.000.
Davis, Jack C. Game board. 326,283, 5-19-92, Cl. D21-15.000.
Dazor Manufacturing Corporation: *See*—
Meyer, Carl X.; Vitt, Louis O.; Burchell, David P.; and Schmid, James A., 326,334, Cl. D26-65.000.
Meyer, Carl X.; Vitt, Louis O.; Burchell, David P.; and Schmid, James A., 326,335, Cl. D26-65.000.
DeJaynes, Arnold M. Ribbon shredder. 326,215, 5-19-92, Cl. D8-98.000.
Dinand, Pierre F., to Fox Fragrances S.r.l. Combined perfume bottle and cap. 326,224, 5-19-92, Cl. D9-522.000.
Dova, Maurizia, to Euroitalia S.R.L. Cosmetic container. 326,223, 5-19-92, Cl. D9-522.000.
Doxey, Andre ; and Hradisky, John L., to Rubbermaid Incorporated. Refuse container. 326,342, 5-19-92, Cl. D34-7.000.
Ediger, Glen W.: *See*—
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 326,317, Cl. D23-332.000.
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 326,318, Cl. D23-335.000.
Elsag International B.V.: *See*—
Bastijanic, Edward; Molnar, Richard J.; and Wroblewski, David J., 326,235, Cl. D10-75.000.
Ethicon, Inc.: *See*—
Hunt, John V.; and Murray, Michael A., 326,323, Cl. D24-145.000.
Euroitalia S.R.L.: *See*—
Dova, Maurizia, 326,223, Cl. D9-522.000.
Fat City Cycles, Inc.: *See*—
Chance, Christopher W.; and Feddersen, Jeffrey B., 326,249, Cl. D12-118.000.
Feddersen, Jeffrey B.: *See*—
Chance, Christopher W.; and Feddersen, Jeffrey B., 326,249, Cl. D12-118.000.
Feucht, Mark A.: *See*—
Fitermann, Benjamin; Waterston, Rebecca L.; Feucht, Mark A.; and Thorud, Stanley R., 326,344, Cl. D34-11.000.
Fitermann, Benjamin; Waterston, Rebecca L.; Feucht, Mark A.; and Thorud, Stanley R., to Liberty Diversified Industries. Security waste disposal cabinet with pivotal door. 326,344, 5-19-92, Cl. D34-11.000.
Forbes, Hampton E., Jr., to Westvaco Corporation. Carton blank. 326,227, 5-19-92, Cl. D9-433.000.
Fornara & Maulini S.p.A.: *See*—
Lenci, Fabio; and Talocci, Giovanna, 326,311, Cl. D23-223.000.
Fox Fragrances S.r.l.: *See*—
Dinand, Pierre F., 326,224, Cl. D9-522.000.
Franci, George P. Christmas tree stand. 326,243, 5-19-92, Cl. D11-130.100.
Francoeur, Sharon D. Dual-headed shower. 326,310, 5-19-92, Cl. D23-213.000.
Frankel, Gail B., to Kel-Gar, Inc. Combination spout cover and liquid soap dispenser. 326,312, 5-19-92, Cl. D23-256.000.
Frankel, Gail B., to Kel-Gar, Inc. Combination spout cover and liquid soap dispenser. 326,313, 5-19-92, Cl. D23-256.000.
Frauhiger, Robert W. Carton. 326,341, 5-19-92, Cl. D34-1.000.
Freadman, Tommyca, to Sparkomatic Corp. Equalizer for automobile audio systems or the like. 326,265, 5-19-92, Cl. D14-217.000.
Freilich, Joshua. Retractable screwdriver. 326,213, 5-19-92, Cl. D8-82.000.
Frietze, Jesus. Steering wheel. 326,253, 5-19-92, Cl. D12-176.000.
Fulton, Elinor J.: *See*—
Ashmun, Stuart; Garthwaite, Charlie; Cameron, Bridget; Stephan, Allan H.; Nelson, Michael D.; Paull, Mike M.; Bradley, Paul; Yurchenco, James R.; and Fulton, Elinor J., 326,261, Cl. D14-114.000.
Funazaki, Ichiji, to Sokkisha Co. Ltd. Paperweight. 326,281, 5-19-92, Cl. D19-96.000.
Fuqua, Jerry W.; and Sharp, James M., Jr., to International Telecommunication Corp. Telephone base with display. 326,263, 5-19-92, Cl. D14-151.000.
Gale, Bradley D.; and Davis, J. Stanley, to Public Safety Equipment, Inc. Rotating warning beacon. 326,237, 5-19-92, Cl. D10-114.000.
Garthwaite, Charlie: *See*—
Ashmun, Stuart; Garthwaite, Charlie; Cameron, Bridget; Stephan, Allan H.; Nelson, Michael D.; Paull, Mike M.; Bradley, Paul; Yurchenco, James R.; and Fulton, Elinor J., 326,261, Cl. D14-114.000.

Gerhart, Mark D., to Scott Paper Company. Packaging container. 326,226, 5-19-92, Cl. D9-423.000.
Girardi, Josephine. Garlic container. 326,210, 5-19-92, Cl. D7-612.000.
Graesslin KG: *See—*
Tinz, Bernhard H., 326,234, Cl. D10-50.000.
Graham, Arthur D. B.; Roncz, John G.; and Swanell, Graham, to Composite Industries Limited. Aircraft. 326,255, 5-19-92, Cl. D12-331.000.
Graseby Medical Limited: *See—*
Rutter, Paul, 326,320, Cl. D24-111.000.
Grauer, Furrell E., Jr. Game card holder. 326,287, 5-19-92, Cl. D21-54.000.
Grosse, Hatto, to Siemens Aktiengesellschaft. Data printer. 326,278, 5-19-92, Cl. D18-54.000.
Guerin, J. Douglas, Sr. Golf putter. 326,302, 5-19-92, Cl. D21-217.000.
Hampshire, James, to InterDesign Inc. Holder for the haft of a broom, mop or similar article. 326,220, 5-19-92, Cl. D8-373.000.
Hampton, Harold J. Commode seat lift handle. 326,216, 5-19-92, Cl. D8-307.000.
Harbert - Giochi per Giocare S.r.l.: *See—*
Zampolli, Paolo, 326,294, Cl. D21-122.000.
Hatano, Katsuhiro. Clock movement. 326,239, 5-19-92, Cl. D10-129.000.
Haugabook, Connie, to Little Friends, Inc. Combined storage and display unit. 326,193, 5-19-92, Cl. D6-434.000.
Heiligenthal, Charles H.; Pacetti Larry D.; Parise, Jack A.; and Slivon, George R., to Snap-on Tools Corporation. Cabinet housing for receiving drawers. 326,197, 5-19-92, Cl. D6-474.000.
Heiligenthal, Charles H.; Pacetti Larry D.; Parise, Jack A.; and Slivon, George R., to Snap-on Tools Corporation. Cabinet housing for receiving drawers. 326,199, 5-19-92, Cl. D6-477.000.
Hepworth, Paul S., to Plas Plugs Limited. Wire stripper. 326,214, 5-19-92, Cl. D8-98.000.
Herman, Rodney: *See—*
Lee, Noel; and Herman, Rodney, 326,257, Cl. D13-129.000.
Hess Design: *See—*
Hess, Stanley C., 326,247, Cl. D12-111.000.
Hess, Stanley C., to Hess Design. Bicycle. 326,247, 5-19-92, Cl. D12-111.000.
Highland Supply Corporation: *See—*
Weder, Donald E., 326,244, Cl. D11-149.000.
Weder, Donald E., 326,245, Cl. D11-152.000.
Weder, Donald E., 326,246, Cl. D11-152.000.
Hillman, Richard K. Model railroad track clamp. 326,296, 5-19-92, Cl. D21-143.000.
HIP Industries, Inc.: *See—*
Brown, Larry E., 326,304, Cl. D21-223.000.
Hirayama, Yasuo: *See—*
Nagasaka, Yasuhiro; Hirayama, Yasuo; Wakata, Shigekazu; Yamada, Shinichi; and Tanaka, Yoshihiro, 326,258, Cl. D13-147.000.
Horita, Yoshiyuki; and Mizuno, Hiroshi, to Yoshida Kogyo K.K. Pull tab for slide fastener. 326,248 5-19-92, Cl. D11-221.000.
Hradisky, John L., to Rubbermaid Incorporated. Drop top wastebasket. 326,343, 5-19-92, Cl. D34-7.000.
Hradisky, John L.: *See—*
Doxey, Andre ; and Hradisky, John L., 326,342, Cl. D34-7.000.
Hunt, John V.; and Murray, Michael A., to Ethicon, Inc. Cartridge for a skin stapler. 326,323, 5-19-92, Cl. D24-145.000.
Iida, Keiko. Tongue cleaner. 326,324, 5-19-92, Cl. D24-147.000.
InterDesign Inc.: *See—*
Hampshire, James, 326,220, Cl. D8-373.000.
International Business Machines Corporation: *See—*
Allen, Duane V.; and Davis, Arnold M., 326,200, Cl. D6-479.000.
International Telecommunication Corp.: *See—*
Fuqua, Jerry W.; and Sharp, James M., Jr., 326,263, Cl. D14-151.000.
Israel, Gary P.: *See—*
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 326,317, Cl. D23-332.000.
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 326,318, Cl. D23-335.000.
Itakura, Hitoshi: *See—*
Noshiro, Mitsunori; and Itakura, Hitoshi, 326,291, Cl. D21-111.000.
Iverson, Kent E.: *See—*
Schneider, Patricia A.; Iverson, Kent E.; Coules, Ronald A.; and Clegg, Robert D., 326,321, Cl. D24-112.000.
Jambhekar, Shrinrang: *See—*
Soren, Leonid; and Jambhekar, Shrinrang, 326,262, Cl. D14-138.000.
Jis, Inc.: *See—*
Schiffman, Alvin, 326,191, Cl. D6-338.000.
Johs. Link GmbH & Co. KG: *See—*
Sassmannshausen, Werner; and Sassmannshausen, Werner, 326,275, Cl. D17-22.000.
Julius Blum Gesellschaft m.b.H.: *See—*
Rupp, Reinhold, 326,202, Cl. D6-510.000.
Kaga, Gary: *See—*
Arnott, John; and Kaga, Gary, 326,288, Cl. D21-71.000.
Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Toy vehicle. 326,289, 5-19-92, Cl. D21-71.000.
Katz, Joyce M.; and Roan, Tracy C., to R. G. Barry Corporation. Footwear sole. 326,181, 5-19-92, Cl. D2-320.000.
Kel-Gar, Inc.: *See—*
Frankel, Gail B., 326,312, Cl. D23-256.000.
Frankel, Gail B., 326,313, Cl. D23-256.000.
Kendrick, Virgil P. Chemical dispenser. 326,309, 5-19-92, Cl. D23-208.000.
Kerivan, David W. Chess set. 326,286, 5-19-92, Cl. D21-52.000.
King, Jon E.; and Stack, Bradley G., to Sinclair & Rush, Inc. Dumbbell. 326,298, 5-19-92, Cl. D21-197.000.
King, Jon E.; and Stack, Bradley G., to Sinclair & Rush, Inc. Dumbbell. 326,299, 5-19-92, Cl. D21-197.000.
King, Jon E.; and Stack, Bradley G., to Sinclair & Rush, Inc. Dumbbell. 326,300, 5-19-92, Cl. D21-197.000.
Klein, Helen, executrix: *See—*
Klein, John R., deceased, 326,330, Cl. D25-139.000.
Klein, John R., deceased (by Klein, Helen, executrix), to CertainTeed Corporation. Shingle. 326,330, 5-19-92, Cl. D25-139.000.
Kochsiek, Ann M. Examination table. 326,325, 5-19-92, Cl. D24-183.000.
Kochsiek, Ann M. Examination table. 326,326, 5-19-92, Cl. D24-183.000.
Kocinski, Kenneth: *See—*
Beckerman, Kenneth; Beckerman, Alan; Brady, Beth A.; Kocinski, Kenneth; and Leusch, Michael, 326,225, Cl. D9-418.000.
Komatsu Zenoah Co.: *See—*
Wada, Minoru; and Taniguchi, Mitsuru, 326,270, Cl. D15-16.000.
Kouns, Marjorie K. Necklace or similar article. 326,240, 5-19-92, Cl. D11-6.000.
Koziol, Walter, to Modern Home Products Corp. Barbecue grill. 326,207, 5-19-92, Cl. D7-332.000.
Kroh, Norma J. Hand knitting aid. 326,241, 5-19-92, Cl. D11-27.000.
Kurebayashi, Masao, to Seiko Instruments Inc. Wristwatch. 326,232, 5-19-92, Cl. D10-39.000.
Lagier, Serge: *See—*
Perrissoud, Claude; and Lagier, Serge, 326,178, Cl. D2-276.000.
Lambert, Lahman D., II; and Puerner, Dean A., to AMP Incorporated. Electrical connector housing. 326,256, 5-19-92, Cl. D13-147.000.
Lee, Noel; and Herman, Rodney, to Monster Cable. Insulating jacket for electrical connectors and cables. 326,257, 5-19-92, Cl. D13-129.000.
Lenci, Fabio; and Talocci, Giovanna, to Fornara & Maulini S.p.A. Spray head for a shower. 326,311, 5-19-92, Cl. D23-223.000.
Le Tixerant, Eric D. P. Support for a telephone headset or a similar article. 326,268, 5-19-92, Cl. D14-253.000.
Leusch, Michael: *See—*
Beckerman, Kenneth; Beckerman, Alan; Brady, Beth A.; Kocinski, Kenneth; and Leusch, Michael, 326,225, Cl. D9-418.000.
Leveille, Norman H. Game board. 326,285, 5-19-92, Cl. D21-35.000.
Levitan, Stephen L.: *See—*
Sadowski, Mark H.; and Levitan, Stephen L., 326,184, Cl. D3-16.000.
Lewis, Sally S. Chest of drawers. 326,194, 5-19-92, Cl. D6-446.000.
Leyton-Purrier, Jennifer: *See—*
Purrier, Leighton S.; and Leyton-Purrier, Jennifer, 326,314, Cl. D23-278.000.
Liberty Diversified Industries: *See—*
Fitermann, Benjamin; Waterston, Rebecca L.; Feucht, Mark A.; and Thorud, Stanley R., 326,344, Cl. D34-11.000.
Lindahl, Richard: *See—*
Mehaffey, David E.; and Lindahl, Richard, 326,276, Cl. D18-15.000.
Little Friends, Inc.: *See—*
Haugabook, Connie, 326,193, Cl. D6-434.000.
Logan, Genevieve R. Combined multi-paneled easel and art display case. 326,279, 5-19-92, Cl. D19-36.000.
Lomak Industrial Company Limited: *See—*
Wah, Lee K., 326,305, Cl. D22-123.000.
Lowe, Terry J. Remote control holder. 326,195, 5-19-92, Cl. D6-457.000.
Lund Company, Ltd.: *See—*
Lund, William J., 326,277, Cl. D18-34.000.
Lund, William J., to Lund Company, Ltd. Paper trimmer for tearing away edges of perforated computer paper. 326,277, 5-19-92, Cl. D18-34.000.
M. Kamenstein, Inc.: *See—*
Ancona, Jane; and Ancona, Bruce, 326,347, Cl. D34-45.000.
Main, Ewan J. Mattress pad. 326,204, 5-19-92, Cl. D6-596.000.
Mandell, Jonathan; and Andrews, Howard, Jr., to Rubbermaid Commercial Products Inc. Recycling container. 326,345, 5-19-92, Cl. D34-40.000.
Mattei, Michael: *See—*
Neuwirth, Helmuth; Cupani, Carmine; and Mattei, Michael, 326,266, Cl. D14-240.000.
McAtarian, Frank J. Vacuum-packed foil package. 326,222, 5-19-92, Cl. D9-345.000.
McGiboney, James R. Trigger lock for a fuel pump nozzle. 326,271, 5-19-92, Cl. D15-9.100.
Mehaffey, David E.; and Lindahl, Richard, to Porelon, Inc. Hand stamp. 326,276, 5-19-92, Cl. D18-15.000.
Meyer, Carl X.; Vitt, Louis O.; Burchell, David P.; and Schmid, James A., to Dazor Manufacturing Corporation. Lamp head for an adjustable task light. 326,334, 5-19-92, Cl. D26-65.000.
Meyer, Carl X.; Vitt, Louis O.; Burchell, David P.; and Schmid, James A., to Dazor Manufacturing Corporation. Lamp head for an adjustable task light. 326,335, 5-19-92, Cl. D26-65.000.
Michelin Recherche et Technique: *See—*
Slagh, Douglas J., 326,252, Cl. D12-147.000.
Microsoft Corporation: *See—*
Ashmun, Stuart; Garthwaite, Charlie; Cameron, Bridget; Stephan, Allan H.; Nelson, Michael D.; Paull, Mike M.; Bradley, Paul; Yurchenco, James R.; and Fulton, Elinor J., 326,261, Cl. D14-114.000.
Miller, Harry; and Mische, Rosalba L., to Omega Corporation. Shoe for marine activities. 326,177, 5-19-92, Cl. D2-265.000.
Mingrino, Eric, to Mingrino Industries. Combined tee slot cleaner and shovel. 326,212, 5-19-92, Cl. D8-10.000.
Mingrino Industries: *See—*
Mingrino, Eric, 326,212, Cl. D8-10.000.
Miscavage, Vincent. Billfold. 326,185, 5-19-92, Cl. D3-56.000.
Mische, Rosalba L.: *See—*
Miller, Harry; and Mische, Rosalba L., 326,177, Cl. D2-265.000.
Miyazaki, Haruo; Uemura, Shigehiro; and Takada, Kazuo, to Sanyo Electric Co., Ltd. Touch responsive night light or similar article. 326,337, 5-19-92, Cl. D26-104.000.
Mizuno, Hiroshi: *See—*
Horita, Yoshiyuki; and Mizuno, Hiroshi, 326,248, Cl. D11-221.000.
Modern Home Products Corp.: *See—*
Koziol, Walter, 326,207, Cl. D7-332.000.
Molnar, Richard J.: *See—*
Bastijanic, Edward; Molnar, Richard J.; and Wroblewski, David J., 326,235, Cl. D10-75.000.
Monneret, Alain, to Monneret Jouets. Doll bath or the like. 326,292, 5-19-92, Cl. D21-121.000.
Monneret, Alain, to Monneret Jouets. Toy cupboard. 326,293, 5-19-92, Cl. D21-121.000.
Monneret, Alain, to Monneret Jouets. Combined table and seating for dolls or the like. 326,295, 5-19-92, Cl. D21-123.000.
Monneret Jouets: *See—*
Monneret, Alain, 326,292, Cl. D21-121.000.
Monneret, Alain, 326,293, Cl. D21-121.000.
Monneret, Alain, 326,295, Cl. D21-123.000.
Monster Cable: *See—*
Lee, Noel; and Herman, Rodney, 326,257, Cl. D13-129.000.
Moore, Donald J.: *See—*
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 326,317, Cl. D23-332.000.
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 326,318, Cl. D23-335.000.
Motorola Inc.: *See—*
Soren, Leonid; and Jambhekar, Shrinrang, 326,262, Cl. D14-138.000.
MRD, Inc.: *See—*
Spinosa, Robert J., 326,238, Cl. D10-18.000.
Muller, Ronald L.: *See—*
Rakocy, William J.; Muller, Ronald L.; and Tsuji, Masao, 326,206, Cl. D7-317.000.
Murray, Michael A.: *See—*
Hunt, John V.; and Murray, Michael A., 326,323, Cl. D24-145.000.
Nagasaka, Yasuhiro; Hirayama, Yasuo; Wakata, Shigekazu; Yamada, Shinichi; and Tanaka, Yoshihiro, to Sumitomo Wiring systems, Ltd. Housing for electrical connector. 326,258, 5-19-92, Cl. D13-147.000.
Nakamura, Masao: *See—*
Aoki, Shunsuke; and Nakamura, Masao, 326,251, Cl. D12-141.000.
Nakao, Ken; and Ohkase, Wataru, to Tel Sagami Limited. Heat insulating cylinder for thermal treatment of semiconductor wafers. 326,272, 5-19-92, Cl. D15-144.100.
Nakao, Ken; Sato, Seishiro; and Ohkase, Wataru, to Tel Sagami Limited. Heat insulating cylinder for thermal treatment of semiconductor wafers. 326,273, 5-19-92, Cl. D15-144.100.
Nash, Stanley P., to Schweiger Industries, Inc. Seat. 326,192, 5-19-92, Cl. D6-381.000.
Nelson, Michael D.: *See—*
Ashmun, Stuart; Garthwaite, Charlie; Cameron, Bridget; Stephan, Allan H.; Nelson, Michael D.; Paull, Mike M.; Bradley, Paul; Yurchenco, James R.; and Fulton, Elinor J., 326,261, Cl. D14-114.000.
Neuwirth, Helmuth; Cupani, Carmine; and Mattei, Michael, to Porta Systems Corp. Power transfer block for telephone systems or similar device. 326,266, 5-19-92, Cl. D14-240.000.
Nihon Art Pasocon Service Yugen Kaisha: *See—*
Tateyama, Shizumi, 326,338, Cl. D26-129.000.
Nike, Inc. & Nike International Ltd.: *See—*
Rogers, Bruce E., 326,180, Cl. D2-320.000.
Noma Outdoor Products Inc.: *See—*
Arnott, John; and Kaga, Gary, 326,288, Cl. D21-71.000.
North American Philips Corp.: *See—*
Rakocy, William J.; Muller, Ronald L.; and Tsuji, Masao, 326,206, Cl. D7-317.000.
Noshiro, Mitsunori; and Itakura, Hitoshi, to Tomy Company, Ltd. Toy bar code and cash register. 326,291, 5-19-92, Cl. D21-111.000.
Noshiro, Mitsunori, to Tomy Company, Ltd. Toy clock. 326,297, 5-19-92, Cl. D21-144.000.
Ohkase, Wataru: *See—*
Nakao, Ken; and Ohkase, Wataru, 326,272, Cl. D15-144.100.
Nakao, Ken; Sato, Seishiro; and Ohkase, Wataru, 326,273, Cl. D15-144.100.
Oliver, Beverley J. Combined wheelchair and walker. 326,250, 5-19-92, Cl. D12-130.000.
Omega Corporation: *See—*
Miller, Harry; and Mische, Rosalba L., 326,177, Cl. D2-265.000.
Osakada, Kunio, to Coca-Cola Company, The. Crate for bottles. 326,346, 5-19-92, Cl. D34-40.000.
Osborne, Robert S.: *See—*
Clegg, Robert D.; Osborne, Robert S.; and Schneider, Patricia A., 326,322, Cl. D24-130.000.

Oshima, Yuriko, to Seiko Epson Corporation. Monitor or similar article. 326,260, 5-19-92, Cl. D14-113.000.
Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., to Snap-on Tools Corporation. Cabinet housing for receiving drawers. 326,198, 5-19-92, Cl. D6-477.000.
Pacetti, Larry D.: *See—*
Heiligenthal, Charles H.; Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,197, Cl. D6-474.000.
Heiligenthal, Charles H.; Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,199, Cl. D6-477.000.
Package Products, Inc.: *See—*
Beckerman, Kenneth; Beckerman, Alan; Brady, Beth A.; Kocinski, Kenneth; and Leusch, Michael, 326,225, Cl. D9-418.000.
Parise, Jack A.: *See—*
Heiligenthal, Charles H.; Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,197, Cl. D6-474.000.
Heiligenthal, Charles H.; Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,199, Cl. D6-477.000.
Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,198, Cl. D6-477.000.
Paull, Mike M.: *See—*
Ashmun, Stuart; Garthwaite, Charlie; Cameron, Bridget; Stephan, Allan H.; Nelson, Michael D.; Paull, Mike M.; Bradley, Paul; Yurchenco, James R.; and Fulton, Elinor J., 326,261, Cl. D14-114.000.
Perrin, Alain-Dominique, to Cartier International B.V. Spectacles. 326,274, 5-19-92, Cl. D16-102.000.
Perrissoud, Claude; and Lagier, Serge, to Salomon S.A. Ski boot. 326,178, 5-19-92, Cl. D2-276.000.
Petschek, Nick, to ReSeal International Limited Partnership. Dispensing container. 326,217, 5-19-92, Cl. D9-526.000.
Petschek, Nick, to ReSeal International Limited Partnership. Dispensing container. 326,218, 5-19-92, Cl. D9-526.000.
Phillips, Dorothy J. Combined sound generator and light. 326,269, 5-19-92, Cl. D14-299.000.
Pierce, Ian. Badge. 326,242, 5-19-92, Cl. D11-99.000.
Plas Plugs Limited: *See—*
Hepworth, Paul S., 326,214, Cl. D8-98.000.
Porelon, Inc.: *See—*
Mehaffey, David E.; and Lindahl, Richard, 326,276, Cl. D18-15.000.
Porta Systems Corp.: *See—*
Neuwirth, Helmuth; Cupani, Carmine; and Mattei, Michael, 326,266, Cl. D14-240.000.
Public Safety Equipment, Inc.: *See—*
Gale, Bradley D.; and Davis, J. Stanley, 326,237, Cl. D10-114.000.
Puerner, Dean A.: *See—*
Lambert, Lahman D., II; and Puerner, Dean A., 326,256, Cl. D13-147.000.
Purrier, Leighton S.; and Leyton-Purrier, Jennifer. Bathtub for infants. 326,314, 5-19-92, Cl. D23-278.000.
R. G. Barry Corporation: *See—*
Katz, Joyce M.; and Roan, Tracy C., 326,181, Cl. D2-320.000.
Rakocy, William J.; Muller, Ronald L.; and Tsuji, Masao, to North American Philips Corp. Carafe. 326,206, 5-19-92, Cl. D7-317.000.
Ray Cook Company: *See—*
Cameron, Don T., 326,303, Cl. D21-219.000.
ReSeal International Limited Partnership: *See—*
Petschek, Nick, 326,217, Cl. D9-526.000.
Petschek, Nick, 326,218, Cl. D9-526.000.
Riccadelli, Robert. Light fixture. 326,331, 5-19-92, Cl. D26-63.000.
Rizzi, John J.; and Rorke, Anthony B., to Westinghouse Electric Corp. Adjustable lamp. 326,332, 5-19-92, Cl. D26-25.000.
Rizzi, John J.; and Rorke, Anthony B., to Westinghouse Electric Corp. Adjustable lamp. 326,333, 5-19-92, Cl. D26-65.000.
Roan, Tracy C.: *See—*
Katz, Joyce M.; and Roan, Tracy C., 326,181, Cl. D2-320.000.
Rogers, Bruce E., to Nike, Inc. & Nike International Ltd. Outsole bottom. 326,180, 5-19-92, Cl. D2-320.000.
Rolex Watch U.S.A., Inc.: *See—*
St. Dizier, Gerald A. G., 326,229, Cl. D10-32.000.
Roncz, John G.: *See—*
Graham, Arthur D. B.; Roncz, John G.; and Swanell, Graham, 326,255, Cl. D12-331.000.
Rorke, Anthony B.: *See—*
Rizzi, John J.; and Rorke, Anthony B., 326,332, Cl. D26-25.000.
Rizzi, John J.; and Rorke, Anthony B., 326,333, Cl. D26-65.000.
Rubbermaid Commercial Products Inc.: *See—*
Mandell, Jonathan; and Andrews, Howard, Jr., 326,345, Cl. D34-40.000.
Rubbermaid Incorporated: *See—*
Doxey, Andre ; and Hradisky, John L., 326,342, Cl. D34-7.000.
Hradisky, John L., 326,343, Cl. D34-7.000.
Rupp, Reinhold, to Julius Blum Gesellschaft m.b.H. Corner connector for use in the construction of a drawer. 326,202, 5-19-92, Cl. D6-510.000.
Rutter, Paul, to Graseby Medical Limited. Medical syringe pump for infusion. 326,320, 5-19-92, Cl. D24-111.000.
Sadowski, Mark H.; and Levitan, Stephen L. Angled umbrella handle. 326,184, 5-19-92, Cl. D3-16.000.
St. Dizier, Gerald A. G., to Rolex Watch U.S.A., Inc. Wristwatch. 326,229, 5-19-92, Cl. D10-32.000.
Saito, Kiyoshi, to Tokyo Electric Company Ltd. Electronic balance. 326,236, 5-19-92, Cl. D10-91.000.
Sakurai, Tomoharu, to Shimano, Inc. Top portion of fishing reel. 326,306, 5-19-92, Cl. D22-140.000.

Sakurai, Tomoharu, to Shimano Inc. Top portion of fishing reel. 326,307, 5-19-92, Cl. D22-140.000.
Sakurai, Tomoharu, to Shimano Inc. Top portion of fishing reel. 326,308, 5-19-92, Cl. D22-140.000.
Salomon S.A.: *See—*
Perrissoud, Claude; and Lagier, Serge, 326,178, Cl. D2-276.000.
Sanyo Electric Co., Ltd.: *See—*
Miyazaki, Haruo; Uemura, Shigehiro; and Takada, Kazuo, 326,337, Cl. D26-104.000.
Sassmannshausen, Werner; and Sassmannshausen, Werner, to Johs. Link GmbH & Co. KG. Support unit for tom-tom drums. 326,275, 5-19-92, Cl. D17-22.000.
Sassmannshausen, Werner: *See—*
Sassmannshausen, Werner; and Sassmannshausen, Werner, 326,275, Cl. D17-22.000.
Sato, Seishiro: *See—*
Nakao, Ken; Sato, Seishiro; and Ohkase, Wataru, 326,273, Cl. D15-144.100.
Schiffman, Alvin, to Jis, Inc. Children's activity center. 326,191, 5-19-92, Cl. D6-338.000.
Schmid, James A.: *See—*
Meyer, Carl X.; Vitt, Louis O.; Burchell, David P.; and Schmid, James A., 326,334, Cl. D26-65.000.
Meyer, Carl X.; Vitt, Louis O.; Burchell, David P.; and Schmid, James A., 326,335, Cl. D26-65.000.
Schneider, Patricia A.; Iverson, Kent E.; Coules, Ronald A.; and Clegg, Robert D., to Abbott Laboratories. Combined feeding tube and catheter adapter. 326,321, 5-19-92, Cl. D24-112.000.
Schneider, Patricia A.: *See—*
Clegg, Robert D.; Osborne, Robert S.; and Schneider, Patricia A., 326,322, Cl. D24-130.000.
Schweiger Industries, Inc.: *See—*
Nash, Stanley P., 326,192, Cl. D6-381.000.
Scott Paper Company: *See—*
Gerhart, Mark D., 326,226, Cl. D9-423.000.
Secreet, Shirley J. Beach towel. 326,205, 5-19-92, Cl. D6-608.000.
Seiko Epson Corporation: *See—*
Oshima, Yuriko, 326,260, Cl. D14-113.000.
Seiko Instruments Inc.: *See—*
Kurebayashi, Masao, 326,232, Cl. D10-39.000.
Sharp, James M., Jr.: *See—*
Fuqua, Jerry W.; and Sharp, James M., Jr., 326,263, Cl. D14-151.000.
Sherman, Adam; and Dair, Thomas M., to Colgate-Palmolive Company. Dental floss dispenser housing. 326,339, 5-19-92, Cl. D28-64.000.
Shikoff, Barry; and Baseheart, John C. Remote control holder. 326,196, 5-19-92, Cl. D6-467.000.
Shimano, Inc.: *See—*
Sakurai, Tomoharu, 326,306, Cl. D22-140.000.
Sakurai, Tomoharu, 326,307, Cl. D22-140.000.
Sakurai, Tomoharu, 326,308, Cl. D22-140.000.
Shorter, Richard J.: *See—*
Stratford, Michael G.; and Shorter, Richard J., 326,228, Cl. D9-521.000.
Siemens Aktiengesellschaft: *See—*
Grosse, Hatto, 326,278, Cl. D18-54.000.
Sinclair & Rush, Inc.: *See—*
King, Jon E.; and Stack, Bradley G., 326,298, Cl. D21-197.000.
King, Jon E.; and Stack, Bradley G., 326,299, Cl. D21-197.000.
King, Jon E.; and Stack, Bradley G., 326,300, Cl. D21-197.000.
Slagh, Douglas J., to Michelin Recherche et Technique. Tire. 326,252, 5-19-92, Cl. D12-147.000.
Slivon, George R.: *See—*
Heiligenthal, Charles H.; Facetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,197, Cl. D6-474.000.
Heiligenthal, Charles H.; Facetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,199, Cl. D6-477.000.
Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,198, Cl. D6-477.000.
Snap-on Tools Corporation: *See—*
Heiligenthal, Charles H.; Facetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,197, Cl. D6-474.000.
Heiligenthal, Charles H.; Facetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,199, Cl. D6-477.000.
Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,198, Cl. D6-477.000.
Sokkisha Co. Ltd.: *See—*
Funazaki, Ichiji, 326,281, Cl. D19-96.000.
Soren, Leonid; and Jambhekar Shrinrang, to Motorola Inc. Portable handset telephone or similar article. 326,262, 5-19-92, Cl. D14-138.000.
Sparkomatic Corp.: *See—*
Freadman, Tommyca, 326,265, Cl. D14-217.000.
Spinosa, Robert J., to MRD, Inc. Combined annunciator and switching unit for hospital patients. 326,238, 5-19-92, Cl. D10-18.000.
Spoljaric, Davor, to Warrec Company. Vehicle message display sign. 326,282, 5-19-92, Cl. D20-10.000.
Spry, Harriet M., to Beecham Group p.l.c. Headscarf. 326,182, 5-19-92, Cl. D2-502.000.
Stack, Bradley G.: *See—*
King, Jon E.; and Stack, Bradley G., 326,298, Cl. D21-197.000.
King, Jon E.; and Stack, Bradley G., 326,299, Cl. D21-197.000.
King, Jon E.; and Stack, Bradley G., 326,300, Cl. D21-197.000.
Stephan, Allan H.: *See—*
Ashmun, Stuart; Garthwaite, Charlie; Cameron, Bridget; Stephan, Allan H.; Nelson, Michael D.; Paull, Mike M.; Bradley, Paul; Yurchenco, James R.; and Fulton, Elinor J., 326,261, Cl. D14-114.000.
Stratford, Michael G.; and Shorter, Richard J., to Coopers Animal Health Limited. Container. 326,228, 5-19-92, Cl. D9-521.000.
Stryker Corporation: *See—*
Brule', Phillippe Y., 326,221, Cl. D8-375.000.
Studenski, Udo, to U.I. Lapp KG. Cable gland for securing electrical cables and conduits. 326,259, 5-19-92, Cl. D13-156.000.
Sue, Harold. Massager. 326,327, 5-19-92, Cl. D24-214.000.
Sumitomo Wiring systems, Ltd.: *See—*
Nagasaka, Yasuhiro; Hirayama, Yasuo; Wakata, Shigekazu; Yamada, Shinichi; and Tanaka, Yoshihiro, 326,258, Cl. D13-147.000.
Superior S.A.: *See—*
Chauvin, Francios, 326,187, Cl. D3-76.000.
Swanell, Graham: *See—*
Graham, Arthur D. B.; Roncz, John G.; and Swanell, Graham, 326,255, Cl. D12-331.000.
Swiss Army Brands, Ltd.: *See—*
Burgener, Eddy, 326,233, Cl. D10-39.000.
Syracuse China Corporation: *See—*
Unger, Steve A., 326,208, Cl. D7-536.000.
Unger, Steve A., 326,209, Cl. D7-536.000.
Takada, Kazuo: *See—*
Miyazaki, Haruo; Uemura, Shigehiro; and Takada, Kazuo, 326,337, Cl. D26-104.000.
Talocci, Giovanna: *See—*
Lenci, Fabio; and Talocci, Giovanna, 326,311, Cl. D23-223.000.
Tanaka, Yoshihiro: *See—*
Nagasaka, Yasuhiro; Hirayama, Yasuo; Wakata, Shigekazu; Yamada, Shinichi; and Tanaka, Yoshihiro, 326,258, Cl. D13-147.000.
Taniguchi, Mitsuru: *See—*
Wada, Minoru; and Taniguchi, Mitsuru, 326,270, Cl. D15-16.000.
Tateyama, Shizumi, to Nihon Art Pasocon Service Yugen Kaisha. Lamp shade. 326,338, 5-19-92, Cl. D26-129.000.
Tel Sagami Limited: *See—*
Nakao, Ken; and Ohkase, Wataru, 326,272, Cl. D15-144.100.
Nakao, Ken; Sato, Seishiro; and Ohkase, Wataru, 326,273, Cl. D15-144.100.
Thomas, Suzanne, to A. D. Sutton & Sons, Inc. Diaper bag. 326,188, 5-19-92, Cl. D3-48.000.
Thorud, Stanley R.: *See—*
Fitermann, Benjamin; Waterston, Rebecca L.; Feucht, Mark A.; and Thorud, Stanley R., 326,344, Cl. D34-11.000.
Tinz, Bernhard H., to Graesslin KG. Combined thermostat and timer. 326,234, 5-19-92, Cl. D10-50.000.
Tokyo Electric Company Ltd.: *See—*
Saito, Kiyoshi, 326,236, Cl. D10-91.000.
Tomy Company, Ltd.: *See—*
Noshiro, Mitsunori; and Itakura, Hitoshi, 326,291, Cl. D21-111.000.
Noshiro, Mitsunori, 326,297, Cl. D21-144.000.
Tsuji, Masao: *See—*
Rakocy, William J.; Muller, Ronald L.; and Tsuji, Masao, 326,206, Cl. D7-317.000.
U.I. Lapp KG: *See—*
Studenski, Udo, 326,259, Cl. D13-156.000.
Uemura, Shigehiro: *See—*
Miyazaki, Haruo; Uemura, Shigehiro; and Takada, Kazuo, 326,337, Cl. D26-104.000.
Unger, Steve A., to Syracuse China Corporation. Cup or similar article. 326,208, 5-19-92, Cl. D7-536.000.
Unger, Steve A., to Syracuse China Corporation. Demitasse cup or similar article. 326,209, 5-19-92, Cl. D7-536.000.
U.S. Philips Corporation: *See—*
Bouhuys, Louis J., 326,264, Cl. D14-191.000.
Vella-Zarb, Alexander P.; and Coyle, Fergus A. Game board. 326,284, 5-19-92, Cl. D21-33.000.
Vitt, Louis O.: *See—*
Meyer, Carl X.; Vitt, Louis O.; Burchell, David P.; and Schmid, James A., 326,334, Cl. D26-65.000.
Meyer, Carl X.; Vitt, Louis O.; Burchell, David P.; and Schmid, James A., 326,335, Cl. D26-65.000.
Vornado Air Circulation Systems, Inc.: *See—*
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 326,317, Cl. D23-332.000.
Coup, Michael C.; Ediger, Glen W.; Moore, Donald J.; Israel, Gary P.; and Bryan, Neill E., 326,318, Cl. D23-335.000.
Wada, Minoru; and Taniguchi, Mitsuru, to Komatsu Zenoah Co. Mowing apparatus. 326,270, 5-19-92, Cl. D15-16.000.
Wah, Lee K., to Lomak Industrial Company Limited. Combined insect killer and lamp. 326,305, 5-19-92, Cl. D22-123.000.
Wakata, Shigekazu: *See—*
Nagasaka, Yasuhiro; Hirayama, Yasuo; Wakata, Shigekazu; Yamada, Shinichi; and Tanaka, Yoshihiro, 326,258, Cl. D13-147.000.
Waldren, Jonathan G., to B.C. Sanitan Limited. Bidet. 326,315, 5-19-92, Cl. D23-295.000.
Walker, William F., to Burlington International Group p.l.c. Sole for footwear. 326,179, 5-19-92, Cl. D2-320.000.
Warrec Company: *See—*
Spoljaric, Davor, 326,282, Cl. D20-10.000.
Waterston, Rebecca L.: *See—*
Fitermann, Benjamin; Waterston, Rebecca L.; Feucht, Mark A.; and Thorud, Stanley R., 326,344, Cl. D34-11.000.

Weder, Donald E., to Highland Supply Corporation. Flower pot cover. 326,244, 5-19-92, Cl. D11-149.000.
Weder, Donald E., to Highland Supply Corp. Flower pot cover. 326,245, 5-19-92, Cl. D11-152.000.
Weder, Donald E., to Highland Supply Corp. Flower pot cover. 326,246, 5-19-92, Cl. D11-152.000.
Weiser, Isaac: *See—*
Weiser, Margaret A.; and Weiser, Isaac, 326,267, Cl. D14-243.000.
Weiser, Margaret A.; and Weiser, Isaac. Portable telephone amplifier unit. 326,267, 5-19-92, Cl. D14-243.000.
Westinghouse Electric Corp.: *See—*
Rizzi, John J.; and Rorke, Anthony B., 326,332, Cl. D26-25.000.
Rizzi, John J.; and Rorke, Anthony B., 326,333, Cl. D26-65.000.
Westvaco Corporation: *See—*
Forbes, Hampton E., Jr., 326,227, Cl. D9-433.000.
Wilson, Philomina B. Wristwatch having an hourglass face. 326,230, 5-19-92, Cl. D10-33.000.
Woods, Janice C. Garment belt. 326,183, 5-19-92, Cl. D2-627.000.
Woomer, Benjamin E. Wristwatch. 326,231, 5-19-92, Cl. D10-39.000.
Wroblewski, David J.: *See—*
Bastijanic, Edward; Molnar, Richard J.; and Wroblewski, David J., 326,235, Cl. D10-75.000.
Yamada, Shinichi: *See—*
Nagasaka, Yasuhiro; Hirayama, Yasuo; Wakata, Shigekazu; Yamada, Shinichi; and Tanaka, Yoshihiro, 326,258, Cl. D13-147.000.
Yoshida Kogyo K.K.: *See—*
Horita, Yoshiyuki; and Mizuno, Hiroshi, 326,248, Cl. D11-221.000.
Yurchenco, James R.: *See—*
Ashmun, Stuart; Garthwaite, Charlie; Cameron, Bridget; Stephan, Allan H.; Nelson, Michael D.; Paull, Mike M.; Bradley, Paul; Yurchenco, James R.; and Fulton, Elinor J., 326,261, Cl. D14-114.000.
Zampolli, Paolo, to Harbert - Giochi per Giocare S.r.l. Toy ice grating machine. 326,294, 5-19-92, Cl. D21-122.000.
Zhang, Xiao P. Combination dual size toilet seat and cover. 326,316, 5-19-92, Cl. D23-312.000.
Ziaylek, Michael P.: *See—*
Ziaylek, Theodore, Jr.; and Ziaylek, Michael P., 326,254, Cl. D12-217.000.
Ziaylek, Theodore, Jr.; and Ziaylek, Michael P. Vehicle wheel block. 326,254, 5-19-92, Cl. D12-217.000.

LIST OF PLANT PATENTEES

DeVor Nurseries, Inc.: *See—*
Twomey, Jerry, 7,868, Cl. 20.000.
Holtkamp, Reinhold, Sr. African violet plant named Maria Antonia. 7,871, 5-19-92, Cl. 69.000.
Izhar, Shamai: *See—*
Izsak, Eva; and Izhar, Shamai, 7,869, Cl. 48.000.
Izsak, Eva; and Izhar, Shamai, 7,870, Cl. 48.000.
Izsak, Eva; and Izhar, Shamai, to State of Israel, Ministry of Agriculture, The Volcani Center. Strawberry plant Dorit. 7,869, 5-19-92, Cl. 48.000.
Izsak, Eva; and Izhar, Shamai, to State of Israel, Ministry of Agriculture, The Volcani Center. Strawberry plant Sasid. 7,870, 5-19-92, Cl. 48.000.
State of Israel, Ministry of Agriculture, The Volcani Center: *See—*
Izsak, Eva; and Izhar, Shamai, 7,869, Cl. 48.000.
Izsak, Eva; and Izhar, Shamai, 7,870, Cl. 48.000.
Twomey, Jerry, to DeVor Nurseries, Inc. Rose plant named Twofree. 7,868, 5-19-92, Cl. 20.000.

VOL
1138
SS
3
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19
1992
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CLASSIFICATION OF PATENTS

ISSUED MAY 19, 1992

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 5,113,526
7 5,113,527
9 5,113,528
13 5,113,529
19 5,113,530
144 5,113,531
167 5,113,532
170 5,113,533
416 5,113,534
424 5,113,535

CLASS 4

368 5,113,536

CLASS 5

121 5,113,537
127 5,113,538
449 5,113,540
451 5,113,541
464 5,113,539

CLASS 8

102 5,114,426
158 5,113,542
400 5,114,427
405 5,114,428
410 5,114,429
549 5,114,430
639 5,114,431

CLASS 14

24 5,113,543

CLASS 15

104.061 5,113,544
308 5,113,545
315 5,113,546
320 Re.33,926
322 5,113,547
346 5,113,548

CLASS 19

159 A 5,113,550

CLASS 24

115 A 5,113,551
300 5,113,552
464 5,113,553
545 5,113,554
576 5,113,555
633 5,113,556

CLASS 28

115 5,113,563
218 5,113,564

CLASS 29

25.01 5,113,565
25.35 5,113,566
33 D 5,113,557
57 5,113,558
121.1 5,113,559
160.6 5,113,560
228 5,113,561
401.1 5,113,562
408 5,113,567
419.1 5,113,568
433 5,113,570
453 5,113,571
509 5,113,572
596 5,113,573
597 5,113,574
603 5,113,575
611 5,113,576
620 5,113,577
623.5 5,114,432
743 5,113,578
840 5,113,579
5,113,580
5,113,581
889.2 5,113,582
889.21 5,113,583
892 5,113,584

CLASS 30

41 5,113,585
90 5,113,586
340 5,113,587

CLASS 33

264 5,113,588
289 5,113,589
471 5,113,590
550 5,113,591
567.1 5,113,592
644 5,113,593
722 5,113,594
759 5,113,595
770 5,113,596

CLASS 34

22 5,113,597
57 A 5,113,598
90 5,113,600

CLASS 36

88 5,113,599
117 5,113,601

CLASS 37

87 5,113,609
94 5,113,610

CLASS 38

102.7 5,113,611

CLASS 40

336 5,113,612
513 5,113,613
634 5,113,602

CLASS 42

7 5,113,603
50 5,113,604
5,113,605

CLASS 43

40 5,114,869
42.19 5,113,606
5,113,615
42.28 5,113,607
42.49 5,113,608
42.74 5,113,614
44.83 5,113,616

CLASS 44

322 5,114,433
5,114,434
348 5,114,435
385 5,114,436

CLASS 47

57.6 5,113,619
58 5,113,617
71 5,113,618

CLASS 49

375 5,113,620

CLASS 51

5 D 5,113,621
165.73 5,113,622
289 R 5,113,623
293 5,114,437
296 5,114,438
325 5,113,624

CLASS 52

143 5,113,625
157 5,113,626
5,113,627
171 5,113,628
207 5,113,629
223 R 5,113,630
236.8 5,113,631
385 5,113,632
741 5,113,634

CLASS 53

52 5,113,635
308 5,113,636
429 5,113,637
462 5,113,638
466 5,113,639
513 5,113,633

CLASS 55

20 5,114,439
25 5,114,440
26 5,114,441
112 5,114,442
129 Re.33,927
219 5,114,443
294 5,114,444
320 5,114,445
345 5,114,446
485 5,114,447
491 5,114,448

CLASS 56

6 5,113,640
10.5 5,113,641
12.8 5,113,642
153 5,113,643
330 5,113,644

CLASS 57

269 5,113,645

CLASS 60

39.06 5,113,646
39.091 5,113,648
39.36 5,113,647
226.3 5,113,649
253 5,113,650
274 5,113,651
288 5,113,652
299 5,113,653
330 5,113,654
408 5,113,655
525 5,113,656
533 5,113,657
608 5,113,658
641.8 5,113,659
752 5,113,660

CLASS 62

3.1 5,113,661
6 5,113,662
5,113,663
22 5,114,449
24 5,114,450
5,114,451
5,114,452
5,113,664
124 5,113,665
126 5,113,666
259.3 5,113,667
291 5,113,668
305 5,113,669
401 5,113,670
402 5,113,671
468

CLASS 65

30.13 5,114,453
163.000 5,114,454
275 5,114,455
327 5,114,456

CLASS 70

209 5,113,672
5,113,673
5,113,674
418 5,113,676
477 5,113,675

CLASS 71

23 5,114,457
28 5,114,458
32 5,114,459
34 5,114,460
88 5,114,461
5,114,462
92 5,114,463
5,114,464
94 5,114,465
5,114,466

CLASS 72

7 5,113,677
8 5,113,678
21 5,113,679
53 5,113,680
5,113,681
237 5,113,682
306 5,113,683
448 5,113,684
458 5,113,685
462 5,113,686
479 5,113,687

CLASS 73

8 5,113,688
23.31 5,113,689
116 5,113,691
117.3 5,113,692
118.1 5,113,693
121 5,113,694
146.8 5,113,695
147 5,113,696
151 5,113,703
162 5,113,704
168 5,113,705
304 R B1 4,166,388
602 5,113,697
626 5,113,706
784 5,113,707
861.12 5,113,690
862.41 5,113,708
862.48 5,113,709
862.54 5,113,710
862.59 5,113,698
864.63 5,113,711

CLASS 74

69 5,113,712
410 5,113,713
471 XY 5,113,714
473 R 5,113,715
493 5,113,716
502.6 5,113,717
846 5,113,718
856 5,113,719
5,113,720
5,113,721
5,113,722
867 5,113,723
5,113,724
869 5,113,725

CLASS 75

10.22 5,114,467
234 5,114,468
235 5,114,469
338 5,114,470
346 5,114,471
412 5,114,472
722 5,114,473
751 5,114,474

CLASS 81

60 5,113,726
423 5,113,727

CLASS 82

1.11 5,113,728
137 5,113,729
162 5,113,730

CLASS 83

35 5,113,731
154 5,113,732
169 5,113,733
409 5,113,734
508.3 5,113,735
575 5,113,736

CLASS 84

267 5,113,737
462 5,113,738
473 5,113,739
607 5,113,740
609 5,113,741
615 5,113,742
622 5,113,743
634 5,113,744

CLASS 89

14.05 5,113,745
36.02 5,113,700

CLASS 92

94 Re.33,928
165 PR 5,113,746
175 5,113,747

CLASS 96

114 R 5,113,549

CLASS 99

286 5,113,751
295 5,113,752
326 5,113,753
5,113,754
421 H 5,113,699
483 5,113,755

CLASS 100

48 5,113,756

CLASS 101

35 5,113,757
66 5,113,758
93.21 5,113,759
348 5,113,760
350 5,113,761
5,113,762

CLASS 102

202 5,113,763
202.9 5,113,764
336 5,113,765
427 5,113,766

CLASS 104

7.2 5,113,767
112 5,113,768

CLASS 105

422 5,113,769

CLASS 106

13 5,114,475
18.12 5,114,476
20 5,114,477
5,114,478
30 5,114,479
38.24 5,114,480
170 5,114,481
5,114,484
270 5,114,482
281.1 5,114,483
311 5,114,485
443 5,114,486
695 5,114,487

CLASS 110

187 5,113,770
263 5,113,771
345 5,113,772

CLASS 112

292 5,113,774
320 5,113,773

CLASS 114

39.1 5,113,775
102 5,113,776
144 R 5,113,777
219 5,113,702
256 5,113,778
270 5,113,779
286 5,113,780
361 5,113,781
362 5,113,782
5,113,791
365 5,113,783

CLASS 116

137 R 5,113,784

CLASS 118

58 5,113,701
5,113,785
314 5,113,786
400 5,113,787
663 5,113,788
715 5,113,789
723 5,113,790

CLASS 119

3 5,113,792
6.5 5,113,799
19 5,113,793
28 5,113,794
51.01 5,113,795
51.11 5,113,796
53 5,113,797
61 5,113,798
78 5,113,800
163 5,113,801

CLASS 122

41 5,114,672
379 5,113,802

CLASS 123

1 A 5,113,803
5,113,804
21 5,113,805
25 P 5,113,806
41.74 5,113,807
53 BP 5,113,808
58 BA 5,113,809
73 R 5,113,810
90.12 5,113,811
5,113,812
90.16 5,113,813
90.17 5,113,814
146.5 B 5,113,815
179.25 5,113,816
193.6 5,113,817
196 W 5,113,818
198 E 5,113,819
325 5,113,820
335 5,113,821
360 5,113,822
399 5,113,823
5,113,824
400 5,113,825
403 5,113,826
417 5,113,827
425 5,113,828
431 5,113,829
436 5,113,830
457 5,113,831
478 5,113,832
491 5,113,833
520 5,113,834
571 5,113,835
573 5,113,836
587 5,113,837
592 5,113,838
606 5,113,839
644 5,113,840

CLASS 124

23.1 5,113,841
65 5,113,842

CLASS 126

77 5,113,843
110 R 5,113,844
451 5,113,845

CLASS 127

1 5,114,488
2 5,114,489
5,114,490
38 5,114,491
42 5,114,492

CLASS 128

20 5,113,846
24 EL 5,113,848
24 R 5,113,847
26 5,113,849
32 5,113,850
33 5,113,851
5,113,852
200.28 5,113,853
201.23 5,113,854
203.12 5,113,855
205.27 5,113,856
207.18 5,113,857
419 P 5,113,858
419 PG 5,113,859
632 5,113,860
633 5,113,861
5,113,862
652 5,113,863
653.1 5,113,864
653.2 5,113,865
661.01 5,113,866
661.09 5,113,867
675 5,113,868
696 5,113,869
731 5,113,870
768 5,113,871
772 5,113,872
830 5,113,873
844 5,113,874
845 5,113,875
870 5,113,876
882 5,113,877

CLASS 131

198.2 5,113,878
276 5,114,493
329 5,113,879

CLASS 132

321 5,113,880

CLASS 134

1 5,113,881
5,114,494
11 5,114,495
13 5,114,496
19 5,113,882
21 5,114,497
60 5,113,883
122 R 5,113,884
167 C 5,113,885

172 5,113,886

CLASS 135

68 5,113,887

CLASS 136

258 5,114,498

CLASS 137

1 5,113,888
2 5,113,889
13 5,113,890
60 5,113,891
62 5,113,892
70 5,113,893
106 5,113,894
244 5,113,895
269 5,113,896
357 5,113,897
454.5 5,113,898
461 5,113,899
515.5 5,113,900
554 5,113,901
556 5,113,902
5,113,903
5,113,904
571 5,113,905
595 5,113,906
596.16 5,113,907
625.3 5,113,908
625.32 5,113,909
630.15 5,113,910
844 5,113,911

CLASS 138

99 5,113,912

CLASS 139

91 5,113,913
448 5,113,914

CLASS 140

112 5,113,915
147 5,113,916

CLASS 141

71 5,113,917
114 5,113,918

CLASS 144

34 R 5,113,919
286 R 5,113,920

CLASS 148

117 5,114,501
230 5,114,500
302 5,114,502
304 5,114,503
402 5,114,504
437 5,114,505
512 5,114,499

CLASS 149

88 5,114,506

CLASS 156

69 5,114,507
5,114,508
71 5,113,921
73.1 5,114,509
82 5,114,510
133 5,114,511
135 5,114,512
150 5,114,513
153 5,114,514
155 5,114,515
180 5,114,516
187 5,114,517
212 5,114,518
235 5,114,519
240 5,114,520
242 5,114,521
245 5,114,522
294 5,114,523
295 5,114,524
345 5,114,525
361 5,114,526
575 5,114,527
616.1 5,114,528
643 5,114,529
653 5,114,530
659.1 5,114,531
665 5,114,532

CLASS 159

6.1 5,114,533

CLASS 160

172 5,113,922

CLASS 162

9 5,114,534
5,114,535
55 5,114,536
146 5,114,537
158 5,114,538
184 5,114,539
247 5,114,540

CLASS 164

35 5,113,925
41 5,113,923
63 5,113,924
119 5,113,926

CLASS 165

13 5,113,927
38 5,113,928
61 5,113,929
78 5,113,930
5,113,931
104.26 5,113,932
111 5,113,933
173 5,113,934

CLASS 166

51 5,113,935
85 5,113,936
105.5 5,113,937
117.6 5,113,938
120 5,113,939
156 5,113,940
250 5,113,941
5,113,942
291 5,113,943

CLASS 169

13 5,113,944
15 5,113,945
24 5,113,946
46 5,113,947
49 5,113,948

CLASS 172

10 5,113,957
311 5,113,956

CLASS 173

13 5,113,950
075 5,113,951
177 5,113,949

CLASS 174

24 5,115,103
35 GC 5,115,104
36 5,115,105

CLASS 175

57 5,113,952
61 5,113,953
415 5,113,954

CLASS 177

25.15 5,113,955

CLASS 178

18 5,115,107

CLASS 180

9.4 5,113,958
11 5,113,959
65.5 5,113,960
116 5,113,961
167 5,113,962
197 5,113,963
224 5,113,964
300 5,113,965

CLASS 181

106 5,113,966
132 5,113,967
148 5,113,968

CLASS 182

2 5,113,969
45 5,113,971
214 5,113,973

CLASS 186

36 5,113,974
41 5,113,970

CLASS 188

24.12 5,113,975
32 5,113,976
69 5,113,977
73.31 5,113,978
280 5,113,979
299 5,113,980
371 5,113,981

CLASS 190

18 A 5,113,982
127 5,113,983

CLASS 193

3.3 5,113,984
53 F 5,113,985
5,113,986
58 B 5,113,987
98 5,113,988
5,113,989
5,113,991

CLASS 194

206 5,113,990

CLASS 198

347.3 5,113,992
369 5,113,993
395 5,113,994
409 5,113,995
441 5,113,996
460 5,113,997
465.4 5,113,998
497 5,113,999
499 5,114,000
844.2 5,114,001

CLASS 2.8

15 5,115,069

CLASS 200

1 B 5,115,108
86 A 5,115,109
517 5,115,106

CLASS 201

2.5 5,114,541
15 5,114,542

CLASS 204

59 F 5,114,544
67 5,114,545
128 5,114,547
129.46 5,114,548
149 5,114,549
180.1 5,114,550
5,114,551
181.7 5,114,552
182.1 5,114,553
182.4 5,114,554
183.2 5,114,555
192.12 5,114,556
206 5,114,557
224 R 5,114,558
298.05 5,114,559
299 R 5,114,560
421 5,114,561

CLASS 205

152 5,114,543

CLASS 206

0.84 5,114,014
45.14 5,114,002
204 5,114,003
222 5,114,004
328 5,114,005
349 5,114,006
373 5,114,007
387 5,114,008
425 5,114,009
453 5,114,010
499 5,114,011
523 5,114,012

CLASS 208

89 5,114,562
114 5,114,563
131 5,114,564
138 5,114,565
289 5,114,566
401 5,114,567

CLASS 209

72 5,114,546
170 5,114,568
425 5,114,569
535 5,114,015

CLASS 210

94 5,114,570
96.1 5,114,571
120 5,114,572
136 5,114,573
137 5,114,574
188 5,114,575
195.1 5,114,576
198.2 5,114,577
256 5,114,578
321.74 5,114,582
346 5,114,583
490 5,114,584
5,114,585
606 5,114,586
614 5,114,587
634 5,114,588
638 5,114,579
646 5,114,580
650 5,114,581
657 5,114,589
663 5,114,591
667 5,114,592
691 5,114,593
767 5,114,594
792 5,114,595
798 5,114,596

CLASS 211

26 5,114,016
34 5,114,017
41 5,114,018
5,114,019
50 5,114,020
54.1 5,114,021
71 5,114,022
107 5,114,023
175 5,114,024

CLASS 212

147 5,114,025
191 5,114,026

CLASS 213

57 5,114,027

CLASS 215

100 A 5,114,028
220 5,114,029
249 5,114,030
356 5,114,032

CLASS 219

10.67 5,115,110
56.21 5,115,111
69.2 5,115,112
89 5,115,113
99 5,115,114
121.63 5,115,115
202 5,115,116
254 5,115,117
390 5,115,118
469 5,115,119
659 5,114,590

CLASS 220

4.03 5,114,037
7 5,114,034
203 5,114,035
307 5,114,036
408 B1 4,832,228
575 5,114,038

CLASS 221

171 5,114,039

CLASS 222

1 5,114,040
6 5,114,041
67 5,114,042
82 5,114,033
86 5,114,043
94 5,114,044
105 5,114,045
108 5,114,046
129.1 5,114,047
135 5,114,048
153 5,114,049
192 5,114,050
5,114,051
207 5,114,052
345 5,114,053
389 5,114,054
542 5,114,055

CLASS 223

30 5,114,056
37 5,114,057

CLASS 224

32 R 5,114,060
103 5,114,058
209 5,114,059
252 5,114,061

CLASS 226

95 5,114,062
199 5,114,063

CLASS 227

9 5,114,064
175 5,114,065

CLASS 228

4.5 5,114,066

CLASS 229

92.1 5,114,067
123.2 5,114,068
125.15 5,114,069
216 5,114,013

CLASS 235

462 5,115,120
467 5,115,121
5,115,122

CLASS 236

49.3 5,114,070

CLASS 237

12.3 C 5,114,071

CLASS 238

15 5,114,073

CLASS 239

33 5,114,074
135 5,114,075
338 5,114,076
428.5 5,114,072
483 5,114,077
655 5,114,078

CLASS 241

3 5,114,079
19 5,114,131
69 5,114,080
79 5,114,081
121 5,114,082
153 5,114,083
178 5,114,084
195 5,114,085

CLASS 242

7.03 5,114,086
42 5,114,087
68.4 5,114,088
71.8 5,114,089
107 5,114,090
107.11 5,114,091
199 5,114,092
204 5,114,093

CLASS 244

3.22 5,114,094
3.28 5,114,095
7 B 5,114,096
119 5,114,097
121 5,114,098
130 5,114,099
134 C 5,114,100
173 5,114,101
207 5,114,102
209 5,114,103
219 5,114,104

CLASS 248

27.1 5,114,105
141 5,113,972
206.4 5,114,106
217.4 5,114,107
311.2 5,114,108
404 5,114,109
444 5,114,110
460 5,114,111
500 5,114,112
525 5,114,113

CLASS 249

60 5,114,114

CLASS 250

208.1 5,115,123
214 L 5,115,124
222.1 5,115,125
227.11 5,115,126
227.19 5,115,127
227.21 5,115,128
239 5,115,129
251 5,115,130
288 5,115,131
327.2 5,115,132
341 5,115,133
374 5,115,134
423 P 5,115,135
461.1 5,115,136
461.2 5,115,137
485.1 5,115,138
505.1 5,115,139
516.1 5,115,140
548 5,115,141
561 5,115,142
572 5,115,144

CLASS 251

26 5,114,115
129.15 5,114,116
149.9 5,114,117

CLASS 252

8.554 5,114,599
25 5,114,601
51.5 R 5,114,602
56 R 5,114,603
62.54 5,114,604
68 5,114,605
86 5,114,600
103 5,114,606
156 5,114,607
162 5,114,608
171 5,114,609
182.27 5,114,619
182.33 5,114,610
186.33 5,114,611
299.01 5,114,612
299.61 5,114,613
299.65 5,114,614
299.67 5,114,615
337 5,114,616
378 P 5,114,617
389.53 5,114,618
558 5,114,620
586 5,114,621
629 5,114,622
631 5,114,623

CLASS 254

8 R 5,114,118
134.3 R 5,114,119
323 5,114,120

CLASS 261

30 5,114,625
88 Re.33,929

CLASS 264

1.1 5,114,627
1.4 5,114,628
2.2 5,114,629
3.1 5,114,630
6 5,114,631
22 5,114,632
23 5,114,633
28 5,114,634
29.2 5,114,635
40.1 5,114,636
40.3 5,114,637
41 5,114,638
46.6 5,114,639
53 5,114,640
60 5,114,641
61 5,114,642
63 5,114,643
5,114,644
80 5,114,626
84 5,114,645
103 5,114,646
115 5,114,647
134 5,114,648
139 5,114,649
151 5,114,650
156 5,114,651
184 5,114,652
228 5,114,653
313 5,114,654
318 5,114,655
321 5,114,656
334 5,114,657
537 5,114,658
539 5,114,659
572 5,114,660

CLASS 266

48 5,114,121
186 5,114,122
236 5,114,123

CLASS 267

140.1 A 5,114,124
265 5,114,125

CLASS 269

32 5,114,126
41 5,114,127
296 Re.33,930

CLASS 270

1.1 5,114,129
11 5,114,128
53 5,114,130

CLASS 271

18.3 5,114,132
22 5,114,133
34 5,114,134
187 5,114,135
213 5,114,136
251 5,114,137
263 5,114,138
265 5,114,139

CLASS 273

1.5 R 5,114,141
26 C 5,114,142
26 R 5,114,143
72 R 5,114,144
73 F 5,114,145
144 A 5,114,146
146 5,114,147
153 S 5,114,148
176 A 5,114,149
186 R 5,114,150
246 5,114,151
5,114,152
292 5,114,153
310 5,114,154
371 5,114,155
419 5,114,156
434 5,114,157

CLASS 277

1 5,114,158
53 5,114,159
70 5,114,160
81 S 5,114,163
138 5,114,161
207 A 5,114,162

CLASS 280

37 5,114,164
47.331 5,114,165
87.042 5,114,166
297 5,114,167
414.1 5,114,168
423.1 5,114,169
477 5,114,170

612 5,114,171
633 5,114,172
5,114,173
636 5,114,174
675 5,114,175
691 5,114,176
707 5,114,177
716 5,114,178
741 5,114,179
743 5,114,180
750 5,114,181
779 5,114,182
781 5,114,183
784 5,114,184
801 5,114,185
821 5,114,186

CLASS 283

68 5,114,188
81 5,114,187

CLASS 285

7 5,114,189
53 5,114,190
115 5,114,191
319 5,114,250

CLASS 292

21 5,114,192
67 5,114,193
106 5,114,194
251.5 5,114,195
307 R 5,114,196
336.3 5,114,197

CLASS 293

120 5,114,198

CLASS 294

50.8 5,114,199
81.56 5,114,200

CLASS 296

26 5,114,202
50 5,114,203
136 5,114,204
152 5,114,205
201 5,114,206
204 5,114,207
216 5,114,208

CLASS 297

231 5,114,209
300 5,114,210
301 5,114,211
421 5,114,212

CLASS 299

81 5,114,213

CLASS 300

21 5,114,214

CLASS 303

113 TB 5,114,215
117 5,114,216

CLASS 307

10.3 5,115,145
272.3 5,115,146
311 5,115,147
355 5,115,151
475 5,115,148
5,115,149
5,115,150
5,115,434
490 5,115,152
491 5,115,153
494 5,115,154
571 5,115,143
607 5,115,155
638 5,115,156

CLASS 310

11 5,115,157
15 5,115,158
67 A 5,115,159
313 B 5,115,160
323 5,115,161
339 5,115,162

CLASS 313

36 5,115,163
346 DC 5,115,164

CLASS 315

92 5,115,165
111.21 5,115,166
5,115,167
223 5,115,168
241 R 5,115,169
247 5,115,347
370 5,115,170
371 5,115,171

CLASS 318

38 5,115,172
135 5,115,173
254 5,115,174
280 5,115,175
362 5,115,176
568.1 5,115,177
568.11 5,115,178
568.13 5,115,179
616 5,115,418
618 5,115,180
701 5,115,181

CLASS 320

14 5,115,182
61 5,115,183

CLASS 323

207 5,115,185
315 5,115,187
365 5,115,188

CLASS 324

121 R 5,115,189
142 5,115,190
158 R 5,115,191
207.12 5,115,192
5,115,193
207.13 5,115,195
207.2 5,115,194
207.22 5,115,186
220 5,115,196
245 5,115,197
339 5,115,198
533 5,115,199
718 5,115,200

CLASS 329

356 5,115,201

CLASS 330

9 5,115,202
10 5,115,205
251 5,115,203
257 5,115,204
261 5,115,206
284 5,115,207

CLASS 331

1 A 5,115,208
49 5,115,209
99 5,115,210
116 FE 5,115,211
117 R 5,115,212

CLASS 333

18 5,115,213
26 5,115,214
103 5,115,215
195 5,115,216
246 5,115,217
252 5,115,218

CLASS 335

216 5,115,219

CLASS 337

297 5,115,220

CLASS 338

21 5,115,221

CLASS 340

573 5,115,222
5,115,223
574 5,115,224
584 5,115,225
664 5,115,226
707 5,115,230
709 5,115,227
5,115,231
716 5,115,228
5,115,229
784 5,115,232
825.310 5,115,234
825.44 5,115,233
825.52 5,115,235
825.69 5,115,236
967 5,115,237
988 5,115,238

CLASS 341

15 5,115,239
51 5,115,240
143 5,115,241

CLASS 342

124 5,115,242
158 5,115,243
5,115,244
175 5,115,245
195 5,115,246
201 5,115,247
373 5,115,248

CLASS 343

753 5,115,249

CLASS 346

1.1 5,115,250
75 5,115,251
76 PH 5,115,252
5,115,253
5,115,254
5,115,255
108 5,115,256
5,115,257
157 5,115,259

CLASS 351

44 5,114,218
121 5,114,219
160 R 5,114,220
177 5,114,221
204 5,114,222

CLASS 353

101 5,114,223
122 5,114,224

CLASS 354

62 5,115,261
81 5,115,263
82 5,115,264
5,115,265
95 5,115,266
221 5,115,267
275 5,115,268
402 5,115,262
420 5,115,269
481 5,114,225

CLASS 355

18 5,115,270
53 Re.33,931
74 5,115,271
200 5,115,272
209 5,115,273
243 5,115,274
245 5,115,275
253 5,115,276
273 5,115,277
285 5,115,278
290 5,115,279
299 5,115,280
319 5,115,281
328 5,115,282

CLASS 356

5 5,114,226
152 5,114,227
222 5,114,228
237 5,114,229
328 5,114,231
346 5,114,232
354 5,114,233
358 5,114,234
372 5,114,230
401 5,114,235
5,114,236

CLASS 357

17 5,115,283
5,115,284
5,115,285
19 5,115,286
23.4 5,115,287
23.5 5,115,288
23.7 5,115,289
23.9 5,115,290
26 5,115,291
5,115,292
30 5,115,293
5,115,294
5,115,295
42 5,115,296
5,115,297
70 5,115,298
72 5,115,299
75 5,115,300

CLASS 358

12 5,115,301
41 5,115,302
51 5,115,303
60 5,115,305
5,115,306
75 5,115,304
98 5,115,307
102 5,115,308
133 5,115,309
140 5,115,311
5,115,312
183 5,115,313
5,115,314
185 5,115,310
186 5,115,315
188 5,115,316
191.1 5,115,317
213.19 5,115,321
213.23 5,114,237
228 5,115,319
296 5,115,320
304 5,115,322
330 5,115,323
335 5,115,324
806 5,115,325
440 5,115,326
461 5,115,327
474 5,115,328
709 5,115,349

CLASS 359

50 5,115,329
52 5,115,330
117 5,115,331
189 5,115,332
196 5,115,333
216 5,114,217
5,115,334
263 5,115,336
328 5,115,337
337 5,115,338
378 5,115,339
390 5,114,238
484 5,115,340
493 5,115,341
509 5,115,342
529 5,115,343
573 5,115,344
601 5,115,345
604 5,115,346
697 5,115,348
823 5,115,350
849 5,115,351
855 5,115,352
871 5,115,353
873 5,115,354
876 5,115,355

CLASS 360

51 5,115,356
75 5,115,357
5,115,358
77.05 5,115,359
77.08 5,115,360
85 5,115,361
92 5,115,362
104 5,115,363
113 5,115,364
132 5,115,365
133 5,115,366

CLASS 361

49 5,115,367
86 5,115,368
93 5,115,369
106 5,115,371
323 5,115,372
329 5,115,373
393 5,115,374
400 5,115,375
415 5,115,376
426 5,115,377
502 5,115,378

CLASS 362

23 5,115,379
33 5,115,380
61 5,115,381
105 5,115,382
109 5,115,383
301 5,115,384
358 5,115,385

CLASS 363

41 5,115,386
54 5,115,387
56 5,115,388
125 5,115,389

CLASS 364

146 5,115,390
152 5,115,391
413.17 5,115,394
424.1 5,115,395
431.04 5,115,396
431.05 5,115,397
443 5,115,398
449 5,115,399
474.15 5,115,403
474.24 5,115,400
474.37 5,115,401
550 5,115,405
551.01 5,115,406
5,115,407
754 5,115,408
841 5,115,409

CLASS 365

189.01 5,115,411
189.09 5,115,412
230.09 5,115,413

CLASS 366

6 5,114,239
129 5,114,240
162 5,114,241

CLASS 367

7 5,115,414
85 5,115,415
138 5,115,416

CLASS 368

19 5,115,417

CLASS 369

37 5,115,419
44.14 5,115,420
44.33 5,115,421
54 5,115,422
112 5,115,423

CLASS 370

54 5,115,425
60 5,115,426
5,115,427
68 5,115,428
84 5,115,429
85.6 5,115,430
94.1 5,115,431
5,115,432
94.3 5,115,433

CLASS 371

22.3 5,115,435
22.5 5,115,437
37.1 5,115,436
43 5,115,438

CLASS 372

37 5,115,439
38 5,115,440
45 5,115,441
5,115,442
46 5,115,443
50 5,115,444
75 5,115,445
93 5,115,446

CLASS 373

74 5,115,184
102 5,115,447

CLASS 374

128 5,114,242

CLASS 375

1 5,115,448
3 5,115,449
7 5,115,450
5,115,451
14 5,115,452
39 5,115,453
77 5,115,454
106 5,115,455

CLASS 376

146 5,114,661
159 5,114,662
233 5,114,663
245 5,114,664
255 5,114,665
272 5,114,666
299 5,114,667
442 5,114,668

CLASS 377

53 5,115,458

CLASS 378

35 5,115,456
45 5,115,457
88 5,115,459
150 5,115,460
165 5,115,461

CLASS 379

29 5,115,462
58 5,115,463
72 5,115,464
449 5,115,465

CLASS 380

9 5,115,466
44 5,115,467

CLASS 381

31 5,115,468
36 5,115,469
76 5,115,470
106 5,115,471
152 5,115,472
154 5,115,473
158 5,115,474

CLASS 382

8 5,115,475
22 5,115,476
5,115,477
50 5,115,478
56 5,115,479

CLASS 383

84 5,114,243

CLASS 384

103 5,114,244
112 5,114,245
275 5,114,246
461 5,114,247
473 5,114,248
622 5,114,249

CLASS 385

12 5,115,480
14 5,115,512
25 5,115,481
28 5,115,482
60 5,115,483
72 5,115,484
100 5,115,260
101 5,115,485
124 5,115,486
128 5,115,487
129 5,115,488
135 5,115,489

CLASS 392

454 5,115,491

CLASS 395

27 5,115,492
117 5,115,493
127 5,115,494
141 5,115,402
143 5,115,404
200 5,115,495
250 5,115,496
375 5,115,497
400 5,115,490
425 5,115,393
5,115,498
5,115,499
5,115,500
500 5,115,502
550 5,115,503
600 5,115,501
5,115,504
650 5,115,392
5,115,410
5,115,505
725 5,115,506
5,115,507
5,115,508
775 5,115,509
5,115,510
800 5,115,511
5,115,513

CLASS 400

120 5,114,251
124 5,114,252
5,114,253
207 5,114,254

CLASS 401

45 5,114,255
46 5,114,256
195 5,114,257
202 5,114,258

CLASS 402

80 R 5,114,259

CLASS 403

24 5,114,260
122 5,114,261
150 5,114,262
274 5,114,263
323 5,114,264
381 5,114,265

CLASS 404

6 5,114,266
83 5,114,267
92 5,114,268
95 5,114,284
122 5,114,269

CLASS 405

15 5,114,270
52 5,114,271
66 5,114,272
68 5,114,273
128 5,114,274
5,114,275
224 5,114,276
231 5,114,277
259.6 5,114,278
303 5,114,279

CLASS 406

18 5,114,280
39 5,114,281

CLASS 407

40 5,114,282

CLASS 408

103 5,114,283
115 R 5,114,285
226 5,114,286

CLASS 409

13 5,114,287

CLASS 410

34 5,114,288

CLASS 411

11	5,114,369
13	5,114,289
411	5,114,290

CLASS 412

8	5,114,291
11	5,114,292
30	5,114,293

CLASS 414

11	5,114,294
460	5,114,295
607	5,114,296
622	5,114,297
722	5,114,299
729	5,114,300
742	5,114,301
751	5,114,302
786	5,114,303
	5,114,304
787	5,114,305
790.4	5,114,306
793.1	5,114,307
799	5,114,308

CLASS 415

114	5,114,309
169.1	5,114,310
182.1	5,114,311
206	5,114,312

CLASS 416

93 A	5,114,313

CLASS 417

3	5,114,314
18	5,114,315
53	5,114,316
342	5,114,319
354	5,114,317
379	5,114,318
423.13	5,114,320
467	5,114,321

CLASS 418

55.6	5,114,322
58	5,114,323
61.3	5,114,324
171	5,114,325

CLASS 420

8	5,114,669

CLASS 422

24	5,114,670
28	5,114,671
46	Re.33,932
56	5,114,673
57	5,114,674
62	5,114,675
82.06	5,114,676
83	5,114,677
99	5,114,678
100	5,114,679
104	5,114,680
111	5,114,681
142	5,114,682
173	5,114,683
186	5,114,684
219	5,114,685
300	5,114,686

CLASS 423

32	5,114,687
219	5,114,688
230	5,114,689
244	5,114,690
	5,114,691
245.3	5,114,692
344	5,114,693
352	5,114,694
411	5,114,695
446	5,114,696
447.1	5,114,697
515	5,114,698
531	5,114,699
571	5,114,700
588	5,114,701
639	5,114,702

CLASS 424

5	5,114,703
57	5,114,704
66	5,114,705
70	5,114,706
78.12	5,114,709
85.1	5,114,710
	5,114,711
85.8	5,114,842
87	5,114,712
88	5,114,713
400	5,114,714
	5,114,715
401	5,114,716
	5,114,717
422	5,114,718
478	5,114,719
534	5,114,720
551	5,114,721
667	5,114,722
	5,114,707

CLASS 425

79	5,114,326
139	5,114,327
190	5,114,329
193	5,114,330
200	5,114,331
407	5,114,332
466	5,114,333
556	5,114,334
577	5,114,335

CLASS 426

74	5,114,723
249	5,114,724
270	5,114,725
289	5,114,726
302	5,114,727
427	5,114,728
580	5,114,729
593	5,114,730
595	5,114,731
605	5,114,732
	5,114,733
650	5,114,734

CLASS 427

7	5,114,735
30	5,114,736
36	5,114,737
37	5,114,738
38	5,114,770
40	5,114,739
	5,114,740
43.1	5,114,741
77	5,114,742
	5,114,743
96	5,114,744
113	5,114,745
118	5,114,746
164	5,114,747
180	5,114,748
226	5,114,749
	5,114,750
242	5,114,751
273	5,114,752
286	5,114,753
333	5,114,754
373	5,114,755
379	5,114,756
387	5,114,757
391	5,114,758
420	5,114,759
430.1	5,114,760

CLASS 428

4	5,114,761
34.5	5,114,762
34.9	5,114,763
35.5	5,114,764
35.7	5,114,765
	5,114,766
36.91	5,114,767
37	5,114,768
43	5,114,769
49	5,114,771
95	5,114,772
101	5,114,773
107	5,114,774
131	5,114,775
137	5,114,776
141	5,114,777
144	5,114,778
195	5,114,779
198	5,114,780
207	5,114,781
217	5,114,782
246	5,114,783
263	5,114,784
270	5,114,785
284	5,114,786
	5,114,787
328	5,114,788
408	5,114,789
419	5,114,790
422	5,114,791
425.9	5,114,792
447	5,114,793
516	5,114,794
521	5,114,795
553	5,114,796
611	5,114,797
659	5,114,798
692	5,114,799
694	5,114,800
	5,114,801

CLASS 429

13	5,114,802
30	5,114,803
66	5,114,804
112	5,114,805
126	5,114,806
152	5,114,807
172	5,114,808
192	5,114,809
194	5,114,810
	5,114,811
234	5,114,812

CLASS 430

5	5,114,813
46	5,114,814
58	5,114,815
93	5,114,817
97	5,114,818
106.6	5,114,819
109	5,114,820
110	5,114,821
114	5,114,822
120	5,114,823
137	5,114,824
159	5,114,825
192	5,114,816
	5,114,826
271	5,114,827
272	5,114,828
275	5,114,829
280	5,114,830
281	5,114,831
285	5,114,832
313	5,114,833
329	5,114,834
393	5,114,835
434	5,114,836
504	5,114,837
569	5,114,838

CLASS 431

125	5,114,336

CLASS 432

8	5,114,337
206	5,114,338

CLASS 433

24	5,114,339
26	5,114,340
39	5,114,341
95	5,114,342
173	5,114,343

CLASS 434

128	5,114,344
130	5,114,345
184	5,114,346
214	5,114,347
284	5,114,348
403	5,114,349
716	5,114,367

CLASS 435

6	5,114,839
	5,114,840
7.21	5,114,843
	5,114,844
7.9	5,114,841
13	5,114,845
34	5,114,846
41	5,114,847
101	5,114,848
	5,114,849
135	5,114,850
173	5,114,851
189	5,114,852
190	5,114,853
240.1	5,114,854
240.24	5,114,855
252.1	5,114,857
270	5,114,858
288	5,114,350

CLASS 436

50	5,114,859
69	5,114,860
85	5,114,861
169	5,114,862
518	5,114,863
528	5,114,864

CLASS 437

2	5,114,865
3	5,114,866
31	5,114,867
34	5,114,868
40	5,114,870
41	5,114,871
48	5,114,872
52	5,114,873
57	5,114,874
62	5,114,875
89	5,114,876
129	5,114,877
182	5,114,878
195	5,114,879
217	5,114,880

CLASS 439

13	5,114,351
22	5,114,352
65	5,114,353
92	5,114,354
101	5,114,355
133	5,114,356
183	5,114,357
266	5,114,358
271	5,114,359
341	5,114,360
348	5,114,361
460	5,114,362
491	5,114,363
497	5,114,364
540	5,114,365
585	5,114,366

CLASS 440

47	5,114,368

CLASS 441

65	5,114,370
129	5,114,371

CLASS 445

3	5,114,372
	5,114,373

CLASS 446

77	5,114,374
246	5,114,375
301	Re.33,933
369	5,114,376
487	5,114,377

CLASS 452

128	5,114,378
142	5,114,379
176	5,114,380

CLASS 453

57	5,114,381

CLASS 454

63	5,113,750
76	5,114,382
127	5,113,748
193	5,113,749

CLASS 455

9	5,115,514
71	5,115,515

CLASS 472

75	5,114,140

CLASS 474

18	5,114,383
212	5,114,384

CLASS 475

79	5,114,385
211	5,114,386

CLASS 482

51	5,114,387
52	5,114,388
53	5,114,389
54	5,114,390
62	5,114,391

CLASS 493

179	5,114,392
193	5,114,393
227	5,114,394
421	5,114,395

CLASS 494

37	5,114,396

CLASS 501

12	5,114,881
17	5,114,882
32	5,114,883
41	5,114,884
76	5,114,885
88	5,114,886
95	5,114,887
96	5,114,888
97	5,114,889
103	5,114,890
127	5,114,891
141	5,114,892
149	5,114,893

CLASS 502

62	5,114,894
84	5,114,895
111	5,114,896
	5,114,897
158	5,114,899
162	5,114,900
240	5,114,901
334	5,114,902
406	5,114,898

CLASS 503

209	5,114,903
227	5,114,904

CLASS 505

1	5,114,905
	5,114,906
	5,114,907
	5,114,908
	5,114,909
	5,114,910
	5,114,911
	5,114,912
	5,114,913
	5,114,914

CLASS 507

126	5,114,597
	5,114,598

CLASS 512

15	5,114,915

CLASS 514

2	5,114,916
8	5,114,917
11	5,114,918
	5,114,919
	5,114,920
12	5,114,921
	5,114,922
	5,114,923
18	5,114,925
	5,114,926
	5,114,927
25	5,114,928
29	5,114,929
30	5,114,930
46	5,114,931
58	5,114,932
202	5,114,933
212	5,114,934
228.8	5,114,935
233.8	5,114,936
238.2	5,114,937
242	5,114,938
248	5,114,939
	5,114,940
253	5,114,941
255	5,114,942
256	5,114,943
258	5,114,944
278	5,114,945
279	5,114,946
282	5,114,947
288	5,114,948
290	5,114,951
293	5,114,949
294	5,114,950
309	5,114,952
323	5,114,953
338	5,114,954
	5,114,955
356	5,114,956
	5,114,957
361	5,114,958
369	5,114,959
379	5,114,960
397	5,114,961
412	5,114,962
448	5,114,963
460	5,114,964
469	5,114,965
	5,114,966
475	5,114,967
482	5,114,968
514	5,114,969
526	5,114,970
530	5,114,971
	5,114,972
557	5,114,973
566	5,114,974
630	5,114,975
646	5,114,976
716	5,114,708
720	5,114,977
737	5,114,978
783	5,114,979

CLASS 521

51	5,114,980
55	5,114,981
59	5,114,982
84.1	5,114,987
95	5,114,983
121	5,114,984
130	5,114,985
131	5,114,986
159	5,114,989
167	5,114,988

CLASS 523

200	5,114,990
201	5,114,991
217	5,114,992
409	5,114,993
436	5,114,994
506	5,114,995
	5,114,996
508	5,114,997
	5,114,998

CLASS 524

47	5,114,999
	5,115,000
58	5,115,001
91	5,115,002
93	5,115,003
107	5,115,004
133	5,115,005
182	B1 4,701,486
251	5,115,006
267	5,115,007
271	5,115,008
306	5,115,009
410	5,115,010
419	5,115,011
456	5,115,012
457	5,115,013
506	5,115,014
507	5,115,015
513	5,115,016

CLASS 525

59	5,115,017
64	5,115,018
65	5,115,019
74	5,115,020
84	5,115,021
92	5,115,022
103	5,115,023
133	5,115,024
162	5,115,025
199	5,115,026
216	5,115,027
232	5,115,028
239	5,115,029
240	5,115,030
243	5,115,031
279	5,115,032
285	5,115,033
288	5,115,034
314	5,115,035
326.2	5,115,038
326.8	5,115,037
328.2	5,115,036
329.5	5,115,039
	5,115,040
332.1	5,115,041
390	5,115,043
392	5,115,044
397	5,115,042
420	5,115,045
425	5,115,046
444	5,115,047
457	5,115,048
474	5,115,095
479	5,115,049
537	5,115,050

CLASS 526

62	5,115,051
87	5,115,052
106	5,115,053
159	5,115,054
225	5,115,055
243	5,115,056
256	5,115,057
258	5,115,058
260	5,115,059
262	5,115,060
	5,115,061
279	5,115,062
287	5,115,063
301	5,115,064
304	5,115,065
346	5,115,066
348.1	5,115,067
348.5	5,115,068

CLASS 528

59	5,115,070
	5,115,071
67	5,115,072
83	5,115,073
98	5,115,074
99	5,115,075
125	5,115,076
	5,115,077
	5,115,078
171	5,115,079
190	5,115,080
196	5,115,081
219	5,115,082
230	5,115,083
	5,115,084
272	5,115,085
	5,115,086
322	5,115,087
336	5,115,088
353	5,115,089
	5,115,090
188	5,115,091
	5,115,092
	5,115,093
392	5,115,094

CLASS 530

322	5,115,096
326	5,115,097
331	5,115,098
	5,115,099
385	5,115,100
387.9	5,114,856
388.25	5,115,101

CLASS 554

162	5,114,624

CLASS 559

248	5,115,335
399	5,115,102

CLASS 569

275.4	5,115,424

CLASS 600

11	5,114,397
29	5,114,398

CLASS 604

22	5,114,399
53	5,114,400
	5,114,401
95	5,114,402
	5,114,414
96	5,114,403
110	5,114,404
	5,114,405
136	5,114,406
164	5,114,407
167	5,114,408
175	B1 4,772,269
192	5,114,409
195	5,114,410
203	5,114,411
247	5,114,412
266	5,114,413
319	5,114,415
321	5,114,416
349	5,114,417
365	5,114,418
385.1	5,114,419
385.2	5,114,420
403	5,114,421

CLASS 606

14	5,114,422
27	5,114,423
32	5,114,424
034	5,114,425

CLASSIFICATION OF DESIGNS

D2—	265	326,177		332	326,207		75	326,235		191	326,264		121	326,292		111	326,320
	276	326,178		536	326,208		91	326,236		217	326,265			326,293		112	326,321
	320	326,179			326,209		114	326,237		240	326,266		122	326,294		130	326,322
		326,180		612	326,210		129	326,239		243	326,267		123	326,295		145	326,323
		326,181		698	326,211	D11—	6	326,240		253	326,268		143	326,296		147	326,324
	502	326,182	D8—	10	326,212		27	326,241		299	326,269		144	326,297		183	326,325
	627	326,183		82	326,213		99	326,242	D15—	9.1	326,271		197	326,298			326,326
D3—	16	326,184		98	326,214		130.1	326,243		16	326,270			326,299		214	326,327
	48	326,188			326,215		149	326,244		144.1	326,272			326,300		218	326,328
	56	326,185		307	326,216		152	326,245			326,273		206	326,301	D25—	122	326,329
	76	326,187		310	326,219			326,246	D16—	102	326,274		217	326,302		139	326,330
D4—	108	326,189		373	326,220		221	326,248	D17—	22	326,275		219	326,303	D26—	25	326,332
	138	326,190		375	326,221	D12—	111	326,247	D18—	15	326,276		223	326,304		63	326,331
D6—	338	326,191	D9—	345	326,222		118	326,249		34	326,277	D22—	123	326,305		65	326,333
	381	326,192		418	326,225		130	326,250		54	326,278		140	326,306			326,334
	434	326,193		423	326,226		141	326,251	D19—	36	326,279			326,307			326,335
	446	326,194		433	326,227		147	326,252		88	326,280			326,308		98	326,336
	457	326,195		521	326,228		176	326,253		96	326,281	D23—	208	326,309		104	326,337
	467	326,196		522	326,223		217	326,254	D20—	10	326,282		213	326,310		129	326,338
	474	326,197			326,224		331	326,255	D21—	15	326,283		223	326,311	D28—	64	326,339
	477	326,198		526	326,217	D13—	129	326,257		33	326,284		256	326,312	D30—	119	326,340
		326,199			326,218		147	326,256		35	326,285			326,313	D34—	1	326,341
	479	326,200	D10—	18	326,238			326,258		52	326,286		278	326,314		7	326,342
	495	326,201		32	326,229		156	326,259		54	326,287		295	326,315			326,343
	510	326,202		33	326,230	D14—	113	326,260		71	326,288		312	326,316		11	326,344
	522	326,203		39	326,231		114	326,261			326,289		332	326,317		40	326,345
	596	326,204			326,232		138	326,262		81	326,290		335	326,318			326,346
	608	326,205			326,233		151	326,263		111	326,291	D24—	109	326,319		45	326,347
D7—	317	326,206		50	326,234												

CLASSIFICATION OF PLANTS

P.—	20	7,868		48	7,869		7,870		69	7,871		

5,113,703		5,114,451		5,115,079		5,113,705		5,113,843		5,113,891	
5,113,727		5,114,497		5,115,106		5,113,900		5,113,845		5,114,473	
5,113,745		5,114,515		5,115,146		5,113,974		5,113,85"		5,114,900	
5,113,786		5,114,530		5,115,185		5,114,058		5,113,96;		5,115,015	
5,113,863		5,114,566		5,115,198		5,114,094		5,114,037		5,115,025	
5,113,905		5,114,567		5,115,218		5,114,226		5,114,086	55 :	5,113,562	
5,113,935		5,114,595		5,115,225		5,114,373		5,114,100		5,113,656	
5,113,938		5,114,599		5,115,298		5,114,493		5,114,102		5,113,792	
5,113,939		5,114,624		5,115,387		5,114,517		5,114,134		5,113,800	
5,113,940		5,114,633		5,115,408		5,114,542		5,114,260		5,113,818	
5,113,941		5,114,634		5,115,415		5,114,626		5,114,277		5,113,928	
5,113,943		5,114,658		5,115,501		5,114,630		5,114,283		5,113,980	
5,113,968		5,114,688		5,115,503		5,114,652		5,114,527		5,114,001	
5,114,033		5,114,696		5,115,506		5,114,656		5,114,534		5,114,012	
5,114,066		5,114,723	49 :	5,113,560		5,114,665		5,114,580		5,114,120	
5,114,096		5,114,763		5,113,589		5,114,690		5,114,976		5,114,307	
5,114,118		5,114,879		5,113,770		5,114,698		5,115,087		5,114,398	
5,114,158		5,114,880		5,114,259		5,114,783		5,115,096		5,114,413	
5,114,194		5,114,899		5,114,743		5,114,944		5,115,226		5,114,448	
5,114,255		5,114,914	50 :	5,113,630		5,115,342		5,115,250		5,114,504	
5,114,378		5,114,932		5,114,754		5,115,485		5,115,340		5,114,528	
5,114,389		5,115,003		5,114,757		5,115,514		5,115,385		5,114,903	
5,114,425		5,115,009	51 :	5,113,627	53 :	5,113,608		5,115,407		5,115,330	
5,114,436		5,115,019		5,113,629		5,113,698	54 :	5,113,641		5,115,477	
5,114,445											

VOL
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GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 5,113,650
5,113,889
5,114,011
5,114,190
5,114,268
5,114,441
5,114,545
5,115,041
5,115,139
02 : 5,114,272
04 : 5,113,596
5,113,617
5,113,836
5,113,850
5,113,901
5,113,904
5,113,910
5,113,921
5,114,060
5,114,181
5,114,369
5,114,422
5,114,568
5,114,875
5,115,196
5,115,344
5,115,369
5,115,420
5,115,461
5,115,475
5,115,509
05 : 5,113,757
5,114,063
06 : Re.33,930
Re.33,931
5,113,536
5,113,541
5,113,554
5,113,571
5,113,587
5,113,606
5,113,628
5,113,647
5,113,648
5,113,658
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5,113,675
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5,113,696
5,113,699
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5,113,737
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5,113,765
5,113,775
5,113,787
5,113,789
5,113,795
5,113,804
5,113,806
5,113,861
5,113,862
5,113,865
5,113,886
5,113,888
5,113,908
5,113,946
5,114,009
5,114,022
5,114,043
5,114,044
5,114,046
5,114,049
5,114,087
5,114,101
5,114,111
5,114,127
5,114,129
5,114,140
5,114,146
5,114,166
5,114,185
5,114,191
5,114,192
5,114,193
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5,115,101
5,115,111
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5,115,175
5,115,202
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5,115,206
5,115,209
5,115,217
5,115,231
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5,115,311
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5,115,431
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5,115,471
5,115,482
5,115,497
5,115,513
08 : 5,113,604
5,113,784
5,113,832
5,113,869
5,113,936
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5,114,321
5,114,382
5,114,390
5,114,489
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5,115,150
5,115,189
5,115,223
5,115,305
5,115,326
5,115,359
5,115,360
5,115,428
09 : 5,113,572
5,113,660
5,113,670
5,113,713
5,113,736
5,113,764
5,113,771
5,114,039
5,114,065
5,114,067
5,114,072
5,114,098
5,114,115
5,114,286
5,114,310
5,114,407
5,114,447
5,114,464
5,114,478
5,114,618
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5,114,717
5,114,724
5,114,727
5,114,734
5,114,767
5,114,942
5,114,953
5,114,963
5,114,984
5,114,986
5,115,121
5,115,463
5,115,483
10 : 5,114,003
5,114,885
5,115,012
5,115,059
5,115,080
5,115,457
11 : 5,113,887
5,115,495
12 : 5,113,583
5,113,611
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5,113,933
5,114,047
5,114,099
5,114,137
5,114,149
5,114,159
5,114,170
13 : 5,113,802
5,113,831
5,113,973
5,114,057
5,114,074
5,114,187
5,114,195
5,114,269
5,114,536
5,114,646
5,114,686
5,114,708
5,114,773
5,114,781
5,114,787
5,114,830
5,115,427
15 : 5,113,712
16 : 5,114,059
5,114,073
5,114,091
5,114,368
5,114,404
5,115,277
17 : 5,113,545
5,113,546
5,113,557
5,113,561
5,113,590
5,113,600
5,113,671
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5,113,752
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5,113,883

5,113,952
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5,114,035
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5,114,152
5,114,153
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5,114,334
5,114,354
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5,114,481
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5,114,892
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5,114,895
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5,115,129
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5,115,233
5,115,315
5,115,347
5,115,375
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5,115,505
18 : 5,113,625
5,113,931
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5,113,947
5,114,183
5,114,336
5,114,358
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5,114,678
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5,114,948
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5,115,194
5,115,316
19 : 5,114,246
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5,115,203
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5,114,495
5,115,201
5,115,435
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5,114,685
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5,114,598
5,114,699
5,114,856
5,114,863
5,114,897
23 : 5,113,734
5,114,092
5,114,165
24 : 5,113,540
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5,113,714
5,113,779
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5,113,873
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5,114,589
5,114,645
5,114,674
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5,114,974
25 : 5,113,528
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5,113,700
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5,113,842
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5,114,161
5,114,247
5,114,270
5,114,401
5,114,581
5,114,702
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5,114,705
5,114,714
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5,114,790
5,114,864
5,114,905
5,115,084
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5,115,193
5,115,220
5,115,335
5,115,363
5,115,429
5,115,445
5,115,451
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5,115,459
5,115,481
5,115,499
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26 : 5,113,542
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5,113,644
5,113,651
5,113,657
5,113,686
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5,114,077
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5,114,107
5,114,144
5,114,168
5,114,203
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5,115,029
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5,115,162
5,115,176
5,115,346
5,115,380
27 : 5,113,555
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5,113,632
5,113,643

5,113,749
5,113,794
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5,114,391
5,114,408
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5,115,034
5,115,133
5,115,247
5,115,291
5,115,372
29 : 5,113,626
5,113,803
5,113,981
5,114,108
5,114,178
5,114,188
5,114,281
5,114,388
5,114,465
5,114,661
5,114,730
5,115,037
5,115,102
5,115,181
5,115,464
5,115,493
4,772,269
30 : 5,113,893
31 : 5,113,956
5,114,156
5,114,169
32 : 5,113,892
33 : 5,113,553
5,113,578
5,113,679
5,113,709
5,113,924
5,114,392
5,114,416
5,114,582
5,114,682
5,114,747
5,115,104
5,115,190
5,115,235
5,115,264
34 : 5,113,539
5,113,877
5,113,950
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5,114,112
5,114,233
5,114,432
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5,114,558
5,114,596
5,114,640
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5,114,704
5,114,735
5,114,738
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5,114,761
5,114,786
5,114,805
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5,114,978
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5,114,995
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5,114,997
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5,115,018
5,115,028
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5,115,049
5,115,066
5,115,086
5,115,188

5,115,210
5,115,230
5,115,234
5,115,243
5,115,244
5,115,294
5,115,301
5,115,309
5,115,338
5,115,391
5,115,404
5,115,417
5,115,430
5,115,432
5,115,436
5,115,441
5,115,442
5,115,452
5,115,453
5,115,487
5,115,488
35 : 5,113,966
5,114,300
5,114,579
5,114,612
5,115,112
36 : Re.33,926
5,113,531
5,113,558
5,113,565
5,113,602
5,113,631
5,113,661
5,113,663
5,113,674
5,113,801
5,113,854
5,113,874
5,113,876
5,113,920
5,113,985
5,113,986
5,114,006
5,114,017
5,114,018
5,114,052
5,114,128
5,114,135
5,114,147
5,114,151
5,114,171
5,114,217
5,114,266
5,114,287
5,114,343
5,114,344
5,114,346
5,114,365
5,114,377
5,114,394
5,114,405
5,114,409
5,114,415
5,114,418
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5,114,477
5,114,492
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5,114,563
5,114,584
5,114,610
5,114,636
5,114,643
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5,114,651
5,114,672
5,114,679
5,114,689
5,114,720
5,114,736
5,114,759
5,114,766
5,114,810
5,114,811
5,114,818
5,114,821
5,114,826
5,114,833
5,114,850
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5,114,872
5,114,884
5,114,902
5,114,946
5,114,969
5,115,017
5,115,042
5,115,043
5,115,056
5,115,090
5,115,095
5,115,105
5,115,120
5,115,122

5,115,136
5,115,143
5,115,163
5,115,215
5,115,224
5,115,229
5,115,237
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5,115,260
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5,115,276
5,115,336
5,115,339
5,115,356
5,115,368
5,115,384
5,115,396
5,115,437
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5,115,465
5,115,492
5,113,529
5,113,532
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5,113,781
5,114,019
5,114,330
5,114,421
5,114,625
5,114,827
5,114,851
5,114,951
5,114,981
5,115,131
5,115,165
5,115,195
5,115,228
5,115,484
5,115,500
4,832,228
38 : 5,113,603
5,114,312
39 : 5,113,534
5,113,547
5,113,582
5,113,610
5,113,639
5,113,649
5,113,659
5,113,669
5,113,688
5,113,847
5,113,885
5,113,898
5,113,970
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5,114,048
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5,114,335
5,114,375
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5,114,947
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5,114,991
5,114,999
5,115,007
5,115,061
5,115,063
5,115,078
5,115,083
5,115,107
5,115,114
5,115,145

5,115,184
5,115,333
5,115,377
5,115,394
4,701,486
40 : 5,113,544
5,113,702
5,113,942
5,114,239
5,114,273
5,115,053
5,115,054
5,115,068
5,115,093
41 : 5,113,537
5,113,755
5,113,923
5,113,976
5,114,010
5,114,202
5,114,251
5,114,890
5,115,502
42 : 5,113,535
5,113,549
5,113,551
5,113,591
5,113,694
5,113,728
5,113,768
5,113,858
5,113,911
5,113,916
5,113,925
5,113,962
5,113,977
5,113,999
5,114,005
5,114,027
5,114,029
5,114,030
5,114,122
5,114,162
5,114,278
5,114,357
5,114,362
5,114,426
5,114,438
5,114,449
5,114,459
5,114,471
5,114,472
5,114,501
5,114,502
5,114,510
5,114,548
5,114,552
5,114,607
5,114,648
5,114,666
5,114,751
5,114,756
5,114,792
5,114,798
5,114,806
5,114,813
5,114,843
5,114,858
5,114,919
5,114,921
5,114,964
5,114,972
5,114,982
5,115,023
5,115,060
5,115,071
5,115,127
5,115,160
5,115,249
5,115,299
5,115,341
5,115,406
5,115,472
4,166,388
44 : 5,113,982
5,114,104
45 : 5,113,607
5,113,708
5,113,746
5,114,444
5,114,739
5,115,411
46 : 5,114,687
5,115,116
47 : 5,113,751
5,113,948
5,113,971
5,114,016
5,114,028
5,114,929
5,115,134
48 : Re.33,928
5,113,548
5,113,580
5,113,588
5,113,616

05 : 326,216
06 : 326,183
326,194
326,230
326,247
326,257
326,267
326,269
326,277
326,283
326,290
326,296
326,303
326,329
326,340
09 : 326,206
326,332
326,333
10 : 326,227

11 : 326,189
12 : 326,191
326,285
22 : 326,301
326,309
24 : 326,286
25 : 326,193
326,271
326,327
13 : 326,207
15 : 17 :
26 : 326,221
27 : 326,201
326,211
326,219
326,244
326,245
326,246
28 : 326,263
29 : 326,237
326,262
326,321
18 : 326,336
19 : 326,215
20 : 326,241

326,316
326,317
326,318
326,302
326,309
326,286
326,193
326,271
326,249
326,310
326,221
326,201
326,325
326,326
326,344
326,263
326,237
326,298
326,299
326,300
326,334

326,335
33 : 326,188
34 : 326,185
326,222
326,319
35 : 326,213
326,253
36 : 326,200
326,208
326,209
326,210
326,212
326,217
326,218
326,240
326,265
326,266
326,331
326,339

326,347
37 : 326,276
39 : 326,181
326,220
326,231
326,235
326,250
326,322
326,323
326,342
326,343
41 : 326,180
42 : 326,205
326,225
326,226
326,254
326,256
326,330

45 : 326,252
326,341
47 : 326,195
326,203
48 : 326,238
326,243
326,279
326,312
326,313
49 : 326,304
51 : 326,345
53 : 326,261
55 : 326,192
326,196
326,197
326,198
326,199
326,287

PLANT PATENTS

06 : 7,868

VOL
1138

SS
3

MY
19

19 92

UMI

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ISS
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MY
19

1992

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VOL

1138

ISS

3

VOL
1138

ISS
4

MY
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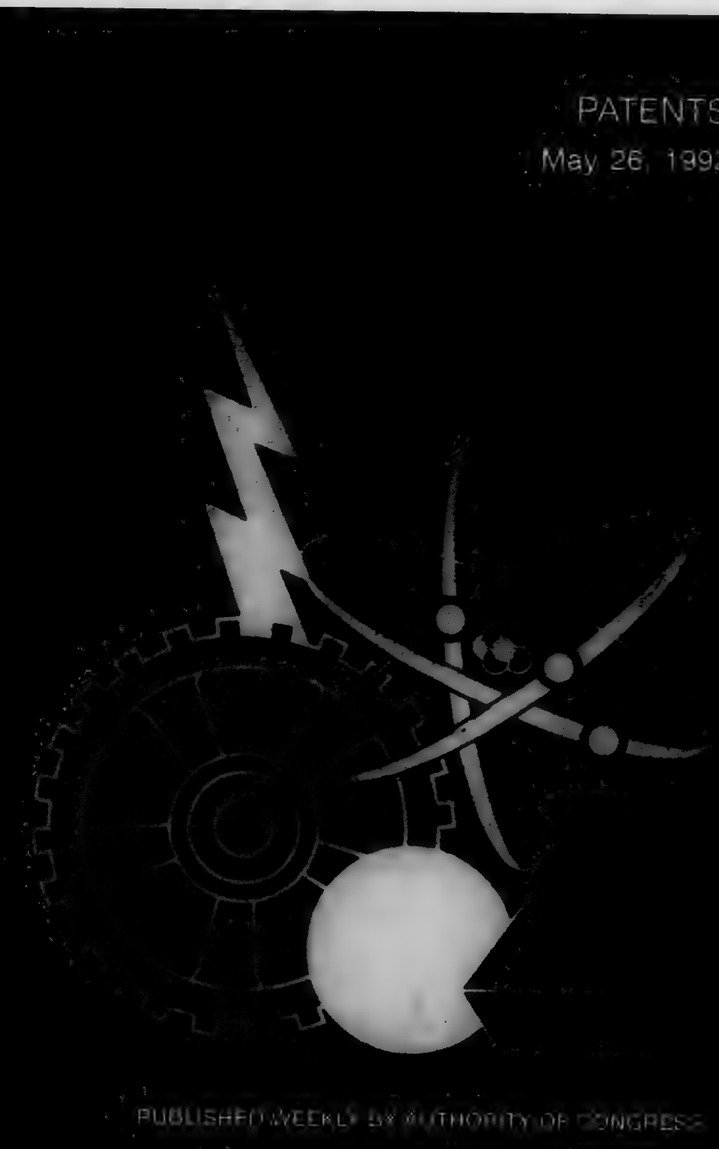
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PATENTS

May 26, 1992



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VOL
1138
ISS
4
MY
26
1992
UMI

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UNITED STATES PATENT AND TRADEMARK OFFICE
May 26, 1992 Volume 1138 Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1138 OG 48
Notice of Maintenance Fees Payable	1138 OG 48
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1138 OG 49
Notification of Acceptance of Delayed Payment of Maintenance Fee	1138 OG 53
Reissue Applications Filed	1138 OG 53
Requests for Reexaminations Filed	1138 OG 54
Public Advisory Committee for Trademark Affairs	1138 OG 54
CD-ROM Patent Images by Technology	1138 OG 54
Notice	1138 OG 54
Patent Terms Extended Under 35 U.S.C. §156	1138 OG 55
Status of PTO Services	1138 OG 56
Patents Certificates of Correction	1138 OG 57
Notice of Proposed Rulemaking	1138 OG 58
Special Boxes for Mail	1138 OG 73
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1138 OG 74
Patent Examining Corps	1138 OG 76
Reexaminations	2089
Reissue Patents Granted (33,934)	2091
Plant Patents Granted (7,872)	2095
Patents Granted	
General and Mechanical (5,115,516)	2097
Chemical (5,116,388)	2395
Electrical (5,117,065)	2601
Design Patents Granted (326,348)	2757
Index of Patentees	PI 1
Indices of Reissue, Reexaminations, Design, and Plant Patents	PI 87
Classification of	
Patents (Including Reissues and Reexaminations)	PI 95
Designs, and Plants Applications	PI 99
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 101
Designs and Plant Applications	PI 103
Change of Address Form	PI 105
Subscription Order Form	PI 107

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VOL
1138
ISS
4
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1992
UMI

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	600.00
—Corresponding prior U.S. national application filed	400.00
—Supplemental search fee, per additional invention	160.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	440.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	650.00
—Additional examination fee, per additional invention	220.00
International fees	
Basic fee	525.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	127.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	161.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	310.00	620.00
USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA .	460.00	920.00
Filing with an EPO or JPO search report	400.	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on May 23, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,831,664 through 4,833,728
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 21, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,517,685 through 4,519,096
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9f)	$450.00
By other than a small entity	$900.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9f)	$905.00
By other than a small entity	$1,810.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§1.9(f))	$1,365.00
By other than a small entity	$2,730.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity ($1.9f)	$65.00
By other than a small entity	$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable $600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 22, 1992
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,437,192	06/476,041	3/20/84
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VOL
1138
ISS
4
MY
26
1992
UMI

Patent Number	Serial Number	Issue Date
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Patent Number	Serial Number	Issue Date
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Patent Number	Serial Number	Issue Date
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4,732,994	07/061,630	3/22/88
4,732,999	06/877,784	3/22/88
4,733,011	06/767,015	3/22/88
4,733,012	07/026,834	3/22/88
4,733,023	06/908,959	3/22/88
4,733,025	07/075,380	3/22/88
4,733,026	07/010,985	3/22/88
4,733,027	07/004,968	3/22/88
4,733,028	07/006,918	3/22/88
4,733,034	07/003,609	3/22/88
4,733,036	06/931,980	3/22/88
4,733,050	06/947,657	3/22/88
4,733,054	06/930,898	3/22/88
4,733,057	06/853,783	3/22/88
4,733,070	06/806,340	3/22/88
4,733,080	06/835,250	3/22/88
4,733,087	06/876,467	3/22/88
4,733,096	06/941,742	3/22/88
4,733,109	06/825,469	3/22/88
4,733,120	07/065,887	3/22/88
4,733,123	06/918,435	3/22/88
4,733,163	07/000,007	3/22/88
4,733,170	06/867,697	3/22/88
4,733,180	06/854,775	3/22/88
4,733,184	07/001,294	3/22/88
4,733,186	06/917,603	3/22/88

Patent Number	Serial Number	Issue Date
4,733,190	07/026,305	3/22/88
4,733,193	06/881,360	3/22/88
4,733,209	06/879,285	3/22/88
4,733,212	07/043,958	3/22/88
4,733,214	06/932,461	3/22/88
4,733,216	06/925,031	3/22/88
4,733,220	06/920,936	3/22/88
4,733,236	06/807,154	3/22/88
4,733,240	07/004,011	3/22/88
4,733,244	06/771,196	3/22/88
4,733,259	07/025,956	3/22/88
4,733,292	06/893,872	3/22/88
4,733,305	06/712,031	3/22/88
4,733,309	06/890,522	3/22/88
4,733,322	07/022,541	3/22/88
4,733,334	07/036,585	3/22/88
4,733,342	07/057,326	3/22/88
4,733,353	06/808,795	3/22/88
4,733,361	06/783,556	3/22/88
4,733,383	06/933,129	3/22/88
4,733,391	06/744,010	3/22/88
4,733,393	06/808,418	3/22/88
4,733,394	06/855,141	3/22/88
4,733,395	06/852,336	3/22/88
4,733,400	06/827,933	3/22/88

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,401,545	06/332,839	8/30/83	12/21/81	3/19/92
4,401,815	06/231,047	8/30/83	2/03/81	3/19/92
4,615,809	06/734,021	10/07/86	5/14/85	2/10/92
4,676,465	06/690,776	6/30/87	1/11/85	10/07/91
4,686,302	06/677,036	8/11/87	11/30/84	12/23/91
4,687,792	06/695,985	8/18/87	1/29/85	9/30/91

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,176,316, Re. S.N. 07/568,668, Filed Aug. 15, 1990, Cl. 380/34, SECURE SINGLE SIDEBAND COMMUNICATION SYSTEM USING MODULATED NOISE SUBCARRIER, Mortimer Rogoff, et. al., Owner of Record: *ITT Corp., New York. N.Y.*, Attorney or Agent: Patrick M. Hogan, Ex. Gp.: 2202

4,831,926, Re. S.N. 07/870,267, Filed Apr. 17, 1992, Cl. 101/138, PROCESSING PAPER AND OTHER WEBS, Kenneth A. Bowman, et. al., Owner of Record: *Strachan Henshaw Machinery, Ltd, Bristol, U.K.*, Attorney or Agent: Ross F. Hunt, Jr., Ex. Gp.: 3307

4,855,725, Re. S.N. 07/819,334, Filed Aug. 7, 1991, Cl. 340/706, MICROPROCESSOR BASED SIMULATED BOOK, Emilio A. Fernandez, Owner of Record: *Inventor*, Attorney or Agent: Laurence J. Marhoefer, Ex. Gp.: 2609

4,887,133, Re. S.N. 07/806,874, Filed Dec. 12, 1991, Cl. 355/321, PRINTER, Kunihiko Ikeda, et. al., Owner of Record: *Ricoh Co., Ltd., Tokyo, Japan*, Attorney or Agent: Robert M. Bauer, Ex. Gp.: 2105

4,917,409, Re. S.N. 07/869,812, Filed Apr. 16, 1992, Cl. 285/334, TUBULAR CONNECTION, Doyle E. Reeves, Owner of Record: *Hydril Co., Houston, Tex.*, Attorney or Agent: Jennings B. Thompson, Ex. Gp.: 3501

4,917,504, Re. S.N. 07/869,954, Filed Apr. 17, 1992, Cl. 381/187, COMMUNICATIONS HEADSET, Charles G. Scott, et. al., Owner of Record: *Plantronics, Inc., Santa Cruz, Calif.*, Attorney or Agent: Terry D. Morgan, Ex. Gp.: 2601

4,918,322, Re. S.N. 07/870,580, Filed Apr. 17, 1992, Cl. 379/88, VOICE/DATA-FORMATTED TELEPHONE INFORMATION STORAGE AND RETRIEVAL SYSTEM, Walter W. Winter, et. al., Owner of Record: *Golden Enterprises, Inc., Melbourne, Fla.*, Attorney or Agent: Charles E. Wands, Ex. Gp.: 2601

4,918,516, Re. S.N. 07/869,792, Filed Apr. 16, 1992, Cl. 358/86, CLOSED CIRCUIT TELEVISION SYSTEM HAVING SEAMLESS INTERACTIVE TELEVISION PROGRAMMING AND EXPANDIBLE USER PARTICIPATION, Michael J. Freeman, Owner of Record: *ACTV, Inc., Port Washington, N.Y.*, Attorney or Agent: Lawrence G. Kurland, Ex. Gp.: 2611

4,921,600, Re. S.N. 07/868,536, Filed Apr. 14, 1992, Cl. 210/169, FILTER CARTRIDGE FOR SWIMMING POOLS AND SPAS, Paul J. Meissner, Owner of Record: *Inventor*, Attorney or Agent: Ira M. Siegel, Ex. Gp.: 1308

4,928,907, Re. S.N. 07/870,505, Filed Apr. 17, 1992, Cl. 244/6, COMPOUND HELICOPTER WITH NO TAIL ROTOR, Daniel R. Zuck, Owner of Record: *Y and B Investment Corp., Sylmar, Calif.*, Attorney or Agent: John E. Wagner, Ex. Gp.: 3105

4,996,249, Re. S.N. 07/870,407, Filed Apr. 17, 1992, Cl. 523/144, METHOD TO IMPROVE FLOWABILITY OF RESIN COATED SAND, Calvin K. Johnson, et. al., Owner of Record: *Acme Resin Corp., Westchester, Ill.*, Attorney or Agent: Stanley M. Parmerter, Ex. Gp.: 1501

5,026,323, Re. S.N. 07/870,379, Filed Apr. 17, 1992, Cl. 464/175, STRUCTURE FOR MOUNTING BOOT, Yoshikazu Fukumura, et. al., Owner of Record: *NTN Corp., Osaka, Japan*, Attorney or Agent: Juan Carlos A. Marquez, Ex. Gp.: 2405

5,053,411, Re. S.N. 07/868,750, Filed Apr. 14, 1992, Cl. 514/259, N-ARYL-N-[4-(1-HETERCYCLICALKYL) PIPERIDINYL] AMIDES AND PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING SUCH COMPOUNDS, Jerome R. Bagley, et. al., Owner of Record: *Anaquest, Inc., Murray Hill, N.J.*, Attorney or Agent: R. Hain Swope, Ex. Gp.: 1205

5,055,334, Re. S.N. 07/859,060, Filed Mar. 27, 1992, Cl. 428/99, HEAT PROTECTIVE COVER FOR HOT WATER PIPES,

Gabriel V. Lechuga, Owner of Record: *Inventor*, Attorney or Agent: Robert J. Schaap, Ex. Gp.: 1508

5,075,997, Re. S.N. 07/868200, Filed Apr. 14, 1992, Cl. 42/89, DISK FOR CARRYING PROPELLANT CHARGES, Harry M. Haytayan, Owner of Record: *Inventor*, Attorney or Agent: Milton E. Gilbert, Ex. Gp.: 2201

5,093,537, Re. S.N. 07/869,572, Filed Apr. 15, 1992, Cl. 568/862, METHOD FOR THE MANUFACTURE OF 1,3-PROPANEDIOL, Jerry D. Unruh, et. al., Owner of Record: *Hoechst Celanese Corp., Somerville, N.J.*, Attorney or Agent: Donald R. Cassady, Ex. Gp.: 1206

5,098,096, Re. S.N. 07/867,529, Filed Apr. 13, 1992, Cl. 273/63E, BOWLING BALL, Joseph A. Gentiluomo, Owner of Record: *Inventor*, Attorney or Agent: None, Ex. Gp.: 3304

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,860,952, Reexam. No. 90/002,701, Requested Apr. 20, 1992, Cl. 358/019, VIDEO TIME BASE CORRECTOR, Michael W. Tallent, et. al., Owner of Record: *Video Patents, Ltd., San Jose, Calif.*, Attorney or Agent: Guy W. Chambers & Warren Kujawa, Townsend & Townsend, San Francisco, Calif., Ex. Gp.: 2602, Requester: FDR, Natick, Mass.

4,890,615, Reexam. No. 90/002,702, Requested Apr. 20, 1992, Cl. 606/146, ATHROSCOPIC SUTURING INSTRUMENT, Richard B. Caspari, et. al., Owner of Record: *Linvatec Corp., Largo, Fla.*, Attorney or Agent: J. Dean Lechtenberger, Arnold, White & Durkee, Houston, Tex., Ex. Gp.: 3309, Requester: Owner

5,015,111, Reexam. No. 90/002,698, Requested Apr. 8, 1992, Cl. 401/052, ERASER DISPENSER AND WRITING INSTRUMENT EQUIPPED WITH ERASER DISPENSER, Tor Petterson, Owner of Record: *Pentel of America Ltd., Torrance, Calif.*, Attorney or Agent: Adams & Wilks, New York, N.Y., Ex. Gp.: 3301, Requester: David O'Reilly, Calabasas, Calif.

5,081,425, Reexam. No. 90/002,700, Requested Apr. 21, 1992, Cl. 330/207P, VSWR ADAPTIVE POWER AMPLIFYER SYSTEM, Charles R. Jackson, et. al., Owner of Record: *E-Systems, Inc., Dallas, Tex.*, Attorney or Agent: Harold E. Meier, Gardere & Wynne, Dallas, Tex., Ex. Gp.: 2502, Requester: Owner

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U.S. Department of Commerce
Office of the Assistant Secretary and Commissioner of Patents and Trademarks

Public Advisory Committee for Trademark Affairs

Agency: Patent and Trademark Office, Commerce
Action: Notice of Renewal
Summary: In accordance with the provisions of the Federal Advisory Committee Act, 5 U.S.C. App. (1976), and after consultation with GSA, it has been determined that the renewal of the charter of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law.
Supplementary Information: The Committee was first established in September 1970, and its latest renewal was signed on April 3, 1992. The Committee's purpose is to advise the Patent and Trademark Office concerning steps which can be taken to increase the efficiency and effectiveness of administration of the Trademark Act and to provide a continuing source of knowledge from the private sector to the Government in the area of international and domestic trademark law.

Committee members are drawn from the trademark bar, business and industry, academia, the public at large, and users of the public search room, and are selected by the Assistant Secretary of Commerce and the Commissioner of Patents and Trademarks to assure a balanced representation among members of the trademark community. The Committee will function solely as an advisory body, and in compliance with the provisions of the Federal Advisory Committee Act.
For Further Information Contact: Lynne Beresford, Committee Control Officer, Office of the Assistant Commissioner for Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231, telephone: (703) 305-9464, or Jan Jivatodi, Committee Management Analyst, U.S. Department of Commerce, Washington, D.C. 20230, telephone: (202) 377-4299.

April 24, 1992 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner for Patents and Trademarks

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CD-ROM Patent Images by Technology

The U.S. Patent and Trademark Office announces the implementation of a demonstration project to provide classified sets of patent images in CD-ROM format. The classified sets are collections of U.S. patents which, by virtue of their placement in the U.S. Patent Classification System, represent meaningful technological groupings.

The two classified sets selected for this project are: Genetic Engineering, as defined by Class 935 and Class 435, subclass 172.3; and Acid Rain, as defined by Class 55, subclass 73 and Class 423, subclasses 220-234 and 242-244.

The sets will contain:

1) current classification information
2) full images for all patents in the set, and
3) full text for those patents in the set where the text is available in electronic format, i.e., since 1971

All available text and classification information will be indexed and searchable, thus allowing all patents in the set to be retrieved by their associated classification information, and/or by words in the text. Images of all patents in the set will be stored in numeric sequence on the discs and may be located on a disc other than the disc where the text and indexes are stored. Images may be retrieved by patent number after loading the appropriate image disc.

It is anticipated that the demonstration CD-ROM sets will be available July 1992. Each set will consist of approximately three discs. They are available for order now by the public for $150 per set. This price represents the marginal cost to the U.S. Patent and Trademark Office to produce and distribute these discs based upon the volume of orders anticipated.

Purchasers will be invited to participate in a voluntary survey to be conducted in October 1992 to assess the usefulness of this demonstration product.

For further information, or to request an order form, please write or call:

U.S. Patent and Trademark Office
Office of Electronic Products and Service
Crystal Mall 2, Room 304
Washington, D.C. 20231
(703) 305-5652

Move Notice

On April 13, 1992, the following organizations were moved to the new **Center for Patent and Trademark Information Services** (CPTIS) suite located in **Room 2C04, Crystal Plaza 2.** The new CPTIS suite has one central telephone number: **703/308-3924.** These employees from the Director's Office and the three

Divisions formerly were located in separate buildings. By consolidating employees and resources into a central location, adjacent to the new Public Service Branch suite, CPTIS will be able to serve their customers more conveniently and efficiently.

Center for Patent and Trademark Information Services
Room 2C04 - Crystal Plaza 2
703/308-3924

Carole A. Shores, Director

Patent and Trademark Depository Library Program

Martha Sneed, Acting Manager

Public Search Services Division

Facilities and File Maintenance

Roselyn Jones, Supervisory Quality Control Assistant

Public Information Services Division

Sharon L. Carver, Acting Manager

Public User Training Branch

Diane Lewis, Acting Chief

Public Service Branch

Sharon Furbush, Chief

This Branch moved earlier to the adjacent suite, Room 2C06. Their central telephone number is 308-HELP.

Public inquiries should be directed to:

703-308-HELP for Personal Assistance

703/557-INFO for Automated Information
(Requires touch-tone telephone)

Patent Terms Extended Under 35 U.S.C. §156

Certificates extending the terms of the following patents were issued on April 24, 1992.

U.S. Patent No. Re. 30,577; Reissued April 14, 1981, to Norbert Busch et. al.; Owner of Record: *Riom Laboratories C.E.R.M.*; Title: ETHER OF N-PROPANOL AMINE; Classification: 548/569; Product Trade Name: Bepadin/Vascor; Term Extended: Two years.

U.S. Patent No. Re. 32,969; Reissued June 27, 1989 to Seymour F. Trager, et. al.; Owner of Record: *Inventors*, Title: INJECTIONABLE VISCOELASTIC OPTHALMIC GEL; Classification: 424/81; Product Trade Name: Orcolon; Term Extended: 931 days

U.S. Patent No. 4,337,201; Granted June 29, 1982, to Edward W. Petrillo, Jr.; Owner of Record: *E. R. Squibb & Sons, Inc.*; Title: PHOSPHINYLALKANOYL SUBSTITUTED PROLINES; Classification: 548/413; Product Trade Name: Monopril; Term Extended: Two years.

U.S. Patent No. 4,410,520; Granted: Oct. 18, 1983, to Jeffrey W. H. Watthey; Owner of Record: *Ciba-Geigy Corp.*; Title: 3-AMINO-[1]-BENZAZEPIN-2-ONE-1-ALKANOIC ACIDS; Classification: 514/212; Product Trade Name: Lotensin; Term Extended: Two years.

U.S. Patent No. 4,701,460; Granted: Oct. 20, 1987, to Hassan A. El-Sayad et. al.; Owner of Record: *Burroughs Wellcome Co.*; Title: LONG DURATION NEUROMUSCULAR BLOCKING AGENTS; Classification: 514/308; Product Trade Name: Nuromax; Term Extended: 137 days.

Status of PTO Services

The following is an update of the status of PTO services for April 1992:

Service Item	FY 1992 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	17
Trademarks	30	40
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	14 Hours
Window Coupons	5	1
Mail Coupons	12	5
Letter Orders	16	15
Electronic Ordering Service (EOS)	11	2
Certified Copies:		
Trademark Registrations	21	20
Patent Applications-As-Filed	17	16
Patent Applications Expedited	7	7
Patent File-Wrapper/Contents	N/A	22
TM Applications-As-Filed	17	13
TM Applications Expedited	7	5
TM File Wrapper/Contents	N/A	33
Trademark Search Library:		
Filing Pending Marks	23	30
Filing Reg. Certificates	Issue Date + 2 days	Issue + 1
Filing Temp. Drawings	8	15
Assignments:		
Recording Patents-New Applications	20	18
Recording Patents-Mail Room Recpts.	20	17
Return Patents-New Applications	34	32
Return Patents-Mail Room Recpts.	34	28
Recording Trademarks	20	13
Returning Trademark Documents	34	26
Avg. Days from Issue Fee Payment to Issue Date	90-100	125
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	99% on Issue Date
Trademark Copies Available	95% on Issue Date	99% on Issue Date

*Unless otherwise noted.

May 1, 1992

THERESA A. BRELSFORD
Assistant Commissioner for Public Services and Administration

PATENT NOTICES

Certificates of Correction For Week of May 26, 1992

Re. 33,298	4,914,561	4,963,905	4,978,646
Re. 33,510	4,916,237	4,964,175	4,979,020
D. 313,496	4,916,635	4,964,481	4,979,348
4,624,677	4,917,695	4,965,251	4,979,422
4,731,446	4,921,756	4,965,385	4,979,650
4,734,410	4,922,752	4,965,759	4,979,993
4,778,790	4,922,777	4,965,814	4,981,236
4,820,054	4,923,671	4,966,257	4,981,848
4,830,718	4,923,776	4,967,089	4,982,206
4,833,701	4,933,971	4,967,113	4,983,443
4,838,970	4,937,921	4,967,526	4,984,458
4,842,759	4,938,880	4,969,534	4,984,492
4,844,899	4,940,253	4,970,184	4,984,596
4,847,281	4,941,972	4,970,191	4,984,931
4,849,300	4,943,597	4,970,351	4,986,073
4,849,382	4,945,714	4,970,357	4,987,276
4,857,506	4,947,285	4,970,417	4,987,316
4,869,367	4,947,804	4,970,525	4,987,358
4,872,729	4,948,764	4,971,077	4,987,429
4,874,589	4,949,646	4,971,712	4,987,551
4,876,261	4,949,769	4,974,056	4,987,587
4,877,480	4,951,421	4,974,146	4,988,058
4,879,608	4,951,677	4,974,243	4,988,062
4,884,113	4,951,767	4,974,472	4,988,351
4,892,594	4,955,285	4,974,642	4,988,413
4,893,340	4,955,993	4,974,703	4,990,346
4,894,035	4,956,195	4,975,292	5,008,276
4,894,288	4,957,157	4,975,544	5,015,036
4,894,670	4,958,166	4,975,732	5,016,573
4,897,306	4,960,495	4,975,949	5,040,896
4,898,551	4,961,317	4,976,530	5,047,743
4,909,806	4,961,760	4,976,663	5,071,790
4,910,274	4,961,887	4,976,715	5,082,113
4,910,330	4,961,996	4,977,077	5,089,293
4,911,752	4,963,028	4,977,980	5,096,798
4,914,430	4,963,349	4,978,022	5,097,918

DEPARTMENT OF COMMERCE

Patent and Trademark Office

37 CFR Parts 1 and 2

[Docket No. 920401-2101]

RIN 0651-AA54

Revision of Patent and Trademark Fees

AGENCY: Patent and Trademark Office, Commerce

ACTION: Notice of Proposed Rulemaking.

SUMMARY: The Patent and Trademark Office (PTO) proposes to amend the rules of practice in patent and trademark cases, Parts 1 and 2 of title 37, Code of Federal Regulations, and to adjust certain patent and trademark fee amounts to reflect fluctuations in the Consumer Price Index (CPI) and to recover costs of operation. The PTO also proposes to establish fees for a Patent and Trademark Depository Library (PTDL) to access APS-Text, and for dividing a trademark application.

DATES: Written comments must be submitted on or before June 24, 1992; a public hearing will be held on June 24, 1992, at 9:00 a.m. Requests to present oral testimony should be received on or before June 23, 1992.

ADDRESSES: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Frances Michalkewicz, Suite 507, Crystal Park 1, or by FAX to (703) 305-8436. A hearing will be held in Suite 912 on the 9th floor of Crystal Park 2, located at 2121 Crystal Drive, Arlington, Virginia. Written comments and a transcript of the hearing will be available for public inspection in Suite 507 of Crystal Park 1, at 2011 Crystal Drive, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Frances Michalkewicz by telephone at (703) 305-8510 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: The proposed changes to the rules are designed to adjust the Patent and Trademark Office fees in accordance with the applicable provisions of title 35, United States Code, section 31 of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113), and section 10101 of the Omnibus Budget Reconciliation Act of 1990 (Public Law 101-508), all as amended by the Patent and Trademark Office Authorization Act of 1991 (Public Law 102-204).

Background:

Statutory Provisions: Patent fees are authorized by 35 U.S.C. 41 and 35 U.S.C. 376. A 50 percent reduction in the fees paid under 35 U.S.C. 41(a) and 41(b) by independent inventors, small business concerns, and nonprofit organizations who meet prescribed definitions is authorized by 35 U.S.C. 41(h).

Subsection 41(f) of title 35, United States Code, provides that fees established under 35 U.S.C. 41(a) and (b) may be adjusted on October 1, 1992, and every year thereafter, to reflect fluctuations in the Consumer Price Index (CPI) over the previous 12 months.

Section 10101 of the Omnibus Budget Reconciliation Act of 1990 (Pub. L. 101-508) provides that there shall be a surcharge on all fees established under 35 U.S.C. 41(a) and 41(b) to collect $99,000,000 in fiscal year 1993.

Subsection 41(d) of title 35, United States Code, authorizes the Commissioner to establish fees for all other processing, services, or materials related to patents to recover the average cost of providing these services or materials, except for the fees for recording a document affecting title, for each photocopy, and for each black and white copy of a patent.

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty.

Subsection 41(g) of title 35, United States Code, provides that new fee amounts established by the Commissioner under section 41 may take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the Patent and Trademark Office*.

Subsection 41(i)(3) of title 35, United States Code, authorizes the Commissioner to establish reasonable fees for access to automated search systems of the Patent and Trademark Office.

Section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113), authorizes the Commissioner to establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for all other services and materials relating to trademarks and other marks.

Section 31(a) of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113(a)), as amended, allows trademark fees to be adjusted once each year to reflect, in the aggregate, any fluctuations during the preceding 12 months in the CPI.

Section 31 also allows new fee amounts to take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the Patent and Trademark Office*.

Recovery Level Determinations: The proposed fees would recover $486,000,000 in fiscal year 1993, as proposed in the Administration's budget request to the Congress.

Fees established by 35 U.S.C. 41(a) and 41(b) ("patent statutory fees") may be adjusted on October 1, 1992, to reflect any fluctuations occurring during the previous 12 months in the CPI. The Office of Management and Budget (OMB) has determined that the PTO should use Consumer Price Index-U to adjust patent statutory fees. The Department of Labor's Consumer Price Index is made public approximately 21 days after the end of the month being calculated. The patent statutory fees are expected to be adjusted by 3.3 percent, which reflects the Administration's projected Consumer Price Index-U for the 12-month period beginning October 1, 1991.

The patent statutory fees established by rule (56 FR 65142) on December 13, 1991, are proposed to be adjusted by the projected changes in the CPI of 3.3 percent. Amounts were rounded by applying standard arithmetic rules so that the amounts rounded would be convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees between $2 and $99 were rounded to the nearest even number so that the comparable small entity fee would be a whole number.

Patent statutory fees are also subject to the provisions of the Omnibus Budget Reconciliation Act of 1990, as amended by Public Law 102-204. These provisions require that $99,000,000 be collected in fiscal year 1993 for deficit reduction purposes in lieu of seeking general taxpayer funds from the U.S. Treasury. The $99,000,000 is deposited in a special account in the U.S. Treasury, and is reserved exclusively for use by the PTO, and is made available to the PTO through the appropriation process.

In establishing the proposed 1993 patent statutory fees, the PTO applied the projected Consumer Price Index U rate of 3.3 percent to the 1992 fees. The proposed 1993 fees were rounded as explained above.

Of the total amount of section 41(a) and (b) income expected to be collected in 1993, $99 million must be deposited to the Fee Surcharge Fund.

Non-statutory patent service fees established under section 41(d) of title 35, United States Code, as amended, and PCT processing fees would be adjusted to recover planned costs in 1993, except in the case of three patent service fees set by statute. The three fees are assignment recording fees, printed patent copy fees and photocopy charge fees.

Trademark fees may be adjusted in fiscal year 1993, in the aggregate, to reflect changes over the prior 12 months in the CPI. The OMB has determined that the PTO should use Consumer Price Index-U to adjust trademark fees, which is made public by the Department of Labor approximately 21 days after the end of the month being calculated. The trademark fees are expected to be adjusted, in the aggregate, by 3.3 percent, which reflects the Administration's projected Consumer Price Index-U for the 12 month period beginning October 1, 1991.

The PTO proposes to adjust only two trademark fees in 1993: for filing an application (§ 2.6(a)(1)) and for assignment records, abstract of title and certification (§ 2.6(b)(7)). One new fee is proposed for dividing an application (§ 2.6 (a)(19)). No other fees are proposed for change in 1993. The net effect of the proposed changes is to increase trademark fees, in the aggregate, by 3.3 percent, the expected Consumer Price Index-U rate for the prior 12 month period.

Workload Projections: Determination of workloads varies by fee. Principal workload projection techniques are as follows:

Patent and trademark application workloads are projected from statistical regression models using recent application trends. Patent issues are projected from an in-house patent production model and reflect examiner production achievements and goals. Patent maintenance fee workloads utilize patents issued 3.5, 7.5 and 11.5 years prior to payment and assume payment rates of 75 percent, 50 percent and 25 percent, respectively. Trademark affidavit projections are based on filing trends for marks registered five to six years prior to 1993. Trademark renewal projections are based on marks registered 10 years prior to 1993. Service fee workloads follow linear trends from prior year activities.

Public Access to Automated Systems: The fiscal year 1993 budget for the PTO does not include any general taxpayer funds, but requires that all of the expenses of the PTO be recovered through user fees. The expenses include the cost of providing APS-Text service to the Patent and Trademark Depository Libraries (PTDLs). Since September 1, 1991, the PTO has provided, without charge, access to APS-Text to 14 PTDLs as a pilot test program. Continuation of this service to the PTDLs, without direct charge to the PTDLs, would require support from all customers who pay for products and services from the PTO.

Therefore, the PTO is proposing the establishment of a fee to recover the cost of providing APS-Text service to the PTDLs. The fee for accessing APS-Text at the PTDLs is calculated using the same marginal cost methodology used in December 1989 to determine the fee for access to similar APS-Text services available in the Patent Search Room.

General Procedures: Any fee amount that is paid on or after October 1, 1992, would be subject to the new fees then in effect. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper

Certificate of Mailing, where authorized under 37 CFR 1.8, will be considered to be the date of receipt in the PTO. A "Certificate of Mailing under Section 1.8" is not "proper" for items which are specifically excluded from the provisions of § 1.8. Section 1.8 should be consulted for those items for which a Certificate of Mailing is not "proper." Such items include, inter alia, the filing of national and international applications for patents and the filing of trademark applications. However, the provisions of 37 CFR 1.10 relating to filing papers and fees with an "Express Mail" certificate do apply to any paper or fee (including patent and trademark applications) to be filed in the PTO. If an application or fee is filed by "Express Mail" with a proper certificate dated on or after the effective date of the rules, as amended, the amount of the fee to be paid would be the fee established by the amended rules.

A comparison of existing and proposed fee amounts is included as an Appendix to this proposed notice.

In order to ensure clarity in the implementation of the fee proposals, a discussion of specific sections is set forth below.

DISCUSSION OF SPECIFIC RULES

37 CFR 1.16 National application filing fees.

Section 1.16, paragraphs (a)-(d) and (f)-(j), if revised as proposed, would adjust patent application filing fees to reflect fluctuations in the CPI.

37 CFR 1.17 Patent application processing fees.

Section 1.17, paragraphs (a)-(g), and (m), if revised as proposed, would adjust fees established therein to reflect fluctuations in the CPI.

Section 1.17, paragraphs (j), (n) and (o), if revised as proposed, would adjust fees established therein to recover costs.

37 CFR 1.18 Patent issue fees.

Section 1.18, paragraphs (a)-(c), if revised as proposed, would adjust the issue fee for each original or reissue patent to reflect fluctuations in the CPI.

37 CFR 1.19 Document supply fees.

Section 1.19, subparagraph (b)(4) and paragraphs (f) and (h), if revised as proposed, would adjust fees established therein to recover costs.

37 CFR 1.20 Post-issuance fees.

Section 1.20, paragraphs (a), (c), and (i), if revised as proposed, would adjust fees established therein to recover costs.

Section 1.20, paragraphs (e)-(g), if revised as proposed, would adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21, subparagraphs (a)(1), (a)(5), (a)(6), (b)(2), (b)(3), and paragraphs (e) and (i), if revised as proposed, would adjust fees established therein to recover costs.

Section 1.21, paragraph (p), if added as proposed, would establish the fee for providing to a Patent and Trademark Depository Library access to the Automated Patent System full-text search capability. The proposed $40.00 fee would recover the PTO's estimated marginal cost of providing the service to the libraries. The PTO is currently exploring the option of using a contract service bureau to provide access. At this time, the proposed fee for that option, based on preliminary analysis, is approximately $70.00. A final decision on which option the PTO will implement will be announced in the final rule.

37 CFR 1.26 Refunds.

Section 1.26, paragraph (a), if revised as proposed, would increase the minimum amount of a refund, without a request, from one dollar to twenty-five dollars in accordance with the Treasury Fiscal Manual, Volume One, Part Six, Chapter 3000.

Section 1.26, paragraph (c), if revised as proposed, would provide for a refund of $1,690 if the Commissioner decides not to institute reexamination proceedings. The $1,690 refund would apply to those instances where the proposed reexamination fee of $2,250 under 37 CFR 1.20(c) was paid. The current $1,635 refund would be made in those cases where the current $2,180 reexamination fee was paid.

37 CFR 1.445 International application filing, processing, and search fees.

Section 1.445, if revised as proposed, would adjust the fees authorized by 35 U.S.C. 376 to recover costs.

37 CFR 1.482 International preliminary examination fees.

Section 1.482, subparagraphs (a)(1), and (a)(2)(ii), if revised as proposed, would adjust the fees authorized by 35 U.S.C. 376 to recover costs.

37 CFR 1.492 National stage fees.

Section 1.492, subparagraphs (a)(1)-(a)(3), and paragraphs (b)-(d), if revised as proposed, would adjust fees established therein to reflect fluctuations in the CPI.

Section 1.492, subparagraph (a)(5), if revised as proposed, would adjust the fee authorized by 35 U.S.C. 376 to recover costs.

VOL 1138 ISS 4 MAY 26 1992 UMI

37 CFR 2.6 Trademark fees.

Section 2.6, subparagraphs (a)(1) and (b)(7), if revised as proposed, would adjust the fees authorized by the Trademark (Lanham) Act of 1946 to reflect fluctuations in the CPI.

New section 2.6(a)(19), if added as proposed, would establish a fee for dividing a trademark application in accordance with 37 CFR 2.87.

37 CFR 2.87

Section 2.87, if revised as proposed, would establish a fee for dividing an application into two or more applications. Currently, no fee is charged for the physical act of dividing an application. Experience to date reveals that the creation of so-called "divisional" applications is labor intensive. For that reason, and because the creation of a divisional application is a significant benefit to an applicant, the PTO proposes to charge a fee for dividing an application. The fee would be due for each new file wrapper created.

Section 2.87, if revised as proposed, will also divide paragraph (a) into paragraphs (a) and (b), and renumber paragraphs (b) and (c) as (c) and (d).

OTHER CONSIDERATIONS: The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354); Executive Orders 12291 and 12612; and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements relating to patent and trademark fee rules.

The PTO has determined that this proposed notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the proposed rule change would not have a significant adverse impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The proposed rule change increases fees by changes in the CPI as authorized by 35 U.S.C. 41(f). Further, the principal impact of the major patent fees has already been taken into account in 35 U.S.C. 41(h), which provides small entities with a 50-percent reduction in the major patent fees.

The PTO has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy would be less than $100 million. There would be no major increase in costs or prices for consumers; individual industries; Federal, state, or local government agencies; or geographic regions. There would be no significant adverse effects on competition, employment, investment, productivity, or innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and recordkeeping requirements, Small businesses.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the preamble, the PTO is amending title 37 of the Code of Federal Regulations, Chapter I, as set forth below.

Part 1-Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is proposed to be amended by revising paragraphs (a)-(d), the parenthetical following paragraph (d), paragraphs (f)-(j), and the note at the end of the section to read as follows:

§ 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant cases:
By a small entity (§1.9(f)) $355.00
By other than a small entity $710.00

(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:
By a small entity (§ 1.9(f)) $37.00
By other than a small entity $74.00

(c) In addition to the basic filing fee in an original application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20. (Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes):
By a small entity (§ 1.9(f)) $11.00
By other than a small entity $22.00

(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s) per application:
By a small entity (§ 1.9(f)) $115.00
By other than a small entity $230.00

(If the additional fees required by paragraphs (b), (c), and (d) of this section are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

*****

(f) For filing each design application:
By a small entity (§1.9(f)) $145.00
By other than a small entity $290.00

(g) Basic fee for filing each plant application:
By a small entity (§ 1.9(f)) $240.00
By other than a small entity $480.00

(h) Basic fee for filing each reissue application:
By a small entity (§ 1.9(f)) $355.00
By other than a small entity $710.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:
By a small entity (§ 1.9(f)) $37.00
By other than a small entity $74.00

(j) In addition to the basic filing fee in a reissue application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 and also in excess of the number of claims in the original patent. (Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes):
By a small entity (§ 1.9(f)) $11.00
By other than a small entity $22.00

(Note: See §§ 1.445, 1.482 and 1.492 for international application filing and processing fees.)

3. Section 1.17 is proposed to be amended by revising paragraphs (a)-(g), (j), (m)-(o) to read as follows:

§ 1.17 Patent application processing fees.

(a) Extension fee for response within first month pursuant to § 1.136(a):
By a small entity (§ 1.9(f)) $55.00
By other than a small entity $110.00

(b) Extension fee for response within second month pursuant to § 1.136(a):
By a small entity (§ 1.9(f)) $180.00
By other than a small entity $360.00

(c) Extension fee for response within third month pursuant to § 1.136(a):
By a small entity (§ 1.9(f)) $420.00
By other than a small entity $840.00

(d) Extension fee for response within fourth month pursuant to § 1.136(a):
By a small entity (§ 1.9(f)) $660.00
By other than a small entity $1,320.00

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:
By a small entity (§ 1.9(f)) $135.00
By other than a small entity $270.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:
By a small entity (§ 1.9(f)) $135.00
By other than a small entity $270.00

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. 134:
By a small entity (§ 1.9(f)) $115.00
By other than a small entity $230.00

*****

(j) For filing a petition to institute a public use proceeding under § 1.292 ..... $1,350.00

*****

(m) For filing a petition:
(1) For revival of an unintentionally abandoned application, or
(2) For the unintentionally delayed payment of the fee for issuing a patent:
By a small entity (§ 1.9(f)). $585.00
By other than a small entity $1,170.00

(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiner's action pursuant to § 1.104--$820.00 reduced by the amount of the application basic filing fee paid

(o) For requesting publication of a statutory invention registration after the mailing of the first examiner's action pursuant to § 1.104--$1,640.00 reduced by the amount of the application basic filing fee paid

*****

4. Section 1.18 is proposed to be amended by revising paragraphs (a)-(c) to read as follows:

§ 1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:
By a small entity (§ 1.9(f)) $585.00
By other than a small entity $1,170.00

(b) Issue fee for issuing a design patent:
By a small entity (§ 1.9(f)) $205.00
By other than a small entity $410.00

(c) Issue fee for issuing a plant patent:
By a small entity (§ 1.9(f)) $295.00
By other than a small entity $590.00

5. Section 1.19 is proposed to be amended by revising paragraph (b)(4) and paragraphs (f) and (h) to read as follows:

§ 1.19 Document supply fees.

*****

(b)***
(4) For assignment records, abstract of title and certification, per patent $25.00

*****

(f) Uncertified copy of a non-United States patent document, per document $25.00

*****

(h) Additional filing receipts; duplicate; or corrected due to applicant error $25.00

6. Section 1.20 is proposed to be amended by revising paragraphs (a), (c), (e)-(g) and (i) to read as follows:

§ 1.20 Post issuance fees.

(a) For providing a certificate of correction for applicant's mistake (§ 1.323) $100.00

*****

(c) For filing a request for reexamination (§1.510(a)) $2,250.00

*****

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond four years; the fee is due by three years and six months after the original grant
By a small entity (§ 1.9(f)) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond eight years; the fee is due by seven years and six months after the original grant
By a small entity (§ 1.9(f)) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond twelve years; the fee is due by eleven years and six months after the original grant
By a small entity (§ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

*****

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable $620.00

*****

7. Section 1.21 is proposed to be amended by revising paragraphs (a)(1), (a)(5), (a)(6), (b)(2), (b)(3),(e), and (i) and adding paragraph (p) to read as follows:

§ 1.21 Miscellaneous fees and charges.

*****

(a) ***

(1) For admission to examination for registration to practice, fee payable upon application $300.00

*****

(5) For review of a decision of the Director of Enrollment and Discipline under § 10.2(c) $130.00

(6) For requesting regrading of an examination under §10.7(c) $130.00

(b) ***

(2) Service charge for each month when the balance at the end of the month is below $1,000.....$25.00

(3) Service charge for each month when the balance at the end of the month is below $300 for restricted subscription deposit accounts used exclusively for subscription order of patent copies as issued $25.00

*****

(e) International type search reports: For preparing an international type search report of an international type search made at the time of the first action on the merits in a national patent application.....$40.00

*****

(i) Publication in Official Gazette: For publication in the Official Gazette of a notice of the availability of an application or a patent for licensing or sale, each application or patent.....$25.00

*****

(p) Library service: marginal cost for providing to a Patent and Trademark Depository Library access to Automated Patent System (APS) full-text search capability, per hour of terminal session time, including print time .....$40.00-$70.00

8. Section 1.26 is proposed to be amended by revising paragraphs (a) and (c) to read as follows:

§ 1.26 Refunds.

(a) Money paid in excess will be refunded, but a mere change of purpose after the payment of money, as when a party desires to withdraw an application, an appeal, or a request for oral hearing, will not entitle a party to demand such a return. Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amount; amounts over twenty-five dollars may be returned by check, or if requested, by credit to a deposit account.

*****

(c) If the Commissioner decides not to institute a reexamination proceeding, a refund of $1,690 will be made to the requester of the proceeding. Reexamination requesters should indicate whether any refund should be made by check or by credit to a deposit account.

9. Section 1.445 is proposed to be amended by revising paragraph (a) to read as follows:

§ 1.445 International application filing, processing and search fees.

(a) The following fees and charges for international applications are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14) $200.00

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:
(i) No corresponding prior United States national application with basic filing fee has been filed.....$620.00
(ii) A corresponding prior United States national application with basic filing fee has been filed.....$410.00

(3) A supplemental search fee when required, per additional invention $170.00

*****

10. Section 1.482 is proposed to be amended by revising paragraphs (a) introductory text, (a)(1), and (a)(2)(ii)to read as follows:

§ 1.482 International preliminary examination fees.

(a) The following fees and charges for international preliminary examination are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A preliminary examination fee is due on filing the Demand:

(i) Where an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, a preliminary examination fee of $450.00

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of $670.00

(2)***

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office.....$230.00

*****

11. Section 1.492 is proposed to be amended by revising paragraphs (a)(1)-(a)(3), (a)(5), paragraphs (b)-(d), and the parenthetical following paragraph (d)to read as follows:

§ 1.492 National stage fees.

*****

(a) ***

(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:
By a small entity (§ 1.9(f)).....$320.00
By other than a small entity.....$640.00

(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:
By a small entity (§ 1.9(f)).....$355.00
By other than a small entity.....$710.00

(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:
By a small entity (§ 1.9(f)).....$475.00
By other than a small entity.....$950.00

*****

(5) Where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office:
By a small entity (§ 1.9(f)).....$415.00
By other than a small entity.....$830.00

(b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:
By a small entity (§ 1.9(f)).....$37.00
By other than a small entity.....$74.00

(c) In addition to the basic national fee, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 (Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes.):
By a small entity (§ 1.9(f)).....$11.00
By other than a small entity.....$22.00

(d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:
By a small entity (§ 1.9(f)).....$115.00
By other than a small entity.....$230.00

(If the additional fees required by paragraphs (b), (c), and (d) are not paid on presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by

amendment prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

*****

Part 2 - Rules of Practice in Trademark Cases

1. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is proposed to be amended by revising paragraphs (a)(1) and (b)(7) and adding paragraph (a)(19) to read as follows:

§ 2.6 Trademark fees.

*****

(a) Trademark process fees.

(1) For filing an application, per class. $210.00

*****

(19) Dividing an application, per new application created. $100.00

(b) Trademark service fees.

*****

(7) For assignment records, abstract of title and certification, per registration..... $25.00

*****

3. Section 2.87 is proposed to be revised to read as follows:

Section 2.87 Dividing an Applicaion

(a) An application may be physically divided into two or more separate applications upon the payment of a fee for each new application created and submission by the applicant of a request in accordance with paragraph (d) of this section.

(b) In the case of a request to divide out one or more entire classes from an application, only the fee under paragraph (a) of this section will be required. However, in the case of a request to divide out some, but not all, of the goods or services in a class, an application filing fee for each new separate application to be created by the division must be submitted, together with the fee under paragraph (a) of this section . Any outstanding time period for action by the applicant in the original application at the time of the division will be applicable to each new separate application created by the division.

(c) A request to divide an application may be filed at any time between the filing of the application and the date the Trademark Examining Attorney approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action; or during an opposition, upon motion granted by the Trademark Trial and Appeal Board. Additionally, a request to divide an application under section 1(b) of the Act may be filed with a statement of use under § 2.88 or at any time between the filing of a statement of use and the date the Trademark Examining Attorney approves the mark for registration or the date of expiration of the six-month response period after issuance of a final action.

(d) A request to divide an application should be made in a separate paper from any other amendment or response in the application. The title "Request to divide application." should appear at the top of the first page of the paper.

Date: 5/14/92

Douglas B. Comer
Acting Assistant Secretary
and Acting Commissioner
of Patents and Trademarks

NOTE.- The following appendix will not appear in the Code of Federal Reg.

Appendix A - Comparison of Existing and Proposed Fee Amounts

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
1.16(a)	Basic Filing Fee	$690	$710
1.16(a)	Basic Filing Fee (Small Entity)	$345	$355
1.16(b)	Independent Claims	$72	$74
1.16(b)	Independent Claims (Small Entity)	$36	$37
1.16(c)	Claims in Excess of 20	$20	$22
1.16(c)	Claims in Excess of 20 (Small Entity)	$10	$11
1.16(d)	Multiple Dependent Claims	$220	$230
1.16(d)	Multiple Dependent Claims (Small Entity)	$110	$115
1.16(e)	Surcharge - Late Filing Fee	$130	$130
1.16(e)	Surcharge - Late Filing Fee (Small Entity)	$65	$65
1.16(f)	Design Filing Fee	$280	$290
1.16(f)	Design Filing Fee (Small Entity)	$140	$145
1.16(g)	Plant Filing Fee	$460	$480
1.16(g)	Plant Filing Fee (Small Entity)	$230	$240
1.16(h)	Reissue Filing Fee	$690	$710
1.16(h)	Reissue Filing Fee (Small Entity)	$345	$355
1.16(i)	Reissue Independent Claims	$72	$74
1.16(i)	Reissue Independent Claims (Small Entity)	$36	$37
1.16(j)	Reissue Claims in Excess of 20	$20	$22
1.16(j)	Reissue Claims in Excess of 20 (Small Entity)	$10	$11
1.17(a)	Extension - First Month	$110	$110
1.17(a)	Extension - First Month (Small Entity)	$55	$55
1.17(b)	Extension - Second Month	$350	$360
1.17(b)	Extension - Second Month (Small Entity)	$175	$180
1.17(c)	Extension - Third Month	$810	$840
1.17(c)	Extension - Third Month (Small Entity)	$405	$420
1.17(d)	Extension - Fourth Month	$1,280	$1,320
1.17(d)	Extension - Fourth Month (Small Entity)	$640	$660
1.17(e)	Notice of Appeal	$260	$270
1.17(e)	Notice of Appeal (Small Entity)	$130	$135
1.17(f)	Filing a Brief	$260	$270
1.17(f)	Filing a Brief (Small Entity)	$130	$135
1.17(g)	Request for Oral Hearing	$220	$230
1.17(g)	Request for Oral Hearing (Small Entity)	$110	$115
1.17(h)	Petition - Not All Inventors	$130	$130
1.17(h)	Petition - Correction of Inventorship	$130	$130
1.17(h)	Petition - Decision on Questions	$130	$130
1.17(h)	Petition - Suspend Rules	$130	$130
1.17(h)	Petition - Expedited License	$130	$130
1.17(h)	Petition - Scope of License	$130	$130
1.17(h)	Petition - Retroactive License	$130	$130
1.17(h)	Petition - Refusing Maintenance Fee	$130	$130
1.17(h)	Petition - Refusing Maintenance Fee - Expired Patent	$130	$130
1.17(h)	Petition - Interference	$130	$130
1.17(h)	Petition - Reconsider Interference	$130	$130
1.17(h)	Petition - Late Filing of Interference	$130	$130
1.20(b)	Petition - Correction of Inventorship	$130	$130
1.17(h)	Petition - Refusal to Publish SIR	$130	$130
1.17(i)(1)	Petition - For Assignment	$130	$130
1.17(i)(1)	Petition - For Application	$130	$130
1.17(i)(1)	Petition - Late Priority Papers	$130	$130
1.17(i)(1)	Petition - Suspend Action	$130	$130
1.17(i)(1)	Petition - Divisional Reissues to Issue Separately	$130	$130
1.17(i)(1)	Petition - For Interference Agreement	$130	$130
1.17(i)(1)	Petition - Amendment After Issue	$130	$130
1.17(i)(1)	Petition - Withdrawal After Issue	$130	$130
1.17(i)(1)	Petition - Defer Issue	$130	$130
1.17(i)(1)	Petition - Issue to Assignee	$130	$130
1.17(i)(1)	Petition - Accord a Filing Date Under §1.53	$130	$130
1.17(i)(1)	Petition - Accord a Filing Date Under §1.60	$130	$130

Appendix A - Comparison of Existing and Proposed Fee Amounts

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
1.17(i)(1)	Petition - Accord a Filing Date Under §1.62	$130	$130
1.17(i)(2)	Petition - Make Application Special	$130	$130
1.17(j)	Petition - Public Use Proceeding	$1,310	$1,350
1.17(k)	Non-English Specification	$130	$130
1.17(l)	Petition - Revive Abandoned Appl.	$110	$110
1.17(l)	Petition - Revive Abandoned Appl. (Small Entity)	$55	$55
1.17(m)	Petition - Revive Unintentionally Abandoned Appl.	$1,130	$1,170
1.17(m)	Petition - Revive Unintent Abandoned Appl. (Small Entity)	$565	$585
1.17(n)	SIR - Prior to Examiner's Action	$790	$820
1.17(o)	SIR - After Examiner's Action	$1,580	$1,640
1.17(p)	Submission of an Information Disclosure Statement (§1.97)		$200
1.18(a)	Issue Fee	$1,130	$1,170
1.18(a)	Issue Fee (Small Entity)	$565	$585
1.18(b)	Design Issue Fee	$400	$410
1.18(b)	Design Issue Fee (Small Entity)	$200	$205
1.18(c)	Plant Issue Fee	$570	$590
1.18(c)	Plant Issue Fee (Small Entity)	$285	$295
1.19(a)(1)(i)	Copy of Patent	$3	$3
1.19(a)(1)(ii)	Patent Copy - Expedited Local Service	$6	$6
1.19(a)(1)(iii)	Patent Copy Ordered Via EOS - Expedited Service	$25	$25
1.19(a)(2)	Plant Patent Copy	$12	$12
1.19(a)(3)(i)	Copy of Utility Patent or SIR in Color	$24	$24
1.19(b)(1)(i)	Certified Copy of Patent Application as Filed	$12	$12
1.19(b)(1)(i)	Certified Copy of Patent Application as Filed, Expedited	$24	$24
1.19(b)(2)	Cert or Uncert Copy of Patent-Related File Wrapper/Contents	$150	$150
1.19(b)(3)	Cert. or Uncert. Copies of Office Records, per Document	$25	$25
1.19(b)(4)	For Assignment Records, Abstract of Title and Certification	$20	$25
1.19(c)	Library Service	$50	$50
1.19(d)	List of Patents in Subclass	$3	$3
1.19(e)	Uncertified Statement-Status of Maintenance Fee Payment	$10	$10
1.19(f)	Copy of Non-U.S. Patent Document	$12	$25
1.19(g)	Comparing and Certifying Copies, Per Document, Per Copy	$25	$25
1.19(h)	Duplicate or Corrected Filing Receipt	$20	$25
1.20(a)	Certificate of Correction	$70	$100
1.20(c)	Reexamination	$2,180	$2,250
1.20(d)	Statutory Disclaimer	$110	$110
1.20(d)	Statutory Disclaimer (Small Entity)	$55	$55
1.20(e)	Maintenance Fee - 3.5 Years	$900	$930
1.20(e)	Maintenance Fee - 3.5 Years (Small Entity)	$450	$465
1.20(f)	Maintenance Fee - 7.5 Years	$1,810	$1,870
1.20(f)	Maintenance Fee - 7.5 Years (Small Entity)	$905	$935
1.20(g)	Maintenance Fee - 11.5 Years	$2,730	$2,820
1.20(g)	Maintenance Fee - 11.5 Years (Small Entity)	$1,365	$1,410
1.20(h)	Surcharge - Maintenance Fee - 6 Months	$130	$130
1.20(h)	Surcharge - Maintenance Fee - 6 Months (Small Entity)	$65	$65
1.20(i)	Surcharge - Maintenance After Expiration	$600	$620
1.20(j)	Extension of Term of Patent	$1,000	$1,000
1.21(a)(1)	Admission to Examination	$290	$300
1.21(a)(2)	Registration to Practice	$100	$100
1.21(a)(3)	Reinstatement to Practice	$15	$15
1.21(a)(4)	Certificate of Good Standing	$10	$10
1.21(a)(4)	Certificate of Good Standing, Suitable Framing	$20	$20
1.21(a)(5)	Review of Decision of Director, OED	$120	$130
1.21(a)(6)	Regrading of Examination	$120	$130
1.21(b)(1)	Establish Deposit Account	$10	$10
1.21(b)(2)	Service Charge Below Minimum Balance	$20	$25
1.21(b)(3)	Service Charge Below Minimum Balance	$20	$25
1.21(c)	Filing a Disclosure Document	$10	$10
1.21(d)	Box Rental	$50	$50
1.21(e)	International Type Search Report	$38	$40
1.21(g)	Self-Service Copy Charge	$0.25	$.25
1.21(h)	Recording Patent Property	$40	$40

Appendix A - Comparison of Existing and Proposed Fee Amounts

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
1.21(i)	Publication in the OG	$20	$25
1.21(j)	Labor Charges for Services	$30	$30
1.21(k)	Unspecified Other Services	Actual Cost	Actual Cost
1.21(l)	Retaining Abandoned Application	$130	$130
1.21(m)	Processing Returned Checks	$50	$50
1.21(n)	Handling Fee - Incomplete Application	$130	$130
1.21(o)	Terminal Use APS-TEXT	$40	$40
1.21(p)	Terminal Use APS-TEXT by the PTDL's		$40-$70
1.24	Coupons for Patent Copies	$3	$3
1.296	Handling Fee - Withdrawal SIR	$130	$130
1.445(a)(1)	Transmittal Fee	$190	$200
1.445(a)(2)(i)	PCT Search Fee - No U.S. Application	$600	$620
1.445(a)(2)(ii)	PCT Search Fee - Prior U.S. Application	$400	$410
1.445(a)(3)	Supplemental Search	$160	$170
1.482(a)(1)(i)	Preliminary Exam Fee	$440	$450
1.482(a)(1)(ii)	Preliminary Exam Fee	$650	$670
1.482(a)(2)(i)	Additional Invention	$140	$140
1.482(a)(2)(ii)	Additional Invention	$220	$230
1.492(a)(1)	Preliminary Examining Authority	$620	$640
1.492(a)(1)	Preliminary Examining Authority (Small Entity)	$310	$320
1.492(a)(2)	Searching Authority	$690	$710
1.492(a)(2)	Searching Authority (Small Entity)	$345	$355
1.492(a)(3)	PTO Not ISA nor IPEA	$920	$950
1.492(a)(3)	PTO Not ISA nor IPEA (Small Entity)	$460	$475
1.492(a)(4)	Claims - IPEA	$90	$90
1.492(a)(4)	Claims - IPEA (Small Entity)	$45	$45
1.492(a)(5)	Filing with EPO/JPO Search Report	$800	$830
1.492(a)(5)	Filing with EPO/JPO Search Report (Small Entity)	$400	$415
1.492(b)	Claims - Extra Individual (Over 3)	$72	$74
1.492(b)	Claims - Extra Individual (Over 3) (Small Entity)	$36	$37
1.492(c)	Claims - Extra Total (Over 20)	$20	$22
1.492(c)	Claims - Extra Total (Over 20) (Small Entity)	$10	$11
1.492(d)	Claims - Multiple Dependents	$220	$230
1.492(d)	Claims - Multiple Dependents (Small Entity)	$110	$115
1.492(e)	Surcharge	$130	$130
1.492(e)	Surcharge (Small Entity)	$65	$65
1.492(f)	English Translation - After 20 Months	$130	$130
2.6(a)(1)	Application for Registration, Per Class	$200	$210
2.6(a)(2)	Amendment to Allege Use, Per Class	$100	$100
2.6(a)(3)	Statement of Use, Per Class	$100	$100
2.6(a)(4)	Extension for Filing Statement of Use, Per Class	$100	$100
2.6(a)(5)	Application for Renewal, Per Class	$300	$300
2.6(a)(6)	Surcharge for Late Renewal, Per Class	$100	$100
2.6(a)(7)	Publication of Mark Under §12(c), Per Class	$100	$100
2.6(a)(8)	Issuing New Certificate of Registration	$100	$100
2.6(a)(9)	Certificate of Correction of Registrant's Error	$100	$100
2.6(a)(10)	Filing Disclaimer to Registration	$100	$100
2.6(a)(11)	Filing Amendment to Registration	$100	$100
2.6(a)(12)	Filing Affidavit Under Section 8, Per Class	$100	$100
2.6(a)(13)	Filing Affidavit Under Section 15, Per Class	$100	$100
2.6(a)(14)	Filing Affidavit Under Sections 8 & 15, Per Class	$200	$200
2.6(a)(15)	Petitions to the Commissioner	$100	$100
2.6(a)(16)	Petition to Cancel, Per Class	$200	$200
2.6(a)(17)	Notice of Opposition, Per Class	$200	$200
2.6(a)(18)	Ex Parte Appeal to the TTAB, Per Class	$100	$100
2.6(a)(19)	Dividing an Application, Per New Application Created		$100
2.6(b)(1)(i)	Copy of Registered Mark	$3	$3
2.6(b)(1)(ii)	Copy of Registered Mark, Expedited	$6	$6

Appendix A - Comparison of Existing and Proposed Fee Amounts

Page 4

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
2.6(b)(1)(iii)	Copy of Registered Mark Ordered Via EOS, Expedited Svc.	$25	$25
2.6(b)(2)(i)	Certified Copy of TM Application as Filed	$12	$12
2.6(b)(2)(ii)	Certified Copy of TM Application as Filed, Expedited	$24	$24
2.6(b)(3)	Cert. or Uncert. Copy of TM-Related File Wrapper/Contents	$50	$50
2.6(b)(4)(i)	Cert. Copy of Registered Mark, Title or Status	$10	$10
2.6(b)(4)(ii)	Cert. Copy of Registered Mark, Title or Status - Expedited	$20	$20
2.6(b)(5)	Certified or Uncertified Copy of TM Records	$25	$25
2.6(b)(6)	Recording Trademark Property, Per Mark, Per Document	$40	$40
2.6(b)(6)	For Second and Subsequent Marks in Same Document	$25	$25
2.6(b)(7)	For Assignment Records, Abstracts of Title and Cert.	$20	$25
2.6(b)(8)	Terminal Use T-SEARCH	$40	$40
2.6(b)(9)	Self-Service Copy Charge	$0.25	$0.25
2.6(b)(10)	Labor Charges for Services	$30	$30
2.6(b)(11)	Unspecified Other Services	Actual Cost	Actual Cost
1.19(g)	Comparing and Certifying Copies, per Document, per Copy	$25	$25
1.24	Trademark Coupons	$3	$3

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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
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PATENT EXAMINING CORPS

VACANT, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
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GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110 — D. E. TALBERT, Director	308-0661	1/11/91
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GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 350 — A.L. SMITH, Director	308-0651	1/20/91

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during April 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,873,996 to 3,881,195 inclusive
Plant Patents ..... P. 3,697 to 3,712

REEXAMINATIONS

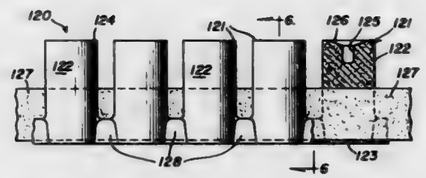
MAY 26, 1992

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,215,513 (1707th)
FIELD TRANSPLANT SYSTEMS AND METHODS AND COMPONENTS THEREOF

Richard R. Dedolph, Naperville, Ill., assignor to Gravi-Mechanics Co., Naperville, Ill.

Reexamination Request No. 90/002,062, Jun. 20, 1990.
Reexamination Certificate for Patent No. 4,215,513, issued Aug. 5, 1980, Ser. No. 928,902, Jul. 28, 1978.
Division of Ser. No. 772,094, Feb. 25, 1977, Pat. No. 4,130,072
Int. Cl.[5] A01G *23/02*
U.S. Cl. 47—56



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–15** and **19–23** are cancelled.

Claims **16** and **18** are determined to be patentable as amended.

Claim **17**, dependent on an amended claim, is determined to be patentable.

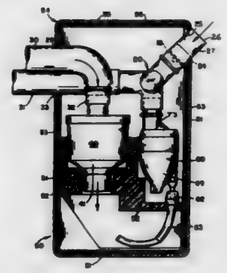
New claim **24** is added and determined to be patentable.

16. A mat of polymerized soil plugs comprising a plurality of bodies of spongy open-celled hydrophilic polymer, a quantity of particles of soil mix distributed throughout said bodies of spongy polymer, a quantity of foam-forming synthetic organic plastic resin reacted in situ *in the presence of the soil mix* to form said bodies of spongy open-celled hydrophilic polymer binding said particles of soil mix therein and into cohesive soil plugs, *the quantity of the resin being effective to form said bodies*, said soil mix comprising from about 20% to about 80% by dry weight of said soil plugs thereby to provide unitary self-supporting polymerized soil plugs, and strips interconnecting the adjacent ones of said soil plugs to one another to form an interconnected mat of soil plugs, said strips having connecting portions extending outwardly beyond the periphery of said mat to accommodate handling and mounting of said mat of soil plugs.

B1 4,598,704 (1708th)
AEROSOL INHALATION DEVICE

Maurice E. Bordoni, Westtown, and Ephraim Lieberman, Suffern, both of N.Y., assignors to Cadema Medical Products, Inc., Middletown, N.Y.

Reexamination Request No. 90/002,136, Sep. 13, 1990.
Reexamination Certificate for Patent No. 4,598,704, issued Jul. 8, 1986, Ser. No. 707,387, Mar. 1, 1985.
Division of Ser. No. 642,718, Aug. 22, 1984, Pat. No. 4,510,929, which is a continuation of Ser. No. 360,370, Apr. 30, 1982, abandoned
Int. Cl.[5] A61M *11/00, 15/00, 16/10*; B05B *17/06*
U.S. Cl. 128—200.14



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2**, **6–9**, and **13–18** are cancelled.

Claims **3** and **10** are determined to be patentable as amended.

Claims **4**, **5**, **11**, and **12**, dependent on an amended claim, are determined to be patentable.

3. [The aerosol inhalation device according to claim **2**] *An aerosol inhalation device for supplying an aerosol mist to a subject, the device comprising first conduit means for providing an exclusive inhalation path and second conduit means for providing an exclusive exhalation path, mouthpiece means connected to the first and second conduit means, valve means for controlling inhalation solely via said first conduit means and exhalation solely via said second conduit means, respectively, a nebulizer coupled to said first conduit means, means in fluid communication with said nebulizer for allowing introduction of liquid into said nebulizer, means associated with said nebulizer for generating an aerosolized mist carrying airborne particles, means for mixing ambient air with the mist, and for introducing said mixture into said first conduit means, and entrapping filter means coupled to said second conduit means for removing the aerosol exhaled, wherein said means for allowing introduction of a liquid into said nebulizer comprises a one-way valve means in fluid communication with said nebulizer and with said first conduit means for permitting entry of atmospheric air into said nebulizer and into said first conduit means*, wherein said one way valve means includes an observable movable member to permit observation of inhalation frequency of a subject.

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REISSUES

MAY 26, 1992

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,934

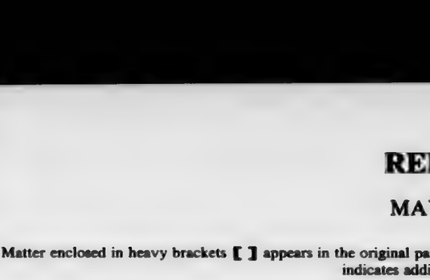
HOSE CLAMP

Hans Oetiker, Horgen, Switzerland, assignor to Hans Oetiker AG Maschinen- und Apparatefabrik, Horgen, Switzerland

Original No. 4,299,012, dated Nov. 10, 1981, Ser. No. 36,980, May 8, 1979. Application for reissue Oct. 4, 1989, Ser. No. 417,241

Int. Cl.[5] **B65D** *63/00;* **F16L** *47/00*

U.S. Cl. 24—19 **72 Claims**



50. A clamp structure, comprising clamping band means having open ends, means mechanically interconnecting the open ends of the band means including outwardly extending hook means in an inner band portion operable to engage in corresponding aperture means provided in an outer band portion, and at least one means in the clamp structure for tightening the clamping band means about an object to be fastened, characterized by a tongue means at the free end of the inner band portion, which is operable to engage into a tongue-receiving means provided at least within the area of an outwardly extending step-like portion provided in the outer band portion to assure a substantially gap-free and stepless transition in the circumferential direction from the inner band portion to the ring-like configuration of the clamp structure defined by the band means upon tightening of the clamp structure by said tightening means, *the tongue-receiving means being a channel-shaped pressed-out recess within the center area of the band means substantially formed as a circumferential continuation of the outwardly displaced outer band portion leaving lateral band portions on both sides of the channel-shaped recess, the step-like portion being formed in the lateral band portions so that the lateral band portions pass over to the radial height of the channel-shaped recess.*

Re. 33,935

APPARATUS AND METHOD FOR FEEDING SINTERING RAW MIX

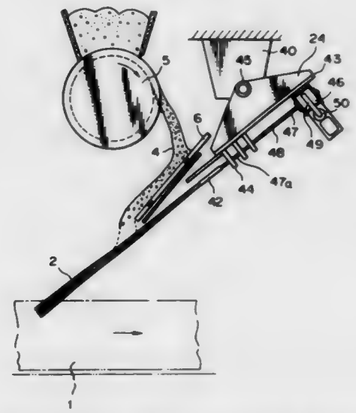
Masami Fujimoto; Tadahiro Inazumi; Katsuhiko Satoh, all c/o Nippon Steel Corporation, R & D Laboratories-III, 1-1-1, Edamitsu, Yahatahigashi-ku, Kitakyushu-shi, Fukuoka; Eiichi Shimozawa; Yasuhiko Awa; Fumihiro Sato; Kenro Nozaki, all c/o Nippon Steel Coroporation, Kimitsu Works 1, Kimitsu, Kimitsu-shi, Chiba; Akira Gushima; Yosinobu Suemura; Nobuo Kusakabe; Kunihiro Imada, all c/o Nippon Steel Coroporation, Yamata Works, 1-1-1, Edamitsu, Yahatahigashi-ku, Kitakyushu-shi, Fukuoka; Masatoshi Arichi, c/o Nippon Steel Corporation, 6-3 Otemachi 2-chime, Chiyoda-ku, Tokyo; Mitsunori Tanaka; Yoshinori Umeza, and Tsuneo Ikeda, all c/o Nippon Steel Corporation, Yawata Works, 1-1-1, Edamitsu, Yahatahigashi-ku, Kitakyushu-shi, Fukuoka, all of Japan

Original No. 4,871,393, dated Oct. 3, 1989, Ser. No. 178,341, Apr. 6, 1988. Application for reissue Sep. 24, 1990, Ser. No. 587,232

Claims priority, application Japan, Apr. 6, 1987, 62-85543; Jun. 8, 1987, 62-88240; Jul. 31, 1987, 62-193451; Jul. 31, 1987, 62-193452; Sep. 10, 1987, 62-138862; Oct. 1, 1987, 62-151492

Int. Cl.[5] **C22B** *1/20*

U.S. Cl. 75—386 **11 Claims**



1. An apparatus for feeding a sintering raw mix to a pallet of a sintering apparatus moving in an advancing direction, comprising:

a plurality of side-by-side bars having a longitudinal axis and sloping downwardly in the direction of falling of the sintering raw mix and which sloping direction is opposite to the advancing direction of the movement of the pallet with said bars forming a screen and the lower ends of said bars being free; and

slope changing means connected to the upper ends of said bars for changing the angle of the slope of the individual bars, and drive means connected to the individual bars for rotating the individual bars around the longitudinal axes of the respective bars.

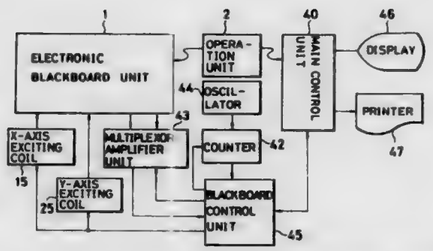
2. An apparatus as claimed in claim **1** in which the [upper] *free* ends of at least some of the respective bars are at different levels relative to each other.

Re. 33,936

ELECTRONIC BLACKBOARD APPARATUS

Nobuyuki Miyamori; Yoshiaki Tomofuji, both of Saitama; Kiyosato Izawa, Tokyo, and Youichi Tsuchida, Saitama, all of Japan, assignors to Wacom Co., Ltd., Tokyo, Japan

Original No. 4,711,977, dated Dec. 8, 1987, Ser. No. 1,740, Jan. 9, 1987. Application for reissue Dec. 8, 1989, Ser. No. 448,041
Claims priority, application Japan, Jan. 9, 1986, 61-2736; Jan. 24, 1986, 61-13515
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—18 **40 Claims**



6. An eraser for removing a line from a display surface on which the line is written while signalling the location of the eraser to a position detector for an implement, the detector establishing magnetic fields for position detection, comprising a housing, the housing including:

an exterior eraser surface for enabling the line to be erased from the display surface,

a structure positioned behind and in proximity to the eraser surface for deriving a field that interacts with the position detector to enable the position detector to derive signals for indicating the eraser position on the display surface, and

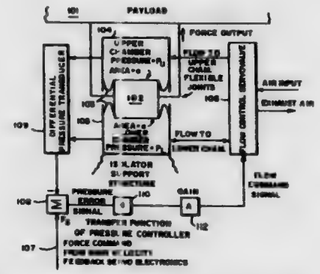
switch means activated in response to the eraser surface being in an erase position on the display surface for causing a response to be coupled from the housing to the detector to indicate the presence of the eraser surface on the display surface.

Re. 33,937

ACTIVE VIBRATION ISOLATION SYSTEM

Dale W. Schubert, Sudbury, Mass., assignor to Barry Wright Corporation, Newton Lower Falls, Mass.

Original No. 4,796,873, dated Jan. 10, 1989, Ser. No. 43,630, Apr. 28, 1987. Continuation of Ser. No. 716,026, Mar. 26, 1985, abandoned. Application for reissue Jan. 12, 1990, Ser. No. 464,298
Int. Cl.[5] F16M *1/00, 13/00*; B60G *17/00*
U.S. Cl. 267—136 **43 Claims**



34. An active vibration isolation system comprising:

a payload mass;

a piston attached to said payload mass;

first pneumatic means, connected to said piston and having a first pressure chamber, for urging said piston in a first direction in accordance with an increase in fluid pressure in said first pressure chamber and for permitting said piston to move in a second opposite direction in accordance with a decrease in fluid pressure in said first pressure chamber;

second pneumatic means, connected to said piston and having a second pressure chamber, for urging said piston in said second opposite direction in accordance with an increase in fluid pressure in said second pressure chamber and for permitting said piston to move in said first direction in accordance with a decrease in fluid pressure in said second pressure chamber;

pressure sensor means for measuring the fluid pressures in said first and second pressure chambers and for providing a differential pressure signal which is representative of the difference in pressure between said first pressure chamber and said second pressure chamber;

a velocity transducer for sensing vibrational movement of said payload mass and for providing an electrical velocity signal that varies as a function of the velocity of said payload mass as it undergoes vibrational motion;

control circuit means for generating an electrical flow command signal that varies as a function of said differential pressure signal and said velocity signal; and

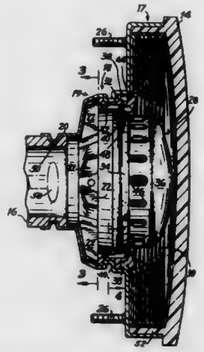
pneumatic control means for adding fluid to, or exhausting fluid from, said first and second pressure chambers so as to vary the fluid pressures in said first and second pressure chambers in response to said flow control signal so as to cause said first and second pneumatic means to cause said piston to move in a direction opposite to the direction of movement of said mass as it vibrates.

Re. 33,938

ASPIRATING/VENTING AIR BAG MODULE ASSEMBLY

Jess Cuevas, Scottsdale, Ariz., assignor to Talley Automotive Products, Inc., Mesa, Ariz.

Original No. 4,877,264, dated Oct. 31, 1989, Ser. No. 290,495, Dec. 27, 1988. Application for reissue Oct. 19, 1990, Ser. No. 601,252
Int. Cl.[5] B60R *21/28, 21/30*
U.S. Cl. 280—731 **20 Claims**



1. An airbag module adapted for installation within a motor vehicle steering assembly, said module comprising:

(a) means for mounting a pyrotechnic gas inflator device upon a steering wheel portion of said steering assembly, said inflator device capable of producing a sufficient amount of a gaseous combustion product within a sufficient time to substantially deploy an inflatable air cushion located in contact relation therewith within an interval between a primary collision between said motor vehicle and an object external thereto and a secondary collision between an operator of said motor vehicle and an interior portion thereof, said mounting means comprising open pan means for supporting said pyrotechnic inflator device, said pan means having several stepped levels extending rearwardly thereon, wherein each said level has a substantially unvarying depth at any point thereon and is positioned directly over a next rearward one of said levels, said levels correspondingly decreasing in volume from front to rear upon said mounting means;

(b) first means, formed integral with a lower portion of said mounting means, for permitting a reciprocal flow of a quantity of surrounding ambient atmosphere from outside said motor vehicle through said mounting means and into said inflatable air cushion upon actuation of said inflator device to facilitate rapid inflation of said air cushion and to permit cooling of said gaseous combustion products produced by said inflator and, subsequent to said primary collision, to permit the contents of said air cushion to flow out of said interior portion of said motor vehicle to the surrounding atmosphere;

(c) a pyrotechnic inflator device positioned within said mounting means, said inflator device comprising a housing formed of a diffuser member having a first open end and a second closed end, and a closure plate member sealing said open end thereof, said housing further comprising an arcuate surface extending along at least a portion of an exterior peripheral surface thereof, said arcuate surface having a relatively greater diameter then a remaining portion of said housing and wherein said surface is configured and adapted to permit a locking engagement of said inflator device within said mounting means;

(d) means for retaining said inflatable air cushion in a contact relation with said inflator device, said retaining means having a first upper grooved portion and a second lower grooved portion extending along at least a portion of an order surface thereof, wherein said retaining means is installed within said mounting means in surrounding relation to said diffuser member and configured to correspond to a portion of said arcuate surface thereof; and

(e) an inflatable air cushion in contact relation with said diffuser member of said inflator device, said cushion configured and adapted for preventing injury to said vehicle operator due to contact with said interior portion of said vehicle upon the occurrence of said primary collision, said cushion comprising means located within a mouth portion thereof configured to facilitate a locking engagement between said cushion and a first grooved portion upon an outer surface of said retaining means upon assembly of said module,

wherein at least a portion of said mounting means is lockingly engaged within said second grooved portion of said retaining means forming a structural seal therebetween such that said inflator device, said retaining means and said inflatable air cushion are all maintained together in locking engagement with one another within said mounting means without the use of any additional locking means.

2. The module of claim **1** wherein said mounting means is a metal stamping comprising, in series, a first, a second and a third stepped level extending rearwardly thereon, each said level completely overlying a next rearward one of said levels, wherein said first and said second levels each comprise a bage portion and an integral peripheral wall portion formed substantially perpendicular to said bage portion, each said peripheral wall extending entirely around said corresponding level and being of a substantially unvarying width therealong such that said first and second levels each have a substantially constant depth at any point thereon.

3. The module of claim **2** wherein said third stepped level comprises an outer peripheral wall formed integral with and substantially perpendicular to said bage of said second stepped level, and extending rearwardly from said peripheral wall of said third level, a metal skirt configured and adapted for locking engagement with second means adapted for permitting a receprocal fluid flow between said inflatable air cushion and said surrounding atmosphere.

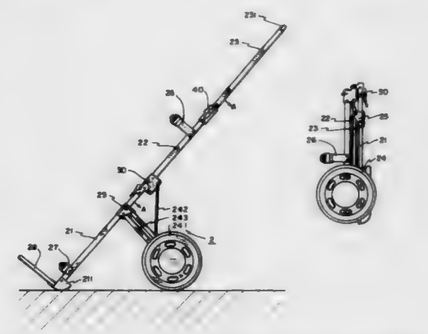
11. The module of claim **3** wherein said mounting means is lockingly engaged within said second grooved portion of said retaining means by a structural seal formed therebetween; said seal created by magnaforming [a] *said peripheral wall* portion of said [metal skirt] *second stepped level* upon said mounting means such that *a part of* said [skirt portion] *wall portion* is formed into said second grooved portion.

Re. 33,939

TELESCOPIC AND COLLAPSIBLE GOLF CART

Alex Cheng, Taipei, Taiwan, assignor to Union Sports Co. Ltd., Taipei, Taiwan

Original No. 4,946,186, dated Aug. 7, 1990, Ser. No. 333,965, Apr. 6, 1989. Application for reissue Feb. 14, 1991, Ser. No. 655,148
Int. Cl.[5] B62B *1/04*
U.S. Cl. 280—646 **24 Claims**



2. A golf cart of the type having two wheels, each wheel rotatably mounted upon an axle, the cart intended to support thereon a golf bag, the cart comprising:

a) at least first and second members; each of said members for supporting a golf bag disposed thereon;

b) first golf bag supporting means secured to said first member and second golf bag supporting means secured to said second member;

c) hinge means connected to and joining said first and second members such that said first and second members may be pivotally moved between a first position wherein said first and second members are disposed to receive the golf bag upon said first and second bag supporting means, and a second position, wherein said first and second members are substantially parallel to one another;

d) first lock means coupled to one member and engagable with the other member for locking one end portion of each of said first and second members into said first position;

e) at least two beams each pivotally connected at one end to said first member and pivotally connected at the other end thereof to one of the axles; and

f) at least two links each pivotally coupled at one end to said second member and each pivotally connected at the other end thereof to one of said beams.

Re. 33,940

DUPLEX COPYING APPARATUS

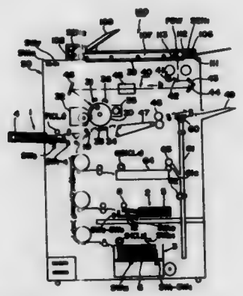
Hirokazu Matsuo, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Original No. 4,721,381, dated Jan. 26, 1988, Ser. No. 941,086, Dec. 12, 1986. Continuation of Ser. No. 708,255, Mar. 5, 1985, abandoned. Application for reissue Dec. 14, 1988, Ser. No. 284,136

Claims priority, application Japan, Mar. 6, 1984, 59-43278; Apr. 27, 1984, 59-87129

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—311 **37 Claims**



35. An image forming apparatus comprising:

image forming means for forming a plurality of images onto one sheet of copy paper;

automatic paper selecting means for selecting a proper copy paper size on the basis of the size of an original and an image forming magnification;

automatic magnification selecting means for selecting a proper image forming magnification on the basis of the size of an original and the size of copy paper, and

control means for making said automatic paper selecting means operative when a first image forming operation is performed by said image forming means and for making said automatic magnification selecting means operative when a second image forming operation is performed.

Re. 33,941

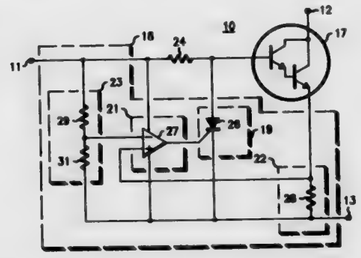
POWER DRIVER HAVING SHORT CIRCUIT PROTECTION

Stefan Lorincz, Arlington Heights, Ill., and Jeffrey J. Braun, Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Original No. 4,771,357, dated Sep. 13, 1988, Ser. No. 890,259, Jul. 23, 1986. Application for reissue Mar. 27, 1990, Ser. No. 499,845

Int. Cl.[5] H02H *3/26*

U.S. Cl. 361—87 **17 Claims**



17. A power driver having short circuit protection comprising:

(a) three input/output terminals, wherein:

(i) one of said terminals comprises a power input;

(ii) another of said terminals comprises a power output; and

(iii) another of said terminals comprises a control signal input that receives a control signal, which control signal is unrelated to said power input;

(b) a switch having power terminals connected in series with said power output and said power input, said switch being enabled by said control signal to connect said power input to said power output; and

(c) over current detection means, including means generating a first signal that relates to said level of current flowing through said switch, means for generating a second signal that relates to a threshold current level, and disconnect means responsive to said first signal exceeding the second signal for disconnecting said power input from said power output, said second signal and said disconnect means being enabled by said control signal.

PLANT PATENTS

GRANTED MAY 26, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,872

PIERIS JAPONICA NAMED SWEETWATER

Carlo Belgiorno, 1165 Connetiquot Ave., Central Islip, N.Y. 11722

Filed Aug. 27, 1990, Ser. No. 572,766

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct *Pieris japonica* substantially as herein shown and described characterized particularly by the unique combination and distinctive characteristics of dense vigorous growth, with heavy blooms every year, and sterile flowers having a sweet fragrance which bloom for longer periods than other *Pieris japonica.*

7,873

GERANIUM PLANT NAMED KLESEC

Siegfried Klemm, Stuttgart, Fed. Rep. of Germany, assignor to Klemm & Sohn, Fed. Rep. of Germany

Filed Apr. 24, 1990, Ser. No. 513,942

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive Geranium plant, substantially as herein shown and described, characterized by its green leaves and its contrasting and profusely blooming large brilliant red flower clusters.

7,874

POINSETTIA PLANT '140'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Inc., Encinitas, Calif.

Filed May 24, 1990, Ser. No. 528,231

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct Poinsettia cultivar, substantially as herein shown and described, characterized by its early flowering, short stature, dark red flower bracts and strong branching habit.

7,875

POINSETTIA PLANT '293'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Inc., Encinitas, Calif.

Filed May 24, 1990, Ser. No. 528,239

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct Poinsettia cultivar, substantially as herein shown and described, characterized by its orange red flower bracts, prolific branching and erect bract presentation.

VOL
1138
SS
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MY
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1992
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PATENTS

GRANTED May 26, 1992

ERRATA

For CLASS	See PATENT NO.
024-090	5,115,548
004-252	5,115,554
043-021	5,115,598
052-805	5,115,621
052-741	5,115,622
052-646	5,115,623
076-108	5,115,697
454-069	5,115,727
454-061	5,115,728
101-327	5,115,729
128-032	5,115,769
600-039	5,115,800
602-039	5,115,801
602-048	5,115,802
134-135	5,115,822
177-070	5,115,874
212-168	5,115,923
222-129	5,115,956
222-321	5,115,980
242-107	5,115,990
246-220	5,116,006
405-614	5,116,032
482-052	5,116,044
472-092	5,116,045
229-103	5,116,105
359-040	5,116,110
084-653	5,116,192
403-027	5,116,193
408-181	5,116,194
040-607	5,116,204
416-107	5,116,209
043-139	5,116,219
102-439	5,116,224
029-842	5,116,228
123-052	5,116,231
033-550	5,116,234
206-545	5,116,240
008-149	5,116,243
083-435	5,116,249
118-052	5,116,250
244-053	5,116,251

VOL
1138
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137-625 5,116,252
132-114 5,116,253
180-140 5,116,254
119-018 5,116,255
119-017 5,116,256
137-043 5,116,257
135-020 5,116,258
073-117 5,116,259
114-221 5,116,260
312-292 5,116,261
187-011 5,116,264
160-370 5,116,273
312-116 5,116,274
139-351 5,116,276
123-182 5,116,287
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073-721 5,116,331
294-067 5,116,341
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405-154 5,116,354
405-230 5,116,355
123-425 5,116,356
060-734 5,116,362
034-022 5,116,363
139-065 5,116,364
071-121 5,116,414
075-711 5,116,415
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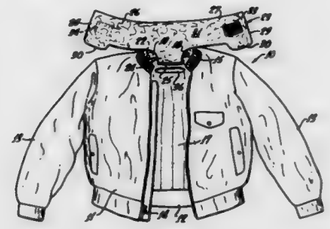
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PATENTS

GRANTED MAY 26, 1992

GENERAL AND MECHANICAL

5,115,516
GARMENT WITH NECK COVERING
Paul J. Golde, Mission Viejo, Calif., assignor to Intersport Fashions West, Inc., Orange, Calif.
Filed Jun. 13, 1991, Ser. No. 714,700
Int. Cl.[5] A41D *1/02*
U.S. Cl. 2—108 **12 Claims**



1. In combination with a garment having a back panel and a lining which includes a first portion having an edge and overlying said back panel and a collar portion at said edge of said first portion, a neck covering comprising a unitary sheet of flexible material having a central portion and two side portions projecting outwardly from the central portion on either side thereof, means for attaching one edge of said central portion to said lining adjacent said collar portion thereof so that said side portions of said neck covering are free and unconstrained and can be extended beyond said collar portion and wrapped around the neck of a wearer, and

fastener means adjacent the ends of said side portions for securing said ends together and holding said neck covering around the neck of the wearer,

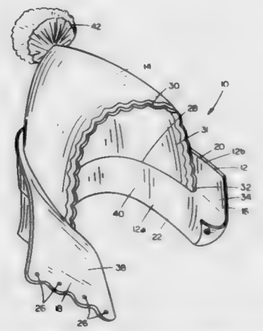
said first portion of said lining having an opening adjacent said edge of said central portion, a major portion of said sheet of flexible material being insertable through said opening to allow said neck covering to be disposed behind said first portion of said lining when not wrapped around the neck of the wearer of said garment.

5,115,517
SCARF GARMENT
Lisa L. Ferguson, 3115 Ave. B, Council Bluffs, Iowa 51501, and Susan M. Ludlow, 5314 S. 45th St., Omaha, Nebr. 68117
Filed Apr. 30, 1991, Ser. No. 693,807
Int. Cl.[5] A42B *1/04*
U.S. Cl. 2—203 **8 Claims**

1. A scarf garment comprising:

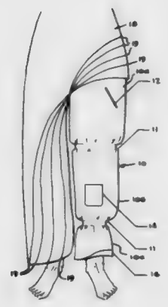
an elongated strip of material having first and second ends, upper and lower edges and inner and outer faces;

said strip having a generally horizontal foldable joint between upper and lower portions such that the upper portion will fold and overlap the lower portion with the outer faces of the upper and lower portions abutting together;



means for connecting said first and second ends to form a closed loop.

5,115,518
ARTICLE OF DRESS
Velimir Hofman, Slangenburg 10, 1082 JW Amsterdam, Netherlands
Division of Ser. No. 31,113, Mar. 25, 1987, which is a continuation of Ser. No. 596,866, Apr. 4, 1984, which is a continuation-in-part of Ser. No. 248,254, Mar. 30, 1981. This application Oct. 25, 1990, Ser. No. 607,111
Claims priority, application United Kingdom, Apr. 25, 1980, 8013710
Int. Cl.[5] A41D *1/06*
U.S. Cl. 2—227 **14 Claims**



1. An article of dress comprising a first piece and a second piece,

said first piece comprising a leg covering of decorative light weight material and capable of being worn as a single unit covering only a first leg of the two legs of a wearer;

(a) said first piece having a length whereby it is capable of extending from above the knee to below the knee of the wearer;

(b) said first piece having upper and lower edges;

(c) said first piece comprising at least one tight fitting attachment portion for engaging a part of the first leg of the wearer;

(d) said first piece having a loose fitting portion at at least

one of said edges, said loose fitting portion extending beyond an adjacent tight fitting portion to said one edge, whereby to allow ambient air to engage at least a portion of the first leg of the wearer;

(e) said first piece having a greater portion of its length loose fitting rather than tight fitting; and

(f) said first piece including at least one inflatable air-pocket; and

said second piece covering at least a portion of the torso of the wearer in the region of the abdomen and hips and a substantial portion of only the second leg of the wearer, leaving the first leg exposed, whereby said first piece can be viewed when worn on the first leg of the wearer.

5,115,519

GARTER WITH CONCEALED COMPARTMENT

MaryBeth H. Dalrymple, 7081 Dearwester Dr., Cincinnati, Ohio 45236

Filed Jul. 29, 1991, Ser. No. 736,798
Int. Cl.[5] A41B 9/00
U.S. Cl. 2—311 **1 Claim**



1. An undergarment for women for having a concealed compartment comprising

an elastic band for encircling and securement to a wearer's leg, said band has an outer covering made from a fabric providing the appearance of an undergarment; and

an inner panel made from fabric separated from the outer covering to form a concealed compartment between said inner panel and outer covering whose juxtaposed marginal edges form an opening having hidden means for closure to form said concealed compartment, said concealed compartment having a lining between said inner panel and outer covering;

an elastic webbing is placed between said outer covering and inner panel to provide said elastic band.

5,115,520

APPARATUS AND METHODS FOR SEALING A LEAKING TOILET TANK VALVE

Peter H. Colebrook, Bainbridge Is.; Jamil A. Razzak, Seattle; Robert H. Deakmann, Redmond, and Alan A. Clifton, Lynnwood, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 15, 1990, Ser. No. 567,459
Int. Cl.[5] E03D 1/00
U.S. Cl. 4—321 **12 Claims**

8. A fluid waste system for an aircraft, the system comprising:

a. means for receiving fluid waste;

b. A closable evacuation outlet;

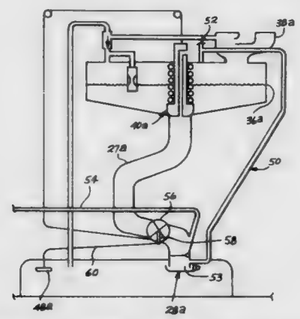
c. a discharge pipe connected between the waste receiving means and the evacuation outlet for conducting the fluid waste from the waste receiving means to the evacuation outlet;

d. a valve mounted in the discharge pipe, the valve including a first side and a second side; and

e. a source of pressurized air located within the aircraft;

f. a first conduit connected between the discharge pipe at a location upstream of the valve and a location on the aircraft in fluid communication with the atmosphere so that an ambient pressure existing while the aircraft is in flight is transmitted to the second side of the valve so as to urge the valve toward a closed position; and

g. a second conduit in fluid communication with the pressurized air source and the discharge pipe at a location in fluid communication with the first side of the valve so that the first side of the valve is caused to be pressure equalized with the pressurized air source so as to urge the valve toward a closed position.

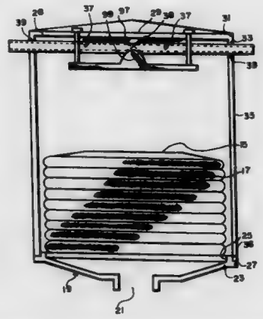


5,115,521

WATER CONSERVATION APPARATUS FOR WATER CLOSETS

Alexander E. Adamides, 834 11th St. No., St. Petersburg, Fla. 33705

Filed Oct. 9, 1990, Ser. No. 594,691
Int. Cl.[5] E03D 3/10
U.S. Cl. 4—354 **5 Claims**



1. An apparatus to minimize the amount of flushing medium required to flush a toilet, also known as a water closet having a water tank, or flushing of any other similar vessel comprising:

a housing for enclosing an axially expansible enclosure, said housing being of an inverted bucket shape including an end panel having an underside,

a base, being of generally tubular configuration, having a discharge end and an intake end, wherein said discharge end of said base is affixed internally to a discharge aperture of said water closet tank in such a manner as to allow said flushing medium to flow from said water closet tank to a water closet bowl, means to facilitate discharging and retention of said flushing medium, and means to replenish said flushing medium,

an axially expansible enclosure, having a top panel adjacent said end panel and built in resistance to expansion and having a single opening therein, wherein said opening is fabricated to mate in a liquid tight manner to said intake end of said base, a gate associated with said chamber to control expulsion of flushing medium therefrom, and wherein said axially expansible enclosure is provided with means to shut off flushing medium inlet, comprising:

a generally straight section of collapsible tube, extending across and mounted substantially centrally at the surface of the underside of said housing end panel, wherein said tube originates at said flushing medium supply and terminates at an aperture in said base so as to supply a flushing medium to said axially expansible enclosure; and

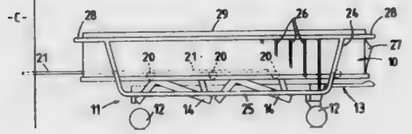
means to collapse said collapsible tube comprising: a substantially centrally placed ridge fabricated at said underside of said cover end panel and generally extending across and at right angles to said collapsible tube, and a similar ridge placed on the opposite side of said tube, in mirror image to said cover end panel ridge, at an exterior surface of said axially expansible enclosure top panel wherein: flushing medium passes through said collapsible tube and into said axially expansible enclosure until said enclosure expands to a point where its exterior surface forces said similar ridge to contact and ultimately collapse said tube between said ridges to shut off the flushing medium inlet, while said built in resistance to expansion causes said flushing medium to be expelled from said chamber when said gate is opened.

5,115,522

CONCEALMENT TROLLEY

Howard S. Wright, 436 Devon Street West, New Plymouth, New Zealand

Filed May 4, 1990, Ser. No. 519,391
Claims priority, application New Zealand, May 5, 1989, 229017
Int. Cl.[5] A61G 7/08
U.S. Cl. 5—81.1 **15 Claims**



1. A concealment trolley, which comprises:

a wheeled frame;

an enclosure into which a deceased person is loadable and fully concealed;

first raising and lowering means mounted on said wheeled frame and coupled with said enclosure such that the enclosure can be raised and lowered relative to said wheeled frame, said enclosure having an open top and a removable cover for closing of said open top, said enclosure also having an opening located at least at one end therof and closure means for closing said opening;

second raising and lowering means operable to raise and lower a removable platform means relative to said enclosure, said second raising and lowering means including transport means such that said platform means can be moved onto or from said second raising and lowering means via said opening when said closure means is in an open position;

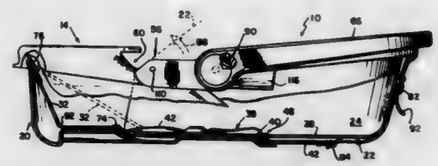
said second raising and lowering means locating, when in a raised position, said platform means at or adjacent said open top such that with the cover removed the deceased person can be loaded onto said platform means.

5,115,523

CONVERTIBLE INFANT RESTRAINT DEVICE

Richard E. Cone, Dayton, Ohio, assignor to Cosco, Inc., Columbus, Ind.

Continuation of Ser. No. 256,040, Oct. 11, 1988, Pat. No. 4,998,307. This application Feb. 11, 1990, Ser. No. 653,788
Int. Cl.[5] A47D 7/04
U.S. Cl. 5—94 **32 Claims**



1. A convertible infant restraint device comprising

a shell assembly including lower and upper shell portions, the lower shell portion including first and second fingers formed as a unitary piece of material with said lower shell portion,

means for pivotably connecting the upper shell portion to the lower shell portion for movement between a first position in which the lower and upper shell portions are aligned in longitudinally extending end-to-end relation to provide a flat bed and a second position in which the lower and upper shell portions are aligned at an angled to one another to provide a chair, and

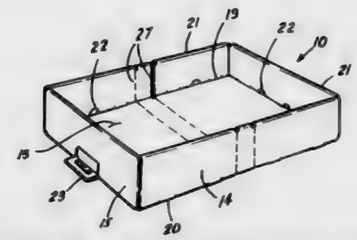
means for selectively locking the lower and upper shells together in one of the first and second positions, the locking means including lever means for engaging the first finger of the lower shell portion to establish the first position and the second finger of the lower shell portion to establish the second position.

5,115,524

FOLDING CRIB MODE FROM CARDBOARD MATERIAL

H. B. Antosko, 16 Harrow Place, Beaconsfield, Quebec, Canada H9W 5C7

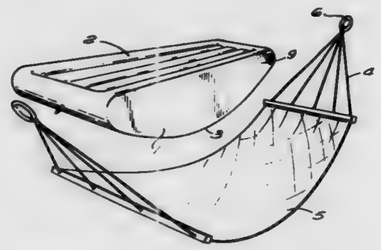
Continuation-in-part of Ser. No. 464,793, Dec. 20, 1989, abandoned. This application Oct. 5, 1990, Ser. No. 599,451
Int. Cl.[5] A47D 7/00; B65D 5/10
U.S. Cl. 5—99.1 **19 Claims**



1. A light-weight, compact, portable knock-down crib comprising a single flat sheet of foldable material having an integrally formed rectangular base, a pair of side wall and end wall panels foldable on folding score lines about said base, attachment means to secure said panels to one another, means to retain said panels elevated from said base when in a position of use to form an open-top enclosure, collapsing folding means disposed in said base and said side wall panels to permit said side walls and end walls to fold together on said rectangular base and further permitting said flat sheet and folded panels to be folded to form a hand-portable package, said collapsing folding means being comprised by a pair of spaced-apart paral-

lel score lines extending transversely across said rectangular base and said side wall panels, and wall folding means in said side wall panels to permit said side walls and end walls to fold together on said rectangular base.

5,115,525
HAMMOCK MATTRESS
Harold B. Lovitt, 8427 Kirkwood Dr., Los Angeles, Calif. 90048
Filed Apr. 11, 1991, Ser. No. 683,805
Int. Cl.[5] A47C *27/08*; A45F *3/22*
U.S. Cl. 5—120 **16 Claims**



15. A device for lounging comprising:
a hammock having a cradle suspended at longitudinally opposite ends; and
a mattress positioned on the cradle, wherein the mattress includes a substantially flat upper surface, a convex lower surface engaging the flat upper surface, two side panels each having a longitudinally arcuate edge subtended by a substantially straight edge in which the straight edge engages the flat upper surface and the arcuate edge engages the convex lower surface.

5,115,526
SOFTSIDE WATERBED FOUNDATION AND PACKAGE
Dennis Boyd, 14457 Rouge River, Chesterfield, Mo. 63017
Filed Apr. 2, 1991, Ser. No. 679,223
Int. Cl.[5] A47C *27/08, 19/00*
U.S. Cl. 5—451 **12 Claims**



1. A softside waterbed foundation comprising:
a pneumatically inflatable base; and
a compressible collar extending around the periphery of the pneumatically inflatable base and extending upwardly therefrom, said collar forming soft sides for the waterbed and, in combination with the pneumatically inflatable base, defining a cavity for a water mattress;
said pneumatically inflatable base including anti-bowing means for preventing said base from bowing upwardly in the center thereof during and after inflation of said base;
said collar being pneumatically inflatable;
said collar being in fluid communication with the base.

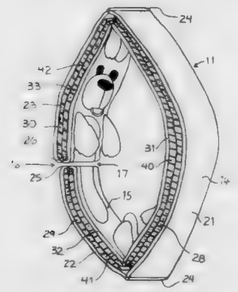
5,115,527
SUPPORT PAD WITH SPACED, PARALLEL LONGITUDINAL CHANNELS AND SUPPORT ELEMENTS
Anthony M. Medley, 23 Langdale Rise, Colne, Lancashire, United Kingdom BB8 7RA
Filed Sep. 24, 1990, Ser. No. 587,030
Claims priority, application United Kingdom, Jul. 23, 1990, 9016134
Int. Cl.[5] A47C *27/14*
U.S. Cl. 5—481 **4 Claims**



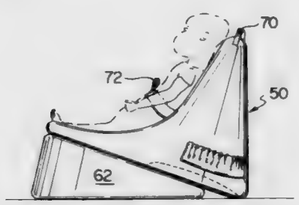
1. A device for pressure sore prevention in a patient, comprising a generally rectangular block of resilient foam material defined by generally parallel and vertical head and foot ends, and generally parallel sides, said block having a main body portion with a plurality of substantially parallel elongate support elements projecting from one side thereof, said support elements being generally parallel with the sides of the block and extending from the head end of the block, to the foot end of the block, said support elements comprising respective flat-topped head portions of generally semi-elliptical cross-section and respective shank portions of narrower width than the corresponding head portions and joining the head portions to said main body portion, with adjacent support elements being spaced apart by elongate channels each including a narrow part open between the head portions of the adjacent support elements and a wider blind part of approximately elliptical cross-section undercutting the head portions of the adjacent support elements and of smaller width than the shank portions thereof, the support elements defining and extending continuously over a substantially flat resilient support surface effective to maintain interface pressure between the surface and a patient resting thereon sufficiently low as to prevent capillary occlusion in the patient.

5,115,528
PILLOW TRANSFORMABLE INTO ANIMAL CHARACTER
Stuart Lamle, 3 Fordham Hill Oval, Ste. 15F, New York City, N.Y. 10468
Filed May 31, 1991, Ser. No. 708,469
Int. Cl.[5] A47G *9/00*
U.S. Cl. 5—640 **9 Claims**

1. A pillow transformable into an animal character comprising first and second cushioning layers each having first and second opposite faces, each first face providing a generally flat substantially rectangular, head supporting surface and at least one second face having indicia representing an animal character, means for attaching the cushioning layers together one on top of the other with, the second faces in face-to-face engagement concealing the animal character and with the head supporting surfaces outermost, exposed, in the pillow mode and, alternatively, with the first faces concealed in face-to-face engagement and the second faces outermost in the animal character mode transforming the pillow into an animal character wherein the attachment means secures the cushioning layers together along opposite longitudinal and lateral edges, one layer having a slit extending generally medially through its thickness to provide two pouch portions one on each longitudinal side of the slit and having adjacent mouths opening towards each other, transformation being effected by turning each pouch inside out, and stuffing the layers through the slit.



5,115,529
SUPPORT FOR SELECTIVELY SEATING AND DEVELOPING BALANCE AND MOTOR CONTROL IN INFANTS
Judy I. White, 2608 Kingsgrove Cres., Ottawa, Ontario, Canada K1J 6G1
Filed Oct. 29, 1991, Ser. No. 784,543
Int. Cl.[5] A47D *1/00, 13/00, 13/08*
U.S. Cl. 5—655 **12 Claims**



1. A support for selectively seating and developing balance and motor control in infants comprising, in combination:
a free-standing support body having a base, front, rear and opposed side surfaces, the front surface including a back rest portion which is inclined at an acute angle with respect tot he base, and spaced-apart side arms which extend forwardly in a plane of the base from opposed sides of the front surface of the support body, said support body further including means for lending weight and stability thereto to inhibit movement of the support body relative to a surface as well as to inhibit tipping of the support body; and
a seat cushion which is independent of the support body but attachable thereto in at least a first position wherein the support cushion, in combination with the support body, forms a rearwardly inclined infant seat having a seat surface formed by a top surface of the seat cushion and a backrest surface formed by the backrest portion of the support body, and a second position wherein the seat cushion is remote from the backrest portion to provide a space enclosed at the rear by the backrest portion of the support body, on the sides by the opposed side arms, and at the front by the seat cushion, said space being adequate to accommodate an infant in a substantially unsupported sitting position for developing balance and motor control while providing a surrounding cushion to help prevent injury from a fall in any direction.

5,115,530
ROTARY TOOTHBRUSH
Robert G. Distiso, 74 Sheffield St., Waterbury, Conn. 06704
Filed Jun. 8, 1990, Ser. No. 535,391
Int. Cl.[5] A46B *13/08*
U.S. Cl. 15—25 **9 Claims**



1. A rotary toothbrush, comprising:
a) an elongated adapted handle to be grasped by the hand of a person using said toothbrush, said handle being longtudinally bisected into two halves in which the mating edges on one of said halves of said handle has a plurality of spaced apart male post couplers with resilient ballooning spherical free ends, while the mating edges on said other half of said handle has a plurality of spaced apart female socket couplers to receive said male post couplers therein so that a shaft can be inserted and removed when needed, said handle having an annular recess adjacent one end thereof;
b) an elongated shaft having a distal end portion and a proxial end portion rotatably positioned at its distal portion within said handle so that its proximal portion extends outwardly therefrom, said shaft is cylindrical, is fabricated out of durable plastic material and has an enlarged disc-shaped member formed about the end of the distal portion thereof so that said enlarged disc-shaped member will rotatably ride within said annular recess in said handle, said shaft being one homogeneous piece of material;
c) a ferrule affixed onto the proximal portion of said shaft adjacent said handle whereby said distal portion of said shaft is captured within said handle between said disc shape member and said ferrule so that the index finger and thumb of the hand of the person gripping said handle can manually rotate said ferrule to turn said shaft and said bristle head in a clockwise and counterclockwise direction about the axis of said shaft in order for said bristle head to brush the teeth by a rotary action, pushing particles of foreign matter away from the gum line and the teeth, while at the same time stimulating the gum line; and
d) a bristle head formed about the free end of the proximal portion of said shaft, said bristle head being totally exposed and void of any covers or guard that could injure the user's mouth.

5,115,531
AIRCRAFT WASHING EQUIPMENT
Tsuneo Suzuki, Tokyo, Japan, assignor to Suzuki Mechanical Engineering Co., Ltd., Tokyo, Japan
Filed Jun. 21, 1990, Ser. No. 541,639
Claims priority, application Japan, Jun. 21, 1989, 1-159020
Int. Cl.[5] B60S *3/06*
U.S. Cl. 15—53.2 **2 Claims**

1. A device for washing aircraft comprising:
a raisable and lowerable arm extending from said device having proximal and distal tip portions;
a sub-arm having proximal and distal portions, the proximal portion of said sub-arm being pivotally attached to the distal tip portion of the raisable and lowerable arm to enable the sub-arm to pivot in a plane within which the raisable and lowerable arm is displaceable;

a first driving mechanism having two attachment points on either of two ends thereof, one of said ends being pivotally attached to the distal end of said raisable and lowerable arm and the other end of which is pivotally attached to the proximal portion of the sub-arm for driving the sub-arm so as to pivot about the distal tip portion of the raisable and lowerable arm;

a brush pivoting frame having a base pivotally attached to the distal portion of the sub-arm, the base of the brush pivoting frame being pivotable in a plane which is perpendicular to said plane within which the raisable and lowerable arm travels;

a second driving mechanism mounted on the distal end of the raisable and lowerable arm mechanism being engaged with the brush pivoting said drive frame by a drive shaft for driving the base of the brush pivoting frame so as to pivot about the distal portion of the sub-arm;

a brush swiveling frame swivelably attached to the base of the brush pivoting frame, the brush swiveling frame being able to swivel about the base of the brush pivoting frame in a plane which is perpendicular to said plane within which the base of the brush pivoting frame pivots;

a third driving mechanism being attached to the brush pivoting frame and a shaft operatively connecting the drive



mechanism to the brush swiveling frame for driving the brush swiveling frame so as to swivel the swiveling frame about the base of the brush pivoting frame;

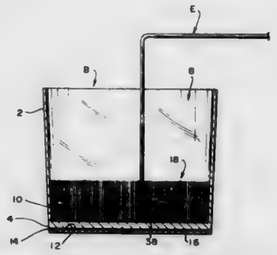
a pair of brush arms hinged to both ends of the brush swiveling frame, the brush arms being bendable in a plane which is parallel to said plane within which the brush swiveling frame swivels;

a park of fourth driving mechanisms each having two ends with one end of each attached to the brush swiveling frame and the other end of each attached to each of two brush arms for driving the brush arms to bend the brush arms;

a plurality of rotating brushes each having a center shaft, each of the center shafts being attached to the brush swiveling frame or the brush arms via a bracket so as to be parallel to the corresponding swiveling frame or the brush arms, the center shafts of the rotating brushes being mutually coupled with each other via universal joints so that the rotating brushes can rotate simultaneously; and

a fifth driving mechanism mounted on the brush swiveling frame and including a sprocket mounted on an output shaft of the fifth driving mechanism in operable communication with a roller chain and a sprocket connected to the center shaft for driving the rotating brushes about the center shaft in synchrony.

5,115,532
APPARATUS FOR FREEING OBSTRUCTIONS FORMED IN A HOLLOW SURGICAL SUCTION IMPLEMENT
Jerry L. Moore, 6229 N. Lafayette St., Fresno, Calif. 93711
Filed Dec. 3, 1990, Ser. No. 620,712
Int. Cl.[5] A46B *15/00;* **B08B** *9/00*
U.S. Cl. 15—104.92 **20 Claims**



1. An apparatus for freeing obstructions formed in a hollow surgical suction implement having first and second open ends, comprising:

a) fluid container means for containing a fluid therein having at least one opening for receiving a first open end of a hollow surgical suction implement, said fluid container means further including interior and exterior surfaces;

b) a plurality of bristles being disposed in said fluid container means, at least one of said plurality of bristles having a first end secured to said interior surface and a second end removed from said interior surface;

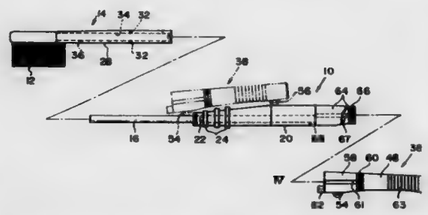
c) indicating means formed on at least one of said interior and exterior surfaces for indicating fluid level in said fluid container means;

d) said fluid container means includes a base and a retaining wall having upper and lower portions, said lower portion of said retaining wall is sealingly connected to said base;

e) said indicating means are formed on said retaining wall intermediate said lower portion and said upper portion;

f) each of said plurality of bristles includes first and second ends, said first ends of said plurality of bristles are secured to said base and said second ends are removed therefrom, at least one of said plurality of bristles is tapered.

5,115,533
TOOTHBRUSH WITH VOLTAGE TESTER
Hiroshi Hukuba, No. 914-1, Nazukari, Nagareyama, Chiba, Japan
Filed Sep. 6, 1990, Ser. No. 578,281
Claims priority, application Japan, Sep. 12, 1989, 1-236491
Int. Cl.[5] A46B *17/02;* **A61N** *1/26*
U.S. Cl. 15—105 **18 Claims**



1. An electronic toothbrush comprising:

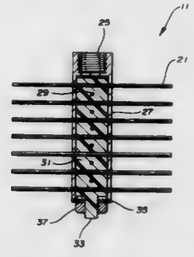
a head portion studded with bristles;

a grip portion adapted to be gripped manually;

an electric power source, one pole of which is connected with an outer surface of said grip portion and other pole of which is connected with said head portion; and

a voltage tester including a tester body for supporting all other testing components of said tester, said entire tester body defining a part of said grip portion that is manually gripped when attached to said grip portion when not being used for testing purposes and separating therefrom for testing the condition of said electric power source.

5,115,534
ROTARY PAINT REMOVED DEVICE
Raymond R. Fournier, Box 528, R.D. 1, Oxford, N.J. 07863
Filed Feb. 19, 1991, Ser. No. 659,721
Int. Cl.[5] A46B *13/02, 3/08, 7/04*
U.S. Cl. 15—179 **20 Claims**



1. A paint stripping attachment apparatus for a rotating string grass trimming tool, wherein said grass trimming tool has a working head so attached by a threaded shaft, said attachment apparatus comprising:

a) a substantially hollow drum having two ends, a first end being open, and a second end being solid, having a means of attachment between said drum and said threaded shaft formed thereon, said drum having a plurality of orifices formed therethrough between said first and second ends;

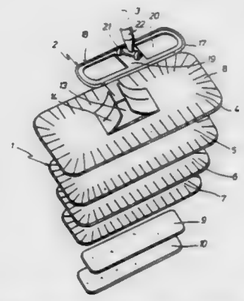
b) a core having a plurality of core orifices formed therethrough, said core fitting within said first end of said drum, said core orifices aligning with said orifices on said drum, creating a plurality of open passages through said drum and said core;

c) a plurality of flexible strands, one said strand traveling through each of said open passages within said drum and said core, each said strand extending outwardly from said drum at both ends of said open passage; and

d) a core displacement means whereby said plurality of core orifices traversing said core are temporarily forced out of alignment with said plurality of orifices fromed through said drum, the displacement of said core orifices pinching said plurality of flexible strands between said drum and said core, temporarily locking said strands into place;

wherein said core has a threaded neck formed thereon, said threaded neck extending below said drum when said core is within said drum, and wherein said core displacement means is a nut that tightens around said threaded neck, said nut contacting said first end of said drum and forcing said core toward said first end of said drum, the movement of said core within said drum pinching said flexible strands between said orifices on said drum and said core orifices, locking said flexible strands into place.

5,115,535
MOP FOR CLEANING AND POLISHING FLOORS AND OTHER SURFACES
Jose M. Casademunt Ferre, and Eduardo Fita Valentin, both of Barcelona, Spain, assignors to Vileda GmbH, Weinheim/Berstrasse, Fed. Rep. of Germany
Filed Sep. 15, 1989, Ser. No. 407,894
Claims priority, application Spain, Sep. 15, 1988, 8802819
Int. Cl.[5] A47L *13/16*
U.S. Cl. 15—229.7 **11 Claims**



1. A mop for mounting on a stiff mounting support and simultaneous cleaning and polishing, comprising:

a lower section;

an upper section joined to said lower-section;

said lower section comprising a plurality of joined fabric layers of substantially the same size and shape;

said upper section comprising a plurality of joined fabric layers including a bottom layer and top layer, said fabric layers having substantially the same shape, arranged in a stack and sized so that said stack tapers outwardly from said bottom layer to said top layer, and the fabric layers of the upper section being larger than those of the lower section;

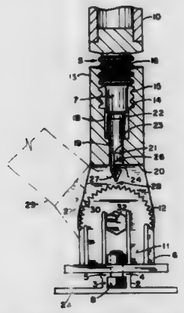
the fabric layers of the upper section further including an adjacent layer joined to said layer so that a pocket is formed therebetween for engaging and aligning a stiff mounting support of substantially the same size and shape as said lower section; and

an opening in said adjacent layer for inserting said mounting support into said pocket.

5,115,536
ADJUSTABLE CONCRETE FINISHING TOOL
Jack D. Jarvis, 2054 Portland St., Memphis, Tenn. 38127
Filed Mar. 26, 1990, Ser. No. 498,979
Int. Cl.[5] E01C *19/12;* **B05C** *17/10;* **E04F** *21/24*
U.S. Cl. 15—235.8 **5 Claims**

1. An adjustable concrete finishing tool for use in finishing concrete or the like, comprising, a plate portion having a handle removably attached thereto, said plate portion having a bottom side for finishing of concrete, said plate portion having an upper side for attachment of said handle thereto, attachment means for the handle formed along the upper side of the plate portion, said handle removably connecting to said attachment means, and said handle upon its loosening from its connection with the attachment means providing for an adjustment in the angular relationship between the handle and the plate portion, so as to compensate for the height of the worker with respect to the distance from the concrete site being finished, whereby once readjusted, the handle means may be remotely reconnected and tightened within the attachment means for fixing the handle with respect to the plate portion and for use in the finishing of concrete, said attachment means for the handle formed along the upper side of the plate portion and extending for some length longitudinally thereof to allow for adjustment

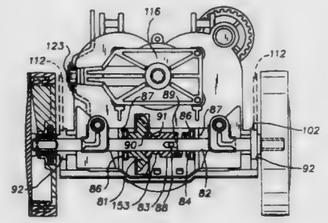
in the positioning of the handle upon the plate portion, said attachment means including a pair of upstanding members, each member having an inward shoulder projecting towards each other and thereby forming a clearance slot between the said members, at least one fastener having an enlarged head being accommodated within said slot, a bracket connecting at the lower end of the handle and securing with the fastener for holding the handle and the plate portion of the tool together in their adjusted positioning, said bracket including at least one angled member, said angled member having a pair of flanges, one flange of the angled member having an aperture therethrough for accommodating the said fastener, the other angle flange having a series of peripherally disposed serrations thereon, the lower end of the handle forming a housing, said housing pivotally connecting to the other angled flange and aligned therewith, said housing having a shiftable detent



therein, said detent of the handle capable of interlocking within select of the serrations of the bracket in order to lock the handle with respect to its bracket and fix the angle of its disposition with respect to the finishing tool, said handle, when tightened within the bracket, extending said detent exteriorly of said handle housing for locking said handle with respect to its supporting bracket, and the loosening of said handle with respect to the bracket providing for retraction of its detent within the housing and disengagement from the bracket serration thereby providing for pivotal shifting of the handle for its readjustment, a spring means cooperating with said handle detent for normally urging said handle into its handle housing, and its disconnection from a bracket serration, and said handle when tightened within its housing, forcing said detent against its spring pressure to extend from the said housing and for engagement with a bracket serration.

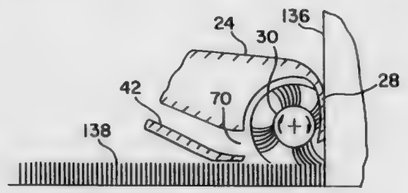
5,115,537
DRIVE SYSTEM
Robert B. Meyer, Middleburg Hts.; John R. Lackner, Westlake, and Hans J. Matuschek, Parma, all of Ohio, assignors to The Scott Fetzer Company, Cleveland, Ohio
Division of Ser. No. 442,615, Nov. 29, 1989, abandoned. This application May 31, 1991, Ser. No. 708,735
Int. Cl.[5] A47L *9/00*
U.S. Cl. 15—340.2 **16 Claims**

1. A self-propelled vacuum cleaner comprising a housing mounted on wheels and manipulated by a handle extending upwardly from the housing, a drive system within the housing for driving the wheels of the cleaner selectively in forward or reverse directions, the drive system including a motor, a pair of mutually intermeshed gears supported in the housing for counter-rotation about respective parallel axes, means driving the gears in rotation with power from the motor, an output element associated with each gear to form a set, means supporting each output element in confronting relation to the respective gear of a set for rotation about the axis of the respective gear, clutching surfaces for each gear and output element set, a common output element supported for rotation about an axis parallel to said gear axes, a belt trained around both of said associated output elements and said common output element, and output shaft operatively connected to said common output element and two said wheels to drive said wheels in directions determined by the rotational direction of the output elements, clutch acutator means responsive to manual forces on the handle to clutch one set of said gears and output elements together through their respective clutching surfaces to drive



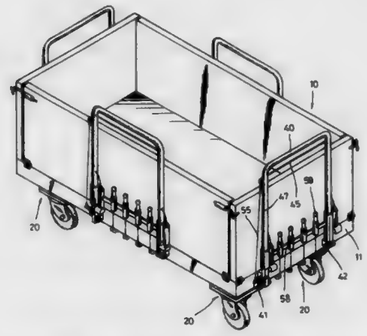
said output elements in a first rotary direction when a manual force is applied on the handle in a corresponding first direction and responsive to a manual force on the handle to clutch the other set of said gears and output elements through their respective clutching surfaces to drive said output elements in a second rotary direction whereby the clutch actuator means functions to cause said output shaft to selectively drive said wheels in either forward or reverse directions.

5,115,538
VACUUM CLEANERS
John R. Cochran, Baltimore, Md.; Rouse R. Bailey, Jr., New Park, Pa., and William R. Lessig, III, Hunt Valley, Md., assignors to Black & Decker Inc., Newark, Del.
Division of Ser. No. 469,176, Jan. 24, 1990, Pat. No. 5,020,186. This application Apr. 29, 1991, Ser. No. 692,645
Int. Cl.[5] A47L *9/04*
U.S. Cl. 15—383 **20 Claims**



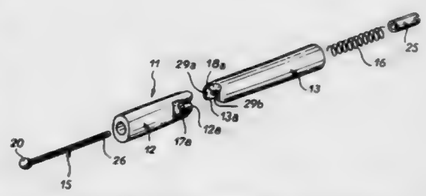
1. A cordless vacuum cleaner, comprising:
a handle connected to a body for pushing said body in a forward direction over a surface to be cleaned and for pulling said body in a rearward direction over said surface;
said body containing a power driven brush rotatable about an axis parallel to the surface to be cleaned;
vacuum nozzle located adjacent said brush;
said brush being disposed immediately adjacent but rearwardly of, a front wall of said body; and
said front wall being resiliently yieldable rearwardly when said body is pressed forwardly against a room wall to enable said brush to contact and sweep the surface to be cleaned at an edge location thereof abutting said room wall.

5,115,539
BRAKING AND WHEEL-ORIENTING MECHANISM FOR A FOUR-WHEELED TROLLEY
Sheng-Hwa Lee, No. 38-1, Tsa-Tzyy-Jyue, Tsa-Jyue Tsuen, Guan-In Country, Taor-Yuarn County, Taiwan
Filed Mar. 12, 1991, Ser. No. 667,901
Int. Cl.[5] B60B *33/00*
U.S. Cl. 16—35 R **3 Claims**



1. A braking and wheel-orienting mechanism for a trolley having four wheels, said mechanism comprising:
an identical braking system on each of said four wheels simultaneously operated by a pushing frame, and a wheel-orienting system on each of said four wheels simultaneously operated by four orienting levers disposed on said pushing frame, wherein,
said braking system includes a slide block fitted with a compression spring and a lifting brake shaft,
said slide block having two symmetrical slant strip projections on sides of said slide block,
said lifting shaft having a groove corresponding to said slant strip projections
said groove permitting said slide block to slide therewithin,
whereby when said slide block moves horizontally, said lifting shaft displaces vertically, wherein,
said wheel-orienting system includes a second slide block fitted with a compression spring and a lifting shaft, the lower end of said lifting shaft having a projection whereby when said slide block moves horizontally, the lifting shaft moves vertically,
each of said four wheels having a support including a fixing seat and a rotary seat, said rotary seat being formed with four recesses at equal angle intervals, wherein,
said pushing frame has two support legs pivoted to said trolley and fixed in a standing position by fixing pins, wherein a left leg of said support legs is provided with a gear connected with a wire drum,
said left leg having a fork-shaped member having two legs and a stem,
said two legs of said fork-shaped member being pivoted to said left leg and said stem being connected to the upper portion of said pushing frame by a wire,
one of said two legs of said fork-shaped member being connected to a first L-shaped abutting block pivoted to said left leg by a wire,
said abutting block being fitted with a compression spring, biasing the lower end of said abutting block to extend between the teeth of said gear,
the other of said two legs of said fork-shaped member extending to a Λ -shaped board pivoted to the carriage,
said Λ- shaped board being connected to a second L-shaped abutting block pivoted to the carriage by a wire,
said abutting block being fitted with a compression spring, making the lower end of said abutting block extend into the teeth of said gear,
a beam being disposed on said pushing frame, four tube members being disposed on said beam,
four orienting levers being disposed in said tube members, each of said orienting levers being formed with two protuberances, the upper end of said tube member being formed with two corresponding recess holes and two slots,
whereby said slide block of said braking system being pulled by a brake cable, and all brake cables are grouped and wound on said wire drum disposed on said left support leg,
while said slide block of said wheel-orienting system is pulled by an orienting wire and said orienting wire is connected to a corresponding orienting lever disposed on said pushing frame,
whereby when said fork-shaped member ascends, said Λ -shaped board is driven to ascend, making said first and second abutting blocks separate from said gear to permit said slide block to move to lower said lifting shaft to brake the wheel,
said pushing frame repeatedly swingable to rewind said brake cable for pulling back said slide block,
whereby when said protuberances of said orienting lever enter said slots of said tube member, said slide block moves to lower said lifting shaft so that the lower projection thereof extends into said recess of said rotary seat of said wheel support to orient the wheel,
and when said orienting lever is pulled upward, making said protuberances enter said recess holes of said tube member, said slide block is pulled back to lift said lifting shaft.

5,115,540
SPRING-LOADED HINGE
Serge Delorme, Paroches, France, assignor to Essilor International Compagnie, Creteil, France
Filed Nov. 20, 1990, Ser. No. 616,201
Claims priority, application France, Nov. 21, 1989, 89 15230
Int. Cl.[5] G02C *5/22*
U.S. Cl. 16—228 **14 Claims**



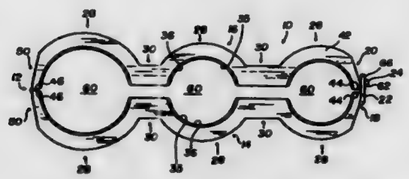
1. A spring loaded hinge suitable for eyeglass frames comprising two elongate hollow members with respective longitudinal recesses and comprising at respective ends complementary articulation surfaces in contact with each other, the two recesses opening at facing orifices, a connecting part accommodated in the two recesses, passing through said orifices, having an enlarged end abutted against an inside end surface of one of said recesses and having its other end coupled to a spring accommodated in the other recess, said spring being prestressed to urge said articulation surfaces against each other through the intermediary of said connecting part and said one of said recesses being provided with an orifice to introduce said enlarged end and a longitudinal cavity to retain said enlarged end.

5,115,541
HOSE CLIP
Willi Stichel, Maintal, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany
Filed Feb. 15, 1991, Ser. No. 656,995
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1990, 4005631
Int. Cl.[5] B65D *63/02*
U.S. Cl. 24—20 R 46 Claims



1. A hose clip comprising a generally annular strap having an inner side and an outer side; an insert adjacent said inner side, having a concave internal surface, overlapping and extending along less than one-half of said inner side and having two end portions spaced apart from each other in the circumferential direction of said strap, at least one of said end portions being movable along said inner side circumferentially of said strap; and means for biasing said insert away from said inner side so that a hose which is surrounded by said strap and by said insert is clampingly engaged by said internal surface and the non-overlapped portion of said inner side.

5,115,542
HOSE SEPARATOR CLIP
Michelle R. Gehres, Convoy, Ohio, assignor to Navistar International Transportation Corp., Chicago, Ill.
Filed Oct. 17, 1991, Ser. No. 777,985
Int. Cl.[5] A44B *21/00*; F16L *3/00*
U.S. Cl. 24—543 8 Claims



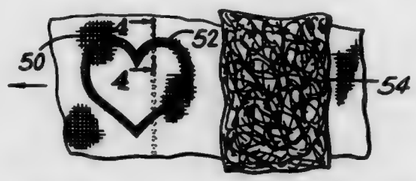
1. A hose separator clip for connecting a plurality of hoses comprising an elongate one piece unitary structure having a living hinge disposed centrally along the length thereof, forming two substantially mirror image clip halves thereabout, said mirror image clip halves including cooperative latch means at free ends thereof for releasably connecting said free ends together, each said clip half including a plurality of arcuate areas with corresponding arcuate areas of said clip halves defining spaced apart circular hose receiving channels therebetween when said clip halves are pivoted about said hinge and latched to one another, said arcuate areas being separated from one another along the length of each clip half by intermediate flat portions disposed parallel to but offset from a midline of said clip, the midline extending between the hinge and free ends when the clip halves are latched together, said intermediate flat portions defining a substantial gap therebetween upon said clip halves being latched together.

5,115,543
BUCKLE FOR SAFETY BELT SYSTEMS IN VEHICLES
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany
Filed Nov. 18, 1991, Ser. No. 793,166
Claims priority, application European Pat. Off., Dec. 11, 1990, 90123817.0
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—633 12 Claims



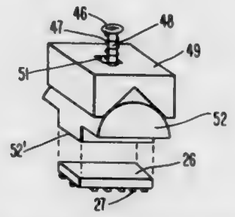
1. A buckle for safety belt systems in vehicles which are provided with an insert tongue for cooperation with said buckle and with a belt pretensioner engaging on the buckle, comprising a loadbearing housing in which an insert path for said insert tongue is formed, a locking bar which engages said insert tongue and is movable between a first position in which said insert tongue is blocked in the buckle and a second position in which said insert tongue is released from the buckle, a release button movable between a rest position and a release position and biased by spring force into said rest position, actuation of said button to said release position in a direction corresponding to an insert movement of the insert tongue, which in turn corresponds to a movement direction of said buckle in a pretensioning operation, causing said locking bar to be moved into said second position, and an inertial mass body for compensating the mass inertia of the release button, said release button being connected with at least one first gear element, said mass body being mounted movably relatively to the housing and having a second gear element formed thereon, said first gear element and said second gear element being in meshing engagement with each other permanently directly or via an interposed third gear element, and the meshing engagement between said gear elements causing the mass inertia of the mass body to oppose movement of the release button in said movement direction of the buckle to prevent the release button from moving to its release position at the end of said pretensioning operation.

5,115,544
NON-WOVENS MANUFACTURING PROCESS
Christian B. Wides, Gallatin, Tenn., assignor to Albany International Corp., Albany, N.Y.
Filed Apr. 3, 1990, Ser. No. 503,740
Int. Cl.[5] D04H *1/46*; D06C *23/00*
U.S. Cl. 28—105 11 Claims



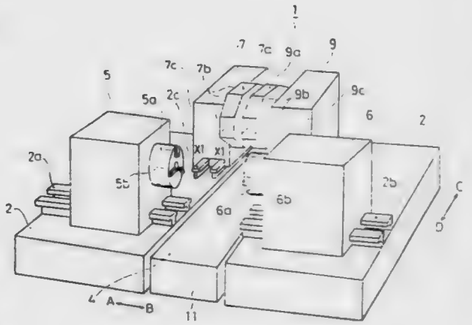
1. A fine-mesh woven screen 1 for use in manufacturing a non-woven fabric 1 having a plurality of specific unconnected designed patterns, each of said plurality of patterns being surrounded by a uniform background area, said fine-mesh woven screen having a surface with said plurality of specific designed patterns in designated areas thereof, said substantially uniform areas thereby forming a continuous whole on said surface of said fine-mesh woven screen, so that said non-woven fabric manufactured thereon may be substantially uniform but may have a plurality of specific designed patterns in designated areas corresponding to said plurality of specific designed patterns in said designated areas on said surface of said fine-mesh woven screen.

5,115,545
APPARATUS FOR CONNECTING SEMICONDUCTOR DEVICES TO WIRING BOARDS
Hiroaki Fujimoto, Hirakata; Kenzo Hatada, Katano; Yoshinobu Takeshita, Kagoshima; Kazuya Otani, Kagoshima, and Kimiaki Takeda, Kagoshima, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 20, 1990, Ser. No. 496,341
Claims priority, application Japan, Mar. 28, 1989, 1-77566
Int. Cl.[5] B23K *31/00*; H01L *21/92*
U.S. Cl. 29—25.01 6 Claims



1. An apparatus for connecting semiconductor devices to a wiring board, said wiring board having wiring patterns, the apparatus comprising:
a first stage for setting a wiring board,
a second stage for setting a semiconductor device, said semiconductor device including bumps thereon,
a container for storing an insulating resin of a photo-setting nature,
a vacuum collet for applying suction to the semiconductor device,
means for monitoring the alignment of the bumps of the semiconductor device with the wiring patterns of the wiring board,
an adjustable pressing unit for evenly pressing together the bumps of the semiconductor device and the wiring board, the pressing unit comprising a chip presser and a receiving block
a source of light for applying a light to the insulating resin so as to harden it,
a control for regulating the first stage, the second stage, the monitoring means, the movement of the vacuum collet, and the lead of the pressing unit,
wherein the insulating resin is applied to the wiring board so as to adhere the semiconductor device thereto,
and wherein the first stage is moved to a point near the pressing unit and the pressing unit is driven so as to enable the receiving block to slide on the surface of the chip presser so that the semiconductor device is evenly pressed against the wiring board, thereby enabling the insulating resin to spread out through gaps between the bumps and the wiring board until the bumps and the wiring board are electrically connected to each other, the gaps between the bumps and the wiring patterns being then irradiated with the light from the source of light so as to harden the insulating resin, and the pressing unit being operated so as to release the semiconductor device therefrom.

5,115,546
COMPLEX MACHINING MACHINE TOOL
Yukio Mitsukuchi, Aichi; Shuichi Hashimoto, Gifu; Shoji Momoi, Gifu, of Japan, assignors to Yamazaki Mazak Corporation, Aichi, Japan
Division of Ser. No. 337,881, Apr. 14, 1989, which is a division of Ser. No. 182,452, Apr. 18, 1988, Pat. No. 4,949,444. This application Jun. 8, 1990, Ser. No. 535,132
Claims priority, application Japan, Apr. 17, 1987, 62-58205; Apr. 28, 1987, 62-105439; Apr. 28, 1987, 62-105441; Apr. 28, 1987, 62-105442; Apr. 28, 1987, 62-105443; Apr. 28, 1987, 62-105444; Apr. 29, 1987, 62-105150; May 29, 1987, 62-134151; Jun. 23, 1987, 62-156054; Jun. 23, 1987, 156055; Jun. 23, 1987, 62-172488; Jul. 24, 1987, 62-185006; Sep. 25, 1987, 62-241521; Oct. 13, 1987, 62-258012; Dec. 24, 1987, 62-327652; Dec. 24, 1987, 62-327654
Int. Cl.[5] B23B *9/10*
U.S. Cl. 29—27 C 11 Claims



1. A lathe, comprising:
a frame;
first and second spindle stocks having first and second workpiece spindles rotatably supported thereby, respectively, said first and second spindle stocks being disposed on said frame so as to face each other and so as to be free to move only in a direction along axis centers of said first and second workpiece spindles, said axis centers of said first and second workpiece spindles being colinear;
first and second workpiece holding means provided with said first and second workpiece spindles, respectively, for holding a single workpiece between said first and second spindle stocks;
at least one tool rest capable of selectively positioning tools for said first and second workpiece holding means;
first and second feed screws rotatably disposed on said frame, said first and second spindle stocks being engaged with said first and second feed screws, respectively, for independently moving said first and second spindle stocks in said direction of said axis centers of said workpiece spindle by rotation of said feed screws;
first and second means for rotatably driving said first and second feed screws, respectively, connected with said first and second feed screws;
a rotation angular quantity detecting means for electrically detecting the angular rotation of both said first and said second feed screws, and for outputting a signal corresponding to the angular rotation of said first and said second feed screws;
a synchronous movement control means for controlling at least one of said first and said second means for rotatably driving said first and said second feed screws so that said first and second spindle stocks synchronously move at the

same speed in the same direction upon rotation of said first and second feed screws by said first and second means for rotatably driving while a single workpiece is held between said first and second spindle stocks on the basis of said signal outputted from said rotation angular quantity detecting means; and

synchronous movement command means for commanding said synchronous movement control means to synchronously move said first and second spindle stocks.

5,115,547

ARRANGEMENT FOR ROLLING HOT-ROLLED WIDE STRIPS

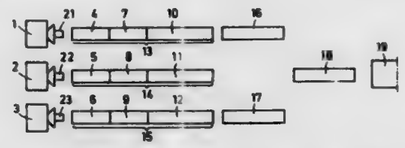
Wolfgang Rohde, Dormagen-Nievenheim, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 18, 1991, Ser. No. 645,270

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1990, 4001288

Int. Cl.[5] B21B *1/46, 13/22;* B22D *11/14*

U.S. Cl. 29—33 C **6 Claims**



1. An arrangement for rolling hot-rolled wide strips from continuously cast thin slabs by means of a continuous finishing train, the arrangement comprising a middle single-strand casting line and two outer single-strand casting lines which are arranged next to each other and in front of the finishing train, wherein the middle casting line is in alignment with the finishing train, means for severing individual thin slabs from each of three cast strands produced by the casting in a staggered sequence, two longitudinal/transverse/longitudinal conveying systems being arranged next to each other and following the casting lines and in front of the finishing train, means for placing each of the thin slabs severed from cast strands produced by the casting lines on one of the two longitudinal/transverse/-longitudinal conveying systems, means for placing the two longitudinal/transverse/longitudinal conveying systems at a distance next to each other which corresponds to the distance between two adjacent casting lines, means for moving the two longitudinal/transverse/longitudinal conveying systems synchronously together or coupled together transversely over a distance which places one of the two longitudinal/transverse/-longitudinal conveying systems in alignment with the middle casting line and with the finishing train, means for conveying each thin slab to the finishing train from the longitudinal/transverse/longitudinal conveying system which is in alignment with the finishing train, and means for simultaneously conveying the thin slabs to be rolled subsequently onto the longitudinal/transverse/ longitudinal conveying system which is in alignment with one of the outer casting lines.

5,115,548

BUTTON FOR USE ON GARMENTS AND THE LIKE

Bernhard Nysten, Aachen, Fed. Rep. of Germany, assignor to William Prym-Werke GmbH & Co. KG, Stolberg, Fed. Rep. of Germany

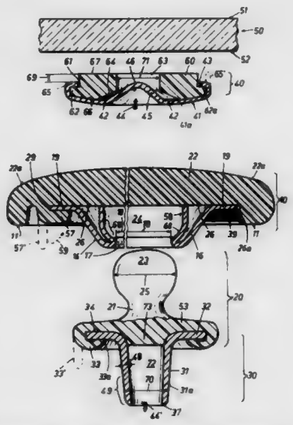
Filed Aug. 24, 1990, Ser. No. 572,896

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1989, 3928529; Mar. 31, 1990, 4010427

Int. Cl.[5] A44B *1/04*

U.S. Cl. 24—90 R **41 Claims**

1. A button for attachment to a penetrable carrier, such as a garment, which has a front side and a rear side, comprising a head having an enlarged portion arranged to pass through a buttonhole and a deformable tubular shank articulately connected with said enlarged portion and arranged to penetrate through the carrier from the front side toward and beyond the rear side of the carrier; and a preassembled retaining device arranged to receive, deform and retain the shank at the rear side of the carrier, said device including an elastically deformable plastic insert and a metallic enclosure partially surrounding said insert, said enclosure having an opening and said insert having a rear portion in said enclosure and a front portion extending from said enclosure through said opening and having a substantially plane front surface arranged to engage the rear side of the carrier, said enclosure further comprising a rear wall and a sidewall defining with said rear wall a chamber for the rear portion of said insert, said sidewall having an opening for said front portion of said insert and said rear portion of said insert defining with said rear wall a clearance in communication with said opening, said enclosure also comprising a deforming portion aligned with said opening and arranged to deform said shank behind said insert into said clearance upon penetration of the shank through the carrier and said insert.



5,115,549

DIAGONAL INSERTION APPARATUS

Takayuki Maruyama, Suwa, Japan, assignor to Seiko Epson Corporation, Japan

Filed May 8, 1990, Ser. No. 520,514

Claims priority, application Japan, May 8, 1989, 1-114619

Int. Cl.[5] B23Q *1/06*

U.S. Cl. 29—281.1 **4 Claims**

1. A diagonal insertion apparatus for inserting a shaft-like member into an insertion receiving component having a plurality of diagonal holes each having different angular orientation with respect to a reference plane and comprising

a pallet for supporting said insertion receiving member and movable along an assembly line,

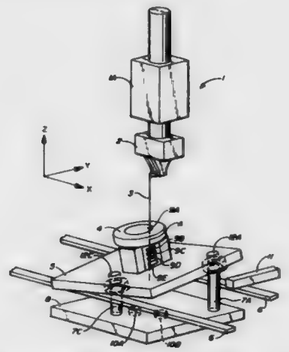
a plurality of positioning jigs provided for position and alignment gaging relative to each one of said insertion receiving component diagonal holes,

said positioning jigs supported along and beneath said assembly line and in aligned relation with said pallet when positioned thereabove, said jigs each having a plurality of vertical pins supported from a surface thereof,

at least some of said jig pins having pin ends with different heights,

each of said jigs selectively elevated to releasably engage the bottom of said pallet when positioned thereabove via said pin ends and concurrently elevate and incline said pallet relative to said reference plane in a fixed relationship relative to said jig so that the center line of a selected one of said diagonal holes is positioned and aligned relative to the axis line of said shaft-like member for aligned insertion thereof,

reference means formed in said positioning jig for accurately determining the positional relationship arrangement of said pins relative to each other and their distal relationship to said reference means,



said reference means provided relative to each of said positioning jigs to insure standardized accuracy among said positioning jigs in the positioning and alignment of each of said diagonal holes relative to its respective shaft-like member.

5,115,550

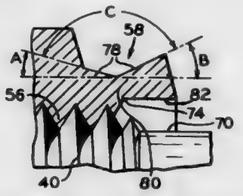
ADJUSTABLE O-RING PORT FITTING FOR A HYDRAULIC COUPLING

Nigel D. L. Williamson, Eccleshall, England, assignor to NWD International, Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 293,392, Jan. 4, 1989, Pat. No. 4,934,742, which is a continuation-in-part of Ser. No. 148,846, Jan. 27, 1988, abandoned. This application Jun. 5, 1990, Ser. No. 533,124

Int. Cl.[5] B23Q *3/00*

U.S. Cl. 29—283.5 **6 Claims**



1. A method of forming a male hydraulic coupling member adapted to form a hydraulic connection to a female port, comprising:

providing a male fitting member including first external thread means for threadedly engaging internal threads of a female port, and second external thread means, said male fitting member having a longitudinal axis;

providing a lock nut for frictionally locking the male fitting member to a port, the lock nut including internal thread means threadedly engaged with said second external thread means, said lock nut including an annular skirt portion extending toward said first external thread means and having an internal surface, and an annular undercut shoulder, said skirt portion including an axially inner section and an axially outer section, said inner section having a first external surface oriented at a first angle relative to the axis of said male member, said outer section including a second external surface oriented at a second angle relative to said axis of said male member and forming a third external angle with said first external surface less than 180° relative to said inner section external surface, said inner and outer sections located directly adjacent each other at a deflection point of said skirt portion; and

bending said skirt portion radially inward about said deflection point until said outer section abuts said male member and said third angle increases to substantially 180°.

5,115,551

METHOD FOR FITTING A FLEXIBLE STRIP

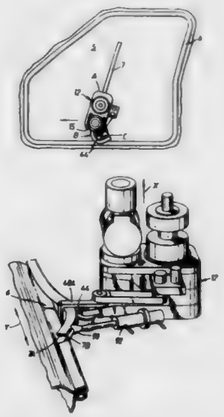
Dieter Goedderz, Erkelenz, and Markus Reuvers, Krefeld, both of Fed. Rep. of Germany, assignors to Draftex Industries, Limited, Edinburgh, Scotland

Continuation of Ser. No. 661,462, Feb. 26, 1991, abandoned, which is a division of Ser. No. 460,285, Jan. 3, 1990, Pat. No. 5,031,293. This application Sep. 20, 1991, Ser. No. 763,869

Claims priority, application United Kingdom, Sep. 6, 1989, 8920133

Int. Cl.[5] B23P *11/00*

U.S. Cl. 29—450 **1 Claim**



1. A method of mounting an elongate resilient strip onto a mounting flange, the mounting flange defining a closed loop, the strip being of open-mouthed channel-shape and compressible lengthwise, comprising the steps of selecting a length of the strip having an initial end and a final end and a distance therebetween slightly greater than the peripheral length of said closed loop,

feeding the strip longitudinally towards the flange, initial end first, in a direction which is transverse to the length of the flange and which lies in a general plane of the flange,

constraining the initial end of the strip to follow a curved path as it approaches the flange as a result of the feeding step, the curved path lying in the general plane of the flange and having an initial part, an intermediate part, and a final part, the initial part being aligned with the direction of feeding of the strip in the feeding step and receiving the strip from the feeding step, the intermediate part being tangential to a line which is substantially parallel to the flange and which is closely adjacent but spaced from the flange, and the final part being directed away from the flange, the feeding step causing the strip to be fed along the curved path so that the part of the strip which is present in the intermediate part of the curved path presents the mouth of the channel to face outwardly of the

curvature of the curved path and towards but spaced from the flange,

moving the curved path bodily towards the flange when the initial end of the strip has reached the final part of the curved path, so that the part of the strip which is at that time in the intermediate part of the curved path moves into embracing relation with the flange but the initial end of the strip which is present in the final part of the curved path is clear of the flange,

continuing to move the strip longitudinally into the curved path and at the same time transporting the curved path, together with the strip therein, along the length of the flange so that successive parts of the strip entering the intermediate part of the curved path are pressed into embracing relation with the flange and the initial end of the strip in the final part of the curved path remains clear of the flange,

when the final end of the strip has been pressed into embracing relation with the flange, mechanically lifting from the flange the part of the strip which corresponds to that which lay in the intermediate part of the curved path when the initial end of the strip first reached the final part of the curved path,

then pressing the initial end of the strip into embracing engagement with the flange and immediately adjacent to the final end of the strip on the flange, and

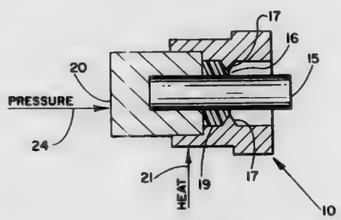
then pressing onto the flange the mechanically lifted part of the strip.

5,115,552

METHOD OF MAKING A DYNAMIC SEAL FOR A LIQUID PUMP OR SPRAY GUN

Roy D. Mattson, White Bear Lake, Minn., assignor to Mattson Spray Equipment, Inc., Centerville, Minn.

Filed Sep. 9, 1991, Ser. No. 756,806
Int. Cl.[5] B29C *43/18*
U.S. Cl. 29—527.4 **4 Claims**



1. Forming a dynamic liquid seal within an opening through a wall of a chamber between said wall an axially slidable rod received through said opening, comprising the steps of:

placing a rod lengthwise coaxially through said opening in the wall of the chamber with a minute space between the rod and the opening so that the rod is able to slide back and forth lengthwise in the chamber through the opening;

placing a ring of thermoplastic material into said chamber around said rod;

applying pressure in an axial direction on said thermoplastic ring to force said ring against one side of said chamber wall while applying heat to cause the thermoplastic material to flow along said one side of said wall into the space between said rod and said wall opening to the other side of said wall; and

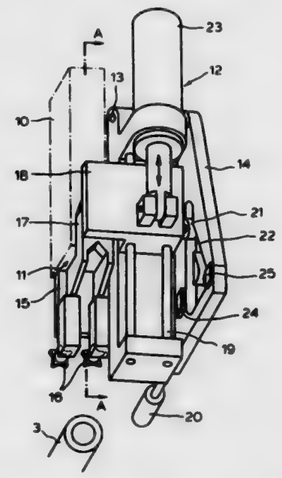
removing the heat and pressure from said thermoplastic material to allow the thermoplastic material to set while the rod is in place.

5,115,553

CONTACT LENS MANUFACTURING APPARATUS

Michael J. Sealey, and Albert H. Morland, both of Southampton, United Kingdom, assignors to The Cooper Companies, Inc., Menlo Park, Calif.

Division of Ser. No. 24,927, Mar. 27, 1987, Pat. No. 4,745,672, which is a continuation of Ser. No. 589,061, Jan. 11, 1984, abandoned. This application Sep. 1, 1987, Ser. No. 94,160
Claims priority, application United Kingdom, May 15, 1982, 82 14045
Int. Cl.[5] B23Q *7/00*; B23P *23/00*
U.S. Cl. 29—563 **14 Claims**



12. An apparatus for manufacturing contact lenses in which workpieces comprising contact lens blanks or partly finished lenses are inserted into a machine tool collet and subjected to a lens forming or polishing operation characterized in that said apparatus comprises:

a loading device arranged at a loading station to remove workpieces sequentially from a first magazine which encloses a plurality of workpieces and to feed the workpieces individually into the collet from the loading station;

said loading device having a first holding means for holding a workpiece removed from the first magazine and a positioning means for positioning said workpiece at the loading station in a predetermined position with respect to the collet;

an unloading device which includes a second holding means for removing workpieces from the collet and for introducing them sequentially into a second magazine, said first holding means is mounted on a carriage which is movable by first and second motion producing devices, said first and second devices being jointly effective to linearly and pivotally move said first holding means from the loading station into a position in which the workpiece is in alignment with the collet, said second device being effective to transfer the workpiece to the machine tool collet, and said first device being effective to move said first holding means away from the collet after the workpiece has been transferred to the collet; and,

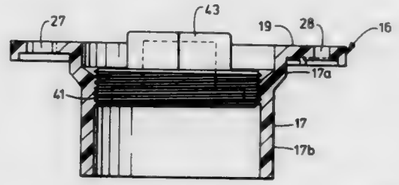
said holding means on said unloading device comprises a pair of star wheels mounted on said unloading device by means of respective one-way clutches, said star wheels being arranged to grip generally cylindrical workpieces as they are released from the collet and said clutches permitting free rotation of said star wheels.

5,115,554

CLOSET FLANGE

Donnie R. Fell, Sr., 3500 Tates Creek Rd., Lexington, Ky. 40517, assignor to James L. Holman and Donnie R. Fell, Sr., Lexington, Ky.

Filed Dec. 19, 1990, Ser. No. 629,928
Int. Cl.[5] E03D *11/13*; F16L *55/10*
U.S. Cl. 4—252.4 **3 Claims**



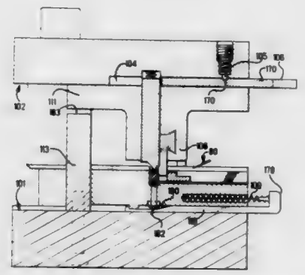
1. A closet flange for mounting a water closet to a supporting surface and for connecting said water closet to plumbing means leading to a soil pipe and vent assembly, said closet flange comprising a cylindrical body with an axial bore, said cylindrical body having upper and lower portions, said lower body portion being configured for connection to said plumbing means, said upper body portion defining the entrance end of said body, an exterior, annular attachment flange means located at said entrance end for attachment to said supporting surface with said body extending through a perforation in said supporting surface and for attachment of said water closet thereto, said axial bore being internally threaded with standard pipe threads at said upper body position for threaded engagement by a standard threaded screw plug whereby to selectively close said axial bore and to seal said axial bore for air or water testing prior to the mounting of said water closet.

5,115,555

APPARATUS FOR MANIPULATING A HIGH DENSITY FLAT CABLE

Billy E. Olsson, New Cumberland, and Iosif Korsunsky, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 22, 1991, Ser. No. 659,787
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—566.3 **19 Claims**



1. An apparatus for positioning conductors of a cable in recesses of a housing, the apparatus comprising:

a frame;

a cutting means mounted to the frame;

a staking means mounted to the frame such that the staking means are movable relative to the cutting means;

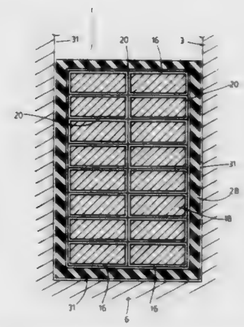
a support member positioned on the frame and movable between a first position and a second position, whereby when the support member is in the first position, the support member cooperates with the staking means to insure that the staking means is not movable relative to the frame, and when the support member is in the second position, the support member does not cooperate with the staking means, thereby allowing the staking means to move relative to the frame.

5,115,556

METHOD OF MANUFACTURING WINDINGS FOR ELECTROMAGNETIC MACHINES

George Gavrilidis, and Edan Garcia, both of 271 Hanlon Road, Woodbridge, Ontario, Canada L4L 3R7

Filed Mar. 18, 1981, Ser. No. 670,871
Int. Cl.[5] H02K *15/04*
U.S. Cl. 29—596 **13 Claims**



1. A method of manufacturing a coil for installation in laminated core slots of an electromagnetic machine, including the steps of winding the coil, forming the coil, wrapping the formed coil with a first layer of electrically insulating tape, then with a second layer of electrically insulating tape formed of a heat curable rubber composition, and then with a third layer of tape, the first and third layers of tape being formed of a material which maintains its structural integrity at the curing temperature of the rubber composition, pressing those portions of the coil to be located in the core slots to the cross-sectional dimensions of said slots, and curing the rubber composition to form a rubber jacket around the coil whilst the coil portions are so pressed, with the first and third layers of tape forming a mould for the rubber composition during the curing process.

5,115,557

METHOD OF CONNECTING A CONDUCTOR WIRE TO A HOOK-SHAPED ELEMENT

Reinke A. Visser, Drachten; Adrianus R. C. Engelfriet, and Klaus B. Schildbach, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 5, 1990, Ser. No. 578,049
Claims priority, application Netherlands, Sep. 7, 1989, 8902240
Int. Cl.[5] H01R *43/06*
U.S. Cl. 29—597 **3 Claims**



1. A method of electrically and mechanically connecting an

electrical conductor wire comprising an electrically conductive core and a sheath of insulating material to a hook-shaped electrically conductive body, said method comprising:

introducing the wire into the hook-shaped body while the hook is open;

ablating the insulating material of the wire in the open hook with a radiation beam;

aiming a gas stream at the wire in the open hook during the ablating to effectively remove the ablated insulating material; and

after ablation, clamping the core in the hook-shaped body by cold deformation of the body.

5,115,558

APPARATUS FOR PRELOADING ANTIFRICTION SHAFT BEARINGS LOCATED IN A CASING

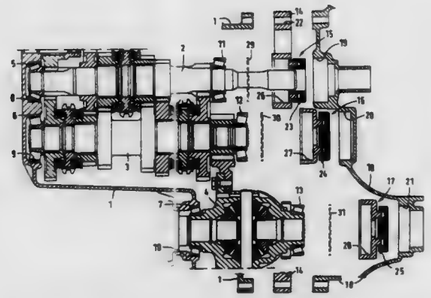
Bodo Bernhardt; Jan Dijkhuis, both of Pulheim, and Theo Molders, Dormagen, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed May 3, 1990, Ser. No. 518,398

Claims priority, application Fed. Rep. of Germany, May 19, 1989, 3916314

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—705 **9 Claims**



1. An apparatus for preloading antifriction bearings located within a casing, said casing comprising first and second casing adapted for mutual connection, and having a first bearing recess in the first casing portion and second bearing recess in the second casing portion, a tightenable attachment for forcing the casing into mutual contact, a first bearing located in the first bearing recess, a second bearing, and a shaft supported on the first bearing and on the second bearing, said apparatus comprising:

a plate located between the casing portions having a recess within which the second bearing is located;

means contacting the second bearing recess at a first axial side and facing the second bearing at a second axial side opposite the first side for measuring the magnitude of forces directed along the axis of the shaft developed between the second bearing and the second bearing recess when the attachment is tightened; and

a replaceable shim supported on the shaft, the shim being located between the first bearing and the first bearing recess or between the second bearing and the recess of said plate.

5,115,559

ELECTRONIC COMPONENT MOUNTING APPARATUS

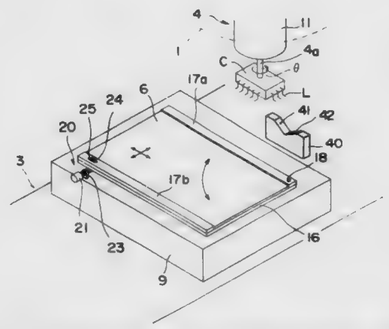
Kenshu Oyama, Umi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 6, 1990, Ser. No. 578,307

Claims priority, application Japan, Sep. 6, 1989, 1-230935

Int. Cl.[5] H05K *13/04*

U.S. Cl. 29—720 **4 Claims**



1. A mounting apparatus for mounting electronic components, comprising:

means for delivering electronic components;

X-axis and Y-axis table means movable in the X-axis and Y-axis directions for adjusting the position of a printed circuit board supported thereon, and means for moving said X-axis and Y-axis table means in X and Y directions respectively;

a carrier mounted between said delivering means and said X-axis and Y-axis table means and having a mounting head thereon, said head having a pick-up nozzle mounted thereon for rotation in a direction Θ around an axis perpendicular to a component held on said nozzle, and means for moving said carrier to move said mounting head along a path between said delivery means and said X-axis and Y-axis table means;

a motor connected to said mounting head for rotating said nozzle in the direction Θ, said nozzle picking up electronic components from said delivery means, being moved so as to feed the electronic components along said path and mounting the electronic components onto the printed circuit board;

recognition means including a camera positioned along said path for recognizing positional deviations of an electronic component picked up by said nozzle in the X, Y and Θ directions and connected to said motor and to said X-axis and Y-axis table means for roughly correcting the positional deviations of the component;

precise measuring means mounted on said X-axis and Y-axis table means for precisely measuring the positions of leads on an electronic component held on said nozzle, said precise measuring means being connected to said X-axis and Y-axis table means moving means for causing said X-axis and Y-axis table means to move in the X-axis and Y-axis directions in response to measuring results from said precise measuring means;

circuit board supporting means pivotably mounted on said X-axis and Y-axis table means for rotating around a pivotal axis parallel to the axis of rotation of said nozzle; and

horizontal rotating means connected to said circuit board supporting means and to which said precise measuring means is connected for being moved to precisely adjust the position of a component in the Θ direction in response to measuring results from said precise measuring means.

5,115,560

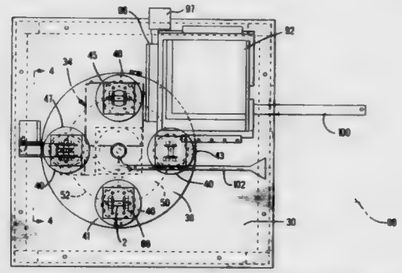
TERMINAL INSERTION APPARATUS HAVING IMPROVED TURNTABLE ASSEMBLY

David J. Erb; Keith L. Nicholas; Howard C. Phillips, and John M. Wasilko, all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 3, 1991, Ser. No. 770,678

Int. Cl.[5] H01R *43/00*

U.S. Cl. 29—747 **20 Claims**



1. An inserting apparatus in combination with a turntable assembly for inserting terminals into terminal receiving cavities in an electrical device, the electrical device having at least two cavities which are at different locations on the electrical device, the turntable assembly and the inserting apparatus being supported on a supporting means, the inserting apparatus and turntable assembly being characterized in that:

the turntable assembly comprises a main turntable and a plurality of secondary turntables on the main turntable, each of the secondary turntables having fixture means thereon for holding one of the electrical devices, the main turntable being rotatable about a main axis, each of the secondary turntables being rotatable about its own secondary axis, the secondary axes being parallel to the main axis and being located at intervals around the main axis,

the inserting apparatus being located proximate to the main turntable at a terminal insertion station, the inserting apparatus being effective to insert a terminal into a first cavity in an electrical device on a secondary turntable at the insertion station when the secondary turntable is in a first position of rotation relative to the main turntable, and being effective to insert a terminal into a second cavity when the secondary turntable is in a second position of rotation, and

actuating and control means are provided for indexing the main turntable thereby to position one of the secondary turntables at the insertion station with the first cavity in alignment with the inserting apparatus, for thereafter actuating the inserting apparatus thereby to insert a terminal into the first cavity, for thereafter indexing the one secondary turntable thereby to locate the second cavity in alignment with the inserting apparatus and for again actuating the inserting apparatus thereby to insert a terminal into the second cavity.

5,115,561

METHOD OF SPOT-FACING PRINTED CIRCUIT BOARD

Masahiro Kawamura, Kawasaki; Tamio Otani, Hadano, and Masao Nishigai, Ayase, all of Japan, assignors to Hitachi Seiko, Ltd., Japan

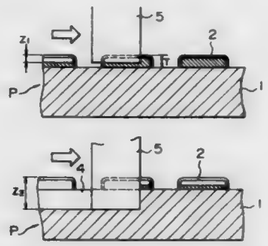
Filed Dec. 11, 1990, Ser. No. 625,451

Int. Cl.[5] H05K *3/00*

U.S. Cl. 29—829 **3 Claims**

1. A method of spot-facing a printed circuit board having a substrate and circuitry with a thickness formed on said substrate, within an area to be spot-faced, in which said circuitry is partially included, comprising the steps of:

cutting and removing a portion of said thickness of said circuitry within said area to be spot-faced; and,



thereafter, spot-facing said substrate to a desired depth thereof.

5,115,562

METHOD OF MAKING SHIELDED ELECTRICAL CONNECTOR

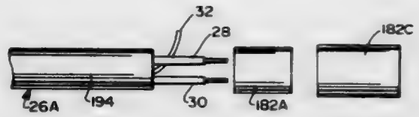
David C. Bowen, Downers Grove; Philip J. Dambach, Naperville; Joseph W. Nelligan, Jr., LaGrange Park, and Irvin R. Triner, Willow Springs, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Division of Ser. No. 587,137, Sep. 24, 1990, Pat. No. 5,057,038.

This application Jun. 3, 1991, Ser. No. 711,470

Int. Cl.[5] H01R *9/07, 43/04*

U.S. Cl. 29—867 **6 Claims**



1. A method of installing a cylindrical ferrule with a slot extending from one end thereof on a cable having at least one signal wire and a drain wire enclosed in an outer insulation, said method comprising:

bending an end portion of said drain wire so that said end portion of said drain wire is disposed along a portion of said outer insulation of said cable;

installing said cylindrical ferrule about said outer insulation and over said bent end portion of said drain wire;

inserting said drain wire into said slot; and

crimping said ferrule about said outer insulation to secure said ferrule to said outer insulation of said cable and capturing said drain wire to said ferrule.

5,115,563

METHOD OF MAKING AN ELECTRICAL CONNECTOR

Ronald A. Wilson, Medway, Mass., assignor to Microwave Development Laboratories, Inc., Needham, Mass.

Filed Nov. 7, 1990, Ser. No. 610,359

The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.

Int. Cl.[5] H01R *43/20*

U.S. Cl. 29—876 **30 Claims**

1. A method of assembling an electrical connector that is constructed employing a rigid outer conductor body, an inner conductor, and a resilient and deformable insulating sleeve providing support between the rigid outer conductor body and the inner conductor, said method comprising the steps of, providing a bore in the rigid outer conductor body, providing interlocking means between the bore of the outer conductor body and the outer surface of the insulating sleeve, providing the maximum diameter of the insulating sleeve greater than the

minimum bore diameter of the outer conductor body when the insulating sleeve is at a rest position, while compressing said insulating sleeve to a smaller diameter than at the rest position thereof, inserting the insulating sleeve into the bore of the rigid



outer conductor body to a position in which the interlocking means are in alignment and inserting the inner conductor into the insulating sleeve bore to radially expand the insulating sleeve to assist in moving the insulating sleeve back toward its rest position diameter.

5,115,564

METHOD FOR FRACTURING CONNECTING RODS

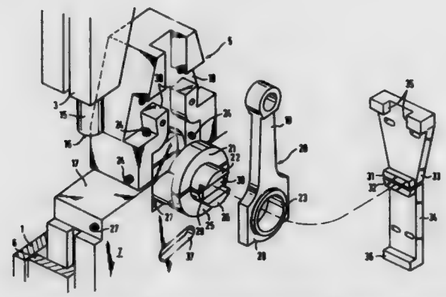
Walter Miessen, Aalen; Nikolaus Fauser, Jagstzell, and Michael Hähnel, Aalen-Nesslau, all of Fed. Rep. of Germany, assignors to Alfing Kessler Sondermaschinen GmbH, Fed. Rep. of Germany

Filed May 9, 1990, Ser. No. 521,108

Claims priority, application European Pat. Off., May 10, 1989, 89108419.6

Int. Cl.[5] B23P *17/00*

U.S. Cl. 29—888.09 **22 Claims**



1. A method for fracture separating into first and second parts a powder forged workpiece having an opening therethrough along a diametral plane with respect to said opening, comprising in combination the steps of fixing that part of said workpiece that is on one side of said diametral plane to a stationary support, fixing the remainder of said workpiece to a support that is moveable away from said fixed support along a straight line normal to said diametral plane, and striking said moveable support with an impacting mass imparting sudden movement to said moveable support away from said stationary support to thereby fracture said workpiece into said first and second parts.

5,115,565

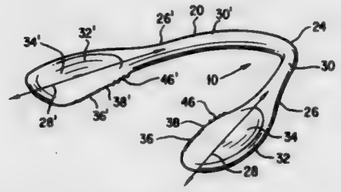
FOOD UTENSIL

Lori L. Narlock, 1825 Levenworth St., #7, San Francisco, Calif. 94109, and Gregg Emmel, 1120 Princeton Dr., Suite #2, Marina Del Rey, Calif. 90292

Filed Apr. 10, 1991, Ser. No. 683,193

Int. Cl.[5] B25F *3/00*; B26B *9/02*

U.S. Cl. 30—123.6 **19 Claims**



1. A food utensil for cutting a food product and removing material therefrom, comprising:

a flexible U-shaped gripping member having a base section joined to a pair of arm members, each of said arm members having a first end section joined to said base section and a second end section, said second end section being spoon shaped in contour, each of said spoon shaped end sections having serrations formed within an inner edge surface, said serrations defining a first set of tooth members formed on said second end section, and a second set of tooth members formed on said arm members, said first set of tooth members for cutting said food product and said second set of tooth members for securely gripping and removing a pit of said food product.

5,115,566

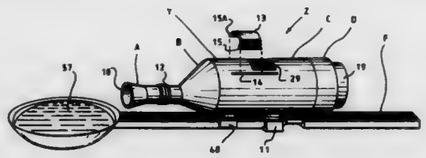
FOOD AND LIQUID FANNING DEVICE

Eric Zeitlin, 3059 Grand Ave., Baldwin, N.Y. 11510

Filed Mar. 1, 1990, Ser. No. 486,812

Int. Cl.[5] B25F *3/00*

U.S. Cl. 30—142 **12 Claims**



1. A combination eating utensil and fan comprising:

an eating utensil having an elongated handle portion and a food-engaging portion;

a fan means for providing a draft of air, having an elongated fan housing; and

attachment means securing said fan housing to said elongated handle portion, whereby said draft is generated by said fan means onto said food-engaging portion of said eating utensil.

5,115,567

ELECTRIC PLASTER CAST SAW CONTROL SYSTEM

Chang-Min Yang, and Chun-Mei Chou, both of No. 13-2, Lane 76, Dong-An Road, Tainan, Taiwan

Filed Nov. 12, 1991, Ser. No. 790,545

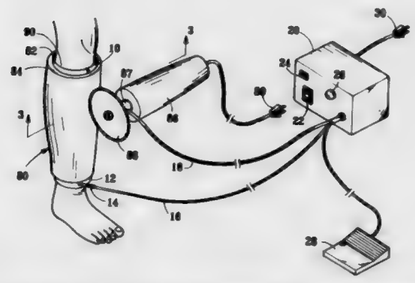
Int. Cl.[5] B27B *9/02*; B23D *47/08*; A61F *13/04, 15/02*

U.S. Cl. 30—166.3 **7 Claims**

1. An electric plastic cast saw control system for cutting off of plastic cast composed of an inner layer of absorbent cotton

and an outer layer formed by hardened covering material, comprising

a thin conductive plate located between the inner layer and the outer layer



a relay device to cut off power supply to electric saw on the instant the thin conductive plate is contacted by saw blade of the electric saw; and

a reset device to drive the relay device to resume power supply to the electric saw after the power supply is cut off.

5,115,568

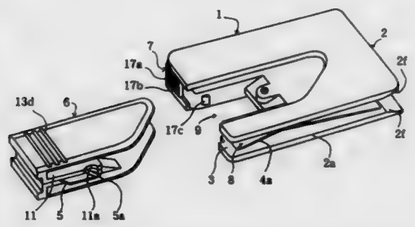
CUTTER FOR CUTTING THE FOLDED EDGE OF FOLDED PAPER SHEETS OR THE LIKE

Masaaki Aida, Sumida, Japan, assignor to Midori Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1991, Ser. No. 743,810

Int. Cl.[5] B26B *29/00*

U.S. Cl. 30—294 **2 Claims**



1. A cutter for cutting the folded edge of folded paper sheets comprising:

a casing;

a groove provided in said casing along one edge thereof, the folded edge of folded paper sheets being fed through said groove;

a pair of leaf springs disposed such as to oppose each other in and along said gooove and in a close proximity of or in forced contact with each other to form a folded paper sheet edge guide region substantially in a central portion of said groove in a length direction thereof;

a cutter blade holder carrying a cutter blade having a cutting end extending in said folded paper sheet edge guide region and removably mounted in said casing; and

a cutter blade holder stopper mechanism for restraining and releasing said cutter blade holder with respect to said casing.

5,115,569

COORDINATE READING AND MARKING DEVICE

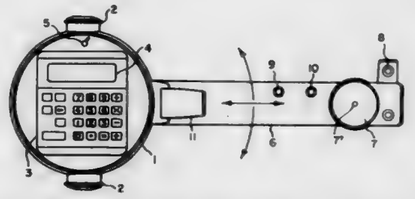
Akio Kubo, 655 Yamanouchi, Kamakura-shi Kanagawa-ken, Japan

Continuation of Ser. No. 512,869, Apr. 23, 1990, abandoned. This application Aug. 6, 1991, Ser. No. 741,970

Claims priority, application Japan, May 29, 1989, 1-137031

Int. Cl.[5] G01B *5/26, 7/03*

U.S. Cl. 33—1 M **6 Claims**



1. In a device for measuring the coordinate of a figure having a body with rollers for traversing a line in a horizontal plane, a measuring lever pivotally mounted on said body to rotate to either side of said line, the improvement comprising: character input means for entering the coordinates of a point; calculating means in said body; display means for displaying input characters and results from said calculating means; visual tracing part means having a sight mark; toggle switch means associated with said calculating means for toggling between a reading and marking operation; reading switch means for reading and recording the position of coordinates of a point located with said visual tracing part; a marking needle on an end of said measuring lever for marking the position of a selected point input by said character input means; marking position determining means comprising means for indicating in said display when said marking needle is positioned at said selected point.

5,115,570

METHOD FOR ELIMINATING GYRO ERRORS

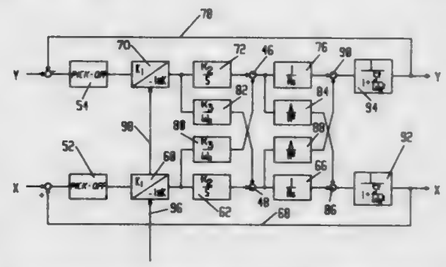
Uwe Krogmann, Zur Äsche 24, 7770 Überlingen-Nussdorf, and Hagen Kempas, Kreuzstrasse 25A, 7770 Überlingen 12, both of Fed. Rep. of Germany

Filed Aug. 21, 1990, Ser. No. 570,389

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3927920

Int. Cl.[5] G01C *19/38*

U.S. Cl. 33—326 **9 Claims**



1. A method of eliminating gyro errors of electrically caged, two-axis gyros of the type having a housing, a gyro rotor rotating in said housing about a spin axis, a first pick-off responding to rotary movement of said gyro rotor relative to said housing about a first input axis orthogonal to said spin axis, a second pick-off responding to rotary movement of said gyro rotor relative to said housing about a second input axis orthogonal to both said spin axis and said first input axis, a first

torquer arranged to exert a torque on said gyro rotor about said first input axis, said first torquer being energized by a first torquer current derived from signals from said second pick-off through amplifier network means, a second torquer arranged to exert a torque on said gyro rotor about said second input axis, said second torquer being energized by a second torquer current derived from signals from said first pick-off through amplifier network means, whereby said first and second torquer currents are indicative of angular rates of said housing relative to inertial space about said second and first input axes, respectively; the method comprising the steps of:

(a) measuring, during a first measuring step, said torquer currents as measures of said angular rates with a first direction of rotation of said gyro rotor,

(b) subsequently measuring, as a second measuring step, said torquer currents as measures of said angular rates with the direction of rotation of the gyro rotor reversed and said signals from said pick-offs inverted,

(c) determining a first value of a heading angle of an inertial reference system from the torquer currents measured during said first measuring step,

(d) determining a second value of said heading angle from the torquer currents measured during said second measuring step and

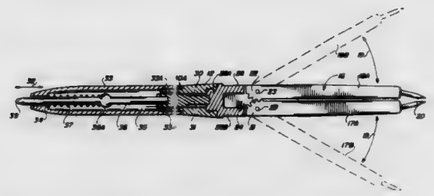
(e) forming a mean using both said first and second values as a heading angle output from said inertial reference system.

5,115,571

REVERSIBLE PEN-CALIPER DEVICE AND METHOD

Robert A. Mackin, 1033 Lake Point, Flagstaff, Ariz. 86004

Filed Sep. 4, 1991, Ser. No. 754,941
Int. Cl.[5] G01B *3/16, 21/20*
U.S. Cl. 33—558.04 **2 Claims**



1. A pen-caliper device, comprising in combination:

(a) a pen assembly including

i. a pen barrel,

ii. a ballpoint ink cartridge in the barrel,

iii. means engaging the ink cartridge and the barrel for advancing the ink cartridge to position a ballpoint of the ink cartridge for writing and retracting the ballpoint into a protected position inside the pen barrel;

(b) a caliper assembly including

i. first and second caliper arms each having a pointed tip and a pivot end,

ii. first and second gear elements attached to the pivot ends of the first and second caliper arms, respectively, the first and second gear elements engaging each other to cause symmetrical opening and closing of the first and second caliper arms,

iii. a pivot support attached to an end of the pen assembly, and first and second pivot elements pivotally connecting the pivot ends of the first and second caliper arms to the pivot support; and

(c) a rigid sheath snugly slidable over either the caliper assembly or the pen assembly,

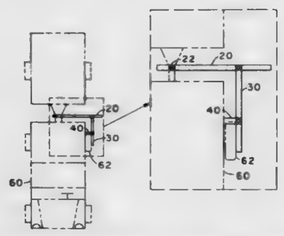
whereby a user can remove the sheath from the caliper assembly to expose the first and second divider arms, slide the sheath over the pen assembly for safe-keeping while using the caliper assembly, place the sheath over the caliper assembly, advance the ballpoint to make notations, and retract the ballpoint tip so the pen-caliper can be safely carried in a pocket of a user's clothing or the like.

5,115,572

TRAILER HITCH GUIDE

Robert T. Harbison, 1301 Saxonburg Rd., Natrona Heights, Pa. 15065

Filed Jun. 6, 1991, Ser. No. 710,977
Int. Cl.[5] B60Q *1/00;* **G01C** *15/00, 5/00*
U.S. Cl. 33—613 **4 Claims**



1. A trailer hitch guide for placement on a ground surface for guiding a towing vehicle driver to position a hitch on a tow vehicle under a hitch on a trailer, the guide comprised of:

(a) a first cross member having one end thereof suitable for positioning on the ground surface under connecting point of said hitch, the first cross member extending laterally of said hitch;

(b) a forward member adjustably attached to the cross member and having a forward portion extending to a side of a rear wheel of said tow vehicle when the vehicle is hitched to said trailer; and

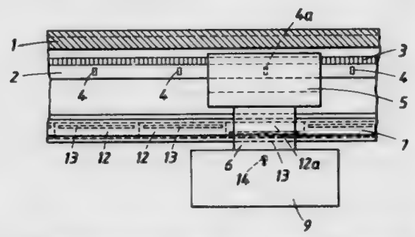
(c) a second cross member adjustably attached to said forward member and positioned substantially parallel to said first cross member and adapted to be positioned to be touched by the rear wheel when the hitch on the tow vehicle is in position to be connected to said hitch on said trailer.

5,115,573

INCREMENTAL LENGTH MEASURING SYSTEM

Heinz Rieder, Oberndorf, and Max Schwaiger, Ostermiething, both of Austria, assignors to RSF-Elektronic Gesellschaft m.b.H., Tarsdorf, Austria

Filed Sep. 26, 1991, Ser. No. 766,813
Claims priority, application Austria, Oct. 11, 1990, 2044/90
Int. Cl.[5] G01B *11/14*
U.S. Cl. 33—706 **22 Claims**



1. In an incremental length measuring system comprising

an elongate scale member provided with a measuring scale extending along said scale member and with a reference track, which extends along said scale and is provided with a plurality of longitudinally spaced apart reference marks defining respective reference points on said scale,

a scanning unit, which is mounted to be movable along said scale member and comprises first scanning means for scanning said scale and for generating measured-value signals in response to the scanning of said scale and second scanning means, which are adapted to scan said reference track and to generate a reference pulse in response to the scanning of each of said reference marks,

a protective housing, which contains said scale member and said scanning unit,

analyzing means connected to receive said measured-value signals and said reference pulses from said scanning unit and adapted to derive data from said signals under the control of said reference pulses, and

selecting means for arbitrarily selecting any of said reference marks and for permitting a delivery of a reference pulse to said analyzing means only in response to the scanning of a selected one of said reference marks by said second scanning means, which selecting means comprise a selector switch, which is arranged to move along said scale member in unison with said scanning unit along a predetermined path and is operable to permit the delivery of such a reference pulse to said analyzing means, and permanent magnet means, which are positioned in said housing in association with any selected one of said reference marks and arranged to operate said switch in conjunction with the scanning of said selected reference mark so as to permit the delivery of such reference pulse in response to such scanning,

the improvement residing in that

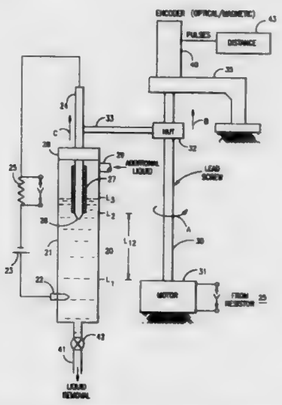
said permanent magnet means comprise a plurality of permanent magnets, each of which is associated with one of said reference marks and is mounted in said hosung to be individually movable from the outside of said housing between an inactive position, in which said permanent magnet is unable to operate said switch in conjunction with the scanning of the associated reference mark, and an active position, in which said permanent magnet is arranged to operate said switch in conjunction with the scanning of the associated reference mark.

5,115,574

METHOD AND APPARATUS FOR MEASURING RISE IN HEIGHT OF A LIQUID COLUMN

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed May 21, 1991, Ser. No. 703,449
Int. Cl.[5] B65B *1/30;* **G01F** *23/24;* **H02P** *5/00*
U.S. Cl. 33—714 **24 Claims**



1. A method for measuring the rise in height of a liquid column, comprising the steps of:

a) forming an electrically conductive, cylindrical liquid column,

b) effecting electrical contact between said liquid column and an electrode to establish current flow between said liquid column and said electrode,

c) raising said electrode to a reference position in juxtaposition with the surface of said liquid column at which contact between said electrode and said liquid column is broken, thereby causing current flow between said liquid column and said electrode to cease,

d) adding an additional quantity of an electrically conductive liquid to said liquid column, to cause the surface of said liquid column to rise to a height above said reference position of said electrode, thereby-causing said current flow between said liquid column and said electrodes,

e) raising said electrode to a second position in juxtaposition with the surface of said liquid column at which contact between said electrode and said liquid column is broken, thereby causing current flow between said liquid column and said electrode to cease, and

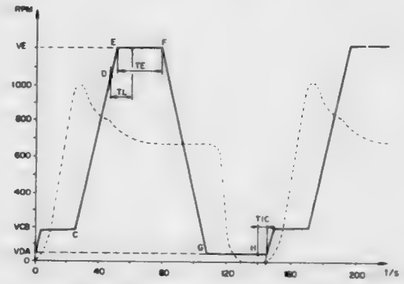
f) determining the distance of travel of said electrode between said reference and second positions as a measure of the rise in height of said liquid column from the adding of said additional quantity of electrically conductive liquid to said liquid column.

5,115,575

AUTOMATED METHOD FOR THE CYCLIC OPERATION OF A CENTRIFUGAL DRIER

Gérard Journet, Coutiches, and Nicolas Francou, Hellemmes, both of France, assignors to Fives-Cail Babcock, Montreuil, France

Filed Jun. 21, 1990, Ser. No. 542,199
Claims priority, application France, Jun. 29, 1989, 89 08714
Int. Cl.[5] F26B *5/08*
U.S. Cl. 34—8 **7 Claims**



1. A method for the automatic operation of a centrifugal drier comprising a rotary cylindrical screening basket and which is operated cyclically in successive cycles whose rhythm is a function of the flow rate of the product to be dried and wherein each cycle includes the stages of charging the basket with the product containing a particulate solid material, accelerating the rotary basket for centrifugally separating liquid from the solid material to obtain the solid material in predried form, washing the predried solid material with a washing liquid, maintaining the basket at a constant rotary speed until the solid material has been completely dried, decelerating the rotary basket and discharging the dried solid material from the basket at a low rotary speed, which method comprises, at the end of each cycle, the steps of

(a) determining the duration of the next successive cycle so as to reduce the time interval between two successive cycles to a minimum,

(b) calculating the duration of the stage of completely drying the solid material as a function of the duration of the next successive cycle, and

(d) determining the quantity of the washing liquid to be used

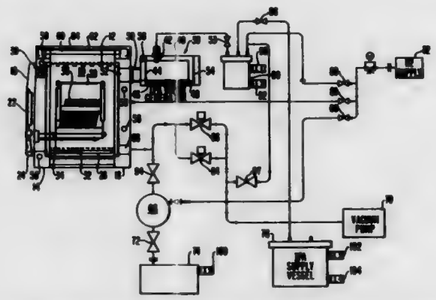
in the next successive cycle as a function of the duration of said stage.

5,115,576

VAPOR DEVICE AND METHOD FOR DRYING ARTICLES SUCH AS SEMICONDUCTOR WAFERS WITH SUBSTANCES SUCH AS ISOPROPYL ALCOHOL

Glenn A. Roberson, Jr., Hollister, and Robert B. Eglinton, Montery, both of Calif., assignors to Semifab Incorporated, Hollister, Calif.

Division of Ser. No. 427,512, Oct. 27, 1989, Pat. No. 4,977,688.
This application Sep. 26, 1990, Ser. No. 588,169
Int. Cl.[5] F26B *5/04*
U.S. Cl. 34—15 **15 Claims**



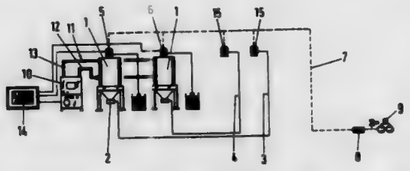
12. A method for drying articles in a vacuum process chamber, the method comprising the steps of:
- maintaining a sub-atmospheric pressure environment in the vacuum process chamber;
- supplying a substance in vapor form to said process chamber while said sub-atmospheric pressure environment is maintain in said process chamber; and
- discouraging substance vapor from condensing on the inside walls of said process chamber.

5,115,577

METHOD AND APPARATUS FOR DRYING OF MATERIAL ESPECIALLY PLASTIC GRANULES

Walter Kramer, Cham, Switzerland, assignor to Motan Plast-Automation AG, Cham, Switzerland

Filed Oct. 26, 1990, Ser. No. 604,902
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1989, 3936008
Int. Cl.[5] F26B *3/00*
U.S. Cl. 34—31 **4 Claims**



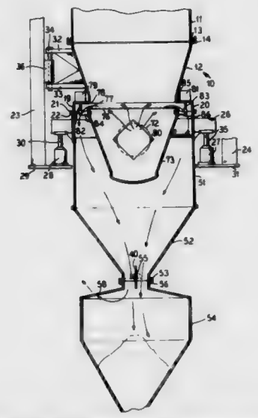
1. A method for drying of material, wherein said material disposed in a container is dried by drying air which is adjusted to a drying temperature specific to said material to be dried, said method including the step of:
- controlling said drying temperature depending on a through put rate of said material;
- recycling said drying air through said material to be dried and through a means for heating said drying air;
- starting a control time span upon initiation of a refilling step of said container with said material;
- restarting said control time span when a further refilling step occurs and increasing said drying temperature; and
- adjusting said drying temperature to a lower setting after said control time span has elapsed.

5,115,578

DISCHARGE MECHANISM FOR A LARGE FLUID BED/DRYER GRANULATOR

Aaron K. Basten, Solon, Iowa, assignor to Vector Corporation, Marion, Iowa

Filed Mar. 5, 1991, Ser. No. 664,792
Int. Cl.[5] F26B *17/00*
U.S. Cl. 34—57 A **12 Claims**



1. A fluid bed dryer and granulator for product comprising, an upper container formed with an open bottom, a lower container formed with an open top and a screen extending over said open top, means for sealing and unsealing said upper and lower containers together with said screen between them, an air inlet in said lower container and an air outlet in said upper container, blower means for moving air from said air inlet through said lower container and through said screen and through said upper container and through said air outlet to process powders and granules in said upper container, when said upper and lower containers are sealed, and said air outlet is open and when said upper and lower containers are unsealed and said air outlet is closed said powders and granules are moved laterally between said screen and out of said upper container.

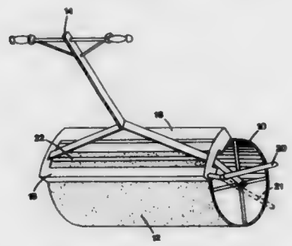
5,115,579

DEVICE FOR DRYING SURFACES

Heraklus Pappas, P.O. Box 352, Pennington 4184 Natal, South Africa

Filed Mar. 14, 1991, Ser. No. 669,071
Claims priority, application South Africa, Mar. 16, 1990, 90/2019
Int. Cl.[5] F26B *13/26*
U.S. Cl. 34—95.3 **4 Claims**

1. A device for removing water from a ground surface, comprising:
- a roller adapted to be rolled along the ground surface and having an outer surface covered with a water absorbent material,
- an element positioned to impart pressure to said outer surface of said roller along a horizontal line positioned above the ground surface,
- at least one water collection channel positioned immediately adjacent said outer surface and below said element for collecting water squeezed from said outer surface by said element,
- at least one water discharge pipe connected to said one water collection channel, with each of said water discharge pipes defining an outlet end, and



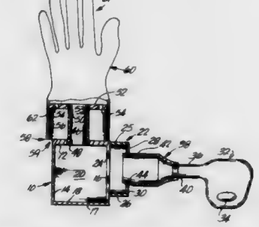
means for permitting said outlet end of each said water discharge pipe to be moved between an operating position located above the level of said water collection channel and a water discharge position located below the level of said water collection channel.

5,115,580

METHOD AND APPARATUS FOR DRYING HAND COVERINGS

Charles M. Blumenfeld, 4700 Parkridge Rd., Sacramento, Calif. 95822, and Barbara M. Koell, 2116 Kinsington St., West Sacramento, Calif. 95691

Filed Jun. 13, 1991, Ser. No. 714,911
Int. Cl.[5] F26B *25/00*
U.S. Cl. 34—104 **13 Claims**



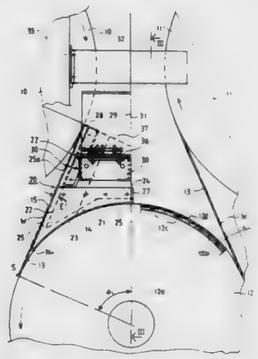
1. Apparatus for drying a hand covering with a wrist portion, the apparatus comprising:
- a closure adapted to make a snug fit within the wrist portion of the hand covering;
- an inlet aperture through the closure and opening into the interior of the hand covering;
- an inlet conduit connected to the inlet aperture and adapted to be connected to a source of gas under pressure and thus permit gas to flow into the interior of the hand covering;
- an outlet port spaced from the inlet aperture and extending through the closure, the outlet port being connected to the atmosphere through a flow channel so the port and channel form an outlet flow path to the atmosphere to permit gas to flow from the interior of the hand covering; and
- means in the outlet flow path making the effective cross sectional area of the outlet flow path for gas flow less than that of the inlet aperture so the hand covering can be inflated by the discharge of gas from a conventional electrically heated blower.

5,115,581

SUCTION BEAM

Olavi Viitanen, Jyväskylä, Finland, assignor to Valmet Paper Machinery Inc., Finland

Filed Mar. 12, 1991, Ser. No. 668,082
Claims priority, application Finland, Mar. 16, 1990, 901339
Int. Cl.[5] F26B *13/30*
U.S. Cl. 34—115 **11 Claims**



1. A drying section of a paper machine for drying a web, comprising
- a drying cylinder,
- a roll adjacent to said drying cylinder, said roll comprising a mantle having intermittent perforations leading to an interior portion of said mantle having negative pressure,
- an inlet nip disposed between said roll and said drying cylinder,
- a drying wire having a straight run between said drying cylinder and said roll for forming a joint run with the web in a direction from said driving cylinder to said roll, said drying wire having a first face contacting said roll and an opposite face contacting the web, said roll having a sector which is not contacted by said drying wire,
- a static closing-suction beam with no blower members, said beam disposed in proximity to said straight joint run of said drying wire and the web between said drying cylinder and said roll and in proximity to said sector of said roll, such that a space is present between said beam, said drying wire and said roll, said beam covering said drying wire, and
- a plurality of seals preventing the access of air into said space such that negative pressure is produced in said space and in said inlet nip via said intermittent perforations, the web being kept in tight contact with said opposite face of said drying wire in said straight joint run against the effect of centrifugal forces by said negative pressure.

5,115,582

SPIRAL FABRIC PAPERMAKERS BELT HAVING ADJUSTABLE PERMEABILITY

William T. Westhead, Waycross, Ga., assignor to Scapa, Inc., Waycross, Ga.

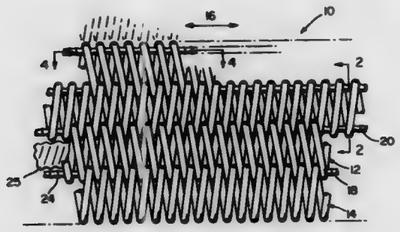
Continuation of Ser. No. 48,466, May 11, 1987, abandoned, which is a continuation of Ser. No. 810,904, Dec. 20, 1985, abandoned, which is a continuation of Ser. No. 529,636, Sep. 6, 1983, abandoned. This application Jul. 19, 1989, Ser. No. 382,028
Int. Cl.[5] D21F *1/10*
U.S. Cl. 34—123 **33 Claims**

1. A papermakers fabric having an upper surface and a lower surface, said fabric comprising:
- a plurality of hinge yarns, all of said hinge yarns extending in a common direction;

a plurality of spiral coils disposed in a common plane in a side-by-side relationship, each of said coils extending in said common direction and having spaces therewithin, with adjacent coils of said spirals being intermeshed and held together in intermeshing relationship by at least one of said hinge yarns.

monofilament yarn stuffers positioned in the spaces within selected portions only of some or all of said coils and extending solely within said spiral coils and for predetermined distances in the spaces within the coils in said common direction, said fabric having areas in which coils are devoid of said stuffers and areas in which coils include said stuffers, thereby permitting a predetermined, variable permeability profile along and across said fabric, the permeability being less in the areas of the fabric in which coils having stuffers are located than in the areas of the fabric in which coils not having stuffers are located, wherein certain of said stuffers extending within respective ones of said spiral coils substantially completely across the full width of said fabric, and coils which are intermediate the coils containing said substantially full width stuffers includes edge stuffers which extend from each of the side edges of said fabric a predetermined distance to define open central areas in said intermediate coils; and

means for holding said monofilament yarn stuffers within said coils to prevent migration of said stuffers in said common direction, wherein said holding means includes heat sealed portions at the edges of the fabric to at least partially close the ends of the coils.

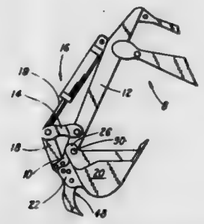


5,115,583

AUXILIARY RIPPER TOOTH FOR BACKHOE

Donald E. Vail, Rte. 190 3, Box 222, Enid, Okla. 73703

Filed Jul. 1, 1991, Ser. No. 723,793
Int. Cl.[5] E02F 9/28
U.S. Cl. 37—103 6 Claims



1. An auxiliary ripper tooth for pivotal attachment to a backhoe bucket comprising:

an elongated, arcuate shank having a first end and a bifurcated second end having two branches, and having a bifurcation between said two branches;

a digging point element on said first end;

a lobe defining an opening spaced from said first end for pivotally supporting said shank on a bucket for pivotation about a substantially horizontally extending axis, and said lobe forming one of said two branches of the bifurcation at the second end of said shank;

a second branch of said two branches off of said lobe and defining a notch in one side thereof, said second branch and said lobe having said bifurcation therebetween; and

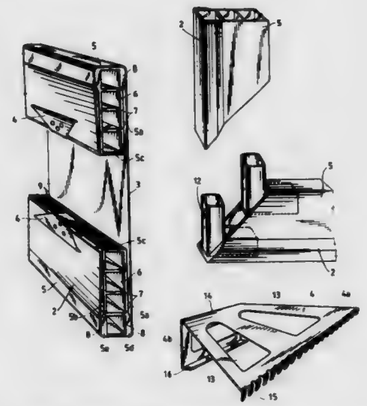
an elongated, transversely extending impact bar secured in said notch at substantially the midpoint of said bar and extending substantially parallel to said substantially horizontally extending axis, said impact bar having an elongated impact surface extending along one side thereof from one end thereof to the other and said impact bar moving with said shank during the pivotal movement of said shank.

5,115,584

ARTIST'S SECTIONAL STRETCHER WITH CANVAS

Renato Lucchetti, Appiano Gentile, Italy, assignor to ColArt International, S.A., France

Filed Jan. 29, 1990, Ser. No. 471,550
Claims priority, application Italy, Feb. 10, 1989, 19416 A/89
Int. Cl.[5] D06C 3/08
U.S. Cl. 38—102.91 13 Claims



1. An artist's framing kit, comprising:

(a) a rigid stretcher frame having stretcher sides having front and rear surfaces;

(b) a canvas having a front canvas region overlying the front surfaces of the stretcher sides, said canvas extending past and folded around the stretcher sides to form rear marginal canvas regions overlying the rear surfaces of the stretcher sides; and

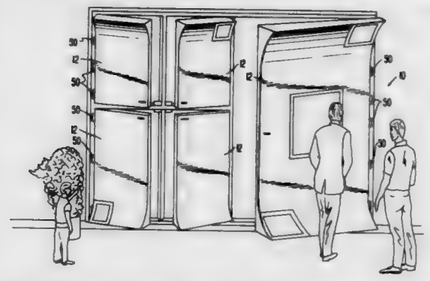
(c) a plurality of inherently resilient elements, each independently operative for fixing, and for simultaneously automatically resiliently tensioning, the canvas on the stretcher frame, each resilient element being selectively positioned at a location on a respective rear marginal canvas region to exert a constant tensioning force at said location, each resilient element being removably mounted from the stretcher frame to another location on the respective rear marginal canvas region to exert a constant tensioning force at said other location.

5,115,585

PHOTOGRAPH EXPOSING DEVICE

Duncan R. Maldonado, Yellowstone Y-1-4, Park Gardens, Rio Piedras, P.R. 00926

Continuation-in-part of Ser. No. 271,678, Nov. 16, 1988, abandoned. This application Sep. 21, 1990, Ser. No. 586,139
Int. Cl.[5] A47G 1/06
U.S. Cl. 40—152.2 11 Claims



1. A photograph exposing device for displaying a plurality of photographs and the like, comprising:

a frame;

at least two swingable members having a generally concave configuration;

each of said swingable members including a plurality of pockets positioned on said swingable member for receiving at least one photograph therein; and

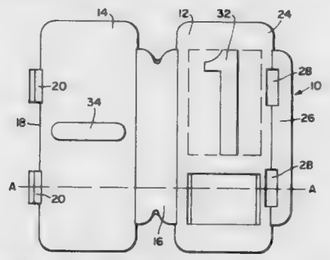
means for securing the swingable members to said frame so that said swingable members may be freely swung while being used to display and store said plurality of photographs and the like outwardly relative to said frame to an open position and inwardly to a closed position and for inserting photographs into said pockets.

5,115,586

CABLE MARKERS

Michael J. Hawker, Hadleigh, England, assignor to Development Technology Limited, Hadleigh, United Kingdom

Filed Apr. 24, 1990, Ser. No. 513,847
Int. Cl.[5] G09F 03/00
U.S. Cl. 40—316 6 Claims



1. A plastic molding, which comprises:

a set of clip on markers for one of electrical leads, optical leads and cables having an elastomeric outer sheath, said markers being disposed in an array in which the individual markers are frangibly connected together by runners so that the molding is formed in a single operation and individual markers are separable from the molding by a user, each marker including first and second half shells of a substantially cylindrical internal profile that are hinged together along one edge and clip together along the other edge to tightly encircle said one of said lead and cable, said first half shells having respectively on external surfaces thereof at least one of either an integral raised region and an integral indented region that are readily perceptible by touch and comprise a number which identifies the marker within the set, an inner face of at least one of said first and second half shells being formed with at least one protuberance for positive axial location of the marker on said one of said lead and cable, said protuberance being deformable for enabling the marker to clip onto any of said one of said lead and cable within a working size range thereof, wherein said second half-shell of each marker carries an identification numeral equal to said number of regions.

5,115,587

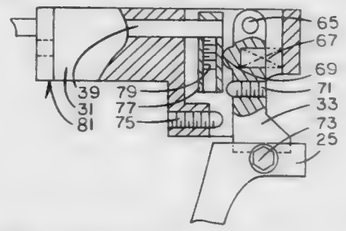
Patent Not Issued For This Number

5,115,588

TRIGGER MECHANISM FOR FIREARMS

Gene Bronsart, and Linda Bronsart, both of 2361 Clarke Pl., Lake Havasu City, Ariz. 86403

Filed Apr. 12, 1990, Ser. No. 509,020
Int. Cl.[5] F41A 19/10
U.S. Cl. 42—69.02 4 Claims



1. A bolt action firearm trigger mechanism comprising:

a. a trigger housing,

b. a cam assembly pivotally mounted to said trigger housing,

c. said cam assembly having a rear portion projecting a 1st stage contact point and a 2nd stage contact point arranged in a line from said pivot mount.

d. a firing mechanism including a sear release restraining a pivotally mounted sear by an engagement surface which is progressively eliminated by said 1st stage contact point and said 2nd stage contact point during rotation of said cam assembly;

e. a means to adjust the relative projection of said 1st stage contact point and said 2nd stage contact point from said back portion of said cam assembly, thereby changing the proportion of elimination of said engagement surface preformed by said 1st stage contact point and said 2nd stage contact point.

5,115,589

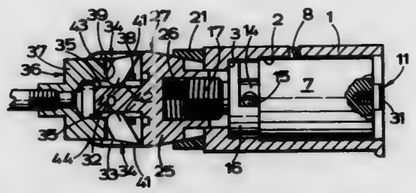
LOCKING DEVICE FOR FIREARMS

John P. D. Shuker, Worcester, England, assignor to Gun Security Limited, Worcester, England

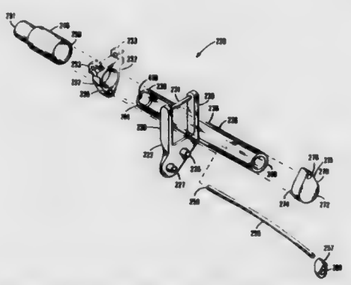
PCT No. PCT/GB89/00447, § 371 Date Oct. 23, 1990, § 102(e) Date Oct. 23, 1990, PCT Pub. No. WO89/10528, PCT Pub. Date Nov. 2, 1989
PCT Filed Apr. 26, 1989, Ser. No. 598,711
Claims priority, application United Kingdom, Apr. 27, 1988, 8809946
Int. Cl.[5] F41A 17/02, 17/44
U.S. Cl. 42—70.11 10 Claims

1. A locking device for firearms, the device being of elongate form for axial insertion into an elongate chamber of a firearm, and comprising adjustment means, locking means comprising opposed radially movable locking portions having respective mutually convergent inner surfaces, and operating means which is axially translatable into engagement with the said mutually convergent surfaces by the said adjustment

means to forcibly urge the locking portions outwards into engagement with the walls of the chamber and whereby frictionally prevent removal of the device from the chamber, the adjustment means comprising a key-operated lock including a plurality of tumblers, a first threaded part rotatable by the lock, and a second threaded part fast with or integral with the operating means and in threaded engagement with the first threaded part, said first threaded part being held fast against axial translation towards said locking means whereby rotation of the first threaded part in a locking direction causes axial translation of the second threaded part and the operating means towards the first threaded part to force the locking portions outwards.

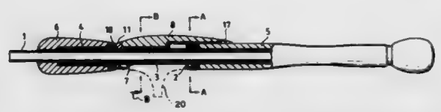


5,115,590
ADJUSTABLE BALANCE BOBBER
Raymond D. Larson, Waunakee, Wis., assignor to Rayco U.S.A., Inc., Waunakee, Wis.
Continuation-in-part of Ser. No. 462,078, Jan. 8, 1990, abandoned. This application Apr. 10, 1991, Ser. No. 683,341
Int. Cl.[5] A01K *97/12*
U.S. Cl. 43—17 **22 Claims**



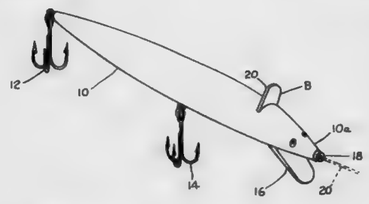
1. A bobber for a fishing pole with a tip comprising:
a) a support adapted for snug attachment to the tip of the fishing pole and having at least one upright member;
b) an elongate balance member having portions defining an internal cavity and having a portion of constant exterior profile wherein the internal cavity is adapted to receive a weight therein such that the weight is free to move to balance the balance member in a substantially horizontal position or to unbalance the balance member so that it assumes an inclined position;
c) a collar pivotally mounted perpendicular to its axis on the upright member and slidably engaging the portion of the elongated balance member and retaining the balance member in position; and
d) a hollow member adapted to receive a centrally threaded fishing line and attached beneath the balance member wherein the balance member is slidably positionable within the collar so as to adjustably balance lures of varying weights suspended at various depths in the water and the balance member and hollow member are adapted to incline downwardly when a fish applies a downward force to the fishing line to signal a user of the presence of the fish.

5,115,591
FISHING ROD
Mitsuyoshi Oyama, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Apr. 23, 1990, Ser. No. 512,361
Int. Cl.[5] A01K *87/06*
U.S. Cl. 43—22 **16 Claims**



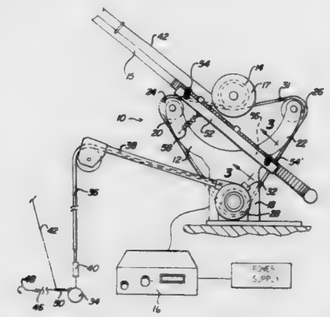
1. A fishing rod onto which a fishing reel is to be mounted, said fishing reel having a T-shaped leg for use with the attachment of said fishing rod, said fishing rod comprising:
a handle rigidly attached to said fishing rod, said handle including a first hood for supporting one end of said leg, said first hood being fixed to said handle, a reel mounting portion where said reel is to be mounted and a cylindrical male screw, said first hood, said reel mounting portion and said cylindrical male screw being arranged in this order in said handle;
an engaging grip engaged with said cylindrical male screw and movable along said handle;
a second hood for supporting the other end of said leg, said second hood being kept in contact with said engaging grip, said second hood being slidingly and non rotatably movable relative to said rod in the axial direction of said handle; and
a cover cylinder surrounding a portion of said handle except for said reel mounting portion and said first hood, and extending from said second hood beyond said first hood, said cover cylinder being movable relative to said rod in conjunction with the sliding movement of said second hood,
wherein said cover cylinder entirely and broadly covers the portion of the handle that is opposite said reel mounting position and is coincident with where a fisherman's hand grasps said rod.

5,115,592
BRAKED ARTIFICIAL FISHING PLUG
Ronnie C. Renaud, Rte. 1, Liberty, S.C. 29657
Continuation of Ser. No. 311,754, Feb. 17, 1989, abandoned. This application Aug. 9, 1990, Ser. No. 565,519
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.47 **12 Claims**



1. An artificial fishing plug comprising:
an elongated plug body having a forward end and a rearward end;
a plurality of fishhooks attached to a bottom portion and said rear end of said fishing plug body;
brake means carried by a top surface of said plug body opposite said bottom portion and disposed rearward of said forward end of said plug body, said brake means extending along a first plane and generally upwards from said top surface, said brake means being centered laterally and spanwise across said top surface of said fishing plug body for slowing the retrieve of said fishing plug through the water and producing a natural wobbling motion and sonic vibrations;
and a weighted spoon bill carried below and forward of said brake means by said forward end of said fish plug body and extending in a second plane generally perpendicular to said first plane.

5,115,593
TEMPERATURE SENSITIVE DOWNRIGGER ASSEMBLY
Richard Keough, 8867 Rushside Dr., Pinckney, Mich. 48169
Filed Nov. 15, 1990, Ser. No. 614,233
Int. Cl.[5] A01K *91/00*
U.S. Cl. 43—43.12 **17 Claims**



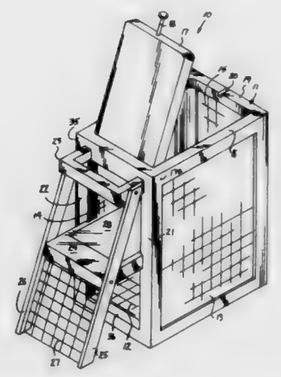
1. A downrigger system for automatically seeking and reaching a desired water temperature, said system comprising:
a power-driven downrigger assembly;
a drive motor fitted to said assembly;
a weight cable, said weight cable being fitted to said downrigger assembly, said cable having an end region;
a weight fitted to said end region of said cable;
a fishing pole and reel assembly fitted to said downrigger assembly;
a water temperature selecting-sensing-driving circuit, said circuit including a temperature selector, a temperature sensor, and a fishing pole and reel assembly and downrigger assembly drive unit, whereby the operator selects a temperature, the sensor senses the temperature, and signals the drive unit for adjustment in response; and
means for connecting said motor and said reel of said pole and reel assembly.

5,115,594
TREBLE HOOK
Jim Gowing, Altus, Ark., assignor to EBSCO Industries, Inc., East Leeds, Ala.
Filed May 16, 1991, Ser. No. 701,054
Int. Cl.[5] A01K *83/00*
U.S. Cl. 43—44.82 **1 Claim**

1. A treble fishing hook comprising:
an elongated shank having a first end and a second end;
an eye secured to the first end of the shank; and
three barb-carrying bight portions secured to the second end of the shank, said bight portions being equally spaced from each other about the axis of the shank, and each lying in a plane which extends at an angle of from 14° to 22° to the axis of the shank; and
a barb carried on each of said bight portions and angularly displaced from the plane in which the bight portion lies so as to be disposed in a plane which projects at an angle of from 12° to 22° with respect to the plane of the bight portion.



5,115,595
RODENT TRAP
Alfonso M. Garcia, 331 College Ave., Vallejo, Calif. 94589
Filed Jun. 13, 1991, Ser. No. 714,555
Int. Cl.[5] A01M *23/02*
U.S. Cl. 43—61 **5 Claims**



1. A rodent trap, comprising,
a housing, the housing including a mesh floor, a mesh right side wall, a mesh left side wall, and a mesh rear wall, the housing further including a rectilinear front frame and a rectilinear top frame, the rectilinear front frame including a front opening coextensively formed within the front frame, and a rectilinear top frame including an access door pivotally mounted within the top frame, the access door including a door axle directed into the top frame, with the top frame including a top frame rear leg, the access door including an access door rear edge, and an abutment rod extending beyond the access door mounted to the access door rear edge, and
the top frame rear leg including a slot, the abutment rod received within the slot in a first position, with the abutment rod extending beyond the slot and the rear wall for manual grasping of the rod to permit lifting of the access door relative to the top frame, and
the front frame including a trap door mounted within the front frame, the trap door pivotal from a first horizontal position permitting access of a rodent to the trap door to a second position, wherein the trap door is arranged in a vertical orientation within the front frame opening.

5,115,596
SLIDING DOOR MOUNTING SYSTEM

Braden N. Fevold, Roseau; Timothy W. Stoll, Salol, and Leslie B. Hendrickson, Roseau, all of Minn., assignors to Marvin Lumber and Cedar Co. d/b/a Marvin Windows, Warroad, Minn.

Filed Jan. 17, 1991, Ser. No. 642,350
Int. Cl.[5] E05D *15/06*
U.S. Cl. 49—411 **6 Claims**



1. Apparatus for mounting a horizontally-sliding door in a frame having an upwardly-extending upper track and an upwardly-extending lower track which comprises a horizontally-elongated rib defining a generally vertically-oriented plane, comprising:

(a) a sliding door panel having upper and lower generally-horizontal rail members;

(b) means mounting said sliding door panel to the upper track for movement therealong; and

(c) an elongated element suspended from said lower generally-horizontal rail member for free reciprocating vertical movement relative to said lower generally-horizontal rail member, said elongated element extending substantially the full length of said lower generally-horizontal rail member and comprising an extrusion having a slot formed in, and extending substantially the full length of, a bottom surface of said elongated element, said slot receiving the horizontally-elongated rib comprising the lower track therein.

5,115,597
UNIVERSAL DOOR JAMB OF THREE PIECE CONSTRUCTION SUITABLE FOR FOUR MODES OF OPERATION

Lawrence I. Tillery, 225 W. Franklin Rd., Meridian, Id. 83642; Keith W. Cline, 1252 E. Victory Rd., Meridian, Id. 83642; Ronald R. Moses, 3812 Gulley Ave., Boise, Id. 83709, and Kurtis K. Cline, 1252 E. Victory Rd., Meridian, Id. 83642

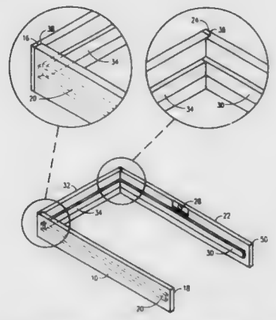
Filed May 29, 1991, Ser. No. 706,761
Int. Cl.[5] F06B *1/04*
U.S. Cl. 49—504 **6 Claims**

1. A door jamb assembly package for shipment to a builder and of essentially three major piece construction, including, in combination:

a. A hinge jamb leg including a door stop strip centrally positioned thereon and spaced hinges located on one side of said door stop strip, said hinge jamb leg having squared off and flat end faces on both ends thereof,

b. a striker jamb leg having dadoed or offset sections on both ends thereof and a door stop strip extending therebetween, and a striker plate being symmetrically spaced on one side of said door stop strip an equal distance from both of said dadoed or offset end sections of said striker jamb leg, and

c. a header jamb member having a squared off flat end face at one end thereof and a dadoed or offset section at the other end thereof, whereby said striker jamb leg may be cut off by a predetermined length at one end thereof and said hinge jamb leg may also be cut off one end thereof and said header jamb member rotated to one of its two

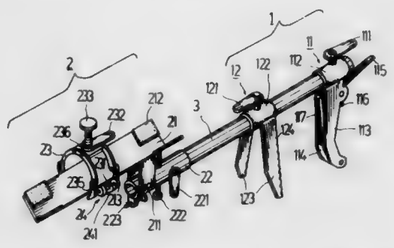


possible horizontal positions to correctly mate with the top ends of said hinge jamb leg and striker jamb leg, respectively, to thereby accommodate both left handed and right handed doors swingable both into and away from a room, thus enabling said striker plate to be positioned a predetermined distance such as thirty-six inches from a floor or carpet and thereby accommodate the standard thirty-six inch door layout construction.

5,115,598
STRUCTURE OF FISHING ROD STAND FOR FISHING ON THE SEA

Chi S. Shaw, 3th Floor, No. 16, Fu Hsing Road, Chung Ho City, Taipei Hsien, Taiwan

Filed Jan. 16, 1991, Ser. No. 642,731
Int. Cl.[5] A01K *97/10*
U.S. Cl. 43—21.2 **3 Claims**



1. A fishing rod stand for fishing on the sea comprising:

a rack assembly composed of a front adjuster and a rear adjuster for fixing to a hull, in which the front adjuster has two side plates extending beneath a sleeve, a holding strip with notches movably hinged to a pivot, and a puller movable fixed to a block at another side of the holding strip, and the rear adjuster has two wings with teeth extending downward from two lateral sides of a sleeve;

a rod adjuster assembly composed of a V-channel for holding a fishing rod with a rubber pad at its front end and another rubber pad at its rear end, a locker ring, and two supports extending from the front end of the V-channel and movably fixed to a sleeve with a horizontal adjusting

screw and a vertical adjusting screw to keep the V-channel in an adjustable horizontal inclination angle or to position the V-channel in an upright position, in which the V-channel is incorporated with a movable locker ring in the middle having two movable plates and a movably fixed holding strip with a hook element for opening the locker ring, an adjusting screw at the end of said strip opposite the hook element to adjust the gap between the holding strip and the V-channel, a screw in the perpendicular direction to fix the said adjusting screw, a rod above the V-channel corresponding to the hook element of the holding strip to retain the locker ring when the hook element is engaged, and the locker ring is incorporated with an adjusting screw on the top, a rubber pad to act against the fishing rod, and a knob on the adjusting screw to position the adjusting screw;

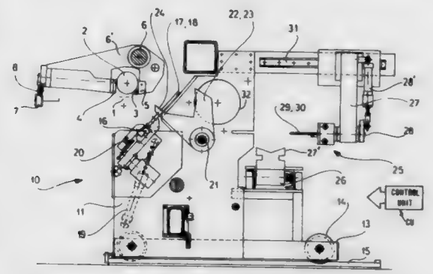
a link with a screw penetrating through its front end to retain and hold the rack assembly firmly, a sleeve for the rod adjuster assembly for different fishing rod or auxiliary fishing tackle, in which the sleeve has a screw to control tightness of the link by adjustment of a knob;

whereby the front and rear adjusters of the rack assembly are arranged to adjust the link to a desired length for fixing to a hull, and then the rod adjuster assembly is fixed by engagement of the locker ring and the holding strip which can be done simply and quickly.

5,115,599
APPARATUS FOR REMOVAL OF WORKPIECE ELEMENTS, PARTICULARLY BOLT, ROD OR DISK-SHAPED ELEMENTS, FROM A CUTTING APPARATUS

Armin Stolzer, Renchen, and Rainer Huck, Baden-Baden-Neuweier, both of Fed. Rep. of Germany, assignors to KEURO Maschinenbau GmbH & Co. KG, Achern-Gamsburst, Fed. Rep. of Germany

Filed Jul. 10, 1990, Ser. No. 550,851
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1989, 3928328
Int. Cl.[5] B26D *7/06*
U.S. Cl. 51—215 CP **22 Claims**



1. A system for handling workpieces (2, 3) of bolt, rod or disk shape after severing of a workpiece of a selected length from rod, rail or stock material, whereby said workpiece will define two cross-sectional, or end regions, and an axially extending stem portion and wherein the length of individual workpieces may differ,

wherein said workpiece is supplied to said system by a supply means (1, 4, 5, 6),

said system comprising

a frame (10);

two oppositely associated transfer jaws (17, 18) which can move relative to each other selectively in accordance with the length of the workpiece between open and closed positions, and located to permit engagement of a workpiece (2, 3) supplied by said supply means, at the cross-sectional, or end regions of the workpiece,

said transfer jaws (17, 18) being pivotable about an axis (20) essentially parallel to the workpiece stem portion;

a workpiece receiver (22, 23) having two projecting portions and defining an opening (24, 24') between said portions, shaped to have essentially prismatic configuration to receive the stem portion of the workpiece therein,

said workpiece receiver being pivotable about an axis (21) essentially parallel to said workpiece stem portion,

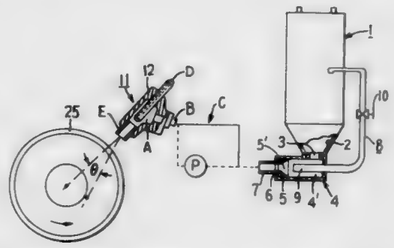
said transfer jaws having a pivoting range which overlaps a pivoting range of the workpiece receiver for transfer of workpieces from the transfer jaws (17, 18), upon movement to open position, to the workpiece receiver (22, 23); and

movable workpiece gripping means (25) including two gripping jaws (29, 30), movably retained on said frame (10) for movement essentially parallel to said workpiece stem portion and additionally movable between a gripping position for selectively gripping the workpiece (2, 3) on the workpiece receiver and releasing the workpiece at a delivery position said delivery portion to said delivery position.

5,115,600
DRESSING METHOD AND APPARATUS FOR SUPER ABRASIVE GRINDING WHEEL

Shigeaki Katsuoka, Shizuoka; Shigeharu Kobayashi, Yokohama, and Fukuzo Yagishita, Shizuoka, all of Japan, assignors to Fuji Seiki Machine Works, Ltd., Shizuoka Prefecture, Japan

Filed May 25, 1990, Ser. No. 528,922
Int. Cl.[5] B24C *3/00*
U.S. Cl. 51—410 **6 Claims**



1. An apparatus for dressing a super abrasive grinding wheel, comprising:

a reservoir having an internal chamber for containing a slurry of liquid and abrasive particles, said reservoir having an upper portion and a funnel-shaped lower portion which tapers toward an outlet opening at a lower end of said lower portion, said reservoir being free of means for agitating the slurry so that said abrasive particles are free to settle into said lower portion of said reservoir whereby liquid substantially free of abrasive particles becomes present in said upper portion of said reservoir, said outlet opening of said reservoir being unobstructed so that abrasive particles that settle in said lower portion of said reservoir can freely flow downwardly through said outlet opening;

a connector structure disposed below said reservoir, said connector structure having a generally horizontally extending central passageway which is closed at one axial end thereof and which has discharge means in the opposite axial end thereof, said connector structure having an entrance opening extending upwardly from said passageway between said axial ends, said entrance opening having an upper end which opens into said outlet opening in said lower portion of said reservoir and is in free, open communication therewith, said outlet opening of said reservoir and said entrance opening of said connector structure being free of valve means so that abrasive particles in said

outlet opening can freely flow downwardly through said entrance opening into said central passageway and accumulate therein;

said discharge means being an annular, mixing, discharge nozzle mounted in said opposite axial end of said passageway, said mixing nozzle having a tapered discharge opening which is in axial alignment with said passageway;

a bypass conduit having a lower end portion extending through said one axial end of said passageway and then extending under and beyond said entrance opening to a location close to said mixing, discharge nozzle, said end portion providing a zone between said bypass conduit and the wall of said passageway into which abrasive particles can freely flow from said entrance opening, said bypass conduit having an upper end which is connected to the upper portion of said reservoir so that liquid substantially free of abrasive particles can flow from said reservoir into said lower end portion of said bypass conduit and thence into said passageway close to said mixing nozzle, said bypass conduit being free of pumping means so that flow of liquid therethrough is caused by means located downstream of said mixing nozzle;

an intermediate pipe connected to one end thereof to said mixing nozzle for receiving a slurry therefrom;

a blasting gun connected to the other end of said intermediate pipe so that the slurry can flow into said blasting gun, and pressure means for supplying pressurized fluid to said blasting gun to aspirate the slurry from said connector structure through said intermediate pipe into said blasting gun, to pressurize the slurry and to discharge a mist of the slurry at a pressure in the range of 2.0 to 3.5 kgf.cm.cm. for impingement against the peripheral surface of the grinding wheel, the pressure of said pressurized fluid being the sole source of energy for moving the abrasive particles and liquid through the apparatus.

5,115,601

MOVABLE SKY LIGHT

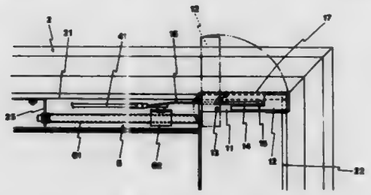
Kenji Yamaguchi; Kenji Hosoyama; Fumitoshi Okazaki, and Daisuke Hozumi, all of Tokyo, Japan, assignors to Sanwa Shutter Corporation, Tokyo, Japan

Filed Nov. 21, 1989, Ser. No. 440,044

Claims priority, application Japan, Dec. 21, 1988, 63-165160[U]; Dec. 27, 1988, 63-168781[U]; Dec. 27, 1988, 63-168782[U]; Jun. 20, 1989, 1-71873[U]; Jul. 31, 1989, 1-90257[U]

Int. Cl.[5] E04D *13/035*; E05F *15/20*

U.S. Cl. 52—1 **26 Claims**



1. In a movable sky light comprising a fixed frame having an opening therein and a movable wing frame connected to said fixed frame, said fixed frame being equipped with a driving device for opening and closing said wing frame relative to said opening, a detecting device disposed on said fixed frame, the detecting device comprising a rainfall sensor and a sensor protecting means, said sensor protecting means including means for swinging said sensor between a first position where said sensor is positioned outside of the fixed frame where said sensor is exposed to outdoor elements and a second position where said sensor is protected under said wing frame, said sensor protecting means allowing rainfall to contact said sensor when the wing frame is open and inhibiting rainfall from contacting said sensor when the wing frame is close, the sensor then being protected by the sensor protecting means.

5,115,602

INSULATING AND STRUCTURAL MASONRY BLOCK AND METHOD FOR THE FABRICATION THEREOF

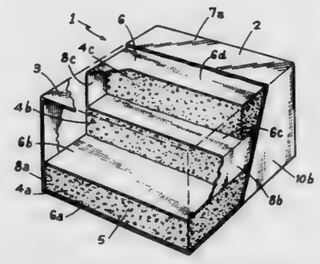
François de Larrard, Vitry-sur-Seine, France, assignor to Etat Francais, représenté par le: Laboratoire Central Des Ponts et Chaussees, Paris, France

Filed Feb. 23, 1990, Ser. No. 484,179

Claims priority, application France, Feb. 24, 1989, 89 02437

Int. Cl.[5] E04B *1/62*

U.S. Cl. 52—2.16 **16 Claims**



1. A masonry block suitable for residential and building construction comprising:

air and water tight outer envelope delimiting an inner cavity of generally right parallelepipedic shape, and

a predetermined quantity of dry granular material completely filling the inner cavity;

said dry granular material being a light aggregate made rough by crushing and having a compression strength of at least 435 psi (3 MPa) and comprising grains of granular material having interstitial spaces therebetween which contain dry gas at a pressure lower than ambient pressure.

5,115,603

ROOF VALLEY FLASHING INCLUDING EXPANSION JOINT

Earl Blair, San Marino, Calif., assignor to Roof-Flex, Harbor City, Calif.

Filed Sep. 20, 1990, Ser. No. 585,431

Int. Cl.[5] E04D *13/04, 1/36*

U.S. Cl. 52—13 **17 Claims**



1. A roof valley flashing including a unitary strip of durable material adapted to be located in a junction between two plane surfaces of a roof, each said surface being covered with roofing material;

said strip comprising a rectangular panel of polypropylene-synthetic rubber having a flexure section extending longitudinally through its center and including laterally extending sides of such width that they can extend a substantial distance under said roofing material, each of said laterally extending sides including a plurality of longitudinally extending ribs spaced from and parallel to said flexure section; and

means located on at least one end of said panel for engagement with another of said panels whereby a plurality of said panels may be arranged end to end as required by the length of said roof valley.

5,115,604

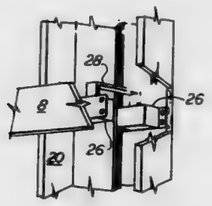
DEVICE FOR ATTACHING TWO BUILDING STRUCTURES TOGETHER

Robert Bunyard, Bob Bunyard Tile Co., 500 Upton St., Redwood City, Calif. 94062

Division of Ser. No. 343,431, Apr. 26, 1989, Pat. No. 4,993,201. This application Jul. 24, 1990, Ser. No. 557,366

Int. Cl.[5] A47K *3/16, 3/22*; E04B *1/00*

U.S. Cl. 52—34 **2 Claims**



1. In combination, a first building frame member, a second building frame member spaced from said first member,

a first upward-opening cup discrete from said first member, first means attaching said first cup to said first member, first adhesive in said first cup,

a second upward-opening cup discrete from said second member, second means attaching said second cup to said second member, second adhesive in said second cup, and

an inverted U-shaped rigid member having vertical legs fitting into and retained by the adhesives in said cups.

5,115,605

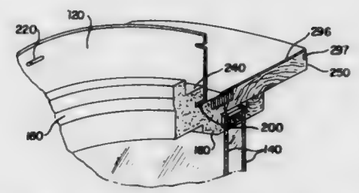
WINDOW UNIT

Dennis Butler, Georgetown, Pa., assignor to Glenn Technologies, Inc., Cecil, Pa.

Filed Feb. 16, 1990, Ser. No. 480,740

Int. Cl.[5] E06B *1/04*; E04F *19/02*

U.S. Cl. 52—105 **2 Claims**



1. In a unitary framing assembly having a jamb and associated molding which together constitute a window unit having glazing and a sash, the improvement comprising a rout within said molding, said rout being positioned on the outer edge of said molding on the side of said molding adjacent said jamb, further wherein said rout has a weather/nailing flange associated therewith, further wherein said weather/nailing flange is L-shaped and further wherein said L-shaped weathr/nailing flange is bonded to said rout by means of both staples and a polymeric bonding agent, said rout further comprising a stepped down aperture in said molding wherein said aperture is open on two sides, said aperture further having dimensions adequate to receive exterior building materials therein adjacent to said molding.

5,115,606

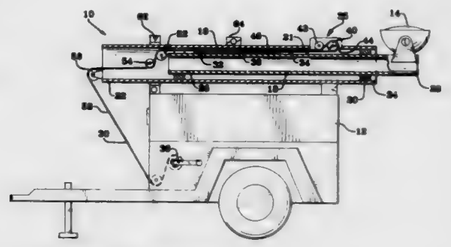
EXTENSION CABLE FOR TELESCOPIC TOWER

Jarvis K. Renegar, Mocksville, and Jeffrey D. Matlock, Clemmons, both of N.C., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Sep. 24, 1990, Ser. No. 587,777

Int. Cl.[5] B66C *23/06*

U.S. Cl. 52—118 **14 Claims**



1. An apparatus comprising:

a first solid wall tubular member;

a second solid wall tubular member being at least partially contained within the first solid wall tubular member wherein a space is defined between the first solid wall tubular member and second solid wall tubular member;

a cable;

tensioning means for applying tension to the cable;

pulley means attached to said first solid wall tubular member for engaging the cable, at least a portion of the pulley means being located within said space and at least a portion of the pulley means being located externally of the first solid wall tubular member;

a first portion of the cable is connected at one end to the second solid wall tubular member, and extends to the pulley means; and

a second portion of the cable extends from said pulley means to the tensioning means, the first and second cable portions being contained within the first solid wall tubular member.

5,115,607

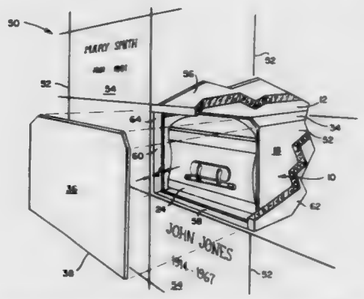
CASKET ENCLOSURE AND METHOD OF STORING SAME IN A BURIAL CRYPT

Richard W. Pirozzoli, Reading; Robert J. Pirozzoli, Huntington, and Alexander P. Pirozzoli, Trumbull, all of Conn., assignors to Norwalk Vault Company of Bridgeport, Inc., Bridgeport, Conn.

Filed May 6, 1991, Ser. No. 696,231

Int. Cl.[5] E04H *13/00*

U.S. Cl. 52—134 **14 Claims**



1. A method of storing an enclosed entombment casket in a

crypt chamber of a generally rectangular configuration having rigid top, bottom and side walls and having an opening at one end serving as the entrance to said crypt chamber, comprising the steps of:

(a) placing within said crypt chamber an empty, generally rectangular casket enclosure made from a thermoplastic resinous sheet material, said casket enclosure having top, bottom and side walls that are dimensioned so that said enclosure fits compactly within said crypt chamber, said enclosure having an open and a closed end and being positioned within said crypt chamber with said open end spaced apart a distance from said entrance opening so that said enclosure is completely contained within said chamber;

(b) inserting the enclosed entombment casket within said empty casket enclosure through said open end thereof after said casket enclosure has been placed within said crypt chamber;

(c) closing said open end of said casket enclosure in place within said crypt chamber by placing over said open end a cover made from said thermoplastic resinous material, said cover being disposed around its outer periphery in abutting relationship with portions of said top, bottom and opposite side walls of said enclosure surrounding said open end; and

(d) sealing said abutting portions of said enclosure and said cover by placing therebetween a chemical bonding agent capable of dissolving said thermoplastic resinous material and forming a chemical bond which is strong, resistant to chemical attach and which is impervious to both gases and liquids.

5,115,608

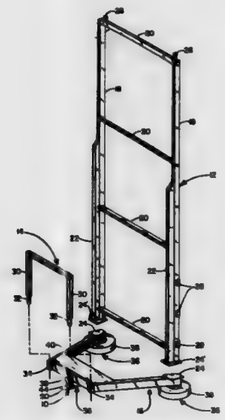
PANEL SUPPORT STRUCTURE

Leslie R. Abraham, and Ronald N. Probst, both of Owatonna, Minn., assignors to Wenger Corporation, Owatonna, Minn.

Continuation of Ser. No. 33,554, Apr. 1, 1987, abandoned. This application Mar. 15, 1990, Ser. No. 496,082

Int. Cl.[5] E04B 2/78

U.S. Cl. 52—238.1 **16 Claims**



1. A support structure for mounting stage backdrop panels and the like, comprising:

(a) a base frame;

(b) at least one caster mounting member rotatably carried by said base frame, for rotation about a generally vertical mounting member axis;

(c) a plurality of casters carried by said at least one mounting member, each of said casters being rotatably carried by said at least one mounting member about a generally vertical individual caster axis, each of said individual caster axes being offset from said mounting member axis, whereby each caster is rotatable about its respective individual caster axis, and each individual caster axis is rotatable about said mounting member axis; and

(d) telescoping adjustment means for selectively raising and lowering said base frame, said adjustment means interposed between said base frame and said at least one caster mounting member and coaxial with said mounting member axis.

5,115,609

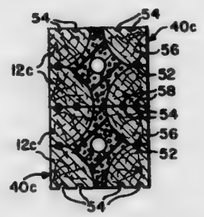
METHOD OF CONVERTING LOGS AND RESULTANT PRODUCT

Peter Sing, P.O. Box 11532, Bainbridge Island, Wash. 98110

Filed Jul. 3, 1991, Ser. No. 725,296

Int. Cl.[5] B27C 9/00; E04C 1/00; B27M 1/08

U.S. Cl. 52—309.9 **21 Claims**



1. The method of converting logs into finished dressed lumber, which comprises the steps of: trimming and debarking the logs; cutting each log longitudinally and diametrically into four equal right-angled segments; transversely cutting quartered logs into selected lengths; kiln-drying the quartered logs; plane milling the cut surfaces of the quartered logs; and assembling the quartered logs into such position that the arcuate surfaces of the four log quarters from each log face toward each other, and the cut, planed surfaces face outwardly and are arranged to form a cross-sectional peripheral configuration which is rectangular.

5,115,610

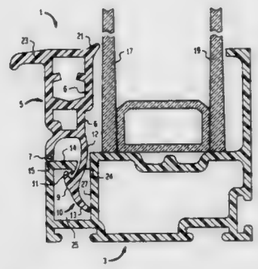
GLAZING BEAD

Gerald Kessler, P.O. Box 389, Youngstown, Ohio 44501

Filed Jul. 25, 1990, Ser. No. 557,039

Int. Cl.[5] E04B 1/61, 1/62

U.S. Cl. 52—397 **13 Claims**



1. In a glazing bead for holding a panel or a pane of glass in a frame member having a locking cavity for interlocking with said glazing bead, said glazing bead comprising:

a rigid body portion elongated in a first direction and adapted to extend in said first direction parallel to and abut in a second direction against and retain a panel or glass pane, said body portion being formed of rigid plastic material, a partly flexible locking arm extending in said first direction and adapted to slide into a locking cavity of the frame member in said first direction, and a locking portion extending from said partly flexible locking arm and being adapted to lock within the locking cavity of the frame member, the improvement comprising:

an elastic part integral with said rigid body portion of said glazing beam extending in said first direction and adapted to abut against a first surface of the frame member extending perpendicular to the panel or pane, said elastic part comprising spring means for assisting in maintaining said locking portion in locked position within the frame member when said elastic part is relatively uncompressed and for facilitating unlocking of said locking portion from the frame member when relatively compressed.

5,115,611

METAL CLADDING SYSTEMS

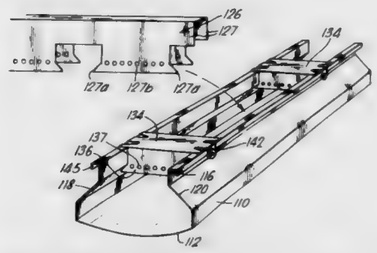
Guy H. Lim, Rotterdam; Willem Rijnders, Papendrecht, and Cornelis Louwerens, Rotterdam, all of Netherlands, assignors to Hunter Douglas International, Curacao, Netherlands Antilles

Filed Aug. 20, 1990, Ser. No. 570,262

Claims priority, application United Kingdom, Aug. 25, 1989, 8919330; Jun. 22, 1990, 9014274

Int. Cl.[5] E04B 2/00

U.S. Cl. 52—537 **32 Claims**



1. A self-sustained cladding panel for use in a cladding system for a building, said panel being formed of a resilient metal or metal alloy sheet material having an elastic range of deformation and said panel comprising a generally central visible portion, longitudinally extending side edges, and means on said panel connecting said longitudinally extending side edges with respect to one another, said connecting means retaining said panel in a final shape under tension with the elastic range of deformation of said material with at least the central visible portion in an elastically deformed state.

5,115,612

TRANSPARENT THERMAL PANEL

Anthony J. Newton, and David Budney, both of Edmonton, Canada, assignors to Vacuglas, Inc., Edmonton, Canada

Filed Mar. 14, 1990, Ser. No. 493,388

Int. Cl.[5] E06B 3/00

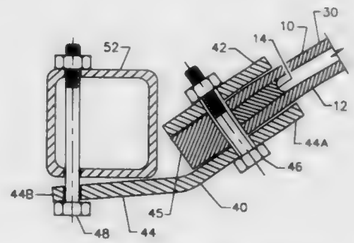
U.S. Cl. 52—208 **4 Claims**

1. A window module comprising:

a rectangular frame having first and second posts forming opposite parallel sides of the rectangular frame;

an evacuated glass envelope having first and second parallel edges and having a first axis parallel to the first and second parallel edges, the glass envelope being formed by inner and outer panes curved in the same direction about the first axis and being sealed about their respective peripheries;

first and second torsion means connected to the first and second posts respectively and to the first and second parallel edges of the glass envelope respectively for placing torsional forces on the glass envelope to balance the



compressional and tensional forces in the outer and inner panes respectively.

5,115,613

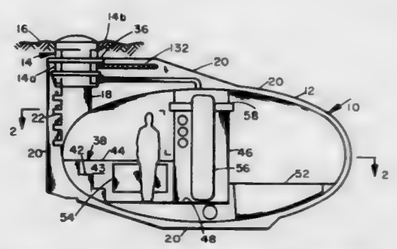
THETA BLAST CELL

Walton McCarthy, Concord, N.H., assignor to Theta Technologies, Inc., Concord, N.H.

Filed Feb. 6, 1989, Ser. No. 306,419

Int. Cl.[5] E02D 27/00

U.S. Cl. 52—169.6 **20 Claims**



1. An underground nuclear blast shelter comprising:

a. elongated cell means below ground level containing living space for one or more occupants of said shelter;

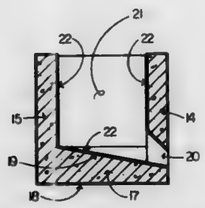
b. underground command station means located above one end of said cell means having a dome at ground surface and passageway means extending directly down into the cell means for providing access through the bottom of said command station means to said cell means, said dome being the only visible portion of said shelter;

c. said cell means comprising a pair of matching elongated clam shaped elements having matching rims extending along the edges thereof, said matching rims bonded to each other to form a flange completely encompassing said cell means along the long dimension thereof;

d. said command station means comprising a lower portion formed within and being an integral part of said flange formed by said clam shaped elements, said flange extending above the cell means, and an upper portion extending above said flange, means joining said upper and lower portions of said command station means to form an enclosed area; and

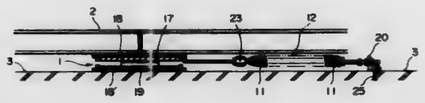
e. said passageway within and being an integral part of said flange formed by said clam shaped elements to provide said communication between said command station means and said cell means.

5,115,614
MASONRY UNIT WITH INTEGRAL FLASHING
David S. McGrath, 13855 Merrie Meadow La., South Lyon, Mich. 48178
Filed May 21, 1991, Ser. No. 703,806
Int. Cl.[5] E02D *19/00*; E04D *17/00*
U.S. Cl. 52—169.5 **6 Claims**



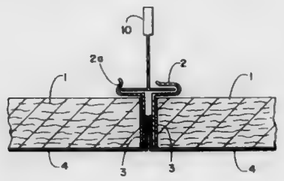
1. A composite masonry unit (10), comprised of a concrete block cast in a shape so as to form a moisture collection void (21) which is sized and shaped to collect and drain moisture travelling vertically within the cores of a single-wythe hollow masonry wall system, in combination with a waterproof material (22) coating the surface of the concrete material which forms the outer limits of said moisture collection void (21), said concrete block is to be comprised of an exterior face shell (14), an interior face shell (15), two side webs (16), and a base (17) which is flat on it's bottom side (18) and sloped on it's top side (19) in such a way as to direct moisture toward a weep hold (20) located directly above said base (17) in the middle of the exterior face shell (14) of said unit.

5,115,615
FLOOR VIBRATION-DAMPING APPARATUS
Hiraku Miyake; Mitsuo Ishiguro; Shigetaka Abe; Nobuo Yamaguchi; Yutaka Hayamizu, and Satoru Aizawa, all of Tokyo, Japan, assignors to Takenaka Corporation, Osaka, Japan
Filed Feb. 19, 1991, Ser. No. 657,071
Int. Cl.[5] E04H *9/02*
U.S. Cl. 52—167 R **12 Claims**



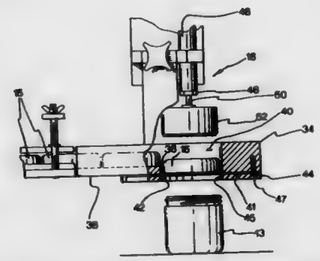
1. A floor vibration-damping apparatus for damping movement of an anti-vibration floor relative to a building, comprising:
a movable supporting portion supporting the anti-damping floor so that it is able to move horizontally relative to the building,
a viscous damper effective between the building and the anti-vibration floor, and
a plurality of spring mechanisms each having two opposite ends and fixed at one end to a selected restriction position of the anti-vibration floor and at the other end to the building, each spring mechanism comprising a tension spring and a pre-tensioning device distinct from the building for pre-tensioning the spring.

5,115,616
EDGEBANDED ACOUSTICAL PANELS
Michael T. Nixon, 2810 Urbandale La., Plymouth, Minn. 55447
Filed Sep. 5, 1989, Ser. No. 402,899
Int. Cl.[5] E04B *1/82*
U.S. Cl. 52—144 **9 Claims**



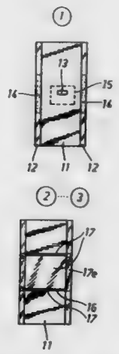
1. An acoustical panel comprising:
a. a core made of a fibrous material, said core having a generally uniform density throughout and including a pair of side surfaces and at least one edge surface which has not been treated with a resin based stiffener;
b. a banding member having a first surface and a second surface;
c. a heat activated adhesive for joining said first surface of said banding member in surface to surface registration with said edge surface of said core so that said banding member and said core mutually support each other to reduce the flexibility of the core along at least one axis.

5,115,617
CAPPING MACHINE
Graham Lewis, Baie d'Urfé ; Milos Prchal, Chomedey-Laval; Siegfried H. Weidner, Brossard, and Max Yablonovitch, Dollard des Ormeaux, all of Canada, assignors to H. G. Kalish Inc., Pointe-Claire, Canada
Filed Dec. 12, 1990, Ser. No. 626,543
Int. Cl.[5] B65B *7/28*
U.S. Cl. 53—306 **17 Claims**



1. An apparatus to cap in succession containers transported in serial order on a conveyance device, said apparatus comprising:
a cap dispensing station to loosely apply on each container a screw-type cap in a thread alignment condition with threads on the container, said cap dispensing station including:
a) a cap release passage;
b) a resilient barrier extending in said passage and at least partially closing said passage for preventing a cap to freely travel through said passage under the effect of gravity; and
c) a selectively actuatable cap ejector driving the cap through said passage against the resiliency of said barrier to eject the cap and deposit same on a container underneath, said resilient barrier constituting means for guiding the cap in its motion toward the container through a frictional sliding contact therewith in order to achieve said thread alignment condition,
a cap tightening station downstream of said cap dispensing station to rotatably grip the cap loosely applied to the container to tighten the cap.

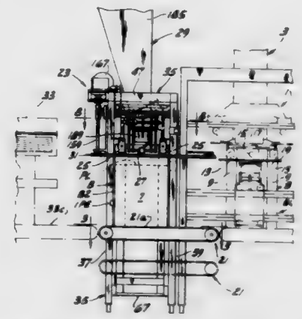
5,115,618
METHOD FOR PACKAGING BOOKS
Veikko I. Janhonen, Helsinki, Finland, assignor to Pussikeskus Oy, Helsinki, Finland
Filed Apr. 9, 1990, Ser. No. 506,422
Claims priority, application Finland, Apr. 19, 1989, 891858
Int. Cl.[5] B65B *11/50*
U.S. Cl. 53—449 **16 Claims**



1. The method of packaging a flat article of rectangular shape including the steps of providing a flat rectangular cardboard sheet (11) having greater length than width and a protective wrapper (17) of flexible material, while the cardboard sheet is flat placing the article (16) on said cardboard sheet centered about the geometric center of said cardboard, bonding an end of the flexible material to the upwardly facing surface of one unfolded lengthwise edge portion of said cardboard sheet and wrapping the flexible material over the article and bonding it to the upwardly facing surface of the other of the unfolded lengthwise edge portions of said cardboard sheet and folding both of said lengthwise edge portions of the cardboard sheet over the upwardly facing surface of the sheet to form marginal reinforcements (12) and clamp the ends of the protective wrapper (17) in said folded marginal reinforcements, folding said cardboard sheet about the article in a direction at a right angle to that along which the flexible material was wrapped about the article.

5,115,619
BAG PACKING
Gaylerd M. Lieder, Crystal, Minn., assignor to Bemis Company, Inc., Minneapolis, Minn.
Filed Apr. 25, 1991, Ser. No. 691,390
Int. Cl.[5] B65B *1/34, 1/12, 1/46, 43/30*
U.S. Cl. 53—459 **20 Claims**

1. The method of packing gusseted open-mouth bags with a fluent solid product, each bag having opposed walls and gussets at the sides, the method comprising:
positioning an unopened bag in a first position for delivery of product into the bag by an auger filler.
gripping the upper corners of the bag to hold the gussets in their original condition at the top of the bag;
opening the mouth of the bag by pulling the walls of the bag apart between the gripped upper corners and moving the latter inwardly toward one another for allowing the opening of the mouth;
delivering into the opened bag an initial quantity of product weighing less than the final desired weight of product;
flattening the top portion of the bag above the level of product therein with said flattened top portion in a vertical plane extending between the walls of the bag.
releasing the grip on said upper corners of the bag and moving the bag forward in a predetermined path with its flattened top portion in said plane;
stopping the bag in a second position for delivery of additional product for completing the filling of the bag;
weighing the bag while in said second position to determine the additional amount of product needed to complete the filling of the bag;



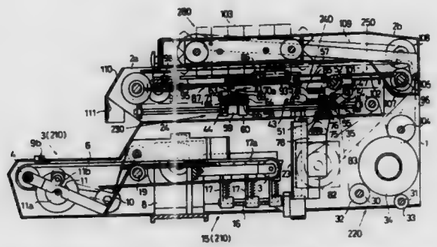
gripping the upper corners of the bag in the second position to hold the gussets in their original condition at the top of the bag;
opening the mouth of the bag in the second position by pulling the walls of the bag apart between the gripped upper corners and moving the latter inwardly toward one another for allowing the opening of the mouth;
delivering said additional amount of product into the bag;
flattening the top portion of the bag above the level of product therein with said flattened top portion in said vertical plane; and
releasing the grip on the upper corners of the bag and moving it further forward in said path for closing its flattened top portion.

5,115,620
WRAPPING MACHINE
Yoshiyuki Takamura, Nagoya, Japan, assignor to Fuji Pack System Ltd., Nagoya, Japan
Filed Sep. 18, 1990, Ser. No. 584,086
Claims priority, application Japan, Sep. 18, 1989, 1-109237; Sep. 18, 1989, 1-109238; Sep. 18, 1989, 1-243166; Sep. 20, 1989, 1-244647; Sep. 20, 1989, 1-244648; Oct. 27, 1989, 1-280190; Feb. 20, 1990, 2-40713; Feb. 20, 1990, 2-40714; Feb. 27, 1990, 2-20319
Int. Cl.[5] B65B *11/18, 59/00*
U.S. Cl. 53—64 **4 Claims**

1. A wrapping machine comprising:
a wrapping portion for wrapping a material;
a film feeder for feeding a film to the wrapping portion, said film feeder having holding means, including a movable film holder, for holding the film passing therethrough and drive means for permitting the holding means to selectively hold and release the film;
a material feeder for feeding the material to the wrapping portion;
a film folding device for wrapping the material with the film at the wrapping portion;
a sensor for detecting an ambient temperature and outputting a temperature detection signal;
memory means for storing desired drive timings for the film

feeder drive means corresponding to various specific temperatures;

driven control means for receiving the temperature detection signal, reading the desired drive timing corresponding to a detected temperature from the memory means, and driving the drive means at the drive timing to release holding of the film by the holding means based upon the retrieved desired drive timing; and



an interlocking means provided between the drive means and the holding means which includes a rotary shaft for supporting the movable film holder in an axial direction, an interlocking member movable on the rotary shaft together with the movable film holder and supported rotatable together with the rotary shaft, a first wire for connecting the drive means and the rotary shaft, and a second wire for connecting the interlocking member in a holding portion of the movable film holder.

5,115,621

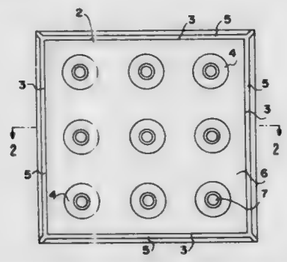
FREE ACCESS FLOOR PANEL

Tokuzo Kobayashi, Okayama, Japan, assignor to O M Kiki Co., Ltd., Okayama, Japan

Continuation-in-part of Ser. No. 361,137, Jun. 5, 1989, abandoned, which is a division of Ser. No. 95,316, Sep. 10, 1987, Pat. No. 4,856,256. This application Apr. 26, 1991, Ser. No. 696,290

Int. Cl.[5] E04C *2/34*

U.S. Cl. 52—805 **4 Claims**



1. A free access floor panel comprising a quadrate top plate and a quadrate bottom plate made of surface treated steel plates, such as galvanized steel, formed into specific forms by pressed-forming, wherein an outer peripheral of said bottom plate is bent as substantially a right angle to form a panel outer peripheral upright wall and an outer peripheral edge along almost an entire periphery, the top and bottom plate are integrated into a single body by only crimping said entire periphery of the top plate and the bottom plate, and a plural number of hollow props are provided in the bottom plate inside of said upright walls and between said top and bottom plates and a plural number of engaging holes corresponding to said plural number of hollow props are provided in said top plate and the top plate portions of said hollow props extend into said engaging holes and said top portions and said engaging holes are crimped together around the edges.

5,115,622

METHOD OF REINFORCING STRUCTURAL COMPONENTS

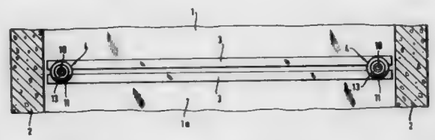
Walter Ammann, Bonstetten; Fritz Muenger, Gossau, and Manfred Hartmann, Frastanz, all of Switzerland, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Dec. 21, 1990, Ser. No. 632,350

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1989, 3942945

Int. Cl.[5] E04C *5/18*

U.S. Cl. 52—741 **6 Claims**



1. Method of reinforcing concrete structural components (1), such as ceilings, beams or the like, by bonding elongated metal reinforcing members (3) having opposite ends spaced apart in the elongated direction to a surface of the concrete structural component (1) in the region of a tension zone therein, comprising the steps of clamping the opposite ends of the reinforcing members (3) against the surface of the structural component by means of attachment members (4) having a pair of opposite ends, securing one of the opposite ends of the attachment members within the concrete structural component (1), locating the other opposite end outwardly from the surface of the concrete structural component and from the metal reinforcing members (3), providing an abutment shoulder (10) on the other opposite end, and placing a prestressable element (11) between the abutment shoulder and the reinforcing member for prestressing the attachment member (4).

5,115,623

DISPLAY SYSTEM

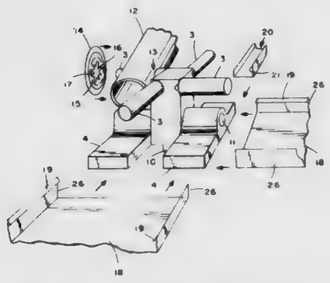
Erik Ahlberg, Stockholm, Sweden, assignor to ODC Exhibit Systems Ltd., British Columbia, Canada

PCT No. PCT/SE89/00026, § 371 Date Jul. 12, 1990, § 102(e) Date Jul. 12, 1990, PCT Pub. No. WO89/07307, PCT Pub. Date Aug. 10, 1989

PCT Filed Jan. 27, 1989, Ser. No. 543,743

Int. Cl.[5] E04H *12/18;* **G09F** *15/00*

U.S. Cl. 52—646 **16 Claims**



1. A hinged, three dimensional display system comprising a plurality of elongated members, a plurality of struts, and at least one associated connecting piece, said connecting piece including a central part having a longitudinal axis and a first end provided with four pivot pins extending away from said central part in a plane perpendicular to said longitudinal axis, each pin having an axis offset from said longitudinal axis and extending in a direction 90° from an adjacent pin, said central part having a second end provided with at least a pair of coupling members; wherein each of said plurality of elongated members is provided with an aperture for receiving a corresponding one of said pivot pins and wherein one or more of said struts are mountable on a corresponding one or more of said coupling members.

5,115,624

THERMOPLASTIC SKIN PACKING MEANS

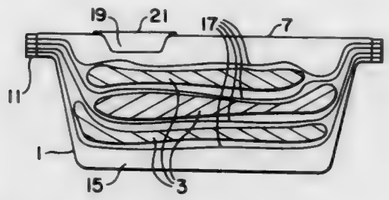
Anthony J. M. Garwood, Bayswater, Australia, assignor to Seawell Corporation N.V., Curacao, Australia

Continuation of Ser. No. 224,381, Jul. 26, 1988, abandoned, which is a division of Ser. No. 86,046, Jun. 19, 1987, Pat. No. 4,840,271. This application Mar. 28, 1990, Ser. No. 500,218

Claims priority, application Australia, Nov. 14, 1985, PH3406; Feb. 24, 1986, PH4760; World Int. Prop. O., Nov. 7, 1986, PCT/AU86/00339

Int. Cl.[5] B65B *31/02, 47/10, 25/08, 11/52*

U.S. Cl. 53—427 **33 Claims**



1. A method of packaging goods including:

(a) providing a base,

(b) placing goods over said base,

(c) applying a flexible web of gas permeable skin wrapping plastics material over said base and said goods and relative to said base to hold said goods relative to said base,

(d) evacuating air or gas from between said base and said skin wrapping so as to allow said skin wrapper to flexibly displace onto said goods and to at least partially skin pack said goods,

(e) applying a lid over said skin wrapping and spaced therefrom,

(f) providing a desired gas in said space between said lid and said skin wrapping to enhance the keeping properties of the packaged goods by permeating said skin wrapping, and

(g) sealing said lid to said base so that said space is permanently retained, and attaching said skin wrapping relative to said base.

5,115,625

IN-LINE BOTTOM LOADING CASE PACKER

Noel K. Barbulesco, Sonoma, and Stan K. Lundquist, Denwood, both of Calif., assignors to Sabel Engineering Corporation, Sonoma, Calif.

Filed Jan. 31, 1991, Ser. No. 648,825

Int. Cl.[5] B65B *5/04, 5/06, 7/20*

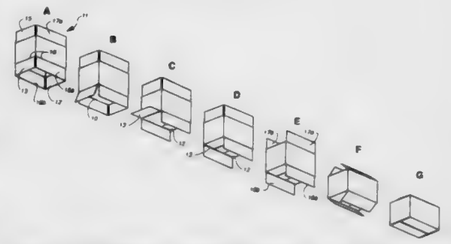
U.S. Cl. 53—467 **25 Claims**

1. A structure comprising:

a frame having a feed end and a discharge end, wherein a longitudinal axis of said frame extends between said feed end and said discharge end, said frame including a plurality of stations along said axis;

means for transferring a carton having a centerline from said feed end to said discharge end generally along said axis while holding said centerline of said carton generally parallel to said longitudinal axis, wherein said means for transferring includes a means for providing an indexing cycle such that at a beginning of said indexing cycle said carton is stationary at a first of a set of any two adjacent stations of said plurality of stations along said axis and at an end of said indexing cycle said carton is stationary at a second of said set of any two adjacent stations, wherein the carton includes a set of bottom flaps on a bottom end of the carton;

means for holding the carton in an open upright position at a first position along said axis;



means for loading a product into the carton at a second position along said axis; and

means for moving the set of bottom flaps on the carton from an open position when the carton is at said first position along said axis between said feed end and said discharge end to a closed position when said carton is at said discharge end, said means for moving being disposed along said axis.

5,115,626

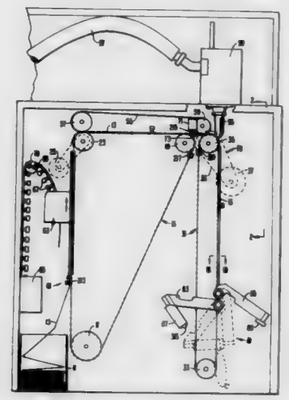
APPARATUS FOR FILLING FLEXIBLE PLASTIC BAGS CARRIED IN A CONTINUOUS WEB AND SUPPLIES THEREFORE

Christopher C. Rutter, Oakland; Robert A. Bilbrey, Orinda, and Bruce R. Koball, Berkeley, all of Calif., assignors to Rapak, Inc., Hayward, Calif.

Division of Ser. No. 252,058, Sep. 30, 1988, Pat. No. 4,981,374. This application Oct. 2, 1990, Ser. No. 591,986

Int. Cl.[5] B65B *3/16*

U.S. Cl. 53—468 **13 Claims**



1. A mechanism for manipulating and filling flexible sealed bags with a liquid or particulate material by separate operations at a series of work stations, comprising:

means provided at a filling work station for holding said bag substantially vertically,

means provided at a cutting station in advance of said filling

station for placing a slit adjacent an end thereof that becomes the top of the bag when held substantially vertically at said filling station and in a shape that includes a substantially horizontal component adjacent a substantially vertical component,

means for moving a bag from said cutting work station to said filling work station,

a nozzle structure held substantially vertically at said filling work station, said nozzle being tapered at a lower end thereof and being movable in a substantially vertical direction and rotatable about a substantially vertically axis thereof,

means provided at said filling station for inserting said nozzle into said bag through said slit, said inserting means including means for moving said nozzle structure downward and rotatably about said vertical axis in a manner to insert itself through said bag slit and into said bag, and

means communicating with a source of said material and provided as part of said nozzle for controlling flow of said material into said bag through the nozzle while it is positioned within a bag.

5,115,627

LEG SUPPORT WRAP FOR HORSE

Dal Scott, 3617 Bancroft Dr. #B, Spring Valley, Calif. 92077

Filed Nov. 12, 1990, Ser. No. 615,315

Int. Cl.[5] A61D *9/00*

U.S. Cl. 54—82 **16 Claims**



1. A support wrap for a horse's lower leg comprising:

a panel for wrapping around a horse's lower leg including:

a lower end for disposition near the pastern; and

an upper end for disposition above the fetlock;

said panel comprising

an inner layer for disposition adjacent the horse's leg comprising:

a sheet of spongy, shock dissipating material;

an outer layer attached to said inner layer and substantially congruent with said inner layer comprising:

a sheet of strong, shock absorbing material, substantially more elastic than said inner layer;

securing means for securing said panel to a horse's lower leg; and;

elastic strap means attached to said panel for passing directly under the horse's fetlock for providing upward support to the underside of the fetlock; said elastic strap means further including:

hold down means for securing said elastic strap means to said panel directly under the horse's fetlock such that said elastic band means cannot move up or down relative to the fetlock.

5,115,628

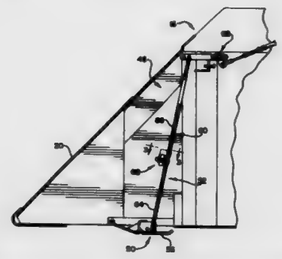
HEIGHT CONTROL SYSTEM FOR A COTTON HARVESTER

Lee F. Garter, Western Springs, and G. Neil Thedford, Naperville, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Dec. 12, 1990, Ser. No. 626,022

Int. Cl.[5] A01D *46/08*

U.S. Cl. 56—10.2 **12 Claims**



1. A height control system for adjusting the elevation of a harvesting unit supported for vertical movement on a frame of a cotton harvester, said cotton harvester having a hydraulic system including hydraulic lift means for vertically positioning said harvesting unit, said height control system comprising:

signal receiving means movable within a predetermined range of movement and arranged and in combination with said lift means for adjusting the elevation of said harvesting unit;

signal transmitting means carried on said harvesting unit for ground engagement and connected to said signal receiving means for causing the lift means to effect harvesting unit elevation correlated with vertical movement of said signal transmitting means relative to said harvesting unit; and

means for interconnecting said signal receiving means and said signal transmitting means, said interconnecting means including a torsionally biased rock shaft mechanism interposed between said signal transmitting means and said signal receiving means to permit said signal transmitting means to move relative tot and following said signal receiving means reaching an extreme limit of its predetermined range of movement and thereby allowing for continued travel of the signal transmitting means relative to the signal receiving means while inhibiting damage to the height control system.

5,115,629

METHOD AND APPARATUS FOR PREPARING YARN ENDS TO BE SPLICED

Heinz Zumfeld, Mönchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst AG & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Feb. 25, 1991, Ser. No. 660,644

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1990, 4005752

Int. Cl.[5] D01H *15/013*; B65H *69/06*

U.S. Cl. 57—22 **12 Claims**

1. A method for preparing two yarn ends to be joined together, which comprises:

placing two yarns to be joined together by pneumatic splicing in a splicer head of a splicer with ends of the yarn to be prepared protruding out of a splicing channel of the splicer head in mutually opposite directions;

holding the yarn ends taut at given points;

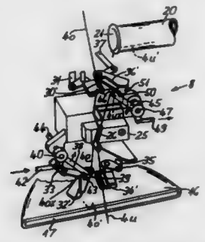
orienting suction openings of preparation nozzles toward the cutting tools;

applying a flow of suction to the suction openings; subsequently

shortening the yarn ends protruding from the splicing channel to a length required for a splicing process by cutting off portions of the yarn ends between the given points and the splicer head and producing cut edges;

aspirating the yarn ends to be prepared with the cut edges leading into the respective preparation nozzles at a predetermined speed;

pneumatically unravelling twists in the yarn ends beginning at the cut edges with compressed air during the aspiration into the preparation nozzles;



maintaining the yarns in the splicing channel stationary relative to one another and to the splicing channel during the pneumatic unraveling;

aspirating the yarn ends far enough to prepare a yarn length for splicing being optimally matched to applicable yarn parameters while a not-unraveled portion of the yarns remains stationary in the splicing channel; and

adapting a duration and intensity of preparation of the yarn ends to the yarn parameters.

5,115,630

PROCESS AND APPARATUS FOR THE SPINNING OF FIBER YARNS, POSSIBLY COMPRISING AT LEAST ONE CORE

Michel Vanhelle, Badditzenbach, Fed. Rep. of Germany, assignor to Spindelfabrik Suessen Schurr Stahlecker & Grill GmbH, Suessen, Fed. Rep. of Germany

Continuation of Ser. No. 392,669, Aug. 11, 1989, abandoned, which is a continuation of Ser. No. 208,834, Jun. 16, 1988, Pat. No. 4,903,472, which is a continuation of Ser. No. 940,508, Dec. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 904,768, Sep. 5, 1986, abandoned, which is a continuation of Ser. No. 600,363, Apr. 13, 1984, abandoned. This application May 18, 1990, Ser. No. 526,538

Claims priority, application France, Apr. 14, 1983, 83 06125

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

Int. Cl.[5] D01H *1/10, 1/11*

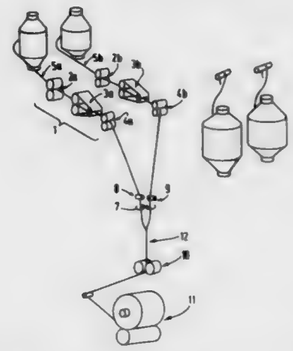
U.S. Cl. 57—58.059 **8 Claims**

1. A compound machine arrangement for producing a staple fiber yarn comprising:

prestrengthening spinning apparatus including a drafting device for drafting at least two rovings of fibers and a first false twisting device for false twisting the drafted rovings to intermediate yarns of preliminary strength, an assembling device for assembling the intermediate yarns, and a winding device for winding the assembled intermediate yarns onto a package;

two-for-one twisting apparatus including a two-for-one twisting spindle having a yarn inlet opening, package support means for supporting the package at the two-for-one twisting spindle, and unwinding means for unwinding the intermediate yarns from the package and guiding them to the yarn inlet opening, said unwinding means including a yarn guide eye disposed adjacent to the radial circumference of the package when in an in-use position at the two-for-one twisting spindle; and

a futher false twisting device disposed radially inward of and downstream of the yarn guide eye at a position directly adjacent the yarn inlet opening of the two-for-one spindle, such that the intermediate yarn has a substantially unimpeded path between the yarn guide eye and the further false twisting device, whereby said intermediate yarn is provided with a further strengthening immediately before being subjected to two-for-one twisting.



wherein said further false twisting device includes only a single false twisting member between the yarn guide eye and the yarn inlet opening of the two-for-one twisting spindle.

5,115,631

SLIVER CAN TRANSPORT APPARATUS

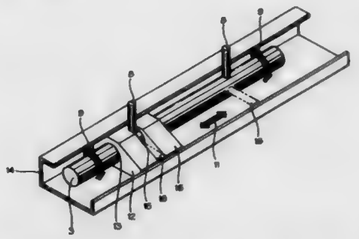
Gregor Gebald, Leppershutte 49, Monchengladbach 2; Manfred Langen, Schulstrasse 58, Monchengladbach 1, and Helmut Bungter, Viersen, all of Fed. Rep. of Germany, assignors to Gregor Gebald and Manfred Langen, both of Monchengladbach, Fed. Rep. of Germany

Filed Oct. 2, 1990, Ser. No. 591,942

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1989, 3934816

Int. Cl.[5] D01H *9/10*; B65G *25/00*

U.S. Cl. 57—281 **6 Claims**



1. Apparatus for transporting sliver cans between a sliver can handling location and a textile spinning machine at which a plurality of spinning stations are each adapted for receiving a supply of sliver delivered from a respective sliver can, comprising:

sliver can supporting means for supporting sliver cans during movement of the sliver cans along at least a portion of a transport path extending between the sliver can handling location and the textile spinning machine, said sliver can support means including a pair of generally planar support surfaces on which the sliver cans are supported for movement in a plane, said planar support surfaces being spaced from one another in a direction transverse to the transport path, and a longitudinal slot extending between said planar support surfaces parallel to the transport path, said sliver

can support means supporting each sliver can thereon in a supported disposition in which the sliver can is supported by both of said planar support surfaces and extends therebetween over said longitudinal slot;

a plurality of engaging members each for individually engaging at least one sliver can;

positioning means for selectively positioning said engaging members, said positioning means including an angular movement means, said angular movement means including an elongated rod member having a longitudinal axis, a plurality of slide blocks, slide block guide means and means for rotating said rod member about its axis, each slide block being secured to said rod member at a fixed axial position relative thereto for axial movement therewith and permitting rotation of said rod member relative thereto, said slide block guide means for guiding said slide blocks during axial movement of said rod member and said slide blocks, said engaging members being secured to said rod member at generally uniform spacings therealong and extending generally radially from said rod member relative to said rod member axis, and said means for rotating said rod member about its axis being operable to rotate said rod member to effect movement of said engaging members between engage positions in which said engaging members project upwardly through said longitudinal slot beyond said plane in position for engagement with sliver cans to effect advancing movement thereof and disengage positions angularly displaced from said engage positions relative to said rod member axis in which said engaging members are disposed below said plane; and

drive means, operatively connected to said positioning means, for axially displacing said rod member in a drive direction to an advance forward position with said engaging members in said engage positions to effect advancing movement of the sliver cans and for axially displacing said rod member in a return direction with said engaging members in said disengage positions out of sliver can engagement to a ready position at which said engaging members can be subsequently moved by said means for rotating said rod member from said disengage positions to said engage positions for engagement and advancement of respective following sliver cans upon subsequent axial movement of said rod member in said drive direction, said means for rotating said rod member being operatively connected to said drive means for rotating said rod member to effect movement of said engaging members into said engage positions in correspondence with displacement of said rod member into said ready position and for rotation of said rod member by said means for rotating said rod member to effect movement of said engaging members from said engage positions to said disengage positions in correspondence with displacement of said rod member into said advance forward position.

5,115,632

RING SPINNING MACHINE AND METHOD OF OPERATING A RING SPINNING MACHINE

Georg Ulmer, Nuerensdorf, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Mar. 28, 1990, Ser. No. 500,759

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1989, 3910182

Int. Cl.[5] D01H *7/46, 13/00*

U.S. Cl. 57—264 **22 Claims**

22. A ring spinning machine comprising

a ring rail;

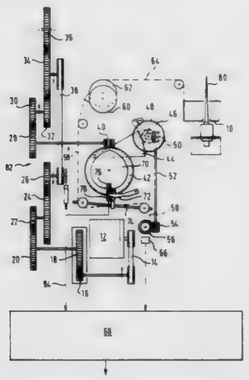
at least one spindle rotatably mounted on said ring rail;

drive means connected to said ring rail for moving said ring rail through a plurality of operating vertical levels;

a rotatably mounted heart-shaped cam disc in said drive for moving said ring rail in response to rotation of said disc in a continuous transversing motion with said ring rail in a least one of said levels, said cam disc having a plurality of angular position corresponding to a plurality of machine functions to be performed;

a marking on said disc indicative of a predetermined angular starting position of said disc;

a stationary sensor for detecting said marking and generating a signal in response thereto; and



a control unit connected to said sensor for receiving said signal therefrom and computing the time from said signal to at least one further predetermined angular position of said disc corresponding to a specific machine function, said control unit effecting execution of said machine function upon expiration of said computed time.

5,115,633

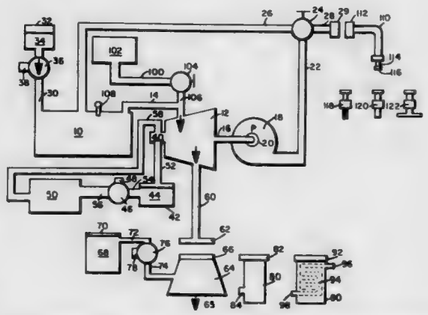
COMPACT HIGH-ENERGY AUXILIARY POWER METHOD AND MEANS

David B. Priser, Edgewood, and Robert L. Dow, La Plata, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 6, 1984, Ser. No. 702,298

Int. Cl.[5] F02C *9/00*

U.S. Cl. 60—39.01 **8 Claims**



1. A low-cost, lightweight, compact, vehicle-mounted auxiliary power system for multiple-purpose battlefield uses, comprising:

hot gas operated turbine means having a gas inlet passage and an exhaust gas outlet

combustion means connected to said hot gas operated turbine means by said gas inlet passage for generating a continuous flow of hot gas operated turbine means through said gas inlet passage, and

air compression means mechanically connected to said hot gas operated turbine means for supplying a continuous stream of pressurized air to said combustion means to support combustion therein,

said air compression means including selective means for diverting a portion of said continuous stream of pressurized air away from said combustion means.

5,115,634

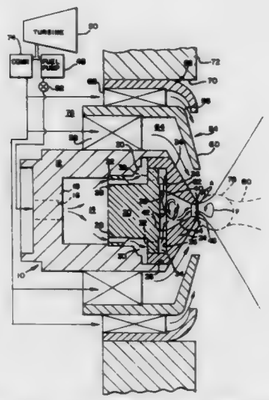
SIMPLEX AIRBLADE FUEL INJECTION METHOD

David H. Bretz, Bloomfield Township, Bloomfield County, and Darrell G. Bobzin, West Des Moines, both of Iowa, assignors to Delavan Inc., West Des Moines, Iowa

Filed Mar. 13, 1990, Ser. No. 492,774

Int. Cl.[5] F02G *3/00*

U.S. Cl. 60—39.02 **10 Claims**



1. A method of atomizing fuel for ignition to drive a gas turbine, comprising:

supplying fuel to a simplex nozzle from a fuel supply powered by the turbine over a range of pressures between maximum and minimum during the operation of the turbine, and also to said simplex nozzle at a substantially lower pressure during turbine startup;

discharging the fuel from the nozzle as a swirling stream of atomized fuel during turbine operation, and during turbine startup as a fuel film which is insufficiently atomized to initiate ignition;

supplying a stream of air at least at a minimum pressure during turbine operation and at a pressure substantially lower than said minimum pressure during turbine startup;

imparting a swirling motion to said stream of substantially lower pressure air, and

directing said swirling stream of said substantially lower pressure air toward the insufficiently atomized fuel film as it issues from the nozzle to create a vortex about the film to explode and atomize the fuel film sufficiently to permit initiation of ignition during turbine startup.

5,115,635

ANALYTICAL FLOW METER BACKUP

Tyler R. Jennings, West Palm Beach; Louis J. Larkin, Lake Clarke Shores, and Rodney O. Johnson, Lake Worth, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 20, 1990, Ser. No. 615,944

Int. Cl.[5] F02C *9/28*

U.S. Cl. 60—39.03 **5 Claims**

1. A method of operating a gas turbine engine comprising:

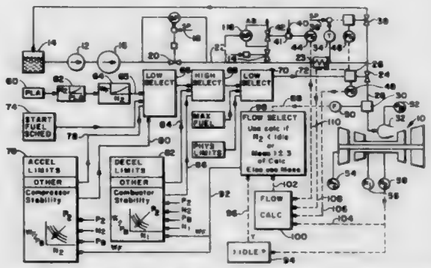
sending a control signal to a fuel flow throttle valve;

modulating said throttle valve in response to said control signal;

measuring fuel flow passing through said throttle valve and establishing a measured flow signal;

using said measured flow signal to modify said control signal;

detecting the physical operating parameters of the pump and valves in the fuel flow system;



calculating a calculated flow based on said operating parameters and establishing a calculated flow signal;

comparing said measured flow signal and said calculated flow signal; and

substituting said calculated flow signal for said measured flow signal to modify said control signal when said measured flow signal and said calculated flow signal differ by more than a preselected amount.

5,115,636

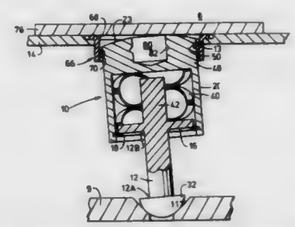
BORESCOPE PLUG

Philip R. Zeiser, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Sep. 12, 1990, Ser. No. 581,606

Int. Cl.[5] F02G *1/00*

U.S. Cl. 60—39.33 **20 Claims**



1. A borescope plug for removably sealing a pair of opposing holes in a gas turbine engine structure having spaced apart walls wherein each of the walls includes one of the opposing holes, and further wherein the holes are initially substantially aligned and subject to becoming non-aligned during engine operation, which comprises:

a shaft means for extending between the two spaced apart walls and having a pair of axially opposing ends and a semi-spherical sealing means at first of said ends for sealing the first hole; and

an annular borescope plug housing coupled to a second one of said ends adapted to be retained within the second hole; and

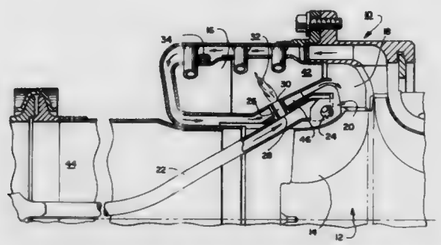
means for biasing said semi-spherical sealing means into biased sealing engagement with the first hole when the first hole is not aligned with the second hole and for retaining sealing engagement of said first sealing means with said first hole during engine operation.

5,115,637

EXTERNAL CARTRIDGE GAS COMBUSTOR IGNITOR

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 22, 1989, Ser. No. 455,270
Int. Cl.[5] F02C *7/264, 7/27*
U.S. Cl. 60—39.142 **15 Claims**



1. In a turbine engine having a turbine rotor, said turbine rotor having turbine blades integral therewith, said turbine engine having a combustor associated therewith for producing hot gases of combustion, said combustor communicating with said turbine rotor through a turbine nozzle, said turbine engine normally being driven by said hot gases of combustion, the improvement comprising:

auxiliary means associated with said turbine rotor for assisting said combustor in starting said turbine engine including a self-contained independent source of hot, pressurized gases, said auxiliary means also including means for directing said hot, pressurized gases from said self-contained independent source to said turbine rotor with sufficient mass flow to avoid substantial loss of energy, said self-contained independent source of hot, pressurized gases being located in an exhaust duct downstream of said turbine rotor; and

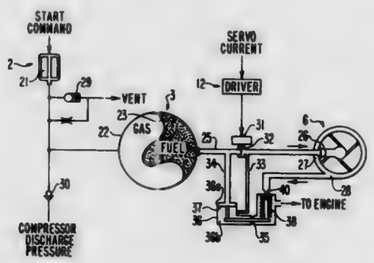
means for simultaneously facilitating diversion of a portion of said hot, pressurized gases into said combustor at a predetermined location.

5,115,638

PROPULSION TURBINE FUEL CONTROL SYSTEM

Wendell E. Reed, 107 Murray St., Chula Vista, Calif. 92010, and Malcolm J. McArthur, 13821 Davenport Ave., San Diego, Calif. 92129

Filed Jan. 8, 1990, Ser. No. 461,746
Int. Cl.[5] F02C *9/28*
U.S. Cl. 60—39.281 **32 Claims**



1. A fuel control system, the fuel control system comprising:

fuel storage means for accommodating a fuel to be supplied to the turbine engine including a pressurized fuel tank accommodating a quantity of fuel and a gas;

fuel pump means adapted to supply fuel from the fuel storage means to the turbine engine;

control means interposed between the fuel storage means and the fuel pump means for enabling and maintaining of a flow of fuel to the turbine engine at a pressure independent of a pressure in the fuel storage means and in the turbine engine in response to operating parameters of the engine including servo-valve means disposed in a fuel line means at a position upstream of the fuel pump means for controlling an opening and closing of a servo-orifice means; means for operating said servo-valve means in response to the operating parameters of the engine;

means for preventing a flow of fuel from the pressurized fuel tank to the fuel pump means until required by the turbine engine, thereby enabling a fuel storage in the fuel tank and fuel line means for subsequent start-up of the turbine engine including a frangible means disposed at an inlet of the fuel pump means; and

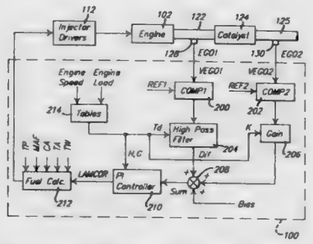
means for at least temporarily providing a pressure pulse to the fuel tank means sufficient to rupture the frangible means to permit fuel flow to the fuel pump means in response to a start-up of the turbine engine.

5,115,639

DUAL EGO SENSOR CLOSED LOOP FUEL CONTROL

Alexander Y. Gopp, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 28, 1991, Ser. No. 724,394
Int. Cl.[5] F01N *3/20*
U.S. Cl. 60—274 **9 Claims**



4. An apparatus for controlling air/fuel ratio in an internal combustion engine having means for supplying air and fuel in variable ratio to the engine, exhaust means including exhaust manifold, catalytic converter and exhaust piping, and two EGO sensors responsive to certain oxygen concentration in exhaust gases, said EGO sensors being located one upstream and one downstream of said catalytic converter said apparatus comprising;

a high pass filter coupled to said upstream EGO sensor;

a summer coupled to an output of said high pass filter as one input, coupled to an output of said downstream EGO sensor as a second input and coupled to a bias signal;

a proportional and integral controller coupled to the output of said summer; and

a fuel calculation means coupled to the output of said proportional and integral controller for generating a signal to determine the amount of fuel to be injected into the engine.

5,115,640

FLUID CONTROLLER AND LOGIC CONTROL SYSTEM FOR USE THEREWITH

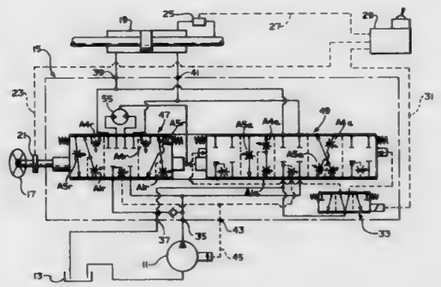
Dwight B. Stephenson, Savage, and James J. Hastreiter, Eden Prairie, both of Minn., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 513,366, Apr. 23, 1990, Pat. No. 5,016,672. This application May 20, 1991, Ser. No. 703,318
Int. Cl.[5] F15B *9/09*
U.S. Cl. 60—384 **8 Claims**

1. A system for controlling the flow of fluid from a source of pressurized fluid to a fluid pressure operated output device and

achieving a desired position of said output device, said system including a controller operable to control the flow of fluid from the source to the output device, input means operable to control said controller, an input position sensing means operable to sense the position of said input means and provide an input position signal, an output position sensing means operable to sense the position of said output device and provide an output position signal, logic control means operable to receive said input and output position signals and generate a correction signal; said controller being of the type including housing means defining an inlet port for connection to the source of pressurized fluid, a return port, and first and second control fluid ports for connection to the output device, valve means disposed in said housing means and comprising a primary, rotatable valve member and a cooperating, relatively rotatable follow-up valve member, said valve members defining a neutral rotary position and a rotary operating position in which said primary valve member is rotatably displaced from said neutral rotary position, relative to said follow-up valve member; said housing means and said primary and follow-up valve members cooperating to define a main fluid path providing fluid communication from said inlet port to said first control fluid port and from said second control fluid port to said return port when said valve members are in said rotary operating position; characterized by:

(a) said primary and follow-up valve members defining a



neutral axial position and an axial operating position in which said follow-up valve member is axially displaced from said neutral axial position, relative to said primary valve member;

(b) said housing means and said valve members cooperating to define a parallel fluid path providing fluid communication from said inlet port to said first control fluid port and from said second control fluid port to said return port when said valve members are in said axial operating position; the flow through said parallel fluid path being generally proportional, for any particular rotary displacement, to said axial displacement of said follow-up valve member from said neutral axial position;

(c) said input position signal being representative of a desired fluid flow X from said controller to said output device;

(d) said main fluid path being operable, when said valve members are in said rotary operating position, to communicate a fluid flow Y to said output device, said fluid flow Y being less than said fluid flow X;

(e) said controller including means operable, in response to said correction signal, to vary said axial displacement of said follow-up valve member, to communicate a fluid flow Z through said parallel fluid path; and

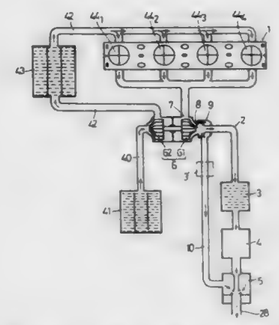
(f) said logic control means being operable to generate an appropriate correction signal whereby said fluid flow Y plus said fluid flow Z is substantially equal to said desired fluid flow X.

5,115,641

METHOD OF AND APPARATUS FOR DRIVING TURBOSUPERCHARGER

Yoshiaki Kakuta, 1-8-1, Hamakawado, Kasukabe-Shi, Saitama-Ken, Japan

Filed Sep. 20, 1990, Ser. No. 585,510
Claims priority, application Japan, Sep. 21, 1989, 1-247535
Int. Cl.[5] F02B *33/44*
U.S. Cl. 60—605.1 **6 Claims**



1. In a method of operating a turbosupercharger wherein an exhaust gas turbine is driven by exhaust gas energy, and a supercharging turbine is driven by the exhaust gas turbine to supercharge an engine with intake air the improvement comprising;

introducing exhaust gas streams into a turbine inlet of said exhaust gas turbine to drive said exhaust gas turbine under a positive pressure;

generating a negative pressure in an exhaust gas system downstream of the outlet of the exhaust gas turbine and;

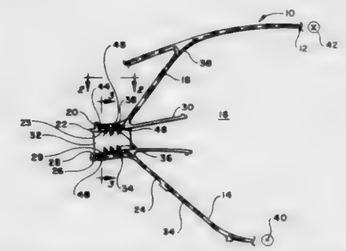
drawing exhaust gas streams passed through said exhaust gas turbine downstream of the outlet thereof and upstream of said negative pressure generation by said negative pressure generation to assist in driving said exhaust gas turbine.

5,115,642

GAS TURBINE ENGINE CASE WITH INTERGRAL SHROUD SUPPORT RIBS

David A. Cvelbar, Rocky Hill, Conn., and Anthony Rubino, Wenham, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 7, 1991, Ser. No. 637,904
Int. Cl.[5] F02C *3/04*
U.S. Cl. 60—751 **5 Claims**



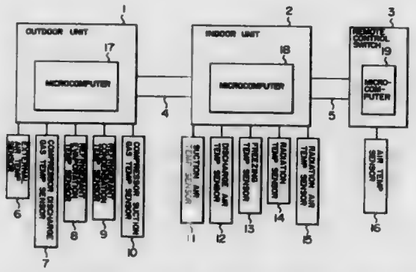
1. A gas turbine engine case construction comprising:

an inner circumferential case including an inner case shroud portion at the upstream end;

a conical case portion secured to the downstream end of said shroud portion;

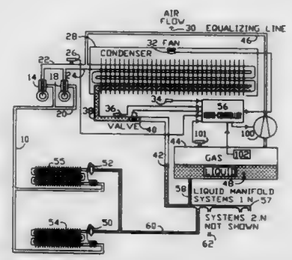
a support ring at an upstream end of said shroud portion; and
an intermediate shroud portion between said support ring and said conical case portion;
an outer circumferential case including an outer case shroud portion at the upstream end;
a conical outer casing portion secured to the downstream end of said inner case shroud portion, a support ring secured to the upstream end of said shroud portion, and an intermediate shroud portion between said support ring and said conical portion;
a diffuser formed of downstream extensions of said shroud portion;
a plurality of cambered vanes joining said shroud portions axially coextensive with said support ring, said intermediate portion, and a portion of said conical section;
characterized by;
the thickness of said intermediate shroud portion not exceeding the maximum thickness of said vanes; and
integral ribs on the side of each intermediate side of each shroud portion away from said vanes, coincident with the radial extension of said vanes.

5,115,643
METHOD FOR OPERATING AIR CONDITIONER
Yoshiki Hayata; Masashi Watanabe, and Kisuke Tashiro, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 30, 1990, Ser. No. 620,056
Claims priority, application Japan, Dec. 1, 1989, 1-312999
Int. Cl.[5] F25B *1/00*
U.S. Cl. 62—115 **5 Claims**



1. A method for operating an air conditioner to supply conditioned air to a room, comprising an outdoor unit and an indoor unit, said air conditioner being controlled by a plurality of temperature sensors including a suction air temperature sensor disposed in the indoor unit for measuring the temperature of suction air flow supplied to a heat exchanger in the indoor unit, and a radiation temperature sensor disposed in the indoor unit to measure the radiation temperature in the room, said suction air temperature sensor having a complementary relation with said radiation temperature sensor, said method comprising the steps of:
detecting at least one of a wire disconnection and short circuit of said suction air temperature sensor;
replacing a value measured by said suction air temperature sensor after the at least one of the wire disconnection and short circuit is detected with a value measured by said radiation temperature sensor if said radiation temperature sensor is operating normally;
continuing the operation of said air conditioner by controlling the air conditioner with the value measured by said radiation temperature sensor.

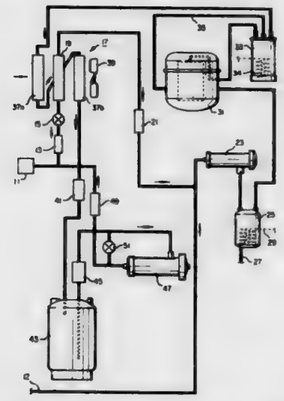
5,115,644
METHOD AND APPARATUS FOR CONDENSING AND SUBCOOLING REFRIGERANT
Richard H. Alsenz, 2402 Creekmeadow Dr., Missouri City, Tex. 77459
Continuation-in-part of Ser. No. 146,285, Jan. 21, 1988, Pat. No. 4,951,475. This application Apr. 6, 1990, Ser. No. 505,557
Int. Cl.[5] F25D *17/00*
U.S. Cl. 62—181 **9 Claims**



1. A refrigeration system having in a closed loop connection a compressor for compressing a refrigerant, a condenser for condensing the compressed refrigerant into a liquid refrigerant and discharging it at a condenser outlet, and an evaporator for evaporating the liquid refrigerant, said refrigeration system further comprising:
(a) a control valve connected to the condenser outlet for trapping liquid refrigerant in the condenser by controlling the discharge of the condensed refrigerant therethrough;
(b) a temperature sensor for providing an electrical signal representative of the temperature of the liquid refrigerant near the condenser outlet;
(c) a temperature sensor for providing an electrical signal representative of the ambient temperature; and
(d) a control circuit coupled to the control valve for controlling the liquid refrigerant discharge therethrough as a function of the temperature difference between the ambient temperature and the liquid refrigerant temperature.

5,115,645
HEAT EXCHANGER FOR REFRIGERANT RECOVERY SYSTEM
Anthony W. Abraham, Arlington, Tex., assignor to Wynn's Climate Systems, Inc., Ft. Worth, Tex.
Filed Nov. 29, 1990, Ser. No. 621,251
Int. Cl.[5] F25B *45/00*
U.S. Cl. 62—292 **7 Claims**

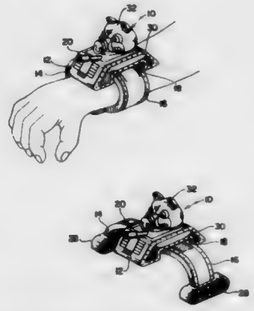
2. In a refrigerant recovery apparatus for recovering refrigerant from an air conditioning system and storing the refrigerant in a storage container, the apparatus having a compressor with an input for receiving refrigerant and an output for discharging compressed refrigerant, an improved heat exchanger, comprising in combination:
a pair of spaced apart headers, each of the headers having a forward edge, a rearward edge, an upper end and a lower end;
a forward row of finned condenser tubes extending between the headers at the forward edge of the headers from the lower end to the upper end of the headers;
a rearward row of finned condenser tubes extending between the headers at the rearward edge of the headers from the lower end to the upper end of the headers;
at least one central row of evaporator tubes extending between the headers from the lower end to the upper end of the headers and disposed between the forward row and rearward row of condenser tubes;
each of the evaporator tubes and condenser tubes extending parallel to each other and perpendicular to the headers, each of the evaporator tubes and condenser tubes having ends which extend through holes provided in each of the headers;
evaporator input means for receiving refrigerant from the air conditioning system and communicating it with one of the evaporator tubes;
manifold means at each header for communicating a portion of the ends of the evaporator tubes with each other for flowing refrigerant received from the evaporator input means through the evaporator tubes, the refrigerant flowing through the evaporator tubes tending to cause water condensation to form on the evaporator tubes;
evaporator output means for supplying refrigerant that has passed through the evaporator tubes to the input of the compressor;
condenser input means for receiving refrigerant from the



output of the compressor and communicating it with one of the condenser tubes;
manifold means at each header of the heat exchanger for communicating a portion of the ends of the condenser tubes with each other for flowing refrigerant received from the compressor through the condenser tubes, the refrigerant flowing through the condenser tubes heating the condenser tubes which causes the water condensation on the evaporator tubes to evaporate;
condenser output means for supplying refrigerant that has passed through the condenser tubes to the storage container; and
fan means mounted adjacent the heat exchanger for flowing air through the heat exchanger to flow across the evaporator tubes and condenser tubes in a direction from the forward edge to the rearward edge of the headers.

5,115,646
NOVELTY BRACELET
Thomas J. Bishop, Ten Lamson Rd., Barrington, R.I. 02806
Filed Apr. 8, 1991, Ser. No. 682,438
Int. Cl.[5] A44C *5/00*
U.S. Cl. 63—9 **3 Claims**

1. Novelty bracelet, comprising
(a) a main body,
(b) an arm extending from each of opposite sides of the body,
(c) hinge means connecting the arms to the main body for pivotal swinging movement about spaced, parallel axes,
(d) detent means associated with said hinge means to releasably lock the arms in either of two functional positions,
(e) said hinge means consisting of opposed sockets in a recess in the main body, and hinge pins extending from the arms, said hinge pins being positioned in said sockets, and
(f) each socket and its corresponding hinge pin having a square cross-sectional shape, the sockets being formed in a material that is substantially more elastic than that of the hinge pin.
3. Novelty bracelet, comprising
(a) a main body having a generally rectangular base
(b) arms attached by hinge means to opposite sides of the base,
(c) detent means associated with the hinge means of each arm to lock it selectively in a first position in which the arm extends from the body generally in the plane of the base and a second wrist encircling position in which the arm extends generally at a right angle to the plane of the base,



(d) each arm having a longitudinal cross section in the shape of a 90-degree arc, one end of which is hingedly attached to the body and the other end of which is provided with a cross bar, and
(e) each of said cross bars extending substantially beyond the width of said arms, and having substantially flat bottom portions for securely mounting the bracelet on a support surface when the arms are in said first position, said cross bars being closely adjacent to each other when the arms are in said second position.

5,115,647
JEWELRY APPARATUS
Rhonda E. Luck-Hoehn, 408 W. Park St., Rome, N.Y. 13440
Filed Feb. 19, 1991, Ser. No. 657,401
Int. Cl.[5] A44C *7/00*
U.S. Cl. 63—12 **6 Claims**



1. A jewelry apparatus comprising,
a front triangular panel, at least one side triangular panel, and a rear triangular panel, and
the triangular panels each including side edges and a bottom edge, and the triangular panels secured together at contiguous side edges and defining a bottom opening defined by the bottom edges of the side panels, and
a top aperture directed through an upper end of the assembly, and
an earring member including a central shaft and an upper

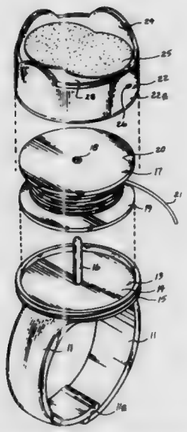
clasp end mounted to an upper end of the central shaft, with the clasp member directed through the top aperture spaced above the side panels for securement to an ear lobe.

5,115,648

ANXIETY TRANSFERENCE RING ORGANIZATION

Anthony J. Salvucci, 10388 Red Fir Rd., P.O. Box 898, Truckee, Calif. 95734

Filed Apr. 3, 1991, Ser. No. 680,125
Int. Cl.[5] A44C *9/00*
U.S. Cl. 63—15 **1 Claim**



1. A ring organization for accomodating anxiety transference in lieu of nail biting. wherein the ring organization comprises,

band means, including at least one leg band for securement of the at least one leg band about an individual's finger, wherein a ring support head is fixedly mounted to the band means, and the ring support head includes a planar top bearing surface, the planar top bearing surface is defined by a predetermined diameter and includes an externally threaded cylindrical skirt extending above the bearing surface, and

a support post defined by a predetermined first height orthogonally and coaxially mounted to the planar top bearing surface, and

a spool rotatably mounted on the bearing surface, wherein the spool is defined by a predetermined second height substantially equal to or less than the predetermined first height, and includes a through-extending bore coaxially directed through the spool for receiving the support post therethrough, and the spool mounting nylon fishing line wound thereabout, and

wherein the spool is defined by a lower cylindrical flange spaced from and parallel a top cylindrical flange, wherein the lower and top cylindrical flanges are defined by a predetermined diameter substantially equal to the predetermined diameter of the bearing surface to align and mount the spool on the bearing surface, and

further including a cap member, the cap member including a cylindrical internally threaded side wall, wherein the side wall is threadedly securable to the externally threaded cylindrical skirt, and the cap member including a roof plate, the roof plate spaced from and parallel to the bearing surface at a height equal to the predetermined first height when the cap member is mounted to the ring support head, and

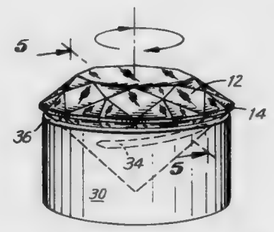
wherein the roof plate includes a top surface, and the top surface integrally mounts an abrasive plate thereon, wherein the abrasive plate is contained in the roof plate, and further including a protective cylindrical side wall coextensive with the cylindrical side wall extending above the roof plate defining a serpentine top edge to provide access to the abrasive plate through the protective cylindrical side wall.

5,115,649

INVISIBLE SETTING FOR ROUND DIAMONDS

Betzalel Amber, Los Angeles, Calif., assignor to Ambar Diamonds, Inc., Los Angeles, Calif.

Filed Jun. 10, 1991, Ser. No. 712,501
Int. Cl.[5] A44C *17/02*
U.S. Cl. 63—26 **12 Claims**



1. Apparatus for setting round diamonds comprising:

a round diamond having a girdle forming its outer diameter and a pavilion portion below the girdle, with grooves formed on the pavilion portion of the diamond;

a barrel of a size smaller than the outer diameter of the diamond;

said barrel comprising an inner wall;

ridge means formed on said inner wall projecting inwardly from said wall;

said diamond placed in said barrel with said diamond held in place by said ridge means engaged in said grooves of said diamond;

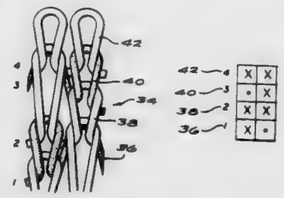
wherein said grooves are located around said diamond in said pavilion portion at an angle with respect to a top of said diamond, said ridge means comprising ridges spaced around the inner wall of said barrel, wherein said diamond is rotated to slide said ridges into said grooves.

5,115,650

NON-RUN PANTYHOSE

Alvin J. Patrick, Los Angeles, Calif.; Willie H. Patrick, deceased, late of Brown Summit, and James W. Patrick, administrator, Greensboro, both of N.C., assignors to Sheer Lady International, Inc., Los Angeles, Calif.

Filed Jun. 11, 1990, Ser. No. 535,729
Int. Cl.[5] D04B *1/06*
U.S. Cl. 66—169 A **17 Claims**



1. A method of knitting a run and tear resistant four-yarn feed structure, wherein four repeating yarn courses extend horizontally across the structure, and a plurality of columns extend vertically down the structure, comprising the steps of:

mechanically kinking the yarn in each of the yarn courses before knitting the structure;

knitting a first yarn course by repeatedly alternating a face loop stitch with a first tuck stitch, each of the stitches being in a separate column;

knitting a second yarn course into the first yarn course by a plurality of consecutive face loop stitches, each of the stitches being in a separate column;

knitting a third yarn course into the second yarn course by repeatedly alternating a second tuck stitch with a face loop stitch, each of the stitches being in a separate column, and further wherein each of the face loop stitches of the first yarn course is in the same column with each of the second tuck stitches of the third yarn course; and

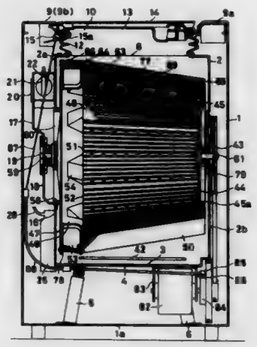
knitting a fourth yarn course into the third yarn course by a plurality of face loop stitches, each of the face loop stitches being in a separate column.

5,115,651

DRUM-TYPE WASHING MACHINE

Tadashi Nukaga; Kentaro Mochizuki; Shinji Yamaguchi, and Yoshikazu Banba, all of Shiga, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 3, 1990, Ser. No. 592,702
Claims priority, application Japan, Oct. 5, 1989, 1-260761; Oct. 24, 1989, 1-277805
Int. Cl.[5] D06F *25/00, 37/22, 39/02, 39/08*
U.S. Cl. 68—17 R **18 Claims**



1. A drum-type washing machine, comprising:

a frame;

an outer tub supported in said frame;

a horizontal shaft-type drum having opposed ends and being rotatably supported in said outer tub, said drum having a diameter which is gradually increased from one said end to the other said end; and

an annular balancer fitted to said other end of said drum for preventing vibration of said drum in a drying operation of said machine, said balancer having a generally symmetrical configuration over its circumferential length.

5,115,652

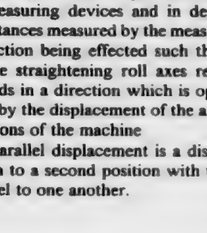
MOTOR VEHICLE ANTI-THEFT DEVICE

John E. Starmer, Colegate, United Kingdom, assignor to Metro Products (Accessories & Leisure) Ltd., Oxted, United Kingdom

PCT No. PCT/GB90/01825, § 371 Date Jun. 14, 1991, § 102(e) Date Jun. 14, 1991, PCT Pub. No. WO91/08127, PCT Pub. Date Jun. 13, 1991
PCT Filed Nov. 23, 1990, Ser. No. 688,620
Claims priority, application United Kingdom, Nov. 25, 1989, 8926674; Aug. 25, 1990, 9018727
Int. Cl.[5] B60R *25/02*
U.S. Cl. 70—209 **8 Claims**

1. An anti-theft device for inhibiting theft of a motor vehicle, of the kind comprising a rigid steering immobiliser bar (2,4,14) having fastening means (3,5,15) by which it can be locked onto a rim of a steering wheel of the vehicle in a position such that a free end portion (2*a*,2*b*,4*a*,14*a*) of the bar is adapted to project from the wheel to obstruct steering by encounter with a fixed part of the vehicle, and in which

the said fastening means (3,5,15) which is lockable to the steering wheel rim, is located at one end only of the said bar (2,4,14); and



the bar being so shaped that when its fastening means is so locked to the rim of a steering wheel which has a hub which projects toward a driver of the vehicle, through a front plane (FP) of the steering wheel rim, the bar extends from that fastening means along a path which undergoes directional change such that the bar can bridge over such a projecting steering wheel hub, said path then passing through the wheel at a position beyond that hub, so that a said projecting free end portion (2*a*,2*b*,4*a*,14*a*) of the bar projects from behind the wheel.

5,115,653

METHOD OF STRAIGHTENING ROLLED MATERIAL

Gerd Beisemann, Speyer, and Klaus Pietsch, Düsseldorf, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 441,765, Nov. 27, 1989, abandoned.
This application Mar. 20, 1991, Ser. No. 680,621
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1988, 3840016
Int. Cl.[5] B21D *1/02, 3/02*
U.S. Cl. 72—8 **10 Claims**

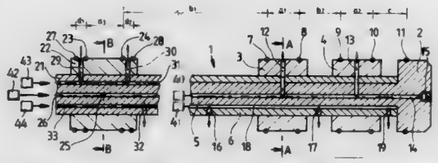
1. In a method for straightening sheets, strips, plates, sections, girders, by means of a straightening machine with straightening rolls and a frame, the method including measuring straightening forces of at least one of the straightening rolls in the roll straightening machine and adjusting the positions of the straightening rolls in accordance with the measured values of the straightening forces, the improvement comprising individually measuring by means of measuring devices each straightening force acting perpendicularly and directly on the axes of rotation of the straightening rolls and of the roll bearings and measuring by means of measuring devices displacement distances of the straightening rolls resulting from the straightening forces due to elastic deformation of the frame of the straightening machine, and automatically correcting the positions of the straightening rolls which are adjustable during the straightening procedure, within a range of the occurring varying straightening forces, in dependence on the force measured by the measuring devices and in dependence on the displacement distances measured by the measuring devices, the automatic correction being effected such that a parallel displacement of the straightening roll axes resulting from the correction extends in a direction which is opposite the direction determined by the displacement of the axes caused by the elastic deformations of the machine

wherein the parallel displacement is a displacement rom a first position to a second position with the two positions being parallel to one another.

5,115,654
EXPANSION APPARATUS HAVING THREE BOREHOLE-CHANNEL SYSTEMS

Helmut Swars, and Wolfgang Maus, both of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Emitec Gesellschaft für Emissionstechnologie mbH, Lohmar, Fed. Rep. of Germany

Filed Dec. 18, 1989, Ser. No. 452,617
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1988, 3842589
Int. Cl.[5] B21D *26/02*
U.S. Cl. 72—62 **1 Claim**



1. An apparatus for radially expanding a tubular member, comprising:

an elongated pressure agent probe having separate first, second and third internal channels each having an open end and a closed end and extending longitudinally of the probe;

first, second and third radial boreholes extending from the first, second and third internal channels, respectively, to an external surface of the probe;

a plurality of circumferential seals mounted on said external surface in longitudinally spaced relation, each of said first boreholes opening into said external surface between an adjacent pair of seals which define between them an effective region for expansion of said tubular member, each said second boreholes opening into said external surface at first intermediate regions immediately adjacent to and on each side of said effective regions, each first intermediate region being defined between one of the seals which defines its adjacent effective region and another seal which does not define an effective region, said third boreholes opening into said external surface in second intermediate regions each defined between said other seals which are arranged successively longitudinally of the probe and in end regions defined between said ends of the probe and said other seals of the first intermediate regions adjacent to said ends;

a first, higher pressure source of pressure agent connected to the open end of said first channel; and

a second lower pressure source and a third lower pressure source of pressure agent connected to the open ends of said second and third channels, respectively.

5,115,655
INTEGRALLY STIFFENED RINGS

James R. Martin, Mequon; James P. Kuchma, Cudahy, and David U. Furrer, Waukesha, all of Wis., assignors to Ladish Co., Inc., Cudahy, Wis.

Filed Feb. 1, 1991, Ser. No. 649,596
Int. Cl.[5] B21H *1/06*
U.S. Cl. 72—68 **23 Claims**

1. A process for preparing a ring having a pattern of integral elements at its outer surface, the process comprising the steps of:

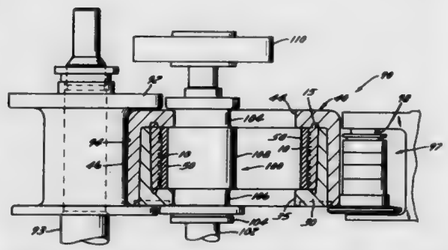
preparing a plurality of arcuate tooling segments, each having a concave face containing contours defining a pattern;

providing a generally cylindrical drum assembly for holding the segments in a fixed orientation with the faces of the tooling directed toward the axis of the assembly;

placing a ring preform within the assembly, the outer surface of which confronts the faces;

heating the preform to a malleable state;

radially enlarging the preform so that the preform is at least partially interlocked with the tooling; and

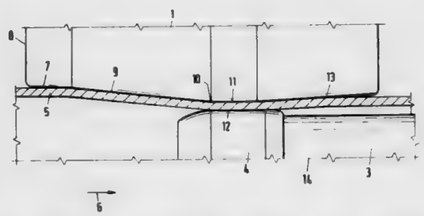


drum rolling the ring preform against the tooling segments to create the integral elements in the outer surface thereof.

5,115,656
METHOD AND APPARATUS FOR MANUFACTURING MEDIUM-WALLED AND THIN-WALLED SEAMLESS PIPES

Rolf Kümmerling, Duisburg; Manfred Bellmann, Ratingen, and Horst Biller, Mülheim, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 6, 1991, Ser. No. 665,259
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1990, 4007406
Int. Cl.[5] B21B *19/10*
U.S. Cl. 72—96 **12 Claims**



1. A method of manufacturing seamless pipes of medium-thick and thin walls from an elongated hollow body of limited length which is reshaped with a roll having a reeling part by rolling to the desired final dimension with only one rolling pass, said method comprising the steps of:

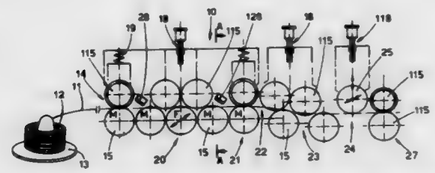
significantly reducing the diameter of the hollow body with only slight change in wall thickness; and

reeling the inner surface of the hollow body with the use of an inner tool, said inner tool having a working part of greater length then the corresponding reeling part on the roll and being longitudinally displaceable relative to the hollow body and to said corresponding reeling part during at least a part of the rolling process so as to minimize material build up and disturbances.

5,115,657
COMBINED ASSEMBLY TO STRAIGHTEN AND LINEARISE SECTIONS

Giorgio Del Fabro, Cassacco-Fraz.Montegnacco, Italy, assignor to M.E.P. Macchine Elettroniche Piegatrici, Reana Del Rojale, Italy

Filed Sep. 28, 1990, Ser. No. 589,609
Claims priority, application Italy, Oct. 17, 1989, 83483 A/89
Int. Cl.[5] B21D *3/02*
U.S. Cl. 72—164 **10 Claims**



1. A combined assembly to straighten and linearise a section in the form of a bar or rod from wound bundles being fed through said combined assembly comprising:

a first straightening unit comprising a plurality of upper rolls opposed to and staggered with a plurality of lower rolls;

inlet feeder means for feeding said section to said first straightening unit and being provided immediately upstream of said first straightening unit;

outlet feeder means for withdrawing said section from said first straightening unit and being provided immediately downstream of said first straightening unit;

a second straightening unit comprising a plurality of upper rolls opposed to and staggered with a plurality of lower rolls, said second straightening unit being provided downstream of said outlet feeder means;

a contrast unit comprising opposing upper and lower rolls and being provided downstream of said second straightening unit; and

orthogonal regulation means for contacting said section and directing said section laterally along two orthogonal directions normal to an axis of said section, said orthogonal regulation means being provided between said second straightening unit and said contrast unit;

wherein said inlet feeder means, said first straightening unit, said outlet feeder means, said second straightening unit, said orthogonal regulation means, and said contrast unit are positioned so as to feed said bar or rod on substantially a single plane throughout the combined assembly; and

wherein a bend is imparted to said section at least between said outlet feeder means and an entrance of said second straightening unit such that said section bends upwardly or downwardly and wherein said second straightening unit is positioned on a path of said section including said bend.

5,115,658
SHAPING MACHINE FOR CYLINDRICALLY BENDING A PLATE

Wilhelm Kirchhoff, Bochum, Fed. Rep. of Germany; Simon Schneider, Reinach, and Hans Zeugin, Dornach, both of Switzerland, assignors to Clr. Haeusler AG, Duggingen, Switzerland and Bergrohr GmbH, Herne, Fed. Rep. of Germany

Filed Apr. 10, 1991, Ser. No. 683,417
Claims priority, application Switzerland, Apr. 12, 1990, 1272/90
Int. Cl.[5] B21D *5/14*
U.S. Cl. 72—175 **10 Claims**

1. A shaping machine for bending a plate into a cylindrical shape, comprising:

(a) a frame assembly including

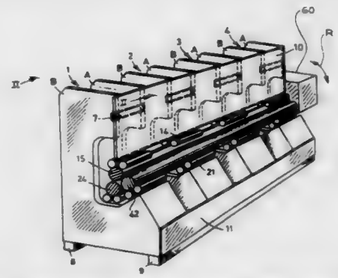
(1) a plurality of C-shaped frames aligned in a series along a length of the machine and

(2) securing means for fastening the frames to one another;

(b) first, second and third rolls for engaging the plate to be bent; each said first, second and third roll extending through said C-shaped frames along the length of the machine; each said first, second and third roll having a longitudinal axis;

(c) a plurality of first pairs of support rollers axially distributed along and supporting said first roll; each said C-shaped frame supporting a separate said first pair of support rollers;

(d) a plurality of second pairs of support rollers axially distributed along and supporting said second roll; each



said C-shaped frame supporting a separate said second pair of support rollers;

(e) a plurality of third pairs of support rollers axially distributed along and supporting said third roll; each said C-shaped frame supporting a separate said third pair of support rollers;

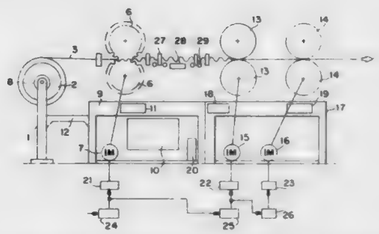
(f) drive means disposed at said frame assembly for directly rotating each said first, second and third roll; and

(g) displacing means mounted on said frame assembly for displacing at least one of said plurality of first, second and third pairs of support rollers together with a respective said first, second and third roll transversely to the longitudinal axis thereof.

5,115,659
PROCESS FOR PRODUCING COMPONENT FOR TIRE AND APPARATUS THEREFOR

Masao Takami, Kobe, Japan, assignor to Sumitomo Rubber Industries, Hyogo, Japan

PCT No. PCT/JP90/00795, § 371 Date Feb. 26, 1991, § 102(e) Date Feb. 26, 1991, PCT Pub. No. WO91/00173, PCT Pub. Date Jan. 10, 1991
PCT Filed Jun. 18, 1990, Ser. No. 623,935
Claims priority, application Japan, Jun. 26, 1989, 1-164136
Int. Cl.[5] B21F *45/00*
U.S. Cl. 72—187 **25 Claims**



1. A process for producing a component of a tire characterized by passing a wire sheet between a pair of gear-shaped rolls in meshing engagement therewith to vertically corrugate the sheet for reforming, each of the pair of gear-shaped rolls hav-

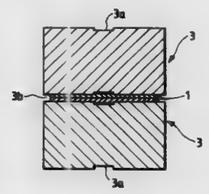
ing a plurality of teeth, the longitudinal axis of each of said plurality of teeth being aligned substantially in parallel to the longitudinal axis of the associated gear-shaped roll, the wire sheet comprising wires arranged side by side in a plane and covered with an elastic material, and passing the shaped sheet between a pair of rolls to lay down the vertical corrugations into a planar arrangement.

5,115,660

METHOD FOR MAKING BAND PLATES DEFORMED IN SECTION

Jun Kurobe; Kenji Hara; Masayuki Ishihara, and Kazuhiro Takagi, all of Sakai, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1990, Ser. No. 570,779
Claims priority, application Japan, Sep. 4, 1989, 1-227601
Int. Cl.[5] B21B *1/36*; B21D *31/00*
U.S. Cl. 72—197 **5 Claims**



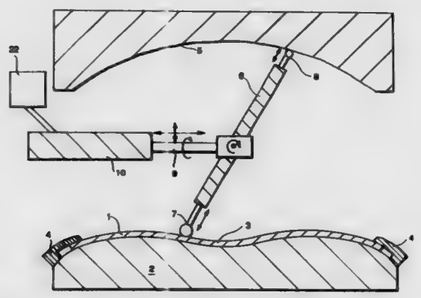
1. A method for making sectionally deformed band plate feeds by cold-rolling plane metal band plate feeds (1) between a set of work rolls (3), wherein at least one of said work rolls (3) has a barrel provided with a circumferential groove (3*a*), a plurality of metal band plate feeds (1) with substantially equal resistance to deformation, while overlaid one upon another, are rolled together between said work rolls (3) at a reduction of 30% or lower at one feeding operation and the resulting metal band plate feeds (1) are separated from each other.

5,115,661

FORMING PARTS FROM DUCTILE MATERIALS

Joseph McGowan, 57 Winckley Road, Broadgate, Preston, Lancashire, England

Filed Apr. 18, 1990, Ser. No. 510,250
Int. Cl.[5] B21D *25/02*
U.S. Cl. 72—297 **8 Claims**



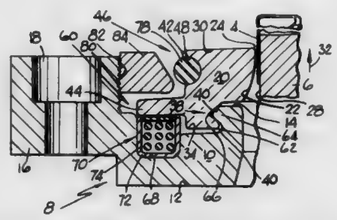
1. A method of repetitively stretch forming a plurality of workpieces, said method comprising the steps of:
placing a first workpiece on a former;
gripping the first workpiece by at least one gripper;
pulling the first workpiece to a desired configuration over the former by said at least one gripper so as to stretch form the first workpiece to a shape defined by the former;
disposing a force-applying means between a fixed reaction surface and the first workpiece;
monitoring the behavior of the first workpiece as it is stretch formed to detect any regions where the first workpiece tends to leave the former;
applying a force to a surface of the first workpiece by said force-applying means, which force is reacted by said force-applying means and said reaction surface;
operating a positioning means to so alter the position of said force-applying means as to apply said force to different parts of the surface of the first workpiece in response to said monitoring of the behavior of the first workpiece, in order to maintain said regions of the first workpiece in contact with the former, such that said force continues to be reacted through said force-applying means and said reaction surface in preference to being reacted through said positioning means, said positioning means being operable to alter the position of said force-applying means independently of the position of said at least one gripper; and
subsequently carrying stretch forming of at least one further said workpiece during which the operations of the force-applying and positioning means during stretch forming of the first workpiece are repeated and are computer controlled to achieve repetitive stretch formings to the same shape.

5,115,662

APPARATUS FOR STRIPPING WORKPIECES

Nick P. Relich, Littleton; Roger A. Hahn, Arvada, and Cook, Jr. Harold, Evergreen, all of Colo., assignors to Coors Brewing Company, Golden, Colo.

Filed Jul. 2, 1991, Ser. No. 724,742
Int. Cl.[5] B21D *45/08*
U.S. Cl. 72—345 **20 Claims**



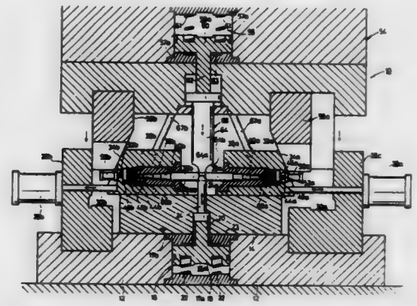
1. Apparatus for stripping a cylindrical workpiece from a reciprocating cylindrical supporting device having a forward and a return stroke and on which the cylindrical workpiece is supported so as to have a leading end surface during the return stroke comprising:
housing means for supporting the apparatus circumjacent the cylindrical workpiece and the cylindrical supporting device;
a plurality of circumferentially spaced apart stripping fingers pivotally mounted in said housing means;
pivot means for mounting said stripping fingers for pivotal movement around axes extending transverse to the direction of movement of said cylindrical workpiece and said cylindrical supporting device for pivotal movement between a non-stripping location whereat said cylindrical workpiece and said cylindrical supporting device may pass through said stripping fingers without contacting said stripping fingers and a stripping location whereat said stripping fingers will contact said leading end of the cylindrical workpiece to strip said cylindrical workpiece from said cylindrical supporting device;
resilient means for moving said stripping fingers into said stripping position; and
force applying means mounted in said housing means to apply a force to each of said stripping fingers to move said stripping fingers into said non-stripping location.

5,115,663

METHOD FOR FORMING A CRANKSHAFT

Shyoichi Ando; Shuichi Yamane; Yoshihisa Doi; Hisayuki Sakurai, and Haruo Meguro, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1990, Ser. No. 616,928
Claims priority, application Japan, Nov. 25, 1989, 1-305711; Nov. 28, 1989, 1-308506; Dec. 1, 1989, 1-313662
Int. Cl.[5] B21D *53/84*
U.S. Cl. 72—370 **7 Claims**



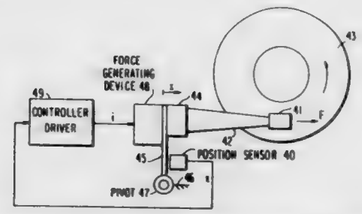
1. A method of forming a shaped metallic article, comprising the steps of:
gripping a portion of an elongate blank with a pair of punches with terminal ends of the gripped portion extending on either side of the pair of punches;
upsetting and bending the blank with dies positioned one on each side of the gripped portion of the blank by moving toward each other into engagement with the terminal ends of the blank, and with said punches, thereby forming an elongate article into a crankshaft having journals; and
thereafter, rolling said journals of the elongate article to correct the same out of a bent configuration.

5,115,664

TUNABLE FEEDBACK TRANSDUCER FOR TRANSIENT FRICTION MEASUREMENT

Suryanarayan G. Hegde, Hollowville; Anthony P. Praino, Poughquag, both of N.Y.; Steven J. Root, Spring Valley, Minn., and Muthuthamby Sri-Jayantha, Ossining, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Jun. 25, 1990, Ser. No. 543,239
Int. Cl.[5] G01N *19/02*
U.S. Cl. 73—9 **10 Claims**



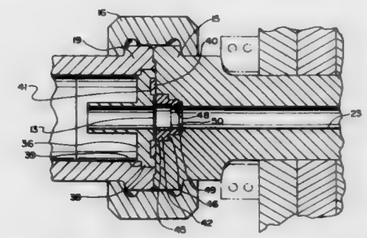
1. A system for measuring transient friction of a head-disk interface in a magnetic disk storage device comprising:
a first movable member carrying a slider simulating a magnetic head which rests on a disk when said disk is at rest;
a second fixed member to which said movable member is movably attached;
frictionless detector means for detecting a displacement of said movable member relative to a position of said fixed member produced by a force due to friction when disk begins to spin;
servo means for maintaining a fixed distance between said first and second members in response to an output from said detector; and
output means connected to said servo means for generating a signal proportional a force due to friction exerted on said movable member.

5,115,665

FREE PISTON SHOCK TUBE TUNNEL

John J. Lacey, Jr., Minnetonka, Minn., assignor to Fluidyne Engineering Corporation, Minneapolis, Minn.

Filed Feb. 2, 1990, Ser. No. 473,871
Int. Cl.[5] G01M *9/00*
U.S. Cl. 73—12 **14 Claims**



1. A free piston shock tube/tunnel comprising:
an elongated compression tube having a piston end and a diaphragm end;
an elongated shock tube having an internal diameter and having a diaphragm end and a test end, said diaphragm end of said shock tube being connected with said diaphragm end of said compression tube;
a piston in said compression tube adapted for compression movement from said piston end to said diaphragm end of said compression tube;
a diaphragm positioned in the area of connection between said compression tube and said shock tube; and
a selectively replaceable orifice insert positioned near said diaphragm, said orifice insert having a single, centrally positioned opening with a diameter less than said internal diameter of said shock tube.

5,115,666

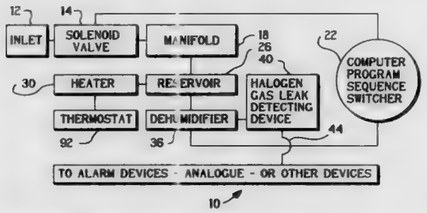
METHOD OF DETECTING HALOGEN GAS IN A LIQUID

William J. Williams, Indianapolis, Ind., assignor to Seatech Corporation, Indianapolis, Ind.

Filed Feb. 8, 1990, Ser. No. 477,309
Int. Cl.[5] G01N *33/00*
U.S. Cl. 73—19.1 **23 Claims**

1. A method of discovering amounts of halogen in a solution of halogen and a liquid comprising the steps of:
providing a sample of said solution;
heating said sample to an evaporation temperature selected upon that temperature dependent solubility of said liquid in halogen which will provide a vapor solution of halogen with a minimum portion of said liquid;
further treating said vapor solution to remove a portion of

said liquid in said vapor to provide a sample of said vapor therefrom: and



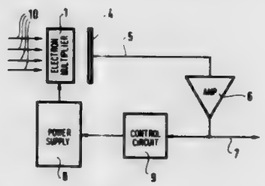
monitoring said vapor sample to detect the presence of halogen therein.

5,115,667

CIRCUIT FOR PROCESSING A SIGNAL RECEIVED BY AN ELECTRON MULTIPLIER

Gilles Baret, Annecy, France, assignor to Alcatel Cit, Paris, France

Filed Jun. 11, 1990, Ser. No. 535,621
Claims priority, application France, Jun. 16, 1989, 89 08047
Int. Cl.[5] G01M *3/20*; H01J *43/30*
U.S. Cl. 73—40.7 **6 Claims**



1. A circuit for processing an input signal received by an electron multiplier, enabling said signal to be measured continuously over a large dynamic measurement range while using a single method of processing, said circuit comprising said electron multiplier receiving the input signal, and wherein said circuit further comprises a high voltage power supply for said electron multiplier, a linear amplifier, said high voltage power supply being controlled by said linear amplifier, said linear amplifier having a negative slope, the gain and reference parameters of said linear amplifier defining said measurement range, and a gain-compressing logarithmic amplifier, said linear amplifier receiving the output of said gain-compressing logarithmic amplifier and said gain-compressing logarithmic amplifier acting on said linear amplifier in such a manner as to vary the gain of said electron multiplier continuously over the entire dynamic measurement range as a function of the output signal from said electron multiplier, as received by an electron collector, the output of said gain-compressing logarithmic amplifier also being the output signal of said circuit.

5,115,668

NON-INVASIVE PRESSURE MEASURING DEVICE AND METHOD

Jeanne A. Welch, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

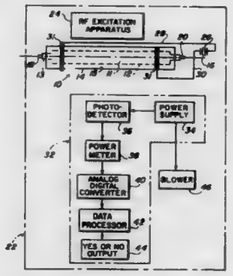
Filed Nov. 30, 1990, Ser. No. 620,108
Int. Cl.[5] G01M *3/40*
U.S. Cl. 73—52 **25 Claims**

1. A device for non-invasively measuring the pressure in a closed container having a gas which can be energized to radiation, the closed container being transparent to the radiation, the device comprising:

means for inducing glow radiation of the gas in said closed container;

means for measuring the luminance level of said radiation of the gas; and

data processing means for comparing the luminance level from said measuring means with reference data of pressure



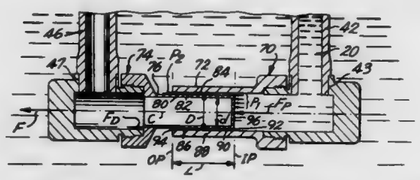
versus luminance, and providing an output of corresponding pressure, said data processing means being provided with a plurality of reference mathematical relationships of pressure versus luminance for a sealed container dimensionally identical to the closed container being measured and for the same type of gas.

5,115,669

MEASURING SHEAR VISCOSITY OF FLUIDS

Gerald G. Fuller, Palo Alto, Calif.; Ronald F. Garritano, Flemington, and Paul Mode, Westfield, both of N.J., assignors to Rheometrics, Inc., Piscataway, N.J.

Filed Oct. 5, 1990, Ser. No. 593,231
Int. Cl.[5] G01N *11/00*
U.S. Cl. 73—54.39 **21 Claims**



1. Apparatus for measuring the shear viscosity of a fluid having given flow characteristics, a sample of which fluid is moved from a reservoir through a circuit in the apparatus, the apparatus comprising:

a first member having a passage including an axially-extending inner surface;

a second member having a portion of known radial area for location within the passage of the first member, the second member including an axially-extending outer surface for extending axially into the passage of the first member with at least a portion of the outer surface of the second member spaced radially from a corresponding portion of the inner surface of the first member to establish an axially-extending gap of predetermined radial and axial dimensions between the inner surface and the outer surface when the portion of known radial area is located within the passage, the gap including an entrance located within the passage of the first member, adjacent the portion of known radial area, and an axially opposite exit;

metering means for moving the sample fluid through the circuit in the apparatus at a known volumetric flow rate, the metering means including means for establishing a pressure in the sample fluid at the entrance of the gap greater than the pressure in the sample fluid at the exit of the gap such that the sample fluid is urged through the gap as the fluid traverses the circuit, the predetermined radial and axial dimensions of the gap being related to the flow characteristics of the sample fluid such that the sample fluid is subjected to shear as the sample fluid passes through the gap; and

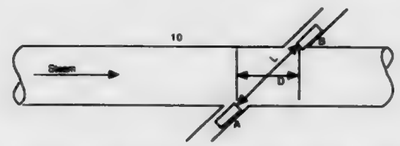
force-measuring means for measuring the force urging one of the first and second members axially in the direction away from the other of the first and second members, as the sample fluid passes through the gap, which axially-directed force is indicative of the shear viscosity of the fluid.

5,115,670

MEASUREMENT OF FLUID PROPERTIES OF TWO-PHASE FLUIDS USING AN ULTRASONIC METER

Joseph Shen, Brea, Calif., assignor to Chevron Research & Technology Company, San Francisco, Calif.

Filed Mar. 9, 1990, Ser. No. 490,864
Int. Cl.[5] G01N *29/02*
U.S. Cl. 73—61.41 **10 Claims**



1. A method for determining the composition of a flowing two-phase fluid that has a gaseous phase and a liquid phase comprising:

(a) measuring transit times of sound within said two-phase fluid using a pair of acoustic transducers that alternately act as transmitters and receivers in sending and receiving pulses,

(b) calculating the speed of sound of said two-phase fluid from said measured transit times, and

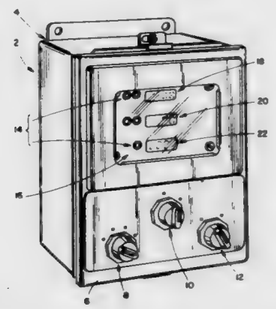
(c) calculating the composition of said two-phase fluid from said calculated speed of sound.

5,115,671

METHOD AND APPARATUS FOR ANALYZING ROTATING MACHINES

Michael D. Hicho, Broadview Heights, Ohio, assignor to Life Systems, Inc., Cleveland, Ohio

Filed Jul. 13, 1990, Ser. No. 552,421
Int. Cl.[5] G01P *15/00*
U.S. Cl. 73—488 **8 Claims**



1. A method for determining a running speed of a rotating machine whose rotating elements are enclosed in a housing, the method comprising:

sensing, from a vibration transducer input means in contact with said housing, mechanical vibrations of the rotating machine;

converting the sensed vibrations into an electrical signal;

filtering the electrical signal to obtain and select frequencies of the electrical signal;

converting the filtered electrical signal into a frequency spectrum;

selecting frequency components of the frequency spectrum characteristic of the running speed, and components that are random, spurious and caused by other effects;

eliminating the components that are random, spurious and caused by other effects;

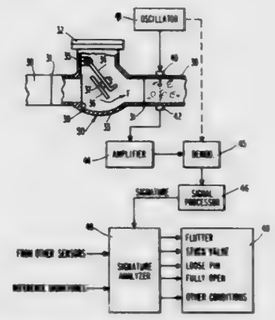
calculating the running speed from the selected running speed characteristic frequency components.

5,115,672

SYSTEM AND METHOD FOR VALVE MONITORING USING PIPE-MOUNTED ULTRASONIC TRANSDUCERS

James L. McShane, Churchill Boro, and Nancy H. Ulerich, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 11, 1991, Ser. No. 653,574
Int. Cl.[5] E03B *7/07*; F16K *37/00*
U.S. Cl. 73—596 **6 Claims**



1. A method of monitoring a condition of a check valve in a fluid carrying pipe, by ultrasonic monitoring of turbulence in the fluid downstream from said valve, comprising:

transmitting ultrasonic signals through said pipe and said fluid at a position adjacent to and downstream of said valve where said transmitted signal is modulated by the downstream turbulence of the fluid;

receiving said transmitted signal and demodulating same to obtain a demodulated signal representative of said downstream turbulence; and

processing said demodulation signal to obtain an indication of an operating condition of said valve.

5,115,673

NON-DESTRUCTIVE METHOD FOR DETERMINING ELASTIC MODULI OF MATERIAL

Ronald A. Kline, Norman, Okla., and Eric I. Madaras, York Town, Va., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C. and The Board of Regents of the University of Oklahoma

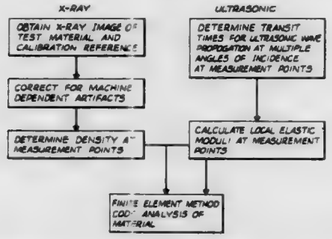
Filed Jul. 20, 1990, Ser. No. 556,584
Int. Cl.[5] G01N *29/04*
U.S. Cl. 73—601 **2 Claims**

1. A non-destructive method for determining elastic moduli of an isotropic or anisotropic or homogenous or nonhomogeneous material, comprising:

subjecting the material to x-radiation to produce an image, digitizing the image and determining density at a sufficient

number of discrete measurement points over the material to substantially create an image of local material density variations;

propagate ultrasonic waves through the material at multiple angles of incidence and determine transit times for each wave at points corresponding to the measurement points; and



determining for each measurement point all of the independent elastic moduli at each measurement point using the densities determined by subjecting the material to x-radiation and the transit times determined by propagating ultrasonic waves through the material.

5,115,674

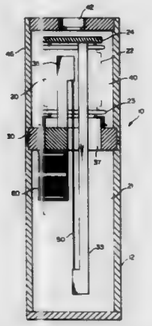
Patent Not Issued For This Number

5,115,675

TENSIONED BELLOWS PRESSURE TRANSDUCER

Alexander I. Feldman, Redmond, and Dale W. Shoup, Edmonds, both of Wash., assignors to The Slope Indicator Company, Seattle, Wash.

Filed Jun. 15, 1990, Ser. No. 538,884
Int. Cl.[5] G01L *7/06, 11/00*
U.S. Cl. 73—704 **17 Claims**



1. A pressure transducer for measuring a pressure p_1 comprising:

a) a rigid body:

b) a reference chamber having a pressure p_0 therewithin, said reference chamber comprised of a pressure deformable member having a movable surface movable in a direction orthogonal to said surface, said reference chamber connected to said rigid body;

c) a magnetically interactive elastic vibrating member connected on a first end to said movable surface and on a second end to said rigid body, such that said movable surface moving in response to an increase in a Δp between said p_0 and p_1 increases a tensile stress in said elastic vibrating member, and a decrease in Δp decreases said tensile stress, and wherein said elastic vibrating member is connected at said first end to a projecting end of a linkage, said linkage disposed interior to said bellows and connected to an inside of said movable surface;

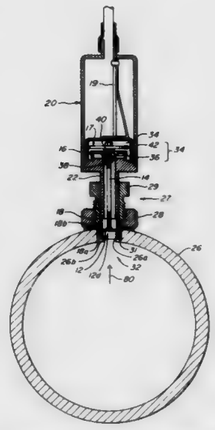
d) electromagnetic means to excite said elastic member into resonant vibration and to generate an output signal with a frequency proportional to tensile stress within said elastic member.

5,115,676

FLUSH-MOUNTED PRESSURE SENSOR

Shih-Ying Lee, Lincoln, Mass., assignor to Setra Systems, Inc., Acton, Mass.

Filed Jan. 10, 1990, Ser. No. 463,247
Int. Cl.[5] G01L *7/08, 9/12*
U.S. Cl. 73—706 **9 Claims**



1. A sensor for measuring the pressure of a fluid in a container comprising:

a. a first diaphragm in contact with the fluid at a first face and capable of converting the pressure of the fluid to a force at the center of the diaphragm directed in a first direction generally perpendicular to the diaphragm;

b. a second diaphragm displaced along said first direction from said first diaphragm;

c. a drive rod mechanically coupled at one end to the first diaphragm at a second face opposite said first face and at the other end to said second diaphragm, said coupling (i) having substantially no lost motion, (ii) being substantially rigid to resist elastic deformation along said first direction in response to said force, and (iii) extending freely between said first and second diaphragms; and

d. means for converting the mechanical deformation of the second diaphragm into a change in capacitance, the magnitude of the change corresponding to the fluid pressure acting on said first diaphragm;

said means for converting comprising an electrode acting in cooperation with said second diaphragm to form a variable capacitor, and

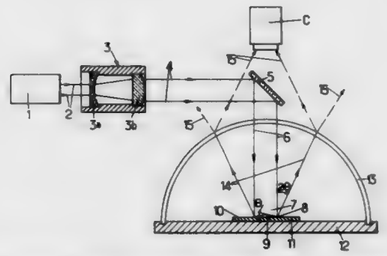
said first diaphragm (i) having a diameter smaller than said second diaphragm, (ii) being formed of a material that is resistant to corrosion caused by said fluid and (iii) having a thickness less than that of said second diaphragm to provide a good responsiveness to the fluid pressure being measured.

5,115,677

METHODS AND DEVICES FOR DETERMINING THE CONTACT ANGLE OF A DROP OF LIQUID PLACED ON A SUBSTRATE

Philippe Martin, Fresnes, and Gilles Le Boudec, Mareil Marly, both of France, assignors to Photonetics, Marly-le Roi, France

Filed Apr. 5, 1990, Ser. No. 504,799
Claims priority, application France, Apr. 6, 1989, 89 04530
Int. Cl.[5] G01N *13/02*
U.S. Cl. 73—64.48 **7 Claims**



1. Method for determining the contact angle of a drop of liquid placed on a substrate, for any contact angle less that 45°, which comprises the steps of:

directing perpendicularly to the substrate a primary beam of parallel light for illuminating a zone which contains an interface between the periphery of the drop and the substrate,

determining the illumination transition zone presented onto at least one receiving surface by a secondary beam resulting from the interaction of the primary beam with the drop and the substrate, said receiving surface being a reflection diffusing surface, intercepting said secondary beam thereby forming a diffusing receiving surface emitting light rays,

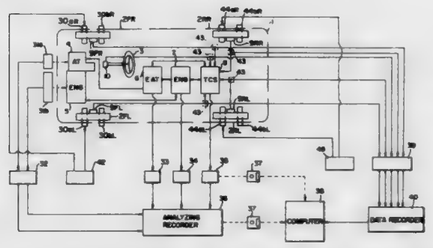
reflecting the light rays from said diffusing receiving surface through a reflecting surface disposed facing said diffusing receiving surface, and collecting the rays, reflected by said reflecting surface, by a camera.

5,115,678

METHOD OF CHECKING THE FUNCTION OF A DRIVING WHEEL SLIP CONTROL SYSTEM

Masaaki Ozaki, Sayama, and Yoh Kojima, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 551,240, Jul. 10, 1990, Pat. No. 5,058,423.
This application Aug. 12, 1991, Ser. No. 744,038
Claims priority, application Japan, Jul. 11, 1989, 1-178393
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—117 **7 Claims**



1. A method of checking the functioning of a driving wheel slip control system which is installed in a vehicle having driving wheels and trailing wheels, said driving wheel slip control system having a prime mover for driving said driving wheels, at least one driving wheel speed sensor for detecting the rotational speed of at least one of said driving wheels and generating at least one signal indicative of the rotational speed of said at least one driving wheel, at least one trailing wheel speed sensor for detecting the rotational speed of at least one of said trailing wheels and generating at least one signal indicative of the rotational speed of said at least one trailing wheel, and control means responsive to said signals indicative of the rotational speeds of said at least one driving wheel and said at least one trailing wheel for outputting a control signal for controlling the output of said prime mover;

the method comprising the steps of:

(1) placing said driving wheels on first support means for rotatably supporting said driving wheels by said first support means;

(2) placing said trailing wheels on second support means for rotatably supporting said trailing wheels by said second support means, said second support means being capable of rotatively driving said trailing wheels;

(3) causing said prime mover to rotatively drive said driving wheels;

(4) causing said second support means to rotatively drive said trailing wheels;

(5) taking out predetermined monitoring signals including at least said control signal outputted from said control means, from said driving wheel slip control system; and

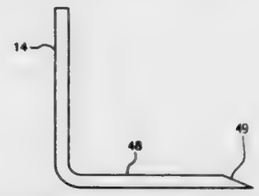
(6) determining whether said predetermined monitoring signals show values falling within respective predetermined allowable ranges.

5,115,679

LEVEL MEASURING BUBBLER TUBE TIP

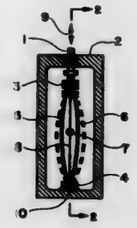
William J. Uhlarik, Whittier, Calif., assignor to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 533,608, Jun. 5, 1990, abandoned. This application May 23, 1991, Ser. No. 704,498
Int. Cl.[5] G01F *23/14;* **G08B** *21/00*
U.S. Cl. 73—302 **3 Claims**



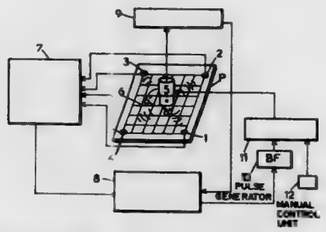
1. In a purging bubbler tube measuring system for determining the level of a fluid in a tank, employing at least two bubbler tubes through which gas is periodically passed, said tubes extending to different levels in or above said fluid, the improvement comprising bending the end of each of said tubes below the fluid level at substantially a right angle, forming a horizontal tube section in each of the tubes long enough such that the interface of the bubbles and the fluid are kept at a constant depth even though they should back up in the horizontal section of the tubes; and cutting off the tips of the bent tubes at an angle such that the bubbles will rest on the tip of the tubes and not sag over the end of the tube tips.

5,115,680
DISPLACEMENT SENSOR WITH MECHANICAL PREAMPLIFICATION MEANS
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005
Filed Mar. 4, 1991, Ser. No. 663,733
Int. Cl.[5] G01B 7/16
U.S. Cl. 73—763 22 Claims



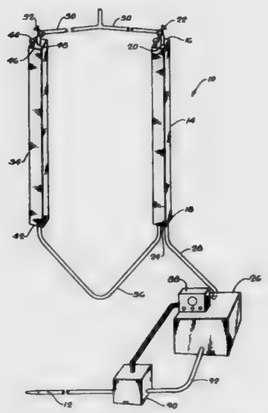
1. A device for measuring physical variable related to displacement of a target object comprising in combination:
a) at least one thin planar member with two opposite extremities respectively supported by two supporting members disposed in an arrangement wherein at least one of the two support members is movable relative to the other of the two support members on a plane including the two opposite extremities of the thin planar member, said thin planar member constituting a first electrical terminal;
b) means for transmitting displacement of the target object to said at least one of the two support members, wherein increase of relative distance between the two support members decreases bending deflection of the thin planar member and decrease of the relative distance between the two support members increases bending deflection of the thin planar member;
c) a second electrical terminal disposed next to the thin planar member constituting the first electrical terminal in an arrangement wherein electrical resistance between the first and second electrical terminals varies as a function of bending deflection of the thin planar member; and
d) means for measuring electrical resistance between the first and second electrical terminals as a measure of displacement of the target object.

5,115,681
ACOUSTIC METHOD AND DEVICE FOR LOCALIZATION OF DEFECTS IN MATERIAL
Ahmed Bouhenaous, Bretillet, and Bernard Lechelle, Garches, both of France, assignors to Avions Marcel Dassault-Breguet Aviation, Vaucresson, France
Filed Apr. 23, 1990, Ser. No. 513,220
Claims priority, application France, Apr. 24, 1989, 89 05410
Int. Cl.[5] G01N 29/14
U.S. Cl. 73—801 12 Claims



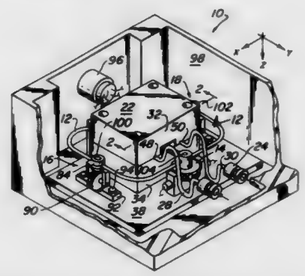
7. An acoustic method for localization of defects in a piece of material comprising the steps of:
a) injecting an acoustic wave into an unstressed piece of material at a succession of mark points distributed over at least part of the surface of the piece,
b) measuring the propagation times of the acoustic waves injected at each of said mark points, to at least three non-collinear acoustic sensors arranged on the piece,
c) measuring the geometric coordinates of the associated mark points,
d) stressing the piece and measuring the propagation times to the sensors of acoustic events triggered by said stressing,
e) determining the coordinates of adjacent mark points that define an element of the surface of the piece which covers the part of the piece where an acoustic event induced by the stressing of a structural defect of the material occurs, with the aid of a norm applied respectively to the differences between the propagation times measured when the piece is unstressed and the propagation times associated with each acoustic event created in the stressed piece.

5,115,682
CORONARY ARTERY GRAFT FLOW-METER
Ernest M. Feiler, 1514 Coral Cove, Champaign, Ill. 61821
Filed May 21, 1990, Ser. No. 526,196
Int. Cl.[5] G01F 1/00
U.S. Cl. 73—861 7 Claims



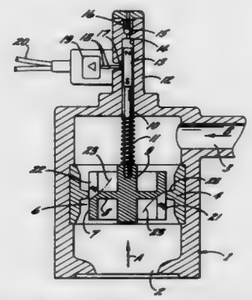
1. A coronary artery graft flow-meter comprising:
a flow-meter chamber having an inflow port for receiving a first liquid and an outflow port for expelling said liquid to said artery graft;
means for controlling the passage of said first liquid into said flow-meter chamber;
an inflatable bag located in said flow-meter chamber,
volumetric container means for holding a second liquid;
means for transferring said second liquid from said volumetric container means to said inflatable bag, wherein said inflatable bag receives said second liquid when said control means prevents passage of said first liquid into said flow-meter chamber; and
means for measuring flow of said second liquid from said volumetric container means to said inflatable bag.

5,115,683
CORIOLIS MASS FLOW METER ADAPTED FOR LOW FLOW RATES
Wayne Pratt, Scottsdale, Ariz., assignor to K-Flow Division of Kane Steel Co., Inc., Millville, N.J.
Continuation-in-part of Ser. No. 249,805, Sep. 27, 1988, abandoned. This application Sep. 8, 1989, Ser. No. 404,919
Int. Cl.[5] G01F 1/84
U.S. Cl. 73—861.38 31 Claims



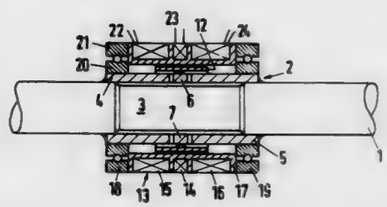
1. A Coriolis mass flow meter comprising: a continuous flow tube adapted to receive and exhaust fluid flow; a base, the flow tube fixedly mounted at its ends to the base; a driver adapted to oscillate the flow tube at a resonant frequency thereof; sensors positioned on opposite sides of the flow tube equidistantly from the driver; and brace means attached at one end to the base and at the opposite end to the flow tube, the brace means attached to the flow tube at substantially the same position as the driver and adapted to limit lateral displacement of the flow tube transverse to the direction of the applied oscillation without substantially restricting the Coriolis reaction of the fluid on the flow tube in response to the applied oscillation of the driver.

5,115,684
FLOWMETER FOR MEASURING THE RATE OF FLUID FLOW IN A CONDUIT
Hubert Haeussler, Neuheim, Switzerland, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany
Filed Nov. 2, 1990, Ser. No. 608,538
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1989, 3936844
Int. Cl.[5] G01F 1/24
U.S. Cl. 73—861.48 12 Claims



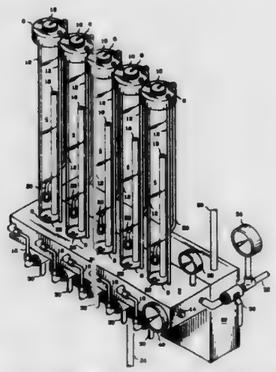
1. A flowmeter for measuring the rate of flow of fluid in a housing having fluid inlet and outlet ports between which the fluid flows, and comprising
a control collar mounted within said housing between said ports,
a piston mounted for axial movement within said collar,
biasing means for biasing said piston to a neutral position relative to said collar and having a spring characteristic, while permitting axial displacement of said piston relative to said collar in response to changes in the rate of flow of the fluid within said housing,
said collar and said piston having cooperating wall surfaces which form a passageway between said collar and piston of increasing size as the piston moves from said neutral position in the direction of fluid flow, and
displacement measuring and electric signal generator means for measuring said displacement of said piston and for generating an electric output signal having a substantially linear relationship to said rate of flow of said fluid, and comprising a sensor having a probe, and a magnetic rod movable adjacent said probe, said magnetic rod including physical means that varies along its length in such a manner that the quotient of said piston displacement and said output signal of said probe corresponds along said displacement of said piston to the quotient of said piston displacement and the flow rate at all positions of said piston displacement in such a manner that the influence of the spring characteristic of said biasing means on the output signal of said probe is compensated and a linear relationship exists between said output signal of said probe and the flow rate of the fluid.

5,115,685
TORQUE METER
Geert Jorgensen, Nordborg; Torben Jensen, Sondergade, and Niels Gade, Hojlund, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark
Filed May 29, 1990, Ser. No. 529,507
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1989, 3918862
Int. Cl.[5] G01L 3/10
U.S. Cl. 73—862.33 16 Claims



1. A torque meter comprising an axial extending shaft having a central axis, a first end portion, an axial intermediate portion, and a second end portion, the shaft intermediate portion being of a reduced diameter relative to the shaft first and second end portions, an axial extending sleeve having a first end portion secured in fixed relationship to the shaft first end portion, a second end portion secured in fixed relationship to the shaft second end portion, and an intermediate portion, the sleeve end portions being fixed to the respective shaft end portion in fixed angular and axial displacement relative to the adjacent shaft end portion, the sleeve intermediate portion having first means to axially segment the sleeve first end portion from the sleeve second end portion to permit rotation of the sleeve (shaft) end portions relative to one another and define a first lug having a first end portion axially separated from the sleeve (shaft) first and second end portions and a second end portion and at least one web portion for connecting the lug second end portion to each of the sleeve end portions, second means for providing one of a changeable electric field and a changeable magnetic field, and an armature mounted to the lug first end portion to change the field when one shaft end portion is rotated relative to the other.

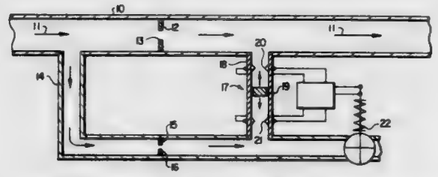
5,115,686
VAPOR FREE MULTI-LIQUID SAMPLER
R. David Walker, Okmulgee, and David A. Scheidt, Sapulpa, both of Okla., assignors to Conoco Inc., Ponca City, Okla.
Filed Mar. 2, 1990, Ser. No. 487,558
Int. Cl.[5] G01N *1/16*
U.S. Cl. 73—863.31 **17 Claims**



1. A vapor tight multi-liquid sampler which comprises:
(a) a rigid housing,
(b) a plurality of transparent sample holders vertically disposed and spaced apart and secured on top of the rigid housing, each sample holder having a removable closure on top and being sealed to the top of the rigid housing,
(c) a pressure relief plug in each said removable closure for relieving pressure,
(d) a vent line for venting gas from each sample holder,
(e) lines for feeding liquid sample to each sample holder and for draining liquid from each sample holder,
(f) overflow tubes for removing excess liquid from each sample holder with aspiration of gas to prevent overfilling; and
(g) valves to control the rate of sample feed to each sample holder and to control the rate of draining from each sample holder.

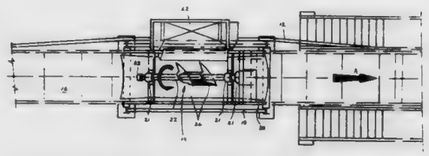
5,115,687
METHOD AND APPARATUS FOR TAKING A PROPORTIONAL SAMPLE OF FLOWING GAS IN A LINE
William H. Clingman, Jr., University Park, and Lyn R. Kennedy, Ovilla, both of Tex., assignors to Badger Meter, Inc., Milwaukee, Wis.
Continuation-in-part of Ser. No. 395,135, Aug. 16, 1989, Pat. No. 5,016,482, which is a continuation-in-part of Ser. No. 143,126, Jan. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 33,919, Apr. 1, 1987, abandoned, which is a continuation of Ser. No. 688,910, Jan. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 518,963, Aug. 1, 1983, abandoned, which is a division of Ser. No. 272,204, Jun. 10, 1981, Pat. No. 4,396,299. This application Mar. 5, 1991, Ser. No. 665,354
Int. Cl.[5] G01N *1/22*
U.S. Cl. 73—863.61 **6 Claims**

1. A method of taking a flowing sample of an at least substantially ideal gas at least substantially isothermally flowing through a line, which flowing sample is constantly proportionate to the flow rate of said flowing gas, said method comprising:
a) passing said gas flowing through said line through a first flow restriction in said line;
b) drawing a flowing sample of said gas from said line at a point upstream of said first flow restriction into a sample line;
c) passing said flowing sample of said gas in said sample line through a second flow restriction in said sample line, the interior of said line, said first flow restriction, said sample line, and said second flow restriction each being substantially cylindrical, the interior diameter of each of the four



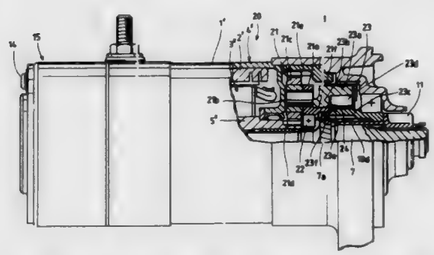
elements above being sequentially identified by the following symbols: D_{15}, d_{15}, D_{12}, and d_{12};
d) equalizing the pressures downstream of said first and second restrictions; and
e) d_{12} being much less than D_{15}, d_{15} and D_{12} so that the flow through said line divided by the flow through said sample line is about $(0.747)\ (d_{15}/d_{12})^2/[1-(d_{15}/D_{15})^2]^{\frac{1}{2}}$.

5,115,688
DEVICE FOR SAMPLING MATERIAL FROM A MOVING BELT CONVEYOR
Eugene van der Merwe, Roodepoort, and Ralph H. English, Johannesburg, both of South Africa, assignors to Johannesburg Consolidated Investment Company, South Africa
Filed Feb. 5, 1990, Ser. No. 475,351
Claims priority, application South Africa, Feb. 8, 1989, 89/0962
Int. Cl.[5] G01N *1/20*
U.S. Cl. 73—863.91 **4 Claims**



1. A method of sampling material from a moving troughed belt conveyor having a belt by means of a frame including a pair of spaced blades connected in oblique relationship to a shaft arranged above the belt and having a centered longitudinal axis thereof extending in parallel relationship to the direction of motion of the belt, the sampling method comprising the steps of:
supporting the belt in a region beneath a sampling zone to keep said region of t he belt substantially straight in said direction of motion of the belt so that the belt does not trough in the direction of motion of the belt between spaced rollers for moving the belt;
periodically rotating the shaft about said longitudinal axis at a predetermined speed so that portions of said blades passing across said region of the belt travel in substantially the same path as the respective leading edges thereof, thereby confining material between the blades in a sampling zone extending obliquely across the belt; and
displacing the material in the sampling zone from the belt while the blades traverse the belt.

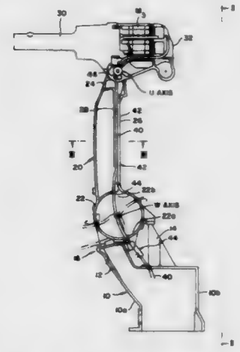
5,115,689
STARTER UNIT
Shuzou Isozumi, and Keiichi Konishi, both of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan
Filed Feb. 21, 1991, Ser. No. 658,715
Claims priority, application Japan, Mar. 13, 1990, 2-63054
Int. Cl.[5] F02N *15/06*; F16D *3/34*
U.S. Cl. 74—7 C **2 Claims**



1. A starter unit having a rotary output shaft which is rotated by an electric motor and is axially movable, which comprises:
a pinion provided at a front end of said output shaft so as to be engaged with a ring gear of an engine;
a planetary gear speed reducer for reducing the speed of rotation of said electric motor, said planetary gear speed reducer having a carrier which supports a plurality of planetary gears; and
an over-running clutch engaged with the output shaft to transmit the rotation of said electric motor, the speed of which has been reduced by said planetary gear speed reducer, to the output shaft,
said over-running clutch including a clutch inner component spline-engaged with the output shaft, and a clutch outer component operatively engaged with said clutch inner component by virtue of a plurality of rollers disposed therebetween;
said carrier having a cylindrical portion extending axially therefrom whose outer surface is engaged with an inner surface of a radially extended wall portion of said clutch outer component in such a manner as to be slidable relative to said wall portion with a predetermined rotation torque,
an end portion of said cylindrical portion, being substantially engaged, at an inner surface substantially opposite said outer surface, with an axially extended portion formed in an outer surface of said clutch inner component.

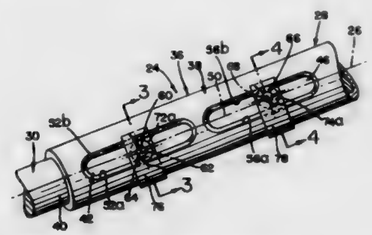
5,115,690
MULTI-ARTICULATED INDUSTRIAL ROBOT WITH AN OFFSET ROBOT ARM
Nobutoshi Torii, Tokyo; Hitoshi Mizuno, and Masanao Miyawaki, both of Yamanashi, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP90/00103, § 371 Date Sep. 28, 1990, § 102(e) Date Sep. 28, 1990, PCT Pub. No. WO90/08632, PCT Pub. Date Aug. 9, 1990
PCT Filed Jan. 29, 1990, Ser. No. 582,214
Claims priority, application Japan, Jan. 30, 1989, 1-17432
Int. Cl.[5] G05G *11/00*; B25J *9/00*
U.S. Cl. 74—479 **8 Claims**

1. A multi-articulated industrial robot comprising:
a robot body having a base at a bottom thereof and a generally upwardly extending body structure, said robot body provided at an upper end portion thereof with a first joint having a first horizontal axis;
a robot upper arm of a length pivotally joined at a lower end thereof to said first joint of said robot body for swing motion about said first horizontal axis of said first joint, and provided at an extremity thereof with a second joint; and
a robot forearm pivotally joined at a rear end to said second joint of said robot upper arm for up-down turning motion about a second horizontal axis;
wherein said robot upper arm extends substantially linearly between the respective horizontal axes of said first joint



provided on said upper end of said robot body and said second joint provided on said extremity of said robot upper arm, said robot upper arm is provided with a back side thereof extending along a straight line connecting the center of said horizontal axis of said first joint provided on said extremity of said robot upper arm, and said back side is formed to allow cables, such as electric cables, to be extended along and lie in said back side.

5,115,691
COLLAPSIBLE SHAFT ASSEMBLY
Howard D. Beauch, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Sep. 3, 1991, Ser. No. 752,346
Int. Cl.[5] B62D *1/18*
U.S. Cl. 74—493 **4 Claims**



1. A collapsible shaft assembly comprising:
a first shaft element having a tube end,
a second shaft element aligned on a common longitudinal centerline with said first shaft element and having a bar end disposed in said tube end,
first slot means on said tube end defining a first side edge and a second side edge each parallel to said longitudinal centerline and located symmetrically on opposite sides of a longitudinal reference plane containing said longitudinal centerline,
second slot means on said tube end diametrically opposite said first slot means defining a first side edge and a second side edge each parallel to said longitudinal centerline and located symmetrically on opposite sides of said longitudinal reference plane,

said first side edges of said first and said second slot means being diagonally opposite each other and said second side edges of said first and said second slot means being diagonally opposite each other,

first roller means on said bar end bearing against said first side edge of said first slot means and said first side edge of said second slot means and defining an antifriction bearing for longitudinal collapse of said tube end relative to said bar end and an angularly lash-free connection between said tube end and said bar end in a first direction of rotation of said shaft assembly, and

second roller means on said bar end spaced longitudinally from said first roller means bearing against said second side edge of said first slot means and said second side edge of said second slot means and defining an antifriction bearing for longitudinal collapse of said tube end relative to said bar end and an angularly lash-free connection between said tube end and said bar end in a second direction of rotation of said shaft assembly opposite said first direction of rotation.

5,115,692

BICYCLE PEDAL

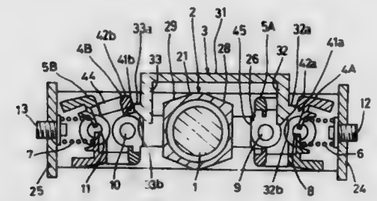
Masashi Nagano, Izumi, Japan, assignor to Shimano Inc., Osaka, Japan

Continuation of Ser. No. 430,376, Nov. 2, 1989, abandoned. This application Aug. 27, 1991, Ser. No. 754,210

Claims priority, application Japan, Nov. 9, 1988, 63-283232

Int. Cl.[5] G05G *1/14*

U.S. Cl. 74—594.4 **5 Claims**



1. A bicycle pedal comprising:

(A) a pedal body rotatably supported by a pedal shaft;

(B) a first clamp assembly mounted on said pedal body for engaging a cleat of a shoe, said first clamp assembly including (a) a front clamp member provided with an engaging portion and (b) a rear clamp member provided with an engaging portion, said rear clamp member being separated from said front clamp member in a direction which is transverse to said pedal shaft, at least one of said front and rear clamp members being movable between a clamping position and a release position;

(C) a second clamp assembly mounted on said pedal body for engaging the cleat, said second clamp assembly including (a) a front clamp member provided with an engaging portion and (b) a rear clamp member provided with an engaging portion, said rear clamp member of said second clamp assembly being separated from said front clamp member of said second clamp assembly in said transverse direction, at least one of said front and rear clamp members of said second clamp assembly being movable between a clamping position and a release position, said second clamp assembly being offset from said first clamp assembly in said transverse direction; and

(D) an urging means for urging said movable clamp members of said first and second clamp assemblies to their respective clamping positions.

5,115,693

TRANSMISSIONS OF VEHICLES EQUIPPED WITH ELECTRIC RETARDERS

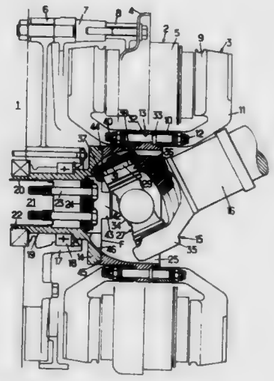
Guy Rugraff, Pantin, France, assignor to Labavia - S.G.E., France

Filed Oct. 11, 1990, Ser. No. 595,851

Claims priority, application France, Oct. 17, 1989, 89 13560

Int. Cl.[5] F16H *57/02*; H02K *49/04*; F16D *3/16*

U.S. Cl. 74—606 R **5 Claims**



1. A vehicle transmission comprising:

a gearbox;

a rear axle;

a double jointed cardan joint which connects said gearbox and said rear axle;

an electric eddy current retarder including an annular inductor stator cantilevered on said gearbox by a frame and a rotor having two armature discs made of a ferromagnetic material, said armature discs surrounding said stator and being supported by a gearbox flange, said gearbox flange being cantilevered on a stub shaft inside said gearbox, each said armature disc being fixed to a bent arm and said bent arm being fixed to one of two rotor rings, said two rotor rings being fixed to said gearbox flange;

a tubular insert through which a journal cross of said cardan joint extends, said journal cross being mounted in a fork of said cardan joint, said tubular insert being fixed to a peripheral portion of said gearbox flange on a side of said gearbox flange opposite said gearbox, said tubular insert including radial lugs to which are fixed said two rotor rings, two coaxial bores for acting as bearings for two first journals of said journal cross, each of said coaxial bores being mounted therein bushings for said two first journals, and said insert further including two coaxial apertures which allow bushings for two second journals transverse of said first journals of said journal cross to be mounted in bearings of said fork.

5,115,694

LINE PRESSURE CONTROL AT CRANKING AND SUBSEQUENT WARMING-UP OPERATION OF ENGINE

Hiroshi Sasaki; Shinsuke Nakazawa, both of Yokohama; Yuji Kato, Tokyo; Tatsuo Wakahara, Kawasaki; Shigeki Shimanaka, Hadano; Hiroshi Asano, Zama; Hiroshi Yamaguchi, Yokohama; Kazuhiro Ishigami, Sagamihara, and Shinichi Takenouchi, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 11, 1991, Ser. No. 727,246

Claims priority, application Japan, Jul. 11, 1990, 2-182906

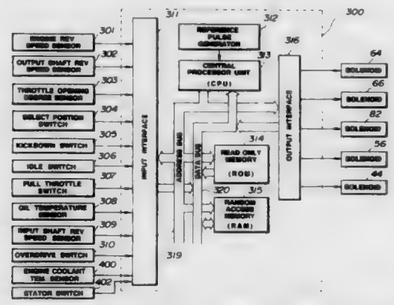
Int. Cl.[5] F16H *59/72, 59/78*

U.S. Cl. 74—844 **4 Claims**

1. A method of controlling a hydraulic pressure under which a hydraulic fluid is supplied from a pump driven by an engine toward a hydraulically actuable coupling of an automatic transmission drivingly coupled with the engine, the method comprising the steps of:

detecting a temperature of the hydraulic fluid and generating a temperature indicative signal indicative of said temperature detected;

comparing said temperature indicative signal with a predetermined temperature value and generating a comparison result indicative signal when said temprature indicative signal is less than said predetermined temperature value;



setting the hydraulic pressure at a first pressure value when said comparison result indicative signal is generated;

detecting a cranking operation of the engine and generating a cranking operation indicative signal indicative of occurrence of said cranking operation detected; and

decreasing the hydraulic pressure to a second pressure value that is lower than said first pressure value for a period of time upon generation of said cranking operation indicative signal when said comparision result indicative signal is generated.

5,115,695

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

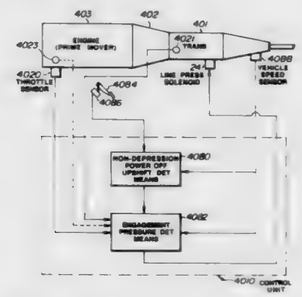
Tatsuo Wakahara, Kawasaki; Kazuyoshi Iwanaga, and Shigeru Ishii, both of Atsugi, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 22, 1990, Ser. No. 483,218

Claims priority, application Japan, Feb. 28, 1989, 1-48759

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—868 **5 Claims**



1. An automatic transmission comprising:

a source of line pressure;

a friction element which is engaged during an upshift, said friction element having a driven element and a driving element;

a shift valve interposed between said source of line pressure and said friction element which controls the supply of line pressure to said friction element;

means for detecting a power off upshift; and

line pressure control means for varying the level of line pressure which develops upstream of said shift valve in accordance with the relative rotation which occurs between said driven and driving elements of said friction element during the inertia phase of a power off upshift.

5,115,696

HYDRAULIC PRESSURE CONTROL DEVICE WITH PARALLEL PRESSURE SUPPLY PASSAGES FOR CERTAIN ONE FRICTION ENGAGING MEANS

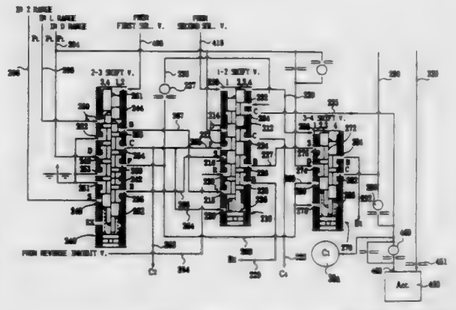
Mitsuru Takada, and Makoto Funahashi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 5, 1990, Ser. No. 593,811

Claims priority, application Japan, Oct. 9, 1989, 1-263610

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—869 **11 Claims**



1. A hydraulic pressure control device of an automatic transmission for a vehicle, said transmission having a speed stage change-over gear mechanism, and a plurality of hydraulically operated friction engaging means to change over a route of transmittance of torque in said speed stage change-over gear mechanism among various options so as selectively to set up each one of a plurality of speed stages, comprising a plurality of change-over valves to change over supply and exhaust of hydraulic pressure to and from said plurality of friction engaging means according to selection among said speed stages to be set up so as to set a certain one of said plurality of speed stages, wherein a certain one of said friction engaging means is connected with a certain one port of a certain one of said plurality of change-over valves so as to be supplied with or exhausted of hydraulic pressure through said certain one port according to selection among said speed stages to be set up, and means for supplying said certain one friction engaging means with hydraulic pressure through a passage means not passing through said certain one port when said certain one of said plurality of speed stages is set up.

5,115,697

DIAMOND ROTARY CUTTER FLUTE GEOMETRY

Arturo A. Rodriguez, Orem, and Ronald B. Crockett, Provo, both of Utah, assignors to Smith International, Inc., Houston, Tex.

Filed Aug. 16, 1991, Ser. No. 745,811

Int. Cl.[5] B21K *5/04*

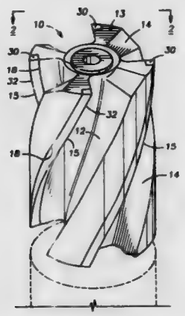
U.S. Cl. 76—108.6 **22 Claims**

1. A diamond rotary cutter comprising:

a rotary cutter blank forming first and second ends, said cutter blank further forming at least a pair of grooves in side walls formed by said blank said groove substantially extending between said first and second ends,

said grooves further being radially oriented substantially at

an angle that conforms to an angle of concave flutes that are subsequently formed adjacent said grooves in said rotary cutter blank, and



diamond material secured within said grooves formed in said side walls, said diamond material and said cutter blank is subsequently machined to form said flutes and a cutting edge along an angled leading edge formed by said diamond material to form said rotary cutter.

5,115,698

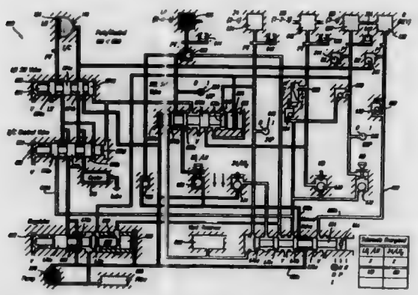
ELECTRONICALLY-CONTROLLED, ADAPTIVE AUTOMATIC TRANSMISSION SYSTEM

Maurice B. Leising, Clawson; Howard L. Benford, Bloomfield Hills, and Gerald L. Holbrook, Rochester Hills, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 187,772, Apr. 29, 1989, Pat. No. 4,875,391. This application Aug. 9, 1989, Ser. No. 391,762

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—868 **4 Claims**



1. A hydraulic system for an automatic transmission having a torque converter for receiving power from a primer mover, the torque converter including a lock-up clutch providing an engagement and disengagement operating mode of the torque converter, and an assembly of hydraulically operated friction elements which provide clutch and brake functions, comprising:

pump means for causing hydraulic fluid to flow through said hydraulic system;

regulator valve means for regulating the fluid pressure from said pump means;

torque converter control valve means for regulating fluid pressure to the torque converter to provide various pressure levels of the fluid pressure from the regulator valve means during the disengagement operating mode of the torque converter;

lock-up valve means for controlling fluid flow to the lock-up clutch during the engagement and disengagement operating mode of the torque convertor;

manual valve means for directing fluid flow produced by said pump means through said hydraulic system in response to a manually selected mode of operation for said transmission;

solenoid valve means for controlling fluid flow received at least in part from said manual valve means to each of said friction elements, said solenoid valve means including a plurality of solenoid valves; and

switch valve means operatively associated with said solenoid valve means for enabling two of said friction elements to be controlled from only one of said solenoid valves, said switch valve means having a first position for allowing fluid flow from one of said plurality of solenoid valves to a friction element while preventing fluid flow to said lock-up valve means during the disengagement operating mode and a second position for preventing fluid flow from the one of said plurality of solenoid valves to the friction element while allowing fluid flow to said lock-up valve means during the engagement operating mode of the torque converter.

5,115,699

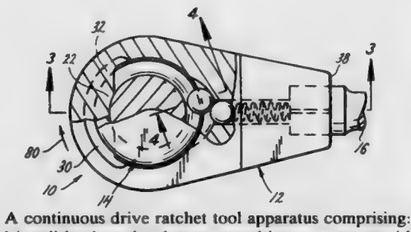
CONTINUOUS DRIVE RATCHET TOOL

James H. Mertens, 4935 A Magnolia Ave., St. Louis, Mo. 63139

Filed Jun. 1, 1990, Ser. No. 531,909

Int. Cl.[5] B25B *13/00*

U.S. Cl. 81—59.1 **15 Claims**



1. A continuous drive ratchet tool apparatus comprising:

a drive disk adapted to be connected in engagement with a threaded fastener for turning the fastener, the disk having a side surface extending around its circumference;

a disk housing having an opening therein and having an interior wall with a projection means thereon, the drive disk being received in the opening and the projection means engaging in the side surface of the drive disk; and

a first ball bearing in the housing opening and engaging the side surface of the drive disk, the first ball bearing selectively enabling either rotation of the drive disk in a first direction relative to the disk housing while preventing rotation of the disk in a second direction relative to the housing, or said first ball bearing enabling rotation of the drive disk in the second direction relative to the housing while preventing rotation of the disk in the first direction relative to the housing.

5,115,700

STRAP WRENCH

Dickie M. Kaler, 2nd, P.O. Box 121, Rim Rock, Ariz. 86335

Filed Aug. 26, 1991, Ser. No. 749,609

Int. Cl.[5] B25B *13/52*

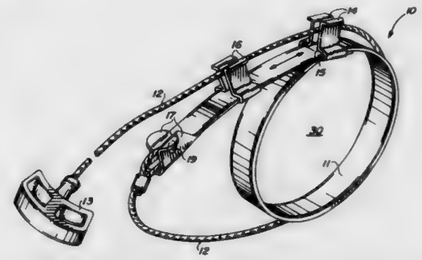
U.S. Cl. 81—64 **19 Claims**

1. A strap wrench comprising:

a semi-rigid, form retaining, wrap around, planar strip having a first end and a second end;

slide coupling means adjacent said first end for slidingly receiving said second end and forming said wrap around strip into a semi-rigid, form retaining, size adjustable loop;

a pull cord coupled to said second end of said wrap around strip; and



said slide coupling means further comprises pull cord guide means for guiding said pull cord when said pull cord is wrapped about said size adjustable loop formed from said wrap around strip.

5,115,701

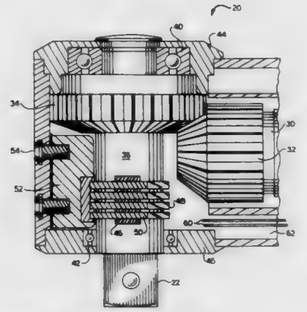
DRIVE MECHANISM AND STRAIN GAUGE MOUNTING FOR A NUTRUNNER APPLIANCE

Mark W. Lehnert, Hoffman Estates, Ill., assignor to GSE, Inc., Farmington Hills, Mich.

Continuation of Ser. No. 590,501, Sep. 26, 1990, abandoned, which is a continuation of Ser. No. 310,952, Feb. 10, 1989, abandoned. This application Aug. 30, 1991, Ser. No. 758,403

Int. Cl.[5] B25B *23/14*

U.S. Cl. 81—467 **14 Claims**



1. A nutrunner appliance comprising:

a motor having a motor shaft driven thereby, said motor shaft carrying gear means affixed to the forward extremity thereof;

a drive shaft mounted transverse to said motor shaft, said drive shaft carrying bevel gear means affixed at a first extremity thereof, said drive shaft gear means being arranged to engage said gear means of said motor shaft, and said drive shaft further having nut engagement means affixed to the second extremity thereof; the bevel gear means tapering inwardly toward said second extremity; and

strain gauge means affixed to said drive shaft proximate said nut engagement means for detecting strain in said drive shaft caused by torque transmitted to said nut engagement means and developing an electrical signal proportional to the torque transmitted to said nut engaging means, and a signal receiver affixed to a non-rotating housing surrounding said drive shaft proximate said nut engagement means to receive the signal transmitted from said strain gauge means.

5,115,702

BAR STOCK FEEDING MEANS

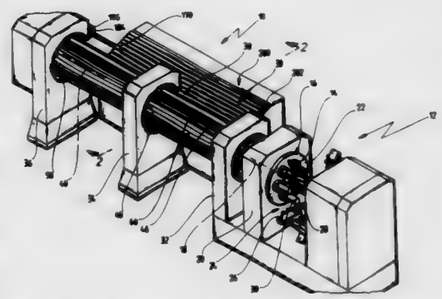
Helmut F. Link, Aichwald, Fed. Rep. of Germany, assignor to Index-Werke GmbH & Co. KG Hahn & Tessky, Esslingen, Fed. Rep. of Germany

Filed Jan. 11, 1991, Ser. No. 640,103

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1990, 4000598

Int. Cl.[5] B23B *13/04*

U.S. Cl. 82—126 **48 Claims**



1. Bar stock feeding means for machine tools comprising a longitudinal guide means on which several holders which each receive the bar stock in a guide means are held for movement in the longitudinal direction of said longitudinal guide means, and a drive means with which said holders are displaceable from an initial position in which they exhibit a maximum spacing from one another in the longitudinal direction into an end position on the machine tool side in which they exhibit a minimum spacing from one another in the longitudinal direction, characterized in that said longitudinal guide means comprises a guide element (**56**) having a longitudinal thread (**58**), in that said holders (**70***a* to *f*) are held in parallel alignment with one another by threaded rings (**72**) engaging said longitudinal thread (**58**), and in that said holders (**70***a* to *f*) are movable in the longitudinal direction (**80**) between the initial position and the end position by a relative rotation between said guide element (**56**) and said threaded rings (**72**) initiated by said drive means.

5,115,703

METHOD OF CUTTING STRIPS FOR WOUND CORE

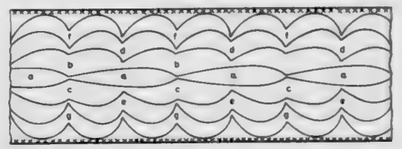
Fumio Kitamura, Chino, Japan, assignor to Kitamura Kiden Co., Ltd., Nagano, Japan

Filed Sep. 19, 1989, Ser. No. 409,432

Claims priority, application Japan, Sep. 27, 1988, 63-239728

Int. Cl.[5] H01F *41/02, 3/04*

U.S. Cl. 83—32 **7 Claims**



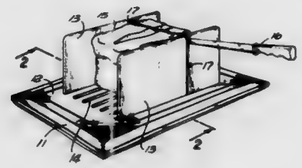
1. A method of cutting winding strips for use in a wound core (**1**) to which a cylindrical coil bobbin (**2**) for winding is applied, each of said winding strips being wound on a predetermined spool to form a predetermined cross section, comprising the steps of:

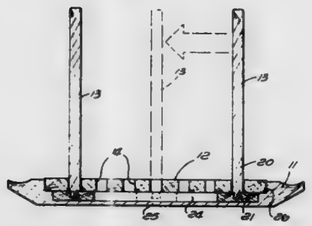
preparing a material having parallel straight sides; and

performing a cutting operation upon said material along a plurality of predetermined curves to thereby continuously

obtain a plurality of winding strips (a, b, c, . . .); each one of said plurality of winding strips being in direct continuous contact with another adjacent one of said plurality of winding strips; each one of said winding strips comprises a series of maximum and minimum material widths positioned at predetermined intervals along the length of said winding strip; and each maximum width position and each minimum width position of one of said winding strips substantially corresponds to each minimum width position and each maximum width position of an adjacent one of said winding strips, respectively.

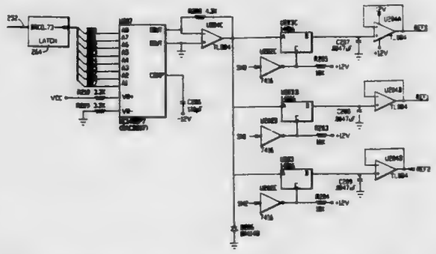
5,115,704
BREAD CUTTER BOX
Herbert B. Hyman, Camarillo, Calif., assignor to International Coffee & Tea Inc., Carsarillo, Calif.
Filed Jan. 3, 1991, Ser. No. 709,168
Int. Cl.[5] B26D *7/20*
U.S. Cl. 83—467.1 **1 Claim**





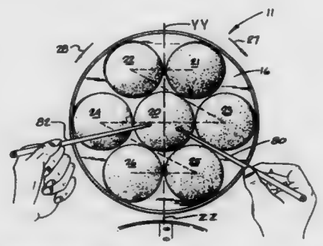
1. In a cutter box for receiving a loaf of bread or the like and guiding slicing of the loaf, the combination of:
a base having a planar top and a closed bottom;
a grill, said base having means defining a grill receiving opening in said top for positioning said grill within said opening in said base and a guide space between said grill and said bottom and defining a rim of said planar top around and substantially flush with said grill,
with said base supporting said grill and with said rim of said base limiting lateral movement of said grill and providing a planar work surface substantially flush with and around said grill; and
a pair of guide plates, said grill having a plurality of parallel spaced slots for receiving said guide plates,
each of said guide plates having a vertical member with a slot for guiding a knife and positionable in said slots of said grill, and a horizontal member positionable in said guide space for holding said guide plates in place when said grill is placed in said base,
with said guide plates being removable from said grill and insertable in a different slot when said grill is separate from said base.

5,115,705
MODULAR ELECTRONIC KEYBOARD WITH IMPROVED SIGNAL GENERATION
Charles Monte, 10 Brodea Way, San Rafael, Calif. 94901; Paul J. White, 3441 Beethaven St., and Anne C. Graham, 3701 Meier St., both of Los Angeles, Calif. 90066
Division of Ser. No. 311,601, Feb. 16, 1989, Pat. No. 5,003,859.
This application Oct. 22, 1990, Ser. No. 600,693
Int. Cl.[5] G10H *1/055, 1/18*
U.S. Cl. 84—617 **31 Claims**



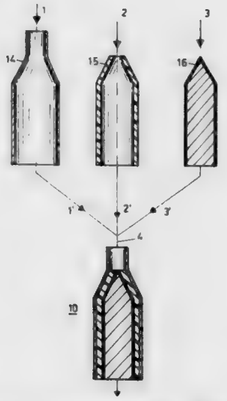
1. A percussive action electronic keyboard for play as a musical instrument of the type having pivoted playing keys having camming surfaces distal from finger contact surfaces thereof, pivoted hammers having impact cam follower surfaces for following the playing key impact camming surfaces, hammer stop means for stopping the swing of the hammer in response to impact of its associated key, comprising:
electronic sensor means for generating an electrical signal for each impacted key, the electrical signal a product of key impact relative to at least one key impact compensation means;
scanning keyboard state monitoring means connected to said sensor means including keyboard scanner means for scanning each key of the keyboard to determine whether a key event has occurred, comparison means for determining when a key impact causes a key impact signal to exceed predetermined minimum and maximum threshold values, and scan counting means for counting the number of scans when the key impact amplitude signal passes between the minimum and maximum threshold values.

5,115,706
ERGONOMIC DRUM ASSEMBLY
Alan L. Aluisi, 44 S. Adams #733, Denver, Colo. 80209
Filed Mar. 3, 1989, Ser. No. 319,252
Int. Cl.[5] G10H *5/00*
U.S. Cl. 84—723 **10 Claims**



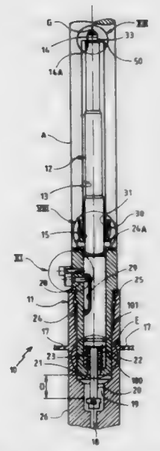
8. A drum assembly comprising:
a) a center drum pad;
b) first, second, third, fourth, fifth, and sixth peripheral drum pads arranged in encompassing relationship about said center drum pad;
c) electronic percussion synthesizer means operably connected to each of said drum pads for producing predetermined percussion sounds in response to the striking of said drum pads;
wherein each of said drum pads comprises a generally circular shape;
wherein each of said drum pads comprises a diameter between 4 inches and 6 inches;
wherein the center of each of said peripheral drum pads lie generally on a common cylindrical locus having a diameter between 4 inches and 6 inches.

5,115,707
METHOD FOR SERIES PRODUCTION OF AXIALLY SYMMETRICAL AMMUNITION BODIES AS WELL AS AMMUNITION BODIES PRODUCED ACCORDING TO THIS METHOD
Jörg Kutzli, Höfen, Switzerland, assignor to Schweizerische Eidgenossenschaft Vertretan Durch Die, EIDG, etc., Thun, Switzerland
Filed Nov. 9, 1990, Ser. No. 611,172
Claims priority, application Switzerland, Jun. 12, 1989, 04373/89
Int. Cl.[5] F42B *3/00*
U.S. Cl. 86—20.1 **9 Claims**



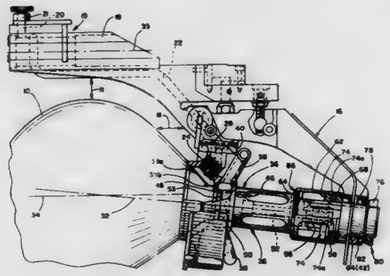
1. A method for the serial production of axially symmetrical ammunition bodies, each of said bodies comprising an outer jacket, an inner jacket designed as an active component, and a centrally disposed explosive charge, comprising the steps of producing the outer jacket on a first production line; simultaneously producing the inner jacket on a second production line; simultaneously producing the explosive charge on a third production line; and subsequently assembling said outer jacket, inner jacket and explosive charge together as they are completed, wherein said assembly step comprises the steps of sliding said inner jacket into said outer jacket and affixing it in place therein; securing said jackets together by adhesive bonding; and sliding said explosive charge into the assembly formed of said inner and outer jackets.

5,115,708
DEVICE FOR TEMPORARY MECHANICAL ATTACHMENT OF AN OBJECT TO A SUPPORT AND RAPID EJECTION OF THE OBJECT FROM THE SUPPORT
Jacques Spariat, Saint Medard en Jalles; Jean-Pierre Aubret, Bordeaux, and Michel Barriere, Saint Medard en Jalles, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France
Filed Apr. 23, 1991, Ser. No. 690,546
Claims priority, application France, Apr. 27, 1990, 90 05450
Int. Cl.[5] F16B *15/10*; F42B *15/36*; B64G *1/64*
U.S. Cl. 89—1.14 **30 Claims**



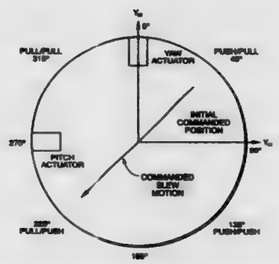
1. A mechanism for attaching, separating and ejecting an object having an internal elongated recess therein, said mechanism comprising:
a receptacle having a longitudinal axis and a reduced body portion along said longitudinal axis at one end of said receptacle, said receptacle further having a male centering segment complementary with said reduced body portion of said receptacle, said male centering segment of said receptacle being mounted for slidable engagement with one end of said internal elongated recess of said object;
a fragile coupling coaxially disposed with said longitudinal axis and interposed said male centering segment and said object;
an annular end member having one end attached to said fragile coupling and an external diametral surface;
means for mounting said external diametral surface to said internal elongated recess of said object; and
an ejector rod slidably mounted to said receptacle in a direction along said longitudinal axis, said ejector rod having one end contiguous said receptacle and an oppositely disposed end extending from said receptacle, said oppositely disposed end of said ejector rod being substantially coaxial with said fragile coupling and said annular end member, said oppositely disposed end of said ejector rod further being mounted for slidable engagement with an oppositely disposed end of said internal elongated recess of said object;
whereby when said object is mounted to said annular end member said male centering segment and said oppositely disposed end of said ejector rod of said receptacle slidably engage said internal elongated recess of said object to guide said object after said fragile coupling is separated and said object is ejected from said receptacle.

5,115,709
RELEASE MECHANISM FOR SPIN-STABILIZED SELF-PROPELLED MISSILES
Michael F. Steele, Fountain Valley, Calif., assignor to Brunswick Corporation, Skokie, Ill.
Filed Aug. 6, 1990, Ser. No. 562,799
Int. Cl.[5] F41C *27/06*; F41F *3/048*
U.S. Cl. 89—1.808 18 Claims



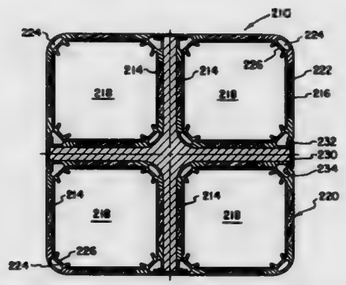
4. A release mechanism for facilitating launching a spin-stabilized self-propelled missile, comprising:
support means including rotary means and means for supporting the rotary means for rotation about a spin axis and for movement axially of the rotary means along the spin axis;
nozzle means extending between said rotary means and the missile coaxial with said spin axis;
separation means for separating the missile from the rotary support means under the influence of exhaust gases expelled by the missile and for allowing aft movement of the rotary support means; and
low friction bearing means for engagement by the rotary means at its aft limit position of travel away from the missile to reduce spin momentum induced forces on the means for supporting the rotary means.

5,115,710
LOAD-REDUCING ROCKET NOZZLE OPERATION METHOD
David L. Mitchell, Los Altos; Alan J. Stein; Charles L. Barndt, Jr., both of Sunnyvale, and William W. Szeto, San Jose, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 19, 1991, Ser. No. 674,275
Int. Cl.[5] F41F *3/07*
U.S. Cl. 89—1.809 3 Claims



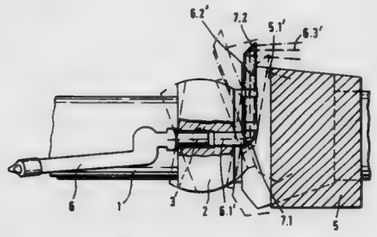
1. A method of operating a submarine launched rocket so as to minimize stress forces on the nozzle actuator system, comprising the steps of:
a) launching said rocket,
b) positioning said nozzle close to center at a first small angle at a first side of center, and
c) opening the actuator valves to move the nozzle, and shortly thereafter
d) causing motor ignition so that ignition occurs while said valves are open and said nozzle is near center.

5,115,711
MISSILE CANISTER AND METHOD OF FABRICATION
Abubaker M. Bushagour, Maplewood; James G. Vaske, Mounds View, and Stan P. Bovee, St. Cloud, all of, assignors to FMC Corporation, Chicago, Ill.
Filed Mar. 25, 1991, Ser. No. 675,365
Int. Cl.[5] F41F *3/042*
U.S. Cl. 89—1.816 17 Claims



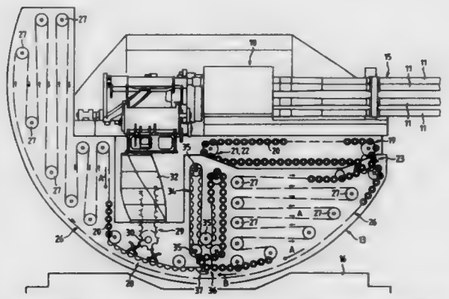
2. A missile cell for storing, transporting and launching a missile comprising:
an outer missile cell skin surrounding a longitudinal missle cell axis;
an inner missile cell skin surrounding said longitudinal missle cell axis such that an interstitial space is defined between said inner and outer missile cell skins; and
a compression resistant material including a honeycomb type material within said interstitial space.

5,115,712
MILITARY TANK
Uwe Sprafke, Schauenburg-Elmshagen, Fed. Rep. of Germany, assignor to Wegmann & Co. GmbH, Schauenburg-Elmshagen, Fed. Rep. of Germany
Filed Dec. 6, 1990, Ser. No. 624,370
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1989, 3940418
Int. Cl.[5] F41H *7/00, 5/18*; F41G *1/30, 3/00*
U.S. Cl. 89—36.14 3 Claims



1. A turret for a military tank having a weapon barrel with a bore and mounted in a cradle on the turret and extending out through a shield and a sight mounted stationary on the weapon and having means forming an optical axis extending through the cradle, parallel to a longitudinal axis of the bore and toward an objective on the outside of the turret, wherein the means forming the optical axis of the sight comprises a first optical deflector between the cradle and the shield to upwardly deflect the optical axis to a point in or on the turret and above the shield and a second optical deflector to forwardly deflect the optical axis towards an objective

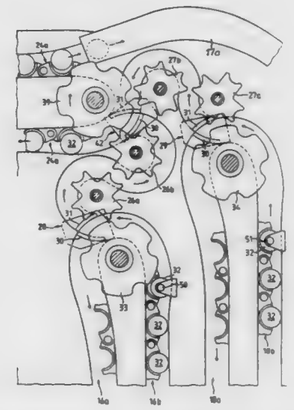
5,115,713
APPARATUS FOR THE INFEED OF CARTRIDGES TO A FIRING WEAPON
Kurt Muller, Zurich; Erwin Bohler, Dubendorf, and Jurg Dunki, Dietikon, all of Switzerland, assignors to Oerlikon-Contraves AG, Zurich, Switzerland
Filed May 10, 1991, Ser. No. 698,075
Claims priority, application Switzerland, May 22, 1990, 01743/90
Int. Cl.[5] F41A *9/34, 9/30*
U.S. Cl. 89—33.14 2 Claims



1. An apparatus for the infeed of cartridges from an ammunition container to a multi-barrel gun having a rotating weapon barrel cluster, the cartridges being movable in a predetermined forward feed direction, said apparatus comprising:
the ammunition container;
a reversibly movable storage and conveyor chain arranged in the ammunition container;
a reversibly movable infeed chain for the transport of the cartridges from reversibly movable storage and conveyor chain to the gun;
a first transfer location where the cartridges from the reversibly movable storage and transport chain of the ammunition container arrive at the reversibly movable infeed chain;
a reversibly movable endless storage chain arranged in the ammunition container;
a second transfer location arranged after said first transfer location, as viewed in the predetermined cartridge forward feed direction; and
a switchable gate arranged at said second transfer location, wherein during reverse movement of the reversibly movable infeed chain and the reversibly movable storage and conveyor chain, said reversibly movable endless storage chain, said second transfer location and said switchable gate enable transfer of empty cartridge cases from the reversibly movable storage and conveyor chain to the reversibly movable endless storage chain.

5,115,714
APPARATUS FOR INFEEDING CARTRIDGES
Kurt Müller, Zurich; Erwin Bohler, Dubendorf; Bruno Ruppen, Zurich; Hanspeter Novet, Volketswil, and Robert Gerber, Adlikon, all of Switzerland, assignors to Oerlikon-Contraves AG, Zurich, Switzerland
Filed Mar. 18, 1991, Ser. No. 671,111
Claims priority, application Switzerland, Apr. 2, 1990, 01095/90
Int. Cl.[5] F41A *9/30*
U.S. Cl. 89—33.16 2 Claims

1. An apparatus for the controlled infeed of cartridges from a stationary ammunition magazine to a multi-barrel firing weapon having an array of rotatable weapon barrels, comprising:
gate means for switching-on and switching-off the infeed of the cartridges;
a first endless chain for the delivery of the cartridges from the gate means to the firing weapon;
a second endless chain with controllable cartridge return for the delivery of the cartridges from the stationary ammunition magazine to the gate means;
two transfer wheels arranged between the first endless chain and the second endless chain;



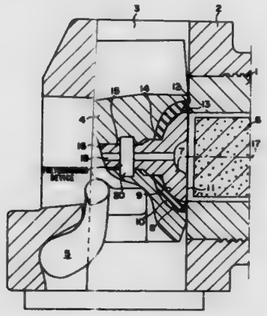
a clutch between said two transfer wheels, operatively interconnecting said first endless chain with said second endless chain;
a sensor for detecting the presence of a cartridge in a starting position, said cartridge to be delivered first to said first endless chain at the beginning of a firing burst;
a separate channel for the return of spent cartridge casings from the first endless chain; and
the gate means being switched off and thereafter the clutch being de-activated for the termination of a firing burst.

5,115,715
BREECH MECHANISMS
Sven Lindberg, Degerfors, and Kjell Eriksson, Karlskoga, both of Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden
Filed May 30, 1990, Ser. No. 530,342
Claims priority, application Sweden, May 30, 1989, 8901919-4
Int. Cl.[5] F41A *3/74*
U.S. Cl. 89—26 14 Claims

1. A breech mechanism for artillery guns including a gun barrel with a loading aperture and a breech member fixedly connected onto the gun barrel, said breech mechanism being displaceable transversely of the rear portion of the gun barrel in a groove extending across the barrel and the breech piece, said breech mechanism comprising:
a main portion and a seating portion disposed therein, said main portion with said seating portion of said breech being displaceable in said groove between a first open position in which the rear portion of the gun with the loading aperture is fully open for loading and a second closed position in which said seating portion entirely covers the loading aperture;
first and second mutually facing surfaces provided on said main portion and said seating portion, said surfaces including convex and conforming concave rotation surfaces respectively, formed from different cams rotated about a

common axis, which, when the breech is in the closed position, coincide with the bore axis of the barrel;

a gap formed between said first and second surfaces, the free edges of which at free ends of said gap facing the rear portion of the gun barrel in said second closed position of said breech are positioned in a single plane which is substantially perpendicular to the bore axis, said gap being confined at said free ends by said rear portion in said second closed position; and



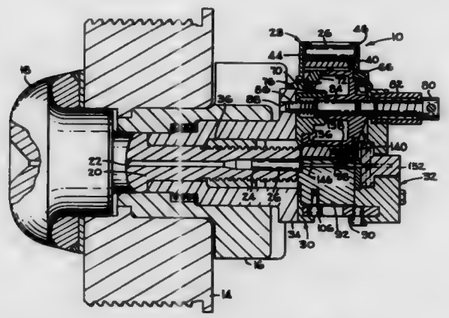
an intermediate layer made of elastically deformable, substantially non-compressible material and filling said gap, said layer being acted upon and deformable by said seating portion which is restrictedly movable in said main portion in a direction away from the barrel by the gas pressure in the gun;

wherein said intermediate layer on its deformation creeps solely towards the rear portion of the gun barrel along said surfaces of said gap filled by said intermediate layer and is urged into tight abutment with the rear portion of the gun barrel about the loading aperture thereof.

5,115,716
AUTOMATIC PERCUSSION PRIMER FEED MECHANISM

Timothy J. Doering, Anoka, and David R. Zappa, Mahtomedi, both of Minn., assignors to FMC Corporation, Chicago, Ill.

Filed Jan. 29, 1990, Ser. No. 471,327
Int. Cl.[5] F41A *3/08*
U.S. Cl. 89—25 **7 Claims**



1. A primer feed mechanism for an artillery piece with a firing chamber for receiving a primer comprising:

a magazine including a hub and a substantially cylindrical drum rotatably mounted about said hub, said drum including a plurality of openings, each of said openings adapted to receive a primer cartridge;

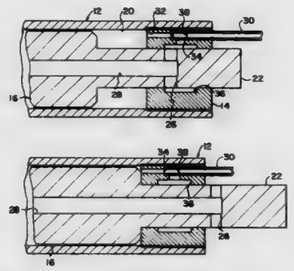
releasable mounting means for releasably mounting said hub to the breech end of the artillery piece;

actuating means, including bolt means, for individually displacing unfired primers from one of said openings into the firing chamber and for returning fired primers from the firing chamber into said one of said openings.

5,115,717
RAMMING APPARATUS

Helmuth Roemer, Attendorner Str. 135, D-5950 Finnentrop-Heggen, Fed. Rep. of Germany

Filed Feb. 1, 1991, Ser. No. 648,789
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1990, 4003189
Int. Cl.[5] F15B *13/02*
U.S. Cl. 91—49 **9 Claims**



1. A ramming apparatus comprising:

a pneumatically driven percussion piston having a front end and a rear end operatively mounted in a housing for back and forth movement along the axis of the piston between a front end and a rear end of the housing;

a compressed air hose;

a front pressure chamber provided in the front end of the housing;

a rear pressure chamber provided in the rear end of the housing, the rear pressure chamber being constantly connected to the compressed air hose;

a control device for controlling the application of pneumatic pressure on the percussion piston having a control piston extending axially from the rear end of the percussion piston into a continuous opening of an end piece of the housing and having at least one radial control channel that can be closed by the end piece; and

an axial channel provided along the axis of the percussion piston to supply pneumatic pressure to the front pressure chamber,

wherein the end piece has a branch line that connects the compressed air hose to the control channel of the control piston when the percussion piston is in a position at a distance from its forward end position, and a switching device for opening and closing the branch line,

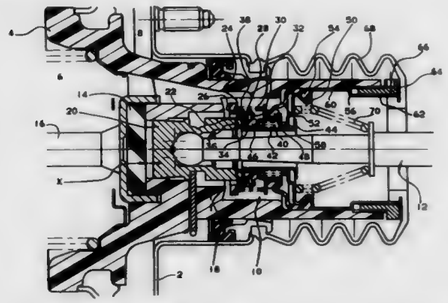
wherein the axial channel is in connection with the radial control channel, the radial control channel connects the axial channel to the compressed air hose, and

wherein in the rearward end position of the percussion piston, the front pressure chamber is vented by the axial channel and the radial control channel.

5,115,718
VACUUM BRAKE BOOSTER WITH A VALVE FOR ALLOWING ATMOSPHERIC AIR INTO A VARIABLE PRESSURE CHAMBER, THE POSITION FOR OPENING OF THE VALVE BEING ADJUSTABLE

Jean-Pierre Gautier, and Ulysse Verbo, both of Aulnay-Sous-Bois, France, assignors to Bendix Europe Services Techniques, Drancy, France

Filed May 23, 1991, Ser. No. 704,491
Claims priority, application France, Jun. 30, 1990, 90 07695
Int. Cl.[5] F15B *9/10*
U.S. Cl. 91—369.2 **4 Claims**



1. A brake booster of the vacuum type, comprising a casing within which is located a piston which, by means of a diaphragm, defines a front chamber connected permanently to a vacuum source and a rear chamber connected to said vacuum source when the booster is at rest, valve means establishing a pressure difference between the two chambers during actuation of a control rod capable, by means of a plunger, of bearing on one face of a reaction disk integral with a push rod intended for actuating a master cylinder, said valve means comprising a first shutter for coming to bear on a first shutter seat integral with said piston and determining, at rest, communication between said front and rear chambers, a second shutter bearing, at rest, on a second shutter seat integral with said plunger in order to close communication between the rear chamber and the outside of said booster, said second shutter being equipped with a stop for limiting its stroke while accompanying said plunger, and a spring tending to keep said first and second shutters apart from one another, said seats and shutters being arranged in such a way that, during operation, said first shutter closes communication between said front and rear chambers before said second shutter opens communication between the rear chamber and the outside of the booster.

5,115,719
PNEUMATIC BOOSTER

Mitsuhiro Endo, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Mar. 18, 1991, Ser. No. 671,966
Claims priority, application Japan, Mar. 19, 1990, 2-69199
Int. Cl.[5] F15B *9/10*
U.S. Cl. 91—376 R **17 Claims**

1. A pneumatic booster comprising:

a housing;

a diaphragm with a power piston which is attached at the outer peripheral portion to said housing to divide the interior of said housing into a pair of front and rear chambers, which are communicated with respective pressure sources;

a valve body which is movable back and forth between first and second positions in said housing, said valve body having the inner peripheral portion of said diaphragm attached to the outer periphery thereof;

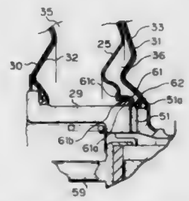
an input rod;

valve means which cooperates with said input rod to effect a switching operation to allow at least one of said front and rear chambers to selectively communicate with said pressure sources which differ from each other in the level of pressure thereof;

an output rod which is connected at one end thereof to said power piston; and

guide means which is provided on said housing to slidably fit on the outer periphery of said valve body;

said valve body being formed therein with a passage that constitutes a part of passage means for connecting one of said front and rear chambers to the pressure source associated therewith, one end of said passage opening on the outer periphery of said valve body so that said passage can communicate with said one chamber;



said opening of said passage being positioned in the axial direction of said valve body so that said guide means overlaps said opening when said valve body is at either said first or second position;

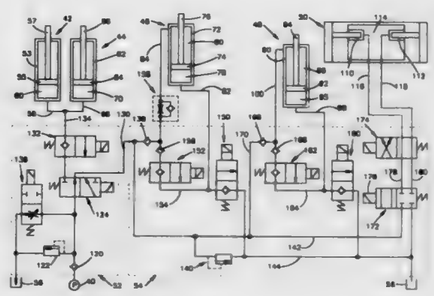
said guide means having a guide member that fits on the outer periphery of said valve body to slidably support it, and a seal member that fits on the outer periphery of said valve body slidably and hermetically;

said guide member having a plurality of axial grooves provided in the inner peripheral surface thereof at predetermined spacings in the circumferential direction so that said passage communicates with said one chamber through said grooves when said valve body is at either said first or second position where said guide means overlaps said opening.

5,115,720
HYDRAULIC VALVE BANK

Vincent L. Babson, Monks Corner, and Lee A. Hagelbarger, Charleston, all of S.C., assignors to Baker Material Handling Corporation, Summerville, S.C.

Filed Apr. 2, 1990, Ser. No. 503,279
Int. Cl.[5] F15B *11/00, 13/00*
U.S. Cl. 91—448 **4 Claims**



1. In a vehicle comprising:

an upright and tiltable mast assembly;

a carriage movable up and down said mast assembly;

fork means connected with said carriage for engaging a load;

hoist motor means connected with said carriage for moving said carriage along said mast assembly; said hoist motor means being operable between a retracted condition and an extended condition to move said carriage along said mast assembly;

tilt motor means connected with said mast for tilting said mast forwardly and rearwardly, said tilt motor means being operable between a retracted condition and an extended condition to tilt said mast;

hoist motor control valve means connected in fluid communication with said hoist motor means and a source of fluid pressure for controlling operation of said hoist motor means between the retracted and extended conditions; and

tilt motor control valve means connected in fluid communication with said tilt motor means and a source of fluid pressure for controlling operation of said tilt motor means between the retracted and extended conditions;

the improvement wherein:

said hoist motor control valve means includes a first two-way valve operable between a first condition directing fluid from a source of fluid under pressure to said tilt motor control valve means and a second condition blocking fluid flow to said tilt motor control valve means, and a second two-way valve connected in fluid communication with said hoist motor means and said first two-way valve and operable between a first condition blocking fluid flow from said first two-way valve to said hoist motor means and a second condition enabling fluid to flow from said first two-way valve to said hoist motor means;

said tilt motor control valve means including a third two-way valve connected in fluid communication with said first two-way valve and with said tilt motor means, said third two-way valve being operable between a first condition blocking fluid flow through said third two-way valve to said tilt motor means and a second condition enabling fluid to flow from said first two-way valve through said third two-way valve to said tilt motor means; and

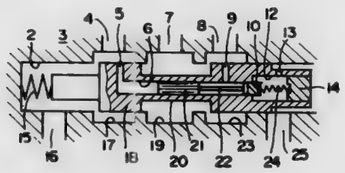
said tilt motor control valve means including a fourth two-way valve connected in fluid communication with said tilt motor means and a reservoir for receiving fluid, said fourth two-way valve being operable between a first condition blocking fluid flow from said tilt motor means to the reservoir and a second condition enabling fluid to flow from said tilt motor means through said fourth two-way valve to the reservoir.

5,115,721

CHANGE-OVER VALVE

Koji Ichihashi, and Kyoji Tanaka, both of Saitama, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Nov. 15, 1990, Ser. No. 613,137
Claims priority, application Japan, Nov. 20, 1989, 1-301617
Int. Cl.[5] F15B *13/07*
U.S. Cl. 91—512 **17 Claims**



1. A hydraulic system comprising:

a first spring biased hydraulic actuator;

a second spring biased hydraulic actuator;

a hydraulic pump;

a fluid reservoir;

valve housing means defining inlet port means connected to receive fluid from said hydraulic pump, a first outlet port connected for feeding operating fluid to said first spring biased hydraulic actuator, a second outlet port connected for feeding operating fluid to said second spring biased hydraulic actuator, drain port means connected for draining fluid to said fluid reservoir;

spool means retained by said housing means and movable therein between first and second positions; said housing means and said spool means in said first position providing communication between said inlet port means and said first outlet port, and preventing communication between said inlet port means and said second outlet port, and said housing means and said spool means in said second position providing communication between said inlet port means and said second outlet port, and preventing communication between said inlet port means and said first outlet port; and

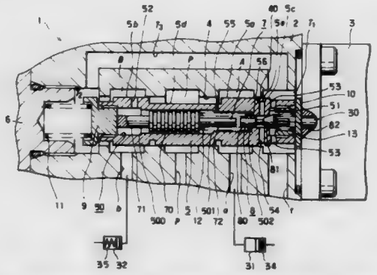
control valve means retained by said spool means and having a sensing port communicating directly with said first outlet port so as to produce movement of said control valve means between open and closed positions in response only to the fluid pressure at said first outlet port, said control valve means providing communication between said second outlet port and said drain port means when in said open position and preventing communication therebetween when in said closed position.

5,115,722

SOLENOID-OPERATED SELECTOR VALVE

Koji Ichihashi, and Kyoji Tanaka, both of Saitama, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed May 3, 1991, Ser. No. 695,431
Claims priority, application Japan, May 11, 1990, 2-19920
Int. Cl.[5] F15B *13/07*
U.S. Cl. 91—512 **9 Claims**



1. A solenoid-operated selector valve capable of assuming two positions and surround by a hydraulic pump and two actuators, said selector valve comprising:

a valve housing (1) provided with a spool hole (4);

a solenoid portion (3) mounted at one end of the valve housing (1);

a pump port (P) formed in the center of the spool hole (4);

a first cylinder port (A) which is formed on one side of the pump port (4) and which, when the solenoid portion (3) is not energized, is connected with the pump port (P), the cylinder port (A) being connected with the first hydraulic actuator (31);

a second cylinder port (B) which is formed on the other side of the pump port (P) and which, when the solenoid portion (3) is energized, is connected with the pump port (P), the second cylinder port (B) being connected with the second hydraulic actuator (32);

tank ports (T_1, T_2) which are formed on opposite sides of the cylinder ports (A, B) and which, when the solenoid portion (3) is not energized, are connected with the second cylinder port (B) and which, when the solenoid portion (3) is energized, are connected with the first cylinder port (A);

a spool (5) slidably inserted in the spool hole (4);

an axially extending hole (50) formed in the spool (5), both ends of the hole (50) being closed off by plug members (9, 10);

a piston (7) and a sequence valve (8) which are disposed on the same axis within the axially extending hole (50) and biased away from each other by a first spring (12) and a second spring (13), respectively, such that given spacing is maintained between them;

the axially extending hole (50) being in communication with the outside of the piston via a first radially extending hole (52), second radially extending holes (53), and third radially extending holes (54), the first radially extending hole (52) being kept in communication with the second cylinder port (B), the first radially extending hole (52) acting to guide hydraulic pressure from the second cylinder port (B) into the axially extending hole (50), for moving the piston (7) toward the sequence valve against the action of the first spring (12), the second radially extending holes (53) being kept in communication with the tank port (T_1), the third radially extending hole (54) being formed close to the second radially extending holes (53);

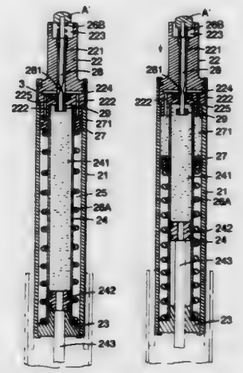
and wherein, when the solenoid portion (3) is not energized, the third radially extending holes (54) are connected with the tank port (T_1) and, when the solenoid portion (3) is energized to move the spool (5), the third radially extending holes (54) guide hydraulic pressure from the first cylinder port (A) to open the sequence valve (8) against the action of the second spring (13) which is weaker than the first spring (12).

5,115,723

HEIGHT ADJUSTING DEVICE

John Wang, No. 129, Tuan-Chu Lane, Tuan-Chu Li, Chiayi City, Taiwan

Filed Apr. 30, 1991, Ser. No. 693,633
Int. Cl.[5] F15B *21/00*; F16F *9/32*
U.S. Cl. 92—5 R **2 Claims**



1. A height adjusting device including an outer cylinder; an inner cylinder provided inside said outer cylinder and confining a fluid reservoir; an upper stopper plugging upper ends of said outer and said inner cylinders; a lower stopper plugging lower ends of said outer and said inner cylinders; a spring member disposed between said outer and said inner cylinders; a first piston provided inside said inner cylinder; a stationary shaft connected to said first piston and extending through said lower stopper, said outer and inner cylinders being movable vertically relative to said stationary shaft; a second piston provided between said outer and said inner cylinders and between said upper stopper and said spring member, said second piston and said upper stopper cooperatively confining a fluid receiving space, said upper stopper having a longitudinal shaft opening and at least one fluid passage means intercommunicating said fluid receiving space and said fluid reservoir via said shaft opening, said fluid passage means including a substantially longitudinal portion communicated with said fluid receiving space and a substantially transverse portion intercommunicating said longitudinal portion and said shaft opening; a movable shaft extending through said shaft opening and having a lowermost end extending into said fluid reservoir; a valve piece provided on said lowermost end of said movable shaft to selectively block said shaft opening; biasing means to bias said valve piece to block said shaft opening; and actuating means to move said movable shaft downward against action of said biasing means to correspondingly remove said valve piece from said shaft opening, downward movement of said outer and said inner cylinders causing fluid inside said fluid reservoir to flow through said fluid passage means and into said fluid receiving space when said valve piece does not block said shaft opening, upward movement of said outer and said inner cylinders causing fluid inside said fluid receiving space to flow through said fluid passage means and into said fluid reservoir when said valve piece does not block said shaft opening,

characterized in that said movable shaft has an annular groove disposed at a level above said fluid passage means when said valve piece blocks said shaft opening, said upper stopper including a fluid resisting ring positioned therein at a level below said transversely extending portion of said fluid passage means and surrounding said movable shaft, said ring being capable of being urged by hydraulic fluid from said fluid receiving space to contact said movable shaft and stop fluid flow from said fluid receiving space to said fluid reservoir when said valve piece blocks said shaft opening and when said spring member is compressed by said second piston, said ring being aligned with said annular groove when said valve piece is displaced from said shaft opening;

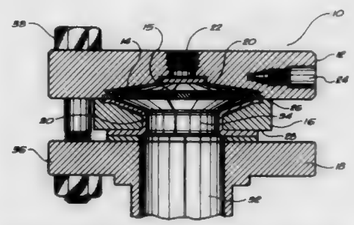
whereby, said ring can prevent hydraulic fluid from said fluid receiving space from bearing against said valve piece when said valve piece blocks said shaft opening, thereby preventing untimely movement of said valve piece away from said shaft opening.

5,115,724

ADAPTER RING FOR A DIAPHRAGM SEAL

John R. Zavoda, LaGrange, Tex., assignor to Zavoda Manufacturing Co., Inc., LaGrange, Tex.

Division of Ser. No. 409,737, Sep. 20, 1989. This application Nov. 23, 1990, Ser. No. 617,210
Int. Cl.[5] F16J *3/00*
U.S. Cl. 92—102 **9 Claims**



1. A diaphragm seal for an instrument comprising:

a first coupling member having a cavity in communication with the instrument;

a pressure-responsive diaphragm attached within said cavity of said first coupling member, said diaphragm having a periphery connected to said first coupling member;

an adapter ring fitted to said first coupling member, said

adapter ring being a rigid cylindrical member having an internal shoulder extending inwardly of said cylindrical member at the end opposite said diaphragm, said adapter ring having a sleeve fitted within said cylindrical member so as to overlie said internal shoulder, said sleeve comprised of a synthetic resin polymeric material, said rigid cylindrical member having a surface in surface-to-surface contact with a surface of said first coupling, said surface of said cylindrical member and said surface of said first coupling being beyond said periphery of said diaphragm, said adapter ring having a counterbore formed internally and inwardly of the other end of said adapter ring, said counterbore receiving the other end of said sleeve, said other end of said sleeve aligned with and in surface-to-surface contact with said periphery of said diaphragm, a force of said contact between said cylindrical member and said first coupling being independent of a force of said contact between said sleeve and said diaphragm; and

a second coupling member connected to said first coupling member, said second coupling member having an internal area communicating with the interior of said adapter ring, said adapter ring interposed between said first and second coupling members.

5,115,725

PISTON AND CONNECTING ROD ASSEMBLY

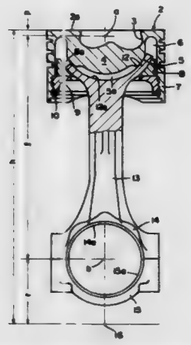
Shigeaki Horiuchi, Fujisawa, Japan, assignor to Isuzu Motors, Ltd., Tokyo, Japan

Filed Mar. 27, 1991, Ser. No. 675,771

Claims priority, application Japan, Mar. 30, 1990, 2-085663; Aug. 29, 1990, 2-226978

Int. Cl.[5] F01B *31/10*

U.S. Cl. 92—157 **24 Claims**



1. Internal combustion engine apparatus comprising:

a piston means having one end defining a crown surface and another end defining an annular piston engagement surface;

connecting rod means having an elongated middle portion, one end adapted for connection to a crank shaft and an opposite end defining an annular rod engagement surface slidably engaged with said piston engagement surface along an annular junction; said rod engagement surface and said piston engagement surface being shaped and arranged to provide for said connecting rod means a center of oscillation substantially displaced from said engaged surfaces in a direction toward said crown surface;

a chamber formed between said piston means and said opposite end of said rod means; said chamber disposed within said annular junction intersecting said annular junction, and extending transversely to the axis of said elongated middle portion of said rod means so as to substantially reduce the width of said annular junction;

passage means providing an oil flow path to said chamber; and

retainer means coupled between said piston means and said connecting rod means and adapted to maintain said piston engagement surface engaged with said rod engagement surface.

5,115,726

TWO-PIECE PISTON ASSEMBLY

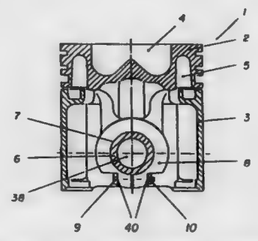
Georg Daxer, Sao Paulo, Brazil, and Joao A. D. T. Cullen, Ann Arbor, Mich., assignors to Metal Leve S.A., Sao Paulo, Brazil

Filed Oct. 20, 1989, Ser. No. 424,882

Claims priority, application Brazil, Oct. 26, 1988, P1 8805717

Int. Cl.[5] F02F *3/00*

U.S. Cl. 92—219 **15 Claims**



1. A two-piece piston assembly for internal combustion engines comprising: a head incorporating a pair of pin bosses depending from its lower portion, each provided with a wrist pin hole; an independent skirt; and a wrist pin for mounting the skirt on the pin bosses; and means connecting said wrist pin to said pin bosses for restraining lateral movement of the pin bosses.

5,115,727

AIR BLOWER UNIT FOR A MOTOR VEHICLE HEATING AND/OR AIR CONDITIONING SYSTEM, AND SUCH A SYSTEM HAVING TWO AIR BLOWER UNITS

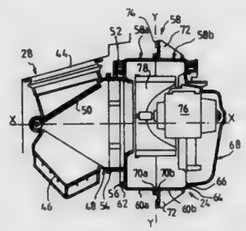
Michel Becquerel, Le Mesnil-Saint-Denis, France, assignor to Valeo Thermique Habitacle, Le Mesnil-Saint-Denix, France

Filed Jul. 8, 1991, Ser. No. 726,887

Claims priority, application France, Jul. 16, 1990, 90 09051

Int. Cl.[5] B60H *1/24*

U.S. Cl. 454—69 **7 Claims**



1. An air blower unit for a motor vehicle heating or air conditioning system that includes an air admission housing having an outlet aperture, wherein the air blower unit comprises: a casing defining a first casing axis and a second axis at right angles to said first axis; a motor support member carried by the casing; a connection member carried by the casing; and a motorized blower within the casing and carried by the motor support member, the connection member having an input edge and an output edge opposed to each other, with said input edge being adapted to be selectively mounted to the outlet aperture of the air admission housing in either one of two different positions selectable by rotation of the connection member on itself through half a turn around said first axis, the casing comprising a lateral wall defining a volute and a delivery orifice terminating the volute, the casing having two opposed, identical first abutment edges such that either one of the first abutment edges can be fitted selectively to said output edge of the connection member, whereby two different mounting positions of the blower unit with respect to the air admission housing are defined by rotation of the casing through half a turn around the said second axis, the motor support member having a second abutment edge adapted to be fitted in mating cooperation with either one of said first abutment edges, wherein one of said first abutment edges being opposite to the first abutment edge fitted to the connection member, and the motorized blower comprising a motor carried by the motor support member and a blower rotor coupled to the motor for drawing air from the air admission housing through the volute chamber and for delivering it under pressure to said delivery orifice.

5,115,728

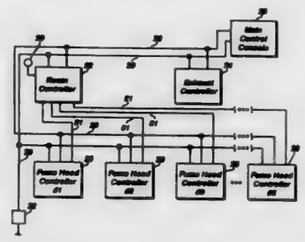
SYSTEM FOR CONTROLLING THE DIFFERENTIAL PRESSURE OF A ROOM HAVING LABORATORY FUME HOODS

Osman Ahmed, Madison, Wis., and Steven A. Bradley, Prairie Village, Kans., assignors to Landis & Gyr Powers, Inc., Buffalo Grove, Ill.

Filed Sep. 28, 1990, Ser. No. 589,931

Int. Cl.[5] B08B *15/02*

U.S. Cl. 454—61 **8 Claims**



1. A system for controlling the differential pressure at a predetermined level between a room such as a laboratory or the like and a reference space such as a corridor or the like, both of which are located in a building having a building heating, ventilating and air conditioning apparatus, and in which room at least one fume hood is located, each fume hood being of the type which has at least one moveable sash door adapted to at least partially cover the opening as the fume hood sash door is moved, each fume hood having an exhaust duct that is in communication with an exhaust apparatus for expelling air and fumes from the room, each fume hood having a means for measuring the actual flow of air through its associated exhaust duct and generating an actual flow signal that is indicative of the actual flow of air through the exhaust duct, each fume hood being controlled by a fume hood controller means for controlling a flow modulating means associated with each fume hood and its associated exhaust duct to maintain a desired face velocity through the uncovered portion of the opening, said system comprising:

room controlling means for controlling at least the volume of air that is supplied to the room from the heating and air conditioning apparatus of the building;

means for interconnecting each of said fume hood controller means to said room controlling means so that the signals representing the actual flow from each of the fume hood controllers is communicated to said room controlling means, said room controlling means being adapted to receive and sum the communicated signals from each of said fume hood controller means and thereby determine the volume of air being exhausted from the room by the fume hoods, said room controlling means utilizing said adjusting means to vary the volume of air that is supplied to the room to replace the volume of air being exhausted from the room at a rate necessary to maintain the differential pressure at said predetermined level.

5,115,729

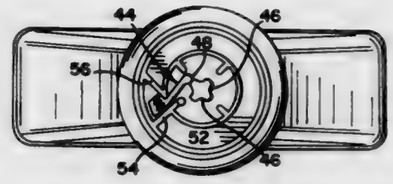
STAMPER HAVING ADJUSTABLE DIE DEPTH

Frederick S. Beckman, South Bend, Ind., and Paul Down, Berrien Springs, Mich., assignors to Superior Marking Equipment Co., Chicago, Ill.

Filed Jan. 7, 1991, Ser. No. 638,399

Int. Cl.[5] B41K *1/56, 1/02*

U.S. Cl. 101—327 **3 Claims**



1. In a stamper having a handle connected to a threaded shaft which in turn is connected to a die, and having an adjustable die stroke wherein the die stroke is a by rotation of the handle upon the threaded shaft, the improvement comprising:

a ratchet having a plurality of camming surfaces formed on one of said handle and shaft, and

a pawl carried by the other of said handle and shaft;

said pawl engaging in each of said camming surfaces seriatim upon rotation of said handle, said pawl being biased against movement along said camming surfaces, such bias being overcome by a sufficient rotational force applied to said handle.

5,115,730

COFFEE MACHINE

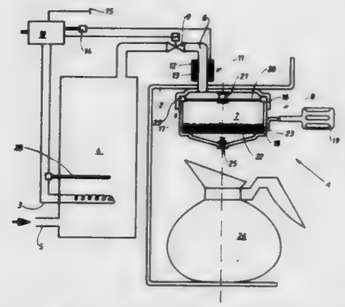
Karl Göckelmann, Gerstetten, Fed. Rep. of Germany, assignor to WMF Wurttembergische Metallwarenfabrik Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 3, 1990, Ser. No. 505,669

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1989, 3911169

Int. Cl.[5] A47J *31/04*

U.S. Cl. 99—280 **6 Claims**



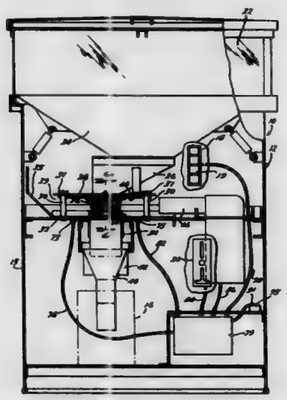
1. In a hot drink making machine for making predetermined quantities of hot drinks by pouring hot water over an aroma compound in a hot drink making chamber wherein said water is heated to a temperature suitable for making said hot drinks,

said machine including a hot water conduit connecting a source of hot water, to the chamber in which the hot water flows in the conduit from the hot water source to the chamber, and a shut-off valve adapted to be closed to stop the flow of water to the chamber after a predetermined quantity of water corresponding to the predetermined quantity of hot drink to be made has passed the valve, the improvement comprising locating said shut-off valve in said conduit downstream of the hot water source and including a flow heater separate and apart from the hot water source and downstream of the shut-off valve in the flowing direction of the hot water for heating residual hot water left in the conduit after the valve has been closed and control means for closing said valve and for activating said flow heater upon completion of a hot drink making cycle to convert said residual water to steam for drying the aroma compound in said chamber that has been exhausted by the hot drink making process.

5,115,731
FOOD HEATING AND DISPENSING VENDING MACHINE

Peter Maitland, Fort Lauderdale, Fla., assignor to Vendtron, Inc., Pompano Beach, Fla.

Continuation of Ser. No. 504,950, Apr. 5, 1990, abandoned. This application Oct. 25, 1991, Ser. No. 782,915
Int. Cl.[5] A47J *27/00*
U.S. Cl. 99—327 **7 Claims**

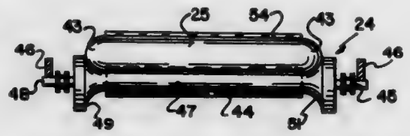


1. A vending machine for dispensing food, said machine including:
- a housing;
- a food storage hopper mounted in said housing;
- a dispenser mounted in said housing and including inlet means for receiving a food supply from said storage hopper, outlet means for discharging said food supply from said dispenser, a container for holding said food supply mounted for movement between a first position for receiving said food supply from said inlet means, a second position for discharging said food supply through said outlet means, and a third position intermediate said first and second positions, a closure means affixed to said container and operative to close said inlet means when said container means is moved away from said first position, and drive means for moving said container means between said first, second, and third position; and
- a heater mounted adjacent said third position of said container for heating said food in said container with the container in said third position.

5,115,732
APPARATUS AND METHOD FOR FORMING CASINGLESS SAUSAGE AND THE LIKE

Timothy G. Mally, Oregon, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Continuation of Ser. No. 400,080, Aug. 29, 1989. This application Aug. 30, 1990, Ser. No. 575,044
Int. Cl.[5] A22C *7/00, 11/00*
U.S. Cl. 99—483 **32 Claims**

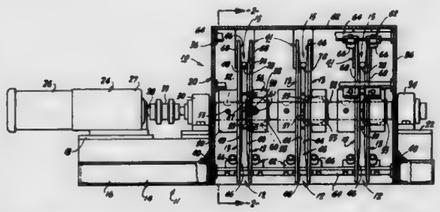


1. An apparatus for forming a casingless sausage and the like, comprising:
- means for stuffing and shaping flowable batter material;
- forming means associated with said stuffing and shaping means, said forming means being for forming a proteinaceous skin of batter material from the batter material of the stuffing and shaping means;
- ejecting means for removing a blank from the stuffing and shaping means, the blank having a shape determined by said stuffing and shaping means, the blank further having an external surface including the proteinaceous skin and a core portion including batter material which has not been formed into the proteinaceous skin; and
- conveyor means for receiving and conveying the blank, said conveyor means including end forming means for engaging batter material at at least one end of the blank and for shaping the end batter material into a generally rounded configuration by relative rotational movement between the blank and the end forming means to thereby form a shaped product.

5,115,733
NUT SHELLING MACHINE

Wilfred C. Frederiksen, 16881 Bolero La., Huntington Beach, Calif. 92649, and Sun Y. Kim, 2384 Lancaster Ct., Hayward, Calif. 92649

Filed Mar. 24, 1989, Ser. No. 328,448
Int. Cl.[5] A23N *5/00*
U.S. Cl. 99—574 **13 Claims**

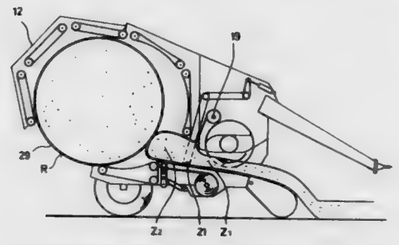


1. A nut cracking machine for cracking nuts of different size having an outer shell and an inner kernel comprising:
- a) a support assembly;
- b) a disk unit having a first disk and a second disk arranged beside and spaced from the first disk,
  - the first disk having a center axis and a disk face with an outer portion and a periphery, and
  - the second disk having a center axis and a disk face with an outer portion and a periphery with at least one of the disks having the outer portion tapered to the periphery, wherein the disk face of a second disk is arranged opposite the disk face of the first disk and forms a cavity between the disk faces with a gap between the outer portions of the disk faces that widens to the periphery;
- c) support means on the support assembly for supporting the first disk for rotation about its center axis and supporting the second disk for rotation about its center axis with the axis of the second disk being skewed from the axis of the first disk, wherein the cavity formed between the disks widens at a wide sector of the disk unit and narrows at an opposite narrow sector;
- d) rotation means for rotating the first disk and the second disk together about their respective center axis; and
- e) nut feed means for feeding nuts having shells into the gap between the disks from the periphery of the disks at the wide sector of the disk unit wherein nuts are engaged by the outer portions of the disk faces, transported to the narrow sector, and compressed, cracking the shells of the nuts during transport to the narrow sector, wherein the feed means comprises a vibratory feeder that feeds nuts in file to the gap between disks.

5,115,734
METHOD FOR MAKING HARVEST PRODUCT ROLL BALES AND APPARATUS FOR PERFORMING THE METHOD

Petrus M. Quartaert, Berg 73, 5671 CB Nuenen, Netherlands

Continuation-in-part of Ser. No. 254,466, Oct. 6, 1988, abandoned. This application May 23, 1990, Ser. No. 527,531
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1987, 37-34850
Int. Cl.[5] B65B *63/04;* A01D *39/00*
U.S. Cl. 100—5 **25 Claims**

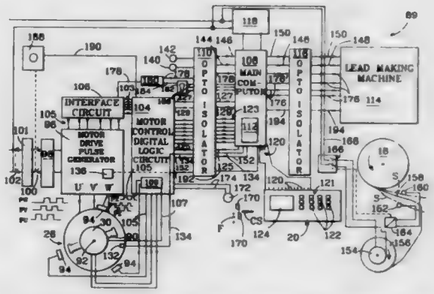


1. Apparatus for forming a cylindrical bale of cut harvest product, comprising a harvest product feed passage leading to a coil and press chamber, defined by sidewalls and press elements driven in a coiling direction and an ejector lid, said ejector lid adapted to be moved back and forth between a closed position and an open position, a first feed element mounted at the entrance of said feed passage, a second feed element mounted at an intermediate location of said feed passage between said first feed element and an inlet, of said press chamber, a tying material feed device disposed downstream of said inlet, a separator element to divide cut harvest product baled in said press chamber from cut harvest product being pre-stored in said feed passage, said separator element movably mounted between said second feed element and said inlet for displacement from an inoperative position outside of said feed passage to an operative position across said feed passage, said second feed element is a continuously driven press cylinder equipped with press blades, and said separator element in its operable position is movable together with said harvest product to move from said feed passage through said inlet into said press chamber.

5,115,735
PRESS WITH CONTROL CIRCUIT ARRANGEMENT

Karl-Heinz Gloe, Reichelsheim; Helmut Kreuzer, Munster, and Harald Biehl, Beasheim, all of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 27, 1990, Ser. No. 544,451
Int. Cl.[5] B30B *15/26*
U.S. Cl. 100—43 **9 Claims**



1. A press comprising a direct current drive electric motor having an output shaft; a slide ram; means for guiding the slide ram in reciprocating motion along a rectilinear path; reduction gearing and an eccentric drive shaft connecting the motor output shaft to the slide ram for driving the slide ram through cycles of reciprocating motion along said rectilinear path; and a control circuit arrangement comprising an encoder connected to the output shaft of the drive electric motor for producing a first output representing the angular position of the eccentric drive shaft and thus the linear position of the slide ram along said rectilinear path and means for controlling the speed of the drive motor to stop the slide ram at least proximate to a home position thereof at the end of each cycle of the slide ram; wherein the means for controlling the speed of the drive motor comprises a computer having registered therein a desired motor speed program, a motor control circuit electrically connected to the incremental encoder and to the computer, a motor drive circuit electrically connected to the motor control circuit and to the drive electric motor, and measuring means associated with the drive electric motor and being electrically connected to the motor control circuit, which measuring means produces a continuous second output representing the speed of the drive electric motor, the motor control circuit receiving and comparing said first and second outputs with said desired motor speed program to provide a third output representing the result of such comparison, said motor drive circuit being responsive to said third output to control the speed of said motor in accordance with the desired motor speed program.

5,115,736
COMPACTION CONTAINER FOR DOMESTIC SOLID WASTE

Alberto Rodolico, Via Micheli 12, Florence, Italy, and Antonino Rodolico, 624 Erskine Dr., Pacific Palisades, Calif. 90272

Filed Oct. 30, 1990, Ser. No. 605,508
Int. Cl.[5] B30B *1/24, 1/04*
U.S. Cl. 100—90 **20 Claims**

1. A compaction container assembly for domestic solid waste, said assembly including:
- a container and a cover therefor, said container having an upper inlet and being adapted to receive therein a plastic impermeable waste material bag which is removable from said container, said bag having an entrance opening for insertion of waste into the bag for compacting the waste within said bag and extracting air therefrom for preventing degradation;

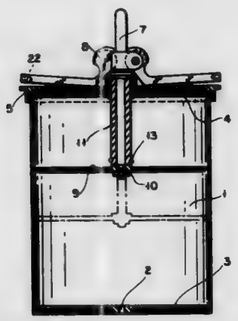
said container being substantially cylindrical in shape and said upper inlet defining an edge through which said bag is inserted into and extracted from said container, said container having a base provided with a bore through which air passes to allow air into said container while said bag is being extracted from said container;

cooperative sealing means on said cover and said container for sealing said cover to said container including a first bayonet seal on said cover and a second bayonet seal on said container cooperating with said first bayonet seal;

said cover having a cover opening therethrough for allowing movement of a compaction assembly means in said container with said cover thereon while being firmly held to said container by said first and said second bayonet seals;

said compaction assembly means including a piston for compaction of waste material in the bag coupled with a rack rod assembly for movement of said piston vertically along a central axis of said container and a lever multiplier coupled with said rack rod assembly for producing increased force and imparting the same to said rack rod assembly;

said rack rod assembly being coupled with said piston and said cover for vertically positioning said piston for movement into and out of said container axially, and said rack rod assembly extending into said container through said



cover opening for causing said piston to compact refuse in said bag within said container;

said piston fitting into said bag through said entrance opening thereof, said entrance opening being coincident with the edge of said container for enabling said piston to exert pressure onto the waste material for compression thereof in said bag to extract air therefrom, the air in said bag being interposed in the waste while said bag is in said container;

setting and compacting means, coupled with said rack rod assembly for causing said piston in response to said lever multiplier to slide downwards together with said rack rod assembly into said bag for compacting of the refuse in said bag, including a cylinder unit slidable into said container through said cover opening and being integral with said lever multiplier, said cylinder unit positioning said rack rod assembly axially of said container and having different compression heights provided by different compression positions;

O-ring—type limit seats operatively associated with said cylinder unit for preventing said cylinder unit from being dislodged at the different compression positions; and

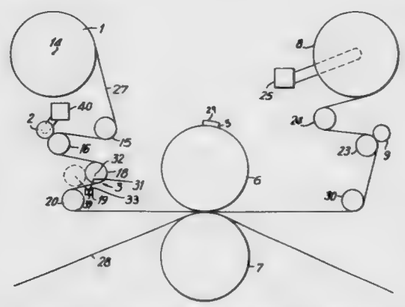
quick release means operatively associated with said rack rod assembly for limiting effects of exceeding forces inadvertently imparted to said lever multiplier, and for disengaging said cylinder unit from said cover.

5,115,737

HOT ROTARY STAMPER APPARATUS AND METHODS FOR METAL LEAF STAMPING

Angel Amendola, Millersville, Md., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 16, 1990, Ser. No. 509,167
Int. Cl.[5] B31F *1/07*
U.S. Cl. 101—32 **24 Claims**



15. A method for stamping metal leaf designs from a continuous sheet of metal leaf onto a continuous sheet of substrate at a stamping location, comprising:

passing the substrate at a first velocity in a first direction between a back-up roller and a die roller having a raised die including a design thereon;

passing the metal leaf moving at a second velocity in the same direction as the substrate, in superposition to the substrate and between the die roller and back-up roller, said first velocity being faster than said second velocity;

rotating the back-up roller and the die roller at the first velocity;

accelerating the metal leaf from the second velocity to the first velocity by contacting the metal leaf with the rotating raised die;

absorbing the forces exerted on the metal leaf during acceleration of the metal leaf; and

urging the raised die in contact with the metal leaf against the substrate web and the back-up roller to stamp the design onto the substrate at the stamping location.

5,115,738

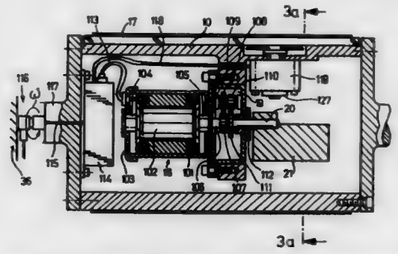
PRINTING MACHINE PARTICULARLY A SHEET-FED OFFSET PRINTING MACHINE

Bertold Grützmacher, Schriesheim; Peter T. Blaser, Dielheim, and Michael Krüger, Edingen-Neckarhausen, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 40,616, Apr. 21, 1987, abandoned. This application Aug. 14, 1989, Ser. No. 393,597
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1986, 3614006
Int. Cl.[5] B41F *5/00*
U.S. Cl. 101—216 **4 Claims**

1. Printing machine with at least one printing unit having rotating cylinders, comprising an energy converter disposed at least partially in one of the cylinder for converting at least some rotational energy of the one cylinder into electrical energy, and an energy storage device also disposed in the one cylinder for storing said electrical energy, said energy converter being an electric generator having a stator and a rotor with an input shaft disposed coaxially with said stator, and an eccentrically disposed weighted mounted on said input shaft,

said weight tending to remain in rest position so that relative motion occurs between the rotor and the stator of said genera-



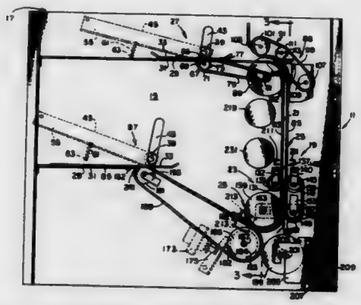
tor when the one cylinder rotates, and including a step-up gear unit is connected to said electric generator.

5,115,739

DOCUMENT IMPRINTING DEVICE HAVING A ROTATION DETECTOR MOUNTED ON THE PRINT DRUM

N. Allen Cargill, Warminster, Pa., assignor to Technitrol, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 354,140, Mar. 19, 1989, Pat. No. 5,000,088. This application Dec. 4, 1989, Ser. No. 445,023
Int. Cl.[5] B41F *13/24*
U.S. Cl. 101—232 **34 Claims**



1. A document imprinting device for imprinting on documents such as checks comprising

a frame,

document feeding means mounted on the frame for sequentially feeding documents,

conveying means for conveying a document from the document feeding means along a document conveyance path,

imprinting means for imprinting the documents conveyed along the document conveyance path, said imprinting means including a print drum mounted on a rotatable shaft having a generally round surface with a flat segment, and

rotation detecting means for detecting whether said rotatable shaft and print drum have made a rotation and imprinted the document,

said rotation detecting means including

a portion on the rotatable shaft having a generally round surface,

said portion being provided with a flat segment on a part of its surface,

light transmitting means for transmitting a beam of light at said portion of said shaft, and

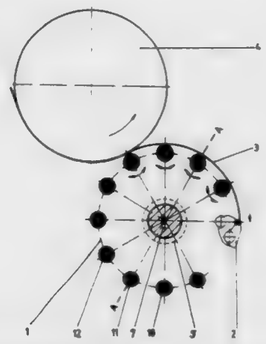
light detecting means for detecting said beam of light each time it is reflected from the flat segment.

5,115,740

SHEET-FEED DRUM IN ROTARY PRESSES

Helmut Emrich, Offenbach/Main, and Uwe Sabrowski, Dreieich, both of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed Sep. 10, 1990, Ser. No. 579,485
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1989, 3930747
Int. Cl.[5] B41F *21/00*; B41L *21/02*
U.S. Cl. 101—420 **2 Claims**



1. In a sheet-feed drum for guiding and transferring sheets in a rotary printing press, wherein said drum has an outer periphery and a central axis, the improvement comprising,

means for securing a plurality of longitudinally extending support rods about said outer periphery of the drum substantially parallel to said central axis, and

a plurality of round brushes rotatably mounted on said support rods for engaging and guiding said sheets, said brushes having generally cylindrical bodies with a multiplicity of generally flexible bristles made of an ink-repellant material projecting outwardly from substantially the entire surface of said cylindrical brush bodies, and said brushes being mounted so as to be freely rotatable with respect to said central axis and disposed in closely spaced axial relation on said support rods substantially without gaps over substantially the entire width of said sheets.

5,115,741

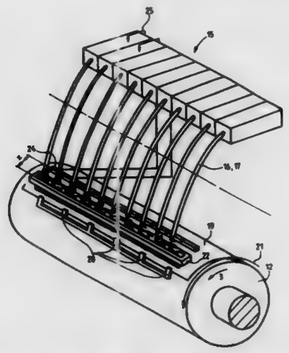
DEVICE FOR DRYING PRINTED PRODUCTS IN A PRINTING MACHINE

Anton Rodi, Leimen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 398,631, Aug. 25, 1989, Pat. No. 4,991,506. This application Dec. 27, 1990, Ser. No. 634,692
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 3828753
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.[5] B41F *23/04*
U.S. Cl. 101—424.1 **14 Claims**

9. Device for drying printed products in a printing machine having a transport device for conveying printed products along a given path, comprising a radiation device located outside the printing machine for generating radiant energy, and means for transmitting the radiant energy generated by the radiation device to a surface of the printed product, said transmitting means being disposed at least partly in the printing machine so as to direct the radiant energy simultaneously over a defined width of said surface of the printed product, said transmitting means comprising an elongated member having a substantially linear-shaped body with at least one gas-filled

tube operatively connected to said radiation device for receiving therefrom the radiant energy generated thereby, said gas filled tube having an end, and fiber optics means connected to



said end of said gas-filled tube facing in a direction towards the printed product and being locatable above the surface of the printed product for transmitted the radiant energy from said end of said gas-filled tube to the printed product.

5,115,742

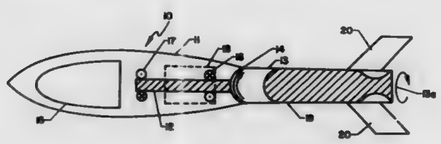
INTEGRATED AND MECHANICALLY AIDED WARHEAD ARMING DEVICE

Alson C. Frazer, Santa Ana, Calif., assignor to United States of America as represented by the Secretary of the Navy

Filed Jun. 24, 1991, Ser. No. 719,426

Int. Cl.[5] F42C *15/40*

U.S. Cl. 102—208 **6 Claims**



1. A warhead arming device for a missile comprising:
- a forebody;
- a rotating afterbody connected with a rotatable joint to said forebody;
- an alternator assembly for generating electrical energy from said rotating afterbody;
- a capacitor electrically connected to said alternator assembly;
- a safe separation measurement device functionally connected to said alternator assembly;
- a fuzing system electrically connected to said capacitor; and
- a detonator electrically connected to said fuzing assembly for arming the missile warhead.

5,115,743

PROPELLANT CASING ASSEMBLY FOR AN ELECTROTHERMIC PROJECTILE FIRING DEVICE

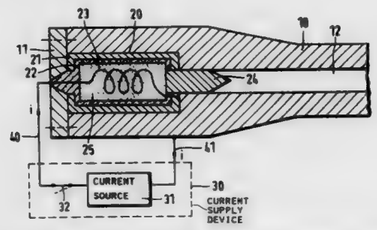
Markus Löffler, Unterlüss, Fed. Rep. of Germany, assignor to TZN Forschungs- und Entwicklungszentrum Unterlüss GmbH, Unterlüss, Fed. Rep. of Germany

Continuation of Ser. No. 351,120, May 12, 1989, abandoned. This application Jun. 12, 1990, Ser. No. 537,046

Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816300

Int. Cl.[5] F42C *19/12*

U.S. Cl. 102—472 **5 Claims**



5. An electrothermic device for firing a projectile, comprising
- (a) a replaceable, fiberglass-reinforced plastic casing operatively connectable with the projectile; and
- (b) an energy source for generating a plasma in said casing; said energy source including
  - (1) a current source and
  - (2) an inductive coil disposed in said casing and electrically connected to said current source to form a closable electric circuit therewith, whereby upon closing said electric circuit, current flow through said inductive coil generates a magnetic field therein and causes said inductive coil to vaporize and form a plasma in said casing for accelerating the projectile.

5,115,744

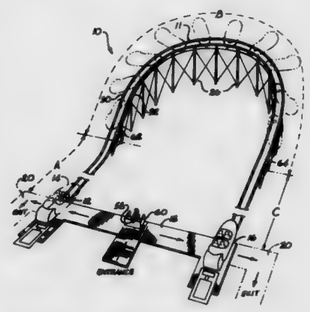
EXTREME"G" ACCELERATOR AMUSEMENT RIDE

Gerald L. Barber, 10 Whittington Ct., Greenville, S.C. 29615

Filed Sep. 20, 1989, Ser. No. 410,717

Int. Cl.[5] A63G *7/00*

U.S. Cl. 104—75 **4 Claims**



1. An amusement car ride comprising
- a track for supporting and guiding the movement of an amusement car having a first straight section, a curved section and a second straight section;
- a car for carrying one or more passengers thereon and arranged for movement on said track; and

drive means operatively associated with said car for imparting accelerating speed movement thereto along said first straight section, generally constant speed movement along said curved section and decelerating speed movement along said second straight section.

5,115,745

POWER TRANSMITTING ASSEMBLY FOR RECIPROCATABLY MOVING A SHUTTLE CART

Daniel S. Ellens, Brighton, and Robert H. Kubsik, West Bloomfield, both of Mich., assignors to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Feb. 22, 1991, Ser. No. 659,169

Int. Cl.[5] B61M *13/00*; B61B *3/00*

U.S. Cl. 104—162 **12 Claims**



1. A power transmitting assembly for reciprocatably moving an article transporting wheeled shuttle cart along a pair of longitudinally extending transversely spaced rails between first and second positions, said power transmitting assembly being adapted to be detachably installed as a unit between and below said rails and comprising:
- a pair of parallel longitudinally extending trolley tracks having a length corresponding to the distance between said first and second positions;
- a plurality of track yokes spaced longitudinally of said pair of trolley tracks, each of said track yokes extending transversely of said pair of trolley tracks in perpendicular relation therewith, each of said track yokes having a pair of transversely spaced legs to which said pair of trolley tracks is secured in a transverse spacing, and having a base portion connecting said pair of legs below said pair of trolley tracks, the transverse dimension of each of said track yokes being less than the maximum transverse spacing between said pair of rails;
- a trolley having wheels engaging said pair of trolley tracks and having shuttle cart driving means projecting between and above said pair of trolley tracks, said driving means being reversibly engageable with said shuttle cart;
- a fluid pressure operable cylinder unit substantially coextensive with said pair of trolley tracks, cradle means on the said base portion of said track yokes for supporting said cylinder unit below said pair of trolley tracks in centered relation therewith, and means for attaching said cylinder unit to at least two of said longitudinally spaced track yokes; and

motion transmitting means reciprocatably driven by said cylinder unit and attachment means for connecting said motion transmitting means to said trolley.

5,115,746

TRANSVERSE GUIDE ROLLER FOR TRACK-GUIDABLE VEHICLES WITH SEALED BEARING ASSEMBLY TO PREVENT ENTRY OF FLUID AND DRAINAGE ORIFICES TO DRAIN FLUID FROM THE BEARING ASSEMBLY

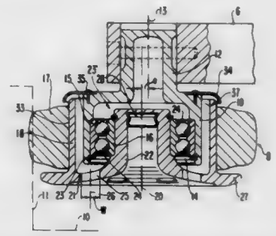
Diether V. Scarpatetti, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Jul. 27, 1990, Ser. No. 558,460

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1989, 3928061

Int. Cl.[5] B61F *9/00, 13/00*

U.S. Cl. 104—245 **29 Claims**



1. A transverse guide roller for track-guidable vehicles arranged in a horizontal plane beneath a journal suspension, comprising a journal suspended vertically in an assembled position and operatively associated with a stationary roller bearing ring, a wheel body for carrying a tire of the transverse guide roller and arranged to receive a rotating rolling bearing ring operatively associated with the stationary roller bearing ring to serve as a rotational rolling bearing for the transverse guide roller, wherein the journal which supports the transverse guide roller in the region of support of the rolling bearing is a bell-shaped bearing bell which covers the entire rolling bearing from above in a protective and sealing manner and receives the stationary roller bearing ring in a defined position, the wheel body is essentially cup-shaped with an upwardly pointing opening and with a bearing journal projecting from a cup bottom, on which the rotating rolling bearing ring is operatively arranged, and the cup bottom is provided, at its lowest point, with discharge orifices for unhindered discharge of water.

5,115,747

FREE TRANSFER MACHINE WITH INDEPENDENT MOTORIZED CARRIAGES AND BATTERY RECHARGING AT WORK STATIONS

Etienne M. Teissier, Malissard, and Bruno A. E. Marie, Chabeuil, both of France, assignors to ADL Automation, Malissard, France

Division of Ser. No. 161,090, Feb. 26, 1988, Pat. No. 4,966,080. This application Aug. 3, 1990, Ser. No. 562,663

Claims priority, application France, Mar. 4, 1987, 87 03129

Int. Cl.[5] B61C *3/00*

U.S. Cl. 105—50 **20 Claims**

1. Free transfer machine of the type comprising a trackway (I) set up in relation with work stations (P), each work station provided with a retractable stop member, and independent travelling carriages (5) which are carried, guided and driven along the trackway and which are adapted to transfer loads on the carriages from one work station to another, each carriage being equipped with a train of driving wheels actuated by an on-board electric drive member energized from on-board battery, wherein:

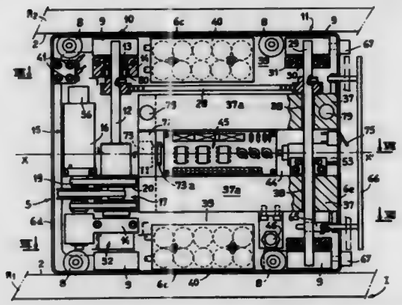
each carriage comprises:

front and rear rolling trains, at least one of which is provided with a free wheel device,

a variable speed motor (15) driving at least one of the front and rear rolling trains,

a rechargeable battery connected to contact blocks (41) and to the variable speed motor (15),

and an individual travelling control system comprising a motor supply and control circuit (45) which is controlled by a switch (65) actuated by a front bumper (66) and by a contactor (73) mounted in series with the switch and carried by a lower face of the carriage in



such a way as to be actuated by the retractable stop members, said circuit being furthermore placed under the control of the environment sensors (46, 53),

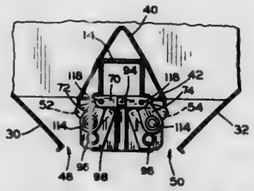
the trackway (I) comprises, in relation with each work station, reed-contacts (42) connected to an electric charge device and adapted to cooperate with the contact blocks (41).

5,115,748

HOPPER DOOR AND OPERATING APPARATUS FOR A RAILWAY CAR

Wayne S. Westlake, McComb, Ohio, assignor to Differential Steel Car Company, Findlay, Ohio

Filed Oct. 23, 1990, Ser. No. 601,981
Int. Cl.[5] B61D *7/16*
U.S. Cl. 105—286 **20 Claims**



1. A door operating apparatus for use in discharging bulk material from a hopper on a railway car comprising:

a door for closing a material discharge opening formed in a hopper, said door having a first pivot point for rotary attachment to the hopper and a second pivot point formed thereon and said door being rotatable about the first pivot point between an open position and a closed position;

a cross beam positioned adjacent to said door for movement in a vertical direction and having a third pivot point formed thereon;

a link arm having one end rotatably attached to said door at the second pivot point and an opposite end rotatably attached to said cross beam at the third pivot point: and

means for selectively moving said cross beam in a vertical direction whereby when said cross beam is moved in an upward direction, said door is rotated about the first pivot point to the open position and, when said cross beam is moved in a downward direction, said door is rotated about the first pivot point to the closed position.

5,115,749

METHOD OF ATTAINING UNIFORM FLOW IN ELONGATED FLUIDIZED BED FURNACE

Hidamitsu Takenoshita; Hisashi Hattori, and Yoichiro Hanada, all of Osaka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

Continuation of Ser. No. 496,110, Mar. 19, 1990, abandoned, which is a continuation of Ser. No. 295,597, filed as PCT/JP88/00281, Mar. 17, 1988, abandoned. This application Jun. 14, 1991, Ser. No. 714,994
Claims priority, application Japan, Mar. 17, 1987, 62-060189
Int. Cl.[5] F22B *1/02*
U.S. Cl. 110—245 **8 Claims**

1. A method for attaining uniform flow in an elongated fluidized bed furnace having a fluidized bed therein, comprising the steps of:

fluidizing said fluidized bed in said furnace by producing a flow of bubbles therein by passing a flowable fluidizing gas from an inlet outside said furnace through said fluidized bed wherein said bubbles tend to expand and unite in said fluidized bed while passing therethrough form said inlet to an outlet of said furnace; and

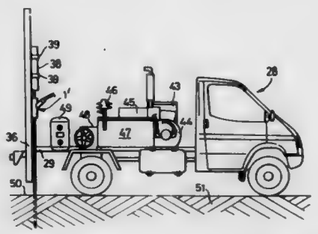
withdrawing at least a portion of said fluidizing gas from a point intermediate the inlet and the outlet of said furnace, said withdrawing step being carried out by using a fluidizing gas purging means cooperating with said furnace to provide a uniform flow state in said fluidized bed and cause a flow of bubbles in a first portion of said fluidized bed to become substantially equal to a flow of bubbles in a second portion of said fluidized bed, said purging means including a filter through which said portion of fluidizing gas is purged to the outside of the fluidized bed, whereby expansion and uniting of bubbles is prevented at least in a region near said purging means.

5,115,750

SUBSOIL TREATMENT APPARATUS

James S. White, and Mark S. White, both of c/o Whites Farmers, Manor Farm, Thorpe Salvin, Worksop S80 3JN, England

Filed Nov. 27, 1990, Ser. No. 618,663
Claims priority, application United Kingdom, Nov. 28, 1989, 8926851
Int. Cl.[5] A01B *45/02*; A01C *15/00*
U.S. Cl. 111—118 **18 Claims**



1. Subsoil treatment apparatus comprising an impact transmission block, an impact striking head associated with one end of said block; an internal chamber provided in said block and connectable to a source of compressed air; and a hollow, tubular, ground-piercing spike projecting from an opposite end of said block and to which impacts are transmitted from said block, the end of the spike associated with said block being in air flow communication with said chamber, and at least one air discharge aperture provided at an opposite end of said spike, said striking head and said block being formed as separate components, and an upper end of said transmission block being provided with a blind socket having an impact base, to receive in abutting relationship, a lower, inserted end of said striking head, said striking head comprising an elongate chisel-like impact head of suitable quality steel.

5,115,751

APPARATUS AND METHOD FOR SUBAQUEOUS WASTE DISPOSAL

Alex G. Copson, 26 Dover Street, London W1X 3PA, England

Filed Jan. 23, 1990, Ser. No. 468,918
Claims priority, application United Kingdom, Jan. 23, 1989, 8901420; Jan. 23, 1989, 8901421
Int. Cl.[5] B62B *35/30*
U.S. Cl. 114—27 **22 Claims**

1. A method of disposal of material on subaqueous ground substantially without said material coming into contact with the surrounding water, which comprises positioning a ship carrying said material above a selected site for disposal, transferring said material to a hollow tube which is divided longitudinally to provide separate channels for passage of a first waste material and of a second waste material to the subaqueous ground, conveying said material to a level at, or close to, said subaqueous ground and depositing said first material and said second material from said longitudinally divided hollow tube on to said subaqueous ground.

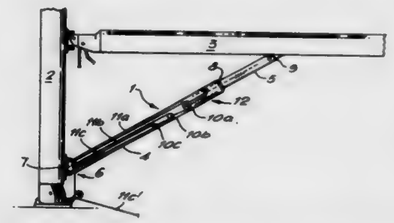
5,115,752

ROD KICKER FOR A SAILING VESSEL RIG

Andrew Mitchell, Brading, United Kingdom, assignor to Offshore Instruments Limited, Cowes, United Kingdom

Filed Nov. 6, 1990, Ser. No. 609,805
Claims priority, application United Kingdom, Nov. 2, 1989, 8924767; France, Oct. 30, 1990, 90 13466
Int. Cl.[5] B63B *35/00*
U.S. Cl. 114—39.1 **13 Claims**

12. A rod kicker comprising a first elongate member adapted at one end to be provided with a mast mounting, a second elongate member extensibly and retractibly engaged with the first member such that an end of the second member projects from the other end of the first member, the projecting end of the second member being adapted to be provided with means to engage a boom, a drive assembly operable between said first and second members to retract the second member, a brake mechanism having a locking action between the first and second members to prevent retraction of the second member unless the drive assembly is operated to retract the second member the brake mechanism comprising a pawl mounted on one of the members and biased to engage a rack bar mounted on the other of the members, the drive assembly being arranged such that operation to retract the second member initially displaces the pawl in opposition to the bias to disable the locking action.

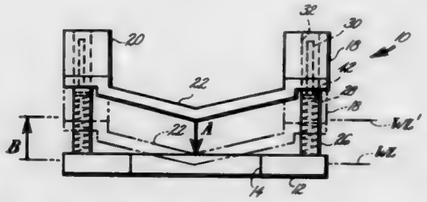


5,115,753

FLOATING BOAT LIFT

Gary D. Craddock, 4942 Commonwealth Dr., Sarasota, Fla. 34242

Filed Jun. 10, 1991, Ser. No. 713,054
Int. Cl.[5] B63C *1/02*
U.S. Cl. 114—48 **3 Claims**



1. A floating boat lift for lifting and supporting a boat above the surface of a body of water comprising:

a lower pontoon base;

two elongated upper pontoons positioned above said lower pontoon base, said upper pontoons held spaced apart generally parallel one to another by a rigid frame connected there between;

each said upper pontoon connected to a water supply whereby each of said upper pontoons may be controlledly filled with water;

each said upper pontoon including means for controlledly draining water therefrom;

a compressible vertical actuator means connected between said upper pontoons and said lower pontoon base for maintaining lateral alignment of said upper pontoons above said lower pontoon base;

said actuator means also for fully extending in length vertically, lifting said upper pontoons and said frame out of the water when said upper pontoons are empty of water;

said actuator means also for fully compressing in length vertically whereby said frame and a portion of said upper pontoons are submerged when said upper pontoons are filled with water;

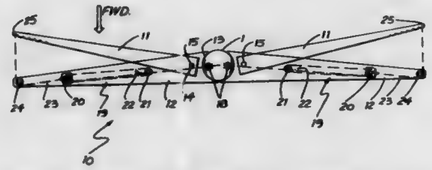
said lower pontoon base sized and of sufficient floatation to support a boat on said frame substantially above the water when said upper pontoons are empty of water.

5,115,754

ADJUSTABLE SPREADER ARMS FOR SAILING CRAFT

Alan J. Gray, 660 Rocky Point Road, and Bruce D. Flett, 1/506A Rocky Point Road, both of Sans Souci, New South Wales 2219, Australia

Filed Aug. 9, 1990, Ser. No. 565,015
Claims priority, application Australia, Aug. 10, 1989, PJ5703
Int. Cl.[5] B63B *15/00*
U.S. Cl. 114—101 **9 Claims**



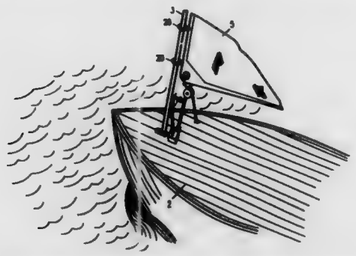
1. Shroud spreader means adapted to radially space shrouds from a mast of a sailing craft, the spreader means comprising:
pivotable spreader arms adapted to extend in a plane generally perpendicular to the mast interjacent top and bottom ends thereof, respective distal end portions of the spreader arms being engagable with respective shrouds,
control arms adapted to extend radially from the mast in said plane and being generally coextensive with and angularly spaced fore or aft of the spreader arms, and
an adjusting means operatively connected to the spreader arms via the control arms and adapted to selectively pivot the spreader arms.

5,115,755

QUICK ATTACHMENT RELEASE JIB HANDLING AND STOWAGE SYSTEM

Gailerd S. Smith, 720 Terry St., Monterey, Calif. 93940

Filed Apr. 10, 1990, Ser. No. 507,688
Int. Cl.[5] B63H *9/04*
U.S. Cl. 114—105 **23 Claims**



1. A sail setting apparatus for affixing a sail to or removing a sail from a rigging line of a vessel, comprising:
a magazine for receiving sail hanks, and
at least one sail hank, each said sail hank having an openable loop for receiving a rigging line, said sail hank adapted for cooperation with said magazine whereby said openable loop is opened by passing said sail hank over said magazine.

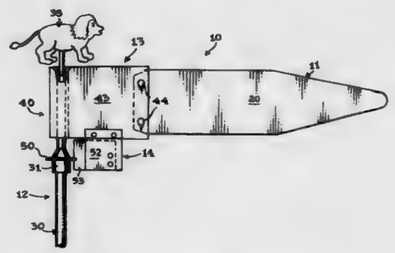
5,115,756

PENNANT/FLAG CONSTRUCTION

John J. Maffei, 41 Mimi Rd., Old Bridge, N.J. 08857

Filed Jun. 10, 1991, Ser. No. 712,370
Int. Cl.[5] G08B *7/02;* **G09F** *27/00*
U.S. Cl. 116—2 **2 Claims**

1. A pennant assembly comprising:
a pole unit including a pole member having a collar bearing element disposed proximate to but spaced from the upper end of the pole member;
a support unit including a bracket member rotatably supported on said pole member at a point above the location of said collar bearing element;
a pennant unit including a pennant member operatively attached to said bracket member; wherein, the bracket member includes a generally cylindrical stem element rotatably disposed on said pole member; and, wherein the stem element is provided with a pair of clamp arms that are adapted to engage one end of the pennant member;



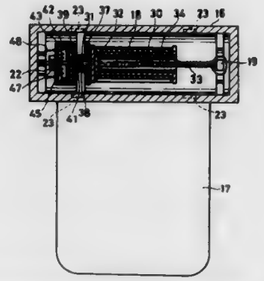
a noise making unit operatively associated with said pole unit and said support unit; wherein said noise making unit comprises; a spoke collar element provided with a plurality of spokes and disposed on said pole member; and a flexible card element operatively associated with the bracket member so as to be brought into sequential engagement with the spokes on said spoke collar element as the bracket member is rotated about the upper end of the pole member; and, at least one downwardly depending clamp plate secured to one of the clamp arms of the bracket member wherein the flexible card element is secured to said at least one clamp plate.

5,115,757

CLIP-CARRYING BOOKMARKER

Mitsuhiko Abe, No. 278-1, Zennoji, Sakado-shi, Saitamaken, Japan

Filed Mar. 6, 1991, Ser. No. 665,065
Int. Cl.[5] B42D *9/00*
U.S. Cl. 116—237 **1 Claim**



1. A clip-carrying bookmarker comprising:
a strap storage box (16) formed integrally with one piece (17) of a clip, said strap storage box including: a wide strap withdrawal port (18) at a central portion of a front side thereof, a rubber catch (19) in the vicinity of one sidewall therein, a first bearing (20) of a first support shaft (31) in the vicinity of a second sidewall thereof, a second bearing (21) of a second support shaft (38) integral with a first operating drum (39) between said strap withdrawal port (18) and said first bearing (20), and a guide frame (22) in which a plurality of projections (46) of a second operating drum (43) are slidably engaged with an inner wall portion thereof between said second bearing (21) and said first bearing (20);
a cover (24) formed integrally with another piece (25) of said clip and covering an open side of said strap storage box (16);
a strap feed and take-up drum opened at one end thereof and closed a second end thereof, said drum having said first support shaft (31) externally projecting from said closed end thereof in such a manner that an end portion of said first support shaft (31) is rotatably supported by said first bearing (20) of said strap storage box (16);
a rubber string (33) provided in a twisted state and set at one end on a rubber string fastening catch (32) formed at a central portion of an inner surface of the closed end of said strap fed and take-up drum (30) and at a second end on said rubber catch (19) affixed within the interior of said strap storage box (16);
a strap (34) connected at one end thereof to said strap feed and take-up drum (30) to be entirely wound on said strap feed and take-up and drawn at a second end thereof from said strap withdrawal port (18) of said strap storage box 16 through an axial cutout (36*a*) of a rotating plate (36);
said rotating plate (36) extending along the outer periphery of said strap feed and take-up drum (30);
a disc (37) attached to one end of said second support shaft and having an axial through hole in which the first support shaft (31) of said strap feed and take-up drum (30) is rotatably received and having said rotating plate (36) affixed thereto, said second support shaft (38) being provided with an axial through hole in which the first support shaft (31) of said strap feed and take-up drum (30) is rotatably received;
said first operating drum (39) having a plurality of sawtooth-shaped projections (40) on one end surface thereof and being formed with an axial through hole in which the first support shaft 31 of said strap feed and take-up drum (30) is rotatably received;
a first circular disc ratchet (42) arranged inside said first operating drum (39) and fixed to the support shaft (31) of said strap feed and take-up drum (30);
said second operating drum (43) having a plurality of sawtooth-shaped projections (44) to be meshed with the sawtooth-shaped projections (40) of said first operating drum (39) at one end surface thereof, said second operating drum being integrally provided with a second annular ratchet (45) to be meshed with said first ratchet (42) inside thereof, said second operating drum being provided with said projections (46) on an outer periphery thereof, and being provided with an axial through hole (47) in which the first support shaft (31) of said strap feed and take-up drum (30) is rotatably received; and
a coiled spring (48) arranged between said second operating drum (43) and the inner surface of the second sidewall of said strap storage box (16) for urging said second operating drum (43) constantly toward the first operating drum (39).

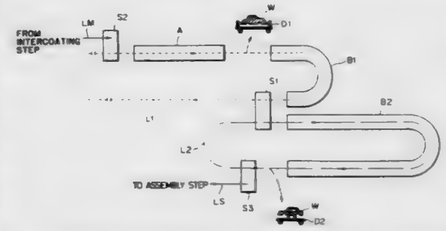
5,115,758

COATING APPARATUS FOR COATING A VEHICLE BODY

Hidenori Suzuki, and Takahiro Mizune, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 23, 1990, Ser. No. 601,346
Claims priority, application Japan, Oct. 23, 1989, 1-275189; Sep. 28, 1990, 2-260250
Int. Cl.[5] B44D *1/094*
U.S. Cl. 118—322 **21 Claims**

1. A coating apparatus having a baking means for baking and drying a coat of paint formed on a substrate and having first and second carriages for carrying the substrate on a predetermined conveyor line which passes through the baking means, the baking means comprising a first baking oven and a second baking oven;
said conveyor line comprising a first conveyor line section and a second conveyor line section, said first conveyor line section being so disposed as to pass through said first baking oven and said second conveyor line section being so disposed as to pass through said second baking oven;
said first carriage being supported only on said first conveyor line section and comprising a rotating means for rotating the substrate about an approximately horizontal axis;



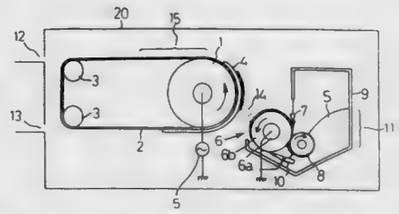
said second carriage being supported only on said second conveyor line section and having means for supporting the substrate fixed relative to said second carriage; and
a transfer device for transferring the substrate from said first carriage to said second carriage in a position located between said first baking oven and said second baking oven.

5,115,759

DEVELOPER COATING APPARATUS

Shigeru Kagayama, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

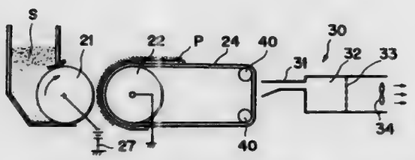
Filed Jul. 3, 1990, Ser. No. 547,128
Claims priority, application Japan, Aug. 10, 1989, 1-207670
Int. Cl.[5] G03G *15/06*
U.S. Cl. 118—621 **14 Claims**



14. A developer material coating apparatus for electrostatically coating developer material onto a surface of a sheet, comprising:
means for receiving the sheet from an inlet, feeding the sheet past a developer material coating region for application of the developer material onto the surface of the sheet, and discharging the sheet after coating to an outlet, said means for receiving including an endless movable support which moves past said inlet, said developer material coating region, and said outlet;
a developer material coating means for triboelectrically charging the developer material and electrostatically supplying the charged developer material to the sheet on sad support disposed int he developer material coating region; and
an alternating current voltage source attached to said support for producing an alternating electric field int he developer material coating region so that he charged

developer material is coated on the sheet on said support through the alternating electric field when the support locates the sheet at said developer material coating region.

5,115,760
DEVELOPER MATERIAL COATING APPARATUS HAVING DEVELOPER MATERIAL REMOVING UNIT
Masataka Maeda, Konan, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Mar. 29, 1990, Ser. No. 500,903
Claims priority, application Japan, Apr. 1, 1989, 1-81741
Int. Cl.[5] G03G *15/06*
U.S. Cl. 118—621 **18 Claims**



1. A developer material coating apparatus for electrostatically coating developer material on a support member such as plain paper in a developer material coating region to form a developer sheet, comprising:

support member feeding means for feeding the support member to the developer material coating region while carrying the support member thereon, said support member feeding means having a mounting surface for mounting said support member;

developer material coating means for triboelectrically charging the developer material and electrostatically supplying the charged developer material toward said support member feeding means to coat the developer material on the surface of the support member in the developer material coating region; and

developer material removing means having a suction port for sucking and removing substantially all the developer material attached to said support member feeding means, except for the developer material attached to the surface of the support member, said developer material removing means being disposed such that said suction port confronts and sucks developer from said support member feeding means.

5,115,761
LIGHT CURING APPARATUS FOR A CONTINUOUS LINEAR PRODUCT
Randy Hood, Milton, Canada, assignor to EFOS Inc., Mississauga, Canada
Filed Oct. 9, 1990, Ser. No. 594,346
Int. Cl.[5] B05C *13/02, 11/00*
U.S. Cl. 118—641 **9 Claims**

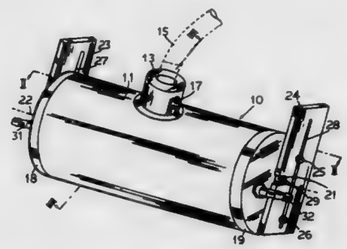
1. A light curing apparatus for a linear product, comprising

an elongated chamber member having two open ends and a cylindrical inner chamber, said inner chamber having a light reflective side wall,

a light guide holder means disposed at a selected location on said side wall, said holder means having a circular port operative to receive a light guide to be inserted therethrough to extend into said chamber member,

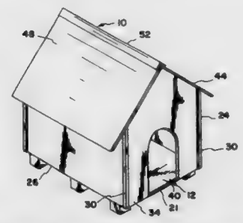
end cap means secured to said open ends, each of said end cap means having a transverse slot formed in a diametrical manner therein,

masking plate means slidably mounted on each of said end cap means and having a shallow slot formed therein, said



shallow slot being in registry with said transverse slot formed in said end cap means.

5,115,762
GABLE STYLE PREFABRICATED DOGHOUSE
Ruth I. Long, 10500 Dean St., #42, Bonita Springs, Fla. 33923
Filed Oct. 4, 1990, Ser. No. 592,836
Int. Cl.[5] A01K *1/00*
U.S. Cl. 119—19 **19 Claims**



1. A prefabricated gable roof animal structure comprising seven separate prefabricated sections which can be quickly assembled and dismantled, each section having an internal and external surface having interlocking means positioned to releasably engage adjacently connected sections, said interlocking means including releasably engageable male and female interlocking means,

the assembled structure comprising a bottom floor section mounted on removable support means, two opposed upstanding side wall sections releasably connected to said floor section by said interlocking means,

two opposed upstanding gable peaked front and end wall sections releasably connected by said interlocking means to said floor and said side wall sections, said front wall section having an opening for entrance and egress of an animal,

two opposed gable roof sections connected to each other and to said side wall sections by said interlocking means, said seven separate sections when assembled are rigidly secured in place internally by said interlocking means forming a solid unit structure with means for restricting outward rotation of adjacent sections.

5,115,763
COLLAPSIBLE PORTABLE CORRAL
Robert L. Wilson, Cherokee, Okla., assignor to Wilson Mfg., Inc., Cherokee, Okla.
Continuation of Ser. No. 364,700, Jun. 12, 1989, Pat. No. 4,960,074. This application Jul. 27, 1990, Ser. No. 558,758
Int. Cl.[5] A01K *3/00*
U.S. Cl. 119—20 **9 Claims**

1. A portable foldable corral for confining and directing the movement of livestock and the like comprising a front chute

means for providing an exit and entrance for livestock and the like;

a first front section pivotally secured to the front chute means;

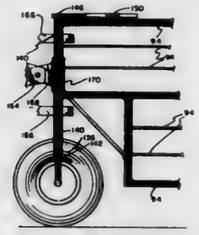
a second front section pivotally secured to the front chute means;

a first intermediate section pivotally secured to the first front section;

a second intermediate section pivotally secured to the second front section;

a first front wheel for supporting the first front section and for facilitating the towing of the first front section;

a second front wheel for supporting the second front section and for facilitating the towing of the second front section;

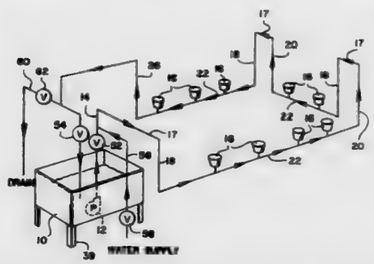


a means, engaged to said first front section and to the first front wheel, for changing and positioning a direction of travel of the first front wheel;

a means, engaged to said second front section and to the second front wheel, for changing and positioning a direction of travel of the second front wheel;

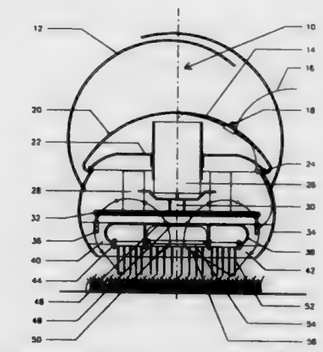
said means for changing and positioning a direction of travel of the first front wheel comprising a first front bracket having at least one first front recess and secured to said first front section, a first front shaft means rotatably engaged to the first front section and having said first front wheel rotatably bound thereto, and a first lever means bound to said first front shaft means for directly removably lodging in the at least one first front recess.

5,115,764
MILK SUPPLY SYSTEM FOR LIVESTOCK
John B. Soppe, R.R. #2, Box 104, Manchester, Iowa 52057
Continuation of Ser. No. 461,810, Jan. 8, 1990, abandoned. This application May 28, 1991, Ser. No. 706,124
Int. Cl.[5] A01K *7/00*
U.S. Cl. 119—75 **11 Claims**



1. An apparatus for supplying liquid to multiple drinkers from which animals can drink on a need basis, said apparatus comprising a plurality of drinker units each having an inlet and an outlet with a normally-closed animal-actuated valve between the inlet and the outlet to direct the liquid to the drinker when the valve is actuated by an animal, a source of supply for the liquid including a liquid reservoir, a closed liquid line leading from the liquid reservoir to the drinkers and returning from the drinkers to the reservoir, said liquid line carrying the liquid upwardly and then downwardly to the drinkers with the portion of the liquid line returning from the drinkers to the reservoir carrying the liquid upwardly from the drinkers and then downwardly to the reservoir, the drinkers being serially connected in the liquid line at a level below the lowest level of the reservoir, a normally-open first valve in the liquid line between the reservoir and the drinkers, a normally-open second valve in the liquid line between the last of the drinkers and the reservoir, a water supply line connected to the liquid line between the first valve and the first of the drinkers, the water supply line having a normally-closed water supply valve, a drain line connected to the liquid line between the last of the drinkers and the second valve, the drain line having a normally-closed drain valve, and means for moving the liquid under pressure through the liquid line and through the drinkers.

5,115,765
FLEA BLOWER VACUUM FOR PETS
Hany M. El Omary, 3202 Westerland Dr., Houston, Tex. 77063
Filed Dec. 10, 1990, Ser. No. 625,143
Int. Cl.[5] A01K *13/00*
U.S. Cl. 119—83 **2 Claims**



1. A self-contained blower/vacuum unit for pets comprising:

an exterior housing;

a disposal bag housing mounted within said exterior housing defining a central passage and further defining a perimeter opening between said disposal bag housing and said exterior housing;

said disposal bag housing having a screen positioned over a trailing end of the central passage;

a filtering disposal bag having a rim secured to said disposal bag housing whereby said filtering disposal bag is supported within the central passage by said disposal bag housing and said screen;

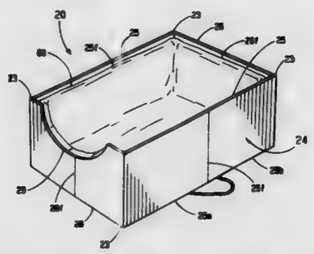
a brush latched to said disposal bag housing, said brush having an central aperture complementary to the central passage;

a fan mounted within said exterior housing above said screen and the central passage;

a means for heating mounted within said exterior housing for heating air blown out the perimeter opening; and

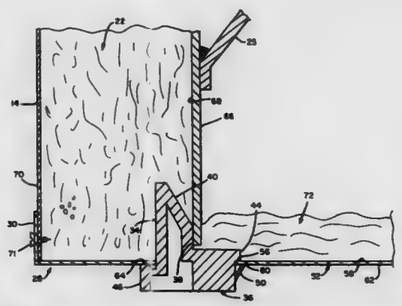
a means for selectively powering said fan and selectively actuating said heating means, whereby air is drawn by said fan into the central passage, through said disposal bag, across said heating means, and then blown out through the perimeter opening.

5,115,766
DISPOSABLE LITTER BOX
Ruth L. Williams, 2842 Kingswood, Garland, Tex. 75040
Filed Jan. 24, 1991, Ser. No. 645,556
Int. Cl.[5] A01K *67/00*
U.S. Cl. 119—168 **20 Claims**



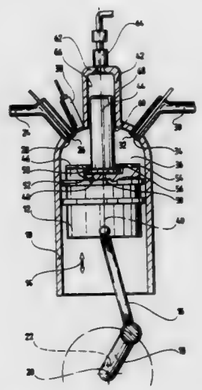
1. A container for disposal of pet animal excrement for placement on a supporting surface comprising:
disposable litter material;
foldable side-wall means, having continuous upper and lower limits, for rectangularly vertically surrounding and unsealed confinement of said litter material when erected on said supporting surface, and for flat packaging when so folded;
means for urging and maintaining the rectangularity of said foldable side-wall means when erected on said supporting surface; and,
impermeable membranous means for containing and sealing under and around said litter material against leakage and providing a bottom positioned on said supporting surface, said membraneous means extending beyond said side-wall means so that the periphery of said membraneous means may be gathered for enclosing and disposing of excrement and litter material within said foldable side-wall means.

5,115,767
HIGH EFFICIENCY INSULATED WATER HEATER AND METHOD FOR MAKING SAME
Eugene L. West; David H. Beck, both of Grand Rapids, and Thomas L. Gort, Wyoming, all of Mich., assignors to Bradford-White Corporation, Philadelphia, Pa.
Filed Aug. 9, 1991, Ser. No. 746,282
Int. Cl.[5] F22B *37/36*
U.S. Cl. 122—494 **21 Claims**



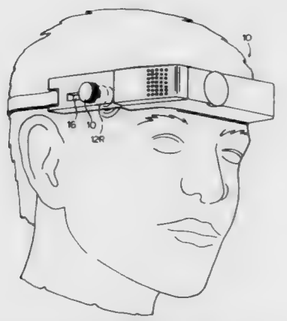
1. In a method of producing an insulated water heater comprising a water tank having a bottom and a base pan having an outer retaining surface, said base pan having at least three feet attached thereto at locations essentially equidistant from a centering point and provided with upper portions extending above the bottom of the base pan and lower portions extending below the bottom of the base pan, the upper portions of said feet having downwardly inwardly inclined centering surfaces terminating immediately adjacent an outer circumference of said water tanks to receive, guide and center the bottom of the water tank in a centered position on base pan, the steps which comprise
positioning the water tank above the base pan and above said feet;
lowering the water tank bottom upon at least one of the downwardly inwardly inclined centering surfaces of said feet, thereby positioning the water tank adjacent the base pan and laterally guiding the water tank into a centered position relative to the base pan;
positioning the outer jacket around the water tank and into engagement with the base pan retaining surface, thereby providing a space between the tank and the jacket and positioning the outer jacket into a centered position relative to the water tank and the base pan; and
introducing insulation material into said space.

5,115,768
COMBUSTION ENGINE FOR HYDROGEN
Walter Peschka, Sindelfingen, and Gottfried Schneider, Stuttgart, both of Fed. Rep. of Germany, assignors to Deutsche Forschungsanstalt fuer Luft-und Raumfahrt e.V., Fed. Rep. of Germany
Filed Feb. 7, 1991, Ser. No. 652,325
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1990, 4003729
Int. Cl.[5] F02B *75/12*
U.S. Cl. 123—1 A **13 Claims**



1. Combustion engine for hydrogen comprising a main piston displaceable in a main cylinder in a stroke direction between a top dead center, forming a minimum main cylinder chamber with the main cylinder, and a bottom dead center and hereby performing a suction stroke, a compression stroke, a displacement stroke and an exhaust stroke, characterized in that an auxiliary piston (**44**) and an auxiliary cylinder (**42**) are provided for movement relative to one another so as to be in equal phase and synchronous with the main piston (**12**) and the main cylinder (**10**), that the auxiliary piston (**44**) and the auxiliary cylinder (**42**) define with one another a cylinder chamber (**66**) varying between a minimum cylinder chamber (**66*a***) in the top dead center and a maximum cylinder chamber (**66*b***) in the bottom dead center, that the minimum cylinder chamber (**66*a***) communicates with the minimum main cylinder chamber (**36*a***) via a passage (**68**) and that the hydrogen is injected into the cylinder chamber (**66**) during the course of the suction stroke.

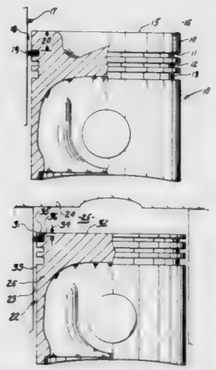
5,115,769
VIBRATOR
Emilio Fiorini, 1890 Valley Farm Road, Penthouse 10, Pickering, Ontario, Canada L1V 6B4 , assignor to Emilio Fiorini, Stouffville and Enzo Polsinelli, Richmond Hill, both of Canada
Filed Dec. 31, 1990, Ser. No. 636,247
Int. Cl.[5] A61H *1/00*
U.S. Cl. 128—32 **9 Claims**



1. Temple massage device comprising:
a resiliently bendable frame adapted to longitudually extend about the front of the head to locations respectively corresponding to the temple area of the wearer,
an adjustable length flexible strap connected to each end of the frame adapted to extend about the rear of the head to maintain said frame in position on said head,
means on said frame for contacting the head at the approximately centre of the forehead
a means on said frame adapted to contact each temple; rotary vibrating means for causing vibrations in directions radial to an axis transverse to the head of the wearer said means being located at the front of the frame,
power unit including battery and motor means for driving said vibrating means located on said frame,
wherein means are provided allowing adjusting of said temple contacting means forwardly and backwardly relative to said frame.

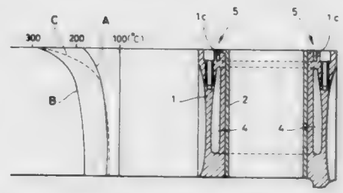
5,115,770
ALUMINUM CASTING ALLOY FOR HIGH STRENGTH/HIGH TEMPERATURE APPLICATIONS
Chia M. Yen, West Bloomfield, and Walter J. Evans, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 610,647, Nov. 8, 1990. This application Dec. 5, 1991, Ser. No. 802,594
Int. Cl.[5] C22F *1/04*; C22C *21/12*; F02F *3/00*
U.S. Cl. 123—193.6 **2 Claims**

1. A piston having a plurality of annular piston ring grooves and a crown, the ring groove most adjacent the piston crown being spaced therefrom by a wall having a thickness of 0.02–0.05 inches, said wall retaining its strength characteristics at combustion chamber temperatures when deployed in an internal combustion engine with little or no dimensional change, said piston being formed of an aluminum alloy consisting of, by weight, the following: 7.0–13.0% copper, 0.4–1.2% manganese, 0.21–0.40% vanadium, 0.31–0.70% zirconium, in which the levels of V and Zr raise the bulk lower solidification temperature of the alloy resulting in a narrower solidification range to reduce the tendency of forming shrinkage microporosity when cast in a mold, and impurities limited as follows: generally equal amounts of silicon and iron totaling less than 1.4%, up to 0.2% Zn, up to 0.1% Mg, up to 0.2% Ni, the remainder being essentially aluminum, said alloy having a



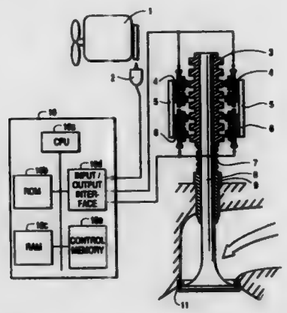
tensile strength of 33 ksi or greater when exposed to a temperature of 500 degrees Fahrenheit for at least 1000 hours.

5,115,771
METHOD OF COOLING CYLINDER LINERS IN AN ENGINE
Godo Ozawa, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Japan
PCT No. PCT/JP89/00886, § 371 Date Apr. 29, 1991, § 102(e) Date Apr. 29, 1991, PCT Pub. No. WO91/03632, PCT Pub. Date Mar. 21, 1991
PCT Filed Aug. 30, 1989, Ser. No. 684,954
Int. Cl.[5] F02F *1/10*
U.S. Cl. 123—41.72 **4 Claims**



1. An apparatus for cooling a cylinder liner in an engine, comprising:
a cylinder liner arranged in a cylinder block;
a thermal insulating channel formed in an upper portion of said block spaced from said cylinder liner for elevating the temperature on the wall surface of the cylinder liner at said upper portion; and
a coolant jacket formed in the cylinder block so as to surround a portion of said cylinder liner, the coolant jacket having an inlet port for coolant formed at a lower side of the cylinder liner and an outlet port formed at an upper side of the cylinder liner.

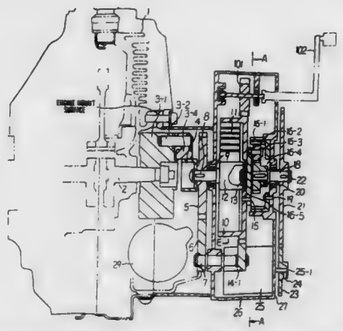
5,115,772
SYSTEM FOR ACTUATING VALVE IN STEPPED MOVEMENT
Hideo Kawamura, Kozu, Japan, assignor to Isuzu Ceramics Research Institute Co., Ltd., Fujisawa, Japan
PCT No. PCT/JP89/01335, § 371 Date Nov. 13, 1990, § 102(e) Date Nov. 13, 1990, PCT Pub. No. WO90/07638, PCT Pub. Date Jul. 12, 1990
PCT Filed Dec. 28, 1989, Ser. No. 571,529
Claims priority, application Japan, Dec. 28, 1988, 63-334960
Int. Cl.[5] F01L *9/04*
U.S. Cl. 123—90.11 10 Claims



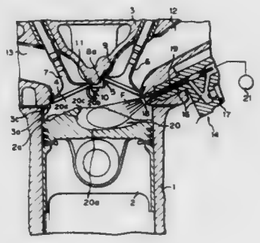
1. A system for actuating a valve, such as an intake and exhaust valve of an engine, in stepped movement, comprising:
a magnetic body coupled to the valve, said magnetic body being mounted for reciprocating movement with said valve and having a plurality of tooth-like magnetic poles juxtaposed at closely spaced equal intervals in the direction in which the magnetic body is reciprocally movable;
a plurality of fixed magnetic poles confronting said tooth-like magnetic poles, said fixed magnetic poles being closely spaced at intervals different from the intervals of said tooth-like magnetic poles in the direction in which the tooth-like magnetic poles are juxtaposed;
excitation coils wound around said fixed magnetic poles, for generating magnetic lines of force through said fixed magnetic poles; and
energization control means for energizing said excitation coils to open and close said valve by attracting to appropriate ones of said plurality of fixed magnetic poles, closely provided ones of said plurality of tooth-like magnetic poles.

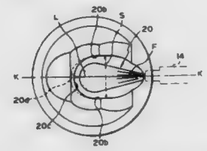
5,115,773
SPIRAL SPRING TYPE STARTER APPARATUS FOR AN INTERNAL COMBUSTION ENGINE
Ryuji Morishima, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 683,171, Apr. 9, 1991, which is a division of Ser. No. 458,374, Dec. 28, 1989, Pat. No. 5,083,534. This application Sep. 17, 1991, Ser. No. 761,247
Claims priority, application Japan, Apr. 5, 1989, 1-84708; Oct. 25, 1989, 1-123981[U]
Int. Cl.[5] F02N *5/02*
U.S. Cl. 123—179.24 1 Claim

1. A spiral spring type starter apparatus for an internal combustion engine, comprising power accumulator means including a spiral spring having its one end fixed to a starter shaft and the other end fixed to a power accumulator box, ratchet means provided respectively on the starter shaft side and on the power accumulator box side of said power accumulator means for maintaining a power accumulated condition in said spring and also enabling power input to said power accumulator box and power output from said starter shaft, a centrifugal type ratchet mechanism interposed between said starter shaft and a crank shaft of the engine, a motor adapted to be fed with electric power from a generator through a control circuit after starting of the engine, power transmission means for transmitting output power from said motor to said power accumulator box, and a hand operating crank adapted to be detachably engaged to a rotary drive shaft of said power accumulator box.



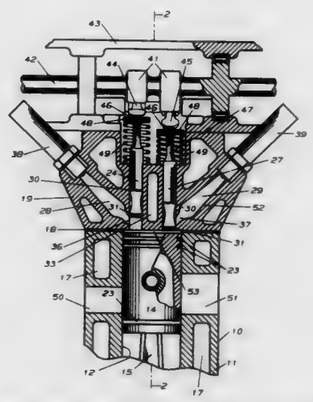
5,115,774
INTERNAL COMBUSTION ENGINE
Hiroshi Nomura, Susono; Norihiko Nakamura; Kenichi Nomura, both of Mishima; Tatsuo Kobayashi, and Hiroaki Nihei, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Jul. 26, 1991, Ser. No. 736,692
Claims priority, application Japan, Dec. 26, 1990, 2-406794; Dec. 26, 1990, 2-406817
Int. Cl.[5] F02B *19/10*
U.S. Cl. 123—276 11 Claims





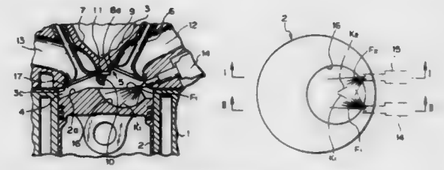
1. An internal combustion engine comprising:
a cylinder head having an inner wall;
a spark plug arranged at a central portion of the inner wall of said cylinder head;
an air blast valve arranged on a peripheral portion of the inner wall of said cylinder head; and
a piston having a top face having a depression extending from a point beneath said spark plug to a point beneath a tip portion of said air blast valve, said air blast valve injecting fuel together with pressurized air toward said depression in the form of a conical shaped spray of fuel at the compression stroke of the engine to direct said conical shaped spray of fuel toward said depression beneath said spark plug along a bottom wall of said depression, a longitudinal width of said depression in the moving direction of said conical shaped spray of fuel being larger than a transverse width of said depression in the direction perpendicular to the moving direction of said conical shaped spray of fuel, opposing side walls of said depression, which define said transverse width, being positioned slightly outward from a side face of said conical shaped spray of fuel.

5,115,775
INTERNAL COMBUSTION ENGINE WITH MULTIPLE COMBUSTION CHAMBERS
David J. Gruenwald, Hartford, Wis., assignor to Titan Marine Engines, Inc., Stillwater, Okla.
Filed Mar. 21, 1991, Ser. No. 674,174
Int. Cl.[5] F02B *19/02*
U.S. Cl. 123—292 5 Claims



1. In a two-cycle compression ignition engine including at least one cylinder, a reciprocable piston movable in said cylinder, a piston connecting rod, a crankshaft for operation of said piston connecting rod, a cylinder head enclosing said cylinder, the upper surface of said piston and the enclosing surface of said cylinder head defining a cylinder clearance volume, a first combustion chamber and a second combustion chamber located in said cylinder head, said combustion chambers being independently isolated from one another and from the clearance volume and each chamber defining a passageway in communication with said cylinder clearance volume, an independently operated throttle valve for each combustion chamber and arranged for opening and closing said passageway associated with its respective chamber, and control means for selective operation of a respective throttle valve; the improvement comprising means for isolating the combustion process for one full 360° rotation of said crankshaft; wherein the combustion chambers alternatively provide for expansion of combustion products in the respective chambers into the cylinder volume near top dead center upon each revolution of the crankshaft.

5,115,776
INTERNAL COMBUSTION ENGINE
Eishi Ohno, Mishima, and Tatsuo Kobayashi, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Jul. 29, 1991, Ser. No. 736,934
Claims priority, application Japan, Dec. 27, 1990, 2-407877
Int. Cl.[5] F02B *3/04, 19/16*
U.S. Cl. 123—299 12 Claims

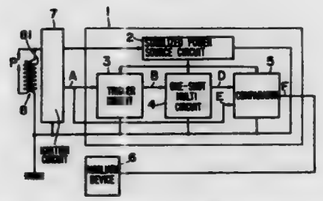


2. An internal combustion engine comprising:
a cylinder head having an inner wall;
a piston having a top face having a depression formed therein;
a first fuel injector arranged on the inner wall of said cylinder head;
a second fuel injector arranged on the inner wall of said cylinder head; and
control means for controlling an injecting operation of said first fuel injector and said second fuel injector in response to an engine load to inject fuel from said first fuel injector when said piston is at a first position and to inject fuel from said second fuel injector when said piston is at a second position which is lower than said first position, an axis of fuel injection of said first fuel injector being determined so that fuel injected from said first fuel injector is directed toward a central portion of said depression, and an axis of fuel injection of said second fuel injector being determined so that fuel injected from said second fuel injector is directed toward a central portion of said depression, wherein when the engine load is lower than a predetermined load only said first fuel injector injects fuel and when the engine load is higher than said predetermined load, said second fuel injector initially injects fuel and then said first fuel injector injects fuel.

5,115,777
METHOD AND APPARATUS FOR DRIVING AN AUXILIARY DEVICE OF AN INTERNAL COMBUSTION ENGINE
Yoshinori Ohki, Tokyo, and Hiroshi Mochizuki, Kanagawa, both of Japan, assignors to Iida Denki Kogyo Co., Ltd., Tokyo, Japan
PCT No. PCT/JP89/00609, § 371 Date Feb. 22, 1990, § 102(e) Date Feb. 22, 1990, PCT Pub. No. WO89/12740, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 19, 1989, Ser. No. 465,151
Claims priority, application Japan, Jun. 22, 1988, 63-154200
Int. Cl.[5] F02P *11/02;* F02D *41/22*
U.S. Cl. 123—333 8 Claims

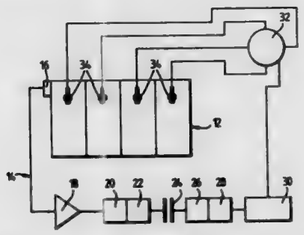
1. A method for driving an auxiliary device of an internal combustion comprising the steps of:
setting a time width of one cycle at a rated speed (N1) of an engine as a reference time (T1);
producing a reference signal (V1) during a time T1-T2, starting from a point (t2), said point (t2) is a fall point of a delay time (T2) started from a rise point (t0) of a primary current (i) of an ignition device of said engine;
stabilizing said reference signal by providing said reference signal as an output of a multivibrator circuit which is triggered in response to another multivibrator circuit which, in turn, is triggered in response to said primary current;

producing a search signal (V2) starting from said rise point (t0);
producing a drive signal (V4) during a time said reference signal (V1) of a preceding cycle and said search signal



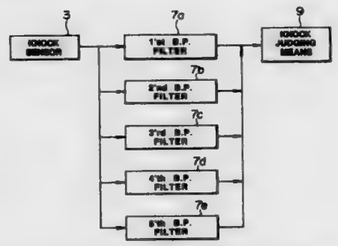
(V2) of a succeeding cycle are superposed on each other when said reference signal (V1) and said search signal (V2) are produced at the same time; and
applying said drive signal (V4) as a signal that drives said auxiliary device of said engine.

5,115,778
APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE
Trevor J. Holroyd, both of Derby, England, assignor to Stresswave Technology Limited, Derby, England
Filed Feb. 5, 1991, Ser. No. 651,017
Claims priority, application United Kingdom, Feb. 21, 1990, 9003878; Aug. 15, 1990, 9017867
Int. Cl.[5] G01L *23/22*; F02P *5/145*
U.S. Cl. 123—425 **14 Claims**



1. An apparatus for controlling an internal combustion engine comprising at least one acoustic emission transducer acoustically coupled to the internal combustion engine arranged to detect the acoustic emissions generating during the operation of the internal combustion engine and to produce an output signal corresponding to the level of the acoustic emission activity, means being arranged to rectify and envelope the transducer output signal to produce an electrical signal, means to remove the direct current component from the electrical signal, means to measure the alternating current component of the electrical signal, means to control the ignition timing of the internal combustion engine, means being arranged to monitor the level of the alternating current component of the electrical signal, the monitoring means being arranged to send a feedback signal to the means to control the ignition timing of the internal combustion engine to adjust the ignition timing to increase efficiency of the internal combustion engine.

5,115,779
ENGINE KNOCK DETECTING SYSTEM
Hiroyuki Itoyama, Kanagawa, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan
Filed May 31, 1991, Ser. No. 708,274
Claims priority, application Japan, Jun. 11, 1990, 2-149783
Int. Cl.[5] F02P *5/145*; F02D *41/04*
U.S. Cl. 123—425 **7 Claims**

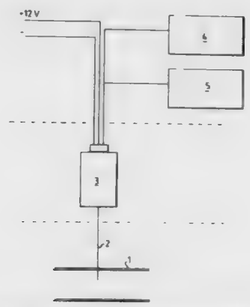


1. An engine knocking detecting system comprising:
an engine vibration sensing means which produces a signal which represents a vibration of an engine;
an engine speed sensing means which produces a signal which represents the speed of the engine;
parallel arranged band-pass filters to which the vibration representative signal from said engine vibration sensing means is fed simultaneously, said band-pass filters having respective pass-bands which are not overlapped; and
knocking judging means for judging whether the engine is under knocking or not by analyzing the output signals issued from said band-pass filters and the engine speed representative signal from said engine speed sensing means,
wherein said knocking judging means includes:
means for deriving respective power spectrum gains of the output signals of said band-pass filters at each engine speed;
means for adding said power spectrum gains to obtain a sum total; and
means for comparing said sum total with a reference gain.

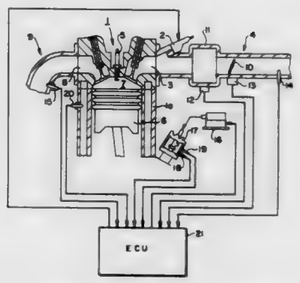
5,115,780
ARRANGEMENT FOR RESTRICTING THE TEMPERATURE OF COMBUSTION ENGINE EXHAUST GASES
Nils Jönsson, Stocksund, and Mats Dahlgren, Lidingö, both of Sweden, assignors to Nira Automotive AB, Enebyberg, Sweden
PCT No. PCT/SE89/00338, § 371 Date Nov. 29, 1990, § 102(e) Date Nov. 29, 1990, PCT Pub. No. WO89/12739, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 13, 1989, Ser. No. 613,570
Claims priority, application Sweden, Jun. 14, 1988, 8802226
Int. Cl.[5] F02D *41/04*; F02M *25/02*
U.S. Cl. 123—478 **8 Claims**

1. Device for limiting exhaust gas temperature in an internal combustion engine having an exhaust manifold, comprising means for supplying a cooling medium to the combustion chamber of the engine, temperature-sensing means (2) protruding into an exhaust gas conducting conduit (1) for sensing the temperature in the exhaust manifold, said temperature-sensing means being coupled to a control unit (3) for sending an exhaust gas temperature-dependent signal to the control unit, said control unit being coupled to said cooling medium supplying means (4; 7) so as to supply a certain amount of cooling medium at a first exhaust gas temperature level and to successively increase the amount of cooling medium at increasing exhaust gas temperatures above the first level to a certain

maximum amount of cooling medium at a second exhaust gas temperature level, said supply of cooling medium being dependent only on the exhaust gas temperature in the exhaust manifold.

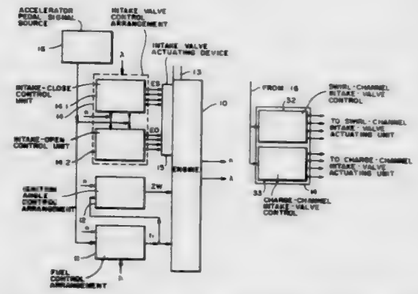


5,115,781
AIR-FUEL RATIO CONTROLLER FOR INTERNAL COMBUSTION ENGINE
Noriaki Kurita, Nagoya; Masakazu Ninomiya, and Kazunori Kishita, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Continuation of Ser. No. 406,725, Sep. 12, 1989, abandoned. This application Apr. 30, 1991, Ser. No. 693,092
Claims priority, application Japan, Sep. 13, 1988, 63-229186
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—481 **22 Claims**



1. An air-fuel ratio controller for an internal combustion engine comprising:
an oxygen density sensor provided in an exhaust system of said engine for detecting an oxygen density in an exhaust gas of said engine and generating an output signal indicative thereof;
memory means for storing a plurality of predetermined non-linear relationships between a) an air-fuel ratio deviation, and b) said oxygen density sensor output signal, over an entire range;
air fuel-ratio deviation determining means for determining a current air-fuel ratio deviation by using said output of said oxygen density sensor and one of said plural predetermined non-linear relationships stored in said memory means;
control variable setting means for setting an air-fuel ratio control variable according to said deviation determined by said air-fuel ratio deviation determining means;
air-fuel ratio control means for controlling an air-fuel ratio of mixed gas to be supplied to said engine toward said desired air-fuel ratio according to said control variable set by said control variable setting means;
characteristic change detection means for detecting a change in an output characteristic of said oxygen density sensor for a predetermined air-fuel ratio by using said output of said oxygen density sensor; and
selection means for correcting said one of said plural predetermined non-linear relationships over said entire range corresponding to a detection result of said characteristic change detection means.

5,115,782
METHOD FOR CONTROLLING A SPARK-IGNITION ENGINE WITHOUT A THROTTLE FLAP
Christian Klinke, Pleidelsheim; Heinz Stutzenberger, Vaihingen/Enz, and Engelbert Tillhon, Lauffen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Dec. 10, 1990, Ser. No. 625,031
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1989, 3940752
Int. Cl.[5] F01L *9/04*; F02D *41/14, 37/00*
U.S. Cl. 123—489 **8 Claims**



1. A method for controlling a spark-ignition engine having a fuel control arrangement and being without a throttle flap and without an air-flow sensor or intake pipe pressure sensor, the method being carried out with an intake valve control arrangement for providing variable air intake valve opening durations and comprising the steps of:
detecting an engine speed signal having a value dependent upon engine speed;
detecting an accelerator pedal signal (γ) having a value dependent upon accelerator pedal position; and,
determining the air intake valve opening durations (ES−EÖ) and the fuel quantities (ti) in dependence upon corresponding values of the engine speed and accelerator pedal signals and applying said signals to said fuel control arrangement and to said intake valve control arrangement; and,
applying a lambda control signal λ to said fuel control arrangement to finely adjust the quantity of fuel injected in dependence upon the oxygen content of the exhaust gas.

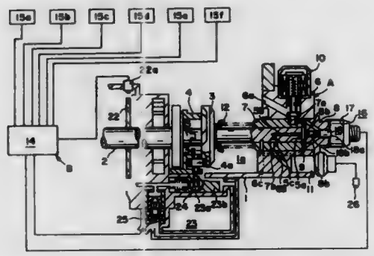
5,115,783
METHOD FOR VARYING THE FLOW RATE OF FUEL IN A DISTRIBUTOR-TYPE ELECTRONIC CONTROL FUEL-INJECTION PUMP
Hisashi Nakamura; Kenichi Kubo; Takashi Ohishi, and Hosokawa Hitoshi, all of Higashi-Matsuyama, Japan, assignors to Zexel Corporation, Tokyo, Japan
Filed Dec. 19, 1990, Ser. No. 623,655
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—496 **7 Claims**

1. In an fuel-injection pump including a signal plunger rotated in connection with rotation of an engine and reciprocatingly moved by a cam, a high pressure chamber extending axially of said plunger, said plunger being operable to pressurize fuel in said high pressure chamber so as to distribute the fuel

under pressure to each engine cylinder, a low pressure chamber communicated with said high pressure chamber through a spill passage, a single solenoid valve operable to open and close the spill passage in a manner to control the timing of initiating and terminating fuel delivery, and a timer operable to change the position of the cam as lifted when the fuel delivery is initiated, a method for varying the flow rate of fuel comprising the steps of:

a) operating said cam under four different modes, said modes including a low idle or low speed/low load zone I, a middle load zone II, a high load zone III, and a governing or high idle zone IV.

b) providing said governing or high idle zone IV between a zero cam speed and a certain cam speed, said high load zone III between the time when cam speed is maximum



and the time when cam speed is decreased after it has reached the maximum speed, said middle load zone II, and said low idle or low speed/low load zone I in that order as said cam is rotated;

c) fixing either one of a cam speed when the fuel delivery is initiated and a cam speed when the fuel delivery is terminated at said high load zone III, said middle load zone II and said low idle or low speed/low load zone I, and controlling the period of the fuel delivery by said solenoid valve so as to inject the necessary amount of fuel; and

d) closing said solenoid valve before said cam is lifted and opening said solenoid valve only when the fuel delivery is terminated so as to control the fuel delivery between the time when said cam is not lifted and the time when said valve is opened.

5,115,784

FUEL INJECTION SYSTEM

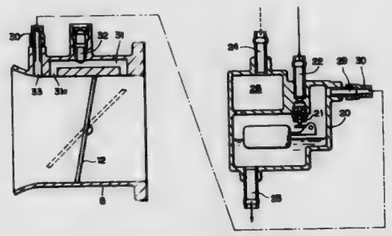
Mitsumasa Mito, and Keisuke Daikoku, both of Hamamatsu, Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jun. 21, 1990, Ser. No. 541,720

Claims priority, application Japan, Jun. 21, 1989, 1-56672; Jul. 31, 1989, 1-199023

Int. Cl.[5] F02M *34/00*

U.S. Cl. 123—516 **17 Claims**



1. A fuel injection system of an outboard motor in which a first fuel tank is disposed on an inboard side and a second fuel tank connected to the first fuel tank is disposed on an outboard side, the second fuel tank being constituted as a vapor separator, the system including an engine including an air intake passage means comprising a throttle body in which a throttle valve is disposed and an intake manifold to which a fuel injector is mounted, said system further comprising:

fuel make-up means connected to the vapor separator for supplying a make-up fuel;

fuel return means connected to the vapor separator;

fuel supply means connected to the vapor separator for supplying fuel to the fuel injector; and

vent means connected to the vapor separator, said vent means being connected to a vent port formed in the throttle body through a connection means on an upstream side of the throttle valve, the vent port opening to the interior of the throttle body at a location at which the speed of air flowing through the throttle body is highest.

5,115,785

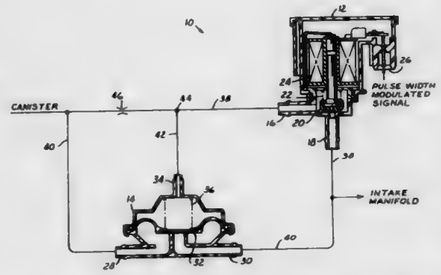
CARBON CANISTER PURGE SYSTEM

John E. Cook, Chatham, Canada, assignor to Siemens Automotive Limited, Chatham, Canada

Continuation-in-part of Ser. No. 517,285, May 1, 1990, abandoned. This application Mar. 25, 1991, Ser. No. 674,626

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—520 **16 Claims**



1. A canister purge system for purging collected volatile fuel vapors from a canister to the intake manifold of an internal combustion engine comprising a canister purge solenoid valve having an inlet, an outlet, and a valving means that is disposed in a passage between said inlet and outlet and imposes a selected restriction to flow through said passage in accordance with an electrical control signal delivered to the solenoid of the valve, and a normally-closed, vacuum-actuated valve having an inlet, an outlet, and a valving means that is disposed in a passage between the last-mentioned inlet and outlet and opens said last-mentioned passage to flow only for values of a vacuum signal input to a control port of said normally-closed, vacuum-actuated valve which exceed a certain minimum, first conduit means, including orifice means, for connecting the inlet and outlet of said canister purge solenoid valve to a canister and an engine intake manifold respectively, second conduit means for connecting the inlet and outlet of said normally-closed, vacuum-actuated valve to such a canister and engine intake manifold respectively, and third conduit means connecting the control port of said normally-closed, vacuum-actuated valve to a tap that is disposed in said first conduit means between said orifice means and said canister purge solenoid valve.

5,115,786

FUEL INJECTION CONTROL SYSTEM

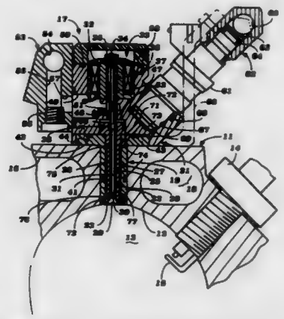
Akira Yamada, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 21, 1990, Ser. No. 633,101

Claims priority, application Japan, Dec. 27, 1989, 1-343769

Int. Cl.[5] F02M *67/00*

U.S. Cl. 123—531 **12 Claims**



1. A fuel injector for an internal combustion engine, said fuel injector comprising a chamber into which fuel is delivered, a nozzle port for communicating said chamber with said engine, an injector valve for controlling the flow through said nozzle port, means for determining whether said engine is running or not, and means for opening said injection valve when said engine has stopped for purging fuel from said chamber.

5,115,787

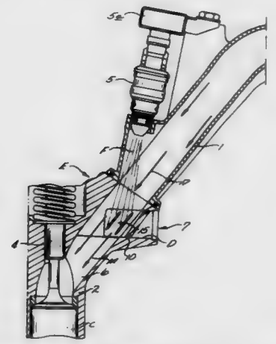
SPARK IGNITION COMBUSTION ENGINE OF THE FUEL INJECTION TYPE AND HEATING ELEMENT THEREFOR

Rikus von Pickartz, Al Borne, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 24, 1991, Ser. No. 764,580

Int. Cl.[5] F02M *31/00*

U.S. Cl. 123—549 **6 Claims**



1. A spark ignition combustion engine of the fuel injector type comprising at least one cylinder, an inlet duct for air, a fuel injector furnishing fuel to be mixed with the air to form an air-fuel mixture, a cylinder head having a passage leading from the air inlet duct to the cylinder, at least one inlet valve disposed on the cylinder head regulating flow of the air-fuel mixture to the cylinder, and a heating element having a heat sink with at least one tablet of electrical resistance material of positive temperature coefficient of resistivity thereon, the heating element being disposed in an opening in a wall of the air inlet duct or cylinder head passage between the fuel injector and the cylinder so that the heat sink thereof protrudes into the flow of the air-fuel mixture to the cylinder, characterized in that the heat sink comprises a hollow flat metal box having an integral connecting piece and has a groove formed in the connecting piece around the circumference thereof, the connecting piece being disposed in the wall opening and having an O-ring gasket means disposed in the groove sealing the opening.

5,115,788

SUPERCHARGING APPARATUS FOR INTERNAL COMBUSTION ENGINE

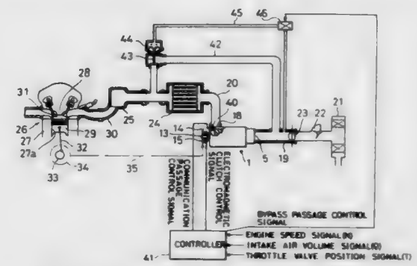
Junsou Sasaki; Hidefumi Fujimoto, and Noriyuki Iwata, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 26, 1990, Ser. No. 557,746

Claims priority, application Japan, Jul. 28, 1989, 1-196112

Int. Cl.[5] F02B *33/36*

U.S. Cl. 123—559.3 **17 Claims**



1. A supercharging apparatus for an internal combustion engine comprising:

a supercharger having an inlet opening and an outlet opening and being adapted to compress intake air relative to the engine in a compression area between the inlet opening and the outlet opening;

clutch means for engaging the supercharger with and disengaging the supercharger from driver means for driving the supercharger;

passage means for allowing the intake air to bypass said supercharger, said passage means being provided with valve means for closing the passage means;

relief means for at least partially relieving compression pressure in said compression area; and

control means for controlling said relief means and said valve means so that when said clutch means disengages the supercharger from the drive means, the relief means relieves the compression pressure and the valve means closes said passage means.

5,115,789

DIRECT INJECTION DIESEL ENGINE

Shunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Aug. 14, 1991, Ser. No. 744,584

Claims priority, application Japan, Aug. 16, 1990, 2-216165

Int. Cl.[5] F02M *25/07, 45/02;* F02B *3/08*

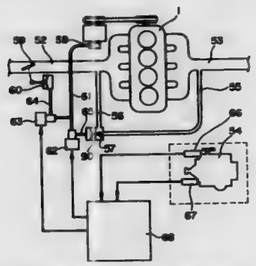
U.S. Cl. 123—569 **7 Claims**

1. A diesel engine having a combustion chamber formed by a cylinder and a piston into which high pressure fuel from a fuel injection pump is injected directly, comprising:

means for recirculating part of the exhaust gas into the air intake depending on the running condition of the engine,

a fuel injection valve supported in the cylinder head of said

cylinder substantially parallel to the cylinder axis and facing the center of said combustion chamber wherein, by lifting a needle valve in two stages according to the fuel pressure, said high pressure fuel is injected in stages into the combustion chamber from the injection nozzle,



a guide on said needle valve which slides on the inner circumference of said injection nozzle and guides said needle valve concentrically, and

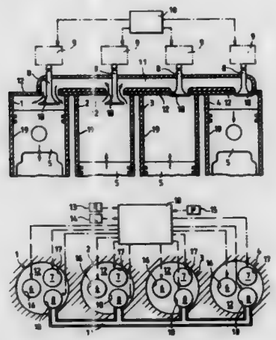
two air intake valves and two exhaust valves disposed symmetrically around the fuel injection nozzle.

5,115,790

RE-COMBUSTION CONTROL MEANS FOR ALCOHOL ENGINE

Hideo Kawamura, Kanagawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 4, 1990, Ser. No. 593,447
Claims priority, application Japan, Oct. 31, 1989, 1-281919
Int. Cl.[5] F02M *25/07*
U.S. Cl. 123—571 **8 Claims**



1. Re-combustion control means for an alcohol engine having a cylinder block provided with cylinders, a cylinder head secured to said cylinder block, pistons each reciprocating in said cylinders of said cylinder block, intake ports and exhaust ports formed in said cylinder head, and intake valves and exhaust valves disposed in said intake ports and exhaust ports, respectively, and designed to sequentially operate in four-cycle of intake, compression, expansion and exhaust strokes

said re-combustion control means comprising:

control valves disposed in said combustion gas ports,

a combustion gas passageway establishing communication between said combustion gas ports,

valve driving means for operating said intake, exhaust and control valves so as to be opened or closed by virtue of electromagnetic force, and

said engine has four cylinders, wherein any two selected cylinders of said four cylinders take thereinto suction air via said intake ports and discharge combustion gas into said combustion gas passageway via said combustion gas ports, wherein the other two cylinders take thereinto combustion gas in said combustion gas passageway via said combustion gas ports, and wherein re-combustion gas is discharged outside via said exhaust ports;

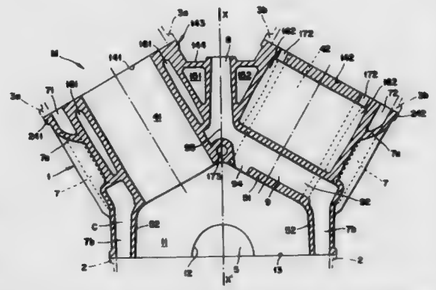
whereby said re-combustion control means is controlled such that alcohol fuel is burned with air introduced via said intake ports of the selected cylinders of said cylinders, that combustion gas from said selected cylinders is discharged into said combustion gas passageway by opening said control valves during an exhaust stroke, that combustion gas is then supplied into the other cylinders from said combustion gas passageway by opening said control valves of the other cylinders that are performing an intake stroke, so that said combustion gas so supplied is reburned in said other cylinders, and that combustion gas resulting from the re-combustion is then discharged outside by opening said exhaust valves of said other cylinders during an exhaust stroke.

5,115,791

ENGINE CRANKCASE WITH CRANKCASE GAS EXHAUST AND OIL RECIRCULATION SYSTEMS

Jacques Dore, Villiers Saint Frederic, France, assignor to Automobiles Peugeot, Paris; Automobiles Citroen, Neuilly Sur Seine and Regie Nationale des Usines Renault S.A., Boulogne-Billancourt Cedex, all of France

Filed Jul. 11, 1991, Ser. No. 728,706
Claims priority, application France, Jul. 11, 1990, 90 08844
Int. Cl.[5] F01M *13/00*; F02M *25/00*
U.S. Cl. 123—572 **5 Claims**



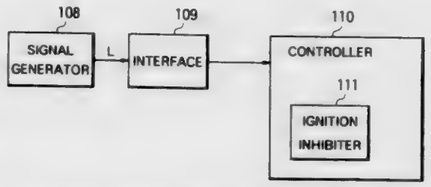
1. A crankcase for an internal combustion engine comprising a crankcase block having an upper part, a bottom, a plurality of piston cylinders, crankshaft bearings on the bottom, lower compartments separating the crankshaft bearings, internal conduits connecting the upper part of the crankcase block with the lower compartments separating crankshaft bearings, said internal conduits including internal exhaust conduits permitting exhaust of crankcase gases and internal recycling conduits for recycling of engine oil, said internal exhaust conduits and internal recycling conduits open into a chamber of a flattened shape, located adjacent to the lower compartments and traversed generally perpendicularly by the piston cylinders, said chamber and said internal conduits forming an as-cast system.

5,115,792

IGNITION CONTROL APPARATUS AND METHOD FOR AN INTERNAL COMBUSTION ENGINE

Wataru Fukui, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed May 14, 1991, Ser. No. 699,842
Claims priority, application Japan, May 17, 1990, 2-125481
Int. Cl.[5] F02P *9/00*
U.S. Cl. 123—613 **5 Claims**



1. An ignition control apparatus for a multi-cylinder internal combustion engine comprising:

a signal generator generating a crank angle reference signal and a cylinder identification signal in synchronism with the rotation of the engine, the crank angle reference signal having high and low levels which change at a first reference crank position and at a second reference crank position for each cylinder of the engine, the cylinder identification signal corresponding to a specific cylinder and being out of phase with respect to the crank angle reference signal; and

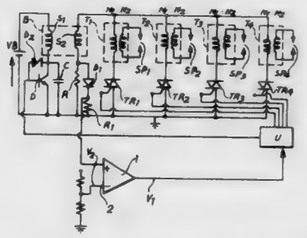
a controller for identifying the operating position of each cylinder on the basis of the crank angle reference signal and the cylinder identification signal, said controller controlling the ignition of each cylinder on the basis of the crank angle reference signal and the cylinder identification signal, said controller including an ignition inhibiter for stopping the ignition control for the cylinders if there is an abnormality in at least one of the crank angle reference signal and the cylinder identification signal.

5,115,793

IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES, PARTICULARLY FOR DETECTING SPARK FAILURE

Eraldo Giaccardi, and Alessandro Dassetto, both of Turin, Italy, assignors to Fiat Auto SpA, Turin, Italy

Filed May 23, 1991, Ser. No. 704,506
Claims priority, application Italy, May 23, 1990, 67376 A/90
Int. Cl.[5] F02P *5/155, 11/00*
U.S. Cl. 123—620 **7 Claims**



2. An ignition device for internal combustion engines, comprising:

mutual impedance means with a primary winding and a secondary winding, the secondary winding being intended to supply at least one ignition branch circuit having at least one spark plug,

excitation means for storing a given spark energy in the primary winding and transferring the energy rhythmically to the secondary winding, in which the at least one ignition branch circuit includes a respective voltage step-up transformer acting on the secondary winding and the at least one respective spark plug with respective activation means which can selectively cause the transfer of the spark energy to the voltage step-up transformed in order to carry out an ignition cycle,

amperometric means sensitive to the intensity of the current flowing through the secondary winding during the transfer of the spark energy to the at least one respective voltage step-up transformer, and

detector means connected to the amperometric means for detecting an absence of current flowing through the secondary winding when the spark energy is transferred, an absence of current being indicative of a spark failure,

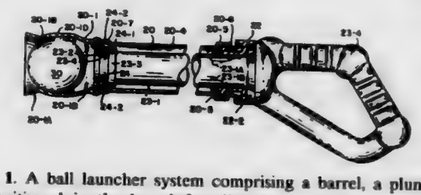
wherein said amperometric means are constituted by a resistor through which the current flows, and said resistor is connected to the secondary winding in series.

5,115,794

COMPRESSIBLE BALL LAUNCHER

Randall H. Moormann, Georgetown, Mass., assignor to Tonka Corporation, Minnetonka, Minn.

Continuation of Ser. No. 269,255, Nov. 9, 1988, Pat. No. 4,892,081. This application Nov. 7, 1989, Ser. No. 433,571
The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.
Int. Cl.[5] F41B *11/00*
U.S. Cl. 124—65 **1 Claim**



1. A ball launcher system comprising a barrel, a plunger positioned in the barrel for slideable motion therein, said plunger forms a seal between it and the inner diameter of the barrel, a compressible foam ball which will spring back substantially to its original shape after compression, the front portion of the barrel having a cavity for receiving said ball, said cavity having rigid constriction at the front thereof, said ball positioned in said cavity, said constriction having an internal diameter less than the external diameter of the ball, and said constriction having an internal diameter less than the largest inner diameter of the cavity to the rear thereof, a portion of said ball receiving cavity to the rear of said constriction also being larger in diameter than that diameter of said ball and a rear constriction in the barrel so that the ball can only be loaded into the cavity from the front open end of said barrel, and said plunger when moved towards said cavity first causes said ball positioned therein to be compressed against the rigid constriction and then causes said ball to move by said rigid constriction as it continues to be compress and then be expelled from said cavity.

5,115,795

CROSSBOW COCKING DEVICE

William M. Farris, Rt. #4, Box 198A, Booneville, Ark. 72927

Filed Aug. 16, 1990, Ser. No. 568,134
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—86 **5 Claims**

4. An apparatus for cocking a crossbow, said apparatus being separate and distinct from the crossbow, and comprising:

a) a stable base (**34**),

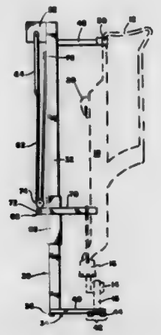
b) an elongated member (**30**, **32**) extending upwardly from

said base (34) for a distance approximating the length of a crossbow,

c) stabilizers (48, 50) located at the upper end of said elongated member (30, 32) adapted to receive the stock of a crossbow therebetween,

d) securement means (15) passing about said base (34) and extending upwardly from said base (34) and adapted to pass around an anchor (14) of a crossbow retained within the stabilizers (48, 50),

e) a tube (68) slidably mounted on said elongated member (30, 32) for movement therealong,



f) fingers (70) projecting parallel to said stabilizers (48, 50), said fingers (70) adapted to engage the string of a crossbow,

g) a bracket (52) secured to the upper end of said elongated member, and

h) force multiplying means secured between said bracket and said fingers (70) for shifting said tube (68) along said elongated member (30, 32) until the bowstring of a crossbow is fully cocked.

5,115,796

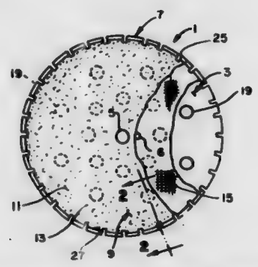
DIAMOND ABRASIVE SAW BLADE AND METHOD OF DRY SAWING CONCRETE

Karl B. Schweickhardt, 179 Spring Oaks Dr., St. Louis, Mo. 63011

Division of Ser. No. 405,100, Sep. 8, 1989, Pat. No. 4,962,748, which is a continuation of Ser. No. 118,858, Nov. 9, 1987, abandoned. This application Sep. 20, 1990, Ser. No. 584,980

Int. Cl.[5] B28D *1/04*

U.S. Cl. 125—13.01 **2 Claims**



1. The method of dry cutting concrete or masonry materials without the use of a coolant liquid comprising the steps of:

mounting a circular abrasive saw blade on a rotary drive shaft of a power driven saw, said saw blade having a flat, circular metal plate including a central mounting hole and a diamond abrasive matrix rim on the outer periphery of said plate, said plate having a coating applied to at least one face thereof;

rotating said blade in one rotary direction; and

moving the diamond abrasive matrix rim of said saw blade into working engagement with said work to be sawed and moving said saw along a desired path so as to cut said work without the application of a cooling liquid to said saw blade and so as to maintain tension on said metal plate during said dry cutting of said concrete.

5,115,797

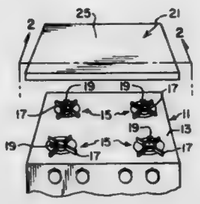
STOVE TOP COVER FOR A MOBILE VEHICLE STOVE

Wes D. Hurner, R.R. 2, Box 289, Glyndon, Minn. 56547

Filed Jul. 5, 1991, Ser. No. 726,240

Int. Cl.[5] F24C *15/10*; 126 *211*

U.S. Cl. 126—214 R **8 Claims**



1. Cover for the top of a mobile vehicle stove, said stove having a plurality of burners, each burner having mounted therearound a rack for supporting cooking utensils over said burner and having a central opening therein, said cover comprising:

a. generally rectangular platform with a generally planar top surface and a bottom; and

b. a plurality of leg members affixed to said platform bottom and projecting downwardly therefrom, each of said legs having a generally cylindrical configuration and a tapered portion and a cover of elastomer material, whereby said legs are adapted to be brought into releasably binding engagement with said central openings and to hold and support said platform and to hold said racks against vertical and lateral movement.

5,115,798

CONDENSATE TRAP

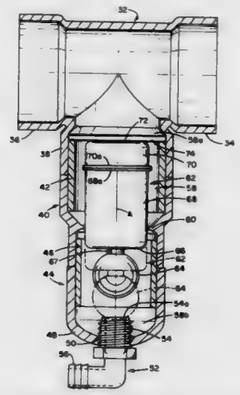
Henry J. Moore, Jr., Playa Del Rey, and Bijan Gidanian, Granada Hills, both of Calif., assignors to Mor-Flo Industries, Inc., Cleveland, Ohio

Filed Aug. 8, 1991, Ser. No. 742,329

Int. Cl.[5] F24H *1/00*

U.S. Cl. 126—351 **29 Claims**

1. A trap for condensate in combustion gases flowing through an exhaust gas conduit from gas fired forced draft liquid heating apparatus comprising, housing means providing a chamber having a condensate inlet open to said conduit and a condensate outlet below said inlet, valve means for opening and closing said outlet, and means responsive to the level of condensate in said chamber for actuating said valve means to open and close said outlet, said valve means including a valve seat and a valve element displaceable to engage and disengage said valve seat respectively to close and open said outlet, and said level responsive means including float means in said chamber for displacing said valve element toward and away from



said valve seat, and means separating and interconnecting said float means and said valve element.

5,115,799

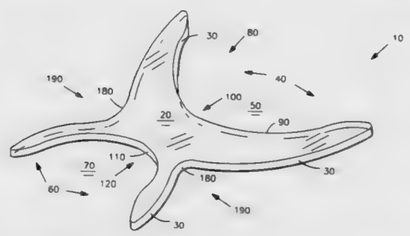
OCCLUSAL LIP AND CHEEK RETRACTOR

Benson D. McGann, 15 N. Vista de Catalina, South Laguna, Calif. 92677

Filed Jan. 15, 1991, Ser. No. 641,654

Int. Cl.[5] A61B *1/00*

U.S. Cl. 128—12 **5 Claims**



1. A dental lip and cheek retracting device comprising:

a rigid sheet having a peripheral edge, the peripheral edge forming a first pair of opposing prongs with a first space formed between said prongs, the peripheral edge also forming a second pair of opposing prongs with a second space formed between said second pair of opposing prongs, the first pair of prongs being larger than the second pair of prongs, the first space being larger than the second space, the first and second pairs of opposing prongs extending in opposite directions, each pair of opposing prongs forming a surface for pushing the lips and cheeks away from the teeth in order to expose the teeth and gums.

5,115,800

APPARATUS FOR ACHIEVING AND MAINTAINING PENIS ERECTION

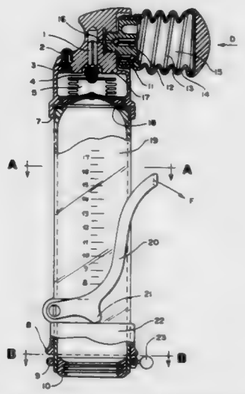
Nenad Matejevic, and Dragica Matejevic, both of Beograd, Yugoslavia, assignors to BVK Konsalting, Yugoslavia

Filed Sep. 5, 1990, Ser. No. 577,913

Claims priority, application Yugoslavia, Sep. 11, 1989, 1740/89

Int. Cl.[5] A61F *5/41*

U.S. Cl. 600—39 **9 Claims**



1. Apparatus for achieving and maintaining penis erection based on the effect of reduced air pressure on the external surface of the penis, said apparatus comprising an elongated tube (19) having an open end for receiving the penis and a closed end; a head (17) attached to said closed end of said tube; a vacuum source (15) attached to said head (17); a valve (4) in said head (17) for regulating air pressure in said tube (19), said valve (4) having a piston (1) which is in air communication with said vacuum source (15) through a small tube (16) for reducing air pressure in said elongated tube (15); a lower end of said valve (4) being movably connected to an elastic bellows (5) filled with gas in order to move said piston (1) which regulates the quantity of air pumped out through said small tube (16) by said vacuum source (15).

5,115,801

HYDROGEL BURN DRESSING PRODUCT

James V. Cartmell, Centerville; Michael L. Wolf, West Milton; Michael J. Allaire, Dayton, and Wayne R. Sturtevant, Centerville, all of Ohio, assignors to NDM Acquisition Corp., Minneapolis, Minn.

Filed May 2, 1990, Ser. No. 517,837

Int. Cl.[5] A61F *13/00, 15/00*; A61L *15/00*

U.S. Cl. 602—48 **5 Claims**



1. A burn dressing product for a burn, comprising:

a burn dressing including

a bacterial barrier layer having a first side and a second side,

a bonding layer coated on said first side of said bacterial barrier layer,

a reticulated layer being sufficiently absorbent to be impregnated with a polyurethane hydrogel material, said reticulated layer being selected from the group consisting of foams, scrim and non-woven materials, said reticulated layer having a first side and a second side, wherein said second side of said reticulated layer is secured to said bacterial barrier layer by means of said bonding layer, and

a polyurethane hydrogel material layer on said first side of said impregnated reticulated layer; and

a release liner overlying said hydrogel material layer and secured to said first side of said reticulated layer by means of said hydrogel material layer.

5,115,802

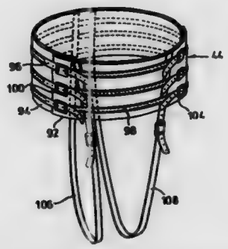
PELVIC HARNESS

Allan E. Dyer, Mississauga, Canada, assignor to Vat-Tech, Inc., Toronto, Canada

Division of Ser. No. 376,154, Jun. 30, 1989, Pat. No. 4,995,378, which is a continuation of Ser. No. 135,533, Dec. 17, 1987, abandoned, which is a continuation of Ser. No. 860,985, May 8, 1986, abandoned. This application Dec. 24, 1990, Ser. No. 633,010

Int. Cl.[5] A61H *1/02*

U.S. Cl. 602—33 **2 Claims**



1. A pelvic harness for use in applying traction to the lumbar region of a patient, comprising:

a wide pelvic belt for encircling the waist of a patient having an anterior portion and a posterior portion;

a pair of anterior strap means each having an end section attached to said anterior portion generally transversely of said anterior portion such that the end sections of said anterior strap means are attached in spaced relationship to each other;

a pair of posterior strap means each having an end section attached to said posterior portion transversely of said posterior portion such that, in use, the end sections of said posterior strap means are directly in line with the patient's spine and wherein said attached end sections of said pair of posterior straps are positioned closely adjacent each other relative to the spacing between said attached end sections of said pair of anterior strap means;

said posterior and anterior strap means having a sufficient length to extend from said pelvic belt to between the legs of a patient in use and including means for connection to a traction device for applying traction to the spine of a patient;

adjustment means between said anterior portion of said pelvic belt and said posterior portion of said pelvic belt for adjusting the circumference of said belt;

said attached end sections of said pair of anterior strap means being attached to said anterior portion of said pelvic belt such that they are inclined toward each other in the direction of said means for connection to a traction device and such that the maximum distance between said end sections of said pair of anterior strap means is such that, in use, said anterior strap means are positionable over the anterior superior spines of the Iliac crest of the pelvis of a patient, whereby said pair of anterior strap means may be positioned to pass over the anterior superior spines of the Iliac crest of the pelvic of the patient and said pair of posterior strap means positioned in line with the spine of the patient and the belt tightened on the patient such that said anterior strap means and said posterior strap means retain their positions.

5,115,803

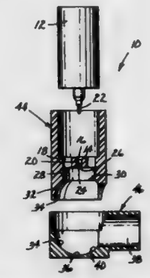
AEROSOL ACTUATOR PROVIDING INCREASED RESPIRABLE FRACTION

Constantinos Sioutas, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1990, Ser. No. 575,971

Int. Cl.[5] A61M *15/00*

U.S. Cl. 128—200.23 **17 Claims**



1. An aerosol actuator adapted to receive an aerosol canister having a hollow valve stem, comprising:

a nozzle block having walls defining at least one bleed hole and walls defining a valve stem receptacle having a socket for receiving the hollow valve stem of the aerosol canister, the socket having walls defining an orifice having a longitudinal axis through the nozzle block;

walls defining a conduit chamber in open communication with the orifice and the bleed hole, wherein the conduit chamber is substantially coaxial with the orifice and dimensioned such that it does not substantially reduce the velocity of an aerosol stream introduced via the orifice;

walls defining a deagglomeration chamber in the form of an arcuate surface in open communication with the conduit chamber and having a bottom point; and

walls defining an exit chamber in open communication with the deagglomeration chamber and having a longitudinal axis,

wherein:

the walls defining the exit chamber intersect the arcuate surface such that there exists, in the plane of the axes of the exit chamber and the orifice, a portion of the arcuate surface between the bottom point of the arcuate surface and the walls of the exit chamber;

the deagglomeration chamber has a greatest cross-sectional area, in the plane normal to the axis of the orifice, greater than the cross-sectional area of the conduit chamber in the plane normal to the axis of the orifice; and

the cross-sectional area of the exit chamber in the plane normal to its axis is less than the greatest cross-sectional area of the deagglomeration chamber in the plane normal to the axis of the orifice.

5,115,804

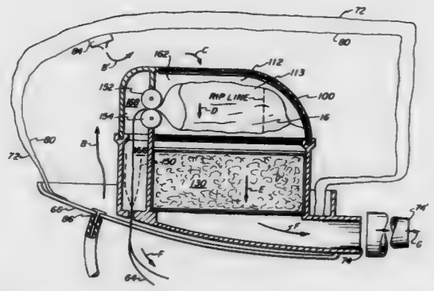
PROTECTIVE HOOD AND ORAL-NASAL MASK

Michael J. Brookman, Davie, Fla., assignor to DME Corporation, Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 81,834, Aug. 5, 1987, abandoned. This application Aug. 1, 1988, Ser. No. 226,624

Int. Cl.[5] A62B *17/04*

U.S. Cl. 128—201.22 **11 Claims**



1. A respiratory system for a user, said system being a generally passive unit, not requiring a generated source of pure oxygen, to directly meet respiratory requirements, comprising:

protective hood means constructed and arranged to cover and enclose the user's head and neck area,

said hood means fabricated of a non-flammable, gas impermeable material, said hood means including at least one viewing means made of generally rigid, transparent material located substantially in front of the user's eyes for providing a user wearing said hood means over the user's head with visibility outside said hood means,

whereby the user's eyes are protected from the effects of irritant gases and soot disposition resulting form toxic fire or the like, and whereby the user may see in a smoke filled atmosphere;

an oral-nasal mask means for a user, connected to said protective hood means,

said oral-nasal mask means for covering at least one of the user's air intake means,

said mask means fabricated of semi-flexible material and constructed and arranged to conform to the contours of the user's mouth and nose region to form a relatively tight seal around the user's air intake means,

whereby the user is protected from suffocation, asphyxiation, or other injury due to smoke or toxic gas inhalation, or aircraft rapid decompression;

means for holding said mask means in position on the user's face;

a chemical air purifier means for converting atmospheric air filled with hot smoke, noxious gas and other gases into temperate, breathable air;

said air purifier means being separate from, and independent of, said hood means, said air purifier means for constantly filtering said atmospheric air without the necessity of, or requirement for, said hood means, said air purifier means including an oxidation catalyst media, acid neutralizing media, and filtration media;

means for transporting atmospheric air to said air purifier means; and

means for connecting said mask means to said air purifier means, whereby clean air from said purifier means is transported to said mask means to be breathed by the user of said respiratory system.

5,115,805

ULTRASOUND-ENHANCED DELIVERY OF MATERIALS INTO AND THROUGH THE SKIN

Durairaj Bommannan; Hirohisa Okuyama; Richard H. Guy, all of San Francisco; Paul Stauffer, San Rafael, all of Calif., and Gordon L. Flynn, Ann Arbor, Mich., assignors to Cygnus Therapeutic Systems, Redwood City and The Regents of the University of California, Alameda, both of Calif.

Filed Feb. 23, 1990, Ser. No. 484,560

Int. Cl.[5] A61B *17/00*; A61M *37/00*

U.S. Cl. 128—24 AA **26 Claims**

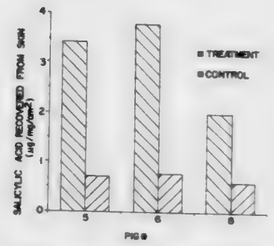


FIG 8

1. A method for enhancing the rate of permeation of a drug medium into a selected intact area of an individual's body surface, which method comprises:

(a) contacting the selected intact area with the drug medium; and

(b) applying ultrasound having a frequency of above 10 MHz to said selected area for a treatment time in the range of about 30 seconds to 60 minutes at an intensity effective to enhance the rate of permeation.

5,115,806

CONTINUOUS PASSIVE MOTION DEVICE FOR IMPARTING A SPIRAL MOTION TO THE DIGITS OF THE HAND

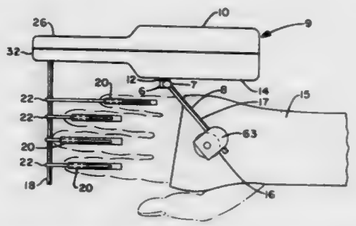
William Greuloch; Dan Shamir, and Mark W. Groves, all of Columbus, Ohio, assignors to Danninger Medical Technology, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 308,437, Feb. 9, 1989, Pat. No. 4,962,756. This application Feb. 1, 1990, Ser. No. 471,365

The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.

Int. Cl.[5] A61H *1/02*

U.S. Cl. 128—26 **10 Claims**

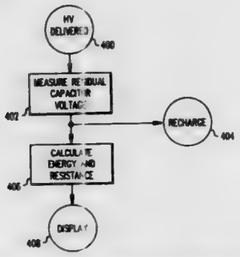


1. A portable device for causing motion of a distal point on a user's hand comprising:

an actuator capable of being mounted on and substantially supported by a user's arm and having an axis of rotation,

a link operatively joining said actuator to at least a point on said user's hand, said point being spaced from said axis of rotation, whereby engagement of said actuator causes said point to travel in a spiral about said axis of rotation.

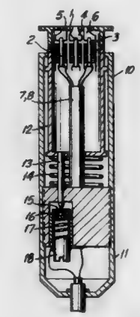
5,115,807
PROGRAMMABLE DEFIBRILLATOR WITH PULSE ENERGY AND RESISTANCE DISPLAYS AND METHODS OF OPERATING THE SAME
Benjamin Pless, Palo Alto; Michael Sweeney, Menlo Park, and Roger Winkle, Palo Alto, all of Calif., assignors to Ventritex, Sunnyvale, Calif.
Division of Ser. No. 464,655, Jan. 11, 1990, Pat. No. 5,014,697, which is a continuation of Ser. No. 301,729, Jan. 16, 1989, abandoned, which is a division of Ser. No. 863,181, May 14, 1986, Pat. No. 4,827,936. This application Jan. 7, 1991, Ser. No. 638,191
Int. Cl.[5] A61N *1/39*
U.S. Cl. 128—419 D **4 Claims**



1. An apparatus for determining and displaying the energy expected to be delivered during the delivery of a defibrillation pulse comprising:
means for storing electrical energy;
circuit means for delivering the energy in the storage means to the heart of a patient in the form of a pulse having a particular voltage level and width;
input means for setting the voltage level and width of the pulse and for entering the expected resistance of the patient;
means for calculating the estimated energy expected to be delivered from the storage means to the patient based upon the voltage level and width of the pulse, the expected resistance of the patient and the capacitance of the storage means; and
means for displaying the estimated energy.

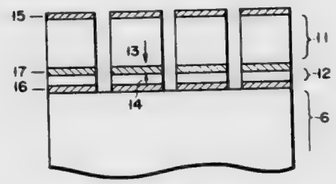
5,115,808
METHOD AND DEVICE FOR NONINVASIVE ACOUSTIC TESTING OF ELASTICITY OF SOFT BIOLOGICAL TISSUES
Goran Popovic, Belgrade, Yugoslavia; Armen Sarvazyan; Viktor Ponomarjev, both of Pushchino, U.S.S.R., and Dusan Vucelic, Belgrade, Yugoslavia, assignors to Institute of General and Physical Chemistry, Belgrade, Yugoslavia and Institute for Biological Physics of the USSR Academy of Science, Pushchino, U.S.S.R.
Continuation-in-part of Ser. No. 234,330, Aug. 18, 1988, Pat. No. 4,947,841. This application May 22, 1990, Ser. No. 526,818
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.02 **11 Claims**

1. A method of noninvasive testing of anisotropic elasticity of a tissue, comprising the steps of:
inducing on the surface of a tissue being tested a tangential oscillatory deformation;
measuring, out of all resulting oscillations of particles of the surface of the tissue being tested, only the oscillations which occur in the direction of the induced deformation; and



determining from a characteristic of said measured oscillations a Young's modulus for said direction and anisotropic characteristics of the elasticity of the tissue being tested.

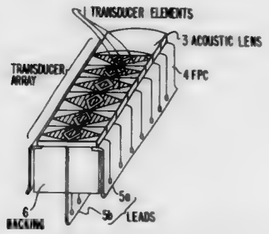
5,115,809
ULTRASONIC PROBE
Shiroh Saitoh, Yokohama; Mamoru Izumi, Tokyo; Syuzi Suzuki, and Shinichi Hashimoto, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 29, 1990, Ser. No. 500,945
Claims priority, application Japan, Mar. 31, 1989, 1-83704
Int. Cl.[5] A61B *8/14*
U.S. Cl. 128—662.03 **11 Claims**



1. An ultrasonic probe comprising:
a piezoelectric element having a plurality of piezoelectric layers laminated in a thickness direction with the polarized directions of the adjacent piezoelectric layers set opposite to each other and each having opposite end faces; and
electrodes formed on said opposite end faces of said piezoelectric layers in the laminated direction wherein the thickness of one of said plurality of piezoelectric layers which is located in an endmost position is set to a smallest value in comparison with that of the other adjacent piezoelectric layers.

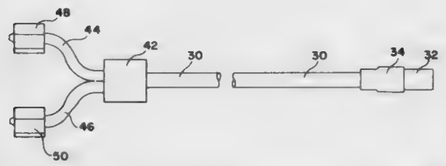
5,115,810
ULTRASONIC TRANSDUCER ARRAY
Kazuhiro Watanabe, Tokyo; Yasushi Hara, Kawasaki; Atsuo Iida, Yokohama; Takaki Shimura, Machida; Kiyoto Matsui; Hiroshi Ishikawa, both of Kawasaki, and Kenji Kawabe, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Oct. 30, 1990, Ser. No. 605,349
Claims priority, application Japan, Oct. 30, 1989, 1-282254
Int. Cl.[5] A61B *8/14*
U.S. Cl. 128—662.03 **23 Claims**

1. A piezo-electric ultrasonic transducer long in a Y direction and short in an X direction which is substantially orthogonal to the Y direction, said transducer having major surfaces substantially parallel to the X and Y directions, said transducer radiating ultrasonic power in a Z direction which is substantially orthogonal to the X and Y directions, the transducer comprising:
a plurality of electrodes on one of the major surfaces, said electrodes comprising:
at least one first electrode located on a center line along the Y direction length of said transducer, said first electrode having a first length in the Y direction, said first electrode having a first width in the X direction at a central portion of the first length and having a second width at the Y direction ends thereof, the first width being greater than the second width; and



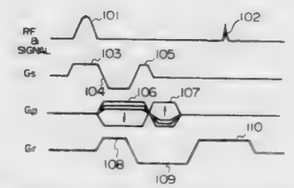
at least two second electrodes arranged respectively on both sides of the center line, outlines of said two second electrodes having outlines with a second length in the Y direction which is substantially greater than the first length, the outlines of said second electrodes having a third width at the central portion of the second length and having a fourth width at the Y direction ends thereof, the third width being greater than the fourth width,
said first electrode selectively providing an ultrasonic beam narrow in the Y direction at a first distance from said transducer, and said second electrodes being selectively connected to said first electrode so as to provide an ultrasonic beam narrow in the Y direction at a second distance substantially longer than the first distance.

5,115,811
TEMPERATURE MEASUREMENT AND COMPENSATION IN A FIBER-OPTIC SENSOR
Jerome T. Hartlaub, New Brighton; Jeffrey A. Schweitzer, St. Paul, and George P. Seifert, Shoreview, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Filed Apr. 30, 1990, Ser. No. 516,621
Int. Cl.[5] H61B *5/14*
U.S. Cl. 128—634 **7 Claims**



6. An apparatus for measuring a parameter of a test fluid, comprising:
a fiber-optic sensor including a dye which displays changes in optical properties correlated to changes in the parameter to be measured and in correlation to changes in temperature;
means for applying light to said sensor;
means for receiving light from said sensor, said means for applying and means for receiving together comprising means for measuring light received from said sensor at first, second and third wavelengths chosen such that said optical characteristics of said dye with respect to said first wavelength do not change significantly with changes in said parameter to be measured, said second and third wavelengths chosen such that said optical properties of said sensor at both said second and third wavelengths do change in both response to changes in temperature and changes in parameter to be measured; and
means responsive to said measurement of said light received from said sensor to provide a temperature corrected measurement of said parameter.

5,115,812
MAGNETIC RESONANCE IMAGING METHOD FOR MOVING OBJECT
Koichi Sano; Akira Maeda, both of Sagamihara; Tetsuo Yokoyama, Tokyo, and Hideaki Koizumi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 28, 1989, Ser. No. 441,972
Claims priority, application Japan, Nov. 30, 1988, 63-300490; Sep. 4, 1989, 1-227364
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653.2 **9 Claims**



1. A magnetic resonance imaging method for a moving object comprising the steps of:
exciting spins within a particular area of an object to be detected;
applying a bipolar phase encoding magnetic field including a phase encoding magnetic field for giving the spins a phase shift and an inverted phase encoding magnetic field having an inverted polarity and a same amplitude of the phase encoding magnetic field, the inverted phase encoding magnetic field being applied after the phase encoding magnetic field;
measuring a one-dimensional echo signal while applying a readout gradient magnetic field;
measuring a two-dimensional echo signal by repeating the step of exciting to the step of measuring the one-dimensional echo signal while applying the bipolar phase encoding magnetic field such that at least one of the amplitude and application time of the bipolar phase magnetic field is changed at each application so as to generate a desired encoding quantity and to make the first order moment of a gradient magnetic field generated by the bipolar phase encoding magnetic field zero; and
reproducing an image by using the measured two-dimensional echo signal.

5,115,813

ULTRASOUND METHOD AND APPARATUS FOR EXAMINING DENSE TISSUES, IN PARTICULARLY DENTAL TISSUE

Kimmo Ylander, Forssa, and Pentti Mattila, Tampere, both of Finland, assignors to Hollming Oy, Rauma and Parma Oy, Forssa, both of Finland

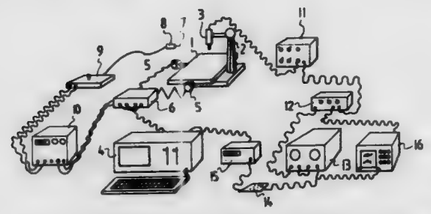
PCT No. PCT/FI88/00170, § 371 Date Apr. 12, 1990, § 102(e) Date Apr. 12, 1990, PCT Pub. No. WO89/03195, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 14, 1988, Ser. No. 469,441

Claims priority, application Finland, Oct. 14, 1987, 874523

Int. Cl.[5] A61B *8/00*

U.S. Cl. 128—660.01 **11 Claims**



1. An ultrasonic method for examining an ultrasonic medium including dense tissues, said method being repetitively performed at periodic intervals, comprising the steps of:

generating a high-frequency ultrasonic pulse by means of an ultrasound source (36),

transmitting the ultrasonic pulse to an object (17) under examination,

converting echo signals returning from the object (17) into electrical signals,

determining the intensity and delay of returning echo signals in relation to the pulse transmitted to the object under examination,

generating an image of the measured object (17) under examination from the determined delay and intensity,

vibrating the measured object (17) or the ultrasound source (36) at a low frequency, and

wherein the converting step further includes detecting and extracting a signal level of the low-frequency vibration signal from the echo signal in order to reveal the location of interfaces of the vibrating object(17) from the delays of the maximum values of the detected low-frequency signal relative to the transmitted high-frequency ultrasonic pulse.

5,115,814

INTRAVASCULAR ULTRASONIC IMAGING PROBE AND METHODS OF USING SAME

James M. Griffith, Newport Beach; Paul J. Zalesky, Huntington Beach; James M. Gessert, Newport Beach; Viet P. Dinh, and James D. Passafaro, both of Santa Ana, all of Calif., assignors to InterTherapy, Inc., Costa Mesa, Calif.

Filed Aug. 18, 1989, Ser. No. 395,839

Int. Cl.[5] A61B *8/12*

U.S. Cl. 128—662.06 **52 Claims**

1. An ultrasonic imaging probe comprising:

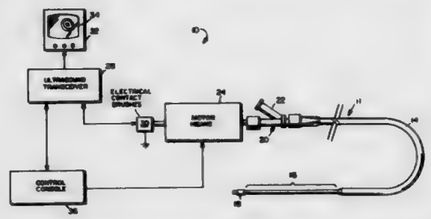
a guide catheter having an interior surface which defines a substantially cylindrical interior lumen;

transducer means adapted to being positioned within said lumen of said guide catheter for producing acoustical signals in response to an electrical stimulus and for generating electrical signals in response to receiving echoes of said produced acoustical signals; and

a flexible coiled torque cable means for rotating said transducer means coaxially relative to said guide catheter; wherein

said guide catheter interior surface provides bearing means for establishing a bearing support for said transducer means during said rotation thereof; and wherein

said flexible coiled torque cable includes at least one tether



fiber having its proximal and distal ends respectively fixed to proximal and distal ends of said flexible coiled torque cable, whereby longitudinal stiffness of said torque cable is increased.

5,115,815

OPHTHERMOMETRY: A METHOD OF MEASURING EYE TEMPERATURE FOR DIAGNOSIS AND SURGERY

Donald H. Hansen, 3923 Main, Davenport, Iowa 52803

Filed Sep. 18, 1990, Ser. No. 584,520

Int. Cl.[5] A61B *5/00*; **G01K** *5/22*

U.S. Cl. 128—664 **6 Claims**

1. A method of detecting eye abnormality in a subject due to abnormal blood flow comprising the steps of detecting and measuring temperatures of the eyes of the subject and comparing such temperatures with known temperature norms.

5,115,816

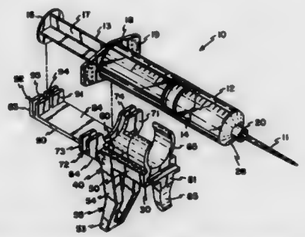
SINGLE-HAND CONTROLLED FINE NEEDLE ASPIRATION DEVICE

Peter F. Lee, Eden Prairie, Minn., assignor to Peter F. Lee, Inc., Edina, Minn.

Filed Jan. 24, 1991, Ser. No. 645,568

Int. Cl.[5] A61B *10/00*

U.S. Cl. 128—749 **7 Claims**



1. A disposable aspirating device comprising:

a. a plastic syringe barrel having an exterior wall, an interior wall, a distal end and a proximal end, said walls and said ends defining a hollow interior space having a predetermined volume, said distal end having an opening extending through a hub, said proximal end terminating at an outer rim;

b. a plastic plunger operative in said barrel, said plunger extending both within said barrel and external to said barrel proximal end and having an interior end sealingly received inside said barrel and an exterior end outside said barrel, said plunger being movable in said barrel inwardly toward said distal end and outwardly away from said distal end, thereby varying the volume of and pressure within said barrel interior space, said plunger including a pressure plate at said exterior end; and

c. a plastic finger grip assembly mounted to said syringe barrel and having a body member and a trigger member slidable within said body member, said body member having a syringe barrel holder section with an inner end, an outer end, a front surface and a back surface, a single outwardly projecting handle, and a trigger guide section between said handle and syringe barrel holder section, said trigger guide section includes opposing inwardly flanged side walls extending from said back surface of said syringe barrel holder section and defining a trigger member guide channel along said syringe barrel holder section, said handle extending outwardly from said trigger guide section and having an opening therein to accommodate trigger member travel through said handle and said trigger guide section, said trigger member having an inner surface, an outer surface, a first end and a second end, said trigger member including a single flange proximate said first end and a plunger withdrawal extension proximate said second end, said flange extending away from said outer surface in a substantially perpendicular direction a sufficient distance to support at least one finger of a user and said plunger withdrawal extension projecting away from said inner surface proximate said second end in a substantially perpendicular direction a sufficient distance to engage said plunger pressure plate so as to direct said plunger outwardly from said barrel when said flange is squeezed toward said handle, said trigger member flange further comprising an integral guide member extending along said outer surface toward said second end, said guide member cooperatively engaging said channel to facilitate linear movement of said trigger member in said trigger guide section.

5,115,817

BLOOD EXTRACTION DEVICE

Walter Sarstedt, Nümbrecht-Rommelsdorf, Fed. Rep. of Germany, assignor to Walter Sarstedt Geräte und Verbrauchsmaterial für Medizin und Wissenschaft, Nurmbrecht-Romelsdorf, Fed. Rep. of Germany

Filed Mar. 26, 1991, Ser. No. 675,638

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1990, 4036673

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—764 **5 Claims**



1. A blood extraction device comprising a cannula having a front end for insertion into the vein of a patient and a rear end;

a sample tubule having a front end and a closed rear end;

an inner tube located on an interior of the sample tubule, a front end of the inner tube being open and the rear end of the cannula communicating with the inner tube;

a cap releasably secured to the sample tubule so that the cap can be removed in an axial direction relation to the sample tubule, the cap closing the front end of the tubule;

means defining a vent communicating the front end of the tubule with an exterior thereof;

a self-closing, perforatable membrane mounted to the cap;

coupling means connecting the inner tube to the cap permitting limited, relative movement between the cap and the inner tube in an axial direction;

engagement means defined by the sample tubule adjacent the rear end thereof adapted to engage the rear end of the inner tube, a spacing between the engagement means and the membrane being selected so that the membrane engages the open end of the inner tube and biases the rear end of the inner tube into engagement with the engagement means to thereby form a seal between the membrane and the open end of the inner tube;

whereby axial movement of the cap relation to the sample tubule away from the rear end of the sample tubule first breaks the seal established between the membrane and the open end of the inner tube and, thereafter, the coupling means causes the inner tube to move with the cap in an axial direction.

5,115,818

IMPLANTABLE ELECTRODE

Timothy W. Holleman, Ham Lake, and Sandra F. Viktora, Coon Rapids, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 479,928, Feb. 14, 1990, Pat. No. 5,042,143. This application Jan. 10, 1991, Ser. No. 639,632

Int. Cl.[5] A61N *1/05*

U.S. Cl. 128—784 **4 Claims**



1. An implantable electrode lead comprising:

an elongated polyurethane lead body, an elongated space wound electrode coil fabricated from a conductive wire having a cross-sectional diameter, exposed to the exterior of said polyurethane lead body, said polyurethane lead body extending radially outward between individual turns of said electrode coil to a depth of approximately one-third or greater of said diameter of said wire; and

conductor means for coupling said electrode coil to an implantable medical device.

5,115,819

METHOD OF HOMOGENIZING THE CONSTITUENTS OF A TOBACCO STREAM

Waldemar Wochnowski, Hamburg-Meiendorf, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Dec. 19, 1990, Ser. No. 629,998

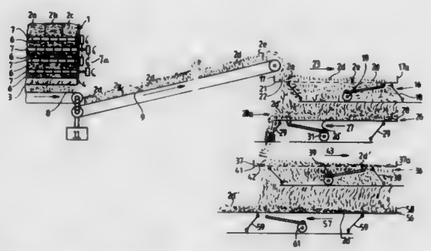
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1989, 3943085

Int. Cl.[5] A24B *1/04*

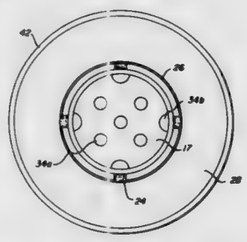
U.S. Cl. 131—109.3 **11 Claims**

1. A method of homogenizing an inhomogeneous accumulation of tobacco parts, comprising the steps of feeding the accu-

mulation onto a support having a plurality of openings so that all of the tobacco parts pass through and descend below the openings; and positioning a conveyor beneath the support so that the conveyor intercepts the descending tobacco parts.

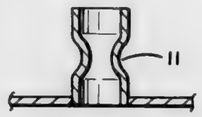


5,115,820
SMOKABLE ARTICLE
Bernhard Hauser, Schenefeld; Guillermo Gerding, Hamburg; Knut Möller, Hamburg; Bernd-Henrik Müller, Hamburg; Gert Rudolph, Hamburg, and Wolfgang Wiethaup, Hamburg, all of Fed. Rep. of Germany, assignors to B.A.T. Cigarettenfabriken GmbH, Hamburg, Fed. Rep. of Germany
Filed Mar. 19, 1990, Ser. No. 495,076
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1989, 3910059
Int. Cl.[5] A24D *1/00, 1/02, 1/18*
U.S. Cl. 131—194 **20 Claims**



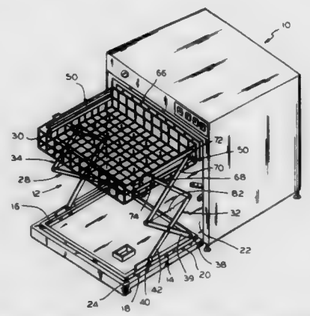
1. A smokable article, comprising:
an aerosol generating section which includes a combustion element and a carrier coaxially receiving said combustion element, said carrier having an aerosol precursor and being composed of porous material for passage of gasses therethrough, said combustion element having a plurality of axial passages along the entire length thereof;
a mouthpiece connected for communication with the gasses passing through said carrier, and
at least one outer sheath surrounding said carrier and said mouthpiece, said outer sheath being substantially impermeable to flow of the gasses passing through said carrier;
a jacket surrounding said combustion element, said jacket being composed of a gas-impermeable heat-insulating material;
a sleeve concentrically surrounding said jacket in spaced relationship to said jacket, said sleeve being composed of a gas-impermeable material, a flow space existing between said jacket and said sleeve, said flow space being in communication with said axial flow passages; and
said sleeve having an ignition side end which is open and a mouth side end, said mouth side end of said sleeve projecting beyond a mouth side end of said combustion element, said mouth side of said sleeve being closed by an interior mouth side end of said carrier such that a flow deflection space is formed to deflect a flow of gasses from said mouth side end of said combustion element to said flow space surrounding said sleeve.

5,115,821
CIGARETTE INCENSE ASHTRAY HOLDER
Dennis B. Grooms, Jr., 1075 Castleton Ave. 2C, Staten Island, N.Y. 10310
Filed Apr. 15, 1988, Ser. No. 182,241
Int. Cl.[5] A24F *19/00, 19/10*
U.S. Cl. 131—238 **2 Claims**



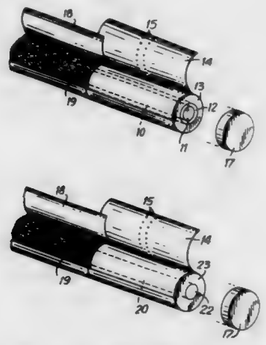
1. An ashtray comprising:
(a) ash receiving means having a base;
(b) at least one incense stick;
(c) at least one incense holding tube provided with a crimp for holding the incense stick;
(d) an attachment means for attaching said tube to the base of the ashtray.

5,115,822
DISHWASHER BASKET ASSEMBLY INCLUDING LIFT MECHANISM
Will E. Nichols, 250 Cassidy Rd., Bowling Green, Ky. 42101
Filed Mar. 20, 1991, Ser. No. 672,451
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—135 **14 Claims**



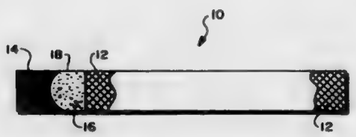
6. A lower basket assembly for a dishwasher comprising:
a frame including means for moving said frame between a position within said dishwasher and a position external of said dishwasher supported on an inner surface of a door of said dishwasher when in an open horizontal position;
a lower basket for holding dishes; and
means for attaching said lower basket to said frame adapted to selectively position said lower basket in a lower position adjacent said inner surface of said door and in a position elevated from said inner surface of said door with said frame positioned on said inner surface of said door.

5,115,823
FLAVOR-ENHANCING SMOKING FILTER
Gus D. Keritsis, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Dec. 20, 1990, Ser. No. 630,481
Int. Cl.[5] A24D *3/04*
U.S. Cl. 131—336 **16 Claims**



1. A flavor-enhancing smoking filter comprising:
(1) a central filtering zone;
(2) an intermediate flavor-enhancing zone comprising a flavorant, having a surface providing for the substantially laminar flow of smoke and permitting the passage of none or a minority of the smoke drawn through the filter; and
(3) a peripheral filtering zone.

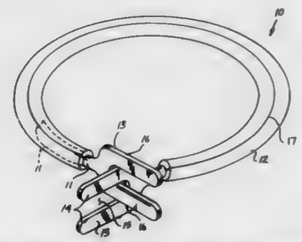
5,115,824
FILTRATION OF TOBACCO USING MOISTURE FREE, ELECTRICALLY NEUTRAL HYDROPHOBIC PARTICLES
Robert A. Marshall, Cambridge, Mass., assignor to Center For Applied Research, Inc., Cambridge, Mass.
Filed Sep. 27, 1990, Ser. No. 588,803
Int. Cl.[5] A24D *3/06*
U.S. Cl. 131—342 **24 Claims**



1. A tobacco smoking article comprising:
a combustible tobacco body to be burned to produce smoke, and,
a filter, placed at one end of said tobacco body, for trapping deleterious substances in the smoke, said filter comprising material that includes generally moisture-free, electrically neutral, hydrophobic particles with polar groups on the surfaces thereof.

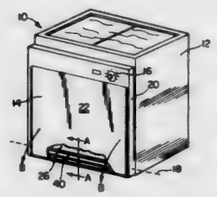
5,115,825
HAIR BAND HAVING TEMPERATURE SENSITIVE LIQUID CRYSTAL
Jessica E. Kuhn, 558 San Diego Ave., Hollywood, Pa. 19111
Filed May 17, 1991, Ser. No. 702,012
Int. Cl.[5] A45D *8/34*
U.S. Cl. 132—273 **1 Claim**

1. A hair band comprising,
a resilient elongate shaft formed of a memory retentent material, and
the shaft including a first end and a second end, the first end and second end include a first clip and a second clip, wherein the first clip and second clip are securable together in surrounding relationship relative to a hair grouping, and
a flexible sheath, the flexible sheath selectively securable to the shaft, wherein the shaft is defined by a first length and the tubular sheath is defined by a further length substantially equal to the first length, and
wherein the sheath includes an elongate slit coextensive with the sheath, wherein the slit permits insertion of the shaft within the sheath, and



wherein each clip includes a "U" shaped member, the "U" shaped member each including parallel legs defined by a predetermined width, and each of the parallel legs defined a gap, wherein the gap is defined by a width equal to the predetermined width, and each of the legs include a projection orthogonally laterally of each side edge of each gap to permit securement of the first clip and second clip together, and
wherein the sheath is transparent, and
wherein the sheath includes a tubular chamber formed within the sheath, the tubular chamber is filled with a temperature sensitive liquid crystal to effect color changing of the liquid crystal in response to ambient temperature proximate the sheath.

5,115,826
SPATTER SHIELD FOR DISHWASHER DOOR
Roger J. Bertsch, Lincoln Township, Berrien County, and Larry D. Marks, St. Joseph Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Oct. 23, 1990, Ser. No. 601,903
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—183 **4 Claims**



1. An apparatus for receiving at least one article and applying fluid to said article, said apparatus having a chamber wherein said article is received, an opening to said chamber, and a door pivotably mounted with respect to said chamber such that said door normally covers said opening when said fluid is being applied to said article and is pivotable away from said opening when said fluid is not being applied to said article, said door including a shield comprising:

a first flange means for deflecting fluid splashed toward said opening when said door is covering said opening, and

a channel at least partially shielded by said first flange means from said fluid splashed toward said opening,

said channel being formed and located such that any fluid within said channel is discharged into said chamber when said door is covering said opening and such that at least a portion of any fluid falling from said first flange means enters said channel when said door is pivoted away from said opening,

wherein said channel comprises a second flange means spaced apart from said first flange means and connected thereto by a bight portion, said second flange means being disposed beneath said first flange means and projecting into said chamber less than said first flange means when said door is covering said opening.

5,115,827

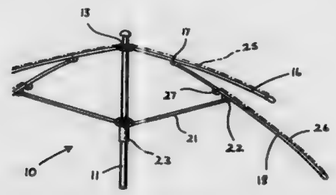
UMBRELLA WITH WIND ESCAPE APERTURE

Wen P. Lee, 39-12 51st St., Woodside Queens, New York City, N.Y. 11377

Continuation-in-part of Ser. No. 557,469, Jul. 25, 1990. This application Jan. 24, 1991, Ser. No. 645,133

Int. Cl.[5] A45B *25/20*

U.S. Cl. 135—33.7 **4 Claims**



1. An umbrella having a collapsible frame structure supporting a two-tier canopy and comprising:

a pole having a handle at a lower end and a ferrule adjacent an upper end;

a series of upper, canopy supporting ribs pivotally connected at inner ends to the ferrule to extend radially therefrom:

a series of lower, canopy supporting ribs having free, inner ends pivotally connected directly to respective upper ribs at medial locations thereon to extend radially outwardly beyond the upper ribs;

a ferrule runner slidably mounted on the pole;

a series of stretchers pivotally connected at inner ends thereof to the ferrule runner and at outer ends thereof to respective lower ribs at medial locations thereof;

an upper canopy having an outer perimeter affixed at intervals to outer ends of the upper ribs and a lower canopy having an outer perimeter affixed at intervals to outer ends of the lower ribs and an inner perimeter affixed at intervals to the lower ribs at locations thereof spaced apart from the upper ribs;

whereby movement of the ferrule runner up the pole to open the umbrella urges both upper and lower ribs upwardly and outwardly with flexure thereof into a curved configuration bracing the upper and lower canopies in taut, dome-like condition with the inner perimeter of the lower canopy spaced apart from the upper canopy material defining therebetween a continuous, annular, wind escape aperture and the upper and lower canopies in imbricating condition.

5,115,828

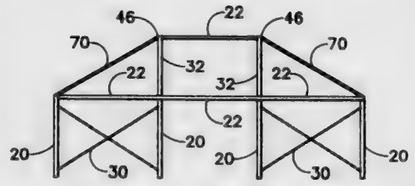
DEMOUNTABLE FRAME STRUCTURE

Stephen E. Spaulding, Coshocton, Ohio, assignor to Shaffer Tent & Awning Co., Coshocton, Ohio

Filed Mar. 18, 1991, Ser. No. 670,573

Int. Cl.[5] E04H *15/44*

U.S. Cl. 135—106 **5 Claims**



1. In a modular tent frame structure of the type including portable components readily assembled or disassembled in either one of a two or four hip roof design the combination of:

a) a plurality of vertical leg members and horizontal support members removably connected to one another to define a generally rectangular frame;

b) a plurality of supporting rafters removably connected between said generally rectangular frame and one or more crown connecting means to define at least a roof frame including at least two opposing hip roofs;

c) said crown connecting means including a pair of outwardly extending, opposing tongue portions, each of said portions conformed to be removably telescoped within one end of one of said supporting rafters and at least two sets of three open bracket receptacles, each of said sets extending outwardly in opposing directions relative to one another;

d) and wherein the remaining ones of said rafters include hook-like connectors disposed at their opposing ends, at least one of said hook-like connectors of each of said remaining rafters being removably received in at least a respective one of said three bracket receptacles of one of said sets of bracket receptacles to form at least one of said plurality of hip roofs.

5,115,829

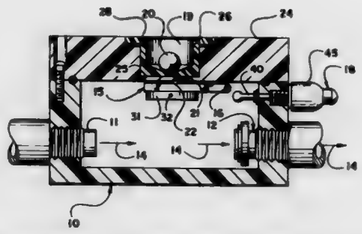
SEISMICALLY TRIGGERED VALVE

Richard E. Franzke, North Fork, Calif., assignor to Ralph R. Swenson, Modesto, Calif., a part interest

Filed Jun. 28, 1991, Ser. No. 723,461

Int. Cl.[5] F16K *17/36*

U.S. Cl. 137—38 **7 Claims**



1. An automatically operable valve comprising a valve body, an entrance port for admitting fluid to said valve body, and an exit port for allowing fluid to exit from said valve body, a valve member for closing said exit port, said valve member being movable from a first position in which said exit port is open to a second position in which said exit port is closed, seismically sensitive magnetic means for holding said valve member in said first position, said valve member being movable to said second position by gravity, and mechanical means for moving said valve member from said second position to said first position, said seismically sensitive magnetic means including a magnet carried by said valve member, a concave surface having an apex at its lowest point, said apex being juxtaposed over said magnet carried by said valve member when said valve member is in said first position, and a ferromagnetic ball received on said concave surface.

5,115,830

VALVE DEVICE, PARTICULARLY A VENTILATION VALVE FOR THE VENT PIPE OF A VEHICLE FUEL TANK

Bo Harde, Göteborg, Sweden, assignor to AB Volvo, Goteborg, Sweden

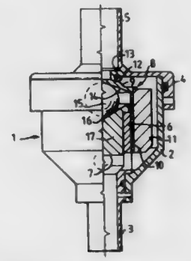
PCT No. PCT/SE89/00622, § 371 Date Apr. 25, 1991, § 102(e) Date Apr. 25, 1991, PCT Pub. No. WO90/05259, PCT Pub. Date May 17, 1990

PCT Filed Nov. 1, 1989, Ser. No. 678,344

Claims priority, application Sweden, Nov. 2, 1988, 8803983

Int. Cl.[5] F16K *17/36*

U.S. Cl. 137—39 **4 Claims**



1. Valve device, comprising a valve housing (1) with an inlet (3) and an outlet (5), a valve seat (13) and a valve closing member (8) movable in said housing between open and closed positions and having a sealing surface, which in the closed position of the valve closing member (8) is in contact with the valve seat to prevent liquid from flowing through the outlet, said valve closing member interacting with means (15, 17) which responsive to tilting of the valve housing, relative to a predetermined position, move the valve closing member to its closed position, said valve closing member being fixed to a float (11), which, as the liquid level rises in the housing (1) in its predetermined position, lifts the valve closing member towards its closed position, the weight of said means (15, 17) being adapted to the lifting force of the float, so that the valve body, when the housing is filled with liquid and has been turned 180° from the predetermined position, is held in its closed position, the valve closing member (8) being coordinated with a movably mounted plunger element (17), which is disposed at a certain liquid flow through the inlet (3) to lift the valve closing member to its closed position.

5,115,831

ADAPTIVE STEPPED COMPENSATOR VALVE

Mrk S. Stroze, Rockford, and Kenneth C. Spurbeck, Stillman Valley, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 12, 1991, Ser. No. 653,948

Int. Cl.[5] F01B *13/00*

U.S. Cl. 137—102 **16 Claims**

1. An adaptive stepped compensator valve for controlling hydromechanical control apparatus having high and low pressure control lines, said valve comprising

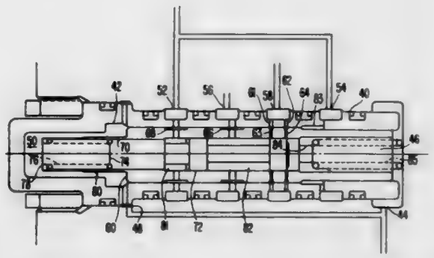
a housing having an elongated bore formed therein;

a plurality of ports are formed in said housing including a first input port for inputting a first portion of high pressure fluid flowing in said high pressure control line at a first end of said elongated bore, a second input port for inputting a second portion of said high pressure fluid flowing in said high pressure control line at a second end of said elongated bore, a third input port, disposed between said first and second input ports, for inputting a portion of low pressure fluid flowing in said low pressure control line, a control port, disposed between said first and second input ports, for outputting a control signal to control said apparatus and stroke and destroke control ports which communicate with said control port;

a sleeve movably positioned in an axial direction in said elongated bore and being disposed in sealed slidable engagement with said housing, said sleeve having an opening formed therein extending the length of said sleeve, a third channel which communicates with said third input port and stroke and destroke control channels which correspondingly communicate with said stroke and destroke control ports; and

direct acting main and balance spools;

said main spool having a first end and being movably positioned in an axial direction in said opening of said sleeve and disposed in sealed slidable engagement with said sleeve to form a first chamber in said first end of said elongated bore, wherein said main spool controls the flow of fluid through said control port by opening said stroke control channel and closing said destroke control channel



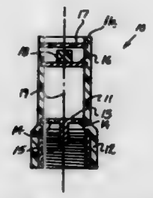
or opening said destroke control channel and closing said stroke control channel, wherein said high pressure fluid being inputted by said first input port generates a first force in said first chamber, said first force is applied to said main spool in a first direction;

said balance spool, having a first end which abuts a second end of said main spool, and being movably positioned in an axial direction in said opening of said sleeve and disposed in sealed slidable, engagement with said sleeve to form a second chamber in said second end of said elongated bore, wherein said high pressure fluid being inputted by said second input port generates a second force in said second chamber, said second force is applied to said balance spool in a second direction;

wherein said portion of said low pressure fluid inputted by said third input port generates forces in a third chamber formed by said second end of said main spool, said first end of said balance spool and sleeve; and

wherein a difference in pressure between said high pressure fluid and said low pressure causes axial movement of said main and balance spools thereby permitting fluid to flow through said stroke control channel or said destroke control channel, whereby said valve adapts to varying pressures by axial movement of said sleeve and said valve is balanced by using high pressure fluid in said first and second chambers at opposite ends of said valve.

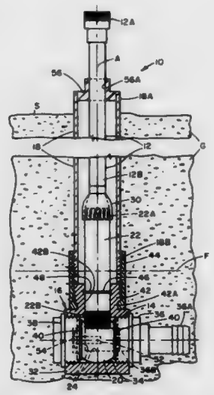
5,115,832
TIRE PRESSURE GAUGE AND CAP APPARATUS
John S. Higdon, 1007 S. 34th Ave., Yakima, Wash. 98902, and Douglas W. Capen, 326/204 Highland Dr., Glen Burnie, Md. 21061
Filed Jul. 19, 1991, Ser. No. 733,176
Int. Cl.[5] B60C *23/02*
U.S. Cl. 137—227 **1 Claim**



1. A tire pressure gauge and cap apparatus, comprising,
a body tube, the body tube including a lower terminal end and an upper terminal end, the lower terminal end including an internally threaded cylindrical skirt fixedly and coaxially mounted to the lower terminal end of the body tube, and
a cylindrical web fixedly mounted within the body tube adjacent the lower terminal end, with the cylindrical web including a plurality of apertures directed therethrough, the cylindrical web formed of a rigid material and including an axle rod fixedly, orthogonally, and coaxially mounted to the cylindrical web projecting downwardly therefrom within the skirt, and
a flexible web mounted within the body tube spaced from the upper terminal end of the body tube, and
a translucent rigid lens mounted within the body tube between the upper terminal end and the flexible web, whereupon deflection of the flexible web effects projection of the flexible web towards a bottom surface of the translucent lens, and
the flexible web is transparent and includes a rigid opaque boss member fixedly and coaxially mounted to a top surface of the flexible web, and
the translucent lens defines a convex lens projecting towards the upper terminal end of the tube, and
a transparent lens directed through the body tube between the cylindrical web and the transparent flexible web for directing illumination interiorly of the body tube and to the convex lens.

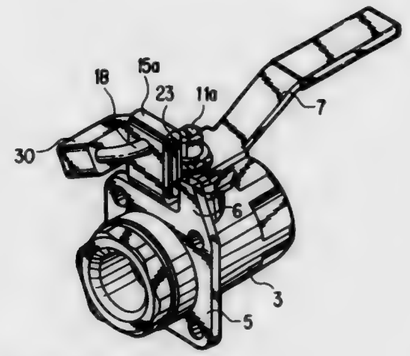
5,115,833
GROUND HYDRANT WITH NINETY-DEGREE WATER FLOW TURN-OFF BALL VALVE BELOW FROST LINE
Harold Himle, 6362 Chatterleigh Ave., West Valley City, Utah 84120
Filed Aug. 13, 1991, Ser. No. 744,303
Int. Cl.[5] E03B *7/12, 9/04*
U.S. Cl. 137—286 **18 Claims**

17. A ground hydrant, comprising:
(a) an elongated hollow water flow pipe extending from above the ground to below the frost line in the ground, said flow pipe having upper and lower opposite ends and a longitudinal axis;
(b) an elongated support pipe disposed around said flow pipe, said support pipe having upper and lower opposite ends, said support pipe at said upper end thereof defining a sliding seal with said flow pipe;
(c) a flow control valve having a generally spherical body, a generally right angle flow bore defined through said body and having an inlet orifice and an outlet orifice, and a hollow extension tube having opposite ends, said extension tube being attached at one of said opposite ends to said body at said outlet orifice thereof in flow communication with said right angle flow bore, said extension tube projecting outwardly from said body;
(d) a valve housing for positionable below the frost line in the ground, said valve housing having an inlet end for connection with a source of supply of water and an outlet end rotatably mounting said extension tube, said support pipe at said lower end thereof being attached to said valve housing, said valve housing mounting said control valve for movement between an opened position in which said inlet orifice of said valve body flow bore is aligned with said housing inlet end to permit communication of water from the source of supply thereof to said flow bore and a closed position in which said inlet orifice of said valve body flow bore is offset from said housing inlet end to block communication of water from the source of supply thereof to said flow bore; and
(e) means for coupling said lower end of said flow pipe to the other of said opposite ends of said extension tube such that by turning said flow pipe said control valve can be moved between the opened and closed positions, said coupling means being operable to permit attaching and detaching of said flow pipe to and from said control valve extension tube when said control valve is at its closed position;



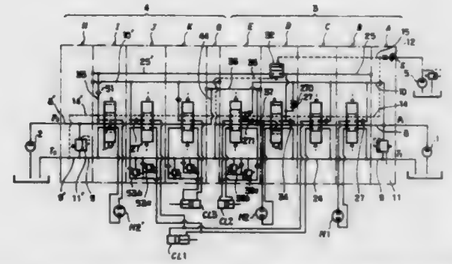
(f) said valve housing including a housing block having a pair of opposite circular-shaped axially-aligned openings and a cylindrical cavity extending through said housing block between opposite openings, said spherical body of said control valve being disposed in said cylindrical cavity of said housing block;
(g) said valve housing also including a circular-shaped stopper member extending into and attached within one of said opposite openings of said housing block so as to close said one opening and a circular-shaped inlet port member defining said inlet end of said valve housing and extending into and attached within the other of said opposite openings of said housing block so as to close said other opening, said stopper member and said inlet port member defining respective seats disposed within said cylindrical cavity in spaced apart facing relation to one another and sealingly engaging opposite sides of said spherical body of said control valve and disposing said spherical body in alignment with and for rotation between said opened and closed positions about an axis extending coaxial with said longitudinal axis of said flow pipe, said valve body and stopper member having interengaging means for limiting rotational movement of said valve body relative to said valve housing to between said opened and closed positions.

5,115,834
VALVE-LOCKING DEVICE
Raymond P. Champagne, Oxford, Mass., assignor to Neles-Jamesbury, Inc., Worcester, Mass.
Filed Oct. 8, 1991, Ser. No. 772,952
Int. Cl.[5] F16K *35/02, 35/06*
U.S. Cl. 137—385 **7 Claims**



1. A rotary valve comprising:
a valve body having a first bore therein for fluid flow, said valve body comprising a flange having a stop post;
a stem extending into a second bore in said valve body;
control means for controlling fluid flow in said first bore of said valve body, said control means being operatively connected to said stem and being disposed in said first bore;
a handle mounted on said stem for operating said control means between open and closed positions, said handle comprising an upwardly extending portion having a first hole therein; and
a freely slidable valve locking member, said valve locking member defining a substantially L-shape member, one leg of said L-shape member defining a folded portion and comprising second and third holes which are aligned with each other, the other leg of said L-shape member defining an opening;
wherein:
the valve locking member is slidably positioned on said stem such that said stem extends through the opening of the other leg of the valve locking member;
said handle is mounted on said stem above said valve locking member;
said upwardly extending portion of said handle extends between the folded portion of said valve locking member; and
said valve locking member is slidable about the valve stem along a distance defined by said opening between at least one locked position and at least one unlocked position;
said at least one locked position occurring when an abutting surface of a periphery of said other leg of the valve locking member abuts against said stop post and the first hole on the handle is aligned with the second and third holes on the folded portion of the valve locking member for permitting a lock means to pass between said first, second and third holes so as to lock said handle and said locking member in a predetermined position; and
said at least one unlocked position occurring when said first hole is not aligned with said second and third holes and the abutting surface of said other leg of the valve locking member is spaced away from said stop post thereby permitting movement of said handle.

5,115,835
STACKED TYPE HYDRAULIC CONTROL VALVE SYSTEM
Katsumi Ueno, Saitama, Japan, assignor to Zexel Corporation, Tokyo, Japan
Filed Jan. 22, 1991, Ser. No. 643,778
Claims priority, application Japan, Jan. 26, 1990, 2-14906; May 18, 1990, 2-126995
Int. Cl.[5] F15B *13/08, 13/09*
U.S. Cl. 137—596.13 **14 Claims**



1. A hydraulic control valve of the type comprising: a first direction change-over valve group 3 connected to a first hydraulic pump 1; and a second direction change-over valve group 4 connected to a second hydraulic pump 2, said first direction change-over valve group 3 including one connection plate A, one traveling section valve D and a plurality of working machine section valves B, C and E, said second direction change-over valve group 4 including one connection plate H, one traveling section valve I and a plurality of working machine section valves J and K, all of said section valves are stacked together with said connection plates, characterized:
(1) in that said connection plates A and H respectively include pump ports P_1 and P_2 to be fed with the discharged oil from said first hydraulic pump 1 and said second hydraulic pump 2, and tank ports T_1 and T_2 leading to tanks;
(2) in that the section valves B, C, D, E, I, J and K of said first change-over valve group 3 and said second change-over valve group 4 individually have communication passages 25 and 25' which are formed in their valve bodies near bridge passages 20 and 20' for causing the discharged oil of said second hydraulic pump 2 to merge into the discharged oil of said first hydraulic pump 1, and in that said bridge passage 20' and a communication passage 25' in the traveling section valve I of said second change-over valve group 4 are connected to each other through a check valve 51;
(3) in that said section valves B, C, D, E, I, J and K have their valve bodies formed therethrough with signal conduits 14 on line and at a right angle with respect to spool bores, in that both of said traveling section valves D and I are formed with annular grooves 142 which are formed in the bores of spools 19 and 19' in positions corresponding to said signal conduits 14 for providing communications between the upstreams and downstreams of said signal conduits 14 irrespective of the positions of said spools 19 and 19', in that said working machine section valves B, C, E, J and K other than said traveling section valves D and I are individually formed in their spool portions with annular grooves 141 for providing communications between the upstreams and downstreams of said signal conduits 14 only when said spools 19 and 19' are in their neutral states, and in that said signal conduits 14 have their most downstreams connected with tank passages 9' in the connection plate H of said second change-over valve group 4;
(4) in that the working machine section valves B and C and the traveling section valve D of said first change-over

valve group 3 are individually formed with operation signal conduits 15 said communication pasages 25 and said spool bores, and in that said operation signal conduits 15 have their upstreams communicating with the most upstreams of said signal conduits 14 in the connection plate A of said first change-over valve group 3; and

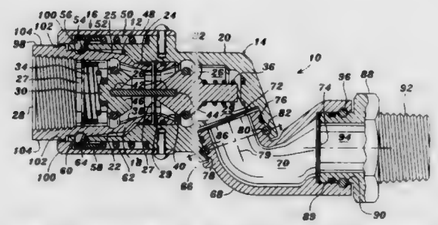
(5) in that said traveling section valve D has its valve body 30 formed with a vertical hole 31 which so extends at right angles with respect to said bridge passages 20 and said communication passage 25 as to reach said operation signal conduit 15, in that a communication valve 32 is fitted in said vertical hole 31, and in that said communication valve 32 normally blocks the communication between said communication passage 25 and said bridge passage 20 and is lifted, when the pressure in the operation signal conduit 15 is raised as a result of blocking said signal conduit 14 by operating the working machine section valve, to provide the communication between said communication passage 25 and said bridge, whereby the communication between the other communication passage 25' and said communication passage 25 is provided to introduce the discharged oil of said second hydraulic pump 2 into said bridge passage 20.

5,115,836

BREAKAWAY HOSE COUPLING WITH INTEGRATED SWIVEL MECHANISM

Walter M. Carow; Alton Richards, and Jerry L. Cox, all of Rusk County, Tenn., assignors to Richards Industries, Rockwood, Tenn.

Filed Jan. 15, 1991, Ser. No. 642,857
Int. Cl.[5] F16L *29/00*
U.S. Cl. 137—614.04 **19 Claims**



10. A breakaway hose coupling device with integrated swivel mechanism for releasably joining two fuel dispensing devices in fluid communications, and for selectively disengaging said dispensing devices in response to a disengaging force in excess of a preselected value being exerted on said coupling device, said coupling device comprising:

a first valve assembly for being secured on, and being placed in flow-through fluid communication with, a first said dispensing device and for selectively terminating the flow of fuel from said first dispensing device, aid first valve assembly including a first valve housing having a forward end portion, said first valve housing being provided with an annular groove circumscribing said first valve housing, said first valve assembly also including a first valve means mounted therein and aligned on a first axis for selectively terminating the flow of fuel through said first valve assembly;

a second valve assembly for being secured on, and placed in flow-through fluid communication with, a second said dispensing device and for selectively terminating the flow of fuel from said second dispensing device, said second valve assembly including a second valve housing provided with a first annular receptor for closely receiving said forward end portion of said first valve housing, said second valve housing including a latch cavity circumscribing said second valve house, said second valve housing defining a plurality of latch ball opening for registering with said annular groove of said first valve housing, said second valve assembly further including an elbow, and having swivel connecting means for pivotally securing said elbow to said second valve housing, whereby said elbow selectively swivels with respect to said second valve housing about a second axis inclined with respect to said first axis, said elbow being provided with further connecting means for rotatably connecting said elbow in fluid communication with said second dispensing device such that said elbow rotates with respect to said second dispensing device about a third axis inclined with respect to said second axis, said second valve assembly also including a second valve means disposed in said second valve housing at a location remote from said swivel connecting means for selectively terminating the flow of fuel through said second valve assembly;

means for prohibiting the rotation of said first valve housing with respect to said second valve housing, said means including at least one protruding member carried by said outer sleeve and defining at least one planar engaging surface for engaging at least one planar surface defined by said first valve housing to prohibit rotation of said first valve housing with respect to said second valve housing as said first valve housing is received in said annular receptor of said second valve housing while allowing uninterrupted axial movement of said first valve housing with respect to said second valve housing; and

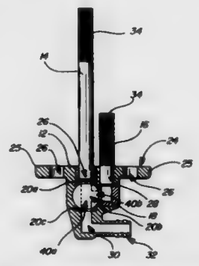
ball latch means housed within said latch cavity for securing said first valve housing within said first receptor of said second valve housing in absence of said disengaging force in excess of said preselected value, said ball latch means including a plurality of latch balls for being selectively received through said latch ball openings and into said annular groove provided in said first valve housing, said ball latch means further including locking means for releasably locking said latch balls in a position whereby at least a portion of said balls extend into said annular groove of said first valve housing in absence of said disengaging force in excess of said preselected value, said locking means including a tapered ring housed within said latch cavity, said tapered ring defining a camming surface for engaging said latch balls and biasing said balls into said annular groove of said first valve housing, said locking means further including spring means housed within said latch cavity for biasing said tapered ring into engagement with said latch balls.

5,115,837

BALL FUEL VALVE WITH RESERVE POSITION

Willis E. Tupper, 11865 Durston Dr., Pinckney, Mich. 48169

Filed Sep. 25, 1991, Ser. No. 766,614
Int. Cl.[5] F16K *11/87*
U.S. Cl. 137—625.41 **7 Claims**



1. A fuel valve adapted for use with the fuel tank of a motor vehicle, comprising:

a valve body defining an internal valve chamber, a substantially planar attachment face adapted to be secured to the exterior of the fuel tank, a main fuel inlet communicating with said internal valve chamber and oriented so as to open on said substantially planar attachment face, a reserve fuel inlet communicating with said internal valve chamber and oriented so as to open on said substantially planar attachment face, and a fuel outlet communicating with said internal valve chamber;

a substantially cylindrical nylon main inlet tube having one end attached to said valve body in communication with said main fuel inlet so as to extend substantially perpendicularly away from said substantially planar attachment face of said valve body, the opposite end of said main inlet tube having an inlet screen disposed thereon;

a substantially cylindrical nylon reserve inlet tube having one end attached to said valve body in communication with said reserve fuel inlet so as to extend substantially perpendicularly away from said substantially planar attachment face of said valve body and substantially parallel to said main inlet tube, the length of said reserve inlet tube being no more than half the length of said main inlet tube, and the opposite end of said reserve inlet tube having an inlet screen disposed thereon;

a valve assembly operatively engaging said valve body, said valve assembly including an externally positionable handle element and a ball element operatively disposed within said internal valve chamber and attached to said handle element, said ball valve element having a plurality of interconnected internal passageways which terminate into at least three openings on the surface thereof, said at least three openings being disposed so that when said handle element is disposed in a first open position said main fuel inlet and fuel outlet are operationally interconnected through said internal passageways of said ball element to allow for the flow of fuel through the fuel valve, in a second reserve position said reserve fuel inlet and fuel outlet are operationally interconnected through said internal passageways of said ball element to allow for the flow of reserve fuel through the fuel valve, and in a third closed position said fuel outlet is operationally isolated from said passageways to prevent the flow of fuel through the fuel valve; and

a plurality of valve gaskets operatively disposed within said internal valve chamber to seal the ball element within said internal valve chamber, said plurality of valve gaskets including a first gasket disposed to seal the interconnection between said ball element and said main fuel inlet, a second gasket disposed to seal the interconnection between said ball element and said reserve fuel inlet, and a third gasket disposed to seal the interconnection between said ball element and said fuel outlet.

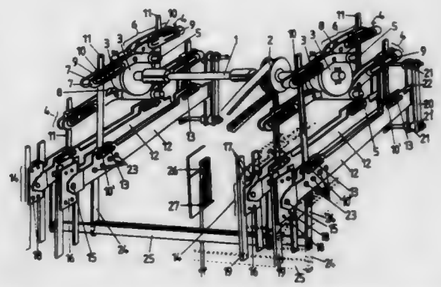
5,115,838

DRIVE SYSTEM FOR THE KNIFE GRIDS OF A DOUBLE-LIFT JACQUARD MACHINE

Carlos Derudder, Kortrijk, Belgium, assignor to N.V. Michel Van de Wiele, Kortrijk-Marke, Belgium

Filed Jul. 11, 1990, Ser. No. 550,898
Claims priority, application Belgium, Jul. 17, 1989, 8900775
Int. Cl.[5] D03C *3/32*
U.S. Cl. 139—65 **9 Claims**

1. A drive system for the knife grids of a double-lift openshed Jacquard machine, in which a mechanism is mounted above the Jacquard machine, characterized in that a drive shaft, rotating at uniform speed, is disposed at top of a Jacquard head and has at its both ends a set of conjugate cams, each of which drives positively two dual roller follower levers on a single piece dual lever arrangement, said arrangement



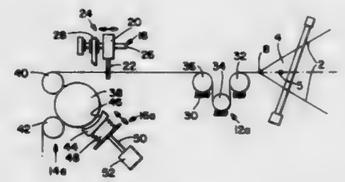
having a central pivot point and extensions at both sides which contain slots to receive a suspension pivot.

5,115,839

WEAVING MACHINE WITH RIBBON CUTTING DEVICE

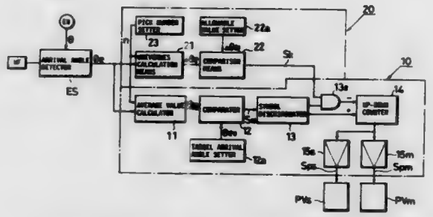
Francisco Speich, Gipf-Oberfrick, Switzerland, assignor to Textilma AG

PCT No. PCT/CH88/00137, § 371 Date May 15, 1989, § 102(e) Date May 15, 1989, PCT Pub. No. WO89/02491, PCT Pub. Date Mar. 23, 1989
PCT Filed Aug. 12, 1988, Ser. No. 358,378
Claims priority, application Switzerland, Sep. 21, 1987, 3631/87; Mar. 18, 1988, 1056/88
Int. Cl.[5] D03J *1/08*
U.S. Cl. 139—291 C **24 Claims**



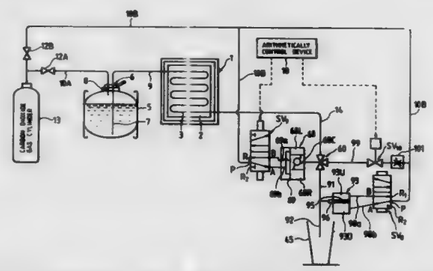
1. A weaving machine comprising a guide device (**12***a*, **12***b*) for a woven material web (**10**) and a filling thread set-up edge (**8**), the guide device (**12***a*, **12***b*) being arranged downstream of the filling thread set-up edge (**8**), a ribbon cutting device (**18**) for cutting up the woven material web (**10**), consisting at least partially of thermoplastic threads, into ribbons and for melting on the cut edges so as to be secure against rippling, the cutting device (**18**) being arranged between the guide device and a breast beam (**40**, **54**), and a thermal fixing device (**16***a*, **16***b*) independent of the cutting device (**18**), wherein the guide device (**12***a*, **12***b*) and the cutting device (**18**) are mounted on the weaving machine independently of one another, and in that the fixing device (**16***a*, **16***b*) is arranged on a take-up roller (**38**, **38***a*) arranged downstream of the breast beam (**40**, **54**) and/or on a guide roller (**42**) immediately following the take-up roller (**38**, **38***a*).

5,115,840
CONTROL OF LOWER LIMIT OF JET PRESSURE FOR A PICKING NOZZLE
Shigeo Yamada, Komatsu, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Kanazawa, Japan
Filed Dec. 14, 1990, Ser. No. 627,356
Claims priority, application Japan, Dec. 28, 1989, 1-340080
Int. Cl.[5] D03D *47/30*
U.S. Cl. 139—435.2 **8 Claims**



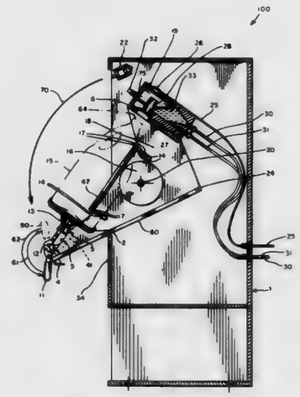
1. A control method for jet pressure of a picking nozzle controlled by variation of the flying characteristic of filling yarn, the method comprising:
calculating unevenness of the flying characteristic of the filling yarns; and
detecting the flying characteristic of filling yarns for each picking; and
inhibiting descent of controlling jet pressure of the picking nozzle when the unevenness of the flying characteristic exceeds a predetermined allowable value.

5,115,841
DRAUGHT BEER DISPENSING SYSTEM
Morikatsu Horino, Tokyo, Japan, and Yoshiaki Yagi, both of Tokyo, Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 395,899, Aug. 18, 1989, abandoned, which is a division of Ser. No. 234,894, Aug. 22, 1988, Pat. No. 4,864,396. This application Jan. 16, 1991, Ser. No. 641,620
Claims priority, application Japan, Aug. 24, 1987, 62-208250; Aug. 24, 1987, 62-208251; Jun. 30, 1988, 63-85698; Jul. 15, 1988, 63-93081
Int. Cl.[5] B67D *1/04*
U.S. Cl. 141—250 **1 Claim**



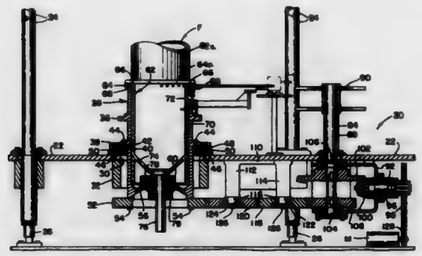
1. A draught beer dispensing system for dispensing draught beer within a draught beer receiving receptacle except a sealed receptacle comprising:
a beer dispensing valve means, operated by carbon dioxide gas, from which the draught beer is dispensed under the pressure of the carbon dioxide gas;
a source of supplying the carbon dioxide gas, said gas supplying source being disposed in the draught beer dispensing system;
a dispensing nozzle communicated with and connected to said beer dispensing valve means;
said beer dispensing valve means including an automatic ball valve comprising a ball having a through hole and a beer dispensing valve actuating means, operated by the carbon dioxide gas, comprising a joint connected to the ball and an opening and closing cylinder for rotating the ball by 90°, said opening and closing cylinder comprising an outer tube, a pair of pistons slidably fitted within the outer tube and operated by the carbon dioxide gas, a rotational shaft rotatably supported on the outer tube and capable of being rotated by the pistons for rotating the joint; and
said dispensing nozzle being operated by the carbon dioxide gas from said source having a double pipe structure comprising a fixed pipe secured to said beer dispensing valve means and a movable pipe which is movable with respect to said fixed pipe, whereby a relative position between a tip of the movable pipe and the receptacle is changed so that when draught beer is dispensed the tip of said movable pipe is positioned within the receptacle, and upon termination of dispensing, the tip of the movable pipe is moved upwardly of the upper edge of the receptacle.

5,115,842
APPARATUS FOR DELIVERY OF A LIQUID
Douglas E. Crafts, San Jose, and Mark A. Leonov, Santa Clara, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.
Filed Aug. 30, 1990, Ser. No. 575,335
Int. Cl.[5] B65B *3/04*
U.S. Cl. 141—286 **16 Claims**



1. An apparatus for delivery of a liquid, comprising:
(a) a housing;
(b) a cradle for holding a container containing the liquid, wherein the cradle is rotatably coupled to the housing, wherein the cradle is rotatable between a first position and a second position;
(c) a reservoir for receiving the liquid from the container, wherein the reservoir is coupled to the cradle and rotates with the cradle, and wherein the reservoir includes:
(1) a passageway through the reservoir through which the liquid is able to flow downward for all positions between the first and second positions, inclusive, that the cradle is permitted to rotate to;
(2) a means for minimizing back flow of the liquid from the reservoir to the container;
(3) a first orifice for allowing the liquid to pass out of the reservoir;
(4) a second orifice for allowing an air bubble in the liquid to return to the reservoir, wherein the second orifice is at a location higher relative to the first orifice for all positions that the cradle is permitted to rotate to; and
(5) a check valve for allowing air to pass into the reservoir when the liquid flows through the passageway into the first orifice.

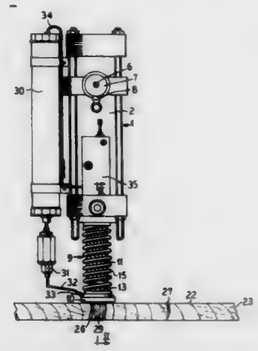
5,115,843
COMMON BASE FOR A PLURALITY OF MODULAR FILLERS
William M. Bayliss, Fresno, Calif., assignor to FMC Corporation, Chicago, Ill.
Filed Nov. 8, 1990, Ser. No. 610,614
Int. Cl.[5] B65B *1/04*
U.S. Cl. 141—1 **5 Claims**



1. In an apparatus for selectively supporting a plurality of types of container fillers on a common adjustable frame; comprising:
means defining a mounting plate having a plurality of openings therein;
means defining a plurality of legs for supporting said mounting plate at selected ones of a plurality of desired elevations;
means defining a rotatable center column bushing supported on and extending partially through said mounting plate and having a vertical key attached thereto;
means defining a rotatable and vertically adjustable center column slidably received within said rotatable center column bushing and having an elongated vertically extending keyway therein for slidably receiving said vertical key;
means defining one of a plurality of types of container fillers removably secured to said rotatable center column for rotation and vertical movement therewith; and
drive means for rotating said vertically adjustable central column and attached ones of said plurality of fillers for dispensing a flowable product into containers (FIGS. 2 and 4) supported by said filler and said mounting plate.

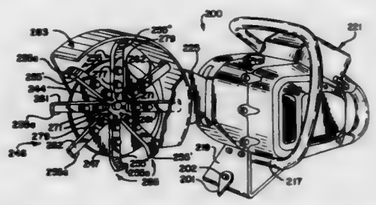
5,115,844
APPARATUS FOR INJECTING GLUE IN JOINTS AND HAIR CHECKS OF WOOD, ESPECIALLY FOR GLUING LOOSE KNOTS IN WOODEN BOARDS
Torben Hansen, Murnau/Hechendorf, Fed. Rep. of Germany, assignor to Schotten & Hansen GmbH, Fed. Rep. of Germany
Filed Apr. 1, 1991, Ser. No. 678,032
Claims priority, application Fed. Rep. of Germany, May 22, 1990, 4016460; European Pat. Off., Dec. 1, 1990, 90123049.0
Int. Cl.[5] B27C *9/00*; B27G *1/00*
U.S. Cl. 144—2 R **15 Claims**

1. An apparatus for injecting glue into wooden boards, said apparatus comprising:
a percussion mechanism including a selectively actuable percussion rod;
a percussion head;
supporting means for holding said percussion head and for permitting limited axial movement of said percussion head beneath said percussion rod;
an axially compliant sealing ring on an underside of said percussion head, said sealing ring defining a shallow, open-bottomed chamber;
glue supply means for selectively filling said chamber with glue; and



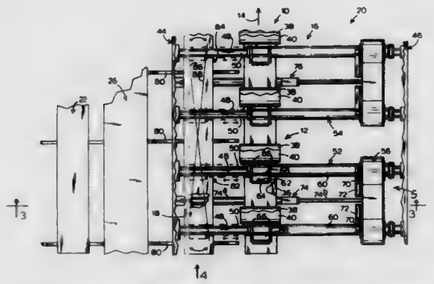
actuation means for selectively causing said percussion rod to strike a top surface of said percussion head.

5,115,845
PORTABLE STUMP REMOVER
Steven M. Hooser, 1 South 726 Ott Ave., Glen Ellyn, Ill. 60137
Continuation-in-part of Ser. No. 688,991, Apr. 23, 1991, Pat. No. 5,034,407, which is a continuation of Ser. No. 573,107, Aug. 28, 1990, abandoned, which is a continuation of Ser. No. 466,462, Jan. 16, 1990, abandoned. This application Apr. 30, 1991, Ser. No. 693,661
Int. Cl.[5] A01G *23/06*; B02C *1/04*
U.S. Cl. 144—2 N **30 Claims**



1. A portable stump remover, manually movable across a tree stump to effect comminution thereof, and comprising:
a frame;
a prime mover mounted to the frame;
at least one rotatable cutting device with plural chisel elements carried on the frame and operably associated with the prime mover so that the cutting device and the chisel elements thereof are rotated in a circular path by the prime mover; and
pivot means carried on the frame and adapted to engage the tree stump at a fixed location so that the stump remover is pivotable about the pivot means in a plane substantially parallel to the plane defined by the surface of the tree stump.

5,115,846
RAPID-ACTION, ANTI-JOLT EDGER CHARGER SYSTEM
Donald F. Miller, Prince George, and John R. Chapman, Langley, both of Canada, assignors to Optimil Machinery, Inc., Delta, Canada
Filed Feb. 25, 1991, Ser. No. 660,677
Int. Cl.[5] B27B *1/00, 25/02*
U.S. Cl. 144—246 R **2 Claims**



1. A facial-grip, clamp-overlap, positive-action, anti-jolt charger system for a lumber workpiece edger of the type having an intake station and a power-driven longitudinal-feed clamp-roll mechanism operable in recurrent cycles to receive, clamp onto and longitudinally-feed, for, edging successive workpieces arriving in the intake station, said charger system in operative condition relative to such an edger comprising

a pre-charge station laterally offset from the intake station for receiving and holding angularly and laterally position-cued workpieces in succession one at a time,

reversibly laterally shiftable, positive-action pinch-roll mechanism disposed adjacent said pre-charge station, adapted to grip opposite faces of successive workpieces held in the pre-charge station and to accommodate lateral transfer of such workpieces, while the same are so gripped, toward and into the edger's intake station for time-overlapping clamp/grip hand-off of the workpieces to the edger's clamp-roll mechanism for longitudinal feed through the edger,

controlled acceleratable/decelerateble linear-positioner means drivingly connected to said pinch-roll mechanism for producing rapid, recurrent, anti-jolt, reversible shifting of the same between the pre-charge and intake stations, and

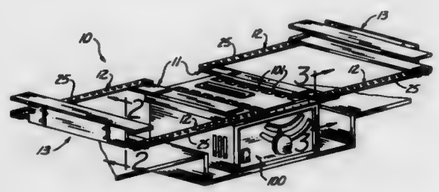
control apparatus operatively interconnecting components in the edger and components in the charger, whereby successive workpieces held in the pre-charge station are positively gripped by the pinch-roll mechanism, transferred in an anti-jolt fashion and without angulation toward and into the intake station, and handed-off, while still gripped against angulation and lateral maladjustment by the pinch-roll mechanism, to the longitudinal-feed clamp-roll mechanism for transport through the edger.

5,115,847
ADJUSTABLE SUPPORT APPARATUS FOR TABLE SAWS
Tarrell L. Taber, 2609 Denver St., Kansas City, Mo. 64141
Filed Apr. 19, 1991, Ser. No. 687,670
Int. Cl.[5] B27H *1/02*
U.S. Cl. 144—287 **5 Claims**

1. An adjustable support apparatus for use with a table saw having a plurality of apertures formed on opposite ends of the table saw for supporting workpieces having different dimensions and configurations; wherein, the apparatus comprises:

a pair of mounting base units wherein each mounting base unit includes an upper and a lower mounting base member and fastening means for securing the upper and lower mounting base members on each end of the table saw

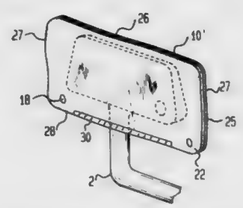
at least one pair of extension arm units operatively associated with at least one of said pair of mounting base units; wherein said extension arm units include elongated extension arm members and fastening means for securing the



extension arm members to said at least one of said pair of mounting base units; and,

a pair of clamp units operatively associated with said pair of mounting base units; wherein each of said clamp units comprises a lower horizontal jaw member, a vertical brace member and fastening means for securing the vertical brace member to the lower jaw member.

5,115,848
PROTECTIVE MIRROR COVER, AND METHODS OF CONSTRUCTING AND UTILIZING SAME
Jimmie L. Malone, 8310 Centrae, Detroit, Mich. 48204
Filed May 2, 1991, Ser. No. 694,509
Int. Cl.[5] B65D *65/08*; B60S *11/00*
U.S. Cl. 150—166 **8 Claims**



1. A system for protecting exposed glass surfaces of a vehicle comprising:

a cover means for at least one external rearview mirror having at least one external support arm comprising a bag-like flexible cover adapted to fit over the free end of said external mirror and having a closed end, an open end and opposed side members, said open end having elastic means adapted to close said opposed side members around the support arm of said external mirror; and

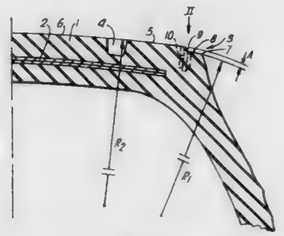
a plurality of window cover means having means for securing said window cover means to a vehicle.

5,115,849
TIRE TREAD PATTERN HAVING STEPPED SHOULDER
Michael R. Corner, Coventry, Great Britain, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Continuation of Ser. No. 413,764, Sep. 28, 1989, abandoned. This application May 9, 1991, Ser. No. 701,343
Claims priority, application United Kingdom, Oct. 8, 1988, 8823690
Int. Cl.[5] B60C *11/01, 11/12*
U.S. Cl. 152—209 R **5 Claims**

1. A radial ply, heavy duty, vehicle tire having a tire tread provided with a tread pattern comprising

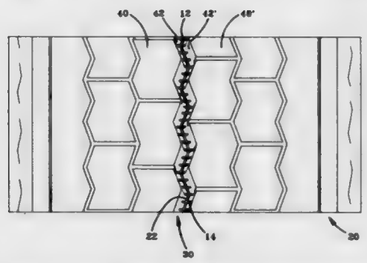
at least two circumferentially extending continuous main

treads grooves providing at each edge of the tread a continuous shoulder rib wherein each shoulder rib comprises in its shoulder edge a narrow edge zone having a width axial of the tread in the range of 3 to 8% of the total tread width and having, in cross section of the tire, a radial height at least 2 mm less than the ground engaging surface of the shoulder rib immediately adjacent to said edge zone and a steeply sloping junction zone between the edge zone and the adjacent shoulder rib which is made flexible in both the transverse and circumferential directions by a



series of circumferentially spaced narrow slots extending across the junction zone into the edge zone and the adjacent shoulder rib at an angle to the center line of the tread of between 20 and 60 degrees, said slots having a width of between 0.4 and 2.0 mm and a depth in the junction zone substantially the same as the main tread grooves, and said slots are spaced circumferentially around the tire such that the distance between each adjacent pair of slots is between two and four times the length of the angled portion of the slots.

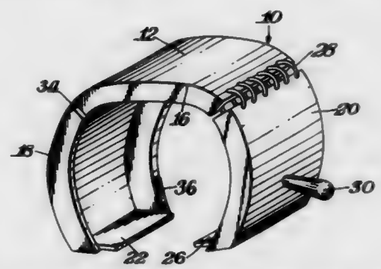
5,115,850
TREAD WITH IMPROVED GROOVE DESIGN
Robert L. Crump, Cumberland, Md.; Ronald T. Harris, Greenspring, W. Va.; Samuel E. Reckley, LaVale; Edward L. Montgomery, Cumberland, both of Md., and Lawrence B. Hurst, North Canton, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 19, 1991, Ser. No. 656,921
Int. Cl.[5] B60C *11/03*
U.S. Cl. 152—209 R **13 Claims**



1. An improved tire tread having a net-to-gross ratio greater than 50% and a plurality of grooves defined by a road contacting ribs, the improvement being characterized by the tread when circumferentially mounted on a tire carcass having:

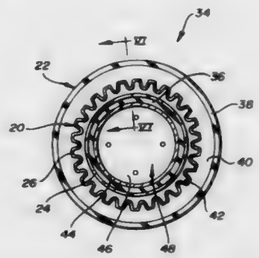
at least one circumferentially extending radially deep groove having a circumferentially continuous projection in the base of the groove, the projection having a height, measured from the base of the groove radially outward, of less than 1/6 the depth of the groove and having a thickness of greater than one-half the height of the projection, the projection being axially spaced from the adjacent road contacting ribs and connected to the adjacent ribs by a plurality of braces, the braces being of substantially the same height as the projection, each brace being spaced circumferentially from adjacent braces and connected to both sidewalls of the circumferentially extending adjacent ribs.

5,115,851
TIRE TRACTION DEVICE
Claudio Chiavatti, 232 Dowdy Dr., Paulsboro, N.J. 08066
Filed Feb. 22, 1991, Ser. No. 659,725
Int. Cl.[5] B60C *27/20*
U.S. Cl. 152—225 R **9 Claims**



1. A tire traction device comprising a band in the form of a rigid plate having an outer surface and depending side walls for spanning across the tread of a tire, said band having a sharp edge at a junction of said outer surface and said side walls for digging into a slippery surface upon rotation of the tire, a first fastener secured to one end of said band for mounting to a portion of the tire remote from the tread, said first fastener terminating at its end remote from said band in an inwardly directed hook for fitting against a tire rim, a second fastener secured to an end of said band remote from said first fastener, said second fastener terminating at its end remote from said band in an inwardly directed hook for fitting against a portion of a tire rim remote from the tread, said second fastener being pivotally connected to said band by torsion coil spring, said torsion coil spring comprising the sole connection of said second fastener to said band, said spring means further comprising resilient means for urging said hooks toward each other to lock said band against the tire tread, and a handle on one of said fasteners for selectively moving its said hook out of engagement with the tire to detach said device from the tire.

5,115,852
CLOSED-TORUS TIRE AND METHOD FOR MANUFACTURING SAME
John Z. De Lorean, 834 Fifth Ave., New York, N.Y. 10021
Filed May 1, 1989, Ser. No. 346,144
Int. Cl.[5] B60C *17/01*; B29D *30/00*
U.S. Cl. 152—518 **50 Claims**



1. A method for manufacturing a tire, comprising the steps of:

providing an internal mold member made of a resilient material with a memory, said mold member having a predetermined annular shape;
expanding said mold member from said predetermined annular shape into a toroidal shape;
forming a closed torus external tire member about the expanded mold member;
maintaining said mold member in the expanded toroidal shape during molding of said tire member;
upon formation of said tire member, contracting said mold member from said toroidal shape so that said mold member essentially resumes said annular shape; and
retaining said mold member inside said tire member so that said mold member becomes a portion of the tire.

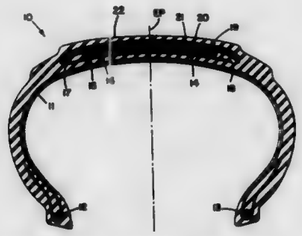
33. A tire comprising:
a substantially hollow run-flat member expandable from a predetermined annular configuration to a predetermined toroidal configuration, said run-flat member being made of a synthetic resin with a memory so that said run-flat member resumes said annular configuration upon collapse from said toroidal configuration;
a closed-torus outer tire member substantially surrounding said run-flat member; and
means for attaching said outer tire member at an axle of an automotive vehicle.

5,115,853

PNEUMATIC TIRE WITH BELT OVERLAY STRUCTURE REINFORCED WITH LOW DENIER NYLON CORDS

Thomas R. Oare, Suffield, and James C. Sykora, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 320,649, Mar. 8, 1989, abandoned. This application Jan. 19, 1990, Ser. No. 467,422
Int. Cl.[5] B60C *9/22, 9/24*
U.S. Cl. 152—527 **19 Claims**



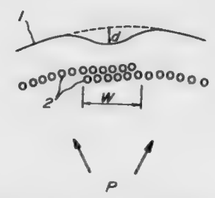
1. A pneumatic tire comprising a radial ply carcass, a belt reinforcing structure disposed radially outwardly of said carcass and an overlay structure disposed radially outwardly of the belt reinforcing structure and wrapped circumferentially thereabout, the overlay structure having an axial width that is at least equal to that of the belt reinforcing structure, said overlay structure comprising a single continuous ribbon helically wound about the reinforcing structure with adjacent turns of the ribbon being in an overlapping relationship, said ribbon comprising cables arranged side by side and disposed at 0° to 5° with respect to the equatorial plane of the tire, each of said cables consisting of two yarns of nylon filaments with said yarns being twisted together with one another, each of said yarns having a denier of 420, and each said cable having a cable twist of not greater than 7 turns per inch, wherein each said cable of the overlay structure has an elongation at break of 15% to 20% as determined by ASTM-D885, and an elongation of about 7% when subjected to a load of 6 pounds as determined by ASTM-D-885.

5,115,854

LOW ROLLING RESISTANCE PNEUMATIC RADIAL TIRES HAVING AN IMPROVED APPEARANCE

Kazuo Oshima, Higashiyamato, and Shizuo Iwasaki, Kodaira, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 228,091, Aug. 4, 1988, abandoned, which is a continuation of Ser. No. 939,974, Dec. 10, 1986, abandoned. This application Oct. 5, 1990, Ser. No. 593,531
Claims priority, application Japan, Feb. 21, 1986, 61-36564
Int. Cl.[5] B60C *9/08*
U.S. Cl. 152—556 **19 Claims**



1. In a low rolling resistance pneumatic radial tire comprising a tread portion, a pair of side portions extending from both ends of the tread portion, a pair of bead portions located at radially inward ends of the side portions, and a tire body consisting of a carcass composed of a single rubberized carcass ply containing cords arranged in the radial direction of the tire and a belt superimposed about a crown region of the carcass and composed of at least one belt layer, the improvement wherein the carcass ply cord is a high tenacity polyvinyl alcohol cord satisfying that the carcass ply cord embedded in rubber in the tire after vulcanization has characteristics represented by the following equations (1)–(3):

$$1.5 \leqq E \leqq 3 \quad (1)$$
$$E \times \Delta S \leqq 5 \quad (2)$$
$$S \geqq 14.5 - 12\,N_T \quad (3)$$

, where E is an elongation (%) at 2.25 g/d, ΔS is a heat shrinkability (%) measured at such a state that the cord is left to stand at 177° C. under a load of 0.015 g/d for 30 minutes, S is a strength (g/d) per gram denier of the cord, N_T is a twisting coefficient represented by $N_T = N \times \sqrt{0.139 \times D/\rho} \times 10^{-3}$ and is $0.27 < N_T < 0.55$, N is a twisting number per 10 cm of cord length (T/10 cm), D is a half of total denier of cord and ρ is a specific gravity of cord, and the number of overlapped cords in a joint portion of the carcass ply at a shoulder portion in the circumferential direction of the tire is not more than 15.

5,115,855

FLAT PANEL PORTABLE EXHIBIT DISPLAY AND HINGE

Curtis Lindblom, Burnsville, and Michael W. Kirchner, Farmington, both of Minn., assignors to Skyline Displays, Inc., Burnsville, Minn.

Filed Nov. 5, 1990, Ser. No. 609,469
Int. Cl.[5] A47G *5/00*; E05D *1/00*
U.S. Cl. 160—135 **6 Claims**

1. The combination of a "living" hinge joining and providing articulation between two adjacent members, each of said members having a front surface, a rear surface, each of the surfaces having side peripheral insets, said combination comprising:
(a) a pair of elongate strips of flexible material, each of the strips having opposing, generally parallel surfaces and opposing, generally parallel side edge insert portions, the side insert portions being affixed in the respective peripheral insets of an adjacent member such that one of the surfaces of each of the strips lies generally flush with one of the surfaces of each of the adjacent members, the strips being spaced from each other;

(b) each of the strips having a first pair of lines of weakness, each of the first lines of weakness running adjacent one of the side peripheral insets of one of the adjacent members; and
(c) each of the strips having a second pair of lines of weakness, each of the second lines of weakness running parallel to each of the other lines of weakness, each of the second pair of lines of weakness adjacent to and inwardly of one of the first lines on weakness, each of the second lines of weakness being disposed equidistant from its respective adjacent first line of weakness, each of the lines of weakness being more flexible than the strip whereby the adjacent members may be hingedly connected at a multitude of angles relative to each other.

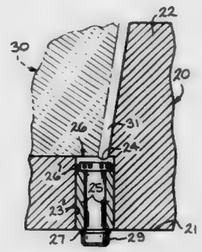


5,115,856

CORE BOX WITH LARGE DIAMETER VENTS AND PLUGS

Robert E. Downing, Toledo, Ohio, and Bobby L. Wilson, Poplar Bluff, Mo., assignors to Doehler-Jarvis Limited Partnership, Toledo, Ohio

Filed Sep. 3, 1991, Ser. No. 753,957
Int. Cl.[5] B22C *7/06*
U.S. Cl. 164—234 **13 Claims**



1. A core box having a mold for forming a cavity having a plurality of air vents, said vents extending from said cavity through the mold, each said air vent containing a perforated bottom cup-shaped plug having a diameter at least 50% larger than the width of the cavity where said plug is located.

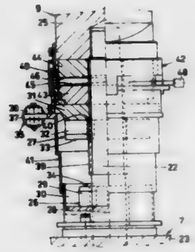
5,115,857

STRAND GUIDE ARRANGEMENT PROVIDED AT A CONTINUOUS CASTING PLANT

Armin Schertler, Guntramsdorf; Josef A. Ortner, Hörsching; Werner Scheurecker, Linz, and Kurt Engel, St. Florian, all of Austria, assignors to Voest-Alpine Industrieanlagenbau G.m.b.H., Linz, Austria

Filed Jul. 5, 1991, Ser. No. 726,348
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1990, 4022871; Jul. 18, 1990, 4022894
Int. Cl.[5] B22D *11/128*
U.S. Cl. 164—448 **24 Claims**

1. In a strand guide arrangement provided at a continuous casting plant and of the type including oppositely arranged framework parts carrying oppositely located strand guiding rollers, a guiding means, a displacement means for displacing at least one of said framework parts along said guiding means by widening or narrowing the distance of said oppositely located strand guiding rollers supporting means having supporting surfaces provided at different height levels and counter supporting means having counter supporting surfaces, said framework parts being clampable relative to each other by said displacement means until abutment of said supporting means on said counter supporting means, the improvement comprising
a rotary bushing including a helicoidal supporting surface and arranged in series to each supporting and counter supporting means between said framework parts, and
an abutment allocated to one of said framework parts and supported on said helicoidal supporting surface.

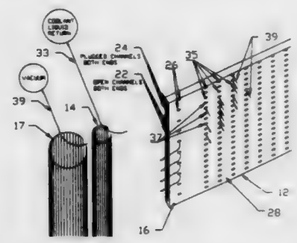


5,115,858

MICRO-CHANNEL WAFER COOLING CHUCK

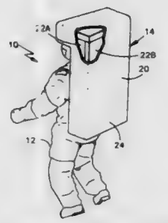
John S. Fitch, Newark, and William R. Hamburgen, Menlo Park, both of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 546,523, Jun. 29, 1990. This application Jun. 28, 1991, Ser. No. 722,891
Int. Cl.[5] H01L *23/40*
U.S. Cl. 165—1 **15 Claims**



10. The method for cooling flat electronic circuits, which comprises providing a planar metal member having opposite ends and a top and a multitude of closely spaced, parallel channels extending along the planar metal member, a first group of the channels being connected to the top of the planar metal member, placing the flat electronic circuits on the top of the planar metal member, applying vacuum to the first group of the channels to hold the flat electronic circuits on the top of the planar metal member, and passing a coolant liquid through a second group of the channels beneath the flat electronic circuits.

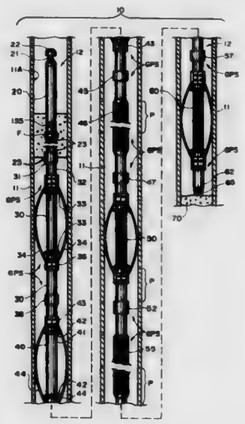
5,115,859
REGENERABLE NON-VENTING COOLER FOR PROTECTIVE SUIT
George J. Roebelen, Jr., and Stephen A. Bayes, both of Suffield, Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Dec. 21, 1990, Ser. No. 633,570
Int. Cl.[5] F23D *20/00*; F25B *21/02*
U.S. Cl. 165—10 **19 Claims**



1. A non-venting cooling apparatus for transferring heat from a coolant fluid to a surrounding environment to cool the coolant fluid from a first temperature at which the coolant fluid is received to a second temperature at which the coolant fluid is discharged for recycle, said apparatus comprising:
a. a first heat dissipation means absorbing heat from the coolant fluid, said first heat dissipation means enclosing a first phase change material;
b. a second heat dissipation means for absorbing heat from the coolant fluid, said second heat dissipation means enclosing a second phase change material, the phase change temperature of the second phase change material being lower than the phase change temperature of the first phase change material;
c. coolant heat exchange means for passing the coolant in heat exchange relationship with said first and second heat dissipation means, said coolant heat exchange means having a first portion operatively associated in heat exchange relationship with said first heat dissipation means and a second portion operatively associated in heat exchange relationship with said second heat dissipation means;
d. circulation control means operatively associated with said coolant heat exchange means for selectively directing the coolant fluid to pass through at least one of the first and second portions of said coolant heat exchange means; and
e. radiator means operatively associated with said first and second heat dissipation means for transferring heat from said first and second phase changes materials to the surrounding environment.

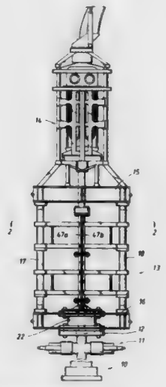
5,115,860
GRAVEL PACK APPARATUS RUN WITH AN ELECTRIC WIRELINE
Glenn Champeaux, Broussard, and James V. Carisella, New Orleans, both of La., assignors to Perf-O-Log, Inc, Broussard, La.
Continuation of Ser. No. 457,369, Dec. 27, 1989, Pat. No. 5,033,549. This application May 21, 1991, Ser. No. 703,410
Int. Cl.[5] E21B *43/04*
U.S. Cl. 166—51 **20 Claims**

1. Apparatus for installing a sand control device in an oil/gas well, the apparatus comprising:
a) a plurality of stackable tool bodies having means for allowing fluid communication between the tool bodies;
b) means for running the plurality of stackable tool bodies into the well, each via wireline deployment;
c) means for positioning each tool body in a desired location relative to the surrounding formation and in flow communication with each so that hydrocarbons can be produced, flowing internally from one tool body to the others;
d) radially extending members that extend from each tool body to generally center the respective tool body in the well bore to provide an annulus about the tool body; and



e) means for disposing sand control media in the well annulus circumferentially about the assembly of the tool bodies.

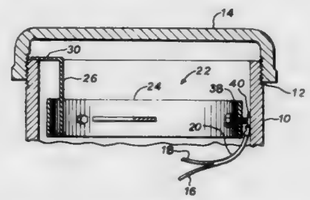
5,115,861
TUBING GUIDE
Tibor Laky, Dallas, Tex., assignor to Otis Engineering Corp., Dallas, Tex.
Filed Apr. 29, 1991, Ser. No. 692,562
Int. Cl.[5] E21B *19/00*
U.S. Cl. 166—85 **10 Claims**



1. A tubing guide comprising;
a pod adapted to be supported on a wellhead and to support means thereabove for injecting and retrieving tubing through the wellhead;
said pod having upper and lower vertically spaced horizontal beams and at least three vertical support legs extending between the beams and providing a window for attaching equipment to a tubing;
a support arm rotatably mounted on at least two support legs between said beams;
arm connecting plate means supported by at least one of said arms and connectable with the other arm or arms;

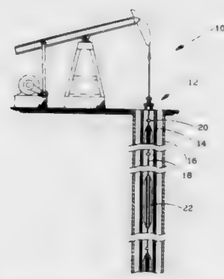
an annular pipe guard vertically split into sections and carried by said plate means;
means for connecting said pipe guard sections together in an annular relationship and with said upper and lower beams;
said supporting arms, connecting plate means and pipe guard constructed and arranged to position the pipe guard sections in engagement with their concave surfaces confronting each other to provide support for a tubing, and with all but the supporting arms released from said plate means permitting the plate means to swing into an out of the way position permitting attachment of equipment to a tubing;
said arms providing support for said pipe guard.

5,115,862
ELECTRICAL GROUNDING DEVICE FOR WELLS
Phillip J. Hastings, 135 Woodview Dr., Cottage Grove, Wis. 53527
Filed Aug. 8, 1990, Ser. No. 564,268
Int. Cl.[5] E21B *41/00*; H02G *9/00*
U.S. Cl. 166—65.1 **9 Claims**



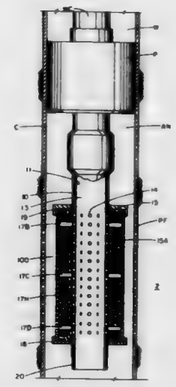
1. An assembly for connecting a grounding wire to a well casing, comprising:
a removable support member for placement into the wall casing toward its upper end, the support member having a longitudinal dimension less than the internal transverse dimension of the well casing for allowing placement of the support member into the interior of the well casing;
means for fixing the position of the support member relative to the well casing, the means comprising a pair of opposed suspension members each including lateral tabs adapted to rest on top of the well casing for suspending the support member within the well casing; and
ground connection means engagable with the support member for establishing a ground connection between the ground wire and the interior of the well casing without connection to the exterior of the well casing.

5,115,863
LOW TURBULENCE ROD GUIDE
Edward L. Olinger, 500 N. Hoyne, Fritch, Tex. 79036
Filed Apr. 5, 1991, Ser. No. 682,164
Int. Cl.[5] E21B *17/10*
U.S. Cl. 166—241 **26 Claims**



1. An improved sucker rod guide for fixedly engaging around a sucker rod at a selected location along the length of the rod, the rod guide comprising:
a substantially cylindrical polymeric body having a longitudinal axis, a terminal end substantially continually tapered to the rod, a radially-inward surface and a radially outward surface, the radially inward surface of the body adjacent to and in gripping engagement with the rod when the rod guide is fixedly engaged around the rod; and
a plurality of substantially continuous, longitudinal vanes carried by the body, a vane having a selected length and width, and longitudinally disposed along the radially outward surface of the guide body, extending radially away from the guide body and having a radially outside wear surface,
the plurality of wear surfaces establishing a selected diameter, the length of the vane being at least substantially 2.1 times the diameter of the plurality of wear surfaces and 5–14 times the selected width of the vanes, the body and plurality of vanes having a cross-sectional area, expressed as a percent of the area encompassed by the selected diameter, of less than 70%.

5,115,864
GRAVEL PACK SCREEN HAVING RETENTION MEANS AND FLUID PERMEABLE PARTICULATE SOLIDS
John E. Gaidry, Lafayette; Larry J. Quebedeaux, Sunset, both of La.; Joseph F. Donovan, Spring, and Jefferson P. Ashton, Conroe, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.
Continuation of Ser. No. 427,710, Oct. 27, 1989, which is a continuation-in-part of Ser. No. 253,967, Oct. 5, 1988, Pat. No. 4,917,183. This application Jun. 20, 1991, Ser. No. 718,550
The portion of the term of this patent subsequent to Sep. 24, 2008, has been disclaimed.
Int. Cl.[5] E21B *43/04*, *43/08*
U.S. Cl. 166—278 **17 Claims**



1. An apparatus for use on a subterranean well conduit to prevent particulate matter in said well of a predeterminable size from passing into said conduit with the well production fluids, comprising:
an inner member having an interior wall and an exterior wall, said exterior wall having a selected exterior wall shape;
a fluid flow passageway defined within the interior wall of said inner member;
fluid flow passage means extending from the interior of said inner member through the exterior wall of said inner member and in communication with said fluid flow passageway;
retention means wrapped around the exterior wall of said

inner member and conforming in shape to said selected exterior wall shape, passing across said fluid flow passage means, and having fluid flow openings therethrough;

a fluid permeable bed of particulate solids around the exterior of said retention means sized to prevent effectively all such particulate matter in said well from passing inwardly with the production fluids through said fluid permeable bed and through said fluid flow passage means and into said fluid flow passageway when said conduit and said apparatus are positioned within said subterranean well;

whereby said openings in said retention means are sized to prevent the particulate solids of said fluid permeable bed from passing into said fluid flow passage means and into said fluid flow passageway and further sized to permit any particulate matter in said well passing through said fluid permeable bed to pass through the retention means and through the subterranean well conduit; and

an outer fluid permeable housing positioned around the exterior of said fluid permeable bed and having fluid passages therethrough for transmission of the production fluids within said well through said housing, said fluid passages in said outer housing being sized to prevent effectively all of said particulate solids of said fluid permeable bed from passing exteriorly through said housing and into said well;

said retention means having a cross-sectional area less than the cross-sectional area of the outer fluid permeable housing.

5,115,865

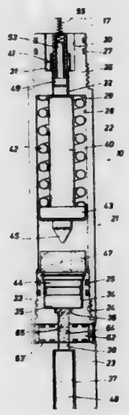
METHOD AND APPARATUS FOR SELECTIVELY ACTUATING WELLBORE PERFORATING TOOLS

James V. Carisella, 7524 Garnet, New Orleans, La. 70124, and Robert B. Cook, Mandeville, La., assignors to James V. Carisella, New Orleans, La.

Division of Ser. No. 538,840, Jun. 15, 1990, Pat. No. 5,052,489. This application Jul. 1, 1991, Ser. No. 723,946

Int. Cl.[5] E21B *43/11*

U.S. Cl. 166—297 **27 Claims**



1. A well perforator to be suspended in a well bore and comprising:

a fixed body;

an impact-acuated explosive on said fixed body;

a movable body arranged on said fixed body to be impelled against said impact-actuated explosive for detonating said explosive;

first means for retaining said movable body in an inactive position on said fixed body including a heat-responsive material arranged between said bodies initially retaining said movable body in its inactive position until subsequent heating of said heat-responsive material renders it incapable of retaining said movable body in its said inactive position; and

second means selectively initiated from the surface and operable for impelling said movable body against said impact-actuated explosive to detonate said impact-actuated explosive only after heating of said heat-responsive material has rendered said heat-responsive material incapable of retaining said movable body in its said inactive position.

5,115,866

SOIL VAPOR WELL CONSTRUCTION

Lawrence J. Corte, Lakewood, and Adrian Brown, Denver, both of Colo., assignors to K N Energy, Inc., Lakewood, Colo.

Filed Jan. 18, 1991, Ser. No. 642,905

Int. Cl.[5] E21B *43/00*

U.S. Cl. 166—370 **10 Claims**



1. A soil vapor well for removing volatile hydrocarbons from the vadose zone in the earth, said well comprising:

a larger diameter first bore hole and having side edges extending from the surface of the earth to a first depth;

an impervious casing having a smaller diameter than said first bore hole mounted concentrically within said first bore hole and extending from the bottom of said first bore hole to a point above the surface of the earth;

concrete filling the space in said first bore hole between said casing and said side edges of said first bore hole to provide a substantially air-tight seal between the earth below said first bore hole and the surface of the earth;

a second bore hole, having a smaller diameter than the diameter of said casing, extending downwardly from the lower end of said casing to second depth located above the water table;

aggregate filling said second hole and said casing; and

means connected to the upper end of said casing for drawing a vacuum in said second bore to extract the volatile hydrocarbons from the surrounding portion of the vadose zone through said aggregate and said casing.

5,115,867

DUAL LINEAR FIRE EXTINGUISHER

Maurice E. Tyler, Orinda, Calif., assignor to Systron Donner, Corporation, Concord, Calif.

Filed Oct. 30, 1990, Ser. No. 605,949

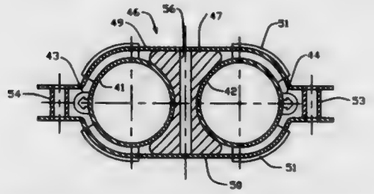
Int. Cl.[5] A62C *35/08, 3/08*

U.S. Cl. 169—28 **10 Claims**

1. A linear fire extinguisher for aircraft and similar applications where a rapid distribution of an extinguishant is necessary along a long linear distance comprising:

a pair of closed, elongated high strength tubular containers each having an axis along which it is elongated, each filled with a pressurized said extinguishant, each including a shaped linear explosive charge means for cutting such container along a line parallel to said respective axes,

means for mounting said pair of containers parallel to each other in close proximity with said linear shaped charges lying on walls of said pair of containers and substantially in the same plane as the axes of said containers, means for



simultaneously detonating said shaped linear charges, said means for cutting the containers along said lines comprising means for allowing the walls of said containers to unwrap around interior elements of said containers, and wherein said means for mounting said containers in close proximity comprises means for counteracting said unwrapping which comprises means for allowing said unwrapping walls to interfere with one another.

5,115,868

FIRE EXTINGUISHING COMPOSITION AND PROCESS

Alfred P. Dougherty, Jr., Wilmington; Richard E. Fernandez, Bear, and Daniel W. Moore, Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 417,654, Oct. 4, 1989, Pat. No. 5,040,609. This application Mar. 20, 1991, Ser. No. 671,432

The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.

Int. Cl.[5] H62C *1/00*

U.S. Cl. 169—45 **4 Claims**

1. A fire extinguishing composition comprising an amount sufficient to act as a propellant of at least 0.5 weight percent of trifluoromethane, and a fire-extinguishant containing at least 1% of at least one halogenated hydrocarbon selected from the group consisting of difluoromethane (HFC-32), chlorodifluoromethane (HCFC-22), 2,2-dichloro-1,1,1-trifluoroethane (HCFC-123), 1,2-dichloro-1,1,2-trifluoroethane (HCFC123a), 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124), 1-chloro-1,1,2,2-tetrafluoroethane (HCFC-124a), pentafluoroethane (HCF-125), 1,1,2,2-tetrafluoroethane (HFC-134), 1,1,1,2-tetrafluoroethane (HFC-134a), 3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca), 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb), 2,2-dichloro-1,1,1,3,3-pentafluoropropane (HCFC-225aa), 2,3-dichloro-1,1,1,3,3-pentafluoropropane (HCFC-225da), 1,1,1,2,2,3,3-heptafluoropropane (HFC-227ca), 1,1,1,2,3,3,3-heptafluoropropane (HFC-227ea), 1,1,1,2,3,3,-hexafluoropropane (HFC-236ea), 1,1,1,3,3,3-hexafluoropropane (HFC-236fa), 1,1,12,2,3,-hexafluoropropane (HFC-236cb), 1,1,2,2,3,3,-hexafluoropropane (HFC-236ca), 3-chloro-1,1,2,2,3-pentafluoropropane (HCFC-235ca), 3-chloro-1,1,1,2,2,-pentafluoropropane (HCFC-235cb), 1-chloro-1,1,2,2,3-pentafluoropropane (HCFC-235cc), 3-chloro-1,1,1,3,3-pentafluoropropane (HCFC-235fa), 3-chloro-1,1,1,2,2,3,-pentafluoropropane (HCFC-235fa), 3-chloro-1,1,1,2,2,3-hexafluoropropane (HCFC-226ca), 1-chloro-1,1,2,2,3,3-hexafluoropropane (HCFC-226cb), 2-chloro-1,1,1,3,3,3-hexafluoropropane (HCFC-226da), 3-chloro-1,1,1,2,3,3-hexafluoropropane (HCFC-226ea) and 2-chloro-1,1,1,2,3,3-hexafluoropropane (HCFC-226ba).

5,115,869

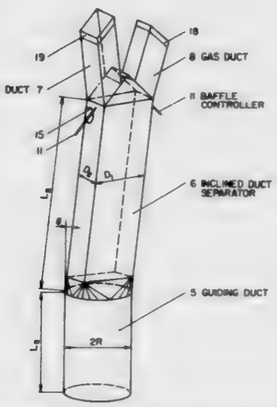
APPARATUS FOR EXTINGUISHING OIL WELL FIRES AND SEPARATING OIL/GAS STREAMS THEREOF

Dobran Flavio, 21 St. & Broadway, Long Island City, N.Y. 11106, assignor to Flavio Dobran, Long Island City, N.Y.

Filed Apr. 24, 1991, Ser. No. 690,663

Int. Cl.[5] A62C *3/06*

U.S. Cl. 169—69 **4 Claims**



1. An apparatus for extinguishing an oil well fire on an oil well releasing oil and gas, the apparatus comprising a guiding duct which covers at one end thereof the fire close to a ground surface; separator means attached at one end thereof to another end of the guiding duct for separating the oil from the gas into separate oil and gas streams, wherein the separator means comprises an inclined duct inclined with respect to vertical; and adjustable baffle means attached at another end of the separator means for diverting the separate oil and gas streams into separate ducts.

5,115,870

FLEXIBLE FLAIL TRIMMER WITH COMBINED GUIDE AND GUARD

Steven E. Byrne, 10787 Big Bone Church Rd., Union, Ky. 41091

Filed Dec. 31, 1990, Ser. No. 636,193

Int. Cl.[5] A01D *34/84*

U.S. Cl. 172—15 **20 Claims**



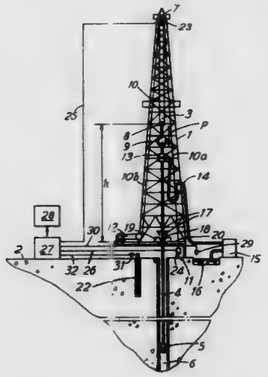
17. A combined guide and guard means for use on a flexible flail trimmer with a rotatable cutting head, said means including vertical surface referencing means and horizontal surface referencing means and being operable to index said trimmer along a sidewalk to edge grass adjacent thereto while shielding a user from debris generated by said trimmer and said guide and guard means including means for rotatably mounting said guide and guard means for rotation about an axis of rotation of said rotatable cutting head as said trimmer is used.

5,115,871

METHOD FOR THE ESTIMATION OF PORE PRESSURE WITHIN A SUBTERRANEAN FORMATION

Dominic P. J. McCann, Paris; Yves Kerbart, Gentilly, both of France, and Trevor M. Burgess, Missouri City, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Mar. 4, 1991, Ser. No. 664,261
Claims priority, application France, Dec. 3, 1990, 90 03230
Int. Cl.[5] E21B *49/00*
U.S. Cl. 175—50 **11 Claims**



1. A method for estimating pore pressure in an underground formation being drilled with a drill string to form a borehole, said drill string comprising a plurality of drill pipes connected together with a drill bit at the lower end thereof, and with a drilling fluid being circulated through the drill pipe and borehole, the method comprising the steps of:

a) monitoring the value of a first parameter to detect an influx of fluid from the formation into the borehole;

b) monitoring the value of a second parameter indicative of the weight of the drill string while the drill bit is generally adjacent to the formation;

c) monitoring any changes in the value of the second parameter while the drill string is being raised to the surface;

d) correlating the first and second parameters and determining the change in value of the second parameter; and

e) estimating the pore pressure of the formation from the determined change in value of the second parameter.

5,115,872

DIRECTIONAL DRILLING SYSTEM AND METHOD FOR DRILLING PRECISE OFFSET WELLBORES FROM A MAIN WELLBORE

Charles G. Brunet, Lafayette, La.; Gilles E. Labbeé, Spring, and Jay W. McGee, Houston, both of Tex., assignors to Anglo Suisse, Inc., Houston, Tex.

Filed Oct. 19, 1990, Ser. No. 599,756
Int. Cl.[5] E21B *7/08*
U.S. Cl. 175—61 **10 Claims**

1. A directional drilling apparatus for deflecting a drill bit to drill an offset borehole from the central axial path of a main wellbore of vertical, horizontal, or slanted orientation, comprising:

a) a tool body having a first, central longitudinally extending passageway that extends through the tool body;

b) inflatable packer means for sealing the main wellbore below the first passageway;

c) means in the first passageway for activating the packer so that it will inflate;

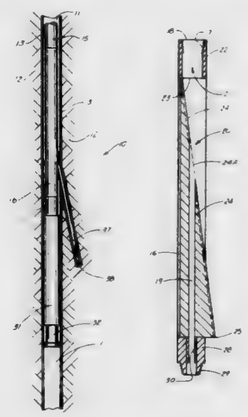
d) the tool body having a second passageway that forms an acute angle with the first passageway, the second passageway having an entry portion that intersects the first passageway above the activating means; and

e) the entry portion having means for routing the drill bit into the second passageway.

8. A method of drilling one or more offset wellbores from a first main wellbore comprising the step of:

a) drilling the initial main wellbore;

b) placing a first, larger drill string in the initial wellbore that has a tool body with first and second passageways therein forming an acute angle with respect to one another;



c) orienting the radial position of the second passageway with respect to the initial, main wellbore using a steering tool;

d) placing a second, smaller drill string in the main wellbore and inside the first drill string, the second drill string having a diameter larger than the first passageway;

e) diverting the second drill string to the second passageway at a position upstream of first passageway;

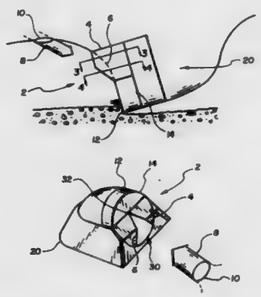
f) tracking the second passageway with the second drill string during drilling of an offset wellbore that forms an angle with the first borehole.

5,115,873

METHOD AND APPARTUS FOR DIRECTING DRILLING FLUID TO THE CUTTING EDGE OF A CUTTER

Paul E. Pastusek, Salt Lake City, Utah, assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Jan. 24, 1991, Ser. No. 645,558
Int. Cl.[5] E21B *10/46, 10/60*
U.S. Cl. 175—65 **21 Claims**



1. A downhole drilling bit and cutter combination, said cutter comprising an upper section and a lower section, said lower section including a cutting tip and said upper section including one or more fluid flow channels, said one or more flow channels focusing the flow of drilling fluid introduced therein towards said cutting tip.

12. A method of directing the flow of drilling fluid towards the cutting tip of one or more downhole drilling bit cutters, said drilling bit including one or more external drilling fluid courses directing drilling fluid away from the central axis of said bit and each of said courses further including one or more flow channels connected thereto, said method comprising the steps of:

flowing drilling fluid through one or more of said fluid courses; and

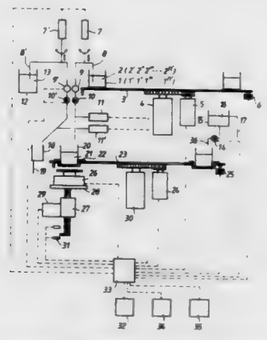
directing said fluid from one or more of said fluid courses by means of one or more of said flow channels towards the cutting tip of one or more of said cutters.

5,115,874

APPARATUS FOR AUTOMATICALLY PREPARING A DYEING SOLUTION

Takuro Hayahara; Haruo Katahira, both of Osaka; Akiyoshi Nishida, and Susumu Fukuda, both of Okayama, all of Japan, assignors to Japan Exlan Company, Limited and Exlan Co., Ltd., both of Osaka, Japan

Filed Sep. 21, 1990, Ser. No. 588,098
Claims priority, application Japan, Oct. 3, 1989, 1-259640
Int. Cl.[5] G01G *19/22*
U.S. Cl. 177—70 **5 Claims**



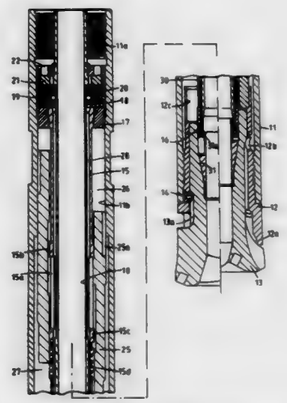
1. An apparatus for automatically preparing dyeing solutions, comprising: a plurality of containers for respectively accommodating a plurality of dye stock solutions and dye auxiliary solutions; a transfer means loaded with said plurality of containers; a plurality of outflow pipes incorporated with a cleaning mechanism and also equipped with a pump and a valve for causing an outflow of said dye stock solutions and said dye auxiliary solutions from respective said containers; a plurality of receiving vessels for successively receiving said dye stock solutions and said dye auxiliary solutions from said outflow pipes; a weighing means for converting, into electric signals, weight changes of said dye stock solutions and said dye auxiliary solutions which have been received in said receiving vessels; a transfer means loaded with said plurality of receiving vessels; a control mechanism for continuously or intermittently opening and closing said pump and said valve by making a comparison with a predetermined value in accordance with a level of said electric signal; a dilution water outflow pipe provided with a valve for causing dilution water to flow into said receiving vessels after completely weighing said dye stock solutions and said dye auxiliary solutions; and a control mechanism for continuously or intermittently opening and closing said valve of said dilution water outflow pipe in accordance with a predetermined value.

5,115,875

HAMMER DRILLS FOR MAKING BOREHOLES

Melvyn S. J. Ennis, 19 Wynnland Park, Carnmoney, Newtownabbey, County Antrim, Northern Ireland BT36 6SE

Division of Ser. No. 178,688, Apr. 6, 1988, Pat. No. 4,921,056.
This application Mar. 1, 1990, Ser. No. 486,939
Claims priority, application United Kingdom, Apr. 23, 1987, 8709572; Jan. 29, 1988, 8801969
The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.
Int. Cl.[5] E21B *4/14*
U.S. Cl. 175—92 **11 Claims**



1. A valveless down-the-hole hammer drill for use with a drill string supplying high pressure fluid to the hammer drill, comprising:

a body tube having an upper end for attachment to a drill string;

a chuck secured to said body tube at a lower end thereof;

a cutter bit carried by said chuck;

cooperating means on said chuck and said cutter bit mounting said cutter bit for limited axial movement relative to said chuck;

a piston within said body tube reciprocable axially therein into percussive contact with said cutter bit and defining with said body tube upper and lower chambers at opposite ends of said piston;

supply control means cooperable with said piston and responsive to axial movement thereof for selectively connecting said upper and lower chambers and the pressure fluid supply from the drill string according to the axial position of said piston in said body tube;

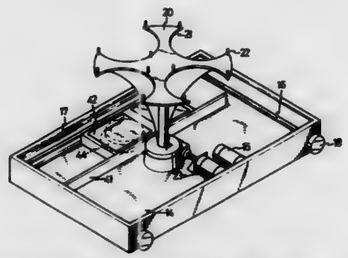
an exhaust port;

exhaust control means cooperable with said piston and responsive to axial movement thereof for selectively connecting said upper and lower chambers to said exhaust port according to the axial position of the piston in said body tube;

said exhaust control means including a foot valve sleeve mounted on said chuck surrounded by an annular space in communication with said exhaust port;

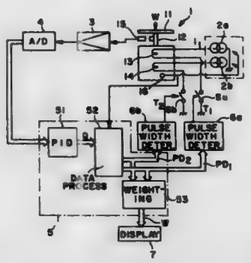
said piston being reciprocable between a raised position in which pressure fluid is supplied to the upper chamber, the lower end of the piston is clear of the foot valve sleeve, and said lower chamber is connected to said exhaust port through said annular space whereby the piston is urged downwardly and a lower position in which pressure fluid is supplied to the lower chamber, the lower end of the piston is sealingly engaged in the foot valve sleeve to seal the lower chamber from the exhaust port, and the upper chamber is connected to the exhaust port whereby the piston is urged upwardly.

5,115,876
AUTOMATIC WEIGHING SYSTEM FOR POWDER
Yuan-Wei Chang, Taipei Hsien, and Chiou-Fwu Chen, Yilan Hsien, both of Taiwan, assignors to Gain Lab Corp., Taipei, Taiwan
Filed Mar. 11, 1991, Ser. No. 667,449
Int. Cl.[5] G01G *19/00*
U.S. Cl. 177—145 5 Claims



1. An automatic weighing system comprising:
at least one carrier movable along a track means for carrying powder, said carrier having a base plate on which a turn table is rotatably disposed, said turn table having a plurality of cut-out portions each configured to support a container to be filled with said powder;
a lifting unit provided on said base plate;
a weighing means for weighing said container supported by said lifting unit, said container being supported by said weighing means when said lifting unit is in an extended position and being supported by said turn table when said lifting unit is in a retracted position;
a first driving means mounted on said base plate for driving said carrier; and
a second driving means mounted on said base plate for controlling a rotational movement of said turn table.

5,115,877
ELECTRONIC BALANCE
Akira Komoto, Okumachi, Japan, assignor to Shimadzu Corporation, Kyoto, Japan
Filed Jul. 31, 1990, Ser. No. 560,172
Claims priority, application Japan, Jul. 31, 1989, 1-199748
Int. Cl.[5] G01G *7/02*
U.S. Cl. 177—212 7 Claims



1. An electronic balance devised so as to weigh a weight placed on a weighing pan by counterbalancing said weight with a force generated by an electromagnetic force transducer having its force coil assembly supplied with pulse currents having their duty factors controlled according to said weight, said electronic balance comprising:
a plurality of pulse current generating means for supplying pulse currents to said force coil assembly of said electromagnetic force transducer;
a displacement data outputting means for detecting a displacement of said weighing pan;
a PID operation means for performing PID operations on the output from said displacement data outputting means; and
a data process part for giving a duty factor of the pulse current from each of said pulse current generating means by determining said duty factor from data corresponding to bits in a plurality of regions in accordance with the output from said PID operation means.

5,115,878
HOOD STRUCTURE FOR A VEHICLE
Ryoji Hayata, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Jul. 26, 1990, Ser. No. 558,000
Claims priority, application Japan, Jul. 26, 1989, 1-87579[U]
Int. Cl.[5] B62D *25/10*
U.S. Cl. 180—69.21 2 Claims

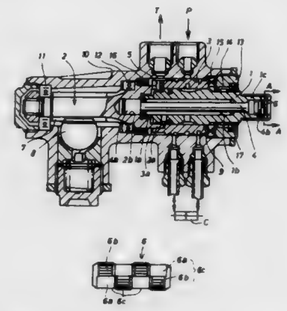


1. An impact absorbing hood structure for a front hood located between a front end and a windshield of a vehicle comprising:
at least one panel extending in both longitudinal and lateral directions of the front hood.
a laterally extending indentation provided in a central region of the front hood, said indentation dividing said front hood longitudinally into a stronger part between the windshield and the indentation and a weaker part between the vehicle front end and the indentation, said stronger part having a higher rigidity than the weaker part so that the front hood is bent and folded by a crash impact at the indentation, the front hood including an outer panel and an inner panel secured to said outer panel, the indentation and the stronger part being provided on the inner panel, the stronger part extending from a rear end part of the inner panel adjacent said windshield to the indentation and including at least one metallic reinforcement plate attached to the inner panel, and
a hinge component for pivotally mounting the front hood on said vehicle, the metallic reinforcement plate having a tube portion projecting through a hole in said inner panel, said tube portion working as a spacer and maintaining a clearance between said metallic reinforcement plate and said hinge component corresponding to the width of the inner panel.

5,115,879
CENTERING DEVICE FOR A SERVO VALVE OF A POWER STEERING DEVICE
Yoshihito Imura, and Keita Ozeki, both of Aichi, Japan, assignors to TRW Steering & Industrial Products (Japan) 051156651, Minato, Japan
Filed Dec. 12, 1990, Ser. No. 626,026
Claims priority, application Japan, May 12, 1989, 1-315911
Int. Cl.[5] B62D *5/10*
U.S. Cl. 180—149 17 Claims

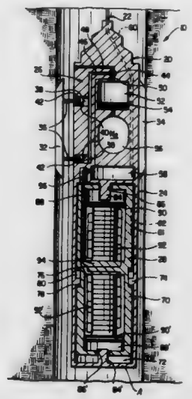
1. A balance pin for connecting an input shaft of a power steering device to a torsion bar of the power steering device, comprising:

a cylindrical solid;
a plurality first sections having a first effective diameter formed on the surface of the cylindrical solid, where each first section is formed entirely on one side of an axial plane including an axis of the cylinder;
a plurality of second sections having a second effective diameter formed on the surface of the cylindrical solid; wherein



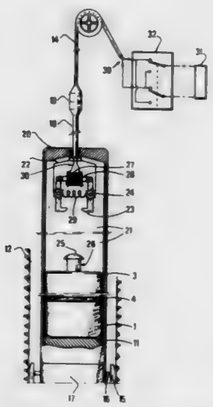
the first effective diameter is greater than the second effective diameter;
each second section corresponds to one first section;
the second sections are located on a side of the axial plane opposite to the side of the axial plane on which corresponding first sections are formed; and
no first section is adjacent to another first section along the cylinder axis.

5,115,880
PIEZOELECTRIC SEISMIC VIBRATOR WITH HYDRAULIC AMPLIFIER
John J. Sallas, Plano, and Michael A. Corrigan, Carrollton, both of Tex., assignors to Halliburton Geophysical Services, Duncan, Okla.
Filed May 8, 1989, Ser. No. 749,058
Int. Cl.[5] G01V *1/40*
U.S. Cl. 181—106 17 Claims



1. A seismic energy source for imparting seismic energy into earth formations, said seismic energy source comprising:
a hydraulic system containing a substantially incompressible fluid and having a power piston and a drive piston wherein small movements of said power piston generate substantially larger movements of said drive piston;
a piezoelectric element adapted to elongate and contract in response to the application of an appropriate electrical signal;
means coupling said piezoelectric element to said power piston; and
means for imparting seismic energy into earth formations in response to movement of said drive piston.

5,115,881
ANTI-BOUNCE DEVICE FOR A MASS STRIKING A TARGET ELEMENT
Patrick Meynier, Chatou, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France
Division of Ser. No. 511,766, Apr. 20, 1990, Pat. No. 5,035,297.
This application Apr. 11, 1991, Ser. No. 683,614
Claims priority, application France, Apr. 20, 1989, 89 05386
Int. Cl.[5] G01V *1/40*
U.S. Cl. 181—106 8 Claims

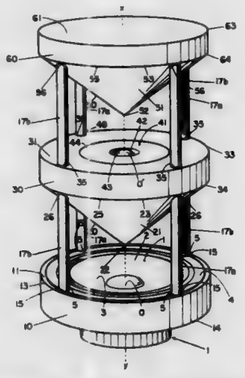


1. An anti-bounce device for a target element in contact with the earth by a mass dropping from a first position, the anti-bounce device comprising a counter-mass for preventing a bouncing of the mass, means for linking the mass and the counter-mass at a predetermined distance from said mass and behind the same as viewed in a dropping direction and for braking the mass and the counter-mass in order to delay the movement of the counter-mass with respect to the mass after impact thereby putting the mass and the counter-mass in phase opposite, whereby secondary impacts of the mass on said target element are suppressed, and wherein said means for linking and for braking comprise a layer of a damping material having a stiffness for substantially preventing a backward movement of the mass after an impact thereof against the target element.

5,115,882
OMNIDIRECTIONAL DISPERSION SYSTEM FOR MULTIWAY LOUDSPEAKERS
D. Grier Woody, 420 Summerour St., Norcross, Ga. 30071
Filed Mar. 29, 1989, Ser. No. 330,052
Int. Cl.[5] H05K *5/00*; H04R *25/00*
U.S. Cl. 181—144 20 Claims

1. An omnidirectional dispersion system for midrange and high frequency sound waves of multiway loudspeakers, said sound waves defining directional sound waves; said dispersion system comprising a plurality of drivers for generating said sound waves, a plurality of reflectors for dispersing said sound waves, a plurality of supporting means for mounting said driv-

ers and said reflectors, and spacing means for vertically spacing apart said supporting means; each of said drivers having a diaphragm, said diaphragm having a planar perimetric outer edge and front and rear surfaces disposed about a geometric center, said diaphragm being vibrated by a voice coil, said voice coil having general dimensions of a thin-walled cylindrical tube with two opposed circular ends, said two ends lying substantially in parallel planes and having geometric centers, said voice coil having a longitudinal axis intersecting said geometric centers of said diaphragm and said two circular ends, one of said ends being a forward end of said voice coil, said forward end rigidly attached to said diaphragm so that said longitudinal axis is substantially perpendicular to a plane of said perimetric outer edge of said diaphragm, said rear surface of said diaphragm facing toward said voice coil, said diaphragm radiating sound waves off said front and rear surfaces thereof in opposite directions along and about a straight line that includes said longitudinal axis as a segment thereof, said straight line defining a firing axis of each of said drivers; said dispersion system utilizing only the radiation of sound waves off the front surface of said diaphragm; each of said drivers having a rigid frame for supporting said diaphragm and said voice coil, said sound waves generated from each of said drivers originating from and approximately about a point on said firing axis located approximately at said geometric center of said diaphragm, said point being an acoustic center of each

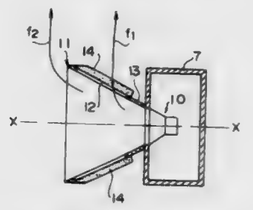


of said drivers; said frame of each of said drivers having a forward part defined by a mounting flange, said mounting flange being a relatively flat outward extension of said frame in planes approximately parallel to the plane of said perimetric outer edge of said diaphragm; said mounting flange having a perimetric edge; there being defined a shortest distance across said mounting flange, said distance being a length of a shortest straight line segment intersecting said firing axis of each of said drivers and having ends thereof on said perimetric edge of said mounting flange; said shortest straight line segment defining a distance across each of said drivers; said drivers being reproducers of different bands of audio frequencies, at least one of said drivers being a reproducer of midrange frequencies, other of said drivers reproducing bands of frequencies above said band of frequencies reproduced by said at least one driver; each of said reflectors having a generally conic reflecting surface defined by an apex and a base; said base having a planar surface and a perimetric edge; each of said reflectors having a geometric height, said geometric height being substantially perpendicular to a plane of said base and extending from said plane to said apex, said conic reflecting surface of each of said reflectors disposed 360 degrees about said geometric height, said reflecting surface sloping from said apex to said perimetric edge of said base, said sloping defining a slope of said reflecting surface; said geometric height having a mid-point half-way between said apex and said plane of said base; each of said supporting means being of relatively flat one-piece construction, a top and bottom of each of said supporting means being vertically aligned planar surfaces in substantially horizontal planes, said planar surfaces being mounting surfaces; said mounting surfaces of each of said supporting means having substantially congruent perimetric outer edges and geometric centers; each of said supporting means having a continuous side surface, said side surface connecting said mounting surfaces at the perimetric outer edges of said mounting surfaces; each of said supporting means for mounting said drivers having a centered vertical opening intersecting a plane of each of said mounting surfaces, said openings accomodating a passage of rearward portions of one of said drivers when said one driver is mounted on one of said supporting means; there being defined a distance across each of said supporting means, said distance being a length of a shortest straight line segment intersecting a geometric center of one of said mounting surfaces and having ends thereof on a perimetric outer edge of said one mounting surface; each of said drivers being mounted across said opening of one of said supporting means for mounting said drivers, said mounting flange of each of said drivers being attached to one of said mounting surfaces of one of said supporting means for mounting said drivers; each of said reflectors being mounted on one of said supporting means, said planar surface of said base of each of said reflectors being attached to one of said mounting surfaces of one of said supporting means; said spacing means spacing apart said supporting means so that said drivers and said reflectors are positioned in a substantially vertical alignment wherein any two of said supporting means adjacent to one another define proximate supporting means, any two consecutively aligned drivers define proximate drivers, and any two consecutively mounted reflectors define proximate reflectors; a total distance across said proximate drivers defined by a combination of the distance across said proximate drivers; said vertical alignment being such that the firing axis of each of said drivers and the geometric height of each of said reflectors are substantially segments of a straight line, said straight line substantially coinciding with a vertical axis of said dispersion system; said alignment being such that each of said drivers faces the reflecting surface of one of said reflectors; said proximate drivers being reproducers of adjacent bands of audio frequencies; said vertical alignment being such that said proximate supporting means are in a spaced relationship, and such that the apex of the reflecting surface of each of said reflectors and the acoustic center of a facing driver are in a spaced relationship; and said alignment being such that said reflecting surface of each of said reflectors disperses said directional sound waves away from said vertical axis of said dispersion system 360 degrees about said vertical axis in substantially horizontal planes; said sound waves radiating outwardly from points on and proximately about said vertical axis in the region of the geometric height of each of said reflectors, a median point of said points being on said geometric height and defining an effective acoustic center of the dispersion system; a straight line segment having ends thereof on said effective acoustic center of proximate reflectors defining a vertical separation of said effective acoustic centers associated with said proximate reflectors; wherein the improvement comprises:

said perimetric edge of said base of each of said reflectors that substantially coincides with said perimetric outer edge of one of said mounting surfaces of each of said supporting means upon which each of said reflectors is mounted, whereby said one mounting surface is substantially shielded from midrange and high frequency sound waves radiating off said diaphragm of a facing driver, and also eliminating thereby parallel planar surfaces partially enclosing the soundpath of said sound waves; and

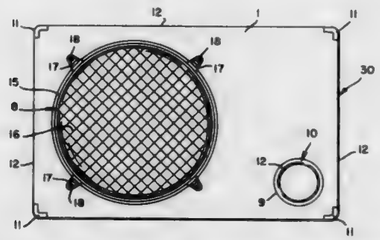
said slope of said reflecting surface of each of said reflectors that cooperate with the spaced relationship of said proximate supporting means so that said reflecting surface reflects directional sound waves directly into ambient air.

5,115,883
LOUDSPEAKER
Hideaki Morikawa; Yasuo Gan; Koushiro Kogure, and Takashi Ooyaba, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Sep. 7, 1990, Ser. No. 578,929
Claims priority, application Japan, Apr. 27, 1990, 2-113811
Int. Cl.[5] H05K *5/00;* **G10K** *11/00*
U.S. Cl. 181—152 **3 Claims**



1. A loudspeaker, comprising:
a baffle having a horn shape provided in a front of said loudspeaker and having sound escape holes, an axial length of said baffle being at least one-half wavelength of sound waves emitted by said loud speaker, and each sound escape hole having an area one-half of one times as large as an area of a section of the baffle sectioned along a plane passing through a center of said each sound escape hole; and
a sound absorptive panel provided on an outside of said baffle so as to cover said sound escape holes.

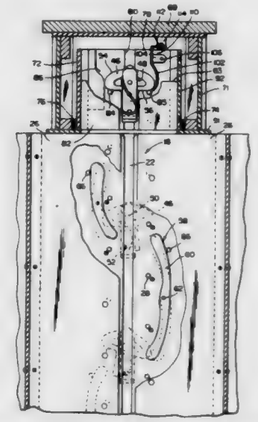
5,115,884
LOW DISTORTION AUDIO SPEAKER CABINET
James Falco, 33-54 165th St., Flushing, N.Y. 11358
Filed Oct. 4, 1989, Ser. No. 417,183
Int. Cl.[5] H05K *5/00*
U.S. Cl. 181—156 **65 Claims**



1. An audio speaker system comprising a cabinet having a front panel, a speaker, said speaker mounted within the front panel, speaker mounting means to mount said speaker flush with the outer wall of said front panel, at least said front panel having a resonant frequency above the resonant frequency of said speaker, said mounting means including substantially non-resonant material between said speaker and said panel, and said speaker floating within said mounting means substantially eliminating any transfer of resonance between said cabinet and speaker.

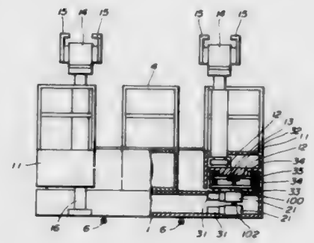
5,115,885
FIRE ESCAPE DEVICE
Evans J. Chouest, P.O. Box 123, Cut Off, La. 70345
Filed Sep. 4, 1991, Ser. No. 754,619
Int. Cl.[5] A62B *1/20*
U.S. Cl. 182—3 **12 Claims**

1. A fire escape device comprising a generally vertically disposed track supported in a building and extending from an elevated area of the building to a lower egress area, a slide mounted on an individual user of a fire escape device, said slide and track including coacting means enabling the slide to be assembled in relation to the track at the elevated position in the building and guiding and controlling the descent of the slide as it moves from the elevated position to the egress position, said means controlling descent of the slide including a plurality of



vertically spaced pins positioned along each side of the track with the pins on one side being staggered in relation to the other, said slide including an oscillatable member having downwardly facing lower surface areas engagable with and sliding off alternate pins on opposite sides of the track during descent of the slide, said egress position of the track including means enabling the slide and occupant of the slide to separate from the track.

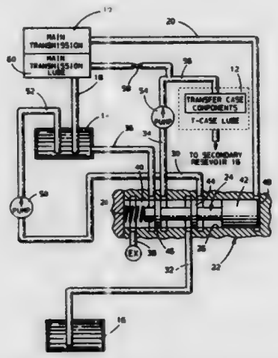
5,115,886
MOVABLE PLATFORM FOR CONSTRUCTION SITES
Kazunari Sakamoto, Tokyo, and Isao Nemoto, Narashino, both of Japan, assignors to Iseki Kaihatsu Koki Co., Ltd., Tokyo and Nemoto Kikaku Kogyo Co., Ltd., Chiba, both of Japan
Continuation of Ser. No. 375,861, Jul. 5, 1989, abandoned. This application May 2, 1991, Ser. No. 696,986
Claims priority, application Japan, Jul. 8, 1988, 63-170116; Nov. 28, 1988, 63-299937
Int. Cl.[5] E04G *3/16*
U.S. Cl. 182—36 **3 Claims**



1. A movable platform for attachment to a structure having a hanging means, comprising:
(a) a stage having two opposite end portions, and a horizontal surface for conveying objects thereon;

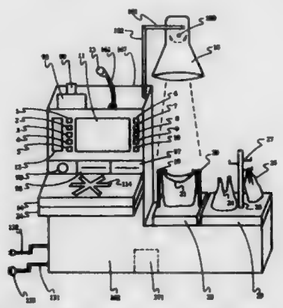
(b) a pair of elongated, horizontal arms having two opposite end portions;
(c) a plurality of upwardly extending holding means installed on said pair of arms for releasably hanging the platform from said hanging means of the structure;
(d) driving means for movably coupling the pair of arms, respectively, to said end portions of the stage to slide and rotate the elongated arms with respect to the stage so as to be respectively rotatable at said end portions of the stage in a horizontal plane and slidable with respect to the stage in the direction of elongation of said arms;
(e) a control means to actuate said driving means for selectively sliding and rotating the arms with respect to said stage, and for selectively actuating and releasing the holding means, so that the platform can be configured relative to the hanging means, and the stage can be conveyed with respect to the structure after at least one of said arms is attached to said hanging means, by actuating said driving means; and
(f) speed-reduction units, said driving means being connected to said arms via said speed-reduction units, wherein each of said speed-reduction units comprises a globoid worm and a wheel, said globoid worm being connected to said driving means, said worm including a helical groove having a constant pitch, said wheel being connected to said arm means and held in engagement with said worm, said wheel including:
a circular plate having an outer peripheral surface and an axis perpendicular to said axis of said worm, said circular plate having a plurality of recesses evenly disposed on the outer peripheral surface at a pitch identical to an integer multiple of said pitch of said helical groove of said worm; and
a plurality of roller units respectively provided to said recesses, each of said roller units having a roller-support installed to said recess so as to be extendable radially outwardly and a pair of rollers rotatably attached to said roller-support, said rollers having a common axis perpendicular to said axis of said wheel, whereby said rollers being fitted in the groove of said worm without backlash while transmitting a rotational movement of the globoid worm to the wheel.

5,115,887
COMMON HYDRAULIC CIRCUITRY FOR A SCAVENGE AND TOWING SYSTEM
Scott A. Smith, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 22, 1991, Ser. No. 688,419
Int. Cl.[5] F01M *1/18*
U.S. Cl. 184—6.4 **2 Claims**



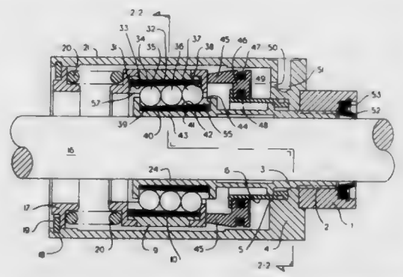
1. A hydraulic fluid system comprising in combination: first sump means; second sump means disposed at a vertical position lower than said first sump for receiving hydraulic fluid drained from a predetermined portion of a transmission; first pump means for drawing hydraulic fluid from said second sump means for delivery to said first sump means during normal operation of said transmission; second pump means for delivering lubricating hydraulic fluid to said predetermined portion of said transmission during normal operation and during towing operation; control valve means for directing hydraulic fluid to said first and second pump; a single passage connecting said second sump to said control valve means; control signal means for controlling said control valve means in response to normal operation of said transmission for positioning said control valve means to connect said first pump to receive hydraulic fluid from said second sump and to connect said second pump to receive hydraulic fluid from said first sump; and spring means for positioning said control valve means in a second position for simultaneously disconnecting said first and second pumps from said second and first sumps respectfully and for connecting said second pump to said second sump to permit delivery of lubricating hydraulic fluid from said second sump to said predetermined portion of said transmission.

5,115,888
SELF-SERVE CHECKOUT SYSTEM
Howard Schneider, 149 Finchley Road, Montreal, Quebec, Canada H3X 3A3
Filed Feb. 4, 1991, Ser. No. 650,167
Int. Cl.[5] G06K *7/10*
U.S. Cl. 186—61 **17 Claims**



1. A self-service checkout system comprising:
(a) a first stationary structural member intended for checkout use by a customer;
(b) bar code reader means and first scale means mounted in said first stationary structural member such that said bar code reader means does not make contact with the active elements of said first scale means but that said bar code reader means is mounted less than one meter away from said first scale means;
(c) said bar code reader means generating a first signal indicative of the product code of a product whose bar coded label has been read by said bar code reader means;
(d) bag holding means mounted upon said first scale means;
(e) said first scale means generating a second signal indicative of the weight present on said first scale means;
(f) first user input means mounted in said first stationary structural member generating a third signal indicative of the particular first user input means device selected;
(g) second scale means mounted in said first stationary structural member such that the top exposed surface of said second scale means defines an area where customers will temporarily deposit products without valid bar coded labels and where said second scale means generates a fourth signal indicative of the weight thereon;
(h) video sensor means mounted in a video sensor movement means above said first scale means and above said second scale means where said video sensor movement means can selectively move said video sensor means so as to view an image of the top exposed surface of the said second scale means or to view an image of the surface of the said first scale means;
(i) said video sensor means generating a fifth signal indicative of the image said video sensor means is currently viewing;
(j) first user display means mounted in said first stationary structural member;
(k) a second stationary structural member intended for supervisory use by a supervisory employee;
(l) second user display means mounted in said second stationary structural member where said second user display means receives said fifth signal and said second user display means displays an image corresponding to said fifth signal;
(m) second user input means mounted in said second stationary structural member generating a sixth signal indicative of the particular second user input means device selected;
(n) controller means receiving via data communications means said first, second, third, fourth and sixth signals;
(o) said controller means sending a first controller signal to said first user display means where said first user display means displays an image corresponding to said first controller signal;
(p) said controller means sending a second controller signal to a third user display means where said third user display means displays an image corresponding to said second controller signal and where said third user display means is mounted in the said second stationary structural member;
(q) said controller means sending a third controller signal to said video sensor movement means where said video sensor movement means moves the said video sensor means corresponding to the said third controller signal;
(r) product lookup table means attached to said controller means;
(s) said controller means upon receiving the first signal from said bar code reader means, sending a signal indicative of the first signal to said product lookup table and receiving in return a stored weight signal from said product lookup table indicative of the weight of the product whose bar code has just been read by said bar code reader means where said controller means compares the said stored weight signal with the increase in the second signal, indicative of the increase in weight on the said first scale means, being received from the said first scale means and where there is no valid correspondence between said stored weight signal and the increase in the second signal, said controller means sends a first controller signal to said first user display means advising the user of the lack of such valid correspondence; and
(t) said controller means upon receiving the third signal from the said first user input means indicative of a product without a valid bar code, sending a third controller signal to said video sensor movement means such that said video sensor movement means moves the said video sensor means such that the said video sensor means views the surface of the said second scale means and thus the image of the surface of the said second scale means is indicated by the fifth signal and is thus displayed on the said second user display means, and sending a second controller signal to the said third user display means, and upon receiving a valid sixth signal from the said second user input means sends a first controller signal to said first user display means advising the user to transfer the contents on the said second scale means to the said first scale means and then verifies that the increase in weight indicated by the increase in the second signal is equal to the previous value of the fourth signal indicating the weight previously on the said second scale means.

5,115,889
SHAFT CLAMPING DEVICE
Norbert Fortmann, Hanover; Helmut Gottling, Isernhagen; Horst Janetzko, Celle; Ralf Kook, Hanover; Hans Kruppa, Barsinghausen, and Gerhard Scharnowski, Gehrden, all of Fed. Rep. of Germany, assignors to Mannesmann Rexroth Pneumatik GmbH, Hanover, Fed. Rep. of Germany
Filed Sep. 13, 1990, Ser. No. 581,745
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1989, 3931014
Int. Cl.[5] G05G *5/14*; F15B *15/26*; F16D *63/00*
U.S. Cl. 188—67 **17 Claims**



1. A clamping device for an axially and rotatably movable cylindrical body of the type comprising:
a) a carrier arranged coaxially to the cylindrical body and spaced therefrom;
b) clamping means located on said carrier essentially radially outwardly from a cylindrical body associated therewith for forceably engaging said cylindrical body;
c) at least one clamping ramp detachably mounted on said clamping means, said clamping ramp having a running surface thereon inclined to the longitudinal axis of said cylindrical body;
d) actuating means for actuating said clamping means, said actuating means having an actuating element mounted coaxially to the cylindrical body radially outwardly of said clamping means and longitudinally movable relative thereto, said actuating element having an inner portion defining an actuating surface, said actuating surface opposed and parallel to said running surface and defining a cavity therebetween;
e) bearing means for urging said clamping means onto said cylindrical body when said actuating element is longitudinally moved, said bearing means having a bearing set of at least two bearings of generally equivalent diameter within said cavity engaging said running surface and said opposing actuating surface; and
f) means for displacing the actuating means in the longitudinal direction of the cylindrical body.

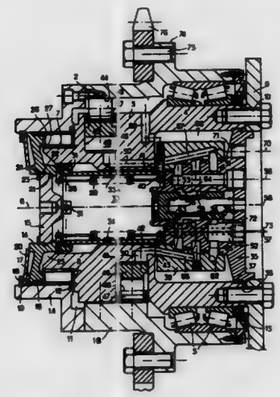
5,115,890
PRESSURE FLUID MECHANISM SUCH AS A MOTOR OR A PUMP COUPLED TO A BRAKING DEVICE
Alain W. Noel, Verberie, France, assignor to Poclain Hydraulics, Verberie, France
Filed Nov. 16, 1990, Ser. No. 614,933
Claims priority, application France, Nov. 30, 1989, 89 15840
Int. Cl.[5] F16D *65/24, 55/00, 63/00*; F01B *11/00*
U.S. Cl. 188—71.5 **9 Claims**

1. A pressure fluid mechanism, a motor or a pump, comprising:
a reaction cam;
a cylinder block mounted to rotate relative to the cam and comprising firstly a central void and secondly a plurality of cylinders each containing a piston suitable for bearing against said cam and delimiting a working chamber inside said cylinder, which cylinder block further includes an

axial extension enabling it to be fixed to a support such as a vehicle chassis;

an internal fluid distributor valve constrained to rotate with the cam in said relative rotation by means of a link device which extends inside said central void of the cylinder block in the opposite axial direction to the direction in which said extension of the cylinder block extends, said link device extending beyond the corresponding end of said cylinder block and itself being constrained with respect to said relative rotation to rotate firstly with said cam and secondly with said internal fluid distributor valve;

the cylinder block and its extension constituting an assembly interposed between the cam and the internal fluid distributor valve;



wherein:

a) a braking device is disposed at the end of the mechanism towards which the link device extends, the braking device being disposed between the cylinder block and the cam, and including a chamber containing the disks of a stack of brake disks and delimited by a cover extending transversely relative to the axis of relative rotation;

b) the link device includes a link mechanism which is constrained with respect to the relative rotation to rotate together with the cover of said chamber containing the disks; and

c) the cover of said chamber containing the brake disks is constrained with respect to said relative rotation to rotate with said cam.

5,115,891

COMPOSITE BRAKE DRUM WITH IMPROVED LOCATING MEANS FOR REINFORCEMENT ASSEMBLY

Donald A. Raitzer, Farmington Hills, and Raymond J. Twisdom, Warren, both of Mich., assignors to The Budd Company, Troy, Mich.

Filed Dec. 17, 1990, Ser. No. 628,464

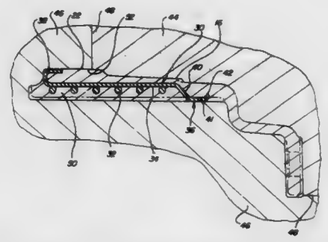
Int. Cl.[5] F16D *65/10*

U.S. Cl. 188—218 R **19 Claims**

1. A composite brake drum for a motor vehicle comprising:

a mounting plate portion for mounting said drum to a motor vehicle axle structure for rotation about an axis of rotation;

a cylindrical side portion joining said mounting plate portion and defining an open end and a closed end of said drum and forming an inside cylindrical braking friction surface, said cylindrical side portion having a reinforcing structure substantially embedded therein and including at least two rings extending circumferentially about said drum and being coaxial with said axis of rotation, said rings also being connected together and axially spaced relative to said axis of rotation by at least two axially extending locator wires having ends for positioning said reinforcing



structure within said cylindrical side portion, at least one end of said locator wires extending axially beyond said rings and contacting only said inside cylindrical braking friction surface.

5,115,892

HYDRAULIC SHOCK ABSORBER WITH PISTON SEAL STRUCTURE FOR ENHANCEMENT OF INITIAL RESPONSE

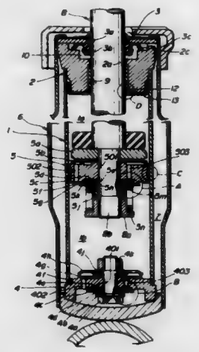
Fumiyuki Yamaoka; Junichi Emura, and Takayuki Furuya, all of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Japan

Filed Sep. 26, 1989, Ser. No. 412,499

Claims priority, application Japan, Sep. 27, 1988, 63-242042; Sep. 29, 1988, 63-245233

Int. Cl.[5] F16F *9/06, 9/52*

U.S. Cl. 188—282 **12 Claims**



1. A shock absorber comprising:

a hollow cylinder filled with a working fluid;

a piston mounted on one end of a piston rod and thrustingly movable within the hollow cylinder, said piston dividing the interior space of said cylinder into first and second chambers;

a fluid path means for establishing fluid communication between said first and second fluid chambers, said fluid path means generating a first damping force in response to piston stroke;

a first flow restricting valve means associated with said fluid path means for restricting fluid flow therethrough for generating a second damping force in response to piston stroke in one direction;

a second flow restricting value means associated with said fluid path means and arranged in series with said first valve means, for restricting fluid flow therethrough for generating a third damping force in response to piston stroke in said one direction, said flow path means and said first and second valve means being formed so that a composite damping force of said first, second and third damping forces has an essentially linear variation characteristic in relation to piston stroke speed; and

a seal member disposed between the outer periphery of said piston and the inner periphery of said cylinder for establishing fluid tight sealing therebetween, said seal member assuring the essentially linear variation characteristic of said composite damping force.

5,115,893

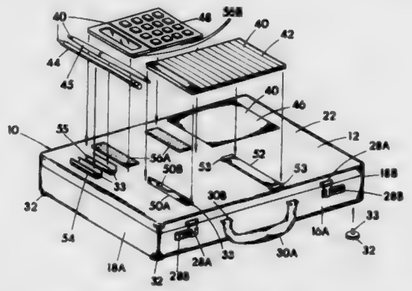
TRAVEL DESK

Sydne N. Terkildsen, P.O. Box 1311, Williams, Calif. 95987

Filed Dec. 11, 1991, Ser. No. 804,690

Int. Cl.[5] A47B *3/10*

U.S. Cl. 190—11 **4 Claims**



1. A carrying case and portable writing desk combination structured for carrying items within the case and for providing an easily employed message recording surface, comprising,

a generally flat top panel and an oppositely disposed generally flat bottom panel, two narrow side panels connected to said top panel and said bottom panel, and two narrow end panels connected to said top panel and said bottom panel and further connected to said side panels so as to define a generally rectangular case having a hollow interior for storing items therein;

said case having a separable seam extending through said case dividing said case into a base and a lid;

at least one hinge attached to said base and spanning across said seam and affixing to said lid to hingidly attach said lid to said base so as to allow raising said lid relative to said base to gain access to said interior of said case;

at least one handle attached to an exterior surface of said case so as to allow carrying of said case by said handle;

at least one latching means, a first portion of said latching means affixed to said lid, and a second portion of said latching means affixed to said base and aligned with said first portion of said latching means so as to allow releasible securement of said lid in a closed position to said base of said case;

a plurality of writing materials affixed on an exterior exposed surface of said top panel of said case so as to render said writing materials stationary relative to said case and readily accessible, said writing materials including at least one multi-sheet paper note pad, said paper note pad being releasibly secured to said top panel of said case by at least one first clamping means affixed to said top panel,

said writing materials further including at least one handholdable writing implement, said writing implement being releasibly secured to said top panel of said case by at least one second clamping means affixed to said top panel.

5,115,894

STRUCTURE OF A HANDLE WITH FASTENING FUNCTION

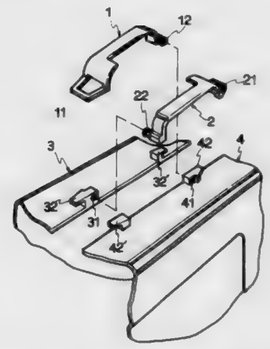
Long-Far Kuo, Taipei, Taiwan, assignor to Ping Ho Liao, Taipei, Taiwan

Filed Jul. 8, 1991, Ser. No. 726,566

Claims priority, application Taiwan, Jun. 22, 1991, 80207515

Int. Cl.[5] B65D *25/28*

U.S. Cl. 190—117 **1 Claim**



1. A structure of a handle arrangement for a case comprising:

a first handle having a first insertion pole at one end and a first buckle at another end;

a second handle having a second insertion pole at an end opposite said first insertion pole of said first handle, said second handle having a second buckle at another end;

a first case shell having a first slot for receiving said second insertion pole of said second handle, said first case shell having a first mortise for receiving said second buckle of said second handle; and

a second case shell connected to said first case shell said second case shell having a second slot formed thereon for receiving said first insertion pole of said first handle, said second case shell having a second mortise for receiving said first buckle of said first handle.

5,115,895

LUGGAGE WITH ASSEMBLED FRAME

Jay E. Myers, Newport Beach, Calif., assignor to Andiamo, Inc., Fountain Valley, Calif.

Filed Mar. 14, 1991, Ser. No. 669,878

Int. Cl.[5] A45C *13/26, 13/36*

U.S. Cl. 190—18 A **25 Claims**

1. An item of luggage comprising a substantially rectangular frame including

a first pair of opposed spaced substantially flat members,

a second pair of opposed spaced substantially flat members,

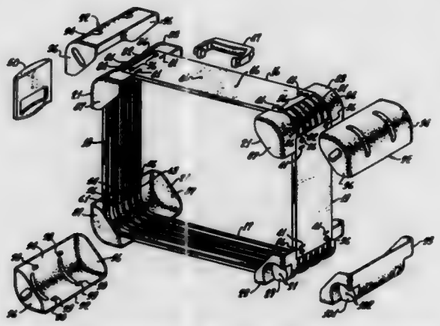
and four inside corner members, each interconnecting one of said substantially flat members of said first pair with one of said substantially flat members of said second pair, thereby to define a substantially rectangular shape,

said corner members and said substantially flat members at each such interconnection including cooperating interlocking means,

a quantity of flexible sheet material defining a container and extending over and supported by said first and second pairs of substantially flat members and said corner members,

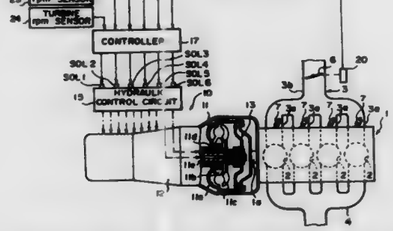
four outside corner members, each overlying said sheet material and one of said inside corner members, whereby

said sheet material is held between said inside and outside corner members, and



means for interconnecting said inside and outside corner members.

5,115,896
CONTROL SYSTEM FOR VEHICLE PROVIDED WITH AUTOMATIC TRANSMISSION
Naoyuki Noguchi; Kazuki Murakami; Eiji Kanehisa, and Seiji Makimoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Feb. 27, 1991, Ser. No. 660,627
Claims priority, application Japan, Feb. 27, 1990, 2-48147
Int. Cl.[5] F16D *43/22*
U.S. Cl. 192—0.052 **4 Claims**

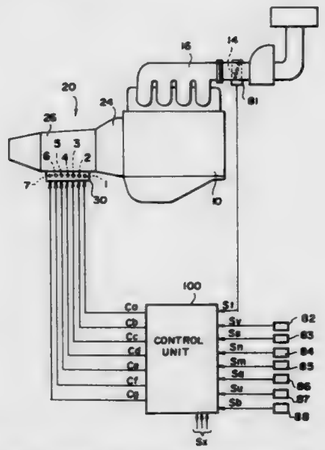


1. A control system for a vehicle provided with an engine and an automatic transmission having a lockup mechanism which engages and disengages to directly connect and disconnect input and output shafts of a torque converter of the automatic transmission to and from each other, the control system comprising a deceleration detecting means which detects that the engine is decelerating based on an engine speed of the engine as detected by an engine speed sensor and a throttle opening as detected by a throttle opening sensor, and a lockup mechanism control means which causes the lockup mechanism to engage when the engine is decelerating and permits the same to disengage when the deceleration of the engine finishes, wherein the improvement comprises:

a downshift detecting means which detects that a downshift of the automatic transmission begins to take place, and

a lockup release inhibiting means which receives an output of the downshift detecting means and inhibits the lockup mechanism control means from causing the lockup mechanism to disengage in a period in which the engine speed can temporarily fall because of the automatic transmission's shifting into neutral in a process of a downshift detected by the downshift detecting means.

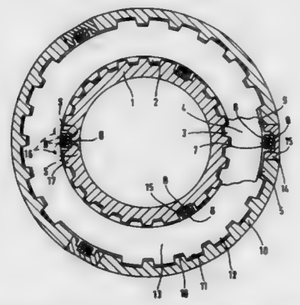
5,115,897
CONTROL SYSTEM FOR FLUID COUPLING
Hiroshi Yoshimura; Takuji Fujiwara, and Kozo Ishii, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed May 2, 1990, Ser. No. 517,848
Claims priority, application Japan, May 10, 1989, 1-116793
Int. Cl.[5] F16H *61/14, 45/02*; B60K *41/28*
U.S. Cl. 192—0.052 **7 Claims**



1. A control system for a fluid coupling for an automatic transmission of a vehicle having a transmission mechanism which fluid coupling includes an input element connected to an output shaft of the engine, an output element connected to the transmission mechanism of the automatic transmission and a lockup clutch interposed between the input element and the output element, the lockup clutch being able to engage and disengage to operatively connect and disconnect the input element and the output element with and from each other and further being able to engage in slipping engagement to connect the input element and the output element in such a way as to allow the input element and the output element to rotate relative to each other, said control system comprising a shift detecting means which detects the gear-shifting operation of the transmission mechanism, a hydraulic pressure supply means which supplies hydraulic pressure to the lockup clutch and selectively causes the lockup clutch to engage, disengage and engage in slipping engagement, the engaging force of the lockup clutch when it is in slipping engagement being changed according to signals indicative of the running condition of the vehicle, and a hydraulic control means which controls the hydraulic pressure supply means according to the running condition of the vehicle, wherein

said hydraulic control means causes the hydraulic pressure supply means to supply hydraulic pressure which causes the lockup clutch to engage with a substantially fixed engaging force which causes slipping engagement of the lockup clutch when the shift detecting means detects an upshift operation of the transmission mechanism and the lockup clutch is in slipping engagement upon detection of the upshift operation, and the hydraulic control means causes the hydraulic pressure supply means to supply hydraulic pressure which causes the lockup clutch to disengage when the shift detecting means detects a downshift operation of the transmission mechanism and the lockup clutch is in slipping engagement upon detection of the downshift operation.

5,115,898
DISK SET WITH SPREADING DEVICES FOR CLUTCHES OR BRAKES
Hubert Lehle, and Rudolf Schneider, both of Meckenbeuren, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany
PCT No. PCT/EP89/01000, § 371 Date Feb. 19, 1991, § 102(e) Date Feb. 19, 1991, PCT Pub. No. WO90/02273, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 25, 1989, Ser. No. 654,619
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 3828800
Int. Cl.[5] F16D *13/52*
U.S. Cl. 192—84 PM **14 Claims**



1. A disk set for one of a clutch and a brake comprising:

an internal disk carrier (**1**) supporting at least one disk (**4**) rotatable therewith,

an external disk carrier (**10**) supporting at least one disk (**13**) rotatable therewith,

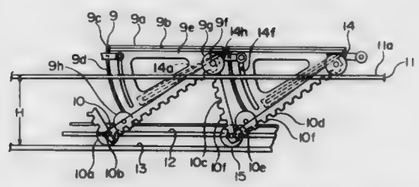
said internal and said external disk carriers (**1**, **10**) being rotatable relative to one another,

means for supplying a compressive force (**19**) to said disks for enaging a disk set formed by said disks, and

spreading means for repeatedly spacing apart said disks of from one another upon disengagement of said disk set,

wherein said spreading means (**8**) comprises a plurality of magnetic fields (**16**) with radially oriented poles provided for spacing apart said disks, of said internal and said external disk carriers (**1**, **20**), upon disengagement of said disk set.

5,115,899
DUAL-SPEED ESCALATOR APPARATUS
Hiroshi Nakatani, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 16, 1991, Ser. No. 641,929
Claims priority, application Japan, Jan. 16, 1990, 2-6775
Int. Cl.[5] B65G *23/00*
U.S. Cl. 198—334 **20 Claims**



1. A dual-speed escalator apparatus comprising:

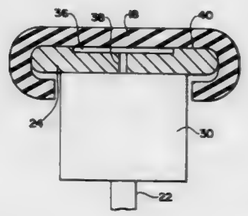
a main frame defining an elongated sloped circulating loop path having an upper load-bearing run and a lower return run;

a plurality of steps disposed along said circulating loop path adjacent one another;

a variable connecting mechanism connecting said steps in an endless loop; and

an intermediate plate having a first end connected to and movable relative to a first one of said steps and a second end in slidable engagement with a second one of said steps adjoining said first one of said steps.

5,115,900
HANDRAIL AIR CUSHION
Thomas R. Nurnberg, Bettendorf, Iowa; Ernie G. Seggebruch, Geneseo, Ill., and Kenneth J. Smith, Princeton, Iowa, assignors to Montgomery Elevator Company, Moline, Ill.
Filed Sep. 3, 1991, Ser. No. 754,388
Int. Cl.[5] B65G *15/00*
U.S. Cl. 198—335 **9 Claims**



7. An air supporting means for a movable handrail, in a passenger conveyor comprising:

a plenum;

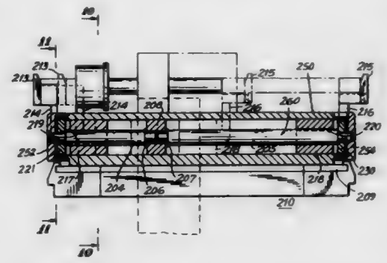
an air supply providing air flow to the plenum;

a handrail guide mounted on one side thereof to the plenum, the guide including at least one air pocket on an opposite side thereof;

a handrail slidably engaged with the guide; and

an orifice in the handrail guide allowing air to pass therethrough under pressure from the plenum to the air pocket, the air pressure in the pocket providing lift to the handrail as it is driven to decrease friction between the handrail and the guide and to support the handrail above the guide.

5,115,901
AUTOMATIC ADJUSTMENT OF PALLET WORKPIECE SUPPORT MEMBERS
Luciano Santandrea, and Massimo Lombardi, both of Florence, Italy, assignors to Axis U.S.A., Inc., Marlborough, Mass.
Continuation-in-part of Ser. No. 212,267, Jun. 27, 1988, abandoned. This application Mar. 20, 1989, Ser. No. 326,158
Int. Cl.[5] B65G *47/00*
U.S. Cl. 198—345.3 **39 Claims**



1. In a pallet conveyor production line for workpieces having support members that are adjustable for supporting work-

pieces and a conveyor for advancing pallets carrying workpieces, apparatus for automatic adjustment of the position of the workpiece support members of the pallets comprising:

a pallet having a first support member, a second support member, a guide for controlling the direction of travel of the first and second support members, and means for translating the first and second support members towards and away from each other along the guide within an extreme range of positions;

a positioning unit having a means for engaging said means for translating the first and second support members and a means for driving the means for engaging so that the first and second support members can be translated relative to each other along the guide from a first relative position to a second relative position within the extreme range of positions; and

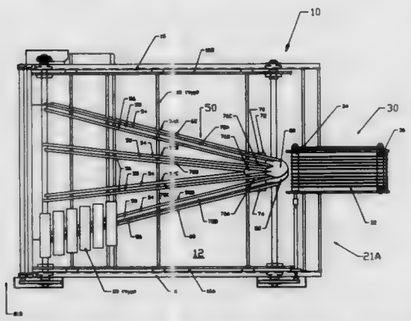
means for moving the pallet and positioning unit into and out of engagement so that in engagement the means for translating and the means for engaging the means for translating are engaged and so that out of engagement the means for translating and the means for engaging the means for translating are disengaged.

5,115,902

LANE DIVIDER

Gene W. Snyder, Minneapolis, and Peter N.Y. Pan, Minnetonka, both of Minn., assignors to Thiele Engineering Company, Minneapolis, Minn.

Filed Dec. 24, 1990, Ser. No. 633,325
Int. Cl.[5] B65G *47/46*
U.S. Cl. 198—365 **5 Claims**



1. A system for dividing a flow of product from a conveyor system into multiple paths comprising:

a. a frame;

b. a driver mounted on the frame for continuous movement along a cyclic path from a first end of the frame longitudinally along a top side of the frame to a second end, down around the second end, back along a bottom of the frame, and upward to the top of the frame at the first end;

c. transverse rods mounted on the driver for longitudinal movement along the path;

d. at least one pallet for receiving product to be conveyed, the pallet slidably mounted on the rods for transverse movement across the rods while the pallet is carried along the path by the rods;

e. multiple lane tracks mounted within the frame in a diverging pattern from a central point at the first end so that the tracks are spaced apart at the second end, the tracks being adapted for slidable engagement with the pallets; and,

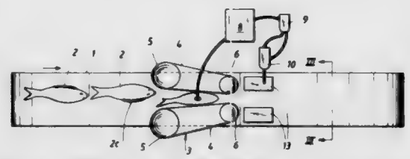
f. a pallet director mounted for movement among multiple positions corresponding to each of the tracks and for receiving pallets from the bottom side of the system and directing each pallet to one of the selected tracks at the central point as the pallet rises to the top of the system, said pallet director including an arcuate pallet path for directing each pallet to the top of the system, and said pallet director is pivotably mounted adjacent to the bottom side of the system for rotatable movement for operable connection to each of the selected tracks at the top of the system.

5,115,903

METHOD AND APPARATUS FOR ORIENTATION OF FISH UPON A CONVEYOR

Leif Leander, Askim, Sweden, assignor to VMK Fish Machinery AB, Sweden

Filed Nov. 21, 1990, Ser. No. 616,373
Claims priority, application Sweden, Nov. 29, 1989, 8904033
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—400 **11 Claims**



6. An apparatus for orientating fish upon a conveyor, said fish having a back portion, a belly portion, and a pair of sides, said apparatus comprising:

conveyor means for conveying said fish in single file along said conveyor means,

uprighting means for uprighting said fish,

detection means for detecting whether each of said uprighted fish is oriented in a desired orientation in which a predetermined one of either said back portion or said belly portion of said fish is facing said detection means, and

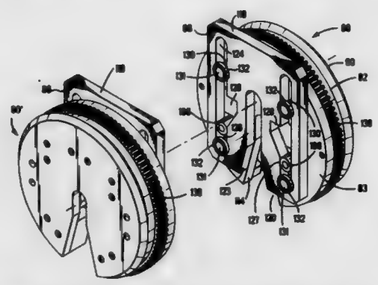
turning means for turning any of said fish in which said predetermined one of said back portion or said belly portion of said fish is not facing said detection means, whereby said single fish of fish is transported by said conveyor with each of said fish with said back portion or said belly portion facing in the same direction.

5,115,904

APPARATUS FOR ROTATING AN ELECTRICAL LEAD ABOUT ITS AXIS

Kenneth F. Folk; Phillip E. Loomis, both of Harrisburg, and Michael A. Yeomans, Camp Hill, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 25, 1991, Ser. No. 691,281
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—403 **12 Claims**



1. Apparatus for rotating an electrical lead about its axis through a predetermined angle, the lead having a terminal on its end and being gripped by a conveyor clamp which is on an intermittently indexed conveyor, the apparatus comprising:

frame means in surrounding relationship to the conveyor

clamp, first and second lead rotating assemblies, and control means,

the rotating assemblies being in alignment with each other and being movable on the frame means in unison between remote positions and proximate positions relative to the conveyor, the rotating assemblies being on each side of the conveyor and in alignment with the conveyor clamp when in their proximate positions, each of the rotating assemblies having a normally open rotating clamp thereon, the rotating assemblies being rotatable about a common axis of rotation which extends normally of the conveyor and through the clamps,

the control means being effective sequentially to move the rotating assemblies from their remote positions to their proximate positions at the beginning of a dwell interval of the conveyor, open the conveyor clamp and close the rotating clamps, rotate the rotating assemblies through the predetermined angle, close the conveyor clamp and open the rotating clamps, rotate the lead rotating assemblies back to their original angular orientations, move the rotating assemblies to their remote positions, and index the conveyor whereby,

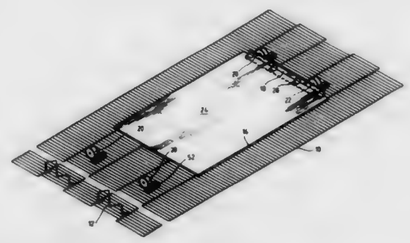
the lead is released by the conveyor clamp, gripped by the rotating clamps, rotated through the predetermined angle, released by the rotating clamps and gripped by the conveyor clamp in its rotated orientation.

5,115,905

MAGNETICALLY SECURED CONVEYOR SYSTEM FOR PRINTED CIRCUIT ASSEMBLIES

Lawrence E. Hollinger, II, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 538,106, Jun. 14, 1990, abandoned.
This application Aug. 2, 1991, Ser. No. 742,096
Int. Cl.[5] B65G *49/00*
U.S. Cl. 198—465.1 **11 Claims**



1. A conveyor system comprising:

a conveyor belt;

at least one magnet attached to the conveyor belt such that the major axis of the lines of magnetic flux is substantially perpendicular to the surface of the conveyor belt;

a printed circuit assembly having a magnetically attracted assembly affixed to at least one edge such that when conveyed on the conveyor belt the magnetically attracted assembly is in contact with the magnet.

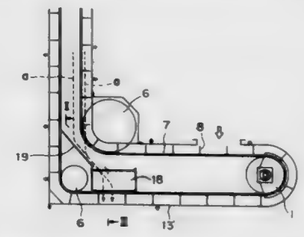
5,115,906

CONVEYOR ELEVATOR SYSTEM

Tameaki Yamaguchi, Toyonaka, Japan, assignor to Tsubakimoto Bulk Systems Corporation, Osaka, Japan

Filed Jul. 26, 1991, Ser. No. 736,257
Claims priority, application Japan, Jul. 26, 1990, 2-78692; Aug. 23, 1990, 2-87427; Aug. 23, 1990, 2-87428
Int. Cl.[5] B65G *19/14*
U.S. Cl. 198—716 **1 Claim**

1. A belt conveyor elevator system for lifting free-flowing particulate materials, comprising: a closed casing having a substantially square cross-section, an endless conveyor belt for lifting the free-flowing particulate material, a plurality of carrier plates projecting outwardly on the carrier surface of said conveyor belt, means for supplying free-flowing particulate material to said conveyor belt, means for discharging free-flowing particulate material from said conveyor belt, a pair of opposed skirt plates provided in spaced-apart relation on the inner surface of a wall of said casing to form a carrier passage



for said carrier plates, said conveyor belt having an upright lifting section and a bent portion at the lower end thereof, a flow-down discharge plate below said bent portion for discharging said materials outwardly of said conveyor belt over both side edges of the return-side portion of said conveyor belt and a recovery guide plate for guiding scattering materials from said discharge plate into said carrier plate passage.

5,115,907

TRAY ACCUMULATOR

Johnny B. Pomara, Jr., 2730 Oak Tree, Suite 1703, Carrollton, Tex. 75006

Filed May 2, 1991, Ser. No. 694,659
Int. Cl.[5] B6GB *25/00*
U.S. Cl. 198—744 **2 Claims**



2. A tray conveyor comprising:

fluid operated and controlled conveyor means having a load end and an unload end for holding and transporting a plurality of trays in tandem array between said load and said unload ends;

control means including a fluid flow control valve at said load end of said conveyor operative responsive to placement of a tray on said load end to activate said conveyor means to move said tray along said conveyor means;

control means including a fluid flow control valve responsive to the movement of said conveyor means one tray length to stop and recycle said conveyor means;

said conveyor means including a cylinder and piston assembly having a piston rod connected with a pusher bar and operable responsive to said control means for reciprocating said pusher bar;

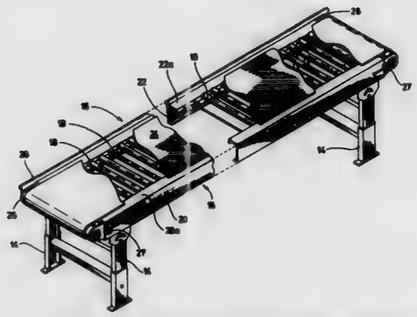
a tray plate mounted at said load end of said conveyor means having a tray support surface for supporting a tray as said tray is placed on said load end of said conveyor means;

a first fluid limit switch secured on said tray plate at said load end of said conveyor means having an operator lever engageable by a tray moving from said tray plate to said load end; and

a second fluid limit switch having a control lever secured at said load end of said conveyor means for operating said conveyor means to recycle said conveyor means when

said conveyor means has moved a tray one tray length along said conveyor means to reposition said conveyor means for a succeeding tray placed upon said tray plate.

5,115,908
PACKAGE HANDLING CONVEYOR SYSTEM
John C. Williams, 770 Sweetbrier Dr., Memphis, Tenn. 38119
Filed Apr. 27, 1990, Ser. No. 515,219
Int. Cl.[5] **B65G** *23/00*
U.S. Cl. 198—832 **1 Claim**



1. Apparatus for handling and conveying packages comprising:

a conveyor frame including roller and slider surfaces used in combination to define a conveyor bed; said frame including a pair of opposed side frame members, each said side frame member including an upwardly facing slide surface;

a plurality of conveying rollers mounted between said side frame members, the upper most part of each said conveying roller being elevated with respect to said slide surfaces;

a plurality of return rollers mounted between said side frame members and below said conveying rollers;

an end pulley mounted between said side frame members at each end of said frame.

an endless belt positioned on said conveying rollers and extending over said slide surfaces to define a package supporting conveyor surface, said belt also mounted to contact said end pulleys and said return rollers;

a drive pulley mounted between said side frame members intermediate said end pulleys and below said return rollers and in contact with said belt, said drive pulley having an integral shaft with a driving key thereon, said integral shaft extending past one of said side frame members;

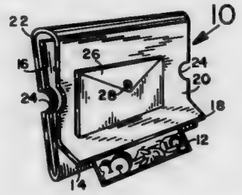
a shaft-mounted gearbox having a hollow output shaft with a keyway therein sized to receive said drive pulley shaft and driving key, said gearbox being mounted on and supported by said drive pulley shaft;

an electric motor coupled directly to said gearbox, said motor being supported by said drive pulley shaft; and

means for controlling the speed and acceleration of said motor.

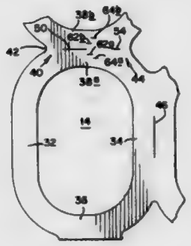
5,115,909
COMBINATION MONEY CLIP
Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434, and Darin S. Hanson, P.O. Box 1301, Winnemucca, Nev. 89445
Filed Jun. 3, 1991, Ser. No. 709,274
Int. Cl.[5] **A45G** *11/32, 15/00, 1/06*
U.S. Cl. 206—38 **11 Claims**

1. A money clip comprising; a substantially rectangular base, said base being made of a material having a memory, said base having a first end section, a second end section and a center section, said first end section being folded substantially parallel to said center section forming a first compartment with a first common edge, said first common edge forming substantially a half-circle, said first compartment being adapted to hold a document, said second end section being folded over on said first end section forming a second compartment with a second common edge, said second common edge forming substantially a half-circle, said second compartment being adapted to hold currency, said second end section having an outwardly extending section at it's outer exposed extremity, said outwardly



extending section forming a lip, said lip cooperating with said center section to form an entrance way to said second compartment, said entrance way being substantially a V, said second end section being tensioned toward said center section with said lip on it's inner extremity being in contact with said center section when in a closed position and being separated from said center section when in and open position, and said half-circle of said second common edge being larger in diameter than said half-circle of said first common edge.

5,115,910
CARRIER STOCK WITH TEAR-OPEN BAND SEGMENTS
Mindaugas J. Klygis, Barrington, and Leslie S. Marco, Bloomingdale, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.
Continuation-in-part of Ser. No. 679,520, Apr. 2, 1991, which is a continuation-in-part of Ser. No. 537,674, Jun. 14, 1990, Pat. No. 5,020,661. This application May 13, 1991, Ser. No. 699,004
Int. Cl.[5] **B65D** *71/00*
U.S. Cl. 206—150.0 **15 Claims**

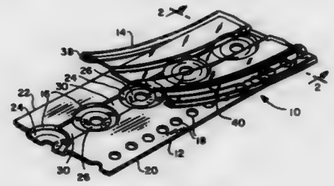


1. Carrier stock for machine application to substantially identical containers, said stock being formed from a single sheet of resilient polymeric material and being severable transversely to form individual carriers, each carrier having band segments defining separate apertures in a rectangular array comprising longitudinal rows and transverse ranks to receive the individual containers, said segments comprising outer segments extending in a generally longitudinal direction when said stock is unstressed, inner segments extending in a generally longitudinal direction when said stock is unstressed, and cross segments extending in a generally transverse direction when said stock is unstressed, each individual carrier having two opposite edges, wherein the band segments defining each container-receiving aperture of each carrier include at least one cross segments joined integrally to two outer segments so as to define a generally Y-shaped junction with a crotch narrowing generally toward a transverse midline of the cross

segment so joined, the transverse midline dividing the cross segment so joined into two half segments, the cross segment so joined having a primary slit extending substantially along the transverse midline and being spaced from the crotch by a primary, frangible bridge formed of the sheet material, the cross segment so joined having at least one secondary slit extending transversely, the primary and secondary slits having innermost extremities spaced longitudinally and transversely by a frangible bridge formed of the sheet material, the secondary slit being spaced from such container-receiving aperture by at least one frangible bridge formed of the sheet material, whereby a tear beginning at the crotch can propagate from the crotch to the primary slit, from the primary slit to the secondary slit, and from the secondary slit to such container-receiving aperture, so as to break the half segment having the secondary slit.

12. Carrier stock for machine application to substantially identical containers, said stock being formed from a single sheet of resilient polymeric material and being severable transversely to form individual carriers, each carrier having band segments defining separate apertures in a rectangular array comprising longitudinal rows and transverse ranks to receive the individual containers, said segments comprising outer segments extending in a generally longitudinal direction when said stock is unstressed, inner segments extending in a generally longitudinal direction when said stock is unstressed, and cross segments extending in a generally transverse direction when said stock is unstressed, each individual carrier having two opposite edges, wherein the band segments defining each container-receiving aperture of each carrier includes at least one cross segment joined integrally to two outer segments so as to define a generally Y-shaped junction, the cross segment so joined having a transverse midline dividing the cross segment so joined into two half segments, the cross segment so joined having a primary slit extending substantially along the transverse midline and being spaced from an edge of the junction by a frangible bridge formed of the sheet material, the cross segment so joined having at least one secondary slit, the secondary slit being spaced longitudinally from the primary slit by a frangible bridge formed of the sheet material, the secondary slit being spaced longitudinally from such container-receiving aperture by at least one frangible bridge formed of the sheet material, wherein the primary and secondary slits and the frangible bridges are arranged wholly within the cross segment so joined to propagate a tear wholly within the cross segment so joined without propagating the tear into any of the outer and inner segments, from the junction to the primary slit, from the primary slit to the secondary slit, and from the secondary slit to such container-receiving aperture.

5,115,911
CARRIER TAPE SYSTEM
Richard D. Schulte, Arlington; Imran Malik, Lewisville, and Richard K. Knight, Arlington, all of Tex., assignors to Illinois Tool Works Inc., Glenview, Ill.
Filed Feb. 4, 1991, Ser. No. 650,077
Int. Cl.[5] **B65D** *73/02, 85/30, 43/04*
U.S. Cl. 206—330 **20 Claims**



1. A carrier tape system, comprising:

an elongated base strip;

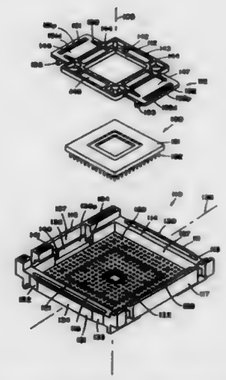
an elongated cover strip coextensive in length with said base strip;

said cover strip having a top surface and opposed sidewalls extending downwardly from said top surface, said opposed sidewalls being spaced apart from each other a distance substantially equal to the width of said base strip, and means for securing said cover strip to said base strip;

said base strip having an upper surface for engaging said cover strip when said cover strip is secured to said base strip; a plurality of longitudinally spaced cavities, extending downwardly from said upper surface of said base strip, for housing a plurality of components therein; and a plurality of trough-like grooves extending longitudinally between and interconnecting adjacent ones of said plurality of cavities at a level beneath said upper surface of said base strip but above a bottom wall portion of each one of said cavities upon which each one of said components is supported; and

retaining means extending downwardly from a lower surface of said cover strip so as to be disposed within said longitudinally extending trough-like grooves of said base strip when said cover strip is secured to said base strip and for engaging said components disposed within said cavities of said base strip so as to retain said components within said cavities of said base strip.

5,115,912
ELECTRICAL COMPONENT CARRIER WITH SHOCK ABSORBING MEANS
Robert H. Murphy, Merrimack, N.H., assignor to R. H. Murphy Co., Inc., Amherst, N.H.
Division of Ser. No. 499,926, Mar. 27, 1990, Pat. No. 5,000,697. This application Sep. 26, 1990, Ser. No. 588,660
Int. Cl.[5] **B65D** *73/02*
U.S. Cl. 206—334 **7 Claims**



1. A carrier for transporting an electrical component along a motion axis, said carrier being subject to the application of a shock force having a component along the motion axis and comprising:

A. a carrier frame means including support means for the electrical component and including peripheral skirt means at the periphery of said support means, said skirt means including at least one skirt portion thereof that is transverse to the motion axis and that has an exterior surface lying in a plane, and

B. shock absorbing means having a central portion spaced from the exterior of said skirt portion exterior surface and overlapped therewith and having offsetting end portions intermediate said skirt portion and said central portion, said central portion being deflectable about said end por-

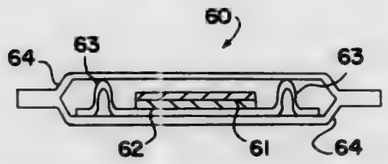
tions toward the exterior surface plane thereby to absorb stresses from any shock force component applied along the motion axis and to minimize the transfer of such stresses to an electrical component in said carrier, said overlapped skirt portion limiting the deflection of said central portion beyond the exterior surface plane.

5,115,913

PACKAGED SUPPORTED PRESSURE-SENSITIVE ADHESIVE PLASTERS

Dieter Anhäuser, Melsbach, and Ralf Huhn, Königswinter, both of Fed. Rep. of Germany, assignors to LTS Lohmann Therapie-Systeme GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Jun. 26, 1990, Ser. No. 543,637
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1989, 3921434
Int. Cl.[5] B65D *57/00*; A61B *19/02*
U.S. Cl. 206—447 **10 Claims**



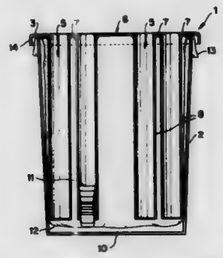
1. In combination, a bag, an active mass, and a support, the active mass being carried on said support within said bag and having an exposed pressure-sensitive adhesive surface, the support being provided with means for spacing said adhesive surface from the bag, such spacing means comprising spacers integral with the support, said spacers being laterally spaced from the active mass and projecting above the surface of the support a distance greater than the height of said active mass.

5,115,914

CONTAINER FOR PLASTIC USED GLASSES

Luigi Dario, Montorso Vincentino, Italy, assignor to ATI SPA - Applicazioni Technologie Ad Iniezione, Montorso Vincentino, Italy

Filed Jun. 6, 1991, Ser. No. 711,089
Claims priority, application Italy, Jun. 8, 1990, 64288/90[U]
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—499 **15 Claims**



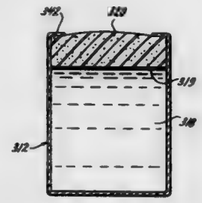
1. A box for disposing of plastic glasses, comprising:
a container;
a diaphragm attached to an upper part of said container, said diaphragm having a plurality of openings in its surface;
a plurality of vertically-oriented guide elements attached to and extending from said diaphragm and projecting into an interior of said container, each of said guide elements corresponding to one of said openings in the diaphragm, whereby plastic glasses inserted into said container through said openings in the diaphragm are guided by said guide elements and fall into nested stacks.

5,115,915

SHIPPING CONTAINER INCLUDING FOAMED-IN-PLACE BLOCK

Charles C. Harris, 1611 Manufacturers Dr., St. Louis, Mo. 63026

Filed May 24, 1989, Ser. No. 357,077
The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.
Int. Cl.[5] B65D *81/10*; B65B *7/28*
U.S. Cl. 206—524 **2 Claims**



1. A container for transporting material in a sealed condition, comprising:
(a) a container including an upper portion and a lower portion,
(b) a quantity of material disposed in the lower portion, and
(c) a non-absorbent foam block disposed in the upper portion of the container substantially only above the material and having a substantially free upper surface and forming a substantially impervious cap for sealing the material,
(d) the foam block being foamed-in-place on top of the material, and
(e) the material being liquid.

2. A method of transporting material in a sealed container comprising the steps of:
(a) placing a quantity of material in the container, and
(b) foaming in place a non-absorbent plastic foam in the container above the material to form a substantially impervious foam block cap for the material having a substantially free upper surface and substantially operatively leaving no unoccupied space between the material and the foam,
(c) the foam block being foamed-in-place on top of the material, and
(d) the material being liquid.

5,115,916

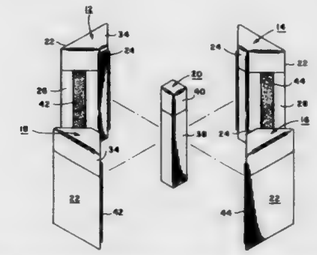
PERSONAL CARE PACKAGE

John C. Beasley, Dallas, Tex., and Pierre F. Dinand, Levallois, France, assignors to Stuart Jacobson Associates, Inc., Dallas, Tex.

Continuation of Ser. No. 511,974, Apr. 17, 1990, Pat. No. 5,007,540, which is a continuation of Ser. No. 179,236, Apr. 8, 1988, abandoned. This application Mar. 11, 1991, Ser. No. 667,024
Int. Cl.[5] B65D *69/00, 21/00*
U.S. Cl. 206—581 **4 Claims**

1. A package of personal care items, comprising:
a plurality of identically shaped individual containers in which personal are commodities are contained;
each of said containers, in section, having a triangular, truncated wedge like geometrical configuration selected to cooperate with the others of said containers, on being juxtaposed, to effect an arrangement in which said containers, when collectively assembled, complementarily interfit with one another to form a generally square shaped ensemble; and

attachment means to releasably retain said containers in said juxtaposed relationship;
each of said containers further including a removable cap



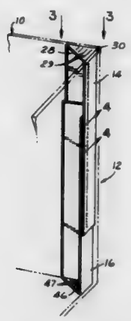
disposed thereon for accessing the personal care commodity in the container, said cap being of the same sectional configuration as the container on which it is disposed so as to provide exterior surface continuity thereto.

5,115,917

CORNER SUPPORT ASSEMBLY

David A. Schrage, 27614 Parkview, Apt. 304, Warren, Mich. 48092

Filed Jul. 8, 1991, Ser. No. 726,754
Int. Cl.[5] B65D *81/02*
U.S. Cl. 206—586 **13 Claims**



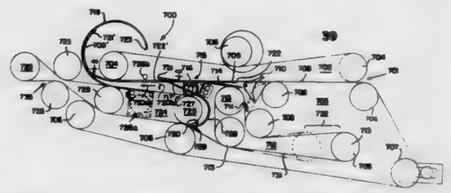
1. A corner support assembly for strengthening associated corners of a container, comprising:
an elongated first member having corner-engaging and overlapping ends;
an elongated second member having corner-engaging and overlapping ends, the overlapping end thereof being adapted to be securable to the first member;
attachment means for releasably securing the overlapping ends of the first and second members to each other so that the length of the assembly can be adjusted commensurately with the length of the edge to be supported, whereby adjustment of the attachment means provides extension or retraction of the members in relation to each other through a secured overlapping relationship;
anchoring means for releasably attaching one of the members within the associated edge of the container, thereby retaining the corner support assembly in juxtaposition therewith, so that the container may support others resting thereupon, the corner support assembly primarily carrying the load associated therewith.

5,115,918

APPARATUS FOR THE AUTOMATED PROCESSING OF BULK MAIL AND THE LIKE

Robert N. DeWitt, Marlton; William R. Lile, Medford, and Stephen Tentarelli, West Berlin, all of N.J., assignors to Opex Corporation, Moorestown, N.J.

Division of Ser. No. 904,966, Sep. 5, 1986, Pat. No. 4,863,037. This application Jun. 8, 1989, Ser. No. 363,511
Int. Cl.[5] B07C *5/02*; B65B *69/00*
U.S. Cl. 209—3.1 **58 Claims**



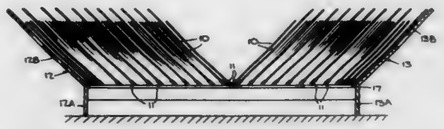
1. An apparatus for orienting a plurality of documents received in differing orientations relative to said apparatus, for delivery from said apparatus in a uniform orientation, comprising:
means for determining the orientation of a document according to characteristic features of said document including means for magnetizing magnetic ink markings provided on said document, means for detecting magnetized ink markings on said document, and means for determining the orientation of said document based upon the location of detected magnetic ink markings on said document; and
means for orienting said document in accordance with signals received from said orientation determining means.

5,115,919

MAGNETIC CARD FILING ASSEMBLY

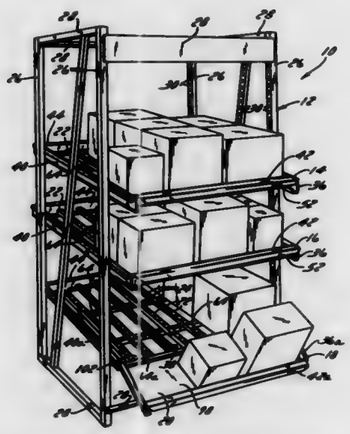
Isidore Dorman, 147-71 6th Ave., Whitestone, N.Y. 11357

Filed Aug. 1, 1991, Ser. No. 739,309
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—50 **9 Claims**



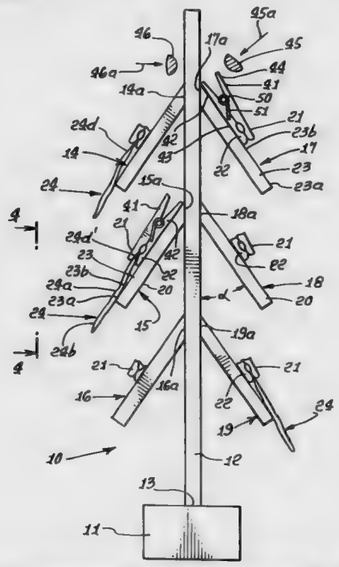
1. A card filing assembly comprising:
(a) a stack of file cards each having a ferromagnetic element attached to and extending along the lower edge of the card; and
(b) a holder for the stack of cards, said holder having side walls to confine the cards to the holder and a pair of permanent magnet parallel rails on which the lower edges of the cards rests and are magnetically attracted thereto, whereby the cards in the holder which are held by magnetic attraction to the rails can be angled to facilitate their inspection, or slid along the rails or removed therefrom.

5,115,920
RACK
Richard E. Tipton, Jeffersontown, and Paul S. Hart, Shepherdsville, both of Ky., assignors to The Interlake Companies, Inc., Shepherdsville, Ky.
Filed Jul. 20, 1990, Ser. No. 556,820
Int. Cl.[5] A47B 47/00
U.S. Cl. 211—59.2 9 Claims



1. A shelf for a hanging rack system, comprising:
a front beam;
a rear beam;
a left side beam;
a right side beam; and
connecting means integral with said beams for connecting each of said beams to an adjacent beam at substantially right angles to form a rectangular shelf having an inside and an outside;
said connecting means comprising:
a downwardly-hooking projection extending from the end of one of said beams,
a vertical face on the beam adjacent to said one beam, said vertical face defining a vertical slot which receives said downwardly-hooking projection; and
locking means integral with the beams for stopping the downwardly-hooking projection from moving upward relative to the vertical slot once the downwardly-hooking projection has been inserted into the slot;
wherein said locking means includes an inwardly-projecting portion on said one beam and an integral vertical flap defined on said vertical face; said integral vertical flap having a top edge which is integral with the vertical face and having two side edges and a bottom edge which are free from the vertical face, with at least a portion of the bottom edge of the vertical flap being bent inward and located such that, as the downwardly-hooking projection of the one beam is being inserted into the vertical slot of the adjacent beam and pushed to the bottom of the slot, the inwardly-projecting portion of the one beam contacts the flap and causes the flap to flex outward, permitting the inwardly-projecting portion of the one beam to pass the inwardly-bent bottom edge portion of the flap, and, once the downwardly-hooking projection has reached the bottom of the slot, the flap returns to its vertical position, and the inwardly-bent bottom edge portion of the vertical flap lies above the inwardly-projecting portion of the one beam, serving as a stop to prevent the one beam from moving upwardly relative to the slot.

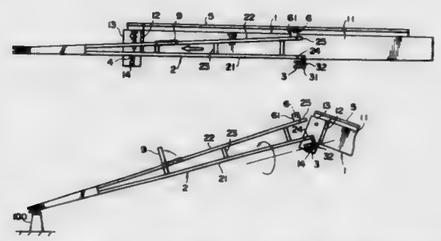
5,115,921
SMALL PACKAGE DISPLAY APPARATUS
Wayne C. Lavelle, 7668 Beverly Dr., Rohnert Park, Calif. 94928
Filed Dec. 28, 1990, Ser. No. 636,423
Int. Cl.[5] G09F 1/00; A47G 29/00
U.S. Cl. 211—71 7 Claims



1. In a display device for articles in substantially flat packages, each having a cross dimension less than three inches, the combination comprising:
(a) an upright standard,
(b) and branches carried by the standard and projecting laterally therefrom,
(c) said branches incorporating clips, each clip having two jaws, one of which is yieldably biased toward the other,
(d) and including said packages partially inserted between the jaws of the clips so that the packages have portions that freely project away from the clips and standard, as continuations of said branches,
(e) said clips having the form of clothes pins, each clothes pin including two levers, one lever attached to the top of one of the branches, the other lever located above the first lever, the other lever having a handle projecting into proximity to the standard, the levers defining said jaws which are spaced above and laterally from lower ends of the branches whereby the branches have upwardly exposed upper sides that support said packages, with lower portions of the packages when hanging over and below lower ends of said upper sides of the branches,
(f) said standard, branches and packages having tree-like configuration wherein each branch is attached at an upper end to the standard substantially opposite and adjacent the upper end of another branch,
(g) said packages also extending downwardly and laterally away from the standard to facilitate pull-out release of the packages from the clips,
(h) the uppermost extent of said one lever handle projecting into close proximity to the standard also projecting above the level of the entirety of said another branch that is located at the side of the standard opposite said one branch.

5,115,922
Patent Not Issued For This Number

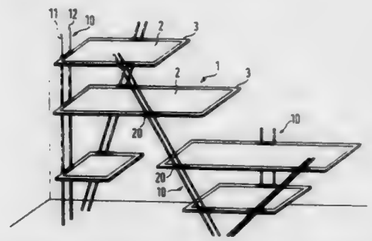
5,115,923
METHOD FOR STRETCHING AND FOLDING A JIB FOR CRANE
Yukio Koizumi, Akashi, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Filed Mar. 8, 1991, Ser. No. 666,637
Claims priority, application Japan, May 30, 1990, 2-142941
Int. Cl.[5] B66C 23/66
U.S. Cl. 212—168 3 Claims



1. A method of stretching and folding a substantially flat strut type jib for a crane, comprising the steps of:
supporting said jib in a vertically disposed condition along one vertical side surface of a boom in a horizontally disposed condition wherein a forward end portion of said jib is directed to a forward end portion of said boom and a base end portion of said jib is oriented to have upper and lower portions lying one above the other;
sliding said jib along a vertical side surface of said boom from a folded position of said jib where a base end portion of said jib is disposed adjacent a base end portion of said boom to an advance position of said jib where the base end portion of said jib is disposed adjacent the forward end portion of said boom;
connecting the lower portion of the base end portion of said jib to the forward end portion of said boom in such a manner that said jib is rotatable about a longitudinal axis of said jib;
rotating said jib about the longitudinal axis of said jib by an angle of substantially 90 degrees from said vertically disposed condition; and
connecting another end portion of the base end portion of said jib to the forward end portion of said boom.

5,115,924
SHELF SYSTEM
Jochen König, Strasslach, Fed. Rep. of Germany, assignor to Beatrice König-Haug, Strasslach, Fed. Rep. of Germany
PCT No. PCT/EP89/00611, § 371 Date Jan. 28, 1991, § 102(e) Date Jan. 28, 1991, PCT Pub. No. WO89/11813, PCT Pub. Date Dec. 14, 1989
PCT Filed May 31, 1989, Ser. No. 623,958
Claims priority, application Fed. Rep. of Germany, May 31, 1988, 3818525; Jun. 8, 1988, 3819512
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—186 17 Claims

1. A shelf system comprising:
a) at least one shelf panel;
b) at least two post elements, each post element including at least two bars; and
c) means for connecting the at least one shelf panel in a horizontal position to the post elements, said means for connecting including:
i) a joint with one degree of freedom;
ii) means for locking said connecting element to said shelf panel at a position along the edges of said shelf panel; and
iii) a plurality of locking elements spaced from each other in a direction parallel to the edges of said shelf panel, whereby each bar is fixedly mounted by said locking elements to a connecting element;



such that each shelf panel is adapted to be fixed in a horizontal position and prevented from tilting at at least two post elements adapted to be inclined at an angle with respect to each other.

5,115,925
JIB STRETCHING AND FOLDING DEVICE FOR CRANE
Yukio Koizumi, Akashi, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Filed May 10, 1990, Ser. No. 521,368
Claims priority, application Japan, Aug. 10, 1989, 1-208504; Jan. 8, 1990, 2-2055
Int. Cl.[5] B66C 23/70
U.S. Cl. 212—266 18 Claims



1. A jib stretching and folding device for a crane comprising:
a boom having a forward end portion with opposite side surfaces, said forward end portion being provided with first and second jib mounting shafts projecting oppositely from said opposite side surfaces of said forward end portion;
a jib having a base end portion provided with first and second jib feet adapted to be detachably connected to said first and second jib mounting shafts, respectively; said jib having a folded condition wherein said jib is positioned next to a side surface of said boom and said first jib foot is positioned under said second jib foot; said jib also having an extended condition wherein said jib extends forwardly from said foward end portion of said boom and said first and second jib feet are connected to said first and second respective jib mounting shafts;
a lower surface formed on said jib;
an auxiliary connector mounted on said lower surface of said jib in the vicinity of said base end portion of said jib, said auxiliary connector comprising a cylindrical housing fixed to said lower surface of said jib and a connecting rod rotatably supported by said housing so as to be rotatable about an axis of said connecting rod, said axis being sub-

stantially parallel to said lower surface of said jib and said jib being pivotable and movable along said axis of said connecting rod; said jib having a transitional suspended condition wherein said jib is suspended by said connecting rod from a connection point between said connecting rod and said first jib mounting shaft;

means for twisting said jib by a predetermined jib twisting angle while said jib is in said transitional suspended condition;

jib raising/lowering means for selectively raising or lowering said jib by a predetermined raising or lowering quantity while said jib is in said suspended condition to connect or disconnect said first jib foot and said first jib mounting shaft and to connect or disconnect said second jib and said jib mounting shaft;

a twist guiding groove provided on one of said housing and said connecting rod of said auxiliary connector; and

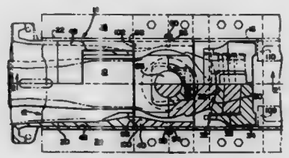
an engagement projection provided on the other of said housing and said connecting rod adapted so as to engage with said twist guiding groove, said twist guiding groove comprising a spiral groove portion extending in a direction corresponding to a twisting direction of said jib and formed in a circumferential angular range corresponding to said predetermined twisting angle, said twist guiding groove further comprising a straight groove portion having a length corresponding to the raising or lowering quantity of said jib; wherein said jib raising/lowering means causes said engagement projection to move relative to said twist guiding groove.

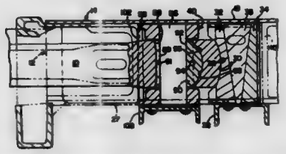
5,115,926

COUPLER MEMBER RETENTION IN A RAILWAY VEHICLE

Horst T. Kaufhold, Chicago, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Sep. 26, 1990, Ser. No. 568,773
Int. Cl.[5] B61G 9/20
U.S. Cl. 213—50 **9 Claims**





1. An improved center sill construction for a railway car of the type having a coupler member extending into a railway car center sill with striker members, said coupler member having a butt end for connection within said center sill, said center sill having a longitudinal axis, a first sidewall with a flange, a second sidewall with a second flange, and an upper wall cooperating to define a center sill channel with an open end, the improvement comprising:

a single retention member of unitary construction extending laterally within said center sill and fitting completely about a longitudinal portion of said butt end of said coupler member, said retention member having a first sidewall, a second sidewall, an upper wall and a lower wall, cooperating to define a cavity, which retention member sidewalls and upper and lower walls having a front edge and a rear edge,

each of said retention member upper and lower walls having a boss projecting into said cavity and an opening through each said boss and retention member upper and lower walls, which retention member upper and lower wall openings are aligned;

each of said retention member sidewalls having a first wall cross-sectional area at said front edge and a second wall cross-sectional area displaced from said front edge along said longitudinal axis such that said first wall cross-sectional area is greater than said second wall cross-sectional area,

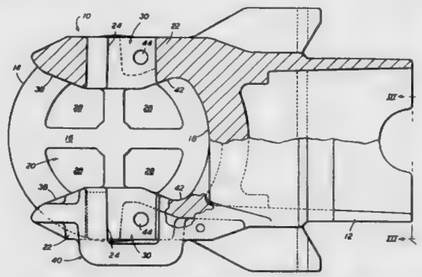
said first wall and said second wall of said center sill channel having striker members attached to each of said walls such that each of said striker members contact said retention member sidewalls at said front edges to transfer draft loads from said retention member to said center sill.

5,115,927

STRENGTHENING MECHANISM FOR A FEMALE ARTICULATED COUPLING MEMBER FOR PROVIDING ADDITIONAL STRENGTH IN RESPONSE TO LOADS EXERTED AT BEARING ASSEMBLY CONNECTION SHAFT

William D. Wallace, Chicago, Ill.; Edward G. Lynch, Jr., Saugus, Calif.; David W. Daugherty, Jr., Bolingbrook; Wajih Kanjo, Lockport, both of Ill., and Michael G. Hawryszkow, Munster, Ind., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sep. 21, 1990, Ser. No. 586,511
Int. Cl.[5] B61G 5/02
U.S. Cl. 213—75 R **26 Claims**



1. A female connection member having a strengthening mechanism for use in an articulated type coupling arrangement which can be easily retrofitted to existing railway cars and is capable of connecting together, in a substantially semi-permanent manner, at least one predetermined end of a first railway car and an adjacent predetermined end of a second railway car, said female connection member comprising:

a. a first end portion having a predetermined configuration which will enable said female connection member to be engaged with and connected to a predetermined end of a center sill member disposed substantially along a longitudinal centerline of a railway car to be connected in such semi-permanent manner;

b. a second end portion formed integrally with said first end portion and disposed axially opposite thereof;

c. a cavity formed in said second end portion of said female connection member, said cavity including:

(i) a substantially horizontally disposed bottom wall portion,

(ii) a substantially vertically disposed back wall portion connected along a bottom edge thereof to a rear edge portion of said bottom wall portion, and

(iii) a pair of substantially vertically disposed and axially opposed side wall portions connected along a bottom edge thereof to an outer respective edge of said bottom wall portion and along a rear edge thereof to a respective outer edge of said back wall portion, each side wall portion having a vertically disposed plane which intersects a geometric centerline of each respective side wall portion and being substantially parallel to each other, an inner surface of each of said bottom wall portion and said rear wall portion and said pair of side wall portions define a predetermined size and a predetermined shape of said cavity which is open adjacent a top surface and a front surface thereof;

d. an opening formed through a predetermined portion of each of said pair of side wall portions for receiving a shaft portion of a bearing assembly for connecting such cars, each said opening includes:

(i) a slot-like portion formed adjacent a top surface of each of said pair of side wall portions, and

(ii) a generally arcuate portion formed below at least a portion of said slot-like portion; and

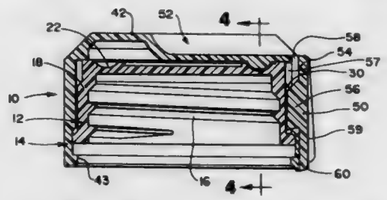
e. at least one strengthening mechanism formed integrally with at least one of said pair of side wall portions adjacent said second end portion of said female connection member and disposed adjacent said slot-like portion adjacent said top surface of at least one of said pair of side wall portions to provide a requisite amount of force absorbing capability to said female connection member in response to forces exerted by such shaft portion during service in a train consist.

5,115,928

CONVERTIBLE CHILD-RESISTANT CLOSURE ASSEMBLY

Archie G. Drummond, Jr., 928 Mallard Ct., Palatine, Ill. 60067

Continuation-in-part of Ser. No. 538,206, Jun. 14, 1990, abandoned. This application Dec. 11, 1990, Ser. No. 625,867
Int. Cl.[5] B65D 55/02
U.S. Cl. 215—219 **18 Claims**



1. A convertible child-resistant closure assembly comprising

a threaded closure and an overlying outer shell mounting said closure therewithin;

a latching key mounted on said shell for movement between an inactive child-resistant position and a converted, active non-child-resistant position;

complementary latching means on said closure for releasably engaging said latching key in said active position in which said shell and closure are corotatable in both clockwise and counterclockwise directions, and wherein when said latching key is in said inactive position, said shell and said closure are not corotatable in said counterclockwise direction; and

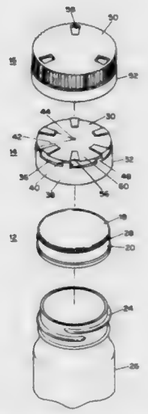
wherein said closure and shell define complementary interengaging aligning means for aligning said latching key and complementary latching means in said active position, said aligning means comprising respective stops on the upper surface of said closure and a confronting surface of said shell, said stops having confronting inclined surfaces to prevent relative vertical movement of said stops when said latching key and latching means are in said active position.

5,115,929

CHILD-RESISTANT CLOSURE WITH VISUAL CLOSE/OPEN INDICATOR

Caetano Buono, 75 Lexa Pl., Staten Island, N.Y. 10312

Filed Aug. 20, 1991, Ser. No. 747,378
Int. Cl.[5] B68D 55/02
U.S. Cl. 215—220 **8 Claims**



1. A child-resistant screw-on closure for use on a container having a threaded portion threadedly engageable with the screw-on closure, the closure having a closure-state indicating pattern, comprising:

an inner cap having a circular top wall portion and a cylindrical skirt depending from the top wall portion, the inner surface of the skirt being threaded for threaded engagement with the container when the inner cap is rotated in a closing direction and disengageable therefrom when the inner cap is rotated in an opening direction;

a middle cap having a circular top wall portion and a cylindrical skirt coaxial with and peripherally surrounding the cylindrical skirt portion of the inner cap, said middle cap being axially displaceable relative to said inner cap, a cam surface having a front end and a trailing end along the circumference of the outer skirt of said middle cap as said middle cap is rotated in the closing direction with the front end being at a greater radial distance from the center than the trailing end, an indicating pattern and a raised stopped on said cylindrical skirt of said middle cap and

an outer cap arranged for rotation relative to the middle and inner caps and having a circular top, a cylindrical skirt coaxial with and peripherally surrounding the skirt of the middle cap, a window, means for frictional engagement with said camming surface of said middle cap providing a progressively increasing frictional engagement between said middle and outer caps as said outer cap is rotated in said closing direction so that the outer cap first rotates relative to said middle cap until said frictional engagement means frictionally engages the camming surface of the middle cap to transmit torque thereto, thereby causing the middle cap to rotate together with the outer cap; and one-way torque transmitting means connecting said middle cap to said inner cap to cause them to rotate together in the closing direction and to prevent concurrent rotation of said inner and middle caps in the opening direction in the absence of the application of axial force thereto, whereby rotation in the closing direction of the outer cap will cause like rotation of said middle and inner caps so that, the threaded portion of the inner cap seals the threaded portion of the container, and thereafter, the outer cap moves relative to the middle and inner caps causing said means for frictional engagement to ride on

said cam surface of the middle cap increasing said frictional engagement so that said indicating pattern on the middle cap is viewable through said window on the outer cap and, conversely, when the outer cap is rotated in said opening direction with the use of both rotational and axial force to open the container, the outer cap first moves relative to the inner cap allowing said indicating pattern on the middle cap to be viewable through the window on the outer cap and secondly abuts said raised stopper wherein the closure is disengaged from said container.

5,115,930

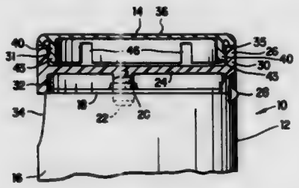
TWO-PIECE CLOSURE

Richard D. Lohrman, 154 Mainsail Dr., Grayslake, Ill. 60030; Philip Ferber, 2239 N. Bissell #2N, Chicago, Ill. 60614, and Gene Dorsch, 18 W. Garden, Palatine, Ill. 60067

Filed May 16, 1991, Ser. No. 701,209

Int. Cl.[5] B65D *55/00*

U.S. Cl. 215—227 **16 Claims**



1. A closure cap including:

a base cap with means for engaging a mouth of a container; a dispensing aperture leading from the mouth of the container; means for preventing flow through said aperture, including a planar portion with an upper side and a lower side, and a plug portion on said lower side of said planar portion for engaging said aperture; hinged means for swinging said preventing means away from said aperture so as to allow flow therethrough; and an engaging means on said upper side of said planar portion; and

an insert adapted to be engaged by said engaging means for providing aesthetic features different from said base cap.

5,115,931

ONE-PIECE PLASTIC SNAP-HINGE CLOSURE

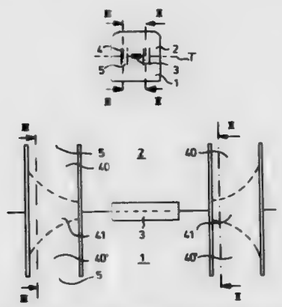
Werner F. Dubach, Maur, Switzerland, assignor to Createchnic AG, Switzerland

Filed Jun. 5, 1991, Ser. No. 710,804

Claims priority, application Switzerland, Jun. 8, 1990, 01919/90

Int. Cl.[5] B65D *43/14*

U.S. Cl. 215—235 **4 Claims**



1. A one-piece plastic snap-hinge closure, having a lower part (1) and a cap (2) hingedly connected to said lower part (1), said lower part and said cap each having a jacket wall which, in a closed position of the closure, are located vertically flush above each other and are connected to each other by at least one film hinge located in a plane of separation of said lower part and said cap, and having two spring elements (4), integrated into the jacket walls of the lower part and the cap, which generate a snap action, the improvement comprising: the spring elements (4) comprising two strip-shaped members, each having a thickness which decreases in a longitudinal direction from shoulder points (5) of said strip-shaped members towards a center of said strip-shaped members, all said shoulder points (5) of the strip-shaped members extending parallel to a plane of separation (T).

5,115,932

SEALING OF CONTAINERS WITH A SCREW SEALING CAP AND A TEAR-OFF SECURITY STRIP

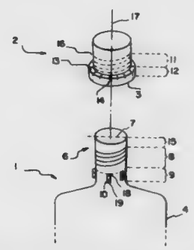
Bernard Schneider, Ste Menehould, France, assignor to Cebal, Clichy, France

Filed Dec. 13, 1990, Ser. No. 627,048

Claims priority, application France, Dec. 15, 1989, 89 17203

Int. Cl.[5] B65D *41/34*

U.S. Cl. 215—252 **20 Claims**



1. Container and tamper-proof sealing cap,

said sealing cap being axially symmetrical and comprising an internally threaded cap body of defined internal diameter closed at a first end thereof and open at an opposite end thereof, said cap body being extended at the open end by an unthreaded, concentric security strip of greater diameter than said cap body and having internally disposed ratchet notches, said cap body being joined to said security strip by axially disposed, frangible bridges; and

said container comprising a hollow body extended by a shoulder portion and terminating in an open-ended, axially symmetrical neck externally threaded adjacent said open end, and adapted for mating with the internally threaded cap, said neck provided, in a neck portion between said external threads and said shoulder portion, with ratchet teeth adapted for mating with said ratchet notches so as to permit screwing on of said tamper-proof sealing cap with security strip, but to prevent unscrewing of said tamper-proof sealing cap without breaking said frangible bridges, said cap being manually unscrewable from said neck with breaking of said frangible bridges,

said teeth being formed from a plastic material and defined by a circumferential external wall and a circumferential internal wall, each attached at one end to said neck portion, said walls located in planes forming an angle A of between 0° and 30° with each other, and a line bisecting angle A forming an angle B of between 15° and 45° with a tangent intersecting the neck portion at the attachment of said circumferential internal wall,

said internal wall terminating in an internal end wall portion adapted for pressing against a notch when said cap is screwed onto said neck, said wall portion located in a plane forming an angle C of between 45° and 90° with respect to said tangent T,

said angle C being greater than an angle D of intersection of the plane of the internal wall with said tangent T,

said teeth being integral over their entire height with said neck portion and having a free upper end and fixed lower end, so as to present an increasing spring action aiding the teeth to return their normal position after passing the notches during screwing on of the cap.

5,115,933

FREIGHT CONTAINER

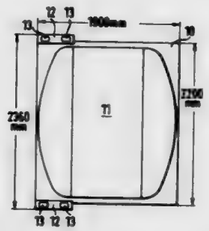
Helmut Gerhard, Weltefeld, Fed. Rep. of Germany, assignor to Westerwaelder Eisenwerk Gerhard GmbH, Fed. Rep. of Germany

Filed Jun. 7, 1990, Ser. No. 534,480

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1989, 8906994[U]

Int. Cl.[5] B65D *88/00*

U.S. Cl. 220—1.5 **20 Claims**



1. A freight container having a length shorter than standard containers comprising lower fittings for simultaneously securing the container to four locking members situated on a vehicle platform on two parallel straight lines spaced by substantially 2259 mm,

wherein a single one-piece double-fitting laterally projecting beyond the container width is provided on either container side, the fitting having openings on the bottom surface thereof for engaging two locking members provided on the vehicle platform at a distance of substantially 280 mm.

5,115,934

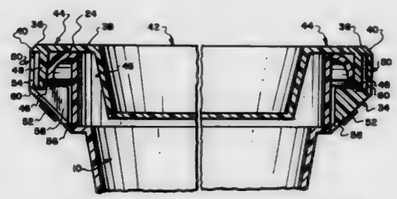
TAMPER RESISTANT CONTAINER LID

James L. Nelson, Temple City, Calif., assignor to Highland Plastics, Inc., Pasadena, Calif.

Filed Nov. 28, 1990, Ser. No. 619,258

Int. Cl.[5] B65D *17/40*

U.S. Cl. 220—276 **11 Claims**



1. A tamper resistant lid for a container comprising;

a lid having a peripheral flange forming an annulus for fitting the rim of a container

a tear strip secured to the periphery of said flange by a thin section of material forming a hinge; said tear strip comprising;

a plurality of spaced apart tabs;

a plurality of thin sections joining said tabs, said thin sections constructed to lie within the plane of said tabs when said tear strip is unstressed and to bend outward when said tear strip is in a stressed condition folded down around the periphery of said lid, said thin sections being of a material that conforms to the plane of said tabs when heated; whereby said thin sections secure said tear strip by conforming to securely hold said lid on said container.

5,115,935

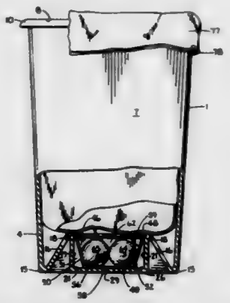
DISPOSABLE BAG BOX FOR TRASH RECEPTACLE

Ralph J. Lemongelli, Rte. 1, Monroe City, Mo. 63456

Filed May 16, 1990, Ser. No. 523,895

Int. Cl.[5] B61D *25/16*

U.S. Cl. 220—407 **8 Claims**



1. In combination, a trash receptacle adapted to be lined by a disposable trash bag and a bag containing box:

(a) said trash receptacle comprising a receptacle wall having an upper edge and a lower edge;

(b) cavity forming means integral with said wall at said lower edge and forming a box receiving cavity;

(c) said cavity means including box engagement means; and

(d) said bag containing box having a tapered configuration whereby said box, upon entrance into said cavity is wedgably received in said cavity.

5,115,936

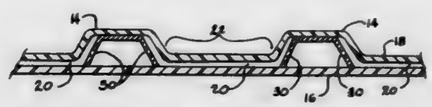
DOUBLE WALL UNDERGROUND STORAGE TANK

David H. Bartlow, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 23, 1991, Ser. No. 644,511

Int. Cl.[5] B65D *90/04*

U.S. Cl. 220—426 **22 Claims**



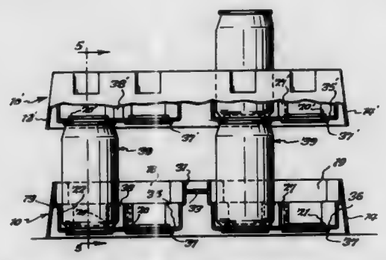
1. An underground storage tank having an inner wall and an outer wall defining a generally annular space between the inner and outer walls for receiving a leak detecting fluid, and a plurality of ribs bonded to the inner and outer walls and projecting radially outwardly from the inner wall, each rib comprising sidewalls and a top wall, the outer wall being attached to the top wall of each rib but substantially unattached to and spaced from the sidewalls of each rib, and the outer wall substantially conforming to the contour of the inner wall and the ribs.

5,115,937

CONTAINER FOR STORING AND TRANSPORTING A PLURALITY OF BEVERAGE CONTAINERS

Joseph J. Chausse, Lockport, and Edward A. Ebert, Snyder, both of N.Y., assignors to Ecology Plastics Corp., Lockport, N.Y.

Filed Feb. 15, 1991, Ser. No. 657,640
Int. Cl.[5] B65D *21/00*
U.S. Cl. 220—507 **3 Claims**



1. A container for storing and transporting a plurality of beverage containers and the like, comprising a substantially frusto-pyramidal housing having four supporting walls and a top wall supported by said walls, said housing having at least one storage chamber extending downwardly from said top wall, wherein said supporting walls of said container are arranged to telescopingly engage supporting walls of an identical container and said chamber nestles within a corresponding chamber of said identical container when said identical container is empty of said beverage containers, said storage chamber having a floor having a plurality of elevated annular rings arising upwardly therefrom, said annular rings arranged to receive and position said beverage containers and the like within said chamber, said floor also having a plurality of annular rings extending downwardly therefrom to align and position tops of beverage containers within said identical container stacked therebelow, said annular rings having an external diameter that is less than the external diameter of said beverage containers, wherein said housing further includes means for securing said container to said identical container when said identical container contains one or more of said beverage containers.

5,115,938

CONTAINERS AND CANS AND METHOD OF AND APPARATUS FOR PRODUCING THE SAME

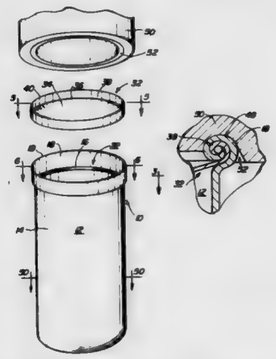
Mortimer S. Thompson, Maumee, Ohio, assignor to Tri-Tech Systems International, Inc., Maumee, Ohio

Continuation-in-part of Ser. No. 115,445, Oct. 30, 1987, Pat. No. 4,975,132. This application May 3, 1989, Ser. No. 347,263
The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.
Int. Cl.[5] B65D *6/28, 7/16*
U.S. Cl. 220—618 **49 Claims**

1. A container comprising:
a body having a free end of plastic,
and an end portion having a central portion and a free end of plastic about its perimeter, and
said free ends being in juxtaposition and continuously flexed to provide a curl to form a plurality of curled walls which are joined together as a seam, wherein at least one of said curled free ends includes internal stresses and related strain and memory along its length for providing a seam of integrity and reliability by maintaining engagement therebetween wherein during curling at least one of the free ends are maintained at a temperature below its Vicat softening point.

10. A container comprising:
a body having a free end including plastic,
an end portion having a central portion and a free end about its perimeter including plastic, and
said free ends being tapered, juxtaposed and curled to form a plurality of curled walls which are joined together as a seam, wherein at least one of said curled free ends includes internal stresses and related strain and memory for providing a seam of integrity and reliability by maintaining engagement therebetween.

11. A method of forming a container having a body and an end portion with free ends about their perimeters, wherein the free ends include a plastic and are adapted to be curled, comprising:
juxtaposing the free ends,
maintaining plastic in at least one of the juxtaposed free ends at a temperature which is below its Vicat Softening Point at the time of curling of the free ends so that at least one of the free ends can develop stress and related elastic strain and elastic memory during curling, and
concurrently and circumferentially engaging at least one of the juxtaposed free ends about its perimeter with a die and progressively curving the juxtaposed free ends into a multi-wall curled configuration wherein plastic in at least one free end maintained at a temperature below its Vicat Softening Point during curling develops stress and related strain and elastic memory to thereby produce and maintain engagement therebetween after disengagement between the die and the perimeter of the juxtaposed curled free ends.



14. A method of forming a container having a body and an end portion with free ends about their perimeter, wherein the free ends include a plastic and are adapted to be curled, comprising:
juxtaposing the free ends,
maintaining plastic in at lest one of the juxtaposed free ends at a temperature which is below its Vicat Softening Point at the time of curling of the free ends so that at least one of the free ends can develop stress and related elastic strain and elastic memory during curling, and
concurrently engaging at least one of the juxtaposed free ends about its perimeter with a die and progressively curving the juxtaposed free ends as at least the engaged free end moves along and away from the engaging portion of the die wherein engagement with the die causes the development of stress and related strain and elastic memory in the plastic in at least one of the free ends while said free end is maintained at a temperature below its Vicat Softening Point, whereupon the stress and related strain and elastic memory in at least said one free end urges the free ends to continue to curl into a multi-wall curled configuration as the engaged free end moves away from the die to thereby produce and maintain sealing engagement therebetween.

35. A method of forming a container having a body and an end portion with free ends about their perimeters, wherein the free ends include a plastic and are adapted to be curled, comprising:
forming the body having an opening therein and the free end;
forming the end portion including a central portion, a wall about the perimeter of the central portion, a free end about the end portion and spaced from the wall portion, and a transitional portion between and connected to the wall and free end forming a recess therebetween,
juxtaposing the free ends of the body and end portion to form a plurality of walls therebetween,
maintaining plastic in at least one of the juxtaposed free ends at a temperature which is below its Vicat Softening Point at the time of curling of the free ends so that at lest one of the free ends can develop stress and related elastic strain and elastic memory during curling, and
concurrently and circumferentially engaging at least one of the juxtaposed free ends about its perimeter with a die and progressively curving the juxtaposed free ends into a multi-wall curled configuration in the recess of the end portion, and wherein plastic in at least the one free end maintained at a temperature below its Vicat Softening Point during curling develops stress and related strain and elastic memory to thereby produce and maintain engagement therebetween after disengagement between the die and the perimeter of the juxtaposed curled free ends.

5,115,939

INSULATED BEVERAGE CONTAINER

Kirby H. Porter, 6816 Montauk Dr., Richmond, Va. 23225

Filed Aug. 28, 1991, Ser. No. 751,124
Int. Cl.[5] B65D *11/00*; A47J *41/00*
U.S. Cl. 220—705 **7 Claims**



1. A shielded beverage carrier, comprising:
an insulated sleeve for accommodating a beverage receptacle therein;
a support housing for receiving said insulated sleeve therein, said support housing including an inner wall corresponding to an exterior shape of said insulated sleeve;
an umbrella including a support shaft, said support shaft being anchored to said support housing; and
means for dispensing a beverage from the beverage receptacle, said means for dispensing being secured to at least a portion of said umbrella shaft.

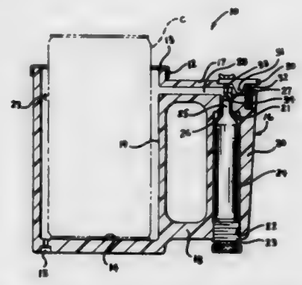
5,115,940

CONTAINER COOLER APPARATUS

Todd A. Friedman, 52 Cherry St., Willow Grove, Pa. 19090

Filed Aug. 8, 1991, Ser. No. 742,375
Int. Cl.[5] F25D *3/08, 3/10*
U.S. Cl. 220—737 **4 Claims**

1. A container cooler apparatus, comprising,
a cylindrical support housing, the cylindrical support housing including a housing upper annular end, wherein the upper annular end slidably receives a cylindrical cap in surrounding relationship relative to the upper annular end, and
the cylindrical cap includes an annular polymeric sealing ring projecting radially and interiorly of the cylindrical cap, and
the cylindrical support housing including a housing floor, a pressure relief valve mounted within the housing floor, and
a "U" shaped handle fixedly mounted to an exterior surface of the support housing, the "U" shaped handle including a top handle leg spaced from a bottom handle leg, and
a handle connecting leg mounted fixedly and between the top handle leg and the bottom handle leg, and



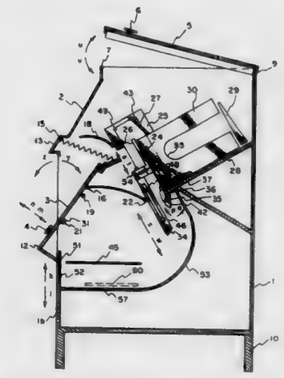
the handle connecting leg including a leg chamber, the leg chamber including a refrigerant cylinder mounted therewithin, and
at least one gas conduit interconnecting the leg chamber, with an interior surface of the support housing, and
a level member means pivotally mounted to the top handle leg for effecting selective refrigerant flow from the refrigerant cylinder through the at least one gas conduit into the support housing.

5,115,941

NEWSPAPER VENDING MACHINES

Ricardo Gueretta, 2917 Vendament St., Las Vegas, Nev. 89101

Filed Jun. 7, 1990, Ser. No. 535,766
Int. Cl.[5] B65H *1/08*
U.S. Cl. 221—229 **23 Claims**



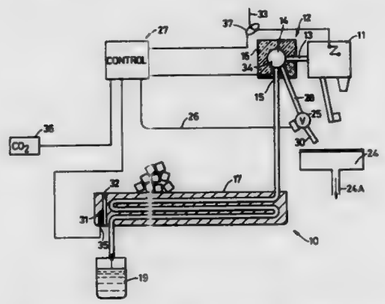
1. A newspaper vending machine comprising:
a) a frame,
b) a newspaper holder mounted inside the frame,
c) a dispensing housing mounted at one end of the newspaper holder, the dispensing housing be reciprocal between a closed position which supports a newspaper in the news-

paper holder and a open position which allows the newspaper to be dispensed,
d) a door mounted in the frame, the door being connected by means of a bar to the dispensing housing
e) and a bottom cover attached to the newspaper holder to assist the dispensing housing in closing the newspaper holder
whereby when the door is opened, the dispensing housing moves from the closed position to the open position to dispense a newspaper.

5,115,942
METHOD AND APPARATUS FOR DISPENSING COLD BEVERAGE

Terry L. Merrill, Anoka, Minn.; Kenneth W. Schneider, Mason, Iowa, and Karl A. Senghaas, San Antonio, Tex., assignors to IMI Cornelius Inc., Anoka, Minn.

Continuation of Ser. No. 284,969, Dec. 15, 1988, Pat. No. 4,969,576. This application Oct. 3, 1990, Ser. No. 592,416
Int. Cl.[5] B67D *7/00, 5/08*
U.S. Cl. 222—1 **7 Claims**



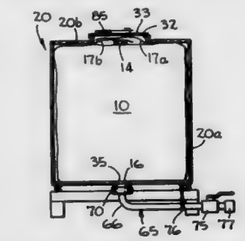
1. A method of dispensing a cooled beverage from a dispensing valve, the valve connected to a source of the beverage by a conduit, the method of dispensing comprising the steps of, delivering the beverage from the source thereof to the dispensing valve, cooling the beverage along a first portion of the conduit upstream of the dispensing valve, and withdrawing beverage from the conduit at a point thereon downstream of the first portion and upstream of the dispensing valve to maintain the beverage in a second portion of the conduit intermediate of the dispensing valve and the first portion in a chilled state for delivery to the dispensing valve.

5,115,943
BULK MATERIAL CONTAINER WITH A FLEXIBLE LINER

Clarence B. Coleman, Oakland, Calif., assignor to Fabricated Metals, Inc., San Leandro, Calif.

Continuation of Ser. No. 533,098, Jun. 4, 1990, Pat. No. 5,072,857, which is a continuation of Ser. No. 251,326, Sep. 30, 1988, Pat. No. 4,960,227. This application May 1, 1991, Ser. No. 694,354
The portion of the term of this patent subsequent to Oct. 2, 2007, has been disclaimed.
Int. Cl.[5] B65D *35/22*
U.S. Cl. 222—94 **3 Claims**

1. A bulk material container comprising:
(a) a shell having an opening at the bottom thereof, said shell having a bottom wall surrounding said opening in the bottom thereof;
(b) a discharge fitting fixedly secured to said shell below the opening thereof, said discharge fitting including a wall;
(c) a flexible liner disposed in said shell for containing bulk material, said flexible liner comprising a bottom outlet fitting received by said opening at the bottom of said shell and having a flange seated on said wall of said discharge fitting in fluid tight relation for forming a seal between outlet fitting and said discharge fitting, said wall of said discharge fitting being disposed below said flange of said bottom outlet fitting for seating said flange of said bottom outlet fitting downwardly onto said wall of said discharge fitting in fluid tight sealing engagement therewith; and

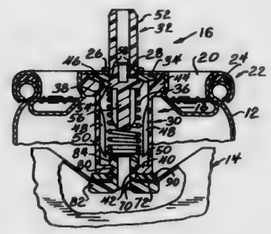


(d) means disposed in engagement with said bottom outlet fitting for urging said flange of said bottom outlet fitting downwardly against the wall of said discharge fitting to form said seal between said bottom outlet fitting and said discharge fitting.

5,115,944
FLUID DISPENSER HAVING A COLLAPSIBLE INNER BAG

Milovan A. Nikolich, Wilmette, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Aug. 14, 1990, Ser. No. 567,069
Int. Cl.[5] B65D *35/00*
U.S. Cl. 222—94 **13 Claims**

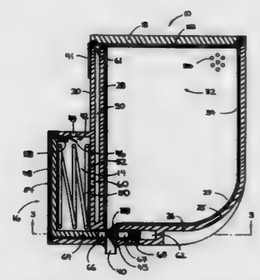


1. A dispenser for a dispensable fluid, comprising:
an outer canister having a mouth and containing a pressurized propellant;
an inner bag disposed within said outer canister; and
valve assembly means including a normally closed valve closing said mouth of said outer canister and communicating with said inner bag for enabling said inner bag to retain said dispensable fluid therein when said valve is at a closed position and for enabling said pressurized propellant to collapse said inner bag in such a manner that said dispensable fluid is propelled from said inner bag through said valve when said valve is at an opened position;
said inner bag comprising a flexible wall with an orifice having a margin defined around said orifice, said inner bag being entirely sealed except at said orifice; and
said valve assembly means including first and second portions mechanically engaged directly with each other and clamping said margin of said inner bag therebetween by engaging inner and outer surface portions of said margin of said inner bag at an axial position of said valve assembly means which is axially remote from said valve of said valve assembly means so as to secure said valve to said flexible wall of said inner bag at said margin of said inner bag flexible wall surrounding said orifice and for forming a substantially fluid-tight seal around said orifice.

5,115,945
DISPENSING DEVICE AND A BATHROOM ORGANIZER INCORPORATING SAME

Wolf E. Ruck, 1720 Lincolnshire Blvd., Mississauga, Ontario, Canada L5E 2S7

Filed Jun. 12, 1990, Ser. No. 536,478
Int. Cl.[5] B65D *35/54, 83/00*
U.S. Cl. 222—96 **13 Claims**

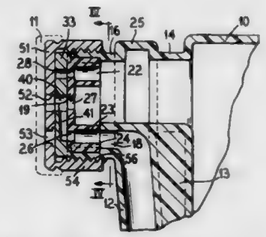


1. A dispensing means for a viscous material comprising:
(a) a reservoir for containing a viscous material, said reservoir having a basal dispensing opening;
(b) an air chamber;
(c) a manual pumping means actuatable to pressurize air in said air chamber, said manual pumping means comprising a manually actuatable piston and urging means to urge said piston to an undepressed, unactuated position;
(d) venting means for venting said air chamber to ambient air pressure prior to actuation of said pumping means comprising a one-way air chamber valve for opening to allow ambient air to enter said air chamber when the pressure in said air chamber is at or below ambient pressure and said one-way air chamber valve is free to open and for closing when the air pressure in said air chamber rises above ambient air pressure;
(e) means for communicating pressurized air from said air chamber to said reservoir;
(f) means for selectively blocking the dispensing of material through said basal dispensing opening comprising a leg depending from said piston and associated with said basal dispensing opening with said leg blocking the dispensing of material when said piston is undepressed, and said leg not blocking the dispensing of material when said piston is depressed;
(g) a valve locking means for locking said valve closed, said valve locking means actuated by depressing said piston, said valve locking means maintaining said valve closed during at least a portion of the return stroke of said piston;
said manual pumping means being operatively connected to said means for selectively blocking the dispensing of material through said basal dispensing opening;
whereby ambient air in said air chamber may be pressurized thereby communicating pressurised air to said reservoir so that when said reservoir contains a viscous material and the dispensing of material is not blocked, viscous material at said based dispensing opening is exposed to ambient air pressure so that viscous material in said reservoir is urged to exit through said basal dispensing opening by the pressure differential between the pressure in said reservoir and ambient air pressure and whereby after viscous material contained within said reservoir is dispensed through said basal dispensing opening and said piston is released and is returning to said undepressed position, pressure in said air chamber may fall below ambient air pressure while said one-way air chamber valve is locked closed so that while the dispensing of material through said basal dispensing opening is not blocked, material at said basal dispensing opening maybe used by a pressure differential to re-enter said reservoir.

5,115,946
SQUEEZE BOTTLE

Sidney M. Libit, 441 Lakeside Ter., Glencoe, Ill. 60022

Filed Feb. 11, 1991, Ser. No. 653,508
Int. Cl.[5] B67D *5/00*
U.S. Cl. 222—145 **5 Claims**

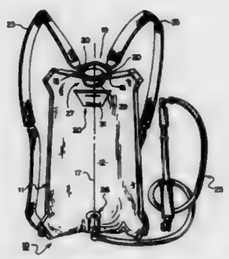


1. A dispensing container for a liquid product comprising, a flexible container, an outlet neck extending from a top portion of said flexible container, a tube integrally formed with said flexible container and extending from said outlet neck to and in fluid communication with the bottom of said container, and a mixing device connected to said tube and to said outlet neck so as to mix air with said liquid product as said container is squeezed, wherein said mixing device includes a first member with a first opening into said container and a second member with a second opening in communication with said tube and with said first opening, and wherein said second member is formed with at least a third opening which has a different size than said second opening and said second member moveable relative to said first member so that either said second or third openings can be aligned with said tube.

5,115,947
COLLAPSIBLE WATER TANK

William J. McDonnell, Clinton; Alexander C. Sarnacki, Jr., Utica, both of N.Y., and Dean E. Collins, Lowell, Mich., assignors to D. B. Smith & Co., Inc., Utica, N.Y.

Filed May 16, 1989, Ser. No. 352,557
Int. Cl.[5] B67D *5/64*
U.S. Cl. 222—107 **10 Claims**



1. A collapsible tank suitable for use in combatting fires and the like that includes
a sheet of flaccid sonically weldable material that is folded back upon itself to form a bag having a first panel, a second panel and edge seams between the panels, the first panel containing a filler hole through which liquid enters the interior of said bag,

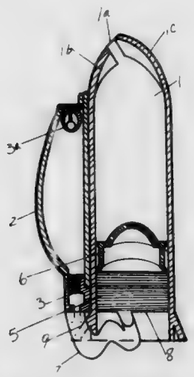
weld joints extending along the length of each edge seam to form water-tight joints between the two panels whereby a quantity of liquid can be stored in said bag,
discharge means mounted in the bottom of said bag through which liquid stored in said bag is fed out of said bag,
gripping means weld the first panel of said bag beneath the filler hole contained in the first panel of said bag, and
handle means attached to the top of said bag above the filler hole contained in the first panel of said bag, whereby the panels can be separated by pulling said gripping means and said handle means in opposite directions to allow rapid filling of said bag through the filler hole.

5,115,948

TOOTHPASTE DISPENSER WITH A FLEXIBLE AIR COMPRESSING BAG USED TO BRING ABOUT DISPENSING

Robin L. Johnson, 1271 Redbush Rd., Akron, Ohio 44320

Filed Jun. 15, 1990, Ser. No. 538,530
Int. Cl.[5] G01F *13/00*
U.S. Cl. 222—209 **9 Claims**



1. A toothpaste dispenser comprising a cylindrical tube having a toothpaste dispensing nozzle at the top end thereof, a pneumatic toothpaste pushing tube positioned at the bottom thereof, a flexible air compressing bag disposed alongside said cylindrical tube having a hose connected to the bottom of said toothpaste pushing tube, including one-way valve means enabling introduction of compressed air at the bottom of said cylindrical tube into said toothpaste pushing tube by squeezing said bag, toothpaste pneumatic pushing means positioned directly above said toothpaste pushing tube actuated by said compressed air introduced at the bottom of said cylindrical tube into said toothpaste pushing tube for forcing toothpaste to exit through said nozzle.

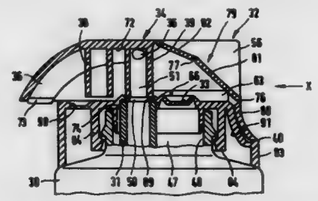
5,115,949

FLEXIBLE LIQUID CONTAINER WITH A SLIDING CLOSURE CAP

Karl-Heinz Rosenthal, Reichsdorf, Fed. Rep. of Germany, assignor to Bielsteiner Verschlusstechnik GmbH, Gummerbach, Fed. Rep. of Germany

Filed Mar. 23, 1990, Ser. No. 498,336
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1989, 3911183
Int. Cl.[5] B65D *37/00*; **B67D** *31/00*
U.S. Cl. 222—211 **13 Claims**

1. A flexible liquid container with a sliding closure cap comprising: a neck on said container defining and surrounding an opening of the container; a lower part on said cap for being mounted to said container neck over said opening; a top wall on said cap lower part defining a passage opening for the liquid in the container; a dip tube extending substantially to the base of the container and mounted to said cap lower part top wall around said passage opening; and an upper part on said cap which is provided with a closing member for the passage opening and which can move between a closed position and an open position; said top wall having a ventilation valve that includes a diaphragm defining a hole; said cap upper part having a lower side and a sealing spike protruding from said lower side for closing said diaphragm hole when said cap upper part is in said closed position; said cap upper part further having a valve spike that projects from said lower side of said cap upper part and that is generally parallel to, but shorter than, said sealing spike for interacting with said diaphragm hole when said cap upper part is in said open position; said



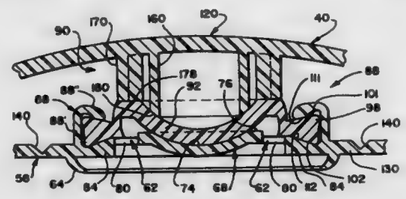
diaphragm being movable away from said valve spike by pressure outside of said container to permit venting of air through said hole into said container when the container internal pressure is less than said outside pressure; said diaphragm being movable to seal against said valve spike when the container is squeezed to dispense the liquid; said cap upper part further having a discharge channel with an inlet opening; said cap also including a pre-tensioning device having means for pressing said discharge channel to seal said inlet opening closed against an upper side of said cap top wall when the cap upper part is in the closed position and for pressing said discharge channel against said cap top wall to establish sealed communication between said inlet opening and said passage opening of said top wall when said cap upper part is in the open position.

5,115,950

DISPENSING CLOSURE WITH UNITARY STRUCTURE FOR RETAINING A PRESSURE-ACTUATED FLEXIBLE VALVE

Robert D. Rohr, Elgin, Ill., assignor to Seaquist Closures a divison of Pittway Corporation, Mukwonago, Wis.

Filed Jan. 14, 1991, Ser. No. 640,640
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—490 **22 Claims**



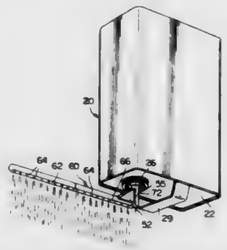
1. A dispensing closure suitable for an opening in a squeeze-type container, said closure comprising:
a body for attachment to said container at said container opening, said body defining a dispensing passage for communicating between the container interior and exterior through said container opening, said body being of unitary construction and molded from thermoplastic material;
a flexible, self-sealing valve of the type which opens in response to increased container pressure, said valve having a peripheral flange disposed in said body to mount said valve in said dispensing passage; and
said body having
(1) an annular seat around said dispensing passage for engaging said valve flange,
(2) a first wall extending from said seat to define a cavity around said seat for receiving said valve flange, and
(3) a second wall that extends from, and is unitary with, said first wall and that has been permanently deformed relative to said first wall into a generally annular configuration extending radially inwardly from said first wall to overlie said seat to clamp said valve flange between said seat and said second wall.

5,115,951

DISPENSING WAND AND COMBINATION OF DISPENSING WAND WITH CONTAINER

Stuart Leslie, and Thomas B. Aldrich, III, both of New York, N.Y., assignors to Sterling Drug, Inc., New York, N.Y.

Filed Jan. 23, 1991, Ser. No. 644,648
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—533 **20 Claims**



1. A dispenser useful for dispensing liquid from a container having a filling and dispensing neck, the dispenser comprising:
an annular insert for placement within the neck of the container, and
an L-shaped tube having a hollow dispensing leg and a hollow retaining leg, the dispensing leg having a row of spaced holes through which the liquid is dispensed and the retaining leg being received with the annular insert, whereby when the container is inverted the liquid is dispensed along a horizontal line from the row of holes to fall in a vertical direction, and as the container is moved in a horizontal direction an area beneath the dispenser is coated with the liquid.

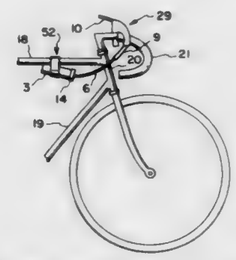
5,115,952

DEVICE FOR PROVIDING LIQUID FLUID FOR CYCLISTS

John D. Jenkins, 5101 236th St., S.W., Mountain Lake Terrace, Wash. 98043

Filed Jul. 26, 1990, Ser. No. 557,794
Int. Cl.[5] B62J *7/00, 7/06*
U.S. Cl. 224—32 R **13 Claims**

1. A body liquid replenishment system for cyclists mounted on said cyclists' cycle comprising container means for said liquid replenishment mounted on said cycle, means to supply said liquid to a cyclist operatively connected to said container means and extending outwardly therefrom and directed toward said cyclist's face, means of securely position said container means on a frame member of a bicycle and means to secure one end portion of said supply means on said bicycle handlebars in proximity to a cyclist's head when said cyclist is in a racing position so that a cyclist can draw or suck said liquid replenishment from said container through said supply means, said supply means other end being connected to an end of said container, said container positioning means comprising a pair of clamping elements integrally formed in a back to back relationship of a resilient material, each clamping element having an omega shape, one of said omega shapes having an internal diameter minimally less than said frame member diameter to insure a frictionally secure fit with said frame member, said other omega shape having a diameter minimally less than said container means exterior diameter to insure a frictionally



secure fit with said container means, said container omega shape clamping element having a longitudinal axis which is inclined downwardly and forwardly with reference to said bicycle frame member clamping element and a longitudinal axis thereof so that when said container is mounted on said frame said supply means is connected to the lowest part of said container means.

5,115,953

KNIFE SCABBARD WITH PRELOADED AND LOCKED INSERT PANEL FOR IMPROVED KNIFE RETENTION

Wesley W. Werner, 1622 Conard, Garden City, Kans. 67846

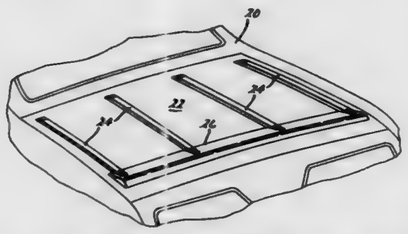
Filed May 21, 1991, Ser. No. 703,846
Int. Cl.[5] B26B *29/02*; **B65D** *25/10*
U.S. Cl. 224—232 **16 Claims**



1. A scabbard for holding a knife having a blade and a handle, comprising:
(a) an elongated insert panel having upper and lower ends and being formed of an elongated resilient semi-rigid semi-flexible sheet;
(b) an elongated holder sheath including an elongated main wall having upper and lower ends and means attached to said main wall and extending between said upper and lower ends of said main wall for removably receiving said insert panel into interfitting relation with said sheath so as to define an elongated cavity between said insert panel and said main wall of said sheath extending from said upper ends of said insert panel and main wall of said sheath to said lower ends thereof;
(c) said insert panel also having upper and lower portions capable of resiliently flexing from an initial configuration and unloaded condition to a different final configuration and loaded condition in response to receipt of said insert panel by said receiving means of said sheath into said interfitting relation with said sheath and in response to insertion of a knife into said cavity and engagement of said insert panel with said sheath and the handle and blade of the knife, said upper and lower portions of said insert panel being capable of returning to said initial configuration and unloaded condition in response to removal of the knife and said insert panel from said sheath; and
(d) means disposed adjacent said lower end of said insert

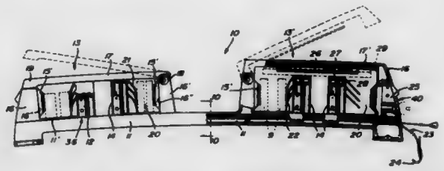
panel and said lower end of said main wall of said sheath for releasably attaching said insert panel to said sheath.

5,115,954
ARTICLE CARRIER
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Continuation of Ser. No. 444,120, Nov. 30, 1989, abandoned, which is a continuation of Ser. No. 207,063, Jun. 13, 1988, Pat. No. 4,903,876. This application Jan. 4, 1991, Ser. No. 636,554
The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.
Int. Cl.[5] B60R 9/04
U.S. Cl. 224—316 7 Claims



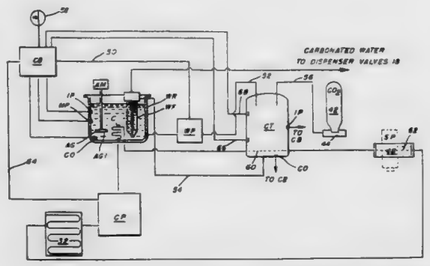
1. An article carrier adapted to be mounted on a generally planar surface of a motor vehicle comprising:
at least two article supporting slats adapted to be coupled with the planar surface and arranged substantially parallel to the planar surface, said slats each having two ends;
means for deflecting wind, said means for deflecting wind adapted to be coupled with the planar surface and oriented substantially transverse and extending between said slats;
said means for deflecting wind having a bottom portion adapted to be disposed in generally facing relation toward the planar surface of the motor vehicle and extending transversely and continuously along the planar surface between said slats to connect said slats longitudinally and transversely,
said means for deflecting wind further having an upper and outer side portion extending upwardly at an angle in relation to said bottom portion, and at least two portions extending longitudinally from said upper and outer side portion and mating with one of said ends of said slats, said longitudinally extending portions forming an opening and having a first upper surface substantially parallel to the surface of the motor vehicle;
means for tying down articles to be carried coupled with said longitudinally extending portions, said means for tying down articles being disposed in said opening and having a second upper surface, pivot means for allowing pivotal movement of said means for tying down articles, said means for tying down articles pivoting from a first position, wherein said second upper surface of said means for tying down articles is substantially flush with said first upper surface of said longitudinally extending portions, to a second position wherein said means for tying down articles projects from said longitudinally extending portions.

5,115,955
SKI RACK WITH ADJUSTABLE RETENTION POST
Michel Dallaire; Michael Santella, and Michel Swift, all of Montréal, Canada, assignors to 167848 Canada Inc., Quebec, Canada
Filed Jan. 24, 1990, Ser. No. 469,911
Int. Cl.[5] B60R 9/00
U.S. Cl. 224—324 30 Claims



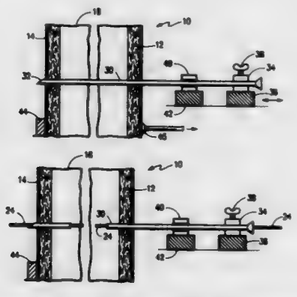
1. A ski rack comprising a support base member, one or more fixed support posts secured to said support base member at predetermined positions and extending vertically therefrom, one or more removable ski retention posts removably connected to a respective one of said support posts, one or more fixed abutment members extending vertically from said base member and disposed in spaced parallel relationship with a respective one of said retention posts, said retention posts each having flexible biasing means in the form of one or more downwardly angulated flexible fingers projecting toward said abutment members in a ski receiving space defined between said posts and said abutment members for applying clamping pressure against a pair of skis supported on said base member in said ski receiving space, and a displaceable bridge member extending above and across said abutment members and said retention posts to provide access to said ski receiving space for insertion and removal of said skis, said removable ski retention post defining a housing having a base with a pair of spaced cavities extending inwardly from said base, said support posts being dimensioned to be received in close friction fit within a selected one of said cavities, said cavities of said retention post constituting adjustment means by permitting said angulated flexible fingers to be positioned at different distances from its associated abutment member, and attachment means to secure said rack to a vehicle.

5,115,956
AGITATOR FOR A POST-MIX BEVERAGE DISPENSER
Jonathan Kirschner, Marietta, and Kathryn M. Chase, Atlanta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Continuation of Ser. No. 943,124, Dec. 18, 1986, abandoned, which is a division of Ser. No. 737,413, May 24, 1985, Pat. No. 4,660,741. This application Jun. 18, 1990, Ser. No. 541,168
Int. Cl.[5] B67D 5/00
U.S. Cl. 222—129.1 6 Claims



1. In a post-mix beverage dispenser including a supply of flavor concentrate, a carbonator for making carbonated water, a manually refillable water reservoir for supplying water to said carbonator, means for refrigerating water in said water reservoir and means for mixing said flavor concentrate with carbonated water supplied by said carbonator, the improvement comprising:
an agitator assembly including a rotary agitator disc within the water of said water reservoir, said disc having continuous uninterrupted smooth planar surfaces on both first and second sides thereof with apertures vertically formed therein permitting the flow of said water therethrough, to thereby increase the amount of water agitation and cooling achieved compared to a similar shaped disc without said apertures.

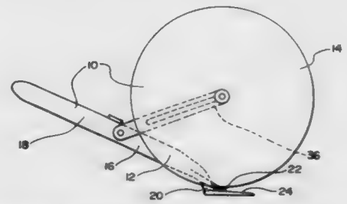
5,115,957
APPARATUS FOR REINFORCING FIBROUS DUCT
Harvell M. Smith, Evergreen, Colo.; Edward J. Marx, Baltimore, Md., and Robert R. Coleman, Westminster, Colo., assignors to Manville Corporation, Denver, Colo.
Filed Jul. 23, 1990, Ser. No. 557,298
Int. Cl.[5] A43D 71/00; B23P 19/04
U.S. Cl. 227—67 5 Claims



1. Apparatus for use in inserting tensile reinforcement means transversely through a length of fibrous duct, comprising:
a support frame;
a back-up frame mounted on the support frame for supporting the side of a length of fibrous duct;
movable support means on the opposite side of the duct mounted for movement toward and away from the duct, the movable support means being connected to a reciprocally movable frame mounted for reciprocal movement on the support frame;
the movable support means supporting elongated means aligned substantially at right angles to the length of the duct and extending between the movable support means and the duct, the elongated means being capable of penetrating said one and said opposite sides of the duct;
means for moving the movable support means toward the duct to cause the elongated means to penetrate both sides of the duct; and
means for preventing the opposite side of the duct from collapsing upon impact by the elongated means.

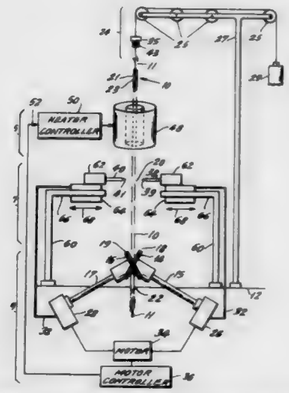
5,115,958
HEMOSTATIC SURGICAL INSTRUMENT COMPRISING STAPLER AND STAPLER COMBINED WITH SURGICAL SCALPEL
Paul M. Petty, 1911 Val Kyrie Dr., NW., Rochester, Minn. 55901
Filed Nov. 8, 1990, Ser. No. 610,848
Int. Cl.[5] A61B 17/068, 17/32; B25C 5/00
U.S. Cl. 227—180 27 Claims

26. A stapling device for ejection of staples into a substrate having a staple-receiving surface, comprising:
(a) a stapling member including a convex edge portion, said stapling member being rollable along said edge portion;
(b) a plurality of staples disposed within said stapling member;
(c) means for causing rolling movement of said stapling member on said surface; and



(d) means for sequentially ejecting said staples through said convex edge portion into said substrate as said stapling member is rolled on said surface, thereby forming a row of staples in said substrate.

5,115,959
SOLDERING MACHINE FOR ROPE CHAIN
Eitan Weinberg, Fairlawn, and Aviad Ofrat, Franklin Lakes, both of N.J., assignors to AR-GOV, Inc., Fairlawn, N.J.
Filed May 1, 1991, Ser. No. 694,128
Int. Cl.[5] B23K 31/02, 3/00
U.S. Cl. 228—4.1 26 Claims



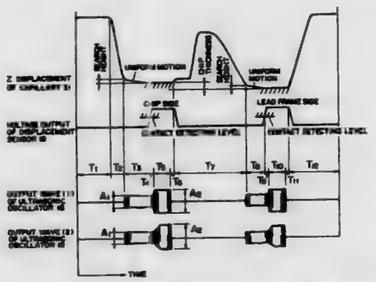
1. A soldering machine for automatically soldering links of a chain, in which the links are disposed adjacent one another and define link junctions, said machine comprising:
feeding means for feeding the chain in a forward direction and in a manner which places successive ones of said link junctions at a solder position, the feeding means comprising at least one rotatable gear which is disposed to engage and advance the links; and
soldering means including solder-applying means for applying solder paste to the chain at said link junctions.

5,115,960

WIRE BONDING METHOD

Yasuhiko Shimizu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 25, 1991, Ser. No. 645,658
Claims priority, application Japan, Feb. 23, 1990, 2-41238
Int. Cl.[5] B23K *1/06, 31/02*
U.S. Cl. 228—110 2 Claims



1. A wire bonding method for connecting a chip electrode on a semiconductor chip and a lead of a lead frame through a metal wire, the metal wire being pressed against the chip electrode, comprising the steps of:

transmitting to the metal wire a first ultrasonic oscilation with an amplitude which is relatively small for bonding the metal wire in contact with the chip electrode until the time of the contact between the metal wire and the chip electrode, and

transmitting to the metal wire a second ultrasonic oscillation with an amplitude which is relatively large for bonding the metal wire crushed by the chip electrode after the time of contact between the metal wire and the chip electrode; wherein

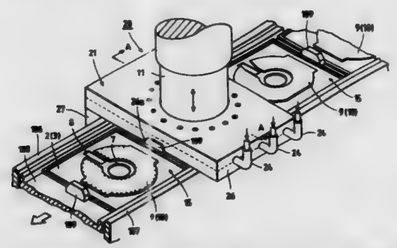
the amplitude of the first ultrasonic oscillation is immediately changed to the amplitude of the second ultrasonic oscillation.

5,115,961

APPARATUS FOR ASSEMBLING MAGNETIC DISK CARTRIDGE AND METHOD OF PRODUCING SAME

Saburo Nakajima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 9, 1991, Ser. No. 743,064
Claims priority, application Japan, Aug. 15, 1990, 2-214334
Int. Cl.[5] B23K *20/10;* B29C *65/08*
U.S. Cl. 228—111 6 Claims



1. An apparatus for attaching a liner to an inner surface of a half shell of a magnetic disk cartridge, comprising:

a welding device for welding the liner to the half shell, said welding device is capable of moving into and out of a welding position;

a casing disposed proximate the periphery of said welding device when said welding device is in said welding position, said casing covering at least a portion of said half shell and said liner, when said half shell and said liner are in an attachment position;

said casing having a plurality of blow out holes formed thereon opposite said inner surface of said half shell when said half shell is in said attachment position, said casing also having an exhaust hole;

a positive pressure device in communication with said blow-out holes so as to force a fluid through said blowout holes into a space defined by said casing and said half shell when said half shell is in said attachment position; and

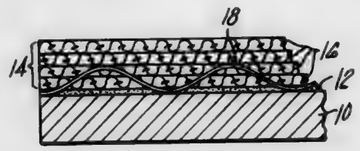
a vacuum device in communication with said exhaust hole so as to exhaust said fluid from said space.

5,115,962

METHOD OF ATTACHING CERAMIC FIBER ARRAYS TO METALLIC SUBSTRATES

David W. Anderson, Tequesta; John H. E. Baker, II, Palm Beach Gardens, and Thomas E. O'Connell, North Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1988, Ser. No. 286,836
Int. Cl.[5] B23K *1/00, 31/02*
U.S. Cl. 228—120 8 Claims



1. A method for attaching a fibrous ceramic body to a metal substrate which comprises:

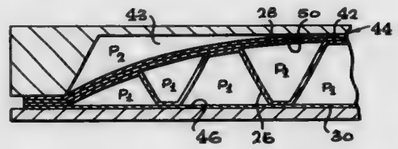
weaving a plurality of wires through the fibrous body with at least a portion of the woven wires being exposed at one face of the fibrous body, and brazing the exposed wire portions to the metal substrate.

5,115,963

SUPERPLASTIC FORMING OF PANEL STRUCTURES

Ken K. Yasui, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 10, 1991, Ser. No. 712,732
Int. Cl.[5] B23K *31/02;* B21D *39/00*
U.S. Cl. 228—157 17 Claims



14. In the process for producing a panel structure by superplastic forming in a die from a core pack comprising a core sheet joined at a plurality of bonded areas to a pair of face sheets, said core sheet and at least one of said face sheets being comprised of a superplastic material,

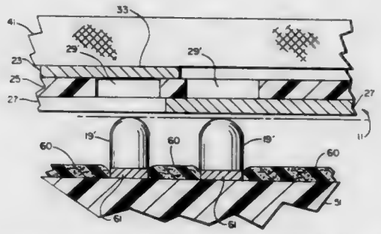
the improvement which comprises applying a superplastic restraining sheet over the surface of said at least one of said face sheets, with the other face sheet in contact with a surface of the die prior to superplastic forming, and subjecting the resulting core pack to an internal superplastic forming pressure while superplastically forming said restraining sheet and applying a back pressure lower than the internal pressure, against said restraining sheet and maintaining said restraining sheet in contact with said one of said face sheets while maintaining the other face sheet in contact with said surface of the die.

5,115,964

METHOD FOR BONDING THIN FILM ELECTRONIC DEVICE

Joseph G. Ameen, Apalachin; Joseph Funari, Vestal, and John A. Goldfuss, Jr., Port Crane, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 578,711, Sep. 7, 1990, Pat. No. 5,057,969.
This application Jul. 1, 1991, Ser. No. 724,276
Int. Cl.[5] B23K *1/012, 101/840;* H05K *3/34*
U.S. Cl. 228—180.2 14 Claims



1. A method of forming a plurality of electrical connections between a flexible film carrier and an electronic device, said method comprising:

providing an electronic device having a plurality of contact locations thereon;

positioned a solder mound on selected ones of said contact locations;

aligning a flexible film carrier with said solder mounds, said carrier including a dielectric layer, a plurality of apertures within said dielectric layer and a plurality of conductive leads, selected ones of said leads bridging a respective one of said apertures within said dielectric layer;

engaging said flexible film carrier to cause said selected ones of said conductive leads to contact and exert a predetermined force against a respective one of said solder mounds such that said selected ones of said leads are bent over said respective solder mounds;

directing a hot gas through said apertures within said dielectric layer onto said conductive leads engaging said solder mounds to heat said leads to a temperature sufficient to cause at lest the portions of said solder mounds engaging said leads to become molten; and

cooling said conductive leads and said solder mounds to solder bond said solder mounds to said leads.

5,115,965

BOX FOR CONTAINING SPHERICAL BODIES

Eleuterio Girona Alepuz, Benifayo, Spain, assignor to Frutas Ballester, S.A., Benifayo, Spain

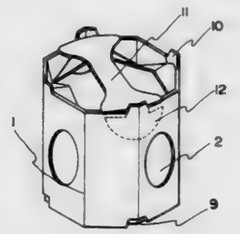
Filed Oct. 15, 1990, Ser. No. 597,822
Claims priority, application Spain, Jun. 27, 1990, 9001777
Int. Cl.[5] B65D *5/06*
U.S. Cl. 229—109 4 Claims

1. A box for containing spherical bodies and made from a rectangular sheet of material having first and second long edges,

a plurality of first longitudinal perforated lines extending between said edges so that upon folding of said sheet along said first lines a prismatic shaped box with an octagonal cross-sectional is formed,

second and third parallel perforated lines formed in said sheet respectively positioned parallel and adjacent to first and second long edges, and

a plurality of fourth diagonal perforated lines formed in said sheet extending from said second and third parallel perforated lines towards the respective first and second edges and between adjacent ones of said first perforated lines, said fourth diagonal lines extending in opposite diagonal directions between said second and third parallel line to the respective first and second edges and between said adjacent ones of said first perforated lines, the areas of said sheet defined by said fourth diagonal perforated lines being adapted to be folded inwardly of the box thereby



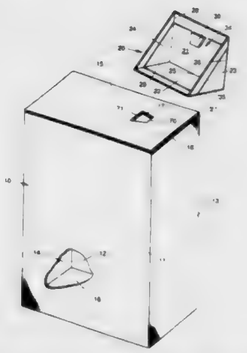
forming alternating triangular folded areas which partially and identically enclose both ends of the box, leaving an opening in the box between said alternating triangular folded areas, whereby said triangular folded areas provide multiple support points for a spherical body within the box regardless of which end of the box provides the bottom of the box.

5,115,966

PACKAGE HAVING A FORMED FITTING EXTERNAL PLUG FIT MEASURING CAP

Gary E. McKibben, Middletown, Ohio; Vernon N. Goetz, Villa Hills, Ky., and Elise M. Boehm, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 4, 1991, Ser. No. 802,383
Int. Cl.[5] B65D *39/04, 5/44*
U.S. Cl. 229—125.03 11 Claims



1. A package for storing and dispensing a granular material or product, said package comprising;

(a) a generally rectangular carton for storing said granular material, said carton comprising, opposing front and back walls, opposing side walls and opposing top and bottom walls, said carton further including a plug receptacle formed in at least one place in at least one of said top and side walls at a location adjacent a top edge of the carton which extends between the front and back walls; and

(b) a removable cap for measuring a pre-determined quantity of said material, said cap comprising two primary walls having substantially the same width as said top edge of said carton and joined together along a common edge at a

substantially right angle, and two secondary walls opposing each other and connected to said primary walls along their side edges such that said cap forms a cup type container having an inner container space;

(c) at least one of said primary walls having a plug extending into said container space, said plug being so located, sized and shaped that it will telescope in complementary fashion into said plug receptacle when said cap is applied to the carton with said common edge of said cap overlaying said top edge of said carton; and

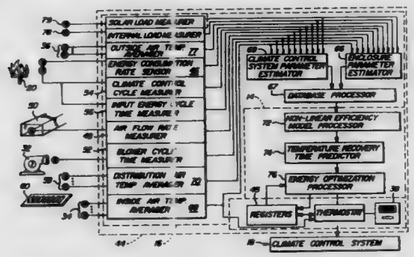
(d) a means to dispense said granular material from said carton to said inner container space of said cap.

5,115,967

METHOD AND APPARATUS FOR ADAPTIVELY OPTIMIZING CLIMATE CONTROL ENERGY CONSUMPTION IN A BUILDING

Gilbert L. Wedekind, 698 McGill, Rochester Hills, Mich. 48309

Filed Mar. 18, 1991, Ser. No. 670,718
Int. Cl.[5] F23N *5/20*; G05D *23/00*
U.S. Cl. 236—46 R **26 Claims**



1. A thermostat assembly **(10)** for changing the output of a climate control system **(13)** for an enclosure **(30)** defining a conditioned space **(28)** having variable energy consumption and utilizing inside air and outside air, said assembly **(10)** comprising:

input means **(38)** for inputting a schedule **(39)** having a plurality of transition domains **(40)** separating a plurality of quasi-steady state domains **(42)**;

inside sensing means **(34)** for measuring the temperature of the inside air;

outside sensing means **(36)** for measuring the temperature of the outside air, said assembly **(10)** characterized by

processing means **(44)** for storing a non-linear efficiency model and for receiving said temperatures of the inside air and the outside air and for changing at least one of said plurality of domains **(40, 42)** utilizing said non-linear efficiency model for optimizing the energy consumption as a function of said temperatures of the inside air and the outside air.

5,115,968

METHOD AND APPARATUS FOR CONTROLLING A HEATING/COOLING SYSTEM BASED ON A TEMPERATURE ERROR

Eric W. Grald, Maple Plain, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 2, 1990, Ser. No. 591,773
Int. Cl.[5] G05D *15/00*
U.S. Cl. 236—78 D **17 Claims**

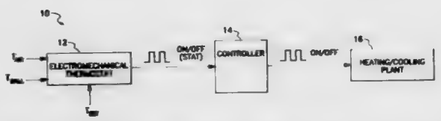
1. An apparatus for controlling a temperature control system having a thermostat with a thermostat switch and which provides an on/off signal, the on/off signal having an on period and an off period and being indicative of a temperature error (e) in a controlled environment, the temperature control system being suitable for controlling temperature control equipment, the apparatus comprising:

means for sensing the on/off signal of the thermostat;

means for determining an estimated temperature error (error) based on the on/off signal of the thermostat; and

a controller for controlling the temperature control equipment based on the estimated temperature error (error) determined from the on/off signal of the thermostat,

wherein the temperature control system includes a proportional-plus-integral (PI) thermostat having a controller with con-



troller memory, and wherein the means for determining the estimated temperature error (error) comprises:

means for determining an estimated composite temperature error (error') including a proportional error portion and an integral portion; and

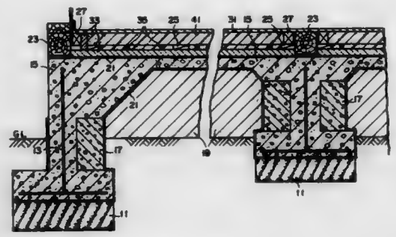
means for determining the estimated temperature error (error) based on the estimated composite error (error') determined.

5,115,969

FLOOR STRUCTURE AND CONSTRUCTION METHOD

Yoshimasa Tanaka, Chiba, and Tomotsu Kondow, Tokyo, both of Japan, assignors to Tanaka Homes Co., Ltd., Chiba, Japan

Filed Oct. 3, 1989, Ser. No. 416,454
Claims priority, application Japan, Oct. 3, 1988, 63-250525
Int. Cl.[5] F24D *5/10*
U.S. Cl. 237—69 **9 Claims**



1. A flooring structure comprising:

an exothermic body for heating purposes laid in a space provided under a floor surface; and

a heat accumulating material completely filling said space under said floor surface so as to completely surround said exothermic body, said heat accumulating material having viscoelastic properties and being capable of absorbing and retaining water therein, said heat accumulating material also having a large heat capacity for providing heat to said floor surface and acting as a cushioning material for providing walking comfort on said floor surface, wherein said heat accumulating material is in a gel form.

5,115,970

SWITCH POINT GUARD RAIL

Paul P. Rice, and William D. Munch, both of Harrisburg, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Sep. 14, 1990, Ser. No. 583,776
Int. Cl.[5] E01B *5/00*
U.S. Cl. 238—17 **6 Claims**

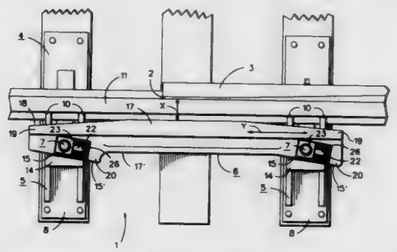
1. In a switch point guard rail assembly including a guard rail and a plurality of chairs, each chair having a vertical surface for engaging and supporting said guard rail against lateral move-

ment adjacent a railway switch, wherein the improvement comprises an adjustable guard rail comprising:

(a) a front portion, having a wheel engaging surface, and

(c) a thinner back portion including;

(i) two or more spaced apart tail pieces positioned along the length of said adjustable guard rail, each said tail piece extending from said thinner back portion in a direction away from said wheel engaging surface, and each said tail piece including a friction engaging surface



for providing continuous engagement with said vertical surface of said chairs as said adjustable guard rail is adjusted to any selected positioned toward or away from said switch point, and

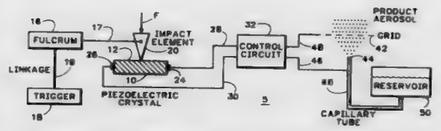
(ii) a top surface including two or more recessed portions, formed within said top surface, each said recessed portion having an elongated aperture extending through said thinner back portion and each aperture being elongated in a direction parallel to said friction engaging surfaces of said tail pieces.

5,115,971

NEBULIZER DEVICE

Bernard J. Greenspan, Richland, and Owen R. Moss, Kennewick, both of Wash., assignors to Battelle Memorial Institute, Richmond, Wash.

Filed Sep. 23, 1988, Ser. No. 248,558
Int. Cl.[5] B05B *5/025*
U.S. Cl. 239—3 **3 Claims**



1. A method of administering a medication in aerosol form, said method comprising:

dispensing a medicinal fluid;

generating an electrical potential by exerting pressure on a piezoelectric member;

electrically attracting said fluid with said potential, including regulating the value of said potential as applied to attract said fluid to provide a monodispersed fan spray; and

directing said spray for medicinal application;

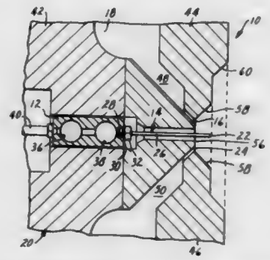
including automatically regulating the duration as well as the value of said potential as applied to attract said fluid to provide a predetermined dose of aid medication.

5,115,972

SPRAY DIE FOR PRODUCING SPRAY FANS

Gary W. Maier, Warren, Wis., and Sharon Wang, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 6, 1991, Ser. No. 651,147
Int. Cl.[5] A62C *5/02*; B05B *1/28*
U.S. Cl. 239—8 **12 Claims**



10. A method of uniformly applying a controlled coating of fluid onto a substrate comprising the steps of:

providing fluid to a fluid manifold;

transporting fluid to fluid nozzles from the fluid manifold;

ejecting fluid onto the substrate through the orifices of the fluid nozzles;

impinging at least one gas stream, from a gas nozzle having an orifice, on the fluid nozzle behind the orifice of the nozzle such that the perpendicular distance from each gas nozzle orifice to its respective fluid nozzle is adjusted to help maintain the dimensions of the gas stream as those of the gas nozzle orifice until the gas impinges on the fluid nozzle;

orienting the gas stream to impinge on the fluid nozzle adjacent to the fluid nozzle orifice to create a two-dimensional spray fan of a predetermined width adjacent each fluid nozzle;

selecting the diameter of each fluid nozzle in combination with the flow rate and viscosity of the ejected fluid; and

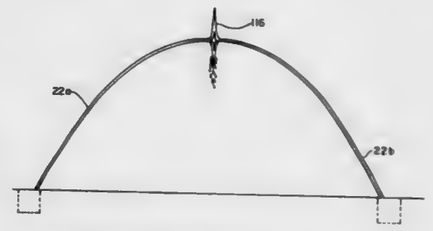
selecting the shape and angle of each gas nozzle in combination with the flow rate and viscosity of the ejected fluid to produce sufficient atomization.

5,115,973

WATER DISPLAYS

Mark W. Fuller, Studio City, and Alan S. Robinson, El Monte, both of Calif., assignors to Wet Design, Universal City, Calif.

Division of Ser. No. 555,311, Jul. 20, 1990, Pat. No. 5,078,320, which is a division of Ser. No. 160,720, Feb. 26, 1988, Pat. No. 4,955,540. This application Aug. 19, 1991, Ser. No. 732,135
Int. Cl.[5] F21P *7/00*
U.S. Cl. 239—20 **2 Claims**



1. A water display comprising;

a source of water under pressure;

first and second laminar flow nozzles disposed at different

locations operatively connected to the source of water, the nozzles each having an outlet adapted to direct a substantially laminar flow stream toward the laminar flow stream of the other nozzle to collide therewith for viewing by observers of the water display, the laminar flow stream of each nozzle having a predetermined trajectory projected at a predetermined angular elevation; and

light source means disposed in said laminar flow nozzles for directing light substantially along an axis essentially parallel with each laminar flow stream emitted thereby, said light source means being adapted to direct a different color along each laminar flow stream, wherein said laminar flow stream of said first laminar flow nozzle has a first color and said laminar flow stream of said second laminar flow nozzle has a second color whereby the laminar flow streams will appear illuminated along at least a substantial part of their length and said first and second colors combine to create a third color where said laminar flow streams collide.

5,115,974

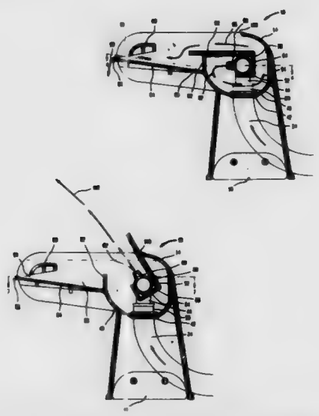
APPARATUS FOR PROVIDING A WATERFALL OR A FOUNTAIN

Samuel Tobias, Edison, N.J., and Fred Hollinger, Kings Park, N.Y., assignors to Hayward Industries, Inc., Elizabeth, N.J.

Filed Aug. 21, 1991, Ser. No. 748,236

Int. Cl.[5] B05B *17/08*

U.S. Cl. 239—23 **33 Claims**



1. A device for creating waterfall and fountain effects in an adjacent body of water, comprising a housing; spraying means for spraying water therefrom, said spraying means being mounted on said housing and being movable relative to said housing between a first position in which said spraying means sprays water externally of said housing and into the adjacent body of water in the form of a spray, thereby creating a fountain effect, and a second position in which said spraying means sprays water internally of said housing; and receiving means within said housing for receiving water sprayed internally of said housing by said spraying means when said spraying means is in its said second position, said receiving means including discharging means for discharging water from said receiving means and into the adjacent body of water in the form of a smooth sheet, thereby creating a waterfall effect.

5,115,975

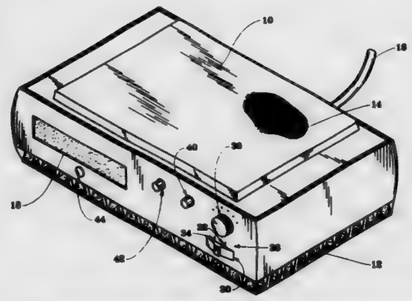
DISPENSER DEVICE AND CARTRIDGE FOR VOLATILE SUBSTANCE WITH RATE CONTROL FOR VOLATILIZATION THEREOF

Lyandon Shilling, 630 S. 4th St., No. 36, Ames, Iowa 50010

Filed Jul. 24, 1990, Ser. No. 556,476

Int. Cl.[5] B05B *1/24;* **A61L** *9/02*

U.S. Cl. 239—55 **17 Claims**



2. In an apparatus for diffusing a volatilizable substance into an ambient atmosphere, a replaceable cartridge for containing the substance and for providing control of diffusion thereof, comprising:

a base;

a membrane means cooperating with said base to form a first chamber for containing the substance for volatilization, said membrane means comprising a membrane having a porous structure wherein pores of said porous structure are non-uniformly distributed, said pores having a larger diameter being distributed in said membrane closer to a second chamber and said pores having a smaller diameter being distributed in said membrane closer to said first chamber;

a cover cooperating with said base for enclosing said membrane means in said cartridge;

said second chamber formed between said cover and said membrane means for the vaporized substance;

said cover including vent means for venting the vaporized substance from said second chamber to the ambient atmosphere; and

vent seal means for releasably sealing said vent means to permit controlled passage of the vaporized substance from the cartridge to the ambient atmosphere.

5,115,976

LIGHTWEIGHT, EASILY ATTACHABLE DISPENSING DEVICE HAVING INTERCHANGEABLE CONTAINERS FOR HOLDING A CHEMICAL TO BE DISPENSED

Lon L. Weiss, Fresno, Calif.; Larry R. Jacobson, Midland, Mich., and Frank S. Rankin, Fresno, Calif., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 16, 1990, Ser. No. 614,301

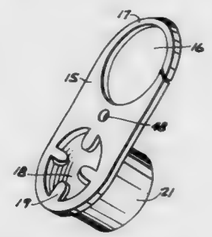
Int. Cl.[5] A61L *9/04*

U.S. Cl. 239—57 **21 Claims**

1. A surface area dispenser comprising:

a one-piece faceplate having an affixing section and a dispensing section, said affixing section being defined by an affixing enclosure substantially disposed at an end of the faceplate and defined by an outermost member substantially defining a loop substantially lying on the same plane as said faceplate, said dispensing section having a hold therein;

a container having an enclosed body with at least one open section; and,



means for attaching said container to said faceplate wherein said open section of said container is substantially in alignment with said hold in said dispensing section.

5,115,977

SPRINKLER

Uri Alkalay, Ra'anana, and Moshe Gorsey, Kibbutz Naan, both of Israel, assignors to Naan Mechanical Works, Israel

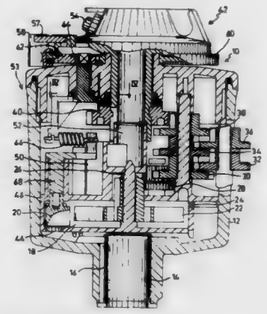
Continuation of Ser. No. 485,783, Feb. 22, 1990, Pat. No. 5,031,833, which is a continuation of Ser. No. 99,079, Sep. 21, 1987, abandoned. This application May 13, 1991, Ser. No. 699,974

Claims priority, application Israel, Sep. 21, 1986, 80102

The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.

Int. Cl.[5] A01G *27/00;* **B05B** *3/16*

U.S. Cl. 239—68 **4 Claims**



1. A rotary sprinkler including:

a base defining a liquid inlet;

a sprinkler head which is rotatable about a rotation axis fixed in the base;

liquid driven means for driving the sprinkler head in rotation about the rotation axis; and

means for selectably limiting the azimuth of rotation including an over-center spring mechanism including a joined leaf spring and flow director arranged to have only two discrete alternative positions, wherein said leaf spring has a longitudinal axis and is bendable over said longitudinal axis so as to cause said flow director to be incapable of assuming a position other than one of said two alternative discrete positions.

5,115,978

SELF-CLEANING SPRAY NOZZLE

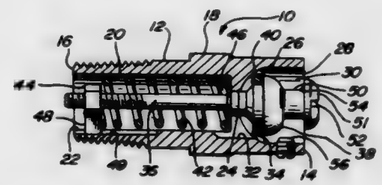
William J. King, Orange, and Robert J. Voyle, Buena Park, both of Calif., assignors to Pure-Chem Products Company, Inc., Stanton, Calif.

Continuation of Ser. No. 387,495, Jul. 28, 1989, Pat. No. 5,033,676. This application Jun. 10, 1991, Ser. No. 712,597

The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.

Int. Cl.[5] B05B *15/02*

U.S. Cl. 239—107 **9 Claims**



1. A spray nozzle for continuously feeding a solution of soap in water under low pressure to lubricate a conveyor, comprising:

a.) an elongate fitting defining a hollow passage for the flow of the solution, the fitting having inlet and outlet ends for the soap solution, the inlet end being fed by the soap solution, and the outlet end defining a valve seat and a tear-shaped gap formed thereon, the fitting being outwardly tapered at the outlet end thereof to deflect a flow of soap solution, and thereby produce a spray;

b.) a poppet valve comprising a threaded valve stem and a rotatably adjustable poppet head, the valve stem being disposed centrally and axially within the hollow passage of the fitting, and the poppet head being seatable on the valve seat and adjacent the tear-shaped gap;

c.) a coil spring surrounding the valve stem within the fitting and adapted for upward biasing against the poppet head to close the poppet head against the valve seat;

d.) a threaded retaining fitting mounted on the valve stem for comprising the spring against a spring seat when the poppet head is adjusted, the poppet head being unseated by pressure of the soap solution;

e.) washer means mounted against and under the poppet head, and sealing the nozzle against leakage when the poppet head is seated on the valve seat; and,

f.) a conveyor associated with a plurality of the spray nozzles, the conveyor being adapted to move food containers, packages and liquid containers thereon; whereby:

i. outward or inward rotational adjustment of the poppet head through the threaded retainer will adjust compression by the spring against the poppet heat onto the valve seat and against the pressure of the soap solution, to control the outlet flow from the tear-shaped gap, thereby changing spray volume and correspondingly changing the volume of a continuous stream of the soap solution applied to the conveyor when the poppet head is unseated by the pressure of the incoming soap solution;

ii. the poppet valve can be cleaned by increasing the soap solution pressure to unseat the poppet head, or by retracting the poppet head away from the outlet of the fitting against the force of the spring bias, thereby cleaning the nozzle outlet, without interrupting the feed of soap solution to the conveyor;

iii. after the nozzle has been cleaned, the poppet valve is released to reseat on the nozzle outlet; and,

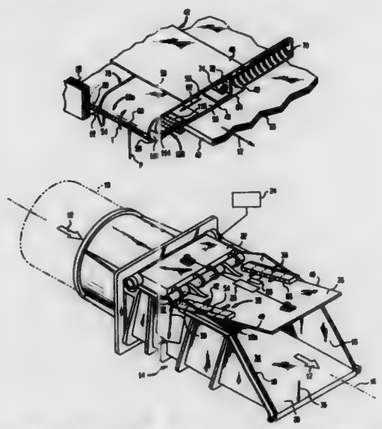
iv. the conveyor is adapted to maintain movement during periods of nozzle outlet cleaning, with reduced contamination by microorganisms.

5,115,979

CONFORMING PLUNGER SEAL ASSEMBLY

Robert J. Ellerhorst, Cincinnati, and Robert H. Kraimer, W. Chester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed May 28, 1991, Ser. No. 706,537
Int. Cl.[5] B64C 9/38
U.S. Cl. 239—265.37 12 Claims



1. A seal assembly for a gas turbine engine exhaust nozzle having an exhaust flap disposed adjacent to a nozzle sidewall for channeling exhaust gases comprising:

a housing fixedly joinable to said exhaust flap and having an opening;

a plurality of adjoining plungers slidably disposed in said housing and each including a top extending outside said housing opening for defining a seal line for contacting said nozzle sidewall for sealing said exhaust gases from flowing therebetween, said seal lines collectively defining a seal first contour being complementary to a first contour of said nozzle sidewall; and

a tie rod extending through said plungers and joining said plungers to said housing, said tie rod being flexible for allowing said plungers to rotate perpendicularly with said tie rod so that said seal lines collectively form a seal second contour, different than said seal first contour, to conform to a second contour of said nozzle sidewall, different than said nozzle sidewall first contour.

5,115,980

MANUALLY OPERATED DUAL INVERTIBLE PUMP

Thomas Skorka, Radolfzell, Fed. Rep. of Germany, assignor to Ing. Erich Pfeiffer GmbH & Co. KG, Fed. Rep. of Germany

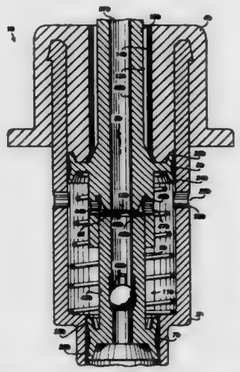
Division of Ser. No. 850,506, Apr. 10, 1986, Pat. No. 4,823,991.
This application Jan. 26, 1989, Ser. No. 303,285
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1985, 3513575
Int. Cl.[5] B67D 5/42
U.S. Cl. 222—321 25 Claims

1. A manually operated dispenser for dispensing media from a media supply means, said dispenser comprising:

at least one duct means for a medium;

at least one valve for substantially closing and opening at least one said at least one duct means, said at least one valve having a valve body cooperating with a valve seat, said valve body being a resiliently deformable disk body inserted between said valve seat and an opposite facing support face, said disk body having a self-resiliency in the manner of a disk spring to be operationally resilient for performing a deformation motion providing a resting position and a second position,

said disk body being substantially planar in one of the resting position and the second position, wherein said disk body is



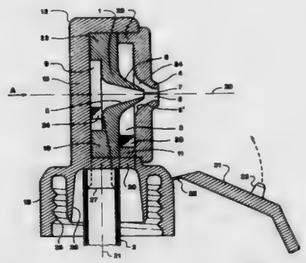
braced between said valve seat and said support face by said self-resiliency, said disk body being substantially spherical in the other of said resting position and said second position, for moving onto and off of the valve seat.

5,115,981

ATOMIZER FOR COMPRESSIBLE CONTAINERS

George E. Callahan, Feldstrasse 34, D-4000 Dusseldorf 30, and Harald Koch, Irmgardstrasse 22, D-4000 Dusseldorf 1, both of Fed. Rep. of Germany

Continuation of Ser. No. 333,729, Apr. 3, 1989, abandoned, which is a continuation of Ser. No. 897,787, Aug. 19, 1986, abandoned. This application Apr. 23, 1990, Ser. No. 660,212
Claims priority, application Switzerland, Sep. 2, 1985, 3765/851
Int. Cl.[5] B05B 1/34, 7/24
U.S. Cl. 239—402 2 Claims



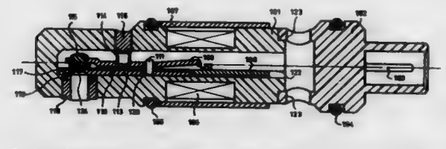
1. Atomizer for attachment to a compressible container with a liquid nozzle (1) for the liquid to be atomized and with a riser (2) extending into the interior of the container, a vortex chamber (9) connected with the riser (2) by means of a tangential inflow channel (10), the vortex chamber leading to the liquid nozzle (1), and also with an annular chamber (3) around the liquid nozzle, the chamber being connected with the air space in the container above the liquid, the annular chamber (3) opening into a mixture nozzle (4) located on the same axis as the liquid nozzle (1), the liquid nozzle (1) and the mixture nozzle (4) having approximately conical interior walls (5, 5'), and the liquid nozzle (1) having an approximately conical exterior wall (6), and extending into the mixture nozzle in such a manner that the annular chamber (3) opens into the mixture nozzle (4) through an annular conical ring channel (34), and that the orifice (7) of the liquid nozzle lies on a level which is retracted in the direction of flow from the orifice (8) of the mixture nozzle, the annular chamber (3) and the mixture nozzle (4) being incorporated in an air-channeling component (29), the vortex chamber (9) and the liquid nozzle (1) being incorporated in a liquid-channeling component (23), the liquid-channeling component (23) and the air-channeling component (29) being successively mounted coaxially in a receptacle component (12), the components (1, 4, 14) located in the receptacle component (12) being cylindrical, and being rotatable in such a manner that they form, together with the side wall (16) of the receptacle component, a valve for narrowing or closing the inflow channels (10, 11).

5,115,982

ELECTROMAGNETIC FUEL INJECTOR WITH TILT ARMATURE

Gerhard Mesenich, Bochum, Fed. Rep. of Germany, assignor to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Oct. 10, 1989, Ser. No. 419,490
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1988, 3834445
Int. Cl.[5] F16K 31/06
U.S. Cl. 239—585.3 7 Claims



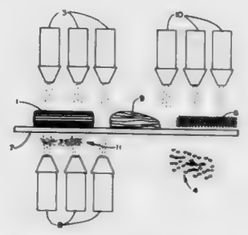
1. An electromagnetic operated fuel injector comprising an injector body having a fuel inlet, a fuel outlet, a valve armature for opening and closing a fuel path through said injector body between said fuel inlet and said fuel outlet, actuating means comprising a solenoid controlling the operation of said valve armature for opening and closing said fuel path, pivot means pivotally mounting said valve armature between opposite ends thereof on said injector body such that said actuating means is effective to reciprocally pivot said valve armature about said pivot means, one of said opposite ends of said valve armature comprising obturator means that, as said valve armature is reciprocally pivoted by said actuating means, selectively seats on and unseats from a seat means that is disposed on said injector body to thereby open and close said fuel path, and another of said opposite ends being disposed for coaction with said solenoid, characterized in that said solenoid bounds an interior space said another of said opposite ends of said armature is disposed in said interior space with said armature passing through one axial end of said interior space, in that a pole piece enters said interior space via another axial end of said solenoid to dispose a pole face of said pole piece in said interior space in mutual juxtaposition to said another of said opposite ends of said valve armature, and in that said valve armature and said pole piece form a magnetic circuit for flux issued by said solenoid, said magnetic circuit including a working gap which is cooperatively defined by and between said pole face and said another of said opposite ends of said valve armature and which provides for said actuating means to reciprocally pivot said valve armature about said pivot means.

5,115,983

PROCESS FOR RECYCLING VEHICLE TIRES

Darrel Rutherford, Sr., Hamilton, Ohio, assignor to D & R Recyclers, Inc., Hamilton, Ohio

Continuation-in-part of Ser. No. 557,152, Jul. 7, 1990, abandoned. This application Jan. 14, 1991, Ser. No. 640,925
Int. Cl.[5] B02C 19/00
U.S. Cl. 241—1 16 Claims



1. A process for fragmenting the rubber of a rubber vehicle tire and separating said fragmented rubber from the metal cording material of said tire, comprising the steps of;

a) directing at least one stream of water onto said tire, said water having a pressure of at least 2,000 pounds per square inch pressure; and,

b) directing said water to all areas of said tire where rubber is located for sufficient duration to fragment said rubber and to separate said rubber from said cording material of said tire by washing said fragmented rubber away from said cording material and into the flow of effluent water leaving said cording material separate from said effluent water and said fragmented rubber therein; and,

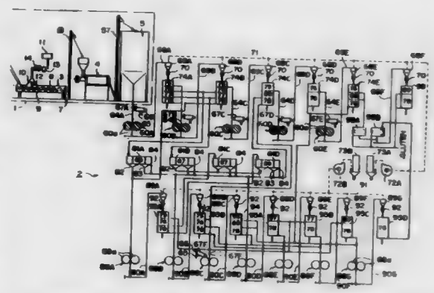
c) separating and recovering from said effluent water said fragmented rubber.

5,115,984

PROCESS OF GRINDING GRAINS

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Division of Ser. No. 343,533, Apr. 25, 1989, Pat. No. 5,025,993.
This application Dec. 28, 1990, Ser. No. 635,213
Claims priority, application Japan, Apr. 26, 1988, 63-104853
Int. Cl.[5] B02C 2/00
U.S. Cl. 241—7 5 Claims



1. A process of flouring wheat grains comprising the steps of:

polishing the grains to produce polished grains;

alternately milling and sifting the polished grains a plurality of times to provide a flour having a desired mesh size;

humidifying the grains milled in said milling and sifting step; and

recovering the flour.

5,115,985

METHOD FOR THE REGENERATIVE TREATMENT OF MAINLY CLAY-BOUND FOUNDRY OLD SAND

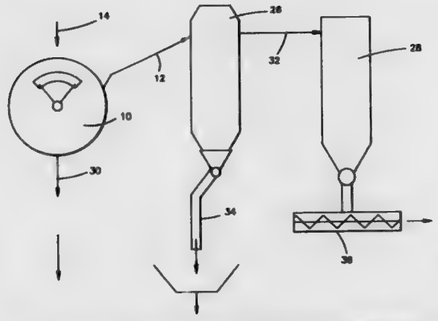
Franz Satmer, Schaffhausen, Switzerland, and Ludwig Wilhelm, Engen, Fed. Rep. of Germany, assignors to Georg Fischer AG, Schaffhausen, Switzerland

Filed Nov. 28, 1990, Ser. No. 619,044

Claims priority, application Switzerland, Nov. 28, 1989, 04259/89

Int. Cl.[5] B02C *23/00*

U.S. Cl. 241—14 5 Claims



1. A process for regenerating old clay-bound foundry sand characterized by sand grains having a surface layer of dead burned binder bonded thereon comprising scouring said old clay-bound sand by combined impact and shearing stress so as to separate said surface layer from said sand grain, grinding said separated surface layer to powdery fractions, separating said powdery fractions from said sand grains by suctioning off said powdery fractions in a fractionated manner from said sand grains, feeding said suctioned off powdery fractions to a separator, separating said powdery fractions into (1) usable dust comprising non-burned bentonite and carbon parts and (2) unusable dust and recirculating said usable dust and said sand grains for further foundry use.

5,115,986

PROCESS FOR TREATING CONTAMINATED SOIL

George F. Bateson, Roseville; Dennis D. Chilcote, Hibbing; Michael M. Martinson, Mound; Steven B. Valine, Carver, and Adolfo R. Zambrano, Hibbing, all of Minn., assignors to BioTrol, Inc, Chaska, Minn.

Continuation-in-part of Ser. No. 388,748, Aug. 2, 1989, Pat. No. 4,923,125, which is a continuation of Ser. No. 153,240, Feb. 8, 1988, abandoned. This application Aug. 24, 1989, Ser. No. 398,082

The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.

Int. Cl.[5] B02C *23/18*

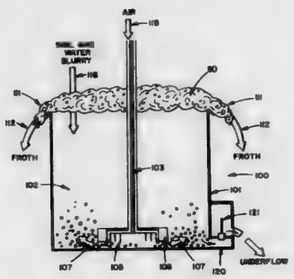
U.S. Cl. 241—20 19 Claims

1. A process for treating soil contaminated with organic materials; said process including the steps of:

(a) forming a slurry of less than about 10 mesh contaminated soil material in a fluid; said contaminated soil slurry containing 40–70% solids by weight;

(b) conducting an attrition process on the contaminated soil slurry to break the soil into particles and generate in fluid suspension sufficient particle/particle collisions to abrade contaminant off larger particles; and

(c) conducting a classification process on the fluid suspension of particles from said attrition process, for isolation and removal of a fraction containing relatively fine, slow settling, particles of less than about 10 microns in size, from a fraction containing coarser, faster settling, particles, by means of relative settling velocities; said step of



classification being performed prior to complete settling of the suspension formed in said attrition process.

5,115,987

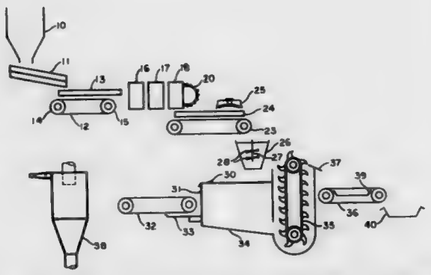
METHOD FOR SEPARATION OF BEVERAGE BOTTLE COMPONENTS

Ashish K. Mithal, Box #2023, University of Lowell, Lowell, Mass. 01854

Filed Feb. 19, 1991, Ser. No. 657,485

Int. Cl.[5] B02C *11/08*

U.S. Cl. 241—23 2 Claims



1. A method for separation of components of beverage bottles, said components being high density polyethylene (HDPE) base-cup, polyethylene terephthalate (PET) bottle body, aluminum cap, labels and adhesives; said method comprising the steps of:

a. transporting said beverage bottles from one location to a second location in a continuous path of travel,

b. orienting said beverage bottles using an orientation device disposed at an intermediate location between said first and second locations, whereby said beverage bottles are longitudinally oriented in the direction of said path of travel,

c. interposing cutting means in said path of travel proximate to said second location, whereupon said longitudinally oriented bottles are bisected into two halves,

d. collecting said bisected bottle halves onto a moving takeaway conveyor,

e. subjecting said bisected bottle halves on said moving takeaway conveyor to thermal treatment, thereby thermally softening said adhesives joining said beverage bottle components,

f. feeding said thermally softened bottle components into a scrambler having agitating means, whereby said beverage bottle components are mutually isolated and disjoined from each other,

g. transporting said disjoined components of said beverage bottles to a flotation tank, whereupon said labels and HDPE base-cups float while said PET and aluminum components sink,

h. collecting said afloat and sunk fractions separately,

i. subjecting said sunk fraction to mechanical screening, whereby said aluminum and PET components are separated,

j. subjecting said afloat fraction to air classification, whereby said labels are separated from said HDPE base-cups.

5,115,988

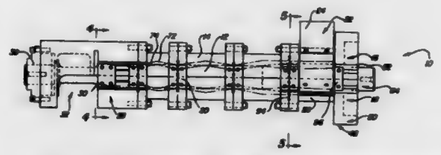
METHOD FOR GRINDING MATERIALS

Eric O. Tolonen, Gladwin, Mich., assignor to Peggy E. Tolonen, Gladwin, Mich.

Continuation of Ser. No. 374,258, Jun. 30, 1989, Pat. No. 4,977,137. This application Mar. 4, 1991, Ser. No. 664,210

Int. Cl.[5] B02C *19/22*

U.S. Cl. 241—30 4 Claims



1. A method for grinding a reinforced particulate material, said method comprising the steps of:

(a) feeding said reinforced particulate material into a transfergrinder device having a grinding plane defined between the interior wall surface of a stator having a first helical thread-like configuration and the exterior wall surface of a rotor having a second helical thread-like configuration, said second helical thread-like configuration being of opposite hand relative to said first helical thread-like configuration;

(b) maintaining a positive grinding pressure in said grinding plane;

(c) advancing said reinforced particulate material along said grinding plane to a transfer point where a single thread feeds a plurality of threads for applying additional pressure upon said reinforced particulate material;

(d) causing the flow of said reinforced particulate material to change direction; and

(e) causing said reinforced particulate material to grind against itself.

5,115,989

DYNAMIC ROLLER MILL AIR CLASSIFIER

Franz Poeschl, Düsseldorf, Fed. Rep. of Germany, assignor to Loesche GmbH, Düsseldorf, Fed. Rep. of Germany

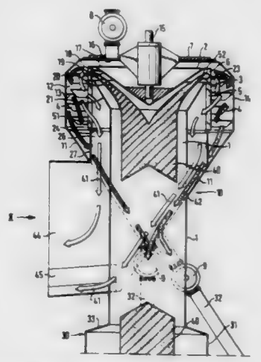
Filed Feb. 19, 1991, Ser. No. 656,549

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1990, 4005031

Int. Cl.[5] B02C *23/32*

U.S. Cl. 241—79.1 9 Claims

1. A dynamic roller mill air classifier with an integrated air classifier for a rising gas-grinding material flow located above a roller mill, with a classifier rotor having roughly vertical classifying ledges, said classifier from the flow standpoint is followed by at least one gas flow outlet and a fine material outlet, as well as at least one coarse material return, with a mill casing for the roller mill, a classifier casing and a classifier chamber surrounding the classifier rotor, wherein a central riser for the rising gas-grinding material flow and which is tapered with respect to the mill casing is provided, deflection means is provided on the top of the riser for deflecting the rising gas-grinding material flow and which is deflected radially outwards into a gravity downflow in the upper area of the classifier rotor, louvres are provided in the classifier chamber which are directed towards the classifier rotor, for uniformly distributing the gas flow over the entire rotor height and for homogenous and repeated feeding of material to be classified to the rotor, a dropshaft around the riser into which the gas-fine material flow passing through the classifier rotor from the outside to the inside is led off downwards through a bottom



opening of the classifier rotor surrounding the central riser and return lines are provided separately with respect to the riser for returning the coarse material from the classifier chamber downwards to the mill casing

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5,115,990

SAFETY BELT MECHANISM

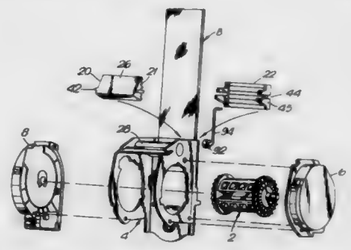
Harry Hanna, Craigavon, and William E. Heaney, Bangor, both of Ireland, assignors to European Components Corporation, United Kingdom

Division of Ser. No. 480,159, Feb. 14, 1990, Pat. No. 5,039,025. This application Jun. 5, 1991, Ser. No. 710,537

Claims priority, application United Kingdom, Feb. 16, 1989, 8903570; Oct. 10, 1989, 8922789

Int. Cl.[5] B65H *75/48*

U.S. Cl. 242—107.2 2 Claims



1. A retainer mechanism for a safety belt web comprising a frame, and mounted on the frame, a retraction reel for the belt web, a pair of locking members having opposed faces between which the web extends, means resiliently biasing said members to a position in which the opposed faces are spaced apart to provide a free travel for the web, and means to cause displacement of at least one of the members against said bias, to move said faces relatively towards one another, to clamp the web between them, and retain the web while it is held under tension, wherein said locking members comprise first and second locking members which are each movable relative to said frame, said second locking member being mounted for translational sliding movement relative to said frame, wherein said means to cause movement of said locking members acts on said second member, movement of which causes said first member to move, whereby its face is moved towards the face of the first member to clamp the web therebetween, wherein said first locking member is also mounted for translational sliding move-

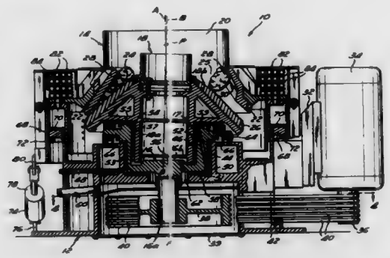
ment relative to said frame, wherein said first locking member further comprises an inclined surface, angled with respect to its face, wherein said frame further comprises a cooperating surface, engaged by said inclined surface, whereby translational sliding movement of said first locking member urges said first locking member towards said second locking member and wherein said first locking member further comprises a lost motion link with said second locking member causes firstly a parallel movement of said first locking member and secondly a transverse movement thereafter towards said second locking member, wherein the means to cause displacement of the second locking member against said bias includes means sensitive to the speed of rotation of said reel, whereby when the speed attains a certain value, said members are moved relatively towards one another and wherein said means sensitive to the speed of rotation of the reel comprise an inertia mass and ratchet wheel, clips holding said inertia mass and ratchet wheel together, said clips permitting said inertia mass and ratchet wheel to rotate relatively to each other about the axis of the reel, a torsion spring attached to the ratchet wheel and the inertia mass to constrain relative movement therebetween, a sensing disc attached to the reel, a sensing pawl pivotally mounted on the sensing disc, a control disc freely rotatable about the axis of the reel, ratchet teeth on said control disc opposed to the pawl and a spring engaging and operatively biasing the pawl out of engagement with the ratchet teeth, whereby when the inertia mass is moved, due to sufficient speed of rotation of the reel, the pawl is pivoted, against the action of said spring, so that it engages the ratchet teeth and causes the control disc to rotate, rotation of the control disc causing movement of said second locking member relative to said first locking member.

5,115,991

GYRATORY CONE CRUSHER

Robert S. Saari, 1002 Avenida de la Estrella, San Clemente, Calif. 92672

Filed Jul. 5, 1991, Ser. No. 726,238
Int. Cl.[5] B02C *2/04*
U.S. Cl. 241—208 **20 Claims**



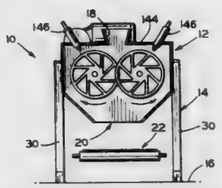
1. A low profile gyratory cone crusher comprising:
a lower main frame having a vertical axis extending therethrough;
a rotatably driven eccentric member disposed within said main frame, said eccentric member comprising:
(a) a lower portion having a generally cylindrical configuration and including a first axis coincident with said vertical axis; and
(b) an upper portion defining a generally cylindrical recess having a second axis oblique to said vertical axis;
a crusher head assembly disposed within said recess, said head assembly having a third axis coincident with said second axis whereby said head assembly will gyrate as the eccentric member rotates, said head assembly defining a first generally conical upwardly presented crushing surface and including a cylindrical portion sized and configured to be receivable into said recess;
an upper bowl assembly attached to said main frame in a manner enclosing said head assembly, said bowl assembly having an inlet opening located generally over said head assembly and a second generally conical crushing surface spaced from the first crushing surface, said second crushing surface being generally fixed in position relative said eccentric member such that material introduced into the cone crusher through the inlet will be crushed in the space between the first and second crushing surfaces;
a first bearing attached to said main frame so as to be mounted between said main frame and the upper portion of said eccentric member, said first bearing having a fourth axis coincident with said vertical axis and including a first horizontal portion for transmitting thrust loads from the eccentric member to the main frame and a first vertical portion for transmitting radial loads from the eccentric member to the main frame, said first bearing member enabling the eccentric member to rotate within the main frame; and
a second bearing disposed within said recess so as to be mounted between said eccentric member and the cylindrical portion of said head assembly, said second bearing having a fifth axis coincident with said second axis and including a second horizontal portion for transmitting thrust loads from the head assembly to the eccentric member and a second vertical portion for transmitting radial loads from the head assembly to the eccentric member.

5,115,992

FOOD CUTTING MACHINE

Duane C. Nugent, 344 East Second St., Perrysburg, Ohio 43551

Filed Feb. 8, 1991, Ser. No. 653,001
Int. Cl.[5] B02C *4/08*
U.S. Cl. 241—236 **17 Claims**



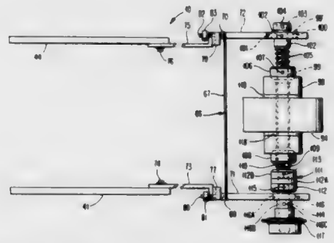
1. A machine for slicing food products comprising first and second stacks of axially aligned, spaced circular knife blades, each said circular knife blade comprising a central hub section and a circumferential cutting ring interconnected by a plurality of spaced spokes, said stacks being positioned so that upon rotation the circumferential cutting rings of the knife blades of said first stack intermesh with and overlap the circumferential cutting rings of the knife blades of said second stack each succeeding circular knife blade in each said stack being displaced by a predetermined angular amount from the preceding knife blade whereby said spaced spokes of said stacks of axially aligned knife blades define helical paths through said stacks from end to end thereof, and drive means for rotating said first and second stacks in opposite directions about their longitudinal axes whereby a said food product supplied to the confluence of said opposite rotating first and second stacks is sliced between said cutting rings into elongated strips and said strips are forced between said rings and deposited within said helical paths defined by said spaced spokes for carriage along said helical paths and discharge at an end of said blade stacks.

5,115,993

TAPE REEL SUPPORT

Michael N. Grimshaw, Milford; Stephen J. Albers, Norwood, and Ralph J. Rust, Cheviot, all of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Division of Ser. No. 380,583, Jul. 17, 1989, Pat. No. 4,978,417.
This application Sep. 10, 1990, Ser. No. 579,761
Int. Cl.[5] B65H *18/02*
U.S. Cl. 242—68.4 **2 Claims**



1. A support arrangement for a reel including:
a pair of spaced side brackets;
a swivel member;
one of said side brackets having an opening within which said swivel member is disposed;
support means for swivelly supporting said swivel member on said one side bracket;
a first shaft having one end rotatably and slidably supported by said swivel member and extending between said spaced side brackets;
a coupling;
said first shaft having its other end releasably coupled to said coupling;
a mandrel fixed to said first shaft;
means on said mandrel for releasably mounting a reel thereon for rotation therewith;
biasing means for biasing said first shaft and said mandrel away from said one side bracket and toward the other of said side brackets;
means secured to the one end of said first shaft for retaining said first shaft connected to said one side bracket;
a second shaft having one end coupled to said coupling;
the other of said side brackets having an opening for receiving the other end of said second shaft to rotatably support said second shaft;
connecting means secured to said second shaft for connecting said second shaft to means for rotating said second shaft;
and said first shaft being pivotal with said swivel member about said support means when said first shaft has its other end disconnected from said coupling and said biasing means is overcome to enable axial sliding movement of said first shaft relative to said one side bracket whereby a reel mounted on said mandrel may be replaced.

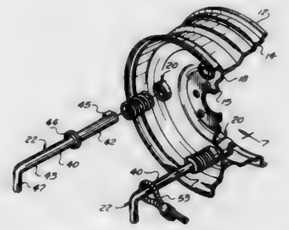
5,115,994

WINCH ATTACHMENT FOR VEHICLE WHEEL

Vernon P. Hershberger, 4001 E. Elmwood, Tucson, Ariz. 85711

Filed Mar. 12, 1990, Ser. No. 492,470
Int. Cl.[5] B65H *75/42*
U.S. Cl. 242—95 **11 Claims**

1. An apparatus for use in combination with a line and with a drive wheel of a vehicle, said wheel including
a central section secured to said vehicle by a plurality of wheel fasteners,
a peripheral section adapted for attachment of a tire, and
a medial section intermediate said central section and said peripheral section,
said line including attachment means for detachably securing said line to a selected object,
and for converting said wheel to a winch about which said line may be wound in response to rotation of said wheel, said apparatus comprising:
a) a plurality of projecting members, each of said projecting members including
i) a coupling portion carrying an engagement element, and
ii) a line receiving portion; and
b) a plurality of smooth-bored coupling receiving apertures for securing the coupling portions of each of said projecting members to said wheel in response to linear movement of said coupling portion relative to said coupling receiving apertures, each of said coupling receiving apertures including a complemental element cooperating with said engagement element to detachably secure said projecting element to said coupling receiving apertures,
wherein said line is coilable about said projecting members in response to rotation of said wheel when said attachment means is secured to the line receiving portion of one of said members.

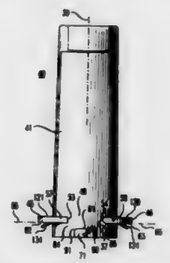


5,115,995

ANGULARLY LOCKABLE PAYOUT TUBE

Rodney J. Hunt, Omaha, Nebr., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

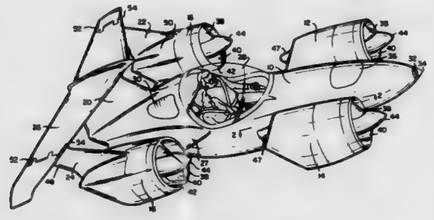
Filed Dec. 26, 1990, Ser. No. 633,887
Int. Cl.[5] B65H *57/12, 49/08*
U.S. Cl. 242—157 R **13 Claims**



1. A payout tube for a filament disposed in a coil in a container having a wall in which is formed a hole used for said tube and comprising a central aperture and notch means extending radially outward from such aperture, said tube comprising:
a tubular sleeve having an axis and adapted for conducting said filament therethrough; stop means projecting at one end of said sleeve radially away from its periphery, at least one axial locking tab projecting at said end radially away from said periphery and axially spaced from said stop means to provide between them a passage for relative angular movement therein of a section of said wall adja-

cent said hole, said tube being securable to said container by advancing said sleeve end and tab through said aperture and notch means, respectively, to pass them from one side to the other of said wall while said stop means remains on the same side of said wall, and by then moving said section into and in said passage by angularly moving said tube relative to said container through an angular displacement at least enough to insert said wall section between said stop means and tab, and detent means disposed on said tube and adapted in response to said turning of said tube to lodge in said notch means and, by engaging the side wall of said notch means, to stop said tube and container from subsequent relative angular turning.

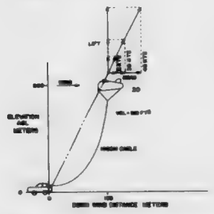
5,115,996
VTOL AIRCRAFT
Paul S. Moller, Dixon, Calif., assignor to Moller International, Inc., Davis, Calif.
Filed Jan. 31, 1990, Ser. No. 472,696
Int. Cl.[5] B64C *29/00*
U.S. Cl. 244—12.5 **38 Claims**



1. A VTOL aircraft comprising:
an elongated fuselage configured to develop aerodynamic lift when moved forward in the direction of its longitudinal axis;
at least one vertical stabilizer connected to an aft portion of said fuselage;
a horizontal stabilizer connected to said vertical stabilizer;
a plurality of fixed nacelles disposed fore, aft and on either side of the center of gravity of said fuselage and rigidly connected thereto and operative to generate independent streams of airflow for propelling and stabilizing said aircraft, each said nacelle having powerplant means and propeller means driven thereby which rotate bout an axis substantially parallel to said longitudinal air and cause air to flow through the nacelle and an airflow directing vane system including a plurality of vanes disposed at the aft end of the nacelle and movable between a first position directing airflow passing out of said nacelle in a direction parallel to the longitudinal axis of said aircraft, and a second position directing said airflow at an angle relative to said longitudinal axis; and
control means for controlling the power generated by each said powerplant means and the positions of the corresponding vanes to cause said airflow to be directed downwardly to case said aircraft to rise vertically, and to alternatively be directed rearwardly to cause said aircraft to move in a forward direction, the power supplied by each said powerplant means and the position of the corresponding vanes being coordinated to maintain the balance and stability of the aircraft.

5,115,997
SURVEILLANCE BALLOON
John M. Peterson, Madison, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Jan. 12, 1990, Ser. No. 464,388
Int. Cl.[5] B64B *1/20*
U.S. Cl. 244—25 **32 Claims**

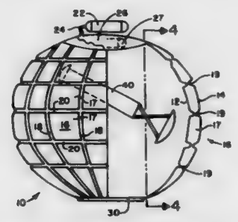




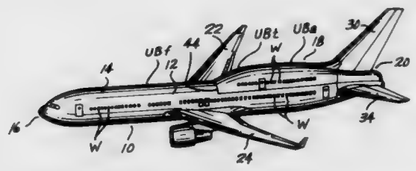
2. A minimum volume tethered surveillance balloon comprising:
an inflatable main body having a semi-spherical front end, a frusto conical mid-region which converges in a direction away from said front end, and a semi-spherical aft end, said main body further including stabilizing fins positioned at the aft-end of said main body;
stub wings adjoined to said main body at an upper-front region of said main body in an area where the semi-spherical front end joins with the frusto conical mid-region;
a payload pod supported by said main body;
a tether line;
means for connecting said tether line to said main body; and
said surveillance balloon having a lift-to-weight ratio of between about 1.05 to 1.15 such that said surveillance balloon has a minimized volume for providing essentially only sufficient enough lift to raise said main body to the length of said tether line while said surveillance balloon is in still air conditions, and said stub wings being dimensioned and arranged so as to maintain said tethered surveillance balloon, when subjected to winds of up to 45 mph, at an altitude level which is at least 80% of the still air altitude said surveillance balloon would assume.

5,115,998
ANNULAR BALLOON
Leonard W. Olive, Hawthorne, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jun. 29, 1990, Ser. No. 546,134
Int. Cl.[5] B64B *1/58*
U.S. Cl. 244—31 **14 Claims**

1. A balloon which requires less gas to inflate than its overall volume would indicate comprising, a detached and self supporting balloon having double walls which include inflatable gores therein, which gores when inflated define a hollow annular body, said gores being joined side-by-side by longitudinal seams, said balloon being free of rigid framework.



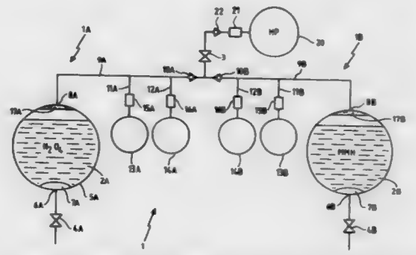
5,115,999
AFT DOUBLE DECK AIRPLANE
Christian K. E. Buchsel, Issaquah; Gary E. King, Snohomish, and Jerry J. Burns, Mukilteo, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Jan. 11, 1990, Ser. No. 463,249
Int. Cl.[5] B64C *1/00*; B64D *11/00*
U.S. Cl. 244—118.5 **15 Claims**



1. An aft double deck airplane, comprising:
a fuselage including a midportion, a forward portion extending forwardly from said midportion to a nose region, and an aft portion extending rearwardly from the midportion to a tail region;
a pair of swept back wings extending laterally outwardly from the midportion of said fuselage;
a main deck extending through said forward portion, said midportion and said aft portion of said fuselage;
a partial upper deck extending throughout said aft portion of said fuselage above said main deck; and
said fuselage having an upper outer boundary which extends rearwardly through the forward portion and the midportion at a first level and then rises and extends rearwardly throughout the aft portion at a higher second level.

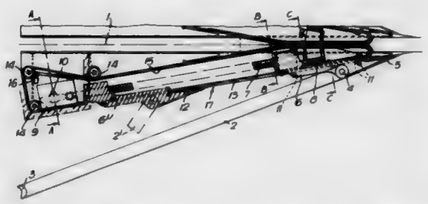
5,116,000
ADAPTABLE SYSTEM FOR STORING LIQUID UNDER PRESSURE AND SPACECRAFT PROPELLANT STORAGE APPLICATIONS THEREOF
Alain Girard, Cagnes Sur Mer, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France
Filed Dec. 18, 1990, Ser. No. 629,764
Claims priority, application France, Dec. 18, 1989, 89 16708
Int. Cl.[5] B64D *37/00*
U.S. Cl. 244—135 R **21 Claims**

1. System for storing liquid under pressure for containing any one of a plurality of different predetermined liquid quantities including a largest liquid quantity with approximately a same filling ratio in an environment in which the temperature varies, said system comprising
a main storage tank adapted to contain the whole of any selected one of said plurality of liquid quantities and a residual volume of pressurized gas, and a reserve gas storage capacity mechanically independent of said main storage tank and in permanent communication during storage with said residual volume of pressurized gas via a liquid non-return device, said gas reserve capacity having a volume specifically chosen as a function of a selected



liquid quantity to be actually introduced into the system so that said selected liquid quantity divided by the sum of the volumes of said main storage tank and gas reserve capacity is at least approximately equal to said filling ratio.

5,116,001
VARIABLE AIR INTAKE
Alan F. E. Perry, Filton, England, assignor to British Aerospace Public Limited Company, London, England
Filed Jul. 6, 1990, Ser. No. 548,706
Claims priority, application United Kingdom, Jul. 6, 1989, 8915481
Int. Cl.[5] B64D *33/02*
U.S. Cl. 244—53 B **14 Claims**

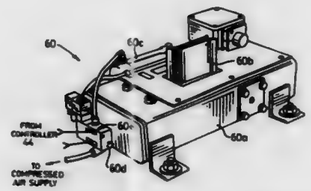


1. A variable geometry engine air intake for a supersonic aircraft comprising:
a hollow intake body defining an intake passage therethrough to receive air into the engine, the air being of high temperature due to contact with said passage,
drive means,
a ramp member forming part of said intake body movable by said drive means to vary the geometry of said intake, and
a thermal shield member movable with said ramp member to shield from the high temperature intake air a portion of the drive means that would otherwise be exposed by movement of said ramp member to such air.

5,116,002
STOPPING ZONES IN A LINEAR MOTOR IN-TRACK TRANSIT SYSTEM
Pierre Veraart, Kingston, Canada, assignor to UTDC, Inc., Canada
Filed Jul. 5, 1990, Ser. No. 548,248
Int. Cl.[5] B61L *3/04, 3/22, 13/06*
U.S. Cl. 246—187 R **20 Claims**

1. A stopping zone in a linear motor in-track transit system, said transit system including a guideway and at least one vehicle carrying a linear motor secondary moveable along said guideway, said stopping zone comprising:
primary braking means in the form of a first linear motor

primary disposed along said guideway, said first linear motor primary being operable to supply a reverse thrust to a vehicle entering said stopping zone, said reverse thrust being sufficient to stop a vehicle at a designated stopping point within said stopping zone, said first linear motor primary also being operable to restart a vehicle stopped thereby;



secondary braking means in the form of a mechanical brake disposed along said guideway downstream of said first linear motor primary, said mechanical brake being conditioned to engage frictionally a portion of said vehicle to stop said vehicle within said stopping zone upon failure of said first linear motor primary; and

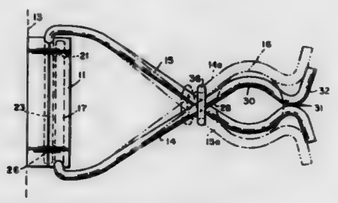
restart means disposed along said guideway adjacent said mechanical brake, said restart means being operable to restart a vehicle stopped by said mechanical brake.

5,116,003

HANGER FOR ARTICLES OF DIFFERENT SIZES AND SHAPES

Karsten H. Gerhardt, 3520 Sweetwater Way, Lemon Grove, Calif. 92045

Filed Nov. 26, 1990, Ser. No. 619,090
Int. Cl.[5] A47K *1/08*
U.S. Cl. 248—312 **6 Claims**



1. A hanger for articles comprising:

a base,

a pair of elongate article gripping members, and

means on said base pivotally supporting these members at one end of each for swinging movement about respective axes oppositely inclined relative to each other and to the horizontal,

each of said members having an article gripping portion between its opposite end and its pivotal supporting means, and said members crossing each other at a point intermediate their pivotal supporting means and their gripping portions,

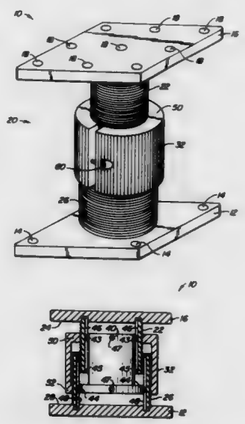
whereby swinging of said members about respective ones of said axes under the influence of gravity causes their gripping portions to converge toward each other and to grip an article positioned therebetween.

5,116,004

VERTICALLY ADJUSTABLE MOUNTING POST FOR OPTICAL ELEMENT

Francis S. Luecke, San Jose, Calif., assignor to New Focus, Inc., Mountain View, Calif.

Filed May 10, 1991, Ser. No. 698,429
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—161 **13 Claims**



1. An adjustable height support column comprising:

a first plate having a first threaded shaft projecting therefrom;

a second plate having a second threaded shaft projecting therefrom, wherein one of the first and second shafts is telescopically received in the other;

means within the first and second shafts for slidably and rotationally aligning said shafts; and

a coupling member having a first threaded end which engages the first threaded shaft and a second threaded end which engages the second threaded shaft, whereby rotation of the coupling member causes axial motion without rotational motion between the first and second plates.

5,116,005

COMPACTLY FOLDING TRIPOD SUPPORT SYSTEM FOR GUITARS

R. Gregory LaGoy, 223 Aulii Dr., Pukalani, Hi. 96768

Filed Nov. 30, 1990, Ser. No. 621,379
Int. Cl.[5] F16M *11/38*
U.S. Cl. 248—168 **2 Claims**

1. A compactly folding tripod support system for guitars and the like, comprising a central hub including a conically shaped upper portion becoming narrower toward the top of said central hub, whereby an appropriately modified guitar can removably engage said upper portion, and a cylindrical lower portion housing three pivot pins arrayed approximately one hundred twenty degrees apart from each other near the periphery of said lower portion, the axes of said pivot pins lying in a horizontal plane through said central hub and forming the sides of an equilateral triangle, three legs pivotally connected at their proximal ends to said central hub by said pivot pins and attached to each of said pivot pins such that the longitudinal axis of each of said legs is perpendicular to the axis of said pivot pin, whereby the legs can fold from the nearly horizontally extended position downward through about ninety degrees of arc to a vertical position below said central hub, each of said legs comprising an inner leg segment of enclosed section, the distal end of said inner leg segment housing a hinge pin pivotally joining said inner leg segment to the proximal portion of a hinge link of thin rectangular section, the distal portion of said

hinge link pivotally joining the proximal end of an outer leg segment of enclosed section by means of a hinge pin housed in said outer leg segment, said outer leg segment being of approximately the same length as said inner leg segment, said hinge pins being parallel to each other and perpendicular to the plane of said hinge link, said hinge link being oriented such that when



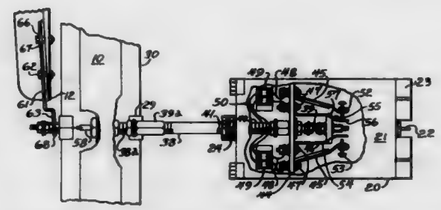
said inner and outer leg segments are fully extended, and therefore coaxial, nearly horizontal, and radial from said central hub, the plane of said hinge link includes the coaxial longitudinal axes of said inner and outer leg segments and is inclined sixty degrees from vertical, whereby, upon folding, all six outer and inner leg segments form a tight hexagonal array below said central hub.

5,116,006

SAFETY DETECTOR FOR RAILROAD SWITCH POINTS WITH REMOTE CONTACT MECHANISM

Salvador C. Ocampo, 4715 W. Wrightwood Ave., Chicago, Ill. 60639

Continuation of Ser. No. 405,659, Sep. 11, 1989, abandoned. This application Oct. 15, 1991, Ser. No. 776,725
Int. Cl.[5] B61L *5/10*
U.S. Cl. 246—220 **21 Claims**



18. A safety detector for a railroad switch point where rails consisting of a switchrail and a stockrail are intended to contact one another, said safety detector comprising:

detector mechanism adjustably secured to one of said rails at said point,

said detector mechanism having means directed toward said other rail to report whether there is substantial contact between said rails at said point,

a housing located remotely from said detector mechanism adjustably attached to said rail to which said detector mechanism is secured,

electrical contact means in said housing adapted to receive the report of said detector mechanism, and

a connecting assembly connecting said detector mechanism and said contact means,

said connecting assembly having a contact end adjacent said detector mechanism and an end remote therefrom in contact with said electrical contact means,

said electrical contact means comprising a plate through which said connecting assembly extends, electrical contact members secured on said plate, and

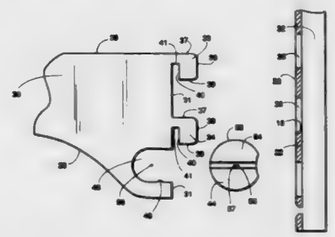
means on said remote end for actuating said electrical contact members when contacted by said connecting assembly.

5,116,007

ECCENTRIC DISC LOCK BRACKET

Lee L. Von Gunton, Buffalo Grove, and Glen C. Hook, Libertyville, both of Ill., assignors to E.Z. Shelf Company, Buffalo Grove, Ill.

Filed Sep. 13, 1990, Ser. No. 582,654
Int. Cl.[5] E04G *3/08*
U.S. Cl. 248—243 **23 Claims**

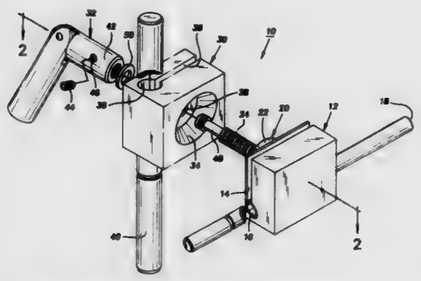


1. An eccentric disc lock bracket for releasable engagement with a support member having a plurality of vertically spaced slots comprising:

A. a cantilever bracket including an end portion having an axle receiving aperture and at least two seating hooks outwardly extending from a rear edge of said end portion vertically positioned one above the other and dimensioned to be receivable in and horizontally removable from a pair of vertically spaced slots of said support member;

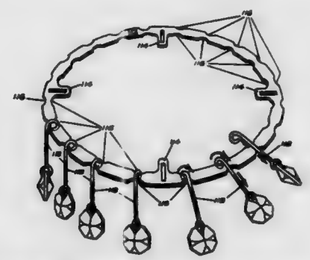
B. an eccentric disc lock having an annular axle which is force fitted over an interference retention nub on the outer periphery of said axle receiving aperture to thereby permanently retain said axle in said axle receiving aperture of said bracket end portion for all 360 degrees of rotational positions of said axle when so force fitted over said retention nub thus preventing removal or loss of said eccentric disc lock from said axle receiving aperture of said bracket end portion and causing said eccentric disc lock to be unitary with said cantilever bracket, said axle capable of being unidirectionally rotated either in a clockwise or counter-clockwise direction to achieve a lock position, and a pair of wheels axially aligned to each other having an essentially alike diameter greater than the diameter of said axle receiving aperture, said wheels being located on opposite ends of the axle spaced apart from each other a distance greater than the thickness of said cantilever bracket, at least one wheel having means for rotating the eccentric disc lock either in a clockwise or counter-clockwise direction to said lock position wherein a portion of the outer annular aligned periphery of each wheel extends outwardly beyond the rear edge of said end portion of said bracket to compressingly engage said support member and to an unlock position wherein another portion of the outer annular aligned periphery of each wheel does not extend outwardly beyond the rear edge of said end portion of said bracket when disposed perpendicular to said support member, said axle having a diameter eccentric to the diameter of said pair of wheels.

5,116,008
ADJUSTABLE SUPPORT ASSEMBLY
R. Dan Allen, Newbury, Ohio, assignor to Edgewater Medical Equipment Systems, Inc., Bedford Heights, Ohio
Filed Apr. 3, 1991, Ser. No. 679,622
Int. Cl.[5] F04G *3/00*
U.S. Cl. 248—286 **19 Claims**



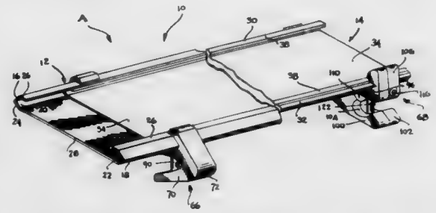
1. An adjustable support assembly, comprising:
a first block;
means for retaining a first support rod within said first block;
a second block;
means for retaining a second support rod within said second block;
means for securing the first support rod within said first block and the second support rod within said second block, said securing means being adjustable between a tightened position and a loosened position; and
means for rotationally binding said first block with said second block when said securing means is in said tightened or loosened position so that the relative rotation of said first and second blocks is prevented, the means for rotationally binding comprising a substantially smooth bearing member on one of said first block and said second block, and
a substantially smooth seat on the other of said blocks, the seat adapted to receive the bearing member when the first and second blocks are joined.

5,116,009
CHANDELIER ORNAMENT SHAFT AND FRAME STRUCTURE
Georg Bayer, Plattsburgh, N.Y., assignor to A. Schonbek & Co., Inc., Plattsburgh, N.Y.
Continuation-in-part of Ser. No. 539,802, Jun. 18, 1990. This application May 28, 1991, Ser. No. 705,920
Int. Cl.[5] A47H *1/16*
U.S. Cl. 248—303 **20 Claims**



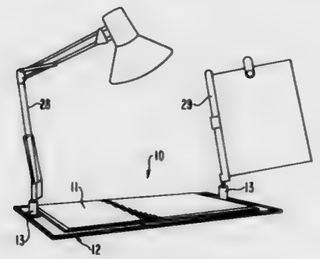
1. A chandelier having a frame for supporting ornaments having shafts attached thereto with increased security comprising:
a frame member having predetermined thickness and width between an inner edge and an outer edge, the width being greater than the thickness and the width having a horizontal hanging orientation; and
an ornament shaft secured to the frame member and terminating in a lop having segments for engaging the width defining edges of the frame member while in a substantially vertical hanging orientation and further having an opening defined by the shaft and a portion of the loop, constructed and arranged so that the loop may be engaged with and disengaged from the frame member only through the opening and only by first rotating the shaft substantially out of the substantially vertical hanging orientation and further constructed and arranged such that substantially vertical displacement is prevented.

5,116,010
VEHICULAR WEAPON SUPPORT
David A. McMasters, Los Angeles, and Donald Wetzel, Arcadia, both of Calif., assignors to Pro-Tech Design & Manufacturing, Inc., Inglewood, Calif.
Filed Jun. 18, 1990, Ser. No. 539,573
Int. Cl.[5] A47F *5/00*
U.S. Cl. 248—309.1 **10 Claims**



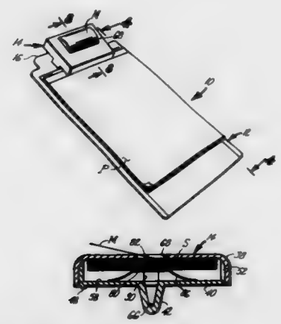
1. A vehicle support rack for holding an arm supported firearm having a stock and an elongated barrel in the passenger compartment of a vehicle, said support rack comprising:
a) a main frame for attachment to an interior portion of a passenger compartment of the vehicle,
b) a stock supporting assembly in proximity to an end of said main frame for releasably retaining a stock of the firearm,
c) a barrel supporting assembly in proximity to another end of said main frame for releasably retaining the barrel of the firearm,
d) locking means associated with said barrel supporting assembly or stock supporting assembly for locking said barrel or stock in said supporting assembly in such manner to prevent unauthorized removal therefrom,
e) restraining means associated with the other of the barrel supporting assembly or stock supporting assembly to preclude the firearm being removed from the barrel supporting assembly and the stock supporting assembly when the locking means is locked,
f) adjusting means associated with said main frame to enable said main frame to conform to a surface contour and to be adjustably sized to become attached to a surface of any of a large number of vehicles having differing sizes and surface contours to which the support rack would be attached, said adjusting means being comprised of:
1) a first plate having grooves in the edges of the first plate,
2) a second plate slidable in the grooves of the first plate so as to be telescopically arranged with respect to the first plate, said second plate also having grooves therein, and
3) a mounting bracket for securement to a vehicle and being shiftable in the grooves of said second plate, and
g) said barrel supporting assembly being comprised of:
(1) a housing having a recess therein to accommodate a gun or rifle barrel,
(2) said housing having a slot of reduced size relative to the recess and communicating with the recess to receive the barrel,
(3) a latching mechanism extending over said slot to close the same and preclude removal of the barrel, and
(4) said locking is means associated with the latching mechanism to permit opening and closing thereof.

5,116,011
ACCESSORY TRACK TO ACCOMMODATE MULTIPLE ACCESSORIES
Lawrence E. Smith, 1903 Cedar La., Melbourne Beach, Fla. 32951
Filed Nov. 21, 1990, Ser. No. 616,331
Int. Cl.[5] A47B *91/00*
U.S. Cl. 248—346 **10 Claims**



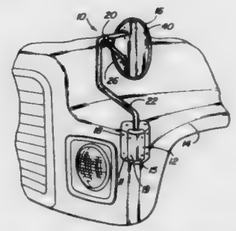
1. An apparatus for accommodating multiple accessories, comprising a generally planar top support plate having an accessory track disposed around a peripheral portion thereof, and at least one accessory holder sized and configured to be easily inserted directly into the accessory track at at least one position therealong without removal of any parts and thereafter moved along the accessory track to a desired location where the accessory holder is form-lockingly retained by the accessory track.

5,116,012
CLIP BOARD
Keith L. Offenhauer, Bradenton, Fla., and Harold M. Zimmermann, Jr., Philadelphia, Pa., assignors to Laser Works, Inc., Sarasota, Fla.
Filed Jan. 28, 1991, Ser. No. 647,428
Int. Cl.[5] A47B *97/00*
U.S. Cl. 248—452 **6 Claims**



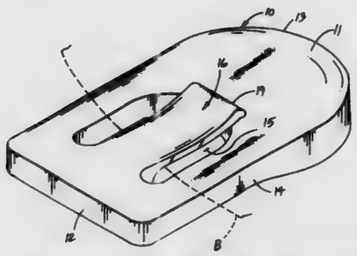
1. A clip board comprising:
a generally flat, relatively thin, generally rectangular board having an upper surface sized to supportively receive writing paper there atop;
a movable paper clamp pivotably connected and spaced above and near one end of said board about a pivotal axis positioned generally parallel to and adjacent said one base end;
said paper clamp having at least one downwardly extending centrally positioned retaining bracket on said paper clamp, said retaining bracket structured at its lower end for insertion into a longitudinal slot formed into said board and for pivotal retention within said slot by insertion of a removable pin transversely through said lower end, said pin sized in length to straddle and extend in either direction beyond said slot;
said paper clamp also having a paper engaging edge which contacts against said board upper surface when said paper clamp is pivoted about said pivotal axis into a first position;
a generally V-shaped spring positioned and compressively acting between a lower surface of said paper clamp and said board upper surface to pivotally urge said paper clamp into said first position;
said paper clamp pivotably movable about said pivotal axis from said first position by manually pressing an area of said paper clamp on the opposite side of said pivotal axis from said paper engaging edge;
a housing engagable over said paper clamp forming an interior sized to receive a stack of alternately adhered paper memo sheets;
said housing having an opening in its upper surface for dispensing one of the memo sheets at a time.

5,116,013
MIRROR MOUNTING MECHANISM
Kirk Malcolmson, Flat Rock, Mich., assignor to Mirror Lite Co., Rockwood, Mich.
Filed Apr. 2, 1991, Ser. No. 685,462
Int. Cl.[5] A47G *1/24*
U.S. Cl. 248—484 **4 Claims**



1. A mirror mounting mechanism comprising:
(a) a first and a second ball-and-socket assembly located within a mirror assembly, the mirror assembly having a top half and a bottom half and including a mirror, the first ball-and-socket assembly projecting through in the top half of the mirror assembly and the second ball-and-socket assembly projecting through in the bottom half of the mirror assembly;
(b) a retainer for continuously retaining the mirror assembly in its adjusted position, the retainer comprising;
(1) an adjustable positioning rod having a first end removably attached to the second ball-and-socket assembly and a second end;
(2) a tubular support rod connected to the positioning rod with a first end removably attached to the first ball-and-socket assembly and a second end removably insertable into means for mounting and being rotatably adjustable therein;
(3) a retaining clamp slidingly mounted on the tubular support rod, and removably attached to the positioning rod; and
(4) means for fastening the clamp to the positioning rod;
(c) means for mounting the retainer to a vehicle.

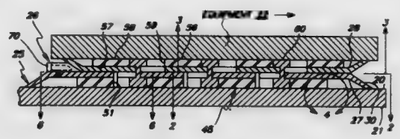
5,116,014
BEACH TOWEL ANCHOR
Samuel T. Slavens, and Carolina G. Slavens, both of 5115 E. 86th St. N., Owasso, Okla. 74055
Filed Jun. 13, 1991, Ser. No. 714,631
Int. Cl.[5] A47B *97/00*
U.S. Cl. 248—500 **2 Claims**



1. A beach towel anchor, comprising in combination,
a unitary positioning block, including a planar top surface, and
a planar rear edge surface orthogonally oriented relative to the top surface, an arcuate convex forward edge surface, and
spaced parallel planar side walls, and
a bottom surface, the bottom surface including planar rear bottom surface directed from the rear edge surface to position medially of the bottom surface, and
a convex arcuate forward bottom surface directed from the planar rear bottom surface to the arcuate forward surface, and
an anchor bore orthogonally directed through the planar top surface and through the planar rear bottom surface, wherein the anchor bore is spaced from the rear surface, and
a tongue clip, wherein the tongue clip is mounted within the anchor bore adjacent the rear surface and projects forwardly and longitudinally of the block member over the anchor bore and extending position over the top surface, with a forward tongue end portion positioned over the planar top surface, and
wherein the tongue clip includes a concave central portion positioned within the anchor bore, and a tongue contact line defining contiguous communication between a bottom surface of the tongue clip and the top surface, wherein the tongue clip is biased against the tongue contact line, and
including a bag pouch mounted rearwardly of the rear surface, the pouch including an entrance opening defined by an entrance edge,
wherein the entrance edge is in confronting relationship relative to the rear edge surface and spaced therefrom, and the entrance edge including an edge tongue, the edge tongue mounted to the planar top surface.

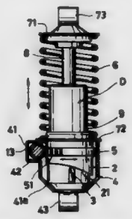
5,116,015
SECURITY MOUNTING
Mark M. Gasaway, 2201 Stern La., Oxnard, Calif. 93030
Continuation of Ser. No. 799,798, Nov. 20, 1985, abandoned. This application Mar. 25, 1988, Ser. No. 175,598
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—553 **2 Claims**

1. A security mounting to hold a protected article which is to be retained to a rigid substrate body from which substrate body the article can be legitimately be removed only by conforming to unlocking requirements of the mounting, said mounting comprising:
a first and a second plate; each plate having a substantial planar area adapted to lie in parallel relationship to one another; and to be held together in such a way that unless the mounting is locked one plate can move relative to the other in an in-plane sliding relationship, at least one of said plates having a plurality of spaced-apart aligned slots, each slot having an enlarged entry port, and a narrower neck extending from said entry port:
means for attaching one of said plates to said substrate body;
a plurality of clips each clip having a shank dimensioned to fit in a respective said neck, and at least one flange dimensioned to pass through a respective said entry port when the shank is centered in said entry port, but to overhang the edges of said neck to frustrate out-of-plane separation of said plates when plates are shifted so that the shank is in said neck, permitted separation being only as the consequence of inplane relative movement of said plates;
lock means attachable to one of said plates to prevent in-plane sliding movement in the direction of alignment of said slots when said flanges are aligned with respective



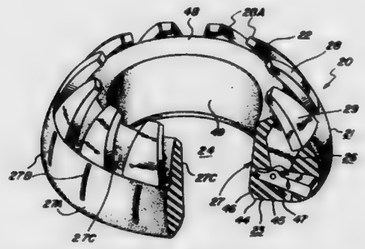
said necks, said lock means in attached, and to permit relative sliding movement to enable separation of the plates when removed;
both of said plates being made of metal of such ductility and thickness that a sufficient out-of-plane force on at least one of said plates when coupled by said clips is likely to bend at least one of said plates; said consequent bending of either or both of said plates causing at least one assembly of slot and clip to hold said plates against in-plane separation from one another; said protected article being thereby retained to each other as the consequence of said deformation;
said means for attaching comprising and adhesive pad which has a substantial thickness, in which said pad is ported to accommodate said flanges of said clips for unimpeded movement therein through the full range of movement of the clips in the slot while said clips move in said slots.

5,116,016
SUSPENSION DEVICE FOR AUTOMOTIVE SEAT
Kojiro Nagata, Akishima, Japan, assignor to Tachi-s Co., Ltd., Tokyo, Japan
Filed Jul. 29, 1991, Ser. No. 736,294
Claims priority, application Japan, Jul. 31, 1990, 2-81634[U]
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—578 **5 Claims**



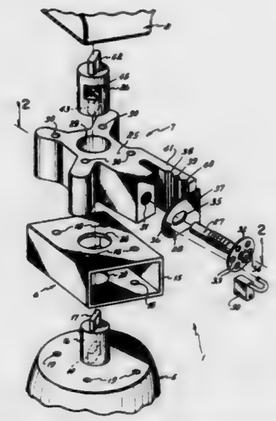
1. A suspension device for automotive seat, comprising:
an upper frame on which said seat is mounted;
a lower frame fixed on a side of floor of an automobile;
a hydraulic damper provided between said upper and lower frames, said hydraulic damper having a cylinder body and a piston rod projected movably form said cylinder body;
a compression coil spring which is wound around the piston rod side of said hydraulic damper, said spring being adjustable in elastic repercussion force;
an upper support means disposed upon an upper end of said compression coil spring;
a lower annular support means attached movably about said hydraulic damper such as to be vertically movable therealong, said lower support member being disposed at a lower end of said compression coil spring;
said upper and lower support means being adapted for supporting the respective upper and lower ends of said coil spring;
a stopper fixed on said cylinder body of said hydraulic damper;
a cam means which is attached about said cylinder of said hydraulic damper, such that said cam means is rotatable about said cylinder in contact with said stopper means so as to cause vertical displacement of said lower support means;
a worm wheel which is integrally provided on said cam means;
a worm gear meshed with said worm wheel; and
an operation knob connected integrally with said worm gear,
wherein rotational operation of said knob causes said cam means to be rotated about and displaced vertically along said cylinder body, thereby effecting said vertical movement of said lower support means along said hydraulic damper and thus allowing adjustment of said coil spring in repercussion force according to a weight of an occupant sitting on said seat.

5,116,017
ANNULAR SEALING ELEMENT WITH SELF-PIVOTING INSERTS FOR BLOWOUT PREVENTERS
Stanley W. Granger, 23800 Gold Nugget, Diamond Bar, Calif. 91765; Joseph O. Beard, 1625 N. Lincoln Ave., Fullerton, Calif. 92631, and Frode Sveen, 12697 Orgren Ave., Chino, Calif. 91710
Filed Oct. 18, 1990, Ser. No. 600,311
The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.
Int. Cl.[5] E21B *33/06*
U.S. Cl. 251—1.2 **10 Claims**



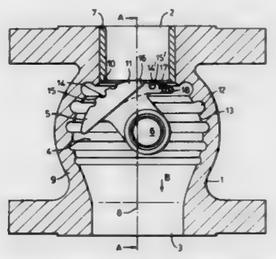
1. An improved sealing member for blowout preventers, said sealing member being a generally circularly symmetric composite structure including a resilient matrix having a plurality of circumferentially spaced apart segments, each of said segments comprising an upper section having a convexly curved upper surface, and a sector-shaped lower base plate, said upper section being pivotably joined to said base plate by pivot means, and said base plate having protruding from the lower surface thereof a convexly curved pivot bar element of finite cross-sectional area adapted to pivot on the top of a piston head, the pivotal axis of said pivot bar being transverse to a radius of said sealing member and located radially inwards of the outer circumferential surface of said base plate.

5,116,018
LOCKOUT MODULES
Dale J. Friesnoth, Loveland, Ohio; Steven A. Hacker, Erlanger, Ky., and Jeff M. Loeb, Cincinnati, Ohio, assignors to Automax, Inc., Cincinnati, Ohio
Filed Apr. 12, 1991, Ser. No. 684,656
Int. Cl.[5] F16K *31/44*
U.S. Cl. 251—90 **25 Claims**



1. A valve actuator and lockout system of the type including an actuator for operating a valve and a mounting kit for mounting said actuator to one of a plurality of different valves, the improvement comprising:
a lockout means structurally independent of said mounting kit but operably interconnected between said actuator and said mounting kit for selectively transferring valve operating force from said actuator to said valve and for locking said valve against operation.

5,116,019
CONTROL VALVE
Reimer Rohweder, and Jouni Pyötsiä, both of Helsinki, Finland, assignors to Neles-Jamesbury Oy, Helsinki, Finland
Filed Jul. 11, 1991, Ser. No. 728,377
Claims priority, application Finland, Jul. 16, 1990, 903583
Int. Cl.[5] F16K *47/04*
U.S. Cl. 251—127 **7 Claims**



1. A control valve comprising a body having a flow-through passage with an interior surface and a center line therethrough, an enlarged chamber with an interior surface and disposed along said flow-through passage, and a closing member, said closing member having an edged closing surface and said passage having a seal, wherein flow enters said body through a first end of said passage and passes through said chamber and

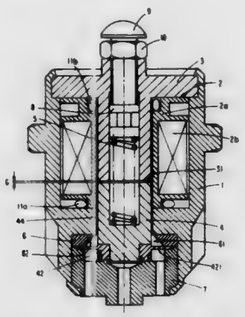
exits said body through a second end of said passage opposite said first end, said closing member being disposed in said chamber for rotation about an axis between a closed position where said closing surface of said closing member sealingly abuts said seal of said passage so that said flow through said passage is prevented, and an open position where flow through said passage is permitted, said axis of said closing member being disposed eccentrically and perpendicularly to said center line of said flow-through passage, whereby in said open position of said control valve a curved flow path is formed between said interior surface of said chamber and said closing member, said flow path including a primary flow path defined between said closing surface of said closing member and said interior surface of said chamber, wherein said closing member has an upstream edge and said upstream edge of said closing member, relative to the flow through said valve when said valve is in said open position, is provided with an edged extension extending therefrom which, when said valve is initially opened, reduces the cross-sectional area of said primary flow path.

5,116,020

DIAPHRAGMATIC ELECTROMAGNETIC VALVE WITH LEAKAGE PREVENTING CONVEX RING

Yu-Yin Peng; Jaw-Long Chen, and Tien-Ho Gau, all of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Feb. 13, 1991, Ser. No. 654,459
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.17 **3 Claims**



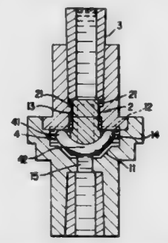
1. An electromagnetic diaphragm-type valve, applicable in an air-assisted fuel injection system, comprising:
- an external housing made of a material having high magnetic induction;
- an electromagnetic coil having a central hole, installed in said external housing;
- a magnetic stator made of a material having high magnetic induction, installed into said central hole in said electromagnetic coil set;
- a movable valve stem having a metallic end installed into a rear end of the housing so as to extend into the central hole of the electromagnetic coil set to connect with the magnetic stator with a gap formed between adjacent end surfaces of the magnetic stator and the valve stem;
- a valve seat disposed to support said valve stem; and
- at a lower end of the valve stem there is provided a circular flat rubber diaphragm with an outwardly extended substantially flat flange and a metal ring at a distal end of the rubber diaphragm,
- whereby an end surface of the rubber diaphragm contacts a surface of the valve seat by pressing against a convex ring formed on the valve seat for complete sealing, the height of said convex ring being in the range 0.05mm–0.20mm and, in closing of the valve, the metal ring makes contact at adjacent metallic surfaces of the valve seat.

5,116,021

QUICK-DISCONNECT VALVE

Valentine Faust, Bow, and Dean L. Kamen, Bedford, both of N.H., assignors to Deka Products Limited Partnership, Manchester, N.H.

Continuation-in-part of Ser. No. 674,813, Mar. 22, 1991, Ser. No. 673,835, Mar. 22, 1991, abandoned, Ser. No. 674,818, Mar. 22, 1991, and Ser. No. 673,834, Mar. 22, 1991, each is a continuation-in-part of Ser. No. 615,612, Nov. 19, 1990, and Ser. No. 614,886, Nov. 19, 1990, said Ser. No. 615,612, and Ser. No. 614,886, each is a continuation-in-part of Ser. No. 523,801, May 15, 1990, and Ser. No. 345,387, May 1, 1989, Pat. No. 4,976,162, which is a continuation-in-part of Ser. No. 92,481, Sep. 3, 1987, Pat. No. 4,826,482, which is a continuation-in-part of Ser. No. 22,167, Mar. 5, 1987, Pat. No. 4,808,161, and Ser. No. 836,023, Mar. 4, 1986, Pat. No. 4,778,451. This application Aug. 22, 1991, Ser. No. 748,341
Int. Cl.[5] F16L *37/28*
U.S. Cl. 251—149.1 **15 Claims**



1. A valve for permitting flow of a fluid therethrough when actuated by a nozzle, and otherwise preventing flow of fluid therethrough, the valve comprising:
- a fluid passageway bounded by a wall; and
- a relatively flat resilient seal member having an edge and a central portion, the seal member being disposed transversely to the fluid passageway such that the edge of the seal is normally disposed against the wall of the fluid passageway so as to prevent the flow of fluid past the seal member, and such that, when the central portion of the seal member is urged in a direction generally parallel to the fluid passageway, the seal member deforms such that the central portion is displaced and such that the edge of the seal member separates from the wall so that fluid may flow through the passageway by passing between the wall and the seal member.

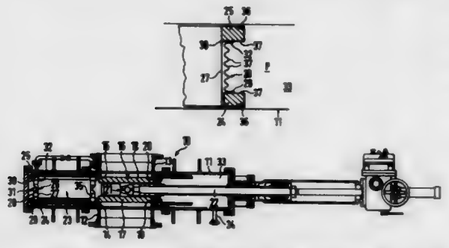
5,116,022

STOP VALVE FOR PIPE BRIDGE

Hans Genroith; Norbert Marx, both of Düren, and Günter Nägler, Eschweiler, all of Fed. Rep. of Germany, assignors to Zimmermann & Jansen GmbH, Düren, Fed. Rep. of Germany

Filed Apr. 3, 1991, Ser. No. 679,783
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1990, 4011274
Int. Cl.[5] F16K *3/18*
U.S. Cl. 251—175 **9 Claims**

1. A double disk wedge valve comprising:
- a valve housing;
- a valve disk disposed within said valve housing which is movable by an actuating rod and which is provided with a pipe bridge, said pipe bridge comprising two sealing rings connected by way of a compensator, said sealing rings being urged by elastic bias against two sealing seats disposed on said valve housing when said valve is in an open position, said compensator comprising a corrugated pipe section and having a circumferentially extending indentation, wherein said corrugated pipe section extends as an outer pipe section coaxially over an inner pipe section having an inner surface and an outer surface which forms an annular space, said inner pipe section being fixedly joined to only one of said two sealing rings, and



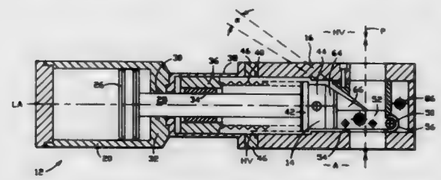
that within said valve housing a gas pressure can be set which is higher than pressure in the valve passageway when the valve is in said open position.

5,116,023

LOW VIBRATION HIGH VACUUM GATE VALVE

Jose L. Contin, Orinda, Calif., assignor to MDC Vacuum Products Corporation, Hayward, Calif.

Filed May 14, 1991, Ser. No. 701,439
Int. Cl.[5] F16K *25/00*
U.S. Cl. 251—203 **10 Claims**



1. A gate valve for a structure defining a longitudinal passageway and a generally transverse gate raceway relative to the longitudinal passageway, the raceway defining a pair of transverse gate races and a seating surface surrounding an opening in the longitudinal passageway, the seating surface generally facing the gate races and defining a predetermined acute angle with respect to the raceway, the gate races defining stops, the gate valve further comprising:
- seal means moveably disposed within the gate raceway, the seal means linearly displaced along the raceway and including a pair of guide wheel means for following the gate races and for providing first fulcrum means for rotating the seal means toward the seating surface when the stops are reached,
- the seal means defining a gate sealing surface for contacting and sealing off the seating surface of the raceway when the seal means is rotated,
- hinge means for hinging the seal means to a carriage means,
- valve actuator means for applying a rectilinear force to the carriage means to displace the carriage means along the raceway until the stops are reached and to cause the seal means to rotate at the first fulcrum means and seal against the seating surface in response to further rectilinear force after the stops have been reached.

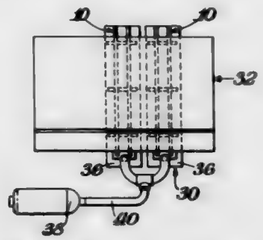
5,116,024

SPACER SYSTEM

Bruce F. Harvey, Newark, Del., assignor to Airsled Inc., Newark, Del.

Filed Mar. 22, 1991, Ser. No. 673,632
Int. Cl.[5] B66F *3/24*
U.S. Cl. 254—93 HP **8 Claims**

1. A spacer system of variable height comprising at least one longitudinal spacer member and a plurality of separate transverse spacer members, and a generally flat horizontally oriented inflatable air beam with the spacer system resting upon the air beam, each of the longitudinal and transverse spacer members having plural groupings of adjacent slots and each grouping including slots of varying depth, each of the slots in the longitudinal spacer member having an open end with all of the open ends facing on one direction and each of the slots in the transverse spacer members having an open end with all of the open ends facing in an opposite direction, the slots in the



longitudinal and transverse spacer members being constructed and arranged to interlockingly and releasably engage one another whereby upon assembly of the longitudinal spacer member with the transverse spacer members through interlocking and releasable engagement between the open ended slots variable height of the spacer system is obtained depending upon which slot of each grouping in the longitudinal spacer member interlockingly and releasably engages a given slot of each grouping in the transverse spacer members.

5,116,025

CANTILEVERED, RETRACTABLE HANDRAIL

Sam Kiniry, 6718 S. 1300 East, Salt Lake City, Utah 84121

Filed Aug. 13, 1990, Ser. No. 566,247
Int. Cl.[5] E04H *17/14*
U.S. Cl. 256—67 **8 Claims**



1. A retractable handrail for use with a recreational vehicle comprising:
- (1.1) a handrail having a hand contacting surface on a top side thereof and a support body extending downward from the hand contacting surface and integral therewith, said support body including a pivotal end and means for pivotal attachment thereat which defines a rotational axis which is orthogonal with a plane of rotation for the handrail;
- (1.2) said handrail further including first and second stop means formed at the pivotal end for defining respective retracted and extended positions of the handrail as it is rotated about the pivotal axis, said first and second stop means each being located on separate radii of approximately equal length having a common origin located at the rotational axis;
- (1.3) a support base having a mounting flange with a planar surface positioned parallel with the plane of rotation of the handrail, said means for pivotal attachment being operable

to rotatably couple the pivotal end of the handrail to the mounting flange of the support base;

(1.4) releasable interlock means coupled to the support base and being operable to selectively engage either the first or second stop means, causing said handrail to be placed in either of said extended or retracted positions; and

(1.5) mounting means attachable to the support base for coupling the support base to an exterior face of a door frame of a recreational vehicle such that (i) placement of the handrail in the retracted position places the handrail flat against the exterior face and (ii) placement in the extended position inclines the handrail for use of a person ascending stairs to the recreational vehicle.

5,116,026

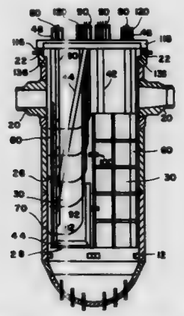
MODULAR ANNEALING APPARATUS FOR IN SITU REACTOR VESSEL ANNEALING AND RELATED METHOD OF ASSEMBLY

Frank I. Bauer, Perry, and Robert S. Mavretish, New Stanton, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1989, Ser. No. 368,454

Int. Cl.[5] C21B *13/00*

U.S. Cl. 266—44 **14 Claims**



10. A method for annealing a nuclear reactor vessel in a containment building, said reactor vessel normally including a core and internals, comprising the steps of:

(a) pre-fabricating a plurality of heater segments at a location outside the containment building;

(b) transporting the plurality of heater segments to the containment building;

(c) removing the core and internals and storing same;

(d) installing temporary shielding for the stored internals;

(e) introducing each of the plurality of heater segments through an equipment hatch in the containment building;

(f) assembling the plurality of heater segments to form an annealing apparatus; and

(g) annealing the reactor vessel.

5,116,027

APPARATUS FOR CONTROLLING TEEMING STREAMS

Roy Widdowson, Marske, Redcar, and Alan Scholes, Nunthorpe, both of Ohio, assignors to British Steel plc, England

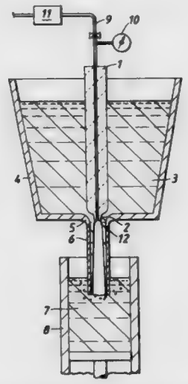
Filed May 3, 1990, Ser. No. 518,160

Claims priority, application United Kingdom, May 3, 1989, 8910136

Int. Cl.[5] C21C *5/42*

U.S. Cl. 266—225 **14 Claims**

1. Apparatus for constraining the flow of molten metal from an upper to a lower receptacle along the inner periphery of a tubular member mounted between the receptacles, comprising a vertically movable stopper rod sited in the upper receptacle and seating at its lower end in a nozzle at the entrance to the tubular member, the said end being so designed as to cause an annular discharge of metal into the tubular member upon the stopper rod lifting from its seating, and means for injecting gas through the stopper whereby the generate a gaseous void



within the interior of the tubular member to promote the maintenance of the annular flow path of said metal along the length of the inner periphery of said member.

5,116,028

PRESSURE TUBE-PISTON DEVICE

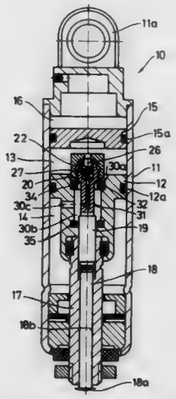
Rolf Mintgen, Thür; Winfried Wirges, Koblenz, both of Fed. Rep. of Germany, and Udo Wagner, Dachsenhausen, Netherlands, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Sep. 24, 1990, Ser. No. 587,024

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1989, 3933360

Int. Cl.[5] F16F *5/00*

U.S. Cl. 267—64.12 **21 Claims**



1. A pressure tube-piston device **(10)** comprising a pressure tube **(11)** having an axis and two ends and defining a cavity **(13,14,16)** therein, a piston rod unit **(17)** axially extending through at least one of said two ends and being axially movable with respect to said pressure tube **(11)**, a piston unit **(12)** connected with said piston rod unit **(17)** within said cavity **(13,14,16)**, said piston unit **(12)** separating two working spaces **(13,14)** within said cavity **(13,14,16)** from each other, said working spaces **(13,14)** containing a fluid, said piston rod unit **(17)** and said piston unit **(12)** being combined as a piston-piston

rod assembly **(12,17)**, a flow passage **(30*a*, 30*b*, 30*c*)** extending within said piston-piston rod assembly **(12,17)** between said two working spaces **(13,14)**, valve means **(20)** being allocated to said flow passage **(30*a*, 30*b*, 30*c*)** for selectively opening and closing said flow passage **(30*a*, 30*b*, 30*c*)**, said valve means **(20)** comprising a valve body unit **(31)** and valve body engagement means **(32)**, said valve body unit **(31)** being movable with respect to said piston-piston rod assembly **(12,17)** between a sealing engagement position relative to said valve body engagement means **(32)** in which said flow passage **(30*a*, 30*b*, 30*c*)** is closed, and an opening position relative to said valve body engagement means **(32)** in which said flow passage **(30*a*, 30*b*, 30*c*)** is open, the positioning of said valve body unit **(31)** being controllable through an axial bore **(18*a*)** of said piston rod unit **(17)**, excess pressure flow means **(28,23,24,24*a*,26,36)** extending through said valve body unit **(31)** across said valve body engagement means **(32)** to provide a flow passage between said two working spaces **(13,14)**, said excess pressure flow means **(28,23,24,24*a*,26,36)** comprising excess pressure valve means **(26, 36)** for providing a connection between said working spaces **(13,14)** through said excess pressure flow means **(28,23,24,24*a*,26,36)** in response to a predetermined pressure difference between said working spaces **(13,14)**,

an excess pressure flow chamber **(23)** being provided within said valve body unity **(31)**, said excess pressure flow chamber **(23)** containing at least one excess pressure valve member **(26)** cooperating with a respective excess pressure valve seat **(36)** within said excess pressure flow chamber **(23)**, said excess pressure valve member **(26)** being biased towards the respective excess pressure valve seat **(36)** by excess pressure valve biasing means **(27)**,

said excess pressure flow chamber **(23)** being at least partially located within a basic valve body **(22)** of said valve body unit **(31)** and being at least partially closed by a cap member **(25)** positionable with respect to said basic valve body **(22)**, and

at least one excess pressure valve seat **(36)** being provided by said cap member **(25)**.

5,116,029

HYDRAULIC ANTIVIBRATORY DEVICES

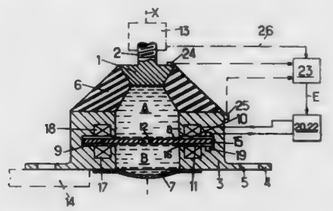
André Gennesseaux, Chalette/Loing, France, assignor to Hutchinson, France

Filed Jan. 30, 1991, Ser. No. 648,526

Claims priority, application France, Jan. 30, 1990, 90 01075; Sep. 19, 1990, 90 11559

Int. Cl.[5] F16M *1/00*

U.S. Cl. 367—140.1 AE **19 Claims**



1. A hydraulic antivibratory device for insertion between and connection to two rigid elements, comprising:

a pair of rigid frames firmly connectable, respectively, one to each of the two rigid elements;

an elastomer spacer structure connecting the two frames together and forming partially therewith two sealed chambers, a restricted passage placing the two sealed chambers into permanent communication with each other;

a liquid mass filling the two chambers and the restricted passage;

at least one rigid movable member having a surface partially defining at least one of the two chambers, said movable member being mounted for limited oscillating movement along an axis generally perpendicular to said surface, guide means for guiding said movable member for movement substantially only in directions parallel to said axis;

at least one electrically energized force applying means for applying to said movable member a force in at least one of two opposite directions parallel to said axis;

sealing means for sealing that portion of said movable member adjacent to the force applying means;

a control system for making the supply of electric power to the electrically energized force applying means dependent on movements of said movable member, such that energization of the electrically energized force applying means is capable of reducing, which includes canceling out, movements of the movable member;

said control system comprising a sensor for detecting said movements in the vicinity of the movable member.

5,116,030

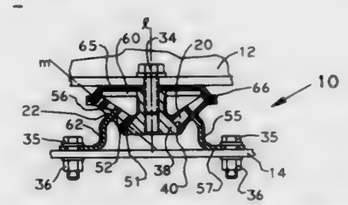
VIBRATION ISOLATOR

Theodore J. Nowak, and Gary P. Tillman, both of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Continuation of Ser. No. 71,697, Jul. 9, 1987, abandoned. This application Mar. 30, 1989, Ser. No. 332,368

Int. Cl.[5] F16F *7/00*

U.S. Cl. 267—140.4 **3 Claims**



1. A fully bonded vibration isolator for attaching a support member to a supporting member having an axial axis generally perpendicular to said support and supporting members comprising:

a rigid inner member adapted for attachment to said supported member and concentric about said axis and having a first surface inclined at an angle from about 30° to about 45° to said axial axis facing the supported member;

a rigid annular intermediate member adapted for attachment to a supporting member wherein said intermediate member is concentric about said axial axis, and radially outwardly spaced from said inner member, and having a conical section inclined at an angle from about 30° to about 45° to said axial axis towards said supported member;

an annular first elastomeric section located in said space between said first surface of the inner member and said conical section of said intermediate member, said first elastomeric section is fully bonded to said first surface and said conical section;

a concentric rigid plate, said plate having a radially outward surface section outwardly spaced from said intermediate member and inclined at an angle from about 30° to about 45° to said axial axis towards said supported member; and

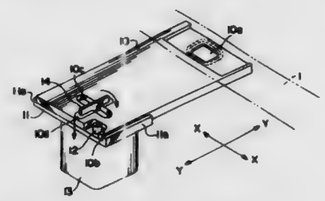
a second annular elastomeric section located in said space between the surface section of the plate and said conical section of said intermediate member, said second elastomeric section is fully bonded between said surface section and said conical section.

5,116,031

CLAMPING DEVICE FOR BONDING MACHINES

Takashi Takeuchi, and Takeyuki Nakagawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Jun. 7, 1991, Ser. No. 711,924
Claims priority, application Japan, Jun. 8, 1990, 2-150697
Int. Cl.[5] B25B *1/00*
U.S. Cl. 269—87.3 **3 Claims**



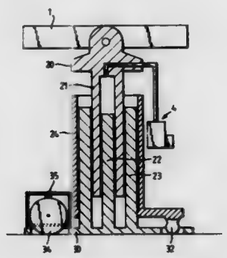
1. A clamping device for bonding a lead frame characterized in that said device comprises:
- a clamp receiver which is driven upwardly and downwardly;
- a rotatable lock key provided movably in a vertical direction on said clamp receiver, said lock key being rotatable between a lock and an unlock positions;
- a lock key pressure loading means which urges said lock key downwardly when said lock key is rotated to said lock position; and
- a clamp which has a bonding window and an opening through which said lock key is passed when said lock key is in said unlock position and an indentation for engagement with said lock key when said lock key is in said lock position so that said clamp mounted on said clamp receiver is positionally secured by said lock key being rotated to said lock position.

5,116,032

ROLLINGTABLE WITH HEIGHT ADJUSTMENT AND BRAKE DEVICE

Julie Strachan, Brighton, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Mar. 29, 1991, Ser. No. 677,568
Claims priority, application United Kingdom, Apr. 4, 1990, 9007606
Int. Cl.[5] A61G *13/00*; B66F *3/24*
U.S. Cl. 5—614 **8 Claims**



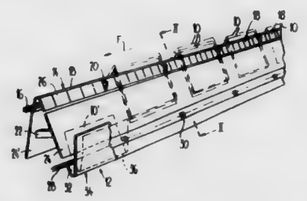
1. A patient support table comprising: a patient support platform; a base that is movable over a floor; an adjustable column that supports the platform on the base; and an hydraulic cylinder for adjusting the column to vary the height of the platform relative to the floor, said hydraulic cylinder being so mounted on said base that when hydraulic fluid is supplied to the cylinder to increase the height of the platform, the cylinder initially lowers the base to automatically brake movement of the base over the floor before the height of the platform is increased.

5,116,033

APPARATUS FOR COLLECTING, ASSSEMBLING AND INSERTING PRINTERY PRODUCTS

Werner Honegger, Tann Ruti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jun. 13, 1989, Ser. No. 365,478
Claims priority, application Switzerland, Jun. 14, 1988, 02284/88
Int. Cl.[5] B65H *5/30*
U.S. Cl. 270—55 **12 Claims**



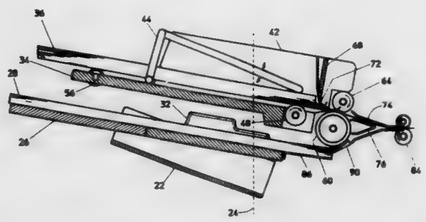
1. An apparatus for collecting, assembling and inserting printery products comprising:
- at least one support, extending in the direction of a processing path, for collecting printery products, which support is operative to support printery products deposited astride the support at two or more feed locations arranged at a distance from one another;
- transporting means for transporting the printery products deposited astride the support along the processing path from the feed locations to a withdrawal location, wherein the transporting means acts on the region of the fold of the printery product deposited astride;
- at least one pocket-shaped receiving part, which extends in the direction of the processing path, which is closed off at a bottom portion, and into which printery products can be fed at the feed locations for assembling or inserting; and
- conveying means separate from the transporting means for transporting the printery products fed into the at least one receiving part along the processing path, wherein the conveying means acts on the region of the fold of the preintery product fed into the receiving part.

5,116,034

ENVELOPE/SHEET FEED MECHANISM

Jeffrey L. Trask; George B. Clifton, and Kenneth E. Heath, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 14, 1990, Ser. No. 627,787
Int. Cl.[5] B65H *3/44*
U.S. Cl. 271—2 **17 Claims**



1. A mechanism for receiving envelopes and sheets through input window means, said mechanism comprising:

first tray means for holding a stack of sheets, said tray means mountable in said window means;

second tray means for holding a stack of envelopes, said second tray means mountable in said window means; roller means including a counter rotatable, fixed axis first feed roller positioned to selectively engage a topmost sheet on said stack in said first tray, or a bottommost envelope of said stack in said second tray, and to feed either said topmost sheet or said bottommost envelope, as the case may be; and

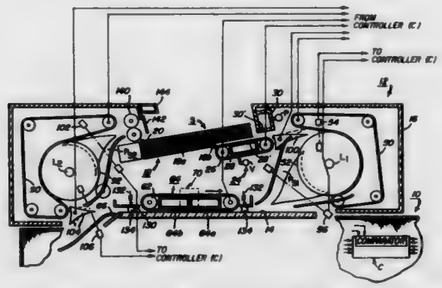
a second feed roller positioned in said second tray means for moving said bottommost envelope into engagement with said first feed roller.

5,116,035

RECIRCULATING DOCUMENT FEEDER WITH SEQUENTIAL CONTROL OF THE DOCUMENT SHEET TRANSPORT MECHANISMS AND METHOD

Matthew J. Russel, Mendon, and Gary P. Lawniczak, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 23, 1990, Ser. No. 617,247
Int. Cl.[5] B65H *7/14*
U.S. Cl. 271—3.1 **16 Claims**



1. An improved circulating document feeder for presenting sheets from a document sheet stack individually to a station of a reproduction apparatus for reproducing information contained on such sheets, said improved recirculating document feeder comprising:
- means for supporting a document sheet stack;
- means, defining a feed path extending away from and then back to said document stack supporting means, for directing sheets from a document sheet stack on said document stack supporting means into association with said reproduction apparatus station and then back to such stack;
- means, operatively associated with said document stack supporting means and said path defining means, for selectively feeding respective document sheets from the stack seriatim about said feed path, said feeding means including a plurality of document sheet transport mechanisms located in substantially sequential order about said feed path;
- an array of sensors, individual sensors of said array respectively positioned at predetermined locations about said feed path and associated with said plurality of document sheet transport mechanisms respectively for detecting a document sheet at said predetermined locations at said document sheet is fed by said feeding means, said individual sensors respectively producing signals when detecting a document sheet; and
- control means responsive to each of said signals from said array of sensors for sequentially commencing operation of a subsequent portion of said feeding means based on a signal form the sensor at a preceding detected document sheet location.

5,116,036

DEVICE FOR FACILITATING STACKING OF SHEETS IN A HOPPER

Robert D. LeRoy, Rochester, and Raymond M. Quackenbush, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 11, 1991, Ser. No. 667,117
Int. Cl.[5] B65H *5/22*
U.S. Cl. 271—3.1 **8 Claims**



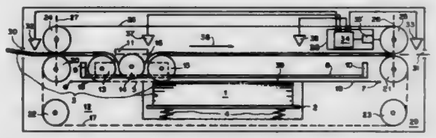
1. In a sheet transporting apparatus having a hopper for supporting a stack of sheets, means for directing sheets seriatim onto a stack of sheets in said hopper, means for feeding sheets seriatim from said stack of sheets in said hopper, and means for facilitating stacking of sheets in said hopper, said facilitating means comprising:
- at least one elongated member including an arm and a weighted portion extending from one end thereof, and means for supporting said elongated member at the end of said arm opposite said weighted portion for substantially free pivotable movement in a vertical plane under the influence of gravity, said support means being located to particularly position said elongated member whereby a sheet directed onto said stack in said hopper will strike said weighted portion of said elongated member to absorb kinetic energy of the directed sheet to stop such sheet movement and pivot said elongated member in a first direction about said support away from such sheet and, when said elongated member pivots in the direction opposite the first direction under the influence of gravity, said weighted portion of said elongated member strikes said sheet to urge said sheet into operative engagement with said feeding means.

5,116,037

APPARATUS FOR RECEIVING AND ISSUING SHEETS

André Gerlier, Sciez, France, and Yves Berthet, Onex, Switzerland, assignors to Landis & Gyr Betriebs AG, Zug, Switzerland

Filed Jul. 18, 1991, Ser. No. 732,079
Claims priority, application Switzerland, Apr. 8, 1991, 01031/91
Int. Cl.[5] B65H *3/12, 29/16*
U.S. Cl. 271—3.1 **12 Claims**



1. Apparatus for receiving and issuing sheets, comprising:
- a rail;
- a carriage mounted for movement along a path on said rail;
- first and second outer guide rollers mounted on said carriage;
- a central guide roller mounted on said carriage between said first and second outer guide rollers;
- a first belt extending between said first and central guide

rollers, part-way around and below said central guide roller, and between said second and central guide rollers;

a second belt having first and second portions, said first portion of said second belt extending part-way around said first guide roller and defining with the first belt a first transportation path for sheets, and said second portion of said second belt extending part-way around said second guide roller and defining with the first belt a second transportation path for sheets;

support means for supporting a stack of sheets below said path of movement of said carriage; and

drive means for causing the carriage to move along said path of movement;

wherein the improvement comprises:

first and second suction devices and control valves associated with said first and second outer guide rollers, respectively, each control valve being operable to cause the respective suction device to suck a top sheet of said stack towards the respective portion of said second belt; and

control means operably connected to said drive means, control valves and detecting means and operable in an issuing cycle to recognize a position of said carriage along said rail which is suitable for one of said suction devices to suck the top sheet of the stack, to operate the respective control valve to cause that suction device to suck said top sheet, and to cause said drive means to move said carriage such that said top sheet is rolled from said stack in a slip-free manner around the respective outer guide roller and is carried along the respective transportation path.

5,116,038

PAPER FEEDING APPARATUS

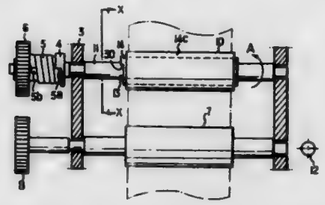
Hyoung-Chae Kim, Ahnyang, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Kyung, Rep. of Korea

Filed Jul. 30, 1990, Ser. No. 559,055

Claims priority, application Rep. of Korea, Nov. 25, 1989, 17201/1989

Int. Cl.[5] B65H *3/06*

U.S. Cl. 271—10 **10 Claims**



1. A paper feeding apparatus comprising paper feeding roller means for feeding paper and transfer roller means for receiving said paper from said paper feeding roller means, said paper feeding roller means comprising:

an axle;

a gear mounted on said axle;

a bushing mounted on said axle;

a clutch spring mounted between said gear and said bushing and on said axle;

a pin mounted on said axle;

a sleeve mounted on said axle, wherein said sleeve has a first end mounted towards said bushing and said first end includes a pair of catching notches for contacting said pin, and wherein said sleeve has a second end spaced apart from said first end and said second end includes a detent for contacting a groove in said axle; and

frictional rubber means circumferentially mounted on said sleeve.

5,116,039

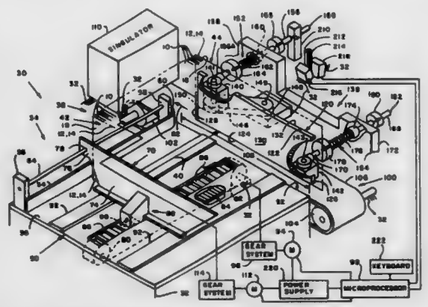
APPARATUS FOR FEEDING SHEETS FROM A STACK THEREOF

Henry P. Braea, Wilton; William J. Wright, Killingworth, and Eric A. Belec, Southbury, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 5, 1990, Ser. No. 577,725

Int. Cl.[5] B65H *3/04*

U.S. Cl. 271—34 **17 Claims**



1. Apparatus for feeding sheets comprising:

a. means for supporting a stack of upright sheets respectively on an edge thereof, the stack having a downstream end, the stack supporting means including an upright wall at the downstream end of the stack;

b. means for feeding the stack in a path of travel;

c. means for feeding successive sheets on their respective edges from said stack in a direction defined by said wall and extending transverse to said path of travel, said wall, having an upstream end and a downstream end relative to said transverse direction, said sheet feeding means including an endless belt having a belt run disposed for engagement of the respective edges of said sheets, said belt run feeding said respective sheets in sliding engagement with said wall;

d. means for exerting a force in a direction opposite to said path of travel against each sheet as it is successively fed from said stack, and said force exerting means including means for independently resiliently urging the upstream and downstream ends of said wall into engagement with said each successive sheet.

5,116,040

SHEET-FEEDER

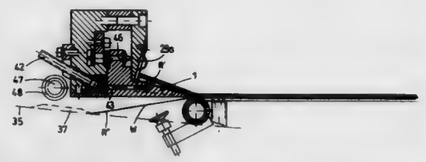
Hartmut K. Sauer, Himmelstadt, Fed. Rep. of Germany, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Filed Mar. 14, 1991, Ser. No. 669,050

Claims priority, application Switzerland, Apr. 6, 1990, 1180/90

Int. Cl.[5] B65H *3/12*

U.S. Cl. 271—101 **19 Claims**



1. Sheet-feeder, comprising a magazine (**24**) for receiving a sheet stack (S), an apparatus for individualizing the sheets with movable separating elements (**1**), which have a suction surface (**5**) with suction openings (**9**), able to be connected to a suction-air source, for contacting the sheet to be individualized and separating the same from the remaining stack, and comprising a sheet conveyor for transporting away the individual sheets, characterized in that the magazine (**24**) is set out for receiving sheets lying substantially vertically one on top of the other and has a base (**26**), which extends only over a part of the magazine underside and leaves free an edge strip (R) of the stack, in that a plurality of separating elements (**1**), provided with a curved suction surface (**5**), are fastened to an endless belt (**18**), able to move past in front of the free edge strip, at a distance from one another which is greater than the length of the edge strip (R), in that the front edge (**4**), in the direction of movement, of the suction surface (**5**) is oriented parallel to the plane of the edge strip and the suction surface is curved away from this plane in the direction of its rear edge (7) in such a way that its angle of inclination with respect to this plane increases constantly, so that the edge strip (R') of the lowermost sheet is increasingly bent away downward from the remaining stack as it is sucked against this curved suction surface, in that at least two spacers (**11**) are fastened to the endless belt (**18**) downstream of each separating element (**1**), in the direction of movement, the distance of which spacers from one another and from the respectively neighboring separating element (**1**) is less than half the length of the edge strip and which spacers run through between the bent-away edge strip (R') of the lowermost sheet and the remaining stack, supporting the latter, and in that, after complete separation of an edge strip (R') in a position of the endless belt (**18**) in which there are only spacers (**11**) underneath the sheet stack (S), the individualized sheet (W) assumes its transfer position and is taken over by the sheet conveyor.

5,116,041

SHEET FEEDER HAVING AN AUXILIARY PIPE FOR NON-STOP OPERATION

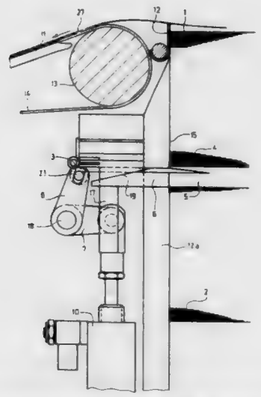
Gerhard Pollich, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Dec. 20, 1990, Ser. No. 633,100

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1989, 3941993

Int. Cl.[5] B65H *1/30*

U.S. Cl. 271—158 **8 Claims**



1. Sheet feeder having an auxiliary pile supporting device for non-stop operation including an auxiliary pile support of given thickness removable from one location at which an auxiliary pile of sheets is supported thereon above a liftable main sheet pile to another location at which no auxiliary pile sheets are supported thereon, and the sheet feeder also having stops disposed in a sheet feeding path of the auxiliary sheet pile and engageable by a leading region of the auxiliary sheet pile as viewed in sheet feeding direction, the sheet feeder further comprising holding means disposed substantially in a plane extending over the width of the sheets and movable under the leading region of the auxiliary pile, when the auxiliary pile support has been removed from the one location, for permitting leading edges of the sheets in the auxiliary pile to be lowered a distance equal to less than the thickness of the removed auxiliary pile so that the auxiliary pile joins the main pile, and displacing means comprising a pneumatic or hydraulic drive cylinder connected to said holding means for moving said holding means under the leading region of the auxiliary pile.

5,116,042

DOCUMENT EJECTION APPARATUS WITH REDUCED DOCUMENT EJECTION SPEED

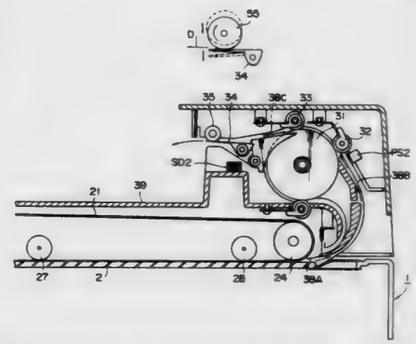
Izumi Hamanaka, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Nov. 6, 1990, Ser. No. 609,919

Claims priority, application Japan, Nov. 10, 1989, 1-293266

Int. Cl.[5] B65H *43/00*

U.S. Cl. 271—176 **8 Claims**



1. A document ejection apparatus for ejecting a sheet to a tray in a sheet conveyance apparatus, comprising:

a) means for conveying a sheet at a conveying speed;

b) means for reducing the speed of said conveyed sheet and for ejecting said conveyed sheet at a reduced speed to said tray, comprising:

1) means for detecting the passage of said conveyed sheet and for outputting a signal responsive to said detected passage of said conveyed sheet,

2) roller means for rotating at a circumferential speed lower than said conveying speed of said conveying means and disposed between said conveying means and said tray,

3) plate means for pressing said conveyed sheet onto said roller means,

said roller means and said plate means being movable relative to each other between a first position at which said plate means is located spaced from said roller means and a second position at which said plate means is in pressure contact with said roller means, said plate means being in said pressure contact with said roller means at a portion of said plate means which is other than a front edge of said plate means,

4) means for moving at least one of said roller means and said plate means from said first position to said second position in response to said signal from said detecting means so as to press said conveyed sheet between said roller means and said plate means to reduce the ejecting speed of said conveyed sheet to a speed lower than said conveying speed, and

5) a timer for delaying said output signal outputted by said detecting means; and

wherein said detecting means detects the passage of said conveyed sheet which is being conveyed by said convey-

ing means, and wherein said timer delays said signal outputted by said detecting means so that a trailing edge portion of said conveyed sheet which has passed over said conveying means is pressed between said roller means and said plate means.

5,116,043

METHOD OF AND APPARATUS FOR WINDING SQUARE FOLDED SHEET-LIKE PRODUCTS ON A ROTARY CORE

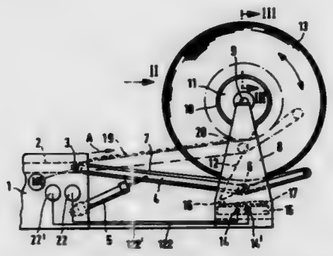
Daniel Jermann, Somerset, N.J., and Bruno Müller, Wikon, Switzerland, assignors to Grapha-Holding AG, Hergiswil, Switzerland

Filed May 23, 1991, Ser. No. 704,372

Claims priority, application Switzerland, Feb. 13, 1991, 446/91

Int. Cl.[5] B65H *31/28*

U.S. Cl. 271—213 **20 Claims**



1. A method of storing successive products of a series of flexible sheet-like products, having substantially parallel first and second marginal portions the first of which is thicker than the second thereof, on a core—which is rotated about a predetermined axis—with assistance from at least one flexible band having an end which is affixed to the core so that the band is wound onto the rotating core, comprising the steps of conveying successive products of the series toward and against the rotating core so that the marginal portions are substantially normal to the axis and successive products are confined between the core and the band and are wound onto the core to form a roll of neighboring convolutions alternating with convolutions of the band and wherein the roll has a central symmetry plane which is normal to the axis and first and second end faces formed by the first and second marginal portions, respectively; and maintaining the convolutions of the at least one band between the symmetry plane and the first end face of the roll.

5,116,044

AEROBIC CLIMBING STEP/BENCH

William T. Wilkinson, Chesapeake, Md.; Peter W. Bressler, Philadelphia, Pa.; David R. Schiff, Philadelphia, Pa.; Eric A. Schneider, Philadelphia, Pa., and Pietr Liacov, Philadelphia, Pa., assignors to William T. Wilkinson, Chesapeake City, Md.

Continuation of Ser. No. 588,449, Sep. 26, 1990, abandoned. This application Jul. 24, 1991, Ser. No. 735,185

Int. Cl.[5] A63B *5/00*

U.S. Cl. 482—52 **21 Claims**

8. An exercise device for use in aerobic step climbing routines/programs comprising a base, said base consisting of a horizontal platform having opposite ends and intermediate sides with a downwardly extending apron extending from said platform, a plurality of spaced legs mounted to said base to support said base at spaced locations, each of said legs being detachably mounted so as to be movable from an active position to a stored condition, said apron having a leg receiving pocket for each of said legs, each of said legs being shaped to be reversably received in its respective one of said pockets, each of said legs terminating in an outer support surface at each end thereof, a first stop means located inwardly of one of said outer surfaces of each of said legs, a second stop means located inwardly of the other of said outer surfaces of each of said legs, each of said stop means being located off-center with respect to



the longitudinal center of said leg, each of said stop means being located a different distance from its respective outer surface than the other of said stop means, and each of said stop means controlling the degree of insertion of each of said legs into its respective pocket.

5,116,045

SPORTS MAT, NOTABLY A MOVABLE JUDO MAT

Frantisek Jaboda, Am Schreiberg 7, A-5201 Seekirchen, Austria

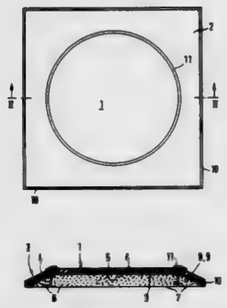
PCT No. PCT/EP89/00402, § 371 Date Apr. 17, 1990, § 102(e) Date Apr. 17, 1990, PCT Pub. No. WO90/03202, PCT Pub. Date Apr. 5, 1990

PCT Filed Apr. 14, 1989, Ser. No. 473,999

Claims priority, application Austria, Sep. 23, 1988, 2355/88

Int. Cl.[5] A63B *6/00, 71/04*

U.S. Cl. 472—92 **11 Claims**



1. A sports mat comprising:
a generally circular rigid platform with a top side and a bottom side;
an elastic foam-like material which is placed on said top side of said platform;
a generally centrally-disposed, downwardly-depending projection which is located on said bottom side of said platform and which serves as a fulcrum when said mat is subject to a load;
a displaceable foam material which resiliently supports said platform and said projection in an unloaded state; and which is partially compressed in a loaded state so as to permit movement of said projection as a fulcrum; and
a skirt which surrounds said platform and is made at least partly of an elastic foam-like material.

5,116,046

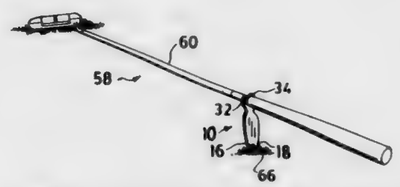
MULTIPURPOSE GOLFER'S TOOL

Lawrence A. Pace, 285 Roycroft Blvd., Snyder, N.Y. 14226

Filed Jul. 3, 1991, Ser. No. 725,659

Int. Cl.[5] A63B *57/00*

U.S. Cl. 273—32 B **1 Claim**



1. A golfer's tool adapted to be removably attached to the shaft of a golf club, wherein said golfer's tool consists essentially of a one piece plastic member includes a planar proximal portion and a planar distal portion, wherein said proximal portion and said integral portion are integrally joined to each other, and wherein:
(a) said proximal portion is comprised of two spaced-apart, substantially wedge-shaped legs terminating in tips adapted to penetrate a putting green for repairing ball marks and supporting a golf club thereon each of which has a length which is from 20 to 50 percent of the total length of said golfer's tool;
(b) said distal portion is comprised of two spaced apart, arcuate, substantially resilient legs, wherein said resilient legs define a substantially circular arc which extends at least 210 degrees so that said resilient legs can be snap fitted onto said shaft of said golf club when pressed transversely thereon to support the grip end of said shaft above the surface of a putting green, wherein each of said substantially resilient legs has a length which is from 10 to 30 percent of the total length of said golfer's tool;
(c) said proximal section and said distal portion are substantially coplanar; and
(d) the length of each of said substantially resilient legs is from 40 to 60 percent of the average length of said substantially wedge-shaped legs, so that said substantially resilient legs can be snap fitted onto said golf club to provide a club support.

5,116,047

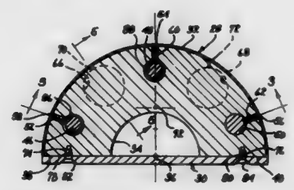
GOLF PUTTING DEVICE AND METHOD

Herbert A. Phelan; Stella Phelan, and Patricia A. Guimont, all of 2543 W. Catalina, Phoenix, Ariz. 85017

Filed Jun. 18, 1990, Ser. No. 539,184

Int. Cl.[5] A63B *53/04*

U.S. Cl. 273—80.1 **4 Claims**



1. A golf putter comprising:
a golf putter handle having a bottom connector portion;
a golf putter head having a top surface having a plurality of holes, each of which extends vertically down from said top surface and can receive and connect to said bottom connector portion;
aperture means located on a side of said head and in communication with each of said plurality of holes for permitting a member insertable within said aperture means to engage or disengage with said bottom connector portion to respectively provide a quick attach - quick detach assembly for said bottom connector portion;
said handle comprising:
a top grip portion;
an intermediate elongate portion connected to the top grip portion at one end thereof and connected to the bottom connector portion at the other end thereof;
said bottom connector portion having an enlarged flange portion and a shank portion projecting therefrom;
said head comprising:
an arcuate portion;
a removable blade connected to the arcuate portion;
said arcuate portion having a center axis having a radially distanced outer semicylindrical surface and having a radially distanced inner semicylindrical surface and having opposite end faces disposed in a plane extending through the center axis;
said blade having two removable connectors respectively connected to the end faces;
said arcuate portion having a top surface and a bottom surface; and
said top surface having a left hole for receiving the shank portion for forming a left handed putter and having a right hole for alternately receiving the shank portion for forming a right handed putter and having a central hole for selectively receiving the shank portion for forming either a left handed putter or a right handed putter.

5,116,048

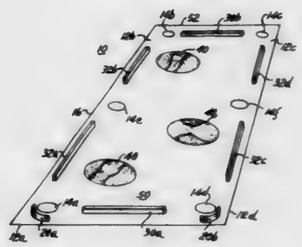
GOLF GAME, APPARATUS AND METHOD THEREFOR

Robert J. Bilocerkowycz, Lake Barrington, and Timothy S. Denison, Chicago, both of Ill., assignors to Risky Business Enterprises, Inc., Farmington Hills, Mich.

Filed Jul. 11, 1990, Ser. No. 552,791

Int. Cl.[5] A63F *7/06*

U.S. Cl. 273—87 B **12 Claims**



1. A golf related game or device comprising:
a playing course or playing surface arranged on particular given surface, including means for defining outer boundaries thereof;

a plurality of movable playing pieces placed into play relatively simultaneously, each playing piece adapted to be propelled about the playing course, by means for propelling same, under control of a player of the game;

propelling means for propelling the playing pieces into play onto the course relatively simultaneously from a distance about the playing surface;

a plurality of receptacles positioned about the playing course, to provide pocket means for receiving various ones of the playing pieces when propelled therein by a player.

5,116,049

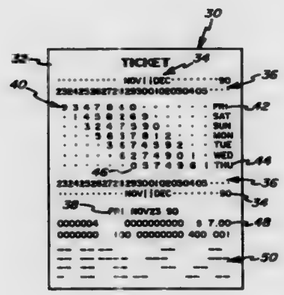
LOTTERY GAME SYSTEM AND METHOD OF PLAYING

Stanley R. Sludikoff, 17437 Tarzana St., Encino, Calif. 91316, and Carl Alexoff, 539 Tarrington Ct., Cherry Hill, N.J. 08034

Filed Sep. 27, 1991, Ser. No. 766,075

Int. Cl.[5] A63F *3/06*

U.S. Cl. 273—139 **8 Claims**



1. A method of playing a lottery game, said method comprising the steps of:

a) selecting numbers for a series of rows to create a plurality of rows and at least one column of numbers;

b) printing a ticket having said series of rows of numbers including at least a first row and a succeeding row wherein the succeeding row is located below said first row and offset at least one number, said series of rows forming at least one column of numbers where said rows overlap; and,

c) matching at least some of said numbers from either a row or a column with a second drawn set of numbers.

5,116,050

Patent Not Issued For This Number

5,116,051

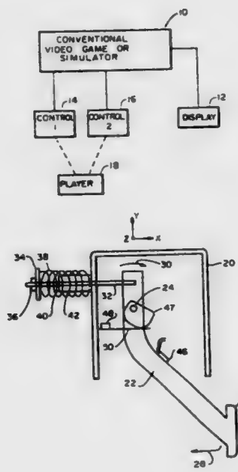
STRAIN GAUGE PRESSURE-SENSITIVE VIDEO GAME CONTROL

Rick L. Moncrief, Santa Clara; Erik J. Durfey, Los Gatos, and Max L. Behensky, Hayward, all of Calif., assignors to Atari Games Corporation, Milpitas, Calif.

Continuation of Ser. No. 296,470, Jan. 12, 1989, abandoned. This application Jun. 8, 1990, Ser. No. 536,045

Int. Cl.[5] A63F *9/22*; G09B *9/04*

U.S. Cl. 273—448 B **18 Claims**



1. An apparatus for simulating the feel of a real control device for a real vehicle and generating an output signal, said apparatus comprising:

means for displaying to an operator a simulated environment in which a simulated vehicle moves;

simulated control device means for simulating the feel of a real control device for a real vehicle and generating an output signal, said simulated control device means being in contact with a mechanical structure including a multistage force simulator means for applying forces to said simulated control device means to simulate the real forces that would resist movement of said real control device, said multistage force simulator means including at least a first elastic means for providing a first level of resistance to movement of said simulated control device means in a first range of movement to simulate a first range of movement inherent in a real control device and a second elastic means for providing a second level of resistance to movement of said simulated control device means which is greater than said first level of resistance to movement, said second level of resistance acting upon said simulated control device means only after said simulated control device means is moved to a predetermined position beyond said first range of movement by force applied to said simulated control device means;

strain gauge means mounted on said simulated control device means for sensing the amount of strain in said simulated control device means resulting from forces placed upon said simulated control device means by said operator of said simulated vehicle in response to stimuli in said simulated environment displayed to said operator, wherein an electrical parameter of said strain gauge means varies with the amount of said strain; and

amplifier means coupled to said strain gauge means for sensing a change in said electrical parameter of said strain gauge means and for generating an output signal indicative of said change in said electrical parameter which is thereby indicative of the amount of force placed on said simulated control device means by said operator.

5,116,052

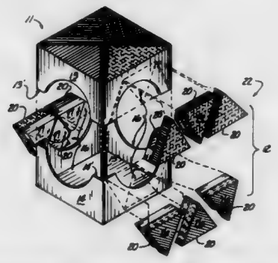
LOGIC PUZZLE

Dumitru A. Pop, 22718 2nd Dr., Bothell, Wash. 98021

Filed May 9, 1991, Ser. No. 697,567

Int. Cl.[5] A63F *9/08*

U.S. Cl. 273—153 R **5 Claims**



1. A spatial logical puzzle construction consisting of:

a housing unit including an upper and a lower housing member operatively and rotatably connected to one another; wherein, both the upper and lower housing members are provided with a plurality of semi-circular recesses which are alignable with one another to create a plurality of circular apertures around a periphery of the housing unit; and,

a plurality of puzzle units; wherein, each puzzle unit comprises a plurality of individual discrete puzzle segments; wherein, each of said discrete puzzle segments comprises a segment body having a triangular front face panel, a rear tab element, and an intermediate generally arcuate groove formed between the triangular face panel and the rear tab element; wherein, the intermediate groove is dimensioned to receive a peripheral portion of each of the housing members surrounding the recesses; such that the puzzle segments are moveable within and transferrable between the recesses formed in the upper and lower housing members; and, wherein each of said plurality of puzzle units is disposed in one of said plurality of circular apertures in said housing unit.

5,116,053

PUZZLE

Karl Blankenburg, 32131 Claeys Dr., Warren, Mich. 48093; Karl V. Blankenburg, 61830 Lantern Cove, Washington, Mich. 48094, and Duane Rode, Oakland, Mich., assignors to Karl Blankenburg, Warren and Karl Van Blankenburg, Washington, both of, Mich.

Filed Aug. 5, 1991, Ser. No. 740,155

Int. Cl.[5] A63F *9/08*

U.S. Cl. 273—153 S **17 Claims**

1. A puzzle comprising:

a tube having a side wall and first and second opposed ends;

first and second end caps fixedly mounted on the first and second ends, respectively, of the tube;

a plurality of gears rotatably and concentrically mounted on the tube between the first and second end caps, each gear being independently rotatable from the other gears about the longitudinal axis of the tube;

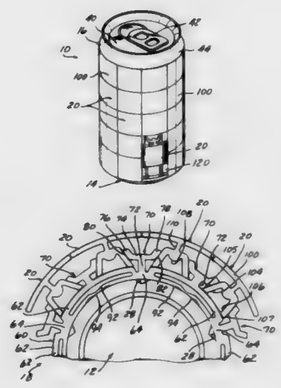
a plurality of circumferentially spaced slide support members mounted on and extending radially outward from each gear, each slide support member having opposed side surfaces, the opposed side surfaces of two circumferentially adjacent slide support members forming a channel therebetween;

lock means formed on the tube and each gear, for temporarily locking each gear in a selected angular position on the tube, the lock means including:

a plurality of planar, parallel, open-ended grooves formed in one of the tube and each gear; and

at least one resilient lock member unitarily formed on the other of the tube and each gear and associated with each gear, the lock member releasably engaging one of the grooves, the lock member including:

a strip-like member having first and second opposed ends, the first and second ends being connected to one of the tube and each gear, the strip-like member being spaced from the adjacent portion of the one of

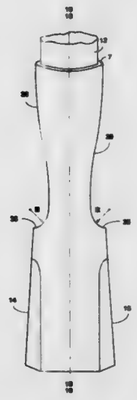


the tube and the gear to which it is connected between the first and second ends thereof; and

a radially extending projection formed on the strip-like member releasably engageable with one of the grooves as the gear is rotated about the tube; and

a plurality of slide elements, each slide element having an exterior, arcuate surface and a depending leg, the leg having a shape complimentary to and slidably engageable with the channel between two adjacent slide support members in each gear, the exterior surfaces of all of the plurality of slide elements being arranged in a cylindrical-shaped mosaic on the gears between the first and second end caps, with at least one channel in the plurality of gears being free of a slide element to form an opening into which a slide element in an adjacent gear can be slid axially in the direction of the longitudinal axis of the tube.

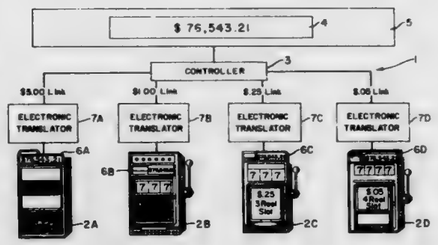
5,116,054
GOLF PUTTER
Alexander T. Johnson, 25 Hillview Road, North Balwyn, Victoria, 3104, Australia, assignor to Alexander T. Johnson, North Balwyn, Australia
Filed Jan. 18, 1991, Ser. No. 643,413
Claims priority, application Australia, Aug. 21, 1990, PK1854
Int. Cl.[5] A63B *69/36, 53/02*
U.S. Cl. 273—164 **9 Claims**



1. A blade type putter comprising a shaft, grip and putter head having a hosel which mounts the head at one end of the shaft, the head including two striking faces, said putter being characterized in that said head includes a light reflective top face from which said hosel projects, and wherein the tops of said striking faces meet said top face of said head at parallel top edges which are straight and extend substantially from the toe to the heel of said head and wherein said hosel includes a base which is elongate in the direction of said top edges and narrower than the distance between the top edges of said striking faces and wherein said base merges into said top face on opposite sides thereof with light reflective surfaces so that light reflected therefrom toward the user of the putter when putting appears as lines which are parallel with said top edges so that the golfer may orient said lines and said striking faces perpendicularly with respect to the direction of a putter stroke.

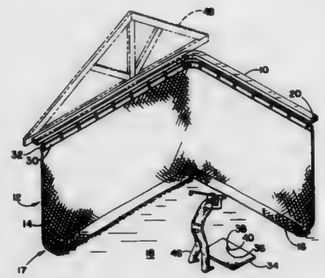
5,116,055
PROGRESSIVE JACKPOT GAMING SYSTEM LINKING GAMING MACHINES WITH DIFFERENT HIT FREQUENCIES AND DENOMINATIONS
Daniel A. Tracy, Las Vegas, Nev., assignor to Mikohn, Inc., Las Vegas, Nev.
Filed Jul. 2, 1991, Ser. No. 725,001
Int. Cl.[5] A63F *5/04*
U.S. Cl. 273—138 A **18 Claims**

1. A progressive jackpot system comprising:
a plurality of gaming machines, each gaming machine being able to buy-into the progressive jackpot and each having one or more different play characteristics; and
means responsive to each of said gaming machines for determining the progressive jackpot value based upon the play at each of said gaming machines, said determination being such that the $s To JP of each gaming machine per win of



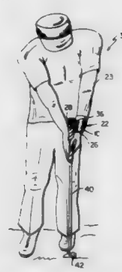
the progressive jackpot at each gaming machine is approximately equal for the different machines.

5,116,056
INDOOR GOLF PRACTICE APPARATUS
Charles T. Schmutte, 4509 Livingston Way, Sacramento, Calif. 95823
Filed Sep. 7, 1990, Ser. No. 579,355
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—181 F **3 Claims**



2. An indoor golf practice apparatus for suspension from the ceiling of a building structure, comprising:
(a) an elongated support rail for attachment to an overhead ceiling structure of a building, said elongated support rail having a first member and a second member, said first and second members being joined at one end, said first member positioned approximately perpendicular to said second member;
(b) a net, said net having a bottom edge and a reinforced top edge, said net having an openwork pattern through which a golf ball cannot pass, said bottom edge of said net adapted to form a seal with a playing surface, said seal edge of said net and said playing surface, said net being scrolled near said bottom edge, said scroll adapted to form said seal with said playing surface, said scroll forming a trough positioned longitudinally along said playing surface for retention of a golf ball after striking said net; and
(c) a plurality of hangers, said hangers being slidably attached to said support rail, said hangers being attached to said reinforced top edge of said net, said net extending downward from said support rail toward said playing surface, said net being retractable as said hangers are moved longitudinally along said support rail, whereby said net can be retracted toward one end of said support rail when not in use.

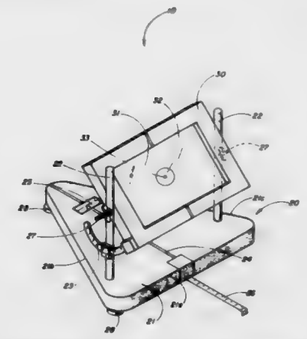
5,116,057
GOLF TRAINING AID
Michael Mangiaracina, 7840 SW 86th St. #21, Miami, Fla. 33143
Filed Sep. 12, 1991, Ser. No. 758,560
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—183 B **4 Claims**



1. Apparatus for learning proper hand and wrist motion of a golfer's leading arm during execution of a short stroke with a golf club comprising, in combination:
a) a cuff having inside and outside surfaces including means releasably securing said cuff about the wrist of the leading arm of a golfer with said inside surface laying against and contacting said wrist and said outside surface facing away from said wrist, said cuff further including a first cooperative fastening element fixed to said outside surface thereof at the location of the inside of said wrist adjacent the palm of the hand;
b) a golf club including a proximal grip portion and a distal club head including a hitting face; and
c) a sleeve having inside and outside surfaces removably attached in encircling relation to at least a portion of said grip portion of said club with said sleeve inside surface laying against and contacting said grip and said sleeve outside surface facing away from said grip, said sleeve including a second cooperative fastening element fixed to said outside surface thereof on the same side of the club as is said hitting face of said club head, said first cooperative fastening element upon the golfer manually gripping said grip portion of said club with the hand of said leading arm in the usual manner ready to strike a golf ball, said first cooperative fastening element on said cuff releasably fastening to said second cooperative fastening element on said sleeve upon said golfer pressing said first fastening element against said second fastening element, said first fastening element separable from said second fastening element upon moving said wrist in a direction away from said gripping portion during execution of said short stroke.

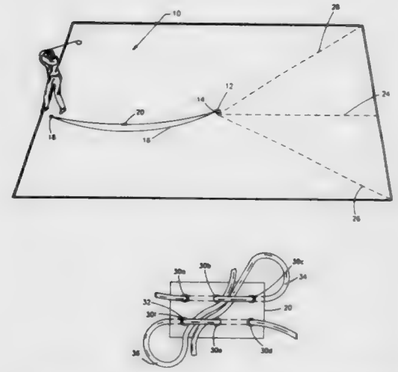
5,116,058
GOLF SWING TRAINING DEVICE
Joseph H. Theriault, 424 Emerson Dr., Raleigh, N.C. 27609
Filed Jun. 27, 1991, Ser. No. 721,952
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—183 E **15 Claims**

1. A golf swing training device to assist in the development of a proper golf swing comprising:
(a) a base to be placed on the ground and having a centering line which is disposed in a reference plane that extends perpendicular to the golfer's swing plane;
(b) a mirror mounted to said base and angled to permit the user to view himself in said mirror;
(c) a reference mark on said mirror to be aligned with the vertical axis of the user's body; and



(d) an opening formed in the mirror through which the centering line on the base is sighted to enable the user to align his stance with respect to the reference plane.

5,116,059
GOLF PRACTICE APPARATUS
Robert A. Pelletier, 657 Rock Springs Rd., Kingsport, Tenn. 37664
Filed Sep. 13, 1991, Ser. No. 759,872
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—200 A **8 Claims**

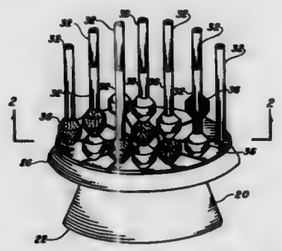


1. A golf practice apparatus comprising in combination:
a golf ball having a bore extending through the center thereof, the core of the ball adjacent to said bore comprising a body of rigid solid material;
a cord made of cold processed monofilament material, said cord being threaded through said bore and having its first and second ends secured together, forming a loop on which the ball is slidably mounted;
a keeper plate having two sets of at least three holes each extending therethrough for threading said cord into position such as to secure said ends together; and
a stake connectable to the ground and having an enclosed aperture through which said cord may be threaded for slidable movement therethrough.

5,116,060
GOLF BALL CORE CROSSLINKED WITH T-AMYL PEROXIDE AND BLENDS THEREOF
Michael J. Sullivan, Chicopee; R. Dennis Nesbitt, Westfield, and John L. Nealon, Springfield, all of Mass., assignors to Lisco, Inc., Tampa, Fla.
Filed Mar. 20, 1991, Ser. No. 672,189
Int. Cl.[5] A63B *37/06*
U.S. Cl. 273—218 **10 Claims**

1. A golf ball comprising a cove and molded spherical core;
said core comprising a base elastomer selected from the group consisting of polybutadiene having a molecular weight of from about 50,000 to about 500,000 and admixtures of said polybutadiene with other elastomers,
at least one metallic salt of an alpha, beta-ethylenically unsaturated monocarboxylic acid, and
a free radical initiator selected from the group consisting of a tert-amyl peroxide and blends of tert-amyl peroxides and compatible organic peroxides.

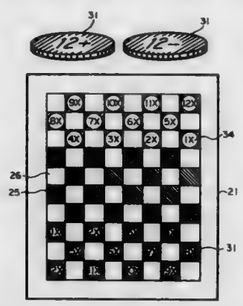
5,116,061
GAME USING BEADS STACKED ON PINS
John R. Zentner, Jr., 22442 Bessemer St., Canoga Park, Calif. 91367
Filed May 20, 1991, Ser. No. 702,189
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—241 **8 Claims**



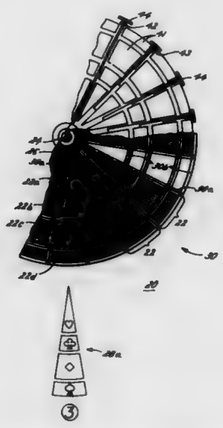
1. A competitive strategy game apparatus for two players comprising:
a) a structural base for mounting on a flat surface,
b) a concentric pedestal having a top and a bottom rotatably disposed upon the base permitting manual rotation thereof,
c) a plurality of upright dowel pins axially affixed to the pedestal top all of said dowel pins located near the pedestals radial peripheral, wherein all of said dowel pins together produce only one peripheral array concentric with the pedestals radial peripheral and said peripheral array having an unlimited boundary form with no side lines or barriers and
d) a plurality of hollow beads having two separate and distinguishable markings one for each player in equal numbers, for interposing one on top of the other upon the pins by each player in turn in an attempt to line up their own beads in a horizontal, diagonal or vertical row.

5,116,062
GAME APPARATUS AND METHOD OF PLAYING
Palmer M. Johnson, 703 E. Second St., Seymour, Ind. 47274
Filed Dec. 18, 1990, Ser. No. 629,394
Int. Cl.[5] A63F *3/02*
U.S. Cl. 273—260 **15 Claims**

1. A game apparatus for play by a plurality of players comprising:
a game board divided into rows of alternate playing and non-playing squares of contrasting colors; and
a plurality of game pieces for each player, each game piece of said pluralities having a playing surface facing upwardly with only one number and one mathematical function symbol disposed on said playing surface.

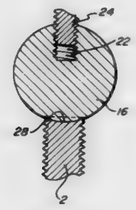


5,116,063
DART GAME WITH EXPANDED SCORING TECHNIQUE
Eugene G. Harlan; Marcio Bonilla, and John R. Martin, all of Rockford, Ill., assignors to Arachnid, Inc., Rockford, Ill.
Filed Feb. 20, 1991, Ser. No. 658,051
Int. Cl.[5] F41J *3/00, 5/04*
U.S. Cl. 273—376 **8 Claims**



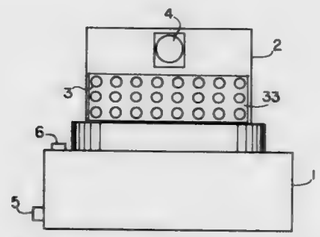
1. A dart game for a self-scoring electronic dart game having a target face in front of the target for receiving thrown darts, and a switch matrix behind the target for detecting a thrown dart striking the target, said target comprising:
a target frame having a plurality of radial ribs and a plurality of circular ribs, said target frame defining scoring areas;
a plurality of scoring segments for receiving thrown darts, said segments being slidably mounted in the scoring area;
a pressure sensitive switch matrix situated behind the target face, said switch matrix having a plurality of different electrical switches corresponding to each scoring segment, each electrical switch having electrodes being urged apart by the switch matrix and each electrical switch being capable of conveying a dart-hit signal in response to a thrown dart striking its corresponding scoring segment so as to maneuver the respective electrodes into electrical contact; and
said switch matrix further including a plurality of electrically independent signal lines electrically connected to each electrical switch for communicating the dart-hit signal to processing means of a dart game, wherein only one signal line is electrically connected to each electrical switch, and each and every signal line in said switch matrix is structurally separate and electrically isolated from each and every other signal line so that every signal line in the switch matrix only communicates a dart hit signal corresponding to one scoring segment.

5,116,064
GAME POST ASSEMBLY
Joshua Corlett, 71 Loveland Hill Rd., Vernon, Conn. 06066
Filed Aug. 9, 1990, Ser. No. 564,784
Int. Cl.[5] F41J *5/18*
U.S. Cl. 273—390 **8 Claims**



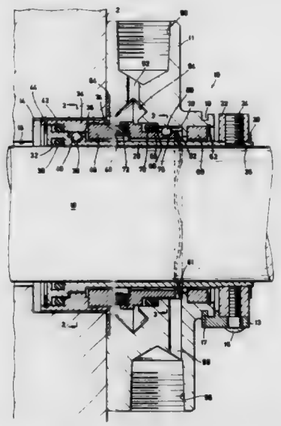
1. A target assembly comprising: a ground-engaging base member with an upper portion lying generally in a horizontal plane, in the position of normal use of said assembly; a target member having a lower portion; means for mounting said target member on said base member in a normally upstanding orientation, said means for mounting operatively engaging said lower portion of said target member and permitting substantially free and universal deflection of said target member therewithin, under kicked-ball impact, in all vertical planes about said base member; and means for maintaining said target member in any position deflected from said upstanding orientation, whereby the effectiveness of ball impact upon said target member can be indicated by the position to which it has been deflected thereby.

5,116,065
ROTATING TABLE GAME
Timothy T. Ackerman, 14 Wilkenda Ave., East Haven, Conn. 06512
Filed Oct. 19, 1990, Ser. No. 601,933
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—446 **1 Claim**



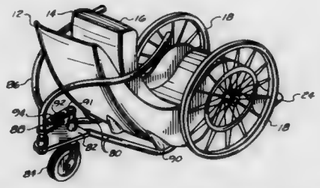
1. A reaction game comprising:
A) a rectangular base having a generally cylindrical recess having a first diameter formed therein,
B) a rotating playing assembly mounted on said base having a cylindrical projection having a second diameter less than said first diameter, rotatably mounted in the recess of said base,
C) two spaced slip rings fastened to the side surface of the recess in the base,
D) two spaced brushes secured to the side of the projection, one brush aligned with and contacting each of the two slip rings,
E) a plurality of equally spaced rollers mounted on the bottom of the recess and contacting the end of the projection to support the playing assembly rotatably on the base,
F) means for holding said projection concentrically in said recess whereby the side of the projection is spaced equally from the side of the recess about its entire perimeter,
G) four equally spaced protrusions extending inwardly of the recess from the side recess and aligned with the sides of the rectangular base,
H) a normally open microswitch fixed to the projection and having a roller extending outwardly of the projection a distance out of contact with the side of the recess and sufficient to contact said protrusions upon rotation of said playing assembly whereby as said playing assembly is rotated said roller contacts and is pushed inwardly by said protrusions to close said microswitch,
I) a grid assembly comprising two sets of conductive strips, each strip of each set being electrically connected to the other strips of the set and isolated from the strips of the other set, the strips being positioned on the playing assembly with the strips of one set spaced from and alternating with the strips of the other set,
J) a plurality of push button assemblies on said playing assembly positioned in a pattern overlying different adjacent pairs of strips of said grid, each push button having a reciprocal contact normally spaced from but movable into contact with the two adjacent strips of the pair it overlies to electrically connect the strips of the pair,
K) a removable card of non-conductive material removably positioned between said push buttons and said grid, said card having a pattern of through holes, large enough to pass a push button contact, underlying less than all said push buttons whereby the contacts of some of said push buttons may pass through said holes to contact the grid and others of said contacts are blocked by said card from contacting said grid,
L) a projectile,
M) an electrically actuated projector, mounted on said playing assembly aligned with said roller, for projecting said projectile and electrically connected to each set of strips,
N) a source of electricity in said base connected through said slip rings and brushes to said microswitch and each set of strips,
O) a timer means electrically connected to said projector and said microswitch for actuating said projector a set period of time after said microswitch has been closed unless said switch is opened before the end of said set period of time,
P) whereby said playing assembly may be rotated to align said projector with one side of the base closing said microswitch and starting said timer, a player located at that side of the base may press one of said push buttons and then rotate said player assembly to align the projector with the next side of the base and if the push button selected by the player is aligned over one of the holes in the card, the contact electrically connects the pair of underlying strips and the projector is operated to project the projectile toward the player or if the player fails to rotate the player assembly before the set time period has passed, the timer actuates the projector to project the projectile.

5,116,066
MECHANICAL SEAL CONSTRUCTION AND LOCKING ASSEMBLY FOR USE THEREIN
Sandy L. Crawford, Katy, Tex., assignor to Utex Industries, Inc., Houston, Tex.
Continuation of Ser. No. 499,780, Mar. 27, 1990, abandoned. This application Oct. 15, 1991, Ser. No. 777,481
Int. Cl.[5] F16J *15/16*
U.S. Cl. 277—81 R **8 Claims**



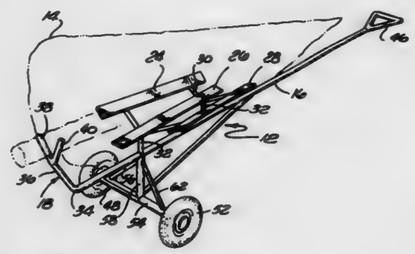
1. In a mechanical seal construction for use between a wall and a shaft extending through the wall and rotatable relative thereto, the seal construction comprising a seal assembly including a pair of seal elements having mutually engaging sealing faces, one seal element being stationary with respect to the wall and the other seal element being rotatable in response to rotation of the shaft, the improvement comprising:
an inner, annular member operatively engaged with said stationary seal element, said inner annular member having a radially outwardly facing surface, at least three, generally equally circumferentially spaced hemispherical recesses being formed in said surface;
a fixed, outer annular member in surrounding relationship to said inner annular member, said outer annular member having at least three, generally equally circumferentially spaced, axially extending grooves, each of said grooves having a radiused surface, respective ones of said grooves being in register with respective ones of said recesses, each of said recesses having received therein a ball having a radius substantially equal to the radius of said recess and to the radius of said radiused surface of each of said grooves, each of said balls projecting into a respective one of said grooves and riding on said radiused surface and said recess to prevent relative rotation between said inner and outer annular members and thereby constraining said inner and outer annular members to closely proximate preventing relative tilting between said inner and outer annular members while permitting axial movement between said inner and outer members;
an annular space being formed between portions of said inner and outer annular members, said inner annular member being axially movable with respect to said outer annular member; and
a single convolution spring member disposed in said annular space to urge said inner annular member toward said stationary seal element whereby said sealing faces on said stationary seal element and said rotating seal element are maintained in sealing contact.

5,116,067
CONVERTIBLE CHAIR SUPPORT FOR DISABLED PERSONS
John M. Johnson, 4239 W. Lawrence La., Phoenix, Ariz. 85051
Filed Nov. 1, 1990, Ser. No. 607,812
Int. Cl.[5] B62B *19/04*
U.S. Cl. 280—7.14 **20 Claims**



1. A motion permitting support structure for adjustably supporting the body of a human user along a substantial portion of its length comprising:
a member having a generally chair-like form curved to conform to the body of the user with a continuous back, seat and upper leg support and upstanding sides following the curved form;
a frame generally curved to conform to the continuous back, seat and upper leg support sections of said member and including upstanding sides following its curved form;
means for adjustably fastening said member to a plurality of different positions relative to said frame;
a resilient cushioning means removably attached to said member and conformable thereto to comfortably support the user's body; and motion permitting means including wheel means removably and adjustably attachable to a plurality of positions on said frame for permitting relative motion to the sport structure relative to the ground surface, said wheel means including a steerable rear wheel attachable to said frame and a handlebar for controlling said steerable wheel.

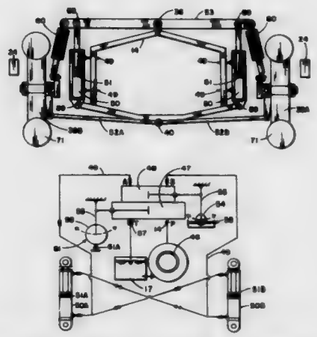
5,116,068
TREE TRANSPORT
Frederick J. Declouette, 18540 Markham St., Perris, Calif. 92370
Filed Feb. 6, 1989, Ser. No. 306,046
Int. Cl.[5] B62B *1/14*
U.S. Cl. 280—47.24 **1 Claim**



1. A tree transport comprising:
a main base having a handle at one end thereof and a tree base spacer at the other end thereof;
a carriage having an axis extending generally parallel to the axis of the main base for supporting a tree during transport thereof, said carriage including a plurality of adjacent carriage supports, each of said supports being formed along a fixed axis generally parallel to the axis of said main base;

at least one axle means having wheels secured thereto for supporting said tree transport with respect to the ground;
support rods interconnecting said axle means and said main base;
and wherein said tree base spacer is generally of Y-shaped configuration wherein the leg of said Y is connected to one end of said main base and said arms of said Y are free to be placed about the trunk of the tree, said tree based spacer being formed in a fixed plane generally perpendicular to the axis of said main base.

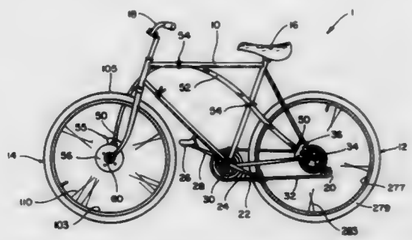
5,116,069
THREE-WHEEL VEHICLE
Robert H. Miller, 600 Laurel Way, Casselberry, Fla. 32707
Filed Mar. 11, 1991, Ser. No. 667,215
Int. Cl.[5] B60G *21/00*; B62D *61/06*
U.S. Cl. 280—112.2 **4 Claims**



1. A tilting mechanism for a three-wheel vehicle of the type having one front wheel and two rear wheels and a mainframe, said tilting mechanism comprising:
a tilt bar attached to the mainframe by a central pivot pin, said tilt bar running transverse from one side of the main frame to an opposite side thereof;
two fluid cylinders, each one attached between said tilt bar and said mainframe;
a fluid pump connected to a supply of fluid;
fluid valve means for shifting the fluid from one to the other fluid cylinder;
a pair of suspension springs, one of each of said springs being connected to one end portion of said tilt bar;
a pair of shock absorbers, one of each of said pair being connected to one end of said tilt bar;
a pair of trailing arms, each pivotally attached to said mainframe and each having a fore and aft end, the aft end of each trailing arm being connected to one said suspension spring and to one said shock absorber whereby the suspension springs and shock absorbers are connected between the tilt bar and the trailing arms; and
control means for tilting said vehicle during a turn, said control means being coupled to said fluid valve means to thereby actuate said two fluid cylinders to shift said tilt bar and thereby tilt said three wheel vehicle.

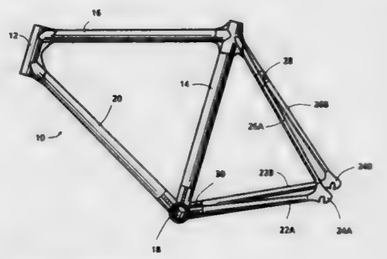
5,116,070
DUAL WHEEL DRIVEN BICYCLE
Billie J. Becoat, 914 Hampton, Alton, Ill. 62002
Continuation-in-part of Ser. No. 404,695, Sep. 8, 1989, Pat. No. 5,004,258. This application Jan. 29, 1991, Ser. No. 647,590
Int. Cl.[5] B62M *1/02*
U.S. Cl. 280—259 **4 Claims**

1. A dual wheel driven bicycle including a conventional drive system having pedals, a pedal sprocket, a chain and a rear sprocket comprising:
(a) a frame;
(b) a rear wheel mounted on said frame:
(c) a rear ring gear mounted on said rear wheel;
(d) a front wheel mounted on said frame;
(e) a front ring gear mounted on said front wheel;
(f) propulsion means for driving said front wheel, said propulsion means including:
(1) a rear gear assembly mounted on said frame including a rear gear to engage and be driven by said rear ring gear;



(2) a front gear assembly mounted on said frame including a front gear to engage and drive said front ring gear; and
(3) an elongate flexible shaft connected on one end to said rear gear and on the opposite end to said front gear, said shaft transferring the rotational motion of said rear ring gear to said front wheel; and
(g) a freewheel assembly permitting said front wheel to rotate in a forward direction when driven by the rotational force from said elongate flexible shaft and permitting said front wheel to rotate in a forward direction freely and independently of said elongate flexible shaft when the rate of rotation of said front ring gear exceeds the rate of rotation of said rear gear.

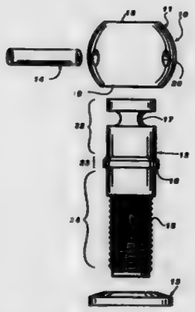
5,116,071
COMPOSITE BICYCLE FRAME
Craig D. Calfee, 691 Minna St., San Francisco, Calif. 94103
Filed Mar. 9, 1989, Ser. No. 321,510
Int. Cl.[5] B62K *3/02, 19/02*
U.S. Cl. 280—281.1 **7 Claims**



1. A bicycle frame, comprising:
a head tube;
a seat tube;
a top tube extending between said head tube and said seat tube;
a bottom bracket shell disposed at a first longitudinal end of said seat tube;
a down tube extending between said head tube and said bottom bracket shell;

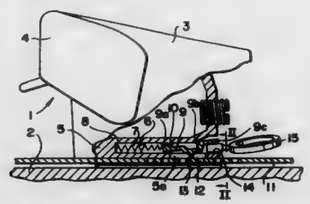
two chain stays extending from said bottom bracket shell in a direction away from said down tube;
two rear drop-outs, each said drop-out disposed in joining relationship to one of said chain stays at a first longitudinal end thereof farthest from said bottom bracket shell;
two seat stays, each said seat stay extending from a second longitudinal end region of said seat tube opposite said first longitudinal end to one of said rear drop-outs; and
continuous fiber composite material with hardening agents impregnated therein, substantially surrounding, and in laminated contact with, the junction between:
(a) said head tube and said top tube,
(b) said head tube and said down tube,
(c) said seat tube and said top tube,
(d) each said chain stay and each said rear drop-out,
(e) each said seat stay and said seat tube, and
(f) each said seat stay and each said rear drop-out,
thereby forming a structural joint connecting said tubes at each said junction, a structural joint connecting said seat stays and said rear drop-outs, and a structural joint connecting said chain stays and said rear drop-outs, and
integrated structural joints and gussets of continuous fiber composite material with hardening agents impregnated therein wrapped in laminated contact with, and connecting:
(a) said seat tube and said bottom bracket shell,
(b) said down tube and said bottom bracket shell, and
(c) each said chain stay and said bottom bracket shell, such that at least one of said gussets extends in a plane whose direction is transverse to the direction of a plane in which the longitudinal axes of at least the head tube, seat tube, top tube, and down tube lie.

5,116,072
BALL HITCH WITH ROTATABLE BALL
John C. Swenson, 110 S. 200 East, Springville, Utah 84663
Filed Aug. 20, 1990, Ser. No. 569,829
Int. Cl.[5] B60D *1/06*
U.S. Cl. 280—511 **1 Claim**



1. A post and ball type hitch apparatus for use with a conventional hitch socket, comprising:
a generally cylindrical post having a top portion, a bottom portion and a longitudinal axis, the top portion having an annular groove which is perpendicular to the longitudinal axis and the bottom portion having means for attaching the port to a vehicle,
a ball connector having a cylindrical channel formed therein for insertion onto the top portion of the post, and a nonradial, smooth, transverse bore offset from the longitudinal axis, the bore intersecting the cylindrical channel, and
a connector pin having first and second end portions and a middle portion, and sized so as to be insertable into the bore such that the first and second end portions are secured within the ball connector and the middle portion intersects a portion of the annular groove to prevent removal of the post from the cylindrical channel, while at the same time allowing relative rotation of the ball connector about the cylindrical post;
wherein the pin includes a notch which cooperates with a rod in the ball connector, the rod allowing the pin to move only within the constraints of the notch.

5,116,073
SAFETY SKI BINDING
Gilles R. Goud, Cran Gevier, France, assignor to Salomon S.A., Annecy Cedex, France
Filed Nov. 6, 1989, Ser. No. 432,240
Claims priority, application France, Nov. 8, 1988, 88 14550
Int. Cl.[5] A63C *9/08*
U.S. Cl. 280—617 **23 Claims**

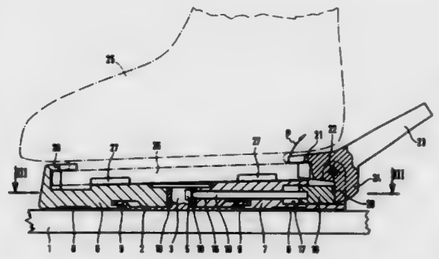


5. A ski binding comprising:
(a) a binding body adapted to be selectively positioned at any of a plurality of locations on a ski;
(b) a latch mounted with respect to said binding body for movement between a locked position for immobilizing said binding body with respect to said ski and an unlocked position for permitting said binding body to be moved to any of said plurality of locations on said ski;
(c) means for biasing said latch to said locked position, said locked position of said latch thereby comprising a single stable biased locked position;
(d) a support surface of said binding toward which a portion of said latch is biased by said biasing means; and
(e) means for maintaining said latch in said unlocked position and for enabling said latch to be moved to said single stable biased locked position by said means for biasing said latch, comprising an element having an enlarged portion for engagement between a portion of said latch and said support surface, thereby enabling said binding body to be moved to any of said plurality of locations on said ski, whereby said latch is movable to said single stable biased locked position, by said means for biasing said latch, in response to removal of said enlarged portion of said element from between said portion of said latch and said support surface, said element further comprising a pull tab affixed to said enlarged portion for facilitating said removal.

5,116,074
SAFETY SKI BINDING FOR THE RELEASABLE HOLDING OF A SKI BOOT
Henri Peyre, Saint Benin d'Azy, France, assignor to Look S.A., Fed. Rep. of Germany
Filed Feb. 12, 1991, Ser. No. 653,967
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1990, 4005254
Int. Cl.[5] A63C *9/081*
U.S. Cl. 280—618 **22 Claims**

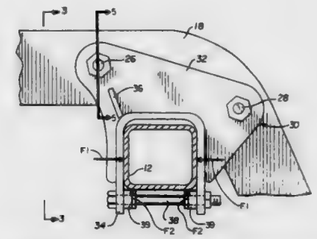
1. A safety ski binding for releasably holding a ski boot at a ski, comprising:
a release pin fixedly disposable on a ski to extend perpendicularly upward from a top ski surface,
a front base part having coupling means engageable with countercoupling means on a ski boot to hold the ski boot in position on the front base part,

a rear base part having coupling means engageable with countercoupling means on a ski boot to hold the ski boot in position on the rear base part,
elastic base part clamping means for elastically holding the front and rear base parts in an in-use ski boot holding position with engagement of the front and rear base parts at respective support surfaces of the release pin while permitting rotative movement of the base parts around the release pin to release the ski boot in response to predetermined forces thereon,



hold down means selectively movable between a ski boot holding position and a ski boot release position for accommodating ski boot attachment and release by a skier,
and base part release means for holding one of the base parts away from the release pin against the force of the elastic base part clamping means when said hold down means is in its ski boot release position to thereby maintain said base parts in relative positions permitting insertion of a ski boot into the respective coupling means.

5,116,075
TRAILING ARM SUSPENSION WITH WRAPPER COMPRESSION AXLE MOUNTING
William C. Pierce, Muskegon, Mich., assignor to Lear Siegler Truck Products Corp., Muskegon, Mich.
Filed Dec. 5, 1990, Ser. No. 622,723
Int. Cl.[5] B60G *7/00*
U.S. Cl. 280—688 **12 Claims**



1. In a vehicle suspension for mounting ground-engaging wheels to a vehicle frame, the suspension system comprising at least two substantially rigid arms secured to opposite sides of the frame through substantially aligned pivot mounts; at least one wheel-carrying axle mounted to said arm through a wrapper plate having an elongated planar complementary surface wrapping at least 180° around said axle and depending opposites sides extending beyond said axle; and compressing means for diametrically compressing said axle by drawing said opposite sides of said wrapper plate toward each other; the improvement comprising;
a transverse compression means for imparting a second diametrical compression force on said axle in a direction substantially transverse to a first diametrical compression force from said wrapper plate on said axle and imparted by said compression means;
whereby said wrapper plate and transverse compression means grip, support and strengthen said wheel carrying axle at the point at which said axle is connected to said rigid arms.

5,116,076
WHEEL SUSPENSION SYSTEM FOR STEERABLE REAR WHEELS OF MOTOR VEHICLES
Patrick Moll, München, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany
Filed Dec. 12, 1990, Ser. No. 626,456
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1989, 3941083
Int. Cl.[5] B60G *3/00*
U.S. Cl. 280—691 **9 Claims**



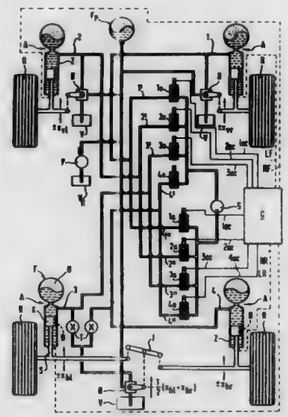
1. A wheel suspension system for a steerable rear wheel of a motor vehicle comprising:
a wheel carrier on which said wheel is rotatably mounted;
upper and lower suspension links arranged respectively above and below an axis of rotation of said wheel, and coupling said wheel carrier with a body of said motor vehicle;
said upper suspension link consisting of an opened-up A-frame arrangement;
said lower suspension link being coupled to said wheel carrier by a wheel carrier joint, and consisting of an A-frame arrangement having at least one A-frame arm which is coupled to the vehicle body by a control bearing having a designed elasticity in a transverse direction relative to said vehicle body;
a rod link arranged rearward, relative to a forward direction of motion of said vehicle, of said A-frame arm of said lower suspension link and being connected at a first end thereof to said wheel carrier by a rotatable joint adjacent said wheel carrier joint;
a steering-adjusting element operatively coupled between a second end of said rod link and said vehicle body;
said wheel carrier being pivotable by said steering adjusting element, by means of elastic deformation of said control bearing, about a steering axis which extends through said wheel carrier joint and through a first intersecting point of longitudinal axes of A-frame arms of said upper suspension link;
said wheel also being pivotable about an elastokinematic swivel axis which extends through said first intersecting point and through a second intersection point of longitudinal axes of the rod link and a forward A-frame arm of said lower suspension link.

5,116,077

HYDROPNEUMATIC SUSPENSION SYSTEM

Dean C. Karnopp, Davis, Calif.; Dietrich Sahm, Bad Urach, Fed. Rep. of Germany; Walter Klinkner, Stuttgart, Fed. Rep. of Germany, and Dieter V. Scarpatetti, Esslingen, Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Nov. 7, 1990, Ser. No. 610,141
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1989, 3936987; Feb. 6, 1990, 4003493
Int. Cl.[5] B60G *11/26*; B60S *9/00*
U.S. Cl. 280—707 13 Claims



1. Hydropneumatic suspension system for motor vehicles of the type having a plurality of vehicle wheels, comprising:

a primary hydraulic medium reservoir,

a primary hydraulic pressure source,

hydropneumatic support units assigned to each of a plurality of vehicle wheels,

a vehicle levelling control system including level-control valves for selectively connecting the support units with said primary pressure source and said primary reservoir as a function of the lifting position of a vehicle wheel associated with the respective support unit,

and an active bypass and feed system for displacing hydraulic medium between respective supporting units in bypassing relationship to the primary pressure source and primary reservoir, to thereby control at least one of vehicle pitch and roll, wherein the active bypass and feed system is faster acting than the vehicle levelling control system.

5,116,078

SUSPENSION CONTROL SYSTEM COOPERATED WITH STEERING CONTROL SYSTEM FOR VEHICLE

Hirotaka Kanazawa, Hiroshima; Shin Takehara, Higashi-Hiroshima, and Hiroshi Ohmura, Hakkaichi, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 5, 1990, Ser. No. 608,981
Claims priority, application Japan, Nov. 6, 1989, 1-289608
Int. Cl.[5] B60G *11/26*; B62D *9/02*
U.S. Cl. 280—707 7 Claims

1. A control system for a vehicle comprising:

means for providing a supply of hydraulic fluid;

a plurality of hydraulic cylinders, each of said hydraulic cylinders provided between a vehicle body and one of a plurality of vehicle wheels;

proportional flow control valves for controlling the supply of hydraulic fluid to each of the hydraulic cylinders;

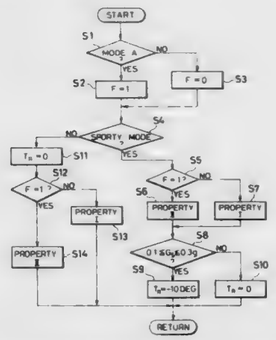
a vehicle suspension system controller for controlling said proportional flow control valves in accordance with a desired roll displacement;

a manual switch for selecting one of a normal roll control mode, in which said desired roll displacement value is zero, and a sporty roll control mode, in which said desired roll displacement value is not necessarily zero;

a rear wheel steering mechanism for steering right and left rear vehicle wheels; and

a four wheel system controller for selecting one of a stronger phase steering property and a weaker phase steering property;

said vehicle suspension system controller cooperating with said four wheel system controller for (1) selecting one of the steering properties over the other and controlling said



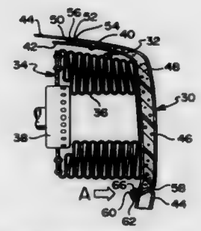
rear wheel steering mechanism based on said one of the steering properties, (2) computing a lateral acceleration of the vehicle, (3) judging if said lateral acceleration is in a particular range, (4) setting said desired roll displacement to a non-zero value if said lateral acceleration is in said particular range, (5) setting said desired roll displacement to a value of zero if said lateral acceleration is not in said particular range, and (6) performing roll control in accordance with said sporty roll control mode, if said sporty roll control mode is selected by said manual switch; and (1) setting said desired roll displacement to a value of zero, and (2) selecting the other of the steering properties and controlling said rear wheel steering mechanism based on the other of the steering properties, if said normal roll control mode is selected by said manual switch.

5,116,079

INSTRUMENT PANEL AIR BAG COVER DOOR

Richard D. Rhodes, Jr., Somersworth, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Dec. 6, 1990, Ser. No. 622,952
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—732 12 Claims



1. In a vehicle passenger compartment having a dash board comprising a support mounting a storage compartment for

inflatable air bag, a resilient covering for the dash board, and an opening in the support for enabling deployment of the air bag upon inflation outwardly of the dash board, a decorative panel carried by the support and concealing the storage compartment characterized by:

a backing plate integrally formed with the support and having a U-shaped cut line having two ends at a top of the U-shaped cut line, said cut line framing the opening and defining a door;

a rod carried by the support and engaging the backing plate along a line connecting the ends of the cut line at the top of the U-shaped cut line to provide a hinge line for the door;

a resilient layer of material overlying the backing plate;

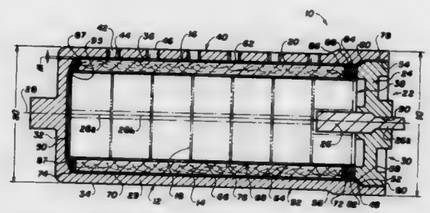
whereby inflation of the air bag will force the door open by bending the backing plate about the rod to enable deployment of the air bag outwardly of the panel.

5,116,080

AIR BAG INFLATOR AND METHOD OF MAKING THE SAME

Pongdet Wipasuramonton, Rochester, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Sep. 5, 1990, Ser. No. 577,785
Int. Cl.[5] B60R *21/28*
U.S. Cl. 280—741 29 Claims



1. An apparatus comprising an air bag inflator structure adapted to direct gas generated under pressure into an air bag, said inflator structure comprising:

a container having a tubular housing wall with an exterior surface forming part of the exterior of said container and an interior surface defining an internal cavity, said tubular housing wall having gas dispensing nozzles extending therethrough, each of said dispensing nozzles having an inlet formed in said interior surface of said tubular housing wall and an outlet formed in said exterior surface of said tubular housing wall,

a tubular lining disposed inside said internal cavity defined by said tubular housing wall, said tubular lining being located immediately adjacent said interior surface of said tubular housing wall so as to cover the inlets of said gas dispensing nozzles,

a gas generating composition disposed within said tubular lining, said gas generating composition being ignitable to generate gas within said tubular lining, and

an end closure coupled with an end of said tubular housing wall, said end closure capturing an end portion of said tubular lining between said end closure and said end of said tubular housing wall to simultaneously close the end of said tubular housing wall and said end portion of said tubular lining,

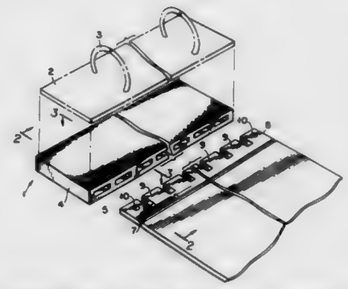
said tubular lining being adapted to burst at locations adjacent the inlets of said gas dispensing nozzles when gas pressure within said tubular lining exceeds a predetermined amount, to permit gas generated within said tubular lining to be directed through said gas dispensing nozzles and from said container.

5,116,081

RING BINDER ADAPTOR FOR REMOVABLE COVERS

John C. Mann, Jr., 29 Tuthill Point Rd., East Moriches, N.Y. 11940

Filed Jul. 12, 1991, Ser. No. 728,878
Int. Cl.[5] B42D *3/00*, *3/06*; B42F *13/00*
U.S. Cl. 281—36 7 Claims



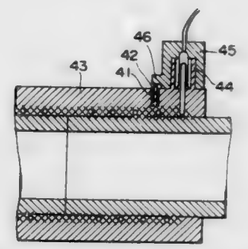
1. An adaptor for a ring binder having a separator mechanism with one or more separable rings attached to a backing member and having means for separating the rings, the adaptor comprising a mounting element, having a width corresponding to the width of the binder, means for attaching the mounting member to the backing member, the mounting element having a plurality of slots on a side thereof, at least one slot having a upwardly extending projection entering into the slot, and, a removable cover having an integral hinge and a notched edged, the edge having extending portions which are receivable the slots in the mounting element, and having at least one hole alignable with the projection for locking the cover in the element.

5,116,082

ELECTROFUSION OF ELECTROFUSION JOINT, METHOD OF CONFIRMING STATE OF FUSION AND FUSION JOINT SUITABLE FOR USE IN THE METHODS

Takayuki Handa, and Naotake Uda, both of Chiyoda, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 383,015
Claims priority, application Japan, Jul. 21, 1988, 63-97084[U]
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—21 5 Claims



1. An electrofusion joint having an electrical heating wire embedded in the inner peripheral region thereof, said electrofusion joint being adapted to be fitted to an end of a plastic pipe and said electrical resistance heating wire being adapted to be supplied with electrical current so that the interface between said joint and said pipe may be fused to bond said joint and said pipe, said electrofusion joint comprising: an annular groove formed in the outer peripheral surface of said joint and extending to a region near said electrical resistance heating

wire: a core member extending upwardly from said groove above the outer peripheral surface of said joint; and a stopper member provided above said core member and capable of limiting the lift of said core member in response to pressure exerted on said core member by molten joint material formed in said groove when electrical current is supplied to said heating wire.

5,116,083

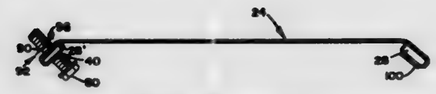
CLAMP FOR COUPLING AND SEALING PIPE JOINTS

Gary R. Gillingham, Prior Lake; Wayne M. Wagner, Apple Valley, and Fred H. Wahlquist, Bloomington, all of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Continuation of Ser. No. 228,760, Aug. 4, 1988, abandoned. This application Apr. 9, 1990, Ser. No. 506,594

Int. Cl.[5] F16L *55/00*

U.S. Cl. 285—23 **8 Claims**



1. A clamp for joining two tubular members of dissimilar diameters together and sealing the joint between the two tubular members comprising:

(a) a pair of substantially rectangular reinforcing bars each having at least one hole formed therein for receiving a securing bolt, each hole located such that each hole and one reinforcing bar is in alignment with a corresponding hole in the other reinforcing bar when the reinforcing bars are in alignment;

(b) a substantially rectangular band of ductile metal having a longitudinal length greater than the circumference of the tubular members, having a width approximately equal to the length of the reinforcing bars, having ends wrapped more than one turn around each of the reinforcing bars, having at least two holes formed therein, each hole having a diameter less than the diameter of a corresponding hole formed in one of said reinforcing bars, each of said holes located over the corresponding hole formed in one of said reinforcing bars, and having a portion of said band adjacent to at least one of said formed holes formed into the holes formed in the reinforcing bars, wherein the substantially rectangular band further comprises two hemmed longitudinal edges.

5,116,084

STEEL EYEJOINT

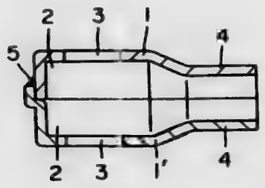
Masayoshi Usui, 843-14, Hon-Matsushita, Shizuoka Prefecture, Numazu, and Yasumitsu Kikuchi, 177-9, Kona, Izunagaoka-cho, Shizuoka Prefecture, Shizuoka, both of Japan

Filed Sep. 17, 1990, Ser. No. 583,452

Claims priority, application Japan, Sep. 18, 1989, 1-108892[U]; Sep. 18, 1989, 1-108893[U]

Int. Cl.[5] F16L *41/00*

U.S. Cl. 285—190 **9 Claims**



1. A steel eyejoint comprising a pair of opposed rigid half members, wherein each said half member includes a head section formed with a flat wall having an attaching hole extending therethrough and a peripheral wall extending from the flat wall, each said half member further including a tail section extending from the flat wall and the peripheral wall of the head section, said tail section being generally semi-arcuate in cross-section, said opposed rigid half members being assembled such that the flat walls of the head section are in opposed spaced relationship with the attaching holes thereof being generally registered for receiving a clamp bolt therethrough, the tail sections of the respective half members being partly overlapped and defining a hollow space thereinside for receiving the end of a pipe, the peripheral walls of the respective head sections being at least partly overlapped with an annular flow path defined thereinside which is in communication with the attaching hole and with the hollow space inside of the tail section, and the thus overlapped portions of the half members being brazed together, whereby the overlapping of portions of the opposed half members efficiently retain the half members together prior to brazing and enable an reliable brazed connection therebetween.

5,116,085

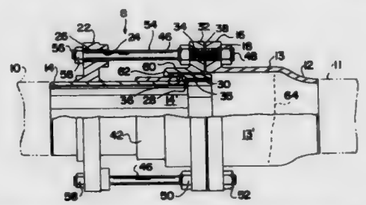
SEALED EXPANSION JOINT

Ralph E. Carrel, Fountain Inn, S.C., assignor to Bishamon, Inc., Ontario, Calif.

Filed Jun. 11, 1990, Ser. No. 535,891

Int. Cl.[5] F16L *21/02*

U.S. Cl. 285—225 **10 Claims**



1. An improved expansion joint for connecting two conduit sections to permit expansion and contraction thereof in accordance with temperature changes in fluids flowing therethrough, ambient temperature or other external sources comprising:

a first member connectable to one of said conduit sections, said first member having a flange located therearound with a plurality of openings defined therein;

a second member connectable to the other of said conduit sections, said first and second members having opposing ends telescopeable with respect to each other, said second member having a flange therearound, said flange defining a plurality of openings therein, said openings being in axial alignment with openings in said flange on said first member;

a rolling seal removably secured at said opposing ends of each of said members to effect a seal therebetween;

means located about a portion of said seal to guide rolling of the seal and shield the seal from external environs; and

a plurality of guide members removably secured between said flanges and being movable with respect to one of said flanges, whereby during expansion and contraction, said seal is rolled while avoiding twisting stresses.

5,116,086

QUICK ACTION COUPLING

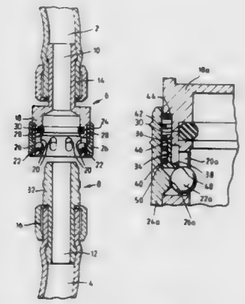
Rihard Psajd, Värnamo, Sweden, assignor to Ezze AB, Sweden

Filed Sep. 19, 1990, Ser. No. 584,627

Claims priority, application Sweden, Sep. 19, 1989, 8903072

Int. Cl.[5] F16L *27/12*

U.S. Cl. 285—277 **4 Claims**



1. A quick action coupling comprising:

a coupling body and a coupling nipple, each connectable with either of a pair of hoses; said coupling body including a coupling sleeve adapted for receiving said coupling nipple therein, said coupling sleeve being provided with slot-shaped through openings radially extending through the wall thereof and having a predetermined length in the longitudinal direction of said coupling sleeve,

locking balls positioned in said openings and radially movable between (a) an inner locking position in which said balls extend substantially inside the inner surface of the wall of said coupling sleeve and each engage a recess in said coupling nipple so as to lock said nipple in the sealing position in said coupling sleeve and (b) an outer releasing position in which said balls extend into said slot-shaped openings beyond the inner surface of said coupling sleeve to facilitate insertion and withdrawal of said nipple into and from said coupling body;

a locking sleeve inserted over the outer surface of said coupling sleeve and having an inwardly extending annular locking surface adapted to cooperate with said locking balls, said locking sleeve being axially movable along said outer surface of said coupling sleeve between a first locking position in which said locking surface engages said locking balls and a second position in which said locking surface is at a distance from said locking balls allowing for their radially outward movement into said releasing position in said slot-shaped openings,

wherein said predetermined length of said slot-shaped openings is so selected with respect to said annular locking surface of said locking sleeve such that an insertion of said nipple into said coupling body effects axial displacement of said balls within said openings away from an engagement with said locking surface without axial displacement of said locking sleeve,

a support ring including a first portion and a second, base portion defining a radially inwardly projecting annular part and a radially outwardly projecting annular part, said support ring being provided in a space formed between said coupling sleeve and said locking sleeve; said support ring being axially displaceable with respect to said coupling sleeve by sliding along at least two sliding engagement surfaces of said ring having different diameters, one of said sliding surfaces being defined by an inner surface of said first portion and said second sliding surface being defined by an inner edge surface of said inwardly projecting annular part, said first and second sliding surfaces being in guiding engagement with said coupling body, and

a common spring means positioned also in said space and confined between said outwardly projecting part and a surface of said coupling sleeve for influencing said locking balls and said locking sleeve through said support ring towards their locking position.

5,116,087

PIPE WHICH IS CONFIGURED FOR COUPLING TO ANOTHER PIPE

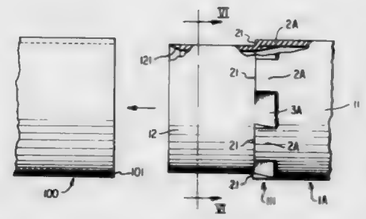
Siegfried Hopperdietzel, Selb, Fed. Rep. of Germany, assignor to Rehau Ag & Co., Rehau, Fed. Rep. of Germany

Filed Aug. 21, 1990, Ser. No. 570,424

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1989, 3928700

Int. Cl.[5] F16L *13/02*

U.S. Cl. 285—286 **16 Claims**



1. In a pipe which has a body portion with a predetermined outer diameter, an end portion with an outer diameter that is smaller than the outer diameter of the body portion, and a transition portion between the body portion and the end portion, at least part of the transition portion being tapered, the outer diameter of the end portion of the pipe corresponding approximately to the inner diameter of another conduit having an end into which the end portion of the pipe can be inserted to couple the pipe to the conduit, the end of the conduit having an end face, the improvement comprising:

abutment means, pressed out of the pipe at the transition portion, for providing a contact face to receive the end face of the conduit, the abutment means including stops which are distributed uniformly about he periphery of the transition portion and which are separated from one another by tapered regions of the transition portion.

5,116,088

VENTILATOR HAVING AN OSCILLATORY INSPIRATORY PHASE AND METHOD

Forrest M. Bird, P.O. Box 817, Sandpoint, Id. 83864

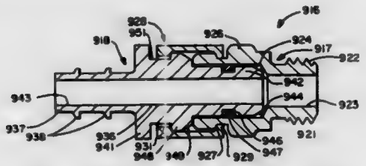
Division of Ser. No. 145,734, Jan. 14, 1988, Pat. No. 5,007,420, which is a continuation of Ser. No. 671,491, Nov. 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 516,133, Jul. 21, 1983, Pat. No. 4,592,349, which is a continuation-in-part of Ser. No. 291,622, Aug. 10, 1981, abandoned, which is a continuation-in-part of Ser. No. 261,629, Apr. 3, 1981, abandoned, which is a continuation-in-part of Ser. No. 250,586, Apr. 3, 1981, abandoned. This application Aug. 30, 1989, Ser. No. 400,720

Int. Cl.[5] F16L *39/00*

U.S. Cl. 285—319 **3 Claims**

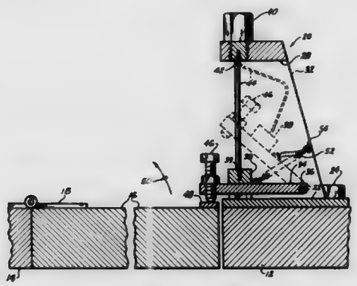
1. In a quick disconnect assembly, a female fitting having a socket formed therein, a male fitting having an integral bayonet adapted to fit in said socket, cooperative sealing means carried by said female and male fittings for forming an airtight seal between the bayonet and the socket and releasable retaining means carried by one of said fittings for retaining said fittings in engagement with each other, said releasable retaining means being circumferential in form and having first and second ends, said first end having axially extending slots therein to provide segmental lips, said first end being provided with an inwardly annular extending lip, said female fitting

being provided with an annular recess receiving said annular lip, said second end having an annular shoulder, said male fitting having an annular recess adapted to receive said annular shoulder, said male fitting being provided with an inclined camming surface for camming said annular shoulder carried by said segmental lips outwardly during movement of the male fitting into the female fitting to expand said first end of the releasable retaining means to clear said inclined camming



surface and to drop into the annular recess provided on the male fitting to provide the sole means independent of forces created by the sealing means for retaining said male fitting in engagement with the female fitting, said male fitting and said annular shoulder of retaining means having cooperative surfaces whereby when said male fitting is pulled away from said female fitting said segmental lips are cammed outwardly to permit a quick disconnect between the male and female fittings.

5,116,089
EXPLOSION VENT DOOR RELEASE
Julian S. Taylor, 8300 SW. 8th, Oklahoma City, Okla. 73128
Filed May 6, 1991, Ser. No. 695,668
Int. Cl.[5] E05C *3/02*
U.S. Cl. 292—78 **3 Claims**



1. A pressure release apparatus for a door hingedly mounted between door jambs and normally closing a vent opening of a chamber or area subject to dangerously elevated internal pressure, comprising:

a base member mounted on the door jamb adjacent the door edge opposite its hinge mounting;

a pin support body means rigidly secured to said base member and having a portion overhanging said base;

arm means having one end portion overlying an edge portion of said door and secured, at its other end portion, to said body means for pivoting movement of said one end portion toward and away from said door edge portion;

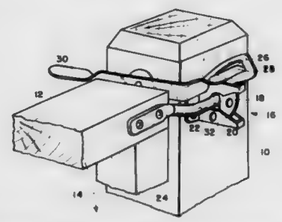
an elongated collapsible pin axially extending between the arm means said one end portion and the body means overhanging portion for normally maintaining said door in closed position; and,

first and second pin end support means each having a socket axially aligned with the other,

said first support means supported by said arm one end portion and,

said second support means supported by the body overhanging portion for supporting respective end portions of said pin.

5,116,090
GATE LATCH CAM
Frederick C. Nichandros, 19640 Center St., Castro Valley, Calif. 94546
Filed Nov. 26, 1990, Ser. No. 617,562
Int. Cl.[5] E05C *3/14*
U.S. Cl. 292—236 **4 Claims**



1. A gate latch for securing a swinging gate to a gate post, said gate latch comprising:

a cam member mountable normal to the surface of the gate post in a yoke attachable to said gate post, said cam member being rotatable about a pivot in said yoke and having a gate pin slot rotatable between an open and a locked position;

a gate pin attachable to the swinging gate and having an end extendible into said gate pin slot in its open position, said gate pin end for striking an arcuate surface on said cam member in its locked position for forcing rotation of said cam member into its open position to receive said pin;

the improvement comprising: an arcuate slot in said cam member, said slot extending above and outward from said gate pin slot and having an arcuate opening edge and closing edge said arcuate opening edge and said arcuate closing edge being plotted from centers below said cam member; and

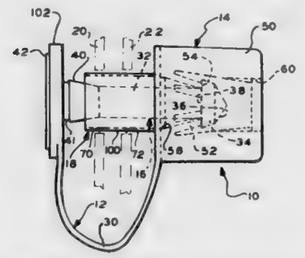
a latch bar extendible from the side of the gate opposite said latch, through an opening between said gate and said gate post and terminating in a flat tongue within said arcuate slot, a lifting of said tongue acting upon the opening edge of said arcuate slot to rotate said cam member into its open position, and a lowering of said tongue acting upon the closing edge of said arcuate slot to urge rotation of said cam member into its closed position.

5,116,091
LOCKING OR SECURITY SEAL WITH PROTECTIVE SHROUD
Allan W. Swift, Denville, N.J., assignor to E. J. Brooks Co., Newark, N.J.
Filed Sep. 21, 1990, Ser. No. 586,429
Int. Cl.[5] E05C *10/18*
U.S. Cl. 292—318 **16 Claims**

1. An improved, frangible locking or security seal of the type which includes: a flexible band carrying at one end a housing and at the other end an elongated pin-like locking portion extending away from the band, the housing containing means for permitting insertion of a terminus of the locking portion thereinto while the remainder of the locking portion extends away from the housing, and for preventing withdrawal of the inserted locking portion terminus; the extending remainder of the locking portion being adapted to be located within apertures formed through relatively movable members of a closure, following which the locking portion terminus is inserted into the housing, the band and the housing maintaining the extending remainder of the locking portion within the apertures; attempts to tamper with or defeat the seal or to move the

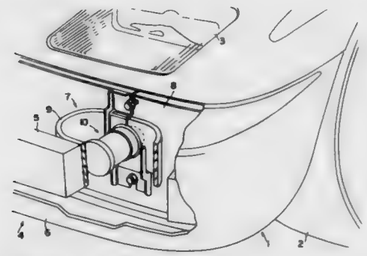
members of the closure resulting in the seal becoming disintegral to thereby give a visual indication of such attempts; the members of the closure and the seal undergoing vibratory or oscillatory motion during transportation and handling, which motion may result in disintegrity of the locking portion; wherein the improvement comprises:

a shroud adjacent the housing and surrounding both the point of insertion of the locking portion terminus into the housing and the majority of the extending remainder of



the locking portion, the length of the shroud being slightly less than the distance, taken along the locking portion, between the two ends of the band when the locking portion terminus is held in the housing, the shroud being adapted to be interposed between the extending remainder of the locking portion and the walls and edges of the apertures in the closure members to prevent the locking portion from being cut or sheared by the vibratory or oscillatory motion.

5,116,092
BUMPER ARRANGEMENT FOR MOTOR VEHICLES, PARTICULARLY PASSENGER CARS
Gerhard Schönleber, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany
PCT No. PCT/EP89/01110, § 371 Date Mar. 20, 1991, § 102(e) Date Mar. 20, 1991, PCT Pub. No. WO89/07465, PCT Pub. Date Aug. 24, 1989
PCT Filed Sep. 23, 1989, Ser. No. 663,820
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 3833048
Int. Cl.[5] B60R *19/06*
U.S. Cl. 293—132 **20 Claims**



1. A bumper arrangement for a motor vehicle having a vehicle body, comprising:

a bumper;

at least one fastening device by which said bumper is held on the vehicle body at a changeable distance, and which can essentially regenerate after said distance changes within a first distance area;

impact absorbing tubes which act as supporting devices for distance changes within a second distance area that is nearer to the vehicle body than the first distance area, and in the event of a pressure load in a longitudinal direction of the tube said impact absorbing tubes acting as supporting devices and being unable to regenerate, said impact absorbing tubes having tube walls, said tube walls being destroyed on a tube end side in the event of a pressure load and the material of the tube wall being deflected in a transverse direction;

wherein said impact absorbing tubes are parts separate from the at least one fastening device and consist of at least one fiber composite, with fibers of the fiber composite arranged at least essentially in the longitudinal direction of the tube.

5,116,093
RESCUE DEVICE
O. Edward Burns, P.O. Box 4039, Scottsdale, Ariz. 85261
Continuation-in-part of Ser. No. 386,421, Jul. 28, 1989, abandoned. This application Dec. 20, 1990, Ser. No. 633,099
Int. Cl.[5] A62B *37/00*; B25J *1/00*
U.S. Cl. 294—19.1 **4 Claims**



1. Apparatus for applying from a first location a pulling force on clothing worn on an individual at a second location, said clothing having a generally flat portion, said apparatus including

(a) an elongate member (16) having a longitudinal axis (71) and extending from said first location toward said second location and including

(i) a first end at said first location, and

(ii) a second end (15) adjacent said second location;

(b) clothing engagement means attached to said second end and including at least a pair of spaced apart contact feed (50, 52) extending outwardly away from said second end (15) and said first end, each of said feet including

(i) a bottom surface (56) for contacting said flat portion of said clothing, and

(ii) at least one side surface (59) extending away from said bottom surface generally toward said second end and coterminating with said bottom surface (56) to form a clothing-engaging edge (60),

said side surface and clothing-engaging edge moving laterally around said longitudinal axis (71) and bearing against and frictionally engaging said clothing when said elongate member and said clothing engagement means ar rotated,

said edge (60) and side surface (59) extending at an angle with respect to said longitudinal axis (71) of said elongate member (16),

said edge being generally parallel to clothing contacting said bottom surface (56);

(c) means for rotating said elongate member and said clothing engagement means and for pressing said bottom surfaces (56) of said feet against said clothing;

said edges frictionally engaging and gathering said flat portion of said clothing and causing said clothing to climb outwardly away from said individual toward said second end of said elongate member (16) and up and over said feet when

(d) said bottom surfaces (56) of said feet (50, 52) are pressed

against said flat portion of said clothing with said longitudinal axis (71) perpendicular to said flat portion, and

(e) said elongate member and feet are rotated about said longitudinal axis.

5,116,094

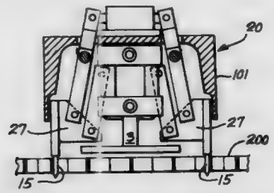
APPARATUS AND METHOD FOR HANDLING HONEYCOMB CORE

Darrell D. Jones, Lynnwood, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 324,276, Mar. 14, 1989, abandoned. This application Mar. 23, 1990, Ser. No. 499,923

Int. Cl.[5] B25J *15/04*

U.S. Cl. 294—81.61 **1 Claim**



1. An end-of-arm tool for transporting honeycomb core sections comprising in combination:

a frame member;

a plurality of spaced apart gripper modules distributed along said frame member;

each of said plurality of spaced apart gripper modules having a pair of gripper head jaws;

each of said pair of gripper head jaws having a plurality of pins;

a pair of Hall sensors disposed on a pair of said plurality of spaced apart gripper modules for sensing the distance between said pair of gripper jaws;

signal processing circuit means coupled to each of said pair of Hall sensors for sensing the movement of said gripper head jaws; and,

means including a cylinder for ejecting a core section from said end-of-arm tool by retraction of said plurality of pins while simultaneously pushing said core section off of said plurality of pins.

5,116,095

APPARATUS FOR LIFTING HEAVY EQUIPMENT

John E. Kotrla, Harris County, Tex., assignor to Baroid Technology, Inc., Houston, Tex.

Filed Jan. 16, 1991, Ser. No. 642,198

Int. Cl.[5] B66C *1/62;* **E21B** *25/00*

U.S. Cl. 294—94 **5 Claims**

1. A running tool used in lifting heavy equipment with a lifting means, said running tool comprising:

a. an inner body;

b. an outer body surrounding said inner body;

c. an engaging means wherein said engaging means to engage heavy equipment includes,

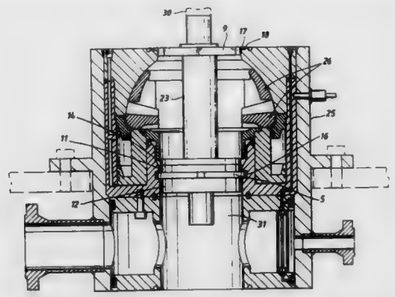
a plurality of dogs slidably mounted within said inner body to physically engage said heavy equipment.

a first disc fixed onto said outer body,

a second and a third disc fixed onto said inner body so that said second and third discs are fixed with respect to each other and with respect to said inner body, said second disc being located between said first and third discs,

said dogs being slidably attached between said second and third disc, said dogs having an upper surface, said upper surface being the engaging surface when said engagement dogs are extended into a groove in said heavy equipment, said groove being shaped to adapt to said engagement dogs,

engaging pins fixed to said dogs and slidably mounted in slots located in said first, second, and third discs so that rotation in a first direction of said second and third discs relative to said first disc constrains said engaging pins and hence said dogs to move outward relative to said running tool, said engaging pins being mounted so that



rotation in a second opposite direction constrains said engaging pins and hence said engagement dogs to move inward relative to said running tool;

d. a keeper assembly for securing said outer body from further motion relative to said heavy equipment such that said engaging means is properly aligned with said heavy equipment; and

e. a locking assembly for locking said running tool in an engaged position during operation.

5,116,096

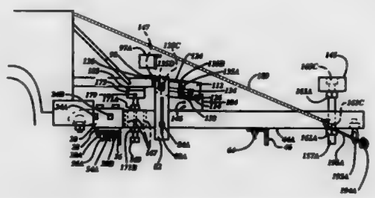
TRUCK CARGO SUPPORT OUTRIGGER

George F. Taylor, 314 Rocky Creek Rd., Hampton, Ga. 30228

Filed Apr. 3, 1990, Ser. No. 504,122

Int. Cl.[5] B62D *33/02*

U.S. Cl. 296—3 **1 Claim**



1. An article of manufacture for providing outboard support for long pieces of cargo extending outward of a rear of a cargo bed of a pickup truck, the pickup truck having a tailgate, the article comprising:

a rearward protruding means connected to said rear, below a level of said bed, wherein the rearward protruding means protrudes rearward a number of feet away from said bed and said tailgate, and provides a support for a portion of said cargo which extends from said bed rearward beyond a support for said cargo of said bed; and

an upward protruding means which protrudes upward from connecting points thereof with said rearward protruding means, and which is adapted, due to a point thereof of contact with the pickup truck, of providing vertical support and lateral stability to the rearward protruding means, and wherein the upward protruding means comprises structural parts for contact with said tailgate.

5,116,097

MOTOR CAR WITH THREE FRONT SEATS SIDE BY SIDE

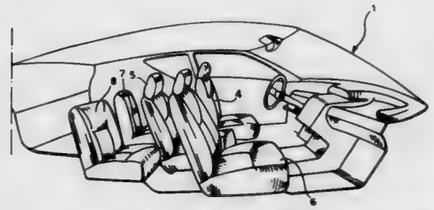
Gianni Bulgari, Roma, Italy, assignor to Gianni Bulgari S.p.A., Roma, Italy

Filed Oct. 17, 1990, Ser. No. 599,312

Claims priority, application Italy, Oct. 17, 1989, 67894 A/89

Int. Cl.[5] B60N *1/00*

U.S. Cl. 296—64 **3 Claims**



1. A five-seat motor car having a longitudinal axis extending front to aft, comprising:

a passenger compartment with a front and a rear row of seats, wherein the front row of seats includes a central front seat and two side front seats, one of said two side front seats being a driving seat, said central front seat being slightly displaced rearwardly with respect to said two side front seats so that a person occupying said central front seat is laterally supported by adjacent sides of said two side front seats, and

wherein said rear row of seats includes only two separate rear seats which are laterally spaced apart from each other and have respective longitudinal axes which are rotated with respect to the longitudinal axis of the motorcar so that they diverge forwardly, the space immediately laterally between said two rear seats being partially occupied by said central front seat.

5,116,098

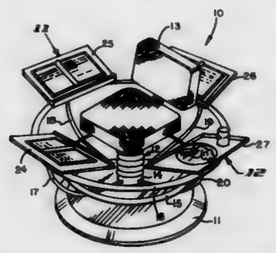
MULTIPLE DESK AND SEAT APPARATUS

Ginger M. Wooten, 112 Minoa Cir., Jacksonville, N.C. 28540

Filed May 29, 1990, Ser. No. 529,538

Int. Cl.[5] A47B *83/00*

U.S. Cl. 297—170 **6 Claims**



1. A multiple desk and seat apparatus comprising, in combination,

An "L" shaped seat member, the "L" shaped seat member fixedly mounted to an upper support rod, the upper support rod spaced from and coaxially aligned with a lower support rod, the lower support rod and the upper support rod including a shock-absorbing dampener mounted therebetween, the lower rod and upper rod including a spring bellows housing mounted about the upper and lower rods and the shock-absorbing dampener, and

the lower rod mounted to a lower support base, the lower support base mounted to a support base housing, and an upper support base coaxially aligned with and overlying the lower support base underlying the spring member with the upper support base rotatably mounted relative to the lower support base, wherein the upper support base includes a framework means positioned for rotation about the seat and the lower support base, the framework means mounted to the upper support base, and

the framework means including a plurality of desks mounted thereon.

5,116,099

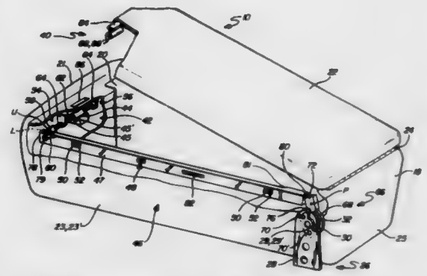
MECHANICAL LATCH LOCKING A COVER OF PIVOTING ARMREST ASSEMBLY

Kenneth Kwasnik, Kalamazoo, and David J. Harrell, Royal Oak, both of Mich., assignors to Lear Seating Corporation, Southfield, Mich.

Filed May 14, 1991, Ser. No. 700,577

Int. Cl.[5] A47C *7/62*

U.S. Cl. 297—194 **23 Claims**



1. A vehicle seat armrest assembly (10) comprising: a lower bin (18) defining a storage compartment (20); an upper cover (22) for covering said lower bin (18); a cover hinge means (24) hinging said cover (22) to said bin (18) for pivotal movement of said cover (22) relative to said bin (18) between a closed position covering said bin (18) and an open position opening said storage compartment (20); bracket means (26) supporting said lower bin (18) for providing rotation of said bin (18) between a horizontal use position and a vertical storage position; latch means (40) for latching said cover (22) to said lower bin (18) in a latched position and allowing opening of said cover (22) in an unlatched position; said assembly characterized by including locking means (42) interacting between said bracket means (26) and said latch means (40) for maintaining said latch means (40) in said latched position in response to pivotal movement of said bin (18) to a predetermined position above said horizontal use position toward said vertical storage position so that said cover (22) remains latched to said bin (18) in all positions above said predetermined position.

5,116,100

PORTABLE OCCUPANT-ARISING ASSIST SEAT WITH TORSION SPRINGS

Howard L. Iversen, P.O. Box 101, Shandon, Calif. 93461

Filed Oct. 25, 1990, Ser. No. 603,318

Int. Cl.[5] A47C *1/00*

U.S. Cl. 297—313 **5 Claims**

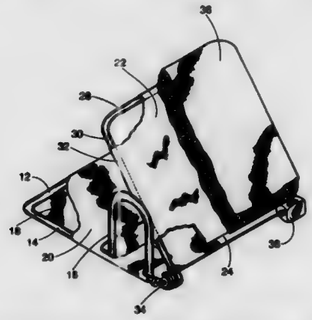
1. Apparatus that is placed on a seat to help its user in being seated and in arising, said apparatus comprising:

a rigid tubular U-shaped frame that rests on the seat when in use and that includes a rear portion and right and left side portions, and that further includes right and left hand holds that extend upwardly from the right and left side portions respectively;

a sheet of a pliable material that spans said rigid tubular U-shaped frame and that supports and stabilizes the apparatus on the seat when in use;

a tubular U-shaped panel support having a left portion, a rear portion and a right portion, the width of said tubular U-shaped panel support being less than the spacing between the right and left hand holds;

right and left torsion springs resiliently connecting said rigid tubular U-shaped frame to said tubular U-shaped panel support and holding said tubular U-shaped panel support



in an unloaded position in which it is inclined upwardly to the rear relative to said rigid tubular U-shaped frame, said right and left torsion springs permitting said tubular U-shaped panel support to yield to the user's weight by pivoting downward toward said rigid tubular U-shaped frame,

said right and left torsion springs each including a frame shank extending into an end of said rigid tubular U-shaped frame, and each including a panel support shank extending into an end of said tubular U-shaped panel support.

5,116,101

SEAT DISCOMFORT PREVENTIVE DEVICE

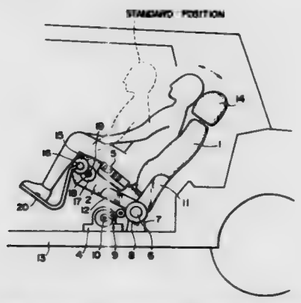
Tatsuya Sekido, Gifu, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Sep. 25, 1990, Ser. No. 587,794

Claims priority, application Japan, Sep. 27, 1989, 1-251591

Int. Cl.[5] B60N *2/00*

U.S. Cl. 297—330 **6 Claims**



1. A seat discomfort preventive device comprising a seat back capable of inclining and rocking in the fore-and-aft direction,

a seat cushion capable of inclining and rocking in the fore-and-aft direction independently of said seat back,

console means for delivering signals designating inclining and rocking conditions depending on the choice of a user,

inclining and rocking control means connected to the console means, for delivering control signals in response to the signals from the console means, and

first drive means for inclining at least one of the seat back and the seat cushion from a standard position and thereafter rocking the same repeatedly based on a sense of fatigue or stagnation of blood, in response to the control signals from the inclining and rocking control means.

5,116,102

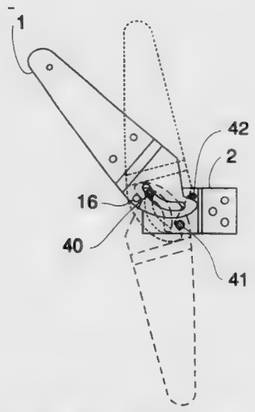
FISHING BOAT CHAIR AND BRACKET THEREIN

Robert L. Chaundy, P.O. Box 1075, Solomons, Md. 20688

Filed Jul. 17, 1990, Ser. No. 553,571

Int. Cl.[5] B60N *1/02*

U.S. Cl. 297—357 **25 Claims**



1. A bracket comprising

a first part including two parallel plates fixedly spaced from each other and joined at their forward ends, and at least two cross-parts extending perpendicularly to and between said two parallel plates, each said cross-part having a respective end-part which is engaged at a respective position on each respective one of said plates, a first of said at least two cross-parts being located below and closer to said forward ends than a second of said cross-parts, and

a second part with a near end which extends between said two plates of said first part, said near end having an extreme tip, a slot through which said second one of said cross-parts passes, and a bearing edge surface in the vicinity of said extreme tip, said slot having an inner edge on the side of said slot closest to said bearing edge surface and an outer edge on the other side of said slot, said slot extending at least in part diagonally to a lengthwise direction of said second part, said second part having a far end opposite said near end, said slot having a near end on the side of said near end of said second part and a far end on the side of said far end of said second part, said at least in part diagonal extension of said slot including a portion of said slot, including said near end thereof, pointing roughly towards said bearing surface at said near end of said second part.

wherein when said second part is in a predetermined upright position relative to said first part, said bearing edge surface engages in part from below said first cross-part, and said second cross-part engages at least in part said inner edge of said slot at said far end of said slot; and

wherein said second part can be rotated in a rearward direction from said upright position toward a fully-down position after only lifting said second part vertically while said second cross-part moves in said slot towards said near end of said slot, to allow said bearing edge surface and said

extreme tip of said second part to clear said first cross-part and rise above it.

5,116,103

METHOD OF STEERING A MINING MACHINE

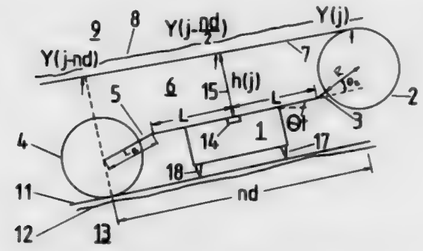
Foster Lewins, Mickleover; Bruce N. Roth, Burton-on-Trent, and John S. Wykes, Chellaston, all of England, assignors to Coal Industry (Patents) Limited, United Kingdom

Filed Feb. 11, 1991, Ser. No. 653,630

Claims priority, application United Kingdom, Feb. 9, 1990, 9002956

Int. Cl.[5] E21C *35/24*

U.S. Cl. 299—1.6 **12 Claims**



1. A method of steering a double-ended ranging drum mining machine in a seam in which the machine has a leading cutting drum arranged to cut mineral from a face to a distance at or near the interface of the mineral and an adjacent roof stratum, and a trailing cutting drum arranged to remove residual material from the face and to form a floor, the method comprising the steps of

positioning a first current cut roof follower means at or adjacent the centre of the machine,

measuring the machine tilt using second means,

estimating coal thickness using third means and generating algorithms therefrom

whereby the height difference between points on the current cut roof can be calculated to control and steer the leading and trailing cutting drums, the algorithms being generated in such a manner that cumulative errors along or towards the face are minimized or eliminated.

5,116,104

METHOD AND EQUIPMENT FOR LOOSENING AND/OR WINNING MINERALS ESPECIALLY COAL AND AGGREGATED MATERIALS BY USING COMPRESSED AIR BREAKING

György Gergo, Pecs; Zoltan Vida, Komlo; Bela Sebestyen, Pecs; Jozsef Nemeth, Budapest; Istvan Viragh, Budapest; Monath, deceased Lajos, late of Budapest, and Gábor Monath, Bp. Kresz Géza, all of Hungary, assignors to Mecseki Szenbanyak, Pecs and Impari Technologiai Intezet, Budapest, both of, Hungary

Filed Aug. 6, 1990, Ser. No. 563,265

Claims priority, application Hungary, Jun. 19, 1990, 3217/89

Int. Cl.[5] E21C *37/14*

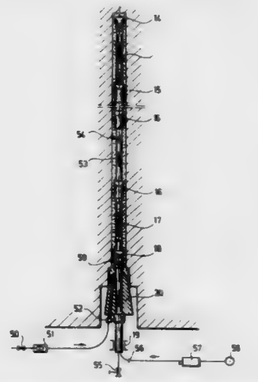
U.S. Cl. 299—16 **14 Claims**

1. A method of loosening mineral matter comprising the steps of:

(a) drilling a bore hole in a mineral stratum with a drill, thereby forming a mouth of said bore hole and a length thereof extending away from said mouth;

(b) continuously supplying a flushing medium to said bore hole during drilling in step (a) by passing said medium through said drill, thereby flushing mineral matter from said bore hole; and

(c) while said drill extends along said length of said bore hole, conveying compressed breaking air through the drill and releasing said compressed breaking air controlledly into said bore hole independently of the supply of the



flushing medium, thereby breaking the mineral matter of said stratum.

5,116,105

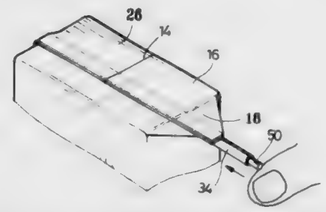
DRINK CONTAINER WITH PIPETTE

Pi-Lien Hong, 1F, No. 13, Alley 158, Lane 30, Yung-Chi Rd., Taipei, Taiwan

Filed Dec. 3, 1990, Ser. No. 620,616

Int. Cl.[5] B65D *77/28*

U.S. Cl. 229—103.1 **2 Claims**

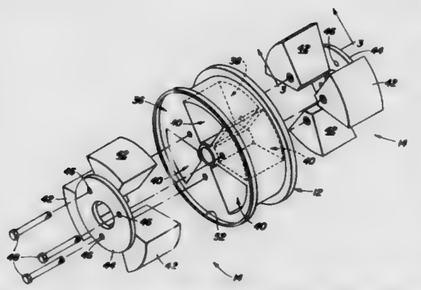


1. A disposable three dimensional drink container having a top wall, a bottom wall, and four side walls, a triangular flap extending from one edge of the top wall for disposition along one of the four side walls; said flap having an inner surface facing said one side wall and an outer surface facing away from said one side wall; a hole in said one side wall near said one edge of the top wall, said hole being in registry with said flap when the flap is disposed along said one side wall; a sealant patch one said one side wall overlying said hole; a hollow extensible pipette means carried on the inner surface of said flap; said pipette means comprising a tubular support means (34) and a hollow tubular liquid conduit means (50) slidably carried in said support means; said hollow tubular conduit means having a sharpened end registrable with said hole when said flap is lifted away from said one side wall to a position in approximate planar alignment with said top wall; said tubular conduit means being manually slidable in said support means so that its sharpened end pierces the sealant patch and extends into said hole.

5,116,106
TRACTOR HUB WITH DETACHABLE WHEEL WEIGHTS

Terry D. Hardesty, Columbus; Wayne R. Hutchison, Mayville; Richard D. Teal, Horicon, all of Wis., and Robert J. Cleereman, Midland, Mich., assignors to Deere & Company, Moline, Ill.

Filed Jun. 14, 1991, Ser. No. 715,176
Int. Cl.[5] B60B *15/28*
U.S. Cl. 301—41 W **15 Claims**

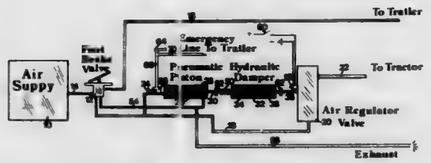


1. Detachable wheel weights usable in a wheel hub having spaced apart inside and outside wall structures oriented generally perpendicular to its axis of rotation,
the hub including, a plurality of circumferentially spaced compartments formed between the wall structures, with adjacent compartments having openings in opposite wall structures;
the detachable wheel weights including first and second wheel weight means having weight members which are complimentarily shaped to and receivable in the compartments, the first and second weight means being receivable respectively in the compartments of the inside and outside wall structures; and
means for detachable fastening said first and second weight means together and in said compartments.

5,116,107
PNEUMATIC BRAKING SYSTEM FOR TRACTOR AND TRAILER

Harold L. Hull, 401 Canyon Way #43, and Terrence W. Stevenson, 401 Canyon Way #40, both of Sparks, Nev. 89434

Filed Jul. 3, 1990, Ser. No. 552,569
Int. Cl.[5] B60T *8/22*
U.S. Cl. 303—7 **14 Claims**

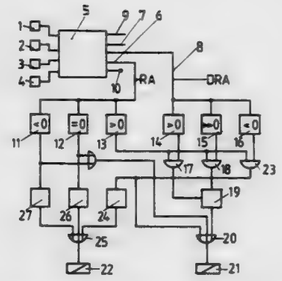


1. A pneumatic braking system comprising; a source of compressed air, an air valve having a variable open position and a combination closed and exhaust position, said air valve being communicated to a trailer brake-applying means, a first housing defining a chamber therein, a piston slideably mounted in said chamber dividing the latter into first and second sections, said first section being communicated with said variable open position of said air valve, a second housing defining a chamber therein, a piston slideably mounted in said chamber dividing the latter into first and second sections, said first and second sections being filled with a viscous fluid, said first and second sections being communicated to provide a dampening means when said piston is urged from said first section to said second section, said piston of said first housing having attaching means to said piston of said second housing, an air regulator, means connecting said piston of said second chamber to said air regulator, said air regulator being communicated to said variable open position of said air valve, said air regulator being communicated to tractor brake-applying means, said attaching means of said pistons of said first and second chambers having a first and second position, means to return said attaching means from said second position to said first position, whereby, said source of compressed air, said air valve, said first housing with said slideable piston, said second housing with said slideable piston, said dampening means, said attaching means between said pistons, said return means of said attaching means, said air regulator, said trailer brake-applying means, said tractor brake-applying means, all cooperating together to form a braking system for supplying a variable source of air to said trailer brake-applying means and said tractor brake-applying means, receiving substantially less air pressure than said trailer brake-applying means when first activated and said pressure increasing over a time period to a near matching air pressure of said trailer brake-applying means.

5,116,108
DRIVE SLIP CONTROL SYSTEM

Alfred Sigl, Sersheim; Manfred Meissner, Unterriexingen; Thomas Isella, Markgröningen, and Johannes Schmitt, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP88/01121, § 371 Date Jul. 6, 1990, § 102(e) Date Jul. 6, 1990, PCT Pub. No. WO89/06615, PCT Pub. Date Jul. 27, 1989
PCT Filed Dec. 8, 1988, Ser. No. 543,821
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1988, 3801321
Int. Cl.[5] B60T *8/32, 8/62;* B60K *28/16*
U.S. Cl. 303—103 **12 Claims**

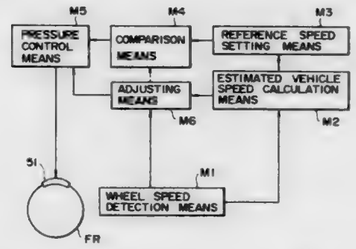


1. Drive slip control system for a vehicle having driven wheels and non-driven wheels which rotate at respective wheel speeds, said system comprising
means for determining the speeds of the driven wheels,
means for determining the speeds of the non-driven wheels,
means for determining a vehicle speed,
means for determining deviations of the speeds of the driven wheels from the vehicle speed,
means for determining accelerations of the driven wheels,
means for increasing brake pressure at at least one of said driven wheels at least temporarily in pulses when the deviation of the speed of said at least one of said driven wheels is greater than a first value and the acceleration of said at least one of said driven wheels is greater than a second value,
means for decreasing brake pressure at said at least one of said driven wheels at least temporarily in pulses when the deviation of the speed of said at least one of said driven wheels is above said first value and the acceleration of said at least one of said driven wheels is below said second value.

5,116,109
ANTI-SKID CONTROL SYSTEM FOR AN AUTOMOTIVE VEHICLE

Kazutaka Kuwana, Toyota; Tsuyoshi Yoshida, Obu; Hiroyuki Ichikawa, Okazaki; Masaru Kamikado, Anjo; Kuniaki Okamoto, Nagoya, and Satoshi Itabashi, Toyota, all of Japan, assignors to Aisin Seiki Kaibshiki Kaisha, Kariya, Japan

Filed Dec. 19, 1990, Ser. No. 630,182
Claims priority, application Japan, Dec. 28, 1989, 1-342558
Int. Cl.[5] B60T *8/32*
U.S. Cl. 303—109 **10 Claims**



1. An anti-skid control system for an automotive vehicle having a wheel brake cylinder mounted on each road wheel for applying a braking force thereto, comprising:
detection means for detecting wheel speed of said each road wheel;
means for calculating an estimated vehicle speed on the basis of said wheel speed;
means for setting a primary reference speed on the basis of said estimated vehicle speed;
comparison means for comparing said wheel speed with said primary reference speed;
pressure control means for controlling a hydraulic braking pressure supplied to said wheel brake cylinder in response to a result of said comparison means; and
adjusting means for controlling said pressure control means to decrease said hydraulic braking pressure in said wheel brake cylinder in response to a change of difference between said wheel speed and said estimated vehicle speed for a predetermined period of time.

5,116,110
PARTIALLY COHERENT OPTICAL SYSTEM WITH SCATTERING TYPE OBJECT

Frederic J. Kahn, Palo Alto, Calif., assignor to Greyhawk Systems, Inc., Milpitas, Calif.

Filed Mar. 3, 1989, Ser. No. 318,671
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—40 **14 Claims**

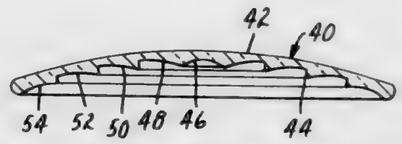


1. An optical system having a projection lens for imaging a scattering type object on an image receiving surface, comprising:
light generating means for propagating light towards and through a scattering type object having an image impressed therein;
projection lens means for imaging said scattering type object onto an image receiving surface; and
optical condenser means located between said light generating means and said scattering type object for condensing light before said light propagates through said scattering type object in such a manner that said condensed light underfills said projection lens means to produce a partially coherent illumination of said projection lens means;
said partially coherent illumination being propagated onto said image receiving surface for creating said image on said image receiving surface.

5,116,111
MULTI-FOCAL DIFFRACTIVE OPHTHALMIC LENSES

Michael J. Simpson, Maplewood, Minn., and John A. Futhey, Petaluma, Calif., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 176,701, Apr. 1, 1988, abandoned. This application Feb. 11, 1991, Ser. No. 653,613
Int. Cl.[5] G02C *7/04;* G02B *27/42;* A61F *2/14, 2/16*
U.S. Cl. 351—161 **17 Claims**



1. A multifocal ophthalmic lens having optical power, at least a portion of said optical power being produced by diffraction, said lens having a plurality of diffractive zones including a central zone and a plurality of concentric annular zones, said central zone having a radius r_0 and the innermost of said annular zones having a radius r_1 where r_0^2 is not equal to $r_1^2 - r_0^2$.

5,116,112
COLORED LENS AND METHOD OF MANUFACTURE

David L. Rawlings, Bayville, N.Y., assignor to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 222,709, Jul. 21, 1988, Pat. No. 5,034,166. This application Apr. 19, 1991, Ser. No. 688,909
Int. Cl.[5] G02C *7/04*
U.S. Cl. 351—162 **25 Claims**



1. A molded contact lens containing a transparent central visual region circumscribed by a colored iris portion made by the process which comprises
a. coating a colored liquid which is either thermosetting or thermoplastic in a mold for making a contact lens onto a surface thereof where the iris portion of the lens is formed to produce a colored film providing a pattern thereon which film contains a surface exposed to the interior of the mold and a surface in contact with the mold,
b. charging the mold with the lens-forming liquid used to form the body of the lens while maintaining the colored film in the iris portion and configuring the lens-forming liquid about the colored film whereby surface of the film

becomes integral with the body of the lens and surface of the film becomes part of the outer surface of the lens when the molded lens is removed from the mold.

5,116,113
LASER EYE PROTECTIVE DEVICES

Nori Y. C. Chu, Shrewsbury, Mass., assignor to American Optical Corporation, Southbridge, Mass.

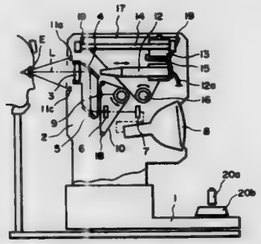
Filed Sep. 10, 1990, Ser. No. 579,942
Int. Cl.[5] G02C *7/10*; G02B *5/22*
U.S. Cl. 351—163 **8 Claims**

1. A laser eye protective device including:
an optically clear organic polymeric host material; and
at least one cupric or ferrous metal ion containing organic compound which absorbs light at a wavelength above about 680 nm, said metal ion containing compound being compatible with, and distributed in, said polymeric host material.

5,116,114
OPHTHALMOLOGIC APPARATUS

Yukitsugu Nakamura, Sagamihara; Yoshimasa Hamano, Yamato; Takashi Masuda, Kawasaki; Isao Matsumura, Yokosuka; Shigeo Maruyama, Machida, and Kazunobu Kobayashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 609,097, Nov. 5, 1990, abandoned, which is a continuation of Ser. No. 248,042, Sep. 23, 1988, abandoned. This application Sep. 30, 1991, Ser. No. 767,360
Claims priority, application Japan, Sep. 30, 1987, 62-250536; Jan. 12, 1988, 63-004030; Mar. 23, 1988, 63-070298
Int. Cl.[5] A61B *3/10*
U.S. Cl. 351—205 **15 Claims**

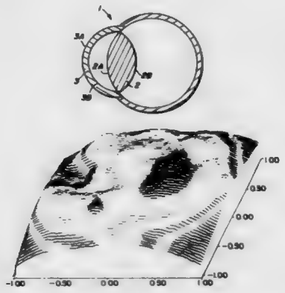


1. An ophthalmologic apparatus, comprising:
(a) a first measuring system for detecting first information of an eye to be examined at a predetermined working distance relative to the cornea of the eye to be examined;
(b) a second measuring system for detecting second information of the eye to be examined with a detection terminal brought into contact with the cornea of the eye to be examined;
(c) observation means for observing a positioning alignment state of said detection terminal to the eye to be examined from a moving direction of said detection terminal, said observation means being fixed at least in the moving direction of said detection terminal during the detecting performed using said detection terminal;
(d) driving means for moving said detection terminal relative to said first measuring system from a position at which said detection terminal is spaced apart from the cornea of the eye to be examined to a position at which said detection terminal contacts the cornea of the eye to be examined without shifting the entire apparatus in the moving direction of said detection terminal; and
(e) driving control means for controlling said driving means so as to slow down at least the speed of movement of said detection terminal when said detection terminal comes near the cornea of the eye to be examined.

5,116,115
METHOD AND APPARATUS FOR MEASURING CORNEAL TOPOGRAPHY

Steven R. Lange, and Edmond H. Thall, both of Tucson, Ariz., assignors to Wyko Corporation, Tucson, Ariz.

Filed May 9, 1990, Ser. No. 521,487
Int. Cl.[5] A61B *3/10*
U.S. Cl. 351—212 **18 Claims**

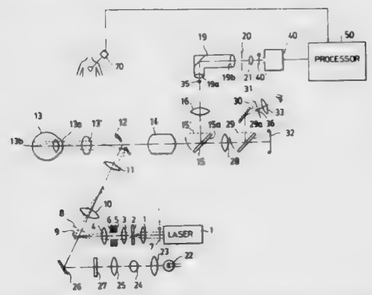


1. A method for profiling an anterior surface of a cornea, comprising the steps of:
(a) placing a thin, elastic, diffusely reflecting cover material on the cornea, the cover material conforming to the shape of the cornea;
(b) operating a slide projector to project a structured light pattern on the cover material and modulating the phase of the structured light pattern;
(c) operating a detector to view the structured light pattern on the cover material;
(d) digitizing intensities of signals from the detector, transferring the digitized intensities to a computer, and operating the computer to compute a phase of each point on the cover material;
(e) operating the computer to calculate the relative height of the cover material from the computed phase for each point.

5,116,116
OPHTHALMOLOGICAL DIAGNOSIS METHOD

Yoshihisa Aizu, Machida, and Kohji Ogino, Hino, all of Japan, assignors to Kowa Company Ltd., Japan

Filed Mar. 5, 1990, Ser. No. 489,284
Claims priority, application Japan, Mar. 6, 1989, 1-51955; Mar. 6, 1989, 1-51956; Mar. 6, 1989, 1-51957
Int. Cl.[5] A61B *3/10*
U.S. Cl. 351—221 **8 Claims**

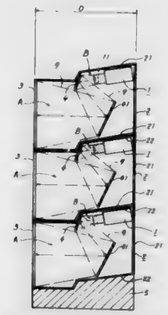


1. An ophthalmological diagnosis method comprising the steps of:
projecting a laser beam of prescribed diameter at a region of an eye to produce a laser speckle pattern formed by light scattered from tissues of the eye fundus;
photoelectrically detecting movement of the laser speckle pattern through a detecting aperture as a fluctuation in the light intensity of the speckles to produce a speckle signal corresponding to the detected movement;
measuring a photon correlation function of the speckle signal to determine a blood flow state in the eye fundus tissue from the measured photon correlation function;
photoelectrically counting count data corresponding to the laser speckle pattern as photoelectric pulses per unit sampling time;
storing the count data in a computer memory as time series data over a measurement time;
dividing the stored count data by the unit sampling time; and
processing the count data divided by the unit sampling time to calculate a variance for each of the count data and classifying the count data as blood vessel signal data, indeterminate signal data, or surrounding tissue signal data by comparing the calculated variance with two reference values.

5,116,117
MULTISCREEN PROJECTOR APPARATUS

Yoshiaki Miyashita, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 29, 1991, Ser. No. 706,832
Claims priority, application Japan, May 30, 1990, 2-56646[U]
Int. Cl.[5] G03B *21/56*
U.S. Cl. 353—94 **2 Claims**

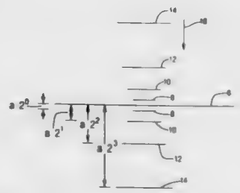


1. A multiscreen projector apparatus comprising a plurality of cabinets joined together as arranged vertically and/or laterally, each of the cabinets having a screen of the transmission type on its front side and a projector accommodated therein for projecting images on the rear surface of the screen, each of the cabinets having a side wall intersecting the screen at substantially a right angle therewith and formed with a projecting portion accommodating the projector therein directing an optical path to the screen, another side wall extending in parallel to the side wall as opposed thereto and formed with a recessed portion shaped in conformity with the shape of the projecting portion, a first reflecting mirror arranged in front of the projector on a slant in an internal space between the projecting portion and the recessed portion, a second reflecting mirror arranged in backward of the first reflecting mirror on a slant for reflecting the optical path twice, said optical path extending from the projector within the projecting portion to the screen overlapping at the portion between the first and second mirrors, the plurality of cabinets being joined together in combination by engaging the projecting portion of each cabinet in the recessed portion of another cabinet immediately adjacent thereto.

5,116,118
GEOMETRIC FIEDLITY OF IMAGING SYSTEMS EMPLOYING SENSOR ARRAYS

Kenneth L. Jones, Altadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 28, 1990, Ser. No. 545,014
Int. Cl.[5] G01P *3/36*
U.S. Cl. 356—2 **9 Claims**

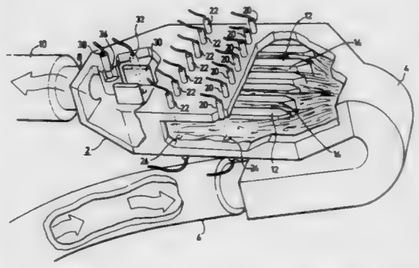


1. A terrain imaging system comprising:
a sensor assembly to be carried on an aircraft or spacecraft which will travel along an arbitrary flight path, for providing an image of terrain over which the craft travels, said assembly comprising a main linear imaging sensor array and two groups of auxiliary linear imaging sensor arrays, each said array being composed of a plurality of photosensitive elements arranged in a row in an image plane for providing terrain image information derived from successive linear terrain regions, each group of auxiliary sensor arrays being composed of a first auxiliary sensor array and a second auxiliary sensor array, with said first auxiliary sensor array being disposed between said main sensor array and said second auxiliary sensor array and being separated from said main sensor array and said second auxiliary sensor array by respectively different distances in the direction of the flight path, and each group of auxiliary sensor arrays being disposed to a respective side of said main sensor array; and
signal processing means connected to said main sensor array and to each of said auxiliary sensor arrays for comparing the terrain image information provided by said main sensor array with the terrain image information provided by each of said auxiliary sensor arrays.

5,116,119
METHOD AND APPARATUS FOR MEASURING LIQUID FLOW

Eyal Brayer, Kfar Monash, Israel, assignor to S.C.R. Engineers Ltd., Natania, Israel

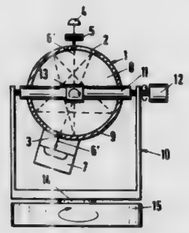
Filed Oct. 4, 1991, Ser. No. 771,903
Int. Cl.[5] G01F *23/00*
U.S. Cl. 356—28 **20 Claims**



1. A method of measuring liquid flow, comprising the steps:

(a) directing the liquid to flow through a flow channel of known dimensions while exposing the liquid to electromagnetic radiation;
(b) measuring the momentary attenuation of the electromagnetic radiation by the liquid flowing through said flow channel;
(c) measuring the relative transparency to electromagnetic radiation of the liquid flowing through said flow channel for calibration purposes;
(d) determining from said measurements the momentary volume of said liquid flowing through said flow channel;
(e) determining the velocity of the liquid flowing through said flow channel; and
(f) determining from said steps (d) and (e) the momentary flow rate of the liquid flowing through said flow channel.

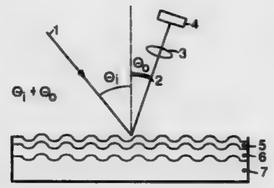
5,116,120
GAS ANALYZER HAVING A TEST CHAMBER TRAVERSED BY RADIATION
Jürgen Picker, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagen AG, Fed. Rep. of Germany
Filed Dec. 12, 1990, Ser. No. 626,683
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1989, 3941456
Int. Cl.[5] G01N *21/61*
U.S. Cl. 356—246 **3 Claims**



1. A gas analyzer comprising a radiation source, a radiation detector, a test chamber of spherical configuration to receive gas to be analyzed including an inner housing surface of spherical configuration and having entrance and exit windows for receiving radiation emitted by the radiation source and passing radiation to the detector, respectively, a mirror surface of constant curvature extending over substantially the entire inner housing surface wherein the radiation attenuation in the gas measured by the detector may be used to characterize the gas in the test chamber, and support means for providing positioning adjustment between the test chamber and one of the source and the detector in order to vary the test distance.

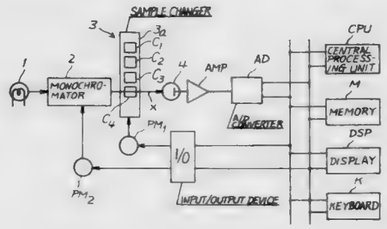
5,116,121
EXAMINATION OF PHYSICAL PROPERTIES OF THIN FILMS
Wolfgang Knoll, Mainz, and Harald Knobloch, Albig, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jan. 28, 1991, Ser. No. 646,082
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1990, 4004088
Int. Cl.[5] G01J *3/44*; G01N *21/65*
U.S. Cl. 356—301 **15 Claims**

1. A method for examining the physical properties of a thin film layer with the aid of polarized light, which comprises directing polarized light at a layer system containing said layer, exciting plasmon surface polaritons therein and thereby creating Raman-scattered light within the layer or layer system



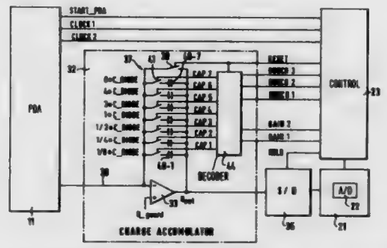
under examination, and directly imaging said light on a detector using an imaging system.

5,116,122
SPECTROPHOTOMETER
Toshiaki Fukuma, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan
Filed Mar. 14, 1991, Ser. No. 669,467
Int. Cl.[5] G01J *3/42*
U.S. Cl. 356—326 **3 Claims**



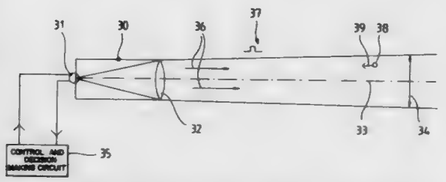
1. A spectrophotometer comprising:
a light source;
a monochromator for dispersing the light from said light source into a sequence of wavelengths to provide a monochromatic light of a selected one of said wavelengths;
a sample changer for holding a plurality of samples to be analyzed, each of which is given an identification code $C_1, C_2, \ldots C_n$;
means for setting a measuring wavelength $\lambda_1, \lambda_2, \ldots \lambda_n$ for each of said identification codes of said samples;
means for driving said sample changer to position a selected one of said samples in the path of said monochromatic light from said monochromator;
means for driving said monochromator to provide a monochromatic light of that one of said wavelengths preset in said setting means which corresponds to said identification code of said selected one of said samples;
means for setting an identification code $A_1, A_2, \ldots A_n$ for the measured data of each of said samples;
means for setting a coefficient to be used for processing the measured data of each of said samples together with an identification code $K_1, K_2, \ldots K_n$;
means for setting an operation expression composed of said identification codes $A_1, A_2, \ldots A_n$ of said measured data of said samples and said identification code $K_1, K_2, \ldots K_n$ of said coefficient;
means for storing the data obtained by measuring each of said samples held by said sample changer with the corresponding wavelength set for said sample in correspondence with the identification code of said measured data; and
means for reading out said data stored in said storing means and said coefficient set in said setting means in accordance with said identification codes of said measured data and said coefficient which constitute said operation expression set in said setting means, and performing an operation for data processing in accordance with said operation expression.

5,116,123
METHOD FOR OPERATING A PHOTODIODE ARRAY SPECTROMETER AND PHOTODIODE ARRAY SPECTROMETER
Hubert Kuderer, Waldbronn, Fed. Rep. of Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Dec. 21, 1989, Ser. No. 454,371
Claims priority, application European Pat. Off., May 20, 1989, 89109138
Int. Cl.[5] G01J *3/18, 3/42*
U.S. Cl. 356—326 **18 Claims**



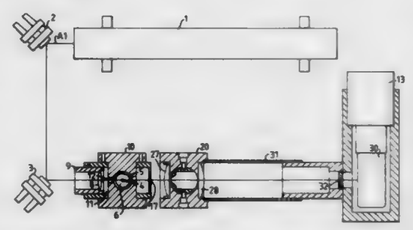
1. A method of operating a photodiode array spectrometer for determining the spectral composition of a polychromatic beam of radiation, said spectrometer comprising a charge amplifier, comprising a variable integrating capacitance, connected to an array of photosensitive elements through a plurality of transfer switching elements, said array of photosensitive elements intercepting different wavelengths of the polychromatic beam of radiation, said method comprising the following steps:
generating signals representing the radiation intercepted by each of said photosensitive elements; and
integrating various combinations of said signals to generate an output signal representing the radiation intercepted by various combinations of said photosensitive elements.

5,116,124
MEASUREMENT SYSTEM FOR SCATTERING OF LIGHT
Horst Hüttmann, Uetersen, Fed. Rep. of Germany, assignor to Vaisala Oy, Helsinki, Finland
Continuation of Ser. No. 404,619, Sep. 8, 1989, abandoned. This application Mar. 4, 1991, Ser. No. 663,785
Claims priority, application Finland, Sep. 8, 1988, 884142
Int. Cl.[5] G01N *21/00*; G01S *13/00*
U.S. Cl. 356—342 **8 Claims**



1. An apparatus for the measurement of parameters of atmospheric visibility or optical density within a measured space of atmosphere comprising:
pulse transmitter means for transmitting pulsed light into the measured space;
receiver means for receiving backscattered light from the measured space;
focusing optics, serving as both transmit and receive optics, for directing said pulsed light toward a desired object within the measured space and for directing said backscattered light onto an active surface of said receiver means; and
information processing means for processing and interpreting intensity and delay information of said backscattered light to generate the parameters and for controlling the apparatus, comprising
control means for generating a trigger pulse,
pulse generating means, coupled to said control means, for directing said pulse transmitter means to transmit said pulsed light after receipt of said trigger pulse, and
delay means, coupled to said control means, for delaying said trigger pulse to enable said receiver means for a period, the onset of which coincides with a falling edge of said pulsed light,
active surfaces of said transmitter means and said receiver means abut one another and are aligned in concentric circles along essentially the same optical axis allowing a single optics system to function as said focusing optics.

5,116,125
FERTILITY ANALYZER
Rudolf Rigler, Danderyd, Switzerland, assignor to Biophos Medical AB, Stockholm, Sweden
Filed Oct. 31, 1990, Ser. No. 605,092
Int. Cl.[5] G01N *15/02, 21/00*
U.S. Cl. 356—343 **10 Claims**

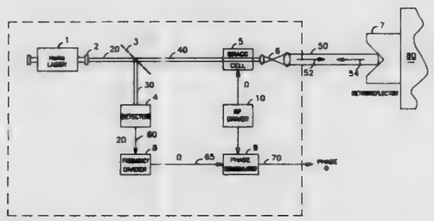


1. Fertility analyzer, comprising
a) means for emitting a laser beam adapted to impinge on a sperm sample in a capillary having a substantially circular section,
b) a first optical means including at least a first lens means focusing said laser beam in said sample,
c) a second optical means including at least a second lens means, a first diaphragm means determining the area of said sample to be monitored, a second diaphragm means determining the space angle of the scattered light from said sample, and a light intensity detecting means,
d) a separating means included in the combination of said first and second optical means for sorting out a determinable small section of said beam outgoing from said sperm sample in a direction lying in a plane having space symmetry in relation to said capillary, and being displaceable to at least two predetermined positions along a straight path of movement in order to sort out said beam in one direction at a time, and
e) a signal processing device storing the varying signals from said light detecting means during a predetermined time separately for beams outgoing from said sperm sample in at least two chosen directions, one said beam in one direction at a time, and for computing at least two parameters related to the fertility of the sperm sample.

5,116,126
INTERFEROMETER REQUIRING NO CRITICAL COMPONENT ALIGNMENT

Charles C. P. Waag, Rancho Palos Verdes, and Joe S. B. Zhou, Monterey Park, both of Calif., assignors to Optodyne, Inc., Compton, Calif.

Filed Jan. 7, 1991, Ser. No. 638,381
Int. Cl.[5] G01B 9/02
U.S. Cl. 356—349 **9 Claims**



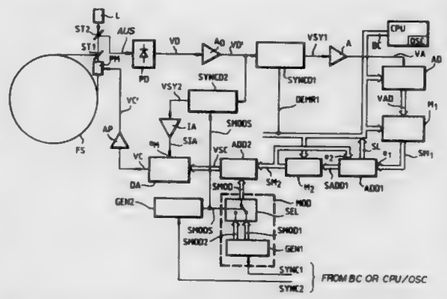
1. An interferometer requiring no critical component alignment, comprising:
- a gas laser for producing an output light beam, the laser having an output mirror;
- means for splitting the output light beam into two spatially separated components, the components being a first beam and a second beam;
- means for detecting the first and the second beams, the first beam being directed by the splitting means directly to the detector for use as a reference;
- means for frequency and direction shifting, the second beam being directed by the splitting means to the shifting means, and therein being frequency and direction shifted;
- means for reflecting, the second beam being directed by the shifting means to the reflecting means, such that the second beam is reflected back to the shifting means and therein being frequency shifted a second time and direction shifted such that the second beam is directed along the path of the output light beam, being colinear thereto, so that the reflected second beam impinges the laser source output mirror and is reflected therefrom toward the splitter, a portion of the twice reflected second beam being colinear with the first beam and directed to the detector therewith, the reflected second light beam, being frequency shifted from the laser frequency therefore not destabilizing the laser upon entry through the output mirror, whereby the stability of the splitter position is not highly critical to the proper operation of the interferometer.

5,116,127
FIBER OPTIC SAGNAC INTERFEROMETER WITH DIGITAL PHASE RAMP RESETTING

Peter Gröllmann, Freiburg, Fed. Rep. of Germany, assignor to Litef GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Dec. 24, 1990, Ser. No. 633,420
Claims priority, application European Pat. Off., Jan. 3, 1990, 90100103
Int. Cl.[5] G01C 19/72
U.S. Cl. 356—350 **6 Claims**

1. In a fiber optic Sagnac interferometer for measuring rotation rate of the type in which: two light beams originating from a light source and generated by beam splitting are irradiated into a fiber coil in opposite directions and subsequently reunited; the interference pattern produced is applied to a detector device whose output signal corresponds to the light intensity of the interference pattern; with the aid of a phase modulator located in the fiber coil the two light beams are modulated by a periodic rectangular signal combined from a plurality of variable signal components having fundamental frequency $f_0=\frac{1}{4}t_0$, where t_0=transit time of each of the light beams through the fiber coil; in conjunction with periodic change in the modulation deviation a first signal component effecting between two operating modes in time with frequency f_0 a reciprocal alternating phase shift (ϕ_m) of the two counterrotating light beams, and a second signal component being a stair-step ramp signal whose risers each have a duration, corresponding to the transit time t_0 or integral multiples of t_0, and amplitude increments that compensate nonreciprocal incremental phase shifts of the two light beams; the amplified photodetector output signal is fed to a first synchronous demodulator clocked with frequency f_0; the demodulated and amplified output signal is fed to an analog-to-digital convertor and after digitization integrated in a digital integrator and is applied to the phase modulator via a digital-to-analog convertor and a driver amplifier to compensate nonreciprocal phase shifts of the light beams by means of the second signal component; a scale factor correction circuit demodulates the amplified pho-



todetector output signal in time with mode reversal and transmits an analog scale factor correction signal to the digital-to-analog convertor via an integrating amplifier; and in which a processor supplies the control and synchronization signals for the first synchronous demodulator, the analog-to-digital converter and the digital integrator, the improvement comprising:
- a) a digital adder arranged between the digital integrator and the digital-to-analog convertor;
- b) the modulation deviation signal is reversed in accordance with predetermined timing between said two operating modes at a second input to said adder; and
- c) said modulation deviation signal is applied form a first pulse generator that is clocked with the frequency f_0 and transmits a signal corresponding to the phase deviation $\pm\pi/4$ for the first operating mode and a signal corresponding to the phase deviation $\pm 3\pi/4$ for the second operating mode to the second input of the digital adder.

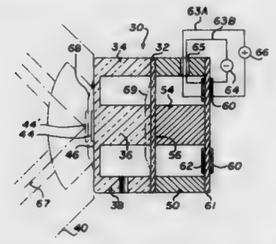
5,116,128
MIRROR TRANSDUCER ASSEMBLY FOR RING LASER GYROSCOPE

David B. Hall, La Crescenta, and Shahrokh R. Farahani, Danville, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 18, 1990, Ser. No. 631,372
Int. Cl.[5] G01C 19/66
U.S. Cl. 356—350 **14 Claims**

1. In a ring laser gyroscope, a pathlength control assembly, comprising:
- a mirror;
- means for mounting said mirror on an axially deflectable membrane;
- a mirror post coupled to said deflectable membrane;
- at least one transducer means;
- means for supporting said transducer means;
- axially-directed, passive thermally expansive means for axially driving said mirror post;
- said at least one transducer means, bonded onto said support-

ing means, for axially deflecting said thermally expansive driving means in response to an electronic input signal;
- said passive thermally expansive driving means passively displacing said mirror post, said membrane, and said mirror;
- said at least one transducer means actively displacing said mirror post, in conjunction with said passive thermally expansive driving means;

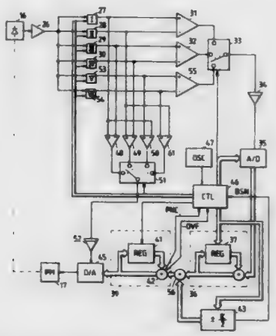


whereby, said passive thermally expansive during means, in conjunction with said at least one transducer means, provided both passive and active mirror displacement functions in order to achieve the full axially driving range needed to drive said mirror post and mirror over a relatively wide range needed to properly operate a ring laser gyroscope.

5,116,129
DIGITAL PHASE RAMP TYPE FIBER OPTIC GYRO

Motohiro Ishigami, Tokyo, Japan, assignor to Japan Aviation Electronics Industry Limited, Tokyo, Japan

Filed Nov. 28, 1990, Ser. No. 618,903
Claims priority, application Japan, Nov. 30, 1989, 1-311649
Int. Cl.[5] G01C 19/72
U.S. Cl. 356—350 **5 Claims**



1. A digital phase ramp type fiber optic gyro comprising:
- a light source;
- a beam splitter for splitting light from said light source into two beams;
- a looped optical transmission line to which said two beams from said beam splitter are applied as right-handed light and left-handed light for propagation therethrough;
- interference means for causing right-handed light and left-handed light emitted from said optical transmission line to interfere with each other;
- an opto-electric converter supplied with interference light from said interference means, for outputting an electric signal corresponding to the intensity of said interference light;
- optical phase modulating means disposed between one end of said optical transmission line and said beam splitter and electrically controlled to shift the phase of light;
- biasing signal generating means for generating a digital biasing signal which is a square wave having a period twice longer than a time $l\tau$ which is an odd-number multiple of the light propagation time τ of said optical transmission line and having a 50% duty and which provides $+\pi/2$ and $-\pi/2$ rad. bias phase differences alternately between said right-handed light and said left-handed light for each period $l\tau$ by said optical phase modulating means and for generating a bias sign signal representing the sign of each of said bias phase differences, l being 1, 3, 5, . . . ;
- first error signal detecting means for detecting a first error signal corresponding to the difference between the outputs of said opto-electric converter when said biasing signal is providing said $+\pi/2$ rad. phase difference and said $-\pi/2$ rad. phase difference, respectively;
- an A/D converter for converting said first error signal to a digital error signal corresponding thereto;
- step value generating means whereby a step value of a magnitude and a sign for cancelling a Sagnac phase difference provided between said right-handed light and said left-handed light by an angular rate input to said optical transmission line is generated, based on said digital signal supplied from said A/D converter;
- ramp signal generating means which accumulates said step value for every period $l\tau$ and, when the accumulated result exceeds a predetermined maximum value corresponding to $2m\pi$, m being a positive integer, regards an overflow value as said accumulated result, outputs as a digital ramp signal said accumulated result varying for every period $l\tau$ and, when said overflow occurs, outputs an overflow signal indicating the occurrence of said overflow and an overflow sign signal indicating the sign of said overflow;
- D/A converting means whereby, based on said digital biasing signal and said digital ramp signal, an analog signal for controlling said optical phase modulating means is generated;
- second error signal detecting means for detecting, as a second error signal, the difference between the output levels of said opto-electric converter at the time of occurrence of said overflow signal and at the immediately preceding period; and
- feedback control means which, based on said overflow sign signal and said bias sign signal at the time of occurrence of said overflow signal, determines which of $+(2m-1)\times\pi/2$, $-(2m-1)\times\pi/2$, $-(2m+1)\times\pi/2$ and $(2m+1)\times\pi/2$ the phase difference between said right-handed light and said left-handed light at the time of occurrence of said overflow signal corresponds to, which generates a negative feedback error signal by multiplying said second error signal by a positive or negative sign dependent on the result of said determination, and which controls the gain of said D/A converting means, based on said negative feedback signal.

5,116,130
RING LASER GYROSCOPE MOUNT

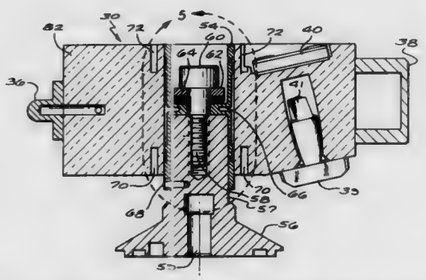
Alfred L. Butler, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 31, 1990, Ser. No. 607,453
Int. Cl.[5] G01C 19/68
U.S. Cl. 356—350 **7 Claims**

1. A ring laser gyroscope, comprising:
- a resonant optical cavity formed in a ring configuration, said ring configuration defining a closed optical path within a monolithic frame;
- a pedestal for supporting the monolithic frame;
- said frame affixed to a ring laser gyroscope mount means for mounting the ring laser gyroscope frame onto said pedestal;
- said ring laser gyroscope mount means including:

a tubular ring laser gyroscope coupler mount having a central compliance groove defining the waist of the coupler;

at least one relief groove defined into said frame, concentric with and surrounding said coupler mount;



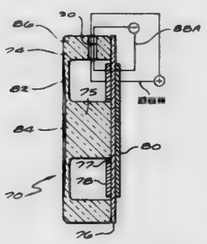
said coupler being securely affixed to said frame and said pedestal.

5,116,131

MIRROR TRANSDUCER ASSEMBLY FOR RING LASER GYROSCOPES

Shahrokh R. Farahani, Moorpark, and Mohammad M. Tehrani, Westlake Village, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 19, 1990, Ser. No. 510,976
Int. Cl.[5] G01C *19/66*
U.S. Cl. 356—350 **13 Claims**



1. In a ring laser gyroscope, a mirror transducer assembly, comprising:

a mirror mounted on a mirror housing, said mirror housing including a single axially deflectable membrane;

a mirror post coupled to said deflectable membrane;

and further consisting essentially of:

a flat backing plate, positioned flush against said mirror post and said mirror housing, and;

at least one piezo-electric transducer, bonded onto said backing plate, for axially deflecting said backing plate in response to an electronic input signal;

said backing plate driving said mirror post, said membrane, and said mirror;

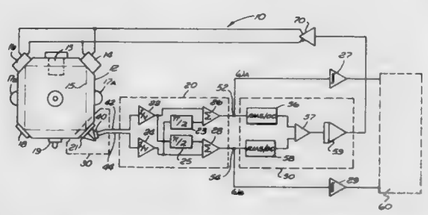
whereby, said backing plate serves the dual functions of supporting said at least one transducer and axially driving said mirror post with minimal mirror tilt.

5,116,132

RING LASER GYROSCOPE OUTPUT OPTICS DETECTION SYSTEM

Robert A. Mitchell, Woodland Hills; David B. Hall, La Crescenta, and Kenneth W. Shafer, Thousand Oaks, all of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jan. 12, 1990, Ser. No. 464,164
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—350 **21 Claims**



1. In a ring laser gyroscope rotational sensing system, an output optics detection system comprising:

an output prism, affixed to an output mirror of a ring resonator cavity of a ring laser gyroscope, suitable for heterodyning multiple frequency optical signals, said signals being grouped into pairs, each pair of signals having a clockwise component and an anti-clockwise component,

a photo-electronic transducer means;

said prism producing a heterodyned carrier optical output signal which is a function of a Sagnac Effect modulated Faraday biased beat frequency signal, in the form of a double side band suppressed carrier output signal, electronically detectable by said photo electronic transducer means;

signal separation means for processing an electronic output signal corresponding to said double side band suppressed carrier output signal from said photo-electronic transducer means, said output signal being a function of said Sagnac Effect modulated Faraday biased beat frequency signal;

whereby, the Sagnac Effect modulated Faraday biased beat frequency signal is electronically separated into its components in order to measure rotational rate and direction.

5,116,133

APPARATUS FOR AND METHOD OF IDENTIFYING SPECTRALLY PURE OPTICAL RADIATION

Harold E. Sweeney, Menlo Park, Calif., assignor to GTE Government Systems Corporation, Stamford, Conn.

Filed Feb. 23, 1990, Ser. No. 483,702
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—352 **9 Claims**

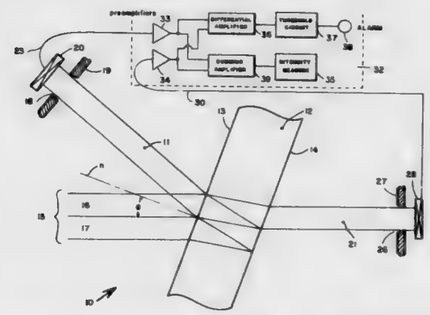
1. Apparatus for identifying spectrally pure optical radiation (SPOR) in radiation of unknown spectral purity (RUSP)179, comprising:

interferometer means having first and second spaced parallel surfaces traversed by a beam of said RUSP at an acute angle with respect to the normal to said first surface;

said first and second surfaces being partially reflective and partially transmissive relative to said beam;

first and second portions of said beam being respectively transmitted through and reflected from said interferometer means;

first and second optical detectors disposed to receive said first and second beam portions, respectively, and producing respective electrical outputs corresponding to the intensities of said beam portions; and



means to compare the magnitudes of said outputs and to provide an indication when said magnitudes are unequal thereby identifying the presence of SPOR.

5,116,134

AUTOMATED PAINT PRODUCTION APPARATUS

Kenneth N. Edwards, Glendale; Edward D. Edwards, Healdsburg, both of Calif.; Philip C. Howlett, Wheaton, and Niles M. Dwyer, Park Ridge, both of Ill., assignors to Fluid Management Limited Partnership, Wheeling, Ill.

Filed Sep. 28, 1990, Ser. No. 590,662
Int. Cl.[5] B01F *11/00, 15/02*
U.S. Cl. 366—208 **33 Claims**

1. An automated apparatus for mixing ingredients stored in closed containers, comprising:

a frame means defining a container receiving cavity;

frame support means for movably supporting the frame means for movement in a mixing motion;

shuttle means for carrying a container to said frame, including a shuttle platform for supporting the container and shuttle moving means for moving said shuttle platform toward and away from said frame means;

inserting means for inserting a container carried by said shuttle platform into the cavity of said frame means;

clamping means for clamping the container within said frame means to maintain engagement therewith during a mixing operation;

drive means for moving said frame means with a mixing motion so as to agitate the contents of a container clamped therein; and

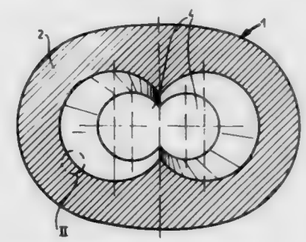
ejecting means for ejecting the container from said frame means onto said shuttle platform.

5,116,135

EXTRUDER HOUSING FOR A DOUBLE-WORM EXTRUDER AND METHOD OF MAKING SAME

Hartmut Kaiser, Mülheim a. d. Ruhr., and Peter Lülsdorf, Niederkassel-Mondorf, both of Fed. Rep. of Germany, assignors to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Oct. 31, 1990, Ser. No. 607,161
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1989, 3936438
Int. Cl.[5] B01F *7/08;* **B29B** *1/10*
U.S. Cl. 366—349 **5 Claims**



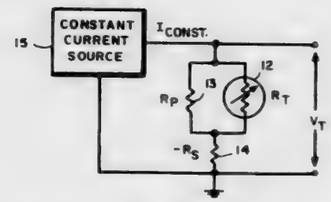
1. An extruder housing part for a double-worm extruder comprising a unitary seamless body formed with two adjoining chambers adapted to receive respective worms of a double-worm extruder, said body being formed with an outer layer of hot isostatically pressed powder of a housing-forming powder-metallurgical material and an inner hard-phase layer delimiting said chambers and composed of hot isostatically pressed hard-phase powder-metallurgical material, and a diffusion layer between said inner and outer layers and bonded thereto, said inner and outer layers having isotropic lattice structures of powder-metallurgical origin with hot-isostatic-pressing texture.

5,116,136

TEMPERATURE MEASUREMENTS USING THERMISTOR ELEMENTS

William H. Newman, Brookline, Mass., and Ralph G. Burgess, Hudson, N.H., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 1, 1989, Ser. No. 359,954
Int. Cl.[5] G01K *3/00, 7/24*
U.S. Cl. 374—102 **14 Claims**



1. A temperature sensing system comprising

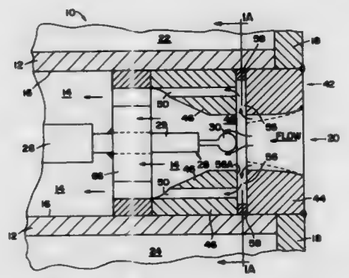
non-linear temperature sensing means;

a current source for providing a substantially constant current for said temperature sensing means;

a circuit including a resistance means and a counter-voltage means, said temperature sensing means and said current source being connected in said circuit so that said resistance means is in parallel with said temperature sensing means and said counter-voltage means is in series with said temperature sensing means for producing an intermediate voltage output which is a substantially exponential func-

tion of the temperature sensed by said temperature sensing means.

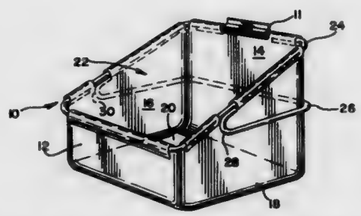
5,116,137
TEMPERATURE MEASURING PYROMETER PROBE WHICH COMPENSATES FOR RADIATION HEAT TRANSFER AND PNEUMATIC LOSSES
Tian-Yu Xiong, Darien, and Lloyd McHie, South Holland, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.
Filed Mar. 29, 1990, Ser. No. 501,130
Int. Cl.[5] G01K *13/02, 1/14*
U.S. Cl. 374—132 **15 Claims**



1. A temperature measuring pyrometer probe comprising:
an inner hollow body defining an inner chamber, said inner hollow body having an open end, said inner chamber in communication with ambient gas surrounding the pyrometer probe at said open end, said inner hollow body mounted within an outer hollow body forming cooling channel means for cooling said inner hollow body;
a converging-diverging nozzle secured to an inner chamber wall of said inner hollow body, said converging-diverging nozzle positioned to direct said ambient gas into said inner chamber toward a thermocouple junction of a thermocouple, said converging-diverging nozzle having a wall suction channel for drawing a boundary layer of an ambient gas flow away from said thermocouple junction;
suction inlet means for admitting said ambient gas surrounding the pyrometer probe into said converging-diverging nozzle and drawing said ambient gas flow through said inner chamber and said wall suction channel;
positioner means for mounting said thermocouple junction in a centered position within a throat of said converging-diverging nozzle downstream, with respect to said ambient gas flow, from said wall suction channel;
gas cooling means for pulsing reverse cooling gas flow through said converging-diverging nozzle, computing means for controlling said reverse cooling gas flow;
said computing means continuously alternating said cooling gas flow and said ambient gas flow through said inner chamber; said thermocouple junction electrically coupled to said computing means; and
said computing means calculating radiation heat transfer losses and pneumatic cooling and determining an instantaneous gas temperature.

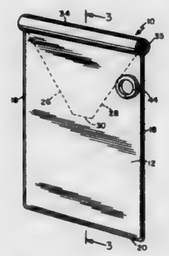
5,116,138
FLEXIBLE, COLLAPSIBLE CONTAINER
Ronald J. Macsenti, and Frederick M. Avery, both of Phoenix, Ariz., assignors to The Niven Marketing Group, Des Plaines, Ill.
Filed Jul. 23, 1990, Ser. No. 557,402
Int. Cl.[5] B65D *33/02*
U.S. Cl. 383—33 **4 Claims**

1. A container for support along a vertical surface, said container comprising front and back walls, and side walls, each of said front, back and side walls having upper ends, and a bottom wall; said container having an open top end for the insertion and removal of goods to be displayed in said container; said walls of said container being made of a transparent, flexible plastic; and said container further comprising an upper rim providing support for and along the upper ends of said



front, back and side walls; and a bottom rod having a pair of spaced apart ends, and circumscribing at least one of said back and side walls, said bottom rod including a C-shaped portion at its ends for fixed securement of said ends to said upper rim.

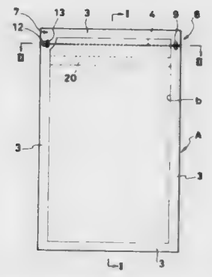
5,116,139
FLUID CONTAINMENT BAG
Ruth E. Young; Daniel L. Young, both of Escondido; Richard E. Warrick, Encinitas, and Clarence A. Cassidy, Carlsbad, all of Calif., assignors to American Innotex, Inc., San Marcos, Calif.
Continuation-in-part of Ser. No. 404,734, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 3,848, Jan. 14, 1987, abandoned. This application Feb. 15, 1991, Ser. No. 657,354
Int. Cl.[5] B65D *30/24*
U.S. Cl. 383—49 **17 Claims**



1. A containment bag for a fluid comprising water or water-based liquid such as bodily fluids which comprises:
a bag having a hollow interior defined by two sides meeting at opposite edges, a bottom and a top, with said edges and bottom sealed and said top at least partially open to receiving said;
a gellable hydrophilic material within said bag, said material becoming fully gelled within thirty seconds of said contact with said fluid when said is deposited in said bag, said gellation serving to essentially completely sequester said and prevent said fluid from thereafter being expelled from said bag;
funnel means within said interior and having an open top, said funnel means being secured to said bag at said top of said bag, and extending downwardly within said interior to a narrower open bottom for conduction of fluid entering said open top through said funnel means and into said bag, with the open bottom of said funnel being disposed intermediate between said top and bottom of said bag, said open bottom being free from attachment to said sides of said bag such that flow of any unsequestered fluid within said bag back toward said funnel means acts to close said funnel means to prevent escape of said unsequestered fluid from said bag; and

closure means for closing the top of said bag after introduction of said fluid into said bag.

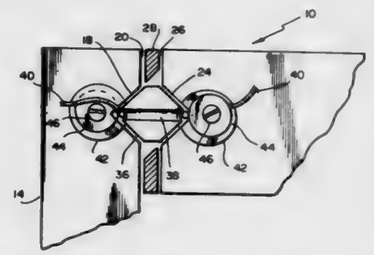
5,116,140
EASY-TO-OPEN SYNTHETIC RESIN BAG
Kazuyoshi Hirashima, 511-1, Oaza-Musashi, Chikushino, Fukuoka, Japan
Filed Jan. 22, 1991, Ser. No. 644,158
Claims priority, application Japan, Jun. 15, 1990, 2-158477
Int. Cl.[5] B65D *27/38*
U.S. Cl. 383—206 **4 Claims**



1. An easy-to-open synthetic resin bag comprising:
a) a bag body substantially consisting of a pair of laminated walls made of synthetic resin films, the peripheries of said laminated walls being heat sealed to form an annular sealed border region while defining an unsealed storing space within said sealed border region,
b) a tear string which is heat sealed along an imaginary opening line on the inside of one of said laminated walls, said tear string having both ends thereof heat sealed in a sandwiched condition on corresponding side portions of said sealed border region,
c) a pulling tab formed by cutting a part of one of said side portions of said sealed border region which corresponds to one end of said tear string, said pulling tab being tearable from said bag body integrally with said tear string, and
d) a tear string retaining portion comprising a transverse opening which is formed by cutting off a part of the other of said side portions of said sealed border region and a pair of inside and outside heat sealed portions which are located at both sides of said transverse opening, said transverse opening extending in a direction perpendicular to said tear string such that said tear string passes through a central portion of said transverse opening.

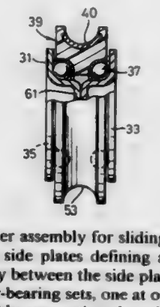
5,116,141
ANTI-CREEP FOR BEARING RETAINERS
Anwar Chitayat, Duck Island, P.O. Box 107, Northport, N.Y. 11768
Filed Nov. 1, 1990, Ser. No. 607,813
Int. Cl.[5] F16C *29/04*
U.S. Cl. 384—17 **10 Claims**

1. An apparatus for correcting a position of a bearing assembly of a positioning table comprising:
a base;
a slide;
at least a first rolling bearing assembly between said slide in said base;
said at least a first rolling bearing assembly including a retainer and a plurality of rolling bearings;
at least one flexible line having a first end connected to said base, and second ends connected to said slide;
means on said retainer for permitting said flexible line to pass thereover in a loop; and



resilient means for applying a tension to said at least one flexible line in a direction to oppose retainer creep.

5,116,142
ROLLER OR WHEEL ASSEMBLY FOR PATIO DOORS
John C. Smith, Letchworth, and Patrick E. Christmas, Heulow, both of United Kingdom, assignors to Schlegal (UK) Holdings Limited, Leeds, England
Continuation of Ser. No. 506,684, Apr. 9, 1990, abandoned. This application Jun. 21, 1991, Ser. No. 724,491
Claims priority, application United Kingdom, May 18, 1989, 8911400
Int. Cl.[5] F16C *29/04*
U.S. Cl. 384—55 **7 Claims**



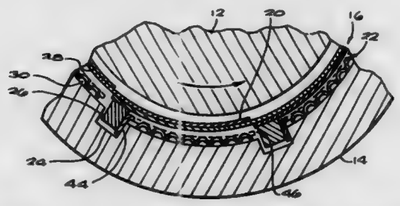
1. A wheel or roller assembly for sliding fenestration, comprising two parallel side plates defining a carriage, a wheel located at least partly between the side plates, and two spaced ball-bearing or roller-bearing sets, one at or adjacent each side of the wheel, rotatably supporting the wheel within the carriage, said side plates each having a side wall an annular inturned portion connected to the side wall, and a central web portion connected to the annular inturned portion, the inturned portion and part of the side wall of each side plate together defining an inner race for a respective one of said bearing sets, means connecting together said central web portions of said side plates, and wherein said wheel has two inner annular edge regions, one on each side thereof to receive one of said bearing sets, and defining an outer race for its bearing set.

5,116,143
HIGH LOAD CAPACITY JOURNAL FOIL BEARING
Marshall P. Saville, Lawndale, and Alston L. Gu, Rancho Palos Verdes, both of Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Dec. 20, 1990, Ser. No. 631,591
Int. Cl.[5] F16C *17/03*
U.S. Cl. 384—106 **21 Claims**

1. A journal foil bearing comprising:
a journal member;
a shaft member arranged for relative coaxial rotation with respect to said journal member;

a compliant foil bearing disposed between said shaft and journal members, said compliant foil bearing including at least one foil element mounted to said journal member; and

means for providing a variable underspring force for supporting said foil element and maintaining an approximately optimum wedge shaped uniform spacing between said foil element and said rotating shaft member matched to the changing pressure force along the circumferential length of said foil element; and

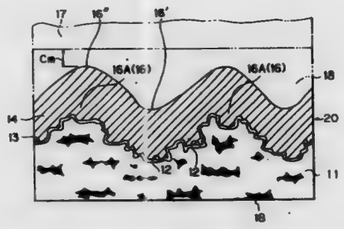


wherein said means for providing a variable underspring force comprises: an underspring positioned between said foil element and said journal member to which said foil member element is mounted, said underspring including a plurality of curvilinear beams extending a majority of the axial length of said underspring, said curvilinear beams separated by a plurality of generally "I" shaped slots, said "I" shaped slots extending axially along said underspring.

5,116,144
PLANE BEARING

Soji Kamiya, and Yuji Yokota, both of Aichi, Japan, assignors to Taibo Kogyo Co., Ltd., Aichi, Japan

Division of Ser. No. 482,573, Feb. 21, 1990, Pat. No. 5,071,263.
This application Sep. 9, 1991, Ser. No. 756,652
Claims priority, application Japan, Oct. 13, 1989, 1-267694
Int. Cl.[5] F16C *33/06*
U.S. Cl. 384—291 9 Claims

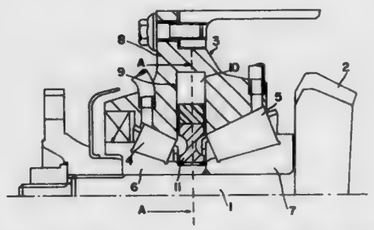


1. A plane bearing comprising of a lining having scratches in a sliding direction on the surface and first concavities on the scratched surface, and an overlay formed on the lining characterized in that a first length of first concavities as seen in a direction perpendicular to a sliding direction, is not equal to a second length of the first concavities as seen in the sliding direction.

5,116,145
ROLLER BEARING CONTAINING A LUBRICATION PUMP

Alexander Jan de Vries, Tiel, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Nieuwegien, Netherlands

Filed Sep. 24, 1990, Ser. No. 586,899
Claims priority, application Netherlands, Sep. 25, 1989, 8902384
Int. Cl.[5] F16C *33/66*
U.S. Cl. 384—465 1 Claim

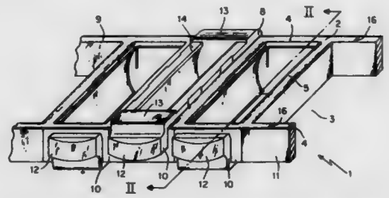


1. The combination comprising a shaft (1) having an axis; a rolling bearing (3) having an inner race ring (6, 7) mounted on said shaft (1) and a one piece outer race ring (8), and a pair of axially spaced rows of rolling elements (4, 5) mounted between said inner (6, 7) and outer (8) race rings; and a pump (9) for lubricating said rolling bearing (3) with a lubricant, including a pump chamber (10) defined by an annular, enclosed cavity within said outer race ring (8) which opens radially inwardly eccentric to the shaft axis and includes a lubricant inlet and a lubricant outlet; a rotating member (11) concentric with said shaft (1) operable to transfer lubricant from said lubricant inlet to said lubricant outlet; a plurality of displacement elements (12) radially mounted on said rotating member (11); rotation of said rotating member (11) drawing lubricant into said enclosed cavity through said inlet, and discharging lubricant from said cavity through said outlet by the pressure differential caused by the action of displacement elements (12) within said eccentric cavity and means for delivering lubricant from the said outlet to lubricate said rolling elements.

5,116,146
CAGE FOR A LARGE ROLLER BEARING

Alois Stenert, Lippstadt, Fed. Rep. of Germany, assignor to Hoesch AG, Dortmund, Fed. Rep. of Germany

Filed May 10, 1991, Ser. No. 698,835
Claims priority, application Fed. Rep. of Germany, May 12, 1990, 4015303
Int. Cl.[5] F16C *33/51, 33/56*
U.S. Cl. 384—578 7 Claims

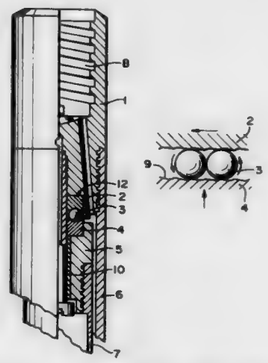


1. A cage for a large roller bearing surrounding loosely and securing in place rollers of said bearing, comprising: a strip of metal with lateral webs and intermediate webs forming recesses; plastic windows fitting into said recesses; collars on said plastic windows and resting against a surface of said strip, each of said windows having one of said collars; each window having a securing rim on said collar and overlapping one of said lateral webs.

5,116,147
ANTI-BLOCKAGE BEARING

George Pajari, Sr., 503 Atlas Ave., Toronto, Ontario, Canada M6C 3R4

Continuation-in-part of Ser. No. 394,055, Aug. 15, 1989, abandoned. This application May 20, 1991, Ser. No. 702,494
Claims priority, application Canada, Oct. 19, 1988, 580568
Int. Cl.[5] F16C *33/58;* F16H *25/16*
U.S. Cl. 384—615 3 Claims



1. An apparatus for rotary core drilling comprising:

an outer tube having a longitudinal axis;

a core barrel assembly freely suspended within said outer tube for axial motion with respect to said outer tube, said core barrel assembly having a lower end for receiving a core sample and an upper end;

a core barrel coupling assembly supporting said outer tube and connecting said outer tube to a rotatable drill rod;

an anti-blockage bearing assembly situated between said upper end of said core barrel assembly and said core barrel coupling, said anti-blockage bearing assembly comprising a plurality of spherical ball bearings retained within coaxial upper and lower annular retaining members, said upper annular retaining member being mounted to said core barrel coupling for rotation therewith and said lower annular retaining member being mounted on said upper end of said core barrel assembly;

at least one of said annular retaining members being provided with an annular thrust race having an undulating surface incorporating a plurality of ridges and intervening indentations;

means maintaining said plurality of spherical ball bearings disengaged from said upper annular retaining member during non-blockage operation of said rotation core drilling apparatus;

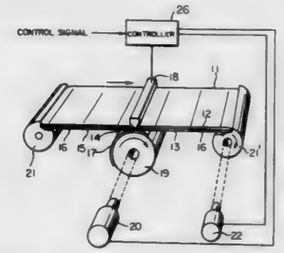
said core barrel assembly and said lower annular retaining member automatically axially elevating upwardly toward said core barrel coupling in direct response to a blockage at said lower end of said core barrel assembly to engage said spherical ball bearings with both said upper and lower annular retaining members; and

means for causing relative rotational movement between said upper and lower annular retaining members when said core barrel assembly is blocked wherein said at least one annular thrust race creates vibrational forces on said upper end of said core barrel assembly due to the upward axial displacement of said core barrel assembly and said lower annular retaining member, said vibrational forces acting longitudinally downwardly along said core barrel assembly to automatically eliminate said blockage at said lower end of said core barrel assembly.

5,116,148
HEAT TRANSFER INK SHEET HAVING A PRECOATING LAYER WHICH IS THERMALLY TRANSFERRED PRIOR TO SUBLIMATION OF AN INK DYE

Shuichi Ohara; Shiniichi Akasaka; Hiroyuki Oka, all of Hitachi; Shintaroo Hattori, Otsu, and Rieko Oyama, Toyoake, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 440,487, Nov. 24, 1989, abandoned, which is a continuation of Ser. No. 374,572, Jul. 3, 1989, abandoned, which is a continuation of Ser. No. 90,141, Aug. 27, 1987, abandoned. This application May 29, 1990, Ser. No. 528,893
Claims priority, application Japan, Aug. 27, 1986, 61-198848; Jan. 8, 1987, 62-997; Feb. 12, 1987, 62-28252
Int. Cl.[5] B41J *31/09*
U.S. Cl. 400—241 10 Claims



1. A process for printing a colored image on a recording sheet, which comprises the steps of:

preparing an ink sheet which is provided with on one surface thereof an ink layer region containing a sublimable or vaporizable dye and a precoating layer region for a precoating layer, said precoating layer region being adjacent to said ink layer region and both regions being arranged alternately, the precoating layer region being made of an organic material having at least one of an ester bond and an amide bond and being capable of being easily dyed with the dye in the ink layer region, wherein said ink sheet is further provided with a first silicone resin layer over said ink layer region and a second silicone resin layer between said precoating layer region and a base sheet of said ink sheet;

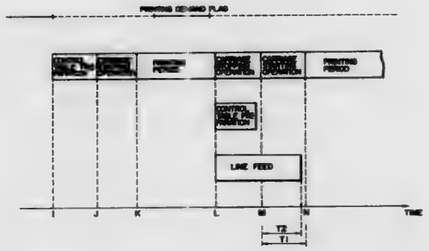
bringing the precoating layer region of the ink sheet into contact with the surface of the recording sheet;

heating the precoating layer region by a thermal heat controlled by a controlling means so as to effect transfer of the precoating layer region to the surface of the recording sheet;

bringing the ink layer region of the ink sheet into contact with the surface of the transferred precoating layer on the recording sheet; and

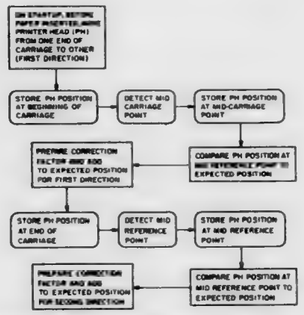
effecting sublimation or vaporization of the dye in the ink layer region by heat from the thermal heat so as to transfer the dye into the transferred precoating layer wherein said first silicone resin layer prevents adhering of the ink layer region remaining on the ink sheet to the transferred precoating layer and wherein said second silicone resin layer facilitates separation of said precoating layer from said ink sheet during transfer of said precoating layer region to the surface of the recording sheet.

5,116,149
PRINTER FOR REDUCING PRINTING OPERATION TIME
Keiichi Yamasaki, Kurume, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation of Ser. No. 256,790, Oct. 12, 1988, abandoned. This application Sep. 6, 1990, Ser. No. 579,232
Claims priority, application Japan, Oct. 14, 1987, 62-258915
Int. Cl.[5] B41J *19/94*
U.S. Cl. 400—314.1 **2 Claims**



1. A printer comprising:
a carriage carrying printing means and capable of reciprocating movement;
memory means for storing a plurality of carriage drive speed patterns;
a control table for storing address data for indicating a selected drive speed pattern for controlling driving of said carriage;
drive means for driving said carriage according to the selected drive speed pattern which is stored in said memory means and indicated by address data stored in said control table;
sheet feeding means for feeding a printing sheet, said sheet feeding means starting to feed a printing sheet to the position of a next line upon completion of printing of data of one line;
control table preparing means for causing the storage in said control table of the address data corresponding to a selected drive speed pattern stored in said memory means for the next line to be started upon completion of printing of data of one line;
first computing means for computing a first period of time required from the time when said carriage is stopped after the completion of printing of the data of the one line, until said carriage starts its movement and reaches a printing enable speed;
second computing means for sequentially computing, each time when said carriage is stopped after the completion of printing of the data of one line, a second period of time required from the time of stoppage of said carriage to the completion of the feeding operation of said sheet feeding means; and
control means for comparing the second period of time computed by said second computing means with the first period of time computed by said first computing means whenever said carriage is stopped, and initiating acceleration of said carriage when the second period of time computed by said second computing means becomes less than the first period of time computed by said first computing means.

5,116,150
APPARATUS AND METHOD FOR MAPPING AND ALIGNING DIGITAL IMAGES ONTO PRINTED MEDIA
Thomas P. Courtney, Santa Clara, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Filed Jan. 9, 1991, Ser. No. 639,585
Int. Cl.[5] A41J *25/28*
U.S. Cl. 400—320 **2 Claims**



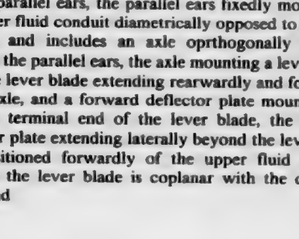
2. A method of determining and correcting the alignment of a print head of a serial printer which utilizes bidirectional printing, comprising the steps of:
providing a printer system comprising said print head, means including a carriage for moving said print head bidirectionally, timing means for determining the activation and deactivation of said print head, sensor means for detecting a midcarriage indicia marker, a platen having first and second ends and said mid-carriage indicia marker, and a perceived mid-carriage indicator associated with said timing means;
moving said print head to a first end of said platen;
moving said print head toward said second end of said platen and monitoring said sensor means for detection of said mid-carriage indicia marker;
comparing the position of said perceived mid-carriage indicator with said mid-carriage indicia marker and determining the difference therebetween;
correcting the timing means of said print system to align said perceived mid-carriage indicator with said mid-carriage indicia marker;
moving said print head to a second end of said platen;
moving said print head toward said first end of said platen and monitoring said sensor means for detection of said mid-carriage indicia marker;
comparing the position of said perceived mid-carriage indicator with said mid-carriage indicia marker and determining the difference therebetween; and
correcting the timing means of said print system to align said perceived mid-carriage indicator with said mid-carriage indicia marker.

5,116,151
CEILING FAN CLEANING APPARATUS
Linda E. Lytton, P.O. Box 650, and Richard D. Perron, P.O. Box 189, both of Homosassa Springs, Fla. 32647
Filed Jul. 12, 1991, Ser. No. 729,325
Int. Cl.[5] A47L *25/00, 4/02, 13/17*
U.S. Cl. 401—9 **1 Claim**

1. A ceiling fan cleaning apparatus, comprising,
an elongate handle first leg, the elongate handle first leg including a first leg upper terminal end, and defined along a central axis, and
a handle second leg orthogonally mounted to an upper terminal end of the first leg orthogonally oriented relative to the central axis, and a second leg slot diametrically directed through a forward end of the second leg orthogonally oriented relative to the central axis, and
a planar upper plate mounted fixedly within the second leg slot, and
the upper plate includes an upper plate forward edge, and connecting web orthogonally mounted to the upper plate at the forward edge, and
the connecting web including a lower edge, and a planar lower plate orthogonally mounted to the connecting web lower edge arranged parallel to and below the planar upper plate to define a cleaning channel between the upper plate, lower plate, and connecting web, and
a fibrous fluid absorbent covering mounted substantially coextensively about the upper plate, lower plate, and connecting web, and
wherein the upper plate is defined by a first length, and the lower plate is defined by a second length, and the second length is substantially less than the first length to permit ease of mounting of the lower plate about a fan blade for effective cleaning of an edge portion of the fan blade, and
wherein the first leg includes an externally threaded lower end portion, and including an extension handle, the extension handle including an internally threaded socket fixedly and coaxially mounted to an upper terminal end of the extension handle, and the internally threaded socket is

arranged for threadedly receiving the externally threaded end portion of the first leg, and
including a plunger shaft reciprocatably mounted through a lower end portion of the first leg, and the plunger shaft extending into the first leg orthogonally mounting a lower ratchet plate fixedly thereon, an upper ratchet plate spaced from the lower ratchet plate within the first leg, and a ratchet member fixedly mounted orthogonally between the lower ratchet plate and the upper ratchet plate, and a first handle aperture directed through the first leg, and a ratchet brake lever pivotally mounted within the first leg in communication with the ratchet member and the ratchet brake lever extending exteriorly of the first leg permitting pivotment of the ratchet member to effect selective reciprocation of the ratchet member, and a piston member mounted fixedly and in a spaced relationship relative to the upper ratchet plate, and the piston member including an annular seal mounted thereabout to effect a sealing relationship between the piston member and an interior surface of the first leg, and a reservoir chamber defined between the piston member and the second leg slot, whereupon projection of the piston member within the reservoir effects pressurizing of the reservoir, and
wherein the upper plate includes a fluid conduit directted substantially coextensively and longitudinally thereof, with the fluid conduit including a plurality of upper feed conduits directing fluid from the fluid conduit to an upper surface of the upper plate, and a plurality of lower feed conduits in communication with the fluid conduit directing fluid from the fluid conduit and reservoir chamber to a lower surface of the upper plate, wherein the upper and lower feed conduits permit directing of cleaning fluid contained within the reservoir chamber into the covering contained about the upper plate.

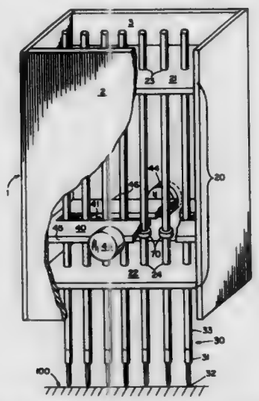
5,116,152
FLUID NOZZLE AND SCRAPER APPARATUS
Warren E. Caswell, 2881 Townline Rd., Madison, Ohio 44057
Filed Nov. 13, 1990, Ser. No. 612,545
Int. Cl.[5] A47L *13/03*
U.S. Cl. 401—261 **1 Claim**



1. A fluid nozzle and scraper apparatus comprising,
a handle, including a fluid conduit directed therethrough, and
an upper fluid conduit mounted in fluid communication with the handle, and
a valve member operatively associated with the handle and upper fluid conduit to effect selective fluid flow to the handle and upper fluid conduit, and
a scraper blade means mounted to the upper fluid conduit adjacent a forward terminal end thereof permitting selective scraping during directing of fluid flow through the upper fluid conduit, and
wherein the scraper blade means includes a slide housing, the slide housing mounted to a bottom surface of the upper fluid conduit and positioned adjacent the forward terminal end of the upper fluid conduit extending rearwardly therefrom, wherein the upper fluid conduit includes an upper conduit axis and wherein the slide housing is arranged parallel to the upper conduit axis, and the slide housing includes a slide blade reciprocatably mounted relative to the slide housing, and wholly contained within the slide housing in a first retracted position, and wherein the slide blade extends forwardly of the upper fluid conduit in a second extended position, and a blade button projecting through the housing and operatively associated with the slide blade to effect reciprocation of the slide blade relative to the slide housing, and
further including water deflection means mounted to the upper fluid conduit in an orientation diametrically opposed to the slide housing for directing fluid spray to the slide blade when the slide blade is in the second position, and
wherein the water deflection means includes a plurality of spaced parallel ears, the parallel ears fixedly mounted to the upper fluid conduit diametrically opposed to the slide housing and includes an axle oprthogonally directed through the parallel ears, the axle mounting a lever blade, with the lever blade extending rearwardly and forwardly of the axle, and a forward deflector plate mounted to a forward terminal end of the lever blade, the forward deflector plate extending laterally beyond the lever blade and positioned forwardly of the upper fluid conduit, wherein the lever blade is coplanar with the deflector plate, and

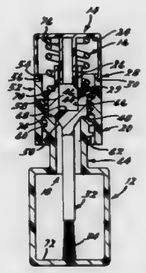
wherein the lever blade further includes a rear plate, the rear plate integrally mounted to a rear terminal end of the lever blade, the rear plate including an internally threaded aperture, the internally threaded aperture threadedly receiving a threaded rod therethrough , the threaded rod including a lower terminal end in contact with the upper fluid conduit, and an upper terminal end of the rod including a grasping cap to permit manual rotation of the rod to permit radial adjustment of the deflector plate relative to the upper fluid conduit.

5,116,153
MULTIPLE LINE WRITING INSTRUMENT
Paul R. Tully, 42 Windward Rd., Lowell, Mass. 01852
Filed Apr. 1, 1991, Ser. No. 678,145
Int. Cl.[5] B43K *27/08*; B43L *13/02*
U.S. Cl. 401—35 **14 Claims**



1. A multiple line writing instrument of a size and shape for one-handed use thereof, said instrument comprising: an enclosure having secured therein holder means comprising multiple apertures, each said aperture receiving in sliding relationship therethrough an elongate writing means having a writing tip whereby said multiple elongate writing means are established in a spaced apart parallel array oriented longitudinally of said enclosure, the writing tips of said array extending to the exterior of said enclosure and whereby each said elongate writing means is enabled to stroke upwardly and downwardly of said holder means; a journalled stop table secured to said enclosure and having a least one slot therethrough to slidingly receive each said elongate writing means of said array, said stop table being journalled so as to pivot transversely with respect to the longitudinal axis of said enclosure and responsively to upwardly directed forced imposed thereupon by at least certain of said elongate writing means when the instrument is held at a writing angle with respect to a writing surface and the plural writing tips of the elongate writing means array are contacted with said writing surface, and (b) to pivot sufficiently in accordance with (a) as to establish and maintain a parallel relationship to said writing surface and up stop means affixed to each elongate writing means of said array at a distance from the writing tip thereof, said up stop means butting against the bottom of said stop table upon upward stroking of the writing means associated therewith, thereby to define the upward stroke limit of said associated writing means, said distance of each said up stop means from said writing tip of said elongate writing means of said array being such as to maintain the writing tips of the entire array of elongate writing means in writing contact with said writing surface.

5,116,154
SPRING-LOADED BOTTLE CAP/APPLICATOR APPARATUS
Gary E. Fulkerson, 673 Center Ridge, South Lyon, Mich. 48178
Filed Jun. 6, 1991, Ser. No. 711,628
Int. Cl.[5] A46B *11/00*; A45D *34/00*
U.S. Cl. 401—127 **12 Claims**



1. A spring-loaded bottle cap/applicator apparatus for enabling extraction of fluids and semi-solids from a bottom surface of a bottle, jar and other like containers, said apparatus comprising:

a brush member having an elongated stem portion and a base portion, a lowermost end portion of said elongated stem portion having an applicator brush secured thereto, said base portion including a lower shoulder portion and an outwardly protruding shoulder portion spaced longitudinally apart from said lower shoulder portion, said base portion further including an uppermost end portion, said lower shoulder portion of said brush member being positioned at a predetermined point along a length of said brush member to provide said elongated stem portion a length sufficient to enable said applicator brush to reach to a position closely adjacent an interior lower surface of a container;

an integrally formed cap member having an inner upper surface;

biasing means disposed inbetween said inner upper surface of said cap member and an upper surface of said outwardly protruding shoulder portion of said base portion for biasing said brush member linearly outwardly of said cap member when said brush member is not threadably secured to a threaded neck portion of a container; and

threaded means operatively associated with said cap member for limiting the outward linear movement of said brush member relative to said cap member and for threadably engaging said threaded neck portion of said container as said apparatus is threadably secured to said threaded neck portion, said inner upper surface of said cap member being able to move independently relative to said brush member;

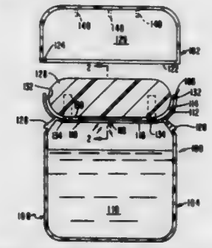
said applicator brush being operable to reach to said position closely adjacent said interior lower surface of said container without being threadably secured to said threaded neck portion of said container when said elongated stem portion is inserted through said threaded neck portion; and

whereby said threaded means may be threadably secured to said threaded neck portion while said brush member is inserted through said threaded neck portion into said container and said lower shoulder portion of said base portion is in abutting contact with an upper surface of said neck portion, said brush member thereby being held stationary relative to said container and said cap member regardless if said threaded means are threadably engaged with, or disengaged from, said neck portion.

5,116,155

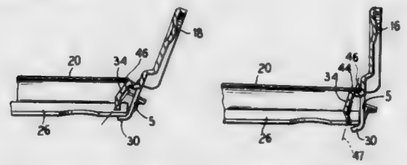
Patent Not Issued For This Number

5,116,156
ROLLER-TYPE MATERIAL APPLICATOR
Joseph V. Landi, 7-11 Hopper Ave., Fair Lawn, N.J. 07410
Filed Jul. 27, 1990, Ser. No. 558,567
Int. Cl.[5] B05C *17/025*
U.S. Cl. 401—208 **16 Claims**



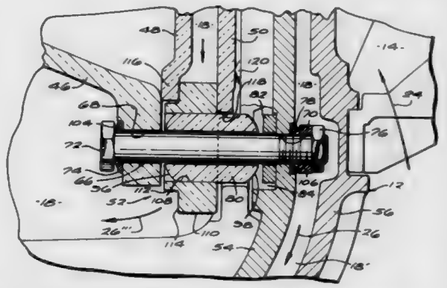
1. An applicator comprising a housing having a material containing portion and an opening through which material is discharged, an oval shaped roller element of resilient material having an uninterrupted surface and a long axis arranged within said housing for application of a material upon rotation of said roller element about said long axis, a seal element comprising a portion of said housing in operative association with said opening, and said roller element, said seal element comprising a raised rib immediately surrounding said opening and a cap removably securable to said housing overlying said roller element, said cap when secured to said housing causing at least a portion of said roller element to deform upon engagement with said seal element to provide a seal thereat to prevent discharge of material by said applicator.

5,116,157
LOCKING RING BINDER
Steven Gillum, Fairhaven, and Luke Fuller, Acushnet, both of Mass., assignors to U.S. Ring Binder Corporation, New Bedford, Mass.
Filed Dec. 28, 1990, Ser. No. 635,284
Int. Cl.[5] B42F *13/22, 13/26*
U.S. Cl. 402—38 **6 Claims**



1. A locking ring binder incorporating a plurality of ring portions secured to a pair of hinged plates, and a resilient cover member for urging the peripheral portions of said hinge plates toward each other, thereby to hold the rings in open position or closed position, and at least one operating lever rotatably mounted on said cover having an actuator located below said hinged plates for moving at least a portion of said hinged plates upwardly to force said rings into an open position, said operating lever having a tongue adapted to force at least a portion of said hinged plates downwardly as said operating lever is rotated to a closed position, and a detent incorporating a projection on said cover member and a corresponding projection on said operating lever, said detent becoming engaged when said operating lever is moved away from its open position, said detent tending to resist rotation of said operating lever as a result of a force supplied directly to said rings, whereby said leaves are locked in their closed position.

5,116,158
HIGH TEMPERATURE TURBINE ENGINE STRUCTURE
William D. Carruthers, Mesa, and Gary L. Boyd, Tempe, both of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Continuation-in-part of Ser. No. 280,760, Dec. 6, 1988, Pat. No. 5,011,353. This application Nov. 20, 1989, Ser. No. 439,991
Int. Cl.[5] F16B *35/00*
U.S. Cl. 403—28 **9 Claims**



1. A hybrid ceramic/metallic structure comprising:

a radially extending disk-like metallic first wall member experiencing respective change of radial dimension in response to change of temperature thereof;

a radially extending disk-like ceramic second wall member spaced apart in parallel relation and coaxial with said first wall member, said second wall member experiencing respective change of radial dimension in response to respective change of temperature thereof;

a plurality of spacers disposed between said wall members and circumferentially spaced apart, each of said spacers having a first and second end portion having an end surface adjacent said first and second wall members respectively, said end surfaces having a cylindrical curvature extending transversely relative to said first and second wall members; and

a plurality of securing means for clamping said first and said second wall members into contact with each of said first and second cylindrically curved end surfaces, whereby said first and second wall members remain parallel and coaxial while experiencing said respective changes in radial dimension.

5,116,159
BALL AND SOCKET JOINT ASSEMBLY
Karle O. Kern, Jr., Reminerville, and Dana A. Desko, Atwater, both of Ohio, assignors to Dana Corporation, Toledo, Ohio
Continuation-in-part of Ser. No. 572,197, Aug. 23, 1990, abandoned. This application Aug. 16, 1991, Ser. No. 749,640
Int. Cl.[5] F16C *11/06*
U.S. Cl. 403—132 **9 Claims**



1. In a ball and socket joint assembly including a ball, a cylindrical housing adapted to contain said ball, said housing defining an axis, and having first and second axially spaced ends, said housing comprising a radially extending annular first seat between said ends, said housing containing said ball between said first end and said first seat, said first seat facing said end, an elongated ball stud fixed to said ball, said stud extend-

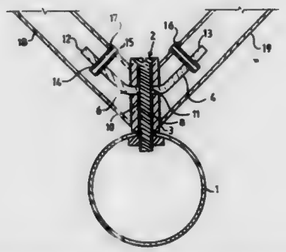
ing outwardly through said first end of said housing, first and second axially opposed socket bearings rigidly supported within said housing and adapted to position said ball for limited oscillatory movement of said ball, and means disposed between said first seat and said first socket bearing for providing an internal axial preload on said first socket bearing against said ball and, in turn, on said ball against said second socket bearing; an improvement wherein said housing comprises first and second adjoining coaxial interior bores, each of said bores communicating with an axially fixed, nonadjustable annular member extending radially between said bores and defining an aperture therethrough, said member defining said first seat, and wherein said means for providing said internal preload comprises a conical spring washer having a central aperture comprising an annular second seat, and wherein said aperture of said annular member is concentric with, but sized equal to or smaller than, said aperture of said washer, said first socket bearing formed of an extrudable plastic composition and comprising a concave seat bounded by an annular rim, said rim comprising a chamfered annular extremity, wherein said rim becomes flattened against said second socket bearing upon preloading of said joint assembly.

5,116,160

CONNECTORS

Juri Pold, and Ilmar Pold, both of 1/25 Brougham Pl, Alberton, Australia

Filed May 9, 1990, Ser. No. 521,097
Claims priority, application Australia, May 9, 1989, PJ4091
Int. Cl.[5] F16B *7/00*
U.S. Cl. 403—172 **14 Claims**



1. A connector for providing interconnection between frame members comprising:

a block adapted to be attached to a side of a first frame member, said block having at least one slot formed therein and at least one aperture passing through said block and intersecting said slot,

at least one wing member having an apex portion and two wing portions, each of said wing portions extending away from said apex portion and with an incline one wing with respect to the other to opposite ends of said wing member and adapted to engage a corresponding hollow frame member with an interference fit, said apex portion adapted to be located within said slot of said block and having an aperture formed therein in registry with an aperture in said block, and

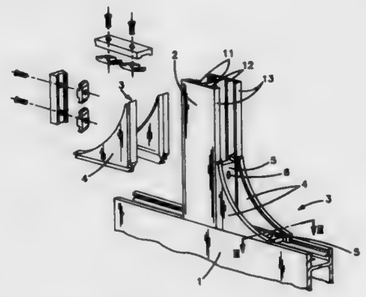
a fastening means passing through the apertures of said block and said apex portion to secure said block to said first frame member.

5,116,161

CORNER JOINT BETWEEN TWO SECTIONS HAVING A C-SHAPED ATTACHING PORTION BY MEANS OF A CORNER CONNECTOR, AND ANGLE PIECE FOR PRODUCING THE JOINT

Dieter Faist, Winterthur, Switzerland, assignor to Alusuisse-Lonza Services, Ltd., Zurich, Switzerland

Filed Apr. 1, 1991, Ser. No. 678,600
Claims priority, application Switzerland, Apr. 11, 1990, 01246/90
Int. Cl.[5] F16B *9/00*
U.S. Cl. 403—231 **9 Claims**



1. Corner joint which comprises:

a first section having a C-shaped attaching portion and a second section arranged at an angle thereto and having a C-shaped attaching portion, wherein said first and second sections each have two parallel section legs and a first inwardly facing web on each of the two section legs;

a corner connector consisting of two angle pieces each having two legs which bear against the two sections and each having a complementary angle piece;

at least one screw and an associated parallelogram nut associated with each angle piece operative to screw the angle piece to the sections, wherein the nut grips behind the two first webs of the associated section;

wherein said two angle pieces are separate and moveable relative to one another, and wherein the legs of the angle pieces bear against the first and second sections and each leg of said angle piece has a groove on the side remote from the complimentary angle piece and a wedge surface on the side opposed to said groove;

a second web on each of the two section legs parallel to the first web wherein said second webs engage in a form-fitting manner in the grooves of the angle pieces; and

at least one wedge rail which bears against the wedge surfaces and is clamped by the screws, wherein the angle pieces are spread apart by the wedge rail.

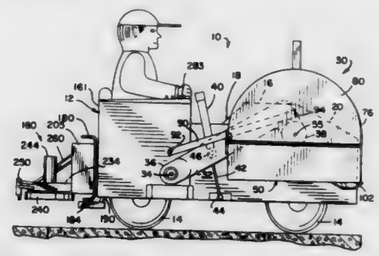
5,116,162

PAVEMENT MAINTENANCE MACHINE AND METHOD

Albert G. Burhite, Nekoosa, Wis., assignor to B-J Development, Nekoosa, Wis.

Filed Feb. 25, 1991, Ser. No. 661,033
Int. Cl.[5] E01C *23/08;* **A01D** *34/84*
U.S. Cl. 404—72 **17 Claims**

17. A method of maintaining pavement comprising: identifying slabs of pavement which have been upheaved by tree roots growing under said slabs, cutting said tree roots along an edge of said slab between said pavement and said tree, and milling off an elevated corner of said slab to approximately the level of the next adjacent slab.

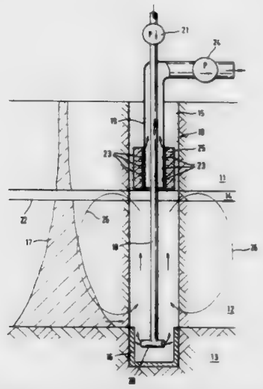


5,116,163

ARRANGEMENT FOR DRIVING OUT VOLATILE IMPURITIES FROM GROUND WATER

Bruno Bernhardt, Reutlingen, Fed. Rep. of Germany, assignor to IEG Industrie-Engineering GmbH, Reutlingen, Fed. Rep. of Germany

Filed Jan. 16, 1991, Ser. No. 641,683
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1990, 4001012
Int. Cl.[5] B09B *1/00*
U.S. Cl. 405—128 **3 Claims**



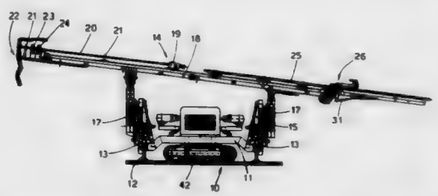
1. An arrangement for driving out volatile impurities from a ground water and a ground region through which the ground water passes by introducing air or another gas into an opening in the ground region and subsequent aspiration of the air or the gas with entrained contamination substances, the arrangement comprising a cup insert arranged to close an opening formed in a ground region at its lower end and provided with a closed wall; two pipes arranged concentrically in the opening for supplying the air or gas and withdrawing the air or gas, respectively, said pipes including an outer pipe extending above a water level in the opening and having an upper end and a lower region, an inner pipe extending into an interior of said cup insert, said inner pipe having an upper end and a lower end; a pressure pump connected with said upper end of said inner pipe; a distributor head provided at said lower end of said inner pipe and having a plurality of openings; a suction pump connected with said upper end of said outer pipe, said outer pipe having a wall provided in said lower region and having a plurality of perforations.

5,116,164

DEVICE TO LOAD REINFORCEMENT RODS

Bruno Casagrande, Fontanafredda, Italy, assignor to Casagrande SpA, Fontanafredda, Italy

Filed Oct. 16, 1990, Ser. No. 598,135
Claims priority, application Italy, Oct. 26, 1989, 83495 A/89
Int. Cl.[5] E21D *19/00*
U.S. Cl. 405—303 **7 Claims**



1. A device for handling drill rods and reinforcing rods used in conjunction with excavation equipment, said excavation equipment being used to remove material from an excavation face of a tunnel being excavated, where such excavation equipment utilizes drilling equipment to drill holes along a drilling axis where upon reinforcing rods are subsequently inserted into said holes to provide lengthwise reinforcements in said tunnels, said drill rods and reinforcing rods extending to a length of about twenty meters, and said excavation equipment is borne on an excavation machine, said excavation equipment including a drilling head means for cooperating with drill rods to drill said holes and cooperating with said reinforcement rods to insert said rods into said holes, said device comprising;

a plurality of arm support structures (**28**) connected to said excavation equipment;

a plurality of arms, each arm associated with a corresponding arm support structure, for selectively moving said drill rod and said reinforcement rod from stored positions to positions in alignment with said drilling head; and

a plurality of bearing means, each bearing means associated with a corresponding arm and arm support structure, each said bearing means for pivotally mounting said arm on said arm support structure, said arm pivotally mounted for controlled movement between engaged and non-engaged positions with respect to said drill head, where each of said plurality of arms comprising:

an arm support (**29**);

a shaped sector (**32**), said sector including at least one aperture, said at least one aperture for engaging at least one of said drill rod and said reinforcing rod;

means for pivotally mounting said shaped sector on said arm support for movement between two sector positions where, when said support arm is in said engaged position, in one of said sector positions said at least one of said reinforcing rod and said drill rod is in an engaged position with said drill head and in said other sector position said at least one of said reinforcing rod and said drill rod is in a non-engaged position with said drill head;

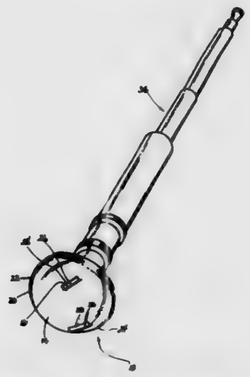
actuator means (**35**) for moving said sector (**32**) between said two sector positions;

clamp sector means (**33**);

pivot means for mounting said clamp sector means for pivotal movement between a clamped position and an unclamped position with respect to said shape sector;

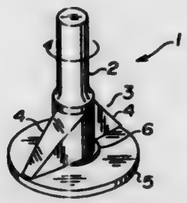
clamping actuator means (**38**) for moving said clamp sector means (**33**) between said clamped position and said unclamped position, wherein in said clamped position said clamp sector means clamps any drill rod and reinforcing rod in position in said at least one shaped sector aperture.

5,116,165
ACETABULAR REAMER CUP
Paul E. Salyer, Warsaw, Ind., assignor to Othy, Inc., Warsaw, Ind.
Filed Mar. 11, 1991, Ser. No. 667,174
Int. Cl.[5] A61B *17/16*; B23C *5/12*
U.S. Cl. 407—54 **20 Claims**



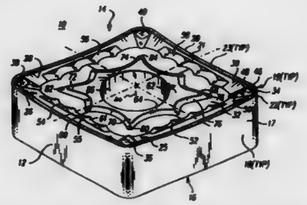
1. An acetabular reamer cup comprising a cutting bowl having a plurality of singly curved cutting edges, said cutting bowl having a plurality of slots preceding said cutting edges, said cutting bowl defining an axis of rotation, said cutting edges being spirally arranged about said axis, and a bottom joined to said cutting bowl, said bottom having a tool driver opening coaxial with said cutting bowl.

5,116,166
45 DEGREE MITER UNDERCUTTER BIT
Glenn Rinas, 9115 - 105 Avenue, Fort St. John, B. C., Canada V1J 2L5
Filed Nov. 6, 1990, Ser. No. 609,728
Int. Cl.[5] B23C *3/12*
U.S. Cl. 407—57 **1 Claim**



1. A miter joint undercutter bit assembly adapted for use with a router which comprises:
a rotatable shaft adapted for attachment to said router;
a cutter mounted on said shaft and adapted to rotate therewith, said cutter forming a generally triangular arm defining an upper surface which extends downwardly from said shaft at an angle of about 45 degrees;
bearing means mounted on said shaft beneath said cutter, said bearing means having substantially the same diameter as the base of said cutter; and
means for securing said bearing means and said cutter to said assembly.

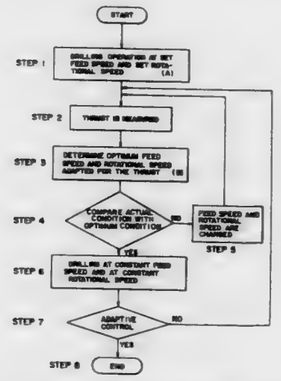
5,116,167
CUTTING INSERT WITH CHIP CONTROL
Kenneth L. Niebauer, Raleigh, N.C., assignor to Kennametal Inc., Latrobe, Pa.
Filed Feb. 19, 1991, Ser. No. 657,483
Int. Cl.[5] B23B *27/16*, *27/22*
U.S. Cl. 407—114 **20 Claims**



1. An indexable cutting insert comprising a polygonal body of wear resistant material, said body including top and bottom surfaces and therebetween a peripheral wall with sides and rounded corners, the intersection of said peripheral wall and said top surface forming a cutting edge, said top surface comprising:
a) a land area joining said cutting edge and extending inwardly toward a center of said body, said land area comprised of corner portion land areas and side portion land areas;
b) a floor between said land area and said center of said body disposed at a lower elevation than said land area,
c) sloping wall portions inclined downwardly and inwardly from said land area to said floor;
d) corner portions disposed at respective corners of said body, each corner portion positioned about a bisector line which bisects the angle formed by the intersection at said corner portion of a line extended from the cutting edge along each adjacent side, each corner portion embedded in and protruding from the respective corner portion land area such that the respective corner portion land area extends inwardly to a lesser amount than adjacent side portion land areas, wherein a reference plane is defined by a plane intersecting the corner portion land areas along the cutting edge and wherein each corner portion comprises;
i) a recessed planar area disposed in and protruding from said sloping wall portions at an elevation between said corner portion land area and said floor,
ii) an upper descending wall from said corner portion land area to said recessed planar area,
iii) a convex lower descending wall about said respective bisector line from said recessed planar area to said floor; and
a plateau disposed upon said floor, said plateau spaced apart from said sloping wall portions and said plateau having sloped sides ascending from said floor.

5,116,168
METHOD AND APPARATUS FOR CONTROLLING DRILLING OPERATION
Yukitaka Aihara, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 28, 1989, Ser. No. 344,631
Claims priority, application Japan, Apr. 28, 1988, 63-107269
Int. Cl.[5] B23B *35/00*, *39/00*
U.S. Cl. 408—1 R **6 Claims**

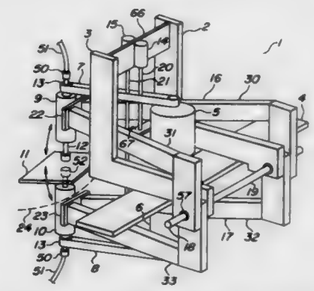
1. A method of controlling the drilling operation of a drill for a composite workpiece made of a plurality of laminated materials including at least a first material and a subsequent material, comprising:
setting a rotational speed and a feed speed of said drill to a set rotational speed and a set feed speed, respectively, for said first material;
starting said drilling operation in said first material in accordance with said set rotational speed and said set feed speed;
detecting an actual rotational speed, an actual feed speed and an actual thrust force applied to said drill during said drilling operation;
determining an optimum rotational speed and an optimum feed speed depending on said actual thrust force;
comparing said actual rotational speed and said actual feed speed with said optimum rotational speed and said optimum feed speed, respectively;



correcting said set rotational speed and said set feed speed to said optimum rotational speed and said optimum feed speed respectively when said actual rotational speed and said actual feed speed are not substantially equal to said optimum rotational speed and said optimum feed speed, respectively; and
continuing said drilling operation with said rotational speed and said feed speed when said actual rotational speed and said actual feed speed are substantially equal to said optimum rotational speed and said optimum feed speed, respectively, so as to make a precise and uniform hole and to improve durability of said drill.

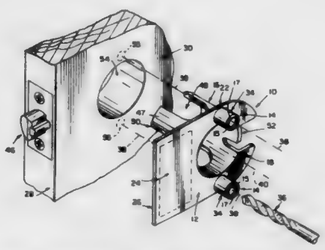
5,116,169
APPARATUS AND METHOD FOR DRILLING GLASS
Garry M. Loy, Raleigh, N.C., assignor to ABB Power T&D Company, Inc., Blue Bell, Pa.
Filed Mar. 1, 1991, Ser. No. 663,408
Int. Cl.[5] B23B *39/22*
U.S. Cl. 408—39 **34 Claims**

16. A drilling machine comprising:
a) upper and lower approximately triangularly shaped arm assemblies, said triangular shape forming an apex and a base for each arm assembly;
b) first and second drills attached to the apex of said upper and lower arm assemblies, respectively; and



c) means for pivoting said first and second arm assemblies about a common centerline, said pivoting means disposed in the base of said upper and lower arm assemblies.

5,116,170
DRILL JIG FOR PREPARING A DOOR TO RECEIVE A CYLINDRICAL LOCK
Ralph P. Palmer, Indianapolis; David A. Whitmoyer, Lapel, and Mark A. Shumaker, Indianapolis, all of Ind., assignors to Best Lock Corporation, Indianapolis, Ind.
Filed Feb. 22, 1991, Ser. No. 660,337
Int. Cl.[5] B23B *49/02*
U.S. Cl. 408—72 B **18 Claims**



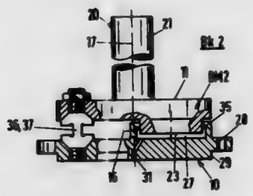
1. A door preparation drill jig mountable in a main bore formed in a door prior to insertion of a latch-actuating lockset in the main bore, the drill jig comprising
an exterior member formed to include at least one drill guide, the exterior member including a plate having a flat surface abutting the door, and
means for mounting the exterior member to the door, the mounting means extending into the main bore to locate the exterior member and the at least one drill guide in a mounted position on the door so that each drill guide is oriented to face the door and aim a drill bit received therein at a portion of the door to be drilled to provide a lockset mounting hole adjacent tot he main bore, the mounting means including a cylindrical body sized to fit int he empty main bore of the door and being configured to include flexible tabs yieldably engaging in interior wall in the main bore to cause the cylindrical body to fit snugly in the main bore of the door.

5,116,171

PRESSURE CONTROLLED CUTTER BIT RETAINER WITH PRECISION ADJUSTABLE CUTTER BIT

Wilfried Gerk, Rödermark; Hartmut Hirt, Königstein, and Gerhard Klee, Frankfurt, all of Fed. Rep. of Germany, assignors to Samson AG, Frankfurt, Fed. Rep. of Germany

Filed Sep. 5, 1990, Ser. No. 577,520
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1989, 3929472
Int. Cl.[5] B23B *51/00*
U.S. Cl. 408—147 4 Claims



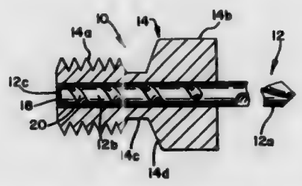
1. A boring apparatus, comprising:
a rotating hydraulic pressure controlled cutter bit retainer with a precision adjustable boring bar bearing a cutter bit;
a base; and
an integrated pressure motor having a pressure fluid chamber and an output part sealed and resiliently mobile with respect to said base, the pressure motor output part and the boring bar being a rigid unit without any parts which mechanically rub upon each other, so that displacement of the output part caused by a volume of pressure fluid is smaller than displacement of the cutter bit upon a curved path extending approximately perpendicularly to the axis of rotation of the cutter bit, the output part having a pivot axis tiltable with respect to said base and located externally of the axis of symmetry of the boring bar, the output port being a round plate tiltable with respect to said base, and further comprising an elastomeric seal for sealing said round plate in a mobile manner against said base, said elastomeric seal being stressed by squeezing, and said round plate being connected with said base in a resilient manner by two replaceable elastic rods.

5,116,172

COMPOSITE ROTARY CUTTING TOOL AND ADAPTOR AND METHOD OF MAKING SAME

Paul E. Koster, McHenry, Ill., assignor to Precision Twist Drill Co., Crystal Lake, Ill.

Filed May 28, 1991, Ser. No. 706,288
Int. Cl.[5] B23B *51/02*; B23P *15/32*
U.S. Cl. 408—226 32 Claims



1. A composite cutting tool and adaptor for precision cutting metallic parts, said tool and adaptor comprising a metallic cutting tool having a cutting end and a generally cylindrical shank end, and an adaptor having a metallic body defining an external gripping surface and having an axial bore free from scale, said shank end of said cutting tool being disposed within said bore and establishing relatively small clearance peripherally of said shank end, said shank end having at least one spiral groove along a predetermined length thereof, and an anaerobic adhesive between the interfacing surfaces of said shank and the peripheral wall of said bore and filling said groove, said adhesive being cured to a hardened state so as to lock said shank end within said adaptor, said metallic cutting tool shank and said metallic body of said adaptor having metal ions which react with said anaerobic adhesive.

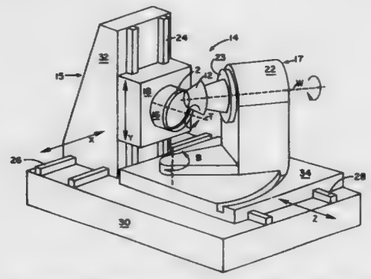
11. A method of making a composite cutting tool and adaptor for precision cutting metallic material wherein the cutting tool is made of metallic material and has a cutting end and a generally cylindrical shank end, and wherein the adaptor has a metallic body having an external gripping surface and an axial cylindrical bore, said method comprising the steps of;
forming said axial bore in said adaptor tool to a predetermined diameter having a relatively narrow tolerance range,
forming said shank end of said cutting tool to a diameter which will provide a relatively small clearance peripherally of said shank end when inserted in said axial bore,
forming at least one spiral groove along a predetermined length of said shank end of said cutting tool so as to retain a substantial portion of the outer cylindrical shank surface undisturbed,
applying an anaerobic adhesive to said shank end of said cutting tool so as to cover said undisturbed cylindrical surface and fill said spiral groove,
inserting said shank end into said bore so that said adhesive wets the mutually interfacing surfaces of said shank end and said bore, and
curing said adhesive to a hardened state so as to lock said shank end within said adaptor.

5,116,173

METHOD OF GENERATING BEVEL AND HYPOID GEARS

Robert N. Goldrich, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Feb. 26, 1991, Ser. No. 661,775
Int. Cl.[5] B23F *9/14*
U.S. Cl. 409—13 43 Claims



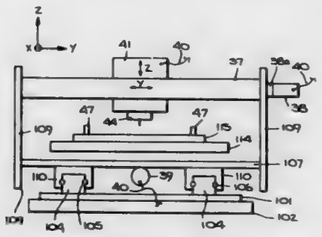
1. In a method of generating bevel and hypoid gears comprising the steps of:
rotating a tool, and
operatively engaging said tool with a work gear in a predetermined rolling motion about a theoretical axis of rotation wherein said theoretical axis represents the axis of rotation of a theoretical generating gear and wherein said theoretical axis intersects the pitch plane of said work gear and said theoretical generating gear, said theoretical generating gear rolling in mesh with said work gear and having tooth surfaces represented by the stock removing surfaces of said tool, the improvement comprising the step of,
substantially simultaneously with said rolling motion, varying at least the position of intersection of said theoretical axis and said pitch plane relative to said work gear.

5,116,174

METHOD AND APPARATUS FOR MANUFACTURING JEWELRY, AND AN ARTICLE OF JEWELRY MADE THEREBY

Kenneth Fried, 25 Thornwood La., East Hills, N.Y. 11577, and Herman Herskovic, 24-39 E. 71st St., Brooklyn, N.Y. 11234

Filed Nov. 13, 1989, Ser. No. 435,243
Int. Cl.[5] B23C *1/06*; B23Q *15/007*
U.S. Cl. 409—79 20 Claims



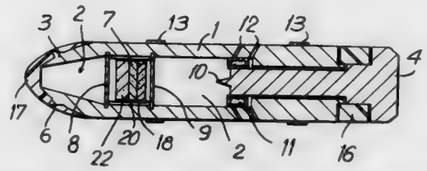
1. An apparatus for manufacturing an article of jewelry from a workpiece comprising:
input means for inputting a pattern for the article of jewelry;
mounting means for removably mounting the workpiece thereon;
machining means for accepting the mounted workpiece and for transferring a pattern corresponding to the pattern input by said input means to the workpiece; and
processing means for processing the pattern input by said input means into a form suitable for said machining means and for causing said machining means to transfer the pattern to the workpiece,
wherein said input means includes means for compensating for the geometry of said machining means by leaving more material on the workpiece than that called for by the pattern.

5,116,175

EXPLOSIVELY DEFORMABLE ANCHORING ASSEMBLY

Ari Adini, 104-20 Queens Blvd., Forest Hills, N.Y. 11375

Filed Feb. 19, 1991, Ser. No. 657,525
Int. Cl.[5] F16B *13/04*
U.S. Cl. 411—20 20 Claims



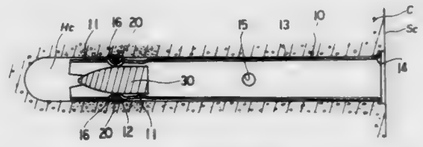
1. An anchoring assembly for attachment to a base material, comprising:
a body having a forward section and a hollow insertion portion with an open end and an expandable portion positioned behind said open end;
an explosive cartridge movably housed within said insertion portion near to said open end and capable of moving from said insertion portion to said expandable portion when forces are applied thereto; and
firing means housed within said body behind said cartridge for igniting said cartridge when said cartridge is moved from said insertion portion to said expandable portion, upon ignition causing an explosive discharge which outwardly deforms said expandable portion against said base material.

5,116,176

EXPANSION ANCHOR

Yoshino Yousuke, Kawagoe, Japan, assignor to Yoshino Seiki Inc., Kawagoe, Japan

Filed Jun. 19, 1991, Ser. No. 717,816
Claims priority, application Japan, Jan. 20, 1990, 2-161996
Int. Cl.[5] F16B *13/06*
U.S. Cl. 411—60 10 Claims



1. An expansion anchor comprising:
a hollow cylindrical anchor body having an inner diameter and an outer diameter and having a wall portion thereof deformed into the interior of said anchor body to form at least one circumferential retaining groove which at the deepest portion thereof has an inner diameter and an outer diameter respectively smaller than the inner and outer diameters of said anchor body;
at least one clamp member in the form of a generally U- or C-shaped plate having peripheral angular edges and fitted into said retaining groove so as to extend radially thereof, said clamp member having an inner diameter substantially equal to said outer diameter of said retaining groove and an outer diameter no greater than a size substantially equal to than said outer diameter of said anchor body; and
a lock plug having a diameter larger than said inner diameter of said retaining groove and less than the inner diameter of said anchor body for being slidably contained in said anchor body.

5,116,177

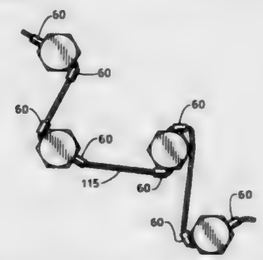
Patent Not Issued For This Number

5,116,178

SAFETY CABLE FOR FASTENERS

Theodore B. Lerman, and Bernard W. Basse, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 324,501, Mar. 16, 1989, abandoned.
This application Oct. 22, 1990, Ser. No. 600,293
Int. Cl.[5] F16B *39/04*
U.S. Cl. 411—87 13 Claims



1. Apparatus for preventing threaded fasteners from loosening, said apparatus comprising:
a) at least two unitary threaded fasteners having head portions and a fixed hole integrally formed and completely enclosed within and extending through each said head portions;

b) a single multi-strand flexible cable comprising at least three wires having a first end extending in a first direction entirely through said hole in each of two of said fasteners; and

c) a first bead bonded to a first end of the cable adjacent a first fastener and a second bead bonded to a second end of said cable extended through said holes and adjacent a second fastener for keeping the cable in place extended through said fasteners.

5,116,179

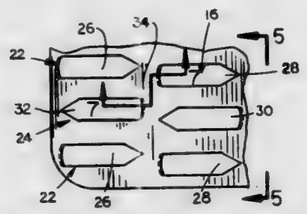
NAIL END PLATE FOR WOODEN TIES

Gordon E. Matlock, 554 Sappington Bridge Rd., Sullivan, Mo. 63080

Continuation-in-part of Ser. No. 582,950, Feb. 23, 1984, abandoned. This application Aug. 11, 1988, Ser. No. 230,892

Int. Cl.[5] F16B *15/00*

U.S. Cl. 411—466 **4 Claims**



1. A nail end plate for wooden ties comprising,

a flat metal plate having first and second sides, a smooth, continuous top edge, a smooth, continuous bottom edge and smooth, continuous opposite side edges to provide a smooth, continuous perimeter without interruptions therein,

said metal plate having a plurality of elongated teeth struck therefrom and extending from said second side,

each of said teeth being formed by a struck-out portion of the plate creating an elongated opening in said plate the longitudinal axis of which is parallel to said top and bottom edges,

each of said teeth being struck out less than 90° from said plate,

said openings being arranged in alternating first and second rows extending parallel to said top and bottom edges,

the openings in each of said first rows comprising a plurality of pairs of first and second openings,

said first openings in said first row being longitudinally aligned with each other, said second openings in said first row being longitudinally aligned with each other and transversely offset with respect to said first opening in said first row,

the openings in each of said second rows comprising a plurality of pairs of third and fourth openings;

said third openings in each second row being longitudinally aligned with each other, said fourth openings in said second row being longitudinally aligned with each other and transversely offset with respect to said third openings in said second row,

each of said teeth in said first row extending from one end of its respective opening,

each of said teeth in said second row extending from the other end of its respective opening,

each of said teeth including a shank portion extending from said plate and a tip portion on the end of said shank portion, said shank portion being generally V-shaped in transverse cross-section,

said teeth in said first rows facing a first direction,

said teeth in said second rows facing a second direction opposite to said first direction,

said first openings in said first rows being substantially vertically aligned with said fourth openings in said second rows and said second openings in said first rows being substantially vertically aligned with said third openings in said second rows whereby the distance between said side edges may be changed by cutting said plate between said first and second openings and said third and fourth openings while still maintaining said continuous side edges,

said teeth of said second openings cooperating with the teeth of said fourth openings to form a plurality of staples and wherein said teeth of said third openings cooperate with the teeth of said first openings to form a plurality of staples.

5,116,180

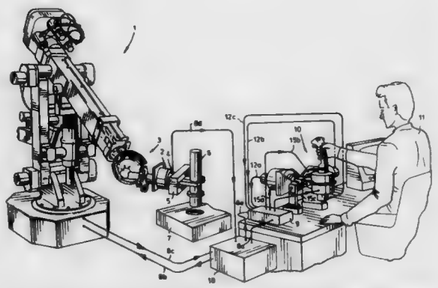
HUMAN-IN-THE-LOOP MACHINE CONTROL LOOP

Patrick T. Fung, Willowdale; Graham Norgate, Oakville; Timothy A. Dilts, Newmarket; Andrew S. Jones, Toronto, and Rangaswamy Ravindran, Bolton, all of Canada, assignors to Spar Aerospace Limited, Weston, Canada

Continuation-in-part of Ser. No. 219,789, Jul. 18, 1988, abandoned. This application May 3, 1990, Ser. No. 518,471

Int. Cl.[5] B25J *3/00*

U.S. Cl. 414—5 **18 Claims**



1. A human-in-the-loop control loop for a machine having a plurality of joints and an operative part, said plurality of joints adapted for moving said operative part, comprising:

(a) a hand controller having at least one degree of freedom so as to be deflectable in order to provide hand controller position signals for moving said operative part, said hand controller, in each degree of freedom, controlling motion of said operative part along one path;

(b) position mapping means to map each of said hand controller position signals to an operative part position command signal indicative of a position for said operative part along each of said at least one path;

(c) velocity mapping means to map each of said hand controller position signals to an operative part velocity command signal indicative of a velocity for said operative part along each of said at least one path;

(d) selector means to selectively activate said position mapping means and deactivate said velocity mapping means or activate said velocity mapping means and deactivate said position mapping means; and

(e) resolving means responsive to said selector means for resolving operative part position command signals to joint command signals and operative part velocity command signals to joint command signals for controlling the movement of each of said joints.

5,116,181

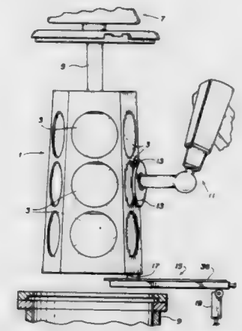
ROBOTICALLY LOADED EPITAXIAL DEPOSITION APPARATUS

David W. Severns, Sunnyvale; Brian Tompson, Campbell; Paul R. Lindstrom, Aptos, and David K. Carlson, Santa Clara, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed May 19, 1989, Ser. No. 354,161

Int. Cl.[5] C23C *16/00*

U.S. Cl. 414—222 **11 Claims**



1. In a semiconductor-processing apparatus of the type employing a reaction chamber for confining a reactive gaseous atmosphere in contact with a substrate, the combination comprising:

a susceptor for supporting said substrate;

susceptor mounting means for supporting said susceptor within said apparatus;

substrate loading means selectively operable to: (1) load a substrate onto said susceptor for processing within said apparatus, and (2) remove a substrate from said susceptor at the completion of said processing;

susceptor stabilization means mounted on said apparatus and selectively operable independently of said loading means to: (1) move into engagement with said susceptor for fixing the position of said susceptor with respect to said apparatus during the operations of loading and removing a substrate, and (2) move out of engagement with said susceptor and (3) produce a vacuum in a region adjacent said chamber opening.

5,116,182

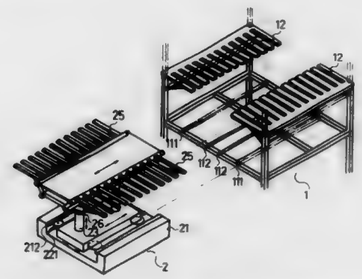
AUTOMATIC CAR PARKING SYSTEM

Bao N. Lin, No. 441, Jen AI Rd., Chu Tung Town, Hsin Chu Hsien, Taiwan

Filed Oct. 17, 1990, Ser. No. 598,969

Int. Cl.[5] E04H *6/06*

U.S. Cl. 414—254 **3 Claims**



1. An automatic car parking system, comprising:

a parking rack system defined therein a plurality of parking spaces each of which comprising a base frame at the bottom and two opposite comb-like platforms at the top, said base frame having two opposite racks transversely made thereon and a pair of guide rails set therebetween; and

at least one car lifting feeder for sending a car into said parking spaces, comprising a rotary base having a rotary mechanism therein for rotation, a pair of guide rails at the middle and a pair of racks at two opposite sides, a sliding seat movably mounted on said guide rails and having gears attached thereto at two opposite sides and respectively engaged with the racks of said rotary base, a plurality of power lift cylinders mounted on the sliding seat for carrying a platform to move up and down, and said platform further having a pair of comb-like wings at two opposite sides respectively driven by power tilt cylinders to incline them downward.

5,116,183

APPARATUS FOR UNLOADING FREIGHT FROM AN OPEN FREIGHT CAR

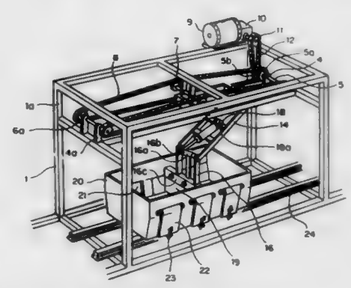
Sang H. Lee, 165-1 Daehyun-Dong, Buk-Ku, Daegu, D.P.R. of Korea

Filed Nov. 16, 1990, Ser. No. 614,511

Claims priority, application D.P.R. of Korea, Nov. 27, 1989, 89-17735

Int. Cl.[5] B65G *67/26*

U.S. Cl. 414—395 **19 Claims**



1. An apparatus for unloading freight loaded in an open freight car, which comprises:

a hexahedral supporting frame,

a pair of railroad rails disposed on the bottom of said supporting frame providing means for positioning an open freight car having a plurality of outlets on sides thereof in the supporting frame,

a pair of belting members supported on a pair of horizontal supports which are disposed on an upper portion of said supporting frame, respectively,

a moving member inserted into said pair of belting members for moving forward and backward along said pair of belting members;

a connecting member pivotally connected to said moving member by pivotal mounting means,

a shoveling member pivotally connected to said connecting member by pivotal mounting means, and

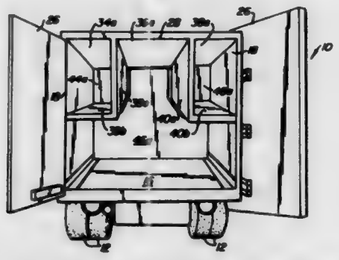
a main motor for rotating said belting member, whereby when the belting member is rotated by the motor, the moving member is moved forward and backward so that the shoveling member is moved forward and backward within the open freight car in the supporting frame so as to provide means for moving out the freight through the plurality of outlets in the freight car sides.

5,116,184

VEHICLE AND METHOD FOR COLLECTING RECYCLABLE WASTE MATERIALS

Louis A. Pellegrini, 1231 Thurston Ave., Los Altos, Calif. 94022

Continuation of Ser. No. 421,829, Oct. 19, 1989, abandoned, which is a continuation of Ser. No. 277,474, Nov. 23, 1988, abandoned, which is a continuation of Ser. No. 53,205, May 23, 1987, abandoned. This application Aug. 3, 1990, Ser. No. 563,748
The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.
Int. Cl.[5] B65G 67/04
U.S. Cl. 414—406 13 Claims



1. Apparatus for collecting recyclable waste materials comprising:

a vehicle having a bed, a top, a front end, a rear end, and vertical partition means extending longitudinally of the vehicle to a location near said rear end for defining a number of compartments on the bed, there being an access opening at the top near said front end through which segregated waste materials can be directed into respective compartments, said access opening near said front end being normally in a generally horizontal plane, there being exit opening means near the rear end through which waste materials can be directed out of the compartments, the partition means having an upper edge portion aligned with and sufficiently close to the access opening to cause segregated waste materials directed into the access opening to remain segregated as the waste materials are directed into the compartments, the partition means being the only means on the vehicle for dividing the bed into compartments, and the upper edge portion of the partition means being the only means for keeping waste materials segregated as the waste materials are directed into the compartments;

means near the front end for at least one compartment for forcing waste materials in the compartment longitudinally of the vehicle toward the exit opening means;

means for closing the exit opening means;

a waste material container having partition structure defining a number of compartments; and

means on the vehicle near the front end thereof for elevating the waste material container into a position aligned with, above and in dumping relationship to the access opening with each compartment of the container being vertically aligned with a respective compartment of the vehicle, whereby segregated waste materials carried in the compartments of the container can be dumped into respective compartments of said vehicle.

5,116,185

VIBRATORY TUBE-TO-TUBE TRANSFER SYSTEM

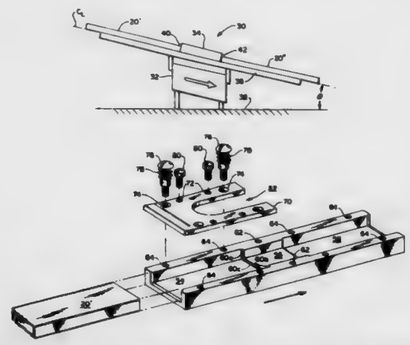
Michael L. Lofstedt, Tracy, Calif., assignor to LSI Logic Corp., Milpitas, Calif.

Filed May 1, 1990, Ser. No. 517,048
Int. Cl.[5] B65B 35/14
U.S. Cl. 414—415 16 Claims

1. A vibratory tube-to-tube transfer system for transferring integrated circuit devices from an input tube to an output tube, comprising:

an alignment fixture having an input section for receiving and partially enclosing an end of an input tube containing integrated circuit devices, an output section in collinear alignment with the input section for receiving and partially enclosing an end of an output tube capable of receiving integrated circuit devices from an input tube, and a linear transfer section having a first end adjacent to and collinear with said input section and a second end adjacent to and collinear with said output section; wherein the input section holds an input tube in longitudinal, end-to-end, spaced-apart, collinear alignment with an output tube held in said output section;

support means for supporting said alignment fixture;



vibrator means affixed to said support means for directionally vibrating said alignment fixture to transfer integrated circuits from an input tube through said linear transfer section and into an output tube;

a first cover plate including means for resiliently closing the input section, said means for resiliently closing the input section including first spring means for limiting the maximum vertical distance of said first cover plate above a top surface of said input section and for biassing said first cover plate against an input tube; and

a second cover plate including means for resiliently closing the output section, said means for resiliently closing the output section including second spring means for limiting the maximum vertical distance of said second cover plate above a top surface of said output section and for biassing said second cover plate against an output tube.

5,116,186

APPARATUS FOR CONTROLLING HYDRAULIC CYLINDERS OF A POWER SHOVEL

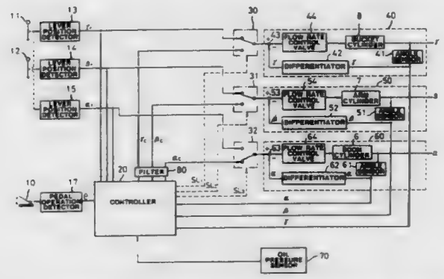
Tadayuki Hanamoto, Hiratsuka, and Shinji Takasugi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

PCT No. PCT/JP88/00771, § 371 Date Mar. 30, 1990, § 102(e) Date Mar. 30, 1990, PCT Pub. No. WO90/01586, PCT Pub. Date Feb. 22, 1990
PCT Filed Aug. 2, 1988, Ser. No. 465,259
Int. Cl.[5] E02F 9/20
U.S. Cl. 414—694 4 Claims

1. A controlling device for a power shovel which includes a boom, an arm pivoted to the boom, a bucket pivoted to the arm, a boom cylinder for pivoting the boom, an arm cylinder for pivoting the arm, a bucket cylinder for pivoting the bucket, and a hydraulic pump for supplying pressurized oil into said boom cylinder, arm cylinder, and bucket cylinder, said controlling device being utilized for initially setting a reference locus of movement of a front edge of the bucket approximated by a plurality of points, for setting respective postures of the bucket when the front edge of the bucket is situated at the plurality of points, and for driving the bucket, arm, and boom so that the front edge of the bucket moves from an assigned position to start excavation along the plurality of points while the bucket maintains the initially set posture at the plurality of points, wherein said controlling device comprises:

pump pressure detection means for detecting the pump pressure of hydraulic oil supplied by the pump;

first control means comprising means for receiving detected values of an angle of the bucket, an angle of the arm and an angle of the boom at an assigned moment to start excavation, means for obtaining a position of the front edge of the bucket relative to a vehicle according to the detected values, means for calculating positions of the plurality of points set relative to the vehicle according to the obtained position to start excavation for the front edge of the bucket, means for obtaining an angle of rotation of the bucket, an angle of rotation of the arm and an angle of rotation of the boom needed to move the front edge of the bucket at said calculated position and to set the bucket to



the posture of the bucket set for a proper point for each of excavation sections, and means for obtaining a distribution ratio of flow rates of pressurized oil to be supplied to the respective cylinders according to the angles of rotation for each of the excavation sections; and

second control means comprising means for setting a relationship between the pump pressure and the flow rate of the pump at the predetermined pressure, means for obtaining commands for flow rates for the respective cylinders by distributing the flow rate of the pump calculated from the relationship set and from the pump pressure detected by the pump pressure detection means in the distribution ratio obtained, means for outputting a command for a flow rate which is larger than the flow rate of the obtained command for a cylinder having the largest load, and for outputting the obtained commands for the flow rates for the other two cylinders; and

whereby the bucket arm and boom cylinders drive the bucket, arm and boom, respectively, according to the commands for flow rates output from said second control means.

5,116,187

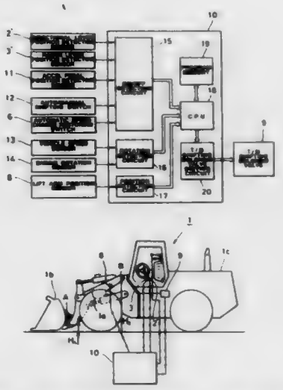
AUTOMATIC SPEED CHANGING APPARATUS FOR WHEEL LOADER

Masao Fukuda, and Yasuo Yamazaki, both of Saitama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP88/00501, § 371 Date Jan. 5, 1990, § 102(e) Date Jan. 5, 1990, PCT Pub. No. WO89/11407, PCT Pub. Date Nov. 30, 1989
PCT Filed May 24, 1988, Ser. No. 457,776
Int. Cl.[5] E02F 3/84
U.S. Cl. 414—699 2 Claims

1. An automatic speed changing apparatus employable for a wheel loader wherein speed changing is effected by automatically selecting a certain speed stage in a transmission corresponding to the current vehicle speed, said apparatus comprising;

a position sensor for detecting a position where lift arms on said wheel loader are raised up, and



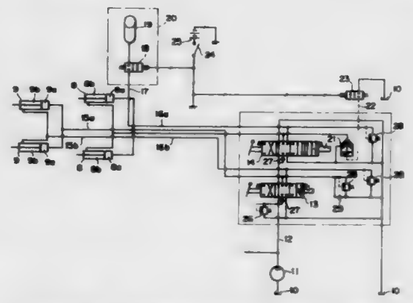
maintaining means for maintaining the selected current speed stage in the transmission when it is found that the raised position of the lift arms which has been detected by said position sensor is higher than a preset position.

5,116,188

VIBRATION SUPPRESSING DEVICE FOR WHEELED CONSTRUCTION EQUIPMENT

Michiya Kurohashi, Takasago; Satoru Torii, Kakogawa, and Yoichi Kunieda, Akashi, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 244,672, Sep. 15, 1988, abandoned. This application Aug. 16, 1990, Ser. No. 568,613
Claims priority, application Japan, Sep. 16, 1987, 62-233276; Sep. 16, 1987, 62-233277
Int. Cl.[5] B66C 23/26; A01B 63/111; F16D 31/02
U.S. Cl. 414—719 3 Claims



1. A vibration suppressing device for wheeled construction equipment travelling on a road having a wheeled chassis, a working device operatively supported on the wheeled chassis for vertical motion, and a hydraulic circuit including a plurality of hydraulic actuators for moving the working device in a vertical direction, comprising:

an accumulator for suppression of vibrations, filled with a pressurized gas;

a mode changeover valve for connecting the accumulator to the load bearing pressure chambers of the hydraulic actua-

tors in a travelling mode in which the wheeled construction equipment is travelling on said road and for disconnecting the accumulator from the load bearing pressure chambers of the hydraulic actuators in a working mode in which the working device of the wheeled construction equipment is operated;

means for maintaining the position of said working device over a predetermined minimum limit height from said road for travelling, wherein said vibration suppressing device is so designed as to meet the following conditions for preventing said working device from contacting said road when said working device thus positioned is bounced during travelling and which includes means for limiting the quantity of hydraulic fluids allowed to flow into or out of the accumulator according to the relationship:

$$P_G \times V_A^n \leqq P_H \times V_F^n$$

$$P_G \leqq P_H$$

where P_G is the pressure of a gas initially sealed in the accumulator, V_A is the volumetric capacity of the accumulator, P_H is static holding pressure maintained in the load bearing pressure chambers of the hydraulic actuators in the travelling mode, V_F is volume variation in the load bearing pressure chambers of the hydraulic actuators, and n is the coefficient of adiabatic change of the gas;

an auxiliary mode changeover valve for controlling pressure to rod side chambers of the hydraulic actuators; and

a changeover switch for controlling operation of both said mode changeover valve and said auxiliary mode changeover valve.

5,116,189

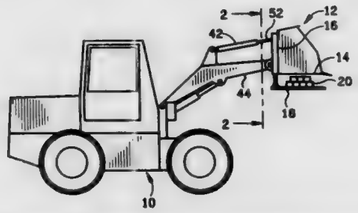
LOADER BUCKET WITH POWER LIFT APPARATUS

Mohammad Shammout, 3950 Ecochee Ave., San Diego, Calif. 92117, assignor to Mohammad Shammout, San Diego, Calif.

Filed Nov. 5, 1990, Ser. No. 608,709

Int. Cl.[5] B66F *19/00*

U.S. Cl. 414—722 **9 Claims**



9. A combined bucket and lift apparatus for attachment to a vehicle, comprising:

a loader bucket having a bottom wall;

a lifting member;

suspending means connected between the loader bucket and lifting member for adjustably suspending the lifting member below the bucket in a plane substantially parallel to the bottom wall of the bucket;

the suspending means comprising hydraulic means extending perpendicular to said lifting member for raising and lowering said lifting member in planes parallel to the bottom wall of the bucket and at least one telescopic guide means extending transversely between the bucket and lifting member for guiding said lifting member as it moves up and down, said guide means comprising a first part secured to the bucket and a second part secured to the lifting member, one of the parts comprising a guide bar and the other part comprising a hollow tubular member for telescopic sliding engagement with said guide bar.

5,116,190

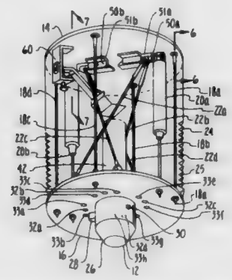
REMOTELY ADJUSTABLE COMPLIANCE FOR END EFFECTOR TOOLING

Gerald W. Silke, El Cajon, Calif., assignor to General Atomics, San Diego, Calif.

Filed Aug. 2, 1990, Ser. No. 561,809

Int. Cl.[5] B25J *17/02*

U.S. Cl. 414—735 **13 Claims**



13. A method for gripping a remote article with a robot, comprising the steps of:

attaching a first mounting plate to said robot;

attaching a second mounting plate to said article;

interconnecting said plates by attaching a plurality of cables therebetween;

disposing a plurality of stiffening devices between said plates, said stiffening devices each comprising an arm and an extendable stiffener and a pair of tensioning cables, said arm having a first end pivotally attached to said first mounting plate and a second end, said extendable stiffener having a first end attached to said second plate and a second end pivotally joined with said second end of said arm and each of said tensioning cables having a first end attached to said second plate and a second end attached to said arm intermediate said first and second ends of said arm; and

employing said stiffening devices to shift said selected tensioning cables between stiff and compliant configurations by extending and retracting said extendable stiffeners.

5,116,191

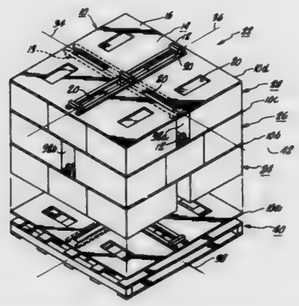
METHOD AND ARTICLE FOR STACKING BOXES ON A PALLET BOARD

Eugene Van, 630 S. Oaks Ave., Ontario, Calif. 91762

Continuation-in-part of Ser. No. 832,147, Feb. 24, 1986, abandoned. This application Jun. 20, 1988, Ser. No. 208,594

Int. Cl.[5] B65D *13/00*

U.S. Cl. 414—786 **12 Claims**



1. A method of storing a plurality of uniformly shaped boxes,

wherein each box has a horizontal base, vertical sides and a horizontal top, the method comprising the steps of:

(a) cross-stacking the boxes in horizontal tiers on a plurality of pallet boards to define a plurality of pallet board loads, each pallet board load having a plurality of tiers formed in a cross-stacked relationship to adjacent tiers, each pallet board load having four vertical sides, an exterior and an interior, the boxes being stacked on each pallet board such that at least one ventilated tier is defined in each pallet board load by arranging the boxes on the ventilated tier to define a horizontal interior ventilation channel, the ventilation channel defining a first pallet board load opening in a first vertical side of the pallet board load and a second pallet board load opening in a second side of the pallet board load;

(b) bracing the boxes in each ventilated tier by interposing spacing elements between the boxes located on opposite sides of the ventilation channel, the spacing elements being predisposed in fixed relationship to one another by rigid structural means so as to conform to the outline of part of the ventilation channel while leaving open the balance of the ventilation channel for ventilation purposes, and thereby prevent the boxes from shifting laterally into the ventilation channel; and

(c) arranging the pallet board loads in close proximity to one another in such a way that the pallet board load openings of adjacent pallet board loads are in alignment with one another and a ventilation channel in each pallet board load communicates with a ventilation channel of at least one other pallet board load.

5,116,192

TONE GENERATION DEVICE CAPABLE OF GENERATING A SPECIAL TONE

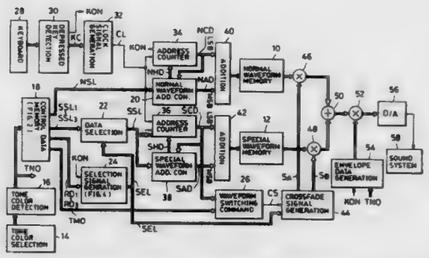
Satoshi Usa, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed May 17, 1990, Ser. No. 525,113

Claims priority, application Japan, May 18, 1989, 1-125406

Int. Cl.[5] G10H *1/057, 1/08, 1/18, 1/46*

U.S. Cl. 84—653 **11 Claims**



11. A method of simulating the tone generation of one of a plurality of natural musical instruments in an electronic musical instrument, comprising the steps of:

selecting a tone color of one of the plurality of natural musical instruments;

providing a normal tone signal for the selected tone color;

providing a special tone signal corresponding to the normal tone signal but having at least one of the special tone signal's tone color, tone pitch, and tone volume different from that of the normal tone signal;

designating the tone to be generated;

selecting, upon the tone designation, either the normal tone signal or the special tone signal to be generated; and

generating either the normal tone signal or the special tone signal in accordance with the tone signal selected.

5,116,193

COUPLING FOR THREE-DIMENSIONAL FRAMED STRUCTURE

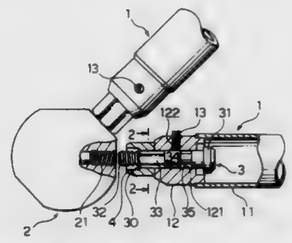
Takato Takizawa, and Kouji Yamagishi, both of Toyama, Japan, assignors to Yoshida Kogyo, K.K., Tokyo, Japan

Filed Jan. 31, 1991, Ser. No. 648,988

Claims priority, application Japan, Jan. 31, 1990, 2-8900[U]; Jan. 31, 1990, 2-8901[U]

Int. Cl.[5] B25G *3/00*

U.S. Cl. 403—27 **18 Claims**



1. A coupling for a three-dimensional framed structure, comprising:

(a) a plurality of knuckle members each having a plurality of screw holes;

(b) a plurality of rod members adapted to be interconnected end to end by said knuckle members, each of the rod members including a pair of sleeves mounted one on each of opposite ends of each said rod member, a pair of connecting bolts each having a head and axially inserted through a respective one of said sleeves from an inner side thereof, and a pair of rotary members each disposed at an outer end of a respective one of said sleeves, each engaged with a respective one of said connecting bolts in such a manner that each said rotary member is turnable with said respective one of said connecting bolts and said respective one of said connecting bolts is movable axially relative to said rotary member; and

(c) holding means carried by each said sleeve, said holding means being slightly projected outwardly from an outer peripheral surface of each said sleeve while the bolt is not engaged with said knuckle member and said holding means temporarily hold said respective one bolt from being axially moved relative to said rotary member until said holding means are released, said respective one bolt is threadedly insertable into one of said screw holes of one of said knuckle members to a predetermined extent, said holding means being insertable into each said sleeve, until it is at least flush with said outer peripheral surface of each said sleeve, when said respective one bolt is threadedly inserted into said one screw hole of each said knuckle member to said predetermined extent.

5,116,194

BORING HEAD

Emile Pfalzgraf, Bouxwiller; Claude Jaeger, Monswiller, and Raymond Tugend, Uberach, all of France, assignors to E.P.B. Emile Pfalzgraf, S.A., Bouxwiller, France

Filed May 15, 1991, Ser. No. 700,416

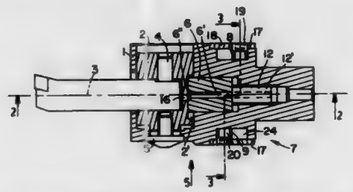
Claims priority, application France, May 15, 1990, 90 06218

Int. Cl.[5] B23B *51/12*

U.S. Cl. 408—181 **7 Claims**

1. Boring head constituted by a body (1) providing with a radial piston (2) for reception of a boring tool (3) clamped in the piston (2) by means of a screw (4), said piston (2) being adjustable in position by means of a micrometric screw (5), wherein the body (1) is provided also with a slide block (6) slidable axially within the body (1) effecting the guidance, the orientation and an end-of-travel abutment for the piston (2) for

reception of the boring tool (3) and with a balancing device (7) with independent counterweights (8 and 9) carried by the body



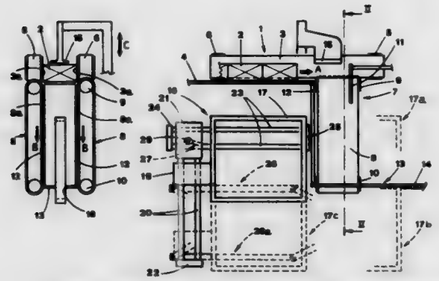
(1) and adjustable in position relative to the body to correct unbalance of the boring head.

5,116,195

DEVICE FOR FORMING VERTICAL PILES OF ITEMS

Domenico Pattarozzi, S. Lazzaro di Savena, Italy, assignor to PRB Packaging Systems S.R.L., Bologna, Italy

Filed Jan. 22, 1991, Ser. No. 643,734
Claims priority, application Italy, Jan. 26, 1990, 3318 A/90
Int. Cl.[5] B65G *57/03*
U.S. Cl. 414—790.3 **10 Claims**



1. A device for forming vertical piles of items delivered successively by a horizontal conveyor means, comprising:

translating means to downwardly displace said items delivered by said horizontal conveyor means;

support means located below said translating means and having an upper surface to support a pile of the items being formed thereon;

vertically movable pushing means located above said translating means and said support means, said pushing means being operable to successively engage an upper surface of each delivered item when said delivered item is positioned above said translating means and to push said delivered item towards said translating means;

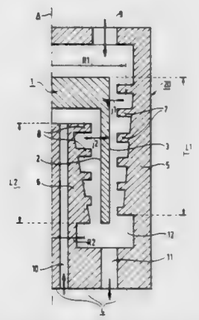
transfer means for transferring a pile of said items formed on said upper support surface, said transfer means being provided with a horizontally and vertically movable transfer frame, said transfer frame being moveable horizontally to displace a said delivered item positioned above said translating means and to push said delivered item during a transfer phase, and being moveable vertically into a position below said upper support surface, during a return phase, said transfer frame also supporting a subsequent pile being formed thereon during said transfer phase, as well as depositing said subsequent pile onto said upper support surface during said return phase.

5,116,196

MECHANICAL PUMP ASSEMBLY FOR PUMPING A SECONDARY VACUUM, AND A LEAK DETECTION INSTALLATION USING SUCH AN ASSEMBLY

Gilles Baret, Annecy, and Denis Perrillat-Amede, Annecy le Vieux, both of France, assignors to Alcatel CIT, Paris, France

Filed Jul. 10, 1990, Ser. No. 550,403
Int. Cl.[5] F04D *19/04*
U.S. Cl. 415—89 **5 Claims**



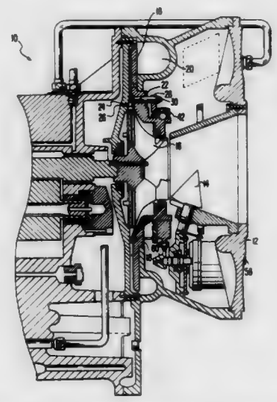
1. In a mechanical pump assembly (20) for pumping a secondary vacuum, comprising two pumping stages, the first stage having a suction inlet (9) and the second stage having a suction orifice (10), said inlet said orifice both opening out to the outside, both stages having a common delivery outlet (4), the improvement wherein said pumping stages are solely of the Holweck drum type, said first stage having a compression ratio of about 50 for a gas such as helium and of about 30,000 for air, the pumping speed of the first stage being about 4 l/s for air and about 2.5 l/s for said gas, and in that said second stage has a pumping speed of about 3.5 l/s for air and of about 2 l/s for said gas, the nominal speed of rotation of said mechanical pump assembly being about 27,000 rpm.

5,116,197

VARIABLE GEOMETRY DIFFUSER

Paul W. Snell, York, Pa., assignor to York International Corporation, York, Pa.

Filed Oct. 31, 1990, Ser. No. 606,618
Int. Cl.[5] F04D *29/40*
U.S. Cl. 415—126 **21 Claims**



1. A system for a variable capacity compressor having a diffuser, the capacity of which can be varied by changing the relative position of a fixed diffuser surface and a movable diffuser surface, the system comprising:

a nozzle base plate fixed to the compressor housing, said nozzle base plate having an axially elongated, cylindrical surface;

a drive ring coaxial with said annular nozzle base plate and positioned adjacent to and radially outward of said axially elongated surface of said nozzle base plate;

mechanical means between said base plate and said drive ring to translate rotational movement of said drive ring into axial movement relative to said base;

a push ring coaxially slidably received on said drive ring and positioned adjacent to and radially outward of said drive ring, said push ring being fixed relative to said drive ring in the axial direction;

means for connecting the push ring to the movable diffuser surface, said connecting means preventing rotational movement of said push ring; and

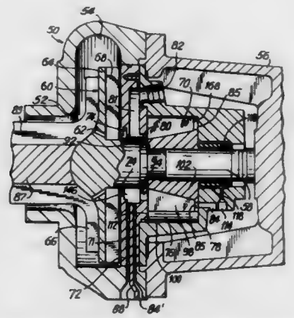
means for rotating said drive ring.

5,116,198

CENTRIFUGAL PUMPING APPARATUS

Reijo Vesala, Kotka, and Vesa Vikman, Kymi, both of Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Sep. 7, 1990, Ser. No. 579,406
Int. Cl.[5] F01D *25/32*
U.S. Cl. 415—169.1 **14 Claims**



1. A centrifugal pump for pumping gas containing medium comprising:

a centrifugal pumping chamber (54);

a centrifugal impeller (60) rotatably mounted within said pumping chamber (54);

a liquid ring vacuum pump (70) having a vacuum pump chamber (76) adjacent said centrifugal pumping chamber and comprising a radially vaned vacuum pump rotor (96) mounted for rotation therein;

an intermediate plate (72) separating said pumping chamber from said vacuum pump; and

a gas inlet port (94) and a gas discharge port (80) on the same axial side of said vacuum pump within said intermediate wall (72) for permitting entry into and discharge of said gas from said vacuum pump.

5,116,199

BLADE TIP CLEARANCE CONTROL APPARATUS USING SHROUD SEGMENT ANNULAR SUPPORT RING THERMAL EXPANSION

John J. Ciokajlo, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 20, 1990, Ser. No. 630,651
Int. Cl.[5] F01D *5/20*
U.S. Cl. 415—173.2 **18 Claims**

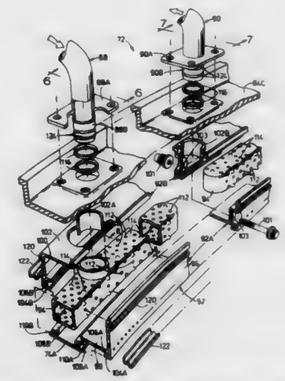
1. In a gas turbine engine including a rotatable rotor having a central axis and a row of blades with outer tips and a stationary casing with a shroud disposed in concentric relation with said rotor, said rotor blade tips and casing shroud having a clearance therebetween, an apparatus for controlling the clearance between said rotor blade tips and casing shroud, said apparatus comprising:

(a) structural means on said casing disposed radially outwardly of said rotor blade tips for defining an annular channel extending in circumferential relation to said rotor central axis about said rotor blade tips and having an annular opening located outwardly of and adjacent to said rotor blade tips;

(b) at least one shroud segment disposed across said opening of said annular channel;

(c) means mounted on said casing for introducing a cooling gas flow into said annular channel from the exterior thereof and means mounted on said casing for exhausting the cooling gas flow from said annular channel to the exterior thereof;

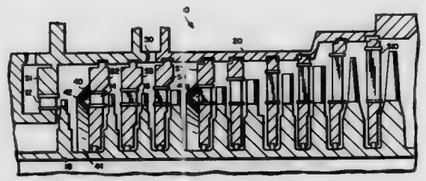
(d) an annular hollow ring disposed in said annular channel and extending in circumferential relation to said rotor central axis, said annular ring mounting said shroud segment across said opening of said channel and, in turn, being mounted to and in communication with said introducing means and exhausting means for undergoing



movement radially outwardly and inwardly relative the rotor blade tips and to said introducing means and exhausting means in response to thermal expansion and contraction of said annular ring; and

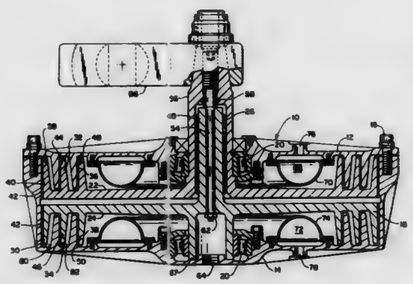
(e) at least one manifold having an elongated hollow body disposed within said annular hollow ring in said annular channel and being connected at the interior of said hollow body of said manifold in communication with only said introducing means for receiving the cooling gas flow into the interior of said hollow body of said manifold so as to prevent introduction of the cooling gas flow into said annular ring about the exterior of said hollow body directly from said gas introducing means without first passing through said interior of said hollow body, said hollow body of said manifold having a plurality of jet-like apertures defined through said hollow body for permitting communication of the cooling gas flow from the interior to the exterior of said hollow body and impingement of the cooling gas flow upon portions of said annular ring adjacent to said apertures and the exterior of said hollow body such that after such impingement the cooling gas can flow directly from said annular ring through said exhausting means to the exterior of said annular channel without again passing through said interior of said hollow body of said manifold.

5,116,200
APPARATUS AND METHODS FOR MINIMIZING VIBRATIONAL STRESSES IN AXIAL FLOW TURBINES
William G. Catlow, Princeton, and Edward T. Vitone, Jr., Ashburnham, both of Mass., assignors to General Electric Company, Schenectady, N.Y.
Filed Jun. 28, 1990, Ser. No. 544,956
Int. Cl.[5] F01D *1/02*
U.S. Cl. 415—183 **10 Claims**



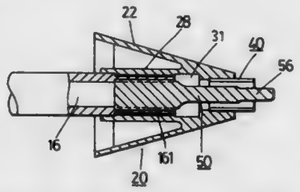
1. A multi-stage axial flow turbine, comprising:
a plurality of turbine stages arranged in the direction of axial flow with each stage including a plurality of stator blades and a plurality of rotor blades:
means carried by the turbine for introducing gas under pressure asymmetrically about the axis of the turbine into the turbine stages; and
a baffle disposed downstream of said introducing means for attenuating the asymmetry of the gas flow in the turbined stages downstream of said baffle, said baffle including an annular member disposed between the rotor blades of one stage and the stator blades of an adjacent subsequent stage and against which member the gas from said one stage rotor blades impinges for diversion towards an axi-symmetric flow prior to flowing through the stator blades of said subsequent stage, said member (i) having a plurality of apertures therethrough, (ii) extending symmetrically about the axis of the turbine and (iii) overlying the stator blades in a radial direction, to enable gas flow around and about the baffle before flowing through said openings.

5,116,201
ADJUSTMENT MEANS FOR HELICOPTER ROTOR BLADE VISCOUS DAMPER
Evan A. Fradenburgh, Fairfield, and Gordon G. Miller, Shelton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Mar. 5, 1991, Ser. No. 664,736
Int. Cl.[5] B64C *27/51;* **F16D** *57/00*
U.S. Cl. 416—140 **12 Claims**



1. A helicopter rotor blade viscous damper, said damper having a stator member and a rotor member, said stator member having an internal cylindrical surface of a first diameter and said rotor member having an external cylindrical surface of slightly smaller diameter than said stator member internal cylindrical surface and defining a shear gap therebetween, said rotor member consisting of two axial aligned rotor discs, one of which has a fixed axial position within said stator member and the other of which is movable axially within said stator member, said damper containing a high-viscosity fluid.

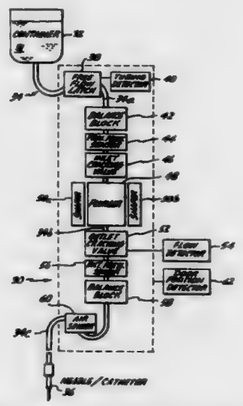
5,116,202
IMPELLER
Yeun-Junn Lin, No. 27-1, 36-6 Lane, Jen Hua Rd., Ta Li Hsiang Taichung Hsien, Taiwan
Filed Jul. 25, 1990, Ser. No. 557,008
Int. Cl.[5] F04D *29/34*
U.S. Cl. 416—204 R **2 Claims**



1. An impeller adapted to be mounted in a nozzle of a motorboat having a propeller shaft, said impeller having a hollow shaft member having a leading end, a trailing end and an inner thread adapted to screw thereto a hollow fixing shaft rotatably mounted in said nozzle into which said propeller shaft projects to drive said fixing shaft, characterized in that said leading end is truncated cone-shaped and includes a crosssectionally polygonal inner bore further comprising a tool for screwing together said shaft member and said fixing shaft wherein said tool includes:
an outerly crosssectionally polygonal insert having a through hole and capable of being inserted in said leading end; and
a rod member having a first flat end capable of projecting through said through hole, and a second opposite end spacedly axially providing thereon a plurality of splines in order that said second end can be inserted into said fixing shaft to engage therewith in manner that said second end and said fixing shaft cannot be in a relative rotation.

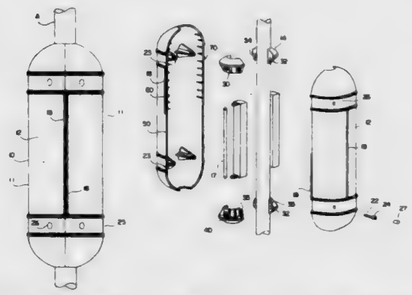
5,116,203
DETECTING OCCLUSION OF PROXIMAL OR DISTAL LINES OF AN IV PUMP
Vernon R. Natwick, Los Altos; Michael W. Lawless, Poway; Joseph E. Doll, Saratoga, and Chung-You C. Wu, San Francisco, all of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.
Continuation-in-part of Ser. No. 494,210, Mar. 15, 1990, Pat. No. 5,055,001. This application Aug. 12, 1991, Ser. No. 743,559
Int. Cl.[5] F04B *43/12, 49/02*
U.S. Cl. 417—53 **24 Claims**

19. A method for detecting at least a partial occlusion of either an inlet line or an outlet line of a pump during a pumping cycle, comprising:
a. at a predefined first time interval during the pumping cycle, mechanically sensing a fluid pressure at the inlet of the pump without directly contacting a fluid within the inlet line, the predefined time interval being selected so as to minimize noise in a signal produced thereby that is indicative of said fluid pressure;
b. at a predefined second time interval during the pumping cycle, mechanically sensing a fluid pressure at the outlet of the pump without directly contacting a fluid within the outlet line, the predefined time being selected so as to minimize noise in a signal produced thereby that is indicative of said fluid pressure;
c. rejecting residual noise in the signals indicative of fluid pressure pressure in the inlet line and in the outlet line, respectively; and



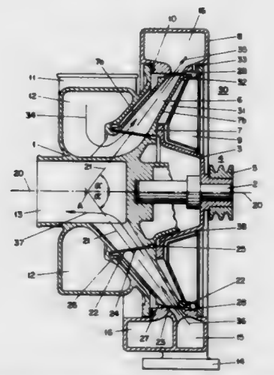
d. determining whether an occlusion of the inlet line or of the outlet line has occurred, as a function of the signals indicative of fluid pressure in the inlet line and in the outlet line of the pump, respectively.

5,116,204
DISPLAY DEVICE
Peter A. Power, Carrobeg, Burrow Road, Portrane, County Dublin; Adrian P. Power, 47 Hollybrook Road, Clontarf, Dublin 3; Julian M. Power, 49 Lein Road, Artane, Dublin 5, and David Conlon, "Primavera", Brighton Road, Foxrock, Dublin 18, all of Ireland
Filed Sep. 4, 1990, Ser. No. 577,364
Claims priority, application Ireland, Sep. 5, 1989, 2846/89
Int. Cl.[5] G09F *15/00*
U.S. Cl. 40—607 **13 Claims**



1. A display device rotatably mounted on a support member such as a pole, comprising:
an elongate member having its outer surface adapted for supporting and displaying an information bearing sheet, said elongate member being coaxial with the support member;
said elongate member including a cylindrical portion and top and bottom gradually bending domed portions, said elongate member being entirely formed of two identical parts, which engage with each other along a longitudinal direction of said member;
each part having a male and female rim section which are engageable with complementary rim sections of the other part along said longitudinal direction;
means for interengaging said two identical parts including engaging members provided on an inner surface of said female rim section, said engaging members being spaced along said female rim section, and being engageable with said male rim section; and
means for rotatably supporting said elongate member on the support member.

5,116,205
PRESSURE EXCHANGER FOR INTERNAL-COMBUSTION ENGINES
Hubert Kirchhofer, Untersiggenthal, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland
Filed Nov. 29, 1990, Ser. No. 619,444
Claims priority, application Switzerland, Dec. 6, 1989, 4375/89-0
Int. Cl.[5] F04B *21/00*
U.S. Cl. 417—64 **11 Claims**

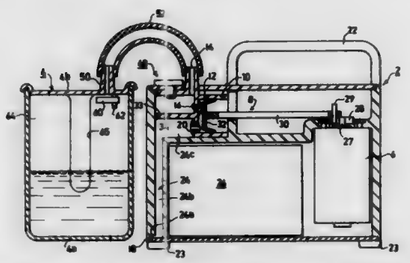


1. A pressure exchanger for internal combustion engines, with a central axis (20), with an at least single-series cellular wheel (4) which is arranged on this central axis (20) and is equipped with cells (6) and the cells (6) of which interact in a specific time sequence on the one hand with channels (15, 16) in a hot-gas guide housing (8) and on the other hand with channels in an air guide housing (1), wherein the cells (6) each have a longitudinal axis which intersects the central axis (20) at an angle (α), wherein a face (23) of the cellular wheel (4) confronting the hot-gas guide housing (8) is designed as an annular segment of the generated surface of a first cylinder, wherein a face (24) of the cellular wheel (4) confronting the air guide housing (1) is designed as an annular segment of the generated surface of a second cylinder, wherein the first and second cylinders have the central axis (20) as a common axis, and wherein the faces of the hot-gas guide housing (8) and air guide housing (1) confronting the cellular wheel (4) extend parallel to the corresponding faces (23, 24) of the cellular wheel (4).

5,116,206
PORTABLE FLUID PUMPING DEVICE
Carmeli Adahan, Netivei Am 11, Ramot Gimmel, 97552 Jerusalem, Israel
Filed Dec. 11, 1990, Ser. No. 625,339
Int. Cl.[5] F04B *39/12;* **F16J** *1/04*
U.S. Cl. 417—234 **14 Claims**

1. A portable fluid pumping device, comprising:
a pump housing having a fluid inlet port, a fluid outlet port, a passageway between said ports, and a cylinder in said passageway;
a piston having a piston stem and a piston head reciprocatable within said cylinder;
a valve assembly in said passageway to produce a positive

pressure at one of said ports and a negative pressure at the other of said ports;
a drive coupled to said piston stem for reciprocating the piston head within said cylinder;
and a relief valve determining the degree of suction producible in the pump housing:
characterized in that said relief valve includes presettable means comprising:
an opening in said pump housing;
a plug slidably and rotatably movable within said opening and carrying a seal ring on the end of the plug disposed within the pump housing;

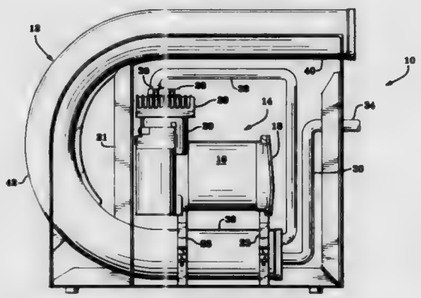


and a leaf spring fixed at its center to said plug so as to rotate therewith, and having outer ends engageable with the outer face of the pump housing around said opening;
said outer face of the pump housing around said opening having a projecting formation projecting at different heights from the surface of the pump housing such that rotation of the plug causes the outer ends of the spring to engage different portions of said projecting formation and thereby presets the negative pressure produced by said negative-pressure port by presetting the outward force applied by the spring to the plug in opposition to the inward force applied to the plug by the negative pressure in the pump housing.

5,116,207
U-SHAPED COMPRESSOR RESERVOIR

Stephen D. Doolittle, Davidson, and Bobby E. Finchum, Gastonia, both of N.C., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 4, 1991, Ser. No. 650,294
Int. Cl.[5] F04B *41/02*
U.S. Cl. 417—312 **11 Claims**

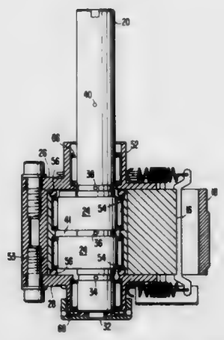


2. An apparatus comprising:
a compressor having an inlet and an outlet; and
a U-shaped reservoir, having a substantially constant internal cross section, in fluid communication with the outlet, the reservoir having two leg portions and a connecting portion, wherein a plane extending through an axis of the compressor also extends through both leg portions, the compressor being located between the two leg portions wherein an overall dimension of the apparatus is limited.

5,116,208
SEAL RINGS FOR THE ROLLER ON A ROTARY COMPRESSOR

Charles B. Parme, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 20, 1990, Ser. No. 570,300
Int. Cl.[5] F04C *18/356, 27/00, 29/02*
U.S. Cl. 418—63 **23 Claims**



1. A sliding vane rotary compressor including a cylinder housing having a cylinder opening, an inlet for supplying a fluid to be compressed to said cylindrical opening and an outlet for outputting pressurized fluid from said cylindrical opening, a roller rotatably mounted in said cylindrical opening, a shaft having a cam which is operably coupled to said roller causing said roller to follow the surface of said cam, a sliding vane reciprocally mounted in said cylinder housing between said inlet and said outlet in wiping engagement with said roller, a bottom bearing plate for closing a bottom end of said cylindrical opening and a top bearing plate for closing a top end of said cylindrical opening, said roller comprising:
a cylindrical tube having an internal space, wherein each end of said cylindrical tube is provided with a counterbored surface, said counterbored surface having a flat bottom surface perpendicular to the side of said cylindrical tube; and
a continuous seal ring disposed within said counterbored surface of each end of said cylindrical tube such that said continuous seal ring rests on said flat bottom surface of said counterbored surface;
said internal space being filled with a pressurized fluid which generates a force biasing each continuous seal ring in a direction perpendicular to said flat bottom surface toward a bearing plate, thereby forming a seal with said bearing plate.

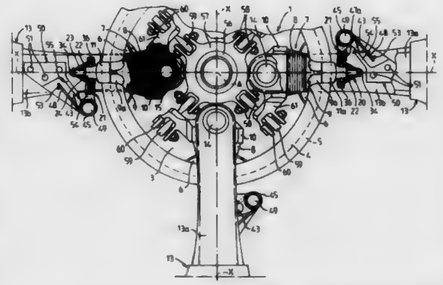
5,116,209
DEVICE OF RETRACTABLE STOPS FOR ROTOR BLADES OF GIROPLANES, AND ROTOR HEAD INCLUDING SUCH A DEVICE

Marc Anglade, Carnoux; Bruno Guimbal, Chateauneuf-Les-Martigues, and Michel A. Hancart, Bouc-Bel-Air, all of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Jun. 5, 1990, Ser. No. 533,642
Claims priority, application France, Jun. 8, 1989, 89 07618
Int. Cl.[5] B64C *27/51*
U.S. Cl. 416—107 **28 Claims**

1. An articulated rotor head for a gyroplane, comprising:
a rotor mast,

a rotor hub fixedly mounted to said rotor mast,
a plurality of rotor blades,
retaining and linking means coupled to said blades and said hub, for coupling said blades to said hub, said retaining and linking means including at least two arm portions forming a forked fastening element, which are connected to one of said blades and said rotor hub;
flapping and drag stop means coupled to each rotor blade for limiting a flapping angle of the blade, said flapping and drag stop means for each blade including
a) a first stop element fixedly coupled to said hub, and radially protruding outward in a direction perpendicular to an axis of said hub, and is disposed in a gap formed by upper and lower said arm portions of said retaining and linking means, and has at least one support zone defined by at least one portion of a surface of a revolution around a longitudinal axis of the stop element which is substantially radial and identical to a pitch axis of a corresponding blade,
(b) a second stop element resiliently mounted on said retaining and linking means, said second stop element being substantially circular and having at least one support surface defined by at least one portion of an inner peripheral surface around the longitudinal axis of the first stop element,

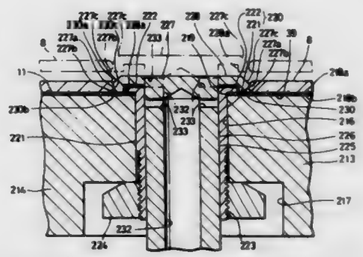


(c) resilient return means springably pressing said second stop element radially inward toward an axis of rotation of said hub when a rotation speed of the rotor is below a fixed value, wherein when a rotation speed of said rotor is higher than the fixed value, centrifugal force moves said second stop element away from said axis of rotation of said hub;
said first stop element being of a cone-like shape radially converging toward the radial exterior, and said second stop element is mounted on said retaining and linking means by a pivoting member having an axis substantially parallel to the rotation axis of the hub, and a clearance progressively increases between said first stop element and said second stop element corresponding to the rotation speed of the rotor, with the clearance creating a flapping and drag stop limit for the rotor blade, and when the rotation speed of the rotor is below the fixed value, said first stop element and said second stop element are urged into a cooperation position where the support surface of said second stop element is urged into close proximity with said at least one support zone of said first stop element, thereby limiting angular movement of the rotor blade to close to zero in both a flapping and a dragging direction.

5,116,210
OPTICAL-DISK MANUFACTURING APPARATUS

Hidetoshi Watanabe, Ibaragi; Hirotsugu Suzuki, Chiba, and Masanobu Yamamoto, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 519,398, May 4, 1990. This application Mar. 22, 1991, Ser. No. 673,392
Claims priority, application Japan, May 15, 1989, 1-121073; May 17, 1989, 1-123680
Int. Cl.[5] B29D *17/00*
U.S. Cl. 425—111 **8 Claims**



1. A transfer device in which a side of a transparent disk coated with an ultraviolet-set resin is pressed against a flat stamper and irradiated by ultraviolet rays through the disk, so as to transfer a pattern provided in the stamper to the ultraviolet-set resin of the disk, comprising:
plate means for holding the stamper against a flat surface thereof;
sleeve means passing through the stamper and being fixed to the plate means for pressing the periphery of a central hole of the stamper against the flat surface of the plate means; and
a pin having a shaft portion inserted into a through hole in the sleeve means and a head portion arranged at the top of the shaft portion, the shaft portion being movable between a lower position and a raised position with respect to the sleeve means;
and in which said head portion of said pin is formed with a recess at a lower surface thereof relative to said plate means for receiving therein said flange of said sleeve means when said pin is in said lower position;
wherein when the pin is in the lower position thereof, the head portion of the pin is fitted into a central hole of the disk so as to put the disk in a proper position on the stamper, and while the pin is in the raised position, the resin-coated disk is separated from the stamper.

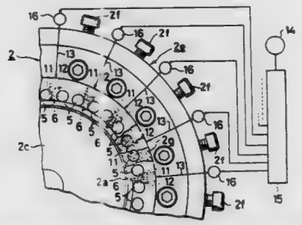
5,116,211
APPARATUS FOR CONTROLLING THICKNESS OF FILM FORMED BY MELT EXTRUSION

Jitsumi Shinmoto, Tokyo, Japan, assignor to Tomi Machinery Manufacturing Co., Ltd., Japan

Filed Mar. 29, 1990, Ser. No. 501,157
Claims priority, application Japan, Mar. 30, 1989, 1-76617; Mar. 27, 1990, 2-75749
Int. Cl.[5] B29C *47/22*
U.S. Cl. 425—141 **11 Claims**

1. In a film molding die having extruding means and a die lip in which a plurality of individually controlled elongate heating elements, each defining a longitudinal axis, are provided to heat the die lip and cooling means are provided for cooling the die lip, the heating elements and the cooling means being provided to adjust the temperature distribution of the die lip thereby to assist in controlling the thickness of a film manufactured by the film molding die,
the improvement wherein the cooling means comprises a plurality of air channels each having a plurality of longitudinally extending grooves, at least a longitudinal exterior

surface of each heating element is in fluid communication with a longitudinal portion of at least one of said plurality of air channels, each of said plurality of air channels extending substantially parallel to the axis of the heating



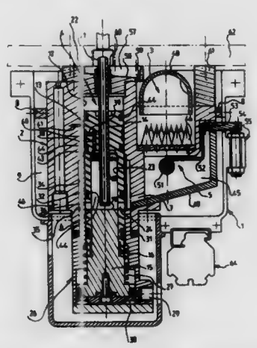
element with which it is in fluid communication, and the longitudinal exterior surface of each heating element at least partially forms an interior surface of the air channel with which it is in fluid communication.

5,116,212

SYSTEM FOR INJECTING MOLTEN MATERIAL INTO A MOLDING APPARATUS

Jean-Claude A. Clement-Demange, 27, rue du Four á Chaux, Jouy Le Moutier, Cergy, France

Filed Sep. 6, 1990, Ser. No. 578,325
Claims priority, application France, Sep. 8, 1989, 89 11789
Int. Cl.[5] B29C *45/76*
U.S. Cl. 425—147 **10 Claims**



1. An apparatus for injecting material into a cavity comprising:

a device for melting meltable material into a molten material and having a vertical melting chamber;

a device for injecting said molten material having a valve cylinder which is slidable in a fixed body and delimiting therein a vertical injection chamber, said injection chamber having an outlet port through which said molten material is forced from said injection chamber to said cavity;

means for vertically moving said slidable valve cylinder from a lower position to an upper position;

means for controlling the level of said molten material in said melting chamber and thereby controlling an amount of said molten material in said injection chamber and triggering an injection operation when said injection chamber is filled with a predetermined amount of said molten material to be injected;

means for forcing said molten material in said injection chamber into the cavity through said outlet port when said slidable valve member is in said upper position;

wherein said melting chamber and said injection chamber are vertically juxtaposed and communicate therebetween at their respective bottoms, when said slidable valve cylinder is in said lower position, through a transfer canal constituted by a first canal portion traversing a lateral wall of said fixed body and a second canal portion traversing a lateral wall of said slidable valve cylinder, said second canal portion located in the vicinity of the bottom of said injection chamber at a small distance thereabove and facing said first canal portion so that said molten material can flow from said melting chamber to said injection chamber until a predetermined level of said molten material in said injection chamber, controlled by said controlling and triggering means, is reached;

wherein said moving means moves said slidable valve cylinder upwardly to the upper position once said injection chamber is filled with said molten material so as to obstruct said second canal portion; and

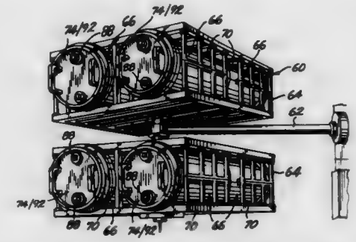
wherein said forcing means include a source of a fluid under pressure and means for feeding the fluid under pressure into said injection chamber when the slidable valve cylinder is in its upper position to force said molten material out of the injection chamber through said outlet port in order to inject said molten material upwardly into said cavity.

5,116,213

INDUSTRIAL DRUM MOLDING

Seymour Zilbert, Demarest, N.J., assignor to Bergen Barrel & Drum Co., Kearny, N.J.

Filed Oct. 11, 1990, Ser. No. 595,997
Int. Cl.[5] B29C *39/00*
U.S. Cl. 425—183 **11 Claims**



1. Molding apparatus for making an industrial drum of a synthetic polymeric material by rotational molding, the industrial drum having a construction including a tubular body having a head end and a head at the head end of the body, the industrial drum having a configuration selected from alternate configurations including a closed-head configuration in which the head is molded unitary with the body at the head end, and an open-head configuration in which the head is separated from the body at the head end, the molding apparatus comprising:

first rotational mold means providing a first mold cavity for rotationally molding the tubular body of the industrial drum;

further rotational mold means selected from a second rotational mold means and a third rotational mold means and providing a selected further mold cavity for rotationally molding the head of the industrial drum when assembled with the first mold means such that upon rotational molding of the industrial drum, the head and the body will be molded simultaneously; and

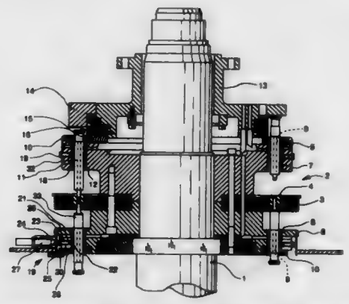
separator means for interposition between the first mold cavity and the corresponding selected further mold cavity to separate the first mold cavity from the selected further mold cavity when the first rotational mold means and the third rotational mold means are assembled with the separator means interposed between the first mold cavity and the selected further mold cavity, and for removal from between the first mold cavity and the corresponding selected further mold cavity for selectively integrating the first mold cavity and the selected further mold cavity when the first rotational mold means and the second rotational mold means are assembled, such that upon rotational molding of the industrial drum with the second rotational molding means assembled with the first rotational molding means, the head will be molded simultaneous and unitary with the body to establish the closed-head configuration, and upon rotational molding of the industrial drum with the third rotational molding means assembled with the first rotational molding means and the separator means interposed between the first mold cavity and the corresponding selected further mold cavity, the head will be molded simultaneous with and separate from the body to establish the open-head configuration.

5,116,214

ROTARY TABLET PRESS

Wolfgang Korsch, and Michael Schmett, both of Berlin, Fed. Rep. of Germany, assignors to Korsch Maschinenfabrik, Berlin, Fed. Rep. of Germany

Filed Mar. 15, 1991, Ser. No. 670,748
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1990, 9003241[U]
Int. Cl.[5] B30B *11/00*
U.S. Cl. 425—345 **6 Claims**



1. A rotary press for pressing cylindrically shaped bodies, the rotary press comprising:

a rotor with a die table, an upper section and a lower section;

an upper rotatable bushing supported by said upper section;

a lower rotatable bushing supported by said lower section;

an upper stamp supported slidably and non-rotatably within said upper rotatable bushing;

a lower stamp supported slidably and non-rotatably within said lower rotatable bushing, each of said upper stamp and said lower stamp engaging into at least one die of said die table;

an upper stationary serrated section;

a lower stationary serrated section;

an upper rotatable bushing serrated section connected to said upper bushing and cooperating with said upper stationary serrated section; and,

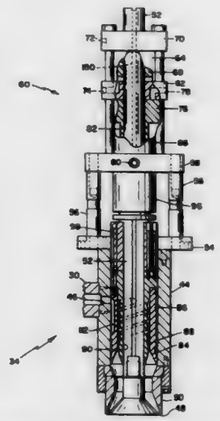
a lower rotatable bushing serrated section, connected to said lower rotatable bushing, cooperating with said lower stationary serrated section.

5,116,215

ACCUMULATOR HEAD FOR EXTRUSION BLOW MOLDING MACHINE

John S. Hsu, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jul. 5, 1991, Ser. No. 726,227
Int. Cl.[5] B29C *49/04*
U.S. Cl. 425—381 **13 Claims**



1. An accumulator head for an extrusion-blow molding machine, said accumulator head comprising:

a. a tubular outer barrel having a barrel wall and a barrel inner surface, the outer barrel including a material inlet and a material outlet;

b. an annular inner sleeve member slidably received within the outer barrel for movement along the barrel inner surface, the inner sleeve member having an inner sleeve inner surface and including an external, material-receiving slot in communication with the outer barrel material inlet, and at least two radially inwardly directed flow apertures providing communication between the material-receiving slot and the inner surface of the inner sleeve member;

c. a tubular inner body member received within the inner sleeve member for engagement with the inner sleeve inner surface, the inner body member including a plurality of external helical channels, each channel being in communication with a respective one of the flow apertures in the inner sleeve to provide helical flow passageways between the inner body member and the inner sleeve member; and

d. an actuator connected with the inner sleeve and the inner body member for simultaneously moving the inner sleeve and inner body member toward the outer barrel material outlet to extrude material therethrough.

5,116,216

APPARATUS FOR PREPARING THERMOPLASTIC COMPOSITES

Roland C. Cochran, Gleanside, and Edwin L. Rosenzweig, Warrington, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1991, Ser. No. 662,678
Int. Cl.[5] B29C *43/56;* B32B *31/20*
U.S. Cl. 425—504 **9 Claims**

1. An apparatus for processing thermoplastic matrix composites, comprising:

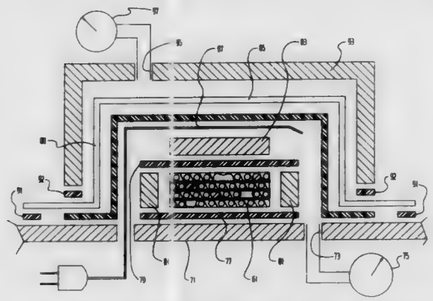
a. base means having a first vacuum source connected therethrough to hold unconsolidated piles of a prepreg;

b. edge dam means surrounding said plies to prevent the

pinching off of edges of the plies and to facilitate volatile removal;

c. heat producing means to provide sufficient heat to the prepreg to melt thermoplastic resin contained therein to permit flow thereof;

d. an air impervious bag enveloping the plies, said first vacuum source, said edge dam means and said heat producing



means, and being hermetically sealed to said base means; and

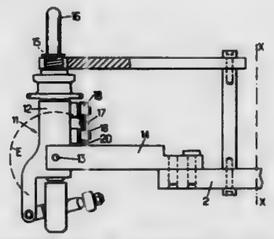
e. an air impervious rigid box hermetically sealed to said bag, having an interior and having a second vacuum source connected therethrough; wherein said air impervious bag is sealed to said base means adjacent the interior of said rigid box.

5,116,217

APPARATUS FOR MANUFACTURING HOLLOW PLASTIC BOTTLES FROM PREFORMS, WITH MEANS FOR SWINGING THE PREFORMS

Gerard Doudement, and Alain Evrard, both of Le Havre, France, assignors to Sidel, Cedex, France

Filed May 2, 1990, Ser. No. 518,586
Claims priority, application France, May 3, 1989, 89 05885
Int. Cl.[5] B29C *49/42*
U.S. Cl. 425—534 **5 Claims**



1. An installation for the manufacture of hollow plastic objects from preforms (16) having one closed and one open end which forms a neck, the installation including:

at least one conveyor (2, 9) equipped with a plurality of supports (11) for the preforms, a swing-motion control means, said at least one conveyor being a rotating plate conveyor and said supports being displaced along a predetermined path (T), arranged one behind the other, and capable of pivoting (19) within a given angular range when acted upon by said swing-motion control means, so that the preforms may be brought into a final position different from an initial position, wherein said control means comprises:

a stationary, elongated guide piece (17) forming a male cam, composed of a filiform guide in the shape of a spiral section coiled around the path (T) followed by swivel pins (13) of the preform supports, said spiral section being coiled around a toroid whose axis is the path of the swivel pins of the supports and said spiral section having a length determined according to the pitch of the spiral and the angular amplitude of swing required for the preforms; and

a plurality of follower means (18) individually attached to each support for cooperating without slippage with the cam such that, during the movement of the supports along the path, the follower means guided by the cam cause each support to swing;

wherein the follower means comprise at least two protruding fingers attached to each of said supports, said fingers being disposed on opposite sides of the filiform guide at flanking positions; and

wherein each of said fingers is equipped with a loose roller (18) capable of providing a rolling contact without slippage with the cam.

5,116,218

SEGMENTED HOT MOLDING APPARATUS

Gérard E. A. Jourdain, Saintry sur Seine, and Régis Raynal, Montgeron, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A.", Paris, France

Filed Dec. 5, 1990, Ser. No. 622,647
Claims priority, application France, Dec. 6, 1989, 89 16096
Int. Cl.[5] B29C *45/37*
U.S. Cl. 425—547 **2 Claims**



1. A molding apparatus, which comprises:

a first die, said first die having a die wall with a first thermal expansion coefficient;

a second die surrounded by said first die, said second die having a die wall with a second thermal expansion coefficient greater than said first thermal expansion coefficient, said die wall of said second die being separated from and facing opposite said die wall of said first die so as to form a mold cavity, wherein said second die comprises a support member and a plurality of separate sectors which are pivotally mounted on said support member, each of said sectors having a radial outer face forming part of the die wall of the second die; and

means for heating said first and second dies, said sectors being dimensioned and arranged such that when heated by said heating means said radial outer faces of said sectors adjoin each other contiguously to define the wall of the second die.

5,116,219

INSECT COLLECTION APPARATUS

Mark R. Zimmerman, P.O. Box 272, Smithmill, Pa. 16680

Filed Mar. 12, 1991, Ser. No. 668,091
Int. Cl.[5] A01M *1/06*
U.S. Cl. 43—139 **4 Claim**

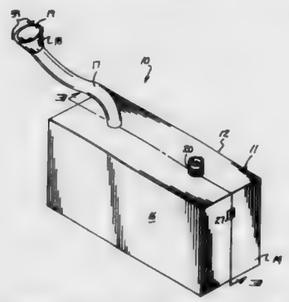
1. An insect collection apparatus comprising, in combination,

a housing, the housing defined by a top wall, a bottom wall, a rear end wall, a forward end wall, and spaced side walls to define an enclosure including a housing cavity defined by the enclosure, and

a flexible intake conduit directed into the housing cavity in pneumatic communication therewith, the flexible intake conduit including a funnel mounted at a free terminal end of the flexible intake conduit remote from the top wall, and

a rigid output conduit mounted through the top wall in pneumatic commendation with the housing cavity spaced from the flexible intake conduit and positioned adjacent the rear end wall, and

a blower motor fixedly mounted to the top wall within the housing cavity, the blower motor including an on/off



switch mounted on the rear end wall to effect selective actuation of the blower motor, and

wherein the blower motor includes a blower motor intake conduit aligned with the top wall directed along an interior surface thereof, and

wherein the housing cavity includes a fluid reservoir formed therewithin positioned below the blower motor intake conduit and the blower motor, and

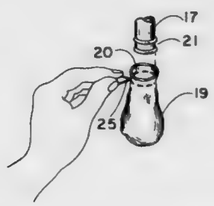
wherein the flexible intake conduit and the funnel include an insect attracting coating formed within an interior surface of the flexible intake conduit and the funnel, and further including insect simulation decoys mounted about a periphery of the funnel directed exteriorly thereof.

5,116,220

QUICK DISCONNECT CLIP FOR GAS LATERN MANTLE

George M. Kinzel, 521 Case, St. Paul, Minn. 55101, and James L. Warren, 2314 Dorothy Ave., White Bear Lake, Minn. 55110

Continuation of Ser. No. 489,241, Mar. 5, 1990, abandoned. This application Apr. 26, 1991, Ser. No. 692,964
Int. Cl.[5] F21H *1/04*
U.S. Cl. 431—113 **2 Claims**



1. A replacement mantle for a gas lantern having a burner tube with an outlet opening at one end for gas to exit for ignition, in combination:

a bag-shaped mantle made of mesh fabric, the mantle having a mouth opening for surrounding the burner tube at the tube gas outlet end; and

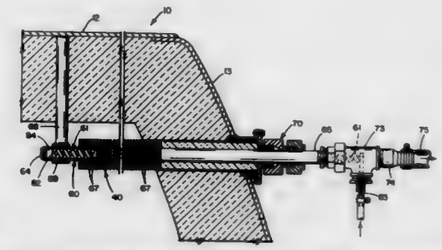
a unitary resilient wire clip having a bight section and two ends, said bight section engaging the mantle mouth by being threaded around the mantle mouth opening, said bight section biased to make the mantle mouth opening smaller than the burner tube, said wire ends being manually squeezable together for expanding the bight section to make the mantle mouth opening larger than the burner tube.

5,116,221

INTERNAL HEAT EXCHANGE TUBES FOR INDUSTRIAL FURNACES

Max Hoetzl, Toledo, Ohio, and Thomas M. Lingle, Temperance, Mich., assignors to Surface Combustion, Inc., Maumee, Ohio

Division of Ser. No. 557,324, Jul. 23, 1990, Pat. No. 5,035,610.
This application May 2, 1991, Ser. No. 694,758
Int. Cl.[5] F27D *7/00*
U.S. Cl. 432—77 **9 Claims**



2. A method for cooling the work within an industrial furnace comprising the steps of:

a) providing a longitudinally extending outer tube which extends into the furnace having a closed axial end and an open axial end;

b) providing a preformed inner tube open at both axial ends within said outer tube;

c) heating said tubes to an elevated temperature when said work is within said furnace;

d) injecting a coolant into said inner tube so that said coolant flows from one axial end of the tube out the opposite end adjacent said closed end of said outer tube, and from said closed end of said outer tube to the open end thereof;

e) circulating a gas within said furnace against said outer tube to effect heat transfer therewith.

5,116,222

LOW-DUSTING POWDERY ALGINATE IMPRESSION MATERIALS FOR DENTAL PURPOSES

Shunichi Futami, Nagareyama, and Kimihiko Sato, Tokyo, both of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Nov. 8, 1989, Ser. No. 433,222
Claims priority, application Japan, Nov. 25, 1988, 63-296093; Mar. 1, 1989, 1-46480; Sep. 22, 1989, 1-245011
Int. Cl.[5] A61C *9/00*
U.S. Cl. 433—48 **3 Claims**

1. A low-dusting powdery alginate impression material for dental purposes, comprising:

(a) an alginate,

(b) a gelation agent,

(c) a gelation controlling agent,

(d) a filler,

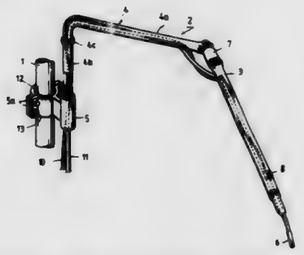
(d) at least one of an oxide, hydroxide and fluoride of a metal, and

(f) lanolin.

5,116,223
SWING ARM FOR SUPPORT OF DENTIST'S SUCTION PUMP NOZZLE

Won-Young Chung, No. 310-1501 Hyundai Apt., 484 Kwang-jang-dong, Seongdong-ku, Seoul, Rep. of Korea

Filed Aug. 1, 1991, Ser. No. 739,165
Claims priority, application Rep. of Korea, Jan. 29, 1991, 1278/1991
Int. Cl.[5] A61C *15/00*
U.S. Cl. 433—79 **1 Claim**

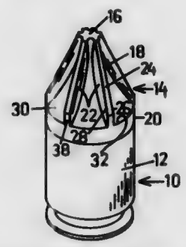


1. A swing arm for supporting a saliva suction pump nozzle, consisting of an upper arm and a forearm made of lengths of pipe and connected together by a joint which acts as a pivot, permitting said forearm to swing up and down, left and right, with cables and hose which pass through said forearm and said upper arm being stowed under the surface of said forearm and upper arm except for the area of said joint, a vertical part of said upper arm being inserted revolvably in a shaft supporting holder in the form of a cut of pipe fixed on a pole of a dental chair unit by a two-part band, with said saliva suction pump nozzle being fixed on a free end of said suction pump hose at the free end of said forearm.

5,116,224
DEVEL SMALL ARMS BULLET

Charles C. Kelsey, Jr., 1601 Hollyhurst, c-21, Houston, Tex. 77056

Filed Jun. 25, 1990, Ser. No. 542,889
Int. Cl.[5] F42B *12/00*
U.S. Cl. 102—439 **7 Claims**

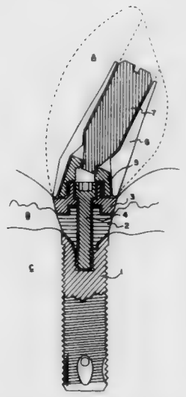


1. A small arms projectile, comprising:
(a) a substantially cylindrical main body;
(b) a front portion formed as one-piece with the main body and terminating in a flat front end which is smaller than the diameter of the main body;
(c) the front portion formed of a plurality of narrow ribs with parallel sides extending along their entire length, said ribs also extending radially outward and equally spaced around the front portion, the ribs extending from the main body to the flat front end, at least a major portion of the outer surface of the ribs continuously tapering from the outer diameter of the main body to the flat end; and
(d) cavities formed between the ribs, at least a major portion of which form a continuously curved surface from the outer diameter of the main body inwardly toward the flat front end.

5,116,225
ANGULATED ABUTMENT FOR OSSEOINTEGRATED IMPLANTS

Juan C. A. Riera, Brasil 838, Salto, Uruguay

Filed Mar. 13, 1991, Ser. No. 668,969
Claims priority, application Uruguay, Oct. 17, 1990, 23,140
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—173 **22 Claims**



1. A system for fixing a dental prosthesis to an anchor implanted in the jaw bone of a patient so that a longitudinal axis through said prosthesis is at an angle with respect to a longitudinal axis through said anchor, said system comprising:
an intermediate abutment member having three component parts being connected to a prosthesis and to said anchor;
means for rotating two of said component parts with respect to each other whereby said prosthesis can have a plurality of different angular positions with respect to said anchor;
one of said rotating components having two multi-sided faceted faces adapted to be telescopically inserted into a multi-sided recess at each end to rigidly secure a particular angular position;
wherein a first of said component parts has a twelve sided first end that is adapted to be received in a hexagonal recess in one end of the anchor; and
said first of said component parts has a five sided second end that is received in a ten sided recess in a first end of a second of said component parts.

5,116,226
NECKLESS BLADE IMPLANT

Leonard I. Linkow, 1530 Palisades Ave., Fort Lee, N.J. 07024

Continuation-in-part of Ser. No. 252,290, Sep. 30, 1988. This application Oct. 4, 1990, Ser. No. 592,963
The portion of the term of this patent subsequent to May 5, 2009, has been disclaimed.
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—176 **25 Claims**

1. An oral implant for supporting an artificial tooth structure, comprising:
an implant portion having a top surface and a connection part located along the top surface, the connection part defining an area on the top surface having sides and generally orthogonal ends, the distance between the sides of the connection part being as wide as the lateral dimension of the rest of the implant portion, the implant portion being adapted to be fitted in an opening in a bone in the vicinity of the occlusal plane of a patient in such a manner that at least a part of the connection part extends beyond the rim of the opening in the bone or remains just below it and is directed toward a base of the opening away from the rim, the implant portion having a substantially triangular configuration, the connection part of the implant portion being positioned at the apex of the triangle, the implant portion having mesial and distal occlusional struts extending from the sides of the implant portion, said struts directed toward a plane perpendicular to the triangle apex and terminating in an area of bucco-lingual cortice of bone when installed in a patient; and
at least one post portion having first and second ends, the first end being adapted to receive at least a part of said artificial tooth structure and the second end being adapted for a direct connection to the connection part of the implant portion, the post portion having lateral dimensions



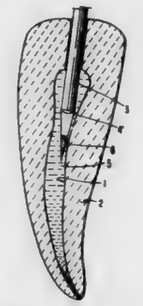
such that a part of the second end extends outwardly at least to the sides of the connection part and defines shoulders for supporting the artificial tooth structure, the shoulders of the second end of the post portion extend outwardly from sides of the triangle, and the post portion having longitudinal dimensions such that another part of said second end extends outwardly at least to the ends of said connection part,
the implant portion having bucco-lingual side surfaces in the mesio-distal plane connected with the top surface along a connection edge, the connection edge sloping toward the base of the opening in the direction away from the connection part so that the top surface in the direction away from the connection part is substantially below the rim, whereby bone may grow over the implant portion up to the connection part and no narrow neck portion is provided between the post portion and the implant portion.

5,116,227
PROCESS FOR CLEANING AND ENLARGING PASSAGES

Guy Levy, Tustin, Calif., assignor to Endo Technic Corporation, San Clemente, Calif.

Filed Mar. 1, 1991, Ser. No. 663,425
Int. Cl.[5] A61C *15/00, 5/00, 5/02*
U.S. Cl. 433—216 **15 Claims**

1. A process for cleaning and/or shaping a passage, comprising: providing an optical fiber having a diameter sufficiently small to be introduced into the passage and having a free end provided with a radiation focussing element; introducing the free end of the fiber into the passage so that the focal point defined by the radiation focussing element is located adjacent the region to be cleaned or shaped; providing a liquid in the passage at the location of the focal point of the radiation focussing element; and supplying pulses of laser radiation to the fiber so that the radiation exits the fiber via the free end to transform

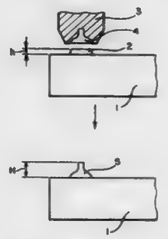


a portion of the liquid into vapor and provoke a cavitation of the vapor at the interior of the liquid.

5,116,228
METHOD FOR BUMP FORMATION AND ITS EQUIPMENT

Akira Kabeshita, and Yoshifumi Kitayama, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

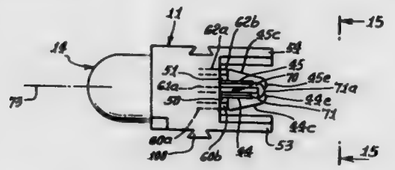
Continuation-in-part of Ser. No. 425,832, Oct. 20, 1989, abandoned. This application Oct. 23, 1989, Ser. No. 425,841
Claims priority, application Japan, Oct. 20, 1988, 63-264527
Int. Cl.[5] H01R *9/00;* **B23K** *20/00*
U.S. Cl. 29—842 **5 Claims**



1. A method of forming bumps on a plurality of IC chips, said method comprising:
providing a wafer on which a plurality of IC chips are formed in a checkered pattern, each of said IC chips having a plurality of bump bases thereon of a certain height, width and length;
providing a forming tool having at least one recessed part defining a respective recess extending into the forming tool, from an end of the tool constituting one end of the recessed part, and terminating at a location within the forming tool constituting the other end of the recessed part;
each said at least one recessed part having a height, as taken between the ends thereof, that is greater than said certain height of the bump bases of the IC chip, respectively, and the recess having a draft in the direction from the one end to the other end of each said at least one recessed part; and
pressing the forming tool, at said end thereof, against each of the bump bases under pressure sufficient to deform a respective part of each of the bump bases into a shape corresponding to that of the recess defined by each said at least one recessed part of the forming tool, so as to form pumps of said shape on the IC chips of a height greater

than that of the bump bases from which said bumps were respectively formed.

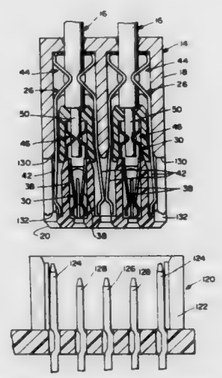
5,116,229
LIGHT UNIT TERMINALS MAINTAINED IN BENT CONDITION
John M. Savage, Jr., 538 B Via de la Valle, Solana Beach, Calif. 92075
Filed Dec. 17, 1990, Ser. No. 628,853
Int. Cl.[5] H05K *1/00*
U.S. Cl. 439—56 **17 Claims**



1. For use in an assembly including a circuit element having a base and terminal means projecting rearwardly from the base, the combination with said element comprising
a) a body defining a forwardly extending structure for telescopically interfitting the base of the element for retention thereto,
b) the body having a laterally extending rear wall defining through opening means for passing said rearwardly projecting terminal means,
c) and terminal retention means integral with the body and extending rearwardly of said rear wall for retaining said terminal means in bent condition, rearwardly of said rear wall,
d) said terminal retention means including flange means projecting rearwardly of the body and defining J slot means into which said terminal means is bent and retained against rearward withdrawal,
e) said J slots means including two J-slots, and said terminal means including two elongated terminals respectively retained in said two J-slots, in bent condition of the two terminals, there being cam surfaces which act to displace the elongated terminals transversely away from said J-slots just prior to resilient spring-back of the terminals into the J-slots.

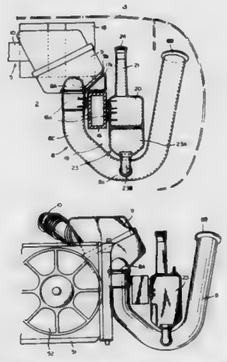
5,116,230
COAXIAL CABLE CONNECTOR
Helen Dechelette, Wissous, France, and David L. Brunker, Naperville, Ill., assignors to Molex Incorporated, Lisle, Ill.
Filed Apr. 9, 1991, Ser. No. 682,818
Int. Cl.[5] H01R *13/648*
U.S. Cl. 439—101 **21 Claims**

1. A connector assembly for terminating a shielded insulated wire having a conductor core with a sheath of insulation thereabout, an outer insulating jacket and a shield means between the sheath and the jacket, comprising:
dielectric means mounting an electrically conductive signal terminal for termination to the conductor core of the wire; and
conductive grounding terminal means outside the dielectric means and having piercing means for displacing the outer insulating jacket of the wire to engage the shield means



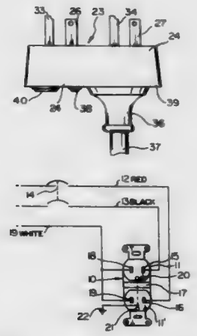
thereof wherein said grounding terminal means include shielding portions juxtaposed outside the signal terminal.

5,116,231
INTAKE SYSTEM FOR AUTOMOBILE ENGINE
Nariyasu Oki; Tsunetoshi Yokokura; Koji Mizuno, all of Hiroshima; Katsutoshi Shimada, Iwakuni, and Kazuyuki Yamamoto, Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Jun. 28, 1991, Ser. No. 721,350
Claims priority, application Japan, Jun. 29, 1990, 2-69924; Sep. 28, 1990, 2-259289
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 MB **15 Claims**



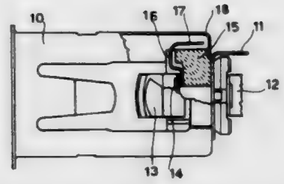
1. An intake system installed in an engine room of an automobile for supplying air into an internal combustion engine through an intake passage, said intake system comprising:
an air cleaner connected to one end of said intake passage remote from said internal combustion engine;
an air inlet passage for introducing air into said air cleaner, said air inlet passage comprising an outside passage portion, formed with an inlet opening at an upper portion thereof and extending downward from said inlet opening, an inside passage portion extending upward to said air cleaner, and a generally U-shaped intermediate passage portion extending between said outside and inside passage portions to form a space between said outside and inside passage portions;
a stationary liquid container disposed close to said space;
silencing means, formed integrally with said liquid container and having an interior space therein, for decreasing noises caused by air introduced into said intake system; and
a connecting passage for connecting and communicating said interior space with said air inlet passage at said generally U-shaped intermediate passage portion.

5,116,232
DOUBLE PLUG ASSEMBLY
Brad Follett, Box 256, Site 2, R.R. 7, Calgary, Alberta, Canada T2P 2G7
Filed Jun. 17, 1991, Ser. No. 716,552
Int. Cl.[5] H01R *29/00*
U.S. Cl. 439—107 **2 Claims**



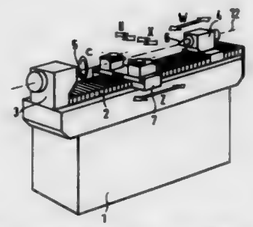
1. A plug assembly for use in combination with a duplex outlet wired as a single circuit or split circuit having a first pair of connectors at a certain voltage potential and a second pair of connectors at a neutral potential, said plug assembly comprising:
a) a housing;
b) a first pair of prong connectors extending outwardly from aid housing and adapted to register with the first pair of connectors in the duplex receptacle;
c) a second pair of prong connectors extending outwardly from said housing and adapted to register with the second pair of connectors in the duplex receptacle;
d) first connection means for connecting to one of said first pair of prong connectors;
e) second connection means for connecting to the other of said first pair of prong connectors;
f) third connection means for connecting to said second pair of prong connectors;
g) indicator means connected across each of said first pair of prong connectors for indicating a voltage potential therebetween, thereby indicating whether the first pair of connectors in the duplex receptacle is connected to said split circuit; and
h) switch means disposed in one of said first and second connection means having on and off positions for selectively switching said one of said first and second connection means in one of said one and off positions, thereby providing a higher power output when said switch means is in said on position than in said off position to selectively choose between said single and split circuits.

5,116,233
ELECTRIC CONTACT HOLDER BASE
Claudio Croce, Caselette, Italy, assignor to Imos Italia S.r.l., Turin, Italy
Filed Jan. 3, 1991, Ser. No. 637,167
Claims priority, application Italy, Jan. 12, 1990, 52812 B/90
Int. Cl.[5] H01R *13/20*
U.S. Cl. 439—161 **3 Claims**



1. An electric contact holder base for electric lighters or gadgets for motor vehicles, provided with a thermic protection against overheating that allows its reutilization, which comprises: a substantially cylindrical body having a bottom and a wall portion permanently fixed to the interior of a motor vehicle and carrying electric contacts for an item that is inserted in said cylindrical body; a bimetallic spring acting as a holding element in the cylindrical body during the resting phase of the same; a bimetallic lamina inside the base as the thermic protection device against overheating; wherein the bimetallic lamina is a separate element connected at one end with one of said electric contacts while the other end is a free end facing the wall of the cylindrical body and folded back towards said bottom, and wherein said free end contacts said wall portion to cause a short circuit on overheating with a substantially linear course of deflection as a function of temperature, wherein the bimetallic lamina and the bimetallic spring are made of materials having different characteristics with regard to the respective deflections as a function of the temperature, and wherein the bimetallic lamina maintains a substantially linear course of the deflection as a function of the temperatures greater in comparison with the bimetallic spring.

5,116,234
MEASURING ARRANGEMENT FOR ROTATIONALLY SYMMETRICAL WORKPIECES
Hans-Ulrich Bertz, Kuppenheim, and Willi Meder, Ettlingen-Bruchhausen, both of Fed. Rep. of Germany, assignors to Dr.-Ing. Hofler Messgeratebau GmbH, Fed. Rep. of Germany
Filed Sep. 5, 1991, Ser. No. 755,295
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1990, 4028076
Int. Cl.[5] G01B *7/28*
U.S. Cl. 33—550 **15 Claims**



1. Measuring arrangement for rotationally symmetrical workpieces with longitudinal guides running in the axial direction of the workpiece, on which guides a clamping device adjustable along the longitudinal guides carries the workpiece and on which a measuring slide is movable which carriers at

least one measuring head measuring the workpiece with a sensing pin in a measuring direction, the measuring direction running radially and/or axially to the workpiece, wherein the measuring head is movable on the measuring slide transversely to the longitudinal guides and in which the sensing pin is coupled over a spring element onto the measuring head in such a manner that it is movable at least in the measuring direction with respect to the workpiece out of a basis position, in which on the sprung part there is fastened at least one measurement value indicator, with which the position change of the sensing pin is detectable, characterized in that the sensing pin (10, 11) is arranged in a sensing pin carrier which carries at least one other sensing pin (14), said sensing pin carrier being arranged to turn about an axis perpendicular to the workpiece axis (12) and in a plane which contains the workpiece axis, and that the sensing pin carrier is stoppable in each case in a rotary position allocated to the individual sensing pins by a stopping device.

5,116,235

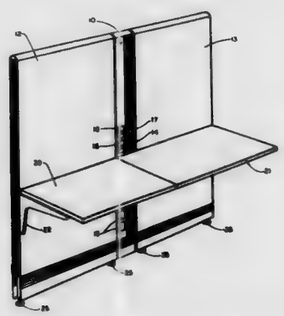
POWER PANEL STRUCTURE

James H. Nienhuis, Wyoming; Jeffrey L. Clark, Holland, and Bruce R. Gezon, Caledonia, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Continuation-in-part of Ser. No. 585,248, Sep. 9, 1990. This application Mar. 15, 1991, Ser. No. 670,240

Int. Cl.[5] H01R *4/64*

U.S. Cl. 439—215 **16 Claims**



1. A power panel arrangement for use in a space-divider wall panel system, comprising:

a frame structure;

a frontal face cover and a rear face cover supported on said frame structure;

said frame structure comprising first and second vertically extending end plates and a web interconnecting said end plates and extending in a generally vertical direction, said frame structure defining front and rear spatial areas between said web and said front and rear covers for accommodating forwardly-facing and rearwardly-facing electrical outlet receptacles in said spatial areas;

a pair of electrical outlet receptacles blocks mounted in at least one of said spatial areas, each of said electrical outlet blocks comprising a frontal wall and at least one electrical receptacle in said frontal wall; and

at least one opening in one of said covers in register with said outlet receptacle blocks to provide access thereto.

5,116,236

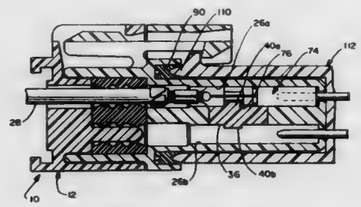
ELECTRICAL CONNECTOR WITH TERMINAL POSITION ASSURANCE COMPONENT

Stephen Colleran, Lisle; Fred L. Krehbiel, Chicago, and Bill Wilson, Montgomery, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Division of Ser. No. 608,782, Nov. 5, 1990. This application May 28, 1991, Ser. No. 706,122

Int. Cl.[5] H01R *13/52*

U.S. Cl. 439—271 **4 Claims**



1. An electrical connector comprising a housing having a forward mating end and a rearward end, a seal-engaging channel enclosed on three sides with opposing walls defined in the housing and opening forwardly thereon, a unitarily molded elastomeric seal engaged in the channel of the housing, said seal defining, in cross-section, a central supporting portion, a pair of spaced apart forwardly projecting arms defining a forwardly opening space there between, a pair of spaced apart rearwardly projecting arms defining a rearwardly engaging space there between, the forwardly projecting arms and the rearwardly projecting arms being substantially in size with respect to said central supporting portion and identical in an unbiased condition of said seal, said seal being dimensioned to be compressed upon insertion into the channel, such that the rearwardly opening space between the rearwardly projecting arms of the seal creates a suction with the channel for retaining the seal in the channel.

5,116,237

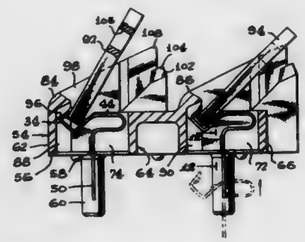
PRINTED CIRCUIT BOARD EDGE CONNECTOR

Heinz Loewen, Palos Verdes, Calif., assignor to Versatile Engineering Co., Inc., Gardena, Calif.

Continuation of Ser. No. 217,323, Jul. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 96,379, Sep. 14, 1987, abandoned. This application Nov. 20, 1989, Ser. No. 438,976

Int. Cl.[5] H01R *13/62*

U.S. Cl. 439—326 **23 Claims**



1. A contact:

said contact being cut out of the flat of a sheet of substantially planar metallic spring material and bent out of the plane of the sheet;

said contact having first and second arms having ends attached together and outer ends away from said attached ends to define a generally U-shaped socket therein, said first and second arms having first and second facing walls defining said socket, first and second contact points respectively in said first and second walls and generally facing each other, said contact points being spaced so that a printed circuitboard can be placed therebetween without contacting said points when it is at a first angle with respect to said walls and is in engagement with both said first and second points when the printed circuitboard is at a second angle with respect to said walls;

a formed spring extending from the outer end of one of said arms;

an attachment body on said spring away from said socket so that said attachment body can be secured to a connector body so that said spring can flex so that said U-shaped socket can move with respect to said attachment body as the printed circuitboard is moved from a first position at the first angle to a second position at the second angle; and

a pin secured to said attachment body so that said pin can be connected to a mother board so that a printed circuitboard in said socket in said second position is connected to said contact and to the mother board.

5,116,238

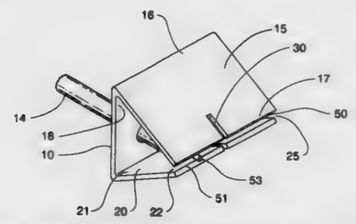
REUSEABLE ELECTRICAL CONNECTOR

Sammy Holloman, 221 Floyd Golden Cir., Portales, N. Mex. 88130

Filed Jul. 5, 1991, Ser. No. 726,212

Int. Cl.[5] H01R *4/24*

U.S. Cl. 439—441 **12 Claims**



1. Reuseable electrical connector for wires having an electrically conductive core, comprising an electrically conductive, hard, resilient plate having two opposing parallel wire gripping edges, formed to a concave cross-section defining a uniform longitudinal slot between said edges, the width of said slot slightly smaller than the diameter of said core so that said edges may grip said core, a plurality of wire entry holes having diameter greater than the transverse dimension of said slot disposed through said plate and parallel to and opposing said slot, and a plurality of opposing paired notches disposed through said plate adjacent to and transverse to said slot so that one pair of said notches is disposed in a plane intermediate to each adjacent pair of said wire entry holes.

5,116,239

MULTICONDUCTOR FLAT CABLE CONNECTOR, APPARATUS AND METHOD

Paul P. Siwinski, Seminole, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 14, 1990, Ser. No. 538,284

Int. Cl.[5] H01R *9/07*

U.S. Cl. 439—497 **17 Claims**

1. An electrical connector for coupling the signal and ground wires of a plurality of multiconductor flat cables with another electrical component comprising, in combination:

a plurality of electrically insulating blocks;

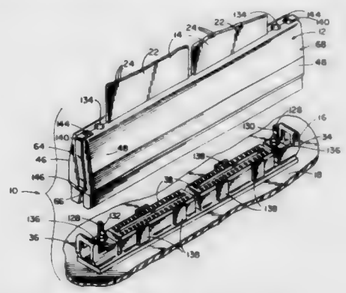
a plurality of signal contacts extending through each block, the signal contacts of each block couplable with the signal wires of one associated multiconductor flat cable;

an elongated ground bus extending through each block, each elongated ground bus couplable with the ground wires of one associated multiconductor flat cable;

a single housing for supporting the plurality of blocks in a fixed position with respect to each other;

an additional electrical member having a plurality of receptacle connectors for receiving signal contacts, the additional electrical member also having an elongated receptacle connector for each block for receiving its ground bus; and

means to couple the housing with the additional electrical member.



5,116,240

MULTI-PARTITION FOOD STORAGE AND MULTIPLE SERVING APPARATUS

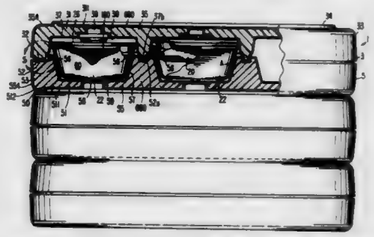
Heiner Wischhusen, and Hans Kehlbeck, both of Bremen, Fed. Rep. of Germany, assignors to Aladdin Synergetics, Inc., Nashville, Tenn.

Continuation of Ser. No. 360,145, Jun. 1, 1989, Pat. No. 5,016,756. This application Dec. 4, 1990, Ser. No. 622,000

The portion of the term of this patent subsequent to May 21, 2008, has been disclaimed.

Int. Cl.[5] A45G *11/20*

U.S. Cl. 206—545 **7 Claims**



1. A multi-partition and multiple portion food storage and service apparatus comprising:

a tray portion including a plurality of tray cavities formed therein, said tray portion formed of an insulating material such that said tray cavities are insulated from each other;

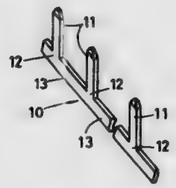
a cover portion including a plurality of cover cavities formed therein, said cover portion formed substantially of an insulating material, each said cover cavity corresponding to one of said tray cavities such that when said cover portion is disposed on said tray portion, each said cover cavity is disposed above the corresponding tray cavity to form a bowl holding cavity;

a plurality of bowls, said bowls removably disposable in said bowl holding cavities;

wherein, each of said bowl holding cavities has an identical shape and size, said bowl holding cavities approximately conforming to the shape of said bowls whereby only one

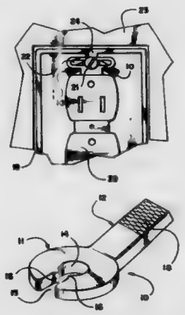
bowl may be disposed in said at least one bowl holding cavity or more than one bowl may be disposed in said at least one bowl holding cavity such that in the latter case said bowl holding cavity substantially conforms to said more than one bowl taken together.

5,116,241
CONNECTOR TERMINAL
Kensaku Sato, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Feb. 22, 1991, Ser. No. 659,080
Claims priority, application Japan, Dec. 14, 1989, 1-143639
Int. Cl.[5] H01R *31/08*
U.S. Cl. 439—511 **1 Claim**



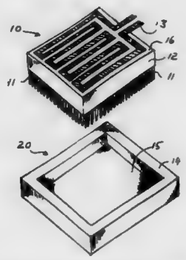
1. An electrical connector terminal comprising:
a connector housing made from an insulation material and having a plurality of receiving apertures and
at least one interconnected shunt terminal each having a plurality of terminal pins aligned in a line, said parallel linear shunt terminals joined together with a cross linkage strip which is made from a conductive material, with said terminal pins press fitted through said receiving apertures such that the number of said terminal pins of one of said linear shunt terminals being different from that of the other said shunt terminal on either side of said cross linkage strip.

5,116,242
SHIM FOR ELECTRICAL DEVICE
Joseph F. Scotti, 5329 Talley Green Dr., Marietta, Ga. 30068
Filed May 13, 1991, Ser. No. 699,365
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—538 **7 Claims**



1. In the combination comprising a box mounted within a wall adjacent to the surface of said wall, an electrical device received within the box to be mounted substantially flush with said surface of said wall, and a mounting screw extending through said electrical device and into said box, the improvement comprising at least one shim selectively receivable around said mounting screw between said electrical device and said box for spacing said electrical device from said box to locate said electrical device flush with said surface of said wall, said shim including a body defining an opening therein for receiving said screw, a channel connecting said opening with the periphery of said body for allowing said screw to enter said opening, and a handle extending from said body for manipulating said body.

5,116,243
CARPET DYE FIXATION METHOD AND APPARATUS
Leslie J. Wills, Lidcombe, Australia, assignor to Scientific and Industrial Research Organisation, Australia
PCT No. PCT/AU89/00246, § 371 Date Jan. 30, 1991, § 102(e) Date Jan. 30, 1991, PCT Pub. No. WO89/12136, PCT Pub. Date Dec. 14, 1989
PCT Filed Jun. 2, 1989, Ser. No. 602,325
Claims priority, application Australia, Jun. 2, 1988, PI8578
Int. Cl.[5] D06B *5/24*
U.S. Cl. 8—149.2 **11 Claims**



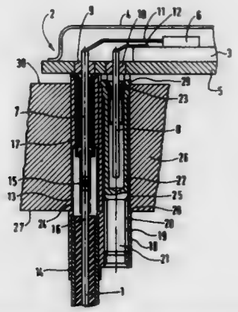
1. A method of fixation of a liquid dye applied to the pile of a carpet tile consisting of a backing material with pile thereon, said method comprising the steps of:
(a) positioning the carpet tile within a housing having a base and side walls extending from said base, with the backing material of the tile in contact with said base;
(b) moving into the housing a block having a two-dimensional array of heated pins extending from a lower face thereof, until each pin of the array penetrates the pile of the carpet tile to a predetermined depth; and
(c) transferring heat from the pins to raise the temperature of the dye on the pile to a temperature sufficient to fix the dye.

5. Apparatus for fixation of liquid dye on a pile of a carpet tile consisting of a backing material with pile thereon, said apparatus comprising:
(a) a carpet tile receiving housing, said housing having a base and side walls extending therefrom;
(b) a thermally conducting block having an upper face and a lower face, said block having dimensions such that the block can be moved into said housing;
(c) a two-dimensional array of pins extending from the lower face of said block;
(d) a heating element either (i) located within said block or (ii) affixed to said upper face of said block; and
(e) a layer of thermally insulating material mounted on said upper face.

5,116,244
CONNECTOR FOR COAXIAL CABLE
Jacques Cartier, Fontenay-Sous-Bois, France, assignor to Radiall, Rosny-Sous-Bois, France
Filed May 29, 1991, Ser. No. 706,885
Claims priority, application France, May 30, 1990, 9006722
Int. Cl.[5] H01R *17/04*
U.S. Cl. 439—578 **3 Claims**

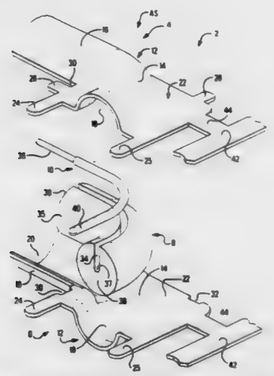
1. A connector for connecting, in a separate manner, a coaxial cable to a pair of parallel spaced pins (7,8), particularly contact pins exiting from an integrated circuit, characterized by the fact that the connector includes a conductive tubular

body (13) adapted to be affixed to the outer conductor (14) of the coaxial cable (1) at the end of the latter, and internally provided with means (15) for connecting, in a separable manner, the central conductor (16) of the coaxial cable to one of the pins (7); said tubular body including, in the vicinity of the end of the coaxial cable, a conductive tubular arm (18) having an axis parallel to the axis of the tubular body, said arm being arranged for receiving, in a removable manner, contact means



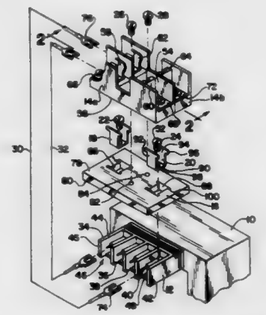
(21,22,23) appropriate for providing an electrical contact with the second pin (8) and said tubular arm (18); said contact means (21,22,23) including a tubular contact piece (22) provided at one end with fixation means (20,21) adapted to cooperate with complimentary fixation means (19) formed inside of the tubular arm (18) and, at its other end, provided with resilient means (23) for contact with the corresponding pin (8); and said contact piece (22) being removably secured to the interior of the arm (18) by threaded means (19,20).

5,116,245
COAXIAL ELECTRICAL CONNECTORS AND THEIR MANUFACTURE
Robert W. Baker, Kenton, England, assignor to AMP Incorporated, Harrisburg, Pa.
Filed Aug. 30, 1991, Ser. No. 752,713
Claims priority, application United Kingdom, Sep. 7, 1990, 9019540
Int. Cl.[5] H01R *17/04*
U.S. Cl. 439—581 **13 Claims**



1. A method of manufacturing shielded, coaxial electrical connectors, comprising the steps of;
a. providing first and second strips of metal half shells, the half shells of each strip being connected together by means of carrier strips, each half shell of one of said first and second strips, being mateable with each half shell of the other of these strips to define a tubular shield;
b. feeding each strip of half shells towards an assembly station to locate a shell half of each strip thereat with the shell halves so located being relatively positioned for mating, but in spaced relationship;
c. providing between the half shells so located, a dielectric insert with a centre pin extending coaxially therethrough;
d. mating said half shells so located insert, thereby to enclose said insert in the tubular shield defined by the mated half shells;
e. securing said mated half shells together so that said insert is snugly received in said tubular shield coaxially therewith;
f. repeating steps b to e a multiplicity of times; and
g. winding the strip of shielded coaxial electrical connectors so produced about a storage reel.

5,116,246
FUSE BLOCK ADAPTERS FOR TERMINAL BLOCKS
Jeffrey E. Perry, 22 Marlborough Road, Guelph, Ontario, Canada N1E 3X2 , and Harry Barber, R.R. #2, Elora, Ontario, Canada N0B 1S0
Filed Feb. 12, 1991, Ser. No. 654,810
Int. Cl.[5] H01R *13/68*
U.S. Cl. 439—621 **12 Claims**



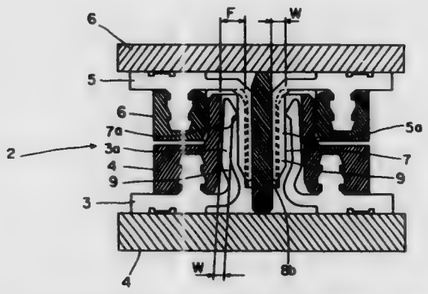
1. An adapter for mechanically joining a terminal block and a fuse block;
the terminal block having at least one external surface, at least one bay recessed in the external surface, and a bay terminal within the bay;
the fuse block comprising opposed first and second sides, fuse engaging means for engaging and carrying at least one fuse fastened to the first side, and fuse terminals for providing electrical contact points with the fuse;
said adapter being independent of fuse engaging and contacting means, for interposition between said terminal block and said fuse block and mounting said fuse block on said terminal block, and comprising a mounting plate member having opposed first and second sides; first fastening means for attaching the first side of said plate member to the fuse block second side; and second fastening means for attaching the second side of said plate member to the terminal block adjacent to the external surface thereof.

5,116,247

BOARD-TO-BOARD ELECTRIC CONNECTOR HAVING MALE AND FEMALE TERMINALS AT REDUCED PITCH

Masahiro Enomoto, Inagi; Minoru Fukushima, Kanagawa, and Shinichi Aihara, Atsugi, all of Japan, assignors to Molex Incorporated, Lisle, Ill.

Filed May 2, 1991, Ser. No. 694,712
Claims priority, application Japan, May 29, 1990, 2-56272[U]
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—660 6 Claims



1. A board-to-board electric connector comprising a female socket having a plurality of female terminals arranged at narrow regular pitch and means for holding said female terminals in a housing and a male plug having a plurality of male terminals arranged at narrow pitch and means for holding said male terminals in its housing, characterized in that:

said female and male terminals have terminal contact surfaces which come into contact with each other when said female socket and male plug are coupled and board mounting means, the contact surfaces and the board mounting means of said male and female terminals being the same width as the thickness of the metal sheet from which said female and male terminals are stamped, said male terminal having a housing contact surface opposite said terminal contact surfaces;

said female terminals inserted into female terminal slots having an inner bottom end and an opposite top edge which are made in the housing of said female socket, allowing the opposite side walls of each female terminal slot to prevent the female terminal from moving laterally, and said male terminals inserted into male terminal slots having an inner bottom end and an opposite top edge which are made in the housing of said male socket allowing the opposite side walls of each slot to prevent the male terminal from moving laterally and said male terminal slot inner bottom end to contact said terminal contact surface of said male terminal to prevent the male terminal from moving in the plane of the terminal in a direction toward the male terminal inner bottom end;

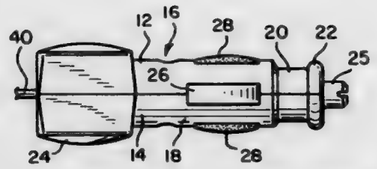
said male terminal slots designed so as to allow the male terminal contact surface to project one half of the width of the male terminal or more beyond the top edge of the side walls of each male terminal slot, said female terminal slots designed so as to have a depth to allow the female terminal to fit and remain flush with said female terminal slot top edge when said female socket and male plug are not coupled and where the projecting portion of said male terminal beyond said male terminal slot sidewalls are allowed to enter the corresponding female terminal slot by causing the female terminal therein to yieldingly withdraw when said female socket and male plug are coupled.

5,116,248

POWER PLUG FOR RADAR WARNING DETECTOR

John D. Hiers, Connersville, Ind., and Michael D. Valentine, Cincinnati, Ohio, assignors to Valentine Research, Inc., Cincinnati, Ohio

Filed Feb. 8, 1991, Ser. No. 652,613
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—669 15 Claims



1. A power plug adapted to be received within a lighter socket of a motor vehicle for electrically connecting a device, such as a radar warning receiver, with an electrical system of the motor vehicle, said power plug comprising:

a housing having a forward tubular end sized to be slidingly received within said lighter socket and a rearward handle end sized to be conveniently gripped between a thumb and fingers of a human hand;

a first contact mounted in the outermost end of said forward tubular end of said housing and extending from said outermost end for electrically contacting said electrical system when said forward tubular end is inserted within said lighter socket;

at least one outwardly bowed spring arm secured within said housing and projecting outside said forward tubular end of said housing for electrically contacting said electrical system when said forward tubular end is inserted within said lighter socket; and

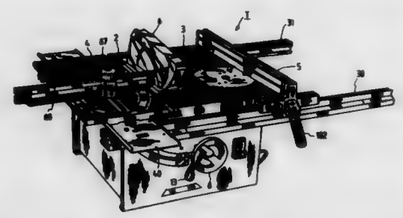
resilient polymeric power plug securing means mounted to said forward tubular end of said housing for frictionally engaging within said socket to resist movement of said power plug within said socket.

5,116,249

TABLE SAW

Takeshi Shiotani; Kouichi Miyamoto; Kunio Tsugami; Mitsumasa Sato, and Tatsuya Wada, all of Tokyo, Japan, assignors to Ryobi Limited, Hiroshima, Japan

Continuation of Ser. No. 564,770, Aug. 9, 1990, abandoned. This application Oct. 25, 1991, Ser. No. 781,639
Claims priority, application Japan, Aug. 11, 1989, 1-2090061; Aug. 28, 1989, 1-100291[U]; Aug. 28, 1989, 1-100292[U]; Aug. 30, 1989, 1-101646[U]; Aug. 30, 1989, 1-101647[U]; Dec. 8, 1989, 1-142196[U[
Int. Cl.[5] B26D *7/06, 7/01*
U.S. Cl. 83—435.001 8 Claims



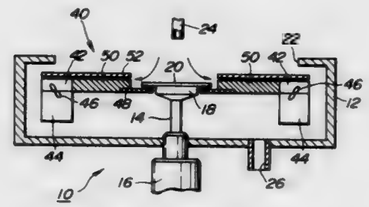
1. A table saw having a circular saw table for supporting a circular saw for cutting a work, a miter table disposed adjacent a side of said circular saw table and having a miter fence thereon for guiding said work to said circular saw and a supplementary table cooperating with said two tables for supporting said work, said three tables being disposed so as to form a working table, said working table having front and rear directions, the improvement in which a pair of guide rails are disposed laterally on front and rear sides of said working table, respectively, and said miter table and supplementary table are slidably relative to said saw table along said guide rails so as to be fastened at their desired positions and detachably mounted thereon, said miter table being slidably in the front and rear directions of said working table in a state wherein an upper face of said miter table is approximately flush with an upper face of said circular saw table.

5,116,250

METHOD AND APPARATUS FOR APPLYING A COATING MATERIAL TO A SUBSTRATE

Hiroyoshi Sago; Hideyuki Mizuki; Katsuhiko Kudo, all of Kanagawa, and Muneo Nakayama, Tokyo, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Filed Sep. 19, 1988, Ser. No. 246,403
Claims priority, application Japan, Sep. 18, 1987, 62-234054
Int. Cl.[5] B05C *11/023;* B05D *3/12*
U.S. Cl. 118—52 4 Claims



1. An apparatus for applying a coating material to a substrate, comprising:

an enclosure;

a spinning chuck rotatably supported within the enclosure and having a vacuum table on which a substrate is securely held;

means for applying a coating material onto a surface of the substrate;

means for developing a flow of air over the substrate; and

means for guiding said flow of air in a direction identical to the direction of rotation of the substrate, said guiding means including an annular air duct disposed in surrounding and spaced relation to the spinning chuck and having outlets, and a fixed disk disposed between the air duct and the spinning chuck and having a plurality of guide vanes thereon.

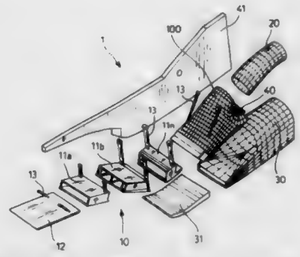
5,116,251

INLET SYSTEM FOR SUPERSONIC OR HYPERSONIC AIRCRAFT

Bartholomäus Bichler, Raubling, and Michael Jost, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohn GmbH, Ottobrunn, Fed. Rep. of Germany

Filed Mar. 18, 1991, Ser. No. 671,121
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1990, 4008956
Int. Cl.[5] B64D *33/02*
U.S. Cl. 244—53 B 13 Claims

1. An inlet system for supersonic and hypersonic aircraft for supplying air to substantially parallel turbojet and ramjet engine inlets, comprising a pivotable inlet ramp having a box shaped configuration for changing the inlet cross-section, said inlet ramp comprising a plurality of hollow box-like elements bounded by walls on all sides, means for pivotably supporting said box-like elements with respect to each other, a pivotable inlet plate upstream of the box-like elements, and a pivotably arranged re-direction member connected with the inlet ramp



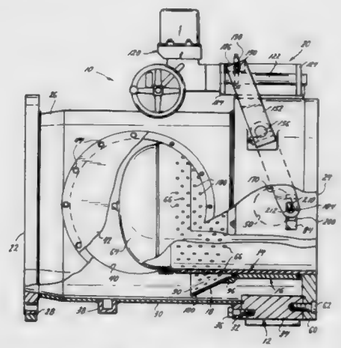
downstream of the box-like elements for regulating the air supply to the turbojet and ramjet inlets.

5,116,252

IN-LINE SLEEVE VALVE HAVING VELOCITY GUIDE PRESSURE EQUALIZATION AND DRIVE ASSEMBLY WITH IMPROVED DRIVE PIN MOUNTINGS

Thomas A. Hartman, 700 Capac Ct., St. Louis, Mo. 63125

Filed Aug. 2, 1991, Ser. No. 739,917
Int. Cl.[5] F16K *3/26*
U.S. Cl. 137—625.3 11 Claims



1. An in-line sleeve valve having an inlet and an outlet aligned generally along the same axis said valve comprising:

a housing;

a sleeve mounted to the housing, the longitudinal axis of said sleeve being generally aligned with the housing inlet axis, said sleeve having nozzles in the cylindrical wall thereof, said nozzles being in a pattern extending over a selected length thereof;

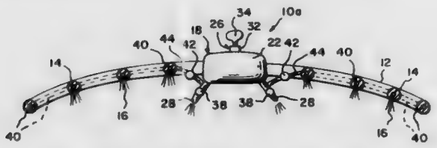
a sleeve gate slidably mounted to the sleeve, said sleeve gate extending around the outer cylindrical surface of the sleeve in sliding sealing engagement therewith;

means for sliding said sleeve gate between a closed position whereby said gate fully covers said nozzles to prevent the flow of fluid through said valve, and a fully open position whereby said nozzles are exposed to allow the maximum flow of fluid through said valve; and

a velocity guide mounted to said sleeve gate and movable therewith, said guide comprising a ring shaped of generally conical section, said ring being located forward of said sleeve gate, the end of largest ring diameter being forward of the end of smallest ring diameter, the velocity guide directing the fluid entering the valve inlet toward said nozzles and assisting in controlling the velocity of the fluid passing through said nozzles to provide a more constant velocity of fluid flow through the nozzles over the

exposed length of the nozzle pattern, said velocity guide, sleeve, and sleeve gate defining a passage means at the rearward end of said velocity guide ring between the rearward end of the ring and the sleeve and gate for the flow of fluid therethrough to rapidly equalize the pressure across the velocity guide upon initially opening the valve.

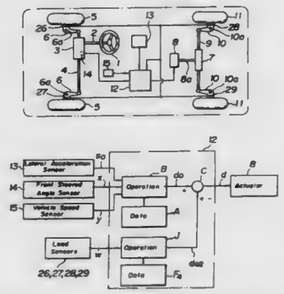
5,116,253
SHAMPOO STIMULATOR
Satendra Charitar, 37 E. Cavour St., Daly City, Calif. 94014, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007
Filed Sep. 14, 1990, Ser. No. 582,668
Int. Cl.[5] A45D *24/22*
U.S. Cl. 132—114 **2 Claims**



1. A hair shampoo stimulator device comprising:
a) an open frame being slightly curved downwardly;
b) a plurality of zigzag supports affixed to and extending across a narrow portion of said frame in a spaced apart relationship;
c) a plurality of bristles affixed to and facing downwardly on each said support; and
d) means on said frame for dispensing shampoo solution directly to a scalp of a person using said device so that said bristles will foam the shampoo solution and massage the scalp of the person to stimulate the hair roots; wherein aid dispensing means includes:
e) a container affixed to and extending across the center of said narrow portion of said frame with said supports arranged substantially uniformly therefrom, said container having a chamber for holding the shampoo solution therein;
f) a manually operable pump reciprocally carried within said container;
g) a pair of nozzles, each fluidly connected to one bottom edge of said container so that when said pump is activated said nozzle will spray some of the shampoo solution out of the chamber onto the scalp;
h) a plunger slideably supported in said container;
i) a hollow shaft extending upwardly through the top of said container and affixed to said plunger so that the chamber can be filled with the shampoo solution through said hollow shaft;
j) a tension spring affixed about said hollow shaft within said chamber to pull said plunger in an upward direction.

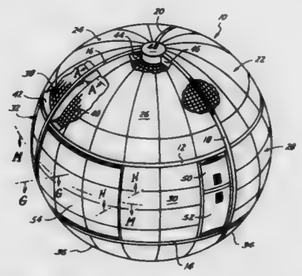
5,116,254
STEERING SYSTEM FOR VEHICLES
Shoichi Sano, Tokyo; Yoshimi Furukawa, and Tetsur Hamada, both of Tochigi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 690,167, Jan. 10, 1985, Pat. No. 4,964,481. This application Nov. 5, 1987, Ser. No. 118,398
Claims priority, application Japan, Jan. 13, 1984, 59-4597; Jan. 13, 1984, 59-4598; Jan. 13, 1984, 59-4599; Jan. 13, 1984, 59-4600
Int. Cl.[5] B62D *5/06*
U.S. Cl. 180—140 **12 Claims**

1. A steering system for a vehicle having steerable front and rear wheels, comprising:
a front wheel steering mechanism for steering front wheels;
a rear wheel steering mechanism for steering rear wheels in dependence on a traveling state quantity of said vehicle; and
said rear wheel steering mechanism including:
detection means for detecting said traveling state quantity of said vehicle;
control means connected to said detection means and adapted to generate a control signal based on said detected traveking state quantity; and
actuation means for receiving the control signal from said control means and for actuating steering movements of said rear wheels dependent on said traveling state quantity of said vehicle;
said control means having:



first process means for receiving and output signal from said detection means to produce a first signal based on predetermined data on various appropriate traveling states of said vehicle, said first signal representing an ordinary steering angle for said rear wheels;
second process means for receiving said output signal from said detection means for deriving data relating to at least a cornering power of said rear wheels, and for producing a second signal for correcting said first signal based on data derived by said second process means; and
synthesizing means for synthesizing said first signal and said second signal to produce said control signal.

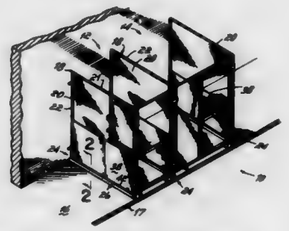
5,116,255
ANIMAL CAGE
Michale E. Keeling, 103 Wedgewood, Elgin, Tex. 78621; William E. Britz, Jr., and David W. Clark, both of P.O. Box 1151, Bryan, Tex. 77806
Filed Oct. 13, 1988, Ser. No. 257,091
Int. Cl.[5] A01K *1/00, 15/02*
U.S. Cl. 119—18 **20 Claims**



1. An animal cage, comprising:
an enclosure of shape capable of rolling movement, the enclosure having openings therein for passage of gases and matter therethrough and for preventing egress of the animal;

a door in the enclosure for passage of the animal; and
a fluid reservoir located on the enclosure for dispensing fluid to the animal, the fluid reservoir comprising a collapsible bladder having a valve for selectively releasing fluid therefrom.

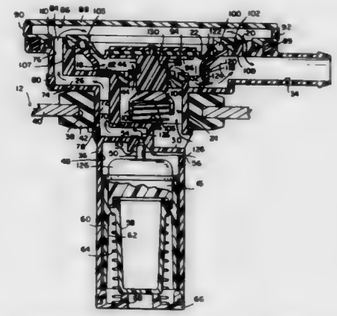
5,116,256
KENNEL RUN ISOLATING MEANS
James F. Allen, Wilmington, Ohio, assignor to The Mason Company, Leesburg, Ohio
Filed Nov. 30, 1990, Ser. No. 621,274
Int. Cl.[5] A01K *1/02*
U.S. Cl. 119—17 **12 Claims**



1. A kennel run isolating device comprising,
adjacent kennel runs situated on a common floor and having a common partition between them,
said partition, at least in its lower portion, comprising an imperforate panel which prevents liquid waste from an animal in one of said runs from passing through the panel into an adjacent run,
an upwardly opening channel mounted on said floor directly beneath said panel,
means sealing said channel to said floor to prevent the passage of liquid beneath said channel from one of said runs into another of said runs,
said channel having a bottom and sidewalls on each side of said bottom, said channel sloping longitudinally to an outlet,
said panel having a lower edge positioned substantially between the sidewalls of said channel, and
means supporting said panel in such position whereby waste impinging on said panel from either side thereof will flow downwardly off said panel into said channel, and along said channel to said outlet.

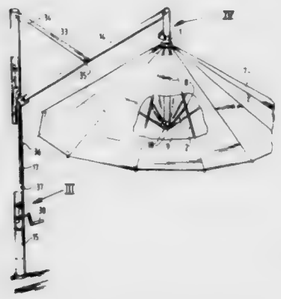
5,116,257
TANK VENTING CONTROL ASSEMBLY
Emil Szlaga, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.
Filed Jan. 8, 1991, Ser. No. 638,787
Int. Cl.[5] F16K *17/36*
U.S. Cl. 137—43 **72 Claims**

1. An apparatus for controlling discharge of fuel vapor and liquid fuel through an aperture in a fuel tank, the apparatus comprising
a housing mounted in the aperture, the housing being formed to include a venting outlet,
means for selectively blocking discharge of fuel vapor and liquid fuel through the venting outlet, the blocking means being movable between a flow-blocking position closing the venting outlet and a flow-delivery position opening the venting outlet,
first means for using pressurized fuel vapor in the tank to move the blocking means from the flow-blocking position to the flow-delivery position, the using means including a diaphragm appended to the blocking means for movement therewith, the diaphragm being movable between a first position allowing the blocking means to assume its flow-blocking position and a second position moving the blocking means to its flow-delivery position, and
second means for using fuel vapor discharged from the fuel



tank through the venting outlet to provide a pressure cushion acting against the diaphragm to urge the diaphragm from its second position forward to its first position.

5,116,258
COLLAPSIBLE UMBRELLA
Johan Vennik, Breda, Netherlands, assignor to Nijkamp B.V., Breda, Netherlands
Filed Aug. 28, 1990, Ser. No. 574,148
Int. Cl.[5] A45B *11/00*
U.S. Cl. 135—20.3 **5 Claims**



1. Collapsible umbrella against for instance sunlight, rain and so on, comprising:
a shaft and a number of ribs fixed pivotally thereto for supporting a fabric-like material, which ribs are each pivotally connected to a rodlike stretcher, a bottom end whereof is displaceable in lengthwise direction of said shaft, wherein said shaft takes a hollow form and serves as a guide for a common control rod slidably received within the shaft, said shaft having a top end and a length dimension, said control rod being connected to said stretcher rods:
wherein the control rod has a length form a top end that is greater than said length of said shaft;
a hollow carrier for axially receiving the top end of the control rod, said carrier being pivotally attached to the shaft at a location below the top end of the shaft and pivotable thereon to a position angularly spaced from the shaft; and
wherein the carrie space for receiving the top end of said control rod is positioned to selectively lock the shaft

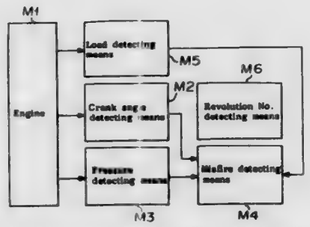
against pivotal motion when the control rod top end is received in said space.

5,116,259

MISFIRE DETECTING DEVICE OF AN INTERNAL COMBUSTION ENGINE

Akira Demizu; Akihiro Nakagawa, and Toshiki Kuroda, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1991, Ser. No. 696,808
Claims priority, application Japan, Jun. 5, 1990, 2-148222
Int. Cl.[5] **G01L** *23/22*
U.S. Cl. 73—117.3 **1 Claim**



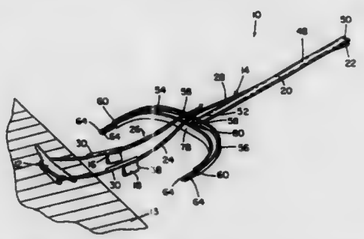
1. A misfire detecting device for an internal combustion engine having a cylinder, and a piston reciprocable within the cylinder and coupled to a crank shaft, said device comprising:
- pressure detecting means for detecting an internal pressure of said cylinder;
- crank angle detecting means for detecting a crank angle of said crank shaft;
- load detecting means for detecting a load of the engine;
- revolution number detecting means for detecting a revolution number of the engine; and
- misfire detecting means for determining that a misfire has occurred when the internal cylinder pressure at a predetermined crank angle after a top dead center of a compression stroke and during an engine combustion cycle, is below a predetermined value established from a combination of the detected engine load and the detected engine revolution number.

5,116,260

LINE HANDLING DEVICE

Paul E. Upchurch, 2082 W. Pinewood Way, Oak Harbor, Wash. 98277

Filed May 29, 1991, Ser. No. 706,865
Int. Cl.[5] **B63B** *21/54*
U.S. Cl. 114—221 R **43 Claims**



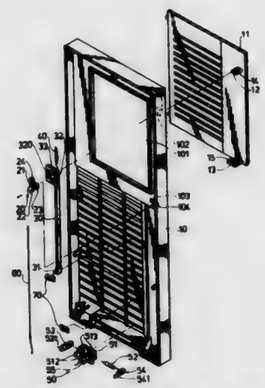
1. An apparatus to assist a user in tying a boat to a mooring rail, comprising:
- a line having a first end portion attachable to the boat, a second end portion having first and second end segments, each with a free terminal end portion, and a length of line extending between said first and second end portions;
- first and second spreaders, each said spreader being disconnected from the other and having an aperture, said terminal end portion of said line first end segment being fixedly secured in said first spreader aperture and said terminal end portion of said line second end segment being fixedly secured in said second spreader aperture, said first and second spreaders being independently movable relative to the other of said first and second spreaders, each said spreader further having a connection recess and a hook sized to reach at least partially around the mooring rail; and
- a handle having an elongated shaft with a proximal end portion for grasping by the user and a distal end portion, and further having a pair of spreader arms, each spreader arm having one end rigidly attached to said shaft distal end portion and a free end spaced apart from said free end of the other of said spreader arms by a predetermined distance, said free end of each of said spreader arms being releasably insertable into said recess of a different one of said first and second spreaders to selectively hold said first and second spreaders spaced apart by about said predetermined distance, said free ends of said spreader arms being releasable from said recesses of said first and second spreaders in response to the user pulling said handle in a direction away from the mooring rail with a predetermined separation force with said hooks in place around the mooring rail to allow said hooks to remain hooked around the mooring rail during mooring uninhibited by said first and second spreaders or said spreader arms, whereby the user, while located at a distance from the mooring rail and holding said proximal end portion of said shaft, can easily place said hooks around the mooring rail, and the user can selectively disconnect said first and second spreaders from said spreader arms by pulling on said handle for tying the boat to the mooring rail.

5,116,261

AUXILIARY COMPUTER PANEL TO COVER A DISK DRIVE ACCESS SIDE OF A COMPUTER CASING

Ray Lan, and Collins Tsai, both of Taipei, Taiwan, assignors to Mitac International Corp., Hsinchu, Taiwan

Filed Oct. 5, 1990, Ser. No. 593,882
Int. Cl.[5] **A47B** *81/00;* **E05C** *3/16;* **H05K** *7/00*
U.S. Cl. 312—292 **8 Claims**



1. An auxiliary computer panel to cover a front panel of a computer casing from which disk drives are accessed, said front panel being provided with a first engaging means, said auxiliary computer panel comprising:
- a panel member having a window opening to access said disk drives;

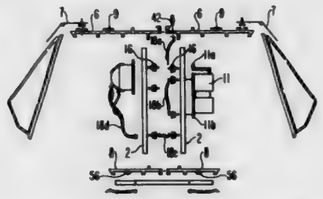
- a cover hinged to said panel member to close said window opening;
- a first lock means provided on said panel member and including a second engaging means releasably engaging said first engaging means so as to lock said panel member against said front panel of said computer casing;
- a second lock means provided on said panel member to lock said cover against said panel member; and
- a key operable actuating member mounted on said panel member and connected to said first and second lock means to simultaneously actuate said first and second lock means to unlock said cover from said panel member and said panel member from said front panel when said key operable actuating member is operated by a key.

5,116,262

MOUNTING SYSTEM FOR ELECTRICAL DEVICES

Fred S. Marton; William R. Segar, both of Monroeville, and William E. Schmitz, Pittsburgh, all of Pa., assignors to AEG Westinghouse Transportation Systems, Inc., Pittsburgh, Pa.

Filed Jun. 4, 1990, Ser. No. 533,278
Int. Cl.[5] **H01R** *9/22*
U.S. Cl. 439—709 **13 Claims**



9. An arrangement for mounting high voltage electrical devices, comprising:
- a generally planar member made of electrically insulating material and including an uniform grid of recesses;
- mounting plugs selectively insertable into desired ones of the recesses of said member, each mounting plug comprising an insulating body which is configured to be removably fixed in a desired one of the recesses of said member and a conductive pin extending through said insulating body and presenting a mounting terminal on each side of said member when the plug is inserted into one of said recesses, each mounting terminal on at least one side of said member being configured for affixing thereto both an electrical lead and a mounting means for an electrical device to be mechanically attached to said member;
- a housing enclosing said planar member, said housing including upper and lower members between which said planar member is secured, one of said upper and lower members including an outer surface having a longitudinal channel formed therein; and a means for fastening said housing to an external structure, said means including a component slidably engageable with said channel so that the position of said housing can be longitudinally adjusted with respect to the external structure.

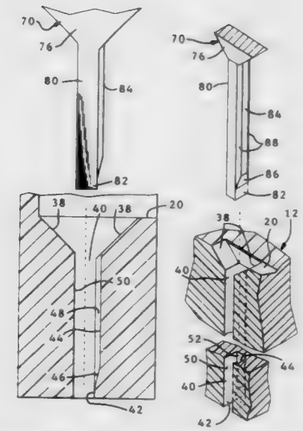
5,116,263

CONNECTOR FOR POSTED TERMINALS

Glenn E. Bennett, Glendale, and Donald F. Urgo, Tempe, both of Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

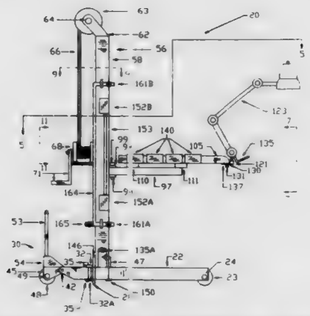
Continuation of Ser. No. 522,397, May 1, 1990, abandoned, which is a continuation of Ser. No. 379,523, Jul. 13, 1989, abandoned, which is a division of Ser. No. 175,013, Mar. 30, 1988, abandoned. This application Feb. 4, 1991, Ser. No. 651,095
Int. Cl.[5] **H01R** *13/41*
U.S. Cl. 439—733 **5 Claims**

1. A positioning system for an electrical contact terminal insertable into a respective passageway of a housing from a face thereof, said terminal having a post section of known general cross-sectional shape and dimensions, comprising:
- dielectric housing means having at least one terminal-receiving passageway extending therethrough from a terminal-receiving face thereof to an opposed mating face thereof; and
- at least one electrical contact terminal associated with said at least one terminal-receiving passageway, said terminal including a post section at a first end thereof insertable into said passageway from said terminal-receiving face of said housing means, and further including retention means between said post section and a second end of said terminal;
- said passageway including an orthogonal passageway constriction of short axial length defined by a reduction of the cross-section of a section of said passageway adjacent an end thereof at said mating face, said constriction merging to a length of said passageway having a cross-sectional shape corresponding to and dimensioned just very slightly larger than the terminal post section cross-section thereat after terminal insertion, said length of said passageway forming cooperable retention means, said constriction precisely positioning said post section transversely with



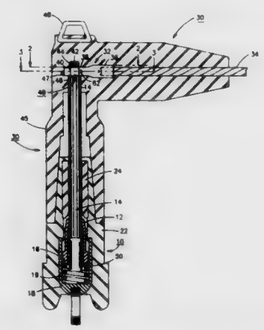
respect to the plane of said mating face as said post section exits said passageway at said mating face after insertion through said passageway; and
- said retention means being located at a position along said terminal selected such that said retention means engages said cooperable retention means of said passageway to retain said terminal therein only as said terminal becomes fully inserted, whereby insertion of said terminal proceeds unhindered by interference from engagement of said terminal retention means with said cooperable retention means of said housing means until said precise positioning of said terminal post section is achieved at said mating face by said passageway constriction; and
- wherein said passageway include means therealong urging said terminal post section into a precise axial alignment during insertion thereof and prior to engagement of said retention means and said cooperable retention means, whereby said terminal post section is both precisely positioned and axially aligned prior to said engagement, and said terminal post section is secured in said precisely positioned and axially aligned state by said engagement of said retention means and said cooperable retention means and said passageway constriction.

5,116,264
POSITIONABLE SERVICE BENCH
LeRoy J. Wiederrich, Box 509, and Robert G. Butler, 1045 Lincoln Ave., both of Havre, Mont. 59501
Filed Jan. 22, 1991, Ser. No. 645,033
Int. Cl.[5] B66B *9/20*
U.S. Cl. 187—11 **13 Claims**



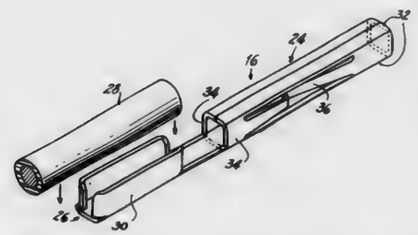
1. A positionable service bench facilitating mechanical work at a work station by one or more mechanics comprising:
a horizontal base assembly;
support structure secured to said horizontal base assembly and engaging a support surface;
said support structure including means selectively facilitating and impeding movement of said horizontal base assembly about said support surface;
a vertical mast secured to said horizontal base assembly;
elevator means disposed on, and selectively movable up and down, said vertical mast;
linear tool tray support structure secured to and movable with said elevator means;
a horizontal tool tray having a planar bottom and at least three vertically extending sides supported by said linear tool tray support structure;
said horizontal tool tray serving to receive and support hand tools for use by one or more mechanics at the work station;
said linear tool tray support structure being pivotally connected at one end to said elevator means and releasably attached to said planar bottom of said horizontal tool tray at the other end thereof;
said horizontal tool tray being pivotally and horizontally movable relative to said vertical mast to adjust the relative position thereof;
said at least three vertically extending sides on said horizontal tool tray including a first vertical side disposed adjacent a rectangular frame of said elevator means and second and third sides each having a first end connected to the ends of said first side to leave an open end for said horizontal tool tray spaced from said elevator means;
an accessory receiving bracket for receiving an accessory support secured to a second end of each of said second and third sides at the open end of said horizontal tool tray;
said vertical mast including a pair of spaced vertical columns and said elevator means including said rectangular frame movably supported between said pair of spaced vertical columns;
said rectangular frame including a pair of vertical sides and a pair of horizontal sides;
an elongated arm member pivotally attached at one end to, and extending in a horizontal direction from, each member of said pair of vertical sides of said rectangular frame and serving as said liner tool tray support structure;
whereby, when said positionable service bench is moved to a work station and secured in position by said means selectively facilitating and impeding movement thereof, said elevator means may be moved to the desired height on said vertical mast and said horizontal tool tray may be pivotally and horizontally adjusted to the position desired by the mechanic working at the work station.

5,116,265
SEPARABLE CONNECTOR MODULE WITH IMPROVED CURRENT-CARRYING THREADED JOINT
Thomas W. Brown, Hickory, and Gerald W. Young, Conover, both of N.C., assignors to General Electric Company, King of Prussia, Pa.
Filed May 13, 1991, Ser. No. 699,436
Int. Cl.[5] H01R *4/30*
U.S. Cl. 439—801 **9 Claims**



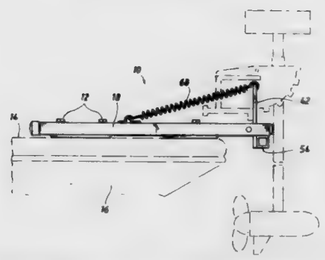
1. A separable electrical connector module movable through an operating stroke and adapted to couple with a mating connector module, comprising:
(a) a connector member comprising a copper portion containing a hole having a central longitudinal axis and internal threads surrounding said axis,
(b) a copper contact rod having one end that is externally threaded to provide external threads that mate with said internal threads to form a current-carrying threaded joint between said contact rod and said connector member and an opposite end adapted to engage a contact within said mating module, and
(c) means for enhancing the current-carrying capabilities of said threaded joint and for restraining said external threads against rotation with respect to said internal threads comprising:
a passage in said connector member portion that intersects said internal threads in a predetermined location at one side of said central longitudinal axis, and
a pin of plastic material tightly fitting within said passage and bearing against the external threads of said contact rod to provide a radial force on said contact rod that urges the external threads of said contact rod into high pressure engagement with said internal threads at the opposite side of said longitudinal axis from said predetermined location, thus maintaining a good electrical connection between the threads of said contact rod and said connector member despite repeated motion of said movable separable connector module through its operating stroke, and in which:
(d) said contact rod includes a shoulder adjacent said externally-threaded one end,
(e) said shoulder bears against a surface of said connector member when said contact rod is in its normal position with respect to said connector member, and
(f) repeated motion of said movable module through its operating stroke causes a slight stretching of said threaded one end of the contact rod that tends to separate said shoulder from said surface of the connector member.

5,116,266
ELECTRICAL CONNECTOR
Douglas G. Seymour, and Randall E. Gillotti, both of Warren, Pa., assignors to GTE Products Corporation, Stamford, Conn.
Filed Oct. 19, 1987, Ser. No. 110,156
Int. Cl.[5] H01R *11/22*
U.S. Cl. 439—851 **7 Claims**



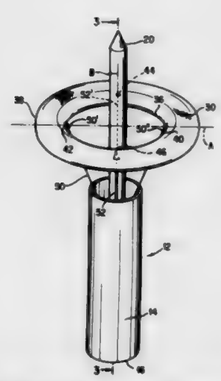
1. An electrical connector comprising: a housing of electrically insulating material containing cavities; and an electrically conductive female contact positioned in each of said cavities, said female contact having a first end and a second end, said first end being formed to provide a substantially quadrangular tube having two pairs of diametrically opposed sides, and two contact beams formed with one of said pairs, one on each of said opposed sides, said beams being formed to provide electrical connection with an inserted male contact pin and being connected to said sides from which they are formed at each of their ends; each of said beams having a variable height measured parallel to said side, the widest portion of said beams being where said beams join said sides and the narrowest portion of said beams projecting inwardly toward the center of said tube where said narrowest portions of said beams will contact said inserted male contact pin.

5,116,267
YIELDABLE PROTECTIVE MOUNT FOR TROLLING MOTORS
Richard J. Olson, 11410 Sharpcrest, Houston, Tex. 77072
Filed May 10, 1991, Ser. No. 697,964
Int. Cl.[5] B63H *5/12*
U.S. Cl. 440—56 **16 Claims**



1. A yieldable protective mounting mechanism for trolling motors that are intended for selected mounting at the bow or stern of small boats, which trolling motors have elongate motor shafts with an electric motor and propeller mechanism at the lower end of said motor shaft and a motor support and positioning bracket for supporting and positioning said shaft, said yieldable mounting mechanism comprising:
(a) a substantially flat mounting base adapted to be fixed in immovable relation to the structure of said boat, said mounting base having first spring connectors projecting laterally from opposed sides thereof;
(b) a motor support element adapted to receive said motor support and positioning bracket of said trolling motor in fixed relation therewith and having pivotal connection with said mounting base, said motor support element having second spring connectors on opposed sides thereof, said motor support element having a motor operating position relative to said mounting base and being pivotally movable from said motor operating position by forces transmitted through said trolling motor to said motor support element by submerged objects encountered by the motor or motor shaft of the trolling motor mechanism during operation thereof; and
(c) a pair of tension springs each being interconnected at respective extremities thereof with said first and second spring connectors and continuously urging said motor support element to said operating position, said tension springs yielding when said forces exceed a predetermined minimum, thus permitting pivotal movement of said motor support element and the trolling motor secured thereto to protecting the shaft of the trolling motor from being bent or otherwise damaged upon encountering a submerged object.

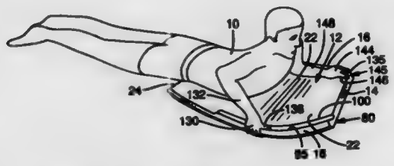
5,116,268
BUOY FLOTATION GIMBAL
James E. Eninger, Torrance; James M. Zamel, Hermosa, and Richard L. Prossen, San Pedro, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 10, 1991, Ser. No. 712,784
Int. Cl.[5] B63B *22/02*
U.S. Cl. 441—3 **12 Claims**



1. A device for maintaining a buoy in a substantially vertical position comprising:
flotation means for causing said buoy to float, said flotation means disposed above said buoy and having first, second, third and fourth points, said first point and said second point being disposed opposite each other, and said third point and said fourth point behind disposed opposite each other;
a first riser having a first end and a second end, said first end attached to said flotation means at said first point and said second end attached to said flotation means at said second point;
a second riser having a first end and a second end, said first end of said second riser attached to said flotation means at said third point and said second end of said second riser attached to said flotation bladder at said fourth point; and
means disposed on said buoy for guiding said first and second risers, said guiding means allowing said first and second risers to freely move within said guide to maintain

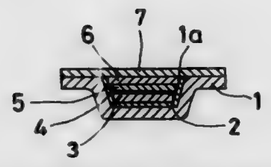
even tension along said risers as the position of said flotation means is varied.

5,116,269
BODYBOARD WITH SIDE GRIP CONTOUR
Steven M. Moran, Long Beach, Calif., assignor to Kransco, San Francisco, Calif.
Filed Feb. 22, 1991, Ser. No. 660,416
Int. Cl.[5] B63C *9/08*
U.S. Cl. 441—65 **14 Claims**



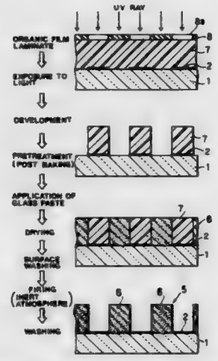
1. A bodyboard comprising:
an elongated, substantially planar board having a top riding surface for supporting a rider, a bottom surface for planing on water, a front nose end, a rear tail end, and elongate, laterally-opposed side edges extending between the nose and tail ends, wherein each side edge of the board is beveled to include an upper beveled surface which angles outwardly and downwardly relative to the top riding surface of the board and a lower beveled surface which angles upwardly and outwardly relative to the bottom surface, the beveled surfaces defining an outwardly extending triangular shape, and including
grip contours in selected regions along the side edges of the board, each grip contour forming a side edge which generally matches the inside shape of the fingers and palm of a hand gripping the side edge to provide a comfortable handhold, including a ridge on the top surface adjacent the side edge extending above the top riding surface of the board, one side of the ridge forming a continuation of the upper beveled side edge of the board which extends to the apex of the ridge, and including
a depression adjacent the ridge extending below the top riding surface of the board, the depression being sized to receive the thumb of a hand gripping the side edge within the depression.

5,116,270
LUMINOUS POINTER AND MANUFACTURING METHOD THEREOF
Junichi Aizawa, and Satoru Yamauchi, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan
Division of Ser. No. 440,035, Nov. 21, 1989, abandoned. This application Sep. 10, 1990, Ser. No. 581,452
Int. Cl.[5] H01J *9/22, 9/26*
U.S. Cl. 445—24 **10 Claims**



3. A method of manufacturing luminous members comprising the steps of: providing a substrate from which the bodies of the luminous members are to be formed; forming at the same time a plurality of insulating layer portions on one surface of the substrate, the insulating layer portions being formed at predefined portions of the substrate corresponding to respective ones of the luminous member bodies; forming at the same time a luminescent layer on the respective insulating layer portions; forming at the same time a transparent electrode on the luminescent layer; blanking the substrate along outlines of the luminous member bodies by press working to produce a plurality of individual luminous members; and sealing the luminous members with a moistureproof film.

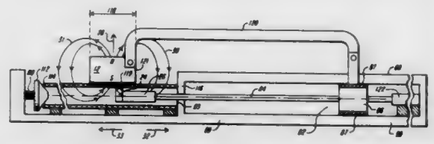
5,116,271
METHOD FOR MAKING A PLASMA DISPLAY
Hironobu Arimoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 13, 1990, Ser. No. 627,158
Claims priority, application Japan, Aug. 29, 1990, 2-227394
Int. Cl.[5] B05D *3/02*; H01J *9/24*
U.S. Cl. 445—24 **3 Claims**



1. A method for fabricating a plasma display which comprises the steps of:
forming a given pattern of discharge electrodes on a transparent plate;
forming organic films on the discharge electrodes so that grooves are established between adjacent discharge electrodes;
pre-heating said organic films at a temperature lower than that at which the organic films undergo an exothermic phenomenon, for a given time;
filling an insulating material into each said groove between adjacent organic films; and
firing the insulating material at a temperature higher than the pre-heating temperature to remove the organic film.

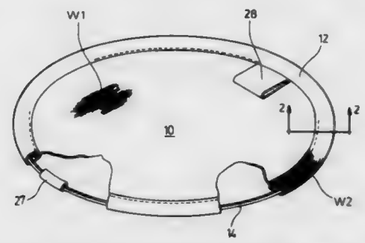
5,116,272
METHOD AND APPARATUS FOR FORMING APERTURES IN FLUORESCENT LAMPS
Ronald G. Blaisdell, Saugus; Harold L. Hough, Beverly, and Robert Y. Pai, Hamilton, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed Jul. 3, 1990, Ser. No. 547,942
Int. Cl.[5] H01J *9/00, 61/35*
U.S. Cl. 445—26 **15 Claims**

1. Apparatus for making an aperture in a coating on an inside surface of a lamp envelope, comprising:
scraping tool means disposed adjacent to the inside surface of the lamp envelope, said scraping tool means including a magnetic material;
magnet means disposed adjacent to an outside surface of the lamp envelope to influence the scraping tool means, said magnet means maintaining a scraping portion of the scraping tool means in contact with the inside surface of the lamp envelope;
guide means attached to the scraping tool means for guiding the scraping tool means along a direction substantially parallel to the inside surface of the lamp envelope; and



means for coupling the magnet means to the guide means, comprising a coupling member which maintains said magnet means and said scraping tool means in fixed relative positions during scraping.

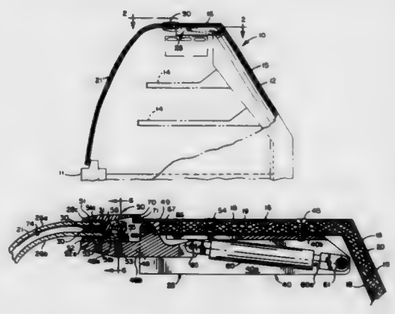
5,116,273
SELF-EXTENDING PORTABLE PANELS
David S. Chan, 8 Argonne Crescent, Willowdale, Ontario, Canada M2K 2K1
Filed Apr. 26, 1991, Ser. No. 691,816
Int. Cl.[5] B60J *3/00*
U.S. Cl. 160—370.2 **5 Claims**



1. A self supporting storable panel system comprising;
a circular panel portion formed of flexible material, and defining a circular perimeter of predetermined diameter;
a linear strip of woven material formed of intersecting threads, bias-cut with said threads extending diagonally of said strip of said woven material, said strip having a linear dimension equal to somewhat greater than the length of said perimeter of said panel portion, said linear strip being secured around said panel portion to form a perimeter sleeve having a diameter greater than said diameter of said panel portion; and,
a spring metal hoop located in said perimeter sleeve, said hoop being dimensioned to have a diameter greater than said diameter of said panel portion so as to distend said sleeve and thereby extend and stretch said panel portion, said spring hoop being resiliently collapsible, in a looped manner, into at least two adjacent connected smaller hoops, whereby said panel portion may be collapsed, for storage.

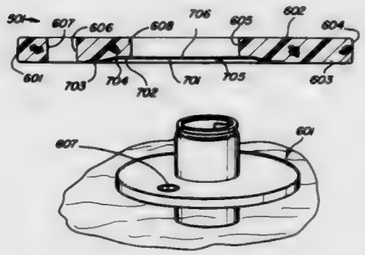
5,116,274
REFRIGERATOR DISPLAY CABINET WITH THERMALLY INSULATED PIVOTABLE WINDOW PANE
Paul Artwohl, Flossmoor, Ill., and David Robinson, Valparaiso, Ind., assignors to Ardco, Inc., Chicago, Ill.
Filed Oct. 2, 1990, Ser. No. 591,746
Int. Cl.[5] A47F *3/04*
U.S. Cl. 312—116 **30 Claims**

1. A refrigerator display case comprising a cabinet for containing refrigerated items for display, said cabinet having a front opening, a window panel, clamp and hinge means engageable with an upper marginal end of said window panel for supporting said window panel for pivotal movement relative to said cabinet about a horizontal axis adjacent said upper marginal end between a lowered position closing said cabinet opening and a raised position for permitting access to the interior of said cabinet through said front opening, fluid controlled cylinder means for facilitating and controlling movement of said panel between said lowered and raised positions, said window panel comprising a pair of glass panels disposed in side-by-side relation, a spacer interposed between said panes for maintaining said panes in parallel relation with an air space therebetween, said spacer including a pair of side spacer members disposed between said glass panes adjacent opposite peripheral sides of said window panel and upper and lower spacer members disposed between said glass panes adjacent



upper and lower peripheral ends of said window panel respectively, said upper spacer member being in the form of a solid metal bar having a rectangular cross section, said spacer bar extending the entire width of the upper marginal end of said window panel, said solid spacer bar being located between said glass panes at the location engaged by said clamp and hinge means, said clamp and hinge means including a pair of relatively pivotal clamping plates, and means for adjustably pivoting at least one of said clamping plates relative to the other for establishing the desired clamping pressure on said window panel with said upper spacer bar disposed directly between said clamping plates.

5,116,275
TOSSABLE FLYING DISC
Mark S. Sassak, 1340 Linden, Plymouth, Mich. 48170
Continuation-in-part of Ser. No. 440,810, Nov. 24, 1989, Pat. No. 4,973,284. This application Nov. 26, 1990, Ser. No. 617,605
The portion of the term of this patent subsequent to Nov. 27, 2007, has been disclaimed.
Int. Cl.[5] A63H *27/00*; A47F *7/00*
U.S. Cl. 446—48 **11 Claims**



1. An amusement device comprising:
a disk adapted for flight, said disk comprising an annular body constructed of a foam-like material and having an upper surface and a bottom surface disposed generally

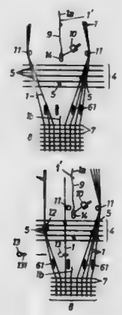
parallel to one another, first means extending between said surfaces and forming a first opening centrally of said disk for releasably gripping an object adapted to be removably retained by said disk, plate means mounted to said bottom surface for strengthening said disk and enhancing lift of the disk when in flight, and second means extending between said surfaces and forming a second opening radially outwardly of said first opening for receiving a finger whereby when a finger is inserted in said second opening said disk can be twirled.

5,116,276

LOCATION OF A SLIT BETWEEN DENTS CORRESPONDING TO A BROKEN WARP

Yujiro Takegawa, Kahoku, and Souichi Nakai, Kanazawa, both of Japan, assignors to Tsudakoma Corp., Ishikawa, Japan

Filed Mar. 27, 1991, Ser. No. 675,255
Claims priority, application Japan, Mar. 28, 1990, 080227; Jun. 8, 1990, 148694; Jun. 8, 1990, 2-148695
Int. Cl.[5] D03J *1/14*; D03D *23/00*
U.S. Cl. 139—351 **3 Claims**



1. A method of locating a slit between dents of a reed of a loom corresponding to a broken warp, comprising the steps of:

extracting a normal warp in a predetermined positional relation with a broken warp by catching the normal warp at a position between a heddle through which the normal warp is drawn and the reed of the loom;

vertically displacing the extracted normal warp relative to other warps;

detecting the displaced normal warp to determine the position of the displaced normal warp on the reed with respect to the direction of the weaving width; and

locating a slit between the dents of the reed corresponding to the broken warp on the basis of the position of the displaced normal warp on the reed.

5,116,277

DOLL HAVING VARIABLE LENGTH HAIR SEGMENT

William J. Kelley, 4721 Laurette St., Torrance, Calif. 90503

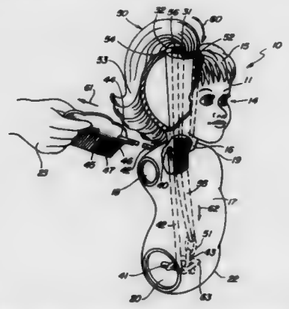
Filed May 17, 1991, Ser. No. 702,216
Int. Cl.[5] A63H *3/44, 13/02*
U.S. Cl. 446—319 **14 Claims**

1. A doll having a hair segment extending therefrom in a variable extension, said doll comprising:

a doll body including a hollow head defining an interior cavity, an interior surface, a first aperture therein and a hollow torso and said body defining a second aperture therein;

a hair segment having a first end secured in a fixed attachment to said interior surface within said interior cavity proximate said first aperture, a second end external to said doll body and an intermediate portion within said hollow head and torso extending from said fixed first end to form an internal loop within said torso and through said first aperture in a single direction; and

a flexible draw member having a first end coupled to said intermediate portion of said hair segment extending outwardly from said doll body through said second aperture therein and defining a second end,



said flexible draw member being withdrawable from said doll body to increase the length of said intermediate portion of said hair segment and decrease the length of said second end of said hair segment external to said doll body.

5,116,278

BRASSIERE FOR WOMEN

Brian J. Sroub, 3123 Portsmouth Ave., Cincinnati, Ohio 45208, and Melvin A. Pomeranz, Marina del Rey, Calif., assignors to Brian J. Sroub, Shaker Heights, Ohio

Filed Jan. 3, 1991, Ser. No. 637,020
Int. Cl.[5] A41C *3/14*
U.S. Cl. 450—61 **10 Claims**

1. In a woman's brassieres comprising an encircling band adapted to be fastened around her rib cage, a pair of cups joined to the encircling band, and a pair of shoulder loops each attached to a respective cup and to the encircling band, the improvement comprising;

said cups being bounded on their sides by a pair of elastic risers joined to the encircling band and to an end of a respective shoulder strap, said risers converging toward the shoulder strap, said cups comprising a web of elastic material with side edges continuously joined to said risers and anchored to said band; and

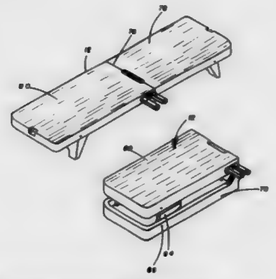
a cradle comprising an elastic member having a lower edge anchored to the encircling band, and an upper free edge entirely unattached to said web, whereby its surface between said side edges and above a lower edge are entirely unattached to said web and free to move in relative shear-like movement, said cradle also having side edges, said side edges being joined to respective risers, whereby said cradle acts to reinforce said web when said web is substantially deflected by a breast and to support the lower portion of said breast independently of said web.

5,116,279

FISH FILLETING APPARATUS

James G. Perry, Omaha, Nebr., assignor to Advanced Innovations Inc., Omaha, Nebr.

Filed Feb. 26, 1990, Ser. No. 484,263
Int. Cl.[5] A22C *25/06*
U.S. Cl. 452—195 **24 Claims**



1. A fish cleaning apparatus comprising,

an elongated table having front and back edges and opposite ends, and

a clamp operative to releasably receive and hold the tail of a fish to be cleaned,

said clamp being mounted on said table so as to releasably receive and hold the tail of a fish at a position in substantial spaced relation from both ends of said table whereby a clamped fish may be supported on either side of said table for cleaning on side of the fish and then flipped onto the other side of the table for cleaning the other side of the fish,

said clamp being mounted so as to open at the top for receiving the tail of a fish held upright and lowered into the clamp,

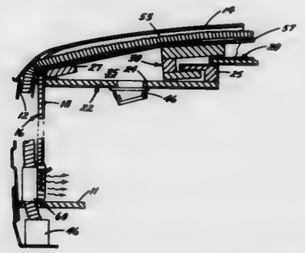
said clamp including at least one handle protruding therefrom, said handle being reciprocally moveable in opposite directions for opening and closing said clamp.

5,116,280

CONDITIONED AIR DISTRIBUTION SYSTEM FOR A CONVERSION VAN

John M. Kloster, Caledonia, Ill., assignor to Atwood Industries, Inc., Rockford, Ill.

Filed Feb. 4, 1991, Ser. No. 650,086
Int. Cl.[5] B60H *1/26*
U.S. Cl. 454—137 **11 Claims**



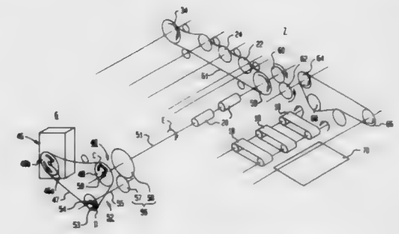
1. The combination of, a motorized conversion van, and a system for supplying conditioned air to the interior of said van, said van having a floor, having a pair of laterally spaced and longitudinally extending interior side panels extending upwardly from said floor and having a roof adjacent the upper ends of said side panels, a headliner spaced below and substantially concealing said roof, said headliner having outboard margins near said side panels, a longitudinally extending plenum located inboard of each side panel below said roof and between the side panel and the adjacent outboard margin of said headliner the outer margins of said plenum being defined in part by said side panel and said roof, a plurality of individually controllable air distribution outlets spaced along, communicating with and extending downwardly from each plenum in order to direct conditioned air downwardly into said van at a plurality of locations beneath each plenum, a heat exchanger located beneath said floor, and air supply conduit means communicating with said heat exchanger and extending upwardly therefrom along the outboard side of one of said side panels, said conduit means communicating with the plenum adjacent said one side panel and extending laterally across said van between said headliner and said roof into communication with the plenum adjacent the other side panel.

5,116,281

ROTATIONAL SPEED SWITCHER

Tetsuo Ohara; Tsutomu Miura; Shinichi Hagiwara; Shigeomi Koshimizu, and Eiichi Shimizu, all of Kanagawa, Japan, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 9, 1991, Ser. No. 682,297
Claims priority, application Japan, Aug. 23, 1990, 2-223148
Int. Cl.[5] G03B *1/00*
U.S. Cl. 474—1 **6 Claims**



1. A rotational speed switcher comprising:

a reversible drive motor;

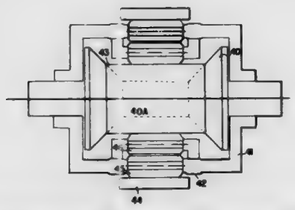
an output drive shaft;

a first speed converter which comprises a first speed changing section connected to the drive motor for changing the speed of the motor to a prescribed speed and a first one-way clutch which transmits the rotation of the first speed changing section to the output drive shaft when the drive motor is in a forward mode, thereby rotating the output drive shaft in a driving direction and cutting the transmission of motive power to the output drive shaft when the drive motor is in a reverse mode; and

a second speed converter which comprises a second speed changing section connected to the drive motor for changing the speed of the motor to a prescribed speed and a second one-way clutch which transmits the rotation of the second speed changing section to the output drive shaft when the drive motor is in a reverse mode, thereby rotating the drive shaft in the driving direction and cutting the transmission of motive power to the output drive shaft when the drive motor is in a forward mode;

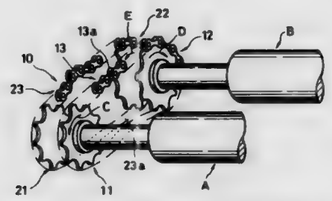
whereby the driving force of the drive motor in both forward and reverse modes is transmitted to the two speed conversion means via the one-way clutches to rotate the output drive shaft in a constant direction while switching between two different speeds.

5,116,282
VARIABLE CIRCUMFERENCE ADJUSTABLE-DRIVE PULLEY MECHANISM
James A. Graham, 3712 N. Broadway, Chicago, Ill. 60613
Continuation-in-part of Ser. No. 597,318, Oct. 15, 1990, Pat. No. 5,049,113. This application Sep. 16, 1991, Ser. No. 760,188
Int. Cl.[5] F16H *55/00, 7/08*
U.S. Cl. 474—49 3 Claims



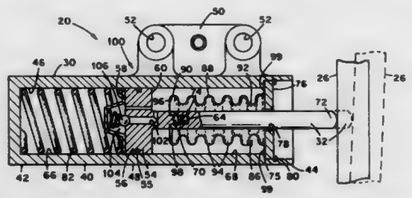
1. A variable diameter pulley drive mechanism, comprising:
a splined, rotably supported, hollow, axle member having one or more longitudinally extending openings;
a variable diameter traction element carried by said axle member, wherein said traction element includes a pair of outwardly biased frusto-conical pulley members capable of relative axial movement along said axle member;
one or more flexible engaging elements for positively contacting power transfer means riding upon said traction assembly; and
tensioning means operatively connected to said engaging element, whereby stress exerted upon said tensioning means causes said engaging element to retract into said axle member through said longitudinal opening, so that said flexible engaging element is tightly carried by said traction element through every degree of variation, said frusto-conical pulley halves having one or more slots to allow storage of unused portions of the engaging elements;
said frusto-conical halves are disposed in a carrier; said carrier contains bearings on which ring gears are disposed in contact-relationship with planets; and said planets are disposed in contact-relationship with variable span planets.

5,116,283
POWER TRANSMISSION MECHANISM WITH TWO SETS OF CHAINS
Yuichi Futami, Iruma; Eisaku Ohmon, Tokorozawa, and Tadasu Suzuki, Tokyo, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan
Filed Apr. 19, 1991, Ser. No. 689,698
Claims priority, application Japan, Apr. 20, 1990, 2-41586[U]
Int. Cl.[5] F16H *7/00*
U.S. Cl. 474—84 5 Claims



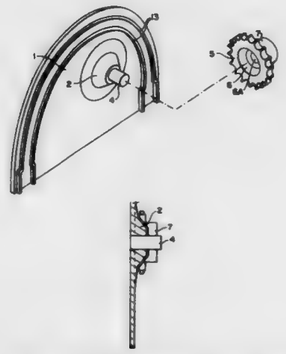
1. A chain-type power transmission mechanism for connection between drive and driven shafts, comprising first and second sets of sprockets, each said set including a one said sprocket provided on the drive shaft and a further said sprocket provided on the driven shaft, a first chain extended between and engaged with said first set of sprockets, a second chain extended between and engaged with said second set of sprockets, means associated with the two sprockets provided on at least one of said shafts for relatively changing the rotational position of said two sprockets, and the forward side of one chain and the backward side of the other chain being tensioned.

5,116,284
TENSIONER FOR A POWER TRANSMISSION BELT OR THE LIKE
Nakwon Cho, 3604 Kranbrook La., Knoxville, Tenn. 37921
Filed Apr. 11, 1991, Ser. No. 683,999
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—110 13 Claims



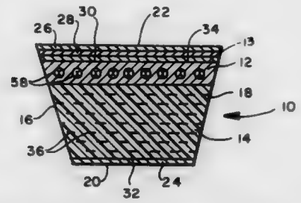
1. A tensioner for a power transmission belt or the like comprising:
housing means providing an elongated interior cavity having two opposite ends and including an opening which opens between the exterior of the housing means and the interior cavity at one end thereof;
piston means having a head which is positioned within the interior cavity for movement therealong between the opposite ends thereof and for dividing at least a part of the interior cavity into first and second variable-volume chambers for holding hydraulic fluid wherein the first variable-volume chamber is disposed on one side of the piston head opposite said one cavity end and a second variable-volume chamber is disposed on the other side of the head, said piston means including a plunger which is connected to the head for movement with the head along the cavity and having an end portion which extends through the opening in the housing means for interaction of the housing means and plunger between a power transmission belt and a stationary structure adjacent the belt;
a spring interposed between the piston means and the housing means for biasing the piston means toward said one end of the interior cavity from the other end thereof;
bellows means connected between the piston means and the housing means for separating the second variable-volume chamber from the opening in the housing means and for accommodating limited changes in the fluid volume of the variable-volume chambers; and
flow control means associated with the first and second variable-volume chambers for permitting a substantially unrestricted flow of hydraulic fluid from the second variable-volume chamber to the first variable-volume chamber as the piston head is moved by the spring toward said one cavity end and for permitting a controlled flow of hydraulic fluid from the first variable-volume chamber to the second variable-volume chamber as the piston head is moved against the force of the spring away from said one cavity end.

5,116,285
SUPPORT PLATE AND SPROCKET FOR A ROTATING STACK MECHANISM
Colette Wahl, 49, rue de Monceau, 75008 Paris, France
PCT No. PCT/FR89/00064, § 371 Date Aug. 17, 1990, § 102(e) Date Aug. 17, 1990, PCT Pub. No. WO89/07566, PCT Pub. Date Aug. 24, 1989
PCT Filed Feb. 20, 1989, Ser. No. 555,456
Claims priority, application France, Feb. 19, 1988, 88 01976
Int. Cl.[5] F16H *57/02*
U.S. Cl. 474—144 3 Claims



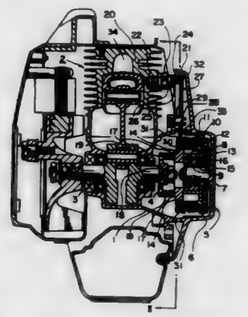
1. For a rotating stack mechanism, a cast metal plate for supporting a toothed sprocket wheel and a pair of vertical chain guide sections, comprising:
a thin molded disc of half-circular shape having two concentric, circular shaped stiffening ribs, a cone-shaped embossing including a cylindrical shaft for supporting a toothed sprocket wheel, parallel grooves for embedding a pair of vertical chain guide sections, said grooves being located on each side of the cone-shaped embossing.

5,116,286
POWER TRANSMISSION BELT
Takashi Kinoshita, Takasago; Masayoshi Nakajima, Motoyamaminami, and Kazuhiro Takeda, Hyogo, all of Japan, assignors to Mitsuboshi Belting Ltd., Japan
Filed Nov. 16, 1990, Ser. No. 615,026
Claims priority, application Japan, Nov. 17, 1989, 1-300010
Int. Cl.[5] F16G *1/10*
U.S. Cl. 474—237 27 Claims



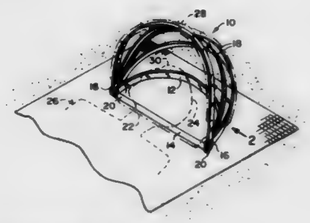
1. An improved cord for use in a load carrying section of a power transmission belt, the improvement comprising:
a) said cord upon being heated having a ratio of shrinkage percentage to shrinkage stress before an adhesive stretching thermal fixation treatment of less than 12.0%/g/d; and
b) said cord upon being heated having a ratio of shrinkage percentage to shrinkage stress after an adhesive stretching thermal fixation of less than 6.0%/g/d,
said cord, when incorporated into a load carrying section of a power transmission belt, minimizing elongation of the belt during operation while maximizing dimensional stability over the life of the belt.

5,116,287
DECOMPRESSOR FOR INTERNAL COMBUSTION ENGINE
Yoshiaki Hironaka, Sayama, and Yoshikiyo Kamata, Hachioji, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan
Filed Jan. 15, 1991, Ser. No. 641,412
Claims priority, application Japan, Jan. 16, 1990, 2-002576[U]
Int. Cl.[5] F02N *3/02, 17/00*
U.S. Cl. 123—182.1 2 Claims



1. A decompressor for an internal combustion engine drivingly connected with a Bendix-type recoil starter comprising, a decompressor valve mounted on a cylinder of said internal combustion engine and a decompressor actuating lever slidably supported by guide members, wherein a proximal end of said lever is inserted into a peripheral groove formed in a driving pawl member of said recoil starter, said actuating lever being laterally moved over its entire length with said driving pawl member when starting said engine and a distal end of said lever is closely disposed to and cooperates with a valve rod of said decompressor valve to open said valve.

5,116,288
HEADSHADE
Kyle K. Kondo, 727 Lukepane Ave., Honolulu, Hi. 96816, and George Spector, 233 Broadway Rm. 3815, New York, N.Y. 10007
Filed Jul. 18, 1991, Ser. No. 732,485
Int. Cl.[5] A42B *1/00*
U.S. Cl. 2—177 4 Claims



1. A head shade which comprises:
a) a flat strip bent in a half round shape;
b) a straight front flat strip having upturned ends;
c) a plurality of curved flat ribs;
d) means for pivotally attaching the ends said half round

strip and the ends of said curved flat ribs to the upturned ends of said straight front flat strip;

e) a first flexible sheet shaped to fit over said half round strip and said straight front strip so that a head of a person can rest thereupon; and

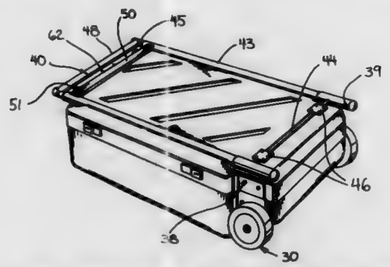
f) a second flexible sheet shaped to fit over said half round strip and said curved flat ribs, so that when said curved flat ribs are pulled into an open position said second flexible sheet will protect the face and head of the person from the rays of the sun when the person is in a reclined position.

5,116,289

CARRY-ON CASE HAVING WHEELS AND AN EXTENDABLE HANDLE

Cecil E. Pond, Palm City, Fla., and Gary E. Pond, South Bend, Ind., assignors to Porter Case, Inc., South Bend, Ind.

Filed Mar. 29, 1991, Ser. No. 676,716
Int. Cl.[5] A45C *5/14, 9/00, 13/26*
U.S. Cl. 190—18 A **5 Claims**



1. A carry case comprising a base and a lid, a hinge member pivotally connecting said lid to the base, said lid being shiftable between an open position exposing the interior of said base and a closed position overlying the base, means for releasably securing said lid to the base in its said closed position, wheels carried by said base adjacent one end of the base, handle means pivotally carried by said lid and being shiftable between a lowered position overlying the lid and a raised position extending upwardly from the lid, said handle means for tilting said base with said lid in its closed position upwardly about said wheels when the handle means is in its raised position, said lid forming means for supporting articles thereon when the lid is in its closed position and said handle means is in its raised position, said handle means including extendable parts for causing the handle means to have either a collapsed position or an extended position when in its lowered position, means for releasably securing said handle means in its lowered position, said handle means for tilting said base with said lid in its closed position upwardly about said wheels when the handle means is in its extended position and secured in its lowered position.

5,116,290

PACKAGING CONTAINER

John A. Ross, P.O. Box 201160, Durban North, South Africa 4016

Filed Dec. 6, 1990, Ser. No. 622,979
Claims priority, application South Africa, Feb. 20, 1990, 90/1258
Int. Cl.[5] B65D *5/32*
U.S. Cl. 229—23 R **8 Claims**

6. A container preform for a container comprising

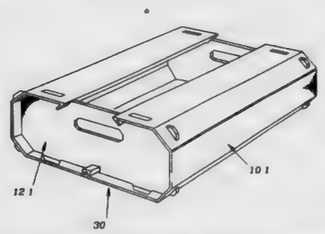
a multiplicity of web plates to be wrapped with

a cover sheet extending about a periphery of said web plates to define a substantially tubular enclosure with said web plates extending substantially transversely to a principal axis of said tube,

where said cover sheet is part of a preform and said preform being an assembly of

said cover sheet including a base panel, and arranged in opposed spaced relationship, upright side panels, top closure panels and pairs of joinder panels located on both sides of said side panels connecting said side panels to said base panel and said top closure panels respectively, which each of said pair of joinder panels are angularly disposed relatively to said side panels and formed with transversely extending slots within which said web plates constitute a friction fit,

said peripheral corners of said web plates being dimensioned to extend through said slots frictionally to secure said cover sheet to said web plates and to retain said webs substantially transversely to said principal axis to said tube,



said web plates being relatively rigid and, locking projections being formed in each of said web plate which extend outwardly from one of said edges thereof,

said cover sheet conformed with said slots which are complementary to said locking projections to extend through said cover sheet slots when said cover sheet is formed about said web plates,

said locking projections of said web plates and said cover sheet slots being dimensioned and positioned for complementary interengagement of one or more of said locking projections on said web plates of one container with a corresponding cover sheet slot of an adjacent container, and said web plates in the vicinity of said cover sheet slots being formed with recesses complementary to said locking projections said slots to receive.

5,116,291

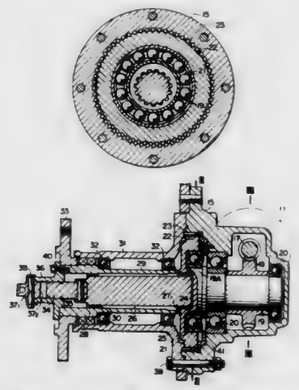
MOTOR DRIVEN WHEEL USING HYPOCYCLIC PLANETARY BEARING WITH AXIAL POSITIVE ENGAGEMENT MEANS

Shigeru Toyosumi, Obu; Masayuki Tanigawa, Kariya; Masanori Egawa, Chiryu, and Kiyoji Minegishi, Aichi, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Aug. 16, 1991, Ser. No. 745,650
Claims priority, application Japan, Oct. 17, 1990, 2-277620
Int. Cl.[5] F16H *35/00, 1/32*
U.S. Cl. 475—178 **10 Claims**

1. A rotary driving apparatus with an hypocyclic eccentric planetary reduction gear, comprising: a motor; hypocyclic eccentric planetary reduction gear to which the output rotation of said motor is inputted; a drive shaft to which the output rotation of said hypocyclic eccentric planetary reduction gear is transmitted; an output rotary shaft to which the rotation of said drive shaft is transmitted; and a rotary flange which is provided on said output rotary shaft and on which a wheel is mounted, wherein the speed of said output rotation of said motor is reduced and then transmitted to said wheel so as to cause a vehicle to run on said wheel,

said rotary driving apparatus with said hypocyclic eccentric planetary reduction gear further comprising a free-wheel mechanism which comprises: first engagement means provided between said drive shaft and an external gear of said hypocyclic eccentric planetary reduction gear, said first engagement means being slidable axially; second engagement means provided between said drive shaft and said output rotary shaft, said second engagement means being slidable axially; an operational shaft arranged to be fixed to an end portion of said drive shaft, said operational shaft being slidable axially and capable of being fixed at an



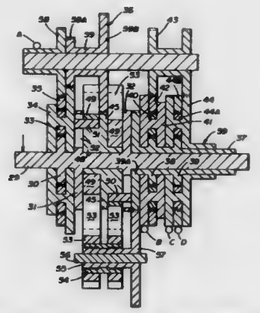
axial position; a guide in which said operational shaft is guided; and means for permitting said operational shaft to slide axially, wherein, when said operational shaft is slid axially, at least the engagement between said drive shaft and said external gear is either established or interrupted.

5,116,292

VARIABLE DRIVE TRANSMISSION

Kyung S. Han, 1922 Coe's Post Run, Westlake, Ohio 44415

Filed Aug. 1, 1991, Ser. No. 739,229
Int. Cl.[5] F16H *37/12*
U.S. Cl. 475—16 **3 Claims**



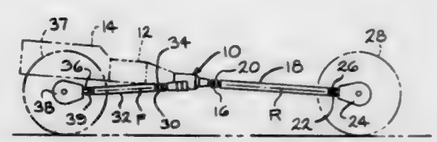
1. A variable drive transmission comprising a main input shaft, a principal element comprising a plurality of planetary gears within an output element engageable by a drive gear on said input shaft, an adjustable camming and drive assembly interconnected to said principal element by a transfer gear, said adjustable camming and drive assembly comprising a pair of oppositely disposed offset circular cams on a cam disk, pins extending from said circular cams registerable in slotted control disks on said main input shaft, a modified form of said principal element interconnected to said adjustable camming drive comprising at least one secondary drive input gear on said main input shaft, a plurality of planetary gears engageable on said secondary drive gear and engageable on a ring gear, a secondary output gear selectively driven by said planetary gears and a multiple transfer gear, a pair of cam engagement arms with one-way clutch drive gears selectively engaged thereon interconnecting said adjustable camming device and said modified form of said principal element, a central transfer gear engageable with a ring gear on said principal element for selectively disengaging said adjustable cam and drive assembly from said main drive shaft.

5,116,293

FOUR WHEEL DRIVE TRANSFER CASE WITH CV JOINT ANGLED FRONT OUTPUT SHAFT

David C. Reuter, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Feb. 14, 1990, Ser. No. 480,101
Int. Cl.[5] F16H *1/38;* **F16D** *3/00*
U.S. Cl. 475—202 **16 Claims**



9. A torque transfer case comprising:

a housing;

an input shaft rotatably supported within said housing;

a hollow drive member rotatably supported within said housing;

means for drivingly connecting said input shaft to said drive member;

a constant velocity universal joint contained within said drive member;

an output shaft rotatably supported within said housing and having one end extending into an opening in said drive member and coupled to said constant velocity universal joint;

said output shaft being solely rotatably supported at said one end thereof by said constant velocity universal joint; and

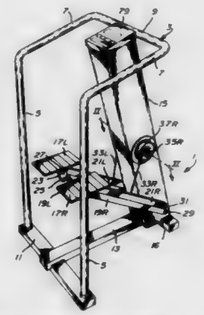
said housing including only a single bearing means for supporting the opposite end of said output shaft.

5,116,294

STAIR CLIMBING EXERCISE APPARATUS

Nathanial B. Findlay, Quebec, Canada, assignor to Inside Fitness Inc., Ste Foy, Canada

Division of Ser. No. 595,289, Oct. 10, 1990, Pat. No. 5,033,733.
This application Apr. 22, 1991, Ser. No. 688,437
Int. Cl.[5] A63B *23/04*
U.S. Cl. 482—52 **1 Claim**



1. A stair climbing exercise apparatus, comprising:

a frame structure;

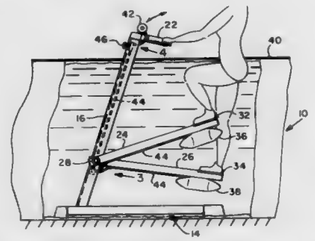
a first step and a side-by-side second step, said steps being

pivotally connected to said frame structure for up-and-down motion thereof;
a first rotary member mounted on said frame structure adjacent said first step and a second rotary member mounted on said frame structure adjacent said second step;
a first strap means having one end connected to said first step and the other end connected to said first rotary member whereby, when said first step is moved from an upward to a downward position, said first rotary member is caused to rotate in one direction;
a second strap means having one end connected to said second step and the other end connected to said second rotary member whereby, when said second step is moved from an upward to a downward position, said second rotary member is caused to rotate in said one direction;
shaft means extending between said first rotary member and said second rotary member;
first connecting means connecting said first rotary member to one end of said shaft means such that said shaft means rotates with said first rotary member when said first rotary member rotates in said one direction and does not rotate with said first rotary member when said first rotary member rotates in an opposite direction;
second connecting means connecting said second rotary member to the other end of said shaft means such that said shaft means rotates with said second rotary member when said second rotary member rotates in said one direction and does not rotate with said second rotary member when said second rotary member rotates in said opposite direction;
an exercise resistance element;
means for transmitting rotation of said shaft means to said resistance element; and
first spring means for returning said first step to an upward position, and second spring means for returning said second step to an upward position;
said first rotary member comprising a first pulley and said second rotary member comprising a second, spaced, parallel pulley;
said first connecting means comprising a bushing connected to said one end of said shaft by a keyway;
said first pulley being connected to said bushing by a first one-way clutch;
said resistance element comprising an electromagnetic brake having a rotatable armature;
said rotatable armature of said electromagnetic brake comprising a short cylinder disposed parallel to said first and second pulleys and co-axial therewith;
a circular pedestal mounted within said armature and co-axial therewith;
a plurality of bobbins equally spaced around said pedestal;
said second connecting means comprising a second one-way clutch between the second end of said shaft means and said second pulley;
said first spring means being connected to said first pulley such that said first spring means winds up when said first pulley is rotated in said one direction, and, wherein, when said first spring means upwinds, it rotates said pulley in said opposite direction; and
said second spring means being connected to said second pulley such that said second spring means winds up when said second pulley is rotates in said one direction, and, wherein, when said second spring means unwinds, it rotates said pulley in said opposite direction.

5,116,295
WATER IMMERSED STAIR CLIMBER WITH AIR BLADDER

Thomas J. Dunn, 7963 Glen Abby Cir., Orlando, Fla. 32819, and Donald B. Gronachan, 4 Spiral Rd., Holtsville, N.Y. 11742

Continuation-in-part of Ser. No. 638,237, Jan. 7, 1991, Pat. No. 5,060,935. This application Oct. 24, 1991, Ser. No. 781,850
Int. Cl.[5] A63B *21/20, 23/04*
U.S. Cl. 482—53 **12 Claims**

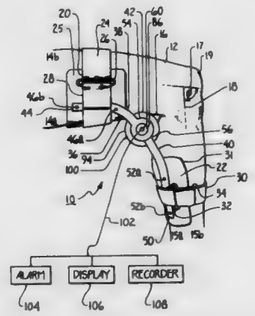


1. Stair climbing apparatus for use by an exerciser comprising:
a. support frame means including a ground engaging base immersed in water;
b. a pair of laterally adjacent foot stepping means pivotally mounted on said support frame means at a location above said base; and
c. resistance means mounted on and connected solely to said stepping means for relying on said water to resist downward pivotal movement of said stepping means said apparatus being sufficiently immersed so that the water level is above said resistance means, said resistance means including means for establishing adjustable buoyancy which resists downward motion of said stepping means.

5,116,296
ISOMETRIC LEG MUSCLE ERGOMETER

K. Richard Watkins, San Diego, and Dale M. Daniels, La Mesa, both of Calif., assignors to MEDmetric Corporation, San Diego, Calif.

Filed Apr. 26, 1991, Ser. No. 692,142
Int. Cl.[5] A63B *21/02*
U.S. Cl. 482—91 **23 Claims**

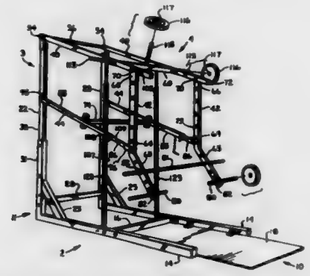


1. An ergometer engageable with the leg of a patient for exercising a leg muscle comprising:
an upper leg restraint positionable on the upper leg;
a lower leg restraint positionable on the lower leg;
a crossbar rigidly connecting said upper leg restraint and said lower leg restraint;
a bolster positionable at the popliteal surface and connected to said upper and lower leg restraints; and
measuring means operatively positioned on said ergometer to measure a force applied to said ergometer across the leg of the patient by contraction of the leg muscle.

5,116,297
WEIGHT-LIFTING MACHINE

William L. Stonecipher, 7001 W. 69th Ter., Overland Park, Kans. 66204

Filed Mar. 4, 1991, Ser. No. 663,569
Int. Cl.[5] A63B *21/06*
U.S. Cl. 482—97 **10 Claims**

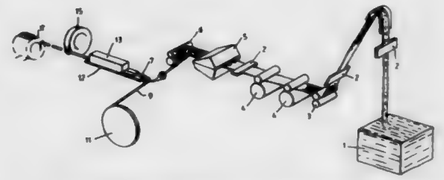


1. A weight-lifting machine comprising:
(a) a base having a front and a rear;
(b) a pair of vertical support members extending vertically upward from said rear of said base in spaced relation to each other;
(c) a pair of first pivotal members pivotally secured at a first set of pivot points to respective vertical support members so as to extend towards said front of said base in planar alignment and so as to be pivotal about a first horizontal axis extending through said first set of pivot points;
(d) a first cross-member secured to and extending between said first pivotal members so as to maintain said first members in planar alignment;
(e) a pair of second pivotal members pivotally securable at a second set of pivot points positioned on respective pivotal members in spaced relation to said first set of pivot points so as to allow said second pivotal members to pivot about a second horizontal axis extending through said second set of pivot points;
(f) engaging means for engagement by a user of said machine;
(g) means for securing said engaging means to said second pivotal members; said second pivotal members cooperating with said first pivotal member such that said engaging means may be engaged by a user and advanced through a range of motions having a horizontal component and a vertical component;
(h) a pair of telescoping beams each pivotally connected at a first end thereof to respective vertical support members and at a second end thereof to respective second pivotal members;
(i) a second cross-member secured to and extending between said telescoping beams so as to maintain said first telescoping beams in planar alignment; and
(j) weight support means secured to said weight-lifting machine in spaced relationship to said first set of pivot points and adapted to removably receive a plurality of weights so as to vary the weight to be lifted by a user.

5,116,298
CONTROL PROCESS AND APPARATUS FOR THE PRODUCTION OF CIGARETTE FILTERS

Luigi Bondanelli, Zola Predosa; Mauro Sirani, Castenaso; Alfonso Schembri, Monteneglio, and Dante Boido, Bologna, all of Italy, assignors to Intertaba, S.p.A., Zola Predosa, Italy

Filed Jul. 13, 1990, Ser. No. 553,117
Claims priority, application United Kingdom, Jul. 20, 1989, 8916589
Int. Cl.[5] B31C *13/00*
U.S. Cl. 493—4 **14 Claims**

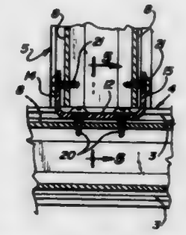


1. A method of controlling the manufacture of cigarette filters, comprising:
periodically removing a completed filter from a production line on which said filters are manufactured;
measuring at least two variable parameters of said remove filter;
comparing each of said measured parameters with a respective predetermined target;
in response to said comparison, if one or both of said parameters are outside their respective targets, selecting for adjustment one of said parameters in accordance with a predetermined set of priorities dependent upon which parameter is outside said target and the degree and sense of each excursion from said target; and
adjusting the operating conditions affecting the selected parameter.

5,116,299
FASTENING SYSTEM FOR MEMBERS OF A FRAMEWORK

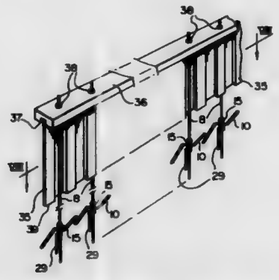
Kevin Kvols, 213 Aspen Garden Way, Suite 100, Woodland Park, Colo. 80863

Filed Nov. 22, 1991, Ser. No. 796,396
Int. Cl.[5] F16B *7/08*
U.S. Cl. 403—187 **5 Claims**



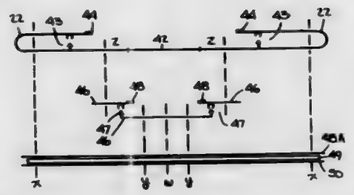
1. A fastening system for making right angle interconnections between the structural components of a framework comprising;
first and second frame members to be interconnected, each having at least one flat side which carries track means; and
"U"-shaped connector means having a flat base and mutually parallel upright stems, where the flat base is engaged by the track means of the first frame member and the upright stems engage the track means of the second frame member.

5,116,300
CONTAINMENT SYSTEM
Mikhail Pildysh, 30 Douglas Bank Drive S.E., Calgary, Alberta, Canada T2Z 2B7
Filed May 28, 1991, Ser. No. 706,346
Int. Cl.[5] E02B *7/02*
U.S. Cl. 405—107 **9 Claims**



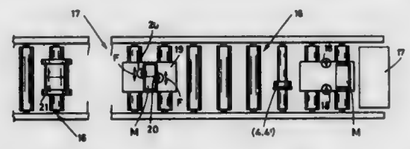
1. A protective barrier comprising elongated panel means; cap means on said panel means; a plurality of threaded rod means for extending through said cap means into the ground; anchor means on said rod means for engaging the ground when said rod means is pulled upwardly; and nut means for mounting on the top end of said rod means above said cap means, whereby, when said anchor means is in a ground engaging position and the nut means is tightened, the nut means and cap means press said panel means into the ground.

5,116,301
METHOD OF MAKING A DOUBLE ZIPPER POUCH
John P. Robinson, Clifton; William R. Stadick, North Brunswick; Thomas L. Clawges, Spotswood, and Thomas P. Minogue, Clifton, all of N.J., assignors to LPS Industries, Inc., Newark, N.J.
Division of Ser. No. 443,480, Nov. 30, 1989, Pat. No. 4,993,844. This application Oct. 15, 1990, Ser. No. 597,087
Int. Cl.[5] B31B *1/90*
U.S. Cl. 493—215 **1 Claim**



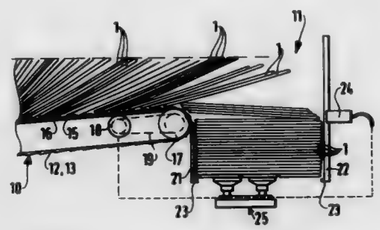
1. Method for manufacturing a pair of pouches, each having two pockets, comprising the steps of:
providing a folded sheet having a pair of end-to-end pockets at a first work station, each pocket bearing a first interlocking resealable fastener and an extended flange;
maintaining a lateral separation between the pockets;
fixing a pair of second interlocking resealable fasteners to the corresponding pair of extended flanges;
fixing a backing sheet to the pair of end-to-end pockets and to the second pair of resealable fasteners, thereby to form a second pair of pockets on the back of said end-to-end pockets; and
severing the folded sheet and backing sheet to provide said pair of pouches.

5,116,302
PROCESS AND APPARATUS FOR THE SEALING OF PAPER SHEETS
Armando Speroni, and Aldo Bedodi, both of Milan, Italy, assignors to Datapac S.R.L., Rome, Italy
Filed Oct. 11, 1989, Ser. No. 420,039
Int. Cl.[5] B31B *21/26*
U.S. Cl. 493—254 **6 Claims**



1. An apparatus for closing and sealing edges of paper envelopes, comprising a plurality of folding means including first means for folding a paper sheet along one of orthogonal axes thereof; a plurality of moistening means including first means for moistening opposing edges of said folded sheet to be sealed, a plurality of pairs of knurling rollers including a first pair of knurling rollers applying pressure to said edges for closing and sealing said moistened edges; said plurality of folding means including second means for folding said paper sheet along another of orthogonal axes thereof; said plurality of moistening means including second means for moistening opposing edges of said double-folded paper sheet to be sealed; said plurality of pairs of knurling rollers including a second pair of knurling rollers applying pressure to said opposing edges of said double-folded paper sheet for closing and sealing said opposing edges; and an elongated paper sheet-conveying belt for advancing said paper sheet through said plurality of folding means, said plurality of moistening means, and said plurality of pairs of knurling rollers, wherein moisture content of said paper sheet moistened by each jet is between 5% and 98% by weight, whereby all edges of the paper sheet to be sealed are closed and sealed without application of any adhesive therebetween, each of said moistening means being positioned between a respective folding means and a respective pair of knurling rollers so as to apply moisture to the edges to be sealed immediately before each sealing procedure.

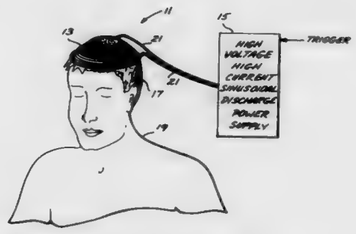
5,116,303
MAGAZINE FOR FLAT ARTICLES, SUCH AS FOLDING BOXES LYING FLAT
Walter Dietrich; Eberhard Krieger, both of Weinstadt, and Siegfried Weber, Rudersberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Dec. 5, 1990, Ser. No. 622,579
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1990, 4003153
Int. Cl.[5] B31B *1/80*
U.S. Cl. 493—313 **5 Claims**



1. A magazine for receiving flat articles, in the form of folded boxes lying flat, in stacked form for delivering them

individually, into a delivery conveyor in opened form, having a conveyor apparatus extending substantially in a horizontal plane rising slightly toward a delivery end of said conveyor apparatus on which the folded boxes are stacked in an oblique position and covering one another, the folded boxes are moved with their upper edge region in a forward position from a rear portion of the conveyor; a receiving chute adjoins a front end of the conveyor apparatus for receiving folded boxes; a feeler device is positioned relative to said receiving chute for monitoring the filling of the receiving chute, said feeler device triggers movement of the conveyor apparatus for refilling the receiving chute if the supply of folded boxes in the receiving chute drops below said feeler device, said receiving chute (**11**) substantially adjoins the conveyor apparatus (**10**) in a vertical alignment with the folded boxes (**1**) resting horizontally one above the other in the receiving chute; a wedge-shaped gap is formed between the folded boxes (**1**) stacked in an oblique position on the conveyor apparatus (**10**) and those stacked horizontally in the receiving chute (**11**), wherein the forwardmost folded boxes, in the conveyor direction, disposed on the conveyor apparatus protrude freely by their upper, leading edge region, past the receiving chute portion at the transition from the conveyor apparatus to the receiving chute (**11**) and are pressed onto the conveyor apparatus by their trailing edge region by the weight of the following folded boxes, said leading boxes tilt progressively out of the oblique position into the horizontal position in the receiving chutes; and the height of the stack of folded boxes in the receiving chute (**11**) is maintained constant by triggering of the conveyor apparatus (**10**) by said feeler device (**24**) associated with the receiving chute.

5,116,304
MAGNETIC STIMULATOR WITH SKULLCAP-SHAPED COIL
John A. Cadwell, Kennewick, Wash., assignor to Cadwell Industries, Inc., Kennewick, Wash.
Continuation-in-part of Ser. No. 548,025, Jul. 5, 1990, Pat. No. 5,047,005, Division of Ser. No. 8,210, Jan. 28, 1987, Pat. No. 4,940,453. This application May 10, 1991, Ser. No. 698,397
Int. Cl.[5] A61N *1/00*
U.S. Cl. 600—13 **13 Claims**



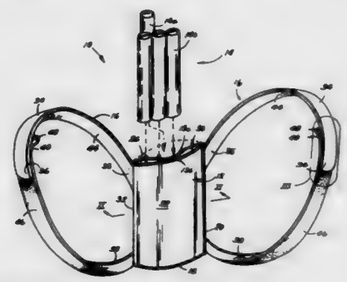
1. A magnetic stimulator comprising:
a coil of wire wound into a skullcap shape and adapted for positioning on the cranium of a human being; and
a power supply connected to said skullcap-shaped coil for applying power to said skullcap-shaped coil adequate to create a neuron depolarizing magnetic field when said skullcap-shaped coil is positioned on said cranium.

5,116,305
CURVED INTRA AORTIC BALLOON WITH NON-FOLDING INFLATED BALLOON MEMBRANE
Fredric L. Milder, Brookline, and Meir Rosenberg, Salem, both of Mass., assignors to Abiomed, Inc., Danvers, Mass.
Continuation of Ser. No. 474,529, Feb. 1, 1990, abandoned. This application Oct. 23, 1991, Ser. No. 780,393
Int. Cl.[5] A61N *1/362*
U.S. Cl. 600—18 **24 Claims**



1. A cardiac assist device for insertion into the aorta, comprising:
a pumping balloon having a membrane formed in a generally cylindroidal inflated shape wherein the maximum diameter in a plane transverse to the long axis of the balloon is located intermediate the ends of the balloon and wherein the balloon diameter decreases in both directions from the plane of largest diameter along said axis;
a catheter means for providing fluid to the balloon when the balloon is positioned within the aorta, said catheter means being joined at a terminal end thereof to one end of the balloon; and
a support member tensioning the inflated balloon membrane, said support member being located within and extending the length of the balloon, the support member also being in contact with an interior surface of the balloon membrane, said balloon membrane being stretched along the length of its surface contacting said support member to provide said tensioning.

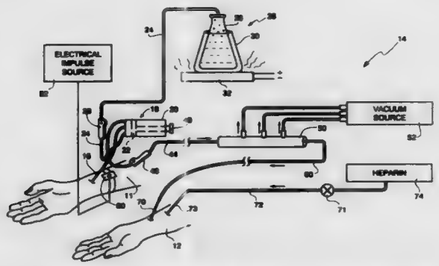
5,116,306
ADJUSTABLE CLAVICLE STRAP AND ORTHOTIC DEVICE USING SAME
Linda K. Zander, Grass Lake, Mich., assignor to Camp International, Inc., Jackson, Mich.
Filed Sep. 6, 1990, Ser. No. 578,560
Int. Cl.[5] A61F *5/02*; A41F *9/00*; A45F *3/02*
U.S. Cl. 602—19 **8 Claims**



1. A clavicle strap assembly comprising:
a two-piece clavicle strap for securing an object to a user's back, each of said two pieces having a first end fastened to said object and a second end for releasably fastening to the second end of the other piece, one of said two pieces being an upper portion, said upper portion extending from said first end, over the clavicle of the user, to said second end,

and the other of said two pieces being a lower portion, said lower portion extending from said first end, around the torso of the user, to said second end;
fastening means for fastening said two pieces together at said second ends; and
a tether connected between said two pieces, near said second ends.

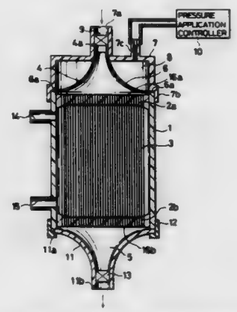
5,116,307
METHOD AND SYSTEM FOR TREATMENT OF AIDS
Harvey T. Collins, 1486 E. 56th St., Chicago, Ill. 60637
Filed Jul. 9, 1990, Ser. No. 549,961
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—4 **6 Claims**



1. A method for the extracorporeal or extravascular treatment of blood for killing virus cells in the blood comprising the steps of:
withdrawing blood from one arm of a patient;
passing the withdrawn blood through a container;
exposing the blood in the container to vaporized diethyl ether, which has been vaporized by heating, thereby to enable the diethyl ether to strip the viral envelope away from the virus cells and dissolve the lipid layers of same in the blood thereby to kill the virus cells;
passing the blood through a manifold;
drawing a vacuum on the blood in the manifold to remove most of the ether from the blood; and
returning the treated blood to the other arm of the patient.

5,116,308
APPARATUS FOR PROCESSING FLUID AND METHOD OF DRIVING THE SAME
Kazuhiko Hagiwara, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 10, 1990, Ser. No. 463,271
Claims priority, application Japan, Jan. 13, 1989, 1-7068; Apr. 13, 1989, 1-93558
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—4 **26 Claims**

1. An apparatus for processing fluid, comprising:
a housing;
a fluid processor accommodated in said housing and having a fluid in-flow port and a fluid out-flow port;
fluid in- and out-flow spaces respectively provided for said respective fluid in- and out-flow ports and having respective fluid ports;
a pair of wall means defining said respective fluid in- and out-flow spaces;
a flexible member provided for deformation on at least one of said wall means and capable of being reciprocally deformed to cause processing fluid pressure variations;
an operation chamber provided in correspondence to said flexible member;
fluid pressure supply means for supplying fluid pressure to said operation chamber for causing reciprocal deformation operation of said flexible member; and
a pair of port on-off means for communicating and blocking said fluid ports;
said pair of port on-off means including first on-off means for communicating and blocking said fluid in-flow space fluid port and second on-off means for communicating and blocking said fluid out-flow space fluid port; and
said fluid pressure supply means including a first pressure source for providing a fluid pressure to said operation



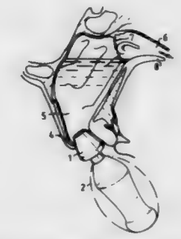
chamber, a second pressure source for providing a negative or atmospheric fluid pressure to said operation chamber, a first pressure supply flow path for communicating said first pressure source and said operation chamber with each other, a second pressure supply flow path for communicating said second pressure source and said operation chamber with each other, and switching means for switching said first and second pressure supply flow paths for communicating and blocking.

5,116,309
URETERAL STENT-CATHETER SYSTEM HAVING VARYING DIAMETER STENT
Milton E. Coll, 6 Pear Tree La., Lafayette Hill, Pa. 19444
Continuation of Ser. No. 301,090, Jan. 25, 1989, abandoned. This application May 20, 1991, Ser. No. 704,718
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—8 **9 Claims**



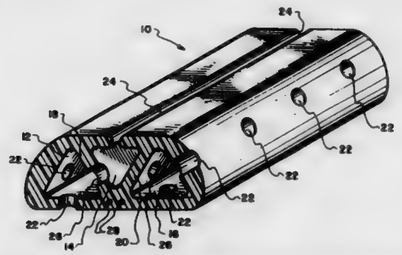
1. A ureteral stent-catheter device for implantation in a ureteral meatus, comprising:
a) an elongated flexible tubular stent having a pair of preformed set curls at both ends and a fluid passage channel extending substantially the entire length of said stent, comprising:
i) a drain passage segment having a plurality of drain passages connecting the channel extending along the length thereof to the outside of said stent, the channel having a first preset width dimension, one end of said drain passage segment forming a closed end and forming one end of said stent, a portion of said passage segment forming one of said pair of preset curls;
ii) a ureteral catheter receiving segment being integral and co-extensive with said passage segment, the channel extending along the length of said receiving segment which has a second preset width dimension, said second width dimension and an outer width dimension of said receiving segment being larger than said first width dimension and an outer width dimension of said drain passage segment respectively, said catheter segment and said passage segment being tapered at the area where they are integrated so as to form a continuous, non-abrupt surface, a portion of said catheter segment forming the other preset curl; and
iii) a flange formed at a free end of said catheter segment, an end of said flange forming an abutment surface; and
b) a stiff ureteral catheter insertable into said catheter segment, whereby said other curl formed at said catheter segment of said stent is held in a straight alignment by inserting said catheter to said catheter segment, and wherein, on extraction of said catheter from the catheter segment of said stent, said other curl reforms, said other curl serving to prevent migration of the ureteral device, said catheter comprising:
i) an elongated stiff tube having an outer width dimension which is substantially equal to said second width dimension of said catheter receiving portion; and
ii) a channel extending through said tube for permitting insertion of a stiffening wire to straighten said curl formed at said drain segment of said stent.

5,116,311
METHOD FOR DRUG ADMINISTRATION
Sigmund J. Löfstedt, St. Pauligatan 22, Jönköping, Sweden S-552 58
Continuation of Ser. No. 275,120, Nov. 22, 1988, abandoned. This application Oct. 25, 1990, Ser. No. 602,393
Claims priority, application Sweden, Nov. 30, 1987, 8704767
Int. Cl.[5] A61M *31/00, 11/00*
U.S. Cl. 604—54 **8 Claims**



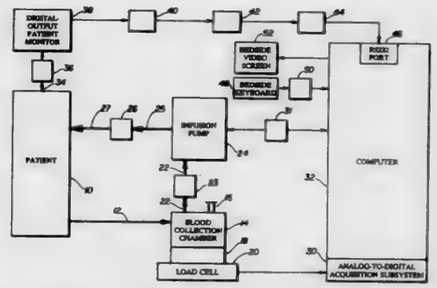
1. A method for the administration of drugs in solutions into one nasal cavity comprising the steps of:
bending the patient's head forward between 55°-90° from an upright position so that the opening between the nasal cavity and the pharynx is positioned higher than the opening between the two nasal cavities; and
introducing a drug-containing solution into one nostril, while the other nostril remains open to the air, in an amount to substantially fill the one nasal cavity and in a manner to allow any excess solution to flow into and drain freely from the other nasal cavity so as to avoid flowing down the pharynx.

5,116,310
MULTIPLE LUMEN WOUND DRAIN WITH BYPASS OPENINGS
Edmund V. Seder; Frederick L. Coe, both of Santa Barbara, and Martin Mitchell, Oxnard, all of Calif., assignors to Helix Medical, Inc., Santa Barbara, Calif.
Filed Jul. 30, 1990, Ser. No. 559,670
Int. Cl.[5] A61M *3/00, 25/00*
U.S. Cl. 604—43 **3 Claims**



1. A wound drain comprising an elongate structure formed from a pliable and soft material with multiple parallel lumens in said structure, with external openings to the outside of the structure from said lumens and with bypass interconnecting openings between said luments, fluid flow from said wound being channeled through said external openings to said lumens so as to exit the wound and also channeled through said bypass openings to adjacent lumens when one or more of the lumens is obstructed, and in which said lumens are generally triangular in shape so that said drain has a truss shaped cross section to maximize resistance to mechanical compression.

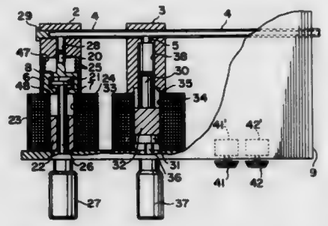
5,116,312
METHOD AND APPARATUS FOR AUTOMATIC AUTOTRANSFUSION
Howard B. Blankenship, and Fred D. Wallace, both of Birmingham, Ala., assignors to The UAB Research Foundation, Birmingham, Ala.
Filed Nov. 3, 1989, Ser. No. 431,296
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—66 **35 Claims**



1. A system for closed-loop, automated, closed autotransfusion, comprising:
(a) a computer;
(b) a first infusion pump having a first variable infusion rate that is controlled by said computer;
(c) a blood collection chamber;
(d) first conduit means for transferring shed mediastinal blood from a patient to said chamber;

(e) second conduit means for transferring said blood from said chamber to said first infusion pump;
(f) third conduit means for transferring said blood from said first infusion pump into a view of said patient, said first conduit means, said chamber, said second conduit means, and said third conduit means defining a path of travel;
(g) means for filtering said blood located along said path of travel;
(h) means for collecting first data relating to a hemodynamic variable of said patient over a period of time;
(i) means for encoding said first data into a plurality of first digitally coded signals;
(j) means for transmitting said first digitally coded signals to said computer;
(k) means in said computer for analyzing said first digitally coded signals to set said first rate of said first infusion pump, wherein said first rate is set for a preselected period of time and wherein said analyzing means comprise:
(i) means for storing the value for said hemodynamic variable in the memory of said computer;
(ii) means for determining if said infusion pump is an alarm state;
(iii) means for ascertaining the incremental volume of said blood pumped through said first infusion pump during said preselected period of time;
(iv) means for calculating the total volume of said blood infused by summing the respective said ascertained incremental volumes;
(v) means for computing the volume of said blood in said chamber;
(vi) means for calculating the volume difference in said chamber between said computed volume in said chamber and the volume of said blood in said chamber after the previous said preselected period of time;
(vii) means for computing the incremental volume of blood drainage from the mediastinum during said preselected period to time by summing said volume difference and said ascertained volume of blood pumped through said first infusion pump;
(viii) means for calculating the total amount of blood drainage from the mediastinum by summing said computed incremental volumes over a predetermined interval of time;
(ix) means for setting said first infusion rate at a predetermined low rate to keep said patient's vein open upon the occurrence of a selected one of the following conditions:
(A) if the volume of said blood in said chamber is less than a predetermined acceptable volume;
(B) if said value for said hemodynamic variable does not fall within a predetermined acceptable range;
(C) if said volume of blood drainage from the mediastinum during said preselected period of time exceeds a predetermined acceptable value;
(x) means for setting said first infusion rate to deliver an aliquot of said blood at a predetermined acceptable rate unless said predetermined low rate was set in step (9); and
(xi) means for allowing the infusion of said blood at said first infusion rate unless said first pump is in said alarm state;
(l) a video display monitor in electronic communication with said computer for visually displaying information relating to said analyzing means; and
(m) a keyboard in electronic communication with said computer for providing bedside control of said system.

5,116,313
VARIABLE INTENSITY REMOTE CONTROLLED NEEDLELESS INJECTORS
Gavin McGregor, Gloucester, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the National Research Council Canada, Canada
Filed Aug. 31, 1990, Ser. No. 576,609
Claims priority, application Canada, Aug. 31, 1989, 609988
Int. Cl.[5] A61M *5/307*
U.S. Cl. 604—70 **21 Claims**



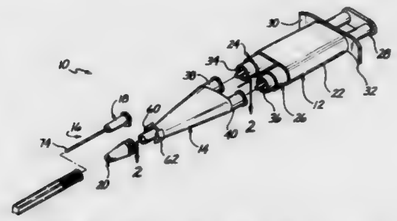
1. An apparatus for injecting liquid into a body through a penetrable skin thereof, comprising a slim hand-held portion having a restricted orifice in a tip at its free end and its other end connected to a high pressure flexible tube containing hydraulic fluid, said flexible tubing being connected to remote pressure intensifier means, said hand-held portion comprising a first cylinder within said hand-held portion communicating with said orifice, a first piston movable in said first cylinder, movement of the first piston towards said orifice ejecting any liquid placed in the first cylinder out through the orifice, a second cylinder in said hand-held portion co-axial with said first cylinder, a second piston movable in said second cylinder and connected to said first piston, the second piston being spring-biased towards said other end and communicating with the hydraulic fluid in said flexible tube; and said remote pressure intensifier means comprising a first high pressure intensifier provided with a first adjustable drive system to provide a high initial pressure pulse through the hydraulic fluid to said second piston and a second low pressure intensifier consisting of a third cylinder containing a third piston which is in contact with the hydraulic fluid, the third piston being movable by a second adjustable drive system to transfer a low secondary pressure via the hydraulic fluid to the second piston.

5,116,314
MEDICATING DEVICE FOR ANIMALS
Lawrence E. Inabinet, 1-B Greenwood Park, Marion, S.C. 29571
Filed Nov. 5, 1990, Ser. No. 608,676
Int. Cl.[5] A61J *7/00*
U.S. Cl. 604—77 **12 Claims**



1. A device for orally administering medication to animals, the device comprising:
a chamber dimensioned to contain said medication and to fit into the mouth of an animal, said chamber having an opening;
a wire having a first end and a second end, said first end attached to said chamber, said wire curved to pass behind the teeth of said animal and exit the mouth of said animal to the side of the head of said animal; and
means for gripping said wire carried by said second end of said wire, said gripping means having at least one loop dimensioned to receive fingers of a human being.

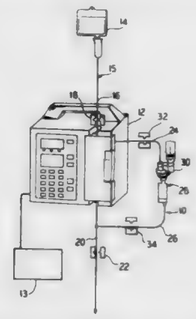
5,116,315
BIOLOGICAL SYRINGE SYSTEM
Emil E. Capozzi, Costa Mesa, and H. Stephen Cooksten, Malibu, both of Calif., assignors to Hemaedics, Inc., Malibu, Calif.
Continuation-in-part of Ser. No. 418,707, Oct. 3, 1989, Pat. No. 4,978,336, which is a continuation of Ser. No. 102,543, Sep. 29, 1987, abandoned. This application Dec. 29, 1989, Ser. No. 459,134
The portion of the term of this patent subsequent to Dec. 18, 2007, has been disclaimed.
Int. Cl.[5] A01M *37/00*
U.S. Cl. 604—82 **19 Claims**



1. A biological syringe system for delivering a first and second fluid in a mixed composition comprising:
a manifold, said manifold having first and second component channels therethrough, said manifold further having first and second input connections respectively communicating with said first and second component channels, said first and second component channels terminating in exit channels adjacent to each other on an opposing end of said manifold;
a discharge assembly coupled to said opposing end of said manifold and receiving fluid from both of said exit channels, said discharge assembly for mixing fluid from both of said exit channels and delivering said mixed fluid in a spray, said discharge assembly having a first and second passage therethrough communicating with said exit channels from said manifold for carrying fluid from said first and second component channels in corresponding first and second passages within said discharge assembly while maintaining said first and second fluids separated from each other, said discharge assembly having a mixing space defined therein to receive separate flows from said passages, said discharge assembly further comprising mixing means disposed within said mixing space to thoroughly mix said first and second fluids for the first time within said mixing space and to immediately thereafter atomize said thoroughly mixed first and second fluids in a spray discharged from said discharge assembly.

5,116,316
AUTOMATIC IN-LINE RECONSTITUTION SYSTEM
James L. Sertic, Portage, Mich.; Joseph A. Bancsi, Vernon Hills, Ill.; Lisa D. Sertic, Portage, Mich.; Grace M. Esche, Algonquin, and John Lawson, McHenry, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.
Filed Feb. 25, 1991, Ser. No. 660,493
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—83 **23 Claims**

1. A system for adding a beneficial agent to a fluid to be administered to a patent comprising:
a vial including an agent;
a fluid source coupled to a first fluid line;
an access member including means for coupling the vial to the access member and providing at least two separate fluid paths between the access member and an interior of the vial;
means for establishing fluid communication between the first fluid line and the access member;
the access member including means for allowing fluid to enter the vial from a first fluid path and allowing air to be vented from the vial through a second fluid path;



the access member also including means for allowing fluid to enter the vial through the second fluid path and exit the vial through the first fluid path;
the access member includes an adapter for allowing fluid to enter the vial including a rigid cannula having an inlet and a outlet and a shell spaced from said cannula intermediate of said cannula inlet and said cannula outlet, with said cannula and said shell defining a channel therebetween about the exterior of said cannula;
a tubing segment coupled to the access member for allowing fluid exiting the vial to be administered to a patient; and
a pump that acts on a portion of the first fluid line.

5,116,317
ANGIOPLASTY CATHETER WITH INTEGRAL FIBER OPTIC ASSEMBLY
Richard F. Carson, Jr., Mission Viejo, and Ronald J. Ehmsen, Villa Park, both of Calif., assignors to Optimed Technologies, Inc., Orange, Calif.
Continuation of Ser. No. 587,622, Sep. 19, 1990, abandoned, which is a continuation of Ser. No. 207,726, Jun. 16, 1988, abandoned. This application Jun. 18, 1991, Ser. No. 715,716
Int. Cl.[5] A61B *1/06;* **A61M** *29/00*
U.S. Cl. 604—96 **8 Claims**



1. A disposable angioplasty catheter comprising:
a flexible, tubular sheath with an inflatable balloon at its distal end coaxial with the exterior of the sheath; said sheath being divided internally into three lumens includ-

ing an inflation lumen for admitting an inflation fluid into the balloon,

a flushing lumen with the sheath for conducting a flushing liquid to an orifice at the distal end of the catheter, and

an optical lumen; and

an optical assembly positioned in and directly and permanently bonded to the interior of said optical lumen without a separate supporting tube for the assembly, said assembly including a plurality of individual optical fibers formed of an optical quality, transparent plastic for transmitting light from the proximal end of the catheter, through the optical lumen, to the distal end of the catheter, thereby illuminating an object to be viewed, a bundle of optical fibers for transmitting an image of the illuminated object from the distal end of the catheter, through the optical lumen, to the proximal end of the catheter, and a gradient index objective lens bonded to the distal end of the fiber bundle and positioned within the optical lumen.

5,116,318

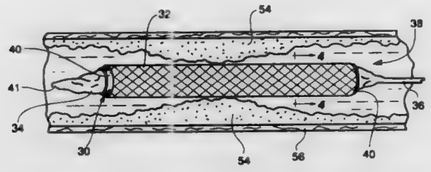
DILATATION BALLOON WITHIN AN ELASTIC SLEEVE

Richard A. Hillstead, Miramar, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Jun. 6, 1989, Ser. No. 362,251

Int. Cl.[5] A61M *29/00*

U.S. Cl. 604—96 **18 Claims**



1. A dilatation balloon assembly for insertion into a blood vessel comprising: a catheter having a distal end, distal end portion, a proximal end and an overall outer diameter; a dilatation balloon mounted to, about, and around said distal end portion of said catheter and having an interior, an elongate axis, a deflated balloon outer diameter and an at rest collapsed state width; said catheter having means in said distal end portion thereof for communicating with the interior of said balloon; and, an elastic sleeve having a length sufficient to extend the length of said balloon only and not the length of said catheter, being positioned about and around said balloon, being arranged for substantially no axial movement relative to the elongate axis of said balloon so that said sleeve is generally longitudinally coextensive with said balloon at all times, and having an at rest diameter which is less than the width of the collapsed balloon if the collapsed balloon was allowed, when deflated, to assume a flat shape and less than the deflated balloon outer diameter such that said sleeve, when at rest, is in a compressive state compressing said balloon to a smaller diameter.

5,116,319

SAFETY DEVICE FOR AN INJECTION SYRINGE NEEDLE

Abraham van den Haak, Eesergroen, Netherlands, assignor to Advanced Protective Injection Systems B.V., Eesergroen, Netherlands

PCT No. PCT/NL89/00064, § 371 Date Apr. 26, 1990, § 102(e) Date Apr. 26, 1990, PCT Pub. No. WO90/01962, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 23, 1989, Ser. No. 490,568

Int. Cl.[5] A61M *5/50*

U.S. Cl. 604—110 **8 Claims**



1. A syringe body for medications injected from a cartridge, comprising:

an elongate casing having first and second ends and an interior surface which defines a chamber for receiving a cartridge;

said first end having an opening adapted for slidable engagement with a plunger movable within said chamber, said opening including means for preventing removal of said plunger from said chamber and said second end being adapted for engagement with a needle cap;

said plunger comprising an actuator handle having a rod and a needle foot engagement means extending therefrom; and

a blocking means for preventing a cartridge disposed within said chamber from passing through said opening until said plunger has been passed through said opening into said chamber.

5,116,320

DISPOSABLE SYRINGE FOR ONCE-ONLY USE

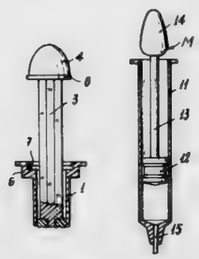
Carmelo Lo Duca, Milan, Italy, assignor to GI.BI.EFFE S.R.L., Milan, Italy

Continuation of Ser. No. 538,095, Jun. 13, 1990, abandoned. This application Oct. 3, 1991, Ser. No. 770,160

Claims priority, application Italy, Jul. 5, 1989, 21108 A/89

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 **4 Claims**



1. A disposable syringe for once-only use, comprising:

a hollow cylinder open at one end and connected to a needle at its other end,

an elongate shaft;

a plunger slidable under sealed conditions within the cylinder and connected to one end of the elongate shaft, and

a head having a maximum diameter at least as great as the inner diameter of the cylinder and connected to an opposite, terminal end of the shaft so as to be operable with a finger of a hand of an operator of the syringe, wherein said head is of an elongate form in a length direction of said shaft with a surface diameter of said enlarged head being of varying diameter which is gradually reduced towards the free end of the head, the shaft being of a length such that when the plunger has been pushed to the bottom of the cylinder, the maximum diameter portion of the head passes the open one end of the cylinder and is housed within the cavity of the cylinder.

5,116,321

FLUIDIZING AND SUCTION WITHDRAWAL UNIT INCLUDING A LEVEL SENSOR

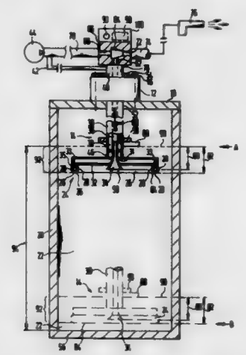
Silvano Gelain, Abtwil, Switzerland, assignor to Gema Volstatic AG, St. Gallen, Switzerland

Filed Apr. 12, 1991, Ser. No. 684,293

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1990, 4012190

Int. Cl.[5] B05B *5/025*

U.S. Cl. 118—694 **6 Claims**



1. Pneumatic powder feed, specifically for coating powder, comprising a fluidizing and suction withdrawal unit which can be lowered into a container holding a powder, so as to fluidize the powder in the container and withdraw the fluidized powder by suction, the fluidizing and suction withdrawal unit (**14**) comprising a level sensor (**88**) which generates a signal in contingence on the immersion depth (**80, 82**) to which the fluidizing and suction withdrawal unit (**14**) is immersed in a powder layer (**92**) fluidized by it.

5,116,322

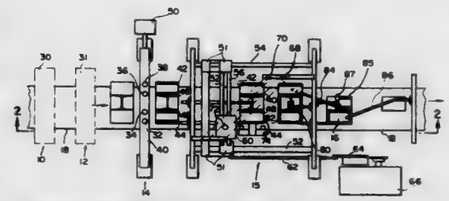
METHOD AND APPARATUS FOR GLUING CLOSURE FLAPS OF A CARTON ON A CONTINUOUSLY MOVING CONVEYOR

Daniel L. Chromowsky, Howell, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Filed Nov. 23, 1990, Ser. No. 617,327

Int. Cl.[5] B65B *7/20, 7/28*

U.S. Cl. 53—485 **31 Claims**



1. Apparatus for forming a carton from an open ended carton shell having a front, rear and two opposing side flaps, said apparatus comprising;

transporting conveyor means for carrying a plurality of cartons in a conveying direction with an open end of each carton facing upwardly on the conveyor, said carton positioned on said conveyor with at least one closure flap folded outwardly;

glue means to apply glue to at least one closure flap in a substantially straight line substantially perpendicular to the conveying direction wherein said glue means comprises a carriage rectilinearly reciprocal in a direction substantially parallel to the direction of travel of the conveyor, at least one glue head assembly mounted on said carriage and rectilinearly reciprocal in a direction transverse to the direction of the carriage, and cam means operatively connected to said glue head assembly whereby linear movement of said carriage in the direction of travel of said conveyor moves said glue head assembly in a forward diagonal direction with respect to said conveyor to apply said glue in the transverse line; and

closing means to fold said outwardly facing closure flaps inwardly to close said carton.

5,116,323

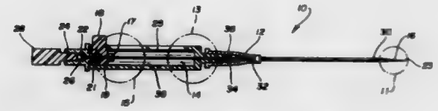
ARTERIAL CATHETER

James A. Kreuzer, Bellbrook, and Min S. Lee, Spring Valley, both of Ohio, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jan. 22, 1991, Ser. No. 644,067

Int. Cl.[5] A61M *5/178, 25/01*

U.S. Cl. 604—164 **5 Claims**



1. A catheter placement assembly, comprising

(a) a catheter having a distal end, a proximal end, and a lumen extending from said distal end to said proximal end;

(b) a catheter hub positioned on the proximal end of said catheter;

(c) a catheter placement tube extending coaxially through said catheter lumen;

(d) said catheter placement tube having a distal end, a proximal end and a lumen extending from said distal end to said proximal end;

(e) a catheter tube slide body positioned on said catheter placement tube adjacent the said proximal end of said catheter placement tube;

(f) a catheter tube slide positioned on said proximal end of said catheter placement tube;

(g) said catheter tube slide mounted for relative reciprocable movement in said catheter tube slide body;

(h) a catheter placement tube hub positioned on said distal end of said catheter tube slide body for detachable connection to said catheter hub;

(i) an insertion needle extending coaxially through said catheter placement tube lumen;

(j) said insertion needle having a sharpened distal end extending outwardly from said distal end of said catheter placement tube, and a lumen extending from said distal end to the proximal end thereof;

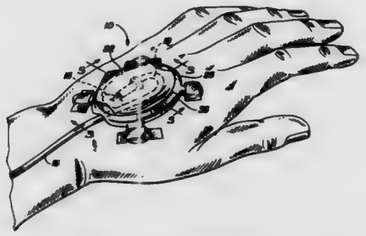
(k) a transparent hollow needle hub positioned on said proximal end of said insertion needle for detachable connection to said catheter tube slide; and

(l) means in said transparent needle hub for venting air therefrom when the said distal end of said needle makes vein entry;

(m) whereby when vein entry has been made, said needle

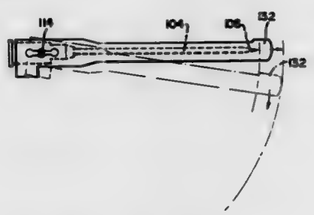
hub is removed from said catheter tube slide body, said needle is removed from said catheter placement tube lumen and said catheter tube slide is moved forward distally through said catheter lumen to provide a guide path for said catheter distal end.

5,116,324
PROTECTOR FOR IV SITE
Carol L. Brierley, 2512 S. Rennington, and Lisa Wolf, 1718 S. Lingmore #55, both of Mesa, Ariz. 85202
Filed Jul. 15, 1991, Ser. No. 730,087
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—180 **12 Claims**



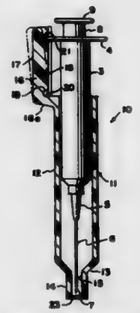
1. A protective shield to be positioned at a location on the human body about a venepuncture site, said shield comprising:
(a) a flexible base having a bottom surface defining an opening to be placed about the site;
(b) a protective cover openably attached to said base and extending at least partially across said opening, said cover having a first open position permitting access to the site and a closed position in which the shield extends at least partially across the opening;
(c) a projection extending from said base having a surface for attachment of an adhesive member to secure said shield with said adhesive member to the body at the said site; and
(d) wherein the exterior surface of said cover is generally dome-shaped and in a closed position defines an aperture providing access to the venepuncture site.

5,116,325
NEEDLE ASSEMBLY
Donald W. Paterson, 8 Chanier Road, Moument Heights, Kimberley, Cape Province, South Africa
Filed May 31, 1991, Ser. No. 708,999
Claims priority, application South Africa, Jun. 6, 1990, 90/4357; Dec. 4, 1990, 90/9742
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **7 Claims**



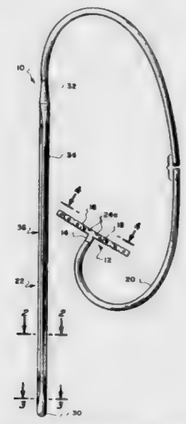
1. A needle assembly, which comprises
a needle device comprising a needle base and a hollow needle, having a pointed free end, protruding from the base, with a passageway extending along the needle, and with an opening to the passageway being provided in proximity to the pointed end of the needle;
a needle guard comprising a hollow cylindrical sheath around the needle and having a first open end accommodating the needle base and a second closed end in proximity to the needle point, an elongate slot extending from the first end of the sheath to near its second end and through which the needle can pass, and a first pair of openings in the sheath in proximity to its first end, with the openings being aligned with each other and being located on opposite slides of the slot;
a pair of complementary pivot pins protruding from the needle base, with each pin being pivotally located in one of the openings such that the needle guard can be pivoted from a primary position in which the pointed end is protected by the sheath, to a secondary position in which the needle point is exposed for use; and
a pair of secondary openings in the sheath, spaced longitudinally from the first pair of openings and also being capable of accommodating the pivot pins in pivotal fashion, with each secondary open being connected to its associated first opening by means of a first passageway along which the pivot pin can pass and with the secondary openings being spaced further from the first end of the sheath than the first pair of openings so that the sheath is displaceable in a longitudinal direction with respect to the needle from a first position in which the needle point is held captive by a portion of the sheath between the distal end of the slot in the sheath and the second end of the sheath, to a second position in which the needle point is aligned with the slot, to permit pivoting of the sheath from its primary to its secondary position.

5,116,326
HYPODERMIC NEEDLE SHEATH
David A. Schmidt, Bay City, Mich., assignor to Schmidt Industries, Inc., Bay City, Mich.
Filed Apr. 25, 1991, Ser. No. 691,085
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—198 **18 Claims**



1. A hypodermic syringe comprising a tubular barrel having a fitting at one end thereof; a needle having a free end, said needle being secured at its other end to said fitting and extending in prolongation of said barrel; a piston slideably accommodated in said barrel for movement axially thereof; a tubular sheath member movably carried by said barrel and operable selectively to enclose and expose said one end of said needle, said sheath member comprising a hollow body member in one position of which said needle and at least a portion of said barrel are accommodated within said body member; and releasable latch means reacting between said body member and said sheath member for removably latching said body member in said one position, said latch means comprising a laterally extending flange on said body member, a single arcuate extension on said sheath member subtending an angle of not more than about 90°, and a groove in said extension for the removable accommodation of said flange.

5,116,327
HYSTERECTOMY DRAIN APPLIANCE
Edmund V. Seder, Santa Barbara, and Richard E. Houts, Santa Ynez, both of Calif., assignors to Helix Medical, Inc., Santa Barbara, Calif.
Division of Ser. No. 361,325, Jun. 5, 1989, Pat. No. 5,041,101. This application Feb. 19, 1991, Ser. No. 656,985
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—284 **6 Claims**

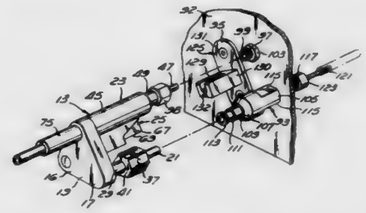


1. An extroducer rod for retrograde introduction of a hysterectomy drain appliance, said rod being solid, unperforated and being sufficiently stiff as to be easily pushed through a female human vagina, being longer than a human female vagina, having a smooth, closed, rounded first leading end, and having an opposite end formed with a drain tube connector, at least a portion of said rod extending from the rounded end having longitudinally shaped side walls with longitudinal ridges of sufficient height to permit ready identification of the exterior of the rod by feel by a human hand.

5,116,328
DIAGNOSTIC KIT FOR THE DETECTION OF ATYPICAL EPITHELIA
Dennie W. Dyer, Tiburon, and Dennis W. Adair, Suisun City, both of Calif., assignors to Oclassen Pharmaceuticals, Inc., San Rafael, Calif.
Continuation of Ser. No. 553,791, Jul. 16, 1990. This application May 1, 1991, Ser. No. 697,908
Int. Cl.[5] A61M *35/00*
U.S. Cl. 604—289 **12 Claims**

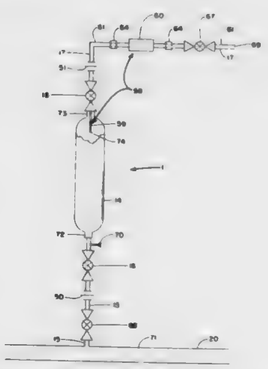
1. A kit for use in the visualization of atypical epithelia comprising:
a tear-open, liquid-impermeable sealed pouch made up of two flexible sheets, the sheets each having an inner surface which is resistant to aqueous acetic acid and an outer surface, the two sheets joined to one another at their peripheries, thereby defining an inner chamber;
an applicating towelette formed of an acetic acid-resistant, hydrophilic substrate residing in the inner chamber; and
an effective atypical epithelia-visualizing amount of aqueous acetic acid solution residing in the inner chamber and permeating the applicating towelette,
wherein the substrate from which the applicating towelette is formed comprises pulp fiber with an acetic acid-resistant polymeric binder.

5,116,329
MEDICAL LASER INTERCONNECT SYSTEM
Tom H. Vannus, Anaheim; Stephen G. Mauser, Tarzana; Wendell V. Ebling, El Toro, and Wayne E. Manska, Anaheim, all of Calif., assignors to Pfizer Hospital Products Groups, Inc., New York, N.Y.
Continuation of Ser. No. 260,242, Oct. 20, 1988, abandoned. This application Aug. 16, 1990, Ser. No. 568,549
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—11 **32 Claims**



1. A medical device, comprising:
a medical laser for producing light for propagation along an optical path;
a first interconnect assembly; and
a second interconnect assembly for detachably connecting with said first interconnect assembly, one of said interconnect assemblies including a shutter for blocking said optical path, said first and second assemblies having camming surfaces which mechanically co-act to drive said shutter relative to said optical path;
optical guide means connected to one of said interconnect assemblies, for receiving light from said optical path; and
an optical port on another of said interconnect assemblies, for engaging said optical guide means, said engagement of said guide means and said optical port being independent of said mechanical co-action of said camming surfaces.

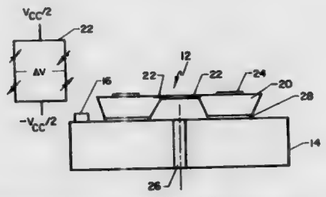
5,116,330
SAMPLE EXTRACTION SYSTEM
R. Wilson Spencer, P.O. Box 22586, Houston, Tex. 77227
Continuation-in-part of Ser. No. 435,935, Nov. 13, 1989, Pat. No. 5,003,830, which is a continuation-in-part of Ser. No. 304,815, Jan. 31, 1989, abandoned, which is a continuation of Ser. No. 55,720, May 29, 1987, Pat. No. 4,800,761. This application Feb. 15, 1991, Ser. No. 656,817
Int. Cl.[5] G01N *1/00*
U.S. Cl. 73—863.71 **5 Claims**



1. A sample extraction system, comprising:
a. a sample container having an inlet and an outlet;

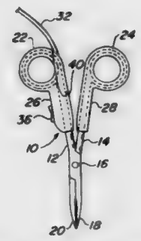
b. a sample inlet line, fluidly connected at one end to a source of sample fluid and at the other end to said inlet of said sample container;
c. a sample exit line, fluidly connected at one end to a desired outlet point and at the other end to said outlet of said sample container;
d. a sample inlet valve, positioned in said sample inlet line;
e. a sample exit valve, positioned in said sample exit line;
f. a disposal line, fluidly connected externally of said sample container between a desired disposal point and said sample inlet line;
g. a means for selecting between inlet flow and disposal flow, adapted to select a flow path either between said source of sample fluid and said inlet of said sample container or between said disposal line and said inlet of said sample container; and
h. a means for determining when the quantity of sample fluid within said sample container is reduced to a desired level, fluidly connected to said inlet of said sample container, said means for determining when the quantity of sample fluid within said sample container is reduced to a desired level including:
i. a dip tube fluidly connected between said sample inlet line and said inlet of said sample container, said dip tube extending a desired distance into said sample container; and
ii. a sight glass, fluidly connected externally of said sample container between said desired disposal point and said dip tube.

5,116,331
PRESSURE TRANSDUCER AND SYSTEM FOR CRYOGENIC ENVIRONMENTS
John J. Chapman, Ware Neck, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Apr. 23, 1991, Ser. No. 690,198
Int. Cl.[5] G01L *7/08, 9/06, 19/14*
U.S. Cl. 73—721 **18 Claims**



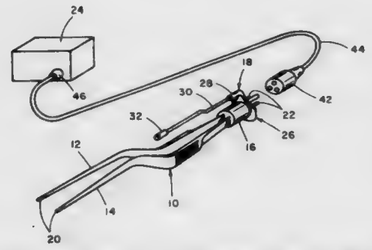
9. A pressure sensor array system for use below −55° C. comprising:
a borosilicate substrate having a plurality of pneumatic ports therethrough;
a plurality of sensors mounted on said borosilicate substrate, one sensor above each pneumatic port, each sensor comprising a silicone pressure die and a Wheatstone bridge circuit formed on said silicon die, each Wheatstone bridge circuit comprising bridge elements of silicon doped with boron to a dopant level of approximately $1\times10^{19}-10^{21}$ boron/cm^3.

5,116,332
ELECTROCAUTERY HEMOSTAT
Edward A. Lottick, 789 Wyoming Ave., Kingston, Pa. 18704
Continuation-in-part of Ser. No. 881,750, Jul. 2, 1986, Pat. No. 5,026,370, which is a continuation of Ser. No. 663,091, Oct. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 443,517, Nov. 22, 1982, Pat. No. 4,552,143, which is a continuation-in-part of Ser. No. 242,746, Mar. 11, 1981, Pat. No. 4,370,980. This application Feb. 8, 1990, Ser. No. 477,094
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—42 **22 Claims**



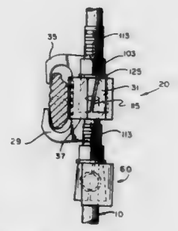
1. An electrocautery instrument, comprising:
a pair of members pivotally connected to each other at a point between the ends of each member, one end of each member being provided with a non-conductive handle and the other end being constructed of a conductive material;
a switch means for controlling electrical energy flow being provided along one member near the handle provided for the member;
at least a portion of each pivotal member being constructed of a non-conductive material extending from the handle of each member and being connectable to a conductive portion forming the portion of each member extending to the other end of each member; and
means for connecting an electrical output of said switch to the conductive end of at least one of said members such that said electrical energy flow is primarily from said conductive end to a patient's tissue.

5,116,333
BIPOLAR HANDSWITCH ADAPTER
Richard M. Beane, Hingham, Mass., assignor to Kirwan Surgical Products, Inc., Rockland, Mass.
Filed Nov. 2, 1990, Ser. No. 608,552
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—51 **2 Claims**



2. The combination of a handswitch adapter and bipolar forceps, the bipolar forceps comprising first and second tines formed of a conductive material, the first and second tines each having a tip and having a terminal end remote from its tip, each of the terminal ends formed into a connector pin, the first and second tines in substantially spaced relation to each other and connected adjacent the connector pins by an insulating instrument cup, the connector pins extending beyond the instrument cup, the hand switch adapter comprising a handswitch adapter base and an adapter extension, the handswitch adapter base formed of an electrically nonconductive material and including a tubular handswitch adapter connector physically open at one end and extending from the handswitch adapter base in integral right angle relation thereto, the adapter extension being formed of a coaxial, electrically conductive material and engaged to the open end of the handswitch adapter connector, the adapter extension having a free end remote from the handswitch adapter connector, the free end including a reed microswitch, the handswitch adapter base having a front face and a rear face, a pair of spaced through holes formed therethrough and a terminal pin extending from the rear face thereof in a direction opposite from that toward which the adapter extension extends, the connector pins extending through the holes formed in the handswitch adapter base in spaced, parallel relation with the terminal pin, the adapter extension in spaced relation to the first and second tines, the handswitch adapter electrically connected to the terminal pin, the adapter extension having coaxial conductors, one of the conductors connected to the terminal pin, the other conductor connected to one of the through holes.

5,116,334
POSTERIOR SPINAL SYSTEM AND METHOD
Trent E. Cozad, Fort Wayne; Antony J. Lozier, Warsaw; Jerry L. Lower, Bourbon, all of Ind., and Allan F. Teneer, Seattle, Wash., assignors to Zimmer, Inc., Warsaw, Ind.
Division of Ser. No. 287,245, Dec. 21, 1988. This application May 14, 1991, Ser. No. 700,222
Int. Cl.[5] A61F *5/01*
U.S. Cl. 606—61 **10 Claims**



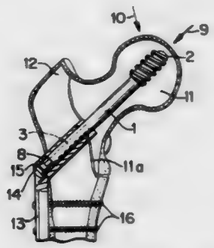
1. A spinal implant system including:
a) rod means;
b) sleeve means having a tapered outer surface and slidable along said rod means;
c) attachment means for interconnecting the rod means to another structure, said attachment means having a tapered cavity for matingly accepting the tapered outer surface of said sleeve means; and wherein said sleeve means further includes a securing means for enabling said sleeve means to be compressed securely onto the rod means, wherein said attachment means comprises a hook body secured on at least one side of a mid-line clamp, wherein the mid-line clamp comprises first and second clamp halves slidably interconnected with one another, wherein said hook body is connected to a stud extending from the mid-line clamp and wherein the sleeve means connects said hook body to said rod.

5,116,335
INTRAMEDULLARY HYBRID NAIL AND INSTRUMENTATION FOR INSTALLATION AND REMOVAL
Gerard T. Hannon, 6 Standish Dr., Scarsdale, N.Y. 10583; James Molnar, deceased, late of Trumbull, and Lucienne Molnar, executrix, 25 Clemons Ave., Trumbull, both of Conn. 06611
Filed Sep. 18, 1989, Ser. No. 408,874
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—62 **25 Claims**



1. An intramedullary fixation device for use in internal fixation of various fracture patterns involving the longitudinal axis of a long bone and including distal and proximal ends thereof comprising:
a substantially rigid center rod having a plurality of longitudinal slots extending along the length thereof;
a plurality of generally flexible outer rods extending outwardly from said center rod, each said outer rod being received and retained within one of said longitudinal slots and having a distal retention section angulated from the longitudinal axis which penetrates through and is retained by the cancellous bone and the endosteal canal thereby stabilizing the fracture at the distal and proximal ends of the long bone.

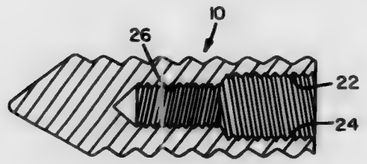
5,116,336
OSTEOSYNTHETIC ANCHOR BOLT
Robert Frigg, Davos, Switzerland, assignor to Synthes (U.S.A.), Paoli, Pa.
Filed Jun. 18, 1990, Ser. No. 539,595
Claims priority, application Switzerland, Mar. 19, 1990, 836/90
Int. Cl.[5] A61F *5/00*
U.S. Cl. 606—65 **8 Claims**



1. An anchor bolt for osteosynthesis having a cylindrical shaft with front and back ends, an external thread on said front end and an internally threaded socket at the back end, the major diameter of said external thread being greater than the diameter of the shaft, the thread profile of said external thread being of buttress configuration with the forward-facing flanks substantially perpendicular to the bolt axis, thereby enhancing resistance to forces acting from the front of the bolt.

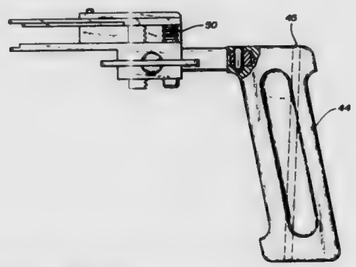
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5,116,337
FIXATION SCREW AND METHOD FOR LIGAMENT RECONSTRUCTION
Lanny L. Johnson, 3800 Hagadorn Rd., Okemos, Mich. 48864
Filed Jun. 27, 1991, Ser. No. 721,893
Int. Cl.[5] A61B *17/58*
U.S. Cl. 606—73 **4 Claims**



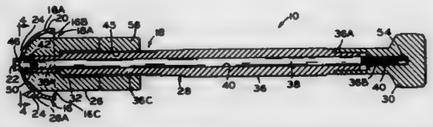
1. A screw for fixation of a tendon/bone graft during a surgical procedure, comprising:
a smooth conical forward end having a rounded tip,
a spiral thread running from a position behind the smooth conical forward end to a rearward end of the screw, the depth of the thread being shallow and an exterior edge of the thread being rounded to decrease cutting and fragmentation of the tendon and bone,
a longitudinal internal bore including a first right-handed threaded portion and a second left-handed threaded portion, one of the first and second threaded portions engageable with an insertion device for insertion of the screw, the other of the first and second threaded portions engageable with an extraction device for extraction of the screw, one of the first and second threaded portions having a smaller diameter than the other of the first and second threaded portions, the threaded portion with the smaller diameter being located closer to the forward end of the screw.

5,116,338
APPARATUS FOR KNEE PROSTHESIS
Matthew P. Poggie, Union City, N.J.; Peter S. Walker, Northwood, England, and Frederick C. Ewald, Weston, Mass., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.
Division of Ser. No. 151,734, Feb. 3, 1988, Pat. No. 5,002,547.
This application Jan. 24, 1991, Ser. No. 645,388
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—90 **9 Claims**



1. A femoral distractor of the type to be mounted on the end of a medullary alignment rod placed within the femoral medullary canal comprising:
a handle;
a body having an anterior surface thereof connected to said handle, said body having a key element formed thereon for slidably receiving an end of the medullary alignment rod to align the femoral distractor with respect to the femur;
a movable medial arm and lateral arm operatively connected to said body and extending posteriorly and generally parallel to a surface of said body which is generally perpendicular to the anterior surface thereof; and
means mounted within said body for independently raising and lowering said medial and lateral arms.

5,116,339
ACETABULAR CUP INSTALLATION TOOL AND METHOD OF INSTALLING AN ACETABULAR CUP
Steven R. Glock, 5419 Damask Dr., Fort Wayne, Ind. 46815
Filed Jul. 11, 1990, Ser. No. 551,614
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—91 **20 Claims**

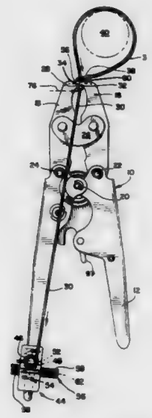


10. A system for replacement of an acetabulum socket, comprising:
an acetabular cup having a posterior opening and an anterior opening formed at the interior surface of and extending at least partially through said cup; and
an elongated tool that extends through the posterior opening of the cup and having an end actuatable between expanded and contracted conditions for frictionally engaging said anterior cup opening when expanded and releasing said cup when contracted, and, when said tool end is engaged with said cup, for ensuring movement of said cup with movement of said tool end in order to place said cup for implanting at a desired position.

5,116,340
SURGICAL SECURANCE APPARATUS
Robert J. Songer, 2104 Butternut, Northbrook, Ill. 60062, and Matthew N. Songer, 2645 W. Grove St., Marquette, Mich. 49855
Division of Ser. No. 301,728, Jan. 26, 1989, Pat. No. 4,966,600.
This application Aug. 9, 1990, Ser. No. 564,749
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—103 **20 Claims**

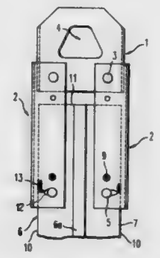
1. Crimping pliers which comprises a pair of operating handles and connected, opposed jaws, said jaws defining opposed recesses for carrying and crimping a tubular crimp member by manual pressure on the operating handles, and capstan means carried on one of said handles for winding a cable which passes through a tubular crimp member carried in said jaws, said

capstan means comprising a winding shaft for retaining and winding said cable, a rotatable handle, and self-locking worm



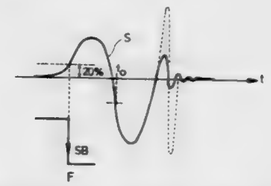
gear means for rotating said winding shaft in either direction with rotation of said handle.

5,116,341
LIFTING SHACKLE
David S. Cameron, Ecton Brook, England, assignor to British Guide Rails Limited, West Bromwich, England
PCT No. PCT/GB90/00847, § 371 Date Feb. 1, 1991, § 102(e) Date Feb. 1, 1991, PCT Pub. No. WO90/14965, PCT Pub. Date Dec. 13, 1990
PCT Filed Jun. 1, 1990, Ser. No. 640,315
Claims priority, application United Kingdom, Jun. 2, 1989, 8912661
Int. Cl.[5] B66C *1/64*
U.S. Cl. 294—67.3 **5 Claims**



1. A lifting shackle for an elongated load to be lifted, said load including an end part having a pair of laterally spaced side edges extending in the same general direction away from said end part, said shackle comprising head plate means provided with an aperture, a pair of elongate load supporting arm means having first and second ends, means pivotably attaching the first end of each of said arm means to said head plate means at respective points substantially equidistant from a vertical, in use, axis of said head plate means passing through said aperture, each of said load supporting arm means comprising an elongate member of U-shape in horizontal cross sections having two rigidly interconnected arms which define therebetween an open-sided channel which is also open at said second end of said arm means, said channel extending from said open end towards said first end of said arm means, said pair of load supporting arm means being disposed, in use, with the open sides of said channels facing each other for receiving therein said laterally spaced side edges of said end part of said load to be lifted, and means adjacent said second end of each load supporting arm means for releasably engaging said arm means with said load to be lifted.

5,116,342
TRIGGER CIRCUIT WITH SELF-ADJUSTING REFERENCE VALUE
Wolfgang Schmidt, Vaihingen/Enz; Werner Fischer, Heimsheim, and Johannes Locher, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Dec. 31, 1990, Ser. No. 636,417
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—119 A **10 Claims**

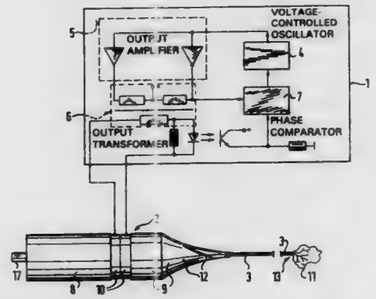


1. A trigger circuit for receiving a signal waveform of a periodic signal, the trigger circuit comprising:
storage means for storing a particular reference value dependent upon the preceding waveform of said periodic signal;
circuit means for determining said reference value from only the first half wave of each period of said signal;
comparator means for comparing the amplitudes of said signal waveform of said periodic signal to said reference value and for emitting a trigger signal when said particular reference value is reached;
said storage means being a capacitor which is charged by said signal and which is connected to said comparator means; and,
said reference value being proportional to the peak value of said first half wave of said period of said signal.

5,116,343
DEVICE FOR DISINTEGRATING CONCRETIONS DISPOSED IN BODY CAVITIES
Felix Ams, Kämpfelbach; Ulf Zanger, Bruchsal, and Ulrich Bolg, Sulzfeld, all of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany
Filed Aug. 28, 1990, Ser. No. 574,333
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1989, 3932966
Int. Cl.[5] A61B *17/22*
U.S. Cl. 606—128 **6 Claims**

1. A device for disintegrating concretions disposed in body cavities, the device comprising:
a reflector;
a horn having a longitudinal axis
an ultrasonic transducer element connected between the reflector and the horn; and
a sonotrode connected to the horn for directing ultrasonic waves generated by said transducer element to a concretion to be disintegrated;

wherein the horn is provided with surface depression means which extend transversely of the longitudinal axis for



generating transverse and rotational oscillations in addition to longitudinal oscillations.

5,116,344

APPARATUS FOR MARKING AN OPERATING SITE

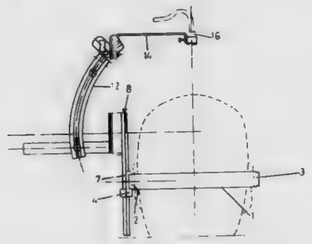
Hans Sundqvist, Vikingstad, Sweden, assignor to Elekta Instrument AB, Stockholm, Sweden

Continuation of Ser. No. 288,039, filed as PCT/SE88/00214, Apr. 27, 1988, abandoned. This application Aug. 22, 1991, Ser. No. 751,585

Claims priority, application Sweden, Apr. 27, 1987, 8701719

Int. Cl.[5] A61B *19/00*

U.S. Cl. 606—130 **10 Claims**



1. Apparatus for marking a predetermined position of a target for surgical treatment within a patient's brain, comprising frame means for non-displaceable attachment to the patient's skull and having at least one guide means extending along a first line, a first support member mounted to said guide means for adjustment along said first line and along a second line perpendicular to said first line, rotatable means supported on said first support member for rotation about a third line perpendicular to said first and second lines, a second support member extending parallel to said third line in spaced relation thereto and connected to said rotatable means for adjustment about said third line by rotation of said rotatable means, an arcuate support member mounted to said second support member for adjustment along said third line and for adjustment transversely of said second support member along an arcuate path defined by the arc of said arcuate support member, and laser light source means mounted to said arcuate support member for aiming a laser beam into the patient's skull directly at the position of the target to provide guiding beam illumination of intervening tissue on a surgical path to the target as the surgeon proceeds to the target along said path and to mark the target when reached by the surgeon.

5,116,345

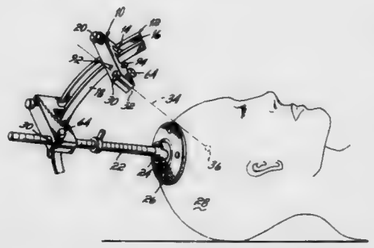
STEREOTACTICALLY IMPLANTING AN INTRACRANIAL DEVICE

Brian Jewell, Batavia, and Hwa-Shain Yeh, Cincinnati, both of Ohio, assignors to Ohio Medical Instrument Co., Inc., Cincinnati, Ohio

Filed Nov. 28, 1990, Ser. No. 619,105

Int. Cl.[5] A61B *19/00*

U.S. Cl. 606—130 **23 Claims**



1. Apparatus for stereotactically implanting a flexible intracranial device comprising,

a support mountable on a stereotactic apparatus, said support having a guide bore alignable on a selected axis toward a target within a patient's skull,

drill guide means removably mountable in said guide bore in alignment with said axis,

a drill bit receivable in said drill guide means for rotary and axial movement therein, said drill guide means aligning said bit for drilling a cranial opening along said axis,

a stiff cannula insertable through said guide bore and said cranial opening into the patient's skull, after removal of said bit, and

a flexibel intracranial device which is insertable longitudinally through said cannula into said opening,

said cannula having a longitudinal slot extending from one end to the other thereof, said slot having a width sufficient for lateral removal of said cannula from said device.

5,116,346

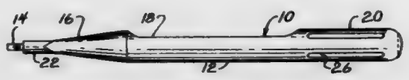
DISPOSABLE DERMAL CURETTE

Charles R. Yeh, Plantation, Fla., assignor to Acuderm, Inc., Ft. Lauderdale, Fla.

Continuation of Ser. No. 427,791, Oct. 27, 1989, abandoned. This application May 3, 1991, Ser. No. 697,721

Int. Cl.[5] A61B *17/32. 17/50*

U.S. Cl. 606—131 **8 Claims**



1. A disposable dermal curette comprising:

a generally cylindrical plastic handle having a proximal end portion, a distal end portion and a mid-section portion in between said end portions;

the proximal end portion of the handle tapering inwardly from a point near the mid-section portion to a point near a flat-nosed end of the handle;

the distal end portion being generally cylindrical in shape and having a textured surface extending substantially along its entire length;

the mid-section portion having a flattened surface on the top side of the handle, with the flattened surface being recessed relative to the adjacent sections of the proximal end and distal end portions, the remainder of the mid-section portion being generally cylindrical in shape;

said mid-section portion and recessed flattened surface being substantially centrally located on said handle between said proximal end and distal end portions and extending approximately one-half of the total length of said handle; and,

a working element having a generally circular or loop-shaped cutting edge for scraping fixedly attached directly to the flat-nosed end of the proximal end of the handle, said cutting edge being disposed substantially adjacent to said flat-nosed end.

5,116,347

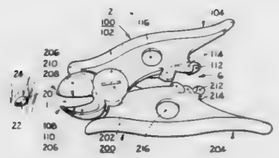
TICK REMOVER FOR PEOPLE AND ANIMALS

Robert B. Butler, R.D. 8, 650 Union Valley Rd., Mahopac, N.Y. 10541

Filed Jan. 29, 1991, Ser. No. 647,241

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—131 **8 Claims**



1. A plier for removing ticks from humans and animals comprising two rotatably interconnected mating halves, said plier having a pivot located between two mutually opposed jaws at one end of the plier and two mutually opposed handles at the other end of the plier, so that when said handles are squeezed said jaws are enabled to engage a tick, with said tick having a snout imbedded in said human or animal, a possibly swollen posterior, and a narrow area between said imbedded snout and possibly swollen posterior, with

(A) said mutually opposed jaws being similar in shape and having thin co-operating jaw edges which coalign along substantially their entire length, with

said jaw edges having a base at an end nearest said pivot and a tip at an end farthest from said pivot, with said jaw edges curving slightly upward in side profile from said base to said tip, and

said jaw edges being dull, non-cutting, non-overlapping, and having convex-shaped cross sections along substantially their entire length,

said jaw edges forming a thin gap between them when they engage said tick, with said thin jaw edge gap adapted to be approximately as wide as said tick's narrow area between its imbedded snout and possibly swollen posterior;

(B) said mutually opposed jaws curving upward in a direction away from said coaligning jaw edges to form a cavity between said jaws when said handles are squeezed, with

said cavity being configured to loosely hold a fully engorged tick,

said cavity having a curved upper rim which is substantially thinner than said cavity's width,

said cavity having no opening below said rim other than said thin jaw edge gap when said jaw edges engage said tick; and

(C) said mutually opposed handles having integrally formed co-operating stops between said handles, with

said stops consisting solely of two mutually opposed surfaces that are nonadjustable, have only one setting, and have no movable or separable parts,

said stops having a length that is substantially greater than their maximum width, and

said stops serving to maintain said thin jaw edge gap when said jaw edges engage said tick when said handles are squeezed.

5,116,348

DEPILATING APPARATUS

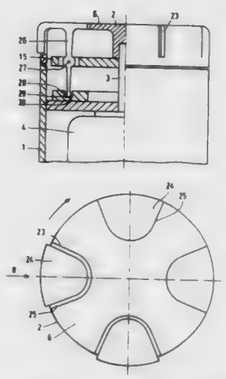
Willem K. Gorter, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jul. 10, 1990, Ser. No. 550,587

Claims priority, application Netherlands, Jul. 10, 1989, 8901753

Int. Cl.[5] A45D *26/00*

U.S. Cl. 606—133 **24 Claims**



1. A depilating apparatus for removing hair from the skin comprising a housing containing a depilating member which can be driven so as to be rotating; means for driving said depilating member; and at least one clamping element, wherein the depilating member is disc-shaped and comprises entrance slots which open into an end face of said depilating member which is adpted to contact the surface of the skin, at least one said clamping element which is movable with respect to the depilating member being present in an entrance slot.

5,116,349

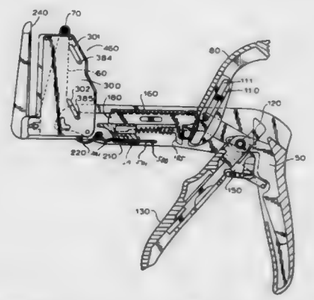
SURGICAL FASTENER APPARATUS

Ernie Aranyi, Easton, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed May 23, 1990, Ser. No. 528,125

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—142 **24 Claims**



1. Apparatus for applying a plurality of surgical fasteners to body tissue or the like by gripping body tissue between fastener holding means and fastener closure means, applying the fasten-

ers to the body tissue, and closing the fasteners, which comprises means for pivotally biasing at least one of said fastener holding means and said fastener closure means toward a position which provides separation of the body tissue from said fastener holding means and fastener closure means, and means for resisting the force of said pivotal biasing means, said resisting means being disengaged after the fasteners have been closed.

5,116,350
CATHETER SYSTEM HAVING DISTAL TIP FOR OPENING OBSTRUCTIONS

Robert C. Stevens, Williston, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Continuation of Ser. No. 370,115, Jun. 21, 1989, Pat. No. 4,936,845, and a continuation of Ser. No. 83,859, Aug. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 27,186, Mar. 17, 1987, abandoned. This application Jun. 14, 1990, Ser. No. 538,389
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—159 **5 Claims**



1. Apparatus for opening an obstructed region of a patient blood vessel comprising:

a) a catheter having

i) a distal tip for opening the obstructed region by back and forth rotation of said distal tip as the distal tip is brought into contact with the obstructed region of the blood vessel,

ii) an elongated flexible drive shaft coupled to the distal tip and having a length sufficient to extend from a region outside a patient to said obstructed region,

iii) a proximal coupling connected to a proximal end portion of the drive shaft that remains outside the patient for imparting the back and forth rotation to said distal tip via the flexible drive shaft; and

iv) a tightly coiled wire bearing extending a substantial length along the flexible drive shaft between the distal tip and proximal coupling for rotatably supporting said drive shaft; and

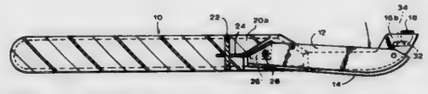
b) reciprocating means positioned outside the patient including a motor having an output shaft for imparting a rotating back and forth motion to the proximal coupling to impart a rotating back and forth motion to the drive shaft within the tightly coiled wire bearing to cause back and forth rotating motion of the distal tip.

5,116,351
SAFETY SCALPEL

Paris R. Frassetti, 1378 Dahill Rd., Brooklyn, N.Y. 11204

Filed Oct. 11, 1989, Ser. No. 419,782
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—167 **1 Claim**

1. A scalpel comprising a handle, a blade having a cutting edge, means mounted on said handle for protecting said cutting edge, means for mounting said blade for movement relative to said protecting means from a protected position, wherein said cutting edge is within said protecting means, to an exposed position, wherein said cutting edge is exposed, means for biasing said blade toward said protected position, said protecting means having a cutaway portion exposing a part of said blade to permit access to said blade part for application force on said blade to move said blade toward said exposed position and



further comprising means for locking said blade in said protected position, said locking means comprising means for preventing relative movement between said blade and said protecting means, said relative movement preventing means comprising a recess in said blade, and a part having a protrusion, said part being mounted for movement on said protecting means from a first position wherein said protrusion is situated within said recess and a second position wherein said protrusion is remote from said recess.

5,116,352
APPARATUS FOR REMOVING DEPOSITS FROM VESSELS

Wolfram Schnepp-Pesch, Ettlingen, and Josef Lindenberg, Karlsruhe, both of Fed. Rep. of Germany, assignors to Angiomed AG, Karlsruhe, Fed. Rep. of Germany

Filed Sep. 28, 1990, Ser. No. 589,588
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1989, 8911909[U]; Oct. 6, 1989, 8911911[U]; Oct. 6, 1989, 8911912[U]
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—171 **11 Claims**



1. Apparatus for removing deposits, such as plaque in vessels, aterosclerotically transformed wall portions, the apparatus comprising a rotary wire, a working coil extending on a front end of the rotary wire, a ball provided on a distal end of the working coil, sharp cutting edges provided on said ball for engaging and cutting said deposits, and means for mounting said ball so as to enable said ball to rotate eccentrically with respect to a longitudinal axis of symmetry of said working coil.

5,116,353
SAFETY TROCAR

David T. Green, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

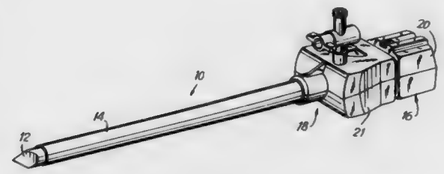
Filed Oct. 5, 1990, Ser. No. 593,676
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—184 **20 Claims**

1. A trocar comprising:

(a) a cannula assembly comprising a cannula and a cannula housing defining an internal cannula passage;

(b) a trocar assembly adapted to cooperate with said cannula assembly, said trocar assembly comprising a sharp trocar tip, an obturator shaft, and a trocar housing, said trocar tip and at least a portion of said obturator shaft being configured and dimensioned for entry into said internal cannula passage;

(c) releasable obturator means associated with the obturator shaft which releasably maintains the trocar tip in an extended position relative to said cannula;



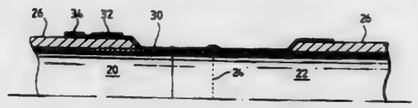
(d) means for releasing the releasable obturator means; and

(e) biasing means for retracting the trocar tip from said extended position to a retracted position in response to release of the releasable obturator means.

5,116,354
RECOVERABLE SLEEVE ASSEMBLY FOR PIPE JOINT

Josef F. L. Van Beersel, Temse, Belgium, assignor to N. V. Raychem S.A., Belgium

PCT No. PCT/GB90/00532, § 371 Date Feb. 7, 1991, § 102(e) Date Feb. 7, 1991, PCT Pub. No. WO90/12235, PCT Pub. Date Oct. 18, 1990
PCT Filed Apr. 6, 1990, Ser. No. 613,906
Claims priority, application United Kingdom, Apr. 7, 1989, 8907880
Int. Cl.[5] F16L *1/028, 58/18*
U.S. Cl. 405—154 **14 Claims**



1. A method of covering a joint between two coated pipes the coating of which has been bared in the joint region, and which pipes are to be pushed or pulled through soil so that, in use, the pipe joint has a leading and a trailing edge, the method including the use of a first heat recoverable sleeve and a second heat recoverable sleeve, and the method comprising the steps of:

(i) positioning the first heat recoverable sleeve around the joint region so that it covers the bared joint and overlaps the coating on either side of the joint region;

(ii) heating the first heat recoverable sleeve to cause it to recover into contact with the bared joint and with the coating on either side of the joint region;

(iii) positioning the second heat recoverable sleeve around the first sleeve and the pipe coating on at least one side of the first sleeve which side, in use, will be towards the leading edge of the pipe joint, so that the second sleeve overlaps at least part of the first sleeve and at least part of the said coating on the said at least one side of the first sleeve;

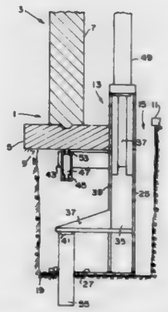
(iv) heating the second heat recoverable sleeve to cause it to recover into contact with (a) the first sleeve and (b) the said pipe coating on at least one side of the sleeve after the heating of the first heat recoverable sleeve; and

(v) fastening a band around the second sleeve at the edge of the sleeve which, in use, is towards the leading edge of the pipe joint.

5,116,355
SYSTEM FOR UNDERPINNING A BUILDING

Thomas R. Freeman, III, 8 Woodford, St. Charles, Mo. 63301

Filed Jun. 11, 1991, Ser. No. 713,265
Int. Cl.[5] E20D *17/02, 5/22*
U.S. Cl. 405—230 **9 Claims**



1. A pier driving bracket assembly for use with pier driving apparatus for the underpinning of a building having a foundation which sits on a footing, said bracket assembly comprising;

a hollow tube secured to a bottom plate, said tube having an elongate slot therein;

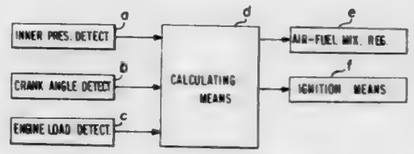
a pier driving shoe slidably received in said tube, said shoe including a pier pipe engaging portion extending through said slot; and

a hydraulic ram in contact with said shoe, said ram pressing down on said shoe so that said pier engaging portion will press down on a pier to drive said pier into the ground.

5,116,356
CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Satoru Ohkubo, Amagasaki, and Setsuhiro Shimomura, Himeji, both of Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Mar. 11, 1991, Ser. No. 667,510
Claims priority, application Japan, Apr. 4, 1990, 2-91278
Int. Cl.[5] F02D *43/04*
U.S. Cl. 123—425 **1 Claim**



1. A control apparatus for an internal combustion engine, comprising:

pressure detecting means for detecting an inner pressure of a cylinder of the engine,

crank angle detecting means for detecting a crank angle of the engine,

a control device having means for receiving output signals of said pressure detecting means and said crank angle detecting means to determine data of an inner pressure of the cylinder, means for determining a mean value of said data of said inner pressure of the cylinder by using a predetermined number of the data of the inner pressure of the cylinder, means for determining at least one of a fuel quantity to be supplied to said engine and an ignition

timing of the engine based on said means value, and means for renewing said mean value during a period when the engine is in a steady state and when the predetermined number of the data of the inner pressure of the cylinder are being received by said control device, and memorizing said mean value in a memory, means for stopping said determining of the mean value of the data when the engine is not in a steady state, and means for restarting the determining of the mean value of the data when the engine recovers a steady state.

means for supplying fuel to the engine in accordance with the fuel quantity determined by the control device, and

an ignition means for igniting the engine in accordance with the ignition timing determined by the control device.

5,116,357

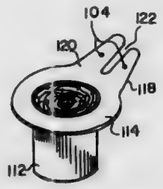
HERNIA PLUG AND INTRODUCER APPARATUS

Mark A. Eberbach, 4232 Winding Willow Dr., Tampa, Fla. 33624

Continuation-in-part of Ser. No. 595,956, Oct. 11, 1990. This application Mar. 11, 1991, Ser. No. 667,456

Int. Cl.[5] A61F *13/00, 15/00*

U.S. Cl. 606—213 **13 Claims**



13. A laparoscopic systems comprising:

a plug/patch assembly comprising a cylindrical plug of a flexible material positionable in an opening in the abdominal wall to be repaired with the plug in contact with the opening, the plug having a distal end and a proximal end; a patch of an inextensible, flexible mesh material positionable over weakened portions of the abdominal wall adjacent to the opening, a central extent of the patch being coupled to the proximal end of the plug with the periphery of the patch remote from the plug and constituting a flange; and resilient means coupled to the flange and provided with memory to assume a configuration of an extended shape for the proper positioning of the flange with respect to the weakened portions of the abdominal part;

a cylindrical sleeve of the length to extend from exterior of a patient, through a laparoscopic opening into a surgical cavity; and

a plunger having a cylindrical exterior configuration positioned with the sleeve, the plunger having a distal end of a reduced radial size to form a space at the distal end of the sleeve for the receipt of patch material of said plug/patch assembly.

5,116,358

COMBINED SURGICAL NEEDLE-SUTURE DEVICE POSSESSING A CONTROLLED SUTURE SEPARATION FEATURE

Richard N. Granger, Huntington, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Jul. 23, 1990, Ser. No. 556,737

Int. Cl.[5] A61B *17/00*

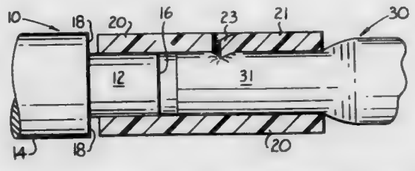
U.S. Cl. 606—224 **18 Claims**

3. A method for attaching a surgical needle to a suture to provide a combined surgical needle-suture device possessing a controlled suture separation feature which comprises:

a) providing a needle possessing a shank end of reduced diameter;

b) providing a suture, one tip region of which is to be attached to the shank end of the needle;

c) placing a shrinkable tubing, one section of which possesses a lance-forming region around the reduced diameter shank end of the needle and around the tip region of the suture such that the lance-forming region of the tubing is adjacent to the tip region of the suture;



d) applying energy to the shrinkable tubing to bring the tubing into engagement with at least the shank end of the needle; and,

e) depressing the lance-forming region of the tubing to form a lance in engaging, but controllably separable contact with the tip region of the suture thereby providing the combined surgical needle-suture device with its controlled separation feature,

wherein the tubing is fabricated from a memory metal or from a plastic.

5,116,359

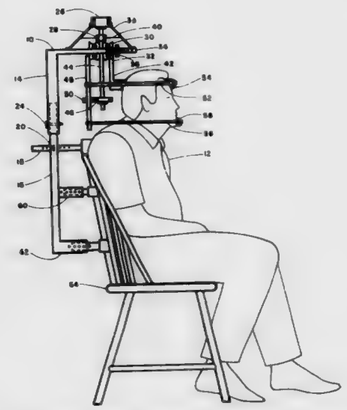
HEAD, NECK AND SHOULDER THERAPEUTIC EXERCISE DEVICE

Joseph L. Moore, 918 Green Valley Dr., Abilene, Tex. 79601

Filed Dec. 5, 1990, Ser. No. 622,636

Int. Cl.[5] A61H *1/02*

U.S. Cl. 606—241 **3 Claims**



1. A head, neck, and shoulder therapeutic exercise device comprising:

a frame;

an electric motor assembly supported on said frame, said assembly comprising a motor having a shaft and means for reducing the rotational speed of said shaft;

back head rest means for restricting the backward movement of a patient's head during treatment;

means for implementing or assisting the backward and forward movement of a patient's head during treatment, said means for implementing or assisting including a cam, said cam mounted on said shaft;

a roller bearing plate housing a roller bearing, said roller bearing positioned to be in contact with the outer edge of said cam;

means for restraining the forehead and chin of a patient to said roller bearing plate;

a roller block assembly for selectively positioning said back head rest means to be in contact with the back of a patient's head during treatment, and for facilitating the backward and forward movement during treatment of said back head rest means and said roller bearing plate, said back head rest means and said roller bearing plate being affixed to aid roller block assembly;

a timer for selectively and cyclically stopping and restarting said motor during treatment;

wherein upon motorized rotation of the shaft, the high side of the cam contacts the roller bearing causing the roller bearing plate to move away from the patient's head thereby tensioning the means for restraining the head, whereupon the timer briefly stops the motor leaving the roller bearing plate in retracted position until the motor restarts causing the high side of the cam to rotate out of contact with the roller bearing thereby allowing the roller bearing plate and means for restraining the head to return to original position.

5,116,360

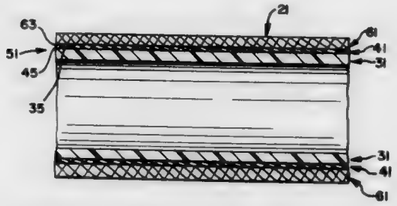
MESH COMPOSITE GRAFT

Leonard Pinchuk; John B. Martin, Jr., both of Miami, and Bruce A. Weber, Pembroke Pines, all of Fla., assignors to Corvita Corporation, Miami, Fla.

Filed Dec. 27, 1990, Ser. No. 634,425

Int. Cl.[5] A61F *2/06*

U.S. Cl. 623—1 **19 Claims**



1. A composite graft for implantation within a host, comprising:

an inner component made from wound, criss-crossing layers of fibers of a first biocompatible synthetic material and shaped to form a porous generally elongated cylindrical shape having a lumen through which blood may flow, said inner component having an outer surface;

an intermediate compliant bonding component made from wound, criss-crossing layers of fiber of a second biocompatible synthetic material, said second material having a melting point lower than the melting point of said first material and lower than the melting point of polyethylene terephthalate, said intermediate component positioned generally over and substantially covering said outer surface of said inner component, said intermediate component being porous and having an outer surface;

said intermediate component as positioned over said outer surface of the inner component forming a fluid transmission unit;

an outer component made from a mesh formed from strands of matrices of durable material, said strands or matrices preformed in a generally elongated cylindrical shape having a lumen therethrough and a diameter which is approximately equal to the outside diameter of said intermediate component, said outer component is positioned over and substantially covering said outer surface of the intermediate component; wherein each said outer component and said inner component is bonded to said intermediate component when each of the components is heated to a temperature less than the melting temperature of said firs material and said durable material thereby securing said components to each other to form a totally porous mesh composition graft.

5,116,361

SULFONATED POLYETHYLENEOXIDE-SUBSTITUTED POLYMERS WITH IMPROVED BLOOD COMPATIBILITY

Young-Ha Kim; Seo-Young Jeong; Kwang-Duk Ahn, and Dong-Keun Han, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Jun. 7, 1990, Ser. No. 534,242

Claims priority, application Rep. of Korea, Jun. 14, 1989, 89-8518

Int. Cl.[5] A61F *2/06*

U.S. Cl. 623—1 **10 Claims**

1. A modified polymeric material having improved blood compatibility, comprising a polymeric substrate having sulfonated polyethylene oxide groups substituted for amide or acid amide groups of said substrate.

5,116,362

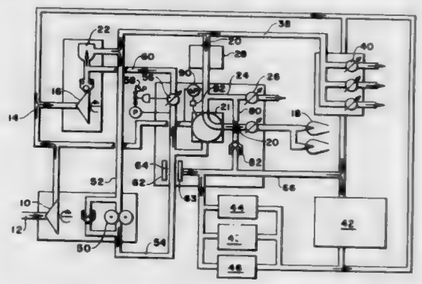
FUEL METERING AND ACTUATION SYSTEM

Samuel B. Arline, Lake Park; Matthias Eder; Jeffrey J. Dunlap, both of Stuart, and Gary W. Douglas, Palm Beach Gardens, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 3, 1990, Ser. No. 621,684

Int. Cl.[5] F02C *7/236*

U.S. Cl. 60—734 **11 Claims**



1. A fuel metering and actuation system for a gas turbine engine aircraft having a fuel tank comprising:

a centrifugal boost fuel pump;

a centrifugal main fuel pump; a combustor;

a suction line from the discharge of said boost pump to the suction of said main pump;

a discharge line free of additional pumps from the discharge of said main pump to said combustor;

a plurality of actuators;

a gear pump;

a gear pump supply line from said discharge line to said gear pump;

a gear pump exit line from said gear pump to said plurality of actuators;

a pressure relief line from said exit line;

a selector valve located in said discharge line downstream of said gear pump supply line connection;

an alternate supply line from said exit line to said selector valve; and

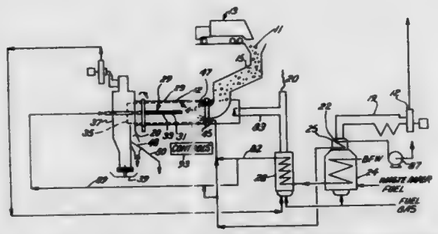
said selector valve in said discharge line connected to alter-

natively receive flow from said main pump or said gear pump, and in fluid communication with said combustor.

5,116,363
METHOD AND APPARATUS FOR CONDITIONING REFUSE

Frank T. Romweber, P.O. Box 95, Olympia Fields, Ill. 60461, and Dennis F. Sowa, 321 Montclare La., Wood Dale, Ill. 60191

Continuation-in-part of Ser. No. 475,995, Feb. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 410,093, Sep. 20, 1989, abandoned. This application May 6, 1991, Ser. No. 698,355
Int. Cl.[5] F26B *3/00*
U.S. Cl. 34—22 **40 Claims**



1. A method of preprocessing raw trash for subsequent sorting, the trash having polyfoam plastic, paper, aluminum, glass and other types of refuse, using a movable chamber, comprising:
inputting trash into the moveable chamber;
heating the environment within the chamber to a temperature of between 250° F and 500° F., said heating including non-combustibly shrinking the polyfoam plastic of the trash;
moving the trash within the chamber for a time period during said step of heating;
filtering out portions of a predetermined size or less of the trash during movement of the trash within the chamber; and
recovering the remaining larger portions of the trash for subsequent processing.

5,116,364
HARNESS CORD PULLEY ARRANGEMENT FOR JACQUARD SHED FORMING DEVICE

Dario Bassi, Chaponnay, and Damien Bouchet, Decines, both of France, assignors to Etablissements STAUBLI-VERDOL, Chassieu, France

Filed Dec. 6, 1990, Ser. No. 623,227
Claims priority, application France, Dec. 15, 1989, 89 16938
Int. Cl.[5] D03C *3/06*
U.S. Cl. 139—65 **3 Claims**

1. In a shed forming device for heddle or harness threads in a weaving loom having a frame which includes a plurality of mechanisms each composed of a pair of hooks vertically moveable under the effect of knives which move in opposition in a reciprocating manner, a first cord extending between the pair of hooks, a block and tackle having first and second pulleys, the first cord partially surrounding the first pulley, a second cord partially surrounding the second pulley, the improvement comprising, an idler pulley, one of the ends of the second cord being anchored to the frame and the other end thereof being connected to the heddle or harness threads, said idler pulley being mounted to rotate below said second pulley of the block and tackle, a lower guide pulley, said lower guide pulley being fixed to said frame, the second cord extending from said one end partially around said idler pulley and then partially around said lower guide pulley and then partially around said second

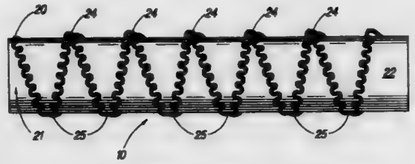


pulley of the block and tackle to said other end which is connected to said heddle or harness threads.

5,116,365
STENT APPARATUS AND METHOD FOR MAKING

Richard A. Hillstead, Miami, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Feb. 22, 1991, Ser. No. 660,127
Int. Cl.[5] A61F *2/06*
U.S. Cl. 623—1 **18 Claims**

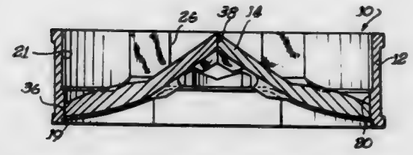


1. A stent for use within a subject vessel comprising
a cylindrical support defining a fluid flow through passage, said support dimensioned to fit within an interior of said vessel and having opposite first and second end portions, said support characterized by:
a) said support being constructed from at least one elongated flexible filament defining a plurality of relatively tightly spaced bends;
b) said filament being interlocked together at a first interlocking junction located at said first end portion of said cylindrical support;
c) said filament being intertwined together at a first set of junctions substantially aligned along a portion of said stent;
d) said filament being intertwined together at a second set of junctions substantially aligned along an opposite portion of said stent; and,
e) said filament being permanently adhered together at a second interlocking junction at said second end portion of said cylindrical support.

5,116,366
PROSTHETIC HEART VALVE

Ned H. C. Hwang, Memphis, Tenn., assignor to Ned H. C. Hwang, Memphis, Tenn. and Onx, Inc., Del.

Filed Aug. 11, 1989, Ser. No. 392,745
Int. Cl.[5] A61F *2/24*
U.S. Cl. 623—2 **20 Claims**



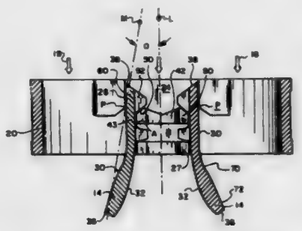
1. A prosthetic heart valve which comprises
a generally annular valve body having an interior sidewall which defines a central passageway therethrough for the passage of blood in a downstream direction said annular valve body having an upstream edge and a downstream edge,
occluder means having an upstream surface and a downstream surface which occluder means is mounted in said valve body to alternately permit the flow of blood therethrough in a downstream direction and block the flow of blood in the reverse direction,
said valve body and said occluder means having a pivot arrangement by which said occluder means is mounted to pivot between an open position and a closed position where blood flow is blocked;
said pivot arrangement including a pair of projections extending inward from said sidewall and a pair of notches in said occluder means for receiving said projections;
each of said projections being formed with first and second flat surfaces oriented at a predetermined angle to each other, said second surface being located upstream of said first surface, and each of said notches having a flat leading surface portion and a flat intermediate surface portion oriented at the same predetermined angle to each other as said projection first and second surfaces, said intermediate surface portion and said first flat surface each having a downstream edge, and
said flat leading and intermediate surface portions in said notches being positioned so that, when said occluder means is in the open position, said pair of first and second flat surfaces on said projections are respectively in surface-to-surface contact with said flat intermediate and leading surface portions in said notches.

5,116,367
PROSTHETIC HEART VALVE

Ned H. C. Hwang, 2155 Lochlevin Dr., Memphis, Tenn. 38119, and Jack C. Bokros, Austin, Tex., assignors to Ned H. C. Hwang, Memphis, Tenn. and Onx, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 392,745, Aug. 11, 1989. This application Oct. 10, 1989, Ser. No. 419,288
Int. Cl.[5] A61F *2/24*
U.S. Cl. 623—2 **15 Claims**

1. A prosthetic heart valve which comprises
a generally annular valve body having an interior sidewall which defines a central passageway therethrough for the passage of blood in a downstream direction, said interior sidewall being arcuate except for a pair of diametrically opposed flat sidewall sections,
a pair of occluders each having an upstream surface and a downstream surface, which occluders are mounted in said valve body so as to alternately permit the flow of blood therethrough in a downstream direction and block the flow of blood in a reverse direction,
said valve body having projections extending radially inward from a central region of each of said flat sidewall sections,
said occluders each having a pair of notches for receiving said projections so that said occluders pivot each about an eccentric axis, which axis is perpendicular to said flat sidewall sections and is defined by said projections, moving alternately between an open position and a closed position.
said upstream surface of each of said occluders being formed with a concave region of two-dimensional curvature and with a generally convex region of two-dimensional curvature, said concave surface region being spaced downstream from said pivot axis in said open position and being



formed of straight lines which are generally parallel to said pivot axis, said convex region being spaced further downstream from said pivot axis than said concave region,
each of said projections being formed with two flat surfaces that are parallel to said pivot axis and oriented at a predetermined angle to each other, each of said notches having two flat surface portions oriented at said same predetermined angle to each other, and
said respective projection flat surfaces and notch flat surface portions being positioned so that, when each said occluder is in the open position, said pair of flat surfaces on said projections are respectively in surface-to-surface contact with said flat surface portions in said notches.

5,116,368
POLYPEPTIDES WITH FIBRONECTIN ACTIVITY

James B. McCarthy, and Leo T. Furcht, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 89,073, Aug. 25, 1987, Pat. No. 4,839,464. This application Mar. 21, 1989, Ser. No. 326,279
Int. Cl.[5] C07K *7/08*; A61F *2/16, 2/02*
U.S. Cl. 623—2 **9 Claims**

1. A prosthetic device designed for placement in vivo, comprising a surface coated with a composition consisting essentially of a polypeptide of the formula:

tyr—glu—lys—pro—gly—ser—pro—pro—arg—glu—val—val—pro—arg—pro—arg—pro—gly—val,

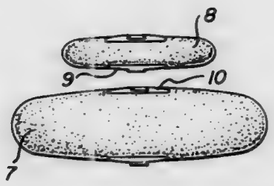
lys—asn—asn—gln—lys—ser—glu—pro—leu—ileu—gly—arg—lys—lys—thr—asp—glu—leu, or mixtures thereof.

5,116,369
COMPOSITION FOR INTRAOCULAR LENS
Nobuo Kushibiki, Yamato; Noriyuki Nose, Machida; Yukichi Niwa, Narashino, and Norio Kaneko, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 405,584, Sep. 11, 1989, abandoned, which is a continuation of Ser. No. 164,415, Mar. 4, 1988, abandoned. This application Sep. 14, 1990, Ser. No. 582,117
Claims priority, application Japan, Mar. 6, 1987, 62-49907
Int. Cl.[5] A61F 2/14
U.S. Cl. 623—6 11 Claims



1. An intraocular lens having a shear modulus of 1×10^3–5×10^6 dyne/cm^2 and a transmittance of at least 50% with respect to visible radiation of 400–700 nm; said lens comprising a cured product of a composition consisting essentially of:
(i) an organopolysiloxane (A) having a molecular weight less than or equal to 60,000, a viscosity of 10,000 cp or below at normal temperature and comprising at least one unsaturated aliphatic group in an average polymer molecule;
(ii) an organopolysiloxane (B) comprising at least three hydrogenated silyl units in an average polymer molecule; and
(iii) a platinum compound, wherein said platinum compound based on its platinum content constitutes 10–200 ppm by weight of said composition.

5,116,370
BREAST PROSTHESIS WITH FEMALE AND MALE ADAPTER SNAPS
Mark A. Foglietti, 32640 N. Burr Oak Dr., Solon, Ohio 44139
Filed Mar. 22, 1991, Ser. No. 673,361
Int. Cl.[5] A61F 2/12
U.S. Cl. 623—8 12 Claims

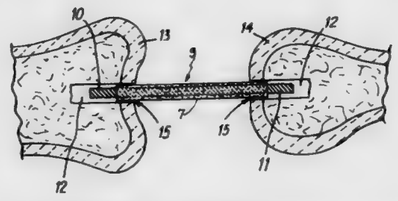


1. A breast prosthesis for surgical insertion comprising:
a first implant element having a first outer shell enveloping a fluid filler;
a second implant element having a second outer shell also enveloping a fluid filler;
a first connector means attached to said first outer shell of said first implant element for connecting and attaching to a second connector means attached to said second outer shell of said second implant element;
said first and second connector means configured for releasable interconnection one to the other.

5,116,371
PROSTHESIS WITH IMPROVED BIOCOMPATIBILITY
James M. Christensen, 1207 E. Saga, Glendora, Calif. 91740, and Parviz R. Ainpour, P.O. Box 70364, Pasadena, Calif. 91117
Filed Jul. 6, 1990, Ser. No. 549,096
Int. Cl.[5] A61F 2/02
U.S. Cl. 623—11 16 Claims

1. A surgically implantable prosthesis comprising at least an outer flexible envelope having enclosed therein a hydrogel having both hydrophobic and hydrophilic regions wherein the improvement consists of hydrophobic regions selected from the group consisting of polymerized N-vinylic hydrophobic monomers, hydrolyzed polyacrylonitriles, and combinations thereof.

5,116,372
ARTIFICIAL LIGAMENT IN SYNTHETIC MATERIALS IMPREGNATED AND COATED WITH ELASTIC RESIN AND ITS COATING PROCEDURE
Jacques-Philippe Laboureau, 24, rue de la Fontaine Billenois, 21000 Dijon, France
Continuation of Ser. No. 319,813, Mar. 6, 1989, abandoned, which is a continuation of Ser. No. 47,782, May 6, 1987, abandoned. This application Sep. 17, 1991, Ser. No. 762,734
Claims priority, application France, May 7, 1986, 86 06656
Int. Cl.[5] A61F 2/08
U.S. Cl. 623—13 7 Claims

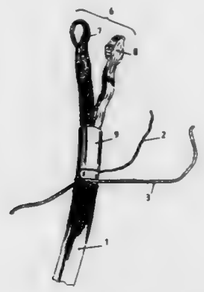


1. A prosthetic ligament, comprising:
a cylindrical bundle of longitudinally extending and substantially parallel synthetic fibers, said fibers being spirally twisted along the cylindrical axis of the bundle to form a spiral core, the synthetic fibers exhibiting an elastic extension and then a post-elastic deformation to rupture when loaded in traction, the core having a central inter-articular portion and opposite terminal ends; and
a non-degradable coating of a biocompatible elastomer resin coating only the central inter-articular portion of the core and leaving the terminal ends uncoated, whereby the coating constrains the fibers of the core in its spiral configuration and restores the fibers back to the spiral arrangement upon removal of a tensile load such that when the ligament is subjected to a tensile load the spiral core deforms first elastically by unwinding of the spiral and deforms further by elastic elongation of the fibers.

5,116,373
PULL-THROUGH APPLIANCE
Roland P. Jakob, Hinterkappelen; Stefan Freudiger, Bremgarten; Rudolf Koch, Berlingen, and Hans Fluckiger, Ötwil, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur and Protek AG, Berne, both of, Switzerland
Filed Aug. 15, 1990, Ser. No. 567,803
Claims priority, application Switzerland, Aug. 28, 1989, 3108/89
Int. Cl.[5] A61F 2/08
U.S. Cl. 623—13 9 Claims

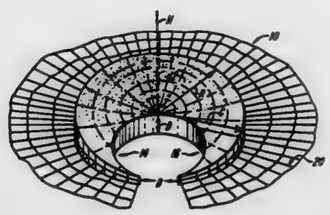
1. A pull-through appliance for pulling through a bore in a bone comprising

a tubular textile mesh structure for receiving at least one of a synthetic tendon prosthesis, a synthethic ligament prosthesis and at least one of an organic ligament prosthesis and an organic tendon prosthesis, said mesh being formed of at least one continuous thread having a free end extending therefrom; and



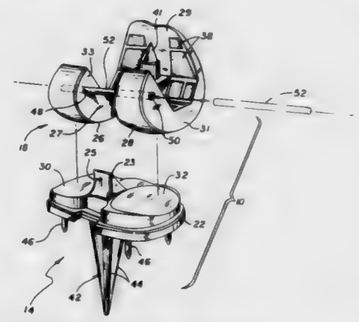
a pull-out thread disposed at one end of said mesh structure to prevent unraveling of said mesh structure, said pull-out thread having a pair of free ends extending from said mesh structure.

5,116,374
PROSTHETIC MENISCUS
Kevin R. Stone, San Francisco, Calif., assignor to ReGen Corporation, San Francisco, Calif.
Division of Ser. No. 317,951, Mar. 2, 1989, Pat. No. 5,007,934, which is a continuation-in-part of Ser. No. 75,352, Jul. 20, 1987, Pat. No. 4,880,429. This application Sep. 13, 1990, Ser. No. 582,516
Int. Cl.[5] A61F 2/20
U.S. Cl. 623—16 5 Claims



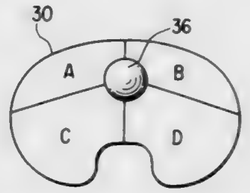
1. A method of regenerating meniscal tissue in vivo comprising the steps of:
(a) fabricating a prosthetic menisucs comprising a dry porous matrix of biocompatible and bioresorbable fibers, said fibers selected from the group consisting of natural polymers, and analogs, and mixtures thereof,
said matrix being adapted to have in vivo and outer surface contour substantially the same as that of a natural meniscus,
said matrix having pore size in the approximate range of greater than 50 microns to less than about 500 microns,
whereby said matrix establishes an at least partially bioresorbable scaffold adapted for ingrowth of meniscal fibrochondrocytes, and wherein said scaffold and said ingrown meniscal fibrochondrocytes support natural meniscal load forces; and
(b) implanting said prosthetic meniscus into a knee joint by surgical procedure.

5,116,375
KNEE PROSTHESIS
Aaron A. Hofmann, 1349 E. Princeton Ave., Salt Lake City, Utah 84105
Filed Aug. 27, 1990, Ser. No. 572,450
Int. Cl.[5] A61F 2/38
U.S. Cl. 623—20 5 Claims



1. A knee joint prosthesis, comprising:
a femoral component for fixation to the resected end of a patient's femur, said femoral component including spaced medial and lateral condyles defining a rearwardly open intercondylar recess therebetween, and a patellar wall anteriorly interconnecting said medial and lateral condyles;
a tibial component for fixation to the resected end of a patient's tibia;
meniscal bearing means on said tibial component for supporting said medial and lateral condyles of said femoral component; and further
a stabilizing post having a posterior facing cam surface formed thereon, said stabilizing post projecting upwardly from said tibial component at a position between said medial and lateral condyles; and
stabilization mean for removable mounting onto said femoral component to substantially bridge between said medial and lateral condyles to close the rear end of said intercondylar recess, said stabilization means engaging said cam surface upon moderate to severe joint flexion to stabilize the relative position of said femoral and tibial components.

5,116,376
KNEE PROSTHESIS
Denis R. W. May, Stanmore, United Kingdom, assignor to University College London, London, England
Filed Oct. 17, 1989, Ser. No. 422,544
Claims priority, application United Kingdom, Oct. 18, 1988, 8824383
Int. Cl.[5] A61F 2/38
U.S. Cl. 623—20 8 Claims



1. A knee prosthesis which comprises: femoral and tibial members interconnected by first means defining a knee hinge

having an axis, and second means comprising an intermediate member and configured for permitting twisting of knee, said second means comprising:

(a) bearing means defining an articulation surface of said knee about an axis generally at right angles to a knee hinge axis and;

(b) means defining a pair of oppositely handed concave helical surfaces, and a pair of condylar members having convexly curved surfaces that are complementary to and ride over said helical surfaces so that when said knee is twisted from a neutral position each of said condylar members rides over the respective helical surfaces forcing the femur and tibia of a user of the prosthesis apart, such that weight applied through the knee has an untwisting action which returns the femoral and tibial members to a neutral position.

5,116,377

CEMENTABLE HIP PROSTHESIS

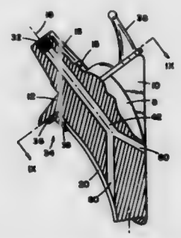
Walter Skripitz, Koblenz, and Klaus-Dieter Schelhas, Bremen, both of Fed. Rep. of Germany, assignors to Bristol-Myers Squibb Company, New York, N.Y.

Filed Apr. 10, 1990, Ser. No. 507,148

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1989, 3912465

Int. Cl.[5] A61F *2/32*

U.S. Cl. 623—23 **17 Claims**



1. An implantable femoral prosthesis for cementation in a prepared intramedullary canal of a femur, said prosthesis comprising:

an elongated shaft tapering from a proximal end to a distal end, said proximal end having a support collar formed thereon, said collar extending radially outwardly from said shaft and being configured to engage a resected surface of the femur, and said shaft including a circumferential groove formed therein adjacent and below said collar, and a longitudinal groove formed in a medial surface of the shaft and opening into said circumferential groove; and

a separable elastic spacer ring configured to be disposed on said support collar and at least partially in the circumferential groove; and

a main bore extending from the proximal end of the shaft, above the collar through the support collar downwardly into a trochanter region of the shaft and outwardly of a surface in a thigh region of the shaft.

5,116,378

METHOD AND APPARATUS FOR EXPANDING A SHAFT FOR USE IN PROSTHESIS

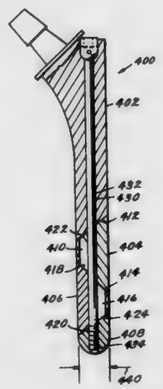
John J. Carbone, Baltimore, Md., assignor to Orthovations, Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 468,731, Jan. 23, 1990, Pat. No. 5,032,133. This application May 2, 1990, Ser. No. 517,766

The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.

Int. Cl.[5] A61F *2/34*

U.S. Cl. 623—23 **16 Claims**



1. A prosthetic positioning device adapted for cooperation with an interior surface of a bone cavity, the positioning device comprising separation first, second and third elongated members, said first member having an elongated bore extending therethrough from one end of said first member to an opposite end, said second member having an elongated bore extending therethrough from one end of said second member to at least adjacent an opposite end, said opposite end of said first member and said one end of said second member being disposed to face each other with facing end surfaces extending at acute angles to said respective bores to form a first slide surface with said extending angles being substantially equal, said third member having an elongated bore extending therethrough from one end of said third member to an opposite end, said opposite end of said second member and said one end of said third member being disposed to face each other with facing end surfaces extending at acute angles to said respective bores to form a second slide surface with said extending angles being substantially equal, said positioning device further including an elongated actuatable manipulation means configured to be disposed within said bores of said first, second, and third members for holding said first and second slide surfaces in abutting relation to one another and, upon actuation of said manipulation means, causing relative sliding motion along said first and second slide surfaces thereby varying at least the width dimension of said positioning device.

5,116,379

PROSTHESIS

Peter D. McLardy-Smith, 30 Stanley Road, Oxford OX4 1QZ, United Kingdom

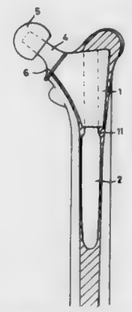
Filed Sep. 12, 1989, Ser. No. 405,952

Claims priority, application United Kingdom, Sep. 15, 1988, 8821574

Int. Cl.[5] A61F *2/34*

U.S. Cl. 623—23 **10 Claims**

1. A prosthesis for implantation in a bone comprising a proximal portion shaped to fit within the medullary canal of the metaphysis of the bone and to project from the end of the bone and an elongate distal portion defining a longitudinal axis and shaped to fit within the medullary canal of the diaphysis of the bone, the proximal and distal portions being separately formed and having complimentary engaging surfaces, parallel to each other and to the longitudinal axis, shaped so they may be fitted together in a manner which permits relatively free



axial movement between the two portions while maintaining axial alignment of the portions, whereby the two portions may be independently selected to provide an optimum fit within the bone and, following implantation, are able to move freely relative to each other along said axis to maintain loading between the proximal portion and the bone.

5,116,380

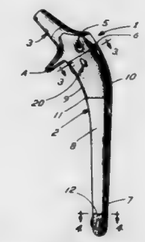
PROSTHETIC IMPLANT WITH SPACERS HAVING TAPERED TRAILING EDGES

Leda C. Hewka, Philadelphia, Pa.; Perry A. Geremakis, South Bend, Ind.; Mark B. Lester, Warsaw, Ind., and Jack E. Parr, North Webster, Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Feb. 28, 1991, Ser. No. 662,089

Int. Cl.[5] A61F *2/36, 2/30*

U.S. Cl. 623—23 **10 Claims**



1. A prosthetic implant for insertion into a cement filled intramedullary canal, said implant comprising a body for insertion into said canal, a means carried by said body for spacing said body a predetermined distance from an interior wall of said canal, said spacing means including a body extending a distance along said implant body, said body of said spacing means including a frontal portion and a trailing portion, said spacing means body narrowing with distance from said frontal portion toward said trailing portion, the narrowing body of said spacing means constitutes means for interrupting the flow of cement along said implant body as said body is inserted into a cement filled intramedullary canal and causing said cement flow to smoothly re-attach to said implant body.

5,116,381

PROSTHESIS WITH A MONOBLOC FRAMEWORK FOR LEG AMPUTATION AND METHOD FOR PRODUCING THIS PROSTHESIS

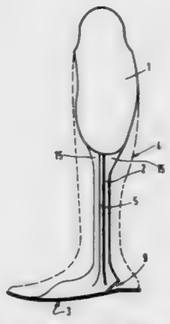
Michel Palfray, Seurre, France, assignor to Etablissements Proteor, France

Filed Apr. 23, 1991, Ser. No. 690,051

Claims priority, application France, Apr. 23, 1990, 90 05126

Int. Cl.[5] A61F *2/60, 2/66*

U.S. Cl. 623—33 **16 Claims**



1. A prosthesis for a leg amputee, comprising a cast framework, covered with a coating material and comprising a socket (1), a leg part (2) and a prosthetic foot (3), one adjoining the other, characterized in that the framework of the leg part (2) and of the prosthetic foot (3) constitutes a monobloc assembly, produced in a single casting operation, and in that the prosthetic foot includes, at the level of a sole of the prosthetic foot, a cut having served for the extraction of a molding core and, at the level of a heel of the prosthetic foot at a rear portion thereof, above the sole, a cut of wedge formation allowing a flexion of the rear of the sole relative to the leg part.

5,116,382

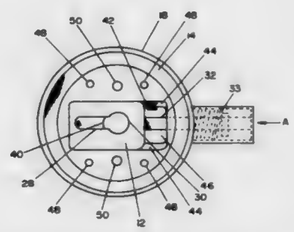
PROSTHESIS CAPTURE DEVICE

Stephen P. Steinkamp, Elizabethtown, and Jeffrey C. Batzer, Lancaster, both of Pa., assignors to Victory Prosthetic Systems, Inc., Lancaster, Pa.

Filed Jun. 4, 1990, Ser. No. 532,918

Int. Cl.[5] A61F *2/62*

U.S. Cl. 623—38 **7 Claims**



1. A capture device to attach a prosthesis to a securing means protruding from a sleeve on a natural limb of an amputee comprising:

a base plate with a first hole which is large enough to accept a securing means protruding from a sleeve on a natural limb of a user and with a slot located so that the first hole is within the slot:

a keyhole plate located within the slot in the base plate and including a keyhole shaped through hole which includes a circular portion large enough to clear the securing means

and an attached slotted portion which is small enough to prevent the securing means from passing through the slotted portion, the keyhole plate being sized and located within the slot in the base plate so that, when the keyhole plate is moved toward one end of the slot in the base plate the circular portion of the keyhole shaped hole is aligned with the first hole in the base plate, and when the keyhole plate is moved toward the other end of the slot in the base plate, the slotted portion of the keyhole shaped hole is aligned with the first hole in the base plate;

an actuator means for imparting motion to the keyhole plate and extending away from the keyhole plate and the base plate so that the actuator means can be operated by a user in order to move the keyhole plate within the slot in the base plate;

retaining means attached to the base plate and holding the keyhole plate within the slot in the base plate, the retaining means having an opening aligned with the first hole and at least large enough for the securing means protruding from the sleeve to pass through the opening and the retaining means is a cover plate which is attached to the base plate by at least one screw so that each screw penetrates the cover plate and is fitted into a threaded hole within the base plate; and

attachment means for attaching components to the capture device.

5,116,383

LOWELIMB PROTHESIS

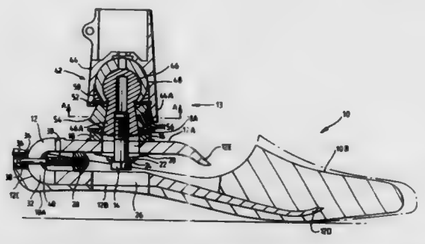
John J. Shorter, Basing; Graham J. Harris, Basingstoke, and Victor J. Woolnough, North Waltham, all of England, assignors to Chas. A. Blatchford & Sons Ltd., Hampshire, England

Filed Mar. 3, 1989, Ser. No. 318,917

Claims priority, application United Kingdom, Mar. 4, 1988, 8805191; Dec. 23, 1988, 8830149

Int. Cl.[5] A61F *2/66*

U.S. Cl. 623—49 **27 Claims**



1. A lower limb prosthesis comprising:

an energy storing foot having an anterior portion, an ankle mounting portion, and an internal energy storing keel member which extends from said ankle mounting portion to said anterior portion and which, between said portions has lengthwise-distributed resilience in the metatarsal region of the foot, whereby the keel member is resiliently deformable to allow dorsi movement of the anterior portion relative to the ankle mounting portion; and

a resilient ankle joint for coupling the ankle mounting portion of the foot to an upper component of the prosthesis, the ankle joint including means for allowing plantar movement of the ankle mounting portion of the foot from a rest position relative to the upper component but substantially preventing dorsi movement of the ankle mounting portion of the foot from the rest position relative to the upper component, whereby at least the majority of the dorsiflexion of the combination of the foot and the ankle joint occurs in the keel member.

5,116,384

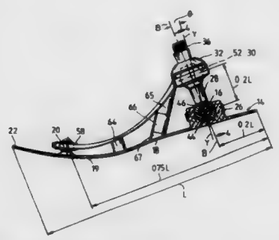
PROSTHETIC FOOT

Michael T. Wilson, Missouri City, Tex., and David F. Jolly, Abrams, Wis., assignors to Syncor, Ltd., Abrams, Wis.

Filed Aug. 31, 1990, Ser. No. 576,228

Int. Cl.[5] A61F *2/66*

U.S. Cl. 623—49 **20 Claims**



1. A prosthetic foot, comprising:

a plantar member having first and second end portions, a primary socket connected to said plantar member adjacent said first end portion with said primary socket further positioned closely to a bottom horizontal surface of said plantar member, and a tertiary ball connected to said plantar member adjacent said second end portion;

a pylon having a first and second end, a primary ball attached to said first end of said pylon, a secondary ball attached to said pylon spaced from said primary ball, and an adaptor assembly attached to said second end of said pylon, said pylon being connected to said plantar member by said primary socket engaging said primary ball; and,

a dorsal member having first and second end portions, a secondary socket connected to said dorsal member adjacent said first end portion of said dorsal member and a tertiary socket connected to said dorsal member adjacent said second end portion of said dorsal member, said dorsal member being connected to said pylon by said secondary ball engaging said secondary socket, and said dorsal member being connected to said plantar member by said tertiary socket engaging said tertiary ball.

5,116,385

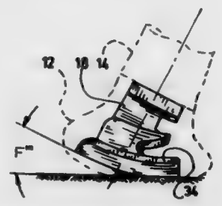
MEDIO-LATERAL CONTROL ENHANCING, CANTILEVER-SPRING TYPE PROSTHETIC FOOT

Paul Allard, Pierrefonds; Claude Levesque, Montréal, and Jean Dansereau, Sainte-Thérèse, all of Canada, assignors to Universite de Montréal, Montreal, Canada

Filed May 6, 1991, Ser. No. 695,918

Int. Cl.[5] A61F *2/66*

U.S. Cl. 623—55 **6 Claims**



1. A prosthetic foot keel consisting of a cantilever spring monolithic member made from a substantially rigid, yet resiliently elastic material, and forming a generally rectangular band defining one an another lateral side edges; said band formed of three integral parts, namely:

(a) a C-shape heel part, at one end of said band, said heel part consisting of a straight, free, outer end portion, an opposite, straight, inner end portion substantially parallel to said outer end portion, and an arcuate portion integrally joining said inner and outer end portions; said arcuate portion itself defining an intermediate transverse cavity made into said one lateral side edge at said arcuate portion; said heel part free end portion further having attachment means for connection to an upper prosthesis;

(b) a forefoot part, at the end of said band opposite said heel part, a flange projecting transversely from said another lateral side edge at said forefoot part integrally thereto; and

(c) a curved part, integrally interconnecting said forefoot part and said heel part inner end portion, said curved part curved toward a plane intersecting said heel part free end portion, whereby said heel part, forefoot part and curved part extend substantially within a single sagittal plane, and said forefoot flange projecting outwardly from and about an axis orthogonal to said sagittal plane; wherein upon said cantilever spring member being fitted to an amputee's limb through said attachment means, said cantilever spring member, during gait, will absorb energy at said heel part during prosthetic foot heel strike, will store said energy, will transfer this stored energy to said curved part and forefoot part, and will restore said energy at foot push-off in such a way as to provide substantial medio-lateral control of the prosthetic foot during both loading and unloading of the prosthetic foot keel.

5,116,386

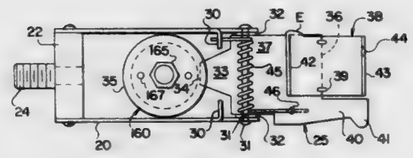
HAND PROSTHESIS

Albert W. Scribner, 6 Country Club Rd., Darien, Conn. 06820

Filed Feb. 15, 1991, Ser. No. 656,284

Int. Cl.[5] A61F *2/56*

U.S. Cl. 623—64 **12 Claims**



1. An improved hand prosthesis: comprising

a frame;

gripping means carried by said frame and adapted to assume open and closed conditions; said gripping means including a thumb-like jaw means and a cooperating finger-like jaw means, one of said jaw means being movably carried by said frame for cooperating movement towards and away from the other of said jaw means;

biasing means adapted to normally yieldably urge said movable jaw means towards said other jaw means; and

actuating means for said movable jaw means, said actuating means comprising a contact element coupled to said movable jaw means and located in a position corresponding to that of the little finger of an actual hand and adapted when said hand prosthesis as a whole is moved by the wearer so that said contact element is pressed against an external object the resultant force applied to said element will displace said movable jaw means away from said other jaw means against the action of said biasing means whereby said gripping means may receive an item to be held, and when said hand prosthesis is moved so that said contact element is no longer pressed against said external object and said force is now removed from said contact element said movable jaw means will be moved to a gripping condition under the action of said biasing means whereby said gripping means may grasp and hold the item to be held.

5,116,387

PREPARATION OF INJECTABLE POLYMERIC BODIES

Eric P. Berg, Plymouth, Minn., assignor to American Medical Systems, Inc., Minnetonka, Minn.

Division of Ser. No. 364,722, Jun. 9, 1989, Pat. No. 5,007,940. This application Jan. 10, 1991, Ser. No. 639,616

Int. Cl.[5] A61F *2/02*

U.S. Cl. 623—66 **18 Claims**

1. A process for the preparation of an injectable composition consisting of a plurality of discrete physiologically-compatible, non-biodegradable, polymeric bodies, said bodies having (i) an average outside diameter of from about 0.005 to 0.20 inch, (ii) reversible deformability of about 20 to 75% of their unstressed outside diameter, and (iii) a lubricous surface, which process comprises dissolving a physiologically-compatible, non-biodegradable, water-insoluble, non-crosslinked polymer in a dipolar aprotic organic solvent, rapidly injecting the resulting solution in a fine stream into a relatively large volume of a liquid medium which is a non-solvent for the polymer while slowly stirring said medium so that discrete bodies of the polymer are formed, washing said bodies until said solvent is removed and recovering bodies of the desired size by filtration through an appropriate sieve.

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5,116,388

METHOD OF BLEACHING AND CONDITIONING HAIR, BLEACH PACKET AND BLEACHING SOLUTIONS

Geoffrey J. Brooks, Livingston, N.J., assignor to Gijj, Inc., S. River, N.J.

Division of Ser. No. 383,857, Jul. 21, 1989. This application Oct. 29, 1990, Ser. No. 606,435

Int. Cl.[5] A61K *7/13, 7/06;* **D06L** *3/02*

U.S. Cl. 8—405 **5 Claims**

1. A method of bleaching and conditioning hair comprising:

(a) providing a bleaching packet comprising a predetermined effective amount of hair bleach composition to bleach a person's hair, enclosed in a water soluble polymer enclosure comprising a polyvinyl alcohol, (PVA), the PVA effective, when dissolved, for conditioning a person's hair;

(b) providing an activator solution comprising water and an effective amount of a hydrogen peroxide or a hydrogen peroxide releasing composition activator to activate the bleach and dissolve the water soluble polymer enclosure;

(c) contacting bleach packet with the activator solution to thereby dissolve the water soluble polymer enclosure and activate the bleach to form a bleach solution containing PVA for conditioning a person's hair;

(d) applying the bleach solution to a person's hair whereby the activated bleach bleaches the hair and the PVA conditions the hair.

5,116,389

METHOD OF OBTAINING COLLAGEN HUMAN-SKIN FIBERS, FIBERS THUS PRODUCED, AND A COMPOUND CONTAINING THEM

Vladimir Mitz, 176, boulevard Saint-Germain, F 75006 Paris, France

Filed Jun. 28, 1990, Ser. No. 545,520

Claims priority, application France, Jan. 4, 1989, 8900056

Int. Cl.[5] D06M *13/00*

U.S. Cl. 8—127.5 **13 Claims**

1. A method of obtaining human-skin collagen fibers from sterile pieces of human skin, the method comprising the steps of:

a) comminuting the sterile skin such that it can pass through a sieve having a mesh size of 0.25 mm;

b) mixing the comminuted sterile skin with a sterile aqueous solution of an alkaline-metal or alkaline-earth salt to form a suspension;

c) diluting the suspension with a promoter of fibrillogenesis taken from the group formed by acetylated glucosamine, n-acetyl enuraminic acid, and mixtures thereof and setting the Ph of the suspension to a value between 4 and 6;

d) maturating the diluted suspension at a temperature brought to between 30° C. and 50° C. in a time of less than two hours and then holding the diluted suspension at between 0° C. and 10° C. for a time between 10 hours and 50 hours such that collagen fibers grow in the suspension;

e) separating collagen fibers from the suspension and checking them for the presence of protein impurities; and

f) on discovering any protein impurities, rinsing the fibers by agitation with an atoxic aqueous solution of a nonionic detergent, then separating out substantially all of the residual protein impurities to obtain an aqueous suspension of collagen fibers having no foreign matter, and rinsing the collagen fibers in sterilized water.

5,116,390

CATALYTICALLY ENHANCED COMBUSTION PROCESS

Carlos Rodriguez, Belmont House, 10 Princes Road, Douglas, Isle of Man, Isle of Man

Continuation of Ser. No. 898,619, Aug. 21, 1986, abandoned. This application Jan. 5, 1989, Ser. No. 293,813

Int. Cl.[5] C10L *1/18, 1/02*

U.S. Cl. 44—300 **15 Claims**

9. A fuel having improved combustion efficiency comprising:

(a) a petroleum based liquid hydrocarbon; and

(b) a combustion catalyst comprising from about 18 to about 21 weight percent naphthalene, from about 75 to about 80 weight percent toluene, and from about 2.8 to about 3.2 weight percent benzyl alcohol, said catalyst:liquid hydrocarbon volume ratio being between about 1:3,000 and 1:500.

5,116,391

CURVED SURFACE RUBBING APPARATUS

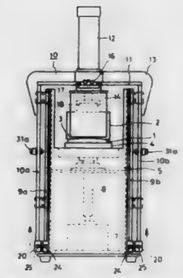
Yasumitsu Moriki, Tokyo, and Hirotomo Numakura, Kawasaki, both of Japan, assignors to Maruma Jyusharyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 399,771, Aug. 28, 1989, abandoned. This application May 14, 1991, Ser. No. 701,609

Claims priority, application Japan, May 31, 1989, 1-63910

Int. Cl.[5] B24B *13/00*

U.S. Cl. 51—26 **5 Claims**



1. Apparatus for polishing, lapping and abrading different paired workpieces constituting two workpieces having respective arcuate contact surfaces to be placed in contact for rubbing contact movement therebetween, the respective arcuate contact surfaces constituting surfaces of curvature having respective centers of arbitrary radii of curvature, the apparatus comprising a first mount for removably mounting thereon a first workpiece of said two workpieces with a surface of curvature having a respective center of arbitrary radii of curvature, a second mount for removably mounting thereon a second workpiece of said two workpieces with a surface of curvature having a respective center of arbitrary radii of curvature and in close contact with the surface of curvature of the first workpiece, swing means for effecting relative swinging movement between said first mount and said second mount to effect relative movement between the surfaces of curvature of the two workpieces while in close contact, the swing means having means for supporting said first mount and having pivot means variably positionable in different axial positions along a longitudinal reference axis for variably spacing the first mount from the second mount in dependence upon a dimension between the centers of arbitrary radii of curvature of the workpieces for thereby accommodating different dimensioned paired workpieces and different dimensioned pairs of workpieces, means for defining said reference axis, a swing unit for reciprocally swinging the swing means on said pivot means reciprocally and laterally of said reference axis for effecting swinging of said first mount with said first workpiece thereon to effect a

swinging movement of the first workpiece relative to the second workpiece with said surfaces of curvature in close contact, and means for variably positioning said first mount on said swing means relative to said reference axis spaced from said pivot means so that the first mount is swingable reciprocally symmetrically or asymmetrically of said reference axis and the first workpiece thereon is swingable reciprocally about the centers of the arbitrary radii of curvature when the surfaces of curvature of the workpieces are in close contact.

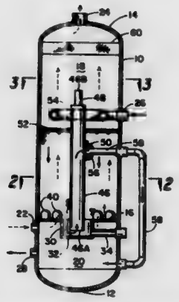
5,116,392
ABRASIVE ARTICLE AND ABRASIVE
Volker Selgrad, Natters, and Friedrich Sladky, Innsbruck, both of Austria, assignors to Tyrolit - Schleifmittelwerke Swarovski K.G., Schwaz, Austria
Filed Dec. 27, 1989, Ser. No. 457,953
Claims priority, application European Pat. Off., Dec. 30, 1988, 88121884.6; Jun. 21, 1989, 89111276.5
Int. Cl.[5] B24D *3/02*
U.S. Cl. 51—309 **32 Claims**

1. An abrasive article comprising abrasive grains, a binder which is a hardenable organic or inorganic system, and fillers which are at least partly grinding-active, wherein at least part of the grinding-active fillers are metal complex salts with the following structure:

$$uM_1 \cdot vM_2 \cdot wHal \cdot xChal \cdot zPh$$

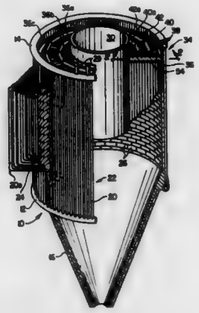
in which M_1 is one or more members selected from the group consisting of an alkali metal, an alkaline earth metal and Al,
M_2 is one or more members selected from the group consisting of Zn, Mn and Fe,
Hal is one or more members selected from the group consisting of F, Cl, Br and I,
Chal is one or more members selected from the group consisting of O and S,
Ph is a phosphate or more highly condensed phosphate of the formula P_rO_s where r is 1 to 10 and s is 4 to 20,
each of u, v, w, x and z is 1 to 95%, and the total of u and v is 1 to 95%, and the total of w, x and z is 1 to 95%, wherein the total of u, v, w, x and z is 100% , and wherein the fillers are melted or sintered with each other.

5,116,393
ABSORBER FOR DEHYDRATING GAS WITH LIQUID DESICCANT
Harold O. Ebeling, 4718 S. Lewis Ct., Tulsa, Okla. 74105
Filed Aug. 1, 1991, Ser. No. 738,827
Int. Cl.[5] B01D *47/14, 47/12*
U.S. Cl. 55—229 **17 Claims**



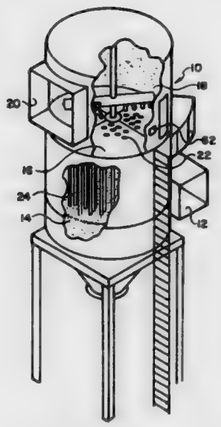
1. An improved absorber for contacting gas having water entrained therein with a liquid desiccant, comprising:
an upright vessel having a generally horizontal partition therein dividing the vessel interior into a treating zone and, below that, a collection zone, the vessel having a gas inlet and a desiccant outlet in the collection zone, a gas outlet in the treating portion of the treating zone and a desiccant inlet in the treating zone, the horizontal partition having a collection bucket means therein providing a reservoir below the level of the partition, the partition having a plurality of small diameter openings therein spaced from the collection bucket;
an upright tubular riser positioned within said vessel having an opening in the bottom and in the top, the bottom of the riser extending within said collection bucket;
a desiccant circulation conduit connecting the interior of the upper portion of said riser with said vessel collection zone;
packing within said treating zone; and
desiccant distribution means above said treating zone connected to receive the flow of liquid desiccant therethrough, liquid desiccant passing downwardly through said packing into said collection bucket and upwardly within said riser and by said desiccant circulation conduit into said collection zone and out through said desiccant outlet, gas passing upwardly from said collection zone through said small diameter openings in said partition and upwardly through said packing to thereby contact desiccant passing downwardly through said packing, at least a substantial portion of water in the gas being absorbed by the liquid desiccant.

5,116,394
CYCLONE SEPARATOR ROOF
Michael Garkawe, Madison, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.
Filed Mar. 25, 1991, Ser. No. 673,920
Int. Cl.[5] B01D *45/12*
U.S. Cl. 55—259 **21 Claims**



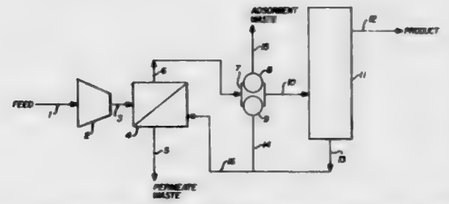
10. A cyclone separator comprising:
an inner cylinder;
an outer cylinder extending around said inner cylinder in a coaxial relationship to define an annular chamber between said inner and outer cylinders;
means for directing gases containing solid particles through said annular chamber for separating said solid particles from said gases, said separated gases exiting through said inner cylinder and said separated solids falling to a bottom portion of said separator; and
a roof extending between said cylinders and comprising first means for accommodating differential radial thermal expansion across said roof, and second means for accommodating differential circumferential thermal expansion across said roof.

5,116,395
DUST COLLECTION WITH PROGRAMMABLE CLEANING AIR CONTROL
Roger D. Williams, Dallas, N.C., assignor to Pneumafil Corporation, Charlotte, N.C.
Filed Jul. 9, 1991, Ser. No. 727,648
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—273 **19 Claims**



1. Apparatus for filtering particulate matter and the like entrained in a transport fluid, said apparatus comprising:
(a) a housing divided by a partition plate into a dirty fluid chamber and clean fluid chamber, said partition plate having a plurality of openings therein and tubular filter elements depending therefrom into said dirty fluid chamber, and said housing including an inlet to said dirty air chamber and an outlet from said dirty air chamber, whereby said transport fluid will flow into said dirty air chamber, through said filter elements to deposit said particulate matter on the exterior surfaces thereof, and out from said clean air chamber;
(b) means for cleaning said filter elements at predetermined intervals, said cleaning means comprising:
(i) a plurality of nozzle means mounted for movement across said partition plate for directing a jet of cleaning air into and through said openings in said partition plate and into said tubular filter elements to create a back flow of cleaning fluid therethrough;
(ii) a source of pressurized fluid for providing said cleaning fluid to said nozzles;
(iii) a plurality of electrically operated valve means for selectively connecting said source of cleaning fluid to said nozzles; and
(iv) control means for operating said valve means for connecting said source of pressurized fluid to said nozzle means at predetermined intervals to form said jet of cleaning air, said control means generating a plurality of electrical control signals that are transmitted to said plurality of electrically operated valve means to operate said plurality of valve means in a preprogrammed sequence to cause said plurality of nozzles to emit said cleaning fluid in a predetermined sequence and to cause at least some of said nozzles to be operated at different timed frequencies, whereby said nozzles will produce jets of cleaning air as they pass over selected ones of said openings in said partition plate during said movement of said nozzles over said partition plate.

5,116,396
HYBRID PREPURIFIER FOR CRYOGENIC AIR SEPARATION PLANTS
Ravi Prasad, East Amherst; Frank Notaro, Amherst, and Oscar W. Haas, Cheektowaga, all of N.Y., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.
Continuation-in-part of Ser. No. 350,848, May 12, 1989, Pat. No. 4,934,148. This application Jun. 18, 1990, Ser. No. 539,808
The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.
Int. Cl.[5] F25J *3/02*
U.S. Cl. 62—24 **27 Claims**

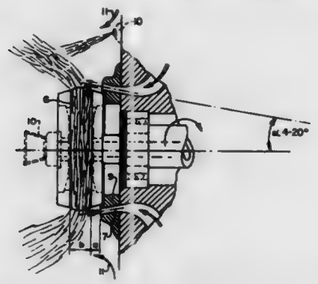


1. An improved system for the production of dry, high purity nitrogen and/or oxygen from air comprising:
(a) a membrane dryer system capable of selectively permeating water and carbon dioxide present in wet feed air, said system comprising separate membrane materials, one adapted for the selective permeation of water from said feed air and the other for the selective permeation of carbon dioxide from said feed air;
(b) a prepurification adsorption system capable of selectively adsorbing residual water, residual carbon dioxide, and other contaminants from dry feed air removed as non-permeate gas from said membrane dryer system;
(c) a cryogenic air separation system for the cryogenic rectification of air, and the production of dry, high purity nitrogen and/or oxygen product gas, together with a dry waste gas;
(d) conduit means for passing relatively dry purge gas to the low pressure permeate side of the membrane dryer system to facilitate the carrying away of water vapor and carbon dioxide from the surfaces of said separate membrane materials of the membrane and maintaining the driving force for removal of water vapor and carbon dioxide through said separate membrane materials of the membrane from the feed air stream for enhanced moisture separation therefrom, said relatively dry purge gas comprising waste or product gas from said cryogenic air separation system and/or the prepurifier adsorption system or ambient air, whereby the provision of purge gas on the permeate side of the membrane dryer system facilitates the desired moisture and carbon dioxide removal with minimum loss of feed air.

5,116,397
FIBRILLATION DEVICE FOR THE MANUFACTURE OF MINERAL WOOL
Tom Nurmi; Lasse Johansson, and Mikael Fjäder, all of Pargas, Finland, assignors to Oy Partek AB, Pargas, Finland
PCT No. PCT/FI88/00050, § 371 Date Nov. 28, 1989, § 102(e) Date Nov. 28, 1989, PCT Pub. No. WO88/07980, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 5, 1988, Ser. No. 411,508
Claims priority, application Finland, Apr. 6, 1987, 871488
Int. Cl.[5] C03B *37/05*
U.S. Cl. 65—14 **7 Claims**

1. A fibrillation device for the manufacture of mineral wool, comprising:
at least one rapidly rotating spinning wheel having an outer

peripheral surface; means for directing a fluid melt to run down onto said outer peripheral surface; and a fixedly attached gap arranged around each said spinning wheel, concentric with and adjacent to each said spinning wheel means for introducing through said gap a stream of air for cooling and transporting molten mineral fibre material thrown out from the outer peripheral surface of each said spinning wheel mainly int he direction of the axes of rotation of each said spinning wheel; said air gap being arranged so as to impart to the air stream a tangential

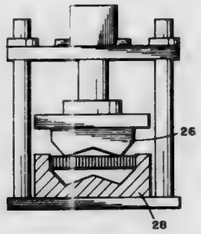


component of motion in the direction of rotation of the respective said spinning wheel said air gap being so arranged, by being inclined in relation to the axis of rotation of the respective spinning wheel, as to impart to said air stream another velocity component which is directed radially outwards in relation to the axis of rotation of the respective spinning wheel so that said air stream forms a conically shaped curtain around the respective spinning wheel with the vertex of the cone located in front of the respective spinning wheels as seen in the direction of flow.

5,116,398
PROCESS FOR FORMING FIBER REINFORCED COMPOSITE ARTICLES

Karl M. Prewo, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 23, 1990, Ser. No. 527,148
Int. Cl.[5] C03C *25/00*
U.S. Cl. 65—18.1 **11 Claims**

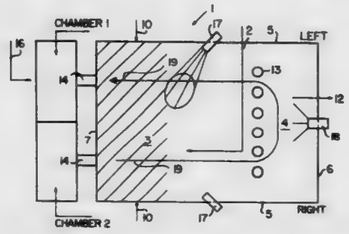


1. A method of manufacturing a glass matrix or glass-ceramic matrix composite article comprising the steps of:
(a) providing a preform composed of a mixture of reinforcing fiber material and glass or glass-ceramic matrix material;
(b) heating the preform external of die means to a temperature sufficiently high to soften the glass or glass-ceramic powder to a deformable state;
(c) deforming the preform in die means defining a shaped die cavity having an initial temperature below that of the preform; and
(d) cooling the deformed preform by the natural loss of heat to the die means resulting in a composite article assuming the configuration of the shaped die cavity.

5,116,399
GLASS MELTER WITH FRONT-WALL OXYGEN-FIRED BURNER PROCESS

Eddy J. Lauwers, Kalmthout, Belgium, assignor to Union Carbide Industrials Gases Technology Corporation, Danbury, Conn.

Filed Apr. 11, 1991, Ser. No. 684,028
Int. Cl.[5] C03B *5/16*
U.S. Cl. 65—135 **13 Claims**



1. In a process for melting glass forming ingredients in a glass melting regenerative or recuperative furnace having a cross-sectional dimension (width) of at least 4 meters, said furnace having an upstream melting zone and a downstream fining zone, wherein the glass forming ingredients introduced to the upstream melting zone through inlet means and the resulting melt travel along a path from the melting zone to the fining zone, said melt being withdrawn from outlet means which communicate with the fining zone, the improvement comprising; providing at least one oxygen-fired flame having a velocity greater than about 100 m/sec at the tip of at least one auxiliary oxy-fuel burner wherein said at least one oxygen-fired flame is directed to impinge on the surface of the melt at about 0.5 to about 2 meters from the front wall of said furnace in a direction which is essentially toward the back wall of said furnace to sweep unmelted glass forming ingredients floating on the surface of the melt in the vicinity of such outlet means to prevent said unmelted glass forming ingredients from entering the outlet means whereby the contamination of said melt withdrawn from said outlet means is avoided or reduced.

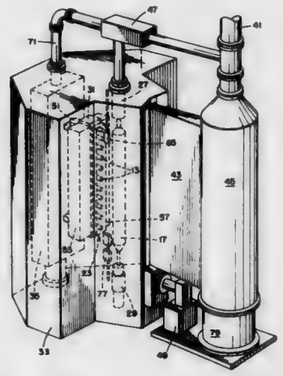
5,116,400
APPARATUS FOR FORMING A POROUS GLASS PREFORM

John S. Abbott, Elmira, N.Y.; Mark C. Bertz, Greenville, S.C.; James H. Faler, Wilmington, N.C.; William Schirmer, III, Wilmington, N.C., and John G. Williams, Wilmington, N.C., assignors to Corning Incorporated, Corning, N.Y.

Filed Sep. 20, 1990, Ser. No. 585,192
Int. Cl.[5] C03B *19/06*
U.S. Cl. 65—144 **16 Claims**

1. Apparatus for forming an elongated, substantially-porous, glass preform comprising:
(a) first means for supporting the preform, maintaining the preform substantially free from unidirectional longitudinal motion and rotating the preform about its longitudinal axis;
(b) an array of burners spaced from the preform, including at least two glass soot depositing burners, for depositing glass soot on the preform; and
(c) second means for oscillating the array of burners along a path substantially parallel to the preform's longitudinal axis such that the travel of each burner in the array has a first limit in one direction and a second limit in the opposite direction, th distance between the first and second limits for each of the burners being less than the usable

length of the preform, wherein said usable length of the preform is the length of said preform having substantially uniform properties and a substantially uniform diameter, and such that each of said soot depositing burners tra-



verses and deposits soot on only a portion of said usable length, said means for oscillating further comprising means for varying the locations at which the array of burners changes directions.

5,116,401
HERBICIDE AND METHOD WITH THE GLYPHOSATE-UREA ADDUCT OF SULFURIC ACID

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 890,076, Jul. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 771,260, Aug. 30, 1985, abandoned, Ser. No. 673,358, Nov. 20, 1984, Pat. No. 4,664,717, Ser. No. 442,296, Nov. 17, 1982, abandoned, Ser. No. 444,667, Nov. 26, 1982, abandoned, and Ser. No. 453,496, Dec. 27, 1982, Pat. No. 4,910,179, which is a continuation-in-part of Ser. No. 331,001, Dec. 15, 1981, Pat. No. 4,402,852, Ser. No. 330,904, Dec. 15, 1981, Pat. No. 4,404,116, Ser. No. 318,629, Nov. 5, 1981, Pat. No. 4,445,925, Ser. No. 318,368, Nov. 5, 1981, Pat. No. 4,447,253, and Ser. No. 318,343, Nov. 5, 1981, Pat. No. 4,397,675. This application Feb. 3, 1989, Ser. No. 306,529
Int. Cl.[5] A01N *57/04, 59/02*
U.S. Cl. 71—86 **22 Claims**

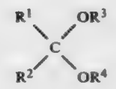
1. A herbicidal composition comprising the glyphosate-urea adduct of sulfuric acid.

5,116,402
HERBICIDAL COMPOSITION CONTAINING DIOXOLANE, DIOXANE, OR DIOXEPANE DERIVATIVES AS ANTIDOTE

Ferenc Dutka; Tamás Komives; Katalin Fodor, née Csorba; Attila Márton; Anikó Csikós, née Gliick; Éva Oxztheimer, all of Budapest; Károly Henger; Róbert Laborczy, both of Balatonfüzfo; Zsuzsanna Réti, née Bosnyak; Dezso Sebok, both of Veszprém; József Szabolcs, Balatonalmádi, and Elemér Tömördi, Peremarton, all of Hungary, assignors to Magyar Tudomanyos Akademia Kozponti Kemiai Kutato Intezete Nitrokemia Inartelenek Fuzfogyartelep, Budapest, Hungary

Continuation of Ser. No. 885,400, Jul. 18, 1986, abandoned, which is a continuation of Ser. No. 658,462, Oct. 9, 1984, abandoned, which is a continuation of Ser. No. 329,121, Dec. 9, 1981, abandoned. This application Mar. 31, 1989, Ser. No. 333,737
Claims priority, application Hungary, Dec. 11, 1980, 2967/80
Int. Cl.[5] A01N *43/30, 37/02, 37/18, 47/28*
U.S. Cl. 71—88 **33 Claims**

1. A herbicidal composition comprising an active amide, urea, thiocarbamate, carbamate herbicide compound, and an antidotally effective amount of a heterocyclic compound having formula I:



I

wherein
R^1 and R^2, independently of each other, are hydrogen, C_{1-6} alkyl, C_{2-6} alkenyl, C_{1-4} cyanoalkyl, C_{1-6} haloalkyl, phenyl-C_{1-4}-haloalkyl, phenyl, halogen-phenyl, C_{1-4}-alkyl-phenyl, C_{1-4}-alkoxyphenyl or; and
R^3 and R^4, together, are C_{2-4}-alkylene, C_4-alkenylene, acetoxy-C_3-alkylene, C_{1-4}-alkoxy-C_3-alkylene, hydroxy-C_3-alkylene or halogen-C_3-alkylene.

5,116,403
TURFGRASS MANAGEMENT COMPOSITION USING A 2-IMIDAZOLE-2-YL NICOTINIC ACID DERIVATIVE COMPOSITION

Prithvi R. Bhalla, East Windsor; Robert M. Herrick, Mercerville, both of N.J., and Donald W. Gates, Yardley, Pa., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 818,591, Jan. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 698,191, Feb. 4, 1985, abandoned. This application Sep. 22, 1989, Ser. No. 411,444
The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.
Int. Cl.[5] A01N *43/50*
U.S. Cl. 71—92 **3 Claims**

1. A composition for retarding growth and suppressing seedheading in turfgrasses, comprising a solid or liquid diluent and a sufficient amount for retarding growth and suppressing seedheading in turfgrasses of 5-ethyl-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl) nicotinic acid in combination with 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl) nicotinic acid or a salt thereof; wherein the amount of 5-ethyl-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl) nicotinic acid provides an application rate of about 5 grams per hectare to about 140 grams per hectare and the amount of 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl) nicotinic acid or the salt thereof provides an application rate of about 0.1 gram per hectare to about 20 grams per hectare; with the proviso that when 5-ethyl-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl) nicotinic acid is present in an amount that provides a rate of 18 grams per hectare to 105 grams per hectare, then 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl) nicotinic acid or the salt thereof must be present in an amount that provides a rate of less than 2 grams per hectare or greater than 5 grams per hectare; and

with the further proviso that when 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl) nicotinic acid or the salt thereof is present in an amount that provides a rate of 2 grams per hectare to 5 grams per hectare, then 5-ethyl-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl) nicotinic acid must be present in an amount that provides a rate of less than 18 grams per hectare or greater than 105 grams per hectare.

5,116,404

URACIL DERIVATIVES AND PESTICIDES CONTAINING THE SAME AS ACTIVE INGREDIENT

Shigeru Iahii, Funabashi; Kazunari Nakayama; Kazuo Yagi, both of Narashino; Jun Satow, Funabashi; Kenzou Fukuda, Funabashi; Kaoru Itoh, Funabashi; Toshiyuki Umehara, Kuki; Masaki Kudo; Yoichi Inoue, both of Urawa; Tsutomu Nawamaki, Yono, and Shigeomi Watanabe, Omiya, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

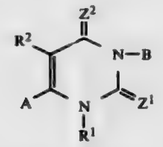
Filed Jan. 8, 1991, Ser. No. 638,811

Claims priority, application Japan, Jan. 18, 1990, 2-8826; Mar. 5, 1990, 2-53450; Nov. 28, 1990, 2-327671

Int. Cl.[5] A01N *43/54, 43/10;* **C07D** *239/95, 239/96*

U.S. Cl. 71—92 **13 Claims**

1. Uracil derivatives represented by formula (I):



(I)

wherein R^1 represents hydrogen atom, C_{1-4} alkyl group, C_{2-4} alkenyl group, C_{2-4} alkynyl group, C_{1-4} haloalkyl group, C_{2-4} alkoxyalkyl group, formyl group, C_{2-6} alkylcarbonyl group, C_{2-6} alkoxycarbonyl group, C_{3-6} alkoxycarbonylalkyl group, C_{2-6} cyanoalkyl group, benzyl group, phenyl group, $—SR^{12}$ group

wherein R^{12} is C_{2-6} alkoxycarbonyl group, C_{1-6} alkylsulfonyl group, $—NR^{13}R^{14}$ group

wherein R^{13} is C_{1-6} alkyl group and R^{14} is C_{1-6} alkyl group, C_{2-6} alkoxycarbonyl group C_{3-9} alkoxycarbonylalkyl group, C_{1-6} alkylsulfonyl group, C_{2-6} alkylcarbonyl group, C_{3-9} dialkylaminocarbonyl group and C_{2-6} dialkylaminosulfonyl group

or phenyl group which may be substituted or non-substituted,

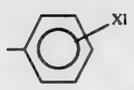
the substituent is selected from halogen atom, cyano group, nitro group, C_{1-4} alkyl group, C_{1-4} haloalkyl group, C_{1-4} alkoxy group, C_{2-6} alkoxycarbonyl group, C_{1-4} haloalkoxy group, C_{2-6} haloalkoxycarbonyl group, C_{2-6} alkylcarbonyl group, C_{2-6} haloalkylcarbonyl group, C_{1-4} alkylsulfonyl group or C_{1-4} haloalkyl sulfonyl group, and when the number of the substituents is not less than 2, the substituents may be same or different,

alkali metal or alkaline earth metal;

R^2 represents hydrogen atom, halogen atom, C_{1-4} alkyl group, C_{1-4} haloalkyl group, C_{1-4} hydroxyalkyl group, C_{2-4} alkoxyalkyl group, C_{2-4} alkylthioalkyl group, thiol group, C_{1-4} alkylthio group, C_{1-4} alkylsulfinyl group, C_{1-4} alkylsulfonyl group, C_{1-4} haloalkylthio group, C_{1-4} haloalkylsulfinyl group, C_{1-4} haloalkylsulfonyl group, hydroxyl group, C_{1-4} alkoxy group, C_{1-4} haloalkoxy group, formyl group, cyano group, nitro group or thiocyanate group;

Z^1 and Z^2 represent independently oxygen atom, sulfur atom or imino group;

A represents



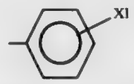
wherein X is halogen atom, C_{1-4} alkyl group, C_{1-4} alkoxy group, C_{1-4} alkylthio group, C_{1-4} haloalkyl group, C_{1-4} haloalkoxy group, C_{1-4} haloalkylthio group, amino group, cyano group or nitro group, and l is an integer of 0 to 5, and when l is an integer of 2 to 5 the substituents X may be same or different,

naphthyl group furyl group, thienyl group, pyrrolyl group, pyrazolyl group, imidazolyl group, thiazolyl group, isothiazolyl group, oxazolyl group, isoxazolyl group, oxadiazolyl group, thiadiazolyl group, triazolyl group, pyridyl group, pyridazyl group, pyrimidyl group or pyrazyl group, any of which may be substituted or non-substituted,

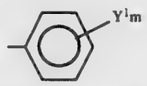
the substituent of the above aromatic groups is selected from halogen atom, C_{1-4} alkyl group, C_{1-4} alkoxy group, C_{1-4} alkylthio group, C_{1-4} haloalkyl group, C_{1-4} haloalkoxy group, C_{1-4} haloalkylthio group, amino group, cyano group and nitro group, and when the number of the substituents is not less than 2, these substituents may be same or different,

C_{1-6} haloalkyl group containing one or more fluorine atoms, halogen atom, cyano group, nitro group, C_{1-6} alkylthio group, C_{1-6} alkylsulfinyl group, C_{1-6} alkylsulfonyl group, C_{1-6} haloalkylthio group, C_{1-6} haloalkylsulfinyl group, C_{1-6} haloalkylsulfonyl group, C_{1-6} alkoxy group, C_{1-6} haloalkoxy group, or C_{2-6} alkoxycarbonyl group; and

when A is



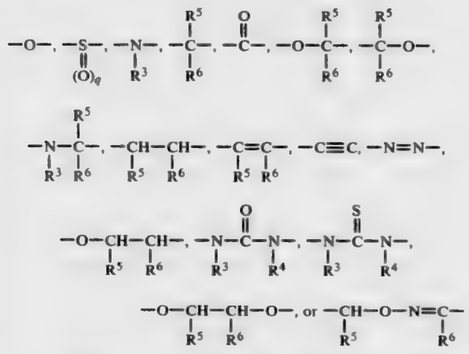
where X and l are as defined above, or a naphthyl group, furyl group, thienyl group, pyrrolyl group, pyrazolyl group, imidazolyl group, thiazolyl group, isothiazolyl group, oxazolyl group, isoxazolyl group, oxadiazolyl group, thiadiazolyl group, triazolyl group, pyridyl group, pyridazyl group, pyrimidyl group or pyrazyl group, any of which may be substituted as defined above, B is



wherein Y^1 is halogen atom, C_{1-6} alkyl group, C_{2-6} alkenyl group, C_{2-6} alkynyl group, C_{3-6} cycloalkyl group, C_{1-6} haloalkyl group, C_{2-6} haloalkenyl group, C_{2-6} haloalkynyl group, C_{3-6} halocycloalkyl group, C_{2-6} cyanoalkyl group, C_{1-6} hydroxyalkyl group, C_{2-6} carboxyalkyl group, C_{1-6} alkoxy group, C_{2-6} alkenyloxy group, C_{2-6} alkynyloxy group, C_{3-6} cycloalkyloxy group, C_{1-6} haloalkoxy group, C_{2-6} haloalkenyloxy group, C_{2-6} haloalkynyloxy group, C_{3-6} halocycloalkoxy group, C_{4-7} halocycloalkylalkoxy group, C_{1-6} alkylthio group, C_{2-6} alkenylthio group, C_{2-6} alkynylthio group, C_{3-6} cycloalkylthio group, C_{1-6} haloalkylthio group, C_{1-6} alkylsulfinyl group, C_{2-6} alkenylsulfinyl group, C_{2-6} alkynylsulfinyl group, C_{3-6} cycloalkylsulfinyl group, C_{1-6} haloalkylsulfinyl, C_{1-6} alkylsulfonyl group, C_{2-6} alkenylsulfonyl group, C_{2-6} alkynylsulfonyl group, C_{3-6} cycloalkylsulfonyl group, C_{1-6} haloalkylsulfonyl group, C_{2-6} alkoxyalkyl group, C_{2-6} alkoxyalkoxy group, C_{2-6} haloalkoxyalkyl group, C_{2-6} haloalkoxyalkoxy group, C_{2-6} alkylthioalkyl group, C_{2-6} alkylthioalkoxy group,

C_{3-6} alkoxycarbonylalkyl group, C_{3-6} alkylcarbonylalkyl group, C_{2-6} alkoxycarbonyloxy group, C_{2-6} alkylcarbonyl group, C_{3-6} alkenylcarbonyl group, C_{3-6} alkynylcarbonyl group, C_{4-7} cycloalkylcarbonyl group, C_{2-6} haloalkylcarbonyl group, C_{2-6} alkoxycarbonyl group, C_{2-6} haloalkoxycarbonyl group, C_{3-6} alkoxycarbonylalkoxy group, nitro group, cyano group, hydroxyl group, carboxyl group, thiocyanate group, isothiocyanate group, C_{2-6} thiocyanatealkyl group, C_{1-6} alkylsulfonyloxy group, C_{2-6} alkylthiocarbonyl group, amino group ($—NR^3R^4$), aminocarbonyl group ($—CONR^3R^4$), aminocarbonyloxy group ($—OCONR^3R^4$), amide group ($—NR^3COR^4$), alkoxycarbonylamino group ($—NR^3CO_2R^4$), aminosulfonyl group ($—SO_2NR^3R^4$), thioamide group ($—NR^3CSR^4$), methylenedioxy group, halomethylenedioxy group, ethylenedioxy group, haloethylenedioxy group, trimethylsilyl group of $—W_nAr$ group

wherein W is



in which R^3 and R^4 represent independently hydrogen atom, C_{1-6} alkyl group, C_{2-6} alkenyl group, C_{2-6} alkynyl group, C_{1-6} haloalkyl group, C_{2-6} haloalkenyl group, C_{2-6} haloalkynyl group, C_{2-6} alkylcarbonyl group, C_{2-6} alkoxycarbonyl group, phenyl group or benzyl group; R^5 and R^6 represent independently hydrogen atom, halogen atom, C_{1-6} alkyl group, C_{3-6} cycloalkyl group, cyano group, or phenyl group; and q is an integer of 0 to 2;

n is an integer of 0 or 1; and Ar is phenyl group, naphthyl group, furyl group, thienyl group, pyrrolyl group, pyrazolyl group, imidazolyl group, thiazolyl group, isothiazolyl group, oxazolyl group, isoxazolyl group, oxadiazolyl group, thiadiazolyl group, triazolyl group, pyridyl group, pyridazyl group, pyrimidyl group, pyrazyl group, quinolyl group or quinoxalyl group, any of which may be substituted or non-substituted,

the substituent of the above aromatic groups is selected from halogen atom, cyano group, nitro group, C_{1-4} alkyl group, C_{1-4} haloalkyl group, C_{1-4} alkoxy group, C_{1-4} haloalkoxy group, C_{1-4} alkylthio group, C_{1-4} haloalkylthio group, C_{1-4} alkylsulfonyl group, C_{1-4} haloalkylsulfonyl group, C_{2-4} alkoxycarbonyl group, carboxyl group, amino group, C_{1-4} monoalkylamino group, C_{2-8} dialkylamino group, phenyl group, benzyl group, methylenedioxy group or halomethylenedioxy group, and when the number of the substituents is not less than 2, the substituents may be same or different;

and m is an integer of 0 to 5, and when it is 2 to 5, the substituents Y^1 may be same or different,

naphthyl group, furyl group, thienyl group, pyrrolyl group, pyrazolyl group, imidazolyl group, thiazolyl group, isothiazolyl group, oxazolyl group, isoxazolyl group, thiadiazolyl group, oxadiazolyl group, triazolyl group, pyridyl group, pyridazyl group, pyrimizyl group, pyrazyl group, quinolyl group, quinoxalyl group, benzofuryl group, benzothienyl group, indolyl group, benzoxazolyl group or benzothiazolyl group, any of which may be substituted or non-substituted,

the substituent of the above aromatic groups is selected from halogen atom, cyano group, nitro group, C_{1-4} alkyl group, C_{1-4} haloalkyl group, C_{1-4} alkoxy group, C_{1-4} haloalkoxy group, C_{1-4} alkylthio group, C_{1-4} haloalkylthio group, C_{1-4} alkylsulfonyl group, C_{1-4} haloalkylsulfonyl group, C_{2-4} alkoxycarbonyl group, carboxyl group, amino group, C_{1-4} monoalkylamino group, C_{2-8} dialkylamino group, phenyl group, phenoxy group or benzyl group, and when the number of the substituents is 2 or more, the substituents may be same or different, and

when A is C_{1-6} haloalkyl group containing one or more fluorine atoms, halogen atom, cyano group, nitro group, C_{1-6} alkylthio group, C_{1-6} alkylsulfinyl group, C_{1-6} alkylsulfonyl group, C_{1-6} haloalkylthio group, C_{1-6} haloalkylsulfinyl group, C_{1-6} haloalkylsulfonyl group, C_{1-6} alkoxy group, C_{1-6} haloalkoxy group or C_{2-6} alkoxycarbonyl group, B is



wherein Y^2 is halogen atom, C_{1-4} alkyl group, C_{1-4} alkoxy group, C_{1-4} haloalkyl group, C_{1-4} haloalkoxy group, C_{1-4} alkylthio group, C_{1-4} haloalkylthio group, C_{1-4} alkylsulfinyl group, C_{1-4} haloalkylsulfinyl group, C_{1-4} alkylsulfonyl group, C_{1-4} haloalkylsulfonyl group, sulfonamide group, C_{2-4} alkenyl group, C_{2-4} haloalkenyl group, amino group, C_{1-4} monoalkylamino group, C_{2-8} dialkylamino group, C_{2-6} alkoxyalkoxy group, C_{2-6} alkoxycarbonyl group, cyano group or nitro group, and r is an integer of 3 to 5,

the substituents Y^2 may be same or different, and when r=3 with the substituents at the 2-, 4- and 5-positions, the substituent Y^2 at the 5-position is not C_{1-4} alkoxy group, C_{1-4} haloalkoxy group, C_{2-6} alkoxyalkoxy group or C_{2-6} alkoxycarbonyl group,

provided that A is not a phenyl group or a 3-bromo-4-methoxyphenyl group when B is a phenyl group.

5,116,405

PYRIDINESULFONAMIDE DERIVATIVES AND HERBICIDES

Kenzi Makino; Katsushi Morimoto; Shigeaki Akiyama; Hideaki Suzuki; Takeshi Nagaoka, all of Funabashi; Koichi Suzuki, Shiraoka; Tsutomu Nawamaki, Shiraoka, and Shigeomi Watanabe, Shiraoka, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

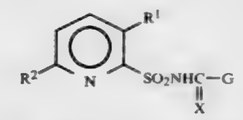
Filed Oct. 31, 1990, Ser. No. 606,311

Claims priority, application Japan, Nov. 6, 1989, 1-288313; Jun. 11, 1990, 2-152325; Sep. 11, 1990, 2-240264

Int. Cl.[5] A01N *43/40;* **C07D** *401/12*

U.S. Cl. 71—94 **24 Claims**

1. A pyridinesulfonamide derivative of the formula (I) and a salt thereof:



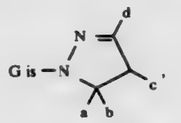
(I)

wherein R^1 is a halogen atom, a trifluoromethyl group, a C_1–C_6 alkoxycarbonyl group, a C_1–C_6 mono- or di-alkylaminocarbonyl group, a C_1–C_6 alkoxy group, a C_1–C_6 alkylsulfonyl group, a C_1–C_6 alkylthio group, a C_1–C_6 alkyl

group substituted by a C_1–C_6 alkoxy group, a C_1–C_6 alkyl group substituted by a C_1–C_6 mono- or poly-halogenoalkoxy group, a C_1–C_6 mono- or poly-halogenoalkoxy group, a C_1–C_6 mono- or di-alkylaminosulfonyl group, a C_1–C_6 alkoxyaminosulfonyl group substituted by a C_1–C_6 alkyl group, a nitro group, a C_1–C_6 alkyl group substituted by a C_1–C_6 alkylthio a C_1–C_6 alkyl group Substituted by a C_1–C_6 group, a C_1–C_6 alkyl group substituted by a C_1–C_6 alkylsulfonyl group, or a C_1–C_6 alkyl group substituted by a C_1–C_6 alkoxycarbonyl group;

R^2 is a hydrogen atom or a halogen atom;

X is a oxygen atom or a sulfur atom; and



wherein each of a, b, c and d independently represents a hydrogen atom, a C_1–C_6 alkyl group, a C_2–C_6 alkenyl group, a C_2–C_6 alkynyl group, a C_1–C_6 alkyl group mono- or poly-substituted by a halogen atom, a C_1–C_6 alkoxy group, a C_1–C_6 alkyl group substituted by a C_1–C_6 alkoxy group, a C_1–C_6 alkoxycarbonyl group, a C_1–C_6 alkyl group substituted by a C_1–C_6 alkylthio group, a C_1–C_6 alkyl group substituted by a C_1–C_6 alkylsulfonyl group, a C_1–C_6 alkylthio group, a C_1–C_6 alkylcarbonyl group, a C_3–C_7 cycloalkyl group, a C_3–C_7 cycloalkenyl group, a cyano group, or a phenyl or benzyl group which may be mono- or poly-substituted by a halogen atom, a trifluoromethyl group, a C_1–C_6 alkyl group, a C_1–C_6 alkoxy group, a C_1–C_6 alkoxycarbonyl group or a nitro group.

5,116,406

PLANT GROWTH REGULATING COMPOSITION

Suong B. Hyeon, Urawa, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jun. 19, 1990, Ser. No. 540,062

Claims priority, application Japan, Jun. 20, 1989, 1-155629

Int. Cl.[5] A01N *41/04, 33/12*

U.S. Cl. 71—103 **3 Claims**

1. A plant growth promoting composition, which comprises plant growth promoting effective amounts of choline chloride, and at least one of vitamin K_3 compounds selected from the group consisting of menadione sodium hydrogen sulfite, menadione dimethylpyrimidinol hydrogen sulfite, and salts thereof.

5,116,407

ANTIFOULING COATINGS

Julian E. Hunter, Newcastle-upon-Tyne; James Reid, Tyne and Wear, both of Great Britain; David E. J. Arnold; George Hails, both of Newcastle-upon-Tyne, United Kingdom; Kenneth F. Baxter, Sunderland, United Kingdom; Andrian F. Andrews, and Michael J. Nunn, both of Hexham, United Kingdom, assignors to Courtaulds Coatings Limited, United Kingdom

Filed Oct. 10, 1989, Ser. No. 418,852

Claims priority, application United Kingdom, May 12, 1989, 8910970; Oct. 13, 1989, 8924003

Int. Cl.[5] C09D *4/00*

U.S. Cl. 106—16 **8 Claims**

1. An antifouling coating composition comprising a pigment and a binder containing acid groups, the composition including an ingredient having marine biocidal properties, in which said binder is a film-forming addition copolymer of an acid-functional monomer and one or more comonomers which are unreactive with acid groups, which acid groups are blocked by a hydrolysable blocking group, said hydrolysable blocking group being a monoamine group which forms an organic-solvent-soluble amine salt of the film-forming addition copolymer.

5,116,408

WATER-BASED WOOD STAIN

Veva W. Crozer, 19 Rockwood La., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 329,017, Mar. 27, 1989, Pat. No. 4,976,782. This application Dec. 5, 1990, Ser. No. 622,429

The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.

Int. Cl.[5] C09D *15/00*

U.S. Cl. 106—19 **10 Claims**

1. A composition for use as a wood stain comprising, by weight of the total composition, about 0.5% to about 35% of a water based flexographic printing ink, about 2.5% to about 12.4% of a glycol, about 10% to about 50% of a system binder, and about 10% to about 50% water, wherein said water-based flexographic printing ink is comprised of an alkaline solution of an acidic resin and at least one pigment dispersed in said resin.

5,116,409

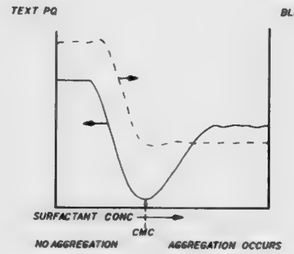
BLEED ALLEVIATION IN INK-JET INKS

John R. Moffatt, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 17, 1991, Ser. No. 686,731

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—22 **18 Claims**



1. A process for reducing color bleed in inks employed in thermal ink-jet printing, comprising printing a first ink on a medium followed by substantially simultaneously printing a second ink adjacent thereto, each said ink having the following composition:

(a) a vehicle; and

(b) about 0.1 to 10 wt% of at least one water-soluble anionic dye dissolved therein,

wherein said vehicle comprises (1) at least one member selected from the group consisting of zwitterionic surfactants and non-ionic amphiphiles, present in an amount that is at least equal to its critical micelle concentration; (2) 0 to about 20 wt% of at least one organic solvent which supports the micelle formation of said at least one member; and (3) the balance water, whereby invasion of one color by another is avoided.

5,116,410

WASHABLE DYE-CONTAINING COMPOSITION

Richard E. Miller, Nazareth, Pa., assignor to Binney & Smith Inc., Easton, Pa.

Continuation-in-part of Ser. No. 335,272, Apr. 10, 1989, abandoned. This application Nov. 5, 1990, Ser. No. 613,922

Int. Cl.[5] C09D *11/16*

U.S. Cl. 106—22 **16 Claims**

1. A washable dye-containing composition for imparting color to a surface comprising:

(a) an acid dye,

(b) a dye vehicle, and

(c) an aromatic organic sulfonate, other than an alkyl benzene sulfonate, in an amount of at least about 10% by weight of the composition, said amount of sulfonate being sufficient to enhance the fugitivity of said composition from skin and fabric.

5,116,411

PRINTING INK

Michael W. O'Neill, Abbotsford, Canada, and Gerald Sugerman, Allendale, N.J., assignors to Topex Company, British West Indies

Filed Dec. 22, 1989, Ser. No. 456,112

Int. Cl.[5] C09D *11/00, 11/08*

U.S. Cl. 106—22 **21 Claims**

1. A composition useful for enhancing the performance of printing ink which comprises an admixture comprising an organophosphate-titanate and an orgaophosphate-zirconate and a resin or resin precursor vehicle.

5,116,412

INTERNAL MOULD RELEASE COMPOSITIONS

Roberto Frigo, and Gian-Carlo Bagaglio, both of Varese, Italy, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Continuation of Ser. No. 551,799, Jul. 12, 1990, abandoned. This application Jun. 26, 1991, Ser. No. 723,658

Claims priority, application United Kingdom, Jul. 20, 1989, 8916573

Int. Cl.[5] B28B *7/38*

U.S. Cl. 106—38.24 **7 Claims**

1. An internal mold release composition comprising:

a) from 5% to 95% by weight of a metal salt of an organic acid, said metal salt having mold release properties and

b) from 5% to 95% by weight of a polyol and wherein the metal salt is in the form of homogeneously dispersed solid particles having a diameter of up to 200μ with the proviso that a compatibilizer comprising a member selected from the group consisting of nitrogen-containing, isocyanate-reactive, acyclic compounds and nitrogen containing, isocyanate-reactive polymers and tertiary amines is not present in a compatibilizing amount.

5,116,413

PROCESS AND SEALING AGENT FOR PRODUCING A WATERTIGHT AND/OR GASTIGHT BUSHING OF LINES IN A WATER-RESISTANT AND/OR GAS-BLOCKING WALL, AND DEVICE FOR USE THEREOF

Franciscus P. M. Nooren, Stadskanaal, Netherlands, assignor to Waterproof Coatings S.A., Luxembourg, Luxembourg

Continuation of Ser. No. 360,354, Jun. 2, 1989, abandoned. This application Jun. 11, 1991, Ser. No. 713,576

Claims priority, application Netherlands, Jun. 3, 1988, 8801436

Int. Cl.[5] C08L *1/00, 3/00, 5/00*

U.S. Cl. 106—212 **8 Claims**

1. Sealing agent for producing a watertight bushing of one or more lines through a water-resistant wall, comprising an intimate mixture of 5–70% by weight of a high molecular substance capable of swelling in water selected from the group consisting of water-swellable clay minerals, water-swellable polysaccharides, water-swellable polysaccharide derivatives, starches, starch derivatives, polyalkalene oxides, polyvinyl alcohol, polyvinylpyrrolidone and polyacrylates and 30–95% by weight of a viscous hydrophobic substance capable of becoming less viscous upon heating, selected from the group consisting of tar, bitumen and vaseline, said mixture having the character of a permanently deformable, plastic paste, said mixture also containing a hydrophilic substance selected from the group consisting of water and polyhydric alcohols in an amount greater than 0% and not exceeding 4% by weight of the mixture.

5,116,414

LONG-TERM CONTROL OF ROOT GROWTH

Frederick G. Burton, West Richland; Dominic A. Cataldo, Kennewick; John F. Cline, Prosser, and W. Eugene Skiens, Richland, all of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Continuation-in-part of Ser. No. 314,809, Oct. 26, 1981, abandoned, and a continuation-in-part of Ser. No. 314,810, Oct. 26, 1981, abandoned. This application Nov. 23, 1983, Ser. No. 555,113

Int. Cl.[5] A01N *33/06, 33/18*

U.S. Cl. 71—121 **25 Claims**

1. A method for preventing roots of plants from intruding into a zone of soil below the surface of said soil, without killing said plants, said method comprising the following steps:

(a) incorporating a herbicidal 2,6-dinitroaniline into a polymer to form a controlled release device, the release rate and the amount of said 2,6-dinitroaniline being sufficiently large to maintain for an extended period of time said zone at a concentration of said 2,6-dinitroaniline sufficiently high to prevent roots of said plants from intruding into said zone of soil but sufficiently low to prevent killing of the plants;

(b) inserting at least one controlled release device into said zone of soil;

(c) allowing said 2,6-dinitroaniline to release into the zone to maintain for an extended period of time the concentration of said 2,6-dinitroaniline in said zone sufficiently high to prevent roots of plants from intruding into said zone of soil, but sufficiently low to prevent killing the plants whose roots are prevented from intruding into said zone of soil.

5,116,415

METAL VALUE RECOVERY OR REMOVAL FROM AQUEOUS MEDIA

Robert W. Rinehart, Arvada, Colo., assignor to AQS, Inc., Englewood, Colo.

Continuation-in-part of Ser. No. 411,816, Sep. 25, 1989, abandoned, and a continuation-in-part of Ser. No. 411,999, Sep. 25, 1989, abandoned, and a continuation-in-part of Ser. No. 411,876, Sep. 25, 1989, abandoned, and a continuation-in-part of Ser. No. 411,877, Sep. 25, 1989, abandoned. This application Sep. 25, 1990, Ser. No. 588,134

Int. Cl.[5] B01D *15/00*

U.S. Cl. 75—711 **35 Claims**

1. The process of recovering metal values comprising contracting an aqueous feedstock containing water and metal values with a hydrophilic hydrogen having a swelling factor of 100-400 upon absorption of water, and collecting the water and metal values with the hydrogel.

5,116,416

BORON-TREATED HARD METAL

Jack D. Knox, and Donald C. Pennington, Jr., both of Louisville, Ky., assignors to Vermont American Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 317,612, Mar. 6, 1989, Pat. No. 4,961,780, which is a continuation-in-part of Ser. No. 211,197, Jun. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 167,000, Mar. 11, 1988, abandoned. This application Oct. 9, 1990, Ser. No. 593,999

The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.

Int. Cl.[5] C22C *29/02*

U.S. Cl. 75—238 11 Claims



1. A cemented carbide body, comprising:
a tungsten carbide phase;
a nickel binder phase; and
a third phase comprising nickel, tungsten, boron, and carbon.

5,116,417

COMPOSITION AND METHOD FOR AGGLOMERATING ORE

Daniel D. Walker, Jr., and Joseph Oliphant, both of Henderson, Nev., assignors to Chemical Lime Company, Fort Worth, Tex.

Division of Ser. No. 322,557, Mar. 13, 1989, abandoned. This application May 21, 1990, Ser. No. 528,350

Int. Cl.[5] C22B *1/08*

U.S. Cl. 75—327 4 Claims

1. A heap leach bed which is leached with an aqueous cyanide leaching agent for recovering gold and silver metals, comprising:
granulated ore containing precious metal values selected from the group consisting of gold and silver metals;
a binder composition in an amount of 0.001 to 2.000% by weight of ore mixed with the granulated ore, the binder composition comprising:
10 to 80% by weight lime;
10 to 80% by weight gypsum;
5 to 50% by weight fly ash; and
water added to the mixture of granulated ore and binder composition in an amount effective to form an agglomerated ore; and
wherein said fly ash is low carbon fly ash having less then 0.5% by weight carbon.

5,116,418

PROCESS FOR MAKING STRUCTURAL AGGREGATE PIGMENTS

Adam F. Kaliski, East Windsor, N.J., assignor to Industrial Progress Incorporated, East Windsor, N.J.

Continuation of Ser. No. 341,791, Apr. 21, 1989, abandoned, which is a continuation of Ser. No. 158,871, Feb. 22, 1988, abandoned, which is a continuation of Ser. No. 96,391, Sep. 14, 1987, abandoned, which is a division of Ser. No. 926,011, Oct. 31, 1986, abandoned, which is a continuation of Ser. No. 677,391, Dec. 3, 1984, abandoned. This application Oct. 12, 1989, Ser. No. 420,388

Int. Cl.[5] C04B *14/00*

U.S. Cl. 106—419 22 Claims

1. A process for the manufacture of single-component and multicomponent structural aggregate pigment products from particulate matter, said particulate matter being selected from the group consisting of naturally occurring and synthetic minerals, non film forming organic emulsion polymers, latex adhesives, and color pigments treated with complex functional microgels, comprising the steps of:
(a) preparing, in-situ, a subcolloidal reactive hydrosol by blending aqueous solutions, one of which contains at leas one compound selected from the group consisting of alkali-metal silicates and quaternary ammonium silicates in amounts of from 0.1% to 2.0%, by weight, and the other of which contains at least one compound selected from the group consisting of alkali-metal aluminates and alkali-metal zincates in amounts of from 0.1% to 2.0% by weight, each in an aqueous dispersion of quantitatively predominant particulate matter wherein the ratio of silicate to aluminate or zincate is from 10:1 to 1:10;
(b) blending an aqueous solution containing at least one gel-setting agent selected from the group consisting of bivalent and multivalent inorganic salts in amounts of from 0.5% to 10.0%, by weight, and organic cationically-active chemical compounds with at least two reactive groups in each molecule in amounts of from 0.1% to 5.0%, by weight, with the resultant system from step (a) to crosslink the in-situ formed subcolloidal reactive hydrosol and synthesize said complex functional microgels, wherein the particulate matter flocculates instantaneously, indiscriminately and completely to form a structural aggregate pigment product; and
(c) recovering said structural aggregate pigment product from step (b).

5,116,419

PROCESS FOR THE PREPARATION OF MAGNETIC IRON OXIDES AND THE PIGMENTS OBTAINED THEREFROM

Hendrik Kathrein, and Peter Kiemle, both of P.O. Box 166, Bayer AG, D 4150 Krefeld-Uerdingen, Fed. Rep. of Germany

Filed Dec. 11, 1989, Ser. No. 448,505

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843848; Apr. 4, 1989, 3910782

Int. Cl.[5] C09C *1/22*

U.S. Cl. 106—459 14 Claims

1. Process for the preparation of magnetic iron oxide pigments which comprises coating a magnetic iron oxide core particle material having the composition FeO_x, wherein x is from 1.33 to 1.5, in a first step with a preliminary coating of a cobalt-containing bertholloid material or a material having the composition $Co_xFe^{II}_{1-x}Fe^{III}_2O_4$ wherein x is greater than zero but less than or equal to 1 and then in a second step the preliminary coated particle is coated with a cobalt compound.

5,116,420

HOMOGENEOUS COMPOSITION OF CEMENTITIOUS AND TAR COMPONENTS AND PROCESS FOR FORMING SHAPED ARTICLES THEREFROM

John F. Schneider, and Kurt A. Schneider, both of 3956-200th St. E., Farmington, Minn. 55024

Filed Sep. 7, 1990, Ser. No. 578,882

Int. Cl.[5] C04B *22/16*

U.S. Cl. 106—640 44 Claims

1. A concrete composition formed from a combination of ingredients, comprising:
(a) about 0–85 weight percent aggregate;
(b) about 7–90 weight percent dry cement;
(c) about 0–50 weight percent fly ash; and
(d) about 3–10 weight percent aqueous premix;
wherein the aqueous premix is a highly dispersed mixture of water, an emulsifier system, sodium tripolyphosphate and a tar component, the tar component is from about 0.1–25 weight percent of the aqueous premix, the sodium tripolyphosphate is present at about 0.5 to 180 ppm relative to the weight of the aqueous premix and the weight percents of ingredients (a)-(d) are relative to the total weight of the composition.

5,116,421

HIGH TEMPERATURE FLUID LOSS ADDITIVE FOR CEMENT SLURRY AND METHOD OF CEMENTING

Kalyan K. Ganguli, The Woodlands, Tex., assignor to The Western Company of North America, Houston, Tex.

Filed Dec. 12, 1990, Ser. No. 626,572

Int. Cl.[5] C04B *7/35;* E21B *33/14*

U.S. Cl. 106—823 33 Claims

1. A cementing composition useful in cementing a casing in a high temperature well wherein the temperature ranges from about 200° F. to about 500° F. comprising:
(a) aqueous fluid;
(b) hydraulic cement; and
(c) a fluid loss additive comprised of a copolymer of (1) in the range of about 5 to about 95 weight percent of 2-acrylamido-2-methylpropane-3-sulphonic acid; (2) in the range of about 5 to about 95 weight percent of a vinylacylamide; and (3) in the range of about 0 to about 80 weight percent of acrylamide.

5,116,422

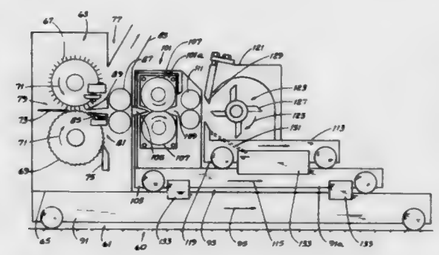
SUGARCANE SEPARATOR CONFIGURATION

Syndey E. Tilby, 4688 Boulderwood Drive, Victoria, B.C., Canada V8Y 2P8

Filed Jan. 4, 1991, Ser. No. 637,500

Int. Cl.[5] B02C *9/04*

U.S. Cl. 127—2 12 Claims



1. In an apparatus for sugarcane separation of the type having means to split sugarcane billets, means for removing pith from the rinds of split billets, and means for removing dermax from such rinds, such apparatus including a central unit with a pair of upwardly pivotable wings on either side thereof, the improvement comprising a primary carriage adjacent to the central unit and movable into and out of a rind-receiving relationship with one of the wings, such primary carriage having the dermax-removing means thereon for receiving depithed rind from the central unit.

5,116,423

APPARATUS FOR WASHING PULP

Seppo K. Kokkonen, and Harri T. Qvintus, both of Savonlinna, Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

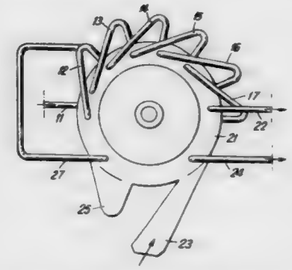
Continuation-in-part of Ser. No. 28,273, Mar. 20, 1987, Pat. No. 4,919,158. This application Feb. 26, 1990, Ser. No. 485,134

Claims priority, application Finland, Mar. 20, 1986, 861167

Int. Cl.[5] D21C *9/06*

U.S. Cl. 134—15 13 Claims

1. An apparatus for countercurrent washing of pulp, where the pulp moves in a first direction and a washing liquid moves in a second direction, said second direction being substantially opposite to said first direction and where washing is performed in a number of washing stages, the apparatus comprising:
a liquid pervious support surface for the pulp to be washed;
means for feeding washing liquid to a pulp layer;
means for collecting the liquid being displaced from said pulp layer;
means for separating a number of washing stages from each other arranged outside the pulp layer with respect to said liquid pervious surface;



means for dividing the liquid being displaced from at least one of the washing stages into at least two partial flows;
means for guiding said partial flows separately to a preceding washing stage; and
means for introducing said partial flows to the pulp layer in said preceding washing stage in a corresponding order as received from a washing stage, so that at least two washing phases have been created.

5,116,424

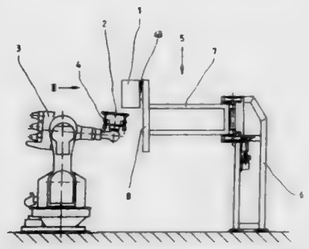
PROCESS FOR CLEANING VEHICLE PARTS, IN PARTICULAR GLASS PANES OF VEHICLES

Wilhelm Steinhart, Friedberg; Mohann Maischberger, Dinkelscherben; Thomas Biewald, Memmingen, and Gerwin Berens, Augsburg, all of Fed. Rep. of Germany, assignors to KUKA Schweissanlagen & Roboter GmbM, Augisburg, Fed. Rep. of Germany

Division of Ser. No. 504,583, Apr. 4, 1990, Pat. No. 5,046,211. This application Jun. 11, 1991, Ser. No. 713,751

Int. Cl.[5] B08B *1/02, 7/00;* A47L *25/00*

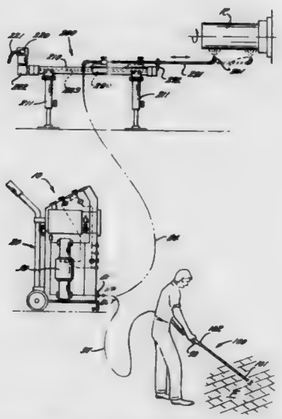
U.S. Cl. 134—15 7 Claims



1. A process for automatically cleaning vehicle parts, including vehicle glass panes, for preparation for subsequent treatment and/or installation processes, using a cleaning device with a wiping element and a multiaxial manipulator for preparing and positioning the vehicle part, comprising the steps of: moving the vehicle part held by the multiaxial manipulator relative to the wiping element; providing a plurality of wiping surfaces associated with said wiping element and cyclically changing a wiping surface of a cleaning location of said wiping element by feeding the wiping element forward during or between a cleaning process, including said step of moving the

vehicle part relative to the wiping element, and contacting the vehicle part with a wiping surface as said cleaning device supports said plurality of wiping surfaces during said step of contacting.

5,116,425
CLEANING METHOD
Helmut Ruef, Charlotte, N.C., assignor to Softblast, Inc., Charlotte, N.C.
Filed Jun. 7, 1990, Ser. No. 534,429
Int. Cl.[5] B05B *15/06;* **B08B** *3/02, 3/08*
U.S. Cl. 134—17 **21 Claims**

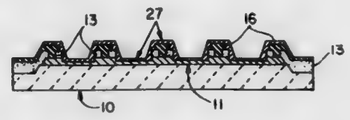


1. A cleaning method that is particularly useful for cleaning surfaces formed of relatively hard materials which are contaminated with relatively hard embedded deposits of undesirable materials that are difficult to remove by conventional washing or abrading cleaning methods, and while substantially reducing the effluent resulting from the cleaning step so that the cleaning method may be conveniently used in areas where effluent disposal may be a problem such as smaller indoor rooms, areas, or equipment, the method comprising pressurizing a cleaning liquid with a gas driven hydraulic pump located at or close to a surface to be cleaned and directing a flow of the cleaning liquid from the gas driven hydraulic pump toward a surface to be cleaned at a pressure of between about 5,000 and 15,000 pounds per square inch (psi) and at a volumetric flow rate of greater than about 0.3 and less than 1.0 gallons per minute (gpm), so that the pressure of the cleaning liquid being directed toward the surface is sufficient to remove from the surface deposits of the type that cannot be removed by mechanical scrubbing, using tools or chemical detergent action other than by damaging the surface itself, and in which the volumetric flow rate at that pressure is small enough so that the liquid flow does not cause damage to the surface that would otherwise occur if the same pressure were used at a higher volumetric flow rate.

5,116,426
METHOD OF CLEANING A SUBSTRATE USING A DICHLOROPENTAFLUOROPROPANE
Teruo Asano, Yokohama; Naohiro Watanabe, Chiba; Kazuki Jinushi, Ichihara, and Shunichi Samejima, Tokyo, all of Japan, assignors to Asaki Glass Company Ltd., Tokyo, Japan
Continuation of Ser. No. 369,769, Jun. 22, 1989. This application Oct. 25, 1990, Ser. No. 602,041
Claims priority, application Japan, Jun. 22, 1988, 63-152271; Jun. 22, 1988, 63-152272; Jun. 22, 1988, 63-152273; Jun. 22, 1988, 63-152274; Jun. 22, 1988, 63-152275; Jun. 22, 1988, 63-152276; Jun. 22, 1988, 63-152277
Int. Cl.[5] C23G *5/028, 5/032*
U.S. Cl. 134—40 **2 Claims**

1. A method of cleaning a surface of a substrate which comprises treating said surface with a solvent comprising a compound of the formula 1,1-dichloro-2,2,3,3-pentafluoropropane.

5,116,427
HIGH TEMPERATURE PHOTOVOLTAIC CELL
John C. C. Fan, Chestnut Hill, and Paul M. Zavracky, Norwood, both of Mass., assignors to Kopin Corporation, Taunton, Mass.
Continuation of Ser. No. 658,443, Feb. 21, 1991, abandoned, which is a continuation of Ser. No. 424,676, Oct. 20, 1989, abandoned, which is a division of Ser. No. 87,459, Aug. 20, 1987, Pat. No. 4,889,565. This application Nov. 7, 1991, Ser. No. 790,141
Int. Cl.[5] H01L *31/068, 31/0304*
U.S. Cl. 136—259 **17 Claims**



1. A photovoltaic device comprising:
a single crystal compound semiconductor region having a light incident surface on a mesa structure, the region including an n-doped layer having an active junction with a p-doped layer, the active junction extending across a plane parallel to said light incident surface;
a conductive metallized layer making a low resistance contact with the light incident surface on one side of the junction;
a diffusion barrier covering said metallized layer;
a conductor in conductive contact with the light incident surface via said metallized layer and diffusion barrier; and
at least one encapsulating layer provided such that the semiconductor region, conductor, and junction are encapsulated by the encapsulating layer to reduce diffusion of material from the compound semiconductor.

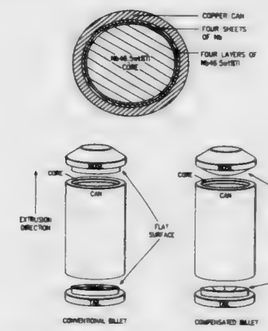
5,116,428
ROLLED THIN SHEETS OF ALUMINUM ALLOY
Jochen Hasenclever, Bonn, Fed. Rep. of Germany, assignor to Vereingte Aluminum-Werke Aktiengesellschaft, Fed. Rep. of Germany
Division of Ser. No. 511,105, Apr. 20, 1990, Pat. No. 5,019,188. This application Mar. 7, 1991, Ser. No. 665,676
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1989, 3913324
Int. Cl.[5] C22C *21/00*
U.S. Cl. 148—438 **4 Claims**

1. Thin, rolled sheets, strips, or foils of an aluminum alloy of the AlFeMn type with a uniform, fine-grained structure, characterized by the alloy having the following composition:

Fe	0.7–1.15 wt. %
Mn	0.5–2.0 wt %
Si	0.05–0.6 wt %
Mg	0–0.6 wt %
Cu	0–0.3 wt %
Zr	0–0.2 wt %
Impurities	0–0.03 wt %
Aluminum	balance wt %,

the grain diameter of the structure being within the range of about 5 to 11 μm and the percentage of rod-shaped intermetallic phases being less than about 5 vol. %.

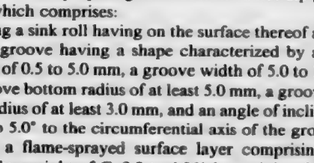
5,116,429
SUPERCONDUCTING WIRE
James Wong, Wayland, Mass., assignor to Composite Materials Technology, Inc., Shrewsbury, Mass.
Continuation-in-part of Ser. No. 605,926, Oct. 30, 1990, which is a continuation-in-part of Ser. No. 525,124, May 17, 1990. This application Jan. 10, 1991, Ser. No. 639,298
Int. Cl.[5] H01L *39/00;* **B32B** *15/00*
U.S. Cl. 29—599 **14 Claims**



1. The process of producing a Type II superconducting alloy monofilament which comprises surrounding a (Type II) superconducting alloy ingot with at least two layers of a type II superconducting alloy sheet and an outer refractory metal barrier layer, surrounding said barrier with a copper extrusion can, said extrusions can including a nose and/or tail section having a k factor equal to or greater than the body of the core, hot extruding the resultant composite product and reducing the extruded product to wire.

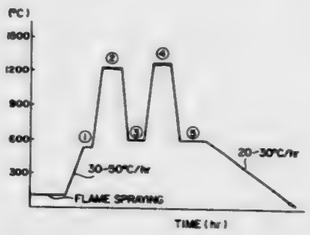
5,116,430
PROCESS FOR SURFACE TREATMENT TITANIUM-CONTAINING METALLIC MATERIAL
Eiji Hirai; Kazuyoshi Kurosawa, and Yoshio Matsumura, all of Tokyo, Japan, assignors to Nihon Parkerizing Co., Ltd., Tokyo, Japan
Filed Feb. 8, 1991, Ser. No. 653,087
Claims priority, application Japan, Feb. 9, 1990, 2-30494; May 21, 1990, 2-129268; Sep. 11, 1990, 2-238998
Int. Cl.[5] B05D *7/00;* **G23C** *18/00*
U.S. Cl. 148—518 **15 Claims**

1. A process for surface treating a titanium-containing metallic material, comprising the steps of:
(A) cleaning a surface of a titanium-containing metallic material;
(B) first plating the resultant cleaned surface of the titanium-containing metallic material with a member selected from the group consisting of copper and nickel to a thickness of 1 to 6 μm by a strike plating method or to a thickness of 0.1 to 5 μm by a flash plating method;
(C) second plating the resultant first surface of the titanium-containing metallic material with a member selected from the group consisting of nickel, nickel-phosphorus alloys and composite materials comprising a matrix consisting of a nickel-phosphorous alloy and a number of fine ceramic particles dispersed in the matrix, to a thickness of 5 to 30 μm by an electro-plating method;
(D) non-oxidatively heat-treating the resultant second plated titanium-containing metallic material at a temperature of 450° C. or more for one hour or more;



(E) surface-activating the resultant surface of the non-oxidatively heat-treated titanium-containing metallic material; and
(F) coating the resultant surface-activated surface of the titanium-containing metallic material with a heat-resistant and abrasion-resistant coating layer comprising a matrix comprising a member selected from the group consisting of nickel-phosphorus alloys and cobalt and a number of fine ceramic particles dispersed in the matrix to a thickness of 5 to 500 μm by an electroplating method.

5,116,431
IMMERSION MEMBER FOR HOT DIP GALVANIZING BATH AND METHOD FOR PREPARING THE SAME
Michinori Suhara, Tokai; Masaaki Takagi, Nagoya; Yuuji Okuzaki, Sakura; Kuro Tashiro, Chiba, and Michiyoshi Mizunuma, Nagoya, all of Japan, assignors to Taiyo Steel Co., Ltd. & Nippon Steel Hardfacing Co., Ltd., Tokyo, Japan
PCT No. PCT/JP89/01119, § 371 Date Jul. 3, 1990, § 102(e) Date Jul. 3, 1990, PCT Pub. No. WO90/05201, PCT Pub. Date May 17, 1990
PCT Filed Oct. 31, 1989, Ser. No. 536,562
Claims priority, application Japan, Nov. 4, 1988, 63-278825
Int. Cl.[5] C25C *7/00;* **B32B** *3/30*
U.S. Cl. 148—530 **5 Claims**



5. A method for preparing a sink roll for a hot dip galvanizing bath which comprises:
providing a sink roll having on the surface thereof a double-cross groove having a shape characterized by a groove depth of 0.5 to 5.0 mm, a groove width of 5.0 to 10.0 mm, a groove bottom radius of at least 5.0 mm, a groove shoulder radius of at least 3.0 mm, and an angle of inclination of 0.3° to 5.0° to the circumferential axis of the groove,
forming a flame-sprayed surface layer comprising 1.0 to 1.5% by weight of C, 2.0 to 4.0% by weight of B, 2.0 to 4.0% by weight of Si, 1.0 to 6.0% by weight of Fe, 10.0 to 16.0% by weight of W, 5.0 to 21.0% by weight of Cr and

10.0 to 15.0% by weight of Ni, with the balance being Co, on the surface of said sink roll,
heating the flame-sprayed surface layer at a temperature-elevating rate of 10° to 100° C./hr,
maintaining the flame-sprayed surface layer at a preheating temperature of 300° to 600° C. for at least 0.5 hour,
subjecting the flame-sprayed surface layer to at least one fusing treatment by heating at a temperature of at least 1000° C. for up to 30 minutes,
dropping the temperature of the flame-sprayed surface layer,
carrying out a soaking treatment of said surface layer at a temperature of 500° to 800° C. for at least 1 hour, and
carrying out a cooling treatment of said surface layer at a temperature-dropping rate of 20° to 50° C./hr.

5,116,432

PROCESSING METHOD FOR THE MANUFACTURING OF ELECTRONIC COMPONENTS USING A SOFT SOLDERING FLUX BASED ON CARBOXYLIC ACID

Rudolf A. Kerner, Josef-Kreitmeir-Str. 12, Tandern, Fed. Rep. of Germany D-8893

PCT No. PCT/EP88/00017, § 371 Date Feb. 5, 1990, § 102(e) Date Feb. 5, 1990, PCT Pub. No. WO89/06584, PCT Pub. Date Jul. 27, 1989
PCT Filed Jan. 12, 1988, Ser. No. 499,401
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—23 **16 Claims**

1. A process for the manufacturing of electrical and electronic components by soft soldering performed with soft soldering machines and comprising the step of applying a soft soldering flux containing carboxylic acid and alcyl fluoric alcohols.

5,116,433

SOLDER PASTE HAVING SOLDER ALLOY/FORMATE COMPLEXES AS OXIDE SCAVENGERS, AND METHOD FOR PREPARING SAME

James L. Davis, Tamarac; Fadia Nounou, Plantation; Anthony B. Suppelsa, Coral Springs, and Robert W. Pennisi, Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1990, Ser. No. 607,387
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—24 **21 Claims**

1. A solder paste formulation consisting essentially of:
a solder paste vehicle comprising:
a solvent; and
a fluxing agent;
a resin; and
solder alloy particles, having on the surface thereof, an oxygen scavenger comprising the reaction product of the solder alloy particles and formate ion, and said solder paste formulation excluding formic acid.

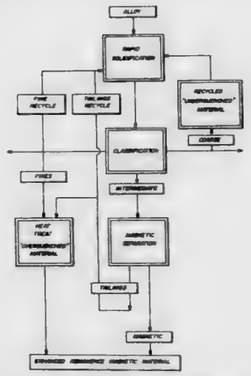
5,116,434

METHOD OF MANUFACTURING, CONCENTRATING, AND SEPARATING ENHANCED MAGNETIC PARAMETER MATERIAL FROM OTHER MAGNETIC CO-PRODUCTS

John Keem, Bloomfield Hills, and Jun S. Im, Detroit, both of Mich., assignors to Ovonic Synthetic Materials Company, Inc., Troy, Mich.

Continuation of Ser. No. 541,443, Jun. 20, 1990, abandoned, which is a continuation of Ser. No. 302,642, Jan. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 63,936, Jun. 19, 1987, Pat. No. 4,834,811. This application Mar. 19, 1991, Ser. No. 671,631
The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.
Int. Cl.[5] H01F *1/02*
U.S. Cl. 148—101 **5 Claims**

1. A method of separating an initially non-magnetized particulate ferromagnetic material of substantially a single composition into a first fraction having relatively high magnetic parameters at substantially complete magnetization and a second fraction having relatively low magnetic parameters at substantially complete magnetization, the method including the steps of:
providing an initially non-magnetized particulate ferromagnetic material of substantially a single composition, having a distribution of magnetic properties such that a first fraction of said particulate ferromagnetic material is characterized by relatively high magnetic parameters at substantially complete magnetization and a second fraction of said particulate ferromagnetic material is characterized by relatively low magnetic parameters at substantially complete magnetization, said magnetic parameters being one



or more magnetic properties selected from the group consisting of coercivity, remanence and energy product;
applying a low strength magnetic field to said first and second fractions of said particulate ferromagnetic material so as to at least partially magnetize, at least said second fraction, the applied magnetic field having a low enough field strength to avoid substantial magnetization of said first fraction but high enough to effect magnetization of said second fraction so as to induce a higher magnetization in said second fraction than in said first fraction; and
magnetically separating said second fraction from said first fraction by magnetically attracting the magnetized second fraction from the substantially non-magnetized first fraction.

5,116,435

METHOD FOR PRODUCING NON-ORIENTED STEEL SHEETS

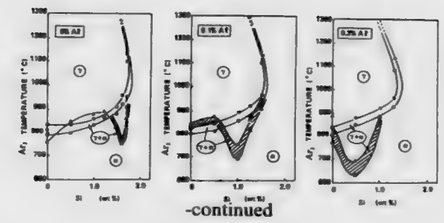
Akihiko Nishimoto; Yoshihiro Hosoya, and Toshiaki Urabe, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 101,721, Sep. 28, 1987, abandoned. This application Mar. 27, 1989, Ser. No. 330,926
Claims priority, application Japan, Sep. 29, 1986, 61-228114
The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—111 **15 Claims**

1. A method for producing a non-oriented electrical steel sheet with precise thickness and homogeneous magnetic property comprising the steps of:
providing a steel slab which has:

0.01 wt. % or less C,

0.003 wt. % or less N,



-continued

0.1 to 1.0 wt. % Mn,

Al and Si satisfying in wt. % the formulas of:

0.01 wt. % or less C,

0.003 wt. % or less N,

0.1 to 1.0 wt. % Mn,

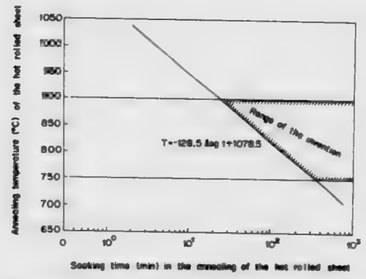
provided that (Si %) represents the Si content in wt. % and (al %) represents the Al content in wt. % and the balance being Fe and inevitable impurities;
hot-rolling the slab at a finishing temperature of 700° C. to 900° C. into a steel strip, coiling the hot rolled strip; and cold-rolling the hot-rolled strip into a cold-rolled strip, and annealing the cold rolled strip.

5,116,436

METHOD OF MAKING NON-ORIENTED ELECTRICAL STEEL SHEETS HAVING EXCELLENT MAGNETIC PROPERTIES

Akihiko Nishimoto; Yoshihiro Hosoya; Kunikazu Tomita; Toshiaki Urabe, and Masaharu Jitsukawa, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

PCT No. PCT/JP89/00440, § 371 Date Jun. 13, 1990, § 102(e) Date Jun. 13, 1990, PCT Pub. No. WO90/12897, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 26, 1989, Ser. No. 476,508
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—111 **2 Claims**



1. A method of making non-oriented electrical steel sheet having excellent magnetic properties, comprising:
a) heating a slab containing C: not more than 0.0050 wt %, Si: 1.0 to 4.0 wt %, Al: 0.1 to 2.0 wt %, the rest being Fe and unavoidable impurities, to temperatures between higher than 1150° C. and not higher than 1250° C.;
b) hot rolling said slab so as to form a hot rolled sheet;
c) coiling said hot rolled sheet at temperatures of not more than 700° C.;
d) de-scaling said hot rolled sheet;
e) subsequently open-annealing the hot rolled sheet at a relation between temperature (°C) of 750° to 900° C. and the soaking time t (min.), in a non-oxidizing atmosphere and under conditions satisfying the following:

$T \geqq -128.5 \log t + 1078.5$;

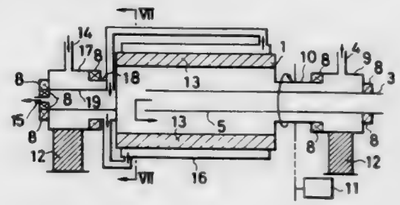
f) carrying out a cold rolling or plural cold rollings having interposed therebetween an intermediate annealing;
g) and finish-annealing at temperatures between 800° and 1050° C.

5,116,437

METHOD FOR STABILIZATION TREATMENT OF FERROMAGNETIC METAL POWDER

Testushi Yamamoto; Masaru Niwano, and Etsuo Nakagawa, all of Minamata, Japan, assignors to Chisso Corporation, Japan

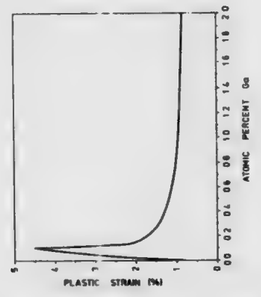
Division of Ser. No. 364,489, Jun. 9, 1989, Pat. No. 5,003,919, which is a continuation of Ser. No. 154,324, Feb. 10, 1988, abandoned. This application Sep. 27, 1990, Ser. No. 588,739
Claims priority, application Japan, Feb. 12, 1987, 62-30558
Int. Cl.[5] C23C *8/14*
U.S. Cl. 148—287 **19 Claims**



1. A method of treating ferromagnetic metal powder to achieve a uniform stable oxide coating, comprising:
(a) molding ferromagnetic metal powder into granules having a minimum diameter of 0.25 to 10 mm;
(b) introducing said granules of ferromagnetic metal powder into an apparatus which comprises
(1) a horizontal, cylindrical, rotating type reactor body provided with end walls substantially perpendicular to a cylindrical side wall which forms an inner wall of said reactor body;
(2) a jacket for a heat transfer medium;
(3) a port including a valve for feeding said ferromagnetic metal powder into said reactor body;
(4) a port for withdrawing said ferromagnetic metal powder from said reactor body, which port may be used in common with said feeding port;
(5) a passageway for blowing an oxidizing gas into said reactor body comprising an oxidizing gas inlet in communication with a pipe arranged within said reactor body coaxially with respect to the axis of rotation of said reactor body, said passageway arranged to be in substantial non-contacting relationship with ferromagnetic metal powder and said pipe, having an outlet end, extends longitudinally through said reactor body, said outlet end positioned proximate the side wall remote from said oxidizing gas inlet;
(6) a passageway for withdrawing said oxidizing gas from said reactor body comprising an oxidizing gas outlet in communication with a duct connected to said reactor body and arranged coaxially with respect to the axis of rotation of said reactor body, said passageway arranged to be in substantial non-contacting relationship with ferromagnetic metal powder; and
(7) a plurality of scraping up plates for said ferromagnetic metal powder arranged on said inner wall of said reactor body parallel to the axis of rotation of said reactor body and extending longitudinally from one end of the reactor body to the other end thereof;

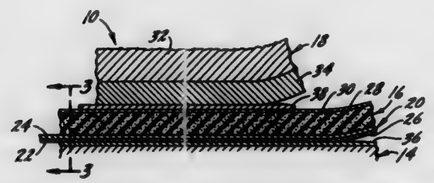
(c) mixing said ferromagnetic metal powder by rotating the reactor body;
(d) surface oxidizing said ferromagnetic metal powder in said reactor body by blowing oxidizing gas through the oxidizing gas blowing passageway toward said ferromagnetic metal powder during said mixing thereof; and
(e) withdrawing oxidizing gas through the oxidizing gas withdrawing necessary.

5,116,438
DUCTILITY NIAL INTERMETALLIC COMPOUNDS MICROALLOYED WITH GALLIUM
Ramgopal Darolia, West Chester, and David F. Lahrman, Mason, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Mar. 4, 1991, Ser. No. 664,246
Int. Cl.[5] C22F *3/02*
U.S. Cl. 148—404 **20 Claims**



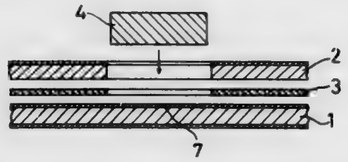
2. A beta phase nickel aluminide alloy consisting essentially of, in atomic percent, about 48% to about 57% nickel, about 0.01% to about 0.25 gallium and the balance essentially aluminum.

5,116,439
METHOD AND PRODUCT FOR FLOOR COVERING INSTALLATION AND REMOVAL
Frank J. Raus, Morris, Ill., assignor to Sponge-Cushion, Inc., Morris, Ill.
Filed Feb. 13, 1989, Ser. No. 309,354
Int. Cl.[5] E04B *2/00*
U.S. Cl. 156—71 **40 Claims**



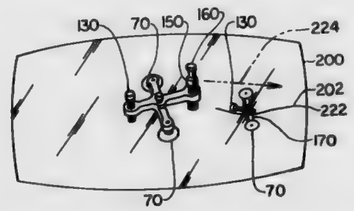
1. A method for installation and removal of a floor covering on the surface of a floor, comprising the steps of:
(a) forming a web of fabric-like material having two separable portions secured to one another at a parting plane,
(b) securing one portion of said web to the bottom surface of the floor covering, and
(c) securing the other portion of said web to the surface of the floor, whereby said floor covering may be removed from the floor by peeling said web apart at the parting plane.

5,116,440
PROCESS FOR MANUFACTURING MULTILAYER PRINTED WIRING BOARD
Kazunori Takeguchi, and Kohji Hirata, both of Amagasaki, Japan, assignors to Risho Kogyo Co., Ltd., Osaka, Japan
Filed Feb. 6, 1990, Ser. No. 475,945
Claims priority, application Japan, Aug. 9, 1989, 1-207587; Sep. 12, 1989, 1-106929[U]
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—90 **10 Claims**



1. A process for manufacturing a multilayer printed wiring board for mounting an electronic device, comprising the steps of putting a prepreg with a hole on a printed wiring board, putting a copper clad laminate with a hole or a second printed wiring board with a hole on said prepreg so that the hole in said prepreg will be in alignment with the hole in said laminate or said second printed wiring board to form a cavity, mounting a rubber or composite rubber sheet in said cavity to form an assembly, applying heat and pressure to said assembly to melt said prepreg and bond said laminate or said second printed wiring board with said printed wiring board, and removing said rubber or composite rubber sheet, wherein said rubber or composite rubber sheet has a smaller size than said cavity and a larger thickness than the depth of said cavity, wherein said rubber or composite rubber sheet is elastic, and wherein said rubber or composite rubber sheet has a plurality of layers, at least two of said layers having different elastic moduli.

5,116,441
GLASS REPAIR KIT AND METHOD OF USE
Richard A. Campfield, Jr., 9249 Loquat Dr., Riverside, Calif. 92508
Filed Sep. 10, 1990, Ser. No. 580,075
Int. Cl.[5] B32B *35/00*
U.S. Cl. 156—94 **30 Claims**



9. A method of repairing a crack in a windshield having two layers of glass and a plastic layer between the two glass layers and each glass layer having a periphery defining a glass area having an outer surface within the periphery and having at least one edge joining the glass area at the periphery the crack being in one layer and being over six inches in length and having a first end within the glass area and a second end either within the glass area or at the edge of the glass and defining a length of the crack which is surfaced comprising;
ensuring a passageway at each end of the crack which is in the glass area for flow of resin from the outer surface into the crack upon the application of vacuum and the injection of resin from the outer surface;

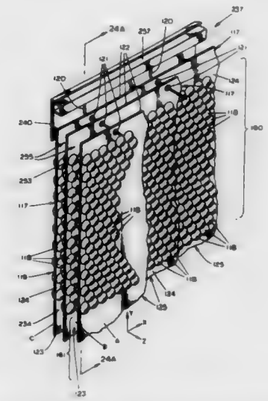
applying a vacuum to each end of the crack which is in the glass area and which has been prepared;
injecting under pressure a first resin having a preselected viscosity to flow into the crack, to each end of the crack which is in the glass area and which has been prepared to cause resin to flow into the crack and part way down the crack;
progressively applying resin having viscosity which is higher than that of the first resin, along the surfaced length of the crack;
causing the resin to cure.

5,116,442
PROCESS FOR PRODUCING A TRANSPARENT POLYURETHANE FILM WITH ENERGY-ABSORBING AND ANTIFOGGING PROPERTIES
Gérard M. Daude, Villenave; D'Ornon, and Jean-Louis M. Bravet, Thourotte, both of France, assignors to Saint-Gobain Vitrage, Aubervilliers, France
Continuation of Ser. No. 354,759, May 22, 1989, Pat. No. 4,983,461. This application Nov. 30, 1990, Ser. No. 620,197
Claims priority, application France, May 20, 1988, 88 06779
Int. Cl.[5] B05D *1/02*; B32B *27/40, 17/10*
U.S. Cl. 156—99 **14 Claims**

1. A process of producing a transparent polyurethane film of high optical quality which is a useful component of safety glass as an external film, having energy-absorbing properties and whose scratch-resistance and abrasion resistance is improved by surface treatment, which comprises:
applying to a substrate a surface treatment compound of an acrylic derivative or isocyanate having a functionality greater than 2 in the form of a thin coating;
thereafter applying onto the surface of said thin coating, for the formation of a polyurethane film by reactive casting or reactive spraying, a reaction mixture of an isocyanate component and a polyol component containing at least one long difunctional polyol having a molecular weight between 500 and 10,000, containing at least partial ethylene oxide segments, with the percentage by weight of ethylene oxide segments relative to the total weight of the polyurethane being greater than 20%, at least one short diol as chain extender, with the ratio of free NCO groups of the isocyanate component to free OH groups of the polyol component ranging from 1.5 to 2;
polymerizing the materials of the applied reaction mixture and the surface treatment compound; and
removing the polymerized polyurethane layer and the attached polymerized surface material from said substrate.

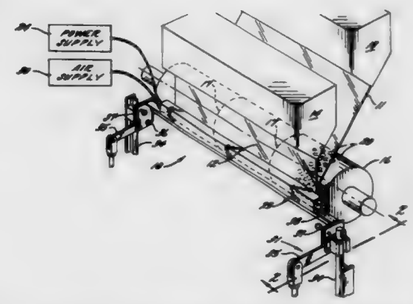
5,116,443
CLARIFIER APPARATUS AND METHODS WITH 3D ARRAYS
Charles L. Meurer, Golden, Colo., assignor to Envirotech Corporation, Salt Lake City, Utah
Division of Ser. No. 325,274, Mar. 16, 1989, Pat. No. 4,933,524, which is a continuation-in-part of Ser. No. 207,987, Jun. 17, 1988, Pat. No. 4,865,753. This application Mar. 9, 1990, Ser. No. 491,687
Int. Cl.[5] B32B *3/30*
U.S. Cl. 156—209 **7 Claims**

1. A method of making sheets for use as lamina in an apparatus for clarifying liquid having solids therein, comprising the steps of:
forming a pair of sheets of plastic material with a series of protrusions extending from one side thereof in a given pattern;
arranging said sheets in opposed, touching relationship with said protrusions aligned and oppositely facing to form hollow members;
joining said sheets together to form said sheets into a unit having said protrusions extending from both of said sides, said hollow members having pockets therebetween, said protrusions being substantially enclosed hemispherical or hemiellipsoidal as said such sheets are joined together; and



installing said sheets in an apparatus for clarifying liquid to define a plurality of flow paths therebetween.

5,116,444
APPARATUS AND METHOD FOR ENHANCING LAMINATION OF PLASTIC FILMS
John G. Fox, Hawthorne, N.J., assignor to Sealed Air Corporation, Saddle Brook, Del.
Filed May 30, 1991, Ser. No. 707,675
Int. Cl.[5] B29C *47/06*; B32B *31/24*
U.S. Cl. 156—244.17 **16 Claims**



1. An apparatus for forming a cellular plastic laminate, said apparatus comprising:
an embossing roll having a predetermined pattern of lands and cavities formed on the outer surface thereof;
means for rotating said embossing roll at a predetermined speed;
first extruding means for extruding a first plastic film onto the surface of said embossing roll so that the first plastic film conforms to the pattern of lands and cavities of said embossing roll;
second extruding means for extruding a second plastic film in superposed contacting relation with the first plastic film on the lands of said embossing roll, thereby forming a pattern of cells between the films corresponding to the pattern of cavities of said embossing roll;
an elongate electrode positioned in spaced apart relation from said embossing roll and extending substantially along the entire length of said embossing roll, said electrode

adapted to be electrically connected to an electrical power supply for producing an electrostatic field of sufficient intensity to force the second plastic film into intimate contact with the first plastic film on the lands of said embossing roll to enhance the contact between the films; and

a housing positioned around said electrode, said housing having an elongate opening therein parallel to said electrode and adjacent said embossing roll, said housing adapted to be connected to a pressurized air supply for providing a positive pressure within said housing to reduce accumulation of smoke and other contaminants from the hot plastic films within the housing and on said electrode;

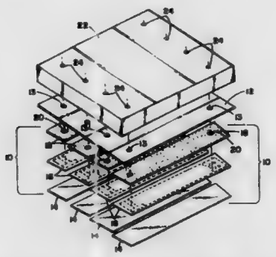
said first and second extruding means each producing respective plastic films having sufficiently high temperatures so that the films will be fused or laminated together when forced into intimate contact on the lands of said embossing roll by said elongate electrode.

5,116,445

METHOD FOR FORMING LOCATOR LUG

John I. Doughty, White Bear Lake, and Darrell W. Blauer, Orono, both of Minn., assignors to Douglas Corporation, Minneapolis, Minn.

Filed Dec. 21, 1990, Ser. No. 631,523
Int. Cl.[5] B29C *39/00*
U.S. Cl. 156—245 **4 Claims**



1. A method of forming a decorative emblem having at least one locator lug, said method comprising the steps of:

forming a decorative emblem having a finish front surface and an opposite back surface;

positioning a mold opposing said back surface with said mold having at least one cavity formed therethrough, said cavity positioned against a desired locator lug position on said back surface, said cavity shaped to conform with a desired shape of a locator lug;

applying a flowable plastic material into said cavity with said material selected to set to a hardened state and adhere to said back surface; setting said material in said mold cavity until said material hardens and adheres to said back surface;

removing said mold from said emblem; and applying a layer of an adhesive to said back surface before positioning said mold, said layer of adhesive having a gap positioned at said locator lug position.

5,116,446

METHOD OF MAKING A PAPER OVERLAID STRUCTURE

Charles G. Cannon, Beaverton, Oreg., assignor to Contact Lumber Company, Portland, Oreg.

Continuation of Ser. No. 196,071, May 18, 1988, abandoned.
This application Feb. 8, 1991, Ser. No. 653,858
Int. Cl.[5] C09J *5/02;* **B32B** *31/26*
U.S. Cl. 156—307.4 **1 Claim**

1. The method of forming an architectural product having a solid wood substrate and a multiple layer resin treated paper overlay therefor comprising

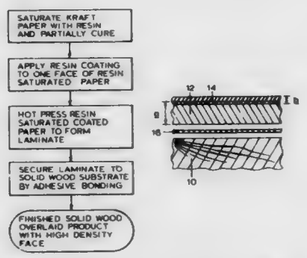
first treating at least two sheets of paper overlay with a thermosetting resin in an identical manner,

the treating of said sheets of paper comprising a first step of saturating said sheets with thermosetting resin in a content per weight of approximately 35%,

partially curing said resin,

applying a thermosetting resin coating to one surface of said sheets in a content per weight of approximately 55%,

laying said sheets of overlay paper up in a multiple layer arrangement at a time when the saturating resin is in said partially cured condition,



not pressing said sheets of overlay paper while in their multiple layer arrangement to fully cure the saturating and coating resin to form a smooth and hardened face surface for said architectural product and a porous bondable surface on the surface opposite from said face surface,

said porous bondable surface of a first sheet of overlay paper providing a bonding connection between said porous bondable surface of said first sheet of overlay paper and the smooth and hardened face surface of a second sheet of overlay paper in said multiple layer arrangement,

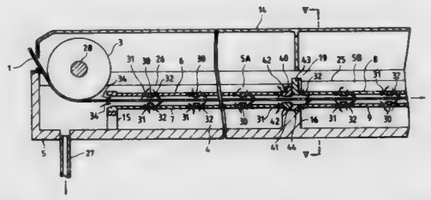
and then adhesively securing the said porous bondable surface of said second sheet of overlay paper directly to a surface of said substrate by low temperature and pressure bonding.

5,116,447

HIGH SPEED PICKLING DEVICE AND HIGH SPEED PICKLING METHOD

Tomoaki Kimura, and Yoshio Takakura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 15, 1991, Ser. No. 670,763
Claims priority, application Japan, Mar. 16, 1990, 2-66309
Int. Cl.[5] B44C *1/22;* **C23F** *1/00*
U.S. Cl. 156—345 **23 Claims**



1. In a high speed pickling device for causing a thin plate to travel in acid fluid and removing through pickling oxidized scales which are formed on the surfaces of the thin plate, the improvement comprising:

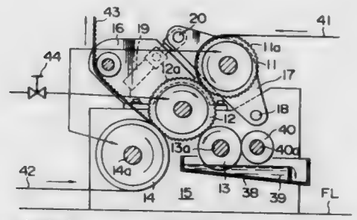
a plurality of weir members which dam wakes of said acid fluid flowing along the surfaces of the thin plate over substantially an entire width of the thin plate, said weir members being provided in the traveling direction of said thin plate with a predetermined interval and substantially close to said thin plate.

5,116,448

SINGLE FACTER CAPABLE OF MAINTAINING A CONSTANT ROLL GAP

Kimio Murayama; Yukuharu Seki, and Hiroaki Sasashige, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1990, Ser. No. 481,026
Claims priority, application Japan, Feb. 17, 1989, 1-16801[U]
Int. Cl.[5] B31F *1/28;* **B32B** *31/08;* **G01D** *3/04*
U.S. Cl. 156—350 **6 Claims**



1. In a single facer apparatus for forming single-faced corrugated sheets having a top corrugating roll, a lower corrugating roll, a gluing roll and a press roll supported on a frame and passing a sheet medium to be corrugated between said lower corrugating roll and each of said top corrugating roll, said gluing roll and said press roll, and heating means for heating each of said rolls, the improvement comprising:

means for adjusting the distance between centers of support shafts of said lower corrugating roll and least one of said top corrugating roll, said gluing roll and said press roll;

temperature sensor means for detecting the expansion of said frame caused by transfer of heat from said rolls by detecting the temperature of said frame; and

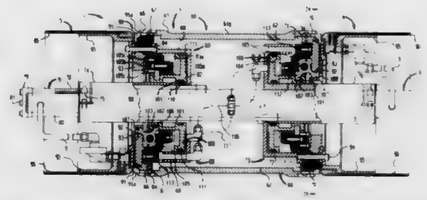
means for actuating said means for adjusting in response to the detection of expansion by said temperature sensor means in order to compensate for said expansion of said frame by maintaining the distance between said centers of support shafts constant.

5,116,449

GROOVED DRUM FOR TIRE BUILDING MACHINE

Arnold J. Fabris, Warren; Valdis L. Pareizs, Detroit, and Leonard S. Stokes, Mt. Clemens, all of Mich., assignors to The Uniroyal Goodrich Tire Company, Akron, Ohio

Filed Sep. 4, 1990, Ser. No. 577,358
Int. Cl.[5] B29D *30/24*
U.S. Cl. 156—415 **12 Claims**



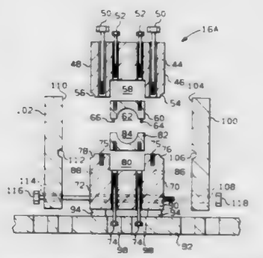
1. A building drum assembly for building a first stage carcass of a sealant tire having a sealant strip adhesively secured to the inner surface of the liner of said carcass, said assembly comprising a shaft; a central building drum rotatably supported by said shaft; means exterior to the central building drum to turn over edges of the carcass; a plurality of movable fingers carried by said central drum adjacent each of its edges, said fingers being interconnected to lateral, grooved segments which together in side-by-side relationship provide an expansible cylindrical drum surface, said fingers being rotatable with said central drum; each said grooved segment having a single groove symmetrically disposed relative to the circumferential center plane of said central drum, said groove being adapted to provide an upper surface having contoured sidewalls in which at least a portion of the surface of each sidewall flares outwardly at an angle α in the range from about 15° to 80° to the horizontal, to accommodate a sealant strip of sufficient width; annular cylinder means surrounding said shaft and fixed relative thereto; annular piston means positioned in said cylinder means and axially movable therein relative to one another; and motion converting means connecting said piston means and said fingers to move said fingers and associated grooved segments radially between a retracted, inactive position and an extended, bead supporting position in response to axial movement of said piston means.

5,116,450

MOLDING APPARATUS

Kevin J. Spoo; Vergil H. Rhodes, Jr., and Bill W. Dodd, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 23, 1990, Ser. No. 556,679
Int. Cl.[5] B32B *27/04;* **B29C** *33/22*
U.S. Cl. 156—441 **25 Claims**



1. A molding apparatus of the type which includes a die set comprising at least one die which defines at least one mold cavity for receiving resin impregnated fibers therethrough, wherein:

(a) any one die of said die set comprises first and second mold base sections which are positioned with respect to one another so as to form a mold base which defines a channel therethrough, and further comprising a mold insert, having an inlet end and an outlet end, which defines a mold cavity completely therethrough from said inlet end to said outlet end and which is removably mounted in said channel in a mounted position; and wherein

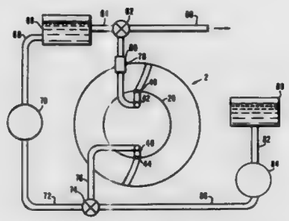
(b) said apparatus further comprises a clamp means which includes a first clamp member and a second clamp member, wherein said clamp means removably clamps said die set between said first and second clamp members in a clamped position so as to allow removal of one of said mold base sections of any one die of said die set from between said first and second clamp members while in said clamped position.

5,116,451

FLOW THROUGH IMPREGNATION OF DEEP NESTED FIBER OPTICAL CANISTER

George W. LeCompte, Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 29, 1990, Ser. No. 575,103
Int. Cl.[5] B65H *81/02*
U.S. Cl. 156—441 **4 Claims**



1. A pressurized system for injecting a controlled amount of adhesive throughout a dry wound filament pack having multiple layers with each succeeding layer having turns deeply nested between turns of a preceding layer such that at least first and second separate channels formed from continuously connected crossover regions in each filament layer extend through all layers of the pack, and comprising;

the filament pack having an exterior surface formed by an outermost filament layer and an interior surface formed by an innermost filament layer;

a layer of sealing material enclosing the pack exterior surface to prevent adhesive from being inadvertently expelled outwardly from the pack;

mandrel means for supporting said filament pack while simultaneously sealing the pack interior surface to prevent adhesive from being inadvertently expelled inwardly from the pack;

an input manifold in direct fluid communication with an end of the first channel through an opening in either the exterior sealing layer or the mandrel means and an output manifold in direct fluid communication with an end of the second channel through an opening in either the exterior sealing layer or the mandrel means;

adhesive supply means in fluid engagement with the input manifold for injecting adhesive through the first channel and into and throughout the dry wound filament pack; and

said adhesive supply means also in fluid engagement with the output manifold for recovering excess adhesive expelled from the filament pack through the second channel and output manifold.

5,116,452

DEVICE FOR APPLYING LABELS TO CONTAINERS

Erich Eder, Donaustauf, Fed. Rep. of Germany, assignor to Kroaes AG Hermann Kronseder Maschinenfabrik, Neutrauling, Fed. Rep. of Germany

Filed Jun. 5, 1991, Ser. No. 714,000
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1990, 9016591[U]
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—566 **2 Claims**

1. A device for applying a label to a series of moving containers comprising:

a label transport cylinder arranged for being driven rotationally about its axis,

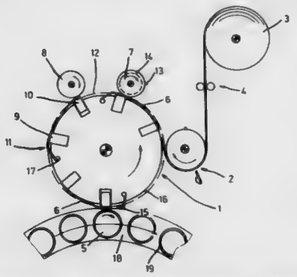
first and second devices for holding a label at its ends mounted in circumferentially spaced apart relationship about the periphery of said transport cylinder and means for moving said devices radially outwardly a small amount relative to said periphery of said transport cylinder and for retracting said devices inwardly, said devices having radially outwardly presented surfaces in which there are orifices,

means for communicating said orifices selectively with vacuum or pressurized air sources,

gripper means including swingable gripper fingers mounted to said first device and swinging means for swinging said fingers in a direction to seize the leading end of a label which is fed onto said cylinder while vacuum is applied to said orifices of the first device,

said orifices of said second device communicating with said vacuum source to attract and hold the trailing end of said label while its leading end is held and said label is being transported in a circular path on said cylinder,

a first glue application roller adjacent said cylinder and rotatable about an axis which is parallel to the axis of said cylinder, said roller having annular grooves into which said fingers enter and said outwardly presented surface of said first device extending radially outwardly from said periphery of the cylinder by a small distance as the



gripped leading end of said label is put in contact with said first glue roller to apply a strip of glue to said leading end without applying glue to the remainder of the label,

a second glue roller adjacent said transport cylinder periphery and spaced in the direction of rotation of the transport cylinder from said first glue roller which is rotatable about an axis parallel to the axis of the cylinder, the periphery of said second glue roller being spaced from the periphery of said cylinder by a distance greater than said small distance to provide for said fingers on the leading end of the label passing the second roller with clearance,

said second device being extended radially sufficiently when passing said second glue roller to contact said trailing end of the label and apply a strip of glue thereto,

said means for swinging said fingers operating to retract said fingers and release said leading end of said label when said end is proximate to a container for the glue on the leading end to adhere to said spinning container and cause the label to wrap around the container.

5,116,453

STRAPPING APPARATUS FOR A PACKAGING STRAP

Franklin Niedrig, Berikon, Switzerland, assignor to Strapex AG, Wohlen, Switzerland

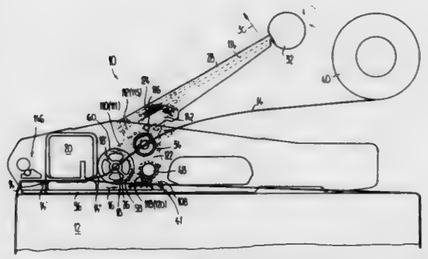
Division of Ser. No. 168,411, Mar. 15, 1988. This application May 7, 1990, Ser. No. 520,034
Claims priority, application Switzerland, Mar. 20, 1987, 01084/87
The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.
Int. Cl.[5] B65B *13/22, 13/34*
U.S. Cl. 156—580 **7 Claims**

1. A strapping apparatus for a packaging strap applied around an item to be packed, said packaging strap having a lower section and an upper section, comprising:

a clamping device for retaining the lower section of the packaging strap;

a tensioning device intended to act upon the upper section of the packaging strap for tensioning the latter;

a releasing device intended to act upon the tensioning device after termination of the tensioning operation for releasing the upper section of the packaging strap; and



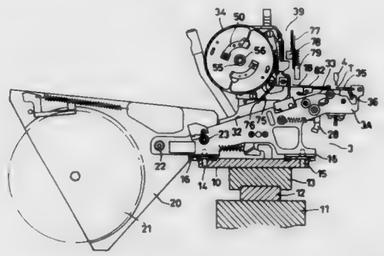
a second clamping device arranged upstream of the tensioning device seen in the tensioning direction and acting upon the packaging strap prior to the release of the upper section of the packaging strap.

5,116,454

COVER-TAPE PEELING APPARATUS FOR A TAPE FEEDER

Masao Kurihara, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 10, 1990, Ser. No. 595,138
Claims priority, application Japan, Oct. 17, 1989, 1-269286
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—584 **1 Claim**



1. A cover-tape peeling apparatus for a tape feeder for peeling a cover tape released from a tape having a number of chip-like electronic parts sealed therein in a substantially equally spaced relation to wind and receive it into a peeling reel, the apparatus comprising:

a first arm rotatably supported on a first shaft stood perpendicularly to a plane of a base of said tape feeder and having ratchet meshed with a gear tooth formed in the outer peripheral portion of said peeling reel;

a second arm having a cam portion in engagement with a cam portion provided on said first arm and rotatably supported on a second shaft, an arm push-down member in contact with said second arm to push down and rotate the second arm; and

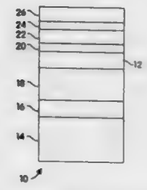
an urging body extended between both said arms and for rotating the first arm in response to the rotation of said second arm rotated by said arm push-down member so that said peeling reel is rotated by means of the ratchet whereby said cover tape is peeled from said tape having a number of chip-like electronic parts sealed therein.

5,116,455

PROCESS OF MAKING STRAIN-FREE, CARBON-DOPED EPITAXIAL LAYERS AND PRODUCTS SO MADE

James T. Daly, Mansfield, Mass., assignor to Spire Corporation, Bedford, Mass.

Filed Jan. 24, 1991, Ser. No. 644,999
Int. Cl.[5] C30B *19/00*
U.S. Cl. 156—605 **9 Claims**



5. A process of epitaxially growing a high performance GaAs device comprising:

(a) forming a substrate of semi-insulating GaAs;

(b) forming an n^+-type GaAs buffer layer on said substrate;

(c) forming an n^+-type GaAs collector layer on said buffer layer;

(d) forming a p^+-type carbon-doped GaAs base layer on said collector layer, said base layer being strain-free, possessing a carbon content level of at least about 1×10^{19} cm^{-3} and being co-doped with an isovalent and isoelectronic dopant straining the lattice structure of said GaAs base layer in a direction opposite to that induced by said carbon doping; and

(e) forming an n-type GaAs emitter layer on said strain-free base layer; the amount of said co-dopant being proportional to the amount of carbon introduced into said GaAs layer, and the amount of said co-dopant to counteract the strain due to said carbon-doping being derived from the following equation:

$$x_{IN} = \frac{a_{GaAs} - a_I}{0.405}$$

where a GaAs is the normal lattice constant of GaAs (5.6534 Å), a_I is the lattice constant of carbon doped GaAs as given by equation 1, and x_{In} is the mole fraction of the co-dopant required to be added to said carbon-doped GaAs layer.

5,116,456

APPARATUS AND METHOD FOR GROWTH OF LARGE SINGLE CRYSTALS IN PLATE/SLAB FORM

Ontario H. Nestor, Shaker Heights, Ohio, assignor to Solon Technologies, Inc., Solon, Ohio

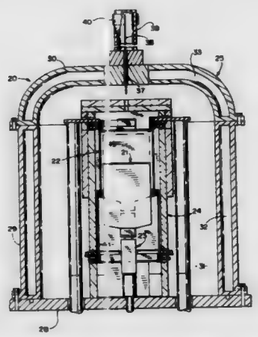
Filed Apr. 18, 1988, Ser. No. 182,995
Int. Cl.[5] C30B *11/02*
U.S. Cl. 156—616.1 **16 Claims**

1. A method for growing a large single crystal in plate/slab form from a melt comprising the steps of:

melting crystal growth stock in a crucible having a wide dimension and a narrow dimension, the narrow dimension being less than about six inches to permit adequate control of the growth process at the melt-crystal interface, and the wide dimension being greater than six inches, and

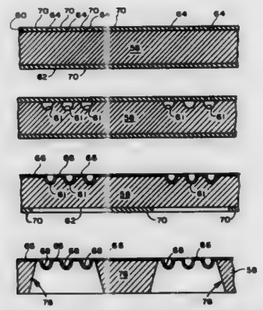
controlling heat input into the melt to establish a vertical temperature gradient in the melt for crystal growth progressively vertically upward through the crucible, the

step of controlling heat input including using side resistance heaters in close proximity to and directly adjacent to



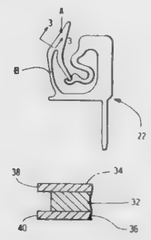
the wide dimension sides of the crucible to input heat into the melt.

5,116,457
SEMICONDUCTOR TRANSDUCER OR ACTUATOR UTILIZING CORRUGATED SUPPORTS
John H. Jerman, Palo Alto, Calif., assignor to I C Sensors, Inc., Milpitas, Calif.
Division of Ser. No. 335,185, Apr. 7, 1989, Pat. No. 5,064,165. This application Aug. 30, 1991, Ser. No. 753,607
Int. Cl.[5] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—628 **25 Claims**



1. A method for forming at least one corrugation in a semiconductor material comprising the steps of:
(a) masking a first surface of said semiconductor material in accordance with a predetermined pattern;
(b) etching said first surface in accordance with said predetermined pattern to provide a predetermined profile on said first surface;
(c) removing said mask from said first surface;
(d) providing an etch stop on said surface in accordance with said predetermined profile; and
(e) etching second surface that is opposite said first surface to said etch stop to form said corrugation.

5,116,458
ELECTRICAL EDGE CONTACT MEMBER AND A METHOD OF MANUFACTURING SAME
Dimitry G. Grabbe, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Division of Ser. No. 467,720, Jan. 19, 1990. This application Sep. 19, 1991, Ser. No. 762,693
Int. Cl.[5] C23F *1/02;* **B44C** *1/22*
U.S. Cl. 156—630 **6 Claims**

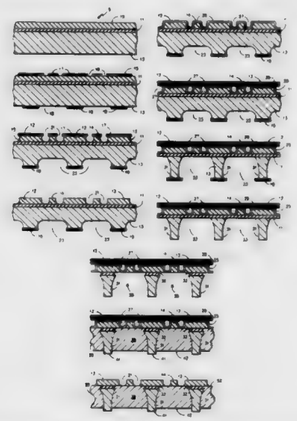


1. A method of manufacturing a contact member used to provide an electrical connection along a defined region of its edge with a lead having at least its contact surface formed of a relatively soft metal, comprising the steps of:
providing a contact member blank formed as a laminate of at least one layer of a first material and at least one layer of a second material, said first material having good spring properties and said second material having the property that it does not form a solid solution with said soft metal; and
recessing said at least one layer of said first material with respect to said at least one layer of said second material along at least said defined edge region.

5,116,459
PROCESSES FOR ELECTRICALLY CONDUCTIVE DECALS FILLED WITH ORGANIC INSULATOR MATERIAL
Mark R. Kordus, Pleasant Valley; Mark S. Schneider, Poughkeepsie, and Louis H. Wirtz, Highland, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 6, 1991, Ser. No. 665,497
Int. Cl.[5] B44C *1/22;* **C23F** *1/02;* **B29C** *37/00*
U.S. Cl. 156—631 **20 Claims**

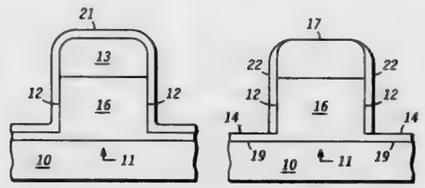
1. A process for making an electrical connection member, comprising the steps of:
a) forming an electrically conductive substrate comprising a first electrically conductive material and a second electrically conductive material, wherein said first material and said second material sandwich at least a third electrically conductive material therebetween, and wherein the material for said third electrically conductive material is different than the material for said first and second electrically conductive materials,
b) patterning and etching said first electrically conductive material to expose at least a portion of said third electrically conductive material and to form at least one first island of said first electrically conductive material,
c) securing a backing material to said at least one first island,
d) patterning and etching said second electrically conductive material to expose at least a portion of said third electrically conductive material and to form at least one second island of said second electrically conductive material, wherein said at least one second island is opposite said at least one first island,
e) removing said exposed third electrically conductive material,
f) filling the area created by the removal of said exposed third electrically conductive material with an organic

insulator material, such that at least a portion of said at least one second island is surrounded by said organic insulator material, and



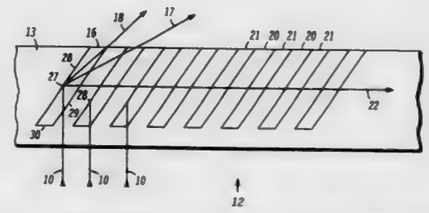
g) removing said backing material and thereby forming said electrical connection member.

5,116,460
METHOD FOR SELECTIVELY ETCHING A FEATURE
Yefim Bukhman, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 12, 1991, Ser. No. 684,130
Int. Cl.[5] B44C *1/22;* **B29C** *37/00*
U.S. Cl. 156—643 **19 Claims**



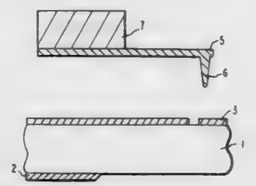
1. A method for selectively etching a feature in layers having similar anisotropic etch characteristics on a semiconductor wafer comprising:
providing a semiconductor wafer with a first and a second layer;
providing an etch mask on the second layer, which defines the second layer into open areas and covered areas that are protected by the etch mask;
etching the open areas of the second layer partially until a predetermined amount of the open areas is removed;
depositing a polymer film over the partially etched open areas and the covered areas;
anisotropic etching of the polymer film, leaving walls of the etched open areas protected by the polymer film while the other areas are etched clear of polymer; and
chemically etching the open areas that are clear of polymer.

5,116,461
METHOD FOR FABRICATING AN ANGLED DIFFRACTION GRATING
Michael S. Lebby, and Michael P. Norman, both of Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 22, 1991, Ser. No. 688,763
Int. Cl.[5] H01L *21/306;* **B44C** *1/22;* **B29C** *37/00;* **C03C** *15/00*
U.S. Cl. 156—643 **20 Claims**



1. A method for fabricating an angled diffraction grating comprising:
providing an optical medium that is patterned with fine lines and spaces; and
etching the fine lines and spaces into the optical medium by an etching means to produce parallel walled angled trenches in the optical medium, thereby producing an angled diffraction grating.

5,116,462
METHOD OF PRODUCING MICROMECHANICAL SENSORS FOR THE AFM/STM PROFILOMETRY
Johann W. Bartha; Thomas Bayer, both of Sindelfingen; Johann Greschner, Pliezhausen; Georg Kraus, Wildberg; Helga Weiss, Boeblingen, and Olaf Wolter, Aidlingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 16, 1990, Ser. No. 568,286
Claims priority, application European Pat. Off., Aug. 16, 1989, 89115099
Int. Cl.[5] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **19 Claims**



1. A method of producing micromechanical sensors for the AFM/STM profilometry, which consist of a cantilever beam with at least one tip at its end and a mounting piece at the opposite, comprising the following steps:
first, coating the top and bottom sides of a wafer substrate to form a first and second insulating layer respectively;
second, producing a mask in said first insulating layer on the top side of the wafer
third, producing a mask in said second insulating layer on the bottom side of the wafer;
fourth, etching a trench in the wafer substrate utilizing said first layer mask;
fifth, removing said first insulating layer from the top side of said wafer substrate by etching;
sixth, coating the top side of the wafer and the trench with the desired. cantilever beam and tip material respectively;
seventh, forming said cantilever beam and tip in a second

photolithographic step and dry or wet etching steps, respectively; and

eighth, removing the supporting wafer material from the bottom side of said wafer by etching through said second layer.

5,116,463

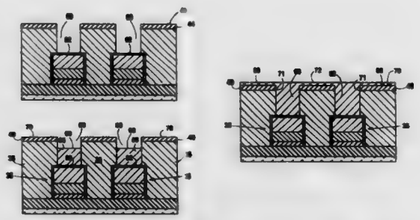
DETECTING COMPLETION OF ELECTROLESS VIA FILL

Charles W. C. Lin, San Antonio; Randy L. German, Austin; Ian Y. K. Yee, Austin, and David M. Sigmond, Austin, all of Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Jun. 19, 1991, Ser. No. 717,767

Int. Cl.[5] B44C *1/22*; B29C *37/00*; C23F *1/00*

U.S. Cl. 156—643 **37 Claims**



1. A method for electrolessly fabricating metal pillars in a dielectric and indicating the pillars are fabricated, comprising the following steps:

providing a flat first dielectric base;

depositing a first electrically conductive metal over the first dielectric;

depositing a second dielectric layer over the first metal;

depositing over the second dielectric an electrically conductive detection mask containing an opening above a portion of the first metal;

etching the second dielectric through the detection mask opening to form a via which exposes the portion of the first metal;

electrolessly depositing a second electrically conductive metal into the via through the opening in the detection mask, wherein the first metal is autocatalytic to the electroless deposition, the detection mask is non-autocatalytic to the electroless deposition, and the second metal deposits on the exposed portion of the first metal and partially fills the via but fails to electrically connect the first metal to the detection mask and fails to deposit on the detection mask;

continuing to electrolessly deposit the second metal into the via until the second metal fills the via, thereby forming a metal pillar in the via which electrically connects the first metal to the detection mask, at which time the second metal begins to deposit on the detection mask;

continuing to electrolessly deposit the second metal until the second metal with a different visual appearance than the detection mask covers the top surface of the detection mask; and then

discontinuing the electroless deposition of the second metal.

5,116,464

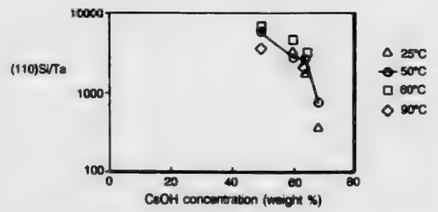
CESIUM HYDROXIDE ETCH OF A SEMICONDUCTOR CRYSTAL

David J. Edell, Lexington, Mass., and Lloyd D. Clark, Jr., Portsmouth, Va., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 360,370, Jun. 2, 1989, abandoned. This application Dec. 7, 1990, Ser. No. 624,514

Int. Cl.[5] C09K *13/02*

U.S. Cl. 156—647 **41 Claims**



1. A method of fabricating a semiconductor device comprising

providing a semiconductor crystal,

providing tantalum on said crystal, and

etching said crystal having said tantalum on it by exposing said crystal and said tantalum to an etch comprising an aqueous solution of cesium hydroxide.

5,116,465

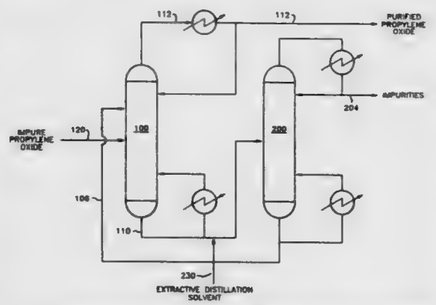
REMOVAL OF WATER, METHANOL AND ACETONE FROM PROPYLENE OXIDE BY EXTRACTIVE DISTILLATION

Ernest L. Yeakey, and Edward T. Marquis, both of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Nov. 1, 1991, Ser. No. 786,688

Int. Cl.[5] B01D *3/40*; C07D *301/32*

U.S. Cl. 203—57 **4 Claims**



1. An extractive distillation process for the distillation of an impure propylene oxide feedstock in a distillation column to remove oxygenated contaminants, including water, acetone and some of the methanol from the impure propylene oxide feedstock which comprises the steps of:

introducing said impure propylene oxide feedstock into the lower half of a distillation column,

introducing an extractive distillation agent consisting essentially of 2-hydroxyethyl 2-hydroxyethylcarbamate above the impure propylene oxide feed point, said extractive distillation agent being introduced into said distillation column in the ratio of said feedstock to said extractive distillation agent of from about 1:1 to about 20:1,

withdrawing an overhead distillate fraction from said distillation column consisting essentially of essentially anhydrous propylene oxide contaminated with reduced quantities of acetone and methanol,

withdrawing a bottoms distillation fraction from said distillation column containing substantially all of the 2-hydroxyethyl 2-hydroxyethylcarbamate, and substantially all of the water, methanol and acetone introduced into said distillation column.

5,116,466

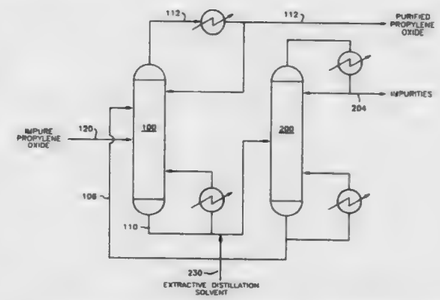
PROPYLENE OXIDE PURIFICATION BY EXTRACTIVE DISTILLATION

Edward T. Marquis; George P. Speranza; Yu-Hwa E. Sheu; William K. Culbreth, III, and David G. Pottratz, all of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Nov. 1, 1991, Ser. No. 786,857

Int. Cl.[5] B01D *3/40*; C07D *301/32*

U.S. Cl. 203—58 **4 Claims**



1. An extractive distillation process for the distillation of an impure propylene oxide feedstock in a distillation column to remove oxygenated contaminants, including water, methanol and acetone from the impure propylene oxide feedstock which comprises the steps of:

introducing said impure propylene oxide feedstock into the lower half of a distillation column,

introducing an extractive distillation agent consisting essentially of 1-methyl-2-pyrrolidone above the impure propylene oxide feed point, said extractive distillation agent being introduced into said distillation column in the ratio of said feedstock to said extractive distillation agent of from about 1:1 to about 20:1,

withdrawing an overhead distillate fraction from said distillation column consisting essentially of essentially anhydrous propylene oxide contaminated with reduced quantities of acetone and methanol, and

withdrawing a bottoms distillation fraction from said distillation column containing substantially all of the 1-methyl-2-pyrrolidone, water, acetone and a portion of the methanol introduced into said distillation column.

5,116,467

WATER AND ACETONE REMOVAL FROM PROPYLENE OXIDE BY EXTRACTIVE DISTILLATION

Edward T. Marquis; George P. Speranza; Yu-Hwa E. Sheu; William K. Culbreth, III, and David G. Pottratz, all of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Nov. 1, 1991, Ser. No. 786,680

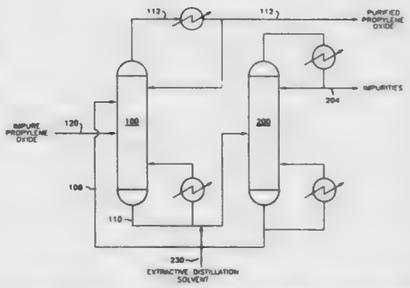
Int. Cl.[5] B01D *3/40*; C07D *301/32*

U.S. Cl. 203—58 **4 Claims**

1. An extractive distillation process for the distillation of an impure propylene oxide feedstock in a distillation column to remove oxygenated contaminants, including water, acetone and some of the methanol from the impure propylene oxide feedstock which comprises the steps of:

introducing said impure propylene oxide feedstock into the lower half of a distillation column,

introducing an extractive distillation agent consisting essentially of sulfolane above the impure propylene oxide feed point, said extractive distillation agent being introduced into said distillation column in the ratio of said feedstock to said extractive distillation agent of from about 1:1 to about 20:1,



withdrawing an overhead distillate fraction from said distillation column consisting essentially of essentially anhydrous propylene oxide contaminated with reduced quantities of acetone and methanol,

withdrawing a bottoms distillation fraction from said distillation column containing substantially all of the sulfolane, substantially all of the water, and acetone introduced into said distillation column and some of the methanol introduced into the distillation column.

5,116,468

METHOD FOR THE PREPARATION OF FINELY DIVIDED, ELECTRICALLY CONDUCTIVE TIN(IV) OXIDE

Joachim Giersberg, Marl-Sinsen; Dirk Naumann, Essen-Kupferdreh, and Frank Honselmann, Herten, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Oct. 15, 1991, Ser. No. 776,554

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1990, 4034353

Int. Cl.[5] C25B *1/00*

U.S. Cl. 204—96 **10 Claims**

1. A method for the preparation of finely divided electrically conductive tin(IV) oxide, in which, in a first step, an aqueous solution of oxalate containing tin(IV) oxalate, oxalates of polymeric tin(IV) compounds or a combination thereof is prepared and in a second step, the tin(IV) oxalate, oxalates of polymeric tin(IV) or combination thereof from the aqueous solution obtained in the first step is calcined to produce tin(IV) oxide, comprising,

in the first step, carrying out electrolysis to produce the aqueous solution of oxalate under conditions wherein:

(a) the anode is comprised of tin or a tin alloy containing a doping metal,

(b) the cathode is comprised of metal or graphite,

(c) the two electrodes are separated from one another by a diaphragm or an organic membrane which is permeable to hydrogen ions and

(d) an aqueous oxalic acid is used as electrolyte and in the second step, calcining the tin(IV) oxalate, oxalates of polymeric tin(IV) compounds or a combination thereof to produce tin(IV) oxide, with the proviso that a doping agent is added to the solution of oxalate before calcination when the anode is comprised of tin.

5,116,469

METHOD FOR TREATMENT OF HIGH-STRENGTH METAL AGAINST HYDROGEN EMBRITTLEMENT

Joseph Yahalom, Haifa, Israel, assignor to Technion Research and Development Foundation Ltd., Haifa, Israel

Filed Jan. 27, 1989, Ser. No. 302,251
Int. Cl.[5] C25C *1/00*; C25F *1/00*
U.S. Cl. 204—147 **16 Claims**

1. A method for the removal of hydrogen from high strength metals, selected from the group consisting of zirconium, titanium and their alloys, against hydrogen embrittlement, consisting essentially of the steps of:

periodically immersing the high strength metal in a non-corrosive electrolyte solution during maintenance, subjecting the metal to an anodic potential having a value of up to 600 millivolts on the hydrogen scale, and

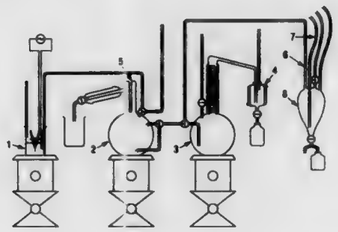
removing elementary hydrogen that has diffused to the outer metal surface from the metal surface by anodic oxidation of hydrogen.

5,116,470

PREPARATION OF HIGH SPECIFIC ACTIVITY TECHNETIUM-96

Leonard F. Mausner, Stony Brook; Suresh C. Srivastava, Setauket, and Thomas Prach, Port Jefferson, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 10, 1990, Ser. No. 565,523
Int. Cl.[5] C01G *1/00*, *57/00*
U.S. Cl. 204—157.21 **4 Claims**



1. A process for producing and isolating technetium-96 comprising:

a) irradiating a high purity rhodium target with protons;

b) dissolving the irradiated rhodium target by electrolysis in an electrolyte;

c) evaporating the resulting solution to remove the electrolyte;

d) dissolving the resulting material in a solvent that makes the solution basic; and

e) extracting the Tc-96 therefrom with an organic solvent.

5,116,471

SYSTEM AND METHOD FOR IMPROVING SAMPLE CONCENTRATION IN CAPILLARY ELECTROPHORESIS

Ring-Ling Chien, San Jose, and Dean S. Burgi, Palo Alto, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Oct. 4, 1991, Ser. No. 771,575
Int. Cl.[5] G01N *27/26*; B01D *57/02*
U.S. Cl. 204—180.1 **33 Claims**

1. A method for improving sample concentration in capillary electrophoresis comprising the steps of:

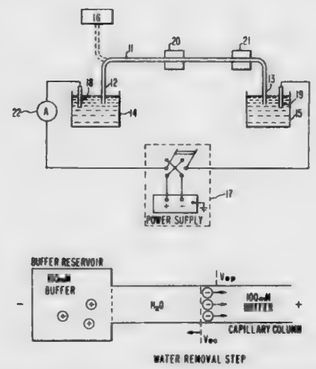
substantially filling a separation column with a first buffer;

measuring the magnitude of a current flow through said first buffer inside said separation column by applying a first voltage across said separation column for a period of time necessary for performing the measurement of said first current flow to determine the first current flow value;

obtaining sample solution by preparing a sample in a second buffer, said second buffer having concentration lower than said first buffer;

introducing a plug of said sample solution into said separation column adjacent to said first buffer;

concentrating ions of said sample at the boundary between said first buffer and said sample solution, and substantially extracting said second buffer from said separation column



by applying a second voltage across said separation column and concurrently monitoring the magnitude of current flow through said sample solution and first buffer within said separation column, said second voltage having an opposite polarity to said first voltage;

applying a third voltage across said separation column for separating said sample into its components thereby providing a signal when each component is detected, said third voltage having opposite polarity to said second voltage.

5,116,472

PROCESS FOR COATING SUBSTRATES WITH AN INSULATING COATING

Herbert Wolter, Gerchsheim, and Helmut Schmidt, Zellingen, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V., Munich, Fed. Rep. of Germany

Filed Jul. 25, 1989, Ser. No. 384,803
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1988, 3826715
Int. Cl.[5] C25D *13/04*
U.S. Cl. 204—181.7 **22 Claims**

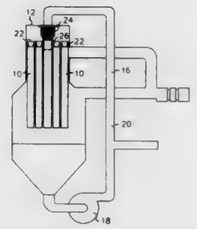
1. A process for electrophoretically coating electrically conducting substrates with an insulating coating, which comprises subjecting at least two silanes which each contain at least one hydrolyzable group and/or an OH group, bound to silicon, at least one of these silanes additionally having at least one radical capable of participating in a radical or ionic polymerization reaction, and at least one of these silanes additionally having at least one radical which has a functional group capable of being converted into a charged group, or a corresponding oligomer, to a polycondensation reaction, depositing the resulting polycondensate substantially free of OH groups on the substrate and curing the coating so obtained by polymerization involving the radicals capable of participating in the radical or ionic polymerization.

5,116,473

APPARATUS FOR CONTROLLING SOLID PARTICLE FLOW IN AN EVAPORATOR

Joseph J. Bostjancic, Renton, Wash., assignor to Resources Conservation Co., Bellevue, Wash.

Continuation of Ser. No. 198,325, May 25, 1988, Pat. No. 5,000,821. This application Oct. 12, 1990, Ser. No. 596,246
The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.
Int. Cl.[5] B01D *1/06*, *1/30*
U.S. Cl. 159—42 **24 Claims**



1. An improved apparatus for selectively controlling the flow of solid particles having a size larger than a critical size for use in an evaporator for concentrating slurries and solutions containing solid particles and liquid, the critical size being a predetermined size above which the solid particles cause unacceptable clogging of the evaporator, the evaporator having a plurality of generally vertical heat exchange tubes, a lower reservoir positioned below the heat exchange tubes, an upper reservoir positioned above the heat exchange tubes, and a recirculation conduit for recirculating slurry or solution from the lower reservoir to the upper reservoir, wherein the improvement comprises:

a separation chamber having an inlet and an outlet and having a plurality of apertures sized to separate from the liquid solid particles larger than the critical size, said separation chamber positioned within the upper reservoir, with said chamber inlet positioned to receive slurry or solution from the recirculation conduit within the interior of said separation chamber, and said chamber apertures communicating a substantial portion of the liquid to the upper reservoir exterior of said separation chamber for passage through the heat exchange tubes to the lower reservoir, said separation chamber being sized to fit between an upper wall of the evaporator and the heat exchange tubes;

a bypass conduit connected to said chamber outlet and positioned to channel from the interior of said separation chamber solid particles which are larger than the critical size to the lower reservoir without entering the upper reservoir exterior of said separation chamber, with said substantial portion of the liquid exiting the interior of said separation chamber through said chamber apertures to the upper reservoir exterior of said separation chamber being recombined with the separated solid particle in the lower reservoir after first passing through the heat exchange tubes.

12. An evaporation apparatus for concentrating slurries or solutions containing liquid and solid particles larger than a critical size, comprising:

an upper reservoir;

a lower reservoir;

a plurality of substantially vertical heat exchange tubes extending between said upper and lower reservoirs for circulating the slurries or solutions from said upper reservoir to said lower reservoir and concentrating said slurries or solutions as they pass through said heat exchange tubes;

a recirculation conduit connected to said upper and lower reservoirs and recirculating the slurry or solution from the lower reservoir to the upper reservoir;

a separation chamber having an inlet and an outlet and having a plurality of apertures sized to separate from the liquid solid particles larger than the critical size, said separation chamber positioned within the upper reservoir, with said chamber inlet positioned to receive slurry or solution from the recirculation conduit within the interior of said separation chamber, and said chamber apertures communicating a substantial portion of the liquid to the upper reservoir exterior of said separation chamber for passage through the heat exchange tubes to the lower reservoir, said separation chamber being sized to fit between an upper wall of the evaporator and the heat exchange tubes; and

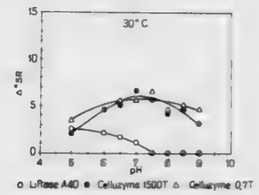
a bypass conduit connected to said chamber outlet and positioned to channel from the interior of said separation chamber solid particles which are larger than the critical size to the lower reservoir without entering the upper reservoir exterior of said separation chamber, with said substantial portion of the liquid exiting the interior of said separation chamber through said chamber apertures to the upper reservoir exterior of said separation chamber being recombined with the separated solid particles in the lower reservoir after first passing through the heat exchange tubes.

5,116,474

PROCESS FOR IMPROVING THE DRAINAGE CAPACITY OF A PAPER PULP USING AN ENZYME OBTAINED FROM THE FUNGUS *HUMICOLA INSOLENS* OR THE BACTERIUM CELLULOMONAS

M. Jean-Luc Fuentes, Villenave D'ornon; M. Christian Rousset, Biganos; M. Gerard Goma, Ramonville, and M. Jean-Claude Pommier, Gradignan, all of France, assignors to LA Cellulose Du Pin, Bordeaux, France

Filed Oct. 1, 1990, Ser. No. 591,268
Claims priority, application France, Oct. 2, 1989, 89 12823
Int. Cl.[5] D21H *25/02*
U.S. Cl. 162—71 **18 Claims**



1. A process for treating paper pulp, comprising:

contacting an aqueous suspension of said pulp having a Schopper-Riegler (SR) value of at least 25 determined according to Standard NFQ 50 003 with a cellulase or hemicellulase enzyme or enzyme composition containing a cellulase or hemicellulase enzyme at a pH in the range 7–9, wherein said enzyme or enzyme composition comprises an enzyme obtained from the fungus *Humicola insolens* or from the bacterium Cellulomonas, and said contacting improves the drainage capacity of said paper pulp.

5,116,475

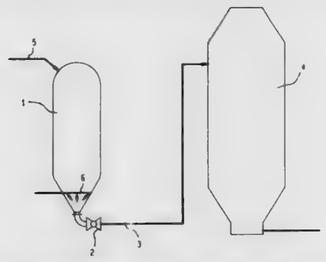
METHOD FOR DISCHARGING A DIGESTER

Runo E. G. Edlund, Sundsvall, and Bertil K. Ernerfeldt, Njurunda, both of Sweden, assignors to Sunds Defibrator Industries Aktiebolag, Sweden

Filed Sep. 26, 1990, Ser. No. 588,655
Claims priority, application Sweden, Oct. 17, 1989, 8903417
Int. Cl.[5] D21C *7/08*
U.S. Cl. 162—52 **6 Claims**

1. A method for the discharge of cooked lignocellulose

material from a digester containing said cooked lignocellulose material in an amount providing a predetermined static pressure to a receiving vessel, said digester having an upper portion and a lower portion, and including an exit port at said lower portion at a predetermined level therein, and said receiving vessel having an entrance port at a predetermined level therein, said predetermined level in said receiving vessel being higher than said predetermined level in said digester by a predetermined level difference, and said exit port of said digester and said entrance port of said receiving vessel being connectable through a conduit providing a predetermined flow resistance between said digester and said receiving vessel,



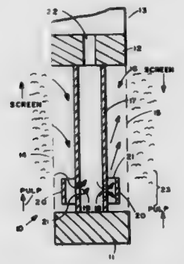
said method comprising cooling said cooked lignocellulose material in said digester to a temperature in the range of about 100° C. to 120° C., supplying a gas to said upper portion of said digester so as to provide a predetermined gas pressure therein, wherein the combination of said predetermined gas pressure and said predetermined static pressure exceeds the sum of the pressure required to overcome said predetermined level difference and said predetermined flow resistance in order to transfer said cooked lignocellulose material from said digester to said receiving vessel by no greater than about 200 kPa, and connecting said exit port in said digester with said entrance port in said receiving vessel so as to transfer said cooked lignocellulose material through said conduit.

5,116,476

ATMOSPHERIC DIFFUSER IMPROVED LOWER SCREENS BACKFLUSHING

Joseph Phillips; J. Robert Prough; Victor Bilodeau; Brian Greenwood; Ronald Bain, and John Weston, all of Glen Falls, N.Y., assignors to Kamyr Inc., Glens Falls, N.Y.

Filed Dec. 17, 1990, Ser. No. 628,090
Int. Cl.[5] D21C *9/04*; B01D *33/06*
U.S. Cl. 162—60 **15 Claims**



1. An atmospheric diffuser for treating cellulosic fibrous material pulp, comprising:

a generally upright vessel;

a plurality of arms mounted within said vessel for up and down movement;

a plurality of annular screen assemblies mounted on said arms, each assembly including at least one screen having holes therein;

conduit means for transporting liquid passing into said screen assemblies from pulp in said vessel, into said arms and out of said vessel;

at least one screen of each screen assembly having an outer face and an inner face, said outer face first encountering the pulp as it moves in its direction of movement, with the arms operatively connected to the screen face at the downstream end thereof in the direction of pulp movement;

means for moving said arms up and down in movement coincident with pulp flow in one direction and to cause backflushing of liquid through the screens in the other direction;

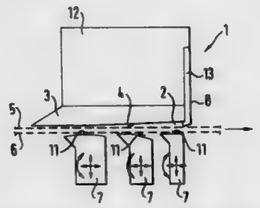
means for directing backflushing liquid from said inner face of said screen back through said screen so that the backflushed liquid passing through the screen adjacent the downstream end thereof has substantially the same properties as liquid just withdrawn through the screen at that point wherein said arms are hollow, and further comprising means defining an opening from the inner face of said screen to a hollow interior of said arms at a first end of said screen, said opening distinct from said screen holes; and wherein means for directing backflushing liquid comprises barrier means for preventing liquid which passes through said screen adjacent said first end thereof from directly passing into said opening, said barrier means extending from said first end of said screen to adjacent a second end of said screen, remote from said first end, and means defining a passage in said barrier means adjacent said second end thereof.

5,116,477

DRAINAGE DEVICE IN A DOUBLE-SIEVE MOLD

Alfred Bubik, Ravensburg, and Otto Hildebrand, Ravensburg-Taldorf, both of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Continuation of Ser. No. 340,874, Apr. 20, 1989, abandoned. This application Nov. 16, 1990, Ser. No. 614,934
Claims priority, application Fed. Rep. of Germany, May 5, 1988, 3815316
Int. Cl.[5] D21F *1/36, 1/48*
U.S. Cl. 162—301 **11 Claims**



1. A drainage device in a double-sieve mold having a first flexible wire sieve and a second flexible wire sieve, means for positioning said first sieve parallel to, but spaced from, said second sieve to form a sandwich with a paper suspension between said first and said second sieves and means for moving said sandwich in a flow direction, said drainage device comprising:

means defining a single first mold surface extending along said flow direction, said first mold surface being mounted in a fixed relationship to said first sieve so that said first mold surface is adjacent to, but spaced from, said first sieve in order to define a liquid intake space having a width between said first mold surface and said first sieve;

means defining a plurality of second mold surfaces, said plurality of second mold surfaces being located on the opposite side of said sandwich from and opposite said single first mold surface and contacting said second sieve; and

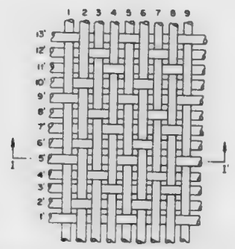
means for moving each of said second mold surfaces relative to said single first mold surface so that said sandwich is moved relative to said single first mold surface whereby said liquid intake space width can be adjusted along said flow direction.

5,116,478

EXTENDABLE AND HEAT SHRINKABLE POLYESTER MONO-FILAMENT FOR ENDLESS FABRIC

Takuo Tate; Taketoshi Watanabe, and Hiroyuki Nagura, all of Tokyo, Japan, assignors to Nippon Filcon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 608,756, Nov. 5, 1990, abandoned. This application Mar. 13, 1991, Ser. No. 669,442
Int. Cl.[5] D21F *3/00*
U.S. Cl. 162—358 **12 Claims**



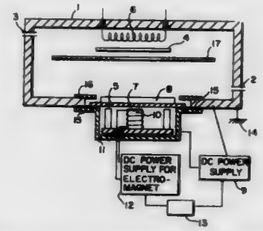
1. An extendable and heat shrinkable polyester monofilament suitable for producing an endless fabric which deforms plastically in the loading range of 0.5 g/d–2.5 g/d and has an extension at the yield point in the range of 1–10%.

5,116,479

PROCESS FOR PRODUCING TRANSPARENT CONDUCTIVE FILM COMPRISING INDIUM OXIDE

Kyuzo Nakamura, Yachimata; Satoru Ishibashi, Narita; Yoshifumi Ota, and Yasushi Higuchi, both of Yachimata, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa, Japan

Division of Ser. No. 415,742, Oct. 2, 1989, abandoned. This application May 17, 1990, Ser. No. 524,768
Claims priority, application Japan, Mar. 3, 1989, 1-50086
Int. Cl.[5] C23C *14/36*
U.S. Cl. 204—192.13 **2 Claims**



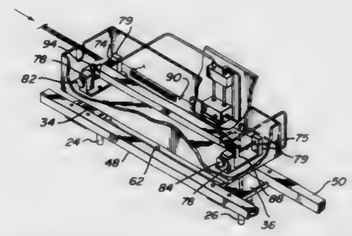
1. In a sputtering process for producing an In-O or In-Sn-O based transparent conductive film on a substrate, said process comprising sputtering a target comprising In, or In and Sn, by applying a sputtering voltage to the target while introducing a sputtering gas comprising oxygen to generate a plasma discharge between the substrate and the target, said target having a magnetic field on its surface, the improvement which comprises maintaining the sputtering voltage at 350V or less by increasing the intensity of the magnetic field on the surface of the target as the conductive film is being formed.

5,116,480

METHOD AND APPARATUS FOR ELECTROLYTIC PLATING

Karl L. Palnik, Huntington Valley, Pa., assignor to The Carolinch Company, Ivyland, Pa.

Filed Mar. 26, 1990, Ser. No. 499,011
Int. Cl.[5] C25D *17/14*
U.S. Cl. 204—206 **9 Claims**



1. A brush-head assembly for metal plating a conductive workpiece as it moves along said brush-head assembly, comprising:

a non-porous titanium brush body extending along the path of said workpiece to be plated;

means defining a liquid-flow channel extending through and along said titanium brush body and having an inlet at one end of said channel and an outlet at the other end of said channel for passage therethrough of a plating electrolyte containing metal ions;

an insertable and removable brush insert of porous material extending along the length of said brush body;

a slot in said brush body for receiving and holding the inner end portion of said brush insert with the outer tip portion thereof extending outwardly of said brush body;

means for flowing a plating electrolyte containing metal ions through said channel from said inlet to said outlet thereof;

said channel communicating with, and supplying said electrolyte to, the surface of an inner end portion of said brush insert in said slot;

platinum plating covering portions of said brush body adjacent the outer end of said slot, to serve as an anode;

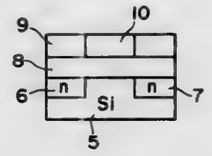
a porous cover covering at least the outer tip portion of said insertable and removable brush insert, for contacting said workpiece and for applying electrolyte thereto.

workpiece-contacting brush means extending along the side of said workpiece, opposite from said same brush cover, and having conductive bristles disposed to contact said workpiece;

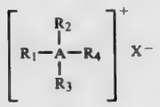
means for maintaining said platinum plating positive with respect to said brush bristles; and

means for mounting said brush body for rotation to different angular portions about its longitudinal axis and for adjustment of the position of said brush body toward and away from said workpiece.

5,116,481
ANION-SELECTIVE, SENSITIVE FILM, ELECTRODE CONTAINING THE SAME AND THE USE THEREOF
Satoshi Ozawa; Naoto Oki, both of Hitachi; Yasuhisa Shibata, Ibaraki, and Hiroyuki Miyagi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 5, 1990, Ser. No. 504,605
Claims priority, application Japan, Apr. 7, 1989, 1-088906; Apr. 13, 1989, 1-094172; Jul. 20, 1989, 1-188201
Int. Cl.[5] **G01N** *27/46*
U.S. Cl. 204—290 R **30 Claims**



1. An anion-selective, sensitive film which contains an anion sensitive substance, a high polymer material and a plasticizer, wherein said anion sensitive substance comprises:
a combination of:
a first compound having the formula:



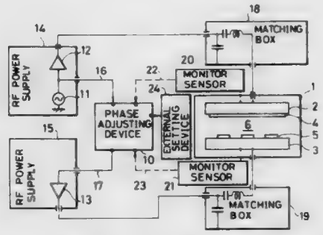
(1)

wherein A represents a nitrogen or phosphorus atom, X^- represents an anion, and R_1, R_2, R_3 and R_4 represent normal- or iso-alkyl radicals each containing a number n_1 of carbon atoms wherein n_1 is an integer between 10 and 24 inclusive, and
a second compound of the formula (1) wherein R_1 represents a normal-or iso-alkyl radical containing a number n_2 of carbon atoms between 1 and 20 inclusive, and R_2, R_3 and R_4 represent normal-or iso-alkyl radicals each having a number n_3 of carbon atoms, with the proviso that $(n_2+1) \leqq n_3 \leqq 24$.

13. A chemical analysis apparatus for measuring an anion concentration, comprising an anion-selective electrode provided with an anion-selective, sensitive film containing an anion sensitive substance supported by a high polymer material, wherein the anion-selective, sensitive film is one as defined in claim 1.

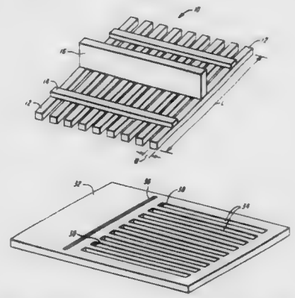
5,116,482
FILM FORMING SYSTEM USING HIGH FREQUENCY POWER AND POWER SUPPLY UNIT FOR THE SAME
Eiji Setoyama, and Mitsuhiro Kamei, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 24, 1990, Ser. No. 587,034
Claims priority, application Japan, Sep. 22, 1989, 1-247322
Int. Cl.[5] **C23C** *14/34, 14/54*
U.S. Cl. 204—298.08 **6 Claims**

1. In a film forming system of a type including an evacuating arrangement, a pair of opposed electrodes, and an RF voltage supplying device for supplying RF voltages to the respective electrodes to generate a discharge between the electodes to effect film depositon comprising one or more steps, the improvement which comprises:
a setting device for presetting a value representing a phase relationship between RF voltages applied to the opposed elecrodes for each step of the film deposition;
a discharge variation detecting device for detecting an amount of a variation in the discharge as a voltage from each of the electrodes; and
a phase adjusting device for detecting the difference in phase



beteeen the RF voltages supplied to the electrodes and for adjusting the phase difference of the RF voltages supplied to the electrodes according to the difference between the detected phase difference and the preset value.

5,116,483
COMB FOR AFFINITY CO-ELECTROPHORESIS
Arthur D. Lander, Brookline, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Division of Ser. No. 432,570, Nov. 6, 1989, abandoned. This application Sep. 21, 1990, Ser. No. 587,536
Int. Cl.[5] **B01D** *61/42;* **C25B** *1/00*
U.S. Cl. 204—299 R **7 Claims**



1. A comb adapted for use in preparing a gel for use in electrophoresis, the comb comprising:
first teeth attached in fixed relation to one another, each tooth having a length defining a longitudinal axis, a width and a height, the length being substantially greater than the width and the longitudinal axis being substantially parallel;
means attached to the teeth for providing a gripping handle; and
a perpendicular tooth attached to the first teeth, the perpendicular tooth having a length spanning the combined width of at least two of the first teeth and being oriented perpendicularly to and intersecting the longitudinal axes.

5,116,484
HYDRODENITRIFICATION PROCESS
John A. Smegal, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Continuation-in-part of Ser. No. 606,414, Oct. 31, 1990, abandoned. This application Feb. 11, 1991, Ser. No. 653,216
Int. Cl.[5] **C10G** *23/02, 45/00*
U.S. Cl. 208—254 H **15 Claims**

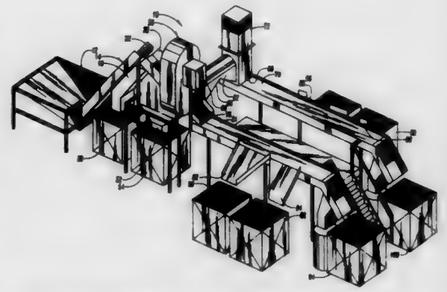
1. A process for the hydrodenitrification of nitrogen-containing hydrocarbons in a hydrocarbon feedstock having a nitrogen content greater than about 100 parts per million by weight which process comprises:
(a) contacting at a temperature between about 575° F. and about 775° F. and a pressure between about 600 psi and about 2500 psi in the presence of added hydrogen said feedstock with a first catalyst bed containing a hydrotreating catalyst comprising nickel and tungsten supported on an alumina support, and
(b) passing the hydrogen and feedstock without modification, from the first catalyst bed to a second catalyst bed where it is contacted at a temperature between about 575° F. and about 775° F. and a pressure between about 600 psi and about 2500 psi with a hydrotreating catalyst comprising nickel and molybdenum supported on an alumina support.

5,116,485
APPARATUS AND METHOD FOR RECOVERING DIESEL-QUALITY FUEL FROM PRODUCED CRUDE OIL
Thomas E. Krisa, 13802 Trailville Dr., Houston, Tex. 77077
Continuation of Ser. No. 226,342, Jul. 26, 1988, abandoned. This application Jan. 18, 1991, Ser. No. 644,473
Int. Cl.[5] **C10G** *7/00*
U.S. Cl. 208—353 **4 Claims**

1. A process for separating diesel-quality fuel from a crude oil feedstream and returning a liquid residue stream of heavier hydrocarbons and a lighter hydrocarbon stream to a stream of crude oil comprising the steps of:
(a) flashing in a flash vessel a crude oil feedstream under conditions effective for separating a vapor product comprising diesel quality fuel and lighter hydrocarbon components from a liquid residue of heavier hydrocarbons, and producing a vapor stream comprising diesel-quality fuel and lighter hydrocarbon components and a liquid residue stream of heavier hydrocarbons;
(b) passing the vapor stream through a diesel-quality fuel accumulation vessel thence into a refluxing exchanger;
(c) condensing the diesel-quality fuel component of the vapor stream to a liquid in the refluxing exchanger and removing overhead from the refluxing exchanger a lighter hydrocarbon stream comprising the lighter hydrocarbon components of the vapor stream;
(d) removing the liquid stream comprising diesel-quality fuel component from the refluxing exchanger and flowing the liquid stream back into the diesel-quality fuel accumulation vessel and accumulating diesel-quality fuel therein;
(e) removing from the flash vessel the liquid residue stream of heavier hydrocarbons and combining said liquid residue stream and said lighter hydrocarbon stream removed from the refluxing exchanger with a crude oil stream; and
(f) withdrawing a diesel-quality fuel stream from the diesel-quality of fuel accumulation vessel.

5,116,486
APPARATUS AND METHOD FOR SEPARATING RECYCLABLE WASTE
Dennis A. Pederson, 234 58th Pl., Des Moines, Iowa 50312
Filed Feb. 1, 1991, Ser. No. 649,744
Int. Cl.[5] **B07B** *9/00*
U.S. Cl. 209—12 **10 Claims**

1. Apparatus for recycling waste materials consisting essentially of
hopper means containing a combination of unground waste materials comprising magnetic responsive metals, magnetic nonresponsive metals, large glass materials of various shapes and colors, small glass materials, and plastic materials;
first conveyor means having an input end and a discharge end, said input end of said first conveyor means being positioned adjacent said hopper means for conveying all of said waste materials to said discharge end of said first conveyor means;
magnetic separating means positioned adjacent said discharge end of said first conveyor means for receiving all of said waste materials therefrom, said magnetic separating means being adapted to remove only said magnetic responsive metals from said waste materials;
screen means having an upper end adjacent said magnetic separating means for receiving all of said waste material except said magnetic responsive metals from said magnetic separating means after removal of said magnetic responsive metals, said screen means having a lower end and being adapted to separate said small glass materials from said waste materials and convey only said large glass materials, said magnetic non-responsive metals, and said plastics to said lower end;
air sorting means having an inlet end positioned adjacent said lower end of said screen means and having a first

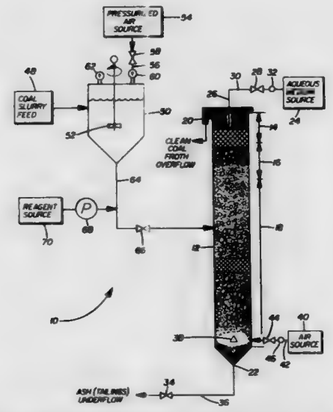


discharge opening, a second discharge opening, and a fan for directing a stream of air toward said first discharge opening, said air sorting means being adapted to move said large glass materials, said magnetic non-responsive metals, and said plastic materials from said screen means through said air stream toward said second discharge opening, said fan means causing said air stream to be sufficiently strong to blow said magnetic non-responsive metals and said plastic materials through said first discharge opening and to permit said large glass materials to pass through said second discharge opening;
second conveyor means having a receiving end adjacent said first discharge opening of said glass air sorting means for receiving said magnetic non-responsive metals and said plastic materials therefrom, said second conveyor means having a discharge end;
third conveyor means having a receiving end adjacent said second discharge opening of said air sorting means for receiving said large glass particles therefrom.

5,116,487
FROTH FLOTATION METHOD FOR RECOVERY OF ULTRA-FINE CONSTITUENT
Bhupendra K. Parekh, Lexington, and John G. Groppo, Jr., Wilmore, both of Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.
Filed Jul. 27, 1990, Ser. No. 560,055
Int. Cl.[5] **B03D** *1/04, 1/14*
U.S. Cl. 209—164 **5 Claims**

1. A froth flotation method for the recovery of a selected ultra-fine constituent utilizing an apparatus including a pressurized air source, a slurry conditioning tank, a feed line and a flotation column, comprising the steps of:
dissolving air in said slurry in said conditioning tank in the absence of flotation reagent by admitting air from said pressurized air source at a pressure above atmospheric pressure;

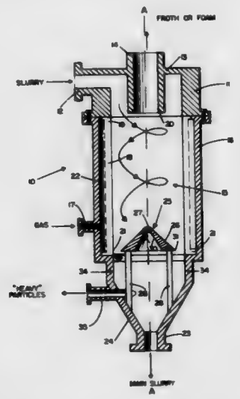
feeding said slurry with dissolved air through said feed line;
adding a flotation reagent to said slurry to render said selected constituent hydrophobic, said flotation reagent being added only after the dissolving of air in said slurry is completed;
delivering said slurry with dissolved air and flotation reagent into said flotation column at atmospheric pressure;
establishing and maintaining a downwardly flowing stream of wash medium in said flotation column, said wash medium being introduced at an upper portion of said flotation column;



establishing and maintaining an upwardly moving stream of diffuse air originating at a lower portion of said flotation column;
providing a matrix in said upper portion of the flotation column so as to provide a tortuous path for said wash medium, selected ultra-fine constituent and diffuse air; and
recovering said selected ultra-fine constituent from said upper portion of said column.

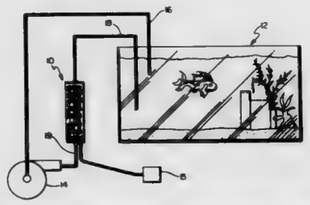
5,116,488
GAS SPARGED CENTRIFUGAL DEVICE
Louis O. Torregrossa, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.
Filed Aug. 28, 1990, Ser. No. 573,978
Int. Cl.[5] B03D *1/14, 1/24;* **B04C** *5/10, 5/107*
U.S. Cl. 209—170 **15 Claims**

1. A hydrocyclone, comprising:
a substantially hollow body having first and second ends, and having a wall disposed about an axis and axially elongated;
tangential inlet means for introducing fluent material into the hollow body at the first end thereof, so that the fluent material flows in a vortex within said hollow body;
first withdrawing means for withdrawing fluid from adjacent the axis at said first end of said body;
a porous surface of revolution disposed within said hollow body wall generally symmetrical with said axis;
means defining a plenum between said body wall and said porous surface of revolution;
means for introducing fluid into said plenum to pass through said porous surface of revolution into said vortex;
second withdrawing means for withdrawing fluent material from said hollow body at said second end thereof; and
means for establishing further vortex action in a volume between said porous surface of revolution and said second withdrawing means to effect separation of gases from the fluent material adjacent said second withdrawing means, said means for establishing a second vortex comprises a conical end section of the hollow body extending from said porous surface of revolution to the second withdrawing means, said means for establishing a second vortex further comprises shroud means disposed above said conical end section and said shroud means extends radially outwardly form the axis of the hollow body to define a



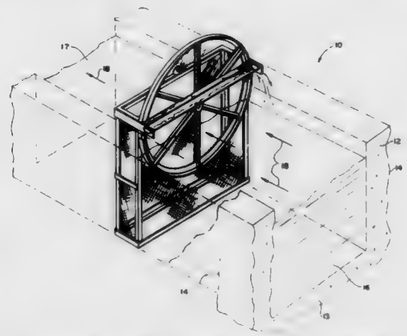
circumferential periphery, said periphery and said porous surface of revolution defining an annular opening there between, said shroud means further defining an axially located gas passage opening in the center of the shroud means for allowing passage of gas separated in said conical end section to flow toward said first withdrawal means.

5,116,489
REEF BIOLOGICAL FILTRATION DEVICE
Frank Englert, Clifton Park, N.Y., assignor to Village Wholesale, Inc., Latham, N.Y.
Filed Jan. 14, 1991, Ser. No. 640,974
Int. Cl.[5] B01D *35/00;* **A01K** *63/04*
U.S. Cl. 210—150 **3 Claims**



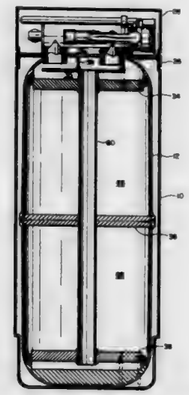
1. A reef filtration device for promoting healthy growth of aerobic bacteria colonies to remove unwanted ammonia in aquarium water which comprises:
a tube member constructed and arranged to be mounted adjacent an aquarium and contain a plurality of media elements;
an output cap having a water output nipple fixed on one end of said tube member;
an input cap having at least two inlet nipples positioned on the other end of said tube member;
one of said inlet nipples formed in the input cap positioned on the other end of said tube member being an air input nipple and one being a water input nipple;
a plurality of large surface area media elements stacked one against another within said tube;
a perforated disk mounted in the input cap of said tube member; and said perforated disk having a plurality of holes drilled in the flat surface thereof with the cross sectional area of the holes in one half of the disk being greater than the cross sectional area in the other half;
so that air and water to be filtered, are mixed together at the input end of the tube member and flowed over the media elements to promote the even growth of ammonia consuming aerobic bacteria.

5,116,490
ROTARY SCREEN APPARATUS FOR USE WITH COOLING TOWERS
Herman Fontenot, Rte. 8, Box 491A, Opelousas, La. 70570
Filed Mar. 21, 1990, Ser. No. 496,861
Int. Cl.[5] B01D *33/15, 33/50*
U.S. Cl. 210—158 **7 Claims**



1. A rotary screen filter apparatus for high quantity filtration of cooling tower water traveling along a generally linear flow path in a flow channel comprising:
(a) a structural truss having a central portion, an upstream surface, and a downstream surface and having front and rear spaced apart, generally rectangular frame members defining upstream and downstream surfaces and a plurality of struts joining the upstream and downstream frame members, forming a truss therewith;
(b) a rotary shaft mounted on the central portion of the truss and aligned with the linear flow path;
(c) a rotary screen having a periphery and mounted on the rotary shaft for rotation with respect to the truss, the rotary screen comprising a central hub, a plurality of radially extending, circumferentially spaced beams, each radially extending beam having an inner end and an outer end and extending from the hub and mounted rigidly thereto, and a peripheral circular beam defining the periphery of the rotary screen and rigidly attached to the outer end of each radially extending beam, and a layer of screen material attached to and supported by the combination of said hub, radially extending beams, and peripheral beam;
(d) a peripheral, curved track mounted on the upstream surface of the truss, and shaped to track the periphery of the rotary screen through at least an obtuse angle, the curved track including a backing member arranged to support the periphery of the rotary screen at the peripheral circular beam on the downstream side of the rotary screen, wherein
the rotary shaft extends between and is joined to the upstream and downstream frame members.
4. The rotary screen filter apparatus of claim 1 wherein:
the rotary screen includes an upstream and a downstream surface, and there are radially extending beams on both the upstream and downstream surfaces of the rotary screen.
5. The rotary screen filter apparatus of claim 4 wherein:
some of the radially extending beams have forwardly extending portions that catch trash falling from the rotary screen during use or during backwashing.
6. The rotary screen filter apparatus of claim 5, further comprising a manifold that extends across the truss and multiple spray heads on the manifold, pontooned to spray backwash water on the downstream surface of the rotary screen.

5,116,491
COMPREHENSIVE WATER TREATMENT SYSTEM
Earl P. Brane, Hide Away Hills, and David L. Tucker, Pickerington, both of Ohio, assignors to Wm. R. Hague, Inc., Groveport, Ohio
Division of Ser. No. 493,896, Mar. 15, 1990. This application Oct. 24, 1991, Ser. No. 782,337
Int. Cl.[5] B01D *21/30*
U.S. Cl. 210—143 **10 Claims**



1. In a water softening system of an exchange medium tank, a brine storage tank in fluid communication therewith, and a valve assembly for controlling fluid flow of said system, the improvement wherein said valve assembly comprises:
(a) a valve body having a drain port, an inlet water port, a softened water outlet port, an injector port, first and second exchange medium tank ports, and first and second injector ports;
(b) a piston valve assembly comprising a piston bearing a first and a second valve, and being disposed within said valve body; a drive assembly connected with said piston for reciprocatingly moving said piston within said valve body for said valves to determine the flow of fluid within said valve body;
(c) a flow meter for measuring water passed through said exchange medium tank;
(d) an injector assembly having a first port in fluid communication with said valve body first port which provides fluid communication with said valve body softened water outlet port, a second port in fluid communication with said valve body second port which provides fluid communication with said valve body inlet water port, and a brine storage tank port; said injector first port being in fluid communication with said injector second port through a nozzle whereby water flowing from said injector second port to said injector first port through said nozzle creates a pressure reduction in the injector assembly between said injector second port and said brine storage tank port for drawing brine from said brine storage tank to within said injector assembly and out said injector second port;
said piston movable from a first position wherein water flows from said valve body inlet port to said second

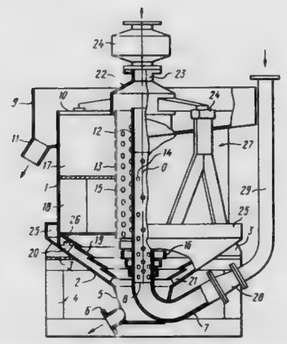
exchange medium tank port, and from said exchange medium tank through said first exchange medium tank port and out said softened water outlet port; to a second position wherein said valves close fluid communication between said valve body inlet water port and said valve body second exchange medium tank port, opens fluid communication between valve body second exchange medium tank port and said valve body drain port, and opens fluid communication between said valve body inlet water port and said first exchange medium tank port and said injector second port for water to backwash said exchange medium tank; to a third position wherein said valves only permit fluid communication between said valve body inlet port and said injector second port for water and brine from said brine storage tank to flow from said injector first port to said valve body first exchange medium tank port, and from said valve body exchange medium tank second port to the valve body drain port; and reciprocatingly movable back.

5,116,492

APPARATUS FOR CLARIFICATION OF INDUSTRIAL SEWAGE

Mikhail N. Zlobin, and Georgy P. Permyakov, both of Mirny, U.S.S.R., assignors to Yakutniproalmaz, Mirny, U.S.S.R.

Filed Oct. 2, 1990, Ser. No. 591,756
Claims priority, application U.S.S.R., May 20, 1988, 4427801
Int. Cl.[5] C02F *1/52*
U.S. Cl. 210—188 **2 Claims**



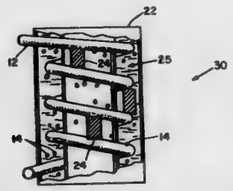
1. An apparatus for clarification of industrial sewage comprising:
- a vertically-arranged cylindrical chamber for circulation of industrial sewage,
- a conical bottom ot said cylindrical chamber;
- a branch pipe for feeding polluted industrial sewage with flocculants, secured on said conical bottom and having an outlet hole arranged along the axis of said cylindrical chamber;
- a branch pipe for discharging the slurry, secured of said conical bottom;
- a circular trough for draining the purified industrial sewage, secured outside of said cylindrical chamber, at its upper edge;
- partitions fort settling of solid particles arranged inside of said cylindrical chamber for circulation of industrial sewage, the surfaces of said partitions being inclined to the axis of said sewage-circulating chamber;
- at least one separating in the form of a body revolution with holes for distributing the polluted sewage over the volume of said cylindrical chamber, in its central part; the upper edge of each of said separting partitions is located, essentially, level with said upper edge of said cylindrical sewage-circulating chamber;
- a pressuretight bell-shaped housing installed above said separating partition, having a lower edge arranged below said upper edge of said separating partition inside of said cylindrical sewage-circulating chamber;
- a means for rarefaction of air communicating with said pressuretight bell-shaped housing.

5,116,493

ARTIFICIAL PANCREATIC PERFUSION DEVICE WITH RESEEDABLE MATRIX

William L. Chick, Wellesley, and Randall G. Rupp, Sterling, both of Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 398,739, Aug. 25, 1989, Pat. No. 5,002,661. This application Mar. 25, 1991, Ser. No. 674,698
Int. Cl.[5] B01D *63/06*
U.S. Cl. 210—192 **18 Claims**



1. An artificial pancreatic perfusion device for providing insulin to an individual, the device comprising:
- a) a hollow fiber having one end connected to a blood vessel through a connecting means to receive blood from the individual and an opposite end connected to a blood vessel through a second connecting means to return blood to the individual, the hollow fiber having a porosity which selectively allows substances to pass transversely therethrough, such that blood flows within the hollow fiber, along the length of the fiber; and
- b) a housing containing a suspension of pancreatic islets of Langerhans, the suspension including pancreatic islets distributed in a supporting material about the hollow fiber such that the hollow fiber is surrounded by pancreatic islets along its length, the supporting material characterized by (i) being sufficiently viscous to maintain distribution of the islets with respect to the hollow fiber, and (ii) being sufficiently fluid to enable removal of the islet suspension for subsequent replacement thereof.

5,116,494

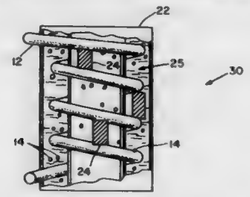
ARTIFICIAL PANCREATIC PERFUSION DEVICE WITH TEMPERATURE SENSITIVE MATRIX

William L. Chick, Wellesley, and Susan J. Sullivan, Newton, both of Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 398,739, Aug. 25, 1989, Pat. No. 5,002,661. This application Mar. 25, 1991, Ser. No. 674,787
Int. Cl.[5] B01D *63/06*
U.S. Cl. 210—192 **16 Claims**

1. An artificial pancreatic perfusion device for providing insulin to an individual, the device comprising:
- a) a hollow fiber having one end connected to a blood vessel through a connecting means to receive blood from the individual and an opposite end connected to a blood vessel through a second connecting means to return blood to the individual, the hollow fiber having a porosity which selectively allows substances to pass transversely therethrough, such that blood flows within the hollow fiber, along the length of the fiber; and
- b) a housing containing a suspension of pancreatic islets of

Langerhans, the suspension including pancreatic islets distributed in a temperature sensitive supporting material about the hollow fiber such that the hollow fiber is surrounded by pancreatic islets along its length, the supporting material characterized by (i) being sufficiently viscous



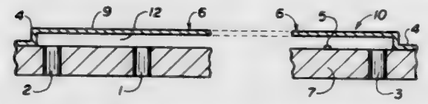
at temperatures below about 45° C. to maintain distribution of the islets with respect to the hollow fiber, and (ii) being sufficiently fluid at temperatures above about 45° C. to enable removal of the islet suspension for subsequent replacement thereof.

5,116,495

CAPILLARY CHROMATOGRAPHY DEVICE

Otto J. Prohaska, Cleveland Heights, Ohio, assignor to Otto-Sensors Corporation, Cleveland, Ohio

Continuation of Ser. No. 96,137, Sep. 11, 1987, abandoned. This application Dec. 22, 1989, Ser. No. 455,502
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 **16 Claims**



1. A capillary chromatography device for separating the components of a sample, said device comprising:
- means defining a capillary column for conducting the sample therethrough, the cross-section of said capillary column having a width less than or equal to 1 millimeter and a height less than or equal to 1 millimeter;
- at least one inlet and at least one outlet for conducting the sample into and out of said capillary column;
- at least one sensor located in said capillary column for measuring a characteristic of the sample;
- said means defining a capillary column including first and second walls, said first wall comprising a substrate and said second wall comprising a cover layer having opposite portions sealingly adhered to a surface of said substrate and partially upwardly bent portions therebetween, said cover layer having a thickness in the range of 0.50 micrometers to 3 micrometers and being formed of a material selected from the group of materials consisting of SiO_x, SiO_xN_y, SiN_y, TiO_x, and TaO_x, and TaO_y, and where x can vary between 1 and 2 and where y can vary between 1 and 5.

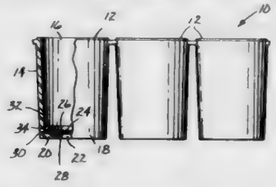
5,116,496

MEMBRANE-CONTAINING WELLS FOR MICROTITRATION AND MICROFILTRATION

John R. Scott, San Jose, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 19, 1991, Ser. No. 671,528
Int. Cl.[5] B01D *24/20, 21/24*
U.S. Cl. 210—232 **6 Claims**

1. A well for use in performing microtitration or microfiltration, said well comprising
- a hollow tubular wall having an axis, upper and lower axially spaced ends, an inner surface, and a lip extending radially inwardly of said inner surface at said lower end, said lip having a distal surface defining an aperture;
- a membrane having a top surface, a bottom surface, and a periphery, and having a shape and size adapted so that a peripheral portion of said membrane adjacent said periphery contacts the upper surface of said lip, with a central portion of said membrane extending across said aperture;
- a generally annular ring having an axis, an outer surface, and



- a lower surface having a width dimension radially of said ring that is generally the same as the radial width of the top surface of said lip, said ring being retained in a predetermined position along the inner surface of said wall with the lower surface of said ring against the upper surface of said membrane and pressing said peripheral portion of the membrane against the lip,
- and means for retaining said outer surface of said ring in engagement with the inner surface of said wall to retain said ring in said predetermined position along said wall.

5,116,497

Patent Not Issued For This Number

5,116,498

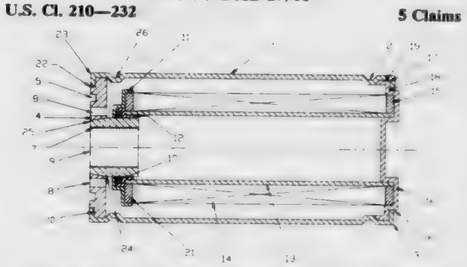
Patent Not Issued For This Number

5,116,499

HIGH-STRENGTH SPIN-ON TUBE FILTER

Richard J. Deibel, 501 Pine St., Bamberg, S.C. 29003

Filed Feb. 25, 1990, Ser. No. 470,053
The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.
Int. Cl.[5] B01D *27/08*
U.S. Cl. 210—232 **5 Claims**

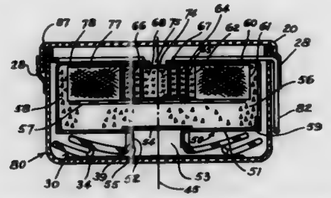


1. A high pressure quick change filter device comprising a tubular metal housing having first and second ends; a first metal end cap secured to the first end of the housing by the housing being folded inwardly over the periphery of the first end cap; a tubular filter element having first and second ends disposed within the housing, said tubular filter element first end bonded to said first end cap, said tubular filter element second end comprising a second metal end cap; and a threaded head assembly sealing said second metal housing end, said threaded head assembly comprising means defining plural circumferentially arranged inlet openings and a central outlet opening, said outlet central opening coaxially aligned with said second metal end cap.

5,116,500
PORTABLE POTABLE WATER PURIFIER KIT

Peter F. Ceaton, Great Falls, Mont., assignor to Aquarian Water Co., Great Falls, Mont.

Filed Apr. 15, 1991, Ser. No. 684,756
Int. Cl.[5] B01D *24/20*
U.S. Cl. 210—238 **18 Claims**

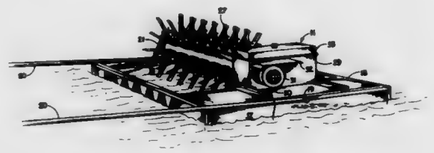


8. A filtration device for filtering water, comprising:
containment means for containing water;
handle means for holding said containment means;
cover means for covering said containment means;
filtration means for filtering water; and
guiding means for guiding water to said filtration means;
said containment means and said cover means being large enough to contain said filtration means and said guiding means;
said containment means being slidably engageable with said handle means;
said guiding means including a funnel mechanism capable of collapsing;
said funnel mechanism having a discharge opening;
said filtration means comprising:
a filter cover having a filter inlet,
a filter inlet screen,
a quantity of finely divided anthracite,
a diverter gasket,
a quantity of ion exchange material,
a filter segment including a spirally wound water impervious material and a quantity of activated carbon,
an outlet screen,
an outlet gasket, and
a filter case containing an outlet aperture;
said filtration means being disposed within said containment means;
said guiding means being disposed within said containment means;
said guiding means being located above said filtration means and below said filtration cover means;
said handle means being slidably engageable with said containment means;
said discharge opening of said funnel mechanism being frictionally fitted to said filter inlet of said filter cover;
said filter cover being frictionally engaged with said filter case;
the filter inlet screen being located substantially under said filter cover;
the anthracite being located substantially under said filter inlet screen and substantially above said diverter gasket;
said diverter gasket being made of water-impervious material that is substantially circular in shape and has a diameter slightly less than the diameter of said filtration means;
said diverter gasket being located substantially on top of the filter segment and said spirally wound material, so that water is forced to travel to the outer perimeter of the filter segment;
the ion exchange material being located substantially along the outer perimeter of the filter segment;
the filter segment being generally ring-shaped;
the filter segment being capable of accepting water inflow at its outer perimeter and discharging water at its inner diameter;
said spirally wound material being located substantially within the inner diameter of the filter segment;
said spirally wound material being comprised of material which is impervious to water;
said spirally wound material containing the quantity of activated carbon;
said spirally wound material and filter segment being seated upon said outlet gasket which is seated upon the bottom of said filter case;
said outlet gasket having an opening at its center in which said outlet screen is placed;
said outlet aperture of said filter case being located at the center of the bottom of said filter case;
whereby water entering said guiding means is guided to said filtration means where the water flows through the filter inlet screen and the anthracite and is diverted to the ion exchange material and subsequently the filter segment and said spirally wound material where the water encounters the activated carbon and is filtered, whereupon the water exits said spirally wound material at said outlet screen and exits the filter case through the outlet aperture in said filter case, whereupon the water falls into said containment means and is stored.

5,116,501
PADDLEWHEEL AERATOR DRIVE MECHANISM

Barry L. House, Wynne, Ark., assignor to House Manufacturing, Inc., Cherry Valley, Ark.

Filed Jan. 25, 1991, Ser. No. 645,701
Int. Cl.[5] C02F *7/00*
U.S. Cl. 210—242.2 **10 Claims**

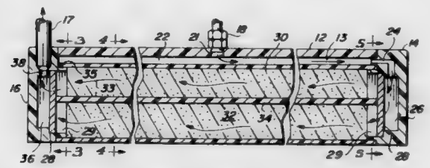


1. A paddlewheel aerator comprising
a frame,
a watertight drive box secured on said frame having a removable cover and a substantially water tight seal means for preventing ingress of water to
the interior of said drive box,
a motor adjacent said drive box having a shaft extending into said box,
an intermediate shaft mounted with said drive box in bearings fixed relative to said frame and on about the same vertical level as, and parallel to, said motor shaft,
speed reduction drive means connected to drive said intermediate shaft from said motor shaft,
a paddlewheel having radially extending paddles rotatably mounted on said frame and having a main shaft extending through an opening in a side of said drive box opposite said motor, the nearest of said paddles being horizontally displaced from said motor by at least the width of said drive box and said main shaft being on about the same vertical level as said motor shaft,
means for providing a water tight seal for said opening and main shaft,
a drive sprocket secured to rotate with said intermediate shaft,
a driven sprocket secured to rotate with said main shaft and having a diameter greater than that of said drive sprocket and,
a chain belt mounted to drive said driven sprocket from said drive sprocket.

5,116,502
ELONGATE HOUSING WITH END CAP MEMBERS

George E. Ferguson, 7740 E. Glenrosa, No. 112, Scottsdale, Ariz. 85251

Filed Sep. 27, 1990, Ser. No. 590,349
Int. Cl.[5] B01D *27/02, 27/08*
U.S. Cl. 210—266 **24 Claims**



1. A water filtration apparatus, comprising:
an elongated housing defining at least one fluid inlet chamber and at least one fluid filtration chamber therein, said fluid inlet chamber being positioned above and substantially parallel to said fluid filtration chamber, and housing further comprising a fluid inlet aperture in fluid flow communication with said fluid inlet chamber and first and second open ends of said elongated housing;
an inlet cap member having a fluid inlet channel and a fluid receiving chamber defined therein, said inlet cap member being operably coupled to said first open end of said elongated housing, wherein said fluid inlet channel is in fluid flow communication with said fluid inlet chamber of said housing and said fluid receiving chamber is in fluid flow communication with said fluid filtration chamber of said housing;
an outlet cap member having a fluid outlet chamber and a fluid outlet channel defined therein, said outlet cap member being operably coupled to said second open end of said housing, wherein said fluid outlet chamber is in fluid communication with a second end of said fluid filtration chamber and said fluid outlet channel conducts filtered fluid external to said housing; and
at least one filter medium provided in said fluid filtration chamber.

5,116,504
ORGANIC POLYMER SEPARATION MEMBRANE HAVING FLUORENE SKELETON AND OXYGEN ENRICHMENT DEVICE UTILIZING SAME

Masao Sakashita; Tetsuo Sakamoto; Shingo Kazama; Yoshiyuki Harada; Takero Teramoto; Kazuhiro Watanabe; Bunji Shimomura, and Tsutomu Kaneta, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

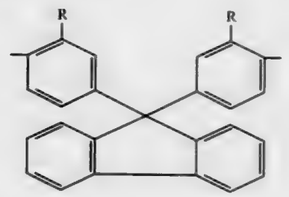
Division of Ser. No. 351,720, May 15, 1989, abandoned. This application Mar. 13, 1990, Ser. No. 493,716
Claims priority, application Japan, May 16, 1988, 63-117067; Aug. 24, 1988, 63-208097
Int. Cl.[5] B01D *71/56*
U.S. Cl. 210—500.23 **2 Claims**



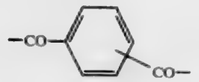
1. A separation membrane consisting of a mixture of (i) a polyamide having a repeating unit (I):

$$-NH-X-NH-Z_1- \quad \text{(I)}$$

wherein X represents



where R represents H, CH_3, or C_2H_5; and Z_1 represents the following structure:



and
(ii) a polyamide having repeating units (II) and (II'):

$$+HN-X-NH-Z_1+_l \quad \text{(II)}$$

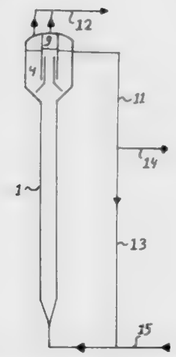
$$+HN-X-NH-Z_1'+_m \quad \text{(II')}$$

wherein X and Z_1 are the same as defined above, Z_1' represents $-CO-(CH_2)_p-CO-$, a ratio n/l is 1.0 to 20, and p is an integer of 4 to 8, the content of the polyamide (ii) in the mixture being 50% or less.

5,116,505
FLUIDIZED BED PROCESS

Pieter A. Lourens, Rijswijk, and Robert J. Zoetemeyer, Montfoort, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

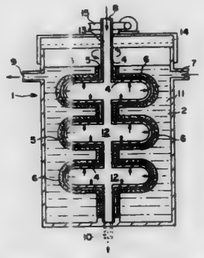
Continuation of Ser. No. 254,060, Oct. 6, 1988, abandoned. This application Dec. 13, 1990, Ser. No. 626,315
Claims priority, application European Pat. Off., Oct. 8, 1987, 87201930.2
Int. Cl.[5] C02F *3/28*
U.S. Cl. 210—603 **8 Claims**



1. Process for the anaerobic purification of waste water having a COD load of from 10–80 kg COD/m^3 reactor.d, wherein biogas is formed in a reactor, comprising the steps of:
a) initiating a fluidized-bed process in the reactor;

b) applying granular biological sludge to the fluidized-bed process;
c) introducing waste water into the reactor;
d) separating the sludge, liquid and biogas in the reactor; wherein the separated biogas is sent to a biogas collection space and the sludge and liquid are separated from each other; and
e) creating and maintaining a gaslift circulation in an area of the reactor where the biogas is separated from the sludge and liquid, wherein the gaslift circulation is created and maintained by an upward flow of the rising biogas and a downward flow of the liquid and sludge, thereby stimulating a coagulation and growth of biological sludge granules.

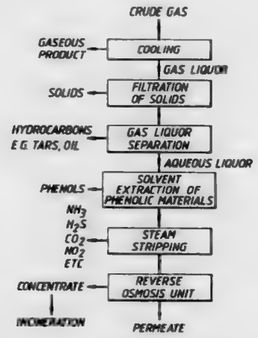
5,116,506
SUPPORT AERATED BIOFILM REACTOR
Kenneth J. Williamson; Sandra Woods, both of Corvallis, Oreg., and Stuart E. Strand, Seattle, Wash., assignors to Oregon State University, Corvallis, Oreg.
Continuation of Ser. No. 375,269, Jun. 30, 1989, abandoned. This application Feb. 11, 1991, Ser. No. 655,206
Int. Cl.[5] C02F *3/30*
U.S. Cl. 210—610 **17 Claims**



1. A method of treating liquid waste, comprising the steps of:
providing a reactor having a gas permeable membrane that divides the reactor into a liquid compartment for the liquid waste and a gas compartment for a gas;
providing a biofilm layer on the liquid compartment side of the membrane, the layer comprising a first layer of aerobic organisms adjacent the membrane, and a second layer of anaerobic organisms between the aerobic layer and liquid;
introducing an oxygen containing gas into the gas compartment, and allowing it to diffuse through the membrane; and
introducing a liquid waste into the liquid compartment and allowing it to react with the biofilm layer.

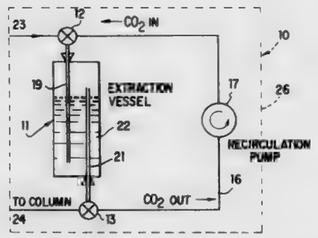
17. A reactor for treating liquid waste, comprising
a reactor having a gas permeable membrane that divides the reactor into a liquid compartment for the liquid waste and a gas compartment for a gas;
a biofilm layer on the liquid compartment side of the membrane, the layer comprising a first layer of aerobic organisms adjacent the membrane, and a second layer of anaerobic organisms between the aerobic layer and liquid;
a means for introducing an oxygen containing gas into the gas compartment, and means for allowing the gas to diffuse through the membrane without mixing the first and second layers; and
means for introducing a liquid waste into the liquid compartment and allowing it to react with the biofilm layer.

5,116,507
TREATMENT FOR REDUCING IMPURITIES IN AQUEOUS LIQUOR
James R. Ebbins, Dunfermline; Simon F. Lopez, Glenrothes, and Christopher Taylor, Kinross, all of United Kingdom, assignors to British Gas plc, London, England
Filed Jun. 29, 1990, Ser. No. 545,650
Claims priority, application United Kingdom, Jul. 19, 1989, 8916486
Int. Cl.[5] B01D *61/04*
U.S. Cl. 210—639 **8 Claims**



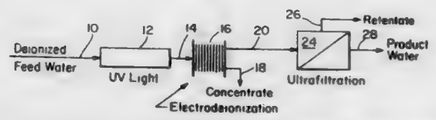
1. A method of treating an aqueous liquor containing impurities comprising phenolic compounds, ammonia, ammonium compounds, dissolved gases and residual organic materials, which method is undertaken in the absence of alkali treatment and comprises subjecting the liquor to dephenolation and ammonia stripping treatment and thereafter subjecting the resulting dephenolated and ammonia stripped liquor (still containing ammonium compounds) to reverse osmosis treatment to produce (a) a permeate which is substantially free from, or contains substantially reduced amounts of, the impurities and (b) a concentrate containing the remaining amounts of the impurities.

5,116,508
SUPERCRITICAL FLUID EXTRACTION FROM LIQUIDS
M. Lalith Kumar, Pittsburgh, Pa., and Joseph L. Hedrick, Blacksburg, Va., assignors to Suprex Corp., Pittsburgh, Pa.
Filed Feb. 23, 1990, Ser. No. 483,870
Int. Cl.[5] B01D *11/04*
U.S. Cl. 210—639 **23 Claims**



1. In a method for the supercritical fluid extraction of a sample from a liquid containing sample, wherein the supercritical fluid and sample form a system having an equilibration time, the improvement of extracting a sample from the liquid containing sample comprising the steps of
adding a compound capable of reducing said equilibration time of said system to the liquid containing sample;
introducing said supercritical fluid into said liquid containing sample to dissolve said sample; and
circulating through said liquid containing sample, the supercritical fluid containing substantially all the dissolved sample a plurality of times to increase extraction recovery.

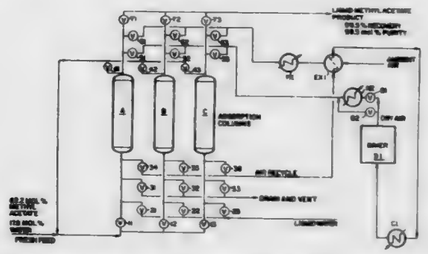
5,116,509
ELECTRODEIONIZATION AND ULTRAVIOLET LIGHT TREATMENT METHOD FOR PURIFYING WATER
Janet White, Boston, Mass., assignor to Millipore Corporation, Bedford, Mass.
Filed Sep. 8, 1989, Ser. No. 404,728
Int. Cl.[5] B01D *61/42, 61/44*
U.S. Cl. 210—644 **22 Claims**



1. The process for purifying water to remove organics and ionic species therein which comprises:
exposing said water to ultraviolet radiation to effect oxidation of said organics,
providing and electrodeionization apparatus comprising;
a cathode compartment at a first end of said apparatus,
an anode compartment at an end of said apparatus opposite said first end,
a plurality of said ion depletion compartments alternating with ion concentration compartments positioned between said cathode compartment and said anode compartment,
an anion permeable membrane and a cation permeable membrane,
said anion permeable membrane and said cation permeable membrane being bonded to a spacer to effect sealing against water leakage between said ion depletion compartment and,
each of said ion depletion compartments containing an ion exchange solid composition,
passing said water exposed to ultraviolet radiation through the ion depletion compartments of said depletion compartments of said electrodionization apparatus,
passing a second liquid for accepting ions from said water, through said concentration compartments while said water is passed through said ion depletion compartments,
applying an electrical voltage between an anode in said anode compartment and a cathode in said cathode compartment, and
recovering purified water from said depletion compartment.

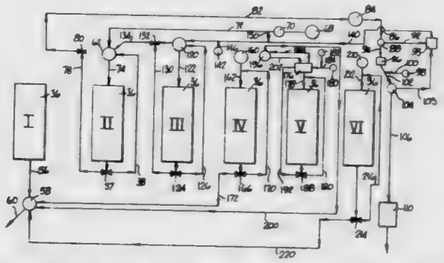
5,116,510
SEPARATION OF LIQUID MIXTURES BY THERMAL SWING ADSORPTION
Shivaji Sircar, Wescosville, and Madhukar B. Rao, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed May 6, 1991, Ser. No. 696,476
Int. Cl.[5] B01D *15/00*
U.S. Cl. 210—673 **9 Claims**

1. A process for separating a liquid feedstock comprising a more adsorbable component (A) and a less adsorbable component (B) with respect to an adsorbent in an adsorption column comprising:
(a) flowing the liquid feedstock through the adsorption column to selective adsorb component (A) while discharging a first liquid effluent stream comprising component (B) as a primary product, said flowing of the feedstock continuing until, or just short of, breakthrough of component (A) from the adsorption column;
(b) rinsing the adsorption column in a direction co-current to the feedstock flow with liquid component (A) while discharging a second liquid effluent stream comprising components (A) and (B) which is recycled as feed, said rinsing continuing until the adsorption column is saturated with component (A);
(c) draining the adsorption column to withdraw a third liquid effluent stream comprising a portion of component (A) left in the adsorption column at the end of step (b);
(d) heating the adsorption column to a temperature greater than component (A)'s boiling point by flowing a hot non-sorbable gas through the adsorption column to vaporize and desorb the remaining portion of component (A) left in



the adsorption column at the end of step (c) while discharging a fourth gaseous effluent stream comprising vaporized component (A) and the hot non-sorbable gas;
(e) cooling the adsorption column to a temperature less than the liquid feedstock's boiling point by flowing a cold non-sorbable gas through the adsorption column while discharging a fifth gaseous effluent stream comprising the cold non-sorbable gas;
(f) filling the adsorption column in a direction counter-current to the feedstock flow with component (B) thereby making the column ready to start a new cycle beginning with step (a).

5,116,511
WATER TREATMENT SYSTEM AND METHOD FOR OPERATING THE SAME
Dennis H. Green, Arvada, and George S. Cochetas, Golden, both of Colo., assignors to Harrison Western Environmental Services, Inc., Wheat Ridge, Colo.
Filed Feb. 22, 1991, Ser. No. 659,993
Int. Cl.[5] C02F *1/42*
U.S. Cl. 210—673 **27 Claims**



25. A method for purifying water contaminated with metal ions comprising the steps of:
providing a first column, a second column, and a third column, said first column, said second column, and said third column each containing a supply of a water purifying agent comprising a metal ion extractant therein;
passing feed water contaminated with metal ions from a

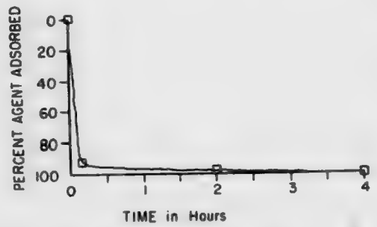
supply thereof through said first column in order to remove said metal ions from said water, said metal ions being retained within said first column by said extractant;
passing said feed water through said second column after said passing thereof through said first column in order to remove any of said metal ions from said water which were not removed by said first column, said metal ions being retained within said second column by said extractant;
operatively connecting said third column to said second column in order to receive said feed water therefrom;
terminating said passing of said feed water from said supply thereof through said first column;
redirecting said feed water from said supply thereof into said second column;
providing a first vessel containing a primary acid solution;
providing a second vessel containing a secondary acid solution, said first vessel being maintained separately from said second vessel;
passing said primary acid solution from said first vessel through said first column at least once in order to remove said metal ions from said extractant;
terminating said passing of said primary acid solution from said first vessel through said first column;
treating said primary acid solution after said terminating of said passing thereof through said first column in order to remove said metal ions from said primary acid solution, said treating of said primary acid solution producing a purified acid solution, said treating comprising the step of passing said primary acid solution through at least one membrane which is capable of preventing passage of said metal ions therethrough while allowing passage said primary acid solution in order to produce said purified acid solution;
passing said secondary acid solution from said second vessel through said first column at least once in order to remove any of said metal ions from said extractant which were not removed by said primary acid solution;
directing said secondary acid solution into said first vessel after said passing thereof through said first column;
directing said purified acid solution into said second vessel after said directing of said secondary acid solution into said first vessel;
passing a preliminary supply of water through said first column at least once after said passing of said secondary acid solution from said second vessel through said first column;
passing an alkali solution from an alkali storage vessel through said first column at least once after said passing of said preliminary supply of water therethrough;
concentrating said alkali solution after said passing thereof through said first column, said concentrating of said alkali solution comprising the step of placing said alkali solution in contact with a membrane capable of allowing only water to pass therethrough in order to eliminate excess water from said alkali solution;
directing said alkali solution after said concentrating thereof back into said alkali storage vessel for reuse;
passing an additional supply of water through said first column at least once after said passing of said alkali solution therethrough;
operatively connecting said first column to said third column after said passing of said additional supply of water through said first column so that said first column receives said feed water from said third column;
terminating said passing of said feed water from said supply thereof through said second column; and
redirecting said feed water from said supply thereof into said third column.

5,116,512

METHOD OF CHEMICAL DECONTAMINATION

Philip W. Bartram, Abingdon; Noel C. DiBona, Aberdeen Proving Ground, both of Md.; James H. Buchanan, Newark, De.; Dennis K. Rohrbaugh, Bel Air, Md., assignors to the United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 17, 1991, Ser. No. 718,320
Int. Cl.[5] B01D *15/04*
U.S. Cl. 210—690 **1 Claim**



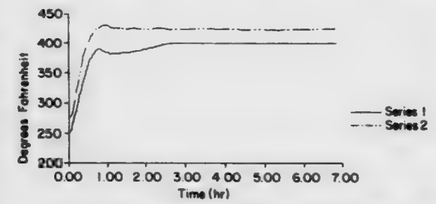
1. In an improved method of decontaminating 1,1,2-trichloro-1,2,2-trifluoroethane which contains pinacolyl methylphosphonofluoridate, the improvement consisting essentially of using polydivinylbenzene to absorb up to about 99.5 percent of said pinacolyl methylphosphonofluoridate from said solvent, said polydivinylbenzene being present at about 10 percent weight/volume based on said solvent.

5,116,513

POLYASPARTIC ACID AS A CALCIUM SULFATE AND A BARIUM SULFATE INHIBITOR

Larry P. Koskan, Orland Park, and Kim C. Low, Alsip, both of Ill., assignors to Donlar Corporation, Harvey, Ill.

Filed Mar. 19, 1991, Ser. No. 671,380
Int. Cl.[5] C02F *5/12*
U.S. Cl. 210—698 **12 Claims**



1. A method of inhibiting the precipitation of calcium sulfate in an aqueous system, which comprises treating the aqueous system with a calcium sulfate inhibiting amount of polyaspartic acid, wherein said polyaspartic acid has $>50\%$ β and $<50\%$ α form, and a weight average molecular weight within the range of 1000–5000.

5,116,514

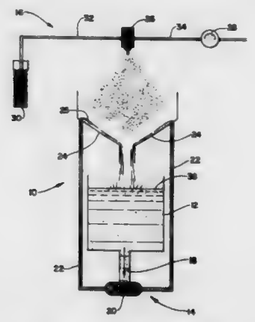
METHOD FOR DETACKIFYING OVERSPRAYED PAINT

Bhupati R. Bhattacharyya, deceased, late of Downers Grove by Uma Bhattacharyya, executrix ; Shu-Jen Huang, Naperville; Chandrashekar S. Shetty, Lisle; Nang T. Bui, Aurora, and Yvonne O. Dunn, Naperville, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Apr. 8, 1991, Ser. No. 681,751
Int. Cl.[5] C02F *1/56*
U.S. Cl. 210—712 **8 Claims**

1. A method for the detackificaton of oversprayed paint in a paint spray operation wherein said oversprayed paint comes into contact with water of a waste water system, comprising:

dosing said water of said waste water system with a composition comprising a polymer and aluminum sulfate,
said polymer consisting essentially from about 10 to about 50 mole percent of cationic mer units of monoethylenically unsaturated monomer, selected from a dimethylaminoethylmethacrylate sulfuric acid salt, and from about 50 to about 90 mole percent of (meth)acrylamide mer units,
said polymer having an intrinsic viscosity of from about 1.2 to about 4.0



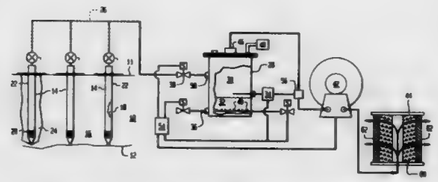
said composition containing from about 0.2 to about 10.0 parts by weight of aluminum sulfate as the octadecahydrate for each part by weight of said polymer,
wherein said composition is present in said water of said waste water system in sufficient amount to detackify oversprayed paint when said oversprayed paint comes into contact with said water.

5,116,515

PROCESS AND APPARATUS FOR REMOVING VOLATILE ORGANIC COMPOUNDS FROM CONTAMINATED VADOSE SOIL AREAS

Lawrence B. Selesnick, Fort Lauderdale, Fla., assignor to Soil Guardian Inc., Trenton, N.J.

Filed Apr. 24, 1991, Ser. No. 690,473
Int. Cl.[5] B01D *3/42, 17/035;* E21B *43/34*
U.S. Cl. 210—744 **21 Claims**



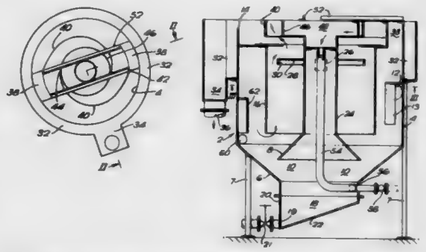
18. A process for removing volatile organic compounds from contaminated vadose soil areas comprising:
a) establishing at least one bore hole extending downwardly into the vadose layer of soil above a given underground water table;
b) positioning of a recovery probe device within each at least one bore hole to facilitate removal of underground gases therefrom;
c) backfilling with a sand material around each recovery probe device to facilitate entry of underground gases therein;
d) operatively connecting fluid flow lines with respect to each recovery probe device to facilitate drawing of gases therefrom;
e) operatively connecting the fluid flow lines with respect to a water separator tank which receives gases from the respective recovery probe devices; filtering of gases received from within the water separator tank to remove volatile organic contaminants therefrom;
f) periodically applying a vacuum to the water separator tank to draw gases upwardly from the at least one bore hole into the recovery probe devices and through the fluid flow lines to the water separator tank and for filtering thereof;
g) accumulating water drawn through the fluid flow liens within the water separator tank and separating thereof from the gases drawn;
h) using sensing means to detect a full liquid condition within the water separator tank and then halting fluid flow through the fluid flow liens;
i) aerating of the liquid within the water separator tank responsive to the sensing means sensing the full liquid condition with the water separator tank;
j) monitoring the level of contamination in the gases exiting from the water separator tank; and draining of the water from the water separator tank after the level of contamination monitored therein falls below a predetermined level.

5,116,516

GRAVITATIONAL SEPARATOR FOR SEPARATING SOLID COMPONENTS OUT OF A LIQUID MIXTURE

Robert P. M. Smisson, Clevedon, United Kingdom, assignor to Hydro International Limited, United Kingdom

Filed Mar. 12, 1991, Ser. No. 668,980
Claims priority, application United Kingdom, Mar. 16, 1990, 9005977
Int. Cl.[5] B01D *21/02, 21/24*
U.S. Cl. 210—747 **11 Claims**



9. A storm water overflow system comprising:
(i) a low energy separator comprising (a) a vessel having a cylindrical outer wall and a base at one end, (b) a body which is provided within the vessel and which defines with the base an annular opening spaced from the outer wall, (c) an inlet for introducing the liquid mixture into the vessel said inlet opening directly into the vessel, (d) an outlet in the upper region of the vessel for removing from the vessel liquid from which solid components have been separated, (e) a primary annular dip plate extending downwardly towards the base from an upper region of the vessel and spaced from the outer wall of the vessel, and (f) means for promoting a rotational movement of liquid and suspended solids within the vessel, said rotational movement being sufficient to cause or enhance an inward sweeping effect towards the annular opening on solids accumulated at the base of the vessel, while being of sufficiently low energy that separation of the solids components of the liquid in the vessel is brought about primarily by gravity; said separator further including a central upper chamber and a deflector plate arranged in an upper region of the vessel to collect buoyant material moving toward the outlet, and to direct said buoyant material into the central upper chamber, the deflector plate extending in an arcuate manner from a first radial position of the vessel to a second radial position of the vessel, and said

second radial position being further inward of the vessel than the first radial position.

10. A method of separating solid components out of a liquid mixture, using a low energy separator comprising (a) a vessel having a cylindrical outer wall and a base at one end, (b) a body which is provided within the vessel and which defines with the base an annular opening spaced from the outer wall, (c) an inlet for introducing the liquid mixture into the vessel, said inlet opening directly into the vessel, (d) an outlet in the upper region of the vessel for removing from the vessel liquid from which solid components have been separated, (e) a primary annular dip plate extending downwardly towards the base from an upper region of the vessel and spaced from the outer wall of the vessel, (f) means for promoting a rotational movement of liquid and suspended solids within the vessel, (g) a central upper chamber within the vessel and (b) deflector plate arranged in an upper region of the vessel to collect buoyant material moving toward the outlet, and to direct said buoyant material into the central upper chamber, the deflector plate extending in an arcuate manner from a first radial position of the vessel to a second radial position of the vessel, and said second radial position being further inward of the vessel than the first radial position;

said method comprising the steps of:

(i) introducing into said vessel, via the inlet, the liquid mixture;

(ii) causing or promoting a rotational movement of liquid and suspended solids within the vessel, said rotational movement being sufficient to cause or enhance an inward sweeping effect towards the annular opening on solids accumulated at the base of the vessel, while being of sufficiently low energy that separation of the solids components of the liquid in the vessel is brought about primarily by gravity;

(iii) using said deflector plate to provide trapping and concentrating in said central upper chamber of buoyant solids material within the vessel; and

(iv) removing, via the outlet, liquid from which solid components have been separated.

5,116,517

Patent Not Issued For This Number

5,116,518

PROCESS FOR THE PURIFICATION OF DIMETHYL TERI PHTHALATE

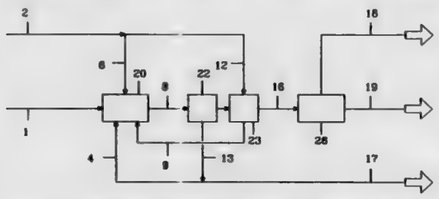
Wilfried Bachmann, Frankfurt am Main; Rolf Bader, Dietzenbach; Horst Büttner, Bad Soden am Taunus, and Edgar Wetzel, Heusenstamm, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 3, 1990, Ser. No. 621,644

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1989, 3939913; May 30, 1990, 4017343

Int. Cl.[5] B01D *9/00, 29/78;* **C07c** *67/52*

U.S. Cl. 210—772 **5 Claims**



1. A process for the purification of dimethyl terephthalate by recrystallization from methanolic solution in a first recrystallization tank in which a mother liquor containing impurities is separated off and passed to a workup tank, and moist crystals are dried by melting and evaporating the methanol, which comprises:

separating off the mother liquor by filtration and washing the moist crystals obtained from the separation before melting by passing a washing liquid through the crystals in the form of a plug flow and recycling the washing liquid together with a portion of the separated mother liquor into the recrystallization tank.

5,116,519

SEPARATOR WITH OUTLETS IN A SPIRAL GROOVE FOR SEPARATING A MIXTURE OF LIQUIDS

Peter G. Michaluk, Gloucester, England, assignor to Serck Baker Limited, Dorset, England

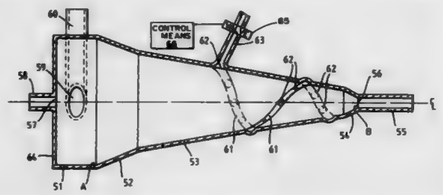
PCT No. PCT/GB89/01033, § 371 Date Mar. 15, 1991, § 102(e) Date Mar. 15, 1991, PCT Pub. No. WO90/02593, PCT Pub. Date Mar. 22, 1990

PCT Filed Sep. 5, 1989, Ser. No. 663,887

Claims priority, application United Kingdom, Sep. 9, 1988, 8821161

Int. Cl.[5] B01D *17/038*

U.S. Cl. 210—788 **16 Claims**



16. A method of separating a mixture of liquids into a less dense component and a more dense component, said method comprising the steps of:

providing a separator tube reducing from a wide end to a narrow end along an axis, said tube having an inner surface with a spiral groove therein, said groove extending from a position between said ends towards said narrow end, said groove having at least one outlet port located therein;

introducing the mixture to be separated at a relatively high velocity in a tangential direction with respect to said axis;

withdrawing said less dense liquid along said axis of said separator tube; and

withdrawing said more dense liquid from said at least one outlet port.

5,116,520

FABRIC SOFTENING AND ANTI-STATIC COMPOSITIONS CONTAINING A QUATERNIZED DI-SUBSTITUTED IMIDAZOLINE ESTER FABRIC SOFTENING COMPOUND WITH A NONIONIC FABRIC SOFTENING COMPOUND

Glen D. Lichtenwalter, Corsicana, Tex.; Theresa Rosario-Jansen, Fairfield, and Errol H. Wahl, Cincinnati, both of Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

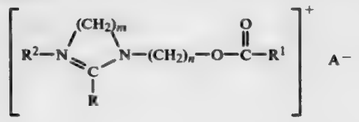
Continuation-in-part of Ser. No. 403,549, Sep. 6, 1989, abandoned. This application Jun. 25, 1990, Ser. No. 542,843

Int. Cl.[5] D06M *10/08*

U.S. Cl. 252—8.6 **22 Claims**

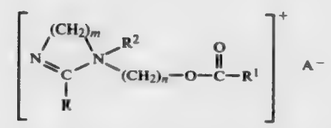
1. A liquid fabric softening and antistatic composition comprising:

(a) from about 1% to about 30% by weight of a quaternized di-substituted imidazoline ester softener compound of the formula



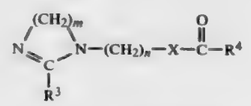
-continued

or



or mixtures thereof, wherein R and R^1 are, independently, C_{11}–C_{21} hydrocarbyl groups, R^2 is a C_1–C_4 hydrocarbyl group, m and n are, independently from about 2 to about 4, and A^- is an anion;

(b) from about 1% to about 30% by weight of a nonionic di-substituted imidazoline softener compound of the formula



wherein R^3 and R^4 are, independently, C_{11}–C_{21} hydrocarbyl groups, m and n are, independently from about 2 to about 4, and X is O, S, or NR^5, wherein R^5 is H or a C_1–C_4 alkyl group; and

(c) a liquid carrier.

0,326,520

Patent Not Issued For This Number

5,116,521

AQUEOUS LUBRICATION TREATMENT LIQUID AND METHOD OF COLD PLASTIC WORKING METALLIC MATERIALS

Hiroyuki Fujii, Chiryu; Tokuo Shirai; Takanori Mizutani, both of Aichi; Yoshio Nagae, Osaka; Koji Hetsugi, Hiratsuka; Yasuo Tanizawa, Yamato, and Kouji Kaburagi, Yokohama, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nihon Parkerizing Co., Ltd., Tokyo, both of, Japan

Continuation-in-part of Ser. No. 375,973, July 6, 1989 abandoned.

Filed Aug. 8, 1990, Ser. No. 564,461

Claims priority, application Japan, Jul. 7, 1988, 63-167849; Aug. 9, 1989, 1-204585

Int. Cl.[5] C10M *125/00, 103/00*

U.S. Cl. 251—18 **4 Claims**

1. A method of aqueous lubrication treatment for a cold plastic working of a metallic material, comprising treating a metallic material surface coated with a chemical conversion layer with an aqueous lubrication treatment liquid, said treatment liquid comprising:

(a) 50 to 400 g/l of a solid lubricant consisting essentially of molybdenum disulfide;

(b) 0.5 to 40 g/l of a surfactant for uniformly dispersing the solid lubricant in water;

(c) a colloidal titanium compound prepared by neutralizing at least one member selected from the group consisting of compounds of sulfuric acid with titanium and of phosphoric acid with titanium, and in concentration of 10 to 5000 ppm in terms of titanium; and

(d) water;

wherein said colloidal titanium compound forms negatively charged colloidal micelles in water.

5,116,522

GREASE COMPOSITION CONTAINING AN ETHYLENE COPOLYMER HAVING A MELT INDEX OF AT LEAST ABOUT 40

Terrance O. Brown, Corunna; David A. Slack, Sarnia; A. Gordon Alexander, Sarnia, and Lyle E. Moran, Sarnia, all of Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 241,655, Sep. 8, 1988, abandoned. This application Aug. 23, 1989, Ser. No. 397,542

Int. Cl.[5] C10M *145/14*

U.S. Cl. 252—18 **21 Claims**

1. A lubricating composition which comprises:

(a) from above about 50 to about 90 wt.% of a lubricating oil,

(b) from about 1 to about 15 wt.% of a thickener,

(c) from about 5 to about 40 wt.% of a VI improver which is a polymer of isobutylene or a copolymer of ethylene, propylene, butene, or isobutylene with a C_3 to C_{30} olefin, and

(d) from about 1 to about 10 wt.% of a copolymer consisting essentially of ethylene and vinyl acetate, alkyl acrylate, or alkyl methacrylate, wherein the copolymer has a Melt Index of at least about 40 g/10 min. and a vinyl acetate, alkyl acrylate, or alkyl methacrylate content between about 10 and about 40 wt.%.

5,116,523

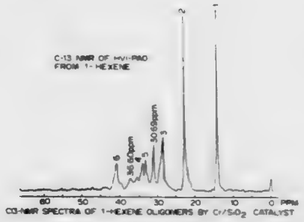
SULFIDE ADDUCTS OF HIGH VISCOSITY INDEX POLYALPHAOLEFINS

Noyes L. Avery, Gwynedd Valley; Linda A. Benjamin, Horsham, and Derek A. Law, Yardley, all of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 23, 1988, Ser. No. 210,598

Int. Cl.[5] C10M *136/04*

U.S. Cl. 252—45 **24 Claims**



1. A liquid sulfur adduct of an unsaturated oligomer composition formed from an alpha olefin having six to twenty carbon atoms, said oligomer having a methyl group to methylene group branch ratio of less than 0.19 and comprising the oligomerization product of said alpha olefin in contact with reduced chromium oxide catalyst on a porous support, said catalyst having been treated by oxidation at a temperature of 200° to 900° C., in the presence of an oxidizing gas and then by treatment with a reducing agent at a temperature and for a time sufficient to reduce said catalyst; wherein the sulfur adduct has a sulfur content of 0.01 to 5 moles based on mole(s) of oligomer and is selected from the group consisting of sulfide, disulfide, polysulfides, and admixtures thereof.

5,116,524

DETERGENT PRODUCT INCLUDING A WATER-INSOLUBLE, WATER-PERMEABLE BAG MADE FORM SHEATHED BICOMPONENT FIBERS

Franz-Josef Carduck, Haan; Ulrich Jahnke, Monheim; Eduard Smulders, Hilden; Guenther Vogt, Toenisvorst; Monika Boecker, Duesseldorf, and Werner Kuenzel, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

PCT No. PCT/EP89/00406, § 371 Date Oct. 23, 1990, § 102(e) Date Oct. 23, 1990, PCT Pub. No. WO89/10395, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 15, 1989, Ser. No. 598,732

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813773

Int. Cl.[5] C11P *17/04*

U.S. Cl. 252—90 **10 Claims**

1. A detergent product containing a particulate detergent composition in a water-insoluble, water-permeable bag, said bag being constructed from a sheet-form textile material wherein the fibers thereof consist of sheathed bicomponent fibers consisting of an inner core of polypropylene having a crystallinity of about 40 to about 60 percent and a sheath of polyethylene having a crystallinity of about 50 to about 70 percent, said crystallinity values having been determined by x-ray analysis, said fibers having a denier of about 0.7 to about 3 dTex, said textile material having a permeability to air of about 200 to about 600 liters per square meter and second for a pressure difference of about 10 millimeters water column, an absorption capacity of about 1.5 to about 7, and a tenacity of from about 50 to about 70 newtons as measure din the longitudinal direction.

5,116,525

TERNARY AZEOTROPIC COMPOSITIONS OF DICHLOROPENTAFLUOROPROPANE AND TRANS-1,2-DICHLOROETHYLENE WITH METHANOL OR ETHANOL OR ISOPROPANOL

Abid N. Merchant, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 491,577, Mar. 12, 1990, abandoned. This application Oct. 18, 1990, Ser. No. 599,281

Int. Cl.[5] C11D *7/30, 7/50;* C23G *5/028;* C09K *5/04*

U.S. Cl. 252—171 **16 Claims**

1. An azeotropic composition consisting essentially of:

(a) about 47–57 weight percent dichloropentafluoropropane consisting essentially of a blend of about 50 to 75 weight percent 1,1-dichloro-2,2,3,3,3-pentafluoropropane and about 25 to 50 weight percent 1,3-dichloro-1,1,2,2,3-pentafluoropropane , about 38–48 weight percent trans-1,2-dichloroethylene and about 3–9 weight percent methanol, wherein the composition has a boiling point of about 43.7° C. when the pressure is adjusted to substantially atmospheric pressure, or

(b) about 47–57 weight percent dichloropentafluoropropane consisting essentially of about 50 to 75 weight percent 1,1-dichloro-2,2,3,3,3-pentafluoropropane and about 25 to 50 weight percent 1,3-dichloro-1,1,2,2,3-pentafluoropropane, about 40–50 weight percent trans-1,2-dichloroethylene and about 1–5 weight percent ethanol, wherein the composition has a boiling point of about 46.5° C. when the pressure is adjusted to substantially atmospheric pressure, or

(c) about 49–59 weight percent dichloropentafluoropropane consisting essentially of about 50 to 75 weight percent 1,1-dichloro-2,2,3,3,3-pentafluoropropane and about 25 to 50 weight percent 1,3-dichloro-1,1,2,2,3-pentafluoropropane, about 41–51 weight percent trans-1,2-dichloroethylene and about 0.1–1.0 weight percent isopropanol, wherein the composition has a boiling point of about 47.7° C. when the pressure is adjusted to substantially atmospheric pressure.

5,116,526

AZEOTROPE-LIKE COMPOSITIONS OF DICHLOROPENTAFLUOROPROPANE AND 1,2-DICHLOROETHYLENE

Hillel Magid, Buffalo; Richard E. Eibeck, Orchard Park; Michael Van Der Puy, Cheektowaga; Richard M. Hollister, Buffalo; Dennis M. Lavery, Springville, and David P. Wilson, East Amherst, all of N.Y., assignors to Allied-Signal Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 418,317, Oct. 6, 1989, abandoned, and a continuation-in-part of Ser. No. 417,952, Oct. 6, 1989, abandoned. This application Jul. 9, 1990, Ser. No. 549,781

Int. Cl.[5] C11D *7/30, 7/50;* C23G *5/028*

U.S. Cl. 252—172 **20 Claims**

1. Azeotrope-like compositions consisting essentially of from about 77 to about 93 weight percent 1,1-dichloro-2,2,3,3,3-pentafluoropropane and from about 7 to about 23 weight percent of a mixture consisting of cis-1,2-dichloroethylene and trans-1,2-dichloroethylene wherein said trans-1,2-dichloroethylene is present in an amount of from about 5 to about 25 weight percent of said mixture which boil at about 50.0° C. at 753 mm Hg; or from about 62 to about 82 weight percent 1,3-dichloro-1,1,2,2,3-pentafluoropropane and from about 18 to about 38 weight percent of a mixture consisting of cis-1,2-dichloroethylene and trans-1,2-dichloroethylene wherein said trans-1,2-dichloroethylene is present in an amount of from about 5 to about 25 weight percent of said mixture which boil at about 53.5° C. at 751 mm Hg; or from about 35 to about 60 weight percent 1,1-dichloro-2,2,3,3,3-pentafluoropropane and from about 40 to about 65 weight percent of a mixture consisting of cis-1,2-dichloroethylene and trans-1,2-dichloroethylene wherein said cis-1,2-dichloroethylene is present in an amount of from about 5 to about 25 weight percent of said mixture which boil at about 44.2° C. at 745 mm Hg; or from about 23 to about 49 weight percent 1,3-dichloro-1,1,2,2,3-pentafluoropropane and from about 51 to about 77 weight percent of a mixture consisting of trans-1,2-dichloroethylene and cis-1,2-dichloroethylene wherein said cis-1,2-dichloroethylene is present in an amount of from about 5 to about 25 weight percent of said mixture which boil at about 45.5° C. at 743 mm Hg; wherein the components of each azeotrope-like composition consist of 1,1-dichloro-2,2,3,3,3-pentafluoropropane or 1,3-dichloro-1,1,2,2,3-pentafluoropropane and a mixture of trans-1,2-dichloroethylene and cis-1,2-dichloroethylene.

5,116,527

DISPLAY ELEMENT BASED ON THE ELECTROCLINIC EFFECT

David Coates, Merley; Ian C. Sage, Broadstone, both of Great Britain; Thomas Geelhaar, Mainz, and Andreas Wächtler, Griesheim, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaftt Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP89/00518, § 371 Date Jul. 27, 1989, § 102(e) Date Jul. 27, 1989, PCT Pub. No. WO89/11451, PCT Pub. Date Nov. 30, 1989

PCT Filed May 12, 1989, Ser. No. 391,619

Claims priority, application United Kingdom, May 25, 1988, 8812427.6

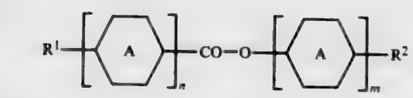
Int. Cl.[5] C09K *19/52;* G02F *1/00*

U.S. Cl. 252—299.61 **11 Claims**

1. In an electroclinic effect display element containing a liquid crystal medium, the improvement wherein:

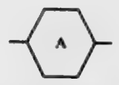
said medium is a mixture of at least two chiral components and at least one non-chiral component, said medium has a compensated cholesteric phase above an optically active smectic A phase, wherein said medium is capable of exhibiting an electroclinic effect, and

wherein said at least one non-chiral component is a compound of formula I



wherein

R^1 and R^2 are each independently an alkyl group with 5 to 15 C atoms wherein one or two non-adjacent CH_2 groups can also be replaced by —O—, —S—, —CO—O—, —O—CO— and/or —CH=CH,



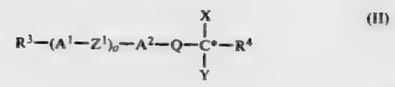
is a 1,4-phenylene group optionally substituted by fluorine wherein in Formula I, at least one group



is a 1,4-phenylene group which is substituted by fluorine, and

n and m are each independently 1 or 2, and

at least one of said chiral components is a compound of formula II



(II)

wherein

R^3 is an alkyl or alkenyl group each with 5 to 15 C atoms, optionally substituted by CN or at least one halogen atom wherein one or two non-adjacent CH_2 groups can be replaced by —O—, —CO—, —CO—O—, —O—CO—, —S— and/or —C≡C—,

R^4 is an alkyl group with up to 8 C atoms wherein one CH_2 group can be replaced by —O—, —CO—O— or —O—CO—,

A^1 and A^2 are independently each an unsubstituted or mono- or polysubstituted 1,4-cyclohexylene group wherein one or two non-adjacent CH_2 groups may be replaced by —O—and/or —S—, a 1,4-bicyclo[2,2,2]octylene group, or a 1,4-phenylene group optionally substituted by fluorine, and wherein one or two CH groups may be replaced by N,

X is CN, Cl, F, Br, CH_3 or CF_3,

Y is H or CH_3,

Z^1 is —CO—O—, —O—CO—, $—CH_2CH_2—$, —CH-CN—CH_2—, $—CH_2—CHCN—$, —CH=CH—, —C≡C—, $—OCH_2—$, $—CH_2O—$, —CH=N—, —N=CH—, —N=N—, —N=NO— or a single bond,

is 1, 2, or 3, and

is an alkylene or alkenylene group with 1 to 7 C atoms wherein one CH_2 group can be replaced by —O—, —CO—O— or —O—CO—,

with the proviso that X, Y and R^4 are different groups.

5,116,528

LIGHT MODULATING MATERIAL INCLUDING LIQUID CRYSTALLINE MATERIAL

Patrick Mullen, 241 Shamrock Dr., Mahtomedi, Minn. 55115, and Frederick E. Nobile, P.O. Box 434, Depere, Wis. 54115-0434

Filed Feb. 28, 1990, Ser. No. 486,517

Int. Cl.[5] C09K *19/52, 19/54;* G02B *5/02*

U.S. Cl. 252—299.5 **31 Claims**

1. A light modulating material comprising liquid crystalline material dispersed within a polymer material including an acrylic isocyanate material reacted with an active hydrogen group containing material.

5,116,529

FERROELECTRIC LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL DISPLAY ELEMENT

Kanetsugu Terashima, Chiba; Mitsuyoshi Ichihashi, Fukuoka; Makoto Kikuchi; Fusayuki Takeshita, both of Chiba, and Kenji Furukawa, Kanagawa, all of Japan, assignors to Chisso Corporation, Japan

Filed Nov. 28, 1989, Ser. No. 442,517

Claims priority, application Japan, Nov. 28, 1988, 63-298156

The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.

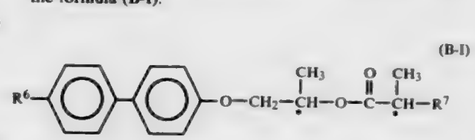
Int. Cl.[5] C09K *19/34, 19/52, 19/30, 19/12*

U.S. Cl. 252—299.61 **4 Claims**

1. A ferroelectric liquid crystal composition comprising at least three liquid crystal components A, B and C as defined below, the proportions of these components being 5 to 40% by weight of A, 20 to 75% by weight of B and 5 to 35% by weight of C with respect to the total weight of said three components;

said liquid crystal component A being comprised of one or more members selected from the group consisting of compounds represented by the following formulae (B-I), (B-II), (B-III), (B-IV) and (B-V);

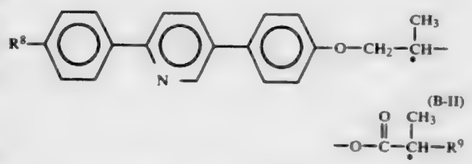
the formula (B-I):



(B-I)

wherein R^6 is a straight-chain or branched alkyl group or alkoxy group having 1 to 18 carbon atoms, R^7 is straight-chain or branched alkyl group having 2 to 18 carbon atoms or a straight-chain or branched alkoxy group having 1 to 18 carbon atoms, and * indicates an asymmetric carbon atom,

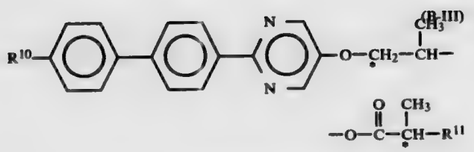
the formula (B-II):



(B-II)

wherein R^8 is a straight-chain or branched alkyl group or alkoxy group having 1 to 18 carbon atoms, R^9 is a straight-chain or branched alkyl group having 2 to 18 carbon atoms or a straight-chain or branched alkoxy group having 1 to 18 carbon atoms, and * indicates an asymmetric carbon atom,

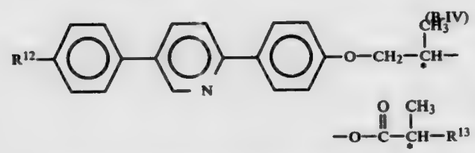
the formula (B-III):



(B-III)

wherein R^{10} is a straight-chain or branched alkyl group or alkoxy group having 1 to 18 carbon atoms, R^{11} is a straight-chain or branched alkyl group having 2 to 18 carbon atoms or a straight-chain or branched alkoxy group having 1 to 18 carbon atoms, and * indicates an asymmetric carbon atom,

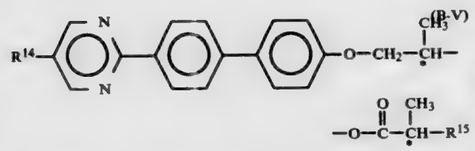
the formula (B-IV):



(B-IV)

wherein R^{12} is a straight-chain or branched alkyl group or alkoxy group having 1 to 18 carbon atoms, R^{13} is a straight-chain or branched alkyl group having 2 to 18 carbon atoms or a straight-chain or branched alkoxy group having 1 to 18 carbon atoms, and * indicates an asymmetric carbon atom, and

the formula (B-V):

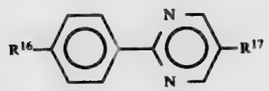


(B-V)

wherein R^{14} is a straight-chain or branched alkyl group or alkoxy group having 1 to 18 carbon atoms, R^{15} is a straight-chain or branched alkyl group having 2 to 18 carbon atoms or a straight-chain or branched alkoxy group having 1 to 18 carbon atoms, and * indicates an asymmetric carbon atom,

said liquid crystal component B being comprised of one or more members selected from the group consisting of compounds represented by the following formulae (C-VI), (C-VII), (VIII) and (IX);

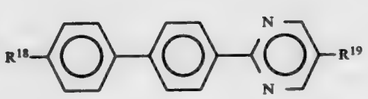
the formula (C-VI):



(C-VI)

wherein R^{16} and R^{17} are identical or different and each of them is a straight-chain or branched alkyl group of alkoxy group having 1 to 18 carbon atoms;

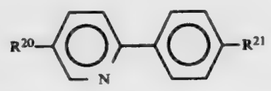
the formula (C-VII):



(C-VII)

wherein R^{18} and R^{19} are identical or different and each of them is a straight-chain or branched alkyl group or alkoxy group having 1 to 18 carbon atoms,

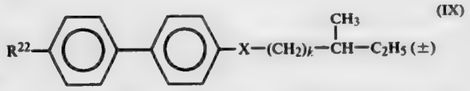
the formula (VIII):



(VIII)

wherein R^{20} and R^{21} are identical or different and each of them is a straight-chain or branched alkyl group or alkoxy group having 1 to 18 carbon atoms, and

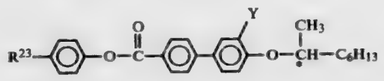
the formula (IX):



(IX)

wherein R^{22} is a straight-chain or branched alkyl group or alkoxy group having 1 to 18 carbon atoms, X is a single bond or —O—, k is a value of from 0 to 10, and (±) indicates a racemic compound,

said liquid crystal component C being comprised of one or more members selected from the group consisting of compounds represented by the formula (X)



(X)

wherein R^{23} is a straight-chain or branched alkyl group or alkoxy group having 1 to 18 carbon atoms, Y is —H, —F or —CN, and * indicates an asymmetric carbon atom.

5,116,530

MESOMORPHIC COMPOUND, LIQUID CRYSTAL COMPOSITION CONTAINING SAME AND LIQUID CRYSTAL DEVICE USING SAME

Takeshi Togano, Yokohama; Takao Takiguchi, Tokyo; Yoko Yamada, Atsugi; Masanobu Asaoka, Yokohama, and Kenji Shinjo, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

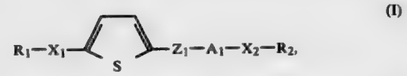
Filed Oct. 16, 1989, Ser. No. 421,948

Claims priority, application Japan, Oct. 17, 1988, 63-262516

Int. Cl.[5] C09K *19/34, 19/32, 19/12;* **C07D** *333/02*

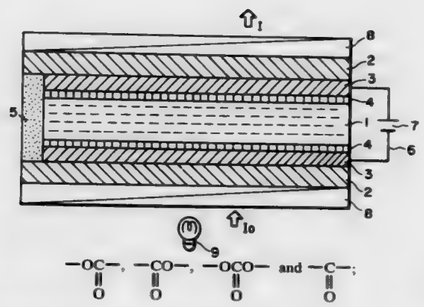
U.S. Cl. 252—299.61 **8 Claims**

1. A mesomorphic compound represented by the following formula (I):

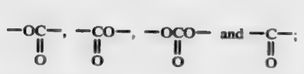


(I)

wherein R_1 and R_2 respectively denote a linear or branched alkyl group having 1–18 carbon atoms which are unsubstituted or substituted with fluorine or alkoxy group; X_1 denotes any one of a single bond, —O—,



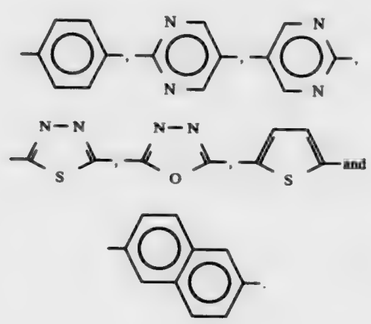
X_2 denotes any one of a single bond, —O—,



Z_1 denotes any one of



—CH_2O— and —CH=C(CN)—; and A_1 denotes —A_2— or —A_2—A_3— wherein A_2 and A_3 respectively denote any one of



5,116,531

LIQUID CRYSTAL COMPOUND

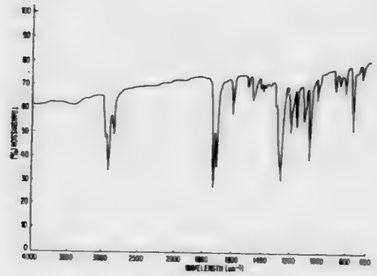
Takashi Hagiwara; Noriko Yamakawa, and Ichiro Kawamura, all of Tokyo, Japan, assignors to Showa Shell Sekiyu K.K., Tokyo, Japan

Filed Aug. 28, 1990, Ser. No. 573,751

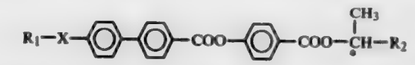
Claims priority, application Japan, Aug. 28, 1989, 1-220659

Int. Cl.[5] C09K *19/12;* **C07C** *69/76*

U.S. Cl. 252—299.65 **3 Claims**



1. A liquid crystal compound represented by formula (I):



(I)

wherein R_1 represents a straight chain alkyl group having from 5 to 18 carbon atoms; R_2 represents a straight chain alkyl group having from 4 to 15 carbon atoms; X represents



and indicates an optically active center, which exhibits three stable states.

5,116,532

METHOD OF MAKING LANTHANUM CERIUM TERBIUM PHOSPHATE PHOSPHOR

Chung N. Chau, Sayre; Anthony F. Kasenga; Charles F. Chenot, both of Towanda, all of Pa., and Leslie F. Gray, Waverly, N.Y., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 14, 1990, Ser. No. 522,695

Int. Cl.[5] C09K *11/81*

U.S. Cl. 252—301.4 P **21 Claims**

1. A method of making lanthanum cerium terbium phosphate phosphor, comprising the steps of:

a) reacting single-phase lanthanum cerium terbium oxide with boron phosphate at about 1150° C. to about 1300° C. in an inert or reducing atmosphere to form a mixture comprising lanthanum cerium terbium phosphate phosphor and boron oxide; and

b) separating said lanthanum cerium terbium phosphate phosphor from said boron oxide.

5,116,533

PHOSPHORESCENT MARKING MATERIAL

William Grandmont, P.O. Box 808, Brockton, Mass. 02403, and Paula Rendino, 36 Salisbury Rd., Watertown, Mass. 02172

Continuation of Ser. No. 504,884, Apr. 5, 1990, abandoned. This application Jun. 11, 1991, Ser. No. 713,622

Int. Cl.[5] C09K *11/02, 11/00;* **B43K** *19/00*

U.S. Cl. 252—301.36 **14 Claims**

1. A phosphorescent marking material comprising a wax

base vehicle, filler particles, and phosphorescent particles, said phosphorescent particles being suspended in a mixture of said wax base vehicle and said filler particles, said mixture comprising a range of 10 percent to 30 percent by weight of said filler particles and a range of 10 to 50 percent by weight of said phosphorescent particles, said phosphorescent particles having a particle size in the size range of 5 to 20 microns, said filler particles being at least partially transparent to actimic radiation.

5,116,534

AQUEOUS EMULSIONS CONTAINING ANTIOXIDANTS

Hans Mollet, Reinach, and Martin Holer, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 18, 1991, Ser. No. 645,377

Claims priority, application Switzerland, Jan. 24, 1990, 229/90

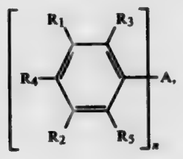
Int. Cl.[5] B01J *13/00*

U.S. Cl. 252—308 **20 Claims**

1. A storage-stable, non-sedimenting emulsion containing

a) 10 to 40% by weight, based on the emulsion, of antioxidants, at least one antioxidant from the series comprising the compounds (A) of the formula I

(I)



in which

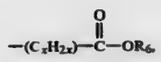
R_1 is alkyl having 1 to 18 C atoms, cycloalkyl having 5 to 12 C atoms, C_1–C_4alkyl-substituted cycloalkyl having 5 to 12 ring C atoms, phenyl or aralkyl having 7 to 9 C atoms, or, if R_4 is —H or C_1–C_4alkyl and R_5 is —OH, R_1 can additionally be —H,

R_2 is —H, alkyl having 1 to 18 C atoms, cycloalkyl having 5 to 12 C atoms, C_1–C_4alkyl-substituted cycloalkyl having 5 to 12 ring C atoms, phenyl or aralkyl having 7 to 9 C atoms, R_3 is —H or CH_3 and

n is 1 or 2, and,

(i) when n is 1,

A is



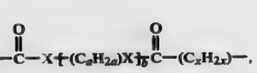
x is 0 to 6,

R_6 is —H, alkyl having 1 to 23 C atoms, cycloalkyl having 5 to 12 C atoms or C_1–C_4alkyl-substituted cycloalkyl having 5 to 12 ring C atoms,

R_4 is —OH and R_5 is —H, and

(ii) when n is 2,

A is the formula



x is 0 to 6,

X is oxygen or sulfur,

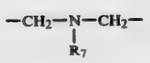
a is 2 to 6,

b is 3 to 40,

R_4 is —OH and R_5 is —H, or

(iii) when n is 2,

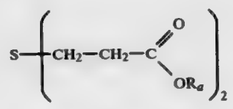
A is —S—, —O—, —CH_2—S—CH_2—,



or an alkylene radical having 1 to 20 C atoms, and R_4 is —OH and R_5 is —H, or R_5 is —OH and R_4 is —H or C_1–C_4alkyl, and R_1 is additionally —H, and

R_7 is alkyl having 1 to 18 C atoms, unsubstituted, hydroxy-substituted or C_1–C_{18}alkyl-substituted phenyl or a phenyl- or hydroxyphenyl-substituted C_1–C_{18}alkyl; and at least one antioxidant from the series comprising compounds (B) of the formula II and/or of the compounds (C) of the formula II

(II)



(III)



in which R_a is alkyl having 8 to 18 C atoms and X_1, X_2 and X_3 are identical or different and are C_6–C_{18}alkyl, C_6–C_{18}alkenyl, C_5–C_7cycloalkyl, phenyl or with C_1–C_{18}alkyl substituted phenyl,

b) 0.25 to 10% by weight, based on the emulsion, of a surfactant of the formula R—COOY, in which R is alkyl having 3 to 18 C atoms, alkenyl having 3 to 18 C atoms or phenyl-C_3–C_{18}alkyl and Y is an alkali metal,

c) 0.25 to 10% by weight, based on the emulsion, of an alcohol of the formula R′—OH, in which R′ is alkyl having 4 to 19 C atoms, alkenyl having 4 to 19 C atoms or phenyl-C_4–C_{19}-alkyl, and

d) water as the remainder to make up to 100% by weight.

5,116,535

AQUEOUS COLLOIDAL DISPERSION OF FUMED SILICA WITHOUT A STABILIZER

Hector Cochrane, Champaign, Ill., assignor to Cabot Corporation, Boston, Mass.

Filed Mar. 21, 1989, Ser. No. 326,891

Int. Cl.[5] B01J *13/00*

U.S. Cl. 252—313.2 **19 Claims**

1. An aqueous colloidal dispersion consisting of: at least about 35%, by weight fumed silica dispersed in water, wherein the dispersion by high shear mixing will not gel for a period of at least 2 hours, has a viscosity of below about 1000 centipoise, and is non-dilatant.

5,116,536

PREPARATION OF PHARMACEUTICAL OR COSMETIC DISPERSIONS

Manfred Bücheler, Overath; Hans Gehringer, Cologne; Bernd Klinksiek, and Bernd Koglin, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 07/324,985, Mar. 15, 1989, Pat. No. 4,996,004, which is a continuation of Ser. No. 518,902, Aug. 1, 1983, abandoned. This application Sep. 13, 1990, Ser. No. 581,867

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230289

The portion of the term of this patent subsequent to Feb. 26, 2008, has been disclaimed.

Int. Cl.[5] B01J *13/00*

U.S. Cl. 252—314 **3 Claims**

1. Process for the preparation of fineparticled, stable, pharmaceutical or cosmetic dispersions consisting of an aqueous phase and an organic oily phase which is insoluble or not completely soluble in water, characterized in that a pre-emulsion is pumped through a jet disperser under a pressure of 2 to 50 bar, said jet disperser consisting of one or more jets, which are designed as capillary bores with a diameter of 0.5 to 0.8 mm and have a length to diameter ratio of 1.5 to 2 in the course of which all the pressure energy is consumed in the dispersing zone and the dispersion leaves the dispersing zone as a non-directional stream.

5,116,537

LOW TEMPERATURE EXPANDABLE VERMICULITE AND INTUMESCENT SHEET MATERIAL CONTAINING SAME

Julie C. Yang, Lexington, and Charles I. Sanders, Brookline, both of Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 436,584, Nov. 15, 1989. This application Jul. 23, 1991, Ser. No. 734,657

Int. Cl.[5] C04B *14/20, 14/14*

U.S. Cl. 252—378 R **16 Claims**

1. A method of treating vermiculite ore to lower its expansion temperature comprising subjecting vermiculite ore containing interlamellar ions to a potassium nitrate solution for a time interval sufficient to ion-exchange interlamellar cations within said vermiculite ore with potassium ions.

5,116,538

BATTERY TERMINAL CORROSION PROTECTION

Jerome Johnson, Rte. 4, Box 4022, Hayward, Wis. 54843

Filed Dec. 4, 1989, Ser. No. 445,362

Int. Cl.[5] C23F *11/18, 11/10*

U.S. Cl. 252—389.61 **20 Claims**

1. A corrosion protective composition formulated for protection of battery terminals and connectors thereto consisting essentially of a mixture of (a) a lithium grease comprised of a lithium soap and a paraffinic oil, (b) an alkali metal or alkaline earth metal salt and (c) an alkaline earth metal oxide.

8. A process of protecting battery terminals and associated connectors from corrosion comprising applying to at least one of said terminals and connector the composition consisting essentially of a lithium grease, an alkali metal or alkaline earth metal salt and an alkaline earth metal oxide.

5,116,539

REAGENT AND METHOD FOR MEASURING LEUKOCYTES AND HEMOGLOBIN IN BLOOD

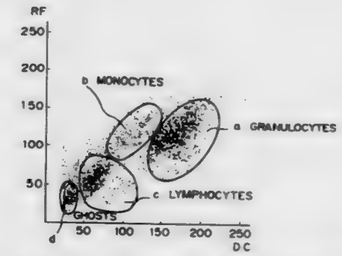
Yukio Hamaguchi, and Yukio Tsujino, both of Hyogo, Japan, assignors to TOA Medical Electronics Co., Ltd., Hyogo, Japan

Filed Nov. 3, 1988, Ser. No. 266,860

Claims priority, application Japan, Jan. 27, 1988, 63-16735

Int. Cl.[5] G01N *31/00*; C12Q *1/04*

U.S. Cl. 252—408.1 **5 Claims**



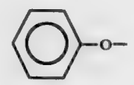
1. A method of measuring both leukocytes and hemoglobin at the same time comprising:

(1) contacting a blood sample with a water-soluble reagent consisting essentially of an aqueous solution of:

(a) a polyoxyethylene-based nonionic surfactant represented by the formula:

R_1—R_2—$CH_2CH_2O)_n$—H

where R_1 is an alkyl, alkenyl or alkynyl group having 6 to 24 carbon atoms, R_2 is —O—,



or —COO—, and n is an integer of 6 to 50, and

(b) a buffer to adjust the pH of the solution within the range of 3–11, and thereafter

(2) counting the thus-treated blood sample in an automated blood analyzer.

5,116,540

FREE-RADICAL MODIFIED CARBON BLACK FILLED POLYPROPYLENES

Deenadayalu Chundury, North Royalton, Ohio; Daniel L. Davidson, Newburgh, Ind.; Berdine L. Leonard, Macedonia, and Anthony S. Scheibelhoffer, Norton, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Filed Mar. 3, 1989, Ser. No. 318,386

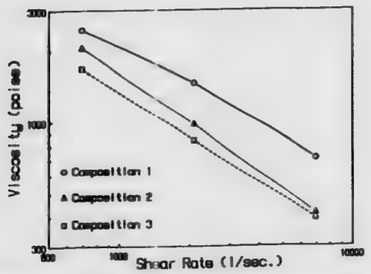
Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—511 **8 Claims**

1. A conductive polypropylene, comprising:

from about 50 to about 90 percent by weight of polypropylene and from about 10 to about 50 percent of conductive carbon which may be in the form of one or more of fibers and spheres, said polypropylene and said carbon being in

situ melt processed in the presence of an effective amount of a peroxide to provide a narrowed molecular weight



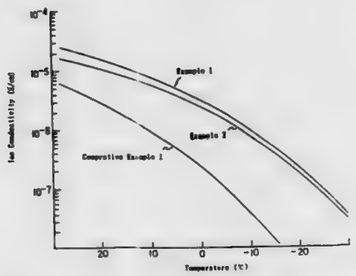
distribution of said polypropylene, said effective amount being more than 0 up to about 5 percent by weight.

5,116,541

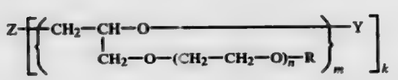
ION-CONDUCTIVE POLYMER ELECTROLYTE

Kenji Motogami, Takatsuki, and Shigeo Mori, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Apr. 10, 1990, Ser. No. 507,143
Claims priority, application Japan, Apr. 13, 1989, 1-93763; Oct. 26, 1989, 1-280723
Int. Cl.[5] H01B *1/06*; H01M *6/18*
U.S. Cl. 252—518 **2 Claims**

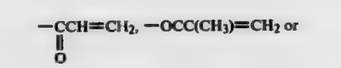


1. An ion-conductive polymer electrolyte comprising an organic polymer and a soluble electrolyte salt, characterized in that said organic polymer is obtained by crosslinking a compound having an average molecular weight of 1,000 to 20,000 and having a structure of the following formula (1):

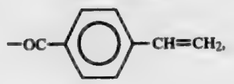


(1)

in which Z is a residue of polyalcohols, amine compounds, compounds having a phenolic active hydrogen or compounds having at least two different active hydrogens in a molecule, Y is



-continued



m is an integer of 1 to 250,
n is 0 or an integer of 1 to 25,
k is an integer of 1 to 12, and
R is an alkyl, alkenyl, aryl or alkylaryl group having 1 to 20 carbon atoms,

said soluble electrolyte salt is at least one selected from the group consisting of inorganic-ion salts containing at least one metal element selected from the group consisting of Li, Na, K, Cs, Ag, Cu and Mg, and organic-ion salts consisting of lithium stearylsulfate, sodium octylsulfate, lithium dodecylbenzenesulfate, sodium naphthalenesulfate, lithium dibutyl-napthalenesulfate, potassium octylnapthalenesulfate, potassium dodecylnapthalenesulfate, and the added amount of said soluble electrolyte salt to an oxyethylene unit in said organic polymer is 0.0001～5.0 (mole/EO).

5,116,542

VARISTOR MATERIAL AND METHOD OF PRODUCING SAME FROM ZINC OXIDE AND MANGANESE OXIDE: CONTROLLED POROSITY AND HIGH NON-LINEAR COEFFICIENT

Hideo Ochi, Misato; Akihide Igari, and Masaaki Toyoda, both of Saitama, all of Japan, assignors to Somar Corporation, Japan

Filed Jul. 12, 1990, Ser. No. 551,412
Claims priority, application Japan, Jul. 20, 1989, 1-188624
The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.
Int. Cl.[5] C04B *35/00*; H01C *7/10*
U.S. Cl. 252—518 **5 Claims**

1. A varistor material having a composition consisting essentially of 93–97 mole % of ZnO and 3–7 mole % of MnO, a non-linear coefficient of at least 20 and such a bulk density as to provide a porosity of greater than 15% but not greater than 50%, said porosity being defined as follows:

$$Porosity(\%)=(1-d/d_0)\times 100$$

wherein d represents the bulk density and d_0 represents the theoretical density of the single phase pure ZnO.

5,116,543

WHOLE BODY CLEANING AGENT CONTAINING N-ACYLTAURATE

Steven E. Lentsch, St. Paul, Minn., assignor to The United States of America as represented by the administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 29, 1990, Ser. No. 529,427
Int. Cl.[5] C11D *1/28*; A61K *7/075*; C02F *1/00*; E03D *1/00*
U.S. Cl. 252—545 **11 Claims**

1. A method of bathing with a small quantity of water, comprising the steps under microgravity conditions of:
wetting the skin and hair with a small quantity of water;
lathering said wetted skin and hair with a whole body cleansing agent comprising a formulation of paste consistency consisting essentially of:
(i) N-acyl taurate of the formula R—C(O)—NR′—CH$_2$—CH$_2$—SO$_3^-$ M$^+$ wherein RCO is aliphatic acyl of from about 6 to about 20 carbon atoms, R′ is hydrogen, lower alkyl or lower cycloalkyl, and M$^+$ is a non-toxic water soluble cation in an amount effective for cleaning hair and skin using a small quantity of water;
(ii) a conditioner or conditioners in amounts effective for conditioning the skin and hair; and
(iii) a preservative in an amount effective to preserve said taurate and said conditioner or conditioners;
rinsing said lather from said skin and hair with a small quantity of water to produce a rinse water containing said cleaning agent;
aspirating said rinse water from said skin and hair;
defoaming said rinse water; and
supplying said defoamed rinse water to a water reclamation unit for recycle thereof, said steps effectively cleansing said skin and hair with a maximum quantity of about 10 liters of water.

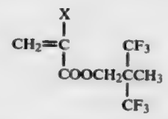
5,116,544

HEXAFLUORONEOPENTYL ALCOHOL, DERIVATIVE THEREOF FLUORINE-CONTAINING POLYMER AND ITS USE

Hiroshi Inukai; Takashi Yasuhara, both of Settsu, and Takahiro Kitahara, Suita, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

PCT No. PCT/JP88/01228, § 371 Date Aug. 4, 1989, § 102(e) Date Aug. 4, 1989, PCT Pub. No. WO89/05287, PCT Pub. Date Jun. 15, 1989
PCT Filed Dec. 5, 1988, Ser. No. 397,430
Claims priority, application Japan, Dec. 4, 1987, 62-308092; Dec. 10, 1987, 62-312529
Int. Cl.[5] C07C *69/62*; C08F *18/20*
U.S. Cl. 560—219 **4 Claims**

1. A hexafluoroneopentyl (meth)acrylate represented by the formula



wherein X represents hydrogen atom, fluorine atom, chlorine atom, bromine atom, iodine atom or methyl group.

5,116,545

COMPOSITION AND METHOD FOR THE TREATMENT OF SICKLE CELL ANEMIA

Alfred J. Weinheimer, Houston, Tex., assignor to Omex International, Inc., Missouri City, Tex.

Continuation-in-part of Ser. No. 174,602, Mar. 20, 1988, abandoned, which is a continuation-in-part of Ser. No. 41,035, Apr. 22, 1987, abandoned. This application May 29, 1990, Ser. No. 529,459
Int. Cl.[5] C11C *3/14*
U.S. Cl. 554—149 **3 Claims**

1. A method of making a compound for the treatment of sickle cell disease which comprises
the partial epoxidation of a compound which is a member of the group consisting of methyl linolenate and linseed oil, said partial epoxidation resulting in epoxide products; and
the isomerization of said epoxide products using p-toluenesulfonic acid.

5,116,546

PROCESS FOR PRODUCING FATTY-ACID LOWER-ALKYL MONO-ESTERS

Robbert Klok, Vlaardingen, and Herbert H. Verveer, Ridderkerk, both of Netherlands, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed Apr. 3, 1990, Ser. No. 503,656
Claims priority, application European Pat. Off., Apr. 5, 1989, 89105947.9
Int. Cl.[5] C11C *3/02*
U.S. Cl. 554—167 **12 Claims**

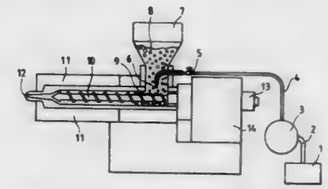
1. In a process for producing fatty-acid lower-alkyl monoesters which comprises a first esterification-step (1) wherein one or more fatty-acid glycerolesters and a monohydric lower-alkylalcohol are reacted in the presence of an alcoholysis catalyst to produce a mixture comprising fatty-acid lower-alkyl mono-esters, fatty-acid glycerolesters and glycerol, a separation step (2) wherein said mixture produced in step (1) is separated into a glycerol-rich fraction (a) and a fraction (b) rich in fatty-acid lower-alkyl mono-ester, and a recovery step (4) wherein said fatty-acid lower-alkyl mono-esters are recovered from said fraction (b), the improvement comprising a second esterification step (3) in which before said recovery step (4) substantially all glycerol and fatty-acid glycerolesters of said fraction (b) are esterified to the corresponding fatty-acid glycerol tri-esters.

5,116,547

METHOD OF COLORING POLYCARBONATE EXTRUDED OR MOLDED PRODUCTS FOR OPTICAL MEMBERS

Shuji Tsukahara, Yokohama; Toshikazu Umemura, and Kazuyoshi Ichise, both of Osaka, all of Japan, assignors to Mitsubishi Gas Chemical Co., Tokyo and Victor Company of Japan, Ltd., Yokohama, both of, Japan

Filed Jul. 20, 1990, Ser. No. 554,763
Claims priority, application Japan, Jul. 30, 1989, 1-197464
Int. Cl.[5] B29C *45/00, 47/00*; B29D *11/00*
U.S. Cl. 264—1.1 **15 Claims**



1. A method of coloring a polycarbonate extruded or molded product for optical members, which is colored by a liquid coloring process for obtaining a polycarbonate extruded or molded product for optical members, colored with a coloring agent, in an extruder or injection molding machine that extrudes or molds a polycarbonate resin for optical members; said process comprising mixing a polycarbonate resin for optical members and a liquid coloring agent dispersion obtained by dispersing a coloring agent in a dispersing agent, thereafter melting said resin and said dispersion, and subsequently forming a colored extruded or molded product for optical members wherein;
said liquid coloring agent dispersion comprises a coloring agent comprising at least one of a dye and a pigment, and a dispersing agent comprising a saturated fatty acid ester comprising a full ester of a straight-chain or branched saturated monobasic fatty acid having 4 to 35 carbon atoms with a saturated monohydric or polyhydric alcohol having 2 to 35 carbon atoms; and
said liquid coloring agent dispersion is used in an amount of from 0.05 to 2 parts by weight based on said polycarbonate resin for optical members.

5,116,548

REPLICATON OF MICROSTRUCTURES BY CASTING IN CONTROLLED AREAS OF A SUBSTRATE

Donald W. Mallik, North Tarrytown, and Salvatore F. D'Amato, Floral Park, both of N.Y., assignors to American Bank Note Holographics, Inc., Elmsford, N.Y.

Division of Ser. No. 399,812, Aug. 29, 1989. This application Jun. 22, 1990, Ser. No. 542,916
Int. Cl.[5] B29D *11/00, 39/10*
U.S. Cl. 264—1.3 **20 Claims**

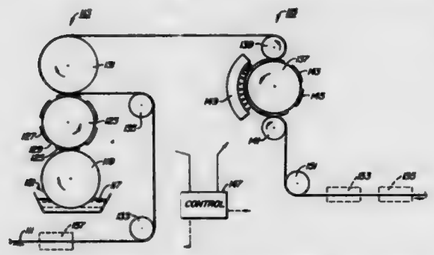
1. A method of continuously casting multiple replicas of a

surface relief microstructure onto an elongated flexible substrate, comprising the steps of:

positioning a plurality of surface relief masters of said microstructures spaced apart along a continuous support structure,

moving the continuous support structure and the elongated substrate together through a processing station,

in the processing station, holding liquid casting resin between the substrate and the master surface relief microstructures in an area that is less than that of said master surface relief microstructures, whereby casting resin is confined to areas of the substrate smaller than the areas of



the master surface relief microstructures and which are substantially surrounded by regions without any resin held thereagainst,

curing said resin while being held between the substrate material and the surface relief master without relative movement therebetween, thereby to substantially harden the resin in attachment with said substrate material, and

separating said surface relief master from the hardened resin and substrate material as the continuous support structure and substrate leave the processing station, thereby to retain the hardened resin in place on said substrate material with the surface relief microstructure of said master contained in a surface thereof.

5,116,549

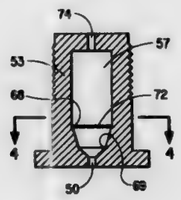
SOLUTION FLOW SPLITTING FOR IMPROVED SHEET UNIFORMITY

John Farago, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 2, 1991, Ser. No. 636,851

Int. Cl.[5] D01D *5/11*

U.S. Cl. 264—5 **3 Claims**



1. An improved process for the flash spinning of fibrillated plexifilamentary material by the steps of continuously supplying under pressure into a dissolution zone, a synthetic crystallizable, organic polymer of filament-forming molecular weight and a solvent for the polymer, the concentration of polymer being 2 to 20% by weight of the solution, dissolving the polymer and forming a polymer solution having a temperature of at least the solvent critical temperature minus 45° C. and a pressure above the two-liquid-phase boundary for the solution, forwarding the solution through a transfer zone, passing the solution into a pressure let-down zone for lowering the pressure of the solution to below the two-liquid-phase pressure boundary for the solution, and discharging the solution through a spinneret orifice of restricted size to an area of substantially atmospheric pressure and temperature, the improvement comprising splitting the solution flow into a plurality of individual streams within the pressure let-down zone before the solution is discharged through the spinneret orifice.

5,116,550

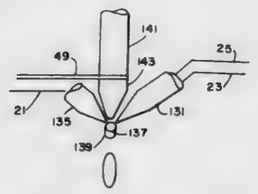
METHOD OF MAKING BIODEGRADABLE FREE FILL FOAM PACKING MATERIAL

Newton B. Perkins, 10 Halsey Dr., Brick, N.J. 08723

Filed Mar. 27, 1990, Ser. No. 499,647

Int. Cl.[5] B29B *9/06, 9/16*

U.S. Cl. 264—12 **9 Claims**



1. The method of making a free fill foam expanded packing material, comprising flowing liquid A and B components separately to A and B nozzleheads, heating the A and B components to about 90° F. to 140° F., mixing the A and B components in a swirl chamber, releasing material from the swirl chamber through an opening and chopping flow from the opening and thereby forming shapes, expanding the shapes in an expansion chamber, dropping the expanding shapes in the expansion chamber, removing the fully expanded shapes from the expansion chamber and storing the expanded shapes.

5,116,551

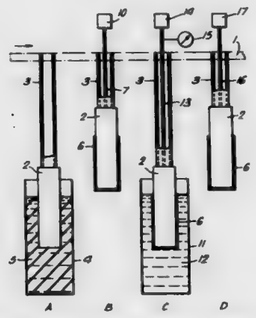
METHOD AND APPARATUS FOR PRODUCING AN ARTICLE BY MICROWAVE HEATING

Roderick I. Davidson, Marbaix House, Bessemer Road, Basingstoke RG21 3NT, and Peter R. Hornsby, 31 Manor Way, Chesham, Buckinghamshire HP5 3BH, both of England

Continuation of Ser. No. 435,456, filed as PCT/GB88/00347, May 4, 1988, abandoned. This application May 9, 1991, Ser. No. 698,373

Int. Cl.[5] B29C *41/14, 41/42, 41/52, 35/08*

U.S. Cl. 264—26 **13 Claims**



1. A method of producing an article comprising the steps of:

a) coating an external surface of at least a portion of a microwave-heatable, ceramic former with liquid-containing material;

b) subjecting said former to microwave radiation sufficiently so as to heat said former and remove liquid from the liquid-containing material to thereby leave a dry solid coating on said former; and

c) effecting relative separation between the former and the dry solid coating so as to produce the article.

5,116,552

PROCESS FOR PREPARATION OF DRIED COLLAGEN SPONGE

Shinichiro Morita; Nobuya Takahashi, both of Ayabe; Takeshi Shimamoto, Fukuchiyama; Kazuya Matsuda, and Shigehiko Suzuki, both of Kyoto, all of Japan, assignors to Gunze Limited, Kyoto, Japan

Filed Jan. 28, 1991, Ser. No. 646,034

Claims priority, application Japan, Jan. 31, 1990, 2-22860

Int. Cl.[5] B29B *13/04*

U.S. Cl. 264—28 **5 Claims**

1. A process for preparing a crack-free, dried collagen sponge having a shrinkage factor of up to 14%, comprising the steps of impregnating a crosslinked collagen sponge with an aqueous solution of a hydrophilic organic solvent selected from the group consisting of aliphatic lower alcohols and aliphatic lower ketones, freezing the sponge and the aqueous solution therein at a temperature of −80° C. or lower, and vacuum-drying the sponge, the aqueous solution thereby being removed.

5,116,553

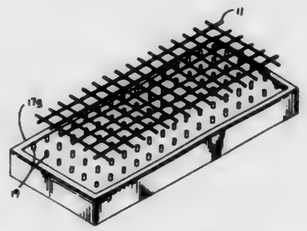
METHOD OF SURFACING SCREEN ORGANIZATION

Marty D. Harvey, Rte. 3, Box 856, Tuskugee, Ala. 36083

Filed Dec. 31, 1990, Ser. No. 636,204

Int. Cl.[5] B29C *41/02*

U.S. Cl. 264—39 **1 Claim**



1. A method of surfacing screen organizations, including the steps of,

providing a screen grid, cleaning the screen grid, providing a container, wherein the container is formed with a recessed cavity, and positioning the screen grid within the recessed cavity, and

directing a fluid polymeric to overlie the screen grid, and

permitting the fluid polymeric to cure, and

removing the screen grid from the container for subsequent use, and

wherein the step of cleaning the screen grid includes directing a first nozzle at the screen grid and directing an abrasive particulate stream at the screen grid and effecting a surface roughening of the screen grid, and

wherein prior to positioning the screen grid in the container, an adhesive is applied over a bottom surface of the screen grid, and the bottom surface is positioned to overlie a floor defined by the recessed cavity of the container, and

wherein prior to application of the fluid polymeric within the container, a positioning block is positioned within each opening of each screen grid, and the positioning block is formed to define a predetermined cross-sectional configuration, and wherein each screen grid opening is defined by the predetermined cross-sectional configuration, and

wherein the container floor is formed to include a matrix of positioning rods, and a positioning rod is directed medially of each screen grid opening, and each block member includes a block member cavity to complementarily receive a positioning rod therewithin, and

wherein the step of directing the fluid polymeric into the recessed cavity includes completely covering the screen grid by the fluid polymeric, and

wherein subsequent to the step of curing the fluid polymeric, the block members are removed from the container, and subsequently the screen grid is removed from the container.

5,116,554

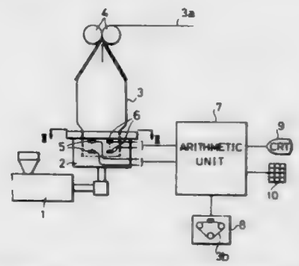
METHOD OF MAKING A FILM HAVING UNIFORM THICKNESS

Jitsumi Shinmoto, Tokyo, Japan, assignor to Tomi Machinery Manufacturing Co. Ltd., Japan

Filed Oct. 23, 1989, Ser. No. 425,756

Int. Cl.[5] B29C *47/92, 55/28*

U.S. Cl. 264—40.1 **3 Claims**



1. A method of providing uniform thickness of a synthetic resin film upon inflation molding of the synthetic resin film, comprising the steps of:

drawing out molten resin from a die which includes a plurality of heating means on a circumferential edge of a die lip thereof to inflation mold a film;

measuring a thickness of the film after molding in a direction perpendicular to the drawing out direction of the film by measuring a sampling film which is sampled by cutting the molded film and measuring the thickness of the sampling film in a direction perpendicular to the drawing out direction while establishing a corresponding relationship between the film thickness and measurement positions;

establishing a corresponding relationship between measured film thickness data and said plurality of heating means while establishing a corresponding relationship between a particular position of said die lip and one of the measurement positions;

calculating, based on the measured film thickness data individually corresponding to said heating means, electric control values for controlling heat to be individually generated by said heating means so that the measured film thickness data may be equal to each other; and

controlling amounts of heat to be individually generated by said heating means in accordance with the electric control values individually calculated for said heating means.

5,116,555

METHOD OF AND APPARATUS FOR CONTROLLING THE MANUFACTURING PROCESS IN THE CONTINUOUS PRODUCTION OF GYPSUM-CEMENTED WORKPIECES

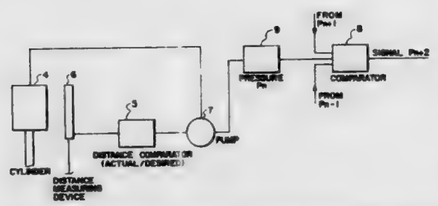
Volker Thole, and Thomas Hilbert, both of Braunschweig, Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung eV, Munich, Fed. Rep. of Germany

Filed Nov. 26, 1990, Ser. No. 617,763

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1989, 3939280

Int. Cl.[5] B28B *3/06;* **B29C** *39/16;* **B30B** *5/06, 15/14*

U.S. Cl. 264—40.5 **10 Claims**



1. Method for controlling compaction pressure and thickness of a gypsum-cemented workpiece during continuous manufacture thereof, comprising the steps of:

depositing gypsum undergoing hydration and water on a lower belt of a belt-type press, the press having an upper belt comprising a plurality of press segments joined in tandem relationship and positioned at a predetermined distance from the lower belt for controlling workpiece thickness;

allowing the deposited gypsum undergoing hydration to swell while being restrained by the upper belt, thereby causing compaction pressure to be applied to the gypsum, by the upper belt and the press segments, and thereby generating in the gypsum a swelling pressure which increases over the course of hydration of the gypsum as a result of the swelling of the gypsum;

continuously measuring the distance between each press segment and the lower belt and the swelling pressure of the gypsum at each press segment and comparing each measured distance with the predetermined distance and comparing the measured swelling pressure at each press segment with the measured swelling pressure at other press segments;

adjusting the compaction pressure of the press segments based on the distance and swelling pressure comparisons, to achieve a gypsum-cemented workpiece of predetermined thickness; and

terminating the compaction pressure when:

(a) the measured swelling pressure ceases to increase between consecutive press segments, thereby indicating substantial completion of hydration; or (b) a predetermined swelling pressure is measured, prior to substantial completion of hydration; or

(c) a predetermined dP_S/dt is achieved, P_S being swelling pressure and t being time, prior to substantial completion of hydration.

7. Apparatus for continuous production of gypsum-cemented workpieces, wherein compaction pressure and thickness of the gypsum-cemented workpieces are controlled during the continuous production, comprising:

first belt means for transporting gypsum undergoing hydration;

means for applying compaction pressure to the gypsum undergoing hydration, comprising a second belt means and a plurality of press segments arranged to apply the second belt means to the gypsum, and joined in tandem;

each of the press segments comprising means for determining a distance between a respective press segment and the first belt means, means for comparing the determined distance with a predetermined distance, pump means for actuating the respective press segment and setting its distance from the first belt means by application of pressure to control the thickness of the gypsum, and means for determining swelling pressure of the gypsum being compacted by the respective press segment;

means for comparing the determined swelling pressures of the gypsum compacted by each of the respective press segments; and

means for terminating compaction pressure applied to the gypsum by the press segments in response to the comparison of the swelling pressures of the gypsum.

5,116,556

PROCESS FOR MOLDING A FRAME ONTO A SEAT OUTFIT FOR THE PURPOSE OF PRODUCING A SEAL ELEMENT

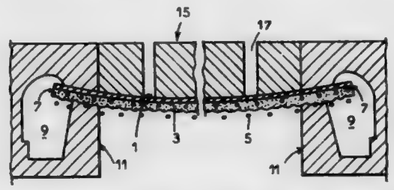
Jean-Louis Danton, Boulogne, France, assignor to Etablissements M. Duret et Fils, Brionne, France

Continuation of Ser. No. 249,574, Sep. 26, 1988, abandoned. This application Sep. 13, 1990, Ser. No. 582,981

Claims priority, application France, Sep. 24, 1989, 87 13199

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—464 **3 Claims**



1. A process for producing a seat element from an outfit of desired shape, said outfit having at least a relatively compact plastic covering layer, a network of continuous spiral metal springs having axes parallel with the covering layer, said network of springs having intermingled turns which are substantially flush against a lower face of the covering and cover essentially the entire surface thereof, an intermediate plastic foam connecting layer between the covering layer and the network of springs adhering to the lower face of the covering layer and partially incasing the turns of the network of springs adjacent said covering layer; said process comprising the steps of:

gripping a peripheral edge portion of said outfit in a cavity of an injection mold, said mold having meting jaw portions of which one said jaw portion contacts an upper face of said covering and the other jaw portion contacts the network of springs and the plastic foam connecting layer in clamping engagement, thereby sealing said cavity without interposing a sealing bead between said jaw portions;

simultaneously applying a stress force to the surface of said outfit and imparting a predetermined curvature to the surface of said outfit in the region of said surface intermediate the peripheral confines of said edge portion concurrently with the gripping application of said mold to said peripheral edge portion;

injecting an expandable thermoplastic material to which an expanding agent has been added into said mold cavity;

allowing said expandable thermoplastic to expand and harden about said peripheral edge of said outfit and to bond therewith in said cavity of said mold while maintaining said portion of the outfit between said edge portion in contact with said curvature-imparting mold portion; and

removing said seat element formed from said outfit from said mold whereby the expanded and hardened thermoplastic material engaging the peripheral edge portion of the seat element maintains the shaped curvature thereof.

5,116,557

METHOD OF MAKING OBJECTS HAVING AN ELASTOMERIC OUTER WALL AND A SYNTHETIC FOAM CORE

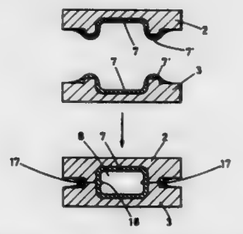
Bernard Debaes, Damme; Hugo De Winter, Gentbrugge, and Frank Nicolaus, Destelbergen, all of Belgium, assignors to Recticel, Sint-Pieters-Woluwe, Belgium

Filed Mar. 2, 1990, Ser. No. 487,505

Claims priority, application Belgium, Mar. 3, 1989, 8900228

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—46.6 **10 Claims**



1. A method of making in a mould cavity objects having an outer wall from a micro-cellular or non-cellular elastomer and a core comprising a synthetic foam, wherein use is made of a mould comprising at least two mutually movable mould parts, which can be brought into an open and closed position with respect to each other, said parts having edges with contacting sides adjacent said mould cavity which are in substantially hermetically closed contact with each other in said closed position, the improvement comprising:

applying, in a first step, a first layer of said elastomer onto a first mould part of said at least two mutually movable mould parts and a second layer of said elastomer onto a second mould part of said mutually movable mould parts, said elastomer layers also being applied onto said contacting sides of said edges of said first and second mould parts while said at least two mutually movable mould parts are in said open position;

bringing, in a second step, the mould parts into said closed position while said elastomer is still substantially liquid so as to press at least a part of said elastomer layers located on said contacting sides of said edges away in the direction of said mould cavity, and to bring said contacting sides of said edges of said first and second mould parts into a hermetically closed state against each other, thereby connecting said elastomer layers such that a substantially invisible dividing joint is obtained on a side of said elastomer layers facing said mould parts and a thickening serving as a reinforcement is formed on a side of said elastomer layers facing said mould cavity, and injecting into a space defined by said elastomer layers a second reaction mixture which forms a synthetic foam; and

demoulding, in a third step, after said synthetic foam has been cured substantially completely and forms a whole with said elastomer layers, a moulded object.

5,116,558

METHOD OF FORMING GASKETS BY INJECTION AND COMPOSITIONS FOR USE THEREIN

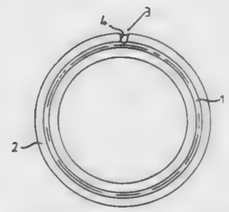
Peter Wrobel, Dublin, and James Houlihan, County Clare, both of Ireland, assignors to Loctite (Ireland) Limited, Dublin, Ireland

Filed Jun. 28, 1990, Ser. No. 546,212

Claims priority, application Ireland, Jul. 11, 1989, 2231/89

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—46.6 **10 Claims**



1. A method of forming a gasket in a machine or engine in-situ wherein the method comprises:

1) mating two components of the machine or engine in a face-to-face relationship, each of said components having a mating face, at least one of said faces having a groove therein for defining the gasket and an inlet thereto for injecting a gasket forming composition into the groove;

2) injecting into the groove a curable gasket forming composition comprising one or more cross-linkable, free-radically polymerizable vinyl esters, a free radical polymerization initiator therefor, alone or in combination with an activator for said free-radical polymerization initiator and, optionally, a free-radical inhibitor, said composition having a Brookfield viscosity at the time of injection of from about 2,000 to about 15,000 mPas at 25° C. and gelling to a non-flowable state within five (5) minutes of the initiation of the cure and having the consistency of a flexible solid upon full cure, wherein the composition further comprises one or more constituents for minimizing volume reduction otherwise manifested on curing of the composition; and

3) allowing or enabling the composition to cure.

5,116,559

METHOD OF FORMING YTTRIA-GADOLINIA CERAMIC SCINTILLATOR USING HYDROXIDE COPRECIPITATION STEP

Stephen L. Dole, Burnt Hills, and Subramanian Venkataramani, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 26, 1991, Ser. No. 660,462

Int. Cl.[5] C04B *35/50*

U.S. Cl. 264—65 **8 Claims**

1. A method of forming a polycrystalline translucent-to-transparent yttria-gadolinia composition scintillator that does not require milling, comprising:

forming an aqueous suspension of hydroxide coprecipitates of the yttria-gadolinia composition by a wet ammonium hydroxide process;

agitating the hydroxide suspension while admixing an effective amount of oxalic acid to convert the hydroxides to oxalates;

calcining the oxalates to substantially fully oxidize the oxalates and form a powder of the yttriagadolinia scintillator composition;

cold pressing the powder to form a compact; and

sintering the compact in a reducing atmosphere or vacuum to form the polycrystalline translucent-to-transparent yttria-gadolinia composition scintillator.

5,116,560
METHOD OF FORMING RARE EARTH OXIDE CERAMIC SCINTILLATOR WITH AMMONIUM DISPERSION OF OXALATE PRECIPITATES

Stephen Lee Dole, Burnt Hills, and Subramaniam Venkataramani, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 22, 1991, Ser. No. 673,608
Int. Cl.[5] C04B *35/50*
U.S. Cl. 264—65 21 Claims

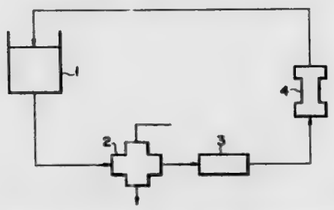
1. A method of forming a polycrystalline rare earth oxide ceramic scintillator containing an oxide of a rare earth activator selected from the group consisting of europium, neodymium, ytterbium, dysprosium, terbium and praseodymium, having improved transparency that does not require milling, said scintillator being formed by dissolving a mixture of oxides of the scintillator composition in an aqueous hydrochloric or nitric acid solution to form a rare earth solution, precipitating oxalates from the rare earth solution, calcining the oxalates to form oxides, cold pressing the oxides to form a compact, and sintering the compact in a reducing atmosphere or vacuum to form the scintillator, the improvement comprising:

precipitating the oxalates by admixing the rare earth solution with an oxalic solution comprised of, oxalic acid and ammonium ions in an amount that disperses the oxalate precipitates.

5,116,561
METHOD OF PREPARING A COMPOSITE MATERIAL IN THE FORM OF ULTRA-FINE PARTICLES

Seiji Kagawa, Yokohama, Japan, assignor to Atsuko Kagawa, Yokohama, Japan

Continuation of Ser. No. 559,997, Jul. 31, 1990, abandoned, which is a continuation of Ser. No. 332,995, Apr. 4, 1989, abandoned. This application Aug. 21, 1991, Ser. No. 752,211
Claims priority, application Japan, Dec. 28, 1988, 63-328888
Int. Cl.[5] B29B *9/08*
U.S. Cl. 264—115 8 Claims



1. A method of preparing a composite material comprising at least two different kinds of organic polymers in the form of an intimate blend of ultra fine particles having an average particle diameter of at most 0.1 micron, said method comprising the steps of:

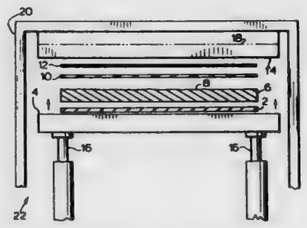
(a) providing a liquid dispersion of particles in which at least two different kinds of organic polymers, having different physical properties, are dispersed; and

(b) forcing the organic polymer particles dispersed in the liquid dispersion through a high speed particle impingement means under pressure sufficient to cause the particles to accelerate and impinge with each other at least twice at a speed sufficient to crush each organic polymer particle into particles smaller than those of the dispersion of step (a) and continuing the impingement and crushing until the resulting ultra fine particles have been reduced to an average particle diameter of at most 0.1 micron, and thereafter fusing together the smaller particles to form a composite material comprising an intimate blend of ultra fine particles of the polymers.

5,116,562
METHOD FOR REPRODUCING PAINTINGS AND THE LIKE

Stefan Lang, Scarborough, Canada, assignor to Artagraph Reproduction Technology Inc., Ontario, Canada

Continuation-in-part of Ser. No. 325,962, Mar. 20, 1989, Pat. No. 4,971,743. This application Oct. 17, 1990, Ser. No. 599,173
The portion of the term of this patent subsequent to Nov. 20, 2008, has been disclaimed.
Int. Cl.[5] B29C *43/20*
U.S. Cl. 264—132 17 Claims

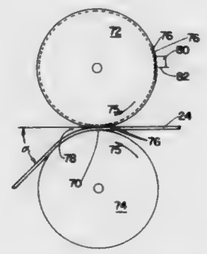


1. A method for producing a reproduction of a painting, said reproduction having a relief surface texture imitating the relief surface of said painting, said process comprising the steps of applying heat and pressure to an assembly consisting of a mold of said painting, a coloured sheet for colouring said reproduction, and a substrate to retain said reproduction, and then immediately thereafter shock cooling the assembly by contacting said assembly with cooling plates to permanently retain said relief surface texture on said substrate.

5,116,563
PROCESS FOR PRODUCING A MECHANICAL FASTENER

Dennis A. Thomas, and David J. K. Goulait, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 28, 1990, Ser. No. 546,198
Int. Cl.[5] B29C *67/02*
U.S. Cl. 264—167 13 Claims



1. A process for producing free formed prongs of a mechanical fastening system, said process comprising the steps of:

providing a thermally sensitive material;

heating said thermally sensitive material to at least the melting point so that said thermally sensitive material is flowable, and can be deposited onto a substrate;

providing a substrate;

providing a means to deposit discrete amounts of said thermally sensitive material onto said substrate

providing a means for imparting a nonorthogonal-to-the-substrate vector orientation to said deposited material;

transporting said substrate in a first direction and at a first velocity relative to said depositing means;

depositing discrete amounts of said flowable thermally sensitive material onto said transported substrate in a second direction relative to said first direction of transport;

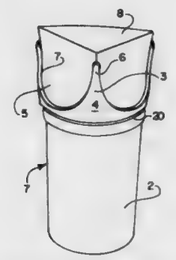
imparting a nonorthogonal-to-the-substrate vector component to said discrete amounts of said deposited material so that each of said discrete amounts of said deposited material forms a prong having a shank attached to said substrate at a base and an engaging means, said engaging mans being nonorthogonal to said substrate; and

freezing said prongs so that said flowable material solidifies until rigid.

5,116,564
METHOD OF PRODUCING A CLOSING MEMBER HAVING FLEXIBLE CLOSING ELEMENTS, ESPECIALLY A HEART VALVE

Josef Jansen, Mauerstr. 108, 5100 Aachen; Helmut Reul, Akazienstr. 65, 5160 Duren, and Gunter Rau, Fuchserde 50, 5100 Aachen, all of Fed. Rep. of Germany

Filed Oct. 10, 1989, Ser. No. 420,112
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1988, 3834545
Int. Cl.[5] B28B *1/00*
U.S. Cl. 264—255 33 Claims



1. A method of producing a closing member for controlling the flow of a fluid, said closing member having an annular housing through which the fluid flows and at least one closing element joined to the housing, said closing element being movable between an open quasi-stable end position in which fluid flow is permitted and a closed quasi-stable end position in which the closing element blocks the flow of fluid, said closing element permitted and a closed quasi-stable end position in which the changes during movement between the open and closed end positions, said method comprising the steps of:

circumferentially expanding the annular housing from a normal condition;

forming the closing element as a substantially two-dimensional element;

joining the closing element to the housing while the housing is in the expanded condition; and

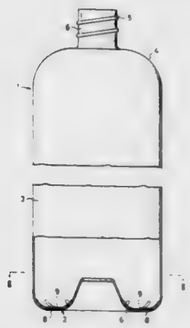
thereafter allowing the housing to circumferentially contract to the normal condition,

whereby the joinder of the closing element to the housing while the latter is in the expanded condition enables the closing element to assume the two quasi-stable end positions when the housing is in its normal condition.

5,116,565
SYNTHETIC RESIN THIN-WALLED BOTTLE

Yataro Yoshino, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 677,333, Dec. 4, 1984, Pat. No. 4,997,692, which is a continuation of Ser. No. 343,860, Jan. 29, 1982, abandoned, which is a division of Ser. No. 89,537, Oct. 29, 1979, abandoned. This application Aug. 27, 1990, Ser. No. 572,401
Claims priority, application Japan, Nov. 7, 1978, 53-137419; Nov. 24, 1978, 53-145689; Nov. 24, 1978, 53-145690; Dec. 4, 1978, 53-149871; Dec. 11, 1978, 53-153313; Dec. 18, 1978, 53-158253
Int. Cl.[5] B29C *49/06, 49/10, 49/64*
U.S. Cl. 264—532 9 Claims



4. A method of producing a synthetic resin thin-walled container comprising the steps of:

forming by injection molding of a synthetic resin an intermediate with a neck portion with a thread, a generally hemispherical bottom portion, a tubular portion between said neck portion and said bottom portion, and a plurality of radial ridges integrally formed on and extending radially from a center area of said bottom portion and terminating within said bottom portion or a lower part of said tubular portion, and using said intermediate by:

heating said intermediate to a temperature suitable for biaxial orientation,

setting the heated intermediate in a blow mold for the container and holding the neck portion of the intermediate,

moving the bottom portion of said intermediate to axially stretch said intermediate, and

blow molding said intermediate thereby to form the container having an inwardly-raised portion at a bottom portion of said container, and a plurality of ridged ribs extending radially from a rising wall of said inwardly-raised portion to a side wall of said container through a ground-contacting area of said container.

5,116,566
CRD MILLING MACHINE

Donato L. Ricci, Rte. 1, Box 1067, Hager City, Wis. 54014

Filed Feb. 19, 1991, Ser. No. 656,746
Int. Cl.[5] G21C *19/00*
U.S. Cl. 376—260 6 Claims

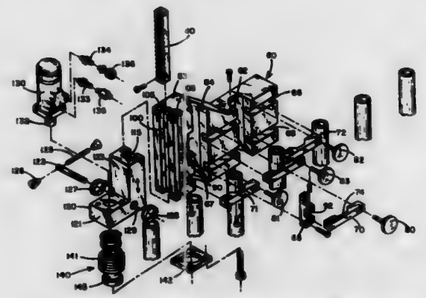
1. Apparatus for refurbishing the ends of a plurality of control rods where the rods are disposed in a grid of rows and columns with a known predetermined spacing therebetween, comprising:

a. support block means including means for rapidly clamping and unclamping said support block to two adjacent rods of said control rods in a given column or row;

b. motor mounting means coupled to said support block means and reciprocally movable relative to said support

block means in a direction parallel to the longitudinal axis of said tubular rods, said motor mounting means including a bearing housing;

c. a rotatable spindle member journalled for rotation in said bearing housing for supporting an end mill bit, said spindle having its axis of rotation generally coaxially aligned with the longitudinal axis of a given one of said control rods when said support block means is clamped to said two adjacent ones of said tubular rods;



d. motor means mounted on said motor mounting means in driving relation to said spindle member for rotating said spindle about its axis of rotation; and

e. means for translating said motor mounting means reciprocally relative to said support block means for selectively bringing said end mill bit into contact with the end of said given one of said control rods as said spindle member is rotated.

5,116,567

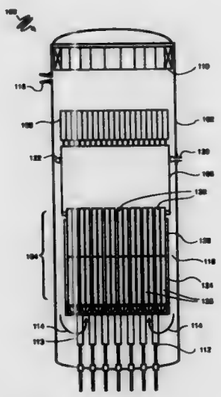
NUCLEAR REACTOR WITH BI-LEVEL CORE

Larry E. Feenera, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Jul. 10, 1990, Ser. No. 553,073

Int. Cl.[5] G21C *3/04*

U.S. Cl. 376—433 **5 Claims**



1. A nuclear reactor comprising:

a reactor vessel;

a reactor core having a fuel bundles arranged in a lower two-dimensional array, said reactor core also having fuel bundles arranged in an upper two-dimensional array, each of said fuel bundles containing vertically extending fuel rods, each of said fuel rods having a fuel section containing fissionable fuel and a plenum section for accumulating gaseous fission byproducts, said fuel rods in fuel bundles in said lower array having plenum sections below their fuel sections, said fuel rods in fuel bundles in said upper array having plenum sections above their fuel sections; and said fuel bundles in said upper array on the average being less spent than the fuel bundles in said lower array; and

circulation means for circulating heat transfer fluid so that it flows axially through said bundles in said lower array toward and through said bundles of said upper array.

5,116,568

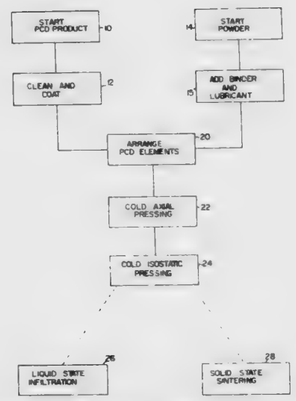
METHOD FOR LOW PRESSURE BONDING OF PCD BODIES

Chien-Min Sung, Northboro, Mass., and Sy-Hwa Chen, Salt Lake City, Utah, assignors to Norton Company, Worcester, Mass.

Continuation of Ser. No. 273,923, Nov. 18, 1988, Pat. No. 5,030,276, which is a continuation-in-part of Ser. No. 95,054, Sep. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 921,364, Oct. 20, 1986, abandoned, and a continuation-in-part of Ser. No. 61,705, Jun. 11, 1987, abandoned. This application May 31, 1991, Ser. No. 708,761

Int. Cl.[5] G22F *7/00*

U.S. Cl. 419—11 **17 Claims**



1. A method of forming a temperature staple synthetic diamond product having a temperature stability up to about 1200° C. from a temperature stable synthetic diamond element of a predetermined geometric shape, comprising

coating at least a portion of the surface of said temperature stable synthetic diamond element with a carbide forming metal to form a substantially uniform metallic coating at least about 1 micron thick,

placing said coated portion of said synthetic diamond element in contact with a matrix material, and

heating said coated synthetic diamond element and said matrix material under carbide forming conditions so as to convert said metallic coating into an inner carbide layer chemically bonded to said diamond element and a substantially metallic outer layer which is chemically bonded to said matrix material, said carbide layer bonding said diamond element to said matrix material with a bond strength in shear of at least 5,000 pounds per square inch.

5,116,569

AUSTENITIC STEEL EXCELLENT IN RESISTANCE TO NEUTRON IRRADIATION EMBRITTLEMENT AND MEMBERS MADE OF THE STEEL

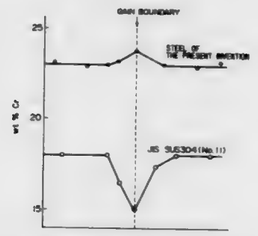
Shigeki Kasahara, Hitachi; Kiyotomo Nakata, Katsuta; Jiro Kuniya, Hitachi, and Shigeo Hattori, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 7, 1990, Ser. No. 563,697

Claims priority, application Japan, Aug. 11, 1989, 1-206799

Int. Cl.[5] C22C *38/58*

U.S. Cl. 420—44 **14 Claims**



1. An austenitic steel excellent in resistance to neutron irradiation embrittlement and used in high-temperature and high-pressure pure water under neutron irradiation which contains, by weight, not more than 0.03% carbon, not more than 1% silicon, 5 to 25% manganese, 15 to 26% chromium, 10 to 20% nickel, the ratio of atomic volume of chromium to the average atomic volume of matrix of said steel being from 0.900 to 1.030, and balance essentially iron.

5,116,570

STAINLESS MARAGING STEEL HAVING HIGH STRENGTH, HIGH TOUGHNESS AND HIGH CORROSION RESISTANCE AND IT'S MANUFACTURING PROCESS

Young G. Kim, Seoul; Soon H. Hong, Daejon, and Jin I. Seok, Kyungsangbuk-do, all of Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Daejeon, Rep. of Korea

Filed Sep. 12, 1991, Ser. No. 758,637

Claims priority, application Rep. of Korea, Sep. 21, 1990, 15019/1990

Int. Cl.[5] C22C *38/44, 38/50*

U.S. Cl. 420—54 **2 Claims**

1. A stainless maraging steel having high strength, high toughness and high corrosion resistance consisting of 8% to 12% by weight Cr, 7% to 12% by weight Ni, 2% to 6% by weight W, 0.1 to 0.5% by weight Al, 0.1 to 0.4% by weight Ti and the balance iron.

5,116,571

CHROMOUM HEAT-RESISTANT STEEL EXCELLENT IN TOUGHNESS AND HAVING HIGH CRACKING RESISTANCE AND HIGH CREEP STRENGTH IN WELDED JOINT

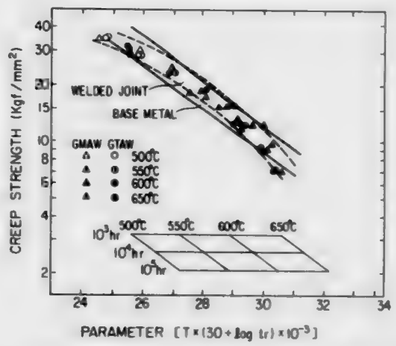
Nakatsugu Abe, Yokohama; Haruo Suzaki, Chigasaki; Hiroaki Tsukamoto, Yokohama; Seishi Tsuyama, Fukuyama, and Moriyasu Nagae, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 600,157, Oct. 17, 1990, abandoned, which is a continuation of Ser. No. 442,493, Nov. 27, 1989, abandoned, which is a continuation of Ser. No. 309,047, Feb. 9, 1989, abandoned, which is a continuation of Ser. No. 207,025, Jun. 13, 1988, abandoned, which is a continuation of Ser. No. 883,066, Jul. 8, 1986, abandoned. This application Jul. 12, 1991, Ser. No. 730,013

Claims priority, application Japan, Jul. 25, 1985, 60-162914; May 20, 1986, 61-113441

Int. Cl.[5] C22C *38/22, 38/26*

U.S. Cl. 420—110 **11 Claims**



1. A chromium heat-resistant steel having excellent toughness and having high cracking resistance and high creep strength when said steel is utilized to form a welded joint, said steel consisting essentially of:

carbon:	from 0.04 to 0.09 wt. %,
silicon:	from 0.01 to 0.50 wt. %,
manganese:	from 0.25 to 1.50 wt. %,
chromium:	from 7.0 to 9.2 wt. %,
molybdenum:	from 0.50 to 1.50 wt. %,
soluble aluminum:	from 0.005 to 0.060 wt. %,
nitrogen:	from 0.001 to 0.060 wt. %,

the total amount of said nitrogen and said carbon being up to 0.13 wt.%, at least one element selected from the group consisting of:

vanadium: and niobium:	from 0.01 to 0.30 wt. %, from 0.005 to 0.200 wt. %,

the total amount of said vanadium and 1.5 times said niobium being no more than 0.30 wt.%, and the balance being iron and incidental impurities; and the amount of ferrite as represented by the ferrite number δF in said chromium heat-resistant steel being −5 or lower, as calculated by the following formula:

$$\delta_F = -104 - 555(C + 6/7N) + 32.9Si - 49.5Mn + 12.1Cr + 39.1Mo + 46.1V + 83.5Nb$$

5,116,572
ALUMINUM-LITHIUM ALLOY

G. Hari Narayanan, Seattle; R. Eugene Curtis, Issaquah; William E. Quist, Redmond; Michael V. Hyatt, and Sven E. Axter, both of Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 708,541, Aug. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 492,367, Mar. 9, 1990, which is a continuation of Ser. No. 94,025, Sep. 4, 1987, abandoned, which is a continuation of Ser. No. 701,124, Feb. 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 567,356, Dec. 30, 1983, abandoned. This application Aug. 28, 1989, Ser. No. 401,565

Int. Cl.[5] C22C *21/12*

U.S. Cl. 420—533 15 Claims

1. An aluminum-lithium alloy exhibiting good fracture toughness consisting essentially of:

Element	Amount (wt. %)
Li	2.0 to 2.4
Mg	0.3 to 0.9
Cu	2.1 to 2.9
Zr	0.08 to 0.15
Fe	0.15 max
Si	0.12 max
Zn	0.25 max
Ti	0.15 max
Cr	0.1 max
Other trace elements, each	0.05 max
Other trace elements, total	0.15 max
Al	Balance.

5,116,573
LABELLED VITAMIN D_3 DERIVATIVE AND PRODUCTION PROCESS THEREOF

Sachiko Yamada, Hachioji; Koichi Niimura, Sayama; Kenji Fukushima, Yokohama, and Yuji Maeda, Nagareyama, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

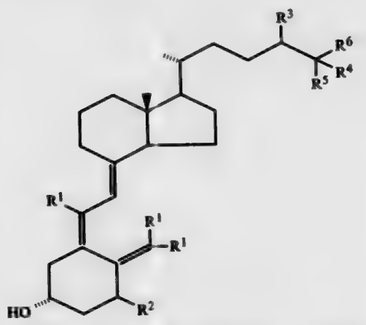
Filed Sep. 7, 1989, Ser. No. 403,466

Claims priority, application Japan, Sep. 14, 1988, 63-231339

Int. Cl.[5] A61K *43/00, 49/02, 31/59*; C07C *13/15*

U.S. Cl. 424—1.1 5 Claims

1. A vitamin D_3 derivative represented by the formula (I):



(I)

wherein R^1 represents a deuterium atom or a tritium atom; R^2, R^3 and R^4 independently represent a hydrogen atom or a hydroxy group, provided that at least one of R^2, R^3 and R^4 represents a hydroxy group; and R^5 and R^6 independently represent a methyl group, a hydroxymethyl group or a trifluorocarbon group.

5,116,574
CONTINUOUS TREATMENT PROCESS AND APPARATUS FOR THE DISINFECTION OF INFECTIOUS WASTE

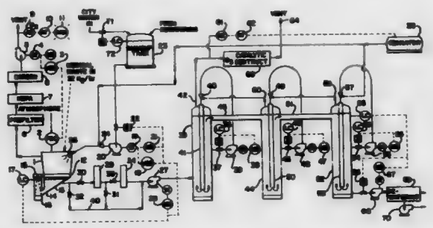
Erich H. Pearson, 925 Oakwood Ct., Glen Ellyn, Ill. 60137

Filed Apr. 3, 1991, Ser. No. 679,601

The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.

Int. Cl.[5] G05B *13/00*

U.S. Cl. 422—3 28 Claims



1. A process for the continuous treatment of infectious waste material, which comprises:

(a) introducing bulk unseparated infectious waste material into a receiving container means, said receiving container means being in communication with a shredding means whereby bulk unseparated infectious waste material supplied to said receiving container means is conducted to said shredding means;

(b) shredding said bulk unseparated waste material by said shredding means;

(c) transferring the shredded waste material from said shredding means to a separation tank means having a fluid filling means to provide a predetermined fluid level in said separation tank means and removing from said shredded waste material any glass and metal components which settle by gravity in a lowermost portion of said separation tank means to form a waste slurry;

(d) transferring said waste slurry from said separation tank means of step (c) to a disinfection vessel means, said disinfection vessel means comprising a first disinfection means communicating in series relationship with at least one second disinfection means, and contacting said waste slurry in said disinfection vessel means with a disinfectant comprising ozone in gas phase and in aqueous solution for a sufficient amount of time to disinfect said waste slurry; and

(e) transferring said disinfected waste slurry to a dewatering means to remove liquid therefrom said recover solid components of said disinfected waste slurry.

5,116,575
POWDERED ANTI-MICROBIAL COMPOSITION

Duncan C. Badertscher, Cleveland, and Raymond C. Kralovic, Austinburg, both of Ohio, assignors to Steris Corporation, Mentor, Ohio

Continuation-in-part of Ser. No. 229,917, Aug. 8, 1988, which is a continuation-in-part of Ser. No. 140,388, Jan. 4, 1988, Pat. No. 4,892,706, and a continuation-in-part of Ser. No. 165,189, Mar. 7, 1988, Pat. No. 5,037,623, which is a continuation-in-part of Ser. No. 826,730, Feb. 6, 1986, Pat. No. 4,731,222. This application Apr. 24, 1989, Ser. No. 342,189

Int. Cl.[5] A61L *2/18*

U.S. Cl. 422—28 19 Claims

1. A method of microbially decontaminating items, the method comprising:

measuring selected quantities of powdered ingredients, which powdered ingredients include:

a powdered borate, and

a powdered water soluble acid precurser, which reacts in water to form a oxidant of sufficient strength to kill at least pathogenic microorganisms, an organic corrosion inhibitor, and a borate corrosion inhibitor;

sealing the powdered ingredients in an ampule until an item is to be microbially decontaminated;

opening the ampule and dissolving and reacting the powdered ingredients in a water containing liquid to form an anti-microbially effective solution of the oxidant, the borate corrosion inhibitor, and the organic corrosion inhibitor;

immersing the item in the solution at least until pathogenic microorganisms are killed; and,

rinsing the item.

5,116,576
DEVICE FOR ANALYTICAL DETERMINATIONS

Christopher J. Stanley, Cambridgeshire, United Kingdom, assignor to Scientific Generics Limited, Cambridge, United Kingdom

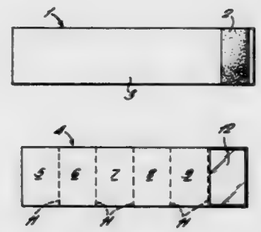
PCT No. PCT/GB88/01071, § 371 Date Aug. 2, 1990, § 102(e) Date Aug. 2, 1990, PCT Pub. No. WO89/05457, PCT Pub. Date Jun. 15, 1989

PCT Filed Dec. 7, 1988, Ser. No. 548,971

Claims priority, application United Kingdom, Dec. 8, 1987, 8728639

Int. Cl.[5] G01N *21/00, 33/561*; C12M *1/34*

U.S. Cl. 422—55 22 Claims



1. An assay cassette device for carrying out an analytical determination including a body portion containing a plurality of separate discrete reagent chambers each containing, successively, a reagent required to perform the desired analytical determination, the reagent chambers being separated one from another by a separation means which, in use is ruptured or opened,

a sample transport body having a sample collection area located thereon, the sample collection area having a specific binding agent immobilized thereon;

said reagent chambers formed in the body portion of an assay cassette, the body portion being closed at one end and has an inlet at the other end for insertion of the sample transport body whereby the sample for analysis is carried to the reagent chambers; said separation means between the reagent chambers, in use, being ruptured or opened by the transport body; and

a signal detection chamber formed in the body portion of the assay cassette adjacent to the closed end thereof, the signal detection chamber being separated from the final reagent chamber by a separation means which, in use, is ruptured or opened by the transport body and said signal detection chamber being provided with a transparent wall.

5,116,577
TUBULAR DOSIMETER

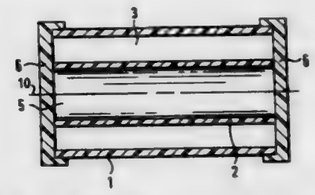
Edgar Eickeler, and Ralf Löffelholz, both of Lübeck, Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Mar. 8, 1990, Ser. No. 490,437

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1989, 3908846

Int. Cl.[5] G01N *31/22*

U.S. Cl. 422—58 8 Claims



1. A dosimeter for detecting a gaseous or aerosol substance in the ambient, the dosimeter comprising:

a tubular outer shell membrane defining a longitudinal axis;

at least one inner shell disposed within said outer shell membrane so as to extend coaxially therewith;

said outer shell membrane and said at least one inner shell each having first and second longitudinal ends;

said at least one inner shell and said outer shell membrane conjointly defining an intermediate space therebetween;

said outer shell membrane being permeable to the substance to be detected and defining a diffusion path from the ambient into said intermediate space in a direction transverse to said axis thereby facilitating the diffusion of the substance through said outer shell membrane into said intermediate space;

a conversion reagent disposed in said intermediate space for reacting with the substance to yield a conversion product;

said inner shell being permeable to said conversion product and defining an inner space into which said conversion product passes after diffusing through said inner shell also in a direction transverse to said axis; and,

a collecting reagent disposed in said inner space for reacting with the conversion product.

5,116,578
VIAL SLEEVE

James A. Baxter, 73a Friern Barnet Lane, London N20 0XT, United Kingdom

Continuation of Ser. No. 593,274, Mar. 26, 1984, abandoned. This application Oct. 15, 1987, Ser. No. 108,670

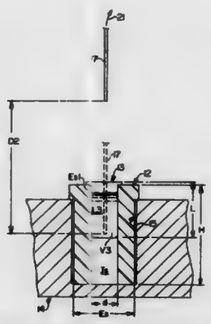
Claims priority, application United Kingdom, Mar. 26, 1983, 8308378

Int. Cl.[5] G01N *35/02*

U.S. Cl. 422—63 6 Claims

1. A combination comprising an autosampler, a precision vial locating and supporting device and a plurality of precision vials wherein the autosampler includes a carrier having means defining a plurality of relatively large diameter openings, each opening being positioned and arranged for normally receiving a conventional relatively large outer diameter vial of a prede-

termined standard outer diameter, said autosampler including a sampling station, a probe at said sampling station, means for moving said carrier to present individual ones of said plurality of carrier openings in general alignment with said probe, means for effecting relative movement between said probe and each carrier opening to move said probe a predetermined distance toward each carrier opening; said probe being positioned and arranged to move a predetermined distance into a conventional vial near a bottom thereof to withdraw liquid therefrom when the liquid is at a first predetermined depth and volume but being incapable of withdrawing liquid therefrom when the liquid is at a second predetermined depth and volume below said first predetermined depth, said precision vial locating and supporting device comprising a plurality of sleeves, each sleeve having a preselected height, an exterior surface of a preselected diameter, an interior surface of another preselected diameter, and means defined by the exterior surface thereof for accurately matching each large diameter opening of said auto-



sampler, each sleeve being accurately fitted in an associated one of said autosampler openings, means defined by the interior surface of each sleeve or accurately matching an exterior surface of a relatively small outer diameter vial, a small outer diameter vial accurately fitted in each sleeve interior surface whereby an otherwise incompatible small outer diameter vial and larger diameter opening autosampler are rendered compatible, each small outer diameter vial being generally aligned with and being of a length to accommodate said probe when said probe is moved said predetermined distance into each small vial, each small vial being of a reduced interior diameter as compared to a conventional relatively large outer diameter vial, the small vial diameter and length further rendering accessible to said probe a volume of liquid in said small vial corresponding to said second volume when said probe is moved said predetermined distance, and said autosampler probe including means for withdrawing liquid from each small outer diameter vial when said small outer diameter vial is in a respective sleeve at said sampling station.

5,116,579

REMOVING NITROGEN OXIDES IN EXHAUST GASES FROM A DIESEL ENGINE

Motonobu Kobayashi; Futoru Kinoshita; Mitsuharu Hagi, all of Hyogo; Akira Inoue, and Terushige Uno, both of Osaka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 474,274, Feb. 2, 1990, Pat. No. 5,021,227. This application Apr. 1, 1991, Ser. No. 678,119

Claims priority, application Japan, Feb. 2, 1989, 1-25209; Feb. 2, 1989, 1-25210

Int. Cl.[5] B01D *53/34*

U.S. Cl. 422—111 **3 Claims**

1. Apparatus for removing nitrogen oxides in exhaust gases from a diesel engine, comprising:

a) humidity detector means for detecting the humidity of in-take air,

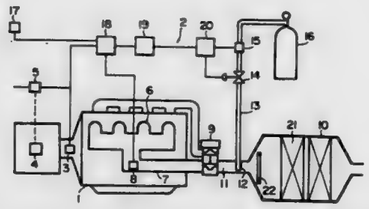
b) at least one of the following:

i) engine power detector means for detecting the power of said engine,

ii) in-take air temperature detecting means for detecting the temperature of the in-take air,

iii) fuel consumption detecting means for detecting the fuel consumption of said engine, and

iv) exhaust gas temperature detecting means for detecting the temperature of an exhaust gas from said engine,



c) ammonia supply means for supplying ammonia into an exhaust gas flow channel from the engine to the reactor, and

d) flow control means for controlling the flow rate of ammonia into said exhaust gas flow channel in response to said humidity detector means and at least one of said engine power detecting means, in-take air temperature detecting means, fuel consumption detecting means and exhaust gas temperature detecting means.

5,116,580

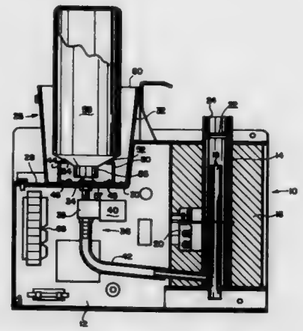
GAS GENERATING APPARATUS AND A METHOD OF FEEDING LIQUID THERETO

Robert W. Wilson, 2128 Forest Dr., E., Charlotte, N.C. 28211

Filed Oct. 12, 1988, Ser. No. 256,712

Int. Cl.[5] B01J *7/00*

U.S. Cl. 422—111 **10 Claims**



1. A gas generating apparatus comprising a frame, a generating chamber mounted on said frame and disposed for generation of gas therein, said chamber opening to the atmosphere for dispensing of generated gas therefrom, means for heating the interior of said chamber to effect generation of gas therein from a liquid, a reservoir for containing a liquid to be fed to said chamber for generation of gas therefrom and having a lower portion and side walls upstanding from the lower portion with an opening in said lower portion, conduit means communicating between said reservoir opening and said generating chamber, said conduit means including a valve to control flow of liquid therethrough and means for actuating said valve,

and a container supporting bracket supported on and upstanding from the lower portion of the reservoir for support of a container containing liquid thereon, said bracket having a top opening spaced above the reservoir opening and shaped for location of a lower opening of the container inwardly of and below said bracket opening, said reservoir being shaped for selective positioning of the container with its lower opening within the reservoir and being closed above the lower opening, for selective feeding of liquid to the chamber by pouring a supply of liquid into the reservoir, causing feeding at a decreasing pressure head and resulting gas generation at a decreasing volumetric rate, or by positioning a container containing liquid in said reservoir with liquid in the reservoir at the level of the container opening, causing feeding of liquid from the reservoir at a generally uniform pressure head and resulting gas generation at a generally uniform volumetric rate.

5. A method of feeding liquid to a gas generating apparatus having a frame, a generating chamber mounted on said frame for generation of gas therein with the chamber opening to the atmosphere for dispensing generated gas therefrom, a reservoir for containing a liquid to be fed to the chamber, conduit means communicating between the reservoir and the chamber with valve means for controlling flow of liquid therethrough, wherein liquid fed from the reservoir through the conduit to the chamber as controlled by the valve means is heated in the chamber to generate gas, said method of feeding comprising feeding selectively by pouring a supply of liquid into the reservoir to feed liquid from the reservoir to the chamber at a decreasing pressure head and resulting gas generation at a decreasing volumetric rate, or by positioning a container of liquid in the reservoir with liquid in the reservoir at the level of an opening in the container above which the container is closed for feeding liquid at a generally uniform pressure head and resulting gas generation at a generally uniform volumetric rate.

5,116,581

MOUNTING ASSEMBLY FOR AN EXHAUST GAS CATALYST

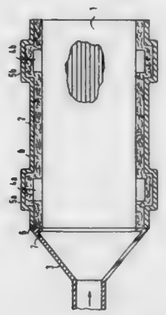
Theodor Cyron, and Wolfgang Maus, both of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Interatom GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 70,034, Jul. 6, 1987, Pat. No. 4,795,615, which is a continuation-in-part of Ser. No. 888,827, Jul. 22, 1986, abandoned. This application Sep. 13, 1988, Ser. No. 244,075

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526681

Int. Cl.[5] B01J *8/02*

U.S. Cl. 422—180 **4 Claims**



1. Mounting assembly for an exhaust gas catalyst, comprising a metallic exhaust gas catalyst carrier body having at least two beads being mutually spaced apart in axial direction of said catalyst carrier body, each of said beads encircling at least part of said catalyst carrier body, a tubular jacket in which said catalyst carrier body is held while permitting lengthwise expansion of said catalyst carrier body, formations formed in said tubular jacket into which said beads protrude in the form of slots and keys, said catalyst carrier body with said beads being disposed at axial and radial distances from said tubular jacket and said formations defining a spacing therebetween, and thermal insulating material at least partially filling said spacing.

5,116,582

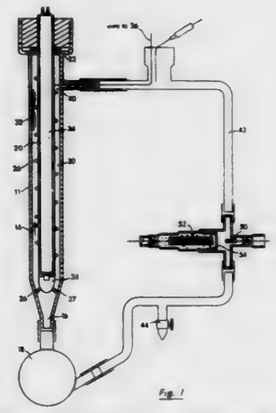
PHOTOCATALYTIC SLURRY REACTOR HAVING TURBULENCE GENERATING MEANS

Gerald Cooper, Boulder; Matthew A. Ratcliff, Lakewood, and Jeffrey G. Sczechowski, Boulder, all of Colo., assignors to Photo-Catalytics, Inc., Boulder, Colo.

Filed Apr. 26, 1990, Ser. No. 514,557

Int. Cl.[5] B01J *19/12*

U.S. Cl. 422—186.3 **7 Claims**



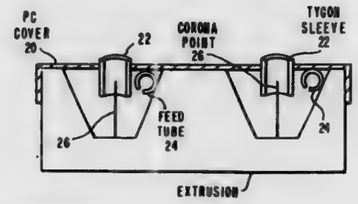
1. A reactor for carrying out a photocatalytic reaction in a photocatalytic slurry, said reactor comprising an elongated cylindrical reaction chamber having an axially aligned inlet for receiving at-least-partially unreacted photocatalytic slurry and an outlet for discharging at-least-partially reacted photocatalytic slurry, a conduit connecting said inlet and said outlet externally of said chamber, means defining an inlet port in said conduit for introducing unreacted photocatalytic slurry into said chamber and conduit, means defining an outlet port for withdrawing reacted photocatalytic slurry from said chamber and conduit, a pump intermediate said chamber inlet and said conduit for circulating photocatalytic slurry through said conduit and said chamber, an ultraviolet light source mounted axially within said chamber and having an external surface defining therewith an annular reaction flow passage, a conductive wire helically wrapped around the external surface of said light source for increasing the turbulence in the boundary layer of the stream of photocatalytic slurry flowing through said annular chamber around said light source, means for charging said wire with an electrical charge, a counter-electrode in said conduit for supplying hydrogen ions to said slurry for maintaining the electrical charge therein, and a charge detecting and measuring electrode in said conduit for measuring the state of charge of said slurry and controlling electrical charge applied to said slurry by said conductive wire to increase and control the quantum yield of reaction product produced in said slurry.

5,116,583

SUPPRESSION OF PARTICLE GENERATION IN A MODIFIED CLEAN ROOM CORONA AIR IONIZER

John S. Batchelder, Tarrytown, N.Y.; Vaughn P. Gross, St. Albans, Vt.; Philip C. D. Hobbs, Ossining; Robert J. Miller, Yorktown Heights, both of N.Y., and Kenneth D. Murray, Huntington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 499,880, Mar. 27, 1990, abandoned.
This application Apr. 29, 1991, Ser. No. 696,308
Int. Cl.[5] B01J *19/08*; H01T *23/00*; H05F *3/00*
U.S. Cl. 422—186.07 4 Claims



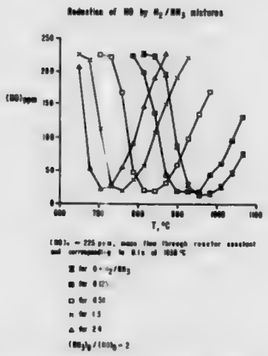
1. A corona air ionizer comprising:
a housing;
a corona point disposed in said housing;
feed means coupled to said housing for causing a stream of non-hydrogen-containing dry gas without ambient air to flow past said corona point;
cover means containing a plurality of perforations coupled to said housing and disposed in proximity to said corona point and said feed means; and
sleeve means extending through said perforations for channeling ions generated by corona discharge through said sleeve means out of said housing away from said corona point.

5,116,584

METHODS FOR ENLARGING THE USEFUL TEMPERATURE WINDOW FOR NOX REDUCTION IN COMBUSTION SYSTEMS

Shih L. Chen, Irvine; William R. Seeker, San Clemente, and Loc Ho, Anaheim, all of Calif., assignors to Energy and Environmental Research Corporation, Irvine, Calif.

Filed Apr. 5, 1991, Ser. No. 681,697
Int. Cl.[5] C01B *21/00*
U.S. Cl. 423—235 36 Claims



1. A process for selectively reducing NO in combustion effluent streams having temperature variations, comprising the single-stage step of introducing a first reducing agent into a combustion effluent stream containing NO_x and excess oxygen, said first reducing agent being in the form of an ammonium salt of an organic acid, said first reducing agent being a precursor of gaseous ammonia and a precursor of a second reducing agent, said first reducing agent being introduced into the combustion effluent stream at a point where the temperature of the combustion effluent stream is in the range from about 1300° F. to about 2000° F., the first reducing agent being present in an amount sufficient to noncatalytically and selectively reduce the NO_x content.

5,116,585

PROCESS FOR PURIFICATION OF OFFGASES

Peter Schoubye, Hørsholm, Denmark, assignor to Haldor Topsoe A/S, Denmark

Filed Oct. 31, 1990, Ser. No. 606,113
Claims priority, application Denmark, Jun. 8, 1990, 1401/90
Int. Cl.[5] C01B *21/00*, *7/00*, *17/00*
U.S. Cl. 423—235 7 Claims

1. An improved process for the removal of acidic gaseous compounds comprising sulphur dioxide, sulphur trioxide, hydrogen chloride, hydrogen fluoride and nitrogen dioxide from a stream of offgas by treatment with ammonia, the improvement of which comprises introduction of a core-gas containing solid particles of silica, carbon or metal oxides with a diameter of between about 40 and 1000 Å into the stream of offgas previous to the treatment with ammonia.

5,116,586

METHOD FOR THE REDUCTION OF NITROGEN OXIDES FROM WASTE GASES USING A ZEOLITE

Michael Baecke; Reinhold Brand; Bernd Engler, all of Hanau; Akos Kiss, Alzenau/Wasserlos; Peter Kleine-Möllhoff, Waldbuettelbrunn; Peter Kleinschmit, Hanau; Edgar Koberstein, Alzenau, and Mustafa Siray, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1989, Ser. No. 448,198
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1988, 3841990
Int. Cl.[5] B01J *8/00*; C01B *21/00*
U.S. Cl. 423—239 57 Claims

1. A method for the reduction of oxides of nitrogen present in waste gases containing oxygen, comprising mixing the waste gases containing nitrogen oxides with ammonia gas and passing said mixture at a temperature in the range of from 200°–600° C. with a space velocity of 1,000– 60,000 h^{-1} corresponding to a catalyst area velocity of 0.5–100 $m^3/h \cdot m^2$ at standard temperature and pressure over a mordenite type zeolite catalyst including 0.2–5.2% by weight copper, 0.1–4.5% by weight iron and 0.1–1.0% by weight cerium relative to the zeolite weight.

20. A method for the reduction of oxides of nitrogen present in waste gases containing oxygen, comprising mixing the waste gases containing nitrogen oxides with ammonia gas and passing said mixture at a temperature in the range of from 200°–600° C with a space velocity of 1,000–60,000 h^{-1} corresponding to a catalyst area velocity of 0.5–100 $m^3/h \cdot m^2$ at standard temperature and pressure over a mordenite type zeolite catalyst including 0.2–5.2% by weight copper, 0.1–4.5% by weight iron and 0.2–2.5% by weight molybdenum, relative to the zeolite weight.

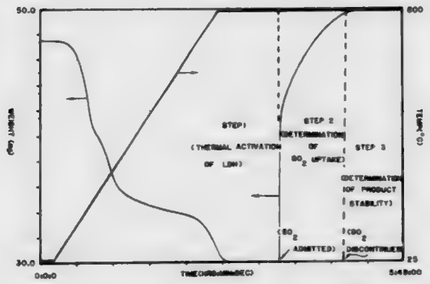
39. A method for the reduction of oxides of nitrogen present in waste gases containing oxygen, comprising mixing the waste gases containing nitrogen oxides with ammonia gas and passing said mixture at a temperature in the range of from 200° –600° C. with a space velocity of 1,000–60,000 h^{-1} corresponding to a catalyst area velocity of 0.5–100 $m^3/h \cdot m^2$ at standard temperature and pressure over a mordenite type zeolite catalyst including 0.2–5.2% by weight copper and 0.2–2.5% by weight molybdenum, relative to the zeolite weight.

5,116,587

LAYERED DOUBLE HYDROXIDE SORBENTS FOR THE REMOVAL OF SO_x FROM FLUE GAS RESULTING FROM COAL COMBUSTION

Thomas J. Pinnavaia; Jayantha Amarasekera, both of East Lansing, and Christine A. Polansky, Ithaca, all of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Jan. 18, 1990, Ser. No. 466,984
The portion of the term of this patent subsequent to May 19, 2009, has been disclaimed.
Int. Cl.[5] B01J *8/00*; C01B *17/00*
U.S. Cl. 423—244 27 Claims



1. A process for removing the SO_x components from air in a flue gas stream containing oxygen, sulfur dioxide and sulfur trioxide from the combustion of coal within a coal fired boiler which comprises combusting the coal in the boiler to provide the flue gas stream and contacting the said flue gas stream with a heated sorbent composition at a temperature between about 400° and 1000° C. wherein the said sorbent before being heated was a layered double hydroxide structure of formula:

$$[M^{II}_{1-x}M^{III}_{x-y}D^{III}_{y}(OH)_2](A^{n-})_{x/n} \cdot pH_2O$$

wherein M^{II} is a divalent metal cation, M^{III} and D^{III} are trivalent metal cations, A is a non-metallic interlayer anion of charge n−, x is between 0.8 and 0.12, and $0<y\leqq x$, wherein said M^{II} and M^{III} are selected from the group consisting of metal cations which form metal oxides and which are capable of reacting with SO_2 to form metal sulfites and with SO_3 to form metal sulfates, and D^{III} is incorporated into the layers of the layered double hydroxide structure as a replacement for all or part of M^{III} metal cations, and selected from the group consisting of transition metal cations which provide oxidation of sulfur dioxide to sulfur trioxide in an amount sufficient that said layered double hydroxide structure promotes the oxidation of the sulfur dioxide to sulfur trioxide at the combustion conditions within the coal-fired boiler wherein p is a positive number.

5,116,588

PROCESS FOR REDUCTION OF SULFUR EMISSION DURING SINTERING PROCESSES

Horst Sulzbacher; Harald Derler, and Heinz Schöllnhammer, all of Leoben, Austria, assignors to Voest-Alpine Stahl Donawitz Gesellschaft m.b.H., Leoben and Voest-Alpine Stahl Linz Gesellschaft m.b.H., Linz, both of, Austria

Filed Oct. 1, 1990, Ser. No. 591,096
Claims priority, application Austria, Oct. 6, 1989, A2315/89
Int. Cl.[5] B01J *8/00*; C01B *17/00*
U.S. Cl. 423—244 8 Claims

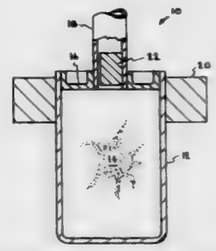
1. Process for reduction of pollutant emissions of SO_2 during sintering of a fuel-containing mixture comprised of coke with a grain range of 0.5–5 mm, comprising the steps of drying the coke of the mixture by heating the mixture to a temperature of essentially 105° C. and contacting the dried coke with $Ca(OH)_2$ by the step selected from the group consisting of rolling the dried coke in dry Ca(OH), and impregnating the dried coke with a sludge of Ca(OH).

5,116,589

HIGH DENSITY HEXAGONAL BORON NITRIDE PREPARED BY HOT ISOSTATIC PRESSING IN REFRACTORY METAL CONTAINERS

Clarence L. Hoenig, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 18, 1990, Ser. No. 539,393
Int. Cl.[5] C04B *35/64*
U.S. Cl. 423—298 14 Claims



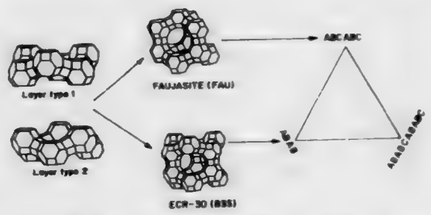
1. A method of densifying hexagonal boron nitride comprising:
placing boron nitride powder in a refractory metal container consisting essentially of tantalum, niobium, tungsten, molybdenum or alloys thereof;
hot isostatically pressing the refractory container filled with boron nitride powder at about 1800 C. and at about 30 KSI (206.8 MPa) to form boron nitride with a bulk density greater than 2.0 g/cc and an isotropically uniform microstructure.

5,116,590

CRYSTALLINE ZEOLITE ECR-35 AND A METHOD FOR PRODUCING SAME

David E. W. Vaughan, Flemington; Karl G. Strohmaier, Port Murray; Michael M. J. Treacy, Princeton, all of N.J., and John M. Newsam, San Diego, Calif., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 9, 1991, Ser. No. 727,202
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—328 19 Claims



1. A synthetic large pore crystalline metalsilicate zeolite composition, designated as ECR-35, having the formula, expressed in term of mole ratio of oxides:

(0.05–0.50) T_2O: (0.50–0.95) Na_2O:
X_2O_3: (4–24) SiO_2: (0–25) H_2O

where T is an organic cation selected from the group consisting of tetraethylammonium and methyltriethyl ammonium, and mixtures thereof and X is Al or Ga; wherein the composition consists of an X-ray diffraction pattern having the line intensities:

Line #	d(Å)	Intensity
(1)	15.00 ± 0.2	weak to very strong
(2)	14.20 ± 0.2	very strong
(3)	13.40 ± 0.2	weak to medium
(4)	8.70 ± 0.2	medium
(5)	8.03 ± 0.2	zero to medium
(6)	7.40 ± 0.15	medium
(7)	5.65 ± 0.15	medium-strong

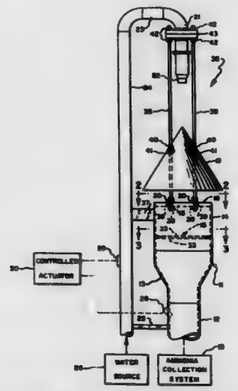
and wherein the intensity of line (2) is greater than line (1) which is substantially greater than the intensity of line (3); and wherein the intensity of line (4) is substantially greater than the intensity of line (6) which is greater than the intensity of line (5).

5,116,591

METHOD AND APPARATUS FOR COMBINING FLUIDS

James S. Witter, Clarence Center, N.Y., assignor to Mollenberg-Betz, Inc., Buffalo, N.Y.

Filed Apr. 12, 1989, Ser. No. 336,759
Int. Cl.[5] C01C *1/00*; G05B *9/05*; G05D *16/00*
U.S. Cl. 423—352 **4 Claims**



1. In a refrigeration system having a first outlet through which ammonia refrigerant, NH_3, is arranged to be vented, the improvement comprising:

a second outlet having two ends and connected, at its one end, to a source of water and having at its other end, a connected spray nozzle, said spray nozzle positioned over said first outlet for spraying water thereover;

dispersion means, arranged within said first outlet for diffusing said ammonia vented through said outlet;

an ammonia sensor, interposed within said first outlet for sensing the presence of ammonia refrigerant in said first outlet;

a capping means arranged to allow dispersion and venting of said ammonia from said first outlet, while simultaneously covering said first outlet, said capping means further arranged to be interposed between said second outlet spray nozzle and said first outlet and further adapted to provide a water spray pattern enveloping said first outlet upon venting of said ammonia and spraying of said water,

whereby said ammonia refrigerant is combined with said water at said outlet.

4. In an ammonia refrigeration system, the method of combining vented ammonia refrigerant with water at an outlet, comprising the steps of:

venting ammonia from said refrigeration system at a first outlet;

automatically sensing the presence of ammonia refrigerant in said first outlet;

providing a source of water separate from said first outlet;

providing a second outlet communicating with said source of water and positioned adjacent said first outlet;

discharging said water through said second outlet toward said first outlet upon the sensing of ammonia refrigerant in said first outlet;

providing a spray nozzle at one end of said second outlet for spraying water therefrom;

providing a conical cap disposed between said second outlet spray nozzle and said first outlet for defining a spray pattern enveloping said first outlet;

spraying said water from said second outlet over said conical cap toward said first outlet;

providing an atomizer within said first outlet for dispersing said ammonia refrigerant;

venting said ammonia from said first outlet;

combining said ammonia refrigerant with said water in the area of said first outlet;

whereby said water and ammonia refrigerant are combined to form a reaction product having a molecular weight less than that of ambient air.

5,116,592

FLUORINATED CARBONS AND USES THEREOF

Norman L. Weinberg, East Amherst, N.Y., assignor to The Electrosynthesis Company, Inc., East Amherst, N.Y.

Continuation-in-part of Ser. No. 869,286, Jun. 2, 1986, Pat. No. 4,908,198. This application Jan. 16, 1990, Ser. No. 466,073
Int. Cl.[5] C01B *31/00*; H01M *4/96*
U.S. Cl. 423—415 R **49 Claims**

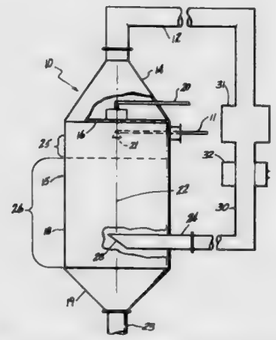
1. An electrode which comprises a specifically fluorinated carbon.

5,116,593

METHOD OF PRODUCING A HYPOHALOGENATED ACID

James K. Melton; Garland E. Hilliard, and John H. Shaffer, all of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 254,634, Oct. 7, 1988, abandoned, and a continuation-in-part of Ser. No. 264,667, Oct. 31, 1988. This application May 17, 1990, Ser. No. 525,285
Int. Cl.[5] C01B *11/00, 11/04*
U.S. Cl. 423—473 **18 Claims**



1. A method of producing a hypohalogenated acid in a reactor, comprising the steps of:

(a) spraying atomized droplets of an aqueous hydroxide into a reactor vessel;

(b) feeding a gaseous halogen into the atomized alkali metal hydroxide spray;

(c) reacting the gaseous halogen with the atomized droplets of the hydroxide in a heated atmosphere to form a reaction product mixture including hypohalogenated acid, water and a solid halide salt by-product;

(d) introducing a heated recycled gaseous halogen medium into the reactor vessel to vaporize the hypohalogenated acid and substantially all of the water in the halide salt in a drying zone in the reactor vessel to dry the halide salt to a moisture content of less than about 5 percent by weight; and

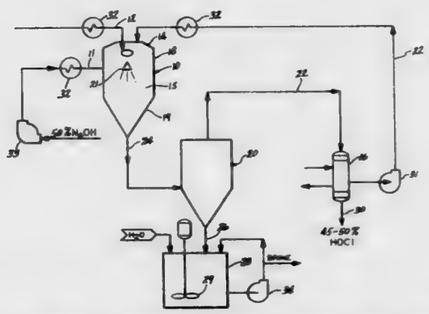
(e) removing the hypohalogenated acid and the halide salt from the reactor vessel.

5,116,594

SALT HANDLING APPARATUS FOR A HYPOCHLOROUS ACID REACTOR

Garland E. Hilliard; James K. Melton, and David A. Helmstetter, all of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 353,573, May 18, 1989. This application Jul. 5, 1990, Ser. No. 548,700
Int. Cl.[5] B01D *46/02, 46.04*; C01B *11/04*
U.S. Cl. 423—473 **20 Claims**



1. A method of removing solid salt by-product from a gaseous hypohalogenated acid product stream in a reactor that reacts an aqueous alkali metal hydroxide and a gaseous halogen, comprising the steps of:

(a) feeding a gaseous product dust-laden with by-product salt into a separation means;

(b) collecting solid salt by-product on the exterior of a plurality of suspended bags;

(c) pulsing a dry gas consisting essentially of halogen through the plurality of suspended bags to inflate the bags and cause the solid salt by-product to fall from the exterior of the suspended bags into a collection location within the separation means, the halogen gas and gaseous product being fed into a recirculation loop connected to the reactor; and

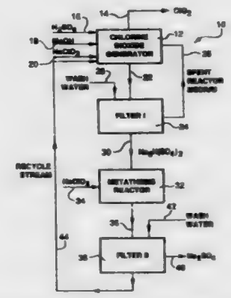
(d) removing the separated solid salt by-product from the separation means.

5,116,595

METATHESIS OF ACIDIC BY-PRODUCT OF CHLORINE DIOXIDE GENERATING PROCESS

Herbert C. Scribner, Monroe, La.; Maurice C. J. Fredette, Mississauga, and Edward J. Bechberger, Etobicoke, both of Canada, assignors to Tenneco Canada Inc., Islington, Canada

Filed Apr. 22, 1991, Ser. No. 688,438
Int. Cl.[5] C01B *11/02*
U.S. Cl. 423—477 **75 Claims**



1. A process for the conversion of sodium sesquisulfate to neutral anhydrous sodium sulfate, which consists essentially of:

contacting said sodium sesquisulfate in solid crystalline form with an aqueous medium consisting essentially of from about 0.01 to about 7 molar sodium chlorate for a time and at a temperature at least sufficient to effect conversion of said solid crystalline sodium sesquisulfate to neutral anhydrous sodium sulfate at least partially in solid crystalline form and to form an aqueous acid-containing medium having a total acid normality up to about 4.8 normal. 10. (Amended) A process for the conversion of sodium sesquisulfate to neutral anhydrous sodium sulfate, which consists essentially of:

contacting said sodium sesquisulfate in solid crystalline form with an aqueous medium consists essentially of from about 0.01 to about 5 molar sodium chloride for a time and at a temperature at least sufficient to effect conversion of said solid crystalline sodium sesquisulfate to neutral anhydrous sodium sulfate at least partially in solid crystalline form and to form an aqueous acid-containing medium having a total acid normality of up to about 4.8 normal.

5,116,596

PROCESS FOR THE PREPARATION OF AN ORGAN-SPECIFIC SUBSTANCE LABELED WITH TECHNETIUM-99M

Karl-Heinz Bremer, Bad Soden am Taunus; Ludwig Kuhlmann; Alexander Schwarz, both of Flörsheim am Main, and Axel Steinstrüsser, Liederbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 130,183, Dec. 8, 1987, abandoned. This application Oct. 27, 1989, Ser. No. 427,990
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642173; Aug. 27, 1987, 3728599
Int. Cl.[5] A61K *39/395, 43/00*; B65D *69/00*
U.S. Cl. 424—1.1 **3 Claims**

1. A test kit comprising two separate freeze-dried components, one of which contains an organ-specific substance which has been pretreated in order to generate at least one functional group having complexing properties in the molecule of the organ-specific substance, and the other component contains a reducing agent which is required for the reduction of 99m pertechnetate and subsequent binding of technetium-99m to the pretreated organ-specific substance.

5,116,597

KIT FOR THE SELECTIVE LABELING OF RED BLOOD CELLS IN WHOLE BLOOD WITH TC-99M

Suresh C. Srivastava, Setauket, N.Y.; John W. Babich, Redhill Surrey, England; Rita Straub, Brookhaven, N.Y., and Powell Richards, New Bern, N.C., assignors to Associated Universities, Inc., Washington, D.C.

Division of Ser. No. 853,123, Apr. 17, 1986, Pat. No. 4,755,375, which is a continuation-in-part of Ser. No. 574,486, Jan. 27, 1984, abandoned. This application Apr. 18, 1988, Ser. No. 182,441

Int. Cl.[5] B65D *69/00*; A61K *49/02*

U.S. Cl. 424—1.1 **7 Claims**

1. A kit for use in labeling with technetium-99m the red blood cells contained in a whole blood sample drawn from a patient which kit comprises: A) a container having therein under sterile conditions lyophilized stannous ions complexed with a tin complexing agent selected from the group consisting of alkali metal citrates, alkali metal glucoheptonates, alkaline earth metal citrates, alkaline earth metal glucoheptonates, alkali metal tartrates, alkali metal pyrophosphates, diethylenetriamine pentaacetic acid, organic diphosphonates, ethylenediaminetetraacetic acid, and dimercaptosuccinic acid, wherein the tin content is from 5 to 100 μg, together with a tin complex stabilizer; B) a supply of an oxidizing agent; and C) a separate supply of a chelating agent for both stannic and stannous tin, said chelating agent selected from the group consisting of disodium ethylenediaminetetraacetic acid, calcium disodium ethylenediaminetetraacetic acid, and acid citrate dextrose.

5,116,598

N_4 TECHNETIUM-99M COMPLEXES FOR USE AS RADIOPHARMACEUTICALS

Dennis L. Nosco, Florissant, Mo., assignor to Mallinckrodt Medical, Inc., St. Louis, Mo.

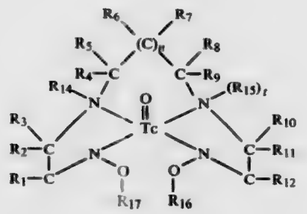
Filed Oct. 29, 1990, Ser. No. 605,207

Int. Cl.[5] A61K *49/02*; C07F *13/00*

U.S. Cl. 424—1.1 **2 Claims**

1. A method of examining the renal function using a radiopharmaceutical complex comprising:

providing a radiopharmaceutical complex having the formula:



wherein

each of the symbols R_1–R_{15} is individually selected from the group consisting of hydrogen, straight or branched, unsubstituted or substituted alkyl having 1–4 carbon atoms, and ACOOH, wherein A is a straight or branched, unsubstituted or substituted alkyl group having 0–4 carbon atoms;

R_4 together with R_5 or R_8 together with R_9 additionally may form an oxygen atom;

each of the symbols R_{16} and R_{17} is individually selected from the group consisting of alkyl, hydroxy substituted alkyl, or hydrogen;

Tc represents technetium-99m;

t is 0 or 1; and

n is 0 or 1;

with the provisos that

(a) if R_{14} and/or R_{15} are/is ACOOH, then A is a straight or branched, unsubstituted or substituted alkyl group having 1–4 carbon atoms;

(b) at least one of the symbols R_1–R_{15} is ACOOH;

(c) at most four of the symbols R_1–R_{15} are ACOOH; and

(d) if t is 1, at least two of the symbols R_1–R_{15} are ACOOH;

or a pharmaceutically acceptable salt of this complex;

administering an effective amount of said radiopharmaceutical complex to a living being; and

scanning said living being with detection means to detect said administered radiopharmaceutical complex.

5,116,599

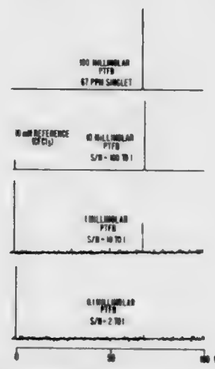
PERFLUORO-T-BUTYL-CONTAINING COMPOUNDS FOR USE IN FLUORINE-19 NMR AND/OR MRI

Walter J. Rogers, Jr., Ellicott City, and Thomas S. Everett, Lutherville, both of Md., assignors to Johns Hopkins Univ., Baltimore and Towson State Univ., Lutherville, both of, Md.

Filed Jul. 31, 1989, Ser. No. 388,049

Int. Cl.[5] G01N *31/00, 24/00*; C07H *1/00, 15/00*

U.S. Cl. 424—9 **7 Claims**



1. A composition for use in NMR imaging and spectroscopy, said composition comprising:

a derivatized biological compound, wherein said derivatized biological compound is a biologically active host molecule derivatized so as to contain at least one perfluoro-t-butyl moiety, and

a carrier for said derivatized biological compound.

5. A method of NMR imaging or spectroscopy comprising administering to a subject a composition comprising a derivatized host compound and a carrier for said derivatized host compound, wherein said derivatized host compound is a host compound derivatized so as to contain at least one perfluoro-t-butyl moiety, each of said at least one perfluoro-t-butyl moiety having nine (9) magnetically equivalent fluorine nuclei which generate a single, intense resonance for easy detection in said imaging or spectroscopy.

5,116,600

COMPOSITION AND METHOD FOR INHIBITING INFLAMMATION CAUSED BY NON-PARENTERAL ADMINISTRATION OF 5-FLUOROURACIL TYPE COMPOUNDS

Setsuro Fujii, deceased, late of Kyoto by Keiko Fujii, legal heir; Shinichiro Fujii, legal heir, Uji; Kaoruko Takada, legal heir, Ehime; Tetsuhiko Shirasaka, and Masakazu Fukushima, both of Otsu, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/00015, § 371 Date Sep. 4, 1990, § 102(e) Date Sep. 4, 1990, PCT Pub. No. WO90/07334, PCT Pub. Date Jul. 12, 1990

PCT Filed Jan. 4, 1990, Ser. No. 576,468

Int. Cl.[5] A61K *31/505, 49/00*

U.S. Cl. 424—10 **11 Claims**

1. An anti-cancer composition for non-parenteral administration to treat cancers susceptible to treatment with an anti-cancer compound selected from the group consisting of 5-fluorouracil, 5'-deoxy-5-fluorouridine, 1-(2-tetrahydrofuranyl)-5-fluorouracil and 3-[3-[6-benzoyloxy-3-cyano-2-pyridyloxycarbonyl)benzoyl]-1-ethoxymethyl-5-fluorouracil, comprising a) said anti-cancer compound and b) 0.05 to 10 parts by weight of oxonic acid, or a pharmacologically acceptable salt thereof, per part by weight of the anti-cancer compound.

5,116,601

AEROSOL HAIR SPRAY CONTAINING A TETRAPOLYMER OF ACRYLIC ACID, N,N-DIMETHYLACRYLAMIDE, N-TERT-BUTYLACRYLAMIDE, AND ETHYL METHACRYLATE AND A NON-HALOGENATED PROPELLANT GAS

Jean Mondet, Drancy; Christos Papantoniou, Montmorency; Jean-Charles Cheneble, Boudy, and Claude Mahieu, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Feb. 14, 1991, Ser. No. 655,348

Claims priority, application France, Feb. 16, 1990, 90 01917

Int. Cl.[5] A61K *7/06*

U.S. Cl. 424—47 **14 Claims**

1. Cosmetic composition in the form of an aerosol spray for hair control, comprising, as a film-forming substance, a tetrapolymer resulting from the copolymerization of:

(a) 5 to 10 wt.% acrylic acid;

(b) 20 to 52 wt.% N,N-dimethylacrylamide;

(c) 3 to 28 wt.% N-tert-butylacrylamide; and

(d) 20 to 45 wt.% ethyl methacrylate;

the carboxylic acid functions of said tetrapolymer being at least 50% neutralized with a mineral or organic base, a solvent for said tetrapolymer; and, a non-halogenated gas.

5,116,602

ANTIPLAQUE ORAL COMPOSITIONS

Richard S. Robinson, Piscataway, N.J.; Arthur B. Buzin, Jamison, Pa., and Ruby E. Kirkup, Bridgewater, N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Filed Sep. 27, 1989, Ser. No. 413,366

Int. Cl.[5] A61K *7/16*

U.S. Cl. 424—49 **10 Claims**

1. A mouthrinse comprising farnesol at a concentration of about 0.05 to about 1.0 percent by weight, about 0.1 to 2 percent by weight of at least one additive selected from the group consisting of benzoic acid, an organic preservative, an anionic linear polymeric carboxylate, and an anionic cross-linked polycarboxylate, said mouthwash having a pH of about 3–5.

5,116,603

ORAL ANTIFUNGAL PREVENTATIVE, AND METHOD OF USE

Michael Friedman, Jerusalem, Israel, assignor to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

Continuation-in-part of Ser. No. 304,092, Jan. 31, 1989, abandoned. This application Jan. 18, 1990, Ser. No. 465,786

Int. Cl.[5] A61K *6/00, 31/74, 31/745, 31/78*

U.S. Cl. 424—53 **9 Claims**

1. A sustained release oral anti-fungal varnish composition which comprises:

(a) efficacious levels of an antimycotic drug;

(b) a sustained release hydrophobic polymer, wherein said sustained release hydrophobic polymer is selected from the group consisting of polyethylene, polymethacrylate, polyamide-nylon, poly(ethylene-vinyl acetate) cellulose nitrate, and silicones and

(c) a plasticizer;

in a pharmaceutically acceptable vehicle.

5,116,604

SUNSCREEN COMPOSITIONS CONTAINING NOVEL NEOPENTANOATE ESTERS

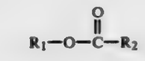
Arnold W. Fogel, Upper Saddle River, and Albert Zofchak, Matawan Township, Monmouth County, both of N.J., assignors to Bernel Chemical Co., Englewood and Alzo, Inc., Matawan, both of, N.J.

Continuation-in-part of Ser. No. 645,334, Jan. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 335,439, Mar. 20, 1989, abandoned. This application Sep. 26, 1991, Ser. No. 765,811

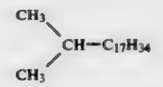
Int. Cl.[5] A61K *72/42, 7/44, 7/48*

U.S. Cl. 424—59 **1 Claim**

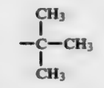
1. A sunscreen composition which comprises stearic acid, cetyl alcohol, diethanolamine cetyl phosphate, 100 centistokes silicone fluid, octyl p-methoxy cinnamate, octyl salicylate, deionized water, glycerine, magnesium aluminum silicate, xanthan gum, triethanolamine diethanolamine p-methoxy cinnamate, a preservative, and from 5 to 20% by weight of the composition neopentanoate emollient having the chemical structure as follows:



where R_1 is a C_{20} alcohol moiety of the neopentanoate ester having the chemical structure:



R_2 is the acid moiety of the neopentanote having the chemical structure:



which emollient increases the sunscreen protection factor of the composition, stability and pleasant odorific properties due to the emollient's unique stability.

5,116,605

COMPOSITION AND SKIN TREATMENT METHOD THEREWITH FOR MITIGATING ACNE AND MALE-PATTERN BALDNESS

John P. Alt, 616 NE. 11th Ave., Fort Lauderdale, Fla. 33304

Continuation-in-part of Ser. No. 527,813, May 24, 1990, which is a continuation-in-part of Ser. No. 321,216, Mar. 9, 1989, abandoned. This application Dec. 5, 1991, Ser. No. 803,178

Int. Cl.[5] A61K *7/06, 7/075*

U.S. Cl. 424—70 13 Claims

1. A topical application composition for mitigating male pattern baldness and testosterone-induced acne consisting essentially of

a) sodium chloride	2.0 to 5.5%
b) lecithin	0.35 to 3.5%
inositol	0.0 to 3%
soy oil	0.008 to 0.04%
phosphoric acid	0.005 to 0.035%
choline chloride	0.025 to 3.0%
c) polysorbate —80	0.3 to 3.0%

the balance a cosmetically acceptable vehicle for topical application.

5,116,606

SKIN TREATMENT METHOD AND SOLUTION

John P. Alt, 2100 S. Federal Hwy., Fort Lauderdale, Fla. 33316

Continuation-in-part of Ser. No. 321,216, Mar. 9, 1989. This application May 24, 1990, Ser. No. 527,813

Int. Cl.[5] A61K *7/06, 7/075*

U.S. Cl. 424—70 6 Claims

1. A method of treating a selected area of a person's skin which comprises applying topically to said area of skin an aqueous solution consisting essentially of the following percentages by weight of the named ingredients:

sodium chloride	3.4%
inositol	0.08%
choline chloride	0.04%
pantothetic acid	0.01%
Vitamin E	200 IU/gal

wherein the pH of said solution is within the 6.0–7.5 range.

5,116,607

HAIR DRESSING

Alma L. Jones, 19232 S. Cliveden, Carson, Calif. 90746

Filed Feb. 27, 1990, Ser. No. 485,943

Int. Cl.[5] A61K *7/11*

U.S. Cl. 424—70 11 Claims

1. A hair dressing comprised of: petrolatum (light); CARBOWAX 940 (a trade name for the product polyethylene glycol (PEG); PEG-75 lanolin (a trade name for the product Solulan L-575 a water soluble lanolin that is 50% aqueous); castor oil; AMBERWAX (a trade name for micro crystalline wax): paraffin wax; biotin; keratin protein; and polysorbate 80.

5,116,608

PERMANENT WAVING COMPOSITION

Issei Yoshioka, Osaka; Yoichi Kamimura, Nara; Masao Kitano, Kamakura, and Yujiro Goto, Kawasaki, all of Japan, assignors to Seiwa Kasei Co., Ltd., Osaka, Japan

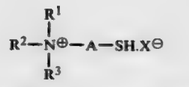
Filed Sep. 25, 1989, Ser. No. 411,979

Claims priority, application Japan, Sep. 29, 1988, 63-245795

Int. Cl.[5] A61K *7/09*

U.S. Cl. 424—72 4 Claims

1. A permanent waving composition comprising 0.5 to 10% by weight of a quaternary ammoniomercaptan or its salt of the formula (1):



(1)

wherein R^1, R^2 and R^3 are the same or different and each is an alkyl group having 1 to 3 carbon atoms or a hydroxyalkyl group having 1 to 3 carbon atoms, A is ethylene, group, and X is Cl, Br, I, NO_3, $\frac{1}{2}SO_4$, OH or R^4OSO_3 in which R^4 is an alkyl group having 1 to 3 carbon atoms.

5,116,609

Patent Not Issued For This Number

5,116,610

COMPOSITIONS FOR TREATING HYPERCHOLESTEROLEMIA

Charles D. Broaddus, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 719,058, Jun. 21, 1991, abandoned, which is a continuation of Ser. No. 425,510, Oct. 19, 1989, abandoned, which is a continuation of Ser. No. 333,845, Apr. 4, 1989, abandoned, which is a continuation of Ser. No. 138,976, Dec. 29, 1987, abandoned. This application Sep. 30, 1991, Ser. No. 768,093

Int. Cl.[5] A61K *27/00*

U.S. Cl. 424—78.12 11 Claims

1. A composition of matter for reducing blood cholesterol levels, comprising:

a) cholestyramine; and

b) a nonabsorbable, nondigestible polyol polyester.

5,116,611

ANTIFOULING PAINT

Shigeru Masuoka, Hyogo, and Yoshihiro Honda, Osaka, both of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

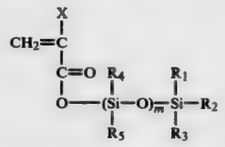
Continuation of Ser. No. 212,745, Jun. 28, 1988, abandoned. This application May 2, 1990, Ser. No. 519,349

Claims priority, application Japan, Jun. 28, 1987, 62-160090; Nov. 4, 1987, 62-278473

Int. Cl.[5] C08L *31/00, 31/02;* C09D *5/14*

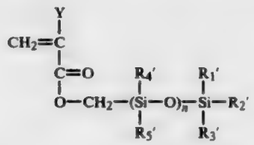
U.S. Cl. 424—78.09 5 Claims

1. An antifouling paint containing as its essential components an antifoulant and a polymer of at least one of monomers A and A′ represented by the following general formulae (a) and (b), respectively, and/or a copolymer composed of at least 5 wt. % of at least one of the monomers A and A′ and up to 95 wt. % of one or more vinyl polymerizable monomers B that are copolymerizable with said monomers A and A′ and selected from the group consisting of a methacrylate ester, an acrylate ester, a maleic acid ester, a fumaric acid ester, styrene, vinyltoluene, α-methylstyrene, vinyl chloride, vinyl acetate, butadiene, acrylamide, acrylonitrile, methacrylic acid, acrylic acid and maleic acid:



(a)

wherein X is a hydrogen atom or a methyl group; m is a real number of 1 or more; R_1–R_5 are each a group selected from the group consisting of an alkyl group of up to about 5 carbon atoms, an alkoxy group of up to about 5 carbon atoms, an unsubstituted phenyl group, a phenyl group substituted by halogen, an alkyl group, an alkoxyl group or an acyl group, an unsubstituted phenoxyl group and a phenoxyl group substituted by halogen, an alkyl group, an alkoxyl group or an acyl group; in which R_1–R_5 may be the same or different;



(b)

wherein Y is a hydrogen atom or a methyl group; n is 0 or more; R'_1–R'_5 each is a group selected from the group consisting of an alkyl group of up to about 5 carbon atoms, an alkoxyl group of up to about 5 carbon atoms, an unsubstituted phenyl group, a phenyl group substituted by halogen, an alkyl group, an alkoxyl group or an acryl group, an unsubstituted phenoxyl group and a phenoxyl group substituted by halogen, an alkyl group, an alkoxyl group or an acyl group, in which R'_1–R'_5 may be the same or different, and each of R'_1–R'_5 is other than the alkoxyl group when n is 0, said antifoulant being present in an amount of 0.1 to 65 wt. % of the total of said polymer and said antifoulant.

5,116,612

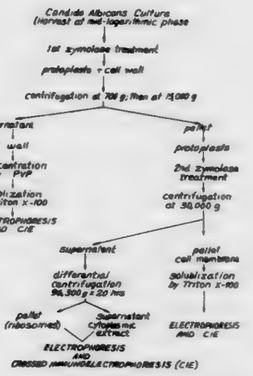
IMMUNOTHERAPY AGENTS FOR TREATMENT OF IGE MEDIATED ALLERGIES

Aristo Wojdani, Los Angeles, Calif., assignor to Allergy Immuno Technologies, Inc., Newport Beach, Calif.

Division of Ser. No. 65,310, Jun. 23, 1987, Pat. No. 4,946,945. This application Jun. 7, 1990, Ser. No. 534,237

Int. Cl.[5] A61K *37/66, 39/385;* C07K *15/26, 17/02*

U.S. Cl. 424—85.2 10 Claims



1. A protein conjugate useful in allergy immunotherapy comprising an allergen which causes IgE mediated allergic response conjugated to a biological response modifier (BRM) selected from the group of interleukin-1 and interleukin-2.

5,116,613

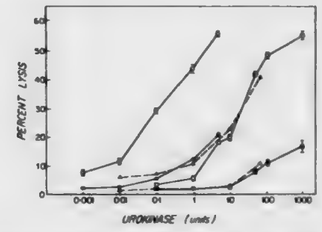
ANTIBODY-THROMBOLYTIC AGENT PRODUCT AND METHOD OF USE

Edgar Haber, Weston, and Gary R. Matsueda, Winchester, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed Jan. 8, 1985, Ser. No. 689,851

Int. Cl.[5] A61K *39/395;* C07K *15/28*

U.S. Cl. 424—85.8 8 Claims



1. A thrombolytic product comprising a fibrin-specific antibody substantially devoid of fibrinogen cross-reactivity coupled to a thrombolytic agent.

5,116,614

JOMOL DERIVATIVES AS AGENTS FOR THE USE IN MALIGNANT TUMORS AND LOWERED IMMUNE DEFENSES

Udo Ehrenfeld, Furtmayrstr. 20, 8400 Regensburg, Fed. Rep. of Germany

Division of Ser. No. 842,313, Mar. 21, 1986. This application Jan. 22, 1990, Ser. No. 468,269

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1985, 3510795

Int. Cl.[5] A61K *39/02;* C12N *1/20*

U.S. Cl. 424—92 8 Claims

1. Jomol derivative pharmaceutical preparation, wherein Jomol is

a product obtained from bacteria by a production process in that

(a) Nocardia opaca cells (DSM 43 202, ATCC 21953) are cultured on a buffered culture medium,

(b) the cells are collected,

(c) the cells are suspended in a medium containing glucose and buffer, the suspension is allowed to stand for 15 minutes to several hours,

(d) the suspension is treated in a buffer with a murolytic enzyme, and optionally with deoxyribonuclease,

(e) the cells are destroyed,

(f) the resulting material is separated into sediment and supernatant;

(g) the supernatant is subjected to separation on Sephadex columns using a buffer as eluent, which can optionally contain 0.1 to 0.05% EDTA-Na_2,

(h) the active fraction is obtained, and

(i) the active fraction is reacted with acetaldehyde,

and said Jomol derivative is Jomol coupled with a crown ether, diethylene triamine pentaacetic acid, tin-II-chloride, fluorescein isothiocyanate or another dyestuff or a cytostatic.

5,116,615
METHOD FOR TREATING BENIGN PROSTATIC HYPERTROPHY
Muharrem Gokcen, Minneapolis, and Terry J. Guy, Chaska, both of Minn., assignors to Immunolytics, Inc., Minneapolis, Minn.
Continuation of Ser. No. 429,966, Oct. 31, 1989, abandoned, which is a continuation-in-part of Ser. No. 303,809, Jan. 27, 1989, abandoned. This application May 30, 1991, Ser. No. 707,628
Int. Cl.[5] A61K *37/62, 37/547, 37/54, 37.48*
U.S. Cl. 424—94.2 19 Claims

1. A method of treating prostatic hypertrophy in a living mammal comprising direct intraprostatic injection of a composition comprising a therapeutically effective concentration of collagenase and at least one enzyme selected from the group consisting of hyaluronidase, elastase, trypsin, chymotrypsin, pronase, DNase I, bromelin, clostripain, thermolysin, neuraminidase, phospholipase, cholesterol esterase, dispase, subtilisin, papain, chymopapain, plasminogen activator, plasmin, streptokinase, urokinase, fibrinolysin, serrathiopeptidase, pancreatin, amylase, lysozyme, cathepsin-G, and the PMN leukocyte serine proteases; wherein said composition causes the dissolution and regression of hypertrophied prostatic tissue thereby providing relief from the obstructive symptoms associated with prostatic hypertrophy.

5,116,616
USE OF INTRATRACHEAL ADMINISTRATION OF SOD TO PROTECT HUMANS FROM LUNG INJURY DUE TO HYPEROXIA AND HYPERVENTILATION
Amnon Gonenne, Great Neck, N.Y., assignor to Bio-Technology General Corp., New York, N.Y.
Filed Apr. 29, 1991, Ser. No. 692,630
Int. Cl.[5] A61K *37/50*
U.S. Cl. 424—94.4 10 Claims

1. A method of protecting a human from lung injury due to hyperoxia and hyperventilation which comprises intratracheally administering to the human an amount of free CuZn-SOD effective to protect the human from lung injury due to hyperoxia and hyperventilation.

5,116,617
PHARMACEUTICAL COMPOSITION FOR TOPICAL USE IN THE TREATMENT OF THE CAPILLARY FRAGILITY
Marisa Mantovani, Villa Guardia; Roberto Porta, Cernobbio, and Giuseppe Prino, Milan, all of Italy, assignors to Crinos Industria Farmacobiologica S.p.A., Villa Guardia, Italy
Filed Aug. 16, 1990, Ser. No. 568,126
Claims priority, application Italy, Sep. 7, 1989, 21651 A/89
Int. Cl.[5] A61K *9/06, 31/33*
U.S. Cl. 424—401 3 Claims

1. A method of strengthening capillaries in a human in need of such treatment, comprising topically applying a composition to the skin of said human, said composition being in the form of a gel, ointment, cream or lotion, and containing Defibrotide in an amount effective to strengthen said capillaries.

5,116,618
WATER-SOLUBLE ARTHROPODICIDALLY-ACTIVE FOAM MATRIX AND METHOD OF MANUFACTURE
John D. Hagarty, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Continuation of Ser. No. 339,565, Apr. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 922,926, Oct. 24, 1986, Pat. No. 4,889,710, which is a continuation of Ser. No. 727,932, Apr. 26, 1985, abandoned. This application Aug. 20, 1990, Ser. No. 569,499
Int. Cl.[5] A01N *25/16*
U.S. Cl. 424—405 4 Claims

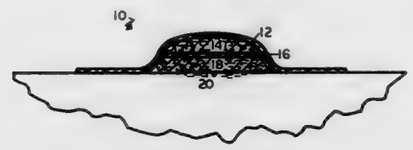
1. An arthropodicidally-active composition-of-matter characterized as a formulation, comprising:
an aqueous lower alkanol solvent consisting essentially of water and about 3 parts-by-weight to about 40 parts-by-weight of a C_1 to C_4 lower alkanol, based upon 100 parts-by-weight of total water and lower alkanol;
a toxicant contained within the solvent; and
an effective amount of an emulsifier, with respect to the amount of solvent and contained within the solvent, for enabling the formulation to form a foam matrix that is able to remain stable for at least about 5 days, the toxicant being present in an amount of about 0.01 parts-by-weight to about 2.5 parts-by-weight, based upon 100 parts-by-weight of the arthropodicidally-active composition-of-matter, the emulsifier being present in an amount of at least about 1 weight percent based upon total weight of the arthropodicidally-active composition-of-matter, wherein the formulation is characterized as a water-out emulsion prior to formation of the foam matrix.

5,116,619
VAGINAL PROGESTERONE TABLET
John C. Greco, 120 Country Club La., Mamou, La. 70554, and James W. McGinity, Austin, Tex., assignors to Lee Roy Morgan and John C. Greco, both of New Orleans, La.
Filed Aug. 30, 1988, Ser. No. 238,535
Int. Cl.[5] A61K *9/02;* A61F *13/00*
U.S. Cl. 424—433 34 Claims



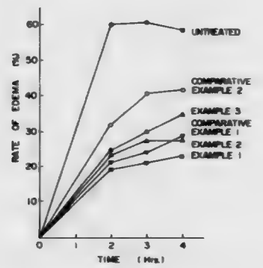
1. A vaginal tablet which disintegrates from its surface after insertion in the vagina and comprises:
a binder selected from the group consisting of particulate starch and polyvinylpyrrolidone,
a disintegrant selected from the group consisting of corn starch, rice starch, wheat starch and potato starch,
progesterone, lactose, binder and disintegrant formulated in sufficient amounts and particle sizes to deliver progesterone above basal blood levels for 48 to 72 hours after the tablet is inserted into a human vagina.

5,116,620
ANTIMICROBIAL WOUND DRESSING
Milos Chvapil, Tucson, Ariz., and Bruce A. Barber, 77 Duck Hill Rd., Duxbury, Mass. 02331, assignors to Bruce A. Barber, Duxbury, Mass.
Division of Ser. No. 439,472, Nov. 21, 1989. This application Aug. 8, 1991, Ser. No. 742,319
Int. Cl.[5] A61L *15/00*
U.S. Cl. 424—445 15 Claims



1. An antimicrobial wound dressing, which wound dressing comprises:
a) a first layer of a retaining dressing material selected from the group consisting of: open cell foam materials, membrane materials, woven materials and non-woven materials impregnated with an antimicrobial effective amount of stabilized, dry, lyophilized chlorine-containing compounds which on activation generate a chlorine-oxidizing compound, one side of the first layer to be placed in contact with a wound to be treated; and
b) a second layer of a retaining dressing material adjacent to the first layer, said second layer impregnated with an amount of dry organic acid compound effective to activate said chlorine-containing compounds whereby
when the first layer of the wound dressing is placed on the wound being treated the presence of moisture from the wound causes, the dry organic acid compound to activate the dry chlorine-containing compounds to produce an antiviral, antimicrobial chlorine oxidant to treat the wound.

5,116,621
ANTI-INFLAMMATORY ANALGESIC PATCH
Akihito Oji, Ohkawa; Yukihiro Tada, Takamatsu; Noriyuki Sasaki, Shiki, and Mitsuo Mizumura, Kawagoe, all of Japan, assignors to Lederle (Japan), Ltd., Tokyo and Teikoku Seiyaku Co., Ltd., Kagawa, both of, Japan
Filed Dec. 24, 1990, Ser. No. 633,146
Claims priority, application Japan, Dec. 25, 1989, 1-332599
Int. Cl.[5] A61F *13/00*
U.S. Cl. 424—445 9 Claims



1. An anti-inflammatory analgesic dosage unit for transdermal application in the form of a patch having (i) a drug-reservoir layer comprising an effective anti-inflammatory amount of 4-biphenylacetic acid to provide an analgesic effect; (ii) a polymer of acrylic acid, (iii) at least 0.05 parts by weight crotamiton per 100 parts by weight 4-biphenylacetic acid within said drug-reservoir, and (iv) 0.5 to 15% by weight water-soluble organic amine based on the weight of the drug-reservoir and 0.1 to 5% organic acid based on the weight of the drug-reservoir, said water-soluble organic amine and said organic acid being adjusted whereby said drug-reservoir is maintained at a pH in the range of 6 to 8.

5,116,622
METHODS FOR TREATING PARKINSON'S DISEASE
Stanislaw R. Burzynski, 20 West Rivercrest, Houston, Tex. 77042
Filed Sep. 12, 1990, Ser. No. 581,022
Int. Cl.[5] A61K *35/22*
U.S. Cl. 424—545 6 Claims

1. A method of treating original Parkrinson's disease in an afflicted host comprising:
administering to the host a pharmaceutical composition containing a therapeutically effective amount of a urine peptide fraction containing 3-[N-phenylacetylaminopiperidine]-2,6-dion, the urine peptide fraction obtained by
providing a volume of urine;
separating from the urine particulate matter and matter having a molecular weight greater than about 5000;
acidifying the urine;
separating from the acidified urine any precipitated matter;
introducing the acidified urine to a first chromatography column containing a polymeric resin adsorbent;
eluting the column to recover an eluate;
adjusting the pH of the eluate to between about 2 and 8;
introducing the adjusted eluate to a second chromatography column; and
recovering the peptide fraction containing the compound 3-[N-phenylacetylaminopiperidine]-2,6-dion.

5,116,623
PERIODATE IODOPHOR COMPOSITION WITH INCREASED STABILITY
Mohammad A. Khan, Sandy, and John F. Moellmer, Salt Lake City, both of Utah, assignors to Becton-Dickinson and Company, Franklin Lakes, N.J.
Filed Jan. 22, 1991, Ser. No. 643,737
Int. Cl.[5] A61K *33/18*
U.S. Cl. 424—616 10 Claims

1. An aqueous iodophor composition comprising:
elemental iodine in a germicidally effective amount of about 0.5–1.25%;
about 0.01–0.3% of periodate which maintains the level of elemental iodine by oxidation;
said composition having a pH of below about 4.5;
wherein said elemental iodine is maintained at a level of about 0.5%–1.25% by weight and wherein the percentage of iodine in the composition aged for 20 weeks at 52° C. and irradiated at 2.5 Mrads is higher than in the same composition not containing periodate.

5,116,624
EFA COMPOSITIONS AND THERAPY
David F. Horrobin, Guildford, England, and Frank Corrigan, Argyll, Scotland, assignors to Efamol Holdings plc, Surrey, United Kingdom
Filed Jan. 9, 1991, Ser. No. 638,998
Claims priority, application United Kingdom, Jan. 18, 1990, 9001121
Int. Cl.[5] A61K *31/20, 33/04*
U.S. Cl. 424—702 5 Claims

1. A method of treating dementia in a person having same comprising administering to said person an effective amount of a composition comprising, per unit dose, 1 mg to 20 g of GLA,

DGLA or both together with 1 to 10,000 micrograms of bioavailable selenium.

5,116,625

NITROGEN SPARGING METHOD FOR ELIMINATING OFF-NOTES FROM MINT FLAVORS AND METHOD OF MAKING CHEWING GUM COMPRISING SAID FLAVORS

Mansukh M. Patel, Downers Grove, and Charles M. Copper, Westmont, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Dec. 26, 1990, Ser. No. 634,064
Int. Cl.[5] A23G *3/30*; A23L *1/015*
U.S. Cl. 426—3 3 Claims

2. A method of preparing a chewing gum containing nitrogen sparged mint flavor comprising the following steps:
providing gum ingredients, comprising gum base, softener, and sweetener ingredients;
providing a mint flavor selected from the group consisting of spearmint oil, peppermint oil, and oil of wintergreen;
passing nitrogen through said flavor for a sufficient time at sufficient pressure to eliminate undesirable off-notes contained therein; and
mixing the nitrogen sparged mint flavor with the chewing gum ingredients so that the said flavor comprises about 0.1% to about 1.5% by weight of the chewing gum.

5,116,626

TRANSPARENT BASE AND GUM COMPOSITION

Steven P. Synosky, Green Brook; Dinah Diaz, Edison, and Scott E. Hartman, Roosevelt, all of N.J., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Jul. 25, 1991, Ser. No. 736,028
Int. Cl.[5] A23G *3/30*
U.S. Cl. 426—3 58 Claims

1. A transparent gum base comprising:
from about 70.0 percent to about 95.0 percent by weight of one or more elastomers selected from the group consisting of
a polyvinyl acetate having an average GPC molecular weight from about 2,000 to about 85,000;
a polyisobutylene having an average GPC molecular weight from about 50,000 to about 95,000; and
a vinyl laurate-vinyl acetate copolymer having an average vinyl laurate content from about 10 percent to about 60 percent by weight of the copolymer;
from about 1.0 percent to about 20.0 percent by weight softeners selected from the group consisting of one or more of glycerol triacetate, mono-, di- or triglycerides or acetylated mono-, di- or triglycerides, having a saponification number greater than about 350,
and less than 1 percent by weight filler, wherein the gum base has a light transmittance of at least 60 percent using ASTM Method DI746-35, and a softening point of from about 40 3C to about 90° C.,

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5,116,627

CHEWING GUM CONTAINING COMPOSITIONS FOR CONTROLLED RELEASE OF FLAVOR BEARING SUBSTANCES AND PROCESS FOR PRODUCING SAME

Howard J. Rutherford, Highlands; Nayan Desai, Freehold; Keith McDermott, Bound Brook, and Charles Wiener, Middletown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 7, 1991, Ser. No. 666,036
Int. Cl.[5] A23G *3/33*
U.S. Cl. 426—5 1 Claim

1. A chewing gum composition consisting essentially of a chewing gum base having dispersed therein sweetener and flavor bearing polymeric particles, each of said polymeric particles consisting essentially of:
(a) at least one water-soluble normally solid polymer;
(b) at least one water-insoluble normally solid polymer;
(c) (i) at least one flavor composition, a portion of which is incorporated in the water-insoluble polymer and a portion of which is incorporated in the water-soluble polymer; and
(ii) at least one sweetener composition, a portion of which is incorporated in the water-insoluble polymer and a portion of which is incorporated in the water-soluble polymer;
the water-soluble polymer and the water-insoluble polymer being physically associated with each other and in such a manner that one is in the form of a multiplicity of discrete entities in a matrix of the other produced according to the process consisting essentially of the sequential steps of:
(a) first mixing a water-soluble polymer and a water-insoluble polymer to form a first polymer blend;
(b) then adding to the polymer blend at least one sweetener composition and at least one flavor composition;
(c) then mixing the resulting blend to form a second polymer blend;
(d) then cooling the resulting second polymer blend to a substantially solid state to form a substantially solid bland;
(e) then grinding the resulting substantially solid blend to form a particulate substantially solid flavor and sweetener composition; and then
(f) admixing the resulting particulate substantially solid flavor and sweetener composition with a chewing gum base.

5,116,628

PROCESS FOR PRODUCING LIQUID EGG HAVING REDUCED CHOLESTEROL CONTENT

Johji Ogasahara, Osaka; Hitoshi Hariu, Kyoto, and Masakazu Takahashi, Hyogo, all of Japan, assignors to Sumitomo Seika Chemicals Co., Ltd., Hyogo; Otsuka Foods Co., Ltd., Osaka and Mitsubishi Corporation, Tokyo, all of, Japan

Filed Oct. 19, 1990, Ser. No. 599,840
Claims priority, application Japan, Oct. 30, 1989, 1-282217
Int. Cl.[5] A23L *1/32*
U.S. Cl. 426—330.1 9 Claims

1. A process for producing liquid egg having a reduced cholesterol content which comprises contacting liquid egg with a supercritical fluid to extract cholesterol from the liquid egg.

5,116,629

PROCESSED MEAT PRODUCTS CONTAINING FISH OILS STABILIZED WITH FRUCTOSE

Lisa R. Schroeder, Plymouth, and Dorothy J. Muffett, Bloomington, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 603,270, Oct. 24, 1990, abandoned, which is a continuation of Ser. No. 449,239, Dec. 7, 1989, abandoned, which is a continuation of Ser. No. 191,946, May 9, 1988, abandoned. This application Aug. 6, 1991, Ser. No. 740,698
Int. Cl.[5] A23L *1/317*
U.S. Cl. 426—545 13 Claims

1. A processed meat product, other than fish meat, containing fish oil, yet exhibiting enhanced stability against flavor degradation, wherein the product comprises:
A. a meat ingredient, other than fish meat, in an amount of not less than about 30% of said meat product;
B. a deodorized, nonhydrogenated fish oil in an amount of about 1% to 15% by weight of said meat product, said fish oil having
1) about 150 to 250 ppm of a fish oil stabilizing antioxidant and
2) about 1500 to 2000 ppm tocopherol; and
C. fructose in an amount such that the weight ratio of fructose to said fish oil ranges from about 1 to 100:100;
wherein said meat product is substantially free of any fish proteinaceous material.

5,116,630

PROCESS FOR THE DEAGGLUTINATION OF NATURAL GLUTEN AND DIETARY PRODUCTS CONTAINING LARGE QUANTITIES OF WHEAT GLUTEN

John S. Chen, and Maria G. Menesini Chen, both of Strada di Renaccio 11, I-53100 Siena, Italy

PCT No. PCT/IT88/00036, § 371 Date Nov. 15, 1989, § 102(e) Date Nov. 15, 1989, PCT Pub. No. WO88/09129, PCT Pub. Date Dec. 1, 1988
PCT Filed May 19, 1988, Ser. No. 449,945
Claims priority, application Italy, May 20, 1987, 65502 A/87
Int. Cl.[5] A21D *13/00*
U.S. Cl. 426—549 5 Claims

1. Process for treating natural gluten to be used in the formulation of less digestible dietary products containing gluten, said process comprising:
a) providing a quantity of natural gluten; and
b) heating the natural gluten to a temperature between 60° and 110° C. for at least 75 minutes for denaturating the natural gluten to render it into a less digestible by proteinases product.

5,116,631

LOW-CALORIE FOOD PRODUCTS CONTAINING KONJAK MANNAN AND PROCESSES FOR PREPARING THE SAME

Jiro Sakamoto, and Hiromi Tanuma, both of Kawasaki, Japan, assignors to Ajinomoto Company, Inc., Tokyo, Japan

Continuation of Ser. No. 455,945, Dec. 22, 1989, abandoned. This application Jan. 23, 1991, Ser. No. 646,504
Claims priority, application Japan, Dec. 26, 1988, 63-326276; Jul. 6, 1989, 1-174548
Int. Cl.[5] A23J *3/00*
U.S. Cl. 426—568 4 Claims

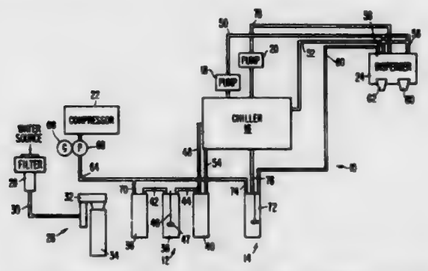
1. A process for preparing meringue, consisting essentially of mixing an aqueous solution of 0.05–2% by weight konjak mannan with an amount of powdered egg white and/or powdered whole egg effective to produce homogeneous konjak mannan containing meringue.

5,116,632

BREWING AND DISPENSING SYSTEM AND METHOD FOR ICED TEA

Harold F. Miller, 107 Winston Way, Goose Creek, S.C. 29445

Division of Ser. No. 288,573, Dec. 22, 1988, Pat. No. 4,919,041. This application Feb. 2, 1990, Ser. No. 473,723
Int. Cl.[5] A23F *3/18*
U.S. Cl. 426—597 4 Claims



1. A method of brewing and dispensing chilled presweetened iced tea including the steps of producing a supply of tea, producing a supply of liquid sweetener, prepared from a syrup composed of eleven cups of water, eleven cups of sugar, two teaspoons of corn syrup, one teaspoon of honey, and three grams of fructose and maintaining the tea and sweeteners in a chilled condition until dispensed at a first location, propelling chilled tea and chilled sweetener under pressure to a dispensing mans at a second location remote from said first location in response to actuation of the dispensing means, mixing the tea and sweetener in a predetermined ratio to produce sweetened tea, dispensing a desired quantity of chilled tea at said second location and returning the undispensed tea and sweetener, respectively, to the tea supply and to the sweetener supply at the first location.

5,116,633

MEAT PRODUCTS HAVING A MARKEDLY REDUCED SATURATED FAT AND CHOLESTEROL CONTENT AND A MARKEDLY INCREASED UNSATURATED FAT CONTENT

Donald M. Small, Quincy, Mass., assignor to Trustees of Boston University, Boston, Mass.

Continuation of Ser. No. 541,873, Jun. 21, 1990, abandoned, which is a division of Ser. No. 381,233, Jul. 18, 1989, Pat. No. 4,980,185. This application Jul. 15, 1991, Ser. No. 729,917
Int. Cl.[5] A23L *1/31*
U.S. Cl. 426—641 6 Claims

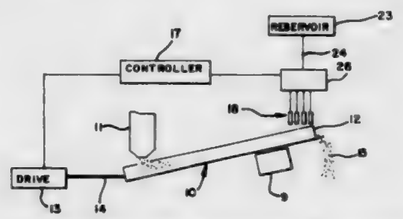
1. A processed, fragmented meat product having a markedly reduced saturated fat content and a markedly increased unsaturated fat content in comparison to the fat content of raw meat wherein the unsaturated fat constitutes up to 70% of the total fat present in said processed meat product, said processed meat product being the product of fragmented raw meat which has been combined with an extracting unsaturated oil, heated to not substantially less than 100° C., and then washed with a heated aqueous washing fluid to separate and remove at least a portion of the extracting oil containing solubilized saturated fat.

5,116,634

APPARATUS AND METHOD FOR CONSISTENT SPRAY PROPORTIONING OF LIQUID TO DRY MATERIAL

Terry L. Havens, Wenona, and Arthur C. Guede, East Peoria, both of Ill., assignors to Phoenix Park Systems, Wenona, Ill.

Filed Aug. 21, 1989, Ser. No. 396,090
Int. Cl.[5] B05D *7/00*
U.S. Cl. 427—4 6 Claims



1. A system for controlling the operation of a plurality of nozzles for spraying a substance on a product, said nozzles having different flow volumes and being located adjacent the product, said system comprising first means for measuring the quantity of the product, third means for measuring the quantity of substance flowing through said nozzles, and second means responsive to said first and third means for opening selected nozzles to produce a desired ratio of the quantity of the substance to the quantity of the product, a plurality of said nozzles having fixed flow volumes, and at least one of said nozzles having fixed flow volumes, and at least one of said nozzles having an adjustable flow volume between on and off.

5,116,635

PROCESS FOR CONTROLLING THE FURNACE TEMPERATURE IN A MANUFACTURE OF HONEYCOMB STRUCTURES TREATED WITH PHENOLIC RESIN

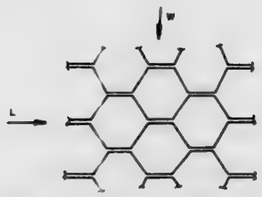
Michael Radbach, Echternach, and Guy Weisand, Strassen, both of Luxembourg, assignors to Euro-Composites S.A., Echternach, Luxembourg

Filed Apr. 24, 1990, Ser. No. 513,907

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1990, 4003249

Int. Cl.[5] B05D *1/04*

U.S. Cl. 427—8 **4 Claims**



1. (Amended) A process for producing a phenolic resin-treated honeycomb structure having increased strength by controlling a furnace temperature in a manufacture of said phenolic resin-treated honeycomb structure, wherein said phenolic resin-treated honeycomb structure includes a plurality of paper webs which are affixed to one another and shaped to a body, comprising the steps of:

(a) immersing said body into a solution of a phenolic resin mixture;

(b) drying and curing said body in an indirectly heated furnace, subsequent to said step (a), said drying and curing step being carried out at a temperature in a range of 70° C. to 110° C.;

(c) immersing said body into a solution of a phenolic resin mixture subsequent to said drying and curing of said step (b); and,

(d) drying and curing said body in an indirectly heated furnace, subsequent to said immersing step of said step (c), said drying and curing of step (d) being carried out at a temperature in a range of 145° C. to 155° C. and;

(e) condensing an air mixture exiting from said furnace, said air mixture containing a member selected from the group consisting of organic compounds, inorganic compounds and a combination thereof, in order to obtain a condensate;

(f) fractionally distilling said condensate;

(g) measuring the distillate amounts of inorganic compounds and organic compounds obtained per unit of time in order to determine the degree of drying; and

(h) adjusting the temperature of the furnace to a higher temperature based upon reduced amounts of distillate of inorganic compounds and organic compounds obtained per unit of time, as measured in said measuring step.

5,116,636

METHOD FOR STEAM CLEANING AND ELECTROSTATIC COATING OF LAMINATED ARTICLES

Bodrich Hajek, New Haven, and Donald J. Gillette, Guilford, both of Conn., assignors to S.L. Electrostatic Technology, Inc., Branford, Conn.

Division of Ser. No. 493,791, Mar. 15, 1990, Pat. No. 5,052,332. This application Aug. 9, 1991, Ser. No. 743,098

Int. Cl.[5] B05D *1/06, 3/12*

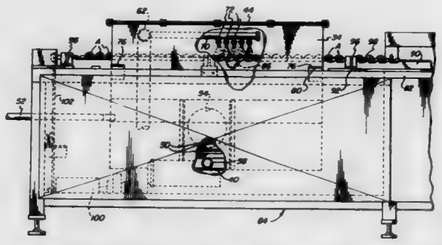
U.S. Cl. 427—33 **6 Claims**

1. A method for cleaning and coating a workpiece contaminated with a liquid lubricant or the like, comprising the steps:

a. transporting a workpiece contaminated with a volatilizable liquid along a travel path, and carrying out the following steps during such transport;

b. discharging steam upon said workpiece so as to remove such contamination therefrom and elevate the temperature of said workpiece;

c. exposing said workpiece to a cloud of electrostatically charged particles with said workpiece at an electrical



potential effective to attract particles of said cloud thereto, to form a coating thereupon;

d. cooling said workpiece between said steps b. and c., as necessary to prevent fusion of said particles of said coating during said step c; and

e. effecting fusion of said particles of said coating on said workpiece subsequent to step c.

5,116,637

AMINE CATALYSTS FOR THE LOW TEMPERATURE CONVERSION OF SILICA PRECURSORS TO SILICA

Ronald H. Baney; Carl J. Bilgrien, both of Midland; Dennis W. Broderick, Rhodes, and Leslie E. Carpenter, II, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jun. 4, 1990, Ser. No. 532,705

Int. Cl.[5] B05D *3/04, 3/10*

U.S. Cl. 427—340 **24 Claims**

1. A method of forming a ceramic coating on an electronic device comprising:

coating said device with a solution comprising a solvent and hydrogen silsesquioxane resin;

evaporating said solvent to deposit a hydrogen silsesquioxane resin coating on said device;

exposing said coating to an environment comprising an amine and moisture to catalyze the conversion of the coating; and

subjecting the catalyzed coating to a temperature sufficient to facilitate conversion of said coating to a ceramic coating.

5,116,638

ORGANIC ELECTRO-CONDUCTIVE THIN FILMS AND PROCESS FOR PRODUCTION THEREOF

Norihisa Mino, Settsu, and Kazufumi Ogawa, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

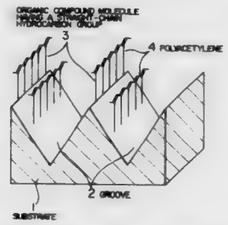
Filed Feb. 8, 1990, Ser. No. 476,829

Claims priority, application Japan, Feb. 15, 1989, 1-36858

Int. Cl.[5] B05D *3/06, 5/06*; H01C *1/00, 1/06*

U.S. Cl. 427—54.1 **2 Claims**

1. A process for producing an organic electroconductive thin film, which comprises the steps of: providing grooves on a substrate by an anisotropic process, forming an organic thin film, which is composed of an organic compound molecule having a straight-chain hydrocarbon group and terminal groups, on the substrate surface by means of chemical adsorption, conducting the mutual polymerization between functional groups in the organic compound molecules having a straight-chain hydrocarbon group under irradiation of an energy beam selected from the group consisting of ultraviolet ray, extreme far ultraviolet ray, electron beam and x-ray, or by a catalytic polymerization reaction in the presence of a transition metal of Group V or VI of the Periodic Table as a catalyst, wherein one of the terminal groups of said organic compound



molecule which has a straight-chain hydrocarbon group is a mono-, di- or tri-chlorosilane group, and the functional groups in said organic compound molecules which have a straight-chain hydrocarbon group of 8 to 25 carbon atoms are double bonded or triple bonded.

5,116,639

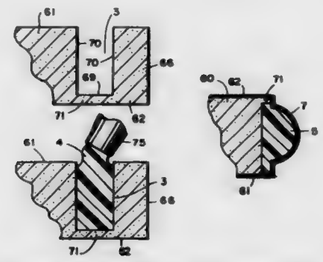
MONOLITHIC FINISHING PROCESS AND MACHINE FOR FURNITURE PARTS AND THE LIKE

Stephen B. Kolk, Grand Rapids; James P. Theuerkauf, Alto, and Fredrick J. Walz, Caledonia, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Feb. 7, 1989, Ser. No. 307,689

Int. Cl.[5] B05D *3/06, 5/00*; B31F *1/00*

U.S. Cl. 427—54.1 **35 Claims**



1. A process for making furniture worksurfaces and the like, comprising:

providing a sheet of substantially rigid substrate material;

forming a blank from the sheet of substrate material, wherein the blank has a preselected shape according to a selected worksurface article, and is defined by first and second oppositely oriented face surfaces, and a marginal edge surface disposed contiguously therebetween;

forming a groove through the first surface of the blank located a preselected distance laterally inwardly from the blank marginal edge surface to a depth adjacent to but not through the second surface of the blank;

providing a curable, liquid edge protection material formulated to adhere to the substrate material, and adapted to provide a durable edge guard for a marginal edge portion of the selected worksurface article;

pouring the edge protection material into the groove to a preselected level;

curing the edge protection material in plac in the groove to a solid condition;

cutting through the cured edge protection material in the groove, as well as the adjacent second surface of the blank, to create a decoratively shaped, integrally formed, protective strip about the marginal edge of the selected worksurface article.

5,116,640

PROCESS FOR PREPARING AN ELECTROLUMINESCENT DEVICE

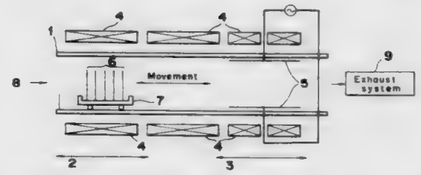
Akiyoshi Mikami, Yamatotakada; Takashi Ogura, Nara; Kousuke Terada, Tenri; Masaru Yoshida, Nara; Takuo Yamashita, Tenri; Koichi Tanaka, Nara; Katsushi Okibayashi, Sakurai; Shigeo Nakajima, Nara; Hirouki Nakaya, Tenri, and Kouji Taniguchi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 10, 1990, Ser. No. 594,139

Claims priority, application Japan, Oct. 24, 1989, 1-278133

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—66 **6 Claims**



1. A process for preparing a display comprising the steps of:

forming an insulating layer on a substrate in a first forming area of a vapor deposition chamber; and

forming a luminescent layer on the substrate in a second forming area, different from the first forming area in the vapor deposition chamber.

5,116,641

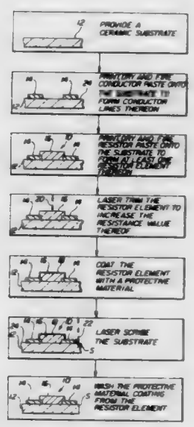
METHOD FOR LASER SCRIBING SUBSTRATES

Daxesh K. Patel, Hatfield, Pa., and Jay D. Baker, Detroit, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 20, 1990, Ser. No. 570,063

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—96 **22 Claims**



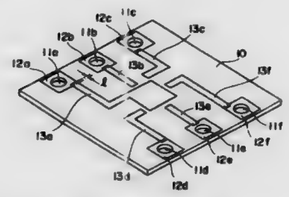
13. A method of forming a thick-film circuit having at least one thick-film resistor upon a substrate comprising the steps of:

printing said thick-film circuit having said at least one thick-film-film resistor onto said substrate;

laser trimming said at least one thick-film resistor to increase the resistance value thereof;

coating onto the outer surface of said resistor a protective material to protect said resistor from hot-slag substrate material generated during a laser scribing operation;
laser scribing an uncoated portion of said substrate to separate said thick-film circuit from the remainder of said substrate; and
removing said protective material from said outer surface of said resistor.

5,116,642
THICK FILM FORMING PROCESS
Takeshi Sekiguchi, and Nobuo Shiga, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Continuation of Ser. No. 367,019, Jun. 16, 1989, abandoned. This application Dec. 20, 1990, Ser. No. 683,033
Claims priority, application Japan, Jun. 22, 1988, 63-153739
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—96 **21 Claims**



1. A process of forming a thick film on a substrate, comprising:
a first step of successively forming a thick film having a predetermined common pattern on a plurality of said substrates by screen printing;
a second step of drying and sintering said plurality of substrates on which said predetermined pattern is formed;
a third step of setting said substrates on a movable table one by one, wherein the movement of the table is controlled on the basis of the thick film pattern formed by said first step; and
a fourth step of successively forming thick films having different patterns on the individual substrates by using direct writing, wherein the regions of the substrates with thick films formed by direct writing are subject to frequent pattern changes.

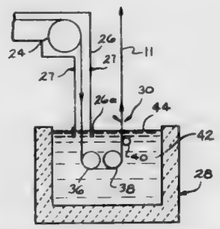
5,116,643
METHOD FOR PREPARING PLZT, PZT AND PLT SOL-GELS AND FABRICATING FERROELECTRIC THIN FILMS
William D. Miller, Colorado Springs, Colo., and Leo N. Chapin, Sunnyvale, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.
Continuation-in-part of Ser. No. 520,959, May 9, 1990, Pat. No. 5,028,455, which is a continuation of Ser. No. 57,323, Jun. 2, 1987, Pat. No. 4,946,710. This application Dec. 19, 1990, Ser. No. 610,432
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—126.3 **38 Claims**

1. A method of preparing a mixture suitable for spin deposition on substrates, comprising:
(a) solubilizing amounts of two or more precursors of lead, titanium, zirconium and lanthanum in predetermined solvents, said solvents being different for each precursor at proportions such that upon hydrolysis the metal precursors will exhibit approximately equal reaction rates;
(b) mixing under an inert atmosphere at a pressure from about 350 mmHg to about 650 mmHg the metal precursors and solvents at a temperature sufficient to maintain the metal precursors in solution and for a period of time sufficient to produce a homogeneous mixture;
(c) adding a predetermined amount of water to resulting solution sufficient to begin a hydrolysis reaction without causing precipitation of solids while maintaining the mixture under an insert atmosphere; and
(d) boiling the mixture at a temperature sufficient to vaporize said solvents and azeotrope water to increase a viscosity suitable for spin coating.

5,116,644
PLASTIC LENS AND METHOD OF FORMING ANTI-REFLECTING LAYER ON A PLASTIC LENS
Kazuo Asai, and Masaharu Kikuchi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 363,682, Jun. 9, 1989, abandoned. This application Apr. 26, 1991, Ser. No. 690,325
Claims priority, application Japan, Jun. 10, 1988, 63-143128
Int. Cl.[5] B05D *5/06*
U.S. Cl. 427—164 **8 Claims**

1. A method of forming an anti-reflecting layer on a plastic lens which comprises:
coating the lens with a solution containing at least one silane coupling agent, at least one colloidal oxide sol and at least one epoxy resin in a solvent,
hardening the coated solution to give a hard coat layer on the surface of the lens, said hard coat layer containing oxide particles, and
immersing the lens into an aqueous solution of an acidic or alkaline substance to dissolve the oxide particles contained in the layer so that the refractive index in the direction of the thickness of the layer varies.

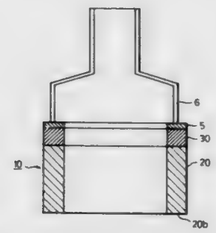
5,116,645
HOT DIP ALUMINUM COATED CHROMIUM ALLOY STEEL
Steven L. Boston, Middletown; Farrell M. Kilbane, Centerville; Danny E. Lee, Middletown; William R. Seay, Franklin, and Richard A. Coleman, West Chester, all of Ohio, assignors to Armco Steel Company, L.P., Middletown, Ohio
Division of Ser. No. 237,915, Aug. 29, 1988, Pat. No. 5,023,113. This application Aug. 27, 1990, Ser. No. 549,569
Int. Cl.[5] C23C *2/12*
U.S. Cl. 427—320 **7 Claims**



1. A method of continuous hot dip coating a steel strip with aluminum, comprising the steps of:
heating a ferritic chromium alloy steel strip in an atmosphere formed by the gaseous products of the combustion of fuel and air wherein said atmosphere has no free oxygen and the temperature of said strip is insufficient to excessively oxidize chromium in said strip,
further heating said strip to a temperature no less than about the melting point of an aluminum coating metal,
cooling said strip if necessary to near or slightly above the melting point,
maintaining said strip during said further heating step and during said cooling step in a protective atmosphere containing at least about 95% by volume hydrogen,
dipping said strip into a molten bath of said coating metal to deposit a coating layer on said strip,

said coating layer being substantially free of uncoated areas and tightly adherent to said strip.

5,116,646
METHOD OF METALLIZING OXIDE CERAMIC WITH EXCELLENT HERMETIC SEALING AND BRAZING PROPERTIES
Hirokazu Taniguchi; Shogo Konya, and Akira Okamoto, all of Sakai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Continuation of Ser. No. 379,633, Jul. 13, 1989, abandoned. This application Jul. 9, 1991, Ser. No. 728,839
Claims priority, application Japan, Mar. 3, 1989, 1-51271
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—383.5 **6 Claims**

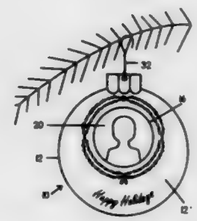


1. A method of metallizing an oxide ceramic to provide excellent hermetic sealing and brazing properties, comprising the steps of:
applying to a sintered oxide ceramic a first paste prepared by mixing with an organic vehicle a powder mixture composed of 70 to 95 wt% of a wolfram powder having an average particle diameter of 10 μm or less and 30 to 5 wt% of a glass powder having an average particle diameter of 10 μm or less and a melting point of from 1100° to 1300° C.,
drying the first paste-applied ceramic to form a primary coating on the ceramic,
applying to the primary coating a second paste prepared by mixing with an organic vehicle one or more powders selected from the group consisting of nickel, nickel oxide, and nickel salt powders, having an average particle diameter of 10 μm or less,
drying the second paste-applied ceramic to form a final coating on the primary coating, and
firing the ceramic having the primary and the final coatings thereon at a temperature of from 1200 ° to 1400° C. which is not higher than the melting point of nickel and not lower than the melting point of the glass, in an atmosphere having a H_2/H_2O ratio higher than 1 and lower than 100000 in terms of partial pressure ratio, to form a two-layered metallized structure composed of an outermost layer of nickel and an underlying composite layer of wolfram and glass.

5,116,647
METHODS FOR WATER PROOFING WET STRUCTURES FORMED FROM WATER-PENETRABLE CONSTRUCTION MATERIALS
James M. Gaidis, Ellicott City, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.
Division of Ser. No. 243,377, Sep. 12, 1988, Pat. No. 5,023,290. This application Dec. 17, 1990, Ser. No. 628,814
Int. Cl.[5] B05D *1/36, 7/00*
U.S. Cl. 427—407.1 **17 Claims**

1. A method for reducing water penetration through a structure that comprises applying to the structure a waterproofing agent primer composition which can be used on wet and dry structures that comprises
a C_8 C_{18} fatty acid in a concentration of about 0.1% to 3% w/w;
a natural or synthetic rubber;
a diluent or filler resin; and
an organic solvent in which the fatty acid is soluble; and
applying a waterproofing agent to the waterproofing agent primer.

5,116,648
CHRISTMAS TREE ORNAMENT
Mark M. Martin, and M. Frances Upp, both of 3934 Sprig Way, Antioch, Calif. 94509
Filed Mar. 19, 1991, Ser. No. 672,468
Int. Cl.[5] A47G *1/06*
U.S. Cl. 428—7 **3 Claims**



1. A christmas tree ornament, comprising:
a first panel of stiff sheet material;
a second panel of stiff sheet material;
bridge means joining said panels, said bridge means having a transverse crease and a hole on each side of said crease for receiving a Christmas tree ornament hanger;
means for securing a photograph to said second panel; and
a window opening in said first panel positioned to confront said photograph when said panels are in contact with said photograph secured therebetween;
at least one of said panels being contoured to a silhouette of a conventional three-dimensional Christmas tree ornament.

5,116,649
OXYGEN AND FLAVOR BARRIER LAMINATE FOR LIQUID PACKAGING
Debora F. Massouda, Silver Spring, Md., assignor to Westvaco Corporation, New York, N.Y.
Continuation of Ser. No. 417,068, Oct. 4, 1989, abandoned. This application Jul. 18, 1991, Ser. No. 732,744
Int. Cl.[5] B65D *85/00*; B32B *27/10, 31/00*
U.S. Cl. 428—34.2 **9 Claims**



1. A paperboard container, the container being constructed from a laminate comprising:
(a) a paperboard substrate having opposed inner and outer surfaces;
(b) a layer of heat-sealable, low density polyethylene polymer coated onto the outer surface of said paperboard substrate;
(c) a layer of a heat-sealable, low density polyethylene polymer coated onto the inner surface of said paperboard substrate; and,
(d) an inner, product contact sandwich comprising an ethyl-

ene vinyl alcohol copolymer layer, a tie layer, and a heat-sealable low density polyethylene polymer layer, the sandwich being coextruded in molten form onto the outer surface of the low density polyethylene polymer applied to the inner surface of said paperboard substrate wherein said ethylene vinyl alcohol copolymer layer is next to said low density polyethylene polymer layer coated on the inner surface of the paperboard substrate and the coextruded low density polyethylene polymer layer provides the product contact surface of the sandwich and forms a strong bond with the adjacent tie layer as a result of coextrusion therewith in molten form.

5,116,650

DIOXOLE/TFE COPOLYMER COMPOSITES

John Bowser, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Dec. 3, 1990, Ser. No. 621,661

Int. Cl.[5] B01D *71/36;* **B32B** *5/28, 27/04, 33/00*

U.S. Cl. 428—34.2 **5 Claims**

1. A gas permeable material that contains passageways through the material, said material containing on at least a portion of the interior of the passageways an amorphous copolymer of 10–40 mole percent tetrafluoroethylene and complementally 90–60 mole percent of perfluoro-2,2-dimethyl-1,3-dioxole.

5,116,651

EASILY OPENABLE SEALED PACKAGE CONTAINER

Tadahiko Katsura; Kikuo Matsuoka; Kazuo Miyake, all of Yokohama; Kazuo Taira, Tokyo; Yoshiki Watanabe, Yokohama, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

PCT No. PCT/JP89/00500, § 371 Date Mar. 16, 1990, § 102(e) Date Mar. 16, 1990, PCT Pub. No. WO89/11426, PCT Pub. Date Nov. 30, 1989

PCT Filed May 18, 1989, Ser. No. 460,064

Claims priority, application Japan, May 19, 1988, 63-120667; Jun. 30, 1988, 63-161022; Jun. 30, 1988, 63-161024

Int. Cl.[5] B65D *41/00*

U.S. Cl. 428—35.7 **11 Claims**



1. An easy-open sealed packaging vessel comprising
a flanged vessel proper,
a lid, and
a heat-sealed portion formed between the flange of the vessel proper and the lid, wherein one of the flanged vessel proper and the lid has a covered structure comprising
(i) a metal foil sheet, and
(ii) a coating on the inner surface of the metal sheet, said coating having a composition comprising
(a) a thermosetting resin, and
(b) 0.8 to 30% by weight, based on the coating, of an acid-modified olefin resin dispersed in the thermosetting resin, said coating having a covering degree (l) in the range of from 0.3 to 20, said covering degree (l) being defined by the following formula:

$$l = \frac{L}{1 + \frac{100}{X} \cdot \frac{d_2}{d_1}}$$

wherein
L represents the thickness in μm of the coating,
X represents the amount incorporated of the acid-modified polyolefin in parts by height per 100 parts by weight of the thermosetting resin,
d_1 represents the density in g/cm^3 of the thermosetting resin, and
d_2 represents the density in g/cm^3 of the acid-modified polyolefin,
and the other of the flanged vessel proper and the lid has a structure with a polyolefin resin at least on the inner face side thereof, whereby an easily peelable sealing is attained between the lid and the flange of the vessel proper.

5,116,652

KINK-RESISTANT MEDICAL TUBING AND CATHETERS

Bernard G. Alzner, Round Lake, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 13, 1989, Ser. No. 421,420

Int. Cl.[5] B32B *1/08*

U.S. Cl. 428—36.9 **8 Claims**

1. Medical tubing comprising an extruded product of a composition consisting essentially of about 60 to about 80% of a terpolymer of ethylene, acrylic acid, and zinc acrylate, about 10 to about 25% of polyamide, and about 10 to about 20% of polyurethane.

5,116,653

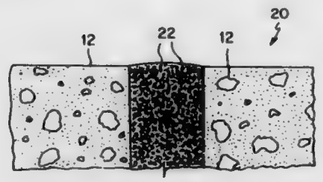
EXPANSION JOINT

Antonio Frandina, 259-60 Craft Ave., Rosedale, N.Y. 11422

Filed Feb. 22, 1991, Ser. No. 660,144

Int. Cl.[5] B32B *3/00, 13/00*

U.S. Cl. 428—58 **4 Claims**



1. In combination, a concrete member, and a joint filler of non-porous, water impermeable material made from polymerically bound rubber particles treated so as to be resistant to microbes, oils and fungi, said material being formed in an elongated strip for insertion between the slab ends.

5,116,654

SELF-DISPENSING SPACED ELECTRONIC MARKERS

Armond D. Cosman, Austin; Gary H. Knippelmier, Travis, and Joe T. Minarovic, Williamson, all of Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 409,523, Sep. 18, 1989, Pat. No. 5,017,415. This application Jan. 3, 1991, Ser. No. 637,185

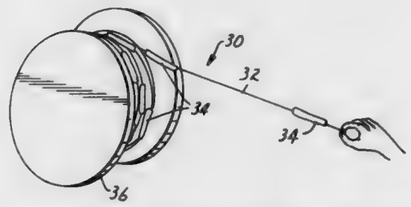
The portion of the term of this patent subsequent to May 21, 2008, has been disclaimed.

Int. Cl.[5] F16L *57/00;* **G01V** *3/08*

U.S. Cl. 428—77 **5 Claims**

1. An article for electronically marking a buried conduit, comprising:
a plurality of electronic markers having longitudinal axes;

tether means maintaining a spacing of said markers at predetermined intervals, said predetermined intervals forming a known pattern which encodes information about the buried conduit, and said axes of said markers being succes-



sively oriented in a predetermined pattern which encodes additional information about the buried conduit; and
means attaching said markers to said tether means at said predetermined intervals.

5,116,655

PREVENTIVE METHOD AGAINST APPOSITION OF A MARINE ORGANISM AND A PREVENTIVE SHEET AGAINST APPOSITION OF A MARINE ORGANISM

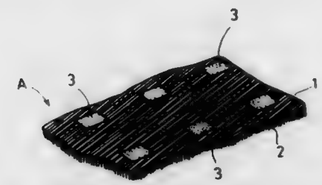
Tuguo Ezoe, 2-701, 1 Nagai Higashi 1-chome, Sumiyoshiku, Osaka, Japan

Filed Jul. 27, 1989, Ser. No. 385,883

Claims priority, application Japan, Jul. 28, 1988, 63-189429; Apr. 17, 1989, 1-96753

Int. Cl.[5] F02B *3/04;* **B08B** *17/00;* **B32B** *3/02, 33/00*

U.S. Cl. 428—92 **8 Claims**



1. A preventive sheet against apposition of marine organisms onto a structure in contact with water, comprising:
a base member having a front surface and a back surface to be attached to a submerged portion of the structure;
fine fibers thickly provided on the front surface of said base member, said fine fibers being flexible so as to naturally sway in the water even when the structure is in the static condition, said fine fibers having a diameter of 0.01–0.3 mm and a length of 10–30 mm; and
magnets dotted on said back surface of said base member.

5,116,656

USE OF METHYL ABIETATES FOR TRANSFER OF PERFUMING COMPOSITIONS DURING FABRIC DRYING

Anthony F. Morris, Gingins, and Sina D. Escher, Confignon, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

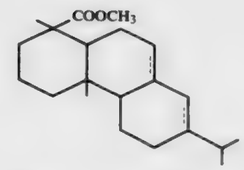
Filed Apr. 24, 1990, Ser. No. 513,633

Claims priority, application Switzerland, Apr. 27, 1989, 1606/89

Int. Cl.[5] D06B *13/00;* **B32B** *3/10*

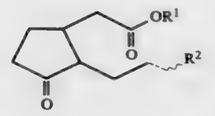
U.S. Cl. 428—131 **18 Claims**

7. A flexible porous or fibrous element carrying a perfuming composition and at least one fabric conditioning agent, said perfuming composition containing a mixture of methyl abietates of formula



(I)

which can have one or two double bonds in the positions indicated by the dotted lines, in admixture with at least one perfuming ingredient of formula



(II)

which can have a double bond in the position indicated by the dotted line and wherein the wavy line defines a C—C bond of E or Z configuration when the bond indicated by the dotted line is a double bond, and symbols R^1 and R^2 can be identical or different and stand each for a lower alkyl radical from C1 to C3 in an amount sufficient to enhance the efficiency of transfer of said perfuming composition to the fabric when the element and fabric are dried.

5,116,657

CONDUCTING MATERIAL AND A METHOD OF FABRICATING THEREOF

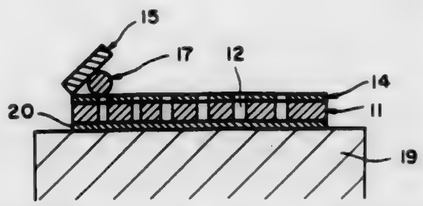
Kenichiro Abe, Tokyo, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 1, 1989, Ser. No. 444,423

Claims priority, application Japan, Dec. 1, 1988, 63-306582

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—137 **5 Claims**

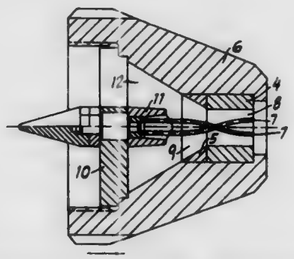


1. A green sheet including a conducting material with which through holes of the green sheet are filled and vias in the through holes are formed respectively in a process for firing the green sheet, said conducting material comprising:
spheroidized copper powder particles, each surface of said spheroidized copper powder particles being coated with an organic titanium compound film; and
spheroidized copper oxide powder particles, each surface of said spheroidized copper oxide powder particles being coated with an organic titanium compound film; wherein
said spheroidized copper oxide powder particles and said spheriodized copper powder particles are mixed to form mixed powder particles so that the weight of said spheroidized copper oxide powder particles is less than 50% of the weight of said spheroidized copper powder particles.

5,116,658
MAGNETIC RECORDING MEDIUM
Toru Miyake, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan
Filed Nov. 29, 1990, Ser. No. 619,890
Claims priority, application Japan, Dec. 4, 1989, 1-315001; Dec. 4, 1989, 1-315002; Dec. 4, 1989, 1-315003
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—141 20 Claims

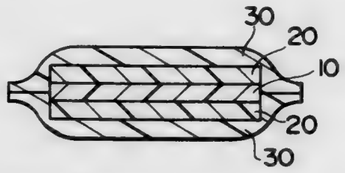
1. A magnetic recording medium comprising a support and a magnetic layer thereon containing a magnetic powder and a binder resin, wherein
1) a surface waviness of t he magnetic layer is 0.022 μm or less;
2) a surface waviness of the support on a magnetic layer side is 0.020 μm or less; and
3) at least one of two surfaces of the support has protrusions thereon satisfying the following relationships:
a. an average height is from 0.01 μm to 0.25 μm,
b. a number of the protrusions not lower than 0.01 μm is not less than 200 per linear millimeter measured along said support,
c. a number of the protrusions not lower than 0.30 μm is not more than 500 per 400 linear millimeters measured along said support, and
d. a ratio of a maximum height to said average height is not more than 10.

5,116,659
EXTRUSION PROCESS AND TOOL FOR THE PRODUCTION OF A BLANK HAVING INTERNAL BORES
Rudolf Glatzle, Reutte; Ronald Huber, Vils; Thomas Schopf, Breiterwang, and Michael Schretter, Ehrwald, all of Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.
Filed Dec. 3, 1990, Ser. No. 624,696
Claims priority, application Austria, Dec. 4, 1989, 2751/89
Int. Cl.[5] G32G *3/20*
U.S. Cl. 428—188 11 Claims



1. An extruded cylindrical metallic or ceramic blank having a smooth surface and one or more internal twisted longitudinal bores prepared by a powder-metallurgical process, the process comprising the step of extruding a deformable powdered metallic or ceramic starting material through a space formed by a die and a mandrel, the mandrel having one or more rigid, helically twisted central pins for forming the internal twisted longitudinal bores in the blank, which pins protrude from the mandrel into the die in the direction of the exit end of the die.

5,116,660
DEOXIDIZER FILM
Toshio Komatsu, Inashiki, and Yoshiaki Inoue, Tokyo, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan
Filed Sep. 6, 1989, Ser. No. 403,482
Claims priority, application Japan, Sep. 8, 1988, 63-223571
Int. Cl.[5] B32B *23/02, 5/16*
U.S. Cl. 428—192 36 Claims



1. A deoxidizer film comprising:
a film body containing a thermoplastic resin and a deoxidizer composition, said deoxidizer composition being dispersed in said thermoplastic resin, and said film body having pores with a diameter of 0.01 to 600 μ formed by drawing said film body at a drawing ratio of 1.01:1 to 10:1.

5,116,661
DRIP-ABSORBING SHEET
Mamoru Matsubara, Tokyo, Japan, assignor to Showa Denko K.K., Tokyo, Japan
Filed Oct. 29, 1990, Ser. No. 604,317
Claims priority, application Japan, Jul. 10, 1990, 2-182086
Int. Cl.[5] B32B *27/14*
U.S. Cl. 428—198 4 Claims

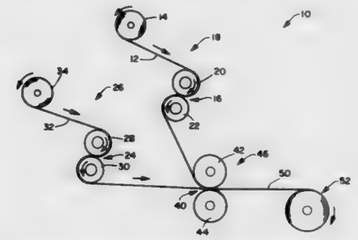


1. A drip-absorbing sheet comprising a powdery or granular edible saccharide supported and laminated between a semipermeable membrane and a water-absorbing porous sheet, wherein the amount of the powdery or granular edible saccharide is 10 to 200 g/m^2.

5,116,662
MULTI-DIRECTION STRETCH COMPOSITE ELASTIC MATERIAL
Michael T. Morman, Alpharetta, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 15, 1989, Ser. No. 451,264
The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.
Int. Cl.[5] B32B *27/14*
U.S. Cl. 428—198 26 Claims

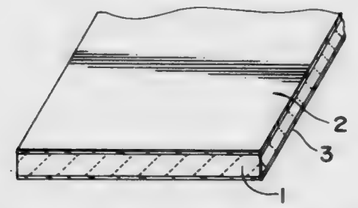
1. A composite elastic material capable of stretching in at least two directions comprising:
at least one elastic sheet; and

at least one necked material joined to the elastic sheet at least at three locations arranged in a nonlinear configuration,



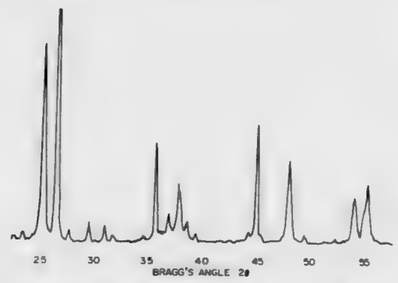
the necked material being gathered between at least two of the locations.

5,116,663
CERAMIC SUBSTRATE MATERIAL CONTAINING AN AMORPHOUS FLUORINE RESIN
Hiroyoshi Fujimoto; Sunao Fukutake, and Rie Egashira, all of Okayama, Japan, assignors to W. L. Gore & Associates, Inc., Newark, Del.
Filed Dec. 3, 1990, Ser. No. 621,676
Claims priority, application Japan, Dec. 4, 1989, 1-313441
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 4 Claims



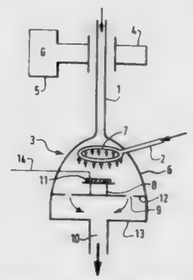
1. A porous ceramic substrate coated with an amorphous copolymer of tetrafluoroethylene and perfluoro-2,2-(lower alkyl)-1,3-dioxole; said copolymer having a dielectric constant between about 1.9 and 2.6.

5,116,664
TITANIUM-MICA COMPOSITE MATERIAL
Asa Kimura, and Fukuji Suzuki, both of Yokohama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan
Continuation of Ser. No. 154,164, Feb. 9, 1988, abandoned. This application Mar. 14, 1991, Ser. No. 670,380
Int. Cl.[5] B32B *9/00, 19/00*
U.S. Cl. 428—216 7 Claims



1. A titanium-mica composite material comprising (i) mica, (ii) a first coating composed of titanium dioxide, coated on the surface of the mica, and (iii) a second coating composed of powder particles of at least one metal selected from the group consisting of cobalt, nickel, copper, zinc, tin, gold and silver coated on the first coating, the thickness of the first coating being 200 Å or more and the thickness of the second coating being 5 to 600 Å, the composite exhibiting high chrome and brightness, and consistent appearance color and interference color.

5,116,665
MULTILAYER PROTECTIVE COATING FOR A SUBSTRATE, PROCESS FOR PROTECTING A SUBSTRATE BY A PLASMA DEPOSITION OF SUCH A COATING, COATINGS OBTAINED AND APPLICATIONS THEREOF
Jean-Marie Gauthier, Palaiseau; Francois Coeuret, Guyancourt, and Claude Bonet, Paris, all of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France
Filed May 11, 1989, Ser. No. 351,942
Claims priority, application France, May 11, 1988, 8806369
Int. Cl.[5] B32B *7/02*
U.S. Cl. 428—216 8 Claims



1. A coated body comprising a polymeric substrate having a surface coated with at least two silicon-based transparent layers each formed of a deposited material consisting essentially of silicon, carbon, nitrogen, oxygen and hydrogen, a first of said layers, deposited on the substrate surface being formed of a material having the formula $SiC_xN_yO_zH_t$, in which x does not exceed 0.5; y does not exceed 0.15; z is 0.6–0.8 and t is 0.6–1.2, wherein a second said layer, deposited on said first layer, is formed of a material having the formula $SiC_{x'}C_{x'}N_{y'}O_{z'}H_{t'}$, in which x' does not exceed 0.5; y' is 0.3–0.8; z' is 1.3–2.5 and t' is 0.5–1.2, and wherein the thickness of the first layer is between 1 and 30 nm and the thicknes of the second layer is 1.25–1.5 μm.

5,116,666
ELECTROSTATIC RECORDING FILM
Takeshi Konno, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jul. 23, 1990, Ser. No. 555,694
Claims priority, application Japan, Jul. 21, 1989, 1-189041
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—220 5 Claims

1. An electrostatic recording film comprising an insulating film, a conductive layer and a dielectric layer laminated in this order, wherein said dielectric layer consists essentially of a polymer binder comprised of a thermoplastic resin or a hardening resin having a volume resistance of 10^{12} Ω.cm or above, insulating grains having a volume resistance of 10^8 Ω.cm or above and conductive powders, and wherein said conductive powders are fibrous conductive powders, and the thickness of

the dielectric layer, excluding the insulating grains, is from 1 to 10 μm.

5,116,667
COMPOSTIBLE COMPOSITIONS AND PRODUCTS
Robert R. Zimmerman, Pickerington, and Tamela A. Viers, Columbus, both of Ohio, assignors to Century Adhesives Inc., Columbus, Ohio
Filed Aug. 8, 1990, Ser. No. 564,061
The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.
Int. Cl.[5] B32B *25/12*
U.S. Cl. 428—220 **12 Claims**

1. A flexible, compostible sheet about 1 to 10 mils thick composed of a homogeneous mixture of the following ingredients in the stated percentages by weight:

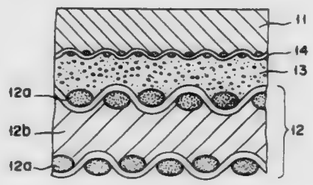
unvulcanized, uncured C4–C6 alkadiene elastomer	20–80%,
modifier selected from animal and plant protein, dextrose, starch or mixtures thereof	5–20%,
filler	1–40%,
wax	0–30%,
styrene resin	0–40%,
additive	0–10%
yeast	0–20%.

5,116,668
HYBRID YARN, UNIDIRECTIONAL HYBRID PREPREG AND LAMINATED MATERIAL THEREOF
Shinji Yamamoto; Hideho Tanaka; Fumio Adachi, and Hisataka Uchimura, all of Hirakata, Japan, assignors to Ube Industries, Ltd., Ube, Japan
Continuation of Ser. No. 303,742, Jan. 25, 1989, abandoned. This application Jul. 23, 1990, Ser. No. 555,784
Claims priority, application Japan, Jan. 29, 1988, 63-16807; Jan. 29, 1988, 63-16808
Int. Cl.[5] B32B *5/00*
U.S. Cl. 428—221 **1 Claim**

1. A unidirectional hybrid prepreg comprising unidirectionally arranged hybrid yarns impregnated with a thermosetting resin, each yarn consisting of a combination of carbon fibers and inorganic fibers which are composed substantially of elements Si, Ti or Zr, C and O, the ratio of tensile modulus of each inorganic fiber to the tensile modulus of each carbon fiber being in the range of from 0.6 to 1.4, the inorganic fibers being present in an amount of 1 to 80% by volume based on the total volume of the inorganic fibers and carbon fibers, the total volume of carbon fibers and inorganic fibers in the prepreg being in the range of 30 to 80% by volume.

5,116,669
COMPRESSIBLE RUBBER BLANKET FOR OFFSET PRINTING
Saburo Sonobe, Toride, Japan, assignor to Kinyosha Co., Ltd., Tokyo, Japan
Filed May 13, 1991, Ser. No. 700,172
Int. Cl.[5] B32B *7/00*
U.S. Cl. 428—250 **5 Claims**

1. A compressible rubber blanket for offset printing comprising woven cloths laminated on both surface and rear sides of a solid rubber layer having a thickness of 0.25 mm or greater, and a surface rubber layer integrally laminated on one said



woven cloth sequentially through a compressible layer and a woven cloth.

5,116,670
ALLYL ESTER RESIN COMPOSITION AND LAMINATED SHEET USING THE SAME
Noboru Suzuki; Masaharu Yoshida; Satoshi Noda; Minoru Takaishi; Kenichiro Takiguchi; Hiroshi Uchida, and Takeshi Onoda, all of Kanagawa, Japan, assignors to Showa Denko K.K., Tokyo, Japan
Filed Sep. 28, 1990, Ser. No. 589,578
Claims priority, application Japan, Sep. 29, 1989, 1-255038; Jan. 11, 1990, 2-4078; Mar. 15, 1990, 2-65214; Mar. 15, 1990, 2-65215; May 1, 1990, 2-115472
Int. Cl.[5] D03D *3/00, 15/00, 17/00, 25/00*
U.S. Cl. 428—285 **23 Claims**

1. A laminated sheet comprising at least one resin-impregnated fibrous base, wherein said base is impregnated with a liquid resin composition comprising at least one allyl ester resin, said allyl ester resin comprising a polybasic acid and a polyhydric alcohol, wherein an allyl ester group of said resin is bonded to at least one of the terminals of said resin.

5,116,671
GYPSUM BOARD
Robert Bruce, Brantford, and Dimitrios Mitakidis, Oakville, both of Canada, assignors to Domtar, Inc., Montreal, Canada
Continuation of Ser. No. 463,637, Jan. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 311,908, Feb. 17, 1989, Pat. No. 5,085,929. This application Jun. 7, 1991, Ser. No. 711,710
Int. Cl.[5] B32B *13/00, 5/14*
U.S. Cl. 428—309.9 **13 Claims**

1. Wallboards, suitable for use in constructing interior walls and ceilings of buildings, comprising:

(1) a core of foamed gypsum with a multiplicity of relatively large voids substantially uniformly distributed therethrough and having a first specific gravity, said core having a void population of not greater than 11,000 voids per square inch of surface area of a plane formed by scoring and snapping said board, said core having top and bottom surfaces, with the top and bottom surfaces being substantially parallel to each other;

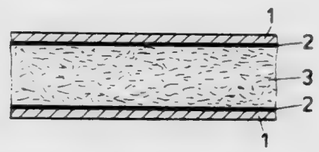
(2) fibrous material cover sheets disposed on and in substantially the entire top and bottom surfaces, wherein first and other interfaces between the fibrous material cover sheets and the top and bottom surfaces of the gypsum core are established and wherein the interfaces are a mixture of fibers from the cover sheets and gypsum from the core; and

(3) a first stratum of the gypsum core wherein said first stratum does not contain any substantial number of voids, has a specific gravity of at least 0.95, has a specific gravity significantly greater than said first specific gravity and is disposed substantially parallel to and substantially next to the first interface, but spaced from said interface a distance sufficient that fibers of said cover sheet disposed in said interface do not substantially protrude into said stratum and said stratum is substantially free from said fibers.

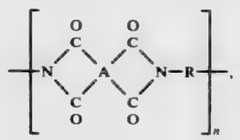
5,116,672
ORGANIC COATINGS WITH ION REACTIVE PIGMENTS ESPECIALLY FOR ACTIVE METALS
Mark F. Mosser, Sellersville, and William A. Harvey, III, MontClare, both of Pa., assignors to Sermatech International, Inc., Limerick, Pa.
Filed Feb. 5, 1990, Ser. No. 475,353
Int. Cl.[5] B32B *15/02, 5/16, 5/18*
U.S. Cl. 428—328 **15 Claims**

1. A metal part having a galvanically active metal surface of aluminum, magnesium, cadmium, manganese, zinc or their respective alloys which part is coated with a cured organic coating composition which forms an adherent film on the metal part which comprises a mixture of epoxy/polyamide-imide polymers in an organic solvent containing a first and a second inorganic pigment, the first pigment being an ion-reactive pigment consisting essentially of metallic spheroidal particles of an ESD in the range of about 2 to about 10 μm, the ion-reactive pigment being magnesium or aluminum, and the second pigment being a leachable chromate salt, which metal coated part has improved resistance to acidic or salty environmental conditions, especially acidic Cl^- or SO^-_4 ions, and which polymers bond with the pigments to form a protective barrier coating for the metal part.

5,116,673
HIGH-TEMPERATURE RESISTANT STACKING SUPPORT
Robert Vodiunig, Leoben; Gerhard Reiter, Schörfling, and Klaus Weinrotter, Vöcklabruck, all of Austria, assignors to Lenzing AG, Lenzing, Austria
Filed Mar. 23, 1990, Ser. No. 498,284
Claims priority, application Austria, Apr. 6, 1989, 814/89
Int. Cl.[5] B32B *15/08, 17/10*
U.S. Cl. 428—332 **9 Claims**

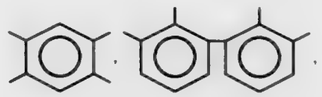


1. A high-temperature resistant stacking support comprising of a core and a high-temperature resistant fiber composite made of polyimide fibers of the general formula

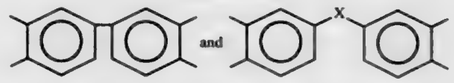


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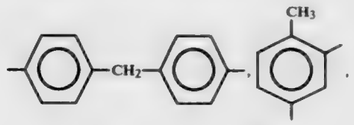
wherein n is an integer larger than 1 and A represents a four-valent aromatic group selected from



-continued



in which X is selected from the group consisting of CO, CH_2, O, S and CF_2, and R represents at least one of the following divalent aromatic groups selected from



and at least partially surrounding said core.

4. A stacking support as set forth in claim 3, wherein said thickness is 1.0 to 3.0 mm.

5,116,674
COMPOSITE STRUCTURE
Beat Schmidhalter, Oberkirch, and Heinz Spahni, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Jan. 16, 1990, Ser. No. 465,720
Claims priority, application Switzerland, Jan. 27, 1989, 275/89
Int. Cl.[5] B32B *15/04, 15/20*
U.S. Cl. 428—335 **15 Claims**

1. A composite structure comprising a substrate having deposited thereon an electrically conductive metal film which is coated with a layer of porous metal oxide, wherein a thin, transparent and electrically conductive metal film selected from an anodically oxidizable metal is deposited on at least one surface of said substrate, said metal film having thereon a thin transparent coating of an oxide of said metal, and wherein said oxide coating has, distributed over the surface thereof, fine pores which are closed adjacent to said metal film.

7. A composite structure according to claim 1, wherein the metal film has a thickness of 1.0 nm to 50 nm.

5,116,675
DISPOSABLE, ELASTICIZED ADHESIVE NECK AND FACIAL WRINKLE GATHERING DEVICE
Leonora E. Nash-Morgan, 3524 E. Forest Lake Dr., Sarasota, Fla. 34232
Filed Aug. 28, 1991, Ser. No. 751,156
Int. Cl.[5] A61F *13/12*
U.S. Cl. 428—343 **7 Claims**

1. A disposable neck and facial wrinkle gathering device structured for unobtrusive appearance when worn cosmetically for short periods of time comprising:

a central elastic portion formed of a thin sheet of flexible elastic material;

elongated non-elastic strips having an adhesive surface and connected at one end along each of two opposing end margins of said central portion and oppositely extending in either direction therefrom;

said adhesive strips sized in length to partially encircle a user's neck about halfway therearound and to adhere in opposing position to either side of the neck when said elastic portion is stretched and positioned centrally against

the nape of the neck in the region just below the user's hairline;

said stretched elastic portion elastically acting through and supported only by said adhesive strips adhered to the sides of the neck to draw skin on the anterior of the neck rearwardly whereby wrinkles in the neck anterior skin are stretched and generally flattened;

said elastic portion formed of spandex material which is elastic and stretchable in all directions within a plane defined by said elastic portion when flat.

4. A disposable neck and facial wrinkle gathering device structured for unobtrusive appearance when worn cosmetically for short periods of time comprising:

a central elastic portion formed of a thin sheet of flexible, elastic material;



a plurality of elongated non-elastic strips each having an adhesive surface and each connected at one end along each of two opposing margins of said central portion and generally oppositely extending in either direction from each said margin;

each adhesive strip of said plurality of adhesive strips sized in length to partially encircle a user's neck and to adhere in opposing position to either side of the neck when said elastic portion is stretched and positioned centrally against the nape of the neck in the region just below the user's hairline;

said stretched elastic portion elastically acting through and supported only by said adhesive strips adhered to the sides of the neck to draw skin on the anterior of the neck rearwardly whereby wrinkles in the neck anterior skin are stretched and generally flattened.

5,116,676

REMOVABLE PRESSURE-SENSITIVE ADHESIVE TAPE

Louis E. Winslow, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 414,714, Sep. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 203,587, May 27, 1988, abandoned, which is a continuation of Ser. No. 111,214, Oct. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 36,550, Apr. 15, 1987, abandoned. This application May 16, 1991, Ser. No. 702,446

Int. Cl.[5] C08K *5/52*; C32B *7/12*

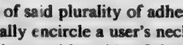
U.S. Cl. 428—343 **15 Claims**

1. A cleanly removable pressure-sensitive adhesive made from an aqueous dispersion of said adhesive wherein said adhesive comprises a copolymer of monomers comprising

(a) from 95 to 99.9 by weight of at least one terminally unsaturated vinyl monomer, 60 to 100 weight percent of said vinyl monomer being selected from the class of non-tertiary alkyl acrylates wherein each alkyl group has at least half of its carbon atoms in a single chain and the average length of the alkyl chain is at least 4 and not more than 12, and

(b) from 0.1 to 5 parts by weight of at least one vinyl-unsaturated, homopolymerizable emulsifier monomer which is a surfactant having both a hydrophobic and a hydrophilic moiety, contains at least 5 but not more than 40 carbon atoms, and is water-dispersible, the total parts by weight of (a) plus (b) being 100 and said adhesive further comprising a phosphate emulsifier comprising from 0.5 part by weight to about 8 parts by weight of the adhesive, said phosphate emulsifier selected from at least one of

(i) polyoxyethylene phosphate having the formula



wherein

at least one of R_1, R_2 and R_3 is R—O—(—$CH_2CH_2O)_n$— and the others are —OH; R is selected from alkyl, alkenyl, aryl and alkylaryl; and n is a positive integer; and

(ii) a salt of (i)

wherein said aqueous dispersion of said adhesive has the property that it can be dried at a rate that at least 87% of the water contained in the dispersion is evaporated when the dispersion is exposed to hot air at 200° F. for 20 minutes, and wherein said adhesive has a peel adhesion of at least about 35 N/dm.

5,116,677

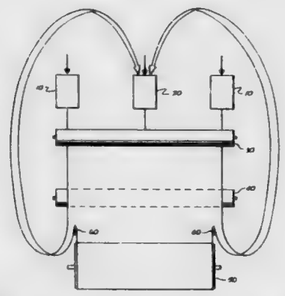
THERMOPLASTIC STRETCH-WRAP MATERIAL

Jerry F. Jones, Christiana, Tenn., assignor to Co-Ex Plastics, Inc., Lewisburg, Tenn.

Continuation-in-part of Ser. No. 139,776, Dec. 30, 1987, Pat. No. 4,923,750. This application Dec. 5, 1989, Ser. No. 446,219

Int. Cl.[5] B32B *7/12*

U.S. Cl. 428—349 **21 Claims**



1. An improved coextruded stretch wrap film comprising a core and two skin layers thereon, said core comprising an ethylene polymer having in polymerized form a major portion of ethylene and a minor portion of an olefinic monomer, the first of said two skin layers comprising an ethylene polymer having in polymerized form a major portion of ethylene and a minor portion of an olefinic monomer, the second of said two skin layers comprising a polymer having in polymerized form a major portion of ethylene and a minor portion of vinyl acetate.

5,116,678

ARTICLES

Gaylen M. Knutson, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 292,448, Dec. 30, 1988, Pat. No. 5,055,506. This application Jul. 15, 1991, Ser. No. 729,927

Int. Cl.[5] B32B *7/12*

U.S. Cl. 428—355 **20 Claims**

1. An article comprising a substrate having a first surface and a second surface, at least a portion of the first surface being covered with a polymer mass formed by drying an emulsion comprising:

(a) an alkenyl aromatic/alkadiene copolymer having at least one anionic pendant group;

(b) a tackifier resin;

(c) an anionic surfactant capable of emulsifying the alkenyl aromatic/alkadiene or the tackifier or both; and

(d) a polyamine having at least two amine groups,

wherein the polymer mass is a pressure-sensitive adhesive.

5,116,679

PROCESS FOR PRODUCING FIBRES COMPOSED OF OR COATED WITH CARBIDES OR NITRIDES

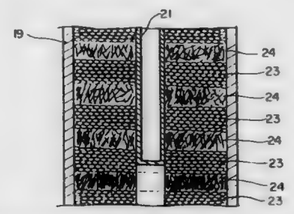
Sadashiv K. Nadkarni, and Mukesh K. Jain, both of Jonquiere, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Jul. 25, 1989, Ser. No. 385,248

Claims priority, application Canada, Jul. 29, 1988, 573505

Int. Cl.[5] B05D *7/24*

U.S. Cl. 428—367 **36 Claims**



1. A process for preparing fibres consisting of or coated with a carbide or nitride substantially free of whiskers, which process comprises:

forming a first reaction zone and filling said first reaction zone with microfine particles of an oxide or oxide precursor of silicon or boron containing at least one catalyst for generation of a gaseous sub-oxide of silicon or boron uniformly dispersed in said oxide or oxide precursor, said particles being uniformly dispersed within a matrix of carbon or a carbon precursor, wherein the molar ratio of the oxide present as a starting material or derivable from the oxide precursor to the carbon present as a starting material or derivable from the carbon precursor is equal to or slightly greater than the stoichiometrical ratio required for the generation of a gaseous sub-oxide or silicon or said boron;

forming a second reaction zone closely adjacent to the first reaction zone, said second zone comprising a layer having a thickness of about 1 cm or less, and filling said second reaction zone with a porous mass having a density of about 1 g/cc or less formed of fibres selected from the group consisting of carbon fibres, fibres of a heat resistant non-carbonaceous material coated with carbon, fibres made of a carbon precursor and fibres made of a heat resistant non-carbonaceous material coated with a carbon precursor;

heating said first reaction zone in a non-oxidizing atmosphere which promotes the formation of suboxide to a temperature at which said carbon precursor, if present, is converted to carbon, said oxide precursor, if present, is converted to said oxide and then said gaseous sub-oxide is formed by the reaction of the oxide and carbon in the first reaction zone and the gaseous sub-oxide diffuses to the second reaction zone;

simultaneously heating said second reaction zone to a temperature no lower than that in the first reaction zone in a non-oxidizing atmosphere selected from nitrogen-free and nitrogen-containing atmospheres, and to a temperature at which said carbon precursor, if present, is converted to carbon, and at which the gaseous sub-oxide reacts with some or all of the carbon in the second reaction zone to form a substantially whisker-free carbide on said fibres or additionally with said nitrogen to form a nitride on said fibres; and

separating the resulting fibres from any carbide or nitride whiskers that may also have been formed in the second reaction zone.

5,116,680

LIGHTLY BONDED POLYAMIDE YARNS AND PROCESS THEREFOR

Thomas L. Nelson, Georgetown, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 443,371, Nov. 30, 1989, which is a continuation of Ser. No. 78,155, Jul. 27, 1987, abandoned, which is a continuation of Ser. No. 754,703, Jul. 15, 1985, abandoned. This application Feb. 26, 1991, Ser. No. 661,011

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—369 **8 Claims**

1. A substantially twist-free multifilament polyamide combined yarn suitable for use in cut-pile applications, comprising a plurality of crimped filaments lightly bonded at points of contact, said filaments having an oriented core portion and a deoriented skin portion, said yarn being characterized by a bending rigidity ratio (R/R_{cfm}) of greater than about 20 and less than about 200, said filaments being characterized by a Skin Deorientation Index of greater than about 0.05.

5,116,681

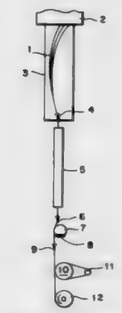
ANTI-STATIC YARNS CONTAINING POLYSTYRENE

Perry H. Lin, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 406,575, Oct. 5, 1989, Pat. No. 4,997,712, which is a division of Ser. No. 179,015, Apr. 8, 1989, Pat. No. 4,900,495. This application Aug. 13, 1990, Ser. No. 566,972

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—373 **2 Claims**

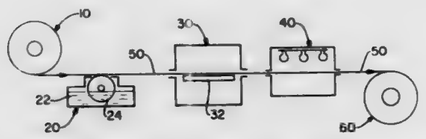


1. A multi-filament yarn comprising at least one spin-oriented, conductive filament having a nonconductive polymeric component coextensive with a component of electrically conductive carbon dispersed in a polymeric matrix wherein the nonconductive polymeric component of the spin-oriented, conductive filaments is a melt-blend containing a major amount of a nonconductive, fiber-forming polymeric material and a minor amount of polystyrene.

5,116,682
PROCESS FOR PRODUCING ANTI-WICKING POLYESTER YARN AND PRODUCT PRODUCED THEREBY

Kalidas Chakravarti, and Jamshid Khalatbari, both of Midlothian, Va., assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Dec. 17, 1990, Ser. No. 628,764
Int. Cl.[5] B05D *3/02*; B32B *27/36*
U.S. Cl. 428—395 **18 Claims**



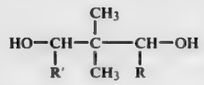
1. A process for improving the anti-wicking of polyester yarn, comprising the steps of:
(a) applying a coating to the yarn of an aqueous emulsion or dispersion of a heat-curable polyfluorinated polymeric anti-wicking agent;
(b) processing said yarn at a speed of at least about 1000 FPM through a dryer to remove at least 90 percent of the water in the coating, said processing being carried out without the coating contacting any surface to avoid transfer of the finish;
(c) curing said coating by heating said yarn at about 200°–260° C. for about 0.1–0.5 seconds so as to bond the anti-wicking agent to the yarn surface; and
(d) collecting said yarn carrying said cured coating of anti-wicking agent.

5,116,683
MAGNETIC RECORDING MEDIUM CONTAINING A SPECIFIED FERROMAGNETIC POWDER, POLYURETHANE RESIN PREPARED FROM SPECIFIED BRANCHED CHAIN DIOLS AND A FATTY ACID ESTER

Noboru Koyama; Setsuko Kawahara; Rieko Ren; Kenji Kumamoto, and Noboru Nakajima, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 12, 1990, Ser. No. 536,536
Claims priority, application Japan, Jun. 14, 1989, 1-149526; Jun. 14, 1989, 1-149527; Jun. 14, 1989, 1-149528; Aug. 22, 1989, 1-216691
Int. Cl.[5] G11B *5/00*
U.S. Cl. 428—403 **14 Claims**

1. A magnetic recording medium comprising a non-magnetic support having provided thereon at least one magnetic layer containing a ferromagnetic powder having a coercive force of not less than 650 Oe, an average particle size of not more than 0.3 μm and a BET value of not less than 35 m^2/g, wherein at least one magnetic layer contains;
a fatty acid ester in an amount of 0.05 to 2.0 parts by weight per 100 parts by weight of said ferromagnetic powder,
a urethane resin prepared from isocyanate and polyesteropolyol comprising a carboxylic acid and a diol represented by the following Formula I, and
a vinyl chloride resin having a functional group selected from the group consisting of $—SO_3$, $—OSO_3M$, —COOM, and $—PO_3M_1M_2$, wherein M is hydrogen, lithium, or sodium; and M_1 and M_2 are each hydrogen, lithium, sodium, or an alkyl;

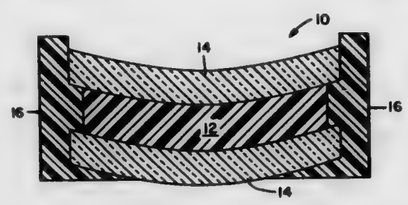

(I)

wherein R represents a hydrocarbon group having 1 to 6 carbon atoms; and R′ represents a hydrogen atom or a hydrocarbon group having 1 to 6 carbon atoms, provided that the total number of carbon atoms included in R and R′ is 3 to 10 and that at least one of R and R′ is a branched alkyl group having 3 or more carbon atoms.

5,116,684
COMPOSITE OPHTHALMIC LENS

Edward R. Fretz, Jr., Corning, and Anthony R. Olszewski, Bath, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Sep. 28, 1990, Ser. No. 589,403
Int. Cl.[5] B32B *27/38*; G02C *7/10*
U.S. Cl. 428—417 **15 Claims**



1. In a laminated, ophthalmic lens structure comprising an inorganic glass layer and a rigid, organic plastic layer wherein the organic plastic layer is an optically clear, epoxy polymer cast from an aliphatic and/or aromatic epoxide monomer, a curing agent, a source of active hydroxyl groups and an accelerator, and has a predetermined refractive index, the improvement wherein the ratio of curing agent to epoxide, by equivalent weights, is between 2:5 and 5:4, the ratio of curing agent to hydroxyl group source, by equivalent weights, is between 2:1 and 6:1, and the amount of accelerator is at least 0.01%, but not over 1.0%, of the mixture.

5,116,685
MAGNETIC RECORDING MEDIUM COMPRISING A POLYESTER POLYURETHANE POLYMER AND A SMALL PERCENTAGE OF A LOW MOLECULAR WEIGHT POLYOL

Dennis W. Karle, San Jose; Fred C. Chung, Palo Alto, and Frederic J. Sischka, II, Los Gatos, all of Calif., assignors to Memorex Telex, N.V., Amsterdam, Netherlands

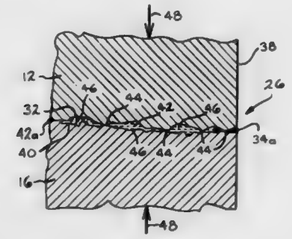
Filed Feb. 14, 1990, Ser. No. 480,179
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—425.9 **9 Claims**

6. A magnetic recording medium comprising a nonmagnetic support and a layer of magnetic composition adhered to the nonmagnetic support, wherein the magnetic composition comprises a ferromagnetic substance and a binder system for attaching the ferromagnetic substance to the nonmagnetic support, wherein the binder system comprises a polyester polyurethane polymer and a polyol having a molecular weight of less than about 400, said polyol crosslinked with a multifunctional isocyanate, and wherein the polyol is present in the binder system in less than about 1 wt % and more than about 0.07 wt % of the total weight of the magnetic coating mixture.

5,116,686
METHOD OF FORMING A LAMINATE AND THE PRODUCT THEREOF A LAMINATE INCLUDING A SEALING AGENT AND A BONDING AGENT

Jerry W. Schoen, Middletown, Ohio, assignor to Armco Inc., Ohio

Division of Ser. No. 402,310, Sep. 5, 1989, Pat. No. 5,018,267.
This application Sep. 27, 1990, Ser. No. 589,301
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—467 **5 Claims**

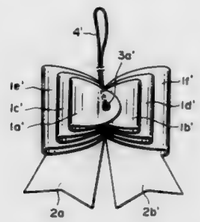


1. A laminate, comprising:
at least two sheets each having a facing surface,
said surfaces in contact with each other,
a sealing agent along the longitudinal edges on said surfaces and a liquid bonding agent between said sealing agent on said surfaces,
said sealing agent having a viscosity of no greater than 2500 cP at
24° C. and said liquid bonding agent having a viscosity no greater than about
80 cP at 24° C.
air between said surfaces being displaced by said liquid bonding agent and said sealing agent,
said sealing agent forming a continuous barrier to prevent reentry of said air and minimizing seepage of said liquid bonding agent along said edges,
whereby said laminate can be handled without delamination.

5,116,687
DECORATION FOR USE ON PACKAGES

Eiji Asano, 5-28, Nijigahama, Hiratsuka-shi, Kanagawa-ken, and Yoshiko Iwaki, 2-8-17-302, Minami Kugahara, Oota-Ku, Tokyo, both of Japan

Filed May 23, 1990, Ser. No. 527,411
Claims priority, application Japan, May 24, 1989, 1-59148[U]
Int. Cl.[5] D04D *7/10*
U.S. Cl. 428—542.8 **7 Claims**

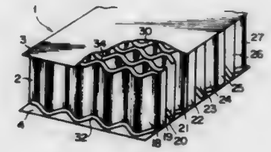


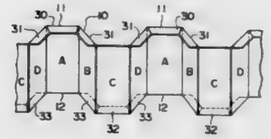
1. A decoration consisting of a belt shaped strip with plural segments longitudinally interconnected, both edges of said segments being rounded out in substantial symmetry and a looped elastic string folded and passed through plural holes provided on suitable positions of the belt shaped strip, and having a decorative configuration provided on one end segment alone and consisting of at least two decorative pieces, said decorative configuration being formed only on one side of said one end segment with respect to the longitudinal axis of said belt shaped strip, said belt shaped strip being composed of at least three segments interconnected and successively becoming larger from one end to the other.

5,116,688
CORE STRIP FOR HONEYCOMB CORE PANEL AND METHOD OF PRODUCING THE SAME

Katsuhiro Minamida; Atsushi Sugihashi, and Motoi Kido, all of Sagamihara, Japan, assignors to Nippon Steel Corporation, Japan

Filed Apr. 12, 1991, Ser. No. 684,641
Claims priority, application Japan, Apr. 13, 1990, 2-96373
Int. Cl.[5] B32B *3/12*; B23K *26/00, 101/02*; E04C *2/36*
U.S. Cl. 428—582 **4 Claims**





1. A core strip for a honeycomb core panel, comprising:
a metal strip formed into a corrugated configuration and having continuous alternate convex and concave portions of substantially identical shape, each of said convex portions being defined by a plateau portion and a pair of inclined portions, each of said concave portions being defined by a bottom portion and said pair of inclined portions, each of said inclined portions interconnecting said plateau portion and said bottom portion;
plurality of first flanges provided along the edge of said metal strip in the direction of the width of said metal strip, said first flanges being located only on said plateau portions and said inclined portions disposed respectively on opposite sides of each said plateau portion, said first flanges being disposed perpendicular to said metal strip and directed away from a convex surface of said convex portion; and
plurality of second flanges provided along the opposite edge of said metal strip in the direction of the width of said metal strip, said second flanges being located only on said bottom portions and said inclined portions disposed respectively on opposite sides of each said bottom portion, said second flanges being disposed perpendicular to said metal strip and directed away from a convex surface of said concave portion and therefore in a direction opposite to said first flanges.

5,116,689
APPARATUS AND METHOD FOR SELECTIVELY INCREASING DENSITY AND THERMAL CONDUCTIVITY OF HONEYCOMB STRUCTURES

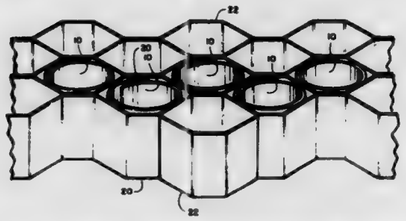
Robert M. Castro, La Mesa, and James M. Adee, San Diego, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Continuation-in-part of Ser. No. 267,930, Nov. 7, 1988, abandoned. This application Apr. 16, 1990, Ser. No. 509,932
Int. Cl.[5] B32B *3/12*
U.S. Cl. 428—593 **16 Claims**

1. A locally reinforced, high temperature resistant, high

strength, low weight structural panel having improved transverse thermal conductivity in reinforced areas, which comprises:

a honeycomb core having a plurality of parallel cells and consisting of shaped high temperature resistant metal foil strips;



at least one high temperature resistant thin metal face sheet bonded to at least one face of said core; and

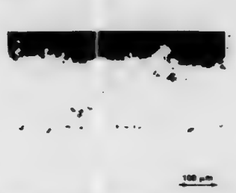
a plurality of generally cylindrical thin resilient coils of high temperature resistant metal foil positioned in a selected plurality of cells in said core, said resiliency causing intimate contact between coils and cell interior walls.

5,116,690

OXIDATION RESISTANT COATING FOR TITANIUM ALLOYS AND TITANIUM ALLOY MATRIX COMPOSITES

William J. Brindley; James L. Smialek, both of Strongsville, and Carl J. Rouge, Cleveland, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 1, 1991, Ser. No. 682,160
Int. Cl.[5] B32B *5/02, 15/01, 15/20*
U.S. Cl. 428—614 **6 Claims**



1. A coated article of manufacture comprising

a substrate of a material consisting of Ti_3Al+Nb titanium alloys alone or as a matrix of a composite comprising SiC fiber in the Ti_3Al+Nb material, said substrate having a surface that is exposed to an oxidizing environment, and

a thermal sprayed oxidation resistant metal coating of NiCrAlY adhered to said surface of said substrate, said coating being substantially crack free.

5,116,691

DUCTILITY MICROALLOYED NIAL INTERMETALLIC COMPOUNDS

Ramgopal Darolia, West Chester, and David F. Lahrman, Mason, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 4, 1991, Ser. No. 664,236
Int. Cl.[5] C22C *1/09, 19/05*
U.S. Cl. 428—614 **30 Claims**

1. A NiAl intermetallic alloy comprising, in atomic percent, at least about 50% nickel, about 0.01% to about 0.25% yttrium, about 0 to about 0.15% gallium and about 0.05% to about 4% of an element selected from the group consisting of chromium and molybdenum and combinations of chromium and molybdenum, and balance from about 40% to about 49.85% aluminum and trace impurities.

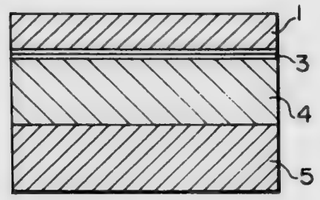
29. A reinforced intermetallic matrix composite article, comprising fiber within a NiAl intermetallic alloy matrix, the intermetallic matrix consisting essentially of, in atomic percent, about 0.01% to about 0.25% yttrium, about 0 to about 0.15% gallium, about 0.05% to about 4% chromium, at least about 50% nickel and the balance essentially aluminum.

5,116,692

MULTI-LAYER TYPE SLIDING BEARING OF ALUMINUM ALLOY AND METHOD OF PRODUCING THE SAME

Sanae Mori; Masaaki Sakamoto, both of Nagoya; Hideo Ishikawa, Komaki, and Yoji Nagai, Nagoya, all of Japan, assignors to Daido Metal Company Ltd., Nagoya, Japan

Filed Jun. 1, 1989, Ser. No. 359,549
Claims priority, application Japan, Jun. 2, 1988, 63-136342
Int. Cl.[5] B32B *15/10*
U.S. Cl. 428—650 **10 Claims**



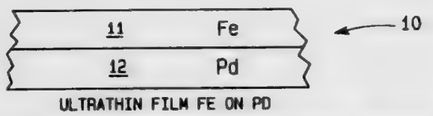
1. In a multi-layer type sliding bearing of aluminum alloy, having a backing layer of steel, a bearing layer of aluminum alloy bonded to the backing layer, and an overlay layer, the improvement further comprising a mixture layer of a thickness of not more than 0.5 microns between the bearing layer and the overlay layer in a bonded relation to both the bearing layer and said overlay layer, said mixture layer being constituted by the material of the overlay layer and one element selected from the group consisting of Ni, Co and Fe, said overlay consisting by weight of 0 to 15% Cu, 0 to 20% Sb, and the balance- Sn and incidental impurities.

5,116,693

UNIQUE SYSTEM OF FE/PD FOR MAGNETO-OPTICAL RECORDING AND MAGNETIC SWITCHING DEVICES

Chian Q. Liu, Hinsdale, and Samuel D. Bader, Oak Park, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 22, 1990, Ser. No. 526,915
Int. Cl.[5] G11B *5/70*
U.S. Cl. 428—694 **10 Claims**



1. A magneto-optical information storage medium comprising:

a palladium substrate;

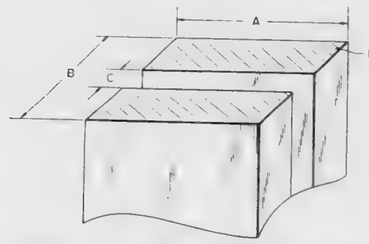
an ultrathin iron film epitaxially deposited on said palladium substrate where said ultrathin iron film has a thickness of less than 2.5 monolayers and has an easy axis of magnetization oriented perpendicular to the plane of said ultrathin iron film.

5,116,694

COATED CEMENTED CARBIDES

Hiroshi Tsukada; Masaaki Tobioka; Toshio Nomura, and Yasuhiro Saito, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 246,950, Sep. 16, 1988, abandoned, which is a continuation of Ser. No. 110,034, Oct. 15, 1987, abandoned, which is a continuation of Ser. No. 816,722, Dec. 31, 1985, abandoned. This application Jun. 3, 1991, Ser. No. 709,786
Claims priority, application Japan, Jan. 21, 1985, 60-9754
Int. Cl.[5] C23C *28/04*
U.S. Cl. 428—698 **5 Claims**



1. A coated cemented carbide comprising a substrate of a cemented carbide, the surface of which is coated with a multilayer coating having a total thickness of 1 to 10 μm, formed by a PVD method, consisting of:

an innermost layer of TiN having a thickness of 0.1 to 0.8 in contact with said substrate,

at least one layer selected from the group consisting of a TiC layer and a TiCN layer having a total thickness of 1 to 5 μm in contact with said innermost layer, wherein when both said TiC and TiCN layers are present, said TiC layer is in contact with said innermost layer, and optionally

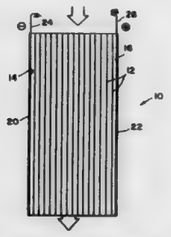
an outermost layer of TiN having a thickness of 0.3 to 5 μm.

5,116,695

DEFERRED ACTUATED BATTERY ASSEMBLY SYSTEM

Bhaskara M. L. Rao, Flemington, and Robert P. Hamlen, Bernardsville, both of N.J., assignors to Alupower, Inc., Warren, N.J.

Filed May 8, 1990, Ser. No. 520,642
Int. Cl.[5] H01M *6/48*
U.S. Cl. 429—12 **3 Claims**



1. A battery assembly system, which comprises:

a battery assembly comprised of an anode plate formed of a material selected from the group consisting of aluminum, magnesium, aluminum alloys, magnesium alloys and mixtures thereof; an inert cathode current collector plate functioning as a hydrogen electrode and a plurality of space-apart bipolar electrodes disposed between and spaced-apart from said anode plate and said inert cathode plates, each of said bipolar electrodes including an anode layer formed of a material selected from aluminum, magnesium, aluminum alloys, magnesium alloys and mixtures thereof and an inert cathode current collector layer functioning as a hydrogen electrode and laminated to said anode layer;

storage means for a hydroxide-based alkaline electrolyte solution selected from the group consisting of potassium hydroxide, sodium hydroxide and mixtures thereof; and

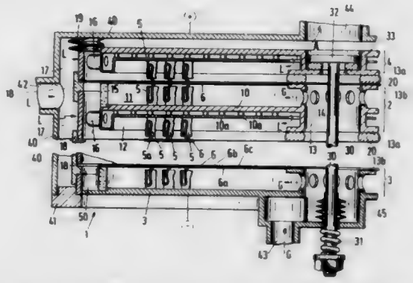
means for introducing said hydroxide-based alkaline electrolyte into said battery assembly.

5,116,696

GAS AND AIR FEED MEMBER FOR A FEED CELL BATTERY AND A FUEL CELL BATTERY

Bruno Barp, Rudolfstetten, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 3, 1991, Ser. No. 637,076
Claims priority, application Switzerland, Jan. 9, 1990, 00066/90
Int. Cl.[5] H01M *8/04*
U.S. Cl. 429—26 **26 Claims**



1. A gas and air feed member for a fuel cell battery comprising

an axially symmetrical plate-like hollow member defining a boundary between a gas space for exposure to an electrochemically active plate and an air space; and

a tubular member passing through said hollow member on an axis of symmetry thereof for conducting a gas flow therethrough, said tubular member being in communication with said gas space to deliver a flow of gas therethrough in countercurrent to a flow of air in said hollow member.

5,116,697

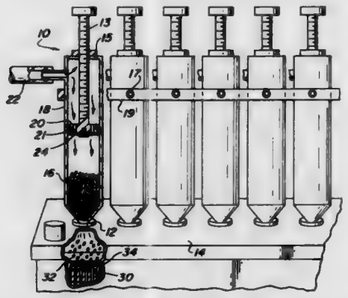
HOT CLIMATE BATTERY AND MATERIALS FOR USE IN SAME AND METHODS AND APPARATUS FOR SAME

Charles W. Fleischmann, Blue Bell; Chester R. Sinnk, Boyertown, and Veit, Jr., William E., Wyomissing Hills, all of Pa., assignors to Exide Corp., Reading, Pa.

Filed Aug. 18, 1989, Ser. No. 396,383
Int. Cl.[5] H01M *10/02, 10/10*
U.S. Cl. 429—86 **6 Claims**

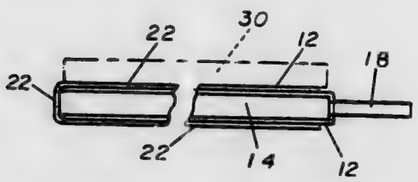
1. In an electric storage battery including a substantially closed container, electrode elements and an electrolyte disposed within the container, and a normally open space within the container above the elements and electrolyte, an improved material for insertion into said space to form a floating layer on the electrolyte to reduce evaporative water loss in operation of

the battery at elevated temperatures, the improved material comprising:



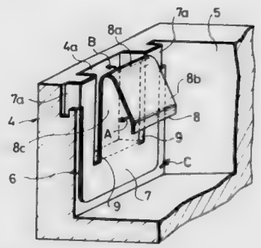
particles of closed cell foam material having sizes of less than one quarter inch in longest section and density in the range of 0.02 to 0.05 grams per cubic centimeter.

5,116,698
BIFOLD SEPARATOR
Stanley L. Sears, Bristol, Tenn., assignor to Eveready Battery Company, Inc., St. Louis, Mo.
Filed Jul. 11, 1990, Ser. No. 551,185
Int. Cl.[5] H01M *2/18*
U.S. Cl. 429—94 **8 Claims**



1. An electrode and separator assembly for winding into a jelly roll type configuration and placement in a container for a galvanic cell, comprising:
- a first electrode having a generally rectangular configuration with two opposite side faces, two opposite short edges and two opposite elongated edges;
- a first foldable separator sheet having a length dimension and a width dimension, said length dimension being substantially the same as that of one of said elongated edges, said width dimension being twice that of said first electrode, said first sheet being folded over said one elongated edge along the center line of said width dimension of said first separator sheet, in a U-shaped configuration, to lie against said electrode side faces and substantially fully cover said side faces;
- a second foldable separator sheet substantially like said first sheet, having a length dimension and a width dimension, said length dimension being substantially the same as that of the second of said elongated edges, said width dimension being twice that of said first electrode, said second sheet being folded over said second elongated edge along the centerline of said width dimension of said second sheet in a U-shaped configuration to overlap said first sheet over substantially all of said side faces, whereby both said elongated electrode edges are covered and said side faces are covered by two layers of separator in a uniform thickness across said faces;
- a conductive terminal tab protruding from said one electrode through one of said separator sheets at one of said electrode edges; and
- a second electrode adjacent said second sheet, separated from said first electrode by said second separator sheet and said first separator sheet, whereby said electrodes and sheets can be rolled into a jelly roll for insertion into a container to form a galvanic cell.

5,116,699
BATTERY BOX
Kazuhiko Miyajima, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan
Filed Oct. 12, 1990, Ser. No. 596,799
Claims priority, application Japan, Nov. 11, 1989, 1-131582[U]
Int. Cl.[5] H01M *2/20*
U.S. Cl. 429—100 **4 Claims**



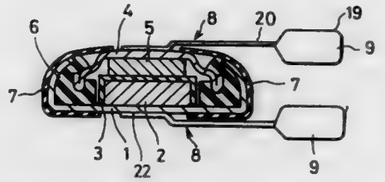
1. A battery box comprising:
- a battery accommodating case having a cavity defined for removably receiving battery therein; and
- a leaf spring terminal secured to an inner wall of said battery accommodating case for contacting with an electrode of a battery received in said cavity of said battery accommodating case, said leaf spring terminal having a resilient supporting portion with an overall, substantially U-shape, wherein said leaf spring terminal is secured at the opposite end portions of the U-shape of said resilient supporting potion thereof to said inner wall of said battery accommodating case;

said leaf spring terminal further having a resilient tongue which is folded over itself, said resilient tongue having a base portion extending in the form of a cantilever from the bottom of said U-shape of said resilient supporting portion in the same plane as and in parallel to the opposite sides of said resilient supporting portion with a pair of slits left therebetween;

said inner wall of said battery accommodating case having a recess formed at a portion opposite to said base portion of said resilient tongue of said leaf spring terminal to allow said base portion of said resilient tongue to be deflected therein.

5,116,700
POWER SOURCE ELEMENT WITH CONNECTING TERMINALS
Kazutoshi Takeda, Sendai, Japan, assignor to Seiko Electronics Components Ltd., Japan
Filed Jan. 23, 1990, Ser. No. 468,597
Claims priority, application Japan, Jan. 23, 1989, 1-6179[U]
Int. Cl.[5] H01M *2/22*
U.S. Cl. 429—121 **10 Claims**

1. A power source unit comprising:
- a power source element having a positive terminal and a negative terminal;
- a pair of connected terminal pieces, each having a planar base portion bonded to the respective terminal of the power source element and a planar top end portion twisted perpendicular to the planar base portion, each planar base portion facing in parallel with the other planar base portion; and



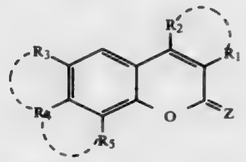
the planar top end portion being positioned outside the outer perimeter of the power source element.

5,116,701
MICROPOROUS SEPARATOR COMPOSED OF MICROSPHERES SECURED TO AN ELECTRODE STRIP
David W. Kalisz, Lakewood, Ohio, assignor to Eveready Battery Company, Inc., St. Louis, Mo.
Filed Feb. 22, 1991, Ser. No. 660,184
Int. Cl.[5] H01M *2/18*
U.S. Cl. 429—130 **20 Claims**

1. An integral electrode and separator composite comprising an electrode strip having a microporous separator secured to its surface, said microporous separator comprising at least one layer of insulating microspheres contacting each other and partially embedded in the surface of the electrode strip and wherein said microspheres are from 5 microns to 0.05 inch in diameter and cover at least 65 percent of the area of the surface of the electrode strip defined by the microsphere layer.

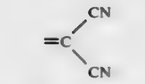
5,116,702
ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL COMPRISING A CHARGE GENERATING LAYER AND A CHARGE TRANSFER LAYER
Sadao Okano; Kazuya Hongo, both of Kanagawa, Japan; Hidekazu Aonuma, Ontario, Canada, and Hiroshi Miyamoto, Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed May 29, 1990, Ser. No. 529,361
Claims priority, application Japan, May 30, 1989, 1-134751; May 30, 1989, 1-134753
Int. Cl.[5] G03G *5/09*
U.S. Cl. 430—54 **7 Claims**

1. An electrophotographic light-sensitive material comprising a conductive support having formed thereon, in succession, a charge generating layer and a charge transfer layer, wherein the charge generating layer comprises a binder resin containing therein a positive hole-transferring charge generating pigment and a compound represented by formula (I)

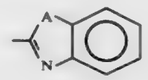


(I)

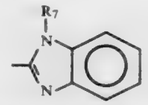
wherein Z represents



or an oxygen atom; R_1 represents a hydrogen atom, an alkyl group, —CN, —COOH, —$COOR_6$ (wherein R_6 represents an alkyl group), an aryl group,



(wherein A represents an oxygen atom or a sulfur atoms), or



(wherein R_7 represents an alkyl group); R_2 represents a hydrogen atom, an alkyl group, or a halogenated alkyl group; R_3 represents a hydrogen atom or an alkyl group; R_4 represents a hydrogen atom, an alkyl group, —OH, —NH_2, —NHR_8 (wherein R_8 represents an alkyl group) or —NR_9R_{10} (wherein R_9 and R_{10} each represents an alkyl group); and R_5 represents a hydrogen atom or an alkyl group; said R_1 and R_2 may combine with each other to form a ring and two or three of R_3, R_4, and R_5 may combine with each other to form a ring.

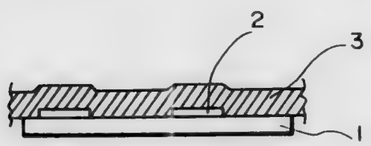
5,116,703
FUNCTIONAL HYBRID COMPOUNDS AND THIN FILMS BY SOL-GEL PROCESS
Santokh S. Badesha, Pittsford; Milan Stolka, Fairport; John F. Yanus, Webster, and John H. Hodge, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 15, 1989, Ser. No. 451,050
Int. Cl.[5] G03G *5/047*
U.S. Cl. 430—59 **34 Claims**

1. A multilayer electrophotographic imaging member, comprising at least one photoresponsive layer, wherein at least one layer of said imag.ng member is composed of a compound containing subunits of the formula G-D-F, wherein G is an inorganic glassy network subunit, D is a flexible organic subunit, and F is a subunit having charge transporting or generating characteristics.

5,116,704
BARRIER RIB FORMING METHOD OF PDP
Ki-Duck Kwon, Seoul, Rep. of Korea, assignor to Samsung Electron Device Co., Ltd., Seoul, Rep. of Korea
Filed Sep. 6, 1989, Ser. No. 403,767
Claims priority, application Rep. of Korea, Sep. 14, 1988, 11870
Int. Cl.[5] G03H *3/00*
U.S. Cl. 430—3 **4 Claims**

1. A barrier rib forming method for fabricating a plasma display panel comprising the steps of:
- forming an emulsion layer by deposition of an emulsion on a glass substrate upon which transparent electrodes are formed;
- exposing and developing said emulsion layer with ultraviolet rays to selectively form emulsion layers only on the electrodes;
- printing a barrier rib material including glass particles over said glass substrate and over said electrodes upon which said emulsion layer remains;

heating said glass substrate printed with said barrier rib material; and,



ultrasonically vibrating said glass substrate to selectively remove said emulsion layer and barrier rib material thereby leaving barrier ribs between said transparent electrodes.

5,116,705

LIQUID COLOR TONER COMPOSITION

Peter E. Materazzi, Southington, Conn., assignor to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 498,785, Mar. 26, 1990, abandoned. This application Feb. 15, 1991, Ser. No. 657,012

Int. Cl.[5] G03G *13/01*

U.S. Cl. 430—45 **23 Claims**

1. A liquid color toner composition comprising:

(a) an organic solvent;

(b) a fine particle size compounded mixture comprising:

(i) a resin matrix which is essentially insoluble and nonswellable in said solvent,

(ii) submicron-sized pigment particles dispersed within the resin, and

(iii) a plasticizer which is compatible with the resin,

said compounded mixture being essentially insoluble and nonswellable in said solvent, and

(c) a dispersing agent capable of dispersing the particles in the compounded mixture; and optional

(d) a charge control agent which will render the toner either positive or negative.

5,116,706

1,2,4,5-BENZOYLENEBIS(NAPHTHO[1,8-DE]PYRIMIDINE) COMPOUNDS AND THEIR USE IN PHOTOSENSITIVE LAYERS

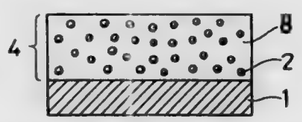
Yoshimi Kojima, Nara; Satoshi Katayama, Tenri; Yoshihide Shimoda, Nara; Hiroshi Sugimura, Osaka, and Eiji Imada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 369,849, Jun. 22, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 605,160

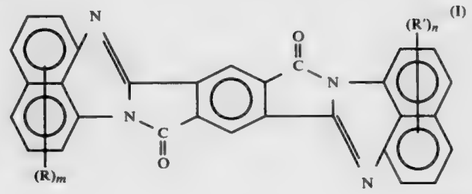
Claims priority, application Japan, Jun. 25, 1988, 63-157246

Int. Cl.[5] G03G *5/04*

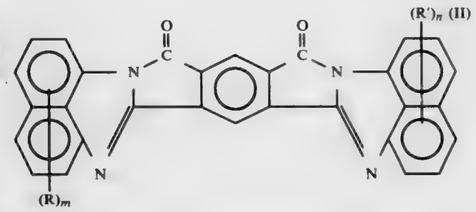
U.S. Cl. 430—58 **13 Claims**



1. A photosensitive member comprising a photosensitive layer containing the compound of the following formula (I) or (II) on a conductive support:



(I)



(II)

wherein R and R' are the same or different and are each selected from the group consisting of a hydrogen atom; halogen atom; hydroxyl group; nitro group; cyano group; an alkyl group; an alkyl substituted with at least one of a halogen atom, hydroxy group, nitro group or cyano group; an alkoxyl group; an alkoxyl group substituted with at least one of a halogen atom, hydroxy group, nitro group or cyano group; an aryl group; an aryl group substituted with at least one of a halogen atom, nitro group, cyano group, hydroxy group, lower alkyl group, lower alkoxy group or di-lower alkylamino group; an aralkyl group; an aralkyl group substituted with at least one of a halogen atom, nitro group, cyano group, hydroxy group, lower alkyl group, lower alkoxy group or di-lower alkylamino group; a carboxyl group; a carboxylate group; a carbamoyl group; and a carbamoyl group substituted with at least a halogen atom, nitro group or cyano group; and m and n each are an integer from 1 to 6, wherein the photosensitive layer is a multilayer type, consisting of a charge-generating layer and a charge-transporting layer, the former containing the compound of formula (I) or (II).

5,116,707

LAMINATED ORGANIC PHOTOSENSITIVE MATERIAL

Toshiaki Kanzaki, and Yosuke Matsui, both of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan

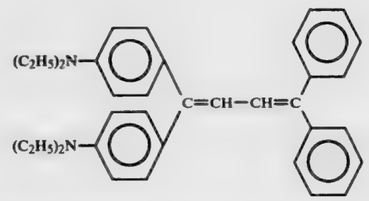
Filed Jul. 27, 1990, Ser. No. 558,339

Claims priority, application Japan, Jul. 28, 1989, 1-197424

Int. Cl.[5] G03G *5/047*

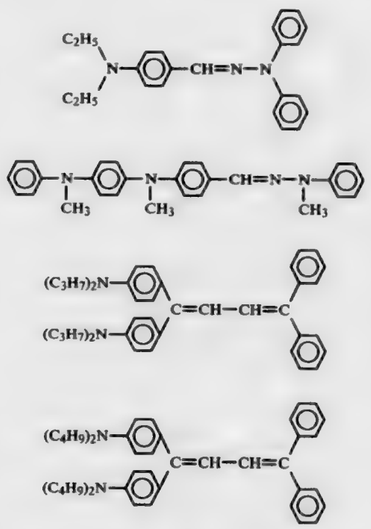
U.S. Cl. 430—59 **7 Claims**

1. A laminated organic photosensitive material which comprises an electroconductive support, a charge producing layer and a charge transporting layer on the charge producing layer, wherein the charge transporting layer comprises a mixture of a bistyryl compound represented by the formula



in an amount of 65–90% by weight based on the mixture as a

first charge transporting substance and a second charge transporting substance which is at least one compound selected from the group consisting of



in an amount of 35-10% by weight based on the mixture, the second charge transporting substance having a glass transition temperature of not more than 20° C., the mixture having a glass transition temperature of not more than 45° C.

5,116,708

HOLE TRANSPORTING MATERIAL

Yutaka Shikatani; Naoki Katsoka, both of Kawasaki; Nobuyuki Kuroda, Yokohama, and Kazuo Matsuura, Tokyo, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

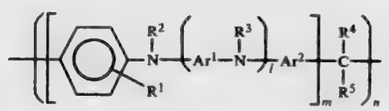
Filed Dec. 8, 1989, Ser. No. 447,649

Claims priority, application Japan, Dec. 9, 1988, 63-309940; Aug. 31, 1989, 1-222840

Int. Cl.[5] G03G *5/087*

U.S. Cl. 430—59 **8 Claims**

1. A hole transporting material is constituted by a compound represented by the following general formula (1):



(I)

wherein R^1, R^2, R^3, R^4 and R^5, which may be the same or different, are each independently hydrogen or a hydrocarbon residue having 1 to 20 carbon atoms; Ar^1 and Ar^2 are each independently a divalent hydrocarbon residue; λ is an integer of 0 or more; m is an integer of 1 or more; and n is an integer of 2 or more.

5,116,709

ELECTROPHOTORECEPTOR USING STYRENE-MALEIC ANHYDRIDE COPOLYMER AS THE POLYMERIC BINDER

Tai J. Chen, Chutung, Taiwan, assignor to Industrial Technology Research Institute, Taiwan, Taiwan

Filed Jun. 13, 1989, Ser. No. 365,760

The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.

Int. Cl.[5] G03G *5/00, 15/02*

U.S. Cl. 430—96 **3 Claims**

1. An electrophotoreceptor comprising:

an electrically conductive substrate;

a charge generation layer, coated on said electrically conductive substrate, comprising a charge generation material selected from the group consisting of phthalocyanine pigment, bisazo pigment and squaraine pigment; and

a charge transport layer, coated over said charge generation layer, comprising a polymeric binder and a charge transport material, said polymeric binder being a copolymer of styrene and maleic anhydride, said copolymer characterized by a weight average molecular weight of from 100,000 to 300,000 and a styrene to maleic anhydride weight ratio in the range of between 99:1 and 80:20, and said charge transport material selected from the group consisting of hydrazone and pyrazoline.

5,116,710

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Eiichi Kato, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 14, 1990, Ser. No. 582,320

Claims priority, application Japan, Sep. 14, 1989, 1-237319

Int. Cl.[5] G03G *5/087*

U.S. Cl. 430—96 **11 Claims**

1. An electrophotographic light-sensitive material comprising a support having provided thereon at least one photoconductive layer containing an inorganic photoconductive substance and a binder resin, wherein the binder resin comprises at least one graft copolymer resin (A) having a weight average molecular weight of from 1×10^3 to 2×10^4 formed from a monofunctional macromonomer (MA) and a monomer represented by the general formula (III) described below, and having a component containing at least one acidic group selected from the group consisting of $-PO_3H_2$, $-SO_3H$, $-COOH$, $-OH$,



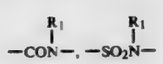
(where R represents a hydrocarbon group or —OR' (where R' represents a hydrocarbon group)) and a cyclic acid anhydride-containing group bonded to only one of the terminals of the main chain thereof, the monofunctional macromonomer (MA) having a weight average molecular weight of not more than 2×10^4, containing at least one polymer component corresponding to a repeating unit represented by the general formula (IIa) or (IIb) described below, and having a polymerizable double bond-containing group represented by the general formula (I) described below bonded to only one of the terminals of the main chain of the macromonomer:



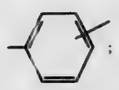
(I)

wherein A_0 represents —COO—, —OCO—, —(CH_2)-

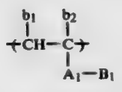
n—OCO—, —$(CH_2)_{l2}$—COO— (wherein l_1 and l_2 each represents an integer of from 1 to 3), —O—, —SO_2—, —CO—,



(wherein R_1 represents a hydrogen atom or a hydrocarbon group), —CONHCOO—, —CONHCONH— or



and a_1 and a_2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —COO—D_1 or —COO—D_1 bonded through a hydrocarbon group (wherein D_1 represents a hydrogen atom or a substituted or unsubstituted hydrocarbon group:



(IIa)



(IIb)

wherein A_1 has the same meaning as A_0 defined in the general formula (I); B_1 represents an aliphatic group having from 1 to 18 carbon atoms or an aromatic group having from 6 to 12 carbon atoms; b_1 and b_2, which may be the same or different, each has the same meaning as a_1 and a_2 defined in the general formula (I); and B_0 represents —CN, —$CONH_2$ or



(wherein J represents a hydrogen atom, a halogen atom, an alkoxyl group or —$COOD_4$ (wherein D_4 represents an alkyl group, an aralkyl group or an aryl group)):



(III)

wherein A_2 has the same meaning as A_1 defined in the general formula (IIa); B_2 has the same meaning as B_1 defined in the general formula (IIa); and c_1 and c_2, which may be the same or different, each has the same meaning as a_1 and a_2 defined in the general formula (I); and at least one copolymer resin (B) having a weight average molecular weight of from 5×10^4 to 1×10^6 and formed from at least a monofunctional macromonomer (MB) having a weight average molecular weight of not more than 2×10^4 and a monomer represented by the general formula (III) described above, the macromonomer (MB) comprising at least one polymer component corresponding to a repeating unit represented by the general formula (IIa) or (IIb) described above, and at least one polymer component containing at least one acidic group selected from —COOH, —PO_3H_2, —SO_3H, —OH,



(wherein R_0 represents a hydrocarbon group of —OR_0' (wherein R_0' represents a hydrocarbon group)), —CHO, and an acid anhydride-containing group, and the macromonomer (MB) having a polymerizable double bond-containing group represented by the general formula (I) described above bonded to only one terminal of the main chain thereof wherein the content of the component containing the acidic group bonded to the terminal of the polymer main chain of resin (A) is from 1 to 20% by weight based on the weight of resin (A).

5,116,711

COLOR TONER AND TWO-COMPONENT DEVELOPER CONTAINING SAME

Hiroyuki Kobayashi, Yokohama; Mitsuru Uchida, Chofu, and Kenji Okado, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 117,753, Nov. 6, 1987, abandoned. This application Apr. 5, 1990, Ser. No. 504,696

Claims priority, application Japan, Jan. 19, 1987, 62-009467

Int. Cl.[5] G03G *9/083, 9/09, 9/107*

U.S. Cl. 430—106 **15 Claims**

1. A black developer for developing electrostatic latent images, comprising: (1d) a black toner composition containing a black toner which in turn contains at least a binder resin and two or more colorants, and hydrophobic silica fine powder and (2d) a ferrite carrier coated with a mixture of a fluorine-containing resin and a styrene type resin in a weight ratio of 90:10 to 20:80, wherein the binder resin comprises a styrene-arcylic acid ester type resin or a polyester ester, the ferrite carrier has an average particle size of 30–60 microns, and the ferrite carrier is coated with 0.01 to 5 wt. % based on the carrier of the mixture of the fluorine-containing resin and the styrene type resin;

the black toner having a volume particle size of 11.0 to 14.0 microns, containing 30% by number or less of particles having sizes below 6.35 microns and containing 9% by weight or less of particles having sizes above 20.2 microns;

the black toner composition having an agglomeration degree of 25% or below and an apparent density of 0.2 to 1.5 g/cm^3;

the black toner having an apparent viscosity of 100° C. of 10^4 to 5×10^5 poise, an apparent viscosity of 90° C. of 5×10^4 to 5×10^6 poise, a DSC heat-absorption peak at 58° to 72° C., and a gloss of 5.0% or higher;

the black toner having chromatically values of $a^*=-3.5$ to 6.5, $b^*=-6.0$ to 4.0, and $L^*=26.0$ to 36.0;

the black toner showing a triboelectric charge of −5 to −20 micro-C/g with respect to the ferrite carrier coated with the mixture of the fluorine-containing resin and the styrene type resin containing 70 wt. % or more of carrier particles having sizes of 250 mesh-pass and 350 mesh-on and

the black toner having a spectral reflectance of 60% or more in an infrared region of 900 to 1,000 nm.

5,116,712

COLOR TONER CONTAINING ORGANIC PIGMENT AND PROCESS FOR PRODUCING THE SAME

Tatsuya Nakamura, Tokyo; Hiromi Mori, Yokohama; Masayoshi Shimamura, Kamakura, and Reiko Morimoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1990, Ser. No. 507,472

Claims priority, application Japan, Apr. 11, 1989, 1-089689; Apr. 28, 1989, 1-107236

Int. Cl.[5] G03G *9/09*

U.S. Cl. 430—106 **18 Claims**

1. A color toner, comprising a binder resin and a colorant wherein said binder resin having been produced by suspension-polymerizing a monomer composition comprising a polymerizable monomer and the colorant, wherein the colorant comprises organic pigment particles having an —OH group, said particles having been treated with an isocyanic ester or a silicon-containing compound to enhance dispersibility of said organic pigment particles in the polymerizable monomer without inhibiting the suspension polymerization reaction.

5,116,713

TONER FOR DEVELOPING LATENT ELECTROSTATIC IMAGE

Masafumi Uchida; Toshiko Yajima; Hiroyuki Takagiwa, and Jiro Takahashi, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 16, 1990, Ser. No. 552,763

Claims priority, application Japan, Jul. 18, 1989, 1-186895

Int. Cl.[5] G03G *9/087*

U.S. Cl. 430—110 **18 Claims**

1. A toner for development of a latent electrostatic image that contains as a binder a polyester having a ratio of hydroxyl group value (OHV) to acid value (AV) not exceeding 1.2 obtained by polycondensation reaction of a monomer composition containing the components (1)–(3) described below and which also contains a polypropylene modified with a carboxylic acid or an acid anhydride thereof:

component (1): a polyvalent monomer having a valence of 3 or more;

component (2): an aromatic dicarboxylic acid; and

component (3): a dialcohol containing at least 70 mol % of aliphatic dialcohol.

5,116,714

IMAGE FORMING MATERIAL WITH DEVELOPER AND PHOTOSENSITIVE BASE ON WHICH AN ELECTROSTATIC LATENT IMAGE IS FORMED

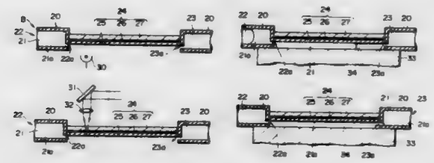
Haruo Watanabe, Kanagawa; Akio Yasuda, Tokyo; Koichi Kawasumi; Takao Tsuchiya, both of Kanagawa, and Kiyosuke Suzuki, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 5, 1990, Ser. No. 475,272

Claims priority, application Japan, Feb. 6, 1989, 1-25921

Int. Cl.[5] G03G *9/08, 13/10, 15/10*

U.S. Cl. 430—117 **19 Claims**



1. An image forming material, comprising:

a photosensitive base on which an electrostatic latent image is formed in correspondence with an image information;

a developer container formed integrally with said base and containing a developer composed of colorant particles charged to an opposite polarity to said latent image and dispersed in an electrically insulating organic material which is solid at ambient temperature and which is changed between a solid state and a liquid state on heating and cooling; and

an area of the photosensitive base being dimensioned and image characteristics of the photosensitive base being designed for direct use of the electrostatic latent image after developing with said developer without transfer to another medium.

5,116,715

PHOTOSENSITIVE COMPOSITIONS CONTAINING AROMATIC FUSED POLYCYCLIC SULFONIC ACID AND PARTIAL ESTER OF PHENOLIC RESIN WITH DIAZOQUINONESULFONIC ACID OR DIAZOQUINONECARBOXYLIC ACID

Bruno Roland, Heverlee; Jan Vandendriessche, Haasrode, and Catherine Jakus, Diegem, all of Belgium, assignors to U C B S.A., Brussels, Belgium

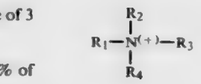
Continuation of Ser. No. 284,058, Dec. 12, 1988, abandoned. This application Mar. 8, 1991, Ser. No. 668,810

Claims priority, application United Kingdom, Dec. 18, 1987, 8729510

Int. Cl.[5] G03F *7/023;* **G03C** *1/61*

U.S. Cl. 430—190 **14 Claims**

1. A photosensitive composition suitable for use as a photoresist which consists essentially of, in admixture at least one partial ester of a phenolic resin with a diazoquinonesulfonic acid or a diazoquinonecarboxylic acid and an amount sufficient to increase the contrast and the selectivity of the composition, of at least one aromatic fused polycyclic sulfonic acid, in the form of the free acid and/or an ammonium salt, the cation component of the ammonium salt having the formula



wherein R_1, R_2, R_3 and R_4, which may be the same or different, each represent a hydrogen atom, an alkyl or a hydroxyalkyl group containing 1 to 4 carbon atoms, with the proviso that said aromatic sulfonic acid is other than an aromatic amino acid.

5,116,716

HEAT-DEVELOPABLE COLOR PHOTOGRAPHIC MATERIAL AND IMAGE-FORMING PROCESS

Tawara Komamura; Masaru Iwagaki, and Hiroyuki Kaguchi, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 371,645, Jun. 22, 1989, abandoned, which is a continuation of Ser. No. 116,008, Oct. 30, 1987, abandoned. This application Apr. 29, 1991, Ser. No. 697,530

Claims priority, application Japan, Nov. 6, 1986, 61-264192; Dec. 9, 1986, 61-292789

Int. Cl.[5] G03C *5/54, 1/34, 7/26*

U.S. Cl. 430—203 **8 Claims**

1. A process for forming an image on a heat-developable color photographic material of the type having a light sensitive silver halide emulsion and a diffusible dye providing substance, which comprises image-wise exposing the photographic material to light, and thereafter carrying out heat-developable processing at a temperature of 80° C. to 200° C. the presence of a compound represented by Formula (1) shown below:

Formula (1)



wherein X represents a halogen atom, and Y represents a group of nonmetallic atoms necessary for forming a nitrogen-containing heterocyclic ring bearing on the ring at least one substituent having 6 to 30 carbon atoms, and being a ballast group.

5,116,717

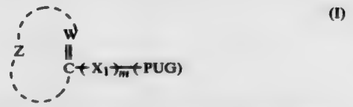
SILVER HALIDE PHOTOGRAPHIC MATERIAL

Tetsunori Matsushita, and Morio Yagihara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

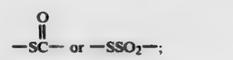
Continuation of Ser. No. 329,909, Mar. 28, 1989, abandoned. This application Feb. 25, 1991, Ser. No. 660,233
Claims priority, application Japan, Mar. 28, 1988, 63-74249
Int. Cl.[5] G03C *1/06, 1/34, 1/42, 7/32*
U.S. Cl. 430—264 **18 Claims**

1. A silver halide photographic material comprising a support having thereon at least one silver halide photosensitive emulsion layer, at least one layer of the material comprising a blocked photographic reagent precursor represented by formula (I):

(I)



wherein X_1 represents a divalent linking group containing a heteroatom bonded to the carbon atom, provided that X_1 is linked to the carbon atom by a group other than

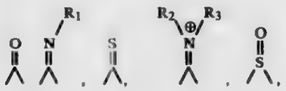


PUG represents a photographically useful group containing a hetero atom bonded to X_1; W represents =N— or

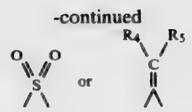


Y_1 represents a hydrogen or a group capable of being substituted; Z represents an atomic group necessary for forming a 6-membered heterocyclic ring or a condensed ring containing 6-membered heterocyclic ring selected from pyrazine, triazine, quinazoline, a triazaindene, a tetraazindene, and a pentaazaindene, provided that when W represents a

the group adjacent to W in the heterocyclic ring is a group other than



-continued



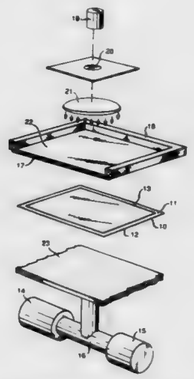
wherein R_1, R_2, R_3, R_4 and R_5 each represents hydrogen or a group capable of being substituted; and m is 0 or 1, with the proviso that when m is 0, the photographically useful group represented by PUG is bonded to the carbon atom of the heterocyclic ring formed by Z via a heteroatom of PUG.

5,116,718

CONTACT PRINTING PROCESS

William F. Dalton, and Henry B. Micks, Jr., both of Richmond, Va., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 414,035, Sep. 28, 1989, abandoned. This application Jun. 14, 1991, Ser. No. 715,849
Int. Cl.[5] G03C *5/56*
U.S. Cl. 430—327 **7 Claims**



1. A method of defining a pattern in a photoresist layer formed over a first major surface of a substrate comprising the step of:
transporting the substrate to a station by means of a manifold;
applying a vacuum through said manifold to said substrate at said station to hold it in place;
placing a mask in contact with the photoresist layer;
applying a flow of gas through said manifold to a second major surface of the substrate opposite to said first surface; and
while applying said gas flow, exposing the photoresist layer to a source of light through said mask.

5,116,719

TOP POLE PROFILE FOR POLE TIP TRIMMING

George J. Gau, Santa Barbara, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Feb. 15, 1990, Ser. No. 480,250
Int. Cl.[5] G03F *7/36;* **G11B** *5/187*
U.S. Cl. 430—313 **25 Claims**

1. A method for manufacturing a pole tip structure in a thin film magnetic transducer carried by a substrate, the thin film magnetic transducer of the type used for reading and writing information upon a magnetic storage medium, the method comprising the steps of:
depositing a magnetic bottom pole piece upon the substrate;

depositing an insulating gap layer upon the magnetic bottom pole piece;
depositing photoresist dams on the insulating gap layer, wherein the photoresist dams have opposed negatively sloped profiles which define a three dimensional relief;
depositing a magnetic top pole piece upon the insulating gap layer in the three dimensional relief formed by the photoresist dams, whereby the magnetic top pole piece has a positively sloped profile;
depositing a mask upon the magnetic top pole piece wherein the mask is aligned with the top pole piece; and
exposing the mask and the magnetic bottom pole piece to an ion milling source whereby nonaligned portions of the magnetic bottom pole piece are removed.

16. A method for manufacturing pole tips in a thin film magnetic transducer of the type used for reading and writing information upon magnetic storage medium, comprising:
depositing a magnetic bottom pole piece upon a nonmagnetic substrate;
depositing an insulating gap layer upon the magnetic bottom pole piece;

depositing photoresist dams on the insulating gap layer, the photoresist dams having opposed negatively sloped profiles defining a three dimensional relief;
depositing a magnetic top pole piece upon the insulating gap layer in the three dimensional relief formed by the photoresist dams, the magnetic top pole piece comprising:
a first surface in surface abutting contact with the insulating gap layer, the first surface having a first surface length; and
a second surface positioned distally from the first surface and having a second surface length, the second surface length shorter than the first surface length whereby a profile of the magnetic top pole piece has a generally trapezoidal shape;
depositing a mask upon the second surface of the top pole piece wherein the mask is aligned with the top pole piece; and
exposing the mask and the magnetic bottom pole piece to an ion milling source whereby the portions of the magnetic top pole piece which are nonaligned with the magnetic bottom pole piece are removed.

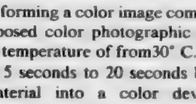
5,116,720

DEVELOPING SOLVENT FOR LAYERS WHICH ARE CROSSLINKABLE BY PHOTOPOLYMERIZATION AND PROCESS FOR THE PRODUCTION OF RELIEF FORMS

Werner Frass; Hans-Joachim Schlosser, and Guenther Schoen, all of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 25, 1989, Ser. No. 426,412
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1988, 3836404
Int. Cl.[5] G03F *7/32*
U.S. Cl. 430—331 **14 Claims**

1. A developing solvent for layers which are crosslinkable by photopolymerization and include a binder base don an elastomeric polymer, a photopolymerizable monomer compatible therewith and a photoinitiator, said developing solvent comprising a mixture of:
(a) about 55 to 90% by weight of at least one phenol ether represented by the general formula I



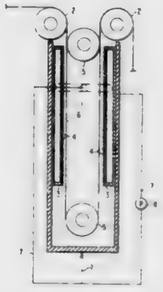
wherein
R^1 denotes (C_1–C_6)n-alkyl or iso-alkyl, cycloalkyl or (C_6–C_{12})-aryl and
R^2 denotes hydrogen, (C_1–C_6)n-alkyl or iso-alkyl or —OR^1; and
(b) a relatively high-boiling alcohol.

5,116,721

METHOD OF FORMING A COLOR IMAGE BY HIGH-SPEED DEVELOPMENT PROCESSING

Soichiro Yamamoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 7, 1990, Ser. No. 578,974
Claims priority, application Japan, Sep. 7, 1989, 1-232590
Int. Cl.[5] G03C *7/30;* **G03D** *3/04*
U.S. Cl. 430—351 **15 Claims**



1. A method of forming a color image comprising subjecting an imagewise exposed color photographic material to color development at a temperature of from30° C. to 50° C. and for a period of from 5 seconds to 20 seconds by immersing the photographic material into a color developing solution wherein the solution is applied to the surface of the photosensitive layer of the photographic material as a jet stream while the material is immersed in the color developing solution; wherein said color photographic material comprises a support having thereon at least two silver halide photographic emulsion layers, each of said layers comprising an emulsified dispersion of fine oleophilic grains containing at least one non-diffusive oil-soluble coupler capable of forming a dye by coupling with the oxidation product of an aromatic primary amine color developing agent and at least one high boiling point organic solvent, wherein silver halide grains in all of the silver halide photographic emulsion layers on the support comprise at least 95 mol % silver chloride, and the ratio of the silver halide mean grain size calculated for each photographic emulsion layer on the support to that calculated for any other photographic emulsion layer is from 0.77/1 to 1.3/1, and wherein the color photographic material has an alkali-swelled film pH value of at least 9.0.

5,116,722

SPECTRALLY SENSITIZED SILVER HALIDE EMULSIONS

Paul R. Callant, Edegem, and Jean-Marie O. Dewanckele, Drongen, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

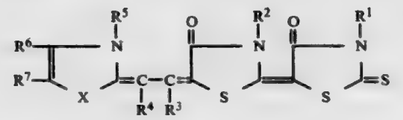
Filed Nov. 2, 1990, Ser. No. 608,262

Claims priority, application European Pat. Off., Nov. 14, 1989, 89202880

Int. Cl.[5] G03C *1/26*

U.S. Cl. 430—363 **6 Claims**

1. Method of forming a silver image comprising image-wise exposing by means of a light source emitting light in the wavelength range of from 600 to 690 nm a photographic material comprising a light-sensitive silver halide emulsion incorporating at least one trinuclear merocyanine dye spectrally sensitizing said emulsion for said wavelength range or for a substantial part of said wavelength range, and wet-processing the exposed photographic material with aqueous developing or activating solutions and fixing solutions, thereby dissolving away said dye from the resulting silver-image-containing material, wherein said dye corresponds to one of the following general formulae I and II:



(I)

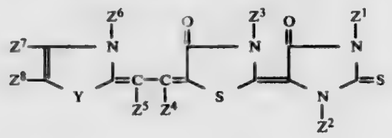
wherein:

X is —S— or —Se—,

at least 2 members of R^1, R^2, R^3, and R^4—but R^3 and R^4 not together—stand for an organic radical carrying a water-solubilizing group in free acid form, in salt form, or in latent form, and are same or different, the members of R^1, R^2, R^3, and R^4 that do not represent a said organic radical carrying a water-solubilizing group standing for hydrogen, an alkyl group, an alkenyl group, or an aryl group,

R^5 is an alkyl group, an alkenyl group, or an aryl group, and

R^6 and R^7 (same or different) each represent hydrogen, hydroxy, a halogen atom, an alkyl group, an alkenyl group, an alkoxy group, an alkylthio group, an arylthio group, an aryl group, an acyl group, an acyloxy group, an alkoxycarbonyl group, an alkylsulphonyl group, a carbamoyl group, a sulphamoyl group, carboxy, or cyano, or R^6 and R^7 together represent the atoms necessary to complete an annellated carbocyclic ring system, which may bear one or more substituents, which may be same or different and are chosen from the above substituents given to R^6 and R^7 individually, and



(II)

wherein:

Y is —S— or —Se—,

at least 2 members of Z^1, Z^2, Z^3, Z^4, Z^5, and Z^6—but Z^4 and Z^5 not together—stand for an organic radical carrying a water-solubilizing group in free acid form, in salt form or in latent form, and are same or different, the members of Z^1 to Z^6 that do not represent a said organic radical carrying a water-solubilizing group standing for hydrogen, an alkyl group, an alkenyl group, or an aryl group, and

Z^7 and Z^8 (same or different) have a significance as defined for R^6 and R^7 of general formula 1.

5,116,723

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Makoto Kajiwara, and Hideki Ono, both of Odawara, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 448,067, Dec. 8, 1989, abandoned. This application Aug. 15, 1991, Ser. No. 749,466

Claims priority, application Japan, Dec. 13, 1988, 63-312979

Int. Cl.[5] G03C *1/34, 7/30*

U.S. Cl. 430—611 **12 Claims**

1. A silver halide color photographic light-sensitive material comprising at least one photographic component layer including a silver halide emulsion layer wherein said silver halide emulsion layer contains silver halide grains having a silver chloride content of not less than 90 mol % and at least one of said photographic component layers contains a nitrogen-containing heterocyclic compound capable of forming a compound with silver ion having a solubility product of not more than 1×10^{-10}, and a sulfur- containing compound selected from the group consisting of organic compounds including a polysulfide linkage comprised of three or more sulfur atoms and organic compounds having a heterocyclic ring including at least two thioether linkages or at least one disulfide linkage.

5,116,724

PRODUCTS FOR SEPARATION APPLICABLE TO CELLS IN THE IMMUNOPURIFICATION FIELD

Michel Delaage; Jean-Louis Drocourt; Jöelle Hirn, and Andréas van Agthoven, all of Marseilles, France, assignors to Immunotech, Marseilles, France

Continuation of Ser. No. 787,968, Oct. 2, 1985, abandoned. This application Sep. 29, 1988, Ser. No. 251,119

Claims priority, application France, Oct. 4, 1984, 84 15434

Int. Cl.[5] C12N *1/00, 11/00; A61B 19/00*

U.S. Cl. 435—2 **8 Claims**

2. A method for the separation of selected cells or viruses from a biological medium, comprising:

contacting the biological medium containing cells or viruses to be separated with floatable particles coated with a substance capable of specifically binding to the cells or viruses to be separated, said particles having a size and density sufficient to permit the particles to float upon the surface of the biological medium in which it is to be used when bound to the cells or viruses to be extracted, said contacting being for a time sufficient to permit binding of the selected cells or viruses to the particles; and

removing the floating particles from the biological medium.

5,116,725

ASSAY FOR EPSTEIN-BARR VIRUS INFECTION WITH SOLID PHASE BOUND SYNTHETIC POLYPEPTIDES

John H. Vaughan, La Jolla; Dennis A. Carson, Del Mar; Gary Rhodes, Leucadia; Richard Houghten, Solana Beach; Richard S. Smith, Del Mar, all of Calif., and John E. Geltosky, Doylestown, Pa., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Continuation-in-part of Ser. No. 29,860, Mar. 24, 1987, abandoned, which is a continuation of Ser. No. 638,726, Aug. 8, 1984, Pat. No. 4,654,419. This application Nov. 4, 1987, Ser. No. 117,241

Int. Cl.[5] C12Q *1/70, 1/28; G01N 33/543; C07K 7/08*

U.S. Cl. 435—5 **2 Claims**

1. A method for determining the state of Epstein-Barr virus infection in a patient in about six minutes comprising the steps of:

(a) providing a solid phase matrix in the shape of a double-welled spoon, said spoon hvaing a generally flattened upper portion extending for about one-half the length of said spoon and adapted for being held by a user's fingers, the remaining, lower, one-half length portion of said spoon including a cylindrically-shaped portion that is narrower than said upper portion and extends about two-thirds the length of said lower portion, the lowest about one-third of said spoon containing a second flattened portion that is about the width of said upper portion and defines two dish-shaped depressions that are slightly smaller in diameter than the width of the second flattened portion, said two depressions being separated by a dam that extends at approximately right angles to said second flattened portion, said two depressions including a coating of a synthetic polypeptide containing about 15 to about 40 amino acid residues and having an amino acid residue sequence, written from left to right and in the direction from amino-terminus to carboxyterminus, that is selected from the group consisting of:

(i) H—Gly—Gly—Gly—Ala—Gly—Ala—Gly—Gly—Ala—Gly—Ala—Gly—Gly—Gly—Gly—Arg—OH

(ii) H—Lys—Gly—Thr—His—Gly—Gly—Thr—Gly—Ala—Gly—Ala—Gly—Ala—Gly—Gly—Ala—Gly—Ala—Gly—OH;

(iii) H—Ala—Gly—Ala—Gly—Gly—Gly—Ala—Gly—Gly—Ala—Gly—Ala—Gly—Gly—Gly—Ala—Gly—Gly—Ala—Gly—OH;

(iv) H—Gly—Gly—Ala—Gly—Gly—Ala—Gly—Gly—Ala—Gly—Ala—Gly—Gly—Gly—Ala—Gly—OH;

(v) H—Gly—Gly—Ala—Gly—Ala—Gly—Gly—Ala—Gly—Ala—Gly—Gly—Ala—Gly—Ala—Gly—Gly—Ala—Gly—Ala—Gly—Gly—OH;

(vi) H—Gly—Ala—Gly—Gly—Ala—Gly—Ala—Gly—Gly—Gly—Ala—Gly—Gly—Ala—Gly—Gly—OH;

(vii) H—Gly—Gly—Gly—Ala—Gly—Gly—Ala—Gly—Ala—Gly—Gly—Gly—Ala—Gly—Gly—Ala—Gly—OH;

(viii) H—Ala—Gly—Gly—Ala—Gly—Ala—Gly—Gly—Gly—Ala—Gly—Gly—Ala—Gly—OH and

the pharmaceutically acceptable salts thereof; said synthetic polypeptide-coated depressions constituting adjacent solid phase supports;

(b) admixing an aliquot of a human body sample to be assayed with each of said solid supports in liquid medium to form first and second solid/liquid phase admixtures;

(c) maintaining said two solid/liquid phase admixtures for about two minutes;

(d) separating the solid and liquid phase of each of said solid/liquid phase admixtures to provide two separated solid phase-bound immunoreactants;

(e) admixing anit-human IgG antibodies having a linked indicating means to one of the two separated solid phase-bound immunoreactants of step (d) and admixing anti-human IgM antibodies having a linked indicating means to the other of said two separated solid phase-bound immunoreactants to form two second solid/liquid phase admixtures;

(f) maintaining said two solid/liquid phase admixtures for about two minutes;

(g) separating the solid and liquid phases, and washing the separated solid phases;

(h) admixing hydrogen peroxide and a color-forming dye precursor substantially simultaneously with each of said solid phases to form two color-forming solid/liquid reaction admixtures;

(i) stopping said two color-forming reactants after about two minutes; and

(j) comparing the color intensity of the resulting two depressions, a more intense color in the depression containing anti-human IgG antibodies indicating that the patient is in convalescence, a more intense color in the depression containing anti-human IgM antibodies indicating that the patient is in the acute phase, and colors of about the same intensity indicating acute phase passing into convalescence.

5,116,726

METHODS FOR REMOVAL OF DETERGENTS FROM ANALYTES

Arthur C. Switchenko, Mountain View; Nurith Kurn, Palo Alto; Christian Neukom, Mountain View; Marcel Pirio; Donald E. Berger, Jr., both of San Jose, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 25, 1988, Ser. No. 223,501

Int. Cl.[5] C12Q *1/70*

U.S. Cl. 435—5 **52 Claims**

1. A method for increasing the hydrophilic properties of a component of a biological material, selected from the group consisting of bacteria, virus, mitochondria, nuclei, and cell membranes for the purpose of enhancing the water solubility and the detectability of said component, which method comprises:

(a) contacting said biological material in an aqueous medium with a compound having detergent properties, said compound having the structural formula L—P wherein L is a lipophilic portion having a modifiable group, and P is a polar portion, and wherein:

L is Y—A—Z: wherein Y is alkyl, alkenyl, or alkynyl, having from 2 to 12 carbon atoms; or aralkyl, aralkenyl or aralkynyl, having from 7 to 12 carbon atoms; A is a group modifiable by the reagent of step (b) and is selected from the group consisting of —S—; —Se—; —CHX— wherein X is Cl, Br, or I; —O—CH=CH—; —S—CH=CH— and —S—S—; and Z is saturated or unsaturated alkylene having from 1 to 12 carbon atoms or saturated or unsaturated aralkylene having from 7 to 10 carbon atoms whereupon the hydrophilic properties of said material are increased and the component is extracted; and then

(b) adding to said medium a modifying reagent capable of chemically modifying said modifiable group, whereupon said detergent properties are modified and the hydrophilic properties of said biological material are reduced,

said method resulting in an enhancement of the water solubility and detectability of said component.

5,116,727

HYBRIDIZATION METHOD AND COMPOSITION WITH ALTERNATING POLYSACCHARIDE OF SULFATED N-ACETYLGALACTOSAMINE

David J. Brigati, Edmond, Okla., assignor to Iniziative Maritime 1991, S.r.L., Turin, Italy

Filed Aug. 31, 1989, Ser. No. 404,990

Int. Cl.[5] C12Q *1/68*

U.S. Cl. 435—6 **14 Claims**

1. A method for increasing the rate of hybridization between two complementary polynucleotide segments in an aqueous medium which comprises the step of forming an aqueous medium containing the two complementary polynucleotide segments and a water-soluble heteropolysaccharide having an alternating structure of sulfated N-acetylgalactosamine and an unsulfated monosaccharide, the water-soluble heteropolysaccharide being of sufficient molecular weight and concentration to produce an observable increase in the rate of hybridization.

5,116,728

REAGENTS FOR CO_2 DETECTION

Fredric H. Crowther, Chadds Ford, Pa., and Wai T. Law, Sewell, N.J., assignors to Em Diagnostic Systems, Incorporated, Gibbstown, N.J.

Filed Jul. 20, 1990, Ser. No. 554,512

Int. Cl.[5] C12Q *1/54, 1/58, 1/50, 1/26*

U.S. Cl. 435—14 **18 Claims**

1. A method of stabilizing a diagnostic reagent for the detection of CO_2 in a solution containing said diagnostic reagent, which diagnostic reagent requires a coenzyme for activity, and

wherein the reagent initially comprises at least two components,

a first component (i) containing

a first diagnostic substrate for a first diagnostic enzyme,

a reduced form of the coenzyme, and

optionally, a buffer, and

a second component (ii) containing diagnostically effective amount of

said first diagnostic enzyme and/or

a second diagnostic enzyme;

comprising adding to said first component a stabilizer, which comprises

(a) a stabilizer enzyme which reduces the oxidized form of the coenzyme;

(b) a substrate for the stabilizer enzyme; wherein the amount of (a) or (b) in the solution is rate-limiting and sufficiently low to reduce the oxidized coenzyme at a rate which is less than 10% of the lowest expected diagnostically significant rate of oxidation of the diagnostic reaction;

(c) optionally, an amount of the oxidized form of the coenzyme sufficient to provide equilibrium conditions for the constant amount of reduced coenzyme and the amount of stabilizer enzyme present in the stabilized diagnostic reagent,

(d) a rate-limiting and thereby CO_2-stabilizing amount of one of said first or second diagnostic enzymes, and

(e) a non-rate-limiting amount of the other of said diagnostic enzymes,

wherein the rate-limiting amount of (d) is sufficiently low to remove dissolved CO_2 from the solution at a rate which is less than 10% of the lowest expected diagnostically significant rate of removal of CO_2 of the diagnostic reaction.

5,116,729

STABILIZATION OF OXIDASE ENZYME-BASED TEST STRIPS

Ibrahim A. Ismail, South Bend, and Wen H. Wu, Elkhart, both of Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Mar. 10, 1989, Ser. No. 321,724

Int. Cl.[5] C12Q *1/26, 1/54, 1/00;* **C12N** *9/96*

U.S. Cl. 435—14 **13 Claims**

1. An enzyme reagent composition for incorporation into a dry phase test strip capable of exhibiting a sufficient color transition upon contacting an analyte determined from the group consisting of glucose, cholesterol, uric acid and lower alcohols to show the presence or concentration of the analyte being determined in a liquid test sample and capable of maintaining enzymatic activity over an extended time period comprising:

an oxidase enzyme for the analyte being determined; an oxidizable chromogen; peroxidase; a buffer capable of buffering the enzyme reagent composition to a pH in the range of from about 4 to about 7; and a hydrazine selected from the group consisting of hydrazine monohydrate, (carboxymethyl)trimethylammonium chloride hydrazide, 1-(carboxymethyl)-pyridinium chloride hydrazide, 2-hydrazine-2-imidazoline hydrobromide and 2-furoic acid hydrazide.

5,116,730

AMINO ACID SUBSTITUTED 4-AMINOPHENAZONES FOR MEASURING ENZYME ACTIVITY

Joseph D. Artiss, Windsor, Ontario, Canada; Jill M. Bensie, Ferndale; Bennie Zak, West Bloomfield, both of Mich., and Daniel S. Raden, Hawthorn Woods, Ill., assignors to Board of Governors of Wayne State University, Detroit, Mich.

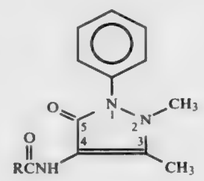
Filed Jun. 15, 1988, Ser. No. 206,835

Int. Cl.[5] C12Q *1/48, 1/37, 1/26*

U.S. Cl. 435—15 **18 Claims**

1. In a method for detecting an enzyme by providing an amino acid coupled to an amino dye intermediate wherein the amino acid is cleaved by the enzyme to form the dye intermediate which is then coupled with a second dye intermediate to form a chromogen the improvement which comprises:

(a) providing a compound of the formula:

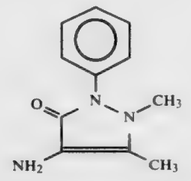


wherein



is an amino acid group recognized by the enzyme and containing between 2 and 6 carbon atoms in an aqueous solution with an acceptor for an amino acid carbonyl group produced by the reaction with the enzyme;

(b) reacting the compound with the enzyme to form a 4-amino dye intermediate of the formula:



and the amino acid carbonyl group reacted with the acceptor; and

(c) coupling the 4-amino dye intermediate with a second dye intermediate in the presence of an oxidizing agent to form a chromogen dye complex which is a reaction product of the 4-amino group of the 4-amino dye intermediate with the second dye intermediate.

5,116,731

PROCESS FOR THE DETECTION OF AN ALLERGY OR AN ANTI-ALLERGIC SUBSTANCE

Otto-Henning Wilhelms, Weinheim-Rittenweier, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 807,259, Dec. 10, 1985, abandoned. This application May 9, 1989, Ser. No. 349,983

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446714

Int. Cl.[5] C12Q *1/34*

U.S. Cl. 435—18 **26 Claims**

1. A process for the detection of an allergy produced by foreign or self-antigens wherein an allergy-specific protease is liberated from mast cells and basophils in response to a degranulation factor specific for said allergy comprising

incubating a suspension containing 10^9 to 10^{10} human leukocytes per liter with said allergy-specific degranulation stimulation factor for a period of time sufficient to liberate said allergy-specific protease wherein the incubation is carried out in an aqueous medium containing a buffer with a pH of from 6.3 to 9, and 0.5 to 5×10^{-3} mol/l of calcium ions and 10^{-4} to 10^{-3} mol/l of a chromogen in isotonic solution wherein said chromogen specifically reacts with the liberated allergy-specific protease to form a chromophor,

determining the liberation of allergy-specific protease by kinetically measuring formation of said chromophor, and detecting thereby the presence of said allergy.

5,116,732

TETRAZOLIUM HALIDE COMPOUNDS AND METHODS

David J. Brigati, Edmond, Okla.; Sreeramulu Nagubandi, New City, N.Y., and Massoud Arvanaghi, Hackensack, N.J., assignors to Fisher Scientific Co., Pittsburgh, Pa.

Filed Sep. 11, 1989, Ser. No. 405,754

Int. Cl.[5] C12Q *1/32, 1/00;* **C02D** *257/04, 257/10*

U.S. Cl. 435—26 **16 Claims**

1. A compound of the formula DNB-TZ(P2)(P3) X, wherein TZ is a tetrazolium ring, DNB is 5-(2,4-dinitrophenyl), X is halide, P2 is 2-halophenyl and P_3 is 3-nitrophenyl, 3-dinitrophenyl or 3-phenyl.

7. A method for staining tissue which comprises:

a) contacting tissue with the tetrazolium compound of claim 1, and

b) reducing the tetrazolium compound to formazan to stain the tissue.

5,116,733

METHOD OF ASSAYING TARGET SUBSTANCE

Masahiko Yamasaki, Tokyo, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Aug. 22, 1989, Ser. No. 396,681

Claims priority, application Japan, Aug. 22, 1988, 63-208749

The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.

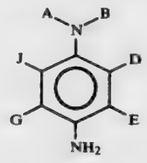
Int. Cl.[5] C12Q *1/78, 1/68, 1/00;* **G01N** *33/53*

U.S. Cl. 435—28 **1 Claim**

1. A method of assaying a target substance selected from proteins, nucleic acids, hormones, lipids, complex carbohydrates, glycolipids, polysaccharides, enzymes, vitamins, anitgens and antibodies, said method comprising the steps of:

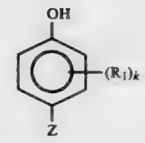
fixing on a hydrophobic polyvinylidene fluoride membrane a complex of the target substance to be assayed and a labelled substance which specifically reacts with the target substance, said labelled substance being labelled with peroxidase;

contacting hydrogen peroxide, an aromatic primary amine compound and a phenolic compound with the peroxidase on the membrane to generate and deposit color on the hydrophobic membrane, said aromatic primary amine being a p-phenylene diamine of the formula I:



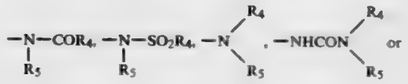
I

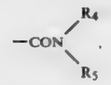
wherein A and B independently represent hydrogen or alkyl, or A and B cooperatively form a heterocyclic ring with the nitrogen; D, E, G and J independently represent hydrogen, halogen, hydroxy, amino, alkoxy, acylamide, arylsulfonamide, alkylsulfonamide or alkyl, and said phenolic compound being represented by the formula II:



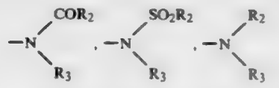
II

wherein R_1 represents an aliphatic carbohydrate residue, an alicylcic residue, a heterocyclic residue, an aryl group, —SCN, —OR_4, —$OCOR_4$, —OSO_2R_4, —SR_4,—$OCONHR_4$, —OSO_2NHR_4,





wherein R_4 and R_5 independently represent hydrogen, an aliphatic carbohydrate residue, an alicyclic residue, an aryl group or a heterocyclic residue, Z represents hydrogen, a detaching group selected from —OR_2, —$OCOR_2$, —OSO_2R_2, —SR_2,—$OCONHR_2$, —OSO_2NHR_2,



and —SCN, where R_2 and R_3 are the same or different and represent hydrogen, an aliphatic carbohydrate residue, an alicyclic residue, an aryl group or a heterocyclic residue, or a detaching halogen atom and k represents an integer of 1 to 4; and

measuring the color deposited on the hydrophobic membrane.

5,116,734

HIGHLY SENSITIVE METHOD FOR DETECTING PEROXIDASE

Thomas W. Higgs, Cockeysville, and Floyd E. Taub, Silver Spring, both of Md., assignors to Digene Diagnostics, Inc., Silver Spring, Md.

Continuation of Ser. No. 402,448, Sep. 1, 1989, abandoned. This application Oct. 25, 1991, Ser. No. 782,918

Int. Cl.[5] C12Q *1/28, 1/68, 1/00;* **C01N** *33/566*

U.S. Cl. 435—28 **15 Claims**

1. A process for detecting the presence of an oxidative catalyst in a sample containing a biological substance, comprising in the order recited:

(a) treating the sample with a chromogenic substrate of the oxidative catalyst;

(b) treating the sample with a transition metal;

(c) washing the sample in a low pH phthalic acid solution;

(d) treating the sample with a gold salt;

(e) treating the sample with a silver salt in the presence of a reducing substance; and

(f) detecting the presence or absence of a precipitate, whereby the presence of a precipitate indicates the presence of said catalyst.

5,116,735
DIAGNOSING PERIODONTAL DISEASE BY MEASURING PROTEOLYTIC ACTIVITY OF PERIODONTOPATHOGENIC BACTERIA

Walter J. Loesche, Ann Arbor, Mich., assignor to The University of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 385,977, Jul. 26, 1989, abandoned, which is a continuation of Ser. No. 56,596, Jun. 1, 1987, abandoned, which is a continuation-in-part of Ser. No. 740,097, May 31, 1985, abandoned. This application Dec. 24, 1990, Ser. No. 634,924

Int. Cl.[5] C12Q *1/04, 1/02;* **G01N** *33/48;* **C12N** *1/20*

U.S. Cl. 435—34 **27 Claims**

1. A method of diagnosing periodontal disease, the method comprising the steps of:

(a) obtaining a sample of bacterial flora containing a multiplicity of microorganisms from the oral cavity of a mammal;

(b) determining whether the total number of microorganisms in said multiplicity of microorganisms exceeds about 1,000,000 by subjecting said sample of bacterial flora to a nonspecific chromogenic test substance hydrolyzable by enzymatic activity of said multiplicity of microorganisms in said sample such that a chromophore will be released and observable provided that there are greater than about 1,000,000 of said microorganisms in said sample; and

(c) measuring the proteolytic activity of said bacterial flora, in response to a positive indication in said step of determining, with a chromogenic test substance specific to a proteolytic enzyme produced by suspected periodontiopathogenic bacteria in said bacterial flora, said measurement being characterized by a positive indication in response to an elevated proportion of said periodontiopathogenic bacteria with respect to the total number of microorganisms in said multiplicity of microorganisms, providing that said total number of microorganisms is greater than about 1,000,000, said elevated proportion indicates a diagnosis of periodontal disease.

5,116,736
METHOD FOR THE QUANTITATIVE DETERMINATION OF MICRO-ORGANISMS OR PYROGENS

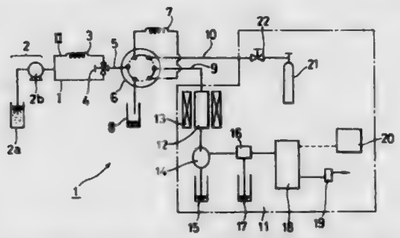
Shu Tahara, Kyoto; Nariyoshi Kawabata, Osaka; Akira Kojima, Kyoto, and Shigeru Fukushima, Ootsu, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Nov. 21, 1988, Ser. No. 273,945

Claims priority, application Japan, Feb. 19, 1988, 63-38341; Jun. 30, 1988, 63-164139

Int. Cl.[5] G01N *33/487, 31/12*

U.S. Cl. 435—39 **8 Claims**



1. A method for the quantitative determination of micro-organisms or pyrogens which comprises introducing a first sample of a prescribed amount of a test liquor containing micro-organisms or pyrogens into a total carbon analyzer to organisms or pyrogens into a total carbon analyzer to obtain a total carbon value A, while removing micro-organisms or pyrogens from a second sample of the same said prescribed amount of the same test liquor and introducing the resultant into a total carbon analyzer to obtain a total carbon value B, subtracting the total carbon value B from the total carbon value A, and determining micro-organisms or pyrogens based upon the resulting value.

5,116,737
METHOD FOR GROWING ACID-PRODUCING BACTERIA

David R. McCoy, Muskego, Wis., assignor to Chr. Hansen's Laboratory, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 323,318, Mar. 14, 1989, abandoned. This application Jul. 27, 1990, Ser. No. 559,185

Int. Cl.[5] C12P *39/00, 1/38;* **A23C** *9/12;* **C12R** *1/46*

U.S. Cl. 435—42 **8 Claims**

1. A method of producing a dairy starter culture, from lactic-acid producing bacteria comprising the steps of:

a) preparing a starter medium comprising a dry mixture of urea and nutrients for the lactic acid-producing bacteria to be cultured, said medium containing urea in an amount of from 1 to 20 percent by weight of the dry medium;

b) mixing said started medium with water to form a liquid medium in which the bacteria are to be cultured, said liquid medium containing from 0.1 to 2.0 weight percent urea;

c) inoculating said liquid medium with the lactic-acid producing bacteria, said bacteria including a urease-producing strain selected from stains of *Streptococcus thermophilus* and Bifidobacterium; and

d) culturing said bacteria in the liquid urea-containing medium with the production of lactic acid and urease, the urea being hydrolyzed to ammonia by the urease and reacting with the lactic acid to offset the pH drop which would otherwise occur, the liquid medium during the culturing being maintained at a pH above 5.0 by means of said urease hydrolysis of urea to ammonia.

5,116,738
DNA SEQUENCES ENCODING

Elizabeth A. Wang, Carlisle; John M. Wozney, Hudson, and Vicki Rosen, Brookline, all of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Continuation of Ser. No. 179,197, Apr. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 28,285, Mar. 20, 1987, abandoned, and Ser. No. 943,332, Dec. 17, 1986, abandoned, and Ser. No. 880,776, Jul. 1, 1986, abandoned. This application Apr. 26, 1991, Ser. No. 692,827

Claim priority, application United States, Jun. 30, 1987, PCT/US87/01537

Int. Cl.[5] C12P *21/02, 19/34;* **C12N** *15/00, 7/00, 5/00, 1/16, 1/18, 15/70, 15/85;* **C07H** *15/12;* **C07K** *3/00*

U.S. Cl. 435—69.1 **18 Claims**

1. An isolated DNA sequence encoding an osteoinductive protein said DNA sequence comprising a coding sequence selected from the group consisting of

(a) nucleostide #414 through nucleotide #746 of FIG. IA and #305 through nucleotide #493 of FIG. IB,

(b) nucleotide #321 through nucleotide #1736 of FIG. II,

(c) naturally occurring allelic sequences and equivalent degenerative codon sequences of (a) and (b); and

(d) sequences which

(1) hybridize to any of sequences (a) and (b) or (c) under stringent hybridization conditions; and

(2)encode a protein characterized by the ability to induce the formation of bone and/or cartilage.

5. A vector comprising a DNA sequence of claim 1 in operative association with an expression control sequence for said DNA sequence.

8. A host cell transformed with the vector of claim 5 wherein said host cell is selected from the group consisting of mammalian, bacterial, yeast and insect cells.

13. A method of producing an osteoinductive protein, said method comprising the steps of

(a) culturing in a suitable culture medium said transformed host cell of claim 8; and

(b) isolating and purifying said osteoinductive protein from said culture medium.

5,116,739
PROCESS FOR THE PRODUCTION OF HUMAN APOLIPOPROTEIN E, AND TRANSFORMED HOSTS AND PRODUCTS THEREOF

Yutaka Teranishi, Sagamihara; Nobuhiko Takamatsu; Yasushi Matsui, both of Yokohama; Masako Kimura, Nakano; Yasuko Ikeda, Sagamihara, and Yuuki Morimoto, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation of Ser. No. 754,050, Jul. 11, 1985, abandoned. This application Dec. 22, 1988, Ser. No. 288,470

Claims priority, application Japan, Oct. 16, 1984, 59-216987; Jun. 11, 1985, 60-126989

Int. Cl.[5] C12P *21/02;* **C12N** *5/06, 15/12*

U.S. Cl. 435—69.6 **4 Claims**

1. A method for producing human apolipoprotein E which comprises the steps of (i) providing a culture of CHO cells transformed with a plasmid which contains the human ApoE gene and the SV40 early promoter, wherein expression of human apolipoprotein E by said CHO cells is driven by said promoter, and (ii) isolating from said culture human apolipoprotein E, wherein said CHO cells are obtained from clones that satisfy a yield level for apolipoprotein E of about 10 mg/l/day at a cell density of 10^6/ml.

5,116,740
METHOD FOR PRODUCING NATIVE HIV GP160

Mangalasseril G. Sarngadharan, McLean, Va., and Vaniambadi S. Kaiyanaraman, Germantown, Md., assignors to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 232,859, Aug. 16, 1988, abandoned. This application Jun. 7, 1989, Ser. No. 362,548

Int. Cl.[5] C12N *7/00*

U.S. Cl. 435—70.4 **2 Claims**

1. A method for the production of native human immunodeficiency virus gp160 comprising:

infecting cells from a HUT78 T-cell line with HTLV-III_{451};

selecting infected HUT78 cells that produce native gp160;

incubating said gp160 producing cell line in serum-free medium under conditions that promote cell growth; and

isolating native gp160 from said medium.

5,116,741
BIOSYNTHETIC USES OF THERMOSTABLE PROTEASES

Philip N. Bryan, Silver Spring; Michael W. Pantoliano, Germantown; Michele L. Rollence, Damascus, all of Md., and Chi H. Wong, College Station, Tex., assignors to Genex Corporation, Gaithersburg, Md.

Continuation-in-part of Ser. No. 180,756, Apr. 12, 1988, Pat. No. 4,990,452, which is a continuation-in-part of Ser. No. 180,757, Apr. 12, 1988, which is a continuation-in-part of Ser. No. 34,964, Apr. 6, 1987, Pat. No. 4,908,773, and a continuation-in-part of Ser. No. 34,965, Apr. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 828,545, Feb. 12, 1986, abandoned. This application Jan. 26, 1989, Ser. No. 301,683

Int. Cl.[5] C12P *19/38, 19/40*

U.S. Cl. 435—87 **3 Claims**

1. A method for the formation of a 5'-acylnucleoside, comprising condensing an enol ester with the sugar residue of a nucleoside in a reaction medium comprising an organic solvent, wherein the reaction is catalyzed by subtilisin mutein 8350 which is stable relative to native subtilisin in said reaction medium.

5,116,742
RNA RIBOZYME RESTRICTION ENDORIBONUCLEASES AND METHODS

Thomas R. Cech; Felicia L. Murphy, both of Boulder; Arthur J. Zaug, Louisville, and Cheryl Grosshans, Denver, all of Colo., assignors to University Patents, Inc., Westport, Conn.

Continuation-in-part of Ser. No. 937,327, Dec. 3, 1986, Pat. No. 4,987,071. This application Mar. 24, 1989, Ser. No. 328,503

The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.

Int. Cl.[5] C12P *19/34;* **C12N** *15/00, 9/22*

U.S. Cl. 435—91 **22 Claims**

1. A method for preventing non-complementary cleavage by an enzymatic RNA molecule of a separate RNA molecule, comprising the steps of:

providing an enzymatic RNA molecule having an RNA substrate-binding site comprising a first nucleotide sequence and an endonuclease activity independent of any protein in vitro, said endonuclease activity being active at or at a location proximal to a second nucleotide sequence in the separate RNA molecule complementary to said first nucleotide sequence, and

contacting said enzymatic RNA molecule and the separate RNA molecule in the presence of a denaturing agent to allow said endonuclease activity to cause specific cleavage of said separate RNA molecule at or proximal to said second nucleotide sequence but not at any other nucleotide sequence which is not complementary to said first nucleotide sequence.

5,116,743
L-ALANINE PRODUCTION WITH TWO MICROORGANISMS HAVING FUMARASE INACTIVITY IN A SINGLE REACTION TANK

Makoto Goto; Terukazu Nara; Masato Terasawa, and Hideaki Yukawa, all of Ami, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 474,508, Feb. 2, 1990, abandoned. This application Nov. 12, 1991, Ser. No. 790,063

Claims priority, application Japan, Feb. 6, 1989, 1-27044; Mar. 16, 1989, 1-62089; Apr. 7, 1989, 1-88267

Int. Cl.[5] C12P *13/06, 39/00;* **C12N** *1/00, 1/20*

U.S. Cl. 435—116 **13 Claims**

1. A process for producing L-alanine by reacting, in a single reaction tank, in an aqueous reaction mixture having a pH of 6 to 10 and containing at least one alpha-keto acid, and at a temperature of 40° C. to 50° C. fumaric acid or a salt thereof with ammonia or ammonium ions in the presence of cells of a first microorganism and cells of a second microorganism, and thereby obtaining L-alanine,

wherein:

(i) said cells of said first microorganism contain aspartase but no fumarase activity due to having been subjected to a heating treatment under alkaline conditions at a temperature of from 40° C. to 60° C. in the presence of L-aspartic acid and ammonium ions;

wherein said first microorganism cells are *Brevibacterium flavum* MJ-233 (FERM BP-1497), *Brevibacterium flavum* MJ-233-AB-41 (FERM BP-1498), *Brevibacterium ammoniagenes* ATCC 6872 or *Corynebacterium glutamicum* ATCC 31830; and

(ii) said cells of said second microorganism contain aspartate beta-decarboxylase but no fumarase activity due to having been subjected to a heating treatment, at a pH of 6.5 to 7.5, in an aqueous solvent containing pyridoxal phosphate or an alpha-keto acid, or both, or a salt thereof, and at a temperature of over 40° C. and up to 60° C.;

wherein said second microorganism cells are *Pseudomonas dacunhae* ATCC 21192, *Pseudomonas putida* ATCC 21812 or *Pseudomonas fluorescens* IFO 3081.

5,116,744
MICROBIAL CYANIDE CONVERTING ENZYMES, THEIR PRODUCTION AND USE
Kjeld Ingvorsen; Sven E. Godtfredsen, and Birgitte Hojer-Pedersen, all of Vaerloese, Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark
Continuation of Ser. No. 167,720, Mar. 14, 1988, abandoned. This application Sep. 19, 1990, Ser. No. 595,684
Claims priority, application Denmark, Mar. 12, 1987, 1283/87
Int. Cl.[5] C12P *13/00*; C12N *9/78*
U.S. Cl. 435—128 20 Claims

1. Cyanidase, a cyanide converting enzyme of bacterial origin which converts inorganic cyanide to formic acid and ammonia, said enzyme being characterized by enzymatic activity in the presence of sodium cyanide at a concentration above about 0.1M and by an enzymatic capability to reduce inorganic cyanide to below about 1 ppm.

5,116,745
PROCESS FOR PREPARING 2-ACYLGLYCERIDES OR 1,2-DIACYL DIGLYCERIDES OR 2,3-DIACYL DIGLYCERIDES
Adam W. Mazur; George D. Hiler, II, and Magda El-Nokaly, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 19, 1990, Ser. No. 511,115
Int. Cl.[5] C12P *7/64, 7/62*; C12N *9/20*
U.S. Cl. 435—134 14 Claims

1. A process for preparing 2-acylglycerides comprising:
(A) mixing the following ingredients for at least one hour at a temperature of from 20° C. to 50° C.
(1) from 15% to 25% of an aqueous buffer having a pH of from 4 to 8 containing a catalytic amount of 1,3-specific lipase enzyme;
(2) from 20% to 60% of a water immiscible hydrocarbon;
(3) from 3% to 40% of a triglyceride;
(4) from 10% to 25% of a lower alkyl alcohol selected from the group consisting of methanol, 1-butanol, 2-butanol, 2-methyl-1-propanol, 3-methyl-1-propanol, and primary alkyl alcohols having 5 carbon atoms
to form 2-acylglycerides;
(B) separating the water immiscible hydrocarbon containing the 2-acylglyceride.

5,116,746
CELLULASE-FREE ENDO-XYLANASE ENZYME OF USE IN PULP DELIGNIFICATION
Roger L. Bernier, Mississauga; Dieter Kluepfel, Montreal; Rolf Morosoli, Ville St-Laurent, and Francois Shareck, Dollard-des-Ormeaux, all of Canada, assignors to Institut Armand Frappier, Quebec, Canada
Continuation of Ser. No. 164,472, Mar. 4, 1988, abandoned. This application Sep. 23, 1991, Ser. No. 764,083
Int. Cl.[5] D21C *3/00*; C12N *1/21, 15/52, 15/76*
U.S. Cl. 435—172.3 27 Claims

1. A method of hydrolyzing the β-1,4-D-xylosidic linkage within a lignocellulosic material having xylanase hydrolyzable β-1,4-D-xylosidic linkages, said method comprising subjecting said material to said hydrolysis by a substantially cellulase-free xylanase obtained from the recombinant microorganism produced by the introduction of a hybrid plasmid into a host microorganism mutant strain of the strain *Streptomyces, lividans* said strain characterized by it having cellulase-negative activity, said hybrid plasmid being constructed by the insertion of the xylanase (xln) gene obtained from a xylanase (xln) gene-containing microorganism of the genus Streptomyces into a vector plasmid obtained from a microorganism of the genus Streptomyces.

5,116,747
IMMOBILIZATION OF BIOLOGICALLY ACTIVE MATERIAL IN CAPSULES PREPARED FROM A WATER-SOLUBLE POLYMER AND CHITOSAN ACETATE
Murray Moo-Young; Niels C. Bols, both of Waterloo; Sandra E. Overgaard, Perth, and Jeno M. Scharer, Waterloo, all of Canada, assignors to University of Waterloo, Waterloo, Canada
Filed Aug. 11, 1989, Ser. No. 392,351
Int. Cl.[5] C12N *11/10, 11/02*; C12P *21/08*
U.S. Cl. 435—178 23 Claims

1. A process for immobilizing, in the form of capsules, biologically-active material, with retained viability, which comprises:
suspending said biologically-active materials in aqueous culture medium containing a water-soluble polymer having multiple anionic reactive groups that are readily ionized,
forming the resulting suspension into droplets,
gelling the droplets to form water-insoluble temporary capsules by forming the calcium salt of said water-soluble polymer,
coating the surface of the temporary capsules with chitosan acetate, and
adding a sequestering agent for the calcium ions to effect ionotropic gelation of the water-soluble polymer and chitosan acetate to form a semi-permeable membrane around each capsule.

5,116,748
PROCESS FOR THE PRODUCTION OF L-ALANINE DEHYDROGENASE FROM 78-3 FERM BP-2517
Mamoru Takahashi; Shinobu Nagasawa; Shigeru Ikuta, and Kazuo Matsuura, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan
Filed Sep. 26, 1989, Ser. No. 413,431
Claims priority, application Japan, Sep. 27, 1988, 63-241537
Int. Cl.[5] C12N *9/02, 1/12*
U.S. Cl. 435—189 1 Claim

1. A process for the production of L-alanine dehydrogenase which comprises culturing Sporolactobacillus sp. 78-3 FERM BP-2517 in a nutrient medium and recovering said L-alanine dehydrogenase.

5,116,749
GAMMA-GLUTAMYLCYSTEINE TRANSFERASE
Erwin Grill; Susanne Loffler; Ernst-Ludwig Winnacker, and Meinhard H. Zenk, all of Munchen, Fed. Rep. of Germany, assignors to Consortium fur Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany
Filed Jun. 30, 1989, Ser. No. 373,400
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825677
Int. Cl.[5] C12N *9/10, 11/00*
U.S. Cl. 435—193 3 Claims

1. A substantially purified γ-Glutamylcysteine transferase having the following characteristics comprising:
a) molecular weight 95,000±10%, determined by gel filtration; enzyme in the form of a dimeric protein (monomer 47,000±10%);
b) optimum temperature 45° C.;
c) optimun pH=8.0;
d) K_M at 30° C., and pH=7.8, 6.8 mM for glutathione and 1.0 mM for glutathione S-biman;
e) complete inhibition in the presence of ethylenediaminetetraacetic acid (EDTA), reversible after removal of EDTA and addition of heavy metal ions; and
f) cofactors being heavy metal ions.

5,116,750
SELECTABLE FUSION PROTEIN HAVING AMINOGLYCOSIDE PHOSPHOTRANSFERASE ACTIVITY
David H. Gelfand; Frances C. Lawyer, both of Oakland, and Susanne Stoffel, El Cerrito, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.
Division of Ser. No. 602,118, Apr. 19, 1984, Pat. No. 4,784,949.
This application Jul. 22, 1988, Ser. No. 223,430
Int. Cl.[5] C12N *9/10, 9/04, 15/00*
U.S. Cl. 435—193 7 Claims

1. A fusion protein which comprises an N-terminal sequence comprising the N-terminal amino acid sequence of a desired protein and a C-terminal sequence comprising modified truncated aminoglycoside phosphotransferase, wherein said modified truncated aminoglycoside phosphotransferase is missing the amino acid encoded by the codons 2–9 or 2–20.

5,116,751
PROCESS FOR PRODUCING PEROXIDASE
Yoshifumi Shinmen, Kyoto; Sumio Asami; Norihide Amano, both of Osaka; Teruo Amachi, Hyogo, and Hajime Yoshizumi, Osaka, all of Japan, assignors to Suntory Limited, Osaka, Japan
Continuation of Ser. No. 377,759, Jul. 10, 1989, abandoned, which is a continuation of Ser. No. 91,342, Aug. 11, 1987, abandoned, which is a continuation of Ser. No. 791,439, Oct. 25, 1985, abandoned. This application Jan. 22, 1991, Ser. No. 643,166
Claims priority, application Japan, Oct. 26, 1984, 59-225485
Int. Cl.[5] C12N *9/08*
U.S. Cl. 435—194 5 Claims

1. A process for producing a peroxidase comprising culturing a peroxidase-producing microorganism which is selected from the group consisting of *Coprinus cinereus* f. microsporous IFO 8371, *Coprinus cinereus* IFO 30114, *Coprinus cinereus* IFO 30627, *Coprinus cinereus* IFO 30628 and *Coprinus cinereus* IFO 31333 in a liquid medium and recovering the peroxidase secreted into the liquid medium.

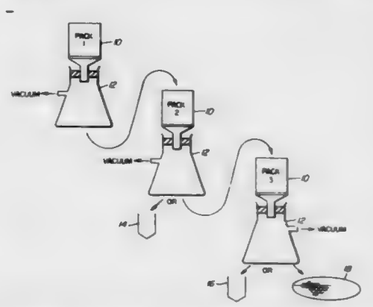
5,116,752
PROCESS FOR PREPARING NEURAMINIDASE
Tsunetake Sugimori, Uji; Yoji Tsukada, Kyoto, and Yasuhiro Ohta, Uji, all of Japan, assignors to Marukin Shoyu Co., Ltd., Kagawa, Japan
Continuation of Ser. No. 171,869, filed as PCT/JP87/00386, Jun. 12, 1987, abandoned. This application Jan. 15, 1991, Ser.No. 640,548
Claims priority, application Japan, Jun. 16, 1986, 61-139896
Int. Cl.[5] C12N *9/24, 1/20*
U.S. Cl. 435—200 2 Claims

1. A process for preparing neuraminidase comprising culturing *Arthrobacter ureafaciens* M 1057 under conditions suitable for production of meuraminidase, and recovering neuraminidase from the resulting culture.

5,116,753
MAINTENANCE OF PANCREATIC ISLETS
Gillian M. Beattie, Poway; Douglas A. Lappi, Del Mar; J. Andrew Baird, San Diego, and Alberto Hayek, La Jolla, all of Calif., assignors to The Salk Institute for Biological Studies, La Jolla and The Whittier Institute for Diabetes & Endocrinology, San Diego, both of, Calif.
Filed Jul. 30, 1991, Ser. No. 737,758
Int. Cl.[5] C12N *5/06, 5/08*
U.S. Cl. 435—240.2 13 Claims

1. A method for maintaining mammalian pancreatic islet cells in culture, which method comprises adding to the culture medium an effective amount of FGF conjugated to a cytotoxic agent.

5,116,754
SEPARATION OF BACTERIA FROM ORGANIC MATTER
Ann D. E. Fraser, 286D Dalehurst Drive, Nepean, Ontario, Canada K2G 4E4; Dawn M. J. Martin, 13 Kingsmill Drive, Nepean, Ontario, Canada K2E 5H9, and Edward M. Riche, 2630 Draper Avenue, Ottawa, Ontario, Canada K2H 8V2
Filed Oct. 4, 1990, Ser. No. 592,518
Int. Cl.[5] C12N *1/12*; C12M *1/00*
U.S. Cl. 435—252.1 15 Claims



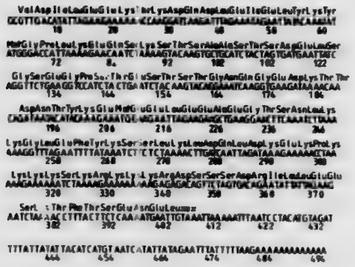
1. A method of separating viable bacteria from bacteria-containing organic matter, or mixtures thereof with inorganic matter, the method comprising the steps of:
(a) admixing said organic matter with saline solution;
(b) generating a first filtrate by inducing said organic matter and saline solution to pass through a first filter pack, wherein said first filter pack comprises a set of stacked filter members, the pore size of each sequentially decreasing from the first to the last;
(c) washing said first filter with a saline solution and mixing the wash therefrom with said first filtrate;
(d) generating a second filtrate by inducing said first filtrate and wash to pass through a second filter pack wherein said second filter pack comprises a set of stacked filter members the pore size of each sequentially decreasing from the first to last and the pore size of the first is smaller than the last filter member in the first filter member, and the pore size of the last filter member is larger than the bacteria;
(e) washing said second filter with a saline solution and mixing the wash therefrom with said second filtrate;
(f) generating a third filtrate by inducing said second filtrate and wash to pass through a third filter pack comprising one or more layers of borosilicate microfibers;
(g) washing said third filter with a saline solution and mixing the wash therefrom with said third filtrate; and
(h) separating said bacteria from said third filtrate and wash.

5,116,755
ASEXUAL BLOOD STAGE ANTIGENS OF *PLASMODIUM FALCIPARUM* WHICH ENCODE A RHOPTRY PROTEIN
David J. Kemp, 309 Belmore Road, North Balwyn, 3104, Victoria; Robin F. Anders, 55 Brougham Street, North Melbourne, 3051, Victoria; Ross L. Coppel, 6 Mercer Road, Armadale, 3143, Victoria, and Graham V. Brown, 35 Walsh Street, Balwyn, 3103, Victoria, all of Australia
PCT No. PCT/AU86/00386, § 371 Date Aug. 25, 1987, § 102(e) Date Aug. 25, 1987, PCT Pub. No. WO87/03882, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 18, 1986, Ser. No. 131,137
Claims priority, application Australia, Dec. 24, 1985, PH4021
Int. Cl.[5] C12P *21/06, 19/34*; C12N *15/00, 5/00, 15/30, 15/70, 1/21*; C07H *15/12*; C07K *3/00*
U.S. Cl. 435—252.3 8 Claims

1. An isolated and purified DNA molecule comprising: a

nucleotide sequence encoding an antigen of *P. falciparum* selected from the group consisting of:

a M_r 103,000 Rhoptry Protein,



a M_r 105,000 Rhoptry Protein, and

a M_r 107,000 Rhoptry Protein.

5,116,756

PROCESS FOR PRODUCING FK-506

Francis Dumont, Rahway; George M. Garrity, Westfield, both of N.J.; Isabel M. Fernandez, and Teresa D. Matas, both of Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 28, 1991, Ser. No. 646,555

Int. Cl.[5] C12R *1/465*; C12P *17/16*

U.S. Cl. 435—253.5 **1 Claim**

1. A biologically pure culture of the microorganism, Streptomyces sp., ATCC No. 55098.

5,116,757

MEVALONIC ACID-PRODUCING MICROORGANISM

Haruyuki Yamashita; Teiyu Shimada, and Hiromu Sugiyama, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1990, Ser. No. 477,572

Claims priority, application Japan, Apr. 14, 1989, 1-94927

Int. Cl.[5] C12N *1/16*; C12P *7/40*

U.S. Cl. 435—255 **3 Claims**

1. A biologically pure culture of a mevalonic acid-producing microorganism selected from the group consisting of *Saccharomycopsis fibuligera* FERM BP-2320 and *Saccharomycopsis fibuligera* FERM BP-2321, said microogranism being resistant to ML-236B such that said microorganism, after seven days incubation in a medium containing 0.02% by weight ML-236B at 25° C., has an absorbance A_1 at 660 nm that is at least 70% of an absorbance A_0 at 660 nm of said microorganism incubated under otherwise identical conditions in a medium free of ML-236B.

5,116,758

FERMENTATION VESSEL CLOSURE

Kuldeep Verma, 15611 Southland Blvd., Apt. 9, Taylor, Mich. 48180

Filed Dec. 29, 1989, Ser. No. 458,990

Int. Cl.[5] C12M *61/00*

U.S. Cl. 435—287 **6 Claims**

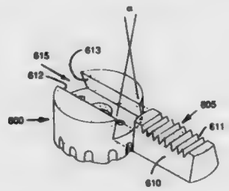
5. A fermentation vessel closure device comprising:

a cylindrical wall portion open at one end thereof and having at the other end thereof a capping end;

means for engaging the mouth of a fermentation vessel disposed along the inner surfaces of said cylclindrical wall portion and said capping end to permit the free flow of gases into and out of the fermentation vessel;

an aperture in said capping end to permit access to the contents of the fermentation vessel; and

moveable means for closing said aperture;



wherein said moveable means for closing said aperture comprises a pinch valve.

5,116,759

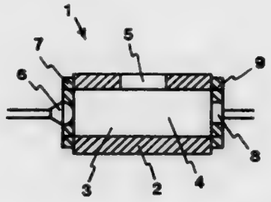
RESERVOIR CHEMICAL SENSORS

Stanley M. Klainer, Henderson; Johnny R. Thomas, Las Vegas, and Marcus S. Butler, Henderson, all of Nev., assignors to FiberChem Inc., Las Vegas, Nev.

Filed Jun. 27, 1990, Ser. No. 544,681

Int. Cl.[5] C12M *1/40*; G01N *21/17, 31/2*

U.S. Cl. 435—288 **50 Claims**



1. A reservoir chemical sensor comprising:

a modular reservoir cell body made of acetal theremoplastic polymer;

a sensing reagent in the cell body;

species communication means formed in the cell body for passing a species of interest into the cell body to interact with the sensing reagent.

a light source positioned at one end of the cell body to illuminate the interior of the cell body;

a detector positioned at an opposed end of the cell body to detect effects produced by the interaction of the species of interest with the sensing reagent;

an adaptor means at each end of the cell for mounting and aligning the light source and detector to the cell body.

5,116,760

APPARATUS FOR MANUFACTURE OF ORGANIC FERTILIZERS

Toshikazu Tanaka, Okayama, and Yoshinori Fujii, 1-7-11, Midorimachi, Chikko, Okayama-shi, Okayama, both of Japan, assignors to Hagihara Industries, Inc. and Yoshinori Fujii, both of, Japan

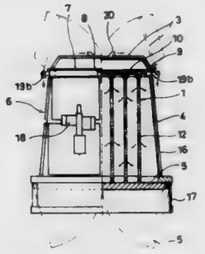
Filed Jun. 24, 1990, Ser. No. 557,250

Claims priority, application Japan, Jul. 26, 1989, 1-194825

Int. Cl.[5] C05F *15/00*

U.S. Cl. 435—290 **6 Claims**

1. An apparatus for manufacture of an organic fertilizer from an organic biodegradable refuse which comprises at least one fermentor having a top cover which is openable and closable, a heat-insulated body and a bottom cover which is openable and closable, an air blow frame pipe and an air suction frame pipe which are horizontally arranged and form part of a top frame structure of said body, and a plurality of air blow means and air suction means pendant from said part of the top frame structure and communicating with either one of said air blow frame pipe and air suction frame pipe, each of said air blow means and each of said air suction means being disposed in parallel, horizontally spaced apart and alternate relation and wherein said air blow means and air suction means are not supported at their lower portions.



5,116,761

APPARATUS FOR PREPARING COMPOST FROM MANURE BY FERMENTATION

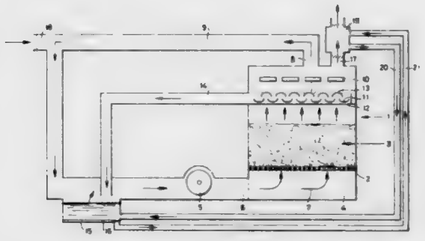
Gerrit Groenenboom, Biddinghuizen, Netherlands, assignor to Groenenboom Beheer B.V., Biddinghuize, Netherlands

Filed Jul. 11, 1989, Ser. No. 377,792

Claims priority, application Netherlands, Jul. 12, 1988, 8801766

Int. Cl.[5] C05F *17/02*

U.S. Cl. 435—316 **3 Claims**



1. In an apparatus for preparing compost from manure by fermentation, comprising a manure-receiving chamber having discharge means for gaseous phase discharged from the manure and having inlet means for supplying an oxygen-containing gas to the manure, the inlet and discharge means being fluidly connected to one another and forming a circulation loop with the chamber, said circulation loop having an inlet part; the improvement which comprises a cooling apparatus for cooling the gaseous phase and thereby form an aqueous phase and a residual gas phase, and a collection apparatus for collecting said aqueous phase, and a collection apparatus for collecting said aqueous phase separated by the cooling of the gaseous phase, the residual gas phase remaining after cooling being passed through said circulation loop, said collecting apparatus being fluidly connected to a reservoir for holding the aqueous phase, said reservoir being provided with heating means for separating ammonia by heating the aqueous phase, and being in communication with the inlet part of the circulation loop for introducing thus-separated ammonia into the residual gas phase to be supplied to the manure.

5,116,762

METHOD FOR DETERMINING THE CONCENTRATION OF FRUCTOSAMINE USING A STANDARD SOLUTION AND METHOD OF CALIBRATING THE STANDARD SOLUTION

Bernd Vogt, Tutzing; Hans-Dieter Lessmann, Hirschber-Grossachsen; Christian Klein, Weilheim, and Wolfgang Treiber, Seeshaupt, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 10, 1989, Ser. No. 377,603

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1988, 3824562

Int. Cl.[5] G01N *33/66, 33/68*

U.S. Cl. 436—15 **9 Claims**

1. A method for the determination of the concentration of fructosamine in a body fluid sample comprising

measuring a characteristic of the body fluid related to fructosamine, and

using a glucose-free peptide or protein-containing solution having a pH value range of less than 1 to 4 as a standard solution for calibration wherein the peptide or protein contains amino acid units comprising at least 25% of lysine, ornithine or mixtures thereof and the protein or peptide is glycosylated and wherein the characteristic of the body fluid sample solution is compared to the standard solution to determine the fructosamine concentration of the body fluid.

9. A method for the calibration of a standard for the determination of fructosamine in body fluids comprising

analyzing a series of known concentrations of a standard solution by a test for fructosamine in order to compare those results to a similar test result for a body fluid wherein the body fluid test result is compared to that of the standard in order to determine the fructosamine content of the body fluid and

wherein the standard solution has a pH value of less than 1 to 4 and is a glycosylated peptide or protein with an amino acid content comprising at lest 25% of lysine, ornithine or mixtures thereof.

5,116,763

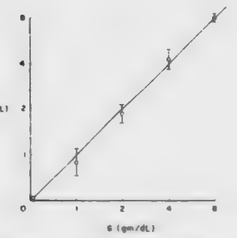
NONENZYMATIC GLUCOSE TEST

Carmine Greene; Ibrahim A. Ismail, both of South Bend, and Wen H. Wu, Elkhart, all of Ind., assignors to Miles, Inc., Elkhart, Ind.

Continuation of Ser. No. 885,535, Oct. 2, 1986, abandoned, which is a continuation of Ser. No. 736,300, May 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 673,184, Nov. 19, 1984, abandoned. This application Oct. 13, 1988, Ser. No. 256,559

Int. Cl.[5] G01N *33/52*

U.S. Cl. 436—95 **2 Claims**



1. A method for determining glucose concentration in a sample, said method comprising the steps of:

mixing a liquid sample with a test solution having an initial pH greater than 6.5 and consisting essentially of a borate buffer and pH indicator capable of detecting pH in the pH range of 6.5 to 12;

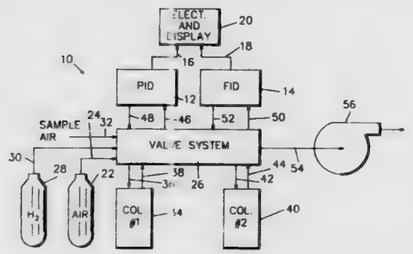
detecting the pH of the resulting mixture; and

correlating the detected pH to a glucose concentration for the liquid sample.

5,116,764
DUAL-COLUMN, DUAL-DETECTOR GAS DETECTOR AND ANALYZER

Raymond Annino, 9 Winchester Rd., North Smithfield, R.I. 02895; Michael L. Bartlett, 610 Elm St., Walpole, Mass. 02081; Edwin L. Karas, 475 Ware St., Mansfield, Mass. 02048; Dale E. Lueck, 19 Chestnut Hill Rd., Chelmsford, Mass. 01824; John L. Middleton, 4 Hudson Rd., Lexington, Mass. 02173, and Richard Villalobos, 19 Trout Farm La., Duxbury, Mass. 02332

Filed Jul. 26, 1988, Ser. No. 224,505
Int. Cl.[5] G01N *30/02*
U.S. Cl. 436—161 **6 Claims**

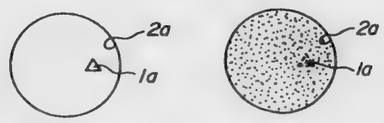


3. A method for analyzing a gas comprising:
providing an apparatus having a first chromatographic column, a second chromatographic column, a first gas detector of a first type, a second gas detector of a type different from said first type, and gas identification means;
passing a first predetermined sample volume of said gas through said first chromatographic column, said first column being of a type effective for selectively retarding passage of at least a first gas component therethrough for a first time period;
passing an effluent of said first chromatographic column to said first gas detector of a first type;
passing a second predetermined sample volume of said gas through said second chromatographic column, said second column being of a type effective for selectively retarding a passage of said at least a first gas component therethrough for a second time period;
said first and second time periods being different;
passing an effluent of said second chromatographic column through said second gas detector of a second type different from said first type;
said first and second gas detectors having different first and second amplitude responses to said at least a first gas component; sending signals indicative of said first and second time periods and of said first and second amplitude responses to said identification means; and
identifying said at least a first gas component by comparing said first and second time periods and said first and second amplitude responses with a library data of respective time periods and amplitude responses of gas components of said identification means to indicate a presence of said at least a first gas component.

5,116,765
METHOD FOR AUTOMATIC CHEMICAL ANALYZING

Haruhisa Watanabe; Satoshi Tanaka, and Shinya Matsuyama, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1990, Ser. No. 510,883
Claims priority, application Japan, Apr. 25, 1989, 1-103457; Aug. 24, 1989, 1-216111
Int. Cl.[5] G01N *33/539, 33/555*
U.S. Cl. 436—165 **3 Claims**



1. A method for detecting and measuring the image of an agglutination particle pattern produced in a test liquid comprising:
picking up an image of a mark as well as an image of a particle pattern produced in each one of a plurality of samples of a test liquid through the test liquid by an image pick up device;
processing the image of each of the marks picked up from each sample by said pick up device;
calculating a numerical value of the sharpness of each mark;
judging the existence of hemolysis in each sample of the test liquid from the numerical value to derive a hemolysis judgement signal for each sample;
removing any samples of the test liquid judged to have hemolysis;
judging the remaining samples of the test liquid, which have no hemolysis, for the formation of an agglutination particle pattern; and
feeding back the result of the judgement of hemolysis to the judgement of agglutination to increase the precision in analyzing the test liquid.

5,116,766
IMMUNE COMPLEX ISOLATION

Thomas L. McDonald, Omaha, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

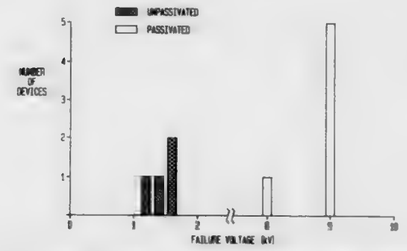
Division of Ser. No. 816,700, Jan. 9, 1986, which is a continuation-in-part of Ser. No. 441,060, Nov. 12, 1982, abandoned. This application Mar. 21, 1988, Ser. No. 170,777
Int. Cl.[5] G01N *33/531, 33/564*
U.S. Cl. 436—506 **3 Claims**

1. A method comprising the steps of:
obtaining sera from a mammal;
removing salts and adjusting the pH of the sera to form a precipitate at a pH of between 5.0 and 6.5;
purifying the precipitate by removing glyco-proteins until the reagent has less than 25 percent by weight of proteins whereby a reagent is obtained having properties of combining with the FC region of complexed antibodies without binding to monomeric immunoglobulin;
mixing at least 25 micrograms of the reagent with a sample of serum from the subject at a pH in the range of 6.5 to 9.5, whereby the reagent binds to the immune complex;
separating the bound immune complexes as a precipitate from the sera;
separating the reagent from the immune complex by chromatography;
separating the antigen and the antibody of the immune complex by electrophoresis; and
developing an antiserum or monoclonal antibody against the antigen(s) to detect antigen in patients that have specific disorders.

5,116,767
SEMICONDUCTOR LASER PASSIVATION AND OVERSTRESSING

Louis F. DeChiaro, Lanoka Harbor, and Claude J. Sandroff, Tinton Falls, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 9, 1991, Ser. No. 754,740
Int. Cl.[5] H01L *21/00, 21/66*
U.S. Cl. 437—7 **9 Claims**

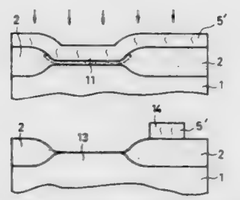


1. A method of passivating and screening semiconductor lasers, comprising the steps of:
determining an electrostatic discharge failure level associated with internal defects of a type of InGaAsP semiconductor lasers;
sulfide passivating a plurality of said type of lasers having at least one exposed end facet, said plurality constituting a lot;
electrostatic discharge stressing said plurality of lasers to a stressing corresponding to said failure level;
testing each of said stressed lasers to determine whether it is a failed laser; and
removing each said failed laser from said lot.

5,116,768
FABRICATION METHOD OF A SEMICONDUCTOR INTEGRATED CIRCUIT HAVING AN SOI DEVICE AND A BULK SEMICONDUCTOR DEVICE ON A COMMON SEMICONDUCTOR SUBSTRATE

Seiichiro Kawamura, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 20, 1990, Ser. No. 496,031
Claims priority, application Japan, Mar. 20, 1989, 1-68073
Int. Cl.[5] H01L *21/205*
U.S. Cl. 437—21 **6 Claims**

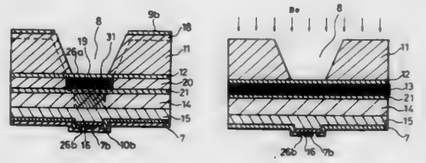


1. A method of fabricating a semiconductor integrated circuit carrying a first type semiconductor device wherein at least a part thereof is formed within a substrate and a second type semiconductor device which is provided on an oxide layer formed on the substrate, comprising the steps of:
a) providing a silicon oxide film on the substrate selective in correspondence to where the first type semiconductor device is to be formed, the silicon oxide film having an upper major surface at a first level;
b) producing a silicon nitride film on the silicon oxide film;
c) oxidizing the substrate using the silicon nitride film as an oxidation resistant mask to form an oxide layer in correspondence to where the substrate is not covered by the silicon nitride film, the oxide layer having an upper major surface at a second level that is higher than the first level, the oxide layer forming a birds beak structure at a boundary between the oxide layer and the oxide film, the birds beak structure having a declining upper major surface that declines toward the oxide film and continues declining toward the upper major surface of the oxide film, the oxide layer having the silicon nitride film extending over a limited portion of the declining upper major surface of the birds beak structure;
d) depositing a silicon layer on the substrate extending continuously over the silicon nitride film and the oxide layer to bury thereunder the silicon nitride film and the oxide layer;
e) annealing the silicon layer such that the silicon layer melts and crystallizes prior to forming a single crystal silicon layer; and
f) patterning the single crystal silicon layer such that the single crystal silicon layer is removed except for a part thereof covering a region of the oxide layer where the second type semiconductor device is to be provided, the patterning being performed to remove the silicon nitride film simultaneously with the removal of the silicon layer.

5,116,769
METHOD OF PRODUCING A SEMICONDUCTOR LASER BY IMPLANTING IMPURITIES WHICH SUPPRESS DISORDERING

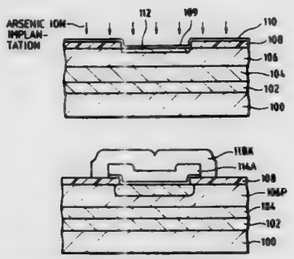
Yoshito Seiwa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Itami, Japan

Division of Ser. No. 492,838, Mar. 13, 1990, Pat. No. 5,034,954. This application Mar. 22, 1991, Ser. No. 673,319
Claims priority, application Japan, Oct. 20, 1989, 1-274614
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—22 **6 Claims**



1. A method of producing a semiconductor laser device comprising:
successively epitaxially growing an etching stopping layer, a first conductivity type superlattice structure, a second conductivity type cladding layer, an active layer, and a first conductivity type cladding layer on a substrate;
producing a current confinement structure in said first conductivity type cladding layer;
etching a groove in said substrate reaching said etching stopping layer opposite said current confinement structure;
implanting dopant impurity ions which suppress disordering of said superlattice structure and are activated to a second conductivity type by annealing in the superlattice structure through said groove so that said dopant impurity ions reach said second conductivity type cladding layer opposite said groove but do not reach said first conductivity type cladding layer and remain in said substrate at the side walls of said groove; and
annealing to disorder said superlattice structure at a region beyond the groove where said dopant impurity ions are not implanted and converting the region of the superlattice structure opposite the groove to the second conductivity type.

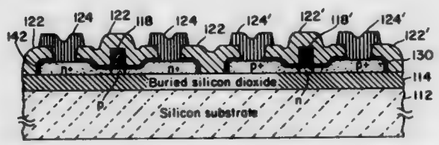
5,116,770
METHOD FOR FABRICATING BIPOLAR SEMICONDUCTOR DEVICES
Shuichi Kameyama, Itami; Hiroyuki Sakai, Osaka; Kazuya Kikuchi, Osaka, and Masaoki Kajiyama, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 12, 1989, Ser. No. 378,671
Claims priority, application Japan, Jul. 14, 1988, 63-175705
Int. Cl.[5] H01L *21/265, 21/328*
U.S. Cl. 437—31 **8 Claims**



1. A method for fabricating a bipolar semiconductor device which comprises:
providing a semiconductor substrate having a single crystalline semiconductor layer of a first conductivity type;
forming a first semiconductive region of a second conductivity in a single crystalline semiconductor layer;
forming a dielectric film on the semiconductor substrate prior to or after the formation of the first semiconductive region;
making at least one opening in the dielectric film to expose the first semiconductive region;
forming a first non-crystalline semiconductor film on the surface of the first semiconductive region in the opening;
forming a second semiconductive region of the first conductivity type into the first semiconductive region by implanting an impurity of the first conductivity type through the first semiconductor film;
forming a second non-crystalline semiconductor film on the first semiconductor film;
incorporating an impurity of the first conductivity type into the second semiconductor film; and
forming a metal electrode on the second non-crystalline semiconductor film after thermal treatment of the semiconductor films and the semiconductive regions, wherein the semiconductor layer of the first conductivity type is a collector, the first semiconductive region of the second conductivity type is a base, and the second semiconductive region of the first conductivity type is an emitter whereby a bipolar semiconductor device is fabricated.

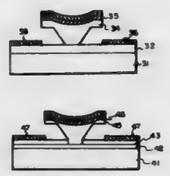
5,116,771
THICK CONTACTS FOR ULTRA-THIN SILICON ON INSULATOR FILMS
Pramod C. Karulkar, Burlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Mar. 20, 1989, Ser. No. 326,169
Int. Cl.[5] H01L *21/265, 21/86*
U.S. Cl. 437—40 **10 Claims**

1. The method of forming a device with silicon channel regions between silicon source regions and silicon drain regions of an epitaxial silicon film on insulator substrate comprising the steps of:
a) forming a protective layer over the silicon film;
b) forming a mask layer over the protective layer;
c) removing regions of the mask layer to form openings overlying the channel regions;



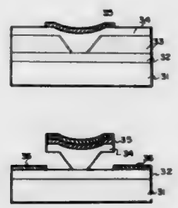
d) thinning the silicon regions underlying the openings leaving the source and drain regions on either side the same thickness as the original silicon film.

5,116,772
METHOD FOR MANUFACTURING A JUNCTION FIELD EFFECT TRANSISOR
Ki S. Park, DongKu; Sang B. Kim; Kwang Y. Oh, both of YuseongKu, and Yong T. Lee, JungKu, all of Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea
Division of Ser. No. 633,789, Dec. 26, 1990. This application Apr. 11, 1991, Ser. No. 684,060
Int. Cl.[5] H01L *21/265, 21/20*
U.S. Cl. 437—41 **4 Claims**



1. A method for manufacturing a homojunction type field effect transistor comprising:
a first epitaxy growth process for growing a N type InP channel layer on a semi-insulating substrate and, thereafter, growing a GaInAs(P) layer thereon,
a first selective etching process of the GaInAs(P) layer for selectively anisotropically etching only the GaInAs(P) layer by using a selective etching solution, after lithographically forming an etching mask of photoresist,
a second epitaxy growth process for growing a P type InP layer for a PN junction after removing entirely the photoresist pattern,
a gate metal evaporation process for evaporating a metal which is in ohmic contact with the P type InP layer, to thereby form a gate electrode,
a second selective etching process of the P type InP layer and the GaInAs(P) layer for etching selectively said InP layer using a gate metal as an etching mask and for forming under-cuts near both sides of the PN junction by selectively etching the GaInAs(P) layer which is exposed on surface after said second selective etching is completed,
a source and a drain metal evaporation process for forming the source and the drain electrodes by evaporating the metal which is in ohmic contact with the N type InP layer, to thereby obtain a gate length L shorter than a length W on mask determined by the lithography method and to obtain the source and the drain electrodes by a self-aligning method.

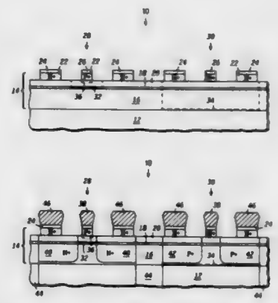
5,116,773
METHOD FOR MANUFACTURING A JUNCTION FIELD EFFECT TRANSISTOR
Ki S. Park, DongKu; Sang B. Kim; Kwang Y. Oh, both of YuseongKu, and Yong T. Lee, JungKu, all of Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea
Filed Dec. 26, 1990, Ser. No. 633,789
Claims priority, application Rep. of Korea, Dec. 27, 1989, 1989-19572
Int. Cl.[5] H01L *21/265, 21/20, 21/208*
U.S. Cl. 437—41 **6 Claims**



1. A method for manufacturing a heterojunction type field effect transistor comprising:
a first epitaxy growth process for growing a N type GaInAs(P) channel layer, a N type InP layer and a GaInAs(P) layer on a semi-insulating substrate,
a selective etching process of the GaInAs(P) layer and the N type InP layer for selectively anisotropically etching only the GaInAs(P) layer by using a selective etching solution, and selectively etching the N type InP layer additionally, after lithographically forming an etching mask of photoresist,
a second epitaxy growth process for growing a P type InP layer for a PN junction after removing entirely the photoresist pattern,
a gate metal evaporation process for evaporating a metal which is in ohmic contact with the P type InP layer, to thereby form a gate electrode,
a selective etching process of the P type InP layer and the GaInAs(P) layer for etching selectively the P type InP layer by using an etching mask as a gate metal and for forming large under-cuts near both sides of the PN junction by selectively etching the GaInAs(P) layer which is exposed on surface after said selective etching is completed,
a source and drain metal evaporation process for forming source and drain electrodes by evaporating a metal which is in ohmic contact with the N type InP layer, to thereby obtain a gate length L shorter than a length W on mask determined by the lithography method and to obtain electrodes by a self-aligning method.

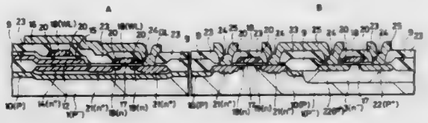
5,116,774
HETEROJUNCTION METHOD AND STRUCTURE
Jenn-Hwa Huang, Gilbert, and Jonathan K. Abrokwah, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 22, 1991, Ser. No. 673,438
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—40 **12 Claims**

1. A method of fabricating heterojunction structures comprising the steps of:
providing a semiconductor substrate;
forming a plurality of semiconductor layers on said substrate, said plurality of semiconductor layers including a channel layer and at least one additional layer disposed on said channel layer;
forming ohmic and gate contacts on said plurality of semiconductor layers;
removing portions of said at least one additional layer of said plurality of semiconductor layers that are disposed between said ohmic and gate contacts wherein no portions of said channel layer are removed;
forming gate metal on said gate contacts;



forming source and drain regions in said plurality of semiconductor layers, the formation of said source and drain regions being self-aligned to said gate metal; and
forming ohmic metal on said ohmic contacts.

5,116,775
METHOD OF PRODUCING SEMICONDUCTOR MEMORY DEVICE WITH BURIED BARRIER LAYER
Hisao Katto, Hinode, and Jun Sugiura, Musashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 63,110, Jun. 17, 1987, abandoned. This application Aug. 22, 1989, Ser. No. 396,686
Claims priority, application Japan, Jun. 18, 1986, 60-140061
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **32 Claims**



22. A method of manufacturing a semiconductor memory device, comprising the steps of:
(a) preparing a semiconductor substrate having a main surface, said substrate having a memory cell region in which a plurality of memory cells are to be formed, and having a peripheral circuit region in which a peripheral circuit is to be formed, wherein said memory cell region includes first active regions of a first conductivity type and a first isolation region for isolating said first active regions from each other, wherein said peripheral circuit region includes second active regions and a second isolation region for isolating said second active regions each other;
(b) selectively forming a mask film on said main surface of said substrate so that said mask film covers first active regions and said first isolation region in said memory cell region and said second active regions in said peripheral circuit region;
(c) selectively introducing first impurities of said first conductivity type into said main surface of said substrate by using mask film as a mask, to form a first channel stopper region of said first conductivity type at said second isolation region in said peripheral circuit region;
(d) after the step (c), selectively forming an isolation oxide film on said main surface of said substrate so that said

isolation oxide film is disposed at said first and second isolation regions;

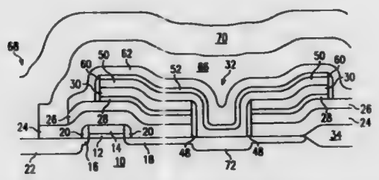
(e) after the step (d), introducing second impurities of said first conductivity type into said memory cell region of said substrate, through at least said isolation oxide film, to form a second channel stopper region of said first conductivity type under said isolation oxide film and a barrier region under said first active regions, said barrier region being integrally formed with said second channel stopper region in said substrate and having a higher impurity concentration than that of said first active regions of said memory cell region.

5,116,776

METHOD OF MAKING A STACKED CAPACITOR FOR DRAM CELL

Tsiu C. Chan, Carrollton, and Frank R. Bryant, Denton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Nov. 30, 1989, Ser. No. 443,897
Int. Cl.[5] H01L *21/70, 27/108*
U.S. Cl. 437—52 **15 Claims**



1. A method for fabricating an integrated circuit capacitor on a semiconductor substrate, comprising the steps of:

forming a first insulating layer over the substrate;

forming a polycrystalline silicon lower capacitor plate over the first insulating layer;

forming a second insulating layer over the first polycrystalline silicon layer;

forming an opening to the substrate through the lower capacitor plate and the first and second insulating layers, and having insulating sidewalls isolating the opening from the lower capacitor plate;

forming a polycrystalline silicon charge storage capacitor plate over the second insulating layer and in the opening, and making contact with the substrate through the opening;

forming a third insulating layer over the charge storage plate and the second insulating layer;

exposing a portion of the polycrystalline silicon lower capacitor plate through the second and third insulating layers; and

forming a polycrystalline silicon upper capacitor over the third insulating layer and in contact with the lower capacitor plate.

5,116,777

METHOD FOR FABRICATING SEMICONDUCTOR DEVICES BY USE OF AN N+ BURIED LAYER FOR COMPLETE ISOLATION

Tsiu C. Chan, Carrollton, and Mehdi Zamanian, Dallas, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Apr. 30, 1990, Ser. No. 516,287
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—56 **15 Claims**

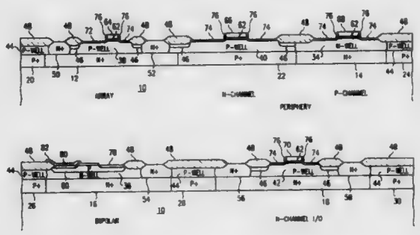
1. A method for fabricating a semiconductor memory device, comprising the steps of:

forming an N-type buried layer in a substrate;

forming an epitaxial silicon layer above said buried layer;

forming a plurality of P-type regions in said epitaxial layer;

forming a plurality of contacts to said N-type buried layer through said epitaxial layer wherein the plurality of



contacts are spaced at regular intervals throughout the memory array; and

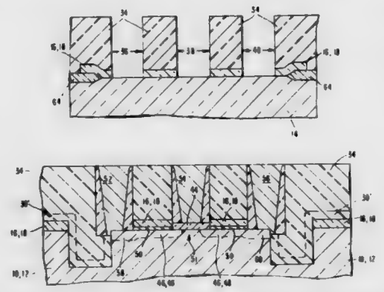
forming an array of N-channel field effect devices in said P-type regions.

5,116,778

DOPANT SOURCES FOR CMOS DEVICE

Jacob D. Haskell, Palo Alto; Steven C. Avanzino, Cupertino, and Balaji Swaminathan, Mountain View, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 5, 1990, Ser. No. 474,614
Int. Cl.[5] H01L *21/70, 21/76, 21/331*
U.S. Cl. 437—57 **48 Claims**



1. A process for in situ doping of portions of a plurality of semiconductor devices having source, gate, and drain regions and electrically conducting contacts thereto, with connector regions therebetween, and with isolation trenches having sidewalls between neighboring devices formed in a semiconductor substrate, said process comprising:

(a) forming a doped glass layer over at least said connector regions and along said sidewalls and subsequently, just prior to forming a gate oxide over said gate region;

(b) outdiffusing dopant from said doped glass layer and into said connector regions and said sidewalls; and

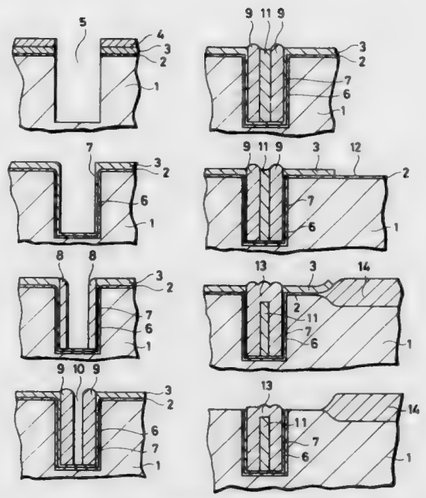
(c) separately forming said source and drain regions by outdiffusion from doped polysilicon plugs formed thereover.

5,116,779

PROCESS FOR FORMING SEMICONDUCTOR DEVICE ISOLATION REGIONS

Katsuji Iguchi, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Feb. 20, 1991, Ser. No. 657,770
Claims priority, application Japan, Feb. 23, 1990, 2-43393
Int. Cl.[5] H01L *21/302, 21/304, 21/306, 21/76*
U.S. Cl. 437—67 **6 Claims**



1. A process for simultaneously forming semiconductor device isolation regions having various widths which comprises:

a) forming on a silicon substrate at least a first thin silicon oxide film and a first silicon nitride film thereon,

b) etching the substrate to form a trench for providing a narrow isolation region,

forming a second silicon oxide film and a second silicon nitride film on the side walls and bottom wall of the trench,

subsequently forming a first polycrystalline silicon film on the substrate including the trench, leaving the first polycrystalline siliconfilm only on the side walls of the trench by anisotropic etching, and thereafter oxidizing the remaining first polycrystalline silicon film to form an oxide film on the side walls of the trench,

further forming a second polycrystalline silicon film over the semiconductor substrate including the trench, leaving the second polycrystalline silicon film only between the oxide film portions on the side walls of the trench by anisotropic etching,

c) etching the part of said first silicon nitride film which will form a wide isolation region, and

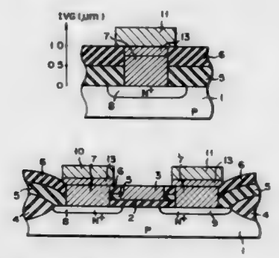
d) thereafter simultaneously oxidizing both the remaining second polycrystalline silicon film and said etched part of the siliconnitride film to thereby form oxide films.

5,116,780

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING IMPROVED CONTACT RESISTANCE CHARACTERISTICS

Shuichi Samata, Yokohama, and Yoshiaki Matsushita, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 515,695, Apr. 26, 1990, abandoned, which is a continuation of Ser. No. 374,557, Jul. 3, 1989, abandoned, which is a continuation of Ser. No. 122,038, Nov. 17, 1987, abandoned. This application Oct. 16, 1990, Ser. No. 596,732
Claims priority, application Japan, Nov. 19, 1986, 61-275801
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—89 **8 Claims**



1. A method of manufacturing a semiconductor device comprising:

forming an impurity diffused region of n-conductivity type in a silicon substrate comprising a semiconductor body of p-conductivity type;

forming a superposed insulation film structure comprising a first insulation layer and a second insulation layer comprising a film of a component selected from the group consisting of phospho-silicate glass, arseno-silicate glass, boro-phospho-silicate glass, boro-arseno-silicate glass, phospho-arseno-silicate glass, and boro-phospho-arseno-silicate glass, said first insulation layer being formed on said semiconductor body, and said second insulation layer being formed on said semiconductor body, and said second insulation layer being formed on said first insulation layer and containing impurities of n-conductivity type;

forming in said first and second insulation layers a continuous contact hole opening onto said impurity diffused region;

forming a single crystalline semiconductor silicon layer of said n-conductivity type in said contact hole of said first and second insulation layers by an epitaxial growth process, with the single crystalline semiconductor silicon layer contacting said second insulation layer to diffuse said impurities from said second insulation layer into said single crystalline semiconductor silicon layer during said epitaxial growth process to increase an impurity concentration in a surface region thereof while said first insulation layer prevents impurity diffusion into the silicon substrate; and

forming a conductive layer on said semiconductor silicon layer.

5,116,781

ZINC DIFFUSION PROCESS

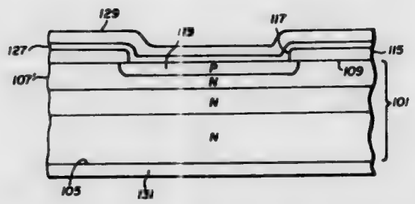
John A. Agostinelli, and David J. Lawrence, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 17, 1990, Ser. No. 568,803
Int. Cl.[5] H01L *21/223*
U.S. Cl. 437—168 **11 Claims**

1. A process of diffusing a zinc dopant into a III-V compound substrate comprising

coating an organic composition comprised of a zinc organic

compound chosen from the group consisting of zinc alcoholates, β-diketonate chelates and carboxylate salts, said composition including at least one organic film-forming moiety containing from 5 to 30 carbon atoms,



thermally converting the organic composition coating to a smooth zinc oxide layer,

capping the zinc oxide layer with silica, and

heating the zinc oxide layer to drive zinc ions into the substrate.

5,116,782

METHOD AND APPARATUS FOR PROCESSING A FINE PATTERN

Hiroshi Yamaguchi; Keiya Saito, and Tateoki Miyauchi, all of Kanagawa, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1989, Ser. No. 455,155

Claims priority, application Japan, Dec. 26, 1988, 63-325768

Int. Cl.[5] H01L *21/302, 21/326*

U.S. Cl. 437—172 **13 Claims**

1. A method for processing a fine pattern of a sample of one of an electrnoic device, molecular device and bioelement device, comprising the steps of:

coarsely aligning the sample mounted on a movable stage by moving the stage in at least an x-y direction in accordance with measured positional data of the stage;

finely scanning a needle having a sharpened tip disposed in opposed relation to the coarsely aligned sample and with a gap therebetween in three-dimensional directions by driving of an actuator;

applying a voltage between the needle and the sample so as to enable at least one of a tunnel current and a field emission current to flow therebetween;

displaying at least three-dimensional displacement data of the needle obtained from the actuator while controlling at least a z-directional displacement of the needle in accordance with one of detected tunnel current and detected field emission current obtained by detecting at least one of the tunnel current and field emission current flowing between the needle and the sample so as to observe the surface structure of the sample on an atomic scale;

focusing at least one of the tunnel current and the field emission current by applying one of a controllable first magnetic field and a controllable first electrostatic field;

finely deflecting at least one of the tunnel current and the field emission current by applying one of a contrallable second magnetic field and a controllable second electrostatic field; and

processing the fine pattern to correct the fine pattern by effecting at least one of removal, repositioning annealing and film formation of at least one of individual atoms and individuals molecules by the flow of at least one of the focused and finely deflected tunnel current and field emission current when the needle is finely positioned in accordance with the observed surface structure of the sample by finely scanning the needle in the three-dimensional directions by driving of the actuator.

5,116,783

METHOD OF PRODUCING SEMICONDUCTOR DEVICE

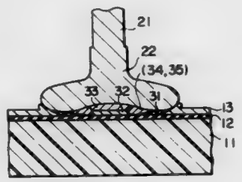
Kiyoaki Tsumura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1989, Ser. No. 392,553

Claims priority, application Japan, Jan. 13, 1989, 1-6827

Int. Cl.[5] H01L *23/30*

U.S. Cl. 437—211 **2 Claims**



1. A method of producing a semiconductor device comprising:

bonding a semiconductor chip having an aluminum electrode to a die pad of a lead frame with a bonding material disposed between the lead frame and die pad and having an elasticity modulus ranging between 1 kg/cm^2 and 100 kg/cm^2 from room temperature to about 400° C.;

melting an end of a copper wire to form a copper ball;

heating the aluminum electrode and pressing the copper ball on the heated aluminum electrode while applying ultrasonic energy to the heated aluminum electrode to deform the copper ball plastically and to form a θ phase intermetallic compound ($CuAl_2$) of copper and aluminum in the region where the deformed copper ball contacts the electrode; and

encapsulating the bond between the aluminum electrode and the copper wire with an epoxy resin.

5,116,784

METHOD OF FORMING SEMICONDUCTOR FILM

Harunori Ushikawa, Kofu, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Oct. 9, 1991, Ser. No. 773,430

Claims priority, application Japan, Nov. 30, 1990, 2-340199

Int. Cl.[5] H01L *21/00, 21/02, 21/31;* **C23C** *16/00*

U.S. Cl. 437—225 **12 Claims**

1. A method of simultaneously forming semiconductor films on a plurality of substrates, comprising the steps of:

preparing a first treatment gas, the first treatment gas providing a main material of the semiconductor films as a result of thermal decomposition;

preparing a second treatment gas, the second treatment gas providing an impurity, with which the semiconductor films are doped, as a result of thermal decomposition;

heating a reaction tube;

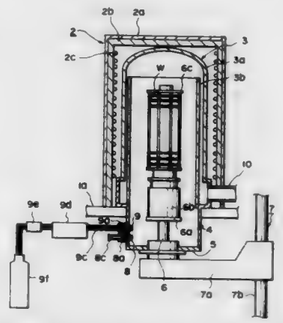
loading the substrates into the reaction tube;

reducing pressure in the reaction tube;

supplying the reaction tube with the first and second treatment gases at first and second flow rates, respectively, thereby forming first layer on each of the substrates, the first layer containing the impurity of a first density;

supplying the reaction tube with the first and second treatment gases at third and fourth flow rates, respectively, thereby forming a second layer on the first layer, the second layer containing the impurity of a second density sufficiently higher than the first density;

supplying the reaction tube with the first and second treatment gases at fifth and sixth flow rates, respectively,



thereby forming third layer on the second layer, the third layer containing the impurity of a third density sufficiently lower than the second density; and

diffusing the impurity contained in the second layer into the first and third layers by heating the first through third layers, thereby making an integral film of uniform impurity density from the first through third layers.

5,116,785

METHOD OF DEPOSITING METAL FLUORIDE

Kevin J. Mackey; Anthony W. Vere, both of Worcestershire; Donald C. Bradley, London, all of England; Dario M. Frigo, Utrecht, Netherlands, and Marc M. Faktor, deceased, late of london, England by Jill Faktor, executrix , assignors to The Secretary of State for Defence in her Britannic Majesty's Government of The United Kingdom of Great Britian and Northern Ireland, London, United Kingdom

Filed Nov. 30, 1990, Ser. No. 619,831

Claims priority, application United Kingdom, Mar. 31, 1988, 8807793; May 3, 1988, 8810404

Int. Cl.[5] C23C *16/22*

U.S. Cl. 437—243 **16 Claims**

1. A method of forming a layer of a fluoride of a Group II or Group III metal on a semiconductor substrate, characterised by steps (1) and (2):

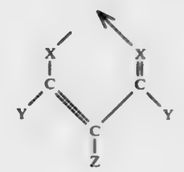
(1) forming a vapour of one or more fluorinated precursor compounds of formula I:



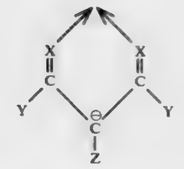
I

wherein M is an atom or an ion of a metal selected from Be, Ca, Sr Ba or a lanthanide, wherein each of b and d is independently 0 or 1, wherein each of A, B, C and D is independently selected from bidentate ligands of formula IIA or IIB:

IIA



IIB



wherein X is independently selected from 0, S, NR or PR, R being H, C_{1-10} alkyl or C_{1-10} perfluoroalkyl; each Y being independently selected from C_{1-10} alkyl, C_{1-10} perfluoroalkyl, C_{1-10} fluoroalkenyl, C_{1-10} fluoroalkylamine and C_{1-10} fluoroalkenylamine; Z being selected from H, F, C_{1-10} alkyl. C_{1-10} perfluoroalkyl and C_{1-10} fluoroalkenyl provided at least one of Y or Z is or contains fluorine: and:

(2) causing the vapour of the said precursor compound to decompose in the vicinity of the substrate surface to form a layer of a fluoride of the metal M.

5,116,786

LOW TEMPERATURE SEALING GLASS COMPOSITION

Ichiro Matsuura, Otsu, Japan, assignor to Nippon Electric Glass Co., Ltd., Otsu, Japan

Continuation of Ser. No. 651,784, Feb. 7, 1991, abandoned. This application Nov. 7, 1991, Ser. No. 793,221

Claims priority, application Japan, Feb. 9, 1990, 2-30225

Int. Cl.[5] C03C *3/12, 8/24, 14/00*

U.S. Cl. 501—15 **3 Claims**

1. A low temperature sealing glass composition comprising a glass powder consisting of 25 to 50% by weight of PbO, 25 to 50% by weight of V_2O_5, 10 to 35% by weight of TeO_2, 0.5 to 7% by weight of Al_2O_3, 0 to 10% by weight of at least one element selected from a group consisting of ZnO, Bi_2O_3 and P_2O_5, and 0 to 5% by weight of at least one element selected from a group consisting of Cu_2O, WO_3, B_2O_3, SiO_2, Mo_2O_3, Nb_2O_5, Fe_2O_3, ZrO_2, SrO and BaO, the sealing glass composition having a sealing temperature of 370° C. or less.

5,116,787

HIGH ALUMINA, ALKALINE EARTH BOROSILICATE GLASSES FOR FLAT PANEL DISPLAYS

William H. Dumbaugh, Jr., Painted Post, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Aug. 12, 1991, Ser. No. 743,799

Int. Cl.[5] C03C *3/085, 3/091*

U.S. Cl. 501—66 **2 Claims**

1. In a flat panel display device containing a flat, transparent glass substrate carrying polycrystalline silicon thin film transistors, the improvement wherein said glass exhibits a strain point of 655° C. or greater, a liquidus temperature below 1075° C., a long term stability against devitrification when in contact with platinum and high temperature refractory ceramic materials, a liquidus viscosity greater than 1.5×10^5 poises, and, being essentially free from alkali metal oxides and MgO, consists essentially, expressed in terms of mole percent on the oxide basis, of:

SiO_2	63–68	BaO	4.5–10

-continued

Al_2O_3	7.5–11	CaO + SrO + BaO	14–26
CaO	9.5–16	B_2O_3	1–7
SrO	0–5.		

5,116,788

ALKALINE EARTH ALUMINOBOROSILICATE GLASSES FOR FLAT PANEL DISPLAYS

William H. Dumbaugh, Jr., Painted Post, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Aug. 12, 1991, Ser. No. 743,800

Int. Cl.[5] C03C *3/085, 3/091*

U.S. Cl. 501—66 **2 Claims**

1. In a flat panel display device containing a flat, transparent glass substrate carrying polycrystalline silicon thin film transistors, the improvement wherein said glass exhibits a strain point over 675° C., a liquidus temperature below 1125° C., a viscosity at the liquidus temperature between 2×10^4–10^5 poises, a viscosity of 100 poises at temperatures below 1550° C., and a weight loss of less than 1 mg/cm^2 after immersion for 24 hours in an aqueous 5% by weight HCl solution at 95° C., said glass being essentially free from alkali metal oxides and consisting essentially, expressed in terms of mole percent on the oxide basis, of:

SiO_2	60–65	MgO	0–4
Al_2O_3	8–10	SrO	0–12
B_2O_3	1–4	BaO	0–9
CaO	11–24	CaO + MgO + SrO + BaO	23–28.

5,116,789

STRONTIUM ALUMINOSILICATE GLASSES FOR FLAT PANEL DISPLAYS

William H. Dumbaugh, Jr., Painted Post, and Josef C. Lapp, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Aug. 12, 1991, Ser. No. 743,802

Int. Cl.[5] C03C *3/085, 3/091*

U.S. Cl. 501—66 **1 Claim**

1. In a flat panel display device containing a flat, transparent glass substrate carrying polycrystalline silicon thin film transistors, the improvement wherein said glass is capable of being melted at temperatures not exceeding about 1600° C., it exhibits a strain point over 675° C., a liquidus temperature no higher than 1325° C., a long term stability when in contact with platinum metal and high temperature refractory ceramic materials, and, being essentially free from alkali metal oxides and MgO, consists essentially, expressed in terms of mole percent on the oxide basis, of:

SiO_2	67–70	CaO and/or BaO	0–10
Al_2O_3	7–9	B_2O_3	0–5
SrO	21–25	[CaO and/or BaO] + B_2O_3	0–12.

5,116,790

COG DIELECTRIC WITH HIGH K

Salvatore A. Bruno, Wilmington, and Ian Burn, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 16, 1990, Ser. No. 614,550

Int. Cl.[5] C04B *35/49*

U.S. Cl. 501—139 **7 Claims**

1. A composition of a COG densified dielectric body, composition consisting essentially of:

(a) 60.0–70.0 mol % TiO_2;

(b) 14.3–20.0 mol % Nd_2O_3;

(c) 11.0–16.7 mol % BaO;

(d) 1.0–8.0 mol % ZrO_2; and

(e) 0.05–0.30 mol % CeO_2.

5,116,791

COMPOSITE BORON NITRIDE/SILICON CERAMIC MATERIALS

Gerard Mignani, Lyons, and Jean-Jacques Lebrun, Caluire, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

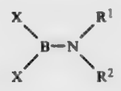
Division of Ser. No. 243,827, Sep. 12, 1988, Pat. No. 5,068,164. This application Aug. 5, 1991, Ser. No. 740,416

Claims priority, application France, Sep. 11, 1987, 87 12588

Int. Cl.[5] C04B *35/46, 35/48*

U.S. Cl. 501—96 **13 Claims**

1. A process for the preparation of a composite ceramic material which comprises a boron nitride matrix and a compatible amount of a silicon component, said ceramic material comprising a core volume having an external sheath layer on an outer face surface thereof, and the majority of said silicon components being distributed throughout said external layer, which comprises pyrolyzing a preceramic precursor under ammonia at a temperature of 1,000° to 2,000° C., said precursor comprising the product of reaction between (a) admixture of a trihalogenoborane A and at least one dihalogenated boron compound B having the following general formula (I):



(I)

wherein X is a halogen, and R^1 and R^2, which may be identical or different, are each a silyl radical, with (b) an amino compound C which comprises at least one $—NH_2$ group.

5,116,792

HYDROCARBON CONVERSION CATALYST FOR USE IN SELECTIVELY MAKING MIDDLE DISTILLATES

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 332,517, Mar. 31, 1989, Pat. No. 4,990,476, which is a continuation-in-part of Ser. No. 196,942, Apr. 4, 1988, Pat. No. 4,879,019, which is a division of Ser. No. 28,654, Mar. 20, 1987, Pat. No. 4,762,813, which is a continuation of Ser. No. 793,567, Oct. 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 699,919, Feb. 8, 1985, Pat. No. 4,610,973, which is a continuation of Ser. No. 531,924, Sep. 13, 1983, Pat. No. 4,517,074, which is a division of Ser. No. 84,761, Oct. 15, 1979, Pat. No. 4,419,271. This application Aug. 28, 1990, Ser. No. 573,735

The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl.[5] B01J *29/06, 37/10*

U.S. Cl. 502—66 **27 Claims**

19. A catalyst composition prepared by a process comprising:

(a) extruding a mixture of at least one inorganic refractory oxide component and a crystalline aluminosilicate zeolite having cracking activity to form extrudates, wherein said zeolite is selected from the group consisting of Y zeolites, modified Y zeolites, X zeolites and modified X zeolites; and

(b) calcining said extrudates in the presence of added steam at a water vapor partial pressure greater than about 2.0 p.s.i.a. under conditions such that the unit cell size of said crystalline aluminosilicate zeolite is reduced to a value between about 24.20 and about 24.35 Angstroms.

said calcined extrudates are impregnated with at least one hydrogenation component.

5,116,793

PROCESS FOR MODIFYING CLINOPTILOLITE ADSORBENT

Chien C. Chao, Millwood, N.Y., and Henry Rastelli, New Fairfield, Conn., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 509,651, Apr. 16, 1990, Pat. No. 5,019,667, which is a continuation-in-part of Ser. No. 206,280, Jun. 14, 1988, Pat. No. 4,935,580. This application Apr. 24, 1991, Ser. No. 690,238

Int. Cl.[5] B01J *29/28, 37/30*

U.S. Cl. 502—68 **4 Claims**

1. A process for the production of a modified clinoptilolite from natural or synthetic clinoptilolite wherein at least about 40% of the ion-exchangeable cations in the clinoptilolite comprise any one or more of lithium, potassium, calcium, magnesium, barium, strontium, zinc, copper, cobalt, iron and manganese cations, said process comprising subjecting a clinoptilolite to ion-exchange with a solution containing sodium cations until at least about 40% of the ion-exchangeable non-sodium cations in the clinoptilolite have been replaced by sodium cations, thereby producing a sodium clinoptilolite, and thereafter subjecting said sodium clinoptilolite to ion-exchange with a solution containing any one or more of lithium, potassium, calcium, magnesium, barium, strontium, zinc, copper, cobalt, iron and manganese cations.

5,116,794

METHOD FOR ENHANCING THE ACTIVITY OF ZEOLITE BETA

Gary W. Skeels, Brewster, and Edith M. Flanigen, White Plains, both of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 175,333, Mar. 30, 1988, abandoned, and a continuation-in-part of Ser. No. 366,264, Jun. 12, 1989, abandoned. This application Jun. 21, 1990, Ser. No. 541,580

Int. Cl.[5] B01J *29/28, 37/08*

U.S. Cl. 502—85 **26 Claims**

1. A method for enhancing at least one catalytic property of a crystalline microporous three-dimensional solid catalyst having the structure and composition of zeolite beta for use in a hydrocarbon conversion process, said catalyst having previously been calcined and subjected to ion-exchange with a hydrogen-forming cation, said method comprising; activating said catalyst by heating in air or an inert atmosphere at a temperature from about 600°–675° C. and for a period of time sufficient to enhance at least one catalytic property of the catalyst in the hydrocarbon conversion process.

7. A method for enhancing at least one catalytic property of a crystalline microporous three-dimensional solid catalyst having the structure and composition of zeolite beta for use in a hydrocarbon conversion process, said catalyst having previously been calcined, said method comprising:

(a) ion-exchanging said catalyst with a salt solution containing at least one hydrogen-forming cation other than hydronium; and

(b) activating said catalyst by heating in air or an inert atmosphere at a temperature of from about 600°–675° C. and for a period of time sufficient to enhance at least one catalytic property of the catalyst in said hydrocarbon conversion process.

5,116,795

ALPHA OLEFIN OLIGOMERIZATION CATALYST

Richard W. Fries, Joliet, Ill., assignor to Quantum Chemical Corporation, Cincinnati, Ohio

Continuation of Ser. No. 331,019, Mar. 29, 1989, abandoned, which is a continuation of Ser. No. 11,034, Mar. 25, 1987, abandoned, which is a continuation of Ser. No. 856,499, Apr. 28, 1986, abandoned, which is a division of Ser. No. 761,876, Aug. 2, 1985, abandoned. This application Apr. 9, 1990, Ser. No. 506,577

Int. Cl.[5] C08F *4/652*

U.S. Cl. 502—117 **12 Claims**

1. A catalyst active for oligomerizing one or more oligomerizable alpha olefin monomers in a hydrocarbon solvent to produce linear olefin oligomers of from about 4 to about 20 carbon atoms, said oligomerization catalyst comprising

an organometallic compound wherein the metal thereof is selected from the group consisting of zinc, magnesium, and aluminum, in combination with the reaction mixture obtained by reacting in a hydrocarbon,

(a) a zirconium compound of the formula ZrX_nY_{4-n} wherein X is a halogen, Y is selected from the group consisting of aryloxides, alkoxides, and carboxylates, and n ranges from 1 to 4, inclusive, and

(b) a basic salt of a carboxylic acid, wherein the ratio of basic salt equivalents to moles of zirconium compound in said oligomerization catalyst is from above zero to about 4.0:1 and the amount of said basic salt is sufficient to inhibit Fridel-Crafts alkylation during said oligomerization, said basic salt forming a fine suspension or homogenous solution with said solvent.

5,116,796

ORGANIC SOLVENT SOLUBLE OXIDE SUPPORTED HYDROGENATION CATALYST PRECURSORS

David J. Edlund, Bend; Richard G. Finke, Eugene, both of Oreg., and Robert J. Saxton, Sunnyvale, Calif., assignors to The University of Oregon, Eugene, Oreg.

PCT No. PCT/US88/00609, § 371 Date Oct. 26, 1988, § 102(e) Date Oct. 26, 1988, PCT Pub. No. WO88/06489, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 26, 1988, Ser. No. 275,105

Int. Cl.[5] B01J *31/22*

U.S. Cl. 502—154 **12 Claims**

1. A catalyst precursor which comprises:

$$Ax[L_nIr^{(1)}X_2M_{15}M'_3O_{62}]^{x-}$$

wherein

A is a countercation;

L is an olefinic ligand or dioxygen;

$Ir^{(1)}$ is monovalent iridium;

n=1 or 2;

X is a hetero atom selected from the group consisting of B, Si, Ge, P, As, Se, Te, I, Co, Mn and Cu;

M=W or Mo;

M'=Nb, V, Ti, Zr, Ta or Hf; and,

x<15.

5,116,797

POLYMERIZATION PROCESS

Gerrit G. Rosenbrand, Amsterdam, Netherlands, and Pui K. Wong, Katy, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 424,650, Oct. 20, 1989, Pat. No. 5,010,170. This application Feb. 6, 1991, Ser. No. 651,706

Claims priority, application Netherlands, Oct. 24, 1988, 8502611

Int. Cl.[5] B01J *31/24*

U.S. Cl. 502—162 **10 Claims**

1. A catalyst composition formed from a compound of palladium, an anion of a non-hydrohalogenic acid having a pKa below about 4 and a mixture of tetraaryl diphosphines wherein at least 50% of the mixture is an ortho alkoxy substituted

VOL 1138 ISS 4 MAY 26 1992 UMI

diphosphine that has an alkoxy substituent on at least one carbon atom ortho to the carbon atom through which each aryl group is connected to phosphorus, and the remainder of the mixture is a diphosphine that is free of ortho alkoxy substituents.

5,116,798

PROCESS FOR PRODUCING CATALYSTS AND IMPREGNATING SOLUTIONS AND CATALYSTS PRODUCED BY THE PROCESS

Wolfgang Feuerstein, Karben, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1991, Ser. No. 674,759

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1990, 4009327

Int. Cl.[5] B01J *23/22, 27/055*

U.S. Cl. 502—218 **13 Claims**

1. A process for producing a catalyst containing vanadium oxide compounds and alkali compounds and capable of oxidizing SO_2 to SO_3, comprising the steps of:

(a) forming an impregnating solution by dissolving fine-grain V_2O_5 in an aqueous acid medium containing a reducing agent effective to form VO^{2+} and with an acid and said reducing agent in approximately stoichiometric amounts for the dissolution and reduction of the V_2O_5, said solution containing alkalis adapted to form said alkali compounds in the form of salts;

(b) adjusting said solution so that it contains $SO_4^{=}$ in an amount sufficient to combine all of said alkalis in said solution in the form of neutral sulfates upon impregnation of said solution into prefabricated carrier bodies and during subsequent drying and activation of impregnated carrier bodies;

(c) impregnating prefabricated carrier bodies with the impregnating solution of step (b) to form solution-impregnated carrier bodies;

(d) drying said solution-impregnated carrier bodies at an elevated temperature to form catalyst bodies; an

(e) activating said catalyst bodies by heating same under oxidizing conditions to a temperature of 750° to 1000° C. to produce a catalyst containing vanadium oxide compounds and alkali compounds and capable of oxidizing SO_2 to SO_3.

5,116,799

OXYCHLORINATION OF HYDROCARBONS

Yves Correia, Chateau-Arnoux; Jean Lesparre, Volonne, and Alain Petit, Martigues, all of France, assignors to Atochem, Puteaux, France

Division of Ser. No. 454,528, Dec. 21, 1989, Pat. No. 5,053,567. This application Mar. 15, 1991, Ser. No. 669,864

Claims priority, application France, Dec. 26, 1988, 88 17181

Int. Cl.[5] B01J *23/72, 21/08, 21/04*

U.S. Cl. 502—225 **2 Claims**

1. A composition of matter comprising (i) a catalytically effective amount of an oxychlorination catalyst, (ii) diluent particles of at least one catalytically and chemically inert solid material, and (iii) copper powder or a powdered copper compound.

5,116,800

HIGH DURABILITY AND EXHUAST CATALYST WITH LOW HYDROGEN SULFIDE EMISSIONS

W. Burton Williamson, Broken Arrow; Douglas G. Linden, and Jack C. Summers, II, both of Tulsa, all of Okla., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 11, 1990, Ser. No. 625,576

Int. Cl.[5] B01J *21/04, 23/10, 23/58*

U.S. Cl. 502—303 **21 Claims**

1. A high durability catalyst for treating automotive exhaust gas which produces a minimal, amount of hydrogen sulfide and is essentially free of cerium oxide and which consists essentially of:

a) a support consisting substantially of delta alumina;

b) an effective amount of a promoter consisting essentially of barium oxide and, optionally, lanthanum oxide deposited on the support; and,

c) effective amounts of the noble metals palladium and rhodium deposited on the support.

5,116,801

CATALYSTS FOR THE SELECTIVE REDUCTION OF NITROGEN OXIDES AND PROCESS FOR PREPARING THE CATALYST

Francis Luck, Noisy Le Grand, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Division of Ser. No. 368,605, Jun. 20, 1989, Pat. No. 5,037,792. This application Apr. 9, 1991, Ser. No. 682,693

Claims priority, application France, Jun. 20, 1988, 88 08220

The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.

Int. Cl.[5] B01J *21/10, 23/06, 23/22, 23/28, 23/30, 23/84, 23/85*

U.S. Cl. 502—307 **14 Claims**

1. A catalyst comprising a porous alumina support having a surface coating of at least one spinel compound thereon, and a catalytically active phase deposited onto such coated support said catalytically active phase comprising vanadium oxide V_2O_5 and either molybdenum oxide MoO_3 or tungsten oxide WO_3.

5,116,802

HEAT-SENSITIVE RECORDING MATERIAL

Naoto Arai, Ikeda, and Kazuo Watanabe, Itami, both of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1991, Ser. No. 644,583

Claims priority, application Japan, Jan. 24, 1990, 2-15581

Int. Cl.[5] B41M *5/30*

U.S. Cl. 503—208 **15 Claims**

1. A heat-sensitive recording material comprising (a) a base sheet and (b) a heat-sensitive recording layer formed on the base sheet and comprising a colorless or pale-colored basic dye, a color developing material which develops a color on contact with the dye, and a heat-fusible material, the recording material being characterized in that the basic dye comprises 3-di(n-butyl)amino-6-methyl-7-phenylaminofluoran, and that the heat-fusible material comprises di(p-methylbenzyl) oxalate.

5,116,803

REVERSIBLE THERMOSENSITIVE RECORDING MATERIALS

Yoshihiko Hotta, Numazu, and Keishi Kubo, Yokohama, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

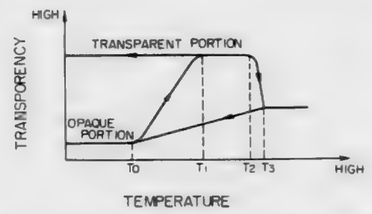
Division of Ser. No. 361,801, May 30, 1989, Pat. No. 4,977,030, which is a continuation of Ser. No. 80,432, Jul. 30, 1987, abandoned. This application Oct. 10, 1990, Ser. No. 595,244

Claims priority, application Japan, Aug. 5, 1986, 61-182667; Oct. 22, 1986, 61-251234; Oct. 23, 1986, 61-253095; Nov. 21, 1986, 61-278102; Jan. 20, 1987, 62-9077; Jan. 21, 1987, 62-12971

Int. Cl.[5] B41M *5/26*

U.S. Cl. 503—208 **15 Claims**

1. A reversible thermosensitive recording material having a thermosensitive layer whose transparency reversibly changes depending upon temperatures, said layer comprising essentially of a resin matrix and an organic low molecular substance dispersed in said resin matrix, wherein said thermosensitive layer further contains at lest one member selected from the group consisting of undermentioned high boiling solvents having boiling points of 200° C. or more; tributyl phosphate, tri-2-ethylhexyl phosphate, triphenyl phosphate, tricresyl phosphate, butyl oleate, dimethyl phthalate, diethyl phthalate, dibutyl phthalate, diheptyl phthalate, di-n-actyl phthalate, di-2-ethylhexyl phthalate, diisononyl phthalate, dioctyldecyl phthalate, diisodecyl phthalate, butylbenzyl phthalate, dibutyl adipate, di-n-hexyl adipate, di-2-ethylhexyl adipate, di-2-ethylhexyl azelate, dibutyl sebacate, di-2-ethylhexyl sebacate, diethylene glycol dibeazoate, triethylene glycol di-2-ethylene butylate, methyl acetylricinolate,.butyl acetylricinolate; butyl phthalyl butylglycolate, tributyl acetylcitsate, epoxyated soybean oil, and epoxydated tall oil fatty acid 2-ethylhexyl ester.



5,116,804

THERMOSENSITIVE RECORDING MATERIAL

Tomohisa Kakuda, Numazu, and Norio Kurisu, Susono, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 30, 1990, Ser. No. 530,337

Claims priority, application Japan, Jun. 9, 1989, 1-147728

Int. Cl.[5] B41M *5/30*

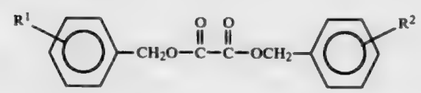
U.S. Cl. 503—209 **5 Claims**

1. A thermosensitive recording material comprising a support and a coloring layer formed thereon, said coloring layer comprising:

(a) a leuco dye,

(b) at least one of 1,7-bis(4-hydroxyphenylthio)-3,5-dioxaheptane and 1,5-bis(4-hydroxyphenylthio)-3-oxapentane as a color developer, and

(c) a dibenzyl oxalate derivative having formula (I) as a sensitizer:



(I)

wherein R^1 and R^2 each independently represent hydrogen, an alkyl group having 1 to 4 carbon atoms, a halogen or a hydroxyl group.

5,116,805

THERMAL TRANSFER RECEIVER

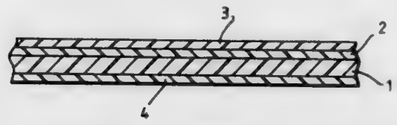
John A. Pope; Roger N. Barker, both of Essex, and Richard A. Hann, Suffolk, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 23, 1990, Ser. No. 555,735

Claims priority, application United Kingdom, Jul. 21, 1989, 8916723; Nov. 9, 1989, 8925279

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **15 Claims**



1. A receiver sheet for dye-diffusion thermal transfer printing comprises a dielectric substrate supporting a receiver coat of dye-receptive material on one side, characterised in that there are antistatic coatings provided on both sides of the dielectric substrate, such coatings being sufficient on each side to reduce the surface resistivity to less than 1×10^{13} Ω/square.

5,116,806

DYES FOR USE IN THERMAL DYE TRANSFER

Luc J. Vanmaele, Lochristi, Belgium, assignor to AGFA-Gevaert, N.V., Mortsel, Belgium

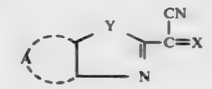
Filed Feb. 13, 1991, Ser. No. 654,684

Claims priority, application European Pat. Off., Mar. 1, 1990, 90200483

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **12 Claims**

1. Dye-donor element for use according to thermal dye transfer methods, said element comprising a support having thereon a dye/binder layer comprising a dye carried by a polymeric binder resin, wherein said dye corresponds to the following general formula I:



(I)

wherein:

A represents the atoms necessary to complete an aromatic or heteroaromatic ring system,

Y stands for O, S, or NR^1,

X stands for N-Ar, N-Het, N-N=Het, or CR^2R^3,

R^1 stands for hydrogen, an alkyl group, a cycloalkyl group, an aryl group, $-SO_2R^4$, $-COR^4$, $-CSR^4$, or $-POR^4R^5$,

Ar represents an aromatic nucleus, which is substituted in para-position with a substituent chosen from the group consisting of an amino group, an alkyloxy group, an aryloxy group, an alkylthio group, an arylthio group, hydroxy, and mercapto, and which aromatic nucleus may also be substituted in other positions with an alkyl group, an aryl group, or an acylamido group,

Het represents a heterocyclic ring,

R^2 and R^3 each independently represent hydrogen, an alkyl group, a cycloalkyl group, an aryl group, an alkenyl group, an alkynyl group, a heterocyclic ring, cyano, a halogen atom, $-SO_2R^4$, $-COR^4$, $-CSR^4$, or $-POR^4R^5$, or R^2 and R^3 together with the carbon atom to which they are attached represent the atoms necessary to complete a ring system including a heterocyclic ring system, and

R^4 and R^5 each independently represent an alkyl group, a cycloalkyl group, an aryl group, an alkenyl group, an aralkyl group, an alkyloxy group, an aryloxy group, an alkylthio group, an arylthio group, an amino group, or a heterocyclic ring, or R^4 and R^5 together with the phosphor atom to which they are attached represent the atoms necessary to complete a 5- or 6-membered ring system.

5,116,807

MONOLITHIC MM-WAVE PHASE SHIFTER USING OPTICALLY ACTIVATED SUPERCONDUCTING SWITCHES

Robert R. Romanofsky, Graton, and Kul B. Bhasin, Rocky River, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 25, 1990, Ser. No. 587,921

Int. Cl.[5] H01P *1/18, 3/08;* **H01B** *12/00*

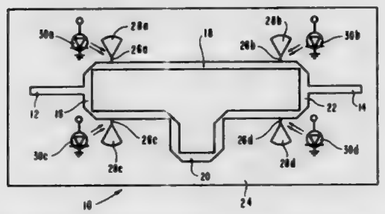
U.S. Cl. 505—1 **9 Claims**

1. A monolithic phase shifter having an input and an output, comprising:

a substrate;

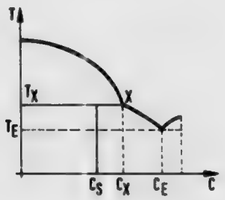
a bifurcation junction operatively connected to the input and forming a reference path and a delay path;

a rejoining junction operatively connected to the output and joining said reference and delay paths;
first and second light-activated, superconducting switches disposed in said reference and delay paths, respectively, each switch being about one quarter wavelength from the bifurcation junction;
third and fourth light-activated, superconducting switches disposed in said reference and delay paths, respectively, each switch being about one quarter wavelength away from the rejoining junction;



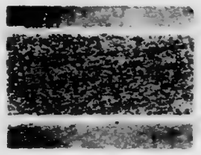
first illumination means for providing light to said first and third switches;
second illumination means for providing light to said second and fourth switches, said first and second illumination means providing light alternately, and
wherein said bifurcation and rejoining junctions, said reference and delay paths, and said switches are formed on said substrate.

5,116,808
TAPE BASED ON A SUPERCONDUCTING OXIDE, AND METHOD OF MANUFACTURE
Christian Belouet, Sceaux, France, assignor to Compagnie Generale d'Electricite, Paris, France
Filed Mar. 30, 1990, Ser. No. 501,441
Claims priority, application France, Mar. 31, 1989, 89 04251
Int. Cl.[5] B32B *9/00*
U.S. Cl. 505—1 **4 Claims**



1. A tape of a superconducting oxide containing Cu-O made by the process comprising the following steps:
(a) preparing a bath of melted superconducting oxide selected from the group consisting of congruent fusion oxides, quasi-congruent fusion oxide and oxides having peritectic decomposition close to an eutectic point;
(b) drawing a substrate of flexible metal having a rectangular transversal cross-section through said bath, vertically from bottom to top at a speed between 1 and 100 cm per minute and depositing on at least one of the faces of said substrate a crystallized film of said melted superconducting oxide having a thickness of between 1 μm to 100 μm;
heat treating said substrate covered with said film, with the orientation of the axis C of the superconducting crystals being perpendicular to said face of said substrate, and the Cu-O planes being oriented in common and parallel to the plane of said face of said substrate, whereby the texture of the film deposited on the substrate is characterized by the absence of cavities therein, thereby conferring a density to the fraction of superconducting material in the film which is equal to its intrinsic density, with the Cu-O planes of the superconducting crystals being oriented in common and parallel to the plane of the face of the substrate resulting in the critical current density Jc of the superconducting film at 77° K. being greater than or equal to 10^4 A/cm^2, and wherein said super conducting oxide is selected from the group consisting of the Bi-Sr-Ca-Cu-O oxides and the compounds of the Y-Ba-Cu-O family where yttrium is replaced by rare earths such as europium or ytterbium.

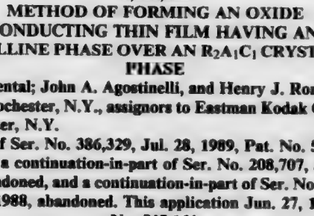
5,116,809
OXIDE SERIES SUPERCONDUCTIVE SINTERED BODY AND METHOD OF PRODUCING THE SAME
Nobuo Tsuno, Kasugai; Keiji Matsuhiro, Nagoya, and Hitoshi Sakai, Komaki, all of Japan, assignors to NGK Insulators, Ltd., Japan
Filed Jul. 6, 1989, Ser. No. 375,917
Claims priority, application Japan, Jul. 13, 1988, 63-172533
Int. Cl.[5] B32B *9/00*
U.S. Cl. 505—1 **5 Claims**



1. A high Tc superconductive composite sintered body, comprising a high Tc superconductive sintered body and a coating metal layer on a surface thereof, said coating metal layer having a thickness of about 20–200 μm, said coating metal layer comprising at least one metal selected from the group consisting of aluminum, aluminum alloy, copper, lead, molybdenum, zirconium, and tungsten, and said coating metal layer being applied to the surface of said sintered body at a temperature below about 200° C.;
wherein the superconductive property and the magnetic shielding functional ability of said high Tc superconductive composite sintered body is substantially equal to the superconductive property and the magnetic shielding functional ability to said high Tc superconductive sintered body.

5,116,810
PROCESS FOR MAKING ELECTRICAL CONNECTIONS TO HIGH TEMPERATURE SUPERCONDUCTORS USING A METALLIC PRECURSOR AND THE PRODUCT MADE THEREBY
Chandrashekhar H. Joshi, and Christopher A. Craven, both of Bedford, Mass., assignors to American Superconductor Corporation, Watertown, Mass.
Filed Oct. 16, 1989, Ser. No. 422,227
Int. Cl.[5] C01F *17/00;* **C22C** *24/00*
U.S. Cl. 505—1 **26 Claims**

1. A process for forming a superconducting connection between a pair of superconducting ceramic oxide pieces, each of said pair formed by combining the metallic elements of said superconducting oxide in substantially the stoichiometric proportions needed to form said superconducting oxide into a precursor and forming said precursor into a shaped piece, said process comprising the steps of:
a. placing each of said shaped pieces in a protected environment;
b. contacting each of said shaped pieces with the other;
c. connecting each of said shaped pieces to the other by means for forming a metallurgical bond between the shaped pieces; and



d. oxidizing said connected shaped pieces under conditions sufficient to oxidize said metallic elements to said superconducting oxide.

5,116,811
CVD METHOD FOR THE FORMATION OF BI-CONTAINING SUPERCONDUCTING THIN FILMS
Hitoshi Abe, and Tomohiro Nakamori, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
PCT No. PCT/JP89/00939, § 371 Date Jun. 20, 1990, § 102(e) Date Jun. 20, 1990, PCT Pub. No. WO90/03453, PCT Pub. Date May 4, 1990
PCT Filed Sep. 14, 1989, Ser. No. 474,099
Claims priority, application Japan, Sep. 28, 1988, 63-242696
Int. Cl.[5] B05D *5/12;* **C23C** *16/00*
U.S. Cl. 505—1 **7 Claims**

1. A method for forming a superconductive thin film on a heated substrate with a metal layer, comprising the steps of:
forming said metal layer consisting of at least a mono-atomic layer of bismuth on said substrate; and
forming said superconductive thin film of an oxide containing bismuth on said metal layer by a chemical vapor deposition technique using triphenyl bismuth $Bi(C_6H_5)_3$ as a gas source for bismuth.

5,116,812
METHOD OF FORMING AN OXIDE SUPERCONDUCTING THIN FILM HAVING AN $R_1A_2C_3$ CRYSTALLINE PHASE OVER AN $R_2A_1C_1$ CRYSTALLINE PHASE
Mark Lelental; John A. Agostinelli, and Henry J. Romanofsky, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 386,329, Jul. 28, 1989, Pat. No. 5,059,583, which is a continuation-in-part of Ser. No. 208,707, Jun. 20, 1988, abandoned, and a continuation-in-part of Ser. No. 236,420, Aug. 25, 1988, abandoned. This application Jun. 27, 1990, Ser. No. 545,164
Int. Cl.[5] B05D *5/12, 3/02*
U.S. Cl. 505—1 **18 Claims**

11. A process comprising
forming a mixed rare earth alkaline earth copper oxide layer on a substrate and
converting the mixed rare earth alkaline earth copper oxide layer to an electrically conductive layer comprised of a crystalline $R_1A_2C_3$ oxide phase by heating in the presence of oxygen, wherein rare earth and R is in each instance chosen from among yttrium, lanthanum, samarium, europium, gadolinium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium and alkaline earth and A is in each instance chosen from among calcium, strontium and barium,
characterized in that
a crystalline $R_2A_1C_1$ oxide phase is first formed as a layer on the substrate and
the crystalline $R_1A_2C_3$ oxide phase is formed over the crystalline $R_2A_1C_1$ oxide phase by
coating a mixed rare earth alkaline earth copper oxide on the crystalline $R_2A_1C_1$ oxide phase and
heating the mixed rare earth alkaline earth copper oxide to a temperature of at least 1000° C.

5,116,813
PERFUME COMPOSITION
Katsuhiko Tajima, and Sachio Tanaka, both of Chiba, Japan, assignors to Kao Corporation, Tokyo, Japan
Filed Mar. 14, 1990, Ser. No. 493,311
Claims priority, application Japan, Mar. 15, 1989, 1-62686
Int. Cl.[5] A61K *7/46*
U.S. Cl. 512—27 **3 Claims**

1. A combination perfume composition which comprises a perfume base; and
a fragrance emitting effective amount of a compound selected from the group consisting of 8-methyl nonanal, 8-methyl decanal, 9-methyl decanal, 8-methyl nonanol, 8-methyl decanol, and 9-methyl decanol.

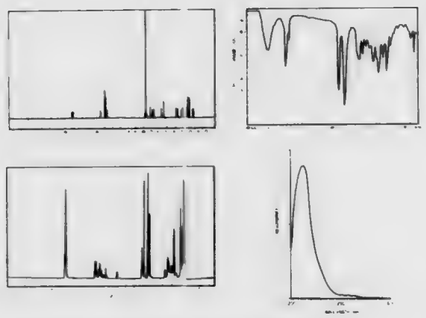
5,116,814
PROCESS FOR THE REMISSION OF SYMPTOMS ASSOCIATED WITH AIDS
Salvatore J. Catapano, 66 S. Brush Dr., Valley Stream, N.Y. 11581
Continuation of Ser. No. 382,673, Jun. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 804,858, Dec. 5, 1985, Pat. No. 4,711,876, and a continuation-in-part of Ser. No. 562,458, Aug. 1, 1990, abandoned, which is a continuation of Ser. No. 453,104, Dec. 20, 1989, abandoned, which is a continuation of Ser. No. 344,508, Apr. 20, 1989, abandoned, which is a continuation of Ser. No. 214,835, Jul. 1, 1988, abandoned, which is a continuation of Ser. No. 133,176, Dec. 11, 1987, abandoned, which is a continuation of Ser. No. 17,586, Feb. 24, 1987, abandoned, which is a division of Ser. No. 410,593, Aug. 23, 1982, abandoned, which is a continuation-in-part of Ser. No. 925,536, Jul. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 855,191, Nov. 28, 1977, abandoned. This application May 6, 1991, Ser. No. 698,196
The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.
Int. Cl.[5] A61K *39/00, 39/02*
U.S. Cl. 514—2 **13 Claims**

1. A method of treating a human patient to effect the remission of symptoms associated with AIDS, which comprises parenterally administering, in multiple injections, to the patient in need of such treatment typhoid vaccine in a therapeutically effective amount which is sufficient to provide immunostimulating activity, wherein
at least one subsequent administration occurs between three (3) and twenty eight (28) days after the first administration, and
wherein more than one subsequent administration of typhoid vaccine is given, with at least one of the subsequent administrations occurring between three (3) and twenty eight (28) days after a previous administration, and
wherein a series of said subsequent administrations is provided over a period of at least about four (4) weeks or longer.

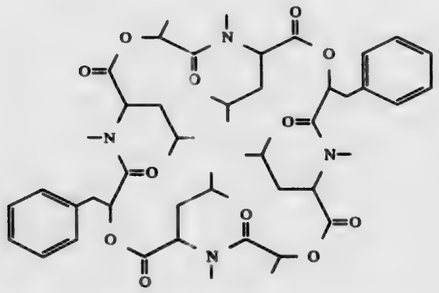
5,116,815
PF 1022 SUBSTANCE, METHOD OF TREATING HELMINTHIC PARASITIC INFECTION AND ANTHELMINTIC COMPOSITION

Masayuki Takagi; Tadaaki Okada; Naotoshi Akai; Takashi Yaguchi; Shinji Miyadoh; Takashi Shomura; Toru Sasaki; Masaji Sezaki; Takao Shimizu, and Masashi Niida, all of Kanagawa, Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Filed Feb. 6, 1990, Ser. No. 475,544
Claims priority, application Japan, Feb. 7, 1989, 1-26739
Int. Cl.[5] A61K *37/02; C07K 7/54, 11/02*
U.S. Cl. 514—11 **3 Claims**



1. A substance represented by the formula:



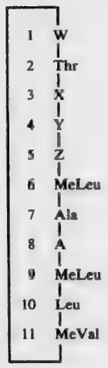
wherein said substance has the following characteristics:
(1) Appearance: Colorless crystals;
(2) Melting point: 104°–106° C.;
(3) Molecular formula: $C_{52}H_{76}N_4O_{12}$;
(4) elemental analysis: Calculated (%): C, 65.80; H, 8.07; N, 5.90; Found (%): C, 65.46; H, 8.25; N, 6.10;
(5) Mass spectrum (EI-MS): m/z 948 (M^+);
(6) Specific rotation $[\alpha]_D^{22}$: −102° (c=0.1, methanol);
(7) Ultraviolet absorption spectrum: As shown in FIG. 1;
(8) Infrared absorption spectrum: As shown in FIG. 2;
(9) ^1H NMR spectrum: As shown in FIG. 3;
(10) ^{13}C NMR spectrum: As shown in FIG. 4;
(11) solubility: Soluble in methanol, ethyl acetate, acetone, chloroform and dimethyl sulfoxide; insoluble in water
(12) Classification by basicity, acidity or neutrality: Neutral substance.

5,116,816
CYCLOSPORIN PEPTOLIDES HAVING AN α-HYDROXYCARBOXYLIC ACID AT POSITION 8

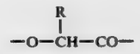
Michael M. Dreyfuss; Max H. Schreier, both of Basel; Hans Tscherter, Allschwil, and all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jun. 20, 1988, Ser. No. 209,680
Claims priority, application Switzerland, Jun. 19, 1987, 2317/87; Jul. 2, 1987, 2517/87
Int. Cl.[5] A61K *37/02;* **C07K** *7/50, 7/54, 11/02*
U.S. Cl. 514—11 **9 Claims**

1. A cyclosporin of formula II



in which
W is MeBmt, 8'-OHMeBmt, or $MeBmtH_2$,
X is Sar or Gly,
Y is MeLeu or Leu,
Z is Leu, Ile or Val, and
A is a group of formula III



in which R is C_{1-4} alkyl.

9. A pharmaceutical composition comprising a therapeutically effective amount of a cyclosporin according to claim **1** and a pharmaceutically acceptable carrier therefor.

5,116,817
LHRH PREPARATIONS FOR INTRANASAL ADMINISTRATION

Shabbir T. Anik, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 20,419, Jan. 20, 1987, abandoned, which is a continuation of Ser. No. 741,312, Jun. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 448,548, Dec. 10, 1982, abandoned. This application Sep. 20, 1990, Ser. No. 587,494
Int. Cl.[5] A61K *37/02*
U.S. Cl. 514—15 **11 Claims**

1. An aqueous composition for the nasal administration of LHRH analogs comprising:
an effective amount of an LHRH agonist or antagonist, or a pharmaceutically acceptable salt thereof; and from about 0.2 to about 15 weight percent of a bile acid surfactant, or a pharmaceutically acceptable salt thereof in aqueous solution.

5,116,818
METHOD AND KIT FOR CONTRACEPTION WITH GNRH-ANTAGONIST

Gary D. Hodgen, Norfolk, Va., and Daniel Kenigsberg, Stony Brook, N.Y., assignors to Medical College of Hampton Roads, Norfolk, Va.

Continuation-in-part of Ser. No. 24,205, Mar. 10, 1987, abandoned. This application Aug. 9, 1990, Ser. No. 565,029
Int. Cl.[5] A61K *37/38*
U.S. Cl. 514—15 **15 Claims**

1. A method of providing contraception and regulating of a menstrual cycle of a gonadal female mammal, without blocking hormonogenesis, which comprises the steps of (a) administering to the female on day 1, 2 or 3 of her menses and thereafter at about once every 7 days an amount of a GnRH-antagonist effective to block folliculogenesis thereby creating a contraceptive state during that cycle, but less than the amount thereof required to block hormogenesis; and (b) inducing menses by administering to the female only during the last two weeks of that cycle an amount of a progestin effective to produce a secretory endometrium and then terminating the progestin administration.

5,116,819
ENTERAL DIET FOR PATIENTS WITH PULMONARY DISEASE

Susan L. Trimbo, Evanston; W. Bruce Rowe, Chicago, both of Ill., and M. Umberto Bracco, Vevey, Switzerland, assignors to Clintec Nutrition Co., Deerfield, Ill.

Filed May 5, 1989, Ser. No. 348,338
Int. Cl.[5] A61K *31/00;* **A23C** *11/02*
U.S. Cl. 514—21 **9 Claims**

1. A method for providing nutrition to a patient with pulmonary disease without increasing the ventilatory response to the patient comprising administering to a patient in need of same a sufficient amount of an enteral diet for patients with pulmonary disease having a caloric distribution which comprises:
a) not less than 18% of said calories from a high quality protein source;
b) from about 20 to 50% of said calories from maltodextrin or other partially hydrolyzed polysaccharides;
c) from about 40–55% of said calories from a mixture of lipids comprising medium and long chain triglycerides;
d) 100% of the USRDA of all vitamins and minerals except phosphorus; and
e) biologically compatible nutritious surfactant.

5,116,820
INTESTINAL ABSORPTION INHIBITING AGENT

Yasutake Hiji, c/o Tottori University School of Medicine, 86, Nishi-machi, Yonago-shi, Tottori-ken, Japan

Continuation of Ser. No. 418,715, Oct. 3, 1989, abandoned, which is a continuation of Ser. No. 34,957, Apr. 6, 1987, abandoned. This application Aug. 6, 1990, Ser. No. 563,734
Claims priority, application Japan, Apr. 4, 1986, 61-77725
Int. Cl.[5] A61K *31/70, 31/715;* **A21D** *10/00*
U.S. Cl. 514—25 **3 Claims**

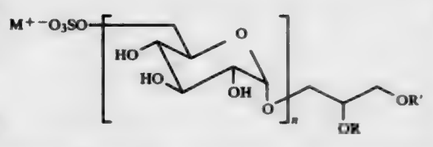
1. A composition which inhibits the absorption of glucose through the intestinal tract of an animal comprising 0.05–0.1 parts by weight of gymnemic acid and 0.002–0.05 parts by weight of pullulan.

5,116,821
SULFATED GLYCEROGLUCOLIPIDS AS INHIBITORS OF BACTERIAL ADHERENCE

Jared L. Randall, North Bend, and Robert D. Leunk, Cincinnati, both of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Nov. 20, 1990, Ser. No. 616,285
Int. Cl.[5] A01N *43/04*
U.S. Cl. 514—25 **19 Claims**

1. A method of preventing gastroduodenal infections caused by *H. pylori* comprising orally administering to a person at risk of being infected with *H. pylori*, a safe and effective amount of a sulfated glyceroglucolipid having the structure:



(1)

wherein n is an integer of from 1to about 5, R is hydrogen or C_1–C_{24} acyl or alkyl, R' is hydrogen or C_1–C_{24} acyl or alkyl, and M^+ is a cationic moiety.

5,116,822
THERAPEUTIC APPLICATION OF DIDEOXYCYTIDINENE

Erik D. A. De Clercq, Leuven; Piet A. M. M. Herdewijn, Kessel-Lo, both of Belgium; Samuel Broder, Bethesda, and Jan M. R. Balzarini, Rockville, both of Md., assignors to Stichting Rega VZW, Louvain, Belgium and The United States of America as represented by the Department of Health and Human Serices, Washington, D.C.

Division of Ser. No. 922,957, Oct. 24, 1986, Pat. No. 4,963,533. This application Jul. 2, 1990, Ser. No. 546,928
Int. Cl.[5] A61K *21/70*
U.S. Cl. 514—49 **11 Claims**

1. A pharmaceutical composition for the treatment of AIDS and AIDS related diseases, which comprises a therapeutically effective amount of 2',3'-didehydro-2',3'-dideoxycytidine as an active ingredient for mitigating the replication and the effects of HIV, and at least one pharmaceutically acceptable carrier therefor, wherein the pharmaceutically acceptable carrier comprises at least one of an aqueous solvent, nonaqueous solvent, stabilizer, emulsifier, detergent, additive, dye or aromatizer, said composition being in the form of powders, suspensions, solutions, sprays, emulsions, unguents or creams.

5,116,823
DRUG COMBINATIONS CONTAINING AZT

Paul Calabresi, and James W. Darnowski, both of Barrington, R.I., assignors to Roger Williams General Hospital, Providence, R.I.

Filed Feb. 27, 1990, Ser. No. 486,062
Int. Cl.[5] A61K *31/70, 31/505*
U.S. Cl. 514—50 **5 Claims**

1. The method of treating a mammal suffering from carcinoma to inhibit growth of said carcinoma which comprises administering to said mammal an effective dose of 1) at least 3 g/m^2/day of 3'-azido-3'-deoxythymidine in combination with 2) 5-fluorouracil, the synergistic ratio of 3'-azido-3'-deoxythymidine to 5-fluorouracil being from 10:1 to 1:1 by weight.

5,116,824
BIOMATERIAL COMPRISING A COMPOSITE MATERIAL OF A CHITOSAN DERIVATIVE AND COLLAGEN DERIVATIVE

Teruo Miyata, Tokyo; Kazuhiko Kodaira, Mitaka; Hitoshi Higashijima, Koganei; Takashi Kimura, Chigasaki, and Yasuharu Noishiki, Tottori, all of Japan, assignors to Katakura Chikkarin Co., Ltd. and Koken Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 854,756, Apr. 22, 1986, abandoned. This application Oct. 29, 1990, Ser. No. 603,370
Claims priority, application Japan, May 2, 1985, 60-93868
Int. Cl.[5] A61K *31/70;* **A01J** *21/00*
U.S. Cl. 514—55 **3 Claims**

1. A wound dressing material comprising a composite material of an N-succinylchitosan and atelocollagen in a proportion

of 50 to 90% by weight of the N-succinylchitosan to 10 to 50% by weight of the compound selected from the group consisting of atelocollagen, acetylated atelocollagen and methylated atelocollagen, the composite material being crosslinked and in the form of a sponge or film and the N-succinylchitosan being obtained by succinylation of chitosan prepared by deacetylation of chitin with a concentrated alkali to form a chitosan succinylated in a proportion of at least 55%.

5,116,825

PHYTOSANITARY COMPOSITION, ITS PROCESS FOR PREPARATION AND ITS USE FOR TREATING CRYPTOGAMIC DISEASES

Jean-Claude Malras, Erquinghem-sur-la-Lys, and Serge Gosset, Lestrem, both of France, assignors to Roquette Freres, Lestrem, France

Filed Mar. 27, 1990, Ser. No. 500,046
Claims priority, application France, May 29, 1989, 89 07003
Int. Cl.[5] A01N *43/16, 63/02, 65/00, 47/38*
U.S. Cl. 514—58 **27 Claims**

1. Phytosanitary composition, useful for the protection of plants against cryptogamic diseases, essentially consisting of a source of Cu^{++} copper ions and one cyclodextrin adapted to form complexes with said copper ions.

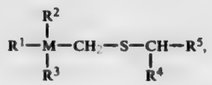
5,116,826

SILAZANEOPHYL SULFIDES, AND THEIR USE AS PESTICIDES

Hans H. Schubert, Frankfurt am Main; Gerhard Salbeck; Hans-Peter Krause, both of Hofheim am Taunus; Werner Knauf, Eppstein/Taunus; Anna Waltersdorfer, Frankfurt am Main, and Manfred Kern, Lörzweiler, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 327,971, Mar. 23, 1989, Pat. No. 5,002,957. This application Jan. 3, 1991, Ser. No. 637,304
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810379
Int. Cl.[5] C07D *213/22*; C07F *7/10*; A01N *43/40*
U.S. Cl. 514—63 **5 Claims**

5. A method for controlling insects, acarids or nematodes which comprises applying an effective amount of a compound of formula I

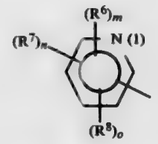


(I)

wherein:

M is Si;

R^1 is a radical of formula A



(A)

R^2 and R^3 independently of one another are (C_1–C_3)alkyl, (C_2–C_8)alkenyl, (C_1–C_2)haloalkyl, phenyl, or R^2 and R^3 taken together form an alkylene chain which, together with the quaternary central atom M, forms an unsubstituted or fluorine-substituted ring having four to six ring members;

R^4 is H, F, —CN, —CCl_3, —C≡CH, (C_1–C_4)alkyl or —C(=S)—NH_2;

R^5 is pyridyl, furyl, thienyl, all of which can be substituted by alkoxy, aryloxy or halogen, or is phthalimidyl, di(C_1–C_4)alkylmaleimidyl, thiophthalimidyl, dihydrophthalimidyl, tetrahydrophthalimidyl or phenyl substituted by alkoxy, aryloxy or halogen, or

R^4 and R^5, together with the carbon atom bridging them, form an indanyl or cyclopentenyl radical, which radicals can be unsubstituted or substituted by alkoxy, aryloxy or halogen;

R^6, R^7 and R^8 independently of one another are (C_1–C_5)alkyl, halogen, (C_2–C_6)alkenyl, (C_2–C_6)alkynyl, (C_3–C_7)cycloalkyl, (C_1–C_3)alkoxy, (C_2–C_4)alkenyloxy, (C_2–C_4)alkynyloxy, (C_1–C_4)alkylthio, (C_3–C_6)cycloalkyloxy, (C_1–C_4)haloalkyl, (C_1–C_3)haloalkoxy, (C_1–C_3)haloalkylthio, (C_2–C_5)haloalkenyl, (C_2–C_5)haloalkenyloxy, (C_2–C_5)haloalkenylthio, or two of the radicals R^6, R^7 and R^8, when they are in the ortho position, form a methylenedioxy, ethylenedioxy or (C_3–C_5)alkylene radical; and

m, n, and o are 0, 1 or 2 provided that $0 \leqq m+n+o \leqq 3$, to an insect, acarid or nematode or to an area, plant or substrate infested with said insect, acarid or nematode.

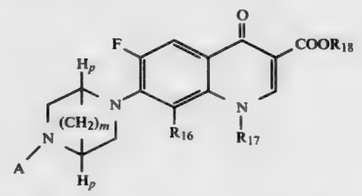
5,116,827

QUINOLINECARBOXYLIC ACID DERIVATIVES AS SOLUBILIZED PRO-DRUGS

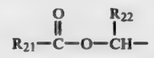
Keith C. Murdock, Pearl River, and Ving J. Lee, Monsey, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 330,000, Mar. 31, 1989, abandoned, which is a continuation-in-part of Ser. No. 184,998, Apr. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 91,077, Aug. 31, 1987, abandoned, which is a continuation-in-part of Ser. No. 922,220, Oct. 23, 1986, abandoned. This application Mar. 18, 1991, Ser. No. 671,052
Int. Cl.[5] A61K *31/495*; C07D *401/04*
U.S. Cl. 514—82 **27 Claims**

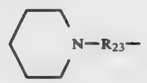
1. A compound of the formula



such that R_{16} is hydrogen, halogen or C_1–C_3 alkyl, R_{17} is selected from the group consisting of methyl, ethyl cyclopropyl, 2,4 difluorophenyl or —$NHCH_3$, R_{18} is hydrogen, C_1–C_6 alkyl, phenyl, benzyl,



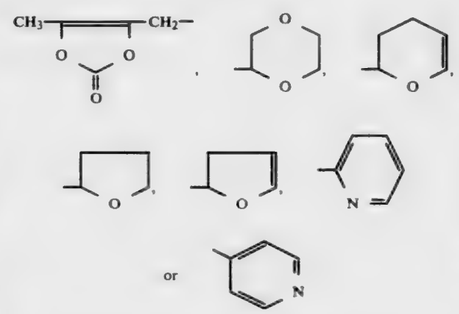
(where R_{21} is hydrogen, straight or branched chain alkyl or aryl and R_{22} is hydrogen or C_1–C_4 alkyl),



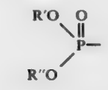
(where R_{23} is C_1–C_3 alkylene),



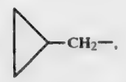
(where R_{24} and R_{25} are straight or branched chain C_1–C_4 alkyl),



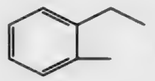
m is 0–2 and p is 1 or 2 such that when m is 0, p is 2 and wherein A is



such that R′ and R″ may be the same or different and are R (where R is C_1–C_6 alkyl, C_6H_5—, C_6H_5—CH_2, NC—CH_2C-H_2—,



Cl_3C—CH_2—or $R_7OCH_2CH_2$—, where R_7 is hydrogen or C_1–C_6 alkyl), hydrogen, or a pharmaceutically acceptable cation or R′ and R″ are linked to form a —CH_2—CH_2 or a



group.

5,116,828

PHARMACEUTICAL COMPOSITION FOR TREATMENT OF OSTEOPOROSIS

Tomoshi Miura; Shinichiro Aonuma, and Hiroyuki Ohara, all of Hyogo, Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 25, 1990, Ser. No. 603,214
Claims priority, application Japan, Oct. 26, 1989, 1-281141
Int. Cl.[5] A61K *31/565, 37/24*
U.S. Cl. 514—171 **8 Claims**

1. A method for treatment of osteoporosis which shows an observable increase in the amount of bone, comprising administering to a host with osteoporosis an osteoporosis treating effective amount of the following components (a) and (b):

(a) at least one first member known to have a therapeutic effect on osteoporosis selected from the group consisting of an estrogen, an estrogen precursor, a derivative thereof, an ester thereof, and a pharmacologically acceptable salt thereof, an ester thereof, and a pharmacologically acceptable salt thereof; and

(b) at least one second member having a hardly observable increase in bone amount selected from the group consisting of a thyroid hormone and a pharmacologically acceptable salt thereof; whereby more increase in bone amount is obtained than is obtainable from administering component (a) along.

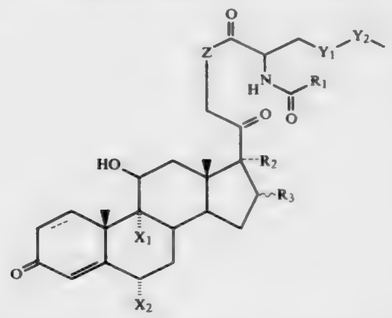
5,116,829

STEROID COMPOUNDS

Kimihiko Hori, Utsunomiya; Yasuto Suzuki; Tomoki Morioka, both of Ichikai; Shigeru Moriwaki, Utsunomiya; Osamu Hirota, Ichikai, and Shuichi Tsuchiya, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Apr. 10, 1991, Ser. No. 683,346
Claims priority, application Japan, Apr. 23, 1990, 2-107255
Int. Cl.[5] A61K *31/58*; C07J *71/00, 7/00*
U.S. Cl. 514—172 **7 Claims**

1. A 21-substituted steroid compound of formula (I),



(I)

wherein R^1 is a hydrogen atom, a lower alkyl, lower alkenyl, lower alkoxy, or phenyl group, R^2 is a hydroxyl group or an acyloxy group having 1–6 carbon atoms, R^3 is a hydrogen atom or a lower alkyl group, or R^2 and R^3 may together form a lower alkylidenedioxy group, X^1 and X^2 may be the same or different and individually represents a hydrogen atom or a halogen atom, Y^1 and Y^2 may be the same or different and individually represents a methylene group or a sulfur atom, Z is a sulfur atom or an imino group, the wave line means that the configuration of R^3 may be of either α or β, and dotted line between the 1 and 2 position means that the bond may be the double bond.

3. A method for the treatment of an inflammation, which comprises administering an effective amount of the steroid compound define din claim 1 to the patient suffering from an inflammatory disease.

5,116,830

STEREOISOMERICALLY PURE 17α-ETHYNYL-ESTRA-2-EN-17β-OL AND THE 17β ESTERS THEREOF, METHODS OF PREPARATION AND USES

Masato Tanabe, Palo Alto; David F. Crowe, Yreka; Richard H. Peters, San Jose, and John G. Johansson, Menlo Park, all of Calif., assignors to SRI International, Menlo Park, Calif.

Continuation of Ser. No. 641,750, Aug. 17, 1984, abandoned. This application Jun. 2, 1986, Ser. No. 873,074
Int. Cl.[5] A61K *31/58*; C07J *5/00, 7/00, 1/00*
U.S. Cl. 514—182 **25 Claims**

1. Stereoisomerically pure 17α-ethynyl-estra-2-en-17β-ol consisting of not less than 99% of the Δ_2 isomer and not more than 1% of other materials.

5,116,831

AMINOALKYL-SUBSTITUTED CYCLOALKYLAMINE PLATINUM (II) COMPLEXES

James D. Hoeschele, Canton; David A. Berry, Ann Arbor, both of Mich., and Luigi G. Marzilli, Atlanta, Ga., assignors to Warner-Lambert Company, Morris Plains, N.J.

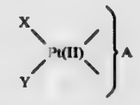
Continuation-in-part of Ser. No. 142,151, Jan. 8, 1988, Pat. No. 4,970,324, which is a continuation of Ser. No. 813,205, Dec. 24, 1985, abandoned. This application Jul. 31, 1990, Ser. No. 560,394

The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.

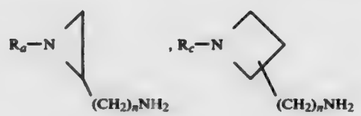
Int. Cl.[5] A61K *31/555*; C07F *15/00*

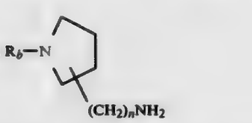
U.S. Cl. 514—184 **18 Claims**

1. A square-planar cis-platinum (II) four-coordinate complex having the formula



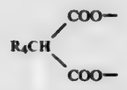
wherein A is a neutral bidentate aminoalkylcyclo(aza)alkane ligand selected from





and

wherein n is one or two; R_a is hydrogen or straight or branched lower alkyl of from one to four carbon atoms; R_f and R_c are straight or branched lower alkyl of from one to four carbon atoms; and X and Y are negatively-charged monodentate ligands which may be the same or different and are selected from chloro, bromo, iodo, nitrato; or where X and Y taken together form a dinegatively-charged bidentate ligand selected from sulfato, oxalato,



wherein R_4 is hydrogen, hydroxy, amino, alkyl of from one to four carbon atoms, benzyl, hydroxyalkyl of from one to four carbon atoms, or aminoalkyl of from one to four carbon atoms; wherein the ligand A is complexed to the central platinum atom through the nitrogen atom of the cycle(aza)alkane ring and the nitrogen atom of the aminoalkyl substituent of said group A.

17. A pharmaceutical composition for inhibiting the growth of neoplasms selected from solid tumors, leukemias and lymphomas in a mammal comprising an antineoplastically effective amount of a compound as defined in claim **1** in combination with a pharmaceutically acceptable carrier.

18. A method of inhibiting the growth of neoplasms selected from solid tumors, leukemias and lymphomas in a mammal comprising the administration to a mammal in need of such treatment of a pharmaceutical composition as defined in claim **17**.

5,116,832

PENEM DERIVATIVES PRODUCTION AND USE THEREOF

Masaji Ishiguro, Osaka; Hiromitsu Iwata, Takatsuki, and Rie Tanaka, Kyoto, all of Japan, assignors to Suntory Limited, Osaka, Japan

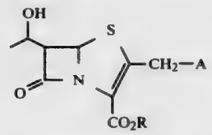
Continuation of Ser. No. 135,352, Dec. 21, 1987, abandoned. This application Feb. 5, 1991, Ser. No. 652,242

Claims priority, application Japan, Dec. 26, 1986, 61-311480

Int. Cl.[5] C07D *499/00*; A61K *31/425*

U.S. Cl. 514—195 **13 Claims**

1. A penem derivative represented by the formula,



wherein R denotes hydrogen atom or allyl group, and A denotes an aliphatic 5- or 6-membered heterocyclic group having one or two oxygen atoms in the ring, or a pharmaceutically acceptable salt thereof.

5,116,833

ANTIBIOTIC C-3 DITHIOACETAL-SUBSTITUTED CARBAPENEM COMPOUNDS, COMPOSITIONS, AND METHODS OF USE THEREOF

Martel Alain, Delson; Carol Bachand, Candiac, and Jean-Paul Daris, St. Hubert, all of Canada, assignors to Bristol-Myers Squibb Company, New York, N.Y.

Filed Oct. 19, 1990, Ser. No. 600,359

Int. Cl.[5] C07D *487/04*; A61K *31/40*

U.S. Cl. 514—210 **39 Claims**

1. A compound of the formula

(I)

in which

R^1 is hydrogen or C_{1-6} alkyl;

n is 0, 1 or 2;

R3 is hydrogen or C_{1-6} alkyl;

R2 is

C_{1-6} alkyl,

phenyl optionally substituted with cyano, $—CONH_2$, $—CH_2OH$, $—CH_2NH_2$, $—CONHNH_2$ or with up to 5 halogen atoms, C_{1-6} alkyl or C_{1-6} alkyloxy groups,

phenylmethyl optionally substituted with up to 5 halogen atoms, C_{1-6} alkyl or C_{1-6} alkyloxy groups on the phenyl ring, or

a radical represented by the formula

$—(CH_2)_p—X$

in which p is 0 or 1; X is five-membered aromatic heterocyclic ring containing up to 1 sulfur, 1 oxygen or 4 nitrogen atoms, optionally substituted with a C_{1-6} alkyl group, or six-membered aromatic heterocylic ring containing up to 4 nitrogen atoms, optionally substituted with a C_{1-6} alkyl group,

or a non-toxic pharmaceutically acceptable salt, physiologically hydrolyzable ester or solvate thereof.

5,116,834

QUINOLINECARBOXYLIC ACID ANTIBACTERIAL AGENTS

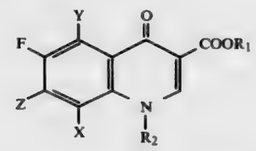
John M. Domagala, Canton; Mark J. Suto, and William R. Turner, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 508,886, Apr. 12, 1990, Pat. No. 5,047,538. This application Apr. 18, 1991, Ser. No. 687,254

Int. Cl.[5] A61K *31/55, 31/47, 31/495*; C07D *401/10*

U.S. Cl. 514—212 **13 Claims**

1. A compound of the formula



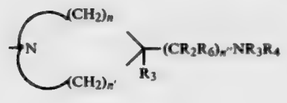
wherein X is alkenyl from two to ten carbon atoms, alkynyl from two to eight carbon atoms, cycloalkyl from three to six carbon atoms or cycloalkyl substituted by alkyl in which alkyl is one to four carbon atoms;

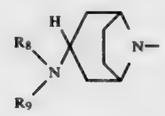
Y is hydrogen, fluoro or amino;

R_1 is hydrogen, alkyl of from one to six carbon atoms or a cation;

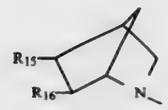
R_2 is alkyl of from one to four carbon atoms, vinyl, haloalkyl or hydroxyalkyl of from one to four carbon atoms, cycloalkyl of from three to six carbon atoms, phenyl or phenyl substituted by one or more halogen atoms;

Z is a secondary cyclic amino group of the formulae;





or



wherein

n is 1, 2, 3, or 4;

n′ is 1, 2, 3, or 4;

n+n′ is a total of 2, 3, 4, or 5;

n″ is 0, 1, or 2;

R_3 is hydrogen, alkyl of from one to four carbon atoms or a cycloalkyl of from three to six carbon atoms;

R_4 is hydrogen, alkyl of from one to four carbon atoms, hydroxyalkyl of from two to four carbon atoms, trifluoroethyl, or R'_4CO wherein R'_4 is alkyl of from one to four carbon atoms, or alkoxy of from one to four carbon atoms;

R_5 and R_6 are each independently hydrogen or alkyl of from one to three carbon atoms;

R_8 and R_9 are each independently hydrogen, alkanoyl of from one to three carbon atoms, alkyl of from one to three carbon atoms, isopropyl or cyclopropyl;

R_{15} and R_{16} are each independently hydrogen, halogen, $NR_{17}R_{18}$, OR_{17}, SR_{17}, alkyl or form one to three carbon atoms, wherein R_{17} and R_{18} are each independently hydrogen, alkyl of from one to three carbon atoms, or acyl of from one to three carbon atoms;

or a pharmaceutically acceptable acid addition salt thereof.

5,116,835

ENZYME-INHIBITING UREA DERIVATIVES OF DIPEPTIDES, A PROCESS FOR THE PREPARATION THEREOF, AGENTS CONTAINING THESE, AND THE USE THEREOF

Wolfgang Rüger, Kelkheim; Hansjörg Urbach; Dieter Ruppert, both of Kronberg/Taunus, and Bernward Schölkens, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

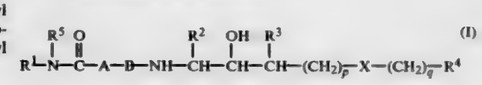
Filed Dec. 7, 1989, Ser. No. 447,414

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1988, 3841520

Int. Cl.[5] A61K *31/55, 31/535*; C07D *243/08, 417/00*

U.S. Cl. 514—218 **3 Claims**

1. A compound of the formula I



(I)

in which

A denotes a radical, which is linked N-terminal via $—NR^6—$ with —CO— and C-terminal via —CO— with B, of an amino acid selected from the group consisting of phenylalamine, tyrosine, β-2-thienylalanine, β-3-thienylalanine, 4-chlorophenylalanine, O-methylalanine, 1-anphthylalanine, 2-naphthylalanine, 2-fluorophenylalanine, 3-fluorophenylalanine and 4-fluorophenylalanine, and R^6 denotes hydrogen,

B denotes a radical, which is linked N-terminal via $—NR^7—$ with A and C-terminal via —CO— with $—NH—CHR^2—$, of an amino acid selected from the group consisting of phenylalanine, histidine, leucine, β-2-thienylalanine, β-b 3-thienylalanine, lysine, norvaline, 2-fluorophenylalanine, 3-fluorophenylalanine, 4-fluorophenylalanine, norleucine, S-methylcysteine, (1,3-dioxolan-2-yl)-alanine, (1-, 3- or 4-pyrazolyl)-alanine, 4-thiazolylalanine and (2-, 4- or 5-pyridimidyl)-alanine and R^7 denotes hydrogen,

R^2 denotes hydrogen, $(C_1–C_{10})$-alkyl, $(C_4–C_7)$-cycloalkyl-$(C_1–C_6)$-alkyl or $(C_6–C_{14})$-aryl-$(C_1–C_6)$-alkyl,

R^3 is hydrogen,

X is absent,

R^4 denotes 2-imidazolyl, 4-imidiazolyl, 5-imidazolyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-piperidyl, 3-piperidyl, 4-piperidyl, 1-piperazinyl or 2-piperazinyl,

P is O

q denotes 0, 1 or 2

R^1 and R^5 form together with the nitrogen atom connecting them, a radical selected from the group consisting of pyrrolidinyl, piperidyl, morpholinyl, thiomorpholinyl, piperazinyl, homopiperazinyl and hexahydroazepinyl, which may be substituted by one substituent selected from the group consisting of methyl, ethyl, propyl, isopropyl, n-butyl, s-butyl, isobutyl and tert.butyl,

as well as the physiologically tolerated salt thereof.

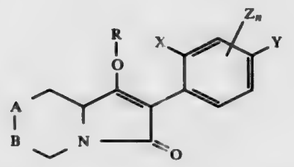
3. A method for the treatment of high blood pressure in a mammal, which comprises administration of an effective amount of a compound of the formula I as claimed in claim **1**, or a physiologically tolerated salt thereof to said mammal.

5,116,836
3-PHENYL-PYRROLIDINE-2,4-DIONE DERIVATIVES HAVING PESTICIDAL ACTIVITY

Reiner Fischer, Monheim; Hermann Hagemann, Leverkusen; Andreas Krebs, Odenthal-Holz; Albrecht Marhold; Hans-Joachim Santel, both of Leverkusen; Robert R. Schmidt; Klaus Lürssen, both of Bergisch-Gladbach, all of Fed. Rep. of Germany; Benedikt Becker, Steinmaanhof, Italy; Wilhelm Stendel, Wuppertal, and Christoph Erdelen, Leichlingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 15, 1990, Ser. No. 567,872
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1989, 3929087
Int. Cl.[5] C07D *279/08;* A61K *31/54*
U.S. Cl. 514—224.2 6 Claims

1. A 3-phenyl derivative of the formula



(I)

in which
A—B represents —S—CH_2—, —SO—CH_2—, —SO_2—CH_2—, —CH_2—S—, —CH_2—SO or —CH_2—SO_2—,
X represents C_1–C_6-alkyl, halogen or C_1–C_6-alkoxy,
Y represents hydrogen, C_1–C_6-alkyl, halogen, C_1–C_6-alkoxy or C_1–C_3-halogenoalkyl,
Z represents C_1–C_6-alkyl, halogen or C_1–C_6-alkoxy,
n represents a number from 0–3,
R represents hydrogen, or a group of the formula

—CO—R^1,

—CO—O—R^2

or

E,

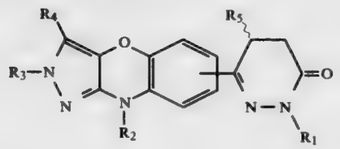
in which
E represents a metal cation equivalent or an ammonium ion,
R^1 represents C_1–C_{20}-alkyl, C_2–C_{20}-alkenyl, C_1–C_8-alkoxy-C_1–C_8-alkyl, C_1–C_8-alkythio-C_1–C_8-alkyl, C_1–C_8-polyalkoxy-C_2–C_8-alkyl or cycloalkyl having 5–6 ring atoms, which may be interrupted by oxygen or sulphur, and which are optionally substituted by halogen, represents phenyl which is optionally substituted by halogen, nitro, C_1–C_6-alkyl, C_1–C_6-alkoxy, C_1–C_6-halogenoalkyl or C_1–C_6-halogenoalkoxy, represents phenyl-C_1–C_6-alkyl which is optionally substituted by halogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, C_1–C_6-halogenoalkyl or C_1–C_6-halogenoalkoxy, represents pyridyl, pyrimidyl, thiazolyl or pyrazolyl optionally substituted by halogen or C_1–C_6-alkyl, represents phenoxy-C_1–C_6-alkyl optionally substituted by halogen or C_1–C_6-alkyl, or represents pyridyloxy-C_1–C_6 alkyl, pyrimidyloxy-C_1–C_6-alkyl or thiazolyloxy-C_1–C_6 alkyl optionally substituted by halogen, amino or C_1–C_6-alkyl, and
R^2 represents C_1–C_{20}-alkyl, C_2–C_{20}-alkenyl, C_1–C_8-alkoxy-C_2–C_8-alkyl or C_1–C_8-polyalkoxy-C_2–C_8-alkyl which are optionally substituted by halogen, or represents phenyl optionally substituted by halogen, nitro, C_1–C_6-alkyl, C_1–C_6-alkoxy or C_1–C_6-halogenoalkyl.

5,116,837
2,9-DIHYDRO-(6 OR 7)-(3-OXO-2,3,4,5-TETRAHYDROPYRIDAZINYL)-PYRAZOLO (4,3-B)-1,4-BENZOXAZINES

Donald W. Combs, Piscataway, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Dec. 21, 1990, Ser. No. 631,560
Int. Cl.[5] C07D *498/04;* A61K *31/535*
U.S. Cl. 514—229.8 9 Claims

1. A compound of the formula



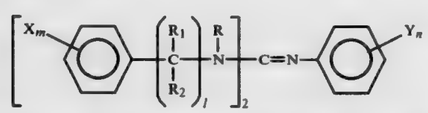
wherein
R_1, R_2 and R_3 are each independently selected from the group consisting of H, C_{1-6} straight-chain or branched-chain alkyl, C_{3-6} cycloalkyl and C_{3-6} alkenyl; and
R_4 and R_5 each is selected from the group consisting of H, C_{1-6} straight-chain or branched-chain alkyl and C_{3-6} cycloalky, and
provided that were R_1, R_2 and R_3 each independently is other than H, the nitrogen is bonded to a carbon in R_1, R_2 and R_3 other than an unsaturated carbon, and
that the C-6 of the pyridazinone moiety in the compound is attached at the C-6 or C-7 of the benzoxazine ring moiety in the compound.

5,116,838
GUANIDINE DERIVATIVES AND FUNGICIDES FOR AGRICULTURE AND HORTICULTURE CONTAINING THE SAME

Hiromichi Ishikawa, Atsugi; Takashi Umeda, Sagamihara; Shinji Onoue, Atsugi; Kazuo Kajikawa, Atsugi; Toshihiro Shibata, Atsugi, and Hiroshi Ohyama, Chigasaki, all of Japan, assignors to Hokko Chemical Industry Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1990, Ser. No. 614,389
Claims priority, application Japan, Nov. 20, 1989, 1-299655; Oct. 4, 1990, 2-265230
Int. Cl.[5] A61K *31/155;* C07C *279/16*
U.S. Cl. 514—634 2 Claims

1. A guanidine derivative represented by the formula



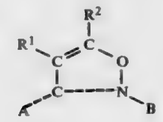
wherein R represents a (C_5–C_6)-cycloalkyl group, X represents a halogen atom, a lower alkyl group or a lower alkoxy group, Y represents a hydrogen atom, R_1 and R_2 represent a hydrogen atom, l, m and n represent an integer of 1.

5,116,839
USE OF ISOXAZOLIN-3-ONE DERIVATIVES AS ANTIDEPRESSANTS

Nobuyoshi Iwata; Kenji Yoshimi, and Mitsuo Nagano, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Filed Jun. 13, 1990, Ser. No. 537,517
Claims priority, application Japan, Jun. 26, 1989, 1-162940; Aug. 22, 1989, 1-215607; Oct. 11, 1989, 1-264706
Int. Cl.[5] A61K *31/535;* A01N *43/80*
U.S. Cl. 514—236.8 10 Claims

1. A method of treating depression, which method comprises administering to a patient in need thereof, an effective antidepressive amount of a compound having the formula (I)



(I)

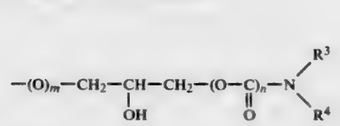
wherein:
the endocyclic dotted line

( )

is a single bond;
the exocyclic dotted line

( )

is a double bond;
A is oxygen;
B is a group of the formula (II)



(II)

wherein
m is 0 and n is 0 or 1;
R^3, R^4 and the nitrogen atom to which they are attached together represent an alicyclic amino group having a total of 5 or 6 ring atoms, of which one ring atom is said nitrogen atom and one ring atom is optionally an additional heteroatom selected from the group consisting of nitrogen, oxygen and sulfur, said alicyclic amino group being unsubstituted or, where there is an additional nitrogen heteroatom, said alicyclic amino group having as a substituent a C_1–C_3 group on said additional nitrogen heteroatom;
R^1 is an hydrogen atom or a halogen atom; and
R^2 is an unsubstituted phenyl group, a substituted phenyl group having at least one substituent selected from the group consisting of C_{1-3} alkyl group, C_{1-3} alkoxy groups, halogen atoms and a nitro group, an unsubstituted 5- or 6-membered heterocyclic group having one or more of oxygen, sulfur or a nitrogen atom as heteroatoms, or a substituted 5- or 6- membered heterocyclic group having one or more of oxygen, sulfur or a nitrogen atom as heteroatoms and having at least one substituent selected from the group consisting of C_1–C_3 alkyl groups, C_{1-3} alkoxy groups, halogen atoms and a nitro group;
or a pharmaceutically acceptable acid addition salt thereof.

5,116,840
POLYCYCLIC QUINOLINE, NAPHTHYRIDINE AND PYRAZINOPYRIDINE DERIVATIVES

Ashit K. Ganguly, Upper Montclair; Richard J. Friary, West Orange; John H. Schwerdt, Lake Hiawatha; Marvin I. Siegel, Woodbridge; Sidney R. Smith, Ridgewood; Vera A. Seidl, Wayne, and Edmund J. Sybertz, South Orange, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 307,646, Feb. 7, 1989, Pat. No. 4,988,705, which is a division of Ser. No. 17,027, Feb. 17, 1987, Pat. No. 4,810,708, which is a continuation-in-part of Ser. No. 861,788, May 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 744,865, Jun. 13, 1985, abandoned. This application Aug. 31, 1990, Ser. No. 576,640
Int. Cl.[5] C07D *487/04;* A61K *31/495*
U.S. Cl. 514—250 8 Claims

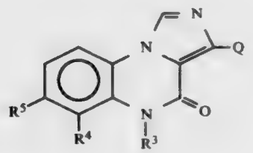
1. A compound having the name:
5-(3-chlorophenyl)-5,6,7,8-tetrahydro-9H-cyclopenta-[5,6]pyrido[2,3-b]pyrazin-9-one;
5-(3,4-dichlorophenyl)-5,6,7,8,-tetrahydro-9H-cyclopenta[5,6-]pyrido[2,3-b]pyrazin-9-one;
5,6,7,8-tetrahydro-5-(3-nitrophenyl)-9H-cyclopenta[5,6-]pyrido[2,3-b]pyrazine-9-one; or
5,6,7,8-tetrahydro-5-phenyl-9H-cyclopenta[5,6]pyrido[2,3-]pyrazin-9-one.

5,116,841
IMIDAZOQUINOXALINES AND THEIR PREPARATION AND USE

Frank Watjen, and Holger C. Hansen, both of Vaerlose, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

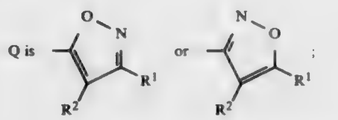
Filed Nov. 20, 1990, Ser. No. 615,707
Claims priority, application Denmark, Nov. 22, 1989, 5884/89
Int. Cl.[5] A61K *31/495;* C07D *487/04*
U.S. Cl. 514—250 7 Claims

1. A compound of formula I



(I)

wherein



Q is

or

;

R^1 and R^2 independently are hydrogen, straight or branched C_{1-6}-alkyl or C_{3-7}-cycloalkyl;
R^3 is hydrogen, straight or branched C_{1-6}-alkyl, straight or branched C_{2-6}-alkenyl, or aralkyl or aroylalkyl, the latter two may be optionally substituted with halogen or C_{1-6}-alkoxy; and
R^4 and R^5 independently are hydrogen, halogen, C_{1-6}-alkyl or trifluoromethyl.

5,116,842

CHEMICAL COMPOUNDS

Alan Naylor, Royston, and Duncan B. Judd, Stanstead Abbots, both of England, assignors to Glaxo Group Limited, London, England

Filed May 17, 1990, Ser. No. 524,441

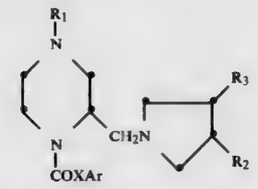
Claims priority, application United Kingdom, May 18, 1989, 8911451; May 18, 1989, 8911452

The portion of the term of this patent subsequent to Jul. 24, 2007, has been disclaimed.

Int. Cl.[5] A61K *31/495;* **C07D** *403/06*

U.S. Cl. 514—252 **20 Claims**

1. A compound of formula (I)



(I)

wherein

R_1 represents $—COR_4$, $—COCO_2R_4$ or $—CONR_4R_5$ (where R_4 and R_5 may be the same or different and represent a hydrogen atom or a C_{1-3}alkyl group);

R_2 represents a hydrogen atom or a hydroxy or oxo group, with the proviso that when R_1 is $—COR_4$, or $—CO-CO_2R_4$, R_2 is not a hydrogen atom;

R_3 represents a hydrogen atom or a hydroxy group;

X represents a direct bond, $—CH_2—$ or $—CH_2O—$;

Ar represents a substituted phenyl moiety;

or a physiologically acceptable salt thereof.

5,116,843

TRICYCLIC BENZIMIDAZOLE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

Alfred Mertens, Schriesheim; Wolfgang von der Saal, Weinhim; Erwin Boehm, Ladenburg, and Klaus Strein, Hemsbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

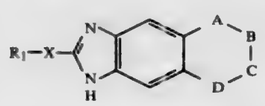
Division of Ser. No. 144,514, Jan. 15, 1988, Pat. No. 4,954,498. This application Jun. 25, 1990, Ser. No. 543,350

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1987, 3701277

Int. Cl.[5] A61K *31/495, 31/415;* **C07D** *237/00, 471/02*

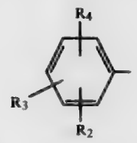
U.S. Cl. 514—253 **27 Claims**

1. A tricyclic benzimidazole compound of the formula:



(I)

wherein R_1 is a phenyl of the formula:



(II)

wherein

R_2, R_3 and R_4 can be the same or different and each is hydrogen, alkylsulphonyloxy, carbonyl substituted by hydroxyl or amino, alkylthio, alkylsulphhonyl, nitro, halogen, amino, hydroxyl, alkyl, alkoxy, alkenyloxy, hydroxyalkyl, dialkylamino, 1-imidazoyl, trifluoromethyl, cyano, hydroxy-sulphonyl, 1-pyrrolidino or pyrrolyl and wherein the phenyl carries 1–3 of the above substituents, or

R_1 is naphthyl or methylenedioxyphenyl or a five- or six-membered heterocyclic ring selected from the group consisting of pyrrole, furan, thiophene, pyrazole, pyridazine, or pyridine, which are unsubstituted or substituted at least once by alkyl or hydroxy and can be optionally condensed with a phenyl ring to form a bicyclic radical or when X is a valency bond, besides the above-mentioned groups R_1 can also be alkyl, hydroxyl or amino, wherein the alkyl groups are C_1–C_{10} straight or branched chains,

X is a valency bond, C_1–C_4 alkylene or vinylene, imino or amide (—CONH—) and A and B are carbon and either C or D is nitrogen and the other is carbon which can be substituted by hydrogen or alkyl or cycloalkyl wherein the carbon can also carry hydroxyl or oxo groups or can be components of a 3 to 7-membered spirocycle wherein the six-membered ring containing A, B, C and D can be saturated or unsaturated, the tautomers thereof and the physiologically acceptable salts thereof with inorganic and organic acids together with the optically active compounds and racemates.

5,116,844

TRIAZOLE ANTIFUNGAL AGENTS

Roger P. Dickinson, Dover, and Kenneth Richardson, Birchington, both of England, assignors to Pfizer Inc., New York, N.Y.

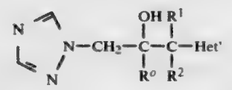
Filed Aug. 11, 1989, Ser. No. 392,686

Claims priority, application United Kingdom, Aug. 13, 1988, 8819308

Int. Cl.[5] A01N *43/54, 43/58, 43/40, 43/64*

U.S. Cl. 514—269 **9 Claims**

1. A pharmaceutical composition for treating a fungal infection in a human which comprises an antifungel effective amount of a compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein R^0 is mono- or disubstituted phenyl wherein said substituent is each chloro, fluoro, bromo or trifluoromethyl, R^1 is alkyl having one to four carbon atoms; R^2 is hydrogen or alkyl having one to four carbon atoms; and Het' is pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl or triazinyl or substituted pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl or triazinyl wherein said substituent is alkyl having one to four carbon atoms, alkoxy having one to four carbon atoms, fluoro, chloro, bromo, trifluoromethyl, cyano, nitro, amino, alkanoylamino having one to four carbon atoms or alkoxycarbonylamino having two to five carbon atoms together with a pharmaceutically acceptable carrier.

5,116,845

BU-3420T ANTITUMOR ANTIBIOTIC

Hiroaki Ohkuma, Tokyo; Masataka Konishi, Kanagawa; Kiyoshi Matsumoto, Kawaguchi; Toshikazu Oki, Yokohama, and Yutaka Hoshino, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed May 4, 1990, Ser. No. 519,067

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—279 **1 Claim**

1. A method for inhibiting the growth of a mammalian tumor sensitive to treatment with BU-3420T or BU-3420T triacetate, which comprises administering to said mammal in need thereof an effective tumor-inhibiting amount of BU-3420T or BU-3420T triacetate.

5,116,846

N-ARALKYL PIPERIDINE DERIVATIVES AS PSYCHOTROPIC DRUGS

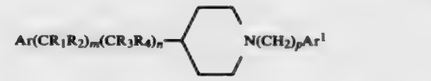
Gary A. Cain, New Castle; Paul J. Gilligan, Claymont, and Sang W. Tam, Hockessin, all of Del., assignors to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Filed Mar. 28, 1990, Ser. No. 500,573

Int. Cl.[5] A61K *31/445*

U.S. Cl. 514—317 **6 Claims**

1. A method of treating physiologic or drug induced psychosis or dyskinesia in a mammal comprising administering to the mammal an antipsychotic or antidyskinetic affective amount of a compound of the formula:



or a pharmaceutically acceptable salt thereof wherein:

R_1 and R_3 independently are H, alkyl of 1–3 carbon atoms, OH, or alkoxy of 1–3 carbon atoms;

R_2 and R_4 independently are H, or alkyl of 1–3 carbon atoms;

CR_1R_2 or CR_3R_4 may be C═O, provided that both cannot be C═O;

Ar and Ar^1 independently are phenyl optionally substituted with 1–5 substituents independently selected from the group consisting of:

H, halogen, OH, alkoxy of 1–3 carbon atoms, $NR_{10}R_{11}$, SH, $S(O)_tR_{12}$ where t═0–2, haloalkyl of 1–3 carbon atoms and 1–7 halogen atoms, alkyl of 1–3 carbon atoms, CO_2H, carboalkoxy of 2–6 carbon atoms, $CO_2NR_{13}R_{14}$, CN, NO_2, SO_2NH_2, OR SO_3H;

or Ar and Ar^1 independently are naphthyl optionally substituted with H, halogen, or alkyl of 1 to 3 carbon atoms;

R_{10} to R_{14} independently are H or alkyl of 1 to 3 carbon atoms;

m and n independently are 1–5; and

p is 1–2.

5,116,847

USE OF LOPERAMIDE AND RELATED COMPOUNDS FOR TREATMENT OF RESPIRATORY DISEASE SYMPTOMS

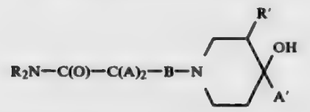
Sheri A. Gilbert, Cincinnati; Haruko Mizoguchi, Fairfield; Robert P. Charest, Forest Park; Timothy P. O'Neill, Wyoming, and Ronald L. Smith, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 25, 1991, Ser. No. 645,855

Int. Cl.[5] A61K *31/445*

U.S. Cl. 514—327 **20 Claims**

1. A method of treatment of symptoms associated with respiratory diseases, of humans and lower animals, comprising administration to the human or lower animal safe and effective amount of a compound having the structure:



(I)

wherein each —R is independently hydrogen or lower alkyl, or the two —Rs are connected to form a cyclic lower alkyl; each —A is independently phenyl or halophenyl; —B—is $—CH_2CH_2—$or $—CH_2CH(CH_3)—$; —R' is hydrogen or methyl; and —A' is phenyl or substituted phenyl;

or N-oxide thereof, or a pharmaceutically-acceptable salt thereof.

5,116,848

N-(((2,6-DISUBSTITUTED)PHENYL)-N-DIARYLALKYL-)UREAS AS ANTIHYPERLIPIDEMIC AND ANTIATHEROSCLEROTIC AGENTS

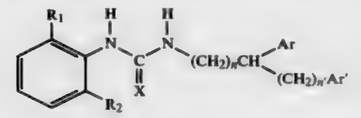
Bharat K. Trivedi, Farmington Hills, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 30, 1988, Ser. No. 176,079

Int. Cl.[5] C07C *275/34, 275/28;* **A61K** *31/17*

U.S. Cl. 514—332 **9 Claims**

1. A compound having the structural formula



wherein

R_1 and R_2 are independently selected from alkyl of from one to six carbon atoms, alkoxy of from one to six carbon atoms;

n is zero or an integer of from one to four;

n' is zero or an integer of from one to three;

X is oxygen or sulfur;

Ar and Ar' are independently

unsubstituted phenyl, 1- or 2-naphthyl, 2- or 3-thienyl, or 2-, 3-, or 4-pyridinyl; or

phenyl, 1- or 2-naphthyl, 2- or 3-thienyl, or 2-, 3-, or 4-pyridinyl substituted with

alkyl of from one to six carbon atoms,

hydroxy,

alkoxy of from one to six carbon atoms,

fluorine,

chlorine,

bromine,

nitro,

benzyloxy,

trifluoromethyl, or

$—NR_5R_6$ in which R_5 and R_6 are independently hydrogen or alkyl of from one to six carbon atoms; or NH-acetyl

with the proviso that when Ar and Ar' are both not phenyl or substituted phenyl, n is one and n' is zero; or

a pharmaceutically acceptable salt thereof.

5,116,849

4-AMIDINO CHROMAN AND 4-AMIDINO PYRANO (3,2-C) PYRIDINE DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Georges Garcia, Saint-Gely-du-Fesc; Patrick Gautier, Cournonterral; Dino Nisato, Saint-Georges d'Orques, and Richard Roux, Vailhauques, all of France, assignors to Sanofi, Paris, France

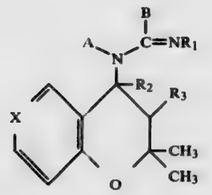
Filed Oct. 31, 1990, Ser. No. 606,864

Claims priority, application France, Nov. 6, 1989, 89 14518; Feb. 2, 1990, 90 01258

Int. Cl.[5] A61K *31/44;* **C07D** *407/04*

U.S. Cl. 514—337 **15 Claims**

1. Compound of formula:



(I)

in which:

A and B are linked together between N and C=NR$_1$ and represent a —CH=CR$_4$—CR$_5$=CH— group, one of the substituents R$_4$ or R$_5$ denoting hydrogen, the other being selected from hydrogen, halogen, nitro or C$_1$–C$_4$ alkyl;

X represents a C—Z group;

Z represents hydrogen, halogen, C$_1$–C$_4$ alkyl, cyano, nitro, acetyl or trifluoroacetyl, phosphono or dialkoxyphosphoryl, the alkyl group being a C$_1$–C$_3$ group or an amino group;

R$_1$ represents hydrogen, cyano, nitro, C$_1$–C$_4$ alkyl, hydroxyl, C$_1$–C$_4$ alkoxy, trifluoroacetyl, methanesulfonyl, benzenesulfonyl unsubstituted or substituted on the phenyl by methyl, halogen or trifluoromethyl;

R$_2$ represents hydrogen.

R$_3$ represents hydroxyl or acetyloxy or R$_2$ and R$_3$ together form a bond.

5,116,850

HETEROCYCLIC PYRAZOLINE CARBOXANILIDES

Thomas M. Stevenson, Newark, Del., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.

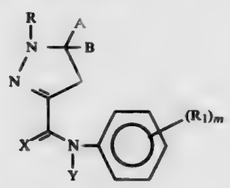
PCT No. PCT/US88/04213, § 371 Date May 21, 1990, § 102(e) Date May 21, 1990, PCT Pub. No. WO89/05300, PCT Pub. Date Jun. 15, 1989

Continuation of Ser. No. 126,619, Nov. 30, 1987, abandoned. This PCT application Nov. 30, 1988, Ser. No. 543,855

Int. Cl.[5] A61K *31/44*; C07D *401/04*

U.S. Cl. 514—341 **13 Claims**

1. A compound of the formula



wherein:

X is O or S;

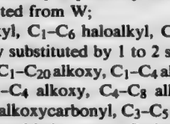
Y is selected from the group H, C$_1$ to C$_4$ alkyl, C$_2$ to C$_4$ alkoxyalkyl, C$_1$ to C$_4$ alkylthio, C$_1$ to C$_4$ haloalkylthio, SX', phenylthio, or phenylthio substituted with 1 to 3 substituents independently selected from W, C$_2$ to C$_4$ alkoxycarbonyl, C(O)H, C$_2$ to C$_4$ alkylcarbonyl and C$_2$ to C$_4$ haloalkylcarbonyl;

A is selected from the group H, C$_1$ to C$_6$ alkyl, phenyl, phenyl substituted by (R$_5$)$_p$, CN, CO$_2$R$_3$, C(O)R$_3$, C(O)NR$_3$R$_4$, C(S)NR$_3$R$_4$, C(S)R$_3$, C(S)SR$_3$;

B is selected from the group H, C$_1$ to C$_6$ alkyl, C$_1$ to C$_6$ haloalkyl, C$_2$ to C$_6$ alkoxyalkyl, C$_2$ to C$_6$ cyanoalkyl, C$_3$ to C$_8$ alkoxycarbonylalkyl, C$_2$ to C$_6$ alkenyl, C$_2$ to C$_6$ alkynyl, C$_2$ to C$_6$ alkoxycarbonyl, phenyl, phenyl substituted with 1 to 3 substituents independently selected from W, benzyl and benzyl substituted with 1 to 3 substituents independently selected from W;

W is selected from the group halogen, CN, NO$_2$, C$_1$ to C$_2$ alkyl, C$_1$ to C$_2$ haloalkyl, C$_1$ to C$_2$ alkoxy, C$_1$ to C$_2$ haloalkoxy, C$_1$ to C$_2$ alkylthio, C$_1$ to C$_2$ haloalkylthio, C$_1$ to C$_2$ alkylsulfonyl and C$_1$ to C$_2$ haloalkylsulfonyl;

R is

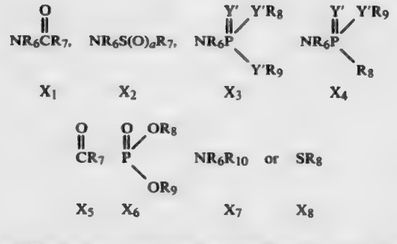


R$_1$, R$_2$ and R$_5$ are independently selected from the group R$_3$, halogen, CN, N$_3$, SCN, NO$_2$, OR$_3$, SR$_3$, S(O)R$_3$, S(O)$_2$R$_3$, OC(O)R$_3$, OS(O)$_2$R$_3$, CO$_2$R$_3$, C(O)R$_3$, C(O)NR$_3$R$_4$, S(O)$_2$NR$_3$R$_4$, NR$_3$R$_4$, NR$_4$C(O)R$_3$, OC(O)NHR$_3$, NR$_4$C(O)NHR$_3$, NR$_4$S(O)$_2$R$_3$;

R$_3$ is selected from the group H, C$_1$ to C$_4$ alkyl, C$_1$ to C$_4$ haloalkyl, C$_2$ to C$_4$ alkenyl, C$_2$ to C$_4$ haloalkenyl, C$_2$ to C$_4$ alkynyl, C$_2$ to C$_4$ haloalkynyl, C$_2$ to C$_4$ alkoxyalkyl, C$_2$ to C$_4$ alkylthioalkyl, C$_1$ to C$_4$ nitroalkyl, C$_1$ to C$_4$ cyanoalkyl, C$_3$ to C$_6$ alkoxycarbonylalkyl, C$_3$ to C$_6$ cycloalkyl, C$_3$ to C$_6$ halocycloalkyl, phenyl, benzyl, or phenyl or benzyl substituted with 1 to 3 substituents independently selected from W;

R$_4$ is H or C$_1$ to C$_4$ alkyl;

X' is



R$_6$ and R$_{10}$ are independently selected from C$_1$ to C$_6$ alkyl, C$_1$–C$_6$ haloalkyl, C$_3$–C$_6$ cycloalkyl, C$_4$–C$_7$ cycloalkylalkyl, C$_2$ to C$_6$ cyanoalkyl, C$_2$ to C$_6$ alkoxyalkyl, C$_3$ to C$_8$ alkoxycarbonylalkyl, C$_4$ to C$_8$ dialkylaminocarbonylalkyl, phenyl optionally substituted by 1 to 2 substituents selected from W, benzyl optionally substituted by 1 to 2 substituents selected from W, and phenethyl optionally substituted by 1 to 2 substituents selected from W;

R is F, C$_1$–C$_{20}$ alkyl, C$_1$–C$_6$ haloalkyl, C$_2$–C$_8$ dialkylamino, phenyl optionally substituted by 1 to 2 substituents selected from W, or R$_7$ is C$_1$–C$_{20}$ alkoxy, C$_1$–C$_4$ alkoxy substituted by cyano, nitro, C$_1$–C$_4$ alkoxy, C$_4$–C$_8$ alkoxyalkoxy, C$_1$–C$_2$ alkylthio, C$_2$–C$_3$ alkoxycarbonyl, C$_3$–C$_5$ dialkylaminocarbonyl, phenyl or 1 to 6 halogens, or R$_7$ is phenoxy optionally substituted by 1 to 2 substituents selected from W,

R$_8$ and R$_9$ are independently selected from C$_1$–C$_4$ alkyl, C$_2$–C$_4$ haloalkyl or phenyl optionally substituted by 1 to 2 substituents selected from W;

a is 0 to 2;

Y' is O or S;

m is 1 to 3;

n is 0 to 3; and

p is 0 to 3.

5,116,851

PHARMACEUTICAL COMPOSITION AND METHOD FOR TREATING CARDIOVASCULAR DISEASES USING SUBSTITUTED ANILIDES AND SULFONAMIDES

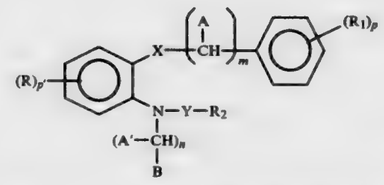
John Krapcho, Somerset, N.J.; James L. Bergey, Lansdale, Pa., and Gary J. Grover, Stockton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 26, 1990, Ser. No. 471,254

Int. Cl.[5] A01N *43/00, 43/60, 41/06, 37/18*

U.S. Cl. 514—354 **38 Claims**

1. A method for the treatment of myocardial ischemia and arrhythmia comprising administering to a mammalian specie in need thereof a therapeutically effective amount of a compound having the formula



and to acid addition salts and quaternary ammonium salts thereof, wherein

R and R$_1$ each independently represent hydrogen, halo, lower alkyl, lower alkoxy, trihalomethyl, nitro, amino or hydroxy;

X represents oxa (—O—) or thia (—S—);

B represents a basic nitrogen-containing radical of the formula

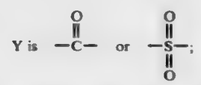


A and A' are independently selected from hydrogen or lower alkyl;

m is zero or an integer from 1 to 3;

n represents an integer from 2–5;

p and p' are the same or different integer of 1 to 3;



R$_2$ is lower alkyl, aryl, aralkyl, cycloalkyl(lower alkyl), lower alkenyl, lower alkadienyl, α-substituted phenyl alkyl, aralkenyl, aralkynyl or heteroaryl; and

R$_3$ and R$_4$ are independently selected from hydrogen, lower alkyl, hydroxy lower alkyl, R substituted phenyl lower alkyl, R substituted cinnamoyl, 2- or 4-pyridylaklyl, and N-(lower alkyl)phenyl-(lower alkyl); or R$_3$ and R$_4$ taken together with the nitrogen atom to which they are attached form a 5- to 7-membered monocyclic heterocycle which may contain one oxygen atom or one additional nitrogen atom and which heterocycle may be substituted by 1, 2 or 3 lower alkyl, lower alkoxy, hydroxy lower alkyl or lower alkanoyloxy-lower alkyl groups.

5,116,852

TREATMENT OF SLEEP DISORDERS

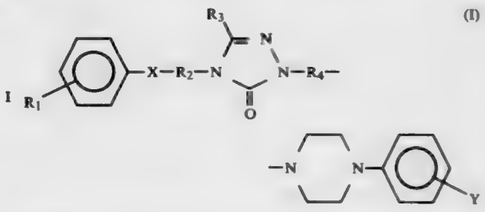
Richard Gammans, Killingworth, Conn., assignor to Bristol-Myers Squibb Co., New York, N.Y.

Filed Dec. 3, 1990, Ser. No. 620,696

Int. Cl.[5] A61K *31/41*

U.S. Cl. 514—359 **4 Claims**

1. A method for the treatment of sleep disorders involving decreased REM sleep and/or decreased slow wave sleep, the method comprising administration to a subject in need thereof of a therapeutically effective regimen of at least one compound of Formula I:



(I)

wherein

X is a direct bound, O, N, NH or S;

R$_1$ and R$_3$ are each hydrogen or C$_{1-6}$ substituted or unsubstituted hydrocarbon groups which may be connected to the ring via an -O- or -N- linkage;

R$_2$ and R$_4$ are each a direct bond, a C$_{1-8}$ saturated or an unsaturated hydrocarbon group;

Y is a halogen atom.

5,116,853

PHENYLENE DERIVATIVES

Toshiyasu Mase, No. 81, Maruyama-cho, Nijusseikigaoka, Matsudo-shi, Chiba; Kiyoshi Murase, No. 809-1, Amanuma-cho 2-chome, Omiya-shi, Saitama; Hiromu Hara, No. 5-16, Mizonuma danchi 2-505, Mizonuma, Asaka-shi, Saitama, and Kenichi Tomioka, No. 1214-76, Sakata, Okegawa-shi, Saitama, all of Japan

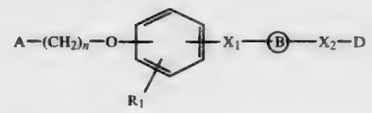
Division of Ser. No. 899,218, Aug. 15, 1986, Pat. No. 4,994,479. This application Sep. 27, 1989, Ser. No. 413,458

Claims priority, application Japan, Apr. 3, 1985, 60-70566; Dec. 26, 1985, 60-297096

Int. Cl.[5] C07D *285/125*; A01K *31/41*

U.S. Cl. 514—363 **21 Claims**

1. A compound represented by the general formula (I) or a pharmaceutically acceptable salt thereof:



wherein symbols represent:

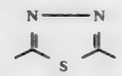
A: hydrogen or a phenyl group;

n: an integer of 4 to 7;

R$_1$: hydrogen atom;

X$_1$: a group shown by —CH$_2$—Y$_1$— (wherein Y$_1$: —S—, —CO—Y$_2$— (wherein Y$_2$: —NH— or —CH$_2$—Y$_1$);

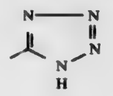
Ⓑ: a group represented by:



X$_2$: a group represented by —CH=CH— or —Y$_3$—Y$_4$—.

wherein Y_3: a single bond, —O— or —S—; Y_4: an alkylene group having 1 to 6 carbon atoms which may be intervened by a sulfur atom.

D: a carboxy group, or a group represented by:



5,116,854

ANTI-INFLAMMATORY 1-HETEROARYL-3-ACYL-2-OXINDOLES

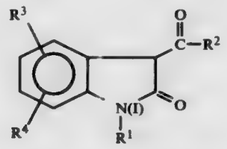
Anthony Marfat, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 28, 1991, Ser. No. 688,600

Int. Cl.[5] C07D *407/04, 409/04, 417/04;* **A61K** *31/40*

U.S. Cl. 514—365 **16 Claims**

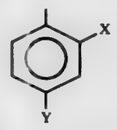
1. A compound of the formula (I)



or a pharmaceutically acceptable base salt thereof wherein

R^1 is thienyl, furyl or 2-thiazolyl;

R^2 is thienyl, furyl or



wherein X is hydrogen, fluoro, chloro, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, nitro or trifluoromethyl;

Y is hydrogen, fluoro or chloro;

and each of R^3 and R^4, which may be alike or different, is hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, nitro or trifluoromethyl.

5,116,855

RHODANINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Hitoshi Inoue; Hiroki Kato; Noriyoshi Sueda; Yoshiyuki Tahara, and Nobuhiro Kinoshita, all of Saitama, Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

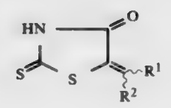
Filed May 11, 1990, Ser. No. 521,902

Claims priority, application Japan, May 19, 1989, 1-124252; May 1, 1990, 2-111761

Int. Cl.[5] C07D *277/34;* **A01K** *31/425*

U.S. Cl. 514—369 **6 Claims**

1. A rhodanine derivative of formula (I)



(I)

wherein

R^1 is hydrogen, C_1–C_8 alkyl, carboxyl (C_1–C_4) alkyl or (C_1–C_4) alkoxycarbonyl (C_1–C_4) alkyl;

R^2 is $CH_2{}_n$ $CONHR^{4'}$(n is 0 or 1–4); and

$R^{4'}$ is a phenyl group substituted by carboxyl or (C_1–C_3) alkoxycarbonyl, or a pharmaceutically acceptable salt thereof.

5,116,856

AMINOETHYLTHIAZOLE AND AMINOETHYLOXAZOLE DERIVATIVES

Duncan R. Rae, Lanark, and Samuel G. Gibson, Motherwell, both of Scotland, assignors to Akzo N.V., Arnhem, Netherlands

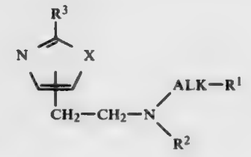
Filed Feb. 22, 1990, Ser. No. 483,156

Claims priority, application European Pat. Off., Mar. 3, 1989, 89302131.1

Int. Cl.[5] C07D *277/42;* **A61K** *31/42*

U.S. Cl. 514—370 **4 Claims**

1. Aminoethylthiazole and aminoethyloxazole derivatives with the general formula I



I

wherein

X is S;

ALK is a hydrocarbyl (C_2–C_6) group and selected from the group consisting of unbranched hydrocarbons, branched hydrocarbons, saturated hydrocarbons, unsaturated hydrocarbons, and cyclohydrocarbons of 2 to 6 carbon atoms;

R^1 is a substituted or unsubstituted aryl group selected from the group consisting of phenyl, naphthyl, pyridyl, thienyl, and furanyl, any member of said aryl group may be substituted with a substituent selected from the group consisting of OH, halogen, CF_3, CN, NO_2, hydrocarbyl containing from 1 to 6 carbon atoms and alkoxy containing from 1 to 6 carbon atoms;

R^2 is a hydrogen, a hydrocarbyl group containing from 1 to 6 carbon atoms and selected from the group consisting of methyl, unbranched hydrocarbons, branched hydrocarbons, saturated hydrocarbons, unsaturated hydrocarbons, and cyclohydrocarbons of 2 to 6 carbon atoms or an aralkyl group containing from 7 to 13 carbon atoms wherein aryl is defined in R^1 and alkyl is defined as ALK; and

R^3 is a substituted or unsubstituted amino group wherein the substituted amino group is selected from the group consisting of a hydrocarbyloxycarbonylamino comprising 2 to 7 carbon atoms, an amino group substituted by alkyl with 1 to 6 carbon atoms, an amino group substituted by acyl comprising 1–13 carbon atoms derived from a aliphatic or araliphatic carboxylic acid with 1 to 13 carbon atoms and an amino group substituted by aralkyl containing 7–13 carbon atoms;

or the pharmaceutically acceptable acid solution salts thereof.

5,116,857

METHOD OF INCREASING GASTROINTESTINAL MOTILITY WITH SUBSTITUTED BENZAMIDES

Jacques Acher, Itteville; Jean-Claude Monier, Lardy; Jean-Paul Schmitt, Arpajon, all of France; Brenda Costall; Robert Naylor, both of Ilkey, United Kingdom, and Renee Gardaix-Luthereau, Cachan, France, assignors to Laboratoires Delagrange Div. Societe d'Applications Pharmacodynamiques, Paris, France

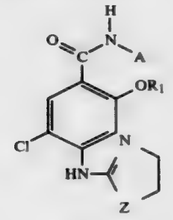
Filed Dec. 14, 1989, Ser. No. 450,422

Claims priority, application France, Dec. 14, 1988, 88 16433

Int. Cl.[5] A61K *31/425, 31/42, 31/415*

U.S. Cl. 514—370 **9 Claims**

1. A method for increasing gastrointestinal motility which comprises administering a therapeutically effective amount of a compound of the general formula I:



(I)

in which:

A is linear or branched C_1–C_3 alkyl; allyl or diethylaminoethyl;

R_1 is hydrogen or methyl, and

Z—is —NH—, —O—or —S—,

or their pharmacologically acceptable salts, to an appropriate host.

5,116,858

4-IMIDAZOLINE DERIVATIVES

Yoshio Hayashi, Ushiku; Yasuhiro Morinaka, Tsuchiura; Masaki Shinoda, Yokohama; Hiroyoshi Nishi, Ibaraki; Kazutoshi Watanabe, and Nobuko Fukushima, both of Yokohama, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

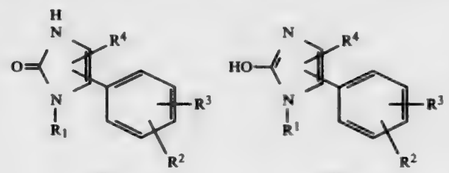
Filed Apr. 26, 1990, Ser. No. 514,832

Claims priority, application Japan, Apr. 26, 1989, 1-107028

Int. Cl.[5] C07D *233/70;* **A61K** *31/415*

U.S. Cl. 514—391 **7 Claims**

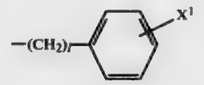
1. A compound of the formula (I) and/or formula (II):



(I) (II)

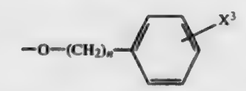
wherein

R^1 is C_1–C_4 alkyl, C_5–C_6 cycloalkyl, or a group of the formula:



wherein X^1 is hydrogen, halogen, C_1–C_3 alkyl, or C_1–C_3 alkoxy, and l is an integer of 0–3;

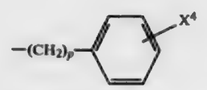
R^2 represents C_3–C_{20} alkyl, C_3–C_{20} alkoxy, C_5–C_6 cycloalkyl, C_1–C_5 alkylthio, phenyl, or a group of the formula:



wherein X^3 is hydrogen, halogen, C_1–C_3 alkyl, or C_1–C_3 alkoxy, and n is an integer of 0–3;

R^3 represents hydrogen,

R^4 represents C_1–C_4 alkyl, C_5–C_6 cycloalkyl, or a group of the formula:



wherein X^4 is hydrogen, halogen, C_1–C_3 alkyl, or C_1–C_3 alkoxy, and p is an integer of 1–3, or a pharmaceutically acceptable salt thereof.

5,116,859

METHOD OF PROVIDING ANXIOLYTIC AND ANTIPSYCHOTIC TREATMENT

Jacques Acher, Itteville; Jean-Claude Monier, Lardy; Jean-Paul Schmitt, Arpajon, all of France; Brenda Costall; Robert Naylor, both of Ilkey, United Kingdom, and Renee Gardaix-Luthereau, Cachan, France, assignors to Laboratoires Delagrance Societe d'Application Pharmacodynamiques, Paris Cedex, France

Filed Jun. 17, 1988, Ser. No. 207,947

Claims priority, application European Pat. Off., Jun. 17, 1987, 87401364.2

The portion of the term of this patent subsequent to Oct. 26, 2007, has been disclaimed.

Int. Cl.[5] A01M *43/50*

U.S. Cl. 514—392 **4 Claims**

1. A method of treating anxiety which comprises administering to a patient exhibiting anxiety characteristics a therapeutically effective amount of N-[2-(diethylamino)-ethyl]-2-methoxy-4-[(1-H-4,5-dihydro-2-imidazolyl-amino]-5-chlorobenzamide, or a pharmaceutically acceptable salt thereof.

5,116,860

N-SUBSTITUTED AZOLES FOR COMBATING INSECTS, ARACHNIDS AND NEMATODES

Rainer Buerstinghaus, Teigte; Hans-Juergen Neubauer, Mannheim; Peter Hofmeister, Neustadt; Christoph Kuenast, Otterstadt; Joachim Leyendecker, Maanheim, and Uwe Kardorff, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 184,804, Apr. 22, 1988, Pat. No. 4,943,585.

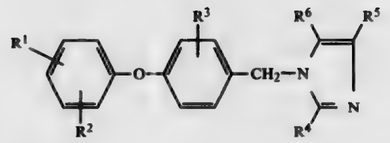
This application Apr. 30, 1990, Ser. No. 516,925

Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714709; Jan. 23, 1988, 3801919

Int. Cl.[5] A01N *43/50;* **C07D** *233/68, 233/60, 233/90*

U.S. Cl. 514—399 **24 Claims**

1. A process for combatting insects, arachnids and nematodes, comprising treating the insects, arachnids or nematodes, or the areas or spaces to be kept free from insects, arachnids or nematodes with a insecticidally, arachinidically or nematocidally effective amount of compound of the formula:



wherein

R^1, R^2 and R^3 are each hydrogen, halogen, C_1–C_8-alkyl, C_1–C_8-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, C_3–C_{10}-cycloalkyl, nitro or cyano, and

R^4, R^5 and R^6 are each hydrogen, halogen, C_1–C_8-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_3–C_{10} cycloalkyl, phenyl or naphthyl, or phenyl or naphthyl mono-di- or tri-substituted by halogen, C_1–C_8-alkyl, C_1–C_8-alkoxy, C_1–C_4-haloalkyl or C_1–C_4-haloalkoxy.

5,116,861

NITROSOTHIOL DERIVATIVES AND THEIR USE

Giichi Goto, Toyono; Shigenori Ohkawa, Takatsuki, and Shoji Fukumoto, Kobe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

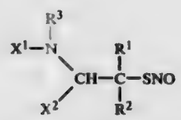
Filed Aug. 3, 1990, Ser. No. 562,626

Claims priority, application Japan, Aug. 7, 1989, 1-204361; Jan. 25, 1990, 2-015240

Int. Cl.[5] **A61K** *31/40, 31/195;* **C07D** *207/09;* **C07C** *323/07*

U.S. Cl. 514—427 **33 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are independently a hydrogen atom or an unsubstituted or substituted hydrocarbon group, or R^1 and R^2 taken together form a ring of the formula $—(CH_2)_n—$ wherein n is an integer of 2 to 6; R^3 is a hydrogen atom, an acyl group or an unsubstituted or substituted hydrocarbon group; X^1 is a hydrogen atom, an acyl group, a lower alkoxy group or an unsubstituted or substituted hydrocarbon group; X^2 is an acyl group, a carboxyl group, a carboxyl group which is esterified or a carboxyl group forming an amide;

wherein said substituted hydrocarbon groups are substituted with 1 to 3 substituents selected from the groups consisting of halogen, nitro, nitrile, hydroxyl, carboxyl, C_{1-4}-alkoxy, C_{1-4}-alkylthio, amino, mono- or di-$_{1-4}$-alkyl substituted amino, mono- or di-aralkyl substituted amino, mono- or di-pyridylcarbonyl substituted amino, C_{1-4}-alkoxycarbonyl, hydroxycarbonyl, C_{1-6}-alkylcabonyl, cyclo-C_{3-6}-alkylcarbonyl, carbamoyl, mono- or di-C_{1-4}-alkyl substituted carbamoyl, and phenyl, phenoxy, benzoyl, phenoxycarbonyl, phenyl-C_{1-4}-alkylcarbamoyl and phenylcarbamoyl wherein the phenyl ring is unsubstituted or substituted with 1 to 4 substituents selected from the group consisting of C_{1-4}-alkyl, halogen, hydroxyl, benzyloxy, amino, mono- or di-C_{1-4}-alkyl substituted amino, nitro and C_{1-4}-alkoxycarbonyl.

provided that when X^2 is a carboxyl group, X^1 is not a hydrogen atom or acetyl group and that when both R^1 and R^2 are hydrogen atoms X^1 is not acetyl group or γ-glutamyl group,

or a pharmaceutically acceptable salt thereof.

5,116,862

PESTICIDAL COMPOUNDS

John B. Weston; John P. Larkin, and Ian H. Smith, all of Berkhamsted, England, assignors to The Wellcome Foundation Limited, London, United Kingdom

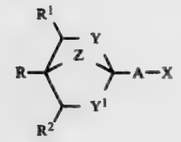
Continuation-in-part of Ser. No. 171,311, Mar. 21, 1988, abandoned, Division of Ser. No. 401,490, Jul. 1, 1989, Pat. No. 4,985,582, which is a continuation of Ser. No. 911,913, Sep. 22, 1986, abandoned. This application Jul. 21, 1988, Ser. No. 222,405

Claims priority, application United Kingdom, Jul. 22, 1987, 8717274; Oct. 7, 1987, 87234488; Apr. 26, 1988, 8809851

Int. Cl.[5] **A01N** *43/32;* **C07D** *339/08*

U.S. Cl. 514—436 **7 Claims**

1. A compound of the formula (I):



(I)

wherein R is a C_{2-10} non-aromatic hydrocarbyl group or a C_{1-10} non-aromatic hydrocarbyl group substituted by cyano, halo, C_{1-4} alkoxy, C_{1-4} haloalkoxy, or a group $S(O)_mR^3$ where R^3 is C_{1-4} alkyl or C_{1-4} haloalkyl, and m is 0, 1 or 2, or R is phenyl or phenyl substituted by C_{1-4} alkoxy, C_{1-3} alkyl, C_{2-4} alkynyl, halo, C_{1-4} haloalkyl, cyano or a group $S(O)_mR^3$ as defined hereinabove;

R^1 and R^2 may be the same or different, and each is hydrogen, halo or a C_{1-3} aliphatic group or a C_{1-3} aliphatic group substituted by halo, cyano, C_{1-4} alkoxy, or a group $S(O)_{m'}R^4$ wherein m′ is 0, 1 or 2 and R^4 is C_{1-4} alkyl, cyano or gem dimethyl, or R^1 and R^2 and the carbon atoms to which they are attached form a C_{5-7} carbocyclic ring or a C_{5-7} carbocyclic ring substituted by halo, or a C_{1-3} aliphatic or alkoxy group;

A-X is a group:

A′ C≡C in which A′ is a C_{3-6} non-cyclic hydrocarbyl group optionally substituted by fluoro, chloro or hydroxy;

X is hydrogen, halo, or a group



wherein R^8 and R^9 are the same or different and are each independently selected from hydrogen, halo, cyano, C_{1-4} alkyl, C_{1-4} alkyl substituted by one to three halo atoms, cyano, C_{1-4} alkoxy or a group $S(O)_{m''}R^{11}$ wherein m″ is 0, 1 or 2 and R^{11} is C_{1-4} alkyl, C_{1-4} alkoxy or $S(O)_{m'''}R^{12}$ wherein m‴ is 0, 1 or 2 and R^{12} is C_{1-4} alkyl or C_{1-4} alkyl substituted by one to three fluoro atoms, or R^8 and R^9 and the carbon atom to which they are attached form a C_{3-6} cycloalkyl ring, and R^{10} is hydrogen, halo, hydroxy, cyano, C_{1-4} alkoxy, a C_{1-9} hydrocarbyl group or a C_{1-9} hydrocarbyl group substituted by hydroxy, cyano, C_{1-4} alkoxy, one to three halo atoms or a group $(SO)_{m''''}R^{13}$ wherein m⁗ is 0, 1 or 2 and R^{13} is C_{1-4} alkyl or R^{10} is a group $S(O)_{m''''}R^{14}$ wherein m⁗′ is 0, 1 or 2 and R_{14} is C_{1-4} alkyl or a C_{1-4} alkyl substituted by one to three fluoro atoms;

Y and Y^1 are the same or different and are each independently $S(O)_{n'}$ wherein n′ is 0, 1 or 2; and

Z is $CH_2S(O)_{n''}$ where n″ is 0, 1 or 2.

5,116,863

DIBENZ[B,E]OXEPIN DERIVATIVE AND PHARMACEUTICAL COMPOSITIONS THEREOF

Etsuo Oshima; Toshiaki Kumazawa; Shizuo Otaki; Hiroyuki Obase, all of Shizuoka; Kenji Ohmori, Mishima; Hidee Ishii, Shizuoka; Haruhiko Manabe, Shizuoka; Tadafumi Tamura, Shizuoka, and Katsuichi Shuto, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

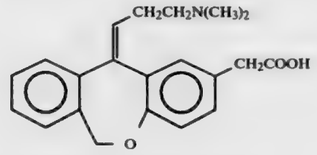
Filed Mar. 2, 1987, Ser. No. 20,900

Claims priority, application Japan, Mar. 3, 1986, 61-45676

Int. Cl.[5] **A61K** *31/335;* **C07D** *313/12*

U.S. Cl. 514—450 **3 Claims**

1. A dibenz[b,e]oxepin compound in cis form having the formula



and pharmaceutically acceptable salts thereof.

3. A pharmaceutical composition comprising a pharmaceutical carrier and as an active ingredient, an effective amount of a dibenz[b,e]oxepin compound defined in claim **1**.

5,116,864

METHOD FOR PREVENTING RESTENOSIS FOLLOWING RECONFIGURATION OF BODY VESSELS

Keith L. March, Carmel; David R. Hathaway; Robert L. Wilensky, both of Indianapolis, and Brian L. Patton, Thorntown, all of Ind., assignors to Indiana University Foundation, Bloomington, Ind.

Filed Apr. 9, 1991, Ser. No. 682,627

Int. Cl.[5] **A61K** *31/35*

U.S. Cl. 514—455 **20 Claims**

1. A method for preventing restenosis in peripheral or cardiac vasculature following vascular recanalization which comprises:

(a) systemically administering a photoactivatable psoralen to a subject undergoing vascular recanalization said psoralen being administered in a safe and effective amount to achieve serum levels of psoralen appropriate for light-dependent inhibition of smooth muscle cell growth,

(b) recanalizing at least a partially-occluded vessel, and

(c) delivering ultraviolet radiation to the region of said recanalization in the presence of said psoralen.

5,116,865

15,16-SECO-19-NOR PROGESTINS

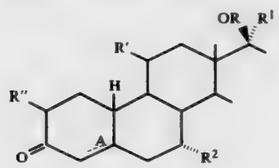
Richard H. Peters, 365 Springpark Cir., San Jose, Calif. 95136, and Masato Tanabe, 972 Moreno Ave., Palo Alto, Calif. 94303

Continuation-in-part of Ser. No. 578,091, Sep. 5, 1990, abandoned. This application Jan. 28, 1991, Ser. No. 647,298

Int. Cl.[5] **A61K** *31/21;* **C07C** *69/013, 255/45*

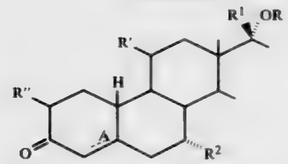
U.S. Cl. 514—510 **11 Claims**

1. A compound having the formula (Ia) or (Ib):



(Ia)

-continued



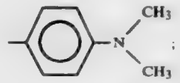
(Ib)

wherein:

R is hydrogen or an acyl group of the formula —(C=O)—Y;

Y is an organic substituent selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkylene, haloalkyl, aryl, haloaryl and arylalkylene;

R′ is hydrogen or, alkyl of 1 to 12 carbon atoms, or



R″ is hydrogen or lower alkyl;

R^1 is selected from the group consisting of hydrogen, alkyl, alkenyl and alkynyl;

R^2 is selected from the group consisting of hydrogen, lower alkyl, and cyano; and

A represents an optional double bond.

5,116,866

ANILINE DERIVATIVES AND FUNGICIDES CONTAINING THEM

Bernd Wenderoth, Lampertheim; Franz Schuetz, Ludwigshafen; Hubert Sauter, Mannheim; Franz Roehl; Eberhard Ammermann, both of Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

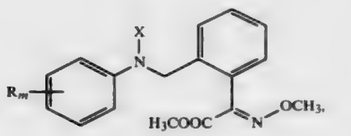
Filed Sep. 27, 1990, Ser. No. 588,837

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1989, 3932542

Int. Cl.[5] **A01N** *37/34*

U.S. Cl. 514—522 **6 Claims**

1. Aniline derivatives of the formula I



(I)

where

R is hydrogen, halogen, cyano, nitro, C_1–C_{15}-alkyl, C_3–C_6-cycloalkyl, C_3–C_6-alkenyl, C_1–C_4-alkoxy, C_1–C_2-haloalkyl, C_1–C_2-haloalkoxy, substituted or unsubstituted phenyl, substituted or unsubstituted phenoxy, benzyl, halobenzyl having up to three halo substituents, or substituted or unsubstituted benzyloxy, wherein the substituents of substituted phenyl, substituted phenoxy, and substituted benzyloxy are up to 3 substituents independently selected from the group consisting of halo and C_1–C_4-alkyl,

m is an integer of from 1 to 5 or the group



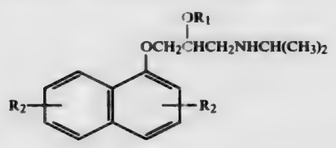
is α-naphthyl or β-naphthyl and
X is hydrogen, C_1–C_6-alkyl or C_3–C_6-cycloalkyl, or a plant-tolerated acid addition salt or metal complex thereof.

5,116,867
D-PROPRANOLOL AS A SELECTIVE ADENOSINE ANTAGONIST

David C. Klein, Gaithersburg, Md., and Olga Nikodijevic, Suopje, Yugoslavia, assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Jun. 30, 1989, Ser. No. 373,863
Int. Cl.[5] A61K *31/24, 31/22;* **C07C** *69/76, 69/02*
U.S. Cl. 514—534 **16 Claims**

1. A method of inhibiting adenosine-dependent processes by administration to a mammal an adenosine-inhibiting effective amount of a composition of matter containing as an active ingredient a compound of the formula



(Formula 1)

wherein R_1 is COH or COA, wherein A is alkyl or benzyl which may be substituted with halo or hydroxy and wherein R_2 is alkyl, hydroxy, halo, or hydrogen and wherein at least 85% of the compound is the D optical isomer or salts thereof.

5,116,868
EFFECTIVE OPHTHALMIC IRRIGATION SOLUTION

Chung-Ho Chen, and Sami C. Chen, both of Phoenix, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed May 3, 1989, Ser. No. 346,700
Int. Cl.[5] A61K *31/22*
U.S. Cl. 514—546 **18 Claims**

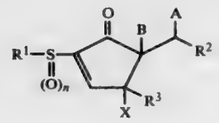
1. A method of applying an ophthalmic irrigation composition to ocular tissues to sustain tissue cell viability and capability to perform physiological functions in an amount sufficient to irrigate the tissues, said composition comprising an aqueous phosphate-buffered balanced salt solution including glucose, an antioxidant, and at least one of ketone bodies and precursors thereof in amounts sufficient to effectively meet requirements of ocular tissues for efficient physiological and biochemical functioning.

5,116,869
2-SUBSTITUTED-2-CYCLOPENTENONES

Satoshi Sugiura; Atsuo Hazato; Toru Minoshima; Yoshinori Kato, all of Hino; Yasuko Koshihara, Kawaguchi, and Seizi Kurozumi, Kokubunji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 340,207, Apr. 19, 1989, abandoned. This application Sep. 3, 1991, Ser. No. 759,785
Claims priority, application Japan, Apr. 19, 1988, 63-94687; Jan. 24, 1989, 1-13036
Int. Cl.[5] A61K *31/35*
U.S. Cl. 514—456 **17 Claims**

1. A 2-substituted-2-cyclopentenone represented by the formula (I):



(I)

wherein A is a hydroxyl group or



and B is a hydrogen atom or A and B are absent and a double bond is present between the two carbon atoms to which A and B would be bound;
R^1 represents an alkyl group having 1 to 10 carbon atoms, an aralkyl group having 7 to 10 carbon atoms, or an aryl group having 6 to 10 carbon atoms or said alkyl, aralkyl or aryl group substituted with a hydroxyl group, a tri(C_1–C_7-)hydrocarbonsilyloxy group, a halogen atom, an alkoxy group, an acyloxy group, an acyl group, an alkoxycarbonyl group, or a carboxyl group;
R^2 represents an aliphatic hydrocarbon group having from 1 to 10 carbon atoms or an aliphatic hydrocarbon group having from 1 to 10 carbon atoms substituted with —$COOR^5$, wherein R^5 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms or one equivalent cation; —OR^6, wherein R^6 represents a hydrogen atom, an acyl group having 2 to 7 carbon atoms, a tri(C_1–C_7)hydrocarbonsilyloxy group, a methoxymethyl group, a 1-ethoxyethyl group, a 2-methoxy-2-propyl group, a 2-ethoxy-2-propyl group, a 2-methoxyethoxy-methyl group, a tetrahydropyran-2-yl group, a tetrahydrofuran-2-yl group, a 6,6-dimethyl-3-oxa-2-oxo-bicyclo[3.1.0]-hexan-4-yl group, an aromatic hydrocarbon group which may be substituted with a halogen atom, a hydroxyl group, a tri(C_1–C_7)hydrocarbonsilyloxy group, a carboxyl group, an acyloxy group having 2 to 7 carbon atoms, an acyl group having 2 to 7 carbon atoms, an alkoxycarbonyl group having 2 to 5 carbon atoms, an alkyl group having 1 to 4 carbon atoms, or an alkoxy group having 1 to 4 carbon atoms; an aromatic hydrocarbon group which may be substituted with a halogen atom, a hydroxyl group, a tri(C_1–C_7)hydrocarbonsilyloxy group, a carboxyl group, an acyloxy group having 2 to 7 carbon atoms, an acyl group having 2 to 7 carbon atoms, an alkoxycarbonyl group having 2 to 5 carbon atoms, an alkyl group having 1 to 4 carbon atoms, or an alkoxy group having 1 to 4 carbon atoms; or an alicyclic group which may be substituted with a halogen atom, a hydroxyl group, a tri(C_1–C_7-)hydrocarbonsilyloxy group, a carboxyl group, an acyloxy group having 2 to 7 carbon atoms, an acyl group having 2 to 7 carbon atoms, an alkoxycarbonyl group having 2 to 5 carbon atoms, an alkyl group having 1 to 4 carbon atoms, or an alkoxy group having 1 to 4 carbon atoms;
R^3 represents an aliphatic hydrocarbon group having from 1 to 10 carbon atoms or an aliphatic hydrocarbon group having from 1 to 10 carbon atoms substituted with —$COOR^5$, wherein R^5 represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms or one equivalent cation; —OR^6, wherein R^6 represents a hydrogen atom, an acyl group having 2 to 7 carbon atoms, a tri(C_1–C_7)hydrocarbonsilyloxy group, a methoxymethyl group, a 1-ethoxyethyl group, a 2-methoxy-2-propyl group, a 2-ethoxy-2-propyl group, a 2-methoxyethoxy-methyl group, a tetrahydropyran-2-yl group, a tetrahydrofuran-2-yl group, a 6,6-dimethyl-3-oxa-2-oxo-bicyclo[3.1.0]-hexan-4-yl group, an aromatic hydrocarbon group which may be substituted with a halogen atom, a hydroxyl group, a tri(C_1–C_7)hydrocarbonsilyloxy group, a carboxyl group,

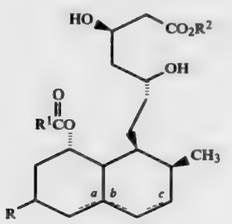
an acyloxy group having 2 to 7 carbon atoms, an acyl group having 2 to 7 carbon atoms, an alkoxycarbonyl group having 2 to 5 carbon atoms, an alkyl group having 1 to 4 carbon atoms, or an alkoxy group having 1 to 4 carbon atoms; an aromatic hydrocarbon group which may be substituted with a halogen atom, a hydroxyl group, a tri(C_1–C_7)hydrocarbonsilyloxy group, a carboxyl group, an acyloxy group having 2 to 7 carbon atoms, an acyl group having 2 to 7 carbon atoms, an alkoxycarbonyl group having 2 to 5 carbon atoms, an alkyl group having 1 to 4 carbon atoms, or an alkoxy group having 1 to 4 carbon atoms; or an alicyclic group which may be substituted with a halogen atom, a hydroxyl group, a tri(C_1–C_7-)hydrocarbonsilyloxy group, a carboxyl group, an acyloxy group having 2 to 7 carbon atoms, an acyl group having 2 to 7 carbon atoms, an alkoxycarbonyl group having 2 to 5 carbon atoms, an alkyl group having 1 to 4 carbon atoms, or an alkoxy group having 1 to 4 carbon atoms; wherein
R^3 is attached via a single bond, and X represents a hydrogen atom, a hydroxyl group, an alkoxy group, a tri(C_1–C_7)hydro-carbonsilyloxy group, an acetal group selected from the group consisting of a methoxymethoxy group, a 1-ethoxyethoxy group, a 2-methoxyethoxymethoxy group, and a tetrahydropyran-2-yloxy group or an acyloxy group or R^3 is attached via a double bond and X is absent; and m and n represent 0, 1 or 2.

5,116,870
HMG-COA REDUCTASE INHIBITORS

Robert L. Smith, Lansdale; Wasyl Halczenko, Hatfield; George D. Hartman, Lansdale; Gerald E. Stokker, Gwynedd Valley, all of Pa.; Edward S. Isaacine, Rahway; Otto D. Hensens, Red Bank, both of N.J.; David R. Houck, Los Alamos, N. Mex., and Ta J. Lee, Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

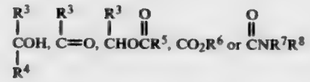
Division of Ser. No. 254,525, Oct. 6, 1988, Pat. No. 4,940,727, which is a continuation-in-part of Ser. No. 92,353, Sep. 2, 1987, abandoned, and a continuation-in-part of Ser. No. 48,136, May 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 1,933, Oct. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 877,041, Jun. 23, 1986, abandoned. This application Jun. 6, 1990, Ser. No. 533,744
Int. Cl.[5] A61K *31/225;* **C07C** *69/74*
U.S. Cl. 514—548 **25 Claims**

1. A compound represented by the following structural formula II:



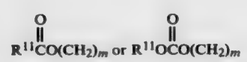
(II)

wherein:
R is



R^1 and R^5 are independently:
(1) C_{1-10} alkyl;
(2) substituted C_{1-10} alkyl in which one or more substituent(s) is:
(a) halogen,
(b) hydroxy,
(c) C_{1-10} alkoxy,
(d) C_{1-5} alkoxycarbonyl,
(e) C_{1-5} acyloxy,
(f) C_{3-8} cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y,
(i) C_{1-10} alkylS(O)$_n$ in which n is 0 to 2,
(j) C_{3-8} cycloalkylS(O)$_n$,
(k) phenylS(O)$_n$,
(l) substituted phenylS(O)$_n$ in which the substituents are X and Y, and
(m) oxo;
(3) C_{1-10} alkoxy;
(4) C_{2-10} alkenyl;
(5) C_{3-8} cycloalkyl;
(6) substituted C_{3-8} cycloalkyl in which one substituent is:
(a) C_{1-10} alkyl
(b) substituted C_{1-10} alkyl in which the substituent is selected from
(i) halogen,
(ii) hydroxy,
(iii) C_{1-10} alkoxy,
(iv) C_{1-5} alkoxycarbonyl,
(v) C_{1-5} acyloxy,
(vi) phenyl,
(vii) substituted phenyl in which the substituents are X and Y
(viii) C_{1-10} alkylS(O)$_n$,
(ix) C_{3-8} cycloalkylS(O)$_n$,
(x) phenylS(O)$_n$,
(xi) substituted phenylS(O)$_n$ in which the substituents are X and Y, and
(xii) oxo,
(c) C_{1-10} alkylS(O)$_n$,
(d) C_{3-8} cycloalkylS(O)$_n$,
(e) phenylS(O)$_n$,
(f) substituted phenylS(O)$_n$ in which the substituents are X and Y,
(g) halogen,
(h) hydroxy,
(i) C_{1-10} alkoxy,
(j) C_{1-5} alkoxycarbonyl,
(k) C_{1-5} acyloxy,
(l) phenyl, and
(m) substituted phenyl in which the substituents are X and Y;
(7) phenyl;
(8) substituted phenyl in which the substituents are X and Y;
(9) amino;
(10) C_{1-5} alkylamino;
(11) di(C_{1-5} alkyl)amino;
(12) phenylamino;
(13) substituted phenylamino in which the substituents are X and Y;
(14) phenyl C_{1-10} alkylamino;
(15) substituted phenyl C_{1-10} alkylamino in which the substituents are X and Y;
(16) R^9S in which R^9 is selected from
(a) C_{1-10} alkyl,
(b) phenyl, and
(c) substituted phenyl in which the substituents are X and Y;
R^2 and R^6 are independently:
(1) hydrogen;
(2) C_{1-5} alkyl;
(3) substituted C_{1-5} alkyl in which the substituent is:
(a) phenyl,
(b) dimethylamino, and
(c) acetylamino, and

(4) 2,3-dihydroxypropyl;
R^3 and R^4 are independently:
(1) hydrogen;
(2) C_{1-10} alkyl;
(3) substituted C_{1-10} alkyl in which one or more substituent(s) is:
(a) halogen,
(b) hydroxy,
(c) C_{1-10} alkoxy,
(d) C_{1-5} alkoxycarbonyl,
(e) C_{1-5} acyloxy,
(f) C_{3-8} cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y,
(i) C_{1-10} alkyl$S(O)_n$,
(j) C_{3-8} cycloalkyl$S(O)_n$,
(k) phenyl$S(O)_n$,
(l) substituted phenyl$S(O)_n$ in which the substituents are X and Y, and
(m) oxo;
(4) C_{2-10} alkenyl;
(5) substituted C_{2-10} alkenyl in which one or more substituent(s) is:
(a) halogen,
(b) hydroxy,
(c) C_{1-10} alkoxy,
(d) C_{1-5} alkoxycarbonyl,
(e) C_{1-5} acyloxy,
(f) C_{3-8} cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y,
(i) C_{1-10} alkyl$S(O)_n$,
(j) C_{3-8} cycloalkyl$S(O)_n$,
(k) phenyl$S(O)_n$,
(l) substituted phenyl$S(O)_n$ in which the substituents are X and Y, and
(m) oxo;
(6) C_{3-8} cycloalkyl;
(7) substituted C_{3-8} cycloalkyl in which one substituent is:
(a) C_{1-10} alkyl
(b) substituted C_{1-10} alkyl in which the substituent is
(i) halogen,
(ii) hydroxy,
(iii) C_{1-10} alkoxy,
(iv) C_{1-5} alkoxycarbonyl,
(v) C_{1-5} acyloxy
(vi) phenyl,
(vii) substituted phenyl in which the substituents are X and Y
(viii) C_{1-10} alkyl$S(O)_n$,
(ix) C_{3-8} cycloalkyl$S(O)_n$,
(x) phenyl$S(O)_n$,
(xi) substituted phenyl$S(O)_n$ in which the substituents are X and Y, and
(xii) oxo,
(c) C_{1-10} alkyl$S(O)_n$,
(d) C_{3-8} cycloalkyl$S(O)_n$,
(e) phenyl$S(O)_n$,
(f) substituted phenyl$S(O)_n$ in which the substituents are X and Y,
(g) halogen,
(h) hydroxy,
(i) C_{1-10} alkoxy,
(j) C_{1-5} alkoxycarbonyl,
(k) C_{1-5} acyloxy,
(l) phenyl, and
(m) substituted phenyl in which the substituents are X and Y;
(8) phenyl
(9) substituted phenyl in which the substituents are X and Y;
R^7 and R^8 are independently:
(1) hydrogen;
(2) C_{1-10} alkyl;
(3) substituted C_{1-10} alkyl in which one or more substituent(s) is:
(a) halogen,
(b) hydroxy,
(c) C_{1-10} alkoxy,
(d) C_{1-10} alkoxycarbonyl,
(e) C_{1-5} acyloxy,
(f) C_{3-8} cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y,
(i) C_{1-10} alkyl$S(O)_n$ in which n is 0 to 2,
(j) C_{3-8} cycloalkyl $S(O)_n$,
(k) phenyl $S(O)_n$;
(l) substituted phenyl $S(O)_n$ in which the substituents are X and Y, and
(m) oxo;
(4) C_{2-10} alkenyl;
(5) C_{3-8} cycloalkyl;
(6) aminocarbonyl;
(7) substituted aminocarbonyl in which one or more substituent(s) is:
(a) C_{1-5} alkyl,
(b) C_{3-8} cycloalkyl,
(c) phenyl,
(d) substituted phenyl in which the substituents are X and Y;
(8) phenyl;
(9) substituted phenyl in which the substituents are X and Y;
(10) C_{1-10} alkylcarbonyl;
(11) C_{3-8} cycloalkylcarbonyl;
(12) phenylcarbonyl;
(13) substituted phenylcarbonyl in which the substituents are X and Y; and
X and Y independently are hydrogen, halogen, trifluoromethyl, C_{1-3} alkyl, nitro, cyano or a group selected from:
(1) $R^{10}O(CH_2)_m$ in which m is 0 to 3 and R^{10} is hydrogen, C_{1-3}alkyl or hydroxy-C_{2-3}alkyl;
(2)



$R^{11}CO(CH_2)_m$ or $R^{11}OCO(CH_2)_m$

in which R^{11} is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3}alkyl, phenyl, naphthyl, amino-C_{1-3}alkyl, C_{1-3}alkylamino C_{1-3}alkyl, di(C_{1-3}alkyl)amino-C_{1-3}alkyl, hydroxy-C_{2-3}-alkylamino-C_{1-3}alkyl or di(hydroxy C_{2-3}alkyl) amino-C_{1-3}alkyl;
(3)



$R^{12}OC(CH_2)_m$

in which R^{12} is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3}alkyl, C_{1-3}alkoxy-C_{1-3}alkyl, phenyl or naphthyl;
(4)



$R^{13}R^{14}N(CH_2)_m$, $R^{13}R^{14}NC(CH_2)_m$ or $R^{13}R^{14}NCO(CH_2)_m$

in which R^{13} and R^{14} independently are hydrogen, C_{1-3} alkyl, hydroxy-C_{2-3}alkyl;
(5) $R^{15}S(O)_n(CH_2)_m$ in which R^{15} is hydrogen, C_{1-3}alkyl, amino, C_{1-3}alkylamino or di(C_{1-3}alkyl)amino; and
a, b and c each represent single bonds or one of a, b and c represents a double bond or both a and c represent double bonds; or a pharmaceutically acceptable salt thereof.

5,116,871
FATTY ACID THERAPY AND COMPOSITIONS FOR THE TREATMENT OF MYALGIC ENCEPHALOMYELITIS

David F. Horrobin, and John C. M. Stewart, both of Guildford, England, assignors to Efamol Holdings PLC, Surrey, United Kingdom

Filed Aug. 24, 1989, Ser. No. 397,789
Claims priority, application United Kingdom, Sep. 13, 1988, 8821466; Japan, Aug. 10, 1989, 8918293
Int. Cl.[5] A61K *31/20, 35/78*
U.S. Cl. 514—560 5 Claims

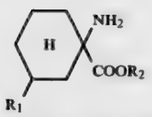
1. A method of treating myalgic encephalomyelitis comprising administering to a person suffering therefrom an effective amount of a mixture of a 6-desaturated essential fatty acid of the n-6 series and a 6-desaturated essential fatty acid of the n-3 series.

5,116,872
MICROBICIDAL COMPOSITIONS

Peter Ackermann, Pfeffingen; Hanspeter Fischer, Bottmingen; Rolf Vogel, Reinach, all of Switzerland; Karlheinz Drauz, Freigericht; Hans-Albrecht Hasseberg, Rodenbach; Hans-Jochen Hasselbach, Gelnhausen; Günter Knaup, Bruchköbel; Hans-Peter Krimmer, Frankfurt, and Matthias Schäfer, Obernburg, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. and Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 22, 1991, Ser. No. 643,882
Claims priority, application Switzerland, Jan. 24, 1990, 228/90
Int. Cl.[5] A01N *37/00, 37/44, 55/02, 55/04*
U.S. Cl. 514—561 8 Claims

1. A method of protecting plants from fungal attack, which comprises treating the plants, the parts of the plant or the site where it grows with a fungicidally effective amount of a 1-aminocyclohexanecarboxylic acid derivative having the formula I,



(I)

an acid addition salt or a metal complex thereof, R_1 being hydrogen, methyl, ethyl or isopropyl and R_2 being hydrogen, methyl, ethyl, propyl, isopropyl, the metal ion equivalent of Li, Na, K, Mg, Ca, Cu, Mn, Zn, Sn, Fe, Ni, Co, Cr, Al, Ti, Zr or of two or more of these elements.

5,116,873
DRUG ACTIVE IN RESTORING NEURONAL PLASTICITY

Alfredo Gorio, via G.B. Pergolesi 7, Milano, Italy 20124 , and Enrico Genazzani, via Della Maddalena 102, Revigliano (Torino), Italy

Filed Dec. 7, 1990, Ser. No. 629,642
Claims priority, application Italy, Dec. 14, 1989, 48660 A/89
Int. Cl.[5] A61K *31/195*
U.S. Cl. 514—567 5 Claims

1. A method for stimulating neuronal plasticity in neuronal tissue which comprises administering a pharmaceutical composition comprising a pharmacology effective amount of thyroid T_4 to a patient in need thereof.

5,116,874
ANTI-TUMOR METHOD AND COMPOUNDS

Gerald A. Poore, Martinsville; Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 49,185, May 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 888,675, Jul. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 779,354, Sep. 23, 1985, abandoned. This application May 15, 1989, Ser. No. 351,755
Int. Cl.[5] A61K *31/175*
U.S. Cl. 514—592 1 Claim

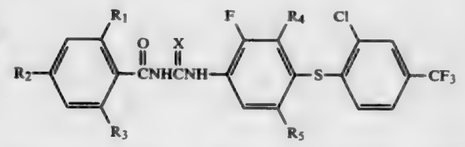
1. A method of treating susceptible neoplasms in mammals which comprises administering to a mammal in need of such treatment an effective amount of N-{[(4-cholorophenyl-)amino]carbonyl}-2,3-dihydro-1H-indene-5-sulfonamide.

5,116,875
BENZOYLUREA DERIVATIVE AND ITS PRODUCTION AND USE

Noriyasu Sakamoto; Tatsuya Mori, both of Takarazuka; Tadashi Ohsumi, Nishinomiya; Hiroaki Fujimoto, Takarazuka, and Izumi Fujimoto, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 171,900, Mar. 22, 1988, abandoned. This application Jul. 25, 1990, Ser. No. 560,231
Claims priority, application Japan, Apr. 3, 1987, 62-83513; May 6, 1987, 62-111489; Aug. 5, 1987, 62-196745
Int. Cl.[5] A01N *47/34;* C07C *275/54*
U.S. Cl. 514—594 16 Claims

1. A benzoylurea derivative represented by the formula:



wherein R_1 is chlorine or fluorine, each of R_2 and R_3, which may be the same or different, is fluorine or hydrogen, R_4 is hydrogen, R_5 is halogen, methyl or trifluoromethyl, and X is oxygen or sulfur.

5,116,876
PHOTOPOLYMERIZATION PROCESSES WITH SEPARATION OF INITIATOR LAYER FROM RESIN LAYER

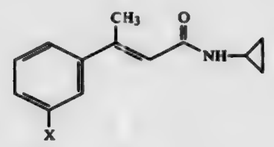
Robert S. Davidson, London, England, and Susan A. Wilkinson, Frankfurt, Fed. Rep. of Germany, assignors to National Research Development Corporation, London, England

Filed May 3, 1990, Ser. No. 520,222
Claims priority, application United Kingdom, May 12, 1989, 8910921
Int. Cl.[5] C08F *2/46;* C08G *00/00;* C08J *3/28;* B05D *3/06*
U.S. Cl. 522—1 22 Claims

1. A process for the polymerization of a cationically polymerizable resin, said process comprising the steps of:
positioning a first layer comprising a radiation sensitive initiator adjacent to but not in contact with a second layer comprising the uncured or partially cured resin in a manner such that volatile species produced as a result of irradiating said first layer come into contact with said second layer; and
irradiating the first layer.

5,116,877
PHARMACEUTICAL USE FOR CINNAMAMIDE DERIVATIVES
Hironaka Aihara; Michio Kurachi, both of Kitamoto, and Kazuyuki Tomiswa, Saitama, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan
Filed Jan. 29, 1990, Ser. No. 471,596
Claims priority, application Japan, Feb. 2, 1989, 1-024159
Int. Cl.[5] A01N *37/18*
U.S. Cl. 514—617 4 Claims

1. A method for relaxing muscle tone which comprises administering to a patient in need thereof 5–1000 mg per adult per day of a cinnamamide derivative represented by the formula



wherein X is fluorine or chlorine.

5,116,878
MEDICAL COMPOSITION FOR THE TREATMENT AND PREVENTION OF THE SYMPTOMS OF HEART FAILURE, CONTAINING A VASOCONSTRICTOR ALPHA-STIMULANT AGENT AS ACTIVE PRINCIPLE
Laure Cabanes; Alain Lockhart, and Simon Weber, all of Paris, France, assignors to Universite de Paris V, Paris, France
Filed Jun. 14, 1989, Ser. No. 366,183
Claims priority, application France, May 16, 1989, 89 06380
Int. Cl.[5] A61K *31/135*
U.S. Cl. 514—653 9 Claims

1. A method of treating the symptoms of left ventricular dysfunction, the method which comprises:
(a) providing a medicinal composition comprising as its active principle a therapeutically effective amount of at least one compound selected from the group consisting of 2-amino-1-(2,5-dimethoxyphenyl) -1-propanol and pharmaceutically acceptable salts thereof, and which medicinal composition is in a form which can be administered by inhalation; and
(b) administering said medicinal composition by inhalation to a patient in order to treat symptoms of left ventricular dysfunction in said patient.

5,116,879
PROCESS USING A SUPPORTED CATALYST FOR HYDROCARBON SYNTHESIS
Sigrid Eri, Trondheim, Norway; James G. Goodwin, Jr.; George Marcelin, both of Pittsburgh, Pa., and Trygve Riis, Oslo, Norway, assignors to Den norske stats oljeselskap a.s., Stavanger, Norway
Division of Ser. No. 290,936, Dec. 28, 1988. This application Sep. 28, 1990, Ser. No. 590,430
Int. Cl.[5] C07C *1/04*
U.S. Cl. 518—716 3 Claims

1. A process for the production of hydrocarbons comprising the step of contacting a synthesis gas feed comprised of hydrogen and carbon monoxide with a catalyst consisting essentially of an amount of cobalt catalytically active in a Fischer-Tropsch synthesis, and at least one second metal selected from the group consisting of iridium, rhodium, and mixtures thereof composited on an alumina support, said second metal being present in relatively lesser amounts than the cobalt content of the catalyst, at a temperature, gas hourly space velocity and a pressure useful for promoting a Fischer-Tropsch Synthesis.

5,116,880
BIODISINTEGRABLE THERMOPLASTIC RESIN FOAM AND A PROCESS FOR PRODUCING SAME
Yutaka Tokiwa, Tsuchiura, and Akira Iwamoto, Tsukuba, both of Japan, assignors to Director-General of Agency of Industrial Science and Technology and JSP Corporation, both of, Japan
Division of Ser. No. 630,165, Dec. 19, 1990. This application Nov. 1, 1991, Ser. No. 786,605
Claims priority, application Japan, Dec. 27, 1989, 1-339196
Int. Cl.[5] C08J *9/10, 9/14*
U.S. Cl. 521—134 3 Claims

1. A biodisintegrable thermoplastic resin foam of a mixed resin of:
5–40 weight % of a thermoplastic resin decomposable by microorganisms, said decomposable resin being an aliphatic polyester selected from the group consisting of polycondensates of an aliphatic polycarboxylic acid with an aliphatic polyhydric alcohol, polycondensates of aliphatic hydroxycarboxylic acids, ring-opened polycondensates of lactones, block copolymers of said polycondensates and polyamide and block copolymers of said polycondensates and polyvinyl alcohol; and
95–60 weight % of a thermoplastic resin not decomposable by microorganisms,
said foam being composed of foam having an apparent density of 0.5 g/cm^3.

5,116,881
POLYPROPYLENE FOAM SHEETS
John J. Park, Neenah, Wis.; Leon Katz, Stamford, Conn., and Norman G. Gaylord, New Providence, N.J., assignors to James River Corporation of Virginia, Richmond, Va.
Filed Mar. 14, 1990, Ser. No. 493,541
Int. Cl.[5] C08J *9/08, 9/14*
U.S. Cl. 521—143 5 Claims

1. A foam sheet of a polypropylene characterized by at least
(a) either z-average molecular weight M_z of at least 1.0×10^6 or a ratio of the z-average molecular weight M_z to weight average molecular weight M_w M_z/M_w of at least 3.0, and
(b) either equilibrium compliance J_{eo} of at least 12×10^{-5} cm^2/dyne
or recoverable shear strain per unit stress Sr/S of at least 5×10^{-5} cm^2/dyne at 1 sec^{-1}.

5,116,882
PROCESS FOR MAKING COPOLYMERS OF VINYL AROMATIC MONOMERS AND VINYL PHOSPHONIC ACID DERIVATIVES AND FOAMED ARTICLES THEREFROM
Roger A. Grey, West Chester; Laurel E. Schock, Paoli, and Diandre Armstead, Philadelphia, all of Pa., assignors to Arco Chemical Technology, L.P., Wilmington, Del.
Filed May 16, 1991, Ser. No. 701,279
Int. Cl.[5] C08F *230/02, 212/08;* C08J *9/28*
U.S. Cl. 521—147 30 Claims

1. A process for making a foamed article, said process comprising molding foamed beads prepared by thermally expanding thermoplastic polymer beads, said thermoplastic polymer beads made by copolymerizing in an aqueous suspension a vinyl aromatic monomer and a vinyl phosphonic acid derivative selected from vinyl phosphonic acids and vinyl phosphonate mono- and diesters.

5,116,883
LOW DENSITY MICROCELLULAR FOAMS
James D. LeMay, Castro Valley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Division of Ser. No. 535,007, Jun. 8, 1990, Pat. No. 5,066,684. This application May 17, 1991, Ser. No. 701,722
Int. Cl.[5] C08J *9/28*
U.S. Cl. 521—178 11 Claims

1. A low density epoxy foam material prepared by a process comprising:
(a) selecting a multifunctional epoxy oligomer resin;
(b) mixing said epoxy resin with a non-reactive organic diluent to form a resin-diluent mixture;
(c) forming a diluent containing cross linked epoxy gel from said resin diluent mixture;
(d) replacing said diluent with a solvent therefor;
(e) replacing said solvent with liquid carbon dioxide; and
(f) vaporizing off said liquid carbon dioxide under super critical condition, whereby a foam having a density of less than about 50 mg/cm^3 and cell diameters less than about 1 μm is produced.

5,116,884
MELANIN HYDROPHILIC CONTACT LENSES
James M. Gallas, San Antonio, Tex., assignor to Photoprotective Technology Incorporated, San Antonio, Tex.
PCT No. PCT/US88/02859, § 371 Date Feb. 16, 1990, § 102(e) Date Feb. 16, 1990, PCT Pub. No. WO89/01639, PCT Pub. Date Feb. 23, 1989
Continuation-in-part of Ser. No. 88,029, Aug. 18, 1987, abandoned, and a continuation-in-part of Ser. No. 105,632, Oct. 5, 1987, abandoned, and a continuation-in-part of Ser. No. 105,631, Oct. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 739,556, May 30, 1985, Pat. No. 4,698,374, which is a continuation-in-part of Ser. No. 618,745, Jun. 8, 1984, abandoned, said Ser. No. 105,631, is a continuation-in-part of Ser. No. 88,029, which is a continuation of Ser. No. 837,852 Mar. 6, 1986, abandoned, which is a continuation of Ser. No. 739,756, May 30, 1985, abandoned, which is a continuation of Ser. No. 618,745, said Ser. No. 105,632, is a continuation-in-part of Ser. No. 88,029,. This PCT application Aug. 18, 1988, Ser. No. 459,749
Int. Cl.[5] C08J *3/00*
U.S. Cl. 523—106 35 Claims

1. A hydrophilic contact lens, comprising:
a polymeric material formed by the polymerization of a monomer; and
melanin connected to the polymeric material by a chemical covalent bond.

5,116,885
RESIN COMPOSITION
Eiji Hattori, Machida, and Yasuo Oguri, Tokyo, both of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan
Continuation of Ser. No. 397,889, Aug. 24, 1989, abandoned. This application Sep. 21, 1990, Ser. No. 588,493
Claims priority, application Japan, Sep. 9, 1988, 63-225813; Apr. 19, 1989, 1-99847
Int. Cl.[5] C08K *7/18*
U.S. Cl. 523—200 13 Claims

1. A resin composition having inorganic filler particles with an average particle size of from 0.05 to 150 μm incorporated in an amount of from 20 to 85% by volume based on the entire resin composition, wherein:
(a) said particles comprise from two to twelve groups of particles differing the average particle size,
(b) particles constituting a group of particles with the smallest average particle size, are spherical particles with an average particle size smaller than 5 μm, and with the standard deviation of the particle size distribution being at most 1.2,
(c) a group or groups of particles with an average particle size larger than the particles of (b), are constituted by spherical particles, pulverized particles or a mixture thereof,
(d) as between two groups of particles with their average particle sizes being close to each other, the ratio of the minimum particle size within a range defined by the standard deviation of the particle size distribution of the group of particles with a large average particle size, to the maximum particle size within a range defined by the standard deviation of the particle size distribution of the group of particles with a small average particle size, is at least 2, and
(e) the proportion of the volume of the group of particles with a large average particle size, to the total volume of the two groups of particles with their average particles sizes being close to each other, is from 20% to 95% by volume, and
wherein said inorganic filler particles are first dispersed in a polar liquid, and then, the filler particles, from which said polar liquid is removed, are incorporated into said resin.

5,116,886
METHOD FOR THE PRODUCTION OF FILLERS MODIFIED WITH ORGANOSILICON COMPOUNDS, THE FILLERS PRODUCED IN THIS MANNER AND THEIR USE
Siegfried Wolff, Bornheim-Merten; Udo Gorl, Meckenheim, and Hans Deusser, Karlstein, all of Fed. Rep. of Germany, assignors to Degussa AG, Fed. Rep. of Germany
Filed Feb. 15, 1991, Ser. No. 655,780
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1990, 4004781
Int. Cl.[5] C08K *9/06, 9/00;* C04B *14/04*
U.S. Cl. 523—209 2 Claims

1. A method for the surface-modification of natural or synthetic, oxide or silicate fillers having surface —OH groups using one or more organosilicon compounds of the Formula I:

$$[R_n^1(RO)_{3-n}Si-(Alk)_m-(Ar)_p]q\ [B] \qquad (I)$$

in which:
B represents —SCN (if q=1) or —S_x— (if q=2),
[R and] R^1[, which may be the same or different, signify] signifies an alkyl group with 1 to 4 carbon atoms or the phenyl group,
R signifies an alkyl group with 1 to 4 carbon atoms or the phenyl group or a C_1–C_4 alkyl-C_1–C_4 alkoxy group,
n represents 0, 1 and 2,
Alk signifies a bivalent, straight or branched hydrocarbon group having 1 to 6 carbon atoms,
m represents 0 or 1,
Ar is an arylene group with 6 to 12 carbon atoms,
p is 0 or 1 the provision that p and m do not signify 0 simultaneously, and
x is a number from 2 to 8,
said method comprising
a) intensively mixing at least one organosilicon compound according to Formula I with the filler, but without the addition of further solvents, at a temperature below 60° C. in a concentration of up to 3.5×10^{-6} moles trialkoxysilyl groups per one square meter filler surface and
b) subsequently subjecting the homogenized mixture to a hydrophobing reaction at temperature greater than 60° C.

5,116,887

WET STRENGTH RESIN COMPOSITION AND METHOD OF MAKING SAME

Stephen A. Fischer, Yardley, and Reuben H. Grinstein, Blue Bell, both of Pa., assignors to Henkel Corporation, Ambler, Pa.

Filed Dec. 7, 1989, Ser. No. 447,278
Int. Cl.[5] C08L *63/00*
U.S. Cl. 523—400 **6 Claims**

1. A process for making a polyamine-epichlorohydrin resin comprising the steps of: (a) providing a water-polyol-polyamine solution; (b) adding to said solution epichlorohhydrin at a rate sufficient to maintain the temperature of said solution in a range of from about 5° C. to about 15° C. to form a reaction mixture having an E/N ratio of from about 1.0 to about 1.4; (c) maintaining the temperature of said reaction mixture in a range of from about 50° C. to about 80° C. until a 35% solids solution of said reaction mixture has a viscosity of at least about 70 cps; and (d) adjusting the pH of said reaction mixture to from about 2 to about 3 with an aqueous acid solution

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5,116,888

EPOXY-ACRYLIC GRAFT COPOLYMERS WITH PHOSPHONIUM COCATALYSTS CARBON-GRAFT

James T. K. Woo, Medina, and Gary C. Pompignano, North Royalton, Ohio, assignors to The Glidden Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 411,925, Sep. 22, 1989, abandoned. This application Oct. 4, 1990, Ser. No. 593,647
Int. Cl.[5] C08F *283/10*
U.S. Cl. 523—409 **10 Claims**

1. In a non-aqueous process for producing an epoxy-acrylic, carbon-graft copolymer comprising the reaction product of ethylenically unsaturated monomers, including acrylic monomers and carboxyl-functional acrylic monomers copolymerized in the presence of epoxy resin, the improvement comprising:

copolymerizing said monomers including at least about 20% carboxyl monomer based on the total weight of said monomers at temperatures from about 80° C. and 130° C. in the presence of an addition polymerization catalyst consisting of between about 0.5 and 3% peroxide in combination with 0.02% to 0.1% of a phosphonium cocatalyst based on the weight of said monomers copolymerized to produce a carbon-graft, acrylic-epoxy copolymer having at least 2% by weight free carboxyl groups and comprising by weight 10% to 70% acrylic component and 30% to 90% epoxy component; and

where said epoxy-acrylic copolymer is at least partially neutralized by aminating the carboxyl groups with an amine compound and dispersing the same into water.

5,116,889

PULPED PAPERBOARD-POLYMER COMPOSITIONS

Seymour G. Gilbert, 76 N. Ross Hall Blvd., Piscataway, N.J. 08854, and Urban J. Coelho, Bedminster, N.J., assignors to Seymour G. Gilbert, Pascataway, N.J.

Filed Jan. 26, 1990, Ser. No. 470,880
Int. Cl.[5] C08L *1/00*; D21H *17/53*
U.S. Cl. 524—14 **15 Claims**

1. A homogeneous composition of a combination of pulped waste paperboard and a finely divided polymer, said combination having incorporated an effective amount of a tensile strength enhancer selected from the group consisting of polyethyloxazoline, hydrolysis derivatives thereof, including polyethylene imine, and titanium salts, and having at least about 100 percent of the improvement in tensile strength over the corresponding control combination of the pulped paperboard and the finely divided polymer, said improvement in tensile strength as determined by ASTM Test Designation D638-89.

5,116,890

NON-FORMALDEHYDE SELF-CROSSLINKING LATEX

William C. Floyd, Chester, and Louis R. Dragner, Rock Hill, both of S.C., assignors to Sequa Chemicals, Inc., Chester, S.C.

Continuation-in-part of Ser. No. 371,493, Jun. 26, 1989, Pat. No. 5,026,746. This application Jun. 20, 1991, Ser. No. 718,500
The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.
Int. Cl.[5] C08L *3/08, 3/06, 3/04*
U.S. Cl. 524—50 **31 Claims**

1. A water dispersible, self-crosslinking non-formaldehyde latex comprising:

a starch-polymer graft comprising a starch hydrolyzate having a water solubility in excess of 50% by weight at 25° C. and a viscosity equivalent to a dextrose equivalent of less than 20, and a polymer based on a monomer which contains at least 50% by weight of a hydrophobic olefinically unsaturated monomer; and a glyoxal compound which has been reacted with the starch-polymer graft at temperatures of at least 70° C.

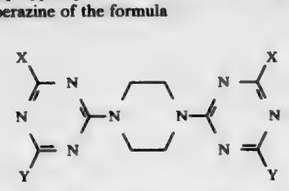
5,116,891

FLAME-RESISTANT POLYMERIC COMPOSITIONS

Werner Eberspach, Frankfurt am Main, Fed. Rep. of Germany; Daniel Scharf, East Greenwich, R.I., and Manfred Lysek, Bonn, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 18, 1991, Ser. No. 643,470
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1990, 4003231
Int. Cl.[5] C08K *5/357, 5/3492*
U.S. Cl. 524—97 **16 Claims**

1. A flame-resistant polymeric composition which contains 8 to 45% by weight of a flameproofing system which comprises at least one free-flowing, pulverulent, sparingly water-soluble ammonium polyphosphate and a monomeric, pulverulent bistriazinylpiperazine of the formula

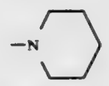


in which X and Y are identical or different —OR[1], —SR[1] or —NR[2]R[3] radicals where

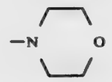
R^1 is a C_1- to C_{18}-alkyl group, a C_5- to C_{18}-cycloalkyl group, a phenyl or naphthyl group which is optionally substituted by inert radicals, or a C_7- to C_{18}-aralkyl group;

R^2 and R^3, independently of one another, are a C_1- to C_3-alkyl group, a C_5- to C_{18}-cycloalkyl group, a phenyl or naphthyl group which is optionally substituted by inert radicals, or a C_7- to C_{18}-aralkyl group, or

NR^2R^3 is piperidinyl of the formula



or morpholinyl of the formula



wherein 5 to 30% by weight of ammonium polyphosphate

and 3 to 15% by weight of bistriazinyl piperazine, both based on the flame-resistant polymeric composition, are present.

5,116,892

THERMOSETTING POWDER COATING COMPOSITIONS

Robert B. Barbee, and Glenn C. Jones, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 22, 1991, Ser. No. 733,582
Int. Cl.[5] C08K *5/3435, 5/09*; C08J *3/24*
U.S. Cl. 524—99 **12 Claims**

1. A thermosetting powder coating composition comprising an intimate blend comprising

(1) an acrylic copolymer comprising

(a) about 10 to 35 percent by weight, based on the weight of the copolymer, of a monoethylenically unsaturated monomer having at least one epoxy group, and

(b) about 65 to 90 percent by weight, based on the weight of the copolymer, of at least one monethylenically unsaturated monomer which is free of epoxy groups, wherein the copolymer has a number average molecular weight of about 1,000 to 8,000, a weight average molecular weight of about 2,000 to 16,000 and a glass transition temperature of 40° C. to 90° C., and

(2) a crosslinking effective amount of 1,3-cyclohexane dicarboxylic acid and/or 1,4-cyclohexanedicarboxylic acid.

5. The thermosetting powder coating composition of claim 1, further comprising one or more ultraviolet light screens and/or hindered amine light stabilizers.

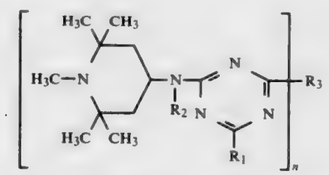
5,116,893

PIPERIDYLAMINOTRIAZINE DERIVATIVES AND THEIR USE AS STABILIZERS

Giuseppe Cantatore, Bitonto; Valerio Borzatta, and Franca Masina, both of Bologna, all of Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

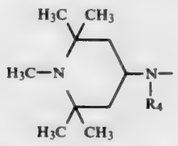
Division of Ser. No. 453,061, Dec. 8, 1989, Pat. No. 4,997,938, which is a continuation of Ser. No. 192,974, May 12, 1988, abandoned. This application Jan. 7, 1991, Ser. No. 638,609
Claims priority, application Italy, May 22, 1987, 20641 A/87
Int. Cl.[5] C08K *5/34*
U.S. Cl. 524—100 **11 Claims**

1. A composition comprising an organic material subject to thermal, oxidative or light-induced degradation and an effective stabilizing amount of a compound of the formula (I)



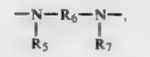
(I)

in which R_1 is di(C_1–C_4-alkyl)amino, C_1–C_4-alkoxy, a 5-membered to 7-membered nitrogen containing heterocyclic group with the nitrogen atom bonded to the triazine ring, or a group of the formula (II),

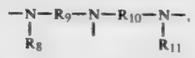


(II)

R_2 and R_4 which are identical or different are C_1–C_{12}-alkyl, C_5–C_7-cycloalkyl, benzyl or 1,2,2,6,6-pentamethyl-4-piperidyl, n is 2 or 3 and, if n is 2, R_3 is a group



with R_5 and R_7, which are identical or different, being hydrogen, C_1–C_{12}-alkyl, C_5–C_7-cycloalkyl, benzyl or 1,2,2,6,6-pentamethyl-4-piperidyl and R_6 being C_2–C_{12}-alkylene, cyclohexylene, cyclohexylenedimethylene or methylenedicyclohexylene, or R_3 is the divalent radical of a 6-membered to 7-membered heterocyclic compound with two nitrogen atoms which are each bonded to a triazine ring, or, if n is 3, R_3 is a group



with R_8 and R_{11}, which are identical or different, being as defined above for R_5 and R_7, and R_9 and R_{10}, which are identical or different, being C_2–C_{12}-alkylene.

5,116,894

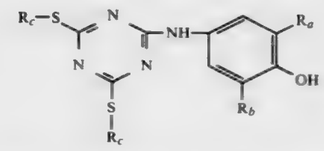
STABILIZER MIXTURES FOR ELASTOMERS

Gerrit Knobloch, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 16, 1991, Ser. No. 701,265
Claims priority, application Switzerland, May 22, 1990, 1731/90
Int. Cl.[5] C08K *5/34*
U.S. Cl. 524—100 **16 Claims**

1. A composition comprising an elastomer and a stabiliser mixture consisting of

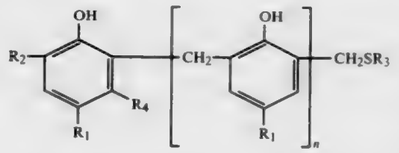
a) at least one phenol of formula



I

wherein R_a and R_b are each independently of the other C_1–C_4alkyl and R_c is C_6–C_{12}alkyl, and

b) at least one phenol of formula II



II

wherein n is 0 to 3, R_1 and R_2 are each independently of the other C_1–C_{12}alkyl or —CH_2SR_3, R_3 is C_8–C_{18}alkyl, phenyl or benzyl, and R_4 is hydrogen or methyl.

5,116,895
POLYMER SYSTEMS AND METHODS FOR THEIR PRODUCTION

Gaylen M. Knutson, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 292,448, Dec. 30, 1988, Pat. No. 5,055,506.
This application Jul. 15, 1991, Ser. No. 729,939
Int. Cl.[5] C08K *5/53*
U.S. Cl. 524—123 20 Claims

1. A polymer mass formed by drying an emulsion comprising:
(a) an alkenyl aromatic/alkadiene copolymer having at least one anionic pendant group;
(b) a tackifier resin;
(c) an anionic surfactant capable of emulsifying the alkenyl aromatic/alkadiene or the tackifier or both; and
(d) a polyamine having at least two amine groups,
wherein the polymer mass is a pressure-sensitive adhesive.

5,116,896
PHOTO-DEGRADABLE HEAT RESISTANT RESIN COMPOSITION

Kunihiro Hirose, and Takashi Inoue, both of Kawasaki, Japan, assignors to Nippon Unicar Company Limited

Filed May 31, 1991, Ser. No. 708,381
Claims priority, application Japan, Jun. 1, 1990, 2-141737
Int. Cl.[5] C08L *23/12, 73/00;* C08G *67/02*
U.S. Cl. 525—190 11 Claims

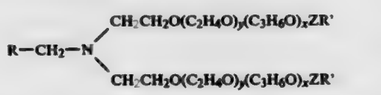
1. A composition comprising:
(a) a copolymer of ethylene and carbon monoxide, and, optionally, one or more ethylenically unsaturated monomeric organic compounds having 3 or more carbon atoms wherein ethylene is present in major proportion, by weight, and carbon monoxide is present in an amount of about 5 to about 10 percent by weight based on the weight of the copolymer; and
(b) polypropylene
wherein the copolymer is present in an amount of about 65 to about 70 percent by weight and the propylene is present in an amount of about 30 to about 35 percent by weight, based on the combined weight of the copolymer and the polypropylene.

5,116,897
ANTISTATIC COMPOSITION

Wendel L. Burton, Ardea, N.C., assignor to BASF Corporation, Parsippany, N.J.

Filed Jun. 27, 1990, Ser. No. 544,305
Int. Cl.[5] C08J *5/10;* C08L *33/24*
U.S. Cl. 524—243 16 Claims

1. A compound imparting durable antistatic properties to polyamide materials and of the general formula:



wherein R is a C_{1-9} alkyl group or hydrogen, Z is a difunctional chain modifier group, R' is a C_{1-4} alkyl group or hydrogen and x and y are between about 10 and about 50.

5,116,898
FLAME RETARDANT POLYPROPYLENE BASED FORMULATIONS

Robert A. Schleifstein, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 354,908, May 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 177,102, Apr. 4, 1988, abandoned. This application Sep. 17, 1990, Ser. No. 583,402
Int. Cl.[5] C08K *5/06*
U.S. Cl. 524—371 20 Claims

1. A flame retardant polypropylene based formulation comprising:
(a) polypropylene;
(b) up to about 10 wt. % of a flame retardant composition comprising
(i) about 3 wt. % to about 5 wt. % decabromodiphenyl oxide, and
(ii) about 5 wt. % to about 7 wt. % tetrabromocyclododecane or hexabromocyclododecane; and
(c) a flame retardant synergist.

5,116,899
RESIN COMPOSITION FOR ELECTRIC INSULATION MATERIALS FOR VEHICLES

Kazuhiko Aratake; Masayoshi Horikoshi, both of Ichihara; Fumio Kato, Kariya; Yasuhiko Suzuki, Toyoake, and Yuki Morimoto, Okazaki, all of Japan, assignors to Chisso Corporation and Nippondenso Co., Ltd., both of, Japan

Continuation of Ser. No. 332,605, Apr. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 131,629, Dec. 10, 1987, abandoned. This application Aug. 8, 1991, Ser. No. 742,281
Claims priority, application Japan, Dec. 15, 1986, 61-298019
Int. Cl.[5] C08K *13/04, 3/34;* C08L *23/26, 79/08*
U.S. Cl. 524—371 20 Claims

1. A resin composition for electric insulation materials for components of vehicles consisting essentially of a blend of an unmodified crystalline propylene-ethylene copolymer resin with 3 to 10 wt. % of glass fibers, 10 to 20 wt. % of talc or mica, 5 to 20 wt. % of silica, 4 to 20 wt. % of a modified polyolefin resin, 10 to 30 wt. % of a halogen-containing flame retardant and 3 to 15 wt. % of an auxiliary flame retardant, said percentages being based on the weight of said resin composition.

5,116,900
COATING COMPOSITION FOR FIBERS

Martin C. Flautt, Granville, and Leonard J. Adzima, Pickerington, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 13, 1990, Ser. No. 479,566
Int. Cl.[5] C08J *3/03;* C08K *5/06;* C08G *64/00;* C08L *69/00*
U.S. Cl. 524—377 6 Claims

1. An aqueous coating composition consisting essentially of, by weight percent:

	Weight Percent
Powdered polycarbonate precursor material comprising cyclic polycarbonate oligomers	15–35
Water soluble polymer comprising polyethylene oxide	.5–2
Viscosity modifier comprising a high molecular weight, highly charged, anionic, acrylic acid polymer or copolymer	.02–.10
Dispersant	.5–2.0
Defoamant	0–trace
Catalyst	0.009–.021
Water	balance.

5,116,901
LATEX-LIPOPHILIC POLYMER GRAFT POLYMERIZATION PROCESS

John Biale, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

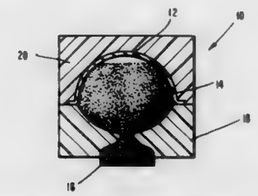
Filed Nov. 30, 1989, Ser. No. 444,551
Int. Cl.[5] C08F *8/00*
U.S. Cl. 524—457 20 Claims

1. A synthesis process comprising the step of polymerizing alpha, beta-ethylenically unsaturated monomer units in an aqueous medium containing a graft promoting system and a lipophilic polymer at reaction conditions sufficient to form a latex-lipophilic polymer composed of the lipophilic polymer and the polymerized alpha, beta-ethylenically unsaturated monomers units, wherein the lipophilic polymer (a) is devoid of olefinic unsaturation and (b), prior to becoming part of the latex-lipophilic polymer, contains at least one secondary and/or tertiary carbon atom.

5,116,902
ELASTOMER FOR USE WITH AQUEOUS INKS

Charles B. Chapman, San Diego, Calif., and Michael R. Williams, Brooklyn Park, Minn., assignors to Hewlett-Packard Company, Palo Alto, Calif. and Hiawatha Rubber Co., Brooklyn Park, Minn.

Filed Jan. 30, 1990, Ser. No. 472,157
Int. Cl.[5] C08K *3/04*
U.S. Cl. 524—579 6 Claims



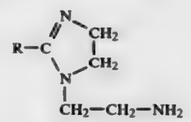
1. An elastomer resin composition consisting essentially of 100 parts high cross-link density ethylene propylene diene monomer having an iodine number of greater than 10, 18 to 30 parts carbon black as reinforcement, 7 to 7.5 parts dicumyl peroxide on Kaolin clay as curative, and 20 to 25 parts fully hydrogenated clay filtered mineral oil as plasticizer.

5,116,903
PIGMENT DISPERSANT RESIN: REACTION PRODUCT OF IMIDAZOLINE AND ALKYLENE CARBONATE ADDUCT AND A HALF BLOCKED DIISOCYANATE

Taddesse Gebregiorgis, Sterling Heights, Mich., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 5, 1991, Ser. No. 681,567
The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.
Int. Cl.[5] C08K *3/22*
U.S. Cl. 524—589 8 Claims

1. A pigment dispersant which is prepared by the following steps: bringing into contact compound (i), an alkylene carbonate, with a compound (ii) of the structure:



where R is an alkyl group having 8–24 carbon atoms, and bringing the resulting reaction product of (i) and (ii) into contact with a half blocked organic diisocyanate.

5,116,904
SOLUBLE, SOLID, OR CROSSLINKED GRAFT COPOLYMERS OF LIGNIN (2-PROPENAMIDE)-(2-METHYL-3-OXO-4-OXYBUT-1-ENE-(P-ETHOXY-(3*P+3)-OL, METHODS OF MAKING THE SAME AND USES THEREFORE

John J. Meister, 31675 Westlady Rd., Beverly Hills, Mich. 48010-5624; Amit Lathia, 2379 Mt. Hope, Okemos, Mich. 48864, and Fu-Fong Chang, 147-45 84th Ave., Kew Garden, N.Y. 11435

Filed Oct. 22, 1990, Ser. No. 601,198
Int. Cl.[5] C08H *5/02*
U.S. Cl. 525—8 15 Claims

1. A method for preparing a graft copolymer of lignin-(2-PROPENAMIDE)-2-methyl-3-oxo-4-oxybut-1-ene-(p-ethoxy (3*p+3)-ol) which comprises free radically graft copolymerizing 2-propenamide and 2-methyl-3-oxo-4oxybut-1-ene-(P-ethoxy(3*p+3)-ol on lignin, where the number of ethoxyl repeat units, p, in the polyol repeat unit is greater than 1 and up to about 300,000, such that the central lignin network has a molecular weight of about 1,000 to 150,000 and the total number of randomly repeating units in the graft side chain or chains is up to about 300,000, such that the total graft copolymer molecular weight is in the range of 15,000 to 300,000,000. Note: the symbol * stands for multiplying.

5,116,905
POLYCARBONATE RESIN MIXTURES

Edward L. Belfoure, New Harmony, and Omar M. Boutni, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Continuation of Ser. No. 527,744, Aug. 30, 1983, abandoned. This application Jan. 29, 1988, Ser. No. 153,532
Int. Cl.[5] C08L *69/00*
U.S. Cl. 525—67 4 Claims

1. A resin mixture comprising:
(A) an aromatic polycarbonate resin and
(B) an impact modifier combination therefor comprising:
(i) a polyester resin comprising
(a) a poly(alkylene terephthalate) resin, and
(b) an amorphous copolyester copolymer resin, and
(ii) a grafted core-shell copolymer resin comprising an elastomeric core phase comprising a conjugated diene polymer, said core being polymerized from over 50 weight percent of said diene; optionally a second intermediate phase of a polymerized vinyl aromatic monomer being grafted to said core; and a final shell phase polymerized from a monomer selected from the group consisting of a C_1–C_6 alkyl acrylate, a C_1–C_6 alkyl methacrylate, acrylic acid, methacrylic acid, and a mixture of any of the foregoing, together with a crosslinking monomer wherein component (A) comprises from about 50 to about 90 parts by weight, component (B)(i) comprises from about 9 to about 40 parts by weight and component (B)(ii) comprises from about 1 to about 10 parts by weight, based upon the weight of (A) and (B).

5,116,906
THERMOPLASTIC RESIN COMPOSITION

Yukio Mizuno, Ehime, and Takashi Maruyama, Ibaraki, both of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Feb. 8, 1990, Ser. No. 476,740
Claims priority, application Japan, Feb. 9, 1989, 1-31492
Int. Cl.[5] C08L *67/00, 69/00, 71/12, 79/00*
U.S. Cl. 525—68 5 Claims

1. A thermoplastic resin composition which comprises:
100 parts by weight of a composition comprising (A) 5–95% by weight of a polyphenylene ether and (B) 95–5% by weight of a thermoplastic polyester,

(C) 0.5–100 parts by weight of an aromatic polycarbonate resin, and

(E) 0.01–10 parts by weight of an amino resin obtained by modifying with an alcohol an addition reaction product of formaldehyde and at least one compound selected from the group consisting of melamine, guanamine and urea.

5,116,907

HEAT DISTORTION RESISTANT, THERMOPLASTIC MOLDING MATERIAL CONTAINING A COPOLYMER, PREPARATION OF THE MOLDING MATERIAL AND ITS USE

Ehrenfried Baumgartner, Roedersheim-Gronau; Adolf Echte, and Juergen Mertes, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 324,102, Mar. 16, 1989, Pat. No. 5,116,907. This application Sep. 28, 1990, Ser. No. 589,276

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811054; Mar. 31, 1988, 3811055

Int. Cl.[5] C08L *51/00;* **C08F** *212/10*

U.S. Cl. 525—77 **2 Claims**

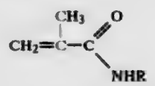
1. A molding material containing, in each case based on the sum of A, B and C,

A. from 5 to 95% by weight of a copolymer A comprising

a) from 1 to 95% by weight of styrene,

b) optionally not more than 40% by weight of acrylonitrile and

c) from 5 to 98% by weight of an amide of methacrylic acid of the formula I



where R is primary, secondary or tertiary C_1–C_{12} alkyl, C_1–C_{12} cycloalkyl, C_6–C_{12} aryl or C_7–C_{12} aralkyl, with the proviso that, when alkyl is methyl or isopropyl, the copolymer has a styrene content of less than 75% by weight,

B. from 5 to 60% by weight of a graft polymer B, prepared by emulsion polymerization of a mixture of styrene and acrylonitrile in the weight ratio from 60:40 to 90:10 in the presence of, based on the amount of expected copolymer, from 40 to 80% by weight of a particulate, partially crosslinked diene rubber or acrylate rubber, and

C. a positive amount not more than 90% by weight of a thermoplastic resin C which is a copolymer of styrene of substituted styrene with an ester of acrylic acid or methacrylic acid, or is a copolymer of styrene or substituted styrene with acrylonitrile or methacrylonitrile.

5,116,908

THERMOPLASTIC RESIN COMPOSITION

Toshio Inoue, Kawasaki; Masaki Miyazaki, Yokohama, and Shiuzi Kashiwase, Kawasaki, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Jun. 20, 1990, Ser. No. 540,939

Claims priority, application Japan, Jun. 27, 1989, 1-162646

Int. Cl.[5] C08F *8/00;* **C08L** *23/10*

U.S. Cl. 525—193 **6 Claims**

1. A partially crosslinked thermoplastic resin composition prepared by dynamically heat-treating a thermoplastic resin having substantially no carbon-carbon bond unsaturation in the presence of a dihydroaromatic compound as a crosslinking agent, said dihydroaromatic compound being selected from the group consisting of a 1,2-dihydroquinoline compound, a polymer thereof and 9,10-dihydrophenanthrene; and a polyfunctional monomer.

5,116,909

FLAME-RETARDANT INJECTION-MOLDING RESIN COMPOSITION

Ikuhiro Mishima; Kenji Nishimoto, and Hideki Hosoi, all of Hyogo, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 9, 1990, Ser. No. 490,888

Claims priority, application Japan, Mar. 10, 1989, 1-58222

Int. Cl.[5] C08L *33/06, 33/18*

U.S. Cl. 525—227 **3 Claims**

1. A flame-retardant injection-molding resin composition comprising (A) 100 parts by weight of a flame-retardant resin composed of from 30% to 80% by weight of a styrene resin having a reduced viscosity of a methyl-ethyl-ketone soluble portion of 0.2 to 0.55 dl/g in N,N-dimethylformamide at a concentration of 0.3 g/dl at 30° C., and from 20% to 70% by weight of a polyvinyl chloride resin having a polymerization degree of from 400 to 800; and (B) 0.5 to 10 parts by weight of a copolymer of from 3% to 35% by weight of a vinyl cyanide compound, 30% to 97% by weight of alkyl acrylate, and 0% to 67% by weight of an aromatic vinyl monomer being copolymerizable with the vinyl cyanide compound and the alkyl acrylate.

5,116,910

PREPARATION METHOD OF COMB COPOLYMER, ACRYLIC COMB COPOLYMER, AND IMPACT RESISTANT RESIN COMPOSITION

Seiji Tone, Ohtake; Haruko Takeda, Fujisawa, and Masahiro Sugimori, Nagoya, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 399,992, Aug. 29, 1989, Pat. No. 5,053,461. This application Jun. 7, 1991, Ser. No. 711,950

Claims priority, application Japan, Aug. 31, 1988, 63-215128; Sep. 5, 1988, 63-220431

Int. Cl.[5] C08F *265/06;* **C08L** *31/02*

U.S. Cl. 525—244 **6 Claims**

1. A preparation method of a comb copolymer comprising mixing a polymer having a main chain consisting essentially of a methacrylic ester monomer ester unit acrylic ester monomer ester unit or styrene monomer unit and a vinyl group at one end of the main chain and having a number average molecular weight of 3,000 to 50,000 with a vinyl monomer and a polymerization intiator in a halogenated hydrocarbon solvent which is a good solvent for said polymer and has an azeotropic point with water ranging from 30° to 90° C., and subjecting the resultant mixture to aqueous suspension polymerization at a temperature above the azeotropic point of said solvent with water.

5,116,911

METHACRYLATE (CO)POLYMERS CONTAINING CARBAZOLYL SIDE GROUPS AND ELECTROPHOTOGRAPHIC RECORDING ELEMENTS CONTAINING THE SAID (CO)POLYMERS

Reinhold J. Leyrer, Ludwigshafen; Harald Lauke, Mannheim; Bernhard Nick, Ludwigshafen; Peter Strohriegl, Hummeltal, and Dietrich Haarer, Bayreuth, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

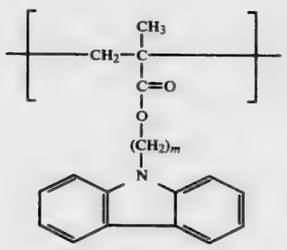
Filed Feb. 8, 1990, Ser. No. 476,879

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1989, 3906245

Int. Cl.[5] C08F *8/30*

U.S. Cl. 525—329.9 **3 Claims**

1. A methacrylate (co)polymer containing carbazolyl side groups which comprises not less than 60% of repeating units of the formula (I)



(I)

where m is an integer of from 3 to 11.

5,116,912

POLYPHENOLIC COMPOUNDS AND USES THEREOF

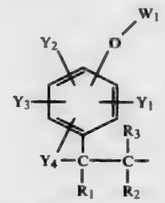
Andreas Lindert, Troy; John R. Pierce, Huntington Woods; David R. McCormic, Madison Heights, and Williams D. Zimmermann, Farmington Hills, all of Mich., assignors to Henkel Corporation, Ambler, Pa.

Continuation of Ser. No. 128,672, Dec. 4, 1987, Pat. No. 5,039,770. This application Jun. 6, 1991, Ser. No. 710,885

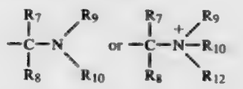
Int. Cl.[5] C08C *19/24, 19/20, 19/22*

U.S. Cl. 525—340 **20 Claims**

1. A co-polymer or a condensation product or salt thereof, wherein at least 1 percent of the repeating units in the co-polymer conform to the general formula:



in which R_1 through R_3 are independently selected for each repeating unit from hydrogen, an alkyl group having from 1 to about 5 carbon atoms, or an aryl group having from about 6 to about 18 carbon atoms; Y_1 through Y_3 are independently selected for each repeating unit from hydrogen, Z, $-CR_4R_5OR_6$, $-CH_2Cl$, or an alkyl or aryl group having from 1 to 18 carbon atoms; Y_4 is Z; and Z conforms to the general formula:



wherein R_5 through R_{12} are independently selected for each of such units from hydrogen, or an alkyl, aryl, hydroxyalkyl, amino-alkyl, mercapto-alkyl or phospho-alkyl moeity; R_{12} may also be selected from $-O^{(-1)}$ or $-OH$; and W_1 is independently selected for each repeating unit from the group consisting of hydrogen; an acyl moiety; acetyl; 3-allyloxy-2-hydroxypropyl; 3-benzyloxy-2-hydroxy-propyl; 3-alkylbenzyloxy-2-hydroxy-propyl; 3-phenoxy-2-hydroxy-propyl; 3-alkylphenoxy-2-hydroxy-propyl; 3-butoxy-2-hydroxy-propyl; 3-alkyloxy-2-hydroxy-propyl; 2-hydroxyoctyl; 2-hydroxyalkyl; 2-hydroxy-2-phenyl ethyl; 2-hydroxy-2-alkylphenyl ethyl; benzyl; alkyl; allyl; alkylbenzyl; haloalkyl; haloalkenyl; 2-chloropropenyl; sodium, potassium; tetra aryl ammonium; tetra alkyl ammonium; tetra alkyl phosphonium; tetra aryl phosphonium; or a condensation product of ethylene oxide, propylene oxide, or mixtures thereof;

and said copolymer also contains one or more monomers selected from the group consisting of acrylonitrile, methacrylonitrile, methyl acrylate, methyl methacrylate, vinyl acetate, vinyl methyl ketone, isopropenyl methyl ketone, acrylic acid, methacrylic acid, acrylamide, methacrylamide, n-amyl methacrylate, styrene, m-bromostyrene, p-bromostyrene, pyridine, diallyldimethylstyrene, 1,3-butadiene, n-butyl acrylate, tert-butylamino-ethyl methacrylate, n-butyl methacrylate, tert-butyl methacrylate, n-butyl vinyl ether, tert-butyl vinyl ether, m-chlorostyrene, o-chlorostyrene, p-chlorostyrene, n-decyl methacrylate, N,N-diallylmelamine, N,N-di-n-butylacrylamide, di-n-butyl itaconate, di-n-butyl maleate, diethylaminoethyl methacrylate, diethyleneglycol monovinyl ether, diethyl fumarate, diethyl itaconate, diethyl vinylphosphonate, vinylphosphonic acid, diisobutyl maleate, diisopropyl itaconate, diisopropyl maleate, dimethyl fumarate, dimethyl itaconate, dimethyl maleate, di-n-nonyl fumarate, di-n-nonyl maleate, dioctyl fumarate, di-n-octyl itaconate, di-n-propyl itaconate, n-dodecyl vinyl ether, ethyl acid fumarate, ethyl acid maleate, ethyl acrylate, ethyl cinnamate, N-ethylmethacrylamide, ethyl methacrylate, ethyl vinyl ether, 5-ethyl-2-vinylpyridine, 5-ethyl-2-vinylpyridine 1-oxide, glycidyl acrylate, glycidyl methacrylate, n-hexyl methacrylate, 2-hydroxyethyl methacrylate, 2-hydroxypropyl methacrylate, isobutyl methacrylate, isobutyl vinyl ether, isoprene, isopropyl methacrylate, isopropyl vinyl ether, itaconic acid, lauryl methacrylate, methacrylamide, methacrylic acid, methacrylonitrile, N-methylolacrylamide, N-methylolmethacrylamide, N-alkoxymethylacrylamide, N-alkoxymethylmethacrylamide, N-butoxymethylmethacrylamide, N-vinyl-caprolactam, methyl acrylate, N-methylmethacrylamide, α-methylstyrene, m-methylstyrene, o-methylstyrene, p-methylstyrene, 2-methyl-5-vinylpyridine, n-propyl methacrylate, sodium p-styrenesulfonate, stearyl methacrylate, styrene, p-styrenesulfonic acid, p-styrenesulfonamide, vinyl bromide, 9-vinylcarbazole, vinyl chloride, vinylidene chloride, 1-vinylnaphthalene, 2-vinylnaphthalene, 2-vinylpyridine, 4-vinylpyridine, 2-vinylpyridine N-oxide, 4-vinylpyrimidine, N-vinylpyrrolidone, and mixtures thereof; said condensation product of said copolymer compound being made by reacting said copolymer compound with a second compound selected from the group consisting of phenols, tannins, novolak resins, lignin compounds, aldehydes, ketones, and mixtures thereof.

5,116,913

POLYAMIDE-POLYIMIDE BLOCK COPOLYMERS SOLUBLE IN APROTIC DIPOLAR SOLVENTS

Rudolf Pfaendner, Rimbach/Odenwald, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

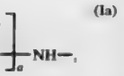
Filed Jan. 25, 1990, Ser. No. 470,196

Claims priority, application Switzerland, Feb. 1, 1989, 377/89

Int. Cl.[5] C08L *79/08;* **B32B** *27/08*

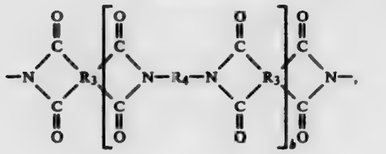
U.S. Cl. 525—432 **15 Claims**

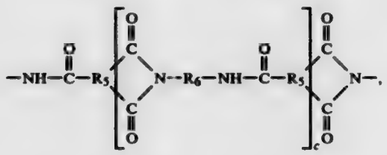
1. A process for the preparation of crosslinked polyamide-polyimide block copolymers, which comprises heating, at temperatures above the glass transition point, a polyamide-polyimide block copolymer soluble in aprotic dipolar solvents and having an average molecular weight M_n of 1,000–50,000 containing combinations of blocks of the formulae Ia together with IIb or IIc or of the formulae Ib together with IIa or IIc or of the formula Ic together with IIa or IIb

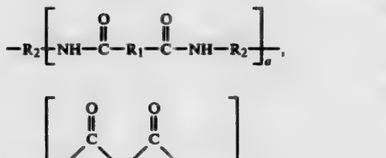


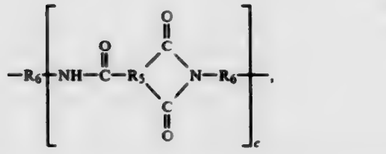
(Ia)

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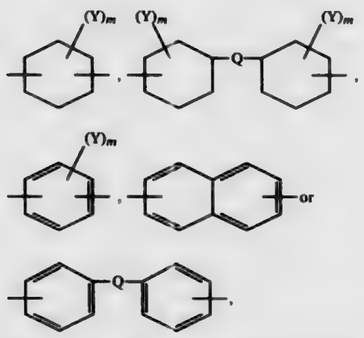




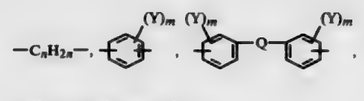


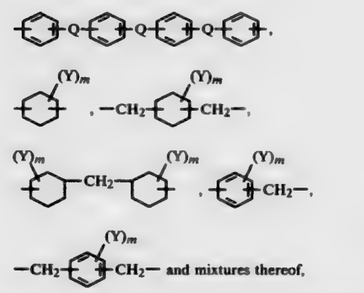


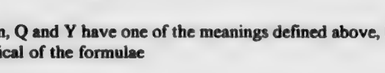
in which the indices a, b and c independently of one another are integers from 1 to 100, R_1 is a radical of the formulae $-C_nH_{2n}-$,



n is an integer from 2 to 12, m is an integer from 0 to 4, Y is alkyl or halogen, or in which two radicals Y which are each in the ortho-position relative to one another together form an alkylene group, Q is a direct bond or $-CH_2-$, $-CH_2-CH_2-$, $-CH(CH_3)-$, $-C(CH_3)_2-$, $-C(CF_3)_2-$, $-O-$, $-S-$, $-SO_2-$ or $-CO-$, R_2 is a radical selected from the group consisting of

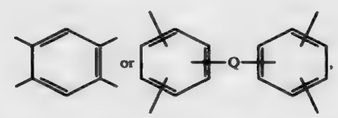
(Ib) 

(Ic) 

(IIa) 

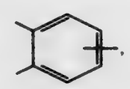
(IIb)

n, m, Q and Y have one of the meanings defined above, R_3 is a radical of the formulae

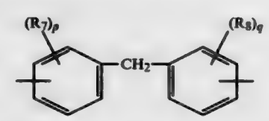


(IIc)

in which Q has one of the meanings defined above, R_5 is a radical of the formula



and R_4 and R_6 independently of one another have one of the meanings defined for R_2, with the proviso that 10–100 mol% of all the radicals R_2, R_4 and R_6, relative to the total quantity of these radicals, have the formula



in which p is 1 or 2 and q is 0, 1 or 2, R_7 and R_8 are alkyl or in which two radicals R_7 and R_8 which are each in the ortho-position relative to one another together each form an alkylene group.

5,116,914

CATHODIC ELECTRODEPOSITION COATINGS CONTAINING ALKYL METAL ACETONATE CATALYST

Ding Y. Chung, Rochester Hills, and Tapan K. Debroy, Shelby Township, Macomb County, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 18, 1990, Ser. No. 629,475

Int. Cl.[5] C08L *63/02*; C08F *283/10*

U.S. Cl. 525—528 **3 Claims**

1. In a cathodic electrocoat composition, the catalyst being used to catalyze a curing reaction of the film forming constituents of the composition of a blocked polyisocyanate and a polymer comprising an epoxy amine adduct after the composition has been applied to a substrate; wherein the improvement comprises a catalyst of alkyl tin acetyl acetonate.

5,116,915

METHOD OF CONTROLLING POLYMERIZATION PROCESS OF OLEFINIC HYDROCARBONS

Ulchar A. O. Mamedov, Moscow; Anatolyi E. Tokar, Toljatti, both of U.S.S.R., and George J. Elbaum, Hermosa Beach, Calif., assignors to Giprokautchuk, Moscow, U.S.S.R.

Filed Dec. 28, 1987, Ser. No. 138,153

Int. Cl.[5] C08F *4/14, 10/10*

U.S. Cl. 526—60 **7 Claims**

1. A method of controlling polymerization of an olefinic hydrocarbon comprising introducting said hydrocarbon, a catalyst, and an inert solvent into the lower end of a vertical reaction zone, agitating said hydrocarbon, catalyst, and solvent to form a reaction mass by means of said agitating throughout said reaction zone, withdrawing said reaction mass from the upper end of said reaction zone, determining temperatures of said reaction zone near its lower and upper ends, measuring dynamic or kinematic viscosity and the concentration of polymer in said withdrawn reaction mass, transmitting said viscosity and concentration measurements to means for determining Mooney viscosity of said polymer, and depending on said Mooney viscosity of said polymer, maintaining a specific temperature difference between the upper and lower ends of said reaction zone by varying speed or pitch of said means for said agitating to obtain a polymer with a desired molecular weight distribution.

5,116,916

ACID CATALYZED REACTIONS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 771,259, Aug. 30, 1985, Pat. No. 4,722,986, which is a continuation-in-part of Ser. No. 679,235, Dec. 7, 1984, Pat. No. 4,589,925, Ser. No. 675,774, Nov. 28, 1984, Pat. No. 4,673,522, Ser. No. 673,358, Nov. 20, 1984, Pat. No. 4,664,717, Ser. No. 673,508, Nov. 20, 1984, Pat. No. 4,944,787, and Ser. No. 453,496, Dec. 27, 1982, Pat. No. 4,910,179, which is a continuation-in-part of Ser. No. 442,296, Nov. 17, 1982, abandoned, Ser. No. 444,667, Nov. 26, 1982, abandoned, Ser. No. 331,001, Dec. 15, 1981, Pat. No. 4,402,852, Ser. No. 330,904, Dec. 15, 1981, Pat. No. 4,404,116, Ser. No. 318,629, Nov. 5, 1981, Pat. No. 4,445,925, Ser. No. 318,368, Nov. 5, 1981, Pat. No. 4,447,253, and Ser. No. 318,343, Nov. 5, 1981, Pat. No. 4,397,675. This application Jan. 29, 1988, Ser. No. 150,230

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.[5] L08L *19/20*; L07L *209/00, 27/26, 327/00*

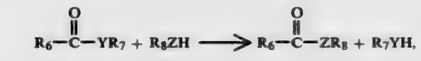
U.S. Cl. 525—350 **17 Claims**

1. A method for reacting a compound selected from the group consisting of water, alcohols, thiols, and combinations thereof with a member selected from the group consisting of

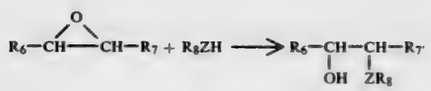
(1) ethers, thioethers, diorganoamines, and combinations thereof, in accordance with the expression

$$R_6-Y-R_7+R_8ZH \rightarrow R_6ZR_8+R_7YH,$$

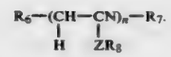
(2) carboxylic acid esters, thioesters, amidoesters, and combinations thereof, in accordance with the expression



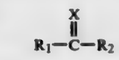
(3) epoxides, in accordance with the expression



(4) olefins, in accordance with the expression



and combinations thereof, wherein N is any integer of 1 as greater, R_6 and R_7 are independently selected from monovalent organic radicals, R_8 is selected from hydrogen and monovalent organic radicals, Y is selected from oxygen, sulfur and NH, and Z is selected from oxygen and sulfur, which method comprises the step of catalyzing said reaction with a catalyst composition comprising a catalytically active amount of the monoadduct of sulfuric acid and a chalcogen-containing compound having the empirical formula



wherein X is O or S, each of R_1 and R_2 is selected from the group consisting of hydrogen, NR_3R_4 and NR_5, at least one of R_1 and R_2 is other than hydrogen, each of R_3 and R_4 is selected from the group consisting of hydrogen and monovalent organic radicals, and R_5 is a divalent organic radical.

5,116,917

THERMOPLASTIC POLYESTER LOW PROFILE ADDITIVES FOR VINYL ESTER RESINOUS COMPOSITIONS

Ken K. Chang, Dublin, and Timothy A. Tufts, Powell, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Dec. 11, 1990, Ser. No. 625,975

Int. Cl.[5] C08G *59/17*

U.S. Cl. 525—407 **20 Claims**

1. In a thermosettable vinyl ester/low profile additive resinous composition, the improvement which comprises said low profile additive comprising a non-gelling, saturated polyester formed from dibasic acid and an EO/PO block copolymer having an EO/PO molar ratio ranging from about 0.1 to 0.9, said polyester having an acid value of greater than about 10.

5,116,918

CROSSLINKED COPOLYMERS BASED ON CYCLIC ESTERS AND CARBONATES

Hartwig Höcker; Helmut Keul, both of Aachen; Edgar Leitz, Dormagen; Norbert Schön, and Steffen Kühling, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 19, 1991, Ser. No. 657,410

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1990, 4006401

Int. Cl.[5] C08G *63/91, 63/08*

U.S. Cl. 525—415 **7 Claims**

1. Radically crosslinked copolymers produced from

A) 5 to 99.5% by weight cyclic aliphatic esters and

B) 0.5 to 95% by weight cyclic aliphatic carbonates, of which at least part are

B1) cyclic aliphatic carbonates containing cross-linking active side groups.

5,116,919
PROCESS FOR INCREASING THE RELATIVE VISCOSITY OF POLYAMIDES WITH REDUCED THERMAL DEGRADATION

John F. Buzinkai, Chattanooga, Tenn.; Marion R. DeWitt, Jr., Midlothian, Va., and Robert C. Wheland, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 5, 1990, Ser. No. 623,263
Int. Cl.[5] C08G 69/48
U.S. Cl. 525—420 14 Claims

1. A process for increasing the relative viscosity of a polyamide comprising heating the polyamide in the presence of a base and a catalyst, said catalyst being at least one compound of the formula:

$$X—(CH_2)_nPO_3R_2$$

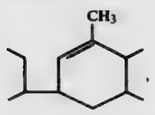
wherein
X is 2-pyridyl, 4-morpholino, 1-pyrrolidino, 1-piperidino or $R'_2—N—$ wherein R', being the same or different, is an alkyl group having between 1 and 12 carbon atoms;
n is an integer from 2 to 5; and
R, being the same or different, is H or an alkyl group having between 1 and 12 carbon atoms.

5,116,920
POLYAMIDE-POLYIMIDE BLOCK COPOLYMERS SOLUBLE IN APROTIC DIPOLAR SOLVENTS

Rudolf Pfaendner, Rimbach/Odenwald, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 25, 1990, Ser. No. 470,200
Claims priority, application Switzerland, Feb. 1, 1989, 376/89
Int. Cl.[5] C08L 79/08; B32B 27/08
U.S. Cl. 525—432 13 Claims

1. A polyamide-polyimide block copolymer soluble in aprotic dipolar solvents having an average molecular weight M_n of 1,000–50,000, which has a ratio of amide to imide groups of about 4:1 to 1:4, these polymers in the imide blocks having a content of at least 2 mol %, of radicals of the formula



relative to the content of all the carboxylic acid radicals in the copolymer.

5,116,921
SUPERABSORBENT CROSSLINKED AMPHOLYTIC ION PAIR COPOLYMERS

Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 613,171, Nov. 15, 1990, Pat. No. 5,075,399. This application Oct. 28, 1991, Ser. No. 783,735
Int. Cl.[5] A61F 13/15; C08F 20/54
U.S. Cl. 526—287 9 Claims

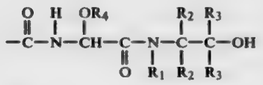
1. An absorption diaper article comprising:
(a) A liquid impervious backing sheet;
(b) a hydrophobic, liquid pervious topsheet; and
(c) an absorbent core positioned between said backing sheet and said topsheet; said core comprising a polymer formed by the copolymerization of an effective amount of each of the following components to produce a highly absorbent polymer;
(a) an ampholytic ion pair monomer comprising
(i) an ammonium cation 2-methacryloyloxyethyltrimethylammonium and
(ii) a sulfonate anion selected from the group consisting of 2-acrylamido-2-methylpropane sulfonate, 2-methacryloyloxyethane sulfonate, and combinations of two or more thereof;
(b) at least one comonomer selected from the group consisting of acrylamide, methacrylamide, acrylonitrile, acrylic acid, methacrylic acid, alkali salts of acrylic acid, alkali salts of methacrylic acid, 2-methacryloyloxyethane sulfonic acid, alkali salts of 2-methacryloyloxyethane sulfonic acid, N-vinyl-2-pyrrolidone and combinations of two or more thereof; and
(c) at least one crosslinking agent which has at least two polymerizable olefinic functionalities wherein each of the olefinic functionalities is suitable for crosslinking.

5,116,922
POLYMERS CONTAINING BETA-HYDROXYALKYLAMIDE GROUPS

Padmanabhan Sundararaman, Allison Park; Rudolf Maska, and Cynthia L. Versardi, both of Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 3, 1991, Ser. No. 770,491
Int. Cl.[5] C08F 20/58; C08L 51/00, 51/08
U.S. Cl. 526—304 9 Claims

1. A polymer containing one or more groups of the formula:



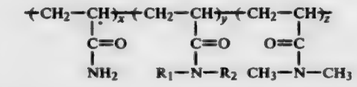
where R_4 is alkyl having 1 to 6 carbon atoms, cycloalkyl of 5 to 6 carbon atoms and hydroxyalkyl of 2 to 6 carbon atoms; R_1 is hydrogen, alkyl having 1 to 5 carbon atoms or hydroxyalkyl having 1 to 5 carbon atoms; R_2 and R_3 are the same or different radicals selected from hydrogen, alkyl having 1 to 5 carbon atoms or one of the R_2 and one of the R_3 radicals joined together with the carbon atom to which they are attached to form cycloalkyl.

5,116,923
HYDROPHOBICALLY ASSOCIATING POLYMERS CONTAINING DIMETHYL ACRYLAMIDE FUNCTIONALITY

Jan Bock, Bridgewater, and Paul L. Valint, Asbury, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 484,755, Feb. 26, 1990, Pat. No. 4,981,935. This application Jun. 28, 1990, Ser. No. 545,011
Int. Cl.[5] C08F 226/02
U.S. Cl. 526—307.2 2 Claims

1. A terpolymer having the formula:



wherein R_1 is hydrogen, a C_1 to C_{10} alkyl, cycloalkyl or aralkyl group; R_2 is a C_4 to C_{18} alkyl, cycloalkyl or aralkyl group; x is about 10 mole percent to about 90 mole percent; y is about 0.1 to about 10 mole percent; and z is about 10 to about 50 mole percent.

5,116,924
PAPER SIZING AGENTS CONTAINING CATIONIC DISPERSANTS

Josef Bung; Hasan Ulubay, both of Dannstadt-Schauernheim, and Bernd Schutzius, Römerberg, all of Fed. Rep. of Germany, assignors to Guilini Chemie GmbH, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Jul. 5, 1990, Ser. No. 548,417
Claims priority, application European Pat. Off., Jul. 5, 1989, 89112252.5
Int. Cl.[5] C08F 26/02, 226/02
U.S. Cl. 526—312 13 Claims

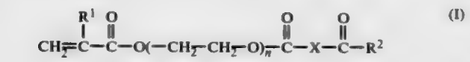
1. In a cationic dispersant the improvement comprising a copolymer obtained by the reaction of monomers:
(a) 10 to 30 weight % of a member of the group consisting of N,N-dimethylaminoethyl acrylate and N,N-dimethylaminoethyl methacrylate;
(b) 5 to 30 weight % of a member of the group consisting of acrylic acid ester and methacrylic acid ester of a C_{10} to C_{22} fatty alcohol;
(c) 10 to 60 weight % of a member of the group consisting of methyl acrylate and methyl methacrylate;
(d) 0 to 60 weight % of a member of the group consisting of n-butyl acrylate and n-butyl methacrylate;
(e) 0 to 60 weight % of a member of the group consisting of isobutyl acrylate and isobutyl methacrylate;
(f) 3 to 15 weight % of a member of the group consisting of acrylic acid and methacrylic acid;
with the sum of said monomers being 100%.

5,116,925
AMPHIPHILIC MONOMERS AND POLYMERS AND FILM COMPRISING AT LEAST ONE UNIMOLECULAR LAYER THEREOF

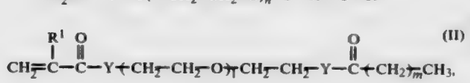
Donald Lupo, Eppstein/Taunus; Werner Prass, Mainz, and Ude Scheunemann, Liederbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 508,007, Apr. 10, 1990, abandoned. This application Oct. 11, 1990, Ser. No. 595,543
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1989, 3911929
Int. Cl.[5] C08F 22/10, 22/36
U.S. Cl. 526—323.1 10 Claims

1. A layer element comprising a film of at least one unimolecular layer of an amphiphilic compound on a solid base material, wherein the layer contains a polymer obtained by polymerization of a monomer of the general formula (I) or (II)



(I)



(II)

where
X is $(CH_2)_n$ or $(CH_2—O—CH_2)_n$,
Y is O or NH,
l is an integer from 0 to 10, m is an integer from 10 to 26, n is an integer from 1 to 10,
R^1 is H, CH_3, Cl, CN, F or Br, and R^2 is an O-alkyl radical or NH-alkyl radical having an alkyl chain of at least 8 carbon atoms.

5,116,926
POLYOLEFIN FILM

Michael J. Packham, Shefford, and Bernard C. Bushnell, Essex, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed May 6, 1991, Ser. No. 695,021
Claims priority, application United Kingdom, May 4, 1990, 9010092
Int. Cl.[5] C08F 10/00, 110/00
U.S. Cl. 526—348.1 5 Claims

1. A polymeric film comprising a biaxially oriented substrate layer of a propylene polymer, characterised in that the film has an X-ray scattering phi (ϕ) scan full width half maximum (FWHM) value, of greater than 16.0°.

5,116,927
STARCH POLYMER GRAFT COMPOSITION AND METHOD OF PREPARATION

William C. Floyd, Chester; Louis R. Dragner, Rock Hill; Blanche H. Black, York, and Bernard F. North, Rock Hill, all of S.C., assignors to Sequa Chemicals, Inc., Chester, S.C.

Division of Ser. No. 371,988, Jun. 27, 1989, Pat. No. 5,055,541. This application Jun. 10, 1991, Ser. No. 712,394
Int. Cl.[5] C08G 18/00
U.S. Cl. 527—300 30 Claims

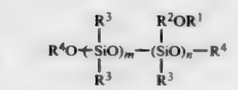
1. A starch-polymer graft interpenetrating polymer network composition comprising a first crosslinked polymer network which is intertwined on a molecular scale with a second starch-polymer graft, the starch-polymer graft comprising a starch hydrolyzate having a water solubility in excess of 80% by weight at 25° C. and a viscosity equivalent to a dextrose equivalent of 1–20, and a polymer based on a monomer containing a hydrophobic olefinically unsaturated monomer, and wherein said starch hydrolyzate includes at least one millimole of graft sites per mole of starch hydrolyzate where the polymer is bound to said starch hydrolyzate to form the starch-polymer graft.

5,116,928
PROCESS FOR PREPARING A FLUOROORGANOPOLYSILOXANE

Hiroshi Inomata, Takasaki, Japan, and Yasuo Tarumi, Iowa City, Iowa, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1990, Ser. No. 481,240
Claims priority, application Japan, Feb. 21, 1989, 1-40961
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—18 7 Claims

1. A process for preparing a fluoroorganopolysiloxane having the following general formula (I):



(I)

wherein R^1 represents a fluorine-containing organic group represented by the following formula:

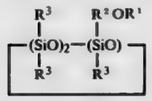
$$F—(—C_gF_{2g}O—)_d—C_hF_{2h}CH_2—$$

where d represents an integer of from 1 to 5, g represents an integer of from 1 to 3, and h is 1 or 2, R^2 represents a divalent substituted or unsubstituted hydrocarbon group having 3 to 10 carbon atoms and containing no fluorine atom, R^3 represents a substituted or unsubstituted hydrocarbon group containing 1 to 10 carbon atoms and containing no fluorine atom, R^4 has the same meaning as R^3 or represents a hydrogen atom or a group having the formula:



wherein R^3 is as defined above, R^5 has the same meaning as R^3 or represents a group having the formula: $-R^2OR^1$ wherein R^1 and R^2 are as defined above, m is an integer of at least 2, and n is an integer of not less than 1, provided $m \geqq 2n$, said process comprising the steps of:

polymerizing a fluorine-containing cyclotrisiloxane having the following formula (II):



(II)

wherein R^1, R^2 and R^3 are as defined above, or a mixture of said fluorine-containing cyclosiloxane of the formula (II) and a cyclosiloxane having the following formula (III):



(III)

wherein R^3 is as defined above, in the presence of an acidic catalyst or a basic catalyst selected from the group consisting of quaternary phosphonium hydroxides, quaternary ammonium hydroxides, and silanolates thereof, and in the presence of water at a temperature of not higher than 80° C., and

neutralizing the resulting polymerization product by adding a neutralizing agent.

5,116,929

COPOLYESTER-DIOL POLYCARBONATES, PROCESS FOR PRODUCING THEM AND THEIR USE

Alberto Greco, Dresano, and Patrizia Biasioli, Biassono, both of Italy, assignors to Enichem Synthesis S.p.A., Palermo, Italy

Filed Oct. 10, 1989, Ser. No. 420,769

Claims priority, application Italy, Oct. 14, 1988, 22295 A/88

Int. Cl.[5] C08G *18/44, 18/32*

U.S. Cl. 528—44 **11 Claims**

1. Copolyester diol polycarbonates, fluid at room temperature, having a molecular weight comprised within the range of from 1,500 to 6,000 with a glass transition temperature (T_g) lower than −45° C., obtained by means of a reaction of transesterification by starting from:

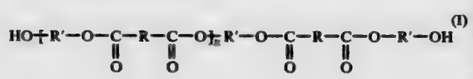
(a) and organic carbonate,

(b) an aliphatic diol of formula

$$HO-(CH_2)_x-OH,$$

wherein x is an integer comprised within the range of from 4 to 12,

(c) an oligopolyester-diol which can be represented by means of the formula:



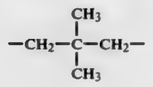
(I)

wherein:

n is an integer comprised within the range of from 0.001 to 1,

R are $-(CH_2)_y-$ radicals, derived from an unsaturated aliphatic bicarboxy acid, wherein y is an integer comprised within the range of from 2 to 10,

R′ are: a portion of them, radicals:



derived from neopentyl-glycol; and partially are

$$-(CH_2)_z-$$

radicals, derived from an aliphatic diol, wherein z is an integer comprised within the range of from 4 to 12;

with the amount of (c) being furthermore comprised within the range of from 30 to 60% by weight, relatively to the total weight of (b)+(c); and the molar ratio of [(b)+(c)]/(a) being comprised within the range of from 1.03 to 1.3.

5,116,930

SELF-CURING RESIN

Motoshi Yabuta, Hadano; Yoshiyuki Yukawa, and Yasushi Nakao, both of Hiratsuka, all of Japan, assignors to Kansai Paint Company Limited, Hyogo, Japan

Filed Mar. 4, 1991, Ser. No. 663,530

Claims priority, application Japan, Mar. 6, 1990, 2-56185

Int. Cl.[5] C08G *18/80*

U.S. Cl. 528—45 **6 Claims**

1. A self-curing resin containing at least one blocked isocyanate group and at least one hydroxyl group in the resin molecule, the resin being produced by polymerizing a monomer component containing, as an essential monomer thereof, at least one isocyanate group-containing, radical-polymerizable monomer, whereby a polymer is formed, blocking part of the isocyanate groups of the polymer and then introducing one or more hydroxyl groups into the polymer by reacting the isocyanate group or groups thereof which remain unblocked as yet with an alkanolamine whereby the resin is formed.

5,116,931

THERMOSET POLYURETHANE ELASTOMERS AND POLYUREA ELASTOMERS MADE USING HIGH FUNCTIONALITY, LOW UNSATURATION LEVEL POLYOLS PREPARED WITH DOUBLE METAL CYANIDE CATALYSTS

John W. Reisch, Guilford, and Deborah M. Capone, Hamden, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Sep. 28, 1990, Ser. No. 589,842

Int. Cl.[5] C08L *75/04*

U.S. Cl. 528—59 **20 Claims**

1. A thermoset polyurethane or polyurea elastomer made by reacting an isocyanate-terminated prepolymer with a chain-extender other than ethylene glycol, the isocyanate-terminated prepolymer being the reaction product of a polyisocyanate and a polyether polyol prepared utilizing a double metal cyanide complex catalyst and having a molecular weight of between about 400 and about 15,000, said polyol having an end group unsaturation level of no greater than 0.04 milliequivalents per gram of polyol, the equivalent ratio of NCO groups on said polyisocyanate to active hydrogen groups on said polyol plus chain extender being between about 1:0.7 and about 1:1.3, and the molar ratio of chain extender to polyol being between about 0.15:1 and about 1.3:1.

5,116,932

HYDROLYSIS RESISTANT POLYURETHANE RESINS

Takaaki Fujiwa, Hiroshima, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 18, 1990, Ser. No. 554,317

Claims priority, application Japan, Jul. 19, 1989, 1-187043

Int. Cl.[5] C08G *18/34, 18/42, 63/08, 63/82*

U.S. Cl. 528—80 **9 Claims**

1. A polyurethane resin comprising the reaction product of at least one organic diisocyanate compound with a polyol having at least 2 active hydrogen atoms wherein the polyol is a copolymerization product of ϵ-caprolactone and trimethylcaprolactone.

5,116,933

AROMATIC POLYMER

Alan B. Newton, Lealholm, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 154,038, Feb. 9, 1988, abandoned. This application Dec. 4, 1989, Ser. No. 445,126

Claims priority, application United Kingdom, Feb. 10, 1987, 8702993

Int. Cl.[5] C08G *8/02, 14/00, 65/38, 75/00*

U.S. Cl. 528—125 **22 Claims**

1. A crystalline polyarylether insoluble in methlene chloride, having Tg (quenched) at least 185° C. and Tg (annealed) at least 195° C., and capable of being shaped into fibres or films or molded or used as a matrix in composites, which polyarylether consists essentially of the repeating units Ph'_n, Ar^1 and Ar^2 in the relative molar proportions:

Ph'_n=40 to 60 percent; and

Ar^1=92 to 50 percent of the total of Ar^1 and Ar^2; wherein:

Ph'_n is 1,3 or 1,4 phenylene optionally substituted with up to 4 methyl or chloro groups and n is an integer from 1 to 4;

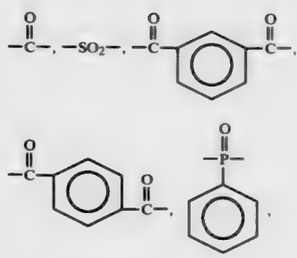
Ar^1 is $Ph[CO[Ph'CO]_xPh]_y$

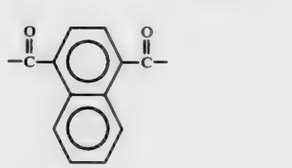
wherein Ph is 1,4 phenylene optionally substituted with up to 4 methyl or chloro groups;

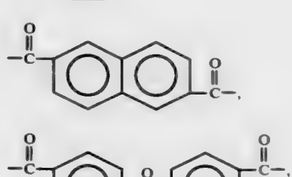
x is 0 or 1; and

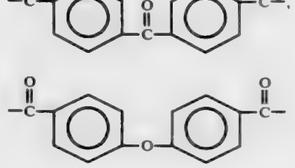
y is 1 or 2; and

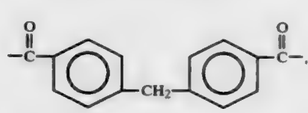
Ar^2 is selected from the group consisting of

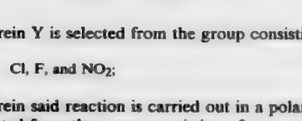












Ph SO_2 Ph Ph SO_2 Ph
Ph SO_2 Ph Ph Ph SO_2 Ph and
Ph SO_2 Ph Ph SO_2 Ph Ph,

and wherein said repeating units Ph'_n, Ar^1 and Ar^2 are connected by ether linkages.

5,116,934

POLYIMIDAZOLES VIA AROMATIC NUCLEOPHILIC DISPLACEMENT

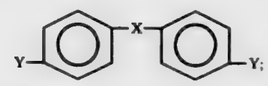
John W. Connell, and Paul M. Hergenrother, both of Yorktown, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 508,316, Apr. 12, 1990, Pat. No. 5,066,811. This application Jul. 19, 1991, Ser. No. 732,884

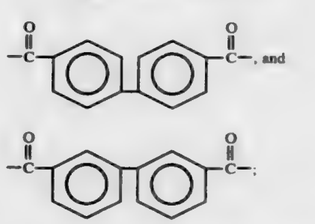
Int. Cl.[5] C08G *8/02*

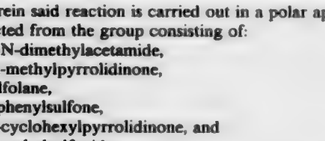
U.S. Cl. 528—125 **7 Claims**

1. A process for synthesizing polyimidazoles by aromatic nucleophilic displacement, which comprising reacting a di(hydroxyphenyl)imidazole with an activated aromatic dihalide or dinitro compound having the general structure:



wherein X is a radical selected from the group consisting of:





wherein Y is selected from the group consisting of:

Cl, F, and NO_2;

wherein said reaction is carried out in a polar aprotic solvent selected from the group consisting of:

N,N-dimethylacetamide,

N,-methylpyrrolidinone,

sulfolane,

diphenylsulfone,

N-cyclohexylpyrrolidinone, and

dimethylsulfoxide;

wherein said reaction is carried out in the presence of an alkali metal base; and wherein said reaction is carried out with the application of heat.

5,116,935

POLYIMIDE OLIGOMERS AND BLENDS AND METHOD OF CURING

Hyman R. Lubowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

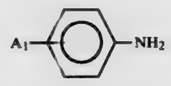
Continuation-in-part of Ser. No. 46,376, May 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 715,801, Mar. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 536,264, Sep. 27, 1983, abandoned. This application May 18, 1989, Ser. No. 353,588

Int. Cl.[5] C08G *73/10, 73/12, 8/02, 69/08*

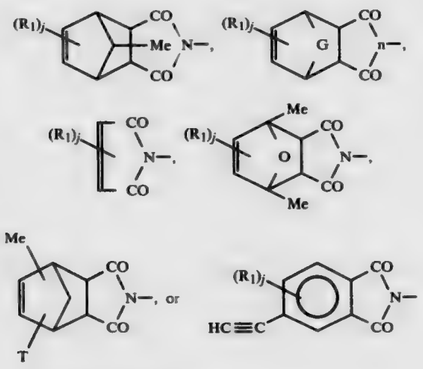
U.S. Cl. 528—173 **13 Claims**

1. A difunctional, crosslinkable, thermoplastic, polyimide oligomer which is the product formed by reacting under an inert gas atmosphere a mixture comprising:

(a) two moles of a crosslinkable imidophenylamine end cap having the general formula:



wherein A is selected from the group consisting of:



wherein Me=Methyl.

G=—O—, —SO_2—, —CH_2—, or —S—;

T=allyl or methallyl;

R_1=lower alkoxy, aryl, substituted aryl, lower alkyl, substituted alkyl, aryloxy, or halogen;

i=2; and

j=0, 1 or 2;

(b) n moles of at least one diamine having terminal groups and selected from the group consisting of lower alkylene diamines and polyaryl diamines having the general formula:

$$H_2N—Ar—O\left(Ar—L_1—Ar—O\right)_m Ar—NH_2$$

or

$$H_2N—Ar—L_2—Ar—NH_2$$

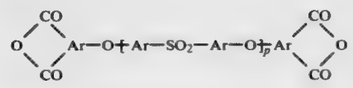
wherein Ar=an aromatic radical;

L_1=a linkage selected from the group consisting of —SO_2—, —S—, —CO—, —$(CF_3)_2C$—, and —$(CH_3)_2C$—;

L_2=a linkage selected from the group consisting of —SO_2—, —O—, —S—, and —CH_2—; and

m=a small integer greater than or equal to 1;

(c) n+1 moles of at least one dianhydride of the general formula:



wherein

Ar=an aromatic radical; and

p=a small integer greater than or equal to 1; and

wherein n=an integer selected so that the oligomer possesses thermoplastic properties.

5,116,936

PREPARATION OF POLY ANHYDRIDE FROM CO/NON CONJUGATED DIENE/DICARBOXYLIC ACID.

Eit Drent, and Anthonius J. M. Breed, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 451,918, Dec. 18, 1989, Pat. No. 5,049,650. This application May 23, 1991, Ser. No. 704,546

Claims priority, application United Kingdom, Dec. 29, 1988, 8830333

Int. Cl.[5] C08G *67/04*

U.S. Cl. 528—271 **10 Claims**

1. A process for the production of a polyanhydride polymer by contacting carbon monoxide, a non-conjugated diene and a dicarboxylic acid, under polymerization conditions in the substantial absence of water, in the presence of a catalyst composition formed from a palladium compound, a tertiary mondentate phosphorus ligand, optionally a tertiary bidentate phosphorus ligand, and up to 1 mol per mol of total phosphine of an oxygen containing protonic acid having a pKa below 2.

5,116,937

WATER-SWELLABLE THERMOPLASTIC COPOLYETHERESTER ELASTOMER

Robin N. Greene, Rockland, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1991, Ser. No. 709,920

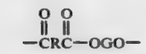
Int. Cl.[5] C08G *63/20*

U.S. Cl. 528—272 **14 Claims**



1. A thermoplastic, segmented copolyetherester elastomer which consists essentially of a multiplicity of recurring intralinear long-chain and short-chain ester units connected head-to-tail through ester linkages, wherein

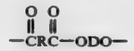
the long-chain ester units amount to 80 to 92 weight percent of the elastomer and are represented by the structure



(I)

and

the short-chain ester units amount to 20 to 8 weight percent and are represented by the structure



(II)

and wherein

R represents a divalent radical which remains after removal of two carboxyl groups from a dicarboxylic acid selected from the group consisting of terephthalic acid, 4,4'-bibenzoic acid, 2,6-naphthalenedicarboxylic acid and mixtures thereof,

G is a divalent radical which remains after removal of two hydroxyl groups from a long chain poly(alkylene oxide) glycol having a number average molecular weight in the range of 1,000 to 3,500 and consisting essentially of 60 to 95 weight percent of poly(ethylene oxide) glycol copolymerized or mixed with 40 to 5 percent of a second poly-(alkylene oxide) glycol, and

D is a divalent radical which remains after removal of terminal hydroxyl groups from a short chain diol selected from the the group consisting of ethylene glycol, 1,3-propane glycol, 1,4-butane diol and mixtures thereof.

5,116,938

PROCESS FOR PRODUCING THE POLYESTER POLYETHYLENE TEREPHTHALATE (PET) FROM A LOWER DIALKYL ESTER OF A DICARBOXYLIC ACID AND A GLYCOL USING A SPECIFIC CATALYST SYSTEM

Monika Engel-Bader, Charlotte, N.C., and Bobby N. Furr, Fort Mill, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 425,540, Oct. 23, 1989, abandoned. This application Jul. 26, 1990, Ser. No. 557,831

Int. Cl.[5] C08G *63/00, 63/02, 63/78, 63/82*

U.S. Cl. 528—272 **14 Claims**

1. In a process for making a polyester from a lower dialkyl ester of a dicarboxylic acid and glycol comprising the steps of:

1. reacting a lower alkyl ester of a dicarboxylic acid and glycol by an ester interchange reaction to produce monomer and alcohol;
2. removing said alcohol during said ester interchange reaction;
3. polymerizing said monomer by a polycondensation reaction to produce said polyester and glycol; and
4. removing said glycol during said polycondensation reaction;

wherein the improvement comprises: adding an effective catalytic amount of manganese and lithium before or during said ester interchange reaction to increase the ester interchange rate; and adding an effective catalytic amount of cobalt and antimony at the beginning of or during the polycondensation reaction, with the proviso that said cobalt not be added prior to substantial completion of said ester interchange reaction, to increase the polycondensation rate.

5,116,939

POLYIMIDE PROCESSING ADDITIVES

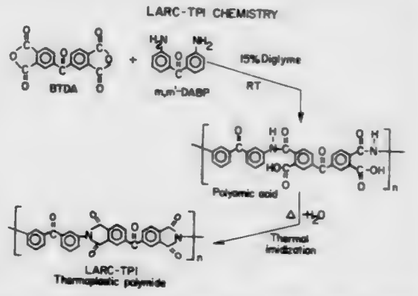
James C. Fletcher, Washington, D.C.; J. Richard Pratt, Poquoson, Va.; Terry L. St. Clair, Poquoson, Va.; Diane M. Stoakley, Poquoson, Va., and Harold D. Burks, Newport News, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 11, 1987, Ser. No. 84,064

Int. Cl.[5] C08F *283/04;* **C08G** *63/00, 69/42;* **C08L** *77/00*

U.S. Cl. 528—353 **4 Claims**

1. A process for preparing polyimides having enhanced melt flow properties, which process comprises admixing a member selected from the group consisting of high molecular weight poly(amic acids) and high molecular weight polyimides with 0.05 to 15 percent by weight of a member selected from the group consisting of low molecular weight amic acid additives



and low molecular weight imide additives, and thermally curing the admixture.

5,116,940

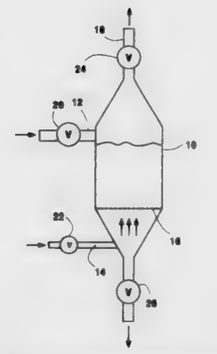
PROCESS FOR RECYCLING INERT PARTICULATE MATERIALS

Ronald S. Eisinger, Charleston, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Oct. 30, 1991, Ser. No. 785,055

Int. Cl.[5] C08F *2/34*

U.S. Cl. 528—483 **15 Claims**



1. A process for recycling inert particulate materials used in sticky polymer gas phase polymerization reactions which comprises (a) producing a sticky polymer in a gas phase polymerization reactor at a pressure of about 200 to 600 lbs/in^2 in the presence of an inert particulate material which renders said sticky polymer non-sticky, (b) discharging from said reactor said non-sticky polymer having unbound inert particulate material on its surface, (c) introducing said non-sticky polymer into a product hold tank, which is initially maintained at a pressure below the pressure in said reactor, (d) permitting the pressure in said product hold tank to reach reactor pressure, (e) directing a sweep gas into said product hold tank in contact with said non-sticky polymer, said sweep gas being maintained for a time and at a velocity sufficient to remove substantially all of said unbound inert particulate materials from said non-sticky polymers, (f) discharging said sweep gas containing substantially all of said unbound inert particulate materials from said hold tank and (g) recycling said sweep gas containing said unbound inert particulate material to said polymerization reactor.

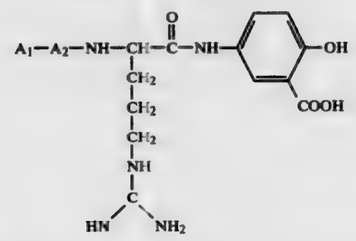
5,116,941

PEPTIDE SUBSTRATES FOR DETERMINATION OF ENZYME ACTIVITY

Shuichi Nakatsuyama; Yoshio Nakamura; Katsumasa Kuroiwa, all of Koriyama, and Takeshi Nagasawa, Urawa, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Jul. 12, 1989, Ser. No. 378,850
Claims priority, application Japan, Jul. 14, 1988, 63-173789
Int. Cl.[5] C07K *5/06, 5/08, 5/10*
U.S. Cl. 530—331 **5 Claims**

1. A substrate for determination of enzyme activity represented by the following formula:



wherein

A_1 represents L- or D-PyroGlu or L- or D-Glu(OR), wherein OR is a group binding to γ-carboxyl group of glutamic acid; R represents hydrogen or an aliphatic hydrocarbon residue of 1 to 8 carbon atoms or a cycloalkyl having from 3 to 8 carbon atoms; and,

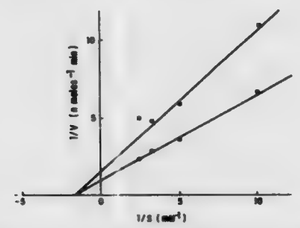
A_2 represents Gly, Pro, Pip, Ala, Val, But, NVal or NLeu; and acid addition salts thereof.

5,116,942

PROTEIN HAVING AN INFLAMMATORY PHOSPHOLIPASE A_2 INHIBITORY ACTIVITY

Keizo Inoue; Atsushi Imaizumi; Takashi Kamimura; Yorimasa Suwa; Masahiro Okada; Yoji Suzuki, and Ichiro Kudo, all of Tokyo, Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP88/00318, § 371 Date Dec. 2, 1988, § 102(e) Date Dec. 2, 1988, PCT Pub. No. WO88/07552, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 30, 1988, Ser. No. 295,724
Claims priority, application Japan, Apr. 2, 1987, 62-79693
Int. Cl.[5] C07K *15/06;* **A61K** *37/64*
U.S. Cl. 530—350 **2 Claims**



1. A substantially pure protein which inhibits inflammatory phospholipase A_2, wherein said inflammatory phospholipase A_2 is isolated from peritoneal exudate of a rat induced with casein, and wherein said protein is isolated and purified from the peritoneal cavity of a rat after administration of a glucocorticoid to said rat, wherein said protein has a molecular weight of about 40 K, and an N-terminal amino acid sequence as follows:

Asp—Val—Pro—Ala—Ala—Asp—Leu—Ser—Asp—.
2 5 10

5,116,943

OXIDATION-RESISTANT MUTEINS OF IL-2 AND OTHER PROTEIN

Kirston E. Koths, El Cerrito; Robert F. Halenbeck, San Rafael; both of Calif. David F. Mark, Plainsboro, N.J.; Danutee Nitecti, Berkeley, Calif. assignors to Cetus Corporation, Emeryville, Calif.

Division of Ser. No. 893,186, Aug. 5, 1986, Pat. No. 4,752,585, which is a continuation-in-part of Ser. No. 810,656, Dec. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 692,596, Jan. 18, 1985, abandoned. This application May 10, 1988, Ser. No. 192,293
Int. Cl.[5] C07K *13/00;* **A61K** *37/00*
U.S. Cl. 530—351 **13 Claims**

1. An oxidation-resistant IL-2 mutein having therapeutically useful biological activity, wherein each methionine residue of a reference protein susceptible to chloramine T or peroxide oxidation is replaced by a conservative amino acid, and wherein additional, non-susceptible methionine residues are not so substituted.

5,116,944

CONJUGATES HAVING IMPROVED CHARACTERISTICS FOR IN VIVO ADMINISTRATION

Gowsala P. Sivam, and A. Charles Morgan, Jr., both of Edmonds, Wash., assignors to NeoRx Corporation, Seattle, Wash.

Filed Dec. 29, 1989, Ser. No. 459,068
Int. Cl.[5] C07K *17/02*
U.S. Cl. 530—362 **10 Claims**

1. A conjugate of a proteinaceous toxin, targeting moiety and albumin moiety wherein:

a proteinaceous toxin selected from the group consisting of: ricin; abrin; diphtheria toxin; Pseudomonas exotoxin A; and modified forms thereof that exhibit toxic properties that are substantially equivalent to those of a native form of the corresponding proteinaceous toxin;

a targeting moiety linked to said proteinaceous toxin, said targeting moiety selected from the group consisting of: antibodies; antibody fragments; and modified antibodies and fragments having binding activities substantially equivalent to that of a native form of the corresponding antibody or fragment; and

an albumin moiety linked to one of said targeting moiety and said proteinaceous toxin wherein the molar ratio of targeting moiety:proteinaceous toxin:albumin moiety is about 1:1:1 to 2.

5,116,945

RESINOUS SUBSTANCE

Ken'ichi Ozawa, Ichihara; Hisao Ikeda, Funabashi; Fumio Mizuochi, and Hiroyuki Uehara, both of Ichihara, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Feb. 12, 1990, Ser. No. 478,534
Claims priority, application Japan, Feb. 14, 1989, 1-34681; Dec. 14, 1989, 1-324446
Int. Cl.[5] C08L *77/00*
U.S. Cl. 530—215 **3 Claims**

1. A resinous substance obtained by a process consisting essentially of reacting a rosin compound containing 1 to 10 equivalents of carboxylic groups per kilogram with triglycidyl isocyanurate.

5,116,946

SYNTHETIC, IMMUNOLOGICALLY ACTIVE PEPTIDES USEFUL FOR THE PREPARATION OF ANTIMALARIAL VACCINES

Antonio S. Verdini, Monterotondo; Antonello Pessi, and Fabio Bonelli, both of Rome, all of Italy, assignors to Eniricerche S.p.A., Milan, Italy

Filed May 30, 1989, Ser. No. 358,932
Claims priority, application Italy, Jun. 8, 1988, 2088 A/88
Int. Cl.[5] C07K *3/00;* **A61K** *37/02*
U.S. Cl. 530—300 **5 Claims**

1. Synthetic immunologically active polypeptides which induce in mammals antibody response against the circumsporozoite protein of Plasmodium falciparum comprised of the following formula:

[-H-(Asn-Pro)$_n$-OH] H-[Asn-Pro]$_n$-OH

wherein Asn is L-asparagine and Pro is L-proline, and n has a values not lower than 2.

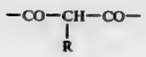
5,116,947

PROCESS FOR THE PREPARATION OF RETRO-INVERSO PEPTIDES AND NEW INTERMEDIATES THEREOF

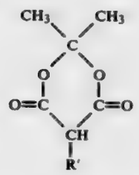
Massimo Pinori, Paderno d'Adda; Felice Centini, Rome, and Antonio S. Verdini, Monterotondo, all of Italy, assignors to Sclavo S.p.A., Siena, Italy

Division of Ser. No. 450,572, Dec. 14, 1989, Pat. No. 5,061,811. This application Aug. 9, 1991, Ser. No. 742,873
Claims priority, application Italy, Dec. 23, 1988, 23098 A/88
Int. Cl.[5] C07K *1/08, 5/02, 7/02*
U.S. Cl. 530—323 **9 Claims**

1. A peptide synthesis process for the preparation of a retro-inverso peptide, incorporating at least one malonyl group of formula (III)


(III)

wherein R represents the side-chain of an α-amino acid, characterized in that said malonyl residue is introduced by condensing a 5-substituted-2,2-di-methyl-1,3-dioxane-4,6-dione of formula (VI)


(VI)

wherein R′ is the side-chain R wherein the functional groups, if any, are suitably protected, with an amino acid, an amino acid amide, a peptide fragment, or a pseudo-peptide fragment wherein the terminal carboxyl group and the side chain functional groups, if any, are suitably protected and the reactive amino group is tri-alkyl-silylated.

5,116,948

PREPARATIONS OF ISLET AMYLOID POLYPEPTIDE (IAPP) AND ANTIBODIES TO IAPP

Per Westermark, Dilinge, Sweden, and Kenneth H. Johnson, Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 105,267, Oct. 7, 1987. This application Apr. 30, 1990, Ser. No. 516,329
Claims priority, application Sweden, Oct. 8, 1986, 8604270
Int. Cl.[5] C07K *7/100*
U.S. Cl. 530—324 **1 Claim**

1. A monomeric insulinoma amyloid polypeptide essentially free of islet amyloid consisting essentially of, from amino to carboxy terminal, the amino acid sequence:

Lys—Cys—Asn—Thr—Ala—Thr—
—Cys—Ala—Thr—Gln—Arg—Leu—
Ala—Asn—Phe—Leu—Val—His—
—Ser—Ser—Asn—Asn—Phe—Gly—
Ala—Ile—Leu—Ser—Ser—Thr—
—Asn—Val—Gly—Ser—Asn—Thr—
Tyr.

Lys—Cys—Asn—Thr—Ala—Thr—
—Cys—Ala—Thr—Gln—Arg—Leu—
Ala—Asn—Phe—Leu—Val—His—
—Ser—Ser—Asn—Asn—Phe—Gly—
Ala—Ile—Leu—Ser—Ser—Thr—
—Asn—Val—Gly—Ser—Asn—Thr—
Tyr.

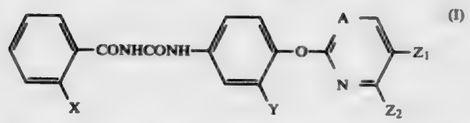
5,116,949

BENZOYL UREA COMPOUND-ALBUMIN COMPLEX

Tsunetaka Nakajima; Tadao Okamoto; Nobuo Kondo; Masahiro Watanabe; Koichi Yamauchi; Kazumasa Yokoyama, all of Hirakata; Takahiro Haga, Kusatsu; Nobutoshi Yamada, Kusatsu; Hideo Sugi, Kusatsu, and Toru Koyanagi, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd. and The Green Cross Corporation, both of Osaka, Japan

Filed Aug. 31, 1989, Ser. No. 400,941
Claims priority, application Japan, Sep. 12, 1988, 63-226553
Int. Cl.[5] C07K *15/00, 15/12;* **A61K** *37/02*
U.S. Cl. 530—363 **5 Claims**

1. A benzoyl urea compound-albumin complex comprising a benzoyl urea compound of the formula:


(I)

wherein X is a halogen atom or a nitro group, Y is a hydrogen atom, a halogen atom, a nitro group or a trifluoromethyl group, Z_1 is a halogen atom or a trifluoromethyl group, Z_2 is a hydrogen atom or a halogen atom and A is CH or a nitrogen atom, and albumin.

5,116,950

PROCESS FOR HEAT TREATING FIBRINOGEN

Kenmi Miyano, Osaka; Kenji Tanaka; Hideo Nishimaki, both of Nara, and Yoshiro Iga, Osaka, all of Japan, assignors to Green Cross Corporation, Osaka, Japan

Filed Apr. 21, 1988, Ser. No. 184,303
Claims priority, application Japan, Apr. 21, 1987, 62-98314
Int. Cl.[5] C07K *3/00*
U.S. Cl. 530—382 **18 Claims**

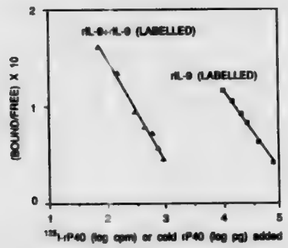
1. In the process for heat treating an aqueous solution of fibrinogen to inactivate virus(es) therein, the improvement which comprises heating an aqueous solution containing fibrinogen in the presence of a stabilizer combination of at least a sugar, an amino acid and a magnesium salt until virus(es) contaminating said fibrinogen are inactivated, wherein said heating is carried out at a temperature of approximately 50° to 80° C. for approximately 10 minutes to 40 hours, and wherein the aqueous solution of fibrinogen comprises 20 to 100 w/v % of the sugar, 0.1 to 15 w/v % of the amino acid and 0.01 mM to 3M of the magnesium salt, each based on 0.2 to 6 w/v % of fibrinogen solution.

5,116,951

SUBSTANTIALLY PURE INTERLEUKIN-9 RECEPTOR AND USES THEREOF

Catherine Druez, Sint-Stevens-Woluwe; Pierre Coulie, Kraainem; Catherine Uyttenhove, Chaumont-Gistoux, and Jacques Van Snick, Kraainem, all of Belgium, assignors to Ludwig Institute for Cancer Research, New York, N.Y.

Filed Sep. 19, 1990, Ser. No. 585,229
Int. Cl.[5] C07K *3/02, 15/06, 15/14*
U.S. Cl. 530—395 **4 Claims**



1. Substantially pure interleukin-9 receptor (IL-9R).

5,116,952

PROTEIN ACTIVE IN HUMORAL HYPERCALCEMIA OF MALIGNANCY-PTHRP

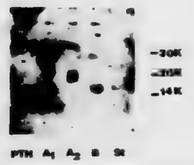
Thomas J. Martin, Kew; Jane M. Moseley, North Balwyn; Bruce E. Kemp, Kew, and Richard E. H. Wettenhall, Camberwell, all of Australia, assignors to The University of Melbourne, Victoria, Australia

PCT No. PCT/AU87/00165, § 371 Date May 9, 1988, § 102(e) Date May 9, 1988, PCT Pub. No. WO88/00596, PCT Pub. Date Jan. 28, 1988
PCT Filed Jun. 4, 1987, Ser. No. 199,235
Claims priority, application Australia, Jul. 18, 1986, PH7027/86; Feb. 13, 1987, PI0349/87
Int. Cl.[5] C07K *15/14, 3/28, 3/22, 3/18*
U.S. Cl. 530—399 **4 Claims**

1. Substantially pure parathyroid hormone related protein having:

(a) an N-terminal amino acid sequence A V S E H Q L L H D K G K S I Q D L R R R F F L H H L I A E I H T A E I R A T S E X T X N wherein X is an unidentified amino acid;

(b) a molecular weight between 15 to 25 kilodaltons, as determined by sodium dodecyl polyacrylamide gel electrophoresis under reducing and non-reducing conditions; and



(c) a specific biological activity of at least about 6 mg equivalents of a peptide composed of amino acids 1 to 34 of parathyroid hormone per mg protein as measured in an adenylate cyclase response assay.

5,116,953

METHOD FOR THERMALLY TREATING LACTOFERRIN

Shunichi Dosako, Urawa; Rika Shinooka, Tokorozawa, and Maki Tanaka, Sayama, all of Japan, assignors to Snow Brand Milk Products Company, Limited, Hokkaido, Japan

Filed Oct. 17, 1989, Ser. No. 422,489
Claims priority, application Japan, Oct. 17, 1988, 63-259311; Oct. 17, 1988, 63-259312
Int. Cl.[5] C07K *3/00, 15/22*
U.S. Cl. 530—400 **6 Claims**

1. A method for thermally treating an aqueous solution of isolated lactoferrin having iron-binding activity which comprises the steps of adjusting the ionic strength I of said aqueous lactoferrin solution then heating said aqueous lactoferrin solution, in accordance with the following formulae:

$$\log I \leqq -T/10+5 \quad (60 \leqq T \leqq 80°)$$

$$\log I \leqq -3 \quad T \geqq 80° C.$$

wherein I is ionic strength and
T is temperature (°C.) and thereafter spray-drying said aqueous lactoferrin solution.

5,116,954

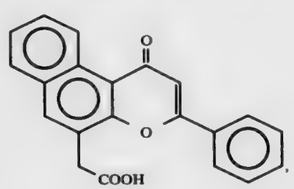
PHARMACEUTICALLY USEFUL FLAVONOIC COMPOUNDS CONTAINING AT LEAST ONE SUBSTITUENT ON THE BENZOPYRANONE RING MOIETY

Philippe Briet, Felix Faure; Jean-Jacques Berthelon, Bonhomme, and Francois Collonges, Chemin de Halage, all of France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyon, France

Continuation of Ser. No. 178,315, Apr. 6, 1988, abandoned. This application Aug. 2, 1989, Ser. No. 388,738
Int. Cl.[5] C07D *311/30, 311/78, 215/33, 335/06, 345/00;* A61K *31/35*
U.S. Cl. 534—551 **12 Claims**

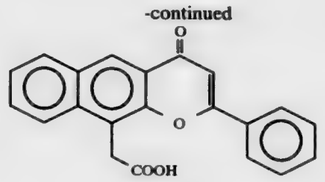
1. A compound of one of the following formulae:

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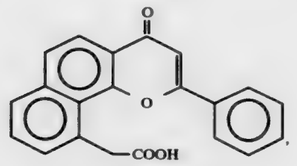


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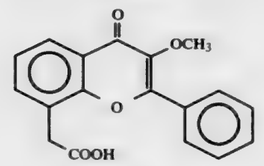
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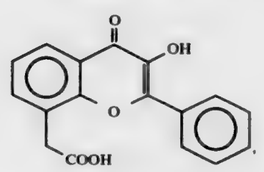
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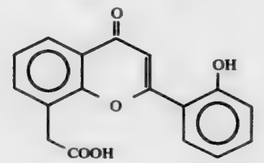
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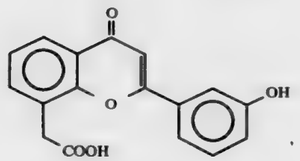
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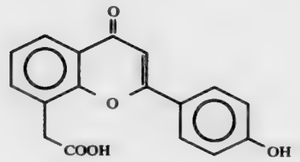
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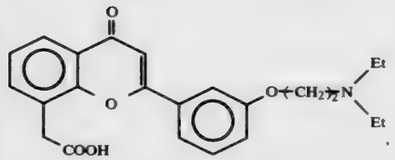
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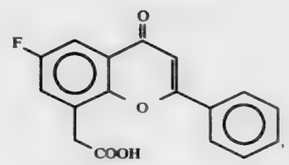


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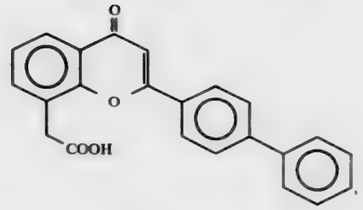


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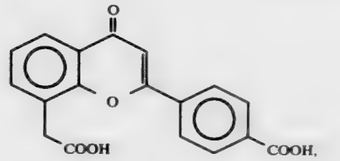
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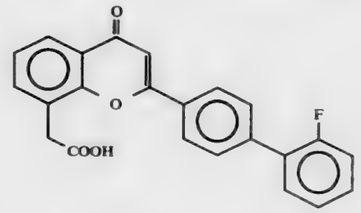
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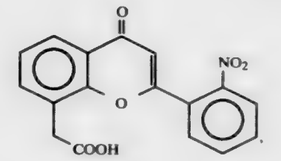
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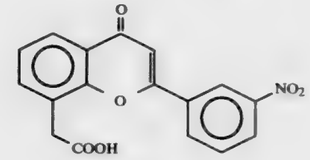
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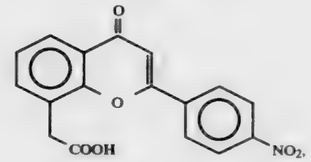
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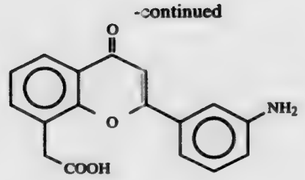


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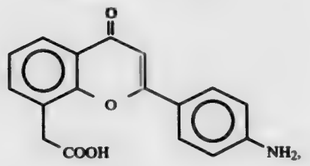


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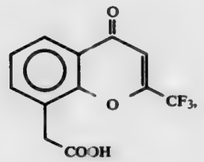
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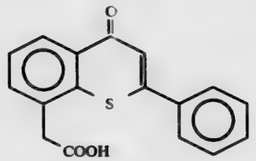
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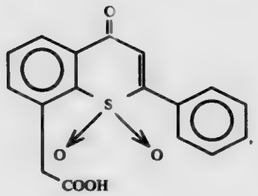
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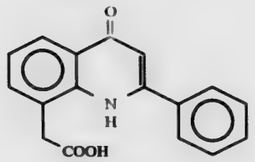
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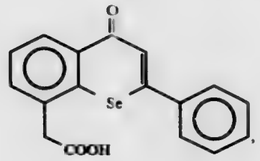
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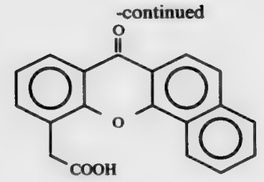


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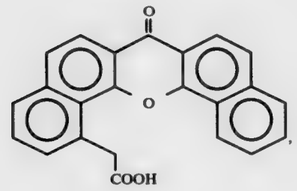


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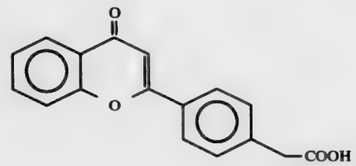
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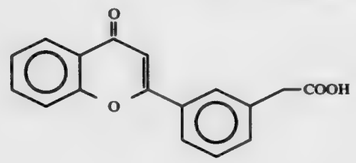
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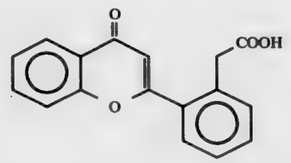
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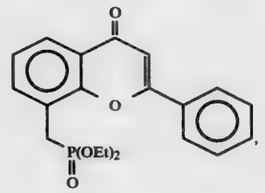
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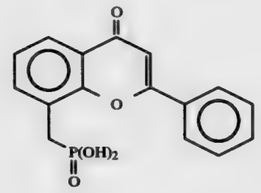
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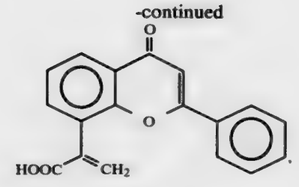


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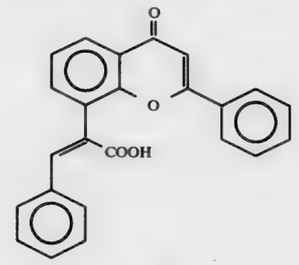


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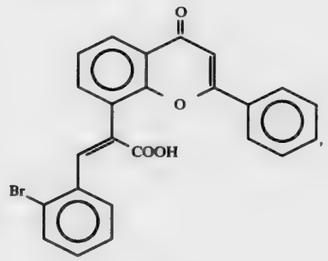
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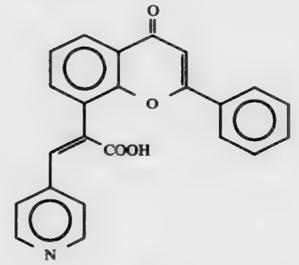
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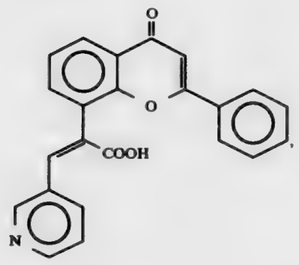
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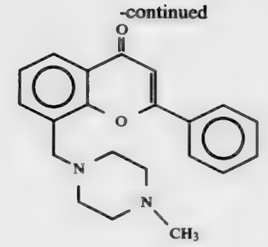


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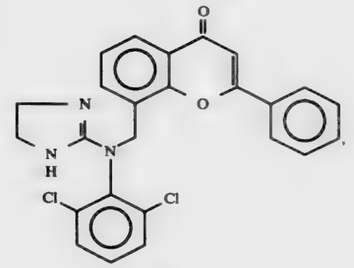


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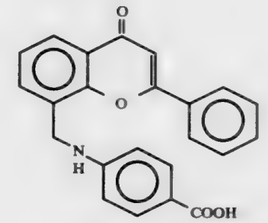
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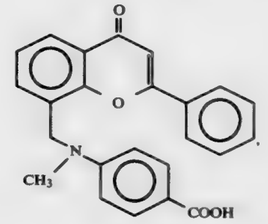
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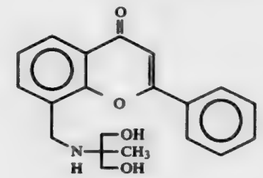
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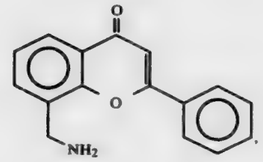
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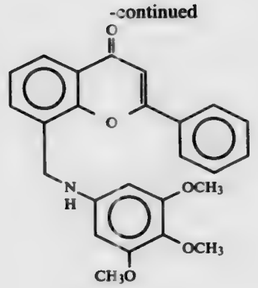


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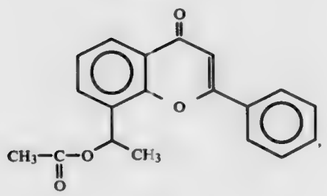


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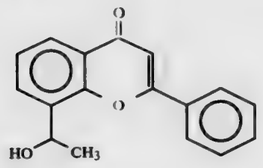
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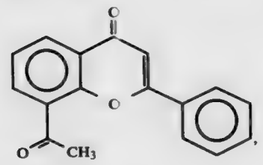
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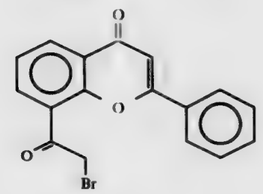
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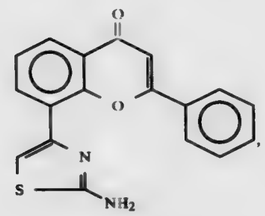
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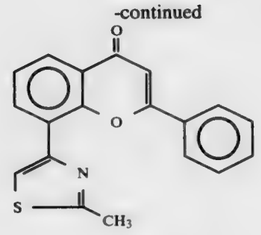


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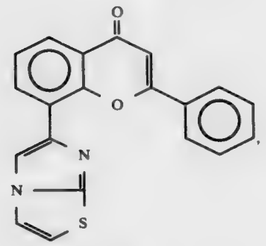


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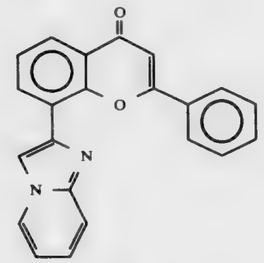
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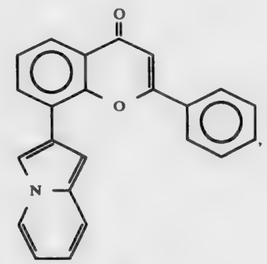
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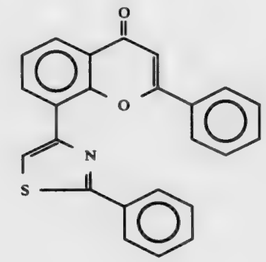
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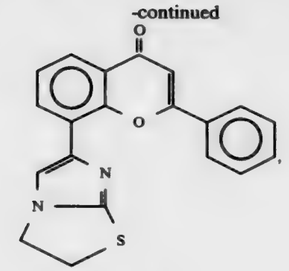
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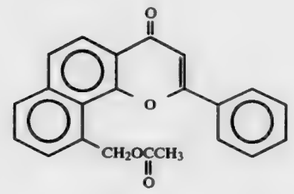


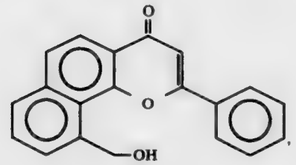
(63)

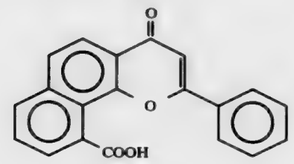


-continued









(64) in succession, the mineral acid containing solutions of the different diazotised diazo components, and b) the solution of a base, which process comprises carrying out the coupling reaction under adiabatic conditions and adjusting and stabilising the coupling pH of the resorcinol in the reactor prior to the reaction with the aid of a buffer system, and keeping the pH constant during the coupling reaction or reactions by controlling the flow ratio of the streams a) and b), and wherein the coupling reactions are carried out in a pH range from 3 to 12 and at a temperature from −5° to 30° C.

5,116,956

POLYAZO DYE COMPOUNDS HAVING VINYLSULFONE TYPE AND PYRIDINIUM TYPE FIBER REACTIVE GROUPS

(65) **Tetsuya Miyamoto, Takatsuki; Kazufumi Yokogawa, Minoo; Yutaka Kayane, Ikoma; Takashi Omura, Kobe; Takeshi Washimi, Toyonaka; Naoki Harada, Ibaraki, and Kingo Akahori, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

Filed May 17, 1990, Ser. No. 524,743

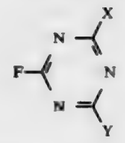
Claims priority, application Japan, Jun. 1, 1989, 1-141855; Jan. 18, 1990, 2-9963; Jan. 18, 1990, 2-9964; Feb. 16, 1990, 2-36892; Feb. 16, 1990, 2-36893

Int. Cl.[5] **C09B** *62/503;* **D06P** *1/384*

(66) **U.S. Cl. 534—612** **16 Claims**

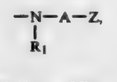
1. A polyazo compound of the following formula,

(I)

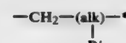


(67)

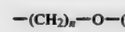
wherein X is



(68) $-NR_2R_3$, $-OR_4$ or $-SR_5$, in which R_1 is hydrogen, methyl or ethyl and R_3, independently of one another, are each hydrogen, C_1–C_4 alkyl unsubstituted or substituted once or twice by C_1–C_4 alkoxy, sulfo, carboxy, hydroxy, chloro, phenyl or sulfato, phenyl unsubstituted or substituted once or twice by C_1–C_4 alkyl, C_1–C_4 alkoxy, sulfo, carboxy, chloro or bromo, naphthyl unsubstituted or substituted once, twice or three times by hydroxy, carboxy, sulfo, C_1–C_4 alkyl, C_1–C_4 alkoxy or chloro or benzyl unsubstituted or substituted once or twice by C_1–C_4 alkyl, C_1–C_4 alkoxy, sulfo or chloro, R_4 and R_5, independently of one another, are each hydrogen, C_1–C_4 alkyl unsubstituted or substituted once or twice by C_1–C_4 alkoxy, sulfo, carboxy, hydroxy, chloro, phenyl, cyano or sulfato; phenyl unsubstituted or substituted once or twice by C_1–C_4 alkyl, C_1–C_4 alkoxy, sulfo, carboxy, chloro or bromo; naphthyl unsubstituted or substituted once, twice or three times by hydroxy, carboxy, sulfo, C_1–C_4 alkyl, C_1–C_4 alkoxy or chloro; benzyl unsubstituted or substituted once or twice by C_1–C_4 alkyl, C_1–C_4 alkoxy, sulfo or chloro; A is phenylene unsubstituted or substituted once or twice by methyl, ethyl, methoxy, ethoxy, chloro, bromo or sulfo, naphthylene unsubstituted or substituted by sulfo or alkylene represented by the following formula (a), (b) or (c),



(a)



(b)

5,116,955

PROCESS FOR THE PREPARATION OF MONO- AND POLYAZO DYES

Horst Langfeld, and Roland Minges, both of Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 25, 1990, Ser. No. 587,385

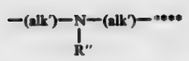
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1989, 3932829

Int. Cl.[5] **C09B** *27/00*

U.S. Cl. 534—582 **16 Claims**

1. A process for coupling one or more diazo components with resorcinol by charging a reactor with an aqueous solution of resorcinol, adjusting the pH of the coupling to the desired value and running in separately from each other a) the mineral acid containing solution of the diazotised diazo component or,

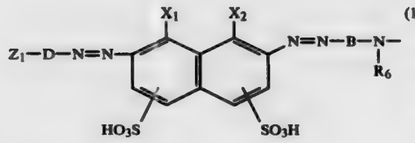
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wherein the linkage marked with **** bonds to the group

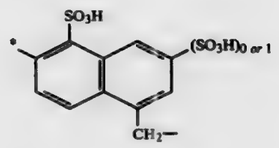


wherein R_1 is as defined above, alk is polymethylene having 1 to 6 carbon atoms or its branched isomer, R′ is hydrogen, chloro, bromo, fluoro, hydroxy, sulfato, C_1–C_4 acyloxy, cyano, carboxy, C_1–C_5 alkoxycarbonyl or carbamoyl, R″ is hydrogen or C_1–C_6 alkyl, each alk′ is independently polymethylene having 2 to 6 carbon atoms or its branched isomer, or each alk′ is taken together with R″ to form a ring through methylene, m and n are each independently an integer of 1 to 6, and Z is $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Z'$ in which Z′ is a group capable of being split by the action of an alkali, Y is pyridinio unsubstituted or substituted by carboxy, carbamoyl, sulfo, halogen or C_1–C_4 alkyl unsubstituted or substituted by hydroxy or sulfo, and F is a polyazo dye moiety selected from the group consisting of those represented by the following formulas (1), (2), (3) and (4) each in free acid form, the formula (1) being

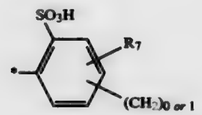


(1)

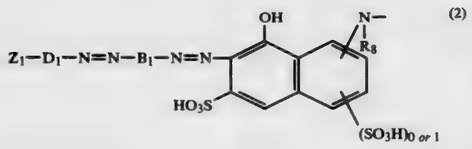
wherein B is



or

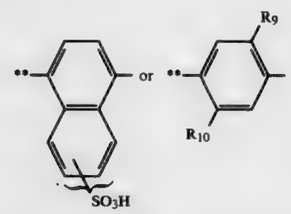


in which the asterisked linkage bonds to the azo group, and R_7 is hydrogen, methyl, methoxy or sulfo, D is naphthylene unsubstituted or substituted by sulfo or sulfophenylene, R_6 is hydrogen, methyl or ethyl, any one of X_1 and X_2 is $-NH_2$ and the other is —OH, and Z_1 is $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Z_1'$, in which Z'_1 is a group capable of being split by the action of an alkali, the formula (2) being



(2)

wherein Z_1 is as defined above, R_8 is hydrogen, methyl or ethyl, B_1 is

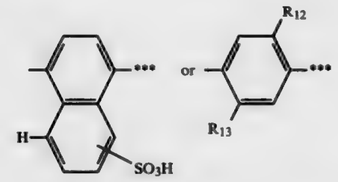


in which the linkage marked with ** bonds to the group —N=N—D_1, R_9 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or sulfo, and R_{10} is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylsulfonylamino, C_1–C_4 acylamino or ureido, and D_1 is phenylene unsubstituted or substituted once or twice by methyl, ethyl, methoxy, ethoxy, chloro, bromo or sulfo or naphthylene unsubstituted or substituted by sulfo, the formula (3) being



(3)

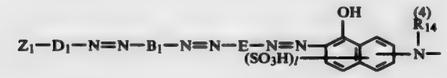
wherein B_1, D_1 and Z_1 are as defined above, R_{11} is hydrogen, methyl or ethyl, E is



in which the linkage marked with *** bonds to the group

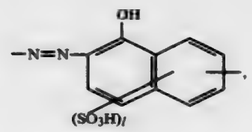


R^{12} is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or sulfo, and R_{13} is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylsulfonylamino, C_1–C_4 acylamino or ureido, and the formula (4) being



(4)

wherein B_1, D_1 and Z_1 are as defined above, and E is as defined above, provided that the linkage marked with **** bonds to the azo group of



R_{14} is hydrogen, methyl or ethyl, and l is 1 or 2.

5,116,957

REACTIVE AZO DYESTUFFS HAVING A FLUOROTRIAZINE GROUP AND IMPROVED FIXATION PROPERTIES

Horst Jäger, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

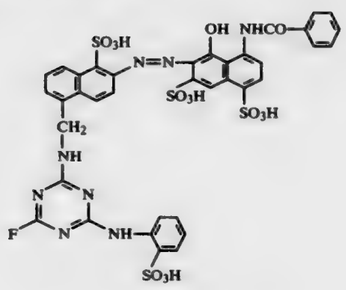
Continuation-in-part of Ser. No. 63,186, Jun. 17, 1987, abandoned, which is a continuation of Ser. No. 311,097, Oct. 13, 1981, abandoned, which is a continuation of Ser. No. 155,801, Jun. 2, 1980, abandoned, which is a continuation of Ser. No. 43,251, May 29, 1979, abandoned. This application Oct. 25, 1990, Ser. No. 603,595

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 2829711

Int. Cl.[5] **C09B** *62/08;* **D06P** *1/382*

U.S. Cl. 534—632 **1 Claim**

1. A dyestuff of the formula



5,116,958

DISPERSE DYES WHICH ARE CONVERTIBLE INTO A THERMOMIGRATION FAST FORM

Peter Liechti, Arisdorf, and Martin Trottmann, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

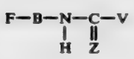
Filed Jan. 5, 1990, Ser. No. 461,497

Claims priority, application Switzerland, Jan. 13, 1989, 107/89

Int. Cl.[5] **C09B** *23/14, 29/08;* **D06P** *1/16*

U.S. Cl. 534—591 **11 Claims**

1. A disperse dye of the formula

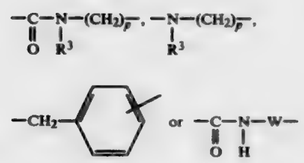


(1)

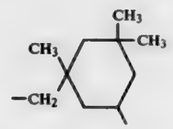
where

F is the radical of a dye which is free of water-solubilizing groups, selected from the group consisting of nitro dyes, nitrodiphenylamine dyes, quinoline dyes, aminonaphthoquinone dyes, coumarin dyes, methine dyes, anthraquinone dyes, tricyanovinyl dyes and azo dyes,

B is a direct bond or a bridge member selected from the group consisting of straight-chain or branched alkylene of 2 to 8 carbon atoms or one of the following groups:

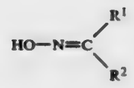


where R^3 is hydrogen or C_1–C_6alkyl, p is an integer from 1 to 8 and W is a divalent organic radical selected from the group consisting of straight-chain or branched alkylene of 2 to 8 carbon atoms, unsubstituted or C_1–C_4alkyl-substituted phenylene, C_1–C_4alkylene-phenylene-C_1–C_4-alkylene, phenylene-C_1–C_4-alkylene-phenylene or a radical of the formula



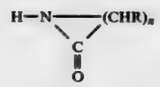
Z is O or S and

V is the radical of a group H—V, where H—V is an oxime of the formula



(2)

or a lactam of the formula



(3)

in which R^1 and R^2 are each independently of the other

a) unsubstituted C_1–C_{12}alkyl or C_1–C_{12}alkyl which is substituted by hydroxy, C_1–C_4alkoxy, halogen, cyano, phenyl, —CO—U or —O—CO—U, where U is C_1–C_6alkyl or phenyl or

b) phenyl, naphthyl or pyridyl or phenyl which is substituted by C_1–C_4alkyl, C_1–C_4alkoxy, bromine, chlorine, nitro or C_1–C_4alkylcarbonylamino, or

R^1 and R^2 together with the carbon atom linking them form a cyclopentyl, cyclohexyl, methylcyclohexyl or cycloheptyl ring,

R is hydrogen or C_1–C_4alkyl and

n is an integer from 4 to 11.

5,116,959
FIBER-REACTIVE MONOAZO DYE COMPOUNDS HAVING SUBSTITUTED TRIAZINYL BRIDGING GROUP

Toshihiko Morimitsu, Minoo; Naoki Harada, Suita; Takashi Omura, Ashiya, and Sadanobu Kikkawa, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

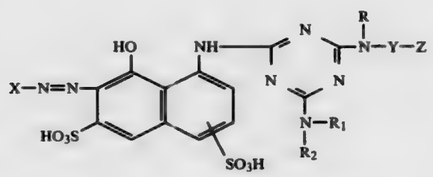
Filed Mar. 9, 1987, Ser. No. 23,563

Claims priority, application Japan, Mar. 13, 1986, 61-55696; Apr. 30, 1986, 61-101330; Sep. 19, 1986, 61-223454; Sep. 22, 1986, 61-224645

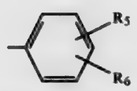
Int. Cl.[5] C09B *62/51;* **D06P** *1/384*

U.S. Cl. 534—642 **8 Claims**

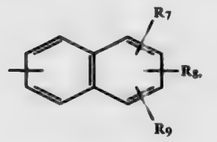
1. A monoazo compound represented by the following formula in a free acid form,



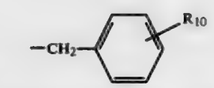
wherein R is hydrogen or C_1 to C_4 alkyl unsubstituted or substituted with 1 or 2 members selected from hydroxy, cyano, C_1 to C_4 alkoxy, halogeno, carobxy, carbamoyl, C_1 to C_4 alkoxycarbonyl, C_1 to C_4 alkylcarbonyloxy, sulfo and sulfamoyl; X is phenyl unsubstituted or substituted with 1 to 3 members selected from methyl, ethyl, methoxy, ethoxy, halogeno, acetylamino, propionylamino, nitro, sulfo and carboxy, or mono-, di- or tri-sulfonaphthyl; Y is phenylene unsubstituted or substituted with 1 or 2 members selected from methyl, ethyl, methoxy, ethoxy, chloro, bromo and sulfo, or unsubstituted naphthylene or mono-sulfonaphthylene; Z is $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Z_1$ in which Z_1 is a group splittable by the action of an alkali; and R_1 and R_2 are independently hydrogen, C_1 to C_4 alkyl, phenyl, naphthyl or benzyl, excepting the case where both R_1 and R_2 are hydrogen, the alkyl having 1 to 4 carbon atoms and being unsubstituted or substituted with hydroxy, cyano, C_1 to C_4 alkoxy, amino, halogeno, carboxy, C_1 to C_4 alkoxycarbonyl, C_1 to C_4 alkylcarbonyloxy, carbamoyl, sulfamoyl, sulfo or sulfato, the phenyl being represented by the formula,



in which R_5 and R_6 are independently hydrogen, halogeno, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, hydroxy, nitro, carboxy or sulfo, the naphthyl being represented by the formula,



in which R_7, R_8 and R_9 are independently hydrogen, hydroxy or sulfo, and the benzyl being represented by the formula,



in which R_{10} is hydrogen, methyl, methoxy or chloro; with the proviso that

(a) Y is the unsubstituted or substituted phenylene as described hereinabove when X is the unsubstituted or substituted phenyl as described hereinabove,

(b) Y is the unsubstituted or mono-sulfonaphthylene when X is the mono-, di- or tri-sulfonaphthyl, and

(c)

(1) R_1 is hydrogen and R_2 is chlorophenyl, or

(2) R_1 is hydrogen and R_2 is the naphthyl excepting sulfonaphthyl, or

(3) is said alkyl excepting methyl and said sulfo substituted alkyl and R_2 is said phenyl excepting sulfophenyl,

when R is hydrogen and X and Y are the unsubstituted or substituted phenyl as described hereinabove and the unsubstituted or substituted phenylene as described hereinabove, respectively.

5,116,960
AMPHOTERICIN B DERIVATIVES

Michael J. Driver; David T. MacPherson, and William S. MacLachlan, all of Epsom, England, assignors to Beecham Group p.l.c., Brentford, England

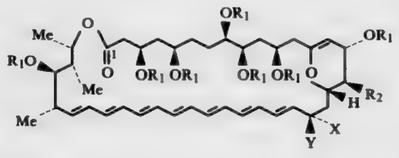
Filed Jun. 9, 1989, Ser. No. 367,390

Claims priority, application United Kingdom, Jun. 13, 1988, 8813927; Dec. 19, 1988, 8829592

Int. Cl.[5] C07H *17/08;* **C07D** *313/06*

U.S. Cl. 536—6.5 **9 Claims**

1. A compound of formula (I), or a salt thereof:



(I)

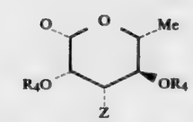
wherein:

each R_1 is independently hydrogen or a silyl protecting group selected from the group consisting of trimethylsilyl, triethylsilyl and tertiarybutyldimethylsilyl;

R_2 is a carboxyl group or a derivative thereof selected from the group consisting of hydroxycarbonyl, C_{1-8} alkoxycarobnyl, phenyloxycarbonyl, naphthloxycarbonyl, heteroaryloxycarbonyl, C_{1-8} alkylthiocarbonyl, phenylthiocarbonyl, naphthylthiocarbonyl, heteroarylthiocarbonyl, a primary, secondary, or tertiary amide in which the nitrogen moiety is optionally substituted with one or two C_{1-6} alkyl groups; a C_{1-6} alkyl, phenyl, naphthyl or heteroaryl ketone; or hydroxymethyl; any of said phenyl or naphthyl moieties optionally mono-, di-, or tri-substituted by substituents selected from the group consisting of carboxy, C_{1-8} alkoxycarbonyl, hydroxy, C_{1-8} alkyl, C_{1-8} alkoxy, halogen and amino optionally mono- or di-substituted by C_{1-8} alkyl;

said heteroaryl moiety is a 5- or 6-membered monocyclic or a 9- or 10-membered bicyclic heteroaryl containing one or two heteroatoms selected from the group consisting of nitrogen, oxygen and sulphur, which, in the case of more than one heteroatom, may be the same or different;

one of X and Y is hydrogen and the other is a sugar residue having the formula



in which R_4 is independently hydrogen or a silyl protecting group as defined for R_1 above and Z is an amino group or a protected amino group NHR_3 wherein R_3 is selected from the group consisting of hydrogen, acetyl, trifluoroacetyl, 9-fluorenylmethoxycarbonyl, trichloroethoxycarbonyl, 2-methylsulphonylethoxycarbonyl and 2-trimethylsilylethoxycarbonyl; hydroxy; or

X and Y together with the carbon atom to which they are bonded are a carbonyl group; with the proviso that when each R_1 is trimethylsilyl and R_2 is methoxycarbonyl, one of X and Y is not hydroxy, 4-nitrophenylcarboxy or N-acetyl-3,4-o-trimethylsilymycosamine, or X and Y together with the carbon atom to which they are bonded are not a carbonyl group; when each R_1 is hydrogen and R_2 is methoxycarbonyl, one of X and Y is not hydroxy or 4-nitrophenylcarboxy; and when each R_1 is hydrogen and R_2 is carboxy, one of X and Y is not hydroxy.

5,116,961
1',6,6'-TRIMETHACRYLOYL-2,3,3',4,4'-PENTA-O-METHYLSUCROSE

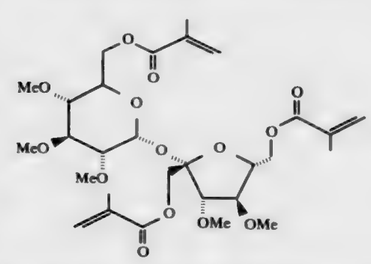
Navzer Sachinvala, Aiea, Hi., assignor to Hawaiian Sugar Planters' Association, Aiea, Hi.

Continuation-in-part of Ser. No. 623,548, Dec. 7, 1990, abandoned. This application May 10, 1991, Ser. No. 697,983

Int. Cl.[5] C07H *15/00*

U.S. Cl. 536—18.2 **2 Claims**

1. A compound having the following structure (I):



(I)

which compound is 1',6,6'-trimethylacryloyl-2,3,3',4,4'-penta-O-methylsucrose.

5,116,962
MATERIAL FOR AFFINITY CHROMATOGRAPHY WHICH IS A SULFATED POLYSACCHARIDE BONDED TO AN INSOLUBLE POLYMER

Werner Stüber, Lahntal, and Eric-Paul Pâques, Marburg, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Continuation of Ser. No. 338,370, Apr. 13, 1989, abandoned, which is a continuation of Ser. No. 866,248, May 23, 1986, abandoned. This application Jul. 16, 1990, Ser. No. 554,075

Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3519011

Int. Cl.[5] C08B *37/10;* **C08G** *4/00*

U.S. Cl. 525—54.2 **1 Claim**

1. A sulfated polysaccharide bonded to an insoluble polymer prepared by a process which comprises treating a sulfated polysaccharide selected from the group consisting of heparin and its sodium salt with an alkali metal periodate which oxidizes glycols to aldehydes, thereby cleaving the carbon chain, and reacting the modified sulfated polysaccharide with an insoluble polymer containing amino groups selected from the group consisting of dextran resins, agarose resins and copolymers of methacrylic acid derivatives, pentaerythritol, polyethylene glycol and divinylbenzene.

5,116,963
HIGH-PURITY DERMATAN SULPHATE

Rinaldo Del Bono, Milan; Luigi De Ambrosi, Santhià; Gianni Ferrari, Milan; Pier L. Rugarli, Milan, and Pier G. Pagella, Isola S. Antonio, all of Italy, assignors to Mediolanum Farmaceutici Srl, Milan, Italy

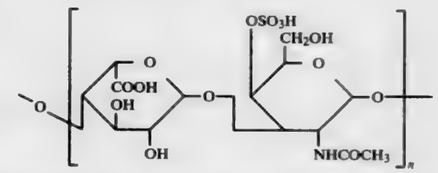
Continuation of Ser. No. 386,152, Jul. 28, 1989, abandoned, which is a division of Ser. No. 27,733, Mar. 19, 1987, Pat. No. 4,870,166. This application Oct. 23, 1990, Ser. No. 600,267

Claims priority, application Italy, Mar. 25, 1986, 19864 A/86

Int. Cl.[5] A61K *31/72.5;* **C08B** *37/10*

U.S. Cl. 536—21 **4 Claims**

1. Dermatan sulphate consisting of repeating disaccharide units of formula



wherein one mole of iduronic acid and one mole of N-acetyl galactosamine sulphate, is linked by a 1,3 glucoside bond, said dermatan sulphate having the following characteristics:

single band under electrophoresis in various buffer systems

molecular weight: 20,000–40,000

organic sulphur: 6–8%

uronic acids: 30–36%

ratio of sulphate groups to carboxyl groups: 1.2–1.5

ratio of uronic acids to galactosamine: 1:1

iduronic acid: 80–90% of the total uronic acids

$[\alpha]_D$: $-60°$ to $-65°$

heparin activity: 10 U/mg USP.

5,116,964
HYBRID IMMUNOGLOBULINS

Daniel J. Capon, San Mateo, and Laurence A. Lasky, Sausalito, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 315,015, Feb. 23, 1989. This application Nov. 22, 1989, Ser. No. 440,625

Int. Cl.[5] C07H *21/04;* **C12N** *15/62;* **C12P** *21/02*

U.S. Cl. 536—27 **8 Claims**

1. Nucleic acid encoding a polypeptide fusion comprising a ligand binding partner protein containing more than one polypeptide chain, wherein the ligand binding partner protein is not a platelet growth factor receptor or an insulin receptor, one of said chains being fused to an immunoglobulin constant region through C- or N-terminal amino or carboxyl groups.

5,116,965
METHODS OF OBTAINING HISTIDINE-RICH PROTEIN GENES OF PLASMODIA, AND DNA OBTAINED THEREFROM

Jeffrey V. Ravetch, and Laura Pologe, both of New York, N.Y., assignors to Sloan-Kettering Institute For Cancer Research, New York, N.Y.

Filed Aug. 26, 1986, Ser. No. 900,401
Int. Cl.[5] C07H *21/04;* **C07K** *13/00;* **C12Q** *1/68;* **G01N** *33/68*
U.S. Cl. 536—27 **3 Claims**



3. Substantially pure *P. falciparum* histidine-rich protein characterized by amino acid sequence:

M K S F K N K N T L R R K K A F D V F T
K I L L V S F L V W V L K C S N N C N N
G N G S G D S F D F R N K R T L A Q K Q
H E H H H H H H Q H Q H Q H Q A P H Q
A H H H H H G E V N H Q A P Q V H Q Q
V H G Q D Q A H H H H H H H H Q L Q P
Q Q L Q G T V A N P P S N E P V V K T Q
V F R E A R P G G G F K A Y E E K Y E S
K H Y K L K E N V V D G K K D C D E K Y
E A A N Y A F S E E C P Y T V N D Y S Q
E N G P N I F A L R K R F P L G M N D E
D E E G K E A L A I K D K L P G G L D E
Y Q N Q L Y G I C N E T C T T C G P A A
I D Y V P A D A P N G Y A Y G G
S A H D
G S H G N L R G H G N K G S E G Y G Y E
A P Y N P G F N G A P G V M V C K L C P
T P W C R L F S S I R S S T W C S H G S
R Y S S F S S V N K Y G K H G D E K H H
S S K H E G N T V K E K K R K N Q K N
T K T T M E K R K N Q K N T K T M K M Q
K A

5,116,966
PROCESS FOR SEPARATION OF SULFATED GLYCOSAMINOGLYCANS

Christian Gagnieu, Lyon, and Michel DuBois, Chaponost, both of France, assignors to Societe De Developpement Des Utilisations Du Cuir - SADUC, Chaponost, France

Filed Jan. 3, 1990, Ser. No. 460,644
Claims priority, application France, Jan. 5, 1989, 89 00564
Int. Cl.[5] C08B *34/00, 34/02, 37/08, 37/10*
U.S. Cl. 536—50 **13 Claims**

1. A process for separation of sulfated glycosaminoglycans (abbreviated to sGAG) from a starting complex medium comprising in solution at least one sGAG and contaminants with amino acid groups, in which process the sGAG is selectively precipitated by complexing with a water-soluble polyamine, wherein:

in a first precipitation stage, the water-soluble polyamine is mixed with the starting complex medium, while maintaining the pH of the mixture at a value below the ionic dissociation potential (pKa) of the free carboxyl groups of contaminants and sGAG, in order to obtain selectively a precipitated ionic macromolecular complex, essentially between the sGAG and the water-soluble polyamine,

in a second stage, in a suspension medium of the precipitate, the sGAG is solubilized and at the same time the polyamine is maintained in insoluble form, the suspension medium comprising a concomitant displacing agent of ionized carboxyl groups of the sGAG and ionized amine groups of the polyamine,

the water-soluble polyamine being soluble both in the starting complex medium and the suspension medium of the precipitate.

5,116,967
METHOD OF MANUFACTURING AN ADJUSTABLE-VISCOSITY CATIONIC STARCH

Wolfgang Fischer, Kahl; Dietmar Bischoff, Marktbreit; Michael Huss, Eschborn; Reinhard Stober, Hasselroth, and Gert Roessler, Bruehl, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 17, 1990, Ser. No. 524,757
Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917632
Int. Cl.[5] C08B *31/12*
U.S. Cl. 536—50 **14 Claims**

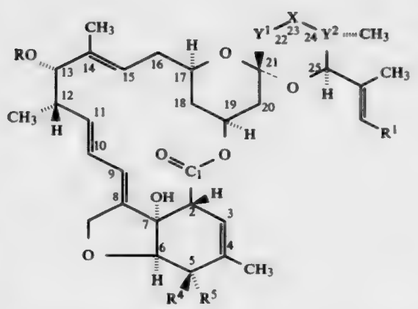
1. A method of manufacturing an etherified starch capable of conversion to an adjustable-viscosity cationised starch in pulverulent form, comprising the process step of mixing starch, with an alkylene epoxide and a peroxo compound or a mixture of peroxo compound or a mixture of peroxo compounds in the presence of 10 to 35 wt. % water, an alkaline oxide, alkaline hydroxide, alkaline silicate, alkaline aluminate or mixtures thereof, to form an admixture, homogenizing said admixture.

5,116,968
MACROLIDE COMPOUNDS

Gordon C. Lawrence, Burnham; Michael J. Dawson, Ickenham; David Noble, Stock Mandeville; Michael V. J. Ramsay, South Harrow; Richard Bell, South Ruislip; Derek R. Sutherland, Chalfont St Giles, and Edward P. Tiley, Pinner, all of England, assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 351,380, May 9, 1989, abandoned. This application Dec. 20, 1990, Ser. No. 630,437
Claims priority, application United Kingdom, May 10, 1988, 8811036
Int. Cl.[5] A61K *31/70, 31/71, 31/365;* **C07H** *17/04*
U.S. Cl. 536—71 **9 Claims**

1. Compounds of formula (1)



(1)

wherein

R represents a sugar residue or an acylated derivative thereof;

R^1 represents a methyl, ethyl or isopropyl group;

Y^1 is $—CH_2$, Y^2 is —CH— and X represents



[wherein R^2 represents a hydrogen atom or a group OR^6 (where OR^6 is a hydroxyl group or a substituted hydroxyl group having up to 25 carbon atoms) and R^3 represents a hydrogen atom, or R^2 and R^3 together with the carbon atom to which they are attached represent >C=O, $>C=CH_2$ or $>C=NOR^7$ (where R^7 represents a hydrogen atom, a C_{1-8} alkyl group or a C_{3-8} alkenyl group) and the group $>C=NOR^7$ is in the E configuration] or $—Y^1—X—Y^2—$ represents —CH=CH—CH— or $—CH_2—CH=C—$; and

R^4 represents a group OR^6 as defined above and R^5 represents a hydrogen atom, or R^4 and R^5 together with the carbon atom to which they are attached represent >C=O or $>C=NOR^8$ (where R^8 is as defined above for R^7), and salts thereof.

5,116,969
ULTRAREFINED ARABINOGALACTAN PRODUCT

Mark F. Adams, and Melvin R. Knudson, both of Tacoma, Wash., assignors to Larex International, Inc., Tacoma, Wash.

Filed Apr. 26, 1990, Ser. No. 514,961
Int. Cl.[5] C07H *1/00;* **C08B** *37/00*
U.S. Cl. 536—128 **11 Claims**

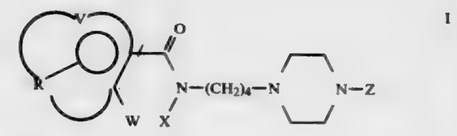
1. A highly refined arabinogalactan polymer having a molecular weight within the range of about 6,000 to 2,500,000 and a tannic acid equivalent no greater than about 0.5 mg/g, said polymer further having the property of making negligible contribution to solution osmolality in solutions as high as 50% concentration by weight.

5,116,970
PSYCHOTROPIC HETEROBICYCLOALKYLPIPERAZINE DERIVATIVES: 2. FUSED PYRIDAZINONES

James S. New, 45 Wellington Ct., Belle Mead, N.J. 08502, and William J. Christopher, 103 Charlesberry La., Chapel Hill, N.C. 27514

Division of Ser. No. 157,016, Feb. 18, 1988, Pat. No. 5,001,130. This application Dec. 20, 1990, Ser. No. 630,672
Int. Cl.[5] C07D *495/04, 491/048*
U.S. Cl. 544—235 **5 Claims**

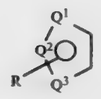
1. A compound of Formula I and its pharmaceutically acceptable acid addition salts thereof



I

wherein

V is



(A)

in which one of Q^1, Q^2 or Q^3 is an oxygen or sulfur atom and the other two Qs are carbon atoms bearing either a hydrogen atom or R which is a C_{1-4} alkyl group;

W is CH or CH_2;

X is N;

the dotted line accompanying the full line can be either a single or double bond; and

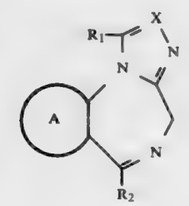
Z is a heteroaromatic ring system selected from pyrimidine, 1,2-benzisothiazole, thieno [3,2-c]-pyridine, and furo[3,2-c]pyridine.

5,116,971
SUBSTITUTED-1,4-DIAZEPINES

Albrecht Harreus, Ingelheim am Rhein; Karl-Heinz Weber; Werner Stransky, both of Gau-Algesheim; Gerhard Walther, Bingen; Gojko Muacevic, Ingelheim am Rhein; Jorge C. Stenzel, Munich, and Wolf-Dietrich Bechtel, Appenheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

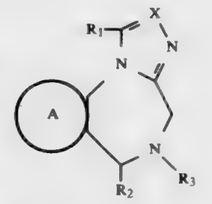
Continuation of Ser. No. 33,966, Apr. 1, 1987, abandoned. This application Sep. 19, 1990, Ser. No. 584,815
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1986, 3610848
Int. Cl.[5] C07D *495/14, 487/04;* **A61K** *31/55*
U.S. Cl. 540—362 **32 Claims**

1. A compound of formula



I

or



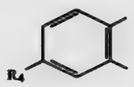
II

in which

X is CH, C-halogen or nitrogen;

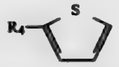
R_1 is hydrogen, branched or unbranched C_1–C_4 alkyl optionally substituted by hydroxyl or halogen, cyclopropyl, C_1–C_4 alkoxy or halogen;
R_2 is phenyl, α-pyridyl or phenyl substituted with one or more substituents selected from methyl, methoxy, halogen, nitro and trifluoromethyl;
R_3 is hydrogen or branched or unbranched C_1–C_4 alkyl;
A is a fused-on ring of the formula

a



or

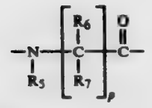
b



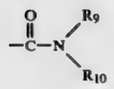
in which
R_4 is a functional side-chain of the formula



in which
n is zero or an integer from 1 to 8;
m is an integer from 1 to 3;
y is a branched or unbranched alkyl with n carbons;
<AA> is an amino acid linked N-terminally of the formula



where
p is an integer from 1 to 8;
R_5 is hydrogen or branched or unbranched C_1–C_5 alkyl; and
R_6 and R_7, which can be identical or different, are each hydrogen, alkenyl or alkynyl having 1 to 10 carbons, C_3–C_6 cycloalkyl, or phenyl, said phenyl being optionally substituted with at least one substituent selected from hydroxyl, halogen, amino, and branched or unbranched C_1–C_4 alkylamino, d-(C_1–C_4) alkylamino or C_1–C_4 alkoxy,
or
R_6 and R_7, which can be identical or different, are each branched or unbranched alkyl with 1 to 10 carbons, which may be substituted one or more times by hydroxyl, C_1–C_4 alkoxy, C_3–C_7 cycloalkyl, halogen, amino, (which can optionally be substituted once or twice by branched or unbranched alkyl, alkoxycarbonyl or aralkoxycarbonyl, in each case having 1 to 4 carbon atoms in the alkyl chain), guanidino, ureido, carboxy, C_1–C_4 alkoxycarbonyl, cyano, aminocarbonyl, C_1–C_4 alkylcarbonyl, mercapto, C_1–C_4 alkylthio, benzylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, 3-indolyl, imidazolyly, pyrazolyl, or an amide of the formula



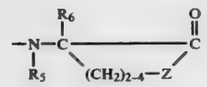
in which
R_9 and R_{10}, which can be identical or different, are each hydrogen, branched or unbranched alkyl, alkenyl or alkynyl having 1 to 4 carbons, C_1–C_4 alkyl substituted by amino which can optionally be substituted once or twice with branched or unbranched C_1–C_4 alkyl in the alkyl chain or once with hydroxyl, or
R_9 and R_{10} together form a 5- to 6-membered ring selected from pyrrol, pyrrolin, pyrrolidin, 2-methylpyrrolidin, 3-methylpyrrolidin, piperidin, piperazin, N-methylpiperazin, N-ethylpiperazin, N-n-propyl-piperazin, N-benzylpiperazin, morpholin, thiomorpholin, imidazol, imidazolin, imidazolidin, triazol, pyrazol, pyrazolin, pyrazolidin, triazin, 1,2,3,4-tetrazin, 1,2,3,5-tetrazin, 1,2,4,5-tetrazin, said ring being optionally substituted with at least one branched or unbranched C_1–C_4 alkyl;
R_8 is an amino of the formula



or branched or unbranched C_1–C_4 alkoxy or C_1–C_4 alkylthio, the alkyl of which can be optionally substituted with an amino of the formula



in which
R_9 and R_{10}, singly or together, are as previously defined
R_6 and R_7, taken together optionally form a 3- to 7-membered carbocyclic ring, said ring being optionally substituted with at least one branched or unbranched C_1–C_4 alkyl; or
R_5 taken together with R_6 or R_7, optionally form a 4- to 7-membered carbocyclic ring, said ring being optionally substituted with at least one branched or unbranched C_1–C_4 alkyl; or
R_7 taken together with R_8 optionally form a 5- to 7-membered ring of the formula



in which
R_5 and R_6 are as previously defined; and Z is one of the heteroatoms, oxygen or sulphur, or Z is NH;
and the optically active isomers, racemates and physiologically acceptable acid addition salts thereof.

25. The morpholide of N-{[1-methyl-6-(2-chloro-phenyl)-4H-[1,2,4]triazolo[4,3-a][1,4]-benzodiazepin-8-yl]carbonyl}-D,L-β-aminoisobuteric acid.

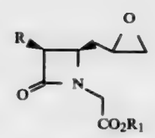
5,116,972

4-(2,3 EPOXYPROPANE)AZETIDINONES

Robert J. Ternansky, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 691,257, Apr. 25, 1991, Pat. No. 5,089,610. This application Aug. 14, 1991, Ser. No. 744,857
Int. Cl.[5] C07D *405/06, 7/10, 205/095, 205/085*
U.S. Cl. 540—364 **2 Claims**

1. A compound of the formula (II)



(II)

wherein R is a protected amino group and R_1 is a carboxy protected group.

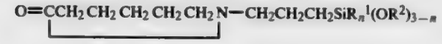
5,116,973

CAPROLACTAM SILANE COMPOUND AND A METHOD OF MANUFACTURING THE SAME

Tohru Kubota; Toshinobu Ishihara, and Mikio Endo, all of Joetsu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1990, Ser. No. 564,093
Claims priority, application Japan, Aug. 15, 1989, 1-210400
Int. Cl.[5] C07F *7/10, 7/18;* **C07B** *47/00*
U.S. Cl. 540—487 **3 Claims**

1. A silane compound having the following formula, wherein R^1 and R^2 are each a monovalent hydrocarbon radical having 1 to 4 carbon atoms and n is an integer of 0, 1 or 2:



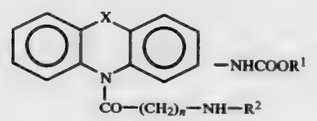
5,116,974

3-CARBALKOXYAMINO-5-AMINOACYL-5H-DIBENZ[B,-F]AZEPINES, AND METHODS FOR MAKING

Helmut Wunderlich, Dresden; Andreas Stark, Radebeul; Lothar Zenker, Radebeul; Dieter Lohmann, Radebeul; Hildegard Poppe; Reni Bartsch, both of Dresden, all of German Democratic Rep.; Aleksandr P. Skoldinov, Moskau, U.S.S.R.; Natalja V. Kaverina, Moskau, U.S.S.R.; Anna N. Grizenko, Moskau, U.S.S.R., and Valentin V. Lyskovzev, Moskau, U.S.S.R., assignors to Arzneimittelwerk Dresden GmbH, Radebeul, Fed. Rep. of Germany

Filed Jun. 29, 1990, Ser. No. 546,590
Claims priority, application German Democratic Rep., Jun. 30, 1989, 330174
Int. Cl.[5] C07D *223/22*
U.S. Cl. 540—591 **4 Claims**

1. The compounds 3-Carbalkoxyamino-5-aminoacyl-5H-dibenz[b,f]azepines of formula I and their physiologically tolerated salts,



wherein
R^1 is a straight chain, or branched C_{1-3} alkyl residue,
R^2 is hydrogen, or a straight chain, branched, or ring closed C_{2-6} alkyl residue, or methyl residue, or an aralkyl group,
n is a cardinal number from 1 to 5, and
X is a —CH_2—CH_2—, or —CH=CH— residue,
and their pharmaceutically acceptable acid addition salts, provided that when R^2 is methyl, then R^1 is methyl or isopropyl or n is a cardinal number from 2 to 5.

5,116,975

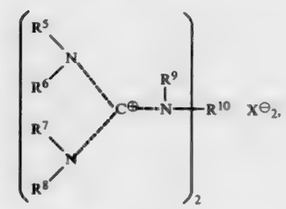
BIS(GUANIDINIUM)ALKANE SALTS AS PHASE TRANSFER CATALYSTS

Daniel J. Brunelle, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 665,879, Mar. 7, 1991, abandoned, which is a continuation-in-part of Ser. No. 626,147, Dec. 12, 1990, Pat. No. 5,081,298. This application Jun. 24, 1991, Ser. No. 719,458
Int. Cl.[5] C07D *295/12, 295/00, 207/325*
U.S. Cl. 544—86 **9 Claims**

1. An α, ω-bis(guanidinium)alkane salt having the formula

(I)



wherein at least one of the R^5–R^6 and R^7–R^8 combinations with the connecting nitrogen atom forms a heterocyclic radical and any additional radicals from R^5, R^6, R^7 and R^8 are primary alkyl, R^9 is a primary alkyl radical, R^{10} is a bis(primary alkylene) radical and X is an anion.

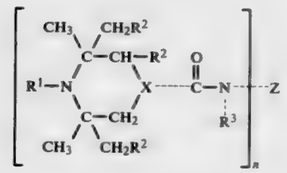
5,116,976

HINDERED AMINE LIGHT STABILIZER HYDRAZIDES

Terry N. Myers, Erie, N.Y., assignor to Atochem North America, Inc, Philadelphia, Pa.

Filed Jul. 17, 1990, Ser. No. 553,923
Int. Cl.[5] C07D *211/58;* **C08K** *5/3435*
U.S. Cl. 546—20 **13 Claims**

1. A compound of the formula



where
R^1 is hydrogen, oxyl, hydroxyl, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted alicyclic of 5–12 carbons, substituted or unsubstituted carbocyclic araliphatic of 7–22 carbons, substituted or unsubstituted aliphatic acyl of 2–20 carbons, substituted or unsubstituted alicyclic acyl of 7–16 carbons, substituted or unsubstituted carbocyclic aromatic acyl of 7–11 carbons, substituted or unsubstituted carbocyclic araliphatic acyl of 7–22 carbons, —(C(=O))$_a$—N(R^4)(R^5), —(C(=O))$_a$—O—R^6, —(CH_2)$_a$—C(=O)—O—R^7 where is a 1–2, or —(CH_2—CH(R^8)—O)$_b$—R^9 where b is 2–50;
R^2 is hydrogen or aliphatic of 1–4 carbons;
R^3 is hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted carbocyclic araliphatic of 7–22 carbons or substituted or unsubstituted alicyclic of 5–12 carbons;
R^4 and R^5 are independently hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted carbocyclic aryl of 6–14 carbons, substituted or unsubstituted carbocyclic araliphatic of 7–22 carbons or substituted or unsubstituted alicyclic of 5–12 carbons which may optionally contain —N(R^{10})— as a ring mem-

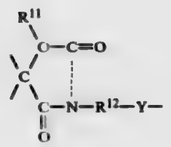
ber with the proviso that bonding to the amide nitrogen to which R^4 and R5 are attached is through a carbon atom, or R^4 and R^5 may be linked together through —$N(R^{10})$— or —O— to form a heterocyclic ring including the nitrogen atom to which they are attached of 5–7 atoms with the proviso that the —$N(R^{10})$— or —O— linking R^4 and R^5 must be separated from the nitrogen atom to which R^4 and R^5 are attached by at least one carbon atom;

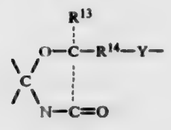
R^6 is substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted alicyclic of 5–12 carbons, substituted or unsubstituted carbocyclic aryl of 6–14 carbons or substituted or unsubstituted carbocyclic araliphatic of 7–22 carbons,

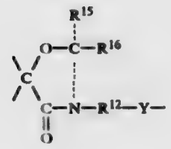
R^7, R^8 and R^9 are independently hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted alicyclic of 5–12 carbons, substituted or unsubstituted carbocyclic aryl of 6–14 carbons or substituted or unsubstituted carbocyclic araliphatic of 7–22 carbons,

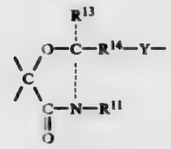
R^{10} is hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted alicyclic of 5–20 carbons, substituted or unsubstituted carbocyclic araliphatic of 7–22 carbons, substituted or unsubstituted aliphatic acyl of 2–20 carbons, substituted or unsubstituted alicyclic acyl of 7–16 carbons, substituted or unsubstituted carbocyclic aromatic acyl of 7–11 carbons, substituted or unsubstituted carbocyclic araliphatic acyl of 7–22 carbons, $—(C(=O))_a—N(R^4)(R^5)$, $—(C(=O))_a—O—R^6$, $—(CH_2)_a—C(=O)—O—R^7$ where a is 1-2, or $—(CH_2—CH(R^8)—O)_b—R^9$ were b is 2–50,

X is a triradical



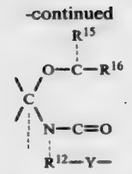






or

-continued



R^{11} is independently of the same definition as R^7 and when alicyclic may optionally contain —$N(R^{10})$— as a ring member, with the proviso that bonding to the nitrogen atom to which "R" is attached must be through a carbon atom;

R^{12} is substituted or unsubstituted aliphatic diradical of 1–20 carbons, substituted or unsubstituted carbocyclic aryl diradical of 6–12 carbons, substituted or unsubstituted alicyclic diradical of 5–12 carbons or substituted and unsubstituted carbocyclic araliphatic diradical of 7–22 carbons and the diradicals may optionally contain 1–6 heteroatoms —O—, —S—, and —$N(R^{10})$— with the proviso that multiple heteroatoms must be separated from each other by at least two carbon atoms and from the diradical ends by at least one carbon atom;

R^{13} is independently of the same definition as R^6;

R^{14} is independently of the same definition as R^{12}, and when Y is a direct bond, R^{14} may also be a direct bond;

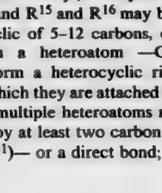
R^{13} and R^{14} together with the carbon atom linking them may form a substituted or unsubstituted cycloalkyl ring of 5–12 carbons,

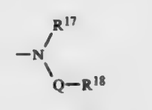
R^{15} and R^{16} are independently of the same definition as R^{11} and may also be carbamoyl, alkoxycarbonyl of 2–5 carbons or pyridyl, and R^{15} and R^{16} may be linked together to form an alicyclic of 5–12 carbons, or may be linked together through a heteroatom —O—, —S—, and —$N(R^{10})$— to form a heterocyclic ring including the carbon atom to which they are attached of 5–7 atoms with the proviso that multiple heteroatoms must be separated from each other by at least two carbon atoms;

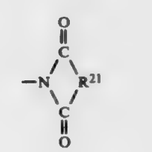
Y is —O—, —$N(R^{11})$— or a direct bond;

n is 1 or 2;

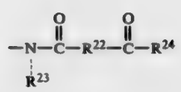
when n is 1, Z is



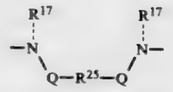




or



when n is 2, Z is



R^{17} is independently of the same definition as R^{11},

R^{18} is independently of the same definition as R^{11},

Q is —C(=O)—, —$S(=O)_2$—, —C(=O)—O—, —$[C(=O)]_2$—O—, —C(=O)—$N(R^{10})$—, —$[C(=O)]_2$—$N(R^{10})$—, —C(=S)—$N(R^{10})$—, —C(=O)—R^{22}—C(=O)—$N(R^{10})$— or, when n is 1, a direct bond between the nitrogen and R^{18},

R^{19} and R^{20} are independently of the same definition as R^{11}, and R^{19} and R^{20} may be linked together to form a substituted or unsubstituted alicyclic ring of 5–12 carbons or may be linked together through a heteroatom —$N(R^{10})$—, —O— and —S— to form a heterocyclic ring including the carbon atom to which they are attached of 5–12 atoms,

R^{21} is substituted or unsubstituted aliphatic diradical of 2–2000 carbons, substituted or unsubstituted carbocyclic aryl diradical of 6–14 carbons, substituted or unsubstituted alicyclic diradical of 5–12 carbons or substituted or unsubstituted carbocyclic araliphatic diradical of 7–22 carbons, and the diradical chain(s) may optionally contain 1–6 heteroatoms —O—, —S— and —$N(R^{10})$— with the provisos that (a) multiple heteroatoms must be separated from each other by at least two carbon atoms and from the chain ends by at least one carbon atom, and that (b) the cyclic group formed contains 5–6 atoms in the ring,

R^{22} is a direct bond or is a substituted or unsubstituted aliphatic diradical of 1–200 carbons, substituted or unsubstituted carbocyclic aryl diradical of 6–14 carbons, substituted or unsubstituted alicyclic diradical of 5–22 carbons or substituted or unsubstituted carbocyclic araliphatic diradical of 7–22 carbons, and the diradical chain(s) may optionally contain 1–6 heteroatoms —O—, —S—, and —$N(R^{10})$— with the proviso that multiple heteroatoms must be separated from each other by at least two carbon atoms and from the chain ends by at least one carbon atom,

R^{23} is independently of the same definition as R^{11},

R^{24} is chosen from —$NH(R^{18})$, —OH and O^-M^+, where M^+ is sodium ion, potassium ion or ammonium ion,

R^{25} is substituted or unsubstituted aliphatic diradical of 1–20 carbons, substituted or unsubstituted aryl diradical of 6–12 carbons, substituted or unsubstituted alicyclic diradical of 5–12 carbons or substituted or unsubstituted carbocyclic araliphatic diradical of 7–22 carbons, and the diradical chain(s) may optionally contain 1–6 heteroatoms selected from —O— and —$N(R^{10})$— with the proviso that multiple heteroatoms must be separated from each other by at least two carbon atoms and from the chain ends by at least one carbon atom,

and optional substitutents for R^1, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19}, R^{20}, R^{21}, R^{22}, R^{23} and R^{25} are one or more of the following: chloro, bromo, alkyl of 1–8 carbons, alkoxy of 1–12 carbons, phenoxy, cyano, hydroxy, epoxy, carboxy, benzoyl, benzoyloxy, dialkylamino of 2–8 carbons total, alkyoxycarbonyl of 2–6 carbons, acyloxy of 1–4 carbons, acryloyl, acryloyloxy, methacryloyl, methacryloyloxy, hydroxymethyl, hydroxyethyl, alkylthio of 1–4 carbons and trialkoxysilyl of 3–12 carbons; and additional optional substituents for R^{21} and R^{22} are alkyl of 5–180 carbons, alkylthio of 5–180 carbons, carbocyclic aralkylthio of 7–20 carbons, carbocyclic arylthio of 6–20 carbons, alkenyl of 2–180 carbons, cycloalkenyl of 5–12 carbons, carbocyclic aryl of 6–16 carbons, carbocyclic aralkyl of 7–17 carbons, carbocyclic aryloxy of 6–16 carbons, alkoxycarbonyl of 7–10 carbons, and (alkoxycarbonyl)alkylthio of 3–30 carbons; and additional substituents for R^{18} are chosen from aliphatic of 1–20 carbons, cycloaliphatic of 5–12 carbons, carbocyclic aryl of 6–14 carbons, carbocyclic aralkyl of 7–22 carbons, alkoxy of 1–20 carbons, cycloalkoxy of 5–12 carbons, carbocyclic aryloxy of 6–14 carbons, carbocyclic aralkoxy of 7–15 carbons, aliphatic acyloxy of 2–20 carbons, alicyclic acyloxy of 6–13 carbons, carbocyclic aromatic acyloxy of 7–15 carbons, and carbocyclic araliphatic acyloxy of 8–16 carbons.

5,116,977

HALOMETHYL-1,3,5-TRIAZINES CONTAINING AN AMINE-CONTAINING MOIETY

Mitchel A. Rossman, Minneapolis, and James A. Bonham, Grant Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 241,383, Sep. 7, 1988, Pat. No. 4,985,562. This application Jan. 14, 1991, Ser. No. 640,706 The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.

Int. Cl.[5] **C07D** *413/12*

U.S. Cl. 544—113 **14 Claims**

1. A 1,3,5-triazine compound having at least one halomethyl substituent on a carbon atom of the triazine nucleus and at least one amine-containing moiety attached to another carbon atom of the triazine nucleus, said at least one amine-containing moiety containing at least one tertiary amine group having three alkyl substituents on the amine nitrogen atom, said alkyl substituents having a hydrogen atom on the carbon atom adjacent to the amine nitrogen atom, provided that the amine nitrogen atom is not directly attached to the 1,3,5-triazine nucleus by a covalent bond or by a conjugated linkage.

5,116,978

PROCESS FOR BIS(INDOLYL)ETHYLENE SYNTHESIS

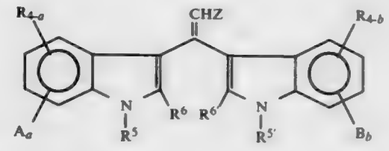
Ponnampalam Mathisparanam, Appleton, Wis., assignor to Appleton Papers Inc., Appleton, Wis.

Continuation-in-part of Ser. No. 320,642, Mar. 8, 1989, Pat. No. 4,996,328. This application Nov. 19, 1990, Ser. No. 615,731

Int. Cl.[5] **C07D** *413/00*

U.S. Cl. 544—144 **6 Claims**

1. A process for producing a bis-(indolyl)ethylene of the formula



wherein a is 1 or 2,

wherein b is 1 or 2,

wherein each A is selected from the group consisting of a dialkylamino, dialkoxyalkylamino, diaroxyalkylamino, diarylamino, alkylarylamino, dicycloalkylamino, alkylcycloalkylamino, arylcycloalkylamino, pyrrolidino, piperidino, and morpholino radical,

wherein each B is selected from the group consisting of A, alkoxy, alkoxyalkyl and aroxy radical,

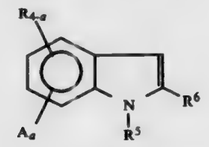
wherein each R is selected from the group consisting of hydrogen, halogen, alkyl, and alkoxy,

wherein each of R^5, $R^{5'}$, R^6, and $R^{6'}$ are selected from the group consisting of hydrogen, alkyl (C_1–C_8), alkoxyalkyl, aroxyalkyl, cycloalkyl (C_3–C_6), phenyl, and phenyl substituted by alkyl (C_1–C_8) or alkoxy (C_1–C_8),

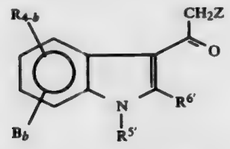
wherein Z is selected from the group consisting of hydrogen, alkyl (C_1–C_8), alkoxyalkyl, aroxyalkyl, halogen, phenyl, and phenyl substituted by alkyl or alkoxy,

the alkyl moieties referred to herein being of one to eight carbons, the cycloalkyl moieties referred to herein being of three to six carbons,

said method comprises reacting an indole of the formula



with an acylindole of the formula



in the presence of a Vilsmeier reagent selected from the group consisting of phosphoryl chloride, phosgene, oxalyl chloride, benzoyl chloride, thionyl chloride, alkanesulfonyl chloride, arenesulfonyl chloride, alkylchloroformate, and arylchloroformate, together with a Lewis Acid selected from the group consisting of zinc chloride, boron trifluoride, and aluminum chloride.

5,116,979

DIHYDROCAFFEIC ACID DERIVATIVES AND PHARMACEUTICAL PREPARATIONS CONTAINING SAME

Nobuyuki Fukazawa; Hajime Iizuka; Osamu Yano, all of Mobara, and Yukio Miyama, Chosei, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

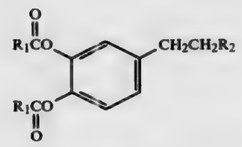
Filed Sep. 6, 1990, Ser. No. 578,494

Claims priority, application Japan, Sep. 12, 1989, 1-234646

Int. Cl.[5] C07D *295/10*

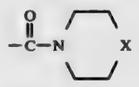
U.S. Cl. 544—172 **7 Claims**

1. A dihydrocaffeic acid derivative represented by the formula (I)



(I)

wherein R_1 is an alkyl group having 2 or more carbon atoms, an aryl group, a phenethyl group, p-methylphenyl group, a benzyl group, a pyridyl group, pyrimidyl group, imidazolyl group, or furyl group; R_2 is



and X is an oxygen atom or a salt of said derivative.

5,116,980

BORON CONTAINING COMPOUNDS AND THEIR PREPARATION AND USE IN NEUTRON CAPTURE THERAPY

Detlef Gabel, Bremen, Fed. Rep. of Germany, assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

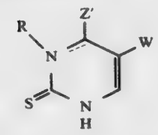
Division of Ser. No. 302,289, Jan. 27, 1989, Pat. No. 5,021,572. This application Feb. 25, 1991, Ser. No. 660,077

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3803063

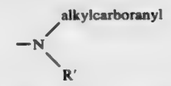
Int. Cl.[5] C07F *5/02*

U.S. Cl. 544—229 **3 Claims**

1. A compound of the formula



wherein R is hydrogen or an alkyl group having from 1 to 8 carbon atoms, provided that where a terminal double bond originates from the 3-position nitrogen atom, the R is absent from said 3-position nitrogen; Z′ is =O, $—SB_{12}H_{11}^{-2}$, or $—NHB_{12}H_{11}^{-2}$, provided that if Z′ is a boron containing group, the compound is in the form of a salt with a physiologically compatible cation; and W is hydrogen when Z′ contains a boron group and W is



wherein the alkyl group has 1 to 7 carbon atoms and R′ is hydrogen or alkyl having 1 to 7 carbon atoms, when Z′ is =O and their salts with physiologically compatible organic and inorganic bases or acids.

5,116,981

ANTIINFLAMMATORY LEUKOTRIENE B_4 ANALOGS

Joel Morris, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

PCT No. PCT/US87/03364, § 371 Date Jun. 29, 1989, § 102(e) Date Jun. 29, 1989, PCT Pub. No. WO88/05045, PCT Pub. Date Jul. 14, 1988

Continuation-in-part of Ser. No. 947,018, Dec. 29, 1986, abandoned. This PCT application Dec. 22, 1987, Ser. No. 438,491

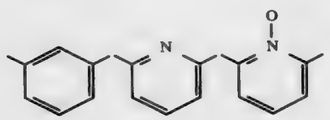
Int. Cl.[5] C07D *213/55, 307/46, 405/06;* C07C *33/28;* A61K *31/045, 31/19, 31/335, 31/44*

U.S. Cl. 546—268 **8 Claims**

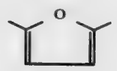
1. A compound of the formula

B—C≈C—CH_2—CR(OH)—C≈C—P—Q

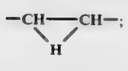
wherein —C≈C is —CH_2CH_2—, cis or trans —CH=CH—, or C≡C—;
wherein P is



-continued



wherein Q is
(a) —CH_2—CR(OH)—$(CH_2)_3$—Z,
(b) —CH_2—Z_1,
(c) —R_5—$(CH_2)_3$—Z, or
(d) —CR(OH)—Z_1;
wherein Z is
(a) —COOH,
(b) —COO(C_1–C_{12} alkyl),
(c) —COO(C_3–C_{10} cycloalkyl),
(d) —CH_2OH, or
(e) —CH_3;
wherein B is (C_4–C_7) cycloalkyl, —$(CH_2)_a$—CH_2OH or —CR_3R_4—$(CH_2)_a$—CH_3;
wherein a is zero or an integer of 1 to 5 and R_3 and R_4 are the same or different and are H, F or CH_3, with the proviso that CR_3R_4 is not $CFCH_3$;
wherein R_5 is
(a) cis—CH=CH—,
(b) trans—CH=CH—,
(c) —C≡C—,
(d) —CR(OH)—CR(OH)—,
(e) —CH(SL_7)—CR(OH)—, or
(f)



wherein each R is H or CH_3;
wherein Z_1 is a 5 or 6-membered lactone or lactol; and
wherein L_7 is
(a) —$(CH_2)_2$COOH,
(b) —CH_2COOH,
(c) —CH_2CH(NH_2)COOH,
(d) —CH_2—CH(CONHCH_2COOH)—NH—CO—CH_2C-H_2—CH(COOH)—NH_2, or
(e) —CH_2CH(NH_2)CONHCH_2COOH.

5,116,982

PREPARATION OF FLUOROHALOPHENOLS AND N-ACYFLUOROHALOANILINES

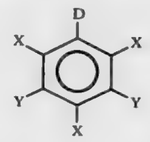
Alexander P. Fung, Martinez; M. Moklesur Rahman, Antioch, and Thomas J. Dietsche, Berkeley, all of Calif., assignors to DowElanco, Indianapolis, Ind.

Filed Aug. 6, 1990, Ser. No. 562,782

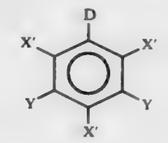
Int. Cl.[5] C07F *5/02*

U.S. Cl. 546—13 **18 Claims**

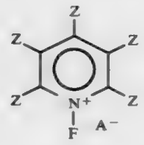
1. A process for the preparation of a fluorohalophenol or N-acylfluorohaloaniline product of the formula



wherein
each X and each Y independently represents H, F, Cl, Br, C_1–C_4 alkyl, C_1–C_4 alkoxy, CF_3, CN, CO_2H, or CO_2(C_1–C_4 alkyl) with the proviso that at least one X represents F, at least one X or one Y represents Cl or Br, and at least one X or one Y represents H: and
D represents OH or NHCO(C_1–C_4 alkyl) which comprises contacting a halophenol or N-acylhaloaniline starting compound of the formula



wherein
each X′ independently represents H, F, Cl, Br, C_1–C_4 alkyl, C_1–C_4 alkoxy, CF_3, CN, CO_2H, or CO_2(C_1–C_4 alkyl) with the proviso that one X′ represents H, at least one Y or one additional X′ represents H, and at least one X′ or one Y represents Cl or Br: and
D represents OH or NHCO(C_1–C_4 alkyl) with an N-fluoropyridinium salt fluorinating agent of the formula



wherein
each Z independently represents H, Cl, F, C_1–C_4 alkyl, C_1–C_4 alkoxy, CN, CO_2(C_1–C_4 alkyl), or CCl_3 with the proviso that not more than two of Z represent CN, CO_2(-C_1–C_4 alkyl), or CCL_3: and
A- represents (C_1–C_4)$RfSO_3$—, FSO_3—, SbF_6—, BF_4—, PF_6—, TaF_6—, or NbF_6—
under conditions conducive to fluorination.

5,116,983

DEHYDROGENATION PROCESS INTERMEDIATES

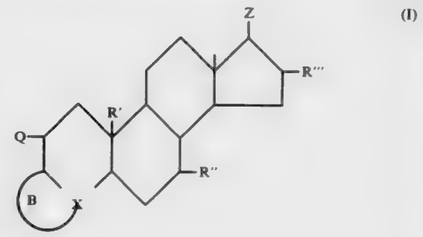
Apurba Bhattacharya, Rahway; Alan W. Douglas, Monmouth Junction; Edward J. Grabowski, and Ulf H. Dolling, both of Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 182,806, Apr. 18, 1988, abandoned. This application May 8, 1990, Ser. No. 520,991

Int. Cl.[5] C07F *7/04*

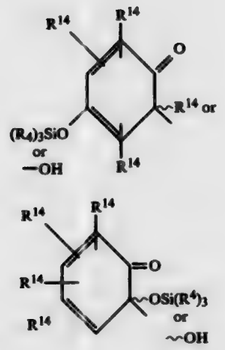
U.S. Cl. 546—14 **6 Claims**

1. The compounds of the formula



(I)

wherein:
Q is absent or is



where R^4 is methyl, C_{1-8} straight or branched chain alkyl, C_{3-6} cycloalkyl, phenyl, or combinations thereof; and R^{14} is hydrogen, C_{1-6} alkyl, C_{1-6} straight or branched chain alkoxy, halo, nitro or cyano;

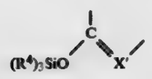
B is

(a) when Q is present,.



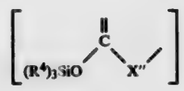
where X is NR^1; and R^1 is hydrogen, methyl or ethyl;

(b) when Q is absent,



where X' is N;

(c)

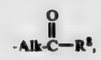


Z is

(1) β-hydrogen and α-hydroxyl;

(2) α-hydrogen or α-hydroxyl and

(a)



where Alk is present or absent and is a straight or branched hydrocarbon chain of 1 to 12 carbon atoms; and R^8 is,

(i) hydrogen,

(ii) hydroxyl,

(iii) C_{1-12} alkyl

(iv) NR^9R^{10}, where R^9 and R^{10} are each independently selected from hydrogen; C_{1-12} straight or branched chain alkyl; C_{1-12} straight or branched chain alkyl having a hydrogen substituted with a hydroxy, carboxylic acid or C_{1-4} alkyl ester; C_{3-6} cycloalkyl; phenyl; or R^9 and R^{10} taken together with the nitrogen to which they are attached represent a 5–6 membered saturated ring comprising up to one other hereroatom selected from oxygen and nitrogen; or

(v) OR^{11}, where R^{11} is M, where M is hydrogen or alkali metal, or C_{1-18} straight or branched chain alkyl; benzyl; or

(b) —(Alk)—OR^{12}, where Alk is always present and has the same meaning as above; and

R^{12} is

(i) phenyl C_{1-6} alkylcarbonyl,

(ii) C_{5-10} cycloalkylcarbonyl,

(iii) benzoyl, or

(iv) C_{1-18} alkoxycarbonyl;

(v) amino, or C_{1-8} alkyl substituted amino, carbonyl; or

(vi) hydrogen, provided that Alk is a branched C_3-C_8 chain;

(3)



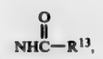
or=CH—Alk—OR^{12}, where Alk is present or absent and has the same meaning as above, and R^8 and R^{12} have the same meaning as above, and R^{12} is also hydrogen or C_{1-10} alkylcarbonyl;

(4)



where the dashed bond replaces the 17α hydrogen;

(5) α-hydrogen and



where R^{13} is,

(a) C_{1-12} alkyl; or

(b) NR^9R^{10};

(6) α-hydrogen and cyano; or

(7) α-hydrogen and tetrazolyl;

R' is hydrogen or methyl;

R'' is hydrogen or β-methyl;

R''' is hydrogen, β-methyl or hydroxyl.

5,116,984

IMIDAZOLE DERIVATIVES

Peter C. North; Alexander W. Oxford, both of Royston, and Ian H. Coates, Hertford, all of England, assignors to Glaxo Group Limited, London, England

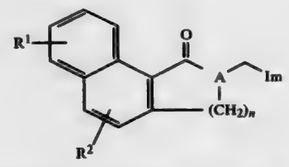
Filed Apr. 6, 1989, Ser. No. 333,967

Claims priority, application United Kingdom, Apr. 7, 1988, 8808085; Apr. 7, 1988, 8808086

Int. Cl.[5] C07D *221/06, 209/56, 223/04;* **A61K** *31/44*

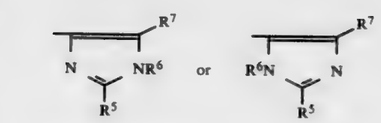
U.S. Cl. 546—101 **6 Claims**

1. A compound of formula (I)



(I)

wherein Im represents an imidazolyl group of formula:



A represents the group CH or a nitrogen atom;

R^1 and R^2, which may be the same or different, and may be attached to either the same or different fused rings of the naphthalene moiety, each represents a hydrogen atom, a halogen atom, or a hydroxy, C_{1-4}alkoxy, C_{1-4}alkyl or C_{1-4}alkylthio group, and one of R^1 and R^2 may also represent a group —NR^3R^4 (wherein R^3 and R^4, which may be the same or different, each represents a hydrogen atom or a C_{1-4}alkyl group, or together with the nitrogen atom to which they are attached form a saturated 5 to 7 membered ring);

n represents 2;

one of the groups represented by R^5, R^6 and R^7, is a hydrogen atom or a C_{1-6}alkyl, C_{3-7}cycloalkyl, C_{3-6}alkenyl, phenyl or phenylC_{1-3}alkyl group, and each of the other two groups, which may be the same or different, represents a hydrogen atom or a C_{1-6}alkyl group;

or a physiologically acceptable salt or solvate thereof.

5,116,985

ISOQUINOLINE DERIVATIVES AND SALTS THEREOF

Yasuyoshi Takeshita, Tochigi; Hiroshi Nakamura, Chiba; Susumu Ishiguro, Saitama; Noboru Kwaguchi, Tochigi; Shin'ichi Shimada, Tochigi; Tadayoshi Koyama, Tochigi; Motohide Seya, Tochigi; Noriko Abe, Tochigi, and Shin Nomoto, Tochigi, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido, Japan

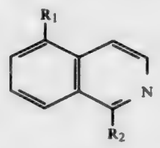
Filed Dec. 19, 1990, Ser. No. 630,064

Claims priority, application Japan, Dec. 28, 1989, 1-342737; Jun. 8, 1990, 2-150483; Oct. 18, 1990, 2-280262

Int. Cl.[5] C07D *217/02, 217/16, 217/24, 217/26*

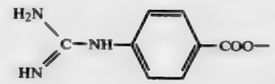
U.S. Cl. 546—141 **20 Claims**

1. A compound of Formula (I)



(I)

and pharmaceuticaliy acceptable salts thereof, wherein R_1 is



and R_2 is selected from the group consisting of a hydrogen atom, hydroxy, cyano, a —COR_3 group (wherein R_3 is an amino or (C_1–C_4) alkyl group) or a —$COOR_4$ group (wherein R_4 is a hydrogen atom, a (C_1–C_4) alkyl group, phenyl, or benzyl) or a —$CH_2CONR_5R_6$ group (wherein R_5 and R_6 are the same or different and are selected from a hydrogen atom and a (C_1–C_4) alkyl group).

5,116,986

HETEROAROMATIC AMINE DERIVATIVES

Andreas Bomhard, Biberach; Joachim Heider, Warthausen; Manfred Paiorz, Biberach; Norbert Hauel, Biberach; Berthold Narr, Biberach; Klaus Noll, Warthausen, all of Fed. Rep. of Germany; Christian Lillie; Walter Kobinger, both of Vienna, Austria, and Willi Diederen, Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

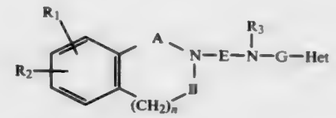
Continuation of Ser. No. 627,514, Dec. 14, 1990, abandoned, which is a continuation of Ser. No. 455,722, Dec. 22, 1989, abandoned. This application May 7, 1991, Ser. No. 696,677

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640641

Int. Cl.[5] C07D *217/22, 209/44*

U.S. Cl. 546—141 **10 Claims**

1. A heteroaromatic amine derivative of formula



(I)

wherein

A is a carbonyl or thiocarbonyl group;

B is a methylene group;

E is a straight-chained C_2–C_4 alkylene group, which can be substituted by a C_1–C_3 alkyl group;

G is a straight-chained C_1–C_6 alkylene group; which can be substituted by a C_1–C_3 alkyl group;

R_1 and R_2, which may be identical or different, are hydrogen atoms, C_1–C_3 alkyl or C_1–C_3 alkoxy groups;

R_3 is a hydrogen atom, a C_3–C_5 alkenyl group, an alkyl or phenylalkyl group, wherein the alkyl moiety may contain from 1 to 3 carbon atoms;

n is 0 and

Het is a benzo[b]thienyl group, whilst the carbon structure of the above-mentioned homocyclic or heteroaromatic ring may be mono- or disubstituted by a halogen atom or by an alkyl, hydroxy, alkoxy, phenylalkoxy, phenyl, dimethoxyphenyl, nitro, amino, acetylamino, carbamoylamino, N-alkyl-carbamoylamino, hydroxymethyl, mercapto, alkylmercapto, alkylsulphinyl, alkylsulphonyl, alkylsulphonyloxy, alkylsulphonylamino, alkoxycarbonylmethoxy, carboxymethoxy or alkoxymethyl group or may be substituted by a methylenedioxy or ethylenedioxy group, whereby the above-mentioned alkyl moieties may each contain from 1 to 3 carbon atoms; or

n is 0 or 1, and

Het is a thienyl group, whilst the carbon structure of the above-mentioned heteroaromatic ring may be mono- or disubstituted by a halogen atom or by an alkyl, hydroxy, alkoxy, phenylalkoxy, phenyl, dimethoxyphenyl, nitro, amino, acetylamino, carbamoylamino, N-alkyl-carbamoylamino, hydroxymethyl, mercapto, alkylmercapto, alkylsulphinyl, alkylsulphonyl, alkylsulphonyloxy, alkylsulphonylamino, alkyoxycarbonylmethoxy, carboxymethoxy or alkoxymethyl group or may be substituted by a methylenedioxy or ethylenedioxy group, whereby the above-mentioned alkyl moieties may each contain from 1 to 3 carbon atoms;

and the N-oxide, the enantiomer, diastereomer or acid addition salt thereof.

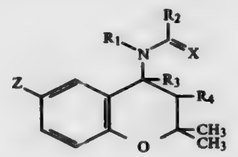
5,116,987

METHOD OF PREPARING CHROMAN DERIVATIVES, AND SYNTHESIS INTERMEDIATES

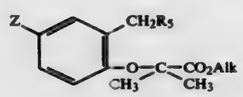
Georges Garcia, Saint-Gely-Du-Fesc; Daniel Mettefeu, Montpellier, and Richard Roux, Vailhanques, all of France, assignors to Sanofi, Paris, France

Division of Ser. No. 456,491, Dec. 26, 1989, Pat. No. 5,071,991. This application Sep. 20, 1991, Ser. No. 763,202
Claims priority, application France, Dec. 26, 1988, 88 17194
Int. Cl.[5] C07D *211/60*, *207/12*; C07C *255/00*, *69/76*
U.S. Cl. 546—223 **2 Claims**

1. A synthesis intermediate compound for the preparation of a compound having the formula:



said synthesis intermediate compound having the formula (IX):



[IX]

in which
X is oxygen or a group N=R,
Z is an electron attracting group,
R is a hydrogen atom, a nitro or a cyano group,
Alk is a methyl or an ethyl, and
R_1 and R_2 form a 5-membered or 6-membered heterocycle with the group —N—CX— to which they are bonded.
R_3 is hydrogen and R_4 is an hydroxyl group or R_3 and R_4 together form a bond,
R_5 is hydrogen, a bromine atom or a group $N(R_1)CXR_2$, provided that Z is other than a chlorine atom when R_5 is hydrogen and Alk is an ethyl group.

5,116,988

VARIOUS N-SUBSTITUTED 3-PIPERIDINE CARBOXYLIC ACIDS OR N-SUBSTITUTED 3-PYRIDINECARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Michael R. Pavia, Ann Arbor, Mich., assignor to Warner-Lambert Co., Morris Plains, N.J.

Division of Ser. No. 451,393, Dec. 15, 1989, Pat. No. 5,053,521, which is a division of Ser. No. 207,688, Jun. 16, 1988, Pat. No. 4,910,312, which is a continuation-in-part of Ser. No. 110,052, Oct. 14, 1987, Pat. No. 4,772,615, which is a continuation of Ser. No. 927,908, Nov. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 897,308, Aug. 21, 1986, abandoned, and Ser. No. 796,345, Nov. 8, 1985, abandoned. This application May 21, 1991, Ser. No. 703,521
Int. Cl.[5] C07D *211/60*
U.S. Cl. 546—245 **4 Claims**

1. 3-Piperidinecarboxylic acid, 1-(4-propyldecyl)-.

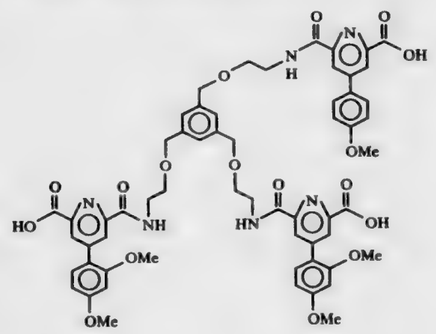
5,116,989

FLUORESCENT POLY(ARYLPYRIDINE) RARE EARTH CHELATES

Ron L. Hale, Woodside, and Dennis W. Solas, San Francisco, both of Calif., assignors to Baxter Diagnostics Inc., Deerfield, Ill.

Division of Ser. No. 118,292, Nov. 6, 1987, Pat. No. 5,032,677. This application May 30, 1989, Ser. No. 339,287
Int. Cl.[5] C07D *401/14*
U.S. Cl. 546—265 **3 Claims**

1. A ligand compound having the structural formula:



5,116,990

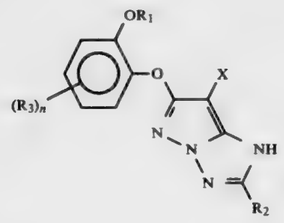
MAGENTA DYE-FORMING COUPLER

Keizo Kimura, and Tadahisa Sato, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 205,064, Jun. 10, 1988, abandoned. This application Aug. 2, 1990, Ser. No. 563,822
Claims priority, application Japan, Jun. 10, 1987, 62-144362
Int. Cl.[5] C07D *403/00*
U.S. Cl. 548—262.4 **14 Claims**

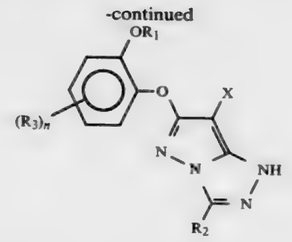
1. A magenta dye-forming coupler represented by formula (I) or (II):

Formula (I):



Formula (II):

-continued



wherein:
R_1 represents a hydrogen atom, an alkyl group, or an aryl group;
R_2 represents an alkyl group, an aryl group, a heterocyclic group, a cyano group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, or a heterocyclic thio group;
R_3 represents a hydrogen atom, a halogen atom, an alkoxy group, an aryloxy group, an alkylamino group, an anilino group, an alkylthio group, an arylthio group;
X represents a hydrogen atom or a coupling split-off group;
n is an integer of 0 to 4;
R_1 and R_3 may bond together to form a ring.

5,116,991

PROCESS FOR PREPARATION OF FLUOROMETHYL-SUBSTITUTED DIHYDROPYRIDINE CARBODITHIOATES

Helen L. Janoski, St. Peters; Sherrol L. Baysdon, Chesterfield, and Mitchell L. Pulwer, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 19, 1990, Ser. No. 495,074
Int. Cl.[5] C07D *211/68*
U.S. Cl. 546—315 **5 Claims**

1. A process for dehydration of a 4-(lower alkyl)-2,6-bis(trifluoromethyl)-2,6-bis(hydroxy)-piperidine-3,5-dicarboxylic acid alkyl thioester to form a mixture of 2-chloro-1,2,3,4-tetrahydro-4-(lower alkyl)-2,6-bis(trifluoromethyl)-, 3,5-pyridinedicarbothioic acid, S,S-dialkyl ester, 1,4-dihydro-4-(lower alkyl)-2,6-bis(trifluoromethyl)-3,5-pyridine dicarbothioic acid, S,S-dialkyl ester and 3,4-dihydro-4-(lower alkyl)-2,6-bis(trifluoromethyl)-3,5-pyridine dicarbothioic acid-, S,S-dialkyl ester which comprises contacting the selected piperidine compound with a dehydrating agent selected from hydrogen chloride, hydrochloric acid of at least 30% concentration and $PCl_3$and PCl_3 is used in the presence of acetic acid as a solvent.

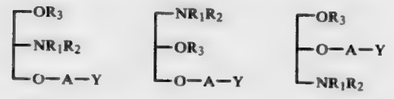
5,116,992

GLYCEROL DERIVATIVES, AND THERAPEUTICAL COMPOSITIONS CONTAINING THEM

Pierre Braquet, Garches; Colette Broquet, Boulogne; Bénédicte Vandamme, Versaille, and Paola Principe-Nicolas, Paris, all of France, assignors to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), France

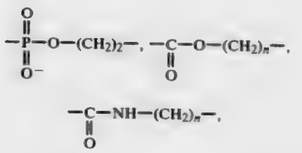
Filed Dec. 19, 1990, Ser. No. 630,296
Claims priority, application United Kingdom, Dec. 22, 1989, 29074; Dec. 22, 1989, 29075
Int. Cl.[5] C07D *213/24*
U.S. Cl. 514—77 **2 Claims**

1. Glycerol derivatives of general formulae Ia, Ib and Ic



Ia Ib Ic

wherein:
R_1 represents a hydrogen atom or a lower alkyl group up to C_5;
R_2 represents a straight chain or branched chain alkyl group having from 10 to 24 carbon atoms;
R_3 represents an aryl or an alkyl radical, CONH-alkyl, CON-dialkyl, each alkyl group having from 1 to 6 carbon atoms;
A stands for:



n being an integer of from 2 to 10;
Y represents the following quaternary ammonia:ammonium, alkylammonium, dialkylammonium, trialkylammonium, each alkyl group having from 1 to 6 carbon atoms, or a saturated or unsaturated heterocycle containing nitrogen atom as a hetero atom,
and therapeutically acceptable salts thereof.

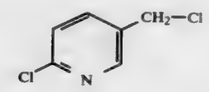
5,116,993

PROCESS FOR THE PREPARATION OF 2-CHLORO-5-CHLOROMETHYLPYRIDINE, AND NEW INTERMEDIATES

Klaus Jelich, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

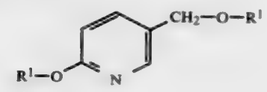
Continuation of Ser. No. 504,783, Apr. 4, 1990, abandoned. This application Sep. 11, 1991, Ser. No. 759,702
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1989, 3912964
Int. Cl.[5] C07D *213/61*
U.S. Cl. 546—345 **9 Claims**

1. A process for the preparation of 2-chloro-5-chloro-methyl-pyridine of the



(I)

comprising reacting a 2-alkoxy-5-alkoxymethylpyridine derivative of the formula (II)

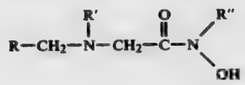


(II)

in which
R^1 represents alkyl,
with a chlorination agent selected from the group consisting of phosphorous (V) chloride, phosphorus (III) chloride, and phosphoryl chloride, at a temperature between 0° C. and 200° C., optionally in the presence of a reaction auxiliary excluding DMF.

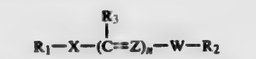
5,116,994
DEACYLATING AGENT AND DEACYLATING METHOD
Mitsunori Ono, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 17, 1990, Ser. No. 509,826
Claims priority, application Japan, Apr. 19, 1989, 1-99225; Jul. 19, 1989, 1-186248
Int. Cl.[5] C07D *257/04*
U.S. Cl. 548—251 6 Claims

1. A deacylating method comprising deacylating a substrate with a deacylating agent represented by formula (I):



(I)

wherein R represents an insoluble polymer obtained by the copolymerization of styrene and divinylbenzend, and R′ and R″ each represent an alkyl group; wherein said substrate is represented by formula (II):

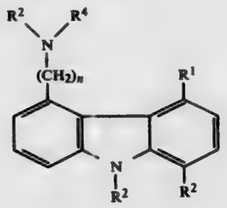


(II)

wherein X represents a hetero atom; Z represents a carbon atom or a nitrogen atom, such that when X represents a nitrogen atom, or when Z represents a carbon atom, the compound has a substituent at a nitrogen atom or a carbon atom; W represents a carbonyl group or a sulfonyl group; R_1R_2, and R_3 represent organic groups, and R_1, R_2, and R_3 may be linked to one another; and n represents 0, 1, 2 or 3; and, wherein the deacylating is conducted in a non-aqueous solvent which contains a small amount of alcohol or water.

5,116,995
CARBAZOLE COMPOUNDS
Atsuro Nakazato, Satte; Sanae Kitsukawa, Tokyo; Yutaka Kawashima, Tatebayashi; Katsuo Hatayama, Omiya, and Satoshi Hibino, Fukuyama, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan
Filed May 20, 1991, Ser. No. 702,507
Claims priority, application Japan, May 25, 1990, 2-135838
Int. Cl.[5] C07D *209/86*
U.S. Cl. 548—444 3 Claims

1. A carbazole compound represented by the formula



wherein R^1 is a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, R^2 is a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, an alkanoyl group having 2 to 6 carbon atoms or a benzoyl group. R^3 and R^4 are the same or different, and are each a hydrogen atom, an alkyl group having 1 to 7 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an alkyl group having 1 to 3 carbon atoms substitued by a phenyl group, or R^3 and R^4 together with the nitrogen atom to which they are attached form a morpholino group, a piperidino group, a pyrrolidino group or a piperazino group, and n is an integer from 1 to 3, or a salt thereof.

5,116,996
PURIFICATION OF INDIGO
Reinhold Kohlhaupt, Frankenthal; Walter Bieg, Gruenstadt, and Ernst Lang, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jul. 17, 1991, Ser. No. 731,657
Int. Cl.[5] C09B *7/00*
U.S. Cl. 548—457 8 Claims

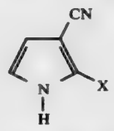
1. A process for preparing purified indigo, which comprises stripping the as-synthesized aqueous alkaline indoxylate solution before its oxidation to indigo of impurities in the absence of oxygen by distillation or by passing in steam or an inert gas and then treating the indigo precipitated on oxidation of the stripped indoxylate solution with dilute hydrogen peroxide solution.

5,116,997
PURIFICATION OF INDIGO
Reinhold Kohlhaupt, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Apr. 15, 1991, Ser. No. 684,874
Int. Cl.[5] C09B *7/00*
U.S. Cl. 548—457 5 Claims

1. A process for the purification of indigo, which comprises reacting the indigo with sulfuric acid to give indigo sulfate, separating off and subsequently hydrolyzing the latter to reform indigo, and then treating the dye with dilute hydrogen peroxide solution.

5,116,998
PROCESS FOR THE PREPARATION OF INSECTICIDAL, ACARICIDAL AND MOLLUSICIDAL 2-HALOPYRROLE-3-CARBONITRILE COMPOUNDS
Gregory T. Lowen, Durham, N.C., assignor to American Cyanamid Company, Stamford, Conn.
Division of Ser. No. 625,739, Dec. 11, 1990, Pat. No. 5,041,556. This application Apr. 22, 1991, Ser. No. 689,204
Int. Cl.[5] C07D *207/30*
U.S. Cl. 548—560 3 Claims

1. A process for the preparation of a 2-halopyrrole-3-carbonitrile compound having the structural formula



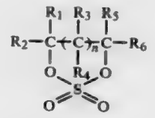
wherein X is Cl or Br which comprises reacting a (formylmethyl)malononitrile di(C_1–C_4 alkyl) acetal compound having the structural formula



wherein R is C_1–C_4 alkyl with at least 1 molar equivalent of a hydrogen halide acid to form said 2-halopyrrole-3-carbonitrile compound.

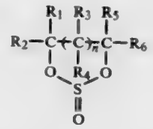
5,116,999
PROCESS FOR THE PREPARATION OF CYCLIC SULPHATES
Pierre Le Roy, Lyons, and Bernadette Mandard-Cazin, Alfortville, both of France, assignors to Rhone Poulenc Sante, Antony, France
Division of Ser. No. 403,444, Sep. 6, 1989, Pat. No. 4,960,904, which is a continuation-in-part of Ser. No. 319,190, Mar. 6, 1989, abandoned. This application Apr. 12, 1990, Ser. No. 507,799
Claims priority, application France, Mar. 8, 1988, 88 02917
Int. Cl.[5] C07D *499/28*
U.S. Cl. 549—18 9 Claims

1. A process for the preparation of a cyclic sulphate of formula:



(I)

in which R_1, R_2, R_3, R_4, R_5 and R_6 are identical or different and each represents hydrogen, halogen, alkyl, phenyl, alkoxy, phenyloxy or alkoxycarbonyl, the said alkyl radicals and alkyl portions of the alkoxy or alkoxycarbonyl radicals containing 1 to 4 carbon atoms each and being unsubstituted or substituted by at least one identical or different atoms or radicals selected from halogen, alkoxy, phenyloxy or alkoxycarbonyl, the said phenyl radicals and the phenyl portions of the phenyloxy radicals being unsubstituted or substituted by at least one identical or different atoms or radicals selected from halogen, alkyl, alkoxy, phenyloxy or alkoxycarbonyl, and n is 0 or 1, which comprises oxidizing a cyclic sulphite of formula:

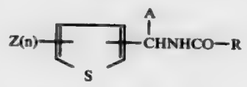


(II)

in which R_1, R_2, R_3, R_4, R_5, R_6 and n are as previously defined, with a hypohalite of an alkali or alkaline-earth metal in the presence of a catalytic quantity of a ruthenium derivative, in an aqueous or aqueous-organic medium at a temperature below 10° C.

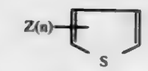
5,117,000
PREPARATION OF N-(1-(THIENYL)ALKYL)AMINE DERIVATIVE
Hitomi Suzuki; Takuji Ogawa; Hidemitsu Uno, all Ehime; Tetsuo Kitahaba, Osaka; Kouji Kigawa, Osaka; Tomonori Fukamachi, Osaka, and Katsuhiko Kitahara, Kyoto, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan
Filed Mar. 27, 1990, Ser. No. 499,666
Claims priority, application Japan, Mar. 31, 1989, 1-82048
Int. Cl.[5] C07D *333/32, 333/34*
U.S. Cl. 549—59 16 Claims

1. A method of preparing an N-[1-(thienyl)alkyl]-amine derivative of the fomula:



(I)

which comprises reacting a thiophene derivative of the formula:



with an aldehyde of the formula:

ACHO

and an amine of the formula:

NH_2—CO—R

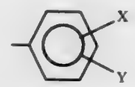
in the presence of formic acid or a mixture of formic acid and phosphoric acid,

wherein,

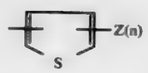
Z is a halogen atom, a lower alkyl group or a lower alkoxy group; (n) is 0, 1 or 2;

A is a hydrogen atom or an alkyl group having 1 to 8 carbon atoms;

R is a lower alkyl group, a group of the formula:



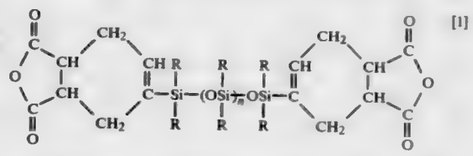
in which X and Y are the same or different and each a hydrogen atom, a straight or branched lower alkyl group (X and Y may form a ring,) a straight or branched lower haloalkyl group, a straight or branched lower alkoxy group, a straight or branched lower alkoxymethyl group or a halogen atom, or a group of the formula:



in which Z and (n) are the same ad defined above.

5,117,001
SILOXANE COMPOUND CONTAINING TETRAHYDROPHTHALIC ANHYDRIDE GROUP AND METHOD OF PRODUCING THE SAME
Hiroshige Okinoshima, Annaka, and Hiroshi Kanbara, Takasaki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1991, Ser. No. 662,037
Claims priority, application Japan, Feb. 28, 1990, 2-48319
Int. Cl.[5] C07F *7/08*
U.S. Cl. 549—214 4 Claims

1. A siloxane compound having the general formula [1]:



[1]

wherein each R is a substituted or unsubstituted monovalent hydrocarbon group having from 1 to 10 carbon atoms, the R groups may be the same or different, and n is an integer of from 0 to 100.

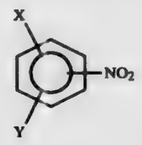
5,117,002

PREPARATION OF DIPHENYL ETHER

Robert A. Buchanan, and Jeffrey S. Stults, both of Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jan. 14, 1991, Ser. No. 640,781
Int. Cl.[5] C07D *307/77*; C07C *43/225*
U.S. Cl. 549—241 **32 Claims**

1. A process for the production of diaryl ethers which comprises heating, to a temperature of 80° C. to 220° C., a compound of the formula



wherein X and Y are selected from the group consisting of H, CN, CO_2H, CHO, NO_2, and CF_3, provided that both X and Y may not simultaneously be H, with the further proviso that if X and Y are ortho to each other and are both CO_2H, they together form an anhydride, in a solvent, in the presence of an inorganic base selected from the group consisting of the alkali metal carbonates, bicarbonates, and hydroxides, and in the presence of a catalyst selected from the group consisting of benzoic acid, substituted benzoic acids, C2–C14 aliphatic carboxylic acids, and alkali metal salts of said acids.

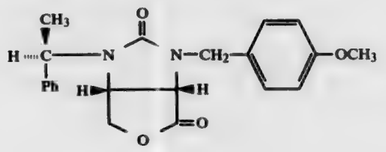
5,117,003

PROCESS FOR THE PRODUCTION OF (+) BIOTIN

John McGarrity, and Leander Tetaud, both of Visp, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Division of Ser. No. 134,210, Dec. 16, 1987, Pat. No. 4,876,350. This application Jan. 10, 1989, Ser. No. 271,180
Claims priority, application Switzerland, Dec. 18, 1986, 5051/86
Int. Cl.[5] C07D *473/28*
U.S. Cl. 548—303 **1 Claim**

1. (3aS,6aR)-[(R)-(1-phenylethyl)]-3-4-methoxybenzyl dihydro-1H-furo-[3,4-d]-imidazol-2,4(3H,3aH)-dione



5,117,004

PREPARATION OF IMIDAZOLE-2-CARBOXYLIC ACIDS

Uwe Kempe, Dannstadt-Schauernheim; Toni Dockner, Meckenheim, and Hermann Koehler, Beindersheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 309,089
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804545
Int. Cl.[5] C07D *235/30*, *435/30*
U.S. Cl. 548—323 **7 Claims**

1. A process for preparing a 4,5-disubstituted imidazole-2-carboxylic acid, which comprises reacting a 4,5-disubstituted imidazole with carbon dioxide under superatmospheric pressure at from 150° to 300° C. in the presence of a base.

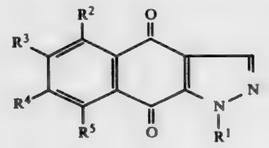
5,117,005

NAPHTHINDAZOLE-4,9-QUINONES

Klaus Ditrich, Bad Duerkheim; Gerhard Hamprecht, Weinheim; Bruno Wuerzer, Otterstadt; Norbert Meyer, Ladenburg; Karl-Otto Westphalen, Speyer, and Hartmut Laatsch, Goettingen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 407,318, Sep. 14, 1989, Pat. No. 5,007,954. This application Aug. 15, 1990, Ser. No. 567,627
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1988, 3831332
Int. Cl.[5] C07D *231/54*, *401/02*, *403/02*
U.S. Cl. 548—369 **4 Claims**

1. A naphthindazole-4,9-quinone of the formula



where:

R^1 is C_3–C_{10}-alkenyl or C_2–C_{10}-alkynyl and

R^2, R^3, R^4 and R^5 are identical or different and each denotes hydrogen, halogen, nitro, cyano, hydroxy, amino, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, C_1–C_6-alkyl, C_1–C_5-haloalkyl, C_1–C_5-alkoxy, C_1–C_5-haloalkoxy, C_1–C_5-alkylthio, C_1–C_5-haloalkylthio, C_2–C_{10}-alkoxyalkyl, carboxyl, C_2–C_6-alkoxycarbonyl, C_2–C_6-alkanoyloxy, C_2–C_6-haloalkanoyloxy, C_1–C_4-alkylcarbonylamino, C_1–C_4-alkylaminocarbonyl, di-(C_1–C_4-alkyl)-aminocarbonyl, or phenyl or heteroaryl, each of which is unsubstituted or substituted by halogen, trifluoromethyl, nitro, cyano, amino, C_1–C_4-alkoxy, C_1–C_4-alkylthio or C_1–C_5-haloalkylthio.

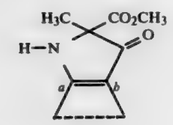
5,117,006

DC-88A DERIVATIVES USEFUL AS ANTITUMOR AGENTS

Hiromitsu Saito, Sagamihara; Masaji Kasai, Fujisawa; Makoto Morimoto; Eiji Kobayashi, both of Shizuoka; Yoichi Uosaki, Machida, all of Japan; Yutaka Kanda, Houston, Tex., and Hiroshi Sano, Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 392,271, Aug. 10, 1989, Pat. No. 5,084,468. This application May 15, 1991, Ser. No. 700,507
Claims priority, application Japan, Aug. 11, 1988, 63-200352; Oct. 21, 1988, 63-265581; Feb. 14, 1989, 63-34482
Int. Cl.[5] C07D *487/07*
U.S. Cl. 548—421 **3 Claims**

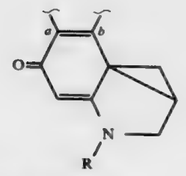
1. A DC-88A derivative represented by general formula:



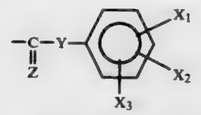
wherein



represents



wherein R represents:



wherein each of X_1, X_2, and X_3 independently represents hydrogen, —OH, —CHO, —OR_1, (wherein R_1 represents a straight or branched alkyl having 1 to 7 carbon atoms or benzyl), —$OCOR_1$ as described, —NO_2, —NH_2, —NR_2R_3 (wherein each of R_2 and R_3 represents hydrogen or R_1, —NR_2COR_1, —$NHCO_2R_1$, —$NHCONH_2$, —SH, —SR_1, —$SCOR_1$, chlorine or bromine; or X_1 and X_2 are combined together to represent —OCH_2O—; Z represents O, S or NH; Y represents —$(CH_2)_l$— (wherein l is an integer of 0 to 7), —$(CH{=}CH)_m$— (wherein m is an integer of 1 or 2), —Y'—(wherein Y' represents O, S or NH), —Y'—$(CH_2)_n$— (wherein n represents an integer of 1 to 4), —$(CH_2)_n$—Y'— (wherein Y' and n have the same significances as described above), or

(wherein p represents an integer of 0 to 4).

5,117,007

CONTINUOUS PROCESS FOR THE PRODUCTION OF MALEIC ANHYDRIDE FROM A C_4-HYDROCARBON FEEDSTOCK

Hassan Taheri, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 305,798, Feb. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 91,440, Aug. 31, 1987, abandoned. This application Jan. 12, 1990, Ser. No. 464,286
Int. Cl.[5] C07D *307/60*
U.S. Cl. 549—259 **4 Claims**

1. A continuous process for the partial oxidation of a hydrocarbon feedstock comprising from about 1.6 to about 3.1 mole percent n-butane to produce maleic anhydride, which process comprises contacting in a reaction zone said feedstock with an oxidant selected from the group consisting of molecular oxygen, air, and other oxygen-containing gases under oxidation conditions in the presence of an oxidation catalyst comprising vanadium, phosphorus, and oxygen wherein atomic ratio of vanadium to phosphorus is in the range of from about 0.5:1 to about 1.25:1, and continuously adding to said feedstock, water and an alkyl ester of orthophosphoric acid having the formula $(RO)_3P{=}O$, wherein R is hydrogen of a C_1 to C_4 alkyl radical, at least one R being a C_1 to C_4 alkyl radical, wherein ratio by weight of said water to phosphorus is in the range of from about 6500:1 wt. to about 35,000:1 wt. water to phosphorus, wherein oxidation conditions comprise an inlet pressure within the range of from about 1.68 atoms (10 psig) to about 3.72 atmos (40 psig) and a VHSV within the range of from about 100 hr^{-1} to about 4000 hr^{-1} and wherein reaction temperature gradient throughout said reaction zone is from about 425° C. (797° F.) to about 470° C. (878° F.) and wherein the amounts of water and the alkyl ester of orthophosphoric acid are sufficient to provide temperature differences between any hot spot temperature in the catalyst bed and the temperature of the tail-out section of said reaction zone of from 0° F. to less than 80° F., or from 0° C. to less than 45° C.

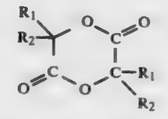
5,117,008

SOLVENT SCRUBBING RECOVERY OF LACTIDE AND OTHER DIMERIC CYCLIC ESTERS

Kamlesh K. Bhatia; Neville E. Drysdale, both of Newark, and John R. Kosak, Greenville, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 23, 1990, Ser. No. 602,346
Int. Cl.[5] C07D *319/00*
U.S. Cl. 549—274 **19 Claims**

1. In the gas-assisted process for depolymerizing an oligomeric poly(hydroxycarboxylic acid) to a dimeric cyclic ester of the formula (I):



wherein each R group is independently H or a C_1–C_6 hydrocarbyl, which process comprises:

(a) heating the corresponding oligomer in a reaction zone at a suitable temperature and pressure and for a time effective to generate the cyclic ester;

(b) passing a stream comprising an inert gas through the oligomeric material at a rate and in an amount sufficient to sweep the cyclic ester and any water present from the reaction zone and to form a gas stream containing the cyclic ester and any water entrained therewith; and

(c) scrubbing the gas stream with a solvent to remove the cyclic esters therefrom, the improvement comprising:

(i) the solvent is nonpolar and water-immiscible,

(ii) scrubbing step (c) is conducted at a first temperature which is below said suitable temperature of step (a) and at which the solvent is liquid, the cyclic ester is removed from the gas stream to form a phase comprising the cyclic ester and solvent, and is such that any water removed from the gas stream forms an aqueous phase separate from the solvent and cyclic ester phase, and

(iii) the phase containing the solvent and cyclic ester is recovered.

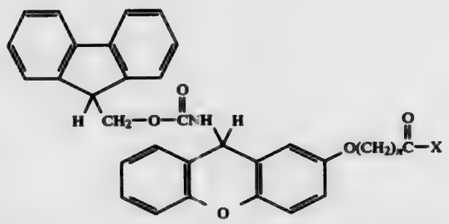
5,117,009

XANTHENYLAMIDE HANDLE FOR USE IN PEPTIDE SYNTHESIS

George Barany, Falcon Heights, Minn., assignor to University of Minnesota, Minneapolis, Minn.

Filed Aug. 31, 1990, Ser. No. 576,232
Int. Cl.[5] C07D *311/88*
U.S. Cl. 549—394 **2 Claims**

1. A xanthenylamide compound for use in peptide synthesis having the formula:



wherein n is an integer from about 1 to about 10; and X is hydroxyl or the activating group of an active ester or thioester.

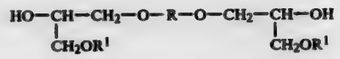
5,117,010

PROCESS FOR THE PREPARATION OF ADDITION PRODUCTS OF EPOXIDES AND ALCOHOLS

Chi-Wen F. Cheng, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 15, 1991, Ser. No. 745,569
Int. Cl.[5] C07D *301/27*; C07C *41/03, 43/164*
U.S. Cl. 549—516 **14 Claims**

1. A process for the preparation of di-secondary alcohols of the formula (I)



(I)

wherein R represents

(i) a phenylene or naphthylene group or

(ii) a radical consisting of two or three phenylene groups linked by one or two carbon-carbon bonds, ether oxygen atoms, sulphur atoms, sulphonyl groups, sulphoxide groups, carbonyl groups, or alkylene groups of 1 to 5 carbon atoms,

each phenylene group or each naphthylene group optionally being substituted in the ring or rings by one or two alkyl groups, each of from 1 to 4 carbon atoms, or by one or two chlorine or bromine atoms, and each R^1 represents

(i) a straight chain or branched alkyl group of 1 to 16 carbon atoms, which may be substituted by one to four chlorine or bromine atoms, or

(ii) a straight chain or branched alkenyl group of 2 to 6 carbon atoms, which may be substituted by one to four chlorine or bromine atoms, or

(iii) a phenyl or naphthyl group, optionally substituted in the ring or rings by one or two chlorine or bromine atoms or by from one or two alkyl groups, each of 1 to 4 carbon atoms, and having in all from 6 to 12 carbon atoms, or

(iv) a phenylalkyl or naphthylalkyl group, optionally substituted in the ring or rings by one or two chlorine or bromine atoms or by one or two alkyl groups, each of 1 to 4 carbon atoms, said phenylalkyl or naphthylalkyl group having in all from 7 to 12 carbon atoms, or

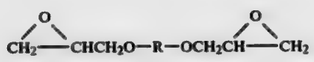
(v) a mononuclear cycloalkyl group of 3 to 6 carbon atoms, or

(vi) a mononuclear cycloalkylalkyl group of from 4 to 10 carbon atoms comprising reacting an alcohol of the formula II



(II)

wherein R^1 is defined hereinabove with a diglycidyl ether of a dihydric phenol of the formula III



(III)

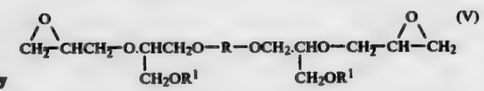
wherein R is defined hereinabove in the presence of a catalyst of the formula IV



(IV)

wherein M is a metal from Groups IB to VIIIB or a metal or metalloid from Groups IIA to VA of the Periodic Chart of Elements or an ammonium ion and X is an anion selected from the group consisting BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, AlF_4^-, TiF_6^{2-}, $SiF_6^{2-}$and ZrF_6^{2-}producing said di-secondary alcohol.

7. A process for the preparation of diglycidyl ethers of di-secondary alcohols of the formula V



(V)

where R represents

(i) a phenylene or naphthylene group or

(ii) a radical consisting of two or three phenylene groups linked by one or two carbon-carbon bonds, ether oxygen atoms, sulphur atoms, sulphonyl groups, sulphoxide groups, carbonyl groups, or alkylene groups of 1 to 5 carbon atoms,

each phenylene group or each naphthylene group optionally being substituted in the ring or rings by one or two alkyl groups, each of from 1 to 4 carbon atoms, or by one or two chlorine or bromine atoms, and each R^1 represents

(i) a straight chain or branched alkyl group of 1 to 16 carbon atoms, which may be substituted by one to four chlorine or bromine atoms, or

(ii) a straight chain or branched alkenyl group of 2 to 6 carbon atoms, which may be substituted by one to four chlorine or bromine atoms, or

(iii) a phenyl or naphthyl group, optionally substituted in the ring or rings by one or two chlorine or bromine atoms or by from one or two alkyl groups, each of 1 to 4 carbon atoms, and having in all from 6 to 12 carbon atoms, or

(iv) a phenylalkyl or naphthylalkyl group, optionally substituted in the ring or rings by one or two chlorine or bromine atoms or by one or two alkyl groups, each of 1 to 4 carbon atoms, said phenylalkyl or naphthylalkyl group having in all from 7 to 12 carbon atoms, or

(v) a mononuclear cycloalkyl group of 3 to 6 carbon atoms, or

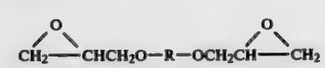
(vi) a mononuclear cycloalkylalkyl group of from 4 to 10 carbon atoms comprising the steps of

(a) reacting an alcohol of the formula II



(II)

wherein R^1 is defined hereinabove with a diglycidyl ether of a dihydric phenol of the formula III



(III)

wherein R is defined hereinabove in the presence of a catalys of the formula IV

(IV)

wherein M is a metal from Groups IB to VIIIB or a metal or metalloid from Groups IIA to VA of the Periodic Chart of Elements or an ammonium ion and X is an anion selected from the group consisting BF_4^-, PF_6^{31}, AsF_6^-, SbF_6^-, AlF_4^-, TiF_6^{2-}, $SiF_6^{2-}$and ZrF_6^{2-}producing a di-secondary alcohol; and

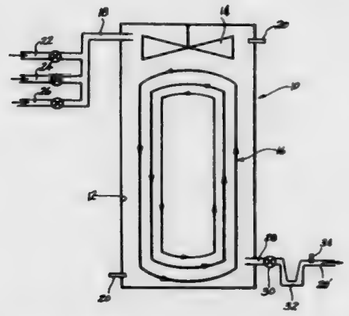
(b) reacting said di-secondary alcohol with epichlorohydrin in the presence of an alkali and a phase transfer catalyst to produce said glycidyl ether of a di-secondary alcohol of the formula V.

5,117,011

NON-CATALYTIC OXIDATION OF PROPYLENE TO PROPYLENE OXIDE

Ruford T. Pennington, Sulfur, and Michael C. Fullington, Lake Charles, both of La., assignors to Olin Corporation, Cheshire, Conn.

Filed Aug. 7, 1991, Ser. No. 741,377
Int. Cl.[5] C07D *301/04, 303/04*
U.S. Cl. 549—523 **25 Claims**



1. A process for the production of an alkylene oxide or mixture of alkylene oxides from a gaseous mixture comprising at least one hydrocarbon selected from the group consisting of alkylenes, alkanes and derivations thereof and oxygen, said process comprising:

(a) circulating said mixture in a reactor vessel; and

(b) oxidizing said hydrocarbon under substantially isothermal and essentially non-catalytic conditions while maintaining a hydrocarbon partial pressure of from about 80 to about 300 psia and a reaction temperature of from about 200° C. to about 350° C.

5,117,012

RECOVERY OF 3,4-EPOXY-1-BUTENE FROM 1,3-BUTADIENE OXIDATION EFFLUENTS

Jerome L. Stavinoha, Jr., and John D. Tolleson, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1991, Ser. No. 772,750
Int. Cl.[5] C07D *301/10, 301/32*
U.S. Cl. 549—538 **12 Claims**

1. Process for the recovery of EpB from a substantially-gaseous, effluent from an epoxidation zone wherein butadiene is contacted with an oxygen-containing gas in the presence of a catalyst and an inert gas to produce an epoxidation effluent comprising EpB, butadiene, oxygen and an inert gas which comprises feeding the effluent to an absorption vessel wherein the effluent is intimately contacted with liquid butadiene at a pressure of about 5 to 15 bars and a temperature of about 0° to 30° C. to obtain:

(1) a vapor effluent comprising butadiene and the oxygen and inert gas from the upper section of the absorption vessel; and

(2) a liquid effluent comprising EpB and butadiene from the lower section of the absorption vessel;

wherein EpB is 3,4-epoxy-1-butene and butadiene is 1,3-butadiene.

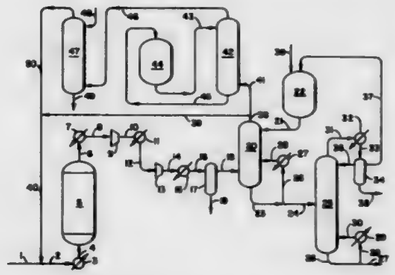
12. Process for the manufacture and separation of EpB which comprises the steps of:

I. feeding a gas comprising about 10 to 25 mole percent butadiene, about 5 to 18 mole percent oxygen and about 50 to 80 mole percent of an inert material to an epoxidation zone wherein butadiene is epoxidized to EpB in the presence of a silver catalyst;

II. removing from the epoxidation zone a gaseous epoxidation effluent comprising about 0.5 to 6 mole percent EpB, about 7 to 26 mole percent butadiene, about 4 to 16 mole percent oxygen and about 50 to 80 mole percent inert gas;

III. feeding the gaseous epoxidation effluent to a cooling-/compression zone wherein the effluent is pressurized to a pressure of about 6 to 13 bars and cooled to a temperature of about 0° to 60° C.;

IV. feeding the effluent obtained from step (III) to an absorption vessel wherein the effluent is intimately contacted with liquid butadiene at a pressure of about 6 to 13 bars and a temperature of about 2° to 22° C. to obtain:



(1) a vapor effluent comprising the inert gas and oxygen and about 10 to 25 mole percent butadiene from the upper section of the absorption vessel; and

(2) a liquid effluent comprising a solution containing about 20 to 40 weight percent EpB in butadiene from the lower section of the absorption vessel; and

V. feeding the effluent of step IV.(1) to a carbon dioxide removal zone comprising an absorption vessel wherein the vapor effluent of step IV.(1) is contacted with an aqueous solution of an alkali metal hydroxide to obtain a carbon dioxide-depleted vapor effluent containing less than about 1000 ppm and feeding the carbon dioxide-depleted effluent to the epoxidation zone.

wherein the butadiene fed in step I. is provided by the carbon dioxide-depleted effluent of step V., EpB is 3,4-epoxy1-butene and butadiene is 1,3-butadiene.

5,117,013

PROCESS FOR THE SELECTIVE HYDROGENATION γ, δ-EPOXYALKENES TO EPOXYALKANES

Stephen N. Falling, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 518,629, May 3, 1990, Pat. No. 5,077,418.
This application Jul. 11, 1991, Ser. No. 728,466
Int. Cl.[5] C07D *301/02*
U.S. Cl. 549—540 **1 Claim**

1. A process for the preparation of 1,2epoxybutane which comprises the steps of:

(1) hydrogenating 3,4-epoxy-1-butene in the presence of a supported rhodium catalyst at a pressure of about 2 to 56 bar and a temperature of about 25° to 80° C. to obtain a mixture of 1,2-epoxybutane and butyraldehyde;

(2) hydrogenating the mixture obtained from step (1) in the presence of a nickel catalyst to convert the butyraldehyde to butanol;

(3) separating the 1,2-epoxybutane from the 1-butanol.

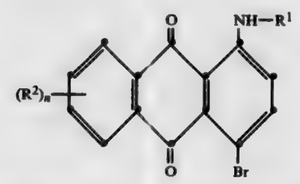
5,117,014

PROCESS FOR THE PREPARATION OF 1-AMINO-4-BROMOANTHRAQUINONES

Kim S. Chamberlin, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

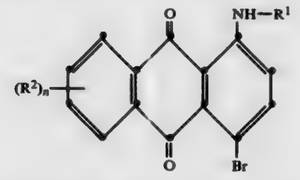
Filed May 2, 1991, Ser. No. 694,612
Int. Cl.[5] C07C *46/00*
U.S. Cl. 552—249 **5 Claims**

1. Process for the preparation of anthraquinone compounds having the formula



(I)

which comprises adding elemental bromine to a mixture of an anthraquinone reactant having the formula



(I)

hydrogen bromine, and one or more lower carboxylic acids at a temperature of 25° C. or less, wherein:

the mole ratio of hydrogen bromide:anthraquinone reactant is at least 0.5:1 at the commencement of the bromine addition;

R^1 is hydrogen or an alkyl or cycloalkyl radical;

R^2 is an alkyl radical, a cycloalkyl radical, halogen or —N-H—R^1; and

n is 0, 1 or 2.

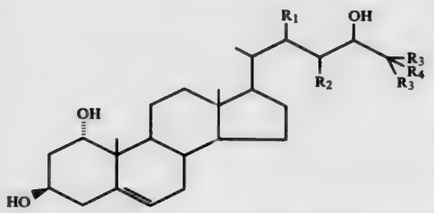
5,117,015

PROCESS FOR PRODUCTION OF 1-α, 3-β, 24-TRIHYDROXY Δ-5-STEROIDS

Tatuo Yarino, and Takao Fujii, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 374,023, Jun. 30, 1989, abandoned.
This application Apr. 30, 1991, Ser. No. 696,255
Claims priority, application Japan, Jul. 4, 1988, 63-165148
Int. Cl.[5] C07J *9/00*
U.S. Cl. 552—541 **1 Claim**

1. A process for production of a 1α, 3β, 24-trihydroxy-Δ5-steroid represented by the formula (II)

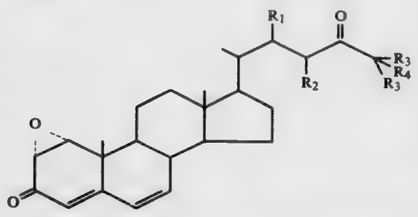


[II]

wherein R_1 and R_2, independently, represent a hydrogen atom, or R_1 and R_2, together form a single bond, R_3 represents an unsubstituted or halogen-substituted lower alkyl, and R_4 represents a hydrogen atom, hydroxy or a protected hydroxy, comprising the steps of:

(a) reacting a

1α, 2α-epoxy-Δ4,63,24-dioxosteroid represented by the formula (I):



[I]

wherein R_1, R_2, R_3 and R_4 have the same meanings as defined for formula (II) with an alkaline metal or alkaline earth metal in the presence of a proton acceptor which is an alkaline metal alkoxide of a primary alcohol having at least two carbon atoms in a solvent comprising ammonia or amine; and thereafter

(b) reacting the product of step (a) which contains an alkaline metal or alkaline earth metal in the presence of a proton donor.

5,117,016

METHOD FOR OBTAINING A STIGMASTEROL ENRICHED PRODUCT FROM DEODORIZER DISTILLATE

Tommy L. Tackett, Batesville, Ak., and Charles A. McCombs, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 13, 1991, Ser. No. 699,021
Int. Cl.[5] C07J *75/00*
U.S. Cl. 552—545 **26 Claims**

1. A method for isolating a stigmasterol material from deodorizer distillate, said method comprising:

(A) esterifying deodorizer distillate to form an esterified deodorizer distillate containing fatty acid esters,

(B) crystallizing the esterified deodorizer distillate from a solvent system comprising:

(a) a C_1 to C_6 alcohol,

(b) water, and

(c) a non-poplar solvent, to form a precipitate enriched with stigmasterol.

22. A method for isolating a stigmasterol material from deodorizer distillate, said method comprising:

(A′) saponifying deodorizer distillate to form a saponified deodorizer distillate containing fatty acids,

(A) esterifying the saponified deodorizer distillate to form an esterified deodorizer distillate containing fatty acid esters,

(B) crystallizing the esterified deodorizer distillate from a solvent system comprising:

(a) a C_1 to C_6 alcohol,

(b) water, and

(c) a non-poplar solvent selected from a C_5 to C_{10} hydrocarbon, the lower alkyl esters of fatty acids, or a mixture thereof, to form a precipitate enriched with stigmasterol, and

(C) washing the stigmasterol enriched precipitate with a C_5 to C_{10} hydrocarbon solvent.

5,117,017

PROCESS FOR PREPARING HIGH PURITY 3-α-7-β-DIHYDROXYCHOLANIC ACID

Antonio Bonaldi, Chiuduno, and Egidio Molinari, Longone del Segrino, both of Italy, assignors to Erregierre Industria Chimica S.p.A., San Paolo d'Argon, Italy

Continuation of Ser. No. 483,729, Feb. 23, 1990, abandoned.
This application Sep. 6, 1991, Ser. No. 758,513
Claims priority, application Italy, Mar. 6, 1989, 19666 A/89
Int. Cl.[5] C07J *75/00*
U.S. Cl. 552—553 **10 Claims**

1. A process for preparing high purity 3-α-7-β-dihydroxycholanic acid from a crude product containing up to 15% by weight of 3-α-7-α-dihydroxycholanic acid and up to 1% by weight of 3-α-hydroxycholanic acid, comprising:

a) esterifying the crude product with excess methanol in the presence of an acid catalyst;

b) crystallizing the obtained 3-α-7-β-dihydroxycholanic methyl ester from a mixture of solvents consisting of the same methanol contained in the reaction mixture coming from step a), an aromatic solvent, and water;

c) recrystallizing the methylester of step b) from a mixture of methanol, aromatic solvent and water; and

d) subjecting the recrystallized methylester to alkaline hydrolysis in a hydroalcoholic environment to obtain pure 3-α-7-β-dihydroxycholanic acid.

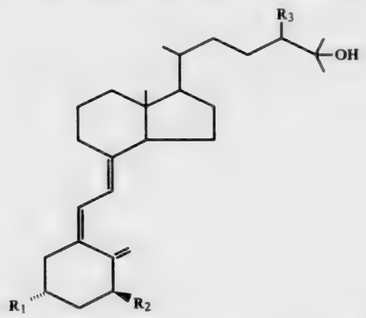
5,117,018

1α (OR 24R), 25-DIHYDROXY VITAMIN D_3 DERIVATIVES

Miyuki Tanabe, and Shigeru Ikuta, both of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 5, 1989, Ser. No. 417,313
Claims priority, application Japan, Oct. 5, 1988, 63-251661; Oct. 11, 1988, 63-255705
Int. Cl.[5] C07J *41/00*
U.S. Cl. 552—653 **1 Claim**

1. A vitamin D_3 amino acid derivative of the formula



wherein R_1 is selected from the group consisting of OH and —O—CO—A—NH_2; and R_2 and R_3 are each selected from the group consisting of hydrogen, OH and —O—CO—A—NH_2; wherein one of R_2 and R_3 is hydrogen, one of R_1, R_2 and R_3 is OH, and one of R_1, R_2 and R_3 is —O—CO—A—NH_2; and wherein A is C_{1-10} alkylene.

5,117,019

MOLYBDENUM PHOSPHATE COMPOSITIONS

Robert C. Haushalter, Little York, and Linda A. Mundi, Lake Hopatcong, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 524,620, May 17, 1990, abandoned. This application Jan. 31, 1991, Ser. No. 648,714
Int. Cl.[5] C07F *9/00, 11/00, 9/70*
U.S. Cl. 556—26 **11 Claims**

1. A composition of matter having the formula $A_a(XR_4)_b(H_3O)_c[Mo_2P_3O_{12}(OH)_2].dH_2O$ where A is Li, Na, K, Rb, Cs, Tl, Mg, Ca, Sr, Ba, NH_4 or combinations thereof; R=H, C_nH_{2n+1}; where n is an integer ≦4, or combinations thereof; X=N, P, As or combinations thereof; Mo has an oxidation state of less than or equal to +5; a, b, c and d are greater than or equal to zero and the amounts of a, b and c are such that their sum equals +1 to balance the one negative charge on the molydenum phosphate framework.

5,117,020

PROCESS FOR THE PREPARATION OF METALLOCENES

Abbas Razavi, Paturages, Belgium, assignor to Fina Research, S.A., Feluy, Belgium

Filed Oct. 25, 1990, Ser. No. 603,059
Claims priority, application European Pat. Off., Oct. 30, 1989, #9870164
Int. Cl.[5] C07F *17/00, 9/00, 11/00*
U.S. Cl. 556—43 **10 Claims**

1. Process for the preparation of metallocenes, comprising the steps of

(i) reacting in a non-polar hydrocarbon liquid a transition metal salt and powder of solid reaction product produced by reacting a ligand with an alkyllithium; and

(ii) recovering a solid mixture of lithium salt and metallocene; wherein the ligand is selected from the group consisting of cyclopentadiene, substituted cyclopentadienes, and bridged dicyclopentadienes wherein each cyclopentadiene may be equal or different and may be substituted or not.

5,117,021

METHOD FOR PURIFICATION OF TELLURIUM AND SELENIUM ALKYLS

John B. Mullin, West Malvern, England; David J. Cole-Hamilton, Boarhills by St. Andrews, Scotland; Deodatta V. Shenai-Khatkhate, Woburn, Mass., and Paul Webb, Didcot, England, assignors to The Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB88/01062, § 371 Date Jul. 31, 1990, § 102(e) Date Jul. 31, 1990, PCT Pub. No. WO89/05293, PCT Pub. Date Jun. 15, 1989
PCT Filed Dec. 2, 1988, Ser. No. 536,579
Claims priority, application United Kingdom, Dec. 4, 1987, #8728392
Int. Cl.[5] C07F *3/08; C07C 391/00*
U.S. Cl. 556—130 **13 Claims**

1. A method of purification of a tellurium or selenium alkyl characterised by forming an adduct of the alkyl with at least one compound of a group IB or IIB metal (Cu, Ag, Au, Zn, Cd, Hg) and thermally dissociating the said adduct to yield the alkyl.

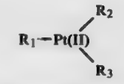
5,117,022

HYDROPHOBIC CIS-PLATINUM COMPLEXES EFFICIENTLY INCORPORATED INTO LIPOSOMES

Abdul R. Khokhar; Gabriel Lopez-Berestein, and Roman Perez-Soler, all of Houston, Tex., assignors to The Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 914,591, Oct. 7, 1986, which is a continuation-in-part of Ser. No. 788,850, Oct. 18, 1985, abandoned. This application Aug. 22, 1988, Ser. No. 234,892
The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.
Int. Cl.[5] C07F 15/00
U.S. Cl. 556—137 28 Claims

1. A platinum (II) four-coordinate complex having the formula:



wherein R_1 is an alkyl diamine or cycloalkyl diamine and R_2 and R_3 are each a hydrophobic alkylcarboxylato containing from five to fourteen carbon atoms.

5,117,023

Patent Not Issued For This Number

5,117,024

PROCESS FOR PREPARATION OF PRIMARY AMINOORGANOSILANES

Paul C. Dinh, and Kenneth P. Kaufman, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 6, 1991, Ser. No. 740,834
Int. Cl.[5] C07F 7/10, 7/18
U.S. Cl. 556—413 19 Claims

1. A process for hydrogenation of cyanoorganosilanes, the process comprising:

(a) contacting a cyanoorganosilane of formula

$$R_3Si(R^1CN)$$

with hydrogen gas, in the presence of a catalyst comprising cobalt retained on a solid support, at a temperature within a range of about 50° C. to 250° C. and a pressure within a range of about 200 psig to 2,000 psig: and

(b) recovering a primary aminoorganosilane of formula

$$R_3Si(R^1CH_2NH_2)$$

where each R is independently selected from a group consisting of alkyl and alkoxy radicals of 1 to 10 carbon atoms, aryl and aryloxy radicals of 5 to 10 carbon atoms, and hydrogen; and R^1 is a divalent hydrocarbon radical of 1 to 20 carbon atoms.

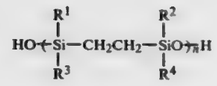
5,117,025

POLYSILETHYLENESILOXANE

Toshio Takago; Hirofumi Kishita; Hitoshi Kinami; Kenichi Fukuda; Shinich Sato, all of Annaka; Koichi Yamaguchi, and Shuji Suganuma, both of Takasaki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1991, Ser. No. 726,334
Claims priority, application Japan, Jul. 6, 1990, 2-178728; Jul. 6, 1990, 2-178730; Jul. 6, 1990, 2-178732
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—434 6 Claims

1. A polysilethylenesiloxane represented by the following general formula I:



I

wherein R^1 and R^2, which may be the same or different, each represent a hydrocarbon group having 1 to 10 carbon atoms, R^3 and R^4, which may be the same or different, each represent a hydrocarbon group having 1 to 10 carbon atoms or a perfluoroalkylethyl group, and n is an integer of 10 to 1,000, wherein, in said general formula I, at least one of R^3 and R^4 represents a perfluoroalkylethyl group.

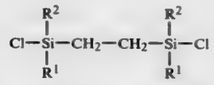
5,117,026

FLUORINE-CONTAINING ORGANIC SILICON COMPOUNDS

Hirofumi Kishita, Annaka; Kouichi Yamaguchi, Takasaki; Hideki Fujii, Annaka; Shuji Suganuma, Takasaki; Yoshikazu Saito, Annaka; Shinichi Sato, Annaka; Kenichi Fukuda, Annaka, and Nobuyuki Kobayashi, Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1991, Ser. No. 723,980
Claims priority, application Japan, Jun. 29, 1990, 2-171563; Jun. 29, 1990, 2-171565
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—435 13 Claims

1. A fluorine-containing organic silicon compound represented by:



(I)

wherein each R^1 independently represents a monovalent hydrocarbon group of 1–10 carbon atoms, and each R^2 independently represents a monovalent hydrocarbon group of 1–10 carbon atoms or a CH_2CH_2Rf group, such that at least one R^2 is CH_2CH_2Rf, wherein Rf is a perfluoroalkyl group of 1–10 carbon atoms.

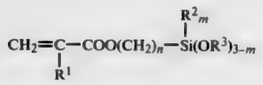
5,117,027

PROCESS FOR THE PREPARATION OF ORGANOSILANES CONTAINING METHACRYLOYLOXY OR ACRYLOYLOXY GROUPS

Günther Bernhardt, St. Augustin; Klaus-Dieter Steffen, Hennef; Margret Haas, Köln, and Heinz Kragl, Troisdorf, all of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 16, 1991, Ser. No. 777,149
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1990, 4034612
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—440 3 Claims

1. The method of preparing an organosilane of the formula



wherein R^1 is hydrogen or methyl,

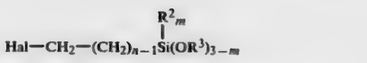
R^2 is alkyl of 1 to 4 carbon atoms,

R^3 is alkyl of 1 to 4 carbon atoms or alkoxyalkyl of a total number of 2 to 4 carbon atoms,

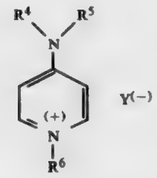
m is 0, 1 or 2, and

n is 1, 3 or 4,

which comprises reacting an alkali metal methacrylate or alkali metal acrylate with an haloalkylsilane of the formula



wherein R^2, R^3, m and n have the meanings previously defined, and Hal is chlorine or bromine, at a temperature of 80° to 150° C. in the presence of a pyridinium salt of the formula

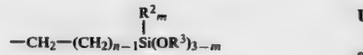


wherein Y is halogen

R^4, R^5 and R^6, which may be identical to or different each other are independently aliphatic radicals of 1 to 12 carbon atoms, cycloaliphatic radicals of 5 to 7 carbon atoms or benzyl, or

R^4 and R^5 together with each other may be $(—CH_2—)_p$, where p is 4, 5 or 6 and the ring formed by R^4, R^5 and the nitrogen atom to which they are attached may be interrupted by an oxygen atom between vicinal carbon atoms, or

R^6 may be an organosilane radical of the formula



wherein R^2, R^3, m and n have the meanings previously defined, as a phase transfer catalyst.

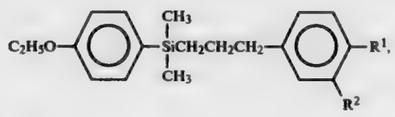
5,117,028

PROCESS FOR THE PREPARATION OF 4-ETHOXYPHENYL-3-ARYLPROPYL(DIMETHYL)SILANES

Harald Knorr, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 27, 1991, Ser. No. 766,855
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1990, 4031001
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—445 3 Claims

1. A process for the preparation of compounds of the formula I

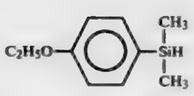


(I)

in which

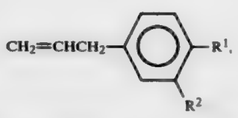
R^1 is hydrogen, halogen, $(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy and

R^2 is hydrogen, halogen, $(C_1–C_4)$alkoxy or phenoxy, which may be substituted by halogen, $(C_1–C_4)$ alkyl, $(C_1–C_4)$alkoxy or $(C_1–C_4)$alkylthio, by reaction of a compound of the formula II



(II)

with a compound of the formula III



(III)

in which R^1 and R^2 have the meanings as in formula I, in the presence of catalytically active amounts of hexachloroplatinic acid, which comprises metering the starting compounds of the formulae II and III simultaneously into the reaction vessel at temperatures of 60° C. to 150° C. and allowing the reaction to go to completion.

5,117,029

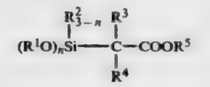
PROCESS FOR PREPARING ALKOXY-FUNCTIONAL ORGANOPOLYSILOXANES AND THE RESULTANT ALKOXY-FUNCTIONAL ORGANOPOLYSILOXANES

Masatoshi Arai, Annaka, Japan, assignor to Shin-Etsu Chemical Company, Limited, Tokyo, Japan

Filed Aug. 7, 1991, Ser. No. 741,371
Claims priority, application Japan, Aug. 8, 1990, 2-209600
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—457 5 Claims

1. A process for preparing an alkoxy-functional organopolysiloxane, comprising the step of:

reacting a hydroxyl-containing organic silicon compound with an at least equimolar amount per mol of the hydroxyl group of said compound of an organic silicon compound of the general formula (A):



(A)

wherein R^1, R^4, and R^5 are independently selected from substituted or unsubstituted monovalent hydrocarbon groups having 1 to 10 carbon atoms free of an aliphatic unsaturated bond, R^2 is a substituted or unsubstituted monovalent hydrocarbon group having 1 to 10 carbon atoms, R^3 is a hydrogen atom or methyl group, and letter n is an integer of 1,2 or 3.

5,117,030

CATALYST/PROMOTER FOR DIRECT SYNTHESIS OF DIMETHYLDICHLOROSILANE

Roland Cattoz, Grigny; Guy Godde, Saint-Symphorien-D'Ozon, and Jean-Louis Plagne, Lyons, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jul. 31, 1991, Ser. No. 738,540
Claims priority, application France, Jul. 31, 1990, 90 10011
Int. Cl.[5] C07F 7/16
U.S. Cl. 556—472 23 Claims

1. A process for the direct synthesis of dimethyldichlorosilane, which comprises reacting methyl chloride with silicon in the presence of (α) a catalytically effective amount of metallic copper or a copper compound and a promoter (β) therefor, said promoter (β) comprising (β_1) metallic tin and/or metallic antimony or a tin and/or antimony compound and (β_3) at least one lanthanide compound.

5,117,031
ACTIVE ESTERS USED FOR PRODUCTION OF ESTERS OR AMIDES AND PROCESS FOR PRODUCING ESTERS OR AMIDES

Katsushige Kouge, Yamaguchi, Japan, assignor to Sanshin Kagaku Kogyo Co. Ltd., Yamaguchi, Japan

Division of Ser. No. 23,251, Mar. 9, 1987, Pat. No. 4,857,656. This application Jun. 20, 1989, Ser. No. 368,824
Claims priority, application Japan, May 8, 1986, 61-106351; Jun. 26, 1986, 61-150985; Jun. 26, 1986, 61-150986
Int. Cl.[5] C07C *229/08, 229/36*
U.S. Cl. 558—20 **8 Claims**

1. An ester represented by the general formula:

$$W{-}CO{-}O{-}p{-}C_6H_4{-}S^+R_1R_2X^-$$

wherein W—CO— is an amino acid selected from the group consisting of phenylalanine and alanine; R_1 and R_2, which may be same or different, each are selected from the group consisting of C_1–C_4 alkyl groups; and X^- represents an anion selected from the group consisting of a halogen ion, a perchlorate ion, a hydrogensulfate ion, a methylsulfate ion, and a p-toluenesulfonate ion.

2. An ester represented by the general formula:

$$Y{-}NH{-}CHR{-}CO{-}O{-}p{-}C_6H_4{-}S^+R_1R_2X^-$$

wherein Y is selected from the group consisting of hydrogen and a protective group for the amino group; R is the side chain of an amino acid selected from the group consisting of phenylalanine and alanine; R_1 and R_2, which may be the same or different, each are selected from the group consisting of C_1–C_4 alkyl groups; and X^- represents an anion selected from the group consisting of a halogen ion, a perchlorate ion, a hydrogensulfate ion, a methylsulfate ion, and a p-toluenesulfonate ion.

5,117,032
PROCESS FOR MAKING GLYCEROL ETHER SULFATES

Bernd Fabry, Korschenbroich; Bert Gruber, Bedburg, both of Fed. Rep. of Germany; James R. Tucker, Cincinnati, Ohio, and Brigitte Giesen, Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Jun. 6, 1990, Ser. No. 534,592
Int. Cl.[5] C07C *305/10*
U.S. Cl. 558—34 **20 Claims**

1. A process for the production of glycerol either sulfates, wherein a gas phase containing sulfur trioxide is contacted at a temperature within the range from about 35 to about 80° C. with a liquid phase initially consisting essentially of one glycerol either or a mixture of glycerol ethers corresponding to formula (I):

$$R^1{-}(C_2H_4O)_m{-}O{-}CH_2{-}\underset{\displaystyle O{-}(C_2H_4O)_pR^3}{\underset{|}{CH}}{-}CH_2{-}O{-}(C_2H_4O)_nR^2, \qquad (I)$$

wherein R^1 is a $C_{4\text{-}22}$ aklyl radical; at least one of R^2 and R^3 is hydrogen and the other of R^2 and R^3 is hydrogen or a $C_{4\text{-}22}$ aklyl radical; and each of m, n, and p independently is zero or a positive integer and the sum of m + n + p is zero or an integer within the range of 1 to about 20 inclusive, for a sufficient time to convert at least part of said glycerol ether to an acidic sulfatization product, and said acidic sulfatization product is converted to a glycerol ether sulfate by neutralization by reaction with basic material dissolved in an aqueous solution.

5,117,033
PHOSPHATE-CONTAINING AND PHOSPHONATE-CONTAINING PHOSPHATE ESTERS

Thomas A. Hardy, Thousand Oaks, Calif., and Edward N. Walsh, New City, N.Y., assignors to Akzo America Inc., Dobbs Ferry, N.Y.

Continuation of Ser. No. 423,838, Oct. 19, 1989, abandoned, which is a continuation of Ser. No. 306,113, Feb. 6, 1989, Pat. No. 4,886,895, which is a division of Ser. No. 66,664, Jun. 26, 1987, Pat. No. 4,820,854, which is a division of Ser. No. 737,374, May 23, 1985, Pat. No. 4,697,030. This application Oct. 31, 1990, Ser. No. 606,668
Int. Cl.[5] C07F *9/09, 9/11, 9/12, 9/40*
U.S. Cl. 558—163 **9 Claims**

1. A compound of the formula:

$$(RO)_nP(OH)_{3-n}$$

wherein
R is:

$$(R_3O)_2P(OR_4)_{\overline{z}}$$

or R is

$$(R_5O)_2PCR_6R_7;$$

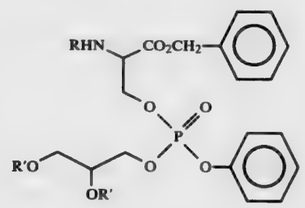
R_3 and R_5 are the same of different and are alkyl, haloalkyl, aryl, or haloaryl;
R_4 is alkylene or haloalkylene;
R_6 and R_7 are the same or different and are hydrogen, alkyl, haloalkyl, aryl or haloaryl;
n is an integer from 1–2;
z is an integer from 1–10.

5,117,034
PHOSPHATIDYLSERINE DERIVATIVES

Mitsunori Ono, and Hideto Mori, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 24, 1990, Ser. No. 602,557
Claims priority, application Japan, Oct. 24, 1989, 1-276525; Oct. 25, 1989, 1-278013; Oct. 25, 1989, 1-278014; May 28, 1990, 2-137887
Int. Cl.[5] C07F *9/12*
U.S. Cl. 558—169 **15 Claims**

1. A phosphatidylserine derivative represented by formula (I):

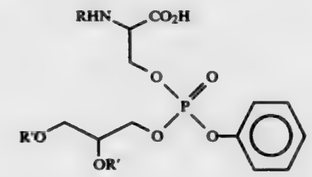


(I)

wherein R represents a tertiary butoxycarbonyl group which can be removed with an acid; and R′ represents a straight chain or branched acyclic hydrocarbon group having from 8 to 24 carbon atoms, and may have a substituent group, wherein said substituent group is an alkylcarbonyl group or alkoxycarbonyl

group, or may be unsaturated, provided that if an asymmetric carbon is present, said phosphatidylserine derivative is a racemic mixture or an optically active isomer thereof.

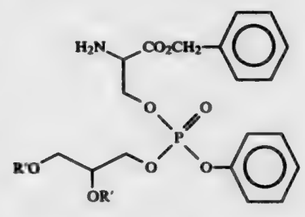
2. A phosphatidylserine derivative represented by formula (II):



(II)

wherein R represents a tertiary butoxycarbonyl group which can be removed with an acid; and R′ represents a straight chain or branched acyclic hydrocarbon group having from 8 to 24 carbon atoms, and may have a substituent group, wherein said substituent group is an alkylcarbonyl group or alkoxycarbonyl group, or may be unsaturated, provided that if an asymmetric carbon is present, said phosphatidylserine derivative is a racemic mixture or an optically active isomer thereof.

3. A phosphatidylserine derivative represented by formula (III):



(III)

wherein R′ represents a straight chain or branched acyclic hydrocarbon group having from 8 to 24 carbon atoms, and may have a substituent group, wherein said substituent group is an alkylcarbonyl group or alkoxycarbonyl group, or may be unsaturated, provided that if an asymmetric carbon is present, said phosphatidylserine derivative is a racemic mixture or an optically active isomer thereof.

5,117,035
FLUORINE-CONTAINING ACRYLIC ACID DERIVATIVE AND POLYMER THEREOF

Shigeru Morita, Ikeda, and Masahiko Oka, Ohtsu, both of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Division of Ser. No. 20,133, Feb. 26, 1987, Pat. No. 4,943,653, which is a continuation of Ser. No. 751,724, Jul. 3, 1985, abandoned. This application May 24, 1989, Ser. No. 356,206
Claims priority, application Japan, Jul. 9, 1984, 59-142986
Int. Cl.[5] C07C *327/00, 69/62, 233/00*
U.S. Cl. 558—250 **4 Claims**

1. A fluorine-containing acrylic acid derivative of the formula:

$$(CH_2{=}CF{-}CO)_p{-}A$$

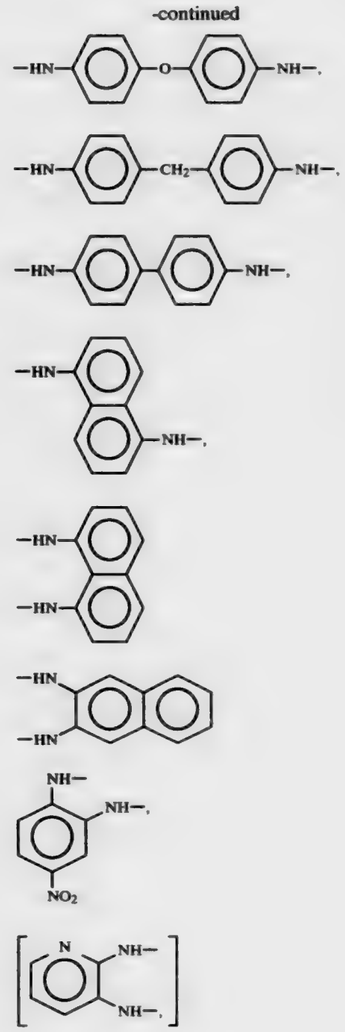
wherein p corresponds to the valency of A, and A is a residue selected from the group consisting of:

(1) an amino group selected form the group consisting of:

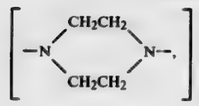
$$-HN{-}(CH_2)_4{-}NH-$$

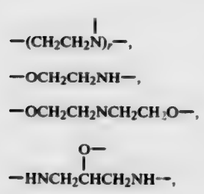
$$-HN(CH_2CH_2NH)_q{-}CH_2CH_2NH-$$

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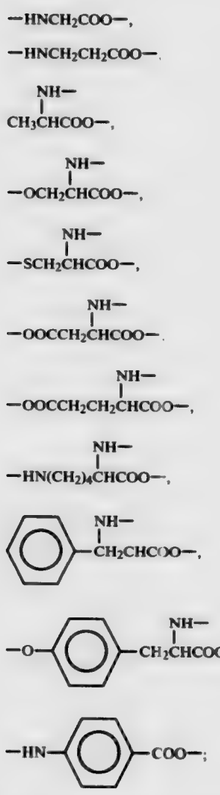


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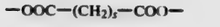




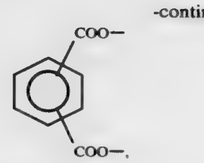
wherein d is an interger of 2 to 12, q is 1 or 2, and r is an integer greater than or equal to 2,

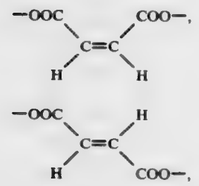


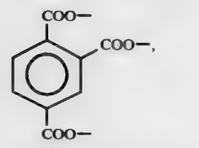
(2) a carboxylic group selected from the group consisting of:

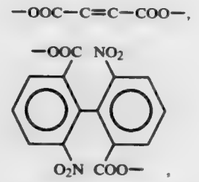


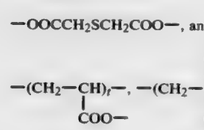
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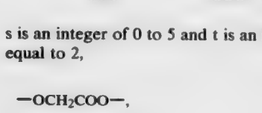




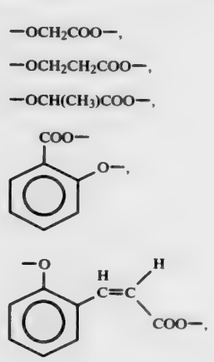


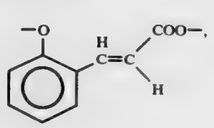






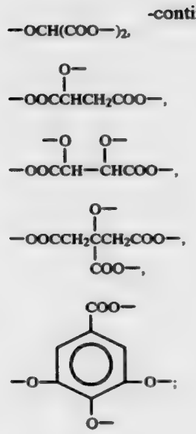
s is an integer of 0 to 5 and t is an integer greater than or equal to 2,



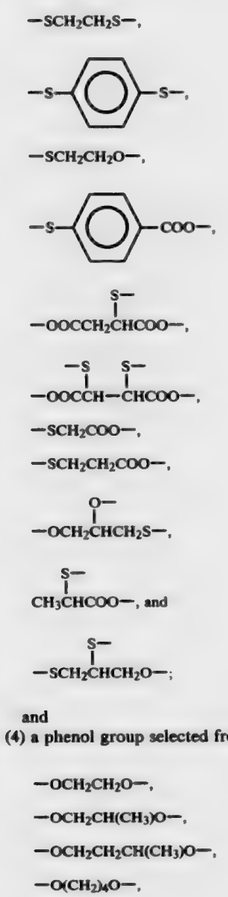




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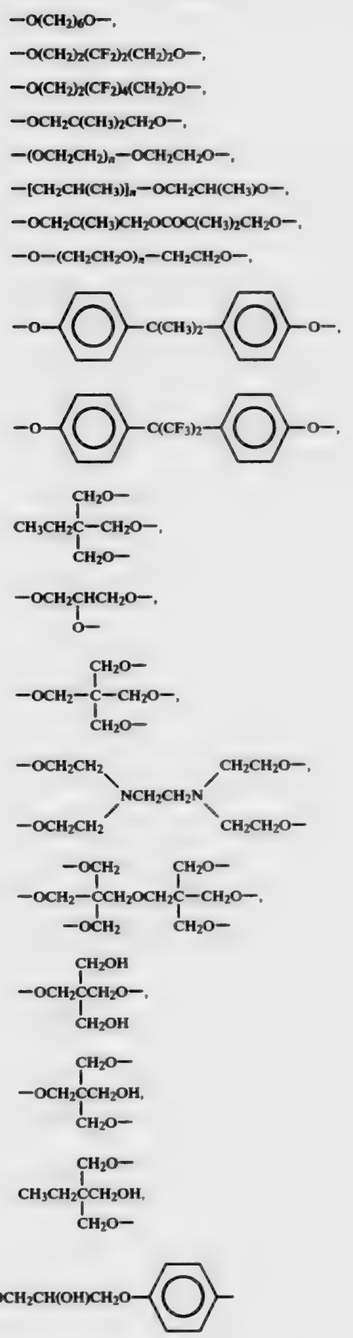
(3) a mercapto group selected from the group consisting of:



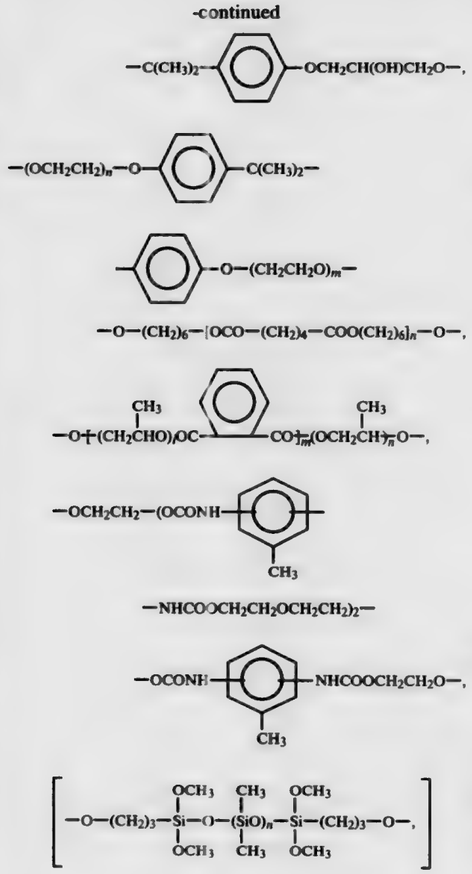
and

(4) a phenol group selected from the group consisting of:

-continued



-continued



wherein l, m and n are each a positive integer.

5,117,036

PREPARATION OF AROMATIC CARBAMATES

Philippe Leconte, Mulhouse, and Francois Metz, Lyons, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Feb. 23, 1989, Ser. No. 313,864

Claims priority, application France, Feb. 23, 1988, 88 02440

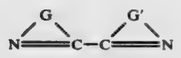
Int. Cl.[5] C07C *261/00*

U.S. Cl. 560—24 **16 Claims**

1. A process for the preparation of an aromatic carbamate, comprising reacting (a) at least one nitroaromatic compound with (b) carbon monoxide and (c) at least one organic compound bearing at least one hydroxyl group, in the presence of:

(d) a palladium-based catalyst,

(e) at least one coordinate of the formula:



(I)

in which each of G and G′, which may be identical or different, is a bridging group which contains 3 or 4 atoms, at least 2 of which are carbon atoms, with the proviso that G and G′ may be linked to each other, and

(f) at least one protonic acid in which no proton is linked to a halogen atom, and wherein the amount of palladium present in the reaction medium is less than or equal to 0.01 mole per liter of such reaction medium and the reaction is carried out such that:

(i) the molar ratio (H^+/Pd) is higher than 150, and

(ii) the molar ratio (coordinate/Pd) is higher than 20.

5,117,037

CIS-BICYCLO(4,3.0)NON-2-ENE DERIVATIVES

Masakatsu Shibasaki, Sapporo; Takahashi Atsuo, Fukushima; Tuyoshi Aoki, Fukushima; Hiroyasu Sato, Fukushima; Shinichi Yamada, Fukuchima; Michiko Kudo, Fukushima; Takaji Yamaguchi, Fukushima; Kentaro Kogi, Shiroishi, and Sen-ichi Narita, Tokyo, all of Japan, assignors to Sagami Chemical Research Center Toa Eiyo Ltd., Tokyo, Japan

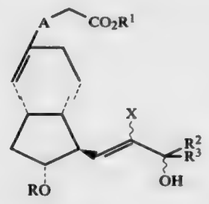
Filed Dec. 5, 1990, Ser. No. 622,471

Claims priority, application Japan, Dec. 5, 1989, 1-314338; Oct. 19, 1990, 2-279196

Int. Cl.[5] C07C *177/00*

U.S. Cl. 560—53 **2 Claims**

1. A cis-bicyclo[4.3.0]non-2-ene derivative of the formula:



(I)

wherein R is a hydrogen atom, or a protecting group for a hydroxyl group, R^1 is a hydrogen atom, a C_1–C_{12} straight or branched chain alkyl group, a substituted or unsubstituted phenyl group, a C_6–C_{12} aralkyl group containing a condensed aromatic ring or an aromatic hetero ring, or 1 equivalent of a cation, A is —CH=CH—CH_2—, or —CH_2—CH_2—O—, R^2 is a C_3—C_{10} straight or branched chain alkyl group, a C_1–C_3 alkyl group substituted by an aryloxy group which may be substituted, a C_3–C_{12} straight or branched chain alkenyl group, a C_3–C_8 straight or branched chain alkynyl group, or a C_1–C_3 alkyl group substituted by a phenyl or phenoxy group which may be substituted, by a C_1–C_6 alkoxy group or by a C_5–C_8 cycloalkyl group, R^3 is a hydrogen atom, a methyl group, or a vinyl group, and X is a halogen atom.

5,117,038

HERBICIDAL SUBSTITUTED PHENOXYPHENYLPROPIONIC ACID DERIVATIVES

Michael Haug, Bergisch Gladbach; Albrecht Marhold; Hans-Joachim Santel, both of Leverkusen; Klaus Lürssen, and Robert R. Schmidt, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

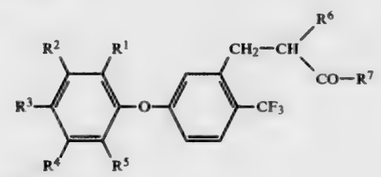
Filed Feb. 16, 1990, Ser. No. 482,134

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1989, 3905518

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—55 **5 Claims**

1. A substituted phenoxyphenylpropionic acid derivative of the formula



(I)

in which

R^1 represents hydrogen, halogen or trifluoromethyl,

R^2 represents hydrogen or halogen,

R^3 represents halogen or trifluoromethyl,

R^4 represents hydrogen or halogen,

R^5 represents hydrogen or halogen,

R^6 represents hydrogen, or alkyl optionally substituted by halogen, and

R^7 represents halogen, hydroxyl, alkylsulphonylamino, or the grouping O—R^8, in which

R^8 represents alkyl, alkenyl, alkynyl or alkoxyalkyl.

5,117,039

MONOESTERS OF ARYLACETIC ACID AND THE PROCESS THEREOF

Mitsuaki Ohtani, Nara; Takaharu Matsuura, Hyogo; Toshiro Konoike, Osaka, and Yoshitaka Araki, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

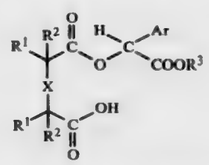
Filed Dec. 7, 1989, Ser. No. 447,518

Claims priority, application Japan, Dec. 14, 1988, 63-315730

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—60 **5 Claims**

1. An ester of arylacetic acid of the formula (II):



II

wherein R^1 is hydrogen or optionally substituted C_1–C_2, alkyl or phenyl or the R^1 groups taken together form C_2–C_6 alkylene, C_2 or C_4–C_6 alkenylene, or a bicyclic-ring; R^2 is hydrogen or methyl; X is a single bond, CH_2, $CHCH_3$, or $CHOR^5$ provided that when X is a single bond or R^1 and R^2 are not simultaneously hydrogen or methyl; R^3 is hydrogen, optionally substituted alkyl, or optionally substituted aralkyl; R^5 is hydrogen or hydroxy protecting group; and Ar is optionally substituted aryl.

5,117,040

ALPHA CRYSTALS OF TETRAKIS[3-(3,5-DI-TERT-BUTYL-4-HYDROXYPHENYL) PROPIONYLOXYMETHYL]METHANE WHICH HAVE GOOD FLOWABILITY AND METHOD OF PRODUCING SAME

Masayoshi Marutani, Chikiyo; Fumihide Izumi, and Kunihide Oka, both of Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed Jun. 5, 1990, Ser. No. 533,531

Claims priority, application Japan, Jun. 8, 1989, 1-145825

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—75 **3 Claims**

1. Tetrakis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionyloxymethyl]methane having a crystal structure of alpha crystals and occurring as granular crystals with good flowability, wherein crystal grains greater than 1 mm in grain size account for not more than 0.5% by weight of said granular crystals, crystal grains 0.1 to 1 mm in grain size account for not less than 95.5% by weight of said granular crystals, and crystal grains smaller than 0.1 mm in grain size account for less than 4.0% by weight of said granular crystals, and the bulk density of said granular crystals being not less than 0.35 but less than 0.50.

5,117,041

SULFONATION PROCESS

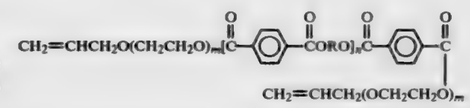
Edward F. McBride, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 13, 1990, Ser. No. 612,353

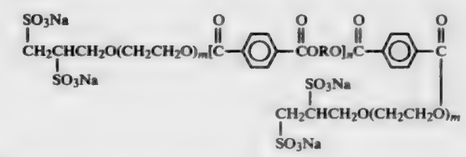
Int. Cl.[5] C07C *67/28, 67/29*; 560 *87, 96*; 528 *272, 295*

U.S. Cl. 560—87 **10 Claims**

1. In a process for sulfonating allyl end-capped propylene terephthalate polyester oligomer prepared by reacting dimethyl terephthalate, propylene glycol, and an allyl ethoxylate, the improvement comprising, at a temperature in the range between about 10° C. and 40° C., reacting at the start of the sulfonation reaction only a part of the stoichiometric amount of the sulfonating agent needed to react fully with allyl end-capped propylene terephthalate polyester oligomer, which is represented by formula:

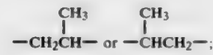


with the remainder of the sulfonating agent being added thereafter in such increments as permit maintaining a clear single phase, and recovering, at concentrations in the range between about 35% an 50%, a sulfonated endcapped propylene terephthalate polyester oligomer which is represented by the formula:



where in each of the formulae

R is



m is an integer from 9 to 15, and

n is 1.5 to 6.

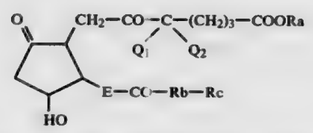
5,117,042

15-KETO-PROSTACLANDIN COMPOUND FOR IMPROVEMENT OF ENCEPHALIC FUNCTION

Ryuji Ueno; Hiroyoshi Osama, and Tomio Oda, all of Hyogo, Japan, assignors to K.K. Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Filed Nov. 21, 1990, Ser. No. 616,960
Claims priority, application Japan, Nov. 22, 1989, 1-303839; Jan. 17, 1990, 2-7611; Mar. 30, 1990, 2-85439
Int. Cl.[5] C07D *177/00*
U.S. Cl. 560—121 **4 Claims**

1. A compound of the formula



(III)

wherein Q_1 is halogen, Q_2 is hydrogen or halogen, E is —CH-2—Ch_2— or —CH=CH—, Ra is hydrogen or lower alkyl, Rb is single bond or lower alkylene, and Rc is lower alkyl which is unsubstituted or substituted with halogen, lower cycloalkyl which is unsubstituted or substituted with lower alkyl, phenyl which is unsubstituted or substituted with halogen or halo(lower) alkyl, or phenoxy which is unsubstituted or substituted with halogen or halo(lower) alkyl, with the proviso that when Rc is phenoxy, Rb is lower alkylene, or a pharmaceutically acceptable salt in case of Ra is hydrogen.

5,117,043

PROCESS FOR THE PREPARATION OF N-SULFOMETHYLGLYCINATE

Bernard Botannet, Vienne; Jean-Louis Clavel, Ecully; Jean-Pierre Corbet, Ecully, and Michel Mulhauser, Ecully, all of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed Aug. 1, 1989, Ser. No. 388,570
Claims priority, application France, Aug. 18, 1988, 88 11141
Int. Cl.[5] C07C *303/326*
U.S. Cl. 560—150 **20 Claims**

1. A process for preparing a N-sulfomethylglycinate having the formula $HO_3S—CH_2—NH—CH_2—COOR_1$ (I), which comprises the step of reacting, at between 0° C. and 100° C., 0.95 to 3 moles of formaldehyde, 0.95 moles to saturation of sulfur dioxide, and 1 mole of a glycinate having the formula $H_2N—N—CH_2—COOR_1$ (II), where in both formulas I and II the R_1 is a linear or branched C_1–C_6 alkyl, C_3–C_{12} cycloalkyl, C_6–C_{10} aryl or C_7–C_{11} aralkyl radical.

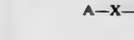
5,117,044

POLYMERIZABLE COMPOUND AND POLYMER THEREFROM

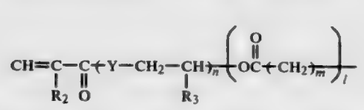
Satoshi Urano, Tsuzuki; Kei Aoki, Ikoma; Nobuaki Tomita, Nara, and Hirohiko Mori, Settsu, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jan. 12, 1990, Ser. No. 464,121
Claims priority, application Japan, Jan. 12, 1989, 1-7031; Dec. 7, 1989, 1-318504
Int. Cl.[5] C07C *69/34*
U.S. Cl. 560—193 **7 Claims**

1. A polymerizable compound represented by the formula (I)



wherein A represents a C_3–C_{18}, alkynyl, alkenylaryl or alkenylaralkyl group, or a group represented by



(wherein R_2 and R_3, which is the same or different, represents a hydrogen atom, or a C_1–C_5 alkyl group, Y represents an oxygen atom or —NR_4—, in which R_4 represents a hydrogen atom or a C_1–C_5 alkyl group, n is an integer of 1 to 5, m is an integer of 1 to 10 and l is 0 or an integer of 1 to 20.);

R_1 represents a C_1–C_5 alkyl group or an aryl group; and

X represents an oxygen atom, a sulfur atom, —COO— or —NR_5—, in which R_5 is a hydrogen atom or a C_1–C_5 alkyl group, provided that if Y is present, X is not —NR_5—.

5,117,045

METHOD OF PRODUCING CHLORINATED EVA

Yoshitatsu Nishijima; Terumasa Fujitaka, and Kazuo Shimizu, all of Iwakuni, Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1990, Ser. No. 608,845
Claims priority, application Japan, Dec. 26, 1989, 1-336904
Int. Cl.[5] C07C *69/62, 67/02*
U.S. Cl. 560—219 **2 Claims**

1. A method for producing solvent-soluble chlorinated ethylene-vinyl acetate copolymer by conducting homogeneous chlorination of ethylene-vinyl acetate copolymer in aqueous suspension by irradiation or by organic or inorganic radical generation, which method comprises conducting the chlorination upon a powder of ethylene-vinyl acetate copolymer containing 5 to 35 wt % of vinyl acetate and having a specific surface area of not less than 300 cm^2/g at a reaction temperature dependent upon the content of vinyl acetate as expressed in the relationship:

$$20 \leqq [\text{reaction temperature (°C.)}] \leqq 60 - [\text{vinyl acetate content (wt. \%)}].$$

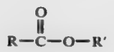
5,117,046

PREPARATION OF ALKYLIDENE DIESTERS

Frank E. Paulik, and Robert G. Schultz, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 30, 1975, Ser. No. 591,919
Int. Cl.[5] C07C *67/36, 67/37, 69/16*
U.S. Cl. 560—232 **21 Claims**

1. A process for the production of alkylidene diesters which comprises contacting a reactant selected from the group consisting of ethers having the formula R—O—R′ and esters having the formula



wherein R and R′ are saturated aliphatic hydrocarbon groups containing from 1 to 5 carbon atoms each and mixtures of said compounds with carbon monoxide, hydrogen and a catalyst system consisting essentially of a catalyst system selected from the group consisting of

(1) a rhodium compound and a halogen component selected from the group consisting of bromine, iodine, bromides and iodides,

(2) a rhodium compound, a halogen component selected from the group consisting of bromine, iodine, bromides and iodides and a palladium salt,

(3) a rhodium compound, a halogen component selected from the group consisting of bromine, iodine, bromides and iodides and a reaction promoter selected from the group consisting of tertiary phosphines, tertiary arsines, tertiary stibines, tertiary amines, quinoline, lithium acetate and mixtures thereof, and

(4) a rhodium compound, a halogen component selected from the group consisting of bromine, iodine, bromides and iodides, a palladium salt and a reaction promoter selected from the group consisting of tertiary phosphine, tertiary arsines, tertiary stibines, tertiary amines, quinoline, lithium acetate and mixtures thereof,

said contacting being effected under substantially anhydrous conditions at a temperature within the range from about 125° C. to about 300° C., at a carbon monoxide partial pressure in the range from 1 to 1100 kg/cm^2 and with an amount of hydrogen from about 5 to about 40 mole per cent.

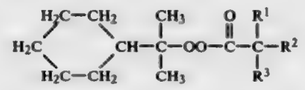
5,117,047

PEROXY ESTER

Shuji Suyama; Mitsukuni Katoh, and Tooru Nishikawa, all of Aichi, Japan, assignors to Nippon Oil & Fats Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1991, Ser. No. 765,208
Claims priority, application Japan, Sep. 28, 1990, 2-257633; Oct. 25, 1990, 2-285801; Dec. 21, 1990, 2-412711
Int. Cl.[5] C07C *331/00*
U.S. Cl. 560—302 **5 Claims**

1. A 1-cyclohexyl-1-methylethyl peroxy ester represented by the formula:



wherein R^1stands for one member selected from the group consisting of H and alkyl groups and $R^2$and R^3 independently stand for an alkyl group, provided that R^2 and R^3each stand for an alkyl group of 1 to 5 carbon atoms and the sum of the carbon atoms of $R^2$and $R^3$is in the range of from 2 to 6 where $R^1$is H and R^1, R^2, and R^3 each stand for an alkyl group of 1 to 9 carbon atoms and the sum of the carbon atoms of R^1, R^2, and $R^3$is in the range of from 3 to 11 where $R^1$is an alkyl group.

5,117,048

PROCESS FOR THE CONTINUOUS PREPARATION OF MONOISOCYANATES OR POLYISOCYANATES

Gottfried Zaby, Leverkusen; Helmut Judat, Langenfeld, both of Fed. Rep. of Germany; Eric Boonstra, Oakdale, Pa.; Stefaan de Vos, Vaartlaan, Belgium; Rolf-W. Eckermann, Bergisch-Gladbach, and Siegbert Humburger, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 14, 1988, Ser. No. 284,204
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744001
Int. Cl.[5] C07C *249/00*
U.S. Cl. 560—347 **20 Claims**

1. A process for the continuous preparation of an organic monoisocyanate or polyisocyanate comprising

a) mixing within a nozzle

(i) a phosgene component comprised of a solution of phosgene in an organic solvent, and

(ii) an amine component comprised of a monoamine or polyamine corresponding to the monoisocyanate or polyisocyanate, wherein said amine component is optionally dissolved in an organic solvent,

by passing an axial stream of one said component (i) or (ii) through a constriction in said nozzle and introducing two or more lateral streams of the other said component (i) or (ii) into the axial stream through two or more lateral bores distributed over the circumference of the constriction in said nozzle, thereby forming a product stream; and

b) allowing the components of the product stream to react.

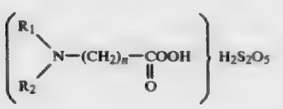
5,117,049

NITROGEN-CONTAINING PEROXYCARBOXYLIC MONOPERSULFATES

Carlo Venturello, Novara; Claudio Cavallotti, Milan, and Fiorella Achilli, Agazzano, all of Italy, assignors to Ausimont S.r.L., Milan, Italy

Continuation of Ser. No. 346,465, May 2, 1989, abandoned. This application Jun. 24, 1991, Ser. No. 718,915
Claims priority, application Italy, May 4, 1988, 20455 A/88
Int. Cl.[5] C07C *179/133*
U.S. Cl. 562—2 **6 Claims**

1. The monopersulfate of an alkylamino-derivative of a peralkanoic acid comprising the formula (I):



(I)

wherein the symbols have the following meanings: R_1 and R_2, which may be alike or different from each other, represent hydrogen atoms or linear or branched alkyl groups containing from 1 to 10 carbon atoms, with the promise that at least one of them is different from a hydrogen atom; n is an integer from 1 to 18.

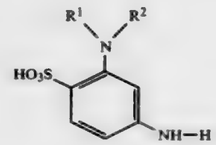
5,117,050

PHENYLENE DIAMINES AND PROCESS FOR THE PREPARATION OF PHENYLENE DIAMINES

Klaus Pandl, Ludwigshafen, and Manfred Patsch, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 16, 1990, Ser. No. 509,137
Claims priority, application Fed. Rep. of Germany, May 3, 1989, 3914650
Int. Cl.[5] C07C *309/46*
U.S. Cl. 562—58 **5 Claims**

1. A process for preparing a phenylene diamine of formula I

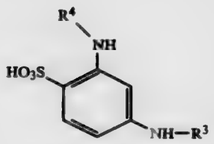


(I)

wherein R^1 is hydrogen, and R^2 is hydrogen or C_1–4 alkyl, provided that R^1 and R^2 are not both hydrogen, comprising the steps of:

a) treating 1,3-diaminobenzene-4-sulfonic acid with formic acid or oxalic acid to form a first product,

b) acylating said first product with an acylating agent derived from a C_{2-8} alkanoic acid to form an acyl-compound of formula II



(II)

wherein R^4 is formyl or oxalyl and R^3 is C_{2-8}alkanoyl,

c) alkylating said acyl compound of formula II with an alkylating agent of formula III

$$R^5—X \qquad \text{(III)}$$

wherein R^5 is C_{1-4} alkyl and X is a leaving group, to form an N-alkylated product, and

d) hydrolytically removing said formyl group or oxalyl group and then said C_{2-8} alkanoyl group.

5,117,051

PREPARATION OF ALKANEDISULFONIC ACIDS

Stanley R. Sandler, Springfield, Pa., assignor to Atochem North America, Inc., Philadelphia, Pa.

Continuation of Ser. No. 287,518, Dec. 19, 1988, abandoned, which is a continuation of Ser. No. 56,579, Jun. 1, 1987, abandoned. This application Oct. 15, 1991, Ser. No. 776,712

Int. Cl.[5] C07C *303/00*

U.S. Cl. 562—101 **20 Claims**

1. A method for preparing an alkanedisulfonic acid comprising reacting chlorosulfonic acid with an alkanesulfonic acid.

5,117,052

PHYSIOLOGICALLY ACTIVE SUBSTANCES, BENASTATINS A AND B, AND PRODUCTION AND USE THEREOF

Tomio Takeuchi, Tokyo; Takaaki Aoyagi, Fujisawa; Hiroshi Naganawa, Tokyo; Masa Hamada, Tokyo; Yasuhiko Muraoka, Tokyo, and Takayuki Aoyama, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

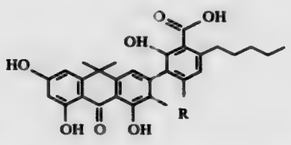
Filed Mar. 14, 1991, Ser. No. 669,387

Claims priority, application Japan, Mar. 16, 1990, 2-066723; Aug. 3, 1990, 2-206130

Int. Cl.[5] C07C *59/76*; A01N *37/10*

U.S. Cl. 562—461 **3 Claims**

1. Benastatins A and B, which are physiologically active substances having the formula (I):



(I)

wherein R represents $—CH_2—CH_2—$ or $—CH=CH—$, or pharmaceutically acceptable salts thereof.

5,117,053

N-BENZYL-CYCLOPROPANECARBOXAMIDE FUNGICIDES

Yoshio Kurahashi, Tokyo; Kozo Shiokawa, Kanagawa; Shinzo Kagabu, Tokyo; Shinji Sakawa, Tokyo, and Koichi Moriya, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

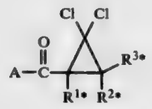
Division of Ser. No. 543,259, Jun. 25, 1990, Pat. No. 5,061,731, which is a division of Ser. No. 154,721, Feb. 11, 1988, abandoned, which is a division of Ser. No. 59,716, Jun. 8, 1987, abandoned, which is a division of Ser. No. 850,462, Apr. 4, 1986, Pat. No. 4,710,518, which is a continuation-in-part of Ser. No. 750,558, Jun. 27, 1985, abandoned. This application Sep. 5, 1991, Ser. No. 755,257

Claims priority, application Japan, Jul. 2, 1984, 59-135268; Jul. 6, 1984, 59-138955; Nov. 13, 1985, 60-252822

Int. Cl.[5] C07C *61/04*

U.S. Cl. 562—506 **2 Claims**

1. A cyclopropanecarboxylic acid or acid halide of the formula



wherein

R^{1*} represents halogen,

R^{2*} represents lower alkyl or halogen-substituted lower alkyl,

R^{3*} represents lower alkyl, and

A represents hydroxy or halogen.

5,117,054

N-HYDROXY, N-METHYL PROPANAMIDES

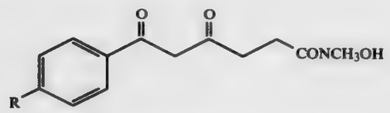
William V. Murray, Belle Mead, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 26, 1991, Ser. No. 766,611

Int. Cl.[5] C07C *259/08*

U.S. Cl. 562—621 **1 Claim**

1. A compound of formula III:



III

where R is selected from either of Cl or CH_3.

5,117,055

METHOD FOR DIRECT CONVERSION OF FLUOROCARBONYL GROUP INTO HALOGENIDES

Takashi Abe, Kasugai; Eiji Hayashi, Konan, and Haruhiko Fukaya, Oobu, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

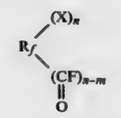
Filed Feb. 22, 1990, Ser. No. 482,969

Claims priority, application Japan, Mar. 31, 1989, 1-82726; Mar. 31, 1989, 1-82727; Mar. 31, 1989, 1-82728; Mar. 31, 1989, 1-82729

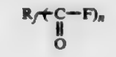
Int. Cl.[5] C07C *51/04, 51/363, 51/377, 41/22, 209/68, 209/78*; C07D *207/00, 265/30*

U.S. Cl. 562—849 **5 Claims**

1. A method for the production of a perfluorohydrocarbon halogenide of the formula:



wherein R_f represents a perfluorohydrocarbon group having 1 to 15 carbon atoms, X represents an element selected from the group consisting of iodine and bromine, n is an integer in the range of 1 to 3 and m is an integer in the range of 1 to 3, provided that m and n satisfy the relationship of $n \geqq m$, which method comprises mixing a perfluorohydrocarboyxlic acid fluoride of the formula:



wherein R_f and n have the same meaning as define above, with LiX, wherein X has the same meaning as defined above, and heating the same to a temperature in the range of 150° to 400° C., where X is iodine, and in the range of 300° to 500° C. where X is bromine.

5,117,056

PREPARATION OF N-(1-ALKOXYALKYL)FORMAMIDE AND BIS FORMAMIDES

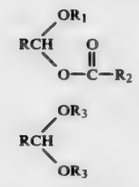
Mark L. Listemann, Whitehall, and Robert K. Pinschmidt, Jr., Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 21, 1990, Ser. No. 631,597

Int. Cl.[5] C07C *231/02*

U.S. Cl. 564—134 **18 Claims**

1. In a process for the preparation of N-(alkoxyalkyl)amides and alkylidene bisamides wherein an alkylamide is reacted with an ether containing composition in the presence of an acid catalyst to form said N-(alkoxyalkyl)amide, the improvement for producing N-(1-alkoxyalkyl)formamides and alkylidene bisformamides which comprises reacting formamide with an acetal or hemicetal carboxylate ester represented by the formulas:



I

II

wherein R is C_1–C_8 alkyl, hydrocarbyl aralkyl or hydrocarbyl aryl; R_1 and R_2 are C_1–C_8 alkyl, or hydrocarbyl aryl; and R_3 is secondary or tertiary alkyl having from 3–8 carbon atoms.

5,117,057

INSECTICIDAL N' SUBSTITUTED-N-N'-DISUBSTITUTED-HYDRAZINES

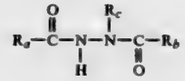
Adam C. Hsu, Lansdale; Harold E. Aller, Norristown; Raymond A. Murphy, Lansdale; Dat P. Le, North Wales; Donald W. Hamp, Horsham, and Barry Weinstein, Dresher, all of Pa., assignors to Rohm and Haas Company, Phila, Pa.

Continuation of Ser. No. 091,687, Aug. 31, 1987, abandoned, which is a continuation-in-part of Ser. No. 911,177, Sep. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 789,797, Oct. 21, 1985, Pat. No. 4,985,461, Ser. No. 274,635, Nov. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 858,482, May 1, 1986, abandoned, Ser. No. 207,081, Jun. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 005,824, Feb. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 835,073, Feb. 28, 1986, abandoned, Ser. No. 024,660, Mar. 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 821,187, Jan. 22, 1986, abandoned, Ser. No. 012,380, Feb. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 885,508, Jul. 14, 1986, abandoned, and a continuation-in-part of Ser. No. 911,928, Sep. 26, 1986, abandoned. This application Jun. 14, 1991, Ser. No. 715,843

Int. Cl.[5] C07C *241/00*

U.S. Cl. 564—149 **10 Claims**

1. A compound of the formula



wherein

R_a is unsubstituted phenyl or substituted phenyl having from one to two substituents independently selected from (C_1–C_6)alkyl and halo;

R_b is unsubstituted phenyl or substituted phenyl having form one to two substituents independently selected from halo; nitro and (C_1–C_6)alkyl; and

R_c is halo(C_2–C_6)alkyl.

5,117,058

CATIONIC AMIDE/ESTER COMPOSITIONS AS DEMULSIFIERS

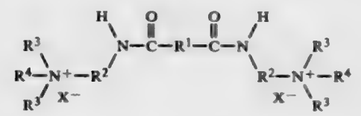
Robert G. Chen, Sugar Land, and Adelina J. Son, Houston, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Nov. 9, 1990, Ser. No. 612,659

Int. Cl.[5] C07C *233/05, 233/64*

U.S. Cl. 564—157 **13 Claims**

1. Cationic monomeric amide compositions useful as demulsifiers in water-in-oil emulsions, said cationic monomeric amide compositions having the structure:



where R^1 represents an alkylene group of the formula C_nH_{2n}, an alkenylene group of the formula C_nH_n, or a phenylene group, or mixtures thereof, where n equals 0 to 10; R^2 represents C_mH_{2m}, where m equals 1 to 4; R^3 independently represents methyl, ethyl or propyl; and the combination of R^4 and X—represents the remnant from a quaternizing agent.

5,117,059

MONODISPERSE MULTIFUNCTIONAL CARBODIIMIDES

James W. Tylor, South Charleston, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 360,108, Jun. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 1,833, Jan. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 747,190, Jun. 21, 1985, abandoned. This application Jan. 24, 1991, Ser. No. 645,094

Int. Cl.[5] C08K *31/00*; C07C *249/00*

U.S. Cl. 564—252 **24 Claims**

1. A branched, monodisperse, multifunctional carbodiimide having methyl, isopropyl, n-butyl, cyclohexyl or phenyl end groups, said carbodiimide providing improved low temperature curing characteristics for cross-linkable compositions containing a carboxyl-containing emulsion resin or a neutralized, carboxylated water-soluble organic resin when said carbodiimide is present in an amount of at least about 3 parts per 100 parts resin.

5,117,060

PROCESS FOR THE PREPARATION OF KETOXIMES

Jonathan S. Witzeman, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 7,534,585, Jun. 6, 1990, abandoned. This application Jun. 10, 1991, Ser. No. 712,820

Int. Cl.[5] C07C *249/08*

U.S. Cl. 564—259 **15 Claims**

1. Process for the preparation of a ketoxime which comprises contacting a ketone having about 5 to 20 carbon atoms with a hydroxylamine salt at a temperature of about 65° to 110° C. in the presence of an alkanol, a heterogeneous carbonate base and up to about 5 weight percent, based on the weight of the ketone and alkanol, water.

5,117,061

PROCESS OF PREPARING SUBSTITUTED ANILINES

Kju H. Shin, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 719,532, Apr. 3, 1985, abandoned, which is a continuation-in-part of Ser. No. 448,247, Dec. 9, 1982, abandoned, and a continuation-in-part of Ser. No. 448,404, Dec. 9, 1982, abandoned. This application May 12, 1986, Ser. No. 861,823

Int. Cl.[5] C07C *209/24, 209/26*

U.S. Cl. 564—384 **13 Claims**

1. A process which comprises adding a primary aniline reactant having a free para position and substituents in both ortho positions to a mixture of one molar proportion of an aldehyde corresponding to the formula RCHO, at least one molar proportion of a secondary amine corresponding to the formula HNR'R", and at least one molar proportion of an acid catalyst and heating the resultant reaction mixture at a temperature in the range of about 30–150° C. so as to form a primary aniline product having a —CHR—NR'R" group para to the primary amino group, the positions ortho to the primary amino groups in the aniline reactant and product, as well as any other substituted ring positions, being occupied by substituents independently selected from halogenated and unhalogenated alkyl, cycloalkyl, and aryl groups; R being hydrogen, alkyl, cycloalkyl, or aryl, and R' and R" being independently selected from alkyl, hydroxyalkyl, cycloalkyl, hydroxycycloalkyl, and aryl.

5,117,062

AROMATIC TERTIARY AMINES, ENAMINES, DEOXYBENZOINS AND BENZILS

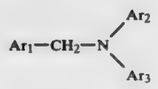
Alan S. Hay, 5015 Glencairn, Montreal, Quebec, Canada H2W 2B3, and Martino Paventi, 11786 28th Avenue, Montreal, Quebec, Canada H1E 9Z7

Continuation of Ser. No. 475,992, Feb. 6, 1990, Pat. No. 5,011,998. This application Jan. 22, 1991, Ser. No. 644,261

Int. Cl.[5] C07C *209/52*

U.S. Cl. 564—385 **14 Claims**

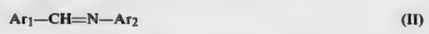
1. A process for preparing aromatic tertiary amines of formula (I):



(I)

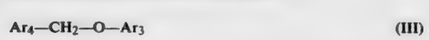
comprising:

reacting an aromatic anil of formula (II):



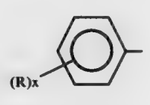
(II)

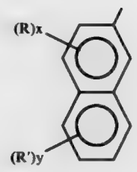
with an aromatic ether of formula (III):

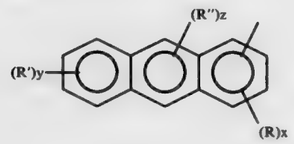


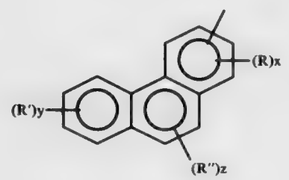
(III)

wherein Ar_1, Ar_2, Ar_3 and Ar_4 are each aromatic radicals independently selected from:

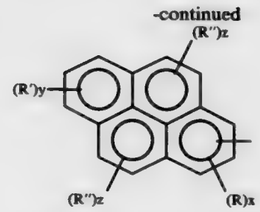






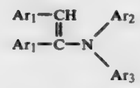


-continued



wherein x and y are integers independently selected from 0, 1, 2 or 3, z is an integer independently selected from 0, 1 or 2 and R, R' and R" are each independently selected from halogen atoms selected from F, Cl and Br, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, aryl of 6 to 12 carbon atoms, aralkyl of 7 to 18 carbon atoms, aralkenyl of 8 to 18 carbon atoms, alkoxy of 1 to 6 carbon atoms, thioalkoxy of 1 to 6 carbon atoms, aryloxy of 6 to 12 carbon atoms and thioaryloxy of 6 to 12 carbon atoms, in a molar ratio of about 1:1, at a temperature of 20° to 100° C., in a basic, anhydrous medium.

5. A process for preparing an aromatic enamine of formula (IV):



(IV)

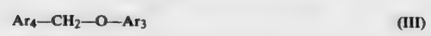
comprising:

reacting an aromatic anil of formula (II):



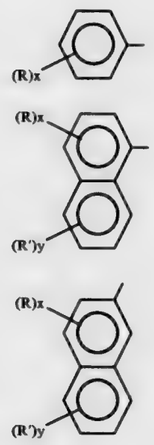
(II)

with an aromatic ether of the formula (III):

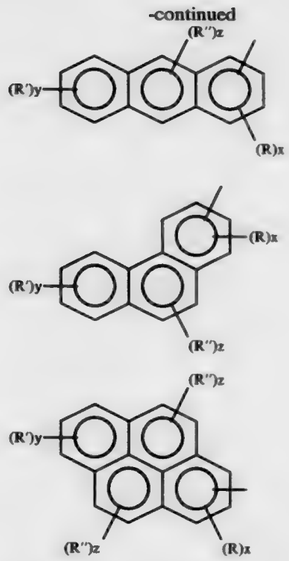


(III)

wherein Ar_1, Ar_2, Ar_3 and Ar_4 are each aromatic radicals independently selected from:



-continued



x and y are integers independently selected from 0, 1, 2 or 3 and z is an integer independently selected from 0, 1 or 2 and R, R' and R" are each independently selected from halogen atoms selected from F, Cl and Br, alkyl of 1 to 6 carbon atoms; alkenyl of 2 to 6 carbon atoms, aryl of 6 to 12 carbon atoms, aralkyl of 7 to 18 carbon atoms, aralkenyl of 8 to 18 carbon atoms, alkoxy of 1 to 6 carbon atoms, a thioalkoxy of 1 to 6 carbon atoms, aryloxy of 6 to 12 carbon atoms and thioaryloxy of 6 to 12 carbon atoms, at a temperature of 20°–100° C., in a molar ratio of said anil (II) to said ether (III) of about 2:1.

5,117,063

METHOD OF PREPARING 4-AMINODIPHENYLAMINE

Michael K. Stern, and James K. Bashkin, both of University City, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 21, 1991, Ser. No. 719,876

Int. Cl.[5] C07C *209/02, 209/26, 209/36, 209/38*

U.S. Cl. 564—398 **94 Claims**

1. A method of producing one or more 4-ADPA intermediates comprising the steps of:

a) bringing aniline and nitrobenzene into reactive contact in a suitable solvent system; and

b) reacting the aniline and nitrobenzene in a confined zone at a suitable temperature, and in the presence of a suitable base and a controlled amount of protic material to produce one or more 4-ADPA intermediates.

30. A method of producing 4-aminodiphenylamine (4-ADPA) comprising the steps of:

a) bringing aniline and nitrobenzene into reactive contact in a suitable solvent system;

b) reacting the aniline and nitrobenzene in a confined zone at a suitable temperature, and in the presence of a suitable base and controlled amount of protic material to produce one or more 4-ADPA intermediates; and

c) reducing the 4-ADPA intermediates under conditions which produce 4-ADPA.

61. A method of producing alkylated p-phenylenediamines comprising the steps of:

a) bringing aniline and nitrobenzene into reactive contact in a suitable solvent system;

b) reacting the aniline and nitrobenzene in a confined zone at

a suitable temperature, and in the presence of a suitable base and controlled amount of protic material to produce one or more 4-ADPA intermediates.

c) reducing the 4-ADPA intermediates to produce 4-ADPA; and

d) reductively alkylating the 4-ADPA of Step c).

5,117,064

METHOD FOR SYNTHESIZING AROMATIC AMINES, AROMATIC ALCOHOLS AND AROMATIC THIOLS BY AROMATIC NUCLEOPHILIC SUBSTITUTION REACTION

Takayuki Ito, and Koki Nakamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

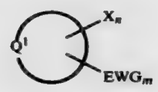
Filed Jan. 25, 1991, Ser. No. 645,861

Claims priority, application Japan, Jan. 25, 1990, 2-13744

Int. Cl.[5] C07C *209/14, 213/02*

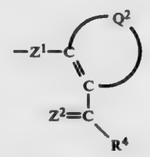
U.S. Cl. 564—399 **13 Claims**

1. A method for synthesizing an aromatic amine, an aromatic alcohol or an aromatic thiol by an aromatic nucleophilic substitution reaction, which comprises reacting a compound represented by formula (I):



(I)

wherein Q^1 is a benzene or naphthalene ring; EWG represents a group having a positive Hammett's σ_p value; m represents an integer of 1 to 5; n represents an integer of 1 to 3; and X represents a group represented by formula (III):



(III)

wherein R^4 represents hydrogen atom, an aryl group or an alkyl group; Q^2 represents an atomic group for forming an aromatic ring; and Z^1 and Z^2 each represents an oxygen atom or a sulfur atom with a nucleophilic reagent represented by formula (II):

$$M—Y \qquad (II)$$

wherein M represents a hydrogen atom, a metal atom or ammonium; Y represents a $—NHR^1$ group, an $—OR^1$ group, or a $—SR^1$ group; R^1 represents a hydrogen atom, an alkyl group, an aryl group, a residue of a heterocyclic ring, a $—NR^2R^3$ group or an $—OR^2$ group; and R^2 and R^3 each represents a hydrogen atom, an alkyl group, an aryl group or a residue of a heterocyclic ring.

5,117,065

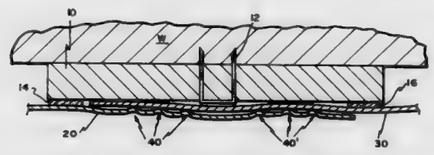
METHOD OF JOINING SHIELDING USED FOR MINIMIZING EMI OR RFI, AND THE JOINT FORMED BY THE METHOD

Howard S. Savage, 808 W. Springfield, Apt. #1, Urbana, Ill. 61801, and Paul H. Nielsen, 112 McKinley St., Mahomet, Ill. 61853

Filed Jun. 15, 1990, Ser. No. 538,806

Int. Cl.[5] H05K *9/00*; H01S *4/00*; B23K *31/02*

U.S. Cl. 174—35 MS **10 Claims**



6. A joint structure for end regions of metallic foil sheets of shielding material adapted for minimizing passage of electromagnetic or radio frequency energy through the walls of an enclosure, said joint structure comprising:

a. a metallic backing plate attached to one of the walls of the enclosure,

b. adhesive means on said backing plate,

c. a first metallic foil sheet having a first metallic foil sheet end region being disposed over and secured to the adhesive means on said backing plate,

d. a second metallic foil sheet having a second metallic foil sheet end region being disposed over said first metallic foil sheet end region such that said end regions of said first and second metallic foil sheet overlap one another forming an overlapping region, said second metallic foil sheet end region being attached to the adhesive means on said backing plate, and

e. at least one bonding zone defined at said overlapping region, each said bonding zone comprising at least one substantially linearly extending metallurgical bond formed between facing surfaces of said first and second metallic foil sheets such that said overlapping region of said first and second metallic foils are mechanically and electrically coupled with one another, each said bonding zone comprises a set of linearly extending bond rows, said bond rows being disposed parallel to one another.

5,117,066

RETAINING AND LOCKING ELECTROMAGNETIC GASKET

Peter J. Balsells, P.O. Box 15092, Santa Ana, Calif. 92705, assignor to Peter J. Balsells and Joan C. Balsells, both of Santa Ana, Calif.

Continuation-in-part of Ser. No. 568,909, Aug. 17, 1990, which is a continuation-in-part of Ser. No. 444,287, Dec. 1, 1989, which is a continuation-in-part of Ser. No. 463,480, Jan. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 348,419, May 8, 1989, Pat. No. 4,974,821, which is a continuation-in-part of Ser. No. 186,017, Apr. 25, 1988, Pat. No. 4,830,344. This application Jan. 24, 1991, Ser. No. 645,197

The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.

Int. Cl.[5] H05K *9/00*; B65D *53/00*

U.S. Cl. 174—35 GC **17 Claims**

1. Electromagnetic shielding spring gasket assembly comprising:

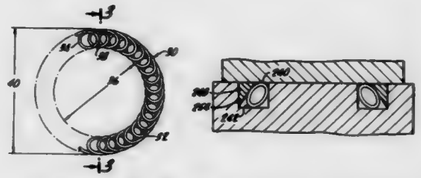
coil spring means for blocking the propagation of electromagnetic waves therepast, said coil spring means comprising:

a plurality of coils having a major and a minor axis and canted along a center line defined by an intersection of the major and minor axes, said coils being interconnected in a manner forming a radial garter-type canted-coil spring;

back angle means for both defining the disposition of a trailing portion of each coil with respect to a line normal to the center line and for determining a radial load-deflection characteristic of the canted-coil spring assembly;

front angle means for defining the disposition of a leading portion of each coil with respect to the normal line, said front angle means being greater than said back angle means; and

means for noninvasively supporting the plurality of coils in an orientation for controlling the blocking of electromagnetic waves, for radial loading of the radial garter-type canted-coil spring and for controlling the resilient characteristics of the radial garter-type canted-coil spring.



5,117,067

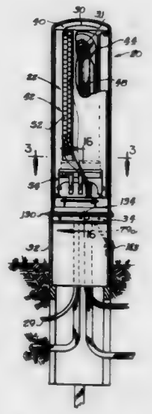
ENVIRONMENTALLY SEALED PEDESTAL

Donald F. Jaycox, Riverwood, Ill., assignor to Reliance Comm-/Tech Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 598,536, Oct. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 531,879, May 31, 1990. This application Jul. 23, 1991, Ser. No. 735,104

Int. Cl.[5] H02G *9/02*

U.S. Cl. 174—38 **21 Claims**



1. A sealed reenterable protective housing for protecting telecommunications equipment and splice connections therebetween from detrimental environmental effects, said protective housing comprising: a base portion, a rigid bulkhead member mounted to said base portion, a dome member selectively attachable to said rigid bulkhead member and sealing means for selectively sealing said dome member to said rigid bulkhead member; a sealed reenterable splice enclosure mounted to said rigid bulkhead member within said dome; a sealing member positioned between said splice enclosure and said bulkhead,

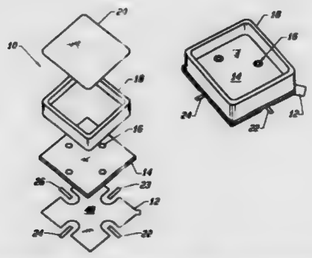
said sealing member having means for accepting at least one entering cable segment and at least one exiting cable segment passing through said sealing member, said sealing member being axially compressed between said splice enclosure and said bulkhead for sealing said splice enclosure; said dome being selectively reenterable for access to the contents thereof while maintaining said splice enclosure in said sealed condition; and said splice enclosure being selectively disengageable from said rigid bulkhead member for providing reenterable access thereto.

5,117,068

SURFACE MOUNT PACKAGE FOR R.F. DEVICES

Louis M. Seieroe, and Kenneth S. Ledford, both of Santa Clara County, Calif., assignors to Watkins-Johnson Company, Palo Alto, Calif.

Filed Aug. 17, 1990, Ser. No. 570,121
Int. Cl.[5] H01L *23/02*
U.S. Cl. 174—52.4 **8 Claims**



1. A surface mount TO-8 package assembly for microwave devices comprising
a ceramic base,
a lead-frame having leads in a TO-8 configuration carried on one face of said base,
a plurality of metal vias, positioned in said base, which serve to electrically connect to a device carried at the other face of said base,
side walls extending upwardly from said other face of said base, and
a cover secured to said side walls to define with said walls and base an enclosure for an R.F. or microwave device.

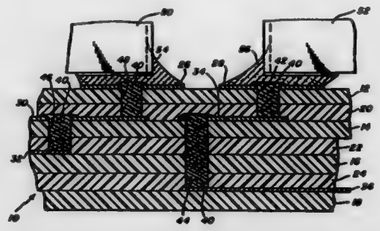
5,117,069

CIRCUIT BOARD FABRICATION

Leo M. Higgins, III, Lakeville, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Continuation of Ser. No. 430,924, Nov. 1, 1989, Pat. No. 4,967,314, which is a continuation of Ser. No. 173,999, Mar. 28, 1988, abandoned. This application Sep. 28, 1990, Ser. No. 589,220
The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.
Int. Cl.[5] H05K *1/04*
U.S. Cl. 174—261 **8 Claims**

1. A printed circuit apparatus comprising a plurality of separate circuit board layers, each board layer comprising
a laminate layer having conductive runs thereon and a prepreg insulating layer;
means securing the board layers in a sandwiched array;
means defining a continuous interconnecting hole in at least two adjacently disposed circuit board layers between at least two conductive runs on separate laminate circuit board layers; and
a curable electrically conductive adhesive disposed within said interconnecting hole providing an electrically conductive bridge between said at least two conductive runs, the interconnecting hole as well as the electrically conductive bridge passing only between said at least two conductive runs, wherein one of said at least two conductive runs is disposed on a first of said plurality of circuit board players, having at least one additional layer above it, and the other of said at least two conductive runs is



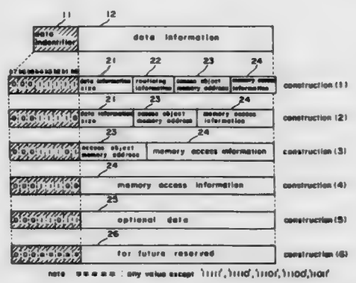
disposed on a second of said plurality of circuit board layers, having at least one additional layer below it, wherein there are no other interconnecting holes on the plurality of circuit board layers in alignment with said interconnecting hole.

5,117,070

DATA TRANSMISSION CONTROL PROCESSING SYSTEM

Reiko Ueno, Neyagawa; Naofumi Nakatani, Takatsuki; Masao Ikezaki, Neyagawa; Terumasa Yamamoto, Takatsuki, and Hiromasa Nakatsu, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 9, 1990, Ser. No. 595,227
Claims priority, application Japan, Oct. 6, 1989, 1-262439
Int. Cl.[5] H04L *17/00*
U.S. Cl. 178—2 R **4 Claims**



1. A data transmission control processing system where in a communication system where a plurality of terminals provided respectively with a transmitting, receiving control processing portion for transmitting, receiving control signals are coupled by transmission passages so as to effect the mutual communication, a data telegraphic message which configures as a telegraphic message the memory contents of the above described writing or reading to be used when a first terminal effects the writing or reading of the memories a second terminal has by the transmission and reception of above described control signal is provided with a first portion (data identifier) showing the form of the above described data telegraphic message and the writing. reading attribute, and a second portion (data information portion) having the data information of the contents different depending upon the value of the above described first portion, the data information portion is provided with a third portion (access object memory address indication portion) indicating the address of the memory of the access object for effecting the writing or the reading, and a fourth portion

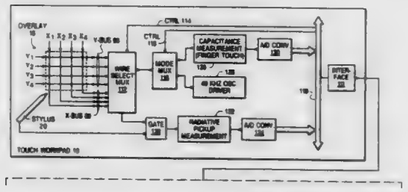
(memory access information portion) showing the specification of the writing or reading onto the above described access object memory and the concrete writing or reading memory contents, the access object memory address indication portion is provided with a fifth portion (memory address type identifier) showing the assignment form of the memory address and a sixth portion (access object memory address information portion) showing the address of the access object memory with a form shown with the above described memory address type identifier, the memory access information portion is provided with a seventh portion (memory access type identifier) showing a form of the memory information to be accessed, an eighth portion (access object memory information portion) showing the size of the memory contents to be accessed and the memory contents to be concretely written with the form shown by the above described memory access type identifier.

5,117,071

STYLUS SENSING SYSTEM

Evon C. Greanias, Chevy Chase, Md.; Frank L. Stein, Vienna, Va.; Robert Donaldson, and Michael Gray, both of Annapolis, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1990, Ser. No. 608,062
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—19 **16 Claims**



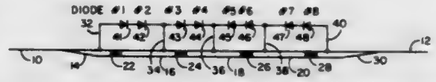
1. An improved finger touch and stylus detection system having a transparent overlay with a transparent array of horizontal and vertical conductors, the horizontal conductors being spaced from the vertical conductors by an insulating material, a control processor, a capacitive measurement means to detect finger input, a radiative source for stylus detection, a switchable path to couple selected conductors to the capacitive measurement means and the radiative source in response to appropriate commands from the control processor and a stylus wherein:
the control processor is connected to the capacitance measuring means to receive measured capacitance values of the conductors when the switchable path has connected a first pattern of conductors to the capacitance measurement means to detect the location of a finger touch with respect to the overlay;
the control processor is connected to a radiative source measurement means to receive measured radiative signal values of the conductors when the switchable path has connected a second pattern of conductors to the radiative source to detect the vertical and horizontal location of the stylus with respect to the overlay;
the control processor is connected to the radiative source measurement means when the switchable path has connected a third pattern of conductors to the radiative source to detect the height of the stylus with respect to the overlay; and,
whereby, finger touch location, stylus horizontal and vertical location and stylus height with respect to the overlay can be determined.

5,117,072

CONSTANT CURRENT NON-BRIDGING SECTION INSULATOR

Paul F. White, 70 Elmwood Rd., Wellesley, Mass. 02181

Continuation-in-part of Ser. No. 581,780, Sep. 13, 1990, abandoned. This application Oct. 30, 1991, Ser. No. 784,150
Int. Cl.[5] B60M *1/18*
U.S. Cl. 191—39 **4 Claims**



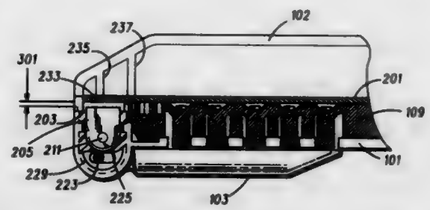
1. An insulator positioned between first and second circuits, each having first and second overhead contact wires respectively from first and second overhead power lines respectively provided for an electrically powered vehicle having a current collector, comprising:
means to prevent current from said first circuit from passing to said second circuit and vice versa as said current collector passes from said first overhead contact wire to said second overhead contact wire;
means to eliminate destructive arcing which would result from potential differences between said first and second circuits as said current collector passes from said first overhead contact wire to said second overhead contact wire; and
means to allow said current collector to continuously collect current with no interruption in said current collection as it passes from said first overhead contact wire to said second overhead contact wire.

5,117,073

CONTROL SIGNAL INITIATOR RESPONSIVE TO A HINGE POSITION

Nicholas Mischenko, Mt. Prospect, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1991, Ser. No. 679,401
Int. Cl.[5] H01H *3/16;* H04R *1/00*
U.S. Cl. 200—61.7 **17 Claims**



1. A hinge actuated switch apparatus for an electronic device having a first and a second housing portion, the first housing portion capable of rotational movement between a first and a second position relative to the second housing portion, the hinge actuated switch apparatus comprising:
an essentially cylindrical hinge shaft, attached to one end of the first housing portion, rotatably coupling the first housing portion to the second housing portion about an axis of rotation through a diametric center of the hinge shaft;
an essentially planar substrate positioned within the second housing portion essentially parallel to the axis of rotation;
a push rod, perpendicularly disposed to the axis of rotation and having a free end capable of linear movement between at least a first and a second position within the second housing portion;
means for translating the rotational movement of the first housing portion between the first and the second position

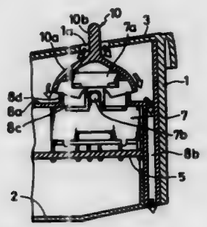
to the linear movement of the free end of the push rod between the first and the second position, respectively;
a first and a second conductive contact on the substrate and essentially opposite the free end of the push rod;
a resilient medium disposed opposite the first and the second conductive contact and between the substrate and the free end of the push rod; and
a conductive medium, disposed between the resilient medium and the first and the second conductive contacts, insulating the first conductive contact from the second conductive contact when the free end of the push rod is in the first position and electrically coupling the first conductive contact to the second conductive contact when the free end of the push rod is in the second position.

5,117,074

WATERPROOF STRUCTURE FOR A SWITCH DEVICE

Shinji Yanai, and Yujiro Shimoyama, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 397,368, Aug. 22, 1989, abandoned, which is a continuation of Ser. No. 160,518, Feb. 26, 1988, abandoned. This application Jul. 15, 1991, Ser. No. 730,574
Claims priority, application Japan, Dec. 5, 1987, 62-69599
Int. Cl.[5] H01H *9/04, 19/06*
U.S. Cl. 200—302.3 **2 Claims**



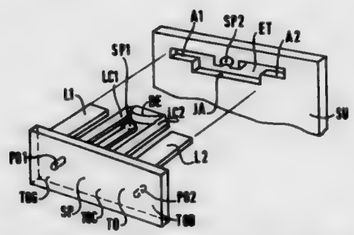
1. A switch device comprising
a seesaw type switch element having a switch actuator, said switch element being mounted to a printed substrate;
a knob coupled to said switch actuator, said knob comprising a projection from a center of an arc-like skirt, said projection for being moved manually to operate said switch element, said arc-like skirt having a convex rounded slope extending from said projection to a periphery of said arc-like skirt wherein said projection and said convex rounded slope of said arc-like skirt are formed so as to cause liquid droplets coming into contact with any portion of said knob to run off said knob under the force of gravity when said projection is pointed in a direction generally away from said force of gravity;
a first cover arranged over said switch element, said first cover defining a first opening and having projection walls formed at peripheral edges of said first opening, said first opening for receiving said switch actuator, said arc-like skirt co-acting with said projection walls for preventing water from entering said first opening;
an upper cover enclosing said arc like skirt and said switch device and for defining an interior and an exterior of said switch device, and further defining a second opening for receiving said projection; and
said first cover further defining a drain passage for draining liquid entering said interior through said second opening to said exterior of said switch device.

5,117,075

RETAINING DEVICE FOR A CONTROL BUTTON MOVABLE ABOUT A PIVOT AND DEVICE IN WHICH SAME IS USED

Pierre Guilleminot, Rambouillet, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1990, Ser. No. 558,115
Claims priority, application France, Jul. 21, 1989, 89 09885
Int. Cl.[5] H01H *13/70*
U.S. Cl. 200—343 **3 Claims**



1. A control button in combination with a support for the button, such that the button is movable about a pivot and has a rest position and an actuating position, the combination further comprising positioning means for positioning the button on the support in the rest position and returning means for returning the button to the rest position after movement to said actuating position, characterized in that said support includes a flattened T-shaped opening extending through said support, said T-shaped opening including a leg and two side wings such that the leg of said opening is wide compared to said side wings, a substantially hemispherical cavity is provided in the support above the leg of the T-shaped opening, and said button includes four continuous strips of elastic material, situated as two central strips and two lateral strips in a plane substantially perpendicular to a front surface of the button, the two central strips having end portions and being sufficiently spaced from one another such that a stub extending from said button and having a hemispherical end corresponding to the hemispherical cavity in the support is accommodated therebetween, the two central strips being moreover interconnected at their end portions by a catch, the button being configured such that, after penetration of the lateral strips into the side wings of the T-shaped opening and, the two central strips into the leg of the T-shaped opening, the catch snaps around the portion of the support which cooperates with the stub now situated in the cavity forming said pivot and said positioning means, and the two lateral strips contact the side wings of the T-shaped opening forming said returning means.

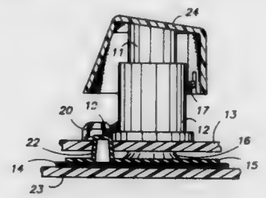
5,117,076

QUIETING DEVICE FOR KEYTOP LEVELING MECHANISMS

Stephen S. Damitio, Spokane, Wash., assignor to Key Tronic Corporation, Spokane, Wash.

Filed Sep. 22, 1989, Ser. No. 410,941
Int. Cl.[5] H01H *13/70, 3/60*
U.S. Cl. 200—344 **7 Claims**

1. In a computer keyboard:
a multi-wide keytop;
stationary keytop support means for guiding the keytop between a relaxed position and a depressed position;
a leveling bar extending across the keytop, the leveling bar being movably connected between the keytop support means and the keytop to maintain it in a substantially level orientation; and
one or more compliant projections, each projection being frictionally engaged between the keytop support means and the leveling bar to exert a preloading force on the leveling bar and thereby remove any mechanical clearance existing between the leveling bar and the keytop support means;
the keyboard further comprising:
an elastomeric sheet including a dome operator operable in conjunction with the keytop;



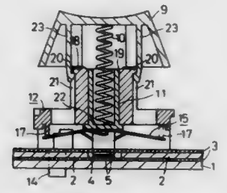
the compliant projections being formed integrally with the elastomeric sheet and protruding through complementary openings formed through the keytop support means.

5,117,077

KEYBOARD SWITCH

Hidemasa Sakurada, Tokyo, Japan, assignor to S M K Co., Ltd., Japan

Continuation of Ser. No. 498,661, Mar. 26, 1990, abandoned. This application Apr. 30, 1991, Ser. No. 693,025
Claims priority, application Japan, Jun. 9, 1989, 1-104596[U]
Int. Cl.[5] H01H *1/10*
U.S. Cl. 200—516 **6 Claims**



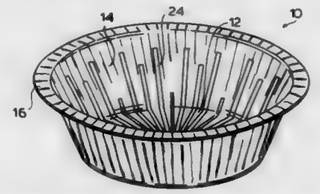
1. A keyboard switch comprising:
a membrane including first and second switching contacts;
a reversing plate for engaging said membrane, said reversing plate including a spring plate with a narrow closed rectangular peripheral strip forming a central opening and a central strip spanning from opposite corners of said peripheral strip across a geometric center of said opening in said peripheral strip forming two substantially equivalent substantially triangular voids between said peripheral strip and said central strip on opposite sides of said central strip, and a contact pressing piece provided in a central portion of said central strip, said peripheral portion of said reversing plate being bent so that said central portion is bulged; and
a key top for engaging said reversing plate and moving said reversing plate into contact with said membrane to operate said first and second contacts.

5,117,078

CONTROLLED HEATING OF FOODSTUFFS BY MICROWAVE ENERGY

D. Gregory Beckett, Oakville, Canada, assignor to Beckett Industries Inc., Oakville, Canada

Continuation-in-part of Ser. No. 535,168, Jun. 8, 1990, abandoned, which is a continuation-in-part of Ser. No. 475,326, Feb. 5, 1990, abandoned. This application Feb. 4, 1991, Ser. No. 650,246
Claims priority, application Canada, Feb. 2, 1990, 2009207
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 E **33 Claims**



1. A multiple layer article of manufacture, adapted to be formed into a packaging structure in which a foodstuff may be heated by microwave energy to an edible condition, comprising:
a layer of flexible electroconductive material supported on a substrate layer,
said layer of flexible electroconductive material having a thickness which is normally substantially opaque to microwave radiation and having a plurality of elongate apertures extending wholly through the thickness of said electroconductive material layer and effective to generate thermal energy in said plurality of apertures when said article is exposed to microwave energy and the foodstuff is in contact with or proximate to said plurality of apertures,
said plurality of apertures being sized and arranged in said layer of flexible electroconductive material to generate sufficient thermal energy to effect a desired surface browning of the foodstuff while permitting sufficient microwave energy to penetrate said layer of flexible electroconductive material through said plurality of apertures into the foodstuff to effect a desired degree of heating of the foodstuff, whereby the foodstuff may be provided in an edible condition, and
said substrate layer being formed of microwave energy transparent material and being in adhered structural supporting relationship with said flexible layer of electroconductive material so that a packaging structure may be formed from said article in which said foodstuff may be positioned.

5,117,079

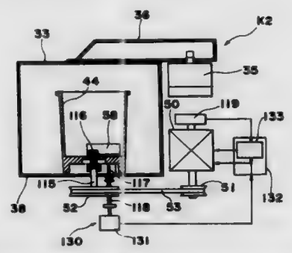
HIGH-FREQUENCY HEATING APPARATUS FOR AUTOMATICALLY PROCESSING AND HEATING COOKING MATERIALS

Taisuke Morino, Suita; Mami Tanaka, Yao; Fuminori Kaneko, Matsubara; Takeyuki Ozaki, Nara, and Shuichi Akiyama, Matsubara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 9, 1989, Ser. No. 363,961
Claims priority, application Japan, Jun. 14, 1988, 63-78982[U]; Jun. 15, 1988, 63-79919[U]; Jun. 15, 1988, 63-147529; Jun. 15, 1988, 63-148925; Jun. 16, 1988, 63-79721[U]; Jun. 29, 1988, 63-161383; Jul. 1, 1988, 63-165220; Jul. 1, 1988, 63-165221; Jul. 15, 1988, 63-94310[U]
Int. Cl.[5] H05B *6/78*
U.S. Cl. 219—10.55 F **7 Claims**

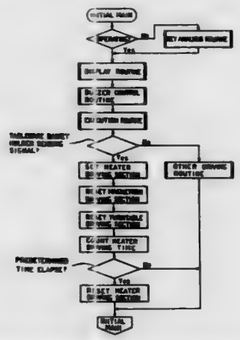
1. A high-frequency heating apparatus having heating means including a magnetron and a waveguide comprising:

a heating vessel for accommodating an article to be heated, which is detachably loaded in a heating chamber;
a stirring mechanism provided in said heating vessel for stirring cooing materials of said article to be heated;
a guide mechanism provided on a bottom surface of said heating chamber for guiding said heating vessel so as to horizontally displace said heating vessel into said heating chamber from an opening formed on a side face adjacent to said bottom surface of said heating chamber;
a rotational drive mechanism connected to said stirring mechanism for driving said stirring mechanism so as to rotate said stirring mechanisms; and



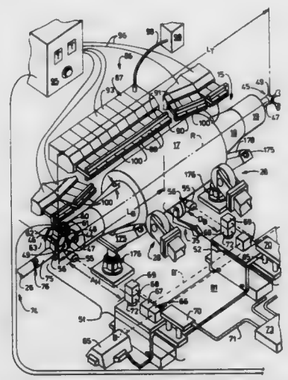
a coupling mechanism coupled between said stirring mechanism and said rotational drive mechanism for transmitting a driving force from said rotational drive mechanism to said stirring mechanism;
said stirring mechanism including a transmission gear which is mounted on a lower end of a stirring shaft extending through a bottom wall of said heating vessel;
said coupling mechanism including an engaging gear which is mounted on an upper end of a central shaft extending from said heating chamber to said rotational drive mechanism and is engageable with said transmission gear.

5,117,080
MICROWAVE OVEN WITH A FUNCTION FOR DRYING TABLEWARE AND A DRIVE CONTROL METHOD THEREOF
Kwan H. Lee, Kyungsangnam-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Aug. 31, 1990, Ser. No. 575,566
Claims priority, application Rep. of Korea, Aug. 31, 1989, 12598/1989
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 R **2 Claims**



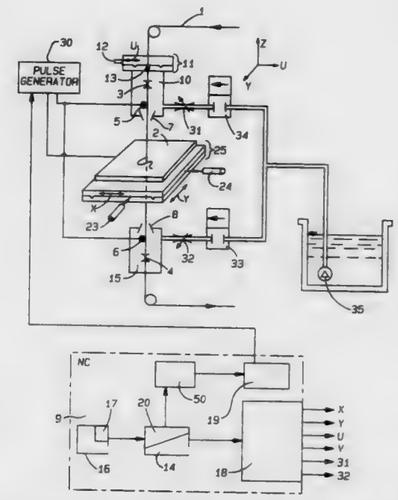
1. A microwave oven with a function for drying tableware, comprising:
a microwave oven including,
a cavity,
a heater,
a magnetron, and
a microcomputer for controlling said heater and said magnetron;
a tableware basket holder detachably connected to said cavity in said microwave oven;
said tableware basket holder including,
a tableware basket,
a water bucket, and
a plate; and
tableware basket holder sensing means for sensing said tableware basket holder in said cavity of said microwave oven;
said microcomputer driving said heater when said tableware basket holder sensing means senses said tableware basket holder is in said microwave oven, thereby performing a tableware drying function.

5,117,081
ROLL ROUNDNESS MEASURING AND MACHINING APPARATUS AND METHOD
Karl T. Bagdal, Middletown, Ohio, assignor to Armco Inc., Middletown, Ohio
Filed Apr. 1, 1991, Ser. No. 678,101
Int. Cl.[5] B23H *9/04*
U.S. Cl. 219—69.1 **22 Claims**



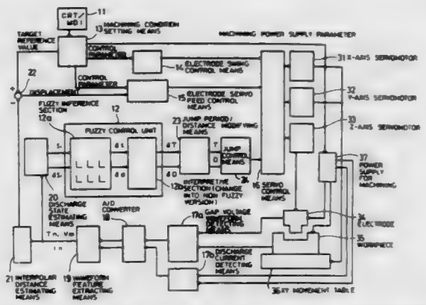
1. An apparatus for measuring the roundness and concentricity of an outer surface of a roll having oppositely disposed ends spaced along a longitudinal axis, said apparatus comprising:
a plurality of spaced roll supports for rotatably supporting said outer surface;
drive means for rotating said roll about its longitudinal axis;
means for limiting the axial movement of said roll during rotation;
a pair of locators, one of said locators mounted adjacent each of said oppositely disposed ends of said roll, said locators establishing a reference line along said roll;
means for measuring the roundness of said outer surface as it is rotated on said supports, said measuring means comprising a plurality of displacement monitoring means for simultaneously measuring variations in the contour of said outer surface and movement of said reference line as said roll is rotated; and
means for determining the true axis of rotation of said roll, whereby a profile of said roll can be obtained by comparing roundness measurements taken at any point along said longitudinal axis to said true axis of rotation.

5,117,082
DEVICE AND PROCESS FOR CONTROLLING THE VARIATION OF A PARAMETER IN EDM MACHINING WITH AN ELECTRODE-WIRE
Jean M. Bosson, Annemasse, France; Juan Odriozola, Chatelaine, Switzerland; Georges-André Marendaz, Borex, Switzerland, and Daniel Blodin, Bernex, Switzerland, assignors to Charmilles Technologies S.A., Meyrin, Switzerland
Filed Jan. 16, 1990, Ser. No. 465,051
Claims priority, application Switzerland, Jan. 13, 1989, 00099/89
Int. Cl.[5] B23H *7/02, 7/06, 7/20*
U.S. Cl. 219—69.12 **21 Claims**



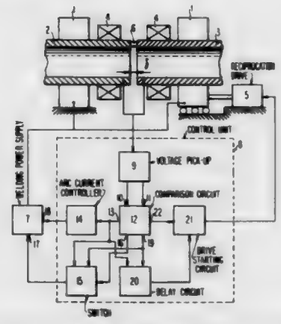
1. A device for an EDM machine for cutting with an electrode-wire according to a predetermined trajectory, said device including a generator connected between said electrode wire and a workpiece to be machined for emitting voltage pulses, and a numerical unit for controlling the relative movements between said workpiece and wire guides guiding said electrode wire, said numerical unit also controlling the rate of the voltage pulses emitted by the generator, said device further comprising:
a computing unit programmed to determine at least one point on said predetermined trajectory at which said relative movements between said workpiece and said wire guides must be stopped and a stepped variation of at least one parameter affecting machining conditions must be initiated, said computing unit being equipped to send corresponding signals to a numerical control element,
a delay circuit equipped to send a signal to said numerical control element at predetermined intervals from the start of said stepped variation of said at least one parameter,
said numerical control element being connected to said computing unit and to said delay circuit, said numerical control element actuating said stepped variation of said at least one parameter in reply to said signals from said computing unit and said delay circuit, said numerical control element terminating said stepped variation when said at least one parameter has reached a final scheduled value, and
actuators connected to said numerical control element, said actuators being equipped to activate said stepped variations of said at least one parameter by given quantities.

5,117,083
JUMP CONTROL SYSTEM FOR AN ELECTRIC DISCHARGE MACHINE
Hideaki Kawamura, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan
Filed Jan. 2, 1991, Ser. No. 635,608
Claims priority, application Japan, May 15, 1989, 1-120855
Int. Cl.[5] B23H *7/32, 7/20*
U.S. Cl. 219—69.16 **11 Claims**



1. A jump control system for an electric discharge machine having a discharge state, comprising:
first control means for performing fuzzy control to set a jump period and a jump distance to optimum values based on the discharge state of the electric discharge machine; and
second control means for controlling movement of an electrode relative to a workpiece in response to the jump period and the jump distance.

5,117,084
METHOD FOR PRESSURE WELDING OF PARTS HEATED WITH AN ARC MOVING IN MAGNETIC FIELD
Sergei I. Kuchuk-Yatsenko, ulitsa P. Osipenko, 17, kv. 18; Vadim J. Ignatenko, Ulitsa Boichenko, 13, kv. 45; Igor A. Genis, ulitsa Nischinskogo, 5, kv. 39; Viktor V. Jumatov, ulitsa Krasnoarmeiskaya, 51, kv. 46; Valery G. Krivenko, Ulitsa Melnikova, 18, kv. 58; Petr V. Kuznetsov, ulitsa Demeevskaya, 53, kv. 48, and Vladimir S. Kachinsky, ulitsa N. Krasnova, 8, kv. 53, all of Kiev, U.S.S.R.
PCT No. PCT/SU89/00025, § 371 Date Sep. 25, 1990, § 102(e) Date Sep. 25, 1990, PCT Pub. No. WO90/08617, PCT Pub. Date Aug. 9, 1990
PCT Filed Jan. 26, 1990, Ser. No. 576,412
Int. Cl.[5] B23K *9/08*
U.S. Cl. 219—100 **4 Claims**



1. A method for pressure welding of parts heated with an arc moving in a magnetic field comprising placing the parts (2,3)

being welded coaxially with the working gap (δ) between their ends, initiating an electric arc (6) in said gap (δ) and creating a magnetic field in said gap (δ) under the effect of which the electric arc (6) moves along the perimeter of the ends of the parts (2,3) being welded to heat them to a temperature of plastic deformation of the material of the parts being welded, determining the time moment when said temperature is reached after which the arc current is pulsatingly increased to the value at which the temperature of the ends of the parts being welded reaches the melting point of the material of the parts being welded, and upsetting the parts (2,3) being welded characterized in that the determination of the time moment at which the temperature of the ends of the parts being welded is essentially equal to the temperature of plastic deformation of the material of the parts being welded is carried out by measuring the d.c. component (U_{cl}) of voltage of said electric arc (6) then setting the minimum value ($U_{d\ min}$) for the d.c. component (U_d) at which the temperature of the ends of the parts being welded is essentially equal to the temperature of plastic deformation of the material of the parts being welded and, as the d.c. component (U_d) of voltage of the electric arc (6) reaches its minimum value ($U_{d\ min}$), the arc current is pulsatingly increased.

5,117,085

CATHODE HOLDER FOR AN ELECTRON BEAM GENERATOR

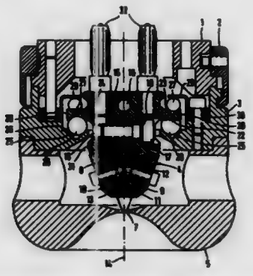
Dieter Fritz, Geinhausen, and Helmut Spruck, Gilching, both of Fed. Rep. of Germany, assignors to PTR Praezisionstechnik GmbH, Maintal/Doernigheim, Fed. Rep. of Germany

Filed Sep. 10, 1990, Ser. No. 579,788

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1989, 3930203

Int. Cl.[5] B23K *15/00*

U.S. Cl. 219—121.27 **11 Claims**



1. A cathode holder for an electron beam generator comprising

a carrier,

two terminals which are joined to form a structural unit, which are insulated from each other, and which carry a hot cathode, said terminals and said cathode defining an optical axis of said generator, said terminals being mounted for rotation in said carrier by guide means comprising a pair of rolling or gliding bodies symmetrically and movable disposed in a plane perpendicular to said optical axis.

5,117,086

PROCESS AND HEAD FOR LASER WORKING IN A TUBE

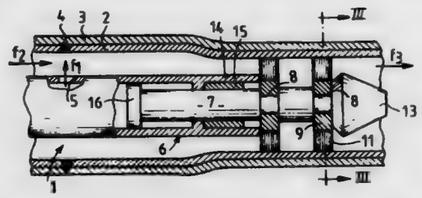
Cécipe Boudot, and Jacques Griffaton, both of Chalon S/Saone, France, assignors to Framatome, Courbevoie, France

Filed Dec. 27, 1990, Ser. No. 634,607

Claims priority, application France, Dec. 28, 1989, 89 17378

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.64 **7 Claims**



1. Process for laser working in a tube, of the type in which a primary protective gas is passed into the working zone through the working head (1), characterized in that a secondary gas is also passed between the periphery of the head and the tube (2), to reach into the working zone.

5,117,087

METHOD OF PRODUCING AN APERTURED COMPONENT

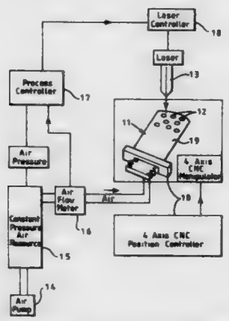
George E. Baker, Leire, and Edward C. Williams, Mickleover, both of England, assignors to Elliott Industries Limited, London, England

Filed Aug. 14, 1990, Ser. No. 567,074

Claims priority, application United Kingdom, Aug. 15, 1989, 8918606

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.71 **6 Claims**



1. A method of producing a component having a plurality of apertures with a given overall fluid flow therethrough, said method comprising the steps of:

a) dividing the component into a plurality of sections, each section having a set number of apertures therein,

b) forming a proportion of the set number of apertures in each section,

c) measuring the amount of fluid flow through the formed set number of apertures in each section,

d) comparing the measured fluid flow with a predetermined fluid flow value, and

e) forming the remaining apertures in all the sections, the remaining apertures having a dimension which is adjusted in accordance with the comparison of the measured fluid flow of step (d) and the predetermined fluid flow value to provide the given overall flow.

5,117,088

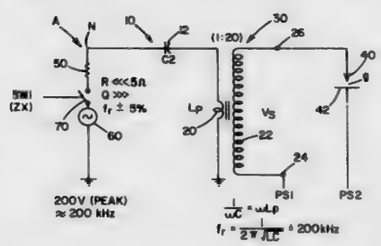
DEVICE AND METHOD FOR STARTING ELECTRIC ARC OF A WELDER

Elliott K. Stava, Brecksville, Ohio, assignor to The Lincoln Electric Company, Cleveland, Ohio

Filed Mar. 13, 1991, Ser. No. 668,790

Int. Cl.[5] B23K *9/067*

U.S. Cl. 219—137 PS **50 Claims**



34. A method of starting the electric arc of a welder including an arc gap between an electrode and a workpiece, said method comprising the steps of:

(a) providing a series resonant circuit including an inductor, a portion of which is a transformer primary winding, and a capacitor, said series circuit having a given resonant frequency;

(b) driving said series circuit with an electrical signal pulsating at a driving frequency near only one of the harmonics of said resonant frequency;

(c) providing a transformer with a secondary winding;

(d) coupling said secondary winding to said primary winding; and,

(e) applying the voltage developed across said secondary winding across said arc gap.

5,117,089

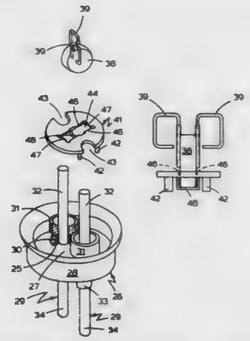
STRUCTURAL SUPPORT FOR HERMETIC TERMINAL ASSEMBLY HEATER APPARATUS

Glenn A. Honkomp, Warren County; Thomas O. McNay, Clermont County, and Larry G. Burrows, Hamilton County, all of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 503,286, Apr. 2, 1990. This application Dec. 27, 1990, Ser. No. 634,610

Int. Cl.[5] H05B *3/12*; H01C *7/02*

U.S. Cl. 219—201 **16 Claims**



1. A heating apparatus for a confined chamber comprising: a fluid medium containing chamber defined by walls of a hermetically sealed housing, one of said walls having an aperture therein; and,

a unitary heating assembly including a body member extending through and sealed to said aperture in said wall, said body member having terminal pin means embedded in a seal extending between said terminal pin means and an aperture in said body member with an outer pin segment of said terminal pin means extending outwardly from the outer face of said wall to be electrically connected to an electric power source and an inner pin segment thereof projecting inwardly from the inner face of said wall into direct contact with the fluid medium of said fluid medium chamber, said unitary assembly having a heating element having an electrical connection to said inner pin segment of said terminal pin means to be disposed in said chamber to directly transmit heat to said fluid medium, said electrical connection for said heating element including a flexible conductive wire in the form of a partial loop with one extremity of said loop being conductively fused to said heating element and an opposite extremity being fused to said pin segment, said opposite extremity fused to said pin segment having the end thereof spaced from said heating element a distance less than the cross-sectional thickness of said wire to minimize wire interlocking; and

support means for said heating element cooperatively and freely mounted relative said body member and said heating element to nestingly receive and surround a portion of said heating element and being sized to support said heating element in freely resting position independently of said electrical connection of said inner pin segment to said heating element to minimize vibration and to insure stable electrical connection of said heating element to said inner pin segment.

5,117,090

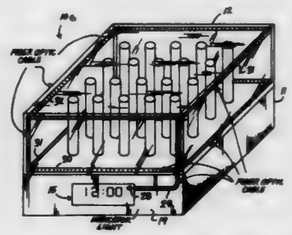
ELECTRIC HAIR CURLING APPARATUS INCLUDING A REMOVABLE BATTERY PACK AND A FIBER OPTIC CABLE ILLUMINATION ARRANGEMENT

Vicki R. Askins, 8105 Royal Dr., Chattanooga, Tenn. 37421

Filed Jul. 23, 1990, Ser. No. 559,675

Int. Cl.[5] H05B *1/02*; A45D *4/12*

U.S. Cl. 219—222 **2 Claims**



1. An electric hair curling apparatus, comprising, in combination,

a base member, including spaced side walls, a top wall, and a forward wall, the top wall including plural series of heating rods with curling roller slidably mounted thereon, the heating rods defining a first, second, and third series of aligned heating rods, wherein the first, second, and third series of heating rods are of an increasing predetermined diameter,

transparent lid pivotally mounted to the base about spaced pivot axles, wherein the pivot axles are oriented rearwardly and upwardly of the top wall of the base,

a control panel mounted on the forward wall, the control panel including a light emitting diode clock,

a timer means for selectively heating the heating rods transferring heat from the heating rods to the curling rollers associated with each of the heating rods,

said timer means including a timer engaging switch for selective engagement of the timer means,

clock setting means for cooperation with a timer engaging

switch for selective actuation and disengaging of the timer means and associated heating of the heating rods,

an on/off indicator light in cooperation with the timer means to provide visual indication of actuation of the timer means and associated heating of the heating rods,

a main fiber optic cable in light transmitting relationship with the on/off indicator light, wherein the main fiber optic cable is exposed and is directed along the forward wall for providing visual indication of the forward wall during limited light conditions, and

wherein the main fiber optic cable is in communication with a front panel fiber optic cable, side panel fiber optic cables and a top panel fiber optic cable, wherein the front panel fiber optic cable defines a visible rectangular frame of a forward wall of the transparent lid, the side panel fiber optic cables provide visible rectangular framing of side walls of the transparent lid, and the top panel fiber optic cable provides a visible rectangular framing of a top wall of the transparent lid.

5,117,091

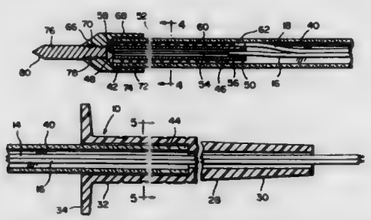
SOLDERING GUN

Laurice D. Ely, 660 W. 17th St. #29, Costa Mesa, Calif. 92627

Filed Aug. 21, 1990, Ser. No. 570,509

Int. Cl.[5] H05B *1/00*; B23K *3/02*

U.S. Cl. 219—236 **9 Claims**



1. A soldering gun including a first larger diameter elongated tubular member of high heat resistant dielectric material and having first and second open opposite ends, a second smaller diameter elongated tubular member of high heat resistant dielectric material and having first and second open opposite ends, said second tubular member being considerably shorter in length than said first tubular member and being lengthwise loosely telescoped into said first tubular member with said first ends being generally flush with each other and an annular space defined between said tubular members, and open coil of resistance heating wire loosely coiled about said second tubular member in said annular space, one end of said coil adjacent the second end of said second tubular member being disposed in said annular space and having the first end of the electrically conductive core of a first insulated conductor electrically connected thereto within said space, the other end of said coil adjacent the first end of said second tubular member extending outwardly thereof and being reversely bent back into the interior of said second tubular member and extending therethrough to a point adjacent the second end of said second tubular member and having the first end of the electrically conductive core of a second insulated conductor electrically connected thereto within said second tubular member, an elongated soldering tip defining a sleeve open end on one end thereof, said first end of said first tubular member being telescopingly received and secured within said sleeve open end, a tubular handle, one end of said tubular handle being telescoped over and secured to said second end of said first tubular member, said first and second insulated conductors extending outwardingly of said second end of said first tubular member, through said tubular handle and outwardly of the other end thereof and being adapted for electrical connection of the second ends of said cores with a suitable source of low voltage electrical potential.

5,117,092

CORDLESS IRON

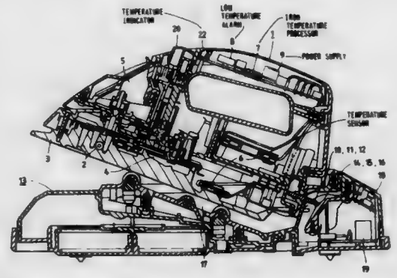
Masao Shimizu, Nishinomiya; Yoshinori Kataoka, Osaka, and Narusaki Akai, Takarazuka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 9, 1990, Ser. No. 550,279

Claims priority, application Japan, Jul. 20, 1989, 1-187858; Jul. 20, 1989, 1-187861

Int. Cl.[5] H05B *1/02*; D06F *75/26*

U.S. Cl. 219—247 **10 Claims**



1. A cordless iron comprising:

a stand;

an iron body placeable on and detachable from the stand and having a sole plate;

means for heating the sole plate of the iron body when the iron body is placed on the stand;

means for sensing a temperature of the sole plate of the iron body and outputting a signal representative of the sensed temperature of the sole plate of the iron body, said temperature sensing means comprising an electrically powered temperature sensor;

means responsive to the signal outputted from the sensing means for informing that the sensed temperature drops to or below a reference temperature; and

means for keeping the sensing means activated when the iron body is detached from the stand.

5,117,093

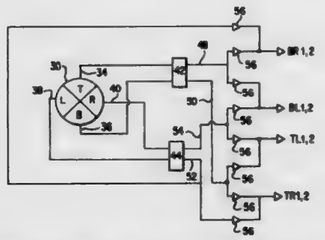
MAINTENANCE OF LINEARITY OF SUPPORT BEAM

Mathew G. Boissevain, Los Altos, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Aug. 15, 1989, Ser. No. 394,207

Int. Cl.[5] H05B *1/02*

U.S. Cl. 219—494 **22 Claims**



1. A system for controlling deflections of an elongate body transverse to a longitudinal axis of the body, said system comprising:

a deflection sensor including a source and a detector, at least one of which is adapted to be operatively coupled to the body, the sensor being operable to produce an output signal indicative of the deflection of the body in at least one direction transverse to its axis;

at least one temperature control device thermally coupled to the body at a location for changing the temperature of a portion of the body in a manner to deflect the body in a direction opposite to the one direction; and

control means connected between said sensor and said at least one temperature control device for controlling the temperature control device in response to the output signal produced by said sensor in a manner to counteract deflection of the body in the one direction.

5,117,094

HEAT RECOVERABLE ARTICLE

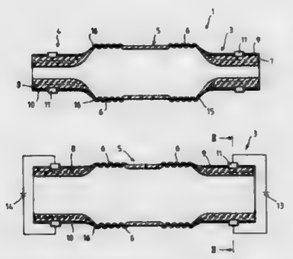
Per J. T. Jensen, Slangerup, Denmark, assignor to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 8, 1988, Ser. No. 242,089

Claims priority, application United Kingdom, Sep. 9, 1987, 8721181; Oct. 9, 1987, 8721180; Oct. 9, 1987, 8723760; Oct. 9, 1987, 8723761

Int. Cl.[5] H05B *3/00*

U.S. Cl. 219—535 **15 Claims**



1. A heat-recoverable article comprising

(1) and element which

(a) is laminar,

(b) is composed of a conductive polymer,

(c) has been rendered heat-recoverable by an expansion process, and

(d) can be caused to recover by passing electrical current through the element, thus generating heat which causes recovery of the element; and

(2) two or more elongate electrodes,

(a) each electrode having two free ends and a main body between the free ends,

(b) at least one of the electrodes having an inwardly directed free end which does not terminate at an edge of the laminar element, and

(c) the electrodes being laterally spaced apart from each other so that, when they are electrically connected to a source of electrical power, current flows between the electrodes through the laminar element, a substantial proportion of the electrical current flowing in a direction which is substantially parallel to the faces of the laminar element.

5,117,095

PLASTIC ACTUATOR FOR POSTAGE MACHINE

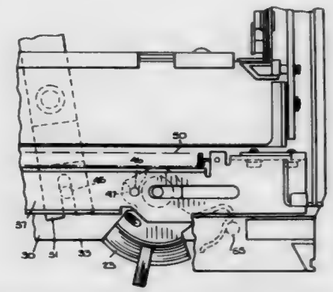
Mark S. Corbett, Hamden, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 24, 1990, Ser. No. 632,824

Int. Cl.[5] G07G *1/10*

U.S. Cl. 235—101 **8 Claims**

1. An improved postage meter of the type having an automatic/manual operable ejection acturator pivotally mounted to a base, the actuator having a mounting hub with a base portion extending therefrom, a control slot for co-acting with a control pin which is received by a control lever pivoted to a chassis and for positioning the postage meter in a first and second position in response to the pivotal motion of the actuator, and a detent means for interacting with a coupling means mounted to said base to maintain the hub in the selected first or second position, wherein the improvement comprises said detent means having a continuous resilient extension having a first end fixably mounted to said base portion, and a first and second



detent portion formed along a continuous engaging surface; said first and second detent portions are recessed such that in a radial distance from an epicenter of the hub flexing stress on the continuous resilient extension when engaged with the coupling means in said selected first or second position is zero.

5,117,096

SYSTEM FOR CONTROLLING AND MONITORING THE DISTRIBUTION OF GOODS

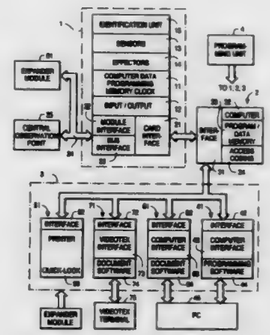
Günther Bauer, Ottobrunn, and Hubert Fleckenstein, Harthausen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Dec. 20, 1990, Ser. No. 631,156

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1989, 3942009

Int. Cl.[5] G06F *15/20*

U.S. Cl. 235—375 **20 Claims**



1. A system for controlling and monitoring the distribution of goods and merchandise, comprising a control and monitoring unit which is firmly connected with the goods or their transport container and which has a circuit with a programmable memory for storing information concerning the type of the goods and the destination address as well as other freight-specific data, an active programmable memory card communicating with the control and monitoring unit and having a memory circuit for the transmitting and receiving of data to and from the control and monitoring unit, as well as an analysis unit for the analyzing of the data transmitted and received;

said control and monitoring unit, comprising a computer as well as sensors and actuators detecting, storing and dis-

playing the momentary condition of the distribution process and of the merchandise;

said active programmable memory card, being constructed with an integrated circuit with data and programming memories communicating by way of an interface with said control and monitoring unit for the inputting and receiving of data; and

said analysis unit having an interface for communication with the memory card.

5,117,097

KEY SYSTEM FOR A VEHICLE

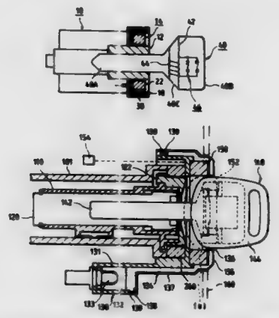
Takashi Kimura, and Toshiaki Nawa, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Feb. 20, 1991, Ser. No. 657,869

Claims priority, application Japan, Feb. 27, 1990, 2-18245[U]; Mar. 14, 1990, 2-25825[U]; Mar. 28, 1990, 2-31115[U]

Int. Cl.[5] G06K *7/00, 19/06;* E05B *49/00*

U.S. Cl. 235—439 **8 Claims**



1. A key system of an electromagnetic coupling type, comprising:

a key for storing key information, said key having an inserting member and a head to be operated;

cylinder means for electromagnetically communicating with said key, said cylinder means including:

a cylinder body having a key insertion hole into which said inserting member of said key is inserted;

a rotor for receiving said key, said rotor being rotatable with said key;

a magnetic core for forming a magnetic circuit with said key, said magnetic core surrounding said rotor, said magnetic core being rotatable with said rotor; and

means for generating a magnetic field, said magnetic field generating means being substantially unmovable with respect to said rotor, said magnetic field generating means including:

a bobbin movably fitted on said magnetic core;

a wire would on said bobbin; and

a cylindrical member for leading said wire along an axis of said cylinder body, said cylindrical member being unitarily formed with said bobbin.

5,117,098

MULTI-POSITION TRIGGER FOR CONTROL OVER AIMING AND SYMBOL READING IN A PORTABLE LASER DIODE SCANNING HEAD

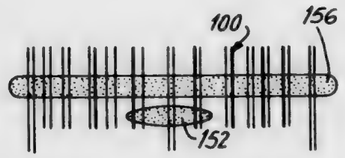
Jerome Swartz, Old Field, N.Y., assignor to Symbol Technologies, Inc., Bohemia, N.Y.

Continuation-in-part of Ser. No. 414,450, Sep. 29, 1989, abandoned. This application Jun. 27, 1990, Ser. No. 544,628

The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.

Int. Cl.[5] G06K *7/10*

U.S. Cl. 235—472 **17 Claims**



1. An arrangement in a light-scanning system for reading indicia having parts of different light reflectivity, comprising:

(a) a housing having an exit port;

(b) light source means in the housing for generating a light beam;

(c) actuatable control means in the housing for directing the light beam through the exit port to illuminate a first zone on the indicia in a first operational state, and for directing the same light beam to illuminate a second zone on the indicia in a second operational state; and

(d) actuator means for manually actuating the control means between said states, including a multi-position trigger manually displaceable from an off position to a first position corresponding to the first operational state, and being further manually displaceable from the first position to a second position corresponding to the second operational state.

5,117,099

AMBIENT LIGHT REJECTING QUAD PHOTODIODE SENSOR

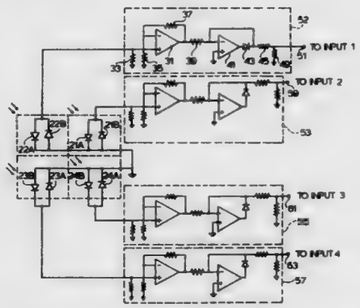
Terrence C. Schmidt, R R #3, Wellesley, Ontario, Canada N0B 2T0

Continuation of Ser. No. 401,961, Sep. 1, 1989, Pat. No. 4,982,081. This application Oct. 29, 1990, Ser. No. 604,864

The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.2 **7 Claims**



1. A photodiode array for detecting a projected image in the presence of ambient light, comprising a plurality of image sensing photodiodes connected together in parallel with like polarity, and a plurality of further photodiodes connected in parallel with and with reverse polarity to respective ones of said image sensing photodiodes, for compensating the effects of said ambient light on and sensor dark current within said image sensing diodes.

5,117,100

APPARATUS FOR AND METHOD OF OPTICAL POSITION DETECTION

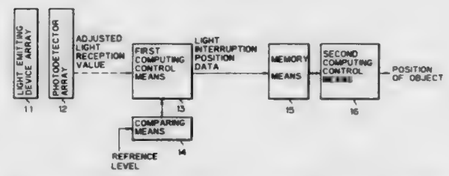
Shigeo Yoshida; Isamu Fujimoto, both of Chiba; Hideyuki Suzuki, Tokyo; Hiroshi Asano, Saitama; Toru Hosaka, Tokyo; Takashi Onioh, Chiba; Kojyu Nagasaki, Tokyo; Kenichi Matsuoka, Tokyo, and Kazufumi Taura, Tokyo, all of Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1990, Ser. No. 634,566

Claims priority, application Japan, Dec. 27, 1989, 1-338976

Int. Cl.[5] G01V *9/04*

U.S. Cl. 250—221 **3 Claims**



2. A method for detecting an optical position, disposing plural pairs of light emitting devices and photodetectors with each pair of said light emitting device and said photodetector being spaced from each other, making adjustment of the light reception values of the respective photodetectors so as to eliminate any variation in the light reception values between photodetectors when the light emitted from said light emitting devices toward said photodetectors is not interrupted by an object and comparing the adjusted light reception values with a reference level to detect a position of the object, said method further comprises the steps of;

computing by arithmetic averaging at least a virtual medial position between two adjacent photodetectors and a virtual light reception value at the virtual position in accordance with the adjusted light reception value of said photodetector and the adjusted light reception value of a photodetector adjacent to said photodetector,

comparing said virtual light reception value and the adjusted light reception values of the respective photodetectors with the reference level to determine the presence of light interruption by an object,

storing the position of the corresponding photodetector and said virtual position as the light interruption position data when light interruption by an object has been decided, and

computing arithmetic mean between the minimum and maximum light interruption position data as a position of the object interrupting the light when there are stored in said memory means the light interruption position data for a series of positions.

5,117,101

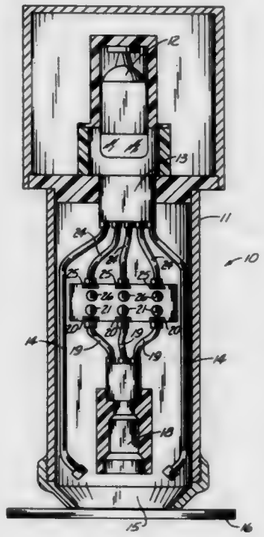
TRISTIMULUS COLOR RECOGNITION SYSTEM WITH MEANS FOR COMPENSATING FOR VARIATIONS IN LIGHT SOURCE COLOR

Richard D. Moore, Akron; Richard K. Peters, and Donald V. Elmerick, both of Tallmadge, all of Ohio, assignors to Technostics Corporation, Hampton, Iowa

Filed Aug. 13, 1990, Ser. No. 567,015

Int. Cl.[5] G01J *3/50;* H05J *5/16*

U.S. Cl. 250—226 **8 Claims**



1. A color sensing system, comprising:

means defining a measurement plane adapted to receive at said measurement plane a test surface for purposes of making a color measurement;

a light source;

means for receiving light directly from said light source and transmitting the light to said measurement plane;

light source red, green, and blue filters associated with light source red, green, and blue photo detectors respectively;

means for receiving light directly from said light source and transmitting the light to said light source red, green, and blue filters such that the filtered source light is incident on said light source red, green, and blue photo detectors respectively;

means for determining a first quantitative output from said light source red, green, and blue photo detectors;

selected light red, green, and blue filters associated with reflected light red, green, and blue photo detectors respectively;

means for receiving light reflected from said test surface and transmitting the light to said reflected light red, green, and blue filters such that filtered reflected light is incident on said reflected light red, green, and blue photo detectors respectively;

means for determining a second quantitative output from said reflected light red, green, and blue photo detectors; and

means for determining a final quantitative output, said final quantitative output being said first quantitative output adjusted with respect to said second quantitative output.

5,117,102

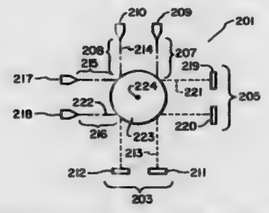
PHOTOELECTRIC JOYSTICK DISPLACEMENT DETECTOR

Randall K. Mitchell, 3840 Hillside La., Salt Lake City, Utah 84109

Continuation-in-part of Ser. No. 444,705, Dec. 1, 1990, abandoned. This application Nov. 30, 1990, Ser. No. 621,008

Int. Cl.[5] **G01D** *5/34*

U.S. Cl. 250—229 **21 Claims**



1. A photoelectric control device for determining the displacement of a control shaft, which device comprises;

(a) an x-axis detector comprising two photo-emitter/detector sets, each set comprising a photo-emitter and a photo-detector with the photo-detector aligned on a light axis to detect light traveling along the light axis and emitted from the photo-emitter, with the light axes of the two sets disposed substantially parallel to one another,

(b) a y-axis detector comprising two photo-emitter/detector sets, each set comprising a photo-emitter and a photo-detector with the photo-detector aligned on a light axis to detect light traveling along the light axis and emitted from the photo-emitter, with the light axes of the two sets disposed substantially parallel to one another,

wherein the light axes of the emitter/detector sets of the x-axis detector and the light axes of the emitter/detector sets of the y-axis detector are substantially perpendicular to each other, and the plane defined by the parallel light axes of the x-axis emitter/detector sets and the plane defined by the parallel y-axis emitter/detector sets are adapted to be disposed in a substantially perpendicular to the longitudinal axis of a control shaft when the control shaft is in the neutral position, and

wherein the x-axis detector and the y-axis detector are adapted to detect displacement of the control shaft from a neutral position blocking passage of light from each photo-emitter to the corresponding photo-detector in the emitter/detector set, and the displacement of the control shaft from the neutral position allows passage of sufficient light from a photo-emitter to activate the corresponding photo-detector in at least one emitter/detector set.

5,117,103

CIRCUIT FOR OPTOELECTRONIC POSITIONING TAP

Jürgen Flamm, Buhlingben, Fed. Rep. of Germany, assignor to Litef GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Aug. 23, 1990, Ser. No. 571,335

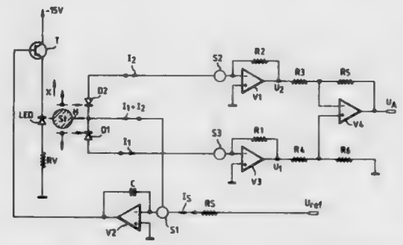
Claims priority, application European Pat. Off., Oct. 9, 1989, 89118727.0

Int. Cl.[5] **G01D** *5/34*

U.S. Cl. 250—229 **7 Claims**

1. In an optoelectronic positioning tap circuit of the type in which a beam from a light source irradiates a pair of linearly adjacent light-sensitive diodes connected at their cathode ends, which includes an element that is movable in a direction perpendicular to the beam path to partially shade said light beam, in which a signal proportional to the difference between diode currents characterizes the position of said shading element relative to said light beam, and in which the current of said light source is determined by an amplifier, the operating point of which is controlled with reference to a fixed potential by an integrating amplifier, whose input is formed by the difference between a constant reference current and a diode current-dependent signal, the improvement comprising:

a) a first and a second current/voltage converter stage arranged to provide the circuit output signal;



b) each of said first and second current/voltage converters is directly connected to the anode end of one of said diodes; and

c) said integrating amplifier is directly connected to the connected cathode ends of said diodes.

5,117,104

ANGULAR DISPLACEMENT DETECTING DEVICE UTILIZING A TUBULAR CASING HAVING A CHAMBER WHEREIN A FLUOROLIQUID IS SEALED

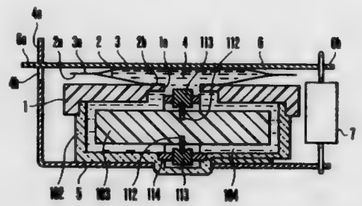
Naoki Kobayashi, Tokyo; Kazuhiro Oki, and Shoichi Shimura, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1990, Ser. No. 628,185

Claims priority, application Japan, Dec. 21, 1989, 1-331743

Int. Cl.[5] **G01D** *5/30*

U.S. Cl. 250—230 **36 Claims**



1. An angular displacement detecting device comprising:

(A) a fluoroliquid; .

(B) a tubular casing having a chamber in which said fluoroliquid is sealed;

(C) a detecting body disposed in said fluoroliquid sealed in said chamber and supported for rotation about a predetermined rotational axis; and

(D) detecting means for detecting the relative angular displacement between said detecting body and said tubular casing about said rotational axis.

5,117,105

ABSOLUTE ENCODER

Takashi Nagase, and Kouichi Higashi, both of Iruma, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Kitakyushu, Japan

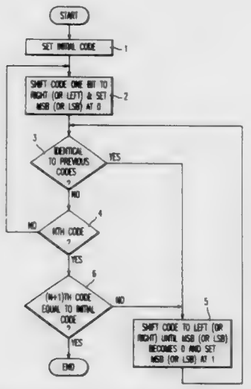
PCT No. PCT/JP90/00072, § 371 Date Mar. 7, 1991, § 102(e) Date Mar. 7, 1991

PCT Filed Jan. 23, 1990, Ser. No. 651,387

Claims priority, application Japan, Jul. 7, 1989, 1-174121

Int. Cl.[5] **G01D** *5/34*

U.S. Cl. 250—231.18 **4 Claims**



1. An absolute encoder comprising a code plate divided into N equal slits, each represented by a code 0 or 1, for producing a sequence of recurring random numbers whose binary codes (B_1–B_N), composed of successive P slits, are different from each other, and a detector device for reading the codes of successive P slits of the code plate so that the absolute angle of the code plate within one revolution can be detected, characterized in that:

the slits are arranged to carry out the process of generating N sequences of random numbers, the process comprising initially setting a P-bit random number code represented by 1 and 0, the binary code being referred to as B'_1, and, at the first stage, shifting the initial random number code one bit to the right or the left (if the code is shifted to the left, the process in the parentheses below is effected), setting the MSB (or the LSB) at 0, determining whether the second P-bit binary code B'_2 thus produced is identical to the initial code B'_1 or not, and if not equal, adding 0 to the lefthand (or the righthand) side of the MSB (or the LSB) of the P-bit random number code to produce a (P+1)-bit random number code, and at a second stage, shifting the random number code one bit to the right (or the left), setting the MSB (or the LSB) at 0, determining whether the third P-bit binary code B'_3 thus produced is identical to codes B'_1, B'_2 or not, and if not equal, adding 0 or 1 to the lefthand (or the righthand) side of the MSB (or the LSB) of the (P+1)-bit random number code to produce a (P+2)- bit random number code, and repeating the above process until an N-bit random number code is determined; and

if identical binary codes are present in any of the stages, shifting the random number code to the left (or the right) up to the stage in which the MSB (or the LSB) becomes 0, converting 0 at the MSB (or the LSB) into 1, determining whether the code is identical to the initially set binary code or not, and if not equal, shifting the code to the right (or the left), and if equal, shifting the code to the left (or the right).

5,117,106

SCANNING PATTERN DRAWING APPARATUS

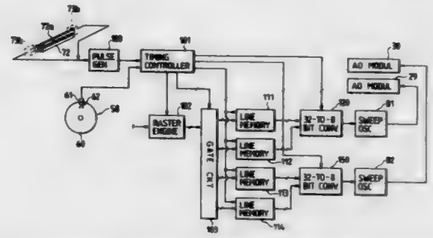
Hiroaki Andon; Michio Ohshima; Yuji Matsui; Takashi Okuyama; Toshitaka Yoshimura; Hidetaka Yamaguchi; Yasushi Ikeda; Jun Nonoka; Tamihiro Miyoshi; Mitsuo Kakimoto; Masatoshi Iwama; Hideyuki Morita; Satoru Tachihara; Akira Morimoto, and Akira Ohwaki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 588,528, Sep. 26, 1990, abandoned, which is a continuation of Ser. No. 444,234, Dec. 1, 1989, abandoned. This application Jun. 23, 1991, Ser. No. 734,034

Claims priority, application Japan, Dec. 5, 1988, 63-307452

Int. Cl.[5] **H01J** *3/14*

U.S. Cl. 250—235 **15 Claims**



1. In a scanning pattern drawing apparatus which scans the surface Of a workpiece with a light beam from beam issuing means so that a pattern is described on the workpiece with the issued light beam being controlled on the basis of pattern drawing data stored in a pattern memory, the improvement wherein said apparatus further comprises: scanning pulse generating means for generating a scanning pulse in response to a predetermined amount of scanning with said light beam; delaying means for converting said scanning pulse to a plurality of timing pulses, producing successive parallel outputs of said timing pulses after being delayed by a predetermined time, and reading said pattern drawing data from said pattern memory in response to said delayed timing pulses; and means for scanning a surface of said workpiece with said light beam modulated in accordance with said pattern drawing data read from said pattern memory.

5,117,107

MASS SPECTROMETER

Michael Guilhaus, Randwick, and John H. Dawson, Potts Point, both of Australia, assignors to Unisearch Limited, New South Wales, Australia

PCT No. PCT/AU88/00498, § 371 Date Jul. 19, 1990, § 102(e) Date Jul. 19, 1990, PCT Pub. No. WO89/06044, PCT Pub. Date Jun. 29, 1989

PCT Filed Dec. 23, 1988, Ser. No. 477,921

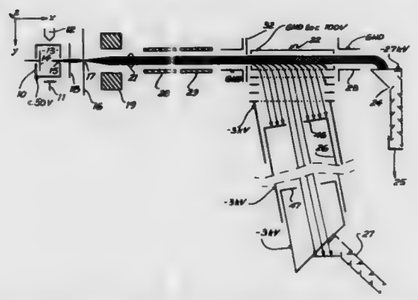
Claims priority, application Australia, Dec. 24, 1987, PI6079

Int. Cl.[5] **B01D** *59/44;* **H01J** *49/00*

U.S. Cl. 250—287 **5 Claims**

1. A time-of-flight mass spectrometer comprising a source of ions, beam forming means to produce a substantially continuous parallel beam of the ions generated by said source, an ion accelerator arranged to apply an acceleration to the ions of said beam to remove a packet of ions from the beam and accelerate the packet towards a target, the acceleration being orthogonally directed relative to the direction of said continuous beam, and means to measure the times of arrival of the ions subjected to said orthogonally directed acceleration, at a detector located at a predetermined distance from the accelerator, the accelerator comprising at least two parallel planar electrodes disposed about the path of said beam to define a first-stage acceleration chamber, at least one of the electrodes being a grid, and a voltage source connected between said electrodes such that when no voltage is applied the electrodes define a field free region and when a voltage is suddenly ap-

plied between the electrodes an electric field will be generated and ions located between said electrodes will be accelerated orthogonally to the direction of the beam, the beam forming

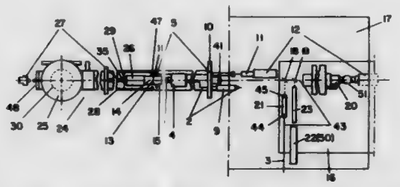


means being arranged such that the absolute values of magnitude of velocities of ions in the orthogonal direction are minimized.

5,117,108
LASER MICROPROBE INTERFACE FOR A MASS SPECTROMETER

Jean-François Muller, Metz; François Tollitte, Belleville Les Verdun; Gabriel Krier, and Marc Pelletier, both of Metz, all of France, assignors to University of Metz, Etablissement Public Carsctere Scient fue et Culturel, Metz, France

PCT No. PCT/FR89/00351, § 371 Date May 4, 1990, § 102(e) Date May 4, 1990, PCT Pub. No. WO90/00811, PCT Pub. Date Jan. 25, 1990
PCT Filed Jul. 6, 1989, Ser. No. 487,992
Claims priority, application France, Jul. 7, 1988, 88 09438
Int. Cl.[5] B01D *59/44*; H01J *49/40*
U.S. Cl. 250—288 **21 Claims**

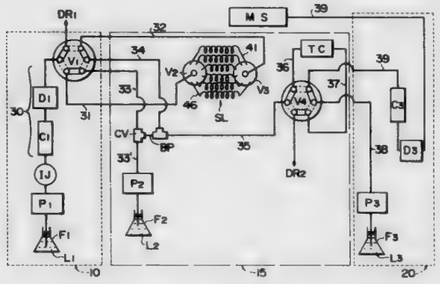


1. Laser microprobe interface for a mass spectrometer in which the ions are generated inside a cell from a sample comprising: focusing optics and visualization optics, an optical stage allowing for the introduction and adjustment of laser rays as well as for the visualization of the samples, and a system for the introduction of the samples, wherein the focusing optics (1) and the visualization optics (4) are located inside the mass spectrometer itself, with the focusing optics (a) being adjustable through means for adjusting (2), thereby to take into account the variation of the focal distance as a function of the wave length of the primary ionization laser ray (3), and being placed at the center of the visualization optics (4), the visualization optics being formed of the achromatic inverted Cassegrain type thereby ensuring perfect image definition and significant magnification, and offering good depth of field and good laser focusing, the location of the focusing optics (1) thereby also allowing for the interchange of the focusing optics (1) with other ionization means.

5,117,109
EXCHANGE METHOD OF MOBILE PHASE IN HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY MASS SPECTROMETRY AND ITS APPARATUS

Naoki Asakawa; Hiroshi Ohe, both of Tsukuba; Yutaka Yoshida, Honjoh; Tadashi Sato, Abiko; Yukuo Nezu, Moriya, and Yoshiya Oda, Tsukuba, all of Japan, assignors to Eisai Co. Ltd., Tokyo, Japan

Filed Sep. 6, 1990, Ser. No. 578,267
Claims priority, application Japan, Sep. 12, 1989, 1-236683
Int. Cl.[5] B01D *59/44*
U.S. Cl. 250—288 **9 Claims**



1. In a method of high performance liquid chromatography mass spectrometry, where a sample having an analytical object therein injected into a liquid mobile phase A, components of the analytical object are separated in mobile phase A in a separation column, mobile phase A is separated from the components and the components analyzed in a mass spectrometer, the improvement comprising:

(1) diluting mobile phase A having the separated components therein with a diluent to form a diluent solution thereof;

(2) passing a dilute solution to a trapping column, trapping the separated components therein and discharging the diluent and mobile phase A therefrom;

(3) eluting the trapped components from the trapping column by passing a mobile phase B therethrough and forming a solution of components in mobile phase B, and wherein mobile phase B is different from mobile phase A; and

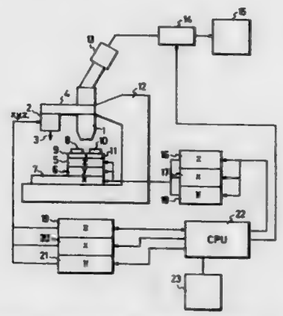
(4) passing the solution to a mass spectrometer where mobile phase B is separated from the components and the components were analyzed.

5,117,110
COMPOSITE SCANNING TUNNELLING MICROSCOPE WITH A POSITIONING FUNCTION

Masatoshi Yasutake, Tokyo, Japan, assignor to Seiko Instruments, Inc., Tokyo, Japan

Filed Jul. 24, 1990, Ser. No. 557,856
Claims priority, application Japan, Jul. 5, 1989, 1-174793
Int. Cl.[5] H01J *37/26*
U.S. Cl. 250—306 **2 Claims**

1. Composite scanning tunnelling microscope apparatus with a positioning function where the composite scanning tunnelling microscope apparatus is equipped with a scanning tunnelling microscope and with a microscope with a wider field of view, characterized in that said apparatus comprises a standard sample having a surface composed of surface elements, each surface element having coordinates, said surface being provided with a pattern of microscopically observable indicia identifying the coordinates of at least selected surface elements for positioning, said standard sample being mounted in a stage comprised within said microscope apparatus, a calculating means which calculates the relative distance between the optical axes of both microscopes from the positional relationship between the images of the indicia of the standard sample observed under both of the abovementioned microscopes, a computing means which computes the amount of discrepancy

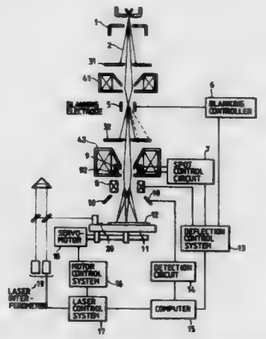


of the scanning tunnelling microscope needle based on the results from the said calculating means, and a stage controller which controls the stage based on the results from the said computing means such that the optical axes of both microscopes are on the same point.

5,117,111
ELECTRON BEAM MEASURING APPARATUS

Kazumitsu Nakamura, Katsuta; Shinichi Kato, Mito; Yoshio Sakitani, Ooarai, and Yoshihisa Minamikawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 19, 1991, Ser. No. 717,500
Claims priority, application Japan, Jun. 27, 1990, 2-166732
Int. Cl.[5] H01J *37/256*
U.S. Cl. 250—310 **9 Claims**



1. An electron beam measuring apparatus for measuring the size of a pattern on a surface of a specimen comprising,

an electron gun for emitting an electron beam,

an electron lens for focusing the electron beam on the specimen surface,

a deflector for deflecting the electron beam so as to scan the pattern with the electron beam,

a spot control means for controlling the shape of the electron beam spot according to the direction of scanning of the electron beam,

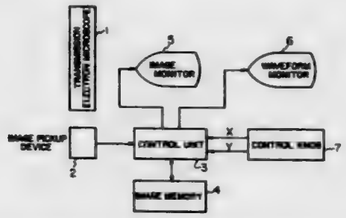
detecting means for detecting secondary electrons from the specimen surface, and

a computer for calculating the size of the pattern based on the secondary electrons from the detecting means.

5,117,112
METHOD AND APPARATUS FOR MONITORING ASTIGMATISM AND FOCUS IN ELECTRON MICROSCOPE

Takashi Ito, Tokyo, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Nov. 21, 1990, Ser. No. 616,323
Claims priority, application Japan, Nov. 21, 1989, 1-303832
Int. Cl.[5] H01J *37/26*
U.S. Cl. 250—311 **3 Claims**



2. An apparatus for monitoring astigmatism and the condition of the focus in an electron microscope, comprising:

the electron microscope creating a transmission electron microscope image of a specimen;

an image pickup means for converting the specimen image into a video signal;

an image memory in which image brightness data represented by the video signal is stored;

an image monitor providing a display of the specimen image, based on the image brightness data;

a means for superimposing radial cursor lines on the image displayed on the image monitor;

a means for reading brightness data about pixels of the image existing on the cursor lines from the image memory; and

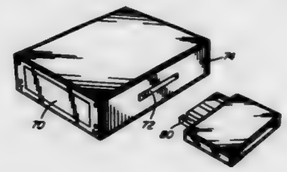
a means for displaying graphs showing the distributions of brightness data of the pixels existing on the cursor lines and displaying said brightness as an array of graphs;

whereby the leading and trailing edges of each graph corresponding to nonparallel lines can be observed, said edges being indicative of the focus of the electron beam along said lines and a comparison of the graphs corresponding to said nonparallel lines can be made, said comparison being indicative of astigmatism of said electron beam.

5,117,113
DIRECT READING DOSIMETER

Ian Thomson, Nepean; Gary F. MacKay, Pictou County, and Martin P. Brown, Ottawa, all of Canada, assignors to Thompson and Nielson Electronics Ltd., Ottawa, Canada

Filed Jul. 6, 1990, Ser. No. 549,156
Int. Cl.[5] H01L *27/14, 31/112*; G01T *1/02*
U.S. Cl. 250—370.07 **24 Claims**



1. A radiation dosimeter comprising:

a pair of insulated gate field effect transistors integrated into the same silicon substrate, each said transistor being operable in a bias mode and a test mode; means for biasing, during said bias mode, each said transistor so that one of

said transistors is more sensitive to ionizing radiation than the other of said transistors;

means for determining, during said test mode, the difference in the threshold voltages of said transistors, said difference voltage being indicative of the radiation dosage; and

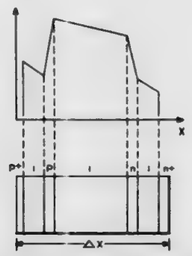
means for continuously switching said transistors between said bias mode and said test model, the period of operation of said transistors in said test mode time period being small in comparison to the period of operation of said transistors in said bias mode.

5,117,114

HIGH RESOLUTION AMORPHOUS SILICON RADIATION DETECTORS

Robert A. Street, Palo Alto; Selig N. Kaplan, El Cerrito, and Victor Perez-Mendez, Berkeley, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Dec. 11, 1989, Ser. No. 448,240
Int. Cl.[5] G01T *1/24*
U.S. Cl. 250—370.11 **15 Claims**



1. Detector elements in an array of such elements for high energy particles or photons that move through the detector, with each detector element comprising:

first and second electrodes lying in approximately parallel planes and being spaced apart from each other;

an amorphous film including a mixture of at least 60 percent Si:H and at most 40 percent Ge:H, deposited approximately in a plane positioned between and adjacent to the first and second electrodes, the film having at least three contiguous regions, a first region of first electrical conductivity type adjacent to the first electrode, a second region of second electrical conductivity type opposite to the first conductivity type adjacent to the second electrode, and an intrinsic region positioned between the first and second regions where the first and second regions have smaller thickness than the thickness of the intrinsic region;

bias means, electrically connected to the first and second electrodes, for impressing an electrical field between the first and second electrodes; and

readout means, positioned adjacent to the first and second electrodes and electrically connected thereto, for selectively reading the voltage or current developed across the amorphous film.

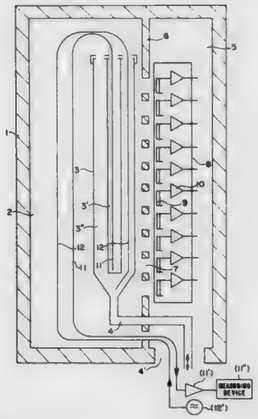
5,117,115

DEVICE FOR MEASURING THE ACTIVITY AND VOLUME OF RADIOACTIVE LIQUIDS

Karl Gärtner, Hall/Tirol, Austria, assignor to Bender & Co., Gesellschaft m.b.H., Vienna, Austria

PCT No. PCT/AT89/00062, § 371 Date Feb. 27, 1991, § 102(e) Date Feb. 27, 1991, PCT Pub. No. WO90/02962, PCT Pub. Date Mar. 22, 1990
PCT Filed Sep. 8, 1989, Ser. No. 635,120
Claims priority, application Austria, Sep. 13, 1988, 2238/88
Int. Cl.[5] G01T *1/167*
U.S. Cl. 250—432 R **5 Claims**

1. A device for measuring the activity and volume of a radioactive, electrically conductive liquid comprising a first shielding housing having a first chamber containing a vessel, said vessel having a central hollow space and a ring chamber comprising means for receiving and discharging the electrically conductive liquid, a second chamber separated from the first chamber by a wall containing a vertical row of windows formed one above another therein and a second shielding housing adjoining these windows comprising means for optical and electrical shielding and containing a vertical row of sensors, each of said sensors being assigned to one of said windows and being connected to an amplifier and a counting device, means for generating high frequency impulses, and first and second electrodes extending into said vessel, said first electrode extending into said ring chamber and being subjected to high frequency impulses from said means for generating high frequency impulses, said second electrode extending into said central hollow space and being connected via an amplifier to a measuring device.

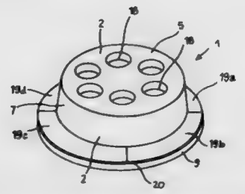


5,117,116

METHOD AND DEVICE FOR MONITORING UV RADIATION

John E. Bannard, and Dennis D. Maguire, both of Nottingham, England, assignors to Cybrandian Limited, Limerick, Ireland

Filed Dec. 11, 1990, Ser. No. 624,748
Claims priority, application Ireland, Dec. 11, 1989, 3945/89
Int. Cl.[5] G01J *1/50*
U.S. Cl. 250—474.1 **20 Claims**



1. A device for monitoring the quantity of UV radiation received by the skin, the device comprising

a support means defining a support surface,

a substantially irreversible UV sensitive material on the support surface, the UV sensitive material having a characteristic which alters substantially irreversibly on being subjected to UV radiation,

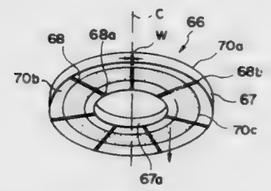
securing means for attaching the support means to the skin, said support means supporting said UV sensitive material such that at least a portion of the UV sensitive material is spaced apart from the skin to receive reflected UV radiation from the skin.

5,117,117

ELECTRON BEAM EXPOSURE SYSTEM HAVING AN IMPROVED SEAL ELEMENT FOR INTERFACING ELECTRIC CONNECTIONS

Yoshihisa Oae, Kanagawa; Kiichi Sakamoto, Tokyo, and Akio Yamada, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 20, 1991, Ser. No. 718,380
Claims priority, application Japan, Jun. 20, 1990, 2-162220
Int. Cl.[5] H01J *3/38*
U.S. Cl. 250—492.2 **10 Claims**



1. An electron beam exposure system for writing a pattern on an object by an electron beam, comprising:

beam source means for producing an electron beam and emitting the electron beam along a predetermined optical path;

beam focusing means, provided along the optical axis between the beam source means and the object, for focusing the electron beam on the object;

beam processing means, provided along the optical axis between the beam source means and the object and supplied with control signals, for modifying the electron beam in response to the control signals;

column means, extending along the optical axis, for surrounding a region that includes the object, the beam source means, the beam focusing means and the beam processing means and maintaining said region evacuated;

interface means, mounted on the column means, for supplying said control signals to said beam processing means;

said column means comprising at least a first part and a second part and holding the interface means between the first and second parts with an hermetic seal established therebetween;

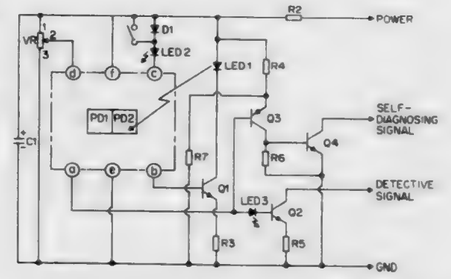
said interface means comprising a ring-shaped base body of a ceramic material, said base body having a first major surface and a second, opposing major surface and being defined by an outer circumferential periphery and an inner circumferential periphery, said first major surface forming a flange surface for establishing an hermetic seal with the first part of the column means, one or more conductor patterns provided on the second major surface and extending from the inner circumferential periphery to the outer circumferential periphery, and an insulator film provided on the second major surface of the base body and burying the conductor patterns thereunder, said insulator film having a substantially flat major surface that establishes an hermetic seal with the second part of the column means.

5,117,118

PHOTOELECTRIC SWITCH USING AN INTEGRATED CIRCUIT WITH REDUCED INTERCONNECTIONS

Toshifumi Fukuyama, Uji, Japan, assignor to Astex Co., Ltd. and Takenaka Electronic Industrial Co., Ltd., both of, Japan

Filed Oct. 13, 1989, Ser. No. 421,529
Claims priority, application Japan, Oct. 19, 1988, 63-263199; Oct. 28, 1988, 63-273914; Oct. 28, 1988, 63-273915; Oct. 28, 1988, 63-273916; Oct. 28, 1988, 63-273917; Jul. 28, 1989, 1-197104
Int. Cl.[5] G02B *27/00*
U.S. Cl. 250—551 **13 Claims**



1. An electric circuit, for use in a photoelectric switch and having a pair of power input pins and a limited number of input/output pins used for multiple functions, comprising:

a first input/output pin coupled to internal detection means for providing a detection signal output when a photoelectric signal derived from light receiving means indicates a predetermined level, coupled to internal self-diagnosing means responsive to failure of an internal circuit in the absence of said detection signal output for providing a self-diagnosing signal output, and coupled to internal short circuit protection means responsive to a voltage increase at said first pin indicative of an external short circuit for terminating said detection signal output;

a second input/output pin coupled to internal pulse signal means for supplying a pulse signal output for illuminating an external illuminating device and for limiting said pulse signal output when said external indicator device is short circuited;

a third input/output pin coupled to internal comparator means, response to said photoelectric signal, for providing a stable operation output signal to illuminate an external indicator device when said photoelectric signal is within a desired amplitude range, and coupled to internal function reversal means responsive to the level of an external voltage applied to said third pin for reversing the function of said external indicator device to selectively indicate reflection or transmission type photoelectric switch operation; and

a fourth input/output pin coupled to internal amplification means, responsive to photoelectric currents from said light receiving elements, for deriving and coupling to said detection means and said comparator means a photoelectric signal which, dependent on the level of an external voltage applied to said fourth pin, is representative of either a cumulative value or a differential value of said photoelectric currents, and for deriving a gain control signal responsive to changes in said external voltage level for controlling the amplitude of said photoelectric signal coupled to said detecting means;

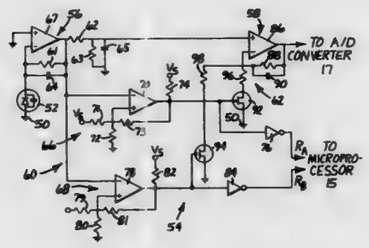
whereby said electric circuit may be utilized in a photoelectric switch adapted to provide connections to said power input and input/output multifunction pins.

5,117,119

AUTO-RANGING FILM DENSITOMETER

Paul C. Schubert, Marine, and Richard R. Lemberger, Forest Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 13, 1991, Ser. No. 668,490
Int. Cl.[5] G01N *21/22*
U.S. Cl. 250—559 **13 Claims**



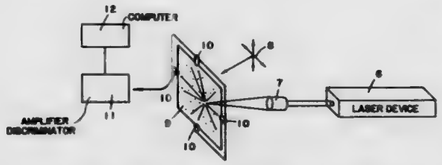
1. A film densitometer, including:
an input for receiving analog transmittance signals;
an analog amplifier coupled to the input for amplifying the transmittance signals and providing amplified transmittance base signals;
a range detector circuit coupled to the input for providing digital transmittance range signals characterizing the magnitudes of the analog transmittance signals as being within one of a plurality of ranges;
a gain control circuit coupled to the amplifier and range detector circuit for controlling the gain of the amplifier as a function of the magnitudes of the transmittance signals;
an analog-to-digital converter coupled to the amplifier for converting the amplified transmittance base signals to digital transmittance base values; and
digital processing circuitry coupled to the converter and the range detector circuit for generating digital density value signals as a logarithmic function of the transmittance base values and the transmittance range signals.

5,117,120

METHOD AND APPARATUS FOR DETECTING FLAWS IN TRANSPARENT BODIES CAUSED BY HEAVY PARTICLES OF RADIOACTIVE DECAY

Menachem Margaliot, Bnei Braq, and Tuvia Schlesinger, Rehovot, both of Israel, assignors to The State of Israel, Atomic Energy Commission, Soreq Nuclear Research Center, Israel

Continuation-in-part of Ser. No. 556,574, Jul. 20, 1990, abandoned, which is a continuation of Ser. No. 320,415, Mar. 8, 1989, abandoned. This application Jan. 4, 1991, Ser. No. 638,357
Claims priority, application Israel, Mar. 24, 1988, 85851
Int. Cl.[5] G01N *21/88*
U.S. Cl. 250—572 **8 Claims**



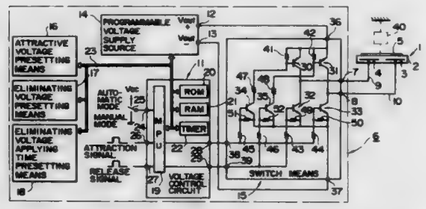
1. A method of measuring in a gaseous environment energetic heavy particles resulting from radioactive decay, comprising exposing a transparent plate with smooth parallel surfaces and edges from one parallel surface to the other to said gaseous environment, subjecting the exposed plate to chemical action, scanning a parallel surface of the chemically active plate with a focused laser light beam, and counting by means of computerized pulse counter means laser light pulses which are detected emerging at at least one edge of the plate.

5,117,121

METHOD OF AND APPARATUS FOR APPLYING VOLTAGE TO ELECTROSTATIC CHUCK

Toshiya Watanabe, and Tetsuo Kitabayashi, both of Kanagawa, Japan, assignors to Toto Ltd., Fukuoka, Japan

Filed Apr. 24, 1990, Ser. No. 513,824
Claims priority, application Japan, Apr. 25, 1989, 1-105679
Int. Cl.[5] H02N *13/000*
U.S. Cl. 307—130 **6 Claims**



5. An apparatus for applying a voltage to an electrostatic chuck, comprising:
a pair of output terminals for applying a voltage with positive and negative potentials;
voltage supply means for supplying voltages;
switch means between said voltage supply means and the electrostatic chuck, for varying the polarity of voltages to be applied to the electrostatic chuck, depending on voltage control signals applied to the switch means; and
voltage control means for indicating voltage values to said voltage supply means and selectively outputting a first voltage control signal to apply a first voltage for attracting a workpiece to the electrostatic and a second voltage control signal to apply a second voltage for eliminating a residual attractive force from the electrostatic chuck, to said switch means, said voltage control means including means for applying said second voltage control signal for a predetermined period of time;
said switch means comprising means for applying, as said second voltage, a voltage of opposite polarity to said first voltage, in response to said second voltage control signal from said voltage control means;
said second voltage having a higher voltage value, as indicated to said voltage supply means by said voltage control means, than the voltage value of said first voltage.

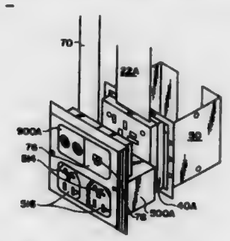
5,117,122

INTEGRATED OUTLET FOR COMMUNICATION AND ELECTRICAL POWER TRANSMISSIONS WITH NOISE REDUCING CHARACTERISTICS

Peter T. Hogarth, P.O. Box 1235, 206 N. 5th St., Fairfield, Iowa 52556; Kurt Swenson, 697 Beth La., Lexington, Ky. 40503; Charles E. Gutenson, 2774 Ginger View La.; Edward L. Nichols, III, 107 Cranes Crook La., both of Annapolis, Md. 21401; Lincoln E. Roberts, 643 Pinetree Dr., Decatur, Ga. 30030, and Vernon R. Miller, 1148 Morningside Pl. N. E., Atlanta, Ga. 30306

Continuation-in-part of Ser. No. 299,192, Jan. 19, 1989. This application Jan. 16, 1990, Ser. No. 464,130
Int. Cl.[5] H01R *9/07, 13/70;* H02J *3/02*
U.S. Cl. 307—140 **10 Claims**

8. An integrated apparatus for establishing electrical connections with at least one of an appliance having an AC power cord, communication wiring and an appliance plug to a first ribbon cable containing AC power conductors and command communications conductors that transmit AC electrial power and command communications signals, and for establishing electrical connection with a telecommunications device having a telecommunications cord and telecommunications plug to a second cable including telecommunications conductors comprising:
a housing;
means for holding said first ribbon cable disposed in said housing and having a front face;
first modular interface means, disposed in said housing and contacting said front face of said holding means and establishing electrical contact with said AC conductors and said command communication conductors of said first



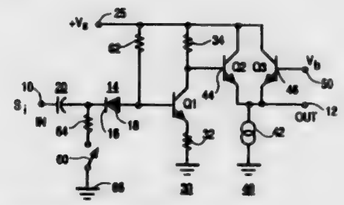
ribbon cable disposed in said holding means, for establishing electrical contact from said AC conductors to said appliance, said first modular interface means including outlet means containing electrical contacts adaptable for insertion of said appliance plug; and
second modular interface means, disposed in said housing and not electrically connected to said first ribbon cable disposed in said holding means, for establishing electrical contact with said telecommunications conductors in said second cable to said telecommunications device, said second mdoular interface means including telecommunications outlet means adaptable for insertion of said telecommunications plug.

5,117,123

DIODE SWITCH PROVIDING TEMPERATURE COMPENSATED D.C. BIAS FOR CASCADED AMPLIFIER

Gene K. Sendelweck, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Apr. 30, 1990, Ser. No. 515,491
Int. Cl.[5] H03K *17/56, 17/74, 5/00;* H04N *5/268*
U.S. Cl. 307—239 **5 Claims**



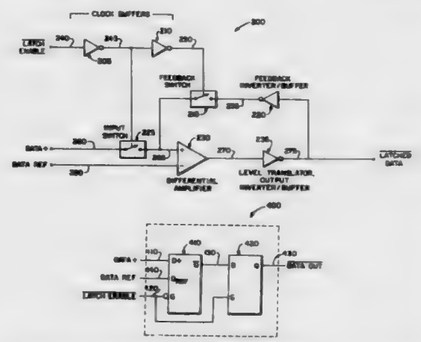
1. A switching circuit comprising:
a diode having a first electrode connected by a DC blocking capacitor to a source of input signal to be switched and having a second electrode coupled via an output circuit to an output terminal for providing a switched output signal; and
a bias control circuit including a first resistor and a switch coupled in series between said first electrode of said diode and a source of reference potential and including a second resistor directly coupled between said second electrode of said diode and a source of supply voltage;
said bias control circuit having a first operating mode responsive to a closed condition of said switch for forward biasing said diode for coupling said input signal to said output terminal;
said bias control circuit having a second operating mode responsive to an open condition of said switch for providing DC isolation of said first electrode of said diode for causing said diode to rectify the AC component of said input signal applied thereto via said capacitor for producing a reverse bias voltage for said diode to thereby decouple said input signal from said output terminal and wherein
said output circuit includes a cascade connection, in the order named, of an amplifier and a non-additive mixer, said amplifier having an input DC coupled to said second electrode of said diode, said non-additive mixer having a first input DC coupled to an output of said amplifier and a second input DC coupled to a source of bias voltage.

5,117,124

HIGH SPEED INPUT RECEIVER/LATCH

Curtis J. Dicke, Medford, Mass., assignor to LSI Logic Corp., Milpitas, Calif.

Filed Dec. 18, 1990, Ser. No. 629,485
Int. Cl.[5] H03K *3/29, 3/26*
U.S. Cl. 307—272.1 **8 Claims**



1. A high speed receiver/latch comprising:
a differential amplifier having two inputs and an output;
an input switch having an input, an output and a control input;
a feedback switch having an input, an output and a control input;
at least one clock buffer having an input and at least one output;
a data input;
a reference input;
a clock input; and
a data output;
the above-recited elements connected as follows:
the data input is connected to the input of the input switch;
the output of the input switch is connected to one input of the differential amplifier and to the output of the feedback switch;
the reference input is connected to the other input of the differential amplifier;
the output of the differential amplifier connects to the input of the feedback switch and to the data output;
the clock input is connected to the input of the at least one clock buffer; and
the at least one output of the at least one clock buffer is connected to the control input of the input switch and to

the control input of the feedback switch such that when one of these two switches is open (not passing signal) the other is closed (passing signal) and vice versa; further comprising:

a level translator having an input and an output;

wherein:

the output of the differential amplifier is connected to the input of the level translator, rather than to the data output and to the input of the feedback switch; and

the output of the level transistor is connected to the data output and to the input of the feedback switch.

5,117,125

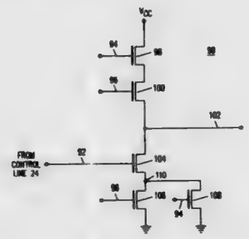
LOGIC LEVEL CONTROL FOR IMPACT IONIZATION SENSITIVE PROCESSES

Michael K. Mayes, San Jose, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Nov. 19, 1990, Ser. No. 615,071

Int. Cl.[5] H03K *3/01*

U.S. Cl. 307—296.2 **8 Claims**



1. A logic level control circuit for preventing impact ionization in a CMOS integrated circuit operable at a plurality of substrate bias voltage levels, comprising:

means for determining a single substrate bias voltage level of said plurality of substrate bias voltage levels;

means for providing a voltage divider control signal in accordance with said determined single bias voltage level;

a controlled device having at least first and second states and means for receiving said voltage divider control signal to select one state of said first and second states in accordance with said voltage divider control signal; and,

said controlled device further comprising voltage divider means for selectively dividing a voltage level in accordance with said selected state.

5,117,126

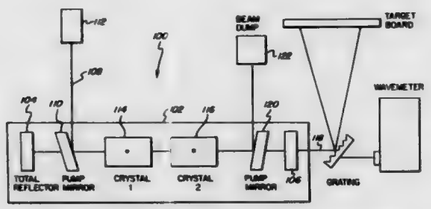
STACKED OPTICAL PARAMETRIC OSCILLATOR

Allen R. Geiger, Las Cruces, N. Mex., assignor to La Sen, Inc., Las Cruces, N. Mex.

Filed Jun. 27, 1990, Ser. No. 544,597

Int. Cl.[5] H03F *7/00*; **H01S** *3/10*

U.S. Cl. 359—330 **20 Claims**



1. A stacked optical parametric oscillator, comprising:

two or more nonlinear optical media for sustaining optical parametric oscillation coaxially disposed in a resonator;

an optical source for providing incident radiation at a primary wavelength;

an input mirror for coupling the incident radiation into the resonator and through the two or more nonlinear optical media; and

an output mirror disposed at one end of the resonator for coupling secondary radiation generated by the nonlinear optical media in response to the incident radiation out of the resonator, the secondary radiation containing different signal and idler wavelengths for each of the two or more nonlinear optical media.

5,117,127

CUSTOMIZABLE LOGIC INTEGRATED CIRCUIT WITH MULTIPLE-DRAIN TRANSISTOR FOR ADJUSTING SWITCHING SPEED

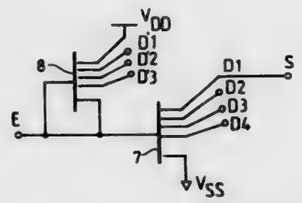
José M. Gobbi, Paris, and Louis Le Berre, Les Ulis, both of France, assignors to Thomson Composants Microondes, Puteaux, France

Filed Sep. 28, 1990, Ser. No. 589,626

Claims priority, application France, Oct. 17, 1989, 89 13536

Int. Cl.[5] H03K *19/017*

U.S. Cl. 307—443 **6 Claims**



1. A customizable logic integrated circuit comprising;

means for supplying two current sources (V_{DD}, V_{SS});

at least one inverter logic operator wherein at least one multiple-drain transistor is connected between an output of said inverter logic operator and at least one of the current sources (V_{DD}, V_{SS}) for adjusting the speed at which said logic operator switches over between two logic states wherein at least a portion of the switch-over speed is adjusted or set by the number of drains connected to said current source.

5,117,128

MOTOR WITH BOTH STEPPED ROTARY AND AXIAL SHIFT MOTIONS

Klaus Albrecht, Königsfeld; Helmut Hans, St. Georgen; Johann von der Heide, Schramberg, and Fritz Schmider, Hornberg, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 90,743, Aug. 28, 1987, Pat. No. 4,920,292. This application Apr. 24, 1990, Ser. No. 513,662

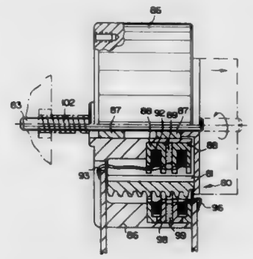
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629377

Int. Cl.[5] H02K *16/04, 7/06*

U.S. Cl. 310—191 **28 Claims**

1. An electric motor having a housing; a rotor of substantially cylindrical form with inner and outer surfaces; a stator; the rotor and stator being supported to move axially with respect to one another and the rotor being capable of rotating; and an exciter system for imparting movement to the rotor, the exciter system including a first exciter imparting step-by-step rotary movement to the rotor and a second exciter imparting within limits relative axial movement between the stator and the rotor, both these exciters being capable of being energized independently of one another, the first exciter that imparts step-by-step rotary movement to the rotor having an annular

configuration and being located coaxially inside the rotor and the second exciter that imparts movement in the axial direction



having an annular configuration and being located coaxially outside the rotor.

5,117,129

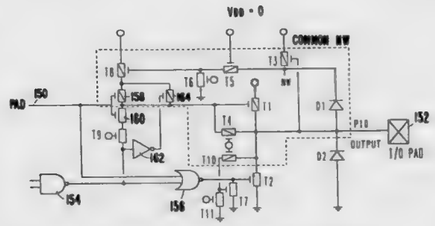
CMOS OFF CHIP DRIVER FOR FAULT TOLERANT COLD SPARING

Joseph A. Hoffman, Manassas; Derwin L. Jallice, Reston; Yogishwar K. Puri, Vienna, and Randall G. Richards, Centreville, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 16, 1990, Ser. No. 598,300

Int. Cl.[5] H03K *19/092, 17/16*

U.S. Cl. 307—443 **2 Claims**



1. A CMOS Off Chip Driver circuit comprising:

an N-well biasing transistor having a source, drain and gate the source being connected to an N-well, the drain connected to a power supply and the gate connected between an input/output pad of the off chip driver circuit and a pair of CMOS final drive transistors;

the pair of CMOS final drive transistors connected to a precharge CMOS circuit having an input and output, the final drive transistors providing amplification of the precharge CMOS circuit output;

a pad signal electronically connected to the input of the precharge CMOS drive circuit and to a tri-state enable, the tri-state enable selecting the active state of the input-/output pad;

whereby the N-well biasing transistor electrically biases the N-well to effectively prevent any leakage current when the circuit is in an unpowered state.

5,117,130

INTEGRATED CIRCUITS WHICH COMPENSATE FOR LOCAL CONDITIONS

Masakazu Shoji, Warren, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

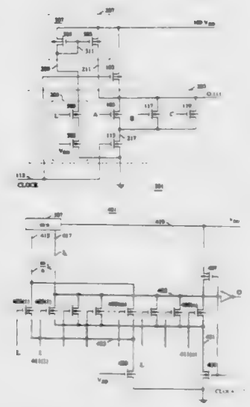
Filed Jun. 1, 1990, Ser. No. 531,961

Int. Cl.[5] H03K *19/003, 19/094, 19/20, 17/06*

U.S. Cl. 307—443 **15 Claims**

1. Apparatus for compensating for a local condition which affects a portion of an integrated circuit which is less than the entire integrated circuit, the apparatus comprising:

a detecting element in the portion which is subject to the local condition and produces a response thereto which is proportional to the effect of the local condition on another element in the portion; and



compensation means coupled to the detecting element and to the portion for reacting to the response of the detecting element to the local condition by providing a compensating input to the portion which is proportional to the response and which compensates for the effect of the local condition on the other 11 element.

5,117,131

BUFFER CIRCUIT HAVING A VOLTAGE DROP MEANS FOR THE PURPOSE OF REDUCING PEAK CURRENT AND THROUGH-CURRENT

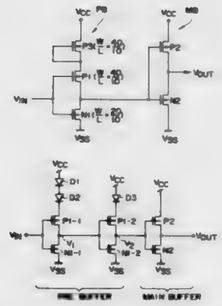
Shinji Ochi, and Yasunori Tanaka, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 540,334, Jun. 19, 1990, abandoned. This application Aug. 9, 1991, Ser. No. 742,551

Claims priority, application Japan, Jun. 30, 1990, 1-169385

Int. Cl.[5] H03K *19/092*

U.S. Cl. 307—448 **20 Claims**



1. A buffer circuit comprising:

a first power source terminal;

a second power source terminal;

a first complementary FET pair arranged between said first and second power source terminals to receive an external

signal, said first complementary FET pair having an output terminal;

a second complementary FET pair arranged between said first and second power source terminals, said second complementary FET pair having an input terminal connected to said output terminal of said first FET pair, and said second complementary FET having an output terminal;

a third complementary FET pair arranged between said first and second power source terminals, said third complementary FET pair having an input terminal connected to said output terminal of said second complementary FET pair;

first means for dropping a voltage of said first power source terminal connected between said first power source terminal and said first FET pair; and

second means for dropping a voltage of said first power source terminal connected between said first power source terminal and said second FET pair;

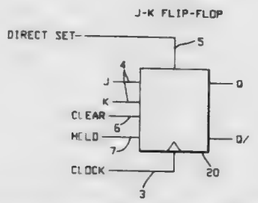
wherein said first means for dropping a voltage drops a voltage further than said second means for dropping a voltage.

5,117,132

FLEXIBLE UTILIZATION OF GENERAL FLIP-FLOPS IN PROGRAMMABLE ARRAY LOGIC

Leland E. Watson, Mission Viejo; Saul Barajas, Capistrano Beach, and Bruce E. Whittaker, Mission Viejo, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Feb. 8, 1991, Ser. No. 652,847
Int. Cl.[5] H03K *19/177*
U.S. Cl. 307—465 **13 Claims**



1. In a programmable array logic module (PAL) having a plurality of D-Type flip-flops and a plurality of gating means, a system for providing flexible functionality comprising:

(a) a plurality of D-Type flip-flops;

(b) a plurality of gating means;

(c) means to connect said gating means to one or more of said D-Type flip-flops to provide the functionality of a J-K flip-flop;

(d) means for holding each of said flip-flops at its current state condition, regardless of control signals which normally influence said flip-flops.

5,117,133

HASHING OUTPUT EXCLUSIVE-OR DRIVER WITH PRECHARGE

Richard J. Luebs, Fort Collins, Colo., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Filed Dec. 18, 1990, Ser. No. 629,291
Int. Cl.[5] H03K *19/21, 19/20*
U.S. Cl. 307—471 **2 Claims**

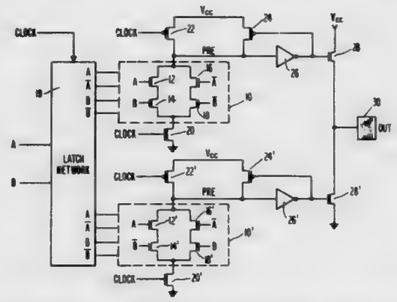
1. A circuit for driving an output in accordance with first and second input signals, comprising:

clocking means for providing a clocking signal;

means responsive to said first and second input signals for making an exclusive OR determination of said first and second input signals;

means for driving the result of said exclusive OR determination to said output when said clocking signal is in a predetermined state; and

an FET responsive to an output of said driving means for precharging said exclusive OR determination means in



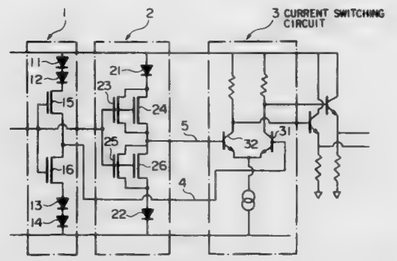
accordance with said output of said driving means before arrival of said first and second input signals when said clocking signal is in a state other than said predetermined state.

5,117,134

CMOS OR TTL TO ECL LEVEL CONVERSION DEVICE

Akira Aso, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 24, 1990, Ser. No. 573,402
Claims priority, application Japan, Aug. 24, 1989, 1-218195
Int. Cl.[5] H03K *19/092*
U.S. Cl. 307—475 **4 Claims**



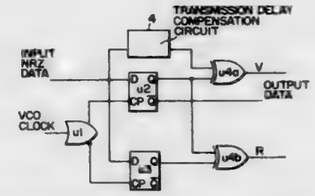
1. A semiconductor level conversion device, comprising: an ECL circuit having a pair of transistors connected at their emitters to each other; a first gate circuit for applying an output signal to a base of one of the transistors; a second gate circuit for applying another output signal to a base of the other of the transistors; an input terminal for supplying a CMOS or TTL input to each gate circuit; and an output terminal for outputting an ECL signal from the ECL circuit; wherein the output signals are in the same phase relation to each other, and the output signal of the first gate circuit has a high level lower than a high level of the output signal of the second gate circuit and has a low level higher than a low level of the output signal of the second gate circuit.

5,117,135

FREQUENCY AND PHASE DETECTION CIRCUIT IN NRZ BIT SYNCHRONOUS SYSTEM

Bhum C. Lee, Daejeon Chungnam, and Kwon C. Park, Seo-gu Daejeon, both of Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon and Korea Telecommunication Authority, Seoul, both of, Rep. of Korea

Filed Dec. 21, 1989, Ser. No. 454,160
Claims priority, application Rep. of Korea, Dec. 22, 1988, 1988-17260
Int. Cl.[5] H03K *5/26, 9/06*
U.S. Cl. 307—514 **1 Claim**



1. A frequency and phase difference detection circuit in an NRZ bit synchronous system, comprising:

a first D-type flip-flop having a D input, a clock input and a logic output, said D input being coupled to receive an input NRZ data;

a second D-type flip-flop having a D input, a clock input and a logic output, said D input being coupled in parallel with said first D-type flip-flop to receive said input NRZ data;

a clock generation means for generating an in-phase clock and an inverse-phase clock from a clock input of a voltage controlled oscillator, said in-phase clock being coupled to said clock input of said first D-type flip-flop and said inverse-phase clock being coupled to said clock input of said second D-type flip-flop;

a transmission delay compensation means for generating a delayed input NRZ data from said input NRZ data;

a first exclusive OR-gate for extracting a first phase difference signal from inputs of said logic output of said first D-type flip-flop and said delayed input NRZ data; and

a second exclusive OR-gate for extracting a second phase difference signal from inputs of said logic output of said second D-type flip-flop and from said logic output of said first D-type flip-flop;

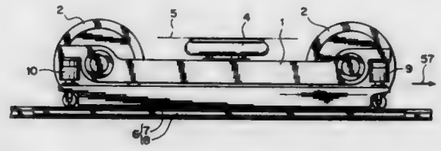
whereby said first and second phase difference signals are generated.

5,117,136

LINEAR MOTOR SUPPORTING APPARATUS FOR VEHICLES

Noboru Kobayashi, and Yukio Uozumi, both of Hyogo, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 30, 1989, Ser. No. 443,310
Claims priority, application Japan, Dec. 2, 1988, 63-306618
Int. Cl.[5] H02K *41/00*
U.S. Cl. 310—12 **12 Claims**



1. A linear motor supporting apparatus for vehicles, comprising:

an on-board coil mounted upon a bogie of said vehicle;

a ground stator laid upon the ground along a track upon which said vehicles travel, said on-board coil and said ground stator together comprising a linear induction motor and being separated by means of a predetermined distance;

means mounted upon said bogie and disposed in contact with said ground stator for measuring said distance defined between said on-board coil and said ground stator, said distance measuring means being movable with respect to said on-board coil; and

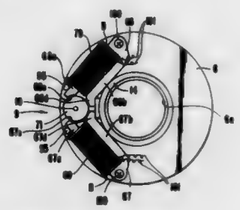
means for automatically displacing said on-board coil in response to said distance measured by said distance measuring means, as a varying input thereto, and with respect to said distance measuring means, said bogie, and said ground stator so as to have said on-board coil disposed above said ground stator at a distance which has a predetermined constant value corresponding to said predetermined distance so as not to reduce the efficiency of said linear induction motor.

5,117,137

STEPPING MOTOR FOR USE IN A CAMERA WITH MULTIPLE SHUTTERS

Takumi Kobayashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1990, Ser. No. 574,455
Claims priority, application Japan, Sep. 1, 1989, 1-102931[U]
Int. Cl.[5] H02K *37/04*; G03B *9/20*
U.S. Cl. 310—49 R **12 Claims**



1. A stepping motor unit comprising:

an annular motor mount having an inner periphery which defines a center opening and an outer periphery which is spaced from the inner periphery by a constant distance;

a rotor which is rotatably supported on said annular motor mount; and,

a pair of stators which are supported on the annular motor mount to cause the rotor to rotate due to a magnetic force, said pair of stators tangentially contacting said inner periphery;

said stators provided with linear coil holders for holding coils, said stators arranged substantially along said inner and outer peripheries of said motor mount.

5,117,138

STATOR FOR AN ELECTRIC MOTOR AND MOTOR EQUIPPED THEREWITH

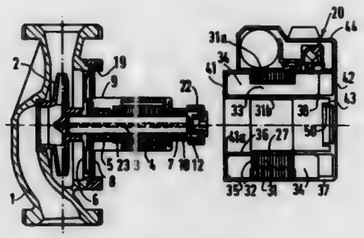
Herve Trian, Parne sur Roc, France, assignor to Pompes Salmson, Rueil Malmaison, France

Continuation of Ser. No. 563,378, Aug. 6, 1990, abandoned. This application Sep. 19, 1991, Ser. No. 762,165
Claims priority, application France, Aug. 11, 1989, 89 10809
Int. Cl.[5] H02K *5/00*
U.S. Cl. 310—89 **5 Claims**

1. An electric motor assembly for driving a pump having a rotor and pump rotor housing, comprising:

a) an electric induction motor rotor sealingly mounted in cantilevered fashion inside an air gap sleeve on the pump rotor housing and including a front bearing that is common to the rotor of said electric motor and the rotor of said pump, and a rear bearing supported on the air gap sleeve; and

b) a stator encapsulated in an insulating envelope closed at the stator's magnetic circuit yoke and at the winding turns thereof right up to the end portion of the laminations at the entrance to the air gap of the stator and open over the whole of the cross-section of the air gap in order to receive the rotor and the air gap sleeve in which it is mounted, the magnetic circuit of the stator being covered with a molded-over insulating layer, said layer including at each of the stator end faces two sleeve portions that are concentric with the air gap and surround the overhang winding parts of the stator and an insulating end cover rigidly and sealingly secured by bonding onto said sleeve



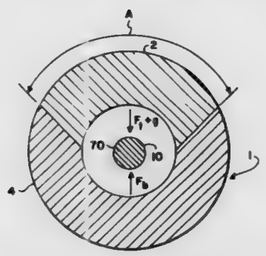
portions in order to enclose said overhang winding parts, a hardening compound at each stator end engaging and holding the overhang winding parts in a fixed position;

c) the whole stator with its embedded windings being inserted over the air gap tube in a removable manner by means of first and second insulating end covers said first insulating end cover being connected at one end of the motor stator to the respective sleeve portions and engaging against said pump rotor housing and said second insulating end cover being connected at the other end of the motor stator with the respective sleeve portions and abutting on a rear rotor bearing support that is integral with said air gap sleeve.

5,117,139
SUPERCONDUCTING BEARINGS WITH LEVITATION CONTROL CONFIGURATIONS

Yury Flom, Silver Spring, and James D. Royston, Columbia, both of Md., assignors to The Unites States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 17, 1991, Ser. No. 691,609
Int. Cl.[5] H02K *1/14*; F16C *32/04*
U.S. Cl. 310—90.5 **7 Claims**



1. A superconducting rotating assembly comprising:

first and second bearing means comprising a material exhibiting superconducting properties, each said bearing means formed as a recess in said superconducting material in the form of a cylindrical, closed-end orifice;

a rotatable member having two extremities aligned along a common axis, each extremity encompassed by one said closed end orifice;

magnet means at each extremity, each magnet means having a polar axis which is collinear with said common axis of said rotatable member, each magnet means thereby presenting a single poleface to a bearing means;

means for maintaining each said bearing means at a temperature where said superconducting properties are manifest;

means for rotating said rotatable member, whereby each said magnet means is levitated and is adapted to rotate in a stable non-contacting position by repulsive fields generated by said first and second bearing means;

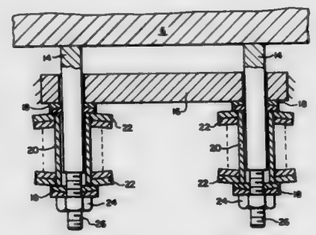
means for sensing the position of said rotatable member relative to each said bearing means; and

means for controlling the levitation forces exerted on said rotatable member by each said bearing means.

5,117,140
STATOR STABILIZING ASSEMBLIES

John B. Sargeant, Oviedo, Fla., and Jan W. Seyler, Guelph, Canada, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 13, 1991, Ser. No. 699,091
Int. Cl.[5] H02K *5/00*
U.S. Cl. 310—91 **9 Claims**

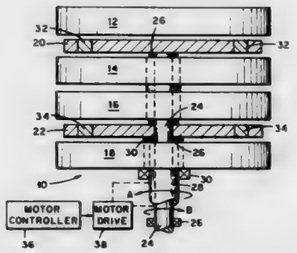


1. In an electromagnetic rotating machine having an annular stator, the stator including a frame having a circumference and laminations secured to the frame and located radially inwardly of the frame, and the stator being mounted on a rigid foundation such that a rotor of the machine has a vertical axis of rotation, the improvement comprising a plurality or stator shape stabilizing devices each connected between said stator frame and the foundation at a respective one of a plurality of spaced points around said stator frame for imposing only outwardly directed radial forces on said frame at said plurality of spaced points in a manner to maintain a circular configuration for said frame, wherein each said device comprises spring means biased for applying only an outwardly directed radial force to said frame of said stator for a range of radial movement of the respective one of said plurality of spaced points relative to the foundation, and stop means defining a limit of inward radial movement of the respective one of said plurality of spaced points of the frame to which said device is connected, wherein each said device further includes a support member secured to the foundation and a stud secured to said frame and projecting radially outwardly from said frame, said stud having a fastening portion, and said spring means being secured between said fastening portion of said stud and said support member.

5,117,141
DISC ROTORS WITH PERMANENT MAGNETS FOR BRUSHLESS DC MOTOR

Robert A. Hawsey, Oak Ridge, and J. Milton Bailey, Knoxville, both of Tenn., assignors to The United States of America as represented by Department of Energy, Washington, D.C.

Filed Jul. 30, 1990, Ser. No. 559,030
Int. Cl.[5] H02K *16/00*; B63H *5/10*
U.S. Cl. 310—114 **5 Claims**



1. A brushless dc permanent magnet motor for driving an autonomous underwater vehicle, said motor comprising:

first and second substantially flat, generally cylindrical stators disposed in side by side relation;

a first substantially flat, generally cylindrical rotor disposed adjacent to said first stator on one side of said stators and a second substantially flat, generally cylindrical rotor disposed adjacent to said second stator on the other side of said stators, each of said rotors including, embedded therein, a plurality of permanent magnets arranged in an annular configuration and an iron ring disposed behind the magnets so as to complete a magnetic flux path between the magnets;

a first shaft connected to said first rotor and a second, concentric shaft connected to said second rotor; and

means for providing rotation of said first and second shafts in opposite directions;

said second shaft and said second rotor including central aligned bores therein and said stators including central aligned bores therein, and said first shaft includes a first portion which is received in said bore in said second shaft and a second portion which extends through said bore in said second rotor and through said aligned bores in said stators, and is connected at the distal end thereof to said first rotor.

5,117,142
PERMANENT MAGNETIZED SYNCHRONOUS MACHINE DESIGNED ACCORDING TO THE TRANSVERSE FLUX PRINCIPLE

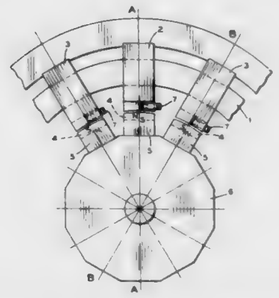
Svante G. A. von Zweygbergk, Kungsbacka, Sweden, assignor to 501 IBK AB, Sweden

Filed Jan. 30, 1991, Ser. No. 648,016
Claims priority, application Sweden, Nov. 20, 1989, 8903876
Int. Cl.[5] H02K *21/12*
U.S. Cl. 310—156 **6 Claims**

1. A permanent-magnetized synchronous machine, operating according to the transverse flux principle, comprising:

a rotor, rotatable about a longitudinal axis thereof, formed from a predetermined number of stellately arranged rotor bars of magnetic material mounted on a rotor hub, a plurality of permanent magnets, equal in number to said predetermined number, each centrally attached to an associated one of said rotor bars and oriented such that an axis of magnetization of each of said permanent magnets is perpendicular to the longitudinal axis of said rotor and that adjacent ones of said permanent magnets have opposite magnetic polarity; and

a stator having a ring winding extending around an outer circumference of said rotor and surrounded by a plurality of stator elements formed of magnetic material and being asymmetric with respect to the axis of magnetization of said permanent magnets, said stator elements being equal

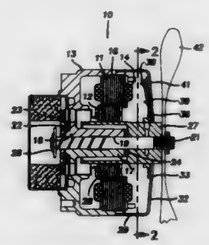


in number to said predetermined number and alternate ones of said stator elements being turned 180° with respect to the axis of magnetization.

5,117,143
ANTI-WINDMILLING MOTOR

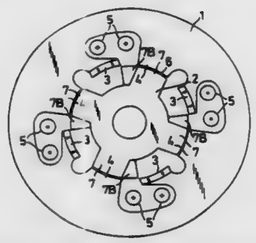
Franklin G. Iddings, Albion, Ind., assignor to Electric Motors and Specialities, Inc., Garrett, Ind.

Filed Mar. 22, 1991, Ser. No. 673,672
Int. Cl.[5] H02K *7/10*
U.S. Cl. 310—191 **7 Claims**



3. An electric motor comprising as components a stator and a rotor, means rotatably supporting the rotor for rotation about an axis relative to the stator and allowing limited axial end play of the rotor relative to the stator, an electrical winding on one of the stator and rotor components arranged to cause rotation of the rotor relative to the stator in a design direction and to cause the rotor to seek a magnetic center between limits of its axial end play when electrically energized, a one-way anti-rotation element on one of said components, a catch surface on the other of said components, said element and surface being constructed and arranged such that said element engages said surface to prevent rotation of said rotor in a direction opposite said design direction while allowing rotation in said design direction when said rotor is axially displaced from said magnetic center and such that said catch surface is axially displaced from and unaffected by said element when said rotor is in its magnetic center position.

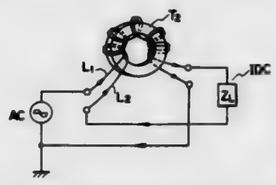
5,117,144
ELECTRIC MOTOR
Vilmos Török, Carl Millers väg 7, 181 34 Lidingö, Sweden
PCT No. PCT/SE89/00443, § 371 Date Feb. 25, 1991, § 102(e) Date Feb. 25, 1991, PCT Pub. No. WO90/02437, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 24, 1989, Ser. No. 651,407
Claims priority, application Sweden, Aug. 25, 1988, 8802972
Int. Cl.[5] H02K *1/24, 1/12*
U.S. Cl. 310—269 **13 Claims**



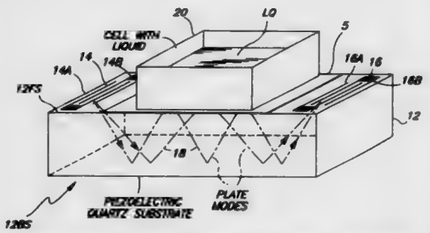
1. An electric motor comprising a first part and a second part which are rotatable relative to another and each of which has a ferromagnetic core and which are separated by an air gap lying between said cores, characterized in that the ferromagnetic core of said first part has provided on a surface thereof facing the air gap, a plurality of magnet pole groups disposed sequentially and peripherally in the direction of mutual rotation of said parts; in that each of said magnet pole groups includes at least one pair of a salient ferromagnetic pole and a salient permanently magnetic pole, which are arranged peripherally in mutually spaced relationship in said rotational direction and which are coupled magnetically to a magnetizing winding for magnetization of both the ferromagnetic and the permanently magnetic pole at the same time and in the same direction, the poles within each magnet pole group as well as of mutually adjacent magnet pole groups having an equal constant pole pitch; in that he ferromagnetic core of the other part s provided on a surface thereof facing said air gap and opposite the magnet pole groups on the ferromagnetic core of the first part with a ring of salient ferromagnetic reluctance poles extending peripherally in said rotational direction with a pole pitch corresponding to twice the pole pitch of the magnet poles on the ferromagnetic core of the first part; in that each of said reluctance poles has a width in said peripheral direction which over a part of the reluctance pole corresponds essentially to the pole pitch of the magnet poles on the ferromagnetic core of the first part and which over the remaining part of the reluctance pole is smaller and corresponds essentially to the peripheral width of the magnet poles on the ferromagnetic core of the first part, in a manner such that each reluctance pole presents a part which projects in a predetermined peripheral direction common to all reluctance poles.

5,117,145
SURFACE-ACOUSTIC-WAVE CONVOLVER
Katsuo Furukawa, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 255,103, Oct. 7, 1988, Pat. No. 4,950,935. This application Mar. 23, 1990, Ser. No. 498,352
Claims priority, application Japan, Oct. 14, 1987, 62-259219
The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—313 R **5 Claims**

1. A surface-acoustic-wave device comprising:
a semiconductor base;
a piezoelectric substrate laid on said base;
at least one transducer laid on said piezoelectric substrate for converting between electrical signal energy and acoustic wave energy traveling across said substrate and having at least two electrical terminals, said transducer presenting a given electrical impedance at said terminals; and
a single impedance matching unit having a single core and a pair of transmission lines wound on said core and connected to said transducer, said lines being magnetically coupled to said core and wound thereon so that magnetic fields are produced in the same direction by means of currents flowing into said lines so as to cancel the capacitive resistance of said transducer and to provide a balance-to-unbalance converting function.

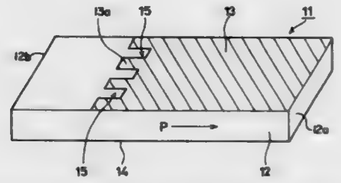


5,117,146
ACOUSTIC WAVE DEVICE USING PLATE MODES WITH SURFACE-PARALLEL DISPLACEMENT
Stephen J. Martin, and Antonio J. Ricco, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Continuation of Ser. No. 187,776, Apr. 29, 1988, abandoned. This application Jun. 21, 1991, Ser. No. 719,654
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—313 R **15 Claims**



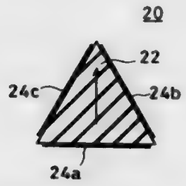
1. A solid-state acoustic plate mode sensor comprising:
(a) a piezoelectric substrate having a pair of opposed surfaces;
(b) input transducer means affixed to said substrate for propagating acoustic plate modes through said substrate;
(c) output transducer means affixed to said substrate for receiving acoustic plate modes propagated through said substrate from said input transducer means;
(d) means for maintaining a liquid in contact over a predetermined portion of either or both surfaces of said substrate, said liquid creating perturbations in the velocity of said acoustic plate modes reflecting internally from said predetermined portion of said surface;
(e) means for applying a rf signal to said input transducer;
(f) means for receiving an rf signal from said output transducer; and
(g) means for determining said velocity perturbations from said rf signals; and
(h) means for monitoring and quantifying the concentration of a chemical species in said liquid resulting from sorption of said species onto or desorption from said surface.

5,117,147
PIEZOELECTRIC VIBRATING DEVICE
Ryuhei Yoshida, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan
Filed Feb. 1, 1991, Ser. No. 649,668
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—320 **6 Claims**



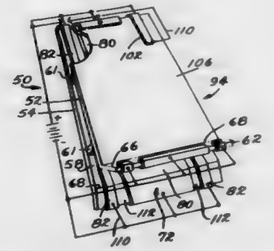
1. A piezoelectric vibrating device utilizing a thickness shear vibration mode, comprising:
a piezoelectric substrate having opposite surfaces including a vibrating region, said substrate being elongated in a longitudinal direction; and
at least one pair of vibrating electrodes formed on said surfaces so as to be opposite to each other through said substrate at least in said vibrating region, at least one of said vibrating electrodes having an edge extending transversely to said longitudinal direction in said vibrating region, said edge having notches which are formed generally in said longitudinal direction.

5,117,148
VIBRATOR
Takeshi Nakamura; Katsumi Fujimoto, and Jiro Inoue, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan
Filed Oct. 31, 1990, Ser. No. 606,286
Claims priority, application Japan, Nov. 7, 1989, 1-290757; Aug. 27, 1990, 2-225842; Aug. 27, 1990, 2-225843; Aug. 27, 1990, 2-225844
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—367 **4 Claims**



1. A vibrator comprising:
a monolithic triangle columnar vibrating body made of a piezoelectric material; and
three external electrodes formed on three side faces of said vibrating body, wherein said vibrating body is polarized in a direction orthogonal to one of said three external electrodes.

5,117,149
PARALLEL PLATE ELECTRON MULTIPLIER WITH NEGATIVELY CHARGED FOCUSSING STRIPS AND METHOD OF OPERATION
John J. Fijol, Longmeadow, Mass., assignor to Galileo Electro-Optics Corporation, Sturbridge, Mass.
Filed May 9, 1990, Ser. No. 521,017
Int. Cl.[5] H01J *43/14, 43/00*
U.S. Cl. 313—103 R **25 Claims**

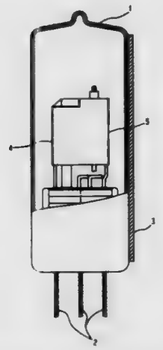


2. An electron multiplier having an input and an output comprising:
dynode surfaces in spaced apart confronting relationship extending between the input and the output having lateral margins defining a dynode area for effecting electron multiplication therebetween lengthwise from the input to the output in response to a lengthwise biasing field of increasing potential gradient; and
biasing means in the form of continuous strips one each extending lengthwise between the input and the output along adjacent lateral margins of the dynode area being isolated therefrom and having a resistance characteristic for establishing biasing fields laterally opposed to each other, said biasing fields for containing electrons within the dynode area and for attracting positive species which may be produced during electron multiplication, said biasing fields having an increasing potential gradient relatively less than the increasing potential gradient for the field of the adjacent dynode.

5,117,150
INTERFERENCE FILTER FOR DEUTERIUM LAMP FOR SPECTRAL ANALYZERS
Werner Schwarz, Gelnhausen; Horst Kremmling, Limeshain; Günter Thomas, Erlensee, and Hans-Georg Lotz, Gründau, all of Fed. Rep. of Germany, assignors to Heraeus Instr. GmbH & Leybold AG, Hanau, Fed. Rep. of Germany
PCT No. PCT/EP90/00114, § 371 Date Sep. 10, 1990, § 102(e) Date Sep. 10, 1990, PCT Pub. No. WO90/09032, PCT Pub. Date Aug. 9, 1990
PCT Filed Jan. 20, 1990, Ser. No. 572,962
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1989, 3902144
Int. Cl.[5] H01J *61/40*
U.S. Cl. 313—112 **6 Claims**

1. A deuterium lamp with a quartz discharge bulb for spectral analyzers, in particular spectral photometers, in which the radiation produced passes through a portion of the bulb, characterized in that
at least that portion of the bulb through which said radiation passes has, on its outer surface,
a multiple interference filter layer of alternating aluminum oxide and either silicon dioxide or magnesium fluoride,
wherein the physical layer thickness of each layer is in the range from 10 to 70 nms and
the first effective layer of the interference filter, facing the bulb surface, comprises aluminum oxide, and

the multiple interference filter layer has an absorption edge at a wavelength from approximately 190 to 200 nm, but has maximally high transmission for wavelengths greater than 200 nm.



5,117,151

COLOR DISPLAY TUBE WITH TWIST CORRECTION MEANS

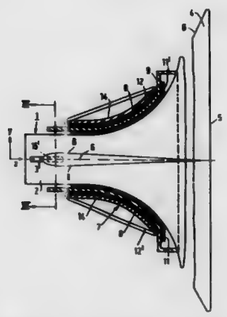
Albertus A. S. Sluyterman; Nicolaas G. Vink, and Fransiscus M. P. P. Doomernik, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 21, 1990, Ser. No. 542,218

Claims priority, application Netherlands, Jun. 23, 1989, 8901589

Int. Cl.[5] H01J *29/76*

U.S. Cl. 313—413 **4 Claims**



1. A color display tube comprising an envelope having a neck portion and including a display screen, said neck portion containing an electron gun system for emitting coplanar electron beams toward the display screen, said electron beams including a central beam substantially coinciding with an axis of the display tube and first and second side beams, said envelope being adapted for supporting a deflection unit for deflecting the electron beams in first and second mutually transverse directions, characterized in that the display tube comprises twist correction means disposed outside the paths of the side beams and proximate to a beam entrance side of the deflection unit, said means producing at a first position along the beam paths first and second mutually opposing magnetic field components for respectively deflecting the first and second outer electron beams transversely of the plane in opposite directions, and producing at a second position along the beam paths third and fourth mutually opposing magnetic field components, in directions opposite to the first and second field components, for respectively deflecting the first and second outer electron beams transversely of the plane in opposite directions.

5,117,152

CATHODE RAY TUBE INCLUDING A MAGNETIC FOCUSING LENS

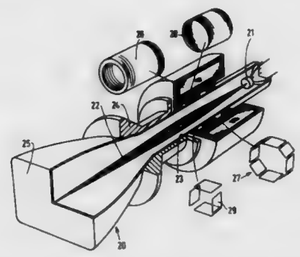
Arne L. Duwaer, Ossining, N.Y., and Willem M. van Alphen, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 59,729, Jun. 9, 1987, abandoned. This application Apr. 10, 1989, Ser. No. 336,528

Claims priority, application Netherlands, Jun. 11, 1986, 8601511

Int. Cl.[5] H01J *29/70*

U.S. Cl. 313—426 **13 Claims**



1. A monochromatic cathode ray tube comprising:

a. an envelope including a neck portion containing an electron gun for producing an electron beam and an enlarged portion containing a luminescent screen for producing a spot when impinged by said beam;

b. a deflection unit disposed around the neck portion for effecting deflection of the electron beam across the screen;

c. a magnetic focusing device disposed around the neck portion for producing a static magnetic dipole field for focusing the electron beam onto the screen, said device being directly adjacent the deflection unit and being spaced from said neck portion; and

d. a system of correction coil means, each coaxially-disposed between the neck portion and the magnetic focusing device for producing a respective dynamic magnetic multipole correction field in cooperation with the static magnetic dipole field to dynamically correct a specific type of distortion which occurs as the electron beam is deflected across the luminescent screen.

5,117,153

CATHODE STRUCTURE FOR ELECTRON GUN

Han-Shin Do, Suwon, Rep. of Korea, assignor to Samsung Electron Services Co., Ltd., Kyunggi, Rep. of Korea

Filed Jul. 13, 1990, Ser. No. 552,130

Claims priority, application Rep. of Korea, Jul. 13, 1989, 89-10282

Int. Cl.[5] H01J *29/48, 29/82*

U.S. Cl. 313—447 **5 Claims**

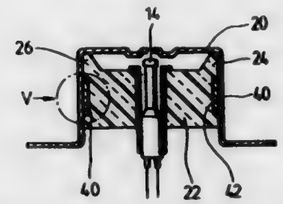
1. A cathode structure for an electron gun of a cathode ray tube, comprising:

a cup shaped control grid made of a conductive material and having a thermion emitting opening on a top face and an insulating block insertion opening on a bottom face;

cathode means disposed substantially within said control grid for emitting thermions through said thermion emitting opening;

an insulating block disposed via said insulating block insertion opening between said control grid and said cathode means for fixedly supporting said cathode means, said insulating block including a plurality of insertion grooves each disposed on an outside surface of said insulating block and said outside surface being normal to the top face of said control grid; and

means for supporting said insulating block on said control grid, said supporting means including a plurality of supporting pieces to be disposed within each of said plurality of insertion grooves, each groove bearing a first portion of a respective supporting piece to be fitted therein, a second portion of the respective supporting piece being attached to an adjacently disposed inside surface of said control grid.



5,117,154

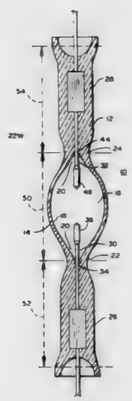
METAL HALIDE DISCHARGE LAMP WITH IMPROVED SHANK LOADING FACTOR

Brian J. Thomas, Phoenix; Daniel C. Briggs, Camillus, and Michael Avdenko, Skaneateles Falls, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Dec. 31, 1990, Ser. No. 636,742

Int. Cl.[5] H01J *17/16, 61/30*

U.S. Cl. 313—634 **8 Claims**



1. A metal halide discharge lamp that includes a tube envelope of a double-ended type having a first neck and second neck axially arranged on opposite ends of a bulb and each respective neck joining a first shaft and a second shaft to the bulb which has a bulb wall that defines an arc chamber which has a chamber length defined by the distance between said necks, predetermined quantities of mercury and a metal halide salt within said chamber, and first and second elongated electrodes of a refractory metal each extending axially through a respective shaft and emerging at a respective one of said necks into said arc chamber, the electrodes having axial tips spaced apart to define an arc gap therebetween, said lamp having a rated power about 40 watts or below that depends on said chamber volume, the quantities of mercury and salt in the chamber, and the arc gap; and wherein each said shaft has a respective shaft segment surface area over a segment of the shaft that extends from the respective neck a distance equal to the length of the arc chamber, wherein said lamp has a rated shaft segment loading factor equal to the rated power of the lamp divided by the sum of the first and second shaft segment areas, said shaft segment loading factor being in the range of 12 to 36 watts per square centimeter.

5,117,155

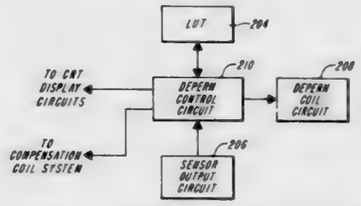
METHOD AND APPARATUS EMPLOYING TWO INDEPENDENT MEANS FOR NULLING AN AMBIENT MAGNETIC FIELD

Frederick T. Bahler, Providence, R.I., assignor to Interstate Electronics Corp., Anaheim, Calif.

Continuation-in-part of Ser. No. 345,575, May 1, 1989, Pat. No. 4,963,789. This application Oct. 3, 1990, Ser. No. 592,691

Int. Cl.[5] H01J *29/06*

U.S. Cl. 315—8 **20 Claims**



1. Apparatus for nulling an ambient magnetic field in a volume including magnetically permeable material comprising,

detection means for detection of said ambient magnetic field in said volume,

compensation means for nulling the ambient field in said volume within a predetermined compensation range of value of the ambient magnetic field, the predetermined compensation range being considered as the range within which the compensation means is effective to null said ambient field,

deperming means for nulling of at least a portion of the ambient field by inserting a magnetizing field independent of said compensation means into said volume, and

controller means coupled to the detection means, compensation means and deperming means for maintaining constant the compensation means when the value of the ambient magnetic field detected by the detection means becomes greater than the predetermined compensation range, and for activating the deperming means to insert its magnetizing field into the volume to establish a new operating point about which the compensation means has a new but predetermined compensation range.

5,117,156

RAPID START FLUORESCENT LAMP HAVING QUICK HOT RESTARTING

Thomas O. Leyh, Bridgeport, and Walter A. Boyce, Fairmont, both of W. Va., assignors to North American Philips Corp., New York, N.Y.

Filed Dec. 6, 1990, Ser. No. 623,138

Int. Cl.[5] H01J *7/44, 13/46*

U.S. Cl. 315—73 **5 Claims**

1. A rapid start fluorescent lamp comprising:

a lamp envelope;

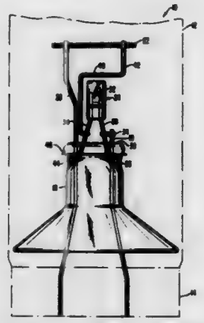
an end cap disposed on one end of said lamp envelope;

a lamp stem having an upper surface disposed within said envelope;

first and second conductive feedthroughs extending through the upper surface of said lamp stem to said endcap for electrical connection thereto;

filament means, said filament means being electrically connected to one of said conductive feedthroughs;

thermally activated switch means, said switch means being electrically connected between said first and second feedthroughs when cold and being disconnected from said first and second feedthroughs when heated; and



said switch means being positioned within said lamp envelope at a level below that of the upper surface of the lamp stem.

5,117,157

BALLAST CIRCUITS FOR DISCHARGE LAMPS

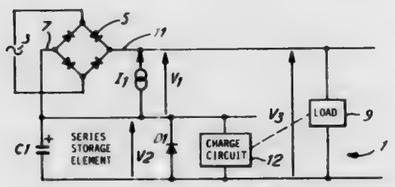
Raymond A. Vos, Enfield, England, assignor to Thorn EMI plc, London, England

Filed Apr. 16, 1990, Ser. No. 508,733

Claims priority, application United Kingdom, Apr. 14, 1989, 8908544

Int. Cl.[5] H05B *37/00*

U.S. Cl. 315—173 **14 Claims**



1. A ballast circuit for the operation of a discharge lamp comprising:

means for deriving a rectified AC voltage from a source of AC supply; a capacitive energy storage device and a load circuit in series across said source of rectified AC supply voltage;

means for providing charge to the capacitive energy storage device from the load circuit in a potential so as to add to the potential from the output of said source of rectified AC supply voltage;

and means for providing a first current path, including a current source, between the capacitive energy storage device and the load circuit, the current path bypassing said means for deriving a rectified AC voltage when the current drawn from the rectified supply approaches zero.

5,117,158

ELECTRONIC BALLAST FOR FLUORESCENT LIGHTS

Abe Arbel, 2444 Benny Crescent, #208, Montreal, Quebec, Canada H4D 2R3

Filed Feb. 4, 1991, Ser. No. 650,282

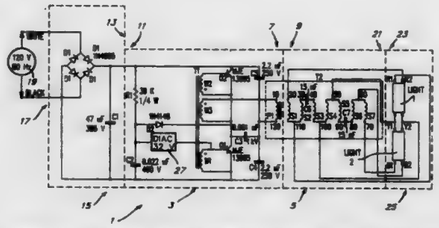
Int. Cl.[5] H05B *41/14*

U.S. Cl. 315—220 **13 Claims**

1. An electronic ballast for a fluorescent light means, said ballast being connected between said fluorescent light means and a source of power for said fluorescent light means, said source of power providing an input voltage having a sinusoidal waveform at a first frequency, said fluorescent light means having input means;

said ballast comprising:

waveform converter means for converting said sinusoidal waveform voltage to a square wave voltage at a second frequency higher than said first frequency, said converter means having input means connected to said source of power and output means; and



distributor means for distributing power to said fluorescent light means, said distributor means having input means connected to the output means of said converter means, said distributor means also having output means connected to the input means of said fluorescent light means;

said distributor means comprising means for converting said square wave voltage to a saw-tooth wave voltage, said saw-tooth wave voltage having a sharp rise at the leading edge of each cycle thereof.

5,117,159

FLAT PANEL TYPE DISPLAY AND METHOD FOR DRIVING THE DISPLAY

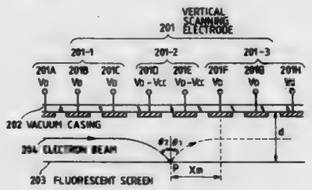
Kaoru Tomii, Isehara; Hiroshi Miyama, Yokohama; Yoshikazu Kawauchi, Kawasaki, and Jun Nishida, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 3, 1989, Ser. No. 431,413

Claims priority, application Japan, Nov. 4, 1988, 63-278701; Nov. 29, 1988, 63-301199

Int. Cl.[5] G09G *1/04*; H01J *29/70*

U.S. Cl. 315—366 **9 Claims**



1. A flat panel type display having a screen comprising:

a vacuum casing;

control electrodes divided in a horizontal direction of the screen in said vacuum casing;

light emitting fluorescent material formed on said control electrodes;

a mesh-like electrode provided in said casing, said mesh-like electrode being spaced from and facing said fluorescent material;

scanning electrodes each divided in a vertical direction of the screen and facing said mesh-like electrode;

an electron source provided in an extension of the space between said light emitting portion and said scanning

electrodes for generating electron beams uniformly or discretely in the horizontal direction of the screen, and

deflection means for deflecting said beams in said vertical direction during a vertical scanning period, said deflection means comprising signal supply means for applying first and second voltage levels to each of said scanning electrodes, said first voltage level being substantially the same as a level of voltage applied to said control or mesh-like electrode and said second voltage level being substantially less than said first voltage level,

wherein said second voltage level is applied sequentially to each scanning electrode for a fixed time period, said fixed time period being at least as long as required for an electron of one of said beams reflected from a position of incidence with said fluorescent material to become substantially parallel to said scanning electrodes, each sequential application of said second voltage level to a successive scanning electrode delayed in time by a predetermined amount different from said fixed time period.

5,117,160

RARE GAS DISCHARGE LAMP

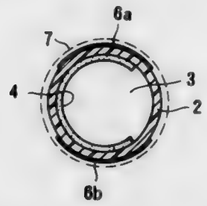
Tsutomu Konda; Seiichiro Fujioka; Satoshi Tamura; Osamu Matsubara, and Shodo Yoshida, all of Osaka, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 19, 1990, Ser. No. 540,326

Claims priority, application Japan, Jun. 23, 1989, 1-161958; Sep. 29, 1989, 1-115236[U]; Dec. 29, 1989, 1-340171; Mar. 28, 1990, 2-80486

Int. Cl.[5] H01J *11/04*

U.S. Cl. 315—326 **8 Claims**



1. A rare gas discharge lamp, wherein a phosphor layer is coated on an inner wall of a tubular glass bulb, a predetermined amount of rare gas containing xenon gas as a main component thereof is sealed and enclosed in said tubular glass bulb, a pair of belt-shaped electrodes are formed on an outer wall of said enclosed glass bulb throughout substantially the entire length of said glass bulb, and an insulating film is coated on said glass bulb between said beltshaped electrodes.

5,117,161

ELECTRONIC BALLAST FOR GAS DISCHARGE LAMPS

Zohar Avrahami, Rehovot, Israel, assignor to Gaash Lighting Industries, Kibbutz Gash, Israel

Filed Jan. 29, 1991, Ser. No. 647,088

Claims priority, application Israel, Feb. 4, 1990, 93265

Int. Cl.[5] H05B *41/24, 41/36*

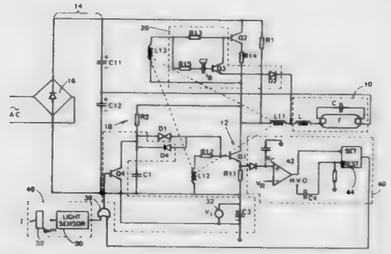
U.S. Cl. 315—226 **8 Claims**

1. An improved electronic ballast inverter for a gas discharge lamp comprising:

oscillator means comprising at least two switching transistors for operating the gas discharge lamp at a high frequency during steady-state operation;

triggering means for triggering the operation of said oscillator means; and

electrical circuit means attached to said oscillator means for gradually increasing the base current of at least one of said switching transistors immediately after start-up in order to



delay the gas breakdown and thereby to produce preheating of said gas discharge lamp during startup.

5,117,162

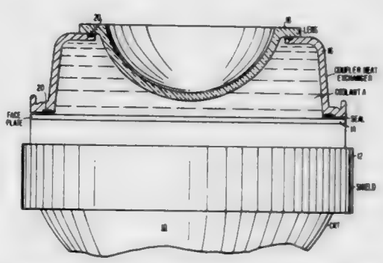
OPTICAL GRADE TRANSFER COOLANT FOR PROJECTION TELEVISION RECEIVERS

Donald D. Dunham, Sevierville, and Sherilyn M. Coburn, Knoxville, both of Tenn., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 20, 1990, Ser. No. 630,684

Int. Cl.[5] H01J *7/24, 7/26*

U.S. Cl. 313—36 **4 Claims**



1. A projection television receiver comprising at least one cathode ray tube for receiving video signals and for projecting images therefrom, said tube including:

a face;

lens means mounted adjacent said face for focusing the images projected by said tube; and

coolant means between said lens means and said face for absorbing and dissipating heat from said tube;

said lens means and said coolant means having substantially the same refractive index for reducing reflections of said images;

wherein said coolant means is an optically clear substantially waterless liquid consisting of an isoparaffinic solvent having a high boiling range.

5,117,163

DRIVE SYSTEM FOR RAILWAY VEHICLE

Lennart Sandberg, Västerås, Sweden, assignor to Asea Brown Boveri AB, Vasteras, Sweden

Filed Oct. 19, 1990, Ser. No. 599,747

Claims priority, application Sweden, Oct. 24, 1989, 8903515

Int. Cl.[5] B60L *15/32*

U.S. Cl. 318—52 **15 Claims**

1. A drive system for a railway vehicle, comprising:

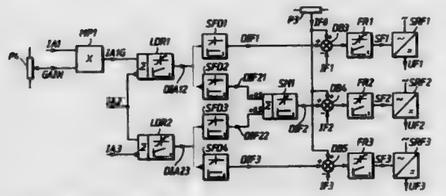
at least a first and second dc drive motor;

means for common control of the armature currents supplied to the drive motors;

field control units for individual control of the fields of the drive motors;

a feedback control system for achieving uniform loadsharing between the drive motors by selectively influencing the field of each drive motor in dependence of a comparison between the armature currents of the drive motors;

a multiplier adapted to generate a product signal which is the product of the armature current of the first drive motor and a signal with a settable value; and



said feedback control system being responsive to said product signal for increasing the other armature currents to a maximum level while maintaining the first armature current at a reduced level for reducing the torque of the first drive motor to ensure that the axle of the first drive motor rotates without slipping thereby utilizing the speed of the axle as a reference for true speed.

5,117,164

LINEAR DRIVING APPARATUS

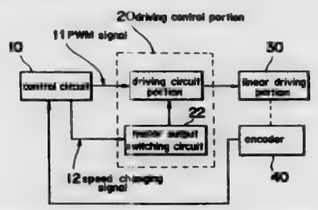
Hiroshi Ishii, Kashihara, and Masaaki Ozaki, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 6, 1989, Ser. No. 431,783

Claims priority, application Japan, Nov. 30, 1988, 63-304358

Int. Cl.[5] H02P *5/28*; G03G *15/00*

U.S. Cl. 318—135 **2 Claims**



1. A linear driving apparatus of a closed loop type, comprising;

linear driving means for moving an object in alternate directions;

speed setting means for generating a speed setting signal which develops a series of speed patterns for returning said object to an initial position at a high acceleration speed after said object has been moved at a constant speed from said initial position, and also, for generating a speed switching signal which determines whether the present speed setting operation of said object is in said constant speed condition or in said high acceleration condition; and

driving control means which controls said linear driving means in accordance with said speed setting signal, and simultaneously, varies the driving output of said linear driving means in accordance with said speed switching signal for precisely controlling the driving output of said linear driving means in both said constant speed condition and said high acceleration condition by freely changing between said constant speed condition and said high acceleration condition.

5,117,165

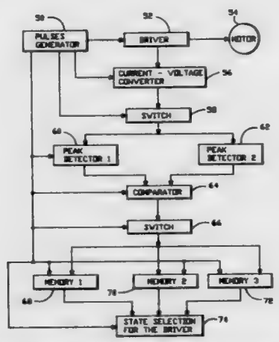
CLOSED-LOOP CONTROL OF A BRUSHLESS DC MOTOR FROM STANDSTILL TO MEDIUM SPEED

Alain M. Cassat, Pully, and Laurent Cardoletti, Montreux, both of Switzerland, assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jun. 29, 1990, Ser. No. 546,374

Int. Cl.[5] H02P *6/62*; H02K *29/00*

U.S. Cl. 318—254 **28 Claims**



1. In a brushless direct current motor having multiple windings arranged as a stator and a permanent magnet rotor, apparatus for controlling ordered application of electrical current to the stator windings and measuring the response thereto comprising:

circuit means coupled to said stator windings for selectively establishing current paths through a selected stator winding in response to control signals;

driver means for applying short duration current pulses of first and second opposite polarities to each said selected stator winding and for applying long duration current pulses to said selected stator winding to accelerate said magnetic rotor;

monitoring means for detecting the voltage detected at a current voltage converter connected to the energized phase;

detection means for identifying a rotational position of said magnetic rotor relative to said stator windings based on the sign of the difference between the response to said pulses applied to the same said selected stator winding; and

control means for controlling the periodic application of said short duration pulses based upon said rotational position of said magnetic rotor and for controlling the periodic application and duration of said long duration pulses based upon said rotational position of said magnetic rotor.

5,117,166

CHOPPER CIRCUIT FOR DYNAMIC BRAKING IN AN ELECTRIC POWER CONVERSION SYSTEM

Ajith K. Kumar, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Mar. 28, 1991, Ser. No. 676,643

Int. Cl.[5] H02P *3/12*

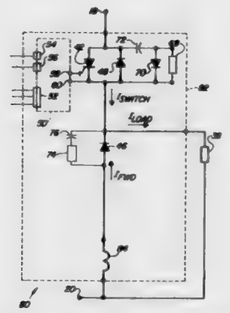
U.S. Cl. 318—362 **14 Claims**

1. A braking resistor circuit for an electric power conversion system comprising:

a power node having positive DC voltage, a ground node having negative DC voltage, a control node having a control voltage, and a switched node;

a thyrister device having its anode terminal connected to the power node, its cathode terminal connected to the switched node, and its gate terminal connected to the control node;

a braking resistor having a given inductance value, and further having a first terminal connected to the switched node and a second terminal connected to the ground node; and



a freewheeling circuit comprising a freewheeling diode connected in series with a di/dt reactor, the freewheeling circuit connected between the switched and ground nodes such that the cathode of the freewheeling diode is directed toward the switched node.

5,117,167

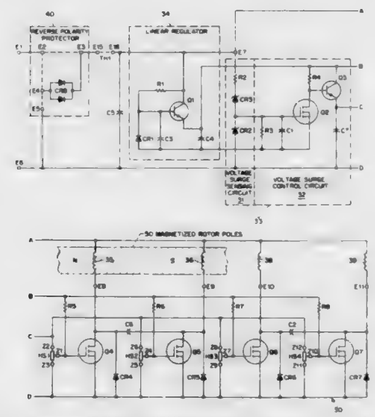
COMMUTATING ENERGY SUPPRESSION CIRCUIT FOR AN ELECTRONICALLY COMMUTATED DC MOTOR

Todd Kazmirski, W. Hurley, N.Y., assignor to Rotron, Incorporated, Woodstock, N.Y.

Filed Nov. 1, 1990, Ser. No. 607,518

Int. Cl.[5] H02P *6/02*

U.S. Cl. 318—439 **14 Claims**



1. An electronically commutated dc motor comprising:

a stator with a plurality of windings;

a permanently magnetized rotor cooperating with said stator;

a plurality of switching transistors, each of which is connected to conduct current to one of said windings in response to a control signal;

a switching control means responsive to a plurality of positions of said rotor for outputting said control signals;

a dc power input means for supplying power potential necessary to conduct current across said windings; and

an over-voltage sensing and control circuit, including means responsive to over-voltage from said dc power input means for providing an output effective to cause conduction of each of the plurality of switching transistors simultaneously,

whereby simultaneous conduction of the switching transistors protects the switching transistors from overvoltage condition by imposing a majority of the voltage across said stator windings.

5,117,168

WINDSHIELD WIPER CONTROL APPARATUS

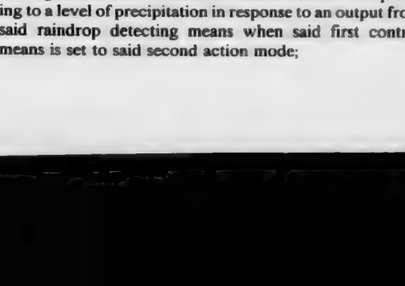
Tetsuya Nomura, Suita, and Yasuhiro Fujita, Kobe, both of Japan, assignors to Fujitsu Ten Limited, Hyogo, Japan

Filed Dec. 19, 1989, Ser. No. 452,379

Claims priority, application Japan, Dec. 19, 1988, 63-321684; Dec. 19, 1988, 63-321685; Jan. 10, 1989, 1-4023; Jul. 5, 1989, 1-174834; Oct. 14, 1989, 1-267797; Oct. 14, 1989, 1-267798; Oct. 14, 1989, 1-267799

Int. Cl.[5] B60S *1/08*

U.S. Cl. 318—444 **8 Claims**



1. A windshield wiper control apparatus comprising:

a rain sensor for detecting a level of precipitation and for providing an output corresponding thereto;

a wiper blade for eliminating matter to be wiped off, said matter being attached to an exterior surface of a windshield;

a wiper driving means for reciprocating said wiper blade on said exterior surface of said windshield;

an action status detecting means for detecting whether or not said wiper blade is in action and for providing an output signal corresponding thereto;

a wiper control means for accumulatively calculating an accumulated amount of the precipitation on the basis of said output of said rain sensor and for outputting a signal commanding the driving of said wiper blade to said wiper driving means when said accumulated amount exceeds a predetermined threshold value; and

a compensating means for reducing said accumulated amount to a smaller level while said wiper blade is in action as compared to while said wiper blade is stopped, in response to said output signal of said action status detecting means.

5. A windshield wiper control apparatus comprising:

a driving means for reciprocating a wiper blade;

a first control means for manually selecting a first action mode wherein said wiper blade is continuously reciprocated and a second action mode wherein said wiper blade is intermittently driven, and for directly driving said driving means;

a raindrop detecting means for detecting raindrops; and

a second control means, disposed between said driving means and said first control means, for controlling said driving means so as to effect an action status corresponding to a level of precipitation in response to an output from said raindrop detecting means when said first control means is set to said second action mode;

wherein a cam switch is provided in connection with said driving means, and a switching status thereof is changed according to whether or not said wiper blade is in a predetermined pause position and power is supplied to said driving means until said wiper blade returns to the pause position when said first control means has selected a stop mode while said wiper blade is in action, and

said second control means feeds an output of said cam switch directly into said first control means when an abnormality occurs in said raindrop detecting means and intermittently drives said driving means with a predetermined intermittent interval.

7. An apparatus for controlling a windshield wiper providing with a driving means for driving a wiper blade which removes objects attached to an exterior surface of a windshield to be wiped off, and a first control means for controlling the driving means directly by manually selecting a first operation mode in which the wiper blade is driven continuously, and a second operation mode in which the wiper blade is driven intermittently, comprising:

a rain sensor for detecting a raining condition, and

a second control means interposed between the driving means and the first control means, for controlling the driving means so as to effect an operating condition corresponding to the raining condition detected by the rain sensor, when it detects that the first control means is set to the second operation mode;

wherein the first control means include a switching means having a plurality of contacts to effect switching states corresponding to the first and second operation modes, and

said second control means generates a signal for discriminating between the switching states and for providing a discrimination signal to the first control means, thereby detecting the switching state of the switching means corresponding to the second operation mode;

wherein the second control means automatically controls the driving means during the first operation mode when a windshield washer liquid is ejected by an ejecting means and shortens a period for detecting the switching state when the power is turned on.

5,117,169

NUMERICAL CONTROL DEVICE FOR A MACHINE TOOL

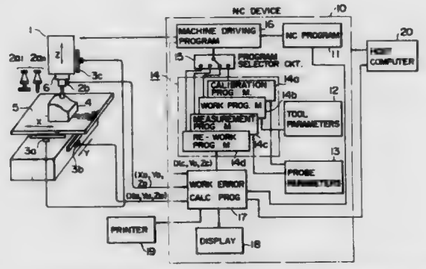
Yoshiaki Kakino, 256-5, Iwakura-Hanazono-cho, Sakyo-ku, Kyoto 606; Shigeaki Tokumo, Asaguchi; Tetsuo Nakamura, Kawasaki, and Torao Takeshita, Nagoya, all of Japan, assignors to Yoshiaki Kakino, Kyoto; Yasuda Kogyo Kabushiki Kaisha, Okayama; Mitutoyo Corporation and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, all of, Japan

Filed Dec. 4, 1990, Ser. No. 622,048

Claims priority, application Japan, Dec. 5, 1989, 1-316241

Int. Cl.[5] G05B *19/42*

U.S. Cl. 318—578 **3 Claims**



1. A numerical control device for a machine tool including working means for machining a workpiece to a target form and dimensions, and measurement means for effecting on-machine measurements of the machined workpiece without changing a position of the workpiece on the machine tool, said numerical control device comprising:

measurement programming means for generating a measurement program for controlling a measurement procedure of said measurement means;

working error calculation means, connected to an output of said measurement means, for determining a working error of form and dimensions as measured by said measurement means with respect to a target form and dimensions as provided by said numerical control device to said machine tool, said working error calculation means judging whether said working error is within a tolerance range or not, and when said working error is judged outside of the tolerance range, whether the working eror is such that a correction re-working of the workpiece is possible or not; and

correction re-working programming means for generating a correction re-working program when said working error is outside of the tolerance range and a correction re-working of the workpiece is judged possible, said correction re-working program controlling said working means in a re-working procedure by which the form and dimensions of the workpiece are corrected to the target form and dimensions.

5,117,170

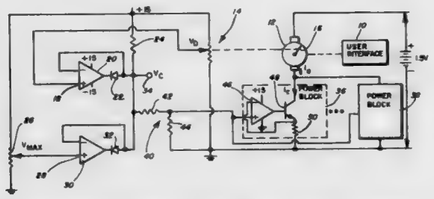
MOTOR CONTROL CIRCUIT FOR A SIMULATED WEIGHT STACK

Martin A. Keane, Arlington Heights, and William H. Englehardt, Wood Dale, both of Ill., assignors to Life Fitness, Franklin Park, Ill.

Continuation of Ser. No. 107,970, Oct. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 812,277, Dec. 23, 1985, abandoned. This application Apr. 20, 1990, Ser. No. 511,830

Int. Cl.[5] A63B *21/24*; H02D *5/16*

U.S. Cl. 318—646 **34 Claims**



1. An exercise machine having a user interface engaged by the user for simulating a weight stack comprising:

a DC motor coupled to the user interface to exert a counterforce that simulates the weight of a weight stack;

means for sensing the displacement of the user interface to provide a displacement signal proportional thereto; and

means responsive to said displacement signal for controlling said motor to provide a force which starts increasing from a first value at a rest position and gradually increases to said counterforce in response to movement of the interface through an initial displacement from said rest position.

5,117,171

METHOD AND APPARATUS FOR CONTROLLING A STEPPING MOTOR

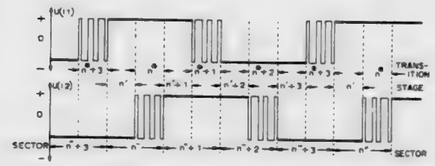
Rainer Bonss, Buechenbach/Roth, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 6, 1990, Ser. No. 534,037

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1989, 3918538

Int. Cl.[5] H02P *8/00*

U.S. Cl. 318—696 **15 Claims**



1. A method of operating a stepping motor having a rotor and two sets of separately energizable stator coils, wherein each possible combination of application of equal voltage in either polarity respectively to said sets of coils defines a stopping position of said rotor and progressive rotation of said rotor is producible by applying waves of alternating polarity of the same value of voltage respectively to said sets of coils which waves differ substantially in phase and only in phase, said method comprising the steps of:

first applying to said sets of coils voltages of substantially equal magnitude and of respective polarities defining a first said stopping position of said rotor:

immediately thereafter applying a sequence of pulses produced by reversals of applied voltage polarity to a first one of said two sets of coils while a second set of said two sets of coils remains energized by continued application of the voltage previously applied thereto in the same polarity as before, said pulses of said sequence being of increasing duty cycle of the voltage polarity not applied to said first set of coils before the beginning of application of pulses, until a predetermined duty cycle between 50% and 100% is reached for a said pulse;

then terminating said pulse sequence by applying the voltage of the polarity of said predetermined pulse duty cycle to said first set of coils while said second set of coils remains energized by continued application of the voltage previously applied thereto in the same polarity as before, whereby said rotor is caused to reach a next one of its stopping positions with reference to said first stopping position;

then, unless it is desired to stop said rotor in said next stopping position, applying a second sequence of pulses produced by reversals of applied voltage polarity to said second set of said two sets of coils, while said first set of coils remains energized by continued application of the voltage previously applied thereto in the same polarity as before, said pulses of said second sequence being of increasing duty cycle of the voltage polarity not applied to said second set of coils during an interval ending with the beginning of application of pulses of said second sequence of pulses thereto, until said predetermined duty cycle between 50% and 100% is reached;

then terminating said pulse sequence by applying the voltage of the polarity of said predetermined pulse duty cycle of said second sequence of pulses to said second set of coils, while said first set of coils remains energized by continued application of the voltage applied thereto in the previous method step in the same polarity as in said previous method step, said rotor being caused, by this method step and the method step previous thereto, to reach a next one of its stopping positions, and then

either stopping said rotor by continuing the application of voltages as specified in the preceding method step or cyclically repeating the foregoing steps of applying a sequence of pulses and terminating a pulse sequence, in the order above set forth, until a desired stopping position is reached and then stopping said rotor there by continued application of voltages applied in a pulse sequence termination method step without change of polarity.

5,117,172

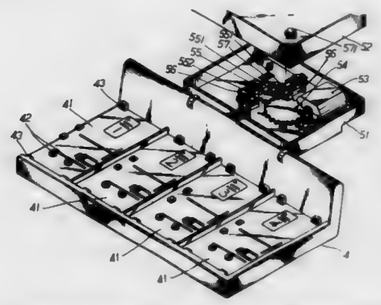
CONTINUOUS BATTERY-CHARGING REPLACING DEVICE

Stephen Chen, No. 52, Lane 563, Chang Tzao Road, Changhua, Taiwan

Filed Nov. 29, 1990, Ser. No. 619,551

Int. Cl.[5] H01M *10/46*

U.S. Cl. 320—15 **5 Claims**



1. A continuous battery-charging replacing device for use with a charging device having a charge condition sensor included therewith, comprising

a seat member having a plurality of engaging seats suitable for receiving batteries to be charged having at least two conductive terminals for each of said engaging seats;

a switch control device suitable for connection to the charging device and pivotally connected to said seat member;

and a circuit control device connected to operate said switch control device;

said switch control device including

a base and cover attached to said seat member and having located therein

a drive motor and a reducing gear set connected thereto and driven by said drive motor;

an activating member connected to and driven by said reducing gear set,

a plurality of microswitches sequentially activated by said activating member;

said activating member having a gear meshing with said reducing gear set to rotate said activating member and at least three activating rods disposed respectively above and below said gear for activating said microswitches in sequence for controlling the connection of power from the charging device to said conductive terminals of said engaging seats, charging the batteries in said engaging seats in turn until all batteries are completely charged.

5,117,173

INTEGRATED BATTERY CYCLE COUNTER

Elio J. Oliva, Pembroke Pines; Vernon Meadows, Coral Springs, and Lilbert S. Hawkins, III, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 22, 1991, Ser. No. 658,811

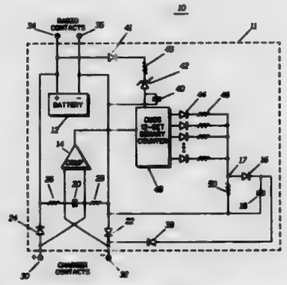
Int. Cl.[5] H01M *10/44*

U.S. Cl. 320—21 **27 Claims**

1. A battery cycle counter, comprising:

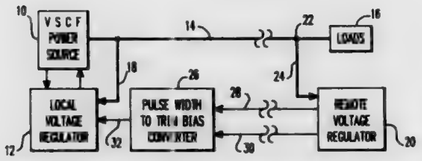
a rechargeable battery having supply and charger contacts;

circuit means for providing an input signal when said rechargeable battery is being charged;
a counter means responsive to said input signal which increments a cycle count, said counter means having input and output ports; and



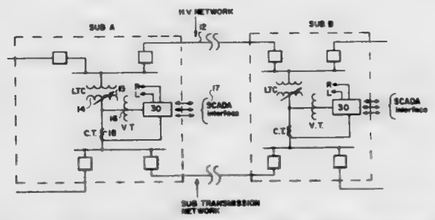
analog output means comprising a parallel impedance network coupled to said counter means output ports for providing a unique analog output signal indicative of said cycle count.

5,117,174
ELECTRIC POWER SYSTEM WITH LINE DROP COMPENSATION
Leland L. Kessler, American Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Oct. 3, 1989, Ser. No. 416,565
Int. Cl.[5] H02P 9/00
U.S. Cl. 322—21 **8 Claims**



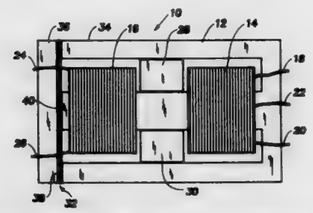
1. An electric power system having line drop compensation, said system comprising:
a controllable electric power source having an output for supplying voltage to a power bus;
a local voltage regulator for monitoring the output voltage of said power source and for producing a control signal representative of a desired nominal output voltage of said power source;
a remote voltage regulator for sensing voltage on said power bus at a point of regulation located away from said power source, and for producing a pulse width modulated signal having a duty cycle representative of the voltage at said point of regulation;
a pulse width to trim bias converter for receiving said pulse width modulated signal and for producing a trim signal having a magnitude representative of the duty cycle of said pulse width modulated signal; and
means for combining said control signal with said trim signal to produce a modified control signal for controlling the output voltage of said power source to produce a predetermined voltage at said point of regulation.

5,117,175
REMOTE BIAS VOLTAGE SETTING LTC CONTROL SYSTEM
Robert D. Pettigrew, 12384 Windtree Blvd., Seminole, Fla. 34642, and Sanh D. Luong, 2437 Old Coach Trail, Clearwater, Fla. 34625
Filed Oct. 16, 1990, Ser. No. 598,218
Int. Cl.[5] G05F 1/14
U.S. Cl. 323—256 **4 Claims**



1. In a alternating current power transmission or distribution system utilizing load tap changing (LTC) transformers having selectively actuable tap selector switches, a remote bias voltage setting LTC control system comprising in combination,
(a) a load tap changing control having a plurality of signal inputs,
(b) means for establishing a voltage band within which an associated transformer must provide an output,
(c) means for providing a center voltage level for said band,
(d) means for providing a remotely adjustable bias voltage with said center voltage to change the center operating level of said band,
(e) a parallel current balancing module and an AC overcurrent relay for enabling paralleling of associated LTC transformers,
(f) supervisory control analog and digital access communication means, and
(g) means for coupling control pulses through said communication means to control said means for providing said remotely adjustable bias voltage.

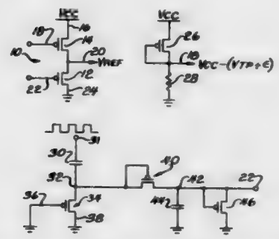
5,117,176
ALTERNATING CURRENT CONDITIONER
Howard H. Bobry, 341 3rd Ave. S., Edmonds, Wash. 98020
Filed Nov. 6, 1990, Ser. No. 620,575
Int. Cl.[5] C05F 3/06; H01F 27/24
U.S. Cl. 323—308 **4 Claims**



1. An alternating current conditioner comprising:
a magnetic core having a gap;
a primary winding about said core;
a secondary winding about said core, said core providing a common magnetic path for fluxes created by said primary and secondary windings, said common magnetic path passing through said gap;
a magnetic shunt providing a shunt path for said primary flux and a shunt path for said secondary flux, said primary flux shunt path passing through said gap and said secondary flux shunt path bypassing said gap;

a capacitor in series with secondary winding; and
a tap on said secondary winding;
means to apply a phase-switched alternating current to said primary winding, said phase-switched alternating current being insufficient to saturate said core, wherein application of said phase-switched alternating current results in a smoothed alternating current being available at said secondary.

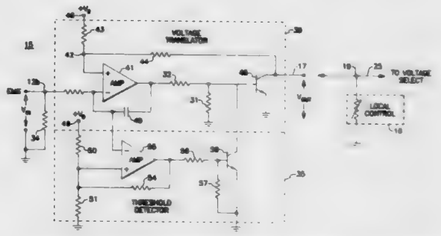
5,117,177
REFERENCE GENERATOR FOR AN INTEGRATED CIRCUIT
S. Sheffield Eaton, Jr., Colorado Springs, Colo., assignor to Ramtron Corporation, Colorado Springs, Colo. and NMB Semiconductor Co., Ltd., Japan
Filed Jan. 23, 1991, Ser. No. 644,904
Int. Cl.[5] G05F 3/20
U.S. Cl. 323—314 **12 Claims**



1. A voltage reference generator for an integrated circuit which receives a source of operating voltage comprising:
a voltage divider having a node for providing an output reference voltage, the divider being coupled between a source of operating voltage and a reference potential, the divider including first and second devices of controllable conductivity;
a first control circuit coupled to control the conductivity of said first device and a second control circuit coupled to control the conductivity of said second device;
said first control circuit providing a first control voltage which is one threshold voltage plus a first variable voltage below the operating voltage wherein variations therein are a function of variations in the operating voltage;
said second control circuit providing a second control voltage which is equal to a negative threshold voltage minus a second variable voltage wherein variations therein are a function of variations in the operating voltage, said second control voltage being configured so that variations in said operating voltage cause said second device to compensate for changes in the operation of said first device, so that the reference voltage developed at said node is independent of changes in the operating voltage and the threshold voltages of the first and second devices of controllable conductivity and is substantially constant.

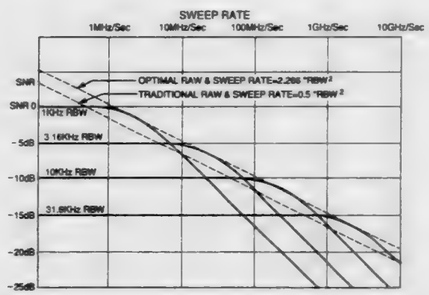
5,117,178
FAIL-SAFE LOAD POWER MANAGEMENT SYSTEM
Roger R. Roth, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 14, 1991, Ser. No. 669,164
Int. Cl.[5] G05F 5/02; G05B 24/02
U.S. Cl. 323—320 **20 Claims**

1. In apparatus having at least one load power circuit controlling the level of electrical power applied to at least one load from a power source, each load power circuit of the type setting the level of power applied to the load as a predetermined function of the voltage applied to a control terminal of the load power circuit and removing power from the load when the voltage at the load power circuit's control terminal is within a first voltage range, an interface circuit having an output terminal for connection to the load power circuit's control terminal and an input terminal for receiving a variable energy management control voltage, said interface circuit including:
(a) a voltage translator means having an input terminal comprising the interface circuit's input terminal and receiving the energy management control voltage thereat and a disable input at which is received a disable signal, and having an output terminal comprising the interface circuit's output terminal, for supplying when the disable signal is absent, a voltage at the interface circuit's output



terminal which is a predetermined function of the energy management control voltage and which includes at least a part of the first voltage range, and for supplying at the interface circuit's output terminal when the disable signal is present at the disable input, a predetermined safety voltage which is outside of the first voltage range; and
(b) a threshold detector receiving the energy management control voltage and providing the disable signal to the disable input of the voltage translator means responsive to the energy management control voltage falling within a second voltage range.

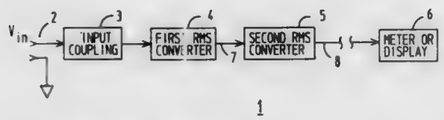
5,117,179
SWEPT SIGNAL ANALYSIS INSTRUMENT AND METHOD
Jay M. Wardle, Seattle; Ronald W. Potter, Snohomish, and John A. Gibbs, Lynnwood, all of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 13, 1990, Ser. No. 493,590
Int. Cl.[5] G01R 27/02
U.S. Cl. 324—77 CS **25 Claims**



1. In a method of spectral analysis comprising the steps:
sweeping a variable frequency oscillator to mix an input signal to an intermediate frequency signal;
filtering the intermediate frequency signal with a filter having a bandwidth BW for resolving a subband of frequencies; and
detecting the spectral power of the intermediate frequency

signal within the filtered subband of frequencies to thereby determine data representing the power of the input signal as a function of frequency;
an improvement wherein;
the sweeping step comprises sweeping at a rate faster than 0.5 BW^2;
and in which the method further includes compensating for errors introduced into said data by the fast sweeping.

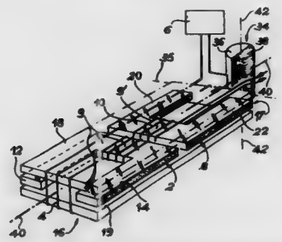
5,117,180
METHOD AND APPARATUS FOR MEASURING RMS VALUES
Ronald L. Swerlein, Longmont, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jun. 6, 1991, Ser. No. 711,010
Int. Cl.[5] G01R *15/10*
U.S. Cl. 324—132 **13 Claims**



1

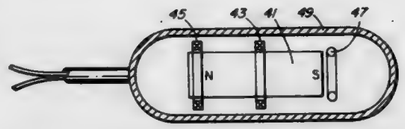
1. An RMS meter comprising:
an RMS converter having a first time constant, having an input for receiving an applied signal whose RMS value is to be measured, and having an output for producing a first signal indicative of the RMS value of the applied signal and which first signal is mixture of AC and DC components according to the relationship between the first time constant and the frequency components of the applied signal;
first RMS conversion means for measuring the AC and DC components of the first signal, the RMS conversion means having a second time constant at least as long as the first time constant, having an input coupled to the output of the RMS converter, and having an output at which appears a DC value proportional to the RMS value of the applied signal; and
means, coupled to the output of the first RMS conversion means, for indicating the RMS value of the applied signal.

5,117,181
INDUCTIVE TRANSDUCER WITH CALIBRATING BALANCING CORE FOR MEASURING MOVEMENT OF AN OBJECT
Henri Clergeot, Massy; Dominique Placko, Creteil, and Michel Plantevin, Aix en Provence, all of France, assignors to Commissariat A l'Energie Atomique, Paris, France
Filed Dec. 12, 1990, Ser. No. 626,632
Claims priority, application France, Dec. 14, 1989, 89 16556
Int. Cl.[5] G01B *7/14*; G01P *3/42*; G01R *35/00*; G21C *17/00*
U.S. Cl. 324—207.18 **9 Claims**



1. Inductive transducer operating by the detection of the variation of the reluctance across a magnetic circuit, characterized in that it comprises two U-shaped ferromagnetic cores (2, 8), positioned back to back in the same plane and a measuring coil (10) having two windings positioned in opposition around the two ferromagnetic cores respectively, (2, 8) for measuring the reluctance of the magnetic circuit through the ferromagnetic cores; two amagnetic material support plates (18, 19) positioned above and below the two ferromagnetic cores (2, 8) for maintaining the latter in place; an exciting coil (4) supplied by a sinusoidal current which encompasses the cores and support plates; and a cylindrical balancing core (34) around an axis of revolution (42) constituted by two half-cylinders (36, 38), whereof one (36) is made from an amagnetic material and the other (38) from a ferromagnetic material, the balancing core (34) being placed close to the open end of one ferromagnetic core (8) and used to calibrate the transducer.

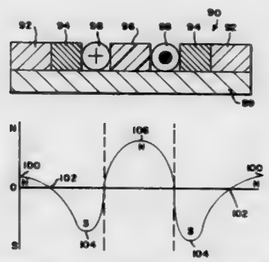
5,117,182
FERROMAGNETIC EDDY CURRENT PROBE HAVING MULTIPLE LEVELS OF MAGNETIZATION
Valentino S. Cecco, and Jon R. Carter, both of Ontario, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada
Filed Jun. 8, 1990, Ser. No. 535,521
The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.
Int. Cl.[5] G01N *27/90*; G01R *33/12*
U.S. Cl. 324—220 **19 Claims**



1. An eddy current probe for detecting defects in a tube made of a ferro-magnetic material, comprising:
a probe housing made of a non-ferromagnetic material and shaped to be introduced into the tube for inspection, said housing having an axis substantially coinciding with the axis of the tube under inspection when the probe is in use;
magnetization means for generating a magnetic field within the probe housing and for magnetizing said tube to partial saturation levels, and
at least two substantially identical eddy current measuring means in said housing, the said eddy current measuring means being spaced apart axially from each other at locations of different saturation levels.

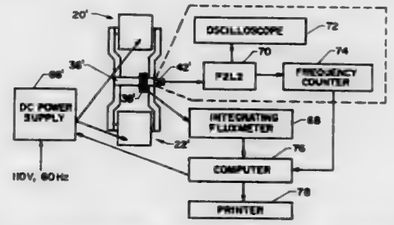
5,117,183
ASYMMETRIC MAGNETIZATION FIXTURE
Alfred J. Santos, Canton Center, Conn., assignor to The Torrington Company, Torrington, Conn.
Division of Ser. No. 482,693, Feb. 21, 1990, Pat. No. 5,097,209.
This application Oct. 18, 1990, Ser. No. 600,647
Int. Cl.[5] G01N *27/72*; G01R *33/12*; H01F *7/20, 13/00*
U.S. Cl. 324—228 **17 Claims**

1. A fixture for magnetizing a magnetic material to produce magnetic poles of non-uniform strength, the fixture comprising:
a support;
an electrically conductive wire disposed in a planar serpentine path on said support forming a plurality of serpentine loops; and
a plurality of magnetic field intensifiers and magnetic field suppressors, the magnetic field intensifiers and magnetic field suppressors being placed in the areas of said support between the serpentine loops of the conductive wire



whereby the strength of adjacent magnetic poles produced in non-uniform.

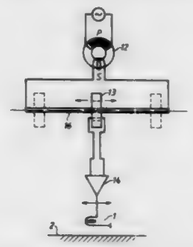
5,117,184
MAGNETIC REMANENCE METHOD AND APPARATUS TO TEST MATERIALS FOR EMBRITTLEMENT
Sidney G. Allison, 104 Laydon Way, Poquoson, Va. 23662; Min Namkung, 112 Villa Way, Tabb, Va. 23602; William T. Yost, 797 Fawn La., Newport News, Va. 23602, and John H. Cantrell, 101 Tuckahoe Trace, Tabb, Va. 23602
Division of Ser. No. 449,211, Dec. 12, 1989, abandoned, which is a division of Ser. No. 210,486, Jun. 23, 1988, Pat. No. 4,912,411.
This application Nov. 2, 1990, Ser. No. 608,504
Int. Cl.[5] G01R *33/12, 27/72*
U.S. Cl. 324—239 **9 Claims**



1. A method of testing a test component for temper embrittlement, the method comprising the steps of:
magnetically saturating the test component with an externally applied, incrementally increased magnetic field,
removing the externally applied magnetic field incrementally,
measuring the retained magnetic induction after removal to determine magnetic remanence,
comparing magnetic remanence of the test component to respective magnetic remanences of similar components having respective known impact toughness values
to determine the impact toughness of the test component, the determined impact toughness being indicative of temper embrittlement in the test component.

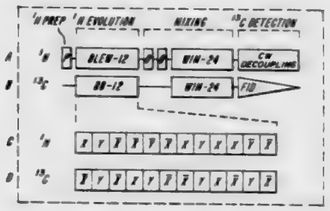
5,117,185
TRANSFORMER-COUPLED TRANSDUCER
Bengt H. Törnblom, Västerås, Sweden, assignor to Tornbloms Kvalitetskontroll AB, Västerås, Sweden
Filed Mar. 28, 1990, Ser. No. 500,514
Claims priority, application Sweden, Mar. 28, 1989, 8901054
Int. Cl.[5] G01R *33/00*
U.S. Cl. 324—262 **9 Claims**

1. In monitoring equipment in which a transducer moves along a path relative to a manipulator over a test object and signals therefrom are transmitted between the transducer and a circuit, for example in equipment for detecting surface cracks in hot steel blanks, the improvement of providing at least one conductor, oriented along the direction of movement of the transducer along the path of movement thereof and at least one



ferrite core fixed to the transducer and surrounding said conductor, for example as sub-devices in a transformer, the ferrite coupling the movable transducer to said circuit by transformer coupling.

5,117,186
METHOD FOR INCREASING RESOLUTION IN TWO-DIMENSIONAL SOLID-STATE NMR HETERONUCLEAR CORRELATION SPECTRA
Douglas P. Burum, Acton, and Anthony Bielecki, Somerville, both of Mass., assignors to Bruker Instruments, Inc., Billerica, Mass.
Filed Oct. 16, 1990, Ser. No. 598,142
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—307 **26 Claims**



1. In a solid-state, two-dimensional heteronuclear correlation NMR experiment involving a first nuclear species and a second nuclear species and having a preparation period, an evolution period, a mixing period and a detection period wherein said first nuclear species is excited with at least one radio frequency preparation pulse during said preparation period and is irradiated with a BLEW-12 radio frequency pulse sequence during said evolution period, a method for improving resolution comprising the steps of:
A. irradiating said second nuclear species during said evolution period with at least one radio frequency pulse sequence composed of twelve 90° radio-frequency pulses having the relative phases:

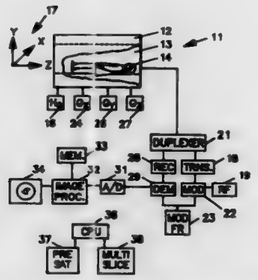
$$-X, Y, -X, X, Y, -X, -X, Y, X, -X, Y, -X,$$

where the phase of an X pulse differs from the phase of a Y pulse by 90° and the phase of an X pulse differs from the phase of a $-X$ pulse by 180°.

5,117,187
LOCALIZED MULTI-REGION MAGNETIC RESONANCE DATA ACQUISITION

Joseph Granot, Holon, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Jun. 26, 1990, Ser. No. 543,492
Claims priority, application Israel, Jul. 4, 1989, 090862
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **24 Claims**

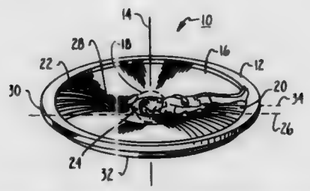


1. A method of acquiring multi-slices in a volume of interest (VOI) during a magnetic resonance (MR) examination, said method comprising the steps of:
determing a VOI in a patient that is a subject of an MR examination,
subjecting the patient to a strong static magnetic field,
presaturating volumes surrounding the VOI leaving only the VOI unsaturated,
said step of presaturating volumes surrounding the VOI comprising the steps of:
applying a pair of RF pulses during the application of a first gradient pulse to saturate volumes juxtaposed to both sides of the said VOI and
applying a second pair of RF pulses during the application of a second gradient pulse to saturate volume juxtaposed to the top and bottom of said VOI,
selecting multiple slices from the VOI,
applying radio frequency (RF) pulses to generate free induction decay (FID) signals in the selected multiple slices,
applying gradient pulses to locate the source of the FID signals, and
processing the FID signals to provide usable data from the MR examination.

5,117,188
QUASI-OPEN MAGNET CONFIGURATION FOR USE IN MAGNETIC RESONANCE IMAGING

Tihiro Ohkawa, La Jolla, Calif., assignor to General Atomics, San Diego, Calif.

Filed Oct. 29, 1990, Ser. No. 605,563
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—318 **18 Claims**

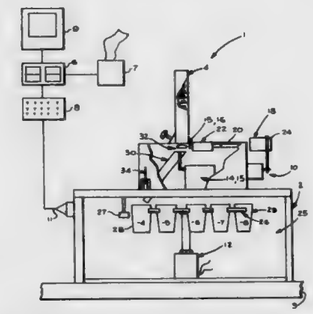


1. A magnet system used for magnetic resonance imaging of an object, comprising:
means for establishing a magnetic field, said establishing means defining a central plane; and
a contoured insert of ferromagnetic material positioned within said establishing means, said insert being substantially dish-shaped and having a front surface contoured to influence said establishing means and create a uniform magnetic field within a target sphere, said target sphere having a portion thereof distanced from said front surface of sufficient size to pass through part of said object positioned on said front surface for imaging said part of said object.

5,117,189
AUTOMATIC TESTING APPARATUS FOR ELECTRICAL SWITCHES

Michael A. Terminiello, Cheshire; Marc P. Asselin, Beacon Falls; Joseph P. Fowler, Newtown; Lawrence M. Hauser, Waterbury, and Raymond E. Sansom, New Milford, all of Conn., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 21, 1990, Ser. No. 482,604
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—415 **1 Claim**

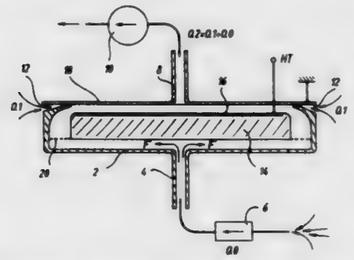


1. A method for testing a double-throw switch (15) having a normally closed contact (36), a common contact (52), a normally open contact (50), and an actuator member (38) to detect, by a redundant technique, a slow transit time of the common contact in moving from the normally closed contact to the normally open contact, comprising the steps of:
driving the actuator of the switch inward by drive apparatus (10, 18) at least until the normally closed contact opens;
detecting the opening of the normally closed contact and thereupon providing a first signal (36, 58);
starting a first timer (84) upon occurrence of said first signal to define a first predetermined time interval;
thereafter, detecting the closing of the normally open contact and thereupon providing a second signal (50, 58);
sending a command to the drive apparatus to operate in an outward direction only if said second signal occurs during said first time interval and not if said second signal occurs after said first time interval (85, 58):
also, upon occurrence of said first signal, stopping said drive apparatus and starting another timing procedure (6) for defining a second time interval;
operating said drive apparatus in said outward direction if and only if said second signal occurs during said second time interval;
blocking operation of said drive apparatus in said outward direction if said second signal occurs after expiration of either or both of said time intervals, thereby identifying that said switch has slow transit time.

5,117,190
ELECTROSTATIC DETECTOR OF AEROSOL PARTICLES

Michel Pourprix, Montlhery, France, assignor to Commissariat a L'Energie Atomique, Paris, France

Filed Jun. 22, 1990, Ser. No. 542,030
Claims priority, application France, Jun. 23, 1989, 89 08400; Feb. 27, 1990, 90 02413
Int. Cl.[5] G01N *27/60*
U.S. Cl. 324—452 **15 Claims**

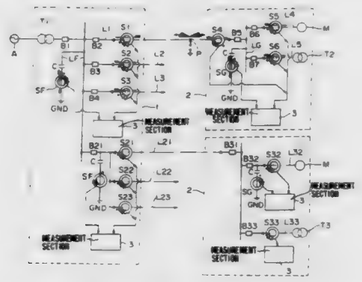


1. Electrostatic detector for aerosol particles contained in an atmosphere to be examined, characterized in that it comprises two parallel, spaced, coaxial conductive disks (16, 18) between which is established an electric field raising them to different potentials, each said disk having a center and a peripheral region disposed radially outwardly of, and completely surrounding, said center, and said two disks delimiting a space which extends between said center and said peripheral region of each said disk, fluid delivery means disposed for delivering the atmosphere to be examined to said space at a location adjacent said peripheral regions of said disks, and a central suction tube (8) communicating with said space adjacent said centers of said disks in order to bring about a flow in said space from the peripheral regions of the disks to the suction tube, of at least part of said atmosphere in the form of a stable, centripetal, laminar flow.

5,117,191
APPARATUS FOR MONITORING DEGRADATION OF INSULATION OF ELECTRICAL INSTALLATION

Akira Saigo, Kimitsu; Shigenari Maezawa, Chiyoda; Tomoaki Kageyama, Kuga; Akio Sera, Kuga, and Fukuso Terunaga, Kuga, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 31, 1990, Ser. No. 560,722
Claims priority, application Japan, Jul. 31, 1989, 1-198556
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—551 **11 Claims**

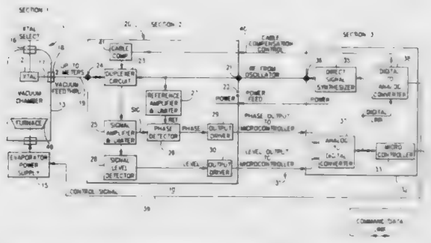


1. An apparatus for monitoring degradation of insulation of an electrical installation comprising:
a first sensor for detecting a progressive wave generated by a partial discharge taking place at a location where the insulation is degraded in the power transmission paths;
a second for detecting the phase of said generated progressive wave as well as external noise;
a third sensor for detecting a reference signal for determining the direction of said progressive wave; and
a measurement section for processing the signals from said first sensor, second sensor and third sensor;
wherein said measurement section determines existence or non-existence of degraded insulation by comparing the phases of the signals from the first sensor and the third sensor when it detects a progressive wave generated at a location where degradation of insulation of an electric cable or an electric equipment is taking place, and it also determines if the signal from the second sensor represents an external noise or degraded insulation and detects the phase of degradation if degraded insulation is involved;
capacitors being arranged between common buses connected with a power cable and ground for each phase of the buses;
said first sensor being adapted to detect progressive waves in a power cable comprising a plurality of power transmission paths;
said second sensor being adapted to detect the phase of progressive waves in lines connecting the capacitors to the ground for each different phase;
said third sensor being adapted to detect a reference signal in lines connecting all the capacitors to the ground,
each of said first, second and third sensors being formed by arranging a detection winding around an annular core and placing an object of detecting operation through the annular core, said object of detecting operation constituting its primary winding,
said measurement section does not proceed with the operation of detecting degradation of insulation caused by a progressive wave once the signal from the second sensor is determined to represent external noise, and
each of the annular cores of said first, second and third sensors showing roughly linear BH characteristics representing a roughly proportional relationship between its magnetomotive force and magnetic flux density and an almost constant magnetic permeability over the entire frequency range from low to high frequency regions.

5,117,192
CONTROL CIRCUITRY FOR QUARTZ CRYSTAL DEPOSITION MONITOR

Clarence Hurd, Baldwinsville, N.Y., assignor to Leybold Inficon Inc., New York, N.Y.

Filed Jan. 12, 1990, Ser. No. 464,371
Int. Cl.[5] G01R *27/02*
U.S. Cl. 324—727 **7 Claims**



1. Monitoring circuit for monitoring at least one resonant frequency of a piezoelectric crystal on which a film of material is being vacuum deposited to control a source of vapors of said material; the monitoring circuit comprising:
a) controllable frequency generating means for generating a drive signal at a frequency, independent of the crystal

resonance frequency, selected within a band of RF frequencies that includes the at least one resonant frequency of said piezoelectric crystal;

b) a duplexing circuit having an input coupled to said frequency generating means to receive said drive signal therefrom, a crystal terminal coupled to said crystal and supplying the drive signal to said crystal and receiving a response signal reflected back from the crystal, and an output terminal at which said response signal appears, the response signal having the frequency of said drive signal but a phase that depends on the proximity of the drive signal frequency to a resonant frequency of said crystal;

c) phase detector means supplied with said drive signal and said response signal and having a phase output signal whose value indicates the relative phase of the drive and response signals, from a negative level through zero to a positive level; and

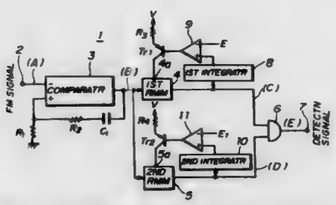
d) controller means coupled to said frequency generating means and said phase detector means for controllably changing the frequency of said drive signal and monitoring the frequency at which said phase detector signal indicates a zero level to identify the frequency of each of said one or more resonances.

5,117,193

DROP-OUT DETECTION CIRCUIT

Hirohisa Yamaguchi, Tokyo, Japan, assignor to TEAC Corporation, Japan

Filed Sep. 20, 1990, Ser. No. 585,600
Claims priority, application Japan, Sep. 25, 1989, 1-248859
Int. Cl.[5] H04N *5/78*
U.S. Cl. 328—120 **6 Claims**



1. A drop-out detection circuit which supplies an output signal indicative of a drop-out within information reproduced from a storage medium when a rectangular wave signal produced from a modulated signal carrying the information reproduced from the storage medium does not supply a trigger pulse within a prescribed pulse duration, said drop-out detection circuit comprising:

first pulse generation means for supplying a first pulse signal having a low level for a prescribed pulse duration when the rectangular wave signal changes from a low level to a high level;

second pulse generation means for supplying a second pulse signal having a low level for the prescribed pulse duration when the rectangular wave signal changes from the high level to the low level; and

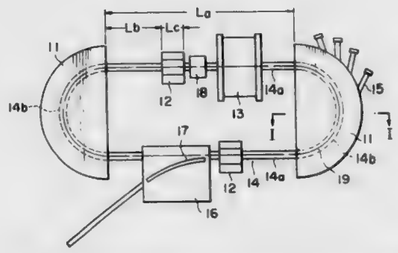
logic gate means for supplying the output signal indicative of the drop-out within the information reproduced form the storage medium, the output signal changing from a low level to a high level when the first pulse generation means supplies the first pulse signal with the high level to the logic gate means and the second pulse generation means supplies the second pulse signal with the high level to the logic gate mans for a time period exceeding the prescribed pulse duration, the output signal continuously having the low level when at least either the first pulse signal or the second pulse signal to be supplied to the logic gate means has the low level for a time period not exceeding the prescribed pulse duration, a first feedback means and a second feedback means, the first feedback means being provided for feeding the first pulse signal back to a first pulse duration setting terminal of the first pulse generation means to maintain a duty factor of the first pulse signal at a predetermined constant level, the second feedback means being provided for feeding the second pulse signal back to a second pulse duration setting terminal of the second pulse generation means to maintain a duty factor of the second pulse signal at a predetermined constant level, the output signal of said logic gate means having the high level constituting a drop-out detection signal for location the drop-out within the reproduced information.

5,117,194

DEVICE FOR ACCELERATING AND STORING CHARGED PARTICLES

Tetsuya Nakanishi; Tadatoshi Yamada; Shunji Yamamoto; Tetsuya Matsuda, and Toshie Ushijima, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 25, 1989, Ser. No. 398,419
Claims priority, application Japan, Aug. 26, 1988, 63-213220; Dec. 27, 1988, 63-327612
Int. Cl.[5] H05H *13/04*
U.S. Cl. 328—233 **20 Claims**



1. A device for accelerating and storing charged particles comprising:

a vacuum duct which has two opposite linear portions and two opposite curved portions respectively connected to said linear portions and which functions to maintain the orbit of revolution of charged particles in a vacuum;

an accelerating means for accelerating charged particles which is disposed on said orbit of said charged particles;

a pair of bending magnets which are respectively disposed in said curved portions of said vacuum duct; and

a pair of quadrupole electromagnets with one of said pair being the only quadrupole electromagnet disposed in one of said linear portions and the other of said pair being the only quadrupole electromagnet disposed in the other of said linear portions and at least one of said pair being disposed at a position at a given distance from the center of the corresponding linear portion.

5,117,195

DATA REFERENCED DEMODULATION OF MULTIPHASE MODULATED DATA

Clyde Robbins, Maple Glen, Pa., assignor to General Instrument Corporation, Hatboro, Pa.

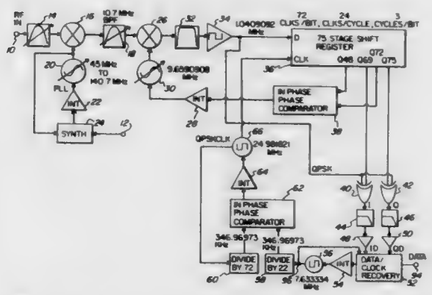
Filed May 17, 1991, Ser. No. 701,772
Int. Cl.[5] H04L *27/22*
U.S. Cl. 329—307 **20 Claims**

1. A method for recovering differentially encoded multiphase modulated digital data comprising the steps of:

receiving an analog carrier containing differentially encoded multiphase modulated data;

converting the received carrier to a digital waveform at an intermediate frequency that is a multiple of a bit frequency at which the multiphase data is modulated;

sampling said digital waveform at a clock rate that is a multiple of said intermediate frequency to obtain a prior portion of the waveform; and processing said prior portion of the waveform with a current portion thereof to recover phase components of said modulated data.

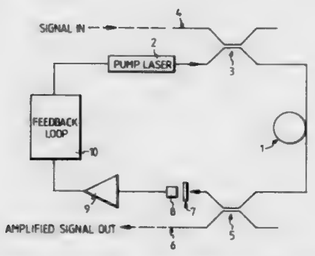


5,117,196

OPTICAL AMPLIFIER GAIN CONTROL

Richard E. Epworth; Kevin C. Byron, both of Stortford; Robert A. Baker, and Nigel Taylor, both of London, all of England, assignors to STC plc, London, England

Filed Apr. 23, 1990, Ser. No. 512,960
Claims priority, application United Kingdom, Apr. 22, 1989, 89009222
Int. Cl.[5] H01L *15/00*; H01S *2/20, 3/13*
U.S. Cl. 359—333 **9 Claims**



1. An optical amplifier with automatic gain control including an input port for an optical signal to be amplified, means for achieving amplification of the optical signal, means for extracting a portion of the amplified signal, an output port for the remainder of the amplified optical signal, and feedback loop means for employing the extracted portion whereby to maintain the output amplified optical signal constant, the extracted portion comprising spontaneous emission at a control wavelength, or band of wavelengths, different to the wavelength, or band of wavelengths, of the output amplified optical signal.

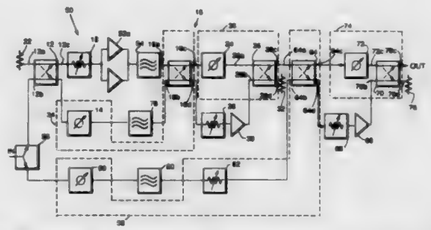
5,117,197

HIGH-POWER FEED-FORWARD MICROWAVE AMPLIFIER APPARATUS WITH OUT-OF-BAND INTERMODULATION PRODUCT SUPPRESSION

Rui T. Hsu, Torrance, and Thomas M. Straus, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 9, 1990, Ser. No. 612,166
Int. Cl.[5] H03F *1/26*
U.S. Cl. 330—149 **8 Claims**

8. In a feed-forward amplifier including a main amplifier for amplifying an input signal having a predetermined bandwidth, error signal generator means for generating an error signal corresponding to distortions introduced into the input signal by the main amplifier means, and error amplifier means for amplifying the error signal, the improvement comprising bandpass filter means connected in circuit between the main amplifier means and the error amplifier for suppressing or blocking intermodulation products generated in the main amplifier which are substantially outside the anticipated bandwidth of the input signal.

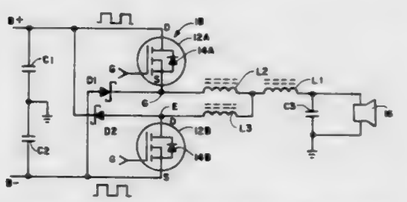


5,117,198

CLASS D MOSFET AMPLIFIER AND VOLTAGE SUPPLY BALANCE CIRCUIT THEREFOR

Kenneth Morenz, 2790 Loker Ave., San Diego, Calif. 92008

Filed Apr. 8, 1991, Ser. No. 681,367
Int. Cl.[5] H03F *3/217*
U.S. Cl. 330—251 **6 Claims**



1. A class D amplifier audio output stage comprising:

A source of B+ and B— voltages with respect to a ground potential:

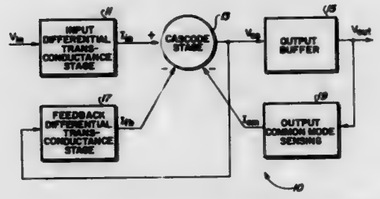
a first and second MOSFET device each having a source, drain and gate elements, said B+ being connected to the drain element of said first MOSFET device and said B— being connected to the source element of said second MOSFET device:

a first, second and third inductance having first and second ends, said first inductance being connected at said first end to said source element of said first MOSFET device and said second end of said first inductance connected to the first end of said third inductance and said first end of said second inductance connected to the drain element of said second MOSFET device and the second end of said second inductance being connected to said first end of said third inductance:

a pair of Schottky diodes each having an anode and cathode, element, said cathode element of a first Schottky diode of said pair being connected to said source element of said first MOSFET device and said anode element of said first Schottky diode, being connected to said source element of said second MOSFET and the anode element of a second Schottky diode of said pair being connected to the drain element of said second MOSFET and said cathode of said second Schottky diode being connected to said drain element of said first MOSFET device: and

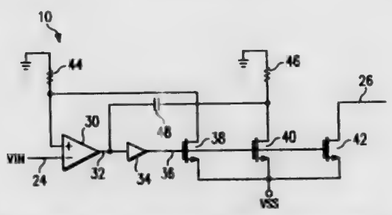
a load being connected to said second end of said third inductance.

5,117,199
FULLY DIFFERENTIAL FOLLOWER USING OPERATIONAL AMPLIFIER
Chorng K. Wang, San Jose; Roomy Khan, Santa Clara, and David A. Freitas, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 27, 1991, Ser. No. 676,904
Int. Cl.[5] H03F *1/45*
U.S. Cl. 330—252 13 Claims



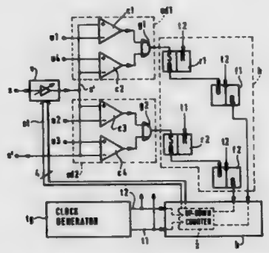
1. A fully differential unity gain operational amplifier comprising:
a cascode stage having a current summing means;
a feedback differential transconductance stage having:
an input for receiving an input signal from said cascode stage;
a unity gain differential mode feedback means; and
an output for providing an output current to said current summing means;
said unity gain differential mode feedback means responsive to said input signal to produce a feedback signal at said output, said feedback signal representative of a differential mode component of said input.

5,117,200
COMPENSATION FOR A FEEDBACK AMPLIFIER WITH CURRENT OUTPUT STAGE
Baker P. L. Scott, III, Austin, Tex., assignor to Crystal Semiconductor Corporation, Austin, Tex.
Filed Dec. 3, 1990, Ser. No. 621,475
Int. Cl.[5] H03F *1/34*
U.S. Cl. 330—253 19 Claims



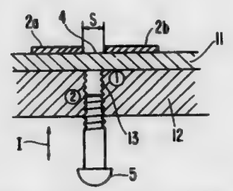
15. A method for compensating a feedback amplifier which receives an input signal at an input terminal and which provides an output current proportional to said input signal, said compensation method comprising the steps of:
a) loading a first node of said amplifier by coupling said first node to a first terminal of an admittance circuit wherein the bandwidth of said amplifier is reduced by the admittance loading at said first node;
b) generating a compensation signal which varies linearly with said output current; and
c) applying said compensation signal to a second terminal of said admittance circuit to thereby provide bandwidth compensation to said amplifier.

5,117,201
AUTOMATIC GAIN CONTROL APPARATUS FOR DIGITAL VARIABLE-GAIN AMPLIFIER
Rainer Luther, Duisburg, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany
Filed Mar. 14, 1991, Ser. No. 669,160
Claims priority, application European Pat. Off., Mar. 23, 1990, 90105500.4
Int. Cl.[5] H03G *3/30*
U.S. Cl. 330—279 19 Claims



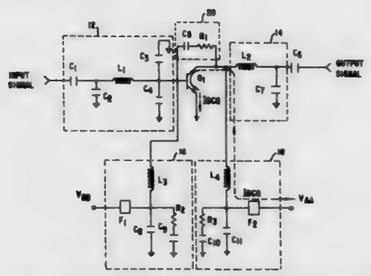
1. Automatic gain control apparatus for automatically adjusting the gain of a variable-gain amplifier, said amplifier providing an amplified signal in response to an input signal, said apparatus comprising:
threshold detection means, responsive to said amplifier, for providing an output signal when the amplitude of said amplified signal falls within a hysteresis region;
latch means, responsive to said threshold detection means, for indicating whether said output signal is provided by said threshold detection means during a sampling period;
memory means, responsive to said latch means, for storing the contents of said latch means; and
varying means, responsive to said memory means, for varying said gain of said amplifier means in accordance with the contents of said latch means as stored in said memory means and including means for decreasing the gain of said amplifier substantially more rapidly than said gain is increased.

5,117,202
AUTOMATIC LEVEL CONTROL CIRCUIT
Yoshiyasu Tsuruoka, Nishinasunomachi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Jan. 24, 1991, Ser. No. 645,409
Claims priority, application Japan, Jan. 24, 1990, 2-15420
Int. Cl.[5] H03G *3/30*
U.S. Cl. 330—279 6 Claims



1. A automatic level control circuit comprising:
an amplifier;
a detector; and
a directional coupler, having a coupling part and operatively connected to said amplifier and said detector, for branching an output of said amplifier to keep constant an output level of said amplifier by detecting said branched output and preventing breakdown of said detector, said directional coupler providing means for changing a degree of coupling of the coupling part for directional coupling.

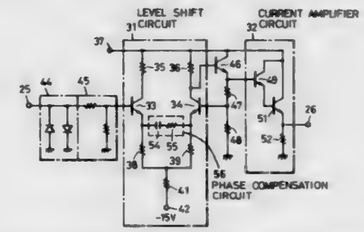
5,117,203
PHASE STABLE LIMITING POWER AMPLIFIER
William R. Tennyson, Utica, N.Y., assignor to General Electric Company, Syracuse, N.Y.
Filed Dec. 13, 1990, Ser. No. 627,011
Int. Cl.[5] H03F *1/34*
U.S. Cl. 330—294 7 Claims



1. A phase stable limiting power amplifier comprising:
a transistor having a collector, an emitter and a base, the transistor for operating in a common emitter mode;
input impedance matching means having an input for receiving an input signal to be amplified and an output coupled to the base of the transistor, the input impedance matching means for matching the input impedance of the amplifier to the impedance of a source of the input signal;
output impedance matching means having an input coupled to the collector of the transistor and an output for providing an amplified signal in response to the input signal, the output impedance matching means for providing the appropriate load impedance between the collector and the emitter of the transistor for achieving desired performance of the amplifier with respect to transmission phase and limiting output power;
first biasing means having an output coupled to the collector of the transistor, the first biasing means for supplying a first biasing voltage to the collector;
second biasing means having an output coupled to the base of the transistor, the second biasing means for supplying a second biasing voltage to the base so that when the first biasing voltage is applied to the collector of the transistor and the second biasing voltage is applied to the base, and the value of the input signal is zero, the value of the voltage of the base of the transistor lies between the value of the voltage of the collector and that of the emitter of the transistor; and
instability suppression means having one port coupled to the base and another port coupled to the collector of the transistor, the instability suppression means for suppressing instabilities in the amplifier.

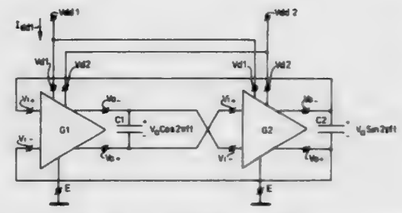
5,117,204
PHASE LOCKED LOOP CIRCUIT
Tadashi Endo; Yasuhiko Sakamoto, both of Tsukuba, and Haruo Yoshida, Gyoda, all of Japan, assignors to Agency of Industrial Science and Technology and Advantest Corporation, both of Tokyo, Japan
Filed May 31, 1991, Ser. No. 708,758
Claims priority, application Japan, Jun. 6, 1990, 2-147625
Int. Cl.[5] H03L *7/00*
U.S. Cl. 331—8 6 Claims

1. A phase locked loop circuit having a super high frequency diode oscillator in which an oscillation output of the super high frequency diode oscillator is input to a source lock counter which operates based on a reference clock from a time base consisting of an atomic frequency standard, a phase difference between a signal corresponding to said oscillation output and a reference frequency signal set in the source lock counter is detected, an error signal corresponding to the phase difference is output from the source lock counter, and an oscillation frequency of the super high frequency diode oscillator is controlled by a feedback of the error signal, said phase locked loop circuit comprising:



a driver circuit including a level shift circuit including high frequency transistors for shifting the level of the error signal input thereto; and
a current amplifier circuit, operatively connected to said driver circuit and the super high frequency diode oscillator, for amplifying the current of the level-shifted error signal and supplying it to the super high frequency diode oscillator as a control signal.

5,117,205
ELECTRICALLY CONTROLLABLE OSCILLATOR CIRCUIT, AND ELECTRICALLY CONTROLLABLE FILTER ARRANGEMENT COMPRISING SAID CIRCUITS
Bram Nauta, Almelo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 12, 1991, Ser. No. 685,240
Claims priority, application Netherlands, May 1, 1990, 9001034
Int. Cl.[5] H03B *5/00*
U.S. Cl. 331—117 FE 14 Claims



1. An electrically controllable oscillator circuit (VCO), comprising:
a first (G1) and a second (G2) balanced transconductance circuit, each having a non-inverting (Vi+) and an inverting (Vi−) input terminal, a non-inverting (Vo+) and an inverting (Vo−) output terminal, a first (Vd1) and a second (Vd2) power-supply terminal and a signal ground terminal (E),
the non-inverting input terminal (Vi+) of the first transconductance circuit (G1) being connected to the inverting output terminal (Vo−) of the second transconductance circuit (G2), the inverting input terminal (Vi−) of the first transconductance circuit (G1) being connected to the non-inverting output terminal (Vo+) of the second transconductance circuit (G2), the non-inverting output termi-

nal (Vo+) of the first transconductance circuit (G1) being connected to the non-inverting input terminal (Vi+) of the second transconductance circuit (G2), and the inverting output terminal (Vo−) of the first transconductance circuit (G1) being connected to the inverting input terminal (Vi−) of the second transconductance circuit (G2),

the first power-supply terminals (Vd1) of the two transconductance circuits being interconnected and constituting a first control-signal terminal (Vdd1), the second power-supply terminals (Vd2) of the two transconductance circuits being interconnected and constituting a second control-signal terminal (Vdd2), and the signal ground terminals (E) of the two transconductance circuits being connected to the signal ground of the oscillator circuit (VCO),

first (C1) and second (C2) capacitance means being connected to the output terminals (Vo+, Vo−) of the first and the second transconductance circuit, respectively, during operation,

the first and the second transconductance circuit each comprising a first (Inv1), a second (Inv2), a third (Inv3) and a fourth (Inv4) transistor pair of a first type and a fifth (Inv5) and a sixth (Inv6) transistor pair of a second type, each having an input electrode and an output electrode, a power-supply electrode and a signal ground electrode,

the input electrode of the first transistor pair (Inv1) being connected to the non-inverting input terminal (Vi+) and the input electrode of the second transistor pair (Inv2) to the inverting input terminal (Vi−), the output electrode of the first transistor pair (Inv1) being connected to the inverting output terminal (Vo−) and the output electrode of the second transistor pair (Inv2) to the non-inverting output terminal (Vo−), the input electrode of the third transistor pair (Inv3) being connected to the output electrode of the first transistor pair (Inv1) and the input electrode of the fifth transistor pair (Inv5) to the output electrode of the second transistor pair (Inv2), said third (Inv3) and said fifth (Inv5) transistor pair having their output electrodes interconnected, the input electrode of the fourth transistor pair (Inv4) being connected to the output electrode of the second transistor pair (Inv2) and the input electrode of the sixth (Inv6) transistor pair to the output electrode of the first transistor pair (Inv1), said fourth (Inv4) and said sixth (Inv6) transistor pair having their output electrodes interconnected, and

the power-supply electrodes of the first, the second, the third and the fourth transistor pair being connected to the first power-supply terminal (Vd1), the power-supply electrodes of the fifth and the sixth transistor pair being connected to the second power-supply terminal (Vd2), and the signal ground electrodes of the transistor pairs being connected to the signal ground terminal (E) of the transconductance circuit (G1, G2),

a transistor pair of the first type comprising two complementary transistors (Tn, Tp) whose main current paths are arranged in series via a connecting point forming the output electrode and whose control electrodes are interconnected to form the input electrode, said series arrangement having end points constituting the power-supply electrode and the signal ground electrode respectively, whereby in operation the transistors can operate in their saturation regions, and

the transistor pair of the second type comprising a structure similar to the transistor pair of the first type but whose input and output electrodes are interconnected,

and a control circuit comprising

a seventh transistor pair (Inv7) of a third type, whose circuit structure corresponds to that of the transistor pair of the second type and in which the active dimensions of the transistors (Tn, Tp) correspond to those of the corresponding transistors (Tn, Tp) of a transistor pair of the first type,

said seventh transistor pair having its power-supply electrode connected to the second control-signal terminal (Vdd2) and its signal ground electrode to the signal ground of the oscillator circuit (VCO), and having its output electrode connected to the control electrodes of a differential transistor pair (Dif) via first (Vb1) and second (Vb2) direct voltage sources of opposite polarity,

the main current paths of transistors (T1, T2) of said differential pair (Dif) being coupled in parallel between the second control-signal terminal (Vdd2) and an input (32) of a first current mirror circuit (IM1) having a supply terminal connected to signal ground,

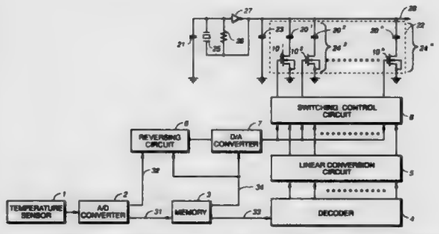
which first current mirror circuit has an output (33) connected to an input (34) of a second current mirror circuit (IM2), which second current mirror circuit has a separate power-supply terminal (36), the first control-signal terminal (Vdd1) of the oscillator circuit (VCO) being connected to an output (35) of said second current mirror circuit.

5,117,206

VARIABLE CAPACITANCE INTEGRATED CIRCUIT USABLE IN TEMPERATURE COMPENSATED OSCILLATORS

Yoichi Imamura, Suwa, Japan, assignor to Seiko Epson Corp., Tokyo, Japan

Filed Dec. 4, 1990, Ser. No. 623,000
Claims priority, application Japan, Dec. 5, 1989, 1-316205
Int. Cl.[5] H01G *4/38*; H03B *5/36*; H03L *1/02*
U.S. Cl. 331—158 **28 Claims**



1. Variable capacitance means formed in an integrated circuit comprising a plurality of capacitor element circuits each having an associated capacitor element, at least some of said capacitor element circuits having a switching element to control the switch-in or switch-out of an associated capacitor element, each of said switching elements undergoing a transient impedance change when activated to either an ON or OFF state, each of said capacitor elements connected on one side to one side of said switching elements and connected on their other side to a common node, the other side of said switching elements connected to a common reference potential, the improvement comprising means providing a plurality of intermediate potential levels to incrementally change the transient impendance of said switching elements when said capacitor element circuits are switched into or switched out of connection relative to said common node during said activation of selected ones of said switching elements whereby fluctuations experienced in the voltage level at said common node during said switching element activation are abated.

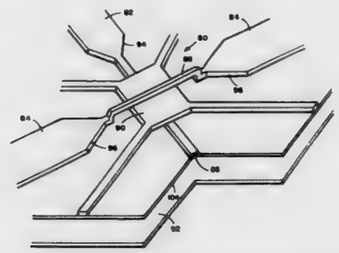
10. A temperature compensated oscillator comprising an oscillator section having a resonator connected to a common node for providing an output frequency, a temperature compensating section to compensate for a change in the oscillator frequency due to a temperature change relative to said oscillator, and variable capacitance means comprising a plurality of capacitor element circuits each having a capacitor element, at least some of said capacitor element circuits having a switching element to control the switch-in or switch-out of an associated capacitor element, said switching elements for switching selected of said capacitor element circuits for connection or disconnection relative to said common node, said temperature compensating section comprising first converter means providing a digital value representative of the temperature conditions at said oscillator, memory means for receiving one portion of said digital value and in response thereto to provide a digital output representative of at least one of said selected capacitor element circuits for connection to said common node, second converter means for receiving the other portion of said digital value to produce at least two different intermediate voltage levels between a source potential and reference potnetial, and voltage control means to receive said digital output to apply a selected one of said intermediate voltage levels to said selected capacitor element circuit to activate said selected circuit switching element to minimize the transient impendance change of said switching elements upon their activation.

5,117,207

MONOLITHIC MICROWAVE AIRBRIDGE

Scott D. Powell, Londonderry, N.H., and David E. Meharry, Lexington, Mass., assignors to Lockheed Sanders, Inc., Nashua, N.H.

Filed Jul. 30, 1990, Ser. No. 559,473
Int. Cl.[5] H01F *3/08*
U.S. Cl. 333—1 **1 Claim**



1. A monolithic microwave transmission line crossover, comprising:

a monolithic integrated circuit substrate;

a lower conductor formed on a surface of the substrate;

a dielectric spacer formed on top of the lower conductor;

a grounded conductor formed on top of the spacer; and

an upper conductor formed as an airbridge over and electrically separated from eh grounded conductor, said airbridge having an integrated circuit construction.

5,117,208

MULTIPOLE CIRCUIT BREAKER

Ramesh G. Nar, Cambridge, Md., assignor to North American Philips Corporation, New York, N.Y.

Filed May 21, 1990, Ser. No. 526,851
Int. Cl.[5] H01H *75/00*
U.S. Cl. 335—8 **9 Claims**

1. A multipole circuit breaker including at least first and second single pole circuit breaker mechanisms, at least said first mechanism comprising:

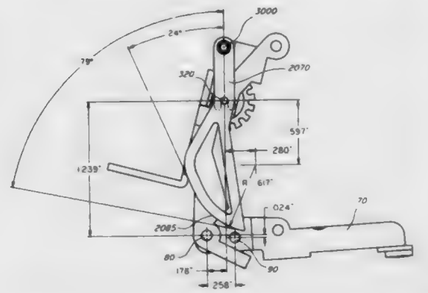
a frame;

a first electrical contact which is substantially stationary relative to said frame;

a contact bar, bearing a second electrical contact, which is pivotably connected to said frame via a pivot pin, said contact bar including a contact bar stop pin which is operable to limit the pivotal motion of said contact bar;

means for pivoting said contact bar, in response to an overcurrent through the circuit breaker mechanism, from a first position, where said electrical contacts are electrically connected, to a second position, where said electrical contacts are electrically disconnected; and

a trip lever which is pivotably connected to said frame, said trip lever including a first convex surface, capable of acting as a camming surface, which is engageable by said contact bar stop pin, the position of the contact bar stop pin on the contact bar and the shape of said first convex surface being chosen to achieve substantially continuous



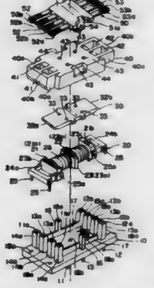
contact between the contact bar stop pin and the first convex surface to produce substantially continuous rotation of the trip lever when the contact bar is pivoted from said first to said second position.

5,117,209

ELECTROMAGNETIC RELAY

Ryuichi Sato, Kyoto, Japan, assignor to Omron Corporation, Kyoto, Japan

Filed Jan. 3, 1991, Ser. No. 637,033
Claims priority, application Japan, Jan. 12, 1990, 2-6006; Mar. 28, 1990, 2-79564
Int. Cl.[5] H01H *51/22*
U.S. Cl. 335—80 **3 Claims**



1. An electromagnetic relay which comprises:

a base having a fixed contact terminal insertion-molded in a prop part erected on an upper surface thereof;

a fixed contact exposed from an upper face of said prop part;

an electromagnetic block provided on the upper surface of said base;

a movable iron piece rotated subsequent to the magnetization or demagnetization of said electromagnetic block; and

a movable contact piece driven by said movable iron piece, so arranged that a movable contact formed in said movable

contact piece is brought into or out of touch with said fixed contact,

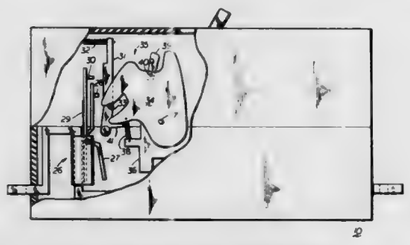
wherein an insulating frame body forming an enclosure with downwardly projecting walls is integrally provided with said movable iron piece, thereby to separate said movable contact piece and fixed contact from said electromagnetic block and movable iron piece, said insulating frame body fixedly enclosing said electromagnetic block and said movable iron piece.

5,117,210

MOLDED CASE CIRCUIT BREAKER FIELD-INSTALLABLE ACCESSORIES

Roger N. Castonguay, Terryville, and David Arnold, Chester, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Feb. 11, 1991, Ser. No. 653,531
Int. Cl.[5] H01H *9/00*
U.S. Cl. 335—172 **9 Claims**



1. A molded case circuit breaker comprising:

a plastic circuit breaker case and cover;

an operating mechanism within said case, said operating mechanism including a latch lever restraining said operating mechanism from separating a pair of contacts within said case during quiescent current conditions within a protected circuit;

an operating handle extending through said cover at one end and connecting with said operating mechanism at an opposite end, said operating handle opening and closing said contacts during said quiescent current conditions;

a thermal-magnetic trip unit within said case displacing a trip bar and articulating said operating mechanism to separate said contacts upon occurrence of overcurrent conditions through said protected circuit; and

a mechanical actuator within said cover interacting with said trip bar and with an accessory unit by means of an electromagnetic latch to displace said trip bar and articulate said operating mechanism when said electromagnetic latch releases said mechanical actuator upon operation of said accessory unit.

5,117,211

COMPACT MOLDED CASE CIRCUIT BREAKER HAVING ANTI-TURN TERMINAL CONNECTORS

Roger J. Morgan, Simsbury; Irenaeus S. Panus, Forestville; Ronald G. Pekral, Southington; Thomas F. Papallo, Jr., Plainville; Robert A. Morris, Burlington; Henry J. Tucholski, Terryville, and Hanson L. Craft, New Britain, all of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 07/546,826, Jun. 29, 1990. This application Nov. 8, 1990, Ser. No. 610,649
Int. Cl.[5] H01H *9/02*
U.S. Cl. 335—202 **5 Claims**

1. A compact industrial-rated circuit breaker comprising:

a plastic circuit breaker case;

a plastic circuit cover attached to said case;

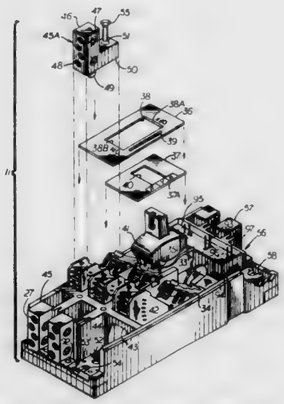
a pair of contacts arranged for automatic separation upon occurrence of an overcurrent condition through said contacts;

an operating handle extending through said cover allowing manual operation of said contacts;

an arc chute proximate said contacts cooling and extinguishing an arc that occurs when said contacts become separated during said overcurrent conditions;

a plurality of line terminal lugs at one end of said circuit breaker case and a corresponding plurality of load terminal lugs at an opposite end of said circuit breaker case;

a corresponding plurality of line terminal straps at said one



end and a corresponding plurality of load terminal straps at said opposite end receiving said line and load terminal lugs said line terminal lugs including means protruding from a bottom thereof providing anti-turn facility to said line terminal lugs both during installation and during said overcurrent condition, said line terminal lugs also including means passing through said bottom attaching said line terminal lugs to said line terminal straps; and

line terminal slot means formed within said line terminal straps under said line terminal lugs receiving said protruding means to provide said anti-turn facility to said line terminal lugs.

5,117,212

ELECTROMAGNET FOR CHARGED-PARTICLE APPARATUS

Shunji Yamamoto, and Tadatoshi Yamada, both of Amagasaki, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jan. 11, 1990, Ser. No. 463,585
Claims priority, application Japan, Jan. 12, 1989, 1-3693; Jan. 13, 1989, 1-4768; Oct. 6, 1989, 1-260083
Int. Cl.[5] H01F *7/00*
U.S. Cl. 335—210 **19 Claims**

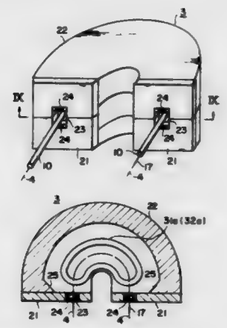
1. An electromagnet for a charged-particle apparatus, comprising:

a principle coil equipped with at least one pair of coils arranged with an equilibrium orbit for charged particles therebetween and extending along said equilibium orbit;

an iron core composed of return yokes surrounding and extending along said principal core, said return yokes providing a predetermined magnetic field density at both ends of said return yokes, and clamping plates provided at said both ends of said return yokes and having cavities through which said equilibrium orbit for charged particles runs; and

steering magnets each composed of at least a pair of coils

which are provided at opposed positions in each of said cavities formed in said clamping plates and which are



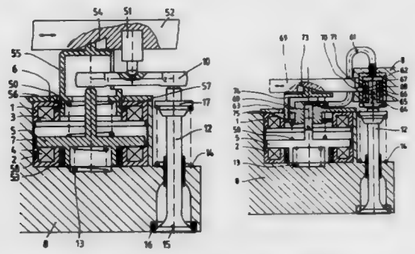
arranged with said equilibrium for charged particles therebetween.

5,117,213

ELECTROMAGNETICALLY OPERATING SETTING DEVICE

Peter Kreuter, Aachen, and Armin Zoschke, Herzogenrath both of Fed. Rep. of Germany, assignors to FEV Motorentechnik GmbH & Co. KG, Aachen, Fed. Rep. of Germany

Filed Jun. 25, 1990, Ser. No. 542,931
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1989, 3920931
Int. Cl.[5] F01L *9/04, 9/02*
U.S. Cl. 335—219 **27 Claims**



1. An electromagnetically operating setting device for at least one oscillatingly movable control element of a displacement engine, comprising:

two switching electromagnets defining switching positions corresponding to opened and closed position of at least one control element;

an armature located between said two electromagnets;

a spring system for oscillating said armature between the two switching positions and said spring system having an equilibrium position between the two switching positions;

a transmission system in communication with said armature and at least one control element, whereby said armature actuates at least one control element between opened and closed positions; and

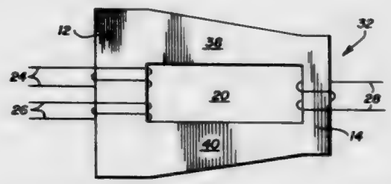
means for varying the transmission ratio of said transmission system.

5,117,214

INTEGRATED MAGNETIC POWER CONVERTER CORE

Clayton L. Sturgeon, Richardson, and Paul A. Jeffries, Plano, both of Tex., assignors to Powercube Corporation, Billerica, Mass.

Filed Jan. 28, 1991, Ser. No. 646,270
Int. Cl.[5] H01F *27/30*
U.S. Cl. 336—170 **1 Claim**



1. A core for an integrated magnetic power converter comprising:

a continuous magnetic structure having first, second, third and fourth legs and a magnetic flux conducting path therebetween;

a primary winding means wound on said first leg;

first secondary winding means wound on said first leg;

second secondary winding means wound on said second leg;

said first leg having a first cross-sectional area and said second leg having a second cross-sectional area, said first cross-sectional area being greater than said second cross-sectional area;

said third and fourth legs disposed parallel to each other and perpendicular to said first and second legs forming a rectangular shaped window;

said third and fourth legs adjacent said first leg having a cross-sectional area substantially equal to said first cross-sectional area of said first leg and said third and fourth legs adjacent said second leg having a cross-sectional area substantially equal to said second cross-sectional area of said second leg; and

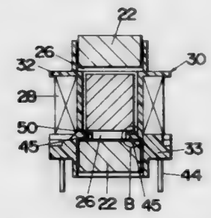
said third and fourth legs between said first and second legs having a continuously variable cross-sectional area in the range between the values of said first and said second cross-sectional areas.

5,117,215

INDUCTIVE DEVICE

Hidenori Kakehashi, Hirakata, and Tomio Oori, Toyonaka, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 16, 1990, Ser. No. 598,319
Claims priority, application Japan, Oct. 18, 1989, 1-272257
Int. Cl.[5] H01F *17/06, 27/30*
U.S. Cl. 336—178 **11 Claims**



1. An inductive device, comprising:

a U-shaped ferrite magnetic core having a base and a pair of opposed legs integrally extending from the opposite ends of said base;

a straight ferrite magnetic core having two ends;

holder means for holding said straight ferrite magnetic core between said pair of opposed legs such that air gaps exist between said two ends of said straight ferrite magnetic core and respective ones of said pair of opposed legs; said holder means comprising a coil bobbin having a bobbin wall bounding a hollow bobbin interior portion, said hollow bobbin interior portion being adapted for receiving said straight ferrite magnetic core, and at least two tabs extending radially inwardly from a lowermost end of said bobbin wall for supporting said straight ferrite magnetic core in spaced relationship from a lower one of said pair of opposed legs;

a winding surrounding said coil bobbin containing said straight core; and

each of said pair of opposed legs having a generally flat surface portion which is adapted for facing engagement with respective ones of the ends of said straight ferrite magnetic core for forming said air gaps.

5,117,216
DISTRIBUTED RTD

Malcolm M. McQueen, Fallbrook, Calif., assignor to Fluid Components, Inc., San Marcos, Calif.

Continuation of Ser. No. 854,802, Apr. 23, 1986, Pat. No. 4,977,385. This application Jun. 25, 1990, Ser. No. 543,356
Int. Cl.[5] H01C *7/10*
U.S. Cl. 338—24 **73 Claims**



1. Distributed RTD sensing means comprising a pair of distributed RTD sensing devices each of which is suitable for interrogating physical phenomena in an extended field and producing a signal output in response thereto, each said sensing devices comprising:

an elongated, thin, tubular outer protective sheath;

an elongated body of electrical insulation material contained within said sheath and extending longitudinally generally coextensively with said sheath;

elongated RTD filament means supported within said insulation body and extending longitudinally within said insulation body and said sheath;

said RTD filament means along its length being physically separated and electrically insulated from said sheath by said insulation body;

said RTD filament means having end means electrically connectable to a source of electrical current and to detection circuitry from at least one end of said sheath; and

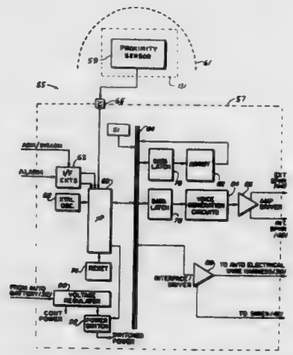
means for heating said RTD filament means;

said pair of RTD sensing devices being arranged in a spaced, generally parallel array and deployed over the extending field having nonuniform thermal response characteristics, one of said sensing devices having its said heating means normally unenergized so that it serves as a thermal reference, and the other of said sensing devices having its said heating means energized when interrogating the physical phenomena in the extended field so as to be response to such thermal response characteristics with a signal output which, when compared with the signal output of said unenergized sensing device, provides physical information about said field.

5,117,217
ALARM SYSTEM FOR SENSING AND VOCALLY WARNING A PERSON TO STEP BACK FROM A PROTECTED OBJECT

Michael Nykerk, Encino, Calif., assignor to Electronic Security Products of California, Canoga Park, Calif.

Continuation of Ser. No. 423,987, Oct. 11, 1989, Pat. No. 4,987,402, which is a continuation-in-part of Ser. No. 260,933, Oct. 21, 1988, Pat. No. 4,897,630, which is a continuation-in-part of Ser. No. 5,873, Jan. 21, 1987, Pat. No. 4,794,368. This application Nov. 7, 1990, Ser. No. 610,402
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[5] B60R *25/10*; B60Q *1/00*
U.S. Cl. 340—426 **22 Claims**



1. Apparatus for warning persons away from an object who move sufficiently near the object to inflect damage thereto comprising

sensing means for sensing the presence of a person sufficiently near said object to inflict damage thereto;

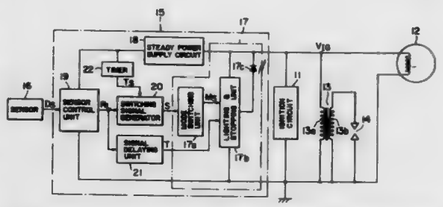
means for electronically issuing a first speech message in response to sensing a person with said sensing means, said first speech message instructing said person to step back from said object; and

means for sounding an alarm if the person sensed by said sensing means does not step back from said object, and for not sounding said alarm if the person does step back from said object.

5,117,218
WARNING SYSTEM FOR AN ENGINE

Asao Sasaki, Chiba, and Yosuke Kubota, Tokyo, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1990, Ser. No. 541,764
Claims priority, application Japan, Jun. 26, 1989, 1-164829; Jun. 26, 1989, 1-164830
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—450.3 **13 Claims**



11. A warning system for warning a lack of a working fluid

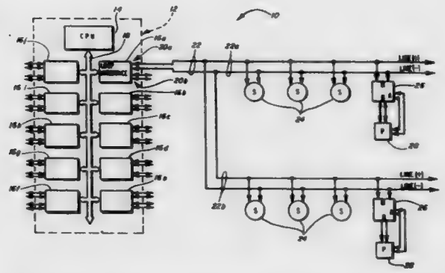
for an engine having an ignition plug, a magneto for generating an ignition power supply including an arc discharging region and a glow discharging region, ignition means responsive to said ignition power supply of said arc discharging region for activating said ignition plug to spark, sensing means for sensing the lack of the working fluid and producing a detection signal and warning means connected to the magneto for warning the lack of the working fluid, comprising:

a controller responsive to said detection signal for actuating said warning means using said ignition power supply of said glow discharging region to provide the warning without deteriorating a performance of said ignition means.

5,117,219
SMOKE AND FIRE DETECTION SYSTEM COMMUNICATION

Lee D. Tice, Bartlett, Ill.; Todd W. Fritz, Jackson, Mich., and Mark A. Kilcommons, Berwyn, Ill., assignors to Pittway Corporation, St. Charles, Ill.

Continuation of Ser. No. 111,811, Oct. 21, 1987, Pat. No. 4,916,432. This application Jan. 30, 1990, Ser. No. 472,225
The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.
Int. Cl.[5] G08B *26/00*
U.S. Cl. 340—518 **11 Claims**



1. A circuit for providing an information carrying signal to a line comprising:

means for providing an electrical signal to the line with a selected parameter representative of the information having a first value for a first predetermined period of time; and

means, coupled to said providing means, for reducing said selected parameter of said signal to a second value still representative of the information, less than said first value, for a second predetermined period of time.

5,117,220
GLASS BREAKAGE DETECTOR

Francis C. Marino, Dix Hills, and Stanley B. Freeman, Jericho, both of N.Y., assignors to Pittway Corporation, Syosset, N.Y.

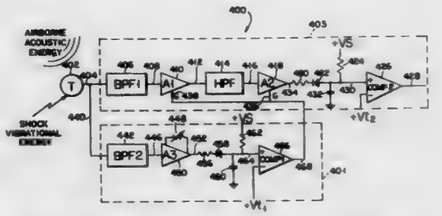
Filed Feb. 11, 1991, Ser. No. 653,887
Int. Cl.[5] G08B *13/00*
U.S. Cl. 340—550 **23 Claims**

1. A method of detecting breaking glass comprising:

detecting by said transducer means structurally-transmitted vibrations of impact on glass for generating a first signal;

gating a circuit in said transducer means responsive to said first signal to enable detection by said transducer means of airborne-transmitted sounds;

detecting by said transducer means airborne-transmitted sounds emitted by breaking glass for generating a second signal; and

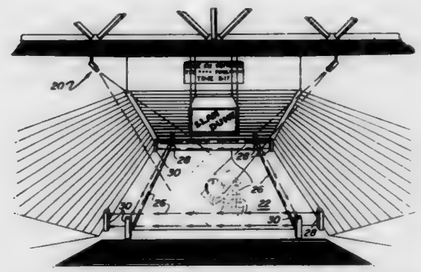


combining said first and second signals in accordance with a time-dependent function to generate an alarm signal indicative of breaking glass.

5,117,221
LASER IMAGE PROJECTION SYSTEM WITH SAFETY MEANS

Robert J. Mishica, Jr., Chanhassen, Minn., assignor to Bright Technologies, Inc., Philadelphia, Pa.

Filed Aug. 16, 1990, Ser. No. 568,395
Int. Cl.[5] G08B *13/18*
U.S. Cl. 340—556 **34 Claims**



1. An image projection system for use at a venue having a field onto which an image is to be projected thereby, said system comprising laser means and control means for generating and projecting said image onto said field, said projection system additionally comprising a safety override means coupled to said control means for determining if a living being is approaching said field and for providing an electrical signal so that said image may be terminated in response thereto, said safety override means comprising means for establishing an enclosure, with an area larger than said field, around the periphery of said field and for providing said electrical signal should a living being traverse said enclosure.

5,117,222
TAMPER INDICATING TRANSMITTER

Jim McCurdy, Middletown, and Frank Pennypacker, Loveland, both of Ohio, assignors to Guardian Technologies, Inc., Cincinnati, Ohio

Filed Dec. 27, 1990, Ser. No. 634,452
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—573 **21 Claims**

1. A tamper-indicating transmitter which can be strapped about an individual's limb or other body part, comprising:

a strap to encircle the individual's limb and hold said transmitter in close proximity to said limb;

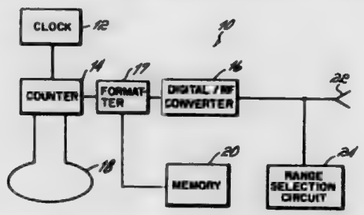
means for generating a strap status signal responsive to tampers to said strap, said strap status signal being indica-

tive of whether said strap is secured about the individual's limb;

a clock for generating clock pulses, each of said clock pulses having a period t;

counting means for counting said clock pulses in response to said strap status signal, said counting means commencing counting of said clock pulses from a predetermined initial count to a predetermined final count, the absolute difference between said predetermined initial count and said predetermined final count multiplied by said period t defining a time period T, said counting means providing a counter output corresponding to the number of pulses counted by said counting means at least once each period t, said counter output being said predetermined initial count whenever said strap status signal indicates said strap is opened, said counter output being an accumulated count during time period T when said strap status signal indicates said strap is closed, and said counter output being said predetermined final count at the expiration of time period T when said counting means has counted to said predetermined final count without an intervening strap status signal indicative of an open strap;

memory means for storing an identification code; and



transmitting means for transmitting data over a predetermined transmission range, said transmitted data including said identification code from said memory means and said counter output of said counting means, said transmitting means transmitting said data at least once within each said period t so that a monitoring unit receiving said transmitted data can determine that the individual to which said tamper-indicating transmitter is strapped is within a monitored area defined by a radius of said transmission range swept about said monitoring unit by comparing said transmitted identification code with a reference identification code equivalent to said identification code stored in said memory and detect said tamper occurring at the commencement of said time period T by initializing a timer within said monitoring unit to said counter value received in said transmitted message, said timer outputs an expected counter output to which said monitoring unit compares subsequent counter outputs in said transmitted messages whereby said monitoring unit detects a tamper when said counter output in said subsequent transmitted message is substantially different from said expected counter output, said monitoring unit calculating an elapsed time from said tamper by multiplying said counter output by said period t and subtracting said elapsed time from the current time.

5,117,223

COMBINATION PORTABLE ALARM SYSTEM AND STORAGE CONTAINER FOR PARTS THEREOF

Harry Tanner, 86 E. Cypress La., Westbury, N.Y. 11590

Filed Feb. 17, 1989, Ser. No. 312,211

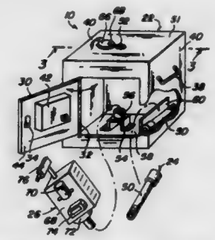
Int. Cl.[5] G08B *13/00*

U.S. Cl. 340—693 **6 Claims**

1. A portable alarm system for a construction site or the like, said alarm system comprising:

a) a cabinet which functions both as a base for said alarm system and as a safe for valuable when when said alarm system is in use and as a storage container for said alarm system when it is not in use, said cabinet having a top well with a central aperture therein; and further comprising:

i) a bracket with a collar, said bracket mounted to a bottom of said cabinet with said collar in vertical alignment with said central aperture in said top wall in said cabinet so that a lowermost pipe section of said stanchion can be supported in said collar when said alarm system is in use and said alarm unit can be supported in said collar when said alarm system is not in use, and



ii) a short partition wall mounted in said cabinet forming a compartment so that said stanchion can be stored therein when said alarm system is not in use;

b) a stanchion supportable by said cabinet when in use and storable within said cabinet when not in use;

c) an alarm unit supportable outside said cabinet on said stanchion when in use and storable within said cabinet when not in use; and

d) control means on said cabinet to control said alarm unit.

5,117,224

COLOR LIQUID CRYSTAL DISPLAY APPARATUS

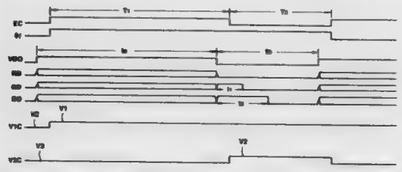
Masao Kawamura, Fuchu, and Ken Yoshino, Koganei, both of Japan, assignors to Casio Computer, Ltd., Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 310,321

Claims priority, application Japan, Feb. 16, 1988, 63-31959; Dec. 7, 1988, 63-309194

Int. Cl.[5] G09G *1/28*; G02F *1/13*

U.S. Cl. 340—703 **18 Claims**



1. A color liquid crystal display apparatus comprising:

color liquid crystal display means, having a plurality of common electrodes, a plurality of segment electrodes crossing said plurality of common electrodes and filters of three primary colors, for displaying a color image by means of a plurality of pixels through said filters; and

drive means for driving said segment electrodes in a gradation according to an image signal having determined non-display periods, and for driving said common electrodes by a scan signal,

said drive means including means for driving said segment electrodes in such a way as to provide, during a non-display period of said image signal, a no-bias period in which a voltage of said common electrodes is set equal to that of said segment electrodes to provide no-bias and which is for setting effective drive voltages of at least two of three types of pixels through said primary color filters different from each other during said non-display period of said image signal.

5,117,225

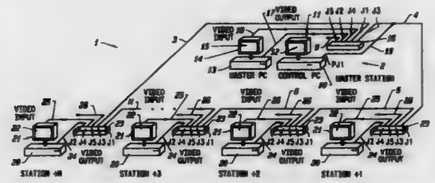
COMPUTER DISPLAY SCREEN MONITORING SYSTEM

Bu-Chin Wang, Saratoga, Calif., assignor to Summit Micro Design, Sunnyvale, Calif.

Filed May 1, 1989, Ser. No. 346,141

Int. Cl.[5] G09G *3/02*

U.S. Cl. 340—717 **7 Claims**



1. A computer display screen monitoring system comprising:

a plurality of stations; and

means, including address decoding means and multiplexing means in each of said stations, for selectively transmitting a video signal from one of said stations to one or more other stations in said system in real time wherein said plurality of stations are coupled in series in a closed-loop fashion in a predetermined sequence, said multiplexing means in each of said stations comprises a first multiplexer for transmitting a video signal received by or generated in said station to the next station in said sequence and a second multiplexer for displaying a video signal received by or generated in said station on a display screen in said station, each of said stations has a predetermined address, said address decoding means in each of said stations comprises means for decoding said address of said station; and means coupling said address decoding means to said first and said second multiplexers for controlling said multiplexers.

5,117,226

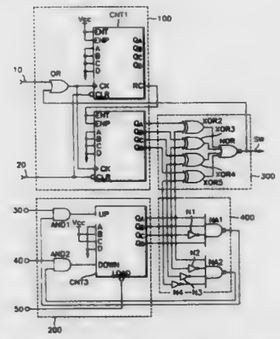
CIRCUIT FOR GENERATING A SCROLL WINDOW SIGNAL IN DIGITAL IMAGE APPARATUS

Kwang-Sup Song, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 15, 1989, Ser. No. 366,538

Int. Cl.[5] G09G *1/06*

U.S. Cl. 340—726 **9 Claims**



1. A scroll window signal generating circuit for use in digital image processing, comprising:

an OR gate coupled to receive a basic clock signal through a first input terminal, for providing a first clock signal;

first and second counter means for receiving a synchronous signal at a clear terminal of each said counter means and receiving said first clock signal from said OR gate at a clock terminal of each of said counter means to produce first output signals;

first and second AND gates for receiving right and left scroll window selecting signals, respectively, generated by a user at each respective first input terminal and rightmost/leftmost scroll window recognition signals at each respective second input terminal to provide first intermediate signals;

third counter means set for use as an up/down-counter according to said right and left scroll window selecting signals and rightmost/leftmost scroll window recognition signals, for receiving a scroll selecting signal at a load terminal and first intermediate signals to generate scroll window setting signals;

a plurality of exclusive OR gates and a NOR gate for receiving said first output signals and said scroll window setting signals, for performing a logical operation on said first output signals and scroll window setting signals to generate a scroll window signal at an output terminal of said NOR gate, said scroll window signal being delivered to a second input terminal of said OR gate for setting a scroll window according to said scroll window signal; and

first and second NAND gates for receiving said scroll window setting signals after inverting said scroll window setting signals through a plurality of inverts, thereby generating, by a logical combination, rightmost/leftmost scroll window recognition signals corresponding to a rightmost/leftmost window of a screen for stopping the movement of said window, regardless of subsequent key inputs from said third counter.

5,117,227

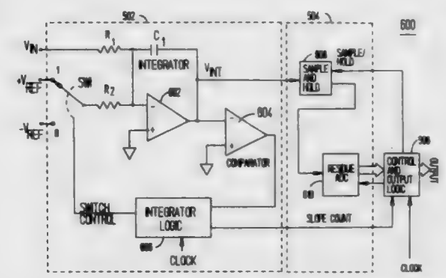
CONTINUOUSLY INTEGRATING HIGH-RESOLUTION ANALOG-TO-DIGITAL CONVERTER

Wayne C. Goeke, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 27, 1991, Ser. No. 767,006

Int. Cl.[5] H03M *1/50*

U.S. Cl. 341—166 **10 Claims**



1. A system for converting an input analog signal into an output digital signal, comprising:

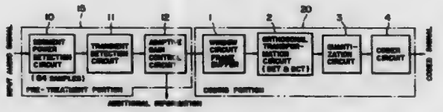
integrating means having an integrator configured to integrate said input analog signal combined with input reference signals, a comparator connected to said integrator configured to monitor polarity changes, and integrator logic connected to said comparator configured to control the application of said reference input signals and provide an integrator count;

a residue ADC adapted to measure the integrated output at the beginning and end of a time interval to derive respective first and second residue voltages; and

control logic connected to said integrating means and said residue ADC, said control logic configured to convert said first and second residue voltages into a residue count and configured to mathematically combine (1) said residue

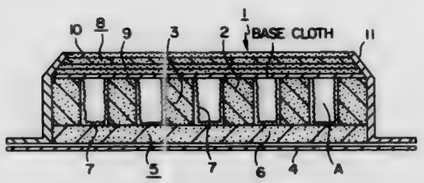
count, and (2) the integrator count within said time interval, so as to derive said output digital signal.

5,117,228
SYSTEM FOR CODING AND DECODING AN ORTHOGONALLY TRANSFORMED AUDIO SIGNAL
Tokuhiko Fuchigami, Yokohama; Masaya Konishi, Yokosuka; Sadahiro Yasura, Ota, and Yasuhiro Yamada, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan
Filed Oct. 17, 1990, Ser. No. 597,706
Claims priority, application Japan, Oct. 18, 1989, 1-271010
Int. Cl.[5] H03M *1/18*; G10L *3/00*
U.S. Cl. 341—200 **8 Claims**



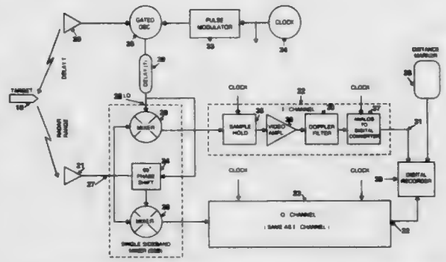
1. A system for coding and decoding an audio signal, said system having a coding apparatus for coding the audio signal by an orthogonal transformation of a block unit, said coding apparatus comprising:
pre-treatment means for obtaining a power level of a segment unit of the audio signal having a time interval shorter than the time interval of said block unit, and comprising adaptive gain control means for performing a predetermined adaptive gain control corresponding to said power level, so as to generate a gain control signal indicative of said predetermined adaptive gain control and a pre-treated audio signal by a result obtained from a comparison between a threshold value and said power level of said segment unit, and wherein said adaptive gain control means sets said threshold value at a trailing edge of said input audio signal to a predetermined value lower than one at a leading edge of said input audio signal; and
coding means including means for receiving said pre-treated audio signal, means for orthogonally transforming said pre-treated audio signal to generate an orthogonally transformed signal, means for quantizing said orthogonally transformed signal, means for quantizing said orthogonally transformed signal to generate a quantization signal, and means for coding said quantization signal to output a coded signal.

5,117,229
ELECTROMAGNETIC WAVE ABSORBER
Yoshio Niioka, 40, Oaza-kunotsuboyama, Nishiharu-cho, Nishikasugai-gun, Japan, assignor to Yoshio Niioka, Aichi, Japan and Marvin Gottlieb, Ill.
Filed Oct. 15, 1990, Ser. No. 598,915
Claims priority, application Japan, Oct. 15, 1989, 1-267463
Int. Cl.[5] H01Q *17/00*
U.S. Cl. 342—1 **13 Claims**



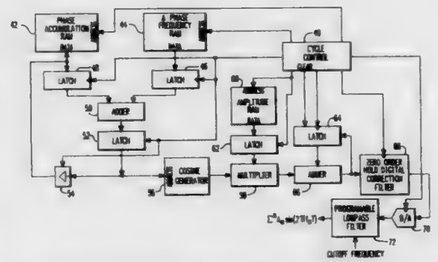
1. A wave absorber comprising an electromagnetic wave absorbing framework having a plurality of cells arranged to define an arbitrary shape of U-shaped hollow spaces adapted to the wavelength of the electromagnetic wave to be absorbed and an electromagnetic wave absorbing ferrite material applied at least on the walls on the cells defining said U-shaped hollow spaces wherein:
said electromagnetic wave absorbing framework is made of a solid, bubbled inorganic material;
an electromagnetic wave transmitting panel made from solid, bubbled inorganic material is provided on said electromagnetic wave absorbing framework;
a weathering resistance coating is formed on the surface of said electromagnetic wave transmitting panel; and
a reinforcing metal frame is provided surrounding said electromagnetic wave absorbing framework and said electromagnetic wave transmitting panel.

5,117,230
ELECTRONIC TARGET RADAR SIMULATOR
John O. Wedel, Jr., Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Apr. 12, 1991, Ser. No. 687,609
Int. Cl.[5] G01S *7/40*
U.S. Cl. 342—169 **4 Claims**



1. A method of electronically simulating an actual missile-radar target encounter for testing said missile-radar comprising the steps of:
collecting data pertaining to target signature at a reduced relative encounter velocity between a modified missile radar and an actual target;
recording data pertaining to independent amplitude and phase signals of said target signature from outputs of said modified missile radar and simultaneously recording data pertaining to target distance;
loading data comprising amplitude and phase measurements pertaining to said target signature into Programmable Read Only Memories in an RF Loop which is part of a simulator;
coupling said modified missile radar to the simulator by means of an anechoic chamber or space hood;
calibrating the RF Loop of the simulator by means of amplitude and phase adjustments so that the outputs of said modified missile radar replicate the outputs of said modified missile radar during data collection at a reduced relative encounter velocity;
scaling the output of said modified missile radar coupled to said simulator to actual encounter velocity;
coupling a missile radar to be tested to the simulator in the same manner as the modified missile radar;
initiating a test sequence wherein the loaded Programmable Read Only Memories modulate the received radar signal in the RF Loop of the simulator,and wherein a clock counter is started;
providing a video output from the missile radar being tested to indicate when the missile radar threshold is exceeded, and
correlating the number of clock pulses counted by said initiated counter with target distance to determine missile lethality.

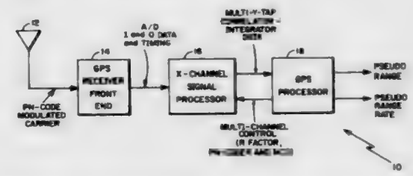
5,117,231
DOPPLER SPECTRUM SYNTHESIZER
John D. Yaron, Cockeysville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Sep. 22, 1989, Ser. No. 411,131
Int. Cl.[5] G01S *7/40*; G09B *9/40*
U.S. Cl. 342—195 **2 Claims**



1. A synthesizer for synthesizing a doppler radar echo signal, said synthesizer comprising:
a first memory for storing n phase increments of n frequency signals to be synthesized;
a second memory for storing n accumulated phase increments;
a first adder, connected to said first and second memories, for adding corresponding phase increments and accumulated phase increments producing a phase value divided into high order and lower order segments;
a third memory connected to said first adder and storing first amplitude components addressed by the high order segment;
a fourth memory connected to said first adder and storing second amplitude components addressed by the lower order segment;
a multiplier connected to said third and fourth memories, and multiplying a first one of the first amplitude components and one of the second amplitude components;
a second adder connected to said multiplier and said third memory, and adding the first amplitude to the multiplied first and second amplitude components producing an amplitude value;
an accumulator connected to said second adder and accumulating the amplitude values; and
a converter for converting the accumulated amplitude values into the doppler radar echo signal.

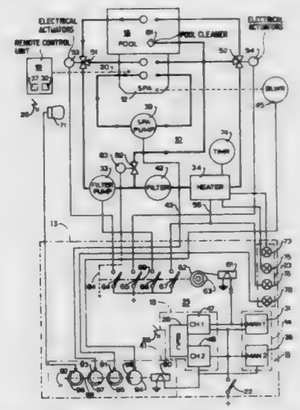
5,117,232
GLOBAL SYSTEM POSITIONING RECEIVER
Robert H. Cantwell, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.
Continuation of Ser. No. 532,834, Jun. 4, 1990, abandoned. This application Apr. 26, 1991, Ser. No. 692,828
Int. Cl.[5] H04B *7/185*; G01S *5/02*
U.S. Cl. 342—357 **46 Claims**

1. A Global Positioning System receiver comprising:
receiving means for performing sampling of a received PN-code modulated carrier to generate in-phase (I) and quadrature-phase (Q) samples;
signal processor means coupled to outputs of said receiving means for removing a doppler frequency and PN-code modulation from said modulated carrier, said signal processor means comprises a plurality of channels, each of said channels including a correlator means, having sign and magnitude input weighting means, for correlating said I and Q samples with an in-phase (IREF) and a quadrature-phase (QREF) components of an internally generated PN-code reference, said correlator means controlled in response to a weighting select signal; and



means coupled to said signal processor means for processing said correlated I and Q samples.

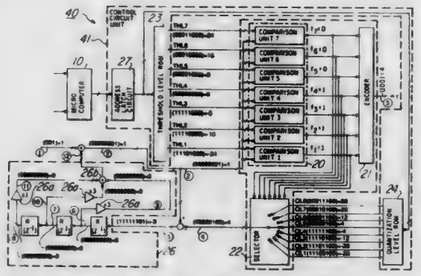
5,117,233
SPA AND SWIMMING POOL REMOTE CONTROL SYSTEMS
Robert E. Hamos, Simi Valley, and William F. Raleigh, Santa Clarita, both of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Oct. 18, 1990, Ser. No. 599,711
Int. Cl.[5] H61H *33/00*; G06F *15/46*; H03G *3/20*
U.S. Cl. 340—825.69 **40 Claims**



1. In a method of controlling equipment for operating a spa, the improvement comprising in combination the steps of:
providing electrical controls for controlling said equipment;
providing a manual stationary control for manual user operation of said electrical controls;
positioning said manual stationary control at a control location beyond manual reach from said spa;
providing a manual remote control including a hand-held wireless remote control unit for manual user operation, at least from inside said spa, of said electrical controls operable by said manual stationary control;
activating said manual stationary control for manual user operation of said equipment through said electrical controls manually from said control location;
activating said manual remote control for manual user operation of said equipment through said electrical controls with said hand-held wireless remote control unit at least from inside said spa; and
maintaining said manual stationary control activated for continued manual user operation of said equipment through said electrical controls manually from said control location while said manual remote control remains

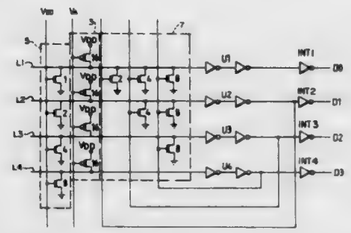
activated for manual user operation of said equipment through said electrical controls interchangeably with said manual stationary control from said control location and with said hand-held wireless remote control unit at least from inside said spa.

5,117,234
SIGNAL MODULATION SYSTEM
Hiroshi Shizawa, Yokohama, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Nov. 20, 1990, Ser. No. 616,169
Claims priority, application Japan, Nov. 24, 1989, 1-305860
Int. Cl.[5] H03M *3/02*
U.S. Cl. 341—143 **5 Claims**



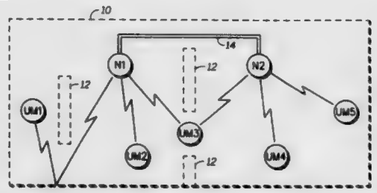
1. A signal modulation system for converting a plural-bit digital input signal to an encoded-bit digital output signal representative of an analog signal having a variable amplitude by employing the delta-sigma modulation technique, said signal modulation system comprising:
input means for receiving a binary plural-bit digital input signal to be converted to an encoded-bit digital output signal representative of an analog signal having a variable amplitude;
memory means having a plurality of threshold values and quantizing values respectively stored therein;
comparator means connected to said memory means and to said input means and having a plurality of comparators for respectively receiving threshold values from a set of threshold values provided by said memory means;
selector means coupled to the output of said comparator means and to said memory means for receiving quantizing values from said memory means and selecting one quantizing value corresponding to the output from said comparator means;
differentiating filter mean connected to the output of said selector means for receiving th selected quantizing value therefrom for quantization noise differentiation to produce an error signal;
arithmetic means disposed between said input means and said differentiating filter means and respectively connected thereto for adding the error signal to the next input signal to be received by said comparator means;
control means for producing a control signal indicative of the desired amplitude of the analog signal to be represented by the encoded-bit digital output signal from said signal modulation system, said control means providing the control signal as an input to said memory means for selecting a predetermined set of threshold values and a predetermined set of quantizing values as stored therein for input to said comparator means and to said selector means respectively; and
encoding output means connected to said comparator means for receiving the results of the comparisons provided by said plurality of comparators and producing an encoded-bit data output signal representative of an analog signal with the desired amplitude.

5,117,235
FEEDBACK COMPARISON TYPE ANALOG-TO-DIGITAL CONVERTER
Jeong Ho-sun, Taegu, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea
Filed Feb. 1, 1990, Ser. No. 473,631
Claims priority, application Rep. of Korea, Feb. 2, 1989, 89-1367
Int. Cl.[5] H03M *1/36*
U.S. Cl. 341—159 **5 Claims**



1. An analog to digital converter which converts analog signals into Nbit digital signals comprising;
a plurality of amplifiers corresponding to each bit of said digital signals, each of said amplifiers having a corresponding input line;
a first group of transistors for connecting a first power source in common with each said input line of said amplifiers, having a connecting weight in accordance with a level change of said analog signals;
a second group of transistors for connecting a second power source in common with each said input line of said amplifiers, said second group of transistors having connecting weights with weighting values of each bit of Nbits when applying said first power source;
a third group of transistors for selectively connecting said second power source in common with each said input line of the amplifiers corresponding to lower order bits in accordance with output values output from the amplifiers corresponding to higher order bits, said third group of transistors having connecting weights with weighting values indicative of the output of the amplifiers corresponding to the higher order bits;
a plurality of inverters for inverting each output of said amplifiers.

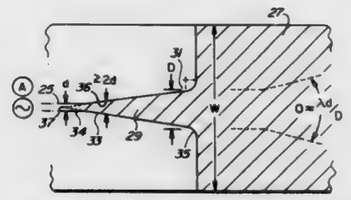
5,117,236
ANTENNA PATTERN SELECTION FOR OPTIMIZED COMMUNICATIONS
Hungkun J. Chang, Schaumburg; William K. Doss, Mount Prospect; Michael P. Nolan, Lake Zurich, and Dale R. Buchholz, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 19, 1990, Ser. No. 601,476
Int. Cl.[5] H04B *7/00, 17/02*
U.S. Cl. 342—367 **14 Claims**



1. A remote communications device capable of RF communication with a node comprising:

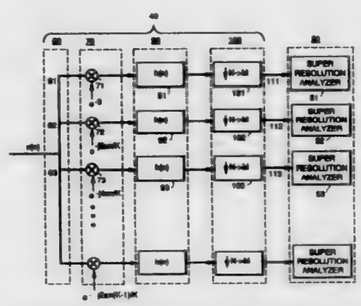
means coupled to said remote device for selecting an antenna pattern from a plurality of directional antenna patterns that cover different geographic areas relative to the remote device;
means for determining the quality (Q) of signals received from the node on each of said antenna patterns;
means for determining the signal strength of (S) of signals received from the node on each of said antenna patterns;
means for ranking each of said antenna patterns according to $R=(q*Q)+(s*S)$, where R is the rank, q and s are numerical weighting factors, wherein $q>0$ and $s>0$ and $q>10*S$, whereby the quality of the received signal is given greater weight than the signal strength; and
means for generating a historical average rank for each of said antenna patterns according to $HRnew=(k*HRold)+((1-k)*R)$, where HRnew is the new historical average rank, HRold is the last calculated historical rank, and R is the rank for the antenna pattern, and $1>k>0$;
said selecting means selecting the antenna pattern for use in communicating with the node based upon said historical average rankings.

5,117,237
QUASI-OPTICAL STRIPLINE DEVICES
Thomas H. Legg, Gloucester, Canada, assignor to National Research Council of Canada, Ottawa, Canada
Filed Jan. 16, 1990, Ser. No. 465,309
Claims priority, application Canada, Jan. 24, 1989, 589060
Int. Cl.[5] H01Q *3/22*; H01P *1/16*
U.S. Cl. 342—372 **13 Claims**



1. A quasi-optical stripline device for forming and controlling a beam of radio waves, comprising:
a strip transmission line including a pair of flat and mutually parallel outer conductors,
a flat center conductor located at substantially the midpoint between and in parallel with the said out conductors,
a dielectric material filling the space between the said outer and center conductors,
the said center conductor having a predetermined conductive pattern which includes a narrow channel region, a wide expansion region and a tapered region smoothly connecting the said narrow channel region and the said wide expansion region, and
phase shifting means in the said wide expansion region for changing the relative phase of an electric field in the said dielectric material by 180° so that the propagating mode of the said beam of radio waves is changed between the stripline mode and the parallel plate mode.

5,117,238
SUPERRESOLUTION BEAMFORMER FOR LARGE ORDER PHASED ARRAY SYSTEM
Seth D. Silverstein, Schenectady, and William E. Engeler, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Feb. 19, 1991, Ser. No. 656,882
Int. Cl.[5] H01Q *3/22, 3/24, 3/26*
U.S. Cl. 342—373 **9 Claims**



1. A superresolution beamformer for preprocessing coherent aperture data comprising:
a plurality of parallel branches, each branch having a modulator, a filter adapted to pass a predetermined bandwidth, a decimator, and an output, the modulator of the first branch coupled to receive a signal from the coherent aperture and pass the signal, the modulator of the second branch coupled to receive the signal from the coherent aperture and shift the signal by a factor of $\exp[-j2\pi n/k]$, where

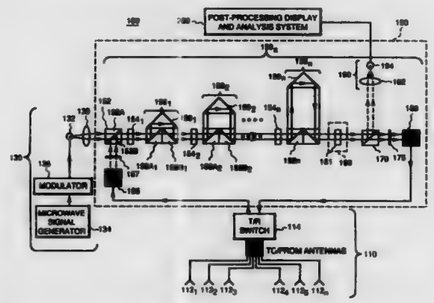
$$j=\sqrt{-1}\ ;$$

π is the ratio of the circumference of a circle to its diameter;
n=the index number of the signal sample and
K=the number of parallel branches in the superresolution beamformer;
the modulator of the third branch of the superresolution beamformer coupled to receive the signal and shift the signal by a factor of $\exp[-j4\pi n/K]$,
the modulator of the Kth branch of the superresolution beamformer coupled to receive the signal and shift the signal by a factor of $\exp[-j2\pi kn/K]$, and the modulator of the last branch of the superresolution beamformer coupled to receive the signal and shift the signal by a factor of $\exp[-j2\pi kn\ (K-1)/K]$;
the filter being operable to filter out selected frequencies of a signal it receives, said decimator being operable to discard selected samples of the signal received from the filter reducing the number of samples and passing these samples to its corresponding output of the branch; and
the output of each branch being coupled to a corresponding superresolution analyzer used in constructing the spacial signal spectrum from the coherent aperture.

5,117,239
REVERSIBLE TIME DELAY BEAMFORMING OPTICAL ARCHITECTURE FOR PHASED-ARRAY ANTENNAS
Nabeel A. Riza, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Apr. 24, 1991, Ser. No. 690,421
Int. Cl.[5] H01Q *3/22*
U.S. Cl. 342—375 **21 Claims**

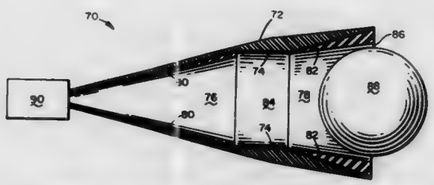
1. A phased array antenna system comprising:

a plurality of antenna elements arranged in an array, said array being operable in a transmit or a receive mode;
an optical signal processing system coupled to said array, said system generating differentially time-delayed optical control signals to control output beam radiation patterns transmitted from said array and to optically process return radiation patterns detected by said array; and
a modulated laser source optically coupled to said signal processing system and having means for dividing light from said laser source into a plurality of collinear light beams;
said optical signal processing system comprising:



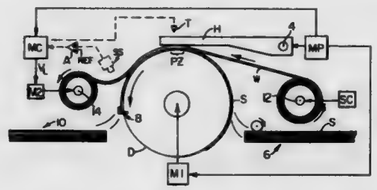
a plurality of spatial light modulators optically coupled to associated free space delay units so as to selectively time delay each of said plurality of light beams,
means for converting said optical control signals into corresponding electrical signals to excite said antenna elements in said transmit mode,
means for converting electrical signals produced by said antenna elements in response to detected electromagnetic radiation in said receive mode into corresponding return optical signals, and
means for converting said return optical signals after said optical processing into electrical signals.

5,117,240
MULTIMODE DIELECTRIC-LOADED DOUBLE-FLARE ANTENNA
Ordean S. Anderson, New Prague; Donald E. Anderson, Northfield; Ramakrishna A. Nair, Mankato, and Michael J. Riebel, New Ulm, all of Minn., assignors to Microbeam Corporation, Kent, Wash.
Continuation-in-part of Ser. No. 142,230, Jan. 11, 1988, abandoned. This application Jan. 11, 1989, Ser. No. 295,805
Int. Cl.[5] H01Q *13/020, 15/080*
U.S. Cl. 343—786 **33 Claims**



1. A multimode antenna for receiving and transmitting electromagnetic radiation, comprising:
(a) a housing having an interior which includes a first region having an outer aperture which conically tapers inward at a first flare angle to a cylindrical region and from an inner edge of which cylindrical region a second region conically tapers inward at a second flare angle less than said first flare angle to an inner aperture, wherein each of said regions is coaxial with the others and a longitudinal axis and wherein a ratio of the diameter of said outer aperture to the distance along said longitudinal axis between said outer and inner apertures is greater than or equal to one-half;
(b) a conductor overlying the interior of said housing;
(c) first dielectric means at least partially mounted within the housing for focusing said radiation to said longitudinal axis;
(d) second dielectric means mounted within the housing and contacting the conductor for reconstituting said radiation within said housing; and
(e) wherein the first and second dielectric means are arranged relative to each other such that the antenna is capable of far-field communications, independent of a reflective collector.

5,117,241
THERMAL PRINTING APPARATUS WITH TENSIONLESS DONOR WEB DURING PRINTING
Stanley W. Stephenson, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 4, 1990, Ser. No. 504,445
Int. Cl.[5] B41J *17/06, 2/325*
U.S. Cl. 346—1.1 **8 Claims**

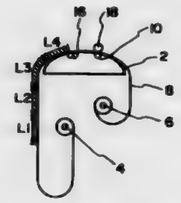


4. A method for printing information on a print-receiving media at a print zone, said method comprising the steps of:
(a) contacting a portion of said media with a portion of a dye-containing web;
(b) advancing said contacting portions of said media and web through said print zone at a predetermined rate;
(c) selectively transferring dye from said web to said media at said print zone to record information on said media; and
(d) maintaining that portion of the web downstream of said print zone in a tensionless condition while information is printed on said media.

5,117,242
METHOD OF WINDING PAPER ONTO A TAKE-UP ROLLER OF AN AUTOMATIC DRAFTING MACHINE
Toshiaki Matsushima, Tokyo, Japan, assignor to Mutoh Industries Ltd., Tokyo, Japan
Filed Oct. 30, 1990, Ser. No. 606,209
Claims priority, application Japan, Jan. 29, 1990, 2-18772
Int. Cl.[5] B65H *18/00*
U.S. Cl. 346—1.1 **8 Claims**

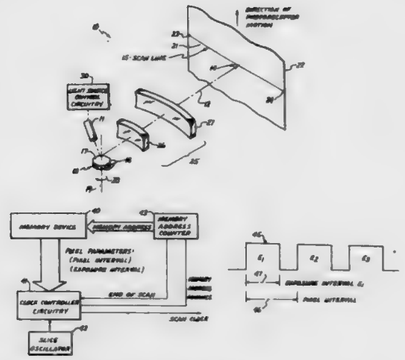
1. A method of operating an automatic drafting machine having a paper supply means for supplying paper, a platen across which the paper is supplied and upon which drafting operations are to be performed, and a paper take-up mans for performing winding operations to wind paper onto a take-up roller after the paper has been utilized in a drafting operation, said method comprising the steps of:
moving the paper forwardly after each drafting operation by a distance equal to a length of the paper utilized in each respective drafting operation;
ascertaining, after each respective drafting operation, total lengths of paper which have been moved forwardly since a last winding operation;

determining, only after said step of ascertaining said total length of paper whether said total lengths of paper which have been moved forwardly since the last winding operation is greater than a predetermined limiting value; and



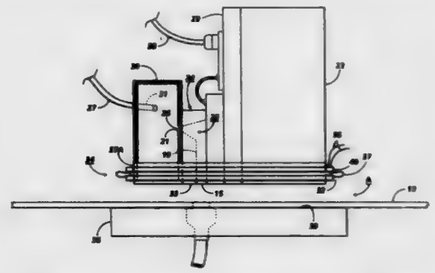
performing a winding operation, to wind onto the take-up roller an amount paper equal to said total lengths of paper which have been moved forwardly since the last winding operation, when a determination is made, in said step of determining that said total lengths of paper is greater than said predetermined limiting value.

5,117,243
SCANNER WITH ELECTRONIC NON-LINEARITY COMPENSATION AND METHOD OF PROCESSING IMAGE DATA
Melvin E. Swanberg, Claremont; Yee-Ming Chung, South Pasadena; Raymond Eskenazi, Los Angeles, and Robert T. Cunningham, Canyon Country, all of Calif., assignors to S&R Tech Development, Inc., Monrovia, Calif.
Filed Apr. 6, 1990, Ser. No. 506,683
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—108 **17 Claims**



1. A scanner system, comprising:
means defining a light source for producing a light beam of constant intensity;
scanning means for directing the light beam to a spot on a surface to be scanned that is located at a predetermined location relative to the scanning means and for moving the spot across the surface along a scan line of a predetermined length; and
means defining an electronic control system for controlling the light beam in order to produce a plurality of pixels on the surface along the scan line, which control means is configured to control the position and exposure of each of the pixels by maintaining a constant exposure interval of the light beam and varying the pixel interval to compensate for varying spot velocity along the scan line.

5,117,244
NOZZLE CAPPING DEVICE FOR AN INK JET PRINTHEAD
Zhao-Zhi Yu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Sep. 23, 1991, Ser. No. 764,299
Int. Cl.[5] B41J *2/02, 2/04*
U.S. Cl. 346—140 R **11 Claims**

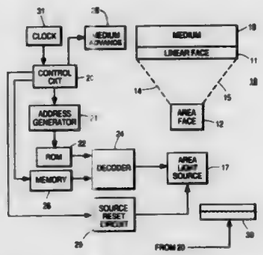


1. A capping device for a printhead means in an ink jet printer, the printhead means having a linear array of nozzles forming an array length in a nozzle face, and the printer having a transport belt for moving a plurality of recording mediums seriatim past the printhead means, one span of the transport belt confronting but being spaced from the printhead nozzle face, comprising:
a relatively thin, flexible sleeve having a predetermined internal dimension and opposing ends, one end of the sleeve being bonded to the printhead means, so that the sleeve sealingly surrounds the printhead means portion having the nozzle face;
an elastomeric closed loop gasket containing a magnetic material, the gasket being attached to the end of the sleeve opposite the one bonded to the printhead means;
a fixed bar being constructed of a material which is magnetically attractable to magnetic material, the bar being positioned on a side of a span of the transport belt opposite a side confronting the printhead means nozzle array and in sliding contact therewith, the bar being aligned and parallel with the printhead nozzle face, so that the fixed bar generates a first magnetic field in a region of the printhead which attracts said gasket toward the span of the transport and transport belt intermediate the gasket and bar;
means for selectively producing a second magnetic field in the region of the printhead which is stronger than the first magnetic field and adapted to attract said gasket in a direction opposite the first magnetic field, the means for producing the second magnetic field being located in a vicinity of the sleeve end bonded to the printhead, so that, when the second magnetic field is produced, said second magnetic field overcomes the first magnetic field and holds the gasket in a position spaced from the transport belt and when the second magnetic force is not produced, the transport belt is stopped and the first magnetic field causes the gasket to be tightly sealed against the transport belt, thereby capping the printhead nozzles in said nozzle face.

5,117,245
ELECTRONIC PRINTER OR SCANNER USING A FIBER OPTIC BUNDLE AND AN ARRAY LIGHT EMISSION DEVICE
Eugene I. Gordon, Summit, N.J., assignor to Photon Imaging Corp., Edison, N.J.
Filed Jan. 22, 1990, Ser. No. 467,863
Int. Cl.[5] G01D *15/14;* **G02B** *6/04;* **H01J** *5/16*
U.S. Cl. 346—160 **7 Claims**

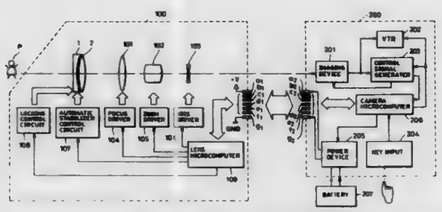
1. Apparatus comprising a random bundle of optical fibers

having the ends of the fibers arranged in a linear array in a first face and in an area array in a second face, an area array of light cells optically coupled to said area face so that light signals



generated by said cells enter associated ones of the fiber ends in said area face, said apparatus including control means for enabling a predetermined set of said cells simultaneously.

5,117,246
CAMERA SYSTEM HAVING AN IMAGE BLUR PREVENTION FEATURE
Kohji Takahashi, Yokohama; Shigeru Ogino, Tokyo; Kazuhiro Noguchi, Kawasaki, and Takashi Kobayashi, Mitaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 31, 1991, Ser. No. 708,199
Claims priority, application Japan, May 31, 1990, 2-141953
Int. Cl.[5] G03B *15/00, 17/00*
U.S. Cl. 354—202 **13 Claims**



12. A camera for controlling a lens unit having a correcting optical system for correcting an image blur, and a locking means for locking said correcting optical system, comprising:
(a) a communication means for conducting communications with said lens unit; and
(b) a camera control means for operating a control signal which controls said correcting optical system and said locking means in said lens unit in accordance with an operation mode of said camera and for transmitting the results of the operation to said lens unit through said communication means.

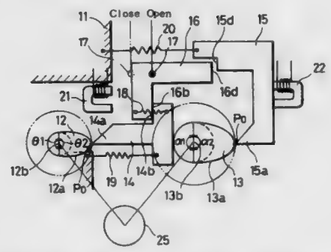
5,117,247
VIEWFINDER OPTICAL SYSTEM COMPENSATED IN MACROPHOTOGRAPHIC OR PARALLOX DIOPTER
Etsuko Nakai, and Hiromu Mukai, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed May 24, 1990, Ser. No. 529,115
Claims priority, application Japan, May 24, 1989, 1-132117; Jun. 22, 1989, 1-160299; Jun. 22, 1989, 1-160300
Int. Cl.[5] G03B *13/10*
U.S. Cl. 354—222 **22 Claims**

1. A viewfinder optical system, separate from a photographing optical system, for picture taking, comprising:
an objective lens;
an eyepiece;
a compensation lens, capable of being inserted into and being retracted from an optical path of the viewfinder optical system, for simultaneously compensating, at its inserting position for any variance in parallax error between the viewfinder optical system and the photographing optical



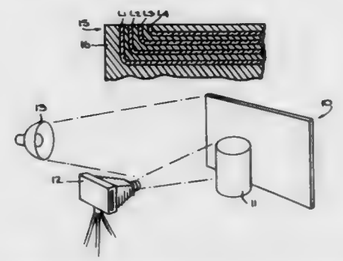
system and any change in diopter, both of which cause problems at closer object distances, and
means for inserting the compensation lens into the optical path of the viewfinder optical system at object distances closer than a predetermined distance.

5,117,248
LENS SHUTTER DEVICE FOR CAMERA
Masakatsu Hori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 600,138, Oct. 19, 1990, abandoned, which is a continuation of Ser. No. 455,139, Dec. 22, 1989, abandoned. This application May 22, 1991, Ser. No. 707,964
Claims priority, application Japan, Dec. 28, 1988, 63-332091
Int. Cl.[5] G03B *9/14, 9/66*
U.S. Cl. 354—234.1 **17 Claims**



1. A lens shutter device for a camera, said device including shutter members which open and close to carry out an exposure, said device comprising;
a shutter operating lever movable to open and close said shutter members in accordance with the positions of said shutter operating lever;
a first lever movable between a first position and a second position;
a connecting spring connecting said first lever and said shutter operating lever so that said first lever and said shutter operating lever are biased toward each other, said connecting spring allowing said first lever and said shutter operating lever to move together when no external force is exerted on said shutter operating lever, and allowing relative movement between said first lever and said shutter operating lever when an external force is exerted on said shutter operating lever;
a closing spring having a spring force which is stronger than the spring force of said connecting spring;
a second lever movable between a third position at which said second lever is engaged with said shutter operating lever and a fourth position at which said second lever is not engaged with said shutter operating lever, said second lever being urged by said closing spring to strike against said shutter operating lever;
means for charging said closing spring by moving said second lever, against the spring force of said closing spring, from said third position to said fourth position; and
means for controlling said second lever such that said second lever is held at said fourth position after said second lever is moved to said fourth position by said charging means, and when a closing signal is input to said control means, said second lever is released and moved to engage with said shutter operating lever, so that said shutter operating lever is moved by said closing spring toward a position at which said shutter members are closed.

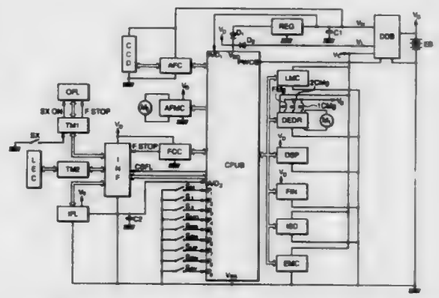
5,117,249
SHADOWLESS BACKGROUND FOR PHOTOGRAPHY
Donald Spector, 380 Mountain Rd., Union City, N.J. 07087
Filed May 16, 1991, Ser. No. 701,022
Int. Cl.[5] G03B *15/00*
U.S. Cl. 354—291 **6 Claims**



1. A shadowless background board for use in producing a photograph of a subject, the subject to be photographed being placed before the board and being illuminated by light rays directed toward the board, said board comprising:
(a) a translucent front panel on which a shadow is cast by the illuminated subject to create on a panel a shadow zone surrounded by an illumination region;
(b) a light distributor joined to the rear of the panel and responsive to light rays impinging on the illuminated region and adapted to convey these rays to the shadow zone to illuminate this zone and erase the shadow, whereby the resultant photograph of the subject is shadow free, said light distributor including light conducting lines to convey the rays.

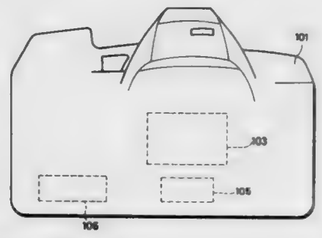
5,117,250
FLASHLIGHT PHOTOGRAPHING DEVICE
Akihiko Fujino; Tsutomu Ichikawa; Katsuyuki Nanba, and Nobuyuki Taniguchi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 515,726, Apr. 27, 1990, Pat. No. 5,055,865. This application Aug. 6, 1991, Ser. No. 741,031
Claims priority, application Japan, Apr. 27, 1989, 1-108920; Apr. 27, 1989, 1-108921; Apr. 27, 1989, 1-108922
Int. Cl.[5] G03B *1/00, 13/36, 15/05*
U.S. Cl. 354—400 **7 Claims**

1. A flashlight photographing device, comprising:
a battery power source;
a first high power consuming circuit for receiving power from said battery power source, said first high power consuming circuit requiring large current at energization thereof;
a second high power consuming circuit for receiving power from said battery power source, said second high power consuming circuit requiring large current at energization thereof;
detecting means for detecting whether or not the power supply of said battery power source recovers to a first predetermined value with which said first high power consuming circuit is capable of operating or reaches a second predetermined value with which said second high power consuming circuit is capable of operating, the second predetermined value being lower than the first predetermined value; and
power supply controlling means for initially permitting supply of power from said battery power source to said first high power consuming circuit while inhibiting supply of power from said battery power source to said second high power consuming circuit and then permitting, after the power supply from said battery power source exceeds the second predetermined value, supply of power from



said battery power source to said second high power consuming circuit, whereby supply of power from said battery power source to both of said first high power consuming circuit and said second high power consuming circuit is permitted while the power supply of said battery power source rises from the second predetermined value to the first predetermined value.

5,117,251
REFLEX CAMERA
Toshihiko Ishimura; Reiji Seki; Kenji Ishibashi; Junichi Tanii, and Takahisa Shimada, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 352,548, May 12, 1989, abandoned. This application Mar. 20, 1991, Ser. No. 672,770
Claims priority, application Japan, May 13, 1988, 63-117442
Int. Cl.[5] G03B *13/36, 17/38*
U.S. Cl. 354—400 **9 Claims**



1. A camera, comprising:
(a) a first actuator;
(b) a second actuator;
(c) power supply means for supplying electric power to said first and second actuators;
(d) first controlling means for causing said first actuator to operate a predetermined operation;
(e) suspending means for suspending said power supply to said first actuator without braking said first actuator, said suspending means allowing said first actuator to continue operation due to inertia; and
(f) second controlling means for controlling said suspending means such that when said power supply to said first actuator is suspended, said power supply is applied to said second actuator in order to actuate said second actuator in

VOL 1138 ISS 4 MAY 26 1992 UMI

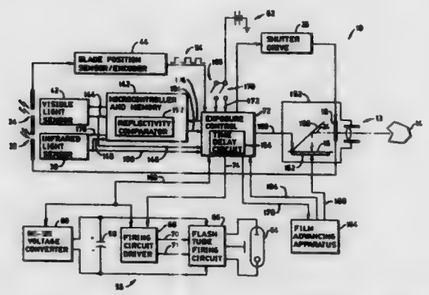
advance of completion of the predetermined operation of said first actuator, and for resuming the power supply to said first actuator to complete the remaining operation of said first actuator after said second actuator has finished operation.

5,117,252

ELECTRONIC FLASH CONTROL SYSTEM FOR USE IN A FIXED FOCUS LENS CAMERA FOR INCREASING DEPTH OF FIELD BY THE TIMING OF FLASH ACTUATION

Jennifer K. Ellwood, Somerville; John P. Gaewsky, Reading, both of Mass., and James C. Magno, Jr., Center Barnstead, N.H., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 4, 1990, Ser. No. 576,978
Int. Cl.[5] G03B *7/00, 15/03*
U.S. Cl. 354—415 **1 Claim**



1. An exposure control system for photographic apparatus having means for defining a film plane and a fixed focus lens for directing light along an optical path from a scene onto photosensitive material located in the film plane, said exposure control system comprising:

a blade mechanism mounted for movement between a blocking arrangement in which said blade mechanism is in light blocking relation with respect to the optical path so as to preclude scene light from being transmitted along the optical path to the film plane and an unblocking arrangement in which said blade mechanism is in light unblocking relation with respect to the optical path so as to allow the passage of scene light to the film plane, said blade mechanism serving to provide an exposure aperture through which scene light passes and whose size varies in a predetermined manner when said blade mechanism is actuated between its said light blocking and unblocking arrangements to produce an exposure interval;

drive means for displacing said blade mechanism between its said blocking and unblocking arrangements to define said exposure interval;

a light source for illuminating the scene with artificial light that is energizable for a period of time before and for a period of time during the exposure interval;

light sensitive means for detecting, prior to an exposure interval, light emitted by said light source and reflected from a subject within the scene that is located at a distance less than a predetermined magnitude and for generating a first signal representative thereof comprising means for storing a reference signal representative of the near distance of the normal depth of field of the fixed focus lens, means responsive to the light emitted by said light source and reflected from the subject within the scene and for generating a signal representative of subject reflectivity and a comparator for comparing said reference signal to said subject reflectivity signal, and for detecting light emitted by said light source and reflected from the scene during the exposure interval and for generating a second signal representative thereof; and

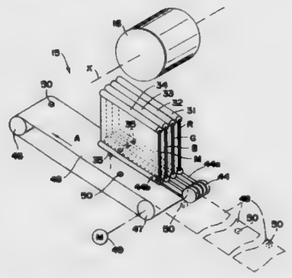
control means 1) for actuating said drive means to effect displacement of said blade mechanism to produce said exposure interval, 2) for energizing and de-energizing said light source to illuminate the scene and a subject included therein, before said exposure interval, 3) responsive to said first signal for energizing said light source a fixed period of time after actuating said drive means to initiate said blade mechanism displacement, said fixed period of time being just sufficient for the aperture to reach a size which is smaller than that which would be normally used, and 4) responsive to said second signal for de-energizing said light source during said exposure interval.

5,117,253

COLOR SEPARATING DEVICE IN COLOR COPYING MACHINE

Minoru Suzuki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1988, Ser. No. 197,974
Claims priority, application Japan, May 30, 1987, 62-136713
Int. Cl.[5] G03B *27/32, 27/52*
U.S. Cl. 355—32 **31 Claims**



18. A color separating device for use in a color copying machine comprising:

(a) a plurality of color filters adapted for movement into an optical path;

(b) a plurality of abutments fixed relative to respective ones of said plurality of color filters;

(c) means for guiding said plurality of color filters into said optical path;

(d) means for selectively propelling said plurality of color filters into said optical path comprising projections for successively engaging said plurality of abutments; and

(e) means for moving said plurality of color filters out of said optical path.

5,117,254

PROJECTION EXPOSURE APPARATUS

Haruna Kawashima, Kawasaki; Akiyoshi Suzuki, Tokyo, and Masato Muraki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 607,640, Oct. 31, 1990, abandoned, which is a continuation of Ser. No. 350,859, May 12, 1989, abandoned. This application May 8, 1991, Ser. No. 700,060
Claims priority, application Japan, May 13, 1988, 63-116455; Oct. 14, 1988, 63-258555
Int. Cl.[5] G03B *27/52, 27/70, 27/42*
U.S. Cl. 355—43 **60 Claims**

1. A projection exposure apparatus, comprising:

a mask stage for supporting a mask;

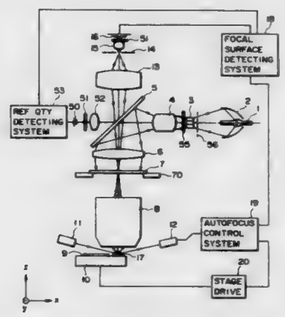
a wafer stage for supporting a wafer;

a projection optical system for projecting an image of a circuit pattern of the mask on the wafer;

surface position detecting means for detecting a position of a surface of the wafer with respect to a direction of an optical axis of said projection optical system;

adjusting means for adjusting an interval between the wafer and said projection optical system, for positioning the wafer surface at a focus position of said projection optical system;

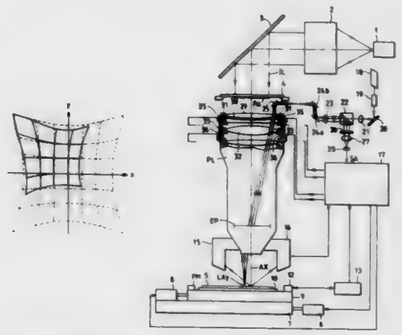
outputting means for directing a light beam to a reflection surface, provided at a predetermined site on said wafer stage by illuminating, with the light beam, a focus detecting mark provided on the mask and for directing, through said projection optical system, an image of the mark to the reflection surface, and for receiving, through said projection optical system and the mark, the reflection light coming from the reflection surface through said projection optical system, said outputting means comprising means for photoelectrically converting the received light to produce a signal corresponding to a positional relationship between the reflection surface and the focus position of said projection optical system;



focus position detecting means for detecting the focus position of said projection optical system, on the basis of the signal produced by said outputting means; and

control means for controlling said adjusting means on the basis of an output of said focus position detecting means and an output of said surface position detecting means.

correcting means for driving said driving means to anisotropically change optical characteristics of said projection optical system so that the projected image of the pattern is matched with a pattern already formed on said substrate.



5,117,255

PROJECTION EXPOSURE APPARATUS

Naomasa Shiraishi, Urawa; Tetsuo Taniguchi, and Hidemi Kawai, both of Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Sep. 13, 1991, Ser. No. 760,004
Claims priority, application Japan, Sep. 19, 1990, 2-249295; Sep. 27, 1990, 2-257927
Int. Cl.[5] 03B *27/42*
U.S. Cl. 355—53 **13 Claims**

1. An exposure apparatus for exposing on a substrate a pattern formed on a mask, comprising:

a projection optical system for forming the pattern on a predetermined focusing plane and projecting an image of the pattern on said substrate located to be substantially aligned with the focusing plane;

driving means for three-dimensionally moving at least one of said mask and at least one of a plurality of optical members constituting said projection optical system, or for inclining said at least one of said mask and said at least one of said plurality of optical members with respect to a plane substantially perpendicular to an optical axis of said projection optical system; and

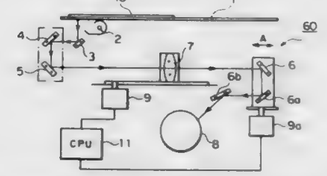
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5,117,256

COMPENSATION METHOD FOR VARIABLE MAGNIFICATION IN AN OPTICAL ZOOMING SYSTEM

Fumio Haibara, Akishima, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed May 31, 1991, Ser. No. 708,191
Claims priority, application Japan, Jun. 5, 1990, 2-146623; Jun. 5, 1990, 2-146622
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—77 **5 Claims**



1. A method for compensating variable image magnification in a zooming system, in which a magnified image is formed on a focal surface by projecting a document image through a projection lens and onto mirrors provided to a variable optical path length means, comprising the steps of:

(a) selecting an optional nominal magnification within a predetermined magnification range;

(b) moving at least one of the projection lens and the variable optical path length means so as to be in focus;

(c) measuring an actual image magnification at a position where the projection lens is in focus;

(d) calculating an actual focal length of the projection lens through the following equations, based on the measured actual image magnification,

$$1/f=1/a+1/b, m=b/a$$

$$U\ 32\ (2+m+1/m)f+H+\delta m$$

in which

f represents the focal length of the projection lens,

m represents the magnification,

a represents the distance between the document image and the first principal point of the projection lens,

b represents the distance between the second principal point of the projection lens and the focal surface,

H represents the distance between the first and the second principal points,

δm represents the aberration of the projection lens and

U represents the entire optical path length between the document image surface and the focal surface;

(e) determining compensation positions of the projection lens and the variable optical path length means, based on the calculated focal length and the selected optional nominal magnification; and

(f) moving the projection lens and the variable optical path length means to the determined compensation positions.

5,117,257

CONTACT PRINTER

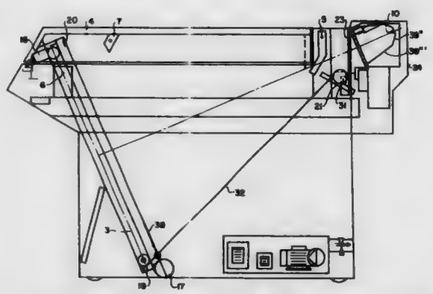
Søren Tjønneland, Sindal, Denmark, assignor to Eskofot A/S, Ballerup, Denmark

Filed May 10, 1990, Ser. No. 521,566

Claims priority, application Denmark, May 18, 1989, 2427/89

Int. Cl.[5] G03B *27/20*

U.S. Cl. 355—91 **7 Claims**



1. An apparatus for producing graphic material by exposing a surface of a light-sensitive material to ultra-violet light, comprising:

an upright box having a body and a lid which is movably associated with the body for movement between an open position in which a cavity defined by the box is open for access from externally of the box, and a closed position in which the cavity is isolated from externally of the box;

a source of ultra-violet light disposed in the box cavity;

a vacuum frame for holding light sensitive material for exposure to ultra-violet light in the box cavity, said vacuum frame being disposed in said box cavity; and

means mounting said vacuum frame to said box for movement between a raised position for loading and unloading, in which said vacuum frame is disposed generally horizontally, below said lid when said lid is in said closed position thereof, and a lowered position, in which said vacuum frame is inclined relative to horizontal for presenting light sensitive material, when loaded thereon, towards said source of ultra-violet light for exposure of said surface.

5,117,258

APPARATUS WITH COPYING FEE BASED ON SIZE AND NUMBER OF SHEETS USED

Yasuhiro Iwata, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 22, 1989, Ser. No. 440,114

Claims priority, application Japan, Dec. 13, 1988, 63-314594; Dec. 26, 1988, 63-325872; Dec. 26, 1988, 63-325875; Dec. 26, 1988, 63-325879; Dec. 26, 1988, 63-325886

Int. Cl.[5] G03G *21/00*

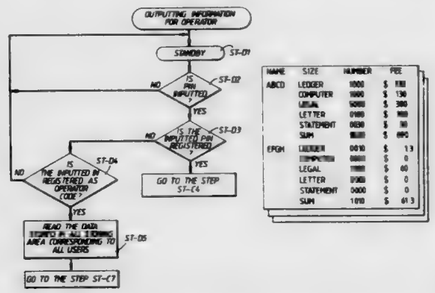
U.S. Cl. 355—201 **2 Claims**

1. An image forming apparatus including an apparatus for feeding a variety of sheet materials and calculating a user fee corresponding to the kinds and the number of sheets fed, the image forming apparatus comprising:

storing means for storing a plurality of kinds of the sheet material;

feeding means for feeding selected kinds of the sheet material;

image forming means for forming an image on the sheet material fed by the feeding means;



counting means for respectively detecting the number and the kinds of sheets fed by the feeding means;

means for calculating a user fee corresponding to the number and kinds of sheets detected by the counting means; and

means for printing the user fee on the sheet material by using the image forming means.

5,117,259

APPARATUS FOR MEASURING DEVELOPER DENSITY

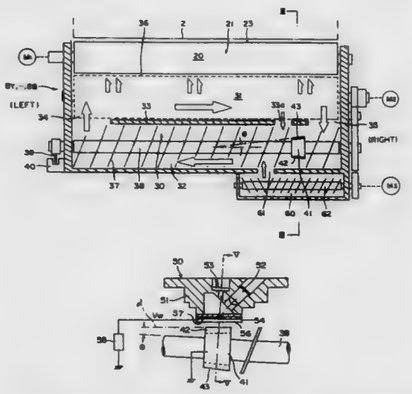
Kouichi Etou, Toyokawa; Naoyoshi Kinoshita, Aichi, and Hideo Kitakubo, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 14, 1991, Ser. No. 699,701

Claims priority, application Japan, May 15, 1990, 2-124664; May 15, 1990, 2-124665; Oct. 31, 1990, 2-296515

Int. Cl.[5] G03G *15/09*

U.S. Cl. 355—203 **4 Claims**



1. Apparatus for measuring developer density comprising:

a container containing a developer constituted by a toner and a carrier;

a rotary member agitating said developer in said container with its rotation;

a transparent detection window facing said container and having an electrically conductive film on its surface facing said developer;

a measuring section measuring said developer density in said container on the basis of reflected light from said developer illuminated through said detection window;

an electrode which is supported by said rotary member, and is rotated together with said rotary member such that a gap between said electrode and said detection window is maintained at a predetermined value;

said electrode being made, at least at one portion facing said detection window, of electrically conductive material;

at least one magnet which is supported by said electrode, and which retains said developer, so that said magnet causes said developer to be brought into contact with said detection window with said rotation of said rotary member; and

a bias application member for applying bias between said detection window and said electrode so as to make said detection window and said toner electrically repulsive to each other.

5,117,260

IMAGE FORMING APPARATUS HAVING STREAMLINED INPUT FOR CONTROL SIGNALS

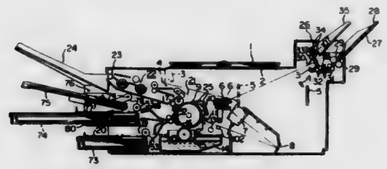
Masao Ariga, Kawasaki; Hiroyuki Hattori, Inagi; Katsuichi Shimizu, Hoya; Hirotoshi Kishi, Tokyo; Hiroshi Ogawa, Kawasaki; Takahiko Amanuma, Tokyo; Kazumi Umezawa; Seiji Sagara, both of Kawasaki, and Kenji Kurita, Mitaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

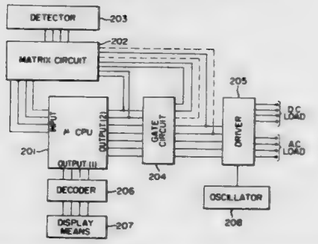
Division of Ser. No. 8,119, Jan. 23, 1987, abandoned, which is a continuation of Ser. No. 675,650, Nov. 28, 1984, abandoned, which is a continuation of Ser. No. 288,211, Jul. 29, 1981, abandoned, which is a division of Ser. No. 882,614, Mar. 1, 1978, Pat. No. 4,312,587. This application Sep. 11, 1989, Ser. No. 405,587

Claims priority, application Japan, Mar. 2, 1977, 52-22981

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—204 **10 Claims**





1. An image recording or reproducing apparatus comprising:

plural operation devices for recording or reproducing an image on a recording member;

means for generating information signals for image recordal or reproduction;

input means for inputting the information signals;

control means for controlling said operation devices in accordance with the information signals from said input means;

output means for outputting operation control signals from said control means for operating said operation devices; and

selecting means for selecting an information signal to be input to said input means in accordance with said operation control signals from said output means;

said control means controlling said operation devices in accordance with the selected information signal.

5,117,261

IMAGE FORMING APPARATUS WITH JAM RECOVERY FUNCTION

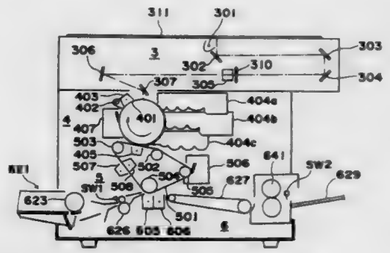
Toshiyuki Sakai; Masaru Imaizumi; Hideya Nishise; Katsuhiko Takeda, and Hideo Kitakubo, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 11, 1989, Ser. No. 336,255

Claims priority, application Japan, Apr. 21, 1988, 63-98810

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—207 **6 Claims**



1. An image forming apparatus comprising:

a photoconductive member;

an electrostatic latent image forming means for forming an electrostatic latent image on said photoconductive member according to an original;

a developing means for developing the electrostatic latent image with toner to thereby form a toner image on said photoconductive member;

a toner image retaining member;

a first transfer means for transferring the toner image on said photoconductive member onto said toner image retaining member;

a second transfer means for transferring the toner image on said toner image retaining member onto a paper at a transfer position;

a paper transport means for transporting the paper to which said toner image is to be transferred along a paper transport path to the transfer position;

a jam detection means for detecting an occurrence of a jam of the paper to which said toner image is to be transferred in the paper transport path before the paper reaches the transfer position and before the transfer of the toner image onto the paper has started; and

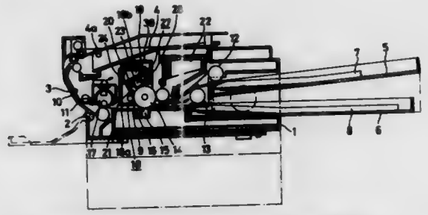
a jam recovery means for activating said paper transport means and said second transfer means immediately when the image forming apparatus is recovered from the paper jam detected by said jam detection means for transferring the toner image on said toner image retaining member at the time that said paper jam was detected onto a paper at the transfer position.

5,117,262

ELECTROPHOTOGRAPHIC APPARATUS WITH DETACHABLE OZONE FILTER MOUNTED NEAR CHARGING DEVICE

Yasuyoshi Yamaguchi, Tagata, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1991, Ser. No. 648,227
Claims priority, application Japan, Jan. 31, 1990, 2-20903
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—215 **10 Claims**



1. An electrophotographic apparatus comprising:
a photosensitive member provided rotatably inside the apparatus and having an exterior surface;
a charging device which is disposed to confront the exterior surface of said photosensitive member and adapted to charge said photosensitive member;
an exposure device which projects a light signal carrying image information onto the exterior surface of said photosensitive member that has been charged by said charging device;
a development device which is disposed to confront the exterior surface of said photosensitive member and adapted to develop an electrostatic latent image formed on said photosensitive member;
a transportation path for feeding paper through said apparatus;
a transfer device which transfers the electrostatic latent image on said photosensitive member developed by said development device onto said paper;
a fixing device which is disposed downstream of said photosensitive member in said transportation path;
a unit member in which said charging device is fixed and an ozone filter is mounted detachably near said charging device, said unit member being supported detachably inside said apparatus; wherein
a toner chamber which accommodates toner removed from said photosensitive member and a lid which closes said toner chamber are formed on said unit member, said ozone filter being attached to said lid to form a unitary member.

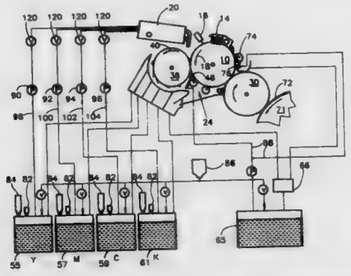
5,117,263

LIQUID TONER DEVELOPER

Yossi Adam, Rehovot, and Alon Gazit, Givataim, both of Israel, assignors to Spectrum Sciences B.V., Wassenaar, Netherlands

Filed Jan. 22, 1991, Ser. No. 643,483
Int. Cl.[5] G03G *15/10*
U.S. Cl. 355—256 **13 Claims**

1. Imaging apparatus comprising:
an electrostatic imaging surface;
latent image forming means for forming an electrostatic latent image on said electrostatic imaging surface; and
development means for developing said electrostatic latent image including:
supply means for supplying a particular liquid toner to the image forming surface, said supply means comprising a plurality of independently controllable outlets for supplying said particular liquid toner; and



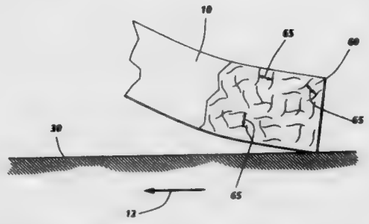
a development surface for developing said electrostatic latent image using said particular liquid toner.

5,117,264

DAMAGE RESISTANT CLEANING BLADE

Neil A. Frankel, Rochester; Nero R. Lindblad, Ontario; Herbert C. Relyea, Webster, and Robert J. Meyer, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 3, 1991, Ser. No. 680,191
Int. Cl.[5] G03G *21/00*; B32B *5/16*
U.S. Cl. 355—299 **11 Claims**



1. A cleaning blade in frictional engagement with a surface and being adapted to remove particles therefrom, comprising:
a blade body having one end thereof defining a free edge, said blade body including a multiplicity of randomly oriented fibers, having a high aspect ratio, therein; and
means for supporting said blade body so as to press the free edge thereof against the surface such that the aspect ratio of the fibers is greater than the square root of the fibers' Young's modulus divided by the fibers tensile strength.

5,117,265

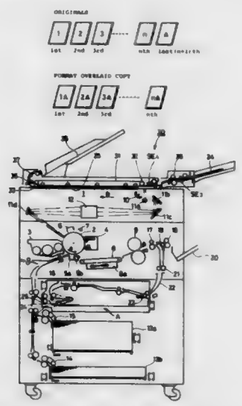
COPYING APPARATUS HAVING A SINGLE EXPOSURE PORTION FOR FINAL ORIGINALS AND NON-FINAL ORIGINALS EXPOSURE IN COMPOSITE COPYING OPERATIONS

Toru Matsui, and Kadotaro Nishimori, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 191,916, May 9, 1988, abandoned. This application Jun. 15, 1990, Ser. No. 538,683
Claims priority, application Japan, May 11, 1987, 62-113773
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—313 **17 Claims**

1. A copying apparatus comprising:
copying means for copying original images onto copy papers;
original feeding means for feeding said originals one by one to said copying means;

detecting means for detecting that a final original of said originals is fed to the copying means;
first feeding means for feeding copy papers one by one to said copying means;



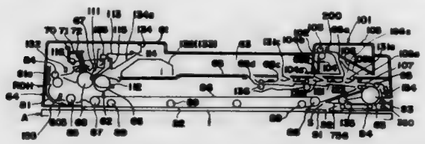
second feeding means for refeeding said copy papers with images formed on one side thereof by said copying means; and
changing means responsive to said detecting means for changing feeding actuation from the first feeding means to the second feeding means.

5,117,266

RECIRCULATING DOCUMENT HANDLER AND IMAGE FORMING APPARATUS EQUIPPED THEREWITH

Kazutaka Takemura; Hirokazu Matsuo; Yusuke Morigami; Wataru Hamakawa, and Takuma Ishikawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 14, 1991, Ser. No. 745,237
Claims priority, application Japan, Mar. 31, 1989, 1-082202; Mar. 31, 1989, 1-082203; Mar. 31, 1989, 1-082204; Mar. 31, 1989, 1-082205; Mar. 31, 1989, 1-082206
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—316 **10 Claims**



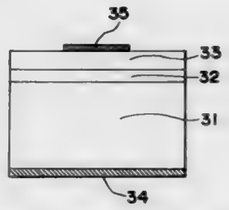
1. An automatic original feeding handler for successively transporting to a reading portion on a platen of an image forming apparatus two originals, images of which are read at the reading portion, said automatic original feeding handler comprising:
an accommodating portion for accommodating originals stacked therein;
an inlet path connecting the accommodating portion and the platen;
a switchback path connected to the inlet path;
feeding means for feeding the originals stacked in the accommodating portion one by one;
transport means for advancing a first original fed by the feeding means along the inlet path and onto the platen; and
control means for controlling the transport means so as to retreat into the switchback path the first original on the platen before a second original is fed by the feeding means.

5,117,267

SEMICONDUCTOR HETEROJUNCTION STRUCTURE

Tsunenobu Kimoto; Tadashi Tomikawa, and Nobuhiko Fujita, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 27, 1990, Ser. No. 588,823
Claims priority, application Japan, Sep. 27, 1989, 1-251389; Oct. 4, 1989, 1-259257
Int. Cl.[5] H01L *29/161, 33/00, 27/12, 29/20*
U.S. Cl. 357—16 **9 Claims**



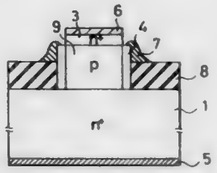
1. A semiconductor heterojunction structure comprising:
a p-type diamond layer;
an n-type cubic boron nitride layer on a first surface of said p-type diamond layer; and
a p-type cubic boron nitride layer on a second surface of the p-type diamond layer, said second surface being opposite said first surface.

5,117,268

THERMIONIC EMISSION TYPE STATIC INDUCTION TRANSISTOR AND ITS INTEGRATED CIRCUIT

Junichi Nishizawa, and Kaoru Motoya, both of Sendai, Japan, assignors to Research Development Corp., Tokyo; Junichi Nishizawa and Kaoru Motoya, both of Miyagi, all of, Japan

Continuation of Ser. No. 227,427, Jul. 29, 1988, abandoned, which is a continuation of Ser. No. 57,333, Jun. 2, 1987, abandoned, which is a continuation of Ser. No. 759,090, Jul. 25, 1985, Pat. No. 4,712,122. This application Jan. 24, 1990, Ser. No. 469,226
Claims priority, application Japan, Jul. 26, 1984, 59-153969; Jul. 26, 1984, 59-153972
Int. Cl.[5] H01L *29/80*
U.S. Cl. 357—22 **11 Claims**



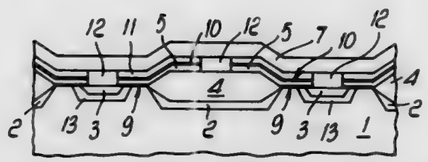
1. A static induction transistor of thermionic emission type comprising a channel region made of a semiconductor and having first and second sides, said channel region comprising a channel portion disposed so that any current flow within the channel region must pass through said channel portion, said channel portion being made of a semiconductor which is a first type of semiconductor which is one of a p-type and an n-type semiconductor, a source region and a drain region having a high impurity concentration and each formed in contact with a respective side of said channel region, said source and drain being made of a semiconductor which is the opposite of said first type, and a gate region making contact with at least part of said channel region, the gate region being formed of a semiconductor having a forbidden band gap larger than that of the semiconductor forming said channel region, the gate semicon-

ductor region being undoped so that injection of carriers from the gate to the channel does not occur, the distance from the said source region to the gate region being selected to be smaller than the mean free path of carriers.

5,117,269
EPROM MEMORY ARRAY WITH CROSSPOINT CONFIGURATION

Orio Bellezza, Curno, and Massimo Melanotte, Milan, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Mar. 2, 1990, Ser. No. 487,480
Claims priority, application Italy, Mar. 9, 1989, 19697 A/89
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.5 **13 Claims**



1. A crosspoint configuration EPROM cell array in a semiconductor substrate of a first conductivity having a surface, said array comprising

a plurality of first and second conducting regions of a second conductivity in said substrate surface, said first and second conducting regions extending parallel and alternately to each other in a first direction;

a plurality of relatively thick insulating regions on said substrate surface and said first conducting regions, said relatively thick insulating regions extending substantially coextensively with said first conducting regions;

relatively thin insulating regions on said substrate surface and extending parallel to said relatively thick insulating regions in said first direction and extending from said relatively thick insulating layer to at least over substantial portions of peripheries of said second conducting regions in a second direction perpendicular to said first direction;

a plurality of word lines over said relatively thick and thin insulating layers, said word lines extending parallel to each other in said second direction;

each memory cell of said array having a floating gate region on said relatively thin insulating layer and under one of said word lines, said floating gate region extending from over a periphery of one of said second conducting regions onto one of said relatively thick insulating layers in said second direction and coextensively with said word line in said first direction.

5,117,270
PHOTOSENSOR WITH AU DIFFUSED PB_2CRO_5 OR SIMILAR FILM

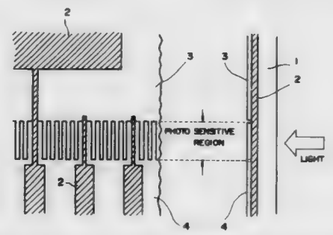
Kohji Toda, 1-49-18, Futabe, Yokosuka, Japan

Filed Oct. 10, 1990, Ser. No. 595,460
Claims priority, application Japan, Oct. 11, 1989, 1-265941; Jun. 14, 1990, 2-156126; Jun. 28, 1990, 2-170471
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 **28 Claims**

1. A photosensor comprising:

a Pb_2CrO_5 thin film formed on a substrate; and

a plurality of interdigital electrodes made of an Au thin film formed on said Pb_2CrO_5 thin film, said plurality of interdigital electrodes having a gap therebetween, wherein Au

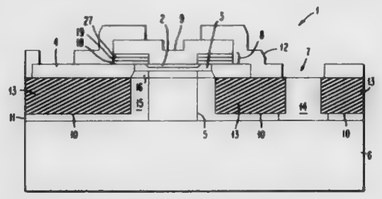


material of said Au thin film is diffused into said Pb_2CrO_5 thin film.

5,117,271
LOW CAPACITANCE BIPOLAR JUNCTION TRANSISTOR AND FABRICATION PROCESS THERFOR

James H. Comfort; Tze-Chiang Chen, both of Yorktown Heights; Pong-Fei Lu, Peekskill; Bernard S. Meyerson, Yorktown Heights; Yuan-Chen Sun, Katonah, and Denny D. Tang, Pleasantville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 7, 1990, Ser. No. 624,018
Int. Cl.[5] H01L *29/72, 29/34, 29/04, 27/12*
U.S. Cl. 357—34 **20 Claims**



1. A self-aligned epitaxial base bipolar transistor comprising

a semiconductor substrate of a first conductivity type

a first epitaxial layer of semiconductor material of said first conductivity type disposed over said substrate having single crystal and recessed oxide regions therein said regions having planar surface portions said single crystal region containing a portion of a collector pedestal spaced from said recessed oxide regions,

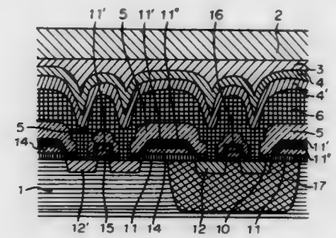
a second planar, epitaxial layer of semiconductor material disposed over said first layer having a single crystal region disposed over said single crystal surface portion and polycrystalline regions over said recessed oxide surface portions said single crystal region containing an intrinsic base region, an emitter region and another portion of said collector pedestal said pedestal being bounded by an edge and said polycrystalline regions containing extrinsic base regions, and,

a planar composite isolation layer containing an aperture disposed on said second layer comprised of at least two different dielectric materials the uppermost of which is made of oxidized material of given thickness said aperture being bounded by an edge said edge of said aperture being self-aligned with said edge of said collector pedestal, said planar cpmposite layer providing emitter-base isolation and the thickness of said oxidized material determining the emitter-extrinsic base capacitance of said transistor.

5,117,272
HAVING A PROTECTIVE FILM OF A POLYMER HAVING A FLUORINE-CONTAINING ALIPHATIC CYCLIC STRUCTURE

Shinzou Nomura, Shiga; Hirosbi Katsushima, Sagamihara; Toru Kawasaki, Ichihara; Masao Unoki, Yokohama, and Masaru Nakamura, Tokyo, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo and NMB Semiconductor Co., Ltd., Tateyama, both of, Japan

Filed Apr. 16, 1990, Ser. No. 509,144
Claims priority, application Japan, Apr. 19, 1989, 1-97650; Feb. 26, 1990, 2-42479
Int. Cl.[5] H01L *29/34, 23/28*
U.S. Cl. 357—52 **23 Claims**

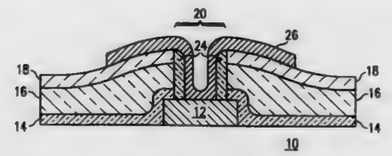


1. A semiconductor integrated circuit device having a protective film made of a polymer having as part of its molecular structure a fluorine-containing aliphatic cyclic structure obtained by cyclic polymerization or radical polymerization.

5,117,273
CONTACT FOR INTEGRATED CIRCUITS

David M. Stark, and Wayne D. Clark, both of Austin, Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrolton, Tex.

Filed Nov. 16, 1990, Ser. No. 614,296
Int. Cl.[5] H01L *29/34, 21/44*
U.S. Cl. 357—54 **28 Claims**



1. A contact structure for an integrated circuit, comprising:

a first conductor on a semiconductor substrate;

a first dielectric layer overlying said conductor and the substrate;

a second dielectric layer overlying said first dielectric layer;

a third dielectric layer overlying said second dielectric layer;

an opening through said first, second, and third dielectric layers to expose a portion of said first conductor;

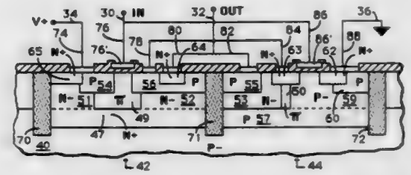
sidewall dielectric spacers along sides of said opening; and

a second conductor overlying portions of said third dielectric layer and extending into said opening; wherein said second conductor makes electrical contact with said first conductor and is separated from said second insulating layer by said sidewall spacers and said third dielectric layer.

5,117,274
MERGED COMPLEMENTARY BIPOLAR AND MOS MEANS AND METHOD

Sal Mastroianni, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 105,161, Oct. 6, 1987, Pat. No. 4,830,973.
This application Jan. 25, 1989, Ser. No. 301,936
Int. Cl.[5] H01L *27/02, 27/12, 27/04*
U.S. Cl. 357—43 **14 Claims**



1. A merged semiconductor device structure comprising:

a substrate having first and second laterally isolated semiconductor regions;

a first MOS transistor having a source and a drain of a first conductivity type, and a channel located between the source and drain of the first conductivity type, wherein the first MOS transistor is located in the first region;

a first bipolar transistor having a base of the first conductivity type and emitter and collector of a second conductivity type opposite the first conductivity type, located in the first region;

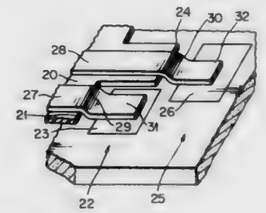
a second MOS transistor having a source and a drain of the second conductivity type, and a channel located between the source and drain of the second conductivity type, wherein the second MOS transistor is located in the second region; and

a second bipolar transistor having a base of the second conductivity type and emitter and collector of a first conductivity type located in the second region.

5,117,275
ELECTRONIC SUBSTRATE MULTIPLE LOCATION CONDUCTOR ATTACHMENT TECHNOLOGY

Mark F. Bregman, Ridgefield, Conn.; Raymond R. Horton, Dover Plains, N.Y.; Alphonso P. Lanzetta, Marlboro, N.Y.; Ismail C. Noyan, Peekskill, N.Y.; Michael J. Palmer, Walden, N.Y., and Ho-Ming Tong, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 24, 1990, Ser. No. 602,837
Int. Cl.[5] H01L *23/48, 29/44, 29/52, 29/60*
U.S. Cl. 357—70 **12 Claims**



1. A structure comprising:

a conducting lead supporting dielectric layer contiguous with the surface of a chip having an aperture therethrough, said aperture exposing a chip contact area with bonding locations therein,

said dielectric layer having an essentially parallel pattern of conducting leads thereon,

said dielectric layer, under every other of said conducting leads, terminating at a first line of conductor supporting edges proximate the border of said chip contact area and under remaining conductors terminating at a second line of conductor supporting edges extended farther into said chip contact area, and

each said lead at an edge extending a uniform cantilevered distance beyond said edge.

5,117,276

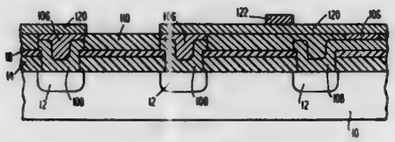
HIGH PERFORMANCE INTERCONNECT SYSTEM FOR AN INTEGRATED CIRCUIT

Michael E. Thomas, Cupertino, and Jeffrey D. Chinn, Foster City, both of Calif., assignors to Fairchild Camera and Instrument Corp., Mountain View, Calif.

Continuation of Ser. No. 525,958, May 18, 1990, Pat. No. 5,000,818. This application Nov. 8, 1990, Ser. No. 610,962

Int. Cl.[5] H01L *23/48*; B44C *1/22*; C03C *15/00*; C23F *1/02*

U.S. Cl. 357—71 **20 Claims**



1. A semiconductor integrated circuit device including an interconnect structure for electrically connecting regions in a semiconductor substrate having contact areas disposed in a predetermined spaced relation, said interconnect structure comprising:

a first level of interconnects disposed above said substrate and making electrical contact with at lease one of said contact areas;

an array of posts, at least one post of said array of posts in electrical contact with said first level of interconnects and extending upwardly above said first level of interconnects;

a metal layer disposed above said first level of interconnects, said metal layer making electrical contact with said at least one upwardly extending post; and,

an air gap between said substrate and said metal layer.

5,117,277

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH IMPROVED CONNECTION PATTERN OF SIGNAL WIRINGS

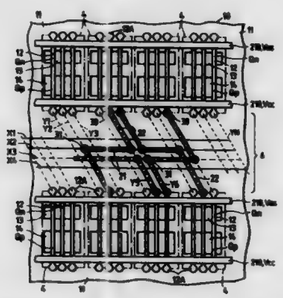
Kyoji Yuyama, Shiroyama, and Mikinori Kawaji, Hino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1990, Ser. No. 469,397

Claims priority, application Japan, Jan. 27, 1989, 1-16133

Int. Cl.[5] H01L *21/82, 27/04*

U.S. Cl. 357—71 **14 Claims**



1. A semiconductor integrated circuit device comprising:

a semiconductor substrate;

a plurality of basic cell columns provided on a main surface of said semiconductor substrate, each of said basic cell columns being constituted by a plurality of MISFETs;

a plurality of wiring channel regions provided between said plurality of basic cell columns;

first wirings along first phantom lines, said first wirings are provided in said wiring channel regions and said first phantom lines extend in a first direction;

second wirings along second phantom lines, said second wirings are provided in said wiring channel regions and said second phantom lines extend in a second direction inclined by an acute angle with respect to said first direction, wherein no wirings extending in a third direction which is perpendicular to said first direction exist in said wiring channel regions; and

means electrically interconnecting first and second wirings at connection portions thereof.

5,117,278

SEMICONDUCTOR DEVICE HAVING A SEMICONDUCTOR BODY EMBEDDED IN AN ENVELOPE MADE OF SYNTHETIC MATERIAL

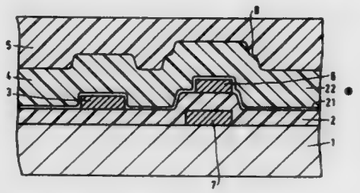
Michael F. B. Bellersen, Hamburg, Fed. Rep. of Germany, and Wilhelmus F. M. Gootzen, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 510,751, Apr. 18, 1990, abandoned. This application Jun. 6, 1991, Ser. No. 713,023

Claims priority, application Netherlands, Apr. 20, 1989, 8900985

Int. Cl.[5] H01L *23/28*

U.S. Cl. 357—72 **14 Claims**



1. A semiconductor device comprising

(a) a semiconductor body having at least one conductor track disposed on a surface of said semiconductor body,

(b) a first insulating layer disposed on said surface of said semiconductor body, said first insulating layer completely covering said at least one conductor track,

(c) a plurality of different conductor tracks disposed on top of said first insulating layer, various ones of said plurality of different conductor tracks being at different heights above said semiconductor body than others of said plurality of different conductor tracks,

(d) a second insulating layer disposed on said first insulating layer over said plurality of conductor tracks, said second insulating layer having a variable top surface with a lowest point being at a level above said semiconductor body higher than a highest point of said plurality of conductor tracks above said semiconductor body, and

(e) an envelope of synthetic material disposed over said second insulating layer, said envelope having a hardness of about 10 GPa,

wherein said second insulating layer has a hardness greater than said hardness of said envelope.

5,117,279

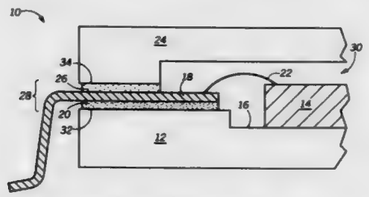
SEMICONDUCTOR DEVICE HAVING A LOW TEMPERATURE UV-CURED EPOXY SEAL

Maurice S. Karpman, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 23, 1990, Ser. No. 498,156

Int. Cl.[5] H01L *23/28, 23/02, 23/12*

U.S. Cl. 357—72 **3 Claims**



1. A semiconductor device comprising:

a base having an integrated circuit attached to a recessed bonding surface thereon;

an adhesive material overlying a lead mounting portion of the base;

a plurality of metal package leads partially embedded in the adhesive material extending outwardly from the recessed bonding surface for electrically coupling the integrated circuit to a mounting substrate;

a plurality of device leads electrically coupling the integrated circuit to the plurality of metal package leads;

a lid overlying the base forming a cavity between the base and the lid enclosing the integrated circuit therein; and

a layer of UV-curable epoxy overlying at least a portion of the plurality of metal package leads sealing the lid to the base.

5,117,280

PLASTIC PACKAGE SEMICONDUCTOR DEVICE WITH THERMAL STRESS RESISTANT STRUCTURE

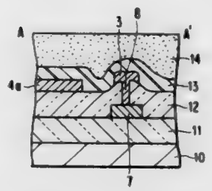
Takao Adachi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 10, 1990, Ser. No. 550,848

Claims priority, application Japan, Jul. 10, 1989, 1-177439

Int. Cl.[5] H01L *23/28, 23/48, 29/44, 29/52*

U.S. Cl. 357—72 **7 Claims**



1. A semiconductor device which is attached on a lead frame member and sealed with a resin sealing member, comprising:

a semiconductor substrate in which a plurality of circuit elements are formed;

a first insulating layer on a main surface of said substrate;

first wiring layers formed on the surface of said first insulating layer and electrically connected to said circuit elements;

at least one independent wiring layer formed in an island-shaped pattern on the surface of said first insulating layer without connection to any of said first wiring layers and any of said circuit elements under said first insulating layer;

a second insulating layer formed on said first insulating layer and covering said first wiring layers and said independent wiring layer and having at least one through hole exposing a part of the surface of said independent wiring layer;

bonding pads formed on the surface of said second insulating layer; and

a second wiring layer formed on the surface of said second insulating layer and having a first portion connected to one of said bonding pads directly and a second portion connected to said at least one independent wiring layer through said at least one through hole, said second portion being located relatively near said first portion and said second wiring layer being electrically connected to at least one of said circuit elements.

5,117,281

SEMICONDUCTOR DEVICE HAVING A HEAT-SINK ATTACHED THERETO

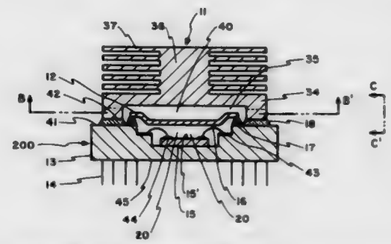
Kiyoshi Katsuraoka, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 22, 1990, Ser. No. 601,415

Claims priority, application Japan, Oct. 23, 1989, 1-276833

Int. Cl.[5] H01L *23/02, 23/12*; H02B *1/00*; H05K *7/20*

U.S. Cl. 357—81 **10 Claims**



1. A semiconductor device comprising:

a pedestal body of a package including a first planar surface at one side of said pedestal body, a second planar surface at another side of said pedestal body which is opposite to said first planar surface, and a recess formed at a center part of said one side of said pedestal body, said recess being depressed from said first planar surface and surrounded by first planar surface, said first planar surface having an inner section near said recess and surrounding said recess, and an outer section remoter from said recess via said inner section and surrounding said inner section;

a semiconductor element installed in said recess of said pedestal body;

a cap of said package bonded to said inner section of said first planar surface of said pedestal body to hermetically seal said recess;

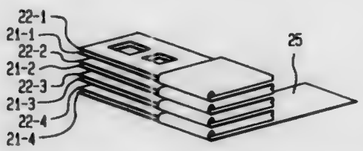
resin;

a heat-sink including a planar surface at one side, a concavity formed at one side, said concavity being depressed from said planar surface and surrounded by said planar surface, said planar surface of said heat-sink being bonded to said outer section of said first planar surface of said pedestal body by said resin such that an enclosed space is formed by said concavity of said heat-sink and said package including said cap and

a plurality of small holes penetrating a member of said heat-sink constituting said concavity and reaching said concavity so that said small holes communicate between an atmosphere outside said heat-sink and said enclosed space constituted of said concavity of said heat-sink and said package including said cap.

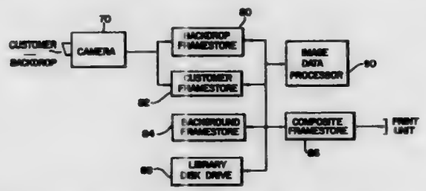
VOL 1138 ISS 4 MY 26 1992 UMI

5,117,282
STACKED CONFIGURATION FOR INTEGRATED CIRCUIT DEVICES
Matthew M. Salatino, Satellite Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.
Filed Oct. 29, 1990, Ser. No. 604,883
Int. Cl.[5] H05K *7/20, 3/30, 1/04*
U.S. Cl. 357—81 **8 Claims**



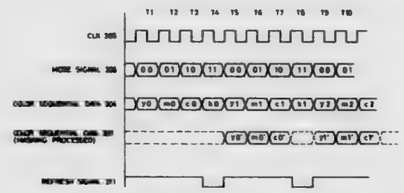
1. An integrated circuit packaging assembly comprising:
an interconnect substrate in the form of a flexible interconnect circuit web having plurality of finger portions, at least respective one of said finger portions having an aperture therethrough sized to accommodate an integrated circuit device, a respective integrated circuit device passing through and thereby being captured within the aperture of said at least a respective finger portion and having leads extending from a first surface of said respective integrated circuit device and being attached to interconnect links on an adjacent first surface of said at least respective one of said finger portions, and wherein said finger portions are folded together in the form of a stack; and
a plurality of heat sinks interleaved with the folded finger portions such that a respective heat sink engages and is in thermal contact with a second surface of a respective captured integrated circuit device adjacent to a second surface of a respective folded finger portion.

5,117,283
PHOTOBOOTH COMPOSITING APPARATUS
Donna S. Kroos, Rochester; David K. McCanley, Henrietta, and Kurt M. Sanger, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 25, 1990, Ser. No. 542,619
Int. Cl.[5] H04N *9/73*
U.S. Cl. 358—22 **46 Claims**



1. A method of combining an image of a subject with an image of an arbitrary background to thereby form a composite image of said subject and said arbitrary background comprising the steps of:
(a) generating a first image of a reference backdrop and storing a first plurality of first image data values respectively representative of the contents of said first image at a plurality of locations of an array of image locations within said first image;
(b) generating a second image of said subject situated in the presence of said reference backdrop and storing a second plurality of second image data values respectively representative of the contents of said second image at said plurality of locations of said array of image locations;
(c) storing a third plurality of third image data values respectively representative of the contents of a third image containing said arbitrary background at said plurality of locations of said array of image locations;
(d) for each of plural sets of image locations within said array, processing color contents of the associated data values for each of said first and second images, so as to generate a fourth plurality of first image mask values respectively representative of the contents of a first image mask associated with the image locations of said array containing said subject and a fifth plurality of second image mask values respectively representative of the contents of a second image mask associated with locations of said array other than said subject; and
(e) combining said fourth and fifth pluralities of respective first and second image mask values with said second plurality of second image data values and said third plurality of third image data values, to thereby obtain a sixth plurality of sixth image data values representative of a composite image of said subject and said arbitrary background.

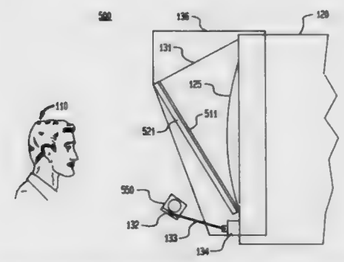
5,117,284
COLOR IMAGE PROCESSING APPARATUS
Tetsuzo Mori, Hiratsuka; Takashi Sugino, Atsugi; Makoto Takaoka, Atsugi; Susumu Sugiura, Atsugi, and Hiroyuki Ichikawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 372,172, Jun. 27, 1989, Pat. No. 5,060,059, which is a continuation of Ser. No. 900,604, Aug. 26, 1986, abandoned. This application Jul. 30, 1991, Ser. No. 738,092
Claims priority, application Japan, Jan. 14, 1986, 61-4161; Jan. 14, 1986, 61-4163; Jul. 26, 1986, 61-176161
Int. Cl.[5] H04N *1/46, 1/40*
U.S. Cl. 358—79 **14 Claims**



1. A color image processing apparatus comprising:
means for obtaining color image data consisting of three color component signals;
arranging means for arranging said three color component signals in sequential manner and providing an empty signal portion between signal sets, each of which is composed of said three color component signals;
black signal forming means for forming a black signal from said three color component signals; and
means for using the thus formed black signal as the signal value of said empty signal portion.

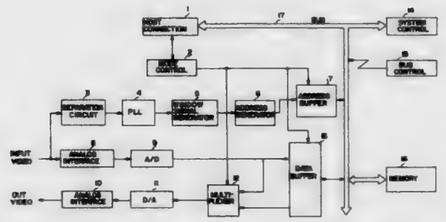
5,117,285
EYE CONTACT APPARATUS FOR VIDEO CONFERENCING
Terence J. Nelson, New Providence, and Lanny S. Smoot, Morris Township, Morris County, both of N.J., assignors to Bell Communications Research, Livingston, N.J.
Filed Jan. 15, 1991, Ser. No. 641,185
Int. Cl.[5] H04N *7/14*
U.S. Cl. 358—85 **12 Claims**

1. An apparatus for establishing eye contact between a local party viewing a terminal screen and the image of a distant party on the terminal screen, said apparatus comprising the elements of:
a first polarizer located in front of the terminal screen which passes a polarization of the image of the distant party radiated from the terminal screen,
a first mirror, which is partially silvered, and which reflects the image of the local party and transmits the image of the distant party radiated from the terminal screen and passed by said first polarizer, said first mirror being angled substantially less than 45 degrees to the terminal screen, and
a camera module located below said first mirror and positioned in front of and horizontally aligned with the terminal screen to capture the image of the local party reflected from said first mirror and to minimize extraneous light radiated from ambient sources and from the terminal screen for optimal contrast, said camera module comprising



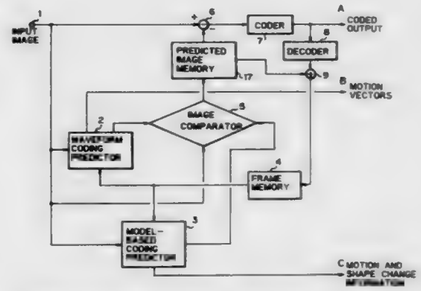
capturing and encoding means which captures the image of the local party reflected from said first mirror and encodes the image of the local party for transmission to another terminal viewed by the distant party, and
a second polarizer which is cross-polarized with said first polarizer and located in front of said capturing and encoding means,
wherein said elements of said apparatus are positioned and angled with respect to each other such that said apparatus is compact, the protrusion of said apparatus from the terminal screen is minimized, and intimate communication between the distant party and the local party is achieved.

5,117,286
VIDEO SIGNAL AND OUTPUT DEVICE FOR FREEZE-FRAME VIDEO TELEPHONE
Ju H. Jeong, Daejeon, D.P.R. of Korea, assignor to Korea Telecommunications Authority Electronics & Telecommunications Research Institute, Seoul, D.P.R. of Korea
Filed Sep. 7, 1990, Ser. No. 578,879
Claims priority, application D.P.R. of Korea, Sep. 9, 1989, 1989-130 82
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—85 **3 Claims**



1. A video input and output device for a freeze-frame video phone, which inputs video data for transmission from a camera and outputs video data to a monitor, comprising;
a bus;
a host connection means connected to the bus so as to allow checking of control and operation status of the equipment by a CPU,
a mode control signal generation means connected to the host connection means, which receives control signal from the host connection means and generates a bypass mode signal, a display mode signal, an acquisition mode signal, and a video image size signal for controlling each operation;
a synchronization signal separation circuit which separates an input composite video signal into a vertical synchronization signal, a horizontal synchronization signal, a composite synchronization signal, an odd/even field signal, and a burst signal;
a PLL (Phase-Locked Loop) circuit which generates a signal with frequency of 384 times the horizontal synchronization signal from the synchronization signal separation circuit;
a window signal generation means connected to the PLL circuit, which selects a part of video image size out of an input video signal;
address buffer means connected to the bus, the window signal generation means, and the mode control signal generation means, which generates address for access of a video image data storage memory;
a first analog interface means for reception of the input video signal;
an A/D (Analog to Digital) converter connected to the first analog interface means;
a data buffer means connected to the bus and the A/D converter and the mode control signal generator, which transmits and receives data to and from the video image data storage memory;
a multiplexer connected to the data buffer means, the A/D converter, and the mode control signal generator;
a D/A converter which converts a digital signal from the multiplexer into an analog signal; and
a second analog interface means connected to the D/A converter.

5,117,287
HYBRID CODING SYSTEM FOR MOVING IMAGE
Atsushi Koike; Masahide Kaneko, both of Tokyo, and Yoshinori Hatori, Kanagawa, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan
Filed Mar. 1, 1991, Ser. No. 664,181
Claims priority, application Japan, Mar. 2, 1990, 2-49506
Int. Cl.[5] H04N *7/12, 7/13*
U.S. Cl. 358—133 **3 Claims**



1. A hybrid coding system for a moving image with combination of waveform coding prediction system and model-based coding prediction system comprising;
an input terminal (1) for receiving a current input image which is subjected to coding and transmission,
a frame memory (4) storing a previous image frame,
a model-based coding predictor (3) for analyzing an object in

the current input image, by using the image of the previous frame stored in said frame memory (4) the current input image, and a three dimensional shape model of the object,

a wavefrom coding predictor (2) for predicting the image for the current input image by using waveform coding prediction system by using the current input image and an output of said frame memory (4),

an image comparator (5) for obtaining first difference between the current input image and the output of said model-based coding predictor (3), and second difference between the current input image and the output of said waveform coding predictor (2), and providing an output image which relates to the smaller difference,

a subtractor (6) for providing difference between the current input image and the output of said image comparator (5),

a coding means (7) for encoding the output of said subtractor (6),

a decoding means (8) for decoding the output of said coding means (7),

an adder (9) for providing sum of the output of said decoding means (8) and output of said image comparator (5), and providing the sum to said frame memory (4), and

an output terminal (A, B, C) for providing coded output (A) from said coding means (7), motion vectors (B) from said waveform coding predictor (2), and motion and shape change information (C) from said model-based coding predictor (3).

5,117,288

METHOD OF DECODING CODED IMAGE DATA UTILIZING TRANSMISSION ERROR DETECTION TO INTERRUPT DECODING AND UP-DATING

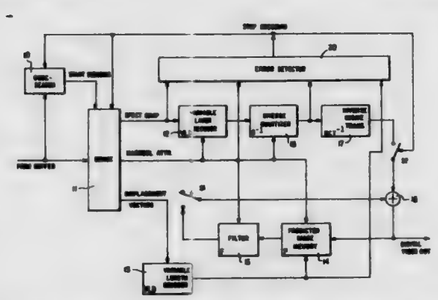
Volker Eisenhardt, Ulm; Georg Kummerfeldt, Neu-Ulm; Franz May, and Winfried Wolf, both of Ulm, all of Fed. Rep. of Germany, assignors to Licentia Patent-verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 27, 1990, Ser. No. 618,566

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1989, 3939136

Int. Cl.[5] H04N *7/13*

U.S. Cl. 358—136 **18 Claims**



1. In a method for decoding and utilizing coded image data from a received data stream, particularly for the transmission of sequences of moving images, wherein the image date are coded according to a coding method employing residual redundancy and the data stream includes unequivocally associatable starting code words for a frame or fields, said method including the steps of decoding the image data to provide reconstructed pixel values, and up-dating the contents of a predicted-image memory on the basis of the reconstructed pixel values obtained form said step of decoding; the improvement comprising: following detection of one of said starting code words, constantly checking said data stream, utilizing said residual redundancy of said image data, for the occurrence of a transmission error; and, upon the detection of a transmission error, interrupting said step of up-dating, and no longer utilizing said reconstructed pixel values to bring the predicted-image memory up to date, until a new starting code word appears for the frame or field.

5,117,289

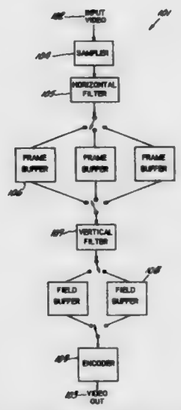
REAL-TIME VIDEO IMAGE CONVERTER

Shai W. Farley, Arcadia, and William McCown, So. Pasadena, both of Calif., assignors to Lyon-Lamb Video Animation, Burbank, Calif.

Filed Apr. 26, 1990, Ser. No. 515,002

Int. Cl.[5] H04N *7/01*

U.S. Cl. 358—140 **7 Claims**



1. A device for converting an image in real time from an input format to an output format, said input and output formats each having a frame rate and a plurality of lines per frame, said device comprising:

first means for converting a number of pixels per line into said output format by means of interpolation and decimation;

second means for converting a frame rate into said output format; and

third means for converting a number of lines per frame into said output format by means of interpolation and decimation, wherein said first means comprises

an input port capable of being coupled to a signal in said input format;

a filter coupled to said input port;

an A/D converter coupled to said filter;

an input FIFO coupled to said A/D converter;

an filter circuit coupled to said input FIFO; and

an output FIFO coupled to said filter circuit.

5,117,290

CIRCUIT ARRANGEMENT IN A PICTURE DISPLAY DEVICE, COMPRISING A VIDEO SIGNAL PROCESSING CIRCUIT AND A LINE SYNCHRONIZING CIRCUIT

Hearicus J. Heerkens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 7, 1990, Ser. No. 580,240

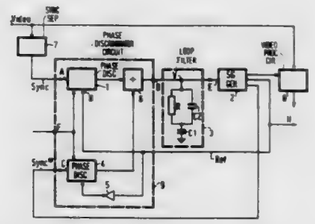
Claims priority, application Netherlands, Oct. 18, 1989, 8902579

Int. Cl.[5] H04N *5/06*

U.S. Cl. 358—158 **5 Claims**

1. A circuit arrangement in a picture display device, comprising an input for receiving a video signal, a video signal processing circuit coupled to said input for receiving said video signal, and a line synchronizing circuit also coupled to said input for generating a reference signal for horizontal

scanning on a picture display device, said line synchronizing circuit including a signal generator for generating said reference signal as well as a clock signal applied to a clock input of said video signal processing circuit, and a phase control loop for controlling the signal generator, said phase control loop comprising a phase discriminator circuit having a first input for receiving a line synchronizing signal which is present in the video signal, a second input for receiving said reference signal and an output which is coupled, via a loop filter, to a control input of the signal generator for applying a control signal to said control input, said reference signal having the same frequency and substantially the same phase as the line synchroniz-



ing signal in the synchronous state of the phase control loop, and the clock signal having a frequency which is coupled to the frequency of the reference signal, characterized in that said line synchronizing circuit further comprises a compensation circuit for compensating phase errors in said reference signal during occurrences of pulses in the line synchronizing signal, said compensation circut generating a compensation signal, also applied to the control input of said signal generator, having a repetition frequency the same as that of said reference signal, whereby the signal at the control input of the signal generator is substantially constant throughout the period of the line synchronizing signal in the synchronous state of the phase control loop.

5,117,291

TECHNIQUE FOR ADJUSTING SIGNAL DISPERSION CANCELLATION APPARATUS IN COMMUNICATIONS SYSTEMS

Jalil Fadavi-Ardekani, Orefield, Pa., and Jin-Der Wang, Ocean, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 30, 1990, Ser. No. 621,151

Int. Cl.[5] H04N *5/21*

U.S. Cl. 358—167 **19 Claims**

11. Apparatus for generating the tap-weight coefficients for a filter which cancels ghosts in a television signal, said apparatus comprising

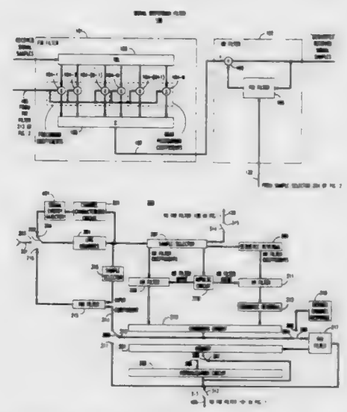
means for processing received signal samples having dispersion and generating a time-ordered sequence of derived signal samples therefrom; and

means for generating the tap-weight coefficients in response to the derived signal samples in a first predetermined portion of said time-ordered sequence in reversed time-order and to the derived signal samples in a second predetermined portion of said time-ordered sequence.

14. A method of generating the tap-weight coefficients for a filter which cancels ghosts in a television signal, said method comprising the steps of

processing received signal samples having dispersion and generating a time-ordered sequence of derived signal samples therefrom; and

generating said tap-weight coefficients in response to the derived signal samples in a first predetermined portion of said time-ordered sequence in reversed time-order and to



the derived signal samples in a second predetermined portion of said time-ordered sequence.

5,117,292

SOLID-STATE CAMERA HAVING CHANGEABLE SENSITIVITY

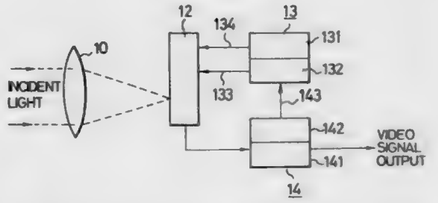
Yoshiyuki Matsunaga, Kamakura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 27, 1990, Ser. No. 514,042

Claims priority, application Japan, Sep. 13, 1989, 1-235751

Int. Cl.[5] H04N *3/14, 5/335, 5/238*

U.S. Cl. 358—213.19 **6 Claims**



1. A solid-state camera comprising:

a solid-state image sensor element composed of a plurality of units of picture element cells planarly arranged therein for outputting electric signals obtained by the photoelectric conversion of incident light;

drive means for driving the solid-state image sensor element; and

signal process means for processing the signals outputted from the solid-state image sensor element to obtain picture image signals;

wherein the signal process means has means for detecting a position which receives strong light over a predetermined strength introduced onto the solid-state image sensor element and generates a detection signal,

the drive means having sensitivity adjustment means for outputting sensitivity adjustment signals to adjust the sensitivity of each of the units of picture element cells existing in a specific portion in the solid-state image sensor element based on the detection signal, and the sensitivity of each picture element cell can be independently controlled variably by the sensitivity adjustment means.

5,117,293

METHOD OF AND APPARATUS FOR GENERATING CONVERSION CURVE EMPLOYABLE FOR CONVERTING REPRODUCTION CHARACTERISTIC OF IMAGE

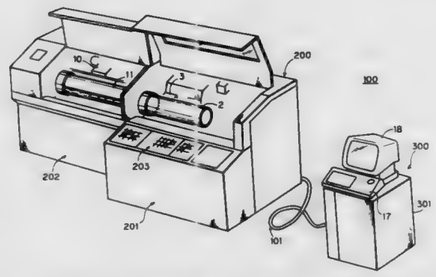
Shinji Asada, and Yasuharu Yonezawa, both of Tenjinkitamachi, Japan, assignors to Dainippon Screen Mfg. Co. Ltd., Japan

Filed Nov. 20, 1990, Ser. No. 616,189

Claims priority, application Japan, Nov. 28, 1989, 1-308484; Oct. 24, 1990, 2-287753

Int. Cl.[5] H04N *1/23*

U.S. Cl. 358—298 **20 Claims**



1. A method of generating a conversion curve which is employable for converting first density values obtained by photoelectrically reading an object image for each pixel and defined in a first density range into second density values defined in a second density range and having a reproduction characteristic suitable for prescribed image processing, said method comprising the steps of:

(a) designating a highlight density value and a shadow density value within said first density range;

(b) determining a dummy shadow density value within said first density range according to a predetermined determination rule; and

(c) generating said conversion curve so as to satisfy two conditions as follows:

said conversion curve substantially passes through first and second points on a two-dimensional coordinate plane on which said conversion curve is defined, said first and second points being determined in accordance with said highlight density value and said shadow density value, respectively; and

on said two-dimensional coordinate plane, said conversion curve extends along a line in a highlight density region which is defined around said highlight density value. said line being so defined as to pass through said first point and a third point determined in accordance with said dummy shadow density value.

5,117,294

IMAGE PROCESSING METHOD AND SYSTEM

Satoshi Yano, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 500,950

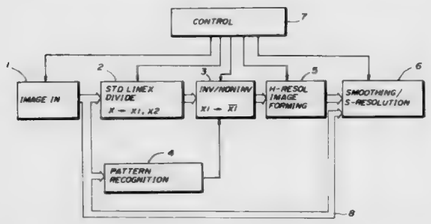
Claims priority, application Japan, Apr. 12, 1989, 1-90757

Int. Cl.[5] H04M *1/40, 1/393*

U.S. Cl. 358—447 **6 Claims**

1. A method for converting a first image of a first resolution wherein the first image is represented by first picture elements each having a first size in a first direction and a second size in a second direction different from the first direction, to a second image of a second, improved resolution wherein the second image is represented by second picture elements each having a third size identical to the first size in the first direction and a fourth size which is one-half of the second size in the second direction, comprising steps of:

detecting a predetermined pattern in the first image, said predetermined pattern containing a stepped boundary defining a region formed by a first group of the first picture elements each having a first content and a second group of the first picture elements each having a second content different from the first content, said predetermined pattern including at least a central picture element having the first content and which is formed by the first picture element, said central picture element being defined by a first edge extending in the first direction and a second edge extending in the second direction, a first neighboring picture element formed by the first picture element and is located at a side of the central picture element beyond the first edge with a contact to the central picture element at



the first edge, said first neighboring picture element having the second content, and a second neighboring picture element formed by the first picture element and having the second content, said second neighboring picture element being located at a side of the central picture element beyond the second edge in the first direction with a contact to the central picture element at the second edge;

dividing said central picture element into a first sub-picture element and a second sub-picture element each having a size of the second picture element such that the first sub-picture element is located at a side of the first edge and that the second sub-picture element is located at a side away from the first edge in the second direction; and

inverting the content of one of the first and second sub-picture elements depending on the detected predetermined pattern.

5,117,295

STRUCTURE FOR AND METHOD OF SCANNING WITH MULTIPLEXED LIGHT SENSOR ARRAYS

Asbjorn Smitt, Aalsgaarde, Denmark, assignor to Contex Components & Business Machines A/S, Denmark

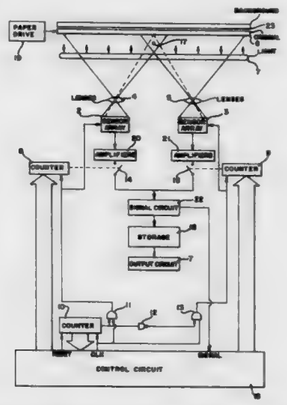
Filed Nov. 13, 1989, Ser. No. 434,456

Int. Cl.[5] H04N *1/40, 1/10*

U.S. Cl. 358—474 **11 Claims**

1. A method of aligning two line segments of discrete elements forming part of a line of discrete elements, comprising the steps of collecting each line segment by a light sensitive sensor array (**2, 3**) having a number of light sensitive cells forming a segment vector (**80**), dividing each sensor array (**2, 3**) having a total visional field into an active visional field and a visional field edge, placing aligning means (**17**) between the sensor arrays (**2, 3**) and an original (**6**) to be copied, imaging the aligning means (**17**), present in the coinciding visual field of two sensor arrays by initialization in at least one cell in the segment vector (**80**), determining the active visional fields of the sensor arrays in dependence on the position of the aligning means in the segment vector (**80**), joining the line by the cells

(**84**) of the segment vectors, which cells (**84**) represent the active visional field, and skipping the cells (**82**) representing



the visional field edge and containing the image of the aligning means (**17**).

5,117,296

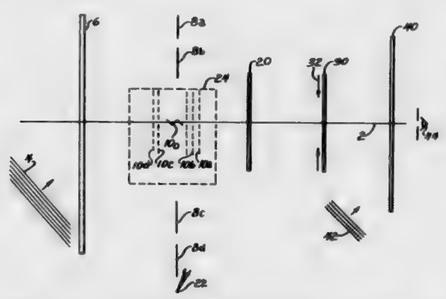
APPARATUS AND SYNTHETIC HOLOGRAPHY

John L. Hoebing, 1229 Leon Pl., Evanston, Ill. 60201

Filed Jul. 17, 1990, Ser. No. 554,028

Int. Cl.[5] G03H *1/26;* **G02B** *5/32*

U.S. Cl. 359—21 **20 Claims**



17. A real time volumetric display wherein the image of one or more of off-axis sections is illuminated by polychromatic light, and passes through a slit aperture between said section and a mxHOE, or at any point of the system conjugate to a region, such that a rainbow image of the region is presented at the point in space where the off-axis region is imaged to by the mxHOE.

5,117,297

LIQUID CRYSTAL WRITING SLATE WITH DC IMAGING SYSTEM

Frederick E. Noble, DePere; John F. Harris, III, Franksville, and Gary S. Silverman, Racine, all of Wis., assignors to Western Publishing Company, Racine, Wis.

Filed Aug. 9, 1990, Ser. No. 566,102

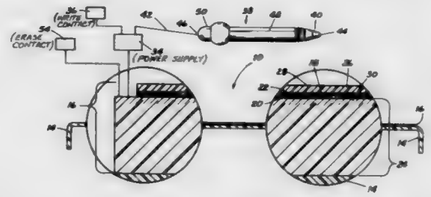
The portion of the term of this patent subsequent to May 5, 2009, has been disclaimed.

Int. Cl.[5] G02F *1/133;* **C08C** *21/00;* **G09G** *3/02, 3/36*

U.S. Cl. 359—52 **20 Claims**

1. In a polarizer-free display device of the type having a liquid crystal layer providing two visual characteristics, the improvement comprising:

a laminate having an LC-layer with first and second surfaces and formed of polymeric material holding micro-volumes of liquid crystal material, and a conductive layer along the first surface, the second surface conductor-free on or along an image-accepting region of the laminate; and



movable means for selective transitory application of DC electrical potential through the LC-layer to the conductive layer,

whereby an image of uniform intensity is formed along the image-accepting region upon application of such potential thereto independent of application method and without degradation of the laminate.

5,117,298

ACTIVE MATRIX LIQUID CRYSTAL DISPLAY WITH REDUCED FLICKERS

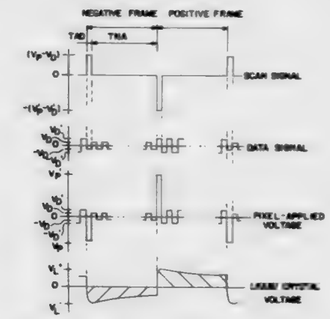
Yoshihiko Hirai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 14, 1989, Ser. No. 407,429

Claims priority, application Japan, Sep. 20, 1988, 63-237034; Sep. 20, 1988, 63-237035; Dec. 22, 1988, 63-325210; Dec. 23, 1988, 63-326844

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—55 **11 Claims**



1. A liquid crystal display comprising:

a plurality of lower electrodes arranged in a matrix form on a substrate;

thin film diodes connected respectively to said lower electrodes;

a plurality of columns of lead electrodes connected respectively to said lower electrodes in each column via said respective thin film diodes;

a plurality of rows of upper electrodes provided respectively over said lower electrodes in each row, one of said upper electrode and said lead electrode serving as a scan line;

a liquid crystal layer inserted between said lower electrodes and said upper electrodes; and

driving means for applying a signal between said lead electrode and said upper electrode, the polarity of said signal

being inverted for every predetermined number of scanning lines and an absolute value of said signal being different for the positive polarity and for the negative polarity, wherein said driving means includes:

control means for generating a frame signal;

a first voltage generating means for generating first and second voltages in response to said frame signal, said first voltage and said second voltage being different;

a second voltage generating means for generating first and second scan signals and first and second data signals in response to said first voltage, as well and third and fourth scan signals and third and fourth data signals in response to said second voltage, said first and said third scan signals being signals that select said scan lines, said second and said fourth scan signals being signals that do not select said scan lines, said first and said third data signals being signals that select said pixels, said second and said fourth data signals being signals that do not select said pixels, the sign of a first signal voltage obtained by subtracting said first data signal from said first scan signal being opposite to the sign of a second signal voltage obtained by subtracting said third data signal from said third scan signal, and the absolute value of said first signal voltage being different from the absolute value of said second signal voltage;

scan signal supplying means for supplying said scan signal to one of said upper electrode and said lead electrode that is used as said scan line in response to said frame signal; and

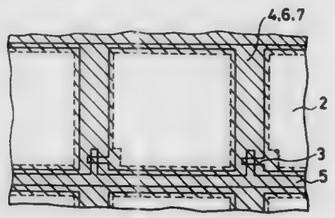
data signal supplying means for applying said data signal to the other of said upper electrode and said lead electrode that is used as said data line in response to said frame signal.

5,117,299

LIQUID CRYSTAL DISPLAY WITH A LIGHT BLOCKING FILM OF HARD CARBON

Hitoshi Kondo, Machida; Yuji Kimura, and Eiichi Ohta, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 523,559, May 15, 1990, abandoned.
This application Sep. 30, 1991, Ser. No. 767,362
Claims priority, application Japan, May 20, 1989, 1-127290
Int. Cl.[5] G02F *1/133;* B32B *9/00;* B01J *3/06;* G09G *3/36*
U.S. Cl. 359—58 4 Claims



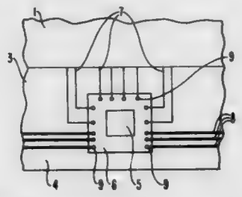
1. A liquid crystal display comprising liquid crystal material sandwiched between two substrates, a plurality of picture element electrodes disposed on at least one inner surface of said substrates, a lead electrode connected with said picture element electrodes by means of at least one conductor-insulator-conductor device, wherein said insulator is a hard carbon film disposed in all regions of said liquid crystal display other than display regions above said picture element electrodes as a light-shielding layer, said hard carbon film having a thickness of from 1100 to 8000 Å, a specific resistivity (ρ) of from 10^6 to 10^{13} ohm-cm, an optical band gap (Egopt) of from 1.0 to 3.0 eV, a hydrogen amount in the film (C_H) of from 10 to 50 atom %, an SP^3/SP^2 ratio of 2-4, a Vickers hardness of from 2500 to to 9500 $kg \cdot mm^{-2}$, a refractive index (n) of from 1.9 to 2.4, a defect density of from 10^{17} to 10^{19} cm^{-3}, a specific dielectric constant of from 2 to 6, and an average optical density in the visible ray region of not less than 0.5.

5,117,300

ELECTRICAL CIRCUIT DEVICE WITH DIFFERENT TYPES OF CONSUCTOR PATHS

Wolfram Wiemer, Blaustein, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed Mar. 29, 1990, Ser. No. 501,042
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1989, 3910963
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—88 10 Claims



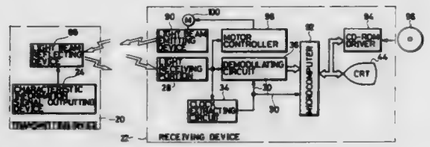
1. An electrical circuit device, including: a glass substrate having a surface; an integrated circuit chip with electrical terminals; an electrical device with electrical terminals and disposed on the same surface of the glass substrate as the integrated circuit chip; and electrical conductor paths applied to the surface of the glass substrate and connected to the electrical terminals of the integrated circuit chip and the electrical device, wherein said conductor paths include supply conductor paths connected to the terminals of the integrated circuit chip for supplying voltage to the integrated circuit chip and actuation conductor paths connected between the terminals of the integrated circuit chip and the electrical device for actuating the electrical device, and said actuation conductor paths comprise layers of indium tin oxide deposited on the surface of the glass substrate and said supply conductor paths comprise metal films glued on the surface of the glass substrate.

5,117,301

SYSTEM FOR TRANSMITTING INFORMATION TO MOVING OBJECT

Toshihiro Tsumura, 7-21 Abiko 3-chome, Sumiyoshi-ku, Osaka-shi, Osaka-fu, Japan

Filed Jun. 28, 1990, Ser. No. 545,998
Claims priority, application Japan, Jul. 3, 1989, 1-171476
Int. Cl.[5] H04B *10/00*
U.S. Cl. 359—154 6 Claims



1. A self contained navigation system for a moving vehicle comprising:

means in said vehicle for emitting a light beam;

means located along the course of travel of the vehicle for reflecting back to the vehicle the light beam emitted, said reflecting means including a light beam reflector and means for modulating the reflected light beam with a characteristic signal representative of a location of said reflecting means;

light receiving means on the vehicle for receiving the modulated reflected light beam;

means for extracting from said modulated reflected light beam identification information that is indicative of said location from which the reflected beam originates; and

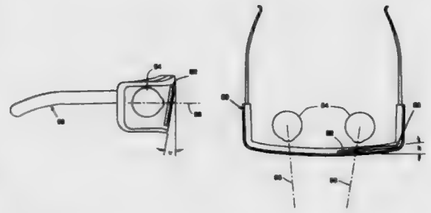
means including a microprocessor connected to said extracting means for processing said identification information.

5,117,302

HIGH DYNAMIC RANGE ELECTRO-OPTICAL SHUTTER FOR STEROSCOPIC AND OTHER APPLICATIONS

Lenny Lipton, Greenbrae, Calif., assignor to StereoGraphics Corporation, San Rafael, Calif.

Continuation of Ser. No. 509,329, Apr. 13, 1990, abandoned.
This application Sep. 19, 1991, Ser. No. 762,655
Int. Cl.[5] G02B *26/02;* G02F *1/13;* H04N *13/00*
U.S. Cl. 359—227 10 Claims



5. An electro-optical shutter system having an axis, and including:

an electro-optical shutter having a surface and a dynamic range in response to light incident at the surface; and

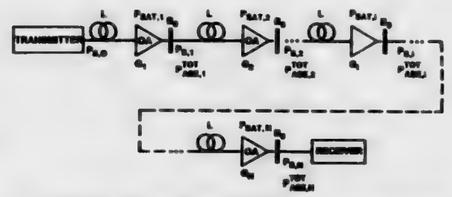
means for mounting the shutter in the system at a tip angle with respect to the axis, wherein the tip angle is selected so that the dynamic range of the shutter in response to a principal light ray incident at the surface at s aid tip angle after propagating along the axis is increased relative to the dynamic range of the shutter in response to a light ray incident at the surface at another angle, wherein the principal light ray is not perpendicular to the surface when said principal light ray is incident at said surface at the tip angle.

5,117,303

METHOD OF OPERATING CONCATENATED OPTICAL AMPLIFIERS

Emmanuel Desurvire, Middletown, and Clinton R. Giles, Holmdel, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 23, 1990, Ser. No. 571,958
Int. Cl.[5] G02B *6/26;* H01S *2/20;* G02F *1/00*
U.S. Cl. 359—341 4 Claims



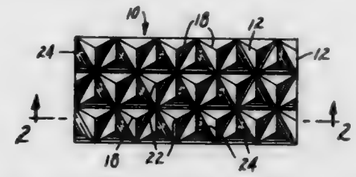
1. A method of operating an optical communication system having a transmitter for generating an optical radiation signal, a receiver of said signal, and an optical fiber communication link interposed between said transmitter and said receiver, spaced greater than seventy (70) kilometers apart said optical fiber communication link having transmission optical fibers concatenated with lumped erbium doped optical fiber amplifiers for amplifying an optical signal as it advances from one amplifier to the next from the transmitter to the receiver comprising the steps of operating each erbium doped optical fiber amplifier in its saturated state, and amplifying the optical signal as it advances through the optical fiber communication link from one amplifier to the next to a power level at the output of each optical amplifier which is substantially constant regardless of the power level of the optical signal received at the input of that optical amplifier.

5,117,304

RETROREFLECTIVE ARTICLE

Tzu-Li J. Huang, Woodbury; Walton J. Hammar, St. Paul; James C. Coderre, Lake Elmo, and Mirian D. Nave, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 21, 1990, Ser. No. 586,005
Int. Cl.[5] G02B *5/122*
U.S. Cl. 359—529 27 Claims



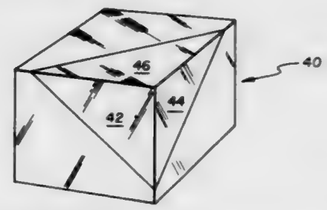
27. A flexible, retroreflective article, comprising a land and an array of retroreflective elements on the land, wherein the retroreflective elements comprise an optically clear, flexible aliphatic polyurethane polymer having a softening temperature of at least 110° C.

5,117,305

MODIFIED RETROREFLECTOR

Thomas W. Dey, Springwater, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1990, Ser. No. 557,891
The portion of the term of this patent subsequent to Jan. 28, 2009, has been disclaimed.
Int. Cl.[5] G02B *5/122*
U.S. Cl. 359—529 8 Claims



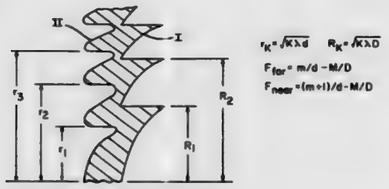
1. An optical device comprising:

a retroreflector corner cube, which corner cube comprises

a) a set of three mutually perpendicular reflecting surfaces; and

b) a face plate located as an entrance window to the set of reflecting surfaces and comprising an enhanced reflectivity coating, such that at least five percent of the energy of a radiation beam incident to the device is reflected at the face plate in accordance with Snell's Law.

5,117,306
DIFFRACTION BIFOCAL WITH ADJUSTED CHROMATICITY
Allen L. Cohen, 10010 Walsham Ct., Richmond, Va. 23233
Filed Jul. 17, 1990, Ser. No. 553,336
Int. Cl.[5] G02C *7/04*; G02B *27/44, 3/10*; A61F *2/16*
U.S. Cl. 359—565 **24 Claims**



1. An optical lens comprising;
(a) a first profiled surface or interface, for diffracting light to two adjacent non negative focal orders m and (m+1), m=0, 1, 2,. . . , comprising a plurality of annular concentric zones spaced according to the formula

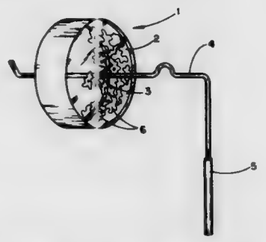
$$r_k=\sqrt{(k\ d\lambda)}\ k=1,\ 2,\ 3.$$

where λ is the design wavelength, d is the primary focal length of the surface or interface. k is a zone, and r_k is the zone radius, and
(b) a second profiled surface or interface, for diffracting light to a negative focal order −M, M=1, 2, 3, . . . , comprising a plurality of annular concentric zones spaced according to the formula

$$R_k=\sqrt{(kD\lambda)}\ k=1,\ 2,\ 3,$$

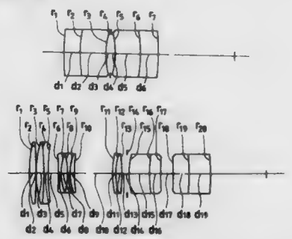
where D is the primary focal length of the surface or interface, and R_k is the zone radius,
said surfaces aligned such that their optical axes are coincident, and such that (m+1)/d > M/D > m/d thereby providing for positive chromatic aberration to be associated with a first focal point and negative chromatic aberration to be associated with a second focal point.

5,117,307
ROTATING WHEEL IMAGE MAKER
Harvey S. Bortock, 21 Alhambra Cir., Apt. 2, Coral Gables, Fla. 33134
Filed Apr. 22, 1991, Ser. No. 688,815
Int. Cl.[5] G02B *23/00*
U.S. Cl. 359—617 **1 Claim**



1. A rotating wheel image maker which comprises:
(a) a hollow container composed of two transparent flat or planar surfaces, each said surface having a hole in its center, and each said surface facing the other parallel or closely parallel and perimeters of one said flat surface connected to the perimeters of t he other said flat surface by material so as to form a hollow container;
(b) an axle which fits through said center holes of each of said transparent flat surfaces so as to enable the two said joined flat surfaces now constituting said hollow container, to revolve around said axle when said container is spun;
(c) loose objects within confines of said container and said loose objects visible to the eye and whereby said loose objects moving into different positions each time said container is rotated on said axle, whereby said loose objects in these positions interact with strobe signals received from an operating TV.

5,117,308
LENS SYSTEM USING UNHOMOGENOUS MEDIA
Hirofumi Tsuchida; Norihiko Aoki, and Kimiaki Yamamoto, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jun. 7, 1991, Ser. No. 711,895
Claims priority, application Japan, Jun. 8, 1990, 2-148598
Int. Cl.[5] G02B *3/00, 15/14*
U.S. Cl. 359—654 **4 Claims**



1. A lens system comprising a first lens unit and a second lens unit, each consisting of a radial type graded refractive index lens element made of a medium having a positive refractive power and a radial type graded refractive index lens element made of a medium having a negative refractive power; each of said graded refractive index lens elements being designed so as to satisfy the following condition (1):

$$0<v_1<v_0 \quad (1)$$

wherein the reference symbols v_1 and v_0 represent the coefficient representing dispersing power and axial Abbe's number respectively of said graded refractive index lens element.

5,117,309
VARI-FOCAL LENS SYSTEM HAVING GRADED REFRACTIVE INDEX LENS
Norihiko Aoki, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jun. 14, 1990, Ser. No. 537,780
Claims priority, application Japan, Jun. 15, 1989, 1-150588; Feb. 20, 1990, 2-37391
Int. Cl.[5] G02B *15/14, 13/18*
U.S. Cl. 359—654 **34 Claims**

1. A vari-focal lens system comprising a plurality of lens units separated from one another by airspaces interposed therebetween and including at least one lens unit having a positive refractive power and at least one lens having a negative refractive power, said lens system varying the focal length thereof by varying the airspace between said lens unit having the positive refractive power and said lens unit having the negative refractive power;
wherein a lens unit disposed on the extreme image side in said lens system has a negative refractive power, said lens unit disposed on the extreme image side including a plurality of lens elements having negative refractive powers

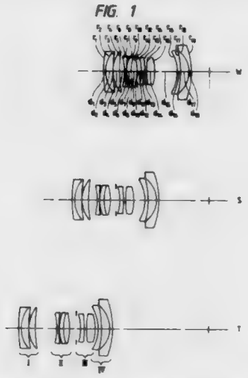
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5,117,310

Patent Not Issued For This Number

with at least one of said lens elements being a graded refractive index lens having a refractive index distribution

FIG. 1

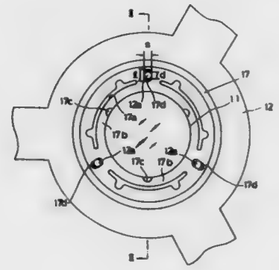


in a direction perpendicular to an optical axis of said lens system.

5,117,310

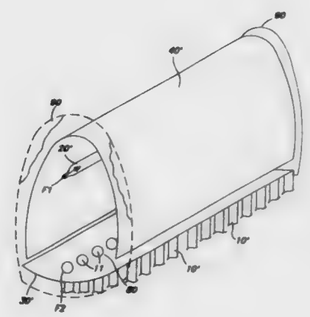
Patent Not Issued For This Number

5,117,311
RETAINING DEVICE OF ANNULAR MEMBER
Hiroshi Nomura, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 18, 1990, Ser. No. 629,715
Claims priority, application Japan, May 25, 1990, 2-54884
Int. Cl.[5] G02B *7/02*
U.S. Cl. 359—819 **15 Claims**



1. A retaining device for an annular member which is connected to a supporting member comprising three supporting projections provided on the supporting member along an imaginary circle, said device comprising three elongated supporting holes provided on the annular member and extending in radial directions on said annular member, so that said supporting projections of said supporting member are adapted to be fitted in the corresponding elongated supporting holes of the annular member.

5,117,312
APPARATUS INCLUDING CONCAVE REFLECTORS AND A LINE OF OPTICAL FIBERS
James T. Dolan, Frederick, Md., assignor to Fusion Systems Corporation, Rockville, Md.
Filed Jan. 4, 1991, Ser. No. 637,019
Int. Cl.[5] G02B *17/06, 5/10*; F21V *7/08, 7/12*
U.S. Cl. 359—858 **4 Claims**



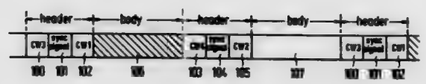
1. An apparatus including a radiation source which emits in a multiplicity of directions for focusing radiation on an object which may receive radiation within a certain solid angle, comprising a first reflector and a second reflector,
said first reflectro being elliptical in cross section and having a first focus and a second focus, said first reflector being formed in the shape of a section of a cylinder of an ellipse,
said second reflector being circular in cross section and having a center, and a radius equal to the distance between the second reflector and said first focus, said second reflector being formed in the shape of a section of a circular cylinder,
said first reflector and said second reflector being arranged so that a concave reflecting surface of said first reflector faces a concave reflecting surface of said second reflector, and so arranged that the first focus of said first reflector corresponds to said center of said second reflector,
said radiation source being an elongated discharge bulb which is located at said corresponding center of said second reflector and said focus of said first reflector, and
said object being a group of two or more optical fibers defining at least one line of optical fibers which are located at said second focus of said first reflector.

5,117,313

DIGITAL TRANSMISSION SYSTEM, TRANSMITTER AND RECEIVER TO BE UTILIZED IN THE TRANSMISSION SYSTEM AND RECORD CARRIER OBTAINED BY MEANS OF THE TRANSMITTER IN THE FORM OF A RECORDING MEANS

Gerardus C. P. Lokhoff; Gustavus L. P. Van Eijck, and Petrus H. M. Arts, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 16, 1990, Ser. No. 598,287
Claims priority, application Netherlands, Jan. 8, 1990, 9000039
Int. Cl.[5] G11B 5/09
U.S. Cl. 360—40 20 Claims



1. A digital transmission system comprising:

a transmitter and a receiver, for transmitting information through an information channel of a transmission medium, and for receiving the information transmitted through the information channel, which transmission medium further includes an auxiliary channel for transmitting an auxiliary signal containing synchronisation (sync) information and additional information,

said transmitter comprising an input terminal for receiving the information and means for converting the information applied to the input terminal to a form in which it is suitable for transmission through the information channel of the transmission medium and for receiving the additional information and transmitting the auxiliary signal through the auxiliary channel, said receiver comprising means for receiving and decoding the information transmitted through the information channel and for receiving the auxiliary signal transmitted through the auxiliary channel, and

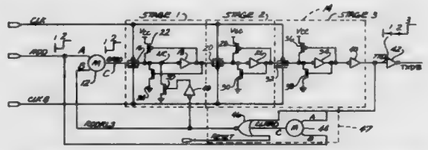
said transmitter comprising means for generating the auxiliary signal in the form of successive blocks, a first and a directly successive second block being composed of first block sections comprising the sync information and second block sections for containing the additional information, the first block section of the first block containing a sync signal and a first codeword, in this order, the second block section of the first block containing additional information, the first block section of the second block containing a sync signal and a second codeword, in this order, and wherein the second codeword is equal to the first codeword if the second block section of the second block likewise contains additional information, and the second codeword is unequal to the first codeword if the second block section of the second block does not contain additional information.

5,117,314

DISK DRIVE PULSE DETECTION METHOD AND CIRCUIT

Mehdi Bathaee, Riverside, and Takashi Asami, Huntington Beach, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Jun. 27, 1989, Ser. No. 372,274
Int. Cl.[5] G11B 5/09
U.S. Cl. 360—51 26 Claims



1. The combination of a rotating data storage disk and a pulse detector for receiving asynchronous input pulses of variable width, derived from the disk and for providing constant width output pulses synchronized with clock pulses, the pulse detector comprising:

a beginning of input pulse sensor for sensing asynchronous variable width input pulses from the disk;

a timing circuit responsive to the sensing of the beginning of one of said input pulses for generating an output pulse of substantially constant pulse width and synchronized with the clock pulses; and

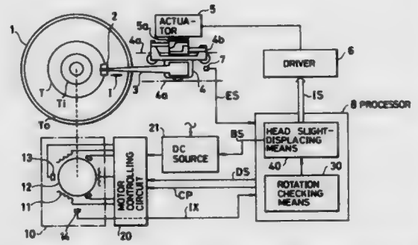
an input pulse presence sensor responsive to the presence of the output pulse for inhibiting generation by the timing circuit of another output pulse until after the input pulse, whose beginning is sensed, terminates so that a single output pulse is generated for each said input pulse.

5,117,315

SYSTEM AND METHOD FOR STARTING ROTATION OF A DISC IN A DISC STORAGE UNIT

Tatsutoshi Nagasaki; Takashi Miyashita, and Akihiko Yanagisawa, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed May 15, 1990, Ser. No. 523,553
Claims priority, application Japan, May 17, 1989, 1-123596
Int. Cl.[5] G11B 15/18
U.S. Cl. 360—71 9 Claims



1. A system for starting rotation of a disc in a disc storage unit including a disc, a head mounted for reading from and writing to the disc, and a disc driving mechanism for applying a driving force of rotation to the disc, comprising:

rotation checking means for checking whether or not the disc is rotating;

head displacing means for slightly displacing the head by a predetermined minute amount if no rotation of the disc is detected by said rotation checking means when a driving force of rotation is applied to the disc by the disc driving mechanism; and

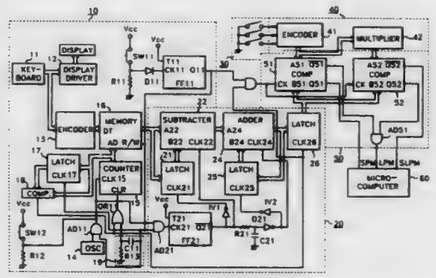
control means for causing a repetitive operation of both said rotation checking means and said head displacing means up to a predetermined number of times.

5,117,316

AUTOMATIC VIDEO TAPE RUNNING MODE SETTING CIRCUIT FOR PROGRAMMED RECORDINGS

Jeong-ho Kim, Taegu, Rep. of Korea, assignor to SamSung Electronics Co., Ltd, Suwon, Rep. of Korea

Filed Jul. 20, 1989, Ser. No. 382,271
Claims priority, application Rep. of Korea, Aug. 26, 1988, 88-13932
Int. Cl.[5] G11B 15/46
U.S. Cl. 360—73.07 15 Claims



1. An automatic video tape running mode setting circuit for programmed recordings, comprising:

programmed recording time memory means for memorizing and outputting programmed recording start and end times successively for a plurality of programs set by a user;

a programmed recording time detector for providing output signals by detecting the total programmed recording time for all the programs by subtracting the start time from the end time outputted from said programmed recording time memory means for each of the programs to calculate each programmed recording time, and by adding all such programmed recording times to obtain the total programmed recording time for all the programs;

a recording capacity detector for detecting recording capacity of the video tape, said video tape being housed in a cassette loaded in a deck;

a recording capacity time base data generator for generating time base data corresponding to the recording capacity detected by said recording capacity detector; and

a running mode signal generator for generating and transmitting a video tape running mode signal to a microcomputer, said microcomputer controlling the operation of the whole system by comparing the output signals of the programmed recording time detector and the recording capacity time base data generator.

5,117,317

MAGNETIC TAPE RECORDING DEVICE WHICH POSITIONS THE BEGINNING OF THE MAGNETIC TAPE ADJACENT A RECORDING HEAD

Kenji Suzuki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Oct. 18, 1989, Ser. No. 423,797
Claims priority, application Japan, Oct. 21, 1988, 63-137727[U]
Int. Cl.[5] G11B 15/48
U.S. Cl. 360—74 5 Claims

1. A magnetic tape recording and playback device comprising:

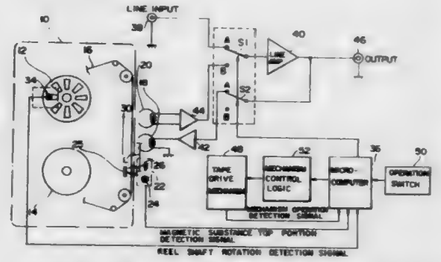
setting means for setting a tape to an initial starting position;

boundary detection means provided along a tape running path for detecting the transition boundary between a leader tape portion and a magnetic tape portion;

a magnetic recording a playback transducer provided along the tape running path to effect recording and playback on the tape, whereby said boundary detection means is disposed at least one of before and after said magnetic recording and playback transducer with respect to a direction of travel of the tape with a predetermined interval therebetween;

mechanical means for driving the tape to move along the tape running path; and

drive control means for controlling driving of the tape so as to drive said mechanical means to rewind the tape when said setting means has been operated and upon detection



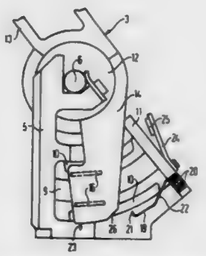
of the transition boundary between the leader tape portion and the magnetic tape portion by said boundary detection means, stop driving of the tape in a state where the magnetic recording and playback transducer means is positioned in the vicinity of starting edge portion of the magnetic tape portion thereby to set the initial starting position, thereafter said drive control means drives the tape so that the tape is displaced forward, toward said transducer means, for a time length L/V, where L represents said predetermined interval and V represents speed of driving the tape, from a point at which said transition boundary has been detected by said boundary detection means.

5,117,318

ROTATIONAL POSITIONER LATCH FOR A MAGNETIC DISC STORAGE

Josef Immler, Puchheim, and Ulber Armin, Unterschleissheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

PCT No. PCT/DE89/00372, § 371 Date Mar. 18, 1991, § 102(e) Date Mar. 18, 1991, PCT Pub. No. WO90/03029, PCT Pub. Date Mar. 22, 1990
PCT Filed Jun. 5, 1989, Ser. No. 671,909
Claims priority, application PCT Int'l Appl., Sep. 16, 1988, PCT/DE88/00580
Int. Cl.[5] G11B 5/54, 21/22
U.S. Cl. 360—105 10 Claims



1. A rotational positioner for a magnetic disc storage, comprising: a base; a swivel member seated rotationally movable on said base and carrying magnetic heads; a drive system; a

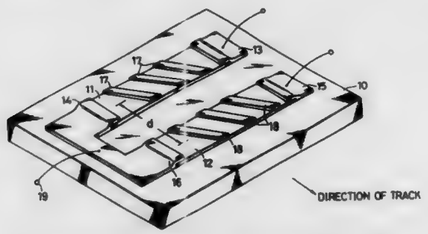
movable element of said drive system of the rotational positioner means fixed to said swivel member, and a latch means for blocking said swivel member in an idle position, said latch means comprising a latch element deflectable opposite a spring pre-stress and a retainer element of the swivel member engaged thereto in the idle position and that can be disengaged from the idle position into an operating position with a release motion forced by the drive system, the retainer element being rigidly fashioned and the latch element comprising a leaf spring clamped at one side and arranged such with reference to the swivel member that said leaf spring deforms in a first phase of the release motion of the swivel member occurring opposite a moving direction into an operating position and thereby disengages the latch element, initially detaching friction-free from the retainer element, into an enable position, so that the retainer element, in a following, second phase of the release motion given maximum acceleration of the swivel member in the opposite moving direction, enters into the operating position passing—in non-contacting fashion—the latch element that subsequently drops back into a latched position.

5,117,319

MAGNETIC MOVEMENT SENSING DEVICE

Ichiro Tokunaga, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 112,675, Oct. 23, 1987, abandoned. This application Oct. 12, 1989, Ser. No. 420,190
Claims priority, application Japan, Feb. 18, 1987, 62-35362
Int. Cl.[5] G11B *5/127*
U.S. Cl. 360—113 **9 Claims**



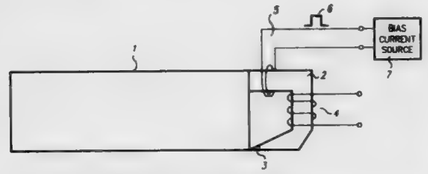
1. A magnetic movement detecting device comprising:
a magnetic sensor having a first surface and a second surface;
a magnetic scale having a magnetic medium including a plurality of magnetic poles in which a first interval spacing between at least a first pair of adjoining magnetic poles has a relative different length than a second interval spacing between at least a second pair of adjoining magnetic poles, and wherein said magnetic scale moves in a relative movement direction with respect to said magnetic sensor and in which said plurality of magnetic poles are magnetized in an alternative polarity of N-pole and S-pole;
a first magnetoresistance effect thin film formed on said first surface of said magnetic sensor and arranged to produce a magnetic anisotropy in which an electrical resistance is varied when a magnetic flux from said plurality of magnetic poles of said magnetic scale is moved in a direction parallel to said relative movement direction of said magnetic scale and in which the electrical resistance is not varied when said magnetic flux is moved in a direction perpendicular to said relative movement direction of said magnetic scale;
a second magnetoresistance effect thin film formed on said second surface of said magnetic sensor and arranged to produce a magnetic anisotropy in parallel with the magnetic anisotropy of said first magnetoresistance effect thin film in which an electrical resistance is varied, said second magnetoresistance effect thin film being spaced apart from said first magnetoresistance effect thin film with respect to said relative movement direction of said magnetic scale by a distance not greater than a minimum interval spacing of said plurality of magnetic poles;
a first set and a second set of oblique electrodes of a conductive material having a lower resistivity than a resistivity of said first and second magnetoresistance effect thin films, said first set of oblique electrodes positioned on a surface of said first magnetoresistance effect thin film and said second set of oblique electrodes positioned on a surface of said second magnetoresistance effect thin film, said first and second sets of oblique electrodes arranged such that bias currents energized in each of said first and second magnetoresistance effect thin films generate first and second self-biasing magnetic fields parallel to said relative movement direction of said magnetic scale, said first self-biasing magnetic field having a polarity in a direction opposite to said second self-biasing magnetic field; and
characterized in that a relative movement of said magnetic scale with respect to said magnetic sensor is detected by a difference of a rate of variation of resistance based on a voltage value between a pair of ends of said first magnetoresistance effect thin film.

5,117,320

MAGNETOSTRICTIVE HEAD WITH D.C. BIAS MAGNETIC FIELD

Kenji Ogasawara, Machida; Koji Kurachi, Yokohama, and Atsushi Tobari, Fujisawa, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1990, Ser. No. 592,431
Claims priority, application Japan, Oct. 5, 1989, 1-258970
Int. Cl.[5] G11B *5/127, 5/33*
U.S. Cl. 360—113 **3 Claims**



1. A magnetic head device comprising:
a magnetic core member having a substantially closed path having pole pieces separated by a non-magnetic material to form a transducing gap, said magnetic core member comprising a magnetic material having a positive magnetostriction constant;
a coil member wound around a part of said magnetic core member so that a read signal can be read out from said coil member in response to magnetic fields at or near said transducing gap; and
means for generating a d.c. bias magnetic field in said magnetic core member when a read signal is read out from said coil member.

5,117,321

SOFT MAGNETIC THIN FILM, METHOD FOR PREPARING SAME AND MAGNETIC HEAD

Kanji Nakanishi, Hadano; Osamu Shimizu, Minami-ashigara; Satoshi Yoshida, Hachioji; Masaaki Katayama, Odawara, and Tatsuya Isomura, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 26, 1990, Ser. No. 470,662
Claims priority, application Japan, Jan. 26, 1989, 1-15112; Feb. 8, 1989, 1-27518; Feb. 15, 1989, 1-33726; Aug. 9, 1989, 1-204586; Nov. 27, 1989, 1-304811; Dec. 1, 1989, 1-310607; Dec. 6, 1989, 1-315361; Jan. 17, 1990, 2-6242
Int. Cl.[5] G11B *5/235*
U.S. Cl. 360—120 **17 Claims**

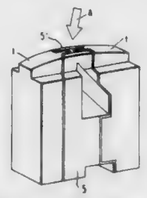
1. A composite magnetic head in which a magnetic head

core includes end faces opposing to each other and a recess set back from said opposing end faces, and in which soft magnetic layers exposed to the opposing end faces are provided on said opposing end faces, each of said soft magnetic layers having the composition $Fe_aB_bN_c$ where a, b and c denot the compositional ratios in atomic percent and B denotes at least one selected from the group consisting of Zr, Hf, Ti, Nb, Ta, V, Mo and W and the compositional range is such that

$0<b\leqq 20$ and

$0<c\leqq 22$

within the exclusion of the range defined by $b\leqq 7.5$ and $c\leqq 5$.

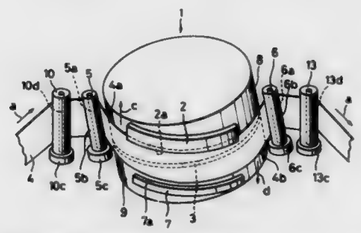


5,117,322

TAPE GUIDE MECHANISM FOR HELICAL SCAN RECORDING/REPRODUCTION APPARATUS

Takuya Kaeriyama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 14, 1990, Ser. No. 538,212
Claims priority, application Japan, Jun. 29, 1989, 1-168926
Int. Cl.[5] G11B *15/60*
U.S. Cl. 360—130.24 **6 Claims**



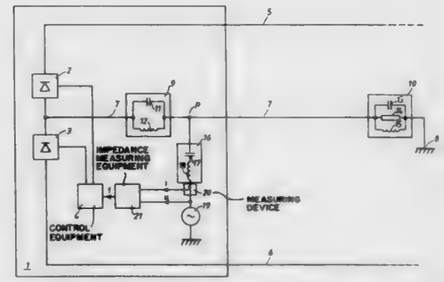
1. A tape guide mechanism comprising:
(a) cylinder means having an outer curved surface over which a tape can travel, a tape entrance point toward which the cylinder is inclined at a first predetermined acute angle with respect to a given plane, a tape exit point, and containing a rotary head for recording/reproducing a signal on/from a magnetic tape wound around the cylinder means;
(b) a pair of rotary, upright guide means, respectively arranged at the entrance point and the exit point of the cylinder means, for guiding the magnetic tape;
(c) a pair of rotary inclined guide means, each arranged between the cylinder means and a different one of the pair of rotary upright guide means, and inclined at a second predetermined acute angle with respect to the plane, for guiding the magnetic tape, each of the pair of rotary inclined guide means comprising a rotatable roller guide and a roller shaft for supporting the roller guide; and
(d) wherein the cylinder means comprises lead means, provided on the curved surface of the cylinder means, for regulating widthwise movement of the magnetic tape at each edge of the magnetic tape, the widthwise movement being caused by rotation of the roller guides when the magnetic tape travels along the rotary inclined guide means in a direction parallel to the plane.

5,117,323

ELECTRODE LINE PROTECTION

Gunnar Asplund, Ludvika, Sweden, assignor to ASEA Brown Boveri AB, Västeras, Sweden

Filed Sep. 13, 1989, Ser. No. 408,967
Claims priority, application Sweden, Sep. 21, 1988, 8803343
Int. Cl.[5] H02H *3/16*
U.S. Cl. 361—47 **6 Claims**



1. A protective device for detection of ground faults on an electrode line of a convertor station, the electrode line being adapted for power transmission by means of high voltage direct current, said protective device comprising:
a) means provided at a feeding point at one end of the electrode line for supplying to the electrode line an alternating voltage or alternating current signal with a predetermined frequency;
b) suppression filters provided at both ends of the electrode line and tuned to said predetermined frequency; and
c) means for determining the impedance of the electrode line at the feeding point in relation to the ground at said predetermined frequency;
wherein the suppression filter located at the end of the electrode line which is remote in relation to the feeding point, is provided with resistive members having such a resistance that the filter is matched to the wave impedance of the electrode line, whereby avoiding standing waves in the electrode line.

5,117,324

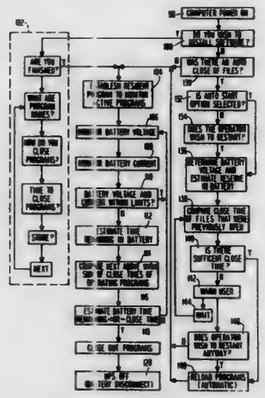
UPS-COMPUTER SYSTEM AND METHOD FOR INITIATING COMPUTER SHUTDOWN BASED ON REMAINING BATTERY TIME AS DETERMINED FROM SENSED BATTERY VOLTAGE AND DISCHARGE CURVES

Robert W. Johnson, Jr., Raleigh, N.C., assignor to Exide Electronics, Raleigh, N.C.

Filed Nov. 13, 1989, Ser. No. 434,279
Int. Cl.[5] H02H *3/24, 7/20;* **H02J** *7/00*
U.S. Cl. 361—66 **10 Claims**

1. An uninterruptable power supply system for powering a computer having a shutdown sequence, wherein the time required to execute said shutdown sequence is known and stored in said computer, comprising:
an auxiliary power source including a battery for supplying power to the computer, said battery having known discharge characteristic curves, said discharge characteristic curves stored in said computer;
sensing means, connected between said battery and said computer, for sensing battery terminal voltage and transmitting the sensed terminal voltage to said computer; and
instruction means, stored in said computer, for determining whether said terminal voltage is within predefined limits, for determining battery time remaining in response to the sensed battery terminal voltage, for comparing said battery time remaining to said time required to execute said

shutdown sequence and for initiating said shutdown sequence whenever said battery time remaining is less than or equal to said time required to execute said shutdown sequence, wherein said battery time remaining is determined from said discharge characteristic curves in relation to said battery terminal voltage after it is determined that said terminal voltage is not within said predefined limits, whereby computer operating time is maximized.

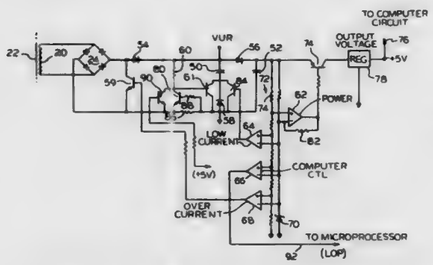


5,117,325

CONTROLLABLE RECLOSER FOR POWER LINE

Michael Dunk, Racine, and Clyde Gilker, S. Milwaukee, both of Wis., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Jan. 23, 1990, Ser. No. 468,903
Int. Cl.[5] H02H 3/06
U.S. Cl. 361—93 22 Claims



1. A recloser for an electrical power line comprising at least one settable switch means coupled in said line to open or close said line, said switch means remaining in the opened or closed condition in which it was last set.

means including a microprocessor for controlling the setting of said switch means to either an opened or a closed position;

a multimodal power source for energizing said recloser under the control of said microprocessor and for causing it to operate in different modes depending upon a level of current then appearing on said line;

said multimodal power source comprising a large capacitor and a small capacitor, means responsive to power line current for charging said capacitors to a level which is indicative of the level of line current;

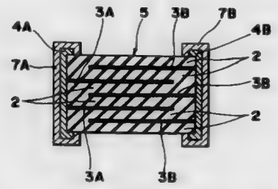
means responsive to said line current indicating a need to open said line for coupling said capacitors to supply energy to said recloser during periods while said line is open; and means responsive to surge current levels on said power line for effectively removing said large capacitor from a charging circuit controlled by said charging means and for charging only said small capacitor in order to provide a quick start, said charge on said small capacitor quickly rising to a level which is sufficient for powering said recloser.

5,117,326

MONOLITHIC CERAMIC CAPACITOR

Harunobu Sano, Kyoto; Nagato Omori; Yoshiaki Kohno, both of Nagaokakyo, and Yukio Sakabe, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 4, 1990, Ser. No. 504,244
Claims priority, application Japan, Apr. 5, 1989, 1-87563
Int. Cl.[5] H01G 4/06; C04B 35/46
U.S. Cl. 361—321 9 Claims



1. A monolithic ceramic capacitor comprising a plurality of dielectric ceramic layers united to one another to form a monolithic body, a plurality of internal electrodes each formed between two adjacent dielectric ceramic layers, and external electrodes formed on opposite sides of said monolithic body and each being connected to alternate internal electrodes, characterized in that said dielectric ceramic layers are made up of a dielectric ceramic composition consisting essentially of a basic composition and an antireducing agent incorporated therein to prevent it from reduction, said basic composition mainly comprising barium titanate and a bismuth compound incorporated therein, and in that said internal electrodes comprise copper or a copper alloy.

5,117,327

NORBORNENE DICARBOXIMIDE POLYMER DIELECTRIC DEVICES

Jawed Asrar, Chesterfield, and Christopher J. Hardiman, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 19, 1990, Ser. No. 629,887
Int. Cl.[5] H01G 4/08; C08G 69/00
U.S. Cl. 361—323 7 Claims

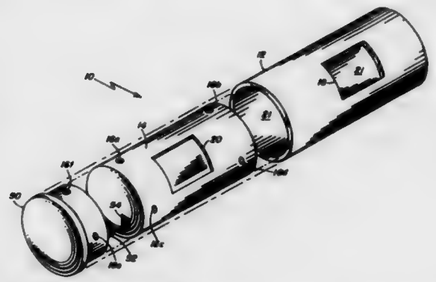
1. A device comprising an electrical conducting component and an electrical insulating component, wherein said electrical insulating component comprises a thermoplastic polymer exhibiting a glass transition temperature greater than about 200° C., moisture absorption after equilibrating in boiling water of less than about 3 weight percent and an electrical permittivity at 1000 hertz measured at 25° C. and 50 percent relative humidity of less than 2.8, wherein said polymer comprises units of norbornene dicarboximide.

5,117,328

PAYLOAD RETENTION APPARATUS

Jules A. Bilodeau, Goleta, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 9, 1990, Ser. No. 506,303
Int. Cl.[5] H05K 7/20; F16B 11/00
U.S. Cl. 361—380 5 Claims



1. A decoy comprising:

a) an electronics assembly having a plurality of countersink holes formed therein and a first alignment indicia; and

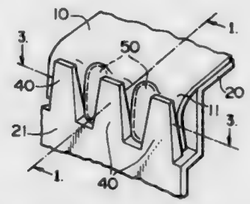
b) a shell adapted to receive the electronics assembly and having a second alignment indicia, with portions of the shell being deformed into the countersink holes to substantially confirm to the contours of the countersink holes with the first and second alignment indicia having a predetermined spatial relationship.

5,117,329

MOUNTING STRUCTURE FOR FLEXIBLE PRINTED WIRING BOARD HAVING HOLDING RIBS AND AUXILIARY RIBS PROTRUDING THEREBETWEEN

Noriaki Ohta, and Kenichi Hashimoto, both of Shimada, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Nov. 14, 1990, Ser. No. 612,670
Claims priority, application Japan, Nov. 15, 1989, 1-132040[U]
Int. Cl.[5] H05K 7/02; A44B 21/00
U.S. Cl. 361—395 3 Claims



1. A mounting structure, for a flexible printed wiring board, comprising receiving means for receiving a portion of a wiring board, said receiving means comprising a side wall further comprising a first portion and a second portion offset from said first portion, a row of spaced-apart holding ribs extending from said first portion and an opposing row of spaced-apart auxiliary ribs extending from said second portion;

wherein said auxiliary ribs each has a rounded side that increases with protrusion toward the root of the auxiliary rib and faces said holding ribs; and

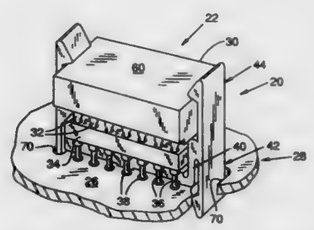
wherein said auxiliary ribs are positioned with respect to said holding ribs such that part of the rounded sides of the auxiliary ribs protrudes between adjacent holding ribs, whereby a portion of a flexible printed wiring board may be received between the row of holding ribs and the row of auxiliary ribs.

5,117,330

FIXTURE FOR CIRCUIT COMPONENTS

Jay M. Miazga, Marysville, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 9, 1990, Ser. No. 507,336
Int. Cl.[5] H05K 7/06
U.S. Cl. 361—400 3 Claims



1. An apparatus for fixing the position of a circuit component relative to a circuit board comprising:

a spacer having a first surface and a second surface spaced a predetermined distance from the first surface;

first clip means for securing the spacer to the circuit board with the first surface contacting the circuit board; and

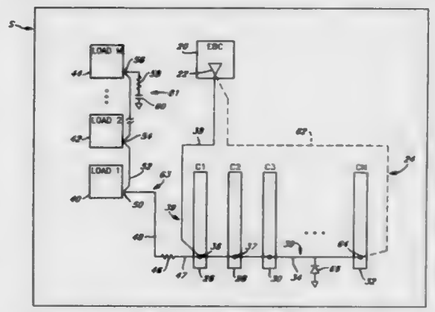
second clip means for securing a circuit component to the spacer with the second surface contacting the component, wherein the second clip means includes a pair of arms attached to the spacer, the arms being detachable from the spacer.

5,117,331

BUS CONTROL SIGNAL ROUTING AND TERMINATION

Ghassan R. Gebara, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed May 16, 1991, Ser. No. 701,180
Int. Cl.[5] H05K 7/06
U.S. Cl. 361—407 4 Claims



1. A computer bus system, comprising:

a system board for mounting electrical components;

an electrical component mounted on said system board having a terminal for generating electrical signals;

a plurality of connectors mounted serially on said system board for receiving circuit boards, each said connector each having at least one terminal;

at least one electrical conductor, each said conductor serially routed and connected to a corresponding terminal of each of said plurality of connectors;

at least one system load mounted on said system board, each said system load having a terminal for receiving an electrical signal;

an electrical conductor connected to said electrical signal generating terminal, said conductor routed and connected to a corresponding terminal of one end connector of said multiple connectors without branching prior to connection to said end connector terminal;

a resistor;

a relatively short electrical conductor connected to one end of said resistor, said conductor routed and connected to one of said terminals of an end connector of said plurality of connectors;

an electrical conductor connected to the other end of said resistor, said conductor serially routed and connected to a corresponding terminal of each said system load without branching, wherein said conductor ends at one of said at least one system load, and

ac termination means connected to said corresponding terminal of said at least one system load wherein said conductor end.

5,117,332

SOLID ELECTROLYTIC CAPACITORS AND METHOD FOR MANUFACTURING THE SAME

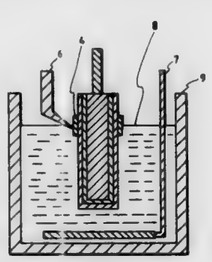
Yasuo Kudoh, Yokohama; Sohji Tsuchiya, Kanagawa; Masao Fukuyama, Kawasaki; Toshikuni Kojima, Zama; Junji Ozaki, Kyoto, and Yasuhiro Kobatake, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 28, 1991, Ser. No. 705,980

Claims priority, application Japan, May 25, 1990, 2-135917; Jun. 18, 1990, 2-159020

Int. Cl.[5] H01G *9/00*; C25D *9/02*; B01J *17/00*

U.S. Cl. 361—525 **24 Claims**



9. A solid electrolytic capacitor which comprises a valve metal member having an electric insulating separation layer for separation of said valve metal member into two regions on opposite sides of said valve metal member, a dielectric film formed on at least one of the regions, and a conductive polymer film formed on the dielectric film on one region to form a capacitor portion, the other region being enfolded or convolutely wound to reduce a volumetric size.

5,117,333

SOLID ELECTROLYTIC CAPACITOR WITH ORGANIC SEMICONDUCTOR AND METHOD OF MANUFACTURING THE SAME

Kenji Kakuma, Kyoto; Katsunori Mizutomi, Moriguchi, and Shinichi Niwa, Toyonaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 27, 1991, Ser. No. 722,424

Claims priority, application Japan, Jun. 29, 1990, 2-173371; Jan. 31, 1991, 3-11337; Apr. 11, 1991, 3-78738

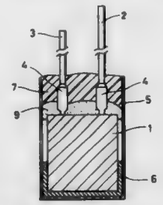
Int. Cl.[5] H01G *9/02*

U.S. Cl. 361—527 **16 Claims**

1. A solid electrolytic capacitor with organic semiconductor comprising:

a capacitor element formed by inserting a separator sheet between an anode foil member being provided with an oxide film on its surface and a cathode foil member and rolling this material;

a solid electrolyte layer formed by heating and melting TCNQ complex salt having electrical conductivity being applicable to an electrolyte for a capacitor, impregnating



said TCNQ complex salt into said capacitor element and thereafter cooling and solidifying the same;

a powder coating layer formed to cover an upper portion of said capacitor element; and

a sealing resin layer covering said powder coating layer for sealing said capacitor element.

5,117,334

ILLUMINATED INDICATOR GAUGE

Tsuyoshi Kameda, Saitama, Japan, assignor to Kanto Seiki Co., Ltd., Omiya, Japan

Division of Ser. No. 443,332, Dec. 1, 1989, Pat. No. 5,029,046.

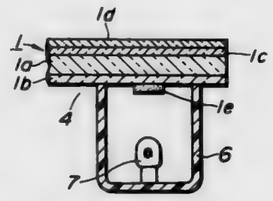
This application Apr. 12, 1991, Ser. No. 684,565

Claims priority, application Japan, Dec. 27, 1988, 63-168746[U]; Dec. 27, 1988, 63-168747[U]; Dec. 27, 1988, 63-168748[U]; Dec. 27, 1988, 63-168749[U]; Dec. 27, 1988, 63-168750[U]

The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.

Int. Cl.[5] G01D *11/28*

U.S. Cl. 362—28 **7 Claims**



1. An indicator gauge comprising:

a meter panel, said meter panel including a transparent base plate, a transparent colored layer applied to a rear surface of said transparent base plate, a fluorescent substance layer applied to a front surface of said transparent base plate and a smoked layer interposed between the front surface of said transparent base plate and said fluorescent transparent substance layer;

a visual alarm indicator including an opaque mark mounted to a rear surface of said transparent colored layer, a lamp housing having an open end which is connected to the rear surface of the transparent colored layer in a manner as to enclose said opaque mark thereby exposing said opaque mark to the interior of said lamp housing, and an electric lamp installed in said lamp housing; and

an ultraviolet lamp arranged in front of said meter panel and generating ultraviolet rays upon electric energization thereof.

5,117,335

HEADLIGHT FOR VEHICLE

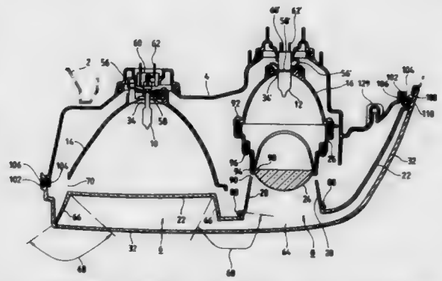
Masaru Yamada, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1990, Ser. No. 625,193

Claims priority, application Japan, Dec. 28, 1989, 1-338381; Dec. 28, 1989, 1-338382; Dec. 28, 1989, 1-338383

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 362—61 **28 Claims**



1. A vehicular headlight comprising: means for producing at least two beams of illuminating light, and lens means positioned over said beam producing means such that said beam passes through said lens mean, said lens means comprising an inner lens, an outer lens, and a hood provided between said inner and outer lenses, extending around said inner lens, said inner lens and said hood being integrally formed with one another of a light-transmissible resin, said hood having a coating thereon to block light, wherein said light beam producing means comprises a first beam reflector, a second ellipsoidal beam reflector, a light bulb positioned within each of said first and second reflectors, a condensing lens positioned forward of said second ellipsoidal beam reflector, and means for mounting said condensing lens to a front end of said second ellipsoidal beam reflector.

5,117,336

WORKING SPOTLIGHT, PARTICULARLY FOR MOTOR VEHICLES

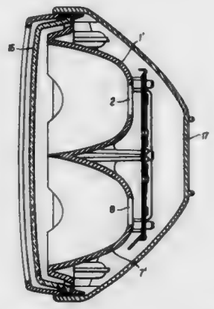
Bela Scenzi, Vienna, Austria, assignor to Hella KG Hueck & Co., Fed. Rep. of Germany

Continuation of Ser. No. 581,704, Sep. 13, 1990, abandoned. This application May 24, 1991, Ser. No. 707,219

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1989, 3930746

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 362—61 **8 Claims**



1. Working spotlight, particularly for motor vehicles, comprising first and second reflectors, each having a light source at a focal point thereof, arranged in a common housing covered by a common, substantially-noncorrecting, lens, wherein the first reflector has a first approximately elliptical portion in horizontal cross section through an optical axis thereof and a second approximately elliptical portion in vertical cross section through the optical axis above the optical axis, with a spacing between focal points of the second approximately elliptical portion being greater than spacing between focal points of the first approximately elliptical portion, and wherein the first reflector has an approximately parabolic portion located below its optical axis in vertical cross section through its optical axis, the second reflector has an approximately elliptical portion in horizontal cross section through its optical axis, and the second reflector has an approximately parabolic portion in vertical cross section through its optical axis, with spacing between focal points of the approximately elliptical portion of the second reflector being greater than spacing between focal points of the first approximate elliptical portion of the first reflector, and with the optical axes of the first and second reflectors being directed approximately parallel.

5,117,337

VANITY MIRROR

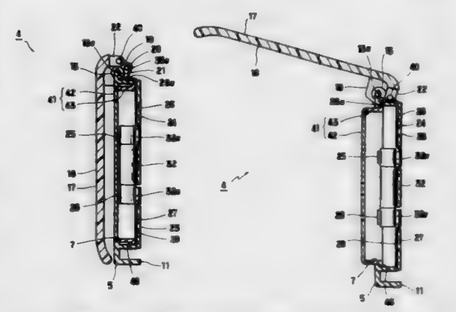
Toranosuke Sakuma, Shimizu, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1991, Ser. No. 732,473

Claims priority, application Japan, Jan. 16, 1991, 3-15001

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 362—74 **7 Claims**



1. A vanity mirror of the type including a mirror, an illuminating portion having a lamp, and a cover for covering and exposing a front surface of the mirror, with the lamp being turned on and off in response to opening and closing of the cover, wherein a lens covering a front side of the lamp is displaceable in fore and aft directions, and a mechanism is provided for displacing the lens in response to opening and closing of the cover, such that when the cover is opened the lens displaces forward and the lamp is turned on.

5,117,338

JEWELRY LIGHTING DEVICE

Charles F. McCrary, 1005 Wheeler Dr., Hanahan, S.C. 29406

Filed Sep. 26, 1991, Ser. No. 765,665

Int. Cl.[5] F21L *15/08*

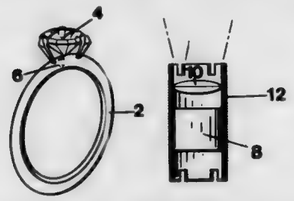
U.S. Cl. 362—104 **15 Claims**

1. A gem stone lighting device for gem stones placed within a jewelry setting, comprising:

a. a stone which is mounted in a jewelry setting; and

b. a lighting means which is mounted to said jewelry setting

externally to said gem stone, wherein said lighting means emits a focused beam of light from said lighting means so



that said focused beam of light strikes a facet of said gem stone at an angle of 45° to 70° to a plane of said facet.

5,117,339

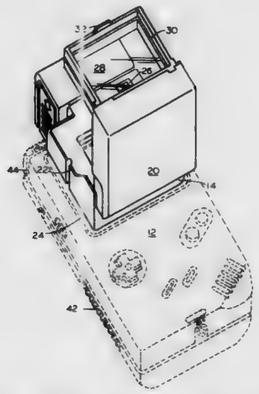
COMPACT COMBINED LIGHT AND MAGNIFIER APPARATUS FOR A HAND HELD COMPUTER WITH VIDEO SCREEN

Angelo Tortola, Lexington, and Robert Howitt, Leominster, both of Mass., assignors to Curtis Manufacturing Company, Inc., Jaffrey, N.H.

Continuation-in-part of Ser. No. 678,265, Apr. 19, 1991. This application Oct. 4, 1991, Ser. No. 771,728

Int. Cl.[5] F21V *33/00*

U.S. Cl. 362—109 **6 Claims**



1. A compact, combined light and magnifying apparatus for use with a hand held computer having a video screen, which combined apparatus comprises:

a) a light means to enhance the view of the video screen, which light means comprises:

i) a body having a one and the other end and a face and bottom surface having a plurality of panels which define an open video viewing space within the body, the video viewing space adapted to conform generally to the computer video screen to be lighted;

ii) a battery compartment secured at the one end of the body adapted to receive one or more batteries as a power source the battery compartment having a bottom surface;

iii) lighting means to light up one or more of the side panels to provide light to the computer video screen;

iv) an electrical switch to control the power from the power source;

v) electrical circuitry means to connect the light means, the switch, the power source and the battery compartment;

vi) attachment means to secure releasably the body of the light means directly on to the compact computer so that the open viewing space can be positioned over the video screen of the computer;

b) a cover of defined shallow depth having a one and the other end, the one end of the cover pivotably secured to the other end of the body of the light means on the face side of the body, the cover adapted to move between a closed, compact position closely adjacent to and over the video viewing space of the body and an open position extending generally perpendicularly outwardly from the other end of the body from the face surface of the body a defined distance; and

c) a magnifier means which comprises a frame having a one and the other end and a magnifying lens secured within the frame, the magnifying lens adapted to conform generally to the dimensions of the video screen, the one end of the frame pivotably secured to the other end of the cover, the frame with the magnifying lens adapted to move between a compact, stored position with the frame and the magnifying lens snugly fitting within the depth of the cover and generally parallel to the plane of the cover and a magnifying, use position extending generally perpendicularly outwardly from the other end of the cover and over the video screen and the video viewing space of the body to magnify the information on the video screen, thereby providing a compact, separately operable light and magnifying apparatus for use in enhancing the view of a video screen of a hand held computer.

5,117,340

LIGHTING DEVICE

Ralf Schäfer, Göllheimer Strasse 10, D-6719 Riissingen, Fed. Rep. of Germany

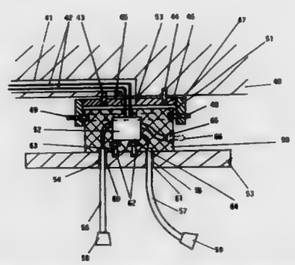
PCT No. PCT/DE88/00694, § 371 Date Sep. 6, 1989, § 102(e) Date Sep. 6, 1989, PCT Pub. No. WO89/04436, PCT Pub. Date May 18, 1989

PCT Filed Nov. 9, 1988, Ser. No. 415,253

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1987, 3738007

Int. Cl.[5] F21S *7/00*

U.S. Cl. 362—148 **16 Claims**



1. A lighting device, comprising a support plate having first and second sides, a current supply attached to said first side, means for supporting said support plate at a distance from a surface of a room, defining a laterally open space between said first side and the surface, a leg having first and second ends, said first end penetrating said plate and protruding from said second side, first socket means attached to said second end for attaching and electrically connecting a light bulb, and second socket means disposed on said first side in said space for attaching and electrically connecting a further light bulb for indirectly lighting the room.

5,117,341

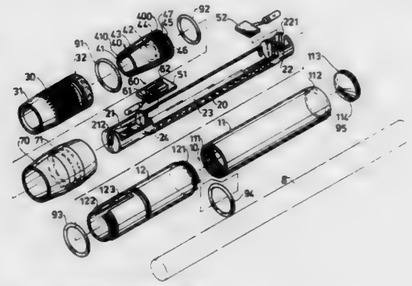
MULTI-FUNCTION FLASHLIGHT

Tien-Tsai Huang, No. 4, Lane 30, Wu-Chang St., Pan-Chiao City, Taiwan

Filed Aug. 19, 1991, Ser. No. 746,633

Int. Cl.[5] F21C *1/00*

U.S. Cl. 362—184 **2 Claims**



1. A flashlight, comprising:

an elongated barrel having a first open end provided with a concave condenser piece and a lens covering one end of said condenser piece, and a second open end provided with an axially extending slide notch;

an elongated battery seat disposed inside said elongated barrel and having a pair of lamp compartments respectively provided on two end portions of said battery seat and an intermediate battery receiving portion to receive a power supplying cell means;

a tubular cap having first and second open ends, one of said open ends being screwed onto said second open end of said barrel;

a clamping member provided inside said tubular cap and having a solid cylindrical portion mounted on said tubular cap and an annular wall portion extending outwardly and coaxial with said cylindrical portion, said annular wall portion confining a receiving space accessible from the second open end of said tubular cap and being provided with a plurality of axially extending partition notches, said cylindrical portion being provided with a light bulb opening communicated with said receiving space;

a translucent acrylic indicator rod having one end portion extending into said receiving space through the second open end of said tubular cap and being tightly clamped thereat by said annular wall portion of said clamping member;

a pair of lamp means each being provided in one of said lamp compartments, one of said lamp means having a light bulb passing through said condenser piece, the other one of said lamp means having a light bulb extending into said light bulb opening; and

a switch unit provided on one of said lamp compartments, said switch unit including a manually operated slide body extending into said axially extending notch of said elongated barrel and movably operated so as to activate a selected one of said lamp means.

5,117,342

UNIVERSAL FIT LONGERON SUPPORTED LOUVER SYSTEM

John A. Vlah, 14330 Georgia Rd., Middlefield, Ohio 44062

Filed Oct. 16, 1990, Ser. No. 598,188

Int. Cl.[5] F21S *3/02*

U.S. Cl. 362—217 **18 Claims**

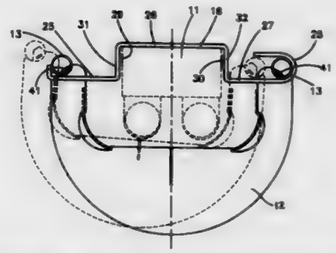
10. For use with a strip lighting fixture, an improved louver assembly, comprising:

a) at least two pairs of spaced longeron support arm portions connected to and projecting laterally from opposite sides of the lighting fixture;

b) each pair of spaced longeron support arm portions further including a spaced pair of upright end portions respectively connected to and projecting upwardly from the support arm portions at locations spaced from the lighting fixture, one end portion projecting upwardly in a C shape such that the one end portion and the connected support portion are J shaped thereby partially closing the corresponding support arm portion;

c) a spaced pair of longerons each adapted for support by the arm portions such that the longerons when in use are supported on opposite sides of an associated fixture;

d) a plurality of louvers at least some of which are connected to both longerons to maintain the longerons in a predetermined spaced relationship, the louvers having light intercepting surfaces disposed laterally of such associated fixture when in use;



e) two formed end louvers, both formed end louvers having two end portions, each end portion being connected to a corresponding longeron end portion;

f) at least one separate longitudinal side baffle connected to the louvers;

g) at least one slotted stringer fin, each slot receiving a corresponding one of the plurality of louvers, the fin running transverse to the louvers and having its end portions connected to a corresponding formed end louver.

5,117,343

REFLECTOR ARRANGEMENT

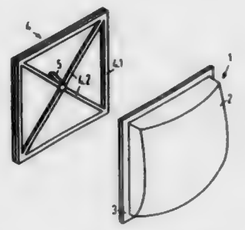
Max Kerscher, Chieming, and Gerhard Stempel, Toeging/Inn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 28, 1991, Ser. No. 705,785

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1990, 9006883

Int. Cl.[5] F21V *7/4;* **G02B** *5/8, 7/18*

U.S. Cl. 362—297 **13 Claims**



1. An apparatus for individual illumination of objects, comprising:

a light source means for generating light rays;

a reflector arrangement positioned relative to said light source generating means such that light rays from the light source means are incident on the reflector arrange-

ment and are reflected in a desired direction onto the objects to be illuminated;

the reflector arrangement comprising at least one shell carrier of transparent material which has a tub-shape with a concave curved portion when viewed from a side opposite the light means, and sidewalls around the curved portion in a rectangular configuration, and wherein an inside of the shell carrier is provided with a vapor-deposited metallic mirror layer such that light rays incident on an outside of the shell carrier pass through the shell carrier and can be reflected by the metallic mirror layer;

cover means provided on the shell carrier for durably protecting the mirror layer against environmental influences and direct mechanical influences which might deteriorate or destroy the mirror layer; and

said shell carrier having holder means located at a side of the shell carrier where the mirror layer is located for mounting of the shell carrier.

5,117,344

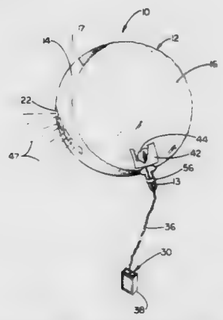
ILLUMINATED BALLOON ASSEMBLY

Rafael Perez, 850 N. Miami Ave., Apt. 1809, Miami, Fla. 33131

Continuation-in-part of Ser. No. 674,794, Mar. 18, 1991, Pat. No. 5,075,830. This application May 6, 1991, Ser. No. 696,236

Int. Cl.[5] F21V *1/06*

U.S. Cl. 362—352 **24 Claims**



1. An illuminated display assembly, comprising:

a balloon having an inflatable body and a neck portion integrally formed therewith, said inflatable body disposed in air tight, sealed relation about a hollow interior gas chamber,

an electric lamp fixedly attached to an outer surface of said inflatable body and structured and disposed to direct light into said interior gas chamber and at least partially out through said inflatable body, thereby effectively illuminating said balloon,

means to attach said electric lamp to said outer surface of said inflatable body,

said means to attach said electric lamp to said outer surface of said inflatable body including an opaque tape adapted to be disposed in covering relation to said electric lamp, so as to effectively attach said electric lamp to said outer surface of said inflatable body,

said opaque tape including a highly reflective inner surface adapted to substantially reflect said light emitted from said electric lamp into said interior gas chamber, and

power supply means.

5,117,345

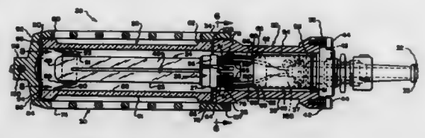
PORTABLE LAMP

Karl A. Baake, Angola, N.Y., assignor to K & H Industries, Inc., Angola, N.Y.

Filed Sep. 19, 1990, Ser. No. 585,233

Int. Cl.[5] F21V *15/04*

U.S. Cl. 362—390 **2 Claims**



1. A portable electric lamp comprising:

an elongated fluorescent electric bulb having a current-receiving portion at an end of the bulb and a generally U-shaped light-generating portion operatively joined to said current-receiving portion so that the light emitted by said bulb is relatively great as measured per unit length of said light-generating portion;

means defining an elongated hand grip having two opposite ends;

means associated with the hand grip for supporting the bulb at one end of the hand grip, the bulb-supporting means adapted to cooperate with the current-receiving portion of the electric bulb and to thereby maintain the bulb in such a relationship with the hand grip that the light-generating portion of the bulb extends generally axially of and from said one end of the hand grip;

an elongated transparent tube held in position about the light-generating portion of the electric bulb and which is transparent to light generated thereby;

conducting means operatively connected to said bulb-supporting means for routing current from a power source to the current-receiving portion of the bulb; and

shock-absorbing means associated with said bulb and adapted to intercept shock to which at least one of the hand grip and transparent tube is exposed to thereby prevent the transference of shock from said one of the hand grip and the transparent tube to the bulb, said shock absorbing means including a ring-like boby snuggly encircling said U-shaped portion of said bulb and a plurality of resiliently flexible fingers extending generally outwardly of said ring-like body for maintaining a spacing between the interior of said one of the hand grip and the transparent tube and the bulb and for cushioning the effect of shock which may otherwise be transferred to the bulb from said one of the hand grip and the transparent tube, said shock-absorbing means being slidable lengthwise along said bulb portion.

5,117,346

CONVERTOR PLANT ROLLER CONTACT CONNECTOR FOR CONVERTOR PLANT

Inge Gard, Ludvika, Sweden, assignor to ASEA Brown Boveri AB, Vasteras, Sweden

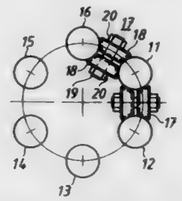
Filed Apr. 18, 1991, Ser. No. 686,999

Claims priority, application Sweden, Apr. 23, 1990, 9001436

Int. Cl.[5] H02M *7/00*

U.S. Cl. 363—51 **6 Claims**

1. A converter plant comprising at least one valve assembly comprising one or several electrically series-connected valves, said valve assembly being suspended from a supporting structure by a suspension device arranged at an upper end of the assembly, and a transformer connected to the valve assembly by a flexible connector, wherein said connector comprises at least two parallel, non-insulated straight conductors, one of said conductors being fixed to the valve assembly and the other of said conductors being fixed to the transformer, said conductors being electrically interconnected via at least one roller contact element comprising two contact rollers arranged on a common shaft, said contact rollers being pressed by means of at least one spring against the conductors, said connector



further comprising two coaxial, electrically conducting tubes arranged in axially spaced relationship to each other, the confronting ends of said tubes each being fixed to a respective one of said conductors.

5,117,347

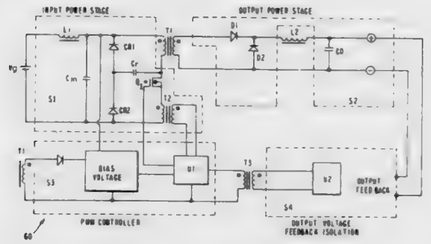
FULL DUTY CYCLE FORWARD CONVERTER

Peter Rebello, Huntington Beach, and Lateef Kajouke, Pasadena, both of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 10, 1990, Ser. No. 521,759

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—56 **34 Claims**



1. A forward converter power supply comprising:

a transformer having a primary winding coupled to a primary circuit including input terminals adapted for connection to an energy source and a secondary winding coupled to a secondary circuit including output terminals adapted for connection to a load;

switching means for coupling said energy source to said primary winding during an ON period, and decoupling said energy source from said primary winding an OFF period, said ON and OFF periods alternating at a desired rate and duration during operation of said forward converter power supply, said transformer having parasitic energy during said OFF period; and

chokeless quasi-resonant circuit means for increasing the duty cycle of said forward converter power supply by reducing the amount of time required to remove said parasitic energy from said transformer during said OFF period.

5,117,348

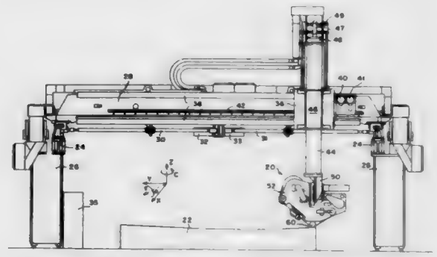
METHOD FOR ALIGNMENT OF A REPRESENTATIVE SURFACE TO AN ACTUAL SURFACE FOR A TAPE LAYING MACHINE

Jorge E. Romero, and Robert C. Trank, both of Rockford, Ill., assignors to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed Mar. 28, 1986, Ser. No. 845,969

Int. Cl.[5] G06F *15/00*

U.S. Cl. 364—167.01 **7 Claims**



1. A method of aligning an actual surface with a single internal coordinate system of a machine which moves relative thereto, wherein the movements of the machine are controlled by a part program including a plurality of programmed points defining a machine path from a mathematical representation of the actual surface and a work function referenced to the internal coordinate system, the alignment method comprising the steps of:

measuring the coordinates of at least three of the actual points on the actual surface with respect to the internal coordinate system of the machine:

obtaining the coordinates of the corresponding representative points from said mathematical representation of the actual surface with respect to the internal coordinate system of the machine;

generating a transformation function based on said actual points and said representative points which describes the orientation of the actual surface with respect to the mathematical representation of the actual surface in the coordinate system of the machine; and

transforming said programmed points with said transformation function such that a plurality of transformed points area generated which describe the programmed movements of said machine relative to said actual surface; and

replacing said programmed points with said transformed points such that the part program defines the machine path with respect to the orientation of the actual surface.

5,117,349

USER EXTENSIBLE, LANGUAGE SENSITIVE DATABASE SYSTEM

Soren J. Tirfing, Palo Alto, and Wayne C. Gramlich, Sunnyvale, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Mar. 27, 1990, Ser. No. 500,138

Int. Cl.[5] G06F *15/40*

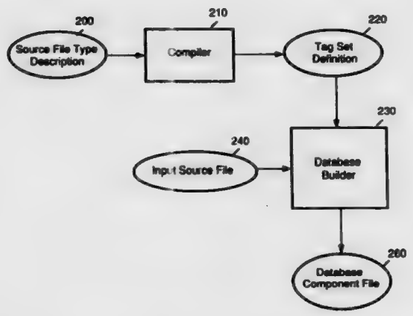
U.S. Cl. 395—600 **7 Claims**

1. In a computer system comprising a CPU, input/output means and memory containing a file system, said file system comprising at least one source file comprising text, a user-extensible database system in which source files of different source file types can be input into the database system and queries can be performed on the source files input using the same browsing mechanism, said database system comprising:

source file type definition which defines the language of the source file to be input to the database system, said source file type definition comprising;

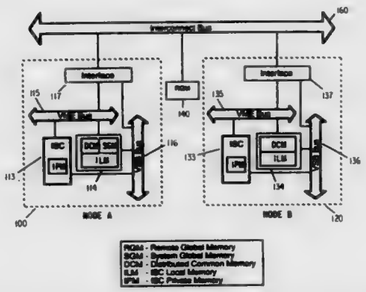
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a properties statement which identifies properties of the language;
a tags statement which identifies semantic tags of the language, said semantic tags defined according to at least one property;
a filter statement which identifies at least one filter item for the language, said filter item defined according to at least one property;
compiler means for compiling the source file type definition to generate a filter description and tag set definition;
said tag set definition comprising a listing of each semantic tag for the language;
said filter description comprising a listing of the filter items for a language, each filter item comprising a filter name, the language in which the filter is used and at least one semantic tag determined according to the properties specified by the tags statement and filter statement in the source file definition;
database builder means to generate a database component file for a source file of a particular source file type, said database builder receiving as input the source file and the tag set definition for the source file type, said database builder comprising:
means for identifying each symbol in the source input file;



means for identifying the semantic tag, as set forth in the tag set definition file, for each symbol identified;
means for storing in the database component file the symbol, the line number where the symbol occurs in the source file and the semantic tag for each symbol occurrence in the source input file;
database browsing means for searching the database comprising at least one database component file in response to a query to find a symbol, said query identifying the symbol to search for and a filter item, said database browsing means comprising;
means for searching a database component file for each occurrence of the symbol identified by the query;
means for comparing the semantic tags of each occurrence of the symbol to the semantic tags specified for the filter item identified by the query;
means for generating as a result of the query those occurrences of the symbol identified by the query which has a semantic tag which matches one of the semantic tags of the filter item identified by the query;
whereby different types of source files can be input into the database system by providing a source file type definition and the same database browsing means is used to perform queries regardless of the input source file type.

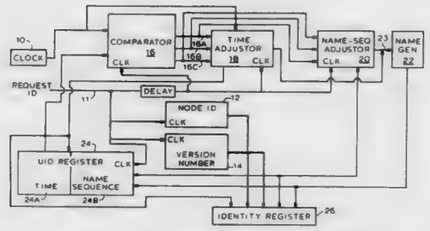
5,117,350
MEMORY ADDRESS MECHANISM IN A DISTRIBUTED MEMORY ARCHITECTURE
Osey C. Parrish, Lauderdale Lakes; Robert E. Peiffer, Jr.; James H. Thomas, both of Plantation, all of Fla., and Edwin J. Hilpert, Jr., Greenbelt, Md., assignors to Flashpoint Computer Corporation, McLean, Va.
Filed Dec. 15, 1988, Ser. No. 284,529
Int. Cl.[5] G06F *12/06, 15/16*
U.S. Cl. 395—425 **35 Claims**



1. In a distributed processing system comprising read/write path means for carrying memory address and data information and connecting a plurality of nodes, each node comprising at least computer means and local memory connected by a local bus and means for partitioning said memory into one or more partitions, the method of a first node writing in a broadcast mode to one or more other nodes comprising:
at said first node;
addressing a local memory partition with a local physical address;
converting said partition location physical address to a system physical address;
writing to said system physical address on said read/write path; and
at said others of said plurality of nodes:
detecting said system physical address from said read/write path,
converting said system physical address to a local memory partition address, and
writing to the local memory partition at each said other nodes.

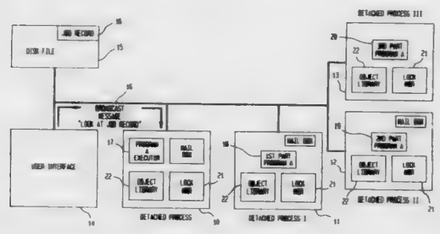
5,117,351
OBJECT IDENTIFIER GENERATOR FOR DISTRIBUTED COMPUTER SYSTEM
Steven Miller, Newton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Oct. 21, 1988, Ser. No. 260,908
Int. Cl.[5] G06F *1/02*
U.S. Cl. 395—650 **15 Claims**

1. A device for generating identifiers for objects in a computer system, said device comprising:
A. a clock for designating the current time;
B. means for generating a random number sequence;
C. a first storage means for storing the time and the random number sequence components of a generated identifier, the contents of said storage means being updated after each identifier is generated;
D. a comparator for comparing the current time read from said clock and the time stored in said storage means;
E. time adjusting means connected to receive the current time from said clock and responsive to the output of said comparator for adjusting the current time if the current time and the stored time are equal;
F. sequence adjusting means connected to receive the random number sequence from said first storage means and responsive to the output of said comparator for adjusting said stored random number sequence if the current time is less than the stored time; and



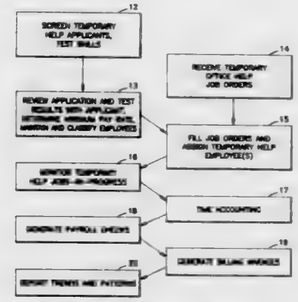
G. a second storage means responsive to the output of said time adjusting means and the output of said sequence adjusting means for storing said outputs as components of the current identifier wherein said current time represents days, months, years, hours, minutes, seconds and fractions of seconds.

5,117,352
MECHANISM FOR FAIL-OVER NOTIFICATION
Louis H. Falek, Belmont, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Oct. 20, 1989, Ser. No. 424,903
Int. Cl.[5] G06F *11/20, 15/16*
U.S. Cl. 395—575 **57 Claims**



1. A method for providing failure notification in a computer network having a plurality of nodes wherein a predetermined number of the nodes are each processing one part of an application program, which method comprises the steps of:
for each part o the application program, making a first request for an exclusive access privilege to a preselected resource name;
for each part of the application program, making a second request for a preselected access privilege to a corresponding resource name having a name based upon the respective part;
granting the first request for an exclusive access privilege to one and only one part of the application program;
granting the second request to each part of the application program;
making a third request on behalf of the one and only one part of the application program for each resource name having a name based upon a respective part of the application program other than the one and only one part; said third request being for an access privilege that is incompatible with each second request;
operating the computer network to:
(i) store information on each third request for a resource having a name based upon a respective part of the application program other than the one and only one part, and
(ii) upon a failure of one node of the predetermined number of nodes processing one part of the application program, automatically invalidating the second request of a respective part being processed on the failed node and automatically granting the third request made on behalf of the one and only one part of the application program for the resource name having a name based upon the respective part being processed on the failed node; and
utilizing the grant of the third request for the resource name having a name based upon the respective part being processed on the failed node to cause a message to be generated to identify the respective part being processed on the failed node.

5,117,353
SYSTEM FOR USE IN A TEMPORARY HELP BUSINESS
Joseph Stipanovich, and Sharon Bredeson, both of Minneapolis, Minn., assignors to Staff-Plus, Inc., Minneapolis, Minn.
Filed May 5, 1989, Ser. No. 347,828
Int. Cl.[5] G06F *15/21*
U.S. Cl. 374—401 **14 Claims**



1. A system for use in temporary help businesses for screening temporary help employees, testing said temporary help employees for one or more employee skills, recording a time that said temporary help employees are available to perform temporary jobs, receiving and recording job orders from one or more clients requesting temporary help personnel with one or more specified required skills to perform temporary jobs, assigning said temporary help employees to said temporary jobs, recording client comments about said temporary help employees, determining an amount of money due to said temporary help employees for specified periods of time, determining an amount of money due from said clients for temporary help services performed by said temporary help employees for specified periods of time, and reporting trends and patterns of said job orders and temporary help employees applications based on specified input criteria, comprising:
a digital computer;
one or more screening terminals, wherein said screening terminals are interactive video display terminals operable on said computer to cause software means responsive to an operator of said screening terminal to
a. enter, for each applicant for temporary work, pre-application information;
b. activate, for each said applicant which will be considered for temporary work, an applicant information terminal;
one or more said applicant information terminals, wherein said applicant information terminals are interactive video display terminals operable on said computer to cause software means operable on said computer to be responsive to
a. enter, applicant personnel information;

VOL 1138 ISS 4 MY 26 1992 UMI

b. an address, a phone number, and a date of birth,
c. a geographic area where said applicant prefers to work,
d. text describing employment experience,
e. a quantity representing said length of work experience,
f. a first available data and a last available date, between which said applicant will perform said temporary jobs,
g. days of the week and times of the day when said applicant will not perform said temporary jobs,
h. whether said applicant has personal transportation available, and
i. data by which income tax withholding from pay should be calculated;

means for determining a statistically based predictor of work site success representing the applicant's general proficiency with said computer terminal, based on the time required by the applicant to enter said pre-application information;

one or more applicant testing terminals, wherein said applicant testing terminals are interactive video display terminals operable on said computer to cause software means operable on said computer to:
a. display test instructions to said applicant,
b. display a test problem requiring an exact answer, a timed response, or both,
c. accept manual entry of a proposed solution to said test problem,
d. repeat said steps until all test problems required for a particular applicant have been displayed,
e. determine, based on said proposed solutions to said test problems, scores representing proficiency in said one or more employee skills, and
f. determine a statistically based predictor of work site success representing applicant's general proficiency with said computer terminal in relation to other applicants, based on said test scores and the time required by the applicant to respond to the inquiries presented by said applicant information terminal;

one or more test review terminals, wherein said test review terminals are interactive video display terminals operable on said computer to cause software means operable on said computer to:
a. display said statistically based predictor for each applicant,
b. respond to operator input of character representations of specified employee skills,
c. respond to operator input of said test review terminal to permit modification of any data recorded for said applicant,
d. permit entry of a minimum pay rate for said applicant, and
e. permit entry of an activation value which specifies that said applicant is an active temporary help employee;

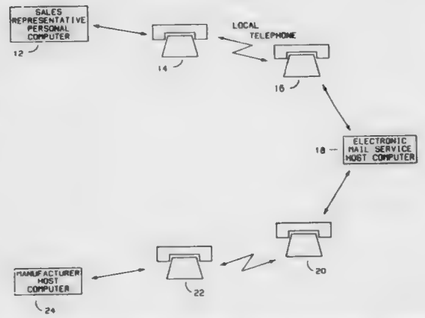
one or more job order entry terminals, wherein said job order entry terminals are interactive video display terminals operable on said computer to cause software means operable on said computer to:
a. respond to operator input to enter, for each said job order, information about a specified temporary job including:
i. a client name, address, division, department, contact person, and phone number,
ii. a unique job order number, a date and time when said job order is entered,
iii. one or more required skills for said temporary job,
iv. a starting and ending time for said temporary job, and
v. a billing rate for said client for said temporary job;
b. determine, for each temporary job order, one or more temporary help employees who are candidates to perform said temporary job by:
i. determining which of said one or more temporary help employees will accept a job and are not already scheduled in a job for the time between said starting and ending times for said temporary job, wherein said employees are matching employees,
ii. determining which of said matching employees have skills and pay rates which match said required skills and pay rate for said temporary job, wherein such employees are candidate employees, and
c. determining which said candidate employee to assign to said temporary job order by:
i. displaying said candidate employees and their phone numbers, and
ii. accepting a confirmation from said salesperson of which candidate employee is assigned to said temporary job;

one or more job monitoring terminals, wherein said job monitoring terminals are interactive video display terminals operable on said computer to cause software means operable on said computer to:
a. be responsive to operator input in accepting data which represents client requests to:
i. replace said assigned employee,
ii. shorten the length of time required to perform said temporary job,
iii. extend the length of time required to perform said temporary job,
iv. store comments on said assigned employee;

one or more accounting terminals, wherein said accounting terminals are interactive video display terminals operable on said computer to cause software means operable on said computer to:
a. display, for a specified accounting period, a time worked for all jobs performed during said specified accounting period by employees which performed said jobs,
b. respond to operator input to modify said time worked, and
c. print, on said one or more printers, payroll checks for said employees and invoices for said clients based on said time records;

one or more planners terminals, wherein said planner terminals are interactive video display terminals operable on said computer to cause software means operable on said computer to sort, calculate and print data based on specified input criteria.

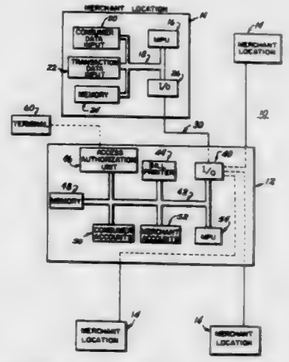
5,117,354
AUTOMATED SYSTEM FOR PRICING AND ORDERING CUSTOM MANUFACTURED PARTS
Gary R. Long, Cross Plains, and Charles W. Callender, Oregon, both of Wis., assignors to Carnes Company, Inc., Verona, Wis.
Division of Ser. No. 198,196, May 24, 1988, abandoned. This application Jun. 5, 1990, Ser. No. 533,567
Int. Cl.[5] G06F *15/21*
U.S. Cl. 364—401 **7 Claims**



7. A method for pricing custom manufactured parts utilizing a remote personal computer operated by a sales representative, a manufacturer host computer operated by a manufacturer and an electronic mail system in which messages can be left in electronic mailboxes assigned to particular users, the method comprising the steps of:
(a) preparing on the personal computer of the sales representative a quotation including a list of items by product identification code, the product identification code for each item including imbedded information as to the physical specifications of the item to be manufactured, the product identification code for each item being developed through a method comprising the steps of
(1) displaying for the sales representative on the personal computer a product ID display including a location for the product identification code and a plurality of product specifications which may be encoded by the product identification code,
(2) receiving from the sales representative a plurality of characters representing the beginning of a product identification code,
(3) displaying on the personal computer a completed default product identification code including the received characters and also displaying the product specifications for the completed default product identification code,
(4) receiving from the sales representative changes to the product specifications displayed for the default product identification code,
(5) the personal computer changing the product identification code displayed to the sales representative to match the changes received to the product specifications, and
(6) receiving from sales representative an indication that the updated product identification code is complete;
(b) transmitting the quotation including the list of items by product identification codes into the electronic mail system addressed to the mailbox of the manufacturer;
(c) periodically polling the mailbox of the manufacturer by the manufacturer host computer;
(d) downloading the quotation from the mailbox of the manufacturer into the manufacturer host computer;
(e) in the manufacturer host computer, pricing each item in the quotation;
(f) transmitting the quotation with the pricing for each item from the manufacturer host computer into the electronic mail system addressed to the mailbox of the sales representative; and
(g) downloading into the personal computer of the sales representative the quotation with the pricing for each item.

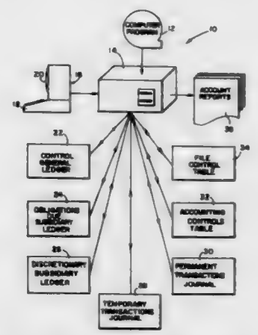
5,117,355
CENTRALIZED CONSUMER CASH VALVE ACCUMULATION SYSTEM FOR MULTIPLE MERCHANTS
Patrick D. McCarthy, 4384 Bowling Blvd., Louisville, Ky. 40207
Continuation of Ser. No. 303,319, Jan. 27, 1989, Pat. No. 4,941,090. This application Apr. 18, 1990, Ser. No. 510,446
The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.
Int. Cl.[5] G07G *1/00*
U.S. Cl. 364—405 **21 Claims**

1. A method of consumer cash value accumulation based upon point-of-sale transactions between consumers and merchants, the method comprising:
at the point-of-sale, obtaining from the consumer an account number unique to the consumer and the consumer's birthdate;
at a merchant location, determining a credit value for the transaction;
providing to a central system for each transaction, the consumer's account number and birthdate, and the credit value;
for each transaction, accumulating, at the central system, cash value in a consumer account associated with that consumer's account number and birthdate by adding the credit value to the cash value in that consumer account; and



selecting at least one birthdate and providing for each consumer account associated with that birthdate access to funds in an amount based upon the cash value in that consumer account.

5,117,356
AUTOMATED LEDGER ACCOUNT MAINTENANCE SYSTEM
Ronald Marks, Philadelphia, Pa., assignor to DNS, Inc., Philadelphia, Pa.
Filed Jul. 28, 1989, Ser. No. 387,134
Int. Cl.[5] G06F *15/30*
U.S. Cl. 364—406 **17 Claims**



1. In a system for maintaining the ledger accounts of a recordkeeping entity, said system including input means for receiving transaction data relating to an accountable transaction affecting at least one of the ledger accounts and output means providing indicia of the money balance in each of said ledger accounts;
a subsystem for recording the data and updating the ledger account balances comprising:
a. control code file means storing a plurality of accounting control records, each control record containing a recordkeeping procedure name, a first symbolic code for controlling the creation and updating of a data file record, a second symbolic code for qualifying a money amount as a debit or credit, and a third symbolic code indicative of a document generated in connection with the accountable transaction;
b. data file means including:

i. ledger account data file means for storing an account record corresponding to one of the ledger accounts, said account record including a money balance, the first symbolic code from a selected one of said accounting control records and the second symbolic code from said selected accounting control record, for qualifying said money balance; and

ii. transaction data file means for storing a transaction record relating to the accountable transaction, said transaction record including the first symbolic code from said selected accounting control record, a money amount, the second symbolic code from said selected accounting control records, for qualifying said money amount, and the third symbolic code from said selected accounting control record;

transaction data recording means for transferring the transaction data including a money amount from the input means and the first, second, and third symbolic codes from the selected accounting control record to a selected transaction record in the transaction data file means; and

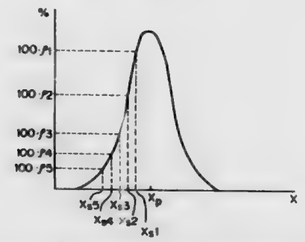
ledger account record posting means responsive to the third symbolic code for posting the money amount from the selected transaction record to the account record for the ledger account affected by the accountable transaction.

5,117,357

METHOD OF DEMARCATING ONE-DIMENSIONAL DISTRIBUTION

Takanobu Inoue, Hyogo, Japan, assignor to Toa Medical Electronics Co., Ltd., Kobe, Japan

Filed Dec. 5, 1988, Ser. No. 279,950
Claims priority, application Japan, Jun. 10, 1988, 63-142849
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—413.08 **2 Claims**



1. A method of demarcating a one-dimensional distribution in which a reticulocyte particle group in a blood sample is demarcated from another particle group in the sample by determining a threshold value thr in a plot of a one-dimensional frequency distribution prepared from signals indicative of fluorescence detected from individual particles during flow cytometry having a variable X as one axis, comprising the steps of:

(a) preparing a specimen for measuring by mixing a sample of blood with a fluorescent dye solution, said dye solution comprising a fluorescent dye which uniquely dyes reticulocyte particles in said blood sample;

(b) introducing an aliquot of the specimen prepared in accordance with step (a), into a flow cell of a flow cytometer, irradiating particles of said aliquot of said specimen in said flow cytometer with a light of a wavelength that excites fluorescence of said fluorescent dye,

(c) measuring from said particles of said aliquot relative intensities of a fluorescence signal due to said fluorescent dye absorbed by said particles and relative intensities of a signal of scattered light from said wavelength of light;

(d) identifying from the particles of said aliquot a one-dimensional frequency distribution of particles consisting of red blood cell particles and reticulocyte particles, said one-dimensional frequency distribution identified on the basis of relative intensities of fluorescence and relative intensities of scattered light;

(e) demarcating said reticulocyte particles from said red blood cell particles by determining positions Xs_1, Xs_2, . . . , Xs_n, which respectively indicate frequencies that are p_1, p_2, . . . p_n (where n is an integer of 3 or greater) of the peak frequency of a distribution, on a side of a peak position Xp of the distribution in the plot of said distribution having smaller (or larger) X values;

(f) assuming a normal distribution on the side of the peak position Xp of the distribution in the plot of said distribution having smaller (or larger) X values, and deriving three or more sets of relations, in which an average μ and a standard deviation σ of the normal distribution serve as constants, from p_1, p_2, . . . p_n and Xs_1, Xs_2, . . . , Xs_n;

(g) applying the law of least squares to said three or more sets of relations and determining the average μ and the standard deviation σ of the normal distribution; and

(h) determining the threshold value thr from the following equation:

$$thr=\mu+\alpha\times\sigma$$

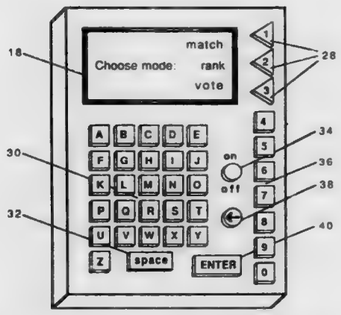
where in α is a positive number when the normal distribution is assumed on the side of the peak position Xp of the distribution having smaller X values, and α is a negative number when the normal distribution is assumed on the side of the peak position Xp of the distribution having larger X values.

5,117,358

ELECTRONIC TRUSTED PARTY

Peter M. Winkler, 1 Fairview Ave., Madison, N.J. 07940

Filed Sep. 25, 1989, Ser. No. 395,966
Int. Cl.[5] G06F *15/38*; G06G *7/60*
U.S. Cl. 364—419 **17 Claims**



1. A device for comparing information in such a way that no person can recover the information input by another person, comprising:

a means for input of information by a multiplicity of persons;

a means for comparing said information, then destroying said information, so that said information is rendered unrecoverable from said device; and

a means for output of the results of said comparison,

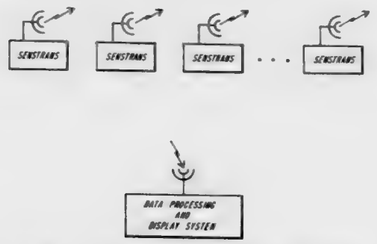
whereby each of said persons is assured that his or her information can not be obtained by one of the other persons unless said other person is already in possession of said information.

5,117,359

SYSTEM AND METHOD FOR DETECTION OF MICROBURSTS BY MEASURING VARIOUS WEATHER CONDITION PARAMETERS AT BOTH SPACED TIME AND LOCATION INTERVALS

Peter J. Eccles, Falls Church, Va., assignor to The Mitre Corporation, Bedford, Mass.

Filed Jan. 26, 1990, Ser. No. 470,385
Int. Cl.[5] G01W *1/10*
U.S. Cl. 364—420 **29 Claims**



1. A weather hazard detection apparatus comprising:

a plurality of SENSTRANS units positioned at spaced intervals in an area in which weather hazards are to be detected, each SENSTRANS unit including:

a humidity sensor,

a wind speed sensor,

a wind direction sensor,

a barometric pressure sensor,

a temperature sensor, and

means for transmitting measurement values from said sensors via RF transmission at predetermined intervals,

a data processing and display unit (DAPAD), said DAPAD comprising,

means for receiving said measurement values transmitted by said SENSTRANS units,

means for storing said values along with an identification of the particular SENSTRANS unit from which it originated and the time period in which it was measured,

a data processing unit for manipulating said stored measurement values to calculate parameters indicative of the presence or absence of weather hazards, said manipulations including, at least, calculation of the time differential of the equivalent potential temperature for at least one point in said area,

said DAPAD further including means for generating a warning signal responsive to one or more of said calculated parameters falling within corresponding predefined ranges indicative of the likely presence of a weather hazard, and

display means responsive to said warning signal for producing a display indicating the presence of a weather hazard.

5,117,360

JOINT SURVEILLANCE TARGET ATTACK RADAR SYSTEM (JSTARS)

Charles R. Hotz, Satellite Beach; Gerald J. McNiff, Indian Harbor Beach, and Dale Burton, Melbourne, all of Fla., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Mar. 28, 1990, Ser. No. 500,182
Int. Cl.[5] G06F *15/14*
U.S. Cl. 364—423 **5 Claims**

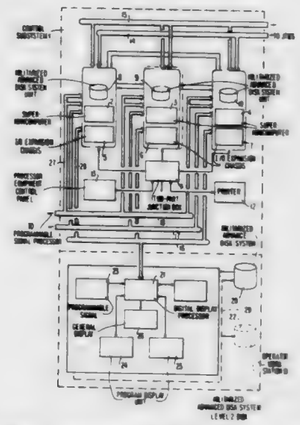
1. In a radar system, central data processor means comprising a plurality of computer family super-minicomputers, each having an input/output expansion chassis and a disk system unit;

programmable signal processor means;

a high speed, asynchronous, bidirectional communications channel providing a communications interface between said programmable signal processor means and said super-minicomputers;

joint tactical information distribution system means;

a joint tactical information distribution system asynchronous, bidirectional communications channel interfacing said joint tactical information distribution system means to said super-minicomputers;



digital display processor means comprising a plurality of advanced disk system units and small computer systems interface means interposed between one of said advanced disk system units and the rest of said digital display processor means;

operator work station local area network means interfacing said digital display processor means and said input/output expansion chassis of said central data processor means.

5,117,361

ANTI-SKID BRAKE CONTROL APPARATUS

Toshio Takayama, 4246-5, Nishiyahata, Ryuoh-cho, Nakakoma-gun, Yamanashi-ken; Masaru Sakuma, 301, Daini Coop Hosaka, 9-12, Kugawahoncho, Kofu-shi, Yamanashi-ken, and Yukou Ono, 708-32, Kamimiyaji, Kushigata-cho, Nakakoma-gun, Yamanashi-ken, all of Japan

Filed Nov. 17, 1989, Ser. No. 438,841
Claims priority, application Japan, Nov. 17, 1988, 63-290878; Oct. 20, 1989, 1-273102
Int. Cl.[5] G05F *15/50*; B60T *8/82, 8/74*
U.S. Cl. 364—426.02 **10 Claims**

1. An anti-skid brake control apparatus for a brake system for wheeled vehicles, the apparatus comprising:

(a) a speedometer for measuring rotational speed of at least one wheel;

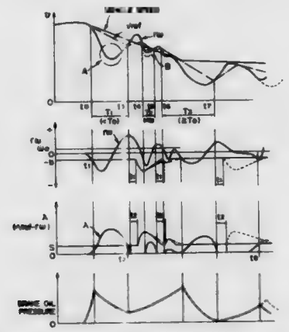
(b) a first calculation means for calculating a reference speed of the vehicle, the reference speed being an estimate of actual speed of the vehicle;

(c) a second calculation means for calculating a slip speed and optionally a wheel acceleration, such that the slip speed is a differential speed between the reference speed and the rotational speed of the wheel, and such that the wheel acceleration is a time derivative of the rotational speed of the wheel;

(d) a threshold value setting means for determining and altering threshold values for at least one of the slip speed and the wheel acceleration, according to the slip speed, wherein the alteration of the threshold values is performed at a predetermined time delay after determining new threshold values;

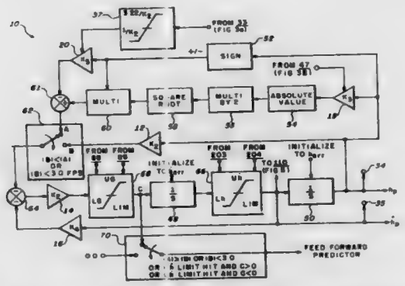
(e) a comparison means for comparing at least one of the slip

speed and the wheel acceleration calculated by the second calculation means with respective threshold values; and



(f) a control means for controlling braking force of the brake system by means of varying brake fluid pressure in response to the comparison made by the comparison means.

5,117,362
PATH CAPTURE FORCING FUNCTION GENERATOR FOR AIRCRAFT VERTICAL AXIS CONTROL
Roger D. Peckham, Glendale, and Michael R. Kelley, Scottsdale, both of Ariz., assignors to Honeywell, Minneapolis, Minn.
Filed Dec. 15, 1989, Ser. No. 451,409
Int. Cl.[5] B64C *13/18*; G05D *1/06*
U.S. Cl. 364—433 **25 Claims**

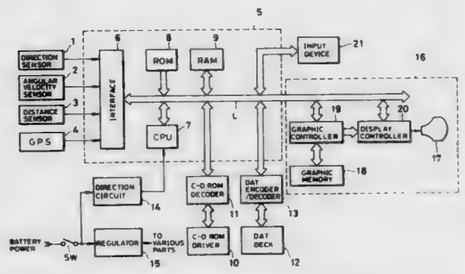


1. An altitude transition flight path capture apparatus for utilization with an aircraft autopilot to provide altitude control comprising:

function means coupled to said autopilot for providing an altitude rate trajectory signal, an altitude trajectory signal, and a predicted altitude acceleration signal; and

means coupled to receive said altitude rate trajectory signal, an altitude rate error signal, said altitude trajectory signal, and an altitude error signal for providing path error and path rate error signals to said autopilot for applying said path error and said path rate error for altitude control.

5,117,363
ONBOARD NAVIGATION SYSTEM
Kazuhiro Akiyama; Takashi Kashiwazaki; Morio Araki; Satoshi Odagawa, and Atsuhiko Fukushima, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 24, 1990, Ser. No. 556,472
Claims priority, application Japan, Oct. 11, 1989, 1-264623
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—449 **4 Claims**



1. In an onboard navigation system including:

present position recognition means for periodically recognizing a present position of a vehicle in which the system is mounted on the basis of a distance traveled by the vehicle and a vehicle's traveling direction;

map display control means for extracting, from map data storage means, a map data group of a region of a given area centered on the present position recognized by the present position recognition means and supplying the extracted map data group to a display device so as to display a map around of the present position of the vehicle;

present position display control means for controlling the display device to display a present position mark representing the present position of the vehicle immovably at a center position of the display area, wherein the improvement comprises:

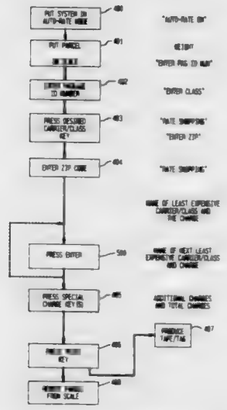
commanding means for commanding an alteration of the fixed display position of the present position mark;

display position setting means for determining a position a predetermined distance displaced from the center position of the display area as a new fixed display position and providing its positional information to the present position display control means during a command period by the commanding means, and

center position setting means for determining the position displaced from the center position of the display area by the predetermined distance as the center position and providing its positional information to the map display control means during the command period by the commanding means, wherein said display position setting means determines a direction for setting said new fixed display on the basis of the vehicle's traveling direction.

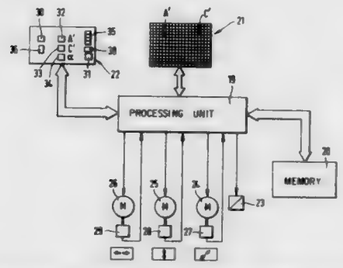
5,117,364
CARRIER MANAGEMENT METHOD AND SYSTEM HAVING AUTO-RATE SHOPPING
Ileana D. Barns-Slavin, 64 Old Hwy., Wilton, Conn. 06897; Alonzo T. Dukes, 220 Red Oak Rd., Bridgeport, Conn. 06606; Angela Njo, 495 Vincellette St., Apt. 211, Bridgeport, Conn. 06606, and David J. Taylor, 23 Ludlow Manor, Norwalk, Conn. 06855
Filed Mar. 2, 1990, Ser. No. 487,085
Int. Cl.[5] G07B *17/02*
U.S. Cl. 364—464.03 **6 Claims**

1. In a carrier management system including a scale for weighing parcels to be shipped, a computer connected to receive data from said scale related to the weight of a parcel thereon, and input means enabling an operator to input information to said computer, said input means including a plurality of keys including separate first input selection keys, the computer having a data base for storing shipping charge data for a plurality of shipping classes, based upon the weight of a parcel of said scale, said computer comprising means responsive to the operation of said first keys for determining shipping charges for predetermined shipping classes represented by data in said data base, the improvement wherein said input means



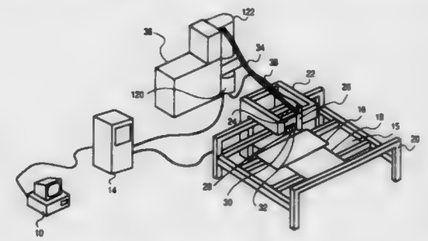
further comprises an auto-rate selection key, and said computer comprises means responsive to operation of said auto-rate selection key for determining shipping charges of the least costly shipping class of a predetermined subgroup of shipping classes represented by data in said data base, and wherein said system further comprises means responsive to the depression of a determined key on said input means for determining the shipping charges for the next least costly shipping class of said subgroup.

5,117,365
ELECTRONIC APPARATUS AND METHOD OF REGISTER CORRECTION
Willi Jeschke, Heidelberg, and Anton Rodi, Leimen, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 311,416, Feb. 13, 1989, which is a continuation of Ser. No. 105,410, Oct. 5, 1987, abandoned. This application Mar. 27, 1989, Ser. No. 328,856
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1986, 3633855
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—468 **9 Claims**



1. Apparatus for performing a method of registration correction having a device for turning a flexible plate about a turning point on a plate cylinder of a printing press, and devices for effecting adjustments in circumferential and side registration of the flexible printing plate, comprising a device for determining data regarding a location of a registration rotation point and register deviations of the flexible printing plate in circumferential and side position and angular position, a computer for computing from the determined data respective adjustment commands for the adjustment effecting device, and devices communicating with said computer for receiving said adjustment commands therefrom for correcting the circumferential and side registration and turning the flexible printing plate on the cylinder, an input panel in said input device connected to said computer and representing the size of the flexible printing plate, means for entering into said input panel the location of the registration rotation point and the magnitude and direction of a chord for a turning angle required for correcting the angular portion in accordance with deviations determined from a printed product of the press.

5,117,366
AUTOMATED CARVING SYSTEM
Jerald W. Stong, 3158 Fowler St., Santa Clara, Calif. 95051
Filed Jun. 28, 1989, Ser. No. 372,730
Int. Cl.[5] G06F *15/46*; B24B *1/00*
U.S. Cl. 364—474.02 **19 Claims**



1. A method of carving an image in a surface comprising the steps of:

forming a resist layer on the surface;

providing a blast head and cutter both mounted on a single support;

cutting a pattern in the resist layer under automatic control using the cutter so as to expose portions of the surface; and

blasting under automatic control using the blast head the portions of the surface exposed so as to form the image.

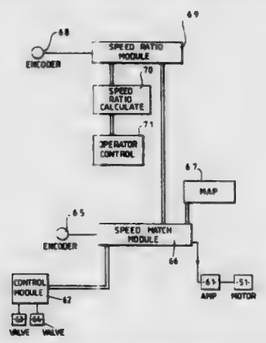
5,117,367
CUTTING MACHINE
Harry A. Hill, 7 Woodhall Close, Durkar, Wakefield, WF4 3HU, and David Hagon, 99 Birchwood Hill, Leeds, LS17 8NT, both of England
Filed Sep. 7, 1990, Ser. No. 579,429
Claims priority, application United Kingdom, Sep. 9, 1989, 8920426
Int. Cl.[5] G06F *15/46*; B23D *25/04*
U.S. Cl. 364—474.09 **9 Claims**

1. A machine for cutting lengths of strip or tube from a moving length of strip or tube comprising:

a reciprocable carriage means movable along a path parallel to the direction of movement of the strip or tube, a cutter mechanism mounted on the carriage means, a crank mechanism including a rotary input member, a drive motor coupled to said input member, so that the carriage means will be reciprocated along said path, and means for actuating said cutter mechanism during the time when the linear speed of the carriage means is substantially equal to the linear speed of the strip or tube, an electronic control system for controlling the speed of the drive motor; and

encoder means for providing signals to the control system indicative of the speed and position of the input member and the speed of the strip or tube respectively, the control

system acting to control the speed of the motor whereby for a substantial portion of one revolution of the input member, the motor speed is constant and for the remain-

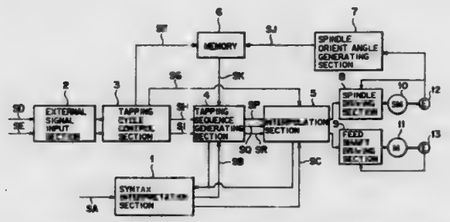


der of the revolution of the input member, the speed of the input member is varied so that the linear speed of the carriage means is substantially equal to the linear speed of the strip or tube.

5,117,368
CONTROL DEVICE FOR TAPPING

Takahiro Yamaguchi, and Takahiko Kitade, both of Ooguchi, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Nagoya, Japan

Filed Mar. 29, 1990, Ser. No. 501,139
Claims priority, application Japan, Mar. 29, 1989, 1-77856
Int. Cl.[5] G05B *19/24*
U.S. Cl. 364—474.32 **3 Claims**



1. A tapping control device in which a tapping process is controlled by synchronizing the rotation of a spindle and the feed on a feed shaft, said tapping control device comprising:

sequence generating means for generating (a) a tapping sequence for execution of said tapping process, (b) a cycle suspension sequence for slowing down and suspending in synchronism said rotation of said spindle and said feed on said feed shaft to permit a tapper to be detached from a work, and (c) a cycle restart sequence for resuming said tapping process;

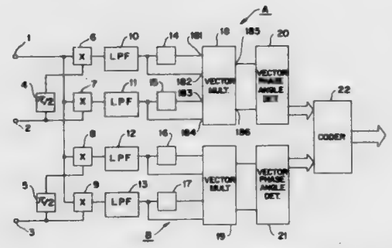
memory means for storing an oriented angle of said spindle for a start of cutting in said tapping sequence; and

sequence executing means for executing (a) said tapping sequence, (b) said cycle suspension sequence when a cycle suspension signal is inputted thereto, and (c) said cycle restart sequence according to the spindle oriented angle read out form said memory means when a cycle restart signal is inputted thereto.

5,117,369
DTMF RECEIVER

Syuuichi Yoshikawa, 4-4-3, Torimi-cho, Nara-shi, Nara-ken, Japan

Filed Nov. 6, 1989, Ser. No. 431,776
Claims priority, application Japan, Nov. 8, 1988, 63-281635
Int. Cl.[5] H04M *1/50*
U.S. Cl. 364—484 **4 Claims**



1. A dual tone multiple frequency (DTMF) receiver comprising:

a frequency shift delay detection unit for a lower group of frequencies; and

another frequency shift delay detection unit for a higher group of frequencies,

each of said frequency shift delay detection units comprising:

circuit means for receiving one of said lower group of frequencies or one of said higher group of frequencies, and for generating a first signal and second signal, said first signal having a frequency obtained by subtracting a reference carrier frequency from a frequency of the corresponding frequency group, and said second signal having a phase difference of $\pi/2$ with respect to said first signal;

other circuit means for generating a third signal and fourth signal, said third signal and said fourth signal being different in phase from said first and second signals, respectively;

vector calculation means connected to said circuit means and said other circuit means, in which said first and second signals are supplied to one input port for receiving one vector, and said third and fourth signals to the other input port for receiving another vector; and

detection means for detecting a phase difference between the output of said vector calculation means.

5,117,370
DETECTION SYSTEM FOR CHEMICAL ANALYSIS OF ZINC PHOSPHATE COATING SOLUTIONS

Michael J. DeCello, Dearborn Heights, and LeRoy C. Westwood, Redford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1988, Ser. No. 288,648
Int. Cl.[5] C23C *22/05*; G06F *15/20*
U.S. Cl. 364—497 **23 Claims**

1. A detection system for quantitative analysis of chemical components of an aqueous phosphate conversion-coating bath, which detection system comprises:

means for purifying a sample of said aqueous Phosphate conversion-coating bath to form a test fluid consisting essentially of an aqueous solution of ionic species;

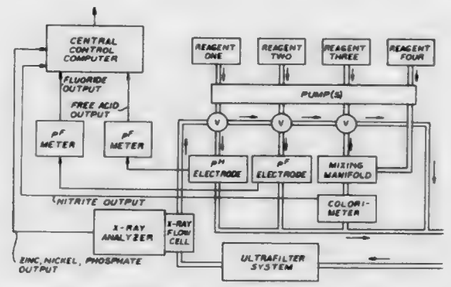
means for determining the concentration of zinc ions present in said test fluid;

means for determining the concentration of phosphate ions present in said test fluid;

means for determining the pH of the test fluid;

means for determining the concentration of nitrite ions present in said test fluid; optionally,

means for determining the concentration of fluoride ions present in said test fluid; and, optionally,

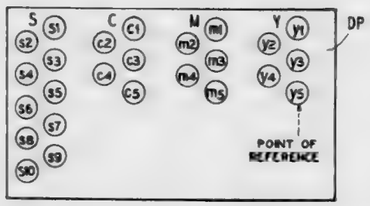


means for determining the concentration of nickel ions present in said test fluid.

5,117,371
CHARACTER STORAGE PROCESS AND ARRANGEMENT FOR REDUCING THE REDUNDANCY OF CHARACTERS FOR MATRIX PRINTERS WITH MULTIPASS PRINTING

Franz Kristen, Münchnerstrasse 24a, D-8039 Puchheim, and Martin Traute, Aidenbachstrasse 123, D-8000 München 71, both of Fed. Rep. of Germany

PCT No. PCT/DE88/00092, § 371 Date May 29, 1990, § 102(e) Date May 29, 1990, PCT Pub. No. WO88/06524, PCT Pub. Date Sep. 7, 1988
PCT Filed Feb. 23, 1988, Ser. No. 415,361
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706468
Int. Cl.[5] G06F *15/62*
U.S. Cl. 395—150 **1 Claim**



1. A character storage process for reducing the redundancy of characters or character sequences describing graphic patterns in an image dot memory for a matrix printer with multipass printing, which can print characters in various print qualities and the print head of which has a plurality of print elements for the printing of individual image dots, the characters being represented by these image dots in grid form in a character matrix (CM), wherein

each character of a given character set is compared matrix line by matrix line with the arrangements of the image dots to be printed occurring in these individual matrix lines (SP),

the individual image dots within a matrix line (SP) are combined into line elements (ZE),

all line elements (ZE) of the character to be printed are compared with one another,

the image dot information of a line element (ZE) is binary-coded by specification of an initial printing column, of a description matrix and of a run length, i.e. number of active image dots,

the coding of the line elements (ZE) is performed either in byte format or half-byte format, depending on the number of line elements (ZE) differing from one another,

the line elements (ZE) are described by alternately specifying regular image dot sequences (PF) and a number of empty columns (LS), and

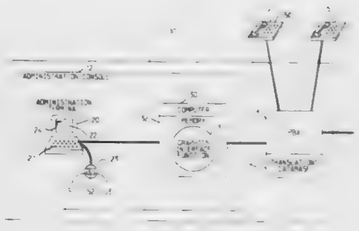
only those line elements (ZE) of all characters of the character set which differ from all remaining line elements (ZE) of the characters of the character set are stored in the image dot memory and

a repetition factor is then stored if successive matrix lines (SP) of a character have identical line elements (ZE).

5,117,372
GRAPHICS-ASSISTED TERMINAL ADMINISTRATION ARRANGEMENT

Norman W. Petty, Boulder, Colo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 20, 1989, Ser. No. 382,863
Int. Cl.[5] G06F *15/46*
U.S. Cl. 395—161 **26 Claims**



1. An arrangement for assigning telecommunications functions to actuators of a telecommunication terminal having a plurality of the actuators, comprising:

means for displaying a graphical representation of the terminal including its actuators, and representations of telecommunications functions assignable to the actuators;

means for selecting individual ones of the displayed representations of the functions and of the actuators;

means responsive to the selecting means selecting one of (a) a displayed representation of a function and (b) a displayed representation of a first actuator, and further selecting a displayed representation of a second actuator, for assigning one of (a) the function whose representation was selected and (b) a function assigned to the first actuator, to the second actuator; and

means for preserving the assignment of the function to the second actuator for subsequent use such that the assigned telecommunications function is performed when the second actuator of the terminal whose graphical representation was displayed is actuated.

5,117,373
LOW PROFILE WEIGHT MEASURING SYSTEM FOR CONTAINERS

Larry D. Huff, Houston, Tex., assignor to Load Cell Systems, Inc., Houston, Tex.

Filed May 18, 1990, Ser. No. 524,848
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—550 **2 Claims**

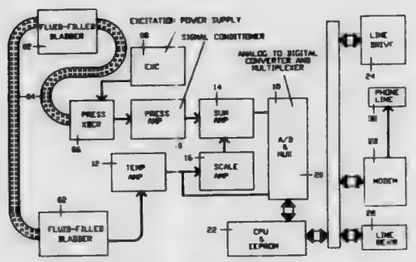
1. A weighing apparatus comprising:

(a) a fluid containing steel bladder consisting of top and bottom plates separated by and sealed to low profile steel sides;

(b) an over filling/pressuring of fluid to effect positive deflection of weight yielding plates; and

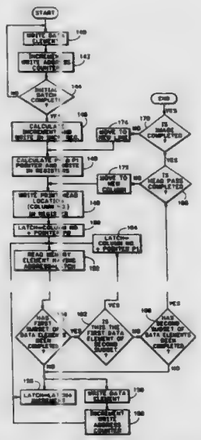
(c) a pressure transducer hydraulically connected to said fluid filled bladder for generating an analog signal indicative of the weight of a containerized shipment.

2. A containerized shipment weighing system comprising:
(a) a pressure transducer for generating an analog signal indicative of the weight of a containerized shipment taken from a weighing apparatus comprising (i) a fluid containing steel bladder consisting of top and bottom plates separated by and sealed to low profile steel sides; (ii) an over filling/pressurizing of fluid to effect positive defection of weight yielding plates; and (iii) a pressure transducer hydraulically connected to said fluid filled bladder for



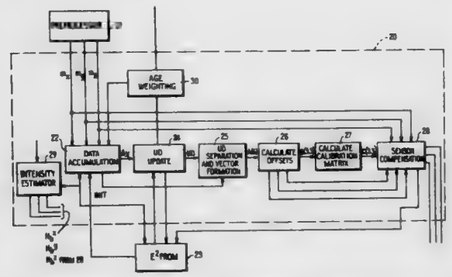
generating an analog signal indicative of the weight of a containerized shipment;
(b) means for conditioning the analog signal including means for compensating for temperature and pressure noise on the analog signal;
(c) means for converting conditioned analog signal to digital pulse signal;
(d) means for transmitting said digital pulse signal to a host computer where a determination of the container's load weight is made.

5,117,374
RECIPROCATING-ELEMENT POSITION ENCODER
Howard V. Goetz, Tigard, assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Oct. 10, 1989, Ser. No. 419,302
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—559 **7 Claims**



1. An apparatus for tracking the position of a first element moveable relative to a second element back and forth along a path having a predetermined maximum length comprising:
means defining a plurality of positions of the first element along the path;
means defining a predetermined position intermediate the ends of the path;
first means responsive to the means defining a plurality of positions for generating a first signal indicative of movement of the first element relative to the second element;
second means responsive to the predetermined position defining means for generating a second signal indicative of movement of the first element past the predetermined position relative to the second element;
counter means responsive to the first signal for counting up and down, corresponding to the direction of travel of the first element relative to the second element; and
means responsive to the second signal for resetting the counter means to a predetermined value greater than zero when the first element travels past the predetermined position relative to the second element.

5,117,375
CALIBRATION OF MAGNETIC COMPASSES
Paul L. A. Worcester; David J. Maxwell, both of Bracknell, and Michael L. Trethewey, Guildford, all of United Kingdom, assignors to British Aerospace Public Company Limited, London, England
Continuation of Ser. No. 349,936, May 5, 1989, abandoned, which is a continuation of Ser. No. 902,881, Sep. 2, 1986, abandoned. This application Oct. 19, 1989, Ser. No. 423,668
Claims priority, application United Kingdom, Sep. 3, 1985, 85 21909
Int. Cl.[5] G01C *17/38*; G06F *15/31*
U.S. Cl. 364—571.01 **8 Claims**



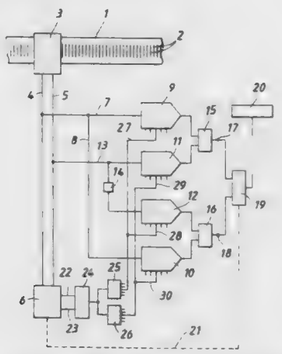
4. A magnetic compass for a vehicle in which an output of the compass is compensated both for disturbance to a magnetic field caused by said vehicle and its load, and for errors of the magnetic compass, said compass comprising:
three magnetic sensors, respectively responsive to nominally orthogonal components of a disturbed magnetic field acting along respective nominally orthogonal body axes of the vehicle, for continuously producing signals corresponding to said orthogonal components; and
data processing means, receiving said signals from said three magnetic sensors, for processing said signals to fit, and to continuously determine coefficients a, b, h, p, q and s of a reduced quadric equation of the form:

$$ax^2+by^2+\tfrac{1}{1}(a+b)z^2+2hxy+2px+2qy+2sz-1=0$$

which define ellipsoids representing a locus of values of said signals, where x, y and z are values representing the magnetic field in the x, y and z directions as the magnetic field changes,
said data processing means including means for executing a continuously updated, recursive algorithm, in which an initial matrix inverse and vector are used for initiation purposes, and which derives, from said coefficients, calibration functions for transforming said ellipsoids to a spheroid centered on an origin of said body axes of the vehicle, and

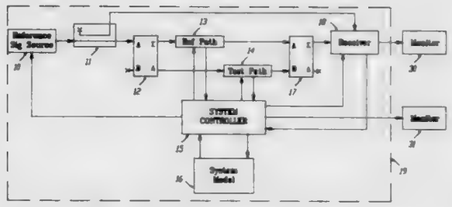
compensation means which receives both said signals from said magnetic sensors and said calibration functions from said executing means, for continuously compensating said signals for disturbance to the magnetic field and compensation for any errors of the sensors to produce said output of said compass.

5,117,376
INCREMENTAL MEASURING SYSTEM
Heinz Rieder, Oberndorf, and Max Schwaiger, Ostermiething, both of Austria, assignors to RSF-Elektronik Gesellschaft m.b.H., Tarsdorf, Austria
Filed May 11, 1990, Ser. No. 522,384
Claims priority, application Austria, May 23, 1989, 1234/89
Int. Cl.[5] G01B *21/00*
U.S. Cl. 364—571.04 **14 Claims**



1. In an incremental measuring system comprising
a scale member provided with an incremental scale,
a scanning unit, which is operable to perform relative to said scale member a scanning movement along said scale and to scan said scale and in response to said scanning to generate basically sinusoidal analog measured-value signals,
digitalizing means for deriving from said measured-value signals digital countable signals depending on the direction of said scanning movement,
evaluating means for receiving and evaluating said countable signals, and
electronic correcting means for correcting said analog measured-value signals in accordance with a correction program,
the improvement residing in that
said correcting means comprise multiplier circuitry for receiving and processing said analog measured-value signals and for delivering corrected analog signals to said evaluating means, and
program-controlled means for generating correcting signals in accordance with said program and for delivering said correcting signals to said multiplier circuits, wherein
said multiplier circuitry is operable to effect in response to said correcting signals a phase displacement of said measured-value signals in correcting steps amounting each to only a fractional part of a period of said measured-value signals and in a number determined by said correcting signals.

5,117,377
ADAPTIVE CONTROL ELECTROMAGNETIC SIGNAL ANALYZER
Paul F. Finman, 621 Barrington Ct., Newbury Park, Calif. 91320-5117
Filed Oct. 5, 1988, Ser. No. 253,965
Int. Cl.[5] G06F *15/20*; H01P *1/10*
U.S. Cl. 364—578 **15 Claims**

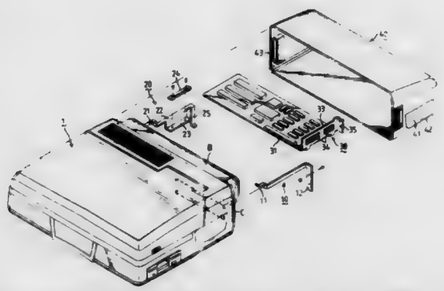


1. An adaptive control electromagnetic signal analyzer system comprising:
a signal receiver means for receiving electromagnetic signals;
a reference signal transmission path including a multifunction controller/detector, said reference signal transmission path having a plurality of control inputs;
a test signal transmission path;
a power divider means for splitting signal power, said power divider means having an input port and two output ports, said output ports being connected to said reference path and said test path;
a reference signal source means for supplying a reference electromagnetic signal to said power divider input port, a portion of said reference electromagnetic signal being directionally coupled to an input of said electromagnetic signal receiver;
a means for modeling characteristics of said reference path and said test path;
a means for predicting the response to said system to changes in said reference signal source and said reference path controls based on said modeled characteristics of said reference path and said test path;
a system controller means for system measurement and control with measured inputs from said reference path and said signal receiver; with calibration and system response prediction inputs from said predicting means; and with control outputs to said reference signal source, said reference path, said receiver, said modeling means, and said predicting means; and
a signal summing means for combining signals from said reference path and said test path, said summing means having an output to said signal receiver.

5,117,378
LAPTOP COMPUTER WITH DETACHABLE INTERFACE CARD
Hertz Ho, Fl. 3, No. 148, Sec. 4, Chung-Ching N. Rd., Taipei City, Taiwan
Filed Jul. 11, 1990, Ser. No. 551,143
Claims priority, application Canada, Apr. 6, 1990, 2014122
Int. Cl.[5] G06F *1/00*; H05K *5/00, 7/16*
U.S. Cl. 364—708 **3 Claims**

1. A laptop computer comprising a main computer body having a rear exposed portion, and a first rear cover and a second rear cover for said rear exposed portion, said first and said second rear covers being detachably and interchangeably connected to said rear exposed portion, said first rear cover confining an extension space adjacent to said rear exposed portion when said first rear cover is attached to said rear exposed portion, said second rear cover having a size smaller than said first rear cover and simply covering said rear exposed

portion when said second rear cover is attached, said laptop computer further having an interface card detachably and optionally attached to said rear exposed portion, said extension space of said first rear cover receiving said interface card when said interface card is attached, wherein said interface card has a first side with a vertical wall projecting therefrom, said



vertical wall having electrical connectors mounted thereon, and wherein said first rear cover includes an access opening adjacent to said vertical well when said first rear cover is attached to said rear exposed portion, said access opening permitting electrical connection of said interface card with external cables.

5,117,379

DATA PROCESSING DEVICE FOR USE IN STATISTIC CALCULATION

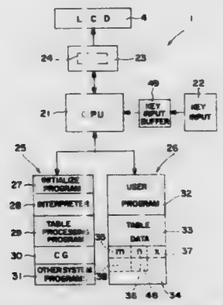
Shigenobu Yanagiuchi, Tenri; Shoichi Kawai, Osaka; Yukihiro Omura, Yamatokoriyama; Yasuhiro Kotani, Nara, and Kazuya Inoue, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 63,216, Jun. 17, 1987, abandoned. This application Jul. 19, 1990, Ser. No. 555,673

Claims priority, application Japan, Jun. 17, 1986, 61-142586; Jun. 17, 1986, 61-142588; Jul. 31, 1986, 61-181792; Aug. 22, 1986, 61-197711; Aug. 30, 1986, 61-204959

Int. Cl.[5] G06F *15/36*

U.S. Cl. 364—715.01 **7 Claims**



1. A statistic processing system in a portable mini-computer for performing a plurality of statistical functions, comprising:

memory means for storing data in a table format formed of a plurality of rows and columns;

input means for inputting each item of said data into a selected row and column of said memory means;

designation means operatively communicating with said input means for designating a particular row and column for storing each item of said data in said memory means;

second memory means for storing a plurality of statistical calculation functions;

calculation means for selecting one of said plurality of statistical calculation functions by recalling the desired said function from said second memory means and the specific row or column containing the data to be used in said function and for performing said selected statistical calculation function, wherein said function can be performed on any collection of data contained in a row or column of said memory means; and

single line display means for displaying said specific row or column selected by said calculation means.

5,117,380

RANDOM NUMBER GENERATOR DRIVEN BY INDEPENDENT CLOCK PULSES ASYNCHRONOUSLY WITH SYSTEM CLOCK PULSES

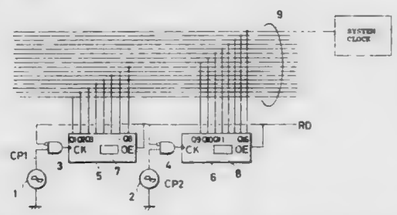
Kouji Tanagawa, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 491,068, Mar. 9, 1990, abandoned. This application May 13, 1991, Ser. No. 701,375

Claims priority, application Japan, Mar. 15, 1989, 1-62562

Int. Cl.[5] G06F *7/38*

U.S. Cl. 364—717 **3 Claims**



1. An integrated circuit including a system clock for producing clock pulses for driving said integrated circuit and a random number generator built into said integrated circuit for generating random numbers in response to a read signal, said random number generator comprising:

at least two oscillators for generating respective independent clock pulse signals each having clock pulses which are asynchronous with respect to the clock pulses of the system clock of said integrated circuit and with respect to the clock pulses the other of said at least two oscillators;

at least two counters each connected to a respective one of said at least two oscillators for respectively counting the clock pulses of said at least two oscillators; and

read-out means connected for reading out the contents of said at least two counters in parallel in response to the read signal, the contents read out of said at least two counters constituting a random number.

5,117,381

DISCRETE ORTHOGONAL AND INVERSE ORTHOGONAL TRANSFORM APPARATUS

Tatsuro Juri, Osaka, and Shinya Kadono, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 425,108, Oct. 23, 1989. This application Aug. 1, 1991, Ser. No. 739,106

Claims priority, application Japan, Oct. 27, 1988, 63-271179; Oct. 27, 1988, 63-271180

Int. Cl.[5] G06F *7/38*

U.S. Cl. 364—725 **8 Claims**

1. An orthogonal transformation apparatus for orthogonally transforming an input signal comprising a set of digitalized 8 data into an output signal comprising data, each having as a base each component of eight point cosine transformation; comprising;

a first resequence unit for resequencing the order of the set of input signals into a predetermined order;

a first butterfly operation unit for performing a butterfly operation which is an addition and subtraction between data separated by a predetermined sample of an output of said first resequence unit;

a second resequence unit for resequencing the order of the output of said first butterfly operation unit;

a first delay unit for delaying an output of said second resequence unit by a predetermined period of time;

a first selector unit for selecting one of three outputs from said first delay unit, a multiplication unit and an addition unit in a predetermined order;

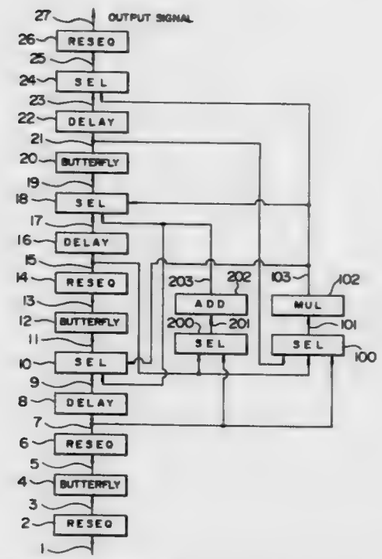
a second butterfly operation unit for performing a butterfly operation for the output of said first selector;

a third resequence unit for resequencing the order of the output of said second butterfly operation unit;

a second delay unit for delaying an output of said third resequence unit by a predetermined period of time;

a second selector unit for selecting one of three outputs from said second delay unit, said multiplication unit and said addition unit;

a third butterfly operation unit for performing a butterfly operation for an output of said second selector;



a third delay unit for delaying an output of said third butterfly operation unit by a predetermined period of time;

a third selector unit for selecting one of two outputs from said third delay unit and said multiplication unit in a predetermined order;

a fourth resequence unit for resequencing the order of output of said third selector into a predetermined order to output an orthogonal transformed signal;

a fourth selector unit for selecting one of three outputs from said second and third resequence units, and said third butterfly operation unit in a predetermined order;

said multiplication unit being adapted to multiply an output of said fourth selector by a multiplier selected in a predetermined order;

a fifth selector unit for selecting a set of data from two outputs from said second and third resequence units in a predetermined order; and

said addition unit being adapted to perform addition for an output of said fifth selector.

5,117,382

SEMICONDUCTOR INTEGRATED CIRCUIT FOR PERFORMING AN ARITHMETIC OPERATION INCLUDING BIPOLAR AND MOS TRANSISTORS

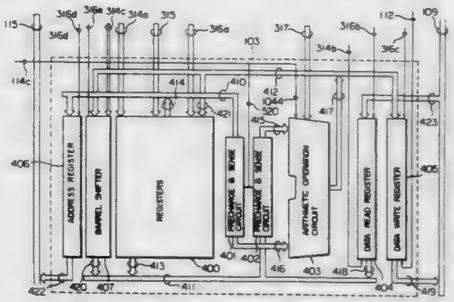
Hideo Maejima; Takashi Hotta; Ikuro Masuda; Masahiro Iwamura; Kouzaburou Kurita, and Masahiro Ueno, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 233,326, Aug. 17, 1988, abandoned, which is a division of Ser. No. 703,171, Feb. 19, 1985, Pat. No. 4,789,958. This application Nov. 26, 1990, Ser. No. 618,114

Claims priority, application Japan, Feb. 20, 1984, 59-31257; Jan. 11, 1985, 60-2020

Int. Cl.[5] G06F *7/48*

U.S. Cl. 364—736 **22 Claims**



1. An arithmetic operation unit comprising:

an arithmetic operation circuit;

a group of registers for storing input data and/or output data of the arithmetic operation circuit, wherein the arithmetic operation circuit includes means for performing arithmetic operations using the input data and data read from registers comprising said group of registers;

at least one read bus for connecting said registers and said arithmetic operation circuit; and

a precharge and sense circuit coupling said arithmetic operation circuit to said read bus, wherein said precharge and sense circuit includes means for precharging the read bus to a first predetermined level before a read operation of said registers begins, and wherein said precharge and sense circuit further includes means for detecting that a potential level on said read bus has discharged from said first predetermined level to a second predetermined level which is lower than said first predetermined level after said read operation begins, thereby detecting slight potential variations on said read bus.

5,117,383

DIGITAL SIGNAL PROCESSING CIRCUIT USING A RESIDUE NUMBER SYSTEM

Tadao Fujita; Yoshiaki Inaba, both of Kanagawa, and Jun Takayama, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 24, 1990, Ser. No. 556,430

Claims priority, application Japan, Jul. 29, 1989, 1-197593

Int. Cl.[5] G06F *7/72*

U.S. Cl. 364—746 **11 Claims**

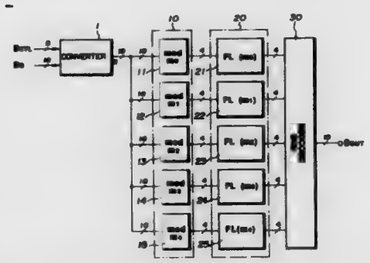
1. A digital signal processing apparatus for processing input data composed of binary codes, comprising:

converting means for converting said input data into a converted value which is a multiple of a selected one of residue number system (RNS) moduli;

control means for selecting one or more of said input data or said converted values of said input data on the basis of selected moduli;

RNS encoding means supplied with an output of said control

means for generating residue data for said RNS moduli, and



processing means for processing said residue data for generating processed data.

5,117,384

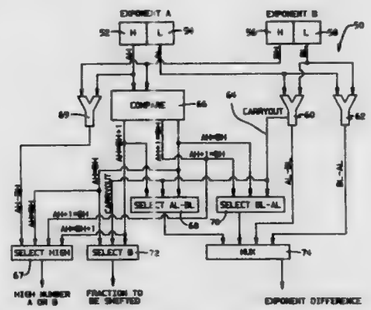
METHOD AND APPARATUS FOR EXPONENT ADDER

Robert A. Drehmel, Goodhue, and Scott A. Hilker, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 469,628, Jan. 24, 1990, abandoned. This application Apr. 3, 1991, Ser. No. 702,341

Int. Cl.[5] G06F *7/38*

U.S. Cl. 364—748 **10 Claims**



1. A circuit in a floating point arithmetic circuit for producing shift controls to align the fraction portion of two floating point numbers, said circuit comprising:

a first register for holding an exponent portion of a first number A, said first register further including a selected number of cells which hold a selected number of less significant bits of the exponent, designated AL, and a selected number of cells for holding the remaining more significant bits of the exponent portion of the number, designated AH;

a second register for holding an exponent portion of a second number B, said second register further including a selected number of cells which hold a selected number of less significant bits of the exponent, designated BL, and a selected number of cells for holding the remaining more significant bits of the exponent portion of the number, designated BH;

a first adder circuit for subtracting a selected number of the cells which hold the less significant bits of the exponent portion of the first floating point number in the first register, designated AL, and a selected number of cells which hold the less significant bits of the second floating point number in the second register, designated BL, said first adder circuit outputting a signal AL−BL;

a second adder circuit for subtracting a selected number of the cells which hold the less significant bits of the exponent portion of the second floating point number in the second register, designated BL, and a selected number of cells which hold the less significant bits of the first floating point number in the first register, designated AL, said second adder circuit outputting a signal BL−AL;

a comparator circuit coupled to said first register and said second register, further comprising:

a first incrementor circuit for incrementing the cells in the first register which hold the more significant bits of the first exponent, designated AH, by one and outputting a signal, designated AH +1;

a second incrementor circuit for incrementing the cells in the second register which hold the more significant bits of the second exponent, designated BH, by one and outputting a signal, designated BH +1;

a first comparator outputting a signal when AH=BH;

a second comparator coupled to the first register and the second incrementor and outputting a signal when AH=BH+1;

a third comparator coupled to the second register and the first incrementor and outputting a signal when BH=AH+1; and

a multiplexer coupled to said first adder circuit, said second adder circuit and said said comparator circuit, said multiplexer receiving AL−BL, and BL−AL, and the output of the comparator circuits as inputs and outputting AL−BL or BL−AL as a shift control signal for aligning the fraction portion of one of the two floating point numbers in response to an output from the comparator circuit.

5,117,385

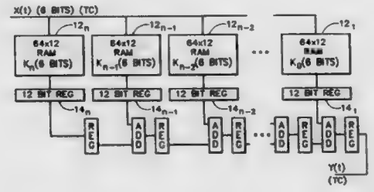
TABLE LOOKUP MULTIPLIER WITH DIGITAL FILTER

Ralph L. Gee, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 662,391, Feb. 27, 1991, abandoned, which is a continuation of Ser. No. 494,687, Mar. 16, 1990, abandoned. This application Oct. 8, 1991, Ser. No. 772,117

Int. Cl.[5] G06F *7/52, 15/31*

U.S. Cl. 364—757 **5 Claims**



1. A method for look-up multiplication of an m-bit operand X and an 1-bit operand K to reduce an n-bit product Y where n=m+1 and the m bits of X are ordered in significance from bit_1, the most significant bit (MSB), to bit_m, the least significant bit (LSB), the method executable with an addressable storage apparatus and a binary adder, the method including the steps of:

partitioning X into consecutive, non-overlapping bit groups, the bit groups forming X when concatenated in a particular magnitude order in which each bit group has a respective magnitude position;

the partitioning step including partitioning X into non-overlapping bit groups, such that:

$$m = \sum_{i=1}^{G} g_i$$

where G is the number of bit groups in X, g_i is the number of bits in the ith bit group, and g_1 is the number of bits in the bit group including the MSB, the maximum size of the bit group being the integer number of bits in the its bit group such that,

$g_i < (m/G)+1$, for all i

and, either g_1 alone is the maximum size bit group, g_{max}, if

$$m = g_{max} + \sum_{i=2}^{G} g_{max}^{-1}$$

or, g_1 is the smallest size bit group;

generating a set of partial products for each bit group, each partial product representing the multiplication of K by a number which the bit group represents;

storing sets of partial products in the addressable storage apparatus such that each partial product of a set is stored at an address location corresponding to the number which is multiplied with K to generate the partial product said partial products including odd multiples of K;

presenting X(t) for multiplication by K, X(t) being a particular value of X;

obtaining partial products from said storage apparatus in response to X(t), each partial product obtained in response to a respective bit group of X(t) and representing the product of the instantaneous value of that bit group and K;

shifting the most significant bit groups in a predetermined magnitude direction with respect to the least significant bit group to form i n-bit partial products; and

adding said i n-bit partial products.

5,117,386

FULL ADDER CIRCUIT

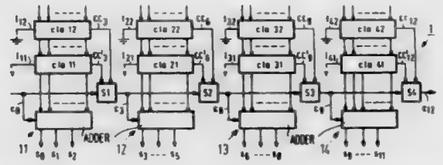
Eric H. J. Persoon, and Christian J. B. O. E. Vandenbulcke, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 661,526, Oct. 15, 1984, abandoned. This application Aug. 28, 1990, Ser. No. 576,132

Claims priority, application Netherlands, Apr. 24, 1984, 8401308

Int. Cl.[5] G06F *7/50*

U.S. Cl. 364—787 **6 Claims**



1. A full adder circuit for adding two n-bit binary numbers comprising: a plurality of cascaded sub-circuits of a first type having a plurality of bit inputs for receiving groups of bit signals having a significance progressing from m to k wherein m<k≦n, each sub-circuit of a first type comprising two sub-circuits of a second type and a selection circuit, first and second sub-circuits of the second type respectively receiving the respective logic values "0" and "1" at a carry signal input and generating at a carry signal output an imaginary carry signal having a significance k+1, the carry signal outputs being connected to inputs of the selection circuit, a further input of the selection circuit being connected to an output of a preceding sub-circuit of the first type or to a sub-circuit of the second type arranged in cascade with the sub-circuit of the first type, at which output a carry signal having a first significance (m) is generated for selecting by means of the selection circuit a carry signal having a higher significance (k+1) from the generated imaginary carry signals and for applying the selected carry signal to a carry signal output of the sub-circuit of the first type, characterized in that the sub-circuits of the second type are carry look-ahead circuits, outputs of which are connected to the carry signal input of the selection circuit whose further input is connected to the carry signal input of a single full adder for adding together two bits of the significance m.

5,117,387

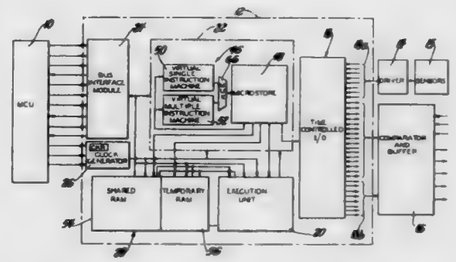
MICROPROGRAMMED TIMER PROCESSOR

Mario D. Nemirovsky, Goleta, Calif., and Matthew D. Sale, Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 18, 1988, Ser. No. 233,678

Int. Cl.[5] G06F *9/26, 9/32, 9/40, 1/08*

U.S. Cl. 395—375 **4 Claims**



1. A microprogrammed timer processor for servicing each of a plurality of input/output channels at a regularly recurring interval of time while concurrently performing other tasks comprising;

storage means for storing a plurality of single instruction programs and a plurality of multiple instruction programs and including address means for accessing the instructions stored in said storage means,

clock means defining sequential fetch and execute operations within an instruction cycle,

instruction execution means responsive to said clock means for receiving and executing said instructions one at a time and including an instruction register for holding said instructions so that they can be interpreted and acted upon,

control means responsive to said clock means for fetching said instructions from said storage means and for interleaving single instruction programs with instructions in said multiple instruction programs so that a single instruction program is executed while an instruction from a multiple instruction program is being fetched,

said control means further including time interval setting means for establishing a single instruction execution loop size corresponding to a predetermined number of said single instruction to fix said regularly recurring interval,

a table of single instruction pointers addressing said predetermined number of single instruction programs and of entry pointers addressing entry instructions of multiple instruction programs,

means including the entry pointers for generating successive multiple instruction pointers, and

the control means for interleaving further comprising means for alternately implementing the single instruction pointers and said multiple instruction pointers.

5,117,388

SERIAL INPUT/OUTPUT SEMICONDUCTOR MEMORY

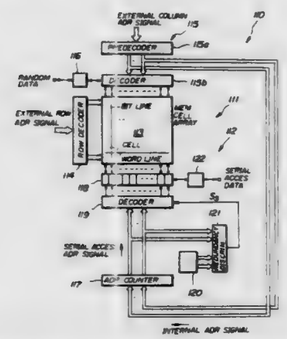
Masao Nakano, Kawasaki; Satoru Kawamoto, Owariasahi, and Akihiko Watanabe, Minokamo, all of Japan, assignors to Fujitsu Limited, Kanagawa and Fujitsu VLSI Limited, Aichi, both of, Japan

Continuation of Ser. No. 407,189, Sep. 14, 1989, abandoned. This application Sep. 18, 1991, Ser. No. 762,046

Claims priority, application Japan, Sep. 20, 1988, 63-235693; Sep. 20, 1988, 63-235694

Int. Cl.[5] G11C *7/00, 8/04, 11/407*

U.S. Cl. 365—73 **20 Claims**



1. A semiconductor memory which outputs data serially, said semiconductor memory comprising:

a serial data register for storing a plurality of bits of data;

a first shift register having a plurality of first registers with input and output ends thereof which are coupled in a loop, said first shift register shifting a content among said plurality of first registers in response to a clock signal;

a second shift register having a plurality of second registers with input and output ends thereof which are coupled in a loop, said second shift register shifting a content among said plurality of second registers in response to a shift clock signal which is obtained from a most significant bit from one of said plurality of first registers of said first shift register; and a decoder which receives as an internal address a plurality of bits of data within said first and second shift registers, said decoder being coupled to a serial data register and designating a bit to be output out of he plurality of bits based on the internal address.

5,117,389

FLAT-CELL READ-ONLY-MEMORY INTEGRATED CIRCUIT

Tom D. H. Yiu, Milpitas, Calif., assignor to Macronix International Co., Ltd., Taiwan, China

Filed Sep. 5, 1990, Ser. No. 577,644

Int. Cl.[5] G11C *17/10*

U.S. Cl. 365—104 **18 Claims**

1. A memory circuit on a semiconductor substrate; comprising:

a plurality of buried diffusion regions LBL_k in the substrate, the regions forming lines in a section of the substrate;

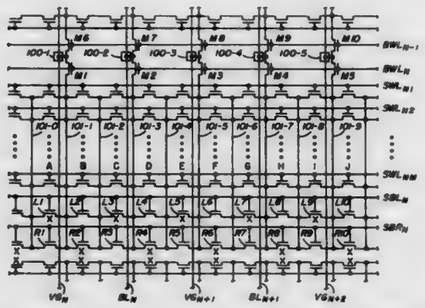
an insulating layer of essentially constant thickness over the section of the substrate;

a first plurality of conductive strips WL_m on the insulating layer, the first plurality of conductive strips forming lines intersecting the buried diffusion regions, so that regions between respective pairs of buried diffusion regions and under a conductive strip, form channels of field effect transistors, whereby a column of storage cells is formed between each pair of buried diffusion regions;

a second plurality of conductive strips ML_j isolated from the first plurality, the second plurality of conductive strips forming lines along the plurality of buried diffusion regions;

code implants in the channels of the field effect transistors to define a conductive or a non-conductive state in response to a signal on the corresponding one of the first plurality of conductive strips;

a plurality of block select transistors, each having a drain connected to one of the second plurality of conductive strips ML_j, a source connected to an adjacent one of the



plurality of buried diffusion regions LBL_k, a gate connected to receive a block select signal; wherein alternate buried diffusion regions are connected to the source of respective block select transistors, and further including:

means, coupled to each of said alternate buried diffusion regions LBL_k, for selectively coupling a buried diffusion region LBL_{k-1} on one side or a buried diffusion region LBL_{k+1} on an other side through said alternate buried diffusion region LBL_k to the source of the respective block select transistor.

5,117,390

SEMICONDUCTOR MEMORY SYSTEM FOR USE IN LOGIC LSI'S

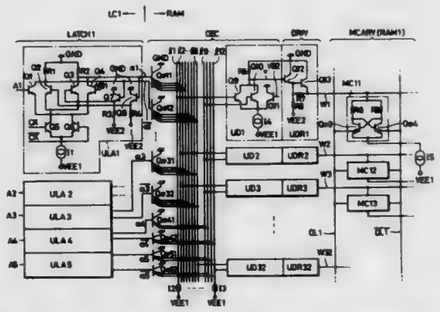
Kazuhiro Akimoto, Tokorozawa; Katsumi Ogiue, Hinode, and Takeo Uchiyama, Oume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 351,044, May 10, 1989, Pat. No. 5,023,835, which is a continuation of Ser. No. 13,550, Feb. 11, 1987, abandoned. This application Feb. 22, 1991, Ser. No. 659,230

Claims priority, application Japan, Feb. 19, 1986, 61-32955

Int. Cl.[5] G11C *7/00, 11/411, 11/415*

U.S. Cl. 365—155 **4 Claims**



1. A memory system formed on a single semiconductor substrate comprising:

first and second memory blocks each having output means for outputting a pair of complementary signals read out from a memory cell in said memory system;

a latch circuit for delivering address signals to said first and second memory blocks;

a logic section coupled to receive pairs of complementary signals from said first and second memory blocks for carrying out a logical processing operation in response to said pairs of complementary signals; and

a plurality of pairs of first and second lines each respectively coupled between said first and second memory blocks and said logic section for transmitting said pairs of complementary signals,

wherein said logic section includes a selecting circuit having a first bipolar transistor having a base coupled to receive one signal of a first pair of complementary signals from said first memory block, a second bipolar transistor having a base coupled to receive the other signal of said first pair of complementary signals from said first memory block, a third bipolar transistor having a base coupled to receive one signal of a second pair of complementary signals from said second memory block, a fourth bipolar transistor having a base coupled to receive the other signal of said second pair of complementary signals from said second memory block, a fifth bipolar transistor coupled to both emitters of said first and second bipolar transistors, and a sixth bipolar transistor coupled to both emitters of said third and fourth bipolar transistors, and

wherein said fifth and sixth bipolar transistors form a differential circuit having their emitters coupled to one another and to a constant current source, and wherein said fifth and sixth bipolar transistors have their bases respectively coupled to receive complementary clock signals.

5,117,391

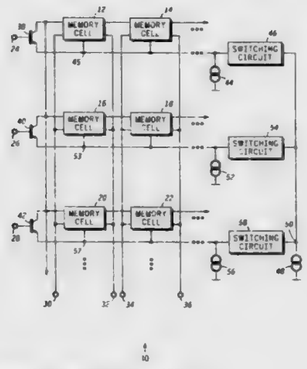
BIPOLAR MEMORY CELL ARRAY BIASING TECHNIQUE WITH FORWARD ACTIVE PNP LOAD CELL

Bor-Yuan Hwang, Tempe, and Thomas P. Bushey, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 4, 1990, Ser. No. 533,220

Int. Cl.[5] G11C *11/40*

U.S. Cl. 365—155 **14 Claims**



1. A memory circuit, comprising:

a plurality of bit lines;

a plurality of word lines;

a plurality of memory cells arranged in a matrix of rows and columns, each row of memory cells being coupled to one of said plurality of word lines and each column of memory cells being coupled between first and second ones of said plurality of bit lines such that asserting one of said plurality of word lines selects a row of memory cells and asserting first and second ones of said plurality of bit lines selects one memory cell of said row of memory cells, each of said plurality of memory cells conducting a load current and having a port for receiving a bias signal to control the magnitude of said load current;

first current supply means having a plurality of outputs respectively coupled to said plurality of word lines for sinking a plurality of currents, each of said plurality of currents having a first magnitude when said row of memory cells is selected and a second magnitude when said row of memory cells is deselected; and

a plurality of transistors each having a base, an emitter and a collector, each of said bases being responsive to a word select signal for selecting one of said rows of memory cells, each of said emitters being coupled to one of said plurality of word lines, each of said collectors of said plurality of transistors being coupled together at a common node to said ports of said plurality of memory cells for developing said bias signal and sourcing a difference current equal to the difference between said first and second magnitudes of said plurality of currents into one of said plurality of word lines associated with said selected one of said rows of memory cells which distributes said difference current evenly between said plurality of memory cells and maintains said bias signal constant and said load current flowing through each of said plurality of memory cells constant.

5,117,392

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

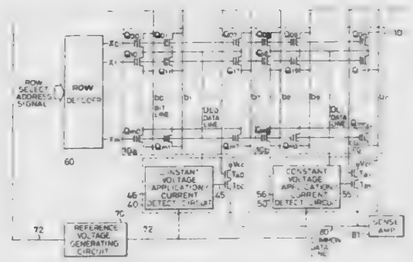
Teruhiro Harada, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Japan

Filed Nov. 2, 1990, Ser. No. 608,226

Claims priority, application Japan, Nov. 2, 1989, 1-286600

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—189.09 **9 Claims**



1. A non-volatile memory device comprising:

a memory matrix having semiconductor memory cells arranged in rows and columns;

a plurality of word lines extending in the direction of the rows of the memory matrix, each word line connected to the control gates of all the semiconductor memory cells arranged in the corresponding one of the rows;

a row decoder for outputting a row select signal to one of the rows of the semiconductor memory cells through the word lines;

a plurality of bit lines extending in the direction of the columns and connected to the sources of the semiconductor memory cells arranged in the columns;

a column decoder for outputting a column select signal to one of the columns of the semiconductor memory cells through said bit lines;

a data line connected to the drains of all the semiconductor memory cells, and

a constant voltage application/current detecting means for applying a constant voltage to the drains of all the semiconductor memory cells through said data line, and detecting the current required to maintain the data line at the constant voltage.

5,117,393

METHOD OF TESTING MEMORY CELLS IN AN ADDRESS MULTIPLEXED DYNAMIC RAM INCLUDING TEST MODE SELECTION

Kazuyuki Miyazawa, Iruma; Katsuhiro Shimohigashi, Musashimurayama; Jun Etoh, Hachiohji, and Katsutaka Kimura, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

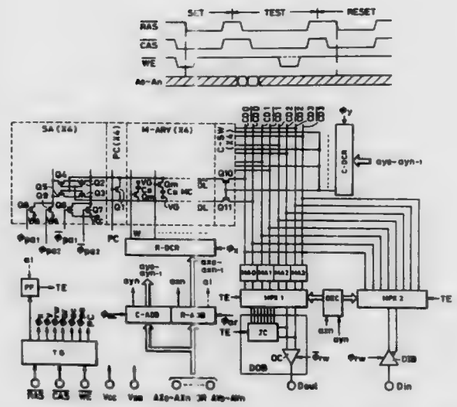
Continuation of Ser. No. 319,693, Mar. 7, 1989, Pat. No. 4,992,985, which is a division of Ser. No. 41,070, Apr. 22, 1987, Pat. No. 4,811,299. This application Jan. 31, 1991, Ser. No. 648,885

Claims priority, application Japan, Apr. 23, 1986, 61-92056

The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.

Int. Cl.[5] G11C *29/00, 7/00*

U.S. Cl. 365—201 **6 Claims**



1. A method of testing memory cells in an address multiplexed dynamic random access memory (RAM) having a first external terminal for receiving a row address strobe ($\overline{RAS}$) signal, a second external terminal for receiving a column address strobe ($\overline{CAS}$) signal and a third external terminal for receiving a write enable signal, said method comprising the steps of:

entering into a test mode from a normal operation mode in response to a change in said $\overline{RAS}$ signal from a logic "high" level to a logic "low" level when said $\overline{CAS}$ signal is at a logic "low" level and said write enable signal is at a logic "low" level;

selecting said memory cells on the basis of row address signals provided to a row decoder in response to a change in said $\overline{RAS}$ signal from a logic "high" level to a logic "low" level and column address signals provided to a column decoder in response to a change in said $\overline{CAS}$ signal from a logic "high" level to a logic "low" level;

writing data having the same logic value to said memory cells;

verifying whether or not data which is read out of said memory cells are in agreement with predetermined data; and

providing a resultant verification output.

5,117,394

HIGH SPEED DIFFERENTIAL SENSE AMPLIFIER FOR USE WITH SINGLE TRANSISTOR MEMORY CELLS

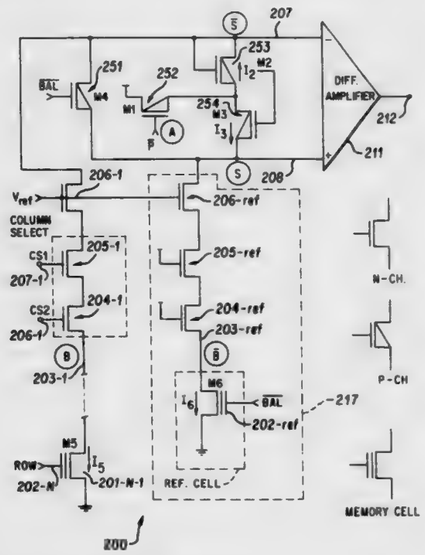
Alaaeldin A. M. Amin, Dhahran, Saudi Arabia, and Bernard Emoto, Midvale, Utah, assignors to National Semiconductor Corp., Santa Clara, Calif.

Continuation of Ser. No. 276,363, Nov. 23, 1988, abandoned.

This application May 6, 1991, Ser. No. 698,257

Int. Cl.[5] G11C *16/06*

U.S. Cl. 365—203 **8 Claims**



1. A memory device comprising:

a plurality of bit lines;

a plurality of word lines;

a plurality of memory cells, each memory cell being uniquely associated with a bit line-word line pair;

means for addressing a selected bit line;

means for addressing a selected word line;

a reference bit line coupled to a reference memory cell comprising a reference memory transistor programmed to a first logical state and having a source coupled to said reference bit line, a drain coupled to a selected voltage level, and a control gate coupled to a control signal;

a differential sense amplifier having a first input lead coupled to said selected bit line, a second input lead coupled to said reference bit line, and an output lead for providing an output signal indicative of the logical state of the data stored in a selected memory cell defined by said selected bit line and said selected word line;

balancing means for selectively causing said first and second input leads to be at the same voltage;

a precharge source having a precharge output terminal;

first means for coupling said precharge output terminal to said first input lead of said sense amplifier in order to provide a selected bit line charging current; and

second means for coupling said precharge output terminal to said second input lead of said sense amplifier, in order to provide a reference bit line charging current; wherein said control signal in a first state selectively causes said reference memory transistor to conduct, and in a second state selectively causes said balancing means to cause said first and second input leads to be at the same voltage level.

5,117,395

EXPANSIBLE FIFO MEMORY FOR ACCOMMODATING ADDED MEMORY STAGES IN A MULTISTAGE MEMORY WITH COMMON CONTROL SIGNALS

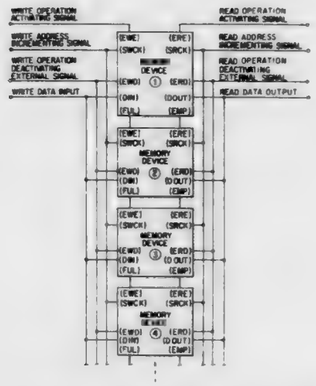
Masashi Hashimoto, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 16, 1988, Ser. No. 245,834

Claims priority, application Japan, Sep. 18, 1987, 62-234522

Int. Cl.[5] G11C *19/00, 8/00*

U.S. Cl. 365—221 **5 Claims**



1. An expansible memory device capable of FIFO data operation, said memory device comprising:

memory storage means having a plurality of memory cells for receiving data bits therein;

means operably connected to said memory storage means for enabling a data write operation in response to an external data write-operation activating signal;

data input means connected to said memory storage means for selectively providing input data as write data to said memory storage means in dependence upon the occurrence of said data write-operation activating signal;

means operably connected to said memory storage means for incrementing a write address in response to an external write data clocking signal to accommodate respective bits of input data in sequential memory cells of said memory storage means;

means operably connected to said memory storage means for transmitting a "memory full" signal externally of said memory storage means in response to the incrementation of said write address within said memory storage means to its maximum value indicative of bits of input data being written into all of said plurality of memory cells of said memory storage means;

said data write operation being deactivated and said write address being reset to a starting write address in response to the occurrence of the "memory full" signal;

means operably connected to said memory storage means for enabling a data read operation in response to an external data read-operation activating signal;

data output means connected to said memory storage means for selectively providing output data as readout data from said memory storage means in dependence upon the occurrence of said data read-operation activating signal;

means operably connected to said memory storage means for incrementing a read address in response to an external read data clocking signal for reading out respective bits of output data from sequential memory cells of said memory storage means;

means operably connected to said memory storage means for transmitting a "memory empty" signal externally of said memory storage means in response to the incrementation of said read address within said memory storage means to its maximum value indicative of the readout of bits of output data from all of said plurality of memory cells of said memory storage means; and

said data read operation being deactivated and said read address being reset to a starting read address in response to the occurrence of the "memory empty" signal.

5,117,396

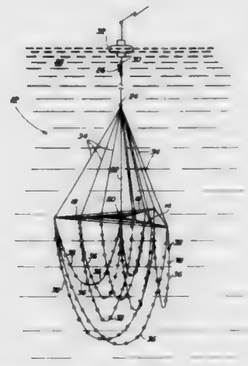
LARGE, AIR DEPLOYABLE, VOLUMETRIC HYDROPHONE ARRAY

Brett D. Castile, Del Mar, and Shelby F. Sullivan, Solana Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 5, 1986, Ser. No. 835,860

Int. Cl.[5] H04B *1/59*

U.S. Cl. 367—3 **11 Claims**



1. A hydrophone array comprising:

a plurality of supporting booms joined together;

a plurality of lines, each being attached at two locations to said plurality of supporting booms, each of said plurality of lines drooping down from said attachment locations so as to approximate the shape of a catenary; and

a plurality of hydrophones attached to each of said plurality of lines.

5,117,397

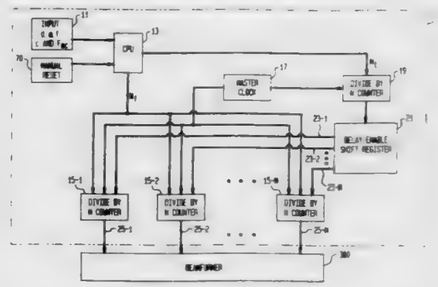
PLANAR WAVEFRONT SIMULATOR

David M. Deveau, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1991, Ser. No. 771,661

Int. Cl.[5] H04B *17/00*

U.S. Cl. 367—13 **6 Claims**



1. An apparatus for simulating a planar wavefront as it

would be received by an imaginary linear array of M equally spaced receiving elements sensitive to the wavefront, the wavefront being simulated to propagate at a known frequency through a medium and to be incident upon the imaginary linear array at a known angle of incidence, said apparatus comprising:

a master clock for generating a clock signal at a selected frequency;

means for generating a frequency divisor and time delay divisor based upon the selected frequency of said master clock, the spacing between the receiving elements, the known frequency of propagation, the known angle of incidence, and wavefront propagation speed in the medium;

a plurality of M frequency generation counters, each of which is connected to receive said master clock signal and the frequency divisor;

a time delay counter connected to receive said master clock signal and the time delay divisor and for generating a pulse every T seconds, where T is equal to the time difference associated with receiving the planar wavefront at any two adjacent receiving elements of the imaginary linear array for the known angle of incidence; and

a delay enable shift register connected to said time delay counter for receiving the generated pulse every T seconds, said shift register further having M enable lines as output lines wherein each successive one of said M enable lines is set HIGH in response to the generated pulse, and wherein each one of said M enable lines is connected to a corresponding one of said M frequency generation counters whereby a signal is generated at the known frequency of propagation at each one of the corresponding M frequency generation counters when its enable line is set HIGH, the generated signal being based on the selected frequency of said master clock and the frequency divisor.

5,117,398

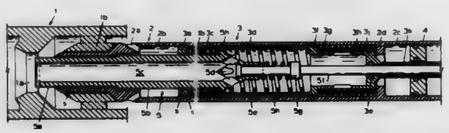
WELL COMMUNICATION PULSER

John D. Jeter, 1403 Teche Dr., St. Martinville, La. 70582

Filed Apr. 11, 1990, Ser. No. 508,047

Int. Cl.[5] G01V *1/40*

U.S. Cl. 367—85 **20 Claims**



11. Apparatus for the generation of drilling fluid pressure change signals, for well bore telemetry, in a stream of drilling fluid being circulated through the bore of a drill string, the apparatus comprising:

(a) a housing comprising a length of drill string with fluid tight means at one end for attachment to an upwardly continuing portion of the drill string and means at the other end for fluid tight attachment to a downwardly continuing portion of the drill string;

(b) an orifice, with an upstream side and a downstream side, situated in the bore of said drill string and arranged to accept at least part of said drilling fluid stream therethrough;

(c) a poppet mounted for reciprocating movement in said housing between a first position near said orifice to produce a signal pressure drop therethrough and a second position farther from said orifice to produce a pressure drop lower than said signal pressure drop;

(d) actuator means situated in said housing comprising a fluid power cylinder with a piston resiliently connected by a first bias means to said poppet such that said piston and said poppet are urged to move in sympathy;

(e) first fluid channel means in said housing to conduct fluid from the drilling fluid stream upstream of said orifice to said cylinder on one side of said piston and second fluid channel means to conduct fluid from said drilling fluid stream downstream of said orifice to the other side of said piston, said two channel means arranged such that increasing pressure across said orifice increasingly urges said poppet away from said orifice;

(f) position latch means in said housing arranged to releasably secure said poppet in at least one of said two positions in response to movement of a latch control member between a first and a second latch control position;

(g) second bias means arranged to urge said actuator means and said latch control member to move in sympathy;

(h) holding means situated to releasably engage said latch control member in at least one of said two latch control positions in response to a first signal from a downhole instrument and to release said latch control member in response to a second signal from said downhole instrument.

5,117,399

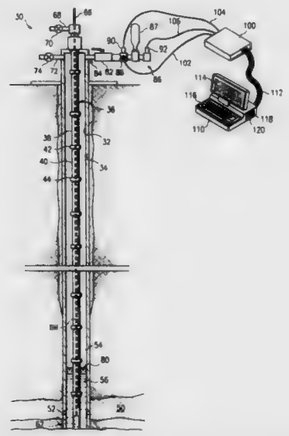
DATA PROCESSING AND DISPLAY FOR ECHO SOUNDING DATA

James N. McCoy, 2210 Midwestern Pkwy., Wichita Falls, Tex. 76308; Kenneth L. Huddleston, Wichita Falls, and Augusto L. Podio, Austin, both of Tex., assignors to James N. McCoy, Wichita Falls, Tex.

Filed Jul. 16, 1990, Ser. No. 552,465

Int. Cl.[5] G01S *15/00*; **G01U** *1/00*

U.S. Cl. 367—99 **27 Claims**



1. A method for evaluating echo reflections produced in response to the transmission of acoustic energy down a borehole in the earth, the borehole having a tubing string therein comprising a plurality of interconnected tubing joints, comprising the steps of:

detecting said reflections to produce a return signal,

storing said return signal,

displaying a waveform derived from said return signal on a screen, said waveform displayed along a dimension proportional to time,

storing a listing of known depths for one or more fixed reflectors located in said borehole, and

displaying a marker on said screen for each of said known reflectors in conjunction with said displayed waveform, each of said markers positioned along said dimension at a position corresponding to the depth in said borehole for the marker.

5,117,400

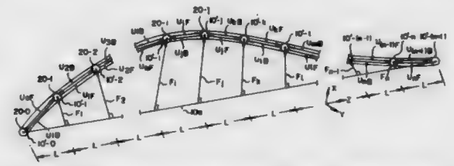
OPTICAL CALIBRATION OF TOWED SENSOR ARRAY

William A. Penn, Baldwinsville, and Donald W. Winfield, Camillus, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 24, 1990, Ser. No. 632,528

Int. Cl.[5] G01S *15/00*

U.S. Cl. 367—128 **20 Claims**



1. Apparatus for detecting deviation from a straight line of each of a plurality (N+2) of stations of an energy-beam-forming sensor array, comprising:

a plurality (N) of optical sensing module means, each having a known relationship to an associated one of the array sensors, for mutually imaging each other to provide first-difference data responsive to a displacement of the sensing module means from said straight line;

means receiving the first-difference data for generating second-difference data from each optical sensing module means; and

means for processing the second-difference data from all optical sensing module means to provide a present deviation of each sensing module means from said straight line.

5,117,401

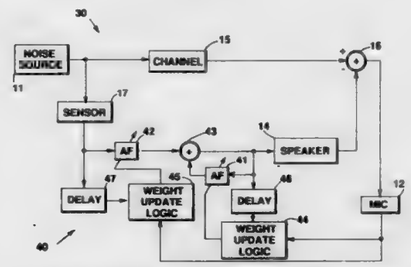
ACTIVE ADAPTIVE NOISE CANCELLER WITHOUT TRAINING MODE

Paul L. Feintuch, Covina, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 16, 1990, Ser. No. 568,289

Int. Cl.[5] H04B *15/00*

U.S. Cl. 367—135 **10 Claims**



1. An active adaptive canceller for use in suppressing noise signals derived from a noise source, said active adaptive canceller comprising:

a noise sensor;

an acoustic sensor;

an acoustic output device;

delay means coupled to the noise sensor for delaying the noise signals generated thereby by a preselected time delay; and

adaptive filter means having a plurality of inputs coupled to the noise sensor, the acoustic sensor, and the delay means, and an output coupled to the acoustic output device;

wherein the delay means causes the active adaptive canceller to be stable and to not require a training mode.

5,117,402

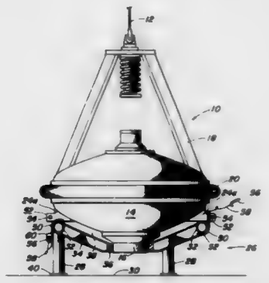
SUPPORT STAND FOR MARINE VIBRATOR

Wilbur J. Myers, Ft. Worth, and Michael E. Sanders, Ponca City, both of Tex., assignors to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 168,202, Mar. 15, 1988, abandoned. This application Jan. 23, 1989, Ser. No. 300,195

Int. Cl.[5] H04R *23/00*

U.S. Cl. 367—143 **10 Claims**



1. Shipboard securing apparatus for positioning and securing a cable-supported marine vibrator of the type having a generally spherical lower section, the combination comprising:

a seismic transducer which includes a vibrator assembly having a generally spherical bottom plate that is symmetrical about a vertical axis and defined by an outer circumfery;

a lower guide ring secured to the bottom plate concentrically about said vertical axis to extend below said bottom plate;

plural spaced support lugs secured around the outer circumfery of the bottom plate and defining a selected circumference;

a support ring having a circumference that is approximately the same as the circumference of said support lugs;

vertical stand means secured on a deck surface and supporting said supporting ring on shipboard in generally horizontal attitude;

a locating ring having a diameter to receive therethrough said vibrator lower guide ring; and

means supporting said locating ring concentric to and parallel beneath said support ring.

5,117,403

ABOVE AND BELOW WATER SOUND TRANSDUCER

Adolf Eberl, and Rolf Eberl, both of 214 Bruce Ave., Kincardine, Ontario N2Z 2P, Canada

Filed May 31, 1991, Ser. No. 710,758

Int. Cl.[5] H04R *9/00*

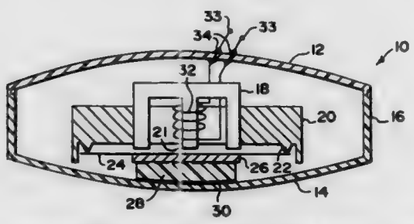
U.S. Cl. 367—175 **11 Claims**

1. A sound transducer comprising:

(a) a symmetrical waterproof outer shell of rigid nonmagnetic material a hemispherical front wall and a hemispherical back wall directly opposite said front wall with both said walls being joined to form a sidewall therebetween, both of said front and back walls being slightly concave with respect to the center of said shell;

b) an inertial member having substantial mass located within said shell, said member extending parallel to an axis contiguous with the center of said sidewall, said member having a length along said axis substantially greater than its width perpendicular to said axis, said member being mounted inside said shell such that it is free to move a short distance within said shell back and forth along a line

perpendicular to said axis, in which said inertial member comprises a disk of magnetic metal bonded on one side to a thin metallic membrane extending beyond the end of said disk, said disk and said membrane being parallel to said axis, and said signal translating means comprises an electromagnet assembly having a central pole piece of soft iron material surrounded by a permanent magnet and having an electrical winding about said central pole piece, said assembly being secured to the inside of one of said



walls with said inertial member being located between said assembly and an inside surface of said shell, said electrical winding extending through said shell to the outside thereof; and

c) signal translating means within said shell adjacent to an interacting with said inertial member and responsive to relative movement between said inertial member and said shell for converting an acoustic wave signal of one wave type to an acoustic wave signal of another wave type.

5,117,404

METHOD FOR ESTABLISHING PROGRAM AND TIME OF THE REMOCON(REMOTE-CONTROLLER)

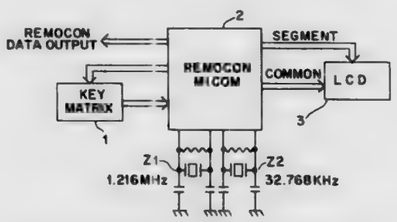
Byung-Hwan Yang, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 31, 1989, Ser. No. 387,533

Claims priority, application Rep. of Korea, Dec. 31, 1988, 88-18242

Int. Cl.[5] G04B *47/00*; H04Q *1/00*

U.S. Cl. 368—10 **15 Claims**



1. A method for establishing a program and time for a remote controller having a microprocessor, comprising the steps of:

performing within a remote controller a time counting operation for one of a plurality of selectable frequencies;

displaying on a visual display of the remote controller representations of time provided by said time counting operation while said time counting operation is being performed under conditions that an initial one of said plurality of frequencies is selected, a functional key is OFF, a mode selection is ON, and an interval of time more than a first period of time goes by after said mode selection is ON; and

while not under all of said conditions, performing subroutines at a second one of said frequencies within the remote controller for controlling an appliance, transmitting functional input as data from the remote controller after decoding of the functional input, and transmitting the mode selection input to the appliance as said data from the remote controller for setting an operational mode for the appliance after said mode selection input is displayed throughout the subroutines for setting each program and time.

5,117,405

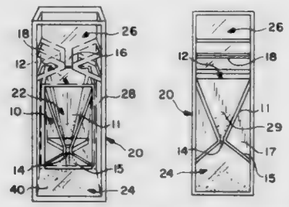
QUICK RESET GAME TIMER

Frank J. Thibault, 13347 Fontaine Dr., Saratoga, Calif. 95070

Filed Mar. 18, 1991, Ser. No. 672,552

Int. Cl.[5] G04F *1/04*

U.S. Cl. 368—93 **7 Claims**



1. A timer that can be quickly reset which comprises:

a) a sealed outer container having transparent walls defining a hollow interior at a base end and a reset reservoir at the opposite end;

b) a quantity of flowable particulate medium sealed within the walls of the outer container;

c) a metering receptacle within the sealed outer container intermediate the base end and the reservoir end, and constituting the walls of the outer container, and having a relatively large, square loading orifice proximal to the reset reservoir, and being configured to funnel downward to a relatively small metering orifice whereby draining of the flowable medium through the receptacle to the base end of the timer is restricted, said receptacle being spaced from two opposite walls of the outer container so that flowable medium in the base flows around two sides of the receptacle upon inversion of the timer; and

d) means for conducting all the flowable medium firstly into the reset reservoir upon inversion of the timer and secondly from the reset reservoir into the receptacle upon righting of the timer by rotation in any direction and in any manner.

5,117,406

WATCHBAND FASTENER AND ARRANGEMENT

Scott L. Sullivan, 1801 Crystal Dr. (709), Arlington, Va. 22202

Filed Feb. 7, 1991, Ser. No. 652,133

Int. Cl.[5] G04B *37/00*

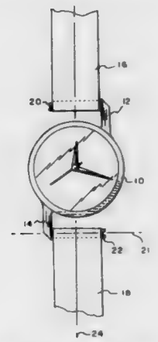
U.S. Cl. 368—282 **13 Claims**

1. In combination, a fastener for connecting a fastening end of a watchband to a watch case, said watchband having a central longitudinal axis, said fastening end defining an end axis non parallel to said central axis, said fastener comprising in combination:

a shaft positioned along said end axis substantially parallel to said end axis, said shaft having an open end and a securable end;

means for fixing said fastening end of said watchband to said shaft between said open end of said shaft and said securable end of said shaft; and

means for securing said securable end of said shaft to said watch case, said securable end of said secured shaft being offset with respect to said central longitudinal axis of said



watchband, said open end of said secured shaft being unsecured and remote to said watch case.

5,117,407

VENDING MACHINE WITH SYNTHESIZED DESCRIPTION MESSAGES

Peter S. Vogel, 28 Adeline St., Faulconbridge, NSW 2776, Australia

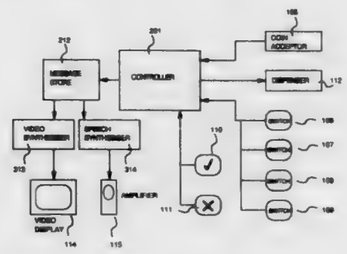
PCT No. PCT/AU89/00051, § 371 Date Oct. 25, 1989, § 102(e) Date Oct. 25, 1989, PCT Pub. No. WO89/07807, PCT Pub. Date Aug. 24, 1989

PCT Filed Feb. 8, 1989, Ser. No. 439,378

Claims priority, application Australia, Feb. 11, 1988, PI6706

Int. Cl.[5] G07F *7/02*; G08B *23/00*

U.S. Cl. 369—30 **9 Claims**



1. A dispenser comprising

a. means for storing merchandise

b. means for dispensing said merchandise

c. means for initiating delivery of said merchandise

d. message data storage means for storing messages, said messages relating to said stored merchandise

e. means for retrieving said message data

f. means for producing audible messages according to the content of said message data

g. means for storing data describing graphical objects

h. video synthesis means adapted to cause said graphical objects to be displayed on display means; and

i. animation means adapted to cause said displayed objects to perform movements responsive to the content of said message data.

5,117,408

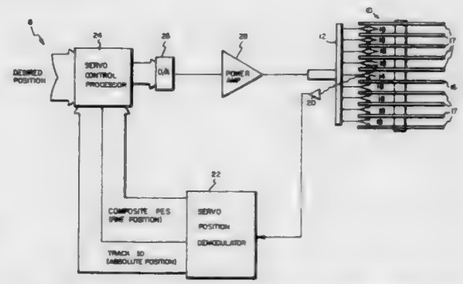
CORRELATION OF SECTORED SERVO POSITION INFORMATION

Gerald L. Weispfenning, St. Paul, and Lloyd C. Goss, Bloomington, both of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Sep. 29, 1989, Ser. No. 415,500

Int. Cl.[5] G11B *21/08, 21/10*

U.S. Cl. 369—32 **6 Claims**



1. A method of determining transducer position relative to a disk in a data storage system, comprising:

reading track identification information from a disk in the data storage system to provide a coarse position signal identifying a track that the transducer is positioned over;

reading position error samples from a disk in the data storage system to provide a fine position signal representing transducer position error within a track that the transducer is positioned over; and

correlating the coarse position signal and the fine position signal so the coarse position signal and the fine position signal correspond to the same track on the disk, the step of correlating comprising:

determining whether the transducer has moved between tracks after reading the track identification information and before reading the position error samples; and

adjusting the coarse position signal to reflect proper track identification information when the transducer has moved.

5,117,409

MULTIDISK CONTAINING PLAYER INCLUDING MAGAZINE HAVING A HOUSING WITH SEPARABLE UPPER AND LOWER HALF PORTIONS

Akira Shimizu; Tutomu Ogawa; Kenji Wakatsuki, and Tomomichi Kimura, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 26, 1990, Ser. No. 603,649

Claims priority, application Japan, Feb. 9, 1990, 2-30715

The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.

Int. Cl.[5] G11B *17/22, 17/04*

U.S. Cl. 369—36 **4 Claims**

1. A multidisk containing player comprising playing means including a turntable, a pickup, and a disk clamp mechanism, said playing means being provided within a player housing, a magazine accommodating a plurality of disks and being removably mounted on a mounting portion as installed within said player housing, and a transfer mechanism for transferring said playing means toward a disk to be played and loading said playing means to said disk to be played, wherein

said magazine comprises:

a housing including an upper half portion and a lower half portion, both portions being separable from each other; and

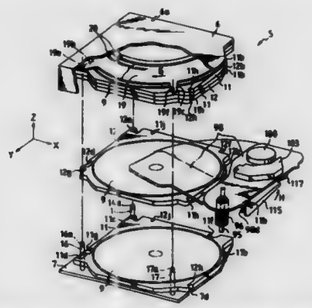
a plurality of plate-like trays having main surfaces and being arrayed within said housing and ejectable from and retractable into said housing along the main surfaces of said

trays, said trays respectively carrying data recording disks on the main surfaces. and

said transfer mechanism comprises:

separating/positioning means for separating the upper and lower half portions, selecting a tray carrying a desired disk from among said trays, holding the selected tray, and separating the selected tray from the remaining trays in a tray separation direction orthogonal to the main surface of said tray to position said selected tray;

movable carrying means for carrying said playing means;



a support shaft supporting said movable carrying means, said movable carrying means being swingable about an axis between an insertion position, which allows said movable carrying means to be inserted between said trays, and a noninsertion position in a direction orthogonal to said tray separation direction, and said movable carrying means being movable along the axis of said support shaft; and

drive means for swinging and moving said movable carrying means.

5,117,410

OPTICAL DISC APPARATUS WITH RAPID AND STABLE ACCESSING CAPABILITY

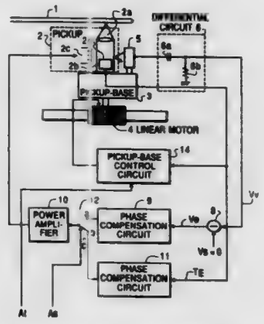
Ryo Akiyama, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 209,642, Jun. 21, 1988. This application Jan. 30, 1991, Ser. No. 646,553

Claims priority, application Japan, Jun. 24, 1987, 62-156798; Sep. 2, 1987, 62-219502

Int. Cl.[5] G11B *7/085*

U.S. Cl. 369—44.25 **8 Claims**



1. An optical disc apparatus comprising:

pickup means for forming a light spot on an optical disc and detecting a light from said optical disc, said pickup means including (a) a focus lens, and (b) a fine actuator for movably supporting thereon said focus lens and moving said focus lens;

light spot positioning means for positioning said light spot on said optical disc, said light spot positioning means constituting an optical servo loop including (a) position error detection means for detecting a position error of said light spot and producing a position error signal indicative of the detected position error of said light spot, (b) first phase compensation means for compensating a phase of said position error signal to obtain a phase-compensated position error signal, and (c) means for feeding said phase-compensated position error signal to said fine actuator;

traversing means for moving said pickup means in a radial direction of said optical disc, said traversing means being responsive to an externally given control signal for moving said pickup means at a high speed;

velocity control means for controlling a velocity of said focus lens, said velocity control means constituting a velocity servo loop including (a) velocity detection means for detecting a velocity of said focus lens and producing a velocity signal indicative of the velocity of said focus lens, (b) velocity error signal producing means for comparing the velocity signal with a predetermined reference velocity to produce an error therebetween as a velocity error signal, (c) second phase compensation means for compensating a phase of the velocity error signal to obtain a phase-compensated velocity error signal, and (d) means for feeding said phase-compensated velocity error signal to said fine actuator; and

switching means responsive to an externally given control signal for selectively closing one of said optical servo loop and said velocity servo loop.

5,117,411

LENS CLEANER FOR A COMPACT DISK PLAYER

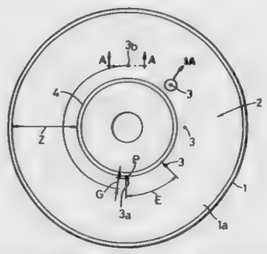
Hiromu Nakagawa, 1-27-601, Uehonmachi 2-chome, Tennohjiku, Osaka, Japan

Filed Mar. 5, 1990, Ser. No. 488,219

Claims priority, application Japan, Mar. 3, 1989, 1-52672

Int. Cl.[5] G11B *7/12*

U.S. Cl. 369—72 **10 Claims**



1. A lens cleaner for a CD player with a pick-up lens, comprising a disk, a cleaning device provided on the disk, said cleaning device comprises brushing hair bundles, said brushing hair bundles being operatively arranged at a circumferential area of the disk radially outwardly of a lead-in area on the disk in a predetermined spiral dispersal pattern in the circumferential direction of at least about 180° and along different radial directions of the disk, with an interval between adjacent brushing hair bundles in the circumferential direction being at least equal to a diameter of a pick-up lens and with an interval between one of the brushing hair bundles positioned on the innermost side of the disk and another of the brushing hair bundles positioned on the outermost side of the disk in the radial direction being set at least equal to the diameter of the pick-up lens.

5,117,412

OPTICAL DISC WITH SERVO PATTERN PROVIDING ENHANCED RELIABILITY OF SERVO CLOCK DETECTION AND APPARATUS FOR ACCESSING THE OPTICAL DISC

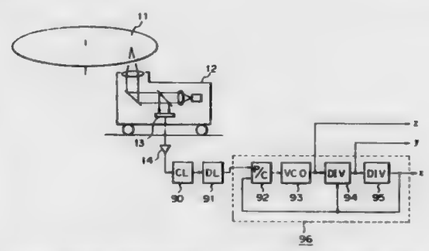
Osamu Ito; Masaharu Ogawa; Kyosuke Yoshimoto; Kunimaro Tanaka; Teruo Furukawa, and Yoshiki Nakajima, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 166,671, Mar. 11, 1988, Pat. No. 5,063,546. This application May 21, 1990, Ser. No. 526,285

Claims priority, application Japan, Mar. 13, 1987, 62-59537; Jun. 2, 1987, 62-138585; Jun. 16, 1987, 62-149586

Int. Cl.[5] G11B *7/12*

U.S. Cl. 369—109 **2 Claims**



2. An accessing apparatus for accessing an optical disc having a plurality of information tracks, each information track having a data field including a plurality of data bytes, each information track further having a servo field including a first servo byte having a pair of wobbled pits and a second servo byte having a clock pit, the byte length of at least one of the first and second servo bytes being different from that of the plurality of data bytes, the apparatus comprising:

a movable portion of an optical head adapted to be moved in the radial direction, the optical head for emitting a light onto the optical disc;

photoelectric means for receiving a light reflected from the optical disc and converting the received light into an electrical signal;

clock extracting means for detecting the position of the clock pit on the basis of the electrical signal from the photoelectric means and generating a corresponding clock signal; and

phase-locked loop circuit means for generating a phase-locked loop clock signal and synchronizing an output frequency of the phase-locked loop clock signal with a frequency of the clock signal obtained from the clock extracting means, whereby a frequency dividing ratio of the phase-locked loop circuit means varies between preset ratios, said preset ratios being preset in accordance with the byte lengths of the first and second servo bytes and the data bytes.

5,117,413

COIL DRIVE FOR PIVOTABLE MOUNTED OPTICAL SCANNER

Gerard E. Van Rosmalen, and Pieter A. Schoneveld, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

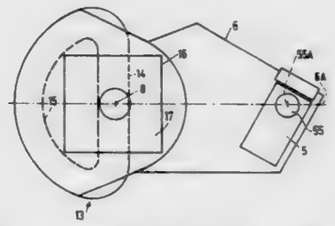
Filed Oct. 19, 1988, Ser. No. 260,083

Claims priority, application Netherlands, Oct. 22, 1987, 8702521

Int. Cl.[5] G11B *17/30*

U.S. Cl. 369—215 **8 Claims**

1. An apparatus for scanning recording tracks in a recording surface of a disc by means of a scanning unit comprising which said disc rotates about an axis of rotation during operation, the apparatus comprising a frame with a disc-supporting member which is rotatable about the axis of rotation, and a pivotal arm which supports the scanning unit and which is pivotable relative to the frame between two extreme pivotal positions about a pivotal spindle defining a pivotal axis which is located near an end of the pivotal arm opposite an end of the pivotal arm near the objective and which is parallel to the axis of rotation by means of two pivoting elements comprising at least one coil having at least one turn and at least one permanent-magnet body, one of the pivotal elements being connected to the pivotal arm and the other pivotal element being connected to the frame, characterized in that each said turn of the coil comprises an at least substantially straight active portion that interacts magnetically with said permanent-magnet body to produce a torque about said pivotal axis on said pivotal arm which is situated near the pivotal axis of the pivotal arm which active



portion, if the pivotal arm is in a central position midway between the two extreme pivotal positions, extends at least substantially transversely of and symmetrically relative to a connecting line between the pivotal axis of the pivotal arm and an optical axis of the objective, opposite ends of each said active portion being interconnected by a respective further portion of each said turn of which is disposed around and spaced from the pivotal axis of the pivotal arm and which is situated at a side of the pivotal arm and which is situated at a side of the pivotal axis which is remote from the objective, and each active portion is arranged opposite poles of the permanent -magnet body, a torque about the pivotal axis being exerted on the pivotal arm when the coil is energised.

5,117,414

DRIVE MOTOR AND SPINDLE ASSEMBLY FOR AN OPTICAL DISK DRIVE

Marcus L. Caldwell, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 19, 1988, Ser. No. 246,502

Int. Cl.[5] G11B *25/04*

U.S. Cl. 369—266 **10 Claims**

1. A drive motor and spindle assembly for a disk drive, comprising:

a drive motor having a drive shaft defining an axis of rotation;

a centering hub having a spherical disk-receiving and supporting surface section about a sphere center; and

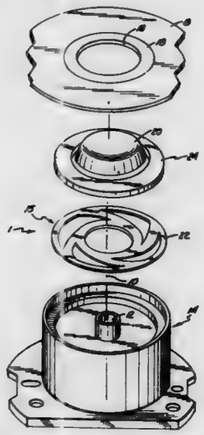
resilient mounting means for resiliently mounting the centering hub with respect to the drive shaft with the sphere center coaxial with the axis of rotation;

wherein the drive motor includes:

a stator;

bearing means for rotatably mounting the drive shaft within the stator; and

a rotor and hub frame mounted to an end of the drive shaft, wherein the centering hub and resilient mounting



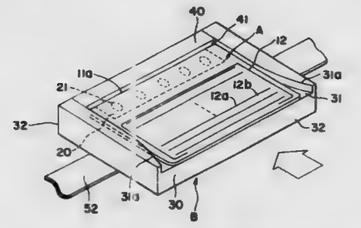
means are mounted to the rotor and hub frame adjacent the end of the drive shaft.

5,117,415

OPTICAL CARD, A CARD HOLDER AND AN APPARATUS FOR RECORDING, REPRODUCING AND ERASING INFORMATION ON AND FROM THE OPTICAL CARD

Kenji Ohta; Hiroyuki Katayama; Junichiro Nakayama, all of Nara; Kazuhiro Kimura, Hyogo; Hirotsugu Matoba, and Shozo Kobayashi, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 340,756, Apr. 20, 1989, abandoned.
This application Jul. 29, 1991, Ser. No. 735,685
Claims priority, application Japan, Apr. 20, 1988, 63-98997; Apr. 30, 1988, 63-108162
Int. Cl.[5] G11B *23/00, 25/04;* **G06K** *19/06*
U.S. Cl. 369—271 **22 Claims**



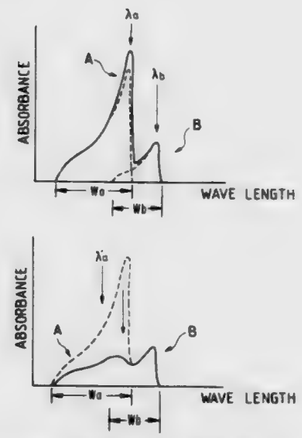
1. An optical card having a first edge comprising:
an optical storage medium for storing information on the optical card, said optical storage medium being located at a predetermined position on the optical car; and
magnetic edge positioning means, disposed along the first edge of the optical card, for magnetically attracting and aligning the first edge of the optical card conformally to a magnetic vertical face, thereby enabling secure positioning of said optical storage medium over an optical reader.

5,117,416

RECORDING METHOD FOR MULTI-LAYER RECORDING FILM

Toshiyuki Miyadera; Makoto Okano, and Fumio Matsui, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 23, 1990, Ser. No. 601,636
Claims priority, application Japan, May 15, 1990, 2-126104
Int. Cl.[5] G11B *3/70, 5/84, 7/26, 7/00*
U.S. Cl. 369—284 **3 Claims**



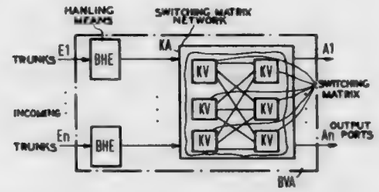
1. A recording method for a multi-layer recording film comprising:
providing a multi-layer recording film comprising a laminate of plural recording films, each of said films having a light absorption band in a predetermined wavelength region and each of said films having an intrinsic absorption peak; and supplying to the multi-layer recording film a plurality of light beams, such that each light beam has a wavelength within the absorption band of one of the respective recording films, to effect recording;
wherein, provided that the light absorption band (Wb) of the recording film (B) having the absorption peak (λb) on the longer wavelength side selected from adjacent absorption peaks is present in a wavelength region which is shorter than the absorption peak wavelength (λa) of the recording film (A) having the absorption peak (λa) on the shorter wavelength side,
the recording film (A) having the absorption peak (λa) on the shorter wavelength side is caused to have an absorbance which is higher than the absorbance of the recording film (B) having the absorption peak (λb) on the longer wavelength side at the absorption peak wavelength (λa) on the shorter wavelength side,
the recording film (A) having the absorption peak (λa) on the shorter wavelength side is irradiated with one of said light beams, said one of said light beams having a wavelength (λ'a) which is shorter than the light absorption band (Wb) of the recording film (B) having the absorption peak (λb) on the longer wavelength side, said wavelength (λ'a) also being shorter than said absorption peak (λa) on the shorter wavelength side,
and the recording film (B) having the absorption peak (λb) on the longer wavelength side is irradiated with another one of said light beams, said another one of said light beams having a wavelength which is substantially the same as said absorption peak (λb) on the longer wavelength side.

5,117,417

CIRCUIT FOR CHECKING THE DEFINED TRANSMISSION BIT RATES

Gerd Danner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 25, 1990, Ser. No. 588,038
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1989, 3932606
Int. Cl.[5] H04J *1/16, 3/14*
U.S. Cl. 370—13 **8 Claims**



1. A circuit arrangement for checking the transmission bit rates defined for the individual virtual connections during transmissions of message cells with the virtual connections according to an asynchronous transmission method in which an ATM switching system (BVA) accepts the message cells from incoming trunks (E1, . . . En) and uses counter means associated with the incoming trunks, comprising for each of the incoming trunks a plurality of counter means (BSP, Reg2, Reg3, ADD) which correspond in number to the plurality of virtual connections for the respective incoming trunk (E1, . . . , En), said counter means individually driven upon the reception of message cells for the transmission duration of the respective message cell and based on the definition of a cell header respectively contained therein which identifies a respective virtual connection, said counter means periodically repeatedly reset to a starting counter reading at defined time intervals, and in response to every drive of the respective counter means; the momentary counter reading is modified at least once during the reception of the respective message cell by an available bit rate which corresponds to the transmission bit rate defined for the respective virtual connection; an upward transgression signal from said counter means indicating the upward transgression of the transmission bit rate defined for the respective virtual connection is produced for a given upward transgression by a momentary counter reading of a maximum counter reading which is defined by the available bit rate value and the duration of time intervals; and said respective counter means can be interrogated at the end of the respective time interval to obtain an upward transgression signal or, respectively, an a signal is directly produced by the respective counter means.

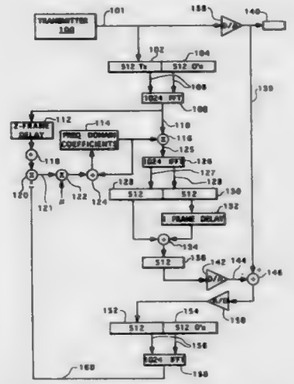
5,117,418

FREQUENCY DOMAIN ADAPTIVE ECHO CANCELLER FOR FULL-DUPLEX DATA TRANSMISSION

Donald L. Chaffee, Park City; Mark P. Mallory, Salt Lake City, both of Utah, and Graham H. Brand, El Cerrito, Calif., assignors to Intelligent Modem Corporation, Midvale, Utah

Filed Nov. 9, 1990, Ser. No. 612,011
Int. Cl.[5] H04M *9/08;* **H04L** *5/14*
U.S. Cl. 370—32.1 **20 Claims**

1. A system for reducing echoes on a duplex communication channel having both transmitted and received signals carried thereon, the system comprising:
means for converting a time domain transmitted signal containing intelligence to a frequency domain transmitted signal;
means for multiplying the frequency domain transmitted signal by an initial set of filter coefficients to generate estimated echo coefficients;
means for subtracting the estimated echo coefficients from a received signal to generate a residual echo signal;
means for multiplying the residual echo signal by the complex conjugate of the frequency domain transmitted signal to generate correlation frequency components, the correlation frequency components each having a magnitude and a sign; and



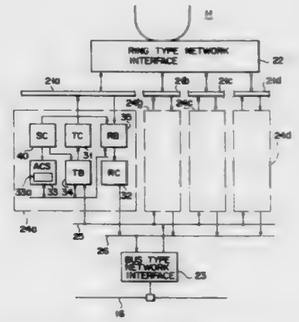
means for receiving the correlation frequency components and for updating the initial set of filter coefficients to another set of filter coefficients, each of the filter coefficients being updated as required by the magnitude and sign of a corresponding correlation frequency component to minimize the residual echo and at least partially cancel the echo present on the communication channel.

5,117,419

SYSTEM FOR CONTROLLING DATA TRANSMISSION AND RECEPTION IN A NETWORK

Kuniyoshi Konishi, Hachiooji, and Akihiko Tojima, Tachikawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 373,057, Jun. 29, 1989, abandoned.
This application Oct. 9, 1991, Ser. No. 774,000
Claims priority, application Japan, Jun. 30, 1988, 63-160817
Int. Cl.[5] H04J *4/00*
U.S. Cl. 370—50 **16 Claims**



1. A network system comprising:
a trunk network having a plurality of transmission paths;
a branch network; and
a station coupled to said trunk and branch networks for controlling data transmission between said trunk and branch networks, said station including:

a plurality of internal buses, each coupled to a respective one of said plurality of transmission paths of the trunk network,

a plurality of transmission-reception control means, each corresponding to a respective one of the plurality of transmission paths and coupled to a respective one of said plurality of internal buses for controlling data transmission between respective transmission paths of the trunk network and said branch network,

first network interface means, coupled to said plurality of transmission paths and said plurality of internal buses, for controlling data transmission between said plurality of transmission paths and said plurality of transmission-reception control means, and

second network interface means, coupled to said branch network and said plurality of transmission-reception control means, for controlling data transmission between said branch network and said plurality of transmission-reception control means.

5,117,420

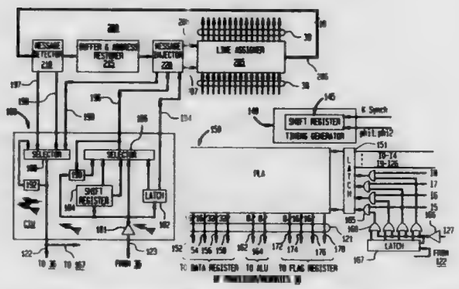
METHOD AND APPARATUS FOR ROUTING MESSAGE PACKETS

W. Daniel Hillis, Brooklin; Brewster Kahle, Somerville; George G. Robertson, Marblehead, and Guy L. Steele, Jr., Lexington, all of Mass., assignors to Thinking Machines Corporation, Cambridge, Mass.

Division of Ser. No. 43,126, Apr. 27, 1987, Pat. No. 4,984,235. This application Jan. 7, 1991, Ser. No. 638,474

Int. Cl.[5] H04J *3/26*

U.S. Cl. 370—60 **5 Claims**



1. A parallel processing array comprising a plurality of nodes interconnected by communications links, each node comprising:

A. at least one processor for processing data and for generating messages for transfer to other processors in response to commands, each processor in said array being identified by an address and each message including an address portion which contains the address of the processor to receive the address; and

B. a communications node including:

i. a message injector for receiving messages from the processor for transfer to other processors;

ii. a message switch connected to said message injector and said communications links for selectively coupling messages from said message injector onto communications links connected thereto in accordance with the address to facilitate the transfer of messages with said processors in accordance with the address in the address portion of said respective messages, said message switch also receiving messages from communications links connected thereto;

iii. a message combining circuit connected to said message switch, said message combining circuit comparing addresses in address portions of messages contemporaneously received by said switch and selectively performing a combining operation in response to a positive comparison; and

iv. a message ejector for receiving messages from the switch and determining whether the address in the address portion of each message identifies the processor and coupling the message to the processor in response to a positive determination.

5,117,421

REMOTE SUPERVISORY AND CONTROLLING SYSTEM

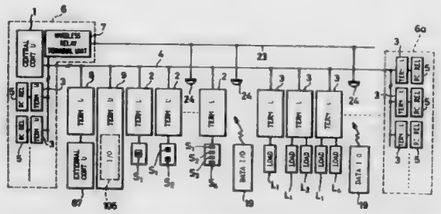
Toshiaki Tokizane; Yoshiharu Ito; Osamu Yamada; Toshiyuki Masuda, and Mitsunobu Kuroda, all of Osaka, Japan, assignors to Matsushita Electric Works Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 218,176, Jul. 13, 1988, abandoned. This application Oct. 24, 1990, Ser. No. 602,556

Claims priority, application Japan, Oct. 27, 1987, 62-271061; Nov. 26, 1987, 62-298738

Int. Cl.[5] H04J *3/24, 3/12*

U.S. Cl. 370—85.1 **11 Claims**



1. A remote supervisory and controlling system comprising:

a central control unit;

a plurality of terminal units, said plurality of terminal units being connected to said central control unit through a two-wire signal line and said central control unit sends out a transmission signal including an address data signal for calling each of said terminal units, a control data signal for controlling a load associated with each of said terminal units, a return wait signal for setting a period of returning a monitor data signal from each of said terminal units to perform time-divisional multiplex transmission of monitor data and control data between said central control unit and each of said terminal units;

at least one external interface for time-divisional data transmission through said signal line between said central control unit and at least one external control unit, said at least one external interface being coupled to said plurality of terminal units through said signal line, and wherein said central control unit manages all of the addresses of said terminal units and pattern control operations for the load control of said loads associated with said terminal units.

5,117,422

METHOD FOR PROVIDING AN EFFICIENT AND ADAPTIVE MANAGEMENT OF MESSAGE ROUTING IN A MULTI-PLATFORM AND APPARATUS COMMUNICATION SYSTEM

Arthur Hauptschein, Tenafly; John B. Kennedy, Nutley, both of N.J., and Arthur Doskow, New York, N.Y., assignors to ITT Corporation, New York, N.Y.

Filed Jul. 9, 1990, Ser. No. 551,177

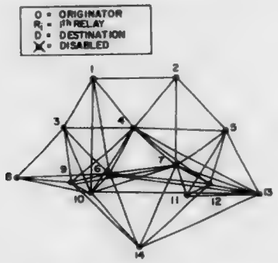
Int. Cl.[5] H04J *3/16*

U.S. Cl. 370—95.1 **22 Claims**

1. A method for providing an efficient and adaptive management of message routing in a multi-platform, multi-network communications system having dynamically changing platform populations and dynamically changing connectivities between platforms where each of said platforms are capable of performing the steps of:

recognizing at least certain ones of said platforms in said system;

deriving from at least one of said recognized platforms the quality of interconnectivities of said recognized platforms and certain others of said platforms in said system, said quality of interconnectivities transmission media disruptions, recognized transmit and receive power and antenna



gain whereby said quality can be determined only after recognition of said platforms; and

employing said derived quality of interconnectivities to make connectivity-based routing decisions using either a point-to-point routing algorithm, a point-to-multipoint routing algorithm, or a broadcast routing algorithm as appropriate.

5,117,423

DATA TRANSMISSION OVER A TIME DIVISION DUPLEX CHANNEL

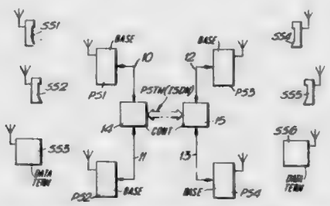
Robert Shepherd, Canterbury; Frank C. G. Owen, Petts Wood, and Christopher D. Pudney, Smallfield, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1990, Ser. No. 527,987

Claims priority, application United Kingdom, May 26, 1989, 8912174

Int. Cl.[5] H04J *3/16*

U.S. Cl. 370—95.1 **14 Claims**



1. A method of data transmission between a first station and a second station over a time division duplex radio channel comprising the steps of:

allocating at least one duplex voice channel constituted by a pair of non-adjacent time slots, in a succession of time frames for effecting a data transaction;

default designation one of said pair of non-adjacent time slots for undirectional transmission of data in a first direction between said first and second stations and the other of said pair of time slots for unidirectional transmission of data in a second direction, opposite to the first direction;

determining if the data transaction will be asymmetric;

releasing the time slot not being used for the transmission of useful data for other unidirectional signalling in response to the determining step.

5,117,424

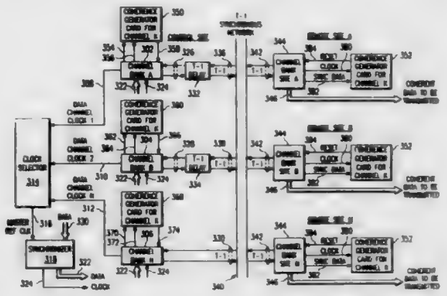
METHOD AND APPARATUS FOR SETTING CLOCK SIGNALS TO PREDETERMINED PHASES AT REMOTE BROADCAST SITES IN SIMULCAST SYSTEMS

Richard Cohen, and Rickie W. Wallace, both of Arlington, Tex., assignors to ElectroCom Automation L.P., Arlington, Tex.

Continuation of Ser. No. 382,264, Jul. 20, 1989, Pat. No. 4,972,410. This application Oct. 26, 1990, Ser. No. 603,394

Int. Cl.[5] H04B *7/00*

U.S. Cl. 370—105.5 **10 Claims**



1. A coherency generator for setting the phase of a clock signal having a predetermined frequency to a known phase in order to achieve bit coherency in an overlap region of a simulcast system, the simulcast system having a plurality of remote broadcast sites each of which transmit the same data signals on the same channels, the clock signal controlling the timing of the transmission of data from a line receiver to a broadcast transmitter at each remote broadcast site, the coherency generator comprising:

means for detecting a predetermined value of a first preselected data bit in a synchronous data transmission signal;

means for detecting a predetermined pattern of data values from preselected data bits in the synchronous data transmission signal to place all line receivers in a simulcast system receiving the synchronous data transmission signal in a known logic state; and

means for setting a clock signal derived at the remote site from the synchronous data transmission signal to a predetermined phase upon detecting the predetermined pattern of data values of the preselected data bits following detection of the predetermined value of the first preselected data bit.

5,117,425

COMMUNICATION INTERFACE

Yukihiko Ogata, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 329,554, Mar. 28, 1989, abandoned. This application Mar. 4, 1991, Ser. No. 664,472

Claims priority, application Japan, Mar. 31, 1988, 63-076162; Mar. 31, 1988, 63-076163

Int. Cl.[5] H04J *3/12*

U.S. Cl. 370—110.1 **17 Claims**

12. A communication interface for a communication system comprising an Integrated Services Digital Network, a network terminal device and a standard terminal connected to the network terminal device, said communication interface comprising:

extracting means for extracting a first clock from data transmitted from the network terminal device;

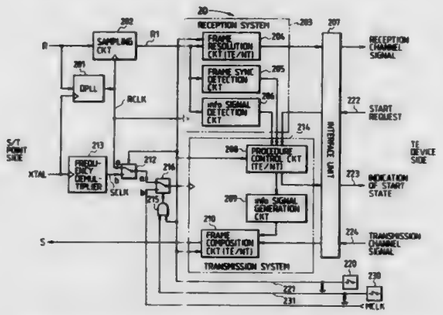
generating means for generating a second clock from a clock of an internal oscillator;

inputting means for inputting a third clock transmitted from said Integrated Services Digital Network; and

communication control means for controlling data transmis-

sion/reception on the basis of said first, second and third clocks,

wherein said communication control means executes control for data transmission to said network terminal device on



the basis of said first clock, control for data transmission to said standard terminal on the basis of said second clock, and control for data transmission to said standard terminal or said Integrated Services Digital Network on the basis of said third clock.

5,117,426

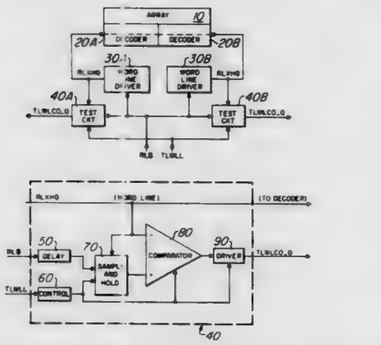
CIRCUIT, DEVICE, AND METHOD TO DETECT VOLTAGE LEAKAGE

Hugh P. McAdams, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 26. 1990, Ser. No. 499,131

Int. Cl.[5] G11C *29/00*

U.S. Cl. 371—214 **11 Claims**



1. A test circuit to test for voltage leakage on word lines, that are charged when memory cells in a memory device are addressed, and to test for voltage leakage of the transfer devices of the addressed memory cells comprising:

a sample and hold circuit connected to the word line of an addressed memory cell to store the voltage level on the word line a the word line charges; and

a comparator connected to the word line and connected to the sample and hold circuit, to compare the stored voltage level with the voltage level on the word line after the word line is charged and to indicate if the voltage level of the word line falls below a predetermined amount.

5,117,427

COMMUNICATION SYSTEM WITH CONCATENATED CODING ERROR CORRECTION

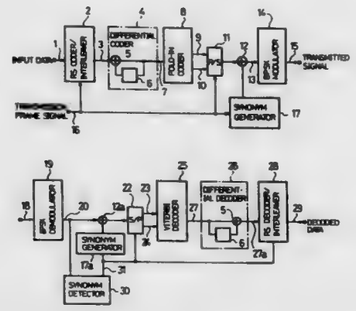
Makoto Miyake, and Toshiharu Kojima, both of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1989, Ser. No. 318,152

Claims priority, application Japan, Mar. 3, 1988, 63-51167; Aug. 18, 1988, 63-205551

Int. Cl.[5] G06F *11/10*; H03M *13/12*

U.S. Cl. 371—37.4 **22 Claims**



1. A concatenated error correction coding communication system for transmitting and receiving data through conversion of data into concatenated coding data consisting of outer and inner codes comprising a transmitting section and a receiving section;

said transmitting section including

Reed-Solomon coding means for outer coding of data;

interleaver means for interleaving said outer coded data and providing coded data;

differential coding means for differentially coding the coded data provided from said interleaver means to provide differentially coded data;

convolutional coding means for convolutionally coding said differentially coded data nd providing 2-channel convolutionary coded data, said convolutional coding means providing logically inverted convolutionally coded data when receiving logically inverted data;

means for parallel-to-serial converting 2-channel convolutionally coding data from said convolutional coding means into a convolutionally coded data sequence;

means for inserting sync-words in gaps of said convolutionally coded data sequence; and

binary phase shift keying modulation means for transmitting data sequence with said sync-word after binary phase shift keying modulation; and

said receiving section including

demodulating means for demodulating the received signal by binary phase shift keying modulation to provide demodulated data;

means for detecting and removing sync-words in said demodulated data;

means for serial-to-parallel converting the demodulated data without sync-words to produce 2-channel demodulated data sequence;

means for Viterbi decoding the 2-channel demodulated data sequence to obtain Viterbi decoded data;

differentially decoding means for differentially decoding Viterbi decoded data to provide differentially decoded data; and

means for Reed-Solomon decoding and deinterleaving said differentially decoded data in synchronization with reception of the sync-word, responsive to said means for detecting to provide decoded data.

5,117,428

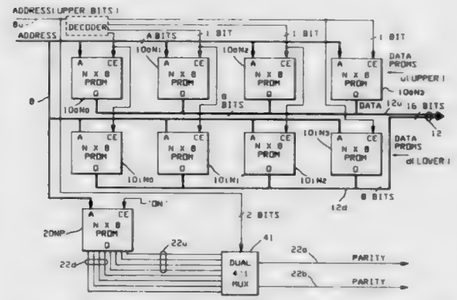
SYSTEM FOR MEMORY DATA INTEGRITY

James H. Jeppesen, III, El Toro, and Bruce E. Whittaker, Mission Viejo, both of Calif., assignors to UNISYS Corporation, Blue Bell, Pa.

Filed Nov. 22, 1989, Ser. No. 440,821

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—51.1 **16 Claims**



11. A length-width expansible memory structure of duplicated PROM/ROM memory data units for storing and accessing selected data bytes with reliability, said memory structure comprising:

(a) means for connectively attaching and addressing multiple rows and/or multiple columns of said duplicative PROM/ROM memory data units;

(b) a plurality of common bus means for enabling a plurality of data byte outputs from selected memory data units to be accessed;

(c) a parity PROM/ROM memory unit which duplicates in type and size said PROM/ROM memory data units and stores a predetermined non-alterable parity bit for each data byte in said memory structure;

(d) means for parity checking each accessed data byte and for selecting whether an odd or even valued parity format will be operative.

5,117,429

PACKET SWITCH FOR A TRANSFER OF DATA IN ASYNCHRONOUS MODE IN A DIGITAL TRANSMISSION NETWORK

Pierre Lagoutte, Issy-Les-Moulineaux, France, assignor to LMT Radio Professinnelle, Boulogne Billancourt, France

Filed Aug. 1, 1989, Ser. No. 388,012

Claims priority, application France, Aug. 5, 1988, 88 10612

Int. Cl.[5] H04Q *11/04*

U.S. Cl. 370—60 **6 Claims**

1. In a digital transmission network, a packet switch for transferring, in an asynchronous mode, data from N incoming trunk lines to N outgoing trunk lines, each of said trunk lines having a respective input clock signal associated therewith, the switch comprising:

an input adapting circuit, connected to the N incoming trunk lines, for converting series data, carried by the N incoming trunk lines at a rate of about 150 Mbits/s, into parallel data of n-bit packets and for producing a first memory stack clock signal for each of said n-bit packets;

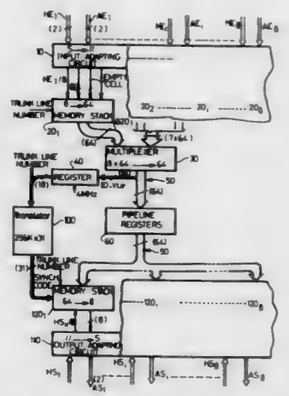
N input shift memory stacks, respectively associated with the N incoming trunk lines, having parallel inputs connected to corresponding outputs of the input adapting circuit and outputs for outputting stored data in packets of n times M bits, wherein M is a whole number, and using respective ones of said first memory stack clock signals;

a multiplexer circuit for successively outputting the stored data, from each of the N input shift memory stacks, in packets of n times M bits;

a single transfer bus for transferring all data transferred by the switch and for receiving the data outputted by the multiplexer in packets of n times M bits;

N output shift memory stacks respectively connected to the single transfer bus, each having a n-bit parallel output; and

an output adapting circuit connected to the outputs of the N output shift memories for converting parallel data received from the N output shirt memories to series data and for transferring the series data to the N outgoing trunk lines;



wherein said output adapting circuit receives a respective output clock used for said transferring of said series data and produces a second memory stack clock signal for a respective one of said N output shift memories;

wherein the input and output adapting circuits are one of an emitter coupled logic and a bipolar complementary metal oxide semiconductor integrated circuit which operate at a rate of about 150 Mhz; and

wherein the input and output shift memory stacks are complementary metal oxide semiconductor circuits which operate at a rate of about 20 MHz.

5,117,430

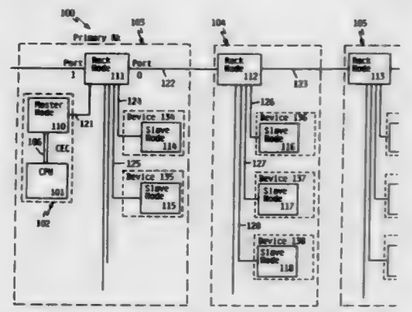
APPARATUS AND METHOD FOR COMMUNICATING BETWEEN NODES IN A NETWORK

Neil C. Berglund, Kasson, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 8, 1991, Ser. No. 652,760

Int. Cl.[5] H04J *3/14*

U.S. Cl. 370—85.1 **23 Claims**



1. A communications network apparatus, comprising:

a master node and a plurality of subject nodes;

a plurality of connections running between nodes, each said connection comprising a single serial data signal carrier

connected a pair of nodes, wherein one of said pair of nodes is a parent node with respect to the other of said pair of nodes, and the other of said pair of nodes is a child node with respect to said parent node, wherein said plurality of connections connect said master node and said plurality of subject nodes in a tree configuration, said tree having said master node at its root, wherein each of said plurality of subject nodes is connected to one or more nodes, one and only one of which is its parent;

means in said master node and in each of said plurality of subject nodes for transmitting and receiving messages comprising serial data on said connections;

end of message detection means in said master node and in each of said plurality of subject nodes for determining that a message being received has ended, wherein said end of message detection means determines that a message has ended when no more serial data is received on said connection for a predefined timeout period; and

collision avoidance means in said master node and in each of said plurality of subject nodes for determining when said node is entitled to initiate transmission of a message on said connections, wherein said means permits a child node to initiate transmission of a message to its parent only during a predefined interval following the occurrence of a predefined event, and said means prevents a parent node from transmitting a message to said child during said predefined interval.

5,117,431

SYNCHROTRON RADIATION EXCITED LASER

Hironari Yamada, Tanashi, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

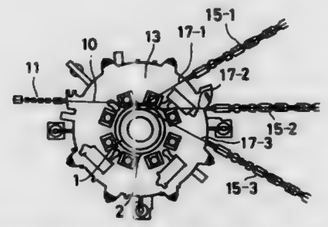
PCT No. PCT/JP90/00899, § 371 Date Mar. 6, 1991, § 102(e) Date Mar. 6, 1991, PCT Pub. No. WO91/01054, PCT Pub. Date Jan. 24, 1991

PCT Filed Jul. 12, 1990, Ser. No. 655,376

Claims priority, application Japan, Jul. 13, 1989, 1-181540

Int. Cl.[5] H01S *3/00*

U.S. Cl. 372—2 **6 Claims**



1. A synchrotron radiation excited laser device, comprising:

a synchrotron radiation unit capable of generating synchrotron radiation in a plane including an electron orbit; and

a laser medium member disposed in said plane outside of said orbit, and formed of a material which can be excited into a light emissive state by the synchrotron radiation.

5,117,432

VANADIUM-PUMPED TITANIUM X-RAY LASER

Joseph Nilsen, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 13, 1991, Ser. No. 654,457

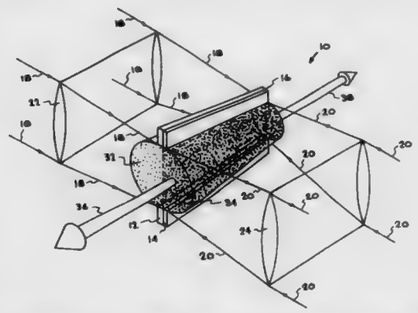
Int. Cl.[5] H01S *3/30*

U.S. Cl. 372—5 **10 Claims**

1. An x-ray laser comprising:

means for providing a quantity of neon-like titanium ions in the J=0 ground state, and

means for resonantly photo-pumping the quantity of neon-like titanium ions from their J=0 ground state to the



$\overline{2}p_{3/2}4d_{5/2}$ (J=1) and $\overline{2}p_{1}4d_{3/2}$ (J=1) levels, which decay directly to the upper laser states of the neon-like titanium.

5,117,433

SECOND HARMONIC GENERATOR FOR OBTAINING AN ABERRATION FREE PLANE WAVE AND INFORMATION PROCESSING SYSTEM USING THE SAME

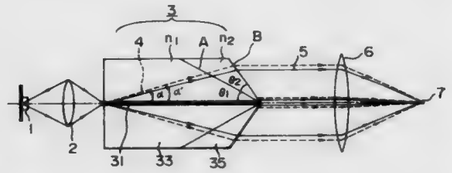
Kimio Tatsuno, Kodaira, and Hironori Yanagisawa, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 27, 1990, Ser. No. 618,406

Claims priority, application Japan, Nov. 27, 1989, 1-304605; Dec. 20, 1989, 1-328456

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—22 **22 Claims**



1. A second harmonic generator comprising:

nonlinear waveguide means for guiding light, said nonlinear waveguide means including a waveguide having nonlinear optical characteristics;

means for directing fundamental light to enter said waveguide; and

aberration correction means provided on an exit end face of said nonlinear waveguide means for collimating a second harmonic to form a substantially flat parallel plane wave, said second harmonic being radiated as a result of said fundamental light being incident on said waveguide;

wherein said aberration correction means includes chromatic aberration correction means for converting a change in a radiation angle of said second harmonic due to a wavelength fluctuation of said fundamental light into a parallel displacement of said substantially flat parallel plane wave.

5,117,434

METAL VAPOR LASER APPARATUS

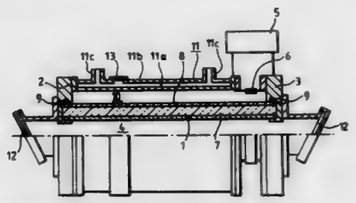
Tuneyoshi Oohashi, Hitachioota; Motoo Yamaguchi; Akira Wada, both of Hitachi; Toshiharu Shirakura, Toukai; Toshimichi Kichikawa, and Hiroyuki Sugawara, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 15, 1991, Ser. No. 641,585

Claims priority, application Japan, Jan. 17, 1990, 2-8013

Int. Cl.[5] H01S *3/22*

U.S. Cl. 372—56 **17 Claims**



1. A metal vapor laser apparatus, comprising:

a discharge tube;

first and second electrodes at opposite ends of said discharge tube for generating a discharge therebetween in said discharge tube;

a first wall connected to said first electrode said first wall being conductive and extending coaxially of said discharge tube;

a power source connected between said second electrode and a connection point electrically connected to a part of said first wall remote from said first electrode, said first wall defining a first path from said first electrode to said power source; and

a second wall coaxially outwardly of said first wall and extending between said first electrode and said part of the first wall to which said power source is connected, said second wall forming part of a second path from said first electrode to said power source, at least a part of said second path being of electrically insulating material, said electrically insulating material is arranged to prevent electrical conduction along said second path.

5,117,435

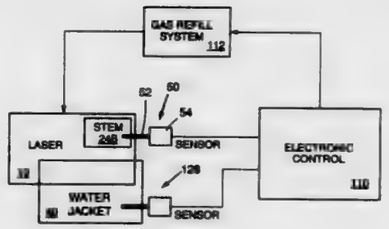
PRESSURE REGULATION SYSTEM FOR GAS LASER BASED ON TEMPERATURE OF ANODE STEM

Benjamin H. Cook, Jr., Livermore, and William P. Kolb, Redwood City, both of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Oct. 25, 1990, Ser. No. 603,128

Int. Cl.[5] H01S *3/22*

U.S. Cl. 372—59 **23 Claims**



1. A gas laser comprising:

a housing for containing a lasing gas under pressure;

a means for electrically exciting the gas including a cathode mounted at one end of the housing and an anode mounted at the other end thereof, said anode having a temperature;

means for monitoring the temperature of said anode and generating a control signal indicative of said temperature;

gas supply means coupled to said housing for varying the gas pressure in the housing; and

regulation means for actuating said gas supply means in response to variations in the control signal to vary the gas pressure in said housing.

5,117,436

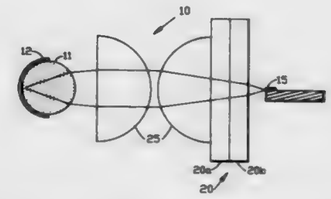
OPTICS FOR DIODE ARRAY TRANSVERSE PUMPED LASER ROD

Frank Hanson, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1990, Ser. No. 502,001

Int. Cl.[5] H01S *3/093*

U.S. Cl. 372—72 **5 Claims**



1. An improvement for the pumping efficiency of a laser comprising:

an elongate laser rod of an anisotropic material

a reflective coating longitudinally disposed and contiguously adjacent an arcuate surface projection along said elongate laser rod;

an elongate laser diode array longitudinally disposed parallel to said elongate laser rod and spaced apart therefrom;

an elongate half-wave plate interposed between said elongate laser rod and said elongate laser diode array being oriented with its optic axis at 45 degrees with respect to the plane of said elongate laser diode array for rotating the linear polarization of the light from said elongate laser diode array by 90° such that Fresnel reflections are reduced and that an increased absorption coefficient for diode light in said anisotropic material is realized; and

at least one lens disposed between said elongate half-wave plate and said elongate laser rod to collimate and focus the light emanating from said elongate laser diode array into said elongate laser rod.

5,117,437

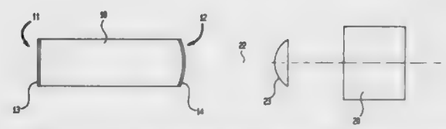
CONTINUOUS-WAVE PAIR-PUMPED LASER SYSTEM

Stephen C. Rand, Ann Arbor, Mich., assignor to The University of Michigan, Ann Arbor, Mich.

Filed Mar. 2, 1990, Ser. No. 487,885

Int. Cl.[5] H01S *3/09*

U.S. Cl. 372—91 **20 Claims**



1. An arrangement for use in a laser device, the arrangement comprising:

a laser crystal for emitting coherent radiation said laser crystal having a trivalent rare earth incorporated therein and having first and second surfaces, each coated to produce a predetermined reflectivity characteristic; and

pumping means for supplying a continuous-wave, coherent pumping energy to said laser crystal and causing electrons in respective ones of atoms within said laser crystal to gain energy so as to achieve respectively higher energy states and electrons in respective others of said atoms to lose energy so as to achieve lower energy states, whereby continuous-wave laser action is achieved by cooperative energy upconversion induced by interactions between said atoms, said continuous-wave laser action having a higher energy level than said continuous-wave, coherent pumping energy.

5,117,438

METHOD OF OPERATING A SMELTING UNIT AND SMELTING UNIT FOR THAT METHOD

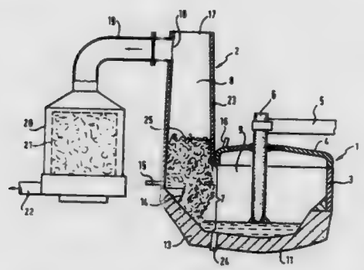
Joachim Ehle, Lautenbach, and Gerhard Fuchs, Kehl-Bodersweier, both of Fed. Rep. of Germany, assignors to Fuchs Systemtechnik GmbH, Fed. Rep. of Germany

Filed Oct. 26, 1989, Ser. No. 427,618

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1988, 3839095

Int. Cl.[5] **F27D** *13/00*

U.S. Cl. 373—80 **17 Claims**



1. A method of operating a smelting unit comprising an electric arc furnace including a furnace vessel and a furnace cover which can be pivoted away, and

at least one shaft-like charging material preheater which is arranged laterally on the furnace vessel and the interior of which is connected in its region adjoining its bottom to the interior of the furnace vessel through a connecting zone and

which is also provided in its upper region with a charging opening for charging material and a gas outlet and in its lower region with burners or nozzles, in which said method the steps involve

charging steel scrap charging material into the charging material preheater wherein a column of charging material which is heated in heat exchange relationship with hot gases of the furnace vessel and the burners is formed and

melting said charging material in the lower region by the burners and under the heating action of arcs as well as in contact with a liquid sump in the furnace hearth, bringing the molten material in the furnace hearth to tapping temperature, and tapping the molten material such that after the tapping operation a residual molten material remains in the furnace hearth,

wherein after the tapping operation the method of charging comprises the steps of;

charging a part of the amount of charging material required for the next melting directly into the furnace vessel and

charging the remainder into the charging material preheater.

5,117,439

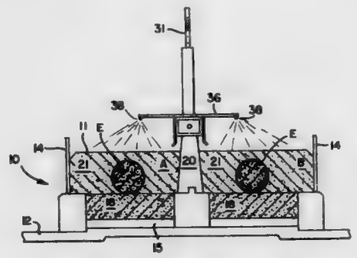
METHOD FOR OPERATING AN ELECTRODE GRAPHITIZATION FURNACE

Frank J. Dagata, Middleburg Heights, and Kenneth G. Politowicz, Brunswick, both of Ohio, assignors to Ucar Carbon Technology Corporation, Danbury, Conn.

Filed Mar. 29, 1991, Ser. No. 677,109

Int. Cl.[5] **H05B** *7/06*

U.S. Cl. 373—88 **10 Claims**



1. A method for operating an electric furnace in the conversion of carbon electrodes to graphite electrodes comprising the steps of:

loading ungraphitized carbon electrodes upon a bed of carbonaceous material, into said furnace;

surrounding said carbon electrodes with presized granulated particles of carbonaceous material to form a porous pack of thermal insulation;

passing electric current through or around said carbon electrodes to elevate the temperature of said electrodes to a temperature above 2800° C. for converting the carbon electrodes into graphitized electrodes;

terminating said current flow;

directing water into said porous pack of carbonaceous material to form a cool blanket of packing material over said electrodes with the rate of water adjusted to percolate through said porous pack to a controlled depth represented by an area saturated with water and an area of vaporized water with the vaporization of water into steam occurring at a rate such that essentially no water or water vapor comes into contact with the electrodes; and

removing the graphitized electrodes from the furnace.

5,117,440

DIGITAL QUADRATURE PHASE DETECTION

James A. Smith, and John A. Johnson, both of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 17, 1989, Ser. No. 395,124

Int. Cl.[5] **H04L** *27/14*

U.S. Cl. 375—82 **7 Claims**

1. An apparatus for detecting the phase of a frequency or phase modulated signal having a carrier signal comprising:

reference signal generating means for providing a reference signal at a specified frequency,

frequency divider means coupled to said reference signal generating means for diving the frequency of said reference signal by an appropriate integer to produce an adjusted reference signal,

delay generator means for splitting said adjusted reference signal into a first reference signal and a second reference signal and for delaying said second reference signal by one quarter of an adjusted reference signal cycle where said delay generator means is coupled to said frequency divider means,

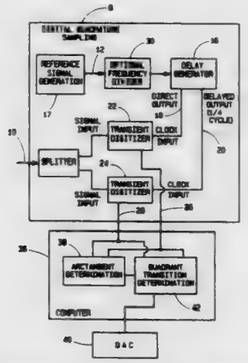
digitizer means for obtaining and transmitting a digitized composite sample signal which reflects a composite sample of the modulated signal at a sampling rate governed by the frequency of said adjusted reference signal and where said composite sample of the modulated signal comprises a first digitizer sample signal of the modulated signal and a second digitized sample signal of the modulated signal acquired one quarter of the adjusted reference signal cycle later where said digitizer means is responsive to said delay generator means and the modulated signal;

arctangent determination means coupled to said digitizing means for using said first digitized sample signal and said second digitized sample signal to determined a phase quadrant,

for determining a ratio of said first digitized sample signal to said second digitized sample signal where said ratio is formed by dividing said first digitized sample signal by said second digitized sample signal and

for calculating an arctangent of said ratio where said phase quadrant and said arctangent combine to define the phase of the modulated signal with values ranging from 0 to 2π radians; and

quadrant transition determination means for formulating a



total phase determination which is representative of the phase outside of the 0 to 2π radians range and where said quadrant transition determination means is responsive to said digitizer means and said arctangent determination means where said quadrant transition determination means is capable of storing a value which represents the algebraic number of times the phase of the modulated signal transgresses a given origin in a given direction and increasing or decreasing said total phase determination by 2π radians depending on the direction of transgression, where said total phase determination is the sum of the phase of the modulated signal and 2π radians multiplied by said stored value where if the quadrant occupied by the phase of the modulated signal changes from the fourth quadrant to the first quadrant said total phase determination would increase by 2π radians and if the quadrant occupied by the phase of the modulated signal changes from the first quadrant to the fourth quadrant whereby said total phase determination would decrease by 2π radians.

5,117,441

METHOD AND APPARATUS FOR REAL-TIME DEMODULATION OF A GMSK SIGNAL BY A NON-COHERENT RECEIVER

David L. Weigand, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

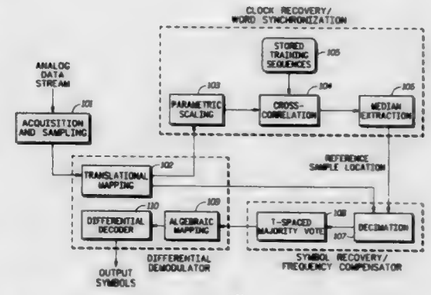
Filed Feb. 25, 1991, Ser. No. 660,372

Int. Cl.[5] **H04L** *27/10*

U.S. Cl. 375—90 **5 Claims**

1. A method for recovering information from a differentially encoded gaussian minimal shift keying (GMSK) signal in real-time by a non-coherent receiver, the receiver having at least one stored synchronization sequence and receiving a GMSK signal containing differentially encoded digital information, the method comprising the steps of:

a) non-coherently detecting the GMSK signal to produce a signal comprising recovered channel symbols; and



b) differentially decoding the recovered channel symbols to recover the digital information by converting the channel symbols to logical symbols representative of the channel symbols and integrating the logical symbols to recover the digital information.

5,117,442

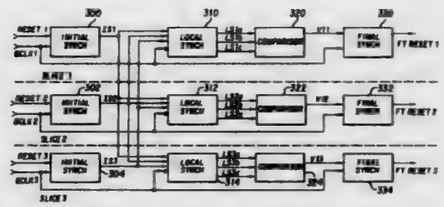
METHODS AND CIRCUITS FOR SYNCHRONIZING SIGNALS IN A MODULAR REDUNDANT FAULT TOLERANT COMPUTER SYSTEM

Christopher M. Hall, Redwood City, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 14, 1988, Ser. No. 284,304

Int. Cl.[5] **H04L** *7/00*

U.S. Cl. 375—107 **23 Claims**



1. Apparatus for synchronizing multiple digital input signals, wherein each said input signal is associated with a clock signal, and said clock signals have a defined period and are skewed relative to one another, said apparatus comprising:

first means responsive to said input signals and said clock signals for producing an initial synchronization signal corresponding to each said input signal and which is synchronized with the beginning of a period of the clock signal associated with said input signal;

second means responsive to said initial synchronization signals and said clock signals for producing a respective set of local synchronization signals for each said clock signal, each said set of local synchronization signals corresponding to said initial synchronization signals and being synchronized with the midpoint of a period of the respective clock signal;

third means responsive to said local synchronization signals for comparing each said set of local synchronization signals and for producing a comparison output signal for each said comparison; and

fourth means responsive to said comparison output signals and said clock signals for producing a final synchroniza-

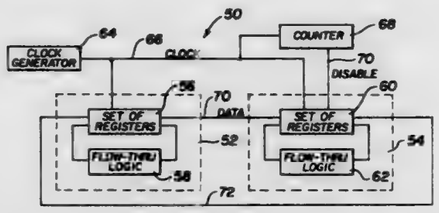
tion signal for each said comparison output signal, each said final synchronization signal being synchronized with the beginning of a clock period of the same clock signal with which the set of local synchronization signals used to produce the comparison output signal was synchronized, such that said final synchronization signals are mutually synchronized within the limits of the skew between said clock signals.

5,117,443

METHOD AND APPARATUS FOR OPERATING AT FRACTIONAL SPEEDS IN SYNCHRONOUS SYSTEMS

Glen E. Shires, Santa Clara, Calif., assignor to Lucid, Inc. (formerly Portable Computer), Dallas, Tex.

Filed Nov. 13, 1989, Ser. No. 435,181
Int. Cl.[5] H04L *7/04*
U.S. Cl. 375—111 **3 Claims**



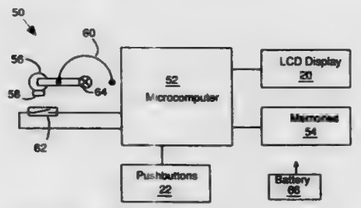
2. A synchronous system comprising in combination:
a clock generator;
at least two subsystems which are synchronous with each other, each including:
(a) a set of registers driven by the clock generator having both inputs for receiving data and outputs for transmitting data; and
(b) a flow-through logic circuit that connects the register inputs as some function of the register outputs and possibly other external inputs and outputs; and
at least one logic circuit to generate at least one disable signal on a regular basis wherein at least one set of subsystem registers is enabled and disabled on a regular basis.

5,117,444

HIGH ACCURACY PEDOMETER AND CALIBRATION METHOD

William R. Sutton, 4898 Dolores Dr., Pleasanton, Calif. 94566, and Scott L. Noble, San Jose, Calif., assignors to W. Ron Sutton, Pleasanton, Calif.

Filed Jul. 30, 1990, Ser. No. 559,076
Int. Cl.[5] G01C *22/00*
U.S. Cl. 377—24.2 **17 Claims**



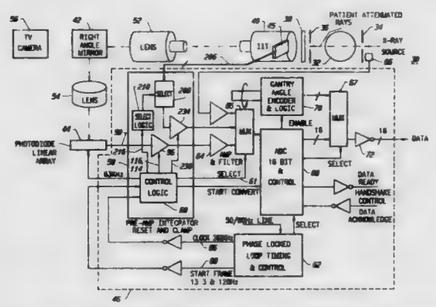
1. A pedometer, comprising:
an output means to communicate numbers to a user;
a switching means to select among a plurality of functions and to set a plurality of event values;
at least one memory to store an event;
a computing means for calculating the activity of the user from an output pulse stream from an acceleration field detection means for detecting motions of the user;
an enclosure comprising a housing with an attached flip open door, said flip open door having a means to reduce the sensitivity of said acceleration field detection means; and
a calibration means for accurately correlating the acceleration field detection means output to activities of a user, the calibration means able to count the total number of output pulses from the acceleration field detection means and to thereafter use said total as being equal to a fraction of a standard unit of measure, the calibration means able to divide said output pulses by a number.

5,117,445

ELECTRONICALLY ENHANCED X-RAY DETECTOR APPARATUS

Edward J. Seppi, Portola Valley; Edward G. Shapiro, Mountain View, and John M. Pavkovich, Palo Alto, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 2, 1990, Ser. No. 547,449
Int. Cl.[5] A61N *5/10*
U.S. Cl. 378—65 **41 Claims**



1. A radiation therapy simulator machine, wherein the radiation therapy simulator machine includes:
a source of X-ray photons:
an X-ray image intensifier tube having an input, said intensifier tube providing a visible output intensity spectrum in response to X-ray photons impinging on said input;
a linear array of a multiplicity of photodiodes;
optical means for coupling the visible output of said intensifier tube to the linear array; and
electronic signal processing means for processing detector signals from said photodiodes to condition said detector signals for use in constructing a tomographic X-ray image corresponding to the geometry of the radiation therapy simulator machine.

5,117,446

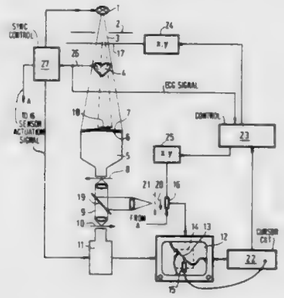
X-RAY DIAGNOSTIC APPARATUS COMPRISING MEANS FOR THE ENLARGED VISUAL DISPLAY OF A SELECTABLE DETAIL OF THE OVERALL IMAGE

Paul R. Haaker, Hamburg; Erhard P. A. Klotz, Halstenbek; Reiner H. Koppe, Hamburg, and Rolf E. Linde, Haseldorf, all of Fed. Rep. of Germany, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Feb. 15, 1991, Ser. No. 656,895
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1990, 4005111
Int. Cl.[5] H05G *1/64*
U.S. Cl. 378—99 **11 Claims**

1. An X-ray diagnostic apparatus, comprising: an X-ray source, first imaging means for forming an image of the intensity distribution of X-rays directed through a test object, first and second image sensors, optical imaging means for imaging

an overall image presented by the first imaging means onto the entrance surface of said first image sensor, display means for visual display of the overall image means for enlarging the visual display of a selectable detail of the overall image and



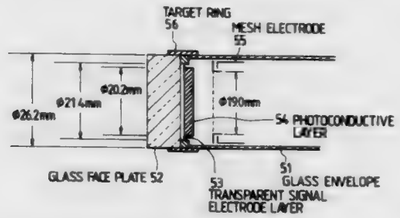
means for directing at least a portion of the overall image onto said second imaging sensor which exhibits a substantially higher number of pixels with respect to the unit of surface area of the overall image than said first sensor.

5,117,447

IMAGE INPUT APPARATUS

Hisatake Yokouchi, Nishitama; Fumitaka Takahashi, Kashiwa, and Hideyuki Sakai, Mobara, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Jan. 18, 1990, Ser. No. 466,928
Claims priority, application Japan, Jan. 25, 1989, 1-13951
Int. Cl.[5] G21K *4/00*
U.S. Cl. 378—99 **22 Claims**



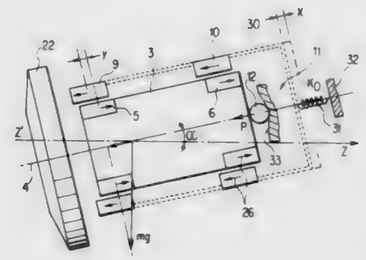
1. An image input apparatus comprising:
a camera tube including a photoconductive layer onto which an optical image is to be projected, a cathode for emitting an electron beam for scanning said photoconductive layer, and a control electrode for controlling a beam current of said electron beam emitted from said cathode in accordance with a control voltage; and
deflecting means for periodically deflecting said electron beam to scan said photoconductive layer, said deflecting means periodically deflecting said electron beam to scan an area outside a restricted scanning area determined by an internal structure of said camera tube;
wherein said optical image is to be projected onto said photoconductive layer in the form of an ellipse, and wherein said deflecting means periodically deflects said electron beam to scan a rectangular area in which said ellipse is inscribed.

5,117,448

WEIGHT COMPENSATION DEVICE FOR X-RAY TUBE COMPRISING PASSIVE MAGNETIC BEARINGS

Jean-Marie Penato, Les Essarts le Roi; Pierre Nouailhaguet, Issy les Moulineaux, and Michel Laurent, Plaisir, all of France, assignors to General Electric CGR S.A., Issy les Moulineaux, France

Filed Mar. 20, 1991, Ser. No. 672,687
Claims priority, application France, Mar. 20, 1990, 90 03523
Int. Cl.[5] H01J *35/10*
U.S. Cl. 378—132 **6 Claims**



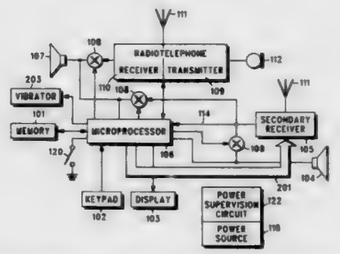
1. A device for weight compensation in a suspension system of a rotating anode of an X-ray tube that has a rotor rotating about an axis, one end of which has the anode, a stator positioned outside the tube, said suspension system having at least two first rings fixed to the rotor and at least two other magnetized rings, said rings being positioned with respect to one another so that the rotor can rotate without mechanical friction about a rotational axis and so that it is axially offset so as to come into contact with a stop, wherein the device for compensating the weight of the rotor and the anode includes an elastic system to support at least one magnetized ring.

5,117,449

DUAL RECEIVER APPARATUS FOR INTEGRATED PAGING AND RADIOTELEPHONE FUNCTIONS

Michael P. Metroka, Algonquin, and Stephen V. Cahill, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

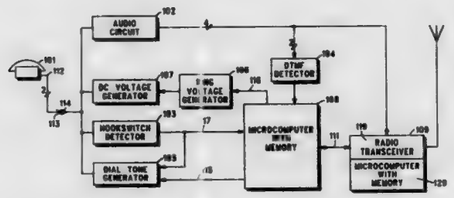
Continuation of Ser. No. 431,518, Nov. 3, 1989, abandoned. This application Apr. 8, 1991, Ser. No. 681,658
Int. Cl.[5] H04M *11/00*; G08B *5/22*
U.S. Cl. 379—58 **4 Claims**



1. An integrated paging and radiotelephone apparatus with integral keypad for entering data, comprising:
a) first receiving means for receiving radiotelephone signals;
b) second receiving means for receiving paging signals;
c) transmission means for transmitting radiotelephone signals;
d) electro-audio transducer means, coupled to the first and the second receiving means, for generating an indication in response to the radiotelephone signals or the paging signals, the electro-audio transducer coupled to the first receiving means through first controllable gating means

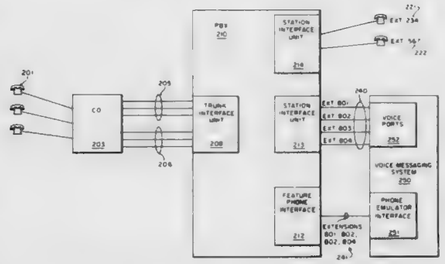
and the second receiving means by second controllable gating means;
e) a shared memory for storing data from the integral keypad and the received paging signals;
f) a processor, directly connected to the first receiving means, the second receiving means, the transmission means, and the first and second controllable gating means, for producing radiotelephone control signals and controlling the first and second controllable gating means;
g) first indicating means for displaying information corresponding to the received paging signals and the radiotelephone control signals; and
h) second indicating means for announcing the received paging signals and the received radiotelephone signals.

5,117,450
CELLULAR TELEPHONE WITH STANDARD TELEPHONE SET
Manohar A. Joglekar, Elk Grove Village, and Philip F. Aseltine, Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 349,419, Jun. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 349,619, May 10, 1989, abandoned. This application Nov. 27, 1990, Ser. No. 622,201
Int. Cl.[5] H01Q *7/04*
U.S. Cl. 379—58 **10 Claims**



1. Cellular telephone apparatus, comprising:
a telephone device having dialing means for dialing digits of telephone numbers, producing a hookswitch signal indicating an off-hook condition and the dialed digits, and having first plug means coupled to the hookswitch signal; and
a cellular telephone including:
second plug means for coupling to the first plug means of the telephone device;
cellular transceiver means including second microcomputer means and memory means, and being operable on cellular radio channels for communicating cellular telephone calls;
data bus means having first and second ports, the second port being coupled to said cellular transceiver means;
first microcomputer means coupled to the second plug means for detecting the off-hook condition of the hookswitch signal and thereafter receiving each dialed digit, and said first microcomputer means coupled to the first port of said data bus means for automatically transmitting each received digit immediately after receipt to the cellular transceiver means; and
said second microcomputer means being coupled to the second port of said data bus means for storing each transmitted digit in said memory means, automatically validating all of the stored digits when the elapsed time from receipt of the last stored digit exceeds a predetermined time interval, and automatically transmitting all of the stored digits on one of the cellular radio channels when the stored digits have been validated, whereby all dialed digits of each telephone number are automatically validated and transmitted when dialing is interrupted for at least the predetermined time interval.

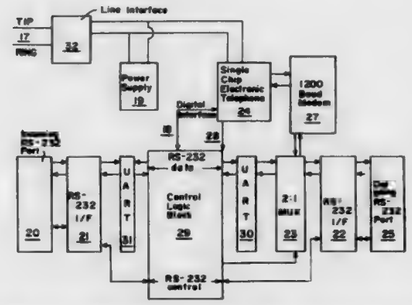
5,117,451
INTERFACE TO AND OPERATION OF A VOICE MESSAGING SYSTEM
David J. Ladd, Saratoga; Gregory E. Pounds, San Jose; Tim J. Kusumi, Los Gatos; Peter A. Bonee, Sunnyvale, and Robert R. Shepard, Fremont, all of Calif., assignors to VMX/OPCOM, San Jose, Calif.
Continuation of Ser. No. 159,783, Feb. 24, 1988, Pat. No. 4,926,462. This application Apr. 16, 1990, Ser. No. 509,089
Int. Cl.[5] H04M *3/50, 3/54*
U.S. Cl. 379—67 **2 Claims**



1. A method for processing a telephone call in a telephone system, said telephone system comprising a switching means for switching said telephone call, a first telephone extension and a second telephone extension, said first and second telephone extensions coupled with said switching means, said telephone system further comprising a voice messaging system, said voice messaging system coupled with said switching means, and a first party being associated with said first telephone extension, said method comprising the steps of:
(a) prior to receiving a telephone call, said first party storing information in said voice messaging system specifying said second extension for servicing telephone calls directed at said first extension when said first extension is unanswered;
(b) said switching means directing said telephone call at said first telephone extension;
(c) detecting said telephone call is not answered by said first telephone extension;
(d) said voice message system providing a message to said telephone call, said message comprising information regarding the reason said first telephone extension did not answer said telephone call, said message further soliciting a caller response as to whether a caller placing said telephone call would like to leave a message for said first party or be transferred to a personal assistant of said first party;
(e) said caller placing said telephone call indicating to said voice messaging system said telephone call is to be transferred to said personal assistant of said first party, said indication accomplished by the passing of a predetermined period of time during which said caller has not responded; and
(f) said telephone system transferring said telephone call to said second extension responsive to step (e).

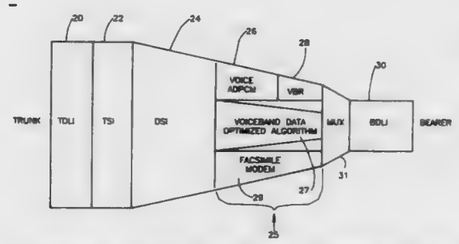
5,117,452
TELEPHONE INTERFACE FOR A COMPUTER FOR RECEIVING AND TRANSMITTING INFORMATION DURING THE SILENT INTERVAL BETWEEN RINGING
David Callele, 2014 Cairns Ave., Saskatoon, Saskatchewan, Canada S7J 1T4 , and Donald Cruickshank, 907 McKercher Drive, Saskatoon, Saskatchewan, Canada S7H 4T9
Filed Sep. 27, 1990, Ser. No. 588,941
Claims priority, application Canada, Sep. 29, 1989, 615028
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—98 **50 Claims**

1. A telephone interface apparatus for connecting a computer external to the interface apparatus to a telephone line for use in telephone systems employing information signalling during the silent interval between rings comprising:
line interface means for interfacing the apparatus with the telephone line,
first computer interface means for interfacing the apparatus with a computer external to the interface apparatus,
ring detector means for detecting a ringing signal upon the telephone line,



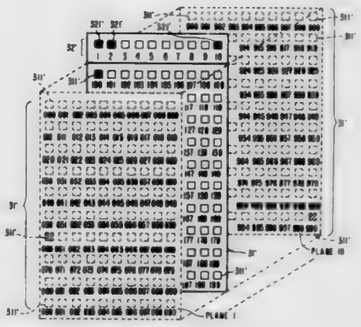
data demodulation means connected with the line interface means and with the first computer interface means for receiving data transmitted over the telephone line during a silent interval after a ringing signal, and
control logic means for controlling flow of the data between the data demodulation means and the first computer interface means in response to a signal from the ring detector means whereby in operation data present on the telephone line during the silent interval is retransmitted through the first computer interface means to the computer external to the interface apparatus.

5,117,453
TELECOMMUNICATION SYSTEM
Joshua Pisecki, Ramat Gan, and Sason Sourani, Hod Hasharon, both of Israel, assignors to ECI Telecom Ltd., Petach Tikva, Israel
Filed Dec. 18, 1989, Ser. No. 451,748
Claims priority, application Israel, Mar. 2, 1989, 89461
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—100 **31 Claims**



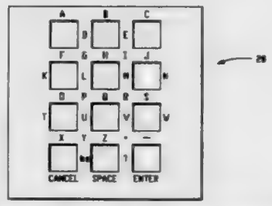
1. A telecommunication system for interconnecting a plurality of telephone communication trunks, carrying voice, facsimile and non-facsimile voiceband data signals, to a transmission network, said system comprising:
transmission means at at least a first end of said transmission network including;
means for detecting facsimile signals, as distinguished from other voiceband data signals, on said plurality of telephone communications trunks;
means for demodulating only said facsimile signals;
means for transmitting along said transmission network, in demodulated form, the facsimile signal output of the means for demodulating; and
receiving means at at least a second end of the transmission network including:
means for modulating said facsimile signals received along said transmission network.

5,117,454
EXCHANGE HAVING A DISPLAY APPARATUS FOR DISPLAYING CALLS TERMINATED AT AN ATTENDANT CONSOLE
Shinji Yamase, Fukuoka, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Feb. 22, 1991, Ser. No. 659,505
Claims priority, application Japan, Feb. 26, 1990, 2-44991
Int. Cl.[5] H04M *5/04, 5/08*
U.S. Cl. 379—262 **25 Claims**



1. In an exchange having an attendant console and accommodating a plurality of groups of subscriber terminals, a display apparatus for displaying a call terminated at the attendant console, each of the groups of subscriber terminals including a predetermined number of subscriber terminals, said display apparatus comprising:
display means for displaying a call for one of the predetermined number of subscriber terminals in one of the groups of subscriber terminals; and
indication means for indicating each group to which one of the subscriber terminals which terminates a call, belongs.

5,117,455
TELEPHONE KEYPAD MATRIX
Adel Danish, Mohandessin, Egypt, assignor to Danish International, Inc., Foster City, Calif.
Filed Mar. 28, 1990, Ser. No. 500,370
Int. Cl.[5] H04M *1/272;* **G06F** *3/02*
U.S. Cl. 379—368 **16 Claims**



1. A method for the entry of numerical characters and alphabetical characters into a telephone system, the telephone system having a keypad, a speaker, a microphone, a receiving station, and memory, the method comprising:
prearranging the characters of the alphabet on the keypad so

that only one character is placed between any two adjacent keys of the keypad; and

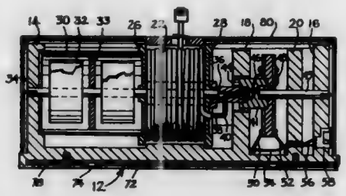
defining at least one keypair for each alphabetical character by selecting at least one key adjacent to each character, the keypairs generating dual tone multifrequency signals corresponding to character codes stored within the memory of the telephone system, each keypair operated by two sequential keystrokes of the at least one adjacent key, in either sequence.

5,117,456

WALL MOUNTED TELEPHONE CORD REEL

Harold O. Aarness, 5808 Knox Ave. No., Brooklyn Center, Minn. 55430, and Daniel R. Saufferer, 8126 Colfax Ave. So., Bloomington, Minn. 55420

Filed Jul. 16, 1990, Ser. No. 552,495
Int. Cl.[5] H04M *1/00*; H02G *11/00*; B65H *75/48*
U.S. Cl. 379—438 **3 Claims**



1. A telephone cord reel unit for mounting on a wall joining a removable telephone handset at one end of a phone cord to a removable telephone station box, comprising:

a non-metallic housing base with first and second end walls, and first and second supporting divider walls;

a flanged phone cord reel for holding the phone cord comprising first and second end flanges;

a first immovable axle extending centrally from said first end wall to a flanged, non-metallic connecting tube joining said flanged phone cord reel to a non-metallic disk which is copper plated on both sides of said non-metallic disk said non-metallic disk located between the first and second supporting divider walls and rotatable with the phone cord reel;

recoil means in the form of a plurality of side-by-side coil springs within a cylindrical casing and attached to the first immovable axle and said cylindrical casing, said cylindrical casing extends tandemly, as a part of the cord reel, between said first end wall and said first flange;

a second immovable axle extending centrally from said second end wall of said non-metallic housing base to the non-metallic disk through said second supporting divider wall;

said unit further comprising the phone cord extending through an opening in said second end flange of the phone cord reel to connect to first electric wires, said first electric wires extending through a passage in said flanged, non-metallic connecting tube to couple to second electric wires which are particularly embedded in a non-metallic center neck member of said non-metallic disk; and

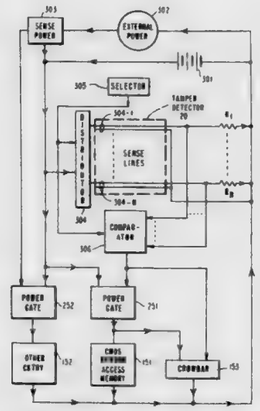
first and second contact brushes mounted on said first and second supporting divider walls respectively, said first contact brush extending to the copper plate at one side of said non-metallic disk and said second contact brush extending to the copper plate at the other side of said non-metallic disk, said first and second contact brushes having spring tension contact for transferring electric current to telephone wires, said telephone wires attached to said first and second contact brushes and extending to a phone jack in said second end wall, wherein said first and second contact brushes contacting the copper plates of said non-metallic disk provide a means for continual, uninterrupted current flow between the handset and the telephone station box.

5,117,457

TAMPER RESISTANT PACKAGING FOR INFORMATION PROTECTION IN ELECTRONIC CIRCUITRY

Liam D. Comerford, Carmel; Peter G. Ledermann, Pleasantville; Lawrence I. Levy, Yorktown Heights, and Steve R. White, New York, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 927,309, Nov. 5, 1986, abandoned. This application Jan. 24, 1990, Ser. No. 471,003
Int. Cl.[5] H04L *9/00*; H02H *7/20*; G11B *23/28*
U.S. Cl. 380—3 **25 Claims**



1. A tamper resistant apparatus for detecting intrusion into a region comprising:

an enclosure being part of and substantially surrounding said region;

energy distribution means including a plurality of paths, each supporting energy distribution, means for changing the condition of the region to any one of a plurality of different conditions by selecting certain of said paths to carry energy and selecting others of the paths not to carry energy;

means for sensing predictable results for said conditions assumed by said region when there is no intrusion into said enclosure and detecting intrusion into said enclosure when results other than said predictable results are sensed, wherein:

said means for sensing predictable results comprises means for sensing the presence and absence of energy on said paths and where an intrusion is detected based on the presence and absence of energy on said paths.

5,117,458

SECRET INFORMATION SERVICE SYSTEM AND METHOD

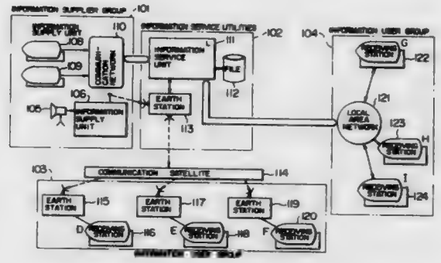
Kazuo Takaragi, Ebina; Ryoichi Sasaki, Fujisawa; Tsutomu Nakamura, Musashino; Minoru Koizumi, Yokohama; Yasuko Fukuzawa, Sagamihara, and Kenji Kataoka, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 31, 1990, Ser. No. 606,898
Claims priority, application Japan, Nov. 1, 1989, 1-282960; Jun. 4, 1990, 2-144305
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—4 **19 Claims**

1. An information service system comprising a plurality of information user groups each group having a plurality of receiving stations, and information service facilities for providing desired service information through broadcast communications to desired receiving stations of each of said plurality of information user groups;

said information service facilities comprising means for storing ID name information composed of receiving station identifiers assigned beforehand to all receiving stations of said information service system, said receiving station identifiers being disposed in a predetermined order; means for storing a plurality of information to be supplied to said plurality of receiving stations; enciphering means for generating an enciphering key for said desired receiving stations performing said broadcast communications within said information user group, and enciphering said service information by using said enciphering key; and means for transmitting through said broadcast communications said enciphered service information and service destination codes of service receiving destination stations encoded from said ID information; and

said each receiving station comprising means for storing its own receiving station identifier and said ID information composed of receiving station identifiers of all receiving stations within one information group performing said broadcast communications; a receiving unit for receiving said enciphered service information service and said service destination codes from said information service facilities; and deciphering means for generating a deciphering key for said ID information corresponding to said service destination codes, in accordance with said received service destination codes and corresponding said ID name information stored beforehand, only when said own receiving station identifier is contained in said service destination codes.

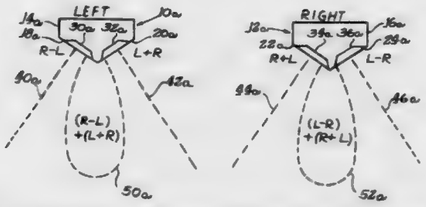


5,117,459

AMBIENT IMAGING LOUDSPEAKER SYSTEM

Charles L. McShane, Mt. Prospect, Ill., assignor to Chicago Steel Rule Die & Fabricators Co., Illinois, Ill.

Filed May 3, 1990, Ser. No. 518,171
Int. Cl.[5] H04R *5/02*
U.S. Cl. 381—24 **6 Claims**



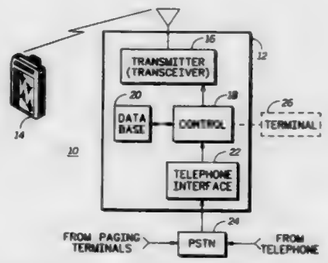
1. Sound reproduction apparatus comprising: a loudspeaker system including a plurality of drivers for producing audio signals in response to respective electrical right and left stereophonic signals from respective signal sources; a first of said plurality of said drivers having a first voice coil wired and connected in circuit for producing an audio output representing one of said electrical right and left stereophonic signals; and a second of said drivers having a dual voice coil wired and connected in circuit for producing an audio output representing a combination of said one of said electrical right and left stereophonic signals, in phase with said first voice coil, and the other of said electrical right and a left stereophonic signals out of phase with its source; and mounting means for mounting said first and second drivers for radiating sound along respective divergent axes; a second loudspeaker system comprising a plurality of drivers, a first of said drivers of said second loudspeaker system having a first voice coil wired and connected for producing an audio output representing the other of said electrical right and left stereophonic signals; and a second of said drivers in said second loudspeaker system having a dual voice coil wired and connected for producing an audio output representing a combination of said other of the electrical right and left stereophonic signals, in phase with said first voice coil of said second system, and said one of said electrical right and left stereophonic signals out of phase with said first voice coil of said first system, and wherein said second loudspeaker system includes mounting means for mounting said first and second drivers thereof for radiating sound along respective divergent axes; and wherein said mounting means are configured such that, when the loudspeaker systems are placed side-by-side, the audio outputs produced by said first voice coils are directed along axes which converge and the audio outputs produced by said dual voice coils are directed along axes which diverge.

5,117,460

VOICE CONTROLLED PAGER AND PROGRAMMING TECHNIQUES THEREFOR

Thomas G. Berry, Schaumburg, Ill.; Paul F. Smith; Kamyar Rohani, both of No. Richland Hills, Tex.; Winfield J. Brown, Jr., Lantana, and Philip P. Macnak, West Palm Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 213,656, Jun. 30, 1988, abandoned. This application Jan. 25, 1991, Ser. No. 646,484
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] G10L *5/00*
U.S. Cl. 381—41 **28 Claims**



1. A pager being at least partially controlled and operated via voice commands, comprising:

radio receiving means for receiving voice recognition data for an individual from a repository station having voice recognition information for a plurality of individuals, the voice recognition data representing voice commands required to initiate one or more functions within the pager;

storage means for storing the voice recognition data;

audio receiving means for receiving voice signals to provide received voice signals;

processing means, coupled to said storage means, for pro-

cessing said received voice signals and at least a portion of the stored voice recognition data to recognize voice commands;

means responsive to said voice commands for initiating functions within the pager as specified by said voice commands.

5,117,461

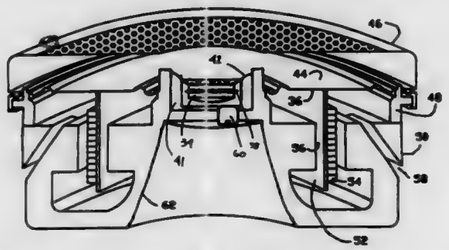
ELECTROACOUSTIC DEVICE FOR HEARING NEEDS INCLUDING NOISE CANCELLATION

William T. Moseley, Shreveport, La., assignor to MNC, Inc., Shreveport, La.

Continuation-in-part of Ser. No. 392,264, Aug. 10, 1989, abandoned. This application Jul. 10, 1990, Ser. No. 532,323

Int. Cl.[5] A61F *11/02*

U.S. Cl. 381—72 **2 Claims**



1. An electroacoustic device for cancelling sound waves in a bounded ear canal, comprising:

an input transducer for converting sound waves incident on a pickup surface of the input transducer into corresponding input electrical signals;

an output transducer for converting output electrical signals into corresponding sound waves which emanate from a diaphragm surface of the output transducer into the bounded ear canal, said output transducer defining a boundary of the bounded ear canal;

a transducer frame to which said input transducer and said output transducer are fixed so that said pickup surface of said output transducer are in substantially the same plane, the input transducer and the output transducer being independently mounted on the transducer frame such that the movement of the pickup surface relative to the transducer frame is primarily in response to incident sound waves, said transducer frame defining another boundary of said bounded ear canal; and

a control means for receiving the electrical signals from the input transducer and for generating the output electrical signals to the output transducer, the output electrical signals being substantially 180 degrees out of phase with respect to said sound waves incident on said pickup surface of said input transducer so that sound waves in said bounded ear canal are substantially cancelled;

said diaphragm of said output transducer being mounted to direct sound waves primarily toward said ear canal and said pickup device of said input transducer being mounted to face in the same direction relative to the ear canal when said device is mounted on a user's ear.

5,117,462

PHASING PLUG FOR COMPRESSION DRIVER

David D. Bie, Sepulveda, Calif., assignor to JBL Incorporated, Northridge, Calif.

Filed Mar. 20, 1991, Ser. No. 672,188

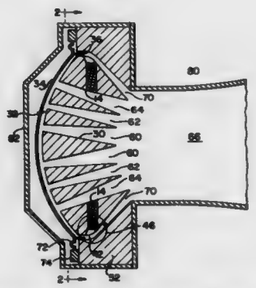
Int. Cl.[5] H04R *25/00*

U.S. Cl. 381—156 **14 Claims**

1. A compression driver, comprising: a pole along an axis piece having a bore therein with upstream and downstream ends, the downstream end of the bore being adapted for coupling to the throat of a horn;

a diaphragm mounted adjacent the upstream end of the bore so as to be vibratable and wherein vibration of the diaphragm produces sound waves directed through the bore toward its front end;

a cylindrical voice coil connected to the diaphragm and disposed within a coil space on the side of the diaphragm facing the pole piece so as to be vibratable within the coil space in a direction parallel to the axis of the pole piece bore;



means for generating a static magnetic field so that oscillatory current flowing through the voice coil causes vibratory motion of the voice coil and thereby vibration of the diaphragm;

a phasing plug disposed between the diaphragm and the upstream end of the bore and having one or more primary air passages for transmitting sound waves from the diaphragm to the downstream end of the bore; and,

wherein an auxiliary air passage is provided for transmitting sound waves from the coil space to the front end of the bore.

5,117,463

SPEAKER SYSTEM HAVING DIRECTIVITY

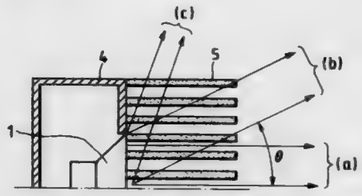
Takashi Oyaba; Hideaki Morikawa; Yasuo Gan, all of Saitama, and Naobumi Kanemaki, Tokyo, all of Japan, assignors to Pioneer Electronic Corporation and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Dec. 21, 1989, Ser. No. 454,235

Claims priority, application Japan, Mar. 14, 1989, 1-59682

Int. Cl.[5] H04R *25/00, 1/02, 7/00*; G10K *11/00*

U.S. Cl. 381—158 **13 Claims**



1. A speaker system having an acoustic panel means for obtaining directivity of a sound wave radiated from a loudspeaker, said acoustic panel means comprising:

a plurality of sound absorbing panel means positioned adjacent and in front of the loudspeaker, said sound absorbing panel means being arranged such that major surfaces thereof are disposed with a predetermined distance between adjacent sound absorbing panel means, such that components of said sound wave radiated from said loudspeaker and having a radiation direction paralleling a central axis of said sound absorbing panel means are substantially unattenuated, while components having a radiation direction oblique to said central axis are attenuated due to propagation through said sound absorbing panel means, and wherein each of the plurality of sound absorbing panel means has a predetermined thickness, and wherein the predetermined distance is substantially more than 3 times the predetermined thickness of each of the sound absorbing panel means, and less than a diameter of the loudspeaker.

5,117,464

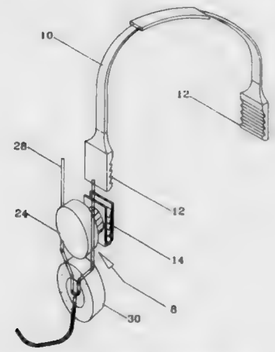
ADJUSTABLE CLIP-ON HEADPHONES

Edward I. Jones, 391 Chestnut Hill Rd., Farmington, N.H. 03835, and Gregory Wilson, 64 Chestnut Hill Rd., Rochester, N.H. 03835

Filed Mar. 8, 1991, Ser. No. 666,345

Int. Cl.[5] H04R *25/00*

U.S. Cl. 381—183 **1 Claim**



1. A stereo headphone system comprising:

(a) A crossover headband equipped with male clip mounts and means to receive female clips mounts;

(b) said stereo headphone system equipped with female clips and means to be connected to said crossover headband;

(c) said female clips having means to disconnect from said crossover headband and means to clip onto an article of headwear other than said crossover headband;

(d) said stereo headphone system having a spring-loaded base piece and socket and means to rotate, swivel and pivot in any direction;

(e) said stereo headphones having speaker connecting rods and means for up and down adjusment.

5,117,465

EARPHONE WITH ADJUSTABLE HEADBAND WITH PROGRESSIVELY SHALLOW DETENTS

James T. MacDonald, Pepperell, Mass., assignor to Unex Corporation, Chelmsford, Mass.

Filed Mar. 15, 1991, Ser. No. 670,531

Int. Cl.[5] H04R *25/00*

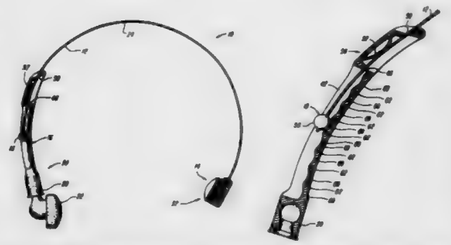
U.S. Cl. 381—187 **11 Claims**

1. An adjustable headband comprising:

a resilient band of a shape and size to fit over the head of a wearer, said band having a first end and a second end and having a positioning member fixedly attached adjacent said first end; and

a housing having a first end and a second end,

said positioning member movably mounted within said housing such that said second end of said housing is oriented nearest said second end of said band, said housing comprising a plurality of depressions linearly arranged within said housing from said first end of said housing to said second end of said housing, each said depression of said plurality of depressions having a shallower depth than the preceeding depression,



said positioning member releasably engaging one of said plurality of depressions so as to maintain said positioning member at a predetermined position within said housing.

5,117,466

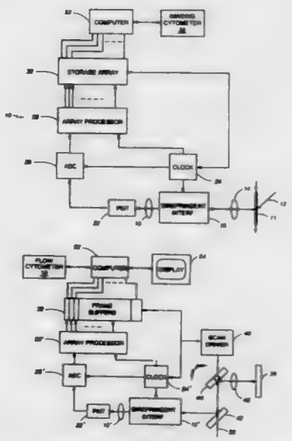
INTEGRATED FLUORESCENCE ANALYSIS SYSTEM

Tudor N. Buican, and Thomas M. Yoshida, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 30, 1991, Ser. No. 693,466

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—6 **4 Claims**



1. An integrated fluorescence analysis system, comprising:

flow cytometer means having birefringent optics for measuring a first plurality of simultaneous spectral wavelengths present in a first fluorescence spectrum from a first sample;

first processor means for resolving said first fluorescence spectrum into first numbers representing the intensity of spectral components of said first plurality of spectral wavelengths;

an imaging cytometer having birefringent optics for measuring a second plurality of simultaneous spectral wavelengths present in a second fluorescence spectrum from a second sample;

second processor means for resolving said second fluorescence spectrum into second numbers representing the intensity of spectral components of said second plurality of spectral wavelengths; and

means connecting said first processor means with said sec-

ond processor means for inputting said first numbers to said second processor and said second numbers to said first processor for respectively enhancing spectral components of said second and said first samples.

5,117,467

COLONY COUNTING APPARATUS

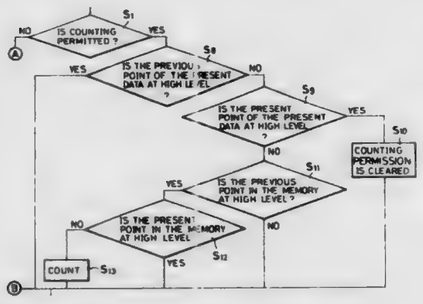
Hideo Misaki; Shigeru Ueda, both of Shizuoka; Kazuhiro Watanabe; Yuzo Ishikawa, both of Tokyo; Hirao Nagae, Ageo, and Takashi Matsuzawa, Kawaguchi, all of Japan, assignors to Toyo Jozo Co., Ltd., Tagata and Nemoto & Co., Ltd., Suginami, both of, Japan

Continuation of Ser. No. 354,554, May 22, 1989, abandoned. This application Jun. 12, 1991, Ser. No. 714,368

Claims priority, application Japan, May 23, 1988, 63-125365

Int. Cl.[5] G06K *9/00;* **G06M** *7/00, 11/02*

U.S. Cl. 382—6 **2 Claims**



1. A colony counting apparatus, comprising:

a reading unit with a visual sensor incorporated therein, said visual sensor reading data at individual points provided in a line direction as logical high or lower signals;

a point storage means for storing results of reading, performed by said reading unit, until reading is performed on a subsequent point on a subsequent line;

a point comparison means for determining when colony counting is permitted, for determining when a colony count value is output after colony counting permitted and for determining when colony counting permission is cancelled by comparing a) data representing a previous point and a present point on a present line from said reading unit with b) data representing a previous point and a present point on a previous line stored in said point storage means,

wherein said point comparison means determining colony counting permitted when 1) said previous point of the previous line from said point storage means and said previous point of the present line from said reading unit are at said logical high and 2) said present point of the previous line from said point storage means and said present point of the present line from said reading unit are at said logical low,

wherein said point comparison means determining said colony count value is to be outputted after colony counting permitted when 3) said previous point of the previous line from said point storage means is at said logical high and 4) said present point of the previous line from said point storage means and said previous and present points of the present line from said reading unit are at said logical low, and

wherein said point comparison means determining colony counting permission cancelled when 5) said previous point of the present line from said reading unit is at the logical low and c) said present point of the present line from said reading unit is at said logical high;

rewriting means for erasing said data representing a previous point on the previous line after the comparison has been performed by said point comparison means and for storing said data from said reading unit on said present point on the present line in said point storage means;

an addition/storage means for adding and storing said colony count value output from said comparison means; and

an output means for outputting results of an addition performed by said addition/storage means.

5,117,468

IMAGE PROCESSING SYSTEM CAPABLE OF CARRYING OUT LOCAL PROCESSING FOR IMAGE AT HIGH SPEED

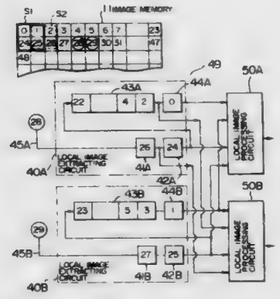
Masatoshi Hino, Zama; Kouji Fukuda, Kawasaki, and Tetsuo Machida, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 28, 1990, Ser. No. 486,436

Claims priority, application Japan, Mar. 3, 1989, 1-49826

Int. Cl.[5] G06K *9/36*

U.S. Cl. 382—41 **16 Claims**



1. An image processing system comprising:

a plurality of local image extracting means each for extracting in parallel a plurality of pixel data, having a predetermined positional relation in a two-dimensional original image, from image data time-sequentially inputted to each local image extracting means;

local image reconstruction means connected to said plurality of local image extracting means for combining a plurality of extracted pixel data outputted in parallel from the plural local image extracting means so as to output in parallel pixel data representing a plurality of local images which, at the time of outputting, partially overlap each other on the original image by a predetermined amount;

a plurality of local image processing means, provided in a number corresponding to the number of local image extracting means, each for processing pixel data representing a respective one of the plurality of local images outputted from the local image reconstruction means, in parallel, to deliver a plurality of modified pixel data corresponding to the local images;

first memory means for storing therein two-dimensional image data to be processed;

second memory means for storing therein image data having been subjected to image processing;

first image data transfer means for supplying pixel that, which is read out form the image data stored in said first memory means in a predetermined scanning order, to the plural local image extracting means in a predetermined order so that each of said local image extracting means is connected in sequence to receive a different one of said pixel data in turn as the two-dimensional original image is scanned;

first control means for controlling data transfer operations in each local image extracting means and the first image data transfer means;

second image data transfer means for writing image data, which is delivered from the plural local image processing means, in the second memory means in a predetermined order; and

second control means for controlling data transfer operations in the local image processing means and the second image data transfer means.

5,117,469

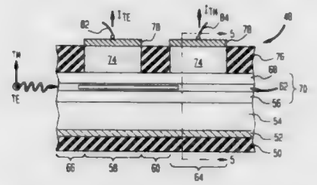
POLARIZATION-DEPENDENT AND POLARIZATION-DIVERSIFIED OPTO-ELECTRONIC DEVICES USING A STRAINED QUANTUM WELL

Kwok-wai Cheung, Red Bank, and Chung-en Zah, Marlboro, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Feb. 1, 1991, Ser. No. 649,659

Int. Cl.[5] G02B *6/10*

U.S. Cl. 385—11 **14 Claims**



1. A polarized opto-electronic system, comprising:

a waveguide formed in and laterally defined within the surface of a substrate for carrying light having a characteristic energy;

a first opto-electronic device formed adjacent to a first portion of said waveguide and including an active strained quantum-well layer interacting with said light and having a first transition energy for light of a first polarization and having a second transition energy for light of a second orthogonal polarization, said characteristic energy falling between said first and second transition energies; and

a second opto-electronic device formed adjacent to a second portion of said waveguide and including an active layer having different strain characteristics than said strained quantum-well layer of said first opto-electronic device.

5,117,470

GUIDED-WAVE OPTICAL CIRCUIT AND METHOD FOR ADJUSTING A CHARACTERISTIC THEREOF

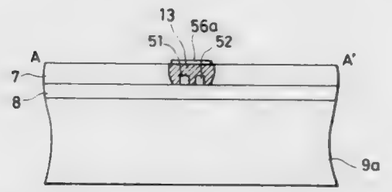
Yasuyuki Inoue; Masayuki Okuno, and Masao Kawachi, all of Mito, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 661,322

Claims priority, application Japan, Feb. 26, 1990, 2-42538; Jul. 9, 1990, 2-179467

Int. Cl.[5] G02B *6/12*

U.S. Cl. 385—14 **27 Claims**



1. A method for adjusting a characteristic of a guided-wave optical circuit which includes one or more waveguides formed by a substrate, a cladding layer formed on said substrate, and a core portion having one or more cores embedded in said cladding layer, said method comprising the step of:

producing a reversible thermal hysteresis phenomenon, after said cladding layer and core portion have been formed, in a thermal hysteresis produced region preselected so as to include at least a portion of said cladding layer and/or said core portion, in order to produce a predetermined difference between the refractive index of said cladding layer and the refractive index of said core portion; said step of producing a reversible thermal hysteresis comprising the steps of:

raising the temperature of said thermal hysteresis produced region to a predetermined temperature;

maintaining the predetermined temperature of said thermal hysteresis produced region for a predetermined time period; and

cooling said thermal hysteresis produced region at a predetermined cooling rate, wherein said step of producing a reversible thermal hysteresis phenomenon is repeated a plurality of times to adjust the characteristic of said guided-wave optical circuits.

5,117,471

BISTABLE OPTICAL SWITCHING ARRANGEMENT

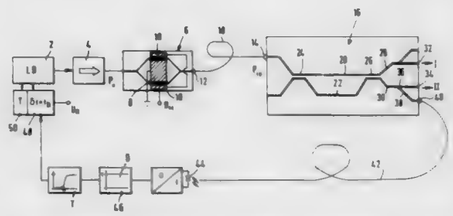
Norbert Fürstenau, Braunschweig, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstalt fur Luft- und Raumfahrt e. V., Köln, Fed. Rep. of Germany

Filed Jul. 8, 1991, Ser. No. 725,623

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1990, 4021293

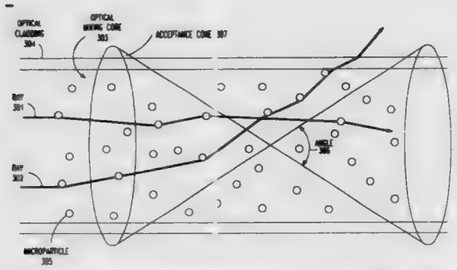
Int. Cl.[5] G02B *6/10;* **G01B** *9/02;* **H01J** *5/16;* **H01S** *3/00*

U.S. Cl. 385—16 **8 Claims**



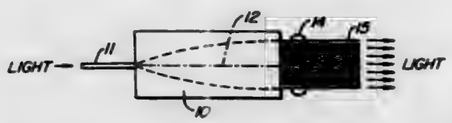
1. An optical switching arrangement comprising as a light source a laser with current supply means, an electrooptical modulator formed as a first two-arm interferometer with control electrodes, and connected after the modulator a second two-arm interferometer as a bistable element, said modulator passing light to said second two arm interferometer, and said second interferometer having a first output for a part of the light, a photodiode being connected to said first output, the output voltage of said photodiode being used as a control magnitude, wherein said second two-arm interferometer is formed with interferometer arms having optical path length differences between the two interferometer arms of the order of magnitude of 10^4 of the wavelength of the light from said laser, wherein said second two-arm interferometer has at least one second output forming a respective at least one signal output, said signal output being arranged parallel to said first output; wherein the output voltage of said photodiode is used to control said current supply means of said laser; and wherein the wavelength of the light passed to said second two-arm interferometer is variable so that an output appears in bistable manner at one or other of said two output arms of said second interferometer according to said wavelength.

5,117,472
OPTICAL COUPLER WITH MODE-MIXING REFRACTIVE MICROPARTICLES
Lee L. Blyler, Jr., Basking Ridge; Robert W. Filas, Bridgewater, both of N.J., and Gary J. Grimes, Thornton, Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Dec. 28, 1990, Ser. No. 635,907
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—28 **22 Claims**



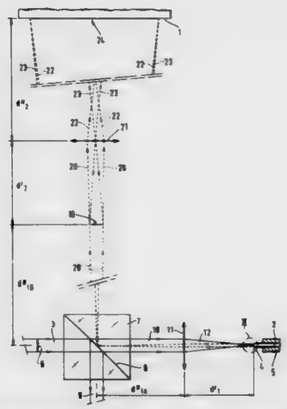
1. An optical device for the communication of light, comprising:
an optical cladding structure; and
an optical core within said optical cladding structure for communicating light from an input of said optical core to an output of said optical core;
said optical core comprising a suspension material having a plurality of refractive particles for coupling light from lower order propagating modes into higher order propagating modes and said plurality of particles having an index of refraction approximately equal to an index of refraction of said suspension material so as to reduce the amount of light being lost through said cladding structure.

5,117,473
FIBER OPTIC COUPLER AND METHOD OF MAKING SAME
Jing-Jong Pan, San Jose, Calif., assignor to E-Tek Dynamics, Inc., San Jose, Calif.
Division of Ser. No. 390,795, Aug. 8, 1989, Pat. No. 5,016,963.
This application Jan. 11, 1991, Ser. No. 640,176
Int. Cl.[5] G02B *6/32*
U.S. Cl. 385—33 **21 Claims**



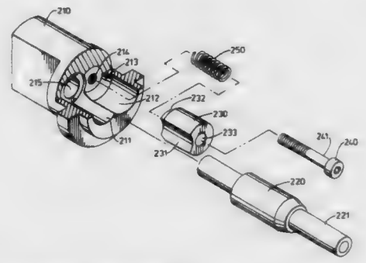
10. A method of manufacturing a 1×N fiber optic coupler comprising
forming a microlens at an end of a first optic fiber;
fixing said microlens end of said first fiber along an optical axis of a GRIN lens a predetermined distance away from a first surface of said GRIN lens so that a light signal from said first optical fiber appears to emanate from a point source at said first surface of said GRIN lens;
tapering each end section of a plurality of second optical fibers such that at least the core is exposed at the end of each fiber, including
disposing a bath of solution capable of etching the cladding and the core of said second optic fibers; and
repetitively dipping said end section of said second optic fiber endfirst into said solution until at least said cladding at the end of said fiber is removed to expose said core so that said fiber is tapered toward said end; and
fixing a bundle of tapered end sections of at least N second optical fibers along said optical axis of said GRIN lens and against a second surface of said GRIN lens opposite said first surface.

5,117,474
DEVICE FOR INJECTING THE LIGHT ENERGY OF A LASER BEAM INTO A FIBRE-OPTIC OPTICAL WAVEGUIDE AND A METHOD FOR ADJUSTING AND MONITORING THE POSITION OF THE END OF THE FIBRE-OPTIC OPTICAL WAVEGUIDE
Hubert van den Bergh, Goumoens-la-Ville; Peter F. Cornaz, deceased, late of Vevy; Max M. Cornaz, heir, Chesalles; Jean-Pierre Cornaz, Heir, Pratteln; Maria I. Cornaz, Heir, Berne, and Georges Wagnières, Lutry, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Oct. 2, 1990, Ser. No. 591,536
Claims priority, application Switzerland, Oct. 3, 1989, 3593/89
Int. Cl.[5] G02B *6/32*
U.S. Cl. 385—39 **2 Claims**



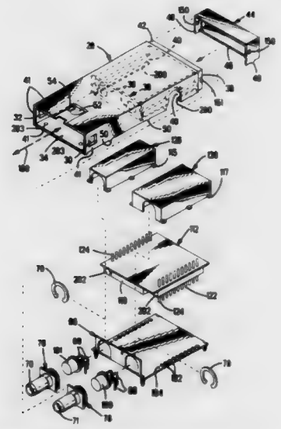
1. A device for injecting the light energy of a laser beam into a fibre-optic optical waveguide, of which the end that is illuminated using a focusing lens arrangement has an end face extending at right angles to the longitudinal axis of the fibre and is fastened to a holding means capable of being positioned along three axes, the focusing lens arrangement generating in the ray path an intermediate image of the end face, wherein there may be inserted in the laser beam ray path, in front of the focusing lens arrangement, a beam splitter through which the light returning from the end face of the optical waveguide can be extracted laterally from the laser beam by way of a reproducing lens system onto a screen surface positioned behind said reproducing lens system, the distance of the reproducing lens arrangement from the screen surface being so selected that a sharp image of the intermediate image, produced by the focusing lens arrangement, of the end face of the optical waveguide is reproduced on the screen surface by the reproducing lens arrangement only when the end face of the optical waveguide is positioned at a prescribed distance in the direction of the fed-in laser beam behind the focal plane in which the laser beam focused with the aid of the focusing lens arrangement has the smallest diameter.

5,117,475
FIBER OPTIC CONNECTOR
Joseph C. Young, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Apr. 29, 1991, Ser. No. 693,260
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—81 **7 Claims**



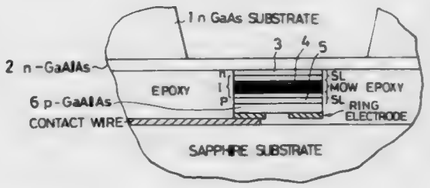
1. A connector comprising:
a housing including first and second openings, said second openings including a first beveled portion;
means for holding and aligning a cable and being adapted to slidably fit into said first opening;
a plurality of wedge means adapted to slidably fit into said second openings; and
means for fastening said wedge means to said housing; and
means for preventing free rotation of said wedge means during insertion and removal of said holding and aligning means.

5,117,476
OPTICAL TRANSCEIVER PACKAGE WITH INSERTABLE SUBASSEMBLY
Stephen M. Yingst, Hummelstown; Robert C. Briggs, Newport; John F. D'Ambrosia, Harrisburg; Steven L. Flickinger, Hummelstown; Steven P. Owens, Grantville, and Jeffrey A. Zeiders, Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of Ser. No. 467,825, Jan. 19, 1990, abandoned. This application Feb. 15, 1990, Ser. No. 480,702
Int. Cl.[5] G02B *6/42*
U.S. Cl. 385—88 **18 Claims**



1. A transceiver package, comprising:
a shell; a receptacle of the shell adapted for receiving a connector terminating a cable having optical fibers; the shell having an opening; a subassembly of functional parts of a transceiver including: a platform, integrated circuit substrate means supported by the platform, an optical transmitter active device and an optical receiver active device on said integrated circuit substrate means, and conductive post means on said integrated circuit substrate means connected to circuits of said integrated circuit substrate means; said subassembly being adapted for insertion in said opening; and the conductive post means extending from said integrated circuit substrate means and from the shell.

5,117,477
OPTICAL FUNCTIONING ELEMENT USING A TRANSPARENT SUBSTRATE WITH MATCHING LATTICE CONSTANT
Shiro Satoh, Ogawara, Japan, assignor to Ricoh Company, Ltd., Tokyo and Ricoh Research Institute of General Electronics Co., Ltd., Natori, both of, Japan
Filed Jan. 25, 1991, Ser. No. 645,694
Claims priority, application Japan, Feb. 14, 1990, 2-33091
Int. Cl.[5] G02B *6/00*; H01L *31/12, 33/00*
U.S. Cl. 385—88 **16 Claims**



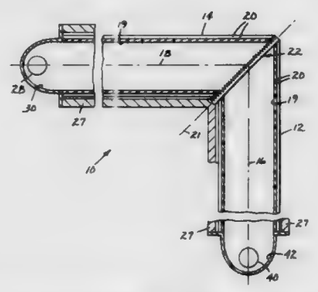
1. An optical functioning element having at least one of a light emitting function, a light receiving function and a light modulating function, said optical functioning element comprising:
an optical element for carrying out said at least one function, having a layer-stacked structure of crystalline substance layers, each of which is selected from a group consisting of GaAs, AlGaAs and AlAs, said layer-stacked structure including at least one junction formed by different conductive type layers;
a substrate of a single crystal substance for mounting said optical element on an upper face thereof, said substrate being transparent with respect to a wavelength of light emitted from said optical element or to which said optical element is photosensitive to allow said optical element to emit or receive said wavelength of light through said substrate; and
an epitaxial growth layer of $Al_xGa_{1-x}As, 0 \leqq x \leqq 1$, having a first lattice constant and formed between said optical element and said substrate, wherein
the single crystal substance of said substrate has a second lattice constant such that the difference between said first lattice constant and said second lattice constant is small enough such that a lattice structure of said substrate matches with a lattice structure of said epitaxial growth layer.

5,117,478

DEVICE FOR REDIRECTING LIGHT THROUGH A HOLLOW TUBULAR LIGHT CONDUIT

Sanford Cobb, Jr., Saint Mary's Point, and Michael J. Leite, Bloomington, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 19, 1991, Ser. No. 657,526
Int. Cl.[5] G02B *6/00*
U.S. Cl. 385—133 **9 Claims**



1. A device for redirecting a beam of light, said device comprising

a source of beamed light including a parabolic reflector,

a hollow tubular light conduit, the axis of which is intersected by the axis of the beamed light at an angle of 90 degrees, and

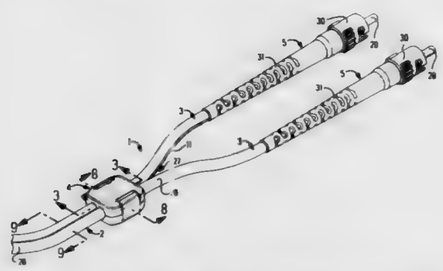
a thin transparent prismatic element mounted in the tubular light conduit to intercept and redirect light from the lamp and parabolic reflector along the axis of the tubular light conduit, the prismatic element extending part way but less than all of the way across the light conduit.

5,117,479

CLAMP FOR SPLIT CABLE OF MULTIPLE OPTICAL FIBERS

David D. Erdman; Kevin T. Monroe, both of Harrisburg, and Robert N. Weber, Hummelstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 2, 1990, Ser. No. 609,323
Int. Cl.[5] G02B *6/36, 6/00*
U.S. Cl. 385—136 **11 Claims**



1. A method of constructing a transition of a multiple fiber cable to single fiber cable, comprising the steps of:

holding together a first portion of the multiple fiber cable by a clamp with sections having frictional surfaces applied to and mounted on the exterior of the multiple fiber cable,

splitting a second portion of the multiple fiber cable from one of its ends to the first portion, whereby the second portion is divided into single fiber cables projecting from the first portion held together by the sections of the clamp, and

assembling optical connectors on corresponding ends of the single fiber cables.

5,117,480

POLYMER COMPOSITION AND OPTICAL FIBER HAVING CLADDING COMPOSED OF THAT COMPOSITION

Takashi Yamamoto, Hiroshima; Tsuruyoshi Matsumoto, Otake; Tadao Kobayashi, Yamaguchi, and Katsuhiko Shimada, Otake, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Continuation of Ser. No. 398,917, Aug. 28, 1989, abandoned. This application Jan. 18, 1991, Ser. No. 642,567
Claims priority, application Japan, Aug. 29, 1988, 63-212339
Int. Cl.[5] G02B *6/02*
U.S. Cl. 385—145 **4 Claims**

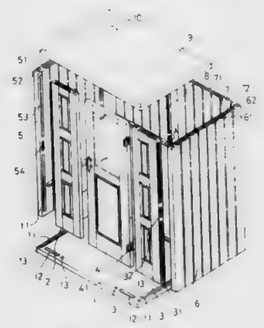
1. An optical fiber having a light transmitting core and a plastic cladding which is composed of a polymer composition consisting of (I) 60 to 99.8% by weight, based on the weight of the polymer composition of an amorphous copolymer comprising (a) units derived from perfluoro-2,2-dimethyl-1,3-dioxole and (b) units derived from at least one ethylenically unsaturated monomer selected from the group consisting of ethylene, tetrafluoroethylene, chlorotrifluoroethylene and a compound represented by the formula $CF_2{=}CFOCF_3$, and (II) 0.2 to 40% by weight, based on the weight of the polymer composition, of an aliphatic hydrocarbon compound, an alicyclic hydrocarbon compound or an aromatic hydrocarbon compound substituted by at least one fluorine atom and a functional group selected from the group consisting of —OH, —SR, —COOH, —SO—, $—SO_2—$, —CONH—, —COO—CO—, —CONH-CO—, —COO—, —CN, —NCO, —CO—, HCOO—, $—NH_2$, —NH—, =C=NH, $—SO_3H$, $—NHNH_2$, $—CONH_2$, and $(RO)_nX_{3-n}Si—$, wherein R is an alkyl group of 1 to 5 carbon atoms, n is 0 or an integer of 1 to 3, and X is a halogen atom or an alkyl group of 1 to 5 carbon atoms.

5,117,481

DETACHABLE BATHING UNIT FOR FAR INFRARED BATH

Lai M. Sung, 8F, No. 1-3, Sec. 5, Chung Hsiao E. Rd., Taipei, Taiwan

Filed Jul. 30, 1991, Ser. No. 737,652
Int. Cl.[5] A61H *33/06;* **F26B** *19/00;* **F24C** *1/14*
U.S. Cl. 392—416 **1 Claim**



1. A bathing unit for far infrared bath, comprising:

a base panel transversely disposed at the bottom, said base panel having on the top surface thereof a first pair of elongated projecting strips transversely disposed at two opposite ends, a second pair of elongated projecting strips longitudinally disposed at two opposite ends at one side, a third pair of elongated projecting strips longitudinally disposed at two opposite ends at an opposite side, and a plurality of mortises disposed at two opposite ends by each of the second and third pairs of elongated projecting strips respectively;

a first front panel and a second front panel vertically fastened in said base panel at the front, said first and second front panel each having two elongated grooves longitudinally aligned on the peripheral edge thereof at one side with a connector set therebetween, an elongated groove and a tenon on the top edge thereof, an elongated groove and a tenon on the bottom edge thereof;

a door panel set between said first and second front panel and pivoted to said second front panel;

a first side panel and second side panel vertically fastened in said base panel at two opposite sides, said first and second side panels each having an elongated end groove and two tenons each on the top edge and the bottom edge thereof, a first pair of elongated side projecting strip longitudinally aligned on the inner wall surface thereof at one side with a first connector set therebetween, and a second pair of elongated side projecting strips longitudinally aligned on the inner wall surface thereof at an opposite side with a second connector set therebetween;

two back panels vertically fastened in said base panel at the back and respectively connected to said first and second side panels, said two back panels each having an elongated end groove and two tenons each on the top edge and the bottom edge thereof, a first pair of elongated side grooves longitudinally aligned on the peripheral edge thereof at one side with a first connector set therebetween, and a second pair of elongated side grooves longitudinally aligned on the peripheral edge thereof at an opposite side with a second connector set therebetween;

a top panel mounted on said first and second front panels, said first and second side panels and said two back panels at the top, said top panel having a plurality of projecting strips and mortises on the bottom surface around the periphery thereof; and wherein:

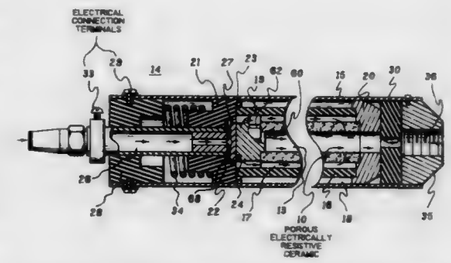
said first and second front panels are vertically fastened in said base panel at the front by inserting the elongated end grooves and the tenons on the bottom edges of the front panels in the second pair of elongated projecting strips and the corresponding mortises on said base panel; said first and second side panels are respectively mounted on said base panel at the top and connected to said first and second front panels by fastening the elongated end grooves and the tenons on the bottom edge of said first and second side panels in the first pair of elongated projecting strips and the corresponding mortises on said base panel and by fastening the first pair of elongated side projecting strips and the first connectors of said first and second side panels in the elongated grooves and the connector of said first and second front panels; said back panels are vertically fastened in said base panel at the back and respectively connected to said first and second side panels by fastening the elongated end grooves and the tenons on the bottom edge of said first and second back panels in the third pair of elongated projecting strips and the corresponding mortises on said base panel and by fastening the first pair of elongated side grooves and the first connector of each back panel in the second pair of elongated side projecting strips and the second connector of said first or second side panel; said top panel is attached to said front, side and back panels at the top with the elongated projecting strips and mortises thereof respectively fastened in the corresponding elongated grooves and tenons on the front, side and back panels.

5,117,482

POROUS CERAMIC BODY ELECTRICAL RESISTANCE FLUID HEATER

David E. Hauber, Troy, N.Y., assignor to Automated Dynamics Corporation, Troy, N.Y.

Filed Jan. 16, 1990, Ser. No. 465,372
Int. Cl.[5] H04B *3/12;* **F24H** *1/10*
U.S. Cl. 392—492 **8 Claims**



1. A fluid heater utilizing a porous electrically conductive body as a heating element energized by an electrical circuit, said heater comprising in combination:

(a) a hollow electrically conductive housing;

(b) an electrically insulating sleeve positioned coaxially in said housing to define an annular space therebetween;

(c) an electrically conductive porous ceramic body positioned concentrically within said electrically insulating sleeve to define an annular fluid flow path therebetween, said body having a central channel therein;

(d) fluid flow means to introduce a fluid into said annular flow path to radially inwardly penetrate through the porous network of said porous ceramic body;

(e) an electrical disc rear contactor positioned within one end of said cylindrical sleeve to peripherally engage said sleeve and axially electrically engage said body;

(f) an electrically conductive disc front contactor positioned concentrically at an opposite end of said sleeve to peripherally engage said housing in electrical contact relationship and axially engage said body in electrical contact relationship, said front disc contactor closing the front end of said annular flow path between said insulating sleeve and said porous body, and said front disc contactor having a central channel therein to provide a fluid flow passage from said central channel of said porous body through said front disc contactor and outwardly of the end of said hollow housing;

(g) an electrically conducting fluid conduit positioned coaxially in said housing to have an end thereof adjacent said rear electrical contactor;

(h) a fluid nozzle at said end of said fluid conduit in fluid flow relationship therewith with said nozzle engaging said rear disc contactor in electrical contact relationship;

(i) said rear disc contactor having axial grooves in its periphery engaging said sleeve to provide a fluid flow passage from said nozzle into said annular fluid flow path so that fluid from said conduit and said nozzle may flow into said annular fluid flow path and radially inwardly penetrate the pore structure of said hollow body to exit axially therefrom; and

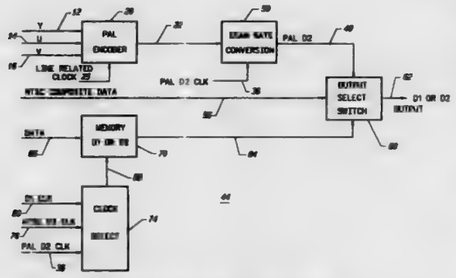
(j) electrical connection means on said housing and said electrically conductive fluid conduit to connect said housing and said conduit to an electrical circuit for electrically energizing said body to generate heat for heating said body and said fluid penetrating its pore structure.

5,117,483

DIGITAL PROCESSING SYSTEM FOR VIDEO AND TELEVISION SIGNAL GENERATION

Don Latshaw, Tigard, Oreg., assignor to Magni Systems, Inc., Beaverton, Oreg.

Filed Jun. 13, 1989, Ser. No. 365,843
Int. Cl.[5] G06F *15/63*
U.S. Cl. 395—100 **5 Claims**



1. A digital processing system comprising

test signal memory means for storing one video line for each component of a first digital video standard test signal clocked by a video line rate related clock,

encoder means for encoding the stored components to form a digital composite test signal,

interpolation data memory means for storing interpolation coefficients corresponding to the stored components, and

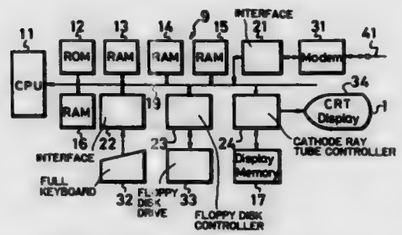
processor means for processing the digital composite test signal and the stored coefficients to form a full frame digital output test signal clocked at a rate different from the video line rate related clock.

5,117,484

TERMINAL APPARATUS FOR VIDEOTEX SYSTEM

Yutaka Nakagawa; Ryoichi Suga; Hiroya Mochida, all of Kanagawa; Masashi Tonomura, Tokyo, and Kazuhiko Shirai, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 838,529, Mar. 11, 1986, abandoned. This application Feb. 3, 1989, Ser. No. 305,616
Claims priority, application Japan, Mar. 18, 1985, 60-053876
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—100 **6 Claims**



1. An image information accessing terminal for accessing image information signals supplied by a remote data center, comprising:

input/output interface means for coupling the terminal to the data canter;

buffer memory means connected to the input/output interface means for storing the image information signals;

display control means, including a display memory, for selectively generating, in response to the stored image information signal, an output video signal which corresponds to the image information signal, but which is in a display form selected from a plurality of television display standards and storing the output video signal in the display memory; and

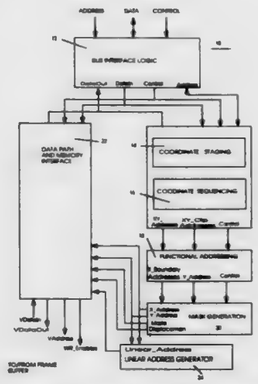
operator programmable control processor means connected to the buffer memory means and the display control means for controlling their operation and for supplying the control signal to the display control means.

5,117,485

METHOD AND APPARATUS FOR SORTING LINE SEGMENTS FOR DISPLAY AND MANIPULATION BY A COMPUTER SYSTEM

Chris Malachowsky, Santa Clara, and Curtis Priem, Freemont, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 287,392, Dec. 20, 1988, abandoned. This application Sep. 14, 1990, Ser. No. 584,496
Int. Cl.[5] G06F *15/62*
U.S. Cl. 395—134 **24 Claims**



9. In a computer graphics system in which information defining graphic images to be presented on an output display is available on a scan line basis for a pair of line segments subtending a portion of an image to be presented, the information including the slope of each line segment and the X positions of both line segments on each scan line, each scan line having a first end and a second end, a circuit comprising:

two comparator subportions, each of the comparator subportions adapted to process information regarding one of said line segments subtending a portion of the image to be presented;

means for receiving first signals representing first X positions of both said line segments to be processed for one scan line;

means for comparing said first signals to determine the relative positions to each other of said first X positions on the scan line;

means for selecting the X positions of the first end of the scan line based on the determination of said relative positions of said first X positions and the slope of each line segment;

means for receiving second signals representing second X positions of both line segments to be processed for the same scan line;

means for comparing said second signals to determine the relative positions to each other of said second X positions on the scan line;

means for selecting the X position of the second end of the scan line based on the determination of said relative positions of said second X positions and the slope of each line segment;

means for receiving signals indicative of the X positions of a clip window in which the portion of the image is to appear; and

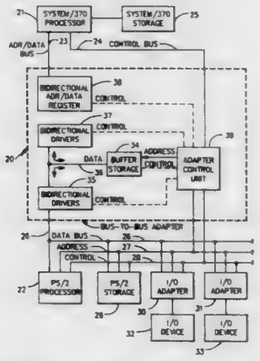
means for comparing said signals indicative of the X positions of a clip window to said first signals and said second signals.

5,117,486

BUFFER FOR PACKETIZING BLOCK OF DATA WITH DIFFERENT SIZES AND RATES RECEIVED FROM FIRST PROCESSOR BEFORE TRANSFERRING TO SECOND PROCESSOR

Alan R. Clark; Joseph P. Higham, both of Endicot, N.Y.; James E. Hughes, Hallstead, Pa., and James W. Valashinas, Endicott, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 21, 1989, Ser. No. 341,503
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—250 **5 Claims**



1. A communications adapter for coupling a first data processor to a second data processor, said communications adapter comprising:

buffer storage means for receiving and storing data supplied by said first data processor at a time, rate and location controlled by said first data processor, which data is en route to said second data processor;

transfer control means, coupled to said buffer storage means, for tracking the amount and location of said data received from said first data processor and stored in said buffer storage means, dynamically packetizing said data, and transferring a resultant packet of said data from said buffer storage means to said second data processor when said buffer storage means contains enough of said data to form said resultant packet, said transfer control means transferring said data from said first data processor to said buffer storage means in units or blocks of different size than said resultant packet, said transfer control means continuing the transfer of additional data from said first data processor to said buffer storage means while packetizing said data into said resultant packet and transferring said resultant packet of data from said buffer storage means to said second data processor; and

wherein a capacity of said buffer storage means for said data received from said first data processor is many times greater than a size of one of said packets; and

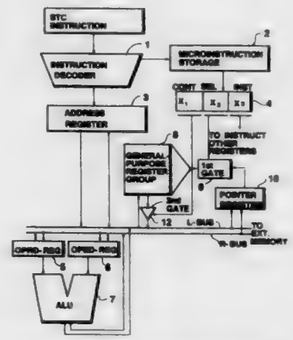
said first data processor has a different architecture than said second data processor, the architecture of said second data processor usually requiring receipt of data in said resultant packets whereas the architecture of said first data processor not requiring transmission of data in said resultant packets.

5,117,487

METHOD FOR ACCESSING MICROPROCESSOR AND MICROINSTRUCTION CONTROL TYPE MICROPROCESSOR INCLUDING POINTER REGISTER

Miyuki Nagata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 25, 1989, Ser. No. 398,437
Claims priority, application Japan, Aug. 26, 1988, 63-210673
Int. Cl.[5] G06F *9/26*
U.S. Cl. 395—375 **10 Claims**



1. A microinstruction control type microprocessor comprising:

decoder means for decoding an instruction to obtain a decoded instruction and address data; said address data designating an address of a control space allocated to a plurality of registers in a general-purpose register group;

address register means for temporarily storing the address data derived from the decoder means;

means for previously storing a plurality of microinstructions and for outputting said microinstructions one by one in response to the decoded instruction;

means for temporarily storing said output microinstruction and for producing a control signal;

calculation means for calculating the address data stored in the address register means to obtain bit information of the address data by shifting a preselected number of bits constituting said address data; and,

pointer register means for temporarily storing the bit information derived from said calculation means, said bit information being used to access a specific register contained in said general-purpose register group, while the general-purpose register group is instructed in response to the control signal.

5,117,488

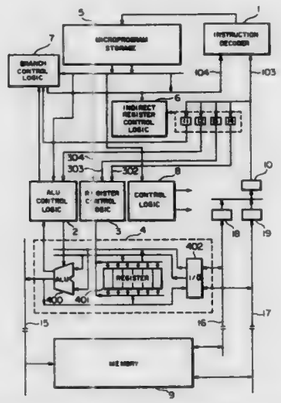
MICROPROGRAM CONTROLLED MICROPROCESSOR HAVING A SELECTIVELY EXPANDABLE INSTRUCTION CODE LENGTH INCLUDING INDEPENDENT DESCRIPTION OF OPERAND ADDRESSING AND A TYPE OF OPERATION FOR AN OPERAND BY SINGLE INSTRUCTION IN A COMMON CODING SCHEME

Kouki Noguchi, Kokubunji; Fumio Tsuchiya, Kodaira; Takashi Tsukamoto, Kodaira; Shigeki Masumura, Kodaira; Hideo Nakamura, Tokyo; Shiro Baba, Tokorozawa, and Yoshimune Hagiwara, Hachioji, all of Japan, assignors to Hitachi, Ltd.; Hitachi Microcomputer Engineering Ltd. and VLSI Engineering Corporation, Tokyo, Japan

Filed Nov. 1, 1988, Ser. No. 265,539
Claims priority, application Japan, Nov. 4, 1987, 62-277410
Int. Cl.[5] G06F *9/22, 9/26, 9/30, 9/34*
U.S. Cl. 395—375 **4 Claims**

1. A microprogram controlled microprocessor having an

instruction for selectively independently setting an operand addressing mode and a type of operation for an operand in one instruction, wherein said instruction outputted from an instruction register is selectively expandable by a unit of predetermined bit length, a first portion of said predetermined bit length code comprising a first instruction code designating said operand addressing, a second portion of said predetermined bit length code comprising a second instruction code designating an operation mode for said operand, said first instruction code and said second instruction code having common coding schemes, comprising:



a combinational logic circuit means for sequentially receiving said first instruction code and then said second instruction code in units of said predetermined bit length and decoding each of the codes by compressing into a shorter bit length with respect to said predetermined bit length thereby comprising an output signal; and

means for generating an address of a microprogram by merging the output signal of said combinational logic circuit and at least a portion of bit information of the microprogram.

5,117,489

DATA-DRIVEN PROCESSOR HAVING AN INTERNAL TAG-GENERATING SYSTEM FOR GENERATING A DISTINCT TAGGED INFORMATION AND ASSEMBLING WITH UN-TAGGED INFORMATION OF AN INPUT/OUTPUT DATA PACKET

Shinji Komori; Hidehiro Takata; Toshiyuki Tamura; Fumiyasu Asai, all of Itami, and Takeshi Fukuhara, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 155,429, Feb. 12, 1988, abandoned. This application Jan. 26, 1990, Ser. No. 471,684

Claims priority, application Japan, Apr. 22, 1988, 62-99338

Int. Cl.[5] G06F *9/32, 9/06*

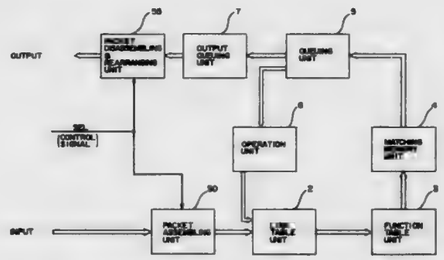
U.S. Cl. 395—375 **10 Claims**

1. A data-driven processor, having an input for receiving untagged data elements, which include no information indicating an instruction for processing the untagged data element, from an exterior source, said processor comprising:

tag-identification (TAG-ID) generating means for generating a set of distinct TAG-ID elements in response to the arrival of a series of untagged input data elements including no destination address from the exterior source;

packet assembly means, coupled to said TAG-ID generating means to receive said set of TAG-ID elements and said series of untagged data elements, for combining a unique one of said TAG-ID elements with each arriving untagged data element to assemble data packets which can be processed in the data-driven processor, where the TAG-ID element in a particular data packet includes at least a pointer to an instruction to be executed by the data-driven processor to process the untagged data element in said particular data packet;

program storage means, which stores therein instructions to be executed to process the untagged data element of said packets, for providing an instruction, identified by said pointer included in the TAG-ID element of the particular



data packet, to be combined with said particular data packet;

matching memory means, which stores at least untagged data elements, for providing a second untagged data element, identified by said pointer, to be combined with said particular data packet; and

an operation unit for processing the untagged data elements said particular data packet in accordance with the instruction combined with said particular data packet.

5,117,490

PIPELINED DATA PROCESSOR WITH PARAMETER FILES FOR PASSING PARAMETERS BETWEEN PIPELINE UNITS

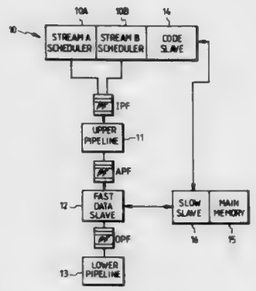
Colin M. Duxbury, Stockport; John R. Eaton, Lancs, and Philip V. Rose, Manchester, all of Great Britain, assignors to International Computers Limited, London, United Kingdom

Filed Jul. 13, 1989, Ser. No. 379,057

Claims priority, application United Kingdom, Jul. 27, 1988, 8817911

Int. Cl.[5] G06F *9/38, 9/30*

U.S. Cl. 395—375 **5 Claims**



1. Data processing apparatus comprising:

a) an instruction scheduler for producing a sequence of instructions,

b) an upper pipeline unit for generating operand addresses for each of said sequence of instructions,

c) a data slave store for retrieving operands, specified by said operand addresses,

d) a lower pipeline unit for performing operations on said operands,

e) an instruction parameter file for passing the instruction from the instruction scheduler to the upper pipeline unit, the instruction parameter file comprising a plurality of independently addressable registers,

f) an address parameter file for passing the operand addresses from the upper pipeline unit to the data slave store, the address parameter file comprising a plurality of independently addressable registers,

g) an operand parameter file for passing the operands from the data slave store to the lower pipeline unit, the operand parameter file comprising a plurality of independently addressable registers, and,

h) means operative whenever an instruction is scheduled by the instruction scheduler, for allocating one of said registers from the instruction parameter file to said instruction, and at the same time allocating one of said registers from the address parameter file and one of said registers from the operand parameter file to said instruction, and for deallocating said registers when said instruction is successfully completed by said lower pipeline unit.

5,117,491

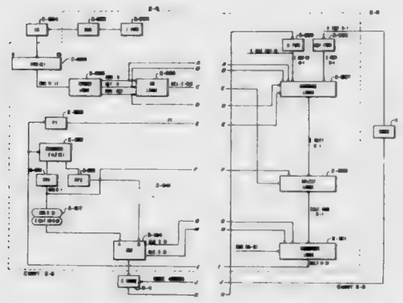
RING REDUCTION LOGIC USING PARALLEL DETERMINATION OF RING NUMBERS IN A PLURALITY OF FUNCTIONAL UNITS AND FORCED RING NUMBERS BY INSTRUCTION DECODING

Robert V. Ledoux, Litchfield; Richard P. Kelly, Nashua, both of N.H., and Forrest M. Phillips, North Chelmsford, Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Mar. 31, 1989, Ser. No. 332,258

Int. Cl.[5] G06F *9/06, 12/00*

U.S. Cl. 395—375 **8 Claims**



1. A ring reduction execution unit for generating a ring number of a ring reduction process during the execution of a pipeline instruction, said ring reduction execution unit comprising:

(a) process type register means for generating a secure process signal specifying a ring reduction operation;

(b) memory means for storing a first operand having a first ring number portion and a first data portion;

(c) ring effective register means for storing a second ring number generated by a virtual memory management unit;

(d) instruction register means for storing said pipeline instruction;

(e) control store means coupled to said instruction register means and responsive to said pipeline instruction for generating a plurality of firmware microinstructions for executing said pipeline instruction;

(f) decode logic means responsive to a first plurality of said firmware microinstructions for generating a plurality of ring control signals; and,

(g) compare logic means, coupled to said ring effective register means, said memory means, said process type register means, and said decode logic means, for concurrently responsive to said first ring number, said second ring number, said secure process signal and said plurality of ring control signals in order to generate an effective ring number, and said ring control signals being operative to force said effective ring number to a predetermined value for selected types of said pipeline instruction.

5,117,492

MEMORY ADDRESSING SYSTEM USING FIRST AND SECOND ADDRESS SIGNALS AND MODIFYING SECOND ADDRESS RESPONSIVE PREDETERMINED VALUES OF FIRST ADDRESS SIGNAL

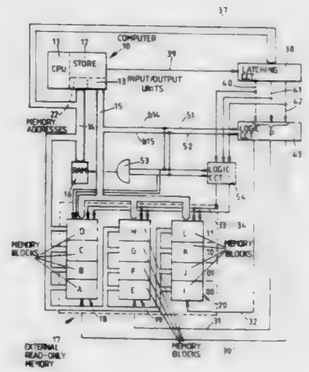
Alan J. Nash, Birmingham, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Oct. 12, 1989, Ser. No. 420,321

Claims priority, application United Kingdom, Nov. 3, 1988, 8825764

Int. Cl.[5] G06F *1/00, 12/00*

U.S. Cl. 395—400 **4 Claims**



1. A computer memory addressing system, said addressing system comprising:

an external memory including a plurality of memory units, each of said memory unit containing a plurality of blocks of memory locations;

means for supplying first address signals indicative of sets of said blocks of memory locations which reside in one or more of said plurality of memory units;

means for supplying second address signals;

a first logic circuit means, responsive to said first address signals and said second address signals, for generating enabling signals for respective ones of said memory units;

a second logic circuit means, responsive to predetermined values of said first address signal, for modifying one bit of at least one of said second address signals;

a second logic circuit means including means, responsive to a first address signals and either said second address signals, or said second address signal modified in response to predetermined vales of said first address signal, for generating access signals for respective ones of said blocks of memory locations in an enabled one of said memory units; and

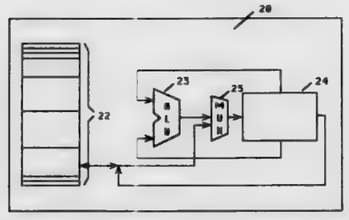
one block of memory locations in one of said memory units, including means for permitting access by an unmodified one of said second address signals only.

5,117,493

PIPELINED REGISTER CACHE

Eric H. Jensen, Livermore, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Aug. 7, 1989, Ser. No. 390,215
Int. Cl.[5] G06 *9/38*
U.S. Cl. 395—425 **11 Claims**



1. A computer processing unit, said computer processing unit comprising:

a plurality of primary registers, each of said primary registers having a register address tag and register data storage means;

an arithmetic and logic unit (ALU) for logically combining a first arithmetic input data value received on a first arithmetic input and a second arithmetic input data value received on a second arithmetic input to produce an arithmetic output data value transmitted on an arithmetic data output;

a multiplexor having a first multiplexor input coupled to said plurality of primary registers, a second multiplexor input coupled to the arithmetic data output of said arithmetic and logic unit, and a multiplexor output for presenting a multiplexor output data value selected between said first and said second multiplexor input;

a register cache having a register cache input coupled to the multiplexor output and a register cache output coupled to said primary registers, said register cache comprising a plurality of register stages, each of said register stages including storage means for storing a register stage address tag and a corresponding register stage data value, said register stages being arranged as a First-In, First-Out queue;

first bus means coupled to the first arithmetic input of said arithmetic and logic unit and coupled to each of said plurality of register stages; and

second bus means coupled to said arithmetic second input of said arithmetic and logic unit and coupled to each of said plurality of register stages.

5,117,494

SYSTEM FOR SELECTIVELY DETECTING AND BYPASSING INOPERATIVE MODULE WITHIN A DAISY CHAINED PROCESSING SYSTEM

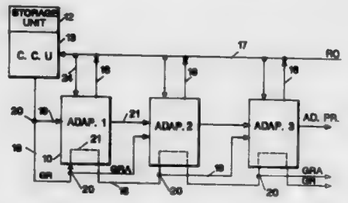
Michel Costes, Cagnes sur Mer; Alain R. Gach, and Jean-Pierre C. Dugre, both of Vence, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1987, Ser. No. 114,804
Claims priority, application European Pat. Off., Oct. 30, 1986, 86430045
Int. Cl.[5] G06Z *11/16, 13/37*
U.S. Cl. 395—575 **8 Claims**

1. A circuit for improving the operation of a plurality of adapters, each of which generates a status signal ("ADAPTER PRESENT"), said adapters being connected to a GR bus in a daisy-chain configuration said bus transporting a regular grant signal "GR" which is generated by a Central Control unit and is retransmitted by said adapters and said "GR" signal may be trapped by any adapter in the chain provided that said adapter has generated a service request which is to be satisfied by the Central Control Unit **(13)** connected to said adapters by a transmission bus **(11)** including a request line **17**, or said grant signal "GR" may be retransmitted ahead as a grant ahead "GRA" signal to the adapter after a next adapter in the chain said circuit comprising:

adapter-selecting means coupled to the request line, said adapter selecting means positioned in each adapter for monitoring service requests generated by other adapters **(10)** and generating a control signal that prevents any adapter from raising a new service request as long as the other adapters have requests pending;

means **(18, 19)** for providing the grant signal "GR" and the grant ahead "GRA" signal, said "GR" signal being transmitted by an adapter No (n−1) and is propagated on the chain directly to the adapter No (n), and the "GRA" signal is being transmitted to the adapter No (n) from an



adapter No (n−2) and by-passing said adapter No (n−1); and

grant signal selecting means **(44)** coupled to the adapter selecting means, said grant signal selecting means responsive to the status signal "ADAPTER PRESENT" from an adapter No (n−1) for determining which signal among the "GR" and "GRA" signals has to be selected by adapter No (n), said adapter No (n) selecting the regular grant signal "GR" transmitted by adapter No (n−1) in case said status signal of the latter adapter indicates that it is operative, and said adapter No (n) selecting the "GRA" signal generated by adapter No (n−2) and which by-passes adapter No (n−1) in case said status signal "ADAPTER PRESENT" of adapter No (n−1) indicates that it is not operative.

5,117,495

METHOD OF SORTING DATA RECORDS

Peter Liu, Paramus, N.J., assignor to Syncsort Incorporated, Woodcliff Lake, N.J.

Filed Mar. 7, 1990, Ser. No. 489,686
Int. Cl.[5] G06F *7/08*
U.S. Cl. 395—600 **9 Claims**

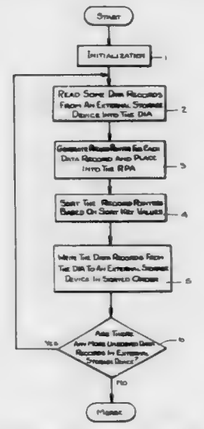
1. A computer process for storing unsorted data records in an external storage device in a desired order comprising the steps of:

(A) storing the unsorted data records in first preallocated computer memory locations,

(B) generating a record pointer for each data record stored in the first memory locations and storing the record pointers in second preallocated computer memory locations,

(C) sorting the record pointers into the desired order, and

(D) sequentially writing each data record to the external storage device directly from the first memory locations in



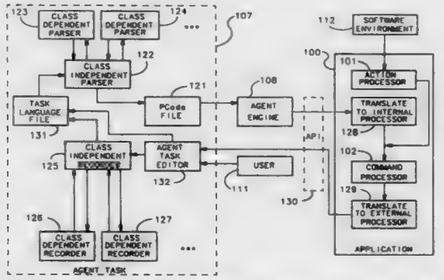
an order corresponding to the sorted order of the record pointers associated with the data records.

5,117,496

METHOD FOR RECORDING AND REPLAYING MOUSE COMMANDS BY RECORDING THE COMMANDS AND THE IDENTITIES OF ELEMENTS AFFECTED BY THE COMMANDS

Glenn Stearns, Scotts Valley; Barbara B. Packard, Los Altos Hills, and Ralph T. Watson, San Jose, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 23, 1988, Ser. No. 197,478
Int. Cl.[5] G06F *11/32*
U.S. Cl. 395—700 **15 Claims**



1. In a computing system which includes a viewer screen and a user interface which enables a user to select and move images displayed on the viewing screen, a computer implemented method for recording in a data file user commands for later playback, the recording of user commands requiring syntactic analysis to determine an identity of an entity, the user commands being made by the user via selection and movement of images on the viewing screen and the user commands being executable by a first application process, the computer implemented method comprising the steps, performed by the computing system, of:

(a) translating, by the fits application process, selection and movement of images on the viewing screen into semantic commands, the translation including performance of syntactic analysis of the selection and movement of images;

(b) concurrent with step (a) when syntactic analysis of selection and movement of images on the viewing screen indicate an entity on the computing system is to be operated upon by a semantic command and the first application process does not know the identity of the entity, performing the following substeps

(b.1) generating, by the first application process, an interrogation message to identify the entity that is to be operated upon, and,

(b.2) returning to the first application process, a response message identifying the entity; and,

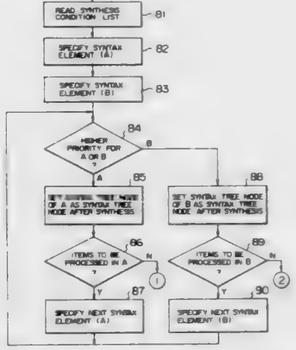
(c) recording the semantic commands translated in step (a) including the identity of any entity identified in step (b) in the data file.

5,117,497

SYSTEM FOR SYNTHESIZING PLURALITY OF SOURCE PROGRAMS BY COMBINING SYNTAX ELEMENTS AND CONDITIONS OF THE PROGRAMS

Yoshimasa Kanamori, Kanazawa, and Kazuhiko Imaizumi, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,822
Claims priority, application Japan, Sep. 18, 1987, 62-234529
Int. Cl.[5] G06F *9/06, 9/44*
U.S. Cl. 395—700 **3 Claims**



1. A program synthesize method of synthesizing source programs by combining a plurality of programs in a structured editor effecting a syntactical analysis on source programs in conformity with a syntax so as to generate syntax parse trees, comprising the steps, being performed on a computer, of:

specifying a synthesis condition on at least two programs;

synthesizing a source program by combining said at least two programs wherein syntax elements are selected from said at least two programs based on said synthesis condition; and

executing, after a synthesizing step is completed on syntax elements of one of said at least two programs assigned with a higher priority level based on said synthesis condition, a step for synthesizing remaining syntax elements of the other one of said at least two programs.

5,117,498

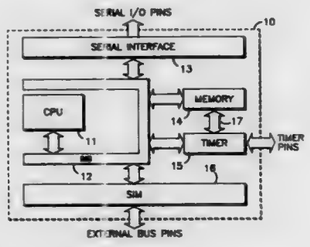
PROCESSER WITH FLEXIBLE RETURN FROM SUBROUTINE

Gary L. Miller, and James C. Nash, Both of Austin, assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 234,102, Aug. 19, 1988, abandoned. This application Sep. 19, 1990, Ser. No. 586,328

Int. Cl.[5] G06F *9/00*

U.S. Cl. 395—775 **28 Claims**



1. A data processor comprising:

execution means for executing instructions;

a register;

a counter;

a program counter; and

instruction fetch means for obtaining, using an address stored in the program counter, an instruction for execution by the execution means;

wherein the execution means further comprises:

first means for responding to a first one of said instructions by loading a value derived from a value contained in the program counter into the register, loading a destination address into the program counter, and enabling the counter to count once for each instruction executed by the execution means after the first instruction; and

second means for responding to the appearance of a predetermined count value in the counter by loading the contents of the register into the program counter.

5,117,499

DATA FLOW TYPE PROCESSING APPARATUS HAVING EXTERNAL AND CACHE MEMORIES FOR FETCHING PAIRED EXECUTING INSTRUCTION WHEN MISHIT OCCURS

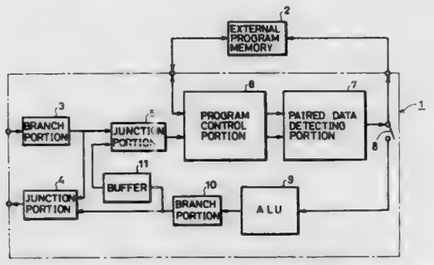
Souichi Miyata, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 19, 1989, Ser. No. 299,772

Claims priority, application Japan, Jan. 22, 1988, 63-12790; Jan. 22, 1988, 63-13279; Jan. 22, 1988, 63-13280

Int. Cl.[5] G06F *9/30, 9/00*

U.S. Cl. 395—800 **8 Claims**



3. A data flow type information processing apparatus comprising:

program control means for storing data flow programs, used to control said data flow type information processing apparatus in a memory, and fetching an instruction from a data flow program from the memory according to input data to be processed;

paired data detecting means for determining whether an instruction from the data flow program, and the input data to be processed, which are to be paired are inputted from said program control means;

operation processing means for executing the instruction of the data flow program based on the input data to be processed, when the instruction of the data flow program and the input data to be processed were paired by said paired data detecting means; and

external program storing means for supplying the data flow program to said program control means;

said program control means including,

input means for receiving the data flow program and for loading the input data to be processed from or into said external program storing means,

input/output control means for autonomous control separate from said program control means for selecting an output of the data flow program to be input to said input means and to said external program storing means, for selecting an input of the data flow program read out from said external program storing means, or for selecting an input of the input data to be processed to be fetched by said external program storing means,

a cache memory for storing the data flow program and outputting corresponding program data to said input-/output control means according to the input data to be processed,

first control means for accessing said cache memory according to address information contained in the input data to be processed, input from said input means or said input/output control means,

said control means for accessing said cache memory at least twice consecutively and outputting, together with copy information, the address information contained in the input data to be processed, input from said input means or said input/output control means, and

output control means for autonomous control separate from said program control means, for selectively outputting the input data to be processed, which was fetched by said cache memory and the input data to be stored by said external program storing means.

5,117,500

MULTI SYSTEM DECODING RECEIVER

Walter L. Davis, Plantation, Fla., and Kuppuswamy Raghunathan, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 924,183, Oct. 23, 1986, Pat. No. 4,829,466, which is a continuation of Ser. No. 699,899, Feb. 6, 1985, abandoned, which is a division of Ser. No. 575,472, Jan. 30, 1984, Pat. No. 4,518,961, which is a continuation of Ser. No. 192,779, Oct. 1, 1980, abandoned. This application Mar. 30, 1988, Ser. No. 83,743

The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.

Int. Cl.[5] G06F *1/00*

U.S. Cl. 395—800 **3 Claims**

1. A receiver for decoding signals transmitted in accordance with one of a plurality of different encoding formats, comprising:

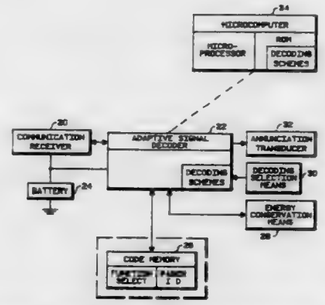
a communication receiver for detecting encoded signals transmitted over a communication channel;

a data sampler, coupled to said receiver to process said detected encoded signals in accordance with any one of a plurality of information decoding formats to provided decoded signals;

coding format selection means, coupled to said data sampler, and including identification means responsive to predetermined characteristics of said detected encoded signals for identifying the format used to encode the encoded signals,

said selection means automatically selecting, in response to said identification means, which of said plurality of information decoding formats will be utilized for processing said detected encoded signal;

a memory coupled to said code format selection means containing predetermined characteristics of decode signals corresponding to at least some of said plurality of information encoding formats; and



comparison means, coupled to said data sampler and said memory, for determining if said decoded signals correlate to said predetermined characteristics of decode signals for the selected information decoding format, and for producing a control, if said signals correlate, to indicate the reception of a message.

5,117,501

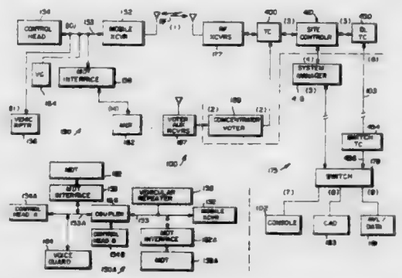
DYNAMIC REGROUPING IN A TRUNKED RADIO COMMUNICATIONS SYSTEM

Jeffrey S. Childress, and David L. Hattey, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Aug. 8, 1988, Ser. No. 229,814

Int. Cl.[5] H04B *7/15*

U.S. Cl. 455—11.1 **30 Claims**



4. A method of dynamically regrouping RF transceivers in a trunked radio repeater system including the steps of:

(1) transmitting a dynamic regroup control message over a digital RF control channel, said regroup message identifying an existing transceiver group;

(2) temporarily establishing an alternate digital RF control channel;

(3) in response to said regroup control message, retuning said existing transceiver group to said alternate control channel; and

(4) communicating further dynamic regroup control messages to said transceiver group over said alternate control channel.

5,117,502

MOBILE RADIO COMMUNICATION SYSTEM

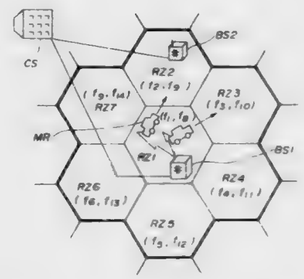
Masahiro Onoda, Sagamihara, and Yoshifumi Toda, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 15, 1991, Ser. No. 669,978

Claims priority, application Japan, Mar. 19, 1990, 2-68918

Int. Cl.[5] H04Q *7/00*

U.S. Cl. 455—33.1 **13 Claims**



1. A mobile radio communication system comprising:

a control station which is provided with respect to a control zone, said control zone being made up of a plurality of radio zones;

a base station which is provided with respect to each of the radio zones; and

a mobile station which is movable within the control zone,

said mobile station including first means for constantly monitoring a quality of a radio line between said mobile station and a first base station with which said mobile station is presently communicating, said first base station being provided with respect to a first radio zone, second means coupled to said first means for detecting a deterioration of the quality of the radio line between said mobile station and said first base station outside a tolerable range, third means coupled to said first means for successively detecting field intensities of signals received from the base stations neighboring said first base station using a free time slot which is unused by said mobile station for communication and for determining a maximum field intensity, fourth means coupled to said third means for supplying to said first base station predetermined information related to a second base station from which the signal with the maximum field intensity is received so as to make a handover request, and fifth means for ending the communication with said first base station in response to a handover message, said second base station being provided with respect to a second radio zone which is different from said first radio zone,

said first base station including means for supplying a handover request message to said control station in response to the handover request from said mobile station,

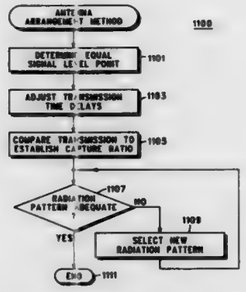
said control station including means for carrying out a handover process in response to the handover request message, said handover process including selecting a new communication channel with which said mobile station is to communicate with said second base station when said mobile station moves from said first radio zone to said second radio zone, and notifying the handover message and the new communication channel to said mobile station and said first and second base stations, so that said mobile station ends the communication with said first base station in response to the handover message and starts a communication with said second base station using the new communication channel.

5,117,503

DIRECTIONAL ANTENNA ARRANGEMENT METHOD FOR SIMULCAST BROADCASTING

Carl B. Olson, San Carlos, Calif., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 2, 1989, Ser. No. 415,799
Int. Cl.[5] H01Q *3/00*; H04B *7/005*
U.S. Cl. 455—51.1 **9 Claims**



1. In a simulcast antenna system covering a geographic area having at least a first and second transmission site and source site for sourcing a digital information signal, a method of improving reception coherence, comprising the steps of:

A) determining an equal signal level point of transmissions from the first and second transmission site;

B) adjusting at least one of the transmissions from the first and second transmission sites to cause a transmission of the information signal from the first transmission site to arrive at the equal signal level point at substantially the same time as a transmission of the information signal from the second transmission site;

C) comparing transmissions from the first transmission site with transmissions from the second transmission site at various points within the geographic area, to thereby measure at least one reception parameter;

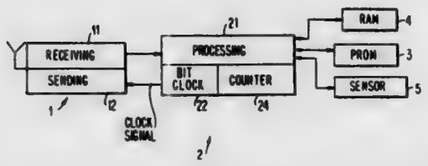
D) selecting a signal radiation pattern for at least one of the first and second transmission sites to optimize the at least one reception parameter.

5,117,504

COMMUNICATIONS DEVICE WITH ADJUSTMENT FOR TEMPERATURE DEPENDENT SIGNAL DELAYS

Ludwig Dennerlein, and Hubert Weber, both of Eckental, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1989, Ser. No. 455,720
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843181
Int. Cl.[5] H04B *17/00*; H03K *5/13*
U.S. Cl. 455—67.1 **16 Claims**



1. A communications device comprising means for receiving a message and transmitting an acknowledge signal; a delay unit for providing a delay time; and a control unit for causing said means to transmit said acknowledge signal delayed by a given response time, said given response time including said delay time, in response to receipt of said message,

characterized in that said device further comrpises means for adjusting said delay time, said means for adjusting comprising a temperature sensor for sensing a temperature within said device and an adjustment-value memory,

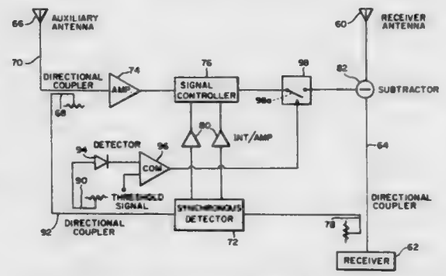
said control unit controlling said memory to receive from said memory an adjustment value corresponding to said temperature sensed by said sensor, and said control unit controlling said delay unit to adjust said delay time to a value corresponding to said adjustment value.

5,117,505

INTERFERENCE CANCELLATION SYSTEM HAVING NOISE REDUCTION FEATURES AND METHOD

Ashok K. Talwar, Westlake Village, Calif., assignor to American Nucleonics Corporation, West Lake Village, Calif.

Filed Feb. 22, 1990, Ser. No. 483,543
Int. Cl.[5] H04B *1/06*; H01Q *21/00*
U.S. Cl. 455—278.1 **6 Claims**



1. An interference cancellation system for connection to a radio receiver system having a receiver antenna, a receiver and a receiver transmission line electrically coupling the receiver antenna to the receiver, the interference cancellation system comprising:

an auxiliary antenna for receiving an interfering signal, the auxiliary antenna providing a reference signal corresponding to the interfering signal received by the auxiliary antenna;

a first directional coupler, the reference signal being provided to the first directional coupler, the first directional coupler having first and second outputs and respectively providing thereon first and second output signals each corresponding to the reference signal;

a second directional coupler, the second directional coupler being electrically coupled to the receiver transmission line, the second directional coupler having an output and providing thereon a sample signal corresponding to an interfering signal and desired signal received by the receiver antenna;

a third directional coupler, the third directional coupler being electrically coupled to the first directional coupler and having first and second outputs and respectively providing thereon first and second output signals each corresponding to the reference signal;

a first detector, the first detector being electrically coupled to the third directional coupler and providing a first detected output signal in response to the first output signal of the third directional coupler;

a synchronous detector, the synchronous detector having at least two inputs respectively electrically coupled to the third and second directional couplers and being responsive to the second output signal of the third coupler and the sample signal of the second coupler, the synchronous detector comparing the third coupler second output signal and the sample signal and providing at least one synchronous detector output signal in response thereto;

a signal controller, the signal controller having a first input electrically coupled to the first directional coupler and being responsive to the first output signal of the first coupler, and at least a second input electrically coupled to the synchronous detector, the signal controller having an output and providing thereon a cancellation signal in response to the synchronous detector output signal;

a subtractor, the subtractor being electrically coupled to the receiver transmission line and being further electrically coupled to the signal controller, the subtractor having an input on which is provided the cancellation signal, the subtractor effectively injecting the cancellation signal onto the receiver transmission line carrying the received interfering and desired signals, the cancellation signal injected into the receiver transmission line being equal in amplitude and opposite in phase to the interfering signal received by the receiver antenna and carried by the receiver transmission line so as to cancel the interfering signal on the receiver line;

a comparator, the comparator being provided with the first detected output signal of the first detector and with a predetermined threshold signal, the comparator comparing the first detected output signal and the predetermined threshold signal and providing an output signal in response thereto; and

switch means for coupling and decoupling at least a portion of the interference cancellation system from the radio receiver system, the switch means being electrically coupled to the comparator and being responsive to the output signal therefrom, the switch means including a first switch circuit, the first switch circuit being electrically coupled to the signal controller and to the subtractor and providing an electrical path between the signal controller and the subtractor in response to the output signal from the comparator.

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DESIGN PATENTS

GRANTED May 26 1992

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For CLASS	See PATENT NO.
D029-007	326,534

VOL
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MY
26
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326,348
BREAD ROLL

Graeme I. K. Walliker, 4 Virginia Pl., West Pennant Hills, N.S.W., 2120, Australia

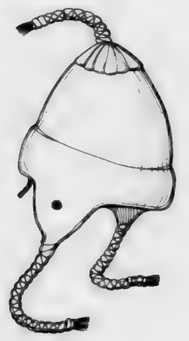
Division of Ser. No. 362,450, May 23, 1989, Pat. No. 5,000,084.
This application Dec. 18, 1990, Ser. No. 629,401
Claims priority, application Australia, Nov. 27, 1986, PH9186; PCT Int'l Appl., Nov. 26, 1987, PCT/AU87/00397
Term of patent 14 years
U.S. Cl. D1—122



326,349
HAT

Randall K. Clark, 139 East Rd., Colchester, Vt. 05446, and Anthony J. Telensky, Snowflake Dr., Jericho, Utah 05465

Filed Mar. 1, 1990, Ser. No. 486,723
Term of patent 14 years
U.S. Cl. D2—249



326,350
SHOE

Jeffrey Silverman, Scarsdale, N.Y., and Paula E. Hyde, Westport, Conn., assignors to Toddler U Inc., Westport, Conn.

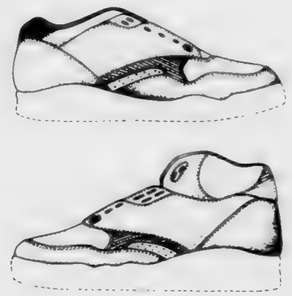
Filed Oct. 30, 1989, Ser. No. 428,668
Term of patent 14 years
U.S. Cl. D2—278



326,351
SHOE UPPER

Craig L. Feller; John S. Earle, both of Tigard, Oreg.; Charles Johnson, Herzogenaurach, Fed. Rep. of Germany, and David Collins, Taichung, Taiwan, assignors to Avia Group International, Inc., Portland, Oreg.

Filed Jan. 13, 1991, Ser. No. 647,637
Term of patent 14 years
U.S. Cl. D2—314



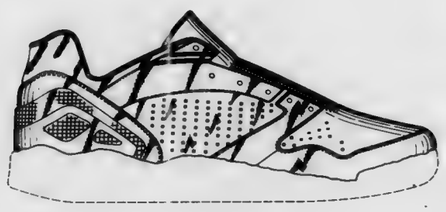
326,352
SHOE UPPER
Craig L. Feller, Tigard, and Peter P. Backus, Portland, both of Oreg., assignors to Avia Group International, Inc., Portland, Oreg.
Filed Feb. 8, 1991, Ser. No. 652,918
Term of patent 14 years
U.S. Cl. D2—314



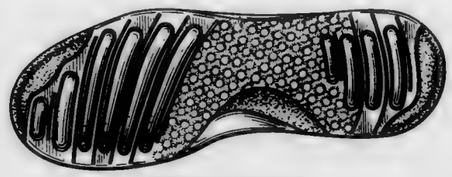
326,353
SHOE UPPER
Judith R. Close, Dedham, Mass., assignor to Reebok International Ltd., Stoughton, Mass.
Filed Apr. 12, 1991, Ser. No. 684,349
Term of patent 14 years
U.S. Cl. D2—314



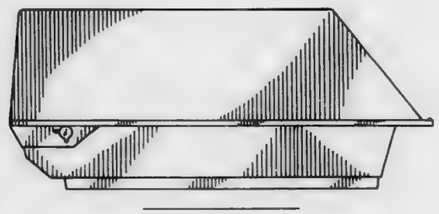
326,354
SHOE UPPER
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jun. 13, 1991, Ser. No. 714,736
Term of patent 14 years
U.S. Cl. D2—314



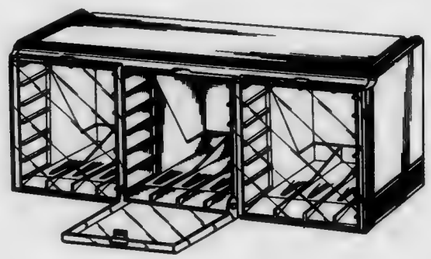
326,355
SHOE SOLE
Kristin N. Cotsidas, Manhattan Beach, Calif., assignor to L.A. GEAR, Inc., Los Angeles, Calif.
Filed Sep. 11, 1991, Ser. No. 757,918
Term of patent 14 years
U.S. Cl. D2—320



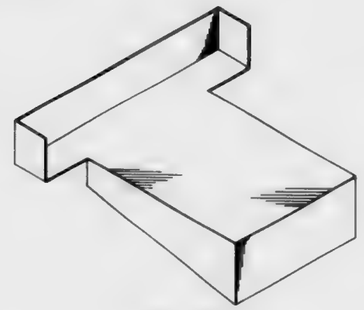
326,356
STORAGE CONTAINER FOR MAGNETIC MEDIA
Robert A. Egly, 31 Belcourt, Newport Beach, Calif. 92660
Filed Dec. 27, 1988, Ser. No. 289,792
Term of patent 14 years
U.S. Cl. D3—35



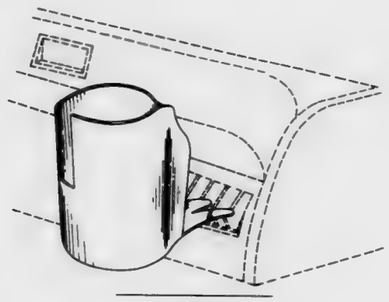
326,357
HOLDER FOR DISCS OR THE LIKE
Yun-Sheung Chow, Kowloon, Hong Kong, assignor to Sun Hing Audio Equipment Mfy. Ltd., Kowloon, Hong Kong
Filed Feb. 26, 1990, Ser. No. 485,328
Claims priority, application United Kingdom, Aug. 24, 1989, 2000603
Term of patent 14 years
U.S. Cl. D3—35



326,358
PIZZA BOX TRANSPORT TRAY
Robert K. Rothbard, 601 N. Clear Creek Dr., Friendswood, Tex. 77546
Filed Feb. 29, 1988, Ser. No. 161,611
Term of patent 14 years
U.S. Cl. D3—40



326,359
BEVERAGE COOLER-CARRIER FOR VEHICLE VENT
John H. Friend, 10200 Arno Rd., Galt, Calif. 95632
Filed Nov. 3, 1989, Ser. No. 431,131
Term of patent 14 years
U.S. Cl. D3—40



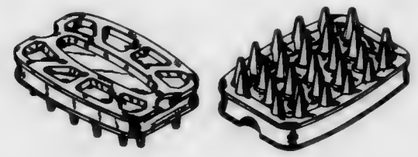
326,360
HANDBAG OR SIMILAR ARTICLE
Alecos Tasou, London, England, assignor to Hi-Tek Bags, Ltd., London, England
Filed Jan. 27, 1989, Ser. No. 303,630
Term of patent 14 years
U.S. Cl. D3—44



326,361
TOOTHBRUSH
R. Gregory Layman, 4435 S. Rural Rd., #367, Tempe, Ariz. 85282
Filed May 22, 1989, Ser. No. 355,308
Substitute of Ser. No. 92,696, Sep. 3, 1987, abandoned.
Term of patent 14 years
U.S. Cl. D4—114



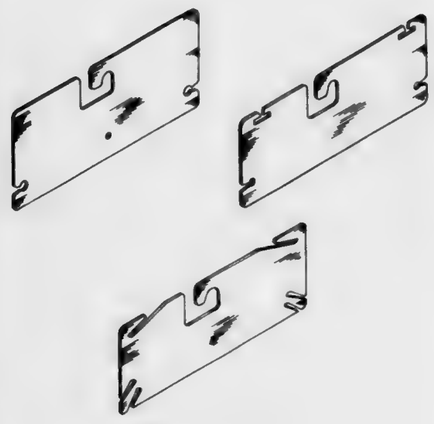
326,362
BRUSH FOR GROOMING ANIMALS
Dale E. Bertwell, 2100 S. Dayton, Denver, Colo. 80231
Filed Dec. 4, 1989, Ser. No. 445,015
Term of patent 14 years
U.S. Cl. D4—136



326,363
CAMOUFLAGE FABRIC
Kevin J. Cooper, P.O. Box House No. 83, Railroad St., Picture Rocks, Pa. 17762
Filed Apr. 12, 1989, Ser. No. 336,669
Term of patent 14 years
U.S. Cl. D5—32



326,365
APPAREL HANGER
Carl S. Stevens; Charles L. Nesbit, Jr., and Larry C. White, all of Winston-Salem, N.C., assignors to Bali Company, Winston-Salem, N.C.
Filed May 29, 1990, Ser. No. 529,263
Term of patent 14 years
U.S. Cl. D6—315



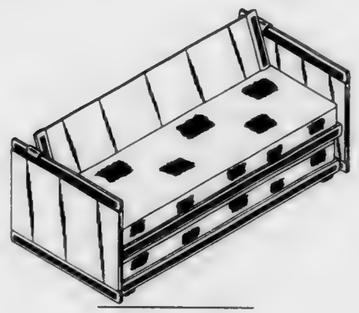
326,366
RACK FOR SUSPENDING CAPS
May Fung, Scarborough, Canada, assignor to Etna Products Co. Inc., New York, N.Y.
Filed Jul. 15, 1991, Ser. No. 729,802
Term of patent 14 years
U.S. Cl. D6—320



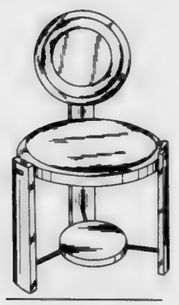
326,364
SPORTSCARD FRAME
Edward D. Harper, 1120 Montreal Dr., Yukon, Okla. 73099
Filed Mar. 2, 1990, Ser. No. 487,704
Term of patent 14 years
U.S. Cl. D6—300



326,367
SOFABED
Rosario Messina, Serengno, Italy, assignor to Flou S.P.A., Meda, Italy
Filed Mar. 8, 1989, Ser. No. 320,454
Claims priority, application Italy, Sep. 13, 1988, 21843/88[U]
Term of patent 14 years
U.S. Cl. D6—335



326,368
CHAIR
Chantal Vilmar-Matthews, 214 Weirfield St., Brooklyn, N.Y. 11221
Filed Jun. 6, 1989, Ser. No. 362,324
Term of patent 14 years
U.S. Cl. D6—363



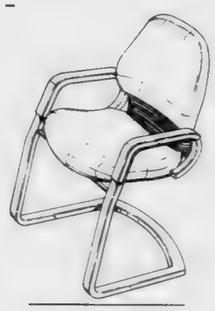
326,369
CHAIR
Jurek Buchacz, "Lovli" , 2360 Ringsaker, Norway
Filed Feb. 28, 1989, Ser. No. 317,276
Claims priority, application Norway, Sep. 2, 1988, 69625
Term of patent 14 years
U.S. Cl. D6—366



326,370
CHAIR
Jurek Buchacz, "Lovli" , 2360 Ringsaker, Norway
Filed Feb. 28, 1989, Ser. No. 317,278
Claims priority, application Norway, Sep. 2, 1988, 69625
Term of patent 14 years
U.S. Cl. D6—366



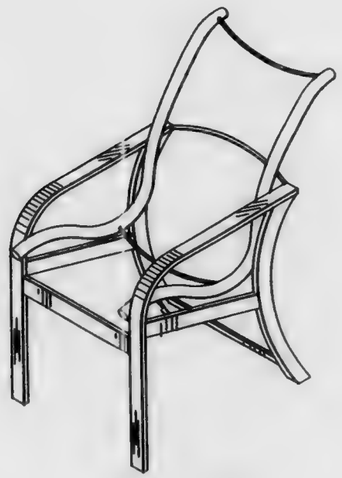
326,371
CHAIR
Jurek Buchacz, "Lovli" , 2360 Ringsaker, Norway
Filed Feb. 28, 1989, Ser. No. 317,279
Claims priority, application Norway, Sep. 2, 1988, 69625
Term of patent 14 years
U.S. Cl. D6—372



326,372
CHAIR
Thomas M. Edwards, Wyoming, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.
Division of Ser. No. 262,665, Oct. 25, 1988, Pat. No. Des. 323,433. This application Jun. 28, 1991, Ser. No. 724,342
Term of patent 14 years
U.S. Cl. D6—360



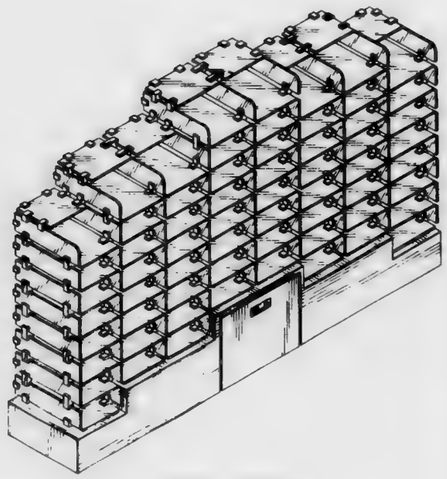
326,373
CHAIR FRAME
Stephen C. Hess, Birmingham, Ala., assignor to Winston Furniture Company of Alabama, Inc., Birmingham, Ala.
Continuation-in-part of Ser. No. 272,863, Nov. 17, 1988, Pat. No. Des. 321,603. This application Apr. 5, 1989, Ser. No. 334,113
The portion of the term of this patent subsequent to Aug. 6, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—379



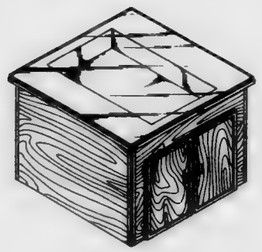
326,374
CLOTHES TREE
Thomas C. Townsend, 208 Hillside Ter., Vista, Calif. 92084
Filed Feb. 20, 1990, Ser. No. 482,392
Term of patent 14 years
U.S. Cl. D6—412



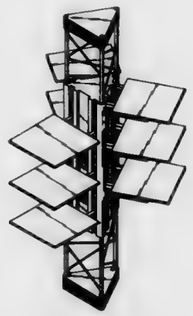
326,375
DISPLAY UNIT
Edward J. Manley, Clarks Summit, Pa., and Robert M. Schumacher, Lake Worth, Fla., assignors to Aureus, Ltd., West Pittston, Pa.
Filed Jul. 24, 1989, Ser. No. 383,991
Term of patent 14 years
U.S. Cl. D6—437



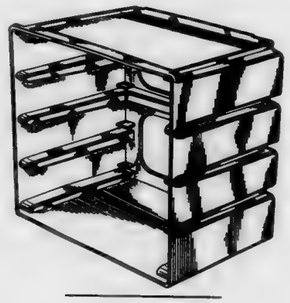
326,376
CABINET
Jesse Barfield, 4208 Canterwood Dr., Houston, Tex. 77068
Filed Aug. 17, 1989, Ser. No. 395,413
Term of patent 14 years
U.S. Cl. D6—436



326,377
DISPLAY RACK FOR AUDIO VIDEO EQUIPMENT
Richard Nagel, Rethorn-Ganderkesee, Fed. Rep. of Germany, assignor to Structura Raum- und Lichtelemente Vertriebsgesellschaft mbH & Co. KG, Bremen, Fed. Rep. of Germany
Filed Mar. 1, 1988, Ser. No. 162,748
Term of patent 14 years
U.S. Cl. D6—461



326,378
CONTAINER RACK
Robert J. Yunger, and James S. Schumaker, both of Plano, Ill., assignors to Plano Molding Company, Plano, Ill.
Filed Nov. 13, 1989, Ser. No. 435,293
Term of patent 14 years
U.S. Cl. D6—467



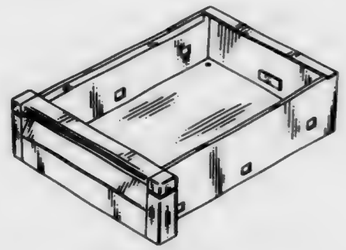
326,379
MAGAZINE RACK
Mark T. Gilbey, Flat 3, 17 Chelsham Road, London SW4 6MP, United Kingdom
Filed Feb. 23, 1990, Ser. No. 483,948
Term of patent 14 years
U.S. Cl. D6—475



326,380
ARMREST
Thomas M. Edwards, Wyoming, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed Oct. 25, 1988, Ser. No. 262,664
Term of patent 14 years
U.S. Cl. D6—501



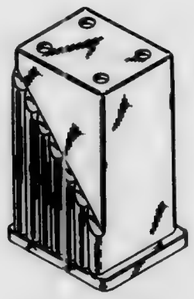
326,381
DRAWER
Charles H. Heiligenthal; Larry D. Pacetti; Jack A. Parise, and George R. Slivon, all of Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed Sep. 25, 1989, Ser. No. 411,623
Term of patent 14 years
U.S. Cl. D6—510



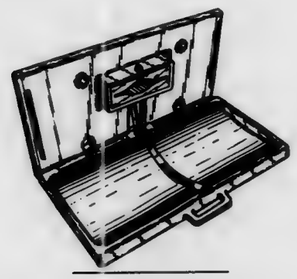
326,382
TOWEL ROD BRACKET
Hsi C. Ko, No. 69, Lane 22, Chang Ting Rd., Lu Kang Chen, Changhua Hsien, Taiwan
Filed Aug. 9, 1990, Ser. No. 564,987
Term of patent 14 years
U.S. Cl. D6—550



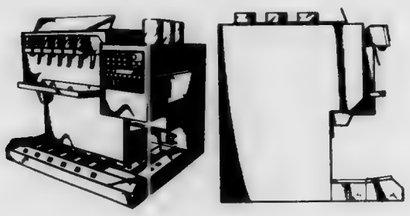
326,383
TOOTHBRUSH COVER OR SIMILAR ARTICLE
Claudette M. Tapocik, 2961 McAllister Ave., Riverside, Calif. 92503
Filed Apr. 2, 1990, Ser. No. 503,164
Term of patent 14 years
U.S. Cl. D6—534



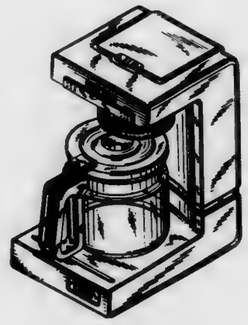
326,384
FOLD DOWN, WALL-MOUNTED DIAPER CHANGING TABLE
Timothy P. Burt, Minneapolis, and Scott W. Smith, Eden Prairie, both of Minn., assignors to American Infant Care Products Corporation, Eden Prairie, Minn.
Filed Sep. 19, 1990, Ser. No. 584,848
Term of patent 14 years
U.S. Cl. D6—555



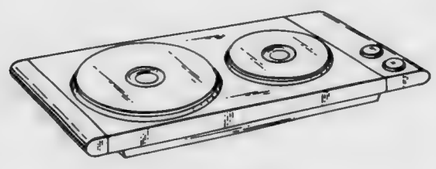
326,385
AUTOMATIC BEVERAGE DISPENSER
Benjamin D. Miller, Chicago; Thaddeus M. Jablonski, Palatine, both of Ill., and Ronald L. Wiley, Marietta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Continuation-in-part of Ser. No. 316,010, Feb. 27, 1989, Pat. No. 4,951,719. This application Aug. 7, 1989, Ser. No. 390,263
Term of patent 14 years
U.S. Cl. D7—308



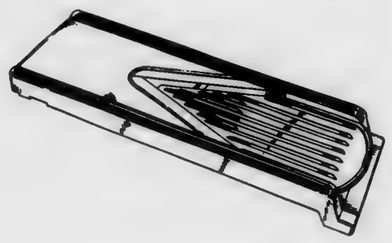
326,386
COMBINED CARAFE AND COFFEE MAKER
William J. Rakocy, Madison; Ronald L. Muller, Old Saybrook, and Masao Tsuji, Old Lyme, all of Conn., assignors to North American Philips Corp., New York, N.Y.
Division of Ser. No. 217,571, Jul. 11, 1988, Pat. No. Des. 317,546. This application Jan. 30, 1991, Ser. No. 647,868
Term of patent 14 years
U.S. Cl. D7—309



326,387
TABLE TOP RANGE
Perry H. Monitto, East Meadow, and Paul J. Farrell, Commack, both of N.Y., assignors to Parallel Development Corp., Jericho, N.Y.
Filed Feb. 16, 1989, Ser. No. 311,589
Term of patent 14 years
U.S. Cl. D7—346



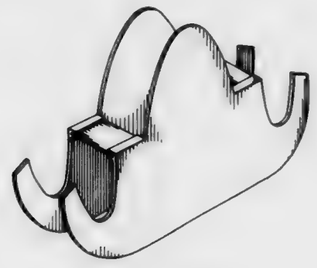
326,388
FOOD SLICER
Alfred Boerner, Niederkail, Fed. Rep. of Germany, assignor to A. Boerner GmbH, Fed. Rep. of Germany
Filed Dec. 7, 1989, Ser. No. 447,259
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1989, 8904005
Term of patent 14 years
U.S. Cl. D7—381



326,389
DECALCOMANIA FOR CHINA DINNERWARE OR SIMILAR ARTICLE
Jeanette Mattson, Syracuse, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 10, 1989, Ser. No. 321,339
Term of patent 14 years
U.S. Cl. D7—396.5



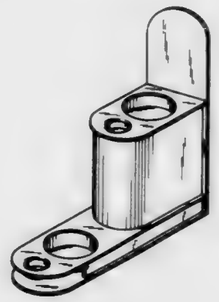
326,390
TACO HOLDER
Allen R. Landel, 811 Newport Green, Newport, R.I. 02840
Filed Jul. 30, 1990, Ser. No. 560,964
Term of patent 14 years
U.S. Cl. D7—504



326,391
CONTAINER
Maurice Verzhere, Oyonnax, France, assignor to Injectaplastic SA, France
Filed Sep. 25, 1990, Ser. No. 587,692
Claims priority, application Hague, Mar. 26, 1990, DM/016 266
Term of patent 14 years
U.S. Cl. D7—605



326,392
HOLDER ASSEMBLY FOR BEVERAGE DISPENSERS AND CUPS
Victor A. Mondry, 5409 Esther Beach Rd., Madison, Wis. 53713, and David V. Dipiazza-Pearson, 6110 Winnequah Rd., Madison, Wis. 53716
Filed Mar. 5, 1990, Ser. No. 488,765
Term of patent 14 years
U.S. Cl. D7—616



326,393
KNIFE
Robert W. Wilhite, 560 N. Arden Bl., Los Angeles, Calif. 90004
Filed Aug. 4, 1989, Ser. No. 389,784
Term of patent 14 years
U.S. Cl. D7—649

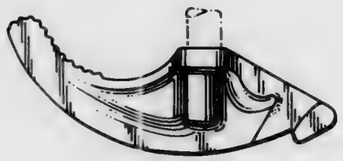


326,394
CUTLERY CONTAINER
Kjell O. Rymoen, Blomstervn.24, 2200 Kongsvinger, Norway
Filed Mar. 26, 1990, Ser. No. 498,603
Claims priority, application Norway, Dec. 5, 1989, 891074
Term of patent 14 years
U.S. Cl. D7—641

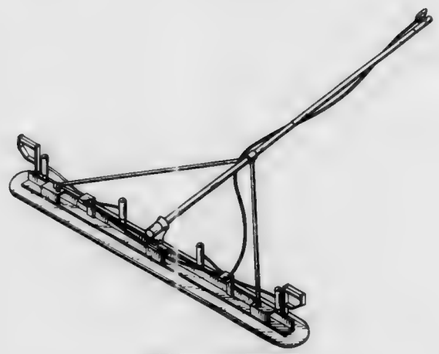


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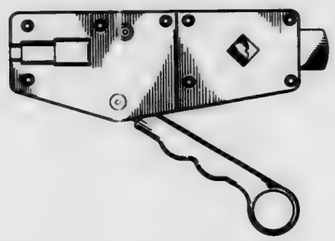
326,395
PIPE BENDER
Cecil H. Aulgur, Independence, Mo., assignor to Mary Adell Vincent, Kansas City, Mo.
Filed Sep. 18, 1989, Ser. No. 409,026
Term of patent 14 years
U.S. Cl. D8—32



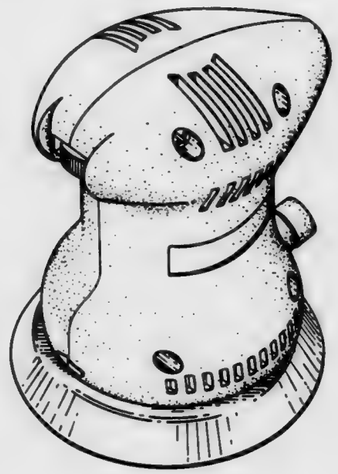
326,396
COMBINED BULL FLOAT AND CONCRETE TAMPER
Joe M. Owens, 842 Lake Holiday Dr., Sandwich, Ill. 60548
Filed Jan. 25, 1989, Ser. No. 301,278
Term of patent 14 years
U.S. Cl. D8—45



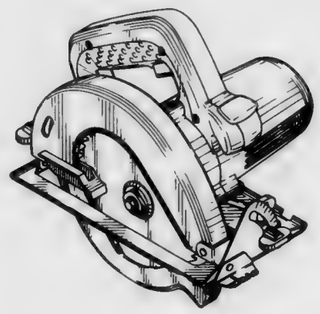
326,397
COMBINED COAXIAL CABLE STRIPPER AND CONNECTOR ATTACHMENT TOOL
Richard A. Steiner, East Haddam, Conn., assignor to Rostra Tool Company, Branford, Conn.
Filed Aug. 23, 1989, Ser. No. 399,755
Term of patent 14 years
U.S. Cl. D8—51



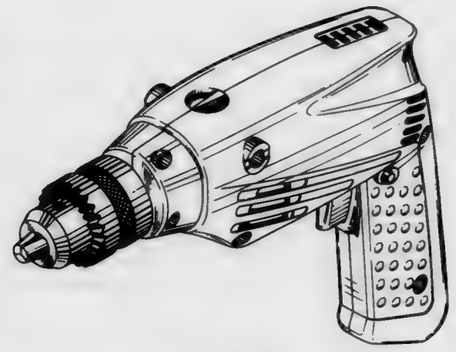
326,398
ORBITAL SANDER
Fusao Fushiya, and Shinobu Yamaguchi, both of Nagoya, Japan, assignors to Makita Electric Works, Ltd., Japan
Filed Nov. 15, 1989, Ser. No. 437,492
Claims priority, application Japan, May 23, 1989, 1-18752
Term of patent 14 years
U.S. Cl. D8—62



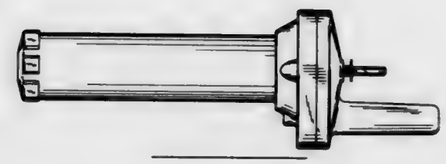
326,399
PORTABLE ELECTRIC CIRCULAR SAW
Fusao Fushiya, and Masahiko Ono, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Dec. 21, 1989, Ser. No. 454,129
Claims priority, application Japan, Jun. 26, 1989, 1-23582
Term of patent 14 years
U.S. Cl. D8—66



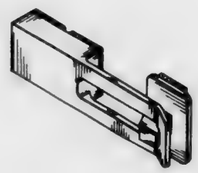
326,400
PORTABLE ELECTRIC DRILL
Fusao Fushiya, and Katsuya Hatakeyama, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Dec. 21, 1989, Ser. No. 454,130
Claims priority, application Japan, Jun. 28, 1989, 1-23943
Term of patent 14 years
U.S. Cl. D8—68



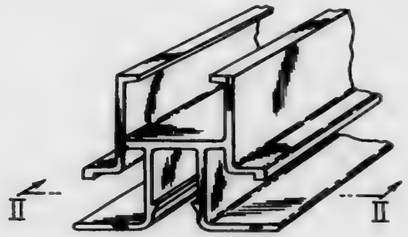
326,401
CAULKING GUN
Ved P. Gakhar; Wilfred M. McCord, and David S. Hubbard, all of Louisville, Ky., assignors to Vermont American Corporation, Louisville, Ky.
Filed Sep. 12, 1989, Ser. No. 406,748
Term of patent 14 years
U.S. Cl. D8—70



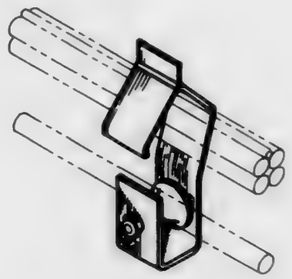
326,402
REFRIGERATOR LATCH
Michael Nicholoulias, 2407 Manchester Ave., Cardiff, Calif. 92007
Filed Jul. 5, 1990, Ser. No. 548,738
Term of patent 14 years
U.S. Cl. D8—331



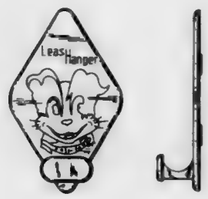
326,403
SUPPORT ELEMENT FOR SECURING FOIL SHEET WALL INSULATION OR THE LIKE
Peter H. Kleias, Highton, Australia, assignor to Renhurst Products Pty. Ltd., Geelong, Australia
Filed Sep. 6, 1989, Ser. No. 403,321
Claims priority, application Australia, Mar. 8, 1989, 681/89
Term of patent 14 years
U.S. Cl. D8—349



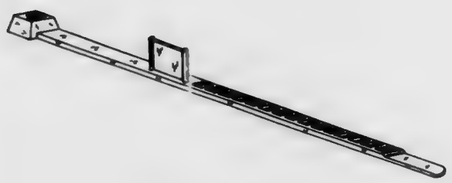
326,404
CABLE SUPPORT
Louis T. Spell, 10016 E. Fowler Ave., Thonotosassa, Fla. 33592
Filed May 2, 1990, Ser. No. 517,605
Term of patent 14 years
U.S. Cl. D8—356



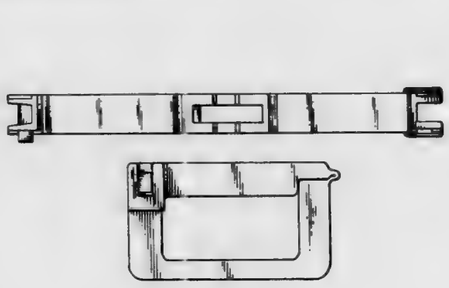
326,405
LEASH HANGER
Joseph Leto, 3480 Frosty Way, Naples, Fla. 33940
Filed Jul. 31, 1990, Ser. No. 560,343
Term of patent 14 years
U.S. Cl. D8—367



326,406
STRAP FASTENER
Franklin R. Anderson, Durham, and John M. Schroer, Raleigh, both of N.C., assignors to Custom Molders, Inc., Durham, N.C.
Filed Jan. 11, 1990, Ser. No. 463,607
Term of patent 14 years
U.S. Cl. D8—394



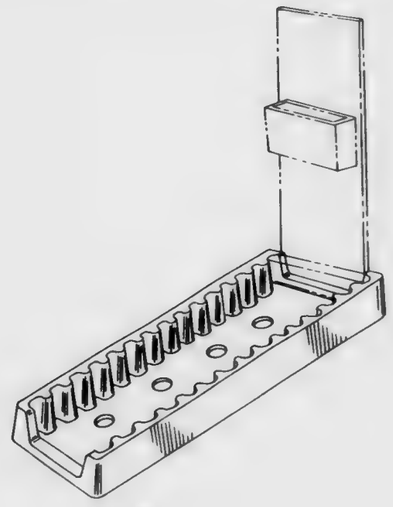
326,407
WIRE BUNDLE CLAMP
Fuminori Ito, Nagoya, Japan, assignor to Kitagawa Industries Co., Ltd., Japan
Filed Oct. 16. 1990, Ser. No. 598,144
Claims priority, application Japan, Apr. 25, 1990, 2-14202
Term of patent 14 years
U.S. Cl. D8—395



326,408
EXPANDABLE PLUG
Lindy Smith, Huntington Beach, Calif., assignor to Aladdin Equipment Company, Inc., Huntington Beach, Calif.
Division of Ser. No. 212,664, Jun. 28, 1988, abandoned. This application Oct. 13, 1989, Ser. No. 421,003
Term of patent 14 years
U.S. Cl. D8—499



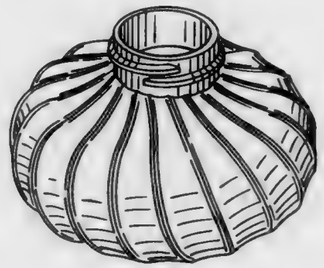
326,409
DISPLAY PACKAGE FOR FOOD PRODUCTS OR THE LIKE
Michael B. Krueger; Robert J. Howard, both of Madison, and Jay A. Eason, Middleton, all of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.
Filed Aug. 25, 1989, Ser. No. 398,724
Term of patent 14 years
U.S. Cl. D9—341



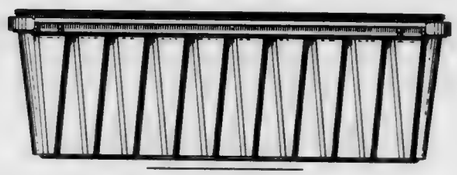
326,410
COMBINED COSMETIC SAMPLE CONTAINER AND STAND
Leon Friedman, Mastic Beach, N.Y., assignor to True Products Sampling, Inc., Island Park, N.Y.
Filed Aug. 29, 1990, Ser. No. 575,508
Term of patent 14 years
U.S. Cl. D9—517



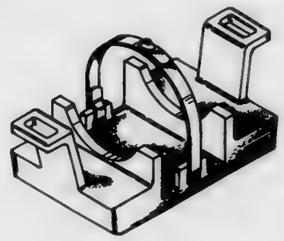
326,411
BOTTLE
Mark E. Wefler, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Mar. 20, 1990, Ser. No. 496,829
Term of patent 14 years
U.S. Cl. D9—552



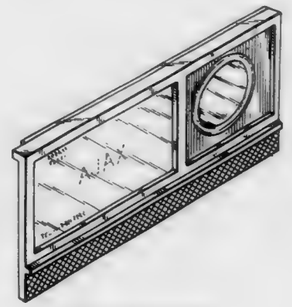
326,412
CONTAINER
Dominique Lesquir, Buckland, Canada, assignor to IPL Inc., Canada
Filed Jun. 4, 1990, Ser. No. 533,070
Term of patent 14 years
U.S. Cl. D9—425



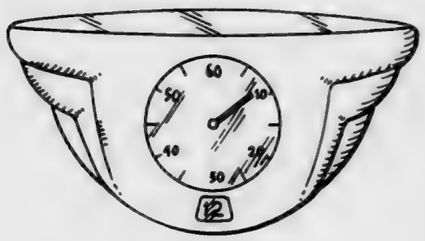
326,413
BARREL SUPPORT
John Vitous, 3648 Foster Rd., N. Versailles, Pa. 15137
Filed Oct. 6, 1989, Ser. No. 418,349
Term of patent 14 years
U.S. Cl. D9—455



326,414
COMBINED CLOCK AND CARD HOLDER
Sol Africk, 3723 Maple Leaf Dr., Glenview, Ill. 60025
Filed Jun. 14, 1990, Ser. No. 538,925
Term of patent 14 years
U.S. Cl. D10—2



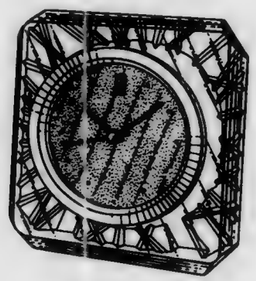
326,415
CLOCK
Gianni Bulgari, Rome, Italy, assignor to Gianni Bulgari S.p.A., Rome, Italy
Filed Mar. 12, 1990, Ser. No. 492,180
Claims priority, application World Int. Prop. O., Sep. 12, 1989, DMA/001079
Term of patent 14 years
U.S. Cl. D10—20



326,416
CLOCK
Hisako Sugano, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Sep. 5, 1989, Ser. No. 402,924
Term of patent 14 years
U.S. Cl. D10—22



326,417
CLOCK
Masakiro Aikawa, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Sep. 11, 1989, Ser. No. 405,672
Term of patent 14 years
U.S. Cl. D10—26



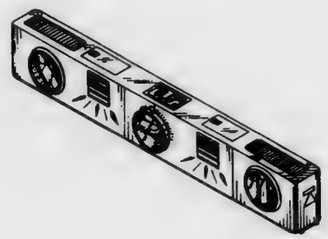
326,418
WATCH
Xavier Rousseau, Paris, France, assignor to Societe Nouvelle Chaumet, S.A., Paris, France
Filed Dec. 27, 1988, Ser. No. 290,732
Term of patent 14 years
U.S. Cl. D10—30



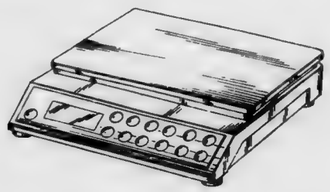
326,419
WRISTWATCH
Gianni Bulgari, Rome, Italy, assignor to Gianni Bulgari S.p.A., Rome, Italy
Filed Jan. 31, 1989, Ser. No. 304,373
Term of patent 14 years
U.S. Cl. D10—39



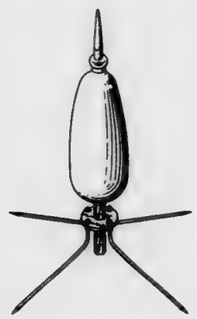
326,420
LEVEL
Thomas Reitano, 59 A Locust Ave. #61, New Rochelle, N.Y. 10801
Filed Dec. 7, 1989, Ser. No. 447,247
Term of patent 14 years
U.S. Cl. D10—69



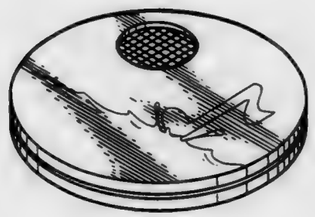
326,421
KITCHEN SCALE
Franz A. Stützer, Offenbach am Main, and Bernd Köhler, Obertshausen, both of Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Aug. 22, 1989, Ser. No. 397,022
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 8901461
Term of patent 14 years
U.S. Cl. D10—92



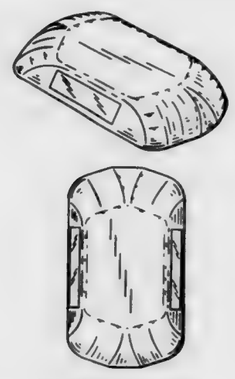
326,422
LIGHTNING PREVENTER AIR TERMINAL
Kenneth P. Heary, Springville, N.Y., assignor to Heary Bros. Lightning Protection Co., Inc., Springville, N.Y.
Filed May 14, 1990, Ser. No. 522,850
Term of patent 14 years
U.S. Cl. D10—105



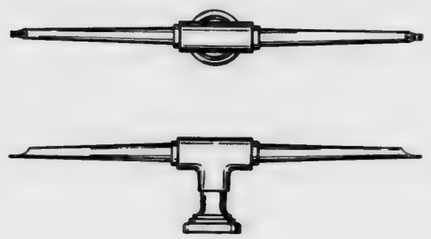
326,423
MOISTURE SENSING ALARM FOR A DIAPER
Thomas Clyde, P.O. Box 2986, Soldotna, Ak. 99669
Filed Jul. 12, 1990, Ser. No. 551,725
Term of patent 14 years
U.S. Cl. D10—106



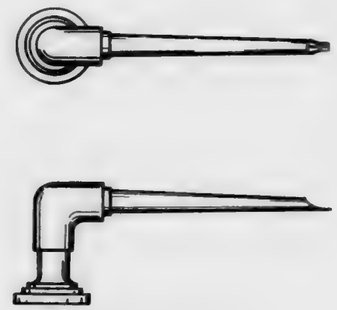
326,424
PAVEMENT MARKER
Michael W. Sakko, P.O. Box 2501, Winter Haven, Fla. 33883
Filed Mar. 19, 1990, Ser. No. 496,492
Term of patent 14 years
U.S. Cl. D10—113



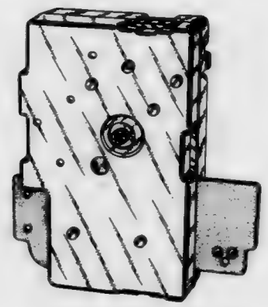
326,425
PORTABLE CHEMILUMINESCENT MARKER
Jacob O. Smith, Sr., 601 Armenia Dr., Pensacola, Fla. 32505
Filed Mar. 12, 1990, Ser. No. 491,846
Term of patent 14 years
U.S. Cl. D10—114



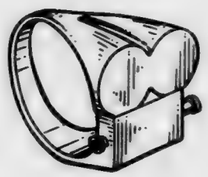
326,426
PORTABLE CHEMILUMINESCENT MARKER
Jacob O. Smith, Sr., 601 Armenia Dr., Pensacola, Fla. 32505
Filed Mar. 12, 1990, Ser. No. 491,847
Term of patent 14 years
U.S. Cl. D10—114



326,427
CLOCK MOVEMENT
Takumi Matsuda, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jul. 9, 1990, Ser. No. 549,695
Term of patent 14 years
U.S. Cl. D10—129



326,428
FINGER RING
Ronnie Bermann, 3755 Richmond Ave., Houston, Tex. 77046
Filed Dec. 19, 1989, Ser. No. 452,944
Term of patent 14 years
U.S. Cl. D11—30



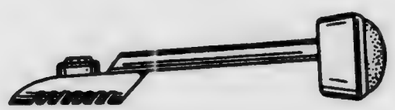
326,429
EARRING
Aya Azrielant, New York, N.Y., assignor to Andin International, Inc., New York, N.Y.
Filed Jul. 30, 1990, Ser. No. 559,191
Term of patent 14 years
U.S. Cl. D11—43



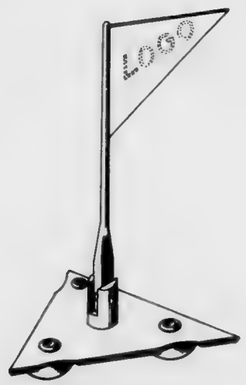
326,430
EARRING
Mary E. Ortega, 924 San Pedro SE., Apt. #2, Albuquerque, N. Mex. 87108
Filed Oct. 5, 1989, Ser. No. 417,680
Term of patent 14 years
U.S. Cl. D11—42



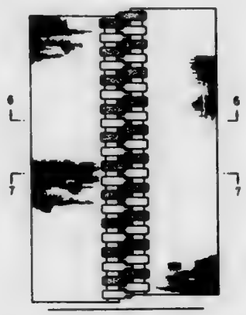
326,431
PENDANT OR SIMILAR ARTICLE
Antonio Maldonado, and Maria Maldonado, both of 15 Alpha Dr., Florissant, Mo. 63031
Filed Nov. 3, 1989, Ser. No. 431,132
Term of patent 14 years
U.S. Cl. D11—81



326,432
AUTOMOBILE WINDSHIELD PENNANT
William J. McNulty, 527 E. Minor Dr., Kansas City, Mo. 64131
Filed Feb. 6, 1990, Ser. No. 476,015
Term of patent 14 years
U.S. Cl. D11—166



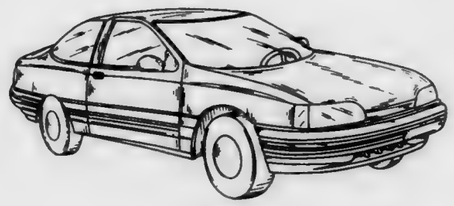
326,433
SLIDE FASTENER CHAIN
Toshiaki Takizawa, and Shinichi Kojima, both of Kurobe, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan
Filed Jun. 5, 1989, Ser. No. 361,586
Term of patent 14 years
U.S. Cl. D11—221



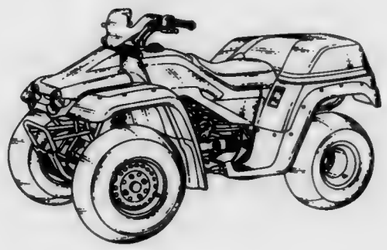
326,434
BUTTON OR THE LIKE
James F. Levy, 434 Barnwell St., Columbia, S.C. 29205
Filed Sep. 26, 1990, Ser. No. 588,420
Term of patent 14 years
U.S. Cl. D11—222



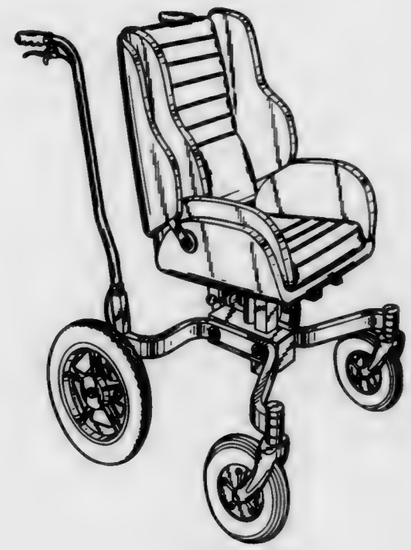
326,435
PASSENGER CAR
Tae K. Park, Ulsan, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea
Filed Feb. 8, 1989, Ser. No. 307,592
Claims priority, application Rep. of Korea, Nov. 4, 1988, 88-14987
Term of patent 14 years
U.S. Cl. D12—92



326,436
FOUR WHEEL VEHICLE
Gen Tamura, Kokubunji; Yukinori Kawaguchi, Fujima, both of Japan, and Kazuhiko Saito, Rancho Palos Verdes, Calif., assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 18, 1989, Ser. No. 408,792
Term of patent 14 years
U.S. Cl. D12—107



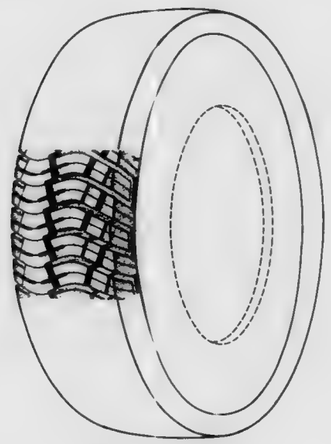
326,437
MOBILE CHAIR
Poul Kühl, Ligusterneij; Flemming Moeller; Erik Ernst, both of Soevind, all of Denmark
Filed Nov. 9, 1990, Ser. No. 611,370
Term of patent 14 years
U.S. Cl. D12—128



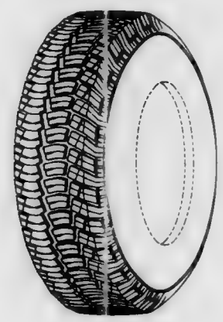
326,438
AUTOMOBILE TIRE
Tetsuhito Tsukagoshi, Kodaira; Naomichi Funato, Kawasaki, and Shinji Murase, Kodaira, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Oct. 4, 1988, Ser. No. 253,289
Claims priority, application Japan, Apr. 4, 1988, 63-13504
Term of patent 14 years
U.S. Cl. D12—142



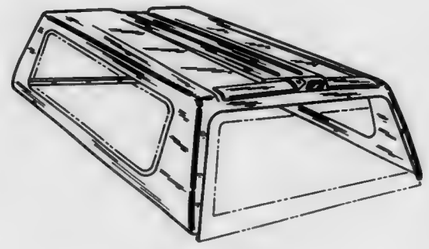
326,439
TIRE TREAD AND BUTTRESS
Darrell E. Covert, Uniontown; Paul B. Maxwell, Akron; Frederick W. Miller, Akron; Richard L. Galante, Akron; Michael A. Kolowski, Mogadore; William M. Hopkins, Hudson, and Anthony J. Scarpitti, Uniontown, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 15, 1989, Ser. No. 436,869
The portion of the term of this patent subsequent to May 26, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147



326,440
TIRE TREAD AND BUTTRESS
Michael A. Kolowski, Mogadore; William M. Hopkins, Hudson; Anthony J. Scarpitti, Uniontown; Andrew N. Hoang, Akron; Darrell E. Covert, Uniontown; Paul B. Maxwell, Akron; Frederick W. Miller, Akron, and Richard L. Galante, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation-in-part of Ser. No. 436,869, Nov. 15, 1989. This application Apr. 2, 1990, Ser. No. 503,560
The portion of the term of this patent subsequent to May 26, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147

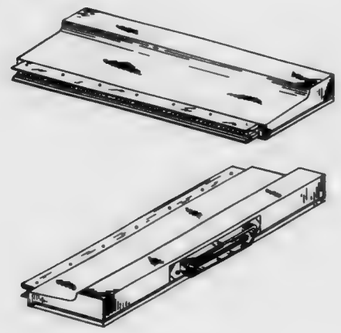


326,441
TRUCK CAP
Charles R. Rogers, 8696 Spinnaker Way, Apartment C1, Ypsilanti, Mich. 48197
Filed Jun. 21, 1990, Ser. No. 541,354
Term of patent 14 years
U.S. Cl. D12—156

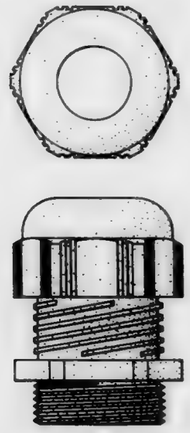


326,442
TRIMARAN BOAT WITH HUMAN-POWERED PROPELLER DRIVE
Sidney G. Shutt, 612 Briarwood Dr., Brea, Calif. 92621
Filed Jul. 6, 1989, Ser. No. 376,259
Term of patent 14 years
U.S. Cl. D12—306

326,443
ADAPTER FOR TELECOMMUNICATIONS TERMINALS
David L. Ingalsbe, Hastings, Minn., assignor to Independent Technologies, Inc., Omaha, Nebr.
Filed Feb. 12, 1990, Ser. No. 478,775
Term of patent 14 years
U.S. Cl. D13—147



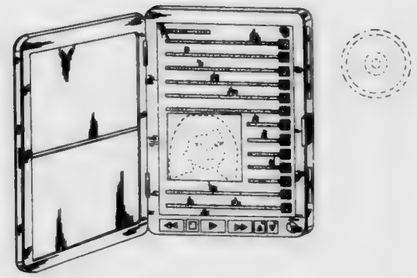
326,444
CABLE GLAND FOR SECURING ELECTRICAL CABLES AND CONDUITS
Udo Studenski, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to U. I. Lapp KG, Fed. Rep. of Germany
Filed Jul. 17, 1989, Ser. No. 380,252
The portion of the term of this patent subsequent to May 19, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—156



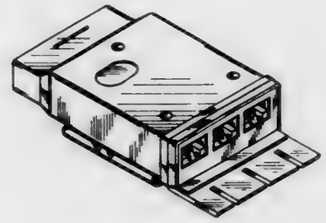
326,445
EXTENSION FOR A LIGHT SWITCH ACTUATOR
Tom J. Enyeart, 308 N. Washington, Atkinson, Ill. 61235
Filed Jun. 12, 1990, Ser. No. 537,102
Term of patent 14 years
U.S. Cl. D13—173



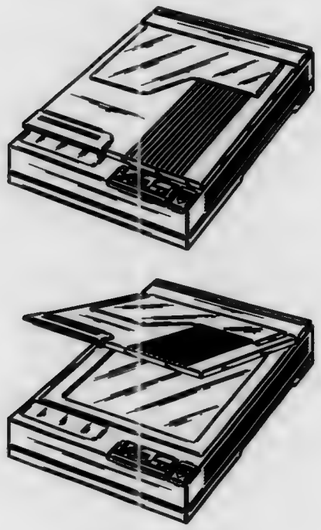
326,446
COMBINED ELECTRONIC BOOK AND CD ROM READER
Curtis G. Wong, 1108 Olmstead Dr., Glendale, Calif. 91202
Filed Jul. 26, 1989, Ser. No. 385,297
Term of patent 14 years
U.S. Cl. D14—100



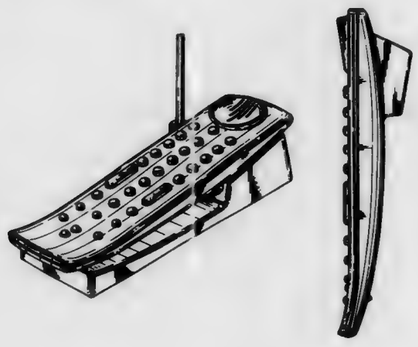
326,447
PROBE MODULE OR THE LIKE
Robert M. Hofland, and Philip D. Smith, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 334,401, Apr. 5, 1989. This application Nov. 17, 1989, Ser. No. 439,111
Term of patent 14 years
U.S. Cl. D14—107



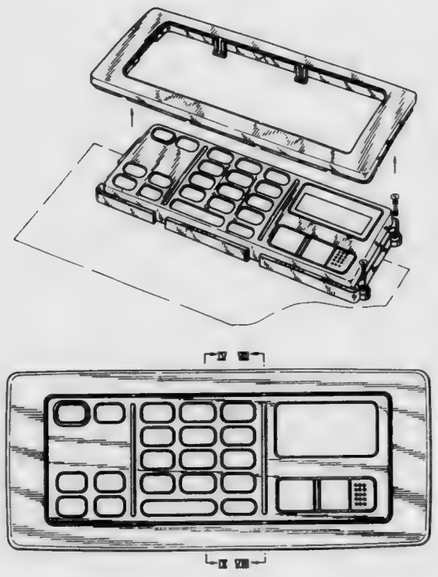
326,448
DOCUMENT SCANNER
Kouki Fukuda, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Feb. 14, 1990, Ser. No. 480,218
Claims priority, application Japan, Aug. 25, 1989, 1-31045
Term of patent 14 years
U.S. Cl. D14—107



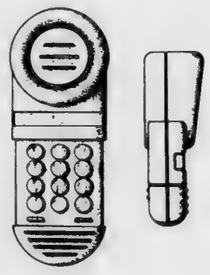
326,449
COMBINATION INTEGRAL REMOTE CONTROL AND CORDLESS HANDSET UNIT TOGETHER WITH A TELEPHONE BASE UNIT WITH AN ANTENNA
David E. Wachob, Elkins Park, Pa., and Charles Curbbun, Huntington Beach, Calif., assignors to General Instrument Corporation, Hatboro, Pa.
Filed Jan. 7, 1991, Ser. No. 637,747
Term of patent 14 years
U.S. Cl. D14—138



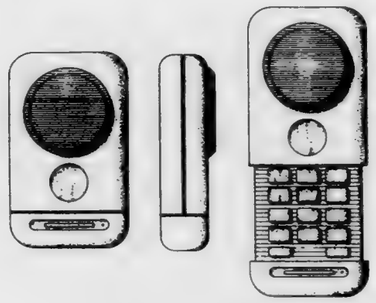
326,450
AUTOMOTIVE TELEPHONE CONTROL UNIT
Katsuhito Watanabe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jan. 7, 1991, Ser. No. 638,423
Claims priority, application Japan, Oct. 5, 1990, 2-33436
Term of patent 14 years
U.S. Cl. D14—138



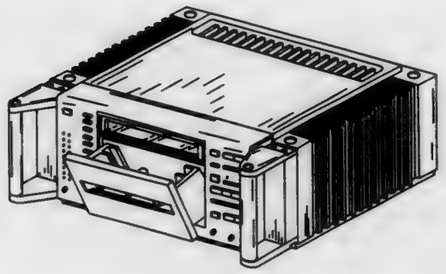
326,451
TELEPHONE
George P. Roegner, Vero Beach, Fla., assignor to Parker Instrument Corp., New York, N.Y.
Filed Apr. 4, 1991, Ser. No. 680,261
Term of patent 14 years
U.S. Cl. D14—138



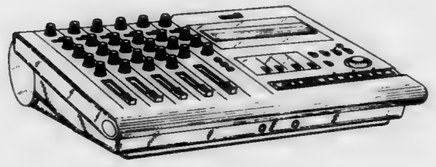
326,452
TELEPHONE
George P. Roegner, Vero Beach, Fla., assignor to Parker Instrument Corp., New York, N.Y.
Filed Apr. 4, 1991, Ser. No. 680,264
Term of patent 14 years
U.S. Cl. D14—138



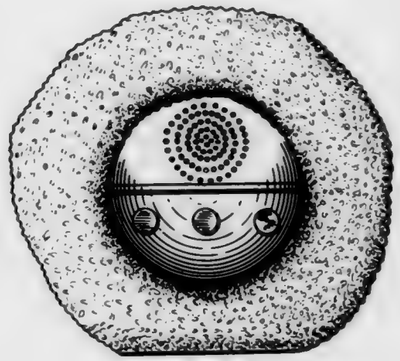
326,453
COMBINED TUNER AND TAPE DECK
Ryozo Hayashi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 27, 1989, Ser. No. 428,756
Term of patent 14 years
U.S. Cl. D14—162



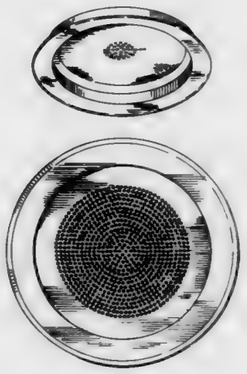
326,454
COMBINED AUDIO MIXER AND TAPE RECORDER
Masafumi Ito, Tokyo, and Shigeru Hasegawa, Kodaira, both of Japan, assignors to TEAC Corporation, Tokyo, Japan
Filed Oct. 31, 1990, Ser. No. 607,096
Claims priority, application Japan, May 7, 1990, 2-15216
Term of patent 14 years
U.S. Cl. D14—162



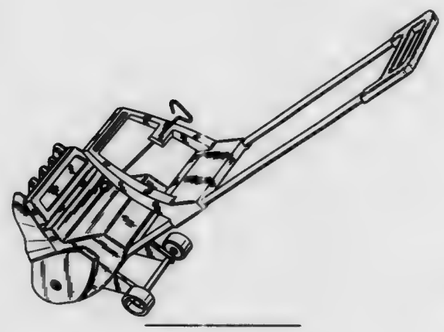
326,455
RADIO
William Kanellos, Park Forest, Ill., assignor to HGK Advertising, Inc., Chicago, Ill.
Filed Nov. 6, 1989, Ser. No. 432,961
Term of patent 14 years
U.S. Cl. D14—189



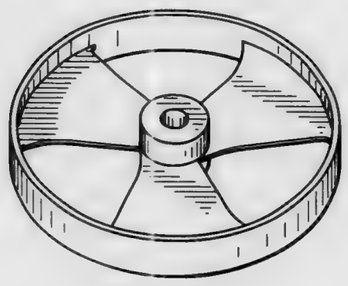
326,456
REGRESSED SPEAKER GRILLE
Richard Hahn, Richmond Heights, Mo., assignor to PRS, Inc., St. Louis, Mo.
Filed Jun. 26, 1989, Ser. No. 374,641
Term of patent 14 years
U.S. Cl. D14—219



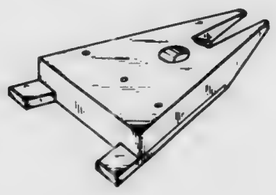
326,457
SNOW THROWER
Anthony N. Pink, Shakopee, and Floyd Niskanen, Golden Valley, both of Minn., assignors to The Toro Company, Minneapolis, Minn.
Continuation of Ser. No. 294,143, Jan. 6, 1989, abandoned. This application Sep. 25, 1991, Ser. No. 765,476
Term of patent 14 years
U.S. Cl. D15—11



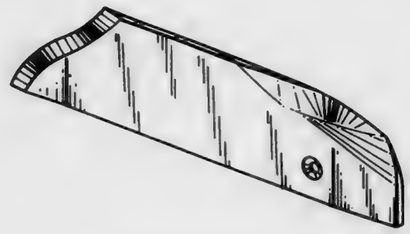
326,458
LEAF BLOWER GRASS TRIMMER ATTACHMENT
Robert D. Huber, Jr., 616E 700N, Westville, Ind. 46391
Filed May 23, 1989, Ser. No. 355,376
Term of patent 14 years
U.S. Cl. D15—17



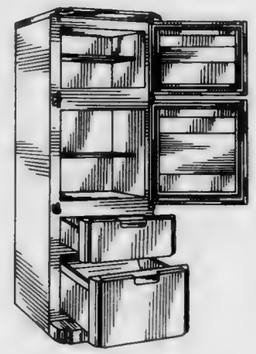
326,459
PRESS PLATE
Kevin M. Anderson, P.O. Box 32, Andover, S. Dak. 57422
Filed Nov. 16, 1989, Ser. No. 437,506
Term of patent 14 years
U.S. Cl. D15—29



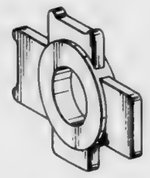
326,460
SIDE PLATE FOR AN EARTHWORKING SEED PLANTING AND FERTILIZING TOOL
Kevin M. Anderson, P.O. Box 32, Andover, S. Dak. 57422
Division of Ser. No. 251,862, Oct. 3, 1988, Pat. No. Des. 313,804. This application Aug. 24, 1990, Ser. No. 571,886
Term of patent 14 years
U.S. Cl. D15—29



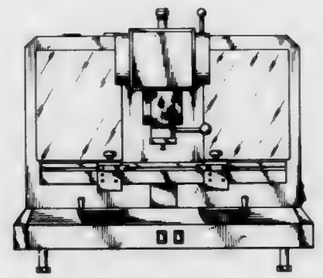
326,461
REFRIGERATOR
Kaname Nakao, and Keiko Matoba, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 23, 1989, Ser. No. 327,590
Claims priority, application Japan, Sep. 29, 1988, 63-38722
Term of patent 14 years
U.S. Cl. D15—86

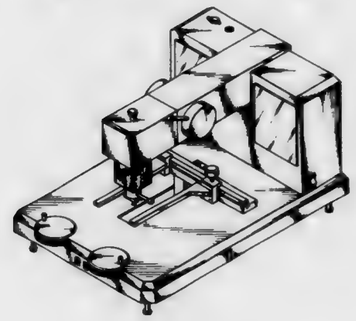


326,462
TRIGGER LOCK FOR FUEL PUMP NOZZLE
Daniel Cooper, 324 Empress La., League City, Tex. 77573
Filed Mar. 26, 1990, Ser. No. 498,390
Term of patent 14 years
U.S. Cl. D15—9.1

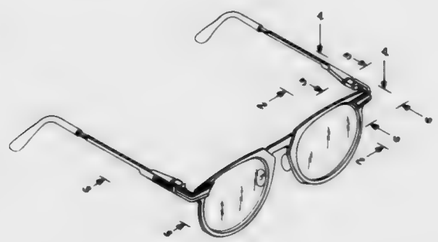


326,463
SURFACE MOUNT REWORK STATION
David Jacks, Pomona, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Apr. 12, 1989, Ser. No. 337,115
Term of patent 14 years
U.S. Cl. D15—125





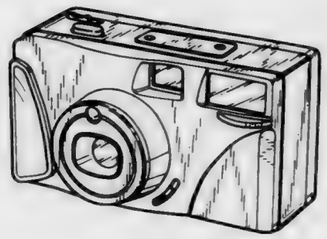
326,464
EYEGLASS FRAME
Vittorio Tabacchi, Padova, Italy, assignor to Safilo, S.p.A., Padova, Italy
Filed Oct. 31, 1989, Ser. No. 436,508
Term of patent 14 years
U.S. Cl. D16—102



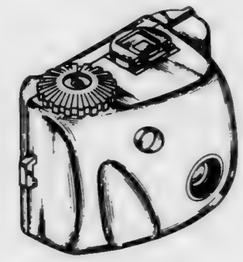
326,465
EYEGLASSES WITH FRAME INSERTS
Judith Coyle, 11 Glendale, Homer, Ill. 61849-1203
Filed Dec. 11, 1989, Ser. No. 448,602
Term of patent 14 years
U.S. Cl. D16—102



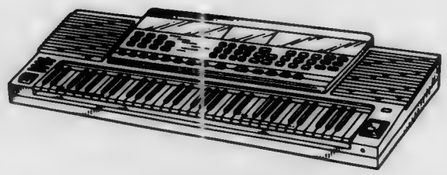
326,466
CAMERA
Jae G. Yu, Inchon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Jan. 30, 1990, Ser. No. 472,477
Claims priority, application Rep. of Korea, Jul. 31, 1989, 10591/1989
Term of patent 14 years
U.S. Cl. D16—209



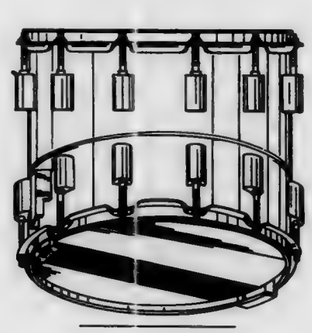
326,467
CAMERA
Yet Chan, Kowloon, Hong Kong, assignor to Achiever Industries Ltd., Kowloon, Hong Kong
Filed Jul. 25, 1989, Ser. No. 385,274
Claims priority, application United Kingdom, Feb. 9, 1989, 1057002
Term of patent 14 years
U.S. Cl. D16—217



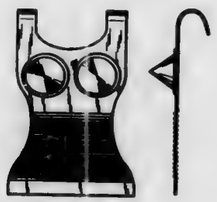
326,468
ELECTRONIC PIANO
Jin S. Jeon, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Aug. 13, 1990, Ser. No. 566,706
Claims priority, application Rep. of Korea, Feb. 13, 1990, 1605/1990
Term of patent 14 years
U.S. Cl. D17—1



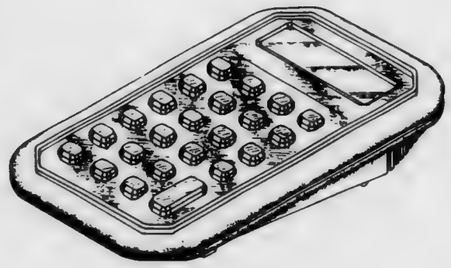
326,469
DRUM
B. Richard Filkins, 834 W. 13th Ct., Riviera Beach, Fla. 33404
Filed Apr. 5, 1990, Ser. No. 504,894
Term of patent 14 years
U.S. Cl. D17—22



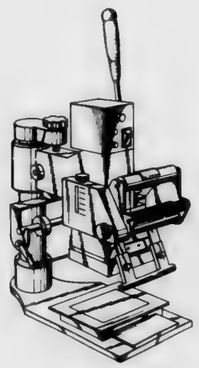
326,470
ZYDECO MUSICAL BOARD
Rita J. Broussard, 422 Bienville., New Orleans, La. 70119
Filed Aug. 29, 1990, Ser. No. 575,505
Term of patent 14 years
U.S. Cl. D17—99



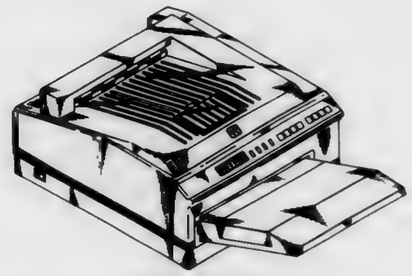
326,471
CALCULATOR
Chiu-Yuan Chen, Taipei Hsien, Taiwan, assignor to Datel Electrocraft Corporation, Taipei Hsien, Taiwan
Filed Oct. 24, 1990, Ser. No. 603,183
Term of patent 14 years
U.S. Cl. D18—7



326,472
PRINTING MACHINE
Ng H. Chung, 20/F., Block C, Boardway Street, Mei Fu Sun Chuen, Kowloon, Hong Kong
Filed Jul. 20, 1988, Ser. No. 221,978
Claims priority, application United Kingdom, Jan. 30, 1988, 1048142
Term of patent 14 years
U.S. Cl. D18—14



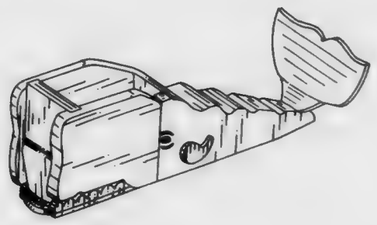
326,473
PRINTER FOR A COMPUTER
Katsumi Kishi, Kawasaki, and Shigeru Sato, Yokohama, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan
Filed Nov. 19, 1990, Ser. No. 615,483
Claims priority, application Japan, May 17, 1990, 2-16603
Term of patent 14 years
U.S. Cl. D18—55



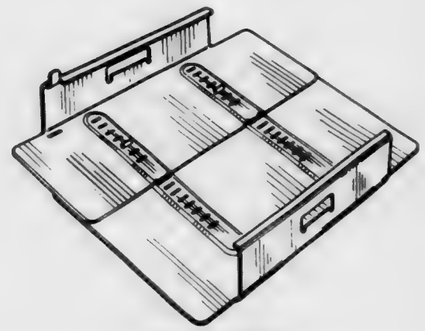
326,474
COMBINED HAND-HELD TAPE DISPENSER AND APPLICATOR
Robert A. Luhman, Deer Park, Wis., and Richard L. Patten, Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 16, 1990, Ser. No. 523,935
Term of patent 14 years
U.S. Cl. D19—69



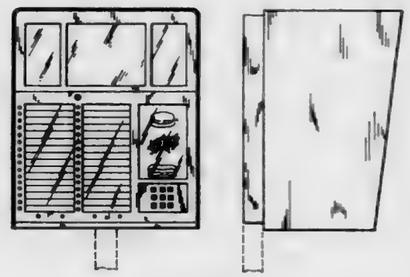
326,475
TAPE DISPENSER
Dave Alexander, 960 Saint John's Pl., Brooklyn, N.Y. 11213
Division of Ser. No. 349,065, May 9, 1989, Pat. No. Des. 322,461. This application Oct. 2, 1991, Ser. No. 770,305
Term of patent 14 years
U.S. Cl. D19—69



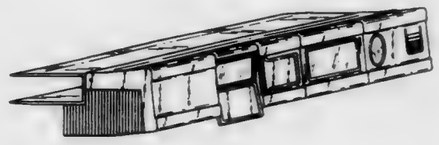
326,476
STACKABLE PAPER TRAY
Ken Bevins, 111 Press La., Chula Vista, Calif. 92010
Filed Aug. 5, 1988, Ser. No. 228,562
Term of patent 14 years
U.S. Cl. D19—92



326,477
CUSTOMER OPERATED VISUAL RESPONSIVE ORDER STAND FOR DRIVE-THROUGH RESTAURANTS
William B. Cunningham, P.O. Box 25463, Oklahoma City, Okla. 73125
Filed Aug. 1, 1990, Ser. No. 561,535
Term of patent 14 years
U.S. Cl. D20—19



326,478
DISPLAY ADVERTISING UNIT FOR STORE FIXTURES OR THE LIKE
Stig Carlsson, Västeras, Sweden, assignor to Unigrafic AG, Zurich, Switzerland
Filed Aug. 31, 1989, Ser. No. 401,091
Claims priority, application Sweden, Mar. 1, 1989, 89-0536
Term of patent 14 years
U.S. Cl. D20—43



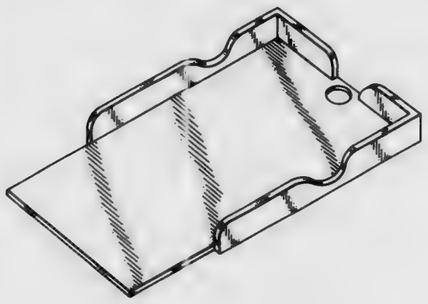
326,479
COMBINED POCKET PLANE AND LAUNCHER THEREFOR
Jeffrey P. Scarpelli, W. 3531 Bruce, Spokane, Wash. 99208
Filed Aug. 5, 1988, Ser. No. 229,901
Term of patent 14 years
U.S. Cl. D21—2



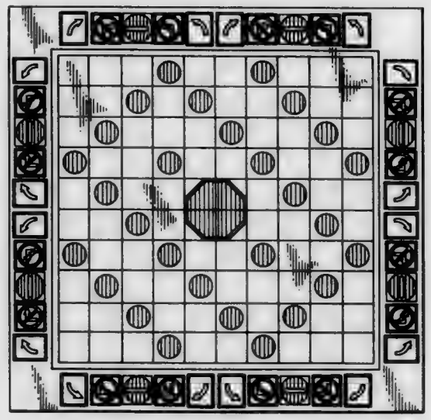
326,480
GAME BOARD SIMULATING A GOLF GREEN
John D. Scott, W173 Madison Ave., Oconomowoc, Wis. 53066
Filed Sep. 2, 1988, Ser. No. 239,833
Term of patent 14 years
U.S. Cl. D21—11



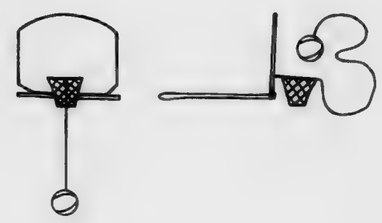
326,481
GAME BOARD
Thomas H. Pritchett, 600 S. Main, Kaysville, Utah 84037
Continuation-in-part of Ser. No. 298,000, Jan. 17, 1989. This application Jun. 7, 1989, Ser. No. 364,005
Term of patent 14 years
U.S. Cl. D21—16



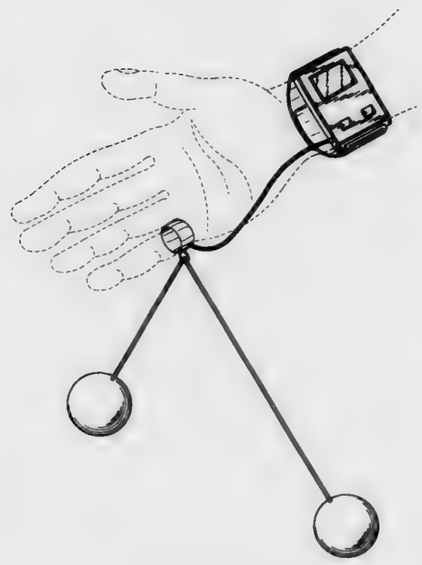
326,482
GAME BOARD
Gaston D. Hoeffel, Rte. 1, Box 74, Round Hill, Va. 22141
Filed Apr. 16, 1990, Ser. No. 509,083
Term of patent 14 years
U.S. Cl. D21—34



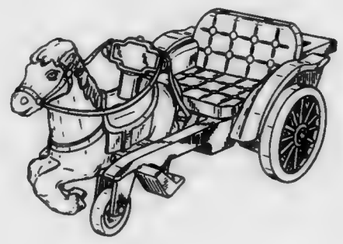
326,483
HAND-HELD BASKETBALL GAME
Kenneth J. Willis, 620 Gramercy Pl. #140, Los Angeles, Calif. 90005, assignor to Kenneth J. Willis, Los Angeles, Calif.
Filed Oct. 20, 1989, Ser. No. 424,580
Term of patent 14 years
U.S. Cl. D21—62



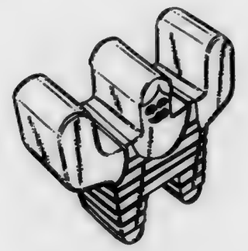
326,484
COMBINED PENDULUM GAME AND SCORE DISPLAY SCREEN THEREFOR
Benjamin Nwoke, P.O. Box 20842, Cleveland, Ohio 44120
Filed Oct. 23, 1989, Ser. No. 424,975
Term of patent 14 years
U.S. Cl. D21—62



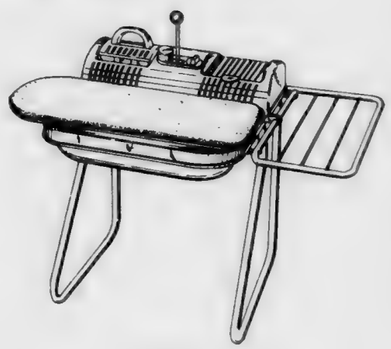
326,485
HORSE AND BUGGY RIDING TOY
Elliot Rudell, 6556 Sattes Dr., Rancho Palos Verdes, Calif. 90274; Joe Cernansky, 2369 W. 246th St., Lomita, Calif. 90717; George Foster, 2700 Panorama Dr., Signal Hill, Calif. 90806, and Rick Kamrath, 26229 Regent St., Lomita, Calif. 90717
Continuation-in-part of Ser. No. 37,458, Apr. 13, 1987. This application Jul. 11, 1990, Ser. No. 551,272
Term of patent 14 years
U.S. Cl. D21—75



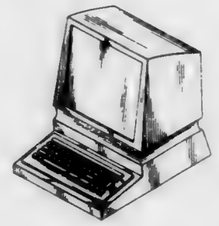
326,486
TOY FIGURE
Daniel B. Klitsner, San Francisco, Calif., assignor to Discovery Toys, Inc., Martinez, Calif.
Filed Mar. 27, 1990, Ser. No. 500,318
Term of patent 14 years
U.S. Cl. D21—108



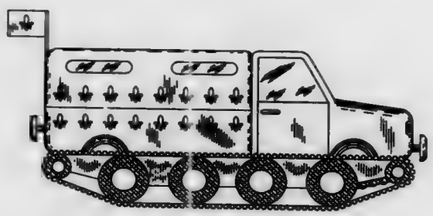
326,487
TOY IRONING BOARD
Alain Monneret, Lons Le Saunier, France, assignor to Monneret Jouets, Lons Le Saunier, France
Filed Jul. 17, 1990, Ser. No. 553,272
Term of patent 14 years
U.S. Cl. D21—109



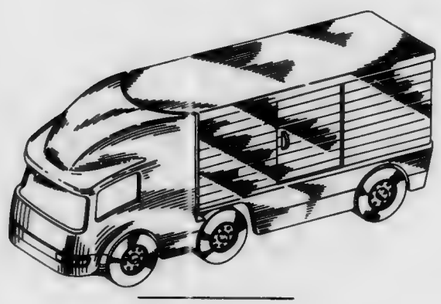
326,488
TOY COMPUTER
Susanne D. Carroll, Arlington, Va., assignor to Emote Control Systems, Inc., Arlington, Va.
Filed Apr. 16, 1990, Ser. No. 509,501
Term of patent 14 years
U.S. Cl. D21—111



326,489
ALL TERRAIN TOY VEHICLE
Steve Bryan, 9517 W. Emory Rd., Knoxville, Tenn. 37931
Filed Oct. 19, 1990, Ser. No. 600,098
Term of patent 14 years
U.S. Cl. D21—131



326,490
SEMI-TRUCK TOY
Kevin R. Aker, Hudson, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Oct. 19, 1990, Ser. No. 605,461
Term of patent 14 years
U.S. Cl. D21—135



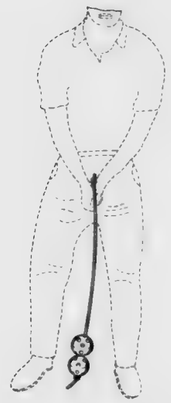
326,491
STEPPING EXERCISE MACHINE
William T. Dalebout, 1770 E. 1730 North, Logan, Utah 84321
Filed Jan. 31, 1990, Ser. No. 473,202
Term of patent 14 years
U.S. Cl. D21—195



326,492
WEIGHTED EXERCISE HARNESS
Joel Leibowitz, 26 W. 87th St., New York, N.Y. 10024
Filed Apr. 13, 1989, Ser. No. 337,441
Term of patent 14 years
U.S. Cl. D21—196



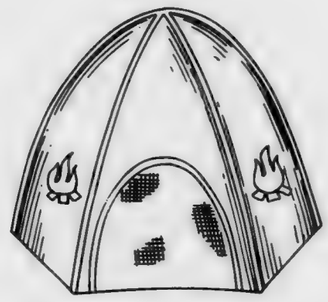
326,493
GOLF SWING PRACTICE DEVICE
David V. Perry, 13979 S. Hwy. 99, Manteca, Calif. 95336
Filed May 4, 1989, Ser. No. 347,284
Term of patent 14 years
U.S. Cl. D21—234



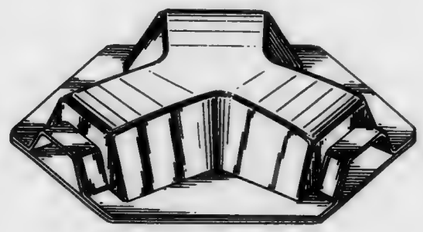
326,494
TENT
Todd Dalland, 110 Reed St., New York, N.Y. 10013
Filed Apr. 17, 1990, Ser. No. 510,412
Term of patent 14 years
U.S. Cl. D21—253



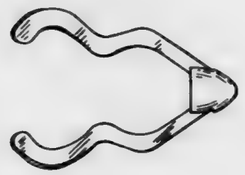
326,495
INFLATABLE TENT
Jimmy Pearce, P.O. Box/115-Hwy. 27S, Moore Haven, Fla. 33471
Filed May 30, 1990, Ser. No. 530,256
Term of patent 14 years
U.S. Cl. D21—253



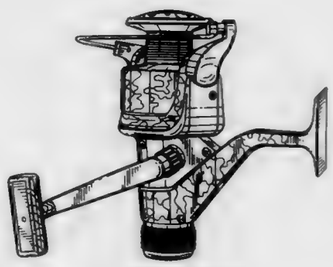
326,496
BAIT STATION
Scott W. Demarest, Caledonia Twp., Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Feb. 12, 1990, Ser. No. 479,029
The portion of the term of this patent subsequent to Feb. 6, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—122



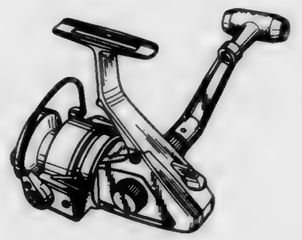
326,497
SPINNER FISHING LURE
Robert L. Greve, Adrian, Minn., assignor to Duin-Greve Industries, Inc., Rushmore, Minn.
Filed Apr. 6, 1990, Ser. No. 505,528
Term of patent 14 years
U.S. Cl. D22—129



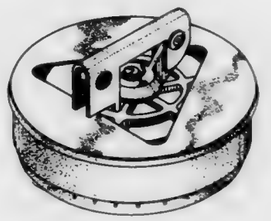
326,498
FISHING REEL
Rupert Kuntze, Haundorf, Fed. Rep. of Germany, assignor to D.A.M. Deutsche Angelgeraete Manufaktur Hellmuth Kuntze GmbH & Co. KG, Gunzenhausen, Fed. Rep. of Germany
Filed Jan. 19, 1990, Ser. No. 467,231
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1989, 8905174; Dec. 15, 1989, 8908643
Term of patent 14 years
U.S. Cl. D22—141



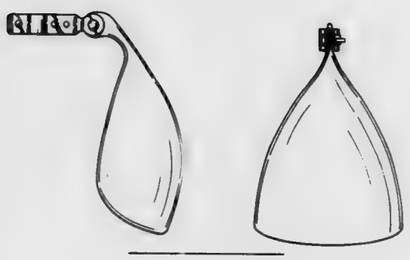
326,499
FISHING REEL
Masaharu Nouma, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan
Filed Feb. 12, 1990, Ser. No. 479,027
Claims priority, application Japan, Aug. 22, 1989, 1-30604
Term of patent 14 years
U.S. Cl. D22—141



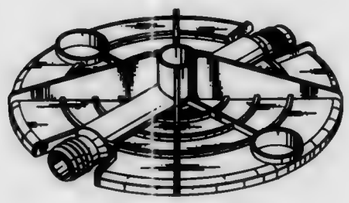
326,500
SEALING PLUG FOR A MONITORING WELL
Martin C. Pettesch, Roselle, N.J., assignor to Universal Valve Company, Inc., Elizabeth, N.J.
Filed Aug. 28, 1989, Ser. No. 399,753
Term of patent 14 years
U.S. Cl. D23—200



326,501
SHOWER SPRAY DEFLECTOR UNIT
Lloyd C. Miller, 10416 NE. 23rd, Oklahoma City, Okla. 73141
Filed Oct. 16, 1990, Ser. No. 598,322
Term of patent 14 years
U.S. Cl. D23—213



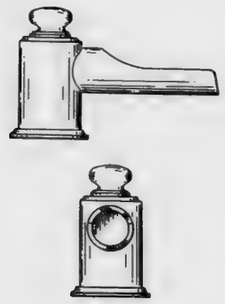
326,502
SPRINKLER BASE
John Arnold, Jr., 15625 Jarrell Rd., Clermont, Fla. 34711
Filed Sep. 14, 1990, Ser. No. 582,420
Term of patent 14 years
U.S. Cl. D23—221



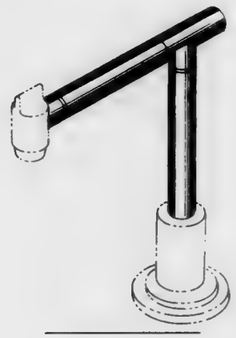
326,503
VALVE FOR A TRANSPORTABLE CONTAINER SUCH AS A KEG FOR DISTRIBUTING A DRINKABLE LIQUID SUCH AS BEER, WINE OR CIDER UNDER PRESSURE OF A GAS SUCH AS CO_2
Bernt Ipsen, Morud, Denmark, assignor to Micro Matic A/S, Odense, Denmark
Filed Dec. 11, 1989, Ser. No. 448,586
Claims priority, application Denmark, Jun. 19, 1989, MA 0739 1989
Term of patent 14 years
U.S. Cl. D23—233



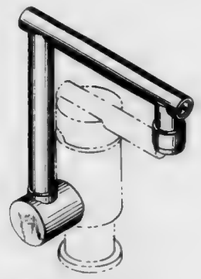
326,504
SPOUT
Tom E. Robbins, San Leandro, Calif., assignor to Kallista, Inc., San Leandro, Calif.
Filed Sep. 19, 1988, Ser. No. 245,549
The portion of the term of this patent subsequent to Oct. 22, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—255



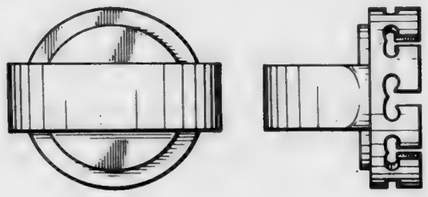
326,505
SPOUT
Herbert V. Kohler, Jr., Kohler, and Alan D. Bengtson, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 17, 1989, Ser. No. 297,916
Term of patent 14 years
U.S. Cl. D23—255



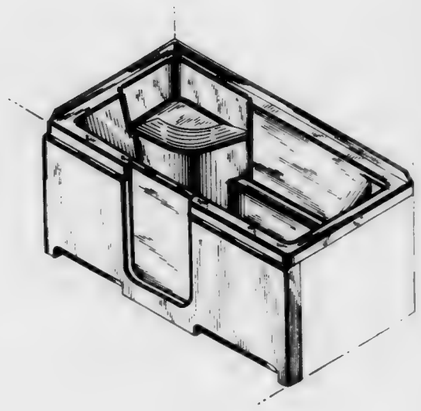
326,506
SPOUT
Herbert V. Kohler, Jr., Kohler, Wis., assignor to Jacob Delafon, Paris, France
Filed Nov. 6, 1989, Ser. No. 433,081
Term of patent 14 years
U.S. Cl. D23—255



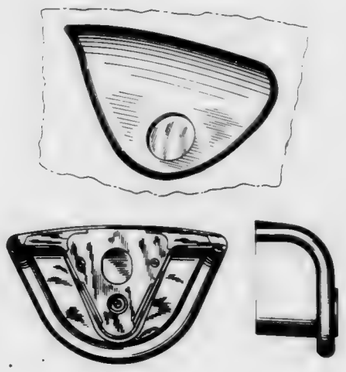
326,507
END CAP FOR A MOTORHOME WASTE LINE
Carl K. Rowley, 3878 Mound Ave., Ventura, Calif. 93003
Filed Oct. 11, 1988, Ser. No. 421,348
The portion of the term of this patent subsequent to Oct. 26, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—260



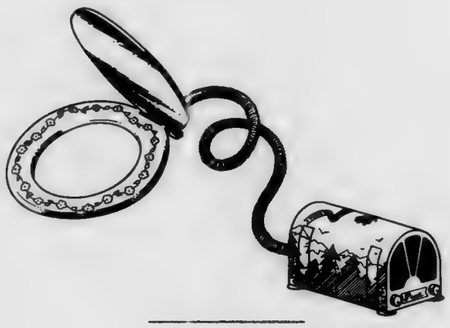
326,508
BATHTUB FOR INVALIDS OR THE LIKE
Bruce M. Sauter, Schaumburg, Ill.; Robert C. Giese, and Todd D. Dannenberg, both of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 10, 1990, Ser. No. 463,631
Term of patent 14 years
U.S. Cl. D23—279



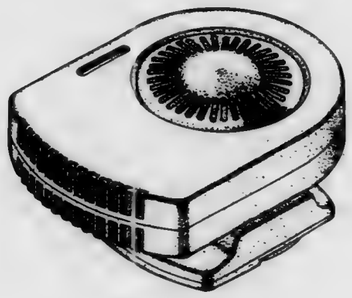
326,509
HANDLE FOR BATHTUBS, DOORS, OR THE LIKE
Roger J. Yvetot, Conflans Saint Honorine, France, assignor to Jacob Delafon, Paris, France
Filed Aug. 24, 1989, Ser. No. 398,384
Term of patent 14 years
U.S. Cl. D23—303



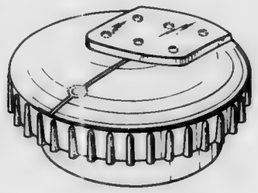
326,510
VENTILATOR SYSTEM FOR A TOILET
Kenneth L. Gusta, Jr., 8152 Halifax Way, N. Charleston, S.C. 29420
Filed Oct. 10, 1989, Ser. No. 419,432
Term of patent 14 years
U.S. Cl. D23—311



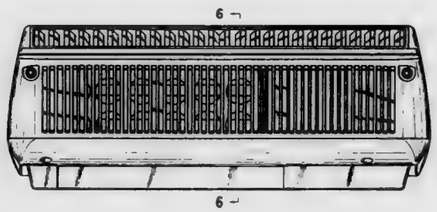
326,511
MINI FAN HEATER OR SIMILAR ARTICLE
Chinfu Chiang, No. 182, Sec. 1, Chin-Hwa Rd., Tainan, Taiwan
Filed Apr. 19, 1991, Ser. No. 689,596
Term of patent 14 years
U.S. Cl. D23—328

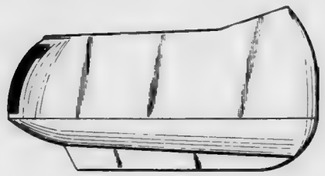


326,512
AIR IONIZER
Frank J. Bianco, Pembroke Pines, Fla., assignor to Elexis Corporation, Miami, Fla.
Filed Jan. 9, 1991, Ser. No. 639,428
Term of patent 14 years
U.S. Cl. D23—355

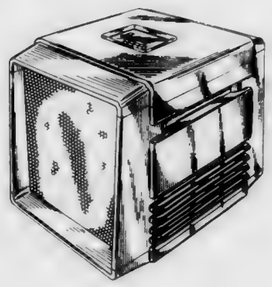


326,513
AIR CLEANER
Hiroaki Kanazawa, Tokyo, Japan, assignor to GM Co., Ltd., Tokyo, Japan
Filed Sep. 4, 1990, Ser. No. 578,101
Term of patent 14 years
U.S. Cl. D23—364

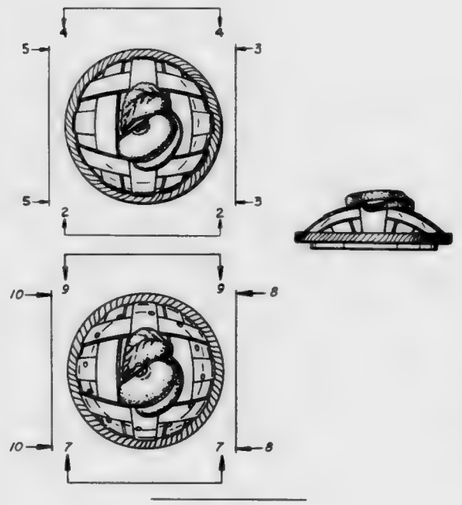




326,514
ELECTRONIC AIR CLEANER
James D. Alsup, Jr.; William J. Saunders, both of Decatur, Ga.; Eric H. Albrecht, and Rengaswamy Ramakrishnan, both of San Antonio, Tex., assignors to U.S. Natural Resources, Inc., San Antonio, Tex.
Filed Feb. 27, 1990, Ser. No. 485,728
Term of patent 14 years
U.S. Cl. D23—364



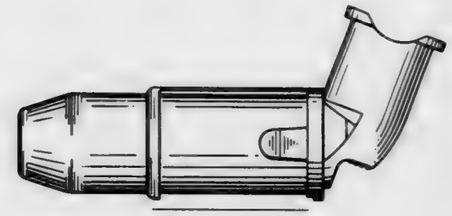
326,515
FRAGRANCE DISH COVER
Howard J. Borakove, Chesterfield, and Cindy L. Morrell, St. Louis, both of Mo., assignors to Willert Home Products, Inc., St. Louis, Mo.
Filed Apr. 25, 1990, Ser. No. 514,654
Term of patent 14 years
U.S. Cl. D23—367



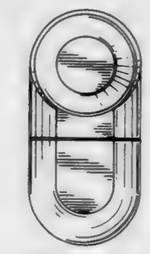
326,516
BREAST PUMP
John M. Chambers, 49 Fox Wood Run, Middletown, N.J. 07748
Filed Feb. 8, 1990, Ser. No. 476,671
Term of patent 14 years
U.S. Cl. D24—109



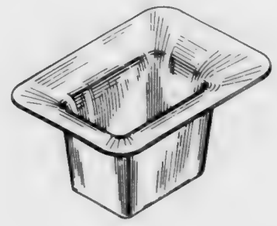
326,517
INHALATOR
Kazuya Funai; Norio Eda, both of Tochigi, and Sachio Nakajima, Tokyo, all of Japan, assignors to Glaxo Group Limited, London, England
Filed Apr. 26, 1989, Ser. No. 344,148
Claims priority, application Japan, Oct. 27, 1988, 63-42317
Term of patent 14 years
U.S. Cl. D24—110



326,518
INHALATOR
Nick Verebelyi, London, United Kingdom, assignor to Harris Pharmaceuticals Ltd., London, England
Claims priority, application United Kingdom, Nov. 16, 1988, 1055011
Filed May 16, 1989, Ser. No. 352,380
Term of patent 14 years
U.S. Cl. D24—110

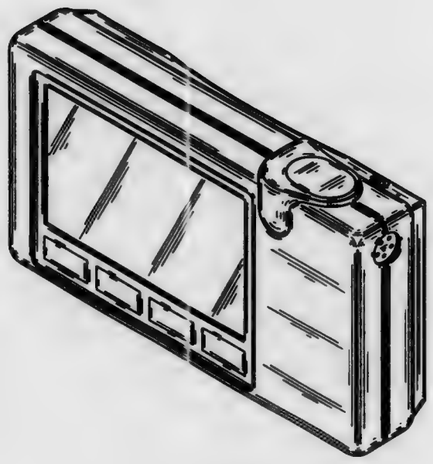


326,519
URINARY FUNNEL FOR WOMEN
George L. Drysdale, 2160 Tamarack Ave., Boulder, Colo. 80304
Filed Mar. 26, 1990, Ser. No. 499,828
Term of patent 14 years
U.S. Cl. D24—122

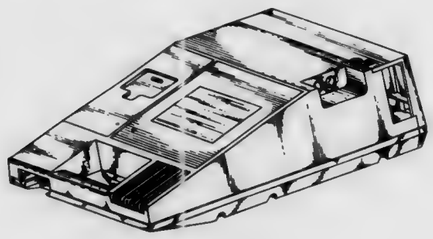


VOL 1138 ISS 4 MY 26 1992 UMI

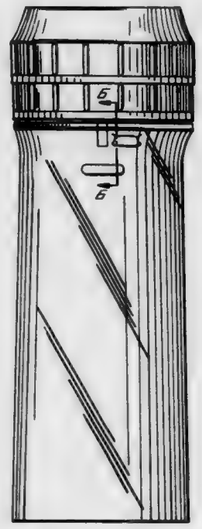
326,521
PORTABLE ELECTROCARDIOGRAPH
Masaji Sawada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 15, 1989, Ser. No. 436,818
Claims priority, application Japan, Nov. 5, 1989, 1-17186
Term of patent 14 years
U.S. Cl. D24—167



326,522
DEFIBRILLATOR
Kurt Arnoy, Stavanger, and Gunnar Naerheim, Hafrsfjord, both of Norway, assignors to Laerdal Manufacturing Corporation, Porland, Oreg.
Filed Mar. 30, 1990, Ser. No. 503,177
Term of patent 14 years
U.S. Cl. D24—167



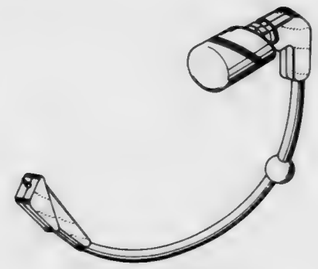
326,523
DISPOSABLE NURSER
Yin I. Chen, Napersville, Ill., and William Bartasevich, Kent, Ohio, assignors to Lisco, Inc., Tampa, Fla.
Filed Feb. 16, 1990, Ser. No. 481,471
Term of patent 14 years
U.S. Cl. D24—197



326,524
BABY BOTTLE HOLDER OR THE LIKE
Kola Lawal, and Karen Lawal, both of 250 Fairmont Ave., #109, Oakland, Calif. 94611
Filed Nov. 16, 1989, Ser. No. 437,220
Term of patent 14 years
U.S. Cl. D24—199



326,525
ELECTRIC KNEADER
Nobuzo Shimizu, Osaka, Japan, assignor to Daito Electric Machine Industry Company Limited, Osaka, Japan
Filed Nov. 13, 1989, Ser. No. 435,296
Term of patent 14 years
U.S. Cl. D24—214



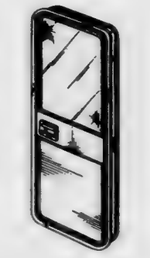
326,526
PAIN THERAPY INSTRUMENT
Heinz Bucher, Rottweil, Fed. Rep. of Germany, assignor to Metronic Electronic GmbH, Fed. Rep. of Germany
Filed Apr. 3, 1990, Ser. No. 503,619
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1989, M8906872.6
Term of patent 14 years
U.S. Cl. D24—214



326,527
SOLVENT STORAGE FLASK
Daniel A. Straus, 15031 Joanne Ave., San Jose, Calif. 95127, and John F. Babashak, 1211 Forest Dr., Millville, N.J. 08332
Filed Mar. 20, 1989, Ser. No. 325,481
Term of patent 14 years
U.S. Cl. D24—224



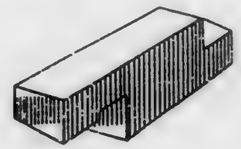
326,528
DOOR
Mathew W. Klein, 27908 Longhill Dr., Rancho Palos Verdes, Calif. 90274
Filed Oct. 27, 1989, Ser. No. 427,632
Term of patent 14 years
U.S. Cl. D25—48



326,529
DOOR PANEL OR THE LIKE
Steven R. Wilkening, Grand Rapids, Mich., assignor to ODL, Incorporated, Zeeland, Mich.
Filed Oct. 29, 1990, Ser. No. 604,605
Term of patent 14 years
U.S. Cl. D25—48



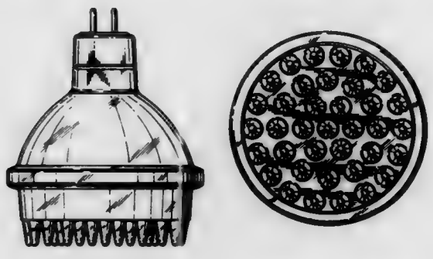
326,530
Z-SHAPED BUILDING BLOCK
John F. Lewis, P.O. Box 363, Quebec J0P 1J0, Canada
Filed Sep. 21, 1989, Ser. No. 410,535
Claims priority, application Canada, Mar. 22, 1989, 22-03-89-14
Term of patent 14 years
U.S. Cl. D25—113



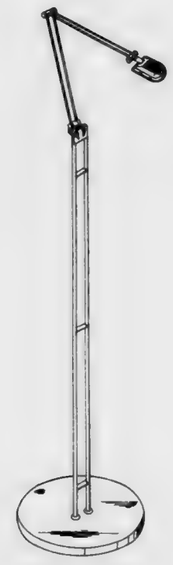
326,531
DOVE-TAILED BUILDING BLOCK
John F. Lewis, P.O. Box 363, Quebec J0P 1J0, Canada
Filed Sep. 21, 1989, Ser. No. 410,536
Claims priority, application Canada, Mar. 22, 1989, 22-03-89-12
Term of patent 14 years
U.S. Cl. D25—113



326,532
LAMP
Roger A. Hume, 2 Dorset Drive, Melton Mobray Leicestershire, LE13 0JN; Richard A. Felstad, 44 Main Street, Burrough on the Hill, Melton Mowbray, Leicestershire, LE14 2JQ, and Luciano Zucchi, 47 Rudall Crescent, London NW3 1RR, all of England
Filed Oct. 31, 1990, Ser. No. 607,074
Claims priority, application United Kingdom, May 1, 1990, 2006507
Term of patent 14 years
U.S. Cl. D26—2



326,533
FLOOR LAMP
Frank P. Cerbini, Freeport, N.Y., assignor to The Genlyte Group Inc., Cleveland, Ohio
Filed Nov. 2, 1989, Ser. No. 430,347
Term of patent 14 years
U.S. Cl. D26—65



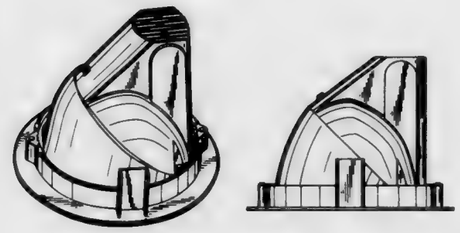
326,534
BREATHING MASK
Alfonso H. Baez, Jr., 1208 S. Marengo Ave., Unit H, Alhambra, Calif. 91803
Filed Oct. 19, 1990, Ser. No. 600,118
Term of patent 14 years
U.S. Cl. D29—7



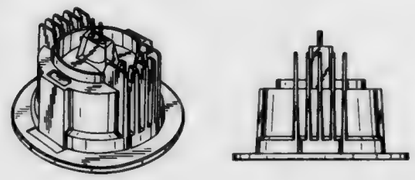
326,535
DESK LAMP
Wang Y. Hsia, Taipei, Taiwan, assignor to Fantasy Int. Corp., Taipei, Taiwan
Filed Sep. 5, 1990, Ser. No. 577,620
Term of patent 14 years
U.S. Cl. D26—65



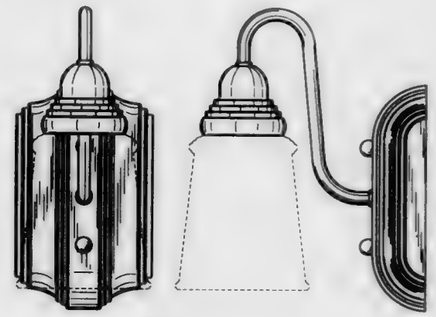
326,536
RECESSED LIGHTING FIXTURE
Massimo Gattari, Potenza Picena, Italy, assignor to Iguzzini Illuminazione S.p.A., Macerata, Italy
Filed Mar. 14, 1990, Ser. No. 493,476
Claims priority, application Italy, Sep. 18, 1989, 21748/89[U]
Term of patent 14 years
U.S. Cl. D26—74



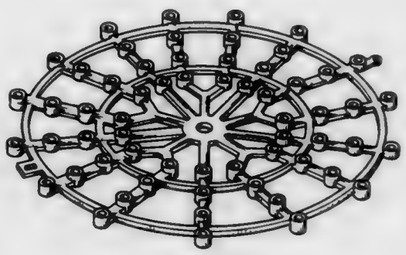
326,537
RECESSED LIGHTING FIXTURE
Massimo Gattari, Potenza Picena, Italy, assignor to Iguzzini Illuminazione S.p.A., Macerata, Italy
Filed Mar. 14, 1990, Ser. No. 493,481
Claims priority, application Italy, Sep. 18, 1989, 21748/89[U]
Term of patent 14 years
U.S. Cl. D26—74



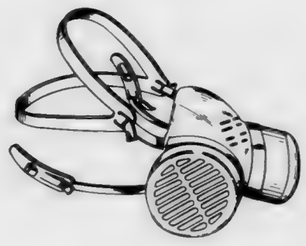
326,538
WALL LAMP
Fran M. Dordick, Lyndhurst, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed Dec. 21, 1989, Ser. No. 454,123
Term of patent 14 years
U.S. Cl. D26—87



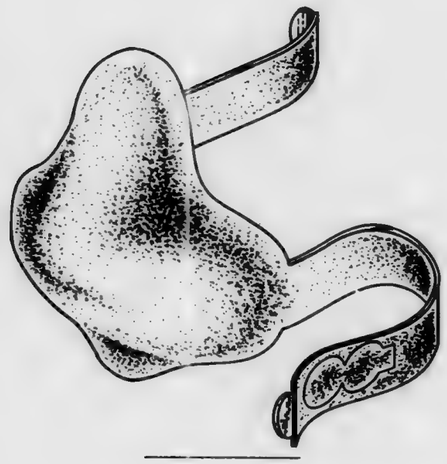
326,539
LAMP BASE FOR CHRISTMAS TREE LIGHTS
Jen-Tuan Ku, No. 78, Ko-Tzu-Nan, Hsin Chu, Taiwan
Filed Feb. 26, 1990, Ser. No. 485,074
Term of patent 14 years
U.S. Cl. D26—138



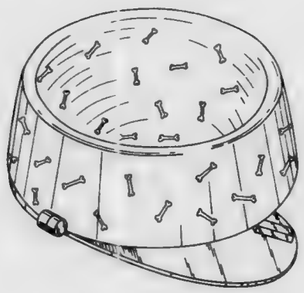
326,540
FILTER MASK
Michael F. Scholey, Pacoima, Calif., assignor to Moldex/Metric Products, Inc., Culver City, Calif.
Filed Sep. 17, 1990, Ser. No. 583,355
Term of patent 14 years
U.S. Cl. D29—7



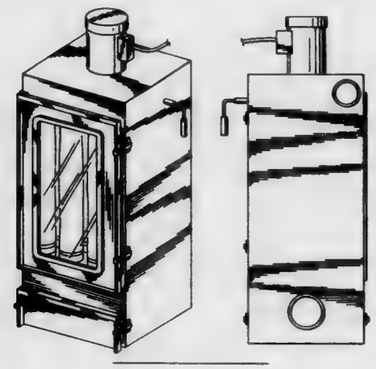
326,541
FACE MASK
Edward M. McBrearty, Jr., 526 Jeffrey, Royal Oak, Mich. 48073
Filed Oct. 23, 1990, Ser. No. 601,568
Term of patent 14 years
U.S. Cl. D29—8



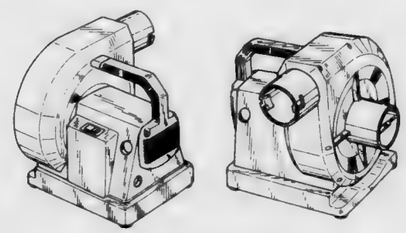
326,542
HEATED PET FOOD DISH
Kenneth J. Bain, Jr., 14 Center St. R.F.D. #2, Andover, Conn. 06232
Filed Mar. 7, 1990, Ser. No. 489,608
Term of patent 14 years
U.S. Cl. D30—129



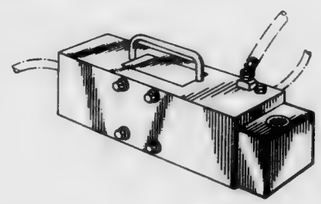
326,543
VACUUM SYSTEM FOR COLLECTING DUST FROM SANDBLASTING CABINETS
Fred Zwicker, Canfield, Ohio, assignor to Skat Blast, Inc., Canfield, Ohio
Filed Aug. 14, 1989, Ser. No. 393,760
Term of patent 14 years
U.S. Cl. D32—21



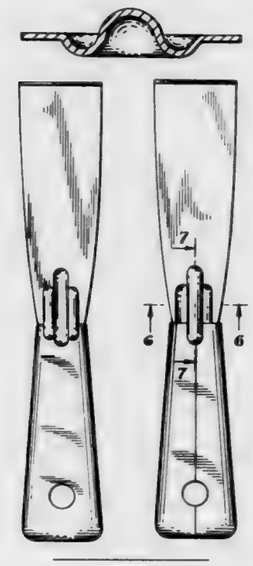
326,544
DUST COLLECTOR
Etsusi Yamamoto, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan
Filed Mar. 14, 1991, Ser. No. 669,244
Claims priority, application Japan, Sep. 19, 1990, 2-31604
Term of patent 14 years
U.S. Cl. D32—21



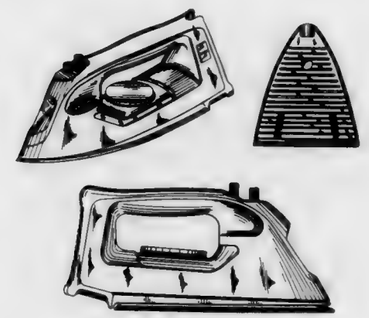
326,545
EXTERNAL HEAT EXCHANGER FOR UPHOLSTERY AND CARPET CLEANING EQUIPMENT
Bernard Gurstein, and Russell Gurstein, both of Agoura Hills, Calif., assignors to U. S. Products, Inc., Hayden, Ind.
Filed Jan. 31, 1989, Ser. No. 304,254
Term of patent 14 years
U.S. Cl. D32—28



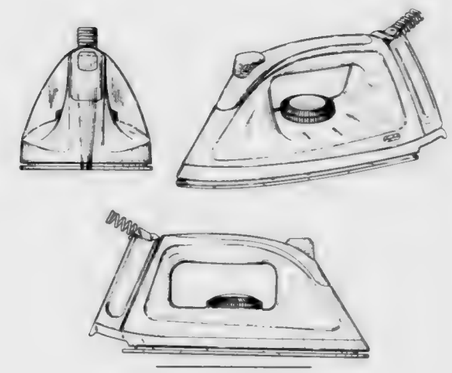
326,546
PUTTY SCRAPER
Donald Gringer, New York, N.Y., assignor to Allway Tools, Inc., Bronx, N.Y.
Filed Mar. 30, 1989, Ser. No. 330,715
Term of patent 14 years
U.S. Cl. D32—49



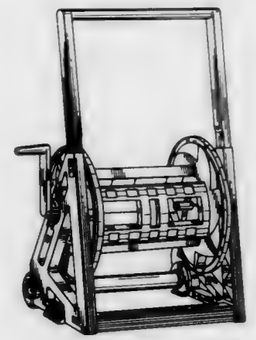
326,547
ELECTRIC IRON
Robert Osit, Shelton, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Feb. 11, 1991, Ser. No. 653,457
Term of patent 14 years
U.S. Cl. D32—70



326,548
ELECTRIC IRON WITH WATER SPRINKLING DEVICE
Jean-Louis Barrault, Boulogne Billancourt, France, assignor to Moulinex Societe Anonyme, Bagnolet, France
Filed Apr. 18, 1991, Ser. No. 687,414
Claims priority, application France, Oct. 26, 1990, 90 6719
Term of patent 14 years
U.S. Cl. D32—70



326,549
HOSE CART
Stephen P. Whitehead, and Joseph J. Sanchez, both of Elgin, Ill., assignors to Suncast Corporation, Batavia, Ill.
Filed Aug. 7, 1990, Ser. No. 564,002
Term of patent 14 years
U.S. Cl. D34—26



VOL
1138
ISS
4
MY
26
1992
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326,550
HAND-CARRYING BASKET
Dewey J. Waterman, Battle Creek, Mich., assignor to United Steel & Wire Company, Battle Creek, Mich.
Filed May 16, 1990, Ser. No. 524,359
Term of patent 14 years
U.S. Cl. D34—40

326,551
COMBINED RABBIT FIGURE AND BASKET
Pearl Liu, 4529 Angeles Crest Hwy., Suite 324, La Canada, Calif. 91011
Filed Sep. 27, 1990, Ser. No. 558,988
Term of patent 14 years
U.S. Cl. D34—41



326,552
SHOPPING BASKET
Donald P. Goodell, P.O. Box 337, LaVergne, Tenn. 37086
Filed Aug. 10, 1990, Ser. No. 565,408
Term of patent 14 years
U.S. Cl. D34—42

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF MAY, 1992

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Alhstrom Corporation: *See*—
Kokkonen, Seppo K.; and Qvintus, Harri T., 5,116,423, Cl. 134-15.000.
A. Schonbek & Co., Inc.: *See*—
Bayer, Georg, 5,116,009, Cl. 248-303.000.
AB Volvo: *See*—
Harde, Bo, 5,115,830, Cl. 137-39.000.
ABB Power T&D Company, Inc.: *See*—
Loy, Garry M., 5,116,169, Cl. 408-39.000.
Abbott, John S.; Bertz, Mark C.; Faler, James H.; Schirmer, William, III; and Williams, John G., to Corning Incorporated. Apparatus for forming a porous glass preform. 5,116,400, Cl. 65-144.000.
Abbott Laboratories: *See*—
Alzner, Bernard G., 5,116,652, Cl. 428-36.900.
Natwick, Vernon R.; Lawless, Michael W.; Doll, Joseph E.; and Wu, Chung-You C., 5,116,203, Cl. 417-53.000.
Abe, Hitoshi; and Nakamori, Tomohiro, to Oki Electric Industry Co., Ltd. CVD method for the formation of Bi-containing superconducting thin films. 5,116,811, Cl. 505-1.000.
Abe, Kenichiro, to Fujitsu Limited. Conducting material and a method of fabricating thereof. 5,116,657, Cl. 428-137.000.
Abe, Mitsuhiko. Clip-carrying bookmarker. 5,115,757, Cl. 116-237.000.
Abe, Nakatsugu; Suzuki, Haruo; Tsukamoto, Hiroaki; Tsuyama, Seishi; and Nagae, Moriyasu, to Nippon Kokan Kabushiki Kaisha. Chromoum heat-resistant steel excellent in toughness and having high cracking resistance and high creep strength in welded joint. 5,116,571, Cl. 420-110.000.
Abe, Noriko: *See*—
Takeshita, Yasuyoshi; Nakamura, Hiroshi; Ishiguro, Susumu; Kwaguchi, Noboru; Shimada, Shin'ichi; Koyama, Tadayoshi; Seya, Motohide; Abe, Noriko; and Nomoto, Shin, 5,116,985, Cl. 546-141.000.
Abe, Shigetaka: *See*—
Miyake, Hiraku; Ishiguro, Mitsuo; Abe, Shigetaka; Yamaguchi, Nobuo; Hayamizu, Yutaka; and Aizawa, Satoru, 5,115,615, Cl. 52-167.00R.
Abe, Takashi; Hayashi, Eiji; and Fukaya, Haruhiko, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for direct conversion of fluorocarbonyl group into halogenides. 5,117,055, Cl. 562-849.000.
Abiomed, Inc.: *See*—
Milder, Fredric L.; and Rosenberg, Meir, 5,116,305, Cl. 600-18.000.
Abraham, Anthony W., to Wynn's Climate Systems, Inc. Heat exchanger for refrigerant recovery system. 5,115,645, Cl. 62-292.000.
Abraham, Leslie R.; and Probst, Ronald N., to Wenger Corporation. Panel support structure. 5,115,608, Cl. 52-238.100.
Abrokwah, Jonathan K.: *See*—
Huang, Jenn-Hwa; and Abrokwah, Jonathan K., 5,116,774, Cl. 437-40.000.
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Costall, Brenda; Naylor, Robert; and Gardaix-Luthereau, Renee, to Laboratoires Delagrange Div. Societe d'Applications Pharmacodynamiques. Method of increasing gastrointestinal motility with substituted benzamides. 5,116,857, Cl. 514-370.000.
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Costall, Brenda; Naylor, Robert; and Gardaix-Luthereau, Renee, to Laboratoires Delagrance Societe d'Application Pharmacodynamiques. Method of providing anxiolytic and antipsychotic treatment. 5,116,859, Cl. 514-392.000.
Achilli, Fiorella: *See*—
Venturello, Carlo; Cavallotti, Claudio; and Achilli, Fiorella, 5,117,049, Cl. 562-2.000.
Ackerman, Timothy T. Rotating table game. 5,116,065, Cl. 273-446.000.
Ackermann, Peter; Fischer, Hanspeter; Vogel, Rolf; Drauz, Karlheinz; Hasseberg, Hans-Albrecht; Hasselbach, Hans-Jochen; Knaup Gunter; Krimmer, Hans-Peter; and Schafer, Matthias, to Ciba-Geigy Corporation; and Degussa Sktiengesellschaft. Microbicidal compositions. 5,116,872, Cl. 514-561.000.
Acuderm, Inc.: *See*—
Yeh, Charles R., 5,116,346, Cl. 606-131.000.
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Yamamoto, Shinji; Tanaka, Hideho; Adachi, Fumio; and Uchimura, Hisataka, 5,116,668, Cl. 428-221.000.
Adachi, Takao, to NEC Corporation. Plastic package semiconductor device with thermal stress resistant structure. 5,117,280, Cl. 357-72.000.
Adahan, Carmeli. Portable fluid pumping device. 5,116,206, Cl. 417-234.000.
Adair, Dennis W.: *See*—
Dyer, Dennie W.; and Adair, Dennis W., 5,116,328, Cl. 604-289.000.
Adam, Yossi; and Gazit, Alon, to Spectrum Sciences B.V. Liquid toner developer. 5,117,263, Cl. 355-256.000.
Adamides, Alexander E. Water conservation apparatus for water closets. 5,115,521, Cl. 4-354.000.
Adams, Mark F.; and Knudson, Melvin R., to Larex International, Inc. Ultrarefined arabinogalactan product. 5,116,969, Cl. 536-128.000.
Adee, James M.: *See*—
Castro, Robert M.; and Adee, James M., 5,116,689, Cl. 428-593.000.
Adini, Ari. Explosively deformable anchoring assembly. 5,116,175, Cl. 411-20.000.
ADL Automation: *See*—
Teissier, Etienne M.; and Marie, Bruno A. E., 5,115,747, Cl. 105-50.000.
Advanced Innovations Inc.: *See*—
Perry, James G., 5,116,279, Cl. 452-195.000.
Advanced Micro Devices, Inc.: *See*—
Haskell, Jacob D.; Avanzino, Steven C.; and Swaminathan, Balaji, 5,116,778, Cl. 437-57.000.
Advanced Protective Injection Systems B.V.: *See*—
van den Haak, Abraham, 5,116,319, Cl. 604-110.000.
Advantest Corporation: *See*—
Endo, Tadashi; Sakamoto, Yasuhiko; and Yoshida, Haruo, 5,117,204, Cl. 331-8.000.
Adzima, Leonard J.: *See*—
Flautt, Martin C.; and Adzima, Leonard J., 5,116,900, Cl. 524-377.000.
AEG Westinghouse Transportation Systems, Inc.: *See*—
Marton, Fred S.; Segar, William R.; and Schmitz, William E., 5,116,262, Cl. 439-709.000.
Aerospatiale Societe Nationale Industrielle: *See*—
Girard, Alain, 5,116,000, Cl. 244-135.00R.
Spariat, Jacques; Aubret, Jean-Pierre; and Barrier, Michel, 5,115,708, Cl. 89-1.140.
Agency of Industrial Science & Technology: *See*—
Abe, Takashi; Hayashi, Eiji; and Fukaya, Haruhiko, 5,117,055, Cl. 562-849.000.
Endo, Tadashi; Sakamoto, Yasuhiko; and Yoshida, Haruo, 5,117,204, Cl. 331-8.000.
Agfa-Gevaert, N.V.: *See*—
Callant, Paul R.; and Dewanckele, Jean-Marie O., 5,116,722, Cl. 430-363.000.
Vanmaele, Luc J., 5,116,806, Cl. 503-227.000.
Agostinelli, John A.; and Lawrence, David J., to Eastman Kodak Company. Zinc diffusion process. 5,116,781, Cl. 437-168.000.
Agostinelli, John A.: *See*—
Lelental, Mark; Agostinelli, John A.; and Romanofsky, Henry J., 5,116,812, Cl. 505-1.000.
Ahlberg, Erik, to ODC Exhibit Systems Ltd. Display system. 5,115,623, Cl. 52-646.000.
Ahlstrom Corporation: *See*—
Vesala, Reijo; and Vikman, Vesa, 5,116,198, Cl. 415-169.100.
Ahmed, Osman; and Bradley, Steven A., to Landis & Gyr Powers, Inc. System for controlling the differential pressure of a room having laboratory fume hoods. 5,115,728, Cl. 454-61.000.
Ahn, Kwang-Duk: *See*—
Kim, Young-Ha; Jeong, Seo-Young; Ahn, Kwang-Duk; and Han, Dong-Keun, 5,116,361, Cl. 623-1.000.
Aida, Masaaki, to Midori Co., Ltd. Cutter for cutting the folded edge of folded paper sheets or the like. 5,115,568, Cl. 30-294.000.
Aihara, Hironaka; Kurachi, Michio; and Tomisawa, Kazuyuki, to Taisho Pharmaceutical Co., Ltd. Pharmaceutical use for cinnamamide derivatives. 5,116,877, Cl. 514-617.000.
Aihara, Shinichi: *See*—
Enomoto, Masahiro; Fukushima, Minoru; and Aihara, Shinichi, 5,116,247, Cl. 439-660.000.
Aihara, Yukitaka, to Fuji Jukogyo Kabushiki Kaisha. Method and apparatus for controlling drilling operation. 5,116,168, Cl. 408-1.00R.
Aikins, James A.: *See*—
Harper, Richard W.; Howbert, J. Jeffry; Poore, Gerald A.; Rieder, Brent J.; Tao, Eddie V. P.; and Aikins, James A., 5,116,874, Cl. 514-592.000.
Ainpour, Parviz R.: *See*—
Christensen, James M.; and Ainpour, Parviz R., 5,116,371, Cl. 623-11.000.
Air Products and Chemicals, Inc.: *See*—
Listemann, Mark L.; and Pinschmidt, Robert K., Jr., 5,117,056, Cl. 564-134.000.
Sircar, Shivaji; and Rao, Madhukar B., 5,116,510, Cl. 210-673.000.
Airsled Inc.: *See*—
Harvey, Bruce F., 5,116,024, Cl. 254-93.0HP.

VOL 1138 ISS 4 MY 26 1992 UMI

Aisin Seiki Kaibahiki Kaisha: *See—*
Kuwana, Kazutaka; Yoshida, Tsuyoshi; Ichikawa, Hiroyuki; Kamikado, Masaru; Okamoto, Kuniaki; and Itabashi, Satoshi, 5,116,109, Cl. 303-109.000.

Aizawa, Junichi; and Yamauchi, Satoru, to Seikosha Co., Ltd. Luminous pointer and manufacturing method thereof. 5,116,270, Cl. 445-24.000.

Aizawa, Satoru: *See—*
Miyake, Hiraku; Ishiguro. Mitsuo; Abe, Shigetaka; Yamaguchi, Nobuo; Hayamizu, Yutaka; and Aizawa, Satoru, 5,115,615, Cl. 52-167.00R.

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Sakamoto, Jiro; and Tanuma, Hiromi, 5,116,631, Cl. 426-568.000.

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Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washimi, Takeshi; Harada, Naoki; and Akahori, Kingo, 5,116,956, Cl. 534-612.000.

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Takagi, Masayuki; Okada, Tadaaki; Akai, Naotoshi; Yaguchi, Takashi; Miyadoh, Shinji; Shomura, Takashi; Sasaki, Toru; Sezaki, Masaji; Shimizu. Takao; and Niida, Masashi, 5,116,815, Cl. 514-11.000.

Akai, Naruaki: *See—*
Shimizu, Masao; Kataoka, Yoshinori; and Akai, Naruaki, 5,117,092, Cl. 219-247.000.

Akasaka, Shiniichi: *See—*
Ohara, Shuichi; Akasaka, Shiniichi; Oka, Hiroyuki; Hattori, Shintaroo; and Oyama, Rieko, 5,116,148, Cl. 400-241.000.

Akimoto, Kazuhiro; Ogiue, Katsumi; and Uchiyama, Takeo, to Hitachi, Ltd. Semiconductor memory system for use in logic LSI's. 5,117,390, Cl. 365-155.000.

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Makino, Kenzi; Morimoto, Katsushi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Suzuki, Koichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,405, Cl. 71-94.000.

Akiyama, Shuichi: *See—*
Morino, Taisuke; Tanaka, Mami; Kaneko, Fuminori; Ozaki, Takeyuki; and Akiyama, Shuichi, 5,117,079, Cl. 219-10.55F.

Aktiebolaget Bofors: *See—*
Lindberg, Sven; and Eriksson, Kjell, 5,115,715, Cl. 89-26.000.

Akzo America Inc.: *See—*
Hardy, Thomas A.; and Walsh, Edward N., 5,117,033, Cl. 558-163.000.

Akzo N.V.: *See—*
Rae, Duncan R.; and Gibson, Samuel G., 5,116,856, Cl. 514-370.000.
Sarngadharan, Mangalasseril G.; and Kalyanaraman, Vaniambadi S., 5,116,740, Cl. 435-70.400.

Aladdin Synergetics, Inc.: *See—*
Wischhusen, Heiner; and Kehlbeck, Hans, 5,116,240, Cl. 206-545.000.

Alain, Martel; Bachand, Carol; and Daris, Jean-Paul, to Bristol-Myers Squibb Company. Antibiotic C-3 dithioacetal-substituted carbapenem compounds, compositions, and methods of use thereof. 5,116,833, Cl. 514-210.000.

Albany International Corp.: *See—*
Widen, Christian B., 5,115,544, Cl. 28-105.000.

Albers, Stephen J.: *See—*
Grimshaw, Michael N.; Albers, Stephen J.; and Rust, Ralph J., 5,115,993, Cl. 242-68.400.

Albrecht, Klaus; Hans, Helmut; von der Heide, Johann; and Schmider, Fritz, to Papst-Motoren GmbH & Co. KG. Motor with both stepped rotary and axial shift motions. 5,117,128, Cl. 310-191.000.

Alcan International Limited: *See—*
Nadkarni, Sadashiv K.; and Jain, Mukesh K., 5,116,679, Cl. 428-367.000.

Alcatel Cit: *See—*
Baret, Gilles, 5,115,667, Cl. 73-40.700.
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Aldrich, Thomas B., III: *See—*
Leslie, Stuart; and Aldrich, Thomas B., III, 5,115,951, Cl. 222-533.000.

Alexander, A. Gordon: *See—*
Brown, Terrance O.; Slack, David A.; Alexander, A. Gordon; and Moran, Lyle E., 5,116,522, Cl. 252-18.000.

Alexoff, Carl: *See—*
Sludikoff, Stanley R.; and Alexoff, Carl, 5,116,049, Cl. 273-139.000.

Alfing Kessler Sondermaschinen GmbH: *See—*
Miessen, Walter; Fauser, Nikolaus; and Hahnel, Michael, 5,115,564, Cl. 29-888.090.

Alkalay, Uri; and Gorney, Moshe, to Naan Mechanical Works. Sprinkler. 5,115,977, Cl. 239-68.000.

Allaire, Michael J.: *See—*
Cartmell, James V.; Wolf, Michael L.; Allaire, Michael J.; and Sturtevant, Wayne R., 5,115,801, Cl. 602-48.000.

Allard, Paul; Levesque, Claude; and Dansereau, Jean, to Universite de Montreal. Medio-lateral control enhancing, cantilever-spring type prosthetic foot. 5,116,385, Cl. 623-55.000.

Allen, James F., to Mason Company, The. Kennel run isolating means. 5,116,256, Cl. 119-17.000.

Allen, R. Dan, to Edgewater Medical Equipment Systems, Inc. Adjustable support assembly. 5,116,008, Cl. 248-286.000.

Aller, Harold E.: *See—*
Hsu, Adam C.; Aller, Harold E.; Murphy, Raymond A.; Le, Dat P.; Hamp, Donald W.; and Weinstein, Barry, 5,117,057, Cl. 564-149.000.

Allergan, Inc.: *See—*
Rawlings, David L., 5,116,112, Cl. 351-162.000.

Allergy Immuno Technologies, Inc.: *See—*
Wojdani, Aristo, 5,116,612, Cl. 424-85.200.

Allied-Signal Inc.: *See—*
Carruthers, William D.; and Boyd, Gary L., 5,116,158, Cl. 403-28.000.
Magid, Hillel; Eibeck, Richard E.; Van Der Puy, Michael; Hollister, Richard M.; Lavery, Dennis M.; and Wilson, David P., 5,116,526, Cl. 252-172.000.
Saville, Marshall P.; and Gu, Alston L., 5,116,143, Cl. 384-106.000.
Williamson, W. Burton; Linden, Douglas G.; and Summers, Jack C., II, 5,116,800, Cl. 502-303.000.

Allison, Sidney G.; Namkung, Min; Yost, William T.; and Cantrell, John H. Magnetic remanence method and apparatus to test materials for embrittlement. 5,117,184, Cl. 324-239.000.

Alps Electric Co., Ltd.: *See—*
Miyajima, Kazuhiko, 5,116,699, Cl. 429-100.000.
Tokunaga, Ichiro, 5,117,319, Cl. 360-113.000.
Yanai, Shinji; and Shimoyama, Yujiro, 5,117,074, Cl. 200-302.300.

Alsenz, Richard H. Method and apparatus for condensing and subcooling refrigerant. 5,115,644, Cl. 62-181.000.

Alt, John P. Composition and skin treatment method therewith for mitigating acne and male-pattern baldness. 5,116,605, Cl. 424-70.000.

Alt, John P. Skin treatment method and solution. 5,116,606, Cl. 424-70.000.

Aluisi, Alan L. Ergonomic drum assembly. 5,115,706, Cl. 84-723.000.

Alupower, Inc.: *See—*
Rao, Bhaskara M. L.; and Hamlen, Robert P., 5,116,695, Cl. 429-12.000.

Alusuisse-Lonza Services, Ltd.: *See—*
Faisst, Dieter, 5,116,161, Cl. 403-231.000.

Alzner, Bernard G., to Abbott Laboratories. Kink-resistant medical tubing and catheters. 5,116,652, Cl. 428-36.900.

Alzo, Inc.: *See—*
Fogel, Arnold W.; and Zofchak, Albert, 5,116,604, Cl. 424-59.000.

Amachi, Teruo: *See—*
Shinmen, Yoshifumi; Asami, Sumio; Amano, Norihide; Amachi, Teruo; and Yoshizumi, Hajime, 5,116,751, Cl. 435-194.000.

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Shinmen, Yoshifumi; Asami, Sumio; Amano, Norihide; Amachi, Teruo; and Yoshizumi, Hajime, 5,116,751, Cl. 435-194.000.

Amanuma, Takahiko: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 5,117,260, Cl. 355-204.000.

Amarasekera, Jayantha: *See—*
Pinnavaia, Thomas J.; Amarasekera, Jayantha; and Polansky, Christine A., 5,116,587, Cl. 423-244.000.

Ambar Diamonds, Inc.: *See—*
Amber, Betzalel, 5,115,649, Cl. 63-26.000.

Amber, Betzalel, to Ambar Diamonds, Inc. Invisible setting for round diamonds. 5,115,649, Cl. 63-26.000.

Ameen, Joseph G.; Funari, Joseph; and Goldfuss, John A., Jr., to International Business Machines Corporation. Method for bonding thin film electronic device. 5,115,964, Cl. 228-180.200.

Amendola, Angel, to Philip Morris Incorporated. Hot rotary stamper apparatus and methods for metal leaf stamping. 5,115,737, Cl. 101-32.000.

American Bank Note Holographics, Inc.: *See—*
Mallik, Donald W.; and D'Amato, Salvatore F., 5,116,548, Cl. 264-1.300.

American Cyanamid Company: *See—*
Bhalla, Prithvi R.; Herrick, Robert M.; and Gates, Donald W., 5,116,403, Cl. 71-92.000.
Lawrence, Gordon C.; Dawson, Michael J.; Noble, David; Ramsay, Michael V. J.; Bell, Richard; Sutherland, Derek R.; and Tiley, Edward P., 5,116,968, Cl. 536-71.000.
Lowen, Gregory T., 5,116,998, Cl. 548-560.000.
Murdock, Keith C.; and Lee, Ving J., 5,116,827, Cl. 514-82.000.

American Innotex, Inc.: *See—*
Young, Ruth E.; Young, Daniel L.; Warrick, Richard E.; and Cassidy, Clarence A., 5,116,139, Cl. 383-49.000.

American Medical Systems, Inc.: *See—*
Berg, Eric P., 5,116,387, Cl. 623-66.000.

American Nucleonics Corporation: *See—*
Talwar, Ashok K., 5,117,505, Cl. 455-278.100.

American Optical Corporation: *See—*
Chu, Nori Y. C., 5,116,113, Cl. 351-163.000.

American Superconductor Corporation: *See—*
Joshi, Chandrashekhar H.; and Craven, Christopher A., 5,116,810, Cl. 505-1.000.

Amin, Alaaeldin A. M.; and Emoto, Bernard, to National Semiconductor Corp. High speed differential sense amplifier for use with single transistor memory cells. 5,117,394, Cl. 365-203.000.

Ammann, Walter; Muenger, Fritz; and Hartmann, Manfred, to Hilti Aktiengesellschaft. Method of reinforcing structural components. 5,115,622, Cl. 52-741.000.

Ammermann, Eberhard: *See—*
Wenderoth, Bernd; Schuetz, Franz; Sauter, Hubert; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,116,866, Cl. 514-522.000.

Amoco Corporation: *See—*
Taheri, Hassan, 5,117,007, Cl. 549-259.000.

AMP Incorporated: *See—*
Baker, Robert W., 5,116,245, Cl. 439-581.000.
Bennett, Glenn E.; and Urgo, Donald F., 5,116,263, Cl. 439-733.000.
Erb, David J.; Nicholas, Keith L.; Phillips, Howard C.; and Wasilko, John M., 5,115,560, Cl. 29-747.000.
Erdman, David D.; Monroe, Kevin T.; and Weber, Robert N., 5,117,479, Cl. 385-136.000.
Folk, Kenneth F.; Loomis, Phillip E.; and Yeomans, Michael A., 5,115,904, Cl. 198-403.000.
Gloe, Karl-Heinz; Kreuzer, Helmut; and Biehl, Harald, 5,115,735, Cl. 100-43.000.
Grabbe, Dimitry G., 5,116,458, Cl. 156-630.000.
Olsson, Billy E.; and Korsunsky, Iosif, 5,115,555, Cl. 29-566.300.
Siwinski, Paul P., 5,116,239, Cl. 439-497.000.
Yingst, Stephen M.; Briggs, Robert C.; D'Ambrosia, John F.; Flickinger, Steven L.; Owens, Steven P.; and Zeiders, Jeffrey A., 5,117,476, Cl. 385-88.000.

Ams, Felix; Zanger, Ulf; and Bolg, Ulrich, to Richard Wolf GmbH. Device for disintegrating concretions disposed in body cavities. 5,116,343, Cl. 606-128.000.

Amsted Industries Incorporated: *See—*
Kaufhold, Horst T., 5,115,926, Cl. 213-50.000.

Anders, Robin F.: *See—*
Kemp, David J.; Anders, Robin F.; Coppel, Ross L.; and Brown, Graham V., 5,116,755, Cl. 435-252.300.

Anderson, David W.; Baker, John H. E., II; and O'Connell, Thomas E., to United Technologies Corporation. Method of attaching ceramic fiber arrays to metallic substrates. 5,115,962, Cl. 228-120.000.

Anderson, Donald E.: *See—*
Anderson, Ordean S.; Anderson, Donald E.; Nair, Ramakrishna A.; and Riebel, Michael J., 5,117,240, Cl. 343-786.000.

Anderson, Ordean S.; Anderson, Donald E.; Nair, Ramakrishna A.; and Riebel, Michael J., to Microbeam Corporation. Multimode dielectric-loaded double-flare antenna. 5,117,240, Cl. 343-786.000.

Andiamo, Inc.: *See—*
Myers, Jay E., 5,115,895, Cl. 190-18.00A.

Ando, Shyoichi; Yamane, Shuichi; Doi, Yoshihisa; Sakurai, Hisayuki; and Meguro, Haruo, to Honda Giken Kogyo Kabushiki Kaisha. Method for forming a crankshaft. 5,115,663, Cl. 72-370.000.

Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, to Asahi Kogaku Kogyo K.K. Scanning pattern drawing apparatus. 5,117,106, Cl. 250-235.000.

Andrews, Andrian F.: *See—*
Hunter, Julian E.; Reid, James; Arnold, David E. J.; Hails, George; Baxter, Kenneth F.; Andrews, Andrian F.; and Nunn, Michael J., 5,116,407, Cl. 106-16.000.

Angiomed AG: *See—*
Schnepp-Pesch, Wolfram; and Lindenberg, Josef, 5,116,352, Cl. 606-171.000.

Anglade, Marc; Guimbal, Bruno; and Hancart, Michel A., to Societe Nationale Industrielle et Aerospatiale. Device of retractable stops for rotor blades of giroplanes, and rotor head including such a device. 5,116,209, Cl. 416-107.000.

Anglo Suisse, Inc.: *See—*
Brunet, Charles G.; Labbee, Gilles E.; and McGee, Jay W., 5,115,872, Cl. 175-61.000.

Anhauser, Dieter; and Huhn, Ralf, to LTS Lohmann Therapie-Systeme GmbH & Co. KG. Packaged supported pressure-sensitive adhesive plasters. 5,115,913, Cl. 206-447.000.

Anik, Shabbir T., to Syntex (U.S.A.) Inc. LHRH preparations for intranasal administration. 5,116,817, Cl. 514-15.000.

Annino, Raymond; Bartlett, Michael L.; Karas, Edwin L.; Lueck, Dale E.; Middleton, John L.; and Villalobos, Richard. Dual-column, dual-detector gas detector and analyzer. 5,116,764, Cl. 436-161.000.

Antosko, H. B. Folding crib mode from cardboard material. 5,115,524, Cl. 5-99.100.

Aoki, Kei: *See—*
Urano, Satoshi; Aoki, Kei; Tomita, Nobuaki; and Mori, Hirohiko, 5,117,044, Cl. 560-193.000.

Aoki, Norihiko, to Olympus Optical Co., Ltd. Vari-focal lens system having graded refractive index lens. 5,117,309, Cl. 359-654.000.

Aoki, Norihiko: *See—*
Tsuchida, Hirofumi; Aoki, Norihiko; and Yamamoto, Kimiaki, 5,117,308, Cl. 359-654.000.

Aoki, Tuyoshi: *See—*
Shibasaki, Masakatsu; Takahashi Atsuo; Aoki, Tuyoshi; Sato, Hiroyasu; Yamada, Shin-ichi; Kudo, Michiko; Yamaguchi, Takaji; Kogi, Kentaro; and Narita, Sen-ichi, 5,117,037, Cl. 560-53.000.

Aonuma, Hidekazu: *See—*
Okano, Sadao; Hongo, Kazuya; Aonuma, Hidekazu; and Miyamoto, Hiroshi, 5,116,702, Cl. 430-54.000.

Aonuma, Shinichiro: *See—*
Miura, Tomoshi; Aonuma, Shinichiro; and Ohara, Hiroyuki, 5,116,828, Cl. 514-171.000.

Aoyagi, Takaaki: *See—*
Takeuchi, Tomio; Aoyagi, Takaaki; Naganawa, Hiroshi; Hamada, Masa; Muraoka, Yasuhiko; and Aoyama, Takayuki, 5,117,052, Cl. 562-461.000.

Aoyama, Shunichi, to Nissan Motor Co., Ltd. Direct injection diesel engine. 5,115,789, Cl. 123-569.000.

Aoyama, Takayuki: *See—*
Takeuchi, Tomio; Aoyagi, Takaaki; Naganawa, Hiroshi; Hamada, Masa; Muraoka, Yasuhiko; and Aoyama, Takayuki, 5,117,052, Cl. 562-461.000.

Apple Computer, Inc.: *See—*
Courtney, Thomas P., 5,116,150, Cl. 400-320.000.

Appleton Papers Inc.: *See—*
Mathiaparanam, Ponnampalam, 5,116,978, Cl. 544-144.000.

Applied Materials, Inc.: *See—*
Severns, David W.; Tompson, Brian; Lindstrom, Paul R.; and Carlson, David K., 5,116,181, Cl. 414-222.000.

AQS, Inc.: *See—*
Rinehart, Robert W., 5,116,415, Cl. 75-711.000.

Aquarian Water Co.: *See—*
Ceaton, Peter F., 5,116,500, Cl. 210-238.000.

AR-GOV, Inc.: *See—*
Weinberg, Eitan; and Ofrat, Aviad, 5,115,959, Cl. 228-4.100.

Arachnid, Inc.: *See—*
Harlan, Eugene G.; Bonilla, Marcio; and Martin, John R., 5,116,063, Cl. 273-376.000.

Arai, Masatoshi, to Shin-Etsu Chemical Company, Limited. Process for preparing alkoxy-functional organopolysiloxanes and the resultant alkoxy-functional organopolysiloxanes. 5,117,029, Cl. 556-457.000.

Arai, Naoto; and Watanabe, Kazuo, to Kanzaki Paper Manufacturing Co., Ltd. Heat-sensitive recording material. 5,116,802, Cl. 503-208.000.

Araki, Morio: *See—*
Akiyama, Kazuhiro; Kashiwazaki, Takashi; Araki, Morio; Odagawa, Satoshi; and Fukushima, Atsuhiko, 5,117,363, Cl. 364-449.000.

Araki, Yoshitaka: *See—*
Ohtani, Mitsuaki; Matsuura, Takaharu; Konoike, Toshiro; and Araki, Yoshitaka, 5,117,039, Cl. 560-60.000.

Aranyi, Ernie, to United States Surgical Corporation. Surgical fastener apparatus. 5,116,349, Cl. 606-142.000.

Aratake, Kazuhiko; Horikoshi, Masayoshi; Kato, Fumio; Suzuki, Yasuhiko; and Morimoto, Yuki, to Chisso Corporation; and Nippon-denso Co., Ltd. Resin composition for electric insulation materials for vehicles. 5,116,899, Cl. 524-371.000.

Arbel, Abe. Electronic ballast for fluorescent lights. 5,117,158, Cl. 315-220.000.

Arco Chemical Technology, L.P.: *See—*
Grey, Roger A.; Schock, Laurel E.; and Armstead, Diandre, 5,116,882, Cl. 521-147.000.

Ardco, Inc.: *See—*
Artwohl, Paul; and Robinson, David, 5,116,274, Cl. 312-116.000.

Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, to Canon Kabushiki Kaisha. Image forming apparatus having streamlined input for control signals. 5,117,260, Cl. 355-204.000.

Arimoto, Hironobu, to Mitsubishi Denki Kabushiki Kaisha. Method for making a plasma display. 5,116,271, Cl. 445-24.000.

Arline, Samuel B.; Eder, Matthias; Dunlap, Jeffrey J.; and Douglas, Gary W., to United Technologies Corporation. Fuel metering and actuation system. 5,116,362, Cl. 60-734.000.

Armco Inc.: *See—*
Bagdal, Karl T., 5,117,081, Cl. 219-69.100.
Schoen, Jerry W., 5,116,686, Cl. 428-467.000.

Armco Steel Company, L.P.: *See—*
Boston, Steven L.; Kilbane, Farrell M.; Lee, Danny E.; Seay, William R.; and Coleman, Richard A., 5,116,645, Cl. 427-320.000.

Armin, Ulber: *See—*
Immler, Josef; and Armin, Ulber, 5,117,318, Cl. 360-105.000.

Armstead, Diandre: *See—*
Grey, Roger A.; Schock, Laurel E.; and Armstead, Diandre, 5,116,882, Cl. 521-147.000.

Arnold, David: *See—*
Castonguay, Roger N.; and Arnold, David, 5,117,210, Cl. 335-172.000.

Arnold, David E. J.: *See—*
Hunter, Julian E.; Reid, James; Arnold, David E. J.; Hails, George; Baxter, Kenneth F.; Andrews, Andrian F.; and Nunn, Michael J., 5,116,407, Cl. 106-16.000.

Artagraph Reproduction Technology Inc.: *See—*
Lang, Stefan, 5,116,562, Cl. 264-132.000.

Artiss, Joseph D.; Bensie, Jill M.; Zak, Bennie; and Raden, Daniel S., to Board of Governors of Wayne State University. Amino acid substituted 4-aminophenazones for measuring enzyme activity. 5,116,730, Cl. 435-15.000.

Arts, Petrus H. M.: *See—*
Lokhoff, Gerardus C. P.; Van Eijck, Gustavus L. P.; and Arts, Petrus H. M., 5,117,313, Cl. 360-40.000.

Artwohl, Paul; and Robinson, David, to Ardco, Inc. Refrigerator display cabinet with thermally insulated pivotable window pane. 5,116,274, Cl. 312-116.000.

Arvanaghi, Massoud: *See*—
Brigati, David J.; Nagubandi, Sreeramulu; and Arvanaghi, Massoud, 5,116,732, Cl. 435-26.000.

Arzneimittelwerk Dresden GmbH: *See*—
Wunderlich, Helmut; Stark, Andreas; Zenker, Lothar; Lohmann, Dieter; Poppe, Hildegard; Bartsch, Reni; Skoldinov, Aleksandr P.; Kaverina, Natalja V.; Grizenko, Anna N.; and Lyskovzev, Valentin V., 5,116,974, Cl. 540-591.000.

Asada, Shinji; and Yonezawa, Yasuharu, to Dainippon Screen Mfg. Co. Ltd. Method of and apparatus for generating conversion curve employable for converting reproduction characteristic of image. 5,117,293, Cl. 358-298.000.

Asahi Denka Kogyo Kabushiki Kaisha: *See*—
Yamashita, Haruyuki; Shinada, Teiyu; and Sugiyama, Hiromu, 5,116,757, Cl. 435-255.000.

Asahi Glass Company Ltd.: *See*—
Nomura, Shinzou; Katsushima, Hiroshi; Kawasaki, Toru; Unoki, Masao; and Nakamura, Masaru, 5,117,272, Cl. 357-52.000.

Asahi Kogaku Kogyo K.K.: *See*—
Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.
Hirakawa, Jun, 5,117,310, Cl. 359-745.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Asai, Kazuo; and Kikuchi, Masaharu, 5,116,644, Cl. 427-164.000.
Hori, Masakatsu, 5,117,248 Cl. 354-234.100.
Kobayashi, Takumi, 5,117,137, Cl. 310-49.00R.
Nomura, Hiroshi, 5,117,311, Cl. 359-819.000.
Suzuki, Minoru, 5,117,253, Cl. 355-32.000.

Asai, Fumiyasu: *See*—
Komori, Shinji; Takata, Hidehiro; Tamura, Toshiyuki; Asai, Fumiyasu; and Fukuhara, Takeshi, 5,117,489, Cl. 395-375.000.

Asai, Kazuo; and Kikuchi, Masaharu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Plastic lens and method of forming anti-reflecting layer on a plastic lens. 5,116,644, Cl. 427-164.000.

Asakawa, Naoki; Ohe, Hiroshi; Yoshida, Yutaka; Sato, Tadashi; Nezu, Yukuo; and Oda, Yoshiya, to Eisai Co. Ltd. Exchange method of mobile phase in high-performance liquid chromatography mass spectrometry and its apparatus. 5,117,109, Cl. 250-288.000.

Asaki Glass Company Ltd.: *See*—
Asano, Teruo; Watanabe, Naohiro; Jinushi, Kazuki; and Samejima, Shunichi, 5,116,426, Cl. 134-40.000.

Asami, Sumio: *See*—
Shinmen, Yoshifumi; Asami, Sumio; Amano, Norihide; Amachi, Teruo; and Yoshizumi, Hajime, 5,116,751, Cl. 435-194.000.

Asami, Takashi: *See*—
Bathaee, Mehdi; and Asami, Takashi, 5,117,314, Cl. 360-51.000.

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Sasaki, Hiroshi; Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinichi, 5,115,694, Cl. 74-844.000.
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Asplund, Gunnar, 5,117,323, Cl. 361-47.000.
Gard, Inge, 5,117,346, Cl. 363-51.000.
Sandberg, Lennart, 5,117,163, Cl. 318-52.000.

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Joglekar, Manohar A.; and Aseltine, Philip F., 5,117,450, Cl. 379-58.000.

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Fukuyama, Toshifumi, 5,117,118, Cl. 250-551.000.

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Dario, Luigi, 5,115,914, Cl. 206-499.000.

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Correia, Yves; Lesparre, Jean; and Petit, Alain, 5,116,799, Cl. 502-225.000.

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Myers, Terry N., 5,116,976, Cl. 546-20.000.

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Kloster, John M., 5,116,280, Cl. 454-137.000.

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Hauber, David E., 5,117,482, Cl. 392-492.000.

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Dore, Jacques, 5,115,791, Cl. 123-572.000.

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Thomas, Brian J.; Briggs, Daniel C.; and Avdenko, Michael, 5,117,154, Cl. 313-634.000.

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Narayanan, G. Hari; Curtis, R. Eugene; Quist, William E.; Hyatt, Michael V.; and Axter, Sven E., 5,116,572, Cl. 420-533.000.

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Hauser, Bernhard; Gerding, Guillermo; Moller, Knut; Muller, Bernd-Henrik; Rudolph, Gert; and Wiethaup, Wolfgang, 5,115,820, Cl. 131-194.000.

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Burhite, Albert G., 5,116,162, Cl. 404-72.000.

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Liu, Chian Q.; and Bader, Samuel D., 5,116,693, Cl. 428-694.000.

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Clingman, William H., Jr.; and Kennedy, Lyn R., 5,115,687, Cl. 73-863.610.

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Frigo, Roberto; and Bagaglio, Gian-Carlo, 5,116,412, Cl. 106-38.240.

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Hawsey, Robert A.; and Bailey, J. Milton, 5,117,141, Cl. 310-114.000.

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Cochran, John R.; Bailey, Rouse R., Jr.; and Lessig, William R., III, 5,115,538, Cl. 15-383.000.

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Chen, Robert G.; and Son, Adelina J., 5,117,058, Cl. 564-157.000.
Gaidry, John E.; Quebedeau, Larry J.; Donovan, Joseph F.; and Ashton, Jefferson P., 5,115,864, Cl. 166-278.000.
Pastusek, Paul E., 5,115,873, Cl. 175-65.000.

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Patel, Daxesh K.; and Baker, Jay D., 5,116,641, Cl. 427-96.000.

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Anderson, David W.; Baker, John H. E., II; and O'Connell, Thomas E., 5,115,962, Cl. 228-120.000.

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Babson, Vincent L.; and Hagelbarger, Lee A., 5,115,720, Cl. 91-448.000.

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De Clercq, Erik D. A.; Herdewijn, Piet A. M. M.; Broder, Samuel; and Balzarini, Jan M. R., 5,116,822, Cl. 514-49.000.

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Nukaga, Tadashi; Mochizuki, Kentaro; Yamaguchi, Shinji; and Banba, Yoshikazu, 5,115,651, Cl. 68-17.00R.

Bancsi, Joseph A.: *See*—
Sertic, James L.; Bancsi, Joseph A.; Sertic, Lisa D.; Esche, Grace M.; and Lawson, John, 5,116,316, Cl. 604-83.000.

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Kanzaki, Toshiaki; and Matsui, Yosuke, 5,116,707, Cl. 430-59.000.

Baney, Ronald H.; Bilgrien, Carl J.; Broderick, Dennis W.; and Carpenter, Leslie E., II, to Dow Corning Corporation. Amine catalysts for the low temperature conversion of silica precursors to silica. 5,116,637, Cl. 427-340.000.

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Watson, Leland E.; Berajas, Saul; and Whittaker, Bruce E., 5,117,132, Cl. 307-465.000.

Barany, George, to University of Minnesota. Xanthenylamide handle for use in peptide synthesis. 5,117,009, Cl. 549-394.000.

Barbee, Robert B.; and Jones, Glenn C., to Eastman Kodak Company. Thermosetting powder coating compositions. 5,116,892, Cl. 524-99.000.

Barber, Bruce A.: *See*—
Chvapil, Milos; and Barber, Bruce A., 5,116,620, Cl. 424-445.000.

Barber, Gerald L. Extreme"G" accelerator amusement ride. 5,115,744, Cl. 104-75.000.

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Perry, Jeffrey E.; and Barber, Harry, 5,116,246, Cl. 439-621.000.

Barbulesco, Noel K.; and Lundquist, Stan K., to Sabel Engineering Corporation. In-line bottom loading case packer. 5,115,625, Cl. 53-467.000.

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Pope, John A.; Barker, Roger N.; and Hann, Richard A., 5,116,805, Cl. 503-227.000.

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Haeussler, Hubert, 5,115,684, Cl. 73-861.480.

Barndt, Charles L., Jr.: *See*—
Mitchell, David L.; Stein, Alan J.; Barndt, Charles L., Jr.; and Szeto, William W., 5,115,710, Cl. 89-1.809.

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Kotrla, John E., 5,116,095, Cl. 294-94.000.

Barp, Bruno, to Sulzer Brothers Limited. Gas and air feed member for a feed cell battery and a fuel cell battery. 5,116,696, Cl. 429-26.000.

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Spariat, Jacques; Aubret, Jean-Pierre; and Barrier, Michel, 5,115,708, Cl. 89-1.140.

Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Kraus, Georg; Weiss, Helga; and Wolter, Olaf, to International Business Machines Corporation. Method of producing micromechanical sensors for the AFM/STM profilometry. 5,116,462, Cl. 156-643.000.

Bartlett, Michael L.: *See*—
Annino, Raymond; Bartlett, Michael L.; Karas, Edwin L.; Lueck, Dale E.; Middleton, John L.; and Villalobos, Richard, 5,116,764, Cl. 436-161.000.

Bartlow, David H., to Owens-Corning Fiberglas Corporation. Double wall underground storage tank. 5,115,936, Cl. 220-426.000.

Bartram, Philip W.; and DiBona, Noel C., to United States of America, Army. Method of chemical decontamination. 5,116,512, Cl. 210-690.000.

Bartsch, Reni: *See*—
Wunderlich, Helmut; Stark, Andreas; Zenker, Lothar; Lohmann, Dieter; Poppe, Hildegard; Bartsch, Reni; Skoldinov, Aleksandr P.; Kaverina, Natalja V.; Grizenko, Anna N.; and Lyskovzev, Valentin V., 5,116,974, Cl. 540-591.000.

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Baumgartner, Ehrenfried; Echte, Adolf; and Mertes, Juergen, 5,116,907, Cl. 525-77.000.
Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, 5,116,860, Cl. 514-399.000.
Ditrich, Klaus; Hamprecht, Gerhard; Wuerzer, Bruno; Meyer, Norbert; Westphalen, Karl-Otto; and Laatsch, Hartmut, 5,117,005, Cl. 548-369.000.
Kempe, Uwe; Dockner, Toni; and Koehler, Hermann, 5,117,004, Cl. 548-323.000.
Knoll, Wolfgang; and Knobloch, Harald, 5,116,121, Cl. 356-301.000.
Kohlhaupt, Reinhold; Bieg, Walter; and Lang, Ernst, 5,116,996, Cl. 548-457.000.
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Leyrer, Reinhold J.; Lauke, Harald; Nick, Bernhard; Strohriegl, Peter; and Haarer, Dietrich, 5,116,911, Cl. 525-329.900.
Pandl, Klaus; and Patsch, Manfred, 5,117,050, Cl. 562-58.000.
Wenderoth, Bernd; Schuetz, Franz; Sauter, Hubert; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,116,866, Cl. 514-522.000.

BASF Corporation: *See*—
Burton, Wendel L., 5,116,897, Cl. 524-243.000.

Bashkin, James K.: *See*—
Stern, Michael K.; and Bashkin, James K., 5,117,063, Cl. 564-398.000.

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Lerman, Theodore B.; and Basse, Bernard W., 5,116,178, Cl. 411-87.000.

Bassi, Dario; and Bouchet, Damien, to Etablissements STAUBLI-VERDOL. Harness cord pulley arrangement for jacquard shed forming device. 5,116,364, Cl. 139-65.000.

Basten, Aaron K., to Vector Corporation. Discharge mechanism for a large fluid bed/dryer granulator. 5,115,578, Cl. 34-57.00A.

Batchelder, John S.; Gross, Vaughn P.; Hobbs, Philip C. D.; Miller, Robert J.; and Murray, Kenneth D., to International Business Machines Corporation. Suppression of particle generation in a modified clean room corona air ionizer. 5,116,583, Cl. 422-186.070.

Bateson, George F.; Chilcote, Dennis D.; Martinson, Michael M.; Valine, Steven B.; and Zambrano, Adolfo R., to BioTrol, Inc. Process for treating contaminated soil. 5,115,986, Cl. 241-20.000.

Bathaee, Mehdi; and Asami, Takashi, to Western Digital Corporation. Disk drive pulse detection method and circuit. 5,117,314, Cl. 360-51.000.

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Burton, Frederick G.; Cataldo, Dominic A.; Cline, John F.; and Skiens, W. Eugene, 5,116,414, Cl. 71-121.000.
Greenspan, Bernard J.; and Moss, Owen R., 5,115,971, Cl. 239-3.000.

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Steinkamp, Stephen P.; and Batzer, Jeffrey C., 5,116,382, Cl. 623-38.000.

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Baumgartner, Ehrenfried; Echte, Adolf; and Mertes, Juergen, to BASF Aktiengesellschaft. Heat distortion resistant, thermoplastic molding material containing a copolymer, preparation of the molding material and its use. 5,116,907, Cl. 525-77.000.

Baxter Diagnostics Inc.: *See—*
Hale, Ron L.; and Solas, Dennis W., 5,116,989, Cl. 546-265.000.

Baxter International Inc.: *See—*
Sertic, James L.; Bancsi, Joseph A.; Sertic, Lisa D.; Esche, Grace M.; and Lawson, John, 5,116,316, Cl. 604-83.000.

Baxter, James A. Vial sleeve 5,116,578, Cl. 422-63.000.

Baxter, Kenneth F.: *See—*
Hunter, Julian E.; Reid, James; Arnold, David E. J.; Hails, George; Baxter, Kenneth F.; Andrews, Andrian F.; and Nunn, Michael J., 5,116,407, Cl. 106-16.000.

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Bucheler, Manfred; Gehringer, Hans; Klinksiek, Bernd; and Koglin, Bernd, 5,116,536, Cl. 252-314.000.
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; Becker, Benedikt; Stendel, Wilhelm; and Erdelen, Christoph, 5,116,836, Cl. 514-224.200.
Haug, Michael; Marhold, Albrecht; Santel, Hans-Joachim; Lurssen, Klaus; and Schmidt, Robert R., 5,117,038, Cl. 560-55.000.
Hocker, Hartwig; Keul, Helmut; Leitz, Edgar; Schon, Norbert; and Kuhling, Steffen, 5,116,918, Cl. 525-415.000.
Jager, Horst, 5,116,957, Cl. 534-632.000.
Jelich, Klaus, 5,116,993, Cl. 546-345.000.
Zaby, Gottfried; Judat, Helmut; Boonstra, Eric; de Vos, Stefaan; Eckermann, Rolf-W.; and Humburger, Siegbert, 5,117,048, Cl. 560-347.000.

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Schonleber, Gerhard, 5,116,092, Cl. 293-132.000.

Bayes, Stephen A.: *See—*
Roebelen, George J., Jr.; and Bayes, Stephen A., 5,115,859, Cl. 165-10.000.

Bayliss, William M., to FMC Corporation. Common base for a plurality of modular fillers. 5,115,843, Cl. 141-1.000.

Baysdon, Sherrol L.: *See—*
Janoski, Helen L.; Baysdon, Sherrol L.; and Pulwer, Mitchell L., 5,116,991, Cl. 546-315.000.

Beand, Reinhold: *See—*
Baacke, Michael; Beand, Reinhold; Engler, Bernd; Kiss, Akos; Kleine-Mollhoff, Peter; Kleinschmit, Peter; Koberstein, Edgar; and Siray, Mustafa, 5,116,586, Cl. 423-239.000.

Beane, Richard M., to Kirwan Surgical Products, Inc. Bipolar hand-switch adapter. 5,116,333, Cl. 606-51.000.

Beard, Joseph O.: *See—*
Granger, Stanley W.; Beard, Joseph O.; and Sveen, Frode, 5,116,017, Cl. 251-1.200.

Beasley, John C.; and Dinand, Pierre F., to Stuart Jacobson Associates, Inc. Personal care package. 5,115,916, Cl. 206-581.000.

Beatrice Konig-Haug: *See—*
Konig, Jochen, 5,115,924, Cl. 211-186.000.

Beattie, Gillian M.; Lappi, Douglas A.; Baird, J. Andrew; and Hayek, Alberto, to Salk Institute for Biological Studies, The; and Whittier Institute for Diabetes & Endocrinology, The. Maintenance of pancreatic islets. 5,116,753, Cl. 435-240.200.

Beauch, Howard D., to General Motors Corporation. Collapsible shaft assembly. 5,115,691, Cl. 74-493.000.

Bechberger, Edward J.: *See—*
Scribner, Herbert C.; Fredette, Maurice C. J.; and Bechberger, Edward J., 5,116,595, Cl. 423-477.000.

Bechtel, Wolf-Dietrich: *See—*
Harreus, Albrecht; Weber, Karl-Heinz; Stransky, Werner; Walther, Gerhard; Muacevic, Gojko; Stenzel, Jorge C.; and Bechtel, Wolf-Dietrich, 5,116,971, Cl. 540-362.000.

Beck, David H.: *See—*
West, Eugene L.; Beck, David H.; and Gort, Thomas L., 5,115,767, Cl. 122-494.000.

Becker, Benedikt: *See—*
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; Becker, Benedikt; Stendel, Wilhelm; and Erdelen, Christoph, 5,116,836, Cl. 514-224.200.

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Becoat, Billie J. Dual wheel driven bicycle. 5,116,070, Cl. 280-259.000.

Becquerel, Michel, to Valeo Thermique Habitacle. Air blower unit for a motor vehicle heating and/or air conditioning system, and such a system having two air blower units. 5,115,727, Cl. 454-69.000.

Becton-Dickinson and Company: *See—*
Khan, Mohammad A.; and Moellmer, John F., 5,116,623, Cl. 424-616.000.
Kreuzer, James A.; and Lee, Min S., 5,116,323, Cl. 604-164.000.

Bedodi, Aldo: *See—*
Speroni, Armando; and Bedodi, Aldo, 5,116,302, Cl. 493-254.000.

Beecham Group p.l.c.: *See—*
Driver, Michael J.; MacPherson, David T.; and MacLachlan, William S., 5,116,960, Cl. 536-6.500.

Behensky, Max L.: *See—*
Moncrief, Rick L.; Durfey, Erik J.; and Behensky, Max L., 5,116,051, Cl. 273-448.00B.

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Stuber, Werner; and Paques, Eric-Paul, 5,116,962, Cl. 525-54.200.

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Belec, Eric A.: *See—*
Braen, Henry P.; Wright, William J.; and Belec, Eric A., 5,116,039, Cl. 271-34.000.

Belfoure, Edward L.; and Boutni, Omar M., to General Electric Company. Polycarbonate resin mixtures. 5,116,905, Cl. 525-67.000.

Bell Communications Research: *See—*
Nelson, Terence J.; and Smoot, Lanny S., 5,117,285, Cl. 358-85.000.

Bell Communications Research, Inc.: *See—*
Cheung, Kwok-wai; and Zah, Chung-en, 5,117,469, Cl. 385-11.000.
DeChiaro, Louis F.; and Sandroff, Claude J., 5,116,767, Cl. 437-7.000.

Bell, Richard: *See—*
Lawrence, Gordon C.; Dawson, Michael J.; Noble, David; Ramsay, Michael V. J.; Bell, Richard; Sutherland, Derek R.; and Tiley, Edward P., 5,116,968, Cl. 536-71.000.

Bellersen, Michael F. B.; and Gootzen, Wilhelmus F. M., to U.S. Philips Corporation. Semiconductor device having a semiconductor body embedded in an envelope made of synthetic material. 5,117,278, Cl. 357-72.000.

Bellezza, Orio; and Melanotte, Massimo, to SGS-Thomson Microelectronics S.r.l. EPROM memory array with crosspoint configuration. 5,117,269, Cl. 357-23.500.

Bellmann, Manfred: *See—*
Kummerling, Rolf; Bellmann, Manfred; and Biller, Horst, 5,115,656, Cl. 72-96.000.

Belouet, Christian, to Compagnie Generale d'Electricite. Tape based on a superconducting oxide, and method of manufacture. 5,116,808, Cl. 505-1.000.

Bemis Company, Inc.: *See—*
Lieder, Gaylerd M., 5,115,619, Cl. 53-459.000.

Bender & Co., Gesellschaft m.b.H.: *See—*
Gartner, Karl, 5,117,115, Cl. 250-432.00R.

Bendix Europe Services Techniques: *See—*
Gautier, Jean-Pierre; and Verbo, Ulysse, 5,115,718, Cl. 91-369.200.

Benford, Howard L.: *See—*
Leising, Maurice B.; Benford, Howard L.; and Holbrook, Gerald L., 5,115,698, Cl. 74-868.000.

Benjamin, Linda A.: *See—*
Avery, Noyes L.; Benjamin, Linda A.; and Law, Derek A., 5,116,523, Cl. 252-45.000.

Bennett, Glenn E.; and Urgo, Donald F., to AMP Incorporated. Connector for posted terminals. 5,116,263, Cl. 439-733.000.

Bensie, Jill M.: *See—*
Artiss, Joseph D.; Bensie, Jill M.; Zak, Bennie; and Raden, Daniel S., 5,116,730, Cl. 435-15.000.

Berens, Gerwin: *See—*
Steinhart, Wilhelm; Maischberger, Mohann; Biewald, Thomas; and Berens, Gerwin, 5,116,424, Cl. 134-15.000.

Berg, Eric P., to American Medical Systems, Inc. Preparation of injectable polymeric bodies. 5,116,387, Cl. 623-66.000.

Bergen Barrel & Drum Co.: *See—*
Zilbert, Seymour, 5,116,213, Cl. 425-183.000.

Berger, Donald E., Jr.: *See—*
Switchenko, Arthur C.; Kurn, Nurith; Neukom, Christian; Pirio, Marcel; Berger, Donald E., Jr.; and Ullman, Edwin F., 5,116,726, Cl. 435-5.000.

Bergey, James L.: *See—*
Krapcho, John; Bergey, James L.; and Grover, Gary J., 5,116,851, Cl. 514-354.000.

Berglund, Neil C., to International Business Machines Corporation. Apparatus and method for communicating between nodes in a network. 5,117,430, Cl. 370-85.100.

Bergrohr GmbH: *See—*
Kirchhoff, Wilhelm; Schneider, Simon; and Zeugin, Hans, 5,115,658, Cl. 72-175.000.

Bernel Chemical Co.: *See—*
Fogel, Arnold W.; and Zofchak, Albert, 5,116,604, Cl. 424-59.000.

Bernhardt, Bodo; Dijkhuis, Jan; and Molders, Theo, to Ford Motor Company. Apparatus for preloading antifriction shaft bearings located in a casing. 5,115,558, Cl. 29-705.000.

Bernhardt, Bruno, to IEG Industrie-Engineering GmbH. Arrangement for driving out volatile impurities from ground water. 5,116,163, Cl. 405-128.000.

Bernhardt, Gunther; Steffen, Klaus-Dieter; Haas, Margret; and Kragl, Heinz, to Huls Aktiengesellschaft. Process for the preparation of organosilanes containing methacryloyloxy or acryloyloxy groups. 5,117,027, Cl. 556-440.000.

Bernier, Roger L.; Kluepfel, Dieter; Morosoli, Rolf; and Shareck, Francois, to Institut Armand Frappier. Cellulase-free endo-xylanase enzyme of use in pulp delignification. 5,116,746, Cl. 435-172.300.

Berry, David A.: *See—*
Hoeschele, James D.; Berry, David A.; and Marzilli, Luigi G., 5,116,831, Cl. 514-184.000.

Berry, Thomas G.; Smith, Paul F.; Rohani, Kamyar; Brown, Winfield J., Jr.; and Macnak, Philip P., to Motorola, Inc. Voice controlled pager and programming techniques therefor. 5,117,460, Cl. 381-41.000.

Berthelon, Jean-Jacques: *See—*
Briet, Philippe; Berthelon, Jean-Jacques; and Collonges, Francois, 5,116,954, Cl. 534-551.000.

Berthet, Yves: *See—*
Gerlier, Andre ; and Berthet, Yves, 5,116,037, Cl. 271-3.100.

Bertsch, Roger J.; and Marks, Larry D., to Whirlpool Corporation. Spatter shield for dishwasher door. 5,115,826, Cl. 134-183.000.

Bertz, Hans-Ulrich; and Meder, Willi, to Dr.-Ing. Hofler Messgeratebau GmbH. Measuring arrangement for rotationally symmetrical workpieces. 5,116,234, Cl. 33-550.000.

Bertz, Mark C.: *See—*
Abbott, John S.; Bertz, Mark C.; Faler, James H.; Schirmer, William, III; and Williams, John G., 5,116,400, Cl. 65-144.000.

Best Lock Corporation: *See—*
Palmer, Ralph P.; Whitmoyer, David A.; and Shumaker, Mark A., 5,116,170, Cl. 408-72.00B.

Bethlehem Steel Corporation: *See—*
Rice, Paul P.; and Munch, William D., 5,115,970, Cl. 238-17.000.

Bhalla, Prithvi R.; Herrick, Robert M.; and Gates, Donald W., to American Cyanamid Company. Turfgrass management composition using a 2-imidazole-2-yl nicotinic acid derivative composition. 5,116,403, Cl. 71-92.000.

Bhasin, Kul B.: *See—*
Romanofsky, Robert R.; and Bhasin, Kul B., 5,116,807, Cl. 505-1.000.

Bhatia, Kamlesh K.; Drysdale, Neville E.; and Kosak, John R., to Du Pont de Nemours, E. I., and Company. Solvent scrubbing recovery of lactide and other dimeric cyclic esters. 5,117,008, Cl. 549-274.000.

Bhattacharya, Apurba; Douglas, Alan W.; Grabowski, Edward J.; and Dolling, Ulf H., to Merck & Co., Inc. Dehydrogenation process intermediates. 5,116,983, Cl. 546-14.000.

Bhattacharyya, Bhupati R., deceased (by Bhattacharyya, Uma, executrix); Huang, Shu-Jen; Shetty, Chandrashekar S.; Bui, Nang T.; and Dunn, Yvonne O., to Nalco Chemical Company. Method for detackifying oversprayed paint. 5,116,514, Cl. 210-712.000.

Bhattacharyya, Uma, executrix: *See—*
Bhattacharyya, Bhupati R., deceased; Huang, Shu-Jen; Shetty, Chandrashekar S.; Bui, Nang T.; and Dunn, Yvonne O., 5,116,514, Cl. 210-712.000.

Biale, John, to Union Oil Company of California. Latex-lipophilic polymer graft polymerization process. 5,116,901, Cl. 524-457.000.

Bichler, Bartholomaus; and Jost, Michael, to Messerschmitt-Bolkow-Blohn GmbH. Inlet system for supersonic or hypersonic aircraft. 5,116,251, Cl. 244-53.00B.

Bie, David D., to JBL Incorporated. Phasing plug for compression driver. 5,117,462, Cl. 381-156.000.

Bieg, Walter: *See—*
Kohlhaupt, Reinhold; Bieg, Walter; and Lang, Ernst, 5,116,996, Cl. 548-457.000.

Biehl, Harald: *See—*
Gloe, Karl-Heinz; Kreuzer, Helmut; and Biehl, Harald, 5,115,735, Cl. 100-43.000.

Bielecki, Anthony: *See—*
Burum, Douglas P.; and Bielecki, Anthony, 5,117,186, Cl. 324-307.000.

Bielsteiner Verschlusstechnik GmbH: *See—*
Rosenthal, Karl-Heinz, 5,115,949, Cl. 222-211.000.

Biewald, Thomas: *See—*
Steinhart, Wilhelm; Maischberger, Mohann; Biewald, Thomas; and Berens, Gerwin, 5,116,424, Cl. 134-15.000.

Bilbrey, Robert A.: *See—*
Rutter, Christopher C.; Bilbrey, Robert A.; and Koball, Bruce R., 5,115,626, Cl. 53-468.000.

Bilgrien, Carl J.: *See—*
Baney, Ronald H.; Bilgrien, Carl J.; Broderick, Dennis W.; and Carpenter, Leslie E., II, 5,116,637, Cl. 427-340.000.

Biller, Horst: *See—*
Kummerling, Rolf; Bellmann, Manfred; and Biller, Horst, 5,115,656, Cl. 72-96.000.

Bilocerkowycz, Robert J.; and Denison, Timothy S., to Risky Business Enterprises, Inc. Golf game, apparatus and method therefor. 5,116,048, Cl. 273-87.00B.

Bilodeau, Jules A., to Raytheon Company. Payload retention apparatus. 5,117,328, Cl. 361-380.000.

Bilodeau, Victor: *See—*
Phillips, Joseph; Prough, J. Robert; Bilodeau, Victor; Greenwood, Brian; Bain, Ronald; and Weston, John, 5,116,476, Cl. 162-60.000.

Binney & Smith Inc.: *See—*
Miller, Richard E., 5,116,410, Cl. 106-22.000.

Bio-Technology General Corp.: *See—*
Gonenne, Amnon, 5,116,616, Cl. 424-94.400.

Biophos Medical AB: *See—*
Rigler, Rudolf, 5,116,125, Cl. 356-343.000.

BioTrol, Inc: *See—*
Bateson, George F.; Chilcote, Dennis D.; Martinson, Michael M.; Valine, Steven B.; and Zambrano, Adolfo R., 5,115,986, Cl. 241-20.000.

Bird, Forrest M. Ventilator having an oscillatory inspiratory phase and method. 5,116,088, Cl. 285-319.000.

Bischoff, Dietmar: *See—*
Fischer, Wolfgang; Bischoff, Dietmar; Huss, Michael; Stober, Reinhard; and Roessler, Gert, 5,116,967, Cl. 536-50.000.

Bishamon, Inc.: *See—*
Carrel, Ralph E., 5,116,085, Cl. 285-225.000.

Bishop, Thomas J. Novelty bracelet. 5,115,646, Cl. 63-9.000.

Black, Blanche H.: *See—*
Floyd, William C.; Dragner, Louis R.; Black, Blanche H.; and North, Bernard F., 5,116,927, Cl. 527-300.000.

Black & Decker Inc.: *See—*
Cochran, John R.; Bailey, Rouse R., Jr.; and Lessig, William R., III, 5,115,538, Cl. 15-383.000.

Blair, Earl, to Roof-Flex. Roof valley flashing including expansion joint. 5,115,603, Cl. 52-13.000.

Blaisdell, Ronald G.; Hough, Harold L.; and Pai, Robert Y., to GTE Products Corporation. Method and apparatus for forming apertures in fluorescent lamps. 5,116,272, Cl. 445-26.000.

Blankenburg, Karl; Blankenburg, Karl V.; and Rode, Duane, to Blankenburg, Karl; and Blankenburg, Karl Van. Puzzle. 5,116,053, Cl. 273-153.00S.

Blankenburg, Karl V.: *See—*
Blankenburg, Karl; Blankenburg, Karl V.; and Rode, Duane, 5,116,053, Cl. 273-153.00S.

Blankenburg, Karl Van: *See—*
Blankenburg, Karl; Blankenburg, Karl V.; and Rode, Duane, 5,116,053, Cl. 273-153.00S.

Blankenship, Howard B.; and Wallace, Fred D., to UAB Research Foundation, The. Method and apparatus for automatic autotransfusion. 5,116,312, Cl. 604-66.000.

Blaser, Peter T.: *See—*
Grutzmacher, Bertold; Blaser, Peter T.; and Kruger, Michael, 5,115,738, Cl. 101-216.000.

Blasioli, Patrizia: *See—*
Greco, Alberto; and Blasioli, Patrizia, 5,116,929, Cl. 528-44.000.

Blauer, Darrell W.: *See—*
Doughty, John I.; and Blauer, Darrell W., 5,116,445, Cl. 156-245.000.

Blodin, Daniel: *See—*
Bosson, Jean M.; Odriozola, Juan; Marendaz, Georges-Andre ; and Blodin, Daniel, 5,117,082, Cl. 219-69.120.

Blumenfeld, Charles M.; and Koell, Barbara M. Method and apparatus for drying hand coverings. 5,115,580, Cl. 34-104.000.

Blyler, Lee L., Jr.; Filas, Robert W.; and Grimes, Gary J., to AT&T Bell Laboratories. Optical coupler with mode-mixing refractive microparticles. 5,117,472, Cl. 385-28.000.

Board of Governors of Wayne State University: *See—*
Artiss, Joseph D.; Bensie, Jill M.; Zak, Bennie; and Raden, Daniel S., 5,116,730, Cl. 435-15.000.

Board of Regents, The University of Texas System, The: *See—*
Khokhar, Abdul R.; Lopez-Berestein, Gabriel; and Perez-Soler, Roman, 5,117,022, Cl. 556-137.000.

Board of Trustees operating Michigan State University: *See—*
Pinnavaia, Thomas J.; Amarasekera, Jayantha; and Polansky, Christine A., 5,116,587, Cl. 423-244.000.

Bobry, Howard H. Alternating current conditioner. 5,117,176, Cl. 323-308.000.

Bobzin, Darrell G.: *See—*
Bretz, David H.; and Bobzin, Darrell G., 5,115,634, Cl. 60-39.020.

Bock, Jan; and Valint, Paul L., to Exxon Research and Engineering Company. Hydrophobically associating polymers containing dimethyl acrylamide functionality. 5,116,923, Cl. 526-307.200.

Boecker, Monika: *See—*
Carduck, Franz-Josef; Jahnke, Ulrich; Smulders, Eduard; Vogt, Guenther; Boecker, Monika; and Kuenzel, Werner, 5,116,524, Cl. 252-90.000.

Boehm, Elise M.: *See—*
McKibben, Gary E.; Goetz, Vernon N.; and Boehm, Elise M., 5,115,966, Cl. 229-125.030.

Boehm, Erwin: *See—*
Mertens, Alfred; von der Saal, Wolfgang; Boehm, Erwin; and Strein, Klaus, 5,116,843, Cl. 514-253.000.

Boehringer Ingelheim KG: *See—*
Harreus, Albrecht; Weber, Karl-Heinz; Stransky, Werner; Walther, Gerhard; Muacevic, Gojko; Stenzel, Jorge C.; and Bechtel, Wolf-Dietrich, 5,116,971, Cl. 540-362.000.

Boehringer Mannheim GmbH: *See—*
Mertens, Alfred; von der Saal, Wolfgang; Boehm, Erwin; and Strein, Klaus, 5,116,843, Cl. 514-253.000.
Vogt, Bernd; Lessmann, Hans-Dieter; Klein, Christian; and Treiber, Wolfgang, 5,116,762, Cl. 436-15.000.
Wilhelms, Otto-Henning, 5,116,731, Cl. 435-18.000.

Boeing Company, The: *See—*
Buchsel, Christian K. E.; King, Gary E.; and Burns, Jerry J., 5,115,999, Cl. 244-118.500.
Colebrook, Peter H.; Razzak, Jamil A.; Denkmann, Robert H.; and Clifton, Alan A., 5,115,520, Cl. 4-321.000.
Jones, Darrell D., 5,116,094, Cl. 294-81.610.
Lubowitz, Hyman R.; and Sheppard, Clyde H., 5,116,935, Cl. 528-173.000.

VOL
1138
ISS
4
MY
26
1992
UMI

Narayanan, G. Hari; Curtis, R. Eugene; Quist, William E.; Hyatt, Michael V.; and Axter, Sven E., 5,116,572, Cl. 420-533.000.

Bohler, Erwin: *See—*
Muller, Kurt; Bohler, Erwin; and Dunki, Jurg, 5,115,713, Cl. 89-33.140.
Muller, Kurt; Bohler, Erwin; Ruppen, Bruno; Novet, Hanspeter; and Gerber, Robert, 5,115,714, Cl. 89-33.160.

Boido, Dante: *See—*
Bondanelli, Luigi; Sirani, Mauro; Schembri, Alfonso; and Boido, Dante, 5,116,298, Cl. 493-4.000.

Boissevain, Mathew G., to Measurex Corporation. Maintenance of linearity of support beam. 5,117,093, Cl. 219-494.000.

Bokros, Jack C.: *See—*
Hwang, Ned H. C.; and Bokros, Jack C., 5,116,367, Cl. 623-2.000.

Bolg, Ulrich: *See—*
Ams, Felix; Zanger, Ulf; and Bolg, Ulrich, 5,116,343, Cl. 606-128.000.

Bols, Niels C.: *See—*
Moo-Young, Murray; Bols, Niels C.; Overgaard, Sandra E.; and Scharer, Jeno M., 5,116,747, Cl. 435-178.000.

Bomhard, Andreas; Heider, Joachim; Psiorz, Manfred; Hauel, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Diederen, Willi, to Dr. Karl Thomae GmbH. Heteroaromatic amine derivatives. 5,116,986, Cl. 546-141.000.

Bommannan, Durairaj; Okuyama, Hirohisa; Guy, Richard H.; Stauffer, Paul; and Flynn, Gordon L., to Cygnus Therapeutic Systems; and University of California, The Regents of the. Ultrasound-enhanced delivery of materials into and through the skin. 5,115,805, Cl. 128-24.0AA.

Bonaldi, Antonio; and Molinari, Egidio, to Erregierre Industria Chimica S.p.A. Process for preparing high purity 3-α-7-β-dihydroxy-cholanic acid. 5,117,017, Cl. 552-553.000.

Bondanelli, Luigi; Sirani, Mauro; Schembri, Alfonso; and Boido, Dante, to Intertaba, S.p.A. Control process and apparatus for the production of cigarette filters. 5,116,298, Cl. 493-4.000.

Bonee, Peter A.: *See—*
Ladd, David J.; Pounds, Gregory E.; Kusumi, Tim J.; Bonee, Peter A.; and Shepard, Robert R., 5,117,451, Cl. 379-67.000.

Bonelli, Fabio: *See—*
Verdini, Antonio S.; Pessi, Antonello; and Bonelli, Fabio, 5,116,946, Cl. 530-300.000.

Bonet, Claude: *See—*
Gauthier, Jean-Marie; Coeuret, Francois; and Bonet, Claude, 5,116,665, Cl. 428-216.000.

Bonham, James A.: *See—*
Rossman, Mitchel A.; and Bonham, James A., 5,116,977, Cl. 544-113.000.

Bonilla, Marcio: *See—*
Harlan, Eugene G.; Bonilla, Marcio; and Martin, John R., 5,116,063, Cl. 273-376.000.

Bonss, Rainer, to Robert Bosch GmbH. Method and apparatus for controlling a stepping motor. 5,117,171, Cl. 318-696.000.

Boonstra, Eric: *See—*
Zaby, Gottfried; Judat, Helmut; Boonstra, Eric; de Vos, Stefaan; Eckermann, Rolf-W.; and Humburger, Siegbert, 5,117,048, Cl. 560-347.000.

Borzatta, Valerio: *See—*
Cantatore, Giuseppe; Borzatta, Valerio; and Masina, Franca, 5,116,893, Cl. 524-100.000.

Bosson, Jean M.; Odriozola, Juan; Marendaz, Georges-Andre; and Blodin, Daniel, to Charmilles Technologies S.A. Device and process for controlling the variation of a parameter in EDM machining with an electrode-wire. 5,117,082, Cl. 219-69.120.

Bostjancic, Joseph J., to Resources Conservation Co. Apparatus for controlling solid particle flow in an evaporator. 5,116,473, Cl. 159-42.000.

Bostock, Harvey S. Rotating wheel image maker. 5,117,307, Cl. 359-617.000.

Boston, Steven L.; Kilbane, Farrell M.; Lee, Danny E.; Seay, William R.; and Coleman, Richard A., to Armco Steel Company, L.P. Hot dip aluminum coated chromium alloy steel. 5,116,645, Cl. 427-320.000.

Boston University, Trustees of: *See—*
Small, Donald M., 5,116,633, Cl. 426-641.000.

Botannet, Bernard; Clavel, Jean-Louis; Corbet, Jean-Pierre; and Mulhauser, Michel, to Rhone Poulenc Agrochimie. Process for the preparation of N-sulfomethylglycinate. 5,117,043, Cl. 560-150.000.

Bott, John A. Article carrier. 5,115,954, Cl. 224-316.000.

Bouchet, Damien: *See—*
Bassi, Dario; and Bouchet, Damien, 5,116,364, Cl. 139-65.000.

Boudot, Cecipe;; and Griffaton, Jacques, to Framatome. Process and head for laser working in a tube. 5,117,086, Cl. 219-121.640.

Bouheraoua, Ahmed; and Lechelle, Bernard, to Avions Marcel Dassault-Breguet Aviation. Acoustic method and device for localization of defects in material. 5,115,681, Cl. 73-801.000.

Boutni, Omar M.: *See—*
Belfoure, Edward L.; and Boutni, Omar M., 5,116,905, Cl. 525-67.000.

Bovee, Stan P.: *See—*
Bushagour, Abubaker M.; Vaske, James G.; and Bovee, Stan P., 5,115,711, Cl. 89-1.816.

Bowen, David C.; Dambach, Philip J.; Nelligan, Joseph W., Jr.; and Triner, Irvin R., to Molex Incorporated. Method of making shielded electrical connector. 5,115,962, Cl. 29-867.000.

Bowser, John, to W. L. Gore & Associates, Inc. Dioxole/TFE copolymer composites. 5,116,650, Cl. 428-34.200.

Boyce, Walter A.: *See—*
Leyh, Thomas O.; and Boyce, Walter A., 5,117,156, Cl. 315-73.000.

Boyd, Dennis. Softside waterbed foundation and package. 5,115,526, Cl. 5-451.000.

Boyd, Gary L.: *See—*
Carruthers, William D.; and Boyd, Gary L., 5,116,158, Cl. 403-28.000.

Bracco, M. Umberto: *See—*
Trimbo, Susan L.; Rowe, W. Bruce; and Bracco, M. Umberto, 5,116,819, Cl. 514-21.000.

Bradford-White Corporation: *See—*
West, Eugene L.; Beck, David H.; and Gort, Thomas L., 5,115,767, Cl. 122-494.000.

Bradley, Donald C.: *See—*
Mackey, Kevin J.; Vere, Anthony W.; Bradley, Donald C.; Frigo, Dario M.; and Faktor, Marc M., deceased, 5,116,785, Cl. 437-243.000.

Bradley, Steven A.: *See—*
Ahmed, Osman; and Bradley, Steven A., 5,115,728, Cl. 454-61.000.

Braen, Henry P.; Wright, William J.; and Belec, Eric A., to Pitney Bowes Inc. Apparatus for feeding sheets from a stack thereof. 5,116,039, Cl. 271-34.000.

Brand, Graham H.: *See—*
Chaffee, Donald L.; Mallory, Mark P.; and Brand, Graham H., 5,117,418, Cl. 370-32.100.

Brane, Earl P.; and Tucker, David L., to Wm. R. Hague, Inc. Comprehensive water treatment system. 5,116,491, Cl. 210-143.000.

Braquet, Pierre; Broquet, Colette; Vandamme, Benedicte; and Principe-Nicolas, Paola, to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.). Glycerol derivatives, and therapeutical compositions containing them. 5,116,992, Cl. 514-77.000.

Bravet, Jean-Louis M.: *See—*
Daude, Gerard M.; and Bravet, Jean-Louis M., 5,116,442, Cl. 156-99.000.

Brayer, Eyal, to S.C.R. Engineers Ltd. Method and apparatus for measuring liquid flow. 5,116,119, Cl. 356-28.000.

Bredeson, Sharon: *See—*
Stipanovich, Joseph; and Bredeson, Sharon, 5,117,353, Cl. 374-401.000.

Breed, Anthonius J. M.: *See—*
Drent, Eit; and Breed, Anthonius J. M., 5,116,936, Cl. 528-271.000.

Bregman, Mark F.; Horton, Raymond R.; Lanzetta, Alphonso P.; Noyan, Ismail C.; Palmer, Michael J.; and Tong, Ho-Ming, to International Business Machines Corporation. Electronic substrate multiple location conductor attachment technology. 5,117,275, Cl. 357-70.000.

Bremer, Karl-Heinz; Kuhlmann, Ludwig; Schwarz, Alexander; and Steinstrasser, Axel, to Hoechst Aktiengesellschaft. Process for the preparation of an organ-specific substance labeled with technetium-99m. 5,116,596, Cl. 424-1.100.

Bressler, Peter W.: *See—*
Wilkinson, William T.; Bressler, Peter W.; Schiff, David R.; Schneider, Eric A.; and Lincov, Pietr, 5,116,044, Cl. 482-52.000.

Bretz, David H.; and Bobzin, Darrell G., to Delavan Inc. Simplex airblade fuel injection method. 5,115,634, Cl. 60-39.020.

Bridgestone Corporation: *See—*
Oshima, Kazuo; and Iwasaki, Shizuo, 5,115,854, Cl. 152-556.000.

Bridgestone/Firestone, Inc.: *See—*
Chakravarti, Kalidas; and Khalatbari, Jamshiid, 5,116,682, Cl. 428-395.000.

Brierley, Carol L.; and Wolf, Lisa. Protector for IV site. 5,116,324, Cl. 604-180.000.

Briet, Philippe; Berthelon, Jean-Jacques; and Collonges, Francois, to Lipha, Lyonnaise Industrielle Pharmaceutique. Pharmaceutically useful flavonoic compounds containing at least one substituent on the benzopyranone ring moiety. 5,116,954, Cl. 534-551.000.

Brigati, David J., to Iniziative Marittime 1991, S.r.L. Hybridization method and composition with alternating polysaccharide of sulfated N-acetylgalactosamine. 5,116,727, Cl. 435-6.000.

Brigati, David J.; Nagubandi, Sreeramulu; and Arvanaghi, Massoud, to Fisher Scientific Co. Tetrazolium halide compounds and methods. 5,116,732, Cl. 435-26.000.

Briggs, Daniel C.: *See—*
Thomas, Brian J.; Briggs, Daniel C.; and Avdenko, Michael, 5,117,154, Cl. 313-634.000.

Briggs, Robert C.: *See—*
Yingst, Stephen M.; Briggs, Robert C.; D'Ambrosia, John F.; Flickinger, Steven L.; Owens, Steven P.; and Zeiders, Jeffrey A., 5,117,476, Cl. 385-88.000.

Bright Technologies, Inc.: *See—*
Mishica, Robert J., Jr., 5,117,221, Cl. 340-556.000.

Brindley, William J.; Smialek, James L.; and Rouge, Carl J., to United States of America, National Aeronautics and Space Administration. Oxidation resistant coating for titanium alloys and titanium alloy matrix composites. 5,116,690, Cl. 428-614.000.

Bristol-Myers Company: *See—*
Ohkuma, Hiroaki; Konishi, Masataka; Matsumoto, Kiyoshi; Oki, Toshikazu; and Hoshino, Yutaka, 5,116,845, Cl. 514-279.000.

Bristol-Myers Squibb Company: *See—*
Alain, Martel; Bachand, Carol; and Daris, Jean-Paul, 5,116,833, Cl. 514-210.000.
Gammans, Richard, 5,116,852, Cl. 514-359.000.
Skripitz, Walter; and Schelhas, Klaus-Dieter, 5,116,377, Cl. 623-23.000.

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Worcester, Paul L. A.; Maxwell, David J.; and Trethewey, Michael L., 5,117,375, Cl. 364-571.010.

British Aerospace Public Limited Company: *See—*
Perry, Alan F. E., 5,116,001, Cl. 244-53.00B.

British Gas plc: *See—*
Ebbins, James R.; Lopez, Simon F.; and Taylor, Christopher, 5,116,507, Cl. 210-639.000.

British Guide Rails Limited: *See—*
Cameron, David S., 5,116,341, Cl. 294-67.300.

British Steel plc: *See—*
Widdowson, Roy; and Scholes, Alan, 5,116,027, Cl. 266-225.000.

Britz, William E., Jr.: *See—*
Keeling, Michale E.; Britz, William E., Jr.; and Clark, David W., 5,116,255, Cl. 119-18.000.

Broaddus, Charles D., to Procter & Gamble Company, The. Compositions for treating hypercholesterolemia. 5,116,610, Cl. 424-78.120.

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De Clercq, Erik D. A.; Herdewijn, Piet A. M. M.; Broder, Samuel; and Balzarini, Jan M. R., 5,116,822, Cl. 514-49.000.

Broderick, Dennis W.: *See—*
Baney, Ronald H.; Bilgrien, Carl J.; Broderick, Dennis W.; and Carpenter, Leslie E., II, 5,116,637, Cl. 427-340.000.

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Brookman, Michael J., to DME Corporation. Protective hood and oral-nasal mask. 5,115,804, Cl. 128-201.220.

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Braquet, Pierre; Broquet, Colette; Vandamme, Benedicte; and Principe-Nicolas, Paola, 5,116,992, Cl. 514-77.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Kagayama, Shigeru, 5,115,759, Cl. 118-621.000.
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Corte, Lawrence J.; and Brown, Adrian, 5,115,866, Cl. 166-370.000.

Brown, Graham V.: *See—*
Kemp, David J.; Anders, Robin F.; Coppel, Ross L.; and Brown, Graham V., 5,116,755, Cl. 435-252.300.

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Thomson, Ian; MacKay, Gary F.; and Brown, Martin P., 5,117,113, Cl. 250-370.070.

Brown, Terrance O.; Slack, David A.; Alexander, A. Gordon; and Moran, Lyle E., to Exxon Research and Engineering Company. Grease composition containing an ethylene copolymer having a melt index of at least about 40. 5,116,522, Cl. 252-18.000.

Brown, Thomas W.; and Young, Gerald W., to General Electric Company. Separable connector module with improved current-carrying threaded joint. 5,116,265, Cl. 439-801.000.

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Berry, Thomas G.; Smith, Paul F.; Rohani, Kamyar; Brown, Winfield J., Jr.; and Macnak, Philip P., 5,117,460, Cl. 381-41.000.

Bruce, Robert; and Mitakidis, Dimitrios, to Domtar, Inc. Gypsum board. 5,116,671, Cl. 428-309.900.

Bruker Instruments, Inc.: *See—*
Burum, Douglas P.; and Bielecki, Anthony, 5,117,186, Cl. 324-307.000.

Brunelle, Daniel J., to General Electric Company. Bis(guanidinium)alkane salts as phase transfer catalysts. 5,116,975, Cl. 544-86.000.

Brunet, Charles G.; Labbee, Gilles E.; and McGee, Jay W., to Anglo Suisse, Inc. Directional drilling system and method for drilling precise offset wellbores from a main wellbore. 5,115,872, Cl. 175-61.000.

Brunker, David L.: *See—*
Dechelette, Helen; and Brunker, David L., 5,116,230, Cl. 439-101.000.

Bruno, Salvatore A.; and Burn, Ian, to Du Pont de Nemours, E. I., and Company. COG dielectric with high K. 5,116,790, Cl. 501-139.000.

Brunswick Corporation: *See—*
Steele, Michael F., 5,115,709, Cl. 89-1.808.

Bryan, Philip N.; Pantoliano, Michael W.; Rollence, Michele L.; and Wong, Chi H., to Genex Corporation. Biosynthetic uses of thermostable proteases. 5,116,741, Cl. 435-87.000.

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Chan, Tsiu C.; and Bryant, Frank R., 5,116,776, Cl. 437-52.000.

Bubik, Alfred; and Hildebrand, Otto, to Sulzer-Escher Wyss GmbH. Drainage device in a double-sieve mold. 5,116,477, Cl. 162-301.000.

Buchanan, Robert A.; and Stults, Jeffrey S., to Occidental Chemical Corporation. Preparation of diphenyl ether. 5,117,002, Cl. 549-241.000.

Bucheler, Manfred; Gehringer, Hans; Klinksiek, Bernd; and Koglin, Bernd, to Bayer Aktiengesellschaft. Preparation of pharmaceutical or cosmetic dispersions. 5,116,536, Cl. 252-314.000.

Buchholz, Dale R.: *See—*
Chang, Hungkun J.; Doss, William K.; Nolan, Michael P.; and Buchholz, Dale R., 5,117,236, Cl. 342-367.000.

Buchsel, Christian K. E.; King, Gary E.; and Burns, Jerry J., to Boeing Company, The. Aft double deck airplane. 5,115,999, Cl. 244-118.500.

Budd Company, The: *See—*
Raitzer, Donald A.; and Twisdom, Raymond J., 5,115,891, Cl. 188-218.00R.

Budney, David: *See—*
Newton, Anthony J.; and Budney, David, 5,115,612, Cl. 52-208.000.

Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, to BASF Aktiengesellschaft. N-substituted azoles for combating insects, arachnids and nematodes. 5,116,860, Cl. 514-399.000.

Buhler, Frederick T., to Interstate Electronics Corp. Method and apparatus employing two independent means for nulling an ambient magnetic field. 5,117,155, Cl. 315-8.000.

Bui, Nang T.: *See—*
Bhattacharyya, Bhupati R., deceased; Huang, Shu-Jen; Shetty, Chandrashekar S.; Bui, Nang T.; and Dunn, Yvonne O., 5,116,514, Cl. 210-712.000.

Buican, Tudor N.; and Yoshida, Thomas M., to United States of America, Energy. Integrated fluorescence analysis system. 5,117,466, Cl. 382-6.000.

Bukhman, Yefim, to Motorola, Inc. Method for selectively etching a feature. 5,116,460, Cl. 156-643.000.

Bulgari, Gianni, to Gianni Bulgari S.p.A. Motor car with three front seats side by side. 5,116,097, Cl. 296-64.000.

Bull HN Information Systems Inc.: *See—*
Ledoux, Robert V.; Kelly, Richard P.; and Phillips, Forrest M., 5,117,491, Cl. 395-375.000.

Bung, Josef; Ulubay, Hasan; and Schutzius, Bernd, to Guilini Chemie GmbH. Paper sizing agents containing cationic dispersants. 5,116,924, Cl. 526-312.000.

Bungter, Helmut: *See—*
Gebald, Gregor; Langen, Manfred; and Bungter, Helmut, 5,115,631, Cl. 57-281.000.

Bunyard, Robert. Device for attaching two building structures together. 5,115,604, Cl. 52-34.000.

Buono, Caetano. Child-resistant closure with visual close/open indicator. 5,115,929, Cl. 215-220.000.

Burgess, Ralph G.: *See—*
Newman, William H.; and Burgess, Ralph G., 5,116,136, Cl. 374-102.000.

Burgess, Trevor M.: *See—*
McCann, Dominic P. J.; Kerbart, Yves; and Burgess, Trevor M., 5,115,871, Cl. 175-50.000.

Burgi, Dean S.: *See—*
Chien, Ring-Ling; and Burgi, Dean S., 5,116,471, Cl. 204-180.100.

Burhite, Albert G., to B-J Development. Pavement maintenance machine and method. 5,116,162, Cl. 404-72.000.

Burks, Harold D.: *See—*
Fletcher, James C.; Pratt, J. Richard; St. Clair, Terry L.; Stoakley, Diane M.; and Burks, Harold D., 5,116,939, Cl. 528-353.000.

Burn, Ian: *See—*
Bruno, Salvatore A.; and Burn, Ian, 5,116,790, Cl. 501-139.000.

Burns, Jerry J.: *See—*
Buchsel, Christian K. E.; King, Gary E.; and Burns, Jerry J., 5,115,999, Cl. 244-118.500.

Burns, O. Edward. Rescue device. 5,116,093, Cl. 294-19.100.

Burrows, Larry G.: *See—*
Honkomp, Glenn A.; McNay, Thomas O.; and Burrows, Larry G., 5,117,089, Cl. 219-201.000.

Burton, Dale: *See—*
Hotz, Charles R.; McNiff, Gerald J.; and Burton, Dale, 5,117,360, Cl. 364-423.000.

Burton, Frederick G.; Cataldo, Dominic A.; Cline, John F.; and Skiens, W. Eugene, to Battelle Memorial Institute. Long-term control of root growth. 5,116,414, Cl. 71-121.000.

Burton, Wendel L., to BASF Corporation. Antistatic composition. 5,116,897, Cl. 524-243.000.

Burum, Douglas P.; and Bielecki, Anthony, to Bruker Instruments, Inc. Method for increasing resolution in two-dimensional solid-state NMR heteronuclear correlation spectra. 5,117,186, Cl. 324-307.000.

Burzynski, Stanislaw R. Methods for treating Parkinson's disease. 5,116,622, Cl. 424-545.000.

Bushagour, Abubaker M.; Vaske, James G.; and Bovee, Stan P., to FMC Corporation. Missile canister and method of fabrication. 5,115,711, Cl. 89-1.816.

Bushey, Thomas P.: *See—*
Hwang, Bor-Yuan; and Bushey, Thomas P., 5,117,391, Cl. 365-155.000.

Bushnell, Bernard C.: *See—*
Packham, Michael J.; and Bushnell, Bernard C., 5,116,926, Cl. 526-348.100.

Butler, Alfred L., to Litton Systems, Inc. Ring laser gyroscope mount. 5,116,130, Cl. 356-350.000.

Butler, Dennis, to Glenn Technologies, Inc. Window unit. 5,115,605, Cl. 52-105.000.

Butler, Marcus S.: *See—*
Klainer, Stanley M.; Thomas, Johnny R.; and Butler, Marcus S., 5,116,759, Cl. 435-288.000.

Butler, Robert B. Tick remover for people and animals. 5,116,347, Cl. 606-131.000.

Butler, Robert G.: *See—*
Wiederrich, LeRoy J.; and Butler, Robert G., 5,116,264, Cl. 187-11.000.

Buttner, Horst: *See—*
Bachmann, Wilfried; Bader, Rolf; Buttner, Horst; and Wetzel, Edgar, 5,116,518, Cl. 210-772.000.

Buzin, Arthur B.: *See—*
Robinson, Richard S.; Buzin, Arthur B.; and Kirkup, Ruby E., 5,116,602, Cl. 424-49.000.

Buzinkai, John F.; DeWitt, Marion R., Jr.; and Wheland, Robert C., to Du Pont de Nemours, E. I., and Company. Process for increasing the

relative viscosity of polyamides with reduced thermal degradation. 5,116,919, Cl. 525-420.000.

BVK Konsalting: *See—*
Matejevic, Nenad; and Matejevic, Dragica, 5,115,800, Cl. 600-39.000.

Byrne, Steven E. Flexible flail trimmer with combined guide and guard. 5,115,870, Cl. 172-15.000.

Byron, Kevin C.: *See—*
Epworth, Richard E.; Byron, Kevin C.; Baker, Robert A.; and Taylor, Nigel, 5,117,196, Cl. 359-333.000.

Cabanes, Laure; Lockhart, Alain; and Weber, Simon, to Universite de Paris V. Medicinal composition for the treatment and prevention of the symptoms of heart failure, containing a vasoconstrictor alpha-stimulant agent as active principle. 5,116,878, Cl. 514-653.000.

Cabot Corporation: *See—*
Cochrane, Hector, 5,116,535, Cl. 252-313.200.

Cadwell Industries, Inc.: *See—*
Cadwell, John A., 5,116,304, Cl. 600-13.000.

Cadwell, John A., to Cadwell Industries, Inc. Magnetic stimulator with skullcap-shaped coil. 5,116,304, Cl. 600-13.000.

Cahill, Stephen V.: *See—*
Metroka, Michael P.; and Cahill, Stephen V., 5,117,449, Cl. 379-58.000.

Cain, Gary A.; Gilligan, Paul J. and Tam, Sang W., to Du Pont Merck Pharmaceutical Company. N-aralkyl piperidine derivatives as psychotropic drugs. 5,116,846, Cl. 514-317.000.

Calabresi, Paul; and Darnowski, James W., to Roger Williams General Hospital. Drug combinations containing AZT. 5,116,823, Cl. 514-50.000.

Caldwell, Marcus L., to Hewlett-Packard Company. Drive motor and spindle assembly for an optical disk drive. 5,117,414, Cl. 369-266.000.

Calfee, Craig D. Composite bicycle frame. 5,116,071, Cl. 280-281.100.

Callahan, George E.; and Koch, Harald. Atomizer for compressible containers. 5,115,981, Cl. 239-402.000.

Callant, Paul R.; and Dewanckele, Jean-Marie O., to Agfa-Gevaert, N.V. Spectrally sensitized silver halide emulsions. 5,116,722, Cl. 430-363.000.

Callele, David; and Cruickshank, Donald. Telephone interface for a computer for receiving and transmitting information during the silent interval between ringing. 5,117,452, Cl. 379-98.000.

Callender, Charles W.: *See—*
Long, Gary R.; and Callender, Charles W., 5,117,354, Cl. 364-401.000.

Cameron, David S., to British Guide Rails Limited. Lifting shackle. 5,116,341, Cl. 294-67.300.

Camp International, Inc.: *See—*
Zander, Linda K., 5,116,306, Cl. 602-19.000.

Campfield, Richard A., Jr. Glass repair kit and method of use. 5,116,441, Cl. 156-94.000.

Canada, Atomic Energy of, Limited: *See—*
Cecco, Valentino S.; and Carter, Jon R., 5,117,182, Cl. 324-220.000.

Canada, Her Majesty the Queen in right of Canada as represented by the National Research Council: *See—*
McGregor, Gavin, 5,116,313, Cl. 604-70.000.

Cannon, Charles G., to Contact Lumber Company. Method of making a paper overlaid structure. 5,116,446, Cl. 156-307.400.

Canon Kabushiki Kaisha: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 5,117,260, Cl. 355-204.000.
Kawashima, Haruna; Suzuki, Akiyoshi; and Muraki, Masato, 5,117,254, Cl. 355-43.000.
Kobayashi, Hiroyuki; Uchida, Mitsuru; and Okado, Kenji, 5,116,711, Cl. 430-106.000.
Kobayashi, Naoki; Oki, Kazuhiro; and Shimura, Shoichi, 5,117,104, Cl. 250-230.000.
Kushibiki, Nobuo; Nose, Noriyuki; Niwa, Yukichi; and Kaneko, Norio, 5,116,369, Cl. 621-6.000.
Mori, Tetsuzo; Sugino, Takashi; Takaoka, Makoto; Sugiura, Susumu; and Ichikawa, Hiroyuki, 5,117,284, Cl. 358-79.000.
Nakamura, Tatsuya; Mori, Hiromi; Shimamura, Masoyoshi; and Morimoto, Reiko, 5,116,712, Cl. 430-106.000.
Nakamura, Yukitsugu; Hamano, Yoshimasa; Masuda, Takashi; Matsumura, Isao; Maruyama, Shigeo; and Kobayashi, Kazunobu, 5,116,114, Cl. 351-205.000.
Ogata, Yukihiko, 5,117,425, Cl. 370-110.100.
Takahashi, Kohji; Ogino, Shigeru; Noguchi, Kazuhiro; and Kobayashi, Takashi, 5,117,246, Cl. 354-202.000.
Togano, Takeshi; Takiguchi, Takao; Yamada, Yoko; Asaoka, Masanobu; and Shinjo, Kenji, 5,116,530, Cl. 252-299.610.

Cantatore, Giuseppe; Borzatta, Valerio; and Masina, Franca, to Ciba-Geigy Corporation. Piperidylaminotriazine derivatives and their use as stabilizers. 5,116,893, Cl. 524-100.000.

Cantrell, John H.: *See—*
Allison, Sidney G.; Namkung, Min; Yost, William T.; and Cantrell, John H., 5,117,184, Cl. 324-239.000.

Cantwell, Robert H., to Raytheon Company. Global system positioning receiver. 5,117,232, Cl. 342-357.000.

Capen, Douglas W.: *See—*
Higdon, John S.; and Capen, Douglas W., 5,115,832, Cl. 137-227.000.

Capon, Daniel J.; and Lasky, Laurence A., to Genentech, Inc. Hybrid immunoglobulins. 5,116,964, Cl. 536-27.000.

Capone, Deborah M.: *See—*
Reisch, John W.; and Capone, Deborah M., 5,116,931, Cl. 528-59.000.

Capozzi, Emil E.; and Cooksten, H. Stephen, to Hemaedics, Inc. Biological syringe system. 5,116,315, Cl. 604-82.000.

Carbone, John J., to Orthovations, Inc. Method and apparatus for expanding a shaft for use in prosthesis. 5,116,378, Cl. 623-23.000.

Cardoletti, Laurent: *See—*
Cassat, Alain M.; and Cardoletti, Laurent, 5,117,165, Cl. 318-254.000.

Carduck, Franz-Josef; Jahnke, Ulrich; Smulders, Eduard; Vogt, Guenther; Boecker, Monika; and Kuenzel, Werner, to Henkel Kommanditgesellschaft auf Aktien. Detergent product including a water-insoluble, water-permeable bag made form sheathed bicomponent fibers. 5,116,524, Cl. 252-90.000.

Cargill, N. Allen, to Technitrol, Inc. Document imprinting device having a rotation detector mounted on the print drum. 5,115,739, Cl. 101-232.000.

Carisella, James V.; and Cook, Robert B., to Carisella, James V. Method and apparatus for selectively actuating wellbore perforating tools. 5,115,865, Cl. 166-297.000.

Carisella, James V.: *See—*
Champeaux, Glenn; and Carisella, James V., 5,115,860, Cl. 166-51.000.

Carlson, David K.: *See—*
Severns, David W.; Tompson, Brian; Lindstrom, Paul R.; and Carlson, David K., 5,116,181, Cl. 414-222.000.

Carnes Company, Inc.: *See—*
Long, Gary R.; and Callender, Charles W., 5,117,354, Cl. 364-401.000.

Carolinch Company, The: *See—*
Palnik, Karl L., 5,116,480, Cl. 204-206.000.

Carow, Walter M.; Richards, Alton; and Cox, Jerry L., to Richards Industries. Breakaway hose coupling with integrated swivel mechanism. 5,115,836, Cl. 137-614.040.

Carpenter, Leslie E., II: *See—*
Baney, Ronald H.; Bilgrien, Carl J.; Broderick, Dennis W.; and Carpenter, Leslie E., II, 5,116,637, Cl. 427-340.000.

Carrel, Ralph E., to Bishamon, Inc. Sealed expansion joint. 5,116,085, Cl. 285-225.000.

Carruthers, William D.; and Boyd, Gary L., to Allied-Signal Inc. High temperature turbine engine structure. 5,116,158, Cl. 403-28.000.

Carson, Dennis A.: *See—*
Vaughan, John H.; Carson, Dennis A.; Rhodes, Gary; Houghten, Richard; Smith, Richard S.; and Geltosky, John E., 5,116,725, Cl. 435-5.000.

Carson, Richard F., Jr.; and Ehmsen, Ronald J., to Optimed Technologies, Inc. Angioplasty catheter with integral fiber optic assembly. 5,116,317, Cl. 604-96.000.

Carter, Jon R.: *See—*
Cecco, Valentino S.; and Carter, Jon R., 5,117,182, Cl. 324-220.000.

Cartier, Jacques, to Radiall. Connector for coaxial cable. 5,116,244, Cl. 439-578.000.

Cartmell, James V.; Wolf, Michael L.; Allaire, Michael J.; and Sturtevant, Wayne R., to NDM Acquisition Corp. Hydrogel burn dressing product. 5,115,801, Cl. 602-48.000.

Casademunt Ferre, Jose M.; and Fita Valentin, Eduardo, to Vileda GmbH. Mop for cleaning and polishing floors and other surfaces. 5,115,535, Cl. 15-229.700.

Casagrande, Bruno, to Casagrande SpA. Device to load reinforcement rods. 5,116,164, Cl. 405-303.000.

Casagrande SpA: *See—*
Casagrande, Bruno, 5,116,164, Cl. 405-303.000.

Casio Computer, Ltd.: *See—*
Kawamura, Masao; and Yoshino, Ken, 5,117,224, Cl. 340-703.000.

Cassat, Alain M.; and Cardoletti, Laurent, to Seagate Technology, Inc. Closed-loop control of a brushless DC motor from standstill to medium speed. 5,117,165, Cl. 318-254.000.

Cassidy, Clarence A.: *See—*
Young, Ruth E.; Young, Daniel L.; Warrick, Richard E.; and Cassidy, Clarence A., 5,116,139, Cl. 383-49.000.

Castile, Brett D.; and Sullivan, Shelby F., to United States of America, Navy. Large, air deployable, volumetric hydrophone array. 5,117,396, Cl. 367-3.000.

Castonguay, Roger N.; and Arnold, David, to General Electric Company. Molded case circuit breaker field-installable accessories. 5,117,210, Cl. 335-172.000.

Castro, Robert M.; and Adee, James M., to Rohr Industries, Inc. Apparatus and method for selectively increasing density and thermal conductivity of honeycomb structures. 5,116,689, Cl. 428-593.000.

Caswell, Warren E. Fluid nozzle and scraper apparatus. 5,116,152, Cl. 401-261.000.

Cataldo, Dominic A.: *See—*
Burton, Frederick G.; Cataldo, Dominic A.; Cline, John F.; and Skiens, W. Eugene, 5,116,414, Cl. 71-121.000.

Catapano, Salvatore J. Process for the remission of symptoms associated with AIDS. 5,116,814, Cl. 514-2.000.

Catlow, William G.; and Vitone, Edward T., Jr., to General Electric Company. Apparatus and methods for minimizing vibrational stresses in axial flow turbines. 5,116,200, Cl. 415-183.000.

Cattoz, Roland; Godde, Guy; and Plagne, Jean-Louis, to Rhone-Poulenc Chimie. Catalyst/promoter for direct synthesis of dimethyldichlorosilane. 5,117,030, Cl. 556-472.000.

Cavallotti, Claudio: *See—*
Venturello, Carlo; Cavallotti, Claudio; and Achilli, Fiorella, 5,117,049, Cl. 562-2.000.

Ceaton, Peter F., to Aquarian Water Co. Portable potable water purifier kit. 5,116,500, Cl. 210-238.000.

Cebal: *See—*
Schneider, Bernard, 5,115,932, Cl. 215-252.000.

Cecco, Valentino S.; and Carter, Jon R., to Canada, Atomic Energy of, Limited. Ferromagnetic eddy current probe having multiple levels of magnetization. 5,117,182, Cl. 324-220.000.

Cech, Thomas R.; Murphy, Felicia L.; Zaug, Arthur J.; and Grosshans, Cheryl, to University Patents, Inc. RNA ribozyme restriction endoribonucleases and methods. 5,116,742, Cl. 435-91.000.

Center For Applied Research, Inc.: *See—*
Marshall, Robert A., 5,115,824, Cl. 131-342.000.

Centini, Felice: *See—*
Pinori, Massimo; Centini, Felice; and Verdini, Antonio S., 5,116,947, Cl. 530-323.000.

Century Adhesives Inc.: *See—*
Zimmerman, Robert R.; and Viers, Tamela A., 5,116,667, Cl. 428-220.000.

Cetus Corporation: *See—*
Gelfand, David H.; Lawyer, Frances C.; and Stoffel, Susanne, 5,116,750, Cl. 435-193.000.
Koths, Kirston E.; Halenbeck, Robert F.; Innis, Michael A.; Wang, Alice M.; and Shaked, Ze'ev, 5,116,943, Cl. 530-351.000.

Chaffee, Donald L.; Mallory, Mark P.; and Brand, Graham H., to Intelligent Modem Corporation. Frequency domain adaptive echo canceller for full-duplex data transmission. 5,117,418, Cl. 370-32.100.

Chakravarti, Kalidas; and Khalatbari, Jamshiid, to Bridgestone/Firestone, Inc. Process for producing anti-wicking polyester yarn and product produced thereby. 5,116,682, Cl. 428-395.000.

Chamberlin, Kim S., to Eastman Kodak Company. Process for the preparation of 1-amino-4-bromoanthraquinones. 5,117,014, Cl. 552-249.000.

Champagne, Raymond P., to Neles-Jamesbury, Inc. Valve-locking device. 5,115,834, Cl. 137-385.000.

Champeaux, Glenn; and Carisella, James V., to Perf-O-Log, Inc. Gravel pack apparatus run with an electric wireline. 5,115,860, Cl. 166-51.000.

Chan, David S. Self-extending portable panels. 5,116,273, Cl. 160-370.200.

Chan, Tsiu C.; and Bryant, Frank R., to SGS-Thomson Microelectronics, Inc. Method of making a stacked capacitor for dram cell. 5,116,776, Cl. 437-52.000.

Chan, Tsiu C.; and Zamanian, Mehdi, to SGS-Thomson Microelectronics, Inc. Method for fabricating semiconductor devices by use of an N^+ buried layer for complete isolation. 5,116,777, Cl. 437-56.000.

Chang, Fu-Fong: *See—*
Meister, John J.; Lathia, Amit; and Chang, Fu-Fong, 5,116,904, Cl. 525-8.000.

Chang, Hungkun J.; Doss, William K.; Nolan, Michael P.; and Buchholz, Dale R., to Motorola, Inc. Antenna pattern selection for optimized communications. 5,117,236, Cl. 342-367.000.

Chang, Ken K.; and Tufts, Timothy A., to Ashland Oil, Inc. Thermoplastic polyester low profile additives for vinyl ester resinous compositions. 5,116,917, Cl. 525-407.000.

Chang, Yuen-Wai; and Che, Chiou-Fwu, to Gain Lab Corp. Automatic weighing system for powder. 5,115,876, Cl. 177-145.000.

Chao, Chien C.; and Rastelli, Henry, to UOP. Process for modifying clinoptilolite adsorbent. 5,116,793, Cl. 502-68.000.

Chapin, Leo N.: *See—*
Miller, William D.; and Chapin, Leo N., 5,116,643, Cl. 427-126.300.

Chapman, Charles B.; and Williams, Michael R., to Hewlett-Packard Company; and Hiawatha Rubber Co. Elastomer for use with aqueous inks. 5,116,902, Cl. 524-579.000.

Chapman, John J., to United States of America, National Aeronautics and Space Administration. Pressure transducer and system for cryogenic environments. 5,116,331, Cl. 73-721.000.

Chapman, John R.: *See—*
Miller, Donald F.; and Chapman, John R., 5,115,846, Cl. 144-246.00R.

Charest, Robert P.: *See—*
Gilbert, Sheri A.; Mizoguchi, Haruko; Charest, Robert P.; O'Neill, Timothy P.; and Smith, Ronald L., 5,116,847, Cl. 514-327.000.

Charitar, Satendra; and Spector, George. Shampoo stimulator. 5,116,253, Cl. 132-114.000.

Chas. A. Blatchford & Sons Ltd.: *See—*
Shorter, John J.; Harris, Graham J.; and Woolnough, Victor J., 5,116,383, Cl. 623-49.000.

Charmilles Technologies S.A.: *See—*
Bosson, Jean M.; Odriozola, Juan; Marendaz, Georges-Andre; and Blodin, Daniel, 5,117,082, Cl. 219-69.120.

Chase, Kathryn M.: *See—*
Kirschner, Jonathan; and Chase, Kathryn M., 5,115,956, Cl. 222-129.100.

Chau, Chung N.; Kasenga, Anthony F.; Chenot, Charles F.; and Gray, Leslie F., to GTE Products Corporation. Method of making lanthanum cerium terbium phosphate phosphor. 5,116,532, Cl. 252-301.40P.

Chaundy, Robert L. Fishing boat chair and bracket therein. 5,116,102, Cl. 297-357.000.

Chausse, Joseph J.; and Ebert, Edward A., to Ecology Plastics Corp. Container for storing and transporting a plurality of beverage containers. 5,115,937, Cl. 220-507.000.

Che, Chiou-Fwu: *See—*
Chang, Yuen-Wai; and Che, Chiou-Fwu, 5,115,876, Cl. 177-145.000.

Chemical Lime Company: *See—*
Walker, Daniel D., Jr.; and Oliphant, Joseph, 5,116,417, Cl. 75-327.000.

Chen, Chung-Ho; and Chen, Sumi C., to Johns Hopkins University, The. Effective ophthalmic irrigation solution. 5,116,868, Cl. 514-546.000.

Chen, Jaw-Long: *See—*
Peng, Yu-Yin; Chen, Jaw-Long; and Gau, Tien-Ho, 5,116,020, Cl. 251-129.170.

Chen, John S.; and Menesini Chen, Maria G. Process for the deagglutination of natural gluten and dietary products containing large quantities of wheat gluten. 5,116,630, Cl. 426-549.000.

Chen, Robert G.; and Son, Adelina J., to Baker Hughes Incorporated. Cationic amide/ester compositions as demulsifiers. 5,117,058, Cl. 564-157.000.

Chen, Shih L.; Seeker, William R.; and Ho, Loc, to Energy and Environmental Research Corporation. Methods for enlarging the useful temperature window for nox reduction in combustion systems. 5,116,584, Cl. 423-235.000.

Chen, Stephen. Continuous battery-charging replacing device. 5,117,172, Cl. 320-15.000.

Chen, Sumi C.: *See—*
Chen, Chung-Ho; and Chen, Sumi C., 5,116,868, Cl. 514-546.000.

Chen, Sy-Hwa: *See—*
Sung, Chien-Min; and Chen, Sy-Hwa, 5,116,568, Cl. 419-11.000.

Chen, Tai J., to Industrial Technology Research Institute. Electrophotoreceptor using styrene-maleic anhydride copolymer as the polymeric binder. 5,116,709, Cl. 430-96.000.

Chen, Tze-Chiang: *See—*
Comfort, James H.; Chen, Tze-Chiang; Lu, Pong-Fei; Meyerson, Bernard S.; Sun, Yuan-Chen; and Tang, Denny D., 5,117,271, Cl. 357-34.000.

Cheneble, Jean-Charles: *See—*
Mondet, Jean; Papantoniou, Christos; Cheneble, Jean-Charles, and Mahieu, Claude, 5,116,601, Cl. 424-47.000.

Cheng, Chi-Wen F., to Ciba-Geigy Corporation. Process for the preparation of addition products of epoxides and alcohols. 5,117,010, Cl. 549-516.000.

Chenot, Charles F.: *See—*
Chau, Chung N.; Kasenga, Anthony F.; Chenot, Charles F.; and Gray, Leslie F., 5,116,532, Cl. 252-301.40P.

Cheung, Kwok-wai; and Zah, Chung-en, to Bell Communications Research, Inc. Polarization-dependent and polarization-diversified opto-electronic devices using a strained quantum well. 5,117,469, Cl. 385-11.000.

Chevron Research & Technology Company: *See—*
Shen, Joseph, 5,115,670, Cl. 73-61.410.

Chiavatti, Claudio. Tire traction device. 5,115,851, Cl. 152-225.00R.

Chicago Steel Rule Die & Fabricators Co.: *See—*
McShane, Charles L., 5,117,459, Cl. 381-24.000.

Chick, William L.; and Rupp, Randall G., to W. R. Grace & Co.-Conn. Artificial pancreatic perfusion device with reseedable matrix. 5,116,493, Cl. 210-192.000.

Chick, William L.; and Sullivan, Susan J., to W. R. Grace & Co.-Conn. Artificial pancreatic perfusion device with temperature sensitive matrix. 5,116,494, Cl. 210-192.000.

Chien, Ring-Ling; and Burgi, Dean S., to Varian Associates, Inc. System and method for improving sample concentration in capillary electrophoresis. 5,116,471, Cl. 204-180.100.

Chilcote, Dennis D.: *See—*
Bateson, George F.; Chilcote, Dennis D.; Martinson, Michael M.; Valine, Steven B.; and Zambrano, Adolfo R., 5,115,986, Cl. 241-20.000.

Childress, Jeffrey S.; and Hattey, David L., to General Electric Company. Dynamic regrouping in a trunked radio communications system. 5,117,501, Cl. 455-11.100.

Chinn, Jeffrey D.: *See—*
Thomas, Michael E.; and Chinn, Jeffrey D., 5,117,276, Cl. 357-71.000.

Chisso Corporation: *See—*
Aratake, Kazuhiko; Horikoshi, Masayoshi; Kato, Fumio; Suzuki, Yasuhiko; and Morimoto, Yuki, 5,116,899, Cl. 524-371.000.
Terashima, Kanetsugu; Ichihashi, Mitsuyoshi; Kikuchi, Makoto; Takeshita, Fusayuki; and Furukawa, Kenji, 5,116,529, Cl. 252-299.610.
Yamamoto, Testushi; Niwano, Masaru; and Nakagawa, Etsuo, 5,116,437, Cl. 148-287.000.

Chitayat, Anwar. Anti-creep for bearing retainers. 5,116,141, Cl. 384-17.000.

Cho, Nakwon. Tensioner for a power transmission belt or the like. 5,116,284, Cl. 474-110.000.

Chou, Chun-Mei: *See—*
Yang, Chang-Min; and Chou, Chun-Mei, 5,115,567, Cl. 30-166.300.

Chouest, Evans J. Fire escape device. 5,115,885, Cl. 182-3.000.

Chr. Haeusler AG: *See—*
Kirchhoff, Wilhelm; Schneider, Simon; and Zeugin, Hans, 5,115,658, Cl. 72-175.000.

Chr. Hansen's Laboratory, Inc.: *See—*
McCoy, David R., 5,116,737, Cl. 435-42.000.

Christensen, James M.; and Ainpour, Parviz R. Prosthesis with improved biocompatibility. 5,116,371, Cl. 623-11.000.

Christmas, Patrick E.: *See—*
Smith, John C.; and Christmas, Patrick E., 5,116,142, Cl. 384-55.000.

VOL
1138
ISS
4
MY
26
1992
UMI

Christopher, William J.: *See*—
New, James S.; and Christopher, William J., 5,116,970, Cl. 544-235.000.
Chromowsky, Daniel L., to Colgate-Palmolive Company. Method and apparatus for gluing closure flaps of a carton on a continuously moving conveyor. 5,116,322, Cl. 53-485.000.
Chrysler Corporation: *See*—
Leising, Maurice B.; Benford, Howard L.; and Holbrook, Gerald L., 5,115,698, Cl. 74-868.000.
Chu, Nori Y. C., to American Optical Corporation. Laser eye protective devices. 5,116,113, Cl. 351-163.000.
Chundury, Deenadayalu; Davidson, Daniel L.; Leonard, Berdine L.; and Scheibelhoffer, Anthony S., to Ferro Corporation. Free-radical modified carbon black filled polypropylenes. 5,116,540, Cl. 252-511.000.
Chung, Ding Y.; and Debroy, Tapan K., to Du Pont de Nemours, E. I., and Company. Cathodic electrodeposition coatings containing alkyl metal acetonate catalyst. 5,116,914, Cl. 525-528.000.
Chung, Fred C.: *See*—
Karle, Dennis W.; Chung, Fred C.; and Sischka, Frederic J., II, 5,116,685, Cl. 428-425.900.
Chung, Won-Young. Swing arm for support of dentist's suction pump nozzle. 5,116,223, Cl. 433-79.000.
Chung, Yee-Ming: *See*—
Swanberg, Melvin E.; Chung, Yee-Ming; Eskenazi, Raymond; and Cunningham, Robert T., 5,117,243, Cl. 346-108.000.
Chvapil, Milos; and Barber, Bruce A., to Barber, Bruce A. Antimicrobial wound dressing. 5,116,600, Cl. 424-445.000.
Ciba-Ceigy Corporation: *See*—
Mollet, Hans; and Holer, Martin, 5,116,534, Cl. 252-308.000.
Ciba-Geigy Corporation: *See*—
Ackermann, Peter; Fischer, Hanspeter; Vogel, Rolf; Drauz, Karlheinz; Hasseberg, Hans-Albrecht; Hasselbach, Hans-Jochen; Knaup Gunter; Krimmer, Hans-Peter; and Schafer, Matthias, 5,116,872, Cl. 514-561.000.
Cantatore, Giuseppe; Borzatta, Valerio; and Masina, Franca, 5,116,893, Cl. 524-100.000.
Cheng, Chi-Wen F., 5,117,010, Cl. 549-516.000.
Knobloch, Gerrit, 5,116,894, Cl. 524-100.000.
Langfeld, Horst; and Minges, Roland, 5,116,955, Cl. 534-582.000.
Liechti, Peter; and Trottmann, Martin, 5,116,958, Cl. 534-591.000.
Pfaendner, Rudolf, 5,116,913, Cl. 525-432.000.
Pfaendner, Rudolf, 5,116,920, Cl. 525-432.000.
Schmidhalter, Beat; and Spahni, Heinz, 5,116,674, Cl. 428-335.000.
van den Bergh, Hubert; Cornaz, Peter F., deceased; Cornaz, Max M., heir; Cornaz, Jean-Pierre, Heir; Cornaz, Maria I., Heir; and Wagnieres, Georges, 5,117,474, Cl. 385-39.000.
Cincinnati Milacron Inc.: *See*—
Grimshaw, Michael N.; Albers, Stephen J.; and Rust, Ralph J., 5,115,993, Cl. 242-68.400.
Hsu, John S., 5,116,215, Cl. 425-381.000.
Ciokajlo, John J., to General Electric Company. Blade tip clearance control apparatus using shroud segment annular support ring thermal expansion. 5,116,199, Cl. 415-173.200.
Clarion Co., Ltd.: *See*—
Furukawa, Katsuo, 5,117,145, Cl. 310-313.00R.
Clark, Alan R.; Higham, Joseph P.; Hughes, James E.; and Valashinas, James W., to International Business Machines Corp. Buffer for packetizing block of data with different sizes and rates received from first processor before transferring to second processor. 5,117,486, Cl. 395-250.000.
Clark, David W.: *See*—
Keeling, Michale E.; Britz, William E., Jr.; and Clark, David W., 5,116,255, Cl. 119-18.000.
Clark, Jeffrey L.: *See*—
Nienhuis, James H.; Clark, Jeffrey L.; and Gezon, Bruce R., 5,116,235, Cl. 439-215.000.
Clark, Lloyd D., Jr.: *See*—
Edell, David J.; and Clark, Lloyd D., Jr., 5,116,464, Cl. 156-647.000.
Clark, Wayne D.: *See*—
Stark, David M.; and Clark, Wayne D., 5,117,273, Cl. 357-54.000.
Clavel, Jean-Louis: *See*—
Botannet, Bernard; Clavel, Jean-Louis; Corbet, Jean-Pierre; and Mulhauser, Michel, 5,117,043, Cl. 560-150.000.
Clawges, Thomas L.: *See*—
Robinson, John P.; Stadick, William R.; Clawges, Thomas L.; and Minogue, Thomas P., 5,116,301, Cl. 493-215.000.
Cleereman, Robert J.: *See*—
Hardesty, Terry D.; Hutchison, Wayne R.; Teal, Richard D.; and Cleereman, Robert J., 5,116,106, Cl. 301-41.00W.
Clement-Demange, Jean-Claude A. System for injecting molten material into a molding apparatus. 5,116,212, Cl. 425-147.000.
Clergeot, Henri; Placko, Dominique; and Plantevin, Michel, to Commissariat A l'Energie Atomique. Inductive transducer with calibrating balancing core for measuring movement of an object. 5,117,181, Cl. 324-207.180.
Clifton, Alan A.: *See*—
Colebrook, Peter H.; Razzak, Jamil A.; Denkmann, Robert H.; and Clifton, Alan A., 5,115,520, Cl. 4-321.000.
Clifton, George B.: *See*—
Trask, Jeffrey L.; Clifton, George B.; and Heath, Kenneth E., 5,116,034, Cl. 271-2.000.
Cline, John F.: *See*—
Burton, Frederick G.; Cataldo, Dominic A.; Cline, John F.; and Skiens, W. Eugene, 5,116,414, Cl. 71-121.000.
Cline, Keith W.: *See*—
Tillery, Lawrence I.; Cline, Keith W.; Moses, Ronald R.; and Cline, Kurtis K., 5,115,597, Cl. 49-504.000.
Cline, Kurtis K.: *See*—
Tillery, Lawrence I.; Cline, Keith W.; Moses, Ronald R.; and Cline, Kurtis K., 5,115,597, Cl. 49-504.000.
Clingman, William H., Jr.; and Kennedy, Lyn R., to Badger Meter, Inc. Method and apparatus for taking a proportional sample of flowing gas in a line. 5,115,687, Cl. 73-863.610.
Clintec Nutrition Co.: *See*—
Trimbo, Susan L.; Rowe, W. Bruce; and Bracco, M. Umberto, 5,116,819, Cl. 514-21.000.
Co-Ex Plastics, Inc.: *See*—
Jones, Jerry F., 5,116,677, Cl. 428-349.000.
Coal Industry (Patents) Limited: *See*—
Lewins, Foster; Roth, Bruce N.; and Wykes, John S., 5,116,103, Cl. 299-1.600.
Coates, David; Sage, Ian C.; Geelhaar, Thomas; and Wachtler, Andreas, to Merck Patent Gesellschaftt Mit Beschrankter Haftung. Display element based on the electroclinic effect. 5,116,527, Cl. 252-299.610.
Coates, Ian H.: *See*—
North, Peter C.; Oxford, Alexander W.; and Coates, Ian H., 5,116,984, Cl. 546-101.000.
Cobb, Sanford, Jr.; and Leite, Michael J., to Minnesota Mining and Manufacturing Company. Device for redirecting light through a hollow tubular light conduit. 5,117,478, Cl. 385-133.000.
Coburn, Sherilyn M.: *See*—
Dunham, Donald D.; and Coburn, Sherilyn M., 5,117,162, Cl. 313-36.000.
Coca-Cola Company, The: *See*—
Kirschner, Jonathan; and Chase, Kathryn M., 5,115,956, Cl. 222-129.100.
Cochetas, George S.: *See*—
Green, Dennis H.; and Cochetas, George S., 5,116,511, Cl. 210-673.000.
Cochran, John R.; Bailey, Rouse R., Jr.; and Lessig, William R., III, to Black & Decker Inc. Vacuum cleaners. 5,115,538, Cl. 15-383.000.
Cochran, Roland C.; and Rosenzweig, Edwin L., to United States of America, Navy. Apparatus for preparing thermoplastic composites. 5,116,216, Cl. 425-504.000.
Cochrane, Hector, to Cabot Corporation. Aqueous colloidal dispersion of fumed silica without a stabilizer. 5,116,535, Cl. 252-313.200.
Coderre, James C.: *See*—
Huang, Tzu-Li J.; Hammar, Walton J.; Coderre, James C.; and Nave, Mirian D., 5,117,304, Cl. 359-529.000.
Coe, Frederick L.: *See*—
Seder, Edmund V.; Coe, Frederick L.; and Mitchell, Martin, 5,116,310, Cl. 604-43.000.
Coelho, Urban J.: *See*—
Gilbert, Seymour G.; and Coelho, Urban J., 5,116,889, Cl. 524-14.000.
Coeuret, Francois: *See*—
Gauthier, Jean-Marie; Coeuret, Francois; and Bonet, Claude, 5,116,665, Cl. 428-216.000.
Cohen, Allen L. Diffraction bifocal with adjusted chromaticity. 5,117,306, Cl. 359-565.000.
Cohen, Richard; and Wallace, Rickie W., to ElectroCom Automation L.P. Method and apparatus for setting clock signals to predetermined phases at remote broadcast sites in simulcast systems. 5,117,424, Cl. 370-105.500.
Coherent, Inc.: *See*—
Cook, Benjamin H., Jr.; and Kolb, William P., 5,117,435, Cl. 372-59.000.
ColArt International, S.A.: *See*—
Lucchetti, Renato, 5,115,584, Cl. 38-102.910.
Cole-Hamilton, David J.: *See*—
Mullin, John B.; Cole-Hamilton, David J.; Shenai-Khatkhate, Deodatta V.; and Webb, Paul, 5,117,021, Cl. 556-130.000.
Colebrook, Peter H.; Razzak, Jamil A.; Denkmann, Robert H.; and Clifton, Alan A., to Boeing Company, The. Apparatus and methods for sealing a leaking toilet tank valve. 5,115,520, Cl. 4-321.000.
Coleman, Clarence B., to Fabricated Metals, Inc. Bulk material container with a flexible liner. 5,115,943, Cl. 222-94.000.
Coleman, Richard A.: *See*—
Boston, Steven L.; Kilbane, Farrell M.; Lee, Danny E.; Seay, William R.; and Coleman, Richard A., 5,116,645, Cl. 427-320.000.
Coleman, Robert R.: *See*—
Smith, Harvell M.; Marx, Edward J.; and Coleman, Robert R., 5,115,957, Cl. 227-67.000.
Colgate-Palmolive Company: *See*—
Chromowsky, Daniel L., 5,116,322, Cl. 53-485.000.
Robinson, Richard S.; Buzin, Arthur B.; and Kirkup, Ruby E., 5,116,602, Cl. 424-49.000.
Coll, Milton E. Ureteral stent-catheter system having varying diameter stent. 5,116,309, Cl. 604-8.000.
Colleran, Stephen; Krehbiel, Fred L.; and Wilson, Bill, to Molex Incorporated. Electrical connector with terminal position assurance component. 5,116,236, Cl. 439-271.000.
Collins, Dean E.: *See*—
McDonnell, William J.; Sarnacki, Alexander C., Jr.; and Collins, Dean E., 5,115,947, Cl. 222-107.000.
Collins, Harvey T. Method and system for treatment of aids. 5,116,307, Cl. 604-4.000.

Collonges, Francois: *See*—
Briet, Philippe; Berthelon, Jean-Jacques; and Collonges, Francois, 5,116,954, Cl. 534-551.000.
Combs, Donald W., to Ortho Pharmaceutical Corporation. 2,9-dihydro-(6 or 7)-(3-oxo-2,3,4,5-tetrahydropyridazinyl)-pyrazolo (4,3-B)-1,4-benzoxazines. 5,116,837, Cl. 514-229.800.
Comerford, Liam D.; Ledermann, Peter G.; Levy, Lawrence I.; and White, Steve R., to International Business Machines Corp. Tamper resistant packaging for information protection in electronic circuitry. 5,117,457, Cl. 380-3.000.
Comfort, James H.; Chen, Tze-Chiang; Lu, Pong-Fei; Meyerson, Bernard S.; Sun, Yuan-Chen; and Tang, Denny D., to International Business Machines Corporation. Low capacitance bipolar junction transistor and fabrication process therfor. 5,117,271, Cl. 357-34.000.
Commissariat A l'Energie Atomique: *See*—
Clergeot, Henri; Placko, Dominique; and Plantevin, Michel, 5,117,181, Cl. 324-207.180.
Pourprix, Michel, 5,117,190, Cl. 324-452.000.
Compagnie Generale d'Electricite: *See*—
Belouet, Christian, 5,116,808, Cl. 505-1.000.
Compaq Computer Corporation: *See*—
Gebara, Ghassan R., 5,117,331, Cl. 361-407.000.
Hollinger, Lawrence E., II, 5,115,905, Cl. 198-465.100.
Composite Materials Technology, Inc.: *See*—
Wong, James, 5,116,429, Cl. 29-599.000.
Cone, Richard E., to Cosco, Inc. Convertible infant restraint device. 5,115,523, Cl. 5-94.000.
Conlon, David: *See*—
Power, Peter A.; Power, Adrian P.; Power, Julian M.; and Conlon, David, 5,116,204, Cl. 40-607.000.
Connell, John W.; and Hergenrother, Paul M., to United States of America, National Aeronautics and Space Administration. Polyimidazoles via aromatic nucleophilic displacement. 5,116,934, Cl. 528-125.000.
Conoco Inc.: *See*—
Myers, Wilbur J.; and Sanders, Michael E., 5,117,402, Cl. 367-143.000.
Walker, R. David; and Scheidt, David A., 5,115,686, Cl. 73-863.310.
Consortium fur Elektrochemische Industrie GmbH: *See*—
Grill, Erwin; Loffler, Susanne; Winnacker, Ernst-Ludwig; and Zenk, Meinhard H., 5,116,749, Cl. 435-193.000.
Contact Lumber Company: *See*—
Cannon, Charles G., 5,116,446, Cl. 156-307.400.
Contex Components & Business Machines A/S: *See*—
Smitt, Asbjorn, 5,117,295, Cl. 358-474.000.
Contin, Jose L., to MDC Vacuum Products Corporation. Low vibration high vacuum gate valve. 5,116,023, Cl. 251-203.000.
Cook, Benjamin H., Jr.; and Kolb, William P., to Coherent, Inc. Pressure regulation system for gas laser based on temperature of anode stem. 5,117,435, Cl. 372-59.000.
Cook, John E., to Siemens Automotive Limited. Carbon canister purge system. 5,115,785, Cl. 123-520.000.
Cook, Jr. Harold: *See*—
Relich, Nick P.; Hahn, Roger A.; and Cook, Jr. Harold, 5,115,662, Cl. 72-345.000.
Cook, Robert B.: *See*—
Carisella, James V.; and Cook, Robert B., 5,115,865, Cl. 166-297.000.
Cooksten, H. Stephen: *See*—
Capozzi, Emil E.; and Cooksten, H. Stephen, 5,116,315, Cl. 604-82.000.
Cooper Companies, Inc., The: *See*—
Sealey, Michael J.; and Morland, Albert H., 5,115,553, Cl. 29-563.000.
Cooper, Gerald; Ratcliff, Matthew A.; and Sczechowski, Jeffrey G., to Photo-Catalytics, Inc. Photocatalytic slurry reactor having turbulence generating means. 5,116,582, Cl. 422-186.300.
Cooper Industries, Inc.: *See*—
Dunk, Michael; and Gilker, Clyde, 5,117,325, Cl. 361-93.000.
Coors Brewing Company: *See*—
Relich, Nick P.; Hahn, Roger A.; and Cook, Jr. Harold, 5,115,662, Cl. 72-345.000.
Coppel, Ross L.: *See*—
Kemp, David J.; Anders, Robin F.; Coppel, Ross L.; and Brown, Graham V., 5,116,755, Cl. 435-252.300.
Copper, Charles M.: *See*—
Patel, Mansukh M.; and Copper, Charles M., 5,116,625, Cl. 426-3.000.
Copson, Alex G. Apparatus and method for subaqueous waste disposal. 5,115,751, Cl. 114-27.000.
Corbet, Jean-Pierre: *See*—
Botannet, Bernard; Clavel, Jean-Louis; Corbet, Jean-Pierre; and Mulhauser, Michel, 5,117,043, Cl. 560-150.000.
Corbett, Mark S., to Pitney Bowes Inc. Plastic actuator for postage machine. 5,117,095, Cl. 235-101.000.
Cordis Corporation: *See*—
Hillstead, Richard A., 5,116,318, Cl. 604-96.000.
Hillstead, Richard A., 5,116,365, Cl. 623-1.000.
Stevens, Robert C., 5,116,350, Cl. 606-159.000.
Corlett, Joshua. Game post assembly. 5,116,064, Cl. 273-390.000.
Cornaz, Jean-Pierre, Heir: *See*—
van den Bergh, Hubert; Cornaz, Peter F., deceased; Cornaz, Max M., heir; Cornaz, Jean-Pierre, Heir; Cornaz, Maria I., Heir; and Wagnieres, Georges, 5,117,474, Cl. 385-39.000.
Cornaz, Maria I., Heir: *See*—
van den Bergh, Hubert; Cornaz, Peter F., deceased; Cornaz, Max M., heir; Cornaz, Jean-Pierre, Heir; Cornaz, Maria I., Heir; and Wagnieres, Georges, 5,117,474, Cl. 385-39.000.
Cornaz, Max M., heir: *See*—
van den Bergh, Hubert; Cornaz, Peter F., deceased; Cornaz, Max M., heir; Cornaz, Jean-Pierre, Heir; Cornaz, Maria I., Heir; and Wagnieres, Georges, 5,117,474, Cl. 385-39.000.
Cornaz, Peter F., deceased: *See*—
van den Bergh, Hubert; Cornaz, Peter F., deceased; Cornaz, Max M., heir; Cornaz, Jean-Pierre, Heir; Cornaz, Maria I., Heir; and Wagnieres, Georges, 5,117,474, Cl. 385-39.000.
Corner, Michael R., to Sumitomo Rubber Industries, Ltd. Tire tread pattern having stepped shoulder. 5,115,849, Cl. 152-209.00R.
Corning Incorporated: *See*—
Abbott, John S.; Bertz, Mark C.; Faler, James H.; Schirmer, William, III; and Williams, John G., 5,116,400, Cl. 65-144.000.
Dumbaugh, William H., Jr., 5,116,787, Cl. 501-66.000.
Dumbaugh, William H., Jr., 5,116,788, Cl. 501-66.000.
Dumbaugh, William H., Jr.; and Lapp, Josef C., 5,116,789, Cl. 501-66.000.
Fretz, Edward R., Jr.; and Olszewski, Anthony R., 5,116,684, Cl 428-417.000.
Correia, Yves; Lesparre, Jean; and Petit, Alain, to Atochem. Oxychlorination of hydrocarbons. 5,116,799, Cl. 502-225.000.
Corrigan, Frank: *See*—
Horrobin, David F.; and Corrigan, Frank, 5,116,624, Cl. 424-702.000.
Corrigan, Michael A.: *See*—
Sallas, John J.; and Corrigan, Michael A., 5,115,880, Cl. 181-106.000.
Corte, Lawrence J.; and Brown, Adrian, to K N Energy, Inc. Soil vapor well construction. 5,115,866, Cl. 166-370.000.
Corvita Corporation: *See*—
Pinchuk, Leonard; Martin, John B., Jr.; and Weber, Bruce A., 5,116,360, Cl. 623-1.000.
Cosco, Inc.: *See*—
Cone, Richard E., 5,115,523, Cl. 5-94.000.
Cosman, Armond D.; Knippelmier, Gary H.; and Minarovic, Joe T., to Minnesota Mining and Manufacturing Company. Self-dispensing spaced electronic markers. 5,116,654, Cl. 428-77.000.
Costall, Brenda: *See*—
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Druez, Catherine; Coulie, Pierre; Uyttenhove, Catherine; and Van Snick, Jacques, 5,116,951, Cl. 530-395.000.
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Hunter, Julian E.; Reid, James; Arnold, David E. J.; Hails, George; Baxter, Kenneth F.; Andrews, Andrian F.; and Nunn, Michael J., 5,116,407, Cl. 106-16.000.
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Carow, Walter M.; Richards, Alton; and Cox, Jerry L., 5,115,836, Cl. 137-614.040.
Cozad, Trent E.; Lozier, Antony J.; Lower, Jerry L.; and Tencer, Allan F., to Zimmer, Inc. Posterior spinal system and method. 5,116,334, Cl. 606-61.000.
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Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., 5,117,211, Cl. 335-202.000.
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Crawford, Sandy L., to Utex Industries, Inc. Mechanical seal construction and locking assembly for use therein. 5,116,066, Cl. 277-81.00R.
Createchnic AG: *See*—
Dubach, Werner F., 5,115,931, Cl. 215-235.000.
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Mantovani, Marisa; Porta, Roberto; and Prino, Giuseppe, 5,116,617, Cl. 424-401.000.
Croce, Claudio, to Imos Italia S.r.l. Electric contact holder base. 5,116,233, Cl. 439-161.000.
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Rodriguez, Arturo A.; and Crockett, Ronald B., 5,115,697, Cl. 76-108.600.
Crowe, David F.: *See*—
Tanabe, Masato; Crowe, David F.; Peters, Richard H.; and Johansson, John G., 5,116,830, Cl. 514-182.000.
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Callele, David; and Cruickshank, Donald, 5,117,452, Cl. 379-98.000.
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Scott, Baker P. L., III, 5,117,200, Cl. 330-253.000.
Csikos, Aniko nee Gluck: *See—*
Dutka, Ferenc; Komives, Tamas; Fodor, Katalin, nee Csorba; Marton, Attila; Csikos, Aniko nee Gluck; Osztheimer, Eva; Henger, Karoly; Laborczy, Robert; Reti, Zsuzsanna, nee Bosnyak; Sebok, Dezso; Szabolcs, Jozsef; and Tomordi, Elemer, 5,116,402, Cl. 71-88.000.
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Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III; and Pottratz, David G., 5,116,466, Cl. 203-58.000.
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Daxer, Georg; and Cullen, Joao A. D. T., 5,115,726, Cl. 92-219.000.
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Swanberg, Melvin E.; Chung, Yee-Ming; Eskenazi, Raymond; and Cunningham, Robert T., 5,117,243, Cl. 346-108.000.
Curtis Manufacturing Company, Inc.: *See—*
Tortola, Angelo; and Howett, Robert, 5,117,339, Cl. 362-109.000.
Curtis, R. Eugene: *See—*
Narayanan, G. Hari; Curtis, R. Eugene; Quist, William E.; Hyatt, Michael V.; and Axter, Sven E., 5,116,572, Cl. 420-533.000.
Cvelbar, David A.; and Rubino, Anthony, to United Technologies Corporation. Gas turbine engine case with intergral shroud support ribs. 5,115,642, Cl. 60-751.000.
Cybrandian Limited: *See—*
Bannard, John E.; and Maguire, Dennis D., 5,117,116, Cl. 250-474.100.
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Bommannan, Durairaj; Okuyama, Hirohisa; Guy, Richard H.; Stauffer, Paul; and Flynn, Gordon L., 5,115,805, Cl. 128-24.0AA.
Cyron, Theodor; and Maus, Wolfgang, to Interatom GmbH. Mounting assembly for an exhaust gas catalyst. 5,116,581, Cl. 422-180.000.
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McDonnell, William J.; Sarnacki, Alexander C., Jr.; and Collins, Dean E., 5,115,947, Cl. 222-107.000.
D & R Recyclers, Inc.: *See—*
Rutherford, Darrel, Sr., 5,115,983, Cl. 241-1.000.
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Jonsson, Nils; and Dahlgren, Mats, 5,115,780, Cl. 123-478.000.
Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Motogami, Kenji; and Mori, Shigeo, 5,116,541, Cl. 252-518.000.
Daicel Chemical Industries, Ltd.: *See—*
Fujiwa, Takaaki, 5,116,932, Cl. 528-80.000.
Daido Metal Company Ltd.: *See—*
Mori, Sanae; Sakamoto, Masaaki; Ishikawa, Hideo; and Nagai, Yoji, 5,116,692, Cl. 428-650.000.
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Inukai, Hiroshi; Yasuhara, Takashi; and Kitahara, Takahiro, 5,116,544, Cl. 560-219.000.
Morita, Shigeru; and Oka, Masahiko, 5,117,035, Cl. 558-250.000.
Suzuki, Hitomi; Ogawa, Takuji; Uno, Hidemitsu; Kitahaba, Tetsuo; Kigawa, Kouji; Fukamachi, Tomonori; and Kitahara, Katsuhiko, 5,117,000, Cl. 549-59.000.
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Mito, Mitsumasa; and Daikoku, Keisuke, 5,115,784, Cl. 123-516.000.
Daimler-Benz AG: *See—*
Scarpatetti, Diether V., 5,115,746, Cl. 104-245.000.
Dainippon Screen Mfg. Co. Ltd.: *See—*
Asada, Shinji; and Yonezawa, Yasuharu, 5,117,293, Cl. 358-298.000.
Daiwa Seiko, Inc.: *See—*
Oyama, Mitsuyoshi, 5,115,591, Cl. 43-22.000.
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Dalrymple, MaryBeth H. Garter with concealed compartment. 5,115,519, Cl. 2-311.000.
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D'Amato, Salvatore F.: *See—*
Mallik, Donald W.; and D'Amato, Salvatore F., 5,116,548, Cl. 264-1.300.
Dambach, Philip J.: *See—*
Bowen, David C.; Dambach, Philip J.; Nelligan, Joseph W., Jr.; and Triner, Irvin R., 5,115,562, Cl. 29-867.000.
D'Ambrosia, John F.: *See—*
Yingst, Stephen M.; Briggs, Robert C.; D'Ambrosia, John F.; Flickinger, Steven L.; Owens, Steven P.; and Zeiders, Jeffrey A., 5,117,476, Cl. 385-88.000.
Damitio, Stephen S., to Key Tronic Corporation. Quieting device for keytop leveling mechanisms. 5,117,076, Cl. 200-344.000.
Dana Corporation: *See—*
Kern, Karle O., Jr.; and Desko, Dana A., 5,116,159, Cl. 403-132.000.
Reuter, David C., 5,116,293, Cl. 475-202.000.
Danfoss A/S: *See—*
Jorgensen, Geert; Jensen, Torben; and Gade, Niels, 5,115,685, Cl. 73-862.330.
Daniels, Dale M.: *See—*
Watkins, K. Richard; and Daniels, Dale M., 5,116,296, Cl. 482-91.000.
Danish, Adel, to Danish International, Inc. Telephone keypad matrix. 5,117,455, Cl. 379-368.000.
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Greuloch, William; Shamir, Dan; and Groves, Mark W., 5,115,806, Cl. 128-26.000.
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Allard, Paul; Levesque, Claude; and Dansereau, Jean, 5,116,385, Cl. 623-55.000.
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Alain, Martel; Bachand, Carol; and Daris, Jean-Paul, 5,116,833, Cl. 514-210.000.
Darnowski, James W.: *See—*
Calabresi, Paul; and Darnowski, James W., 5,116,823, Cl. 514-50.000.
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Giaccardi, Eraldo; and Dassetto, Alessandro, 5,115,793, Cl. 123-620.000.
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Speroni, Armando; and Bedodi, Aldo, 5,116,302, Cl. 493-254.000.
Daude, Gerard M.; and Bravet, Jean-Louis M., to Saint-Gobain Vitrage. Process for producing a transparent polyurethane film with energy-absorbing and antifogging properties. 5,116,442, Cl. 156-99.000.
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Wallace, William D.; Lynch, Edward G., Jr.; Daugherty, David W., Jr.; Kanjo, Wajih; and Hawryszkow, Michael G., 5,115,927, Cl. 213-75.00R.
Davidson, Daniel L.: *See—*
Chundury, Deenadayalu; Davidson, Daniel L.; Leonard, Berdine L.; and Scheibelhoffer, Anthony S., 5,116,540, Cl. 252-511.000.
Davidson, Robert S.; and Wilkinson, Susan A., to National Research Development Corporation. Photopolymerization processes with separation of initiator layer from resin layer. 5,116,876, Cl. 522-1.000.
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Rhodes, Richard D., Jr., 5,116,079, Cl. 280-732.000.
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Guilhaus, Michael; and Dawson, John H., 5,117,107, Cl. 250-287.000.
Dawson, Michael J.: *See—*
Lawrence, Gordon C.; Dawson, Michael J.; Noble, David; Ramsay, Michael V. J.; Bell, Richard; Sutherland, Derek R.; and Tiley, Edward P., 5,116,968, Cl. 536-71.000.
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De La Rue Giori S.A.: *See—*
Sauer, Hartmut K., 5,116,040, Cl. 271-101.000.
De Ambrosi, Luigi: *See—*
Del Bono, Rinaldo; De Ambrosi, Luigi; Ferrari, Gianni; Rugarli, Pier L.; and Pagella, Pier G., 5,116,963, Cl. 536-21.000.
Debaes, Bernard; De Winter, Hugo; and Nicolaus, Frank, to Recticel. Method of making objects having an elastomeric outer wall and a synthetic foam core. 5,116,557, Cl. 264-46.600.
Debroy, Tapan K.: *See—*
Chung, Ding Y.; and Debroy, Tapan K., 5,116,914, Cl. 525-528.000.
DeCello, Michael J.; and Westwood, LeRoy C., to Ford Motor Company. Detection system for chemical analysis of zinc phosphate coating solutions. 5,117,370, Cl. 364-497.000.
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De Clercq, Erik D. A.; Herdewijn, Piet A. M. M.; Broder, Samuel; and Balzarini, Jan M. R., to Stichting Rega VZW; and United States of America, Health and Human Serices. Therapeutic application of dideoxycytidinene. 5,116,822, Cl. 514-49.000.
Declouette, Frederick J. Tree transport. 5,116,068, Cl. 280-47.240.
Deere & Company: *See—*
Hardesty, Terry D.; Hutchison, Wayne R.; Teal, Richard D.; and Cleereman, Robert J., 5,116,106, Cl. 301-41.00W.
Degussa AG: *See—*
Wolff, Siegfried; Gorl, Udo; and Deusser, Hans, 5,116,886, Cl. 523-209.000.
Degussa Aktiengesellschaft: *See—*
Baacke, Michael; Beand, Reinhold; Engler, Bernd; Kiss, Akos; Kleine-Mollhoff, Peter; Kleinschmit, Peter; Koberstein, Edgar; and Siray, Mustafa, 5,116,586, Cl. 423-239.000.
Fischer, Wolfgang; Bischoff, Dietmar; Huss, Michael; Stober, Reinhard; and Roessler, Gert, 5,116,967, Cl. 536-50.000.
Degussa Sktiengesellschaft: *See—*
Ackermann, Peter; Fischer, Hanspeter; Vogel, Rolf; Drauz, Karlheinz; Hasseberg, Hans-Albrecht; Hasselbach, Hans-Jochen; Knaup Gunter; Krimmer, Hans-Peter; and Schafer, Matthias, 5,116,872, Cl. 514-561.000.
Deibel, Richard J. High-strength spin-on tube filter. 5,116,499, Cl. 210-232.000.
Deka Products Limited Partnership: *See—*
Faust, Valentine; and Kamen, Dean L., 5,116,021, Cl. 251-149.100.
Delaage, Michel; Drocourt, Jean-Louis; Hirn, Joelle; and van Agthoven, Andreas, to Immunotech. Products for separation applicable to cells in the immunopurification field. 5,116,724, Cl. 435-2.000.
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Delavan Inc.: *See—*
Bretz, David H.; and Bobzin, Darrell G., 5,115,634, Cl. 60-39.020.
Del Bono, Rinaldo; De Ambrosi, Luigi; Ferrari, Gianni; Rugarli, Pier L.; and Pagella, Pier G., to Mediolanum Farmaceutici Srl. High-purity dermatan sulphate. 5,116,963, Cl. 536-21.000.
Delco Electronics Corporation: *See—*
Nemirovsky, Mario D.; and Sale, Matthew D., 5,117,387, Cl. 395-375.000.
Del Fabro, Giorgio, to M.E.P. Macchine Elettroniche Piegatrici. Combined assembly to straighten and linearise sections. 5,115,657, Cl. 72-164.000.
De Lorean, John Z. Closed-torus tire and method for manufacturing same. 5,115,852, Cl. 152-518.000.
Delorme, Serge, to Essilor International Compagnie. Spring-loaded hinge. 5,115,540, Cl. 16-228.000.
Demizu, Akira; Nakagawa, Akihiro; and Kuroda, Toshiki, to Mitsubishi Denki Kabushiki Kaisha. Misfire detecting device of an internal combustion engine. 5,116,259, Cl. 73-117.300.
Den norske stats oljeselskap a.s.: *See—*
Eri, Sigrid; Goodwin, James G., Jr.; Marcelin, George; and Riis, Trygve, 5,116,879, Cl. 518-716.000.
Denison, Timothy S.: *See—*
Bilocerkowycz, Robert J.; and Denison, Timothy S., 5,116,048, Cl. 273-87.00B.
Denkmann, Robert H.: *See—*
Colebrook, Peter H.; Razzak, Jamil A.; Denkmann, Robert H.; and Clifton, Alan A., 5,115,520, Cl. 4-321.000.
Dennerlein, Ludwig; and Weber, Hubert, to U.S. Philips Corporation. Communications device with adjustment for temperature dependent signal delays. 5,117,504, Cl. 455-67.100.
Derler, Harald: *See—*
Sulzbacher, Horst; Derler, Harald; and Schollnhammer, Heinz, 5,116,588, Cl. 423-244.000.
Derudder, Carlos, to N.V. Michel Van de Wiele. Drive system for the knife grids of a double-lift jacquard machine. 5,115,838, Cl. 139-65.000.
Desai, Nayan: *See—*
Rutherford, Howard J.; Desai, Nayan; McDermott, Keith; and Wiener, Charles, 5,116,627, Cl. 426-5.000.
Desko, Dana A.: *See—*
Kern, Karle O., Jr.; and Desko, Dana A., 5,116,159, Cl. 403-132.000.
Desurvire, Emmanuel; and Giles, Clinton R., to AT&T Bell Laboratories. Method of operating concatenated optical amplifiers. 5,117,303, Cl. 359-341.000.
Deusser, Hans: *See—*
Wolff, Siegfried; Gorl, Udo; and Deusser, Hans, 5,116,886, Cl. 523-209.000.
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Peschka, Walter; and Schneider, Gottfried, 5,115,768, Cl. 123-1.00A.
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Furstenau, Norbert, 5,117,471, Cl. 385-16.000.
Deutsche ITT Industries GmbH: *See—*
Luther, Rainer, 5,117,201, Cl. 330-279.000.
Deveau, David M., to United States of America, Navy. Planar wavefront simulator. 5,117,397, Cl. 367-13.000.
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Hawker, Michael J., 5,115,586, Cl. 40-316.000.
de Vos, Stefaan: *See—*
Zaby, Gottfried; Judat, Helmut; Boonstra, Eric; de Vos, Stefaan; Eckermann, Rolf-W.; and Humburger, Siegbert, 5,117,048, Cl. 560-347.000.
Dewanckele, Jean-Marie O.: *See—*
Callant, Paul R.; and Dewanckele, Jean-Marie O., 5,116,722, Cl. 430-363.000.
De Winter, Hugo: *See—*
Debaes, Bernard; De Winter, Hugo; and Nicolaus, Frank, 5,116,557, Cl. 264-46.600.
DeWitt, Marion R., Jr.: *See—*
Buzinkai, John F.; DeWitt, Marion R., Jr.; and Wheland, Robert C., 5,116,919, Cl. 525-420.000.
DeWitt, Robert N.; Lile, William R.; and Tentarelli, Stephen, to Opex Corporation. Apparatus for the automated processing of bulk mail and the like. 5,115,918, Cl. 209-3.100.
Dey, Thomas W., to Eastman Kodak Company. Modified retroreflector. 5,117,305, Cl. 359-529.000.
Diaz, Dinah: *See—*
Synosky, Steven P.; Diaz, Dinah; and Hartman, Scott E., 5,116,626, Cl. 426-3.000.
DiBona, Noel C.: *See—*
Bartram, Philip W.; and DiBona, Noel C., 5,116,512, Cl. 210-690.000.
Dicke, Curtis J., to LSI Logic Corp. High speed input receiver/latch. 5,117,124, Cl. 307-272.100.
Dickinson, Roger P.; and Richardson, Kenneth, to Pfizer Inc. Triazole antifungal agents. 5,116,844, Cl. 514-269.000.
Diederen, Willi: *See—*
Bomhard, Andreas; Heider, Joachim; Psiorz, Manfred; Hauel, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Diederen, Willi, 5,116,986, Cl. 546-141.000.
Dietrich, Walter; Krieger, Eberhard; and Weber, Siegfried, to Robert Bosch GmbH. Magazine for flat articles, such as folding boxes lying flat. 5,116,303, Cl. 493-313.000.
Dietsche, Thomas J.: *See—*
Fung, Alexander P.; Rahman, M. Moklesur; and Dietsche, Thomas J., 5,116,982, Cl. 546-13.000.
Differential Steel Car Company: *See—*
Westlake, Wayne S., 5,115,745, Cl. 105-286.000.
Digene Diagnostics, Inc.: *See—*
Higgs, Thomas W.; and Taub, Floyd E., 5,116,734, Cl. 435-28.000.
Digital Equipment Corporation: *See—*
Falek, Louis H., 5,117,352, Cl. 395-575.000.
Fitch, John S.; and Hamburgen, William R., 5,115,858, Cl. 165-1.000.
Miller, Steven, 5,117,351, Cl. 395-650.000.
Dijkhuis, Jan: *See—*
Bernhardt, Bodo; Dijkhuis, Jan; and Molders, Theo, 5,115,558, Cl. 29-705.000.
Dilts, Timothy A.: *See—*
Fung, Patrick T.; Norgate, Graham; Dilts, Timothy A.; Jones, Andrew S.; and Ravindran, Rangaswamy, 5,116,180, Cl. 414-5.000.
Dinand, Pierre F.: *See—*
Beasley, John C.; and Dinand, Pierre F., 5,115,916, Cl. 206-581.000.
Dinh, Paul C.; and Kaufman, Kenneth P., to Dow Corning Corporation. Process for preparation of primary aminoorganosilanes. 5,117,024, Cl. 556-413.000.
Dinh, Viet P.: *See—*
Griffith, James M.; Zalesky, Paul J.; Gessert, James M.; Dinh, Viet P.; and Passafaro, James D., 5,115,814, Cl. 128-662.060.
Director-General of Agency of Industrial Science and Technology: *See—*
Tokiwa, Yutaka; and Iwamoto, Akira, 5,116,880, Cl. 521-134.000.
Distiso, Robert G. Rotary toothbrush. 5,115,530, Cl. 15-25.000.
Ditrich, Klaus; Hamprecht, Gerhard; Wuerzer, Bruno; Meyer, Norbert; Westphalen, Karl-Otto; and Laatsch, Hartmut, to BASF Aktiengesellschaft. Naphthindazole-4,9-quinones. 5,117,005, Cl. 548-369.000.
DME Corporation: *See—*
Brookman, Michael J., 5,115,804, Cl. 128-201.220.
DNS, Inc.: *See—*
Marks, Ronald, 5,117,356, Cl. 364-406.000.
Do, Han-Shin, to Samsung Electron Services Co., Ltd. Cathode structure for electron gun. 5,117,153, Cl. 313-447.000.
Dobran, Flavio: *See—*
Flavio, Dobran, 5,115,869, Cl. 169-69.000.
Dockner, Toni: *See—*
Kempe, Uwe; Dockner, Toni; and Koehler, Hermann, 5,117,004, Cl. 548-323.000.
Dr. Ing. h.c.F. Porsche AG: *See—*
Moll, Patrick, 5,116,076, Cl. 280-691.000.
Dr.-Ing. Hofler Messgeratebau GmbH: *See—*
Bertz, Hans-Ulrich; and Meder, Willi, 5,116,234, Cl. 33-550.000.
Dr. Karl Thomae GmbH: *See—*
Bomhard, Andreas; Heider, Joachim; Psiorz, Manfred; Hauel, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Diederen, Willi, 5,116,986, Cl. 546-141.000.
Dodd, Bill W.: *See—*
Spoo, Kevin J.; Rhodes, Vergil H., Jr.; and Dodd, Bill W., 5,116,450, Cl. 156-441.000.
Doehler-Jarvis Limited Partnership: *See—*
Downing, Robert E.; and Wilson, Bobby L., 5,115,856, Cl. 164-234.000.

Doering, Timothy J.; and Zappa, David R., to FMC Corporation. Automatic percussion primer feed mechanism. 5,115,716, Cl. 89-25.000.

Doi, Yoshihisa: *See*—
Ando, Shyoichi; Yamane, Shuichi; Doi, Yoshihisa; Sakurai, Hisayuki; and Meguro, Haruo, 5,115,663, Cl. 72-370.000.

Dolan, James T., to Fusion Systems Corporation. Apparatus including concave reflectors and a line of optical fibers. 5,117,312, Cl. 359-858.000.

Dole, Stephen L.; and Venkataramani, Subramaniam, to General Electric Company. Method of forming yttria-gadolinia ceramic scintillator using hydroxide coprecipitation step. 5,116,559, Cl. 264-65.000.

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Doll, Joseph E.: *See*—
Natwick, Vernon R.; Lawless, Michael W.; Doll, Joseph E.; and Wu, Chung-You C., 5,116,203, Cl. 417-53.000.

Dolling, Ulf H.: *See*—
Bhattacharya, Apurba; Douglas, Alan W.; Grabowski, Edward J.; and Dolling, Ulf H., 5,116,983, Cl. 546-14.000.

Domagala, John M.; Suto, Mark J.; and Turner, William R., to Warner-Lambert Company. Quinolinecarboxylic acid antibacterial agents. 5,116,834, Cl. 514-212.000.

Domtar, Inc.: *See*—
Bruce, Robert; and Mitakidis, Dimitrios, 5,116,671, Cl. 428-309.900.

Donaldson Company, Inc.: *See*—
Gillingham, Gary R.; Wagner, Wayne M.; and Wahlquist, Fred H., 5,116,083, Cl. 285-23.000.

Donaldson, Robert: *See*—
Greanias, Evon C.; Stein, Frank L.; Donaldson, Robert; and Gray, Michael, 5,117,071, Cl. 178-19.000.

Donlar Corporation: *See*—
Koskan, Larry P.; and Low, Kim C., 5,116,513, Cl. 210-698.000.

Donovan, Joseph F.: *See*—
Gaidry, John E.; Quebedeau, Larry J.; Donovan, Joseph F.; and Ashton, Jefferson P., 5,115,864, Cl. 166-278.000.

Doolittle, Stephen D.; and Finchum, Bobby E., to Ingersoll-Rand Company. U-shaped compressor reservoir. 5,116,207, Cl. 417-312.000.

Doomernik, Fransiscus M. P. P.: *See*—
Sluyterman, Albertus A. S.; Vink, Nicolaas G.; and Doomernik, Fransiscus M. P. P., 5,117,151, Cl. 313-413.000.

Dore, Jacques, to Automobiles Peugeot; Automobiles Citroen; and Regie Nationale des Usines Renault S.A. Engine crankcase with crankcase gas exhaust and oil recirculation systems. 5,115,791, Cl. 123-572.000.

Dorman, Isidore. Magnetic card filing assembly. 5,115,919, Cl. 211-50.000.

Dorsch, Gene: *See*—
Lohrman, Richard D.; Ferber, Philip; and Dorsch, Gene, 5,115,930, Cl. 215-227.000.

Dosako, Shunichi; Shinooka, Rika; and Tanaka, Maki, to Snow Brand Milk Products Company, Limited. Method for thermally treating lactoferrin. 5,116,953, Cl. 530-400.000.

Doskow, Arthur: *See*—
Hauptschein, Arthur; Kennedy, John B.; and Doskow, Arthur, 5,117,422, Cl. 370-95.100.

Doss, William K.: *See*—
Chang, Hungkun J.; Doss, William K.; Nolan, Michael P.; and Buchholz, Dale R., 5,117,236, Cl. 342-367.000.

Doudement, Gerard; and Evrard, Alain, to Sidel. Apparatus for manufacturing hollow plastic bottles from preforms, with means for swinging the preforms. 5,116,217, Cl. 425-534.000.

Dougherty, Alfred P., Jr.; Fernandez, Richard E.; and Moore, Daniel W., to Du Pont de Nemours, E. I., and Company. Fire extinguishing composition and process. 5,115,868, Cl. 169-45.000.

Doughty, John I.; and Blauer, Darrell W., to Douglas Corporation. Method for forming locator lug. 5,116,445, Cl. 156-245.000.

Douglas, Alan W.: *See*—
Bhattacharya, Apurba; Douglas, Alan W.; Grabowski, Edward J.; and Dolling, Ulf H., 5,116,983, Cl. 546-14.000.

Douglas Corporation: *See*—
Doughty, John I.; and Blauer, Darrell W., 5,116,445, Cl. 156-245.000.

Douglas, Gary W.: *See*—
Arline, Samuel B.; Eder, Matthias; Dunlap, Jeffrey J.; and Douglas, Gary W., 5,116,362, Cl. 60-734.000.

Dow Corning Corporation: *See*—
Baney, Ronald H.; Bilgrien, Carl J.; Broderick, Dennis W.; and Carpenter, Leslie E., II, 5,116,637, Cl. 427-340.000.
Dinh, Paul C.; and Kaufman, Kenneth P., 5,117,024, Cl. 556-413.000.
Weiss, Lon L.; Jacobson, Larry R.; and Rankin, Frank S., 5,115,976, Cl. 239-57.000.

Dow, Robert L.: *See*—
Priser, David B.; and Dow, Robert L., 5,115,633, Cl. 60-39.010.

Dowa Mining Co., Ltd.: *See*—
Yoshida, Shigeo; Fujimoto, Isamu; Suzuki, Hideyuki; Asano, Hiroshi; Hosaka, Toru; Onoh, Takashi; Nagasaki, Kojyu; Matsuoka, Kenichi; and Taura, Kazufumi, 5,117,100, Cl. 250-221.000.

DowElanco: *See*—
Fung, Alexander P.; Rahman, M. Moklesur; and Dietsche, Thomas J., 5,116,982, Cl. 546-13.000.

Down, Paul: *See*—
Beckman, Frederick S.; and Down, Paul, 5,115,729, Cl. 101-327.000.

Downing, Robert E.; and Wilson, Bobby L., to Doehler-Jarvis Limited Partnership. Core box with large diameter vents and plugs. 5,115,856, Cl. 164-234.000.

Draftex Industries, Limited: *See*—
Goedderz, Dieter; and Reuvers, Markus, 5,115,551, Cl. 29-450.000.

Dragerwerk Aktiengesellschaft: *See*—
Eickeler, Edgar; and Loffelholz, Ralf, 5,116,577, Cl. 422-58.000.

Dragner, Louis R.: *See*—
Floyd, William C.; and Dragner, Louis R., 5,116,890, Cl. 524-50.000.
Floyd, William C.; Dragner, Louis R.; Black, Blanche H.; and North, Bernard F., 5,116,927, Cl. 527-300.000.

Drauz, Karlheinz: *See*—
Ackermann, Peter; Fischer, Hanspeter; Vogel, Rolf; Drauz, Karlheinz; Hasseberg, Hans-Albrecht; Hasselbach, Hans-Jochen; Knaup Gunter; Krimmer, Hans-Peter; and Schafer, Matthias, 5,116,872, Cl. 514-561.000.

Drehmel, Robert A.; and Hilker, Scott A., to International Business Machines Corporation. Method and apparatus for exponent adder. 5,117,384, Cl. 364-748.000.

Drent, Eit; and Breed, Anthonius J. M., to Shell Oil Company. Preparation of poly anhydride from CO/non conjugated diene/dicarboxylic acid. 5,116,936, Cl. 528-271.000.

Dreyfuss, Michael M.; Schreier, Max H.; Tscherter, Hans; and Wenger, Roland, to Sandoz Ltd. Cyclosporin peptolides having an α-hydroxycarboxylic acid at position 8. 5,116,816, Cl. 514-11.000.

Driver, Michael J.; MacPherson, David T.; and MacLachlan, William S., to Beecham Group p.l.c. Amphotericin B derivatives. 5,116,960, Cl. 536-6.500.

Drocourt, Jean-Louis: *See*—
Delaage, Michel; Drocourt, Jean-Louis; Hirn, Joelle; and van Agthoven, Andreas, 5,116,724, Cl. 435-2.000.

Druez, Catherine; Coulie, Pierre; Uyttenhove, Catherine; and Van Snick, Jacques, to Ludwig Institute for Cancer Research. Substantially pure interleukin-9 receptor and uses thereof. 5,116,951, Cl. 530-395.000.

Drummond, Archie G., Jr. Convertible child-resistant closure assembly. 5,115,928, Cl. 215-219.000.

Drysdale, Neville E.: *See*—
Bhatia, Kamlesh K.; Drysdale, Neville E.; and Kosak, John R., 5,117,008, Cl. 549-274.000.

Du Pont Merck Pharmaceutical Company: *See*—
Cain, Gary A.; Gilligan, Paul J.; and Tam, Sang W., 5,116,846, Cl. 514-317.000.

Dubach, Werner F., to Createchnic AG. One-piece plastic snap-hinge closure. 5,115,931, Cl. 215-235.000.

DuBois, Michel: *See*—
Gagnieu, Christian; and DuBois, Michel, 5,116,966, Cl. 536-50.000.

Dugre, Jean-Pierre C.: *See*—
Costes, Michel; Gach, Alain R.; and Dugre, Jean-Pierre C., 5,117,494, Cl. 395-575.000.

Dukes, Alonzo T.: *See*—
Barns-Slavin, Ileana D.; Dukes, Alonzo T.; Njo, Angela; and Taylor, David J., 5,117,364, Cl. 364-464.030.

Dumbaugh, William H., Jr., to Corning Incorporated. High alumina, alkaline earth borosilicate glasses for flat panel displays. 5,116,787, Cl. 501-66.000.

Dumbaugh, William H., Jr., to Corning Incorporated. Alkaline earth aluminoborosilicate glasses for flat panel displays. 5,116,788, Cl. 501-66.000.

Dumbaugh, William H., Jr.; and Lapp, Josef C., to Corning Incorporated. Strontium aluminosilicate glasses for flat panel displays. 5,116,789, Cl. 501-66.000.

Dumont, Francis; Garrity, George M.; Fernandez, Isabel M.; and Matas, Teresa D., to Merck & Co., Inc. Process for producing FK-506. 5,116,756, Cl. 435-253.500.

Dunham, Donald D.; and Coburn, Sherilyn M., to North American Philips Corporation. Optical grade transfer coolant for projection television receivers. 5,117,162, Cl. 313-36.000.

Dunk, Michael; and Gilker, Clyde, to Cooper Industries, Inc. Controllable recloser for power line. 5,117,325, Cl. 361-93.000.

Dunki, Jurg: *See*—
Muller, Kurt; Bohler, Erwin; and Dunki, Jurg, 5,115,713, Cl. 89-33.140.

Dunlap, Jeffrey J.: *See*—
Arline, Samuel B.; Eder, Matthias; Dunlap, Jeffrey J.; and Douglas, Gary W., 5,116,362, Cl. 60-734.000.

Dunn, Thomas J.; and Gronachan, Donald B. Water immersed stair climber with air bladder. 5,116,295, Cl. 482-53.000.

Dunn, Yvonne O.: *See*—
Bhattacharyya, Bhupati R., deceased; Huang, Shu-Jen; Shetty, Chandrashekar S.; Bui, Nang T.; and Dunn, Yvonne O., 5,116,514, Cl. 210-712.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bhatia, Kamlesh K.; Drysdale, Neville E.; and Kosak, John R., 5,117,008, Cl. 549-274.000.
Bruno, Salvatore A.; and Burn, Ian, 5,116,790, Cl. 501-139.000.
Buzinkai, John F.; DeWitt, Marion R., Jr.; and Wheland, Robert C., 5,116,919, Cl. 525-420.000.
Chung, Ding Y.; and Debroy, Tapan K., 5,116,914, Cl. 525-528.000.
Dougherty, Alfred P., Jr.; Fernandez, Richard E.; and Moore, Daniel W., 5,115,868, Cl. 169-45.000.
Farago, John, 5,116,549, Cl. 264-5.000.

Gebregiorgis, Taddesse, 5,116,903, Cl. 524-589.000.
Greene, Robin N., 5,116,937, Cl. 528-272.000.
Lin, Perry H., 5,116,681, Cl. 428-373.000.
McBride, Edward F., 5,117,041, Cl. 560-87.000.
Merchant, Abid N., 5,116,525, Cl. 252-171.000.
Nelson, Thomas L., 5,116,680, Cl. 428-369.000.
Stevenson, Thomas M., 5,116,850, Cl. 514-341.000.

Durfey, Erik J.: *See*—
Moncrief, Rick L.; Durfey, Erik J.; and Behensky, Max L., 5,116,051, Cl. 273-448.00B.

Dutka, Ferenc; Komives, Tamas; Fodor, Katalin, nee Csorba; Marton, Attila; Csikos, Aniko nee Gluck; Osztheimer, Eva; Henger, Karoly; Laborczy, Robert; Reti, Zsuzsanna, nee Bosnyak; Sebok, Dezso; Szabolcs, Jozsef; and Tomordi, Elemer, to Magyar Tudomanvos Akademia Kozponti Kemiai Kutato Intezete Nitrokemia Inartelenek Fuzfogyartelep. Herbicidal composition containing dioxolane, dioxane, or dioxepane derivatives as antidote. 5,116,402, Cl. 71-88.000.

Duwaer, Arne L.; and van Alphen, Willem M., to U.S. Philips Corporation. Cathode ray tube including a magnetic focusing lens. 5,117,152, Cl. 313-426.000.

Duxbury, Colin M.; Eaton, John R.; and Rose, Philip V., to International Computers Limited. Pipelined data processor with parameter files for passing parameters between pipeline units. 5,117,490, Cl. 395-375.000.

Dwyer, Niles M.: *See*—
Edwards, Kenneth N.; Edwards, Edward D.; Howlett, Philip C.; and Dwyer, Niles M., 5,116,134, Cl. 366-208.000.

Dyer, Allan E., to Vat-Tech, Inc. Pelvic harness. 5,115,802, Cl. 602-33.000.

Dyer, Dennie W.; and Adair, Dennis W., to Oclassen Pharmaceuticals, Inc. Diagnostic kit for the detection of atypical epithelia. 5,116,328, Cl. 604-289.000.

E. J. Brooks Co.: *See*—
Swift, Allan W., 5,116,091, Cl. 292-318.000.

E.P.B. Emile Pfalzgraf, S.A.: *See*—
Pfalzgraf, Emile; Jaeger, Claude; and Tugend, Raymond, 5,116,194, Cl. 408-181.000.

E. R. Squibb & Sons, Inc.: *See*—
Krapcho, John; Bergey, James L.; and Grover, Gary J., 5,116,851, Cl. 514-354.000.

E-Tek Dynamics, Inc.: *See*—
Pan, Jing-Jong, 5,117,473, Cl. 385-33.000.

E.Z. Shelf Company: *See*—
Von Gunton, Lee L.; and Hook, Glen C., 5,116,007, Cl. 248-243.000.

Eastman Kodak Company: *See*—
Agostinelli, John A.; and Lawrence, David J., 5,116,781, Cl. 437-168.000.
Barbee, Robert B.; and Jones, Glenn C., 5,116,892, Cl. 524-99.000.
Chamberlin, Kim S., 5,117,014, Cl. 552-249.000.
Dey, Thomas W., 5,117,305, Cl. 359-529.000.
Falling, Stephen N., 5,117,013, Cl. 549-540.000.
Kroos, Donna S.; McCauley, David K.; and Sanger, Kurt M., 5,117,283, Cl. 358-22.000.
Lelental, Mark; Agostinelli, John A.; and Romanofsky, Henry J., 5,116,812, Cl. 505-1.000.
LeRoy, Robert D.; and Quackenbush, Raymond M., 5,116,036, Cl. 271-3.100.
Ohara, Tetsuo; Miura, Tsutomu; Hagiwara, Shinichi; Koshimizu, Shigeomi; and Shimizu, Eiichi, 5,116,281, Cl. 474-1.000.
Russel, Matthew J.; and Lawniczak, Gary P., 5,116,035, Cl. 271-3.100.
Stavinoha, Jerome L., Jr.; and Tolleson, John D., 5,117,012, Cl. 549-538.000.
Stephenson, Stanley W., 5,117,241, Cl. 346-1.100.
Tackett, Tommy L.; and McCombs, Charles A., 5,117,016, Cl. 552-545.000.
Witzeman, Jonathan S., 5,117,060, Cl. 564-259.000.

Eaton Corporation: *See*—
Stephenson, Dwight B.; and Hastreiter, James J., 5,115,640, Cl. 60-384.000.
Terminiello, Michael A.; Asselin, Marc P.; Fowler, Joseph P.; Hauser, Lawrence M.; and Sansom, Raymond E., 5,117,189, Cl. 324-415.000.

Eaton, John R.: *See*—
Duxbury, Colin M.; Eaton, John R.; and Rose, Philip V., 5,117,490, Cl. 395-375.000.

Eaton, S. Sheffield, Jr., to Ramtron Corporation; and NMB Semiconductor Co., Ltd. Reference generator for an integrated circuit. 5,117,177, Cl. 323-314.000.

Ebbins, James R.; Lopez, Simon F.; and Taylor, Christopher, to British Gas plc. Treatment for reducing impurities in aqueous liquor. 5,116,507, Cl. 210-639.000.

Ebeling, Harold O. Absorber for dehydrating gas with liquid desiccant. 5,116,393, Cl. 55-229.000.

Eberbach, Mark A. Hernia plug and introducer apparatus. 5,116,357, Cl. 606-213.000.

Eberl, Adolf; and Eberl, Rolf. Above and below water sound transducer. 5,117,403, Cl. 367-175.000.

Eberl, Rolf: *See*—
Eberl, Adolf; and Eberl, Rolf, 5,117,403, Cl. 367-175.000.

Eberspach, Werner; Scharf, Daniel; and Lysek, Manfred, to Hoechst Aktiengesellschaft. Flame-resistant polymeric compositions. 5,116,891, Cl. 524-97.000.

Ebert, Edward A.: *See*—
Chausse, Joseph J.; and Ebert, Edward A., 5,115,937, Cl. 220-507.000.

Ebling, Wendell V.: *See*—
Vannus, Tom H.; Mauser, Stephen G.; Ebling, Wendell V.; and Manska, Wayne E., 5,116,329, Cl. 606-11.000.

EBSCO Industries, Inc.: *See*—
Gowing, Jim, 5,115,594, Cl. 43-44.820.

Eccles, Peter J., to Mitre Corporation, The. System and method for detection of microbursts by measuring various weather condition parameters at both spaced time and location intervals. 5,117,359, Cl. 364-420.000.

Echte, Adolf: *See*—
Baumgartner, Ehrenfried; Echte, Adolf; and Mertes, Juergen, 5,116,907, Cl. 525-77.000.

ECI Telecom Ltd.: *See*—
Piasecki, Joshua; and Sourani, Sason, 5,117,453, Cl. 379-100.000.

Eckermann, Rolf-W.: *See*—
Zaby, Gottfried; Judat, Helmut; Boonstra, Eric; de Vos, Stefaan; Eckermann, Rolf-W.; and Humburger, Siegbert, 5,117,048, Cl. 560-347.000.

Ecology Plastics Corp.: *See*—
Chausse, Joseph J.; and Ebert, Edward A., 5,115,937, Cl. 220-507.000.

Edell, David J.; and Clark, Lloyd D., Jr., to Massachusetts Institute of Technology. Cesium hydroxide etch of a semiconductor crystal. 5,116,464, Cl. 156-647.000.

Eder, Erich, to Krones AG Hermann Kronseder Maschinenfabrik. Device for applying labels to containers. 5,116,452, Cl. 156-566.000.

Eder, Matthias: *See*—
Arline, Samuel B.; Eder, Matthias; Dunlap, Jeffrey J.; and Douglas, Gary W., 5,116,362, Cl. 60-734.000.

Edgewater Medical Equipment Systems, Inc.: *See*—
Allen, R. Dan, 5,116,008, Cl. 248-286.000.

Edlund, David J.; Finke, Richard G.; and Saxton, Robert J., to University of Oregon, The. Organic solvent soluble oxide supported hydrogenation catalyst precursors. 5,116,796, Cl. 502-154.000.

Edlund, Runo E. G.; and Ernerfeldt, Bertil K., to Sunds Defibrator Industries Aktiebolag. Method for discharging a digester. 5,116,475, Cl. 162-52.000.

Edwards, Edward D.: *See*—
Edwards, Kenneth N.; Edwards, Edward D.; Howlett, Philip C.; and Dwyer, Niles M., 5,116,134, Cl. 366-208.000.

Edwards, Kenneth N.; Edwards, Edward D.; Howlett, Philip C.; and Dwyer, Niles M., to Fluid Management Limited Partnership. Automated paint production apparatus. 5,116,134, Cl. 366-208.000.

Efamol Holdings plc: *See*—
Horrobin, David F.; and Corrigan, Frank, 5,116,624, Cl. 424-702.000.
Horrobin, David F.; and Stewart, John C. M., 5,116,871, Cl. 514-560.000.

EFOS Inc.: *See*—
Hood, Randy, 5,115,761, Cl. 118-641.000.

Egashira, Rie: *See*—
Fujimoto, Hiroyoshi; Fukutake, Sunao; and Egashira, Rie, 5,116,663, Cl. 428-209.000.

Egawa, Masanori: *See*—
Toyosumi, Shigeru; Tanigawa, Masayuki; Egawa, Masanori; and Minegishi, Kiyoji, 5,116,291, Cl. 475-178.000.

Eglinton, Robert B.: *See*—
Roberson, Glenn A., Jr.; and Eglinton, Robert B., 5,115,576, Cl. 34-15.000.

Ehle, Joachim; and Fuchs, Gerhard, to Fuchs Systemtechnik GmbH. Method of operating a smelting unit and smelting unit for that method. 5,117,438, Cl. 373-80.000.

Ehmsen, Ronald J.: *See*—
Carson, Richard F., Jr.; and Ehmsen, Ronald J., 5,116,317, Cl. 604-96.000.

Ehrenfeld, Udo. Jomol derivatives as agents for the use in malignant tumors and lowered immune defenses. 5,116,614, Cl. 424-92.000.

Eibeck, Richard E.: *See*—
Magid, Hillel; Eibeck, Richard E.; Van Der Puy, Michael; Hollister, Richard M.; Lavery, Dennis M.; and Wilson, David P., 5,116,526, Cl. 252-172.000.

Eickeler, Edgar; and Loffelholz, Ralf, to Dragerwerk Aktiengesellschaft. Tubular dosimeter. 5,116,577, Cl. 422-58.000.

Eisai Co. Ltd.: *See*—
Asakawa, Naoki; Ohe, Hiroshi; Yoshida, Yutaka; Sato, Tadashi; Nezu, Yukuo; and Oda, Yoshiya, 5,117,109, Cl. 250-288.000.

Eisenhardt, Volker; Kummerfeldt, Georg; May, Franz; and Wolf, Winfried, to Licentia Patent-verwaltungs-GmbH. Method of decoding coded image data utilizing transmission error detection to interrupt decoding and up-dating. 5,117,288, Cl. 358-136.000.

Eisinger, Ronald S., to Union Carbide Chemicals & Plastics Technology Corporation. Process for recycling inert particulate materials. 5,116,940, Cl. 528-483.000.

Elbaum, George J.: *See*—
Mamedov, Ulchar A. O.; Tokar, Anatolyi E.; and Elbaum, George J., 5,116,915, Cl. 526-60.000.

Electric Motors and Specialities, Inc.: *See*—
Iddings, Franklin G., 5,117,143, Cl. 310-191.000.

ElectroCom Automation L.P.: *See*—
Cohen, Richard; and Wallace, Rickie W., 5,117,424, Cl. 370-105.500.

Electronic Security Products of California: *See*—
Nykerk, Michael, 5,117,217, Cl. 340-426.000.

VOL
1138
ISS
4
MY
26
1992
UMI

Electronics and Telecommunications Research Institute: *See—*
Lee, Bhum C.; and Park, Kwon C., 5,117,135, Cl. 307-514.000.
Park, Ki S.; Kim, Sang B.; Oh, Kwang Y.; and Lee, Yong T., 5,116,772, Cl. 437-41.000.
Park, Ki S.; Kim, Sang B.; Oh, Kwang Y.; and Lee, Yong T., 5,116,773, Cl. 437-41.000.
Electronics & Telecommunications Research Institute, Korea Telecommunications Authority: *See—*
Jeong, Ju H., 5,117,286, Cl. 358-85.000.
Electrosynthesis Company, Inc., The: *See—*
Weinberg, Norman L., 5,116,592, Cl. 423-415.00R.
Elekta Instrument AB: *See—*
Sundqvist, Hans, 5,116,344, Cl. 606-130.000.
Eli Lilly and Company: *See—*
Harper, Richard W.; Howbert, J. Jeffry; Poore, Gerald A.; Rieder, Brent J.; Tao, Eddie V P.; and Aikins, James A., 5,116,874, Cl. 514-592.000.
Ternansky, Robert J., 5,116,972, Cl. 540-364.000.
Ellens, Daniel S.; and Kubsik, Robert H., to Jervis B. Webb Company. Power transmitting assembly for reciprocatably moving a shuttle cart. 5,115,745, Cl. 104-162.000.
Ellerhorst, Robert J.; and Kraimer, Robert H., to General Electric Company. Conforming plunger seal assembly. 5,115,979, Cl. 239-265.370.
Elliott Industries Limited: *See—*
Baker, George E.; and Williams, Edward C., 5,117,087, Cl. 219-121.710.
Ellwood, Jennifer K.; Gaewsky, John P.; and Magno, James C., Jr., to Polaroid Corporation. Electronic flash control system for use in a fixed focus lens camera for increasing depth of field by the timing of flash actuation. 5,117,252, Cl. 354-415.000.
Elmerick, Donald V.: *See—*
Moore, Richard D.; Peters, Richard K.; and Elmerick, Donald V., 5,117,101, Cl. 250-226.000.
El-Nokaly, Magda: *See—*
Mazur, Adam W.; Hiler, George D., II; and El-Nokaly, Magda, 5,116,745, Cl. 435-134.000.
El Omary, Hany M. Flea blower vacuum for pets. 5,115,765, Cl. 119-83.000.
Elscint Ltd.: *See—*
Granot, Joseph, 5,117,187, Cl. 324-309.000.
Ely, Laurice D. Soldering gun. 5,117,091, Cl. 219-236.000.
Em Diagnostic Systems, Incorporated: *See—*
Crowther, Fredric H.; and Law, Wai T., 5,116,728, Cl. 435-14.000.
Emerson Electric Co.: *See—*
Honkomp, Glenn A.; McNay, Thomas O.; and Burrows, Larry G., 5,117,089, Cl. 219-201.000.
Emitec Gesellschaft fur Emissionstechnologie mbH: *See—*
Swars, Helmut; and Maus, Wolfgang, 5,115,654, Cl. 72-62.000.
Emmel, Gregg: *See—*
Narlock, Lori L.; and Emmel, Gregg, 5,115,565, Cl. 30-123.600.
Emoto, Bernard: *See—*
Amin, Alaaeldin A. M.; and Emoto, Bernard, 5,117,394, Cl. 365-203.000.
Emrich, Helmut; and Sabrowski, Uwe, to MAN Roland Druckmaschinen AG. Sheet-feed drum in rotary presses. 5,115,740, Cl. 101-420.000.
Emura, Junichi: *See—*
Yamaoka, Fumiyuki; Emura, Junichi; and Furuya, Takayuki, 5,115,892, Cl. 188-282.000.
Endo, Mikio: *See—*
Kubota, Tohru; Ishihara, Toshinobu; and Endo, Mikio, 5,116,973, Cl. 540-487.000.
Endo, Mitsuhiro, to Tokico Ltd. Pneumatic booster. 5,115,719, Cl. 91-376.00R.
Endo, Tadashi; Sakamoto, Yasuhiko; and Yoshida, Haruo, to Agency of Industrial Science and Technology; and Advantest Corporation. Phase locked loop circuit. 5,117,204, Cl. 331-8.000.
Endo Technic Corporation: *See—*
Levy, Guy, 5,116,227, Cl. 433-216.000.
Energy and Environmental Research Corporation: *See—*
Chen, Shih L.; Seeker, William R.; and Ho, Loc, 5,116,584, Cl. 423-235.000.
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Silverstein, Seth D.; and Engeler, William E., 5,117,238, Cl. 342-373.000.
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Visser, Reinke A.; Engelfriet, Adrianus R. C.; and Schildbach, Klaus B., 5,115,557, Cl. 29-597.000.
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Keane, Martin A.; and Englehardt, William H., 5,117,170, Cl. 318-646.000.
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Greco, Alberto; and Blasioli, Patrizia, 5,116,929, Cl. 528-44.000.
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Edlund, Runo E. G.; and Ernerfeldt, Bertil K., 5,116,475, Cl. 162-52.000.
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Sertic, James L.; Bancsi, Joseph A.; Sertic, Lisa D.; Esche, Grace M.; and Lawson, John, 5,116,316, Cl. 604-83.000.
Escher, Sina D.: *See—*
Morris, Anthony F.; and Escher, Sina D., 5,116,656, Cl. 428-131.000.
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Palfray, Michel, 5,116,381, Cl. 623-33.000.
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de Larrard, Francois, 5,115,602, Cl. 52-2.160.
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Schleifstein, Robert A., 5,116,898, Cl. 524-371.000.
Shin, Kju H., 5,117,061, Cl. 564-384.000.
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Hanna, Harry; and Heaney, William E., 5,115,990, Cl. 242-107.200.
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Yen, Chia M.; and Evans, Walter J., 5,115,770, Cl. 123-193.600.
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Rogers, Walter J., Jr.; and Everett, Thomas S., 5,116,599, Cl. 424-9.000.
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Doudement, Gerard; and Evrard, Alain, 5,116,217, Cl. 425-534.000.
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Fleischmann, Charles W.; Sinnk, Chester R.; and Veit, Jr., William E., 5,116,697, Cl. 429-86.000.

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Johnson, Robert W., Jr., 5,117,324, Cl. 361-66.000.
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Psajd, Rihard, 5,116,086, Cl. 285-277.000.
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Coleman, Clarence B., 5,115,943, Cl. 222-94.000.
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Thomas, Michael E.; and Chinn, Jeffrey D., 5,117,276, Cl. 357-71.000.
Faisst, Dieter, to Alusuisse-Lonza Services, Ltd. Corner joint between two sections having a C-shaped attaching portion by means of a corner connector, and angle piece for producing the joint. 5,116,161, Cl. 403-231.000.
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Hall, David B.; and Farahani, Shahrokh R., 5,116,128, Cl. 356-350.000.
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Miessen, Walter; Fauser, Nikolaus; and Hahnel, Michael, 5,115,564, Cl. 29-888.090.
Faust, Valentine; and Kamen, Dean L., to Deka Products Limited Partnership. Quick-disconnect valve. 5,116,021, Cl. 251-149.100.
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Honegger, Werner, 5,116,033, Cl. 270-55.000.
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Lohrman, Richard D.; Ferber, Philip; and Dorsch, Gene, 5,115,930, Cl. 215-227.000.
Ferguson, George E. Elongate housing with end cap members. 5,116,502, Cl. 210-266.000.
Ferguson, Lisa L.; and Ludlow, Susan M. Scarf garment. 5,115,517, Cl. 2-203.000.
Fernandez, Isabel M.: *See—*
Dumont, Francis; Garrity, George M.; Fernandez, Isabel M.; and Matas, Teresa D., 5,116,756, Cl. 435-253.500.
Fernandez, Richard E.: *See—*
Dougherty, Alfred P., Jr.; Fernandez, Richard E.; and Moore, Daniel W., 5,115,868, Cl. 169-45.000.
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Del Bono, Rinaldo; De Ambrosi, Luigi; Ferrari, Gianni; Rugarli, Pier L.; and Pagella, Pier G., 5,116,963, Cl. 536-21.000.
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Chundury, Deenadayalu; Davidson, Daniel L.; Leonard, Berdine L.; and Scheibelhoffer, Anthony S., 5,116,540, Cl. 252-511.000.
FEV Motorentechnik GmbH & Co. KG: *See—*
Kreuter, Peter; and Zoschke, Armin, 5,117,213, Cl. 335-219.000.
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Giaccardi, Eraldo; and Dassetto, Alessandro, 5,115,793, Cl. 123-620.000.
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Klainer, Stanley M.; Thomas, Johnny R.; and Butler, Marcus S., 5,116,759, Cl. 435-288.000.
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Blyler, Lee L., Jr.; Filas, Robert W.; and Grimes, Gary J., 5,117,472, Cl. 385-28.000.
Fina Research, S.A.: *See—*
Razavi, Abbas, 5,117,020, Cl. 556-43.000.
Finchum, Bobby E.: *See—*
Doolittle, Stephen D.; and Finchum, Bobby E., 5,116,207, Cl. 417-312.000.
Findlay, Nathanial B., to Inside Fitness Inc. Stair climbing exercise apparatus. 5,116,294, Cl. 482-52.000.
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Edlund, David J.; Finke, Richard G.; and Saxton, Robert J., 5,116,796, Cl. 502-154.000.
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Morris, Anthony F.; and Escher, Sina D., 5,116,656, Cl. 428-131.000.
Fischer, Hanspeter: *See—*
Ackermann, Peter; Fischer, Hanspeter; Vogel, Rolf; Drauz, Karlheinz; Hasseberg, Hans-Albrecht; Hasselbach, Hans-Jochen; Knaup Gunter; Krimmer, Hans-Peter; and Schafer, Matthias, 5,116,872, Cl. 514-561.000.
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Fischer, Werner: *See—*
Schmidt, Wolfgang; Fischer, Werner; and Locher, Johannes, 5,116,342, Cl. 73-119.00A.
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Brigati, David J.; Nagubandi, Sreeramulu; and Arvanaghi, Massoud, 5,116,732, Cl. 435-26.000.
Fita Valentin, Eduardo: *See—*
Casademunt Ferre, Jose M.; and Fita Valentin, Eduardo, 5,115,535, Cl. 15-229.700.
Fitch, John S.; and Hamburgen, William R., to Digital Equipment Corporation. Micro-channel wafer cooling chuck. 5,115,858, Cl. 165-1.000.
Fives-Cail Babcock: *See—*
Journet, Gerard; and Francou, Nicolas, 5,115,575, Cl. 34-8.000.
Fjader, Mikael: *See—*
Nurmi, Tom; Johansson, Lasse; and Fjader, Mikael, 5,116,397, Cl. 65-14.000.
Flamm, Jurgen, to Litef GmbH. Circuit for optoelectronic positioning tap. 5,117,103, Cl. 250-229.000.
Flanigen, Edith M.: *See—*
Skeels, Gary W.; and Flanigen, Edith M., 5,116,794, Cl. 502-85.000.
Flashpoint Computer Corporation: *See—*
Parrish, Osey C.; Peiffer, Robert E., Jr.; Thomas, James H.; and Hilpert, Edwin J., Jr., 5,117,350, Cl. 395-425.000.
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Bauer, Gunther; and Fleckenstein, Hubert, 5,117,096, Cl. 235-375.000.

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Gray, Alan J.; and Flett, Bruce D., 5,115,754, Cl. 114-101.000.

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Yingst, Stephen M.; Briggs, Robert C.; D'Ambrosia, John F.; Flickinger, Steven L.; Owens, Steven P.; and Zeiders, Jeffrey A., 5,117,476, Cl. 385-88.000.

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Fluckiger, Hans: *See*—
Jakob, Roland P.; Freudiger, Stefan; Koch, Rudolf; and Fluckiger, Hans, 5,116,373, Cl. 623-13.000.

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McQueen, Malcolm M., 5,117,216, Cl. 338-24.000.

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Edwards, Kenneth N.; Edwards, Edward D.; Howlett, Philip C.; and Dwyer, Niles M., 5,116,134, Cl. 366-208.000.

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Lacey, John J., Jr., 5,115,965, Cl. 73-12.000.

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Bommannan, Durairaj; Okuyama, Hirohisa; Guy, Richard H.; Stauffer, Paul; and Flynn, Gordon L., 5,115,805, Cl. 128-24.0AA.

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Bayliss, William M., 5,115,843, Cl. 141-1.000.
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Doering, Timothy J.; and Zappa, David R., 5,115,716, Cl. 89-25.000.

Fodor, Katalin, nee Csorba: *See*—
Dutka, Ferenc; Komives, Tamas; Fodor, Katalin, nee Csorba; Marton, Attila; Csikos, Aniko nee Gluck; Osztheimer, Eva; Henger, Karoly; Laborczy, Robert; Reti, Zsuzsanna, nee Bosnyak; Sebok, Dezso; Szabolcs, Jozsef; and Tomordi, Elemer, 5,116,402, Cl. 71-88.000

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Folk, Kenneth F.; Loomis, Phillip E.; and Yeomans, Michael A., to AMP Incorporated. Apparatus for rotating an electrical lead about its axis. 5,115,904, Cl. 198-403.000.

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Bernhardt, Bodo; Dijkhuis, Jan; and Molders, Theo, 5,115,558, Cl. 29-705.000.
DeCello, Michael J.; and Westwood, LeRoy C., 5,117,370, Cl. 364-497.000.
Gopp, Alexander Y., 5,115,639, Cl. 60-274.000.
Patel, Daxesh K.; and Baker, Jay D., 5,116,641, Cl. 427-96.000.
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Foster Wheeler Energy Corporation: *See*—
Garkawe, Michael, 5,116,394, Cl. 55-259.000.

Fournier, Raymond R. Rotary paint removed device. 5,115,534, Cl. 15-179.000.

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Terminiello, Michael A.; Asselin, Marc P.; Fowler, Joseph P.; Hauser, Lawrence M.; and Sansom, Raymond E., 5,117,189, Cl. 324-415.000.

Fox, John G., to Sealed Air Corporation. Apparatus and method for enhancing lamination of plastic films. 5,116,444, Cl. 156-244.170.

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Boudot, Cecipe;; and Griffaton, Jacques, 5,117,086, Cl. 219-121.640.

Francou, Nicolas: *See*—
Journet, Gerard; and Francou, Nicolas, 5,115,575, Cl. 34-8.000.

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Wolter, Herbert; and Schmidt, Helmut, 5,116,472, Cl. 204-181.700.

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Thole, Volker; and Hilbert, Thomas, 5,116,555, Cl. 264-40.500.

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Fredette, Maurice C. J.: *See*—
Scribner, Herbert C.; Fredette, Maurice C. J.; and Bechberger, Edward J., 5,116,595, Cl. 423-477.000.

Freeman, Stanley B.: *See*—
Marino, Francis C.; and Freeman, Stanley B., 5,117,220, Cl. 340-550.000.

Freeman, Thomas R., III. System for underpinning a building. 5,116,355, Cl. 405-230.000.

Freitas, David A.: *See*—
Wang, Chorng K.; Khan, Roomy; and Freitas, David A., 5,117,199, Cl. 330-252.000.

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Jakob, Roland P.; Freudiger, Stefan; Koch, Rudolf; and Fluckiger, Hans, 5,116,373, Cl. 623-13.000.

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Girona Alepuz, Eleuterio, 5,115,965, Cl. 229-109.000.

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Nagasaki, Tatsutoshi; Miyashita, Takashi; and Yanagisawa, Akihiko, 5,117,315, Cl. 360-71.000.

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Aihara, Yukitaka, 5,116,168, Cl. 408-1.00R.
Sasaki, Asao; and Kubota, Yosuke, 5,117,218, Cl. 340-450.300.

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Takamura, Yoshiyuki, 5,115,620, Cl. 53-64.000.

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Ito, Takayuki; and Nakamura, Koki, 5,117,064, Cl. 564-399.000.
Kato, Eiichi, 5,116,710, Cl. 430-96.000.
Kimura, Keizo; and Sato, Tadahisa, 5,116,990, Cl. 548-262.400.
Konno, Takeshi, 5,116,666, Cl. 428-220.000.
Matsushita, Tetsunori; and Yagihara, Morio, 5,116,717, Cl. 430-264.000.
Nakajima, Saburo, 5,115,961, Cl. 228-111.000.
Nakanishi, Kanji; Shimizu, Osamu; Yoshida, Satoshi; Katayama, Masaaki; and Isomura, Tatsuya, 5,117,321, Cl. 360-120.000.

Ono, Mitsunori, 5,116,994, Cl. 548-251.000.
Ono, Mitsunori; and Mori, Hideto, 5,117,034, Cl. 558-169.000.
Yamamoto, Soichiro, 5,116,721, Cl. 430-351.000.

Fuji Seiki Machine Works, Ltd.: *See*—
Kataoka, Shigeaki; Kobayashi, Shigeharu; and Yagishita, Fukuzo, 5,115,600, Cl. 51-410.000.

Fuji Xerox Co., Ltd.: *See*—
Okano, Sadao; Hongo, Kazuya; Aonuma, Hidekazu; and Miyamoto, Hiroshi, 5,116,702, Cl. 430-54.000.

Fujii, Hideki: *See*—
Kishita, Hirofumi; Yamaguchi, Kouichi; Fujii, Hideki; Suganuma, Shuji; Saito, Yoshikazu; Sato, Shinichi; Fukuda, Kenichi; and Kobayashi, Nobuyuki, 5,117,026, Cl. 556-435.000.

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Fujii, Keiko, legal heir: *See*—
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Fujii, Takao: *See*—
Yarino, Tatuo; and Fujii, Takao, 5,117,015, Cl. 552-541.000.

Fujii, Yoshinori: *See*—
Tanaka, Toshikazu; and Fujii, Yoshinori, 5,116,760, Cl. 435-290.000.

Fujimoto, Hidefumi: *See*—
Sasaki, Junsou; Fujimoto, Hidefumi; and Iwata, Noriyuki, 5,115,788, Cl. 123-559.300.

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Fujimoto, Hiroaki: *See*—
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Fujimoto, Hiroaki; and Fujimoto, Izumi, 5,116,875, Cl. 514-594.000.

Fujimoto, Hiroyoshi; Fukutake, Sunao; and Egashira, Rie, to W. L. Gore & Associates, Inc. Ceramic substrate material containing an amorphous fluorine resin. 5,116,663, Cl. 428-209.000.

Fujimoto, Isamu: *See*—
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Fujimoto, Izumi: *See*—
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Fujimoto, Hiroaki; and Fujimoto, Izumi, 5,116,875, Cl. 514-594.000.

Fujimoto, Katsumi: *See*—
Nakamura, Takeshi; Fujimoto, Katsumi; and Inoue, Jiro, 5,117,148, Cl. 310-367.000.

Fujino, Akihiko; Ichikawa, Tsutomu; Nanba, Katsuyuki; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Flashlight photographing device. 5,117,250, Cl. 354-400.000.

Fujioka, Seiichiro: *See*—
Konda, Tsutomu; Fujioka, Seiichiro; Tamura, Satoshi; Matsubara, Osamu; and Yoshida, Shodo, 5,117,160, Cl. 315-326.000.

Fujita, Nobuhiko: *See*—
Kimoto, Tsunenobu; Tomikawa, Tadashi; and Fujita, Nobuhiko, 5,117,267, Cl. 357-16.000.

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Fujita, Yasuhiro: *See*—
Nomura, Tetsuya; and Fujita, Yasuhiro, 5,117,168, Cl. 318-444.000.

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Nishijima, Yoshitatsu; Fujitaka, Terumasa; and Shimizu, Kazuo, 5,117,045, Cl. 560-219.000.

Fujitsu Limited: *See*—
Abe, Kenichiro, 5,116,657, Cl. 428-137.000.
Kawamura, Seiichiro, 5,116,768, Cl. 437-21.000.
Nakano, Masao; Kawamoto, Satoru; and Watanabe, Akihiko, 5,117,388, Cl. 365-73.000.
Oae, Yoshihisa; Sakamoto, Kiichi; and Yamada, Akio, 5,117,117, Cl. 250-492.200.
Onoda, Masahiro; and Toda, Yoshifumi, 5,117,502, Cl. 455-33.100.
Tsuruoka, Yoshiyasu, 5,117,202, Cl. 330-279.000.
Watanabe, Kazuhiro; Hara, Yasushi; Iida, Atsuo; Shimura, Takaki; Matsui, Kiyoto; Ishikawa, Hiroshi; and Kawabe, Kenji, 5,115,810, Cl. 128-662.030.
Yamase, Shinji, 5,117,454, Cl. 379-262.000.

Fujitsu Ten Limited: *See*—
Nomura, Tetsuya; and Fujita, Yasuhiro, 5,117,168, Cl. 318-444.000.

Fujitsu VLSI Limited: *See*—
Nakano, Masao; Kawamoto, Satoru; and Watanabe, Akihiko, 5,117,388, Cl. 365-73.000.

Fujiwa, Takaaki, to Daicel Chemical Industries, Ltd. Hydrolysis resistant polyurethane resins. 5,116,932, Cl. 528-80.000.

Fujiwara, Takuji: *See*—
Yoshimura, Hiroshi; Fujiwara, Takuji; and Ishii, Kozo, 5,115,897, Cl. 192-0.052.

Fukamachi, Tomonori: *See*—
Suzuki, Hitomi; Ogawa, Takuji; Uno, Hidemitsu; Kitahaba, Tetsuo; Kigawa, Kouji; Fukamachi, Tomonori; and Kitahara, Katsuhiko, 5,117,000, Cl. 549-59.000.

Fukaya, Haruhiko: *See*—
Abe, Takashi; Hayashi, Eiji; and Fukaya, Haruhiko, 5,117,055, Cl. 562-849.000.

Fukuda, Kenichi: *See*—
Kishita, Hirofumi; Yamaguchi, Kouichi; Fujii, Hideki; Suganuma, Shuji; Saito, Yoshikazu; Sato, Shinichi; Fukuda, Kenichi; and Kobayashi, Nobuyuki, 5,117,026, Cl. 556-435.000.
Takago, Toshio; Kishita, Hirofumi; Kinami, Hitoshi; Fukuda, Kenichi; Sato, Shinich; Yamaguchi, Koichi; and Suganuma, Shuji, 5,117,025, Cl. 556-434.000.

Fukuda, Kenzou: *See*—
Ishii, Shigeru; Nakayama, Kazunari; Yagi, Kazuo; Satow, Jun; Fukuda, Kenzou; Itoh, Kaoru; Umehara, Toshiyuki; Kudo, Masaki; Inoue, Yoichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,404, Cl. 71-92.000.

Fukuda, Kouji: *See*—
Hino, Masatoshi; Fukuda, Kouji; and Machida, Tetsuo, 5,117,468, Cl. 382-41.000.

Fukuda, Masao; and Yamazaki, Yasuo, to Kabushiki Kaisha Komatsu Seisakusho. Automatic speed changing apparatus for wheel loader. 5,116,187, Cl. 414-699.000.

Fukuda, Susumu: *See*—
Hayahara, Takuro; Katahira, Haruo; Nishida, Akiyoshi; and Fukuda, Susumu, 5,115,874, Cl. 177-70.000.

Fukuhara, Takeshi: *See*—
Komori, Shinji; Takata, Hidchiro; Tamura, Toshiyuki; Asai, Fumiyasu; and Fukuhara, Takeshi, 5,117,489, Cl. 395-375.000.

Fukui, Wataru, to Mitsubishi Denki K.K. Ignition control apparatus and method for an internal combustion engine. 5,115,792, Cl. 123-613.000.

Fukuma, Toshiaki, to Shimadzu Corporation. Spectrophotometer. 5,116,122, Cl. 356-326.000.

Fukumoto, Shoji: *See*—
Goto, Giichi; Ohkawa, Shigenori; and Fukumoto, Shoji, 5,116,861, Cl. 514-427.000.

Fukushima, Atsuhiko: *See*—
Akiyama, Kazuhiro; Kashiwazaki, Takashi; Araki, Morio; Odagawa, Satoshi; and Fukushima, Atsuhiko, 5,117,363, Cl. 364-449.000.

Fukushima, Kenji: *See*—
Yamada, Sachiko; Niimura, Koichi; Fukushima, Kenji; and Maeda, Yuji, 5,116,573, Cl. 424-1.100.

Fukushima, Masakazu: *See*—
Fujii, Setsuro, deceased; Fujii, Shinichiro, legal heir; Takada, Kaoruko, legal heir; Shirasaka, Tetsuhiko; and Fukushima, Masakazu, 5,116,600, Cl. 424-10.000.

Fukushima, Minoru: *See*—
Enomoto, Masahiro; Fukushima, Minoru; and Aihara, Shinichi, 5,116,247, Cl. 439-660.000.

Fukushima, Nobuko: *See*—
Hayashi, Yoshio; Morinaka, Yasuhiro; Shinoda, Masaki; Nishi, Hiroyoshi; Watanabe, Kazutoshi; and Fukushima, Nobuko, 5,116,858, Cl. 514-391.000.

Fukushima, Shigeru: *See*—
Tahara, Shu; Kawabata, Nariyoshi; Kojima, Akira; and Fukushima, Shigeru, 5,116,736, Cl. 435-39.000.

Fukutake, Sunao: *See*—
Fujimoto, Hiroyoshi; Fukutake, Sunao; and Egashira, Rie, 5,116,663, Cl. 428-209.000.

Fukuyama, Masao: *See*—
Kudoh, Yasuo; Tsuchiya, Sohji; Fukuyama, Masao; Kojima, Toshikuni; Ozaki, Junji; and Kobatake, Yasuhiro, 5,117,332, Cl. 361-525.000.

Fukuyama, Toshifumi, to Astex Co., Ltd.; and Takenaka Electronic Industrial Co., Ltd. Photoelectric switch using an integrated circuit with reduced interconnections. 5,117,118, Cl. 250-551.000.

Fukuzawa, Yasuko: *See*—
Takaragi, Kazuo; Sasaki, Ryoichi; Nakamura, Tsutomu; Koizumi, Minoru; Fukuzawa, Yasuko; and Kataoka, Kenji, 5,117,458, Cl. 380-4.000.

Fulkerson, Gary E. Spring-loaded bottle cap/applicator apparatus. 5,116,154, Cl. 401-127.000.

Fuller, Gerald G.; Garritano, Ronald F.; and Mode, Paul, to Rheometrics, Inc. Measuring shear viscosity of fluids. 5,115,669, Cl. 73-54.390.

Fuller, Luke: *See*—
Gillum, Steven; and Fuller, Luke, 5,116,157, Cl. 402-38.000.

Fuller, Mark W.; and Robinson, Alan S., to West Design. Water displays. 5,115,973, Cl. 239-20.000.

Fullington, Michael C.: *See*—
Pennington, Ruford T.; and Fullington, Michael C., 5,117,011, Cl. 549-523.000.

Funahashi, Makoto: *See*—
Takada, Mitsuru; and Funahashi, Makoto, 5,115,696, Cl. 74-869.000.

Funari, Joseph: *See*—
Ameen, Joseph G.; Funari, Joseph; and Goldfuss, John A., Jr., 5,115,964, Cl. 228-180.200.

Fung, Alexander P.; Rahman M. Moklesur; and Dietsche, Thomas J., to DowElanco. Preparation of fluorohalophenols and N-acyfluorohaloanilines. 5,116,981, Cl. 546-13.000.
Fung, Patrick T.; Norgate, Graham; Dilts, Timothy A.; Jones, Andrew S.; and Ravindran, Rangaswamy, to Spar Aerospace Limited. Human-in-the-loop machine control loop. 5,116,180, Cl. 414-5.000.
Furcht, Leo T.: *See*—
McCarthy, James B.; and Furcht, Leo T., 5,116,368, Cl. 623-2.000.
Furr, Bobby N.: *See*—
Engel-Bader, Monika; and Furr, Bobby N., 5,116,938, Cl. 528-272.000.
Furrer, David U.: *See*—
Martin, James R.; Kuchma, James P.; and Furrer, David U., 5,115,655, Cl. 72-68.000.
Furstenau, Norbert, to Deutsche Forschungsanstalt fur Luft- und Raumfahrt e. V. Bistable optical switching arrangement. 5,117,471, Cl. 385-16.000.
Furuhashi, Ryoichi: *See*—
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,115,546, Cl. 29-27.00C.
Furukawa, Katsuo, to Clarion Co., Ltd. Surface-acoustic-wave convolver. 5,117,145, Cl. 310-313.00R.
Furukawa, Kenji: *See*—
Terashima, Kanetsugu; Ichihashi, Mitsuyoshi; Kikuchi, Makoto; Takeshita, Fusayuki; and Furukawa, Kenji, 5,116,529, Cl. 252-299.610.
Furukawa, Teruo: *See*—
Ito, Osamu; Ogawa, Masaharu; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Furukawa, Teruo; and Nakajima, Yoshiki, 5,117,412, Cl. 369-109.000.
Furukawa, Yoshimi: *See*—
Sano, Shoichi; Furukawa, Yoshimi; and Hamada, Tetsur, 5,116,254, Cl. 180-140.000.
Furuya, Takayuki: *See*—
Yamaoka, Fumiyuki; Emura, Junichi; and Furuya, Takayuki, 5,115,892, Cl. 188-282.000.
Fusion Systems Corporation: *See*—
Dolan, James T., 5,117,312, Cl. 359-858.000.
Futami, Shunichi; and Sato, Kimihiko, to G-C Dental Industrial Corp. Low-dusting powdery alginate impression materials for dental purposes. 5,116,222, Cl. 433-48.000.
Futami, Yuichi; Ohmon, Eisaku; and Suzuki, Tadasu, to Tsubakimoto Chain Co. Power transmission mechanism with two sets of chains. 5,116,283, Cl. 474-84.000.
Futhey, John A.: *See*—
Simpson, Michael J.; and Futhey, John A., 5,116,111, Cl. 351-161.000.
G-C Dental Industrial Corp. *See*—
Futami, Shunichi; and Sato, Kimihiko, 5,116,222, Cl. 433-48.000.
Gaash Lighting Industries: See—
Avrahami, Zohar, 5,117,161, Cl. 315-226.000.
Gabel, Detlef, to United States of America, Energy. Boron containing compounds and their preparation and use in neutron capture therapy. 5,116,980, Cl. 544-229.000.
Gach, Alain R.: *See*—
Costes, Michel; Gach, Alain R.; and Dugre, Jean-Pierre C., 5,117,494, Cl. 395-575.000.
Gade, Niels: *See*—
Jorgensen, Geert; Jensen, Torben; and Gade, Niels, 5,115,685, Cl. 73-862.330.
Gaewsky, John P.: *See*—
Ellwood, Jennifer K.; Gaewsky, John P.; and Magno, James C., Jr., 5,117,252, Cl. 354-415.000.
Gagnieu, Christian; and DuBois, Michel, to Societe De Developpement Des Utilisations Du Cuir - SADUC. Process for separation of sulfated glycosaminoglycans. 5,116,966, Cl. 536-50.000.
Gaidis, James M., to W. R. Grace & Co.-Conn. Methods for water proofing wet structures formed from water-penetrable construction materials. 5,116,647, Cl. 427-407.100.
Gaidry, John E.; Quebedeaux, Larry J.; Donovan, Joseph F.; and Ashton, Jefferson P., to Baker Hughes Incorporated. Gravel pack screen having retention means and fluid permeable particulate solids. 5,115,864, Cl. 166-278.000.
Gain Lab Corp.: *See*—
Chang, Yuen-Wai; and Che, Chiou-Fwu, 5,115,876, Cl. 177-145.000.
Galileo Electro-Optics Corporation: *See*—
Fijol, John J., 5,117,149, Cl. 313-103.00R.
Gallas, James M., to Photoprotective Technology Incorporated. Melanin hydrophilic contact lenses. 5,116,884, Cl. 523-106.000.
Gammans, Richard, to Bristol-Myers Squibb Co. Treatment of sleep disorders. 5,116,852, Cl. 514-359.000.
Gan, Yasuo: *See*—
Morikawa, Hideaki; Gan, Yasuo; Kogure, Koushiro; and Ooyaba, Takashi, 5,115,883, Cl. 181-152.000.
Oyaba, Takashi; Morikawa, Hideaki; Gan, Yasuo; and Kanemaki, Naobumi, 5,117,463, Cl. 381-158.000.
Ganguli, Kalyan K., to Western Company of North America, The. High temperature fluid loss additive for cement slurry and method of cementing. 5,116,421, Cl. 106-823.000.
Ganguly, Ashit K.; Friary, Richard J.; Schwerdt, John H.; Siegel, Marvin I.; Smith, Sidney F.; Seidl, Vera A.; and Sybertz, Edmund J., to Schering Corporation. Polycyclic quinoline, naphthyridine and pyrazinopyridine derivatives. 5,116,840, Cl. 514-250.000.
Garcia, Alfonso M. Rodent trap. 5,115,595, Cl. 43-61.000.
Garcia, Edan: *See*—
Gavrilidis, George; and Garcia, Edan, 5,115,556, Cl. 29-596.000.
Garcia, Georges; Gautier, Patrick; Nisato, Dino; and Roux, Richard, to Sanofi. 4-amidino chroman and 4-amidino pyrano (3,2-c) pyridine derivatives, a process for their preparation and pharmaceutical compositions containing them. 5,116,849, Cl. 514-337.000.
Garcia, Georges; Mettefeu, Daniel; and Roux, Richard, to Sanofi. Method of preparing chroman derivatives, and synthesis intermediates. 5,116,987, Cl. 546-223.000.
Gard, Inge, to ASEA Brown Boveri AB. Convertor plant roller contact connector for convertor plant. 5,117,346, Cl. 363-51.000.
Gardaix-Luthereau, Renee: *See*—
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Costall, Brenda; Naylor, Robert; and Gardaix-Luthereau, Renee, 5,116,857, Cl. 514-370.000.
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Costall, Brenda; Naylor, Robert; and Gardaix-Luthereau, Renee, 5,116,859, Cl. 514-392.000.
Garkawe, Michael, to Foster Wheeler Energy Corporation. Cyclone separator roof. 5,116,394, Cl. 55-259.000.
Garritano, Ronald F.: *See*—
Fuller, Gerald G.; Garritano, Ronald F.; and Mode, Paul, 5,115,669, Cl. 73-54.390.
Garrity, George M.: *See*—
Dumont, Francis; Garrity, George M.; Fernandez, Isabel M.; and Matas, Teresa D., 5,116,756, Cl. 435-253.500.
Garter, Lee F.; and Thedford, G. Neil, to J. I. Case Company. Height control system for a cotton harvester. 5,115,628, Cl. 56-10.200.
Gartner, Karl, to Bender & Co., Gesellschaft m.b.H. Device for measuring the activity and volume of radioactive liquids. 5,117,115, Cl. 250-432.00R.
Garwood, Anthony J. M., to Seawell Corporation N.V. Thermoplastic skin packing means. 5,115,624, Cl. 53-427.000.
Gassaway, Mark M. Security mounting. 5,116,015, Cl. 248-553.000.
Gates, Donald W.: *See*—
Bhalla, Prithvi R.; Herrick, Robert M.; and Gates, Donald W., 5,116,403, Cl. 71-92.000.
Gau, George J., to Seagate Technology, Inc. Top pole profile for pole tip trimming. 5,116,719, Cl. 430-313.000.
Gau, Tien-Ho: *See*—
Peng, Yu-Yin; Chen, Jaw-Long; and Gau, Tien-Ho, 5,116,020, Cl. 251-129.170.
Gauthier, Jean-Marie; Coeuret, Francois; and Bonet, Claude, to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude. Multilayer protective coating for a substrate, process for protecting a substrate by a plasma deposition of such a coating, coatings obtained and applications thereof. 5,116,665, Cl. 428-216.000.
Gautier, Jean-Pierre; and Verbo, Ulysse, to Bendix Europe Services Techniques. Vacuum brake booster with a valve for allowing atmospheric air into a variable pressure chamber, the position for opening of the valve being adjustable. 5,115,718, Cl. 91-369.200.
Gautier, Patrick: *See*—
Garcia, Georges; Gautier, Patrick; Nisato, Dino; and Roux, Richard, 5,116,849, Cl. 514-337.000.
Gavrilidis, George; and Garcia, Edan. Method of manufacturing windings for electromagnetic machines. 5,115,556, Cl. 29-596.000.
Gaylord, Norman G.: *See*—
Park, John J.; Katz, Leon; and Gaylord, Norman G., 5,116,881, Cl. 521-143.000.
Gazit, Alon: *See*—
Adam, Yossi; and Gazit, Alon, 5,117,263, Cl. 355-256.000.
Gebald, Gregor; Langen, Manfred; and Bungter, Helmut, to Gebald, Gregor; and Langen, Manfred. Sliver can transport apparatus. 5,115,631, Cl. 57-281.000.
Gebara, Ghassan R., to Compaq Computer Corporation. Bus control signal routing and termination. 5,117,331, Cl. 361-407.000.
Gebregiorgis, Taddesse, to Du Pont de Nemours, E. I., and Company. Pigment dispersant resin: reaction product of imidazoline and alkylene carbonate adduct and a half blocked diisocyanate. 5,116,903, Cl. 524-589.000.
Gee, Ralph L., to International Business Machines Corporation. Table lookup multiplier with digital filter. 5,117,385, Cl. 364-757.000.
Geelhaar, Thomas: *See*—
Coates, David; Sage, Ian C.; Geelhaar, Thomas; and Wachtler, Andreas, 5,116,527, Cl. 252-299.610.
Gehres, Michelle R., to Navistar International Transportation Corp. Hose separator clip. 5,115,542, Cl. 24-543.000.
Gehringer, Hans: *See*—
Bucheler, Manfred; Gehringer, Hans; Klinksiek, Bernd; and Koglin, Bernd, 5,116,536, Cl. 252-314.000.
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Gelain, Silvano, to Gema Volstatic AG. Fluidizing and suction withdrawal unit including a level sensor. 5,116,321, Cl. 118-694.000.
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Capon, Daniel J.; and Lasky, Laurence A., 5,116,964, Cl. 536-27.000.
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Ohkawa, Tihiro, 5,117,188, Cl. 324-318.000.
Silke, Gerald W., 5,116,190, Cl. 414-735.000.
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Penato, Jean-Marie; Noualhaguet, Pierre; and Laurent, Michel, 5,117,448, Cl. 378-132.000.
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Belfoure, Edward L.; and Boutni, Omar M., 5,116,905, Cl. 525-67.000.
Brown, Thomas W.; and Young, Gerald W., 5,116,265, Cl. 439-801.000.
Brunelle, Daniel J., 5,116,975, Cl. 544-86.000.
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Catlow, William G.; and Vitone, Edward T., Jr., 5,116,200, Cl. 415-183.000.
Childress, Jeffrey S.; and Hattey, David L., 5,117,501, Cl. 455-11.100.
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Kumar, Ajith K., 5,117,166, Cl. 318-362.000.
Lerman, Theodore B.; and Basse, Bernard W., 5,116,178, Cl. 411-87.000.
Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., 5,117,211, Cl. 335-202.000.
Penn, William A.; and Winfield, Donald W., 5,117,400, Cl. 367-128.000.
Riza, Nabeel A., 5,117,239, Cl. 342-375.000.
Silverstein, Seth D.; and Engeler, William E., 5,117,238, Cl. 342-373.000.
Tennyson, William R., 5,117,203, Cl. 330-294.000.
Young, Joseph C., 5,117,475, Cl. 385-81.000.
Zeiser, Philip R., 5,115,636, Cl. 60-39.330.
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Haber, Edgar; and Matsueda, Gary R., 5,116,613, Cl. 424-85.800.
General Instrument Corporation: *See*—
Robbins, Clyde, 5,117,195, Cl. 329-307.000.
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Schroeder, Lisa R.; and Muffett, Dorothy J., 5,116,629, Cl. 426-545.000.
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Beauch, Howard D., 5,115,691, Cl. 74-493.000.
Smith, Scott A., 5,115,887, Cl. 184-6.400.
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Wang, Elizabeth A.; Wozney, John M.; and Rosen, Vicki, 5,116,738, Cl. 435-69.100.
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Bryan, Philip N.; Pantoliano, Michael W.; Rollence, Michele L.; and Wong, Chi H., 5,116,741, Cl. 435-87.000.
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Kuchuk-Yatsenko, Sergei I.; Ignatenko, Vadim J.; Genis, Igor A.; Jumatov, Viktor V.; Krivenko, Valery G.; Kuznetsov, Petr V.; and Kachinsky, Vladimir S., 5,117,084, Cl. 219-100.000.
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Genreith, Hans; Marx, Norbert; and Nagler, Gunter, to Zimmermann & Jansen GmbH. Stop valve for pipe bridge. 5,116,022, Cl. 251-175.000.
Georg Fischer AG: *See*—
Satmer, Franz; and Wilhelm, Ludwig, 5,115,985, Cl. 241-14.000.
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Gerding, Guillermo: *See*—
Hauser, Bernhard; Gerding, Guillermo; Moller, Knut; Muller, Bernd-Henrik; Rudolph, Gert; and Wiethaup, Wolfgang, 5,115,820, Cl. 131-194.000.
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Hewka, Leda C.; Geremakis, Perry A.; Lester, Mark B.; and Parr, Jack E., 5,116,380, Cl. 623-23.000.
Gergo, Gyorgy; Vida, Zoltan; Sebestyen, Bela; Nemeth, Jozsef; Viragh, Istvan; Monath, deceased Lajos; and Monath, Gabor, to Mecseki Szenbanyak; and Impari Technologiai Intezet. Method and equipment for loosening and/or winning minerals especially coal and aggregated materials by using compressed air breaking. 5,116,104, Cl. 299-16.000.
Gerhard, Helmut, to Westerwaelder Eisenwerk Gerhard GmbH. Freight container. 5,115,933, Cl. 220-1.500.
Gerhardt, Karsten H. Hanger for articles of different sizes and shapes. 5,116,003, Cl. 248-312.000.
Gerk, Wilfried; Hirt, Hartmut; and Klee, Gerhard, to Samson AG. Pressure controlled cutter bit retainer with precision adjustable cutter bit. 5,116,171, Cl. 408-147.000.
Gerlier, Andre ; and Berthet, Yves, to Landis & Gyr Betriebs AG. Apparatus for receiving and issuing sheets. 5,116,037, Cl. 271-3.100.
German, Randy L.: *See*—
Lin, Charles W. C.; German, Randy L.; Yee, Ian Y. K.; and Sigmond, David M., 5,116,463, Cl. 156-643.000.
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Griffith, James M.; Zalesky, Paul J.; Gessert, James M.; Dinh, Viet P.; and Passafaro, James D., 5,115,814, Cl. 128-662.060.
Gezon, Bruce R.: *See*—
Nienhuis, James H.; Clark, Jeffrey L.; and Gezon, Bruce R., 5,116,235, Cl. 439-215.000.
GI.BI.EFFE S.R.L.: *See*—
Lo Duca, Carmelo, 5,116,320, Cl. 604-110.000.
Giaccardi, Eraldo; and Dassetto, Alessandro, to Fiat Auto SpA. Ignition device for internal combustion engines, particularly for detecting spark failure. 5,115,793, Cl. 123-620.000.
Gianni Bulgari S.p.A.: *See*—
Bulgari, Gianni, 5,116,097, Cl. 296-64.000.
Gibbs, John A.: *See*—
Wardle, Jay M.; Potter, Ronald W.; and Gibbs, John A., 5,117,179, Cl. 324-77.0CS.
Gibson, Samuel G.: *See*—
Rae, Duncan R.; and Gibson, Samuel G., 5,116,856, Cl. 514-370.000.
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Moore, Henry J., Jr.; and Gidanian, Bijan, 5,115,798, Cl. 126-351.000.
Giersberg, Joachim; Naumann, Dirk; and Honselmann, Frank, to Th. Goldschmidt AG. Method for the preparation of finely divided, electrically conductive tin(IV) oxide. 5,116,468, Cl. 204-96.000.
Giesen, Brigitte: *See*—
Fabry, Bernd; Gruber, Bert; Tucker, James R.; and Giesen, Brigitte, 5,117,032, Cl. 558-34.000.
Gijj, Inc.: *See*—
Brooks, Geoffrey J., 5,116,388, Cl. 8-405.000.
Gilbert, Seymour G.; and Coelho, Urban J., to Gilbert, Seymour G. Pulped paperboard-polymer compositions. 5,116,889, Cl. 524-14.000.
Gilbert, Sheri A.; Mizoguchi, Haruko; Charest, Robert P.; O'Neill, Timothy P.; and Smith, Ronald L., to Procter & Gamble Company, The. Use of loperamide and related compounds for treatment of respiratory disease symptoms. 5,116,847, Cl. 514-327.000.
Giles, Clinton R.: *See*—
Desurvire, Emmanuel; and Giles, Clinton R., 5,117,303, Cl. 359-341.000.
Gilker, Clyde: *See*—
Dunk, Michael; and Gilker, Clyde, 5,117,325, Cl. 361-93.000.
Gillette, Donald J.: *See*—
Hajek, Bedrich; and Gillette, Donald J., 5,116,636, Cl. 427-33.000.
Gilligan, Paul J.: *See*—
Cain, Gary A.; Gilligan, Paul J.; and Tam, Sang W., 5,116,846, Cl. 514-317.000.
Gillingham, Gary R.; Wagner, Wayne M.; and Wahlquist, Fred H., to Donaldson Company, Inc. Clamp for coupling and sealing pipe joints. 5,116,083, Cl. 285-23.000.
Gillotti, Randall E.: *See*—
Seymour, Douglas G.; and Gillotti, Randall E., 5,116,266, Cl. 439-851.000.
Gillum, Steven; and Fuller, Luke, to U.S. Ring Binder Corporation. Locking ring binder. 5,116,157, Cl. 402-38.000.
Giprokautchuk: *See*—
Mamedov, Ulchar A. O.; Tokar, Anatolyi E.; and Elbaum, George J., 5,116,915, Cl. 526-60.000.
Girard, Alain, to Aerospatiale Societe Nationale Industrielle. Adaptable system for storing liquid under pressure and spacecraft propellant storage applications thereof. 5,116,000, Cl. 244-135.00R.
Girona Alepuz, Eleuterio, to Frutas Ballester, S.A. Box for containing spherical bodies. 5,115,965, Cl. 229-109.000.
Gist-Brocades N.V.: *See*—
Lourens, Pieter A.; and Zoetemeyer, Robert J., 5,116,505, Cl. 210-603.000.
Givens, Wyatt W., to Mobil Oil Corporation. Method and apparatus for measuring rise in height of a liquid column. 5,115,574, Cl. 33-714.000.
Glatzle, Rudolf; Huber, Ronald; Schopf, Thomas; and Schretter, Michael, to Schwarzkopf Development Corporation. Extrusion process and tool for the production of a blank having internal bores. 5,116,659, Cl. 428-188.000.
Glaxo Group Limited: *See*—
Naylor, Alan; and Judd, Duncan B., 5,116,842, Cl. 514-252.000.
North, Peter C.; Oxford, Alexander W.; and Coates, Ian H., 5,116,984, Cl. 546-101.000.
Gleason Works, The: *See*—
Goldrich, Robert N., 5,116,173, Cl. 409-13.000.
Glenn Technologies, Inc.: *See*—
Butler, Dennis, 5,115,605, Cl. 52-105.000.
Glidden Company, The: *See*—
Woo, James T. K.; and Pompignano, Gary C., 5,116,888, Cl. 523-409.000.
Glock, Steven R. Acetabular cup installation tool and method of installing an acetabular cup. 5,116,339, Cl. 606-91.000.
Gloe, Karl-Heinz; Kreuzer, Helmut; and Biehl, Harald, to AMP Incorporated. Press with control circuit arrangement. 5,115,735, Cl. 100-43.000.

Gobbi, Jose M.; and Le Berre, Louis, to Thomson Composants Microondes. Customizable logic integrated circuit with multiple-drain transistor for adjusting switching speed. 5,117,127, Cl. 307-443.000.
Gockelmann, Karl, to WMF Wurttembergische Metallwarenfabrik Aktiengesellschaft. Coffee machine. 5,115,730, Cl. 99-280.000.
Godde, Guy: *See*—
Cattoz, Roland; Godde, Guy; and Plagne, Jean-Louis, 5,117,030, Cl. 556-472.000.
Godtfredsen, Sven E.: *See*—
Ingvorsen, Kjeld; Godtfredsen, Sven E.; and Hojer-Pedersen, Birgitte, 5,116,744, Cl. 435-128.000.
Goedderz, Dieter; and Reuvers, Markus, to Draftex Industries, Limited. Method for fitting a flexible strip. 5,115,551, Cl. 29-450.000.
Goeke, Wayne C., to Hewlett-Packard Company. Continuously integrating high-resolution analog-to-digital converter. 5,117,227, Cl. 341-166.000.
Goetz, Howard V., to Tektronix, Inc. Reciprocating-element position encoder. 5,117,374, Cl. 364-559.000.
Goetz, Vernon N.: *See*—
McKibben, Gary E.; Goetz, Vernon N.; and Boehm, Elise M., 5,115,966, Cl. 229-125.00.
Gokcen, Muharrem; and Guy, Terry J., to Immunolytics, Inc. Method for treating benign prostatic hypertrophy. 5,116,615, Cl. 424-94.200.
Golde, Paul J., to Intersport Fashions West, Inc. Garment with neck covering. 5,115,516, Cl. 2-108.000.
Goldfuss, John A., Jr.: *See*—
Ameen, Joseph G.; Funari, Joseph; and Goldfuss, John A., Jr., 5,115,964, Cl. 228-180.200.
Goldrich, Robert N., to Gleason Works, The. Method of generating bevel and hypoid gears. 5,116,173, Cl. 409-13.000.
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Lee, Kwan H., 5,117,080, Cl. 219-10.55R.
Goma, M. Gerard: *See*—
Fuentes, M. Jean-Luc; Rousset, M. Christian; Goma, M. Gerard; and Pommier, M. Jean-Claude, 5,116,474, Cl. 162-71.000.
Gonenne, Amnon, to Bio-Technology General Corp. Use of intratracheal administration of SOD to protect humans from lung injury due to hyperoxia and hyperventilation. 5,116,616, Cl. 424-94.400.
Goodwin, James G., Jr.: *See*—
Eri, Sigrid; Goodwin, James G., Jr.; Marcelin, George; and Riis, Trygve, 5,116,879, Cl. 518-716.000.
Goodyear Tire & Rubber Company, The: *See*—
Crump, Robert L.; Harris, Ronald T.; Reckley, Samuel E.; Montgomery, Edward L.; and Hurst, Lawrence B., 5,115,850, Cl. 152-209.00R.
Oare, Thomas R.; and Sykora, James C., 5,115,853, Cl. 152-527.000.
Gootzen, Wilhelmus F. M.: *See*—
Bellersen, Michael F. B.; and Gootzen, Wilhelmus F. M., 5,117,278, Cl. 357-72.000.
Gopp, Alexander Y., to Ford Motor Company. Dual EGO sensor closed loop fuel control. 5,115,639, Cl. 60-274.000.
Gordon, Eugene I., to Photon Imaging Corp. Electronic printer or scanner using a fiber optic bundle and an array light emission device. 5,117,245, Cl. 346-160.000.
Gorio, Alfredo; and Genazzani, Enrico. Drug active in restoring neuronal plasticity. 5,116,873, Cl. 514-567.000.
Gorl, Udo: *See*—
Wolff, Siegfried; Gorl, Udo; and Deusser, Hans, 5,116,886, Cl. 523-209.000.
Gorney, Moshe: *See*—
Alkalay, Uri; and Gorney, Moshe, 5,115,977, Cl. 239-68.000.
Gort, Thomas L.: *See*—
West, Eugene L.; Beck, David H.; and Gort, Thomas L., 5,115,767, Cl. 122-494.000.
Gorter, Willem K., to U.S. Philips Corp. Depilating apparatus. 5,116,348, Cl. 606-133.000.
Goss, Lloyd C.: *See*—
Weispfenning, Gerald L.; and Goss, Lloyd C., 5,117,408, Cl. 369-32.000.
Gosset, Serge: *See*—
Malras, Jean-Claude; and Gosset, Serge, 5,116,825, Cl. 514-58.000.
Goto, Giichi; Ohkawa, Shigenori; and Fukumoto, Shoji, to Takeda Chemical Industries, Ltd. Nitrosothiol derivatives and their use. 5,116,861, Cl. 514-427.000.
Goto, Makoto; Nara, Terukazu; Terasawa, Masato; and Yukawa, Hideaki, to Mitsubishi Petrochemical Co., Ltd. L-alanine production with two microorganisms having fumarase inactivity in a single reaction tank. 5,116,743, Cl. 435-116.000.
Goto, Yujiro: *See*—
Yoshioka, Issei; Kamimura, Yoichi; Kitano, Masao; and Goto, Yujiro, 5,116,608, Cl. 424-72.000.
Gottlieb, Marvin: *See*—
Niioka, Yoshio, 5,117,229, Cl. 342-1.000.
Gottling, Helmut: *See*—
Fortmann, Norbert; Gottling, Helmut; Janetzko, Horst; Kook, Ralf; Kruppa, Hans; and Scharnowski, Gerhard, 5,115,889, Cl. 188-67.000.
Goud, Gilles R., to Salomon S.A. Safety ski binding. 5,116,073, Cl. 280-617.000.
Goulait, David J. K.: *See*—
Thomas, Dennis A.; and Goulait, David J. K., 5,116,563, Cl. 264-167.000.
Gowing, Jim, to EBSCO Industries, Inc. Treble hook. 5,115,594, Cl. 43-44.820.
Grabbe, Dimitry G., to AMP Incorporated. Electrical edge contact member and a method of manufacturing same. 5,116,458, Cl. 156-630.000.
Grabowski, Edward J.: *See*—
Bhattacharya, Apurba; Douglas, Alan W.; Grabowski, Edward J.; and Dolling, Ulf H., 5,116,983, Cl. 546-14.000.
Graham, Anne C.: *See*—
Monte, Charles; White, Paul J.; and Graham, Anne C., 5,115,705, Cl. 84-617.000.
Graham, James A. Variable circumference adjustable-drive pulley mechanism. 5,116,282, Cl. 474-49.000.
Grald, Eric W., to Honeywell Inc. Method and apparatus for controlling a heating/cooling system based on a temperature error. 5,115,968, Cl. 236-78.00D.
Gramlich, Wayne C.: *See*—
Tirfing, Soren J.; and Gramlich, Wayne C., 5,117,349, Cl. 395-600.000.
Grandmont, William; and Rendino, Paula. Phosphorescent marking material. 5,116,533, Cl. 252-301.360.
Granger, Richard N., to United States Surgical Corporation. Combined surgical needle-suture device possessing a controlled suture separation feature. 5,116,358, Cl. 606-224.000.
Granger, Stanley W.; Beard, Joseph O.; and Sveen, Frode. Annular sealing element with self-pivoting inserts for blowout preventers. 5,116,017, Cl. 251-1.200.
Granot, Joseph, to Elscint Ltd. Localized multi-region magnetic resonance data acquisition. 5,117,187, Cl. 324-309.000.
Grapha-Holding AG: *See*—
Jermann, Daniel; and Muller, Bruno, 5,116,043, Cl. 271-213.000.
Gray, Alan J.; and Flett, Bruce D. Adjustable spreader arms for sailing graft. 5,115,754, Cl. 114-101.000.
Gray, Leslie F.: *See*—
Chau, Chung N.; Kasenga, Anthony F.; Chenot, Charles F.; and Gray, Leslie F., 5,116,532, Cl. 252-301.40P.
Gray, Michael: *See*—
Greanias, Evon C.; Stein, Frank L.; Donaldson, Robert; and Gray, Michael, 5,117,071, Cl. 178-19.000.
Greanias, Evon C.; Stein, Frank L.; Donaldson, Robert; and Gray, Michael, to International Business Machines Corportion. Stylus sensing system. 5,117,071, Cl. 178-19.000.
Greco, Alberto; and Blasioli, Patrizia, to Enichem Synthesis S.p.A. Copolyester-diol polycarbonates, process for producing them and their use. 5,116,929, Cl. 528-44.000.
Greco, John C.; and McGinity, James W., to Morgan, Lee Roy; and Greco, John C. Vaginal progesterone tablet. 5,116,619, Cl. 424-433.000.
Green Cross Corporation: *See*—
Miyano, Kenmi; Tanaka, Kenji; Nishimaki, Hideo; and Iga, Yoshiro, 5,116,950, Cl. 530-382.000.
Nakajima, Tsunetaka; Okamoto, Tadao; Kondo, Nobuo; Watanabe, Masahiro; Yamauchi, Koichi; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 5,116,949, Cl. 530-363.000.
Green, David T., to United States Surgical Corporation. Safety trocar. 5,116,353, Cl. 606-184.000.
Green, Dennis H.; and Cochetas, George S., to Harrison Western Environmental Services, Inc. Water treatment system and method for operating the same. 5,116,511, Cl. 210-673.000.
Greene, Carmine; Ismail, Ibrahim A.; and Wu, Wen H., to Miles, Inc. Nonenzymatic glucose test. 5,116,763, Cl. 436-95.000.
Greene, Robin N., to Du Pont de Nemours, E. I., and Company. Water-swellable thermoplastic copolyetherester elastomer. 5,116,937, Cl. 528-272.000.
Greenspan, Bernard J.; and Moss, Owen R., to Battelle Memorial Institute. Nebulizer device. 5,115,971, Cl. 239-3.000.
Greenwood, Brian: *See*—
Phillips, Joseph; Prough, J. Robert; Bilodeau, Victor; Greenwood, Brian; Bain, Ronald; and Weston, John, 5,116,476, Cl. 162-60.000.
Greschner, Johann: *See*—
Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Kraus, Georg; Weiss, Helga; and Wolter, Olaf, 5,116,462, Cl. 156-643.000.
Greuloch, William; Shamir, Dan; and Groves, Mark W., to Danninger Medical Technology, Inc. Continuous passive motion device for imparting a spiral motion to the digits of the hand. 5,115,806, Cl. 128-26.000.
Grey, Roger A.; Schock, Laurel E.; and Armstead, Diandre, to Arco Chemical Technology, L.P. Process for making copolymers of vinyl aromatic monomers and vinyl phosphonic acid derivatives and foamed articles therefrom. 5,116,882, Cl. 521-147.000.
Greyhawk Systems, Inc.: *See*—
Kahn, Frederic J., 5,116,110, Cl. 359-40.000.
Griffaton, Jacques: *See*—
Boudot, Cecipe;; and Griffaton, Jacques, 5,117,086, Cl. 219-121.640.
Griffith, James M.; Zalesky, Paul J.; Gessert, James M.; Dinh, Viet P.; and Passafaro, James D., to InterTherapy, Inc. Intravascular ultrasonic imaging probe and methods of using same. 5,115,814, Cl. 128-662.060.
Grill, Erwin; Loffler, Susanne; Winnacker, Ernst-Ludwig; and Zenk, Meinhard H., to Consortium fur Elektrochemische Industrie GmbH. Gamma-glutamylcysteine transferase. 5,116,749, Cl. 435-193.000.
Grimes, Gary J.: *See*—
Blyler, Lee L., Jr.; Filas, Robert W.; and Grimes, Gary J., 5,117,472, Cl. 385-28.000.
Grimshaw, Michael N.; Albers, Stephen J.; and Rust, Ralph J., to Cincinnati Milacron Inc. Tape reel support. 5,115,993, Cl. 242-68.400.

Grinstein, Reuben H.: *See*—
Fischer, Stephen A.; and Grinstein, Reuben H., 5,116,887, Cl. 523-400.000.
Grizenko, Anna N.: *See*—
Wunderlich, Helmut; Stark, Andreas; Zenker, Lothar; Lohmann, Dieter; Poppe, Hildegard; Bartsch, Reni; Skoldinov, Aleksandr P.; Kaverina, Natalja V.; Grizenko, Anna N.; and Lyskovzev, Valentin V., 5,116,974, Cl. 540-591.000.
Groenenboom Beheer B.V.: *See*—
Groenenboom, Gerrit, 5,116,761, Cl. 435-316.000.
Groenenboom, Gerrit, to Groenenboom Beheer B.V. Apparatus for preparing compost from manure by fermentation. 5,116,761, Cl. 435-316.000.
Grollmann, Peter, to Litef GmbH. Fiber optic Sagnac interferometer with digital phase ramp resetting. 5,116,127, Cl. 356-350.000.
Gronachan, Donald B.: *See*—
Dunn, Thomas J.; and Gronachan, Donald B., 5,116,295, Cl. 482-53.000.
Grooms, Dennis B., Jr. Cigarette incense ashtray holder. 5,115,821, Cl. 131-238.000.
Groppo, John G., Jr.: *See*—
Parekh, Bhupendra K.; and Groppo, John G., Jr., 5,116,487, Cl. 209-164.000.
Gross, Vaughn P.: *See*—
Batchelder, John S.; Gross, Vaughn P.; Hobbs, Philip C. D.; Miller, Robert J.; and Murray, Kenneth D., 5,116,583, Cl. 422-186.070.
Grosshans, Cheryl: *See*—
Cech, Thomas R.; Murphy, Felicia L.; Zaug, Arthur J.; and Grosshans, Cheryl, 5,116,742, Cl. 435-91.000.
Grover, Gary J.: *See*—
Krapcho, John; Bergey, James L.; and Grover, Gary J., 5,116,851, Cl. 514-354.000.
Groves, Mark W.: *See*—
Greuloch, William; Shamir, Dan; and Groves, Mark W., 5,115,806, Cl. 128-26.000.
Gruber, Bert: *See*—
Fabry, Bernd; Gruber, Bert; Tucker, James R.; and Giesen, Brigitte, 5,117,032, Cl. 558-34.000.
Gruenwald, David J., to Titan Marine Engines, Inc. Internal combustion engine with multiple combustion chambers. 5,115,775, Cl. 123-292.000.
Grumman Aerospace Corporation: *See*—
Hotz, Charles R.; McNiff, Gerald J.; and Burton, Dale, 5,117,360, Cl. 364-423.000.
Grutzmacher, Bertold; Blaser, Peter T.; and Kruger, Michael, to Heidelberger Druckmaschinen AG. Printing machine particularly a sheet-fed offset printing machine. 5,115,738, Cl. 101-216.000.
GSE, Inc.: *See*—
Lehnert, Mark W., 5,115,701, Cl. 81-467.000.
GTE Government Systems Corporation: *See*—
Sweeney, Harold E., 5,116,133, Cl. 356-352.000.
GTE Products Corporation: *See*—
Blaisdell, Ronald G.; Hough, Harold L.; and Pai, Robert Y., 5,116,272, Cl. 445-26.000.
Chau, Chung N.; Kasenga, Anthony F.; Chenot, Charles F.; and Gray, Leslie F., 5,116,532, Cl. 252-301.40P.
Seymour, Douglas G.; and Gillotti, Randall E., 5,116,266, Cl. 439-851.000.
Gu, Alston L.: *See*—
Saville, Marshall P.; and Gu, Alston L., 5,116,143, Cl. 384-106.000.
Guardian Technologies, Inc.: *See*—
McCurdy, Jim; and Pennypacker, Frank, 5,117,222, Cl. 340-573.000.
Guede, Arthur C.: *See*—
Havens, Terry L.; and Guede, Arthur C., 5,116,634, Cl. 427-4.000.
Gueretta, Ricardo. Newspaper vending machines. 5,115,941, Cl. 221-229.000.
Guilhaus, Michael; and Dawson, John H., to Unisearch Limited. Mass spectrometer. 5,117,107, Cl. 250-287.000.
Guilini Chemie GmbH: *See*—
Bung, Josef; Ulubay, Hasan; and Schutzius, Bernd, 5,116,924, Cl. 526-312.000.
Guilleminot, Pierre, to U.S. Philips Corporation. Retaining device for a control button movable about a pivot and device in which same is used. 5,117,075, Cl. 200-343.000.
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Guimont, Patricia A.: *See*—
Phelan, Herbert A.; Phelan, Stella; and Guimont, Patricia A., 5,116,047, Cl. 273-80.100.
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Shuker, John P. D., 5,115,589, Cl. 42-70.110.
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Morita, Shinichiro; Takahashi, Nobuya; Shimamoto, Takeshi; Matsuda, Kazuya; and Suzuki, Shigehiko, 5,116,552, Cl. 264-28.000.
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Hogarth, Peter T.; Swenson, Kurt; Gutenson, Charles E.; Nichols, Edward L., III; Roberts, Lincoln E.; and Miller, Vernon R., 5,117,122, Cl. 307-140.000.
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Lewis, Graham; Prchal, Milos; Weidner, Siegfried H.; and Yablonovitch, Max, 5,115,617, Cl. 53-306.000.
Haaker, Paul R.; Klotz, Erhard P. A.; Koppe, Reiner H.; and Linde, Rolf E., to U. S. Philips Corporation. X-ray diagnostic apparatus comprising means for the enlarged visual display of a selectable detail of the overall image. 5,117,446, Cl. 378-99.000.
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Prasad, Ravi; Notaro, Frank; and Haas, Oscar W., 5,116,396, Cl. 62-24.000.
Haber, Edgar; and Matsueda, Gary R., to General Hospital Corporation, The. Antibody-thrombolytic agent product and method of use. 5,116,613, Cl. 424-85.800.
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Friemoth, Dale J.; Hacker, Steven A.; and Loeb, Jeff M., 5,116,018, Cl. 251-90.000.
Haeussler, Hubert, to Barmag AG. Flowmeter for measuring the rate of fluid flow in a conduit. 5,115,684, Cl. 73-861.480.
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Nakajima, Tsunetaka; Okamoto, Tadao; Kondo, Nobuo; Watanabe, Masahiro; Yamauchi, Koichi; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 5,116,949, Cl. 530-363.000.
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Babson, Vincent L.; and Hagelbarger, Lee A., 5,115,720, Cl. 91-448.000.
Hagemann, Hermann: *See*—
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; Becker, Benedikt; Stendel, Wilhelm; and Erdelen, Christoph, 5,116,836, Cl. 514-224.200.
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Kobayashi, Motonobu; Kinoshita, Futoru; Hagi, Mitsuharu; Inoue, Akira; and Uno, Terushige, 5,116,579, Cl. 422-111.000.
Hagihara Industries, Inc.: *See*—
Tanaka, Toshikazu; and Fujii, Yoshinori, 5,116,760, Cl. 435-290.000.
Hagiwara, Kazuhiko, to Terumo Kabushiki Kaisha. Apparatus for processing fluid and method of driving the same. 5,116,308, Cl. 604-4.000.
Hagiwara, Shinichi: *See*—
Ohara, Tetsuo; Miura, Tsutomu; Hagiwara, Shinichi; Koshimizu, Shigeomi; and Shimizu, Eiichi, 5,116,281, Cl. 474-1.000.
Hagiwara, Takashi; Yamakawa, Noriko; and Kawamura, Ichiro, to Showa Shell Sekiyu K.K. Liquid crystal compound. 5,116,531, Cl. 252-299.650.
Hagiwara, Yoshimune: *See*—
Noguchi, Kouki; Tsuchiya, Fumio; Tsukamoto, Takashi; Masumura, Shigeki; Nakamura, Hideo; Baba, Shiro; and Hagiwara, Yoshimune, 5,117,488, Cl. 395-375.000.
Hagon, David: *See*—
Hill, Harry A.; and Hagon, David, 5,117,367, Cl. 364-474.090.
Hahn, Roger A.: *See*—
Relich, Nick P.; Hahn, Roger A.; and Cook, Jr. Harold, 5,115,662, Cl. 72-345.000.
Hahnel, Michael: *See*—
Miessen, Walter; Fauser, Nikolaus; and Hahnel, Michael, 5,115,564, Cl. 29-888.090.
Haibara, Fumio, to Konica Corporation. Compensation method for variable magnification in an optical zooming system. 5,117,256, Cl. 355-77.000.
Hails, George: *See*—
Hunter, Julian E.; Reid, James; Arnold, David E. J.; Hails, George; Baxter, Kenneth F.; Andrews, Andrian F.; and Nunn, Michael J., 5,116,407, Cl. 106-16.000.
Hajek, Bedrich; and Gillette, Donald J., to S.L. Electrostatic Technology, Inc. Method for steam cleaning and electrostatic coating of laminated articles. 5,116,636, Cl. 427-33.000.
Halczenko, Wasyl: *See*—
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stoker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta J., 5,116,870, Cl. 514-548.000.
Haldor Topsoe A/S: *See*—
Schoubye, Peter, 5,116,585, Cl. 423-235.000.
Hale, Ron L.; and Solas, Dennis W., to Baxter Diagnostics Inc. Fluorescent poly(arylpyridine) rare earth chelates. 5,116,989, Cl. 546-265.000.
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Koths, Kirston E.; Halenbeck, Robert F.; Innis, Michael A.; Wang, Alice M.; and Shaked, Ze'ev, 5,116,943, Cl. 530-351.000.
Hall, Christopher M., to National Semiconductor Corporation. Methods and circuits for synchronizing signals in a modular redundant fault tolerant computer system. 5,117,442, Cl. 375-107.000.
Hall, David B.; and Farahani, Shahrokh R., to Litton Systems, Inc. Mirror transducer assembly for ring laser gyroscope. 5,116,128, Cl. 356-350.000.

Hall, David B.: *See—*
Mitchell, Robert A.; Hall, David B.; and Shafer, Kenneth W., 5,116,132, Cl. 356-350.000.
Halliburton Geophysical Services: *See—*
Sallas, John J.; and Corrigan, Michael A., 5,115,880, Cl. 181-106.000.
Hamada, Masa: *See—*
Takeuchi, Tomio; Aoyagi, Takaaki; Naganawa, Hiroshi; Hamada, Masa; Muraoka, Yasuhiko; and Aoyama, Takayuki, 5,117,052, Cl. 562-461.000.
Hamada, Tetsur: *See—*
Sano, Shoichi; Furukawa, Yoshimi; and Hamada, Tetsur, 5,116,254, Cl. 180-140.000.
Hamaguchi, Yukio; and Tsujino, Yukio, to TOA Medical Electronics Co., Ltd. Reagent and method for measuring leukocytes and hemoglobin in blood. 5,116,539, Cl. 252-408.100.
Hamakawa, Wataru: *See—*
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Hamanaka, Izumi, to Konica Corporation. Document ejection apparatus with reduced document ejection speed. 5,116,042, Cl. 271-176.000.
Hamano, Yoshimasa: *See—*
Nakamura, Yukitsugu. Hamano, Yoshimasa; Masuda, Takashi; Matsumura, Isao; Maruyama, Shigeo; and Kobayashi, Kazunobu, 5,116,114, Cl. 351-205.000.
Hamburgen, William R.: *See—*
Fitch, John S.; and Hamburgen, William R., 5,115,858, Cl. 165-1.000.
Hamlen, Robert P.: *See—*
Rao, Bhaskara M. L.; and Hamlen, Robert P., 5,116,695, Cl. 429-12.000.
Hammar, Walton J.: *See—*
Huang, Tzu-Li J.; Hammar, Walton J.; Coderre, James C.; and Nave, Mirian D., 5,117,304, Cl. 359-529.000.
Hamos, Robert E.; and Raleigh, William F., to Teledyne Industries, Inc. Spa and swimming pool remote control systems. 5,117,233, Cl. 340-825.690.
Hamp, Donald W.: *See—*
Hsu, Adam C.; Aller, Harold E.; Murphy, Raymond A.; Le, Dat P.; Hamp, Donald W.; and Weinstein, Barry, 5,117,057, Cl. 564-149.000.
Hamprecht, Gerhard: *See—*
Ditrich, Klaus; Hamprecht, Gerhard; Wuerzer, Bruno; Meyer, Norbert; Westphalen, Karl-Otto; and Laatsch, Hartmut, 5,117,005, Cl. 548-309.000.
Han, Dong-Keun: *See—*
Kim, Young-Ha; Jeong, Seo-Young; Ahn, Kwang-Duk; and Han, Dong-Keun, 5,116,361, Cl. 623-1.000.
Han, Kyung S. Variable drive transmission. 5,116,292, Cl. 475-16.000.
Hanada, Yoichiro: *See—*
Takenoshita, Hidamitsu; Hattori, Hisashi; and Hanada, Yoichiro, 5,115,749, Cl. 110-245.000.
Hanamoto, Tadayuki; and Takasugi, Shinji, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for controlling hydraulic cylinders of a power shovel. 5,116,186, Cl. 414-694.000.
Hancart, Michel A.: *See—*
Anglade, Marc; Guimbal, Bruno; and Hancart, Michel A., 5,116,209, Cl. 416-107.000.
Handa, Takayuki; and Uda, Naotake, to Mitsui Petrochemical Industries, Ltd. Electrofusion of electrofusion joint, method of confirming state of fusion and fusion joint suitable for use in the methods. 5,116,082, Cl. 285-21.000.
Hann, Richard A.: *See—*
Pope, John A.; Barker, Roger N.; and Hann, Richard A., 5,116,805, Cl. 503-227.000.
Hanna, Harry; and Heaney, William E., to European Components Corporation. Safety belt mechanism. 5,115,990, Cl. 242-107.200.
Hannon, Gerard T.; Molnar, James, deceased; and Molnar, Lucienne, executrix. Intramedullary hybrid nail and instrumentation for installation and removal. 5,116,335, Cl. 606-62.000.
Hans, Helmut: *See—*
Albrecht, Klaus; Hans, Helmut; von der Heide, Johann; and Schmider, Fritz, 5,117,128, Cl. 310-191.000.
Hansen, Donald H. Ophthermometry: a method of measuring eye temperature for diagnosis and surgery. 5,115,815, Cl. 128-664.000.
Hansen, Holger C.: *See—*
Watjen, Frank; and Hansen, Holger C., 5,116,841, Cl. 514-250.000.
Hansen, Torben, to Schotten & Hansen GmbH. Apparatus for injecting glue in joints and hair checks of wood, especially for gluing loose knots in wooden boards. 5,115,844, Cl. 144-2.00R.
Hanson, Darin S.: *See—*
Hull, Harold L.; and Hanson, Darin S., 5,115,909, Cl. 206-38.000
Hanson, Frank, to United States of America, Navy. Optics for diode array transverse pumped laser rod. 5,117,436, Cl. 372-72.000.
Hara, Hiromu: *See—*
Mase, Toshiyasu; Murase, Kiyoshi; Hara, Hiromu; and Tomioka, Kenichi, 5,116,853, Cl. 514-363.000.
Hara, Kenji: *See—*
Kurobe, Jun; Hara, Kenji; Ishihara, Masayuki; and Takagi, Kazuhiro, 5,115,660, Cl. 72-197.000.
Hara, Yasushi: *See—*
Watanabe, Kazuhiro; Hara, Yasushi; Iida, Atsuo; Shimura, Takaki; Matsui, Kiyoto; Ishikawa, Hiroshi; and Kawabe, Kenji, 5,115,810, Cl. 128-662.030.
Harada, Naoki: *See—*
Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washimi, Takeshi; Harada, Naoki; and Akahori, Kingo, 5,116,956, Cl. 534-612.000.
Morimitsu, Toshihiko; Harada, Naoki; Omura, Takashi; and Kikkawa, Sadanobu, 5,116,959, Cl. 534-642.000.
Harada, Teruhiro, to Oki Electric Industry Co., Ltd. Non-volatile semiconductor memory device. 5,117,392, Cl. 365-189.090.
Harada, Yoshiyuki: *See—*
Sakashita, Masao; Sakamoto, Tetsuo; Kazama, Shingo; Harada, Yoshiyuki; Teramoto, Takero; Watanabe, Kazuhiro; Shimomura, Bunji; and Kaneta, Tsutomu, 5,116,504, Cl. 210-500.230.
Harbison, Robert T. Trailer hitch guide. 5,115,572, Cl. 33-613.000.
Harde, Bo, to AB Volvo. Valve device, particularly a ventilation valve for the vent pipe of a vehicle fuel tank. 5,115,830, Cl. 137-39.000.
Hardesty, Terry D.; Hutchison, Wayne R.; Teal, Richard D.; and Cleereman, Robert J., to Deere & Company. Tractor hub with detachable wheel weights. 5,116,106, Cl. 301-41.00W.
Hardiman, Christopher J.: *See—*
Asrar, Jawed; and Hardiman, Christopher J., 5,117,327, Cl. 361-323.000.
Hardy, Thomas A.; and Walsh, Edward N., to Akzo America Inc. Phosphate-containing and phosphonate-containing phosphate esters. 5,117,033, Cl. 558-163.000.
Hariu, Hitoshi: *See—*
Ogasahara, Johji; Hariu, Hitoshi; and Takahashi, Masakazu, 5,116,628, Cl. 426-330.100.
Harlan, Eugene G.; Bonilla, Marcio; and Martin, John R., to Arachnid, Inc. Dart game with expanded scoring technique. 5,116,063, Cl. 273-376.000.
Harper, Richard W.; Howbert, J. Jeffry; Poore, Gerald A.; Rieder, Brent J.; Tao, Eddie V. P.; and Aikins, James A., to Eli Lilly and Company. Anti-tumor method and compounds. 5,116,874, Cl. 514-592.000.
Harrell, David J.: *See—*
Kwasnik, Kenneth; and Harrell, David J., 5,116,099, Cl. 297-194.000.
Harreus, Albrecht; Weber, Karl-Heinz; Stransky, Werner; Walther, Gerhard; Muacevic, Gojko; Stenzel, Jorge C.; and Bechtel, Wolf-Dietrich, to Boehringer Ingelheim KG. Substituted-1,4-diazepines. 5,116,971, Cl. 540-362.000.
Harris, Charles C. Shipping container including foamed-in-place block. 5,115,915, Cl. 206-524.000.
Harris Corporation: *See—*
Salatino, Matthew M., 5,117,282, Cl. 357-81.000.
Harris, Graham J.: *See—*
Shorter, John J.; Harris, Graham J.; and Woolnough, Victor J., 5,116,383, Cl. 623-49.000.
Harris, John F., III: *See—*
Nobile, Frederick E.; Harris, John F., III; and Silverman, Gary S., 5,117,297, Cl. 359-52.000.
Harris, Ronald T.: *See—*
Crump, Robert L.; Harris, Ronald T.; Reckley, Samuel E.; Montgomery, Edward L.; and Hurst, Lawrence B., 5,115,850, Cl. 152-209.00R.
Harrison Western Environmental Services, Inc.: *See—*
Green, Dennis H.; and Cochetas, George S., 5,116,511, Cl. 210-673.000.
Hart, Paul S.: *See—*
Tipton, Richard E.; and Hart, Paul S., 5,115,920, Cl. 211-59.200.
Hartlaub, Jerome T.; Schweitzer, Jeffrey A.; and Seifert, George P., to Medtronic, Inc. Temperature measurement and compensation in a fiber-optic sensor. 5,115,811, Cl. 128-634.000.
Hartman, George D.: *See—*
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta J., 5,116,870, Cl. 514-548.000.
Hartman, Scott E.: *See—*
Synosky, Steven P.; Diaz, Dinah; and Hartman, Scott E., 5,116,626, Cl. 426-3.000.
Hartman, Thomas A. In-line sleeve valve having velocity guide pressure equalization and drive assembly with improved drive pin mountings. 5,116,252, Cl. 137-625.300.
Hartmann, Manfred: *See—*
Ammann, Walter; Muenger, Fritz; and Hartmann, Manfred, 5,115,622, Cl. 52-741.000.
Harvey, Bruce F., to Airsled Inc. Spacer system. 5,116,024, Cl. 254-93.0HP.
Harvey, Marty D. Method of surfacing screen organization. 5,116,553, Cl. 264-39.000.
Harvey, William A., III: *See—*
Mosser, Mark F.; and Harvey, William A., III, 5,116,672, Cl. 428-328.000.
Hasenclever, Jochen, to Vereingte Aluminum-Werke Aktiengesellschaft. Rolled thin sheets of aluminum alloy. 5,116,428, Cl. 148-438.000.
Hashimoto, Kenichi: *See—*
Ohta, Noriaki; and Hashimoto, Kenichi, 5,117,329, Cl. 361-395.000.
Hashimoto, Masashi, to Texas Instruments Incorporated. Expansible fifo memory for accommodating added memory stages in a multistage memory with common control signals. 5,117,395, Cl. 365-221.000.
Hashimoto, Shinichi: *See—*
Saitoh, Shiroh; Izumi, Mamoru; Suzuki, Syuzi; and Hashimoto, Shinichi, 5,115,809, Cl. 128-662.030.

Hashimoto, Shuichi: *See—*
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,115,546, Cl. 29-27.00C.
Haskell, Jacob D.; Avanzino, Steven C.; and Swaminathan, Balaji, to Advanced Micro Devices, Inc. Dopant sources for CMOS device. 5,116,778, Cl. 437-57.000.
Hasseberg, Hans-Albrecht: *See—*
Ackermann, Peter; Fischer, Hanspeter; Vogel, Rolf; Drauz, Karlheinz; Hasseberg, Hans-Albrecht; Hasselbach, Hans-Jochen; Knaup Gunter; Krimmer, Hans-Peter; and Schafer, Matthias, 5,116,872, Cl. 514-561.000.
Hasselbach, Hans-Jochen: *See—*
Ackermann, Peter; Fischer, Hanspeter; Vogel, Rolf; Drauz, Karlheinz; Hasseberg, Hans-Albrecht; Hasselbach, Hans-Jochen; Knaup Gunter; Krimmer, Hans-Peter; and Schafer, Matthias, 5,116,872, Cl. 514-561.000.
Hastings, Phillip J. Electrical grounding device for wells. 5,115,862, Cl. 166-65.100.
Hastreiter, James J.: *See—*
Stephenson, Dwight B.; and Hastreiter, James J., 5,115,640, Cl. 60-384.000.
Hatada, Kenzo: *See—*
Fujimoto, Hiroaki; Hatada, Kenzo; Takeshita, Yoshinobu; Otani, Kazuya; and Takeda, Kimiaki, 5,115,545, Cl. 29-25.010.
Hatayama, Katsuo: *See—*
Nakazato, Atsuro; Kitsukawa, Sanae; Kawashima, Yutaka; Hatayama, Katsuo; and Hibino, Satoshi, 5,116,995, Cl. 548-444.000.
Hathaway, David R.: *See—*
March, Keith L.; Hathaway, David R.; Wilensky, Robert L.; and Patton, Brian L., 5,116,864, Cl. 514-455.000.
Hatori, Yoshinori: *See—*
Koike, Atsushi; Kaneko, Masahide; and Hatori, Yoshinori, 5,117,287, Cl. 358-133.000.
Hattey, David L.: *See—*
Childress, Jeffrey S.; and Hattey, David L., 5,117,501, Cl. 455-11.100.
Hattori, Eiji; and Oguri, Yasuo, to Mitsubishi Kasei Corporation. Resin composition. 5,116,885, Cl. 523-200.000.
Hattori, Hiroyuki: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 5,117,260, Cl. 355-204.000.
Hattori, Hisashi: *See—*
Takenoshita, Hidamitau; Hattori, Hisashi; and Hanada, Yoichiro, 5,115,749, Cl. 110-245.000.
Hattori, Shigeo: *See—*
Kasahara, Shigeki; Nakata, Kiyotomo; Kuniya, Jiro; and Hattori, Shigeo, 5,116,569, Cl. 420-44.000.
Hattori, Shintaroo: *See—*
Ohara, Shuichi; Akasaka, Shiniichi; Oka, Hiroyuki; Hattori, Shintaroo; and Oyama, Rieko, 5,116,148, Cl. 400-241.000.
Hauber, David E., to Automated Dynamics Corporation. Porous ceramic body electrical resistance fluid heater. 5,117,482, Cl. 392-492.000.
Haul, Norbert: *See—*
Bomhard, Andreas; Heider, Joachim; Psiorz, Manfred; Hauel, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Diederen, Willi, 5,116,986, Cl. 546-141.000.
Haug, Michael; Marhold, Albrecht; Santel, Hans-Joachim; Lurssen, Klaus; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal substituted phenoxyphenylpropionic acid derivatives. 5,117,038, Cl. 560-55.000.
Hauptschein, Arthur; Kennedy, John B.; and Doskow, Arthur, to ITT Corporation. Method for providing an efficient and adaptive management of message routing in a multi-platform and apparatus communication system. 5,117,422, Cl. 370-95.100.
Hauser, Bernhard; Gerding, Guillermo; Moller, Knut; Muller, Bernd-Henrik; Rudolph, Gert; and Wiethaup, Wolfgang, to B.A.T. Cigarettenfabriken GmbH. Smokable article. 5,115,820, Cl. 131-194.000.
Hauser, Lawrence M.: *See—*
Terminiello, Michael A.; Asselin, Marc P.; Fowler, Joseph P.; Hauser, Lawrence M.; and Sansom, Raymond E., 5,117,189, Cl. 324-415.000.
Haushalter, Robert C.; and Mundi, Linda A., to Exxon Research and Engineering Company. Molybdenum phosphate compositions. 5,117,019, Cl. 556-26.000.
Havens, Terry L.; and Guede, Arthur C., to Phoenix Park Systems. Apparatus and method for consistent spray proportioning of liquid to dry material. 5,116,634, Cl. 427-4.000.
Hawaiian Suger Planters'Association: *See—*
Sachinvala, Navzer, 5,116,961, Cl. 536-18.200.
Hawker, Michael J., to Development Technology Limited. Cable markers. 5,115,586, Cl. 40-316.000.
Hawkins, Lilbert S., III: *See—*
Oliva, Elio J.; Meadows, Vernon; and Hawkins, Lilbert S., III, 5,117,173, Cl. 320-21.000.
Hawryszkow, Michael G.: *See—*
Wallace, William D.; Lynch, Edward G., Jr.; Daugherty, David W., Jr.; Kanjo, Wajih; and Hawryszkow, Michael G., 5,115,927, Cl. 213-75.00R.
Hawsey, Robert A.; and Bailey, J. Milton, to United States of America, Energy. Disc rotors with permanent magnets for brushless DC motor. 5,117,141, Cl. 310-114.000.
Hay, Allan S.: *See—*
Paventi, Martino; and Hay, Allan S., 5,117,062, Cl. 564-385.000.
Hayahara, Takuro; Katahira, Haruo; Nishida, Akiyoshi; and Fukuda, Susumu, to Japan Exlan Company, Limited; and Excom Co., Ltd. Apparatus for automatically preparing a dyeing solution. 5,115,874, Cl. 177-70.000.
Hayamizu, Yutaka: *See—*
Miyake, Hiraku; Ishiguro, Mitsuo; Abe, Shigetaka; Yamaguchi, Nobuo; Hayamizu, Yutaka; and Aizawa, Satoru, 5,115,615, Cl. 52-167.00R.
Hayashi, Eiji: *See—*
Abe, Takashi; Hayashi, Eiji; and Fukaya, Haruhiko, 5,117,055, Cl. 562-849.000.
Hayashi, Yoshio; Morinaka, Yasuhiro; Shinoda, Masaki; Nishi, Hiroyoshi; Watanabe, Kazutoshi; and Fukushima, Nobuko, to Mitsubishi Kasei Corporation. 4-imidazoline derivatives. 5,116,858, Cl. 514-391.000.
Hayata, Ryoji, to Mazda Motor Corporation. Hood structure for a vehicle. 5,115,878, Cl. 180-69.210.
Hayata, Yoshiki; Watanabe, Masashi; and Tashiro, Kisuke, to Hitachi, Ltd. Method for operating air conditioner. 5,115,643, Cl. 62-115.000.
Hayek, Alberto: *See—*
Beattie, Gillian M.; Lappi, Douglas A.; Baird, J. Andrew; and Hayek, Alberto, 5,116,753, Cl. 435-240.200.
Hayward Industries, Inc.: *See—*
Tobias, Samuel; and Hollinger, Fred, 5,115,974, Cl. 239-23.000.
Hazato, Atsuo: *See—*
Sugiura, Satoshi; Hazato, Atsuo; Minoshima, Toru; Kato, Yoshinori; Koshihara, Yasuko; and Kurozumi, Seizi, 5,116,869, Cl. 514-456.000.
Heaney, William E.: *See—*
Hanna, Harry; and Heaney, William E., 5,115,990, Cl. 242-107.200.
Heath, Kenneth E.: *See—*
Trask, Jeffrey L.; Clifton, George B.; and Heath, Kenneth E., 5,116,034, Cl. 271-2.000.
Hedrick, Joseph L.: *See—*
Kumar, M. Lalith; and Hedrick, Joseph L., 5,116,508, Cl. 210-639.000.
Heerkens, Henricus J., to U.S. Philips Corporation. Circuit arrangement in a picture display device, comprising a video signal processing circuit and a line synchronizing circuit. 5,117,290, Cl. 358-158.000.
Hegde, Suryanarayan G.; Praino, Anthony P.; Root, Steven J.; and Sri-Jayantha, Muthuthamby, to International Business Machines Corporation. Tunable feedback transducer for transient friction measurement. 5,115,664, Cl. 73-9.000.
Heidelberger Druckmaschinen AG: *See—*
Grutzmacher, Bertold; Blaser, Peter T.; and Kruger, Michael, 5,115,738, Cl. 101-216.000.
Jeschke, Willi; and Rodi, Anton, 5,117,365, Cl. 364-468.000.
Pollich, Gerhard, 5,116,041, Cl. 271-158.000.
Rodi, Anton, 5,115,741, Cl. 101-424.100.
Heider, Joachim: *See—*
Bomhard, Andreas; Heider, Joachim; Psiorz, Manfred; Hauel, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Diederen, Willi, 5,116,986, Cl. 546-141.000.
Helix Medical, Inc.: *See—*
Seder, Edmund V.; Coe, Frederick L.; and Mitchell, Martin, 5,116,310, Cl. 604-43.000.
Seder, Edmund V.; and Houts, Richard E., 5,116,327, Cl. 604-284.000.
Hella KG Hueck & Co.: *See—*
Scenzi, Bela, 5,117,336, Cl. 362-61.000.
Helmstetter, David A.: *See—*
Hilliard, Garland E.; Melton, James K.; and Helmstetter, David A., 5,116,594, Cl. 423-473.000.
Hemaedics, Inc.: *See—*
Capozzi, Emil E.; and Cooksten, H. Stephen, 5,116,315, Cl. 604-82.000.
Hendrickson, Leslie B.: *See—*
Fevold, Braden N.; Stoll, Timothy W.; and Hendrickson, Leslie B., 5,115,596, Cl. 49-411.000.
Henger, Karoly: *See—*
Dutka, Ferenc; Komives, Tamas; Fodor, Katalin, nee Csorba; Marton, Attila; Csikos, Aniko nee Gluck; Osztheimer, Eva; Henger, Karoly; Laborczy, Robert; Reti, Zsuzsanna, nee Bosnyak; Sebok, Dezso; Szabolcs, Jozsef; and Tomordi, Elemer, 5,116,402, Cl. 71-88.000.
Henkel Corporation: *See—*
Fischer, Stephen A.; and Grinstein, Reuben H., 5,116,887, Cl. 523-400.000.
McCormic, David R.; and Zimmermann, William D., 5,116,912, Cl. 525-340.000.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Carduck, Franz-Josef; Jahnke, Ulrich; Smulders, Eduard; Vogt, Guenther; Boecker, Monika; and Kuenzel, Werner, 5,116,524, Cl. 252-90.000.
Fabry, Bernd; Gruber, Bert; Tucker, James R.; and Giesen, Brigitte, 5,117,032, Cl. 558-34.000.
Hensens, Otto D.: *See—*
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta J., 5,116,870, Cl. 514-548.000.

Heraeus Instr. GmbH & Leybold AG: *See—*
Schwarz, Werner; Krenmiling, Horst; Thomas, Gunter; and Lotz, Hans-Georg, 5,117,150, Cl. 313-112.000.

Herdewijn, Piet A. M. M.: *See—*
De Clercq, Erik D. A.; Herdewijn, Piet A. M. M.; Broder, Samuel; and Balzarini, Jan M. R., 5,116,822, Cl. 514-49.000.

Hergenrother, Paul M.: *See—*
Connell, John W.; and Hergenrother, Paul M., 5,116,934, Cl. 528-125.000.

Herman Miller, Inc.: *See—*
Nienhuis, James H.; Clark, Jeffrey L.; and Gezon, Bruce R., 5,116,235, Cl. 439-213.000.

Herrick, Robert M.: *See—*
Bhalla, Prithvi R.; Herrick, Robert M.; and Gates, Donald W., 5,116,403, Cl. 71-92.000.

Hershberger, Vernon P. Winch attachment for vehicle wheel. 5,115,994, Cl. 242-95.000.

Herskovic, Herman: *See—*
Fried, Kenneth; and Herskovic, Herman, 5,116,174, Cl. 409-79.000.

Hetsugi, Koji: *See—*
Fujii, Hiroyuki; Shirai, Tokuo; Mizutani, Takanori; Nagae, Yoshio; Hetsugi, Koji; Tanizawa, Yasuo; and Kaburagi, Kouji, 5,116,521, Cl. 251-18.000.

Hewka, Leda C.; Geremakis, Perry A.; Lester, Mark B.; and Parr, Jack E., to Zimmer, Inc. Prosthetic implant with spacers having tapered trailing edges. 5,116,380. Cl. 623-23.000.

Hewlett-Packard Company: *See—*
Caldwell, Marcus L., 5,117,414, Cl. 369-266.000.
Chapman, Charles B.; and Williams, Michael R., 5,116,902, Cl. 524-579.000.
Goeke, Wayne C., 5,117,227, Cl. 341-166.000.
Kuderer, Hubert, 5,116,123, Cl. 356-326.000.
Luebs, Richard J., 5,117,133, Cl. 307-471.000.
Miazga, Jay M., 5,117,330, Cl. 361-400.000.
Moffatt, John R., 5,116,409, Cl. 106-22.000.
Stearns, Glenn; Packard, Barbara B.; and Watson, Ralph T., 5,117,496, Cl. 395-700.000.
Swerlein, Ronald L., 5,117,180, Cl. 324-132.000.
Trask, Jeffrey L.; Clifton, George B.; and Heath, Kenneth E., 5,116,034, Cl. 271-2.000.
Wardle, Jay M.; Potter, Ronald W.; and Gibbs, John A., 5,117,179, Cl. 324-77.0CS.

Hiawatha Rubber Co.: *See—*
Chapman, Charles B.; and Williams, Michael R., 5,116,902, Cl. 524-579.000.

Hibino, Satoshi: *See—*
Nakazato, Atsuro; Kitsukawa, Sanae; Kawashima, Yutaka; Hatayama, Katsuc; and Hibino, Satoshi, 5,116,995, Cl. 548-444.000.

Hicho, Michael D., to Life Systems, Inc. Method and apparatus for analyzing rotating machines. 5,115,671, Cl. 73-488.000.

Hiers, John D.; and Valentine, Michael D., to Valentine Research, Inc. Power plug for radar warning detector. 5,116,248, Cl. 439-669.000.

Higashi, Kouichi: *See—*
Nagase, Takashi; and Higashi, Kouichi, 5,117,105, Cl. 250-231.180.

Higashijima, Hitoshi: *See—*
Miyata, Teruo; Kodama, Kazuhiko; Higashijima, Hitoshi; Kimura, Takashi; and Noishiki, Yasuharu, 5,116,824, Cl. 514-55.000.

Higdon, John S.; and Capen, Douglas W. Tire pressure gauge and cap apparatus. 5,115,832, Cl. 137-227.000.

Higgins, Leo M., III, to Prime Computer, Inc. Circuit board fabrication. 5,117,069, Cl. 174-261.000.

Higgs, Thomas W.; and Taub, Floyd E., to Digene Diagnostics, Inc. Highly sensitive method for detecting peroxidase. 5,116,734, Cl. 435-28.000.

Higham, Joseph P.: *See—*
Clark, Alan R.; Higham, Joseph P.; Hughes, James E.; and Valashinas, James W., 5,117,486, Cl. 395-250.000.

Highland Plastics, Inc.: *See—*
Nelson, James L., 5,115,934, Cl. 220-276.000.

Higuchi, Yasushi: *See—*
Nakamura, Kyuzo; Ishibashi, Satoru; Ota, Yoshifumi; and Higuchi, Yasushi, 5,116,479, Cl. 204-192.130.

Hiji, Yasutake. Intestinal absorption inhibiting agent. 5,116,820, Cl. 514-25.000.

Hilbert, Thomas: *See—*
Thole, Volker; and Hilbert, Thomas, 5,116,555, Cl. 264-40.500.

Hildebrand, Otto: *See—*
Bubik, Alfred; and Hildebrand, Otto, 5,116,477, Cl. 162-301.000.

Hiler, George D., II: *See—*
Mazur, Adam W.; Hiler, George D., II; and El-Nokaly, Magda, 5,116,745, Cl. 435-134.000.

Hilker, Scott A.: *See—*
Drehmel, Robert A.; and Hilker, Scott A., 5,117,384, Cl. 364-748.000.

Hill, Harry A.; and Hagon, David. Cutting machine. 5,117,367, Cl. 364-474.090.

Hilliard, Garland E.; Melton, James K.; and Helmstetter, David A., to Olin Corporation. Salt handling apparatus for a hypochlorous acid reactor. 5,116,594, Cl. 423-473.000.

Hilliard, Garland E.: *See—*
Melton, James K.; Hilliard, Garland E.; and Shaffer, John H., 5,116,593, Cl. 423-473.000.

Hillis, W. Daniel; Kahle, Brewster; Robertson, George G.; and Steele, Guy L., Jr., to Thinking Machines Corporation. Method and apparatus for routing message packets. 5,117,420, Cl. 370-60.000.

Hillstead, Richard A., to Cordis Corporation. Dilatation balloon within an elastic sleeve. 5,116,318, Cl. 604-96.000.

Hillstead, Richard A., to Cordis Corporation. Stent apparatus and method for making. 5,116,365, Cl. 623-1.000.

Hilpert, Edwin J., Jr.: *See—*
Parrish, Osey C.; Peiffer, Robert E., Jr.; Thomas, James H.; and Hilpert, Edwin J., Jr., 5,117,350, Cl. 395-425.000.

Hilti Aktiengesellschaft: *See—*
Ammann, Walter; Muenger, Fritz; and Hartmann, Manfred, 5,115,622, Cl. 52-741.000.

Himle, Harold. Ground hydrant with ninety-degree water flow turn-off ball valve below frost line. 5,115,833, Cl. 137-286.000.

Hino, Masatoshi; Fukuda, Kouji; and Machida, Tetsuo, to Hitachi, Ltd. Image processing system capable of carrying out local processing for image at high speed. 5,117,468, Cl. 382-41.000.

Hirai, Eiji; Kurosawa, Kazuyoshi; and Matsumura, Yoshio, to Nihon Parkerizing Co., Ltd. Process for surface treatment titanium-containing metallic material. 5,116,430, Cl. 148-518.000.

Hirai, Yoshihiko, to NEC Corporation. Active matrix liquid crystal display with reduced flickers. 5,117,298, Cl. 359-55.000.

Hirakawa, Jun, to Asahi Kogaku Kogyo K.K. Large aperture, medium telephoto lens system. 5,117,310, Cl. 359-745.000.

Hirashima, Kazuyoshi. Easy-to-open synthetic resin bag. 5,116,140, Cl. 383-206.000.

Hirata, Kohji: *See—*
Takeguchi, Kazunori; and Hirata, Kohji, 5,116,440, Cl. 156-90.000.

Hirn, Joelle: *See—*
Delaage, Michel; Drocourt, Jean-Louis; Hirn, Joelle; and van Agthoven, Andreas, 5,116,724, Cl. 435-2.000.

Hironaka, Yoshiaki; and Kamata, Yoshikiyo, to Kioritz Corporation. Decompressor for internal combustion engine. 5,116,287, Cl. 123-182.100.

Hirose Electric Co., Ltd.: *See—*
Sato, Kensaku, 5,116,241, Cl. 439-511.000.

Hirose, Kunihiro; and Inoue, Takashi, to Nippon Unicar Company Limited. Photo-degradable heat resistant resin composition. 5,116,896, Cl. 525-190.000.

Hirota, Osamu: *See—*
Hori, Kimihiko; Suzuki, Yasuto; Morioka, Tomoki; Moriwaki, Shigeru; Hirota, Osamu; and Tsuchiya, Shuichi, 5,116,829, Cl. 514-172.000.

Hirt, Hartmut: *See—*
Gerk, Wilfried; Hirt, Hartmut; and Klee, Gerhard, 5,116,171, Cl. 408-147.000.

Hitachi, Ltd.: *See—*
Akimoto, Kazuhiro; Ogiue, Katsumi; and Uchiyama, Takeo, 5,117,390, Cl. 365-155.000.
Hayata, Yoshiki; Watanabe, Masashi; and Tashiro, Kisuke, 5,115,643, Cl. 62-115.000.
Hino, Masatoshi; Fukuda, Kouji; and Machida, Tetsuo, 5,117,468, Cl. 382-41.000.
Kanamori, Yoshimasa; and Imaizumi, Kazuhiko, 5,117,497, Cl. 395-700.000.
Kasahara, Shigeki; Nakata, Kiyotomo; Kuniya, Jiro; and Hattori, Shigeo, 5,116,569, Cl. 420-44.000.
Katto, Hisao; and Sugiura, Jun, 5,116,775, Cl. 437-52.000.
Kimura, Tomoaki; and Takakura, Yoshio, 5,116,447, Cl. 156-345.000.
Maejima, Hideo; Hotta, Takashi; Masuda, Ikuro; Iwamura, Masahiro; Kurita, Kouzaburou; and Ueno, Masahiro, 5,117,382, Cl. 364-736.000.
Miyazawa, Kazuyuki; Shimohigashi, Katsuhiro; Etoh, Jun; and Kimura, Katsutaka, 5,117,393, Cl. 365-201.000.
Nakamura, Kazumitsu; Kato, Shinichi; Sakitani, Yoshio; and Minamikawa, Yoshihisa, 5,117,111, Cl. 250-310.000.
Noguchi, Kouki; Tsuchiya, Fumio; Tsukamoto, Takashi; Masumura, Shigeki; Nakamura, Hideo; Baba, Shiro; and Hagiwara, Yoshimune, 5,117,488, Cl. 395-375.000.
Ohara, Shuichi; Akasaka, Shiniichi; Oka, Hiroyuki; Hattori, Shintaroo; and Oyama, Rieko, 5,116,148, Cl. 400-241.000.
Oohashi, Tuneyoshi; Yamaguchi, Motoo; Wada, Akira; Shirakura, Toshiharu; Kichikawa, Toshimichi; and Sugawara, Hiroyuki, 5,117,434, Cl. 372-56.000.
Ozawa, Satoshi; Oki, Naoto; Shibata, Yasuhisa; and Miyagi, Hiroyuki, 5,116,481, Cl. 204-290.00R.
Sano, Koichi; Maeda, Akira; Yokoyama, Tetsuo; and Koizumi, Hideaki, 5,115,812, Cl. 128-653.200.
Setoyama, Eiji; and Kamei, Mitsuhiro, 5,116,482, Cl. 204-298.080.
Takaragi, Kazuo; Sasaki, Ryoichi; Nakamura, Tsutomu; Koizumi, Minoru; Fukuzawa, Yasuko; and Kataoka, Kenji, 5,117,458, Cl. 380-4.000.
Tatsuno, Kimio; and Yanagisawa, Hironori, 5,117,433, Cl. 372-22.000.
Yamaguchi, Hiroshi; Saito, Keiya; and Miyauchi, Tateoki, 5,116,782, Cl. 437-172.000.
Yuyama, Kyoji; and Kawaji, Mikinori, 5,117,277, Cl. 357-71.000.

Hitachi Medical Corporation: *See—*
Yokouchi, Hisatake; Takahashi, Fumitaka; and Sakai, Hideyuki, 5,117,447, Cl. 378-99.000.

Hitachi Microcomputer Engineering Ltd.: *See—*
Noguchi, Kouki; Tsuchiya, Fumio; Tsukamoto, Takashi; Masumura, Shigeki; Nakamura, Hideo; Baba, Shiro; and Hagiwara, Yoshimune, 5,117,488, Cl. 395-375.000.

Hitachi Seiko, Ltd.: *See—*
Kawamura, Masahiro; Otani, Tamio; and Nishigai, Masao, 5,115,561, Cl. 29-829.000.

Hitoshi, Hosokawa: *See—*
Nakamura, Hisashi; Kubo, Kenichi; Ohishi, Takashi; and Hitoshi, Hosokawa, 5,115,783, Cl. 123-496.000.

Ho, Hertz. Laptop computer with detachable interface card. 5,117,378, Cl. 364-708.000.

Ho, Loc: *See—*
Chen, Shih L.; Seeker, William R.; and Ho, Loc, 5,116,584, Cl. 423-235.000.

Ho-sun, Jeong, to Samsung Electronics Co., Ltd. Feedback comparison type analog-to-digital converter. 5,117,235, Cl. 341-159.000.

Hobbs, Philip C. D.: *See—*
Batchelder, John S.; Gross, Vaughn P.; Hobbs, Philip C. D.; Miller, Robert J.; and Murray, Kenneth D., 5,116,583, Cl. 422-186.070.

Hocker, Hartwig; Keul, Helmut; Leitz, Edgar; Schon, Norbert; and Kuhling, Steffen, to Bayer Aktiengesellschaft. Crosslinked copolymers based on cyclic esters and carbonates. 5,116,918, Cl. 525-415.000.

Hodge, John H.: *See—*
Badesha, Santokh S.; Stolka, Milan; Yanus, John F.; and Hodge, John H., 5,116,703, Cl. 430-59.000.

Hodgen, Gary D.; and Kenigsberg, Daniel, to Medical College of Hampton Roads. Method and kit for contraception with GnRH-antagonist. 5,116,818, Cl. 514-15.000.

Hoebing, John L. Apparatus and synthetic holography. 5,117,296, Cl. 359-21.000.

Hoechst Aktiengesellschaft: *See—*
Bachmann, Wilfried; Bader, Rolf; Buttner, Horst; and Wetzel, Edgar, 5,116,518, Cl. 210-772.000.
Bremer, Karl-Heinz; Kuhlmann, Ludwig; Schwarz, Alexander; and Steinstrasser, Axel, 5,116,596, Cl. 424-1.100.
Eberspach, Werner; Scharf, Daniel; and Lysek, Manfred, 5,116,891, Cl. 524-97.000.
Frass, Werner; Schlosser, Hans-Joachim; and Schoen, Guenther, 5,116,720, Cl. 430-331.000.
Knorr, Harald, 5,117,028, Cl. 556-445.000.
Lupo, Donald; Prass, Werner; and Scheunemann, Ude, 5,116,925, Cl. 526-323.100.
Ruger, Wolfgang; Urbach, Hansjorg; Ruppert, Dieter; and Scholkens, Bernward, 5,116,835, Cl. 514-218.000.
Schubert, Hans H.; Salbeck, Gerhard; Krause, Hans-Peter; Knauf, Werner; Waltersdorfer, Anna; and Kern, Manfred, 5,116,826, Cl. 514-63.000.

Hoechst Celanese Corporation: *See—*
Engel-Bader, Monika; and Furr, Bobby N., 5,116,938, Cl. 528-272.000.

Hoenig, Clarence L., to United States of America, Energy. High density hexagonal boron nitride prepared by hot isostatic pressing in refractory metal containers. 5,116,589, Cl. 423-298.000.

Hoesch AG: *See—*
Stenert, Alois, 5,116,146, Cl. 384-578.000.

Hoeschele, James D.; Berry, David A.; and Marzilli, Luigi G., to Warner-Lambert Company. Aminoalkyl-substituted cycloalkylamine platinum (II) complexes. 5,116,831, Cl. 514-184.000.

Hoetzl, Max; and Lingle, Thomas M., to Surface Combustion, Inc. Internal heat exchange tubes for industrial furnaces. 5,116,221, Cl. 432-77.000.

Hoffman, Joseph A.; Jallice, Derwin L.; Puri, Yogishwar K.; and Richards, Randall G., to International Business Machines Corporation. CMOS off chip driver for fault tolerant cold sparing. 5,117,129, Cl. 307-443.000.

Hofman, Velimir. Article of dress. 5,115,518, Cl. 2-227.000.

Hofmann, Aaron A. Knee prosthesis. 5,116,375, Cl. 623-20.000.

Hofmeister, Peter: *See—*
Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, 5,116,860, Cl. 514-399.000.

Hogarth, Peter T.; Swenson, Kurt; Gutenson, Charles E.; Nichols, Edward L., III; Roberts, Lincoln E.; and Miller, Vernon R. Integrated outlet for communication and electrical power transmissions with noise reducing characteristics. 5,117,122, Cl. 307-140.000.

Hojer-Pedersen, Birgitte: *See—*
Ingvorsen, Kjeld; Godtfredsen, Sven E.; and Hojer-Pedersen, Birgitte, 5,116,744, Cl. 435-128.000.

Hokko Chemical Industry Co., Ltd.: *See—*
Ishikawa, Hiromichi; Umeda, Takashi; Onoue, Shinji; Kajikawa, Kazuo; Shibata, Toshihiro; and Ohyama, Hiroshi, 5,116,838, Cl. 514-634.000.

Holbrook, Gerald L.: *See—*
Leising, Maurice B.; Benford, Howard L.; and Holbrook, Gerald L., 5,115,698, Cl. 74-868.000.

Holer, Martin: *See—*
Mollet, Hans; and Holer, Martin, 5,116,534, Cl. 252-308.000.

Holleman, Timothy W.; and Viktora, Sandra F., to Medtronic, Inc. Implantable electrode. 5,115,818, Cl. 128-784.000.

Hollinger, Fred: *See—*
Tobias, Samuel; and Hollinger, Fred, 5,115,974, Cl. 239-23.000.

Hollinger, Lawrence E., II, to Compaq Computer Corporation. Magnetically secured conveyor system for printed circuit assemblies. 5,115,905, Cl. 198-465.100.

Hollister, Richard M.: *See—*
Magid, Hillel; Eibeck, Richard E.; Van Der Puy, Michael; Hollister, Richard M.; Lavery, Dennis M.; and Wilson, David P., 5,116,526, Cl. 252-172.000.

Hollming Oy: *See—*
Ylander, Kimmo; and Mattila, Pentti, 5,115,813, Cl. 128-660.010.

Holloman, Sammy. Reuseable electrical connector. 5,116,238, Cl. 439-441.000.

Holman, James L.: *See—*
Fell, Donnie R., Sr., 5,115,554, Cl. 4-252.400.

Holroyd, Trevor J., to Stresswave Technology Limited. Apparatus for controlling an internal combustion engine. 5,115,778, Cl. 123-425.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Ando, Shyoichi; Yamane, Shuichi; Doi, Yoshihisa; Sakurai, Hisayuki; and Meguro, Haruo, 5,115,663, Cl. 72-370.000.
Ozaki, Masaaki; and Kojima, Yoh, 5,115,678, Cl. 73-117.000.
Sano, Shoichi; Furukawa, Yoshimi; and Hamada, Tetsur, 5,116,254, Cl. 180-140.000.

Honda, Yoshihiro: *See—*
Masuoka, Shigeru; and Honda, Yoshihiro, 5,116,611, Cl. 424-78.090.

Honegger, Werner, to Ferag AG. Apparatus for collecting, asssembling and inserting printery products. 5,116,033, Cl. 270-55.000.

Honeywell: *See—*
Peckham, Roger D.; and Kelley, Michael R., 5,117,362, Cl. 364-433.000.

Honeywell Inc.: *See—*
Grald, Eric W., 5,115,968, Cl. 236-78.00D.
Roth, Roger R., 5,117,178, Cl. 323-320.000.

Hong, Pi-Lien. Drink container with pipette. 5,116,105, Cl. 229-103.100.

Hong, Soon H.: *See—*
Kim, Young G.; Hong, Soon H.; and Seok, Jin I., 5,116,570, Cl. 420-54.000.

Hongo, Kazuya: *See—*
Okano, Sadao; Hongo, Kazuya; Aonuma, Hidekazu; and Miyamoto, Hiroshi, 5,116,702, Cl. 430-54.000.

Honkomp, Glenn A.: McNay, Thomas O.; and Burrows, Larry G., to Emerson Electric Co. Structural support for hermetic terminal assembly heater apparatus. 5,117,089, Cl. 219-201.000.

Honselmann, Frank: *See—*
Giersberg, Joachim; Naumann, Dirk; and Honselmann, Frank, 5,116,468, Cl. 204-96.000

Hood, Randy, to EFOS Inc. Light curing apparatus for a continuous linear product. 5,115,761, Cl. 118-641.000.

Hook, Glen C.: *See—*
Von Gunton, Lee L.; and Hook, Glen C., 5,116,007, Cl. 248-243.000.

Hooser, Steven M. Portable stump remover. 5,115,845, Cl. 144-2.00N.

Hopperdietzel, Siegfried, to Rehau Ag & Co. Pipe which is configured for coupling to another pipe. 5,116,087, Cl. 285-286.000.

Hori, Kimihiko; Suzuki, Yasuto; Morioka, Tomoki; Moriwaki, Shigeru; Hirota, Osamu; and Tsuchiya, Shuichi, to Kao Corporation. Steroid compounds. 5,116,829, Cl. 514-172.000.

Hori, Masakatsu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens shutter device for camera. 5,117,248, Cl. 354-234.100.

Horikoshi, Masayoshi: *See—*
Aratake, Kazuhiko; Horikoshi, Masayoshi; Kato, Fumio; Suzuki, Yasuhiko; and Morimoto, Yuki, 5,116,899, Cl. 524-371.000.

Horino, Morikatsu; and Yagi, Yoshiaki, to Kirin Beer Kabushiki Kaisha. Draught beer dispensing system. 5,115,841, Cl. 141-250.000.

Horiuchi, Shigeaki, to Isuzu Motors, Ltd. Piston and connecting rod assembly. 5,115,725, Cl. 92-157.000.

Hornsby, Peter R.: *See—*
Davidson, Roderick I.; and Hornsby, Peter R., 5,116,551, Cl. 264-26.000.

Horrobin, David F.; and Corrigan, Frank, to Efamol Holdings plc. EFA compositions and therapy. 5,116,624, Cl. 424-702.000.

Horrobin, David F.; and Stewart, John C. M., to Efamol Holdings PLC. Fatty acid therapy and compositions for the treatment of myalgic encephalomyelitis. 5,116,871, Cl. 514-560.000.

Horton, Raymond R.: *See—*
Bregman, Mark F.; Horton, Raymond R.; Lanzetta, Alphonso P.; Noyan, Ismail C.; Palmer, Michael J.; and Tong, Ho-Ming, 5,117,275, Cl. 357-70.000.

Hosaka, Toru: *See—*
Yoshida, Shigeo; Fujimoto, Isamu; Suzuki, Hideyuki; Asano, Hiroshi; Hosaka, Toru; Onioh, Takashi; Nagasaki, Kojyu; Matsuoka, Kenichi; and Taura, Kazufumi, 5,117,100, Cl. 250-221.000.

Hoshino, Yutaka: *See—*
Ohkuma, Hiroaki; Konishi, Masataka; Matsumoto, Kiyoshi; Oki, Toshikazu; and Hoshino, Yutaka, 5,116,845, Cl. 514-279.000.

Hosoi, Hideki: *See—*
Mishima, Ikuhiro; Nishimoto, Kenji; and Hosoi, Hideki, 5,116,909, Cl. 525-227.000.

Hosoya, Yoshihiro: *See—*
Nishimoto, Akihiko; Hosoya, Yoshihiro; and Urabe, Toshiaki, 5,116,435, Cl. 148-111.000.
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Hosoyama, Kenji: *See—*
Yamaguchi, Kenji; Hosoyama, Kenji; Okazaki, Fumitoshi; and Hozumi, Daisuke, 5,115,601, Cl. 52-1.000.

Hotta, Takashi: *See—*
Maejima, Hideo; Hotta, Takashi; Masuda, Ikuro; Iwamura, Masahiro; Kurita, Kouzaburou; and Ueno, Masahiro, 5,117,382, Cl. 364-736.000.

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Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta J., 5,116,870, Cl. 514-548.000.
Hough, Harold L.: *See*—
Blaisdell, Ronald G.; Hough, Harold L.; and Pai, Robert Y., 5,116,272, Cl. 445-26.000.
Houghten, Richard: *See*—
Vaughan, John H.; Carson, Dennis A.; Rhodes, Gary; Houghten, Richard; Smith, Richard S.; and Geltosky, John E., 5,116,725, Cl. 435-5.000.
Houlihan, James: *See*—
Wrobel, Peter; and Houlihan, James, 5,116,558, Cl. 264-46.600.
House, Barry L., to House Manufacturing, Inc. Paddlewheel aerator drive mechanism. 5,116,501, Cl. 210-242.200.
House Manufacturing, Inc.: *See*—
House, Barry L., 5,116,501, Cl. 210-242.200.
Houts, Richard E.: *See*—
Seder, Edmund V.; and Houts, Richard E., 5,116,327, Cl. 604-284.000.
Howbert, J. Jeffry: *See*—
Harper, Richard W.; Howbert, J. Jeffry; Poore, Gerald A.; Rieder, Brent J.; Tao, Eddie V. P.; and Aikins, James A., 5,116,874, Cl. 514-592.000.
Howitt, Robert: *See*—
Tortola, Angelo; and Howitt, Robert, 5,117,339, Cl. 362-109.000.
Howlett, Philip C.: *See*—
Edwards, Kenneth N.; Edwards, Edward D.; Howlett, Philip C.; and Dwyer, Niles M., 5,116,134, Cl. 366-208.000.
Hozumi, Daisuke: *See*—
Yamaguchi, Kenji; Hosoyama, Kenji; Okazaki, Fumitoshi; and Hozumi, Daisuke, 5, 15,601, Cl. 52-1.000.
Hsieh, Henry L., to Phillips Petroleum Company. Superabsorbent crosslinked ampholytic ion pair copolymers. 5,116,921, Cl. 526-287.000.
Hsu, Adam C.; Aller, Harold E.; Murphy, Raymond A.; Le, Dat P.; Hamp, Donald W.; and Weinstein, Barry, to Rohm and Haas Company. Insecticidal N' substituted-N-N'-disubstituted-hydrazines. 5,117,057, Cl. 564-149.000.
Hsu, John S., to Cincinnati Milacron Inc. Accumulator head for extrusion blow molding machine. 5,116,215, Cl. 425-381.000.
Hsu, Rui T.; and Straus, Thomas M., to Hughes Aircraft Company. High-power feed-forward microwave amplifier apparatus with out-of-band intermodulation product suppression. 5,117,197, Cl. 330-149.000.
Huang, Jenn-Hwa; and Abrokwah, Jonathan K., to Motorola, Inc. Heterojunction method and structure. 5,116,774, Cl. 437-40.000.
Huang, Shu-Jen: *See*—
Bhattacharyya, Bhupati R., deceased; Huang, Shu-Jen; Shetty, Chandrashekar S.; Bui, Nang T.; and Dunn, Yvonne O., 5,116,514, Cl. 210-712.000.
Huang, Tien-Tsai. Multi-function flashlight. 5,117,341, Cl. 362-184.000.
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Huber, Ronald: *See*—
Glatzle, Rudolf; Huber, Ronald; Schopf, Thomas; and Schretter, Michael, 5,116,659, Cl. 428-188.000.
Huck, Rainer: *See*—
Stolzer, Armin; and Huck, Rainer, 5,115,599, Cl. 51-215.0CP.
Huddleston, Kenneth L.: *See*—
McCoy, James N.; Huddleston, Kenneth L.; and Podio, Augusto L., 5,117,399, Cl. 367-99.000.
Huff, Larry D., to Load Cell Systems, Inc. Low profile weight measuring system for containers. 5,117,373, Cl. 364-550.000.
Hughes Aircraft Company: *See*—
Feintuch, Paul L., 5,117,401, Cl. 367-135.000.
Hsu, Rui T.; and Straus, Thomas M., 5,117,197, Cl. 330-149.000.
LeCompte, George W., 5,116,451, Cl. 156-441.000.
Hughes, James E.: *See*—
Clark, Alan R.; Higham, Joseph P.; Hughes, James E.; and Valashinas, James W., 5,117,486, Cl. 395-250.000.
Huhn, Ralf: *See*—
Anhauser, Dieter; and Huhn, Ralf, 5,115,913, Cl. 206-447.000.
Hukuba, Hiroshi. Toothbrush with voltage tester. 5,115,533, Cl. 15-105.000.
Hull, Harold L.; and Hanson, Darin S. Combination money clip. 5,115,909, Cl. 206-38.000.
Hull, Harold L.; and Stevenson, Terrence W. Pneumatic braking system for tractor and trailer. 5,116,107, Cl. 303-7.000.
Huls Aktiengesellschaft: *See*—
Bernhardt, Gunther; Steffen, Klaus-Dieter; Haas, Margret; and Kragl, Heinz, 5,117,027, Cl. 556-440.000.
Humburger, Siegbert: *See*—
Zaby, Gottfried; Judat, Helmut; Boonstra, Eric; de Vos, Stefaan; Eckermann, Rolf-W.; and Humburger, Siegbert, 5,117,048, Cl. 560-347.000.
Hunt, Rodney J., to AT&T Bell Laboratories. Angularly lockable payout tube. 5,115,995, Cl. 242-157.00R.
Hunter Douglas International: *See*—
Lim, Guy H.; Rijnders, Willem; and Louwerens, Cornelis, 5,115,611, Cl. 52-537.000.
Hunter, Julian E.; Reid, James; Arnold, David E. J.; Hails, George; Baxter, Kenneth F.; Andrews, Andrian F.; and Nunn, Michael J., to Courtaulds Coatings Limited. Antifouling coatings. 5,116,407, Cl. 106-16.000.
Hurd, Clarence, to Leybold Inficon Inc. Control circuitry for quartz crystal deposition monitor. 5,117,192, Cl. 324-727.000.
Hurner, Wes D. Stove top cover for a mobile vehicle stove. 5,115,797, Cl. 126-214.00R.
Hurst, Lawrence B.: *See*—
Crump, Robert L.; Harris, Ronald T.; Reckley, Samuel E.; Montgomery, Edward L.; and Hurst, Lawrence B., 5,115,850, Cl. 152-209.00R.
Huss, Michael: *See*—
Fischer, Wolfgang; Bischoff, Dietmar; Huss, Michael; Stober, Reinhard; and Roessler, Gert, 5,116,967, Cl. 536-50.000.
Hutchinson: *See*—
Gennesseaux, Andre , 5,116,029, Cl. 367-140.1AE.
Hutchison, Wayne R.: *See*—
Hardesty, Terry D.; Hutchison, Wayne R.; Teal, Richard D.; and Cleereman, Robert J., 5,116,106, Cl. 301-41.00W.
Huttmann, Horst, to Vaisala Oy. Measurement system for scattering of light. 5,116,124, Cl. 356-342.000.
Hwang, Bor-Yuan; and Bushey, Thomas P., to Motorola, Inc. Bipolar memory cell array biasing technique with forward active PNP load cell. 5,117,391, Cl. 365-155.000.
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Hwang, Ned H. S.: *See*—
Hwang, Ned H. C., 5,116,366, Cl. 623-2.000.
Hyatt, Michael V.: *See*—
Narayanan, G. Hari; Curtis, R. Eugene; Quist, William E.; Hyatt, Michael V.; and Axter, Sven E., 5,116,572, Cl. 420-533.000.
Hydro International Limited: *See*—
Smisson, Robert P. M., 5,116,516, Cl. 210-747.000.
Hyeon, Suong B., to Mitsubishi Gas Chemical Company, Inc. Plant growth regulating composition. 5,116,406, Cl. 71-103.000.
Hyman, Herbert B., to International Coffee & Tea Inc. Bread cutter box. 5,115,704, Cl. 83-467.100.
I C Sensors, Inc.: *See*—
Jerman, John H., 5,116,457, Cl. 156-628.000.
Ichihashi, Koji; and Tanaka, Kyoji, to Zexel Corporation. Change-over valve. 5,115,721, Cl. 91-512.000.
Ichihashi, Koji; and Tanaka, Kyoji, to Zexel Corporation. Solenoid-operated selector valve. 5,115,722, Cl. 91-512.000.
Ichihashi, Mitsuyoshi: *See*—
Terashima, Kanetsugu; Ichihashi, Mitsuyoshi; Kikuchi, Makoto; Takeshita, Fusayuki; and Furukawa, Kenji, 5,116,529, Cl. 252-299.610.
Ichikawa, Hiroyuki: *See*—
Kuwana, Kazutaka; Yoshida, Tsuyoshi; Ichikawa, Hiroyuki; Kamikado, Masaru; Okamoto, Kuniaki; and Itabashi, Satoshi, 5,116,109, Cl. 303-109.000.
Mori, Tetsuzo; Sugino, Takashi; Takaoka, Makoto; Sugiura, Susumu; and Ichikawa, Hiroyuki, 5,117,284, Cl. 358-79.000.
Ichikawa, Tsutomu: *See*—
Fujino, Akihiko; Ichikawa, Tsutomu; Nanba, Katsuyuki; and Taniguchi, Nobuyuki, 5,117,250, Cl. 354-400.000.
Ichise, Kazuyoshi: *See*—
Tsukahara, Shuji; Umemura, Toshikazu; and Ichise, Kazuyoshi, 5,116,547, Cl. 264-1.100.
Iddings, Franklin G., to Electric Motors and Specialities, Inc. Anti-windmilling motor. 5,117,143, Cl. 310-191.000.
IEG Industrie-Engineering GmbH: *See*—
Bernhardt, Bruno, 5,116,163, Cl. 405-128.000.
Iga, Yoshiro: *See*—
Miyano, Kenmi; Tanaka, Kenji; Nishimaki, Hideo; and Iga, Yoshiro, 5,116,950, Cl. 530-382.000.
Igari, Akihide: *See*—
Ochi, Hideo; Igari, Akihide; and Toyoda, Masaaki, 5,116,542, Cl. 252-518.000.
Ignatenko, Vadim J.: *See*—
Kuchuk-Yatsenko, Sergei I.; Ignatenko, Vadim J.; Genis, Igor A.; Jumatov, Viktor V.; Krivenko, Valery G.; Kuznetsov, Petr V.; and Kachinsky, Vladimir S., 5,117,084, Cl. 219-100.000.
Iguchi, Katsuji, to Sharp Kabushiki Kaisha. Process for forming semiconductor device isolation regions. 5,116,779, Cl. 437-67.000.
Iida, Atsuo: *See*—
Watanabe, Kazuhiro; Hara, Yasushi; Iida, Atsuo; Shimura, Takaki; Matsui, Kiyoto; Ishikawa, Hiroshi; and Kawabe, Kenji, 5,115,810, Cl. 128-662.030.
Iida Denki Kogyo Co., Ltd.: *See*—
Ohki, Yoshinori; and Mochizuki, Hiroshi, 5,115,777, Cl. 123-333.000.
Iizuka, Hajime: *See*—
Nobuyuki, Fukazawa; Iizuka, Hajime; Yano, Osamu; and Miyama, Yukio, 5,116,979, Cl. 544-172.000.
Ikeda, Hisao: *See*—
Osawa, Ken'ichi; Ikeda, Hisao; Mizuochi, Fumio; and Uehara, Hiroyuki, 5,116,945, Cl. 530-215.000.
Ikeda, Yasuko: *See*—
Teranishi, Yutaka; Takamatsu, Nobuhiko; Matsui, Yasushi; Kimura, Masako; Ikeda, Yasuko; and Morimoto, Yuuki, 5,116,739, Cl. 435-69.600.
Ikeda, Yasushi: *See*—
Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.
Ikezaki, Masao: *See*—
Ueno, Reiko; Nakatani, Naofumi; Ikezaki, Masao; Yamamoto, Terumasa; and Nakatsu, Hiromasa, 5,117,070, Cl. 178-2.00R.
Ikuta, Shigeru: *See*—
Takahashi, Mamoru; Nagasawa, Shinobu; Ikuta, Shigeru; and Matsuura, Kazuo, 5,116,748, Cl. 435-189.000.
Tanabe, Miyuki; and Ikuta, Shigeru, 5,117,018, Cl. 552-653.000.
Illinois Tool Works Inc.: *See*—
Klygis, Mindaugas J.; and Marco, Leslie S., 5,115,910, Cl. 206-150.000.
Nikolich, Milovan A., 5,115,944, Cl. 222-94.000.
Schulte, Richard D.; Malik, Imran; and Knight, Richard K., 5,115,911, Cl. 206-330.000.
Im, Jun S.: *See*—
Keem, John; and Im, Jun S., 5,116,434, Cl. 148-101.000.
Imada, Eiji: *See*—
Kojima, Yoshimi; Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; and Imada, Eiji, 5,116,706, Cl. 430-58.000.
Imaizumi, Atsushi: *See*—
Inoue, Keizo; Imaizumi, Atsushi; Kamimura, Takashi; Suwa, Yorimasa; Okada, Masahiro; Suzuki, Yoji; and Kudo, Ichiro, 5,116,942, Cl. 530-350.000.
Imaizumi, Kazuhiko: *See*—
Kanamori, Yoshimasa; and Imaizumi, Kazuhiko, 5,117,497, Cl. 395-700.000.
Imaizumi, Masaru: *See*—
Sakai, Toshiyuki; Imaizumi, Masaru; Nishise, Hideya; Takeda, Katsuhiko; and Kitakubo, Hideo, 5,117,261, Cl. 355-207.000.
Imamura, Yoichi, to Seiko Epson Corp. Variable capacitance integrated circuit usable in temperature compensated oscillators. 5,117,206, Cl. 331-158.000.
IMI Cornelius Inc.: *See*—
Merrill, Terry L.; Schneider, Kenneth W.; and Senghaas, Karl A., 5,115,942, Cl. 222-1.000.
Immler, Josef; and Armin, Ulber, to Siemens Aktiengesellschaft. Rotational positioner latch for a magnetic disc storage. 5,117,318, Cl. 360-105.000.
Immunolytics, Inc.: *See*—
Gokcen, Muharrem; and Guy, Terry J., 5,116,615, Cl. 424-94.200.
Immunotech: *See*—
Delaage, Michel; Drocourt, Jean-Louis; Hirn, Joelle; and van Agthoven, Andreas, 5,116,724, Cl. 435-2.000.
Imos Italia S.r.l.: *See*—
Croce, Claudio, 5,116,233, Cl. 439-161.000.
Impari Technologiai Intezet: *See*—
Gergo, Gyorgy; Vida, Zoltan; Sebestyen, Bela; Nemeth, Jozsef; Viragh, Istvan; Monath, deceased Lajos; and Monath, Gabor, 5,116,104, Cl. 299-16.000.
Imperial Chemical Industries PLC: *See*—
Frigo, Roberto; and Bagaglio, Gian-Carlo, 5,116,412, Cl. 106-38.240.
Newton, Alan B., 5,116,933, Cl. 528-125.000.
Packham, Michael J.; and Bushnell, Bernard C., 5,116,926, Cl. 526-348.100.
Pope, John A.; Barker, Roger N.; and Hann, Richard A., 5,116,805, Cl. 503-227.000.
Imura, Yoshihito; and Ozeki, Keita, to TRW Steering & Industrial Products (Japan) 051156651. Centering device for a servo valve of a power steering device. 5,115,879, Cl. 180-149.000.
Inaba, Yoshiaki: *See*—
Fujita, Tadao; Inaba, Yoshiaki; and Takayama, Jun, 5,117,383, Cl. 364-746.000.
Inabinet, Lawrence E. Medicating device for animals. 5,116,314, Cl. 604-77.000.
Inamine, Edward S.: *See*—
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta J., 5,116,870, Cl. 514-548.000.
Index-Werke GmbH & Co. KG Hahn & Tessky: *See*—
Link, Helmut F., 5,115,702, Cl. 82-126.000.
Indiana University Foundation: *See*—
March, Keith L.; Hathaway, David R.; Wilensky, Robert L.; and Patton, Brian L., 5,116,864, Cl. 514-455.000.
Industrial Progress Incorporated: *See*—
Kaliski, Adam F., 5,116,418, Cl. 106-419.000.
Industrial Technology Research Institute: *See*—
Chen, Tai J., 5,116,709, Cl. 430-96.000.
Peng, Yu-Yin; Chen, Jaw-Long; and Gau, Tien-Ho, 5,116,020, Cl. 251-129.170.
Ing. Erich Pfeiffer GmbH & Co. KG: *See*—
Skorka, Thomas, 5,115,980, Cl. 222-321.000.
Ingersoll Milling Machine Company, The: *See*—
Romero, Jorge E.; and Trank, Robert C., 5,117,348, Cl. 364-167.010.
Ingersoll-Rand Company: *See*—
Doolittle, Stephen D.; and Finchum, Bobby E., 5,116,207, Cl. 417-312.000.
Renegar, Jarvis K.; and Matlock, Jeffrey D., 5,115,606, Cl. 52-118.000.
Ingvorsen, Kjeld; Godtfredsen, Sven E.; and Hojer-Pedersen, Birgitte, to Novo Industri A/S. Microbial cyanide converting enzymes, their production and use. 5,116,744, Cl. 435-128.000.
Iniziative Marittime 1991, S.r.L.: *See*—
Brigati, David J., 5,116,727, Cl. 435-6.000.
Innis, Michael A.: *See*—
Koths, Kirston E.; Halenbeck, Robert F.; Innis, Michael A.; Wang, Alice M.; and Shaked, Ze'ev, 5,116,943, Cl. 530-351.000.
Inomata, Hiroshi; and Tarumi, Yasuo, to Shin-Etsu Chemical Co., Ltd. Process for preparing a fluoroorganopolysiloxane. 5,116,928, Cl. 528-18.000.
Inoue, Akira: *See*—
Kobayashi, Motonobu; Kinoshita, Futoru; Hagi, Mitsuharu; Inoue, Akira; and Uno, Terushige, 5,116,579, Cl. 422-111.000.
Inoue, Hitoshi; Kato, Hiroki; Sueda, Noriyoshi; Tahara, Yoshiyuki; and Kinoshita, Nobuhiro, to Nisshin Flour Milling Co., Ltd. Rhodanine derivatives and pharmaceutical compositions. 5,116,855, Cl. 514-369.000.
Inoue, Jiro: *See*—
Nakamura, Takeshi; Fujimoto, Katsumi; and Inoue, Jiro, 5,117,148, Cl. 310-367.000.
Inoue, Kazuya: *See*—
Yanagiuchi, Shigenobu; Kawai, Shoichi; Omura, Yukihiro; Kotani, Yasuhiro; and Inoue, Kazuya, 5,117,379, Cl. 364-715.010.
Inoue, Keizo; Imaizumi, Atsushi; Kamimura, Takashi; Suwa, Yorimasa; Okada, Masahiro; Suzuki, Yoji; and Kudo, Ichiro, to Teijin Limited. Protein having an inflammatory phospholipase A_2 inhibitory activity. 5,116,942, Cl. 530-350.000.
Inoue, Takanobu, to Toa Medical Electronics Co., Ltd. Method of demarcating one-dimensional distribution. 5,117,357, Cl. 364-413.080.
Inoue, Takashi: *See*—
Hirose, Kunihiro; and Inoue, Takashi, 5,116,896, Cl. 525-190.000.
Inoue, Toshihiko: *See*—
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,115,546, Cl. 29-27.00C.
Inoue, Toshio; Miyazaki, Masaaki; and Kashiwase, Shiuzi, to Nippon Petrochemicals Company, Limited. Thermoplastic resin composition. 5,116,908, Cl. 525-193.000.
Inoue, Yasuyuki; Okuno, Masayuki; and Kawachi, Masao, to Nippon Telegraph and Telephone Corporation. Guided-wave optical circuit and method for adjusting a characteristic thereof. 5,117,470, Cl. 385-14.000.
Inoue, Yoichi: *See*—
Ishii, Shigeru; Nakayama, Kazunari; Yagi, Kazuo; Satow, Jun; Fukuda, Kenzou; Itoh, Kaoru; Umehara, Toshiyuki; Kudo, Masaki; Inoue, Yoichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,404, Cl. 71-92.000.
Inoue, Yoshiaki: *See*—
Komatsu, Toshio; and Inoue, Yoshiaki, 5,116,660, Cl. 428-192.000.
Inside Fitness Inc.: *See*—
Findlay, Nathanial B., 5,116,294, Cl. 482-52.000.
Institut Armand Frappier: *See*—
Bernier, Roger L.; Kluepfel, Dieter; Morosoli, Rolf; and Shareck, Francois, 5,116,746, Cl. 435-172.300.
Institut Francais du Petrole: *See*—
Meynier, Patrick, 5,115,881, Cl. 181-106.000.
Institute for Biological Physics of the USSR Academy of Science: *See*—
Popovic, Goran; Saryazyan, Armen; Ponomarjev, Viktor; and Vucelic, Dusan, 5,115,808, Cl. 128-660.020.
Institute of Gas Technology: *See*—
Xiong, Tian-Yu; and McHie, Lloyd, 5,116,137, Cl. 374-132.000.
Institute of General and Physical Chemistry: *See*—
Popovic, Goran; Saryazyan, Armen; Ponomarjev, Viktor; and Vucelic, Dusan, 5,115,808, Cl. 128-660.020.
Intel Corporation: *See*—
Crafts, Douglas E.; and Leonov, Mark A., 5,115,842, Cl. 141-286.000.
Intelligent Modem Corporation: *See*—
Chaffee, Donald L.; Mallory, Mark P.; and Brand, Graham H., 5,117,418, Cl. 370-32.100.
Interatom GmbH: *See*—
Cyron, Theodor; and Maus, Wolfgang, 5,116,581, Cl. 422-180.000.
Interlake Companies, Inc., The: *See*—
Tipton, Richard E.; and Hart, Paul S., 5,115,920, Cl. 211-59.200.
International Business Machines Corporation: *See*—
Ameen, Joseph G.; Funari, Joseph; and Goldfuss, John A., Jr., 5,115,964, Cl. 228-180.200.
Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Kraus, Georg; Weiss, Helga; and Wolter, Olaf, 5,116,462, Cl. 156-643.000.
Batchelder, John S.; Gross, Vaughn P.; Hobbs, Philip C. D.; Miller, Robert J.; and Murray, Kenneth D., 5,116,583, Cl. 422-186.070.
Berglund, Neil C., 5,117,430, Cl. 370-85.100.
Bregman, Mark F.; Horton, Raymond R.; Lanzetta, Alphonso P.; Noyan, Ismail C.; Palmer, Michael J.; and Tong, Ho-Ming, 5,117,275, Cl. 357-70.000.
Clark, Alan R.; Higham, Joseph P.; Hughes, James E.; and Valashinas, James W., 5,117,486, Cl. 395-250.000.
Comerford, Liam D.; Ledermann, Peter G.; Levy, Lawrence I.; and White, Steve R., 5,117,457, Cl. 380-3.000.
Comfort, James H.; Chen, Tze-Chiang; Lu, Pong-Fei; Meyerson, Bernard S.; Sun, Yuan-Chen; and Tang, Denny D., 5,117,271, Cl. 357-34.000.
Costes, Michel; Gach, Alain R.; and Dugre, Jean-Pierre C., 5,117,494, Cl. 395-575.000.
Drehmel, Robert A.; and Hilker, Scott A., 5,117,384, Cl. 364-748.000.
Gee, Ralph L., 5,117,385, Cl. 364-757.000.

Hegde, Suryanarayan G.; Praino, Anthony P.; Root, Steven J.; and Sri-Jayantha, Muthuthamby, 5,115,664, Cl. 73-9.000.
Hoffman, Joseph A.; Jallice Derwin L.; Puri, Yogishwar K.; and Richards, Randall G., 5,117,129, Cl. 307-443.000.
Kordus, Mark R.; Schneider, Mark S.; and Wirtz, Louis H., 5,116,459, Cl. 156-631.000
Ogasawara, Kenji; Kurachi, Koji; and Tobari, Atsushi, 5,117,320, Cl. 360-113.000.
Wang, Chorng K.; Khan, Roomy; and Freitas, David A., 5,117,199, Cl. 330-252.000.

International Business Machines Corportion: *See—*
Greanias, Evon C.; Stein, Frank L.; Donaldson, Robert; and Gray, Michael, 5,117,071, Cl. 178-19.000.

International Coffee & Tea Inc.: *See—*
Hyman, Herbert B., 5,115,704, Cl. 83-467.100.

International Computers Limited: *See—*
Duxbury, Colin M.; Eaton, John R.; and Rose, Philip V., 5,117,490, Cl. 395-375.000.

International Flavors & Fragrances Inc.: *See—*
Rutherford, Howard J.; Desai, Nayan; McDermott, Keith; and Wiener, Charles, 5,116,627, Cl. 426-5.000.

Intersport Fashions West, Inc.: *See—*
Golde, Paul J., 5,115,516, Cl. 2-108.000.

Interstate Electronics Corp.: *See—*
Buhler, Frederick T., 5,117,155, Cl. 315-8.000.

Intertaba, S.p.A.: *See—*
Bondanelli, Luigi; Sirani, Mauro; Schembri, Alfonso; and Boido, Dante, 5,116,298, Cl. 493-4.000.

InterTherapy, Inc.: *See—*
Griffith, James M.; Zalesky, Paul J.; Gessert, James M.; Dinh, Viet P.; and Passafaro, James D., 5,115,814, Cl. 128-662.060.

Inukai, Hiroshi; Yasuhara, Takashi; and Kitahara, Takahiro, to Daikin Industries, Ltd. Hexafluoroneopentyl alcohol, derivative thereof fluorine-containing polymer and its use. 5,116,544, Cl. 560-219.000.

Iseki Kaihatsu Koki Co., Ltd.: *See—*
Sakamoto, Kazunari; and Nemoto, Isao, 5,115,886, Cl. 182-36.000.

Isella, Thomas: *See—*
Sigl, Alfred; Meissner, Manfred; Isella, Thomas; and Schmitt, Johannes, 5,116,108, Cl. 303-103.000.

Ishibashi, Kenji: *See—*
Ishimura, Toshihiko; Seki, Reiji; Ishibashi, Kenji; Tanii, Junichi; and Shimada, Takahisa, 5,117,251, Cl. 354-400.000.

Ishibashi, Satoru: *See—*
Nakamura, Kyuzo; Ishibashi, Satoru; Ota, Yoshifumi; and Higuchi, Yasushi, 5,116,479, Cl. 204-192.130.

Ishigami, Kazuhiro: *See—*
Sasaki, Hiroshi; Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinichi, 5,115,694, Cl. 74-844.000.

Ishigami, Motohiro, to Japan Aviation Electronics Industry Limited. Digital phase ramp type fiber optic gyro. 5,116,129, Cl. 356-350.000.

Ishiguro, Masaji; Iwata, Hiromitsu; and Tanaka, Rie, to Suntory Limited. Penem derivatives production and use thereof. 5,116,832, Cl. 514-195.000.

Ishiguro, Mitsuo: *See—*
Miyake, Hiraku; Ishiguro, Mitsuo; Abe, Shigetaka; Yamaguchi, Nobuo; Hayamizu, Yutaka; and Aizawa, Satoru, 5,115,615, Cl. 52-167.00R.

Ishiguro, Susumu: *See—*
Takeshita, Yasuyoshi; Nakamura, Hiroshi; Ishiguro, Susumu; Kwaguchi, Noboru; Shimada, Shin'ichi; Koyama, Tadayoshi; Seya, Motohide; Abe, Noriko; and Nomoto, Shin, 5,116,985, Cl. 546-141.000.

Ishihara, Masayuki: *See—*
Kurobe, Jun; Hara, Kenji; Ishihara, Masayuki; and Takagi, Kazuhiro, 5,115,660, Cl. 73-197.000.

Ishihara Sangyo Kaisha Ltd.: *See—*
Nakajima, Tsunetaka; Okamoto, Tadao; Kondo, Nobuo; Watanabe, Masahiro; Yamauchi, Kuichi; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 5,116,949, Cl. 530-363.000.

Ishihara, Toshinobu: *See—*
Kubota, Tohru; Ishihara, Toshinobu; and Endo, Mikio, 5,116,973, Cl. 540-487.000.

Ishii, Hidee: *See—*
Oshima, Etsuo; Kumazawa, Toshiaki; Otaki, Shizuo; Obase, Hiroyuki; Ohmori, Kenji; Ishii, Hidee; Manabe, Haruhiko; Tamura, Tadafumi; and Shuto, Katsuichi, 5,116,863, Cl. 514-450.000.

Ishii, Hiroshi; and Ozaki, Masaaki, to Sharp Kabushiki Kaisha. Linear driving apparatus. 5,117,164, Cl. 318-135.000.

Ishii, Kozo: *See—*
Yoshimura, Hiroshi; Fujiwara, Takuji; and Ishii, Kozo, 5,115,897, Cl. 192-0.052.

Ishii, Shigeru; Nakayama, Kazunari; Yagi, Kazuo; Satow, Jun; Fukuda, Kenzou; Itoh, Kaoru; Umehara, Toshiyuki; Kudo, Masaki; Inoue, Yoichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, to Nissan Chemical Industries Ltd. Uracil derivatives and pesticides containing the same as active ingredient. 5,116,404, Cl. 71-92.000.

Ishii, Shigeru: *See—*
Wakahara, Tatsuo; Iwanaga, Kazuyoshi; and Ishii, Shigeru, 5,115,695, Cl. 74-868.000.

Ishikawa, Hideo: *See—*
Mori, Sanae; Sakamoto, Masaaki; Ishikawa, Hideo; and Nagai, Yoji, 5,116,692, Cl. 428-650.000.

Ishikawa, Hiromichi; Umeda, Takashi; Onoue, Shinji; Kajikawa, Kazuo; Shibata, Toshihiro; and Ohyama, Hiroshi, to Hokko Chemical Industry Co., Ltd. Guanidine derivatives and fungicides for agriculture and horticulture containing the same. 5,116,838, Cl. 514-634.000.

Ishikawa, Hiroshi: *See—*
Watanabe, Kazuhiro; Hara, Yasushi; Iida, Atsuo; Shimura, Takaki; Matsui, Kiyoto; Ishikawa, Hiroshi; and Kawabe, Kenji, 5,115,810, Cl. 128-662.030.

Ishikawa, Takuma: *See—*
Takemura, Kazutaka; Matsuo, Hirokazu; Morigami, Yusuke; Hamakawa, Wataru; and Ishikawa, Takuma, 5,117,266, Cl. 355-316.000.

Ishikawa, Yuzo: *See—*
Misaki, Hideo; Ueda, Shigeru; Watanabe, Kazuhiro; Ishikawa, Yuzo; Nagae, Hirao; and Matsuzawa, Takashi, 5,117,467, Cl. 382-6.000.

Ishimura, Toshihiko; Seki, Reiji; Ishibashi, Kenji; Tanii, Junichi; and Shimada, Takahisa, to Minolta Camera Kabushiki Kaisha. Reflex camera. 5,117,251, Cl. 354-400.000.

Ismail, Ibrahim A.; and Wu, Wen H., to Miles Inc. Stabilization of oxidase enzyme-based test strips. 5,116,729, Cl. 435-14.000.

Ismail, Ibrahim A.: *See—*
Greene, Carmine; Ismail, Ibrahim A.; and Wu, Wen H., 5,116,763, Cl. 436-95.000.

Isomura, Tatsuya: *See—*
Nakanishi, Kanji; Shimizu, Osamu; Yoshida, Satoshi; Katayama, Masaaki; and Isomura, Tatsuya, 5,117,321, Cl. 360-120.000.

Isozumi, Shuzou; and Konishi, Keiichi, to Mitsubishi Denki K.K. Starter unit. 5,115,689, Cl. 74-7.00C.

Isuzu Ceramics Research Institute Co., Ltd.: *See—*
Kawamura, Hideo, 5,115,772, Cl. 123-90.110.

Isuzu Motors, Ltd.: *See—*
Horiuchi, Shigeaki, 5,115,725, Cl. 92-157.000.
Kawamura, Hideo, 5,115,790, Cl. 123-571.000.

Itabashi, Satoshi: *See—*
Kuwana, Kazutaka; Yoshida, Tsuyoshi; Ichikawa, Hiroyuki; Kamikado, Masaru; Okamoto, Kuniaki; and Itabashi, Satoshi, 5,116,109, Cl. 303-109.000.

Ito, Osamu; Ogawa, Masaharu; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Furukawa, Teruo; and Nakajima, Yoshiki, to Mitsubishi Denki Kabushiki Kaisha. Optical disc with servo pattern providing enhanced reliability of servo clock detection and apparatus for accessing the optical disc. 5,117,412, Cl. 369-109.000.

Ito, Takashi, to JEOL Ltd. Method and apparatus for monitoring astigmatism and focus in electron microscope. 5,117,112, Cl. 250-311.000.

Ito, Takayuki; and Nakamura, Koki, to Fuji Photo Film Co., Ltd. Method for synthesizing aromatic amines, aromatic alcohols and aromatic thiols by aromatic nucleophilic substitution reaction. 5,117,064, Cl. 564-399.000.

Ito, Yoshiharu: *See—*
Tokizane, Toshiaki; Ito, Yoshiharu; Yamada, Osamu; Masuda, Toshiyuki; and Kuroda, Mitsunobu, 5,117,421, Cl. 370-85.100.

Itoh, Kaoru: *See—*
Ishii, Shigeru; Nakayama, Kazunari; Yagi, Kazuo; Satow, Jun; Fukuda, Kenzou; Itoh, Kaoru; Umehara, Toshiyuki; Kudo, Masaki; Inoue, Yoichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,404, Cl. 71-92.000.

Itoyama, Hiroyuki, to Nissan Motor Company, Ltd. Engine knock detecting system. 5,115,779, Cl. 123-425.000.

ITT Corporation: *See—*
Hauptschein, Arthur; Kennedy, John B.; and Doskow, Arthur, 5,117,422, Cl. 370-95.100.
Uhlarik, William J., 5,115,679, Cl. 73-302.000.

Iversen, Howard L. Portable occupant-arising assist seat with torsion springs. 5,116,100, Cl. 297-313.000.

Iwagaki, Masaru: *See—*
Komamura, Tawara; Iwagaki, Masaru; and Kaguchi, Hiroyuki, 5,116,716, Cl. 430-203.000.

Iwaki, Yoshiko: *See—*
Asano, Eiji; and Iwaki, Yoshiko, 5,116,687, Cl. 428-542.800.

Iwama, Masatoshi: *See—*
Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.

Iwamoto, Akira: *See—*
Tokiwa, Yutaka; and Iwamoto, Akira, 5,116,880, Cl. 521-134.000.

Iwamura, Masahiro: *See—*
Maejima, Hideo; Hotta, Takashi; Masuda, Ikuro; Iwamura, Masahiro; Kurita, Kouzaburou; and Ueno, Masahiro, 5,117,382, Cl. 364-736.000.

Iwanaga, Kazuyoshi: *See—*
Wakahara, Tatsuo; Iwanaga, Kazuyoshi; and Ishii, Shigeru, 5,115,695, Cl. 74-868.000.

Iwasaki, Shizuo: *See—*
Oshima, Kazuo; and Iwasaki, Shizuo, 5,115,854, Cl. 152-556.000.

Iwata, Hiromitsu: *See—*
Ishiguro, Masaji; Iwata, Hiromitsu; and Tanaka, Rie, 5,116,832, Cl. 514-195.000.

Iwata, Nobuyoshi; Yoshimi, Kenji; and Nagano, Mitsuo, to Sankyo Company, Limited. Use of isoxazolin-3-one derivatives as antidepressants. 5,116,839, Cl. 514-236.800.

Iwata, Noriyuki: *See—*
Sasaki, Junsou; Fujimoto, Hidefumi; and Iwata, Noriyuki, 5,115,788, Cl. 123-559.300.

Iwata, Yasuhiro, to Kabushiki Kaisha Toshiba. Apparatus with copying fee based on size and number of sheets used. 5,117,258, Cl. 355-201.000.

Izumi, Fumihide: *See—*
Marutani, Masayoshi; Izumi, Fumihide; and Oka, Kunihide, 5,117,040, Cl. 560-75.000.

Izumi, Mamoru: *See—*
Saitoh, Shiroh; Izumi, Mamoru; Suzuki, Syuzi; and Hashimoto, Shinichi, 5,115,809, Cl. 128-662.030.

J. I. Case Company: *See—*
Garter, Lee F.; and Thedford, G. Neil, 5,115,628, Cl. 56-10.200.

Jacobson, Larry R.: *See—*
Weiss, Lon L.; Jacobson, Larry R.; and Rankin, Frank S., 5,115,976, Cl. 239-57.000.

Jaeger, Claude: *See—*
Pfalzgraf, Emile; Jaeger, Claude; and Tugend, Raymond, 5,116,194, Cl. 408-181.000.

Jager, Horst, to Bayer Aktiengesellschaft. Reactive azo dyestuffs having a fluorotriazine group and improved fixation properties. 5,116,957, Cl. 534-632.000.

Jahnke, Ulrich: *See—*
Carduck, Franz-Josef; Jahnke, Ulrich; Smulders, Eduard; Vogt, Guenther; Boecker, Monika; and Kuenzel, Werner, 5,116,524, Cl. 252-90.000.

Jahoda, Frantisek. Sports mat, notably a movable judo mat. 5,116,045, Cl. 472-92.000.

Jain, Mukesh K.: *See—*
Nadkarni, Sadashiv K.; and Jain, Mukesh K., 5,116,679, Cl. 428-367.000.

Jakob, Roland P.; Freudiger, Stefan; Koch, Rudolf; and Fluckiger, Hans, to Sulzer Brothers Limited; and Protek AG. Pull-through appliance. 5,116,373, Cl. 623-13.000.

Jakus, Catherine: *See—*
Roland, Bruno; Vandendriessche, Jan; and Jakus, Catherine, 5,116,715, Cl. 430-190.000.

Jallice, Derwin L.: *See—*
Hoffman, Joseph A.; Jallice, Derwin L.; Puri, Yogishwar K.; and Richards, Randall G., 5,117,129, Cl. 307-443.000.

James River Corporation of Virginia: *See—*
Park, John J.; Katz, Leon; and Gaylord, Norman G., 5,116,881, Cl. 521-143.000.

Jan de Vries, Alexander, to SKF Industrial Tading and Developement Company B.V. Roller bearing containing a lubrication pump. 5,116,145, Cl. 384-465.000.

Janetzko, Horst: *See—*
Fortmann, Norbert; Gottling, Helmut; Janetzko, Horst; Kook, Ralf; Kruppa, Hans; and Scharnowski, Gerhard, 5,115,889, Cl. 188-67.000.

Janhonen, Veikko I., to Pussikeskus Oy. Method for packaging books. 5,115,618, Cl. 53-449.000.

Janoski, Helen L.; Baysdon, Sherrol L.; and Pulwer, Mitchell L., to Monsanto Company. Process for preparation of fluoromethyl-substituted dihydropyridine carbodithioates. 5,116,991, Cl. 546-315.000.

Jansen, Josef; Reul, Helmut; and Rau, Gunter. Method of producing a closing member having flexible closing elements, especially a heart valve. 5,116,564, Cl. 264-255.000.

Japan Aviation Electronics Industry Limited: *See—*
Ishigami, Motohiro, 5,116,129, Cl. 356-350.000.

Japan Exlan Company, Limited: *See—*
Hayahara, Takuro; Katahira, Haruo; Nishida, Akiyoshi; and Fukuda, Susumu, 5,115,874, Cl. 177-70.000.

Jarvis, Jack D. Adjustable concrete finishing tool. 5,115,536, Cl. 15-235.800.

Jaycox, Donald F., to Reliance Comm/Tech Corporation. Environmentally sealed pedestal. 5,117,067, Cl. 174-38.000.

JBL Incorporated: *See—*
Bie, David D., 5,117,462, Cl. 381-156.000.

Jeffries, Paul A.: *See—*
Sturgeon, Clayton L.; and Jeffries, Paul A., 5,117,214, Cl. 336-170.000.

Jelich, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of 2-chloro-5-chloromethylpyridine, and new intermediates. 5,116,993, Cl. 546-345.000.

Jenkins, John D. Device for providing liquid fluid for cyclists. 5,115,952, Cl. 224-32.00R.

Jennings, Tyler R.; Larkin, Louis J.; and Johnson, Rodney O., to United Technologies Corporation. Analytical flow meter backup. 5,115,635, Cl. 60-39.030.

Jensen, Eric H., to Sun Microsystems, Inc. Pipelined register cache. 5,117,493, Cl. 395-425.000.

Jensen, Per J. T., to Raychem Corporation. Heat recoverable article. 5,117,094, Cl. 219-535.000.

Jensen, Torben: *See—*
Jorgensen, Geert; Jensen, Torben; and Gade, Niels, 5,115,685, Cl. 73-862.330.

JEOL Ltd.: *See—*
Ito, Takashi, 5,117,112, Cl. 250-311.000.

Jeong, Ju H., to Electronics & Telecommunications Research Institute, Korea Telecommunications Authority. Video signal and output device for freeze-frame video telephone. 5,117,286, Cl. 358-85.000.

Jeong, Seo-Young: *See—*
Kim, Young-Ha; Jeong, Seo-Young; Ahn, Kwang-Duk; and Han, Dong-Keun, 5,116,361, Cl. 623-1.000.

Jeppesen, James H., III; and Whittaker, Bruce E., to UNISYS Corporation. System for memory data integrity. 5,117,428, Cl. 371-51.100.

Jerman, John H., to I C Sensors, Inc. Semiconductor transducer or actuator utilizing corrugated supports. 5,116,457, Cl. 156-628.000.

Jermann, Daniel; and Muller, Bruno, to Grapha-Holding AG. Method of and apparatus for winding square folded sheet-like products on a rotary core. 5,116,043, Cl. 271-213.000.

Jervis B. Webb Company: *See—*
Ellens, Daniel S.; and Kubsik, Robert H., 5,115,745, Cl. 104-162.000.

Jeschke, Willi; and Rodi, Anton, to Heidelberger Druckmaschinen AG. Electronic apparatus and method of register correction. 5,117,365, Cl. 364-468.000.

Jeter, John D. Well communication pulser. 5,117,398, Cl. 367-85.000.

Jewell, Brian, and Yeh, Hwa-Shain, to Ohio Medical Instrument Co., Inc. Stereotactically implanting an intracranial device. 5,116,345, Cl. 606-130.000.

Jinushi, Kazuki: *See—*
Asano, Teruo; Watanabe, Naohiro; Jinushi, Kazuki; and Samejima, Shunichi, 5,116,426, Cl. 134-40.000.

Jitsukawa, Masaharu: *See—*
Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, 5,116,436, Cl. 148-111.000.

Joglekar, Manohar A.; and Aseltine, Philip F., to Motorola, Inc. Cellular telephone with standard telephone set. 5,117,450, Cl. 379-58.000.

Johannesburg Consolidated Investment Company: *See—*
van der Merwe, Eugene; and English, Ralph H., 5,115,688, Cl. 73-863.910.

Johansson, John G.: *See—*
Tanabe, Masato; Crowe, David F.; Peters, Richard H.; and Johansson, John G., 5,116,830, Cl. 514-182.000.

Johansson, Lasse: *See—*
Nurmi, Tom; Johansson, Lasse; and Fjader, Mikael, 5,116,397, Cl. 65-14.000.

Johns Hopkins Univ.: *See—*
Rogers, Walter J., Jr.; and Everett, Thomas S., 5,116,599, Cl. 424-9.000.

Johns Hopkins University, The: *See—*
Chen, Chung-Ho; and Chen, Sumi C., 5,116,868, Cl. 514-546.000.

Johnson, Alexander T., to Johnson, Alexander T. Golf putter. 5,116,054, Cl. 273-164.000.

Johnson, Jerome. Battery terminal corrosion protection. 5,116,538, Cl. 252-389.61U.

Johnson, John A.: *See—*
Smith, James A.; and Johnson, John A., 5,117,440, Cl. 375-82.000.

Johnson, John M. Convertible chair support for disabled persons. 5,116,067, Cl. 280-7.140.

Johnson, Kenneth H.: *See—*
Westermark, Per; and Johnson, Kenneth H., 5,116,948, Cl. 530-324.000.

Johnson, Lanny L. Fixation screw and method for ligament reconstruction. 5,116,337, Cl. 606-73.000.

Johnson, Palmer M. Game apparatus and method of playing. 5,116,062, Cl. 273-260.000.

Johnson, Robert W., Jr., to Exide Electronics. UPS-computer system and method for initiating computer shutdown based on remaining battery time as determined from sensed battery voltage and discharge curves. 5,117,324, Cl. 361-66.000.

Johnson, Robin L. Toothpaste dispenser with a flexible air compressing bag used to bring about dispensing. 5,115,948, Cl. 222-209.000.

Johnson, Rodney O.: *See—*
Jennings, Tyler R.; Larkin, Louis J.; and Johnson, Rodney O., 5,115,635, Cl. 60-39.030.

Jolly, David F.: *See—*
Wilson, Michael T.; and Jolly, David F., 5,116,384, Cl. 623-49.000.

Jones, Alma L. Hair dressing. 5,116,607, Cl. 424-70.000.

Jones, Andrew S.: *See—*
Fung, Patrick T.; Norgate, Graham; Dilts, Timothy A.; Jones, Andrew S.; and Ravindran, Rangaswamy, 5,116,180, Cl. 414-5.000.

Jones, Darrell D., to Boeing Company, The. Apparatus and method for handling honeycomb core. 5,116,094, Cl. 294-81.610.

Jones, Edward I.; and Wilson, Gregory. Adjustable clip-on headphones. 5,117,464, Cl. 381-183.000.

Jones, Glenn C.: *See—*
Barbee, Robert B.; and Jones, Glenn C., 5,116,892, Cl. 524-99.000.

Jones, Jerry F., to Co-Ex Plastics, Inc. Thermoplastic stretch-wrap material. 5,116,677, Cl. 428-349.000.

Jones, Kenneth L., to United States of America, National Aeronautics and Space Administration. Geometric fiedlity of imaging systems employing sensor arrays. 5,116,118, Cl. 356-2.000.

Jonsson, Nils; and Dahlgren, Mats, to Nira Automotive AB. Arrangement for restricting the temperature of combustion engine exhaust gases. 5,115,780, Cl. 123-478.000.

Jorgensen, Geert; Jensen, Torben; and Gade, Niels, to Danfoss A/S. Torque meter. 5,115,685, Cl. 73-862.330.

Joshi, Chandrashekhar H.; and Craven, Christopher A., to American Superconductor Corporation. Process for making electrical connections to high temperature superconductors using a metallic precursor and the product made thereby. 5,116,810, Cl. 505-1.000.

Jost, Michael: *See—*
Bichler, Bartholomaus; and Jost, Michael, 5,116,251, Cl. 244-53.00B.

Jourdain, Gerard E. A.; and Raynal, Regis, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Segmented hot molding apparatus. 5,116,218, Cl. 425-547.000.

Journet, Gerard; and Francou, Nicolas, to Fives-Cail Babcock. Automated method for the cyclic operation of a centrifugal drier. 5,115,575, Cl. 34-8.000.

JSP Corporation: *See—*
Tokiwa, Yutaka; and Iwamoto, Akira, 5,116,880, Cl. 521-134.000.

Judat, Helmut: *See—*
Zaby, Gottfried; Judat, Helmut; Boonstra, Eric; de Vos, Stefaan; Eckermann, Rolf-W.; and Humburger, Siegbert, 5,117,048, Cl. 560-347.000.

Judd, Duncan B.: *See—*
Naylor, Alan; and Judd, Duncan B., 5,116,842, Cl. 514-252.000.

Jumatov, Viktor V.: *See—*
Kuchuk-Yatsenko, Sergei I.; Ignatenko, Vadim J.; Genis, Igor A.; Jumatov, Viktor V.; Krivenko, Valery G.; Kuznetsov, Petr V.; and Kachinsky, Vladimir S., 5,117,084, Cl. 219-100.000.

Junichi Nishizawa: *See—*
Nishizawa, Junichi; and Motoya, Kaoru, 5,117,268, Cl. 357-22.000.

Juri, Tatsuro; and Kadono, Shinya, to Matsushita Electric Industrial Co., Ltd. Discrete orthogonal and inverse orthogonal transform apparatus. 5,117,381, Cl. 364-725.000.

K-Flow Division of Kane Steel Co., Inc.: *See—*
Pratt, Wayne, 5,115,683, Cl. 73-861.380.

K & H Industries, Inc.: *See—*
Baake, Karl A., 5,117,345, Cl. 362-390.000.

K N Energy, Inc.: *See—*
Corté, Lawrence J.; and Brown, Adrian, 5,115,866, Cl. 166-370.000.

Kabeshita, Akira; and Kitayama, Yoshifumi, to Matsushita Electric Industrial Co., Ltd. Method for bump formation and its equipment. 5,116,228, Cl. 29-842.000.

Kaburagi, Kouji: *See—*
Fujii, Hiroyuki; Shirai, Tokuo; Mizutani, Takanori; Nagae, Yoshio; Hetsugi, Koji; Tanizawa, Yasuo; and Kaburagi, Kouji, 5,116,521, Cl. 251-18.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Koizumi, Yukio, 5,115,923, Cl. 212-168.000.
Koizumi, Yukio, 5,115,925, Cl. 212-266.000.
Kurohashi, Michiya; Torii, Satoru; and Kunieda, Yoichi, 5,116,188, Cl. 414-719.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Fukuda, Masao; and Yamazaki, Yasuo, 5,116,187, Cl. 414-699.000.
Hanamoto, Tadayuki; and Takasugi, Shinji, 5,116,186, Cl. 414-694.000.
Ozawa, Godo, 5,115,771, Cl. 123-41.720.
Takenoshita, Hidamitau; Hattori, Hisashi; and Hanada, Yoichiro, 5,115,749, Cl. 110-245.000

Kabushiki Kaisha Okuma Tekkosho: *See—*
Yamaguchi, Takahiro; and Kitade, Takahiko, 5,117,368, Cl. 364-474.320.

Kabushiki Kaisha Shinkawa: *See—*
Takeuchi, Takashi; and Nakagawa, Takeyuki, 5,116,031, Cl. 269-87.300.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Kimura, Takashi; and Nawa, Toshiaki, 5,117,097, Cl. 235-439.000.

Kabushiki Kaisha Toshiba: *See—*
Iwata, Yasuhiro, 5,117,258, Cl. 355-201.000.
Konishi, Kuniyoshi; and Tojima, Akihiko, 5,117,419, Cl. 370-50.000.
Matsunaga, Yoshiyuki, 5,117,292, Cl. 358-213.190.
Nagata, Miyuki, 5,117,487, Cl. 395-375.000.
Ochi, Shinji; and Tanaka, Yasunori, 5,117,131, Cl. 307-448.000.
Saitoh, Shiroh; Izumi, Mamoru; Suzuki, Syuzi; and Hashimoto, Shinichi, 5,115,809, Cl. 128-662.030.
Samata, Shuichi; and Matsushita, Yoshiaki, 5,116,780, Cl. 437-89.000.
Shimizu, Yasuhiko, 5,115,960, Cl. 228-110.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Sekido, Tatsuya, 5,116,101, Cl. 297-330.000.

Kabushiki Kaisha Yaskawa Denki Seisakusho: *See—*
Nagase, Takashi; and Higashi, Kouichi, 5,117,105, Cl. 250-231.180.

K.K. Ueno Seiyaku Oyo Kenkyujo: *See—*
Ueno, Ryuji; Osama, Hiroyoshi; and Oda, Tomio, 5,117,042, Cl. 560-121.000.

Kachinsky, Vladimir S.: *See—*
Kuchuk-Yatsenko, Sergei I.; Ignatenko, Vadim J.; Genis, Igor A.; Jumatov, Viktor V.; Krivenko, Valery G.; Kuznetsov, Petr V.; and Kachinsky, Vladimir S., 5,117,084, Cl. 219-100.000.

Kadono, Shinya: *See—*
Juri, Tatsuro; and Kadono, Shinya, 5,117,381, Cl. 364-725.000.

Kaeriyama, Takuya, to Sony Corporation. Tape guide mechanism for helical scan recording/reproduction apparatus. 5,117,322, Cl. 360-130.240.

Kagabu, Shinzo: *See—*
Kurahashi, Yoshio; Shiokawa, Kozo; Kagabu, Shinzo; Sakawa, Shinji; and Moriya, Koichi, 5,117,053, Cl. 562-506.000.

Kagawa, Atsuko: *See—*
Kagawa, Seiji, 5,116,561, Cl. 264-115.000.

Kagawa, Seiji, to Kagawa, Atsuko. Method of preparing a composite material in the form of ultra-fine particles. 5,116,561, Cl. 264-115.000.

Kagayama, Shigeru, to Brother Kogyo Kabushiki Kaisha. Developer coating apparatus. 5,115,759, Cl. 118-621.000.

Kageyama, Tomoaki: *See—*
Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Sera, Akio; and Terunaga, Fukuso, 5,117,191, Cl. 324-551.000.

Kaguchi, Hiroyuki: *See—*
Komamura, Tawara; Iwaguki, Masaru; and Kaguchi, Hiroyuki, 5,116,716, Cl. 430-203.000.

Kahle, Brewster: *See—*
Hillis, W. Daniel; Kahle, Brewster; Robertson, George G.; and Steele, Guy L., Jr., 5,117,420, Cl. 370-60.000.

Kahn, Frederic J., to Greyhawk Systems, Inc. Partially coherent optical system with scattering type object. 5,116,110, Cl. 359-40.000.

Kaiser, Hartmut; and Lulsdorf, Peter, to Reifenhauser GmbH & Co. Maschinenfabrik. Extruder housing for a double-worm extruder and method of making same. 5,116,135, Cl. 366-349.000.

Kajikawa, Kazuo: *See—*
Ishikawa, Hiromichi; Umeda, Takashi; Onoue, Shinji; Kajikawa, Kazuo; Shibata, Toshihiro; and Ohyama, Hiroshi, 5,116,838, Cl. 514-634.000.

Kajiwara, Makoto; and Ono, Hideki, to Konica Corporation. Light-sensitive silver halide photographic material. 5,116,723, Cl. 430-611.000.

Kajiyama, Masaoki: *See—*
Kameyama, Shuichi; Sakai, Hiroyuki; Kikuchi, Kazuya; and Kajiyama, Masaoki, 5,116,770, Cl. 437-31.000.

Kajouke, Lateef: *See—*
Rebello, Peter; and Kajouke, Lateef, 5,117,347, Cl. 363-56.000.

Kakehashi, Hidenori; and Oori, Tomio, to Matsushita Electric Works, Ltd. Inductive device. 5,117,215, Cl. 336-178.000.

Kakimoto, Mitsuo: *See—*
Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.

Kakino, Yoshiaki; Tokumo, Shigeaki; Nakamura, Tetsuo; and Takeshita, Torao, to Kakino, Yoshiaki; Yasuda Kogyo Kabushiki Kaisha; Mitutoyo Corporation; and Mitsubishi Denki Kabushiki Kaisha. Numerical control device for a machine tool. 5,117,169, Cl. 318-578.000.

Kakuda, Tomohisa; and Kurisu, Norio, to Ricoh Company, Ltd. Thermosensitive recording material. 5,116,804, Cl. 503-209.000.

Kakuma, Kenji; Mizutomi, Katsunori; and Niwa, Shinichi, to Sanyo Electric Co., Ltd. Solid electrolytic capacitor with organic semiconductor and method of manufacturing the same. 5,117,333, Cl. 361-527.000.

Kakuta, Yoshiaki. Method of and apparatus for driving turbosupercharger. 5,115,641, Cl. 60-605.100.

Kaler, Dickie M., 2nd. Strap wrench. 5,115,700, Cl. 81-64.000.

Kaliski, Adam F., to Industrial Progress Incorporated. Process for making structural aggregate pigments. 5,116,418, Cl. 106-419.000.

Kalisz, David W., to Eveready Battery Company, Inc. Microporous separator composed of microspheres secured to an electrode strip. 5,116,701, Cl. 429-130.000.

Kalyanaraman, Vaniambadi S.: *See—*
Sarngadharan, Mangalasseril G.; and Kalyanaraman, Vaniambadi S., 5,116,740, Cl. 435-70.400.

Kamata, Yoshikiyo: *See—*
Hironaka, Yoshiaki; and Kamata, Yoshikiyo, 5,116,287, Cl. 123-182.100.

Kameda, Tsuyoshi, to Kanto Seiki Co., Ltd. Illuminated indicator gauge. 5,117,334, Cl. 362-28.000.

Kamei, Mitsuhiro: *See—*
Setoyama, Eiji; and Kamei, Mitsuhiro, 5,116,482, Cl. 204-298.080.

Kamen, Dean L.: *See—*
Faust, Valentine; and Kamen, Dean L., 5,116,021, Cl. 251-149.100.

Kameyama, Shuichi; Sakai, Hiroyuki; Kikuchi, Kazuya; and Kajiyama, Masaoki, to Matsushita Electric Industrial Co., Ltd. Method for fabricating bipolar semiconductor devices. 5,116,770, Cl. 437-31.000.

Kamikado, Masaru: *See—*
Kuwana, Kazutaka; Yoshida, Tsuyoshi; Ichikawa, Hiroyuki; Kamikado, Masaru; Okamoto, Kuniaki; and Itabashi, Satoshi, 5,116,109, Cl. 303-109.000.

Kamimura, Takashi: *See—*
Inoue, Keizo; Imaizumi, Atsushi; Kamimura, Takashi; Suwa, Yorimasa; Okada, Masahiro; Suzuki, Yoji; and Kudo, Ichiro, 5,116,942, Cl. 530-350.000.

Kamimura, Yoichi: *See—*
Yoshioka, Issei; Kamimura, Yoichi; Kitano, Masao; and Goto, Yujiro, 5,116,608, Cl. 424-72.000.

Kamiya, Soji; and Yokota, Yuji, to Taiho Kogyo Co., Ltd. Plane bearing. 5,116,144, Cl. 384-291.000.

Kamyr Inc.: *See—*
Phillips, Joseph; Prough, J. Robert; Bilodeau, Victor; Greenwood, Brian; Bain, Ronald; and Weston, John, 5,116,476, Cl. 162-60.000.
Torregrossa, Louis O., 5,116,488, Cl. 209-170.000.

Kanamori, Yoshimasa; and Imaizumi, Kazuhiko, to Hitachi, Ltd. System for synthesizing plurality of source programs by combining syntax elements and conditions of the programs. 5,117,497, Cl. 395-700.000.

Kanazawa, Hirotaka; Takehara, Shin; and Ohmura, Hiroshi, to Mazda Motor Corporation. Suspension control system cooperated with steering control system for vehicle. 5,116,078, Cl. 280-707.000.

Kanbara, Hiroshi: *See—*
Okinoshima, Hiroshige; and Kanbara, Hiroshi, 5,117,001, Cl. 549-214.000.

Kanda, Yutaka: *See—*
Saito, Hiromitsu; Kasai, Masaji; Morimoto, Makoto; Kobayashi, Eiji; Uosaki, Yoichi; Kanda, Yutaka; and Sano, Hiroshi, 5,117,006, Cl. 548-421.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Mishima, Ikuhiro; Nishimoto, Kenji; and Hosoi, Hideki, 5,116,909, Cl. 525-227.000.

Kanehisa, Eiji: *See—*
Noguchi, Naoyuki; Murakami, Kazuki; Kanehisa, Eiji; and Makimoto, Seiji, 5,115,896, Cl. 192-0.052.

Kaneko, Fuminori: *See—*
Morino, Taisuke; Tanaka, Mami; Kaneko, Fuminori; Ozaki, Takeyuki; and Akiyama, Shuichi, 5,117,079, Cl. 219-10.55F.

Kaneko, Masahide: *See—*
Koike, Atsushi; Kaneko, Masahide; and Hatori, Yoshinori, 5,117,287, Cl. 358-133.000.

Kaneko, Norio: *See—*
Kushibiki, Nobuo; Nose, Noriyuki; Niwa, Yukichi; and Kaneko, Norio, 5,116,369, Cl. 623-6.000.

Kanemaki, Naobumi: *See—*
Oyaba, Takashi; Morikawa, Hideaki; Gan, Yasuo; and Kanemaki, Naobumi, 5,117,463, Cl. 381-158.000.

Kaneta, Tsutomu: *See—*
Sakashita, Masao; Sakamoto, Tetsuo; Kazama, Shingo; Harada, Yoshiyuki; Teramoto, Takero; Watanabe, Kazuhiro; Shimomura, Bunji; and Kaneta, Tsutomu, 5,116,504, Cl. 210-500.230.

Kanjo, Wajih: *See—*
Wallace, William D.; Lynch, Edward G., Jr.; Daugherty, David W., Jr.; Kanjo, Wajih; and Hawryszkow, Michael G., 5,115,927, Cl. 213-75.00R.

Kansai Paint Company Limited: *See—*
Yabuta, Motoshi; Yukawa, Yoshiyuki; and Nakao, Yasushi, 5,116,930, Cl. 528-45.000.

Kanto Seiki Co., Ltd.: *See—*
Kameda, Tsuyoshi, 5,117,334, Cl. 362-28.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See—*
Arai, Naoto; and Watanabe, Kazuo, 5,116,802, Cl. 503-208.000.

Kanzaki, Toshiaki; and Matsui, Yosuke, to Bando Chemical Industries, Ltd. Laminated organic photosensitive material. 5,116,707, Cl. 430-59.000.

Kao Corporation: *See—*
Hori, Kimihiko; Suzuki, Yasuto; Morioka, Tomoki; Moriwaki, Shigeru; Hirota, Osamu; and Tsuchiya, Shuichi, 5,116,829, Cl. 514-172.000.
Tajima, Katsuhiko; and Tanaka, Sachio, 5,116,813, Cl. 512-27.000.

Kaoru Motoya: *See—*
Nishizawa, Junichi; and Motoya, Kaoru, 5,117,268, Cl. 357-22.000.

Kaplan, Selig N.: *See—*
Street, Robert A.; Kaplan, Selig N.; and Perez-Mendez, Victor, 5,117,114, Cl. 250-370.110.

Karas, Edwin L.: *See—*
Annino, Raymond; Bartlett, Michael L.; Karas, Edwin L.; Lueck, Dale E.; Middleton, John L.; and Villalobos, Richard, 5,116,764, Cl. 436-161.000.

Kardorff, Uwe: *See—*
Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, 5,116,860, Cl. 514-399.000.

Karle, Dennis W.; Chung, Fred C.; and Sischka, Frederic J., II, to Memorex Telex, N.V. Magnetic recording medium comprising a polyester polyurethane polymer and a small percentage of a low molecular weight polyol. 5,116,685, Cl. 428-425.900.

Karnopp, Dean; Sahm, Dietrich; Klinkner, Walter; and Scarpatetti, Dieter V., to Mercedes-Benz AG. Hydropneumatic suspension system. 5,116,077, Cl. 280-707.000.

Karpman, Maurice S., to Motorola, Inc. Semiconductor device having a low temperature UV-cured epoxy seal. 5,117,279, Cl. 357-72.000.

Karulkar, Pramod C., to Massachusetts Institute of Technology. Thick contacts for ultra-thin silicon on insulator films. 5,116,771, Cl. 437-40.000.

Kasahara, Shigeki; Nakata, Kiyotomo; Kuniya, Jiro; and Hattori, Shigeo, to Hitachi, Ltd. Austenitic steel excellent in resistance to neutron irradiation embrittlement and members made of the steel. 5,116,569, Cl. 420-44.000.

Kasai, Masaji: *See—*
Saito, Hiromitsu; Kasai, Masaji; Morimoto, Makoto; Kobayashi, Eiji; Uosaki, Yoichi; Kanda, Yutaka; and Sano, Hiroshi, 5,117,006, Cl. 548-421.000.

Kasenga, Anthony F.: *See—*
Chau, Chung N.; Kasenga, Anthony F.; Chenot, Charles F.; and Gray, Leslie F., 5,116,532, Cl. 252-301.40P.

Kashiwase, Shiuzi: *See—*
Inoue, Toshio; Miyazaki, Masaaki; and Kashiwase, Shiuzi, 5,116,908, Cl. 525-193.000.

Kashiwazaki, Takashi: *See—*
Akiyama, Kazuhiro; Kashiwazaki, Takashi; Araki, Morio; Odagawa, Satoshi; and Fukushima, Atsuhiko, 5,117,363, Cl. 364-449.000.

Katahira, Haruo: *See—*
Hayahara, Takuro; Katahira, Haruo; Nishida, Akiyoshi; and Fukuda, Susumu, 5,115,874, Cl. 177-70.000.

Katakura Chikkarin Co., Ltd.: *See—*
Miyata, Teruo; Kodaira, Kazuhiko; Higashijima, Hitoshi; Kimura, Takashi; and Noishiki, Yasuharu, 5,116,824, Cl. 514-55.000.

Kataoka, Kenji: *See—*
Takaragi, Kazuo; Sasaki, Ryoichi; Nakamura, Tsutomu; Koizumi, Minoru; Fukuzawa, Yasuko; and Kataoka, Kenji, 5,117,458, Cl. 380-4.000.

Kataoka, Naoki: *See—*
Shikatani, Yutaka; Kataoka, Naoki; Kuroda, Nobuyuki; and Matsuura, Kazuo, 5,116,708, Cl. 430-59.000.

Kataoka, Shigeaki; Kobayashi, Shigeharu; and Yagishita, Fukuzo, to Fuji Seiki Machine Works, Ltd. Dressing method and apparatus for super abrasive grinding wheel. 5,115,600, Cl. 51-410.000.

Kataoka, Yoshinori: *See—*
Shimizu, Masao; Kataoka, Yoshinori; and Aksi, Naruaki, 5,117,092, Cl. 219-247.000.

Katayama, Hiroyuki: *See—*
Ohta, Kenji; Katayama, Hiroyuki; Nakayama, Junichiro; Kimura, Kazuhiro; Matoba, Hirotsugu; and Kobayashi, Shozo, 5,117,415, Cl. 369-271.000.

Katayama, Masaaki: *See—*
Nakanishi, Kanji; Shimizu, Osamu; Yoshida, Satoshi; Katayama, Masaaki; and Isomura, Tatsuya, 5,117,321, Cl. 360-120.000.

Katayama, Satoshi: *See—*
Kojima, Yoshimi; Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; and Imada, Eiji, 5,116,706, Cl. 430-58.000.

Kathrein, Hendrik; and Kiemle, Peter. Process for the preparation of magnetic iron oxides and the pigments obtained therefrom. 5,116,419, Cl. 106-459.000.

Kato, Choji: *See—*
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,115,546, Cl. 29-27.00C.

Kato, Eiichi, to Fuji Photo Film Co., Ltd. Electrophotographic light-sensitive material. 5,116,710, Cl. 430-96.000.

Kato, Fumio: *See—*
Aratake, Kazuhiko; Horikoshi, Masayoshi; Kato, Fumio; Suzuki, Yasuhiko; and Morimoto, Yuki, 5,116,899, Cl. 524-371.000.

Kato, Hiroki: *See—*
Inoue, Hitoshi; Kato, Hiroki; Sueda, Noriyoshi; Tahara, Yoshiyuki; and Kinoshita, Nobuhiro, 5,116,855, Cl. 514-369.000.

Kato, Shinichi: *See—*
Nakamura, Kazumitsu; Kato, Shinichi; Sakitani, Yoshio; and Minamikawa, Yoshihisa, 5,117,111, Cl. 250-310.000.

Kato, Yoshinori: *See—*
Sugiura, Satoshi; Hazato, Atsuo; Minoshima, Toru; Kato, Yoshinori; Koshihara, Yasuko; and Kurozumi, Seizi, 5,116,869, Cl. 514-456.000.

Kato, Yuji: *See—*
Sasaki, Hiroshi; Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinichi, 5,115,694, Cl. 74-844.000.

Katoh, Mitsukuni: *See—*
Suyama, Shuji; Katoh, Mitsukuni; and Nishikawa, Tooru, 5,117,047, Cl. 560-302.000.

Katsura, Tadahiko; Matsuoka, Kikuo; Miyake, Kazuo; Taira, Kazuo; Watanabe, Yoshiki; and Ueno, Hiroshi, to Toyo Seikan Kaisha, Ltd. Easily openable sealed package container. 5,116,651, Cl. 428-35.700.

Katsuraoka, Kiyoshi, to NEC Corporation. Semiconductor device having a heat-sink attached thereto. 5,117,281, Cl. 357-81.000.

Katsushima, Hiroshi: *See—*
Nomura, Shinzou; Katsushima, Hiroshi; Kawasaki, Toru; Unoki, Masao; and Nakamura, Masaru, 5,117,272, Cl. 357-52.000.

Katto, Hisao; and Sugiura, Jun, to Hitachi, Ltd. Method of producing semiconductor memory device with buried barrier layer. 5,116,775, Cl. 437-52.000.

Katz, Leon: *See—*
Park, John J.; Katz, Leon; and Gaylord, Norman G., 5,116,881, Cl. 521-143.000.

Kaufhold, Horst T., to Amsted Industries Incorporated. Coupler member retention in a railway vehicle. 5,115,926, Cl. 213-50.000.

Kaufman, Kenneth P.: *See—*
Dinh, Paul C.; and Kaufman, Kenneth P., 5,117,024, Cl. 556-413.000.

Kaverina, Natalja V.: *See—*
Wunderlich, Helmut; Stark, Andreas; Zenker, Lothar; Lohmann, Dieter; Poppe, Hildegard; Bartsch, Reni; Skoldinov, Aleksandr P.; Kaverina, Natalja V.; Grizenko, Anna N.; and Lyskovzev, Valentin V., 5,116,974, Cl. 540-591.000.

Kawabata, Nariyoshi: *See—*
Tahara, Shu; Kawabata, Nariyoshi; Kojima, Akira; and Fukushima, Shigeru, 5,116,736, Cl. 435-39.000.

Kawabe, Kenji: *See—*
Watanabe, Kazuhiro; Hara, Yasushi; Iida, Atsuo; Shimura, Takaki; Matsui, Kiyoto; Ishikawa, Hiroshi; and Kawabe, Kenji, 5,115,810, Cl. 128-662.030.

Kawachi, Masao: *See—*
Inoue, Yasuyuki; Okuno, Masayuki; and Kawachi, Masao, 5,117,470, Cl. 385-14.000.

Kawahara, Setsuko: *See—*
Koyama, Noboru; Kawahara, Setsuko; Ren, Rieko; Kumamoto, Kenji; and Nakajima, Noboru, 5,116,683, Cl. 428-403.000.

Kawai, Hidemi: *See—*
Shiraishi, Naomasa; Taniguchi, Tetsuo; and Kawai, Hidemi, 5,117,255, Cl. 355-53.000.

Kawai, Shoichi: *See—*
Yanagiuchi, Shigenobu; Kawai, Shoichi; Omura, Yukihiro; Kotani, Yasuhiro; and Inoue, Kazuya, 5,117,379, Cl. 364-715.010.

Kawaji, Mikinori: *See—*
Yuyama, Kyoji; and Kawaji, Mikinori, 5,117,277, Cl. 357-71.000.

Kawamoto, Satoru: *See—*
Nakano, Masao; Kawamoto, Satoru; and Watanabe, Akihiko, 5,117,388, Cl. 365-73.000.

VOL 1138 ISS 4 MY 26 1992 UMI

Kawamura, Hideaki, to Fanuc Ltd. Jump control system for an electric discharge machine. 5,117,083, Cl. 219-69.160.

Kawamura, Hideo, to Isuzu Ceramics Research Institute Co., Ltd. System for actuating valve in stepped movement. 5,115,772, Cl. 123-90.110.

Kawamura, Hideo, to Isuzu Motors Limited. Re-combustion control means for alcohol engine. 5,115,790, Cl. 123-571.000.

Kawamura, Ichiro: *See*—
Hagiwara, Takashi; Yamakawa, Noriko; and Kawamura, Ichiro, 5,116,531, Cl. 252-299.600.

Kawamura, Masahiro; Otani, Tamio; and Nishigai, Masao, to Hitachi Seiko, Ltd. Method of spot facing printed circuit board. 5,115,561, Cl. 29-829.000.

Kawamura, Masao; and Yoshino, Ken, to Casio Computer, Ltd. Color liquid crystal display apparatus. 5,117,224, Cl. 340-703.000.

Kawamura, Seiichiro, to Fujitsu Limited. Fabrication method of a semiconductor integrated circuit having an SOI device and a bulk semiconductor device on a common semiconductor substrate. 5,116,768, Cl. 437-21.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Kobayashi, Noboru; and Uozumi, Yukio, 5,117,136, Cl. 310-12.000.

Kawasaki, Toru: *See*—
Nomura, Shinzou; Katsushima, Hiroshi; Kawasaki, Toru; Unoki, Masao; and Nakamura, Masaru, 5,117,272, Cl. 357-52.000.

Kawashima, Haruna; Suzuki, Akiyoshi; and Muraki, Masato, to Canon Kabushiki Kaisha. Projection exposure apparatus. 5,117,254, Cl. 355-43.000.

Kawashima, Yutaka: *See*—
Nakazato, Atsuro; Kitsukawa, Sanae; Kawashima, Yutaka; Hatayama, Katsuo; and Hibino, Satoshi, 5,116,995, Cl. 548-444.000.

Kawasumi, Koichi: *See*—
Watanabe, Haruo; Yasuda, Akio; Kawasumi, Koichi; Tsuchiya, Takao; and Suzuki, Kiyosuke, 5,116,714, Cl. 430-117.000.

Kawauchi, Yoshikazu: *See*—
Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, 5,117,159, Cl. 315-366.000.

Kayane, Yutaka: *See*—
Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washirai, Takeshi; Harada, Naoki; and Akahori, Kingo, 5,116,956, Cl. 534-612.000.

Kazama, Shingo: *See*—
Sakashita, Masao; Sakamoto, Tetsuo; Kazama, Shingo; Harada, Yoshiyuki; Teramoto, Takero; Watanabe, Kazuhiro; Shimomura, Bunji; and Kaneta, Tsutomu, 5,116,504, Cl. 210-500.230.

Kazmirski, Todd, to Rotron, Incorporated. Commutating energy suppression circuit for an electronically commutated DC motor. 5,117,167, Cl. 318-439.000.

Keane, Martin A.; and Englehardt, William H., to Life Fitness. Motor control circuit for a simulated weight stack. 5,117,170, Cl. 318-646.000.

Keeling, Michale E.; Britz, William E., Jr.; and Clark, David W. Animal cage. 5,116,255, Cl. 119-18.000.

Keem, John; and Im, Jun S., to Ovonic Synthetic Materials Company, Inc. Method of manufacturing, concentrating, and separating enhanced magnetic parameter material from other magnetic coproducts. 5,116,434, Cl. 148 101.000.

Kehlbeck, Hans: *See*—
Wischhusen, Heiner; and Kehlbeck, Hans, 5,116,240, Cl. 206-545.000.

Kelley, Michael R.: *See*—
Peckham, Roger D.; and Kelley, Michael R., 5,117,362, Cl. 364-433.000.

Kelley, William J. Doll having variable length hair segment. 5,116,277, Cl. 446-319.000.

Kelly, Richard P.: *See*—
Ledoux, Robert V.; Kelly, Richard P.; and Phillips, Forrest M., 5,117,491, Cl. 395-375.000.

Kelsey, Charles C., Jr. Devel small arms bullet. 5,116,224, Cl. 102-439.000.

Kemp, Bruce E.: *See*—
Martin, Thomas J.; Moseley, Jane M.; Kemp, Bruce E.; and Wettenhall, Richard E. H., 5,116,952, Cl. 530-399.000.

Kemp, David J.; Anders, Robin F.; Coppel, Ross L.; and Brown, Graham V. Asexual blood stage antigens of *Plasmodium falciparum* which encode a rhoptry protein. 5,116,755, Cl. 435-252.300.

Kempas, Hagen: *See*—
Krogmann, Uwe; and Kempas, Hagen, 5,115,570, Cl. 33-326.000.

Kempe, Uwe; Dockner, Toni; and Koehler, Hermann, to BASF Aktiengesellschaft. Preparation of imidazole-2-carboxylic acids. 5,117,004, Cl. 548-323.000.

Kenigsberg, Daniel: *See*—
Hodgen, Gary D.; and Kenigsberg, Daniel, 5,116,818, Cl. 514-15.000.

Kennametal Inc.: *See*—
Niebauer, Kenneth L., 5,116,167, Cl. 407-114.000.

Kennedy, John B.: *See*—
Hauptschein, Arthur; Kennedy, John B.; and Doskow, Arthur, 5,117,422, Cl. 370-95.100.

Kennedy, Lyn R.: *See*—
Clingman, William H., Jr.; and Kennedy, Lyn R., 5,115,687, Cl. 73-863.610.

Keough, Richard. Temperature sensitive downrigger assembly. 5,115,593, Cl. 43-43.120.

Kerbart, Yves: *See*—
McCann, Dominic P. J.; Kerbart, Yves; and Burgess, Trevor M., 5,115,871, Cl. 175-50.000.

Keritsis, Gus D., to Philip Morris Incorporated. Flavor-enhancing smoking filter. 5,115,823, Cl. 131-336.000.

Kern, Karle O., Jr.; and Desko, Dana A., to Dana Corporation. Ball and socket joint assembly. 5,116,159, Cl. 403-132.000.

Kern, Manfred: *See*—
Schubert, Hans H.; Salbeck, Gerhard; Krause, Hans-Peter; Knauf, Werner; Waltersdorfer, Anna; and Kern, Manfred, 5,116,826, Cl. 514-63.000.

Kerner, Rudolf A. Processing method for the manufacturing of electronic components using a soft soldering flux based on carboxylic acid. 5,116,432, Cl. 148-23.000.

Kerscher, Max; and Stempel, Gerhard, to Siemens Aktiengesellschaft. Reflector arrangement. 5,117,343, Cl. 362-297.000.

Kessler, Gerald. Glazing bead. 5,115,610, Cl. 52-397.000.

Kessler, Leland L., to Westinghouse Electric Corp. Electric power system with line drop compensation. 5,117,174, Cl. 322-21.000.

Keul, Helmut: *See*—
Hocker, Hartwig; Keul, Helmut; Leitz, Edgar; Schon, Norbert; and Kuhling, Steffen, 5,116,918, Cl. 525-415.000.

KEURO Maschinenbau GmbH & Co. KG: *See*—
Stolzer, Armin; and Huck, Rainer, 5,115,599, Cl. 51-215.0CP.

Key Tronic Corporation: *See*—
Damitio, Stephen S., 5,117,076, Cl. 200-344.000.

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Kido, Motoi: *See*—
Minamida, Katsuhiro; Sugihashi, Atsushi; and Kido, Motoi, 5,116,688, Cl. 428-582.000.

Kiemle, Peter: *See*—
Kathrein, Hendrik; and Kiemle, Peter, 5,116,419, Cl. 106-459.000.

Kigawa, Kouji: *See*—
Suzuki, Hitomi; Ogawa, Takuji; Uno, Hidemitsu; Kitahaba, Tetsuo; Kigawa, Kouji; Fukamachi, Tomonori; and Kitahara, Katsuhiko, 5,117,000, Cl. 549-59.000.

Kikkawa, Sadanobu: *See*—
Morimitsu, Toshihiko; Harada, Naoki; Omura, Takashi; and Kikkawa, Sadanobu, 5,116,959, Cl. 534-642.000.

Kikuchi, Kazuya: *See*—
Kameyama, Shuichi; Sakai, Hiroyuki; Kikuchi, Kazuya; and Kajiyama, Masaoki, 5,116,770, Cl. 437-31.000.

Kikuchi, Makoto: *See*—
Terashima, Kanetsugu; Ichihashi, Mitsuyoshi; Kikuchi, Makoto; Takeshita, Fusayuki; and Furukawa, Kenji, 5,116,529, Cl. 252-299.610.

Kikuchi, Masaharu: *See*—
Asai, Kazuo; and Kikuchi, Masaharu, 5,116,644, Cl. 427-164.000.

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Usui, Masayoshi; and Kikuchi, Yasumitsu, 5,116,084, Cl. 285-190.000.

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Boston, Steven L.; Kilbane, Farrell M.; Lee, Danny E.; Seay, William R.; and Coleman, Richard A., 5,116,645, Cl. 427-320.000.

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Tice, Lee D.; Fritz, Todd W.; and Kilcommons, Mark A., 5,117,219, Cl. 340-518.000.

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Morman, Michael T., 5,116,662, Cl. 428-198.000.

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Kimura, Asa; and Suzuki, Fukuji, to Shiseido Company Ltd. Titanium-mica composite material. 5,116,664, Cl. 428-216.000.

Kimura, Katsutaka: *See*—
Miyazawa, Kazuyuki; Shimohigashi, Katsuhiro; Etoh, Jun; and Kimura, Katsutaka, 5,117,393, Cl. 365-201.000.

Kimura, Kazuhiro: *See*—
Ohta, Kenji; Katayama, Hiroyuki; Nakayama, Junichiro; Kimura, Kazuhiro; Matoba, Hirotsugu; and Kobayashi, Shozo, 5,117,415, Cl. 369-271.000.

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Kimura, Masako: *See*—
Teranishi, Yutaka; Takamatsu, Nobuhiko; Matsui, Yasushi; Kimura, Masako; Ikeda, Yasuko; and Morimoto, Yuuki, 5,116,739, Cl. 435-69.600.

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Kimura, Takashi: *See*—
Miyata, Teruo; Kodaira, Kazuhiko; Higashijima, Hitoshi; Kimura, Takashi; and Noishiki, Yasuharu, 5,116,824, Cl. 514-55.000.

Kimura, Tomoaki; and Takakura, Yoshio, to Hitachi, Ltd. High speed pickling device and high speed pickling method. 5,116,447, Cl. 156-345.000.

Kimura, Tomomichi: *See*—
Shimizu, Akira; Ogawa, Tutomu; Wakatsuki, Kenji; and Kimura, Tomomichi, 5,117,409, Cl. 369-36.000.

Kimura, Yuji: *See*—
Kondo, Hitoshi; Kimura, Yuji; and Ohta, Eiichi, 5,117,299, Cl. 359-58.000.

Kinami, Hitoshi: *See*—
Takago, Toshio; Kishita, Hirofumi; Kinami, Hitoshi; Fukuda, Kenichi; Sato, Shinich; Yamaguchi, Koichi; and Suganuma, Shuji, 5,117,025, Cl. 556-434.000.

King, Gary E.: *See*—
Buchsel, Christian K. E.; King, Gary E.; and Burns, Jerry J., 5,115,999, Cl. 244-118.500.

King, William J.; and Voyle, Robert J., to Pure-Chem Products Company, Inc. Self-cleaning spray nozzle. 5,115,978, Cl. 239-107.000.

Kiniry, Sam. Cantilevered, retractable handrail. 5,116,025, Cl. 256-67.000.

Kinoshita, Futoru: *See*—
Kobayashi, Motonobu; Kinoshita, Futoru; Hagi, Mitsuharu; Inoue, Akira; and Uno, Terushige, 5,116,579, Cl. 422-111.000.

Kinoshita, Naoyoshi: *See*—
Etou, Kouichi; Kinoshita, Naoyoshi; and Kitakubo, Hideo, 5,117,259, Cl. 355-203.000.

Kinoshita, Nobuhiro: *See*—
Inoue, Hitoshi; Kato, Hiroki; Sueda, Noriyoshi; Tahara, Yoshiyuki; and Kinoshita, Nobuhiro, 5,116,855, Cl. 514-369.000.

Kinoshita, Takashi; Nakajima, Masayoshi; and Takeda, Kazuhiro, to Mitsuboshi Belting Ltd. Power transmission belt. 5,116,286, Cl. 474-237.000.

Kinoshita, Yoshihiro: *See*—
Nagao, Yuji; and Kinoshita, Yoshihiro, 5,116,050, Cl. 273-143.00R.

Kinyosha Co., Ltd.: *See*—
Sonobe, Saburo, 5,116,669, Cl. 428-250.000.

Kinzel, George M.; and Warren, James L. Quick disconnect clip for gas latern mantle. 5,116,220, Cl. 431-113.000.

Kioritz Corporation: *See*—
Hironaka, Yoshiaki; and Kamata, Yoshikiyo, 5,116,287, Cl. 123-182.100.

Kirchhofer, Hubert, to Asea Brown Boveri Ltd. Pressure exchanger for internal-combustion engines. 5,116,205, Cl. 417-64.000.

Kirchhoff, Wilhelm; Schneider, Simon; and Zeugin, Hans, to Chr. Haeusler AG; and Bergrohr GmbH. Shaping machine for cylindrically bending a plate. 5,115,658, Cl. 72-175.000.

Kirchner, Michael W.: *See*—
Lindblom, Curtis; and Kirchner, Michael W., 5,115,855, Cl. 160-135.000.

Kirin Beer Kabushiki Kaisha: *See*—
Horino, Morikatsu; and Yagi, Yoshiaki, 5,115,841, Cl. 141-250.000.

Kirkup, Ruby E.: *See*—
Robinson, Richard S.; Buzin, Arthur B.; and Kirkup, Ruby E., 5,116,602, Cl. 424-49.000.

Kirschner, Jonathan; and Chase, Kathryn M., to Coca-Cola Company, The. Agitator for a post-mix beverage dispenser. 5,115,956, Cl. 222-129.100.

Kirwan Surgical Products, Inc.: *See*—
Beane, Richard M., 5,116,333, Cl. 606-51.000.

Kishi, Hirotoshi: *See*—
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 5,117,260, Cl. 355-204.000.

Kishita, Hirofumi; Yamaguchi, Kouichi; Fujii, Hideki; Suganuma, Shuji; Saito, Yoshikazu; Sato, Shinichi; Fukuda, Kenichi; and Kobayashi, Nobuyuki, to Shin-Etsu Chemical Co., Ltd. Fluorine-containing organic silicon compounds. 5,117,026, Cl. 556-435.000.

Kishita, Hirofumi: *See*—
Takago, Toshio; Kishita, Hirofumi; Kinami, Hitoshi; Fukuda, Kenichi; Sato, Shinich; Yamaguchi, Koichi; and Suganuma, Shuji, 5,117,025, Cl. 556-434.000.

Kishita, Kazunori: *See*—
Kurita, Noriaki; Ninomiya, Masakazu; and Kishita, Kazunori, 5,115,781, Cl. 123-481.000.

Kiss, Akos: *See*—
Baacke, Michael; Beand, Reinhold; Engler, Bernd; Kiss, Akos; Kleine-Mollhoff, Peter; Kleinschmit, Peter; Koberstein, Edgar; and Siray, Mustafa, 5,116,586, Cl. 423-239.000.

Kitabayashi, Tetsuo: *See*—
Watanabe, Toshiya; and Kitabayashi, Tetsuo, 5,117,121, Cl. 307-130.000.

Kitade, Takahiko: *See*—
Yamaguchi, Takahiro; and Kitade, Takahiko, 5,117,368, Cl. 364-474.320.

Kitahaba, Tetsuo: *See*—
Suzuki, Hitomi; Ogawa, Takuji; Uno, Hidemitsu; Kitahaba, Tetsuo; Kigawa, Kouji; Fukamachi, Tomonori; and Kitahara, Katsuhiko, 5,117,000, Cl. 549-59.000.

Kitahara, Katsuhiko: *See*—
Suzuki, Hitomi; Ogawa, Takuji; Uno, Hidemitsu; Kitahaba, Tetsuo; Kigawa, Kouji; Fukamachi, Tomonori; and Kitahara, Katsuhiko, 5,117,000, Cl. 549-59.000.

Kitahara, Takahiro: *See*—
Inukai, Hiroshi; Yasuhara, Takashi; and Kitahara, Takahiro, 5,116,544, Cl. 560-219.000.

Kitakubo, Hideo: *See*—
Etou, Kouichi; Kinoshita, Naoyoshi; and Kitakubo, Hideo, 5,117,259, Cl. 355-203.000.
Sakai, Toshiyuki; Imaizumi, Masaru; Nishise, Hideya; Takeda, Katsuhiko; and Kitakubo, Hideo, 5,117,261, Cl. 355-207.000.

Kitamura, Fumio, to Kitamura Kiden Co., Ltd. Method of cutting strips for wound core. 5,115,703, Cl. 83-32.000.

Kitamura Kiden Co., Ltd.: *See*—
Kitamura, Fumio, 5,115,703, Cl. 83-32.000.

Kitano, Masao: *See*—
Yoshioka, Issei; Kamimura, Yoichi; Kitano, Masao; and Goto, Yujiro, 5,116,608, Cl. 424-72.000.

Kitayama, Yoshifumi: *See*—
Kabeshita, Akira; and Kitayama, Yoshifumi, 5,116,228, Cl. 29-842.000.

Kitsukawa, Sanae: *See*—
Nakazato, Atsuro; Kitsukawa, Sanae; Kawashima, Yutaka; Hatayama, Katsuo; and Hibino, Satoshi, 5,116,995, Cl. 548-444.000.

Klainer, Stanley M.; Thomas, Johnny R.; and Butler, Marcus S., to FiberChem Inc. Reservoir chemical sensors. 5,116,759, Cl. 435-288.000.

Klee, Gerhard: *See*—
Gerk, Wilfried; Hirt, Hartmut; and Klee, Gerhard, 5,116,171, Cl. 408-147.000.

Klein, Christian: *See*—
Vogt, Bernd; Lessmann, Hans-Dieter; Klein, Christian; and Treiber, Wolfgang, 5,116,762, Cl. 436-15.000.

Klein, David C.; and Nikodijevic, Olga, to United States of America, Health and Human Services. D-propranolol as a selective adenosine antagonist. 5,116,867, Cl. 514-534.000.

Kleine-Mollhoff, Peter: *See*—
Baacke, Michael; Beand, Reinhold; Engler, Bernd; Kiss, Akos; Kleine-Mollhoff, Peter; Kleinschmit, Peter; Koberstein, Edgar; and Siray, Mustafa, 5,116,586, Cl. 423-239.000.

Kleinschmit, Peter: *See*—
Baacke, Michael; Beand, Reinhold; Engler, Bernd; Kiss, Akos; Kleine-Mollhoff, Peter; Kleinschmit, Peter; Koberstein, Edgar; and Siray, Mustafa, 5,116,586, Cl. 423-239.000.

Kline, Ronald A.; and Madaras, Eric I., to United States of America, National Aeronautics and Space Administration; and University of Oklahoma, The Board of Regents of the. Non-destructive method for determining elastic moduli of material. 5,115,673, Cl. 73-601.000.

Klinke, Christian; Stutzenberger, Heinz; and Tillhon, Engelbert, to Robert Bosch GmbH. Method for controlling a spark-ignition engine without a throttle flap. 5,115,782, Cl. 123-489.000.

Klinkner, Walter: *See*—
Karnopp, Dean; Sahm, Dietrich; Klinkner, Walter; and Scarpatetti, Dieter V., 5,116,077, Cl. 280-707.000.

Klinksiek, Bernd: *See*—
Bucheler, Manfred; Gehringer, Hans; Klinksiek, Bernd; and Koglin, Bernd, 5,116,536, Cl. 252-314.000.

Klok, Robbert; and Verveer, Herbert H., to Van den Bergh Foods Co., Division of Conopco, Inc. Process for producing fatty-acid lower-alkyl mono-esters. 5,116,546, Cl. 554-167.000.

Kloster, John M., to Atwood Industries, Inc. Conditioned air distribution system for a conversion van. 5,116,280, Cl. 454-137.000.

Klotz, Erhard P. A.: *See*—
Haaker, Paul R.; Klotz, Erhard P. A.; Koppe, Reiner H.; and Linde, Rolf E., 5,117,446, Cl. 378-99.000.

Kluepfel, Dieter: *See*—
Bernier, Roger L.; Kluepfel, Dieter; Morosoli, Rolf; and Shareck, Francois, 5,116,746, Cl. 435-172.300.

Klygis, Mindaugas J.; and Marco, Leslie S., to Illinois Tool Works Inc. Carrier stock with tear-open band segments. 5,115,910, Cl. 206-150.000.

Knauf, Werner: *See*—
Schubert, Hans H.; Salbeck, Gerhard; Krause, Hans-Peter; Knauf, Werner; Waltersdorfer, Anna; and Kern, Manfred, 5,116,826, Cl. 514-63.000.

Knaup Gunter: *See—*
Ackermann, Peter; Fischer, Hanspeter; Vogel, Rolf; Drauz, Karlheinz; Hasseberg, Hans-Albrecht; Hasselbach, Hans-Jochen; Knaup Gunter; Krimmer, Hans-Peter; and Schafer, Matthias, 5,116,872, Cl. 514-561.000.

Knight, Richard K.: *See—*
Schulte, Richard D.; Malik, Imran; and Knight, Richard K., 5,115,911, Cl. 206-330.000.

Knippelmier, Gary H.: *See—*
Cosman, Armond D.; Knippelmier, Gary H.; and Minarovic, Joe T., 5,116,654, Cl. 428-77.000.

Knobloch, Gerrit, to Ciba-Geigy Corporation. Stabilizer mixtures for elastomers. 5,116,894, Cl. 524-100.000.

Knobloch, Harald: *See—*
Knoll, Wolfgang; and Knobloch, Harald, 5,116,121, Cl. 356-301.000.

Knoll, Wolfgang; and Knobloch, Harald, to BASF Aktiengesellschaft. Examination of physical properties of thin films. 5,116,121, Cl. 356-301.000.

Knorr, Harald, to Hoechst Aktiengesellschaft. Process for the preparation of 4-ethoxyphenyl-3-arylpropyl(dimethyl)silanes. 5,117,028, Cl. 556-445.000.

Knox, Jack D.; and Pennington, Donald C., Jr., to Vermont American Corporation. Boron-treated hard metal. 5,116,416, Cl. 75-238.000.

Knudson, Melvin R.: *See—*
Adams, Mark F.; and Knudson, Melvin R., 5,116,969, Cl. 536-128.000.

Knutson, Gaylen M., to Union Oil Company of California. Articles. 5,116,678, Cl. 428-355.000.

Knutson, Gaylen M., to Union Oil Company of California. Polymer systems and methods for their production. 5,116,895, Cl. 524-123.000.

Koball, Bruce R.: *See—*
Rutter, Christopher C.; Bilbrey, Robert A.; and Koball, Bruce R., 5,115,626, Cl. 53-468.000.

Kobatake, Yasuhiro: *See—*
Kudoh, Yasuo; Tsuchiya, Sohji; Fukuyama, Masao; Kojima, Toshikuni; Ozaki, Junji; and Kobatake, Yasuhiro, 5,117,332, Cl. 361-525.000.

Kobayashi, Eiji: *See—*
Saito, Hiromitsu; Kasai, Masaji; Morimoto, Makoto; Kobayashi, Eiji; Uosaki, Yoichi; Kanda, Yutaka; and Sano, Hiroshi, 5,117,006, Cl. 548-421.000.

Kobayashi, Hiroyuki; Uchida, Mitsuru; and Okado, Kenji, to Canon Kabushiki Kaisha. Color toner and two-component developer containing same. 5,116,711, Cl. 430-106.000.

Kobayashi, Kazunobu: *See—*
Nakamura, Yukitsugu; Hamano, Yoshimasa; Masuda, Takashi; Matsumura, Isao; Maruyama, Shigeo; and Kobayashi, Kazunobu, 5,116,114, Cl. 351-205.000.

Kobayashi, Motonobu; Kinoshita, Futoru; Hagi, Mitsuharu; Inoue, Akira; and Uno, Terushige, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Removing nitrogen oxides in exhaust gases from a diesel engine. 5,116,579, Cl. 422-111.000.

Kobayashi, Naoki; Oki, Kazuhiro; and Shimura, Shoichi, to Canon Kabushiki Kaisha. Angular displacement detecting device utilizing a tubular casing having a chamber wherein a fluoroliquid is sealed. 5,117,104, Cl. 250-230.000.

Kobayashi, Noboru; and Uozumi, Yukio, to Kawasaki Jukogyo Kabushiki Kaisha. Linear motor supporting apparatus for vehicles. 5,117,136, Cl. 310-12.000.

Kobayashi, Nobuyuki: *See—*
Kishita, Hirofumi; Yamaguchi, Kouichi; Fujii, Hideki; Suganuma, Shuji; Saito, Yoshikazu; Sato, Shinichi; Fukuda, Kenichi; and Kobayashi, Nobuyuki, 5,117,026, Cl. 556-435.000.

Kobayashi, Shigeharu: *See—*
Kataoka, Shigeaki; Kobayashi, Shigeharu; and Yagishita, Fukuzo, 5,115,600, Cl. 51-410.000.

Kobayashi, Shozo: *See—*
Ohta, Kenji; Katayama, Hiroyuki; Nakayama, Junichiro; Kimura, Kazuhiro; Matoba, Hirotsugu; and Kobayashi, Shozo, 5,117,415, Cl. 369-271.000.

Kobayashi, Tadao: *See—*
Yamamoto, Takashi; Matsumoto, Tsuruyoshi; Kobayashi, Tadao; and Shimada, Katsuhiko, 5,117,480, Cl. 385-145.000.

Kobayashi, Takashi: *See—*
Takahashi, Kohji; Ogino, Shigeru; Noguchi, Kazuhiro; and Kobayashi, Takashi, 5,117,246, Cl. 354-202.000.

Kobayashi, Takumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Stepping motor for use in a camera with multiple shutters. 5,117,137, Cl. 310-49.00R.

Kobayashi, Tatsuo: *See—*
Nomura, Hiroshi; Nakamura, Norihiko; Nomura, Kenichi; Kobayashi, Tatsuo; and Nihei, Hiroaki, 5,115,774, Cl. 123-276.000.
Ohno, Eishi; and Kobayashi, Tatsuo, 5,115,776, Cl. 123-299.000.

Kobayashi, Tokuzo, to O M Kiki Co., Ltd. Free access floor panel. 5,115,621, Cl. 52-805.000.

Koberstein, Edgar: *See—*
Baacke, Michael; Beand Reinhold; Engler, Bernd; Kiss, Akos; Kleine-Mollhoff, Peter; Kleinschmit, Peter; Koberstein, Edgar; and Siray, Mustafa, 5,116,586, Cl. 423-239.000.

Kobinger, Walter: *See—*
Bomhard, Andreas; Heider, Joachim; Psiorz, Manfred; Hauel, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Diederen, Willi, 5,116,986, Cl. 546-141.000.

Koch, Harald: *See—*
Callahan, George E.; and Koch, Harald, 5,115,981, Cl. 239-402.000.

Koch, Rudolf: *See—*
Jakob, Roland P.; Freudiger, Stefan; Koch, Rudolf; and Fluckiger, Hans, 5,116,373, Cl. 623-13.000.

Kodaira, Kazuhiko: *See—*
Miyata, Teruo; Kodaira, Kazuhiko; Higashijima, Hitoshi; Kimura, Takashi; and Noishiki, Yasuharu, 5,116,824, Cl. 514-55.000.

Koehler, Hermann: *See—*
Kempe, Uwe; Dockner, Toni; and Koehler, Hermann, 5,117,004, Cl. 548-323.000.

Koell, Barbara M.: *See—*
Blumenfeld, Charles M.; and Koell, Barbara M., 5,115,580, Cl. 34-104.000.

Kogi, Kentaro: *See—*
Shibasaki, Masakatsu; Takahashi Atsuo; Aoki, Tuyoshi; Sato, Hiroyasu; Yamada, Shin-ichi; Kudo, Michiko; Yamaguchi, Takaji; Kogi, Kentaro; and Narita, Sen-ichi, 5,117,037, Cl. 560-53.000.

Koglin, Bernd: *See—*
Bucheler, Manfred; Gehringer, Hans; Klinksiek, Bernd; and Koglin, Bernd, 5,116,536, Cl. 252-314.000.

Kogure, Koushiro: *See—*
Morikawa, Hideaki; Gan, Yasuo; Kogure, Koushiro; and Ooyaba, Takashi, 5,115,883, Cl. 181-152.000.

Kohlhaupt, Reinhold; Bieg, Walter; and Lang, Ernst, to BASF Aktiengesellschaft. Purification of indigo. 5,116,996, Cl. 548-457.000.

Kohlhaupt, Reinhold, to BASF Aktiengesellschaft. Purification of indigo. 5,116,997, Cl. 548-457.000.

Kohno, Yoshiaki: *See—*
Sano, Harunobu; Omori, Nagato; Kohno, Yoshiaki; and Sakabe, Yukio, 5,117,326, Cl. 361-321.000.

Koike, Atsushi; Kaneko, Masahide; and Hatori, Yoshinori, to Kokusai Denshin Denwa Co., Ltd. Hybrid coding system for moving image. 5,117,287, Cl. 358-133.000.

Koito Manufacturing Co., Ltd.: *See—*
Sakuma, Toranosuke, 5,117,337, Cl. 362-74.000.
Yamada, Masaru, 5,117,335, Cl. 362-61.000.

Koizumi, Hideaki: *See—*
Sano, Koichi; Maeda, Akira; Yokoyama, Tetsuo; and Koizumi, Hideaki, 5,115,812, Cl. 128-653.200.

Koizumi, Minoru: *See—*
Takaragi, Kazuo; Sasaki, Ryoichi; Nakamura, Tsutomu; Koizumi, Minoru; Fukuzawa, Yasuko; and Kataoka, Kenji, 5,117,458, Cl. 380-4.000.

Koizumi, Yukio, to Kabushiki Kaisha Kobe Seiko Sho. Method for stretching and folding a jib for crane. 5,115,923, Cl. 212-168.000.

Koizumi, Yukio, to Kabushiki Kaisha Kobe Seiko Sho. Jib stretching and folding device for crane. 5,115,925, Cl. 212-266.000.

Kojima, Akira: *See—*
Tahara, Shu; Kawabata, Nariyoshi; Kojima, Akira; and Fukushima, Shigeru, 5,116,736, Cl. 435-39.000.

Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, to Yamazaki Mazak Corporation. Complex machining machine tool. 5,115,546, Cl. 29-27.00C.

Kojima, Toshiharu: *See—*
Miyake, Makoto; and Kojima, Toshiharu, 5,117,427, Cl. 371-37.400.

Kojima, Toshikuni: *See—*
Kudoh, Yasuo; Tsuchiya, Sohji; Fukuyama, Masao; Kojima, Toshikuni; Ozaki, Junji; and Kobatake, Yasuhiro, 5,117,332, Cl. 361-525.000.

Kojima, Yoh: *See—*
Ozaki, Masaaki; and Kojima, Yoh, 5,115,678, Cl. 73-117.000.

Kojima, Yoshimi; Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; and Imada, Eiji, to Sharp Kabushiki Kaisha. 1,2,4,5-benzoylenebis(naphtho[1,8-de]pyrimidine) compounds and their use in photosensitive layers. 5,116,706, Cl. 430-58.000.

Koken Co., Ltd.: *See—*
Miyata, Teruo; Kodaira, Kazuhiko; Higashijima, Hitoshi; Kimura, Takashi; and Noishiki, Yasuharu, 5,116,824, Cl. 514-55.000.

Kokkonen, Seppo K.; and Qvintus, Harri T., to A. Ahlstrom Corporation. Apparatus for washing pulp. 5,116,423, Cl. 134-15.000.

Kokusai Denshin Denwa Co., Ltd.: *See—*
Koike, Atsushi; Kaneko, Masahide; and Hatori, Yoshinori, 5,117,287, Cl. 358-133.000.

Kolb, William P.: *See—*
Cook, Benjamin H., Jr.; and Kolb, William P., 5,117,435, Cl. 372-59.000.

Kolk, Stephen B.; Theuerkauf, James P.; and Walz, Fredrick J., to Steelcase Inc. Monolithic finishing process and machine for furniture parts and the like. 5,116,639, Cl. 427-54.100.

Komamura, Tawara; Iwagaki, Masaru; and Kaguchi, Hiroyuki, to Konica Corporation. Heat-developable color photographic material and image-forming process. 5,116,716, Cl. 430-203.000.

Komatsu, Toshio; and Inoue, Yoshiaki, to Mitsubishi Gas Chemical Company, Inc. Deoxidizer film. 5,116,660, Cl. 428-192.000.

Komives, Tamas: *See—*
Dutka, Ferenc; Komives, Tamas; Fodor, Katalin, nee Csorba; Marton, Attila; Csikos, Aniko nee Gluck; Osztheimer, Eva; Henger, Karoly; Laborczy, Robert; Reti, Zsuzsanna, nee Bosnyak; Sebok, Dezso; Szabolcs, Jozsef; and Tomordi, Elemer, 5,116,402, Cl. 71-88.000.

Komori, Shinji; Takata, Hidehiro; Tamura, Toshiyuki; Asai, Fumiyasu; and Fukuhara, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Data-driven processor having an internal tag-generating system for generating a distinct tagged information and assembling with un-tagged information of an input/output data packet. 5,117,489, Cl. 395-375.000.

Komoto, Akira, to Shimadzu Corporation. Electronic balance. 5,115,877, Cl. 177-212.000.

Konda, Tsutomu; Fujioka, Seiichiro; Tamura, Satoshi; Matsubara, Osamu; and Yoshida, Shodo, to NEC Corporation. Rare gas discharge lamp. 5,117,160, Cl. 315-326.000.

Kondo, Hitoshi; Kimura, Yuji; and Ohta, Eiichi, to Ricoh Company, Ltd. Liquid crystal display with a light blocking film of hard carbon. 5,117,299, Cl. 359-58.000.

Kondo, Kyle K.; and Spector, George. Headshade. 5,116,288, Cl. 2-177.000.

Kondo, Nobuo: *See—*
Nakajima, Tsunetaka; Okamoto, Tadao; Kondo, Nobuo; Watanabe, Masahiro; Yamauchi, Koichi; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 5,116,949, Cl. 530-363.000.

Kondow, Tomotsu: *See—*
Tanaka, Yoshimasa; and Kondow, Tomotsu, 5,115,969, Cl. 237-69.000.

Konica Corporation: *See—*
Haibara, Fumio, 5,117,256, Cl. 355-77.000.
Hamanaka, Izumi, 5,116,042, Cl. 271-176.000.
Kajiwara, Makoto; and Ono, Hideki, 5,116,723, Cl. 430-611.000.
Komamura, Tawara; Iwagaki, Masaru; and Kaguchi, Hiroyuki, 5,116,716, Cl. 430-203.000.
Koyama, Noboru; Kawahara, Setsuko; Ren, Rieko; Kumamoto, Kenji; and Nakajima, Noboru, 5,116,683, Cl. 428-403.000.
Miyake, Toru, 5,116,658, Cl. 428-141.000.
Uchida, Masafumi; Yajima, Toshiko; Takagiwa, Hiroyuki; and Takahashi, Jiro, 5,116,713, Cl. 430-110.000.
Yamasaki, Masahiko, 5,116,733, Cl. 435-28.000.

Konig, Jochen, to Beatrice Konig-Haug. Shelf system. 5,115,924, Cl. 211-186.000.

Konishi, Keiichi: *See—*
Isozumi, Shuzou; and Konishi, Keiichi, 5,115,689, Cl. 74-7.00C.

Konishi, Kuniyoshi; and Tojima, Akihiko, to Kabushiki Kaisha Toshiba. System for controlling data transmission and reception in a network. 5,117,419, Cl. 370-50.000.

Konishi, Masataka: *See—*
Ohkuma, Hiroaki; Konishi, Masataka; Matsumoto, Kiyoshi; Oki, Toshikazu; and Hoshino, Yutaka, 5,116,845, Cl. 514-279.000.

Konishi, Masaya: *See—*
Fuchigami, Tokuhiko; Konishi, Masaya; Yasura, Sadahiro; and Yamada, Yasuhiro, 5,117,228, Cl. 341-200.000.

Konno, Takeshi, to Fuji Photo Film Co., Ltd. Electrostatic recording film. 5,116,666, Cl. 428-220.000.

Konoike, Toshiro: *See—*
Ohtani, Mitsuaki; Matsuura, Takaharu; Konoike, Toshiro; and Araki, Yoshitaka, 5,117,039, Cl. 560-60.000.

Konya, Shogo: *See—*
Taniguchi, Hirokazu; Konya, Shogo; and Okamoto, Akira, 5,116,646, Cl. 427-383.500.

Kook, Ralf: *See—*
Fortmann, Norbert; Gottling, Helmut; Janetzko, Horst; Kook, Ralf; Kruppa, Hans; and Scharnowski, Gerhard, 5,115,889, Cl. 188-67.000.

Kopin Corporation: *See—*
Fan, John C. C.; and Zavracky, Paul M., 5,116,427, Cl. 136-259.000.

Koppe, Reiner H.: *See—*
Haaker, Paul R.; Klotz, Erhard P. A.; Koppe, Reiner H.; and Linde, Rolf E., 5,117,446, Cl. 378-99.000.

Korber AG: *See—*
Wochnowski, Waldemar, 5,115,819, Cl. 131-109.300.

Kordus, Mark R.; Schneider, Mark S.; and Wirtz, Louis H., to International Business Machines Corporation. Processes for electrically conductive decals filled with organic insulator material. 5,116,459, Cl. 156-631.000.

Korea Advanced Institute of Science and Technology: *See—*
Kim, Young G.; Hong, Soon H.; and Seok, Jin I., 5,116,570, Cl. 420-54.000.

Korea Institute of Science and Technology: *See—*
Kim, Young-Ha; Jeong, Seo-Young; Ahn, Kwang-Duk; and Han, Dong-Keun, 5,116,361, Cl. 623-1.000.

Korea Telecommunication Authority: *See—*
Lee, Bhum C.; and Park, Kwon C., 5,117,135, Cl. 307-514.000.

Korsch Maschinenfabrik: *See—*
Korsch, Wolfgang; and Schmett, Michael, 5,116,214, Cl. 425-345.000.

Korsch, Wolfgang; and Schmett, Michael, to Korsch Maschinenfabrik. Rotary tablet press. 5,116,214, Cl. 425-345.000.

Korsunsky, Iosif: *See—*
Olsson, Billy E.; and Korsunsky, Iosif, 5,115,555, Cl. 29-566.300.

Kosak, John R.: *See—*
Bhatia, Kamlesh K.; Drysdale, Neville E.; and Kosak, John R., 5,117,008, Cl. 549-274.000.

Koshihara, Yasuko: *See—*
Sugiura, Satoshi; Hazato, Atsuo; Minoshima, Toru; Kato, Yoshinori; Koshihara, Yasuko; and Kurozumi, Seizi, 5,116,869, Cl. 514-456.000.

Koshimizu, Shigeomi: *See—*
Ohara, Tetsuo; Miura, Tsutomu; Hagiwara, Shinichi; Koshimizu, Shigeomi; and Shimizu, Eiichi, 5,116,281, Cl. 474-1.000.

Koskan, Larry P.; and Low, Kim C., to Donlar Corporation. Polyaspartic acid as a calcium sulfate and a barium sulfate inhibitor. 5,116,513, Cl. 210-698.000.

Koster, Paul E., to Precision Twist Drill Co. Composite rotary cutting tool and adaptor and method of making same. 5,116,172, Cl. 408-226.000.

Kotani, Yasuhiro: *See—*
Yanagiuchi, Shigenobu; Kawai, Shoichi; Omura, Yukihiro; Kotani, Yasuhiro; and Inoue, Kazuya, 5,117,379, Cl. 364-715.010.

Koths, Kirston E.; Halenbeck, Robert F.; Innis, Michael A.; Wang, Alice M.; and Shaked, Ze'ev, to Cetus Corporation. Oxidation-resistant muteins of Il-2 and other protein. 5,116,943, Cl. 530-351.000.

Kotrla, John E., to Baroid Technology, Inc. Apparatus for lifting heavy equipment. 5,116,095, Cl. 294-94.000.

Kouge, Katsushige, to Sanshin Kagaku Kogyo Co. Ltd. Active esters used for production of esters or amides and process for producing esters or amides. 5,117,031, Cl. 558-20.000.

Kowa Company Ltd.: *See—*
Aizu, Yoshihisa; and Ogino, Kohji, 5,116,116, Cl. 351-221.000.

Koyama, Noboru; Kawahara, Setsuko; Ren, Rieko; Kumamoto, Kenji; and Nakajima, Noboru, to Konica Corporation. Magnetic recording medium containing a specified ferromagnetic powder, polyurethane resin prepared from specified branched chain diols and a fatty acid ester. 5,116,683, Cl. 428-403.000.

Koyama, Tadayoshi: *See—*
Takeshita, Yasuyoshi; Nakamura, Hiroshi; Ishiguro, Susumu; Kwaguchi, Noboru; Shimada, Shin'ichi; Koyama, Tadayoshi; Seya, Motohide; Abe, Noriko; and Nomoto, Shin, 5,116,985, Cl. 546-141.000.

Koyanagi, Toru: *See—*
Nakajima, Tsunetaka; Okamoto, Tadao; Kondo, Nobuo; Watanabe, Masahiro; Yamauchi, Koichi; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 5,116,949, Cl. 530-363.000.

Kragl, Heinz: *See—*
Bernhardt, Gunther; Steffen, Klaus-Dieter; Haas, Margret; and Kragl, Heinz, 5,117,027, Cl. 556-440.000.

Kraimer, Robert H.: *See—*
Ellerhorst, Robert J.; and Kraimer, Robert H., 5,115,979, Cl. 239-265.370.

Kralovic, Raymond C.: *See—*
Badertscher, Duncan C.; and Kralovic, Raymond C., 5,116,575, Cl. 422-28.000.

Kramer, Walter, to Motan Plast-Automation AG. Method and apparatus for drying of material especially plastic granules. 5,115,577, Cl. 34-31.000.

Kransco: *See—*
Moran, Steven M., 5,116,269, Cl. 441-65.000.

Krapcho, John; Bergey, James L.; and Grover, Gary J., to E. R. Squibb & Sons, Inc. Pharmaceutical composition and method for treating cardiovascular diseases using substituted anilides and sulfonamides. 5,116,851, Cl. 514-354.000.

Kraus, Georg: *See—*
Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Kraus, Georg; Weiss, Helga; and Wolter, Olaf, 5,116,462, Cl. 156-643.000.

Krause, Hans-Peter: *See—*
Schubert, Hans H.; Salbeck, Gerhard; Krause, Hans-Peter; Knauf, Werner; Waltersdorfer, Anna; and Kern, Manfred, 5,116,826, Cl. 514-63.000.

Krebs, Andreas: *See—*
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; Becker, Benedikt; Stendel, Wilhelm; and Erdelen, Christoph, 5,116,836, Cl. 514-224.200.

Krehbiel, Fred L.: *See—*
Colleran, Stephen; Krehbiel, Fred L.; and Wilson, Bill, 5,116,236, Cl. 439-271.000.

Kremmling, Horst: *See—*
Schwarz, Werner; Kremmling, Horst; Thomas, Gunter; and Lotz, Hans-Georg, 5,117,150, Cl. 313-112.000.

Kreuter, Peter; and Zoschke, Armin, to FEV Motorentechnik GmbH & Co. KG. Electromagnetically operating setting device. 5,117,213, Cl. 335-219.000.

Kreuzer, Helmut: *See—*
Gloe, Karl-Heinz; Kreuzer, Helmut; and Biehl, Harald, 5,115,735, Cl. 100-43.000.

Kreuzer, James A.; and Lee, Min S., to Becton, Dickinson and Company. Arterial catheter. 5,116,323, Cl. 604-164.000.

Krieger, Eberhard: *See—*
Dietrich, Walter; Krieger, Eberhard; and Weber, Siegfried, 5,116,303, Cl. 493-313.000.

Krier, Gabriel: *See—*
Muller, Jean-Francois; Tollitte, Francois; Krier, Gabriel; and Pelletier, Marc, 5,117,108, Cl. 250-288.000.

Krimmer, Hans-Peter: *See—*
Ackermann, Peter; Fischer, Hanspeter; Vogel, Rolf; Drauz, Karlheinz; Hasseberg, Hans-Albrecht; Hasselbach, Hans-Jochen; Knaup Gunter; Krimmer, Hans-Peter; and Schafer, Matthias, 5,116,872, Cl. 514-561.000.

Krisa, Thomas E. Apparatus and method for recovering diesel-quality fuel from produced crude oil. 5,116,485, Cl. 208-353.000.

Kristen, Franz; and Traute, Martin. Character storage process and arrangement for reducing the redundancy of characters for matrix printers with multipass printing. 5,117,371, Cl. 395-150.000.

Krivenko, Valery G.: *See—*
Kuchuk-Yatsenko, Sergei I.; Ignatenko, Vadim J.; Genis, Igor A.; Jumatov, Viktor V.; Krivenko, Valery G.; Kuznetsov, Petr V.; and Kachinsky, Vladimir S., 5,117,084, Cl. 219-100.000.

VOL
1138
ISS
4
MY
26
1992
UMI

Krogmann, Uwe; and Kempas, Hagen. Method for eliminating gyro errors. 5,115,570, Cl. 33-326.000.
Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Eder, Erich, 5,116,452, Cl. 156-566.000.
Kroos, Donna S.; McCauley, David K.; and Sanger, Kurt M., to Eastman Kodak Company. Photobooth compositing apparatus. 5,117,283, Cl. 358-22.000.
Kruger, Michael: *See*—
Grutzmacher, Bertold; Blaser, Peter T.; and Kruger, Michael, 5,115,738, Cl. 101-216.000.
Kruppa, Hans: *See*—
Fortmann, Norbert; Gottling, Helmut; Janetzko, Horst; Kook, Ralf; Kruppa, Hans; and Scharnowski, Gerhard, 5,115,889, Cl. 188-67.000.
Kubo, Akio. Coordinate reading and marking device. 5,115,569, Cl. 33-1.00M.
Kubo, Keishi: *See*—
Hotta, Yoshihiko; and Kubo, Keishi, 5,116,803, Cl. 503-208.000.
Kubo, Kenichi: *See*—
Nakamura, Hisashi; Kubo, Kenichi; Ohishi, Takashi; and Hitoshi, Hosokawa, 5,115,783, Cl. 123-496.000.
Kubota, Tohru; Ishihara, Toshinobu; and Endo, Mikio, to Shin-Etsu Chemical Co., Ltd. Caprolactam silane compound and a method of manufacturing the same. 5,116,973, Cl. 540-487.000.
Kubota, Yosuke: *See*—
Sasaki, Asao; and Kubota, Yosuke, 5,117,218, Cl. 340-450.300.
Kubsik, Robert H.: *See*—
Ellens, Daniel S.; and Kubsik, Robert H., 5,115,745, Cl. 104-162.000.
Kuchma, James P.: *See*—
Martin, James R.; Kuchma, James P.; and Furrer, David U., 5,115,655, Cl. 72-68.000.
Kuchuk-Yatsenko, Sergei I.; Ignatenko, Vadim J.; Genis, Igor A.; Jumatov, Viktor V.; Krivenko, Valery G.; Kuznetsov, Petr V.; and Kachinsky, Vladimir S. Method for pressure welding of parts heated with an arc moving in magnetic field. 5,117,084, Cl. 219-100.000.
Kuderer, Hubert, to Hewlett-Packard Company. Method for operating a photodiode array spectrometer and photodiode array spectrometer. 5,116,123, Cl. 356-326.000.
Kudo, Ichiro: *See*—
Inoue, Keizo; Imaizumi, Atsushi; Kamimura, Takashi; Suwa, Yorimasa; Okada, Masahiro; Suzuki, Yoji; and Kudo, Ichiro, 5,116,942, Cl. 530-350.000.
Kudo, Katsuhiko: *See*—
Sago, Hiroyoshi; Mizuki, Hideyuki; Kudo, Katsuhiko; and Nakayama, Muneo, 5,116,250, Cl. 118-52.000.
Kudo, Masaki: *See*—
Ishii, Shigeru; Nakayama, Kazunari; Yagi, Kazuo; Satow, Jun; Fukuda, Kenzou; Itoh, Kaoru; Umehara, Toshiyuki; Kudo, Masaki; Inoue, Yoichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,404, Cl. 71-92.000.
Kudo, Michiko: *See*—
Shibasaki, Masakatsu; Takahashi Atsuo; Aoki, Tuyoshi; Sato, Hiroyasu; Yamada, Shin-ichi; Kudo, Michiko; Yamaguchi, Takaji; Kogi, Kentaro; and Narita, Sen-ichi, 5,117,037, Cl. 560-53.000.
Kudoh, Yasuo; Tsuchiya, Sohji; Fukuyama, Masao; Kojima, Toshikuni; Ozaki, Junji; and Kobatake, Yasuhiro, to Matsushita Electric Industrial Co., Ltd. Solid electrolytic capacitors and method for manufacturing the same. 5,117,332, Cl. 361-525.000.
Kuenast, Christoph: *See*—
Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, 5,116,860, Cl. 514-399.000.
Kuenzel, Werner: *See*—
Carduck, Franz-Josef; Jahnke, Ulrich; Smulders, Eduard; Vogt, Guenther; Boecker, Monika; and Kuenzel, Werner, 5,116,524, Cl. 252-90.000.
Kuhling, Steffen: *See*—
Hocker, Hartwig; Keul, Helmut; Leitz, Edgar; Schon, Norbert; and Kuhling, Steffen, 5,116,918, Cl. 525-415.000.
Kuhlmann, Ludwig: *See*—
Bremer, Karl-Heinz; Kuhlmann, Ludwig; Schwarz, Alexander; and Steinstrasser, Axel, 5,116,596, Cl. 424-1.100.
Kuhn, Jessica E. Hair band having temperature sensitive liquid crystal. 5,115,825, Cl. 132-273.000.
KUKA Schweissanlagen & Roboter GmbM: *See*—
Steinhart, Wilhelm; Maischberger, Mohann; Biewald, Thomas; and Berens, Gerwin, 5,116,424, Cl. 134-15.000.
Kumamoto, Kenji: *See*—
Koyama, Noboru; Kawahara, Setsuko; Ren, Rieko; Kumamoto, Kenji; and Nakajima, Noboru, 5,116,683, Cl. 428-403.000.
Kumar, Ajith K., to General Electric Company. Chopper circuit for dynamic braking in an electric power conversion system. 5,117,166, Cl. 318-362.000.
Kumar, M. Lalith; and Hedrick, Joseph L., to Suprex Corp. Supercritical fluid extraction from liquids. 5,116,508, Cl. 210-639.000.
Kumazawa, Toshiaki: *See*—
Oshima, Etsuo; Kumazawa, Toshiaki; Otaki, Shizuo; Obase, Hiroyuki; Ohmori, Kenji; Ishii, Hidee; Manabe, Haruhiko; Tamura, Tadafumi; and Shuto, Katsuichi, 5,116,863, Cl. 514-450.000.
Kummerfeldt, Georg: *See*—
Eisenhardt, Volker; Kummerfeldt, Georg; May, Franz; and Wolf, Winfried, 5,117,288, Cl. 358-136.000.
Kummerling, Rolf; Bellmann, Manfred; and Biller, Horst, to Mannesmann Aktiengesellschaft. Method and apparatus for manufacturing medium-walled and thin-walled seamless pipes. 5,115,656, Cl. 72-96.000.
Kunieda, Yoichi: *See*—
Kurohashi, Michiya; Torii, Satoru; and Kunieda, Yoichi, 5,116,188, Cl. 414-719.000.
Kuniya, Jiro: *See*—
Kasahara, Shigeki; Nakata, Kiyotomo; Kuniya, Jiro; and Hattori, Shigeo, 5,116,569, Cl. 420-44.000.
Kuo, Long-Far, to Ping Ho Liao. Structure of a handle with fastening function. 5,115,894, Cl. 190-117.000.
Kurachi, Koji: *See*—
Ogasawara, Kenji; Kurachi, Koji; and Tobari, Atsushi, 5,117,320, Cl. 360-113.000.
Kurachi, Michio: *See*—
Aihara, Hironaka; Kurachi, Michio; and Tomisawa, Kazuyuki, 5,116,877, Cl. 514-617.000.
Kurahashi, Yoshio; Shiokawa, Kozo; Kagabu, Shinzo; Sakawa, Shinji; and Moriya, Koichi, to Nihon Tokushu Noyaku Seizo K.K. N-benzyl-cyclopropanecarboxamide fungicides. 5,117,053, Cl. 562-506.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Yamada, Sachiko; Niimura, Koichi; Fukushima, Kenji; and Maeda, Yuji, 5,116,573, Cl. 424-1.100.
Kurihara, Masao, to Sanyo Electric Co., Ltd. Cover-tape peeling apparatus for a tape feeder. 5,116,454, Cl. 156-584.000.
Kurisu, Norio: *See*—
Kakuda, Tomohisa; and Kurisu, Norio, 5,116,804, Cl. 503-209.000.
Kurita, Kenji: *See*—
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 5,117,260, Cl. 355-204.000.
Kurita, Kouzaburou: *See*—
Maejima, Hideo; Hotta, Takashi; Masuda, Ikuro; Iwamura, Masahiro; Kurita, Kouzaburou; and Ueno, Masahiro, 5,117,382, Cl. 364-736.000.
Kurita, Noriaki; Ninomiya, Masakazu; and Kishita, Kazunori, to Nippondenso Co., Ltd. Air-fuel ratio controller for internal combustion engine. 5,115,781, Cl. 123-481.000.
Kurn, Nurith: *See*—
Switchenko, Arthur C.; Kurn, Nurith; Neukom, Christian; Pirio, Marcel; Berger, Donald E., Jr.; and Ullman, Edwin F., 5,116,726, Cl. 435-5.000.
Kurobe, Jun; Hara, Kenji; Ishihara, Masayuki; and Takagi, Kazuhiro, to Nisshin Steel Co., Ltd. Method for making band plates deformed in section. 5,115,660, Cl. 72-197.000.
Kuroda, Mitsunobu: *See*—
Tokizane, Toshiaki; Ito, Yoshiharu; Yamada, Osamu; Masuda, Toshiyuki; and Kuroda, Mitsunobu, 5,117,421, Cl. 370-85.100.
Kuroda, Nobuyuki: *See*—
Shikatani, Yutaka; Kataoka, Naoki; Kuroda, Nobuyuki; and Matsuura, Kazuo, 5,116,708, Cl. 430-59.000.
Kuroda, Toshiki: *See*—
Demizu, Akira; Nakagawa, Akihiro; and Kuroda, Toshiki, 5,116,259, Cl. 73-117.300.
Kurohashi, Michiya; Torii, Satoru; and Kunieda, Yoichi, to Kabushiki Kaisha Kobe Seiko Sho. Vibration suppressing device for wheeled construction equipment. 5,116,188, Cl. 414-719.000.
Kuroiwa, Katsumasa: *See*—
Nakatsuyama, Shuichi; Nakamura, Yoshio; Kuroiwa, Katsumasa; and Nagasawa, Takeshi, 5,116,941, Cl. 530-331.000.
Kurosawa, Kazuyoshi: *See*—
Hirai, Eiji; Kurosawa, Kazuyoshi; and Matsumura, Yoshio, 5,116,430, Cl. 148-518.000.
Kurozumi, Seizi: *See*—
Sugiura, Satoshi; Hazato, Atsuo; Minoshima, Toru; Kato, Yoshinori; Koshihara, Yasuko; and Kurozumi, Seizi, 5,116,869, Cl. 514-456.000.
Kushibiki, Nobuo; Nose, Noriyuki; Niwa, Yukichi; and Kaneko, Norio, to Canon Kabushiki Kaisha. Composition for intraocular lens. 5,116,369, Cl. 623-6.000.
Kusumi, Tim J.: *See*—
Ladd, David J.; Pounds, Gregory E.; Kusumi, Tim J.; Bonee, Peter A.; and Shepard, Robert R., 5,117,451, Cl. 379-67.000.
Kutzli, Jorg, to Schweizerische Eidgenossenschaft Vertretan Durch Die, EIDG, etc. Method for series production of axially symmetrical ammunition bodies as well as ammunition bodies produced according to this method. 5,115,707, Cl. 86-20.100.
Kuwana, Kazutaka; Yoshida, Tsuyoshi; Ichikawa, Hiroyuki; Kamikado, Masaru; Okamoto, Kuniaki; and Itabashi, Satoshi, to Aisin Seiki Kaibshiki Kaisha. Anti-skid control system for an automotive vehicle. 5,116,109, Cl. 303-109.000.
Kuznetsov, Petr V.: *See*—
Kuchuk-Yatsenko, Sergei I.; Ignatenko, Vadim J.; Genis, Igor A.; Jumatov, Viktor V.; Krivenko, Valery G.; Kuznetsov, Petr V.; and Kachinsky, Vladimir S., 5,117,084, Cl. 219-100.000.
Kvols, Kevin. Fastening system for members of a framework. 5,116,299, Cl. 403-187.000.
Kwaguchi, Noboru: *See*—
Takeshita, Yasuyoshi; Nakamura, Hiroshi; Ishiguro, Susumu; Kwaguchi, Noboru; Shimada, Shin'ichi; Koyama, Tadayoshi; Seya, Motohide; Abe, Noriko; and Nomoto, Shin, 5,116,985, Cl. 546-141.000.
Kwasnik, Kenneth; and Harrell, David J., to Lear Seating Corporation. Mechanical latch locking a cover of pivoting armrest assembly. 5,116,099, Cl. 297-194.000.

Kwon, Ki-Duck, to Samsung Electron Device Co., Ltd. Barrier rib forming method of PDP. 5,116,704, Cl. 430-3.000.
Kyowa Hakko Kogyo Co., Ltd.: *See*—
Oshima, Etsuo; Kumazawa, Toshiaki; Otaki, Shizuo; Obase, Hiroyuki; Ohmori, Kenji; Ishii, Hidee; Manabe, Haruhiko; Tamura, Tadafumi; and Shuto, Katsuichi, 5,116,863, Cl. 514-450.000.
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Fuentes, M. Jean-Luc; Rousset, M. Christian; Goma, M. Gerard; and Pommier, M. Jean-Claude, 5,116,474, Cl. 162-71.000.
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Geiger, Allen R., 5,117,126, Cl. 359-330.000.
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Rugraff, Guy, 5,115,693, Cl. 74-606.00R.
Labbee, Gilles E.: *See*—
Brunet, Charles G.; Labbee, Gilles E.; and McGee, Jay W., 5,115,872, Cl. 175-61.000.
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Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Costall, Brenda; Naylor, Robert; and Gardaix-Luthereau, Renee, 5,116,859, Cl. 514-392.000.
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Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Costall, Brenda; Naylor, Robert; and Gardaix-Luthereau, Renee, 5,116,857, Cl. 514-370.000.
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Laboureau, Jacques-Philippe. Artificial ligament in synthetic materials impregnated and coated with elastic resin and its coating procedure. 5,116,372, Cl. 623-13.000.
Lacey, John J., Jr., to Fluidyne Engineering Corporation. Free piston shock tube tunnel. 5,115,665, Cl. 73-12.000.
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Ladd, David J.; Pounds, Gregory E.; Kusumi, Tim J.; Bonee, Peter A.; and Shepard, Robert R., to VMX/OPCOM. Interface to and operation of a voice messaging system. 5,117,451, Cl. 379-67.000.
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Martin, James R.; Kuchma, James P.; and Furrer, David U., 5,115,655, Cl. 72-68.000.
Lagoutte, Pierre, to LMT Radio Professinnelle. Packet switch for a transfer of data in asynchronous mode in a digital transmission network. 5,117,429, Cl. 370-60.000.
LaGoy, R. Gregory. Compactly folding tripod support system for guitars. 5,116,005, Cl. 248-168.000.
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Gauthier, Jean-Marie; Coeuret, Francois; and Bonet, Claude, 5,116,665, Cl. 428-216.000.
Laky, Tibor, to Otis Engineering Corp. Tubing guide. 5,115,861, Cl. 166-85.000.
Lamle, Stuart. Pillow transformable into animal character. 5,115,528, Cl. 5-640.000.
Lan, Ray; and Tsai, Collins, to Mitac International Corp. Auxiliary computer panel to cover a disk drive access side of a computer casing. 5,116,261, Cl. 312-292.000.
Lander, Arthur D., to Massachusetts Institute of Technology. Comb for affinity co-electrophoresis. 5,116,483, Cl. 204-299.00R.
Landi, Joseph V. Roller-type material applicator. 5,116,156, Cl. 401-208.000.
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Gerlier, Andre ; and Berthet, Yves, 5,116,037, Cl. 271-3.100.
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Ahmed, Osman; and Bradley, Steven A., 5,115,728, Cl. 454-61.000.
Lang, Ernst: *See*—
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Lang, Stefan, to Artagraph Reproduction Technology Inc. Method for reproducing paintings and the like. 5,116,562, Cl. 264-132.000.
Lange, Steven R.; and Thall, Edmond H., to Wyko Corporation. Method and apparatus for measuring corneal topography. 5,116,115, Cl. 351-212.000.
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Gebald, Gregor; Langen, Manfred; and Bungter, Helmut, 5,115,631, Cl. 57-281.000.
Langfeld, Horst; and Minges, Roland, to Ciba-Geigy Corporation. Process for the preparation of mono- and polyazo dyes. 5,116,955, Cl. 534-582.000.
Lanzetta, Alphonso P.: *See*—
Bregman, Mark F.; Horton, Raymond R.; Lanzetta, Alphonso P.; Noyan, Ismail C.; Palmer, Michael J.; and Tong, Ho-Ming, 5,117,275, Cl. 357-70.000.
Lapp, Josef C.: *See*—
Dumbaugh, William H., Jr.; and Lapp, Josef C., 5,116,789, Cl. 501-66.000.
Lappi, Douglas A.: *See*—
Beattie, Gillian M.; Lappi, Douglas A.; Baird, J. Andrew; and Hayek, Alberto, 5,116,753, Cl. 435-240.200.
Larex International, Inc.: *See*—
Adams, Mark F.; and Knudson, Melvin R., 5,116,969, Cl. 536-128.000.
Larkin, John P.: *See*—
Weston, John B.; Larkin, John P.; and Smith, Ian H., 5,116,862, Cl. 514-436.000.
Larkin, Louis J.: *See*—
Jennings, Tyler R.; Larkin, Louis J.; and Johnson, Rodney O., 5,115,635, Cl. 60-39.030.
Larson, Raymond D., to Rayco U.S.A., Inc. Adjustable balance bobber. 5,115,590, Cl. 43-17.000.
Laser Works, Inc.: *See*—
Offenhauer, Keith L.; and Zimmermann, Harold M., Jr., 5,116,012, Cl. 248-452.000.
Lasky, Laurence A.: *See*—
Capon, Daniel J.; and Lasky, Laurence A., 5,116,964, Cl. 536-27.000.
Lathia, Amit: *See*—
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Latshaw, Don, to Magni Systems, Inc. Digital processing system for video and television signal generation. 5,117,483, Cl. 395-100.000.
Lauke, Harald: *See*—
Leyrer, Reinhold J.; Lauke, Harald; Nick, Bernhard; Strohriegl, Peter; and Haarer, Dietrich, 5,116,911, Cl. 525-329.900.
Laurent, Michel: *See*—
Penato, Jean-Marie; Noualhaguet, Pierre; and Laurent, Michel, 5,117,448, Cl. 378-132.000.
Lauwers, Eddy J., to Union Carbide Industrials Gases Technology Corporation. Glass melter with front-wall oxygen-fired burner process. 5,116,399, Cl. 65-135.000.
Lavelle, Wayne C. Small package display apparatus. 5,115,921, Cl. 211-71.000.
Lavery, Dennis M.: *See*—
Magid, Hillel; Eibeck, Richard E.; Van Der Puy, Michael; Hollister, Richard M.; Lavery, Dennis M.; and Wilson, David P., 5,116,526, Cl. 252-172.000.
Law, Derek A.: *See*—
Avery, Noyes L.; Benjamin, Linda A.; and Law, Derek A., 5,116,523, Cl. 252-45.000.
Law, Wai T.: *See*—
Crowther, Fredric H.; and Law, Wai T., 5,116,728, Cl. 435-14.000.
Lawless, Michael W.: *See*—
Natwick, Vernon R.; Lawless, Michael W.; Doll, Joseph E.; and Wu, Chung-You C., 5,116,203, Cl. 417-53.000.
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Russel, Matthew J.; and Lawniczak, Gary P., 5,116,035, Cl. 271-3.100.
Lawrence, David J.: *See*—
Agostinelli, John A.; and Lawrence, David J., 5,116,781, Cl. 437-168.000.
Lawrence, Gordon C.; Dawson, Michael J.; Noble, David; Ramsay, Michael V. J.; Bell, Richard; Sutherland, Derek R.; and Tiley, Edward P., to American Cyanamid Company. Macrolide compounds. 5,116,968, Cl. 536-71.000.
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Sertic, James L.; Bancsi, Joseph A.; Sertic, Lisa D.; Esche, Grace M.; and Lawson, John, 5,116,316, Cl. 604-83.000.
Lawyer, Frances C.: *See*—
Gelfand, David H.; Lawyer, Frances C.; and Stoffel, Susanne, 5,116,750, Cl. 435-193.000.
Le, Dat P.: *See*—
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Leander, Leif, to VMK Fish Machinery AB. Method and apparatus for orientation of fish upon a conveyor. 5,115,903, Cl. 198-400.000.
Lear Seating Corporation: *See*—
Kwasnik, Kenneth; and Harrell, David J., 5,116,099, Cl. 297-194.000.
Lear Siegler Truck Products Corp.: *See*—
Pierce, William C., 5,116,075, Cl. 280-688.000.
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Gobbi, Jose M.; and Le Berre, Louis, 5,117,127, Cl. 307-443.000.
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Martin, Philippe; and Le Boudec, Gilles, 5,115,677, Cl. 73-64.480.
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Mignani, Gerard; and Lebrun, Jean-Jacques, 5,116,791, Cl. 501-96.000.

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Bouheraoua, Ahmed; and Lechelle, Bernard, 5,115,681, Cl. 73-801.000.

LeCompte, George W., to Hughes Aircraft Company. Flow through impregnation of deep nested fiber optical canister. 5,116,451, Cl. 156-441.000.

Leconte, Philippe; and Metz, Francois, to Rhone-Poulenc Chimie. Preparation of aromatic carbamates. 5,117,036, Cl. 560-24.000.

Lederle (Japan), Ltd.: *See—*
Oji, Akihito; Tada, Yukihiro; Sasaki, Noriyuki; and Mizumura, Mitsuo, 5,116,621, Cl. 424-445.000.

Ledermann, Peter G.: *See—*
Comerford, Liam D.; Ledermann, Peter G.; Levy, Lawrence I.; and White, Steve R., 5,117,457, Cl. 380-3.000.

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Seieroe, Louis M.; and Ledford, Kenneth S., 5,117,068, Cl. 174-52.400.

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Lee, Bhum C.; and Park, Kwon C., to Electronics and Telecommunications Research Institute; and Korea Telecommunication Authority. Frequency and phase detection circuit in NRZ bit synchronous system. 5,117,135, Cl. 307-514.000.

Lee, Danny E.: *See—*
Boston, Steven L.; Kilbane, Farrell M.; Lee, Danny E.; Seay, William R.; and Coleman, Richard A., 5,116,645, Cl. 427-320.000.

Lee, Kwan H., to Goldstar Co., Ltd. Microwave oven with a function for drying tableware and a drive control method thereof. 5,117,080, Cl. 219-10.55R.

Lee, Min S.: *See—*
Kreuzer, James A.; and Lee, Min S., 5,116,323, Cl. 604-164.000.

Lee, Peter F., to Peter F. Lee, Inc. Single-hand controlled fine needle aspiration device. 5,115,816, Cl. 128-749.000.

Lee, Sang H. Apparatus for unloading freight from an open freight car. 5,116,183, Cl. 414-395.000

Lee, Sheng-Hwa. Braking and wheel-orienting mechanism for a four-wheeled trolley. 5,115,539. Cl. 16-35.00R.

Lee, Shih-Ying, to Setra Systems, Inc. Flush-mounted pressure sensor. 5,115,676, Cl. 73-706.000.

Lee, Ta J.: *See—*
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stoker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta J., 5,116,870, Cl. 514-548.000.

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Murdock, Keith C.; and Lee, Ving J., 5,116,827, Cl. 514-82.000.

Lee, Wen P. Umbrella with wind escape aperture. 5,115,827, Cl. 135-33.700.

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Park, Ki S.; Kim, Sang B.; Oh, Kwang Y.; and Lee, Yong T., 5,116,772, Cl. 437-41.000.
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Legg, Thomas H., to National Research Council of Canada. Quasi-optical stripline devices. 5,117,237, Cl. 342-372.000.

Lehle, Hubert; and Schneider, Rudolf, to Zahnradfabrik Friedrichshafen AG. Disk set with spreading devices for clutches or brakes. 5,115,898, Cl. 192-84.0PM

Lehnert, Mark W., to GSE Inc. Drive mechanism and strain gauge mounting for a nutrunner appliance. 5,115,701, Cl. 81-467.000.

Leising, Maurice B.; Benford, Howard L.; and Holbrook, Gerald L., to Chrysler Corporation. Electronically-controlled, adaptive automatic transmission system. 5,115,698, Cl. 74-868.000.

Leite, Michael J.: *See—*
Cobb, Sanford, Jr.; and Leite, Michael J., 5,117,478, Cl. 385-133.000.

Leitz, Edgar: *See—*
Hocker, Hartwig; Keul, Helmut; Leitz, Edgar; Schon, Norbert; and Kuhling, Steffen, 5,116,918, Cl. 525-415.000.

Lelental, Mark; Agostinelli, John A.; and Romanofsky, Henry J., to Eastman Kodak Company. Method of forming an oxide superconducting thin film having an $R_1A_2C_3$ crystalline phase over an $R_2A_1C_1$ crystalline phase. 5,116,812, Cl. 505-1.000.

LeMay, James D., to United States of America, Energy. Low density microcellular foams. 5,116,883, Cl. 521-178.000.

Lemberger, Richard R.: *See—*
Schubert, Paul C.; and Lemberger, Richard R., 5,117,119, Cl. 250-559.000.

Lemongelli, Ralph J. Disposable bag box for trash receptacle. 5,115,935, Cl. 220-407.000.

Lentsch, Steven E., to United States of America, National Aeronautics and Space Administration. Whole body cleaning agent containing n-acyltaurate. 5,116,543, Cl. 252-545.000.

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Vodiunig, Robert; Reiter, Gerhard; and Weinrotter, Klaus, 5,116,673, Cl. 428-332.000.

Leonard, Berdine L.: *See—*
Chundury, Deenadayalu; Davidson, Daniel L.; Leonard, Berdine L.; and Scheibelhoffer, Anthony S., 5,116,540, Cl. 252-511.000.

Leonov, Mark A.: *See—*
Crafts, Douglas E.; and Leonov, Mark A., 5,115,842, Cl. 141-286.000.

Lerman, Theodore B.; and Basse, Bernard W., to General Electric Company. Safety cable for fasteners. 5,116,178, Cl. 411-87.000.

Le Roy, Pierre; and Mandard-Cazin, Bernadette, to Rhone Poulenc Sante. Process for the preparation of cyclic sulphates. 5,116,999, Cl. 549-18.000.

LeRoy, Robert D.; and Quackenbush, Raymond M., to Eastman Kodak Company. Device for facilitating stacking of sheets in a hopper. 5,116,036, Cl. 271-3.100.

Leslie, Stuart; and Aldrich, Thomas B., III, to Sterling Drug, Inc. Dispensing wand and combination of dispensing wand with container. 5,115,951, Cl. 222-533.000.

Lesparre, Jean: *See—*
Correia, Yves; Lesparre, Jean; and Petit, Alain, 5,116,799, Cl. 502-225.000.

Lessig, William R., III: *See—*
Cochran, John R.; Bailey, Rouse R., Jr.; and Lessig, William R., III, 5,115,538, Cl. 15-383.000.

Lessmann, Hans-Dieter: *See—*
Vogt, Bernd; Lessmann, Hans-Dieter; Klein, Christian; and Treiber, Wolfgang, 5,116,762, Cl. 436-15.000.

Lester, Mark B.: *See—*
Hewka, Leda C.; Geremakis, Perry A.; Lester, Mark B.; and Parr, Jack E., 5,116,380, Cl. 623-23.000.

Leunk, Robert D.: *See—*
Randall, Jared L.; and Leunk, Robert D., 5,116,821, Cl. 514-25.000.

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Allard, Paul; Levesque, Claude; and Dansereau, Jean, 5,116,385, Cl. 623-55.000.

Levy, Guy, to Endo Technic Corporation. Process for cleaning and enlarging passages. 5,116,227, Cl. 433-216.000.

Levy, Lawrence I.: *See—*
Comerford, Liam D.; Ledermann, Peter G.; Levy, Lawrence I.; and White, Steve R., 5,117,457, Cl. 380-3.000.

Lew, Hyok S. Displacement sensor with mechanical preamplification means. 5,115,680, Cl. 73-763.000.

Lewins, Foster; Roth, Bruce N.; and Wykes, John S., to Coal Industry (Patents) Limited. Method of steering a mining machine. 5,116,103, Cl. 299-1.600.

Lewis, Graham; Prchal, Milos; Weidner, Siegfried H.; and Yablonovitch, Max, to H. G. Kalish Inc. Capping machine. 5,115,617, Cl. 53-306.000.

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Hurd, Clarence, 5,117,192, Cl. 324-727.000.

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Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, 5,116,860, Cl. 514-399.000.

Leyh, Thomas O.; and Boyce, Walter A., to North American Philips Corp. Rapid start fluorescent lamp having quick hot restarting. 5,117,156, Cl. 315-73.000.

Leyrer, Reinhold J.; Lauke, Harald; Nick, Bernhard; Strohriegl, Peter; and Haarer, Dietrich, to BASF Aktiengesellschaft. Methacrylate (co)polymers containing carbazolyl side groups and electrophotographic recording elements containing the said (co)polymers. 5,116,911, Cl. 525-329.900.

Libit, Sidney M. Squeeze bottle. 5,115,946, Cl. 222-145.000.

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Eisenhardt, Volker; Kummerfeldt, Georg; May, Franz; and Wolf, Winfried, 5,117,288, Cl. 358-136.000.
Wiemer, Wolfram, 5,117,300, Cl. 359-88.000.

Lichtenwalter, Glen D.; Rosario-Jansen, Theresa; and Wahl, Errol H., to Procter & Gamble Co., The. Fabric softening and anti-static compositions containing a quaternized di-substituted imidazoline ester fabric softening compound with a nonionic fabric softening compound. 5,116,520, Cl. 252-8.600.

Liechti, Peter; and Trottmann, Martin, to Ciba-Geigy Corporation. Disperse dyes which are convertible into a thermomigration fast form. 5,116,958, Cl. 534-591.000.

Lieder, Gaylerd M., to Bemis Company, Inc. Bag packing. 5,115,619, Cl. 53-459.000.

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Keane, Martin A.; and Englehardt, William H., 5,117,170, Cl. 318-646.000.

Life Systems, Inc.: *See—*
Hicho, Michael D., 5,115,671, Cl. 73-488.000.

Lile, William R.: *See—*
DeWitt, Robert N.; Lile, William R.; and Tentarelli, Stephen, 5,115,918, Cl. 209-3.100.

Lillie, Christian: *See—*
Bomhard, Andreas; Heider, Joachim; Psiorz, Manfred; Hauel, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Diederen, Willi, 5,116,986, Cl. 546-141.000.

Lim, Guy H.; Rijnders, Willem; and Louwerens, Cornelis, to Hunter Douglas International. Metal cladding systems. 5,115,611, Cl. 52-537.000.

Lin, Bao N. Automatic car parking system. 5,116,182, Cl. 414-254.000.

Lin, Charles W. C.; German, Randy L.; Yee, Ian Y. K.; and Sigmond, David M., to Microelectronics and Computer Technology Corporation. Detecting completion of electroless via fill. 5,116,463, Cl. 156-643.000.

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Lin, Yeun-Junn. Impeller. 5,116,202, Cl. 416-204.00R.

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Stava, Elliott K., 5,117,088, Cl. 219-137.0PS.

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Wilkinson, William T.; Bressler, Peter W.; Schiff, David R.; Schneider, Eric A.; and Lincov, Pietr, 5,116,044, Cl. 482-52.000.

Lindberg, Sven; and Eriksson, Kjell, to Aktiebolaget Bofors. Breech mechanisms. 5,115,715, Cl. 89-26.000.

Lindblad, Nero R.: *See—*
Frankel, Neil A.; Lindblad, Nero R.; Relyea, Herbert C.; and Meyer, Robert J., 5,117,264, Cl. 355-299.000.

Lindblom, Curtis; and Kirchner, Michael W., to Skyline Displays, Inc. Flat panel portable exhibit display and hinge. 5,115,855, Cl. 160-135.000.

Linde, Rolf E.: *See—*
Haaker, Paul R.; Klotz, Erhard P. A.; Koppe, Reiner H.; and Linde, Rolf E., 5,117,446, Cl. 378-99.000.

Linden, Douglas G.: *See—*
Williamson, W. Burton; Linden, Douglas G.; and Summers, Jack C., II, 5,116,800, Cl. 502-303.000.

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Schnepp-Pesch, Wolfram; and Lindenberg, Josef, 5,116,352, Cl. 606-171.000.

Lindstrom, Paul R.: *See—*
Severns, David W.; Tompson, Brian; Lindstrom, Paul R.; and Carlson, David K., 5,116,181, Cl. 414-222.000.

Lingle, Thomas M.: *See—*
Hoetzl, Max; and Lingle, Thomas M., 5,116,221, Cl. 432-77.000.

Link, Helmut F., to Index-Werke GmbH & Co. KG Hahn & Tessky. Bar stock feeding means. 5,115,702, Cl. 82-126.000.

Linkow, Leonard I. Neckless blade implant. 5,116,226, Cl. 433-176.000.

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Briet, Philippe; Berthelon, Jean-Jacques; and Collonges, Francois, 5,116,954, Cl. 534-551.000.

Lipton, Lenny, to StereoGraphics Corporation. High dynamic range electro-optical shutter for steroscopic and other applications. 5,117,302, Cl. 359-227.000.

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Sullivan, Michael J.; Nesbitt, R. Dennis; and Nealon, John L., 5,116,060, Cl. 273-218.000.

Listemann, Mark L.; and Pinschmidt, Robert K., Jr., to Air Products and Chemicals, Inc. Preparation of N-(1-alkoxyalkyl)formamide and bis formamides. 5,117,056, Cl. 564-134.000.

Litef GmbH: *See—*
Flamm, Jurgen, 5,117,103, Cl. 250-229.000.
Grollmann, Peter, 5,116,127, Cl. 356-350.000.

Litton Systems, Inc.: *See—*
Butler, Alfred L., 5,116,130, Cl. 356-350.000.
Farahani, Shahrokh R.; and Tehrani, Mohammad M., 5,116,131, Cl. 356-350.000.
Hall, David B.; and Farahani, Shahrokh R., 5,116,128, Cl. 356-350.000.
Mitchell, Robert A.; Hall, David B.; and Shafer, Kenneth W., 5,116,132, Cl. 356-350.000.

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Liu, Peter, to Syncsort Incorporated. Method of sorting data records. 5,117,495, Cl. 395-600.000.

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Lagoutte, Pierre, 5,117,429, Cl. 370-60.000.

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Huff, Larry D., 5,117,373, Cl. 364-550.000.

Locher, Johannes: *See—*
Schmidt, Wolfgang; Fischer, Werner; and Locher, Johannes, 5,116,342, Cl. 73-119.00A.

Lockhart, Alain: *See—*
Cabanes, Laure; Lockhart, Alain; and Weber, Simon, 5,116,878, Cl. 514-653.000.

Lockheed Sanders, Inc.: *See—*
Powell, Scott D.; and Meharry, David E., 5,117,207, Cl. 333-1.000.

Loctite (Ireland) Limited: *See—*
Wrobel, Peter; and Houlihan, James, 5,116,558, Cl. 264-46.600.

Lo Duca, Carmelo, to GI.BI.EFFE S.R.L. Disposable syringe for once-only use. 5,116,320, Cl. 604-110.000.

Loeb, Jeff M.: *See—*
Friemoth, Dale J.; Hacker, Steven A.; and Loeb, Jeff M., 5,116,018, Cl. 251-90.000.

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Poeschl, Franz, 5,115,989, Cl. 241-79.100.

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Loffelholz, Ralf: *See—*
Eickeler, Edgar; and Loffelholz, Ralf, 5,116,577, Cl. 422-58.000.

Loffler, Markus, to TZN Forschungs- und Entwicklungszentrum Unterluss GmbH. Propellant casing assembly for an electrothermic projectile firing device. 5,115,743, Cl. 102-472.000.

Loffler, Susanne: *See—*
Grill, Erwin; Loffler, Susanne; Winnacker, Ernst-Ludwig; and Zenk, Meinhard H., 5,116,749, Cl. 435-193.000.

Lofstedt, Michael L., to LSI Logic Corp. Vibratory tube-to-tube transfer system. 5,116,185, Cl. 414-415.000.

Lofstedt, Sigmund J. Method for drug administration. 5,116,311, Cl. 604-54.000.

Lohmann, Dieter: *See—*
Wunderlich, Helmut; Stark, Andreas; Zenker, Lothar; Lohmann, Dieter; Poppe, Hildegard; Bartsch, Reni; Skoldinov, Aleksandr P.; Kaverina, Natalja V.; Grizenko, Anna N.; and Lyskovzev, Valentin V., 5,116,974, Cl. 540-591.000.

Lohrman, Richard D.; Ferber, Philip; and Dorsch, Gene. Two-piece closure. 5,115,930, Cl. 215-227.000.

Lokhoff, Gerardus C. P.; Van Eijck, Gustavus L. P.; and Arts, Petrus H. M., to U.S. Philips Corporation. Digital transmission system, transmitter and receiver to be utilized in the transmission system and record carrier obtained by means of the transmitter in the form of a recording means. 5,117,313, Cl. 360-40.000.

Lombardi, Massimo: *See—*
Santandrea, Luciano; and Lombardi, Massimo, 5,115,901, Cl. 198-345.300.

Long, Gary R.; and Callender, Charles W., to Carnes Company, Inc. Automated system for pricing and ordering custom manufactured parts. 5,117,354, Cl. 364-401.000.

Long, Ruth I. Gable style prefabricated doghouse. 5,115,762, Cl. 119-19.000.

Lonza Ltd.: *See—*
McGarrity, John; and Tenud, Leander, 5,117,003, Cl. 548-303.000.

Look S.A.: *See—*
Peyre, Henri, 5,116,074, Cl. 280-618.000.

Loomis, Phillip E.: *See—*
Folk, Kenneth F.; Loomis, Phillip E.; and Yeomans, Michael A., 5,115,904, Cl. 198-403.000.

Lopez-Berestein, Gabriel: *See—*
Khokhar, Abdul R.; Lopez-Berestein, Gabriel; and Perez-Soler, Roman, 5,117,022, Cl. 556-137.000.

Lopez, Simon F.: *See—*
Ebbins, James R.; Lopez, Simon F.; and Taylor, Christopher, 5,116,507, Cl. 210-639.000.

Lord Corporation: *See—*
Nowak, Theodore J.; and Tillman, Gary P., 5,116,030, Cl. 267-140.400.

L'Oreal: *See—*
Mondet, Jean; Papantoniou, Christos; Cheneble, Jean-Charles; and Mahieu, Claude, 5,116,601, Cl. 424-47.000.

Lorenz, Gisela: *See—*
Wenderoth, Bernd; Schuetz, Franz; Sauter, Hubert; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,116,866, Cl. 514-522.000.

Lottick, Edward A. Electrocautery hemostat. 5,116,332, Cl. 606-42.000.

Lotz, Hans-Georg: *See—*
Schwarz, Werner; Kremmling, Horst; Thomas, Gunter; and Lotz, Hans-Georg, 5,117,150, Cl. 313-112.000.

Lourens, Pieter A.; and Zoetemeyer, Robert J., to Gist-Brocades N.V. Fluidized bed process. 5,116,505, Cl. 210-603.000.

Louwerens, Cornelis: *See—*
Lim, Guy H.; Rijnders, Willem; and Louwerens, Cornelis, 5,115,611, Cl. 52-537.000.

Lovitt, Harold B. Hammock mattress. 5,115,525, Cl. 5-120.000.

Low, Kim C.: *See—*
Koskan, Larry P.; and Low, Kim C., 5,116,513, Cl. 210-698.000.

Lowen, Gregory T., to American Cyanamid Company. Process for the preparation of insecticidal, acaricidal and mollusicidal 2-halopyrrole-3-carbonitrile compounds. 5,116,998, Cl. 548-560.000.

Lower, Jerry L.: *See—*
Cozad, Trent E.; Lozier, Antony J.; Lower, Jerry L.; and Tencer, Allan F., 5,116,334, Cl. 606-61.000.

Loy, Garry M., to ABB Power T&D Company, Inc. Apparatus and method for drilling glass. 5,116,169, Cl. 408-39.000.

Lozier, Antony J.: *See—*
Cozad, Trent E.; Lozier, Antony J.; Lower, Jerry L.; and Tencer, Allan F., 5,116,334, Cl. 606-61.000.

LPS Industries, Inc.: *See—*
Robinson, John P.; Stadick, William R.; Clawges, Thomas L.; and Minogue, Thomas P., 5,116,301, Cl. 493-215.000.

LSI Logic Corp.: *See—*
Dicke, Curtis J., 5,117,124, Cl. 307-272.100.
Lofstedt, Michael L., 5,116,185, Cl. 414-415.000.

LTS Lohmann Therapie-Systeme GmbH & Co. KG: *See—*
Anhauser, Dieter; and Huhn, Ralf, 5,115,913, Cl. 206-447.000.

Lu, Pong-Fei: *See—*
Comfort, James H.; Chen, Tze-Chiang; Lu, Pong-Fei; Meyerson, Bernard S.; Sun, Yuan-Chen; and Tang, Denny D., 5,117,271, Cl. 357-34.000.

Lubowitz, Hyman R.; and Sheppard, Clyde H., to Boeing Company, The. Polyimide oligomers and blends and method of curing. 5,116,935, Cl. 528-173.000.

Lucas Industries Public Limited Company: *See—*
Nash, Alan J., 5,117,492, Cl. 395-400.000.

Lucchetti, Renato, to ColArt International, S.A. Artist's sectional stretcher with canvas. 5,115,584, Cl. 38-102.910.

Lucid, Inc. (formerly Portable Computer): *See—*
Shires, Glen E., 5,117,443, Cl. 375-111.000.

Luck, Francis, to Rhone-Poulenc Chimie. Catalysts for the selective reduction of nitrogen oxides and process for preparing the catalyst. 5,116,801, Cl. 502-307.000.

Luck-Hoehn, Rhonda. Jewelry apparatus. 5,115,647, Cl. 63-12.000.

Ludlow, Susan M.: *See—*
Ferguson, Lisa L.; and Ludlow, Susan M., 5,115,517, Cl. 2-203.000

Ludwig Institute for Cancer Research: *See—*
Druez, Catherine; Coulie, Pierre; Uyttenhove, Catherine; and Van Snick, Jacques, 5,116,951, Cl. 530-395.000.

Luebs, Richard J., to Hewlett-Packard Co. Hashing output exclusive-OR driver with precharge. 5,117,133, Cl. 307-471.000.

Lueck, Dale E.: *See—*
Annino, Raymond; Barlett, Michael L.; Karas, Edwin L.; Lueck, Dale E.; Middleton, John L.; and Villalobos, Richard, 5,116,764, Cl. 436-161.000.

Luecke, Francis S., to New Focus, Inc. Vertically adjustable mounting post for optical element. 5,116,004, Cl. 248-161.000.

Lulsdorf, Peter: *See—*
Kaiser, Hartmut; and Lulsdorf, Peter, 5,116,135, Cl. 366-349.000.

Lundquist, Stan K.: *See—*
Barbulesco, Noel K.; and Lundquist, Stan K., 5,115,625, Cl. 53-467.000.

Luong, Sanh D.: *See—*
Pettigrew, Robert D.. and Luong, Sanh D., 5,117,175, Cl. 323-256.000.

Lupo, Donald; Prass, Werner; and Scheunemann, Ude, to Hoechst Aktiengesellschaft. Amphiphilic monomers and polymers and film comprising at least one unimolecular layer thereof. 5,116,925, Cl. 526-323.100.

Lurssen, Klaus: *See—*
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; Becker, Benedikt; Stendel, Wilhelm; and Erdelen, Christoph, 5,116,836, Cl. 514-224.200.
Haug, Michael; Marhold, Albrecht; Santel, Hans-Joachim; Lurssen, Klaus; and Schmidt, Robert R., 5,117,038, Cl. 560-55.000.

Luther, Rainer, to Deutsche ITT Industries GmbH. Automatic gain control apparatus for digital variable-gain amplifier. 5,117,201, Cl. 330-279.000.

Lynch, Edward G., Jr.: *See—*
Wallace, William D.; Lynch, Edward G., Jr.; Daugherty, David W., Jr.; Kanjo, Wajih and Hawryszkow, Michael G., 5,115,927, Cl. 213-75.00R.

Lyon-Lamb Video Animation: *See—*
Farley, Shal W.; and McCown, William, 5,117,289, Cl. 358-140.000.

Lysek, Manfred: *See—*
Eberspach, Werner; Scharf, Daniel; and Lysek, Manfred, 5,116,891, Cl. 524-97.000.

Lyskovzev, Valentin V.: *See—*
Wunderlich, Helmut; Stark, Andreas; Zenker, Lothar; Lohmann, Dieter; Poppe, Hildegard; Bartsch, Reni; Skoldinov, Aleksandr P.; Kaverina, Natalja V.; Grizenko, Anna N.; and Lyskovzev, Valentin V., 5,116,974, Cl. 540-591.000.

Lytton, Linda E.; and Perron, Richard D. Ceiling fan cleaning apparatus. 5,116,151, Cl. 401-9.000.

M.E.P. Macchine Elettroniche Piegatrici: *See—*
Del Fabro, Giorgio, 5,115,657, Cl. 72-164.000.

MacDonald, James T., to Unex Corporation. Earphone with adjustable headband with progressively shallow detents. 5,117,465, Cl. 381-187.000.

Machida, Tetsuo: *See—*
Hino, Masatoshi; Fukuda, Kouji; and Machida, Tetsuo, 5,117,468, Cl. 382-41.000.

MacKay, Gary F.: *See—*
Thomson, Ian; MacKay, Gary F.; and Brown, Martin P., 5,117,113, Cl. 250-370.070.

Mackey, Kevin J.; Vere, Anthony W.; Bradley, Donald C.; Frigo, Dario M.; and Faktor, Marc M., deceased (by Faktor, Jill, executrix), to Secretary of State for Defence in her Britannic Majesty's Government of The United Kingdom of Great Britian and Northern Ireland, The. Method of depositing metal fluoride. 5,116,785, Cl. 437-243.000.

Mackin, Robert A. Reversible pen-caliper device and method. 5,115,571, Cl. 33-558.040.

MacLachlan, William S.: *See—*
Driver, Michael J.; MacPherson, David T.; and MacLachlan, William S., 5,116,960, Cl. 536-6.500.

Macnak, Philip P.: *See—*
Berry, Thomas G.; Smith, Paul F.; Rohani, Kamyar; Brown, Winfield J., Jr.; and Macnak, Philip P., 5,117,460, Cl. 381-41.000.

MacPherson, David T.: *See—*
Driver, Michael J.; MacPherson, David T.; and MacLachlan, William S., 5,116,960, Cl. 536-6.500.

Macronix International Co., Ltd.: *See—*
Yiu, Tom D. H., 5,117,389, Cl. 365-104.000.

Macsenti, Ronald J.; and Avery, Frederick M., to Niven Marketing Group, The. Flexible, collapsible container. 5,116,138, Cl. 383-33.000.

Madaras, Eric I.: *See—*
Kline, Ronald A.; and Madaras, Eric I., 5,115,673, Cl. 73-601.000.

Maeda, Akira: *See—*
Sano, Koichi; Maeda, Akira; Yokoyama, Tetsuo; and Koizumi, Hideaki, 5,115,812, Cl. 128-653.200.

Maeda, Masataka, to Brother Kogyo Kabushiki Kaisha. Developer material coating apparatus having developer material removing unit. 5,115,760, Cl. 118-621.000.

Maeda, Yuji: *See—*
Yamada, Sachiko; Niimura, Koichi; Fukushima, Kenji; and Maeda, Yuji, 5,116,573, Cl. 434-1.100.

Maejima, Hideo; Hotta, Takashi; Masuda, Ikuro; Iwamura, Masahiro; Kurita, Kouzaburou; and Ueno, Masahiro, to Hitachi, Ltd. Semiconductor integrated circuit for performing an arithmetic operation including bipolar and MOS transistors. 5,117,382, Cl. 364-736.000.

Maezawa, Shigenari: *See—*
Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Sera, Akio; and Terunaga, Fukuso, 5,117,191, Cl. 324-551.000.

Maffei, John J. Pennant/flag construction. 5,115,756, Cl. 116-2.000.

Magid, Hillel; Eibeck, Richard E.; Van Der Puy, Michael; Hollister, Richard M.; Lavery, Dennis M.; and Wilson, David P., to Allied-Signal Inc. Azeotrope-like compositions of dichloropentafluoropropane and 1,2-dichloroethylene. 5,116,526, Cl. 252-172.000.

Magni Systems, Inc.: *See—*
Latshaw, Don, 5,117,483, Cl. 395-100.000.

Magno, James C., Jr.: *See—*
Ellwood, Jennifer K.; Gaewsky, John P.; and Magno, James C., Jr., 5,117,252, Cl. 354-415.000.

Maguire, Dennis D.: *See—*
Bannard, John E.; and Maguire, Dennis D., 5,117,116, Cl. 250-474.100.

Magyar Tudomanvos Akademia Kozponti Kemiai Kutato Intezete Nitrokemia Inartelenek Fuzfogyartelep: *See—*
Dutka, Ferenc; Komives, Tamas; Fodor, Katalin, nee Csorba; Marton, Attila; Csikos, Aniko nee Gluck; Osztheimer, Eva; Henger, Karoly; Laborczy, Robert; Reti, Zsuzsanna, nee Bosnyak; Sebok, Dezso; Szabolcs, Jozsef; and Tomordi, Elemer, 5,116,402, Cl. 71-88.000.

Mahieu, Claude: *See—*
Mondet, Jean; Papantoniou, Christos; Cheneble, Jean-Charles; and Mahieu, Claude, 5,116,601, Cl. 424-47.000.

Maier, Gary W.; and Wang, Sharon, to Minnesota Mining and Manufacturing Company. Spray die for producing spray fans. 5,115,972, Cl. 239-8.000.

Maischberger, Mohann: *See—*
Steinhart, Wilhelm; Maischberger, Mohann; Biewald, Thomas; and Berens, Gerwin, 5,116,424, Cl. 134-15.000.

Maitland, Peter, to Vendtron, Inc. Food heating and dispensing vending machine. 5,115,731, Cl. 99-327.000.

Makimoto, Seiji: *See—*
Noguchi, Naoyuki; Murakami, Kazuki; Kanehisa, Eiji; and Makimoto, Seiji, 5,115,896, Cl. 192-0.052.

Makino, Kenzi; Morimoto, Katsushi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Suzuki, Koichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, to Nissan Chemical Industries Ltd. Pyridinesulfonamide derivatives and herbicides. 5,116,405, Cl. 71-94.000.

Malachowsky, Chris; and Priem, Curtis, to Sun Microsystems, Inc. Method and apparatus for sorting line segments for display and manipulation by a computer system. 5,117,485, Cl. 395-134.000.

Malcolmson, Kirk, to Mirror Lite Co. Mirror mounting mechanism. 5,116,013, Cl. 248-484.000.

Maldonado, Duncan R. Photograph exposing device. 5,115,585, Cl. 40-152.200.

Malik, Imran: *See—*
Schulte, Richard D.; Malik, Imran; and Knight, Richard K., 5,115,911, Cl. 206-330.000.

Mallik, Donald W.; and D'Amato, Salvatore F., to American Bank Note Holographics, Inc. Replicaton of microstructures by casting in controlled areas of a substrate. 5,116,548, Cl. 264-1.300.

Mallinckrodt Medical, Inc.: *See—*
Nosco, Dennis L., 5,116,598, Cl. 424-1.100.

Mallory, Mark P.: *See—*
Chaffee, Donald L.; Mallory, Mark P.; and Brand, Graham H., 5,117,418, Cl. 370-32.100.

Mally, Timothy G., to Oscar Mayer Foods Corporation. Apparatus and method for forming casingless sausage and the like. 5,115,732, Cl. 99-483.000.

Malone, Jimmie L. Protective mirror cover, and methods of constructing and utilizing same. 5,115,848, Cl. 150-166.000.

Malras, Jean-Claude; and Gosset, Serge, to Roquette Freres. Phytosanitary composition, its process for preparation and its use for treating cryptogamic diseases. 5,116,825, Cl. 514-58.000.

Mamedov, Ulchar A. O.; Tokar, Anatolyi E.; and Elbaum, George J., to Giprokautchuk. Method of controlling polymerization process of olefinic hydrocarbons. 5,116,915, Cl. 526-60.000.

MAN Roland Druckmaschinen AG: *See—*
Emrich, Helmut; and Sabrowski, Uwe, 5,115,740, Cl. 101-420.000.

Manabe, Haruhiko: *See—*
Oshima, Etsuo; Kumazawa, Toshiaki; Otaki, Shizuo; Obase, Hiroyuki; Ohmori, Kenji; Ishii, Hidee; Manabe, Haruhiko; Tamura, Tadafumi; and Shuto, Katsuichi, 5,116,863, Cl. 514-450.000.

Mandard-Cazin, Bernadette: *See—*
Le Roy, Pierre; and Mandard-Cazin, Bernadette, 5,116,999, Cl. 549-18.000.

Mangiaracina, Michael. Golf training aid. 5,116,057, Cl. 273-183.00B.

Mann, John C., Jr. Ring binder adaptor for removable covers. 5,116,081, Cl. 281-36.000.

Mannesmann Aktiengesellschaft: *See—*
Kummerling, Rolf; Bellmann, Manfred; and Biller, Horst, 5,115,656, Cl. 72-96.000.

Mannesmann Rexroth Pneumatik GmbH: *See—*
Fortmann, Norbert; Gottling, Helmut; Janetzko, Horst; Kook, Ralf; Kruppa, Hans; and Scharnowski, Gerhard, 5,115,889, Cl. 188-67.000.

Manska, Wayne E.: *See—*
Vannus, Tom H.; Mauser, Stephen G.; Ebling, Wendell V.; and Manska, Wayne E., 5,116,329, Cl. 606-11.000.

Mantovani, Marisa; Porta, Roberto; and Prino, Giuseppe, to Crinos Industria Farmacobiologica S.p.A. Pharmaceutical composition for topical use in the treatment of the capillary fragility. 5,116,617, Cl. 424-401.000.

Manville Corporation: *See—*
Smith, Harvell M.; Marx, Edward J.; and Coleman, Robert R., 5,115,957, Cl. 227-67.000.

Marcelin, George: *See—*
Eri, Sigrid; Goodwin, James G., Jr.; Marcelin, George; and Riis, Trygve, 5,116,879, Cl. 518-716.000.

March, Keith L.; Hathaway, David R.; Wilensky, Robert L.; and Patton, Brian L., to Indiana University Foundation. Method for preventing restenosis following reconfiguration of body vessels. 5,116,864, Cl. 514-455.000.

Marco, Leslie S.: *See—*
Klygis, Mindaugas J.; and Marco, Leslie S., 5,115,910, Cl. 206-150.000.

Marendaz, Georges-Andre : *See—*
Bosson, Jean M.; Odriozola, Juan; Marendaz, Georges-Andre ; and Blodin, Daniel, 5,117,082, Cl. 219-69.120.

Marfat, Anthony, to Pfizer Inc. Anti-inflammatory 1-heteroaryl-3-acyl-2-oxindoles. 5,116,854, Cl. 514-365.000.

Margaliot, Menachem; and Schlesinger, Tuvia, to State of Israel, Atomic Energy Commission, Soreq Nuclear Research Center, The. Method and apparatus for detecting flaws in transparent bodies caused by heavy particles of radioactive decay. 5,117,120, Cl. 250-572.000.

Marhold, Albrecht: *See—*
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; Becker, Benedikt; Stendel, Wilhelm; and Erdelen, Christoph, 5,116,836, Cl. 514-224.200.
Haug, Michael; Marhold, Albrecht; Santel, Hans-Joachim; Lurssen, Klaus; and Schmidt, Robert R., 5,117,038, Cl. 560-55.000.

Marie, Bruno A. E.: *See—*
Teissier, Etienne M.; and Marie, Bruno A. E., 5,115,747, Cl. 105-50.000.

Marino, Francis C.; and Freeman, Stanley B., to Pittway Corporation. Glass breakage detector. 5,117,220, Cl. 340-550.000.

Marks, Larry D.: *See—*
Bertsch, Roger J.; and Marks, Larry D., 5,115,826, Cl. 134-183.000.

Marks, Ronald, to DNS, Inc. Automated ledger account maintenance system. 5,117,356, Cl. 364-406.000.

Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III; and Pottratz, David G., to Texaco Chemical Company. Propylene oxide purification by extractive distillation. 5,116,466, Cl. 203-58.000.

Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III; and Pottratz, David G., to Texaco Chemical Company. Water and acetone removal from propylene oxide by extractive distillation. 5,116,467, Cl. 203-58.000.

Marquis, Edward T.: *See—*
Yeakey, Ernest L.; and Marquis, Edward T., 5,116,465, Cl. 203-57.000.

Marshall, Robert A., to Center For Applied Research, Inc. Filtration of tobacco using moisture free, electrically neutral hydrophobic particles. 5,115,824, Cl. 131-342.000.

Martin, Dawn M. J.: *See—*
Fraser, Ann D. E.; Martin, Dawn M. J.; and Riche, Edward M., 5,116,754, Cl. 435-252.100.

Martin, James R.; Kuchma, James P.; and Furrer, David U., to Ladish Co., Inc. Integrally stiffened rings. 5,115,655, Cl. 72-68.000.

Martin, John B., Jr.: *See—*
Pinchuk, Leonard; Martin, John B., Jr.; and Weber, Bruce A., 5,116,360, Cl. 623-1.000.

Martin, John R.: *See—*
Harlan, Eugene G.; Bonilla, Marcio; and Martin, John R., 5,116,063, Cl. 273-376.000.

Martin, Mark M.; and Upp, M. Frances. Christmas tree ornament. 5,116,648, Cl. 428-7.000.

Martin, Philippe; and Le Boudec, Gilles, to Photonetics. Methods and devices for determining the contact angle of a drop of liquid placed on a substrate. 5,115,677, Cl. 73-64.480.

Martin, Stephen J.; and Ricco, Antonio J., to United States of America, Energy. Acoustic wave device using plate modes with surface-parallel displacement. 5,117,146, Cl. 310-313.00R.

Martin, Thomas J.; Moseley, Jane M.; Kemp, Bruce E.; and Wettenhall, Richard E. H., to University of Melbourne, The. Protein active in humoral hypercalcemia of malignancy-PTHRP. 5,116,952, Cl. 530-399.000.

Martinson, Michael M.: *See—*
Bateson, George F.; Chilcote, Dennis D.; Martinson, Michael M.; Valine, Steven B.; and Zambrano, Adolfo R., 5,115,986, Cl. 241-20.000.

Marton, Attila: *See—*
Dutka, Ferenc; Komives, Tamas; Fodor, Katalin, nee Csorba; Marton, Attila; Csikos, Aniko nee Gluck; Osztheimer, Eva; Henger, Karoly; Laborczy, Robert; Reti, Zsuzsanna, nee Bosnyak; Sebok, Dezso; Szabolcs, Jozsef; and Tomordi, Elemer, 5,116,402, Cl. 71-88.000.

Marton, Fred S.; Segar, William R.; and Schmitz, William E., to AEG Westinghouse Transportation Systems, Inc. Mounting system for electrical devices. 5,116,262, Cl. 439-709.000.

Marukin Shoyu Co., Ltd.: *See—*
Sugimori, Tsunetake; Tsukada, Yoji; and Ohta, Yasuhiro, 5,116,752, Cl. 435-200.000.

Maruma Jyusharyo Kabushiki Kaisha: *See—*
Moriki, Yasumitsu; and Numakura, Hirotomo, 5,116,391, Cl. 51-26.000.

Marutani, Masayoshi; Izumi, Fumihide; and Oka, Kunihide, to Yoshitomi Pharmaceutical Industries, Ltd. Alpha crystals of tetrakis[3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionyloxymethyl]methane which have good flowability and method of producing same. 5,117,040, Cl. 560-75.000.

Maruyama, Shigeo: *See—*
Nakamura, Yukitsugu; Hamano, Yoshimasa; Masuda, Takashi; Matsumura, Isao; Maruyama, Shigeo; and Kobayashi, Kazunobu, 5,116,114, Cl. 351-205.000.

Maruyama, Takashi: *See—*
Mizuno, Yukio; and Maruyama, Takashi, 5,116,906, Cl. 525-68.000.

Maruyama, Takayuki, to Seiko Epson Corporation. Diagonal insertion apparatus. 5,115,549, Cl. 29-281.100.

Marvin Lumber and Cedar Co. d/b/a Marvin Windows: *See—*
Fevold, Braden N.; Stoll, Timothy W.; and Hendrickson, Leslie B., 5,115,596, Cl. 49-411.000.

Marx, Edward J.: *See—*
Smith, Harvell M.; Marx, Edward J.; and Coleman, Robert R., 5,115,957, Cl. 227-67.000.

Marx, Norbert: *See—*
Genreith, Hans; Marx, Norbert; and Nagler, Gunter, 5,116,022, Cl. 251-175.000.

Marzilli, Luigi G.: *See—*
Hoeschele, James D.; Berry, David A.; and Marzilli, Luigi G., 5,116,831, Cl. 514-184.000.

Mase, Toshiyasu; Murase, Kiyoshi; Hara, Hiromu; and Tomioka, Kenichi. Phenylene derivatives. 5,116,853, Cl. 514-363.000.

Masina, Franca: *See—*
Cantatore, Giuseppe; Borzatta, Valerio; and Masina, Franca, 5,116,893, Cl. 524-100.000.

Maska, Rudolf: *See—*
Sundararaman, Padmanabhan; Maska, Rudolf; and Verardi, Cynthia L., 5,116,922, Cl. 526-304.000.

Mason Company, The: *See—*
Allen, James F., 5,116,256, Cl. 119-17.000.

Massachusetts Institute of Technology: *See—*
Edell, David J.; and Clark, Lloyd D., Jr., 5,116,464, Cl. 156-647.000.
Karulkar, Pramod C., 5,116,771, Cl. 437-40.000.
Lander, Arthur D., 5,116,483, Cl. 204-299.00R.
Newman, William H.; and Burgess, Ralph G., 5,116,136, Cl. 374-102.000.

Massouda, Debora F., to Westvaco Corporation. Oxygen and flavor barrier laminate for liquid packaging. 5,116,649, Cl. 428-34.200

Mastroianni, Sal, to Motorola, Inc. Merged complementary bipolar and mos means and method. 5,117,274, Cl. 357-43.000.

Masuda, Ikuro: *See—*
Maejima, Hideo; Hotta, Takashi; Masuda, Ikuro; Iwamura, Masahiro; Kurita, Kouzaburou; and Ueno, Masahiro, 5,117,382, Cl. 364-736.000.

Masuda, Takashi: *See—*
Nakamura, Yukitsugu; Hamano, Yoshimasa; Masuda, Takashi; Matsumura, Isao; Maruyama, Shigeo; and Kobayashi, Kazunobu, 5,116,114, Cl. 351-205.000.

Masuda, Toshiyuki: *See—*
Tokizane, Toshiaki; Ito, Yoshiharu; Yamada, Osamu; Masuda, Toshiyuki; and Kuroda, Mitsunobu, 5,117,421, Cl. 370-85.100

Masumura, Shigeki: *See—*
Noguchi, Kouki; Tsuchiya, Fumio; Tsukamoto, Takashi; Masumura, Shigeki; Nakamura, Hideo; Baba, Shiro; and Hagiwara, Yoshimune, 5,117,488, Cl. 395-375.000.

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Dumont, Francis; Garrity, George M.; Fernandez, Isabel M.; and Matas, Teresa D., 5,116,756, Cl. 435-253.500.

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Ohta, Kenji; Katayama, Hiroyuki; Nakayama, Junichiro; Kimura, Kazuhiro; Matoba, Hirotsugu; and Kobayashi, Shozo, 5,117,415, Cl. 369-271.000.

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Matsuda, Kazuya: *See—*
Morita, Shinichiro; Takahashi, Nobuya; Shimamoto, Takeshi; Matsuda, Kazuya; and Suzuki, Shigehiko, 5,116,552, Cl 264-28.000.

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Haber, Edgar; and Matsueda, Gary R., 5,116,613, Cl. 424-85.800.

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Tsuno, Nobuo; Matsuhiro, Keiji; and Sakai, Hitoshi, 5,116,809, Cl. 505-1.000.

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Miyadera, Toshiyuki; Okano, Makoto; and Matsui, Fumio, 5,117,416, Cl. 369-284.000.

Matsui, Kiyoto: *See—*
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Kanzaki, Toshiaki; and Matsui, Yosuke, 5,116,707, Cl. 430-59.000.

Matsui, Yuji: *See—*
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Matsumoto, Kiyoshi: *See—*
Ohkuma, Hiroaki; Konishi, Masataka; Matsumoto, Kiyoshi; Oki, Toshikazu; and Hoshino, Yutaka, 5,116,845, Cl. 514-279.000.

Matsumoto, Tsuruyoshi: *See—*
Yamamoto, Takashi; Matsumoto, Tsuruyoshi; Kobayashi, Tadao; and Shimada, Katsuhiko, 5,117,480, Cl. 385-145.000.

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Matsuoka, Kenichi: *See—*
Yoshida, Shigeo; Fujimoto, Isamu; Suzuki, Hideyuki; Asano, Hiroshi; Hosaka, Toru; Onoh, Takashi; Nagasaki, Kojyu; Matsuoka, Kenichi; and Taura, Kazufumi, 5,117,100, Cl. 250-221.000.

Matsuoka, Kikuo: *See—*
Katsura, Tadahiko; Matsuoka, Kikuo; Miyake, Kazuo; Taira, Kazuo; Watanabe, Yoshiki; and Ueno, Hiroshi, 5,116,651, Cl. 428-35.700.

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Akiyama, Ryo, 5,117,410, Cl. 369-44.250.
Fujimoto, Hiroaki; Hatada, Kenzo; Takeshita, Yoshinobu; Otani, Kazuya; and Takeda, Kimiaki, 5,115,545, Cl. 29-25.010.
Juri, Tatsuro; and Kadono, Shinya, 5,117,381, Cl. 364-725.000.
Kabeshita, Akira; and Kitayama, Yoshifumi, 5,116,228, Cl. 29-842.000.
Kameyama, Shuichi; Sakai, Hiroyuki; Kikuchi, Kazuya; and Kajiyama, Masaoki, 5,116,770, Cl. 437-31.000.
Kudoh, Yasuo; Tsuchiya, Sohji; Fukuyama, Masao; Kojima, Toshikuni; Ozaki, Junji; and Kobatake, Yasuhiro, 5,117,332, Cl. 361-525.000.
Mino, Norihisa; and Ogawa, Kazufumi, 5,116,638, Cl. 427-54.100.
Oyama, Kenshu, 5,115,559, Cl. 29-720.000.
Shimizu, Masao; Kataoka, Yoshinori; and Akai, Naruaki, 5,117,092, Cl. 219-247.000.
Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, 5,117,159, Cl. 315-366.000.
Ueno, Reiko; Nakatani, Naofumi; Ikezaki, Masao; Yamamoto, Terumasa; and Nakatsu, Hiromasa, 5,117,070, Cl. 178-2.00R.
Yamasaki, Keiichi, 5,117,149, Cl. 400-314.100.

Matsushita Electric Works, Ltd.: *See—*
Kakehashi, Hidenori; and Oori, Tomio, 5,117,215, Cl. 336-178.000.
Tokizane, Toshiaki; Ito, Yoshiharu; Yamada, Osamu; Masuda, Toshiyuki; and Kuroda, Mitsunobu, 5,117,421, Cl. 370-85.100.

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Samata, Shuichi; and Matsushita, Yoshiaki, 5,116,780, Cl. 437-89.000.

Matsuura, Ichiro, to Nippon Electric Glass Co., Ltd. Low temperature sealing glass composition. 5,116,786, Cl. 501-15.000.

Matsuura, Kazuo: *See—*
Shikatani, Yutaka; Kataoka, Naoki; Kuroda, Nobuyuki; and Matsuura, Kazuo, 5,116,708, Cl. 430-59.000.
Takahashi, Mamoru; Nagasawa, Shinobu; Ikuta, Shigeru; and Matsuura, Kazuo, 5,116,748, Cl. 435-189.000.

Matsuura, Takaharu: *See—*
Ohtani, Mitsuaki; Matsuura, Takaharu; Konoike, Toshiro; and Araki, Yoshitaka, 5,117,039, Cl. 560-60.000.

Matsuyama, Shinya: *See—*
Watanabe, Haruhisa; Tanaka, Satoshi; and Matsuyama, Shinya, 5,116,765, Cl. 436-165.000.

Matsuzawa, Takashi: *See—*
Misaki, Hideo; Ueda, Shigeru; Watanabe, Kazuhiro; Ishikawa, Yuzo; Nagae, Hirao; and Matsuzawa, Takashi, 5,117,467, Cl. 382-6.000.

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Ylander, Kimmo; and Mattila, Pentti, 5,115,813, Cl. 128-660.010.

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Mattson, Roy D., 5,115,552, Cl. 29-527.400.

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Meyer, Robert B.; Lackner, John R.; and Matuschek, Hans J., 5,115,537, Cl. 15-340.200.

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Cyron, Theodor; and Maus, Wolfgang, 5,116,581, Cl. 422-180.000.
Swars, Helmut; and Maus, Wolfgang, 5,115,654, Cl. 72-62.000.

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Vannus, Tom H.; Mauser, Stephen G.; Ebling, Wendell V.; and Manska, Wayne E., 5,116,329, Cl. 606-11.000.

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Bauer, Frank L; and Mavretish, Robert S., 5,116,026, Cl. 266-44.000.

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Worcester, Paul L. A.; Maxwell, David J.; and Trethewey, Michael L., 5,117,375, Cl. 364-571.010.

May, Denis R. W., to University College London. Knee prosthesis. 5,116,376, Cl. 623-20.000.

May, Franz: *See—*
Eisenhardt, Volker; Kummerfeldt, Georg; May, Franz; and Wolf, Winfried, 5,117,288, Cl. 358-136.000.

Mayes, Michael K., to National Semiconductor Corp. Logic level control for impact ionization sensitive processes. 5,117,125, Cl. 307-296.200.

Mazda Motor Corporation: *See—*
Hayata, Ryoji, 5,115,878, Cl. 180-69.210.
Kanazawa, Hirotaka; Takehara, Shin; and Ohmura, Hiroshi, 5,116,078, Cl. 280-707.000.
Noguchi, Naoyuki; Murakami, Kazuki; Kanehisa, Eiji; and Makimoto, Seiji, 5,115,896, Cl. 192-0.052.
Oki, Nariyasu; Yokokura, Tsunetoshi; Mizuno, Koji; Shimada, Katsutoshi; and Yamamoto, Kazuyuki, 5,116,231, Cl. 123-52.0MB.
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Suzuki, Hidenori; and Mizune, Takahiro, 5,115,758, Cl. 118-322.000.
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McAdams, Hugh P., to Texas Instruments Incorporated. Circuit, device, and method to detect voltage leakage. 5,117,426, Cl. 371-214.000.

McArthur, Malcolm J.: *See—*
Reed, Wendell E.; and McArthur, Malcolm J., 5,115,638, Cl. 60-39.281.

McBride, Edward F., to Du Pont de Nemours, E. I., and Company. Sulfonation process. 5,117,041, Cl. 560-87.000.

McCann, Dominic P. J.; Kerbart, Yves; and Burgess, Trevor M., to Schlumberger Technology Corporation. Method for the estimation of pore pressure within a subterranean formation. 5,115,871, Cl. 175-50.000.

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McCarthy, Walton, to Theta Technologies, Inc. Theta blast cell. 5,115,613, Cl. 52-169.600.

McCauley, David K.: *See—*
Kroos, Donna S.; McCauley, David K.; and Sanger, Kurt M., 5,117,283, Cl. 358-22.000.

McCombs, Charles A.: *See—*
Tackett, Tommy L.; and McCombs, Charles A., 5,117,016, Cl. 552-545.000.

McCormic, David R.; and Zimmermann, William D., to Henkel Corporation. Polyphenolic compounds and uses thereof. 5,116,912, Cl. 525-340.000.

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Farley, Shal W.; and McCown, William, 5,117,289, Cl. 358-140.000.

McCoy, David R., to Chr. Hansen's Laboratory, Inc. Method for growing acid-producing bacteria. 5,116,737, Cl. 435-42.000.

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McCrary, Charles F. Jewelry lighting device. 5,117,338, Cl. 362-104.000.

McCurdy, Jim; and Pennypacker, Frank, to Guardian Technologies, Inc. Tamper indicating transmitter. 5,117,222, Cl. 340-573.000.

McDermott, Keith: *See—*
Rutherford, Howard J.; Desai, Nayan; McDermott, Keith; and Wiener, Charles, 5,116,627, Cl. 426-5.000.

McDonald, Thomas L., to University of Nebraska, The Board of Regents of the. Immune complex isolation. 5,116,766, Cl. 436-506.000.

McDonnell Douglas Corporation: *See—*
Yasui, Ken K., 5,115,963, Cl. 228-157.000.

McDonnell, William J.; Sarnacki, Alexander C., Jr.; and Collins, Dean E., to D. B. Smith & Co., Inc. Collapsible water tank. 5,115,947, Cl. 222-107.000.

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Brunet, Charles G.; Labbee, Gilles E.; and McGee, Jay W., 5,115,872, Cl. 175-61.000.

McGinity, James W.: *See—*
Greco, John C.; and McGinity, James W., 5,116,619, Cl. 424-433.000.

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Xiong, Tian-Yu; and McHie, Lloyd, 5,116,137, Cl. 374-132.000.

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Honkomp, Glenn A.; McNay, Thomas O.; and Burrows, Larry G., 5,117,089, Cl. 219-201.000.

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Hotz, Charles R.; McNiff, Gerald J.; and Burton, Dale, 5,117,360, Cl. 364-423.000.

McQueen, Malcolm M., to Fluid Components, Inc. Distributed RTD. 5,117,216, Cl. 338-24.000.

McShane, Charles L., to Chicago Steel Rule Die & Fabricators Co. Ambient imaging loudspeaker system. 5,117,459, Cl. 381-24.000.

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MDC Vacuum Products Corporation: *See—*
Contin, Jose L., 5,116,023, Cl. 251-203.000.

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Measurex Corporation: *See—*
Boissevain, Mathew G., 5,117,093, Cl. 219-494.000.

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Gergo, Gyorgy; Vida, Zoltan; Sebestyen, Bela; Nemeth, Jozsef; Viragh, Istvan; Monath, deceased Lajos; and Monath, Gabor, 5,116,104, Cl. 299-16.000.

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Bertz, Hans-Ulrich; and Meder, Willi, 5,116,234, Cl. 33-550.000.

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Hodgen, Gary D.; and Kenigsberg, Daniel, 5,116,818, Cl. 514-15.000.

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Medley, Anthony M. Support pad with spaced, parallel longitudinal channels and support elements. 5,115,527, Cl. 5-481.000.

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Watkins, K. Richard; and Daniels, Dale M., 5,116,296, Cl. 482-91.000.

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Hartlaub, Jerome T.; Schweitzer, Jeffrey A.; and Seifert, George P., 5,115,811, Cl. 128-634.000.
Holleman, Timothy W.; and Viktora, Sandra F., 5,115,818, Cl. 128-784.000.

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Meharry, David E.: *See—*
Powell, Scott D.; and Meharry, David E., 5,117,207, Cl. 333-1.000.

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Takagi, Masayuki; Okada, Tadaaki; Akai, Naotoshi; Yaguchi, Takashi; Miyadoh, Shinji; Shomura, Takashi; Sasaki, Toru; Sezaki, Masaji; Shimizu, Takao; and Niida, Masashi, 5,116,815, Cl. 514-11.000.

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Sigl, Alfred; Meissner, Manfred; Isella, Thomas; and Schmitt, Johannes, 5,116,108, Cl. 303-103.000.

Meister, John J.; Lathia, Amit; and Chang, Fu-Fong. Soluble, solid, or crosslinked graft copolymers of lignin (2-propenamide)-(2-methyl-3-oxo-4-oxybut-1-ene-(p-ethoxy-(3*p*3)-0)), methods of making the same and uses therefore. 5,116,904, Cl. 525-8.000.

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Bellezza, Orio; and Melanotte, Massimo, 5,117,269, Cl. 357-23.500.

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Hilliard, Garland E.; Melton, James K.; and Helmstetter, David A., 5,116,594, Cl. 423-473.000.

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Karle, Dennis W.; Chung, Fred C.; and Sischka, Frederic J., II, 5,116,685, Cl. 428-425.900.

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Chen, John S.; and Menesini Chen, Maria G., 5,116,630, Cl. 426-549.000.

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Dumont, Francis; Garrity, George M.; Fernandez, Isabel M.; and Matas, Teresa D., 5,116,756, Cl. 435-253.500.
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Baumgartner, Ehrenfried; Echte, Adolf; and Mertes, Juergen, 5,116,907, Cl. 525-77.000.

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Bauer, Gunther; and Fleckenstein, Hubert, 5,117,096, Cl. 235-375.000.

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Bichler, Bartholomaus; and Jost, Michael, 5,116,251, Cl. 244-53.00B.

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Daxer, Georg; and Cullen, Joao A. D. T., 5,115,726, Cl. 92-219.000.

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Fennemann, Wolfgang, 5,116,798, Cl. 502-218.000.

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Starmer, John E., 5,115,652, Cl. 70-209.000.

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Meyer, Norbert: *See—*
Ditrich, Klaus; Hamprecht, Gerhard; Wuerzer, Bruno; Meyer, Norbert; Westphalen, Karl-Otto; and Laatsch, Hartmut, 5,117,005, Cl. 548-369.000.

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Tracy, Daniel A., 5,116,055, Cl. 273-138.00A.
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Nakamura, Kazumitsu; Kato, Shinichi; Sakitani, Yoshio; and Minamikawa, Yoshihisa, 5,117,111, Cl. 250-310.000.
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Cosman, Armond D.; Knippelmier, Gary H.; and Minarovic, Joe T., 5,116,654, Cl. 428-77.000.
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Toyosumi, Shigeru; Tanigawa, Masayuki; Egawa, Masanori; and Minegishi, Kiyoji, 5,116,291, Cl. 475-178.000.
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Langfeld, Horst; and Minges, Roland, 5,116,955, Cl. 534-582.000.
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Abe, Takashi; Hayashi, Eiji; and Fukaya, Haruhiko, 5,117,055, Cl. 562-849.000.
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Cobb, Sanford, Jr.; and Leite, Michael J., 5,117,478, Cl. 385-133.000.
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Rossman, Mitchel A.; and Bonham, James A., 5,116,977, Cl. 544-113.000.
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Scott, John R., 5,116,495, Cl. 210-232.000.
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Robinson, John P.; Stadick, William R.; Clawges, Thomas L.; and Minogue, Thomas P., 5,116,301, Cl. 493-215.000.
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Etou, Kouichi; Kinoshita, Naoyoshi; and Kitakubo, Hideo, 5,117,259, Cl. 355-203.000.
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Matsui, Toru; and Nishimori, Kadotaro, 5,117,265, Cl. 355-313.000.
Nakai, Etsuko; and Mukai, Hiromu, 5,117,247, Cl. 354-222.000.
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Takemura, Kazutaka; Matsuo, Hirokazu; Morigami, Yusuke; Hamakawa, Wataru; and Ishikawa, Takuma, 5,117,266, Cl. 355-316.000.
Minoshima, Toru: *See—*
Sugiura, Satoshi; Hazato, Atsuo; Minoshima, Toru; Kato, Yoshinori; Koshihara, Yasuko; and Kurozumi, Seizi, 5,116,869, Cl. 514-456.000.
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Lan, Ray; and Tsai, Collins, 5,116,261, Cl. 312-292.000.
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Bruce, Robert; and Mitakidis, Dimitrios, 5,116,671, Cl. 428-309.900.
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Seder, Edmund V.; Coe, Frederick L.; and Mitchell, Martin, 5,116,310, Cl. 604-43.000.
Mitchell, Randall K. Photoelectric joystick displacement detector. 5,117,102, Cl. 250-229.000.
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Eccles, Peter J., 5,117,359, Cl. 364-420.000.
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Teranishi, Yutaka; Takamatsu, Nobuhiko; Matsui, Yasushi; Kimura, Masako; Ikeda, Yasuko; and Morimoto, Yuuki, 5,116,739, Cl. 435-69.600.
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Ogasahara, Johji; Hariu, Hitoshi; and Takahashi, Masakazu, 5,116,628, Cl. 426-330.100.
Mitsubishi Denki K.K.: *See—*
Fukui, Wataru, 5,115,792, Cl. 123-613.000.
Isozumi, Shuzou; and Konishi, Keiichi, 5,115,689, Cl. 74-7.00C.
Ohkubo, Satoru; and Shimomura, Setsuhiro, 5,116,356, Cl. 123-425.000.
Yamamoto, Shunji; and Yamada, Tadatoshi, 5,117,212, Cl. 335-210.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Arimoto, Hironobu, 5,116,271, Cl. 445-24.000.
Demizu, Akira; Nakagawa, Akihiro; and Kuroda, Toshiki, 5,116,259, Cl. 73-117.300.
Ito, Osamu; Ogawa, Masaharu; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Furukawa, Teruo; and Nakajima, Yoshiki, 5,117,412, Cl. 369-109.000.
Kakino, Yoshiaki; Tokumo, Shigeaki; Nakamura, Tetsuo; and Takeshita, Torao, 5,117,169, Cl. 318-578.000.
Komori, Shinji; Takata, Hidehiro; Tamura, Toshiyuki; Asai, Fumiyasu; and Fukuhara, Takeshi, 5,117,489, Cl. 395-375.000.
Miyake, Makoto; and Kojima, Toshiharu, 5,117,427, Cl. 371-37.400.
Nakanishi, Tetsuya; Yamada, Tadatoshi; Yamamoto, Shunji; Matsuda, Tetsuya; and Ushijima, Toshie, 5,117,194, Cl. 328-233.000.
Nakatani, Hiroshi, 5,115,899, Cl. 198-334.000.
Seiwa, Yoshito, 5,116,769, Cl. 437-22.000.
Tsumura, Kiyoaki, 5,116,783, Cl. 437-211.000.
Mitsubishi Gas Chemical Co.: *See—*
Tsukahara, Shuji; Umemura, Toshikazu; and Ichise, Kazuyoshi, 5,116,547, Cl. 264-1.100.
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Hyeon, Suong B., 5,116,406, Cl. 71-103.000.
Komatsu, Toshio; and Inoue, Yoshiaki, 5,116,660, Cl. 428-192.000.

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Morishima, Ryuji, 5,115,773, Cl. 123-179.240.
Murayama, Kimio; Seki, Yukuharu; and Sasashige, Hiroaki, 5,116,448, Cl. 156-350.000.
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Hattori, Eiji; and Oguri, Yasuo, 5,116,885, Cl. 523-200.000.
Hayashi, Yoshio; Morinaka, Yasuhiro; Shinoda, Masaki; Nishi, Hiroyoshi; Watanabe, Kazutoshi; and Fukushima, Nobuko, 5,116,858, Cl. 514-391.000.
Mitsubishi Petrochemical Co., Ltd.: *See—*
Goto, Makoto; Nara, Terukazu; Terasawa, Masato; and Yukawa, Hideaki, 5,116,743, Cl. 435-116.000.
Mitsubishi Rayon Co., Ltd.: *See—*
Tone, Seiji; Takeda, Haruko; and Sugimori, Masahiro, 5,116,910, Cl. 525-244.000.
Yamamoto, Takashi; Matsumoto, Tsuruyoshi; Kobayashi, Tadao; and Shimada, Katsuhiko, 5,117,480, Cl. 385-145.000.
Mitsuboshi Belting Ltd.: *See—*
Kinoshita, Takashi; Nakajima, Masayoshi; and Takeda, Kazuhiro, 5,116,286, Cl. 474-237.000.
Mitsui Petrochemical Industries, Ltd.: *See—*
Handa, Takayuki; and Uda, Naotake, 5,116,082, Cl. 285-21.000.
Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Sera, Akio; and Terunaga, Fukuso, 5,117,191, Cl. 324-551.000.
Mitsui Toatsu Chemicals, Incorporated: *See—*
Nobuyuki, Fukazawa; Iizuka, Hajime; Yano, Osamu; and Miyama, Yukio, 5,116,979, Cl. 544-172.000.
Mitsukuchi, Yukio: *See—*
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,115,546, Cl. 29-27.00C.
Mitutoyo Corporation: *See—*
Kakino, Yoshiaki; Tokumo, Shigeaki; Nakamura, Tetsuo; and Takeshita, Torao, 5,117,169, Cl. 318-578.000.
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Miura, Tsutomu: *See—*
Ohara, Tetsuo; Miura, Tsutomu; Hagiwara, Shinichi; Koshimizu, Shigeomi; and Shimizu, Eiichi, 5,116,281, Cl. 474-1.000.
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Takagi, Masayuki; Okada, Tadaaki; Akai, Naotoshi; Yaguchi, Takashi; Miyadoh, Shinji; Shomura, Takashi; Sasaki, Toru; Sezaki, Masaji; Shimizu, Takao; and Niida, Masashi, 5,116,815, Cl. 514-11.000.
Miyagi, Hiroyuki: *See—*
Ozawa, Satoshi; Oki, Naoto; Shibata, Yasuhisa; and Miyagi, Hiroyuki, 5,116,481, Cl. 204-290.00R.
Miyajima, Kazuhiko, to Alps Electric Co., Ltd. Battery box. 5,116,699, Cl. 429-100.000.
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Katsura, Tadahiko; Matsuoka, Kikuo; Miyake, Kazuo; Taira, Kazuo; Watanabe, Yoshiki; and Ueno, Hiroshi, 5,116,651, Cl. 428-35.700.
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Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, 5,117,159, Cl. 315-366.000.
Miyama, Yukio: *See—*
Nobuyuki, Fukazawa; Iizuka, Hajime; Yano, Osamu; and Miyama, Yukio, 5,116,979, Cl. 544-172.000.
Miyamoto, Hiroshi: *See—*
Okano, Sadao; Hongo, Kazuya; Aonuma, Hidekazu; and Miyamoto, Hiroshi, 5,116,702, Cl. 430-54.000.
Miyamoto, Kouichi: *See—*
Shiotani, Takeshi; Miyamoto, Kouichi; Tsugami, Kunio; Sato, Mitsumasa; and Wada, Tatsuya, 5,116,249, Cl. 83-435.001.
Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washimi, Takeshi; Harada, Naoki; and Akahori, Kingo, to Sumitomo Chemical Company, Limited. Polyazo dye compounds having vinylsulfone type and pyridinium type fiber reactive groups. 5,116,956, Cl. 534-612.000.
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Nagasaki, Tatsutoshi; Miyashita, Takashi; and Yanagisawa, Akihiko, 5,117,315, Cl. 360-71.000.
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Miyauchi, Tateoki: *See—*
Yamaguchi, Hiroshi; Saito, Keiya; and Miyauchi, Tateoki, 5,116,782, Cl. 437-172.000.
Miyawaki, Masanao: *See—*
Torii, Nobutoshi; Mizuno, Hitoshi; and Miyawaki, Masanao, 5,115,690, Cl. 74-479.000.
Miyazaki, Masaaki: *See—*
Inoue, Toshio; Miyazaki, Masaaki; and Kashiwase, Shiuzi, 5,116,908, Cl. 525-193.000.
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Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.
Mizoguchi, Haruko: *See—*
Gilbert, Sheri A.; Mizoguchi, Haruko; Charest, Robert P.; O'Neill, Timothy P.; and Smith, Ronald L., 5,116,847, Cl. 514-327.000.
Mizuki, Hideyuki: *See—*
Sago, Hiroyoshi; Mizuki, Hideyuki; Kudo, Katsuhiko; and Nakayama, Muneo, 5,116,250, Cl. 118-52.000.
Mizumura, Mitsuo: *See—*
Oji, Akihito; Tada, Yukihiro; Sasaki, Noriyuki; and Mizumura, Mitsuo, 5,116,621, Cl. 424-445.000.
Mizune, Takahiro: *See—*
Suzuki, Hidenori; and Mizune, Takahiro, 5,115,758, Cl. 118-322.000.
Mizuno, Hitoshi: *See—*
Torii, Nobutoshi; Mizuno, Hitoshi; and Miyawaki, Masanao, 5,115,690, Cl. 74-479.000.
Mizuno, Koji: *See—*
Oki, Nariyasu; Yokokura, Tsunetoshi; Mizuno, Koji; Shimada, Katsutoshi; and Yamamoto, Kazuyuki, 5,116,231, Cl. 123-52.0MB.
Mizuno, Yukio; and Maruyama, Takashi, to Sumitomo Chemical Co., Ltd. Thermoplastic resin composition. 5,116,906, Cl. 525-68.000.
Mizunuma, Michiyoshi: *See—*
Suhara, Michinori; Takagi, Masaaki; Okuzaki, Yuuji; Tashiro, Kuro; and Mizunuma, Michiyoshi, 5,116,431, Cl. 148-530.000.
Mizuochi, Fumio: *See—*
Osawa, Ken'ichi; Ikeda, Hisao; Mizuochi, Fumio; and Uehara, Hiroyuki, 5,116,945, Cl. 530-215.000.
Mizutani, Takanori: *See—*
Fujii, Hiroyuki; Shirai, Tokuo; Mizutani, Takanori; Nagae, Yoshio; Hetsugi, Koji; Tanizawa, Yasuo; and Kaburagi, Kouji, 5,116,521, Cl. 251-18.000.
Mizutomi, Katsunori: *See—*
Kakuma, Kenji; Mizutomi, Katsunori; and Niwa, Shinichi, 5,117,333, Cl. 361-527.000.
MNC, Inc.: *See—*
Moseley, William T., 5,117,461, Cl. 381-72.000.
Mobil Oil Corporation: *See—*
Avery, Noyes L.; Benjamin, Linda A.; and Law, Derek A., 5,116,523, Cl. 252-45.000.
Givens, Wyatt W., 5,115,574, Cl. 33-714.000.
Mochida, Hiroya: *See—*
Nakagawa, Yutaka; Suga, Ryoichi; Mochida, Hiroya; Tonomura, Masashi; and Shirai, Kazuhiko, 5,117,484, Cl. 395-100.000.
Mochizuki, Hiroshi: *See—*
Ohki, Yoshinori; and Mochizuki, Hiroshi, 5,115,777, Cl. 123-333.000.
Mochizuki, Kentaro: *See—*
Nukaga, Tadashi; Mochizuki, Kentaro; Yamaguchi, Shinji; and Banba, Yoshikazu, 5,115,651, Cl. 68-17.00R.
Mode, Paul: *See—*
Fuller, Gerald G.; Garritano, Ronald F.; and Mode, Paul, 5,115,669, Cl. 73-54.390.
Moellmer, John F.: *See—*
Khan, Mohammad A.; and Moellmer, John F., 5,116,623, Cl. 424-616.000.
Moffatt, John R., to Hewlett-Packard Company. Bleed alleviation in ink-jet inks. 5,116,409, Cl. 106-22.000.
Molders, Theo: *See—*
Bernhardt, Bodo; Dijkhuis, Jan; and Molders, Theo, 5,115,558, Cl. 29-705.000.
Molex Incorporated: *See—*
Bowen, David C.; Dambach, Philip J.; Nelligan, Joseph W., Jr.; and Triner, Irvin R., 5,115,562, Cl. 29-867.000.
Colleran, Stephen; Krehbiel, Fred L.; and Wilson, Bill, 5,116,236, Cl. 439-271.000.
Dechelette, Helen; and Brunker, David L., 5,116,230, Cl. 439-101.000.
Enomoto, Masahiro; Fukushima, Minoru; and Aihara, Shinichi, 5,116,247, Cl. 439-660.000.

Molinari, Egidio: *See—*
Bonaldi, Antonio; and Molinari, Egidio, 5,117,017, Cl. 552-553.000.

Moll, Patrick, to Dr. Ing. h.c.F. Porsche AG. Wheel suspension system for steerable rear wheels of motor vehicles. 5,116,076, Cl. 280-691.000.

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Witter, James S., 5,116,591, Cl. 423-352.000.

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Moller, Paul S., 5,115,996, Cl. 244-12.500.

Moller, Knut: *See—*
Hauser, Bernhard; Gerding, Guillermo; Moller, Knut; Muller, Bernd-Henrik; Rudolph, Gert; and Wiethaup, Wolfgang, 5,115,820, Cl. 131-194.000.

Moller, Paul S., to Moller International, Inc. VTOL aircraft. 5,115,996, Cl. 244-12.500.

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Hannon, Gerard T.; Molnar, James, deceased; and Molnar, Lucienne, executrix, 5,116,335, Cl. 606-62.000.

Molnar, Lucienne, executrix: *See—*
Hannon, Gerard T.; Molnar, James, deceased; and Molnar, Lucienne, executrix, 5,116,335, Cl. 606-62.000.

Momoi, Shoji: *See—*
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,115,546, Cl. 29-27.00C.

Monath, deceased Lajos: *See—*
Gergo, Gyorgy; Vida, Zoltan; Sebestyen, Bela; Nemeth, Jozsef; Viragh, Istvan; Monath, deceased Lajos; and Monath, Gabor, 5,116,104, Cl. 299-16.000.

Monath, Gabor: *See—*
Gergo, Gyorgy; Vida, Zoltan; Sebestyen, Bela; Nemeth, Jozsef; Viragh, Istvan; Monath, deceased Lajos; and Monath, Gabor, 5,116,104, Cl. 299-16.000.

Moncrief, Rick L.; Durfey, Erik J.; and Behensky, Max L., to Atari Games Corporation. Strain gauge pressure-sensitive video game control. 5,116,051, Cl. 273-148.00B.

Mondet, Jean; Papantoniou, Christos; Cheneble, Jean-Charles; and Mahieu, Claude, to L'Oreal. Aerosol hair spray containing a tetrapolymer of acrylic acid, N,N-dimethylacrylamide, N-tert-butylacrylamide, and ethyl methacrylate and a non-halogenated propellant gas. 5,116,601, Cl. 424-47.000.

Monier, Jean-Claude: *See—*
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Costall, Brenda; Naylor, Robert; and Gardaix-Luthereau, Renee, 5,116,857, Cl. 514-370.000.
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Costall, Brenda; Naylor, Robert; and Gardaix-Luthereau, Renee, 5,116,859, Cl. 514-392.000.

Monroe, Kevin T.: *See—*
Erdman, David D.; Monroe, Kevin T.; and Weber, Robert N., 5,117,479, Cl. 385-136.000.

Monsanto Company: *See—*
Asrar, Jawed; and Hardiman, Christopher J., 5,117,327, Cl. 361-323.000.
Janoski, Helen L.; Bayston, Sherrol L.; and Pulwer, Mitchell L., 5,116,991, Cl. 546-315.000.
Paulik, Frank E.; and Schultz, Robert G., 5,117,046, Cl. 560-232.000.
Stern, Michael K.; and Bashkin, James K., 5,117,063, Cl. 564-398.000.

Monte, Charles; White, Paul J.; and Graham, Anne C. Modular electronic keyboard with improved signal generation. 5,115,705, Cl. 84-617.000.

Montgomery, Edward L.: *See—*
Crump, Robert L.; Harris, Ronald T.; Reckley, Samuel E.; Montgomery, Edward L.; and Hurst, Lawrence B., 5,115,850, Cl. 152-209.00R.

Montgomery Elevator Company: *See—*
Nurnberg, Thomas R.; Seggebruch, Ernie G.; and Smith, Kenneth J., 5,115,900, Cl. 198-335.000.

Moo-Young, Murray; Bols, Niels C.; Overgaard, Sandra E.; and Scharer, Jeno M., to University of Waterloo. Immobilization of biologically active material in capsules prepared from a water-soluble polymer and chitosan acetate. 5,116,747, Cl. 435-178.000.

Moore, Daniel W.: *See—*
Dougherty, Alfred P., Jr.; Fernandez, Richard E.; and Moore, Daniel W., 5,115,868, Cl. 169-45.000.

Moore, Henry J., Jr.; and Gidanian, Bijan, to Mor-Flo Industries, Inc. Condensate trap. 5,115,793, Cl. 126-351.000.

Moore, Jerry L. Apparatus for freeing obstructions formed in a hollow surgical suction implement. 5,115,532, Cl. 15-104.920.

Moore, Joseph L. Head, neck and shoulder therapeutic exercise device. 5,116,359, Cl. 606-241.000.

Moore, Richard D.; Peters, Richard K.; and Elmerick, Donald V., to Technostics Corporation. Tristimulus color recognition system with means for compensating for variations in light source color. 5,117,101, Cl. 250-226.000.

Moormann, Randall H., to Tonka Corporation. Compressible ball launcher. 5,115,794, Cl. 124-65.000.

Mor-Flo Industries, Inc.: *See—*
Moore, Henry J., Jr; and Gidanian, Bijan, 5,115,798, Cl. 126-351.000.

Moran, Lyle E.: *See—*
Brown, Terrance O.; Slack, David A.; Alexander, A. Gordon; and Moran, Lyle E., 5,116,522, Cl. 252-18.000.

Moran, Steven M., to Kransco. Bodyboard with side grip contour. 5,116,269, Cl. 441-65.000.

Morenz, Kenneth. Class D MOSFET amplifier and voltage supply balance circuit therefor. 5,117,198, Cl. 330-251.000.

Morgan, A. Charles, Jr.: *See—*
Sivam, Gowsala P.; and Morgan, A. Charles, Jr., 5,116,944, Cl. 530-362.000.

Morgan, Lee Roy: *See—*
Greco, John C.; and McGinity, James W., 5,116,619, Cl. 424-433.000.

Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., to General Electric Company. Compact molded case circuit breaker having anti-turn terminal connectors. 5,117,211, Cl. 335-202.000.

Mori, Hideto: *See—*
Ono, Mitsunori; and Mori, Hideto. 5,117,034, Cl. 558-169.000.

Mori, Hirohiko: *See—*
Urano, Satoshi; Aoki, Kei; Tomita, Nobuaki; and Mori, Hirohiko, 5,117,044, Cl. 560-193.000.

Mori, Hiromi: *See—*
Nakamura, Tatsuya; Mori, Hiromi; Shimamura, Masoyoshi; and Morimoto, Reiko, 5,116,712, Cl. 430-106.000.

Mori, Sanae; Sakamoto, Masaaki; Ishikawa, Hideo; and Nagai, Yoji, to Daido Metal Company Ltd. Multi-layer type sliding bearing of aluminum alloy and method of producing the same. 5,116,692, Cl. 428-650.000.

Mori, Shigeo: *See—*
Motogami, Kenji; and Mori, Shigeo, 5,116,541, Cl. 252-518.000.

Mori, Tatsuya: *See—*
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Fujimoto, Hiroaki; and Fujimoto, Izumi, 5,116,875, Cl. 514-594.000.

Mori, Tetsuzo; Sugino, Takashi; Takaoka, Makoto; Sugiura, Susumu; and Ichikawa, Hiroyuki, to Canon Kabushiki Kaisha. Color image processing apparatus. 5,117,284, Cl. 358-79.000.

Morigami, Yusuke: *See—*
Takemura, Kazutaka; Matsuo, Hirokazu; Morigami, Yusuke; Hamakawa, Wataru; and Ishikawa, Takuma, 5,117,266, Cl. 355-316.000.

Morikawa, Hideaki; Gan, Yasuo; Kogure, Koushiro; and Ooyaba, Takashi, to Pioneer Electronic Corporation. Loudspeaker. 5,115,883, Cl. 181-152.000.

Morikawa, Hideaki: *See—*
Oyaba, Takashi; Morikawa, Hideaki; Gan, Yasuo; and Kanemaki, Naobumi, 5,117,463, Cl. 381-158.000.

Moriki, Yasumitsu; and Numakura, Hirotomo, to Maruma Jyusharyo Kabushiki Kaisha. Curved surface rubbing apparatus. 5,116,391, Cl. 51-26.000.

Morimitsu, Toshihiko; Harada, Naoki; Omura, Takashi; and Kikkawa, Sadanobu, to Sumitomo Chemical Company, Limited. Fiber-reactive monoazo dye compounds having substituted triazinyl bridging group. 5,116,959, Cl. 534-642.000.

Morimoto, Akira: *See—*
Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.

Morimoto, Katsushi: *See—*
Makino, Kenzi; Morimoto, Katsushi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Suzuki, Koichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,405, Cl. 71-94.000.

Morimoto, Makoto: *See—*
Saito, Hiromitsu; Kasai, Masaji; Morimoto, Makoto; Kobayashi, Eiji; Uosaki, Yoichi; Kanda, Yutaka; and Sano, Hiroshi, 5,117,006, Cl. 548-421.000.

Morimoto, Reiko: *See—*
Nakamura, Tatsuya; Mori, Hiromi; Shimamura, Masoyoshi; and Morimoto, Reiko, 5,116,712, Cl. 430-106.000.

Morimoto, Yuki: *See—*
Aratake, Kazuhiko; Horikoshi, Masayoshi; Kato, Fumio; Suzuki, Yasuhiko; and Morimoto, Yuki, 5,116,899, Cl. 524-371.000.

Morimoto, Yuuki: *See—*
Teranishi, Yutaka; Takamatsu, Nobuhiko; Matsui, Yasushi; Kimura, Masako; Ikeda, Yasuko; and Morimoto, Yuuki, 5,116,739, Cl. 435-69.600.

Morinaka, Yasuhiro: *See—*
Hayashi, Yoshio; Morinaka, Yasuhiro; Shinoda, Masaki; Nishi, Hiroyoshi; Watanabe, Kazutoshi; and Fukushima, Nobuko, 5,116,858, Cl. 514-391.000.

Morino, Taisuke; Tanaka, Mami; Kaneko, Fuminori; Ozaki, Takeyuki; and Akiyama, Shuichi, to Sharp Kabushiki Kaisha. High-frequency heating apparatus for automatically processing and heating cooking materials. 5,117,079, Cl. 219-10.55F.

Morioka, Tomoki: *See—*
Hori, Kimihiko; Suzuki, Yasuto; Morioka, Tomoki; Moriwaki, Shigeru; Hirota, Osamu; and Tsuchiya, Shuichi, 5,116,829, Cl. 514-172.000.

Morishima, Ryuji, to Mitsubishi Jukogyo Kabushiki Kaisha. Spiral spring type starter apparatus for an internal combustion engine. 5,115,773, Cl. 123-179.240

Morita, Hideyuki: *See—*
Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.

Morita, Shigeru; and Oka, Masahiko, to Daikin Industries, Ltd. Fluorine-containing acrylic acid derivative and polymer thereof. 5,117,035, Cl. 558-250.000.

Morita, Shinichiro; Takahashi, Nobuya; Shimamoto, Takeshi; Matsuda, Kazuya; and Suzuki, Shigehiko, to Gunze Limited. Process for preparation of dried collagen sponge. 5,116,552, Cl. 264-28.000.

Moriwaki, Shigeru: *See—*
Hori, Kimihiko; Suzuki, Yasuto; Morioka, Tomoki; Moriwaki, Shigeru; Hirota, Osamu; and Tsuchiya, Shuichi, 5,116,829, Cl. 514-172.000.

Moriya, Koichi: *See—*
Kurahashi, Yoshio; Shiokawa, Kozo; Kagabu, Shinzo; Sakawa, Shinji; and Moriya, Koichi, 5,117,053, Cl. 562-506.000.

Morland, Albert H.: *See—*
Sealey, Michael J.; and Morland, Albert H., 5,115,553, Cl. 29-563.000.

Morman, Michael T., to Kimberly-Clark Corporation. Multi-direction stretch composite elastic material. 5,116,662, Cl. 428-198.000.

Morosoli, Rolf: *See—*
Bernier, Roger L.; Kluepfel, Dieter; Morosoli, Rolf; and Shareck, Francois, 5,116,746, Cl. 435-172.300.

Morris, Anthony F.; and Escher, Sina D., to Firmenich SA. Use of methyl abietates for transfer of perfuming compositions during fabric drying. 5,116,656, Cl. 428-131.000.

Morris, Joel, to Upjohn Company, The. Antiinflammatory leukotriene B_4 analogs. 5,116,981, Cl. 546-268.000.

Morris, Robert A.: *See—*
Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., 5,117,211, Cl. 335-202.000.

Moseley, Jane M.: *See—*
Martin, Thomas J.; Moseley, Jane M.; Kemp, Bruce E.; and Wettenhall, Richard E. H., 5,116,952, Cl. 530-399.000.

Moseley, William T., to MNC, Inc. Electroacoustic device for hearing needs including noise cancellation. 5,117,461, Cl. 381-72.000.

Moses, Ronald R.: *See—*
Tillery, Lawrence I.; Cline, Keith W.; Moses, Ronald R.; and Cline, Kurtis K., 5,115,597, Cl. 49-504.000.

Moss, Owen R.: *See—*
Greenspan, Bernard J.; and Moss, Owen R., 5,115,971, Cl. 239-3.000.

Mosser, Mark F.; and Harvey, William A., III, to Sermatech International, Inc. Organic coatings with ion reactive pigments especially for active metals. 5,116,672, Cl. 428-328.000.

Motan Plast-Automation AG: *See—*
Kramer, Walter, 5,115,577, Cl. 34-31.000.

Motogami, Kenji; and Mori, Shigeo, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Ion-conductive polymer electrolyte. 5,116,541, Cl. 252-518.000.

Motorola, Inc.: *See—*
Berry, Thomas G.; Smith, Paul F.; Rohani, Kamyar; Brown, Winfield J., Jr.; and Macnak, Philip P., 5,117,460, Cl. 381-41.000.
Bukhman, Yefim, 5,116,460, Cl. 156-643.000.
Chang, Hungkun J.; Doss, William K.; Nolan, Michael P.; and Buchholz, Dale R., 5,117,236, Cl. 342-367.000.
Davis, James L.; Nounou, Fadia; Suppelsa, Anthony B.; and Pennisi, Robert W., 5,116,433, Cl. 148-24.000.
Davis, Walter L.; and Raghunathan, Kuppuswamy, 5,117,500, Cl. 395-800.000.
Huang, Jenn-Hwa; and Abrokwah, Jonathan K., 5,116,774, Cl. 437-40.000.
Hwang, Bor-Yuan; and Bushey, Thomas P., 5,117,391, Cl. 365-155.000.
Joglekar, Manohar A.; and Aseltine, Philip F., 5,117,450, Cl. 379-58.000.
Karpman, Maurice S., 5,117,279, Cl. 357-72.000.
Lebby, Michael S.; and Norman, Michael P., 5,116,461, Cl. 156-643.000.
Mastroianni, Sal, 5,117,274, Cl. 357-43.000.
Metroka, Michael P.; and Cahill, Stephen V., 5,117,449, Cl. 379-58.000.
Miller, Gary L.; and Nash, James C., 5,117,498, Cl. 395-775.000.
Mischenko, Nicholas, 5,117,073, Cl. 200-61.700.
Oliva, Elio J.; Meadows, Vernon; and Hawkins, Lilbert S., III, 5,117,173, Cl. 320-21.000.
Olson, Carl B., 5,117,503, Cl. 455-51.100.
Weigand, David L., 5,117,441, Cl. 375-90.000.

Motoya, Kaoru: *See—*
Nishizawa, Junichi; and Motoya, Kaoru, 5,117,268, Cl. 357-22.000.

Muacevic, Gojko: *See—*
Harreus, Albrecht; Weber, Karl-Heinz; Stransky, Werner; Walther, Gerhard; Muacevic, Gojko; Stenzel, Jorge C.; and Bechtel, Wolf-Dietrich, 5,116,971, Cl. 540-362.000.

Muenger, Fritz: *See—*
Ammann, Walter; Muenger, Fritz; and Hartmann, Manfred, 5,115,622, Cl. 52-741.000.

Muffett, Dorothy J.: *See—*
Schroeder, Lisa R.; and Muffett, Dorothy J., 5,116,629, Cl. 426-545.000.

Mukai, Hiromu: *See—*
Nakai, Etsuko; and Mukai, Hiromu, 5,117,247, Cl. 354-222.000.

Mulhauser, Michel: *See—*
Botannet, Bernard; Clavel, Jean-Louis; Corbet, Jean-Pierre; and Mulhauser, Michel, 5,117,043, Cl. 560-150.000.

Mullen, Patrick; and Nobile, Frederick E. Light modulating material including liquid crystalline material. 5,116,528, Cl. 252-299.500.

Muller, Bernd-Henrik: *See—*
Hauser, Bernhard; Gerding, Guillermo; Moller, Knut; Muller, Bernd-Henrik; Rudolph, Gert; and Wiethaup, Wolfgang, 5,115,820, Cl. 131-194.000.

Muller, Bruno: *See—*
Jermann, Daniel; and Muller, Bruno, 5,116,043, Cl. 271-213.000.

Muller, Jean-Francois; Tollitte, Francois; Krier, Gabriel; and Pelletier, Marc, to University of Metz, Etablissement Public Caractere Scientifue et Culturel. Laser microprobe interface for a mass spectrometer. 5,117,108, Cl. 250-288.000.

Muller, Kurt; Bohler, Erwin; and Dunki, Jurg, to Oerlikon-Contraves AG. Apparatus for the infeed of cartridges to a firing weapon. 5,115,713, Cl. 89-33.140.

Muller, Kurt; Bohler, Erwin; Ruppen, Bruno; Novet, Hanspeter; and Gerber, Robert, to Oerlikon-Contraves AG. Apparatus for infeeding cartridges. 5,115,714, Cl. 89-33.160.

Mullin, John B.; Cole-Hamilton, David J.; Shenai-Khatkhate, Deodatta V.; and Webb, Paul, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defense in Her Britannic Majesty's Government of the. Method for purification of tellurium and selenium alkyls. 5,117,021, Cl. 556-130.000.

Munch, William D.: *See—*
Rice, Paul P.; and Munch, William D., 5,115,970, Cl. 238-17.000.

Mundi, Linda A.: *See—*
Haushalter, Robert C.; and Mundi, Linda A., 5,117,019, Cl. 556-26.000.

Murakami, Kazuki: *See—*
Noguchi, Naoyuki; Murakami, Kazuki; Kanehisa, Eiji; and Makimoto, Seiji, 5,115,896, Cl. 192-0.052.

Muraki, Masato: *See—*
Kawashima, Haruna; Suzuki, Akiyoshi; and Muraki, Masato, 5,117,254, Cl. 355-43.000.

Muraoka, Yasuhiko: *See—*
Takeuchi, Tomio; Aoyagi, Takaaki; Naganawa, Hiroshi; Hamada, Masa; Muraoka, Yasuhiko; and Aoyama, Takayuki, 5,117,052, Cl. 562-461.000.

Murase, Kiyoshi: *See—*
Mase, Toshiyasu; Murase, Kiyoshi; Hara, Hiromu; and Tomioka, Kenichi, 5,116,853, Cl. 514-363.000.

Murata Manufacturing Co., Ltd.: *See—*
Nakamura, Takeshi; Fujimoto, Katsumi; and Inoue, Jiro, 5,117,148, Cl. 310-367.000.
Sano, Harunobu; Omori, Nagato; Kohno, Yoshiaki; and Sakabe, Yukio, 5,117,326, Cl. 361-321.000.
Yoshida, Ryuhei, 5,117,147, Cl. 310-320.000.

Murayama, Kimio; Seki, Yukuharu; and Sasashige, Hiroaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Single facter capable of maintaining a constant roll gap. 5,116,448, Cl. 156-350.000.

Murdock, Keith C.; and Lee, Ving J., to American Cyanamid Company. Quinolinecarboxylic acid derivatives as solubilized pro-drugs. 5,116,827, Cl. 514-82.000.

Murphy, Felicia L.: *See—*
Cech, Thomas R.; Murphy, Felicia L.; Zaug, Arthur J.; and Grosshans, Cheryl, 5,116,742, Cl. 435-91.000.

Murphy, Raymond A.: *See—*
Hsu, Adam C.; Aller, Harold E.; Murphy, Raymond A.; Le, Dat P.; Hamp, Donald W.; and Weinstein, Barry, 5,117,057, Cl. 564-149.000.

Murphy, Robert H., to R. H. Murphy Co., Inc. Electrical component carrier with shock absorbing means. 5,115,912, Cl. 206-334.000.

Murray, Kenneth D.: *See—*
Batchelder, John S.; Gross, Vaughn P.; Hobbs, Philip C. D.; Miller, Robert J.; and Murray, Kenneth D., 5,116,583, Cl. 422-186.070.

Murray, William V., to Ortho Pharmaceutical Corporation. N-hydroxy, N-methyl propanamides. 5,117,054, Cl. 562-621.000.

Mutoh Industries Ltd.: *See—*
Matsushima, Toshiaki, 5,117,242, Cl. 346-1.100.

Myers, Jay E., to Andiamo, Inc. Luggage with assembled frame. 5,115,895, Cl. 190-18.00A.

Myers, Terry N., to Atochem North America, Inc. Hindered amine light stabilizer hydrazides. 5,116,976, Cl. 546-20.000.

Myers, Wilbur J.; and Sanders, Michael E., to Conoco Inc. Support stand for marine vibrator. 5,117,402, Cl. 367-143.000.

N. V. Raychem S.A.: *See—*
Van Beersel, Josef F. L., 5,116,354, Cl. 405-154.000.

Naan Mechanical Works: *See—*
Alkalay, Uri; and Gorney, Moshe, 5,115,977, Cl. 239-68.000.

Nadkarni, Sadashiv K.; and Jain, Mukesh K., to Alcan International Limited. Process for producing fibres composed of or coated with carbides or nitrides. 5,116,679, Cl. 428-367.000.

Nagae, Hirao: *See—*
Misaki, Hideo; Ueda, Shigeru; Watanabe, Kazuhiro; Ishikawa, Yuzo; Nagae, Hirao; and Matsuzawa, Takashi, 5,117,467, Cl. 382-6.000.

Nagae, Moriyasu: *See—*
Abe, Nakatsugu; Suzuki, Haruo; Tsukamoto, Hiroaki; Tsuyama, Seishi; and Nagae, Moriyasu, 5,116,571, Cl. 420-110.000.

Nagae, Yoshio: *See—*
Fujii, Hiroyuki; Shirai, Tokuo; Mizutani, Takanori; Nagae, Yoshio; Hetsugi, Koji; Tanizawa, Yasuo; and Kaburagi, Kouji, 5,116,521, Cl. 251-18.000.

Nagai, Yoji: *See—*
Mori, Sanae; Sakamoto, Masaaki; Ishikawa, Hideo; and Nagai, Yoji, 5,116,692, Cl. 428-650.000.
Naganawa, Hiroshi: *See—*
Takeuchi, Tomio; Aoyagi. Takaaki; Naganawa, Hiroshi; Hamada, Masa; Muraoka, Yasuhiko; and Aoyama, Takayuki, 5,117,052, Cl. 562-461.000.
Nagano, Masashi, to Shimano Inc. Bicycle pedal. 5,115,692, Cl. 74-594.400.
Nagano, Mitsuo: *See—*
Iwata, Nobuyoshi; Yoshimi, Kenji; and Nagano, Mitsuo, 5,116,839, Cl. 514-236.800.
Nagao, Yuji; and Kinoshita, Yoshihiro, to Sigma, Incorporated. Slot machine. 5,116,050, Cl. 273-143.00R.
Nagaoka, Takeshi: *See—*
Makino, Kenzi; Morimoto, Katsushi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Suzuki, Koichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,405, Cl. 71-94.000.
Nagasaki, Kojyu: *See—*
Yoshida, Shigeo; Fujimoto, Isamu; Suzuki, Hideyuki; Asano, Hiroshi; Hosaka, Toru; Onion, Takashi; Nagasaki, Kojyu; Matsuoka, Kenichi; and Taura, Kazufumi, 5,117,100, Cl. 250-221.000.
Nagasaki, Tatsutoshi; Miyashita, Takashi; and Yanagisawa, Akihiko, to Fuji Electric Co., Ltd. System and method for starting rotation of a disc in a disc storage unit. 5,117,315, Cl. 360-71.000.
Nagasawa, Shinobu: *See—*
Takahashi, Mamoru; Nagasawa, Shinobu; Ikuta, Shigeru; and Matsuura, Kazuo, 5,116,748, Cl. 435-189.000.
Nagasawa, Takeshi: *See—*
Nakatsuyama, Shuichi; Nakamura, Yoshio; Kuroiwa, Katsumasa; and Nagasawa, Takeshi 5,116,941, Cl. 530-331.000.
Nagase, Takashi; and Higashi. Kouichi, to Kabushiki Kaisha Yaskawa Denki Seisakusho. Absolute encoder. 5,117,105, Cl. 250-231.180.
Nagata, Kojiro, to Tachi-s Co , Ltd. Suspension device for automotive seat. 5,116,016, Cl. 248-578.000.
Nagata, Miyuki, to Kabushiki Kaisha Toshiba. Method for accessing microprocessor and microinstruction control type microprocessor including pointer register. 5,117,487, Cl. 395-375.000.
Nagler, Gunter: *See—*
Genreith, Hans; Marx, Norbert; and Nagler, Gunter, 5,116,022, Cl. 251-175.000.
Nagubandi, Sreeramulu: *See—*
Brigati, David J.; Nagubandi, Sreeramulu; and Arvanaghi, Massoud, 5,116,732, Cl. 435-26.000.
Nagura, Hiroyuki: *See—*
Tate, Takuo; Watanabe, Taketoshi; and Nagura, Hiroyuki, 5,116,478, Cl. 162-358.000.
Nair, Ramakrishna A.: *See—*
Anderson, Ordean S.; Anderson, Donald E.; Nair, Ramakrishna A.; and Riebel, Michael J., 5,117,240, Cl. 343-786.000.
Nakagawa, Akihiro: *See—*
Demizu, Akira; Nakagawa, Akihiro; and Kuroda, Toshiki, 5,116,259, Cl. 73-117.300.
Nakagawa, Etsuo: *See—*
Yamamoto, Testushi; Niwano, Masaru; and Nakagawa, Etsuo, 5,116,437, Cl. 148-287.000.
Nakagawa, Hiromu. Lens cleaner for a compact disk player. 5,117,411, Cl. 369-72.000.
Nakagawa, Takeyuki: *See—*
Takeuchi, Takashi; and Nakagawa, Takeyuki, 5,116,031, Cl. 269-87.300.
Nakagawa, Yutaka; Suga, Ryoichi; Mochida, Hiroya; Tonomura, Masashi; and Shirai, Kazuhiko, to Sony Corporation. Terminal apparatus for videotex system. 5,117,484, Cl. 395-100.000.
Nakai, Etsuko; and Mukai, Hiromu, to Minolta Camera Kabushiki Kaisha. Viewfinder optical system compensated in macrophotographic or parallox diopter 5,117,247, Cl. 354-222.000.
Nakai, Souichi: *See—*
Takegawa, Yujiro; and Nakai, Souichi, 5,116,276, Cl. 139-351.000.
Nakajima, Masayoshi: *See—*
Kinoshita, Takashi; Nakajima, Masayoshi; and Takeda, Kazuhiro, 5,116,286, Cl. 474-237.000.
Nakajima, Noboru: *See—*
Koyama, Noboru; Kawahara, Setsuko; Ren, Rieko; Kumamoto, Kenji; and Nakajima, Noboru, 5,116,683, Cl. 428-403.000.
Nakajima, Saburo, to Fuji Photo Film Co., Ltd. Apparatus for assembling magnetic disk cartridge and method of producing same. 5,115,961, Cl. 228-111.000.
Nakajima, Shigeo: *See—*
Mikami, Akiyoshi; Ogura, Takashi; Terada, Kousuke; Yoshida, Masaru; Yamashita, Takuo; Tanaka, Koichi; Okibayashi, Katsushi; Nakajima, Shigeo; Nakaya, Hiroaki; and Taniguchi, Kouji, 5,116,640, Cl. 427-66.000.
Nakajima, Tsunetaka; Okamoto, Tadao; Kondo, Nobuo; Watanabe, Masahiro; Yamauchi, Koichi; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, to Ishihara Sangyo Kaisha Ltd.; and Green Cross Corporation, The. Benzoyl urea compound-albumin complex. 5,116,949, Cl. 530-363.000.
Nakajima, Yoshiki: *See—*
Ito, Osamu; Ogawa, Masaharu; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Furukawa. Teruo; and Nakajima, Yoshiki, 5,117,412, Cl. 369-109.000.
Nakamori, Tomohiro: *See—*
Abe, Hitoshi; and Nakamori, Tomohiro, 5,116,811, Cl. 505-1.000.
Nakamura, Hideo: *See—*
Noguchi, Kouki; Tsuchiya, Fumio; Tsukamoto, Takashi; Masumura, Shigeki; Nakamura, Hideo; Baba, Shiro; and Hagiwara, Yoshimune, 5,117,488, Cl. 395-375.000.
Nakamura, Hiroshi: *See—*
Takeshita, Yasuyoshi; Nakamura, Hiroshi; Ishiguro, Susumu; Kwaguchi, Noboru; Shimada, Shin'ichi; Koyama, Tadayoshi; Seya, Motohide; Abe, Noriko; and Nomoto, Shin, 5,116,985, Cl. 546-141.000.
Nakamura, Hisashi; Kubo, Kenichi; Ohishi, Takashi; and Hitoshi, Hosokawa, to Zexel Corporation. Method for varying the flow rate of fuel in a distributor-type electronic control fuel-injection pump. 5,115,783, Cl. 123-496.000.
Nakamura, Kazumitsu; Kato, Shinichi; Sakitani, Yoshio; and Minamikawa, Yoshihisa, to Hitachi, Ltd. Electron beam measuring apparatus. 5,117,111, Cl. 250-310.000.
Nakamura, Koki: *See—*
Ito, Takayuki; and Nakamura, Koki, 5,117,064, Cl. 564-399.000.
Nakamura, Kyuzo; Ishibashi, Satoru; Ota, Yoshifumi; and Higuchi, Yasushi, to Nihon Shinku Gijutsu Kabushiki Kaisha. Process for producing transparent conductive film comprising indium oxide. 5,116,479, Cl. 204-192.130.
Nakamura, Masaru: *See—*
Nomura, Shinzou; Katsushima, Hiroshi; Kawasaki, Toru; Unoki, Masao; and Nakamura, Masaru, 5,117,272, Cl. 357-52.000.
Nakamura, Norihiko: *See—*
Nomura, Hiroshi; Nakamura, Norihiko; Nomura, Kenichi; Kobayashi, Tatsuo; and Nihei, Hiroaki, 5,115,774, Cl. 123-276.000.
Nakamura, Takeshi; Fujimoto, Katsumi; and Inoue, Jiro, to Murata Manufacturing Co., Ltd. Vibrator. 5,117,148, Cl. 310-367.000.
Nakamura, Tatsuya; Mori, Hiromi; Shimamura, Masoyoshi; and Morimoto, Reiko, to Canon Kabushiki Kaisha. Color toner containing organic pigment and process for producing the same. 5,116,712, Cl. 430-106.000.
Nakamura, Tetsuo: *See—*
Kakino, Yoshiaki; Tokumo, Shigeaki; Nakamura, Tetsuo; and Takeshita, Torao, 5,117,169, Cl. 318-578.000.
Nakamura, Tsutomu: *See—*
Takaragi, Kazuo; Sasaki, Ryoichi; Nakamura, Tsutomu; Koizumi, Minoru; Fukuzawa, Yasuko; and Kataoka, Kenji, 5,117,458, Cl. 380-4.000.
Nakamura, Yoshio: *See—*
Nakatsuyama, Shuichi; Nakamura, Yoshio; Kuroiwa, Katsumasa; and Nagasawa, Takeshi, 5,116,941, Cl. 530-331.000.
Nakamura, Yukitsugu; Hamano, Yoshimasa; Masuda, Takashi; Matsumura, Isao; Maruyama, Shigeo; and Kobayashi, Kazunobu, to Canon Kabushiki Kaisha. Ophthalmologic apparatus. 5,116,114, Cl. 351-205.000.
Nakanishi, Kanji; Shimizu, Osamu; Yoshida, Satoshi; Katayama, Masaaki; and Isomura, Tatsuya, to Fuji Photo Film Co., Ltd. Soft magnetic thin film, method for preparing same and magnetic head. 5,117,321, Cl. 360-120.000.
Nakanishi, Tetsuya; Yamada, Tadatoshi; Yamamoto, Shunji; Matsuda, Tetsuya; and Ushijima, Toshie, to Mitsubishi Denki Kabushiki Kaisha. Device for accelerating and storing charged particles. 5,117,194, Cl. 328-233.000.
Nakano, Masao; Kawamoto, Satoru; and Watanabe, Akihiko, to Fujitsu Limited; and Fujitsu VLSI Limited. Serial input/output semiconductor memory. 5,117,388, Cl. 365-73.000.
Nakao, Yasushi: *See—*
Yabuta, Motoshi; Yukawa, Yoshiyuki; and Nakao, Yasushi, 5,116,930, Cl. 528-45.000.
Nakata, Kiyotomo: *See—*
Kasahara, Shigeki; Nakata, Kiyotomo; Kuniya, Jiro; and Hattori, Shigeo, 5,116,569, Cl. 420-44.000.
Nakatani, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Dual-speed escalator apparatus. 5,115,899, Cl. 198-334.000.
Nakatani, Naofumi: *See—*
Ueno, Reiko; Nakatani, Naofumi; Ikezaki, Masao; Yamamoto, Terumasa; and Nakatsu, Hiromasa, 5,117,070, Cl. 178-2.00R.
Nakatsu, Hiromasa: *See—*
Ueno, Reiko; Nakatani, Naofumi; Ikezaki, Masao; Yamamoto, Terumasa; and Nakatsu, Hiromasa, 5,117,070, Cl. 178-2.00R.
Nakatsuyama, Shuichi; Nakamura, Yoshio; Kuroiwa, Katsumasa; and Nagasawa, Takeshi, to Nitto Boseki Co., Ltd. Peptide substrates for determination of enzyme activity. 5,116,941, Cl. 530-331.000.
Nakaya, Hiroaki: *See—*
Mikami, Akiyoshi; Ogura, Takashi; Terada, Kousuke; Yoshida, Masaru; Yamashita, Takuo; Tanaka, Koichi; Okibayashi, Katsushi; Nakajima, Shigeo; Nakaya, Hiroaki; and Taniguchi, Kouji, 5,116,640, Cl. 427-66.000.
Nakayama, Junichiro: *See—*
Ohta, Kenji; Katayama, Hiroyuki; Nakayama, Junichiro; Kimura, Kazuhiro; Matoba, Hirotsugu; and Kobayashi, Shozo, 5,117,415, Cl. 369-271.000.
Nakayama, Kazunari: *See—*
Ishii, Shigeru; Nakayama, Kazunari; Yagi, Kazuo; Satow, Jun; Fukuda, Kenzou; Itoh, Kaoru; Umehara, Toshiyuki; Kudo, Masaki; Inoue, Yoichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,404, Cl. 71-92.000.
Nakayama, Muneo: *See—*
Sago, Hiroyoshi; Mizuki, Hideyuki; Kudo, Katsuhiko; and Nakayama, Muneo, 5,116,250, Cl. 118-52.000.
Nakazato, Atsuro, Kitsukawa, Sanae; Kawashima, Yutaka; Hatayama, Katsuo; and Hibino, Satoshi, to Taisho Pharmaceutical Co., Ltd. Carbazole compounds. 5,116,995, Cl. 548-444.000.

Nakazawa, Shinsuke: *See—*
Sasaki, Hiroshi; Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinichi, 5,115,694, Cl. 74-844.000.
Nalco Chemical Company: *See—*
Bhattacharyya, Bhupati R., deceased; Huang, Shu-Jen; Shetty, Chandrashekar S.; Bui, Nang T.; and Dunn, Yvonne O., 5,116,514, Cl. 210-712.000.
Namkung, Min: *See—*
Allison, Sidney G.; Namkung, Min; Yost, William T.; and Cantrell, John H., 5,117,184, Cl. 324-239.000.
Nanba, Katsuyuki: *See—*
Fujino, Akihiko; Ichikawa, Tsutomu; Nanba, Katsuyuki; and Taniguchi, Nobuyuki, 5,117,250, Cl. 354-400.000.
Nar, Ramesh G., to North American Philips Corporation. Multipole circuit breaker. 5,117,208, Cl. 335-8.000.
Nara, Terukazu: *See—*
Goto, Makoto; Nara, Terukazu; Terasawa, Masato; and Yukawa, Hideaki, 5,116,743, Cl. 435-116.000.
Narayanan, G. Hari; Curtis, R. Eugene; Quist, William E.; Hyatt, Michael V.; and Axter, Sven E., to Boeing Company, The. Aluminum-lithium alloy. 5,116,572, Cl. 420-533.000.
Narita, Sen-ichi: *See—*
Shibasaki, Masakatsu; Takahashi Atsuo; Aoki, Tuyoshi; Sato, Hiroyasu; Yamada, Shin-ichi; Kudo, Michiko; Yamaguchi, Takaji; Kogi, Kentaro; and Narita, Sen-ichi, 5,117,037, Cl. 560-53.000.
Narlock, Lori L.; and Emmel, Gregg. Food utensil. 5,115,565, Cl. 30-123.600.
Narr, Berthold: *See—*
Bomhard, Andreas; Heider, Joachim; Psiorz, Manfred; Hauel, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Diederen, Willi, 5,116,986, Cl. 546-141.000.
Nash, Alan J., to Lucas Industries Public Limited Company. Memory addressing system using first and second address signals and modifying second address responsive predetermined values of first address signal. 5,117,492, Cl. 395-400.000.
Nash, James C.: *See—*
Miller, Gary L.; and Nash, James C., 5,117,498, Cl. 395-775.000.
Nash-Morgan, Leonora E. Disposable, elasticized adhesive neck and facial wrinkle gathering device. 5,116,675, Cl. 428-343.000.
National Research Council of Canada: *See—*
Legg, Thomas H., 5,117,237, Cl. 342-372.000.
National Research Development Corporation: *See—*
Davidson, Robert S.; and Wilkinson, Susan A., 5,116,876, Cl. 522-1.000.
National Semiconductor Corp.: *See—*
Amin, Alaaeldin A. M.; and Emoto, Bernard, 5,117,394, Cl. 365-203.000.
Hall, Christopher M., 5,117,442, Cl. 375-107.000.
Mayes, Michael K., 5,117,125, Cl. 307-296.200.
Miller, William D.; and Chapin, Leo N., 5,116,643, Cl. 427-126.300.
Natwick, Vernon R.; Lawless, Michael W.; Doll, Joseph E.; and Wu, Chung-You C., to Abbott Laboratories. Detecting occlusion of proximal or distal lines of an IV pump. 5,116,203, Cl. 417-53.000.
Naumann, Dirk: *See—*
Giersberg, Joachim; Naumann, Dirk; and Honselmann, Frank, 5,116,468, Cl. 204-96.000.
Nauta, Bram, to U.S. Philips Corporation. Electrically controllable oscillator circuit, and electrically controllable filter arrangement comprising said circuits. 5,117,205, Cl. 331-117.0FE.
Nave, Mirian D.: *See—*
Huang, Tzu-Li J.; Hammar, Walton J.; Coderre, James C.; and Nave, Mirian D., 5,117,304, Cl. 359-529.000.
Navistar International Transportation Corp.: *See—*
Gehres, Michelle R., 5,115,542, Cl. 24-543.000.
Nawa, Toshiaki: *See—*
Kimura, Takashi; and Nawa, Toshiaki, 5,117,097, Cl. 235-439.000.
Nawamaki, Tsutomu: *See—*
Ishii, Shigeru; Nakayama, Kazunari; Yagi, Kazuo; Satow, Jun; Fukuda, Kenzou; Itoh, Kaoru; Umehara, Toshiyuki; Kudo, Masaki; Inoue, Yoichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,404, Cl. 71-92.000.
Makino, Kenzi; Morimoto, Katsushi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Suzuki, Koichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,405, Cl. 71-94.000.
Naylor, Alan; and Judd, Duncan B., to Glaxo Group Limited. Chemical compounds. 5,116,842, Cl. 514-252.000.
Naylor, Robert: *See—*
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Costall, Brenda; Naylor, Robert; and Gardaix-Luthereau, Renee, 5,116,857, Cl. 514-370.000.
Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Costall, Brenda; Naylor, Robert; and Gardaix-Luthereau, Renee, 5,116,859, Cl. 514-392.000.
NDM Acquisition Corp.: *See—*
Cartmell, James V.; Wolf, Michael L.; Allaire, Michael J.; and Sturtevant, Wayne R., 5,115,801, Cl. 602-48.000.
Nealon, John L.: *See—*
Sullivan, Michael J.; Nesbitt, R. Dennis; and Nealon, John L., 5,116,060, Cl. 273-218.000.
NEC Corporation: *See—*
Adachi, Takao, 5,117,280, Cl. 357-72.000.
Aso, Akira, 5,117,134, Cl. 307-475.000.
Hirai, Yoshihiko, 5,117,298, Cl. 359-55.000.
Katsuraoka, Kiyoshi, 5,117,281, Cl. 357-81.000.
Konda, Tsutomu; Fujioka, Seiichiro; Tamura, Satoshi; Matsubara, Osamu; and Yoshida, Shodo, 5,117,160, Cl. 315-326.000.
Neles-Jamesbury, Inc.: *See—*
Champagne, Raymond P., 5,115,834, Cl. 137-385.000.
Neles-Jamesbury Oy: *See—*
Rohweder, Reimer; and Pyotsia, Jouni, 5,116,019, Cl. 251-127.000.
Nelligan, Joseph W., Jr.: *See—*
Bowen, David C.; Dambach, Philip J.; Nelligan, Joseph W., Jr.; and Triner, Irvin R., 5,115,562, Cl. 29-867.000.
Nelson, James L., to Highland Plastics, Inc. Tamper resistant container lid. 5,115,934, Cl. 220-276.000.
Nelson, Terence J.; and Smoot, Lanny S., to Bell Communications Research. Eye contact apparatus for video conferencing. 5,117,285, Cl. 358-85.000.
Nelson, Thomas L., to Du Pont de Nemours, E. I., and Company. Lightly bonded polyamide yarns and process therefor. 5,116,680, Cl. 428-369.000.
Nemeth, Jozsef: *See—*
Gergo, Gyorgy; Vida, Zoltan; Sebestyen, Bela; Nemeth, Jozsef; Viragh, Istvan; Monath, deceased Lajos; and Monath, Gabor, 5,116,104, Cl. 299-16.000.
Nemirovsky, Mario D.; and Sale, Matthew D., to Delco Electronics Corporation. Microprogrammed timer processor. 5,117,387, Cl. 395-375.000.
Nemoto & Co., Ltd.: *See—*
Misaki, Hideo; Ueda, Shigeru; Watanabe, Kazuhiro; Ishikawa, Yuzo; Nagae, Hirao; and Matsuzawa, Takashi, 5,117,467, Cl. 382-6.000.
Nemoto, Isao: *See—*
Sakamoto, Kazunari; and Nemoto, Isao, 5,115,886, Cl. 182-36.000.
Nemoto Kikaku Kogyo Co., Ltd.: *See—*
Sakamoto, Kazunari; and Nemoto, Isao, 5,115,886, Cl. 182-36.000.
NeoRx Corporation: *See—*
Sivam, Gowsala P.; and Morgan, A. Charles, Jr., 5,116,944, Cl. 530-362.000.
Nesbitt, R. Dennis: *See—*
Sullivan, Michael J.; Nesbitt, R. Dennis; and Nealon, John L., 5,116,060, Cl. 273-218.000.
Nestor, Ontario H., to Solon Technologies, Inc. Apparatus and method for growth of large single crystals in plate/slab form. 5,116,456, Cl. 156-616.100.
Neubauer, Hans-Juergen: *See—*
Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, 5,116,860, Cl. 514-399.000.
Neukom, Christian: *See—*
Switchenko, Arthur C.; Kurn, Nurith; Neukom, Christian; Pirio, Marc¹ Berger, Donald E., Jr.; and Ullman, Edwin F., 5,116,726, Cl. 435-5.000.
New Focus, Inc.: *See—*
Luecke, Francis S., 5,116,004, Cl. 248-161.000.
New, James S.; and Christopher, William J. Psychotropic heterobicycloalkylpiperazine derivatives: 2. fused pyridazinones. 5,116,970, Cl. 544-235.000.
Newman, William H.; and Burgess, Ralph G., to Massachusetts Institute of Technology. Temperature measurements using thermistor elements. 5,116,136, Cl. 374-102.000.
Newsam, John M.: *See—*
Vaughan, David E. W.; Strohmaier, Karl G.; Treacy, Michael M. J.; and Newsam, John M., 5,116,590, Cl. 423-328.000.
Newton, Alan B., to Imperial Chemical Industries PLC. Aromatic polymer. 5,116,933, Cl. 528-125.000.
Newton, Anthony J.; and Budney, David, to Vacuglas, Inc. Transparent thermal panel. 5,115,612, Cl. 52-208.000.
Nezu, Yukuo: *See—*
Asakawa, Naoki; Ohe, Hiroshi; Yoshida, Yutaka; Sato, Tadashi; Nezu, Yukuo; and Oda, Yoshiya, 5,117,109, Cl. 250-288.000.
NGK Insulators, Ltd.: *See—*
Tsuno, Nobuo; Matsuhiro, Keiji; and Sakai, Hitoshi, 5,116,809, Cl. 505-1.000.
Nichandros, Frederick C. Gate latch cam. 5,116,090, Cl. 292-236.000.
Nicholas, Keith L.: *See—*
Erb, David J.; Nicholas, Keith L.; Phillips, Howard C.; and Wasilko, John M., 5,115,560, Cl. 29-747.000.
Nichols, Edward L., III: *See—*
Hogarth, Peter T.; Swenson, Kurt; Gutenson, Charles E.; Nichols, Edward L., III; Roberts, Lincoln E.; and Miller, Vernon R., 5,117,122, Cl. 307-140.000.
Nichols, Will E. Dishwasher basket assembly including lift mechanism. 5,115,822, Cl. 134-135.000.
Nick, Bernhard: *See—*
Leyrer, Reinhold J.; Lauke, Harald; Nick, Bernhard; Strohriegl, Peter; and Haarer, Dietrich, 5,116,911, Cl. 525-329.900
Nicolaus, Frank: *See—*
Debaes, Bernard; De Winter, Hugo; and Nicolaus, Frank, 5,116,557, Cl. 264-46.600.
Niebauer, Kenneth L., to Kennametal Inc. Cutting insert with chip control. 5,116,167, Cl. 407-114.000.
Niedrig, Franklin, to Strapex AG. Strapping apparatus for a packaging strap. 5,116,453, Cl. 156-580.000.
Nielsen, Paul H.: *See—*
Savage, Howard S.; and Nielsen, Paul H., 5,117,065, Cl. 174-35.0MS.
Nienhuis, James H.; Clark, Jeffrey L.; and Gezon, Bruce R., to Herman Miller, Inc. Power panel structure. 5,116,235, Cl. 439-215.000.

Nihei, Hiroaki: *See—*
Nomura, Hiroshi; Nakamura, Norihiko; Nomura, Kenichi; Kobayashi, Tatsuo; and Nihei, Hiroaki, 5,115,774, Cl. 123-276.000.

Nihon Parkerizing Co., Ltd.: *See—*
Fujii, Hiroyuki; Shirai, Tokuo; Mizutani, Takanori; Nagae, Yoshio; Hetsugi, Koji; Tanizawa, Yasuo; and Kaburagi, Kouji, 5,116,521, Cl. 251-18.000.
Hirai, Eiji; Kurosawa, Kazuyoshi; and Matsumura, Yoshio, 5,116,430, Cl. 148-518.000.

Nihon Shinku Gijutsu Kabushiki Kaisha: *See—*
Nakamura, Kyuzo; Ishibashi, Satoru; Ota, Yoshifumi; and Higuchi, Yasushi, 5,116,479, Cl. 204-192.130.

Nihon Tokushu Noyaku Seizo K.K.: *See—*
Kurahashi, Yoshio; Shiokawa, Kozo; Kagabu, Shinzo; Sakawa, Shinji; and Moriya, Koichi, 5,117,053, Cl. 562-506.000.

Niida, Masashi: *See—*
Takagi, Masayuki; Okada, Tadaaki; Akai, Naotoshi; Yaguchi, Takashi; Miyadoh, Shinji; Shomura, Takashi; Sasaki, Toru; Sezaki, Masaji; Shimizu, Takao; and Niida, Masashi, 5,116,815, Cl. 514-11.000.

Niimura, Koichi: *See—*
Yamada, Sachiko; Niimura, Koichi; Fukushima, Kenji; and Maeda, Yuji, 5,116,573, Cl. 424-1.100.

Niioka, Yoshio, to Niioka, Yoshio; and Gottlieb, Marvin. Electromagnetic wave absorber. 5,117,229, Cl. 342-1.000.

Nijkamp B.V.: *See—*
Vennik, Johan, 5,116,258, Cl. 135-20.300.

Nikodijevic, Olga: *See—*
Klein, David C.; and Nikodijevic, Olga, 5,116,867, Cl. 514-534.000.

Nikolich, Milovan A., to Illinois Tool Works Inc. Fluid dispenser having a collapsible inner bag. 5,115,944, Cl. 222-94.000.

Nikon Corporation: *See—*
Shiraishi, Naomasa; Taniguchi, Tetsuo; and Kawai, Hidemi, 5,117,255, Cl. 355-53.000.

Nilsen, Joseph, to United States of America, Energy. Vanadium-pumped titanium x-ray laser. 5,117,432, Cl. 372-5.000.

Ninomiya, Masakazu: *See—*
Kurita, Noriaki; Ninomiya, Masakazu; and Kishita, Kazunori, 5,115,781, Cl. 123-481.000.

Nippon Electric Glass Co., Ltd.: *See—*
Matsuura, Ichiro, 5,116,736, Cl. 501-15.000.

Nippon Filcon Co., Ltd.: *See—*
Tate, Takuo; Watanabe, Taketoshi; and Nagura, Hiroyuki, 5,116,478, Cl. 162-358.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Abe, Nakatsugu; Suzuki, Haruo; Tsukamoto, Hiroaki; Tsuyama, Seishi; and Nagae, Moriyasu, 5,116,571, Cl. 420-110.000.

Nippon Oil Company, Limited: *See—*
Shikatani, Yutaka; Kataoka, Naoki; Kuroda, Nobuyuki; and Matsura, Kazuo, 5,116,708, Cl. 430-59.000.

Nippon Oil and Fats Co., Ltd.: *See—*
Masuoka, Shigeru; and Honda, Yoshihiro, 5,116,611, Cl. 424-78.090.
Suyama, Shuji; Katoh, Mitsukuni; and Nishikawa, Tooru, 5,117,047, Cl. 560-302.000.

Nippon Paint Co., Ltd.: *See—*
Urano, Satoshi; Aoki, Koji; Tomita, Nobuaki; and Mori, Hirohiko, 5,117,044, Cl. 560-193.000.

Nippon Petrochemicals Company, Limited: *See—*
Inoue, Toshio; Miyazaki, Masaaki; and Kashiwase, Shiuzi, 5,116,908, Cl. 525-193.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Kobayashi, Motonobu; Kinoshita, Futoru; Hagi, Mitsuharu; Inoue, Akira; and Uno, Teruhige, 5,116,579, Cl. 422-111.000.

Nippon Steel Corporation: *See—*
Minamida, Katsuhiro; Sugihashi, Atsushi; and Kido, Motoi, 5,116,688, Cl. 428-582.000.
Sakashita, Masao; Sakamoto, Tetsuo; Kazama, Shingo; Harada, Yoshiyuki; Teramoto, Takero; Watanabe, Kazuhiro; Shimomura, Bunji; and Kaneta, Tsutomu, 5,116,504, Cl. 210-500.230.
Taniguchi, Hirokazu; Konya, Shogo; and Okamoto, Akira, 5,116,646, Cl. 427-383.500.

Nippon Telegraph and Telephone Corporation: *See—*
Inoue, Yasuyuki; Okuno, Masayuki; and Kawachi, Masao, 5,117,470, Cl. 385-14.000.
Oyaba, Takashi; Morikawa, Hideaki; Gan, Yasuo; and Kanemaki, Naobumi, 5,117,463, Cl. 381-158.000.

Nippon Unicar Company Limited: *See—*
Hirose, Kunihiro; and Inoue, Takashi, 5,116,896, Cl. 525-190.000.

Nippon Zoki Pharmaceutical Co., Ltd.: *See—*
Miura, Tomoshi; Aonuma, Shinichiro; and Ohara, Hiroyuki, 5,116,828, Cl. 514-171.000.

Nippondenso Co., Ltd.: *See—*
Aratake, Kazuhiko; Horikoshi, Masayoshi; Kato, Fumio; Suzuki, Yasuhiko; and Morimoto, Yuki, 5,116,899, Cl. 524-371.000.
Fujii, Hiroyuki; Shirai, Tokuo; Mizutani, Takanori; Nagae, Yoshio; Hetsugi, Koji; Tanizawa, Yasuo; and Kaburagi, Kouji, 5,116,521, Cl. 251-18.000.
Kurita, Noriaki; Ninomiya, Masakazu; and Kishita, Kazunori, 5,115,781, Cl. 123-481.000.

Nira Automotive AB: *See—*
Jonsson, Nils; and Dahlgren, Mats, 5,115,780, Cl. 123-478.000.

Nisato, Dino: *See—*
Garcia, Georges; Gautier, Patrick; Nisato, Dino; and Roux, Richard, 5,116,849, Cl. 514-337.000.

Nishi, Hiroyoshi: *See—*
Hayashi, Yoshio; Morinaka, Yasuhiro; Shinoda, Masaki; Nishi, Hiroyoshi; Watanabe, Kazutoshi; and Fukushima, Nobuko, 5,116,858, Cl. 514-391.000.

Nishida, Akiyoshi: *See—*
Hayahara, Takuro; Katahira, Haruo; Nishida, Akiyoshi; and Fukuda, Susumu, 5,115,874, Cl. 177-70.000.

Nishida, Jun: *See—*
Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, 5,117,159, Cl. 315-366.000.

Nishigai, Masao: *See—*
Kawamura, Masahiro; Otani, Tamio; and Nishigai, Masao, 5,115,561, Cl. 29-829.000.

Nishijima, Yoshitatsu; Fujitaka, Terumasa; and Shimizu, Kazuo, to Sanyo-Kokusaku Pulp Co., Ltd. Method of producing chlorinated eva. 5,117,045, Cl. 560-219.000.

Nishikawa, Tooru: *See—*
Suyama, Shuji; Katoh, Mitsukuni; and Nishikawa, Tooru, 5,117,047, Cl. 560-302.000.

Nishimaki, Hideo: *See—*
Miyano, Kenmi; Tanaka, Kenji; Nishimaki, Hideo; and Iga, Yoshiro, 5,116,950, Cl. 530-382.000.

Nishimori, Kadotaro: *See—*
Matsui, Toru; and Nishimori, Kadotaro, 5,117,265, Cl. 355-313.000.

Nishimoto, Akihiko; Hosoya, Yoshihiro; and Urabe, Toshiaki, to NKK Corporation. Method for producing non-oriented steel sheets. 5,116,435, Cl. 148-111.000.

Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, to NKK Corporation. Method of making non-oriented electrical steel sheets having excellent magnetic properties. 5,116,436, Cl. 148-111.000.

Nishimoto, Kenji: *See—*
Mishima, Ikuhiro; Nishimoto, Kenji; and Hosoi, Hideki, 5,116,909, Cl. 525-227.000.

Nishise, Hideya: *See—*
Sakai, Toshiyuki; Imaizumi, Masaru; Nishise, Hideya; Takeda, Katsuhiko; and Kitakubo, Hideo, 5,117,261, Cl. 355-207.000.

Nishizawa, Junichi; and Motoya, Kaoru, to Research Development Corp.; Junichi Nishizawa; and Kaoru Motoya. Thermionic emission type static induction transistor and its integrated circuit. 5,117,268, Cl. 357-22.000.

Nissan Chemical Industries Ltd.: *See—*
Ishii, Shigeru; Nakayama, Kazunari; Yagi, Kazuo; Satow, Jun; Fukuda, Kenzou; Itoh, Kaoru; Umehara, Toshiyuki; Kudo, Masaki; Inoue, Yoichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,404, Cl. 71-92.000.
Makino, Kenzi; Morimoto, Katsushi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Suzuki, Koichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,405, Cl. 71-94.000.
Osawa, Ken'ichi; Ikeda, Hisao; Mizuochi, Fumio; and Uehara, Hiroyuki, 5,116,945, Cl. 530-215.000.

Nissan Motor Co., Ltd.: *See—*
Aoyama, Shunichi, 5,115,789, Cl. 123-569.000.
Itoyama, Hiroyuki, 5,115,779, Cl. 123-425.000.
Sasaki, Hiroshi; Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinichi, 5,115,694, Cl. 74-844.000.
Wakahara, Tatsuo; Iwanaga, Kazuyoshi; and Ishii, Shigeru, 5,115,695, Cl. 74-868.000.

Nisshin Flour Milling Co., Ltd.: *See—*
Inoue, Hitoshi; Kato, Hiroki; Sueda, Noriyoshi; Tahara, Yoshiyuki; and Kinoshita, Nobuhiro, 5,116,855, Cl. 514-369.000.

Nisshin Steel Co., Ltd.: *See—*
Kurobe, Jun; Hara, Kenji; Ishihara, Masayuki; and Takagi, Kazuhiro, 5,115,660, Cl. 72-197.000.

Nitto Boseki Co., Ltd.: *See—*
Nakatsuyama, Shuichi; Nakamura, Yoshio; Kuroiwa, Katsumasa; and Nagasawa, Takeshi, 5,116,941, Cl. 530-331.000.

Niven Marketing Group, The: *See—*
Macsenti, Ronald J.; and Avery, Frederick M., 5,116,138, Cl. 383-33.000.

Niwa, Shinichi: *See—*
Kakuma, Kenji; Mizutomi, Katsunori; and Niwa, Shinichi, 5,117,333, Cl. 361-527.000.

Niwa, Yukichi: *See—*
Kushibiki, Nobuo; Nose, Noriyuki; Niwa, Yukichi; and Kaneko, Norio, 5,116,369, Cl. 623-6.000.

Niwano, Masaru: *See—*
Yamamoto, Testushi; Niwano, Masaru; and Nakagawa, Etsuo, 5,116,437, Cl. 148-287.000.

Nixon, Michael T. Edgebanded acoustical panels. 5,115,616, Cl. 52-144.000.

Njo, Angela: *See—*
Barns-Slavin, Ileana D.; Dukes, Alonzo T.; Njo, Angela; and Taylor, David J., 5,117,364, Cl. 364-464.030.

NKK Corporation: *See—*
Nishimoto, Akihiko; Hosoya, Yoshihiro; and Urabe, Toshiaki, 5,116,435, Cl. 148-111.000.
Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, 5,116,436, Cl. 148-111.000.

NMB Semiconductor Co., Ltd.: *See—*
Eaton, S. Sheffield, Jr., 5,117,177, Cl. 323-314.000.
Nomura, Shinzou; Katsushima, Hiroshi; Kawasaki, Toru; Unoki, Masao; and Nakamura, Masaru, 5,117,272, Cl. 357-52.000.

Nobile, Frederick E.; Harris, John F., III; and Silverman, Gary S., to Western Publishing Company. Liquid crystal writing slate with DC imaging system. 5,117,297, Cl. 359-52.000.

Nobile, Frederick E.: *See—*
Mullen, Patrick; and Nobile, Frederick E., 5,116,528, Cl. 252-299.500.

Noble, David: *See—*
Lawrence, Gordon C.; Dawson, Michael J.; Noble, David; Ramsay, Michael V. J.; Bell, Richard; Sutherland, Derek R.; and Tiley, Edward P., 5,116,968, Cl. 536-71.000.

Noble, Scott L.: *See—*
Sutton, William R.; and Noble, Scott L., 5,117,444, Cl. 377-24.200.

Nobuyuki, Fukazawa; Iizuka, Hajime; Yano, Osamu; and Miyama, Yukio, to Mitsui Toatsu Chemicals, Incorporated. Dihydrocaffeic acid derivatives and pharmaceutical preparations containing same. 5,116,979, Cl. 544-172.000.

Noda, Satoshi: *See—*
Suzuki, Noboru; Yoshida, Masaharu; Noda, Satoshi; Takaishi, Minoru; Takiguchi, Kenichiro; Uchida, Hiroshi; and Onoda, Takeshi, 5,116,670, Cl. 428-285.000.

Noel, Alain W., to Poclain Hydraulics. Pressure fluid mechanism such as a motor or a pump coupled to a braking device. 5,115,890, Cl. 188-71.500.

Noguchi, Kazuhiro: *See—*
Takahashi, Kohji; Ogino, Shigeru; Noguchi, Kazuhiro; and Kobayashi, Takashi, 5,117,246, Cl. 354-202.000.

Noguchi, Kouki; Tsuchiya, Fumio; Tsukamoto, Takashi; Masumura, Shigeki; Nakamura, Hideo; Baba, Shiro; and Hagiwara, Yoshimune, to Hitachi, Ltd.; Hitachi Microcomputer Engineering Ltd.; and VLSI Engineering Corporation. Microprogram controlled microprocessor having a selectively expandable instruction code length including independent description of operand addressing and a type of operation for an operand by single instruction in a common coding scheme. 5,117,488, Cl. 395-375.000.

Noguchi, Naoyuki; Murakami, Kazuki; Kanehisa, Eiji; and Makimoto, Seiji, to Mazda Motor Corporation. Control system for vehicle provided with automatic transmission. 5,115,896, Cl. 192-0.052.

Noishiki, Yasuharu: *See—*
Miyata, Teruo; Kodaira, Kazuhiko; Higashijima, Hitoshi; Kimura, Takashi; and Noishiki, Yasuharu, 5,116,824, Cl. 514-55.000.

Nolan, Michael P.: *See—*
Chang, Hungkun J.; Doss, William K.; Nolan, Michael P.; and Buchholz, Dale R., 5,117,236, Cl. 342-367.000.

Noll, Klaus: *See—*
Bomhard, Andreas; Heider, Joachim; Psiorz, Manfred; Hauel, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Diederen, Willi, 5,116,986, Cl. 546-141.000.

Nomoto, Shin: *See—*
Takeshita, Yasuyoshi; Nakamura, Hiroshi; Ishiguro, Susumu; Kwaguchi, Noboru; Shimada, Shin'ichi; Koyama, Tadayoshi; Seya, Motohide; Abe, Noriko; and Nomoto, Shin, 5,116,985, Cl. 546-141.000.

Nomura, Hiroshi; Nakamura, Norihiko; Nomura, Kenichi; Kobayashi, Tatsuo; and Nihei, Hiroaki, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine. 5,115,774, Cl. 123-276.000.

Nomura, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Retaining device of annular member. 5,117,311, Cl. 359-819.000.

Nomura, Kenichi: *See—*
Nomura, Hiroshi; Nakamura, Norihiko; Nomura, Kenichi; Kobayashi, Tatsuo; and Nihei, Hiroaki, 5,115,774, Cl. 123-276.000.

Nomura, Shinzou; Katsushima, Hiroshi; Kawasaki, Toru; Unoki, Masao; and Nakamura, Masaru, to Asahi Glass Company Ltd.; and NMB Semiconductor Co., Ltd. Having a protective film of a polymer having a fluorine-containing aliphatic cyclic structure. 5,117,272, Cl. 357-52.000.

Nomura, Tetsuya; and Fujita, Yasuhiro, to Fujitsu Ten Limited. Windshield wiper control apparatus. 5,117,168, Cl. 318-444.000.

Nomura, Toshio: *See—*
Tsukada, Hiroshi; Tobioka, Masaaki; Nomura, Toshio; and Saito, Yasuhiro, 5,116,694, Cl. 428-698.000.

Nonoka, Jun: *See—*
Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.

Nooren, Franciscus P. M., to Waterproof Coatings S.A. Process and sealing agent for producing a watertight and/or gastight bushing of lines in a water-resistant and/or gas-blocking wall, and device for use thereof. 5,116,413, Cl. 106-212.000.

Norgate, Graham: *See—*
Fung, Patrick T.; Norgate, Graham; Dilts, Timothy A.; Jones, Andrew S.; and Ravindran, Rangaswamy, 5,116,180, Cl. 414-5.000.

Norman, Michael P.: *See—*
Lebby, Michael S.; and Norman, Michael P., 5,116,461, Cl. 156-643.000.

North American Philips Corporation: *See—*
Dunham, Donald D.; and Coburn, Sherilyn M., 5,117,162, Cl. 313-36.000.
Leyh, Thomas O.; and Boyce, Walter A., 5,117,156, Cl. 315-73.000.
Nar, Ramesh G., 5,117,208, Cl. 335-8.000.

North, Bernard F.: *See—*
Floyd, William C.; Dragner, Louis R.; Black, Blanche H.; and North, Bernard F., 5,116,927, Cl. 527-300.000.

North, Peter C.; Oxford, Alexander W.; and Coates, Ian H., to Glaxo Group Limited. Imidazole derivatives. 5,116,984, Cl. 546-101.000.

Norton Company: *See—*
Sung, Chien-Min; and Chen, Sy-Hwa, 5,116,568, Cl. 419-11.000.

Norwalk Vault Company of Bridgeport, Inc.: *See—*
Pirozzoli, Richard W.; Pirozzoli, Robert J.; and Pirozzoli, Alexander P., 5,115,607, Cl. 52-134.000.

Nosco, Dennis L., to Mallinckrodt Medical, Inc. N_4 technetium-99 m complexes for use as radiopharmaceuticals. 5,116,598, Cl. 424-1.100.

Nose, Noriyuki: *See—*
Kushibiki, Nobuo; Nose, Noriyuki; Niwa, Yukichi; and Kaneko, Norio, 5,116,369, Cl. 623-6.000.

Notaro, Frank: *See—*
Prasad, Ravi; Notaro, Frank; and Haas, Oscar W., 5,116,396, Cl. 62-24.000.

Noualhaguet, Pierre: *See—*
Penato, Jean-Marie; Noualhaguet, Pierre; and Laurent, Michel, 5,117,448, Cl. 378-132.000.

Nounou, Fadia: *See—*
Davis, James L.; Nounou, Fadia; Suppelsa, Anthony B.; and Pennisi, Robert W., 5,116,433, Cl. 148-24.000.

Novet, Hanspeter: *See—*
Muller, Kurt; Bohler, Erwin; Ruppen, Bruno; Novet, Hanspeter; and Gerber, Robert, 5,115,714, Cl. 89-33.160.

Novo Industri A/S: *See—*
Ingvorsen, Kjeld; Godtfredsen, Sven E.; and Hojer-Pedersen, Birgitte, 5,116,744, Cl. 435-128.000.

Novo Nordisk A/S: *See—*
Watjen, Frank; and Hansen, Holger C., 5,116,841, Cl. 514-250.000.

Nowak, Theodore J.; and Tillman, Gary P., to Lord Corporation. Vibration isolator. 5,116,030, Cl. 267-140.400.

Noyan, Ismail C.: *See—*
Bregman, Mark F.; Horton, Raymond R.; Lanzetta, Alphonso P.; Noyan, Ismail C.; Palmer, Michael J.; and Tong, Ho-Ming, 5,117,275, Cl. 357-70.000.

Nugent, Duane C. Food cutting machine. 5,115,992, Cl. 241-236.000.

Nukaga, Tadashi; Mochizuki, Kentaro; Yamaguchi, Shinji; and Banba, Yoshikazu, to Sanyo Electric Co., Ltd. Drum-type washing machine. 5,115,651, Cl. 68-17.00R.

Numakura, Hirotomo: *See—*
Moriki, Yasumitsu; and Numakura, Hirotomo, 5,116,391, Cl. 51-26.000.

Nunn, Michael J.: *See—*
Hunter, Julian E.; Reid, James; Arnold, David E. J.; Hails, George; Baxter, Kenneth F.; Andrews, Andrian F.; and Nunn, Michael J., 5,116,407, Cl. 106-16.000.

Nurmi, Tom; Johansson, Lasse; and Fjader, Mikael, to Oy Partek AB. Fibrillation device for the manufacture of mineral wool. 5,116,397, Cl. 65-14.000.

Nurnberg, Thomas R.; Seggebruch, Ernie G.; and Smith, Kenneth J., to Montgomery Elevator Company. Handrail air cushion. 5,115,900, Cl. 198-335.000.

N.V. Michel Van de Wiele: *See—*
Derudder, Carlos, 5,115,838, Cl. 139-65.000.

NWD International, Inc.: *See—*
Williamson, Nigel D. L., 5,115,550, Cl. 29-283.500.

Nykerk, Michael, to Electronic Security Products of California. Alarm system for sensing and vocally warning a person to step back from a protected object. 5,117,217, Cl. 340-426.000.

Nysten, Bernhard, to William Prym-Werke GmbH & Co. KG. Button for use on garments and the like. 5,115,548, Cl. 24-90.00R.

O M Kiki Co., Ltd.: *See—*
Kobayashi, Tokuzo, 5,115,621, Cl. 52-805.000.

Oae, Yoshihisa; Sakamoto, Kiichi; and Yamada, Akio, to Fujitsu Limited. Electron beam exposure system having an improved seal element for interfacing electric connections. 5,117,117, Cl. 250-492.200.

Oare, Thomas R.; and Sykora, James C., to Goodyear Tire & Rubber Company, The. Pneumatic tire with belt overlay structure reinforced with low denier nylon cords. 5,115,853, Cl. 152-527.000.

Obase, Hiroyuki: *See—*
Oshima, Etsuo; Kumazawa, Toshiaki; Otaki, Shizuo; Obase, Hiroyuki; Ohmori, Kenji; Ishii, Hidee; Manabe, Haruhiko; Tamura, Tadafumi; and Shuto, Katsuichi, 5,116,863, Cl. 514-450.000.

Ocampo, Salvador C. Safety detector for railroad switch points with remote contact mechanism. 5,116,006, Cl. 246-220.000.

Occidental Chemical Corporation: *See—*
Buchanan, Robert A.; and Stults, Jeffrey S., 5,117,002, Cl. 549-241.000.

Ochi, Hideo; Igari, Akihide; and Toyoda, Masaaki, to Somar Corporation. Varistor material and method of producing same from zinc oxide and manganese oxide: controlled porosity and high non-linear coefficient. 5,116,542, Cl. 252-518.000.

Ochi, Shinji; and Tanaka, Yasunori, to Kabushiki Kaisha Toshiba. Buffer circuit having a voltage drop means for the purpose of reducing peak current and through-current. 5,117,131, Cl. 307-448.000.

Oclassen Pharmaceuticals, Inc.: *See—*
Dyer, Dennie W.; and Adair, Dennis W., 5,116,328, Cl. 604-289.000.

O'Connell, Thomas E.: *See—*
Anderson, David W.; Baker, John H. E., II; and O'Connell, Thomas E., 5,115,962, Cl. 228-120.000.

Oda, Tomio: *See—*
Ueno, Ryuji; Osama, Hiroyoshi; and Oda, Tomio, 5,117,042, Cl. 560-121.000.

Oda, Yoshiya: *See—*
Asakawa, Naoki; Ohe, Hiroshi; Yoshida, Yutaka; Sato, Tadashi; Nezu, Yukuo; and Oda, Yoshiya, 5,117,109, Cl. 250-288.000.

Odagawa, Satoshi: *See—*
Akiyama, Kazuhiro; Kashiwazaki, Takashi; Araki, Morio; Odagawa, Satoshi; and Fukushima, Atsuhiko, 5,117,363, Cl. 364-449.000.

ODC Exhibit Systems Ltd.: *See—*
Ahlberg, Erik, 5,115,623, Cl. 52-646.000.

Odriozola, Juan: *See—*
Bosson, Jean M.; Odriozola, Juan; Marendaz, Georges-Andre ; and Blodin, Daniel, 5,117,082, Cl. 219-69.120.

Oerlikon-Contraves AG: *See—*
Muller, Kurt; Bohler, Erwin; and Dunki, Jurg, 5,115,713, Cl. 89-33.140.
Muller, Kurt; Bohler, Erwin; Ruppen, Bruno; Novet, Hanspeter; and Gerber, Robert, 5,115,714, Cl. 89-33.160.

Offenhauer, Keith L.; and Zimmermann, Harold M., Jr., to Laser Works, Inc. Clip board. 5,116,012, Cl. 248-452.000.

Offshore Instruments Limited *See—*
Mitchell, Andrew, 5,115,752, Cl. 114-39.100.

Ofrat, Aviad: *See—*
Weinberg, Eitan; and Ofrat, Aviad, 5,115,959, Cl. 228-4.100.

Ogasahara, Johji; Hariu, Hitoshi; and Takahashi, Masakazu, to Sumitomo Seika Chemicals Co., Ltd.; Otsuka Foods Co., Ltd.; and Mitsubishi Corporation. Process for producing liquid egg having reduced cholesterol content. 5,116,628, Cl. 426-330.100.

Ogasawara, Kenji; Kurachi, Koji; and Tobari, Atsushi, to International Business Machines Corporation. Magnetostrictive head with d.c. bias magnetic field. 5,117,320, Cl. 360-113.000.

Ogata, Yukihiko, to Canon Kabushiki Kaisha. Communication interface. 5,117,425, Cl. 370-110.100.

Ogawa, Hiroshi: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazuru; Sagara, Seiji; and Kurita, Kenji, 5,117,260, Cl. 355-204.000.

Ogawa, Kazufumi: *See—*
Mino, Norihisa; and Ogawa, Kazufumi, 5,116,638, Cl. 427-54.100.

Ogawa, Masaharu: *See—*
Ito, Osamu; Ogawa, Masaharu; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Furukawa, Teruo; and Nakajima, Yoshiki, 5,117,412, Cl. 369-109.000.

Ogawa, Takuji: *See—*
Suzuki, Hitomi; Ogawa, Takuji; Uno, Hidemitsu; Kitahaba, Tetsuo; Kigawa, Kouji; Fukamachi, Tomonori; and Kitahara, Katsuhiko, 5,117,000, Cl. 549-59.000.

Ogawa, Tutomu: *See—*
Shimizu, Akira; Ogawa, Tutomu; Wakatsuki, Kenji; and Kimura, Tomomichi, 5,117,409, Cl. 369-36.000.

Ogino, Kohji: *See—*
Aizu, Yoshihisa; and Ogino, Kohji, 5,116,116, Cl. 351-221.000.

Ogino, Shigeru: *See—*
Takahashi, Kohji; Ogino, Shigeru; Noguchi, Kazuhiro; and Kobayashi, Takashi, 5,117,246, Cl. 354-202.000.

Ogiue, Katsumi: *See—*
Akimoto, Kazuhiro; Ogiue, Katsumi; and Uchiyama, Takeo, 5,117,390, Cl. 365-155.000.

Ogura, Takashi: *See—*
Mikami, Akiyoshi; Ogura, Takashi; Terada, Kousuke; Yoshida, Masaru; Yamashita, Takuo; Tanaka, Koichi; Okibayashi, Katsushi; Nakajima, Shigeo; Nakaya, Hiroaki; and Taniguchi, Kouji, 5,116,640, Cl. 427-66.000.

Oguri, Yasuo: *See—*
Hattori, Eiji; and Oguri, Yasuo, 5,116,885, Cl. 523-200.000.

Oh, Kwang Y.: *See—*
Park, Ki S.; Kim, Sang B.; Oh, Kwang Y.; and Lee, Yong T., 5,116,772, Cl. 437-41.000.
Park, Ki S.; Kim, Sang B.; Oh, Kwang Y.; and Lee, Yong T., 5,116,773, Cl. 437-41.000.

Ohara, Hiroyuki: *See—*
Miura, Tomoshi; Aonuma, Shinichiro; and Ohara, Hiroyuki, 5,116,828, Cl. 514-171.000.

Ohara, Shuichi; Akasaka, Shiniichi; Oka, Hiroyuki; Hattori, Shintaroo; and Oyama, Rieko, to Hitachi, Ltd. Sheet having a precoating layer which is thermally transferred prior to sublimation of an ink dye. 5,116,148, Cl. 400-241.000

Ohara, Tetsuo; Miura, Tsutomu; Hagiwara, Shinichi; Koshimizu, Shigeomi; and Shimizu, Eiichi, to Eastman Kodak Company. Rotational speed switcher. 5,116,281, Cl. 474-1.000.

Ohe, Hiroshi: *See—*
Asakawa, Naoki; Ohe, Hiroshi; Yoshida, Yutaka; Sato, Tadashi; Nezu, Yukuo; and Oda, Yoshiya, 5,117,109, Cl. 250-288.000.

Ohio Medical Instrument Co., Inc.: *See—*
Jewell, Brian; and Yeh, Hwa-Shain, 5,116,345, Cl. 606-130.000.

Ohishi, Takashi: *See—*
Nakamura, Hisashi; Kubo, Kenichi; Ohishi, Takashi; and Hitoshi, Hosokawa, 5,115,783, Cl. 123-496.000.

Ohkawa, Shigenori: *See—*
Goto, Giichi; Ohkawa, Shigenori; and Fukumoto, Shoji, 5,116,861, Cl. 514-427.000.

Ohkawa, Tihiro, to General Atomics. Quasi-open magnet configuration for use in magnetic resonance imaging. 5,117,188, Cl. 324-318.000.

Ohki, Yoshinori; and Mochizuki, Hiroshi, to Iida Denki Kogyo Co., Ltd. Method and apparatus for driving an auxiliary device of an internal combustion engine. 5,115,777, Cl. 123-333.000.

Ohkubo, Satoru; and Shimomura, Setsuhiro, to Mitsubishi Denki K.K. Control apparatus for an internal combustion engine. 5,116,356, Cl. 123-425.000.

Ohkuma, Hiroaki; Konishi, Masataka; Matsumoto, Kiyoshi; Oki, Toshikazu; and Hoshino, Yutaka, to Bristol-Myers Company. BU-3420T antitumor antibiotic. 5,116,845, Cl. 514-279.000.

Ohmon, Eisaku: *See—*
Futami, Yuichi; Ohmon, Eisaku; and Suzuki, Tadasu, 5,116,283, Cl. 474-84.000.

Ohmori, Kenji: *See—*
Oshima, Etsuo; Kumazawa, Toshiaki; Otaki, Shizuo; Obase, Hiroyuki; Ohmori, Kenji; Ishii, Hidee; Manabe, Haruhiko; Tamura, Tadafumi; and Shuto, Katsuichi, 5,116,863, Cl. 514-450.000.

Ohmura, Hiroshi: *See—*
Kanazawa, Hirotaka; Takehara, Shin; and Ohmura, Hiroshi, 5,116,078, Cl. 280-707.000.

Ohno, Eishi; and Kobayashi, Tatsuo, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine. 5,115,776, Cl. 123-299.000.

Ohshima, Michio: *See—*
Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.

Ohsumi, Tadashi: *See—*
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Fujimoto, Hiroaki; and Fujimoto, Izumi, 5,116,875, Cl. 514-594.000.

Ohta, Eiichi: *See—*
Kondo, Hitoshi; Kimura, Yuji; and Ohta, Eiichi, 5,117,299, Cl. 359-58.000.

Ohta, Kenji; Katayama, Hiroyuki; Nakayama, Junichiro; Kimura, Kazuhiro; Matoba, Hirotsugu; and Kobayashi, Shozo, to Sharp Kabushiki Kaisha. Optical card, a card holder and an apparatus for recording, reproducing and erasing information on and from the optical card. 5,117,415, Cl. 369-271.000.

Ohta, Noriaki; and Hashimoto, Kenichi, to Yazaki Corporation. Mounting structure for flexible printed wiring board having holding ribs and auxiliary ribs protruding therebetween. 5,117,329, Cl. 361-395.000.

Ohta, Yasuhiro: *See—*
Sugimori, Tsunetake; Tsukada, Yoji; and Ohta, Yasuhiro, 5,116,752, Cl. 435-200.000.

Ohtani, Mitsuaki; Matsuura, Takaharu; Konoike, Toshiro; and Araki, Yoshitaka, to Shionogi & Co., Ltd. Monoesters of arylacetic acid and the process thereof. 5,117,039, Cl. 560-60.000.

Ohwaki, Akira: *See—*
Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.

Ohyama, Hiroshi: *See—*
Ishikawa, Hiromichi; Umeda, Takashi; Onoue, Shinji; Kajikawa, Kazuo; Shibata, Toshihiro; and Ohyama, Hiroshi, 5,116,838, Cl. 514-634.000.

Oji, Akihito; Tada, Yukihiro; Sasaki, Noriyuki; and Mizumura, Mitsuo, to Lederle (Japan), Ltd.; and Teikoku Seiyaku Co., Ltd. Anti-inflammatory analgesic patch. 5,116,621, Cl. 424-445.000.

Oka, Hiroyuki: *See—*
Ohara, Shuichi; Akasaka, Shiniichi; Oka, Hiroyuki; Hattori, Shintaroo; and Oyama, Rieko, 5,116,148, Cl. 400-241.000.

Oka, Kunihide: *See—*
Marutani, Masayoshi; Izumi, Fumihide; and Oka, Kunihide, 5,117,040, Cl. 560-75.000.

Oka, Masahiko: *See—*
Morita, Shigeru; and Oka, Masahiko, 5,117,035, Cl. 558-250.000.

Okada, Masahiro: *See—*
Inoue, Keizo; Imaizumi, Atsushi; Kamimura, Takashi; Suwa, Yorimasa; Okada, Masahiro; Suzuki, Yoji; and Kudo, Ichiro, 5,116,942, Cl. 530-350.000.

Okada, Tadaaki: *See—*
Takagi, Masayuki; Okada, Tadaaki; Akai, Naotoshi; Yaguchi, Takashi; Miyadoh, Shinji; Shomura, Takashi; Sasaki, Toru; Sezaki, Masaji; Shimizu, Takao; and Niida, Masashi, 5,116,815, Cl. 514-11.000.

Okado, Kenji: *See—*
Kobayashi, Hiroyuki; Uchida, Mitsuru; and Okado, Kenji, 5,116,711, Cl. 430-106.000.

Okamoto, Akira: *See—*
Taniguchi, Hirokazu; Konya, Shogo; and Okamoto, Akira, 5,116,646, Cl. 427-383.500.

Okamoto, Kuniaki: *See—*
Kuwana, Kazutaka; Yoshida, Tsuyoshi; Ichikawa, Hiroyuki; Kamikado, Masaru; Okamoto, Kuniaki; and Itabashi, Satoshi, 5,116,109, Cl. 303-109.000.

Okamoto, Tadao: *See—*
Nakajima, Tsunetaka; Okamoto, Tadao; Kondo, Nobuo; Watanabe, Masahiro; Yamauchi, Koichi; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 5,116,949, Cl. 530-363.000.

Okano, Makoto: *See—*
Miyadera, Toshiyuki; Okano, Makoto; and Matsui, Fumio, 5,117,416, Cl. 369-284.000.

Okano, Sadao; Hongo, Kazuya; Aonuma, Hidekazu; and Miyamoto, Hiroshi, to Fuji Xerox Co., Ltd. Electrophotographic light-sensitive material comprising a charge generating layer and a charge transfer layer. 5,116,702, Cl. 430-54.000.

Okazaki, Fumitoshi: *See—*
Yamaguchi, Kenji; Hosoyama, Kenji; Okazaki, Fumitoshi; and Hozumi, Daisuke, 5,115,601, Cl. 52-1.000.

Oki Electric Industry Co., Ltd.: *See—*
Abe, Hitoshi; and Nakamori, Tomohiro, 5,116,811, Cl. 505-1.000.
Harada, Teruhiro, 5,117,392, Cl. 365-189.090.
Tanagawa, Kouji, 5,117,380, Cl. 364-717.000.

Oki, Kazuhiro: *See—*
Kobayashi, Naoki; Oki, Kazuhiro; and Shimura, Shoichi, 5,117,104, Cl. 250-230.000.

Oki, Naoto: *See—*
Ozawa, Satoshi; Oki, Naoto; Shibata, Yasuhisa; and Miyagi, Hiroyuki, 5,116,481, Cl. 204-290.00R.

Oki, Nariyasu; Yokokura, Tsunetoshi; Mizuno, Koji; Shimada, Katsutoshi; and Yamamoto, Kazuyuki, to Mazda Motor Corporation. Intake system for automobile engine. 5,116,231, Cl. 123-52.0MB.

Oki, Toshikazu: *See—*
Ohkuma, Hiroaki; Konishi, Masataka; Matsumoto, Kiyoshi; Oki, Toshikazu; and Hoshino, Yutaka, 5,116,845, Cl. 514-279.000.

Okibayashi, Katsushi: *See—*
Mikami, Akiyoshi; Ogura, Takashi; Terada, Kousuke; Yoshida, Masaru; Yamashita, Takuo; Tanaka, Koichi; Okibayashi, Katsushi; Nakajima, Shigeo; Nakaya, Hiroaki; and Taniguchi, Kouji, 5,116,640, Cl. 427-66.000.

Okinoshima, Hiroshige; and Kanbara, Hiroshi, to Shin-Etsu Chemical Co., Ltd. Siloxane compound containing tetrahydrophthalic anhydride group and method of producing the same. 5,117,001, Cl. 549-214.000.

Okuno, Masayuki: *See—*
Inoue, Yasuyuki; Okuno, Masayuki; and Kawachi, Masao, 5,117,470, Cl. 385-14.000.

Okuyama, Hirohisa: *See—*
Bommannan, Durairaj; Okuyama, Hirohisa; Guy, Richard H.; Stauffer, Paul; and Flynn, Gordon L., 5,115,805, Cl. 128-24.0AA.

Okuyama, Takashi: *See—*
Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.

Okuzaki, Yuuji: *See—*
Suhara, Michinori; Takagi, Masaaki; Okuzaki, Yuuji; Tashiro, Kuro; and Mizunuma, Michiyoshi, 5,116,431, Cl. 148-530.000.

Olin Corporation: *See—*
Hilliard, Garland E.; Melton, James K.; and Helmstetter, David A., 5,116,594, Cl. 423-473.000.
Materazzi, Peter E., 5,116,705, Cl. 430-45.000.
Melton, James K.; Hilliard, Garland E.; and Shaffer, John H., 5,116,593, Cl. 423-473.000.
Pennington, Ruford T.; and Fullington, Michael C., 5,117,011, Cl. 549-523.000.
Reisch, John W.; and Capone, Deborah M., 5,116,931, Cl. 528-59.000.

Olinger, Edward L. Low turbulence rod guide. 5,115,863, Cl. 166-241.000.

Oliphant, Joseph: *See—*
Walker, Daniel D., Jr.; and Oliphant, Joseph, 5,116,417, Cl. 75-327.000.

Oliva, Elio J.; Meadows, Vernon; and Hawkins, Lilbert S., III, to Motorola, Inc. Integrated battery cycle counter. 5,117,173, Cl. 320-21.000.

Olive, Leonard W., to United States of America, Air Force. Annular balloon. 5,115,998, Cl. 244-31.000.

Olson, Carl B., to Motorola, Inc. Directional antenna arrangement method for simulcast broadcasting. 5,117,503, Cl. 455-51.100.

Olson, Richard J. Yieldable protective mount for trolling motors. 5,116,267, Cl. 440-56.000.

Olsson, Billy E.; and Korsunsky, Iosif, to AMP Incorporated. Apparatus for manipulating a high density flat cable. 5,115,555, Cl. 29-566.300.

Olszewski, Anthony R.: *See—*
Fretz, Edward R., Jr.; and Olszewski, Anthony R., 5,116,684, Cl. 428-417.000.

Olympus Optical Co., Ltd.: *See—*
Aoki, Norihiko, 5,117,309, Cl. 359-654.000.
Tsuchida, Hirofumi; Aoki, Norihiko; and Yamamoto, Kimiaki, 5,117,308, Cl. 359-654.000.
Watanabe, Haruhisa; Tanaka, Satoshi; and Matsuyama, Shinya, 5,116,765, Cl. 436-165.000.

Omex International, Inc.: *See—*
Weinheimer, Alfred J., 5,116,545, Cl. 554-149.000.

Omori, Nagato: *See—*
Sano, Harunobu; Omori, Nagato; Kohno, Yoshiaki; and Sakabe, Yukio, 5,117,326, Cl. 361-321.000.

Omron Corporation: *See—*
Sato, Ryuichi, 5,117,209, Cl. 335-80.000.

Omura, Takashi: *See—*
Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washimi, Takeshi; Harada, Naoki; and Akahori, Kingo, 5,116,956, Cl. 534-612.000.
Morimitsu, Toshihiko; Harada, Naoki; Omura, Takashi; and Kikkawa, Sadanobu, 5,116,959, Cl. 534-642.000.

Omura, Yukihiro: *See—*
Yanagiuchi, Shigenobu; Kawai, Shoichi; Omura, Yukihiro; Kotani, Yasuhiro; and Inoue, Kazuya, 5,117,379, Cl. 364-715.010.

O'Neill, Michael W.; and Sugerman, Gerald, to Topez Company. Printing ink. 5,116,411, Cl. 106-22.000.

O'Neill, Timothy P.: *See—*
Gilbert, Sheri A.; Mizoguchi, Haruko; Charest, Robert P.; O'Neill, Timothy P.; and Smith, Ronald L., 5,116,847, Cl. 514-327.000.

Onioh, Takashi: *See—*
Yoshida, Shigeo; Fujimoto, Isamu; Suzuki, Hideyuki; Asano, Hiroshi; Hosaka, Toru; Onioh, Takashi; Nagasaki, Kojyu; Matsuoka, Kenichi; and Taura, Kazufumi, 5,117,100, Cl. 250-221.000.

Ono, Hideki: *See—*
Kajiwara, Makoto; and Ono, Hideki, 5,116,723, Cl. 430-611.000.

Ono, Mitsunori, to Fuji Photo Film Co., Ltd. Deacylating agent and deacylating method. 5,116,994, Cl. 548-251.000.

Ono, Mitsunori; and Mori, Hideto, to Fuji Photo Film Co., Ltd. Phosphatidylserine derivatives. 5,117,034, Cl. 558-169.000.

Ono, Yukou: *See—*
Takayama, Toshio; Sakuma, Masaru; and Ono, Yukou, 5,117,361, Cl. 364-426.020.

Onoda, Masahiro; and Toda, Yoshifumi, to Fujitsu Limited. Mobile radio communication system. 5,117,502, Cl. 455-33.100.

Onoda, Takeshi: *See—*
Suzuki, Noboru; Yoshida, Masaharu; Noda, Satoshi; Takaishi, Minoru; Takiguchi, Kenichiro; Uchida, Hiroshi; and Onoda, Takeshi, 5,116,670, Cl. 428-285.000.

Onoue, Shinji: *See—*
Ishikawa, Hiromichi; Umeda, Takashi; Onoue, Shinji; Kajikawa, Kazuo; Shibata, Toshihiro; and Ohyama, Hiroshi, 5,116,838, Cl. 514-634.000.

Onx, Inc.: *See—*
Hwang, Ned H. C., 5,116,366, Cl. 623-2.000.
Hwang, Ned H. C.; and Bokros, Jack C., 5,116,367, Cl. 623-2.000.

Oohashi, Tuneyoshi; Yamaguchi, Motoo; Wada, Akira; Shirakura, Toshiharu; Kichikawa, Toshimichi; and Sugawara, Hiroyuki, to Hitachi, Ltd. Metal vapor laser apparatus. 5,117,434, Cl. 372-56.000.

Oori, Tomio: *See—*
Kakehashi, Hidenori; and Oori, Tomio, 5,117,215, Cl. 336-178.000.

Ooyaba, Takashi: *See—*
Morikawa, Hideaki; Gan, Yasuo; Kogure, Koushiro; and Ooyaba, Takashi, 5,115,883, Cl. 181-152.000.

Opex Corporation: *See—*
DeWitt, Robert N.; Lile, William R.; and Tentarelli, Stephen, 5,115,918, Cl. 209-3.100.

Optimed Technologies, Inc.: *See—*
Carson, Richard F., Jr.; and Ehmsen, Ronald J., 5,116,317, Cl. 604-96.000.

Optimil Machinery, Inc.: *See—*
Miller, Donald F.; and Chapman, John R., 5,115,846, Cl. 144-246.00R.

Optodyne, Inc.: *See—*
Wang, Charles C. P.; and Zhou, Joe S. B., 5,116,126, Cl. 356-349.000.

Oregon State University: *See—*
Williamson, Kenneth J.; Woods, Sandra; and Strand, Stuart E., 5,116,506, Cl. 210-610.000.

Ortho Pharmaceutical Corporation: *See—*
Combs, Donald W., 5,116,837, Cl. 514-229.800.
Murray, William V., 5,117,054, Cl. 562-621.000.

Orthovations, Inc.: *See—*
Carbone, John J., 5,116,378, Cl. 623-23.000.

Ortner, Josef A.: *See—*
Schertler, Armin; Ortner, Josef A.; Scheurecker, Werner; and Engel, Kurt, 5,115,857, Cl. 164-448.000.

Osama, Hiroyoshi: *See—*
Ueno, Ryuji; Osama, Hiroyoshi; and Oda, Tomio, 5,117,042, Cl. 560-121.000.

Osawa, Ken'ichi; Ikeda, Hisao; Mizuochi, Fumio; and Uehara, Hiroyuki, to Nissan Chemical Industries, Ltd. Resinous substance. 5,116,945, Cl. 530-215.000.

Oscar Mayer Foods Corporation: *See—*
Mally, Timothy G., 5,115,732, Cl. 99-483.000.

Oshima, Etsuo; Kumazawa, Toshiaki; Otaki, Shizuo; Obase, Hiroyuki; Ohmori, Kenji; Ishii, Hidee; Manabe, Haruhiko; Tamura, Tadafumi; and Shuto, Katsuichi, to Kyowa Hakko Kogyo Co., Ltd. Dibenz[b,e]oxepin derivative and pharmaceutical compositions thereof. 5,116,863, Cl. 514-450.000.

Oshima, Katsushi: *See—*
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,115,546, Cl. 29-27.00C.

Oshima, Kazuo; and Iwasaki, Shizuo, to Bridgestone Corporation. Low rolling resistance pneumatic radial tires having an improved appearance. 5,115,854, Cl. 152-556.000.

Osztheimer, Eva: *See—*
Dutka, Ferenc; Komives, Tamas; Fodor, Katalin, nee Csorba; Marton, Attila; Csikos, Aniko nee Gluck; Osztheimer, Eva; Henger, Karoly; Laborczy, Robert; Reti, Zsuzsanna, nee Bosnyak; Sebok, Dezso; Szabolcs, Jozsef; and Tomordi, Elemer, 5,116,402, Cl. 71-88.000.

Ota, Yoshifumi: *See—*
Nakamura, Kyuzo; Ishibashi, Satoru; Ota, Yoshifumi; and Higuchi, Yasushi, 5,116,479, Cl. 204-192.130.

Otaki, Shizuo: *See—*
Oshima, Etsuo; Kumazawa, Toshiaki; Otaki, Shizuo; Obase, Hiroyuki; Ohmori, Kenji; Ishii, Hidee; Manabe, Haruhiko; Tamura, Tadafumi; and Shuto, Katsuichi, 5,116,863, Cl. 514-450.000.

Otani, Kazuya: *See—*
Fujimoto, Hiroaki; Hatada, Kenzo; Takeshita, Yoshinobu; Otani, Kazuya; and Takeda, Kimiaki, 5,115,545, Cl. 29-25.010.

Otani, Tamio: *See—*
Kawamura, Masahiro; Otani, Tamio; and Nishigai, Masao, 5,115,561, Cl. 29-829.000.

Othy, Inc.: *See—*
Salyer, Paul E., 5,116,165, Cl. 407-54.000.

Otis Engineering Corp.: *See—*
Laky, Tibor, 5,115,861, Cl. 166-85.000.

Otsuka Foods Co., Ltd.: *See—*
Ogasahara, Johji; Hariu, Hitoshi; and Takahashi, Masakazu, 5,116,628, Cl. 426-330.100.

Otsuka Pharmaceutical Co., Ltd.: *See—*
Fujii, Setsuro, deceased; Fujii, Shinichiro, legal heir; Takada, Kaoruko, legal heir; Shirasaka, Tetsuhiko; and Fukushima, Masakazu, 5,116,600, Cl. 424-10.000.

OttoSensors Corporation: *See—*
Prohaska, Otto J., 5,116,495, Cl. 210-198.200.

Overgaard, Sandra E.: *See—*
Moo-Young, Murray; Bols, Niels C.; Overgaard, Sandra E.; and Scharer, Jeno M., 5,116,747, Cl. 435-178.000.

Ovonic Synthetic Materials Company, Inc.: *See—*
Keem, John; and Im, Jun S., 5,116,434, Cl. 148-101.000.

Owen, Frank C. G.: *See—*
Shepherd, Robert; Owen, Frank C. G.; and Pudney, Christopher D., 5,117,423, Cl. 370-95.100.

Owens-Corning Fiberglas Corporation: *See—*
Bartlow, David H., 5,115,936, Cl. 220-426.000.
Flautt, Martin C.; and Adzima, Leonard J., 5,116,900, Cl. 524-377.000.

Owens, Steven P.: *See—*
Yingst, Stephen M.; Briggs, Robert C.; D'Ambrosia, John F.; Flickinger, Steven L.; Owens, Steven P.; and Zeiders, Jeffrey A., 5,117,476, Cl. 385-88.000.

Oxford, Alexander W.: *See—*
North, Peter C.; Oxford, Alexander W.; and Coates, Ian H., 5,116,984, Cl. 546-101.000.

Oy Partek AB: *See—*
Nurmi, Tom; Johansson, Lasse; and Fjader, Mikael, 5,116,397, Cl. 65-14.000.

Oyaba, Takashi; Morikawa, Hideaki; Gan, Yasuo; and Kanemaki, Naobumi, to Pioneer Electronic Corporation; and Nippon Telegraph and Telephone Corporation. Speaker system having directivity. 5,117,463, Cl. 381-158.000.

Oyama, Kenshu, to Matsushita Electric Industrial Co., Ltd. Electronic component mounting apparatus. 5,115,559, Cl. 29-720.000.

Oyama, Mitsuyoshi, to Daiwa Seiko, Inc. Fishing rod. 5,115,591, Cl. 43-22.000.

Oyama, Rieko: *See—*
Ohara, Shuichi; Akasaka, Shiniichi; Oka, Hiroyuki; Hattori, Shintaroo; and Oyama, Rieko, 5,116,148, Cl. 400-241.000.

Ozaki, Junji: *See—*
Kudoh, Yasuo; Tsuchiya, Sohji; Fukuyama, Masao; Kojima, Toshikuni; Ozaki, Junji; and Kobatake, Yasuhiro, 5,117,332, Cl. 361-525.000.

Ozaki, Masaaki; and Kojima, Yoh, to Honda Giken Kogyo Kabushiki Kaisha. Method of checking the function of a driving wheel slip control system. 5,115,678, Cl. 73-117.000.

Ozaki, Masaaki: *See—*
Ishii, Hiroshi; and Ozaki, Masaaki, 5,117,164, Cl. 318-135.000.

Ozaki, Takeyuki: *See—*
Morino, Taisuke; Tanaka, Mami; Kaneko, Fuminori; Ozaki, Takeyuki; and Akiyama, Shuichi, 5,117,079, Cl. 219-10.55F.

Ozawa, Godo, to Kabushiki Kaisha Komatsu Seisakusho. Method of cooling cylinder liners in an engine. 5,115,771, Cl. 123-41.720.

Ozawa, Satoshi; Oki, Naoto; Shibata, Yasuhisa; and Miyagi, Hiroyuki, to Hitachi, Ltd. Anion-selective, sensitive film, electrode containing the same and the use thereof. 5,116,481, Cl. 204-290.00R.

Ozeki, Keita: *See—*
Imura, Yoshihito; and Ozeki, Keita, 5,115,879, Cl. 180-149.000.

Pace, Lawrence A. Multipurpose golfer's tool. 5,116,046, Cl. 273-32.00B.

Packard, Barbara B.: *See—*
Stearns, Glenn; Packard, Barbara B.; and Watson, Ralph T., 5,117,496, Cl. 395-700.000.

Packham, Michael J.; and Bushnell, Bernard C., to Imperial Chemical Industries PLC. Polyolefin film. 5,116,926, Cl. 526-348.100.

Pagella, Pier G.: *See—*
Del Bono, Rinaldo; De Ambrosi, Luigi; Ferrari, Gianni; Rugarli, Pier L.; and Pagella, Pier G., 5,116,963, Cl. 536-21.000.

Pai, Robert Y.: *See—*
Blaisdell, Ronald G.; Hough, Harold L.; and Pai, Robert Y., 5,116,272, Cl. 445-26.000.

Pajari, George, Sr. Anti-blockage bearing. 5,116,147, Cl. 384-615.000.

Palfray, Michel, to Etablissements Proteor. Prosthesis with a monobloc framework for leg amputation and method for producing this prosthesis. 5,116,381, Cl. 623-33.000.

Palmer, Michael J.: *See—*
Bregman, Mark F.; Horton, Raymond R.; Lanzetta, Alphonso P.; Noyan, Ismail C.; Palmer, Michael J.; and Tong, Ho-Ming, 5,117,275, Cl. 357-70.000.

Palmer, Ralph P.; Whitmoyer, David A.; and Shumaker, Mark A., to Best Lock Corporation. Drill jig for preparing a door to receive a cylindrical lock. 5,116,170, Cl. 408-72.00B.

Palnik, Karl L., to Carolinch Company, The. Method and apparatus for electrolytic plating. 5,116,480, Cl. 204-206.000.

Pan, Jing-Jong, to E-Tek Dynamics, Inc. Fiber optic coupler and method of making same. 5,117,473, Cl. 385-33.000.

Pan, Peter N.Y.: *See—*
Snyder, Gene W.; and Pan, Peter N.Y., 5,115,902, Cl. 198-365.000.

Pandl, Klaus; and Patsch, Manfred, to BASF Aktiengesellschaft. Phenylene diamines and process for the preparation of phenylene diamines. 5,117,050, Cl. 562-58.000.

Pantoliano, Michael W.: *See—*
Bryan, Philip N.; Pantoliano, Michael W.; Rollence, Michele L.; and Wong, Chi H., 5,116,741, Cl. 435-87.000.

Panus, Irenaeus S.: *See—*
Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., 5,117,211, Cl. 335-202.000.

Papallo, Thomas F., Jr.: *See—*
Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., 5,117,211, Cl. 335-202.000.

Papantoniou, Christos: *See—*
Mondet, Jean; Papantoniou, Christos; Cheneble, Jean-Charles; and Mahieu, Claude, 5,116,601, Cl. 424-47.000.

Pappas, Heraklus. Device for drying surfaces. 5,115,579, Cl. 34-95.300.

Papst-Motoren GmbH & Co. KG: *See—*
Albrecht, Klaus; Hans, Helmut; von der Heide, Johann; and Schmider, Fritz, 5,117,128, Cl. 310-191.000.

Paques, Eric-Paul: *See—*
Stuber, Werner; and Paques, Eric-Paul, 5,116,962, Cl. 525-54.200.

Pareizs, Valdis L.: *See—*
Fabris, Arnold J.; Pareizs, Valdis L.; and Stokes, Leonard S., 5,116,449, Cl. 156-415.000.

Parekh, Bhupendra K.; and Groppo, John G., Jr., to University of Kentucky Research Foundation. Froth flotation method for recovery of ultra-fine constituent. 5,116,487, Cl. 209-164.000.

Park, John J.; Katz, Leon; and Gaylord, Norman G., to James River Corporation of Virginia. Polypropylene foam sheets. 5,116,881, Cl. 521-143.000.

Park, Ki S.; Kim, Sang B.; Oh, Kwang Y.; and Lee, Yong T., to Electronics and Telecommunications Research Institute. Method for manufacturing a junction field effect transisor. 5,116,772, Cl. 437-41.000.

Park, Ki S.; Kim, Sang B.; Oh, Kwang Y.; and Lee, Yong T., to Electronics and Telecommunications Research Institute. Method for manufacturing a junction field effect transistor. 5,116,773, Cl. 437-41.000.

Park, Kwon C.: *See—*
Lee, Bhum C.; and Park, Kwon C., 5,117,135, Cl. 307-514.000.

Parma Oy: *See—*
Ylander, Kimmo; and Mattila, Pentti, 5,115,813, Cl. 128-660.010.

Parme, Charles B., to Sundstrand Corporation. Seal rings for the roller on a rotary compressor. 5,116,208, Cl. 418-63.000.

Parr, Jack E.: *See—*
Hewka, Leda C.; Geremakis, Perry A.; Lester, Mark B.; and Parr, Jack E., 5,116,380, Cl. 623-23.000.

Parrish, Osey C.; Peiffer, Robert E., Jr.; Thomas, James H.; and Hilpert, Edwin J., Jr., to Flashpoint Computer Corporation. Memory address mechanism in a distributed memory architecture. 5,117,350, Cl. 395-425.000.

Passafaro, James D.: *See—*
Griffith, James M.; Zalesky, Paul J.; Gessert, James M.; Dinh, Viet P.; and Passafaro, James D., 5,115,814, Cl. 128-662.060.

Pastusek, Paul E., to Baker Hughes Incorporated. Method and appartus for directing drilling fluid to the cutting edge of a cutter. 5,115,873, Cl. 175-65.000.

Patel, Daxesh K.; and Baker, Jay D., to Ford Motor Company. Method for laser scribing substrates. 5,116,641, Cl. 427-96.000.

Patel, Mansukh M.; and Copper, Charles M., to Wm. Wrigley Jr. Company. Nitrogen sparging method for eliminating off-notes from mint flavors and method of making chewing gum comprising said flavors. 5,116,625, Cl. 426-3.000.

Paterson, Donald W. Needle assembly. 5,116,325, Cl. 604-192.000.

Patrick, Alvin J.; Patrick, Willie H., deceased; and Patrick, James W., administrator, to Sheer Lady International, Inc. Non-run pantyhose. 5,115,650, Cl. 66-169.00A.

Patrick, James W., administrator: *See—*
Patrick, Alvin J.; Patrick, Willie H., deceased; and Patrick, James W., administrator, 5,115,650, Cl. 66-169.00A.

Patrick, Willie H., deceased: *See—*
Patrick, Alvin J.; Patrick, Willie H., deceased; and Patrick, James W., administrator, 5,115,650, Cl. 66-169.00A.

Patsch, Manfred: *See—*
Pandl, Klaus; and Patsch, Manfred, 5,117,050, Cl. 562-58.000.

Pattarozzi, Domenico, to PRB Packaging Systems S.R.L. Device for forming vertical piles of items. 5,116,195, Cl. 414-790.300.

Patton, Brian L.: *See—*
March, Keith L.; Hathaway, David R.; Wilensky, Robert L.; and Patton, Brian L., 5,116,864, Cl. 514-455.000.

Paulik, Frank E.; and Schultz, Robert G., to Monsanto Company. Preparation of alkylidene diesters. 5,117,046, Cl. 560-232.000.

Paventi, Martino; and Hay, Allan S. Aromatic tertiary amines, enamines, deoxybenzoins and benzils. 5,117,062, Cl. 564-385.000.

Pavia, Michael R., to Warner-Lambert Co. Various N-substituted 3-piperidine carboxylic acids or N-substituted 3-pyridinecarboxylic acids and derivatives thereof. 5,116,988, Cl. 546-245.000.

Pavkovich, John M.: *See—*
Seppi, Edward J.; Shapiro, Edward G.; and Pavkovich, John M., 5,117,445, Cl. 378-65.000.

Pearson, Erich H. Continuous treatment process and apparatus for the disinfection of infectious waste. 5,116,574, Cl. 422-3.000.

Peckham, Roger D.; and Kelley, Michael R., to Honeywell. Path capture forcing function generator for aircraft vertical axis control. 5,117,362, Cl. 364-433.000.

Pederson, Dennis A. Apparatus and method for separating recyclable waste. 5,116,486, Cl. 209-12.000.

Peiffer, Robert E., Jr.: *See—*
Parrish, Osey C.; Peiffer, Robert E., Jr.; Thomas, James H.; and Hilpert, Edwin J., Jr., 5,117,350, Cl. 395-425.000.

Pekrul, Ronald G.: *See—*
Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., 5,117,211, Cl. 335-202.000.

Pellegrini, Louis A. Vehicle and method for collecting recyclable waste materials. 5,116,184, Cl. 414-406.000.

Pelletier, Marc: *See—*
Muller, Jean-Francois; Tollitte, Francois; Krier, Gabriel; and Pelletier, Marc, 5,117,108, Cl. 250-288.000.

Pelletier, Robert A. Golf practice apparatus. 5,116,059, Cl. 273-200.00A.

Penato, Jean-Marie; Noualhaguet, Pierre; and Laurent, Michel, to General Electric CGR S.A. Weight compensation device for X-ray tube comprising passive magnetic bearings. 5,117,448, Cl. 378-132.000.

Peng, Yu-Yin; Chen, Jaw-Long; and Gau, Tien-Ho, to Industrial Technology Research Institute. Diaphragmatic electromagnetic valve with leakage preventing convex ring. 5,116,020, Cl. 251-129.170.

Penn, William A.; and Winfield, Donald W., to General Electric Company. Optical calibration of towed sensor array. 5,117,400, Cl. 367-128.000.

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Knox, Jack D.; and Pennington, Donald C., Jr., 5,116,416, Cl. 75-238.000.

Pennington, Ruford T.; and Fullington, Michael C., to Olin Corporation. Non-catalytic oxidation of propylene to propylene oxide. 5,117,011, Cl. 549-523.000.

Pennisi, Robert W.: *See—*
Davis, James L.; Nounou, Fadia; Suppelsa, Anthony B.; and Pennisi, Robert W., 5,116,433, Cl. 148-24.000.

Pennypacker, Frank: *See—*
McCurdy, Jim; and Pennypacker, Frank, 5,117,222, Cl. 340-573.000.

Perez-Mendez, Victor: *See—*
Street, Robert A.; Kaplan, Selig N.; and Perez-Mendez, Victor, 5,117,114, Cl. 250-370.110.

Perez, Rafael. Illuminated balloon assembly. 5,117,344, Cl. 362-352.000.

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Khokhar, Abdul R.; Lopez-Berestein, Gabriel; and Perez-Soler, Roman, 5,117,022, Cl. 556-137.000.

Perf-O-Log, Inc: *See—*
Champeaux, Glenn; and Carisella, James V., 5,115,860, Cl. 166-51.000.

Perkins, Newton B. Method of making biodegradable free fill foam packing material. 5,116,550, Cl. 264-12.000.

Permyakov, Georgy P.: *See—*
Zlobin, Mikhail N.; and Permyakov, Georgy P., 5,116,492, Cl. 210-188.000.

Perrillat-Amede, Denis: *See—*
Baret, Gilles; and Perrillat-Amede, Denis, 5,116,196, Cl. 415-89.000.

Perron, Richard D.: *See—*
Lytton, Linda E.; and Perron, Richard D., 5,116,151, Cl. 401-9.000.

Perry, Alan F. E., to British Aerospace Public Limited Company. Variable air intake. 5,116,001, Cl. 244-53.00B.

Perry, James G., to Advanced Innovations Inc. Fish filleting apparatus. 5,116,279, Cl. 452-195.000.

Perry, Jeffrey E.; and Barber, Harry. Fuse block adapters for terminal blocks. 5,116,246, Cl. 439-621.000.

Persoon, Eric H. J.; and Vandenbulcke, Christian J. B. O. E., to U.S. Philips Corporation. Full adder circuit. 5,117,386, Cl. 364-787.000.

Peschka, Walter; and Schneider, Gottfried, to Deutsche Forschungsanstalt fuer Luft-und Raumfahrt e.V. Combustion engine for hydrogen. 5,115,768, Cl. 123-1.00A.

Pessi, Antonello: *See—*
Verdini, Antonio S.; Pessi, Antonello; and Bonelli, Fabio, 5,116,946, Cl. 530-300.000.

Peter F. Lee, Inc.: *See—*
Lee, Peter F., 5,115,816, Cl. 128-749.000.

Peters, Richard H.; and Tanabe, Masato. 15,16-seco-19-nor progestins. 5,116,865, Cl. 514-510.000.

Peters, Richard H.: *See—*
Tanabe, Masato; Crowe, David F.; Peters, Richard H.; and Johansson, John G., 5,116,830, Cl. 514-182.000.

Peters, Richard K.: *See—*
Moore, Richard D.; Peters, Richard K.; and Elmerick, Donald V., 5,117,101, Cl. 250-226.000.

Peterson, John M., to Teledyne Industries, Inc. Surveillance balloon. 5,115,997, Cl. 244-25.000.

Petit, Alain: *See—*
Correia, Yves; Lesparre, Jean; and Petit, Alain, 5,116,799, Cl. 502-225.000.

Pettigrew, Robert D.; and Luong, Sanh D. Remote bias voltage setting LTC control system. 5,117,175, Cl. 323-256.000.

Petty, Norman W., to AT&T Bell Laboratories. Graphics-assisted terminal administration arrangement. 5,117,372, Cl. 395-161.000.

Petty, Paul M. Hemostatic surgical instrument comprising stapler and stapler combined with surgical scalpel. 5,115,958, Cl. 227-180.000.

Peyre, Henri, to Look S.A. Safety ski binding for the releasable holding of a ski boot. 5,116,074, Cl. 280-618.000.

Pfaendner, Rudolf, to Ciba-Geigy Corporation. Polyamide-polyimide block copolymers soluble in aprotic dipolar solvents. 5,116,913, Cl. 525-432.000.

Pfaendner, Rudolf, to Ciba-Geigy Corporation. Polyamide-polyimide block copolymers soluble in aprotic dipolar solvents. 5,116,920, Cl. 525-432.000.

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Pfizer Hospital Products Group, Inc.: *See—*
Poggie, Matthew P.; Walker, Peter S.; and Ewald, Frederick C., 5,116,338, Cl. 606-90.000.

Pfizer Hospital Products Groups, Inc.: *See—*
Vannus, Tom H.; Mauser, Stephen G.; Ebling, Wendell V.; and Manska, Wayne E., 5,116,329, Cl. 606-11.000.

Pfizer Inc.: *See—*
Dickinson, Roger P.; and Richardson, Kenneth, 5,116,844, Cl. 514-269.000.
Marfat, Anthony, 5,116,854, Cl. 514-365.000.

Phelan, Herbert A.; Phelan, Stella; and Guimont, Patricia A. Golf putting device and method. 5,116,047, Cl. 273-80.100.

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Phelan, Herbert A.; Phelan, Stella; and Guimont, Patricia A., 5,116,047, Cl. 273-80.100.

Philip Morris Incorporated: *See—*
Amendola, Angel, 5,115,737, Cl. 101-32.000.
Keritsis, Gus D., 5,115,823, Cl. 131-336.000.

Phillips, Forrest M.: *See—*
Ledoux, Robert V.; Kelly, Richard P.; and Phillips, Forrest M., 5,117,491, Cl. 395-375.000.

Phillips, Howard C.: *See—*
Erb, David J.; Nicholas, Keith L.; Phillips, Howard C.; and Wasilko, John M., 5,115,560, Cl. 29-747.000.

Phillips, Joseph; Prough, J. Robert; Bilodeau, Victor; Greenwood, Brian; Bain, Ronald; and Weston, John, to Kamyr Inc. Atmospheric diffuser improved lower screens backflushing. 5,116,476, Cl. 162-60.000.

Phillips Petroleum Company: *See—*
Hsieh, Henry L., 5,116,921, Cl. 526-287.000.
Spoo, Kevin J.; Rhodes, Vergil H., Jr.; and Dodd, Bill W., 5,116,450, Cl. 156-441.000.

Phoenix Park Systems: *See—*
Havens, Terry L.; and Guede, Arthur C., 5,116,634, Cl. 427-4.000.

Photo-Catalytics, Inc.: *See—*
Cooper, Gerald; Ratcliff, Matthew A.; and Sczechowski, Jeffrey G., 5,116,582, Cl. 422-186.300.

Photon Imaging Corp.: *See—*
Gordon, Eugene I., 5,117,245, Cl. 346-160.000.

Photonetics: *See—*
Martin, Philippe; and Le Boudec, Gilles, 5,115,677, Cl. 73-64.480.

Photoprotective Technology Incorporated: *See—*
Gallas, James M., 5,116,884, Cl. 523-106.000.

Piasecki, Joshua; and Sourani, Sason, to ECI Telecom Ltd. Telecommunication system. 5,117,453, Cl. 379-100.000.

Picker, Jurgen, to Volkswagen AG. Gas analyzer having a test chamber traversed by radiation. 5,116,120, Cl. 356-246.000.

Pierce, William C., to Lear Siegler Truck Products Corp. Trailing arm suspension with wrapper compression axle mounting. 5,116,075, Cl. 280-688.000.

Pietsch, Klaus: *See—*
Beisemann, Gerd; and Pietsch, Klaus, 5,115,653, Cl. 72-8.000.

Pildysh, Mikhail. Containment system. 5,116,300, Cl. 405-107.000.

Pinchuk, Leonard; Martin, John B., Jr.; and Weber, Bruce A., to Corvita Corporation. Mesh composite graft. 5,116,360, Cl. 623-1.000.

Ping Ho Liao: *See—*
Kuo, Long-Far, 5,115,894, Cl. 190-117.000.

Pinnavaia, Thomas J.; Amarasekera, Jayantha; and Polansky, Christine A., to Board of Trustees operating Michigan State University. Layered double hydroxide sorbents for the removal of SO_x from flue gas resulting from coal combustion. 5,116,587, Cl. 423-244.000.

Pinori, Massimo; Centini, Felice; and Verdini, Antonio S., to Sclavo S.p.A. Process for the preparation of retro-inverso peptides and new intermediates thereof. 5,116,947, Cl. 530-323.000.

Pinschmidt, Robert K., Jr.: *See—*
Listemann, Mark L.; and Pinschmidt, Robert K., Jr., 5,117,056, Cl. 564-134.000.

Pioneer Electronic Corporation: *See—*
Akiyama, Kazuhiro; Kashiwazaki, Takashi; Araki, Morio; Odagawa, Satoshi; and Fukushima, Atsuhiko, 5,117,363, Cl. 364-449.000.

Miyadera, Toshiyuki; Okano, Makoto; and Matsui, Fumio, 5,117,416, Cl. 369-284.000.
Morikawa, Hideaki; Gan, Yasuo; Kogure, Koushiro; and Ooyaba, Takashi, 5,115,883, Cl. 181-152.000.
Oyaba, Takashi; Morikawa, Hideaki; Gan, Yasuo; and Kanemaki, Naobumi, 5,117,463, Cl. 381-158.000.
Shimizu, Akira; Ogawa, Tutomu; Wakatsuki, Kenji; and Kimura, Tomomichi, 5,117,409, Cl. 369-36.000.

Pirio, Marcel: *See—*
Switchenko, Arthur C.; Kurn, Nurith; Neukom, Christian; Pirio, Marcel; Berger, Donald E., Jr.; and Ullman, Edwin F., 5,116,726, Cl. 435-5.000.

Pirozzoli, Alexander P.: *See—*
Pirozzoli, Richard W.; Pirozzoli, Robert J.; and Pirozzoli, Alexander P., 5,115,607, Cl. 52-134.000.

Pirozzoli, Richard W.; Pirozzoli, Robert J.; and Pirozzoli, Alexander P., to Norwalk Vault Company of Bridgeport, Inc. Casket enclosure and method of storing same in a burial crypt. 5,115,607, Cl. 52-134.000.

Pirozzoli, Robert J.: *See—*
Pirozzoli, Richard W.; Pirozzoli, Robert J.; and Pirozzoli, Alexander P., 5,115,607, Cl. 52-134.000.

Pitney Bowes Inc.: *See—*
Braen, Henry P.; Wright, William J.; and Belec, Eric A., 5,116,039, Cl. 271-34.000.
Corbett, Mark S., 5,117,095, Cl. 235-101.000.

Pittway Corporation: *See—*
Marino, Francis C.; and Freeman, Stanley B., 5,117,220, Cl. 340-550.000.
Tice, Lee D.; Fritz, Todd W.; and Kilcommons, Mark A., 5,117,219, Cl. 340-518.000.

Placko, Dominique: *See—*
Clergeot, Henri; Placko, Dominique; and Plantevin, Michel, 5,117,181, Cl. 324-207.180.

Plagne, Jean-Louis: *See—*
Cattoz, Roland; Godde, Guy; and Plagne, Jean-Louis, 5,117,030, Cl. 556-472.000.

Plantevin, Michel: *See—*
Clergeot, Henri; Placko, Dominique; and Plantevin, Michel, 5,117,181, Cl. 324-207.180.

Pless, Benjamin; Sweeney, Michael; and Winkle, Roger, to Ventritex. Programmable defibrillator with pulse energy and resistance displays and methods of operating the same. 5,115,807, Cl. 128-419.00D.

Pneumafil Corporation: *See—*
Williams, Roger D., 5,116,395, Cl. 55-273.000.

Poclain Hydraulics: *See—*
Noel, Alain W., 5,115,890, Cl. 188-71.500.

Podio, Augusto L.: *See—*
McCoy, James N.; Huddleston, Kenneth L.; and Podio, Augusto L., 5,117,399, Cl. 367-99.000.

Poeschl, Franz, to Loesche GmbH. Dynamic roller mill air classifier. 5,115,989, Cl. 241-79.100.

Poggie, Matthew P.; Walker, Peter S.; and Ewald, Frederick C., to Pfizer Hospital Products Group, Inc. Apparatus for knee prosthesis. 5,116,338, Cl. 606-90.000.

Polansky, Christine A.: *See—*
Pinnavaia, Thomas J.; Amarasekera, Jayantha; and Polansky, Christine A., 5,116,587, Cl. 423-244.000.

Polaroid Corporation: *See—*
Ellwood, Jennifer K.; Gaewsky, John P.; and Magno, James C., Jr., 5,117,252, Cl. 354-415.000.

Pold, Ilmar: *See—*
Pold, Juri; and Pold, Ilmar, 5,116,160, Cl. 403-172.000.

Pold, Juri; and Pold, Ilmar. Connectors. 5,116,160, Cl. 403-172.000.

Politowicz, Kenneth G.: *See—*
Dagata, Frank J.; and Politowicz, Kenneth G., 5,117,439, Cl. 373-88.000.

Pollich, Gerhard, to Heidelberger Druckmaschinen AG. Sheet feeder having an auxiliary pipe for non-stop operation. 5,116,041, Cl. 271-158.000.

Pologe, Laura: *See—*
Ravetch, Jeffrey V.; and Pologe, Laura, 5,116,965, Cl. 536-27.000.

Polsinelli, Enzo: *See—*
Fiorini, Emilio, 5,115,769, Cl. 128-32.000.

Pomara, Johnny B., Jr. Tray accumulator. 5,115,907, Cl. 198-744.000.

Pomeranz, Melvin A.: *See—*
Sroub, Brian J.; and Pomeranz, Melvin A., 5,116,278, Cl. 450-61.000.

Pommier, M. Jean-Claude: *See—*
Fuentes, M. Jean-Luc; Rousset, M. Christian; Goma, M. Gerard; and Pommier, M. Jean-Claude, 5,116,474, Cl. 162-71.000.

Pompes Salmson: *See—*
Trian, Herve, 5,117,138, Cl. 310-89.000.

Pompignano, Gary C.: *See—*
Woo, James T. K.; and Pompignano, Gary C., 5,116,888, Cl. 523-409.000.

Pond, Cecil E.; and Pond, Gary E., to Porter Case, Inc. Carry-on case having wheels and an extendable handle. 5,116,289, Cl. 190-18.00A.

Pond, Gary E.: *See—*
Pond, Cecil E.; and Pond, Gary E., 5,116,289, Cl. 190-18.00A.

Ponomarjev, Viktor: *See—*
Popovic, Goran; Saryazyan, Armen; Ponomarjev, Viktor; and Vucelic, Dusan, 5,115,808, Cl. 128-660.020.

Poore, Gerald A.: *See—*
Harper, Richard W.; Howbert, J. Jeffry; Poore, Gerald A.; Rieder, Brent J.; Tao, Eddie V. P.; and Aikins, James A., 5,116,874, Cl. 514-592.000.

Pop, Dumitru A. Logic puzzle. 5,116,052, Cl. 273-153.00R.

Pope, John A.; Barker, Roger N.; and Hann, Richard A., to Imperial Chemical Industries PLC. Thermal transfer receiver. 5,116,805, Cl. 503-227.000.

Popovic, Goran; Saryazyan, Armen; Ponomarjev, Viktor; and Vucelic, Dusan, to Institute of General and Physical Chemistry; and Institute for Biological Physics of the USSR Academy of Science. Method and device for noninvasive acoustic testing of elasticity of soft biological tissues. 5,115,808, Cl. 128-660.020.

Poppe, Hildegard: *See—*
Wunderlich, Helmut; Stark, Andreas; Zenker, Lothar; Lohmann, Dieter; Poppe, Hildegard; Bartsch, Reni; Skoldinov, Aleksandr P.; Kaverina, Natalja V.; Grizenko, Anna N.; and Lyskovzev, Valentin V., 5,116,974, Cl. 540-591.000.

Porta, Roberto: *See—*
Mantovani, Marisa; Porta, Roberto; and Prino, Giuseppe, 5,116,617, Cl. 424-401.000.

Porter Case, Inc.: *See—*
Pond, Cecil E.; and Pond, Gary E., 5,116,289, Cl. 190-18.00A.

Porter, Kirby H. Insulated beverage container. 5,115,939, Cl. 220-705.000.

Potter, Ronald W.: *See—*
Wardle, Jay M.; Potter, Ronald W.; and Gibbs, John A., 5,117,179, Cl. 324-77.0CS.

Pottratz, David G.: *See—*
Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III; and Pottratz, David G., 5,116,466, Cl. 203-58.000.
Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III; and Pottratz, David G., 5,116,467, Cl. 203-58.000.

Pounds, Gregory E.: *See—*
Ladd, David J.; Pounds, Gregory E.; Kusumi, Tim J.; Bonee, Peter A.; and Shepard, Robert R., 5,117,451, Cl. 379-67.000.

Pourprix, Michel, to Commissariat a L'Energie Atomique. Electrostatic detector of aerosol particles. 5,117,190, Cl. 324-452.000.

Powell, Scott D.; and Meharry, David E., to Lockheed Sanders, Inc. Monolithic microwave airbridge. 5,117,207, Cl. 333-1.000.

Power, Adrian P.: *See—*
Power, Peter A.; Power, Adrian P.; Power, Julian M.; and Conlon, David, 5,116,204, Cl. 40-607.000.

Power, Julian M.: *See—*
Power, Peter A.; Power, Adrian P.; Power, Julian M.; and Conlon, David, 5,116,204, Cl. 40-607.000.

Power, Peter A.; Power, Adrian P.; Power, Julian M.; and Conlon, David. Display device. 5,116,204, Cl. 40-607.000.

Powercube Corporation: *See—*
Sturgeon, Clayton L.; and Jeffries, Paul A., 5,117,214, Cl. 336-170.000.

PPG Industries, Inc.: *See—*
Sundararaman, Padmanabhan; Maska, Rudolf; and Verardi, Cynthia L., 5,116,922, Cl. 526-304.000.

Prach, Thomas: *See—*
Mausner, Leonard F.; Srivastava, Suresh C.; and Prach, Thomas, 5,116,470, Cl. 204-157.210.

Praino, Anthony P.: *See—*
Hegde, Suryanarayan G.; Praino, Anthony P.; Root, Steven J.; and Sri-Jayantha, Muthuthamby, 5,115,664, Cl. 73-9.000.

Prasad, Ravi; Notaro, Frank; and Haas, Oscar W., to Union Carbide Industrial Gases Technology Corporation. Hybrid prepurifier for cryogenic air separation plants. 5,116,396, Cl. 62-24.000.

Prass, Werner: *See—*
Lupo, Donald; Prass, Werner; and Scheunemann, Ude, 5,116,925, Cl. 526-323.100.

Pratt, J. Richard: *See—*
Fletcher, James C.; Pratt, J. Richard; St. Clair, Terry L.; Stoakley, Diane M.; and Burks, Harold D., 5,116,939, Cl. 528-353.000.

Pratt, Wayne, to K-Flow Division of Kane Steel Co., Inc. Coriolis mass flow meter adapted for low flow rates. 5,115,683, Cl. 73-861.380.

PRB Packaging Systems S.R.L.: *See—*
Pattarozzi, Domenico, 5,116,195, Cl. 414-790.300.

Prchal, Milos: *See—*
Lewis, Graham; Prchal, Milos; Weidner, Siegfried H.; and Yablonovitch, Max, 5,115,617, Cl. 53-306.000.

Precision Twist Drill Co.: *See—*
Koster, Paul E., 5,116,172, Cl. 408-226.000.

Prewo, Karl M., to United Technologies Corporation. Process for forming fiber reinforced composite articles. 5,116,398, Cl. 65-18.100.

Priem, Curtis: *See—*
Malachowsky, Chris; and Priem, Curtis, 5,117,485, Cl. 395-134.000.

Prime Computer, Inc.: *See—*
Higgins, Leo M., III, 5,117,069, Cl. 174-261.000.

Principe-Nicolas, Paola: *See—*
Braquet, Pierre; Broquet, Colette; Vandamme, Benedicte; and Principe-Nicolas, Paola, 5,116,992, Cl. 514-77.000.

Prino, Giuseppe: *See—*
Mantovani, Marisa; Porta, Roberto; and Prino, Giuseppe, 5,116,617, Cl. 424-401.000.

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Pro-Tech Design & Manufacturing, Inc.: *See—*
McMasters, David A.; and Wetzel, Donald, 5,116,010, Cl. 248-309.100.

Probst, Ronald N.: *See—*
Abraham, Leslie R.; and Probst, Ronald N., 5,115,608, Cl. 52-238.100.

Procter & Gamble Company, The: *See—*
Broaddus, Charles D., 5,116,610, Cl. 424-78.120.
Gilbert, Sheri A.; Mizoguchi, Haruko; Charest, Robert P.; O'Neill, Timothy P.; and Smith, Ronald L., 5,116,847, Cl. 514-327.000.
Lichtenwalter, Glen D.; Rosario-Jansen, Theresa; and Wahl, Errol H., 5,116,520, Cl. 252-8.600.
Mazur, Adam W.; Hiler, George D., II; and El-Nokaly, Magda, 5,116,745, Cl. 435-134.000.
McKibben, Gary E.; Goetz, Vernon N.; and Boehm, Elise M., 5,115,966, Cl. 229-125.030.
Thomas, Dennis A.; and Goulait, David J. K., 5,116,563, Cl. 264-167.000.

Proctor & Gamble Company, The: *See—*
Randall, Jared L.; and Leunk, Robert D., 5,116,821, Cl. 514-25.000.

Prohaska, Otto J., to OttoSensors Corporation. Capillary chromatography device. 5,116,495, Cl. 210-198.200.

Prossen, Richard L.: *See—*
Eninger, James E.; Zamel, James M.; and Prossen, Richard L., 5,116,268, Cl. 441-3.000.

Protek AG: *See—*
Jakob, Roland P.; Freudiger, Stefan; Koch, Rudolf; and Fluckiger, Hans, 5,116,373, Cl. 623-13.000.

Prough, J. Robert: *See—*
Phillips, Joseph; Prough, J. Robert; Bilodeau, Victor; Greenwood, Brian; Bain, Ronald; and Weston, John, 5,116,476, Cl. 162-60.000.

Psajd, Rihard, to Ezze AB. Quick action coupling. 5,116,086, Cl. 285-277.000.

Psiorz, Manfred: *See—*
Bomhard, Andreas; Heider, Joachim; Psiorz, Manfred; Hauel, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Diederen, Willi, 5,116,986, Cl. 546-141.000.

PTR Praezisionstechnik GmbH: *See—*
Fritz, Dieter; and Spruck, Helmut, 5,117,085, Cl. 219-121.270.

Pudney, Christopher D.: *See—*
Shepherd, Robert; Owen, Frank C. G.; and Pudney, Christopher D., 5,117,423, Cl. 370-95.100.

Pulwer, Mitchell L.: *See—*
Janoski, Helen L.; Baysdon, Sherrol L.; and Pulwer, Mitchell L., 5,116,991, Cl. 546-315.000.

Pure-Chem Products Company, Inc.: *See—*
King, William J.; and Voyle, Robert J., 5,115,978, Cl. 239-107.000.

Puri, Yogishwar K.: *See—*
Hoffman, Joseph A.; Jallice, Derwin L.; Puri, Yogishwar K.; and Richards, Randall G., 5,117,129, Cl. 307-443.000.

Pussikeskus Oy: *See—*
Janhonen, Veikko I., 5,115,618, Cl. 53-449.000.

Pyotsia, Jouni: *See—*
Rohweder, Reimer; and Pyotsia, Jouni, 5,116,019, Cl. 251-127.000.

Quackenbush, Raymond M.: *See—*
LeRoy, Robert D.; and Quackenbush, Raymond M., 5,116,036, Cl. 271-3.100.

Quantum Chemical Corporation: *See—*
Fries, Richard W., 5,116,795, Cl. 502-117.000.

Quartaert, Petrus M. Method for making harvest product roll bales and apparatus for performing the method. 5,115,734, Cl. 100-5.000.

Quebedeau, Larry J.: *See—*
Gaidry, John E.; Quebedeau, Larry J.; Donovan, Joseph F.; and Ashton, Jefferson P., 5,115,864, Cl. 166-278.000.

Quist, William E.: *See—*
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Kokkonen, Seppo K.; and Qvintus, Harri T., 5,116,423, Cl. 134-15.000.

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Murphy, Robert H., 5,115,912, Cl. 206-334.000.

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Rutter, Christopher C.; Bilbrey, Robert A.; and Koball, Bruce R., 5,115,626, Cl. 53-468.000.

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Stichel, Willi, 5,115,541, Cl. 24-20.00R.

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Chao, Chien C.; and Rastelli, Henry, 5,116,793, Cl. 502-68.000.

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Cooper, Gerald; Ratcliff, Matthew A.; and Sczechowski, Jeffrey G., 5,116,582, Cl. 422-186.300.

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Jensen, Per J. T., 5,117,094, Cl. 219-535.000.

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Larson, Raymond D., 5,115,590, Cl. 43-17.000.

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Cantwell, Robert H., 5,117,232, Cl. 342-357.000.

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Crump, Robert L.; Harris, Ronald T.; Reckley, Samuel E.; Montgomery, Edward L.; and Hurst, Lawrence B., 5,115,850, Cl. 152-209.00R.

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Debaes, Bernard; De Winter, Hugo; and Nicolaus, Frank, 5,116,557, Cl. 264-46.600.

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Stone, Kevin R., 5,116,374, Cl. 623-16.000.

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Dore, Jacques, 5,115,791, Cl. 123-572.000.

Rehau Ag & Co.: *See—*
Hopperdietzel, Siegfried, 5,116,087, Cl. 285-286.000.

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Kaiser, Hartmut; and Lulsdorf, Peter, 5,116,135, Cl. 366-349.000.

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Jaycox, Donald F., 5,117,067, Cl. 174-38.000.

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Frankel, Neil A.; Lindblad, Nero R.; Relyea, Herbert C.; and Meyer, Robert J., 5,117,264, Cl. 355-299.000.

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Koyama, Noboru; Kawahara, Setsuko; Ren, Rieko; Kumamoto, Kenji; and Nakajima, Noboru, 5,116,683, Cl. 428-403.000.

Renaud, Ronnie C. Braked artificial fishing plug. 5,115,592, Cl. 43-42.470.

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Grandmont, William; and Rendino, Paula, 5,116,533, Cl. 252-301.360.
Renegar, Jarvis K.; and Matlock, Jeffrey D., to Ingersoll-Rand Company. Extension cable for telescopic tower. 5,115,606, Cl. 52-118.000.
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Nishizawa, Junichi; and Motoya, Kaoru, 5,117,268, Cl. 357-22.000.
Resources Conservation Co.: *See—*
Bostjancic, Joseph J., 5,116,473, Cl. 159-42.000.
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Dutka, Ferenc; Komives, Tamas; Fodor, Katalin, nee Csorba; Marton, Attila; Csikos, Aniko nee Gluck; Osztheimer, Eva; Henger, Karoly; Laborczy, Robert; Reti, Zsuzsanna, nee Bosnyak; Sebok, Dezso; Szabolcs, Jozsef; and Tomordi, Elemer, 5,116,402, Cl. 71-88.000.
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Jansen, Josef; Reul, Helmut; and Rau, Gunter, 5,116,564, Cl. 264-255.000.
Reuter, David C., to Dana Corporation. Four wheel drive transfer case with CV joint angled front output shaft. 5,116,293, Cl. 475-202.000.
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Goedderz, Dieter; and Reuvers, Markus, 5,115,551, Cl. 29-450.000.
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Fuller, Gerald G.; Garritano, Ronald F.; and Mode, Paul, 5,115,669, Cl. 73-54.390.
Rhodes, Gary: *See—*
Vaughan, John H.; Carson, Dennis A.; Rhodes, Gary; Houghten, Richard; Smith, Richard S.; and Geltosky, John E., 5,116,725, Cl. 435-5.000.
Rhodes, Richard D., Jr., to Davidson Textron Inc. Instrument panel air bag cover door. 5,116,079, Cl. 280-732.000.
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Spoo, Kevin J.; Rhodes, Vergil H., Jr.; and Dodd, Bill W., 5,116,450, Cl. 156-441.000.
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Botannet, Bernard; Clavel, Jean-Louis; Corbet, Jean-Pierre; and Mulhauser, Michel, 5,117,043, Cl. 560-150.000.
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Cattoz, Roland; Godde, Guy; and Plagne, Jean-Louis, 5,117,030, Cl. 556-472.000.
Leconte, Philippe; and Metz, Francois, 5,117,036, Cl. 560-24.000.
Luck, Francis, 5,116,801, Cl. 502-307.000.
Mignani, Gerard; and Lebrun, Jean-Jacques, 5,116,791, Cl. 501-96.000.
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Le Roy, Pierre; and Mandard-Cazin, Bernadette, 5,116,999, Cl. 549-18.000.
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Rice, Paul P.; and Munch, William D., to Bethlehem Steel Corporation. Switch point guard rail. 5,115,970, Cl. 238-17.000.
Richard Wolf GmbH: *See—*
Ams, Felix; Zanger, Ulf; and Bolg, Ulrich, 5,116,343, Cl. 606-128.000.
Richards, Alton: *See—*
Carow, Walter M.; Richards, Alton; and Cox, Jerry L., 5,115,836, Cl. 137-614.040.
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Carow, Walter M.; Richards, Alton; and Cox, Jerry L., 5,115,836, Cl. 137-614.040.
Richards, Powell: *See—*
Srivastava, Suresh C.; Babich, John W.; Straub, Rita; and Richards, Powell, 5,116,597, Cl. 424-1.100.
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Hoffman, Joseph A.; Jallice, Derwin L.; Puri, Yogishwar K.; and Richards, Randall G., 5,117,129, Cl. 307-443.000.
Richardson, Kenneth: *See—*
Dickinson, Roger P.; and Richardson, Kenneth, 5,116,844, Cl. 514-269.000.
Riche, Edward M.: *See—*
Fraser, Ann D. E.; Martin, Dawn M. J.; and Riche, Edward M., 5,116,754, Cl. 435-252.100.
Rick, Wolf E. Dispensing device and a bathroom organizer incorporating same. 5,115,945, Cl. 222-96.000.
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Hotta, Yoshihiko; and Kuto, Keishi, 5,116,803, Cl. 503-208.000.
Kakuda, Tomohisa; and Kurisu, Norio, 5,116,804, Cl. 503-209.000.
Kondo, Hitoshi; Kimura, Yuji; and Ohta, Eiichi, 5,117,299, Cl. 359-58.000.
Satoh, Shiro, 5,117,477, Cl. 385-88.000.
Yano, Satoshi, 5,117,294, Cl. 358-447.000.
Ricoh Research Institute of General Electronics Co., Ltd.: *See—*
Satoh, Shiro, 5,117,477, Cl. 385-88.000.
Riebel, Michael J.: *See—*
Anderson, Ordean S.; Anderson, Donald E.; Nair, Ramakrishna A.; and Riebel, Michael J., 5,117,240, Cl. 343-786.000.
Rieder, Brent J.: *See—*
Harper, Richard W.; Howbert, J. Jeffry; Poore, Gerald A.; Rieder, Brent J.; Tao, Eddie V. P.; and Aikins, James A., 5,116,874, Cl. 514-592.000.
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Riera, Juan C. A. Angulated abutment for osseointegrated implants. 5,116,225, Cl. 433-173.000.
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Ulmer, Georg, 5,115,632, Cl. 57-264.000.
Rigler, Rudolf, to Biophos Medical AB. Fertility analyzer. 5,116,125, Cl. 356-343.000.
Riis, Trygve: *See—*
Eri, Sigrid; Goodwin, James G., Jr.; Marcelin, George; and Riis, Trygve, 5,116,879, Cl. 518-716.000.
Rijnders, Willem: *See—*
Lim, Guy H.; Rijnders, Willem; and Louwerens, Cornelis, 5,115,611, Cl. 52-537.000.
Rinas, Glenn. 45 degree miter undercutter bit. 5,116,166, Cl. 407-57.000.
Rinehart, Robert W., to AQS, Inc. Metal value recovery or removal from aqueous media. 5,116,415, Cl. 75-711.000.
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Takeguchi, Kazunori; and Hirata, Kohji, 5,116,440, Cl. 156-90.000.
Risky Business Enterprises, Inc.: *See—*
Bilocerkowycz, Robert J.; and Denison, Timothy S., 5,116,048, Cl. 273-87.00B.
Riza, Nabeel A., to General Electric Company. Reversible time delay beamforming optical architecture for phased-array antennas. 5,117,239, Cl. 342-375.000.
Robbins, Clyde, to General Instrument Corporation. Data referenced demodulation of multiphase modulated data. 5,117,195, Cl. 329-307.000.
Roberson, Glenn A., Jr.; and Eglinton, Robert B., to Semifab Incorporated. Vapor device and method for drying articles such as semiconductor wafers with substances such as isopropyl alcohol. 5,115,576, Cl. 34-15.000.
Robert Bosch GmbH: *See—*
Bonss, Rainer, 5,117,171, Cl. 318-696.000.
Dietrich, Walter; Krieger, Eberhard; and Weber, Siegfried, 5,116,303, Cl. 493-313.000.
Klinke, Christian; Stutzenberger, Heinz; and Tillhon, Engelbert, 5,115,782, Cl. 123-489.000.
Schmidt, Wolfgang; Fischer, Werner; and Locher, Johannes, 5,116,342, Cl. 73-119.00A.
Sigl, Alfred; Meissner, Manfred; Isella, Thomas; and Schmitt, Johannes, 5,116,108, Cl. 303-103.000.
Roberts, Lincoln E.: *See—*
Hogarth, Peter T.; Swenson, Kurt; Gutenson, Charles E.; Nichols, Edward L., III; Roberts, Lincoln E.; and Miller, Vernon R., 5,117,122, Cl. 307-140.000.
Robertson, George G.: *See—*
Hillis, W. Daniel; Kahle, Brewster; Robertson, George G.; and Steele, Guy L., Jr., 5,117,420, Cl. 370-60.000.
Robinson, Alan S.: *See—*
Fuller, Mark W.; and Robinson, Alan S., 5,115,973, Cl. 239-20.000.
Robinson, David: *See—*
Artwohl, Paul; and Robinson, David, 5,116,274, Cl. 312-116.000.
Robinson, John P.; Stadick, William R.; Clawges, Thomas L.; and Minogue, Thomas P., to LPS Industries, Inc. Method of making a double zipper pouch. 5,116,301, Cl. 493-215.000.
Robinson, Richard S.; Buzin, Arthur B.; and Kirkup, Ruby E., to Colgate-Palmolive Company. Antiplaque oral compositions. 5,116,602, Cl. 424-49.000.
Rode, Duane: *See—*
Blankenburg, Karl; Blankenburg, Karl V.; and Rode, Duane, 5,116,053, Cl. 273-153.00S.
Rodi, Anton, to Heidelberger Druckmaschinen AG. Device for drying printed products in a printing machine. 5,115,741, Cl. 101-424.100.
Rodi, Anton: *See—*
Jeschke, Willi; and Rodi, Anton, 5,117,365, Cl. 364-468.000.
Rodolico, Alberto; and Rodolico, Antonino. Compaction container for domestic solid waste. 5,115,736, Cl. 100-90.000.
Rodolico, Antonino: *See—*
Rodolico, Alberto; and Rodolico, Antonino, 5,115,736, Cl. 100-90.000.
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Rodriguez, Carlos. Catalytically enhanced combustion process. 5,116,390, Cl. 44-300.000.
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Wenderoth, Bernd; Schuetz, Franz; Sauter, Hubert; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,116,866, Cl. 514-522.000.
Roemer, Helmuth. Ramming apparatus. 5,115,717, Cl. 91-49.000.
Roessler, Gert: *See—*
Fischer, Wolfgang; Bischoff, Dietmar; Huss, Michael; Stober, Reinhard; and Roessler, Gert, 5,116,967, Cl. 536-50.000.
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Calabresi, Paul; and Darnowski, James W., 5,116,823, Cl. 514-50.000.
Rogers, Walter J., Jr.; and Everett, Thomas S., to Johns Hopkins Univ.; and Towson State Univ. Perfluoro-t-butyl-containing compounds for use in fluorine-19 NMR and/or MRI. 5,116,599, Cl. 424-9.000.
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Berry, Thomas G.; Smith, Paul F.; Rohani, Kamyar; Brown, Winfield J., Jr.; and Macnak, Philip P., 5,117,460, Cl. 381-41.000.

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Hsu, Adam C.; Aller, Harold E.; Murphy, Raymond A.; Le, Dat P.; Hamp, Donald W.; and Weinstein, Barry, 5,117,057, Cl. 564-149.000.
Rohr Industries, Inc.: *See—*
Castro, Robert M.; and Adee, James M., 5,116,689, Cl. 428-593.000
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Roland, Bruno; Vandendriessche, Jan; and Jakus, Catherine, to U C B S.A. Photosensitive compositions containing aromatic fused polycyclic sulfonic acid and partial ester of phenolic resin with diazoquinonesulfonic acid or diazoquinonecarboxylic acid. 5,116,715, Cl. 430-190.000.
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Bryan, Philip N.; Pantoliano, Michael W.; Rollence, Michele L.; and Wong, Chi H., 5,116,741, Cl. 435-87.000.
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Lelental, Mark; Agostinelli, John A.; and Romanofsky, Henry J., 5,116,812, Cl. 505-1.000.
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Blair, Earl, 5,115,603, Cl. 52-13.000.
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Malras, Jean-Claude; and Gosset, Serge, 5,116,825, Cl. 514-58.000.
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Lichtenwalter, Glen D.; Rosario-Jansen, Theresa; and Wahl, Errol H., 5,116,520, Cl. 252-8.600.
Rose, Philip V.: *See—*
Duxbury, Colin M.; Eaton, John R.; and Rose, Philip V., 5,117,490, Cl. 395-375.000.
Rosen, Vicki: *See—*
Wang, Elizabeth A.; Wozney, John M.; and Rosen, Vicki, 5,116,738, Cl. 435-69.100.
Rosenberg, Meir: *See—*
Milder, Fredric L.; and Rosenberg, Meir, 5,116,305, Cl. 600-18.000.
Rosenbrand, Gerrit G.; and Wong, Pui K., to Shell Oil Company. Polymerization process. 5,116,797, Cl. 502-162.000.
Rosenthal, Karl-Heinz, to Bielsteiner Verschlusstechnik GmbH. Flexible liquid container with a sliding closure cap. 5,115,949, Cl. 222-211.000.
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Cochran, Roland C.; and Rosenzweig, Edwin L., 5,116,216, Cl. 425-504.000.
Ross, John A. Packaging container. 5,116,290, Cl. 229-23.00R.
Rossman, Mitchel A.; and Bonham, James A., to Minnesota Mining and Manufacturing Company. Halomethyl-1,3,5-triazines containing an amine-containing moiety. 5,116,977, Cl. 544-113.000.
Roth, Bruce N.: *See—*
Lewins, Foster; Roth, Bruce N.; and Wykes, John S., 5,116,103, Cl. 299-1.600.
Roth, Roger R., to Honeywell Inc. Fail-safe load power management system. 5,117,178, Cl. 323-320.000.
Rotron, Incorporated: *See—*
Kazmirski, Todd, 5,117,167, Cl. 318-439.000.
Rouge, Carl J.: *See—*
Brindley, William J.; Smialek, James L.; and Rouge, Carl J., 5,116,690, Cl. 428-614.000.
Rousset, M. Christian: *See—*
Fuentes, M. Jean-Luc; Rousset, M. Christian; Goma, M. Gerard; and Pommier, M. Jean-Claude, 5,116,474, Cl. 162-71.000.
Roux, Richard: *See—*
Garcia, Georges; Gautier, Patrick; Nisato, Dino; and Roux, Richard, 5,116,849, Cl. 514-337.000.
Garcia, Georges; Mettefeu, Daniel; and Roux, Richard, 5,116,987, Cl. 546-223.000.
Rowe, W. Bruce: *See—*
Trimbo, Susan L.; Rowe, W. Bruce; and Bracco, M. Umberto, 5,116,819, Cl. 514-21.000.
Royston, James D.: *See—*
Flom, Yury; and Royston, James D., 5,117,139, Cl. 310-90.500.
RSF-Elektronic Gesellschaft m.b.H.: *See—*
Rieder, Heinz; and Schwaiger, Max, 5,115,573, Cl. 33-706.000.
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Rubino, Anthony: *See—*
Cvelbar, David A.; and Rubino, Anthony, 5,115,642, Cl 60-751.000.
Rudbach, Michael; and Weinand, Guy, to Euro-Composites S.A. Process for controlling the furnace temperature in a manufacture of honeycomb structures treated with phenolic resin. 5,116,635, Cl 427-8.000.
Rudolph, Gert: *See—*
Hauser, Bernhard; Gerding, Guillermo; Moller, Knut; Muller, Bernd-Henrik; Rudolph, Gert; and Wiethaup, Wolfgang, 5,115,820, Cl. 131-194.000.
Ruef, Helmut, to Softblast, Inc. Cleaning method. 5,116,425, Cl. 134-17.000.
Rugarli, Pier L.: *See—*
Del Bono, Rinaldo; De Ambrosi, Luigi; Ferrari, Gianni; Rugarli, Pier L.; and Pagella, Pier G., 5,116,963, Cl. 536-21.000.
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Rugraff, Guy, to Labavia - S.G.E. Transmissions of vehicles equipped with electric retarders. 5,115,693, Cl. 74-606.00R.
Rupp, Randall G.: *See—*
Chick, William L.; and Rupp, Randall G., 5,116,493, Cl. 210-192.000.
Ruppen, Bruno: *See—*
Muller, Kurt; Bohler, Erwin; Ruppen, Bruno; Novet, Hanspeter; and Gerber, Robert, 5,115,714, Cl. 89-33.160.
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Ruger, Wolfgang; Urbach, Hansjorg; Ruppert, Dieter; and Scholkens, Bernward, 5,116,835, Cl. 514-218.000.
Russel, Matthew J.; and Lawniczak, Gary P., to Eastman Kodak Company. Recirculating document feeder with sequential control of the document sheet transport mechanisms and method. 5,116,035, Cl. 271-3.100.
Rust, Ralph J.: *See—*
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Rutherford, Darrel, Sr., to D & R Recyclers, Inc. Process for recycling vehicle tires. 5,115,983, Cl. 241-1.000
Rutherford, Howard J.; Desai, Nayan; McDermott, Keith; and Wiener, Charles, to International Flavors & Fragrances Inc. Chewing gum containing compositions for controlled release of flavor bearing substances and process for producing same. 5,116,627, Cl. 426-5.000.
Rutter, Christopher C.; Bilbrey, Robert A.; and Koball, Bruce R., to Rapak, Inc. Apparatus for filling flexible plastic bags carried in a continuous web and supplies therefore. 5,115,626, Cl. 53-468.000.
Ryobi Limited: *See—*
Shiotani, Takeshi; Miyamoto, Kouichi; Tsugami, Kunio; Sato, Mitsumasa; and Wada, Tatsuya, 5,116,249, Cl. 83-435.001.
S. C. Johnson & Son, Inc.: *See—*
Hagarty, John D., 5,116,618, Cl. 424-405.000.
S.C.R. Engineers Ltd.: *See—*
Brayer, Eyal, 5,116,119, Cl. 356-28.000.
S.L. Electrostatic Technology, Inc.: *See—*
Hajek, Bedrich; and Gillette, Donald J., 5,116,636, Cl. 427-33.000.
S M K Co., Ltd.: *See—*
Sakurada, Hidemasa, 5,117,077, Cl. 200-516.000.
S&R Tech Development, Inc.: *See—*
Swanberg, Melvin E.; Chung, Yee-Ming, Eskenazi, Raymond; and Cunningham, Robert T., 5,117,243, Cl. 346-108.000.
Saari, Robert S. Gyratory cone crusher. 5,115,991, Cl. 241-208.000.
Sabel Engineering Corporation: *See—*
Barbulesco, Noel K.; and Lundquist, Stan K., 5,115,625, Cl. 53-467.000.
Sabrowski, Uwe: *See—*
Emrich, Helmut; and Sabrowski, Uwe, 5,115,740, Cl. 101-420.000.
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Sagami Chemical Research Center Toa Eiyo Ltd.: *See—*
Shibasaki, Masakatsu; Takahashi Atsuo; Aoki, Tuyoshi; Sato, Hiroyasu; Yamada, Shin-ichi; Kudo, Michiko; Yamaguchi, Takaji; Kogi, Kentaro; and Narita, Sen-ichi, 5,117,037, Cl 560-53.000.
Sagara, Seiji: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 5,117,260, Cl. 355-204.000.
Sage, Ian C.: *See—*
Coates, David; Sage, Ian C.; Geelhaar, Thomas; and Wachtler, Andreas, 5,116,527, Cl. 252-299.610.
Sago, Hiroyoshi; Mizuki, Hideyuki; Kudo, Katsuhiko; and Nakayama, Muneo, to Tokyo Ohka Kogyo Co., Ltd. Method and apparatus for applying a coating material to a substrate. 5,116,250, Cl. 118-52.000
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Karnopp, Dean; Sahm, Dietrich; Klinkner, Walter; and Scarpatetti, Dieter V., 5,116,077, Cl. 280-707.000.
Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Sera, Akio; and Terunaga, Fukuso, to Mitsui Petrochemical Industries, Ltd. Apparatus for monitoring degradation of insulation of electrical installation. 5,117,191, Cl. 324-551.000.
St. Clair, Terry L.: *See—*
Fletcher, James C.; Pratt, J. Richard; St. Clair, Terry L.; Stoakley, Diane M.; and Burks, Harold D., 5,116,939, Cl. 528-353.000.
Saint-Gobain Vitrage: *See—*
Daude, Gerard M.; and Bravet, Jean-Louis M., 5,116,442, Cl. 156-99.000.
Saito, Hiromitsu; Kasai, Masaji; Morimoto, Makoto; Kobayashi, Eiji; Uosaki, Yoichi; Kanda, Yutaka; and Sano, Hiroshi, to Kyowa Hakko

Kogyo Co., Ltd. DC-88A derivatives useful as antitumor agents. 5,117,006, Cl. 548-421.000.
Saito, Keiya: *See—*
Yamaguchi, Hiroshi; Saito, Keiya; and Miyauchi, Tateoki, 5,116,782, Cl. 437-172.000.
Saito, Yasuhiro: *See—*
Tsukada, Hiroshi; Tobioka, Masaaki; Nomura, Toshio; and Saito, Yasuhiro, 5,116,694, Cl. 428-698.000.
Saito, Yoshikazu: *See—*
Kishita, Hirofumi; Yamaguchi, Kouichi; Fujii, Hideki; Suganuma, Shuji; Saito, Yoshikazu Sato, Shinichi; Fukuda, Kenichi; and Kobayashi, Nobuyuki, 5,117,026, Cl. 556-435.000.
Saitoh, Shiroh; Izumi, Mamoru; Suzuki, Syuzi; and Hashimoto, Shinichi, to Kabushiki Kaisha Toshiba. Ultrasonic probe. 5,115,809, Cl. 128-662.030.
Sakabe, Yukio: *See—*
Sano, Harunobu; Omori, Nagato; Kohno, Yoshiaki; and Sakabe, Yukio, 5,117,326, Cl. 361-321.000.
Sakai, Hideyuki: *See—*
Yokouchi, Hisatake; Takahashi, Fumitaka; and Sakai, Hideyuki, 5,117,447, Cl. 378-99.000.
Sakai, Hiroyuki: *See—*
Kameyama, Shuichi; Sakai, Hiroyuki; Kikuchi, Kazuya; and Kajiyama, Masaoki, 5,116,770, Cl. 437-31.000.
Sakai, Hitoshi: *See—*
Tsuno, Nobuo; Matsuhiro, Keiji; and Sakai, Hitoshi, 5,116,809, Cl. 505-1.000.
Sakai, Toshiyuki; Imaizumi, Masaru; Nishise, Hideya; Takeda, Katsuhiko; and Kitakubo, Hideo, to Minolta Camera Kabushiki Kaisha. Image forming apparatus with jam recovery function. 5,117,261, Cl. 355-207.000.
Sakamoto, Jiro; and Tanuma, Hiromi, to Ajinomoto Company, Inc. Low-calorie food products containing konjak mannan and processes for preparing the same. 5,116,631, Cl. 426-568.000.
Sakamoto, Kazunari; and Nemoto, Isao, to Iseki Kaihatsu Koki Co., Ltd.; and Nemoto Kikaku Kogyo Co., Ltd. Movable platform for construction sites. 5,115,886, Cl. 182-36.000.
Sakamoto, Kiichi: *See—*
Oae, Yoshihisa; Sakamoto, Kiichi; and Yamada, Akio, 5,117,117, Cl. 250-492.200.
Sakamoto, Masaaki: *See—*
Mori, Sanae; Sakamoto, Masaaki; Ishikawa, Hideo; and Nagai, Yoji, 5,116,692, Cl. 428-450.000.
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Fujimoto, Hiroaki; and Fujimoto, Izumi, to Sumitomo Chemical Company, Limited. Benzoylurea derivative and its production and use. 5,116,875, Cl. 514-594.000.
Sakamoto, Tetsuo: *See—*
Sakashita, Masao; Sakamoto, Tetsuo; Kazama, Shingo; Harada, Yoshiyuki; Teramoto, Takero; Watanabe, Kazuhiro; Shimomura, Bunji; and Kaneta, Tsutomu, 5,116,504, Cl. 210-500.230.
Sakamoto, Yasuhiko: *See—*
Endo, Tadashi; Sakamoto, Yasuhiko; and Yoshida, Haruo, 5,117,204, Cl. 331-8.000.
Sakashita, Masao; Sakamoto, Tetsuo; Kazama, Shingo; Harada, Yoshiyuki; Teramoto, Takero; Watanabe, Kazuhiro; Shimomura, Bunji; and Kaneta, Tsutomu, to Nippon Steel Corporation. Organic polymer separation membrane having fluorene skeleton and oxygen enrichment device utilizing same. 5,116,504, Cl. 210-500.230.
Sakata, Keikichi: *See—*
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,115,546, Cl. 29-27.00C.
Sakawa, Shinji: *See—*
Kurahashi, Yoshio; Shiokawa, Kozo; Kagabu, Shinzo; Sakawa, Shinji; and Moriya, Koichi, 5,117,053, Cl. 562-506.000.
Sakitani, Yoshio: *See—*
Nakamura, Kazumitsu; Kato, Shinichi; Sakitani, Yoshio; and Minamikawa, Yoshihisa, 5,117,111, Cl. 250-310.000.
Sakuma, Masaru: *See—*
Takayama, Toshio; Sakuma, Masaru; and Ono, Yukou, 5,117,361, Cl. 364-426.020.
Sakuma, Toranosuke, to Koito Manufacturing Co., Ltd. Vanity mirror. 5,117,337, Cl. 362-74.000.
Sakurada, Hidemasa, to S M K Co., Ltd. Keyboard switch. 5,117,077, Cl. 200-516.000.
Sakurai, Hisayuki: *See—*
Ando, Shyoichi; Yamane Shuichi; Doi, Yoshihisa; Sakurai, Hisayuki; and Meguro, Haruo, 5,115,663, Cl. 72-370.000.
Salatino, Matthew M., to Harris Corporation. Stacked configuration for integrated circuit devices. 5,117,282, Cl. 357-81.000.
Salbeck, Gerhard: *See—*
Schubert, Hans H.; Salbeck Gerhard; Krause, Hans-Peter; Knauf, Werner; Waltersdorfer, Anna; and Kern, Manfred, 5,116,826, Cl. 514-63.000.
Sale, Matthew D.: *See—*
Nemirovsky, Mario D.; and Sale, Matthew D., 5,117,387, Cl. 395-375.000.
Salk Institute for Biological Studies, The: *See—*
Beattie, Gillian M.; Lappi, Douglas A.; Baird, J. Andrew; and Hayek, Alberto, 5,116,750, Cl. 435-240.200.
Sallas, John J.; and Corrigan, Michael A., to Halliburton Geophysical Services. Piezoelectric seismic vibrator with hydraulic amplifier. 5,115,880, Cl. 181-106.000.
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Goud, Gilles R., 5,116,073, Cl. 280-617.000.
Salvucci, Anthony J. Anxiety transference ring organization. 5,115,648, Cl. 63-15.000.
Salyer, Paul E., to Othy, Inc. Acetabular reamer cup. 5,116,165, Cl. 407-54.000.
Samata, Shuichi; and Matsushita, Yoshiaki, to Kabushiki Kaisha Toshiba. Method of manufacturing a semiconductor device having improved contact resistance characteristics. 5,116,780, Cl. 437-89.000.
Samejima, Shunichi: *See—*
Asano, Teruo; Watanabe, Naohiro; Jinushi, Kazuki; and Samejima, Shunichi, 5,116,426, Cl. 134-40.000.
Samson AG: *See—*
Gerk, Wilfried; Hirt, Hartmut; and Klee, Gerhard, 5,116,171, Cl. 408-147.000.
Samsung Electron Device Co., Ltd.: *See—*
Kwon, Ki-Duck, 5,116,704, Cl. 430-3.000.
Samsung Electron Services Co., Ltd.: *See—*
Do, Han-Shin, 5,117,153, Cl. 313-447.000.
Samsung Electronics Co., Ltd.: *See—*
Ho-sun, Jeong, 5,117,235, Cl. 341-159.000.
Kim, Hyoung-Chae, 5,116,038, Cl. 271-10.000.
Song, Kwang-Sup, 5,117,226, Cl. 340-726.000.
Yang, Byung-Hwan, 5,117,404, Cl. 368-10.000.
SamSung Electronics Co., Ltd: *See—*
Kim, Jeong-ho, 5,117,316, Cl. 360-73.070.
Sandberg, Lennart, to Asea Brown Boveri AB. Drive system for railway vehicle. 5,117,163, Cl. 318-52.000.
Sanders, Charles I.: *See—*
Yang, Julie C.; and Sanders, Charles I., 5,116,537, Cl. 252-378.00R.
Sanders, Michael E.: *See—*
Myers, Wilbur J.; and Sanders, Michael E., 5,117,402, Cl. 367-143.000.
Sandler, Stanley R., to Atochem North America, Inc. Preparation of alkanedisulfonic acids. 5,117,051, Cl. 562-101.000.
Sandoz Ltd.: *See—*
Dreyfuss, Michael M.; Schreier, Max H.; Tscherter, Hans; and Wenger, Roland, 5,116,816, Cl. 514-11.000.
Sandroff, Claude J.: *See—*
DeChiaro, Louis F.; and Sandroff, Claude J., 5,116,767, Cl 437-7.000.
Sanger, Kurt M.: *See—*
Kroos, Donna S.; McCauley, David K.; and Sanger, Kurt M., 5,117,283, Cl. 358-22.000
Sankyo Company, Limited: *See—*
Iwata, Nobuyoshi; Yoshimi, Kenji; and Nagano, Mitsuo, 5,116,839, Cl. 514-236.800
Sano, Harunobu; Omori, Nagato; Kohno, Yoshiaki; and Sakabe, Yukio, to Murata Manufacturing Co., Ltd. Monolithic ceramic capacitor. 5,117,326, Cl. 361-321.000.
Sano, Hiroshi: *See—*
Saito, Hiromitsu; Kasai, Masaji; Morimoto, Makoto; Kobayashi, Eiji; Uosaki, Yoichi; Kanda, Yutaka; and Sano, Hiroshi, 5,117,006, Cl. 548-421.000.
Sano, Koichi; Maeda, Akira; Yokoyama, Tetsuo; and Koizumi, Hideaki, to Hitachi, Ltd. Magnetic resonance imaging method for moving object. 5,115,812, Cl. 128-653.200.
Sano, Shoichi; Furukawa, Yoshimi; and Hamada, Tetsur, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 5,116,254, Cl. 180-140.000.
Sanofi: *See—*
Garcia, Georges; Gautier, Patrick; Nisato, Dino; and Roux, Richard, 5,116,849, Cl. 514-337.000.
Garcia, Georges; Mettefeu, Daniel; and Roux, Richard, 5,116,987, Cl. 546-223.000.
Sanshin Kagaku Kogyo Co. Ltd.: *See—*
Kouge, Katsushige, 5,117,031, Cl. 558-20.000.
Sansom, Raymond E.: *See—*
Terminiello, Michael A.; Asselin, Marc P.; Fowler, Joseph P.; Hauser, Lawrence M.; and Sansom, Raymond E., 5,117,189, Cl. 324-415.000.
Santandrea, Luciano; and Lombardi, Massimo, to Axis U.S.A., Inc. Automatic adjustment of pallet workpiece support members. 5,115,901, Cl. 198-345.300.
Santel, Hans-Joachim: *See—*
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; Becker, Benedikt; Stendel, Wilhelm; and Erdelen, Christoph, 5,116,836, Cl. 514-224.200.
Haug, Michael; Marhold, Albrecht; Santel, Hans-Joachim; Lurssen, Klaus; and Schmidt, Robert R., 5,117,038, Cl. 560-55.000.
Santella, Michael: *See—*
Dallaire, Michel; Santella, Michael; and Swift, Michel, 5,115,955, Cl. 224-324.000.
Santos, Alfred J., to Torrington Company, The. Asymmetric magnetization fixture. 5,117,183, Cl. 324-228.000.
Sanwa Shutter Corporation: *See—*
Yamaguchi, Kenji; Hosoyama, Kenji; Okazaki, Fumitoshi; and Hozumi, Daisuke, 5,115,601, Cl. 52-1.000.
Sanyo Electric Co., Ltd.: *See—*
Kakuma, Kenji; Mizutomi, Katsunori; and Niwa, Shinichi, 5,117,333, Cl. 361-527.000.
Kurihara, Masao, 5,116,454, Cl. 156-584.000.
Miyashita, Yoshiaki, 5,116,117, Cl. 353-94.000.

Nukaga, Tadashi; Mochizuki, Kentaro; Yamaguchi, Shinji; and Banba, Yoshikazu, 5,115,651, Cl. 68-17.00R.
Sanyo-Kokusaku Pulp Co., Ltd.: *See—*
Nishijima, Yoshitatsu; Fujitaka, Terumasa; and Shimizu, Kazuo, 5,117,045, Cl. 560-219.000.
Sargeant, John B.; and Seyler, Jan W., to Westinghouse Electric Corp. Stator stabilizing assemblies. 5,117,140, Cl. 310-91.000.
Sarnacki, Alexander C., Jr.: *See—*
McDonnell, William J.; Sarnacki, Alexander C., Jr.; and Collins, Dean E., 5,115,947, Cl. 222-107.000.
Sarngadharan, Mangalasseril G.; and Kalyanaraman, Vaniambadi S., to Akzo N.V. Method for producing native HIV gp160. 5,116,740, Cl. 435-70.400.
Sarstedt, Walter, to Walter Sarstedt Gerate und Verbrauchsmaterial fur Medizin und Wissenschaft. Blood extraction device. 5,115,817, Cl. 128-764.000.
Saryazyan, Armen: *See—*
Popovic, Goran; Saryazyan, Armen; Ponomarjev, Viktor; and Vucelic, Dusan, 5,115,808, Cl. 128-660.020.
Sasaki, Asao; and Kubota, Yosuke, to Fuji Jukogyo Kabushiki Kaisha. Warning system for an engine. 5,117,218, Cl. 340-450.300.
Sasaki, Hiroshi; Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinichi, to Nissan Motor Co., Ltd. Line pressure control at cranking and subsequent warming-up operation of engine. 5,115,694, Cl. 74-844.000.
Sasaki, Junsou; Fujimoto, Hidefumi; and Iwata, Noriyuki, to Mazda Motor Corporation. Supercharging apparatus for internal combustion engine. 5,115,788, Cl. 123-559.300.
Sasaki, Noriyuki: *See—*
Oji, Akihito; Tada, Yukihiro; Sasaki, Noriyuki; and Mizumura, Mitsuo, 5,116,621, Cl. 424-445.000.
Sasaki, Ryoichi: *See—*
Takaragi, Kazuo; Sasaki, Ryoichi; Nakamura, Tsutomu; Koizumi, Minoru; Fukuzawa, Yasuko; and Kataoka, Kenji, 5,117,458, Cl. 380-4.000.
Sasaki, Toru: *See—*
Takagi, Masayuki; Okada, Tadaaki; Akai, Naotoshi; Yaguchi, Takashi; Miyadoh, Shinji; Shomura, Takashi; Sasaki, Toru; Sezaki, Masaji; Shimizu, Takao; and Niida, Masashi, 5,116,815, Cl. 514-11.000.
Sasashige, Hiroaki: *See—*
Murayama, Kimio; Seki, Yukuharu; and Sasashige, Hiroaki, 5,116,448, Cl. 156-350.000.
Sassak, Mark S. Tossable flying disc. 5,116,275, Cl. 446-48.000.
Satake Engineering Co., Ltd.: *See—*
Satake, Toshihiko, 5,115,984, Cl. 241-7.000.
Satake, Toshihiko, to Satake Engineering Co., Ltd. Process of grinding grains. 5,115,984, Cl. 241-7.000.
Satmer, Franz; and Wilhelm, Ludwig, to Georg Fischer AG. Method for the regenerative treatment of mainly clay-bound foundry old sand. 5,115,985, Cl. 241-14.000.
Sato, Hiroyasu: *See—*
Shibasaki, Masakatsu; Takahashi Atsuo; Aoki, Tuyoshi; Sato, Hiroyasu; Yamada, Shin-ichi; Kudo, Michiko; Yamaguchi, Takaji; Kogi, Kentaro; and Narita, Sen-ichi, 5,117,037, Cl. 560-53.000.
Sato, Kensaku, to Hirose Electric Co., Ltd. Connector terminal. 5,116,241, Cl. 439-511.000.
Sato, Kimihiko: *See—*
Futami, Shunichi; and Sato, Kimihiko, 5,116,222, Cl. 433-48.000.
Sato, Mitsumasa: *See—*
Shiotani, Takeshi; Miyamoto, Kouichi; Tsugami, Kunio; Sato, Mitsumasa; and Wada, Tatsuya, 5,116,249, Cl. 83-435.001.
Sato, Ryuichi, to Omron Corporation. Electromagnetic relay. 5,117,209, Cl. 335-80.000.
Sato, Shinich: *See—*
Takago, Toshio; Kishita, Hirofumi; Kinami, Hitoshi; Fukuda, Kenichi; Sato, Shinich; Yamaguchi, Koichi; and Suganuma, Shuji, 5,117,025, Cl. 556-434.000.
Sato, Shinichi: *See—*
Kishita, Hirofumi; Yamaguchi, Kouichi; Fujii, Hideki; Suganuma, Shuji; Saito, Yoshikazu; Sato, Shinichi; Fukuda, Kenichi; and Kobayashi, Nobuyuki, 5,117,026, Cl. 556-435.000.
Sato, Tadahisa: *See—*
Kimura, Keizo; and Sato, Tadahisa, 5,116,990, Cl. 548-262.400.
Sato, Tadashi: *See—*
Asakawa, Naoki; Ohe, Hiroshi; Yoshida, Yutaka; Sato, Tadashi; Nezu, Yukuo; and Oda, Yoshiya, 5,117,109, Cl. 250-288.000.
Satoh, Shiro, to Ricoh Company, Ltd.; and Ricoh Research Institute of General Electronics Co., Ltd. Optical functioning element using a transparent substrate with matching lattice constant. 5,117,477, Cl. 385-88.000.
Satow, Jun: *See—*
Ishii, Shigeru; Nakayama, Kazunari; Yagi, Kazuo; Satow, Jun; Fukuda, Kenzou; Itoh, Kaoru; Umehara, Toshiyuki; Kudo, Masaki; Inoue, Yoichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,404, Cl. 71-92.000.
Sauer, Hartmut K., to De La Rue Giori S.A. Sheet-feeder. 5,116,040, Cl. 271-101.000.
Saufferer, Daniel R.: *See—*
Aurness, Harold O.; and Saufferer, Daniel R., 5,117,456, Cl. 379-438.000.
Sauter, Hubert: *See—*
Wenderoth, Bernd; Schuetz, Franz; Sauter, Hubert; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,116,866, Cl. 514-522.000.
Savage, Howard S.; and Nielsen, Paul H. Method of joining shielding used for minimizing EMI or RFI, and the joint formed by the method. 5,117,065, Cl. 174-35.0MS.
Savage, John M., Jr. Light unit terminals maintained in bent condition. 5,116,229, Cl. 439-56.000.
Saville, Marshall P.; and Gu, Alston L., to Allied-Signal Inc. High load capacity journal foil bearing. 5,116,143, Cl. 384-106.000.
Saxton, Robert J.: *See—*
Edlund, David J.; Finke, Richard G.; and Saxton, Robert J., 5,116,796, Cl. 502-154.000.
Scapa, Inc.: *See—*
Westhead, William T., 5,115,582, Cl. 34-123.000.
Scarpatetti, Dieter V.: *See—*
Karnopp, Dean; Sahm, Dietrich; Klinkner, Walter; and Scarpatetti, Dieter V., 5,116,077, Cl. 280-707.000.
Scarpatetti, Diether V., to Daimler-Benz AG. Transverse guide roller for track-guidable vehicles with sealed bearing assembly to prevent entry of fluid and drainage orifices to drain fluid from the bearing assembly. 5,115,746, Cl. 104-245.000.
Scenzi, Bela, to Hella KG Hueck & Co. Working spotlight, particularly for motor vehicles. 5,117,336, Cl. 362-61.000.
Schafer, Matthias: *See—*
Ackermann, Peter; Fischer, Hanspeter; Vogel, Rolf; Drauz, Karlheinz; Hasseberg, Hans-Albrecht; Hasselbach, Hans-Jochen; Knaup Gunter; Krimmer, Hans-Peter; and Schafer, Matthias, 5,116,872, Cl. 514-561.000.
Schafer, Ralf. Lighting device. 5,117,340, Cl. 362-148.000.
Scharer, Jeno M.: *See—*
Moo-Young, Murray; Bols, Niels C.; Overgaard, Sandra E.; and Scharer, Jeno M., 5,116,747, Cl. 435-178.000.
Scharf, Daniel: *See—*
Eberspach, Werner; Scharf, Daniel; and Lysek, Manfred, 5,116,891, Cl. 524-97.000.
Scharnowski, Gerhard: *See—*
Fortmann, Norbert; Gottling, Helmut; Janetzko, Horst; Kook, Ralf; Kruppa, Hans; and Scharnowski, Gerhard, 5,115,889, Cl. 188-67.000.
Scheibelhoffer, Anthony S.: *See—*
Chundury, Deenadayalu; Davidson, Daniel L.; Leonard, Berdine L.; and Scheibelhoffer, Anthony S., 5,116,540, Cl. 252-511.000.
Scheidt, David A.: *See—*
Walker, R. David; and Scheidt, David A., 5,115,686, Cl. 73-863.310.
Schelhas, Klaus-Dieter: *See—*
Skripitz, Walter; and Schelhas, Klaus-Dieter, 5,116,377, Cl. 623-23.000.
Schembri, Alfonso: *See—*
Bondanelli, Luigi; Sirani, Mauro; Schembri, Alfonso; and Boido, Dante, 5,116,298, Cl. 493-4.000.
Schering Corporation: *See—*
Ganguly, Ashit K.; Friary, Richard J.; Schwerdt, John H.; Siegel, Marvin I.; Smith, Sidney R.; Seidl, Vera A.; and Sybertz, Edmund J., 5,116,840, Cl. 514-250.000.
Schertler, Armin; Ortner, Josef A.; Scheurecker, Werner; and Engel, Kurt, to Voest-Alpine Industrieanlagenbau G.m.b.H. Strand guide arrangement provided at a continuous casting plant. 5,115,857, Cl. 164-448.000.
Scheunemann, Ude: *See—*
Lupo, Donald; Prass, Werner; and Scheunemann, Ude, 5,116,925, Cl. 526-323.100.
Scheurecker, Werner: *See—*
Schertler, Armin; Ortner, Josef A.; Scheurecker, Werner; and Engel, Kurt, 5,115,857, Cl. 164-448.000.
Schiff, David R.: *See—*
Wilkinson, William T.; Bressler, Peter W.; Schiff, David R.; Schneider, Eric A.; and Lincov, Pietr, 5,116,044, Cl. 482-52.000.
Schildbach, Klaus B.: *See—*
Visser, Reinke A.; Engelfriet, Adrianus R. C.; and Schildbach, Klaus B., 5,115,557, Cl. 29-597.000.
Schirmer, William, III: *See—*
Abbott, John S.; Bertz, Mark C.; Faler, James H.; Schirmer, William, III; and Williams, John G., 5,116,400, Cl. 65-144.000.
Schlegal (UK) Holdings Limited: *See—*
Smith, John C.; and Christmas, Patrick E., 5,116,142, Cl. 384-55.000.
Schleifstein, Robert A., to Ethyl Corporation. Flame retardant polypropylene based formulations. 5,116,898, Cl. 524-371.000.
Schlesinger, Tuvia: *See—*
Margaliot, Menachem; and Schlesinger, Tuvia, 5,117,120, Cl. 250-572.000.
Schlosser, Hans-Joachim: *See—*
Frass, Werner; Schlosser, Hans-Joachim; and Schoen, Guenther, 5,116,720, Cl. 430-331.000.
Schlumberger Technology Corporation: *See—*
McCann, Dominic P. J.; Kerbart, Yves; and Burgess, Trevor M., 5,115,871, Cl. 175-50.000.
Schmett, Michael: *See—*
Korsch, Wolfgang; and Schmett, Michael, 5,116,214, Cl 425-345.000.
Schmider, Fritz: *See—*
Albrecht, Klaus; Hans, Helmut; von der Heide, Johann; and Schmider, Fritz, 5,117,128, Cl. 310-191.000.

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Schmidt, Helmut: *See—*
Wolter, Herbert; and Schmidt, Helmut, 5,116,472, Cl. 204-181.700.
Schmidt Industries, Inc.: *See—*
Schmidt, David A., 5,116,326, Cl. 604-198.000.
Schmidt, Robert R.: *See—*
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; Becker, Benedikt; Stendel, Wilhelm; and Erdelen, Christoph, 5,116,836, Cl. 514-224.200.
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Acher, Jacques; Monier, Jean-Claude; Schmitt, Jean-Paul; Costall, Brenda; Naylor, Robert; and Gardaix-Luthereau, Renee, 5,116,857, Cl. 514-370.000.
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Schmitt, Johannes: *See—*
Sigl, Alfred; Meissner, Manfred; Isella, Thomas; and Schmitt, Johannes, 5,116,108, Cl. 303-103.000.
Schmitz, William E.: *See—*
Marton, Fred S.; Segar, William R.; and Schmitz, William E., 5,116,262, Cl. 439-709.000.
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Schneider, Eric A.: *See—*
Wilkinson, William T.; Bressler, Peter W.; Schiff, David R.; Schneider, Eric A.; and Lincov, Pietr, 5,116,044, Cl. 482-52.000.
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Peschka, Walter; and Schneider, Gottfried, 5,115,768, Cl. 123-1.00A.
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Merrill, Terry L.; Schneider, Kenneth W.; and Senghaas, Karl A., 5,115,942, Cl. 222-1.000.
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Schneider, John F.; and Schneider, Kurt A., 5,116,420, Cl. 106-640.000.
Schneider, Mark S.: *See—*
Kordus, Mark R.; Schneider, Mark S.; and Wirtz, Louis H., 5,116,459, Cl. 156-631.000.
Schneider, Rudolf: *See—*
Lehle, Hubert; and Schneider, Rudolf, 5,115,898, Cl. 192-84.0PM.
Schneider, Simon: *See—*
Kirchhoff, Wilhelm; Schneider, Simon; and Zeugin, Hans, 5,115,658, Cl. 72-175.000
Schnepp-Pesch, Wolfram; and Lindenberg, Josef, to Angiomed AG. Apparatus for removing deposits from vessels. 5,116,352, Cl. 606-171.000.
Schock, Laurel E.: *See—*
Grey, Roger A.; Schock, Laurel E.; and Armstead, Diandre, 5,116,882, Cl. 521-147.000.
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Frass, Werner; Schlosser, Hans-Joachim; and Schoen, Guenther, 5,116,720, Cl. 430-331.000.
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Scholes, Alan: *See—*
Widdowson, Roy; and Scholes, Alan, 5,116,027, Cl. 266-225.000.
Scholkens, Bernward: *See—*
Ruger, Wolfgang; Urbach, Hansjorg; Ruppert, Dieter; and Scholkens, Bernward, 5,116,835, Cl. 514-218.000.
Schollnhammer, Heinz: *See—*
Sulzbacher, Horst; Derler, Harald; and Schollnhammer, Heinz, 5,116,588, Cl. 423-244.000.
Schon, Norbert: *See—*
Hocker, Hartwig; Keul, Helmut; Leitz, Edgar; Schon, Norbert; and Kuhling, Steffen, 5,116,918, Cl. 525-415.000.
Schoneveld, Pieter A.: *See—*
Van Rosmalen, Gerard E.; and Schoneveld, Pieter A., 5,117,413, Cl. 369-215.000.
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Glatzle, Rudolf; Huber, Ronald; Schopf, Thomas; and Schretter, Michael, 5,116,659, Cl. 428-188.000.
Schotten & Hansen GmbH: *See—*
Hansen, Torben, 5,115,844, Cl. 144-2.00R.
Schoubye, Peter, to Haldor Topsoe A/S. Process for purification of offgases. 5,116,585, Cl. 423-235.000.
Schrage, David A. Corner support assembly. 5,115,917, Cl. 206-586.000.
Schreier, Max H.: *See—*
Dreyfuss, Michael M.; Schreier, Max H.; Tscherter, Hans; and Wenger, Roland, 5,116,816, Cl. 514-11.000.
Schretter, Michael: *See—*
Glatzle, Rudolf; Huber, Ronald; Schopf, Thomas; and Schretter, Michael, 5,116,659, Cl. 428-188.000.
Schroeder, Lisa R.; and Muffett, Dorothy J., to General Mills, Inc. Processed meat products containing fish oils stabilized with fructose. 5,116,629, Cl. 426-545.000.
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Schubert, Paul C.; and Lemberger, Richard R., to Minnesota Mining and Manufacturing Company. Auto-ranging film densitometer. 5,117,119, Cl. 250-559.000.
Schuetz, Franz: *See—*
Wenderoth, Bernd; Schuetz, Franz; Sauter, Hubert; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,116,866, Cl. 514-522.000.
Schulte, Richard D.; Malik, Imran; and Knight, Richard K., to Illinois Tool Works Inc. Carrier tape system. 5,115,911, Cl. 206-330.000.
Schultz, Robert G.: *See—*
Paulik, Frank E.; and Schultz, Robert G., 5,117,046, Cl. 560-232.000.
Schutzius, Bernd: *See—*
Bung, Josef; Ulubay, Hasan; and Schutzius, Bernd, 5,116,924, Cl. 526-312.000.
Schwaiger, Max: *See—*
Rieder, Heinz; and Schwaiger, Max, 5,115,573, Cl. 33-706.000.
Rieder, Heinz; and Schwaiger, Max, 5,117,376, Cl. 364-571.040.
Schwarz, Alexander: *See—*
Bremer, Karl-Heinz; Kuhlmann, Ludwig; Schwarz, Alexander; and Steinstrasser, Axel, 5,116,596, Cl. 424-1.100.
Schwarz, Werner; Kremmling, Horst; Thomas, Gunter; and Lotz, Hans-Georg, to Heraeus Instr. GmbH & Leybold AG. Interference filter for deuterium lamp for spectral analyzers. 5,117,150, Cl. 313-112.000.
Schwarzkopf Development Corporation: *See—*
Glatzle, Rudolf; Huber, Ronald; Schopf, Thomas; and Schretter, Michael, 5,116,659, Cl. 428-188.000.
Schweickhardt, Karl B. Diamond abrasive saw blade and method of dry sawing concrete. 5,115,796, Cl. 125-13.010.
Schweitzer, Jeffrey A.: *See—*
Hartlaub, Jerome T.; Schweitzer, Jeffrey A.; and Seifert, George P., 5,115,811, Cl. 128-634.000.
Schweizerische Eidgenossenschaft Vertretan Durch Die, EIDG, etc.: *See—*
Kutzli, Jorg, 5,115,707, Cl. 86-20.100.
Schwerdt, John H.: *See—*
Ganguly, Ashit K.; Friary, Richard J.; Schwerdt, John H.; Siegel, Marvin I.; Smith, Sidney R.; Seidl, Vera A.; and Sybertz, Edmund J., 5,116,840, Cl. 514-250.000.
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Stanley, Christopher J., 5,116,576, Cl. 422-55.000.
Scientific and Industrial Research Organisation: *See—*
Wills, Leslie J., 5,116,243, Cl. 8-149.200.
Sclavo S.p.A.: *See—*
Pinori, Massimo; Centini, Felice; and Verdini, Antonio S., 5,116,947, Cl. 530-323.000.
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Meyer, Robert B.; Lackner, John R.; and Matuschek, Hans J., 5,115,537, Cl. 15-340.200.
Scott, John R., to Minnesota Mining and Manufacturing Company. Membrane-containing wells for microtitration and microfiltration. 5,116,496, Cl. 210-232.000.
Scotti, Joseph F. Shim for electrical device. 5,116,242, Cl. 439-538.000.
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Vaughan, John H.; Carson, Dennis A.; Rhodes, Gary; Houghten, Richard; Smith, Richard S.; and Geltosky, John E., 5,116,725, Cl. 435-5.000.
Sczechowski, Jeffrey G.: *See—*
Cooper, Gerald; Ratcliff, Matthew A.; and Sczechowski, Jeffrey G., 5,116,582, Cl. 422-186.300.
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Cassat, Alain M.; and Cardoletti, Laurent, 5,117,165, Cl. 318-254.000.
Gau, George J., 5,116,719, Cl. 430-313.000.
Weispfenning, Gerald L.; and Goss, Lloyd C., 5,117,408, Cl. 369-32.000.
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Fox, John G., 5,116,444, Cl. 156-244.170.

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Seaquist Closures a divison of Pittway Corporation: *See—*
Rohr, Robert D., 5,115,950, Cl. 222-490.000.
Sears, Stanley L., to Eveready Battery Company, Inc. Bifold separator. 5,116,698, Cl. 429-94.000.
Seawell Corporation N.V.: *See—*
Garwood, Anthony J. M., 5,115,624, Cl. 53-427.000.
Seay, William R.: *See—*
Boston, Steven L.; Kilbane, Farrell M.; Lee, Danny E.; Seay, William R.; and Coleman, Richard A., 5,116,645, Cl. 427-320.000.
Sebestyen, Bela: *See—*
Gergo, Gyorgy; Vida, Zoltan; Sebestyen, Bela; Nemeth, Jozsef; Viragh, Istvan; Monath, deceased Lajos; and Monath, Gabor, 5,116,104, Cl. 299-16.000.
Sebok, Dezso: *See—*
Dutka, Ferenc; Komives, Tamas; Fodor, Katalin, nee Csorba; Marton, Attila; Csikos, Aniko nee Gluck; Osztheimer, Eva; Henger, Karoly; Laborczy, Robert; Reti, Zsuzsanna, nee Bosnyak; Sebok, Dezso; Szabolcs, Jozsef; and Tomordi, Elemer, 5,116,402, Cl. 71-88.000.
Secretary of State for Defence in her Britannic Majesty's Government of The United Kingdom of Great Britian and Northern Ireland, The: *See—*
Mackey, Kevin J.; Vere, Anthony W.; Bradley, Donald C.; Frigo, Dario M.; and Faktor, Marc M., deceased, 5,116,785, Cl. 437-243.000.
Seder, Edmund V.; Coe, Frederick L.; and Mitchell, Martin, to Helix Medical, Inc. Multiple lumen wound drain with bypass openings. 5,116,310, Cl. 604-43.000.
Seder, Edmund V.; and Houts, Richard E., to Helix Medical, Inc. Hysterectomy drain appliance. 5,116,327, Cl. 604-284.000.
Seeker, William R.: *See—*
Chen, Shih L.; Seeker, William R.; and Ho, Loc, 5,116,584, Cl. 423-235.000.
Segar, William R.: *See—*
Marton, Fred S.; Segar, William R.; and Schmitz, William E., 5,116,262, Cl. 439-709.000.
Seggebruch, Ernie G.: *See—*
Nurnberg, Thomas R.; Seggebruch, Ernie G.; and Smith, Kenneth J., 5,115,900, Cl. 198-335.000.
Seidl, Vera A.: *See—*
Ganguly, Ashit K.; Friary, Richard J.; Schwerdt, John H.; Siegel, Marvin I.; Smith, Sidney R.; Seidl, Vera A.; and Sybertz, Edmund J., 5,116,840, Cl. 514-250.000.
Seieroe, Louis M.; and Ledford, Kenneth S., to Watkins-Johnson Company. Surface mount package for R.F. devices. 5,117,068, Cl. 174-52.400.
Seifert, George P.: *See—*
Hartlaub, Jerome T.; Schweitzer, Jeffrey A.; and Seifert, George P., 5,115,811, Cl. 128-634.000.
Seiko Electronics Components Ltd.: *See—*
Takeda, Kazutoshi, 5,116,700, Cl. 429-121.000
Seiko Epson Corp.: *See—*
Imamura, Yoichi, 5,117,206, Cl. 331-158.000.
Maruyama, Takayuki, 5,115,549, Cl. 29-281.100.
Seiko Instruments, Inc.: *See—*
Yasutake, Masatoshi, 5,117,110, Cl. 250-306.000.
Seikosha Co., Ltd.: *See—*
Aizawa, Junichi; and Yamauchi, Satoru, 5,116,270, Cl. 445-24.000.
Seiwa Kasei Co., Ltd.: *See—*
Yoshioka, Issei; Kamimura, Yoichi; Kitano, Masao; and Goto, Yujiro, 5,116,608, Cl. 424-72.000.
Seiwa, Yoshito, to Mitsubishi Denki Kabushiki Kaisha. Method of producing a semiconductor laser by implanting impurities which suppress disordering. 5,116,769, Cl. 437-22.000.
Seki, Reiji: *See—*
Ishimura, Toshihiko; Seki, Reiji; Ishibashi, Kenji; Tanii, Junichi; and Shimada, Takahisa, 5,117,251, Cl. 354-400.000.
Seki, Yukuharu: *See—*
Murayama, Kimio; Seki, Yukuharu; and Sasashige, Hiroaki, 5,116,448, Cl. 156-350.000.
Sekido, Tatsuya, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Seat discomfort preventive device. 5,116,101, Cl. 297-330.000.
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Roberson, Glenn A., Jr.; and Eglinton, Robert B., 5,115,576, Cl. 34-15.000.
Sendelweck, Gene K., to Thomson Consumer Electronics, Inc. Diode switch providing temperature compensated D.C. bias for cascaded amplifier. 5,117,123, Cl. 307-239.000.
Senghaas, Karl A.: *See—*
Merrill, Terry L.; Schneider, Kenneth W.; and Senghaas, Karl A., 5,115,942, Cl. 222-1.000.
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Williams, William J., 5,115,666, Cl. 73-19.100.
Seok, Jin I.: *See—*
Kim, Young G.; Hong, Soon H.; and Seok, Jin I., 5,116,570, Cl. 420-54.000.
Seppi, Edward J.; Shapiro, Edward G.; and Pavkovich, John M., to Varian Associates, Inc. Electronically enhanced X-ray detector apparatus. 5,117,445, Cl. 378-65.000.
Sequa Chemicals, Inc.: *See—*
Floyd, William C.; and Dragner, Louis R., 5,116,890, Cl. 524-50.000.
Floyd, William C.; Dragner, Louis R.; Black, Blanche H.; and North, Bernard F., 5,116,927, Cl. 527-300.000.
Sera, Akio: *See—*
Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Sera, Akio; and Terunaga, Fukuso, 5,117,191, Cl. 324-551.000.
Serck Baker Limited: *See—*
Michaluk, Peter G., 5,116,519, Cl. 210-788.000.
Sermatech International, Inc.: *See—*
Mosser, Mark F.; and Harvey, William A., III, 5,116,672, Cl. 428-328.000.
Sertic, James L.; Bancsi, Joseph A.; Sertic, Lisa D.; Esche, Grace M.; and Lawson, John, to Baxter International Inc. Automatic in-line reconstitution system. 5,116,316, Cl. 604-83.000.
Sertic, Lisa D.: *See—*
Sertic, James L.; Bancsi, Joseph A.; Sertic, Lisa D.; Esche, Grace M.; and Lawson, John, 5,116,316, Cl. 604-83.000.
Setoyama, Eiji; and Kamei, Mitsuhiro, to Hitachi, Ltd. Film forming system using high frequency power and power supply unit for the same. 5,116,482, Cl. 204-298.080.
Setra Systems, Inc.: *See—*
Lee, Shih-Ying, 5,115,676, Cl. 73-706.000.
Severns, David W.; Tompson, Brian; Lindstrom, Paul R.; and Carlson, David K., to Applied Materials, Inc. Robotically loaded epitaxial deposition apparatus. 5,116,181, Cl. 414-222.000.
Seya, Motohide: *See—*
Takeshita, Yasuyoshi; Nakamura, Hiroshi; Ishiguro, Susumu; Kwaguchi, Noboru; Shimada, Shin'ichi; Koyama, Tadayoshi; Seya, Motohide; Abe, Noriko; and Nomoto, Shin, 5,116,985, Cl. 546-141.000.
Seyler, Jan W.: *See—*
Sargeant, John B.; and Seyler, Jan W., 5,117,140, Cl. 310-91.000.
Seymour, Douglas G.; and Gillotti, Randall E., to GTE Products Corporation. Electrical connector. 5,116,266, Cl. 439-851.000.
Sezaki, Masaji: *See—*
Takagi, Masayuki; Okada, Tadaaki; Akai, Naotoshi; Yaguchi, Takashi; Miyadoh, Shinji; Shomura, Takashi; Sasaki, Toru; Sezaki, Masaji; Shimizu, Takao; and Niida, Masashi, 5,116,815, Cl. 514-11.000.
SGS-Thomson Microelectronics, Inc.: *See—*
Chan, Tsiu C.; and Bryant, Frank R., 5,116,776, Cl. 437-52.000.
Chan, Tsiu C.; and Zamanian, Mehdi, 5,116,777, Cl. 437-56.000.
Stark, David M.; and Clark, Wayne D., 5,117,273, Cl. 357-54.000.
SGS-Thomson Microelectronics S.r.l.: *See—*
Bellezza, Orio; and Melanotte, Massimo, 5,117,269, Cl. 357-23.500.
Shafer, Kenneth W.: *See—*
Mitchell, Robert A.; Hall, David B.; and Shafer, Kenneth W., 5,116,132, Cl. 356-350.000.
Shaffer, John H.: *See—*
Melton, James K.; Hilliard, Garland E.; and Shaffer, John H., 5,116,593, Cl. 423-473.000.
Shaffer Tent & Awning Co.: *See—*
Spaulding, Stephen E., 5,115,828, Cl. 135-106.000.
Shaked, Ze'ev: *See—*
Koths, Kirston E.; Halenbeck, Robert F.; Innis, Michael A.; Wang, Alice M.; and Shaked, Ze'ev, 5,116,943, Cl. 530-351.000.
Shamir, Dan: *See—*
Greuloch, William; Shamir, Dan; and Groves, Mark W., 5,115,806, Cl. 128-26.000.
Shammout, Mohammad, to Shammout, Mohammad. Loader bucket with power lift apparatus. 5,116,189, Cl. 414-722.000.
Shapiro, Edward G.: *See—*
Seppi, Edward J.; Shapiro, Edward G.; and Pavkovich, John M., 5,117,445, Cl. 378-65.000.
Shareck, Francois: *See—*
Bernier, Roger L.; Kluepfel, Dieter; Morosoli, Rolf; and Shareck, Francois, 5,116,746, Cl. 435-172.300.
Sharp Kabushiki Kaisha: *See—*
Iguchi, Katsuji, 5,116,779, Cl. 437-67.000.
Ishii, Hiroshi; and Ozaki, Masaaki, 5,117,164, Cl. 318-135.000.
Kojima, Yoshimi; Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; and Imada, Eiji, 5,116,706, Cl. 430-58.000.
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Miyata, Souichi, 5,117,499, Cl. 395-800.000.
Morino, Taisuke; Tanaka, Mami; Kaneko, Fuminori; Ozaki, Takeyuki; and Akiyama, Shuichi, 5,117,079, Cl. 219-10.55F.
Ohta, Kenji; Katayama, Hiroyuki; Nakayama, Junichiro; Kimura, Kazuhiro; Matoba, Hirotsugu; and Kobayashi, Shozo, 5,117,415, Cl. 369-271.000.
Yanagiuchi, Shigenobu; Kawai, Shoichi; Omura, Yukihiro; Kotani, Yasuhiro; and Inoue, Kazuya, 5,117,379, Cl. 364-715.010.
Shaw, Chi S. Structure of fishing rod stand for fishing on the sea. 5,115,598, Cl. 43-21.200.
Sheer Lady International, Inc.: *See—*
Patrick, Alvin J.; Patrick, Willie H., deceased; and Patrick, James W., administrator, 5,115,650, Cl. 66-169.00A.
Shekleton, Jack R., to Sundstrand Corporation. External cartridge gas combustor ignitor. 5,115,637, Cl. 60-39.142.

Shell Oil Company: *See—*
Drent, Eit; and Breed, Anthonius J. M., 5,116,936, Cl. 528-271.000.
Rosenbrand, Gerrit G.; and Wong, Pui K., 5,116,797, Cl. 502-162.000.
Smegal, John A., 5,116,484, Cl. 208-254.00H.

Shen, Joseph, to Chevron Research & Technology Company. Measurement of fluid properties of two-phase fluids using an ultrasonic meter. 5,115,670, Cl. 73-61.410.

Shenai-Khatkhate, Deodatta V.: *See—*
Mullin, John B.; Cole-Hamilton, David J.; Shenai-Khatkhate, Deodatta V.; and Webb, Paul, 5,117,021, Cl. 556-130.000.

Shepard, Robert R.: *See—*
Ladd, David J.; Pounds, Gregory E.; Kusumi, Tim J.; Bonee, Peter A.; and Shepard, Robert R., 5,117,451, Cl. 379-67.000.

Shepherd, Robert; Owen, Frank C. G.; and Pudney, Christopher D., to U.S. Philips Corporation. Data transmission over a time division duplex channel. 5,117,423, Cl. 370-95.100.

Sheppard, Clyde H.: *See—*
Lubowitz, Hyman R.; and Sheppard, Clyde H., 5,116,935, Cl. 528-173.000.

Shetty, Chandrashekar S.: *See—*
Bhattacharyya, Bhupati R., deceased; Huang, Shu-Jen; Shetty, Chandrashekar S.; Bui, Nang T.; and Dunn, Yvonne O., 5,116,514, Cl. 210-712.000.

Sheu, Yu-Hwa E.: *See—*
Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III and Pottratz, David G., 5,116,466, Cl. 203-58.000.
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Ishikawa, Hiromichi; Umeda, Takashi; Onoue, Shinji; Kajikawa, Kazuo; Shibata, Toshihiro; and Ohyama, Hiroshi, 5,116,838, Cl. 514-634.000.

Shibata, Yasuhisa: *See—*
Ozawa, Satoshi; Oki, Naoto; Shibata, Yasuhisa; and Miyagi, Hiroyuki, 5,116,481, Cl. 204-290.00R.

Shiga, Nobuo: *See—*
Sekiguchi, Takeshi; and Shiga, Nobuo, 5,116,642, Cl. 427-96.000.

Shikatani, Yutaka; Kataoka, Naoki; Kuroda, Nobuyuki; and Matsuura, Kazuo, to Nippon Oil Company, Limited. Hole transporting material. 5,116,708, Cl. 430-59.000.

Shilling, Lynndon. Dispenser device and cartridge for volatile substance with rate control for volatilization thereof. 5,115,975, Cl. 239-55.000.

Shimada, Katsuhiko: *See—*
Yamamoto, Takashi; Matsumoto, Tsuruyoshi; Kobayashi, Tadao; and Shimada, Katsuhiko, 5,117,480, Cl. 385-145.000.

Shimada, Katsutoshi: *See—*
Oki, Nariyasu; Yokokura, Tsunetoshi; Mizuno, Koji; Shimada, Katsutoshi; and Yamamoto, Kazuyuki, 5,116,231, Cl. 123-52.0MB.

Shimada, Shin'ichi: *See—*
Takeshita, Yasuyoshi; Nakamura, Hiroshi; Ishiguro, Susumu; Kwaguchi, Noboru; Shimada, Shin'ichi; Koyama, Tadayoshi; Seya, Motohide; Abe, Noriko; and Nomoto, Shin, 5,116,985, Cl. 546-141.000.

Shimada, Takahisa: *See—*
Ishimura, Toshihiko; Seki, Reiji; Ishibashi, Kenji; Tanii, Junichi; and Shimada, Takahisa, 5,117,251, Cl. 354-400.000.

Shimada, Teiyu: *See—*
Yamashita, Haruyuki; Shimada, Teiyu; and Sugiyama, Hiromu, 5,116,757, Cl. 435-255.000

Shimadzu Corporation: *See—*
Fukuma, Toshiaki, 5,116,122, Cl. 356-326.000.
Komoto, Akira, 5,115,877, Cl. 177-212.000.
Tahara, Shu; Kawabata, Naoyoshi; Kojima, Akira; and Fukushima, Shigeru, 5,116,736, Cl. 435-39.000.

Shimamoto, Takeshi: *See—*
Morita, Shinichiro; Takahashi, Nobuya; Shimamoto, Takeshi; Matsuda, Kazuya; and Suzuki, Shigehiko, 5,116,552, Cl. 264-28.000.

Shimamura, Masoyoshi: *See—*
Nakamura, Tatsuya; Mori, Hiromi; Shimamura, Masoyoshi; and Morimoto, Reiko, 5,116,712, Cl. 430-106.000.

Shimanaka, Shigeki: *See—*
Sasaki, Hiroshi; Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinichi, 5,115,694, Cl. 74-844.000.

Shimano Inc.: *See—*
Nagano, Masashi, 5,115,692, Cl. 74-594.400.

Shimizu, Akira; Ogawa, Tutomu; Wakatsuki, Kenji; and Kimura, Tomomichi, to Pioneer Electronic Corporation. Multidisk containing player including magazine having a housing with separable upper and lower half portions. 5,117,409, Cl. 369-36.000.

Shimizu, Eiichi: *See—*
Ohara, Tetsuo; Miura, Tsutomu; Hagiwara, Shinichi; Koshimizu, Shigeomi; and Shimizu, Eiichi, 5,116,281, Cl. 474-1.000.

Shimizu, Katsuichi: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 5,117,260, Cl. 355-204.000.

Shimizu, Kazuo: *See—*
Nishijima, Yoshitatsu; Fujitaka, Terumasa; and Shimizu, Kazuo, 5,117,045, Cl. 560-219.000.

Shimizu, Masao; Kataoka, Yoshinori; and Akai, Naruaki, to Matsushita Electric Industrial Co., Ltd. Cordless iron. 5,117,092, Cl. 219-247.000.

Shimizu, Osamu: *See—*
Nakanishi, Kanji; Shimizu, Osamu; Yoshida, Satoshi; Katayama, Masaaki; and Isomura, Tatsuya, 5,117,321, Cl. 360-120.000.

Shimizu, Takao: *See—*
Takagi, Masayuki; Okada, Tadaaki; Akai, Naotoshi; Yaguchi, Takashi; Miyadoh, Shinji; Shomura, Takashi; Sasaki, Toru; Sezaki, Masaji; Shimizu, Takao; and Niida, Masashi, 5,116,815, Cl. 514-11.000.

Shimizu, Yasuhiko, to Kabushiki Kaisha Toshiba. Wire bonding method. 5,115,960, Cl. 228-110.000.

Shimoda, Yoshihide: *See—*
Kojima, Yoshimi; Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; and Imada, Eiji, 5,116,706, Cl. 430-58.000.

Shimohigashi, Katsuhiro: *See—*
Miyazawa, Kazuyuki; Shimohigashi, Katsuhiro; Etoh, Jun; and Kimura, Katsutaka, 5,117,393, Cl. 365-201.000.

Shimomura, Bunji: *See—*
Sakashita, Masao; Sakamoto, Tetsuo; Kazama, Shingo; Harada, Yoshiyuki; Teramoto, Takero; Watanabe, Kazuhiro; Shimomura, Bunji; and Kaneta, Tsutomu, 5,116,504, Cl. 210-500.230.

Shimomura, Setsuhiro: *See—*
Ohkubo, Satoru; and Shimomura, Setsuhiro, 5,116,356, Cl. 123-425.000.

Shimoyama, Yujiro: *See—*
Yanai, Shinji; and Shimoyama, Yujiro, 5,117,074, Cl. 200-302.300.

Shimura, Shoichi: *See—*
Kobayashi, Naoki; Oki, Kazuhiro; and Shimura, Shoichi, 5,117,104, Cl. 250-230.000.

Shimura, Takaki: *See—*
Watanabe, Kazuhiro; Hara, Yasushi; Iida, Atsuo; Shimura, Takaki; Matsui, Kiyoto; Ishikawa, Hiroshi; and Kawabe, Kenji, 5,115,810, Cl. 128-662.030.

Shin-Etsu Chemical Company, Limited: *See—*
Arai, Masatoshi, 5,117,029, Cl. 556-457.000.
Inomata, Hiroshi; and Tarumi, Yasuo, 5,116,928, Cl. 528-18.000.
Kishita, Hirofumi; Yamaguchi, Kouichi; Fujii, Hideki; Suganuma, Shuji; Saito, Yoshikazu; Sato, Shinichi; Fukuda, Kenichi; and Kobayashi, Nobuyuki, 5,117,026, Cl. 556-435.000.
Kubota, Tohru; Ishihara, Toshinobu; and Endo, Mikio, 5,116,973, Cl. 540-487.000.
Okinoshima, Hiroshige; and Kanbara, Hiroshi, 5,117,001, Cl. 549-214.000.
Takago, Toshio; Kishita, Hirofumi; Kinami, Hitoshi; Fukuda, Kenichi; Sato, Shinich; Yamaguchi, Koichi; and Suganuma, Shuji, 5,117,025, Cl. 556-434.000.
Takago, Toshio; Kishita, Hirofumi; Kinami, Hitoshi; Fukuda, Kenichi; Sato, Shinich; Yamaguchi, Koichi; and Suganuma, Shuji, 5,117,025, Cl. 556-434.000.

Shin, Kju H., to Ethyl Corporation. Process of preparing substituted anilines. 5,117,061, Cl. 564-384.000.

Shinjo, Kenji: *See—*
Togano, Takeshi; Takiguchi, Takao; Yamada, Yoko; Asaoka, Masanobu; and Shinjo, Kenji, 5,116,530, Cl. 252-299.610.

Shinmen, Yoshifumi; Asami, Sumio; Amano, Norihide; Amachi, Teruo; and Yoshizumi, Hajime, to Suntory Limited. Process for producing peroxidase. 5,116,751, Cl. 435-194.000.

Shinmoto, Jitsumi, to Tomi Machinery Manufacturing Co., Ltd. Apparatus for controlling thickness of film formed by melt extrusion. 5,116,211, Cl. 425-141.000.

Shinmoto, Jitsumi, to Tomi Machinery Manufacturing Co. Ltd. Method of making a film having uniform thickness. 5,116,554, Cl. 264-40.100.

Shinoda, Masaki: *See—*
Hayashi, Yoshio; Morinaka, Yasuhiro; Shinoda, Masaki; Nishi, Hiroyoshi; Watanabe, Kazutoshi; and Fukushima, Nobuko, 5,116,858, Cl. 514-391.000.

Shinooka, Rika: *See—*
Dosako, Shunichi; Shinooka, Rika; and Tanaka, Maki, 5,116,953, Cl. 530-400.000.

Shiokawa, Kozo: *See—*
Kurahashi, Yoshio; Shiokawa, Kozo; Kagabu, Shinzo; Sakawa, Shinji; and Moriya, Koichi, 5,117,053, Cl. 562-506.000.

Shionogi & Co., Ltd.: *See—*
Ohtani, Mitsuaki; Matsuura, Takaharu; Konoike, Toshiro; and Araki, Yoshitaka, 5,117,039, Cl. 560-60.000.

Shiotani, Takeshi; Miyamoto, Kouichi; Tsugami, Kunio; Sato, Mitsumasa; and Wada, Tatsuya, to Ryobi Limited. Table saw. 5,116,249, Cl. 83-435.001.

Shirai, Kazuhiko: *See—*
Nakagawa, Yutaka; Suga, Ryoichi; Mochida, Hiroya; Tonomura, Masashi; and Shirai, Kazuhiko, 5,117,484, Cl. 395-100.000.

Shirai, Tokuo: *See—*
Fujii, Hiroyuki; Shirai, Tokuo; Mizutani, Takanori; Nagae, Yoshio; Hetsugi, Koji; Tanizawa, Yasuo; and Kaburagi, Kouji, 5,116,521, Cl. 251-18.000.

Shiraishi, Naomasa; Taniguchi, Tetsuo; and Kawai, Hidemi, to Nikon Corporation. Projection exposure apparatus. 5,117,255, Cl. 355-53.000.

Shirakura, Toshiharu: *See—*
Oohashi, Tuneyoshi; Yamaguchi, Motoo; Wada, Akira; Shirakura, Toshiharu; Kichikawa, Toshimichi; and Sugawara, Hiroyuki, 5,117,434, Cl. 372-56.000.

Shirasaka, Tetsuhiko: *See—*
Fujii, Setsuro, deceased; Fujii, Shinichiro, legal heir; Takada, Kaoruko, legal heir; Shirasaka, Tetsuhiko; and Fukushima, Masakazu, 5,116,600, Cl. 424-10.000.

Shires, Glen E., to Lucid, Inc. (formerly Portable Computer). Method and apparatus for operating at fractional speeds in synchronous systems. 5,117,443, Cl. 375-111.000.

Shiseido Company Ltd.: *See—*
Kimura, Asa; and Suzuki, Fukuji, 5,116,664, Cl. 428-216.000.

Shizawa, Hiroshi, to Texas Instruments Incorporated. Signal modulation system. 5,117,234, Cl. 341-143.000.

Shoji, Masakazu, to AT&T Bell Laboratories. Integrated circuits which compensate for local conditions. 5,117,130, Cl. 307-443.000.

Shomura, Takashi: *See—*
Takagi, Masayuki; Okada, Tadaaki; Akai, Naotoshi; Yaguchi, Takashi; Miyadoh, Shinji; Shomura, Takashi; Sasaki, Toru; Sezaki, Masaji; Shimizu, Takao; and Niida, Masashi, 5,116,815, Cl. 514-11.000.

Shorter, John J.; Harris, Graham J.; and Woolnough, Victor J., to Chas. A. Blatchford & Sons Ltd. Lowelimb prothesis. 5,116,383, Cl. 623-49.000.

Shoup, Dale W.: *See—*
Feldman, Alexander I.; and Shoup, Dale W., 5,115,675, Cl. 73-704.000.

Showa Denko K.K.: *See—*
Matsubara, Mamoru, 5,116,661, Cl. 428-198.000.
Suzuki, Noboru; Yoshida, Masaharu; Noda, Satoshi; Takaishi, Minoru; Takiguchi, Kenichiro; Uchida, Hiroshi; and Onoda, Takeshi, 5,116,670, Cl. 428-285.000.

Showa Shell Sekiyu K.K.: *See—*
Hagiwara, Takashi; Yamakawa, Noriko; and Kawamura, Ichiro, 5,116,531, Cl. 252-299.650.

Shuker, John P. D., to Gun Security Limited. Locking device for firearms. 5,115,589, Cl. 42-70.110.

Shumaker, Mark A.: *See—*
Palmer, Ralph P.; Whitmoyer, David A.; and Shumaker, Mark A., 5,116,170, Cl. 408-72.00B.

Shuto, Katsuichi: *See—*
Oshima, Etsuo; Kumazawa, Toshiaki; Otaki, Shizuo; Obase, Hiroyuki; Ohmori, Kenji; Ishii, Hidee; Manabe, Haruhiko; Tamura, Tadafumi; and Shuto, Katsuichi, 5,116,863, Cl. 514-450.000.

Sidel: *See—*
Doudement, Gerard; and Evrard, Alain, 5,116,217, Cl. 425-534.000.

Siegel, Marvin I.: *See—*
Ganguly, Ashit K.; Friary, Richard J.; Schwerdt, John H.; Siegel, Marvin I.; Smith, Sidney R.; Seidl, Vera A.; and Sybertz, Edmund J., 5,116,840, Cl. 514-250.000.

Siemens Aktiengesellschaft: *See—*
Danner, Gerd, 5,117,417, Cl. 370-13.000.
Immler, Josef; and Armin, Ulber, 5,117,318, Cl. 360-105.000.
Kerscher, Max; and Stempel, Gerhard, 5,117,343, Cl. 362-297.000.

Siemens Automotive L.P.: *See—*
Mesenich, Gerhard, 5,115,982, Cl. 239-585.300.

Siemens Automotive Limited: *See—*
Cook, John E., 5,115,785, Cl. 123-520.000.

Sigl, Alfred; Meissner, Manfred; Isella, Thomas; and Schmitt, Johannes, to Robert Bosch GmbH. Drive slip control system. 5,116,108, Cl. 303-103.000.

Sigma, Incorporated: *See—*
Nagao, Yuji; and Kinoshita, Yoshihiro, 5,116,050, Cl. 273-143.00R.

Sigmond, David M.: *See—*
Lin, Charles W. C.; German, Randy L.; Yee, Ian Y. K.; and Sigmond, David M., 5,116,463, Cl. 156-643.000.

Silke, Gerald W., to General Atomics. Remotely adjustable compliance for end effector tooling. 5,116,190, Cl. 414-735.000.

Silverman, Gary S.: *See—*
Nobile, Frederick E.; Harris, John F., III; and Silverman, Gary S., 5,117,297, Cl. 359-52.000.

Silverstein, Seth D.; and Engeler, William E., to General Electric Company. Superresolution beamformer for large order phased array system. 5,117,238, Cl. 342-373.000.

Simpson, Michael J.; and Futhey, John A., to Minnesota Mining and Manufacturing Company. Multi-focal diffractive ophthalmic lenses. 5,116,111, Cl. 351-161.000.

Sing, Peter. Method of converting logs and resultant product. 5,115,609, Cl. 52-309.900.

Sinnk, Chester R.: *See—*
Fleischmann, Charles W.; Sinnk, Chester R.; and Veit, Jr., William E., 5,116,697, Cl. 429-86.000.

Sioutas, Constantinos, to Minnesota Mining and Manufacturing Company. Aerosol actuator providing increased respirable fraction. 5,115,803, Cl. 128-200.230.

Sirani, Mauro: *See—*
Bondanelli, Luigi; Sirani, Mauro; Schembri, Alfonso; and Boido, Dante, 5,116,298, Cl. 493-4.000.

Siray, Mustafa: *See—*
Baacke, Michael; Beand, Reinhold; Engler, Bernd; Kiss, Akos; Kleine-Mollhoff, Peter; Kleinschmit, Peter; Koberstein, Edgar; and Siray, Mustafa, 5,116,586, Cl. 423-239.000.

Sircar, Shivaji; and Rao, Madhukar B., to Air Products and Chemicals, Inc. Separation of liquid mixtures by thermal swing adsorption. 5,116,510, Cl. 210-673.000.

Sischka, Frederic J., II: *See—*
Karle, Dennis W.; Chung, Fred C.; and Sischka, Frederic J., II, 5,116,685, Cl. 428-425.900.

Sivam, Gowsala P.; and Morgan, A. Charles, Jr., to NeoRx Corporation. Conjugates having improved characteristics for in vivo administration. 5,116,944, Cl. 530-362.000.

Siwinski, Paul P., to AMP Incorporated. Multiconductor flat cable connector, apparatus and method. 5,116,239, Cl. 439-497.000.

Skeels, Gary W.; and Flanigen, Edith M., to UOP. Method for enhancing the activity of zeolite beta. 5,116,794, Cl. 502-85.000.

SKF Industrial Tading and Developement Company B.V.: *See—*
Jan de Vries, Alexander, 5,116,145, Cl. 384-465.000.

Skiens, W. Eugene: *See—*
Burton, Frederick G.; Cataldo, Dominic A.; Cline, John F.; and Skiens, W. Eugene, 5,116,414, Cl. 71-121.000.

Skoldinov, Aleksandr P.: *See—*
Wunderlich, Helmut; Stark, Andreas; Zenker, Lothar; Lohmann, Dieter; Poppe, Hildegard; Bartsch, Reni; Skoldinov, Aleksandr P.; Kaverina, Natalja V.; Grizenko, Anna N.; and Lyskovzev, Valentin V., 5,116,974, Cl. 540-591.000.

Skorka, Thomas, to Ing. Erich Pfeiffer GmbH & Co. KG. Manually operated dual invertible pump. 5,115,980, Cl. 222-321.000.

Skripitz, Walter; and Schelhas, Klaus-Dieter, to Bristol-Myers Squibb Company. Cementable hip prosthesis. 5,116,377, Cl. 623-23.000.

Skyline Displays, Inc.: *See—*
Lindblom, Curtis; and Kirchner, Michael W., 5,115,855, Cl. 160-135.000.

Slack, David A.: *See—*
Brown, Terrance O.; Slack, David A.; Alexander, A. Gordon; and Moran, Lyle E., 5,116,522, Cl. 252-18.000.

Sladky, Friedrich: *See—*
Selgrad, Volker; and Sladky, Friedrich, 5,116,392, Cl. 51-309.000.

Slavens, Carolina G.: *See—*
Slavens, Samuel T.; and Slavens, Carolina G., 5,116,014, Cl. 248-500.000.

Slavens, Samuel T.; and Slavens, Carolina G. Beach towel anchor. 5,116,014, Cl. 248-500.000.

Sloan-Kettering Institute For Cancer Research: *See—*
Ravetch, Jeffrey V.; and Pologe, Laura, 5,116,965, Cl. 536-27.000.

Slope Indicator Company, The: *See—*
Feldman, Alexander I.; and Shoup, Dale W., 5,115,675, Cl. 73-704.000.

Sludikoff, Stanley R.; and Alexoff, Carl. Lottery game system and method of playing. 5,116,049, Cl. 273-139.000.

Sluyterman, Albertus A. S.; Vink, Nicolaas G.; and Doomernik, Franciscus M. P. P., to U.S. Philips Corporation. Color display tube with twist correction means. 5,117,151, Cl. 313-413.000.

Small, Donald M., to Boston University, Trustees of. Meat products having a markedly reduced saturated fat and cholesterol content and a markedly increased unsaturated fat content. 5,116,633, Cl. 426-641.000.

Smegal, John A., to Shell Oil Company. Hydrodenitrification process. 5,116,484, Cl. 208-254.00H.

Smialek, James L.: *See—*
Brindley, William J.; Smialek, James L.; and Rouge, Carl J., 5,116,690, Cl. 428-614.000.

Smisson, Robert P. M., to Hydro International Limited. Gravitational separator for separating solid components out of a liquid mixture. 5,116,516, Cl. 210-747.000.

Smith, Gailerd S. Quick attachment release jib handling and stowage system. 5,115,755, Cl. 114-105.000.

Smith, Harvell M.; Marx, Edward J.; and Coleman, Robert R., to Manville Corporation. Apparatus for reinforcing fibrous duct. 5,115,957, Cl. 227-67.000.

Smith, Ian H.: *See—*
Weston, John B.; Larkin, John P.; and Smith, Ian H., 5,116,862, Cl. 514-436.000.

Smith International, Inc.: *See—*
Rodriguez, Arturo A.; and Crockett, Ronald B., 5,115,697, Cl. 76-108.600.

Smith, James A.; and Johnson, John A., to United States of America, Energy. Digital quadrature phase detection. 5,117,440, Cl. 375-82.000.

Smith, John C.; and Christmas, Patrick E., to Schlegal (UK) Holdings Limited. Roller or wheel assembly for patio doors. 5,116,142, Cl. 384-55.000.

Smith, Kenneth J.: *See—*
Nurnberg, Thomas R.; Seggebruch, Ernie G.; and Smith, Kenneth J., 5,115,900, Cl. 198-335.000.

Smith, Lawrence E. Accessory track to accommodate multiple accessories. 5,116,011, Cl. 248-346.000.

Smith, Paul F.: *See—*
Berry, Thomas G.; Smith, Paul F.; Rohani, Kamyar; Brown, Winfield J., Jr.; and Macnak, Philip P., 5,117,460, Cl. 381-41.000.

Smith, Richard S.: *See—*
Vaughan, John H.; Carson, Dennis A.; Rhodes, Gary; Houghten, Richard; Smith, Richard S.; and Geltosky, John E., 5,116,725, Cl. 435-5.000.

Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta J., to Merck & Co., Inc. HMG-CoA reductase inhibitors. 5,116,870, Cl. 514-548.000.

Smith, Ronald L.: *See—*
Gilbert, Sheri A.; Mizoguchi, Haruko; Charest, Robert P.; O'Neill, Timothy P.; and Smith, Ronald L., 5,116,847, Cl. 514-327.000.
Smith, Scott A., to General Motors Corporation. Common hydraulic circuitry for a scavenge and towing system. 5,115,887, Cl. 184-6.400.
Smith, Sidney R.: *See—*
Ganguly, Ashit K.; Friary, Richard J.; Schwerdt, John H.; Siegel, Marvin I.; Smith, Sidney R.; Seidl, Vera A.; and Sybertz, Edmund J., 5,116,840, Cl. 514-250.000.
Smiths Industries Public Limited Company: *See—*
Strachan, Julie, 5,116,032, Cl. 5-614.000.
Smitt, Asbjorn, to Contex Components & Business Machines A/S. Structure for and method of scanning with multiplexed light sensor arrays. 5,117,295, Cl. 358-474.000.
Smoot, Lanny S.: *See—*
Nelson, Terence J.; and Smoot, Lanny S., 5,117,285, Cl. 358-85.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See—*
Beisemann, Gerd; and Pietsch, Klaus, 5,115,653, Cl. 72-8.000.
Rohde, Wolfgang, 5,115,547, Cl. 29-33.00C.
Smulders, Eduard: *See—*
Carduck, Franz-Josef; Jahnke, Ulrich; Smulders, Eduard; Vogt, Guenther; Boecker, Monika; and Kuenzel, Werner, 5,116,524, Cl. 252-90.000.
Snell, Paul W., to York International Corporation. Variable geometry diffuser. 5,116,197, Cl. 415-126.000.
Snow Brand Milk Products Company, Limited: *See—*
Dosako, Shunichi; Shinooka, Rika; and Tanaka, Maki, 5,116,953, Cl. 530-400.000.
Takeshita, Yasuyoshi; Nakamura, Hiroshi; Ishiguro, Susumu; Kwaguchi, Noboru; Shimada, Shin'ichi; Koyama, Tadayoshi; Seya, Motohide; Abe, Noriko; and Nomoto, Shin, 5,116,985, Cl. 546-141.000.
Snyder, Gene W.; and Pan, Peter N.Y., to Thiele Engineering Company. Lane divider. 5,115,902, Cl. 198-365.000.
Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.): *See—*
Braquet, Pierre; Broquet, Colette; Vandamme, Benedicte; and Principe-Nicolas, Paola, 5,116,992, Cl. 514-77.000.
Societe De Developpement Des Utilisations Du Cuir - SADUC: *See—*
Gagnieu, Christian; and DuBois, Michel, 5,116,966, Cl. 536-50.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See—*
Jourdain, Gerard E. A.; and Raynal, Regis, 5,116,218, Cl. 425-547.000.
Societe Nationale Industrielle et Aerospatiale: *See—*
Anglade, Marc; Guimbal, Bruno; and Hancart, Michel A., 5,116,209, Cl. 416-107.000.
Softblast, Inc.: *See—*
Ruef, Helmut, 5,116,425, Cl. 134-17.000.
Soil Guardian Inc.: *See—*
Selesnick, Lawrence B., 5,116,515, Cl. 210-744.000.
Solas, Dennis W.: *See—*
Hale, Ron L.; and Solas, Dennis W., 5,116,989, Cl. 546-265.000.
Solon Technologies, Inc.: *See—*
Nestor, Ontario H., 5,116,456, Cl. 156-616.100.
Somar Corporation: *See—*
Ochi, Hideo; Igari, Akihide; and Toyoda, Masaaki, 5,116,542, Cl. 252-518.000.
Son, Adelina J.: *See—*
Chen, Robert G.; and Son, Adelina J., 5,117,058, Cl. 564-157.000.
Song, Kwang-Sup, to SamSung Electronics Co., Ltd. Circuit for generating a scroll window signal in digital image apparatus. 5,117,226, Cl. 340-726.000.
Songer, Matthew N.: *See—*
Songer, Robert J.; and Songer, Matthew N., 5,116,340, Cl. 606-103.000.
Songer, Robert J.; and Songer, Matthew N. Surgical securance apparatus. 5,116,340, Cl. 606-103.000.
Sonobe, Saburo, to Kinyosha Co., Ltd. Compressible rubber blanket for offset printing. 5,116,669, Cl. 428-250.000.
Sony Corporation: *See—*
Fujita, Tadao; Inaba, Yoshiaki; and Takayama, Jun, 5,117,383, Cl. 364-746.000.
Kaeriyama, Takuya, 5,117,322, Cl. 360-130.240.
Nakagawa, Yutaka; Suga, Ryoichi; Mochida, Hiroya; Tonomura, Masashi; and Shirai, Kazuhiko, 5,117,484, Cl. 395-100.000.
Watanabe, Haruo; Yasuda, Akio; Kawasumi, Koichi; Tsuchiya, Takao; and Suzuki, Kiyosuke, 5,116,714, Cl. 430-117.000.
Watanabe, Hidetoshi; Suzuki, Hirotsugu; and Yamamoto, Masanobu, 5,116,210, Cl. 425-111.000.
Soppe, John B. Milk supply system for livestock. 5,115,764, Cl. 119-75.000.
Sourani, Sason: *See—*
Piasecki, Joshua; and Sourani, Sason, 5,117,453, Cl. 379-100.000.
Sowa, Dennis F.: *See—*
Romweber, Frank T.; and Sowa, Dennis F., 5,116,363, Cl. 34-22.000.
Spahni, Heinz: *See—*
Schmidhalter, Beat; and Spahni, Heinz, 5,116,674, Cl. 428-335.000.
Spar Aerospace Limited: *See—*
Fung, Patrick T.; Norgate, Graham; Dilts, Timothy A.; Jones, Andrew S.; and Ravindran, Rangaswamy, 5,116,180, Cl. 414-5.000.
Spariat, Jacques; Aubret, Jean-Pierre; and Barrier, Michel, to Aerospatiale Societe Nationale Industrielle. Device for temporary mechanical attachment of an object to a support and rapid ejection of the object from the support. 5,115,708, Cl. 89-1.140.
Spaulding, Stephen E., to Shaffer Tent & Awning Co. Demountable frame structure. 5,115,828, Cl. 135-106.000.
Spector, Donald. Shadowless background for photography. 5,117,249, Cl. 354-291.000.
Spector, George: *See—*
Charitar, Satendra; and Spector, George, 5,116,253, Cl. 132-114.000.
Kondo, Kyle K.; and Spector, George, 5,116,288, Cl. 2-177.000.
Spectrum Sciences B.V.: *See—*
Adam, Yossi; and Gazit, Alon, 5,117,263, Cl. 355-256.000.
Speich, Francisco, to Textilma AG. Weaving machine with ribbon cutting device. 5,115,839, Cl. 139-291.00C.
Spencer, R. Wilson. Sample extraction system. 5,116,330, Cl. 73-863.710.
Speranza, George P.: *See—*
Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III; and Pottratz, David G., 5,116,466, Cl. 203-58.000.
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Speroni, Armando; and Bedodi, Aldo, to Datapac S.R.L. Process and apparatus for the sealing of paper sheets. 5,116,302, Cl. 493-254.000.
Spindelfabrik Suessen Schurr Stahlecker & Grill GmbH: *See—*
Vanhelle, Michel, 5,115,630, Cl. 57-58.059.
Spire Corporation: *See—*
Daly, James T., 5,116,455, Cl. 156-605.000.
Sponge-Cushion, Inc.: *See—*
Raus, Frank J., 5,116,439, Cl. 156-71.000.
Spoo, Kevin J.; Rhodes, Vergil H., Jr.; and Dodd, Bill W., to Phillips Petroleum Company. Molding apparatus. 5,116,450, Cl. 156-441.000.
Sprafke, Uwe, to Wegmann & Co. GmbH. Military tank. 5,115,712, Cl. 89-36.140.
Spruck, Helmut: *See—*
Fritz, Dieter; and Spruck, Helmut, 5,117,085, Cl. 219-121.270.
Spurbeck, Kenneth C.: *See—*
Stroze, Mrk S.; and Spurbeck, Kenneth C., 5,115,831, Cl. 137-102.000.
SRI International: *See—*
Tanabe, Masato; Crowe, David F.; Peters, Richard H.; and Johansson, John G., 5,116,830, Cl. 514-182.000.
Sri-Jayantha, Muthuthamby: *See—*
Hegde, Suryanarayan G.; Praino, Anthony P.; Root, Steven J.; and Sri-Jayantha, Muthuthamby, 5,115,664, Cl. 73-9.000.
Srivastava, Suresh C.; Babich, John W.; Straub, Rita; and Richards, Powell, to Associated Universities, Inc. Kit for the selective labeling of red blood cells in whole blood with TC-phd 99m. 5,116,597, Cl. 424-1.100.
Srivastava, Suresh C.: *See—*
Mausner, Leonard F.; Srivastava, Suresh C.; and Prach, Thomas, 5,116,470, Cl. 204-157.210.
Sroub, Brian J.; and Pomeranz, Melvin A., to Sroub, Brian J. Brassiere for women. 5,116,278, Cl. 450-61.000.
Stabilus GmbH: *See—*
Mintgen, Rolf; Wirges, Winfried; and Wagner, Udo, 5,116,028, Cl. 267-64.120.
Stadick, William R.: *See—*
Robinson, John P.; Stadick, William R.; Clawges, Thomas L.; and Minogue, Thomas P., 5,116,301, Cl. 493-215.000.
Staff-Plus, Inc.: *See—*
Stipanovich, Joseph; and Bredeson, Sharon, 5,117,353, Cl. 374-401.000.
Stanley, Christopher J., to Scientific Generics Limited. Device for analytical determinations. 5,116,576, Cl. 422-55.000.
Stant Inc.: *See—*
Szlaga, Emil, 5,116,257, Cl. 137-43.000.
Stark, Andreas: *See—*
Wunderlich, Helmut; Stark, Andreas; Zenker, Lothar; Lohmann, Dieter; Poppe, Hildegard; Bartsch, Reni; Skoldinov, Aleksandr P.; Kaverina, Natalja V.; Grizenko, Anna N.; and Lyskovzev, Valentin V., 5,116,974, Cl. 540-591.000.
Stark, David M.; and Clark, Wayne D., to SGS-Thomson Microelectronics, Inc. Contact for integrated circuits. 5,117,273, Cl. 357-54.000.
Starmer, John E., to Metro Products (Accessories & Leisure) Ltd. Motor vehicle anti-theft device. 5,115,652, Cl. 70-209.000.
State of Israel, Atomic Energy Commission, Soreq Nuclear Research Center, The: *See—*
Margaliot, Menachem; and Schlesinger, Tuvia, 5,117,120, Cl. 250-572.000.
Stauffer, Paul: *See—*
Bommannan, Durairaj; Okuyama, Hirohisa; Guy, Richard H.; Stauffer, Paul; and Flynn, Gordon L., 5,115,805, Cl. 128-24.0AA.
Stava, Elliott K., to Lincoln Electric Company, The. Device and method for starting electric arc of a welder. 5,117,088, Cl. 219-137.0PS.
Stavinoha, Jerome L., Jr.; and Tolleson, John D., to Eastman Kodak Company. Recovery of 3,4-epoxy-1-butene from 1,3-butadiene oxidation effluents. 5,117,012, Cl. 549-538.000.
STC plc: *See—*
Epworth, Richard E.; Byron, Kevin C.; Baker, Robert A.; and Taylor, Nigel, 5,117,196, Cl. 359-333.000.
Stearns, Glenn; Packard, Barbara B.; and Watson, Ralph T., to Hewlett-Packard Company. Method for recording and replaying mouse commands by recording the commands and the identities of elements affected by the commands. 5,117,496, Cl. 395-700.000.
Steelcase Inc.: *See—*
Kolk, Stephen B.; Theuerkauf, James P.; and Walz, Fredrick J., 5,116,639, Cl. 427-54.100.
Steele, Guy L., Jr.: *See—*
Hillis, W. Daniel; Kahle, Brewster; Robertson, George G.; and Steele, Guy L., Jr., 5,117,420, Cl. 370-60.000.
Steele, Michael F., to Brunswick Corporation. Release mechanism for spin-stabilized self-propelled missiles. 5,115,709, Cl. 89-1.808.
Steffen, Klaus-Dieter: *See—*
Bernhardt, Gunther; Steffen, Klaus-Dieter; Haas, Margret; and Kragl, Heinz, 5,117,027, Cl. 556-440.000.
Stein, Alan J.: *See—*
Mitchell, David L.; Stein, Alan J.; Barndt, Charles L., Jr.; and Szeto, William W., 5,115,710, Cl. 89-1.809.
Stein, Frank L.: *See—*
Greanias, Evon C.; Stein, Frank L.; Donaldson, Robert; and Gray, Michael, 5,117,071, Cl. 178-19.000.
Steinhart, Wilhelm; Maischberger, Mohann; Biewald, Thomas; and Berens, Gerwin, to KUKA Schweissanlagen & Roboter GmbM. Process for cleaning vehicle parts, in particular glass panes of vehicles. 5,116,424, Cl. 134-15.000.
Steinkamp, Stephen P.; and Batzer, Jeffrey C., to Victory Prosthetic Systems, Inc. Prosthesis capture device. 5,116,382, Cl. 623-38.000.
Steinstrasser, Axel: *See—*
Bremer, Karl-Heinz; Kuhlmann, Ludwig; Schwarz, Alexander; and Steinstrasser, Axel, 5,116,596, Cl. 424-1.100.
Stempel, Gerhard: *See—*
Kerscher, Max; and Stempel, Gerhard, 5,117,343, Cl. 362-297.000.
Stendel, Wilhelm: *See—*
Fischer, Reiner; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; Becker, Benedikt; Stendel, Wilhelm; and Erdelen, Christoph, 5,116,836, Cl. 514-224.200.
Stenert, Alois, to Hoesch AG. Cage for a large roller bearing. 5,116,146, Cl. 384-578.000.
Stenzel, Jorge C.: *See—*
Harreus, Albrecht; Weber, Karl-Heinz; Stransky, Werner; Walther, Gerhard; Muacevic, Gojko; Stenzel, Jorge C.; and Bechtel, Wolf-Dietrich, 5,116,971, Cl. 540-362.000.
Stephenson, Dwight B.; and Hastreiter, James J., to Eaton Corporation. Improved fluid controller and logic control system for use therewith. 5,115,640, Cl. 60-384.000.
Stephenson, Stanley W., to Eastman Kodak Company. Thermal printing apparatus with tensionless donor web during printing. 5,117,241, Cl. 346-1.100.
StereoGraphics Corporation: *See—*
Lipton, Lenny, 5,117,302, Cl. 359-227.000.
Steris Corporation: *See—*
Badertscher, Duncan C.; and Kralovic, Raymond C., 5,116,575, Cl. 422-28.000.
Sterling Drug, Inc.: *See—*
Leslie, Stuart; and Aldrich, Thomas B., III, 5,115,951, Cl. 222-533.000.
Stern, Michael K.; and Bashkin, James K., to Monsanto Company. Method of preparing 4-aminodiphenylamine. 5,117,063, Cl. 564-398.000.
Stevens, Robert C., to Cordis Corporation. Catheter system having distal tip for opening obstructions. 5,116,350, Cl. 606-159.000.
Stevenson, Terrence W.: *See—*
Hull, Harold L.; and Stevenson, Terrence W., 5,116,107, Cl. 303-7.000.
Stevenson, Thomas M., to Du Pont de Nemours, E. I., and Company. Heterocyclic pyrazoline carboxanilides. 5,116,850, Cl. 514-341.000.
Stewart, John C. M.: *See—*
Horrobin, David F.; and Stewart, John C. M., 5,116,871, Cl. 514-560.000.
Stichel, Willi, to Rasmussen GmbH. Hose clip. 5,115,541, Cl. 24-20.00R.
Stichting Rega VZW: *See—*
De Clercq, Erik D. A.; Herdewijn, Piet A. M. M.; Broder, Samuel; and Balzarini, Jan M. R., 5,116,822, Cl. 514-49.000.
Stipanovich, Joseph; and Bredeson, Sharon, to Staff-Plus, Inc. System for use in a temporary help business. 5,117,353, Cl. 374-401.000.
Stoakley, Diane M.: *See—*
Fletcher, James C.; Pratt, J. Richard; St. Clair, Terry L.; Stoakley, Diane M.; and Burks, Harold D., 5,116,939, Cl. 528-353.000.
Stober, Reinhard: *See—*
Fischer, Wolfgang; Bischoff, Dietmar; Huss, Michael; Stober, Reinhard; and Roessler, Gert, 5,116,967, Cl. 536-50.000.
Stoffel, Susanne: *See—*
Gelfand, David H.; Lawyer, Frances C.; and Stoffel, Susanne, 5,116,750, Cl. 435-193.000.
Stokes, Leonard S.: *See—*
Fabris, Arnold J.; Pareizs, Valdis L.; and Stokes, Leonard S., 5,116,449, Cl. 156-415.000.
Stokker, Gerald E.: *See—*
Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; Stokker, Gerald E.; Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; and Lee, Ta J., 5,116,870, Cl. 514-548.000.
Stolka, Milan: *See—*
Badesha, Santokh S.; Stolka, Milan; Yanus, John F.; and Hodge, John H., 5,116,703, Cl. 430-59.000.
Stoll, Timothy W.: *See—*
Fevold, Braden N.; Stoll, Timothy W.; and Hendrickson, Leslie B., 5,115,596, Cl. 49-411.000.
Stolzer, Armin; and Huck, Rainer, to KEURO Maschinenbau GmbH & Co. KG. Apparatus for removal of workpiece elements, particularly bolt, rod or disk-shaped elements, from a cutting apparatus. 5,115,599, Cl. 51-215.0CP.
Stone, Kevin R., to ReGen Corporation. Prosthetic meniscus. 5,116,374, Cl. 623-16.000.
Stonecipher, William L. Weight-lifting machine. 5,116,297, Cl 482-97.000.
Stong, Jerald W. Automated carving system. 5,117,366, Cl. 364-474.020.
Strachan, Julie, to Smiths Industries Public Limited Company. Rollingtable with height adjustment and brake device. 5,116,032, Cl. 5-614.000.
Strand, Stuart E.: *See—*
Williamson, Kenneth J.; Woods, Sandra; and Strand, Stuart E., 5,116,506, Cl. 210-610.000.
Stransky, Werner: *See—*
Harreus, Albrecht; Weber, Karl-Heinz; Stransky, Werner; Walther, Gerhard; Muacevic, Gojko; Stenzel, Jorge C.; and Bechtel, Wolf-Dietrich, 5,116,971, Cl. 540-362.000.
Strapex AG: *See—*
Niedrig, Franklin, 5,116,453, Cl. 156-580.000.
Straub, Rita: *See—*
Srivastava, Suresh C.; Babich, John W.; Straub, Rita; and Richards, Powell, 5,116,597, Cl. 424-1.100.
Straus, Thomas M.: *See—*
Hsu, Rui T.; and Straus, Thomas M., 5,117,197, Cl. 330-149.000.
Street, Robert A.; Kaplan, Selig N.; and Perez-Mendez, Victor, to University of California, The Regents of the. High resolution amorphous silicon radiation detectors. 5,117,114, Cl. 250-370.110.
Strein, Klaus: *See—*
Mertens, Alfred; von der Saal, Wolfgang; Boehm, Erwin; and Strein, Klaus, 5,116,843, Cl. 514-253.000.
Stresswave Technology Limited: *See—*
Holroyd, Trevor J., 5,115,778, Cl. 123-425.000.
Strohmaier, Karl G.: *See—*
Vaughan, David E. W.; Strohmaier, Karl G.; Treacy, Michael M. J.; and Newsam, John M., 5,116,590, Cl. 423-328.000.
Strohriegl, Peter: *See—*
Leyrer, Reinhold J.; Lauke, Harald; Nick, Bernhard; Strohriegl, Peter; and Haarer, Dietrich, 5,116,911, Cl. 525-329.900.
Stroze, Mrk S.; and Spurbeck, Kenneth C., to Sundstrand Corporation. Adaptive stepped compensator valve. 5,115,831, Cl. 137-102.000.
Stuart Jacobson Associates, Inc.: *See—*
Beasley, John C.; and Dinand, Pierre F., 5,115,916, Cl. 206-581.000.
Stuber, Werner; and Paques, Eric-Paul, to Behringwerke Aktiengesellschaft. Material for affinity chromatography which is a sulfated polysaccharide bonded to an insoluble polymer. 5,116,962, Cl. 525-54.200.
Stults, Jeffrey S.: *See—*
Buchanan, Robert A.; and Stults, Jeffrey S., 5,117,002, Cl. 549-241.000.
Sturgeon, Clayton L.; and Jeffries, Paul A., to Powercube Corporation. Integrated magnetic power converter core. 5,117,214, Cl. 336-170.000.
Sturtevant, Wayne R.: *See—*
Cartmell, James V.; Wolf, Michael L.; Allaire, Michael J.; and Sturtevant, Wayne R., 5,115,801, Cl. 602-48.000.
Stutzenberger, Heinz: *See—*
Klinke, Christian; Stutzenberger, Heinz; and Tillhon, Engelbert, 5,115,782, Cl. 123-489.000.
Sueda, Noriyoshi: *See—*
Inoue, Hitoshi; Kato, Hiroki; Sueda, Noriyoshi; Tahara, Yoshiyuki; and Kinoshita, Nobuhiro, 5,116,855, Cl. 514-369.000.
Suga, Ryoichi: *See—*
Nakagawa, Yutaka; Suga, Ryoichi; Mochida, Hiroya; Tonomura, Masashi; and Shirai, Kazuhiko, 5,117,484, Cl. 395-100.000.
Suganuma, Shuji: *See—*
Kishita, Hirofumi; Yamaguchi, Kouichi; Fujii, Hideki; Suganuma, Shuji; Saito, Yoshikazu; Sato, Shinichi; Fukuda, Kenichi; and Kobayashi, Nobuyuki, 5,117,026, Cl. 556-435.000.
Takago, Toshio; Kishita, Hirofumi; Kinami, Hitoshi; Fukuda, Kenichi; Sato, Shinichi; Yamaguchi, Koichi; and Suganuma, Shuji, 5,117,025, Cl. 556-434.000.
Sugawara, Hiroyuki: *See—*
Oohashi, Tuneyoshi; Yamaguchi, Motoo; Wada, Akira; Shirakura, Toshiharu; Kichikawa, Toshimichi; and Sugawara, Hiroyuki, 5,117,434, Cl. 372-56.000.
Sugerman, Gerald: *See—*
O'Neill, Michael W.; and Sugerman, Gerald, 5,116,411, Cl. 106-22.000.
Sugi, Hideo: *See—*
Nakajima, Tsunetaka; Okamoto, Tadao; Kondo, Nobuo; Watanabe, Masahiro, Yamauchi, Koichi; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 5,116,949, Cl. 530-363.000.
Sugihashi, Atsushi: *See—*
Minamida, Katsuhiro, Sugihashi, Atsushi; and Kido, Motoi, 5,116,688, Cl. 428-582.000
Sugimori, Masahiro: *See—*
Tone, Seiji; Takeda, Haruko; and Sugimori, Masahiro, 5,116,910, Cl. 525-244.000.
Sugimori, Tsunetake; Tsukada, Yoji; and Ohta, Yasuhiro, to Marukin Shoyu Co., Ltd. Process for preparing neuraminidase. 5,116,752, Cl. 435-200.000.

Sugimura, Hiroshi: *See—*
Kojima, Yoshimi; Katayama, Satoshi; Shimoda, Yoshihide; Sugimura, Hiroshi; and Imada, Eiji, 5,116,706, Cl. 430-58.000.

Sugino, Takashi: *See—*
Mori, Tetsuzo; Sugino, Takashi; Takaoka, Makoto; Sugiura, Susumu; and Ichikawa Hiroyuki, 5,117,284, Cl. 358-79.000.

Sugiura, Jun: *See—*
Katto, Hisao; and Sugiura, Jun, 5,116,775, Cl. 437-52.000.

Sugiura, Satoshi; Hazato, Atsuo; Minoshima, Toru; Kato, Yoshinori; Koshihara, Yasuko; and Kurozumi, Seizi, to Teijin Limited. 2-substituted-2-cyclopentenones. 5,116,869, Cl. 514-456.000.

Sugiura, Susumu: *See—*
Mori, Tetsuzo; Sugino, Takashi; Takaoka, Makoto; Sugiura, Susumu; and Ichikawa Hiroyuki, 5,117,284, Cl. 358-79.000.

Sugiyama, Hiromu: *See—*
Yamashita, Haruyuki; Shimada, Teiyu; and Sugiyama, Hiromu, 5,116,757, Cl. 435-255.000.

Suhara, Michinori; Takagi, Masaaki; Okuzaki, Yuuji; Tashiro, Kuro; and Mizunuma, Michiyoshi to Taiyo Steel Co., Ltd. & Nippon Steel Hardfacing Co., Ltd. Immersion member for hot dip galvanizing bath and method for preparing the same. 5,116,431, Cl. 148-530.000.

Sullivan, Michael J.; Nesbitt, R. Dennis; and Nealon, John L., to Lisco, Inc. Golf ball core crosslinked with t-amyl peroxide and blends thereof. 5,116,060, Cl. 273-218.000.

Sullivan, Scott L. Watchband fastener and arrangement. 5,117,406, Cl. 368-282.000.

Sullivan, Shelby F.: *See—*
Castile, Brett D.; and Sullivan, Shelby F., 5,117,396, Cl. 367-3.000.

Sullivan, Susan J.: *See—*
Chick, William L.; and Sullivan, Susan J., 5,116,494, Cl. 210-192.000.

Sulzbacher, Horst; Derler, Harald; and Schollnhammer, Heinz, to Voest-Alpine Stahl Donawitz Gesellschaft m.b.H.; and Voest-Alpine Stahl Linz Gesellschaft m.b.H. Process for reduction of sulfur emission during sintering processes. 5,116,588, Cl. 423-244.000.

Sulzer Brothers Limited: *See—*
Barp, Bruno, 5,116,696, Cl. 429-26.000.
Jakob, Roland P.; Freudiger, Stefan; Koch, Rudolf; and Fluckiger, Hans, 5,116,373, Cl. 623-13.000.

Sulzer-Escher Wyss GmbH: *See—*
Bubik, Alfred; and Hildebrand, Otto, 5,116,477, Cl. 162-301.000.

Sumitomo Chemical Company, Limited: *See—*
Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washimi, Takeshi; Harada, Naoki; and Akahori, Kingo, 5,116,956, Cl. 514-612.000.
Mizuno, Yukio; and Maruyama, Takashi, 5,116,906, Cl. 525-68.000.
Morimitsu, Toshihiko; Harada, Naoki; Omura, Takashi; and Kikawa, Sadanobu, 5,116,959, Cl. 534-642.000.
Sakamoto, Noriyasu; Mori, Tatsuya; Ohsumi, Tadashi; Fujimoto, Hiroaki; and Fujimoto, Izumi, 5,116,875, Cl. 514-594.000.

Sumitomo Electric Industries, Ltd.: *See—*
Kimoto, Tsunenobu; Tomikawa, Tadashi; and Fujita, Nobuhiko, 5,117,267, Cl. 357-16.000.
Sekiguchi, Takeshi; and Shiga, Nobuo, 5,116,642, Cl. 427-96.000.
Tsukada, Hiroshi; Tobioka, Masaaki; Nomura, Toshio; and Saito, Yasuhiro, 5,116,694, Cl. 428-698.000.

Sumitomo Heavy Industries, Ltd.: *See—*
Toyosumi, Shigeru; Tanigawa, Masayuki; Egawa, Masanori; and Minegishi, Kiyoji, 5,116,291, Cl. 475-178.000.
Yamada, Hironari, 5,117,431, Cl. 372-2.000.

Sumitomo Rubber Industries: *See—*
Takami, Masao, 5,115,659, Cl. 72-187.000.

Sumitomo Rubber Industries, Ltd.: *See—*
Corner, Michael R., 5,115,849, Cl. 152-209.00R.

Sumitomo Seika Chemicals Co., Ltd.: *See—*
Ogasahara, Johji; Hariu, Hitoshi; and Takahashi, Masakazu, 5,116,628, Cl. 426-330.100.

Summers, Jack C., II: *See—*
Williamson, W. Burton; Linden, Douglas G.; and Summers, Jack C., II, 5,116,800, Cl. 503-303.000.

Summit Micro Design: *See—*
Wang, Bu-Chin, 5,117,225, Cl. 340-717.000.

Sun Microsystems, Inc.: *See—*
Jensen, Eric H., 5,117,493, Cl. 395-425.000.
Malachowsky, Chris; and Priem, Curtis, 5,117,485, Cl. 395-134.000.
Tirfing, Soren J.; and Gramlich, Wayne C., 5,117,349, Cl. 395-600.000.

Sun, Yuan-Chen: *See—*
Comfort, James H.; Chen, Tze-Chiang; Lu, Pong-Fei; Meyerson, Bernard S.; Sun, Yuan-Chen; and Tang, Denny D., 5,117,271, Cl. 357-34.000.

Sundararaman, Padmanabhan; Maska, Rudolf; and Verardi, Cynthia L., to PPG Industries, Inc. Polymers containing beta-hydroxyalkylamide groups. 5,116,922, Cl. 526-304.000.

Sundqvist, Hans, to Elekta Instrument AB. Apparatus for marking an operating site. 5,116,344, Cl. 606-130.000.

Sunds Defibrator Industries Aktiebolag: *See—*
Edlund, Runo E. G.; and Ernerfeldt, Bertil K., 5,116,475, Cl. 162-52.000.

Sundstrand Corporation: *See—*
Parme, Charles B., 5,116,308, Cl. 418-63.000.
Shekleton, Jack R., 5,115,637, Cl. 60-39.142.
Stroze, Mrk S.; and Spurbeck, Kenneth C., 5,115,831, Cl. 137-102.000.

Sung, Chien-Min; and Chen, Sy-Hwa, to Norton Company. Method for low pressure bonding of PCD bodies. 5,116,568, Cl. 419-11.000.

Sung, Lai M. Detachable bathing unit for far infrared bath. 5,117,481, Cl. 392-416.000.

Suntory Limited: *See—*
Ishiguro, Masaji; Iwata, Hiromitsu; and Tanaka, Rie, 5,116,832, Cl. 514-195.000.
Shinmen, Yoshifumi; Asami, Sumio; Amano, Norihide; Amachi, Teruo; and Yoshizumi, Hajime, 5,116,751, Cl. 435-194.000.

Superior Marking Equipment Co.: *See—*
Beckman, Frederick S.; and Down, Paul, 5,115,729, Cl. 101-327.000.

Suppelsa, Anthony B.: *See—*
Davis, James L.; Nounou, Fadia; Suppelsa, Anthony B.; and Pennisi, Robert W., 5,116,433, Cl. 148-24.000.

Suprex Corp.: *See—*
Kumar, M. Lalith; and Hedrick, Joseph L., 5,116,508, Cl. 210-639.000.

Surface Combustion, Inc.: *See—*
Hoetzl, Max; and Lingle, Thomas M., 5,116,221, Cl. 432-77.000.

Sutherland, Derek R.: *See—*
Lawrence, Gordon C.; Dawson, Michael J.; Noble, David; Ramsay, Michael V. J.; Bell, Richard; Sutherland, Derek R.; and Tiley, Edward P., 5,116,968, Cl. 536-71.000.

Suto, Mark J.: *See—*
Domagala, John M.; Suto, Mark J.; and Turner, William R., 5,116,834, Cl. 514-212.000.

Sutton, W. Ron: *See—*
Sutton, William R.; and Noble, Scott L., 5,117,444, Cl. 377-24.200.

Sutton, William R.; and Noble, Scott L., to Sutton, W. Ron. High accuracy pedometer and calibration method. 5,117,444, Cl. 377-24.200.

Suwa, Yorimasa: *See—*
Inoue, Keizo; Imaizumi, Atsushi; Kamimura, Takashi; Suwa, Yorimasa; Okada, Masahiro; Suzuki, Yoji; and Kudo, Ichiro, 5,116,942, Cl. 530-350.000.

Suyama, Shuji; Katoh, Mitsukuni; and Nishikawa, Tooru, to Nippon Oil & Fats Co., Ltd. Peroxy ester. 5,117,047, Cl. 560-302.000.

Suzuki, Akiyoshi: *See—*
Kawashima, Haruna; Suzuki, Akiyoshi; and Muraki, Masato, 5,117,254, Cl. 355-43.000.

Suzuki, Fukuji: *See—*
Kimura, Asa; and Suzuki, Fukuji, 5,116,664, Cl. 428-216.000.

Suzuki, Haruo: *See—*
Abe, Nakatsugu; Suzuki, Haruo; Tsukamoto, Hiroaki; Tsuyama, Seishi; and Nagae, Moriyasu, 5,116,571, Cl. 420-110.000.

Suzuki, Hideaki: *See—*
Makino, Kenzi; Morimoto, Katsushi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Suzuki, Koichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,405, Cl. 71-94.000.

Suzuki, Hidenori; and Mizune, Takahiro, to Mazda Motor Corporation. Coating apparatus for coating a vehicle body. 5,115,758, Cl. 118-322.000.

Suzuki, Hideyuki: *See—*
Yoshida, Shigeo; Fujimoto, Isamu; Suzuki, Hideyuki; Asano, Hiroshi; Hosaka, Toru; Onioh, Takashi; Nagasaki, Kojyu; Matsuoka, Kenichi; and Taura, Kazufumi, 5,117,100, Cl. 250-221.000.

Suzuki, Hirotsugu: *See—*
Watanabe, Hidetoshi; Suzuki, Hirotsugu; and Yamamoto, Masanobu, 5,116,210, Cl. 425-111.000.

Suzuki, Hitomi; Ogawa, Takuji; Uno, Hidemitsu; Kitahaba, Tetsuo; Kigawa, Kouji; Fukamachi, Tomonori; and Kitahara, Katsuhiko, to Daikin Industries, Ltd. Preparation of N-(1-(thienyl)alkyl)amine derivative. 5,117,000, Cl. 549-59.000.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
Mito, Mitsumasa; and Daikoku, Keisuke, 5,115,784, Cl. 123-516.000.

Suzuki, Kenji, to Yamaha Corporation. Magnetic tape recording device which positions the beginning of the magnetic tape adjacent a recording head. 5,117,317, Cl. 360-74.000.

Suzuki, Kiyosuke: *See—*
Watanabe, Haruo; Yasuda, Akio; Kawasumi, Koichi; Tsuchiya, Takao; and Suzuki, Kiyosuke, 5,116,714, Cl. 430-117.000.

Suzuki, Koichi: *See—*
Makino, Kenzi; Morimoto, Katsushi; Akiyama, Shigeaki; Suzuki, Hideaki; Nagaoka, Takeshi; Suzuki, Koichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,405, Cl. 71-94.000.

Suzuki Mechanical Engineering Co., Ltd.: *See—*
Suzuki, Tsuneo, 5,115,531, Cl. 15-53.200.

Suzuki, Minoru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Color separating device in color copying machine. 5,117,253, Cl. 355-32.000.

Suzuki, Noboru; Yoshida, Masaharu; Noda, Satoshi; Takaishi, Minoru; Takiguchi, Kenichiro; Uchida, Hiroshi; and Onoda, Takeshi, to Showa Denko K.K. Allyl ester resin composition and laminated sheet using the same. 5,116,670, Cl. 428-285.000.

Suzuki, Shigehiko: *See—*
Morita, Shinichiro; Takahashi, Nobuya; Shimamoto, Takeshi; Matsuda, Kazuya; and Suzuki, Shigehiko, 5,116,552, Cl. 264-28.000.

Suzuki, Syuzi: *See—*
Saitoh, Shiroh; Izumi, Mamoru; Suzuki, Syuzi; and Hashimoto, Shinichi, 5,115,809, Cl. 128-662.030.

Suzuki, Tadasu: *See—*
Futami, Yuichi; Ohmon, Eisaku; and Suzuki, Tadasu, 5,116,283, Cl. 474-84.000.

Suzuki, Tsuneo, to Suzuki Mechanical Engineering Co., Ltd. Aircraft washing equipment. 5,115,531, Cl. 15-53.200.

Suzuki, Yasuhiko: *See—*
Aratake, Kazuhiko; Horikoshi, Masayoshi; Kato, Fumio; Suzuki, Yasuhiko; and Morimoto, Yuki, 5,116,899, Cl. 524-371.000.

Suzuki, Yasuto: *See—*
Hori, Kimihiko; Suzuki, Yasuto; Morioka, Tomoki; Moriwaki, Shigeru; Hirota, Osamu; and Tsuchiya, Shuichi, 5,116,829, Cl. 514-172.000.

Suzuki, Yoji: *See—*
Inoue, Keizo; Imaizumi, Atsushi; Kamimura, Takashi; Suwa, Yorimasa; Okada, Masahiro; Suzuki, Yoji; and Kudo, Ichiro, 5,116,942, Cl. 530-350.000.

Sveen, Frode: *See—*
Granger, Stanley W.; Beard, Joseph O.; and Sveen, Frode, 5,116,017, Cl. 251-1.200.

Swaminathan, Balaji: *See—*
Haskell, Jacob D.; Avanzino, Steven C.; and Swaminathan, Balaji, 5,116,778, Cl. 437-57.000.

Swanberg, Melvin E.; Chung, Yee-Ming; Eskenazi, Raymond; and Cunningham, Robert T., to S&R Tech Development, Inc. Scanner with electronic non-linearity compensation and method of processing image data. 5,117,243, Cl. 346-108.000.

Swars, Helmut; and Maus, Wolfgang, to Emitec Gesellschaft fur Emissionstechnologie mbH. Expansion apparatus having three borehole-channel systems. 5,115,654, Cl. 72-62.000.

Swartz, Jerome, to Symbol Technologies, Inc. Multi-position trigger for control over aiming and symbol reading in a portable laser diode scanning head. 5,117,098, Cl. 235-472.000.

Sweeney, Harold E., to GTE Government Systems Corporation. Apparatus for and method of identifying spectrally pure optical radiation. 5,116,133, Cl. 356-352.000.

Sweeney, Michael: *See—*
Pless, Benjamin; Sweeney, Michael; and Winkle, Roger, 5,115,807, Cl. 128-419.00D.

Swenson, John C. Ball hitch with rotatable ball. 5,116,072, Cl. 280-511.000.

Swenson, Kurt: *See—*
Hogarth, Peter T.; Swenson, Kurt; Gutenson, Charles E.; Nichols, Edward L., III; Roberts, Lincoln E.; and Miller, Vernon R., 5,117,122, Cl. 307-140.000.

Swenson, Ralph R.: *See—*
Franzke, Richard E., 5,115,829, Cl. 137-38.000.

Swerlein, Ronald L., to Hewlett-Packard Company. Method and apparatus for measuring rms values. 5,117,180, Cl. 324-132.000.

Swift, Allan W., to E. J. Brooks Co. Locking or security seal with protective shroud. 5,116,091, Cl. 292-318.000.

Swift, Michel: *See—*
Dallaire, Michel; Santella, Michael; and Swift, Michel, 5,115,955, Cl. 224-324.000.

Switchenko, Arthur C.; Kurn, Nurith; Neukom, Christian; Pirio, Marcel; Berger, Donald E., Jr.; and Ullman, Edwin F., to Syntex (U.S.A.) Inc. Methods for removal of detergents from analytes. 5,116,726, Cl. 435-5.000.

Sybertz, Edmund J.: *See—*
Ganguly, Ashit K.; Friary, Richard J.; Schwerdt, John H.; Siegel, Marvin I.; Smith, Sidney R.; Seidl, Vera A.; and Sybertz, Edmund J., 5,116,840, Cl. 514-250.000.

Sykora, James C.: *See—*
Oare, Thomas R.; and Sykora, James C., 5,115,853, Cl. 152-527.000.

Symbol Technologies, Inc.: *See—*
Swartz, Jerome, 5,117,098, Cl. 235-472.000.

Syncor, Ltd.: *See—*
Wilson, Michael T.; and Jolly, David F., 5,116,384, Cl. 623-49.000.

Syncsort Incorporated: *See—*
Liu, Peter, 5,117,495, Cl. 395-600.000.

Synosky, Steven P.; Diaz, Dinah; and Hartman, Scott E., to Wm. Wrigley Jr. Company. Transparent base and gum composition. 5,116,626, Cl. 426-3.000.

Syntex (U.S.A.) Inc.: *See—*
Anik, Shabbir T., 5,116,817, Cl. 514-15.000.
Switchenko, Arthur C.; Kurn, Nurith; Neukom, Christian; Pirio, Marcel; Berger, Donald E., Jr.; and Ullman, Edwin F., 5,116,726, Cl. 435-5.000.

Synthes (U.S.A.): *See—*
Frigg, Robert, 5,116,336, Cl. 606-65.000.

Systron Donner, Corporation: *See—*
Tyler, Maurice E., 5,115,867, Cl. 169-28.000.

Szabolcs, Jozsef: *See—*
Dutka, Ferenc; Komives, Tamas; Fodor, Katalin, nee Csorba; Marton, Attila; Csikos, Aniko nee Gluck; Osztheimer, Eva; Henger, Karoly; Laborczy, Robert; Reti, Zsuzsanna, nee Bosnyak; Sebok, Dezso; Szabolcs, Jozsef; and Tomordi, Elemer, 5,116,402, Cl. 71-88.000.

Szeto, William W.: *See—*
Mitchell, David L.; Stein, Alan J.; Barndt, Charles L., Jr.; and Szeto, William W., 5,115,710, Cl. 89-1.809.

Szlaga, Emil, to Stant Inc. Tank venting control assembly. 5,116,257, Cl. 137-43.000.

Taber, Tarrell L. Adjustable support apparatus for table saws. 5,115,847, Cl. 144-287.000.

Tachi-s Co., Ltd.: *See—*
Nagata, Kojiro, 5,116,016, Cl. 248-578.000.

Tachihara, Satoru: *See—*
Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.

Tackett, Tommy L.; and McCombs, Charles A., to Eastman Kodak Company. Method for obtaining a stigmasterol enriched product from deodorizer distillate. 5,117,016, Cl. 552-545.000.

Tada, Yukihiro: *See—*
Oji, Akihito; Tada, Yukihiro; Sasaki, Noriyuki; and Mizumura, Mitsuo, 5,116,621, Cl. 424-445.000.

Tahara, Shu; Kawabata, Nariyoshi; Kojima, Akira; and Fukushima, Shigeru, to Shimadzu Corporation. Method for the quantitative determination of micro-organisms or pyrogens. 5,116,736, Cl. 435-39.000.

Tahara, Yoshiyuki: *See—*
Inoue, Hitoshi; Kato, Hiroki; Sueda, Noriyoshi; Tahara, Yoshiyuki; and Kinoshita, Nobuhiro, 5,116,855, Cl. 514-369.000.

Taheri, Hassan, to Amoco Corporation. Continuous process for the production of maleic anhydride from a C_4-hydrocarbon feedstock. 5,117,007, Cl. 549-259.000.

Taiho Kogyo Co., Ltd.: *See—*
Kamiya, Soji; and Yokota, Yuji, 5,116,144, Cl. 384-291.000.

Taira, Kazuo: *See—*
Katsura, Tadahiko; Matsuoka, Kikuo; Miyake, Kazuo; Taira, Kazuo; Watanabe, Yoshiki; and Ueno, Hiroshi, 5,116,651, Cl. 428-35.700.

Taisho Pharmaceutical Co., Ltd.: *See—*
Aihara, Hironaka; Kurachi, Michio; and Tomisawa, Kazuyuki, 5,116,877, Cl. 514-617.000.
Nakazato, Atsuro; Kitsukawa, Sanae; Kawashima, Yutaka; Hatayama, Katsuo; and Hibino, Satoshi, 5,116,995, Cl. 548-444.000.

Taiyo Steel Co., Ltd. & Nippon Steel Hardfacing Co., Ltd.: *See—*
Suhara, Michinori; Takagi, Masaaki; Okuzaki, Yuuji; Tashiro, Kuro; and Mizunuma, Michiyoshi, 5,116,431, Cl. 148-530.000.

Tajima, Katsuhiko; and Tanaka, Sachio, to Kao Corporation. Perfume composition. 5,116,813, Cl. 512-27.000.

Takada, Kaoruko, legal heir: *See—*
Fujii, Setsuro, deceased; Fujii, Shinichiro, legal heir; Takada, Kaoruko, legal heir; Shirasaka, Tetsuhiko; and Fukushima, Masakazu, 5,116,600, Cl. 424-10.000.

Takada, Mitsuru; and Funahashi, Makoto, to Toyota Jidosha Kabushiki Kaisha. Hydraulic pressure control device with parallel pressure supply passages for certain one friction engaging means. 5,115,696, Cl. 74-869.000.

Takagi, Kazuhiro: *See—*
Kurobe, Jun; Hara, Kenji; Ishihara, Masayuki; and Takagi, Kazuhiro, 5,115,660, Cl. 72-197.000.

Takagi, Masaaki: *See—*
Suhara, Michinori; Takagi, Masaaki; Okuzaki, Yuuji; Tashiro, Kuro; and Mizunuma, Michiyoshi, 5,116,431, Cl. 148-530.000.

Takagi, Masayuki; Okada, Tadaaki; Akai, Naotoshi; Yaguchi, Takashi; Miyadoh, Shinji; Shomura, Takashi; Sasaki, Toru; Sezaki, Masaji; Shimizu, Takao; and Niida, Masashi, to Meiji Seika Kaisha Ltd. PF 1022 substance, method of treating helminthic parasitic infection and anthelmintic composition. 5,116,815, Cl. 514-11.000.

Takagiwa, Hiroyuki: *See—*
Uchida, Masafumi; Yajima, Toshiko; Takagiwa, Hiroyuki; and Takahashi, Jiro, 5,116,713, Cl. 430-110.000.

Takago, Toshio; Kishita, Hirofumi; Kinami, Hitoshi; Fukuda, Kenichi; Sato, Shinich; Yamaguchi, Koichi; and Suganuma, Shuji, to Shin-Etsu Chemical Co., Ltd. Polysilethylenesiloxane. 5,117,025, Cl. 556-434.000.

Takahashi Atsuo: *See—*
Shibasaki, Masakatsu; Takahashi Atsuo; Aoki, Tuyoshi; Sato, Hiroyasu; Yamada, Shin-ichi; Kudo, Michiko; Yamaguchi, Takaji; Kogi, Kentaro; and Narita, Sen-ichi, 5,117,037, Cl. 560-53.000.

Takahashi, Fumitaka: *See—*
Yokouchi, Hisatake; Takahashi, Fumitaka; and Sakai, Hideyuki, 5,117,447, Cl. 378-99.000.

Takahashi, Jiro: *See—*
Uchida, Masafumi; Yajima, Toshiko; Takagiwa, Hiroyuki; and Takahashi, Jiro, 5,116,713, Cl. 430-110.000.

Takahashi, Kohji; Ogino, Shigeru; Noguchi, Kazuhiro; and Kobayashi, Takashi, to Canon Kabushiki Kaisha. Camera system having an image blur prevention feature. 5,117,246, Cl. 354-202.000.

Takahashi, Mamoru; Nagasawa, Shinobu; Ikuta, Shigeru; and Matsuura, Kazuo, to Toyo Jozo Kabushiki Kaisha. Process for the production of L-alanine dehydrogenase from 78-3 FERM BP-2517. 5,116,748, Cl. 435-189.000.

Takahashi, Masakazu: *See—*
Ogasahara, Johji; Hariu, Hitoshi; and Takahashi, Masakazu, 5,116,628, Cl. 426-330.100.

Takahashi, Nobuya: *See—*
Morita, Shinichiro; Takahashi, Nobuya; Shimamoto, Takeshi; Matsuda, Kazuya; and Suzuki, Shigehiko, 5,116,552, Cl. 264-28.000.

Takaishi, Minoru: *See—*
Suzuki, Noboru; Yoshida, Masaharu; Noda, Satoshi; Takaishi, Minoru; Takiguchi, Kenichiro; Uchida, Hiroshi; and Onoda, Takeshi, 5,116,670, Cl. 428-285.000.

Takakura, Yoshio: *See—*
Kimura, Tomoaki; and Takakura, Yoshio, 5,116,447, Cl. 156-345.000.

Takamatsu, Nobuhiko: *See—*
Teranishi, Yutaka; Takamatsu, Nobuhiko; Matsui, Yasushi; Kimura, Masako; Ikeda, Yasuko; and Morimoto, Yuuki, 5,116,739, Cl. 435-69.600.
Takami, Masao, to Sumitomo Rubber Industries. Process for producing component for tire and apparatus therefor. 5,115,659, Cl. 72-187.000.
Takamura, Yoshiyuki, to Fuji Pack System Ltd. Wrapping machine. 5,115,620, Cl. 53-64.000.
Takaoka, Makoto: *See—*
Mori, Tetsuzo; Sugino, Takashi; Takaoka, Makoto; Sugiura, Susumu; and Ichikawa, Hiroyuki, 5,117,284, Cl. 358-79.000.
Takaragi, Kazuo; Sasaki, Ryoichi; Nakamura, Tsutomu; Koizumi, Minoru; Fukuzawa, Yasuko; and Kataoka, Kenji, to Hitachi, Ltd. Secret information service system and method. 5,117,458, Cl. 380-4.000.
Takasugi, Shinji: *See—*
Hanamoto, Tadayuki; and Takasugi, Shinji, 5,116,186, Cl. 414-694.000.
Takata, Hidehiro: *See—*
Komori, Shinji; Takata, Hidehiro; Tamura, Toshiyuki; Asai, Fumiyasu; and Fukuhara, Takeshi, 5,117,489, Cl. 395-375.000.
Takayama, Jun: *See—*
Fujita, Tadao; Inaba, Yoshiaki; and Takayama, Jun, 5,117,383, Cl. 364-746.000.
Takayama, Toshio; Sakuma, Masaru; and Ono, Yukou. Anti-skid brake control apparatus. 5,117,361, Cl. 364-426.020.
Takeda Chemical Industries, Ltd.: *See—*
Goto, Giichi; Ohkawa, Shigenori; and Fukumoto, Shoji, 5,116,861, Cl. 514-427.000.
Takeda, Haruko: *See—*
Tone, Seiji; Takeda, Haruko; and Sugimori, Masahiro, 5,116,910, Cl. 525-244.000.
Takeda, Katsuhiko: *See—*
Sakai, Toshiyuki; Imaizumi, Masaru; Nishise, Hideya; Takeda, Katsuhiko; and Kitakubo, Hideo, 5,117,261, Cl. 355-207.000.
Takeda, Kazuhiro: *See—*
Kinoshita, Takashi; Nakajima, Masayoshi; and Takeda, Kazuhiro, 5,116,286, Cl. 474-237.000.
Takeda, Kazutoshi, to Seiko Electronics Components Ltd. Power source element with connecting terminals. 5,116,700, Cl. 429-121.000.
Takeda, Kimiaki: *See—*
Fujimoto, Hiroaki; Hatada, Kenzo; Takeshita, Yoshinobu; Otani, Kazuya; and Takeda, Kimiaki, 5,115,545, Cl. 29-25.010.
Takegawa, Yujiro; and Nakai, Souichi, to Tsudakoma Corp. Location of a slit between dents corresponding to a broken warp. 5,116,276, Cl. 139-351.000.
Takeguchi, Kazunori; and Hirata, Kohji, to Risho Kogyo Co., Ltd. Process for manufacturing multilayer printed wiring board. 5,116,440, Cl. 156-90.000.
Takehara, Shin: *See—*
Kanazawa, Hirotaka; Takehara, Shin; and Ohmura, Hiroshi, 5,116,078, Cl. 280-707.000.
Takemura, Kazutaka; Matsuo, Hirokazu; Morigami, Yusuke; Hamakawa, Wataru; and Ishikawa, Takuma, to Minolta Camera Kabushiki Kaisha. Recirculating document handler and image forming apparatus equipped therewith. 5,117,266, Cl. 355-316.000.
Takenaka Corporation: *See—*
Miyake, Hiraku; Ishiguro, Mitsuo; Abe, Shigetaka; Yamaguchi, Nobuo; Hayamizu, Yutaka; and Aizawa, Satoru, 5,115,615, Cl. 52-167.00R.
Takenaka Electronic Industrial Co., Ltd.: *See—*
Fukuyama, Toshifumi, 5,117,118, Cl. 250-551.000.
Takenoshita, Hidamitau; Hattori, Hisashi; and Hanada, Yoichiro, to Kabushiki Kaisha Komatsu Seisakusho. Method of attaining uniform flow in elongated fluidized bed furnace. 5,115,749, Cl. 110-245.000.
Takenouchi, Shinichi: *See—*
Sasaki, Hiroshi; Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinichi, 5,115,694, Cl. 74-844.000.
Takeshita, Fusayuki: *See—*
Terashima, Kanetsugu; Ichihashi, Mitsuyoshi; Kikuchi, Makoto; Takeshita, Fusayuki; and Furukawa, Kenji, 5,116,529, Cl. 252-299.610.
Takeshita, Torao: *See—*
Kakino, Yoshiaki; Tokumo, Shigeaki; Nakamura, Tetsuo; and Takeshita, Torao, 5,117,169, Cl. 318-578.000.
Takeshita, Yasuyoshi; Nakamura, Hiroshi; Ishiguro, Susumu; Kwaguchi, Noboru; Shimada, Shinichi; Koyama, Tadayoshi; Seya, Motohide; Abe, Noriko; and Nomoto, Shin, to Snow Brand Milk Products Co., Ltd. Isoquinoline derivatives and salts thereof. 5,116,985, Cl. 546-141.000.
Takeshita, Yoshinobu: *See—*
Fujimoto, Hiroaki; Hatada, Kenzo; Takeshita, Yoshinobu; Otani, Kazuya; and Takeda, Kimiaki, 5,115,545, Cl. 29-25.010.
Takeuchi, Takashi; and Nakagawa, Takeyuki, to Kabushiki Kaisha Shinkawa. Clamping device for bonding machines. 5,116,031, Cl. 269-87.300.
Takeuchi, Tomio; Aoyagi, Takaaki; Naganawa, Hiroshi; Hamada, Masa; Muraoka, Yasuhiko; and Aoyama, Takayuki, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Physiologically active substances, benastatins A and B, and production and use thereof. 5,117,052, Cl. 562-461.000.
Takiguchi, Kenichiro: *See—*
Suzuki, Noboru; Yoshida, Masaharu; Noda, Satoshi; Takaishi, Minoru; Takiguchi, Kenichiro; Uchida, Hiroshi; and Onoda, Takeshi, 5,116,670, Cl. 428-285.000.
Takiguchi, Takao: *See—*
Togano, Takeshi; Takiguchi, Takao; Yamada, Yoko; Asaoka, Masanobu; and Shinjo, Kenji, 5,116,530, Cl. 252-299.610.
Takizawa, Takato; and Yamagishi, Kouji, to Yoshida Kogyo, K.K. Coupling for three-dimensional framed structure. 5,116,193, Cl. 403-27.000.
Talwar, Ashok K., to American Nucleonics Corporation. Interference cancellation system having noise reduction features and method. 5,117,505, Cl. 455-278.100.
Tam, Sang W.: *See—*
Cain, Gary A.; Gilligan, Paul J.; and Tam, Sang W., 5,116,846, Cl. 514-317.000.
Tamura, Satoshi: *See—*
Konda, Tsutomu; Fujioka, Seiichiro; Tamura, Satoshi; Matsubara, Osamu; and Yoshida, Shodo, 5,117,160, Cl. 315-326.000.
Tamura, Tadafumi: *See—*
Oshima, Etsuo; Kumazawa, Toshiaki; Otaki, Shizuo; Obase, Hiroyuki; Ohmori, Kenji; Ishii, Hidee; Manabe, Haruhiko; Tamura, Tadafumi; and Shuto, Katsuichi, 5,116,863, Cl. 514-450.000.
Tamura, Toshiyuki: *See—*
Komori, Shinji; Takata, Hidehiro; Tamura, Toshiyuki; Asai, Fumiyasu; and Fukuhara, Takeshi, 5,117,489, Cl. 395-375.000.
Tanabe, Masato; Crowe, David F.; Peters, Richard H.; and Johansson, John G., to SRI International. Stereoisomerically pure 17α-ethynylestra-2-en-17β-ol and the 17β esters thereof, methods of preparation and uses. 5,116,830, Cl. 514-182.000.
Tanabe, Masato: *See—*
Peters, Richard H.; and Tanabe, Masato, 5,116,865, Cl. 514-510.000.
Tanabe, Miyuki; and Ikuta, Shigeru, to Toyo Jozo Kabushiki Kaisha. 1α (or 24R), 25-dihydroxy vitamin D_3 derivatives. 5,117,018, Cl. 552-653.000.
Tanagawa, Kouji, to Oki Electric Industry Co., Ltd. Random number generator driven by independent clock pulses asynchronously with system clock pulses. 5,117,380, Cl. 364-717.000.
Tanaka, Hideho: *See—*
Yamamoto, Shinji; Tanaka, Hideho; Adachi, Fumio; and Uchimura, Hisataka, 5,116,668, Cl. 428-221.000.
Tanaka Homes Co., Ltd.: *See—*
Tanaka, Yoshimasa; and Kondow, Tomotsu, 5,115,969, Cl. 237-69.000.
Tanaka, Kenji: *See—*
Miyano, Kenmi; Tanaka, Kenji; Nishimaki, Hideo; and Iga, Yoshiro, 5,116,950, Cl. 530-382.000.
Tanaka, Koichi: *See—*
Mikami, Akiyoshi; Ogura, Takashi; Terada, Kousuke; Yoshida, Masaru; Yamashita, Takuo; Tanaka, Koichi; Okibayashi, Katsushi; Nakajima, Shigeo; Nakaya, Hiroaki; and Taniguchi, Kouji, 5,116,640, Cl. 427-66.000.
Tanaka, Kunimaro: *See—*
Ito, Osamu; Ogawa, Masaharu; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Furukawa, Teruo; and Nakajima, Yoshiki, 5,117,412, Cl. 369-109.000.
Tanaka, Kyoji: *See—*
Ichihashi, Koji; and Tanaka, Kyoji, 5,115,721, Cl. 91-512.000.
Ichihashi, Koji; and Tanaka, Kyoji, 5,115,722, Cl. 91-512.000.
Tanaka, Maki: *See—*
Dosako, Shunichi; Shinooka, Rika; and Tanaka, Maki, 5,116,953, Cl. 530-400.000.
Tanaka, Mami: *See—*
Morino, Taisuke; Tanaka, Mami; Kaneko, Fuminori; Ozaki, Takeyuki; and Akiyama, Shuichi, 5,117,079, Cl. 219-10.55F.
Tanaka, Rie: *See—*
Ishiguro, Masaji; Iwata, Hiromitsu; and Tanaka, Rie, 5,116,832, Cl. 514-195.000.
Tanaka, Sachio: *See—*
Tajima, Katsuhiko; and Tanaka, Sachio, 5,116,813, Cl. 512-27.000.
Tanaka, Satoshi: *See—*
Watanabe, Haruhisa; Tanaka, Satoshi; and Matsuyama, Shinya, 5,116,765, Cl. 436-165.000.
Tanaka, Toshikazu; and Fujii, Yoshinori, to Hagihara Industries, Inc.; and Fujii, Yoshinori. Apparatus for manufacture of organic fertilizers. 5,116,760, Cl. 435-290.000.
Tanaka, Yasunori: *See—*
Ochi, Shinji; and Tanaka, Yasunori, 5,117,131, Cl. 307-448.000.
Tanaka, Yoshimasa; and Kondow, Tomotsu, to Tanaka Homes Co., Ltd. Floor structure and construction method. 5,115,969, Cl. 237-69.000.
Tang, Denny D.: *See—*
Comfort, James H.; Chen, Tze-Chiang; Lu, Pong-Fei; Meyerson, Bernard S.; Sun, Yuan-Chen; and Tang, Denny D., 5,117,271, Cl. 357-34.000.
Tanigawa, Masayuki: *See—*
Toyosumi, Shigeru; Tanigawa, Masayuki; Egawa, Masanori; and Minegishi, Kiyoji, 5,116,291, Cl. 475-178.000.
Taniguchi, Hirokazu; Konya, Shogo; and Okamoto, Akira, to Nippon Steel Corporation. Method of metallizing oxide ceramic with excellent hermetic sealing and brazing properties. 5,116,646, Cl. 427-383.500.
Taniguchi, Kouji: *See—*
Mikami, Akiyoshi; Ogura, Takashi; Terada, Kousuke; Yoshida, Masaru; Yamashita, Takuo; Tanaka, Koichi; Okibayashi, Katsushi; Nakajima, Shigeo; Nakaya, Hiroaki; and Taniguchi, Kouji, 5,116,640, Cl. 427-66.000.
Taniguchi, Nobuyuki: *See—*
Fujino, Akihiko; Ichikawa, Tsutomu; Nanba, Katsuyuki; and Taniguchi, Nobuyuki, 5,117,250, Cl. 354-400.000.
Taniguchi, Tetsuo: *See—*
Shiraishi, Naomasa; Taniguchi, Tetsuo; and Kawai, Hidemi, 5,117,255, Cl. 355-53.000.
Tanii, Junichi: *See—*
Ishimura, Toshihiko; Seki, Reiji; Ishibashi, Kenji; Tanii, Junichi; and Shimada, Takahisa, 5,117,251, Cl. 354-400.000.
Tanizawa, Yasuo: *See—*
Fujii, Hiroyuki; Shirai, Tokuo; Mizutani, Takanori; Nagae, Yoshio; Hetsugi, Koji; Tanizawa, Yasuo; and Kaburagi, Kouji, 5,116,521, Cl. 251-18.000.
Tanner, Harry. Combination portable alarm system and storage container for parts thereof. 5,117,223, Cl. 340-693.000.
Tanuma, Hiromi: *See—*
Sakamoto, Jiro; and Tanuma, Hiromi, 5,116,631, Cl. 426-568.000.
Tao, Eddie V. P.: *See—*
Harper, Richard W.; Howbert, J. Jeffry; Poore, Gerald A.; Rieder, Brent J.; Tao, Eddie V. P.; and Aikins, James A., 5,116,874, Cl. 514-592.000.
Tarumi, Yasuo: *See—*
Inomata, Hiroshi; and Tarumi, Yasuo, 5,116,928, Cl. 528-18.000.
Tashiro, Kisuke: *See—*
Hayata, Yoshiki; Watanabe, Masashi; and Tashiro, Kisuke, 5,115,643, Cl. 62-115.000.
Tashiro, Kuro: *See—*
Suhara, Michinori; Takagi, Masaaki; Okuzaki, Yuuji; Tashiro, Kuro; and Mizunuma, Michiyoshi, 5,116,431, Cl. 148-530.000.
Tate, Takuo; Watanabe, Taketoshi; and Nagura, Hiroyuki, to Nippon Filcon Co., Ltd. Extendable and heat shrinkable polyester mono-filament for endless fabric. 5,116,478, Cl. 162-358.000.
Tatsuno, Kimio; and Yanagisawa, Hironori, to Hitachi, Ltd. Second harmonic generator for obtaining an aberration free plane wave and information processing system using the same. 5,117,433, Cl. 372-22.000.
Taub, Floyd E.: *See—*
Higgs, Thomas W.; and Taub, Floyd E., 5,116,734, Cl. 435-28.000.
Taura, Kazufumi: *See—*
Yoshida, Shigeo; Fujimoto, Isamu; Suzuki, Hideyuki; Asano, Hiroshi; Hosaka, Toru; Onioh, Takashi; Nagasaki, Kojyu; Matsuoka, Kenichi; and Taura, Kazufumi, 5,117,100, Cl. 250-221.000.
Taylor, Christopher: *See—*
Ebbins, James R.; Lopez, Simon F.; and Taylor, Christopher, 5,116,507, Cl. 210-639.000.
Taylor, David J.: *See—*
Barns-Slavin, Ileana D.; Dukes, Alonzo T.; Njo, Angela; and Taylor, David J., 5,117,364, Cl. 364-464.030.
Taylor, George F. Truck cargo support outrigger. 5,116,096, Cl. 296-3.000.
Taylor, Julian S. Explosion vent door release. 5,116,089, Cl. 292-78.000.
Taylor, Nigel: *See—*
Epworth, Richard E.; Byron, Kevin C.; Baker, Robert A.; and Taylor, Nigel, 5,117,196, Cl. 359-333.000.
TEAC Corporation: *See—*
Yamaguchi, Hirohisa, 5,117,193, Cl. 328-120.000.
Teal, Richard D.: *See—*
Hardesty, Terry D.; Hutchison, Wayne R.; Teal, Richard D.; and Cleereman, Robert J., 5,116,106, Cl. 301-41.00W.
Technion Research and Development Foundation Ltd.: *See—*
Yahalom, Joseph, 5,116,469, Cl. 204-147.000.
Technitrol, Inc.: *See—*
Cargill, N. Allen, 5,115,739, Cl. 101-232.000.
Technostics Corporation: *See—*
Moore, Richard D.; Peters, Richard K.; and Elmerick, Donald V., 5,117,101, Cl. 250-226.000.
Tehrani, Mohammad M.: *See—*
Farahani, Shahrokh R.; and Tehrani, Mohammad M., 5,116,131, Cl. 356-350.000.
Teijin Limited: *See—*
Inoue, Keizo; Imaizumi, Atsushi; Kamimura, Takashi; Suwa, Yorimasa; Okada, Masahiro; Suzuki, Yoji; and Kudo, Ichiro, 5,116,942, Cl. 530-350.000.
Sugiura, Satoshi; Hazato, Atsuo; Minoshima, Toru; Kato, Yoshinori; Koshihara, Yasuko; and Kurozumi, Seizi, 5,116,869, Cl. 514-456.000.
Yarino, Tatuo; and Fujii, Takao, 5,117,015, Cl. 552-541.000.
Teikoku Seiyaku Co., Ltd.: *See—*
Oji, Akihito; Tada, Yukihiro; Sasaki, Noriyuki; and Mizumura, Mitsuo, 5,116,621, Cl. 424-445.000.
Teissier, Etienne M.; and Marie, Bruno A. E., to ADL Automation. Free transfer machine with independent motorized carriages and battery recharging at work stations. 5,115,747, Cl. 105-50.000.
Tektronix, Inc.: *See—*
Goetz, Howard V., 5,117,374, Cl. 364-559.000.
Teledyne Industries, Inc.: *See—*
Hamos, Robert E.; and Raleigh, William F., 5,117,233, Cl. 340-825.690.
Peterson, John M., 5,115,997, Cl. 244-25.000.
Rebello, Peter; and Kajouke, Lateef, 5,117,347, Cl. 363-56.000.
Tencer, Allan F.: *See—*
Cozad, Trent E.; Lozier, Antony J.; Lower, Jerry L.; and Tencer, Allan F., 5,116,334, Cl. 606-61.000.
Tenneco Canada Inc.: *See—*
Scribner, Herbert C.; Fredette, Maurice C. J.; and Bechberger, Edward J., 5,116,595, Cl. 423-477.000.
Tennyson, William R., to General Electric Company. Phase stable limiting power amplifier. 5,117,203, Cl. 330-294.000.
Tentarelli, Stephen: *See—*
DeWitt, Robert N.; Lile, William R.; and Tentarelli, Stephen, 5,115,918, Cl. 209-3.100.
Tenud, Leander: *See—*
McGarrity, John; and Tenud, Leander, 5,117,003, Cl. 548-303.000.
Terada, Kousuke: *See—*
Mikami, Akiyoshi; Ogura, Takashi; Terada, Kousuke; Yoshida, Masaru; Yamashita, Takuo; Tanaka, Koichi; Okibayashi, Katsushi; Nakajima, Shigeo; Nakaya, Hiroaki; and Taniguchi, Kouji, 5,116,640, Cl. 427-66.000.
Teramoto, Takero: *See—*
Sakashita, Masao; Sakamoto, Tetsuo; Kazama, Shingo; Harada, Yoshiyuki; Teramoto, Takero; Watanabe, Kazuhiro; Shimomura, Bunji; and Kaneta, Tsutomu, 5,116,504, Cl. 210-500.230.
Teranishi, Yutaka; Takamatsu, Nobuhiko; Matsui, Yasushi; Kimura, Masako; Ikeda, Yasuko; and Morimoto, Yuuki, to Mitsubishi Chemical Industries Limited. Process for the production of human apolipoprotein E, and transformed hosts and products thereof. 5,116,739, Cl. 435-69.600.
Terasawa, Masato: *See—*
Goto, Makoto; Nara, Terukazu; Terasawa, Masato; and Yukawa, Hideaki, 5,116,743, Cl. 435-116.000.
Terashima, Kanetsugu; Ichihashi, Mitsuyoshi; Kikuchi, Makoto; Takeshita, Fusayuki; and Furukawa, Kenji, to Chisso Corporation. Ferroelectric liquid crystal composition and liquid crystal display element. 5,116,529, Cl. 252-299.610.
Terkildsen, Sydne N. Travel desk. 5,115,893, Cl. 190-11.000.
Terminiello, Michael A.; Asselin, Marc P.; Fowler, Joseph P.; Hauser, Lawrence M.; and Sansom, Raymond E., to Eaton Corporation. Automatic testing apparatus for electrical switches. 5,117,189, Cl. 324-415.000.
Ternansky, Robert J., to Eli Lilly and Company. 4-(2,3 epoxypropane)azetidinones. 5,116,972, Cl. 540-364.000.
Terumo Kabushiki Kaisha: *See—*
Hagiwara, Kazuhiko, 5,116,308, Cl. 604-4.000.
Terunaga, Fukuso: *See—*
Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Sera, Akio; and Terunaga, Fukuso, 5,117,191, Cl. 324-551.000.
Teshigawara, Mikiro: *See—*
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,115,546, Cl. 29-27.00C.
Texaco Chemical Company: *See—*
Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III; and Pottratz, David G., 5,116,466, Cl. 203-58.000.
Marquis, Edward T.; Speranza, George P.; Sheu, Yu-Hwa E.; Culbreth, William K., III; and Pottratz, David G., 5,116,467, Cl. 203-58.000.
Yeakey, Ernest L.; and Marquis, Edward T., 5,116,465, Cl. 203-57.000.
Texas Instruments Incorporated: *See—*
Hashimoto, Masashi, 5,117,395, Cl. 365-221.000.
McAdams, Hugh P., 5,117,426, Cl. 371-214.000.
Shizawa, Hiroshi, 5,117,234, Cl. 341-143.000.
von Pickartz, Rikus, 5,115,787, Cl. 123-549.000.
Textilma AG. *See—*
Speich, Francisco, 5,115,839, Cl. 139-291.00C.
Th Goldschmidt AG: *See—*
Giersberg, Joachim; Naumann, Dirk; and Honselmann, Frank, 5,116,468, Cl. 204-96.000.
Thall, Edmond H.: *See—*
Lange, Steven R.; and Thall, Edmond H., 5,116,115, Cl. 351-212.000.
Thedford, G. Neil: *See—*
Garter, Lee F.; and Thedford, G. Neil, 5,115,628, Cl. 56-10.200.
Theriault, Joseph H. Golf swing training device. 5,116,058, Cl. 273-183.00E.
Theta Technologies, Inc.: *See—*
McCarthy, Walton, 5,115,613, Cl. 52-169.600.
Theuerkauf, James P.: *See—*
Kolk, Stephen B.; Theuerkauf, James P.; and Walz, Fredrick J., 5,116,639, Cl. 427-54.100.
Thibault, Frank J. Quick reset game timer. 5,117,405, Cl. 368-93.000.
Thiele Engineering Company: *See—*
Snyder, Gene W.; and Pan, Peter N.Y., 5,115,902, Cl. 198-365.000.
Thinking Machines Corporation: *See—*
Hillis, W. Daniel; Kahle, Brewster; Robertson, George G.; and Steele, Guy L., Jr., 5,117,420, Cl. 370-60.000.
Thole, Volker; and Hilbert, Thomas, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung eV. Method of and apparatus for controlling the manufacturing process in the continuous production of gypsum-cemented workpieces. 5,116,555, Cl. 264-40.500.
Thomas, Brian J.; Briggs, Daniel C.; and Avdenko, Michael, to Welch Allyn, Inc. Metal halide discharge lamp with improved shank loading factor. 5,117,154, Cl. 313-634.000.
Thomas, Dennis A.; and Goulait, David J. K., to Procter & Gamble Company, The. Process for producing a mechanical fastener. 5,116,563, Cl. 264-167.000.

Thomas, Gunter: *See—*
Schwarz, Werner; Kremmling, Horst; Thomas, Gunter; and Lotz, Hans-Georg, 5,117,150, Cl. 313-112.000.

Thomas, James H.: *See—*
Parrish, Osey C.; Peiffer, Robert E., Jr.; Thomas, James H.; and Hilpert, Edwin J., Jr., 5 117,350, Cl. 395-425.000.

Thomas, Johnny R.: *See—*
Klainer, Stanley M.; Thomas, Johnny R.; and Butler, Marcus S., 5,116,759, Cl. 435-288.000.

Thomas, Michael E.; and Chinn, Jeffrey D., to Fairchild Camera and Instrument Corp. High pe formance interconnect system for an integrated circuit. 5,117,276, Cl. 357-71.000.

Thompson, Mortimer S., to Tri-Tech Systems International, Inc. Containers and cans and method of and apparatus for producing the same. 5,115,938, Cl. 220-618.000.

Thompson and Nielson Electronics Ltd.: *See—*
Thomson, Ian; MacKay, Gary F.; and Brown, Martin P., 5,117,113, Cl. 250-370.070.

Thomson Composants Microondes: *See—*
Gobbi, Jose M.; and Le Berre, Louis, 5,117,127, Cl. 307-443.000.

Thomson Consumer Electronics, Inc.: *See—*
Sendelweck, Gene K., 5,117,123, Cl. 307-239.000.

Thomson, Ian; MacKay, Gary F.; and Brown, Martin P., to Thompson and Nielson Electronics Ltd. Direct reading dosimeter. 5,117,113, Cl. 250-370.070.

Thorn EMI plc: *See—*
Vos, Raymond A., 5,117,157, Cl. 315-173.000.

Tice, Lee D.; Fritz, Todd W.; and Kilcommons, Mark A., to Pittway Corporation. Smoke and fire detection system communication. 5,117,219, Cl. 340-518.000.

Tilby, Syndey E. Sugarcane separator configuration. 5,116,422, Cl. 127-2.000.

Tiley, Edward P.: *See—*
Lawrence, Gordon C.; Dawson, Michael J.; Noble, David; Ramsay, Michael V. J.; Bell, Richard; Sutherland, Derek R.; and Tiley, Edward P., 5,116,968, Cl. 536-71.000.

Tillery, Lawrence I.; Cline, Keith W.; Moses, Ronald R.; and Cline, Kurtis K. Universal door jamb of three piece construction suitable for four modes of operation. 5,115,597, Cl. 49-504.000.

Tillhon, Engelbert: *See—*
Klinke, Christian; Stutzenberger, Heinz; and Tillhon, Engelbert, 5,115,782, Cl. 123-489.000.

Tillman, Gary P.: *See—*
Nowak, Theodore J.; and Tillman, Gary P., 5,116,030, Cl. 267-140.400.

Tipton, Richard E.; and Hart, Paul S., to Interlake Companies, Inc., The. Rack. 5,115,920, Cl. 211-59.200.

Tirfing, Soren J.; and Gramlich, Wayne C., to Sun Microsystems, Inc. User extensible, language sensitive database system. 5,117,349, Cl. 395-600.000.

Titan Marine Engines, Inc.: *See—*
Gruenwald, David J., 5,115,775, Cl. 123-292.000.

Tjonneland, Soren, to Eskofot A/S. Contact printer. 5,117,257, Cl. 355-91.000.

TOA Medical Electronics Co. Ltd.: *See—*
Hamaguchi, Yukio; and Tsujino, Yukio, 5,116,539, Cl. 252-408.100.
Inoue, Takanobu, 5,117,357, Cl. 364-413.080.

Tobari, Atsushi: *See—*
Ogasawara, Kenji; Kurachi, Koji; and Tobari, Atsushi, 5,117,320, Cl. 360-113.000.

Tobias, Samuel; and Hollinger, Fred, to Hayward Industries, Inc. Apparatus for providing a waterfall or a fountain. 5,115,974, Cl. 239-23.000.

Tobioka, Masaaki: *See—*
Tsukada, Hiroshi; Tobioka, Masaaki; Nomura, Toshio; and Saito, Yasuhiro, 5,116,694, Cl. 428-698.000.

Toda, Kohji. Photosensor with AU diffused Pb_2CrO_5 or similar film. 5,117,270, Cl. 357-30.000.

Toda, Yoshifumi: *See—*
Onoda, Masahiro; and Toda, Yoshifumi, 5,117,502, Cl. 455-33.100.

Togano, Takeshi; Takiguchi, Takao; Yamada, Yoko; Asaoka, Masanobu; and Shinjo, Kenji, to Canon Kabushiki Kaisha. Mesomorphic compound, liquid crystal composition containing same and liquid crystal device using same. 5,116,530, Cl. 252-299.610.

Tojima, Akihiko: *See—*
Konishi, Kuniyoshi; and Tojima, Akihiko, 5,117,419, Cl. 370-50.000.

Tokar, Anatolyi E.: *See—*
Mamedov, Ulchar A. O.; Tokar, Anatolyi E.; and Elbaum, George J., 5,116,915, Cl. 526-60.000.

Tokico Ltd.: *See—*
Endo, Mitsuhiro, 5,115,719, Cl. 91-376.00R.

Tokiwa, Yutaka; and Iwamoto, Akira, to Director-General of Agency of Industrial Science and Technology; and JSP Corporation. Biodisintegrable thermoplastic resin foam and a process for producing same. 5,116,880, Cl. 521-134.000.

Tokizane, Toshiaki; Ito, Yoshiharu; Yamada, Osamu; Masuda, Toshiyuki; and Kuroda, Mitsunobu, to Matsushita Electric Works Ltd. Remote supervisory and controlling system. 5,117,421, Cl. 370-85.100.

Tokumo, Shigeaki: *See—*
Kakino, Yoshiaki; Tokumo, Shigeaki; Nakamura, Tetsuo; and Takeshita, Torao, 5,117,169, Cl. 318-578.000.

Tokunaga, Ichiro, to Alps Electric Co., Ltd. Magnetic movement sensing device. 5,117,319, Cl. 360-113.000.

Tokyo Electric Co., Ltd.: *See—*
Yamaguchi, Yasuyoshi, 5,117,262, Cl. 355-215.000.

Tokyo Electron Limited: *See—*
Ushikawa, Harunori, 5,116,784, Cl. 437-225.000.

Tokyo Ohka Kogyo Co., Ltd.: *See—*
Sago, Hiroyoshi; Mizuki, Hideyuki; Kudo, Katsuhiko; and Nakayama, Muneo, 5,116,250, Cl. 118-52.000.

Tolleson, John D.: *See—*
Stavinoha, Jerome L., Jr.; and Tolleson, John D., 5,117,012, Cl. 549-538.000.

Tollitte, Francois: *See—*
Muller, Jean-Francois; Tollitte, Francois; Krier, Gabriel; and Pelletier, Marc, 5,117,108, Cl. 250-288.000.

Tolonen, Eric O., to Tolonen, Peggy E. Method for grinding materials. 5,115,988, Cl. 241-30.000.

Tolonen, Peggy E.: *See—*
Tolonen, Eric O., 5,115,988, Cl. 241-30.000.

Tomi Machinery Manufacturing Co., Ltd.: *See—*
Shinmoto, Jitsumi, 5,116,211, Cl. 425-141.000.
Shinmoto, Jitsumi, 5,116,554, Cl. 264-40.100.

Tomii, Kaoru; Miyama, Hiroshi; Kawauchi, Yoshikazu; and Nishida, Jun, to Matsushita Electric Industrial Co., Ltd. Flat panel type display and method for driving the display. 5,117,159, Cl. 315-366.000.

Tomikawa, Tadashi: *See—*
Kimoto, Tsunenobu; Tomikawa, Tadashi; and Fujita, Nobuhiko, 5,117,267, Cl. 357-16.000.

Tomioka, Kenichi: *See—*
Mase, Toshiyasu; Murase, Kiyoshi; Hara, Hiromu; and Tomioka, Kenichi, 5,116,853, Cl. 514-363.000.

Tomisawa, Kazuyuki: *See—*
Aihara, Hironaka; Kurachi, Michio; and Tomisawa, Kazuyuki, 5,116,877, Cl. 514-617.000.

Tomita, Kunikazu: *See—*
Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, 5,116,436, Cl. 148-111.000.

Tomita, Nobuaki: *See—*
Urano, Satoshi; Aoki, Kei; Tomita, Nobuaki; and Mori, Hirohiko, 5,117,044, Cl. 560-193.000.

Tomordi, Elemer: *See—*
Dutka, Ferenc; Komives, Tamas; Fodor, Katalin, nee Csorba; Marton, Attila; Csikos, Aniko nee Gluck; Oszthemer, Eva; Henger, Karoly; Laborczy, Robert; Reti, Zsuzsanna, nee Bosnyak; Sebok, Dezso; Szabolcs, Jozsef; and Tomordi, Elemer, 5,116,402, Cl. 71-88.000.

Tompson, Brian: *See—*
Severns, David W.; Tompson, Brian; Lindstrom, Paul R.; and Carlson, David K., 5,116,181, Cl. 414-222.000.

Tone, Seiji; Takeda, Haruko; and Sugimori, Masahiro, to Mitsubishi Rayon Co., Ltd. Preparation method of comb copolymer, acrylic comb copolymer, and impact resistant resin composition. 5,116,910, Cl. 525-244.000.

Tong, Ho-Ming: *See—*
Bregman, Mark F.; Horton, Raymond R.; Lanzetta, Alphonso P.; Noyan, Ismail C.; Palmer, Michael J.; and Tong, Ho-Ming, 5,117,275, Cl. 357-70.000.

Tonka Corporation: *See—*
Moormann, Randall H., 5,115,794, Cl. 124-65.000.

Tonomura, Masashi: *See—*
Nakagawa, Yutaka; Suga, Ryoichi; Mochida, Hiroya; Tonomura, Masashi; and Shirai, Kazuhiko, 5,117,484, Cl. 395-100.000.

Topez Company: *See—*
O'Neill, Michael W.; and Sugerman, Gerald. 5,116,411, Cl. 106-22.000.

Torii, Nobutoshi; Mizuno, Hitoshi; and Miyawaki, Masanao, to Fanuc Ltd. Multi-articulated industrial robot with an offset robot arm. 5,115,690, Cl. 74-479.000.

Torii, Satoru: *See—*
Kurohashi, Michiya; Torii, Satoru; and Kunieda, Yoichi, 5,116,188, Cl. 414-719.000.

Tornblom, Bengt H., to Tornbloms Kvalitetskontroll AB. Transformer-coupled transducer. 5,117,185, Cl. 324-262.000.

Tornbloms Kvalitetskontroll AB: *See—*
Tornblom, Bengt H., 5,117,185, Cl. 324-262.000.

Torok, Vilmos. Electric motor. 5,117,144, Cl. 310-269.000.

Torregrossa, Louis O., to Kamyr, Inc. Gas sparged centrifugal device. 5,116,488, Cl. 209-170.000.

Torrington Company, The: *See—*
Santos, Alfred J., 5,117,183, Cl. 324-228.000.

Tortola, Angelo; and Howitt, Robert, to Curtis Manufacturing Company, Inc. Compact combined light and magnifier apparatus for a hand held computer with video screen. 5,117,339, Cl. 362-109.000.

Toto Ltd.: *See—*
Watanabe, Toshiya; and Kitabayashi, Tetsuo, 5,117,121, Cl. 307-130.000.

Towson State Univ.: *See—*
Rogers, Walter J., Jr.; and Everett, Thomas S., 5,116,599, Cl. 424-9.000.

Toyo Jozo Co., Ltd.: *See—*
Misaki, Hideo; Ueda, Shigeru; Watanabe, Kazuhiro; Ishikawa, Yuzo; Nagae, Hirao; and Matsuzawa, Takashi, 5,117,467, Cl. 382-6.000.

Toyo Jozo Kabushiki Kaisha: *See—*
Takahashi, Mamoru; Nagasawa, Shinobu; Ikuta, Shigeru; and Matsuura, Kazuo, 5,116,748, Cl. 435-189.000.
Tanabe, Miyuki; and Ikuta, Shigeru, 5,117,018, Cl. 552-653.000.

Toyo Seikan Kaisha, Ltd.: *See—*
Katsura, Tadahiko; Matsuoka, Kikuo; Miyake, Kazuo; Taira, Kazuo; Watanabe, Yoshiki; and Ueno, Hiroshi, 5,116,651, Cl. 428-35.700.

Toyoda, Masaaki: *See—*
Ochi, Hideo; Igari, Akihide; and Toyoda, Masaaki, 5,116,542, Cl. 252-518.000.

Toyosumi, Shigeru; Tanigawa, Masayuki; Egawa, Masanori; and Minegishi, Kiyoji, to Sumitomo Heavy Industries, Ltd. Motor driven wheel using hypocyclic planetary bearing with axial positive engagement means. 5,116,291, Cl. 475-178.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Nomura, Hiroshi; Nakamura, Norihiko; Nomura, Kenichi; Kobayashi, Tatsuo; and Nihei, Hiroaki, 5,115,774, Cl. 123-276.000.
Ohno, Eishi; and Kobayashi, Tatsuo, 5,115,776, Cl. 123-299.000.
Takada, Mitsuru; and Funahashi, Makoto, 5,115,696, Cl. 74-869.000.

Tracy, Daniel A., to Mikohn, Inc. Progressive jackpot gaming system linking gaming machines with different hit frequencies and denominations. 5,116,055, Cl. 273-138.00A.

Trank, Robert C.: *See—*
Romero, Jorge E.; and Trank, Robert C., 5,117,348, Cl. 364-167.010.

Trask, Jeffrey L.; Clifton, George B.; and Heath, Kenneth E., to Hewlett-Packard Company. Envelope/sheet feed mechanism. 5,116,034, Cl. 271-2.000.

Traute, Martin: *See—*
Kristen, Franz; and Traute, Martin, 5,117,371, Cl. 395-150.000.

Treacy, Michael M. J.: *See—*
Vaughan, David E. W.; Strohmaier, Karl G.; Treacy, Michael M. J.; and Newsam, John M., 5,116,590, Cl. 423-328.000.

Treiber, Wolfgang: *See—*
Vogt, Bernd; Lessmann, Hans-Dieter; Klein, Christian; and Treiber, Wolfgang, 5,116,762, Cl. 436-15.000.

Trethewey, Michael L.: *See—*
Worcester, Paul L. A.; Maxwell, David J.; and Trethewey, Michael L., 5,117,375, Cl. 364-571.010.

Tri-Tech Systems International, Inc.: *See—*
Thompson, Mortimer S., 5,115,938, Cl. 220-618.000.

Trian, Herve, to Pompes Salmson. Stator for an electric motor and motor equipped therewith. 5,117,138, Cl. 310-89.000.

Trimbo, Susan L.; Rowe, W. Bruce; and Bracco, M. Umberto, to Clintec Nutrition Co. Enteral diet for patients with pulmonary disease. 5,116,819, Cl. 514-21.000.

Triner, Irvin R.: *See—*
Bowen, David C.; Dambach, Philip J.; Nelligan, Joseph W., Jr.; and Triner, Irvin R., 5,115,562, Cl. 29-867.000.

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Liechti, Peter; and Trottmann, Martin, 5,116,958, Cl. 534-591.000.

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Fohl, Artur, 5,115,543, Cl. 24-633.000.

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Imura, Yoshihito; and Ozeki, Keita, 5,115,879, Cl. 180-149.000.

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Wipasuramonton, Pongdet, 5,116,080, Cl. 280-741.000.

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Lan, Ray; and Tsai, Collins, 5,116,261, Cl. 312-292.000.

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Dreyfuss, Michael M.; Schreier, Max H.; Tscherter, Hans; and Wenger, Roland, 5,116,816, Cl. 514-11.000.

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Yamaguchi, Tameaki, 5,115,906, Cl. 198-716.000.

Tsubakimoto Chain Co.: *See—*
Futami, Yuichi; Ohmon, Eisaku; and Suzuki, Tadasu, 5,116,283, Cl. 474-84.000.

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Hori, Kimihiko; Suzuki, Yasuto; Morioka, Tomoki; Moriwaki, Shigeru; Hirota, Osamu; and Tsuchiya, Shuichi, 5,116,829, Cl. 514-172.000.

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Kudoh, Yasuo; Tsuchiya, Sohji; Fukuyama, Masao; Kojima, Toshikuni; Ozaki, Junji; and Kobatake, Yasuhiro, 5,117,332, Cl. 361-525.000.

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Watanabe, Haruo; Yasuda, Akio; Kawasumi, Koichi; Tsuchiya, Takao; and Suzuki, Kiyosuke, 5,116,714, Cl. 430-117.000.

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Takegawa, Yujiro; and Nakai, Souichi, 5,116,276, Cl. 139-351.000.

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Yamada, Shigeo, 5,115,840, Cl. 139-435.200.

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Shiotani, Takeshi; Miyamoto, Kouichi; Tsugami, Kunio; Sato, Mitsumasa; and Wada, Tatsuya, 5,116,249, Cl. 83-435.001.

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Hamaguchi, Yukio; and Tsujino, Yukio, 5,116,539, Cl. 252-408.100.

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Noguchi, Kouki; Tsuchiya, Fumio; Tsukamoto, Takashi; Masumura, Shigeki; Nakamura, Hideo; Baba, Shiro; and Hagiwara, Yoshimune, 5,117,488, Cl. 395-375.000.

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Abe, Nakatsugu; Suzuki, Haruo; Tsukamoto, Hiroaki; Tsuyama, Seishi; and Nagae, Moriyasu, 5,116,571, Cl. 420-110.000.

Tucholski, Henry J.: *See—*
Morgan, Roger J.; Panus, Irenaeus S.; Pekrul, Ronald G.; Papallo, Thomas F., Jr.; Morris, Robert A.; Tucholski, Henry J.; and Craft, Hamon L., 5,117,211, Cl. 335-202.000.

Tucker, David L.: *See—*
Brane, Earl P.; and Tucker, David L., 5,116,491, Cl. 210-143.000.

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Fabry, Bernd; Gruber, Bert; Tucker, James R.; and Giesen, Brigitte, 5,117,032, Cl. 558-34.000.

Tufts, Timothy A.: *See—*
Chang, Ken K.; and Tufts, Timothy A., 5,116,917, Cl. 525-407.000.

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Pfalzgraf, Emile; Jaeger, Claude; and Tugend, Raymond, 5,116,194, Cl. 408-181.000.

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Domagala, John M.; Suto, Mark J.; and Turner, William R., 5,116,834, Cl. 514-212.000.

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Raitzer, Donald A.; and Twisdom, Raymond J., 5,115,891, Cl. 188-218.00R.

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Selgrad, Volker; and Sladky, Friedrich, 5,116,392, Cl. 51-309.000.

TZN Forschungs- und Entwicklungszentrum Unterluss GmbH: *See—*
Loffler, Markus, 5,115,743, Cl. 102-472.000.

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Roland, Bruno; Vandendriessche, Jan; and Jakus, Catherine, 5,116,715, Cl. 430-190.000.

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Blankenship, Howard B.; and Wallace, Fred D., 5,116,312, Cl. 604-66.000.

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Yamamoto, Shinji; Tanaka, Hideho; Adachi, Fumio; and Uchimura, Hisataka, 5,116,668, Cl. 428-221.000.

Ucar Carbon Technology Corporation: *See—*
Dagata, Frank J.; and Politowicz, Kenneth G., 5,117,439, Cl. 373-88.000.

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Suzuki, Noboru; Yoshida, Masaharu; Noda, Satoshi; Takaishi, Minoru; Takiguchi, Kenichiro; Uchida, Hiroshi; and Onoda, Takeshi, 5,116,670, Cl. 428-285.000.

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Kobayashi, Hiroyuki; Uchida, Mitsuru; and Okado, Kenji, 5,116,711, Cl. 430-106.000.

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Yamamoto, Shinji; Tanaka, Hideho; Adachi, Fumio; and Uchimura, Hisataka, 5,116,668, Cl. 428-221.000.

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Akimoto, Kazuhiro; Ogiue, Katsumi; and Uchiyama, Takeo, 5,117,390, Cl. 365-155.000.

Uda, Naotake: *See—*
Handa, Takayuki; and Uda, Naotake, 5,116,082, Cl. 285-21.000.

Ueda, Shigeru: *See—*
Misaki, Hideo; Ueda, Shigeru; Watanabe, Kazuhiro; Ishikawa, Yuzo; Nagae, Hirao; and Matsuzawa, Takashi, 5,117,467, Cl. 382-6.000.

Uehara, Hiroyuki: *See—*
Osawa, Ken'ichi; Ikeda, Hisao; Mizuochi, Fumio; and Uehara, Hiroyuki, 5,116,945, Cl. 530-215.000.
Uemura, Kazuki: *See—*
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,115,546, Cl. 29-27.00C.
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Katsura, Tadahiko; Matsuoka, Kikuo; Miyake, Kazuo; Taira, Kazuo; Watanabe, Yoshiki; and Ueno, Hiroshi, 5,116,651, Cl. 428-35.700.
Ueno, Katsumi, to Zexel Corporation. Stacked type hydraulic control valve system. 5,115,835, Cl. 137-596.130.
Ueno, Masahiro: *See—*
Maejima, Hideo; Hotta, Takashi; Masuda, Ikuro; Iwamura, Masahiro; Kurita, Kouzaburou; and Ueno, Masahiro, 5,117,382, Cl. 364-736.000.
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McShane, James L.; and Ulerich, Nancy H., 5,115,672, Cl. 73-596.000.
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Switchenko, Arthur C.; Kurn, Nurith; Neukom, Christian; Pirio, Marcel; Berger, Donald E., Jr.; and Ullman, Edwin F., 5,116,726, Cl. 435-5.000.
Ulmer, Georg, to Rieter Machine Works, Ltd. Ring spinning machine and method of operating a ring spinning machine. 5,115,632, Cl. 57-264.000.
Ulubay, Hasan: *See—*
Bung, Josef; Ulubay, Hasan; and Schutzius, Bernd, 5,116,924, Cl. 526-312.000.
Umeda, Takashi: *See—*
Ishikawa, Hiromichi; Umeda, Takashi; Onoue, Shinji; Kajikawa, Kazuo; Shibata, Toshihiro; and Ohyama, Hiroshi, 5,116,838, Cl. 514-634.000.
Umehara, Toshiyuki: *See—*
Ishii, Shigeru; Nakayama, Kazunari; Yagi, Kazuo; Satow, Jun; Fukuda, Kenzou; Itoh, Kaoru; Umehara, Toshiyuki; Kudo, Masaki; Inoue, Yoichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,404, Cl. 71-92.000.
Umemura, Toshikazu: *See—*
Tsukahara, Shuji; Umemura, Toshikazu; and Ichise, Kazuyoshi, 5,116,547, Cl. 264-1.100.
Umezawa, Kazumi: *See—*
Ariga, Masao; Hattori, Hiroyuki; Shimizu, Katsuichi; Kishi, Hirotoshi; Ogawa, Hiroshi; Amanuma, Takahiko; Umezawa, Kazumi; Sagara, Seiji; and Kurita, Kenji, 5,117,260, Cl. 355-204.000.
Unex Corporation: *See—*
MacDonald, James T., 5,117,465, Cl. 381-187.000.
Union Carbide Chemicals & Plastics Technology Corporation: *See—*
Eisinger, Ronald S., 5,116,940, Cl. 528-483.000.
Tylor, James W., 5,117,059, Cl. 564-252.000.
Union Carbide Industrial Gases Technology Corporation: *See—*
Prasad, Ravi; Notaro, Frank; and Haas, Oscar W., 5,116,396, Cl. 62-24.000.
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Lauwers, Eddy J., 5,116,399, Cl. 65-135.000.
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Biale, John, 5,116,901, Cl. 524-457.000.
Knutson, Gaylen M., 5,116,678, Cl. 428-355.000.
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Ward, John W., 5,116,792, Cl. 502-66.000.
Young, Donald C., 5,116,401, Cl. 71-86.000.
Young, Donald C., 5,116,916, Cl. 525-350.000.
Uniroyal Goodrich Tire Company, The: *See—*
Fabris, Arnold J.; Parents, Valdis L.; and Stokes, Leonard S., 5,116,449, Cl. 156-415.000.
Unisearch Limited: *See—*
Guilhaus, Michael; and Dawson, John H., 5,117,107, Cl. 250-287.000.
UNISYS Corporation: *See—*
Jeppesen, James H., III; and Whittaker, Bruce E., 5,117,428, Cl. 371-51.100.
Watson, Leland E.; Barajas, Saul; and Whittaker, Bruce E., 5,117,132, Cl. 307-465.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defense in Her Britannic Majesty's Government of the: *See—*
Mullin, John B.; Cole-Hamilton, David J.; Shenai-Khatkhate, Deodatta V.; and Webb, Paul, 5,117,021, Cl. 556-130.000.
United States of America
Air Force: *See—*
Olive, Leonard W., 5,115,998, Cl. 244-31.000.
Army: *See—*
Bartram, Philip W.; and DiBona, Noel C., 5,116,512, Cl. 210-690.000.
Priser, David B.; and Dow, Robert L., 5,115,633, Cl. 60-39.010.
Wedel, John O., Jr., 5,117,230, Cl. 342-169.000.
Energy: *See—*
Buican, Tudor N.; and Yoshida, Thomas M., 5,117,466, Cl. 382-6.000.
Gabel, Detlef, 5,116,980, Cl. 544-229.000.
Hawsey, Robert A.; and Bailey, J. Milton, 5,117,141, Cl. 310-114.000.
Hoenig, Clarence L., 5,116,589, Cl. 423-298.000.
LeMay, James D., 5,116,883, Cl. 521-178.000.
Liu, Chian Q.; and Bader, Samuel D., 5,116,693, Cl. 428-694.000.
Martin, Stephen J.; and Ricco, Antonio J., 5,117,146, Cl. 310-313.00R.
Mausner, Leonard F.; Srivastava, Suresh C.; and Prach, Thomas, 5,116,470, Cl. 204-157.210.
Nilsen, Joseph, 5,117,432, Cl. 372-5.000.
Smith, James A.; and Johnson, John A., 5,117,440, Cl. 375-82.000.
Health and Human Serices: *See—*
De Clercq, Erik D. A.; Herdewijn, Piet A. M. M.; Broder, Samuel; and Balzarini, Jan M. R., 5,116,822, Cl. 514-49.000.
Health and Human Services: *See—*
Klein, David C.; and Nikodijevic, Olga, 5,116,867, Cl. 514-534.000.
National Aeronautics and Space Administration: *See—*
Brindley, William J.; Smialek, James L.; and Rouge, Carl J., 5,116,690, Cl. 428-614.000.
Chapman, John J., 5,116,331, Cl. 73-721.000.
Connell, John W.; and Hergenrother, Paul M., 5,116,934, Cl. 528-125.000.
Fletcher, James C.; Pratt, J. Richard; St. Clair, Terry L.; Stoakley, Diane M.; and Burks, Harold D., 5,116,939, Cl. 528-353.000.
Flom, Yury; and Royston, James D., 5,117,139, Cl. 310-90.500.
Jones, Kenneth L., 5,116,118, Cl. 356-2.000.
Kline, Ronald A.; and Madaras, Eric I., 5,115,673, Cl. 73-601.000.
Lentsch, Steven E., 5,116,543, Cl. 252-545.000.
Romanofsky, Robert R.; and Bhasin, Kul B., 5,116,807, Cl. 505-1.000.
Navy: *See—*
Castile, Brett D.; and Sullivan, Shelby F., 5,117,396, Cl. 367-3.000.
Cochran, Roland C.; and Rosenzweig, Edwin L., 5,116,216, Cl. 425-504.000.
Deveau, David M., 5,117,397, Cl. 367-13.000.
Eninger, James E.; Zamel, James M.; and Prossen, Richard L., 5,116,268, Cl. 441-3.000.
Frazer, Alson C., 5,115,742, Cl. 102-208.000.
Hanson, Frank, 5,117,436, Cl. 372-72.000.
Mitchell, David L.; Stein, Alan J.; Barndt, Charles L., Jr.; and Szeto, William W., 5,115,710, Cl. 89-1.809.
Welch, Jeanne A., 5,115,668, Cl. 73-52.000.
U.S. Philips Corporation: *See—*
Bellersen, Michael F. B.; and Gootzen, Wilhelmus F. M., 5,117,278, Cl. 357-72.000.
Dennerlein, Ludwig; and Weber, Hubert, 5,117,504, Cl. 455-67.100.
Duwaer, Arne L.; and van Alphen, Willem M., 5,117,152, Cl. 313-426.000.
Gorter, Willem K., 5,116,348, Cl. 606-133.000.
Guilleminot, Pierre, 5,117,075, Cl. 200-343.000.
Haaker, Paul R.; Klotz, Erhard P. A.; Koppe, Reiner H.; and Linde, Rolf E., 5,117,446, Cl. 378-99.000.
Heerkens, Henricus J., 5,117,290, Cl. 358-158.000.
Lokhoff, Gerardus C. P.; Van Eijck, Gustavus L. P.; and Arts, Petrus H. M., 5,117,313, Cl. 360-40.000.
Nauta, Bram, 5,117,205, Cl. 331-117.0FE.
Persoon, Eric H. J.; and Vandenbulcke, Christian J. B. O. E., 5,117,386, Cl. 364-787.000.
Shepherd, Robert; Owen, Frank C. G.; and Pudney, Christopher D., 5,117,423, Cl. 370-95.100.
Sluyterman, Albertus A. S.; Vink, Nicolaas G.; and Doomernik, Fransiscus M. P. P., 5,117,151, Cl. 313-413.000.
Van Rosmalen, Gerard E.; and Schoneveld, Pieter A., 5,117,413, Cl. 369-215.000.
Visser, Reinke A.; Engelfriet, Adrianus R. C.; and Schildbach, Klaus B., 5,115,557, Cl. 29-597.000.
U.S. Ring Binder Corporation: *See—*
Gillum, Steven; and Fuller, Luke, 5,116,157, Cl. 402-38.000.
United States Surgical Corporation: *See—*
Aranyi, Ernie, 5,116,349, Cl. 606-142.000.
Granger, Richard N., 5,116,358, Cl. 606-224.000.
Green, David T., 5,116,353, Cl. 606-184.000.
United Technologies Corporation: *See—*
Anderson, David W.; Baker, John H. E., II; and O'Connell, Thomas E., 5,115,962, Cl. 228-120.000.
Arline, Samuel B.; Eder, Matthias; Dunlap, Jeffrey J.; and Douglas, Gary W., 5,116,362, Cl. 60-734.000.
Cvelbar, David A.; and Rubino, Anthony, 5,115,642, Cl. 60-751.000.
Fradenburgh, Evan A.; and Miller, Gordon G., 5,116,201, Cl. 416-140.000.
Jennings, Tyler R.; Larkin, Louis J.; and Johnson, Rodney O., 5,115,635, Cl. 60-39.030.
Prewo, Karl M., 5,116,398, Cl. 65-18.100.
Roebelen, George J., Jr.; and Bayes, Stephen A., 5,115,859, Cl. 165-10.000.

Universite de Montreal: *See—*
Allard, Paul; Levesque, Claude; and Dansereau, Jean, 5,116,385, Cl. 623-55.000.
Universite de Paris V: *See—*
Cabanes, Laure; Lockhart, Alain; and Weber, Simon, 5,116,878, Cl. 514-653.000.
University College London: *See—*
May, Denis R. W., 5,116,376, Cl. 623-20.000.
University of California, The Regents of the: *See—*
Bommannan, Durairaj; Okuyama, Hirohisa; Guy, Richard H.; Stauffer, Paul; and Flynn, Gordon L., 5,115,805, Cl. 128-24.0AA.
Street, Robert A.; Kaplan, Selig N.; and Perez-Mendez, Victor, 5,117,114, Cl. 250-370.110.
University of Kentucky Research Foundation: *See—*
Parekh, Bhupendra K.; and Groppo, John G., Jr., 5,116,487, Cl. 209-164.000.
University of Melbourne, The: *See—*
Martin, Thomas J.; Moseley, Jane M.; Kemp, Bruce E.; and Wettenhall, Richard E. H., 5,116,952, Cl. 530-399.000.
University of Metz, Etablissement Public Caractere Scientifue et Culturel: *See—*
Muller, Jean-Francois; Tollitte, Francois; Krier, Gabriel; and Pelletier, Marc, 5,117,108, Cl. 250-288.000.
University of Michigan, The: *See—*
Loesche, Walter J., 5,116,735, Cl. 435-34.000.
Rand, Stephen C., 5,117,437, Cl. 372-91.000.
University of Minnesota: *See—*
Barany, George, 5,117,009, Cl. 549-394.000.
McCarthy, James B.; and Furcht, Leo T., 5,116,368, Cl. 623-2.000.
Westermark, Per; and Johnson, Kenneth H., 5,116,948, Cl. 530-324.000.
University of Nebraska, The Board of Regents of the: *See—*
McDonald, Thomas L., 5,116,766, Cl. 436-506.000.
University of Oklahoma, The Board of Regents of the: *See—*
Kline, Ronald A.; and Madaras, Eric I., 5,115,673, Cl. 73-601.000.
University of Oregon, The: *See—*
Edlund, David J.; Finke, Richard G.; and Saxton, Robert J., 5,116,796, Cl. 502-154.000.
University of Waterloo: *See—*
Moo-Young, Murray; Bols, Niels C.; Overgaard, Sandra E.; and Scharer, Jeno M., 5,116,747, Cl. 435-178.000.
University Patents, Inc.: *See—*
Cech, Thomas R.; Murphy, Felicia L.; Zaug, Arthur J.; and Grosshans, Cheryl, 5,116,742, Cl. 435-91.000.
Uno, Hidemitsu: *See—*
Suzuki, Hitomi; Ogawa, Takuji; Uno, Hidemitsu; Kitahaba, Tetsuo; Kigawa, Kouji; Fukamachi, Tomonori; and Kitahara, Katsuhiko, 5,117,000, Cl. 549-59.000.
Uno, Terushige: *See—*
Kobayashi, Motonobu; Kinoshita, Futoru; Hagi, Mitsuharu; Inoue, Akira; and Uno, Terushige, 5,116,579, Cl. 422-111.000.
Unoki, Masao: *See—*
Nomura, Shinzou; Katsushima, Hiroshi; Kawasaki, Toru; Unoki, Masao; and Nakamura, Masaru, 5,117,272, Cl. 357-52.000.
UOP: *See—*
Chao, Chien C.; and Rastelli, Henry, 5,116,793, Cl. 502-68.000.
Skeels, Gary W.; and Flanigen, Edith M., 5,116,794, Cl. 502-85.000.
Uosaki, Yoichi: *See—*
Saito, Hiromitsu; Kasai, Masaji; Morimoto, Makoto; Kobayashi, Eiji; Uosaki, Yoichi; Kanda, Yutaka; and Sano, Hiroshi, 5,117,006, Cl. 548-421.000.
Uozumi, Yukio: *See—*
Kobayashi, Noboru; and Uozumi, Yukio, 5,117,136, Cl. 310-12.000.
Upchurch, Paul E. Line handling device. 5,116,260, Cl. 114-221.00R.
Upjohn Company, The: *See—*
Morris, Joel, 5,116,981, Cl. 546-268.000.
Upp, M. Frances: *See—*
Martin, Mark M.; and Upp, M. Frances, 5,116,648, Cl. 428-7.000.
Urabe, Toshiaki: *See—*
Nishimoto, Akihiko; Hosoya, Yoshihiro; and Urabe, Toshiaki, 5,116,435, Cl. 148-111.000.
Nishimoto, Akihiko; Hosoya, Yoshihiro; Tomita, Kunikazu; Urabe, Toshiaki; and Jitsukawa, Masaharu, 5,116,436, Cl. 148-111.000.
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Urbach, Hansjorg: *See—*
Ruger, Wolfgang; Urbach, Hansjorg; Ruppert, Dieter; and Scholkens, Bernward, 5,116,835, Cl. 514-218.000.
Urgo, Donald F.: *See—*
Bennett, Glenn E.; and Urgo, Donald F., 5,116,263, Cl. 439-733.000.
Usa, Satoshi, to Yamaha Corporation. Tone generation device capable of generating a special tone. 5,116,192, Cl. 84-653.000.
Ushijima, Toshie: *See—*
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Bock, Jan; and Valint, Paul L., 5,116,923, Cl. 526-307.200.
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Dyer, Allan E., 5,115,802, Cl. 602-33.000.
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Maitland, Peter, 5,115,731, Cl. 99-327.000.
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Dole, Stephen L.; and Venkataramani, Subramaniam, 5,116,559, Cl. 264-65.000.
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Pless, Benjamin; Sweeney Michael; and Winkle, Roger, 5,115,807, Cl. 128-419.00D.
Venturello, Carlo; Cavallotti, Claudio; and Achilli, Fiorella, to Ausimont S.r.L. Nitrogen-containing peroxycarboxylic monopersulfates. 5,117,049, Cl. 562-2.000.
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Vere, Anthony W.: *See*—
Mackey, Kevin J.; Vere, Anthony W.; Bradley, Donald C.; Frigo, Dario M.; and Faktor, Marc M., deceased, 5,116,785, Cl. 437-243.000.
Vereingte Aluminum-Werke Aktiengesellschaft: *See*—
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Verma, Kuldeep. Fermentation vessel closure. 5,116,758, Cl. 435-287.000.
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Knox, Jack D.; and Pennington, Donald C., Jr., 5,116,416, Cl. 75-238.000.
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Loewen, Heinz, 5,116,237, Cl. 439-326.000.
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Tsukahara, Shuji; Umemura, Toshikazu; and Ichise, Kazuyoshi, 5,116,547, Cl. 264-1.100
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Steinkamp, Stephen P.; and Batzer, Jeffrey C., 5,116,382, Cl. 623-38.000.
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Gergo, Gyorgy; Vida, Zoltan; Sebestyen, Bela; Nemeth, Jozsef; Viragh, Istvan; Monath, deceased Lajos; and Monath, Gabor, 5,116,104, Cl. 299-16.000.
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Zimmerman, Robert R.; and Viers, Tamela A., 5,116,667, Cl. 428-220.000.
Viitanen, Olavi, to Valmet Paper Machinery Inc. Suction beam. 5,115,581, Cl. 34-115.000.
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Vesala, Reijo; and Vikman, Vesa, 5,116,198, Cl. 415-169.100.
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Holleman, Timothy W.; and Viktora, Sandra F., 5,115,818, Cl. 128-784.000.
Vileda GmbH: *See*—
Casademunt Ferre, Jose M.; and Fita Valentin, Eduardo, 5,115,535, Cl. 15-229.700.
Village Wholesale, Inc.: *See*—
Englert, Frank, 5,116,489, Cl. 210-150.000.
Villalobos, Richard: *See*—
Annino, Raymond; Bartlett, Michael L.; Karas, Edwin L.; Lueck, Dale E.; Middleton, John L.; and Villalobos, Richard, 5,116,764, Cl. 436-161.000.
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Sluyterman, Albertus A. S.; Vink, Nicolaas G.; and Doomernik, Fransiscus M. P. P., 5,117,151, Cl. 313-413.000.
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Catlow, William G.; and Vitone, Edward T., Jr., 5,116,200, Cl. 415-183.000.
Vlah, John A. Universal fit longeron supported louver system. 5,117,342, Cl. 362-217.000.
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VMK Fish Machinery AB: *See*—
Leander, Leif, 5,115,903, Cl. 198-400.000.
VMX/OPCOM: *See*—
Ladd, David J.; Pounds, Gregory E.; Kusumi, Tim J.; Bonee, Peter A.; and Shepard, Robert R., 5,117,451, Cl. 379-67.000.
Vodiunig, Robert; Reiter, Gerhard; and Weinrotter, Klaus, to Lenzing AG. High-temperature resistant stacking support. 5,116,673, Cl. 428-332.000.
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Schertler, Armin; Ortner, Josef A.; Scheurecker, Werner; and Engel, Kurt, 5,115,857, Cl. 164-448.000.
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Sulzbacher, Horst; Derler, Harald; and Schollnhammer, Heinz, 5,116,588, Cl. 423-244.000.
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Vogel, Peter S. Vending machine with synthesized description messages. 5,117,407, Cl. 369-30.000.
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Vogt, Bernd; Lessmann, Hans-Dieter; Klein, Christian; and Treiber, Wolfgang, to Boehringer Mannheim GmbH. Method for determining the concentration of fructosamine using a standard solution and method of calibrating the standard solution. 5,116,762, Cl. 436-15.000.
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Carduck, Franz-Josef; Jahnke, Ulrich; Smulders, Eduard; Vogt, Guenther; Boecker, Monika; and Kuenzel, Werner, 5,116,524, Cl. 252-90.000.
Volkswagen AG: *See*—
Picker, Jurgen, 5,116,120, Cl. 356-246.000.
von der Heide, Johann: *See*—
Albrecht, Klaus; Hans, Helmut; von der Heide, Johann; and Schmider, Fritz, 5,117,128, Cl. 310-191.000.
von der Saal, Wolfgang: *See*—
Mertens, Alfred; von der Saal, Wolfgang; Boehm, Erwin; and Strein, Klaus, 5,116,843, Cl. 514-253.000.
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Vos, Raymond A., to Thorn EMI plc. Ballast circuits for discharge lamps. 5,117,157, Cl. 315-173.000.
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King, William J.; and Voyle, Robert J., 5,115,978, Cl. 239-107.000.
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Popovic, Goran; Saryazyan, Armen; Ponomarjev, Viktor; and Vucelic, Dusan, 5,115,808, Cl. 128-660.020.
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Bowser, John, 5,116,650, Cl. 428-34.200.
Fujimoto, Hiroyoshi; Fukutake, Sunao; and Egashira, Rie, 5,116,663, Cl. 428-209.000.
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Chick, William L.; and Rupp, Randall G., 5,116,493, Cl. 210-192.000.
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Gaidis, James M., 5,116,647, Cl. 427-407.100.
Yang, Julie C.; and Sanders, Charles L., 5,116,537, Cl. 252-378.00R.
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Zumfeld, Heinz, 5,115,629, Cl. 57-22.000.
Wachtler, Andreas: *See*—
Coates, David; Sage, Ian C.; Geelhaar, Thomas; and Wachtler, Andreas, 5,116,527, Cl. 252-299.610.
Wada, Akira: *See*—
Oohashi, Tuneyoshi; Yamaguchi, Motoo; Wada, Akira; Shirakura, Toshiharu; Kichikawa, Toshimichi; and Sugawara, Hiroyuki, 5,117,434, Cl. 372-56.000.
Wada, Tatsuya: *See*—
Shiotani, Takeshi; Miyamoto, Kouichi; Tsugami, Kunio; Sato, Mitsumasa; and Wada, Tatsuya, 5,116,249, Cl. 83-435.001.
Wagner, Udo: *See*—
Mintgen, Rolf; Wirges, Winfried; and Wagner, Udo, 5,116,028, Cl. 267-64.120.
Wagner, Wayne M.: *See*—
Gillingham, Gary R.; Wagner, Wayne M.; and Wahlquist, Fred H., 5,116,083, Cl. 285-23.000.

Wagnieres, Georges: *See*—
van den Bergh, Hubert; Cornaz, Peter F., deceased; Cornaz, Max M., heir; Cornaz, Jean-Pierre, Heir; Cornaz, Maria I., Heir; and Wagnieres, Georges, 5,117,474, Cl. 385-39.000.
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Wahl, Errol H.: *See*—
Lichtenwalter, Glen D.; Rosario-Jansen, Theresa; and Wahl, Errol H., 5,116,520, Cl. 252-8.600.
Wahlquist, Fred H.: *See*—
Gillingham, Gary R.; Wagner, Wayne M.; and Wahlquist, Fred H., 5,116,083, Cl. 285-23.000.
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Sasaki, Hiroshi; Nakazawa, Shinsuke; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; Yamaguchi, Hiroshi; Ishigami, Kazuhiro; and Takenouchi, Shinichi, 5,115,694, Cl. 74-844.000.
Wakatsuki, Kenji: *See*—
Shimizu, Akira; Ogawa, Tutomu; Wakatsuki, Kenji; and Kimura, Tomomichi, 5,117,409, Cl. 369-36.000.
Walker, Daniel D., Jr.; and Oliphant, Joseph, to Chemical Lime Company. Composition and method for agglomerating ore. 5,116,417, Cl. 75-327.000.
Walker, Peter S.: *See*—
Poggie, Matthew P.; Walker, Peter S.; and Ewald, Frederick C., 5,116,338, Cl. 606-90.000.
Walker, R. David; and Scheidt, David A., to Conoco Inc. Vapor free multi-liquid sampler. 5,115,686, Cl. 73-863.310.
Wallace, Fred D.: *See*—
Blankenship, Howard B.; and Wallace, Fred D., 5,116,312, Cl. 604-66.000.
Wallace, Rickie W.: *See*—
Cohen, Richard; and Wallace, Rickie W., 5,117,424, Cl. 370-105.500.
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Walsh, Edward N.: *See*—
Hardy, Thomas A.; and Walsh, Edward N., 5,117,033, Cl. 558-163.000.
Walter Sarstedt Gerate und Verbrauchsmaterial fur Medizin und Wissenschaft: *See*—
Sarstedt, Walter, 5,115,817, Cl. 128-764.000.
Waltersdorfer, Anna: *See*—
Schubert, Hans H.; Salbeck, Gerhard; Krause, Hans-Peter; Knauf, Werner; Waltersdorfer, Anna; and Kern, Manfred, 5,116,826, Cl. 514-63.000.
Walther, Gerhard: *See*—
Harreus, Albrecht; Weber, Karl-Heinz; Stransky, Werner; Walther, Gerhard; Muacevic, Gojko; Stenzel, Jorge C.; and Bechtel, Wolf-Dietrich, 5,116,971, Cl. 540-362.000.
Walz, Fredrick J.: *See*—
Kolk, Stephen B.; Theuerkauf, James P.; and Walz, Fredrick J., 5,116,639, Cl. 427-54.100.
Wang, Alice M.: *See*—
Koths, Kirston E.; Halenbeck, Robert F.; Innis, Michael A.; Wang, Alice M.; and Shaked, Ze'ev, 5,116,943, Cl. 530-351.000.
Wang, Bu-Chin, to Summit Micro Design. Computer display screen monitoring system. 5,117,225, Cl. 340-717.000.
Wang, Charles C. P.; and Zhou, Joe S. B., to Optodyne, Inc. Interferometer requiring no critical component alignment. 5,116,126, Cl. 356-349.000.
Wang, Chorng K.; Khan, Roomy; and Freitas, David A., to International Business Machines Corporation. Fully differential follower using operational amplifier. 5,117,199, Cl. 330-252.000.
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Fadavi-Ardekani, Jalil; and Wang, Jin-Der, 5,117,291, Cl. 358-167.000.
Wang, John. Height adjusting device. 5,115,723, Cl. 92-5.00R.
Wang, Sharon: *See*—
Maier, Gary W.; and Wang, Sharon, 5,115,972, Cl. 239-8.000.
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Warner-Lambert Company: *See*—
Domagala, John M.; Suto, Mark J.; and Turner, William R., 5,116,834, Cl. 514-212.000.
Hoeschele, James D.; Berry, David A.; and Marzilli, Luigi G., 5,116,831, Cl. 514-184.000.
Pavia, Michael R., 5,116,988, Cl. 546-245.000.
Trivedi, Bharat K., 5,116,848, Cl. 514-332.000.
Warren, James L.: *See*—
Kinzel, George M.; and Warren, James L., 5,116,220, Cl. 431-113.000.
Warrick, Richard E.: *See*—
Young, Ruth E.; Young, Daniel L.; Warrick, Richard E.; and Cassidy, Clarence A., 5,116,139, Cl. 383-49.000.
Washimi, Takeshi: *See*—
Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washimi, Takeshi; Harada, Naoki; and Akahori, Kingo, 5,116,956, Cl. 534-612.000.
Wasilko, John M.: *See*—
Erb, David J.; Nicholas, Keith L.; Phillips, Howard C.; and Wasilko, John M., 5,115,560, Cl. 29-747.000.
Watanabe, Akihiko: *See*—
Nakano, Masao; Kawamoto, Satoru; and Watanabe, Akihiko, 5,117,388, Cl. 365-73.000.
Watanabe, Haruhisa; Tanaka, Satoshi; and Matsuyama, Shinya, to Olympus Optical Co., Ltd. Method for automatic chemical analyzing. 5,116,765, Cl. 436-165.000.
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Watanabe, Hidetoshi; Suzuki, Hirotsugu; and Yamamoto, Masanobu, to Sony Corporation. Optical-disk manufacturing apparatus. 5,116,210, Cl. 425-111.000.
Watanabe, Kazuhiro; Hara, Yasushi; Iida, Atsuo; Shimura, Takaki; Matsui, Kiyoto; Ishikawa, Hiroshi; and Kawabe, Kenji, to Fujitsu Limited. Ultrasonic transducer array. 5,115,810, Cl. 128-662.030.
Watanabe, Kazuhiro: *See*—
Misaki, Hideo; Ueda, Shigeru; Watanabe, Kazuhiro; Ishikawa, Yuzo; Nagae, Hirao; and Matsuzawa, Takashi, 5,117,467, Cl. 382-6.000.
Sakashita, Masao; Sakamoto, Tetsuo; Kazama, Shingo; Harada, Yoshiyuki; Teramoto, Takero; Watanabe, Kazuhiro; Shimomura, Bunji; and Kaneta, Tsutomu, 5,116,504, Cl. 210-500.230.
Watanabe, Kazuo: *See*—
Arai, Naoto; and Watanabe, Kazuo, 5,116,802, Cl. 503-208.000.
Watanabe, Kazutoshi: *See*—
Hayashi, Yoshio; Morinaka, Yasuhiro; Shinoda, Masaki; Nishi, Hiroyoshi; Watanabe, Kazutoshi; and Fukushima, Nobuko, 5,116,858, Cl. 514-391.000.
Watanabe, Masahiro: *See*—
Nakajima, Tsunetaka; Okamoto, Tadao; Kondo, Nobuo; Watanabe, Masahiro; Yamauchi, Koichi; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 5,116,949, Cl. 530-363.000.
Watanabe, Masashi: *See*—
Hayata, Yoshiki; Watanabe, Masashi; and Tashiro, Kisuke, 5,115,643, Cl. 62-115.000.
Watanabe, Naohiro: *See*—
Asano, Teruo; Watanabe, Naohiro; Jinushi, Kazuki; and Samejima, Shunichi, 5,116,426, Cl. 134-40.000.
Watanabe, Seigo: *See*—
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Watanabe, Shigeomi: *See*—
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Tate, Takuo; Watanabe, Taketoshi; and Nagura, Hiroyuki, 5,116,478, Cl. 162-358.000.
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Nooren, Franciscus P. M., 5,116,413, Cl. 106-212.000.
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Stearns, Glenn; Packard, Barbara B.; and Watson, Ralph T., 5,117,496, Cl. 395-700.000.
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Mullin, John B.; Cole-Hamilton, David J.; Shenai-Khatkhate, Deodatta V.; and Webb, Paul, 5,117,021, Cl. 556-130.000.
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Pinchuk, Leonard; Martin, John B., Jr.; and Weber, Bruce A., 5,116,360, Cl. 623-1.000.

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Dennerlein, Ludwig; and Weber, Hubert, 5,117,504, Cl. 455-67.100.
Weber, Karl-Heinz: *See—*
Harreus, Albrecht; Weber, Karl-Heinz; Stransky, Werner; Walther, Gerhard; Muacevic, Gojko; Stenzel, Jorge C.; and Bechtel, Wolf-Dietrich, 5,116,971, Cl. 540-362.000.
Weber, Robert N.: *See—*
Erdman, David D.; Monroe, Kevin T.; and Weber, Robert N., 5,117,479, Cl. 385-136.000.
Weber, Siegfried: *See—*
Dietrich, Walter; Krieger, Eberhard; and Weber, Siegfried, 5,116,303, Cl. 493-313.000.
Weber, Simon: *See—*
Cabanes, Laure; Lockhart, Alain; and Weber, Simon, 5,116,878, Cl. 514-653.000.
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Sprafke, Uwe, 5,115,712, Cl. 89-36.140.
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Lewis, Graham; Prchal, Milos; Weidner, Siegfried H.; and Yablonovitch, Max, 5,115,617, Cl. 53-306.000.
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Rudbach, Michael; and Weinand, Guy, 5,116,635, Cl. 427-8.000.
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Vodiunig, Robert; Reiter, Gerhard; and Weinrotter, Klaus, 5,116,673, Cl. 428-332.000.
Weinstein, Barry: *See—*
Hsu, Adam C.; Aller, Harold E.; Murphy, Raymond A.; Le, Dat P.; Hamp, Donald W.; and Weinstein, Barry, 5,117,057, Cl. 564-149.000.
Weispfenning, Gerald L.; and Goss, Lloyd C., to Seagate Technology, Inc. Correlation of sectored servo position information. 5,117,408, Cl. 369-32.000.
Weiss, Helga: *See—*
Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Kraus, Georg; Weiss, Helga; and Wolter, Olaf, 5,116,462, Cl. 156-643.000.
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Welch Allyn, Inc.: *See—*
Thomas, Brian J.; Briggs, Daniel C.; and Avdenko, Michael, 5,117,154, Cl. 313-634.000.
Welch, Jeanne A., to United States of America, Navy. Non-invasive pressure measuring device and method. 5,115,668, Cl. 73-52.000.
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Weston, John B.; Larkin, John P.; and Smith, Ian H., 5,116,862, Cl. 514-436.000.
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Wenger Corporation: *See—*
Abraham, Leslie R.; and Probst, Ronald N., 5,115,608, Cl. 52-238.100.
Wenger, Roland: *See—*
Dreyfuss, Michael M.; Schreier, Max H.; Tscherter, Hans; and Wenger, Roland, 5,116,816, Cl. 514-11.000.
Werner, Wesley W. Knife scabbard with preloaded and locked insert panel for improved knife retention. 5,115,953, Cl. 224-232.000.
West Design: *See—*
Fuller, Mark W.; and Robinson, Alan S., 5,115,973, Cl. 239-20.000.
West, Eugene L.; Beck, David H.; and Gort, Thomas L., to Bradford-White Corporation. High efficiency insulated water heater and method for making same. 5,115,767, Cl. 122-494.000.
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Ganguli, Kalyan K., 5,116,421, Cl. 106-823.000.
Western Digital Corporation: *See—*
Bathaee, Mehdi; and Asami, Takashi, 5,117,314, Cl. 360-51.000.
Western Publishing Company: *See—*
Nobile, Frederick E.; Harris, John F., III; and Silverman, Gary S., 5,117,297, Cl. 359-52.000.
Westerwaelder Eisenwerk Gerhard GmbH: *See—*
Gerhard, Helmut, 5,115,933, Cl. 220-1.500.
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Wallace, William D.; Lynch, Edward G., Jr.; Daugherty, David W., Jr.; Kanjo, Wajih; and Hawryszkow, Michael G., 5,115,927, Cl. 213-75.00R.
Westinghouse Electric Corp.: *See—*
Bauer, Frank I.; and Mavretish, Robert S., 5,116,026, Cl. 266-44.000.
Kessler, Leland L., 5,117,174, Cl. 322-21.000.
McShane, James L.; and Ulerich, Nancy H., 5,115,672, Cl. 73-596.000.
Sargeant, John B.; and Seyler, Jan W., 5,117,140, Cl. 310-91.000.
Yaron, John D., 5,117,231, Cl. 342-195.000.
Westlake, Wayne S., to Differential Steel Car Company. Hopper door and operating apparatus for a railway car. 5,115,748, Cl. 105-286.000.
Weston, John: *See—*
Phillips, Joseph; Prough, J. Robert; Bilodeau, Victor; Greenwood, Brian; Bain, Ronald; and Weston, John, 5,116,476, Cl. 162-60.000.
Weston, John B.; Larkin, John P.; and Smith, Ian H., to Wellcome Foundation Limited, The. Pesticidal compounds. 5,116,862, Cl. 514-436.000.
Westphalen, Karl-Otto: *See—*
Ditrich, Klaus; Hamprecht, Gerhard; Wuerzer, Bruno; Meyer, Norbert; Westphalen, Karl-Otto; and Laatsch, Hartmut, 5,117,005, Cl. 548-369.000.
Westvaco Corporation: *See—*
Massouda, Debora F., 5,116,649, Cl. 428-34.200.
Westwood, LeRoy C.: *See—*
DeCello, Michael J.; and Westwood, LeRoy C., 5,117,370, Cl. 364-497.000.
Wettenhall, Richard E. H.: *See—*
Martin, Thomas J.; Moseley, Jane M.; Kemp, Bruce E.; and Wettenhall, Richard E. H., 5,116,952, Cl. 530-399.000.
Wetzel, Donald: *See—*
McMasters, David A.; and Wetzel, Donald, 5,116,010, Cl. 248-309.100.
Wetzel, Edgar: *See—*
Bachmann, Wilfried; Bader, Rolf; Buttner, Horst; and Wetzel, Edgar, 5,116,518, Cl. 210-772.000.
Wheland, Robert C.: *See—*
Buzinkai, John F.; DeWitt, Marion R., Jr.; and Wheland, Robert C., 5,116,919, Cl. 525-420.000.
Whirlpool Corporation: *See—*
Bertsch, Roger J.; and Marks, Larry D., 5,115,826, Cl. 134-183.000.
White, James S.; and White, Mark S. Subsoil treatment apparatus. 5,115,750, Cl. 111-118.000.
White, Janet, to Millipore Corporation. Electrodeionization and ultraviolet light treatment method for purifying water. 5,116,509, Cl. 210-644.000.
White Judy I. Support for selectively seating and developing balance and motor control in infants. 5,115,529, Cl. 5-655.000.
White, Mark S.: *See—*
White, James S.; and White, Mark S., 5,115,750, Cl. 111-118.000.
White, Paul F. Constant current non-bridging section insulator. 5,117,072, Cl. 191-39.000.
White, Paul J.: *See—*
Monte, Charles; White, Paul J.; and Graham, Anne C., 5,115,705, Cl. 84-617.000.
White, Steve R.: *See—*
Comerford, Liam D.; Ledermann, Peter G.; Levy, Lawrence I.; and White, Steve R., 5,117,457, Cl. 380-3.000.
Whitmoyer, David A.: *See—*
Palmer, Ralph P.; Whitmoyer, David A.; and Shumaker, Mark A., 5,116,170, Cl. 408-72.00B.
Whittaker, Bruce E.: *See—*
Jeppesen, James H., III; and Whittaker, Bruce E., 5,117,428, Cl. 371-51.100.
Watson, Leland E.; Barajas, Saul; and Whittaker, Bruce E., 5,117,132, Cl. 307-465.000.
Whittier Institute for Diabetes & Endocrinology, The: *See—*
Beattie, Gillian M.; Lappi, Douglas A.; Baird, J. Andrew; and Hayek, Alberto, 5,116,753, Cl. 435-240.200.
Widdowson, Roy; and Scholes, Alan, to British Steel plc. Apparatus for controlling teeming streams. 5,116,027, Cl. 266-225.000.
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Wiederrich, LeRoy J.; and Butler, Robert G. Positionable service bench. 5,116,264, Cl. 187-11.000.
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Wiener, Charles: *See—*
Rutherford, Howard J.; Desai, Nayan; McDermott, Keith; and Wiener, Charles, 5,116,627, Cl. 426-5.000.
Wiethaup, Wolfgang: *See—*
Hauser, Bernhard; Gerding, Guillermo; Moller, Knut; Muller, Bernd-Henrik; Rudolph, Gert; and Wiethaup, Wolfgang, 5,115,820, Cl. 131-194.000.
Wilensky, Robert L.: *See—*
March, Keith L.; Hathaway, David R.; Wilensky, Robert L.; and Patton, Brian L., 5,116,864, Cl. 514-455.000.
Wilhelm, Ludwig: *See—*
Satmer, Franz; and Wilhelm, Ludwig, 5,115,985, Cl. 241-14.000.
Wilhelms, Otto-Henning, to Boehringer Mannheim GmbH. Process for the detection of an allergy or an anti-allergic substance. 5,116,731, Cl. 435-18.000.

Wilkinson, Susan A.: *See—*
Davidson, Robert S.; and Wilkinson, Susan A., 5,116,876, Cl. 522-1.000.
Wilkinson, William T.; Bressler, Peter W.; Schiff, David R.; Schneider, Eric A.; and Lincov, Pietr, to William T. Wilkinson. Aerobic climbing step/bench. 5,116,044, Cl. 482-52.000.
William Prym-Werke GmbH & Co. KG: *See—*
Nysten, Bernhard, 5,115,548, Cl. 24-90.00R.
Wm. R. Hague, Inc.: *See—*
Brane, Earl P.; and Tucker, David L., 5,116,491, Cl. 210-143.000.
William T. Wilkinson: *See—*
Wilkinson, William T.; Bressler, Peter W.; Schiff, David R.; Schneider, Eric A.; and Lincov, Pietr, 5,116,044, Cl. 482-52.000.
Wm. Wrigley Jr. Company: *See—*
Patel, Mansukh M.; and Copper, Charles M., 5,116,625, Cl. 426-3.000.
Synosky, Steven P.; Diaz, Dinah; and Hartman, Scott E., 5,116,626, Cl. 426-3.000.
Williams, Edward C.: *See—*
Baker, George E.; and Williams, Edward C., 5,117,087, Cl. 219-121.710.
Williams, John C. Package handling conveyor system. 5,115,908, Cl. 198-832.000.
Williams, John G.: *See—*
Abbott, John S.; Bertz, Mark C.; Faler, James H.; Schirmer, William, III; and Williams, John G., 5,116,400, Cl. 65-144.000.
Williams, Michael R.: *See—*
Chapman, Charles B.; and Williams, Michael R., 5,116,902, Cl. 524-579.000.
Williams, Roger D., to Pneumafil Corporation. Dust collection with programmable cleaning air control. 5,116,395, Cl. 55-273.000.
Williams, Ruth L. Disposable litter box. 5,115,766, Cl. 119-168.000.
Williams, William J., to Sentech Corporation. Method of detecting halogen gas in a liquid. 5,115,666, Cl. 73-19.100.
Williamson, Kenneth J.; Woods, Sandra; and Strand, Stuart E., to Oregon State University. Support aerated biofilm reactor. 5,116,506, Cl. 210-610.000.
Williamson, Nigel D. L., to NWD International, Inc. Adjustable O-ring port fitting for a hydraulic coupling. 5,115,550, Cl. 29-283.500.
Williamson, W. Burton; Linden, Douglas G.; and Summers, Jack C., II, to Allied-Signal Inc. High durability and exhuast catalyst with low hydrogen sulfide emissions. 5,116,800, Cl. 502-303.000.
Wills, Leslie J., to Scientific and Industrial Research Organisation. Carpet dye fixation method and apparatus. 5,116,243, Cl. 8-149.200.
Wilson, Bill: *See—*
Colleran, Stephen; Krehbiel, Fred L.; and Wilson, Bill, 5,116,236, Cl. 439-271.000.
Wilson, Bobby L.: *See—*
Downing, Robert E.; and Wilson, Bobby L., 5,115,856, Cl. 164-234.000.
Wilson, David P.: *See—*
Magid, Hillel; Eibeck, Richard E.; Van Der Puy, Michael; Hollister, Richard M.; Lavery, Dennis M.; and Wilson, David P., 5,116,526, Cl. 252-172.000.
Wilson, Gregory: *See—*
Jones, Edward I.; and Wilson, Gregory, 5,117,464, Cl. 381-183.000.
Wilson Mfg., Inc.: *See—*
Wilson, Robert L., 5,115,763, Cl. 119-20.000.
Wilson, Michael T.; and Jolly, David F., to Syncor, Ltd. Prosthetic foot. 5,116,384, Cl. 623-49.000.
Wilson, Robert L., to Wilson Mfg., Inc. Collapsible portable corral. 5,115,763, Cl. 119-20.000.
Wilson, Robert W. Gas generating apparatus and a method of feeding liquid thereto. 5,116,580, Cl. 422-111.000.
Wilson, Ronald A., to Microwave Development Laboratories, Inc. Method of making an electrical connector. 5,115,563, Cl. 29-876.000.
Winfield, Donald W.: *See—*
Penn, William A.; and Winfield, Donald W., 5,117,400, Cl. 367-128.000.
Winkle, Roger: *See—*
Pless, Benjamin; Sweeney, Michael; and Winkle, Roger, 5,115,807, Cl. 128-419.00D.
Winkler, Peter M. Electronic trusted party. 5,117,358, Cl. 364-419.000.
Winnacker, Ernst-Ludwig: *See—*
Grill, Erwin; Loffler, Susanne; Winnacker, Ernst-Ludwig; and Zenk, Meinhard H., 5,116,749, Cl. 435-193.000.
Winslow, Louis E., to Minnesota Mining and Manufacturing Company. Removable pressure-sensitive adhesive tape. 5,116,676, Cl. 428-343.000.
Wipasuramonton, Pongdet, to TRW Vehicle Safety Systems Inc. Air bag inflator and method of making the same. 5,116,080, Cl. 280-741.000.
Wirges, Winfried: *See—*
Mintgen, Rolf; Wirges, Winfried; and Wagner, Udo, 5,116,028, Cl. 267-64.120.
Wirtz, Louis H.: *See—*
Kordus, Mark R.; Schneider, Mark S.; and Wirtz, Louis H., 5,116,459, Cl. 156-631.000.
Wischhusen, Heiner; and Kehlbeck, Hans, to Aladdin Synergetics, Inc. Multi-partition food storage and multiple serving apparatus. 5,116,240, Cl. 206-545.000.
Witter, James S., to Mollenberg-Betz, Inc. Method and apparatus for combining fluids. 5,116,591, Cl. 423-352.000.
Witzeman, Jonathan S., to Eastman Kodak Company. Process for the preparation of ketoximes. 5,117,060, Cl. 564-259.000.
WMF Wurttembergische Metallwarenfabrik Aktiengesellschaft: *See—*
Gockelmann, Karl, 5,115,730, Cl. 99-280.000.
Wochnowski, Waldemar, to Korber AG. Method of homogenizing the constituents of a tobacco stream. 5,115,819, Cl. 131-109.300.
Wojdani, Aristo, to Allergy Immuno Technologies, Inc. Immunotherapy agents for treatment of IgE mediated allergies. 5,116,612, Cl. 424-85.200.
Wolf, Lisa: *See—*
Brierley, Carol L.; and Wolf, Lisa, 5,116,324, Cl. 604-180.000.
Wolf, Michael L.: *See—*
Cartmell, James V.; Wolf, Michael L.; Allaire, Michael J.; and Sturtevant, Wayne R., 5,115,801, Cl. 602-48.000.
Wolf, Winfried: *See—*
Eisenhardt, Volker; Kummerfeldt, Georg; May, Franz; and Wolf, Winfried, 5,117,288, Cl. 358-136.000.
Wolff, Siegfried; Gorl, Udo; and Deusser, Hans, to Degussa AG. Method for the production of fillers modified with organosilicon compounds, the fillers produced in this manner and their use. 5,116,886, Cl. 523-209.000.
Wolter, Herbert; and Schmidt, Helmut, to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V. Process for coating substrates with an insulating coating. 5,116,472, Cl. 204-181.700.
Wolter, Olaf: *See—*
Bartha, Johann W.; Bayer, Thomas; Greschner, Johann; Kraus, Georg; Weiss, Helga; and Wolter, Olaf, 5,116,462, Cl. 156-643.000.
Wong, Chi H.: *See—*
Bryan, Philip N.; Pantoliano, Michael W.; Rollence, Michele L.; and Wong, Chi H., 5,116,741, Cl. 435-87.000.
Wong, James, to Composite Materials Technology, Inc. Superconducting wire. 5,116,429, Cl. 29-599.000.
Wong, Pui K.: *See—*
Rosenbrand, Gerrit G.; and Wong, Pui K., 5,116,797, Cl. 502-162.000.
Woo, James T. K.; and Pompignano, Gary C., to Glidden Company, The. Epoxy-acrylic graft copolymers with phosphonium cocatalysts carbon-graft. 5,116,888, Cl. 523-409.000.
Woods, Sandra: *See—*
Williamson, Kenneth J.; Woods, Sandra; and Strand, Stuart E., 5,116,506, Cl. 210-610.000.
Woody, D. Grier. Omnidirectional dispersion system for multiway loudspeakers. 5,115,882, Cl. 181-144.000.
Woolnough, Victor J.: *See—*
Shorter, John J.; Harris, Graham J.; and Woolnough, Victor J., 5,116,383, Cl. 623-49.000.
Wooten, Ginger M. Multiple desk and seat apparatus. 5,116,098, Cl. 297-170.000.
Worcester, Paul L. A.; Maxwell, David J.; and Trethewey, Michael L., to British Aerospace Public Company Limited. Calibration of magnetic compasses. 5,117,375, Cl. 364-571.010.
Wozney, John M.: *See—*
Wang, Elizabeth A.; Wozney, John M.; and Rosen, Vicki, 5,116,738, Cl. 435-69.100.
Wright, Howard S. Concealment trolley. 5,115,522, Cl. 5-81.100.
Wright, William J.: *See—*
Braen, Henry P.; Wright, William J.; and Belec, Eric A., 5,116,039, Cl. 271-34.000.
Wrobel, Peter; and Houlihan, James, to Loctite (Ireland) Limited. Method of forming gaskets by injection and compositions for use therein. 5,116,558, Cl. 264-46.600.
Wu, Chung-You C.: *See—*
Natwick, Vernon R.; Lawless, Michael W.; Doll, Joseph E.; and Wu, Chung-You C., 5,116,203, Cl. 417-53.000.
Wu, Wen H.: *See—*
Greene, Carmine; Ismail, Ibrahim A.; and Wu, Wen H., 5,116,763, Cl. 436-95.000.
Ismail, Ibrahim A.; and Wu, Wen H., 5,116,729, Cl. 435-14.000.
Wuerzer, Bruno: *See—*
Ditrich, Klaus; Hamprecht, Gerhard; Wuerzer, Bruno; Meyer, Norbert; Westphalen, Karl-Otto; and Laatsch, Hartmut, 5,117,005, Cl. 548-369.000.
Wunderlich, Helmut; Stark, Andreas; Zenker, Lothar; Lohmann, Dieter; Poppe, Hildegard; Bartsch, Reni; Skoldinov, Aleksandr P.; Kaverina, Natalja V.; Grizenko, Anna N.; and Lyskovzev, Valentin V., to Arzneimittelwerk Dresden GmbH. 3-carbalkoxyamino-5-aminoacyl-5H-dibenz[b,f]azepines, and methods for making. 5,116,974, Cl. 540-591.000.
Wykes, John S.: *See—*
Lewins, Foster; Roth, Bruce N.; and Wykes, John S., 5,116,103, Cl. 299-1.600.
Wyko Corporation: *See—*
Lange, Steven R.; and Thall, Edmond H., 5,116,115, Cl. 351-212.000.
Wynn's Climate Systems, Inc.: *See—*
Abraham, Anthony W., 5,115,645, Cl. 62-292.000.
Xerox Corporation: *See—*
Badesha, Santokh S.; Stolka, Milan; Yanus, John F.; and Hodge, John H., 5,116,703, Cl. 430-59.000.
Frankel, Neil A.; Lindblad, Nero R.; Relyea, Herbert C.; and Meyer, Robert J., 5,117,264, Cl. 355-299.000.
Yu, Zhao-Zhi, 5,117,244, Cl. 346-140.00R.
Xiong, Tian-Yu; and McHie, Lloyd, to Institute of Gas Technology. Temperature measuring pyrometer probe which compensates for radiation heat transfer and pneumatic losses. 5,116,137, Cl. 374-132.000.

Yablonovitch, Max: *See*—
Lewis, Graham; Prchal, Milos; Weidner, Siegfried H.; and Yablonovitch, Max, 5,115,617, Cl. 53-306.000.

Yabuta, Motoshi; Yukawa, Yoshiyuki; and Nakao, Yasushi, to Kansai Paint Company Limited. Self-curing resin. 5,116,930, Cl. 528-45.000.

Yagi, Kazuo: *See*—
Ishii, Shigeru; Nakayama, Kazunari; Yagi, Kazuo; Satow, Jun; Fukuda, Kenzou; Itoh, Kaoru; Umehara, Toshiyuki; Kudo, Masaki; Inoue, Yoichi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 5,116,404, Cl. 71-92.000.

Yagi, Yoshiaki: *See*—
Horino, Morikatsu; and Yagi, Yoshiaki, 5,115,841, Cl. 141-250.000.

Yagihara, Morio: *See*—
Matsushita, Tetsunori; and Yagihara, Morio, 5,116,717, Cl. 430-264.000.

Yagishita, Fukuzo: *See*—
Kataoka, Shigeaki; Kobayashi, Shigeharu; and Yagishita, Fukuzo, 5,115,600, Cl. 51-410.000.

Yaguchi, Takashi: *See*—
Takagi, Masayuki; Okada, Tadaaki; Akai, Naotoshi; Yaguchi, Takashi; Miyadoh, Shinji; Shomura, Takashi; Sasaki, Toru; Sezaki, Masaji; Shimizu, Takao; and Niida, Masashi, 5,116,815, Cl. 514-11.000.

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Yajima, Toshiko: *See*—
Uchida, Masafumi; Yajima, Toshiko; Takagiwa, Hiroyuki; and Takahashi, Jiro, 5,116,713, Cl. 430-110.000.

Yakutniproalmaz: *See*—
Zlobin, Mikhail N.; and Permyakov, Georgy P., 5,116,492, Cl. 210-188.000.

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Oae, Yoshihisa; Sakamoto, Kiichi; and Yamada, Akio, 5,117,117, Cl. 250-492.200.

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Yamada, Tadatoshi: *See*—
Nakanishi, Tetsuya; Yamada, Tadatoshi; Yamamoto, Shunji; Matsuda, Tetsuya; and Ushijima, Toshie, 5,117,194, Cl. 328-233.000.
Yamamoto, Shunji; and Yamada, Tadatoshi, 5,117,212, Cl. 335-210.000.

Yamada, Yasuhiro: *See*—
Fuchigami, Tokuhiko; Konishi, Masaya; Yasura, Sadahiro; and Yamada, Yasuhiro, 5,117,228, Cl. 341-200.000.

Yamada, Yoko: *See*—
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Takizawa, Takato; and Yamagishi, Kouji, 5,116,193, Cl. 403-27.000.

Yamaguchi, Hidetaka: *See*—
Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.

Yamaguchi, Hirohisa, to TEAC Corporation. Drop-out detection circuit. 5,117,193, Cl. 328-120.000.

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Yamaguchi, Kouichi: *See*—
Kishita, Hirofumi; Yamaguchi, Kouichi; Fujii, Hideki; Suganuma, Shuji; Saito, Yoshikazu; Sato, Shinichi; Fukuda, Kenichi; and Kobayashi, Nobuyuki, 5,117,026, Cl. 556-435.000.

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Oohashi, Tuneyoshi; Yamaguchi, Motoo; Wada, Akira; Shirakura, Toshiharu; Kichikawa, Toshimichi; and Sugawara, Hiroyuki, 5,117,434, Cl. 372-56.000.

Yamaguchi, Nobuo: *See*—
Miyake, Hiraku; Ishiguro, Mitsuo; Abe, Shigetaka; Yamaguchi, Nobuo; Hayamizu, Yutaka; and Aizawa, Satoru, 5,115,615, Cl. 52-167.00R.

Yamaguchi, Shinji: *See*—
Nukaga, Tadashi; Mochizuki, Kentaro; Yamaguchi, Shinji; and Banba, Yoshikazu, 5,115,651, Cl. 68-17.00R.

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Suzuki, Kenji, 5,117,317, Cl. 360-74.000.
Usa, Satoshi, 5,116,192, Cl. 84-653.000.

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Yamada, Akira, 5,115,786, Cl. 123-531.000.

Yamakawa, Noriko: *See*—
Hagiwara, Takashi; Yamakawa, Noriko; and Kawamura, Ichiro, 5,116,531, Cl. 252-299.650.

Yamamoto, Kazuyuki: *See*—
Oki, Nariyasu; Yokokura, Tsunetoshi; Mizuno, Koji; Shimada, Katsutoshi; and Yamamoto, Kazuyuki, 5,116,231, Cl. 123-52.0MB.

Yamamoto, Kimiaki: *See*—
Tsuchida, Hirofumi; Aoki, Norihiko; and Yamamoto, Kimiaki, 5,117,308, Cl. 359-654.000.

Yamamoto, Masanobu: *See*—
Watanabe, Hidetoshi; Suzuki, Hirotsugu; and Yamamoto, Masanobu, 5,116,210, Cl. 425-111.000.

Yamamoto, Shinji; Tanaka, Hideho; Adachi, Fumio; and Uchimura, Hisataka, to Ube Industries, Ltd. Hybrid yarn, unidirectional hybrid prepreg and laminated material thereof. 5,116,668, Cl. 428-221.000.

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Yamamoto, Soichiro, to Fuji Photo Film Co., Ltd. Method of forming a color image by high-speed development processing. 5,116,721, Cl. 430-351.000.

Yamamoto, Takashi; Matsumoto, Tsuruyoshi; Kobayashi, Tadao; and Shimada, Katsuhiko, to Mitsubishi Rayon Company Ltd. Polymer composition and optical fiber having cladding composed of that composition. 5,117,480, Cl. 385-145.000.

Yamamoto, Terumasa: *See*—
Ueno, Reiko; Nakatani, Naofumi; Ikezaki, Masao; Yamamoto, Terumasa; and Nakatsu, Hiromasa, 5,117,070, Cl. 178-2.00R.

Yamamoto, Testushi; Niwano, Masaru; and Nakagawa, Etsuo, to Chisso Corporation. Method for stabilization treatment of ferromagnetic metal powder. 5,116,437, Cl. 148-287.000.

Yamane, Shuichi: *See*—
Ando, Shyoichi; Yamane, Shuichi; Doi, Yoshihisa; Sakurai, Hisayuki; and Meguro, Haruo, 5,115,663, Cl. 72-370.000.

Yamaoka, Fumiyuki; Emura, Junichi; and Furuya, Takayuki, to Atsugi Unisia Corporation. Hydraulic shock absorber with piston seal structure for enhancement of initial response. 5,115,892, Cl. 188-282.000.

Yamasaki, Keiichi, to Matsushita Electric Industrial Co., Ltd. Printer for reducing printing operation time. 5,116,149, Cl. 400-314.100.

Yamasaki, Masahiko, to Konica Corporation. Method of assaying target substance. 5,116,733, Cl. 435-28.000.

Yamase, Shinji, to Fujitsu Limited. Exchange having a display apparatus for displaying calls terminated at an attendant console. 5,117,454, Cl. 379-262.000.

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Mikami, Akiyoshi; Ogura, Takashi; Terada, Kousuke; Yoshida, Masaru; Yamashita, Takuo; Tanaka, Koichi; Okibayashi, Katsushi; Nakajima, Shigeo; Nakaya, Hiroaki; and Taniguchi, Kouji, 5,116,640, Cl. 427-66.000.

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Nakajima, Tsunetaka; Okamoto, Tadao; Kondo, Nobuo; Watanabe, Masahiro; Yamauchi, Koichi; Yokoyama, Kazumasa; Haga, Takahiro; Yamada, Nobutoshi; Sugi, Hideo; and Koyanagi, Toru, 5,116,949, Cl. 530-363.000.

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Aizawa, Junichi; and Yamauchi, Satoru, 5,116,270, Cl. 445-24.000.

Yamazaki Mazak Corporation: *See*—
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,115,546, Cl. 29-27.00C.

Yamazaki, Yasuo: *See*—
Fukuda, Masao; and Yamazaki, Yasuo, 5,116,187, Cl. 414-699.000.

Yanagisawa, Akihiko: *See*—
Nagasaki, Tatsutoshi; Miyashita, Takashi; and Yanagisawa, Akihiko, 5,117,315, Cl. 360-71.000.

Yanagisawa, Hironori: *See*—
Tatsuno, Kimio; and Yanagisawa, Hironori, 5,117,433, Cl. 372-22.000.

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Yanai, Shinji; and Shimoyama, Yujiro, to Alps Electric Co., Ltd. Waterproof structure for a switch device. 5,117,074, Cl. 200-302.300.

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Yang, Chang-Min; and Chou, Chun-Mei. Electric plaster cast saw control system. 5,115,567, Cl. 30-166.300.

Yang, Julie C.; and Sanders, Charles I., to W. R. Grace & Co.-Conn. Low temperature expandable vermiculite and intumescent sheet material containing same. 5,116,537, Cl. 252-378.00R.

Yano, Osamu: *See*—
Nobuyuki, Fukazawa; Iizuka, Hajime; Yano, Osamu; and Miyama, Yukio, 5,116,979, Cl. 544-172.000.

Yano, Satoshi, to Ricoh Company, Ltd. Image processing method and system. 5,117,294, Cl. 358-447.000.

Yanus, John F.: *See*—
Badesha, Santokh S.; Stolka, Milan; Yanus, John F.; and Hodge, John H., 5,116,703, Cl. 430-59.000.

Yarino, Tatuo; and Fujii, Takao, to Teijin Limited. Process for production of 1-α, 3-β, 24-trihydroxy Δ-^{5}-steroids. 5,117,015, Cl. 552-541.000.

Yaron, John D., to Westinghouse Electric Corp. Doppler spectrum synthesizer. 5,117,231, Cl. 342-195.000.

Yasuda, Akio: *See*—
Watanabe, Haruo; Yasuda, Akio; Kawasumi, Koichi; Tsuchiya, Takao; and Suzuki, Kiyosuke, 5,116,714, Cl. 430-117.000.

Yasuda Kogyo Kabushiki Kaisha: *See*—
Kakino, Yoshiaki; Tokumo, Shigeaki; Nakamura, Tetsuo; and Takeshita, Torao, 5,117,169, Cl. 318-578.000.

Yasuhara, Takashi: *See*—
Inukai, Hiroshi; Yasuhara, Takashi; and Kitahara, Takahiro, 5,116,544, Cl. 560-219.000.

Yasui, Ken K., to McDonnell Douglas Corporation. Superplastic forming of panel structures. 5,115,963, Cl. 228-157.000.

Yasura, Sadahiro: *See*—
Fuchigami, Tokuhiko; Konishi, Masaya; Yasura, Sadahiro; and Yamada, Yasuhiro, 5,117,228, Cl. 341-200.000.

Yasutake, Masatoshi, to Seiko Instruments, Inc. Composite scanning tunnelling microscope with a positioning function. 5,117,110, Cl. 250-306.000.

Yazaki Corporation: *See*—
Ohta, Noriaki; and Hashimoto, Kenichi, 5,117,329, Cl. 361-395.000.

Yeakey, Ernest L.; and Marquis, Edward T., to Texaco Chemical Company. Removal of water, methanol and acetone from propylene oxide by extractive distillation. 5,116,465, Cl. 203-57.000.

Yee, Ian Y. K.: *See*—
Lin, Charles W. C.; German, Randy L.; Yee, Ian Y. K.; and Sigmond, David M., 5,116,463, Cl. 156-643.000.

Yeh, Charles R., to Acuderm, Inc. Disposable dermal curette. 5,116,346, Cl. 606-131.000.

Yeh, Hwa-Shain: *See*—
Jewell, Brian; and Yeh, Hwa-Shain, 5,116,345, Cl. 606-130.000.

Yen, Chia M.; and Evans, Walter J., to Ford Motor Company. Aluminum casting alloy for high strength/high temperature applications. 5,115,770, Cl. 123-193.600.

Yeomans, Michael A.: *See*—
Folk, Kenneth F.; Loomis, Phillip E.; and Yeomans, Michael A., 5,115,904, Cl. 198-403.000.

Yingst, Stephen M.; Briggs, Robert C.; D'Ambrosia, John F.; Flickinger, Steven L.; Owens, Steven P.; and Zeiders, Jeffrey A., to AMP Incorporated. Optical transceiver package with insertable subassembly. 5,117,476, Cl. 385-88.000.

Yissum Research Development Company of the Hebrew University of Jerusalem: *See*—
Friedman, Michael, 5,116,603, Cl. 424-53.000.

Yiu, Tom D. H., to Macronix International Co., Ltd. Flat-cell read-only-memory integrated circuit. 5,117,389, Cl. 365-104.000.

Ylander, Kimmo; and Mattila, Pentti, to Hollming Oy; and Parma Oy. Ultrasound method and apparatus for examining dense tissues, in particularly dental tissue. 5,115,813, Cl. 128-660.010.

Yokogawa, Kazufumi: *See*—
Miyamoto, Tetsuya; Yokogawa, Kazufumi; Kayane, Yutaka; Omura, Takashi; Washimi, Takeshi; Harada, Naoki; and Akahori, Kingo, 5,116,956, Cl. 534-612.000.

Yokokura, Tsunetoshi: *See*—
Oki, Nariyasu; Yokokura, Tsunetoshi; Mizuno, Koji; Shimada, Katsutoshi; and Yamamoto, Kazuyuki, 5,116,231, Cl. 123-52.0MB.

Yokota, Yuji: *See*—
Kamiya, Soji; and Yokota, Yuji, 5,116,144, Cl. 384-291.000.

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Yokoyama, Tetsuo: *See*—
Sano, Koichi; Maeda, Akira; Yokoyama, Tetsuo; and Koizumi, Hideaki, 5,115,812, Cl. 128-653.200.

Yonezawa, Yasuharu: *See*—
Asada, Shinji; and Yonezawa, Yasuharu, 5,117,293, Cl. 358-298.000.

York International Corporation: *See*—
Snell, Paul W., 5,116,197, Cl. 415-126.000.

Yoshida, Haruo: *See*—
Endo, Tadashi; Sakamoto, Yasuhiko; and Yoshida, Haruo, 5,117,204, Cl. 331-8.000.

Yoshida Kogyo, K.K.: *See*—
Takizawa, Takato; and Yamagishi, Kouji, 5,116,193, Cl. 403-27.000.

Yoshida, Masaharu: *See*—
Suzuki, Noboru; Yoshida, Masaharu; Noda, Satoshi; Takaishi, Minoru; Takiguchi, Kenichiro; Uchida, Hiroshi; and Onoda, Takeshi, 5,116,670, Cl. 428-285.000.

Yoshida, Masaru: *See*—
Mikami, Akiyoshi; Ogura, Takashi; Terada, Kousuke; Yoshida, Masaru; Yamashita, Takuo; Tanaka, Koichi; Okibayashi, Katsushi; Nakajima, Shigeo; Nakaya, Hiroaki; and Taniguchi, Kouji, 5,116,640, Cl. 427-66.000.

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Nakanishi, Kanji; Shimizu, Osamu; Yoshida, Satoshi; Katayama, Masaaki; and Isomura, Tatsuya, 5,117,321, Cl. 360-120.000.

Yoshida, Shigeo; Fujimoto, Isamu; Suzuki, Hideyuki; Asano, Hiroshi; Hosaka, Toru; Onioh, Takashi; Nagasaki, Kojyu; Matsuoka, Kenichi; and Taura, Kazufumi, to Dowa Mining Co., Ltd. Apparatus for and method of optical position detection. 5,117,100, Cl. 250-221.000.

Yoshida, Shodo: *See*—
Konda, Tsutomu; Fujioka, Seiichiro; Tamura, Satoshi; Matsubara, Osamu; and Yoshida, Shodo, 5,117,160, Cl. 315-326.000.

Yoshida, Thomas M.: *See*—
Buican, Tudor N.; and Yoshida, Thomas M., 5,117,466, Cl. 382-6.000.

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Kuwana, Kazutaka; Yoshida, Tsuyoshi; Ichikawa, Hiroyuki; Kamikado, Masaru; Okamoto, Kuniaki; and Itabashi, Satoshi, 5,116,109, Cl. 303-109.000.

Yoshida, Yutaka: *See*—
Asakawa, Naoki; Ohe, Hiroshi; Yoshida, Yutaka; Sato, Tadashi; Nezu, Yukuo; and Oda, Yoshiya, 5,117,109, Cl. 250-288.000.

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Iwata, Nobuyoshi; Yoshimi, Kenji; and Nagano, Mitsuo, 5,116,839, Cl. 514-236.800.

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Ito, Osamu; Ogawa, Masaharu; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Furukawa, Teruo; and Nakajima, Yoshiki, 5,117,412, Cl. 369-109.000.

Yoshimura, Hiroshi; Fujiwara, Takuji; and Ishii, Kozo, to Mazda Motor Corporation. Control system for fluid coupling. 5,115,897, Cl. 192-0.052.

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Andon, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonoka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,117,106, Cl. 250-235.000.

Yoshino, Ken: *See*—
Kawamura, Masao; and Yoshino, Ken, 5,117,224, Cl. 340-703.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Yoshino, Yataro, 5,116,565, Cl. 264-532.000.

Yoshino Seiki Inc.: *See*—
Yousuke, Yoshino, 5,116,176, Cl. 411-60.000.

Yoshino, Yataro, to Yoshino Kogyosho Co., Ltd. Synthetic resin thin-walled bottle. 5,116,565, Cl. 264-532.000.

Yoshioka, Issei; Kamimura, Yoichi; Kitano, Masao; and Goto, Yujiro, to Seiwa Kasei Co., Ltd. Permanent waving composition. 5,116,608, Cl. 424-72.000.

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Marutani, Masayoshi; Izumi, Fumihide; and Oka, Kunihide, 5,117,040, Cl. 560-75.000.

Yoshizumi, Hajime: *See*—
Shinmen, Yoshifumi; Asami, Sumio; Amano, Norihide; Amachi, Teruo; and Yoshizumi, Hajime, 5,116,751, Cl. 435-194.000.

Yost, William T.: *See*—
Allison, Sidney G.; Namkung, Min; Yost, William T.; and Cantrell, John H., 5,117,184, Cl. 324-239.000.

Young, Daniel L.: *See—*
Young, Ruth E.; Young, Daniel L.; Warrick, Richard E.; and Cassidy, Clarence A., 5,116,139, Cl. 383-49.000.
Young, Donald C., to Union Oil Company of California. Herbicide and method with the glyphosate-urea adduct of sulfuric acid. 5,116,401, Cl. 71-86.000.
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Young, Gerald W.: *See—*
Brown, Thomas W.; and Young, Gerald W., 5,116,265, Cl. 439-801.000.
Young, Joseph C., to General Electric Company. Fiber optic connector. 5,117,475, Cl. 385-81.000.
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Yu, Zhao-Zhi, to Xerox Corporation. Nozzle capping device for an ink jet printhead. 5,117,244, Cl. 346-140.00OR.
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Goto, Makoto; Nara, Terukazu; Terasawa, Masato; and Yukawa, Hideaki, 5,116,743, Cl. 435-116.000.
Yukawa, Yoshiyuki: *See—*
Yabuta, Motoshi; Yukawa, Yoshiyuki; and Nakao, Yasushi, 5,116,930, Cl. 528-45.000.
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Zaby, Gottfried; Judat, Helmut; Boonstra, Eric; de Vos, Stefaan; Eckermann, Rolf-W.; and Humburger, Siegbert, to Bayer Aktiengesellschaft. Process for the continuous preparation of monoisocyanates or polyisocyanates. 5,117,048, Cl. 560-347.000.
Zah, Chung-en: *See—*
Cheung, Kwok-wai; and Zah, Chung-en, 5,117,469, Cl. 385-11.000.
Zahnradfabrik Friedrichshafen AG: *See—*
Lehle, Hubert; and Schneider, Rudolf, 5,115,898, Cl. 192-84.0PM.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Takeuchi, Tomio; Aoyagi, Takaaki; Naganawa, Hiroshi; Hamada, Masa; Muraoka, Yasuhiko; and Aoyama, Takayuki, 5,117,052, Cl. 562-461.000.
Zak, Bennie: *See—*
Artiss, Joseph D.; Bensie, Jill M.; Zak, Bennie; and Raden, Daniel S., 5,116,730, Cl. 435-15.000.
Zalesky, Paul J.: *See—*
Griffith, James M.; Zalesky, Paul J.; Gessert, James M.; Dinh, Viet P.; and Passafaro, James D., 5,115,814, Cl. 128-662.060.
Zamanian, Mehdi: *See—*
Chan, Tsiu C.; and Zamanian, Mehdi, 5,116,777, Cl. 437-56.000.
Zambrano, Adolfo R.: *See—*
Bateson, George F.; Chilcote, Dennis D.; Martinson, Michael M.; Valine, Steven B.; and Zambrano, Adolfo R., 5,115,986, Cl. 241-20.000.
Zamel, James M.: *See—*
Eninger, James E.; Zamel, James M.; and Prossen, Richard L., 5,116,268, Cl. 441-3.000.
Zander, Linda K., to Camp International, Inc. Adjustable clavicle strap and orthotic device using same. 5,116,306, Cl. 602-19.000.
Zanger, Ulf: *See—*
Ams, Felix; Zanger, Ulf; and Bolg, Ulrich, 5,116,343, Cl. 606-128.000.
Zappa, David R.: *See—*
Doering, Timothy J.; and Zappa, David R., 5,115,716, Cl. 89-25.000.
Zaug, Arthur J.: *See—*
Cech, Thomas R.; Murphy, Felicia L.; Zaug, Arthur J.; and Groshans, Cheryl, 5,116,741, Cl. 435-91.000.
Zavoda, John R., to Zavoda Manufacturing Co., Inc. Adapter ring for a diaphragm seal. 5,115,724, Cl. 92-102.000.
Zavoda Manufacturing Co., Inc.: *See—*
Zavoda, John R., 5,115,724, Cl. 92-102.000.
Zavracky, Paul M.: *See—*
Fan, John C. C.; and Zavracky, Paul M., 5,116,427, Cl. 136-259.000.
Zeiders, Jeffrey A.: *See—*
Yingst, Stephen M.; Briggs, Robert C.; D'Ambrosia, John F.; Flickinger, Steven L.; Owens, Steven P.; and Zeiders, Jeffrey A., 5,117,476, Cl. 385-88.000.
Zeiser, Philip R., to General Electric Company. Borescope plug. 5,115,636, Cl. 60-39.330.
Zeitlin, Eric. Food and liquid fanning device. 5,115,566, Cl. 30-142.000.
Zenk, Meinhard H.: *See—*
Grill, Erwin; Loffler, Susanne; Winnacker, Ernst-Ludwig; and Zenk, Meinhard H., 5,116,749, Cl. 435-193.000.
Zenker, Lothar: *See—*
Wunderlich, Helmut; Stark, Andreas; Zenker, Lothar; Lohmann, Dieter; Poppe, Hildegard; Bartsch, Reni; Skoldinov, Aleksandr P.; Kaverina, Natalja V.; Grizenko, Anna N.; and Lyskovzev, Valentin V., 5,116,974, Cl. 540-591.000.
Zentner, John R., Jr. Game using beads stacked on pins. 5,116,061, Cl. 273-241.000.
Zeugin, Hans: *See—*
Kirchhoff, Wilhelm; Schneider, Simon; and Zeugin, Hans, 5,115,658, Cl. 72-175.000.
Zexel Corporation: *See—*
Ichihashi, Koji; and Tanaka, Kyoji, 5,115,721, Cl. 91-512.000.
Ichihashi, Koji; and Tanaka, Kyoji, 5,115,722, Cl. 91-512.000.
Nakamura, Hisashi; Kubo, Kenichi; Ohishi, Takashi; and Hitoshi, Hosokawa, 5,115,783, Cl. 123-496.000.
Ueno, Katsumi, 5,115,835, Cl. 137-596.130.
Zhou, Joe S. B.: *See—*
Wang, Charles C. P.; and Zhou, Joe S. B., 5,116,126, Cl. 356-349.000.
Zilbert, Seymour, to Bergen Barrel & Drum Co. Industrial drum molding. 5,116,213, Cl. 425-183.000.
Zimmer, Inc.: *See—*
Cozad, Trent E.; Lozier, Antony J.; Lower, Jerry L.; and Tencer, Allan F., 5,116,334, Cl. 606-61.000.
Hewka, Leda C.; Geremakis, Perry A.; Lester, Mark B.; and Parr, Jack E., 5,116,380, Cl. 623-23.000.
Zimmerman, Mark R. Insect collection apparatus. 5,116,219, Cl. 43-139.000.
Zimmerman, Robert R.; and Viers, Tamela A., to Century Adhesives Inc. Compostible compositions and products. 5,116,667, Cl. 428-220.000.
Zimmermann, Harold M., Jr.: *See—*
Offenhauer, Keith L.; and Zimmermann, Harold M., Jr., 5,116,012, Cl. 248-452.000.
Zimmermann & Jansen GmbH: *See—*
Genreith, Hans; Marx, Norbert; and Nagler, Gunter, 5,116,022, Cl. 251-175.000.
Zimmermann, William D.: *See—*
McCormic, David R.; and Zimmermann, William D., 5,116,912, Cl. 525-340.000.
Zlobin, Mikhail N.; and Permyakov, Georgy P., to Yakutniproalmaz. Apparatus for clarification of industrial sewage. 5,116,492, Cl. 210-188.000.
Zoetemeyer, Robert J.: *See—*
Lourens, Pieter A.; and Zoetemeyer, Robert J., 5,116,505, Cl. 210-603.000.
Zofchak, Albert: *See—*
Fogel, Arnold W.; and Zofchak, Albert, 5,116,604, Cl. 424-59.000.
Zoschke, Armin: *See—*
Kreuter, Peter; and Zoschke, Armin, 5,117,213, Cl. 335-219.000.
Zumfeld, Heinz, to W. Schlafhorst AG & Co. Method and apparatus for preparing yarn ends to be spliced. 5,115,629, Cl. 57-22.000.
167848 Canada Inc.: *See—*
Dallaire, Michel; Santella, Michael; and Swift, Michel, 5,115,955, Cl. 224-324.000.
501 IBK AB: *See—*
von Zweygbergk, Svante G. A., 5,117,142, Cl. 310-156.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF MAY, 1992

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Arichi, Masatoshi: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Awa, Yasuhiko: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Barry Wright Corporation: *See—*
Schubert, Dale W., Re. 33,937, Cl. 267-136.000.
Braun, Jeffrey J.: *See—*
Lorincz, Stefan; and Braun, Jeffrey J., Re. 33,941, Cl. 361-87.000.
Cheng, Alex, to Union Sports Co. Ltd. Telescopic and collapsible golf cart. Re. 33,939, Cl. 280-646.000.
Cuevas, Jess, to Talley Automotive Products, Inc. Aspirating/venting air bag module assembly. Re. 33,938, Cl. 280-731.000.
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo. Apparatus and method for feeding sintering raw mix. Re. 33,935, Cl. 75-386.000.
Gushima, Akira: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Hans Oetiker AG Maschinen- und Apparatefabrik: *See—*
Oetiker, Hans, Re. 33,934, Cl. 24-19.000.
Ikeda, Tsuneo: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Imada, Kunihiro: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Inazumi, Tadahiro: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Izawa, Kiyosato: *See—*
Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, Re. 33,936, Cl. 178-18.000.
Kusakabe, Nobuo: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Lorincz, Stefan; and Braun, Jeffrey J., to Motorola, Inc. Power driver having short circuit protection. Re. 33,941, Cl. 361-87.000.
Matsuo, Hirokazu, to Minolta Camera Kabushiki Kaisha. Duplex copying apparatus. Re. 33,940, Cl. 355-311.000.
Minolta Camera Kabushiki Kaisha: *See—*
Matsuo, Hirokazu, Re. 33,940, Cl. 355-311.000.
Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, to Wacom Co., Ltd. Electronic blackboard apparatus. Re. 33,936, Cl. 178-18.000.
Motorola, Inc.: *See—*
Lorincz, Stefan; and Braun, Jeffrey J., Re. 33,941, Cl. 361-87.000.
Nozaki, Kenro: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Oetiker, Hans, to Hans Oetiker AG Maschinen- und Apparatefabrik. Hose clamp. Re. 33,934, Cl. 24-19.000.
Sato, Fumihiro: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Satoh, Katsuhiko: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Schubert, Dale W., to Barry Wright Corporation. Active vibration isolation system. Re. 33,937, Cl. 267-136.000.
Shimozawa, Eiichi: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Suemura, Yosinobu: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Talley Automotive Products, Inc.: *See—*
Cuevas, Jess, Re. 33,938, Cl. 280-731.000.
Tanaka, Mitsunori: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Tomofuji, Yoshiaki: *See—*
Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, Re. 33,936, Cl. 178-18.000.
Tsuchida, Youichi: *See—*
Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, Re. 33,936, Cl. 178-18.000.
Umezu, Yoshinori: *See—*
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, Re. 33,935, Cl. 75-386.000.
Union Sports Co. Ltd.: *See—*
Cheng, Alex, Re. 33,939, Cl. 280-646.000.
Wacom Co., Ltd.: *See—*
Miyamori, Nobuyuki; Tomofuji, Yoshiaki; Izawa, Kiyosato; and Tsuchida, Youichi, Re. 33,936, Cl. 178-18.000.

VOL
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LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bordoni, Maurice E.; and Lieberman, Ephraim, to Cadema Medical Products, Inc. Aerosol inhalation device. B1 4,598,704, 5-26-92, Cl. 128-200.140.

Cadema Medical Products, Inc.: *See—*
Bordoni, Maurice E.; and Lieberman, Ephraim, B1 4,598,704, Cl. 128-200.140.

Dedolph, Richard R., to Gravi-Mechanics Co. Field transplant systems and methods and components thereof. B1 4,215,513, 5-26-92, Cl. 47-56.000.

Gravi-Mechanics Co.: *See—*
Dedolph, Richard R., B1 4,215,513, Cl. 47-56.000.

Lieberman, Ephraim: *See—*
Bordoni, Maurice E.; and Lieberman, Ephraim, B1 4,598,704, Cl. 128-200.140.

LIST OF DESIGN PATENTEES

A. Boerner GmbH: *See—*
Boerner, Alfred, 326,388, Cl. D7-381.000.

Achiever Industries Ltd.: *See—*
Chan, Yet, 326,467, Cl. D16-217.000.

Africk, Sol. Combined clock and card holder. 326,414, 5-26-92, Cl. D10-2.000.

Aikawa, Masahiro, to Seikosha Co., Ltd. Clock. 326,417, 5-26-92, Cl. D10-26.000.

Aker, Kevin R., to Little Tikes Company, The. Semi-truck toy. 326,490, 5-26-92, Cl. D21-135.000.

Aladdin Equipment Company Inc.: *See—*
Smith, Lindy, 326,408, Cl. D8-499.000.

Albrecht, Eric H.: *See—*
Alsup, James D., Jr.; Saunders, William J.; Albrecht, Eric H.; and Ramakrishnan, Rengasvamy, 326,514, Cl. D23-364.000.

Alexander, Dave. Tape dispenser. 326,475, 5-26-92, Cl. D19-69.000.

Allway Tools, Inc.: *See—*
Gringer, Donald, 326,546, Cl. D32-49.000.

Alsup, James D., Jr.; Saunders, William J.; Albrecht, Eric H.; and Ramakrishnan, Rengaswamy, to U.S. Natural Resources, Inc. Electronic air cleaner. 326,514, 5-26-92, Cl. D23-364.000.

American Infant Care Products Corporation: *See—*
Burt, Timothy P.; and Smith, Scott W., 326,384, Cl. D6-555.000.

Anderson, Franklin R.; and Schroer, John M., to Custom Molders, Inc. Strap fastener. 326,406, 5-26-92, Cl. D8-394.000.

Anderson, Kevin M. Press plate. 326,459, 5-26-92, Cl. D15-29.000.

Anderson, Kevin M. Side plate for an earthworking seed planting and fertilizing tool. 326,460, 5-26-92, Cl. D15-29.000.

Andin International, Inc.: *See—*
Azrielant, Aya, 326,429, Cl. D11-43.000.

Arnold, John, Jr. Sprinkler base. 326,502, 5-26-92, Cl. D23-221.000.

Arnoy, Kurt; and Naerheim, Gunnar, to Laerdal Manufacturing Corporation. Defibrillator. 326,520, 5-26-92, Cl. D24-167.000.

Aulgur, Cecil H., to Vincent, Mary Adell. Pipe bender. 326,395, 5-26-92, Cl. D8-32.000.

Aureus, Ltd.: *See—*
Manley, Edward J.; and Schumacher, Robert M., 326,375, Cl. D6-437.000.

Avia Group International, Inc.: *See—*
Feller, Craig L.; Earle, John S.; Johnson, Charles; and Collins, David, 326,351, Cl. D2-314.000.
Feller, Craig L.; and Backus, Peter P., 326,352, Cl. D2-314.000.

Azrielant, Aya, to Andin International, Inc. Earring. 326,429, 5-26-92, Cl. D11-43.000.

Babashak, John F.: *See—*
Straus, Daniel A.; and Babashak, John F., 326,527, Cl. D24-224.000.

Backus, Peter P.: *See—*
Feller, Craig L.; and Backus, Peter P., 326,352, Cl. D2-314.000.

Baez, Alfonso H., Jr. Breathing mask. 326,534, 5-26-92, Cl. D29-7.000.

Bain, Kenneth J., Jr. Heated pet food dish. 326,542, 5-26-92, Cl. D30-129.000.

Bali Company: *See—*
Stevens, Carl S.; Nesbit, Charles L., Jr.; and White, Larry C., 326,365, Cl. D6-315.000.

Barfield, Jesse. Cabinet. 326,376, 5-26-92, Cl. D6-436.000.

Barrault, Jean-Louis, to Moulinex Societe Anonyme. Electric iron with water sprinkling device. 326,548, 5-26-92, Cl. D32-70.000.

Bartasevich, William: *See—*
Chen, Yin I.; and Bartasevich, William, 326,523, Cl. D24-197.000.

Bengtson, Alan D.: *See—*
Kohler, Herbert V., Jr.; and Bengtson, Alan D., 326,505, Cl. D23-255.000.

Bermann, Ronnie. Finger ring. 326,428, 5-26-92, Cl. D11-30.000.

Bertwell, Dale E. Brush for grooming animals. 326,362, 5-26-92, Cl. D4-136.000.

Bevins, Ken. Stackable paper tray. 326,476, 5-26-92, Cl. D19-92.000.

Bianco, Frank J., to Elexis Corporation. Air ionizer. 326,512, 5-26-92, Cl. D23-355.000.

Black & Decker Inc.: *See—*
Osit, Robert, 326,547, Cl. D32-70.000.

Boerner, Alfred, to A. Boerner GmbH. Food slicer. 326,388, 5-26-92, Cl. D7-381.000.

Borakove, Howard J.; and Morrell, Cindy L., to Willert Home Products, Inc. Fragrance dish cover. 326,515, 5-26-92, Cl. D23-367.000.

Bridgestone Corporation: *See—*
Tsukagoshi, Tetsuhito; Funato, Naomichi; and Murase, Shinji, 326,438, Cl. D12-142.000.

Broussard, Rita J. Zydeco musical board. 326,470, 5-26-92, Cl. D17-99.000.

Bryan, Steve. All terrain toy vehicle. 326,489, 5-26-92, Cl. D21-131.000.

Buchacz, Jurek. Chair. 326,369, 5-26-92, Cl. D6-366.000.

Buchacz, Jurek. Chair. 326,370, 5-26-92, Cl. D6-366.000.

Buchacz, Jurek. Chair. 326,371, 5-26-92, Cl. D6-372.000.

Bucher, Heinz, to Metronic Electronic GmbH. Pain therapy instrument. 326,526, 5-26-92, Cl. D24-214.000.

Bulgari, Gianni, to Gianni Bulgari S.p.A. Clock. 326,415, 5-26-92, Cl. D10-20.000.

Bulgari, Gianni, to Gianni Bulgari S.p.A. Wristwatch. 326,419, 5-26-92, Cl. D10-39.000.

Burt, Timothy P.; and Smith, Scott W., to American Infant Care Products Corporation. Fold down, wall-mounted diaper changing table. 326,384, 5-26-92, Cl. D6-555.000.

Carlsson, Stig, to Unigrafic AG. Display advertising unit for store fixtures or the like. 326,478, 5-26-92, Cl. D20-43.000.

Carroll, Susanne D., to Emote Control Systems, Inc. Toy computer. 326,488, 5-26-92, Cl. D21-111.000.

Cerbini, Frank P., to Genlyte Group Inc., The. Floor lamp. 326,533, 5-26-92, Cl. D26-65.000.

Cernansky, Joe: *See—*
Rudell, Elliot; Cernansky, Joe; Foster, George; and Kamrath, Rick, 326,485, Cl. D21-75.000.

Chambers, John M. Breast pump. 326,516, 5-26-92, Cl. D24-109.000.

Chan, Yet, to Achiever Industries Ltd. Camera. 326,467, 5-26-92, Cl. D16-217.000.

Chen, Chiu-Yuan, to Datel Electrocraft Corporation. Calculator. 326,471, 5-26-92, Cl. D18-7.000.

Chen, Yin I.; and Bartasevich, William, to Lisco, Inc. Disposable nurser. 326,523, 5-26-92, Cl. D24-197.000.

Chiang, Chinfu. Mini fan heater or similar article. 326,511, 5-26-92, Cl. D23-328.000.

Chow, Yun-Sheung, to Sun Hing Audio Equipment Mfy. Ltd. Holder for discs or the like. 326,357, 5-26-92, Cl. D3-35.000.

Chung, Ng H. Printing machine. 326,472, 5-26-92, Cl. D18-14.000.

Clark, Randall K.; and Telensky, Anthony J. Hat. 326,349, 5-26-92, Cl. D2-249.000.

Close, Judith R., to Reebok International Ltd. Shoe upper. 326,353, 5-26-92, Cl. D2-314.000.

Clyde, Thomas. Moisture sensing alarm for a diaper. 326,423, 5-26-92, Cl. D10-106.000.

Coca-Cola Company, The: *See—*
Miller, Benjamin D.; Jablonski, Thaddeus M.; and Wiley, Ronald L., 326,385, Cl. D7-308.000.

Collins, David: *See—*
Feller, Craig L.; Earle, John S.; Johnson, Charles; and Collins, David, 326,351, Cl. D2-314.000.

Cooper, Daniel. Trigger lock for fuel pump nozzle. 326,462, 5-26-92, Cl. D15-9.100.

Cooper, Kevin J. Camouflage fabric. 326,363, 5-26-92, Cl. D5-32.000.

Cotsidas, Kristin N., to L.A. GEAR, Inc. Shoe sole. 326,355, 5-26-92, Cl. D2-320.000.

Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; and Scarpitti, Anthony J., to Goodyear Tire & Rubber Company, The. Tire tread and buttress. 326,439, 5-26-92, Cl. D12-147.000.

Covert, Darrell E.: *See—*
Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; Hoang, Andrew N.; Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; and Galante, Richard L., 326,440, Cl. D12-147.000.

Coyle, Judith. Eyeglasses with frame inserts. 326,465, 5-26-92, Cl. D16-102.000.

Cunningham, William B. Customer operated visual responsive order stand for drive-through restaurants. 326,477, 5-26-92, Cl. D20-19.000.

Curbbun, Charles: *See—*
Wachob, David E.; and Curbbun, Charles, 326,449, Cl. D14-138.000.

Custom Molders, Inc.: *See—*
Anderson, Franklin R.; and Schroer, John M., 326,406, Cl. D8-394.000.

D.A.M. Deutsche Angelgeraete Manufaktur Hellmuth Kuntze GmbH & Co. KG: *See—*
Kuntze, Rupert, 326,498, Cl. D22-141.000.

Daito Electric Machine Industry Company Limited: *See—*
Shimizu, Nobuzo, 326,525, Cl. D24-214.000.

Dalebout, William T. Stepping exercise machine. 326,491, 5-26-92, Cl. D21-195.000.

Dalland, Todd. Tent. 326,494, 5-26-92, Cl. D21-253.000.

Dannenberg, Todd D.: *See—*
Sauter, Bruce M.; Giese, Robert C.; and Dannenberg, Todd D., 326,508, Cl. D23-279.000.

Datel Electrocraft Corporation: *See—*
Chen, Chiu-Yuan, 326,471, Cl. D18-7.000.

Demarest, Scott W., to S. C. Johnson & Son, Inc. Bait station. 326,496, 5-26-92, Cl. D22-122.000.

Dipiazza-Pearson, David V.: *See—*
Mondry, Victor A.; and Dipiazza-Pearson, David V., 326,392, Cl. D7-616.000.

Discovery Toys, Inc.: *See—*
Klitsner, Daniel B., 326,486, Cl. D21-108.000.

Dordick, Fran M., to L.D. Kichler Co., The. Wall lamp. 326,538, 5-26-92, Cl. D26-87.000.

Drysdale, George L. Urinary funnel for women. 326,519, 5-26-92, Cl. D24-122.000.

Duin-Greve Industries, Inc.: *See—*
Greve, Robert L., 326,497, Cl. D22-129.000.

Earle, John S.: *See—*
Feller, Craig L.; Earle, John S.; Johnson, Charles; and Collins, David, 326,351, Cl. D2-314.000.

Eason, Jay A.: *See—*
Krueger, Michael B.; Howard, Robert J.; and Eason, Jay A., 326,409, Cl. D9-341.000.

Eda, Norio: *See—*
Funai, Kazuya; Eda, Norio; and Nakajima, Sachio, 326,517, Cl. D24-110.000.

Edwards, Thomas M., to Herman Miller, Inc. Chair. 326,372, 5-26-92, Cl. D6-360.000.

Edwards, Thomas M., to Herman Miller, Inc. Armrest. 326,380, 5-26-92, Cl. D6-501.000.

Egly, Robert A. Storage container for magnetic media. 326,356, 5-26-92, Cl. D3-35.000.

Eldon Industries, Inc.: *See—*
Jacks, David, 326,463, Cl. D15-125.000.

Elexis Corporation: *See—*
Bianco, Frank J., 326,512, Cl. D23-355.000.

Emote Control Systems, Inc.: *See—*
Carroll, Susanne D., 326,488, Cl. D21-111.000.

Enyeart, Tom J. Extension for a light switch actuator. 326,445, 5-26-92, Cl. D13-173.000.

Ernst, Erik: *See—*
Kuhl, Poul; Moeller, Flemming; and Ernst, Erik, 326,437, Cl. D12-128.000.

Etna Products Co. Inc.: *See—*
Fung, May, 326,366, Cl. D6-320.000.

Fantasy Int. Corp.: *See—*
Hsia, Wang Y., 326,535, Cl. D26-65.000.

Farrell, Paul J.: *See—*
Monitto, Perry H.; and Farrell, Paul J., 326,387, Cl. D7-346.000.

Feller, Craig L.; Earle, John S.; Johnson, Charles; and Collins, David, to Avia Group International, Inc. Shoe upper. 326,351, 5-26-92, Cl. D2-314.000.

Feller, Craig L.; and Backus, Peter P., to Avia Group International, Inc. Shoe upper. 326,352, 5-26-92, Cl. D2-314.000.

Felstad, Richard A.: *See—*
Hume, Roger A.; Felstad, Richard A.; and Zucchi, Luciano, 326,532, Cl. D26-2.000.

Filkins, B. Richard. Drum. 326,469, 5-26-92, Cl. D17-22.000.

Flou S.P.A.: *See—*
Messina, Rosario, 326,367, Cl. D6-335.000.

Foster, George: *See—*
Rudell, Elliot; Cernansky, Joe; Foster, George; and Kamrath, Rick, 326,485, Cl. D21-75.000.

Friedman, Leon, to True Products Sampling, Inc. Combined cosmetic sample container and stand. 326,410, 5-26-92, Cl. D9-517.000.

Friend, John H. Beverage cooler-carrier for vehicle vent. 326,359, 5-26-92, Cl. D3-40.000.

Fukuda, Kouki, to Sharp Corporation. Document scanner. 326,448, 5-26-92, Cl. D14-107.000.

Funai, Kazuya; Eda, Norio; and Nakajima, Sachio, to Glaxo Group Limited. Inhalator. 326,517, 5-26-92, Cl. D24-110.000.

Funato, Naomichi: *See—*
Tsukagoshi, Tetsuhito; Funato, Naomichi; and Murase, Shinji, 326,438, Cl. D12-142.000.

Fung, May, to Etna Products Co. Inc. Rack for suspending caps. 326,366, 5-26-92, Cl. D6-320.000.

Fushiya, Fusao; and Yamaguchi, Shinobu, to Makita Electric Works, Ltd. Orbital sander. 326,398, 5-26-92, Cl. D8-62.000.

Fushiya, Fusao; and Ono, Masahiko, to Makita Electric Works, Ltd. Portable electric circular saw. 326,399, 5-26-92, Cl. D8-66.000.

Fushiya, Fusao; and Hatakeyama, Katsuya, to Makita Electric Works, Ltd. Portable electric drill. 326,400, 5-26-92, Cl. D8-68.000.

Gakhar, Ved P.; McCord, Wilfred M.; and Hubbard, David S., to Vermont American Corporation. Caulking gun. 326,401, 5-26-92, Cl. D8-70.000.

Galante, Richard L.: *See—*
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; and Scarpitti, Anthony J., 326,439, Cl. D12-147.000.
Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; Hoang, Andrew N.; Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; and Galante, Richard L., 326,440, Cl. D12-147.000.

Gattari, Massimo, to Iguzzini Illuminazione S.p.A. Recessed lighting fixture. 326,536, 5-26-92, Cl. D26-74.000.

Gattari, Massimo, to Iguzzini Illuminazione S.p.A. Recessed lighting fixture. 326,537, 5-26-92, Cl. D26-74.000.

General Instrument Corporation: *See—*
Wachob, David E.; and Curbbun, Charles, 326,449, Cl. D14-138.000.

Genlyte Group Inc., The: *See—*
Cerbini, Frank P., 326,533, Cl. D26-65.000.

Gianni Bulgari S.p.A.: *See—*
Bulgari, Gianni, 326,415, Cl. D10-20.000.
Bulgari, Gianni, 326,419, Cl. D10-39.000.

Giese, Robert C.: *See—*
Sauter, Bruce M.; Giese, Robert C.; and Dannenberg, Todd D., 326,508, Cl. D23-279.000.

Gilbey, Mark T. Magazine rack. 326,379, 5-26-92, Cl. D6-475.000.

Glaxo Group Limited: *See—*
Funai, Kazuya; Eda, Norio; and Nakajima, Sachio, 326,517, Cl. D24-110.000.

GM Co., Ltd.: *See—*
Kanazawa, Hiroaki, 326,513, Cl. D23-364.000.

Gold Star Co., Ltd.: *See—*
Jeon, Jin S., 326,468, Cl. D17-1.000.
Yu, Jae G., 326,466, Cl. D16-209.000.

Goodell, Donald P. Shopping basket. 326,552, 5-26-92, Cl. D34-42.000.

Goodyear Tire & Rubber Company, The: *See—*
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; and Scarpitti, Anthony J., 326,439, Cl. D12-147.000.
Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; Hoang, Andrew N.; Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; and Galante, Richard L., 326,440, Cl. D12-147.000.

Greve, Robert L., to Duin-Greve Industries, Inc. Spinner fishing lure. 326,497, 5-26-92, Cl. D22-129.000.

Gringer, Donald, to Allway Tools, Inc. Putty scraper. 326,546, 5-26-92, Cl. D32-49.000.

Gurstein, Bernard; and Gurstein, Russell, to U. S. Products, Inc. External heat exchanger for upholstery and carpet cleaning equipment. 326,545, 5-26-92, Cl. D32-28.000.

Gurstein, Russell: *See—*
Gurstein, Bernard; and Gurstein, Russell, 326,545, Cl. D32-28.000.

Gusta, Kenneth L., Jr. Ventilator system for a toilet. 326,510, 5-26-92, Cl. D23-311.000.

Hahn, Richard, to PRS, Inc. Regressed speaker grille. 326,456, 5-26-92, Cl. D14-219.000.

Harper, Edward D. Sportscard frame. 326,364, 5-26-92, Cl. D6-300.000.

Harris Pharmaceuticals Ltd.: *See—*
Verebelyi, Nick, 326,518, Cl. D24-110.000.

Hasegawa, Shigeru: *See—*
Ito, Masafumi; and Hasegawa, Shigeru, 326,454, Cl. D14-162.000.

Hatakeyama, Katsuya: *See—*
Fushiya, Fusao; and Hatakeyama, Katsuya, 326,400, Cl. D8-68.000.

Hatfield, Tinker L., to Nike, Inc. Shoe upper. 326,354, 5-26-92, Cl. D2-314.000.

Hayashi, Ryozo, to Sharp Corporation. Combined tuner and tape deck. 326,453, 5-26-92, Cl. D14-162.000.

Heary Bros. Lightning Protection Co., Inc.: *See—*
Heary, Kenneth P., 326,422, Cl. D10-105.000.

Heary, Kenneth P., to Heary Bros. Lightning Protection Co., Inc. Lightning preventer air terminal. 326,422, 5-26-92, Cl. D10-105.000.

Heiligenthal, Charles H.; Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., to Snap-on Tools Corporation. Drawer. 326,381, 5-26-92, Cl. D6-510.000.

Herman Miller, Inc.: *See—*
Edwards, Thomas M., 326,372, Cl. D6-360.000.
Edwards, Thomas M., 326,380, Cl. D6-501.000.

Hess, Stephen C., to Winston Furniture Company of Alabama, Inc. Chair frame. 326,373, 5-26-92, Cl. D6-379.000.

HGK Advertising, Inc.: *See*—
Kanellos, William, 326,455, Cl. D14-189.000.

Hi-Tek Bags, Ltd.: *See*—
Tasou, Alecos, 326,360, Cl. D3-44.000.

Hoang, Andrew N.: *See*—
Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; Hoang, Andrew N.; Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; and Galante, Richard L., 326,440, Cl. D12-147.000.

Hoeffel, Gaston D. Game board. 326,482, 5-26-92, Cl. D21-34.000.

Hofland, Robert M.; and Smith, Philip D., to International Business Machines Corporation. Probe module or the like. 326,447, 5-26-92, Cl. D14-107.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Tamura, Gen; Kawaguchi, Yukinori; and Saito, Kazuhiko, 326,436, Cl. D12-107.000.

Hopkins, William M.: *See*—
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; and Scarpitti, Anthony J., 326,439, Cl. D12-147.000.
Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; Hoang, Andrew N.; Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; and Galante, Richard L., 326,440, Cl. D12-147.000.

Howard, Robert J.: *See*—
Krueger, Michael B.; Howard, Robert J.; and Eason, Jay A., 326,409, Cl. D9-341.000.

Hsia, Wang Y., to Fantasy Int. Corp. Desk lamp. 326,535, 5-26-92, Cl. D26-65.000.

Hubbard, David S.: *See*—
Gakhar, Ved P.; McCord, Wilfred M.; and Hubbard, David S., 326,401, Cl. D8-70.000.

Huber, Robert J., Jr. Leaf blower grass trimmer attachment. 326,458, 5-26-92, Cl. D15-17.000.

Hume, Roger A.; Feistad, Richard A.; and Zucchi, Luciano. Lamp. 326,532, 5-26-92, Cl. D26-2.000.

Hyde, Paula E.: *See*—
Silverman, Jeffrey; and Hyde, Paula E., 326,350, Cl. D2-278.000.

Hyundai Motor Company: *See*—
Park, Tae K., 326,435, Cl. D12-92.000.

Iguzzini Illuminazione S.p.A. *See*—
Gattari, Massimo, 326,536, Cl. D26-74.000.
Gattari, Massimo, 326,537, Cl. D26-74.000.

Independent Technologies, Inc.: *See*—
Ingalsbe, David L., 326,443, Cl. D13-147.000.

Ingalsbe, David L., to Independent Technologies, Inc. Adapter for telecommunications terminals. 326,443, 5-26-92, Cl. D13-147.000.

Injectaplastic SA: *See*—
Verchere, Maurice, 326,391, Cl. D7-605.000.

International Business Machines Corporation: *See*—
Hofland, Robert M.; and Smith, Philip D., 326,447, Cl. D14-107.000.

IPL Inc.: *See*—
Lesquir, Dominique, 326,412, Cl. D9-425.000.

Ipsen, Bernt, to Micro Matic A/S. Valve for a transportable container such as a keg for distributing a drinkable liquid such as beer, wine or cider under pressure of a gas such as CO_2. 326,503, 5-26-92, Cl. D23-233.000.

Ito, Fuminori, to Kitagawa Industries Co., Ltd. Wire bundle clamp. 326,407, 5-26-92, Cl. D8-395.000.

Ito, Masafumi; and Hasegawa, Shigeru, to TEAC Corporation. Combined audio mixer and tape recorder. 326,454, 5-26-92, Cl. D14-162.000.

Jablonski, Thaddeus M.: *See*—
Miller, Benjamin D.; Jablonski, Thaddeus M.; and Wiley, Ronald L., 326,385, Cl. D7-308.000.

Jacks, David, to Eldon Industries, Inc. Surface mount rework station. 326,463, 5-26-92, Cl. D15-125.000.

Jacob Delafon: *See*—
Kohler, Herbert V., Jr., 326,506, Cl. D23-255.000.
Yvetot, Roger J., 326,509, Cl. D23-303.000.

Jeon, Jin S., to Gold Star Co., Ltd. Electronic piano. 326,468, 5-26-92, Cl. D17-1.000.

Johnson, Charles: *See*—
Feller, Craig L.; Earle, John S.; Johnson, Charles; and Collins, David, 326,351, Cl. D2-314.000.

Kallista, Inc.: *See*—
Robbins, Tom E., 326,504, Cl. D23-255.000.

Kamrath, Rick: *See*—
Rudell, Elliot; Cernansky, Joe; Foster, George; and Kamrath, Rick, 326,485, Cl. D21-75.000.

Kanazawa, Hiroaki, to GM Co., Ltd. Air cleaner. 326,513, 5-26-92, Cl. D23-364.000.

Kanellos, William, to HGK Advertising, Inc. Radio. 326,455, 5-26-92, Cl. D14-189.000.

Kawaguchi, Yukinori: *See*—
Tamura, Gen; Kawaguchi, Yukinori; and Saito, Kazuhiko, 326,436, Cl. D12-107.000.

Kishi, Katsumi; and Sato, Shigeru, to Tokyo Electric Co., Ltd. Printer for a computer. 326,473, 5-26-92, Cl. D18-55.000.

Kitagawa Industries Co., Ltd.: *See*—
Ito, Fuminori, 326,407, Cl. D8-395.000.

Klein, Mathew W. Door. 326,528, 5-26-92, Cl. D25-48.000.

Kleiss, Peter H., to Renhurst Products Pty. Ltd. Support element for securing foil sheet wall insulation or the like. 326,403, 5-26-92, Cl. D8-349.000.

Klitsner, Daniel B., to Discovery Toys, Inc. Toy figure. 326,486, 5-26-92, Cl. D21-108.000.

Ko, Hsi C. Towel rod bracket. 326,382, 5-26-92, Cl. D6-550.000.

Kohler, Bernd: *See*—
Stutzer, Franz A.; and Kohler, Bernd, 326,421, Cl. D10-92.000.

Kohler Co.: *See*—
Kohler, Herbert V., Jr.; and Bengtson, Alan D., 326,505, Cl. D23-255.000.
Sauter, Bruce M.; Giese, Robert C.; and Dannenberg, Todd D., 326,508, Cl. D23-279.000.

Kohler, Herbert V., Jr.; and Bengtson, Alan D., to Kohler Co. Spout. 326,505, 5-26-92, Cl. D23-255.000.

Kohler, Herbert V., Jr., to Jacob Delafon. Spout. 326,506, 5-26-92, Cl. D23-255.000.

Kojima, Shinichi: *See*—
Takizawa, Toshiaki; and Kojima, Shinichi, 326,433, Cl. D11-221.000.

Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; Hoang, Andrew N.; Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; and Galante, Richard L., to Goodyear Tire & Rubber Company, The. Tire tread and buttress. 326,440, 5-26-92, Cl. D12-147.000.

Kolowski, Michael A.: *See*—
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; and Scarpitti, Anthony J., 326,439, Cl. D12-147.000.

Krueger, Michael B.; Howard, Robert J.; and Eason, Jay A., to Oscar Mayer Foods Corporation. Display package for food products or the like. 326,409, 5-26-92, Cl. D9-341.000.

Ku, Jen-Tuan. Lamp base for christmas tree lights. 326,539, 5-26-92, Cl. D26-138.000.

Kuhl, Poul; Moeller, Flemming; and Ernst, Erik, to R82. Mobile chair. 326,437, 5-26-92, Cl. D12-128.000.

Kuntze, Rupert, to D.A.M. Deutsche Angelgeraete Manufaktur Hellmuth Kuntze GmbH & Co. KG. Fishing reel. 326,498, 5-26-92, Cl. D22-141.000.

L.A. GEAR, Inc.: *See*—
Cotsidas, Kristin N., 326,355, Cl. D2-320.000.

L.D. Kichler Co., The: *See*—
Dordick, Fran M., 326,538, Cl. D26-87.000.

Laerdal Manufacturing Corporation: *See*—
Arnoy, Kurt; and Naerheim, Gunnar, 326,522, Cl. D24-167.000.

Landel, Allen R. Taco holder. 326,390, 5-26-92, Cl. D7-504.000.

Lawal, Karen: *See*—
Lawal, Kola; and Lawal, Karen, 326,524, Cl. D24-199.000.

Lawal, Kola; and Lawal, Karen. Baby bottle holder or the like. 326,524, 5-26-92, Cl. D24-199.000.

Layman, R. Gregory. Toothbrush. 326,361, 5-26-92, Cl. D4-114.000.

Leibowitz, Joel. Weighted exercise harness. 326,492, 5-26-92, Cl. D21-196.000.

Lesquir, Dominique, to IPL Inc. Container. 326,412, 5-26-92, Cl. D9-425.000.

Leto, Joseph. Leash hanger. 326,405, 5-26-92, Cl. D8-367.000.

Levy, James F. Button or the like. 326,434, 5-26-92, Cl. D11-222.000.

Lewis, John F. Z-shaped building block. 326,530, 5-26-92, Cl. D25-113.000.

Lewis, John F. Dove-tailed building block. 326,531, 5-26-92, Cl. D25-113.000.

Lisco, Inc.: *See*—
Chen, Yin I.; and Bartasevich, William, 326,523, Cl. D24-197.000.

Little Tikes Company, The: *See*—
Aker, Kevin R., 326,490, Cl. D21-135.000.

Liu, Pearl. Combined rabbit figure and basket. 326,551, 5-26-92, Cl. D34-41.000.

Luhman, Robert A.; and Patten, Richard L., to Minnesota Mining and Manufacturing Company. Combined hand-held tape dispenser and applicator. 326,474, 5-26-92, Cl. D19-69.000.

Makita Electric Works, Ltd.: *See*—
Fushiya, Fusao; and Yamaguchi, Shinobu, 326,398, Cl. D8-62.000.
Fushiya, Fusao; and Ono, Masahiko, 326,399, Cl. D8-66.000.
Fushiya, Fusao; and Hatakeyama, Katsuya, 326,400, Cl. D8-68.000.

Maldonado, Antonio; and Maldonado, Maria. Pendant or similar article. 326,431, 5-26-92, Cl. D11-81.000.

Maldonado, Maria: *See*—
Maldonado, Antonio; and Maldonado, Maria, 326,431, Cl. D11-81.000.

Manley, Edward J.; and Schumacher, Robert M., to Aureus, Ltd. Display unit. 326,375, 5-26-92, Cl. D6-437.000.

Matoba, Keiko: *See*—
Nakao, Kaname; and Matoba, Keiko, 326,461, Cl. D15-86.000.

Matsuda, Takumi, to Seikosha Co., Ltd. Clock movement. 326,427, 5-26-92, Cl. D10-129.000.

Mattson, Jeanette, to Syracuse China Corporation. Decalcomania for china dinnerware or similar article. 326,389, 5-26-92, Cl. D7-396.500.

Maxwell, Paul B.: *See*—
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; and Scarpitti, Anthony J., 326,439, Cl. D12-147.000.
Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; Hoang, Andrew N.; Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; and Galante, Richard L., 326,440, Cl. D12-147.000.

McBrearty, Edward M., Jr. Face mask. 326,541, 5-26-92, Cl. D29-8.000.

McCord, Wilfred M.: *See*—
Gakhar, Ved P.; McCord, Wilfred M.; and Hubbard, David S., 326,401, Cl. D8-70.000.

McNulty, William J. Automobile windshield pennant. 326,432, 5-26-92, Cl. D11-166.000.

Messina, Rosario, to Flou S.P.A. Sofabed. 326,367, 5-26-92, Cl. D6-335.000.

Metronic Electronic GmbH: *See*—
Bucher, Heinz, 326,526, Cl. D24-214.000.

Micro Matic A/S: *See*—
Ipsen, Bernt, 326,503, Cl. D23-233.000.

Miller, Benjamin D.; Jablonski, Thaddeus M.; and Wiley, Ronald L., to Coca-Cola Company, The. Automatic beverage dispenser. 326,385, 5-26-92, Cl. D7-308.000.

Miller, Frederick W.: *See*—
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; and Scarpitti, Anthony J., 326,439, Cl. D12-147.000.
Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; Hoang, Andrew N.; Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; and Galante, Richard L., 326,440, Cl. D12-147.000.

Miller, Lloyd C. Shower spray deflector unit. 326,501, 5-26-92, Cl. D23-213.000.

Minnesota Mining and Manufacturing Company: *See*—
Luhman, Robert A.; and Patten, Richard L., 326,474, Cl. D19-69.000.

Moeller, Flemming: *See*—
Kuhl, Poul; Moeller, Flemming; and Ernst, Erik, 326,437, Cl. D12-128.000.

Moldex/Metric Products, Inc.: *See*—
Scholey, Michael F., 326,540, Cl. D29-7.000.

Mondry, Victor A.; and Dipiazza-Pearson, David V. Holder assembly for beverage dispensers and cups. 326,392, 5-26-92, Cl. D7-616.000.

Monitto, Perry H.; and Farrell, Paul J., to Parallel Development Corp. Table top range. 326,387, 5-26-92, Cl. D7-346.000.

Monneret, Alain, to Monneret Jouets. Toy ironing board. 326,487, 5-26-92, Cl. D21-109.000.

Monneret Jouets: *See*—
Monneret, Alain, 326,487, Cl. D21-109.000.

Morrell, Cindy L.: *See*—
Borakove, Howard J.; and Morrell, Cindy L., 326,515, Cl. D23-367.000.

Moulinex Societe Anonyme: *See*—
Barrault, Jean-Louis, 326,548, Cl. D32-70.000.

Muller, Ronald L.: *See*—
Rakocy, William J.; Muller, Ronald L.; and Tsuji, Masao, 326,386, Cl. D7-309.000.

Murase, Shinji: *See*—
Tsukagoshi, Tetsuhito; Funato, Naomichi; and Murase, Shinji, 326,438, Cl. D12-142.000.

Naerheim, Gunnar: *See*—
Arnoy, Kurt; and Naerheim, Gunnar, 326,522, Cl. D24-167.000.

Nagel, Richard, to Structura Raum- und Lichtelemente Vertriebsgesellschaft mbH & Co. KG. Display rack for audio video equipment. 326,377, 5-26-92, Cl. D6-461.000.

Nakajima, Sachio: *See*—
Funai, Kazuya; Eda, Norio; and Nakajima, Sachio, 326,517, Cl. D24-110.000.

Nakao, Kaname; and Matoba, Keiko, to Sharp Corporation. Refrigerator. 326,461, 5-26-92, Cl. D15-86.000.

Nesbit, Charles L., Jr.: *See*—
Stevens, Carl S.; Nesbit, Charles L., Jr.; and White, Larry C., 326,365, Cl. D6-315.000.

Nicholoulias, Michael. Refrigerator latch. 326,402, 5-26-92, Cl. D8-331.000.

Nike, Inc.: *See*—
Hatfield, Tinker L., 326,354, Cl. D2-314.000.

Niskanen, Floyd: *See*—
Pink, Anthony N.; and Niskanen, Floyd, 326,457, Cl. D15-11.000.

North American Philips Corp.: *See*—
Rakocy, William J.; Muller, Ronald L.; and Tsuji, Masao, 326,386, Cl. D7-309.000.

Nouma, Masaharu, to Ryobi Ltd. Fishing reel. 326,499, 5-26-92, Cl. D22-141.000.

Nwoke, Benjamin. Combined pendulum game and score display screen therefor. 326,484, 5-26-92, Cl. D21-62.000.

ODL, Incorporated: *See*—
Wilkening, Steven R., 326,529, Cl. D25-48.000.

Oki Electric Industry Co., Ltd.: *See*—
Watanabe, Katsuhito, 326,450, Cl. D14-138.000.

Ono, Masahiko: *See*—
Fushiya, Fusao; and Ono, Masahiko, 326,399, Cl. D8-66.000.

Ortega, Mary E. Earring. 326,430, 5-26-92, Cl. D11-42.000.

Oscar Mayer Foods Corporation: *See*—
Krueger, Michael B.; Howard, Robert J.; and Eason, Jay A., 326,409, Cl. D9-341.000.

Osit, Robert, to Black & Decker Inc. Electric iron. 326,547, 5-26-92, Cl. D32-70.000.

Owens, Joe M. Combined bull float and concrete tamper. 326,396, 5-26-92, Cl. D8-45.000.

Pacetti, Larry D.: *See*—
Heiligenthal, Charles H.; Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,381, Cl. D6-510.000.

Parallel Development Corp.: *See*—
Monitto, Perry H.; and Farrell, Paul J., 326,387, Cl. D7-346.000.

Parise, Jack A.: *See*—
Heiligenthal, Charles H.; Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,381, Cl. D6-510.000.

Park, Tae K., to Hyundai Motor Company. Passenger car. 326,435, 5-26-92, Cl. D12-92.000.

Parker Instrument Corp.: *See*—
Roegner, George P., 326,451, Cl. D14-138.000.
Roegner, George P., 326,452, Cl. D14-138.000.

Patten, Richard L.: *See*—
Luhman, Robert A.; and Patten, Richard L., 326,474, Cl. D19-69.000.

Pearce, Jimmy. Inflatable tent. 326,495, 5-26-92, Cl. D21-253.000.

Perry, David V. Golf swing practice device. 326,493, 5-26-92, Cl. D21-234.000.

Pettesch, Martin C., to Universal Valve Company, Inc. Sealing plug for a monitoring well. 326,500, 5-26-92, Cl. D23-200.000.

Pink, Anthony N.; and Niskanen, Floyd, to Toro Company, The. Snow thrower. 326,457, 5-26-92, Cl. D15-11.000.

Plano Molding Company: *See*—
Yunger, Robert J.; and Schumaker, James S., 326,378, Cl. D6-467.000.

Pritchett, Thomas H. Game board. 326,481, 5-26-92, Cl. D21-16.000.

PRS, Inc.: *See*—
Hahn, Richard, 326,456, Cl. D14-219.000.

Rakocy, William J.; Muller, Ronald L.; and Tsuji, Masao, to North American Philips Corp. Combined carafe and coffee maker. 326,386, 5-26-92, Cl. D7-309.000.

Ramakrishnan, Rengaswamy: *See*—
Alsup, James D., Jr.; Saunders, William J.; Albrecht, Eric H.; and Ramakrishnan, Rengaswamy, 326,514, Cl. D23-364.000.

Reebok International Ltd.: *See*—
Close, Judith R., 326,353, Cl. D2-314.000.

Reitano, Thomas. Level. 326,420, 5-26-92, Cl. D10-69.000.

Renhurst Products Pty. Ltd.: *See*—
Kleiss, Peter H., 326,403, Cl. D8-349.000.

Robbins, Tom E., to Kallista, Inc. Spout. 326,504, 5-26-92, Cl. D23-255.000.

Roegner, George P., to Parker Instrument Corp. Telephone. 326,451, 5-26-92, Cl. D14-138.000.

Roegner, George P., to Parker Instrument Corp. Telephone. 326,452, 5-26-92, Cl. D14-138.000.

Rogers, Charles R. Truck cap. 326,441, 5-26-92, Cl. D12-156.000.

Rostra Tool Company: *See*—
Steiner, Richard A., 326,397, Cl. D8-51.000.

Rothbard, Robert K. Pizza box transport tray. 326,358, 5-26-92, Cl. D3-40.000.

Rousseau, Xavier, to Societe Nouvelle Chaumet, S.A. Watch. 326,418, 5-26-92, Cl. D10-30.000.

Rowenta-Werke GmbH: *See*—
Stutzer, Franz A.; and Kohler, Bernd, 326,421, Cl. D10-92.000.

Rowley, Carl K. End cap for a motorhome waste line. 326,507, 5-26-92, Cl. D23-260.000.

Rudell, Elliot; Cernansky, Joe; Foster, George; and Kamrath, Rick. Horse and buggy riding toy. 326,485, 5-26-92, Cl. D21-75.000.

Rymoen, Kjell O. Cutlery container. 326,394, 5-26-92, Cl. D7-641.000.

Ryobi Ltd.: *See*—
Nouma, Masaharu, 326,499, Cl. D22-141.000.
Yamamoto, Etsusi, 326,544, Cl. D32-21.000.

R82: *See*—
Kuhl, Poul; Moeller, Flemming; and Ernst, Erik, 326,437, Cl. D12-128.000.

S. C. Johnson & Son, Inc.: *See*—
Demaresi, Scott W., 326,496, Cl. D22-122.000.
Wefler, Mark E., 326,411, Cl. D9-552.000.

Safilo, S.p.A.: *See*—
Tabacchi, Vittorio, 326,464, Cl. D16-102.000.

Saito, Kazuhiko: *See*—
Tamura, Gen; Kawaguchi, Yukinori; and Saito, Kazuhiko, 326,436, Cl. D12-107.000.

Sakko, Michael W. Pavement marker. 326,424, 5-26-92, Cl. D10-113.000.

Sanchez, Joseph J.: *See*—
Whitehead, Stephen P.; and Sanchez, Joseph J., 326,549, Cl. D34-26.000.

Sato, Shigeru: *See*—
Kishi, Katsumi; and Sato, Shigeru, 326,473, Cl. D18-55.000.

Saunders, William J.: *See*—
Alsup, James D., Jr.; Saunders, William J.; Albrecht, Eric H.; and Ramakrishnan, Rengaswamy, 326,514, Cl. D23-364.000.

Sauter, Bruce M.; Giese, Robert C.; and Dannenberg, Todd D., to Kohler Co. Bathtub for invalids or the like. 326,508, 5-26-92, Cl. D23-279.000.

Sawada, Masaji, to Sharp Corporation. Portable electrocardiograph. 326,521, 5-26-92, Cl. D24-167.000.

Scarpelli, Jeffrey P. Combined pocket plane and launcher therefor. 326,479, 5-26-92, Cl. D21-2.000.

Scarpitti, Anthony J.: *See*—
Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; Galante, Richard L.; Kolowski, Michael A.; Hopkins, William M.; and Scarpitti, Anthony J., 326,439, Cl. D12-147.000.
Kolowski, Michael A.; Hopkins, William M.; Scarpitti, Anthony J.; Hoang, Andrew N.; Covert, Darrell E.; Maxwell, Paul B.; Miller, Frederick W.; and Galante, Richard L., 326,440, Cl. D12-147.000.

Scholey, Michael F., to Moldex/Metric Products, Inc. Filter mask. 326,540, 5-26-92, Cl. D29-7.000.

Schroer, John M.: *See*—
Anderson, Franklin R.; and Schroer, John M., 326,406, Cl. D8-394.000.
Schumacher, Robert M.: *See*—
Manley, Edward J.; and Schumacher, Robert M., 326,375, Cl. D6-437.000.
Schumaker, James S.: *See*—
Yunger, Robert J.; and Schumaker, James S., 326,378, Cl. D6-467.000.
Scott, John D. Game board simulating a golf green. 326,480, 5-26-92, Cl. D21-11.000.
Seikosha Co., Ltd.: *See*—
Aikawa, Masahiro, 326,417, Cl. D10-26.000.
Matsuda, Takumi, 326,427, Cl. D10-129.000.
Sugano, Hisako, 326,416, Cl. D10-22.000.
Sharp Corporation: *See*—
Fukuda, Kouki, 326,448, Cl. D14-107.000.
Hayashi, Ryozo, 326,453, Cl. D14-162.000.
Nakao, Kaname; and Matoba, Keiko, 326,461, Cl. D15-86.000.
Sawada, Masaji, 326,521, Cl. D24-167.000.
Shimizu, Nobuzo, to Daito Electric Machine Industry Company Limited. Electric kneader. 326,525, 5-26-92, Cl. D24-214.000.
Shutt, Sidney G. Trimaran boat with human-powered propeller drive. 326,442, 5-26-92, Cl. D12-306.000.
Silverman, Jeffrey; and Hyde, Paula E., to Toddler U Inc. Shoe. 326,350, 5-26-92, Cl. D2-278.000.
Skat Blast, Inc.: *See*—
Zwicker, Fred, 326,543, Cl. D32-21.000.
Slivon, George R.: *See*—
Heiligenthal, Charles H.; Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,381, Cl. D6-510.000.
Smith, Jacob O., Sr. Portable chemiluminescent marker. 326,425, 5-26-92, Cl. D10-114.000.
Smith, Jacob O., Sr. Portable chemiluminescent marker. 326,426, 5-26-92, Cl. D10-114.000.
Smith, Lindy, to Aladdin Equipment Company, Inc. Expandable plug. 326,408, 5-26-92, Cl. D8-499.000.
Smith, Philip D.: *See*—
Hofland, Robert M.; and Smith, Philip D., 326,447, Cl. D14-107.000.
Smith, Scott W.: *See*—
Burt, Timothy P.; and Smith, Scott W., 326,384, Cl. D6-555.000.
Snap-on Tools Corporation: *See*—
Heiligenthal, Charles H.; Pacetti, Larry D.; Parise, Jack A.; and Slivon, George R., 326,381, Cl. D6-510.000.
Societe Nouvelle Chaumet, S.A.: *See*—
Rousseau, Xavier, 326,418, Cl. D10-30.000.
Spell, Louis T. Cable support. 326,404, 5-26-92, Cl. D8-356.000.
Steiner, Richard A., to Rostra Tool Company. Combined coaxial cable stripper and connector attachment tool. 326,397, 5-26-92, Cl. D8-51.000.
Stevens, Carl S.; Nesbit, Charles L., Jr.; and White, Larry C., to Bali Company. Apparel hanger. 326,365, 5-26-92, Cl. D6-315.000.
Straus, Daniel A.; and Babashak, John F. Solvent storage flask. 326,527, 5-26-92, Cl. D24-224.000.
Structura Raum- und Lichtelemente Vertriebsgesellschaft mbH & Co. KG: *See*—
Nagel, Richard, 326,377, Cl. D6-461.000.
Studenski, Udo, to U. I. Lapp KG. Cable gland for securing electrical cables and conduits. 326,444. 5-26-92, Cl. D13-156.000.
Stutzer, Franz A.; and Kohler, Bernd, to Rowenta-Werke GmbH. Kitchen scale. 326,421, 5-26-92, Cl. D10-92.000.
Sugano, Hisako, to Seikosha Co., Ltd. Clock. 326,416, 5-26-92, Cl. D10-22.000.
Sun Hing Audio Equipment Mfy. Ltd.: *See*—
Chow, Yun-Sheung, 326,357, Cl. D3-35.000.
Suncast Corporation: *See*—
Whitehead, Stephen P.; and Sanchez, Joseph J., 326,549, Cl. D34-26.000.
Syracuse China Corporation: *See*—
Mattson, Jeanette, 326,389 Cl. D7-396.500.
Tabacchi, Vittorio, to Safilo, S.p.A. Eyeglass frame. 326,464, 5-26-92, Cl. D16-102.000.
Takizawa, Toshiaki; and Kojima, Shinichi, to Yoshida Kogyo K.K. Slide fastener chain. 326,433 5-26-92, Cl. D11-221.000.
Tamura, Gen; Kawaguchi, Yukinori; and Saito, Kazuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Four wheel vehicle. 326,436, 5-26-92, Cl. D12-107.000.
Tapocik, Claudette M. Toothbrush cover or similar article. 326,383, 5-26-92, Cl. D6-534.000.
Tasou, Alecos, to Hi-Tek Bags, Ltd. Handbag or similar article. 326,360, 5-26-92, Cl. D3-44.000.
TEAC Corporation: *See*—
Ito, Masafumi; and Hasegawa, Shigeru, 326,454, Cl. D14-162.000.
Telensky, Anthony J.: *See*—
Clark, Randall K.; and Telensky, Anthony J., 326,349, Cl. D2-249.000.
Toddler U Inc.: *See*—
Silverman, Jeffrey; and Hyde, Paula E., 326,350, Cl. D2-278.000.
Tokyo Electric Co., Ltd.: *See*—
Kishi, Katsumi; and Sato, Shigeru, 326,473, Cl. D18-55.000.
Toro Company, The: *See*—
Pink, Anthony N.; and Niskanen, Floyd, 326,457, Cl. D15-11.000.
Townsend, Thomas C. Clothes tree. 326,374, 5-26-92, Cl. D6-412.000.
True Products Sampling, Inc.: *See*—
Friedman, Leon, 326,410, Cl. D9-517.000.
Tsuji, Masao: *See*—
Rakocy, William J.; Muller, Ronald L.; and Tsuji, Masao, 326,386, Cl. D7-309.000.
Tsukagoshi, Tetsuhito; Funato, Naomichi; and Murase, Shinji, to Bridgestone Corporation. Automobile tire. 326,438, 5-26-92, Cl. D12-142.000.
U. I. Lapp KG: *See*—
Studenski, Udo, 326,444, Cl. D13-156.000.
Unigrafic AG: *See*—
Carlsson, Stig, 326,478, Cl. D20-43.000.
U.S. Natural Resources, Inc.: *See*—
Alsup, James D., Jr.; Saunders, William J.; Albrecht, Eric H.; and Ramakrishnan, Rengaswamy, 326,514, Cl. D23-364.000.
U. S. Products, Inc.: *See*—
Gurstein, Bernard; and Gurstein, Russell, 326,545, Cl. D32-28.000.
United Steel & Wire Company: *See*—
Waterman, Dewey J., 326,550, Cl. D34-40.000.
Universal Valve Company, Inc.: *See*—
Pettesch, Martin C., 326,500, Cl. D23-200.000.
Verchere, Maurice, to Injectaplastic SA. Container. 326,391, 5-26-92, Cl. D7-605.000.
Verebelyi, Nick, to Harris Pharmaceuticals Ltd. Inhalator. 326,518, 5-26-92, Cl. D24-110.000.
Vermont American Corporation: *See*—
Gakhar, Ved P.; McCord, Wilfred M.; and Hubbard, David S., 326,401, Cl. D8-70.000.
Vilmar-Matthews, Chantal. Chair. 326,368, 5-26-92, Cl. D6-363.000.
Vincent, Mary Adell: *See*—
Aulgur, Cecil H., 326,395, Cl. D8-32.000.
Vitous, John. Barrel support. 326,413, 5-26-92, Cl. D9-455.000.
Wachob, David E.; and Curbbun, Charles, to General Instrument Corporation. Combination integral remote control and cordless handset unit together with a telephone base unit with an antenna. 326,449, 5-26-92, Cl. D14-138.000.
Walliker, Graeme I. K. Bread roll. 326,348, 5-26-92, Cl. D1-122.000.
Watanabe, Katsuhito, to Oki Electric Industry Co., Ltd. Automotive telephone control unit. 326,450, 5-26-92, Cl. D14-138.000.
Waterman, Dewey J., to United Steel & Wire Company. Hand-carrying basket. 326,550, 5-26-92, Cl. D34-40.000.
Wefler, Mark E., to S. C. Johnson & Son, Inc. Bottle. 326,411, 5-26-92, Cl. D9-552.000.
White, Larry C.: *See*—
Stevens, Carl S.; Nesbit, Charles L., Jr.; and White, Larry C., 326,365, Cl. D6-315.000.
Whitehead, Stephen P.; and Sanchez, Joseph J., to Suncast Corporation. Hose cart. 326,549, 5-26-92, Cl. D34-26.000.
Wiley, Ronald L.: *See*—
Miller, Benjamin D.; Jablonski, Thaddeus M.; and Wiley, Ronald L., 326,385, Cl. D7-308.000.
Wilhite, Robert W. Knife. 326,393, 5-26-92, Cl. D7-649.000.
Wilkening, Steven R., to ODL, Incorporated. Door panel or the like. 326,529, 5-26-92, Cl. D25-48.000.
Willert Home Products, Inc.: *See*—
Borakove, Howard J.; and Morrell, Cindy L., 326,515, Cl. D23-367.000.
Willis, Kenneth J., to Willis, Kenneth J. Hand-held basketball game. 326,483, 5-26-92, Cl. D21-62.000.
Winston Furniture Company of Alabama, Inc.: *See*—
Hess, Stephen C., 326,373, Cl. D6-379.000.
Wong, Curtis G. Combined electronic book and CD ROM reader. 326,446, 5-26-92, Cl. D14-100.000.
Yamaguchi, Shinobu: *See*—
Fushiya, Fusao; and Yamaguchi, Shinobu, 326,398, Cl. D8-62.000.
Yamamoto, Etsusi, to Ryobi Ltd. Dust collector. 326,544, 5-26-92, Cl. D32-21.000.
Yoshida Kogyo K.K.: *See*—
Takizawa, Toshiaki; and Kojima, Shinichi, 326,433, Cl. D11-221.000.
Yu, Jae G., to Gold Star Co., Ltd. Camera. 326,466, 5-26-92, Cl. D16-209.000.
Yunger, Robert J.; and Schumaker, James S., to Plano Molding Company. Container rack. 326,378, 5-26-92, Cl. D6-467.000.
Yvetot, Roger J., to Jacob Delafon. Handle for bathtubs, doors, or the like. 326,509, 5-26-92, Cl. D23-303.000.
Zucchi, Luciano: *See*—
Hume, Roger A.; Felstad, Richard A.; and Zucchi, Luciano, 326,532, Cl. D26-2.000.
Zwicker, Fred, to Skat Blast, Inc. Vacuum system for collecting dust from sandblasting cabinets. 326,543, 5-26-92, Cl. D32-21.000.

LIST OF PLANT PATENTEES

Belgiorno, Carlo. *Pieris japonica* named Sweetwater. 7,872, 5-26-92, Cl. 54.000.
Fruehwirth, Franz, to Paul Ecke Ranch, Inc. Poinsettia plant '140'. 7,874, 5-26-92, Cl. 86.000.
Fruehwirth, Franz, to Paul Ecke Ranch, Inc. Poinsettia plant '293'. 7,875, 5-26-92, Cl. 86.000.
Klemm, Siegfried, to Klemm & Sohn. Geranium plant named Klesec. 7,873, 5-26-92, Cl. 68.000.
Klemm & Sohn: *See*—
Klemm, Siegfried, 7,873, Cl. 68.000.
Paul Ecke Ranch, Inc.: *See*—
Fruehwirth, Franz, 7,874, Cl. 86.000.
Fruehwirth, Franz, 7,875, Cl. 86.000.

VOL 1138 ISS 4 MAY 26 1992 UMI

VOL
1138
ISS
4
MY
26
1992
UMI

CLASSIFICATION OF PATENTS

ISSUED MAY 26, 1992

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

108 5,115,516
177 5,116,288
203 5,115,517
227 5,115,518
311 5,115,519

CLASS 4

252.4 5,115,554
321 5,115,520
354 5,115,521

CLASS 5

81.1 5,115,522
94 5,115,523
99.1 5,115,524
120 5,115,525
451 5,115,526
481 5,115,527
614 5,116,032
640 5,115,528
655 5,115,529

CLASS 8

127.5 5,116,389
149.2 5,116,243
405 5,116,388

CLASS 15

25 5,115,530
53.2 5,115,531
104.92 5,115,532
105 5,115,533
179 5,115,534
229.7 5,115,535
235.8 5,115,536
340.2 5,115,537
383 5,115,538

CLASS 16

35 R 5,115,539
228 5,115,540

CLASS 24

19 Re.33,934
20 R 5,115,541
90 R 5,115,548
543 5,115,542
633 5,115,543

CLASS 28

105 5,115,544

CLASS 29

25.01 5,115,545
27 C 5,115,546
33 C 5,115,547
231.1 5,115,549
283.5 5,115,550
450 5,115,551
527.4 5,115,552
563 5,115,553
566.3 5,115,555
596 5,115,556
597 5,115,557
599 5,116,429
705 5,115,558
720 5,115,559
747 5,115,560
829 5,115,561
842 5,116,228
867 5,115,562
876 5,115,563
888.09 5,115,564

CLASS 30

123.6 5,115,565
142 5,115,566
166.3 5,115,567
294 5,115,568

CLASS 33

1 M 5,115,569
326 5,115,570
550 5,116,234
558.04 5,115,571
613 5,115,572
706 5,115,573
714 5,115,574

CLASS 34

8 5,115,575
15 5,115,576
22 5,116,363
31 5,115,577
57 A 5,115,578
95.3 5,115,579
104 5,115,580
115 5,115,581
123 5,115,582

CLASS 37

103 5,115,583

CLASS 38

102.91 5,115,584

CLASS 40

152.2 5,115,585
316 5,115,586
607 5,116,204

CLASS 42

69.02 5,115,588
70.11 5,115,589

CLASS 43

17 5,115,590
21.2 5,115,598
22 5,115,591
42.47 5,115,592
43.12 5,115,593
44.82 5,115,594
61 5,115,595
139 5,116,219

CLASS 44

300 5,116,390

CLASS 47

56 B1 4,215,513

CLASS 49

411 5,115,596
504 5,115,597

CLASS 51

26 5,116,391
215 CP 5,115,599
309 5,116,392
410 5,115,600

CLASS 52

1 5,115,601
2.16 5,115,602
13 5,115,603
34 5,115,604
105 5,115,605
118 5,115,606
134 5,115,607
144 5,115,616
167 R 5,115,615
169.5 5,115,614
169.6 5,115,613
208 5,115,612
238.1 5,115,608
309.9 5,115,609
397 5,115,610
537 5,115,611
646 5,115,623
741 5,115,622
805 5,115,621

CLASS 53

64 5,115,620
306 5,115,617
427 5,115,624
449 5,115,618
459 5,115,619
467 5,115,625
468 5,115,626
485 5,116,322

CLASS 54

82 5,115,627

CLASS 55

229 5,116,393
259 5,116,394
273 5,116,395

CLASS 56

10.2 5,115,628

CLASS 57

22 5,115,629
58.059 5,115,630
264 5,115,632
281 5,115,631

CLASS 60

39.01 5,115,633
39.02 5,115,634
39.03 5,115,635
39.142 5,115,637
39.281 5,115,638
39.33 5,115,636
274 5,115,639
384 5,115,640
605.1 5,115,641
734 5,116,362
751 5,115,642

CLASS 62

24 5,116,396
115 5,115,643
181 5,115,644
292 5,115,645

CLASS 63

[illegible] 5,115,646
12 5,115,647
15 5,115,648
26 5,115,649

CLASS 65

14 5,116,397
18.1 5,116,398
135 5,116,399
144 5,116,400

CLASS 66

169 A 5,115,650

CLASS 68

17 R 5,115,651

CLASS 70

209 5,115,652

CLASS 71

[illegible] 5,116,401
88 5,116,402
92 5,116,403
5,116,404
94 5,116,405
103 5,116,406
121 5,116,414

CLASS 72

8 5,115,653
62 5,115,654
68 5,115,655
96 5,115,656
164 5,115,657
175 5,115,658
187 5,115,659
197 5,115,660
297 5,115,661
345 5,115,662
370 5,115,663

CLASS 73

[illegible] 5,115,664
12 5,115,665
19.1 5,115,666
40.7 5,115,667
52 5,115,668
54.39 5,115,669
61.41 5,115,670
64.48 5,115,677
117 5,115,678
117.3 5,116,259
119 A 5,116,342
302 5,115,679
488 5,115,671
596 5,115,672
601 5,115,673
704 5,115,675
706 5,115,676
721 5,116,331
763 5,115,680
[illegible]01 5,115,681
861 5,115,682
861.38 5,115,683
861.48 5,115,684
862.33 5,115,685
863.31 5,115,686
863.61 5,115,687
863.71 5,116,330
863.91 5,115,688

CLASS 74

7 C 5,115,689
479 5,115,690
493 5,115,691
594.4 5,115,692
606 R 5,115,693
844 5,115,694
868 5,115,695
5,115,698
869 5,115,696

CLASS 75

238 5,116,416
327 5,116,417
386 Re.33,935
711 5,116,415

CLASS 76

108.6 5,115,697

CLASS 81

59.1 5,115,699
64 5,115,700
467 5,115,701

CLASS 82

126 5,115,702

CLASS 83

32 5,115,703
435.001 5,116,249
467.1 5,115,704

CLASS 84

617 5,115,705
653 5,116,192
723 5,115,706

CLASS 86

20.1 5,115,707

CLASS 89

1.14 5,115,708
1.808 5,115,709
1.809 5,115,710
1.816 5,115,711
25 5,115,716
26 5,115,715
33.14 5,115,713
33.16 5,115,714
36.14 5,115,712

CLASS 91

49 5,115,717
369.2 5,115,718
376 R 5,115,719
448 5,115,720
512 5,115,721
5,115,722

CLASS 92

5 R 5,115,723
102 5,115,724
157 5,115,725
219 5,115,726

CLASS 99

280 5,115,730
327 5,115,731
483 5,115,732
574 5,115,733

CLASS 100

5 5,115,734
43 5,115,735
90 5,115,736

CLASS 101

32 5,115,737
216 5,115,738
232 5,115,739
327 5,115,729
420 5,115,740
424.1 5,115,741

CLASS 102

208 5,115,742
439 5,116,224
472 5,115,743

CLASS 104

75 5,115,744
162 5,115,745
245 5,115,746

CLASS 105

50 5,115,747
286 5,115,748

CLASS 106

16 5,116,407
19 5,116,408
22 5,116,409
5,116,410
5,116,411
38.24 5,116,412
212 5,116,413
419 5,116,418
459 5,116,419
640 5,116,420
823 5,116,421

CLASS 110

245 5,115,749

CLASS 111

118 5,115,750

CLASS 114

27 5,115,751
39.1 5,115,752
[illegible] 5,115,753
101 5,115,754
105 5,115,755
221 R 5,116,260

CLASS 116

[illegible] 5,115,756
237 5,115,757

CLASS 118

52 5,116,250
322 5,115,758
621 5,115,759
5,115,760
641 5,115,761
694 5,116,321

CLASS 119

17 5,116,256
18 5,116,255
19 5,115,762
20 5,115,763
75 5,115,764
[illegible] 5,115,765
168 5,115,766

CLASS 122

494 5,115,767

CLASS 123

1 A 5,115,768
41.72 5,115,771
52 MB 5,116,231
90.11 5,115,772
179.24 5,115,773
182.1 5,116,287
193.6 5,115,770
276 5,115,774
292 5,115,775
299 5,115,776
333 5,115,777
425 5,115,778
5,115,779
5,116,356
478 5,115,780
481 5,115,781
489 5,115,782
496 5,115,783
516 5,115,784
520 5,115,785
531 5,115,786
549 5,115,787
559.3 5,115,788
569 5,115,789
571 5,115,790
572 5,115,791
613 5,115,792
620 5,115,793

CLASS 124

65 5,115,794
86 5,115,795

CLASS 125

13.01 5,115,796

CLASS 126

214 R 5,115,797
351 5,115,798

CLASS 127

2 5,116,422

CLASS 128

12 5,115,799
24 AA 5,115,805
26 5,115,806
32 5,115,769
200.14 B1 4,598,704
200.23 5,115,803
201.22 5,115,804
419 D 5,115,807
634 5,115,811
653.2 5,115,812
660.01 5,115,813
660.02 5,115,808
662.03 5,115,809
5,115,810
662.06 5,115,814
664 5,115,815
749 5,115,816
766 5,115,817
784 5,115,818

CLASS 131

109.3 5,115,819
194 5,115,820
238 5,115,821
336 5,115,823
342 5,115,824

CLASS 132

114 5,116,253
273 5,115,825

CLASS 134

15 5,116,423
5,116,424
17 5,116,425
40 5,116,426
135 5,115,822
183 5,115,826

CLASS 135

20.3 5,116,258
33.7 5,115,827
106 5,115,828

CLASS 136

259 5,116,427

CLASS 137

38 5,115,829
39 5,115,830
43 5,116,257
102 5,115,831
227 5,115,832
286 5,115,833
385 5,115,834
596.13 5,115,835
614.04 5,115,836
625.3 5,116,252
625.41 5,115,837

CLASS 139

65 5,115,838
5,116,364
291 C 5,115,839
351 5,116,276
435.2 5,115,840

CLASS 141

1 5,115,843
250 5,115,841
286 5,115,842

CLASS 144

2 N 5,115,845
2 R 5,115,844
246 R 5,115,846
287 5,115,847

CLASS 148

23 5,116,432
24 5,116,433
101 5,116,434
111 5,116,435
5,116,436
287 5,116,437
404 5,116,438
438 5,116,428
518 5,116,430

VOL
1138
ISS
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530 5,116,431

CLASS 150

166 5,115,848

CLASS 152

209 R 5,115,849
5,115,850
225 R 5,115,851
518 5,115,852
527 5,115,853
556 5,115,854

CLASS 156

71 5,116,439
90 5,116,440
94 5,116,441
99 5,116,442
209 5,116,443
244.17 5,116,444
245 5,116,445
307.4 5,116,446
345 5,116,447
350 5,116,448
415 5,116,449
441 5,116,450
5,116,451
566 5,116,452
580 5,116,453
584 5,116,454
605 5,116,455
616.1 5,116,456
628 5,116,457
630 5,116,458
631 5,116,459
643 5,116,460
5,116,461
5,116,462
5,116,463
647 5,116,464

CLASS 159

42 5,116,473

CLASS 160

135 5,115,855
370.2 5,116,273

CLASS 162

52 5,116,475
60 5,116,476
71 5,116,474
301 5,116,477
358 5,116,478

CLASS 164

234 5,115,856
448 5,115,857

CLASS 165

1 5,115,858
10 5,115,859

CLASS 166

51 5,115,860
65.1 5,115,862
85 5,115,861
241 5,115,863
278 5,115,864
297 5,115,865
370 5,115,866

CLASS 169

28 5,115,867
45 5,115,868
69 5,115,869

CLASS 172

15 5,115,870

CLASS 174

35 GC 5,117,066
35 MS 5,117,065
38 5,117,067
52.4 5,117,068
261 5,117,069

CLASS 175

50 5,115,871
61 5,115,872
65 5,115,873
92 5,115,875

CLASS 177

70 5,115,874
145 5,115,876
212 5,115,877

CLASS 178

2 R 5,117,070
18 Re.33,936
19 5,117,071

CLASS 180

69.21 5,115,878
140 5,116,254
149 5,115,879

CLASS 181

106 5,115,880
5,115,881
144 5,115,882
152 5,115,883
156 5,115,884

CLASS 182

3 5,115,885
36 5,115,886

CLASS 184

6.4 5,115,887

CLASS 186

61 5,115,888

CLASS 187

11 5,116,764

CLASS 188

67 5,115,889
71.5 5,115,890
218 R 5,115,891
282 5,115,892

CLASS 190

11 5,115,893
18 A 5,115,895
5,116,289
117 5,115,894

CLASS 191

39 5,117,072

CLASS 192

0.05 5,115,896
5,115,897
84 PM 5,115,898

CLASS 196

334 5,115,899
335 5,115,900
345.3 5,115,901
365 5,115,902
400 5,115,903
403 5,115,904
465.1 5,115,905
716 5,115,906
744 5,115,907
832 5,115,908

CLASS 200

61.7 5,117,073
302.3 5,117,074
343 5,117,075
344 5,117,076
516 5,117,077

CLASS 203

57 5,116,465
58 5,116,466
5,116,467

CLASS 204

96 5,116,468
147 5,116,469
157.21 5,116,470
180.1 5,116,471
181.7 5,116,472
192.13 5,116,479
206 5,116,480
290 R 5,116,481
298.08 5,116,482
299 R 5,116,483

CLASS 206

38 5,115,909
150.0 5,115,910
330 5,115,911
334 5,115,912
447 5,115,913
499 5,115,914
524 5,115,915
545 5,116,240
581 5,115,916
586 5,115,917

CLASS 208

254 H 5,116,484
353 5,116,485

CLASS 209

3.1 5,115,918
12 5,116,486
164 5,116,487
170 5,116,488

CLASS 210

143 5,116,491
150 5,116,489
158 5,116,490
188 5,116,492
192 5,116,493
5,116,494
198.2 5,116,495
232 5,116,496
5,116,499
238 5,116,500
242.2 5,116,501
266 5,116,502
500.23 5,116,504
603 5,116,505
610 5,116,506
639 5,116,507
5,116,508
644 5,116,509
673 5,116,510
5,116,511
690 5,116,512
698 5,116,513
712 5,116,514
744 5,116,515
747 5,116,516
772 5,116,518
788 5,116,519

CLASS 211

50 5,115,919
59.2 5,115,920
71 5,115,921
186 5,115,924

CLASS 212

168 5,115,923
266 5,115,925

CLASS 213

50 5,115,926
75 R 5,115,927

CLASS 215

219 5,115,928
220 5,115,929
227 5,115,930
235 5,115,931
252 5,115,932

CLASS 219

10.55 E 5,117,078
10.55 F 5,117,079
10.55 R 5,117,080
69.1 5,117,081
69.12 5,117,082
69.16 5,117,083
100 5,117,084
121.27 5,117,085
121.64 5,117,086
121.71 5,117,087
137 PS 5,117,088
201 5,117,089
222 5,117,090
236 5,117,091
247 5,117,092
494 5,117,093
535 5,117,094

CLASS 220

1.5 5,115,933
276 5,115,934
407 5,115,935
426 5,115,936
507 5,115,937
618 5,115,938
705 5,115,939
737 5,115,940

CLASS 221

229 5,115,941

CLASS 222

1 5,115,942
94 5,115,943
5,115,944
96 5,115,945
107 5,115,947
129.1 5,115,956
145 5,115,946
209 5,115,948
211 5,115,949
321 5,115,980
490 5,115,950
533 5,115,951

CLASS 224

32 R 5,115,952
232 5,115,953
316 5,115,954
324 5,115,955

CLASS 227

67 5,115,957
180 5,115,958

CLASS 228

4.1 5,115,959
110 5,115,960
111 5,115,961
120 5,115,962
157 5,115,963
180.2 5,115,964

CLASS 229

23 R 5,116,290
103.1 5,116,105
109 5,115,965
125.03 5,115,966
101 5,117,095
375 5,117,096
439 5,117,097
472 5,117,098

CLASS 236

46 R 5,115,967
78 D 5,115,968

CLASS 237

69 5,115,969

CLASS 238

17 5,115,970

CLASS 239

3 5,115,971
8 5,115,972
20 5,115,973
23 5,115,974
55 5,115,975
57 5,115,976
68 5,115,977
107 5,115,978
265.37 5,115,979
402 5,115,981
585.3 5,115,982

CLASS 241

1 5,115,983
7 5,115,984
14 5,115,985
20 5,115,986
23 5,115,987
30 5,115,988
79.1 5,115,989
208 5,115,991
236 5,115,992

CLASS 242

68.4 5,115,993
95 5,115,994
107.2 5,115,990
157 R 5,115,995

CLASS 244

12.5 5,115,996
25 5,115,997
31 5,115,998
53 B 5,116,001
5,116,251
118.5 5,115,999
135 R 5,116,000

CLASS 246

187 R 5,116,002
220 5,116,006

CLASS 248

161 5,116,004
168 5,116,005
243 5,116,007
286 5,116,008
303 5,116,009
309.1 5,116,010
312 5,116,003
346 5,116,011
452 5,116,012
484 5,116,013
500 5,116,014
553 5,116,015
578 5,116,016

CLASS 250

208.2 5,117,099
221 5,117,100
226 5,117,101
229 5,117,102
5,117,103
230 5,117,104
231.18 5,117,105
235 5,117,106
287 5,117,107
288 5,117,108
5,117,109
306 5,117,110
310 5,117,111
311 5,117,112
370.07 5,117,113
370.11 5,117,114
432 R 5,117,115
474.1 5,117,116
492.2 5,117,117
551 5,117,118
559 5,117,119
572 5,117,120

CLASS 251

1.2 5,116,017
18 5,116,521
90 5,116,018
127 5,116,019
129.17 5,116,020
149.1 5,116,021
175 5,116,022
203 5,116,023

CLASS 252

8.6 5,116,520
18 5,116,522
45 5,116,523
90 5,116,524
171 5,116,525
172 5,116,526
299.5 5,116,528
299.61 5,116,527
5,116,529
5,116,530
299.65 5,116,531
301.36 5,116,533
301.4 P 5,116,532
308 5,116,534
313.2 5,116,535
314 5,116,536
378 R 5,116,537
389.61 5,116,538
408.1 5,116,539
511 5,116,540
518 5,116,541
5,116,542
545 5,116,543

CLASS 254

93 HP 5,116,024

CLASS 256

67 5,116,025

CLASS 264

1.1 5,116,547
1.3 5,116,548
5 5,116,549
12 5,116,550
26 5,116,551
28 5,116,552
39 5,116,553
40.1 5,116,554
40.5 5,116,555
46.6 5,116,557
5,116,558
65 5,116,559
5,116,560
115 5,116,561
132 5,116,562
167 5,116,563
255 5,116,564
464 5,116,556
532 5,116,565

CLASS 266

44 5,116,026
225 5,116,027

CLASS 267

64.12 5,116,028
136 Re.33,937
140.4 5,116,030

CLASS 269

87.3 5,116,031

CLASS 270

55 5,116,033

CLASS 271

2 5,116,034
3.1 5,116,035
5,116,036
5,116,037
10 5,116,038
34 5,116,039
101 5,116,040
158 5,116,041
176 5,116,042
213 5,116,043

CLASS 273

32 B 5,116,046
80.1 5,116,047
87 B 5,116,048
138 A 5,116,055
139 5,116,049
143 R 5,116,050
153 R 5,116,052
153 S 5,116,053
164 5,116,054
181 F 5,116,056
183 B 5,116,057
183 E 5,116,058
200 A 5,116,059
218 5,116,060
241 5,116,061
260 5,116,062
376 5,116,063
390 5,116,064
446 5,116,065
448 B 5,116,051

CLASS 277

81 R 5,116,066

CLASS 280

7.14 5,116,067
47.24 5,116,068
112.2 5,116,069
259 5,116,070
281.1 5,116,071
511 5,116,072
617 5,116,073
618 5,116,074
645 Re.33,939
688 5,116,075
691 5,116,076
707 5,116,077
5,116,078
731 Re.33,938
732 5,116,079
741 5,116,080

CLASS 281

36 5,116,081

CLASS 285

21 5,116,082
23 5,116,083
190 5,116,084
225 5,116,085
277 5,116,086
286 5,116,087
319 5,116,088

CLASS 292

78 5,116,089
236 5,116,090
318 5,116,091

CLASS 293

132 5,116,092

CLASS 294

19.1 5,116,093
67.3 5,116,341
81.61 5,116,094
94 5,116,095

CLASS 296

3 5,116,096
64 5,116,097

CLASS 297

170 5,116,098
194 5,116,099
313 5,116,100
330 5,116,101
357 5,116,102

CLASS 299

1.6 5,116,103
16 5,116,104

CLASS 301

41 W 5,116,106

CLASS 303

7 5,116,107
103 5,116,108
109 5,116,109

CLASS 307

130 5,117,121
140 5,117,122
239 5,117,123
272.1 5,117,124
296.2 5,117,125
443 5,117,127
5,117,129
5,117,130
448 5,117,131
465 5,117,132
471 5,117,133
475 5,117,134
514 5,117,135

CLASS 310

12 5,117,136
49 R 5,117,137
89 5,117,138
90.5 5,117,139
91 5,117,140
114 5,117,141
156 5,117,142
191 5,117,128
5,117,143
269 5,117,144
313 R 5,117,145
5,117,146
320 5,117,147
367 5,117,148

CLASS 312

116 5,116,274
292 5,116,261

CLASS 313

36 5,117,162
103 R 5,117,149
112 5,117,150
413 5,117,151
426 5,117,152
447 5,117,153
634 5,117,154

CLASS 315

8 5,117,155
73 5,117,156
173 5,117,157
220 5,117,158
226 5,117,161
326 5,117,160
366 5,117,159

CLASS 318

52 5,117,163
135 5,117,164
254 5,117,165
362 5,117,166
439 5,117,167
444 5,117,168
578 5,117,169
646 5,117,170
696 5,117,171

CLASS 320

15 5,117,172
21 5,117,173

CLASS 322

5,117,174

CLASS 323

256 5,117,175
308 5,117,176
314 5,117,177
320 5,117,178

CLASS 324

77 CS 5,117,179
132 5,117,180
207.18 5,117,181
220 5,117,182
228 5,117,183
239 5,117,184
262 5,117,185
307 5,117,186
309 5,117,187
318 5,117,188
415 5,117,189
452 5,117,190
551 5,117,191
727 5,117,192

CLASS 328

120 5,117,193
233 5,117,194

CLASS 329

307 5,117,195

CLASS 330

149 5,117,197
251 5,117,198
252 5,117,199
253 5,117,200
279 5,117,201
5,117,202
294 5,117,203

CLASS 331

8 5,117,204
117 FE 5,117,205
158 5,117,206

CLASS 333

1 5,117,207

CLASS 335

8 5,117,208
80 5,117,209
172 5,117,210
202 5,117,211
210 5,117,212
219 5,117,213

CLASS 336

170 5,117,214
178 5,117,215

CLASS 338

24 5,117,216

CLASS 340

426 5,117,217
450.3 5,117,218
518 5,117,219
550 5,117,220
556 5,117,221
573 5,117,222
693 5,117,223
703 5,117,224
717 5,117,225
726 5,117,226
825.69 5,117,233

CLASS 341

143 5,117,234
159 5,117,235
186 5,117,227
200 5,117,228

CLASS 342

1 5,117,229
169 5,117,230
195 5,117,231
357 5,117,232
367 5,117,236
372 5,117,237
373 5,117,238
375 5,117,239

CLASS 343

786 5,117,240

CLASS 346

1.1 5,117,241
5,117,242
108 5,117,243
140 R 5,117,244
160 5,117,245

CLASS 351

161 5,116,111
162 5,116,112
163 5,116,113
205 5,116,114
212 5,116,115
221 5,116,116

CLASS 353

94 5,116,117

CLASS 354

202 5,117,246
222 5,117,247
234.1 5,117,248
291 5,117,249
400 5,117,250
5,117,251
415 5,117,252

CLASS 355

32 5,117,253
43 5,117,254
53 5,117,255
77 5,117,256
91 5,117,257
201 5,117,258
203 5,117,259
204 5,117,260
207 5,117,261
215 5,117,262
256 5,117,263
299 5,117,264
311 Re.33,940
313 5,117,265
316 5,117,266

CLASS 356

2 5,116,118
28 5,116,119
246 5,116,120
301 5,116,121
326 5,116,122
5,116,123
342 5,116,124
343 5,116,125
349 5,116,126
350 5,116,127
5,116,128
5,116,129
5,116,130
5,116,131
5,116,132
352 5,116,133

CLASS 357

16 5,117,267
22 5,117,268
23.5 5,117,269
30 5,117,270
34 5,117,271
43 5,117,274
52 5,117,272
54 5,117,273
70 5,117,275
71 5,117,276
5,117,277
72 5,117,278
5,117,279
5,117,280
81 5,117,281
5,117,282

CLASS 358

22 5,117,283
79 5,117,284
85 5,117,285
5,117,286
133 5,117,287
136 5,117,288
140 5,117,289
158 5,117,290
167 5,117,291
213.19 5,117,292
298 5,117,293
447 5,117,294
474 5,117,295

CLASS 359

21 5,117,296
40 5,116,110
52 5,117,297
55 5,117,298
58 5,117,299
88 5,117,300
154 5,117,301
227 5,117,302
330 5,117,126
333 5,117,196
341 5,117,303
529 5,117,304
5,117,305
565 5,117,306
617 5,117,307
654 5,117,308
5,117,309
745 5,117,310
819 5,117,311
858 5,117,312

CLASS 360

40 5,117,313
51 5,117,314
71 5,117,315
73.07 5,117,316
74 5,117,317
105 5,117,318
113 5,117,319
5,117,320
120 5,117,321
130.24 5,117,322

CLASS 361

47 5,117,323
66 5,117,324
87 Re.33,941
93 5,117,325
321 5,117,326
323 5,117,327
380 5,117,328
395 5,117,329
400 5,117,330
407 5,117,331
525 5,117,332
527 5,117,333

CLASS 362

28 5,117,334
61 5,117,335
5,117,336
74 5,117,337
104 5,117,338
109 5,117,339
148 5,117,340
184 5,117,341
217 5,117,342
297 5,117,343
352 5,117,344
390 5,117,345

CLASS 363

51 5,117,346
56 5,117,347

CLASS 364

167.01 5,117,348
401 5,117,354
405 5,117,355
406 5,117,356
413.08 5,117,357
419 5,117,358
420 5,117,359
423 5,117,360
426.02 5,117,361
433 5,117,362
449 5,117,363
464.03 5,117,364
468 5,117,365
474.02 5,117,366
474.09 5,117,367
474.32 5,117,368
484 5,117,369
497 5,117,370
550 5,117,373
559 5,117,374
571.01 5,117,375
571.04 5,117,376
578 5,117,377
708 5,117,378
715.01 5,117,379
717 5,117,380
725 5,117,381
736 5,117,382
746 5,117,383
748 5,117,384
757 5,117,385
787 5,117,386

CLASS 365

73 5,117,388
104 5,117,389
155 5,117,390
5,117,391
189.09 5,117,392
201 5,117,393
203 5,117,394
221 5,117,395

CLASS 366

208 5,116,134
349 5,116,135

CLASS 367

3 5,117,396
13 5,117,397
85 5,117,398
99 5,117,399
128 5,117,400
135 5,117,401
140.1 AE 5,116,029
143 5,117,402
175 5,117,403

CLASS 368

10 5,117,404
93 5,117,405
282 5,117,406

CLASS 369

30 5,117,407
32 5,117,408
36 5,117,409
44.25 5,117,410
72 5,117,411
109 5,117,412
215 5,117,413
266 5,117,414
271 5,117,415
284 5,117,416

CLASS 370

13 5,117,417
32.1 5,117,418
50 5,117,419
60 5,117,420
5,117,429
85.1 5,117,421
5,117,430
95.1 5,117,422
5,117,423
105.5 5,117,424
110.1 5,117,425

CLASS 371

37.4 5,117,427
51.1 5,117,428
214 5,117,426

CLASS 372

2 5,117,431
5 5,117,432
22 5,117,433
56 5,117,434
59 5,117,435
72 5,117,436
91 5,117,437

CLASS 373

80 5,117,438
88 5,117,439

CLASS 374

102 5,116,136
132 5,116,137
401 5,117,353

CLASS 375

82 5,117,440
90 5,117,441
107 5,117,442
111 5,117,443

CLASS 376

260 5,116,566
433 5,116,567

CLASS 377

24.2 5,117,444

CLASS 378

65 5,117,445
99 5,117,446
5,117,447
132 5,117,448

CLASS 379

58 5,117,449
5,117,450
67 5,117,451
98 5,117,452
100 5,117,453
262 5,117,454
368 5,117,455
438 5,117,456

CLASS 380

3 5,117,457
4 5,117,458

CLASS 381

24 5,117,459
41 5,117,460
72 5,117,461
156 5,117,462
158 5,117,463
183 5,117,464
187 5,117,465

CLASS 382

6 5,117,466
5,117,467
41 5,117,468

CLASS 383

33 5,116,138
49 5,116,139
206 5,116,140

CLASS 384

17 5,116,141
55 5,116,142
106 5,116,143
291 5,116,144
463 5,116,145
578 5,116,146
615 5,116,147

CLASS 385

11 5,117,469
14 5,117,470
16 5,117,471
18 5,117,472
33 5,117,473
39 5,117,474
81 5,117,475
88 5,117,476
5,117,477
133 5,117,478
136 5,117,479
145 5,117,480

CLASS 392

416 5,117,481
492 5,117,482

CLASS 395

100 5,117,483
5,117,484
134 5,117,485
150 5,117,371
161 5,117,372
250 5,117,486
375 5,117,387
5,117,487
5,117,488
5,117,489
5,117,490
5,117,491
400 5,117,492
425 5,117,350
5,117,493
575 5,117,352
5,117,494
600 5,117,349
5,117,495
650 5,117,351
700 5,117,496
5,117,497
775 5,117,498
800 5,117,499
5,117,500

CLASS 400

241 5,116,148
314.1 5,116,149
320 5,116,150

CLASS 401

9 5,116,151
35 5,116,153
127 5,116,154
208 5,116,156
261 5,116,152

CLASS 402

18 5,116,157

CLASS 403

27 5,116,193
28 5,116,158
132 5,116,159
172 5,116,160
187 5,116,299
231 5,116,161

CLASS 404

72 5,116,162

CLASS 405

107 5,116,300
128 5,116,163
154 5,116,354
230 5,116,355
303 5,116,164

CLASS 407

54 5,116,165
57 5,116,166
114 5,116,167

CLASS 408

1 R 5,116,168
39 5,116,169
72 B 5,116,170
147 5,116,171
181 5,116,194
226 5,116,172

CLASS 409

13 5,116,173
79 5,116,174

CLASS 411

20 5,116,175
60 5,116,176
87 5,116,178
466 5,116,179

CLASS 414

5 5,116,180
222 5,116,181
254 5,116,182
395 5,116,183
406 5,116,184
415 5,116,185
694 5,116,186
699 5,116,187
719 5,116,188
722 5,116,189
735 5,116,190
786 5,116,191
790.3 5,116,195

CLASS 415

89 5,116,196
126 5,116,197
169.1 5,116,198
173.2 5,116,199
183 5,116,200

CLASS 416

107 5,116,209
140 5,116,201
204 R 5,116,202

CLASS 417

53 5,116,203
64 5,116,205
234 5,116,206
312 5,116,207

CLASS 418

63 5,116,208

CLASS 419

11 5,116,568

CLASS 420

44 5,116,569
54 5,116,570
110 5,116,571
533 5,116,572

CLASS 422

3 5,116,574
28 5,116,575
55 5,116,576
58 5,116,577
63 5,116,578
111 5,116,579
5,116,580
180 5,116,581
186.07 5,116,583
186.3 5,116,582

CLASS 423

235 5,116,584
5,116,585
239 5,116,586
244 5,116,587
5,116,588
298 5,116,589
328 5,116,590
352 5,116,591
415 R 5,116,592
473 5,116,593
5,116,594
477 5,116,595

CLASS 424

1.1 5,116,573
5,116,596
5,116,597
5,116,598
9 5,116,599
10 5,116,600
47 5,116,601
49 5,116,602
53 5,116,603
59 5,116,604
70 5,116,605
5,116,606
5,116,607
72 5,116,608
78.09 5,116,611
78.12 5,116,610
85.2 5,116,612
85.8 5,116,613
92 5,116,614

94.2 5,116,615
94.4 5,116,616
401 5,116,617
405 5,116,618
433 5,116,619
445 5,116,620
5,116,621
545 5,116,622
616 5,116,623
702 5,116,624

CLASS 425

111 5,116,210
141 5,116,211
147 5,116,212
183 5,116,213
345 5,116,214
381 5,116,215
504 5,116,216
534 5,116,217
547 5,116,218

CLASS 426

3 5,116,625
5,116,626
5 5,116,627
330.1 5,116,628
545 5,116,629
549 5,116,630
568 5,116,631
597 5,116,632
641 5,116,633

CLASS 427

4 5,116,634
8 5,116,635
33 5,116,636
54.1 5,116,638
5,116,639
66 5,116,640
96 5,116,641
5,116,642
126.3 5,116,643
164 5,116,644
320 5,116,645
340 5,116,637
383.5 5,116,646
407.1 5,116,647

CLASS 428

7 5,116,648
34.2 5,116,649
5,116,650
35.7 5,116,651
36.9 5,116,652
58 5,116,653
77 5,116,654
92 5,116,655
131 5,116,656
137 5,116,657
141 5,116,658
188 5,116,659
192 5,116,660
198 5,116,661
5,116,662
209 5,116,663
216 5,116,664
5,116,665
220 5,116,666
5,116,667
221 5,116,668
250 5,116,669
285 5,116,670
309.9 5,116,671
328 5,116,672
332 5,116,673
335 5,116,674
343 5,116,675
5,116,676
349 5,116,677
355 5,116,678
367 5,116,679
369 5,116,680
373 5,116,681
395 5,116,682
403 5,116,683
417 5,116,684
425.9 5,116,685
467 5,116,686
542.8 5,116,687
582 5,116,688
593 5,116,689
614 5,116,690
5,116,691
650 5,116,692
694 5,116,693
698 5,116,694

CLASS 429

12 5,116,695
26 5,116,696
86 5,116,697
94 5,116,698
100 5,116,699
121 5,116,700
130 5,116,701

CLASS 430

3 5,116,704
45 5,116,705
54 5,116,702
58 5,116,706
59 5,116,703
5,116,707
5,116,708
96 5,116,709
5,116,710
106 5,116,711
5,116,712
110 5,116,713
117 5,116,714
190 5,116,715
203 5,116,716
264 5,116,717
313 5,116,719
327 5,116,718
331 5,116,720
351 5,116,721
363 5,116,722
611 5,116,723

CLASS 431

113 5,116,220

CLASS 432

77 5,116,221

CLASS 433

48 5,116,222
79 5,116,223
173 5,116,225
176 5,116,226
216 5,116,227

CLASS 435

1 5,116,724
5 5,116,725
5,116,726
6 5,116,727
14 5,116,728
5,116,729
15 5,116,730
18 5,116,731
26 5,116,732
28 5,116,733
5,116,734
34 5,116,735
39 5,116,736
42 5,116,737
69.1 5,116,738
69.6 5,116,739
70.4 5,116,740
87 5,116,741
91 5,116,742
116 5,116,743
128 5,116,744
134 5,116,745
172.3 5,116,746
178 5,116,747
189 5,116,748
193 5,116,749
5,116,750
194 5,116,751
200 5,116,752
240.2 5,116,753
252.1 5,116,754
252.3 5,116,755
253.5 5,116,756
255 5,116,757
287 5,116,758
288 5,116,759
290 5,116,760
316 5,116,761

CLASS 436

15 5,116,762
95 5,116,763
161 5,116,764
165 5,116,765
506 5,116,766

CLASS 437

7 5,116,767
21 5,116,768
22 5,116,769
31 5,116,770
40 5,116,771
5,116,774
41 5,116,772
5,116,773
52 5,116,775
5,116,776
56 5,116,777
57 5,116,778
67 5,116,779
89 5,116,780
168 5,116,781
172 5,116,782
211 5,116,783
225 5,116,784
243 5,116,785

CLASS 439

56 5,116,229
101 5,116,230
107 5,116,232
161 5,116,233
215 5,116,235
271 5,116,236
326 5,116,237
441 5,116,238
497 5,116,239
511 5,116,241
538 5,116,242
578 5,116,244
581 5,116,245
621 5,116,246
660 5,116,247
669 5,116,248
709 5,116,262
733 5,116,263
801 5,116,265
851 5,116,266

CLASS 440

56 5,116,267

CLASS 441

3 5,116,268
65 5,116,269

CLASS 445

24 5,116,270
5,116,271
26 5,116,272

CLASS 446

48 5,116,275
319 5,116,277

CLASS 450

61 5,116,278

CLASS 452

195 5,116,279

CLASS 454

61 5,115,728
69 5,115,727
137 5,116,280

CLASS 455

11.1 5,117,501
33.1 5,117,502
51.1 5,117,503
67.1 5,117,504
278.1 5,117,505

CLASS 472

92 5,116,045

CLASS 474

1 5,116,281
49 5,116,282
84 5,116,283
110 5,116,284
144 5,116,285
237 5,116,286

CLASS 475

16 5,116,292
178 5,116,291
202 5,116,293

CLASS 482

52 5,116,044
5,116,294
53 5,116,295
91 5,116,296
97 5,116,297

CLASS 493

4 5,116,298
215 5,116,301
254 5,116,302
313 5,116,303

CLASS 501

15 5,116,786
66 5,116,787
5,116,788
5,116,789
96 5,116,791
139 5,116,790

CLASS 502

66 5,116,792
68 5,116,793
85 5,116,794
117 5,116,795
154 5,116,796
162 5,116,797
218 5,116,798
225 5,116,799
303 5,116,800
307 5,116,801

CLASS 503

208 5,116,802
5,116,803
209 5,116,804
227 5,116,805
5,115,806

CLASS 505

1 5,116,807
5,116,808
5,116,809
5,116,810
5,116,811
5,116,812

CLASS 512

27 5,116,813

CLASS 514

2 5,116,814
11 5,116,815
5,116,816
15 5,116,817
5,116,818
21 5,116,819
25 5,116,820
5,116,821
49 5,116,822
50 5,116,823
55 5,116,824
58 5,116,825
63 5,116,826
77 5,116,992
82 5,116,827
171 5,116,828
172 5,116,829
182 5,116,830
184 5,116,831
195 5,116,832
210 5,116,833
212 5,116,834
218 5,116,835
224.2 5,116,836
229.8 5,116,837
236.8 5,116,838
250 5,116,840
5,116,841
252 5,116,842
253 5,116,843
269 5,116,844
279 5,116,845
317 5,116,846
327 5,116,847
332 5,116,848
337 5,116,849
341 5,116,850
354 5,116,851
359 5,116,852
363 5,116,853
365 5,116,854
369 5,116,855
370 5,116,856
5,116,857
391 5,116,858
392 5,116,859
399 5,116,860
427 5,116,861
436 5,116,862
450 5,116,863
455 5,116,864
456 5,116,869
510 5,116,865
522 5,116,866
534 5,116,867
546 5,116,868
548 5,116,870
560 5,116,871
561 5,116,872
567 5,116,873
592 5,116,874
594 5,116,875
617 5,116,877
634 5,116,838
653 5,116,878

CLASS 518

716 5,116,879

CLASS 521

134 5,116,880
143 5,116,881
147 5,116,882
178 5,116,883

CLASS 522

1 5,116,876

CLASS 523

106 5,116,884
200 5,116,885
209 5,116,886
400 5,116,887
409 5,116,888

CLASS 524

14 5,116,889
30 5,116,890
97 5,116,891
99 5,116,892
100 5,116,893
5,116,894
123 5,116,895
243 5,116,897
371 5,116,898
5,116,899
377 5,116,900
457 5,116,901
579 5,116,902
589 5,116,903

CLASS 525

8 5,116,904
54.2 5,116,962
67 5,116,905
68 5,116,906
77 5,116,907
190 5,116,896
193 5,116,908
227 5,116,909
244 5,116,910
329.9 5,116,911
340 5,116,912
350 5,116,916
407 5,116,917
415 5,116,918
420 5,116,919
432 5,116,913
5,116,920
528 5,116,914

CLASS 526

60 5,116,915
287 5,116,921
304 5,116,922
307.2 5,116,923
312 5,116,924
323.1 5,116,925
348.1 5,116,926

CLASS 527

300 5,116,927

CLASS 528

18 5,116,928
44 5,116,929
45 5,116,930
59 5,116,931
80 5,116,932
125 5,116,933
5,116,934
5,116,935
271 5,116,936
272 5,116,937
5,116,938
5,116,939
483 5,116,940

CLASS 530

215 5,116,945
300 5,116,946
323 5,116,947
324 5,116,948
331 5,116,941
350 5,116,942
351 5,116,943
362 5,116,944
363 5,116,949
382 5,116,950
395 5,116,951
399 5,116,952
400 5,116,953

CLASS 534

551 5,116,954
582 5,116,955
591 5,116,958
612 5,116,956
632 5,116,957
642 5,116,959

CLASS 536

6.5 5,116,960
18.2 5,116,961
21 5,116,963
27 5,116,964
5,116,965
50 5,116,966
5,116,967
71 5,116,968
128 5,116,969

CLASS 540

362 5,116,971
364 5,116,972
487 5,116,973
591 5,116,974

CLASS 544

86 5,116,975
113 5,116,977
144 5,116,978
172 5,116,979
229 5,116,980
235 5,116,970

CLASS 546

13 5,116,982
14 5,116,983
20 5,116,976
101 5,116,984
141 5,116,985
5,116,986
223 5,116,987
245 5,116,988
265 5,116,989
268 5,116,981
315 5,116,991
345 5,116,993

CLASS 548

251 5,116,994
262.4 5,116,990
303 5,117,003
323 5,117,004
369 5,117,005
421 5,117,006
444 5,116,995
457 5,116,996
5,116,997
560 5,116,998

CLASS 549

18 5,116,999
59 5,117,000
214 5,117,001
241 5,117,002
259 5,117,007
274 5,117,008
394 5,117,009
516 5,117,010
523 5,117,011
538 5,117,012
540 5,117,013

CLASS 552

249 5,117,014
541 5,117,015
545 5,117,016
553 5,117,017
653 5,117,018

CLASS 554

149 5,116,545
167 5,116,546

CLASS 556

26 5,117,019
43 5,117,020
130 5,117,021
137 5,117,022
413 5,117,024
434 5,117,025
435 5,117,026
440 5,117,027
445 5,117,028
457 5,117,029
472 5,117,030

CLASS 558

20 5,117,031
34 5,117,032
163 5,117,033
169 5,117,034
250 5,117,035

CLASS 560

24 5,117,036
53 5,117,037
55 5,117,038
60 5,117,039
75 5,117,040
87 5,117,041
121 5,117,042
150 5,117,043
193 5,117,044
219 5,116,544
5,117,045
232 5,117,046
302 5,117,047
347 5,117,048

CLASS 562

2 5,117,049
58 5,117,050
101 5,117,051
461 5,117,052
506 5,117,053
621 5,117,054
849 5,117,055

CLASS 564

134 5,117,056
149 5,117,057
157 5,117,058
252 5,117,059
259 5,117,060
384 5,117,061
385 5,117,062
398 5,117,063
399 5,117,064

CLASS 600

13 5,116,304
18 5,116,305
39 5,115,800

CLASS 602

19 5,116,306
33 5,115,802
48 5,115,801

CLASS 604

4 5,116,307
5,116,308
8 5,116,309
43 5,116,310
54 5,116,311
66 5,116,312
70 5,116,313
77 5,116,314
82 5,116,315
83 5,116,316
96 5,116,317
5,116,318
110 5,116,319
5,116,320
164 5,116,323
180 5,116,324
192 5,116,325
198 5,116,326
284 5,116,327
289 5,116,328

CLASS 606

11 5,116,329
42 5,116,332
51 5,116,333
61 5,116,334
5,116,335
65 5,116,336
73 5,116,337
90 5,116,338
91 5,116,339
103 5,116,340
128 5,116,343
130 5,116,344
5,116,345
131 5,116,346
5,116,347
133 5,116,348
142 5,116,349
159 5,116,350
167 5,116,351
171 5,116,352
184 5,116,353
213 5,116,357
224 5,116,358
241 5,116,359

CLASS 623

1 5,116,360
5,116,361
5,116,365
2 5,116,366
5,116,367
5,116,368
6 5,116,369
8 5,116,370
11 5,116,371
13 5,116,372
5,116,373
16 5,116,374
20 5,116,375
5,116,376
23 5,116,377
5,116,378
5,116,379
5,116,380
33 5,116,381
38 5,116,382
49 5,116,383
5,116,384
55 5,116,385
64 5,116,386
66 5,116,387

CLASSIFICATION OF DESIGNS

D1— 122 326,348
D2— 249 326,349
278 326,350
314 326,351
326,352
326,353
326,354
320 326,355
D3— 35 326,356
326,357
40 326,358
326,359
44 326,360
D4— 114 326,361
136 326,362
D5— 32 326,363
D6— 300 326,364
315 326,365
320 326,366
335 326,367
360 326,372
363 326,368
366 326,369
326,370
372 326,371
379 326,373
412 326,374
436 326,376
437 326,375
461 326,377
467 326,378
475 326,379
501 326,380
510 326,381
534 326,383
550 326,382
555 326,384
D7— 308 326,385
309 326,386
346 326,387
381 326,388
396.5 326,389
504 326,390
605 326,391
616 326,392
641 326,394
649 326,393
D8— 32 326,395
45 326,396
51 326,397
62 326,398
66 326,399
68 326,400
70 326,401
331 326,402
349 326,403
356 326,404
367 326,405
394 326,406
395 326,407
499 326,408
D9— 341 326,409
425 326,41.
455 326,413
517 326,410
552 326,411
D10— 2 326,414
20 326,415
22 326,416
26 326,417
30 326,418
39 326,419
69 326,420
92 326,421
105 326,422
106 326,423
113 326,424
114 326,425
326,426
129 326,427
D11— 30 326,428
42 326,430
43 326,429
81 326,431
166 326,432
221 326,433
222 326,434
D12— 92 326,435
107 326,436
128 326,437
142 326,438
147 326,439
326,440
156 326,441
326,442
D13— 147 326,443
156 326,444
173 326,445
D14— 100 326,446
107 326,447
326,448
138 326,449
326,450
326,451
326,452
162 326,453
326,454
189 326,455
219 326,456
D15— 9.1 326,462
11 326,457
17 326,458
29 326,459
326,460
86 326,461
125 326,463
D16— 102 326,464
326,465
209 326,466
217 326,467
D17— 1 326,468
22 326,469
99 326,470
D18— 7 326,471
14 326,472
55 326,473
D19— 69 326,474
326,475
92 326,476
D20— 19 326,477
43 326,478
D21— 2 326,479
11 326,480
16 326,481
34 326,482
62 326,483
326,484
75 326,485
108 326,486
109 326,487
111 326,488
131 326,489
135 326,490
195 326,491
196 326,492
234 326,493
253 326,494
326,495
D22— 122 326,496
129 326,497
141 326,498
326,499
D23— 200 326,500
213 326,501
221 326,502
233 326,503
255 326,504
D25— 48 326,528
D26— 2 326,532
65 326,533
326,535
74 326,536
326,537
87 326,538
138 326,539
D29— 7 326,534
326,540
8 326,541
D30— 129 326,542
D32— 21 326,543
326,544
28 326,545
49 326,546
70 326,547
326,548
D34— 26 326,549
40 326,550
41 326,551
42 326,552
326,518
122 326,519
167 326,521
326,522
197 326,523
199 326,524
214 326,525
326,526
224 326,527
326,528
326,529
113 326,530
326,531

CLASSIFICATION OF PLANTS

P.— 54 7,872
68 7,873
86 7,874
7,875

VOL
1138
ISS
4
MY
26
1992
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GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	5,115,997	5,115,710	5,116,181	5,116,935	08 :	5,115,662	5,116,850
	5,116,312	5,115,733	5,116,184	5,116,943		5,115,680	5,116,937
	5,116,553	5,115,742	5,116,185	5,116,964		5,115,706	5,117,008
02 :	5,117,016	5,115,755	5,116,189	5,116,982		5,115,866	5,117,041
04 :	Re.33,938	5,115,798	5,116,190	5,116,989		5,115,957	11 : 5,116,939
	5,115,571	5,115,799	5,116,191	5,117,033		5,116,299	12 : 5,115,521
	5,115,588	5,115,805	5,116,203	5,117,066		5,116,415	5,115,635
	5,115,683	5,115,807	5,116,208	5,117,068		5,116,443	5,115,731
	5,115,700	5,115,814	5,116,227	5,117,091		5,116,511	5,115,753
	5,115,994	5,115,829	5,116,229	5,117,093		5,116,582	5,115,762
	5,116,047	5,115,842	5,116,237	5,117,114		5,116,643	5,115,804
	5,116,067	5,115,843	5,116,253	5,117,125		5,116,742	5,115,962
	5,116,093	5,115,858	5,116,268	5,117,132		5,117,133	5,116,011
	5,116,115	5,115,867	5,116,269	5,117,188		5,117,177	5,116,012
	5,116,138	5,115,893	5,116,277	5,117,197		5,117,180	5,116,057
	5,116,158	5,115,895	5,116,296	5,117,198		5,117,227	5,116,069
	5,116,263	5,115,921	5,116,310	5,117,199		5,117,372	5,116,151
	5,116,324	5,115,934	5,116,315	5,117,216		5,117,414	5,116,239
	5,116,451	5,115,943	5,116,317	5,117,217	09 :	5,115,530	5,116,289
	5,116,460	5,115,963	5,116,327	5,117,225		5,115,607	5,116,295
	5,116,461	5,115,973	5,116,328	5,117,233		5,115,642	5,116,318
	5,116,502	5,115,976	5,116,329	5,117,243		5,115,859	5,116,346
	5,116,620	5,115,978	5,116,371	5,117,276		5,116,039	5,116,350
	5,116,774	5,115,991	5,116,374	5,117,289		5,116,064	5,116,357
	5,117,274	5,115,996	5,116,401	5,117,302		5,116,065	5,116,360
	5,117,362	5,115,998	5,116,441	5,117,314		5,116,201	5,116,362
	5,117,391	5,116,003	5,116,457	5,117,328		5,116,349	5,116,365
05 :	5,115,594	5,116,004	5,116,471	5,117,347		5,116,353	5,116,433
	5,115,795	5,116,010	5,116,496	5,117,349		5,116,358	5,116,515
	5,116,501	5,116,015	5,116,567	5,117,366		5,116,386	5,116,605
06 :	5,115,516	5,116,017	5,116,584	5,117,377		5,116,398	5,116,606
	5,115,525	5,116,023	5,116,589	5,117,385		5,116,408	5,116,675
	5,115,532	5,116,049	5,116,607	5,117,387		5,116,636	5,117,140
	5,115,565	5,116,051	5,116,612	5,117,389		5,116,705	5,117,173
	5,115,576	5,116,056	5,116,648	5,117,396		5,116,852	5,117,175
	5,115,580	5,116,061	5,116,678	5,117,401		5,116,854	5,117,282
	5,115,595	5,116,068	5,116,685	5,117,405		5,116,931	5,117,307
	5,115,603	5,116,071	5,116,689	5,117,428		5,116,970	5,117,344
	5,115,604	5,116,077	5,116,719	5,117,432		5,117,095	5,117,350
	5,115,625	5,116,090	5,116,725	5,117,435		5,117,183	5,117,360
	5,115,626	5,116,100	5,116,726	5,117,436		5,117,189	5,117,500
	5,115,627	5,116,110	5,116,750	5,117,442		5,117,210	13 : 5,115,582
	5,115,637	5,116,118	5,116,753	5,117,443		5,117,211	5,115,882
	5,115,638	5,116,126	5,116,778	5,117,444		5,117,275	5,115,956
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	5,115,679	5,116,134	5,116,895	5,117,493		5,116,680	5,116,288
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	5,115,709	5,116,150	5,116,916	5,117,505		5,116,846	5,116,034

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17 : Re.33,941
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5,116,172
5,116,236
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5,116,307
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5,116,439
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5,116,634
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5,116,795
5,116,819
5,117,007
5,117,065
5,117,067
5,117,073
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5,117,219
5,117,236
5,117,296
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5,117,441
5,117,449
5,117,450
5,117,459
5,117,460
4,215,513
18 : 5,115,666
5,115,729
5,115,887
5,116,062
5,116,165
5,116,170
5,116,248
5,116,257
5,116,293
5,116,334
5,116,339
5,116,729
5,116,763
5,116,864
5,116,874
5,116,905
5,116,972
5,117,123
5,117,143
19 : 5,115,517
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5,115,634
5,115,764
5,115,815
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5,116,486
5,117,122
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5,116,297
21 : 5,115,554
5,115,822
5,115,870
5,115,920
5,116,416
5,116,487
5,117,355
22 : 5,115,860
5,115,864
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5,115,872
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5,116,490
5,116,595
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5,117,011
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24 : 5,117,461
5,115,538
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5,116,044
5,116,102
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5,116,512
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5,116,868
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5,117,139
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25 : Re.33,937
5,115,563
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5,116,060
5,116,113
5,116,136
5,116,153
5,116,157
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5,116,272
5,116,305
5,116,333
5,116,427
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5,116,464
5,116,483
5,116,493
5,116,494
5,116,509
5,116,533
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5,116,633
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5,116,771
5,116,810
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5,117,072
5,117,124
5,117,149
5,117,186
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5,117,252
5,117,339
5,117,351
5,117,352
5,117,420
5,117,465
26 : 5,115,593
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5,115,691
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5,116,235
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5,116,337
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5,116,388
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5,115,964
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5,116,036
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5,116,141
5,116,173
5,116,174
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5,116,335
5,116,347
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5,116,400
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5,116,470
5,116,476
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5,116,489
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5,116,560
5,116,583
5,116,591
5,116,592
5,116,597
5,116,616
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5,116,703
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5,116,975
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5,117,238
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5,117,244
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5,116,018
5,116,027
5,116,152
5,116,159
5,116,178
5,116,199
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5,116,221
5,116,256
5,116,278
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5,116,323
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5,116,691
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5,116,446
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5,116,927
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5,115,544
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5,116,331
5,116,549
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5,117,306
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5,115,675
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5,115,999
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5,116,414
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5,117,059
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5,115,728
5,115,732

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5,116,566
5,116,618
5,116,737
5,116,881
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5,117,297
5,117,325
5,117,354

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01 : 326,373
02 : 326,423
04 : 326,361
06 : 326,355
326,356
326,359
326,374
326,383
326,393
326,402
326,408
326,442
326,446
326,463
326,476
326,483
326,485
326,486
326,493
326,504
326,507
326,524
326,527

08 : 326,362
326,447
326,519
09 : 326,386
326,397
326,542
326,547
12 : 326,404
326,405
326,424
326,425
326,426
326,451
326,452
326,469
326,495
326,502
326,512

13 : 326,514
326,378
326,385
326,396
326,414
326,445
326,455
326,465
326,508
326,523
326,549
326,458
21 : 326,401
22 : 326,470
25 : 326,353
26 : 326,372
326,380
326,441
326,529
326,541
326,550
27 : 326,384
326,443

326,457
326,497
29 : 326,395
326,431
326,432
326,456
326,515
34 : 326,500
326,516
35 : 326,430
36 : 326,350
326,368
326,387
326,389
326,410
326,420
326,422
326,429
326,475
326,492
326,494
326,533
326,546

37 : 326,365
326,406
39 : 326,439
326,440
326,484
326,490
326,538
326,543
40 : 326,364
326,477
326,501
41 : 326,351
326,352
326,354
42 : 326,363
326,375
326,413
326,449
44 : 326,390
45 : 326,434
326,510
46 : 326,459

47 : 326,460
326,489
326,552
48 : 326,358
326,376
326,428
326,462
49 : 326,481
326,491
50 : 326,349
51 : 326,482
326,488
53 : 326,479
55 : 326,381
326,392
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